

# ENGINEERING REPORT

## Drainage Report

200<sup>th</sup> St Apartments  
Seattle, WA  
February 2026

**PREPARED FOR:**

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# Stormwater Drainage Report

200<sup>th</sup> St. Apartments  
Coughlin Porter Lundeen  
Project No. C24142  
February 2026

## TABLE OF CONTENTS

<b>I. PROJECT OVERVIEW .....</b>	<b>2</b>
<b>II. MINIMUM REQUIREMENTS.....</b>	<b>4</b>
MR1 (PREPARATION OF STORM WATER SITE PLANS) .....	4
MR2 (CONSTRUCTION STORM WATER POLLUTION PREVENTION PLAN).....	4
MR3 (SOURCE CONTROL OF POLLUTION).....	4
MR4 (PRESERVATION OF NATURAL DRAINAGE SYSTEM AND OUTFALLS).....	4
MR5 (ON-SITE STORM WATER MANAGEMENT).....	4
MR6 (RUNOFF TREATMENT).....	5
MR7 (FLOW CONTROL) .....	5
MR8 (WETLAND PROTECTION).....	5
MR9 (OPERATION AND MAINTENANCE) .....	5
<b>III. OFF-SITE ANALYSIS .....</b>	<b>6</b>
FIELD INSPECTION .....	6
DRAINAGE SYSTEM DESCRIPTIONS .....	6
UPSTREAM ANALYSIS.....	6
DOWNSTREAM ANALYSIS .....	6
<b>IV. FLOW CONTROL AND WATER QUALITY FACILITY ANALYSIS AND DESIGN.....</b>	<b>7</b>
EXISTING SITE HYDROLOGY .....	7
DEVELOPED SITE HYDROLOGY .....	7
FLOW CONTROL .....	9
WATER QUALITY .....	9
<b>APPENDIX A: SUPPORTING FIGURES .....</b>	<b>9</b>
FIGURE 1 – VICINITY MAP – VICINITY MAP .....	9
FIGURE 2 – EXISTING CONDITIONS.....	9
FIGURE 3 – PROPOSED CONDITIONS .....	9
FIGURE 4 – CITY OF LYNNWOOD CRITICAL AREAS MAP .....	9
FIGURE 5 – CITY OF LYNNWOOD WATERSHEDS MAP.....	9
FIGURE 6 – FLOW CHART FOR NEW DEVELOPMENT .....	9
FIGURE 7 – FLOW CHART FOR REDEVELOPMENT.....	9
FIGURE 8 – FLOW CHART FOR LID REQUIREMENTS .....	9
FIGURE 9 – UPSTREAM ANALYSIS MAP .....	9
FIGURE 10 – DOWNSTREAM ANALYSIS MAP .....	9
FIGURE 11 – NRCS SOIL MAP .....	9
<b>APPENDIX B: FLOW CONTROL AND WATER QUALITY CALCULATIONS .....</b>	<b>10</b>
<b>APPENDIX C: OPERATIONS AND MAINTENANCE MANUAL .....</b>	<b>11</b>
<b>APPENDIX D: GEOTECHNICAL REPORT .....</b>	<b>12</b>

## I. PROJECT OVERVIEW

### GENERAL DESCRIPTION

This Storm Drainage Report was written per the 2024 Department of Ecology Stormwater Management Manual for Western Washington.

200<sup>th</sup> St Apartments will be located at 5710-5720 200<sup>th</sup> St. SW, Lynwood, WA 98036. The site is in the SW ¼ of NW ¼ of Section 21, Township 27 N, Range 04E, Willamette Meridian. The site consists of three Snohomish County parcels (parcel numbers 00565300001501, 00565300001505, and 00565300001502). This 2.73-acre lot is bounded by residential apartment buildings to the west and south, 200<sup>th</sup> St SW to the north, and condominiums to the east.

The project will re-develop the existing site to include two new apartment buildings with associated utilities, landscaping and hardscaping as well as right of way improvements on 200<sup>th</sup> St. SW.

### PRE-DEVELOPED SITE CONDITIONS

The existing parcels are fully developed consisting of residential apartment buildings. The east parcel (00565300001501) was an existing apartment building with associated parking appurtenances and landscaping. The northwest parcel (00565300001505) was an apartment building(s) with associated parking appurtenances, landscaping, concrete sport court(s), play area with equipment, and pedestrian walkways. The southwest parcel (00565300001502) was an existing apartment building(s) and associated parking appurtenances and landscaping. All buildings on these three parcels have already been removed, with the structural slabs in place to reduce erosion. The total on-site impervious area is 81,327 sf (1.87 ac) and 37,484 sf (0.86 ac) of pervious area. The site currently drains to the 12" storm main within 200<sup>th</sup> St SW. Please see **Figure 2 – Existing Conditions** in Appendix A for the *Existing Conditions Map*.

The parcels drain to the city stormwater main eventually discharging to Scriber Creek within the Scriber Creek Basin. The site experiences mixed grades, with a ridge separating the east parcel from the two western parcels. The east parcel sheet flows to the northeast corner of the parcel, while the western parcels sheet flow towards the south and northeast corners. The low point of the site is observed in the northeast corner of the eastern parcel. Relatively steep slopes are observed around the western and eastern edges of the site, as well as the ridge between the eastern and western parcels. Existing rockery retaining walls are observed in these areas.


A geotechnical investigation and report titled *Housing Authority of Snohomish County Timberglen & Pinewood Redevelopment Geotechnical Engineering Report* was prepared by Ciani and Hatch Engineering. See Appendix D for additional details.

### POST-DEVELOPED SITE CONDITIONS

The proposed project encompasses the construction of two new apartment buildings. Site improvements will include site access roads, parking lots, pedestrian paths, and associated landscaping. The project will result in an impervious area of 85,455 SF (1.96 ac) and 33,356 SF (0.77 ac) of pervious area.

Site work is anticipated to include the installation of new below grade utilities, site grading and paving. New utility systems on the site will include water, sanitary sewer, stormwater drainage, power, and communication. Work in the right of way will include the removal of three existing driveways and construction of two new proposed driveways, and new proposed landscaping strips adjacent to the right of way. The project is proposing a 7.5 ft ROW dedication for the new proposed sidewalk.

Stormwater runoff from the project site will continue to drain to the 12" storm main in 200<sup>th</sup> St SW which ultimately discharges to Scriber Creek. The project will collect stormwater in onsite catch basins and roof downspouts. Runoff from pollution generating surfaces will sheet flow to be treated by on-site bioretention planters and modular wetland water quality facilities. Treated stormwater from bioretention planters and modular wetland facilities will



then be conveyed to a combination of onsite detention chambers and an onsite detention vault. Runoff from roof downspouts will be discharged directly into the two detention systems.

## **PROPOSED ONSITE STORMWATER INFRASTRUCTURE**

The 2024 DOE Western Washington Storm Water Manual outlines nine minimum requirements in section I-3 that must be addressed prior to permit approval. For this project, all minimum requirements will be applied to both new and replaced impervious surfaces based on our analysis of the “Flow Charts for Determining Requirements for New and Redevelopments” (See Appendix A, **Figure 7** for *Flow Chart for New Development Redevelopment* from Volume I Chapter 3 of the DOE SWMMWW).

A detailed description of the minimum requirements and the proposed onsite stormwater infrastructure is provided in the following section.

## II. MINIMUM REQUIREMENTS

The 2024 Stormwater Management Manual for Western Washington (SWMMWW) outlines nine minimum requirements that must be addressed prior to permit approval. For this project, all minimum requirements will be applied to both new and replaced impervious surfaces based on our analysis of the Flow Charts for Determining Minimum Requirements for New Projects. A summary of each of these minimum requirements, and the approach this project will take to address these requirements, are listed below.

### MR1 - PREPARATION OF STORM WATER SITE PLANS

Stormwater site plans and reports that address each of the applicable minimum requirements are prepared by a licensed civil engineer and included as part of the Site Development Permit.

### MR2 - CONSTRUCTION STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

A Construction Storm Water Pollution Prevention Plan was prepared as a separate document is included in Appendix E.

### MR3 - SOURCE CONTROL OF POLLUTION

Runoff from surface level pollution generating impervious surfaces (PGIS) will be treated prior to discharge into the public storm system. Source control BMPs will be selected, designed, and maintained in accordance with the DOE Manual. These include the following:

- S417 BMPs for Maintenance of Stormwater Drainage and Treatment Systems
- S421 BMPs for Parking and Storage of Vehicles and Equipment
- S411 BMPs for Landscaping and Lawn/Vegetation Management
- S442 BMPs for Labeling Storm Drain inlets on Your Property

### MR4 - PRESERVATION OF NATURAL DRAINAGE SYSTEM AND OUTFALLS

The proposed development will best match the existing basins and generally maintain drainage flow patterns from the northwest corner of the site to the northeast corner of the site. The site will continue to discharge to the existing storm main under 200<sup>th</sup> Street SW. The site does not discharge directly to a water body or creek.

### MR5 - ON-SITE STORM WATER MANAGEMENT

The project will employ On-site Stormwater Management to meet the requirements set forth in the 2019 Department of Ecology Stormwater Management Manual. Based on the analysis of Figure I-3.3 (See Appendix A for **Figure 8**) – *Flow Chart for Determining LID Requirements for Minimum Requirements (MR) #5* – On-site Stormwater Management, the project is required to evaluate the following BMP's under List NO. 2:

- **Surface Type: Lawn and Landscape Area:**
  - **BMP T5.13 Post-Construction Soil Quality and Depth:** All new landscaping will include 8" of compost amended soil.
- **Surface Type: Roofs:**
  - **BMP T5.30 Full Dispersion:** Dispersion is infeasible as the future buildings and site improvements do not allow sufficient space on site to provide a dispersion area.
  - **BMP T5.10A: Downspout Full Infiltration:** Full infiltration is infeasible because of the shallow groundwater table and presence of glacially consolidated soils per the geotechnical report and not enough space on site for infiltrating facilities.
  - **BMP T7.30: Bioretention:** The western roof being discharged to the detention vault below Building A will not have the elevations required to reach a bioretention planter before being discharged to the detention vault. Similarly, the eastern roof will not

- **BMP T5.30 Downspout Dispersion:** Downspout Dispersion is infeasible because there is not a sufficient flow path with native vegetation to create a downspout dispersion area.
- **BMP T5.15 Perforated Stub-out Connections:** Perforated stub-out connections are infeasible as the downspouts are located adjacent to paved surfaces and hard compacted surfaces that make maintenance of perforated stub-out connections infeasible.
- **Surface Type: Other Hard Surfaces:**
  - **BMP T5.30 Full Dispersion:** Dispersion is infeasible as the future buildings and site improvements do not allow sufficient space on site to provide a dispersion area.
  - **BMP T5.15 Permeable Pavements:** Based on a geotechnical analysis, the relatively shallow groundwater table and presence of glacially consolidated soils with moderate to high fines content render infiltration likely infeasible.
  - **BMP T7.30: Bioretention:** Bioretention will be used in planters around the site to treat runoff from the proposed parking lot and access drives.

## MR6 - RUNOFF TREATMENT

The 2024 Department of Ecology Standards includes requirements for water quality treatment. According to Section I-3.4.6 of the SWMM a project is required to provide water quality treatment if the amount of pollution generating impervious surface (PGIS) is greater than 5,000 square feet.

The new parking areas and access drives will result in a total PGIS of 42,503 sf. Bioretention planters and modular wetland facilities on the south end of the site will be utilized to treat any pollution generated surface runoff prior to site discharge.

## MR7 - FLOW CONTROL

The 2024 Department of Ecology Standards includes requirements for flow control. According to Section I-3.4.7 of the SWMMWW a project is required to provide flow control BMPs if the amount of impervious surfaces is greater than 10,000 square feet.

The fully developed site will include new buildings, parking lots, access drives, and pedestrian walkways with a total on-site impervious area of approximately 87,715 SF (2.01 ac). Flows from these impervious areas will be collected and detained in a detention vault located under the western building and detention chambers located under the eastern parking lot prior to site discharge to the 12" storm drain main in 200<sup>th</sup> St SW.

All flow control methods will be sized to meet Department of Ecology performance standards.

## MR8 - WETLAND PROTECTION

This requirement is not applicable since there are no existing wetlands or wetland buffers within the project area or downstream of the project site.

## MR9 - OPERATION AND MAINTENANCE

An Operations and Maintenance (O&M) Manual will be included at a later date in Appendix C of this report. The O&M Manual will remain on file with the project owner after completion to inform the property manager of maintenance requirements.

### III. OFF-SITE ANALYSIS

#### FIELD INSPECTION

Field inspection information to be included at a later date.

#### DRAINAGE SYSTEM DESCRIPTIONS

200<sup>th</sup> St Apartments are located within the Scriber Creek Basin (See Figure 5 – City of Lynwood Watershed).

The existing onsite stormwater infrastructure consists of a private stormwater collection system of catch basins. On-site catch basins generally convey stormwater runoff to the northeast corner of the site. Runoff that is not picked up in the onsite conveyance system generally sheet flows to the northeast corner of the site where it is picked up by an existing catch basin. Stormwater is then conveyed to the existing 12" storm main in 200<sup>th</sup> St SW north of the site.

Bioretention and modular wetland water quality units will be used on-site to treat flows from the proposed apartment building parking lot(s) and access drive(s). A detention system will collect treated run-off from the site and provide flow control prior to discharging to the city main.

#### UPSTREAM ANALYSIS

Per the available Lynnwood Arc GIS map, runoff from the upstream sites to the west and north flow onto the 200<sup>th</sup> St Apartments project site or are collected on the northern side of 200<sup>th</sup> St SW by catch basins and conveyed into the 12" storm main in 200<sup>th</sup> St SW. Unconnected storm drain manholes are shown on the western upstream adjacent apartment complex, demonstrating private unrecorded conveyance systems may collect water and send to 12" storm main in 200<sup>th</sup> St SW as well. Runoff from the adjacent condominium complex to the east of the site is collected by a series of onsite inlets and catch basin and conveyed to the 12" storm main in 200<sup>th</sup> St SW as well as a 12" storm main in the northern portion of 56<sup>th</sup> Ave W. Runoff from the apartment complex to the south is collected by on-site catch basins and conveyed to a 12" storm main in 202<sup>nd</sup> St SW. See **Figure 9 – Upstream Analysis Map**.

The project does not propose any modifications to the drainage patterns upstream of the site.

#### DOWNSTREAM ANALYSIS

Runoff from the site will discharge to the existing 12" stormwater main in 200<sup>th</sup> St SW located north of the site. Stormwater will continue to flow east through the 12" concrete storm main in 200<sup>th</sup> St SW for approximately 100 ft. The 12" concrete storm main discharges to an 18" corrugated metal pipe to the north that transitions runoff into an existing ditch. The ditch conveys runoff further north to a catch basin on the southern edge of 198<sup>th</sup> St SW where it enters a 15" concrete pipe. The 15" concrete pipe conveys water beneath 198<sup>th</sup> St SW. On the northern edge of 198<sup>th</sup> St SW the runoff enters an 18" concrete pipe that connects to a 30" concrete pipe in Scriber Lake Park. Finally, runoff enters Scriber Creek via the portion that runs through Scriber Lake Park. Exact connection from storm system to Scriber Creek via Scriber Lake Park unclear through Arc GIS, likely conveyed via an existing storm pipe to the creek. See **Figure 10 – Downstream Analysis Map**.

## IV. FLOW CONTROL AND WATER QUALITY FACILITY ANALYSIS AND DESIGN

### EXISTING SITE HYDROLOGY

The development is concentrated on an existing site totaling 2.78 acres and includes existing structures, hardscape, and associated landscaping. Proposed right-of-way work prior to dedication occurs on 0.07 acres of land, with runoff draining into the ROW and discharging to city mains. The existing onsite and ROW conditions can be seen in **Figure 2 – Existing Conditions Map** in Appendix A.

Table 1 – Existing On-site Area	
Area Type	Area
<i>Units</i>	<i>Square Feet (Acres)</i>
<b>PGIS</b>	46,200 (1.07)
<b>NPGIS</b>	7,687 (0.18)
<b>Roof</b>	27,440 (0.63)
<b>Pervious</b>	37,484 (0.77)
<b>Total</b>	<b>118,811 (2.73)</b>

Table 3 – Existing ROW Area	
Area Type	Area
<i>Units</i>	<i>Square Feet (Acres)</i>
<b>PGIS</b>	2,446 (0.06)
<b>NPGIS</b>	1,454 (0.03)
<b>Pervious</b>	1,799 (0.04)
<b>Total</b>	<b>5,699 (0.13)</b>

### DEVELOPED SITE HYDROLOGY

The project includes the construction of new apartment buildings with associated parking areas, access drives, landscaping and utilities (water, sanitary sewer, and stormwater). Runoff from the western portion of the parking lot will be collected by on-site catch basins and conveyed through modular wetland water quality facilities to a proposed on-site detention vault. Runoff from the western apartment building will be collected via roof downspouts and conveyed directly to a proposed on-site detention vault. Runoff from the eastern and southern parking lots will be collected through a combination of onsite catch basins and sheet flow to bioretention facilities for water quality and then conveyed to a proposed on-site detention chamber system. Runoff from the eastern apartment building will be collected via roof downspouts and conveyed directly to a proposed on-site chamber detention system. Runoff will be discharged from the on-site detention systems via control structure(s) into the 12" storm main in

200<sup>th</sup> St SW. See Table 3 and 4 below for a general breakdown of on-site and ROW proposed areas. A more detailed breakdown of area discharge locations will be provided at a later date.

<b>Table 3 – Proposed On-site Area</b>	
<b>Area Type</b>	<b>Area</b>
<i>Units</i>	<i>Square Feet (Acres)</i>
<b>PGIS</b>	42,140 (0.97)
<b>NPGIS</b>	12,732 (0.29)
<b>Roof</b>	30,583 (0.70)
<b>Pervious</b>	33,356 (0.77)
<b>Total</b>	<b>118,811 (2.73)</b>

<b>Table 4 – Proposed ROW Area</b>	
<b>Area Type</b>	<b>Area</b>
<i>Units</i>	<i>Square Feet (Acres)</i>
<b>PGIS</b>	2,317 (0.05)
<b>NPGIS</b>	2,091 (0.05)
<b>Pervious</b>	1,291 (0.03)
<b>Total</b>	<b>5,699 (0.13)</b>

The proposed onsite and ROW conditions can be seen in **Figure 3 – Proposed Conditions** in Appendix A.

## **FLOW CONTROL**

The project proposes over 10,000 SF of new and replaced impervious area and therefore is required to match predeveloped forested conditions. Stormwater from the proposed buildings and surrounding impervious area will be conveyed to two detention facilities, consisting of a vault under the western building and chambers beneath the eastern parking lot. Sizing calculations for both systems will be included in this report for the Engineering Development Permit submittal.

The capacity of the chamber system will be evaluated using WWHM software at a later date to confirm the size of detention facilities are in compliance with DOE standards. The calculations for the detention facilities are to be included in Appendix B at a later date.

## **WATER QUALITY**

This project includes parking lots and corresponding access drives, subject to pollutants generated by cars, therefore this project will provide water quality runoff treatment. Pollution generating flows from the western portion of the parking lot and access drive will be conveyed to modular wetland water quality system prior to being collected in the detention system. Pollution generating flows for the southern and eastern portions of the parking lot and access drive will be conveyed and sheet flowed to bioretention planters for water quality treatment prior to discharge to onsite detention. The water quality treatment units and planters have been sized based on the tributary area that flows directly to each facility. Sizing calculations for these systems will be included in this report for the Engineering Development Permit submittal.

WWHM models will be used at a later date to analyze and confirm the tributary areas to each water quality unit to ensure each unit meets the required runoff treated. The modular wetland systems will be sized by the manufacturer based on the water quality flow rates to be provided by calculation in WWHM.

## **APPENDIX A: SUPPORTING FIGURES**

**FIGURE 1 – VICINITY MAP**

**FIGURE 2 – EXISTING CONDITIONS**

**FIGURE 3 – PROPOSED CONDITIONS**

**FIGURE 4 – CITY OF LYNNWOOD CRITICAL AREAS MAP**

**FIGURE 5 – CITY OF LYNNWOOD WATERSHEDS MAP**

**FIGURE 6 – FLOW CHART FOR NEW DEVELOPMENT**

**FIGURE 7 – FLOW CHART FOR REDEVELOPMENT**

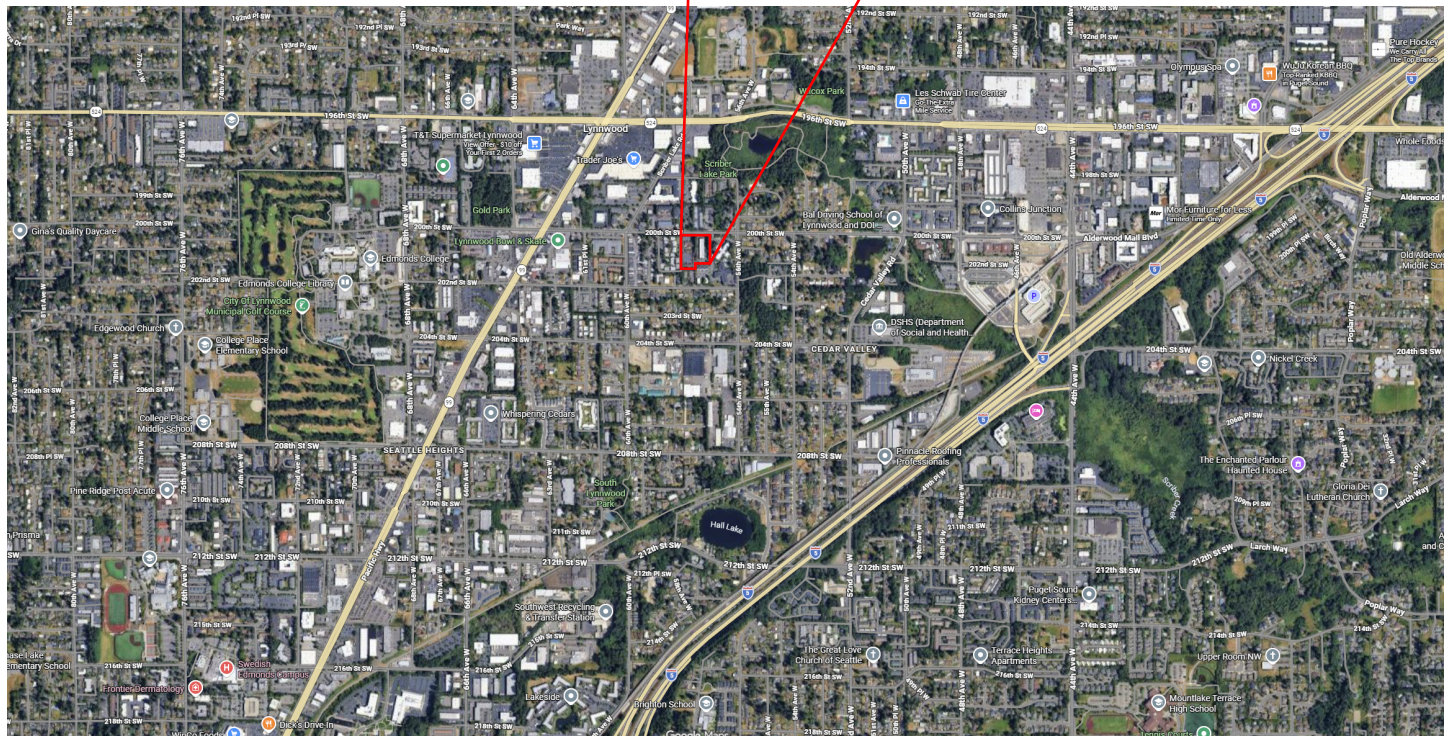
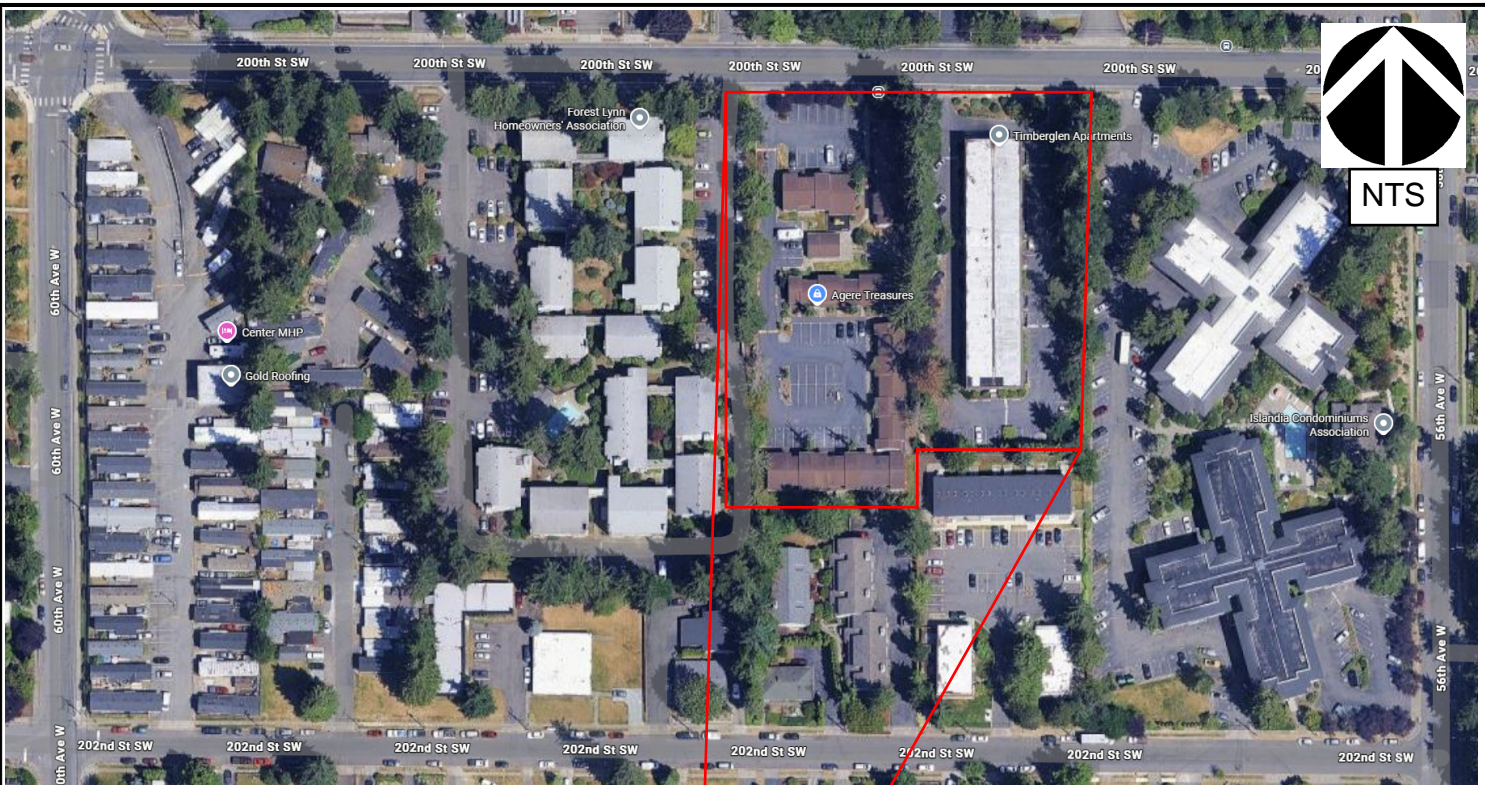
**FIGURE 8 – FLOW CHART FOR LID REQUIREMENTS**

**FIGURE 9 – UPSTREAM ANALYSIS MAP**

**FIGURE 10 – DOWNSTREAM ANALYSIS MAP**

**FIGURE 11 – NRCS SOIL MAP – TO BE PROVIDED AT A LATER DATE**

**FIGURE 12 – WATER QUALITY MAP – TO BE PROVIDED AT A LATER DATE**



**FIGURE 1**  
**VICINITY MAP**

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Project: 200th St Apartment

Designed By: LMM

Date: 02/19/2026

Project No: C24142

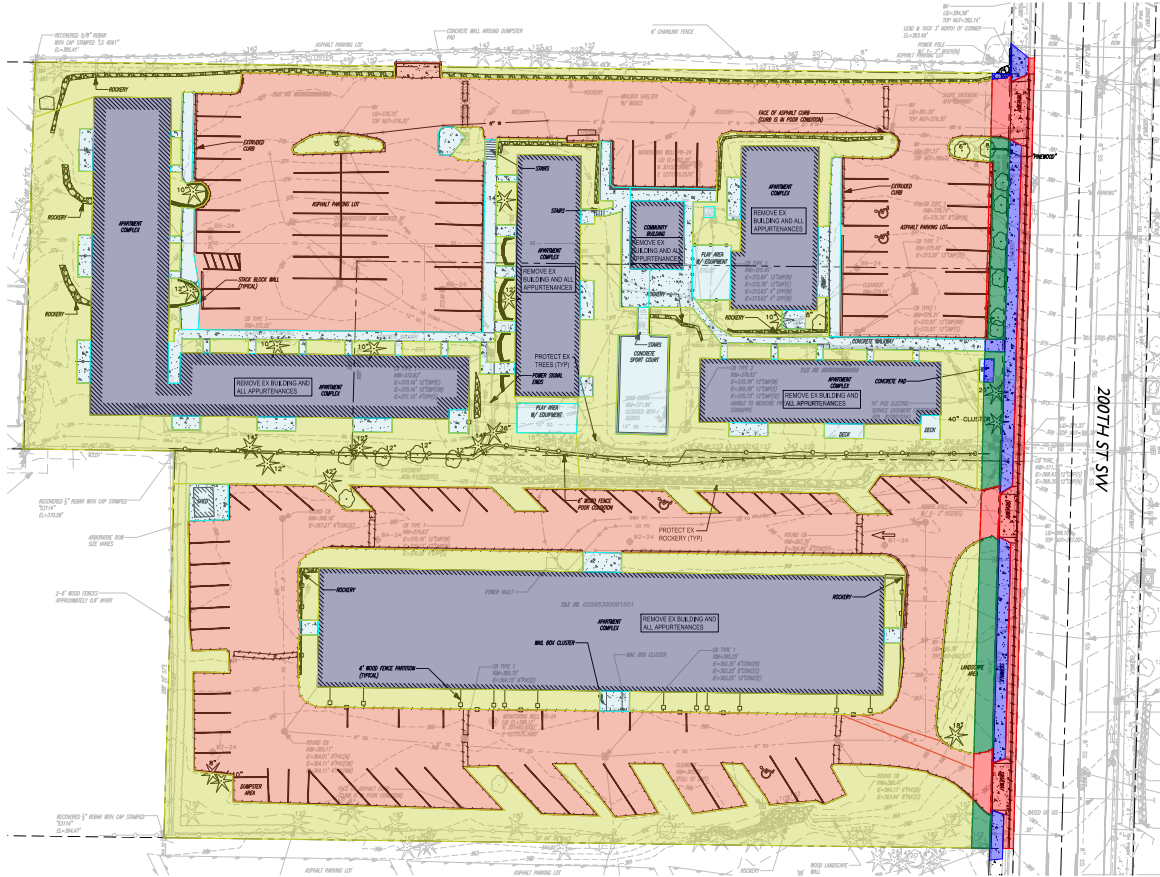
Client:

