EXHIBIT #4:

Applicants October 6, 2026, Road Improvement Submittal:

11/4/25	Wetland Resource's Critical Area Study & Mitigation Plan
5/1/26	Semrau Engineering & Surveying's Drainage Report
10/5/26	SEPA Checklist
6/4/25	DN Traffic Consultant's Truck Path Summary Memo
	Semrau Engineering & Surveying's Revised Option 3 Site Plan
	Semrau Engineering & Surveying's Gripp Road Widening Plans
10/13/25	Associated Earth Sciences Incorporated Gripp Road Widening Project Subsurface Exploration, Geologic Hazard, & Preliminary Geotechnical Engineering Report

CRITICAL AREA STUDY
&
MITIGATION PLAN

FOR

MILES SAND AND GRAVEL
GRIP ROAD IMPROVEMENTS
SKAGIT COUNTY, WA

Wetland Resources, Inc. Project #25267

Prepared By
Wetland Resources, Inc.
9505 19th Avenue SE, Suite 106
Everett, WA 98208
(425) 337-3174

Prepared For
Miles Sand and Gravel
Attn: Brad Barton
400 Valley Avenue NE
Puyallup, WA 98372

Date: November 4, 2025

TABLE OF CONTENTS

1.0 PROPOSED PROJECT 1
1.1 PROJECT LOCATION AND DESCRIPTION 1
1.1.1 Site Investigation 1
1.2 INVESTIGATION AREA DESCRIPTION 2

2.0 WETLAND AND STREAM DETERMINATION 3
2.1 REVIEW OF EXISTING INFORMATION 3
2.2 CRITICAL AREAS DETERMINATION - METHODOLOGY 4
2.2.1 Critical Areas Classification 4
2.2.2 Wetland Delineation Methodology 4
2.2.3 Aquatic Areas Delineation Methodology 5
2.3 WETLAND AND STREAM DELINEATION RESULTS 5
2.3.1 Non-Wetland Areas 5
2.3.2 Identified Wetlands 5
2.3.3 Identified Streams 12

3.0 PROJECT PROPOSAL 14
3.1 PROJECT DESCRIPTION 14
3.1.1 Construction Of Road In Buffer 15
3.1.2 Impact Minimization 15
3.2 IMPACTS AND MITIGATION 17
3.2.1 Definition of Buffer Impact Area 17
3.2.2 Proposed Impacts and Mitigation 17

4.0 WETLAND AND BUFFER RESTORATION PLAN 18
4.1.1 Buffer and Wetland Restoration 18
4.1.2 Critical Areas Marking 18
4.2 PLANTING NOTES 19
4.2.2 Pre-Installation Notes 22
4.3 PROJECT MONITORING PROGRAM 22
4.3.1 Monitoring Reports 23
4.3.2 Project Success and Compliance 23
4.4 MAINTENANCE 24

5.0 FUNCTIONS AND VALUES ASSESSMENT 25
5.1 ASSESSMENT METHODOLOGY 25
5.2 EXISTING CONDITIONS 25
5.3 POST-DEVELOPMENT FUNCTIONS AND VALUES 26

6.0 WILDLIFE ASSESSMENT 26

7.0 USE OF THIS REPORT 27

8.0 REFERENCES 28

List of Figures

Figure 1 - Aerial Overview of Project Area and Limits of Site Investigation 2
Figure 2 – Looking west through the eastern portion of Wetland A 6
Figure 3 – Looking east through western portion of Wetland B 7
Figure 4 – Dense shrubs in Wetland C 8
Figure 5 – View of Wetland D from the edge of Grip Road 9
Figure 6 – Wetland E near the convergence of Stream A and Stream B 10
Figure 7 – Looking through utility corridor towards Wetland F 11
Figure 8 – Stream A flowing adjacent to Wetland A. 12
Figure 9 – Stream B upslope of Wetland E 13
Figure 10 – Convergence of Stream A and Stream C 14

List of Appendices

Appendix A: Corps Wetland Determination Data Forms
Appendix B: Department of Ecology Wetland Rating Forms and Figures
Appendix C: Critical Area Study Maps

1.0 PROPOSED PROJECT

1.1 PROJECT LOCATION AND DESCRIPTION

Miles Sand and Gravel, hereafter referred to as 'the applicant,' is proposing to expand Grip Road along an s-curve located between Skagit County parcels P35728 and P35718 in the north and parcel P35730 in the south. The road expansion includes widening the paved road surface by four feet in the northwest, three feet in the north, and five-and-a-half feet in the south. Two retaining walls will also be built along the south edge of Grip Road. Temporary impacts to wetland and buffer vegetation as well as permanent impacts to buffer areas are required for this project.

1.1.1 Site Investigation

The applicant has legal access to parcel P35730 located along the southern edge of Grip Road. The portion of parcel P35730 within 300 feet of the project area was delineated by Wetland Resources, Inc. (WRI) on September 2, 2025. Areas north of Grip Road were observed from the edge of legal access during the site investigation. Six wetlands and four streams were identified during the September delineation. These critical areas are summarized in the table below.

Table 1 - Critical Areas Summary Table

Feature Name	Ecology Score (Total/Habitat)	Wetland Category	Stream Classification	Standard Buffer
Wetland A	20/8	II	N/A	225 feet
Wetland B	22/8	II	N/A	225 feet
Wetland C	20/8	II	N/A	225 feet
Wetland D	20/8	II	N/A	225 feet
Wetland E	21/8	II	N/A	225 feet
Wetland F	23/8	I	N/A	225 feet
Stream A	N/A	N/A	Type F (>5')	150 feet
Stream B	N/A	N/A	Type Ns	150 feet
Stream C	N/A	N/A	Type F (>5')	50 feet
Stream D	N/A	N/A	Type Ns	50 feet

The September delineation was completed with the direct intent of supporting this project. Therefore, the northern edges of each identified wetland and the northern edges of Stream A and Stream B were delineated. The southern edges of each these features and the entirety of Streams C and D were estimated because the buffers projected by these critical areas have no effect on the proposed development.

The site is not within shoreline jurisdiction. No other wetlands or fish and wildlife habitat conservation areas are known to occur on or near the site that would affect site development. Identification and discussion of aquifer recharge areas and geologically hazardous areas is outside the scope of this report.