Checked By:

Sheet:



SCALE : 1" = 80'



Legend		
Description	Quantity	Unit
NPGIS	7,687	sf
Pervious	37,484	sf
PGIS	46,200	sf
Roof	27,440	sf
ROW NPGIS	1,454	sf
ROW Pervious	1,799	sf
ROW PGIS	2,446	sf
TOTAL ON-SITE AREA = 118,811 SF		
TOTAL ROW AREA = 5,699 SF		

**FIGURE 2**  
**EXISTING CONDITIONS**

Project: 200th St Apartments

Designed By: LMM

Date: 02/19/2026

Project No: C24142

Client:

Checked By:

Sheet:



SCALE : 1" = 80'



Legend			
	Description	Quantity	Unit
	NPGIS	12,732	sf
	PERVIOUS	33,356	sf
	PGIS	42,140	sf
	ROOF	30,583	sf
	ROW NPGIS	2,091	sf
	ROW PERVIOUS	1,291	sf
	ROW PGIS	2,317	sf
TOTAL ON-SITE AREA = 118,811 SF			
TOTAL ROW AREA = 5,699 SF			

**FIGURE 3**  
**PROPOSED CONDITIONS**

Project: 200th St Apartments

Designed By: LMM

Date: 02/19/2026

Project No: C24142

Client:

Checked By:

Sheet:



**ENVIRONMENTALLY  
 CRITICAL AREAS INVENTORY**

**Native Growth  
 Protection Areas**

**Legend**

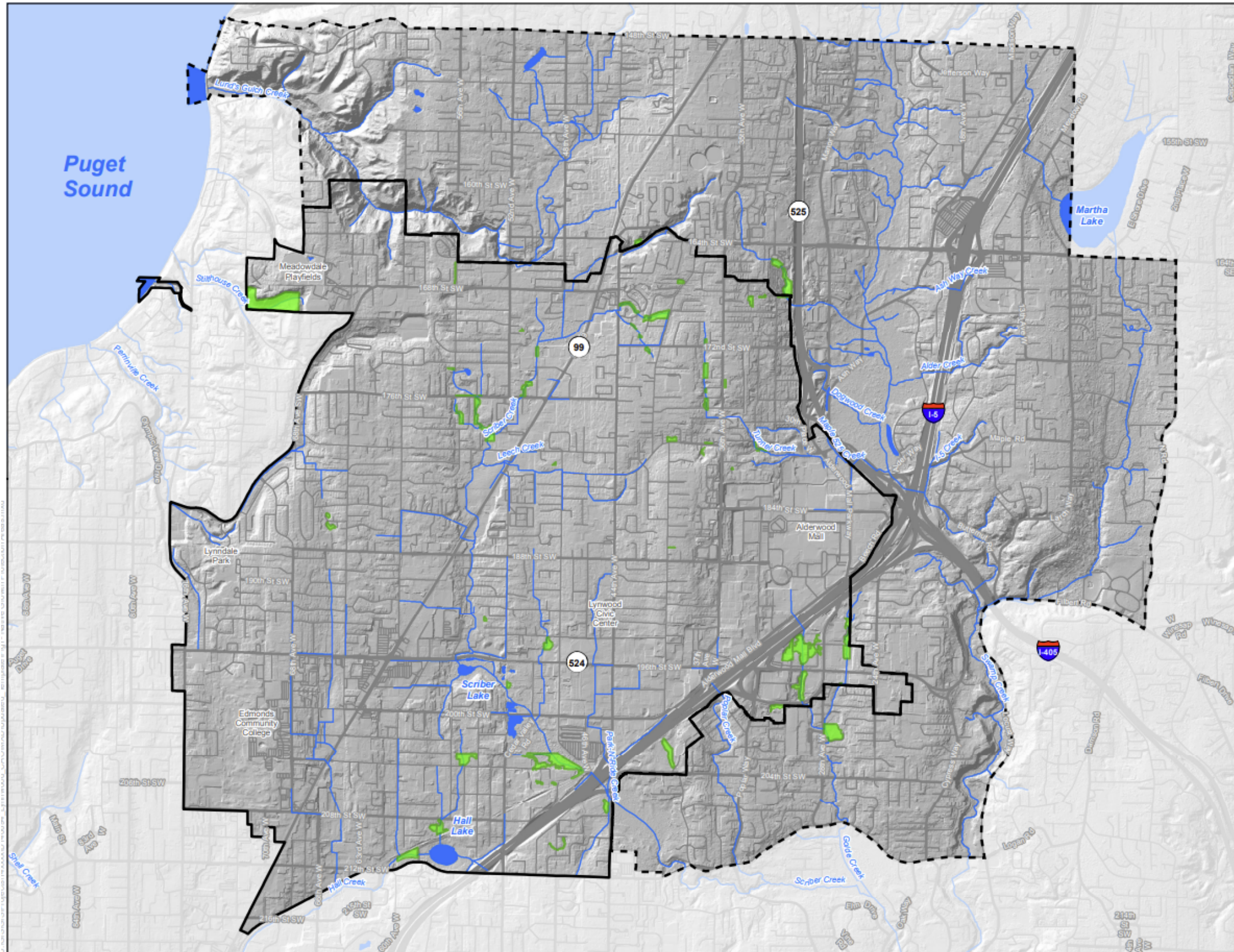
- Native Growth Protection Area
- Stream
- City Limits
- Municipal Urban Growth Area
- Water Body



SOURCE: Snohomish County, 2013; City of Lynnwood, 2014; ESA, 2016; Puget Sound LIDAR Consortium, 2003

This figure is intended for planning purposes only. Environmentally critical areas layers depicted in this figure are based on available City of Lynnwood, Snohomish County, and Washington State inventory information, and do not represent surveyed boundaries. The City makes no representation or warranty as to this product's accuracy or location of any mapped features. For more information, contact the City of Lynnwood.

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**ENVIRONMENTALLY  
CRITICAL AREAS INVENTORY**

**Wetlands**

**Legend**

- Wetlands
- Stream
- City Limits
- Municipal Urban Growth Area
- Water Body



SOURCE: Snohomish County, 2013; City of Lynnwood, 2014; ESA, 2016; Puget Sound LIDAR Consortium, 2003

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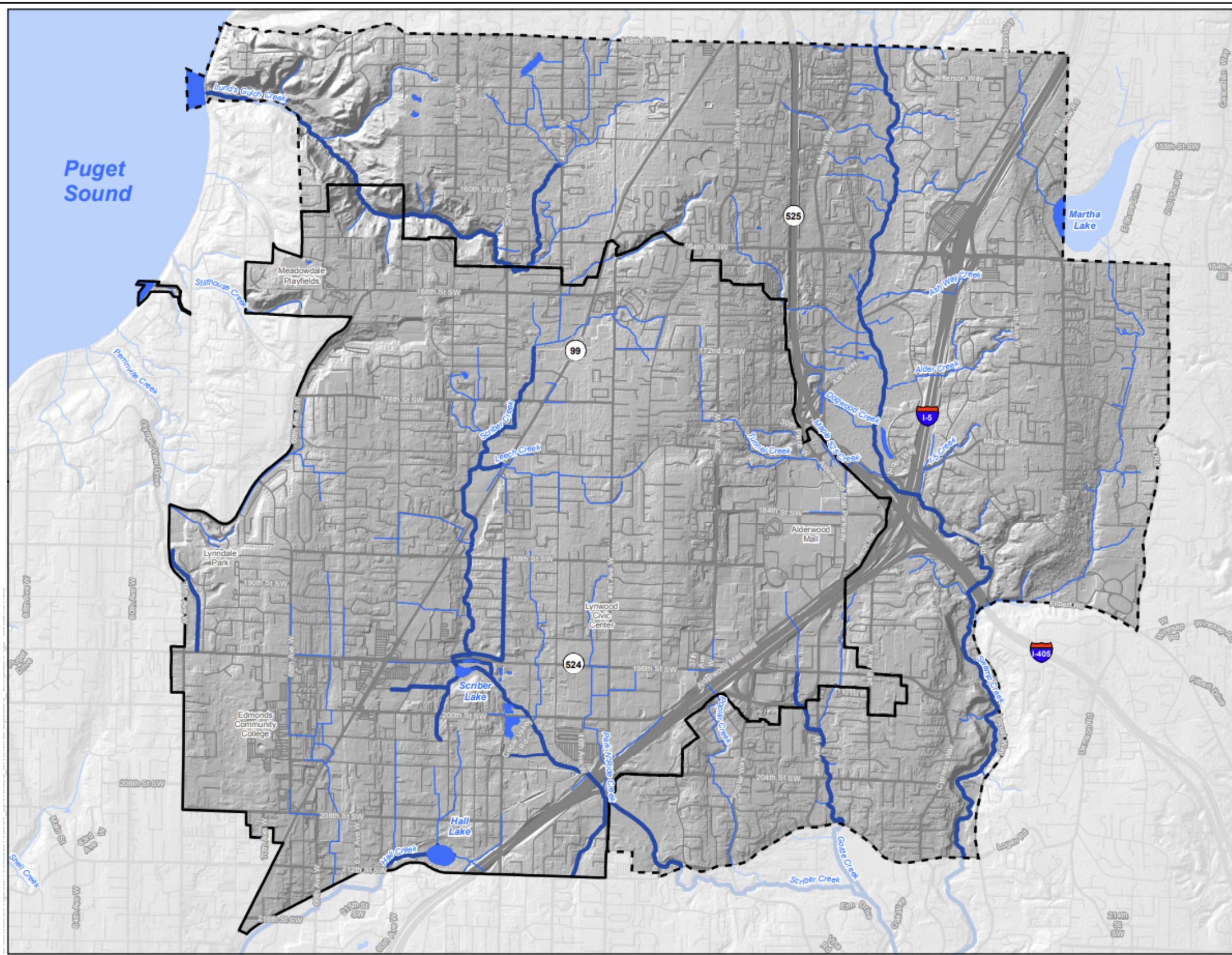
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**ENVIRONMENTALLY  
 CRITICAL AREAS INVENTORY**

**Streams**



**Legend**

- Type F Stream (Fish Bearing)
- Untyped Stream
- City Limits
- Municipal Urban Growth Area
- Water Body



SOURCE: Snohomish County, 2013; City of Lynnwood, 2014; ESA, 2016; Puget Sound LIDAR Consortium, 2003

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**ENVIRONMENTALLY  
CRITICAL AREAS INVENTORY**

**Geologically Hazardous  
Areas**

**Legend**

- Steep Slopes (City Inventory)
- Steep Slopes (2016 LIDAR Analysis)
- Potential Erosion Hazard Areas
- Potential Landslide Hazard Areas
- Seismic Hazard Areas
- Stream
- City Limits
- Municipal Urban Growth Area
- Water Body

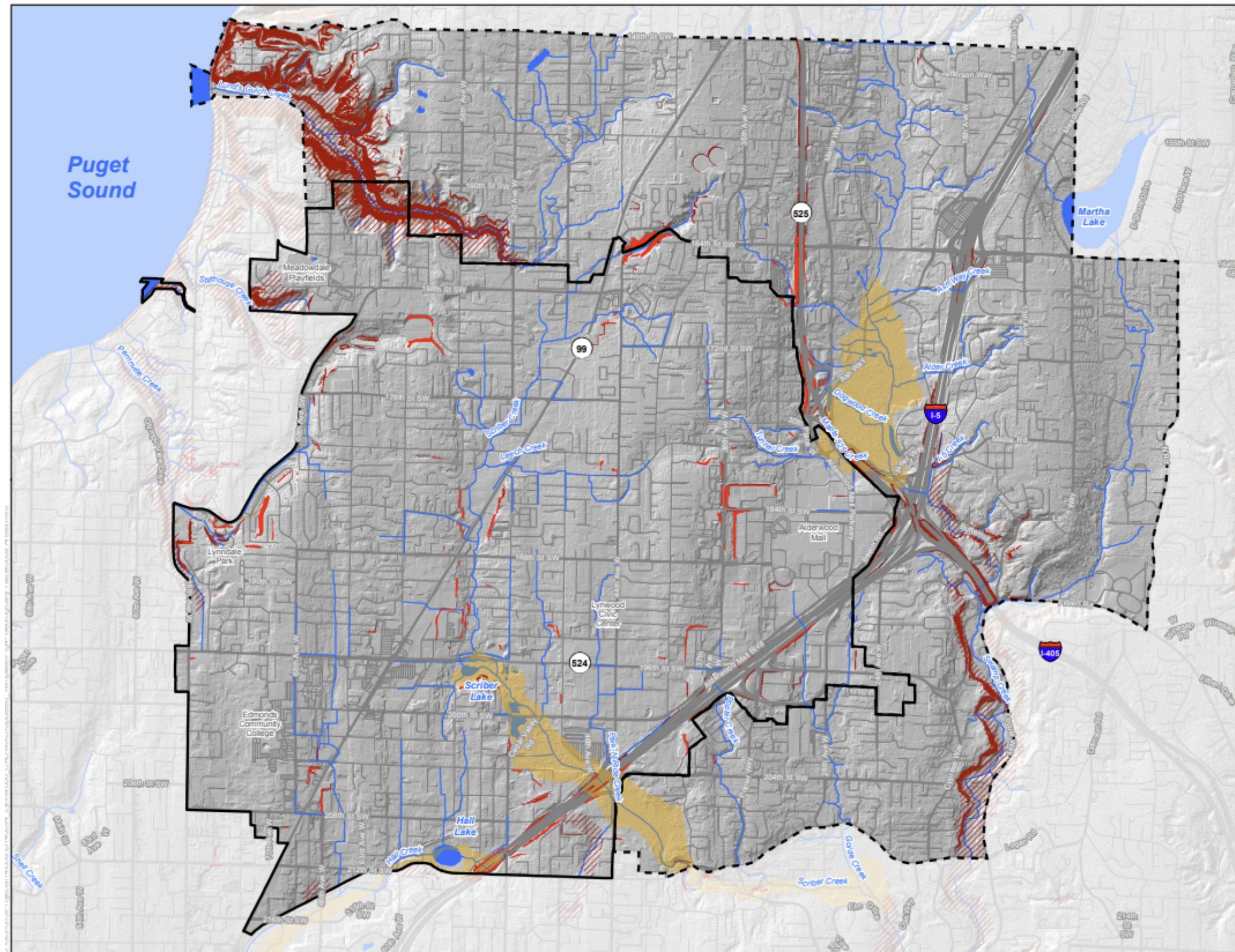
0 0.5 Miles



SOURCE: Steep Slopes - ESA, 2016; City of Lynnwood, 2014; Potential Erosion Hazard Areas and Potential Landslide Hazard Areas - Snohomish County, 2013; Seismic Hazard Areas - WDNR, 2004; Puget Sound LiDAR Consortium, 2003

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**ENVIRONMENTALLY  
CRITICAL AREAS INVENTORY**

**Frequently Flooded  
Areas**

**Legend**

-  Floodplain
-  Floodway
-  Stream
-  City Limits
-  Municipal Urban Growth Area
-  Water Body

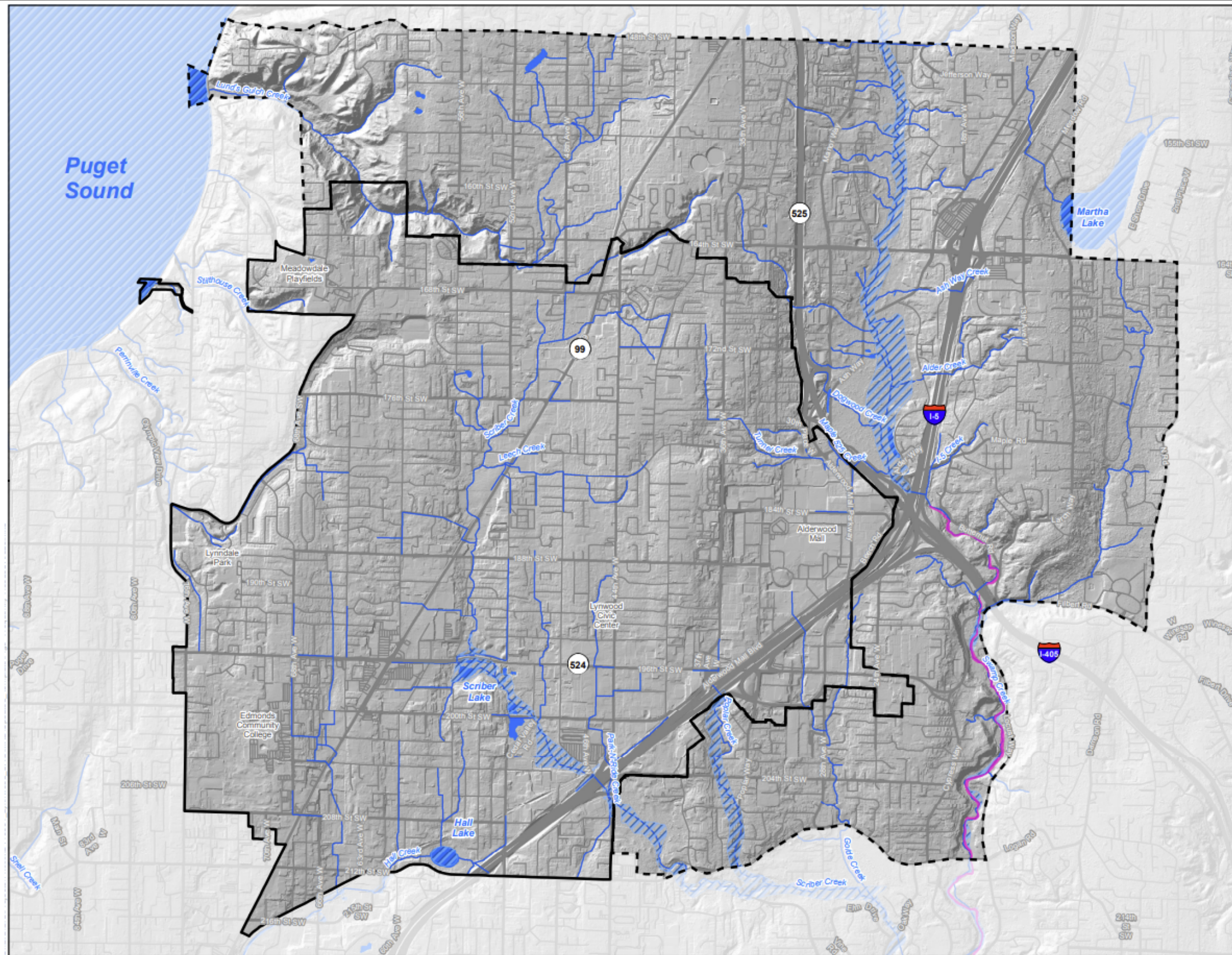
0 0.5 Miles



SOURCE: FEMA, 1999; ESA, 2016; Puget Sound LIDAR Consortium, 2003

This figure is intended for planning purposes only. Environmentally critical areas layers depicted in this figure are based on available City of Lynnwood, Snohomish County, and Washington State inventory information, and do not represent surveyed boundaries. The City makes no representation or warranty as to this product's accuracy or location of any mapped features. For more information, contact the City of Lynnwood.

**DRAFT**



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Project: \_\_\_\_\_

Project No: \_\_\_\_\_ Date: \_\_\_\_\_

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**ENVIRONMENTALLY  
CRITICAL AREAS INVENTORY**

**Critical Aquifer  
Recharge Areas**

**Legend**

**USGS Aquifer Sensitivity**

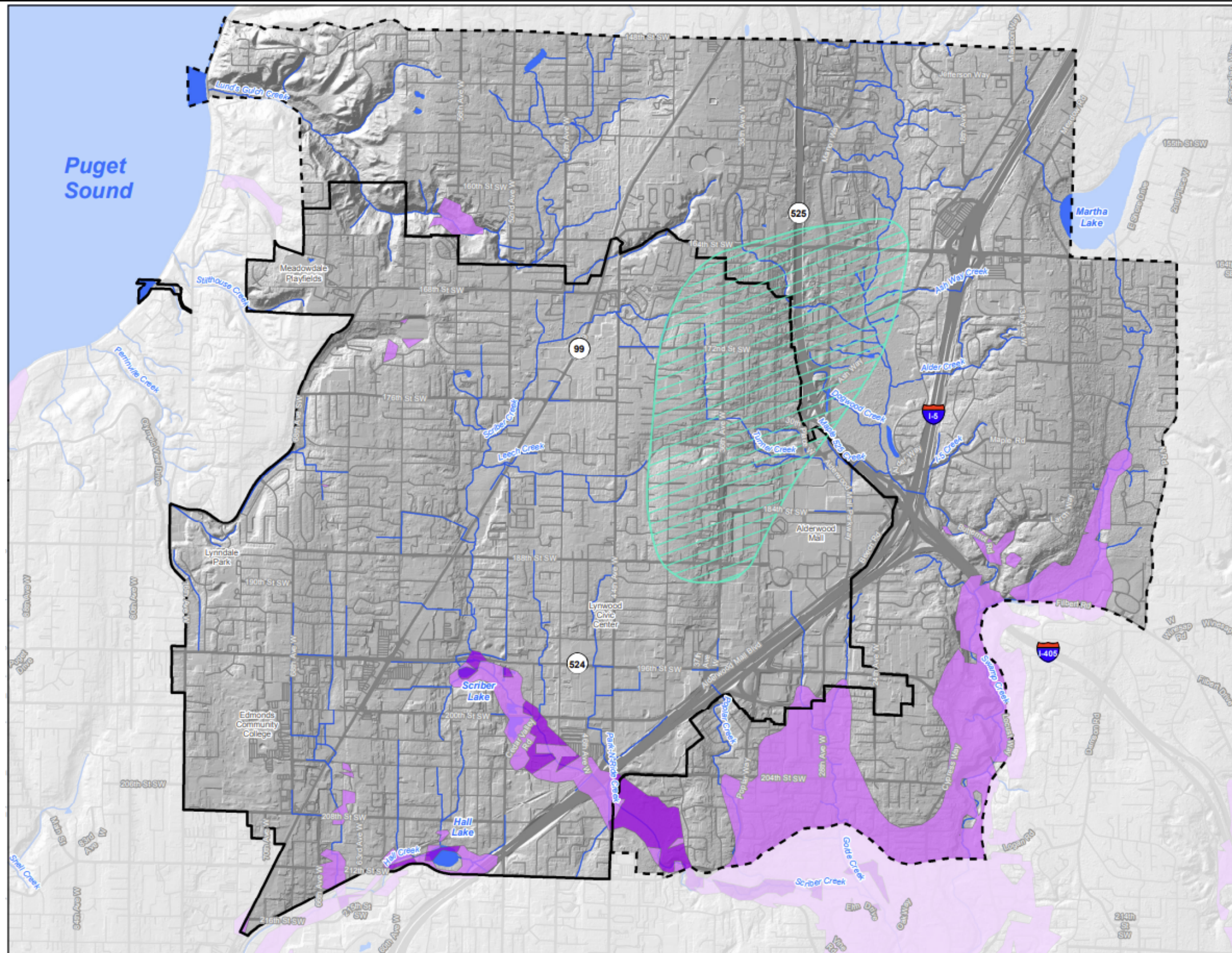
- Moderate, 40 to 100 ft Deep
- High, 0 to 40 ft Deep
- Wellhead Protection Area for 164th Street Artesian Well
- Stream
- City Limits
- Municipal Urban Growth Area
- Water Body



SOURCE: USGS, 1997; Washington Department of Health, 2001; Snohomish Health District, 2001; ESA, 2016; Puget Sound LIDAR Consortium, 2003

This figure is intended for planning purposes only. Environmentally critical areas layers depicted in this figure are based on available City of Lynnwood, Snohomish County, and Washington State inventory information, and do not represent surveyed boundaries. The City makes no representation or warranty as to this product's accuracy or location of any mapped features. For more information, contact the City of Lynnwood.

**DRAFT**



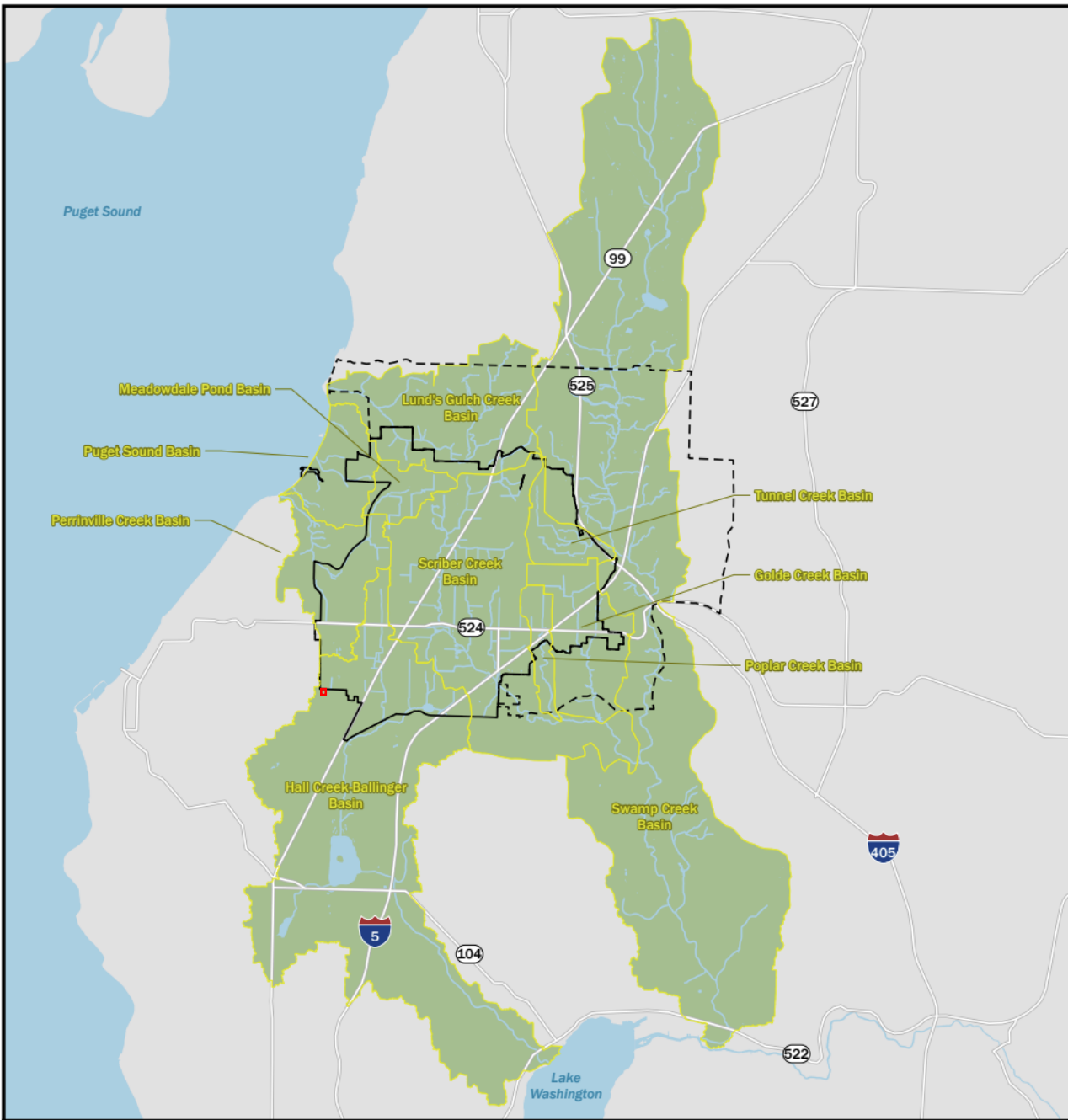
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**Legend**

- Watersheds/Basins
- Lynnwood City Limits
- Lynnwood UGA
- Waterbodies
- Streams
- Roads

**City of Lynnwood Watersheds for Stormwater Management Action Planning (SMAP)**



0 0.5 1 2 Miles



City of Lynnwood

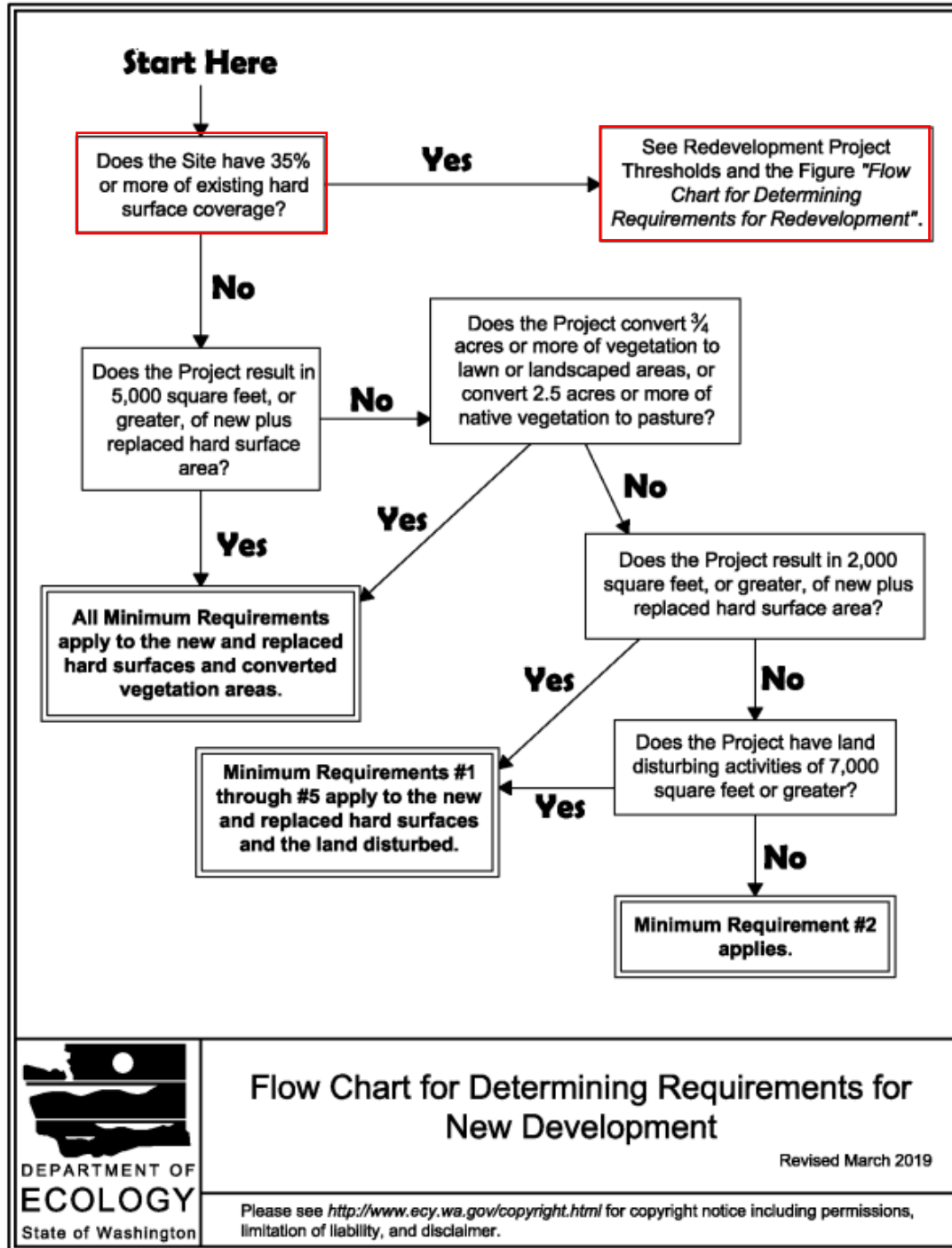
\\SEA-FILE-GIS01\gk\Projects\2022\22-07808-000\ArcPro\Lynnwood\_SMAP\Lynnwood\_SMAP\_Arty.aprx\Lynnwood\_Watersheds\_Figure\_1 Date Exported: 3/28/2022 9:40 AM

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Project: \_\_\_\_\_

Project No: \_\_\_\_\_ Date: \_\_\_\_\_

**Figure I-3.1: Flow Chart for Determining Requirements for New Development**



**Flow Chart for Determining Requirements for New Development**

Revised March 2019

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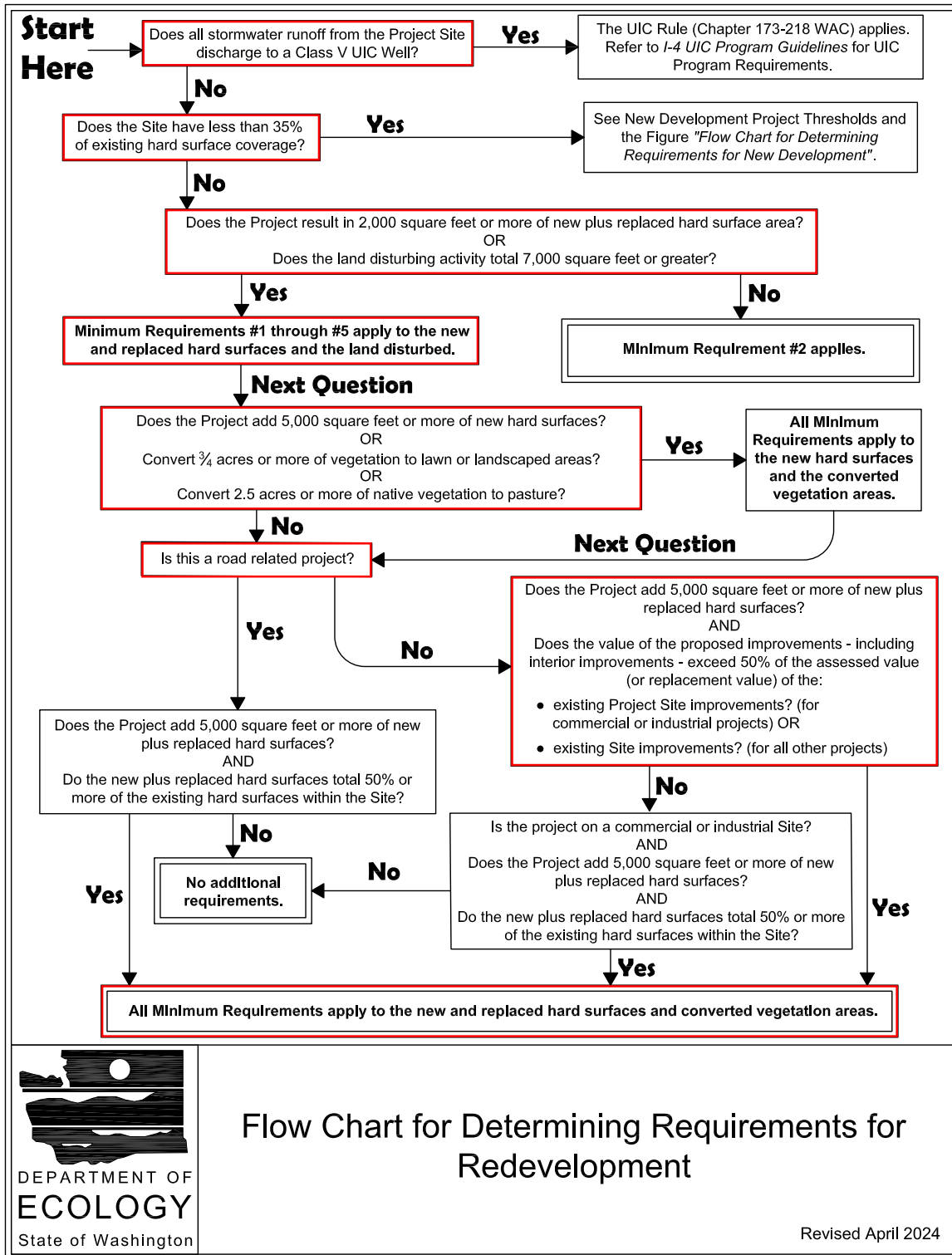
**FIGURE 6**

**FLOW CHART FOR NEW DEVELOPMENT**

Project: 200th St Apartments      Designed By: LMM      Date: 02/19/2026

Project No: C24142      Client:      Checked By:      Sheet:

**Figure I-3.2: Flow Chart for Determining Requirements for Redevelopment**



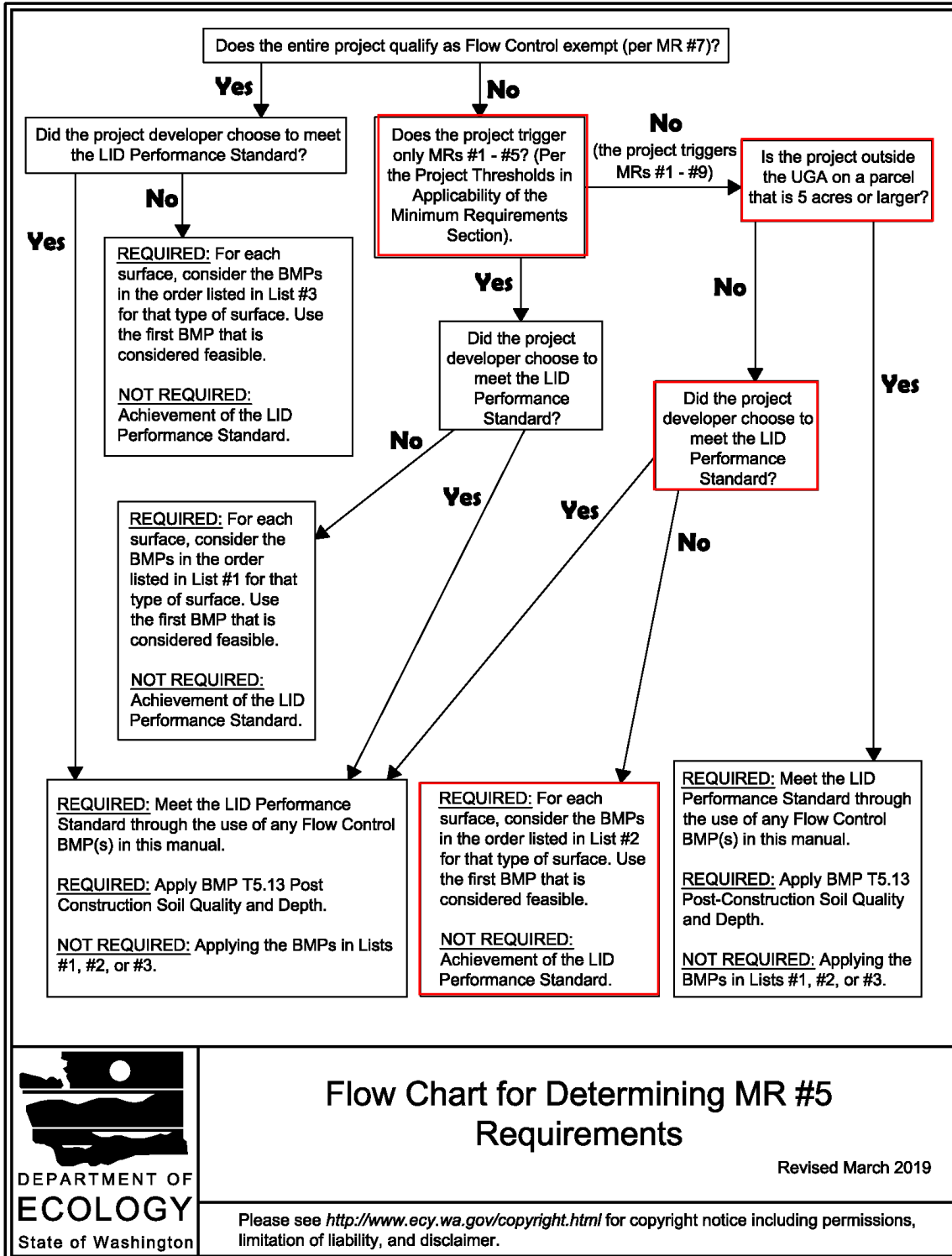
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**FIGURE 7**  
**FLOW CHART FOR REDEVELOPMENT**

Project: 200th St Apartments      Designed By: LMM      Date: 02/19/2026

Project No: C24142      Client:      Checked By:      Sheet:

**Figure I-3.3: Flow Chart for Determining MR #5 Requirements**



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**FIGURE 8**

**FLOW CHART FOR LID REQUIREMENTS**

Project: 200th St Apartments

Designed By: LMM

Date: 02/19/2026

Project No: C24142

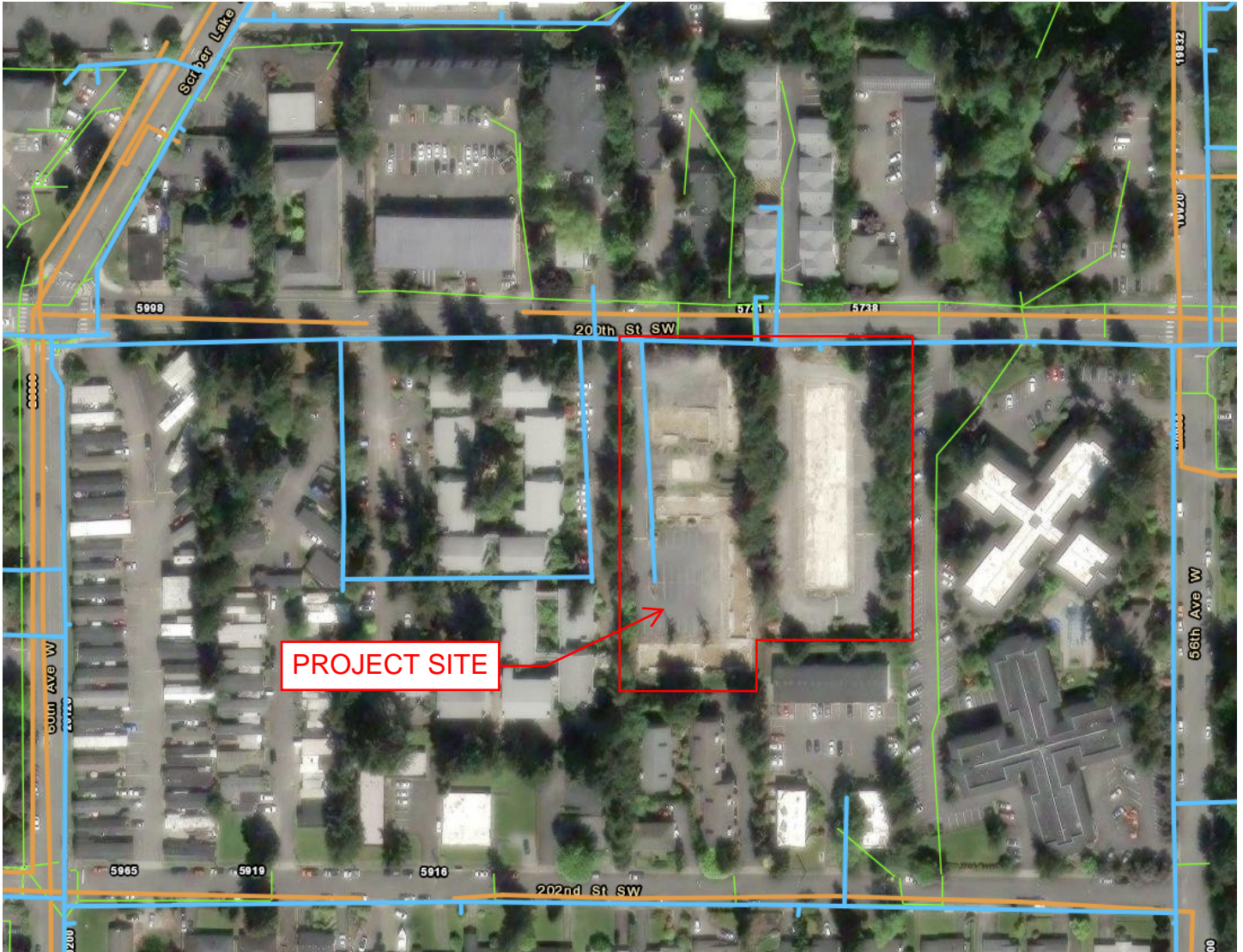
Client:

Checked By:

Sheet:



SCALE : NTS



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**FIGURE 9**

**UPSTREAM ANALYSIS MAP**

Project: 200th St Apartments

Designed By: LMM

Date: 02/19/2026

Project No: C24142

Client:

Checked By:

Sheet:



SCALE : NTS



- STORM MAIN LINES
- DOWNSTREAM RUNOFF PATH

**FIGURE 10**  
**DOWNSTREAM ANALYSIS MAP**

Project: 200th St Apartments

Designed By: LMM

Date: 02/19/2026

Project No: C24142

Client:

Checked By:

Sheet:



## APPENDIX B: FLOW CONTROL AND WATER QUALITY CALCULATIONS

To be provided at a later date.



## APPENDIX C: OPERATIONS AND MAINTENANCE MANUAL

To be provided at a later date.



APPENDIX D: GEOTECHNICAL REPORT (INCLUDED SEPARATELY)



APPENDIX E – STORMWATER POLLUTION PREVENTION PLAN  
(SWPPP)

Construction Stormwater General Permit (CSWGP)

# Stormwater Pollution Prevention Plan (SWPPP)

for  
200<sup>th</sup> St Apartments

Prepared for:  
Department of Ecology  
*Northwest Region*

Permittee / Owner	Developer	Operator / Contractor
Housing Association of Snohomish County	Housing Association of Snohomish County	Walsh Construction

5710 & 5720 200<sup>th</sup> St SW, Lynnwood, WA 98036

### Certified Erosion and Sediment Control Lead (CESCL)

Name	Organization	Contact Phone Number
TBD	TBD	TBD

### SWPPP Prepared By

Name	Organization	Contact Phone Number
Lindsey McNulty	Coughlin Porter Lundeen	206-343-0460

### SWPPP Preparation Date

February 2026

### Project Construction Dates

Activity / Phase	Start Date	End Date
Construction	December 2026	December 2028

## List of Acronyms and Abbreviations

<b>Acronym / Abbreviation</b>	<b>Explanation</b>
<b>303(d)</b>	Section of the Clean Water Act pertaining to Impaired Waterbodies
<b>BFO</b>	Bellingham Field Office of the Department of Ecology
<b>BMP(s)</b>	Best Management Practice(s)
<b>CESCL</b>	Certified Erosion and Sediment Control Lead
<b>CO<sub>2</sub></b>	Carbon Dioxide
<b>CRO</b>	Central Regional Office of the Department of Ecology
<b>CSWGP</b>	Construction Stormwater General Permit
<b>CWA</b>	Clean Water Act
<b>DMR</b>	Discharge Monitoring Report
<b>DO</b>	Dissolved Oxygen
<b>Ecology</b>	Washington State Department of Ecology
<b>EPA</b>	United States Environmental Protection Agency
<b>ERO</b>	Eastern Regional Office of the Department of Ecology
<b>ERTS</b>	Environmental Report Tracking System
<b>ESC</b>	Erosion and Sediment Control
<b>GULD</b>	General Use Level Designation
<b>NPDES</b>	National Pollutant Discharge Elimination System
<b>NTU</b>	Nephelometric Turbidity Units
<b>NWRO</b>	Northwest Regional Office of the Department of Ecology
<b>pH</b>	Power of Hydrogen
<b>RCW</b>	Revised Code of Washington
<b>SPCC</b>	Spill Prevention, Control, and Countermeasure
<b>su</b>	Standard Units
<b>SWMMEW</b>	Stormwater Management Manual for Eastern Washington
<b>SWMMWW</b>	Stormwater Management Manual for Western Washington
<b>SWPPP</b>	Stormwater Pollution Prevention Plan
<b>TESC</b>	Temporary Erosion and Sediment Control
<b>SWRO</b>	Southwest Regional Office of the Department of Ecology
<b>TMDL</b>	Total Maximum Daily Load
<b>VFO</b>	Vancouver Field Office of the Department of Ecology
<b>WAC</b>	Washington Administrative Code
<b>WSDOT</b>	Washington Department of Transportation
<b>WWHM</b>	Western Washington Hydrology Model

## Project Information (1.0)

Project/Site Name: 200<sup>th</sup> St Apartments  
Street/Location: 5710-5720 200<sup>th</sup> St SW  
City: Lynnwood State: WA Zip code: 98036  
Subdivision:  
Receiving waterbody: Scriber Creek

## Existing Conditions (1.1)

Total acreage (including support activities such as off-site equipment staging yards, material storage areas, borrow areas).

Total acreage: [Insert text here]

Disturbed acreage: 2.86 acres

Existing structures: 0.63 acres

Landscape topography: Approximately 0.90 acres of existing pervious surface

Drainage patterns: The site generally slopes from the northwest and southwest corners to the north east with a maximum elevation of 385 ft and a minimum elevation of 360 ft. The site experiences mixed grades, with steep slopes around the eastern and western edges as well as at the property line between the eastern and western parcels. Existing rockery retaining walls are observed in these areas.

Existing Vegetation: 0.90 acres of existing pervious surface

Critical Areas (wetlands, streams, high erosion risk, steep or difficult to stabilize slopes):  
No critical area identified on-site

List of known impairments for 303(d) listed or Total Maximum Daily Load (TMDL) for the receiving waterbody:

Category 5: Total Phosphorous, Benthic Macroinvertebrates Bioassessments, and Bacteria - Fecal Coliform

Table 1 includes a list of suspected and/or known contaminants associated with the construction activity.

**Table 1 – Summary of Site Pollutant Constituents**

<b>Constituent (Pollutant)</b>	<b>Location</b>	<b>Depth</b>	<b>Concentration</b>
[Insert Text]	[Insert Text]	[Insert Text]	[Insert Text]

**Proposed Construction Activities (1.2)**

Description of site development (example: subdivision):

The site development will construct two new apartment buildings with associated landscaping and hardscaping including access drives, parking lots, and pedestrian walkways, .

Description of construction activities (example: site preparation, demolition, excavation):

Construction activities will include site preparation, excavation and grading, landscape and construction of the new buildings.

Description of site drainage including flow from and onto adjacent properties. Must be consistent with Site Map in Appendix A:

Stormwater runoff from the project site will continue to drain to the 12” storm main in 200<sup>th</sup> St SW which ultimately discharges to Scriber Creek. The project will collect stormwater in onsite catch basins and roof downspouts. Runoff from pollution generating surfaces will sheet flow to be treated by on-site bioretention planters and modular wetland water quality facilities. Treated stormwater from bioretention planters and modular wetland facilities will then be conveyed to a combination of onsite detention chambers and an onsite detention vault. Runoff from roof downspouts will be discharged directly into the two detention systems.

Description of final stabilization (example: extent of revegetation, paving, landscaping):

Natural vegetation will be kept to the maximum extent feasible; the rest of the site will be developed with new infrastructure or landscaping. Site will be fully stabilized prior to construction demobilization.

*Contaminated Site Information:*

Proposed activities regarding contaminated soils or groundwater (example: on-site treatment system, authorized sanitary sewer discharge):

Per the geotechnical report, there are no known contaminated soils or groundwater on-site. The groundwater table was recorded as shallow; likely perched groundwater, additional information to be provided at a later date.

## **Construction Stormwater Best Management Practices (BMPs) (2.0)**

The SWPPP is a living document reflecting current conditions and changes throughout the life of the project. These changes may be informal (i.e. hand-written notes and deletions). Update the SWPPP when the CESCL has noted a deficiency in BMPs or deviation from original design.

### **The 12 Elements (2.1)**

#### **Element 1: Preserve Vegetation / Mark Clearing Limits (2.1.1)**

To protect adjacent properties and to reduce the area of soil exposed to construction, the limits of construction will be clearly marked before land-disturbing activities begin. Trees that are to be preserved, as well as all sensitive area and their buffers, shall be clearly delineated, both in the field and on the plans. In general, natural geotations and native topsoil shall be retained in an undisturbed stated to the maximum extent possible.

List and describe BMPs:

- Preserving Natural Vegetation (BMP C101)
- High Visibility Plastic or Metal Fence (BMP C103)
- Silt Fence (BMP C223)

Installation Schedules: TBD

Inspection and Maintenance plan: TBD

Responsible Staff: TBD

## **Element 2: Establish Construction Access (2.1.2)**

Construction access or activities occurring on unpaved areas shall be minimized, yet where necessary, access points shall be stabilized to minimize the tracking of sediment onto public roads, and wheel washing, street sweeping, and street cleaning shall be employed to prevent sediment from entering state waters. All wash wastewater shall be controlled onsite. All site ingress/egress stabilization BMPs shall be installed according to BMP C105. Sediment will be removed from paved areas in and adjacent to construction work areas manually or using mechanical sweepers as needed, to minimize tracking of sediment on vehicle tires away from the site and to minimize washoff of sediments from adjacent streets in runoff.

List and describe BMPs:

- Construction Road/Parking area Stabilization (BMP C107)
- Stabilized Construction Access (BMP C105)
- Wheel Wash (BMP C106)

Installation Schedules: TBD

Inspection and Maintenance plan: TBD

Responsible Staff: TBD

### **Element 3: Control Flow Rates (2.1.3)**

Movable baker tanks will be used just south of the proposed excavation. The tanks will act as a temporary sediment trap during construction. Before constructing new impervious areas, the tanks should be on-site and functional.

Will you construct stormwater retention and/or detention facilities?

**Yes**                      **No**

Will you use permanent infiltration ponds or other low impact development (example: rain gardens, bio-retention, porous pavement) to control flow during construction?

**Yes**                      **No**

List and describe BMPs:

- Temporary Sediement Pond (BMP C241)

Installation Schedules:              TBD

Inspection and Maintenance plan:      TBD

Responsible Staff:      TBD

## **Element 4: Install Sediment Controls (2.1.4)**

All stormwater runoff from disturbed areas shall pass through an appropriated sediment removal BMP before leaving the construction site or prior to being discharged. Storm water will be discharged to the existing storm main which crosses the site. Drainage on site will not interfere with any juvenile salmonids attempting to enter off-channel areas or drainages. Immediate action will be taken at the first sign of BMPs that are ineffective or failing.

List and describe BMPs:

- Silt Fence (BMP C233)
- Temporary Sediment Pond (BMP C241)

Installation Schedules: TBD

Inspection and Maintenance plan: TBD

Responsible Staff: TBD

## Element 5: Stabilize Soils (2.1.5)

### West of the Cascade Mountains Crest

Season	Dates	Number of Days Soils Can be Left Exposed
During the Dry Season	May 1 – September 30	7 days
During the Wet Season	October 1 – April 30	2 days

Soils must be stabilized at the end of the shift before a holiday or weekend if needed based on the weather forecast.

Anticipated project dates:

Start date:

End date:

Will you construct during the wet season?

**Yes**

No

List and describe BMPs:

- Plastic Covering (BMP C123)
- Topsoiling/Composing (BMP C125)
- Temporary and Permanent Seeding (BMP C120)

Installation Schedules: [Insert text here]

Inspection and Maintenance plan: [Insert text here]

Responsible Staff: [Insert text here]

## **Element 6: Protect Slopes (2.1.6)**

All cut and fill slopes will be designed, constructed, and protected in a manner that minimizes erosion.

Will steep slopes be present at the site during construction?

Yes                    **No**

List and describe BMPs:

- Plastic Covering (BMP 123)
- Interceptor Dike and Swale (BMP C200)
- Temporary and Permanent Seeding (BMP C120)

Installation Schedules:        TBD

Inspection and Maintenance plan:    TBD

Responsible Staff:    TBD

## **Element 7: Protect Drain Inlets (2.1.7)**

All storm drain inlets and culverts made operable during construction shall be protected to prevent unfiltered or untreated water from entering the drainage conveyance system. However, the first priority is to keep all access roads clean of sediment and keep street wash water separate from entering storm drains until treatment can be provided. Storm Drain Inlet Protection (BMP C220) will be implemented for all drainage inlets and culverts that could potentially be impacted by sediment-laden runoff on and near the project site. Inlets will be inspected weekly at a minimum and daily during storm events.

List and describe BMPs:

- Inlet Protection (BMP C220)

Installation Schedules: TBD

Inspection and Maintenance plan: TBD

Responsible Staff: TBD

## **Element 8: Stabilize Channels and Outlets (2.1.8)**

Provide stabilization, including armoring material, adequate to prevent erosion of outlets, adjacent stream banks, slopes, and downstream reaches, will be installed at the outlets of all conveyance systems.

The site does not discharge to streams or channels.

List and describe BMPs:

- NA

Installation Schedules: TBD

Inspection and Maintenance plan: TBD

Responsible Staff: TBD

## Element 9: Control Pollutants (2.1.9)

The following pollutants are anticipated to be present on-site:

**Table 2 – Pollutants**

Pollutant (and source, if applicable)
Vehicles and construction equipment
Demolition
Concrete and Grout
Solid Waste

All pollutants, including waste materials and demolition debris, that occur onsite shall be handled and disposed of in a manner that does not cause contamination of stormwater. Good housekeeping and preventative measures will be taken to ensure that the site will be kept clean, well-organized, and free of debris.

Vehicles, construction equipment, and/or petroleum product storage/dispensing:

- All vehicles, equipment, and petroleum product storage/dispensing areas will be inspected regularly to detect any leaks or spills, and to identify maintenance needs to prevent leaks or spills.
- On-site fueling tanks and petroleum product storage containers shall include secondary containment.
- Spill prevention measures, such as drip pans, will be used when conducting maintenance and repair of vehicles or equipment.
- In order to perform emergency repairs on site, temporary plastic will be placed beneath and, if raining, over the vehicle.
- Contaminated surfaces shall be cleaned immediately following any discharge or spill incident.

Demolition

- Dust released from demolished, sidewalks, buildings, or structures will be controlled using Dust Control measures (BMP C140)
- Storm drain inlets vulnerable to stormwater discharge carrying dust, soil, or debris will be protected using Storm Drain Inlet Protection (BMP C220 as described above for Element 7).
- Process water and slurry resulting from saw cutting and surfacing operations will be prevented from entering the waters of the State by implementing Saw cutting and Surfacing Pollution Prevention measures (BMP C152)

Concrete and grout:

- Process water and slurry resulting from concrete work will be prevented from entering the waters of the State by implementing:
  - Concrete Handling measures (BMP C151)
  - Saw cutting and Surfacing Pollution Prevention (BMP C152)
  - Concrete Washout Area (BMP C154)

Solid Waste:

- Solid waste will be stored in secure, clearly marked containers. Per:
  - Material Delivery, Storage and Containment (BMP C153)

List and describe BMPs:

- Concrete Handling (BMP C151)
- Concrete Washout Area (BMP C154)
- Material Delivery, Storage and Containment (BMP C153)

Installation Schedules:        TBD

Inspection and Maintenance plan:    TBD

Responsible Staff:    TBD

Will maintenance, fueling, and/or repair of heavy equipment and vehicles occur on-site?

**Yes**                    **No**

Will wheel wash or tire bath system BMPs be used during construction?

**Yes**                    **No**

Wheel wash water is process water and as such will be discharged separate from stormwater.

List and describe BMPs:

- Wheel Wash (BMP 106)

Installation Schedules:        TBD

Inspection and Maintenance plan:    TBD

Responsible Staff:    TBD

Will pH-modifying sources be present on-site?

**Yes**                    **No**

**Table 3 – pH-Modifying Sources**

	None
X	Bulk cement
X	Cement kiln dust
X	Fly ash
X	Other cementitious materials
X	New concrete washing or curing waters
X	Waste streams generated from concrete grinding and sawing
X	Exposed aggregate processes
X	Dewatering concrete vaults
	Concrete pumping and mixer washout waters
	Recycled concrete
	Other (i.e. calcium lignosulfate) [please describe]

List and describe BMPs:

- Concrete Handling (BMP C151)

Installation Schedules: TBD

Inspection and Maintenance plan: TBD

Responsible Staff: TBD

Concrete trucks must not be washed out onto the ground, or into storm drains, open ditches, streets, or streams. Excess concrete must not be dumped on-site, except in designated concrete washout areas with appropriate BMPs installed.

## Element 10: Control Dewatering (2.1.10)

Dewatering currently not anticipated as necessary on-site. According to the geotechnical report, shallow groundwater table observed; however, it is likely perched groundwater. Additional information to be added at a later date.

**Table 4 – Dewatering BMPs**

	Infiltration
	Transport off-site in a vehicle (vacuum truck for legal disposal)
	Ecology-approved on-site chemical treatment or other suitable treatment technologies
	Sanitary or combined sewer discharge with local sewer district approval (last resort)
	Use of sedimentation bag with discharge to ditch or swale (small volumes of localized dewatering)

List and describe BMPs: [Insert text here]

Installation Schedules: [Insert text here]

Inspection and Maintenance plan: [Insert text here]

Responsible Staff: [Insert text here]

## **Element 11: Maintain BMPs (2.1.11)**

All temporary and permanent Erosion and Sediment Control (ESC) BMPs shall be maintained and repaired as needed to ensure continued performance of their intended function.

Maintenance and repair shall be conducted in accordance with each particular BMP specification (see *Volume II of the SWMMWW* or *Chapter 7 of the SWMMEW*).

Visual monitoring of all BMPs installed at the site will be conducted at least once every calendar week and within 24 hours of any stormwater or non-stormwater discharge from the site. If the site becomes inactive and is temporarily stabilized, the inspection frequency may be reduced to once every calendar month.

All temporary ESC BMPs shall be removed within 30 days after final site stabilization is achieved or after the temporary BMPs are no longer needed.

Trapped sediment shall be stabilized on-site or removed. Disturbed soil resulting from removal of either BMPs or vegetation shall be permanently stabilized.

Additionally, protection must be provided for all BMPs installed for the permanent control of stormwater from sediment and compaction. BMPs that are to remain in place following completion of construction shall be examined and restored to full operating condition. If sediment enters these BMPs during construction, the sediment shall be removed and the facility shall be returned to conditions specified in the construction documents.