1.2 INVESTIGATION AREA DESCRIPTION

The investigation area is comprised of the Grip Road right-of-way, areas visible from the edge of the right-of-way to the north, and areas within 300 feet of the project on parcel P35370. The portion of Grip Road where widening is proposed has a typical width between 23 and 26 feet. The right-of-way is maintained and edges of the road are comprised of gravel surfaces and mowed herbs and shrubs. The investigated part of parcel P35370 is unmaintained and predominantly forested except for areas along the southern edge of Grip Road where shrub vegetation is dominant. Commonly observed plant species include big leaf maple, western red cedar, red alder, osoberry, red elderberry, salmonberry, Himalayan blackberry, English holly, cut-leaf blackberry, and swordfern. Topography of the investigation area slopes towards two ravines south of Grip Road. The first ravine slopes from south to north and contains Stream C. The second ravine, which contains Stream A, Wetland B, and Wetland E, crosses the site from east to west, running parallel to Grip Road.



Figure 1 - Aerial Overview of Project Area and Limits of Site Investigation

2.0 WETLAND AND STREAM DETERMINATION

2.1 REVIEW OF EXISTING INFORMATION

Prior to conducting the site investigation, publicly available resources were reviewed to gather information about wetlands, streams, and other critical areas located in and near the investigation area. These sources included the following:

- USDA/NRCS Web Soil Survey: The Web Soil Survey maps on-site soils as Hoogdal silt loam (15 to 30 percent slopes) and Skipopa silt loam (0 to 3 percent slopes). Neither of these soils are listed as hydric by the NRCS.

- United States Fish and Wildlife Service National Wetlands Inventory (NWI): This resource maps a riverine wetland that extends from south to north through the investigation area. The southern portion of the wetland is mapped in a similar alignment to Stream C. The depicted wetland is shown crossing Grip Road at the northern bend in the s-curve which is inaccurate. Stream C converges with Stream A, turns west, and crosses Grip Road approximately 380 feet west of the northern bend.

- Skagit County Critical Areas Map: The Skagit County critical areas map shows Swede Creek approximately 400 feet northwest of the project area. No other wetlands, streams, or hydric soils are shown in the vicinity of the site.

- WDFW SalmonScape Interactive Mapping System: SalmonScape maps Streams A and C in a similar alignment to their observed on-site locations. A second salmon-bearing stream is shown approximately 150 feet north of the project area within the eastern portion of Wetland F. These streams are identified as documented cutthroat trout and coho salmon habitat as well as gradient-accessible habitat for steelhead trout, pink salmon, and Chinook salmon. Stream A is mapped as a tributary to Swede Creek.

- WDFW Priority Habitat and Species (PHS) Interactive Map: The PHS Interactive Map identifies coho salmon and cutthroat trout habitats in the same location as they are shown by WDFW SalmonScape.

- Washington Department of Natural Resources Forest Practices Application Mapping Tool (DNR-FPAMT): This resource shows Type F streams in a similar alignment to the streams depicted by SalmonScape. These streams are mapped as tributaries to Swede Creek.

2.2 CRITICAL AREAS DETERMINATION - METHODOLOGY

2.2.1 Critical Areas Classification

Critical areas were generally classified in accordance with the standards set forth in Skagit County Code (SCC) 14.24.200 for wetlands, 14.24.510 for aquatic areas, and 14.24.500 for wildlife habitat conservation areas. Identification and classification of other critical areas (critical aquifer recharge areas, coal mine hazard areas, erosion hazard areas, landslide hazard areas, seismic hazard areas, steep slope hazard areas, and volcanic hazard areas) is outside the scope of this report.

2.2.2 Wetland Delineation Methodology

Wetland boundaries were determined using the routine approach described in the Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0) (U.S. Army Corps of Engineers 2010). Under the routine methodology, the process for making a wetland determination is based on three steps:

1.) Examination of the site for hydrophytic vegetation (species present and percent cover);
2.) Examination of the site for hydric soils;
3.) Determining the presence of wetland hydrology
The following criteria must be met in order to make a positive wetland determination.

Hydrophytic Vegetation Criteria

The 2010 Regional Supplement defines hydrophytic vegetation as "assemblage of macrophytes that occur in areas where inundation or soil saturation is either permanent or of sufficient frequency and duration to influence plant occurrence." Field indicators were used to determine whether the vegetation meets the definition for hydrophytic vegetation. Commonly used indicators include the dominance test and the prevalence index, which are based on the wetland indicator status of plant species present.

Hydric Soils Criteria

The 2010 Regional Supplement (per the National Technical Committee for Hydric Soils) defines hydric soils as soils "that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part." Field indicators are used to determine whether a given soil meets the definition for hydric soils. Indicators are numerous and include, but are not limited to, presence of a histosol or histic epipedon, a sandy gleyed matrix, depleted matrix, and redoximorphic depressions.

Wetland Hydrology Criteria

The 2010 Regional Supplement defines wetland hydrology as "areas that are inundated (flooded or ponded) or the water table is less than or equal to 12 inches below the soil surface for 14 or more consecutive days during the growing season at a minimum frequency of 5 years in 10." During the early growing season, wetland hydrology determinations are made based on physical observation of surface water, a high water table, or saturation in the upper 12 inches. Outside of the early growing season, wetland hydrology determinations are made based on physical evidence of recent inundation or saturation (i.e. water marks, surface soil cracks, water-stained leaves).

2.2.3 Aquatic Areas Delineation Methodology

Stream ordinary high water marks are delineated using the methodology described in the Washington State Department of Ecology document Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State (Anderson et al. 2016). Streams are typed according to the water typing system rules set forth in SCC 14.24.510.

2.3 WETLAND AND STREAM DELINEATION RESULTS

2.3.1 Non-Wetland Areas

Non-wetland areas in parcel P35730 are characterized by upland forested vegetation. Species commonly observed in non-wetland areas include western hemlock (*Tsuga heterophylla*; FACU), big leaf maple (*Acer macrophyllum*; FACU), red alder (*Alnus rubra*; FAC), western red cedar (*Thuja plicata*; FAC), salmonberry (*Rubus spectabilis*; FAC), osoberry (*Oemleria cerasiformis*; FACU), beaked hazelnut (*Corylus cornuta*; FACU), cut-leaf blackberry (*Rubus laciniatus*; FACU), swordfern (*Polystichum munitum*; FACU), Pacific bleeding heart (*Dicentra formosa*; FACU), and trailing blackberry (*Rubus ursinus*; FACU). The prevalence of facultative-upland (FACU) species in non-wetland areas demonstrates that the plant communities in these areas are not hydrophytic.

Soils in non-wetland areas are typically very dark brown (10YR 2/2) or dark brown (10YR 3/3) sandy loam beginning at the surface and extending to a depth of at least fourteen inches. These soils were dry during the September site investigation. These conditions do not meet the criteria of any hydric soil or wetland hydrology indicators.

2.3.2 Identified Wetlands

Six wetlands were identified during the site investigation. These wetlands are described in the following tables.