List and describe BMPs:

- Material on Hand (BMP C150)
- Certified Erosion and Sediment Control Lead (BMP C160)

Installation Schedules: TBD

Inspection and Maintenance plan: TBD

Responsible Staff: TBD

## Element 12: Manage the Project (2.1.12)

The project will be managed based on the following principles:

- Projects will be phased to the maximum extent practicable and seasonal work limitations will be taken into account.
- Inspection and monitoring:
  - Inspection, maintenance and repair of all BMPs will occur as needed to ensure performance of their intended function.
  - Site inspections and monitoring will be conducted in accordance with Special Condition S4 of the CSWGP. Sampling locations are indicated on the [Site Map](#). Sampling station(s) are located in accordance with applicable requirements of the CSWGP.
- Maintain an updated SWPPP.
  - The SWPPP will be updated, maintained, and implemented in accordance with Special Conditions S3, S4, and S9 of the CSWGP.

As site work progresses the SWPPP will be modified routinely to reflect changing site conditions. The SWPPP will be reviewed monthly to ensure the content is current.

**Table 5 – Management**

X	Design the project to fit the existing topography, soils, and drainage patterns
X	Emphasize erosion control rather than sediment control
X	Minimize the extent and duration of the area exposed
X	Keep runoff velocities low
X	Retain sediment on-site
X	Thoroughly monitor site and maintain all ESC measures
	Schedule major earthwork during the dry season
	Other (please describe)

List and describe BMPs:

- Materials on Hand (BMP C150)
- Certified Erosion and Sedimentary Control Lead (BMP C160)
- Scheduling (BMP 162)

Installation Schedules: TBD

Inspection and Maintenance plan: TBD

Responsible Staff: TBD





### **Element 13: Protect Low Impact Development (LID) BMPs (2.1.13)**

The areas on the site to be used for these BMPs shall be protected from siltation and compaction during constructing by sequencing the construction in a fashion to install these BMPs at the latter part of the construction grading operations, by excluding equipment from the BMPs and the associated areas, and by using the erosion and sedimentation control BMPs listed below.

The specific BMPs for runoff from roofs and other hard surfaces for this project include:

- BMP C103: High Visibility Fence
- BMP C200: Interceptor Dike and Swale
- BMP C233: Silt Fence

### **Pollution Prevention Team (3.0)**

**Table 7 – Team Information**

<b>Title</b>	<b>Name(s)</b>	<b>Phone Number</b>
<b>Certified Erosion and Sediment Control Lead (CESCL)</b>	TBD	TBD
<b>Resident Engineer</b>	TBD	TBD
<b>Emergency Ecology Contact</b>	TBD	TBD
<b>Emergency Permittee/ Owner Contact</b>	TBD	TBD
<b>Non-Emergency Owner Contact</b>	TBD	TBD
<b>Monitoring Personnel</b>	TBD	TBD
<b>Ecology Regional Office</b>	Washington State Northwest Region	425-649-7000

## Monitoring and Sampling Requirements (4.0)

Monitoring includes visual inspection, sampling for water quality parameters of concern, and documentation of the inspection and sampling findings in a site log book. A site log book will be maintained for all on-site construction activities and will include:

- A record of the implementation of the SWPPP and other permit requirements
- Site inspections
- Stormwater sampling data

Create your own Site Inspection Form or use the Construction Stormwater Site Inspection Form found on Ecology's website. <https://www.ecology.wa.gov/Regulations-Permits/Permits-certifications/Stormwater-general-permits/Construction-stormwater-permit>

File a blank form under Appendix D.

The site log book must be maintained on-site within reasonable access to the site and be made available upon request to Ecology or the local jurisdiction.

Numeric effluent limits may be required for certain discharges to 303(d) listed waterbodies. See CSWGP Special Condition S8 and Section 5 of this template.

Complete the following paragraph for sites that discharge to impaired waterbodies for fine sediment, turbidity, phosphorus, or pH:

The receiving waterbody, Scriber Creek, has no known impairments where the project discharges. All stormwater and dewatering discharges from the site are subject to an **effluent limit** of 8.5 su for pH and/or 25 NTU for turbidity.

### Site Inspection (4.1)

Site inspections will be conducted at least once every calendar week and within 24 hours following any discharge from the site. For sites that are temporarily stabilized and inactive, the required frequency is reduced to once per calendar month.

The discharge point(s) are indicated on the Site Map (see Appendix A) and in accordance with the applicable requirements of the CSWGP.

### Stormwater Quality Sampling (4.2)

#### Turbidity Sampling (4.2.1)

Requirements include calibrated turbidity meter or transparency tube to sample site discharges for compliance with the CSWGP. Sampling will be conducted at all discharge points at least once per calendar week.

Method for sampling turbidity:

**Table 8 – Turbidity Sampling Method**

X	Turbidity Meter/Turbidimeter (required for disturbances 5 acres or greater in size)
	Transparency Tube (option for disturbances less than 1 acre and up to 5 acres in size)

The benchmark for turbidity value is 25 nephelometric turbidity units (NTU) and a transparency less than 33 centimeters.

If the discharge's turbidity is 26 to 249 NTU **or** the transparency is less than 33 cm but equal to or greater than 6 cm, the following steps will be conducted:

1. Review the SWPPP for compliance with Special Condition S9. Make appropriate revisions within 7 days of the date the discharge exceeded the benchmark.
2. Immediately begin the process to fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible. Address the problems within 10 days of the date the discharge exceeded the benchmark. If installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time when the Permittee requests an extension within the initial 10-day response period.
3. Document BMP implementation and maintenance in the site log book.

If the turbidity exceeds 250 NTU **or** the transparency is 6 cm or less at any time, the following steps will be conducted:

1. Telephone or submit an electronic report to the applicable Ecology Region's Environmental Report Tracking System (ERTS) within 24 hours.  
<https://www.ecology.wa.gov/About-us/Get-involved/Report-an-environmental-issue>
  - Central Region (Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, Yakima): (509) 575-2490
  - Eastern Region (Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman): (509) 329-3400
  - Northwest Region (King, Kitsap, Island, San Juan, Skagit, Snohomish, Whatcom): (425) 649-7000
  - Southwest Region (Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Lewis, Mason, Pacific, Pierce, Skamania, Thurston, Wahkiakum,): (360) 407-6300
2. Immediately begin the process to fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible. Address the problems within 10 days of the date the discharge exceeded the benchmark. If installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time when the Permittee requests an extension within the initial 10-day response period
3. Document BMP implementation and maintenance in the site log book.
4. Continue to sample discharges daily until one of the following is true:
  - Turbidity is 25 NTU (or lower).
  - Transparency is 33 cm (or greater).

- Compliance with the water quality limit for turbidity is achieved.
  - 1 - 5 NTU over background turbidity, if background is less than 50 NTU
  - 1% - 10% over background turbidity, if background is 50 NTU or greater
- The discharge stops or is eliminated.

## pH Sampling (4.2.2)

pH monitoring is required for “Significant concrete work” (i.e. greater than 1000 cubic yards poured concrete or recycled concrete over the life of the project). The use of engineered soils (soil amendments including but not limited to Portland cement-treated base [CTB], cement kiln dust [CKD] or fly ash) also requires pH monitoring.

For significant concrete work, pH sampling will start the first day concrete is poured and continue until it is cured, typically three (3) weeks after the last pour.

For engineered soils and recycled concrete, pH sampling begins when engineered soils or recycled concrete are first exposed to precipitation and continues until the area is fully stabilized.

If the measured pH is 8.5 or greater, the following measures will be taken:

1. Prevent high pH water from entering storm sewer systems or surface water.
2. Adjust or neutralize the high pH water to the range of 6.5 to 8.5 su using appropriate technology such as carbon dioxide (CO<sub>2</sub>) sparging (liquid or dry ice).
3. Written approval will be obtained from Ecology prior to the use of chemical treatment other than CO<sub>2</sub> sparging or dry ice.

Method for sampling pH:

Check the analysis method you will use:

**Table 8 – pH Sampling Method**

X	pH meter
	pH test kit
	Wide range pH indicator paper

## **Discharges to 303(d) or Total Maximum Daily Load (TMDL) Waterbodies (5.0)**

### **303(d) Listed Waterbodies (5.1)**

Is the receiving water 303(d) (Category 5) listed for turbidity, fine sediment, phosphorus, or pH?

Yes                  No

### **TMDL Waterbodies (5.2)**

Waste Load Allocation for CWSGP discharges:

TBD

List and describe BMPs:

TBD

Discharges to TMDL receiving waterbodies will meet in-stream water quality criteria at the point of discharge.
--

## **Reporting and Record Keeping (6.0)**

### **Record Keeping (6.1)**

#### **Site Log Book (6.1.1)**

A site log book will be maintained for all on-site construction activities and will include:

- A record of the implementation of the SWPPP and other permit requirements
- Site inspections
- Sample logs

#### **Records Retention (6.1.2)**

Records will be retained during the life of the project and for a minimum of three (3) years following the termination of permit coverage in accordance with Special Condition S5.C of the CSWGP.

Permit documentation to be retained on-site:

- CSWGP
- Permit Coverage Letter
- SWPPP
- Site Log Book

Permit documentation will be provided within 14 days of receipt of a written request from Ecology. A copy of the SWPPP or access to the SWPPP will be provided to the public when requested in writing in accordance with Special Condition S5.G.2.b of the CSWGP.

#### **Updating the SWPPP (6.1.3)**

The SWPPP will be modified if:

- Found ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site.
- There is a change in design, construction, operation, or maintenance at the construction site that has, or could have, a significant effect on the discharge of pollutants to waters of the State.

The SWPPP will be modified within seven (7) days if inspection(s) or investigation(s) determine additional or modified BMPs are necessary for compliance. An updated timeline for BMP implementation will be prepared.

## **Reporting (6.2)**

### **Discharge Monitoring Reports (6.2.1)**

**Cumulative soil disturbance is one (1) acre or larger; therefore,** Discharge Monitoring Reports (DMRs) will be submitted to Ecology monthly. If there was no discharge during a given monitoring period the DMR will be submitted as required, reporting “No Discharge”. The DMR due date is fifteen (15) days following the end of each calendar month.

DMRs will be reported online through Ecology’s WQWebDMR System.

To sign up for WQWebDMR go to:

<https://www.ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Water-quality-permits-guidance/WQWebPortal-guidance>

### **Notification of Noncompliance (6.2.2)**

If any of the terms and conditions of the permit is not met, and the resulting noncompliance may cause a threat to human health or the environment, the following actions will be taken:

1. Ecology will be notified within 24-hours of the failure to comply by calling the applicable Regional office ERTS phone number (Regional office numbers listed below).
2. Immediate action will be taken to prevent the discharge/pollution or otherwise stop or correct the noncompliance. If applicable, sampling and analysis of any noncompliance will be repeated immediately and the results submitted to Ecology within five (5) days of becoming aware of the violation.
3. A detailed written report describing the noncompliance will be submitted to Ecology within five (5) days, unless requested earlier by Ecology.

Specific information to be included in the noncompliance report is found in Special Condition S5.F.3 of the CSWGP.

Anytime turbidity sampling indicates turbidity is 250 NTUs or greater, or water transparency is 6 cm or less, the Ecology Regional office will be notified by phone within 24 hours of analysis as required by Special Condition S5.A of the CSWGP.

- Central Region at (509) 575-2490 for Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, or Yakima County

- Eastern Region at (509) 329-3400 for Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, or Whitman County
- Northwest Region at (425) 649-7000 for Island, King, Kitsap, San Juan, Skagit, Snohomish, or Whatcom County
- Southwest Region at (360) 407-6300 for Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Lewis, Mason, Pacific, Pierce, Skamania, Thurston, or Wahkiakum

Include the following information:

1. Your name and / Phone number
2. Permit number
3. City / County of project
4. Sample results
5. Date / Time of call
6. Date / Time of sample
7. Project name

In accordance with Special Condition S4.D.5.b of the CSWGP, the Ecology Regional office will be notified if chemical treatment other than CO<sub>2</sub> sparging is planned for adjustment of high pH water.

## **Appendix/Glossary**

**A. Site Map**

**B. BMP Detail**

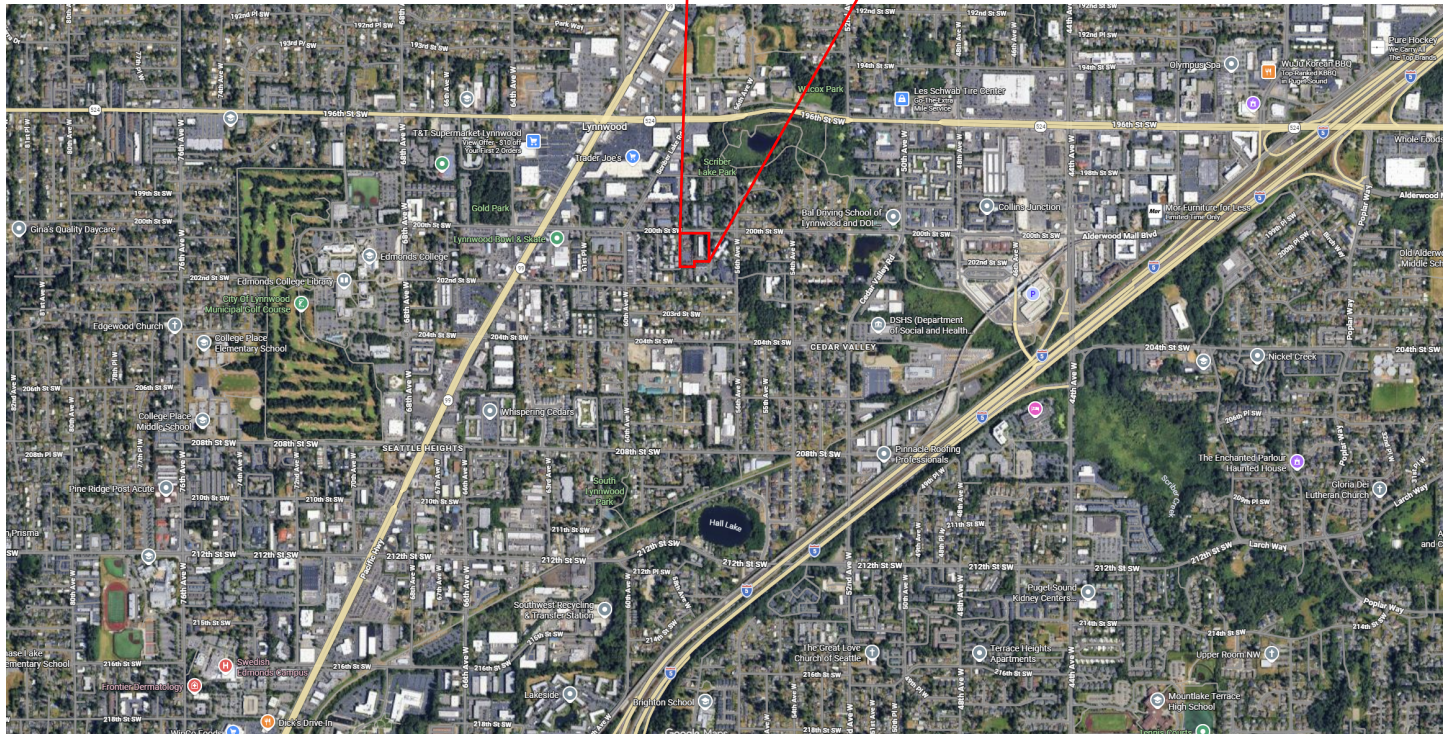
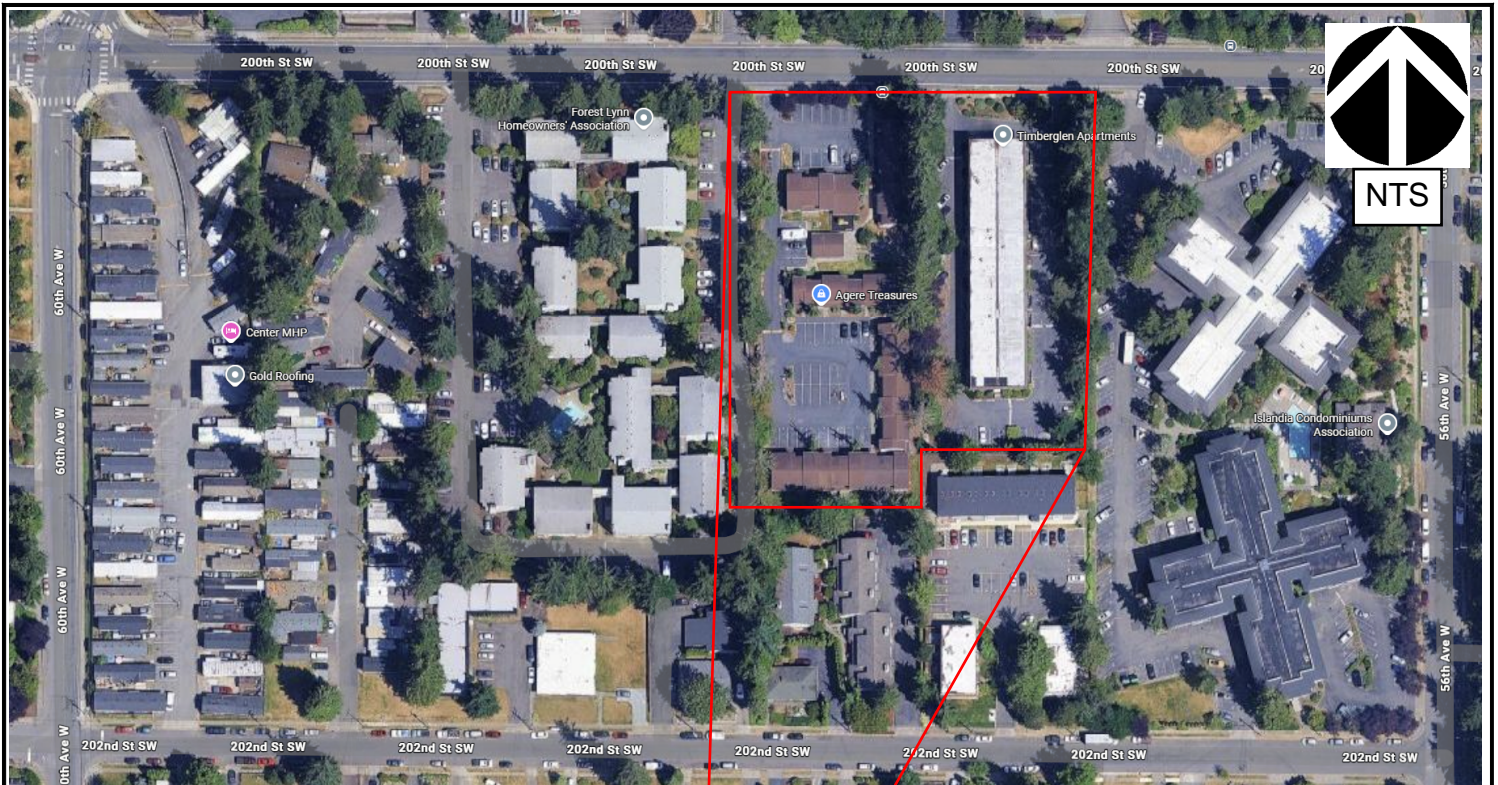
**C. Correspondence**

**D. Site Inspection Form**

**E. Construction Stormwater General Permit (CSWGP)**

**F. Engineering Calculations**

**G. 303(d) List of Waterbodies / TMDL Waterbodies**



**FIGURE 1**  
**VICINITY MAP**

Copyright 2024, COUGHLINPORTERLUNDEEN Inc.

Project: 200th St Apartment

Designed By: LMM

Date: 02/19/2026

Project No: C24142

Client:

Checked By:

Sheet:

## 4.1 Source Control BMPs

### BMP C101: Preserving Natural Vegetation

#### *Purpose*

The purpose of preserving natural vegetation is to reduce erosion wherever practicable. Limiting site disturbance is the single most effective method for reducing erosion. For example, conifers can hold up to about 50 percent of all rain that falls during a storm. Up to 20-30 percent of this rain may never reach the ground but is taken up by the tree or evaporates. Another benefit is that the rain held in the tree can be released slowly to the ground after the storm.

#### *Conditions of Use*

- Natural vegetation should be preserved on steep slopes, near perennial and intermittent watercourses or swales, and on building sites in wooded areas.
- As required by local governments.

#### *Design and Installation Specifications*

Natural vegetation can be preserved in natural clumps or as individual trees, shrubs and vines.

The preservation of individual plants is more difficult because heavy equipment is generally used to remove unwanted vegetation. The points to remember when attempting to save individual plants are:

- Is the plant worth saving? Consider the location, species, size, age, vigor, and the work involved. Local governments may also have ordinances to save natural vegetation and trees.
- Fence or clearly mark areas around trees that are to be saved. It is preferable to keep ground disturbance away from the trees at least as far out as the dripline.

Plants need protection from three kinds of injuries:

- *Construction Equipment* - This injury can be above or below the ground level. Damage results from scarring, cutting of roots, and compaction of the soil. Placing a fenced buffer zone around plants to be saved prior to construction can prevent construction equipment injuries.
- *Grade Changes* - Changing the natural ground level will alter grades, which affects the plant's ability to obtain the necessary air, water, and minerals. Minor fills usually do not cause problems although sensitivity between species does vary and should be checked. Trees can tolerate fill of 6 inches or less. For shrubs and other plants, the fill should be less.

When there are major changes in grade, it may become necessary to supply air to the roots of plants. This can be done by placing a layer of gravel and a tile system over the roots before the fill is made. A tile

system protects a tree from a raised grade. The tile system should be laid out on the original grade leading from a dry well around the tree trunk. The system should then be covered with small stones to allow air to circulate over the root area.

Lowering the natural ground level can seriously damage trees and shrubs. The highest percentage of the plant roots are in the upper 12 inches of the soil and cuts of only 2-3 inches can cause serious injury. To protect the roots it may be necessary to terrace the immediate area around the plants to be saved. If roots are exposed, construction of retaining walls may be needed to keep the soil in place. Plants can also be preserved by leaving them on an undisturbed, gently sloping mound. To increase the chances for survival, it is best to limit grade changes and other soil disturbances to areas outside the dripline of the plant.

- *Excavations* - Protect trees and other plants when excavating for drainfields, power, water, and sewer lines. Where possible, the trenches should be routed around trees and large shrubs. When this is not possible, it is best to tunnel under them. This can be done with hand tools or with power augers. If it is not possible to route the trench around plants to be saved, then the following should be observed:

Cut as few roots as possible. When you have to cut, cut clean. Paint cut root ends with a wood dressing like asphalt base paint.

Backfill the trench as soon as possible.

Tunnel beneath root systems as close to the center of the main trunk to preserve most of the important feeder roots.

Some problems that can be encountered with a few specific trees are:

- Maple, Dogwood, Red alder, Western hemlock, Western red cedar, and Douglas fir do not readily adjust to changes in environment and special care should be taken to protect these trees.
- The windthrow hazard of Pacific silver fir and madronna is high, while that of Western hemlock is moderate. The danger of windthrow increases where dense stands have been thinned. Other species (unless they are on shallow, wet soils less than 20 inches deep) have a low windthrow hazard.
- Cottonwoods, maples, and willows have water-seeking roots. These can cause trouble in sewer lines and infiltration fields. On the other hand, they thrive in high moisture conditions that other trees would not.
- Thinning operations in pure or mixed stands of Grand fir, Pacific silver fir, Noble fir, Sitka spruce, Western red cedar, Western hemlock,

Pacific dogwood, and Red alder can cause serious disease problems. Disease can become established through damaged limbs, trunks, roots, and freshly cut stumps. Diseased and weakened trees are also susceptible to insect attack.

***Maintenance  
Standards***

- Inspect flagged and/or fenced areas regularly to make sure flagging or fencing has not been removed or damaged. If the flagging or fencing has been damaged or visibility reduced, it shall be repaired or replaced immediately and visibility restored.
- If tree roots have been exposed or injured, “prune” cleanly with an appropriate pruning saw or loppers directly above the damaged roots and recover with native soils. Treatment of sap flowing trees (fir, hemlock, pine, soft maples) is not advised as sap forms a natural healing barrier.

## **BMP C103: High Visibility Plastic or Metal Fence**

***Purpose*** Fencing is intended to: (1) restrict clearing to approved limits; (2) prevent disturbance of sensitive areas, their buffers, and other areas required to be left undisturbed; (3) limit construction traffic to designated construction entrances or roads; and, (4) protect areas where marking with survey tape may not provide adequate protection.

***Conditions of Use*** To establish clearing limits, plastic or metal fence may be used:

- At the boundary of sensitive areas, their buffers, and other areas required to be left uncleared.
- As necessary to control vehicle access to and on the site.

***Design and  
Installation  
Specifications***

- High visibility plastic fence shall be composed of a high-density polyethylene material and shall be at least four feet in height. Posts for the fencing shall be steel or wood and placed every 6 feet on center (maximum) or as needed to ensure rigidity. The fencing shall be fastened to the post every six inches with a polyethylene tie. On long continuous lengths of fencing, a tension wire or rope shall be used as a top stringer to prevent sagging between posts. The fence color shall be high visibility orange. The fence tensile strength shall be 360 lbs./ft. using the ASTM D4595 testing method.
- Metal fences shall be designed and installed according to the manufacturer's specifications.
- Metal fences shall be at least 3 feet high and must be highly visible.
- Fences shall not be wired or stapled to trees.

***Maintenance  
Standards***

- If the fence has been damaged or visibility reduced, it shall be repaired or replaced immediately and visibility restored.

## **BMP C105: Stabilized Construction Entrance**

**Purpose** Construction entrances are stabilized to reduce the amount of sediment transported onto paved roads by vehicles or equipment by constructing a stabilized pad of quarry spalls at entrances to construction sites.

**Conditions of Use** Construction entrances shall be stabilized wherever traffic will be leaving a construction site and traveling on paved roads or other paved areas within 1,000 feet of the site.

On large commercial, highway, and road projects, the designer should include enough extra materials in the contract to allow for additional stabilized entrances not shown in the initial Construction SWPPP. It is difficult to determine exactly where access to these projects will take place; additional materials will enable the contractor to install them where needed.

### **Design and Installation Specifications**

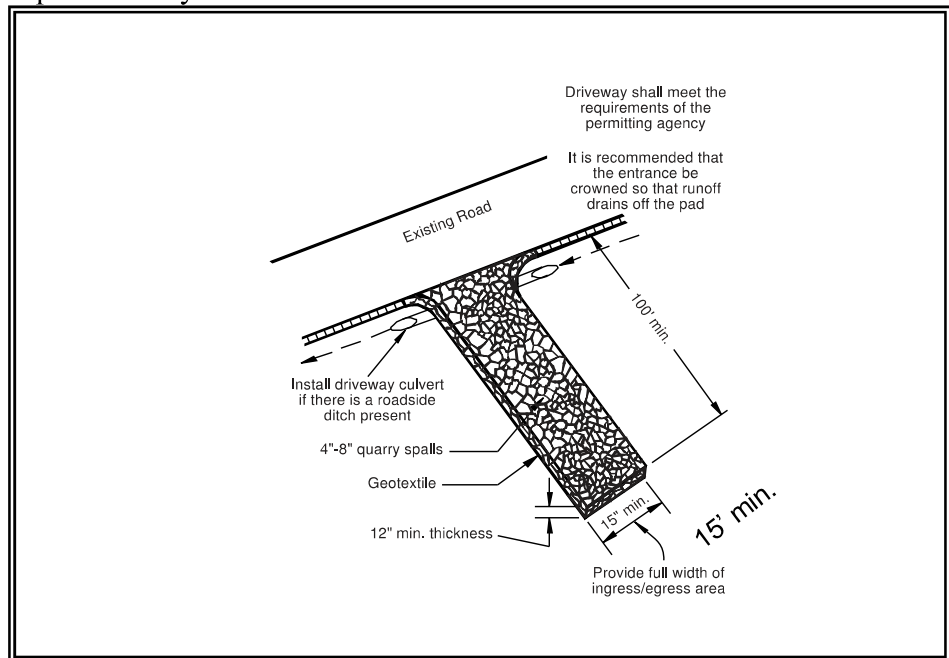
- See Figure 4.2 for details. Note: the 100' minimum length of the entrance shall be reduced to the maximum practicable size when the size or configuration of the site does not allow the full length (100').
- A separation geotextile shall be placed under the spalls to prevent fine sediment from pumping up into the rock pad. The geotextile shall meet the following standards:

Grab Tensile Strength (ASTM D4751)	200 psi min.
Grab Tensile Elongation (ASTM D4632)	30% max.
Mullen Burst Strength (ASTM D3786-80a)	400 psi min.
AOS (ASTM D4751)	20-45 (U.S. standard sieve size)

- Consider early installation of the first lift of asphalt in areas that will paved; this can be used as a stabilized entrance. Also consider the installation of excess concrete as a stabilized entrance. During large concrete pours, excess concrete is often available for this purpose.
- Hog fuel (wood-based mulch) may be substituted for or combined with quarry spalls in areas that will not be used for permanent roads. Hog fuel is generally less effective at stabilizing construction entrances and should be used only at sites where the amount of traffic is very limited. Hog fuel is not recommended for entrance stabilization in urban areas. The effectiveness of hog fuel is highly variable and it generally requires more maintenance than quarry spalls. The inspector may at any time require the use of quarry spalls if the hog fuel is not preventing sediment from being tracked onto pavement or if the hog fuel is being carried onto pavement. Hog fuel is prohibited in permanent roadbeds because organics in the subgrade soils cause degradation of the subgrade support over time.
- Fencing (see BMPs C103 and C104) shall be installed as necessary to restrict traffic to the construction entrance.

**Maintenance Standards**

- Whenever possible, the entrance shall be constructed on a firm, compacted subgrade. This can substantially increase the effectiveness of the pad and reduce the need for maintenance.
- Quarry spalls (or hog fuel) shall be added if the pad is no longer in accordance with the specifications.
- If the entrance is not preventing sediment from being tracked onto pavement, then alternative measures to keep the streets free of sediment shall be used. This may include street sweeping, an increase in the dimensions of the entrance, or the installation of a wheel wash.
- Any sediment that is tracked onto pavement shall be removed by shoveling or street sweeping. The sediment collected by sweeping shall be removed or stabilized on site. The pavement shall not be cleaned by washing down the street, except when sweeping is ineffective and there is a threat to public safety. If it is necessary to wash the streets, the construction of a small sump shall be considered. The sediment would then be washed into the sump where it can be controlled.
- Any quarry spalls that are loosened from the pad, which end up on the roadway shall be removed immediately.
- If vehicles are entering or exiting the site at points other than the construction entrance(s), fencing (see BMPs C103 and C104) shall be installed to control traffic.
- Upon project completion and site stabilization, all construction accesses intended as permanent access for maintenance shall be permanently stabilized.



**Figure 4.2 – Stabilized Construction Entrance**

## **BMP C106: Wheel Wash**

### ***Purpose***

Wheel washes reduce the amount of sediment transported onto paved roads by motor vehicles.

### ***Conditions of Use***

When a stabilized construction entrance (see BMP C105) is not preventing sediment from being tracked onto pavement.

- Wheel washing is generally an effective BMP when installed with careful attention to topography. For example, a wheel wash can be detrimental if installed at the top of a slope abutting a right-of-way where the water from the dripping truck can run unimpeded into the street.
- Pressure washing combined with an adequately sized and surfaced pad with direct drainage to a large 10-foot x 10-foot sump can be very effective.