Table 2 - WETLAND A INFORMATION SUMMARY	
Location: Within the western portion of the investigation area and in off-site areas to the west.	
Relevant data forms: S1 & S2	**Date of Investigation:** 09/02/25
HGM Classification: Slope	**Cowardin Classification:** PFO1E
Wetland Category: II **Total Rating Score/Habitat Score:** 20/8	**Standard Buffer:** 225 feet



Figure 2 – Looking west through the eastern portion of Wetland A

Wetland Description:	Wetland A is located on the west side of Stream A immediately south of the culvert that directs Stream A beneath grip road. The wetland extends along a bench above Stream A and the primary source of hydrology appears to be runoff from slopes to the south. The wetland is dominated by a forested canopy and understory vegetation is moderately dense.
Dominant Wetland Vegetation:	Black cottonwood (*Populus balsamifera*; FAC), red alder (*Alnus rubra*; FAC), western red cedar (*Thuja plicata*; FAC), vine maple (*Acer circinatum*; FAC), salmonberry (*Rubus spectabilis*; FAC), twinberry honeysuckle (*Lonicera involucrata*; FAC), and youth-on-age (*Tolmiea menziesii*; FAC). This plant community is hydrophytic.
Wetland Soils:	Met hydric soil indicator(s): Redox Dark Surface (F6) and Thick Dark Surface (A12)
Wetland Hydrology:	Met wetland hydrology indicator(s): Surface Soil Cracks (B6)

Table 3 - WETLAND B INFORMATION SUMMARY	
Location: Along the Stream A corridor beginning at the confluence of Stream A and Stream C and ending at the culvert beneath Grip Road	
Relevant data forms: S3 & S4	**Date of Investigation:** 09/02/25
HGM Classification: Riverine	**Cowardin Classification:** PFO1E
Wetland Category: II **Total Rating Score/Habitat Score:** 22/8	**Standard Buffer:** 225 feet



Figure 3 – Looking east through western portion of Wetland B

Wetland Description:	Wetland B extends along the flow path of Stream A which is the primary hydrologic input for the wetland. Trees, typically rooted outside of the wetland, extend over dense shrubs in the center of the unit throughout most of Wetland B. Where forest canopy is not present, dense shrubs dominate the plant community.
Dominant Wetland Vegetation:	Red alder (*Albus rubra*; FAC), western red cedar (*Thuja plicata*; FAC), salmonberry (*Rubus spectabilis*; FAC), vine maple (*Acer circinatum*; FAC), twinberry honeysuckle (*Lonicera involucrata*; FAC), youth-on-age (*Tolmiea menziesii*; FAC), and skunk cabbage (*Lysichiton americanus*; OBL). This plant community is hydrophytic.
Wetland Soils:	Met hydric soil indicator(s): Redox Dark Surface (F6), Depleted Below Dark Surface (A11), and Thick Dark Surface (A12)
Wetland Hydrology:	Met wetland hydrology indicator(s): Surface Soil Cracks (B6), Saturated Only (A3), High Water Table (A2), and Surface Water (A1).

Table 4 - WETLAND C INFORMATION SUMMARY	
Location: Between the northern edge of Wetland E and the southern edge of Grip Road in the eastern portion of the investigation area	
Relevant data forms: S5 & S6	**Date of Investigation:** 09/02/25
HGM Classification: Slope	**Cowardin Classification:** PFO1E
Wetland Category: II **Total Rating Score/Habitat Score:** 20/8	**Standard Buffer:** 225 feet



Figure 4 – Dense shrubs in Wetland C

Wetland Description:	Wetland C is dominated by dense shrubs and has sporadic canopy coverage. The wetland originates near the southern edge of Grade Road and extends down the slope until it reaches Wetland E. The distinction between Wetlands C and E is based on the hydrologic regime within the wetlands. Wetland E is sourced primarily by Stream A while Wetland C is sourced by surface flows from the adjacent road prism.
Dominant Wetland Vegetation:	Salmonberry (*Rubus spectabilis*; FAC), twinberry honeysuckle (*Lonicera involucrata*; FAC), Himalayan blackberry (*Rubus armeniacus*; FAC), vine maple (*Acer circinatum*; FAC), cut-leaf blackberry (*Rubus laciniatus*; FACU), common ladyfern (*Athyrium filix-femina*; FAC), and reed canarygrass (*Phalaris arundinacea*; FACW). This plant community is hydrophytic.
Wetland Soils:	Met hydric soil indicator(s): Redox Dark Surface (F6)
Wetland Hydrology:	Saturation was observed near the bottom of the soil profile during the September site investigation. The saturation in combination with observed soils and the hydrophytic plant community led to the determination that Wetland C meets wetland criteria.

Table 5 - WETLAND D INFORMATION SUMMARY	
Location: Between the northern edge of Wetland B and the southern edge of Grip Road in the center of the investigation area	
Relevant data forms: S7 & S8	**Date of Investigation:** 09/02/25
HGM Classification: Slope	**Cowardin Classification:** PFO1E
Wetland Category: II **Total Rating Score/Habitat Score:** 20/8	**Standard Buffer:** 225 feet



Figure 5 – View of Wetland D from the edge of Grip Road

Wetland Description:	Wetland D is similar to Wetland C. It is a dense, shrubby wetland located along the slope between Grip Road and Wetland B. The differences in hydrologic regime between Wetlands B and D led to the differentiation in the wetland units. The southwest part of Wetland D is forested.
Dominant Wetland Vegetation:	Western red cedar (*Thuja plicata*; FAC), black cottonwood (*Populus balsamifera*; FAC), salmonberry (*Rubus spectabilis*; FAC), twinberry honeysuckle (*Lonicera involucrata*; FAC), vine maple (*Acer circinatum*; FAC), cut-leaf blackberry (*Rubus laciniatus*; FACU), common ladyfern (*Athyrium filix-femina*; FAC), and reed canarygrass (*Phalaris arundinacea*; FACW). This plant community is hydrophytic.
Wetland Soils:	Met hydric soil indicator(s): Redox Dark Surface (F6)
Wetland Hydrology:	Saturation was observed near the bottom of the soil profile during the September site investigation. The saturation in combination with observed soils and the hydrophytic plant community led to the determination that Wetland C meets wetland criteria.

Table 6 - WETLAND E INFORMATION SUMMARY	
Location: Along the Stream A corridor in areas south of Wetland C	
Relevant data forms: S9 & S10	**Date of Investigation:** 09/02/25
HGM Classification: Riverine	**Cowardin Classification:** PFO1E
Wetland Category: II **Total Rating Score/Habitat Score:** 21/8	**Standard Buffer:** 225 feet



Figure 6 – Wetland E near the convergence of Stream A and Stream B

Wetland Description:	Wetland E is a narrow wetland that extends into the investigation area from the east and continues along the Stream A channel into the center of the site. The wetland is dominated by a forested canopy with sporadic areas of dense shrubby vegetation underneath. Streams A and B converge in the northern portion of the wetland.
Dominant Wetland Vegetation:	Black cottonwood (*Populus balsamifera*; FAC), red alder (*Alnus rubra*; FAC), cascara (*Frangula purshiana*; FAC), salmonberry (*Rubus spectabilis*; FAC), swamp currant (*Ribes lacustre*; FAC), twinberry honeysuckle (*Lonicera involucrata*; FAC), field horsetail (*Equisetum arvense*; FAC). And youth-on-age (*Tolmiea menziesii*; FAC). This plant community is hydrophytic.
Wetland Soils:	Met hydric soil indicator(s): Redox Dark Surface (F6)
Wetland Hydrology:	Met wetland hydrology indicator(s): Surface Soil Cracks (B6) and Geomorphic Position (D2).

Table 7 - WETLAND F INFORMATION SUMMARY	
Location: North of the investigation area in parcel P35728	
Relevant data forms: None – no access	**Date of Investigation:** 09/02/25
HGM Classification: Depressional	**Cowardin Classification:** PFO1E
Wetland Category: I **Total Rating Score/Habitat Score:** 23/8	**Standard Buffer:** 225 feet



Figure 7 – Looking through utility corridor towards Wetland F

Wetland Description:	Wetland F is a large wetland associated with Stream A. The wetland appears to be mostly forested except for in maintained portions of parcel P35728 and along the utility corridor.
Dominant Wetland Vegetation:	Western red cedar (*Thuja plicata*; FAC), black cottonwood (*Populus balsamifera*; FAC), red alder (*Alnus rubra*; FAC), red-osier dogwood (*Cornus sericea*; FACW), and salmonberry (*Rubus spectabilis*; FAC).
Wetland Soils:	Soils were not observed due to a lack of legal access.
Wetland Hydrology:	Wetland hydrology was not observed due to a lack of legal access. Stream A is visible within Wetland F in aerial photography of the wetland.

2.3.3 Identified Streams

Stream A
Stream Type: Type F,>5' in width
Required Buffer: 150'

Stream A flows from east to west through the investigation area. It is the primary source of hydrology for Wetlands B and E and is affected by hydrologic input from Wetlands A, C, D, and F. The observed reaches of Stream A include areas with a cobble substrate and areas where mud and unconsolidated material comprise the substrate. The stream was dry during the September site investigation. Stream A is a tributary to Swede Creek, a known fish-bearing water. There are no known natural or artificial barriers between Stream A and Swede Creek. It is expected that salmonid species that use Swede Creek are likely to use Stream A as well.



Figure 8 – Stream A flowing adjacent to Wetland A.

Stream B
Stream Type: Type Ns
Required Buffer: 50'

Stream B is a narrow tributary to Stream A that originates at the south edge of Grip Road and flows southwest towards Wetland E and Stream A. Stream B has typical width of approximately two feet and a gradient between 20 and 30 percent. This stream was dry during the September site investigation. Stream B is too narrow and steep to provide habitat to fish and therefore the stream is considered a Type Ns water.



Figure 9 – Stream B upslope of Wetland E

Stream C
Stream Type: Type F,>5' in width
Required Buffer: 150'

Stream C flows from south to north through the investigation area within parcel P35730. It is a wide seasonally flowing tributary to Stream A. Observed portions of Stream C have cobble substrate. Due to the width of Stream C and its uninterrupted connection with Stream A, it is assumed that any fish that may use Stream A would also use Stream C.



Figure 10 – Convergence of Stream A and Stream C

Stream D
Stream Type: Type Ns
Required Buffer: 50'

Stream D is a narrow tributary to Stream B that runs immediately south of Stream B before the two watercourses converge. Similar to Stream B, Stream D is narrow, has an unconsolidated bottom, and has an average gradient steeper than 25 percent. The conditions observed within Stream D are not conducive to fish use.

3.0 PROJECT PROPOSAL

3.1 PROJECT DESCRIPTION

The applicant is proposing to expand the road surface of grip road along the s-curve located north of parcel P35730. The roadway expansion will improve an existing safety concern and facilitate safe use of Grip Road by trucks and other large vehicles. The current road width is insufficient which leads to cross-over of traffic in an area with low visibility. Widening the road will help alleviate this problem. The road expansion includes increasing the width of the road-surface itself by up to 5.5 feet on the south side of the road and as much as 3 feet on the north. Southern improvements are proposed along a 682-linear foot portion of the road that includes both bends in the s-curve. Northern improvements are located adjacent to the northern bend and cover 234-linear feet. Two retaining walls are also proposed along the southern road improvements, one on either side of the southern bend. The proposed expansion and retaining walls are located within the buffers of identified wetlands and streams. These buffer impacts are unavoidable and will be permanent. Mitigation for the proposed impacts will be provided through mitigation banking.

Clearing to facilitate the proposed construction will temporarily impact vegetation. Temporarily impacted areas will be restored as part of this proposal.

3.1.1 Construction Of Road In Buffer

SCC 14.24.240(6)(a) and 14.24.540(5)(a) allow road construction in wetland and fish and wildlife habitat conservation area buffers, respectively. These two code sections each list four requirements (i) – (iv) for the construction of roads in their respective buffer areas. The requirements are functionally identical for each section of code and are listed below in italics with responses demonstrating compliance following in standard text.

(i) It is demonstrated to the Director that there are no alternative routes that can be reasonably used to achieve the proposed development; and

The route for this project has already been established as it is using the existing Grip Road alignment.

(ii) The activity will have minimum adverse impact to the wetland or HCA area; and

Impact minimization is discussed below in Section 3.1.2 of this report. The impacts to all wetland, stream, and buffer areas have been minimized.

(iii) The activity will not significantly degrade surface or groundwater; and

The expanded roadway is intended to ensure that usage of Grip Road is safe for larger vehicles, but will not significantly alter usage of the road itself. Surface and groundwater are not expected to be meaningfully degraded through implementation of this project.

(iv) The intrusion into wetland areas, fish and wildlife habitat conservation areas, and associated buffers is fully mitigated.

Permanent impacts will be mitigated for through mitigation banking. Temporary impacts to buffer and wetland vegetation will be restored.

3.1.2 Impact Minimization

Skagit County requires that any proposed alteration to critical areas or associated buffers provide mitigation sufficient to provide for and maintain the functions and values of the critical area or to prevent risk from a critical areas hazard. Mitigation sequencing is described in SCC 14.24.080(5)(b) and are listed below in italics with WRI responses following in standard text.