### ***Design and Installation Specifications***

Suggested details are shown in Figure 4.3. The Local Permitting Authority may allow other designs. A minimum of 6 inches of asphalt treated base (ATB) over crushed base material or 8 inches over a good subgrade is recommended to pave the wheel wash.

Use a low clearance truck to test the wheel wash before paving. Either a belly dump or lowboy will work well to test clearance.

Keep the water level from 12 to 14 inches deep to avoid damage to truck hubs and filling the truck tongues with water.

Midpoint spray nozzles are only needed in extremely muddy conditions.

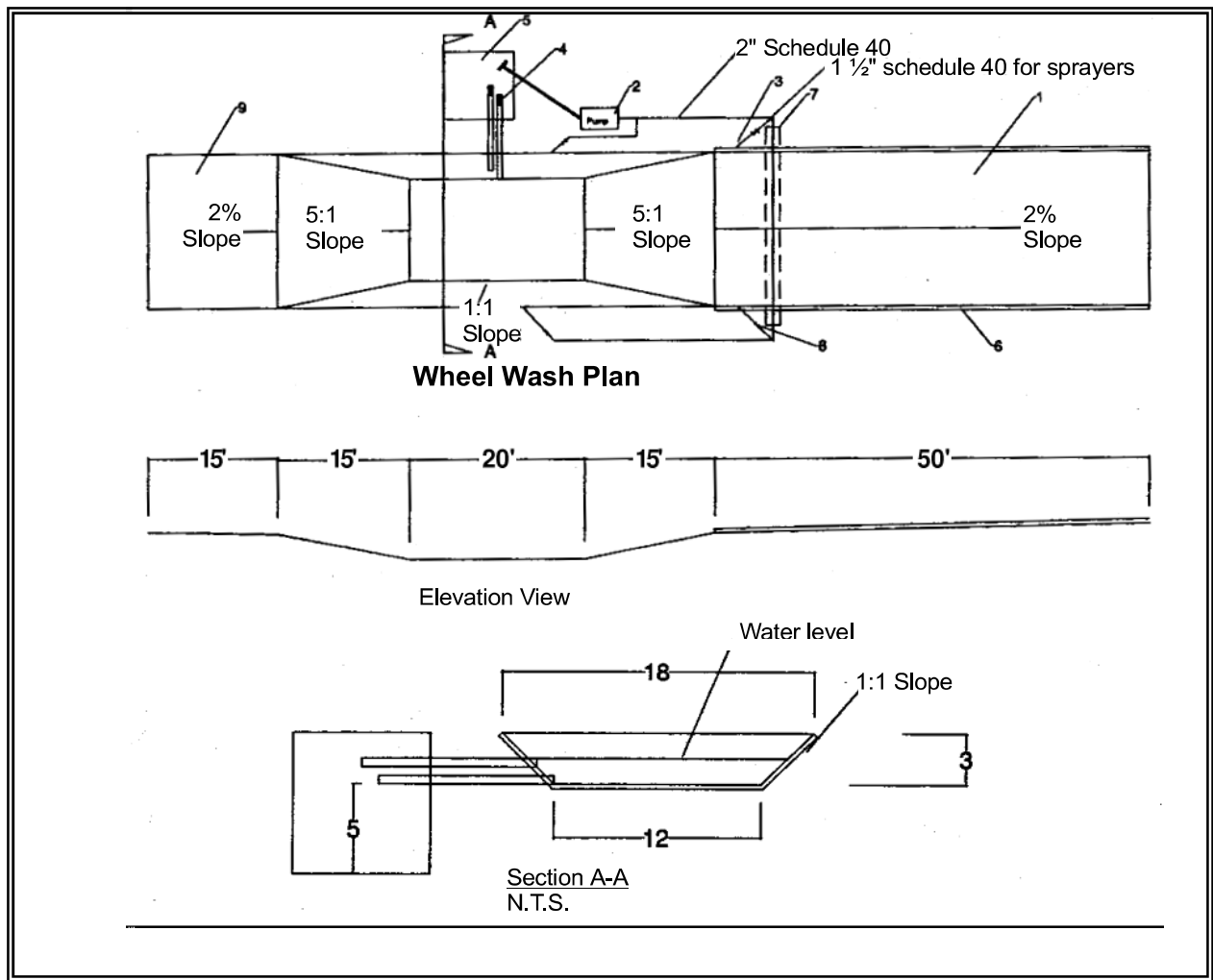
Wheel wash systems should be designed with a small grade change, 6 to 12 inches for a 10-foot-wide pond, to allow sediment to flow to the low side of pond to help prevent re-suspension of sediment. A drainpipe with a 2- to 3-foot riser should be installed on the low side of the pond to allow for easy cleaning and refilling. Polymers may be used to promote coagulation and flocculation in a closed-loop system. Polyacrylamide (PAM) added to the wheel wash water at a rate of 0.25 - 0.5 pounds per 1,000 gallons of water increases effectiveness and reduces cleanup time. If PAM is already being used for dust or erosion control and is being applied by a water truck, the same truck can be used to change the wash water.

### ***Maintenance Standards***

The wheel wash should start out the day with fresh water.

The wash water should be changed a minimum of once per day. On large earthwork jobs where more than 10-20 trucks per hour are expected, the wash water will need to be changed more often.

Wheel wash or tire bath wastewater shall be discharged to a separate on-site treatment system, such as closed-loop recirculation or land application, or to the sanitary sewer with proper local sewer district approval.



**Figure 4.3 Wheel Wash**

**Notes:**

1. Asphalt construction entrance 6 in. asphalt treated base (ATB).
2. 3-inch trash pump with floats on the suction hose.
3. Midpoint spray nozzles, if needed.
4. 6-inch sewer pipe with butterfly valves. Bottom one is a drain. Locate top pipe's invert 1 foot above bottom of wheel wash.
5. 8 foot x 8 foot sump with 5 feet of catch. Build so can be cleaned with trackhoe.
6. Asphalt curb on the low road side to direct water back to pond.
7. 6-inch sleeve under road.
8. Ball valves.
9. 15 foot. ATB apron to protect ground from splashing water.

## **BMP C107: Construction Road/Parking Area Stabilization**

### ***Purpose***

Stabilizing subdivision roads, parking areas, and other onsite vehicle transportation routes immediately after grading reduces erosion caused by construction traffic or runoff.

### ***Conditions of Use***

- Roads or parking areas shall be stabilized wherever they are constructed, whether permanent or temporary, for use by construction traffic.
- Fencing (see BMPs C103 and C104) shall be installed, if necessary, to limit the access of vehicles to only those roads and parking areas that are stabilized.

### ***Design and Installation Specifications***

- On areas that will receive asphalt as part of the project, install the first lift as soon as possible.
- A 6-inch depth of 2- to 4-inch crushed rock, gravel base, or crushed surfacing base course shall be applied immediately after grading or utility installation. A 4-inch course of asphalt treated base (ATB) may also be used, or the road/parking area may be paved. It may also be possible to use cement or calcium chloride for soil stabilization. If cement or cement kiln dust is used for roadbase stabilization, pH monitoring and BMPs are necessary to evaluate and minimize the effects on stormwater. If the area will not be used for permanent roads, parking areas, or structures, a 6-inch depth of hog fuel may also be used, but this is likely to require more maintenance. Whenever possible, construction roads and parking areas shall be placed on a firm, compacted subgrade.
- Temporary road gradients shall not exceed 15 percent. Roadways shall be carefully graded to drain. Drainage ditches shall be provided on each side of the roadway in the case of a crowned section, or on one side in the case of a super-elevated section. Drainage ditches shall be directed to a sediment control BMP.
- Rather than relying on ditches, it may also be possible to grade the road so that runoff sheet-flows into a heavily vegetated area with a well-developed topsoil. Landscaped areas are not adequate. If this area has at least 50 feet of vegetation, then it is generally preferable to use the vegetation to treat runoff, rather than a sediment pond or trap. The 50 feet shall not include wetlands. If runoff is allowed to sheetflow through adjacent vegetated areas, it is vital to design the roadways and parking areas so that no concentrated runoff is created.

### ***Maintenance Standards***

- Storm drain inlets shall be protected to prevent sediment-laden water entering the storm drain system (see BMP C220).
- Inspect stabilized areas regularly, especially after large storm events.
- Crushed rock, gravel base, hog fuel, etc. shall be added as required to maintain a stable driving surface and to stabilize any areas that have eroded.
- Following construction, these areas shall be restored to pre-construction condition or better to prevent future erosion.

## **BMP C120: Temporary and Permanent Seeding**

### ***Purpose***

Seeding is intended to reduce erosion by stabilizing exposed soils. A well-established vegetative cover is one of the most effective methods of reducing erosion.

### ***Conditions of Use***

- Seeding may be used throughout the project on disturbed areas that have reached final grade or that will remain unworked for more than 30 days.
- Channels that will be vegetated should be installed before major earthwork and hydroseeded with a Bonded Fiber Matrix. The vegetation should be well established (i.e., 75 percent cover) before water is allowed to flow in the ditch. With channels that will have high flows, erosion control blankets should be installed over the hydroseed. If vegetation cannot be established from seed before water is allowed in the ditch, sod should be installed in the bottom of the ditch over hydromulch and blankets.
- Retention/detention ponds should be seeded as required.
- Mulch is required at all times because it protects seeds from heat, moisture loss, and transport due to runoff.
- All disturbed areas shall be reviewed in late August to early September and all seeding should be completed by the end of September. Otherwise, vegetation will not establish itself enough to provide more than average protection.
- At final site stabilization, all disturbed areas not otherwise vegetated or stabilized shall be seeded and mulched. Final stabilization means the completion of all soil disturbing activities at the site and the establishment of a permanent vegetative cover, or equivalent permanent stabilization measures (such as pavement, riprap, gabions or geotextiles) which will prevent erosion.
- Seeding should be done during those seasons most conducive to growth and will vary with the climate conditions of the region. Local experience should be used to determine the appropriate seeding periods.
- The optimum seeding windows for western Washington are April 1 through June 30 and September 1 through October 1. Seeding that occurs between July 1 and August 30 will require irrigation until 75 percent grass cover is established. Seeding that occurs between October 1 and March 30 will require a mulch or plastic cover until 75 percent grass cover is established.
- To prevent seed from being washed away, confirm that all required surface water control measures have been installed.

### ***Design and Installation Specifications***

- The seedbed should be firm and rough. All soil should be roughened no matter what the slope. If compaction is required for engineering purposes, slopes must be track walked before seeding. Backblading or smoothing of slopes greater than 4:1 is not allowed if they are to be seeded.
- New and more effective restoration-based landscape practices rely on deeper incorporation than that provided by a simple single-pass rototilling treatment. Wherever practical the subgrade should be initially ripped to improve long-term permeability, infiltration, and water inflow qualities. At a minimum, permanent areas shall use soil amendments to achieve organic matter and permeability performance defined in engineered soil/landscape systems. For systems that are deeper than 8 inches the rototilling process should be done in multiple lifts, or the prepared soil system shall be prepared properly and then placed to achieve the specified depth.
- Organic matter is the most appropriate form of “fertilizer” because it provides nutrients (including nitrogen, phosphorus, and potassium) in the least water-soluble form. A natural system typically releases 2-10 percent of its nutrients annually. Chemical fertilizers have since been formulated to simulate what organic matter does naturally.
- In general, 10-4-6 N-P-K (nitrogen-phosphorus-potassium) fertilizer can be used at a rate of 90 pounds per acre. Slow-release fertilizers should always be used because they are more efficient and have fewer environmental impacts. It is recommended that areas being seeded for final landscaping conduct soil tests to determine the exact type and quantity of fertilizer needed. This will prevent the over-application of fertilizer. Fertilizer should not be added to the hydromulch machine and agitated more than 20 minutes before it is to be used. If agitated too much, the slow-release coating is destroyed.
- There are numerous products available on the market that take the place of chemical fertilizers. These include several with seaweed extracts that are beneficial to soil microbes and organisms. If 100 percent cottonseed meal is used as the mulch in hydroseed, chemical fertilizer may not be necessary. Cottonseed meal is a good source of long-term, slow-release, available nitrogen.
- Hydroseed applications shall include a minimum of 1,500 pounds per acre of mulch with 3 percent tackifier. Mulch may be made up of 100 percent: cottonseed meal; fibers made of wood, recycled cellulose, hemp, and kenaf; compost; or blends of these. Tackifier shall be plant-based, such as guar or alpha plantago, or chemical-based such as polyacrylamide or polymers. Any mulch or tackifier product used shall be installed per manufacturer’s instructions. Generally, mulches come in 40-50 pound bags. Seed and fertilizer are added at time of application.

- Mulch is always required for seeding. Mulch can be applied on top of the seed or simultaneously by hydroseeding.
- On steep slopes, Bonded Fiber Matrix (BFM) or Mechanically Bonded Fiber Matrix (MBFM) products should be used. BFM/MBFM products are applied at a minimum rate of 3,000 pounds per acre of mulch with approximately 10 percent tackifier. Application is made so that a minimum of 95 percent soil coverage is achieved. Numerous products are available commercially and should be installed per manufacturer's instructions. Most products require 24-36 hours to cure before a rainfall and cannot be installed on wet or saturated soils. Generally, these products come in 40-50 pound bags and include all necessary ingredients except for seed and fertilizer.

BFMs and MBFMs have some advantages over blankets:

- No surface preparation required;
- Can be installed via helicopter in remote areas;
- On slopes steeper than 2.5:1, blanket installers may need to be roped and harnessed for safety;
- They are at least \$1,000 per acre cheaper installed.

In most cases, the shear strength of blankets is not a factor when used on slopes, only when used in channels. BFMs and MBFMs are good alternatives to blankets in most situations where vegetation establishment is the goal.

- When installing seed via hydroseeding operations, only about 1/3 of the seed actually ends up in contact with the soil surface. This reduces the ability to establish a good stand of grass quickly. One way to overcome this is to increase seed quantities by up to 50 percent.
- Vegetation establishment can also be enhanced by dividing the hydromulch operation into two phases:
  1. Phase 1- Install all seed and fertilizer with 25-30 percent mulch and tackifier onto soil in the first lift;
  2. Phase 2- Install the rest of the mulch and tackifier over the first lift.

An alternative is to install the mulch, seed, fertilizer, and tackifier in one lift. Then, spread or blow straw over the top of the hydromulch at a rate of about 800-1000 pounds per acre. Hold straw in place with a standard tackifier. Both of these approaches will increase cost moderately but will greatly improve and enhance vegetative establishment. The increased cost may be offset by the reduced need for:

1. Irrigation
2. Reapplication of mulch
3. Repair of failed slope surfaces

This technique works with standard hydromulch (1,500 pounds per acre minimum) and BFM/MBFMs (3,000 pounds per acre minimum).

- Areas to be permanently landscaped shall provide a healthy topsoil that reduces the need for fertilizers, improves overall topsoil quality, provides for better vegetal health and vitality, improves hydrologic characteristics, and reduces the need for irrigation. This can be accomplished in a number of ways:

Recent research has shown that the best method to improve till soils is to amend these soils with compost. The optimum mixture is approximately two parts soil to one part compost. This equates to 4 inches of compost mixed to a depth of 12 inches in till soils. Increasing the concentration of compost beyond this level can have negative effects on vegetal health, while decreasing the concentrations can reduce the benefits of amended soils. Please note: The compost should meet specifications for Grade A quality compost in Ecology Publication 94-038.

Other soils, such as gravel or cobble outwash soils, may require different approaches. Organics and fines easily migrate through the loose structure of these soils. Therefore, the importation of at least 6 inches of quality topsoil, underlain by some type of filter fabric to prevent the migration of fines, may be more appropriate for these soils.

Areas that already have good topsoil, such as undisturbed areas, do not require soil amendments.

- Areas that will be seeded only and not landscaped may need compost or meal-based mulch included in the hydroseed in order to establish vegetation. Native topsoil should be re-installed on the disturbed soil surface before application.
- Seed that is installed as a temporary measure may be installed by hand if it will be covered by straw, mulch, or topsoil. Seed that is installed as a permanent measure may be installed by hand on small areas (usually less than 1 acre) that will be covered with mulch, topsoil, or erosion blankets. The seed mixes listed below include recommended mixes for both temporary and permanent seeding. These mixes, with the exception of the wetland mix, shall be applied at a rate of 120 pounds per acre. This rate can be reduced if soil amendments or slow-release fertilizers are used. Local suppliers or the local conservation district should be consulted for their recommendations because the appropriate mix depends on a variety of factors, including location, exposure, soil type, slope, and expected foot traffic. Alternative seed mixes approved by the local authority may be used.

Table 4.1 represents the standard mix for those areas where just a temporary vegetative cover is required.

<b>Table 4.1 Temporary Erosion Control Seed Mix</b>			
	<b>% Weight</b>	<b>% Purity</b>	<b>% Germination</b>
Chewings or annual blue grass <i>Festuca rubra var. commutata</i> or <i>Poa anna</i>	40	98	90
Perennial rye - <i>Lolium perenne</i>	50	98	90
Redtop or colonial bentgrass <i>Agrostis alba</i> or <i>Agrostis tenuis</i>	5	92	85
White dutch clover <i>Trifolium repens</i>	5	98	90

Table 4.2 provides just one recommended possibility for landscaping seed.

<b>Table 4.2 Landscaping Seed Mix</b>			
	<b>% Weight</b>	<b>% Purity</b>	<b>% Germination</b>
Perennial rye blend <i>Lolium perenne</i>	70	98	90
Chewings and red fescue blend <i>Festuca rubra var. commutata</i> or <i>Festuca rubra</i>	30	98	90

This turf seed mix in Table 4.3 is for dry situations where there is no need for much water. The advantage is that this mix requires very little maintenance.

<b>Table 4.3 Low-Growing Turf Seed Mix</b>			
	<b>% Weight</b>	<b>% Purity</b>	<b>% Germination</b>
Dwarf tall fescue (several varieties) <i>Festuca arundinacea var.</i>	45	98	90
Dwarf perennial rye (Barclay) <i>Lolium perenne var. barclay</i>	30	98	90
Red fescue <i>Festuca rubra</i>	20	98	90
Colonial bentgrass <i>Agrostis tenuis</i>	5	98	90

Table 4.4 presents a mix recommended for bioswales and other intermittently wet areas.

<b>Table 4.4 Bioswale Seed Mix*</b>			
	<b>% Weight</b>	<b>% Purity</b>	<b>% Germination</b>
Tall or meadow fescue <i>Festuca arundinacea</i> or <i>Festuca elatior</i>	75-80	98	90
Seaside/Creeping bentgrass <i>Agrostis palustris</i>	10-15	92	85
Redtop bentgrass <i>Agrostis alba</i> or <i>Agrostis gigantea</i>	5-10	90	80

\* Modified Briargreen, Inc. Hydroseeding Guide Wetlands Seed Mix

The seed mix shown in Table 4.5 is a recommended low-growing, relatively non-invasive seed mix appropriate for very wet areas that are not regulated wetlands. Other mixes may be appropriate, depending on the soil type and hydrology of the area. Recent research suggests that bentgrass (agrostis sp.) should be emphasized in wet-area seed mixes. Apply this mixture at a rate of 60 pounds per acre.

<b>Table 4.5 Wet Area Seed Mix*</b>			
	<b>% Weight</b>	<b>% Purity</b>	<b>% Germination</b>
Tall or meadow fescue <i>Festuca arundinacea</i> or <i>Festuca elatior</i>	60-70	98	90
Seaside/Creeping bentgrass <i>Agrostis palustris</i>	10-15	98	85
Meadow foxtail <i>Alepcurus pratensis</i>	10-15	90	80
Alsike clover <i>Trifolium hybridum</i>	1-6	98	90
Redtop bentgrass <i>Agrostis alba</i>	1-6	92	85

\* Modified Briargreen, Inc. Hydroseeding Guide Wetlands Seed Mix

The meadow seed mix in Table 4.6 is recommended for areas that will be maintained infrequently or not at all and where colonization by native plants is desirable. Likely applications include rural road and utility right-of-way. Seeding should take place in September or very early October in order to obtain adequate establishment prior to the winter months. The appropriateness of clover in the mix may need to be considered, as this can be a fairly invasive species. If the soil is amended, the addition of clover may not be necessary.

<b>Table 4.6 Meadow Seed Mix</b>			
	<b>% Weight</b>	<b>% Purity</b>	<b>% Germination</b>
Redtop or Oregon bentgrass <i>Agrostis alba</i> or <i>Agrostis oregonensis</i>	20	92	85
Red fescue <i>Festuca rubra</i>	70	98	90
White dutch clover <i>Trifolium repens</i>	10	98	90

**Maintenance Standards**

- Any seeded areas that fail to establish at least 80 percent cover (100 percent cover for areas that receive sheet or concentrated flows) shall be reseeded. If reseeding is ineffective, an alternate method, such as sodding, mulching, or nets/blankets, shall be used. If winter weather prevents adequate grass growth, this time limit may be relaxed at the discretion of the local authority when sensitive areas would otherwise be protected.

- After adequate cover is achieved, any areas that experience erosion shall be reseeded and protected by mulch. If the erosion problem is drainage related, the problem shall be fixed and the eroded area reseeded and protected by mulch.
- Seeded areas shall be supplied with adequate moisture, but not watered to the extent that it causes runoff.

## **BMP C123: Plastic Covering**

- Purpose* Plastic covering provides immediate, short-term erosion protection to slopes and disturbed areas.
- Conditions of Use*
- Plastic covering may be used on disturbed areas that require cover measures for less than 30 days, except as stated below.
  - Plastic is particularly useful for protecting cut and fill slopes and stockpiles. Note: The relatively rapid breakdown of most polyethylene sheeting makes it unsuitable for long-term (greater than six months) applications.
  - Clear plastic sheeting can be used over newly-seeded areas to create a greenhouse effect and encourage grass growth if the hydroseed was installed too late in the season to establish 75 percent grass cover, or if the wet season started earlier than normal. Clear plastic should not be used for this purpose during the summer months because the resulting high temperatures can kill the grass.
  - Due to rapid runoff caused by plastic sheeting, this method shall not be used upslope of areas that might be adversely impacted by concentrated runoff. Such areas include steep and/or unstable slopes.
  - While plastic is inexpensive to purchase, the added cost of installation, maintenance, removal, and disposal make this an expensive material, up to \$1.50-2.00 per square yard.
  - Whenever plastic is used to protect slopes, water collection measures must be installed at the base of the slope. These measures include plastic-covered berms, channels, and pipes used to convey clean rainwater away from bare soil and disturbed areas. At no time is clean runoff from a plastic covered slope to be mixed with dirty runoff from a project.
  - Other uses for plastic include:
    1. Temporary ditch liner;
    2. Pond liner in temporary sediment pond;
    3. Liner for bermed temporary fuel storage area if plastic is not reactive to the type of fuel being stored;
    4. Emergency slope protection during heavy rains; and,
    5. Temporary drainpipe (“elephant trunk”) used to direct water.

***Design and  
Installation  
Specifications***

- Plastic slope cover must be installed as follows:
  1. Run plastic up and down slope, not across slope;
  2. Plastic may be installed perpendicular to a slope if the slope length is less than 10 feet;
  3. Minimum of 8-inch overlap at seams;
  4. On long or wide slopes, or slopes subject to wind, all seams should be taped;
  5. Place plastic into a small (12-inch wide by 6-inch deep) slot trench at the top of the slope and backfill with soil to keep water from flowing underneath;
  6. Place sand filled burlap or geotextile bags every 3 to 6 feet along seams and pound a wooden stake through each to hold them in place;
  7. Inspect plastic for rips, tears, and open seams regularly and repair immediately. This prevents high velocity runoff from contacting bare soil which causes extreme erosion;
  8. Sandbags may be lowered into place tied to ropes. However, all sandbags must be staked in place.
- Plastic sheeting shall have a minimum thickness of 0.06 millimeters.
- If erosion at the toe of a slope is likely, a gravel berm, riprap, or other suitable protection shall be installed at the toe of the slope in order to reduce the velocity of runoff.

***Maintenance  
Standards***

- Torn sheets must be replaced and open seams repaired.
- If the plastic begins to deteriorate due to ultraviolet radiation, it must be completely removed and replaced.
- When the plastic is no longer needed, it shall be completely removed.
- Dispose of old tires appropriately.

## **BMP C125: Topsoiling**

### ***Purpose***

To provide a suitable growth medium for final site stabilization with vegetation. While not a permanent cover practice in itself, topsoiling is an integral component of providing permanent cover in those areas where there is an unsuitable soil surface for plant growth. Native soils and disturbed soils that have been organically amended not only retain much more stormwater, but they also serve as effective biofilters for urban pollutants and, by supporting more vigorous plant growth, reduce the water, fertilizer and pesticides needed to support installed landscapes. Topsoil does not include any subsoils but only the material from the top several inches including organic debris.

### ***Conditions of Use***

- Native soils should be left undisturbed to the maximum extent practicable. Native soils disturbed during clearing and grading should be restored, to the maximum extent practicable, to a condition where moisture-holding capacity is equal to or better than the original site conditions. This criterion can be met by using on-site native topsoil, incorporating amendments into on-site soil, or importing blended topsoil.
- Topsoiling is a required procedure when establishing vegetation on shallow soils, and soils of critically low pH (high acid) levels.
- Stripping of existing, properly functioning soil system and vegetation for the purpose of topsoiling during construction is not acceptable. If an existing soil system is functioning properly it shall be preserved in its undisturbed and uncompacted condition.
- Depending on where the topsoil comes from, or what vegetation was on site before disturbance, invasive plant seeds may be included and could cause problems for establishing native plants, landscaped areas, or grasses.
- Topsoil from the site will contain mycorrhizal bacteria that are necessary for healthy root growth and nutrient transfer. These native mycorrhiza are acclimated to the site and will provide optimum conditions for establishing grasses. Commercially available mycorrhiza products should be used when topsoil is brought in from off-site.

### ***Design and Installation Specifications***

If topsoiling is to be done, the following items should be considered:

- Maximize the depth of the topsoil wherever possible to provide the maximum possible infiltration capacity and beneficial growth medium. Topsoil depth shall be at least 8 inches with a minimum organic content of 10 percent dry weight and pH between 6.0 and 8.0 or matching the pH of the undisturbed soil. This can be accomplished either by returning native topsoil to the site and/or incorporating organic amendments. Organic amendments should be incorporated to a minimum 8-inch depth except where tree roots or other natural

features limit the depth of incorporation. Subsoils below the 12-inch depth should be scarified at least 2 inches to avoid stratified layers, where feasible. The decision to either layer topsoil over a subgrade or incorporate topsoil into the underlying layer may vary depending on the planting specified.

- If blended topsoil is imported, then fines should be limited to 25 percent passing through a 200 sieve.
- The final composition and construction of the soil system will result in a natural selection or favoring of certain plant species over time. For example, recent practices have shown that incorporation of topsoil may favor grasses, while layering with mildly acidic, high-carbon amendments may favor more woody vegetation.
- Locate the topsoil stockpile so that it meets specifications and does not interfere with work on the site. It may be possible to locate more than one pile in proximity to areas where topsoil will be used.
- Allow sufficient time in scheduling for topsoil to be spread prior to seeding, sodding, or planting.
- Care must be taken not to apply to subsoil if the two soils have contrasting textures. Sandy topsoil over clayey subsoil is a particularly poor combination, as water creeps along the junction between the soil layers and causes the topsoil to slough.
- If topsoil and subsoil are not properly bonded, water will not infiltrate the soil profile evenly and it will be difficult to establish vegetation. The best method to prevent a lack of bonding is to actually work the topsoil into the layer below for a depth of at least 6 inches.
- Ripping or re-structuring the subgrade may also provide additional benefits regarding the overall infiltration and interflow dynamics of the soil system.
- Field exploration of the site shall be made to determine if there is surface soil of sufficient quantity and quality to justify stripping. Topsoil shall be friable and loamy (loam, sandy loam, silt loam, sandy clay loam, clay loam). Areas of natural ground water recharge should be avoided.
- Stripping shall be confined to the immediate construction area. A 4- to 6- inch stripping depth is common, but depth may vary depending on the particular soil. All surface runoff control structures shall be in place prior to stripping.

Stockpiling of topsoil shall occur in the following manner:

- Side slopes of the stockpile shall not exceed 2:1.
- An interceptor dike with gravel outlet and silt fence shall surround all topsoil stockpiles between October 1 and April 30. Between May 1

and September 30, an interceptor dike with gravel outlet and silt fence shall be installed if the stockpile will remain in place for a longer period of time than active construction grading.

- Erosion control seeding or covering with clear plastic or other mulching materials of stockpiles shall be completed within 2 days (October 1 through April 30) or 7 days (May 1 through September 30) of the formation of the stockpile. Native topsoil stockpiles shall not be covered with plastic.
- Topsoil shall not be placed while in a frozen or muddy condition, when the subgrade is excessively wet, or when conditions exist that may otherwise be detrimental to proper grading or proposed sodding or seeding.
- Previously established grades on the areas to be topsoiled shall be maintained according to the approved plan.
- When native topsoil is to be stockpiled and reused the following should apply to ensure that the mycorrhizal bacterial, earthworms, and other beneficial organisms will not be destroyed:
  1. Topsoil is to be re-installed within 4 to 6 weeks;
  2. Topsoil is not to become saturated with water;
  3. Plastic cover is not allowed.
- Inspect stockpiles regularly, especially after large storm events. Stabilize any areas that have eroded.

***Maintenance  
Standards***

## **BMP C150: Materials On Hand**

### ***Purpose***

Quantities of erosion prevention and sediment control materials can be kept on the project site at all times to be used for emergency situations such as unexpected heavy summer rains. Having these materials on-site reduces the time needed to implement BMPs when inspections indicate that existing BMPs are not meeting the Construction SWPPP requirements. In addition, contractors can save money by buying some materials in bulk and storing them at their office or yard.

### ***Conditions of Use***

- Construction projects of any size or type can benefit from having materials on hand. A small commercial development project could have a roll of plastic and some gravel available for immediate protection of bare soil and temporary berm construction. A large earthwork project, such as highway construction, might have several tons of straw, several rolls of plastic, flexible pipe, sandbags, geotextile fabric and steel “T” posts.
- Materials are stockpiled and readily available before any site clearing, grubbing, or earthwork begins. A large contractor or developer could keep a stockpile of materials that are available to be used on several projects.
- If storage space at the project site is at a premium, the contractor could maintain the materials at their office or yard. The office or yard must be less than an hour from the project site.

### ***Design and Installation Specifications***

Depending on project type, size, complexity, and length, materials and quantities will vary. A good minimum that will cover numerous situations includes:

<b>Material</b>	<b>Measure</b>	<b>Quantity</b>
Clear Plastic, 6 mil	100 foot roll	1-2
Drainpipe, 6 or 8 inch diameter	25 foot section	4-6
Sandbags, filled	each	25-50
Straw Bales for mulching,	approx. 50# each	10-20
Quarry Spalls	ton	2-4
Washed Gravel	cubic yard	2-4
Geotextile Fabric	100 foot roll	1-2
Catch Basin Inserts	each	2-4
Steel “T” Posts	each	12-24

### ***Maintenance Standards***

- All materials with the exception of the quarry spalls, steel “T” posts, and gravel should be kept covered and out of both sun and rain.
- Re-stock materials used as needed.