(b) Mitigation Sequence. The sequence of mitigation is defined below:
(i) Avoid the impact altogether by not taking a certain action or parts of an action;

The roadway expansion will improve an existing safety concern and facilitate safe use of Grip Road by trucks and other large vehicles. The current road width is insufficient which leads to cross-over of traffic in an area with low visibility. Widening the road will help alleviate this problem. It is not possible to widen the road without impacting buffer areas.

(ii) Minimize the impacts by limiting the degree or magnitude of the action and its implementation by using appropriate technology, or by taking affirmative steps to avoid or reduce impacts;

The applicant has explored multiple options for road width expansion with the intent of minimizing impacts to critical areas. Through project redesign, the expansion on the north side of grip road has been reduced in area from 486 square feet to 361 square feet and the expansion on the south side has been reduced from 6,095 to 2,250 square feet. The initial project design also required a 508-linear-foot retaining wall along the south side of Grip Road while the current proposal requires two smaller retaining walls with a combined length of 271 feet.

The following table lists the temporary buffer impacts, permanent buffer impacts, and temporary wetland impacts required to accomplish each development plan. The differences in required impacts between the two plans demonstrates that impacts have been minimized through the project redesign.

Table 8 – Wetland and Buffer Impact Analysis

Impact Type	Wide Road Design Impact Area	Narrow Road Design Impact Area	Difference
Temporary Buffer	8,524 sq. ft.	6,518 sq. ft.	2,006 sq. ft.
Permanent Buffer	7,933 sq. ft.	1,762 sq. ft.	6,171 sq. ft.
Temporary Wetland	663 sq. ft.	22 sq. ft.	641 sq. ft.

(iii) Rectify the impact by repairing, rehabilitating or restoring the affected environment to the conditions existing at the time of the initiation of the project or activity;

Impacted wetland and buffer areas will be restored wherever possible. Areas cleared in support of the construction will be replanted with a diverse array of native species suitable to the site. The road expansion and retaining walls are permanent structures and the impacts directly associated with them cannot be rehabilitated.

(iv) Reduce or eliminate the impact over time by preservation and maintenance operations during the life of the action;

The roadway expansion and retaining wall will be permanent and cannot be reduced or eliminated over time. The restoration plan will ensure that a native plant community reestablishes in areas that are currently dominated by invasive species.

(v) Compensate for the impact by replacing, enhancing, or providing substitute resources or environments.

The applicant will provide compensatory mitigation for permanent buffer impacts by purchasing credits at the Skagit Environmental Wetland Mitigation Bank. This will ensure that critical areas functions and values in the Lower Skagit – Samish Basin are maintained.

3.2 IMPACTS AND MITIGATION

3.2.1 Definition of Buffer Impact Area

The proposed road expansion and associated clearing extends into the standard buffers of Wetlands B, C, D, E, and F and Streams A and C. Skagit County allows for the termination of wetland (SCC 14.24.230(5)) and riparian (14.24.530(4)) buffers at the edge of legally established roadways when the separated buffer areas are functionally isolated from the critical areas they protect.

Grip Road is topographically higher than areas south of the roadway and a ditch captures water on the north side of the road and directs it to the west. The topographic separation means that areas south of the road do not provide water quality or hydrologic value to areas north of Grip Road. The ditch on the north prevents hydrologic flows on the north side of Grip Road from reaching critical areas in the south. Thus the isolated portions of the buffer do not provide any hydrologic or water quality benefits to portions of the buffer that are contiguous with the critical areas. Additionally, the isolated buffer areas are unable to provide wildlife functions because Grip Road is a heavily used roadway that separates habitats on either side of the road and actively degrades habitat quality by generating noise, light, and pollution. The isolated buffer areas do not provide water quality, hydrologic, or habitat functions and values to their respective wetlands or streams and therefore do not provide additional protection to these areas.

For the purposes of this project, the buffers of the identified critical areas will be terminated at the edge of existing roadway improvements. Modifications to the existing road surface will not comprise buffer impacts in areas within the standard buffer of identified critical areas. Any work outside of the existing improved roadway will be considered buffer impact.

3.2.2 Proposed Impacts and Mitigation

The applicant is proposing to increase the surface area of grip road by 2,611 square feet. A total of 308 square feet of the expansion is proposed in currently functioning buffer areas. An additional 408 square feet of permanent impacts to buffer areas are required for construction of the two proposed retaining walls. Finally, the space between the retaining walls and the expanded road surface (totaling 1,046 square feet) will be considered permanent impacts because it will be functionally separated from adjacent wetland and stream areas. In total, 1,762 square feet of permanent impacts to buffer are proposed. These impacts cannot be restored and there is no suitable on-site location to provide buffer mitigation. Therefore, the applicant will purchase credits at the Skagit Environmental Wetland Mitigation Bank to provide mitigation.

Construction of the expanded road surface and retaining walls requires clearing into the buffers of Wetlands B, C, D, E, and F, Streams A and C, and the outer edge of Wetland C. The clearing is proposed in areas dominated by shrubs and herbaceous species. These impacts will be assessed as temporary impacts and will be restored by planting them with a diverse array of native species appropriate to the ecoregion. In total, 6,518 square feet of temporary buffer impacts and 22 square feet of temporary wetland impacts are proposed. These proposed restoration plan will ensure that the functions and values provided by these areas are maintained or improved following the completion of this project.

4.0 WETLAND AND BUFFER RESTORATION PLAN

4.1.1 Buffer and Wetland Restoration

The proposed development requires 6,518 square feet of temporary buffer impacts across two areas and 22 square feet of temporary wetland impacts along the north edge of Wetland C. Following clearing of these wetland and buffer areas, they will be restored by planting native trees and shrubs. Existing plant communities along the edge of Grip Road include a large presence of invasive Himalayan blackberry, cut-leaf blackberry, and English holly. Where these species are removed from the buffer, their roots should be grubbed from the soil and disposed of prior to installing native plant material. The impacted areas will be restored with the following plant lists:

Table 9 – Buffer Restoration Area 1 (342 square feet)

Common Name	Species Name	Size	Spacing	Quantity
Western red cedar	*Thuja plicata*	1-gallon	10'	1
Big leaf maple	*Acer macrophyllum*	1-gallon	10'	2
Douglas fir	*Pseudotsuga menziesii*	1-gallon	10'	1
Salmonberry	*Rubus spectabilis*	1-gallon	5'	2
Beaked hazelnut	*Corylus cornuta*	1-gallon	5'	3
Thimbleberry	*Rubus parviflorus*	1-gallon	5'	3
Snowberry	*Symphoricarpos albus*	1-gallon	5'	2
Vine maple	*Acer circinatum*	1-gallon	5'	2
Swordfern	*Polystichum munitum*	1-gallon	5'	2

Table 10 – Buffer Restoration Area 2 (6,176 square feet)

Common Name	Species Name	Size	Spacing	Quantity
Western red cedar	*Thuja plicata*	1-gallon	10'	25
Big leaf maple	*Acer macrophyllum*	1-gallon	10'	25
Douglas fir	*Pseudotsuga menziesii*	1-gallon	10'	21
Salmonberry	*Rubus spectabilis*	1-gallon	5'	35
Beaked hazelnut	*Corylus cornuta*	1-gallon	5'	26
Thimbleberry	*Rubus parviflorus*	1-gallon	5'	34
Snowberry	*Symphoricarpos albus*	1-gallon	5'	34
Vine maple	*Acer circinatum*	1-gallon	5'	26
Swordfern	*Polystichum munitum*	1-gallon	5'	35

Table 11 –Wetland Restoration Area (22 square feet)

Common Name	Species Name	Size	Spacing	Quantity
Western red cedar	*Thuja plicata*	1-gallon	10'	1
Salmonberry	*Rubus spectabilis*	1-gallon	5'	1
Red-osier dogwood	*Cornus sericea*	1-gallon	5'	1

4.1.2 Critical Areas Marking

The applicant shall install permanent critical areas markers along the outer buffer edge as required by SKC 14.24.090(2)(b). These markers are depicted on the attached Critical Area Study Maps.

4.2 PLANTING NOTES

Plant in the early spring or late fall and obtain all plants from a reputable nursery. Care and handling of all plant materials is extremely important to the overall success of the project. The origin of all plant materials specified in this plan shall be native plants, nursery grown in the Puget Sound region of Washington. Some species substitution may be allowed with the agreement of the consulting wetland professional and/or County staff.

Pre-Planting Meeting
Prior to control of invasive species or installation of mitigation plantings, a site meeting between the contracted landscaper and the consulting wetland professional shall occur to resolve any questions that may arise. During this meeting, a discussion regarding plant spacing and locations of plant species shall occur between the landscape contractor and the consulting wetland professional.

Handling
Plants shall be handled so as to avoid all damage, including: breaking, bruising, root damage, sunburn, drying, freezing or other injury. Plants must be covered during transport. Plants shall not be bound with wire or rope in a manner that could damage branches. Protect plant roots with shade and wet soil in the time period between delivery and installation. Do not lift container stock by trunks, stems, or tops. Do not remove from containers until ready to plant. Water all plants as necessary to keep moisture levels appropriate to the species horticultural requirements. Plants shall not be allowed to dry out. All plants shall be watered thoroughly immediately upon installation. Soak all containerized plants thoroughly prior to installation.

Storage
Plants stored by the Permittee for longer than one month prior to planting shall be planted in nursery rows and treated in a manner suitable to those species' horticultural requirements. Plants must be re-inspected by the wetland biologist and/or landscape designer prior to installation.

Damaged plants
Damaged, dried out, or otherwise mishandled plants will be rejected at installation inspection. All rejected plants shall be immediately removed from the site, and properly replaced.

Plant Names
Plant names shall comply with those generally accepted in the native plant nursery trade. Any question regarding plant species or variety shall be referred to the landscape designer, wetland professional, or County staff. All plant materials shall be true to species and variety and legibly tagged.

Quality and condition
Plants shall be normal in pattern of growth, healthy, well-branched, vigorous, with well-developed root systems, and free of pests and diseases. Damaged, diseased, pest-infested, scraped, bruised, dried out, burned, broken, or defective plants will be rejected. Plants with pruning wounds over 1" in diameter will be rejected.

Roots
All plants shall be balled and burlapped (B&B) or containerized, unless explicitly authorized by the landscape designer and/or wetland professional. Rootbound plants will be rejected. Immediately before installation, plants with minor root damage must be root-pruned. Matted or circling roots of containerized plantings must be pruned or straightened and the sides of the root ball must be roughened from top to bottom to a depth of approximately half an inch in two to four places.

Sizes
Plant sizes shall be the size indicated in the plant schedule in approved plans. Larger stock may be acceptable provided that it has not been cut back to the size specified, and that the root ball is proportionate to the size of the plant. Smaller stock may be acceptable, and preferable under some circumstances, based on site-specific conditions. Measurements, caliper, branching, and balling and burlapping shall conform to the American Standard of Nursery Stock by the American Association of Nurserymen (latest edition).

Form
Evergreen trees shall have single trunks and symmetrical, well-developed form. Deciduous trees shall be single trunked unless specified as multi-stem in the plant schedule. Shrubs shall have multiple stems and be well-branched.

Timing of Planting
Unless otherwise approved by County staff, all planting shall occur between October 1 and March 1. Overall, the earlier the plants go into the ground during the dormant period, the more time they have to adapt to the site and extend their root systems before the water demands of spring and summer.

Weeding
Existing and exotic vegetation in the enhancement areas will be hand-weeded from around all newly installed plants at the time of installation and on a routine basis throughout the monitoring period. No chemical control of vegetation on any portion of the site is recommended without prior approval from the County and wetland specialist.

Site conditions
The contractor shall immediately notify the landscape designer and/or wetland professional of drainage or soil conditions likely to be detrimental to the growth or survival of plants. Planting operations shall not be conducted under the following conditions: freezing weather, when the ground is frozen, excessively wet weather, excessively windy weather, or in excessive heat.

Planting Pits
Planting pits shall be circular or square with vertical sides, and shall be 6" deeper and 12" wider in diameter than the root ball of the plant. Break up the sides of the pit in compacted soils. Set plants upright in pits. Burlap shall be removed from the planting pit. Backfill shall be worked back into holes such that air pockets are removed without adversely compacting soils.

Fertilizer
Slow release fertilizer may be used if pre-approved by County officials. Fertilizers shall be applied only at the base of plantings underneath the required covering of mulch (that does not make contact with stems of the plants). No soil amendment or fertilizers will be placed within planting holes.

Staking
Most shrubs and many trees DO NOT require any staking. If the plant can stand alone without staking in a moderate wind, do not use a stake. If the plant needs support, then strapping or webbing should be used as low as possible on the trunk to loosely brace the tree with two stakes. Do not brace the tree tightly or too high on the trunk. If the tree is unable to sway, it will further lose the ability to support itself. Do not use wire in a rubber hose for strapping as it exerts too much pressure on the bark. As soon as supporting the plant becomes unnecessary, remove the stakes. All stakes must be removed within two (2) years of installation.