## **BMP C151: Concrete Handling**

***Purpose*** Concrete work can generate process water and slurry that contain fine particles and high pH, both of which can violate water quality standards in the receiving water. This BMP is intended to minimize and eliminate concrete process water and slurry from entering waters of the state.

***Conditions of Use*** Any time concrete is used, these management practices shall be utilized. Concrete construction projects include, but are not limited to, the following:

- Curbs
- Sidewalks
- Roads
- Bridges
- Foundations
- Floors
- Runways
- Concrete truck chutes, pumps, and internals shall be washed out only into formed areas awaiting installation of concrete or asphalt.
- Unused concrete remaining in the truck and pump shall be returned to the originating batch plant for recycling.
- Hand tools including, but not limited to, screeds, shovels, rakes, floats, and trowels shall be washed off only into formed areas awaiting installation of concrete or asphalt.
- Equipment that cannot be easily moved, such as concrete pavers, shall only be washed in areas that do not directly drain to natural or constructed stormwater conveyances.
- Washdown from areas such as concrete aggregate driveways shall not drain directly to natural or constructed stormwater conveyances.
- When no formed areas are available, washwater and leftover product shall be contained in a lined container. Contained concrete shall be disposed of in a manner that does not violate groundwater or surface water quality standards.

***Maintenance Standards*** Containers shall be checked for holes in the liner daily during concrete pours and repaired the same day.

## **BMP C153: Material Delivery, Storage and Containment**

### ***Purpose***

Prevent, reduce, or eliminate the discharge of pollutants from material delivery and storage to the stormwater system or watercourses by minimizing the storage of hazardous materials onsite, storing materials in a designated area, and installing secondary containment.

### ***Conditions of Use***

**These procedures are suitable for use at all construction sites with delivery and storage of the following materials:**

- Petroleum products such as fuel, oil and grease
- Soil stabilizers and binders (e.g. Polyacrylamide)
- Fertilizers, pesticides and herbicides
- Detergents
- Asphalt and concrete compounds
- Hazardous chemicals such as acids, lime, adhesives, paints, solvents and curing compounds
- Any other material that may be detrimental if released to the environment

### ***Design and Installation Specifications***

**The following steps should be taken to minimize risk:**

- Temporary storage area should be located away from vehicular traffic, near the construction entrance(s), and away from waterways or storm drains.
- Material Safety Data Sheets (MSDS) should be supplied for all materials stored. Chemicals should be kept in their original labeled containers.
- Hazardous material storage on-site should be minimized.
- Hazardous materials should be handled as infrequently as possible.
- During the wet weather season (Oct 1 – April 30), consider storing materials in a covered area.
- Materials should be stored in secondary containments, such as earthen dike, horse trough, or even a children’s wading pool for non-reactive materials such as detergents, oil, grease, and paints. Small amounts of material may be secondarily contained in “bus boy” trays or concrete mixing trays.
- Do not store chemicals, drums, or bagged materials directly on the ground. Place these items on a pallet and, when possible, in secondary containment.

- If drums must be kept uncovered, store them at a slight angle to reduce ponding of rainwater on the lids to reduce corrosion. Domed plastic covers are inexpensive and snap to the top of drums, preventing water from collecting.

**Material Storage Areas and Secondary Containment Practices:**

- Liquids, petroleum products, and substances listed in 40 CFR Parts 110, 117, or 302 shall be stored in approved containers and drums and shall not be overfilled. Containers and drums shall be stored in temporary secondary containment facilities.
- Temporary secondary containment facilities shall provide for a spill containment volume able to contain precipitation from a 25 year, 24 hour storm event, plus 10% of the total enclosed container volume of all containers, or 110% of the capacity of the largest container within its boundary, whichever is greater.
- Secondary containment facilities shall be impervious to the materials stored therein for a minimum contact time of 72 hours.
- Secondary containment facilities shall be maintained free of accumulated rainwater and spills. In the event of spills or leaks, accumulated rainwater and spills shall be collected and placed into drums. These liquids shall be handled as hazardous waste unless testing determines them to be non-hazardous.
- Sufficient separation should be provided between stored containers to allow for spill cleanup and emergency response access.
- During the wet weather season (Oct 1 – April 30), each secondary containment facility shall be covered during non-working days, prior to and during rain events.
- Keep material storage areas clean, organized and equipped with an ample supply of appropriate spill clean-up material (spill kit).
- The spill kit should include, at a minimum:
  - 1-Water Resistant Nylon Bag
  - 3-Oil Absorbent Socks 3”x 4’
  - 2-Oil Absorbent Socks 3”x 10’
  - 12-Oil Absorbent Pads 17”x19”
  - 1-Pair Splash Resistant Goggles
  - 3-Pair Nitrile Gloves
  - 10-Disposable Bags with Ties
  - Instructions

## **BMP C154: Concrete Washout Area**

***Purpose*** Prevent or reduce the discharge of pollutants to stormwater from concrete waste by conducting washout off-site, or performing on-site washout in a designated area to prevent pollutants from entering surface waters or ground water.

***Conditions of Use*** Concrete washout area best management practices are implemented on construction projects where:

- Concrete is used as a construction material
- It is not possible to dispose of all concrete wastewater and washout off-site (ready mix plant, etc.).
- Concrete trucks, pumpers, or other concrete coated equipment are washed on-site.
- Note: If less than 10 concrete trucks or pumpers need to be washed out on-site, the washwater may be disposed of in a formed area awaiting concrete or an upland disposal site where it will not contaminate surface or ground water. The upland disposal site shall be at least 50 feet from sensitive areas such as storm drains, open ditches, or water bodies, including wetlands.

### ***Design and Installation Specifications***

#### **Implementation**

The following steps will help reduce stormwater pollution from concrete wastes:

- Perform washout of concrete trucks off-site or in designated concrete washout areas only.
- Do not wash out concrete trucks onto the ground, or into storm drains, open ditches, streets, or streams.
- Do not allow excess concrete to be dumped on-site, except in designated concrete washout areas.
- Concrete washout areas may be prefabricated concrete washout containers, or self-installed structures (above-grade or below-grade).
- Prefabricated containers are most resistant to damage and protect against spills and leaks. Companies may offer delivery service and provide regular maintenance and disposal of solid and liquid waste.
- If self-installed concrete washout areas are used, below-grade structures are preferred over above-grade structures because they are less prone to spills and leaks.
- Self-installed above-grade structures should only be used if excavation is not practical.

### **Education**

- Discuss the concrete management techniques described in this BMP with the ready-mix concrete supplier before any deliveries are made.
- Educate employees and subcontractors on the concrete waste management techniques described in this BMP.
- Arrange for contractor's superintendent or Certified Erosion and Sediment Control Lead (CESCL) to oversee and enforce concrete waste management procedures.
- A sign should be installed adjacent to each temporary concrete washout facility to inform concrete equipment operators to utilize the proper facilities.

### **Contracts**

Incorporate requirements for concrete waste management into concrete supplier and subcontractor agreements.

### **Location and Placement**

- Locate washout area at least 50 feet from sensitive areas such as storm drains, open ditches, or water bodies, including wetlands.
- Allow convenient access for concrete trucks, preferably near the area where the concrete is being poured.
- If trucks need to leave a paved area to access washout, prevent track-out with a pad of rock or quarry spalls (see [BMP C105](#)). These areas should be far enough away from other construction traffic to reduce the likelihood of accidental damage and spills.
- The number of facilities you install should depend on the expected demand for storage capacity.
- On large sites with extensive concrete work, washouts should be placed in multiple locations for ease of use by concrete truck drivers.

### **On-site Temporary Concrete Washout Facility, Transit Truck Washout Procedures:**

- Temporary concrete washout facilities shall be located a minimum of 50 ft from sensitive areas including storm drain inlets, open drainage facilities, and watercourses. See [Figures 4.1.7](#) and [4.1.8](#).
- Concrete washout facilities shall be constructed and maintained in sufficient quantity and size to contain all liquid and concrete waste generated by washout operations.
- Approximately 7 gallons of wash water are used to wash one truck chute.
- Approximately 50 gallons are used to wash out the hopper of a concrete pump truck.

- Washout of concrete trucks shall be performed in designated areas only.
- Concrete washout from concrete pumper bins can be washed into concrete pumper trucks and discharged into designated washout area or properly disposed of off-site.
- Once concrete wastes are washed into the designated area and allowed to harden, the concrete should be broken up, removed, and disposed of per applicable solid waste regulations. Dispose of hardened concrete on a regular basis.
- Temporary Above-Grade Concrete Washout Facility
  - Temporary concrete washout facility (type above grade) should be constructed as shown on the details below, with a recommended minimum length and minimum width of 10 ft, but with sufficient quantity and volume to contain all liquid and concrete waste generated by washout operations.
  - Plastic lining material should be a minimum of 10 mil polyethylene sheeting and should be free of holes, tears, or other defects that compromise the impermeability of the material.
- Temporary Below-Grade Concrete Washout Facility
  - Temporary concrete washout facilities (type below grade) should be constructed as shown on the details below, with a recommended minimum length and minimum width of 10 ft. The quantity and volume should be sufficient to contain all liquid and concrete waste generated by washout operations.
  - Lath and flagging should be commercial type.
  - Plastic lining material shall be a minimum of 10 mil polyethylene sheeting and should be free of holes, tears, or other defects that compromise the impermeability of the material.
  - Liner seams shall be installed in accordance with manufacturers' recommendations.
  - Soil base shall be prepared free of rocks or other debris that may cause tears or holes in the plastic lining material.

***Maintenance Standards***

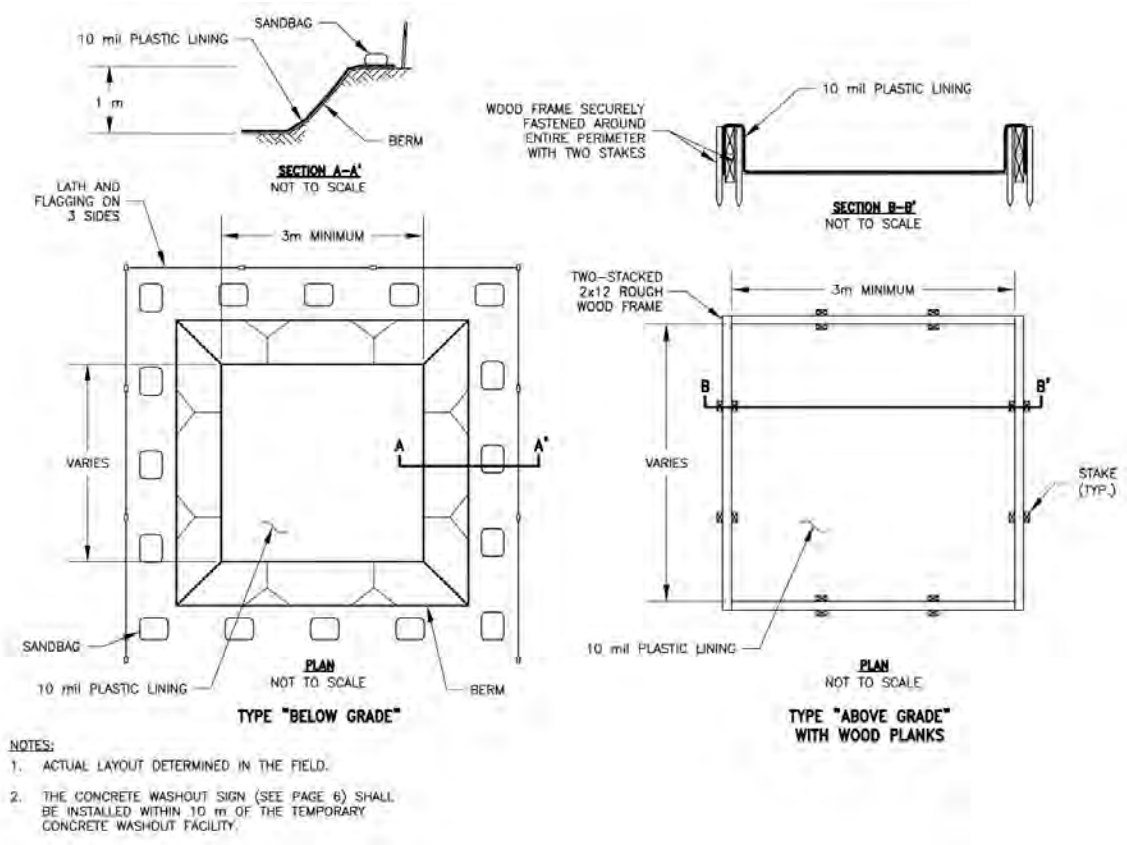
**Inspection and Maintenance**

- Inspect and verify that concrete washout BMPs are in place prior to the commencement of concrete work.
- During periods of concrete work, inspect daily to verify continued performance.
  - Check overall condition and performance.
  - Check remaining capacity (% full).

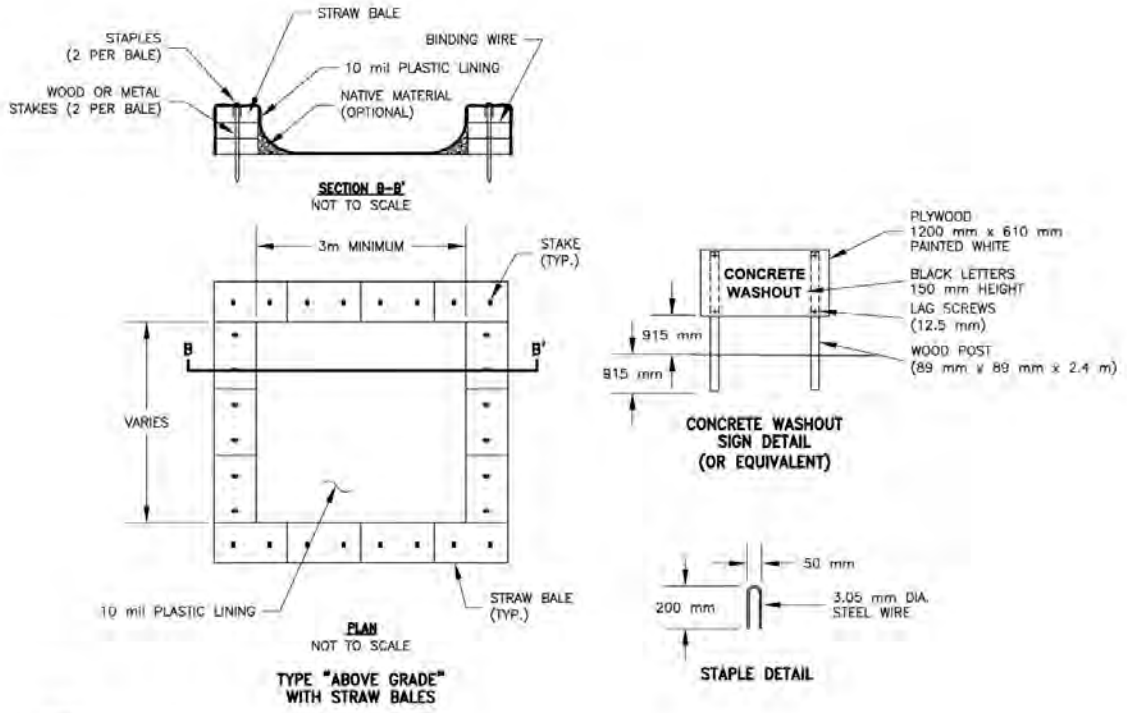
- If using self-installed washout facilities, verify plastic liners are intact and sidewalls are not damaged.
- If using prefabricated containers, check for leaks.
- Washout facilities shall be maintained to provide adequate holding capacity with a minimum freeboard of 12 inches.
- Washout facilities must be cleaned, or new facilities must be constructed and ready for use once the washout is 75% full.
- If the washout is nearing capacity, vacuum and dispose of the waste material in an approved manner.
  - Do not discharge liquid or slurry to waterways, storm drains or directly onto ground.
  - Do not use sanitary sewer without local approval.
  - Place a secure, non-collapsing, non-water collecting cover over the concrete washout facility prior to predicted wet weather to prevent accumulation and overflow of precipitation.
  - Remove and dispose of hardened concrete and return the structure to a functional condition. Concrete may be reused on-site or hauled away for disposal or recycling.
- When you remove materials from the self-installed concrete washout, build a new structure; or, if the previous structure is still intact, inspect for signs of weakening or damage, and make any necessary repairs. Re-line the structure with new plastic after each cleaning.

### **Removal of Temporary Concrete Washout Facilities**

- When temporary concrete washout facilities are no longer required for the work, the hardened concrete, slurries and liquids shall be removed and properly disposed of.
- Materials used to construct temporary concrete washout facilities shall be removed from the site of the work and disposed of or recycled.
- Holes, depressions or other ground disturbance caused by the removal of the temporary concrete washout facilities shall be backfilled, repaired, and stabilized to prevent erosion.



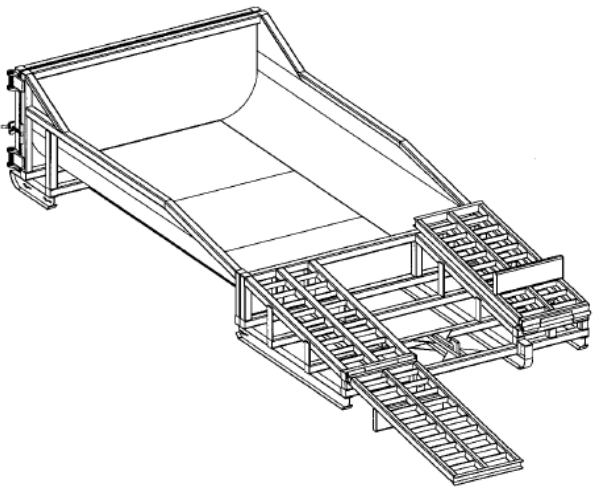
**Figure 4.1.7a – Concrete Washout Area**



- NOTES:**
1. ACTUAL LAYOUT DETERMINED IN THE FIELD.
  2. THE CONCRETE WASHOUT SIGN (SEE FIG. 4-15) SHALL BE INSTALLED WITHIN 10 m OF THE TEMPORARY CONCRETE WASHOUT FACILITY.

DALTRANS/FIG4-14.DWG SAC: B-14-02

**Figure 4.1.7b – Concrete Washout Area**



**Figure 4.1.8 – Prefabricated Concrete Washout Container w/Ramp**

## **BMP C160: Certified Erosion and Sediment Control Lead**

**Purpose** The project proponent designates at least one person as the responsible representative in charge of erosion and sediment control (ESC), and water quality protection. The designated person shall be the Certified Erosion and Sediment Control Lead (CESCL) who is responsible for ensuring compliance with all local, state, and federal erosion and sediment control and water quality requirements.

**Conditions of Use** A CESCL shall be made available on projects one acre or larger that discharge stormwater to surface waters of the state

- The CESCL shall:
  - Have a current certificate proving attendance in an erosion and sediment control training course that meets the minimum ESC training and certification requirements established by Ecology (see details below).

Ecology will maintain a list of ESC training and certification providers at: [www.ecy.wa.gov/programs/wq/stormwater](http://www.ecy.wa.gov/programs/wq/stormwater).

### **OR**

- Be a Certified Professional in Erosion and Sediment Control (CPESC); for additional information go to: [www.cpesec.net](http://www.cpesec.net)

### **Specifications**

- Certification shall remain valid for three years.
- The CESCL shall have authority to act on behalf of the contractor or developer and shall be available, on call, 24 hours per day throughout the period of construction.
- The Construction SWPPP shall include the name, telephone number, fax number, and address of the designated CESCL.
- A CESCL may provide inspection and compliance services for multiple construction projects in the same geographic region.

Duties and responsibilities of the CESCL shall include, but are not limited to the following:

- Maintaining permit file on site at all times which includes the SWPPP and any associated permits and plans.
- Directing BMP installation, inspection, maintenance, modification, and removal.
- Updating all project drawings and the Construction SWPPP with changes made.

- Keeping daily logs, and inspection reports. Inspection reports should include:
  - Inspection date/time.
  - Weather information; general conditions during inspection and approximate amount of precipitation since the last inspection.
  - A summary or list of all BMPs implemented, including observations of all erosion/sediment control structures or practices. The following shall be noted:
    - 1) Locations of BMPs inspected,
    - 2) Locations of BMPs that need maintenance,
    - 3) Locations of BMPs that failed to operate as designed or intended, and
    - 4) Locations of where additional or different BMPs are required.
  - Visual monitoring results, including a description of discharged stormwater. The presence of suspended sediment, turbid water, discoloration, and oil sheen shall be noted, as applicable.
  - Any water quality monitoring performed during inspection.
  - General comments and notes, including a brief description of any BMP repairs, maintenance or installations made as a result of the inspection.
- Facilitate, participate in, and take corrective actions resulting from inspections performed by outside agencies or the owner.

## **Minimum Requirements for ESC Training and Certification Courses**

### **General Requirements**

1. The course shall teach the construction stormwater pollution prevention guidance provided in the most recent version of:
  - a. The Washington State Dept. of Ecology Stormwater Management Manual for Western Washington,
  - b. Other equivalent stormwater management manuals approved by Ecology.
2. Upon completion of course, each attendee shall receive documentation of certification, including, at a minimum, a wallet-sized card that certifies completion of the course. Certification shall remain valid for three years. Recertification may be obtained by completing the 8-hour refresher course or by taking the initial 16-hour training course again.
3. The initial certification course shall be a minimum of 16 hours (with a reasonable time allowance for lunch, breaks, and travel to and from field) and include a field element and test.
  - a. The field element must familiarize students with the proper installation, maintenance and inspection of common erosion and sediment control BMPs including, but not limited to, blankets, check dams, silt fence, straw mulch, plastic, and seeding.
  - b. The test shall be open book and a passing score is not required for certification. Upon completion of the test, the correct answers shall be provided and discussed.
4. The refresher course shall be a minimum of 8 hours and include a test.
  - a. The refresher course shall include:
    - i. Applicable updates to the Stormwater Management Manual that is used to teach the course, including new or updated BMPs; and
    - ii. Applicable changes to the NPDES General Permit for Construction Activities.
  - b. The refresher course test shall be open book and a passing score is not required for certification. Upon completion of the test, the correct answers shall be provided and discussed.
  - c. The refresher course may be taught using an alternative format (e.g. internet, CD ROM, etc.) if the module is approved by Ecology.

### **Required Course Elements**

1. Erosion and Sedimentation Impacts
  - a. Examples/Case studies

2. Erosion and Sedimentation Processes
  - a. Definitions
  - b. Types of erosion
  - c. Sedimentation
    - i. Basic settling concepts
    - ii. Problems with clays/turbidity
3. Factors Influencing Erosion Potential
  - a. Soil
  - b. Vegetation
  - c. Topography
  - d. Climate
4. Regulatory Requirements
  - a. NPDES - Construction Stormwater General Permit
  - b. Local requirements and permits
  - c. Other regulatory requirements
5. Stormwater Pollution Prevention Plan (SWPPP)
  - a. SWPPP is a living document – should be revised as necessary
  - b. 12 Elements of a SWPPP; discuss suggested BMPs (with examples)
    1. Mark Clearing Limits
    2. Establish Construction Access
    3. Control Flow Rates
    4. Install Sediment Controls
    5. Stabilize Soils
    6. Protect Slopes
    7. Protect Drain Inlets
    8. Stabilize Channels and Outlets
    9. Control Pollutants
    10. Control De-watering
    11. Maintain BMPs
    12. Manage the Project
6. Monitoring/Reporting/Recordkeeping
  - a. Site inspections/visual monitoring
    - i. Disturbed areas
    - ii. BMPs
    - iii. Stormwater discharge points
  - b. Water quality sampling/analysis
    - i. Turbidity
    - ii. pH
  - c. Monitoring frequency
    - i. Set by NPDES permit
    - ii. Inactive sites - reduced frequency

- d. Adaptive Management
  - i. When monitoring indicates problem, take appropriate action (e.g. install/maintain BMPs)
  - ii. Document the corrective action(s) in SWPPP
- e. Reporting
  - i. Inspection reports/checklists
  - ii. Discharge Monitoring Reports (DMR)
  - iii. Non-compliance notification

### **Instructor Qualifications**

1. Instructors must be qualified to effectively teach the required course elements.
2. At a minimum, instructors must have:
  - a. Current certification as a Certified Professional in Erosion and Sediment Control (CPESC), or
  - b. Completed a training program for teaching the required course elements, or
  - c. The academic credentials and instructional experience necessary for teaching the required course elements.
3. Instructors must demonstrate competent instructional skills and knowledge of the applicable subject matter.

## **BMP C162: Scheduling**

***Purpose*** Sequencing a construction project reduces the amount and duration of soil exposed to erosion by wind, rain, runoff, and vehicle tracking.

***Conditions of Use*** The construction sequence schedule is an orderly listing of all major land-disturbing activities together with the necessary erosion and sedimentation control measures planned for the project. This type of schedule guides the contractor on work to be done before other work is started so that serious erosion and sedimentation problems can be avoided.

Following a specified work schedule that coordinates the timing of land-disturbing activities and the installation of control measures is perhaps the most cost-effective way of controlling erosion during construction. The removal of surface ground cover leaves a site vulnerable to accelerated erosion. Construction procedures that limit land clearing, provide timely installation of erosion and sedimentation controls, and restore protective cover quickly can significantly reduce the erosion potential of a site.

***Design***

***Considerations***

- Avoid rainy periods.
- Schedule projects to disturb only small portions of the site at any one time. Complete grading as soon as possible. Immediately stabilize the disturbed portion before grading the next portion. Practice staged seeding in order to revegetate cut and fill slopes as the work progresses.

## 4.2 Runoff Conveyance and Treatment BMPs

### BMP C200: Interceptor Dike and Swale

**Purpose**

Provide a ridge of compacted soil, or a ridge with an upslope swale, at the top or base of a disturbed slope or along the perimeter of a disturbed construction area to convey stormwater. Use the dike and/or swale to intercept the runoff from unprotected areas and direct it to areas where erosion can be controlled. This can prevent storm runoff from entering the work area or sediment-laden runoff from leaving the construction site.

**Conditions of Use**

Where the runoff from an exposed site or disturbed slope must be conveyed to an erosion control facility which can safely convey the stormwater.

- Locate upslope of a construction site to prevent runoff from entering disturbed area.
- When placed horizontally across a disturbed slope, it reduces the amount and velocity of runoff flowing down the slope.
- Locate downslope to collect runoff from a disturbed area and direct it to a sediment basin.
- Dike and/or swale and channel must be stabilized with temporary or permanent vegetation or other channel protection during construction.
- Channel requires a positive grade for drainage; steeper grades require channel protection and check dams.
- Review construction for areas where overtopping may occur.
- Can be used at top of new fill before vegetation is established.
- May be used as a permanent diversion channel to carry the runoff.
- Sub-basin tributary area should be one acre or less.
- Design capacity for the peak flow from a 10-year, 24-hour storm, assuming a Type 1A rainfall distribution, for temporary facilities. Alternatively, use 1.6 times the 10-year, 1-hour flow indicated by an approved continuous runoff model. For facilities that will also serve on a permanent basis, consult the local government's drainage requirements.

**Design and Installation Specifications**

**Interceptor dikes** shall meet the following criteria:

Top Width	2 feet minimum.
Height	1.5 feet minimum on berm.
Side Slope	2:1 or flatter.
Grade	Depends on topography, however, dike system minimum is 0.5%, maximum is 1%.
Compaction	Minimum of 90 percent ASTM D698 standard proctor.

Horizontal Spacing of Interceptor Dikes:

Average Slope	Slope Percent	Flowpath Length
20H:1V or less	3-5%	300 feet
(10 to 20)H:1V	5-10%	200 feet
(4 to 10)H:1V	10-25%	100 feet
(2 to 4)H:1V	25-50%	50 feet

Stabilization depends on velocity and reach

Slopes <5% Seed and mulch applied within 5 days of dike construction (*see BMP C121, Mulching*).

**Slopes 5 - 40% Dependent on runoff velocities and dike materials. Stabilization should be done immediately using either sod or riprap or other measures to avoid erosion.**

- The upslope side of the dike shall provide positive drainage to the dike outlet. No erosion shall occur at the outlet. Provide energy dissipation measures as necessary. Sediment-laden runoff must be released through a sediment trapping facility.
- Minimize construction traffic over temporary dikes. Use temporary cross culverts for channel crossing.

**Interceptor swales** shall meet the following criteria:

Bottom Width 2 feet minimum; the bottom shall be level.

Depth 1-foot minimum.

Side Slope 2:1 or flatter.

Grade Maximum 5 percent, with positive drainage to a suitable outlet (such as a sediment pond).

Stabilization Seed as per *BMP C120, Temporary and Permanent Seeding*, or *BMP C202, Channel Lining*, 12 inches thick of riprap pressed into the bank and extending at least 8 inches vertical from the bottom.

- Inspect diversion dikes and interceptor swales once a week and after every rainfall. Immediately remove sediment from the flow area.
- Damage caused by construction traffic or other activity must be repaired before the end of each working day.

Check outlets and make timely repairs as needed to avoid gully formation. When the area below the temporary diversion dike is permanently stabilized, remove the dike and fill and stabilize the channel to blend with the natural surface.

## BMP C220: Storm Drain Inlet Protection

**Purpose** To prevent coarse sediment from entering drainage systems prior to permanent stabilization of the disturbed area.

**Conditions of Use** Where storm drain inlets are to be made operational before permanent stabilization of the disturbed drainage area. Protection should be provided for all storm drain inlets downslope and within 500 feet of a disturbed or construction area, unless the runoff that enters the catch basin will be conveyed to a sediment pond or trap. Inlet protection may be used anywhere to protect the drainage system. It is likely that the drainage system will still require cleaning.

Table 4.9 lists several options for inlet protection. All of the methods for storm drain inlet protection are prone to plugging and require a high frequency of maintenance. Drainage areas should be limited to 1 acre or less. Emergency overflows may be required where stormwater ponding would cause a hazard. If an emergency overflow is provided, additional end-of-pipe treatment may be required.

<b>Table 4.9 Storm Drain Inlet Protection</b>			
<b>Type of Inlet Protection</b>	<b>Emergency Overflow</b>	<b>Applicable for Paved/ Earthen Surfaces</b>	<b>Conditions of Use</b>
<b>Drop Inlet Protection</b>			
Excavated drop inlet protection	Yes, temporary flooding will occur	Earthen	Applicable for heavy flows. Easy to maintain. Large area Requirement: 30' X 30'/acre
Block and gravel drop inlet protection	Yes	Paved or Earthen	Applicable for heavy concentrated flows. Will not pond.
Gravel and wire drop inlet protection	No		Applicable for heavy concentrated flows. Will pond. Can withstand traffic.
Catch basin filters	Yes	Paved or Earthen	Frequent maintenance required.
<b>Curb Inlet Protection</b>			
Curb inlet protection with a wooden weir	Small capacity overflow	Paved	Used for sturdy, more compact installation.
Block and gravel curb inlet protection	Yes	Paved	Sturdy, but limited filtration.
<b>Culvert Inlet Protection</b>			
Culvert inlet sediment trap			18 month expected life.