Plant Location
Colored surveyors ribbon or other appropriate marking shall be attached to the installed plants to assist in locating the plants while removing the competing non-native vegetation and during monitoring activities. Flagging or ribbon shall not be tied to the plant's leader, but to smaller branches.

Arrangement and Spacing
The plants shall be arranged in a pattern with the appropriate numbers, sizes, species, and distribution that are required in accordance with the approved plans. The actual placement of individual plants shall mimic natural, asymmetric vegetation patterns found on similar undisturbed sites in the area. Spacing of the plantings shall be adjusted to maintain existing native vegetation with the agreement of the landscape designer, wetland biologist, and/or County staff.

Inspection(s)
A wetland biologist shall be present on site to inspect the plants prior to planting. Minor adjustments to the original design may be required prior to and during construction.

Mulch
All landscaped areas denuded of vegetation and the soil surface surrounding all planting pit areas shall receive no less than 3 inches (depth) of wood chips after planting. Mulch shall be kept well away (at least 2 inches) from the trunks and stems of woody plants.

Seeding
Seeds must be sown at the recommended seeding rate. Seeds should generally be sown into a relatively clean and weed-free seedbed to a depth of ¼ to ½ inch. Spread seed evenly across the area, and rake lightly to cover. Pack or roll area to ensure seed contact with soil. Seeding should be scheduled in early fall after the first rains have begun, or in early spring. Areas of seeding should be maintained throughout the monitoring period.

4.2.2 Pre-Installation Notes

Pre-Construction Meeting
Buffer enhancement projects are typically more complex to install than described in plans. Careful monitoring by the wetland professional for applicable portions of this project are strongly recommended. Construction timing and sequencing is important to the success of this type of project. There will be a pre-construction meeting on this site between the Permittee, the wetland professional, engineer(s), equipment operator(s), and County representatives (as necessary). The objective will be to verify the location of erosion control facilities, verify the location of planting areas, and to discuss project sequencing.

Inspections
The wetland professional shall be contracted to periodically inspect the planting installation described in this plan. Minor adjustments to the original design may be necessary prior to and during construction due to unusual or hidden site conditions. A County representative and/or the wetland professional will make these decisions during construction.

4.3 PROJECT MONITORING PROGRAM

Requirements for monitoring project:
1. Initial compliance/as-built report
2. Annual site inspection (once per year) for five years
3. Annual reports including final report (one report submitted in the fall of each monitored year)

Purpose for Monitoring
The purpose for monitoring shall be to evaluate the project's success. Success will be determined if monitoring shows at the end of five years that the definitions of success stated below are being met. Access shall be granted to the planting area for inspection and maintenance to the contracted landscape and/or wetland professional and the County during the period of the bond or until the project is evaluated as successful.

Monitoring
Monitoring shall be conducted annually in the fall for five years.

Vegetation Monitoring
Survivorship and areal coverage will be determined by a visual estimate of installed vegetation. Vegetation monitoring shall occur annually between May 15 and September 30 (prior to leaf drop), unless otherwise specified.

Photo points
At least two permanent photo points shall be established within the planting area during as-built site visit. Photographs will be taken from these points annually, to visually record the condition of the enhancement area over time. Photos shall be taken annually between May 15 and September 30 (prior to leaf drop), unless otherwise specified.

4.3.1 Monitoring Reports

Report Contents

Monitoring reports shall be submitted by December 31 of each year during the monitoring period. As applicable, monitoring reports must include descriptions/data for:

(1) Site plan and vicinity map;
(2) Historic description of project, including date of installation, current year of monitoring, restatement of planting/restoration goals, and performance standards;
(3) Plant survival and areal coverage estimates, and explanation of monitoring methodology in the context of assessing performance standards;
(4) Assessment of nuisance/exotic biota and recommendations for management;
(5) The location of color photographs taken from permanent photo-points shall be depicted on monitoring report maps.

4.3.2 Project Success and Compliance

Criteria for Success

Upon completion of the proposed planting plan, an inspection by a qualified biologist will be made to determine plan compliance. A compliance report will be supplied to Snohomish County within 30 days of the completion of planting. A wetland professional will perform condition monitoring of the plantings before September of each year for five years. A written report describing the monitoring results will be submitted to the County after each site inspection of each monitored year. Final inspection will occur five years after completion of this project. The contracted consultant will prepare a report on the success of the project.

Performance Standards

The planting areas shall meet the following performance standards:
Year 1: 100 percent survival of newly planted species;
Year 1: Zero (0) percent invasive tree/shrub cover;
Year 1: At least 25 percent native tree/shrub cover*;

Year 3: 90 percent survival of newly planted species;
Year 3: Less than 5 percent invasive tree/shrub cover**;
Year 3: At least 40 percent native tree/shrub cover*;

Year 5: At least 80 percent survival of installed plant species;
Year 5: Less than 10 percent invasive tree/shrub cover**;
Year 5: At least 70 percent native tree/shrub cover*.

*Native volunteer species may be used in percent cover calculation for all years.
**Maintenance shall occur immediately after any site visit that documents an increase in invasive species coverage, regardless of established thresholds.

4.4 MAINTENANCE

The planting areas will require periodic maintenance to remove undesirable species, cut back reed canarygrass, and replace vegetation mortality. Maintenance of trees and shrubs shall occur at least twice a year for the 5-year monitoring period in accordance with the approved plan. Reed canarygrass shall be cut at least four times a year for the 5-year monitoring period. Maintenance may include, but will not be limited to, removal of competing grasses, irrigation, replacement of plant mortality, and the replacement of mulch for each maintenance period. Mulch should be replenished during each maintenance visit. The contracted landscape professional or property owner is responsible for maintenance during all monitoring years.

Duration and Extent
In order to achieve aforementioned Performance Standards, the Permittee shall have the planting area maintained for the duration of the five-year monitoring period. Maintenance will include: watering, weeding around the base of installed plants, pruning, replacement, re-staking, removal of all classes of noxious weeds (see Washington State Noxious Weeds List), and any other measures needed to insure plant survival.

Survival
The Permittee shall be responsible for the health of 100 percent of all newly installed plants for *one growing season* after installation has been accepted by the County. A growing season for these purposes is defined as occurring from spring to spring (March 15 to March 15 of the following year). For fall installation (often required), the growing season will begin the following spring. The Permittee shall replace any plants that are failing, weak, defective in manner of growth, or dead during this growing season, as directed by the landscape designer, wetland professional, and/or County staff.

Installation Timing for Replacement Plants
Replacement plants shall be installed between October 1 and March 1, unless otherwise determined by the wetland professional and/or County staff.

Standards for Replacement Plants
Replacement plants shall meet the same standards for size and type as those specified for the original installation unless otherwise directed by the landscape designer, wetland professional, and/or County staff.