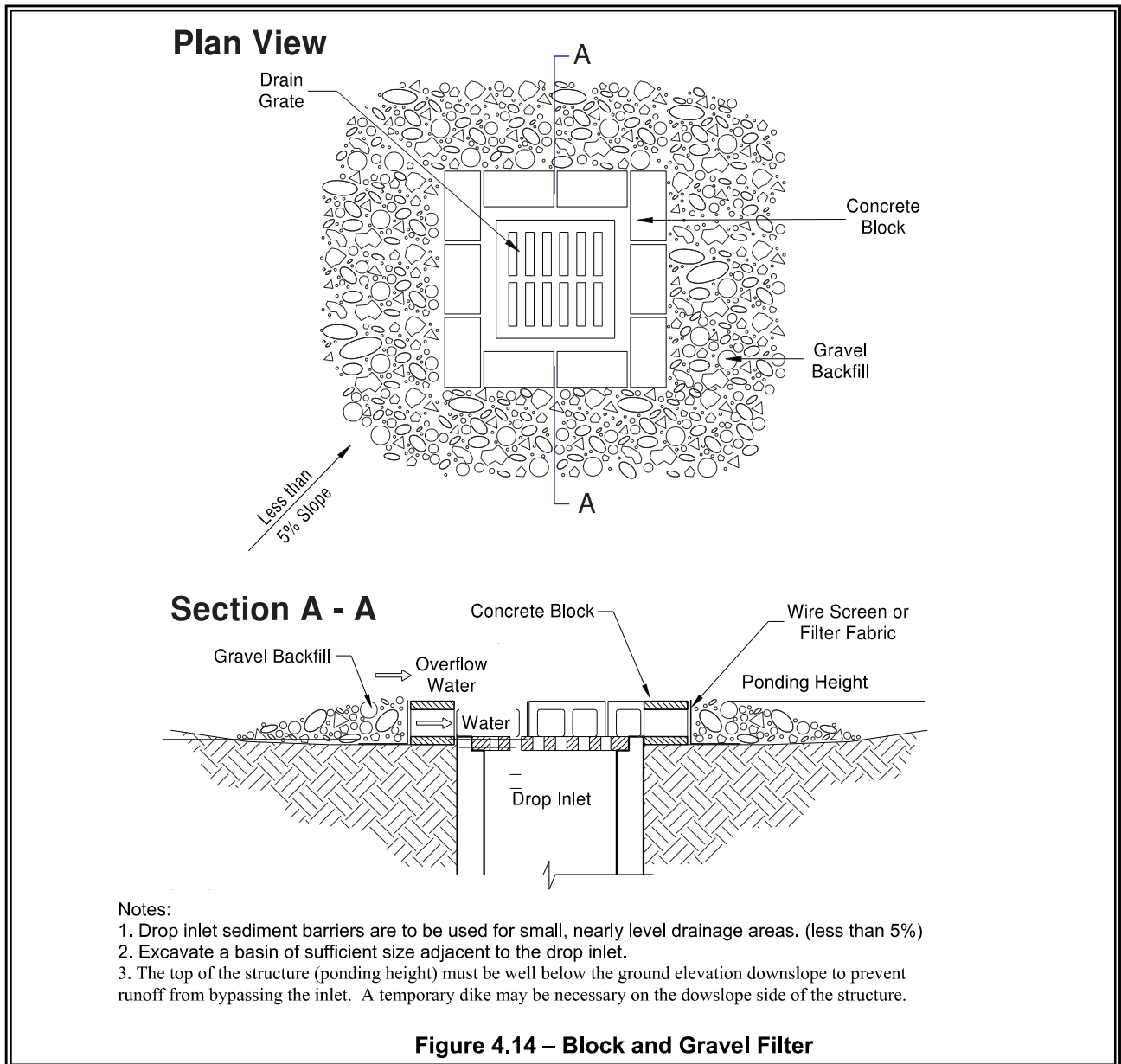
***Design and  
Installation  
Specifications***

*Excavated Drop Inlet Protection* - An excavated impoundment around the storm drain. Sediment settles out of the stormwater prior to entering the storm drain.

- Depth 1-2 ft as measured from the crest of the inlet structure.
- Side Slopes of excavation no steeper than 2:1.
- Minimum volume of excavation 35 cubic yards.
- Shape basin to fit site with longest dimension oriented toward the longest inflow area.
- Install provisions for draining to prevent standing water problems.
- Clear the area of all debris.
- Grade the approach to the inlet uniformly.
- Drill weep holes into the side of the inlet.
- Protect weep holes with screen wire and washed aggregate.
- Seal weep holes when removing structure and stabilizing area.
- It may be necessary to build a temporary dike to the down slope side of the structure to prevent bypass flow.

*Block and Gravel Filter* - A barrier formed around the storm drain inlet with standard concrete blocks and gravel. See Figure 4.14.

- Height 1 to 2 feet above inlet.
- Recess the first row 2 inches into the ground for stability.
- Support subsequent courses by placing a 2x4 through the block opening.
- Do not use mortar.
- Lay some blocks in the bottom row on their side for dewatering the pool.
- Place hardware cloth or comparable wire mesh with ½-inch openings over all block openings.
- Place gravel just below the top of blocks on slopes of 2:1 or flatter.
- An alternative design is a gravel donut.
- Inlet slope of 3:1.
- Outlet slope of 2:1.
- 1-foot wide level stone area between the structure and the inlet.
- Inlet slope stones 3 inches in diameter or larger.
- Outlet slope use gravel ½- to ¾-inch at a minimum thickness of 1-foot.



**Figure 4.14 – Block and Gravel Filter**

*Gravel and Wire Mesh Filter* - A gravel barrier placed over the top of the inlet. This structure does not provide an overflow.

- Hardware cloth or comparable wire mesh with ½-inch openings.
- Coarse aggregate.
- Height 1-foot or more, 18 inches wider than inlet on all sides.
- Place wire mesh over the drop inlet so that the wire extends a minimum of 1-foot beyond each side of the inlet structure.
- If more than one strip of mesh is necessary, overlap the strips.
- Place coarse aggregate over the wire mesh.
- The depth of the gravel should be at least 12 inches over the entire inlet opening and extend at least 18 inches on all sides.

*Catchbasin Filters* - Inserts should be designed by the manufacturer for use at construction sites. The limited sediment storage capacity increases the amount of inspection and maintenance required, which may be daily for heavy sediment loads. The maintenance requirements can be reduced by combining a catchbasin filter with another type of inlet protection. This type of inlet protection provides flow bypass without overflow and therefore may be a better method for inlets located along active rights-of-way.

- 5 cubic feet of storage.
- Dewatering provisions.
- High-flow bypass that will not clog under normal use at a construction site.
- The catchbasin filter is inserted in the catchbasin just below the grating.

*Curb Inlet Protection with Wooden Weir* – Barrier formed around a curb inlet with a wooden frame and gravel.

- Wire mesh with ½-inch openings.
- Extra strength filter cloth.
- Construct a frame.
- Attach the wire and filter fabric to the frame.
- Pile coarse washed aggregate against wire/fabric.
- Place weight on frame anchors.

*Block and Gravel Curb Inlet Protection* – Barrier formed around an inlet with concrete blocks and gravel. See Figure 4.14.

- Wire mesh with ½-inch openings.
- Place two concrete blocks on their sides abutting the curb at either side of the inlet opening. These are spacer blocks.
- Place a 2x4 stud through the outer holes of each spacer block to align the front blocks.
- Place blocks on their sides across the front of the inlet and abutting the spacer blocks.
- Place wire mesh over the outside vertical face.
- Pile coarse aggregate against the wire to the top of the barrier.

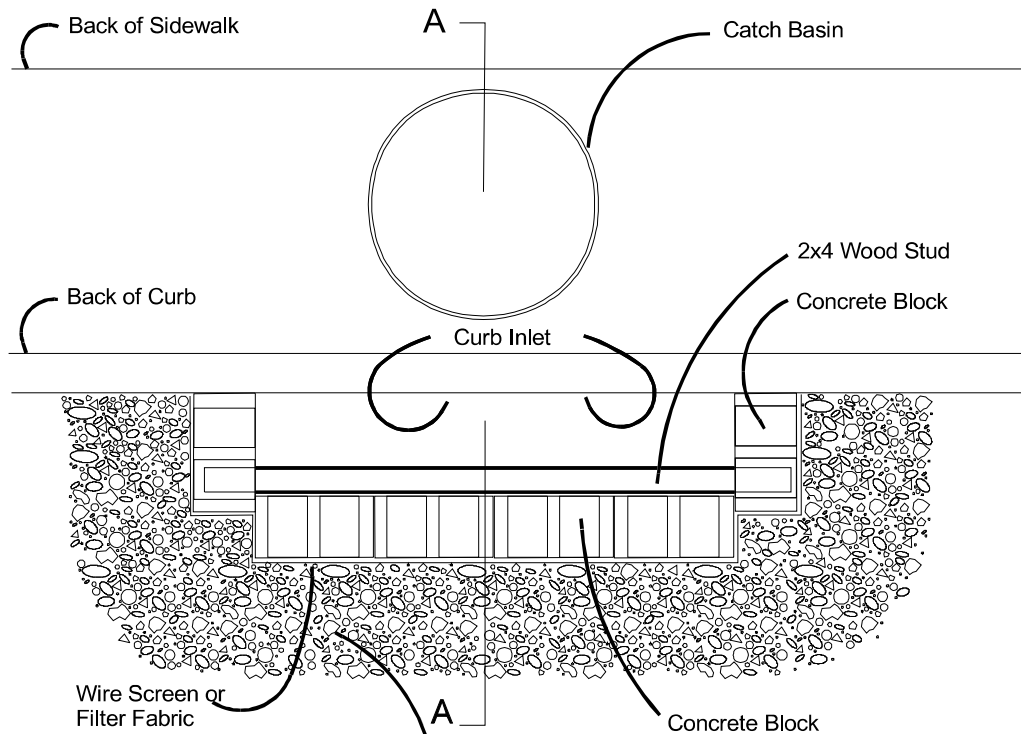
*Curb and Gutter Sediment Barrier* – Sandbag or rock berm (riprap and aggregate) 3 feet high and 3 feet wide in a horseshoe shape. See Figure 4.16.

- Construct a horseshoe shaped berm, faced with coarse aggregate if using riprap, 3 feet high and 3 feet wide, at least 2 feet from the inlet.
- Construct a horseshoe shaped sedimentation trap on the outside of the berm sized to sediment trap standards for protecting a culvert inlet.

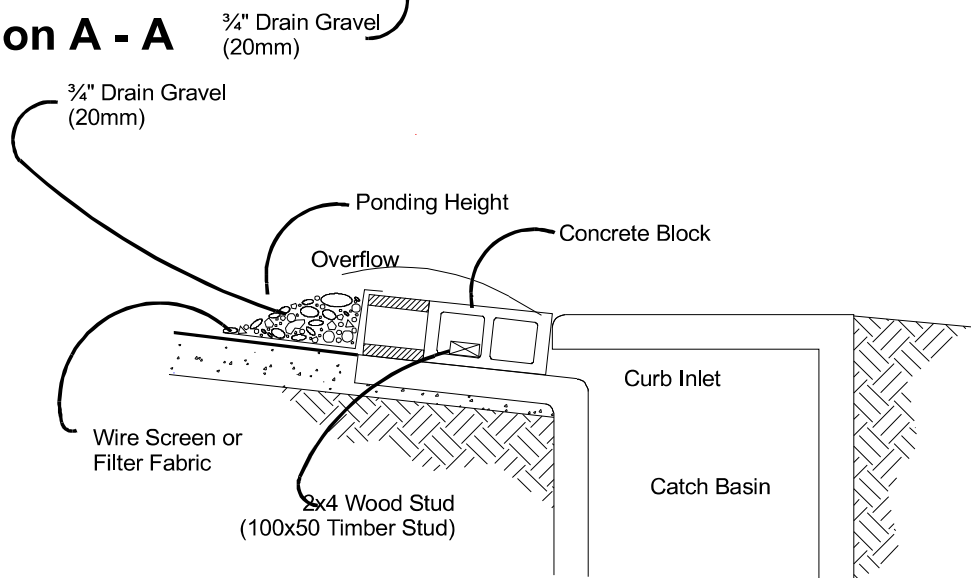
***Maintenance  
Standards***

- Catch basin filters should be inspected frequently, especially after storm events. If the insert becomes clogged, it should be cleaned or replaced.
- For systems using stone filters: If the stone filter becomes clogged with sediment, the stones must be pulled away from the inlet and cleaned or replaced. Since cleaning of gravel at a construction site may be difficult, an alternative approach would be to use the clogged stone as fill and put fresh stone around the inlet.
- Do not wash sediment into storm drains while cleaning. Spread all excavated material evenly over the surrounding land area or stockpile and stabilize as appropriate.

## Plan View



## Section A - A

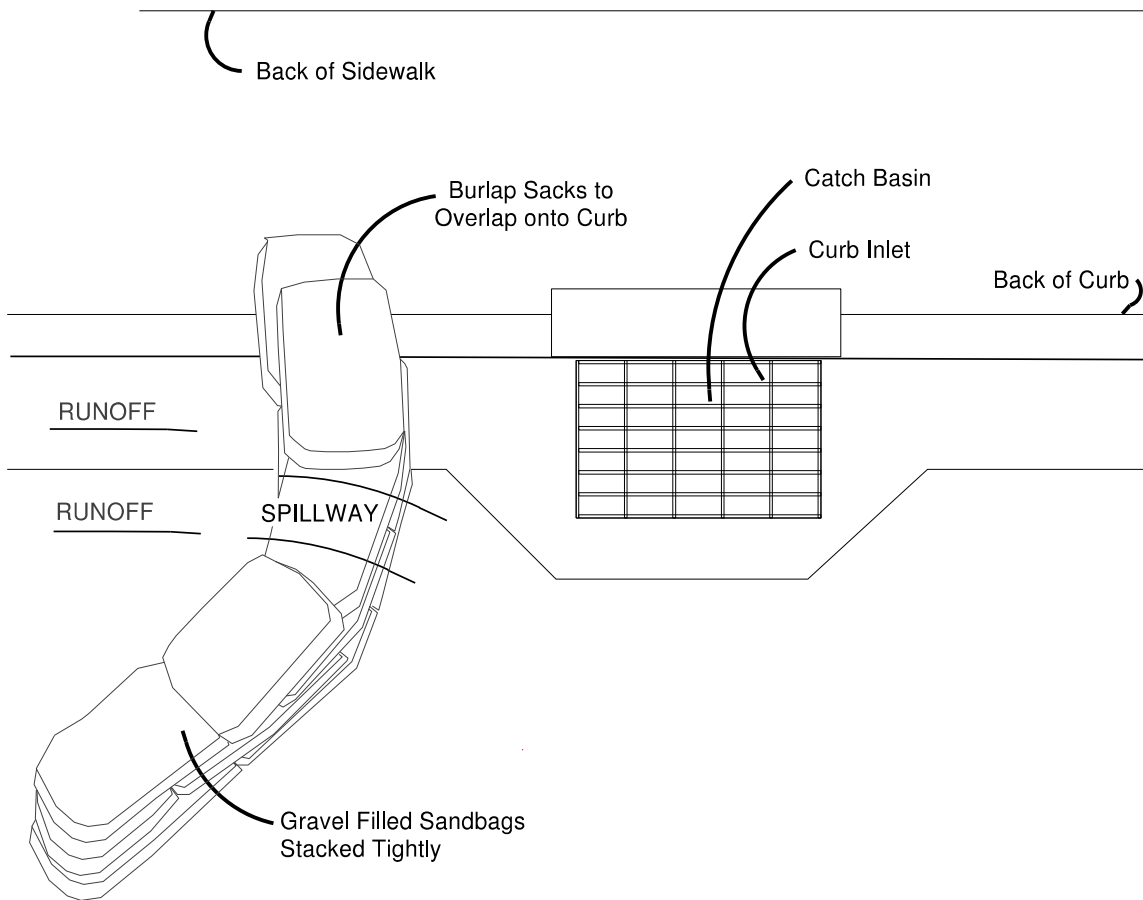


### NOTES:

1. Use block and gravel type sediment barrier when curb inlet is located in gently sloping street segment, where water can pond and allow sediment to separate from runoff.
2. Barrier shall allow for overflow from severe storm event.
3. Inspect barriers and remove sediment after each storm event. Sediment and gravel must be removed from the traveled way immediately.

**Figure 4.15 – Block and Gravel Curb Inlet Protection**

## Plan View



### NOTES:

1. Place curb type sediment barriers on gently sloping street segments, where water can pond and allow sediment to separate from runoff.
2. Sandbags of either burlap or woven 'geotextile' fabric, are filled with gravel, layered and packed tightly.
3. Leave a one sandbag gap in the top row to provide a spillway for overflow.
4. Inspect barriers and remove sediment after each storm event. Sediment and gravel must be removed from the traveled way immediately.

**Figure 4.16 – Curb and Gutter Barrier**

## BMP C233: Silt Fence

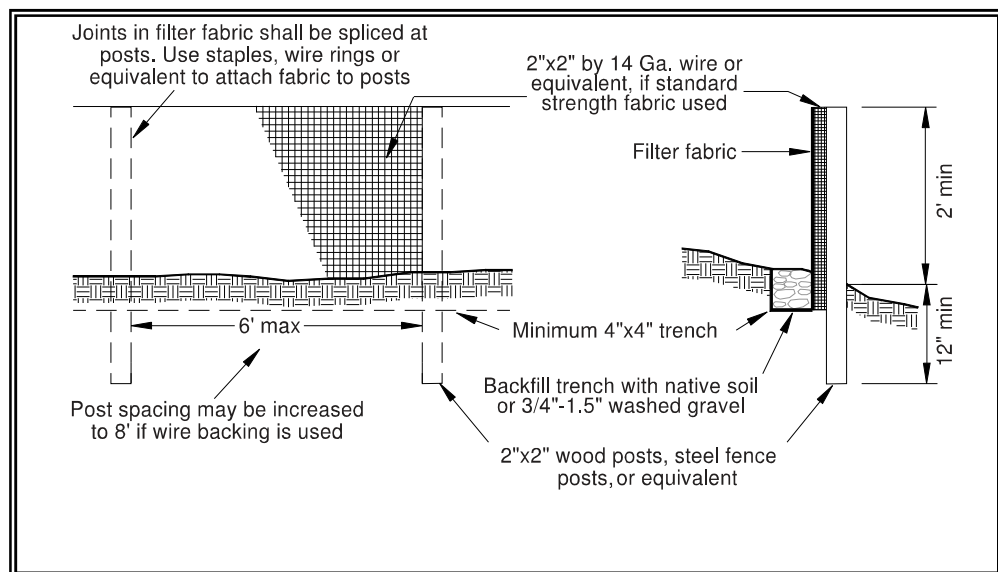
### *Purpose*

Use of a silt fence reduces the transport of coarse sediment from a construction site by providing a temporary physical barrier to sediment and reducing the runoff velocities of overland flow. See Figure 4.19 for details on silt fence construction.

### **Conditions of Use**

Silt fence may be used downslope of all disturbed areas.

- Silt fence is not intended to treat concentrated flows, nor is it intended to treat substantial amounts of overland flow. Any concentrated flows must be conveyed through the drainage system to a sediment pond. The only circumstance in which overland flow can be treated solely by a silt fence, rather than by a sediment pond, is when the area draining to the fence is one acre or less and flow rates are less than 0.5 cfs.
- Silt fences should not be constructed in streams or used in V-shaped ditches. They are not an adequate method of silt control for anything deeper than sheet or overland flow.



**Figure 4.19 – Silt Fence**

### *Design and Installation Specifications*

- Drainage area of 1 acre or less or in combination with sediment basin in a larger site.
- Maximum slope steepness (normal (perpendicular) to fence line) 1:1.
- Maximum sheet or overland flow path length to the fence of 100 feet.
- No flows greater than 0.5 cfs.
- The geotextile used shall meet the following standards. All geotextile properties listed below are minimum average roll values (i.e., the test result for any sampled roll in a lot shall meet or exceed the values shown in Table 4.10):

Polymeric Mesh AOS (ASTM D4751)	0.60 mm maximum for slit film wovens (#30 sieve). 0.30 mm maximum for all other geotextile types (#50 sieve). 0.15 mm minimum for all fabric types (#100 sieve).
Water Permittivity (ASTM D4491)	0.02 sec <sup>-1</sup> minimum
Grab Tensile Strength (ASTM D4632)	180 lbs. Minimum for extra strength fabric. 100 lbs minimum for standard strength fabric.
Grab Tensile Strength (ASTM D4632)	30% maximum
Ultraviolet Resistance (ASTM D4355)	70% minimum

- Standard strength fabrics shall be supported with wire mesh, chicken wire, 2-inch x 2-inch wire, safety fence, or jute mesh to increase the strength of the fabric. Silt fence materials are available that have synthetic mesh backing attached.
- Filter fabric material shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six months of expected usable construction life at a temperature range of 0°F. to 120°F.
- 100 percent biodegradable silt fence is available that is strong, long lasting, and can be left in place after the project is completed, if permitted by local regulations.
- Standard Notes for construction plans and specifications follow. Refer to Figure 4.19 for standard silt fence details.

The contractor shall install and maintain temporary silt fences at the locations shown in the Plans. The silt fences shall be constructed in the areas of clearing, grading, or drainage prior to starting those activities. A silt fence shall not be considered temporary if the silt fence must function beyond the life of the contract. The silt fence shall prevent soil carried by runoff water from going beneath, through, or over the top of the silt fence, but shall allow the water to pass through the fence.

The minimum height of the top of silt fence shall be 2 feet and the maximum height shall be 2½ feet above the original ground surface.

The geotextile shall be sewn together at the point of manufacture, or at an approved location as determined by the Engineer, to form geotextile lengths as required. All sewn seams shall be located at a support post. Alternatively, two sections of silt fence can be overlapped, provided the Contractor can demonstrate, to the satisfaction of the Engineer, that the overlap is long enough and that the adjacent fence sections are close enough together to prevent silt laden water from escaping through the fence at the overlap.

The geotextile shall be attached on the up-slope side of the posts and support system with staples, wire, or in accordance with the manufacturer's recommendations. The geotextile shall be attached to the posts in a manner that reduces the potential for geotextile tearing at the staples, wire, or other connection device. Silt fence back-up support for the geotextile in the form of a wire or plastic mesh is dependent on the properties of the geotextile selected for use. If wire or plastic back-up mesh is used, the mesh shall be fastened securely to the up-slope of the posts with the geotextile being up-slope of the mesh back-up support.

The geotextile at the bottom of the fence shall be buried in a trench to a minimum depth of 4 inches below the ground surface. The trench shall be backfilled and the soil tamped in place over the buried portion of the geotextile, such that no flow can pass beneath the fence and scouring can not occur. When wire or polymeric back-up support mesh is used, the wire or polymeric mesh shall extend into the trench a minimum of 3 inches.

The fence posts shall be placed or driven a minimum of 18 inches. A minimum depth of 12 inches is allowed if topsoil or other soft subgrade soil is not present and a minimum depth of 18 inches cannot be reached. Fence post depths shall be increased by 6 inches if the fence is located on slopes of 3:1 or steeper and the slope is perpendicular to the fence. If required post depths cannot be obtained, the posts shall be adequately secured by bracing or guying to prevent overturning of the fence due to sediment loading.

Silt fences shall be located on contour as much as possible, except at the ends of the fence, where the fence shall be turned uphill such that the silt fence captures the runoff water and prevents water from flowing around the end of the fence.

If the fence must cross contours, with the exception of the ends of the fence, gravel check dams placed perpendicular to the back of the fence shall be used to minimize concentrated flow and erosion along the back of the fence. The gravel check dams shall be approximately 1-foot deep at the back of the fence. It shall be continued perpendicular to the fence at the same elevation until the top of the check dam intercepts the ground surface behind the fence. The gravel check dams shall consist of crushed surfacing base course, gravel backfill for walls, or shoulder ballast. The gravel check dams shall be located every 10 feet along the fence where the fence must cross contours. The slope of the fence line where contours must be crossed shall not be steeper than 3:1.

Wood, steel or equivalent posts shall be used. Wood posts shall have minimum dimensions of 2 inches by 2 inches by 3 feet minimum length, and shall be free of defects such as knots, splits, or gouges.

Steel posts shall consist of either size No. 6 rebar or larger, ASTM A 120 steel pipe with a minimum diameter of 1-inch, U, T, L, or C shape steel posts with a minimum weight of 1.35 lbs./ft. or other steel posts having equivalent strength and bending resistance to the post sizes listed. The spacing of the support posts shall be a maximum of 6 feet.

Fence back-up support, if used, shall consist of steel wire with a maximum mesh spacing of 2 inches, or a prefabricated polymeric mesh. The strength of the wire or polymeric mesh shall be equivalent to or greater than 180 lbs. grab tensile strength. The polymeric mesh must be as resistant to ultraviolet radiation as the geotextile it supports.

- Silt fence installation using the slicing method specification details follow. Refer to Figure 4.20 for slicing method details.

The base of both end posts must be at least 2 to 4 inches above the top of the silt fence fabric on the middle posts for ditch checks to drain properly. Use a hand level or string level, if necessary, to mark base points before installation.

Install posts 3 to 4 feet apart in critical retention areas and 6 to 7 feet apart in standard applications.

Install posts 24 inches deep on the downstream side of the silt fence, and as close as possible to the fabric, enabling posts to support the fabric from upstream water pressure.

Install posts with the nipples facing away from the silt fence fabric.

Attach the fabric to each post with three ties, all spaced within the top 8 inches of the fabric. Attach each tie diagonally 45 degrees through the fabric, with each puncture at least 1 inch vertically apart. In addition, each tie should be positioned to hang on a post nipple when tightening to prevent sagging.

Wrap approximately 6 inches of fabric around the end posts and secure with 3 ties.

No more than 24 inches of a 36-inch fabric is allowed above ground level.

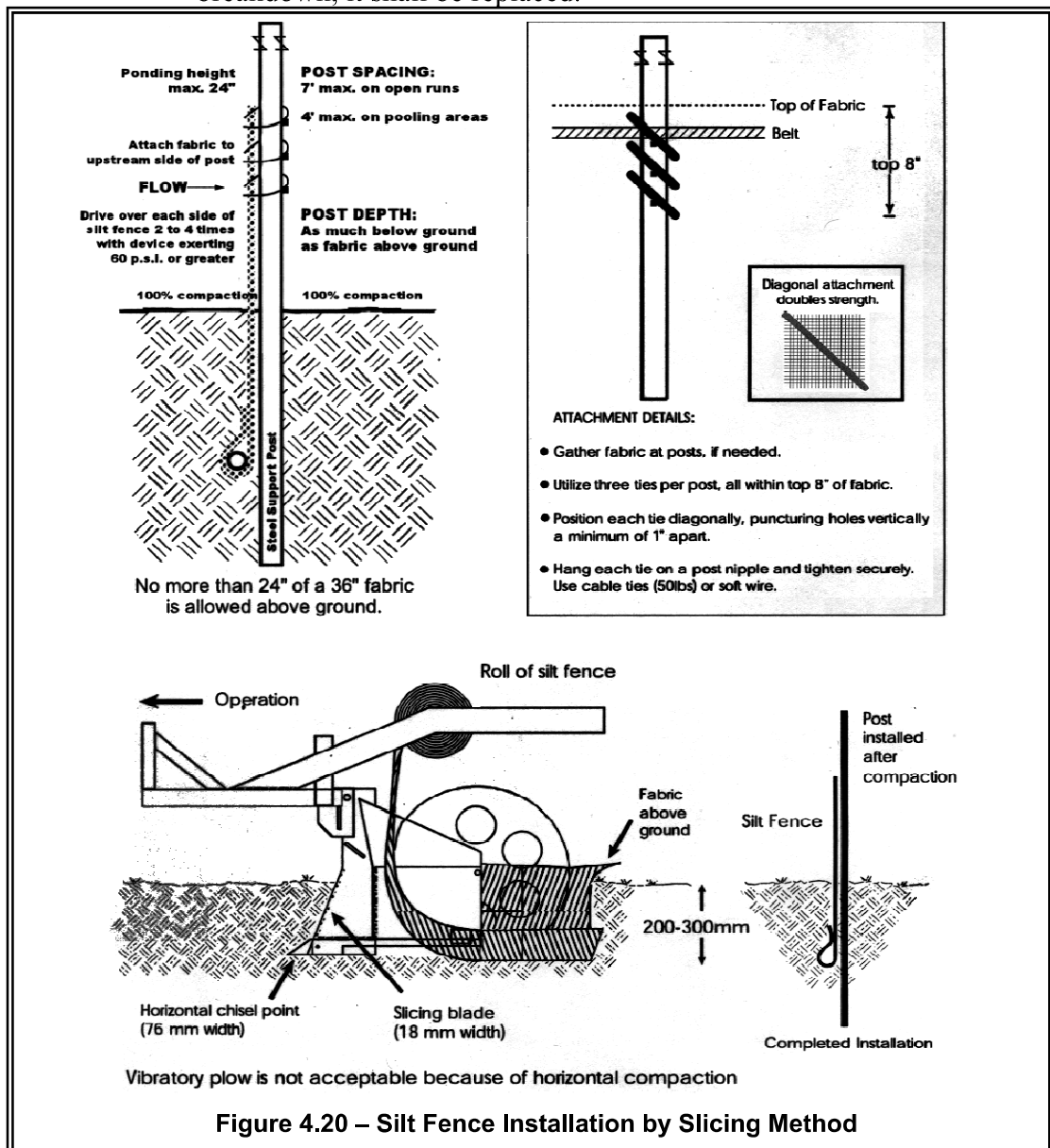
The rope lock system must be used in all ditch check applications.

The installation should be checked and corrected for any deviation before compaction. Use a flat-bladed shovel to tuck fabric deeper into the ground if necessary.

Compaction is vitally important for effective results. Compact the soil immediately next to the silt fence fabric with the front wheel of the tractor, skid steer, or roller exerting at least 60 pounds per square inch. Compact the upstream side first and then each side twice for a total of four trips.

**Maintenance Standards**

- Any damage shall be repaired immediately.
- If concentrated flows are evident uphill of the fence, they must be intercepted and conveyed to a sediment pond.
- It is important to check the uphill side of the fence for signs of the fence clogging and acting as a barrier to flow and then causing channelization of flows parallel to the fence. If this occurs, replace the fence or remove the trapped sediment.
- Sediment deposits shall either be removed when the deposit reaches approximately one-third the height of the silt fence, or a second silt fence shall be installed.
- If the filter fabric (geotextile) has deteriorated due to ultraviolet breakdown, it shall be replaced.



## **BMP C241: Temporary Sediment Pond**

### ***Purpose***

Sediment ponds remove sediment from runoff originating from disturbed areas of the site. Sediment ponds are typically designed to remove sediment no smaller than medium silt (0.02 mm). Consequently, they usually reduce turbidity only slightly.

### ***Conditions of Use***

Prior to leaving a construction site, stormwater runoff must pass through a sediment pond or other appropriate sediment removal best management practice.

A sediment pond shall be used where the contributing drainage area is 3 acres or more. Ponds must be used in conjunction with erosion control practices to reduce the amount of sediment flowing into the basin.

### ***Design and Installation Specifications***

- Sediment basins must be installed only on sites where failure of the structure would not result in loss of life, damage to homes or buildings, or interruption of use or service of public roads or utilities. Also, sediment traps and ponds are attractive to children and can be very dangerous. Compliance with local ordinances regarding health and safety must be addressed. If fencing of the pond is required, the type of fence and its location shall be shown on the ESC plan.
- Structures having a maximum storage capacity at the top of the dam of 10 acre-ft (435,600 ft<sup>3</sup>) or more are subject to the Washington Dam Safety Regulations (Chapter 173-175 WAC).
- See Figure 4.24, Figure 4.25, and Figure 4.26 for details.
- If permanent runoff control facilities are part of the project, they should be used for sediment retention. The surface area requirements of the sediment basin must be met. This may require enlarging the permanent basin to comply with the surface area requirements. If a permanent control structure is used, it may be advisable to partially restrict the lower orifice with gravel to increase residence time while still allowing dewatering of the basin.
- Use of infiltration facilities for sedimentation basins during construction tends to clog the soils and reduce their capacity to infiltrate. If infiltration facilities are to be used, the sides and bottom of the facility must only be rough excavated to a minimum of 2 feet above final grade. Final grading of the infiltration facility shall occur only when all contributing drainage areas are fully stabilized. The infiltration pretreatment facility should be fully constructed and used with the sedimentation basin to help prevent clogging.
- Determining Pond Geometry  
Obtain the discharge from the hydrologic calculations of the peak flow for the 2-year runoff event ( $Q_2$ ). The 10-year peak flow shall be used if the project size, expected timing and duration of construction, or downstream conditions warrant a higher level of protection. If no hydrologic analysis is required, the Rational Method may be used.

Determine the required surface area at the top of the riser pipe with the equation:

$$SA = 2 \times Q_2 / 0.00096 \quad \text{or} \\ 2080 \text{ square feet per cfs of inflow}$$

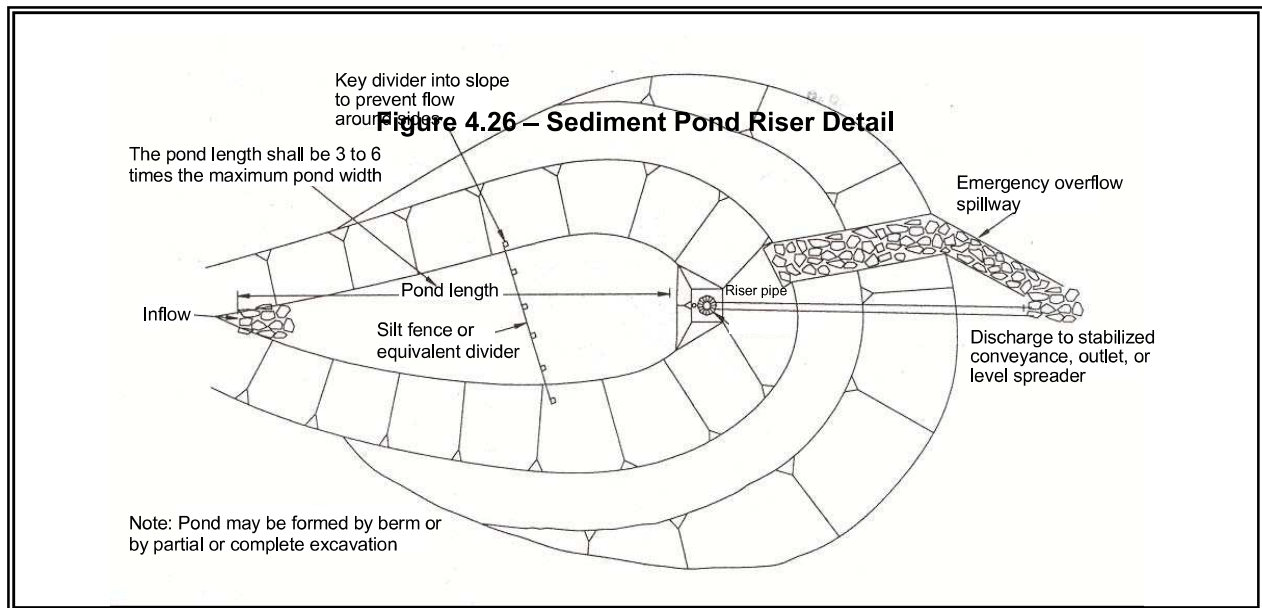
See BMP C240 for more information on the derivation of the surface area calculation.

The basic geometry of the pond can now be determined using the following design criteria:

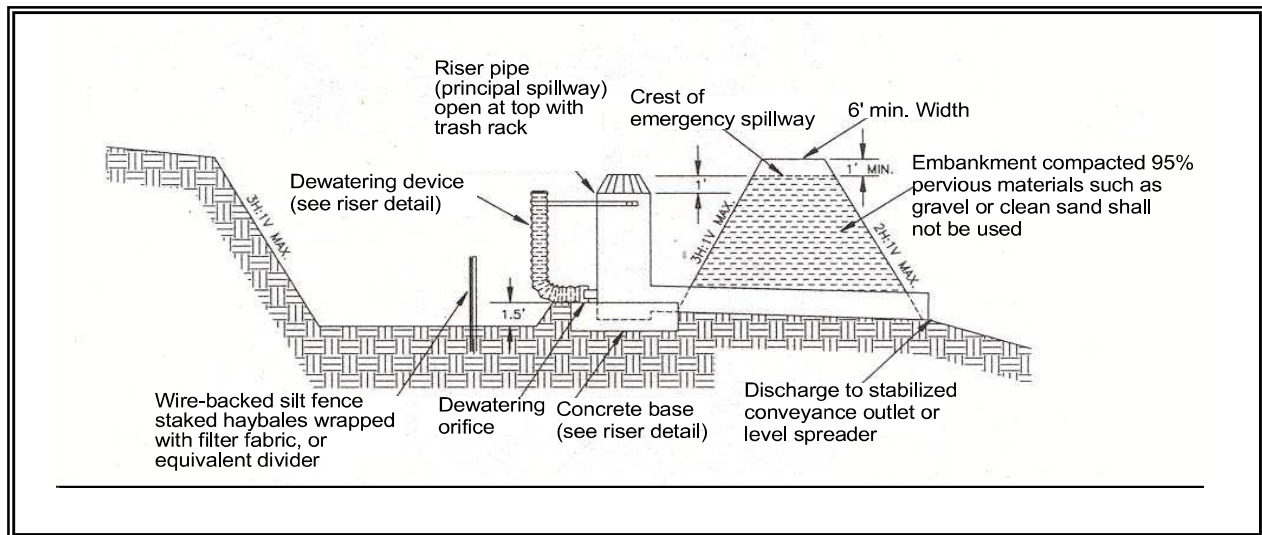
- Required surface area SA (from Step 2 above) at top of riser.
- Minimum 3.5-foot depth from top of riser to bottom of pond.
- Maximum 3:1 interior side slopes and maximum 2:1 exterior slopes. The interior slopes can be increased to a maximum of 2:1 if fencing is provided at or above the maximum water surface.
- One foot of freeboard between the top of the riser and the crest of the emergency spillway.
- Flat bottom.
- Minimum 1-foot deep spillway.
- Length-to-width ratio between 3:1 and 6:1.
- Sizing of Discharge Mechanisms.

The outlet for the basin consists of a combination of principal and emergency spillways. These outlets must pass the peak runoff expected from the contributing drainage area for a 100-year storm. If, due to site conditions and basin geometry, a separate emergency spillway is not feasible, the principal spillway must pass the entire peak runoff expected from the 100-year storm. However, an attempt to provide a separate emergency spillway should always be made. The runoff calculations should be based on the site conditions during construction. The flow through the dewatering orifice cannot be utilized when calculating the 100-year storm elevation because of its potential to become clogged; therefore, available spillway storage must begin at the principal spillway riser crest.

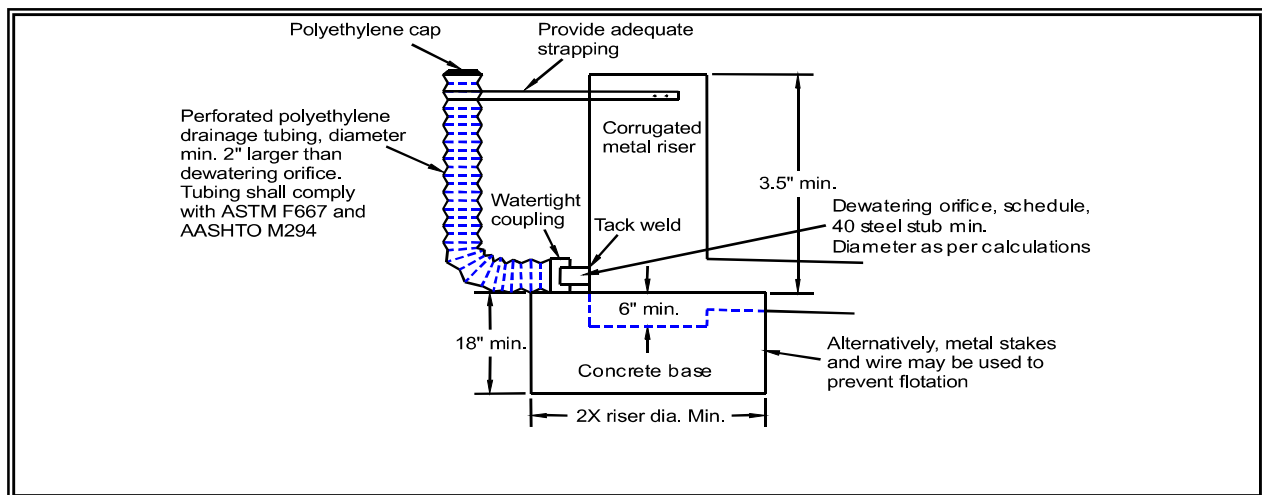
The principal spillway designed by the procedures contained in this standard will result in some reduction in the peak rate of runoff. However, the riser outlet design will not adequately control the basin discharge to the predevelopment discharge limitations as stated in Minimum Requirement #7: Flow Control. However, if the basin for a permanent stormwater detention pond is used for a temporary sedimentation basin, the control structure for the permanent pond can be used to maintain predevelopment discharge limitations. The size of the basin, the expected life of the construction project, the anticipated downstream effects and the anticipated weather conditions during construction, should be considered to determine the need of additional discharge control. See Figure 4.28 for riser inflow curves.



**Figure 4.24 – Sediment Pond Plan View**



**Figure 4.25 – Sediment Pond Cross Section**



**Figure 4.26 – Sediment Pond Riser Detail**

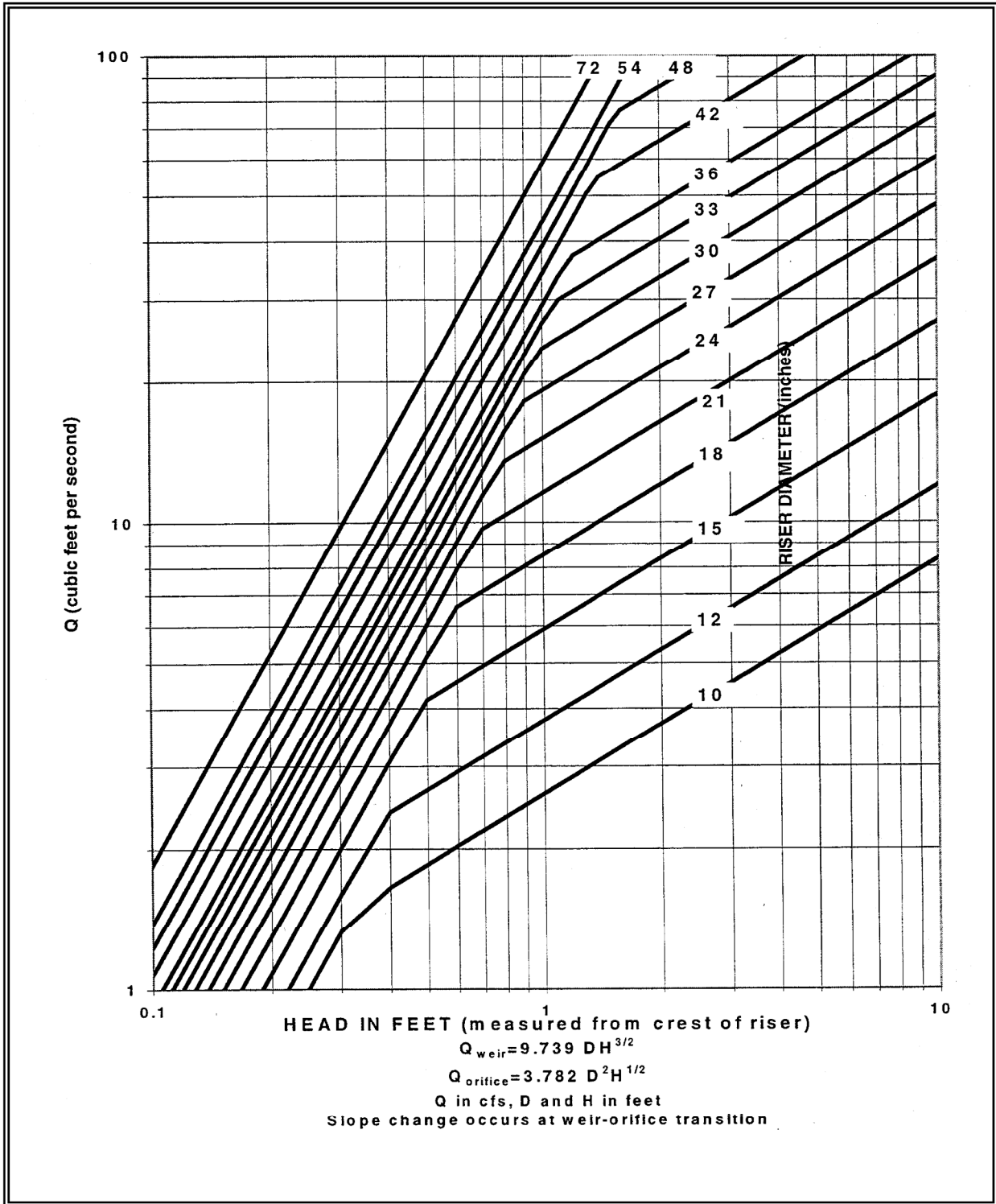


Figure 4.27 – Riser Inflow Curves

**Principal Spillway:** Determine the required diameter for the principal spillway (riser pipe). The diameter shall be the minimum necessary to pass the pre-developed 10-year peak flow ( $Q_{10}$ ). Use Figure 4.28 to determine this diameter ( $h = 1$ -foot). *Note: A permanent control structure may be used instead of a temporary riser.*

**Emergency Overflow Spillway:** Determine the required size and design of the emergency overflow spillway for the developed 100-year peak flow using the method contained in Volume III.

**Dewatering Orifice:** Determine the size of the dewatering orifice(s) (minimum 1-inch diameter) using a modified version of the discharge equation for a vertical orifice and a basic equation for the area of a circular orifice. Determine the required area of the orifice with the following equation:

$$A_o = \frac{A_s (2h)^{0.5}}{0.6 \times 3600 T g^{0.5}}$$

where  $A_o$  = orifice area (square feet)  
 $A_s$  = pond surface area (square feet)  
 $h$  = head of water above orifice (height of riser in feet)  
 $T$  = dewatering time (24 hours)  
 $g$  = acceleration of gravity (32.2 feet/second<sup>2</sup>)

Convert the required surface area to the required diameter  $D$  of the orifice:

$$D = 24 \times \sqrt{\frac{A_o}{\pi}} = 13.54 \times \sqrt{A_o}$$

The vertical, perforated tubing connected to the dewatering orifice must be at least 2 inches larger in diameter than the orifice to improve flow characteristics. The size and number of perforations in the tubing should be large enough so that the tubing does not restrict flow. The orifice should control the flow rate.

- **Additional Design Specifications**

The **pond shall be divided** into two roughly equal volume cells by a permeable divider that will reduce turbulence while allowing movement of water between cells. The divider shall be at least one-half the height of the riser and a minimum of one foot below the top of the riser. Wire-backed, 2- to 3-foot high, extra strength filter fabric supported by treated 4"x4"s can be used as a divider. Alternatively, staked straw bales wrapped with filter fabric (geotextile) may be used. If the pond is more than 6 feet deep, a different mechanism must be proposed. A riprap embankment is one acceptable method of separation for deeper ponds. Other designs that satisfy the intent of

this provision are allowed as long as the divider is permeable, structurally sound, and designed to prevent erosion under or around the barrier.

To aid in determining sediment depth, **one-foot intervals** shall be prominently marked on the riser.

If an **embankment** of more than 6 feet is proposed, the pond must comply with the criteria contained in Volume III regarding dam safety for detention BMPs.

- The most common structural failure of sedimentation basins is caused by piping. Piping refers to two phenomena: (1) water seeping through fine-grained soil, eroding the soil grain by grain and forming pipes or tunnels; and, (2) water under pressure flowing upward through a granular soil with a head of sufficient magnitude to cause soil grains to lose contact and capability for support.

The most critical construction sequences to prevent piping will be:

1. Tight connections between riser and barrel and other pipe connections.
2. Adequate anchoring of riser.
3. Proper soil compaction of the embankment and riser footing.
4. Proper construction of anti-seep devices.

***Maintenance Standards***

- Sediment shall be removed from the pond when it reaches 1-foot in depth.
- Any damage to the pond embankments or slopes shall be repaired.

## **C. Correspondence**

No Correspondence at this time.



# Construction Stormwater Site Inspection Form

Project Name 200<sup>th</sup> St Apartments Permit # \_\_\_\_\_ Inspection Date \_\_\_\_\_ Time \_\_\_\_\_

Name of Certified Erosion Sediment Control Lead (CESCL) or qualified inspector if *less than one acre*  
 Print Name: \_\_\_\_\_

Approximate rainfall amount since the last inspection (in inches): \_\_\_\_\_

Approximate rainfall amount in the last 24 hours (in inches): \_\_\_\_\_

Current Weather Clear  Cloudy  Mist  Rain  Wind  Fog

A. Type of inspection: Weekly  Post Storm Event  Other

**B. Phase of Active Construction (check all that apply):**

Pre Construction/installation of erosion/sediment controls	<input type="checkbox"/>	Clearing/Demo/Grading	<input type="checkbox"/>	Infrastructure/storm/roads	<input type="checkbox"/>
Concrete pours	<input type="checkbox"/>	Vertical Construction/buildings	<input type="checkbox"/>	Utilities	<input type="checkbox"/>
Offsite improvements	<input type="checkbox"/>	Site temporary stabilized	<input type="checkbox"/>	Final stabilization	<input type="checkbox"/>

**C. Questions:**

- Were all areas of construction and discharge points inspected? Yes \_\_\_ No \_\_\_
- Did you observe the presence of suspended sediment, turbidity, discoloration, or oil sheen? Yes \_\_\_ No \_\_\_
- Was a water quality sample taken during inspection? (*refer to permit conditions S4 & S5*) Yes \_\_\_ No \_\_\_
- Was there a turbid discharge 250 NTU or greater, or Transparency 6 cm or less?\* Yes \_\_\_ No \_\_\_
- If yes to #4 was it reported to Ecology? Yes \_\_\_ No \_\_\_
- Is pH sampling required? pH range required is 6.5 to 8.5. Yes \_\_\_ No \_\_\_

If answering yes to a discharge, describe the event. Include when, where, and why it happened; what action was taken, and when.

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

\*If answering yes to # 4 record NTU/Transparency with continual sampling daily until turbidity is 25 NTU or less/ transparency is 33 cm or greater.

Sampling Results: \_\_\_\_\_ Date: \_\_\_\_\_

Parameter	Method (circle one)	Result			Other/Note
		NTU	cm	pH	
Turbidity	tube, meter, laboratory				
pH	Paper, kit, meter				

# Construction Stormwater Site Inspection Form

D. Check the observed status of all items. Provide "Action Required" details and dates.

Element #	Inspection	BMPs Inspected			BMP needs maintenance	BMP failed	Action required (describe in section F)
		yes	no	n/a			
1 Clearing Limits	Before beginning land disturbing activities are all clearing limits, natural resource areas (streams, wetlands, buffers, trees) protected with barriers or similar BMPs? (high visibility recommended)						
2 Construction Access	Construction access is stabilized with quarry spalls or equivalent BMP to prevent sediment from being tracked onto roads?						
	Sediment tracked onto the road way was cleaned thoroughly at the end of the day or more frequent as necessary.						
3 Control Flow Rates	Are flow control measures installed to control stormwater volumes and velocity during construction and do they protect downstream properties and waterways from erosion?						
	If permanent infiltration ponds are used for flow control during construction, are they protected from siltation?						
4 Sediment Controls	All perimeter sediment controls (e.g. silt fence, wattles, compost socks, berms, etc.) installed, and maintained in accordance with the Stormwater Pollution Prevention Plan (SWPPP).						
	Sediment control BMPs (sediment ponds, traps, filters etc.) have been constructed and functional as the first step of grading.						
	Stormwater runoff from disturbed areas is directed to sediment removal BMP.						
5 Stabilize Soils	Have exposed un-worked soils been stabilized with effective BMP to prevent erosion and sediment deposition?						

## Construction Stormwater Site Inspection Form

Element #	Inspection	BMPs Inspected			BMP needs maintenance	BMP failed	Action required (describe in section F)
		yes	no	n/a			
5 Stabilize Soils Cont.	Are stockpiles stabilized from erosion, protected with sediment trapping measures and located away from drain inlet, waterways, and drainage channels?						
	Have soils been stabilized at the end of the shift, before a holiday or weekend if needed based on the weather forecast?						
6 Protect Slopes	Has stormwater and ground water been diverted away from slopes and disturbed areas with interceptor dikes, pipes and or swales?						
	Is off-site storm water managed separately from stormwater generated on the site?						
	Is excavated material placed on uphill side of trenches consistent with safety and space considerations?						
	Have check dams been placed at regular intervals within constructed channels that are cut down a slope?						
7 Drain Inlets	Storm drain inlets made operable during construction are protected.						
	Are existing storm drains within the influence of the project protected?						
8 Stabilize Channel and Outlets	Have all on-site conveyance channels been designed, constructed and stabilized to prevent erosion from expected peak flows?						
	Is stabilization, including armoring material, adequate to prevent erosion of outlets, adjacent stream banks, slopes and downstream conveyance systems?						
9 Control Pollutants	Are waste materials and demolition debris handled and disposed of to prevent contamination of stormwater?						
	Has cover been provided for all chemicals, liquid products, petroleum products, and other material?						
	Has secondary containment been provided capable of containing 110% of the volume?						
	Were contaminated surfaces cleaned immediately after a spill incident?						
	Were BMPs used to prevent contamination of stormwater by a pH modifying sources?						

## Construction Stormwater Site Inspection Form

Element #	Inspection	BMPs Inspected			BMP needs maintenance	BMP failed	Action required (describe in section F)
		yes	no	n/a			
9 Cont.	Wheel wash wastewater is handled and disposed of properly.						
10 Control Dewatering	Concrete washout in designated areas. No washout or excess concrete on the ground.						
	Dewatering has been done to an approved source and in compliance with the SWPPP.						
	Were there any clean non turbid dewatering discharges?						
11 Maintain BMP	Are all temporary and permanent erosion and sediment control BMPs maintained to perform as intended?						
12 Manage the Project	Has the project been phased to the maximum degree practicable?						
	Has regular inspection, monitoring and maintenance been performed as required by the permit?						
	Has the SWPPP been updated, implemented and records maintained?						
13 Protect LID	Is all Bioretention and Rain Garden Facilities protected from sedimentation with appropriate BMPs?						
	Is the Bioretention and Rain Garden protected against over compaction of construction equipment and foot traffic to retain its infiltration capabilities?						
	Permeable pavements are clean and free of sediment and sediment laden-water runoff. Muddy construction equipment has not been on the base material or pavement.						
	Have soiled permeable pavements been cleaned of sediments and pass infiltration test as required by stormwater manual methodology?						
	Heavy equipment has been kept off existing soils under LID facilities to retain infiltration rate.						

**E. Check all areas that have been inspected. ✓**

All in place BMPs  All disturbed soils  All concrete wash out area  All material storage areas   
 All discharge locations  All equipment storage areas  All construction entrances/exits

# Construction Stormwater Site Inspection Form

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F. Elements checked "Action Required" (section D) describe corrective action to be taken. List the element number; be specific on location and work needed. Document, initial, and date when the corrective action has been completed and inspected.

Element #	Description and Location	Action Required	Completion Date	Initials

*Attach additional page if needed*

**Sign the following certification:**

"I certify that this report is true, accurate, and complete, to the best of my knowledge and belief"

Inspected by: (print) \_\_\_\_\_ (Signature) \_\_\_\_\_ Date: \_\_\_\_\_

Title/Qualification of Inspector: \_\_\_\_\_

## **E. Construction Stormwater General Permit (CSWGP)**

To be provided at a later date.

## **F. Engineering Calculations**

No engineering calculations at this time.



## Main Listing Information

**Listing ID:** 6368

**Waterbody Name:** SCRIBER CREEK

**Medium:** Water

**Parameter:** Total Phosphorus

**WQI Project:** None

**Designated Use:** Aquatic Life - General

Year	Category
2018	5
2012	5
2010	5
2008	5
2004	5
1998	Y
1996	Y

### Assessment Unit

**Assessment Unit ID:** 17110012000545\_001\_001

**Size:** 5.498 Kilometers

**Associated Component(s):** Reach: 17110012000545 0% - 100%, Type: Rivers/Streams

**County:** Snohomish

**WRIA:** Cedar-Sammamish

### Basis Table

See Basis Statement field.

### Basis Statement

#### HISTORICAL INFORMATION

Completed Phase I State Clean Lakes Restoration Project in 1987 -Problems Encountered: Blue-green algae, high turbidity, low dissolved oxygen, sediment phosphorus recycling, low transparency, aquatic macrophytes, storm water. URS Consultants, 1986.

### Remarks

Assessment Cycle 2018 - A historic Category 5 determination was carried forward from a previous assessment or administrative decision. See Historic Basis Statement for previous assessment information.

Completed Phase II State Clean Lakes Restoration Project in 1995: Control measures underway based on the Phase I study -diversion, hypolimnetic aeration, structural storm water controls, diversion, watershed nutrient management (ordinance development, passive nutrient attenuation), public education.

### Data Sources

No Source Records

### Map Link

[Map Link \(https://apps.ecology.wa.gov/waterqualityatlas/wqa/map?lstid=6368\)](https://apps.ecology.wa.gov/waterqualityatlas/wqa/map?lstid=6368)

## Main Listing Information

**Listing ID:** 70236  
**Waterbody Name:** SCRIBER CREEK  
**Medium:** Other  
**Parameter:** Benthic Macroinvertebrates Bioassessments  
**WQI Project:** None  
**Designated Use:** Aquatic Life - General

Year	Category
2018	5
2012	5
2010	3
2008	3
2004	3
1998	N
1996	N

### Assessment Unit

**Assessment Unit ID:** 17110012000545\_001\_001  
**Size:** 5.498 Kilometers  
**Associated Component(s):** Reach: 17110012000545 0% - 100%, Type: Rivers/Streams  
**County:** Snohomish  
**WRIA:** Cedar-Sammamish

### Basis Table

Assessment Year												
2018												
Sampling Year	Excursion Count	Sample Count	Criterion/Threshold	Aggregate	Calculated Value	Fine Sediment Biotic Index Score	FSB Threshold	Hilsenhoff Biotic Index Score	HBI Threshold	Metals Tolerance Index Score	MTI Threshold	Sample BIBI scores
2015	2	2	65 (Puget Lowland)	Average BIBI score	36.4	14.9	89	5.49	>5.5	2.3	>4.0	39.3; 33.5

### Basis Statement

#### HISTORICAL INFORMATION

Location ID [SCRIB209] was sampled by Snohomish County in 2005. - the Benthic Index of Biotic Integrity (B-IBI) score was 22. Location ID [SCRIB212] was sampled by Snohomish County in 2008 - the Benthic Index of Biotic Integrity (B-IBI) score was 12.

Location ID [SWAMP219] was sampled by Snohomish County in 2008 - the Benthic Index of Biotic Integrity (B-IBI) score was 20

### Remarks

Assessment Cycle 2018 - A historical Category 5 determination was carried forward from a previous assessment or administrative decision. See Historical Basis Statement for previous assessment information.

The listing has been placed in Category 5 because the two most recent data points indicate that biological integrity is degraded or because two or more B-IBI/RIVPACS data points in the most recent five data points indicate biological degradation and the scores do not qualify for Category 1 or Category 2. A B-IBI score = 27 and a RIVPACS score less than 0.73 indicates degraded biological integrity. A data point is the lowest bioassessment score observed for a given year.

### Data Sources

Study Id	Location Id	Source Database
<a href="#">SAM PLES</a>	<a href="#">RSM06600-015067</a>	EIM
<a href="#">SAM PLES</a>	<a href="#">RSM06600-030971</a>	EIM

### Map Link

[Map Link \(https://apps.ecology.wa.gov/waterqualityatlas/wqa/map?lstid=70236\)](https://apps.ecology.wa.gov/waterqualityatlas/wqa/map?lstid=70236)



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## Main Listing Information

**Listing ID:** 89174

**Waterbody Name:** SCRIBER CREEK

**Medium:** Water

**Parameter:** Bacteria - Fecal coliform

**WQI Project:** None

**Designated Use:** Recreation - Primary Contact

Year	Category
2018	5

---

## Assessment Unit

**Assessment Unit ID:** 17110012000545\_001\_001

**Size:** 5.498 Kilometers

**Associated Component(s):** Reach: 17110012000545 0% - 100%, Type: Rivers/Streams

**County:** Snohomish

**WRIA:** Cedar-Sammamish

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## Basis Table

Assessment Year								
2018								
Sampling Year	Excursion Count	Sample Count	Criterion/Threshold	Aggregate	Calculated Value	Criterion 2	Aggregate 2	Calculated Value 2
2017	6	13	200 #col/100ml	Highest daily average	640	100 #col/100ml	Three-month geometric mean	255

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## Basis Statement

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### Remarks

Assessment Cycle 2018 - During water year 2017, the geometric mean of at least one three-month period exceeded the standards or the ten percent criterion was exceeded with at least two samples exceeding the criterion magnitude in the year.

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### Data Sources

Study Id	Location Id	Source Database
<a href="#">Lynnwood TMDL</a>	<a href="#">COLynnwood SC1</a>	EIM
<a href="#">Lynnwood TMDL</a>	<a href="#">COLynnwood SC2</a>	EIM
<a href="#">SAM PLES</a>	<a href="#">RSM06600-015067</a>	EIM

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### Map Link

[Map Link \(https://apps.ecology.wa.gov/waterqualityatlas/wqa/map?lstid=89174\)](https://apps.ecology.wa.gov/waterqualityatlas/wqa/map?lstid=89174)