Replanting
Plants that have settled in their planting pits too deep, too shallow, loose, or crooked shall be replanted as directed by the wetland professional and/or County staff.

Mulch
All plantings will have mulch reapplied at their bases every year of the monitoring period. Plants shall receive no less than 3 inches of wood chips every spring. Mulch shall be kept well away (at least 2 inches) from the trunks and stems of woody plants.

Herbicides/Pesticides
Chemical controls shall not be used in the planting area, sensitive areas, or their buffers. However, limited use of herbicides may be approved depending on site-specific conditions, only if approved by County staff.

Watering
Water should be provided during the dry season (July 1 through September 15) for at least the first year after installation to insure plant survival and establishment. Water should be applied at a rate of one inch of water once per week.

5.0 FUNCTIONS AND VALUES ASSESSMENT

SCC 14.24.220 and 14.24.520 require a comparative analysis of ecological functions and values in pre- and post-development condition. The following section demonstrates how the proposed impacts, restoration, and mitigation are expected to effect critical areas and their associated buffer at and near the project site.

5.1 ASSESSMENT METHODOLOGY

The methodology for this functions and values assessment is based on professional opinion developed through past field analyses and interpretation. This assessment pertains specifically to on-site wetlands and buffers, but is typical for assessments of similar systems common to western Washington.

5.2 EXISTING CONDITIONS

The wetland and buffer areas where direct impacts are proposed provide functions at a relatively low level. Regular maintenance and usage of Grip Road reduce the availability of habitat, structural diversity, and species richness within wetland and buffer areas near the roadway. Routine disturbance in the buffer creates a condition favorable to aggressive invasive species and as a result dense Himalayan blackberry and cut-leaf blackberry is present along the edge of Grip Road. Additionally, areas where vegetation is removed are unable to reduce the rate of hydrologic flows during peak flow events. The effects of these flows are also amplified by the presence of impervious surface immediately upslope of the identified wetlands and streams. Flows that originate at the roadway also contain a high level of pollutants which reduces the water quality within wetlands and streams near the site.

Wetland, stream, and buffer areas further from the roadway perform at a higher level. Observed forested areas are dense and feature a diverse array of native plants. Dense plant communities reduce hydrologic flow rates which allows pollutants to be absorbed through the roots of plants or fall out of suspension and filter through the soil. The dense plant communities in these areas also provide opportunities for foraging, resting, nesting, shading, hiding, and other activities to wildlife that use the site. No effects to high functioning wetland, stream, and buffer areas are anticipated to result from this project.

5.3 POST-DEVELOPMENT FUNCTIONS AND VALUES

The proposed development will reduce the total amount of functioning buffer at the site by 2,903 square feet. These impacts will be mitigated for by purchasing credits at the Skagit Environmental Wetland Mitigation Bank which will ensure that the functions and values provided by buffer areas within the greater Skagit basin will be maintained. The applicant is also proposing to restore all temporarily impacted wetland and buffer areas at the project location.

The proposed restoration plan is expected to improve the functions and values provided at the site. Currently, areas along the roadway are dominated by invasive species. The prevalence of Himalayan blackberry and cut-leaf blackberry has reduced structural diversity and species richness near Grip Road. This in turn has minimized the opportunities available to wildlife. The restoration plan and ensuing monitoring will ensure that these invasive-dominated areas are converted into function native forests. Creating a more diverse habitat will increase the wildlife functions provided by wetland and buffer areas while maintaining the water quality and hydrologic values provided by the existing dense vegetation. Overall, this project has been designed to maintain water quality and hydrologic functions within the greater Skagit basin while improving wildlife functions at the project site.

6.0 WILDLIFE ASSESSMENT

The on-site wetlands its associated buffer contain resources for wildlife such as food, water, thermal cover, and refuge in close proximity. Given the habitat available, the following mammalian species may use the area: bats (*Myotis spp.*), bobcat (*Lynx rufus*), coyote (*Canis latrans*), raccoon (*Procyon lotor*), black bear (*Ursus americanus*), cougar (*Puma concolor*), beaver (*Castor canadensis*), shrews (*Sorex spp.),* Mountain beaver (*Aplodontia rufa*), skunks (*Mephitis spp.*), deer mouse (*Peromyscus maniculatus*), eastern cottontail rabbit (*Sylvilagus floridanus*), moles (*Scapanus spp.*), squirrels (*Sciuris griseus*, *Tamiasciurus douglasii*), and Virginia opossum (*Didelphis virginiana*). The following avian species are expected to use the area: American Crow (*Corvus brachyrhynchos),* Steller's Jay (*Cyanocitta stelleri*), Black-capped Chickadee (*Poecile atricapillus)*, Bushtit (*Psaltriparus minimus*), Northern Flicker (*Colaptes auratus*), Hairy Woodpecker (*Picoides villosus*), Red-breasted Nuthatch (*Sitka canadensis*), Brown Creeper (*Certhia americana*), Varied Thrush (*Ixoreus naevius*), and Wood Duck (*Aix sponsa*). Other wildlife expected to use this site include garter snakes (*Thamnophis spp.*), and northwestern salamander (*Ambystoma gracile*). These lists are not meant to be all-inclusive and may omit species that currently utilize or could utilize the site.

SalmonScape depicts the presence of multiple salmonid species in on-site streams including Chinook (*Oncorhynchus tshawytscha*), Steelhead (*O. mykiss*), Pink (*O. gorbuscha*), Coho (*O. kisutch*) and cutthroat trout (*O. clarkii*).

7.0 USE OF THIS REPORT

This Critical Area Study is supplied to Miles Sand and Gravel as a means of determining the presence of on-site wetlands and streams, as required by Skagit County during the permitting process. This report is based largely on readily observable conditions and, to a lesser extent, on readily ascertainable conditions. No attempt has been made to determine hidden or concealed conditions. The laws applicable to environmentally critical features are subject to varying interpretations and may be changed at any time by the courts or legislative bodies. This report is intended to provide information deemed relevant in the applicant's attempt to comply with the laws now in effect.

The work for this report has conformed to the standard of care employed by wetland ecologists. No other representation or warranty is made concerning the work or this report, and any implied representation or warranty is disclaimed.

Wetland Resources, Inc.



Eamonn Collins, PWS
Senior Ecologist

8.0 REFERENCES

Anderson, P., S. Meyer, P. Olson, E. Stockdale. 2016. *Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State*. DOE Publication no. 16-06-029. Shorelands and Environmental Assistance Program. Washington State Department of Ecology. Olympia, Washington. October 2016.

Brinson, M.M. 1993. A Hydrogeomorphic Classification for Wetlands. Technical Report WRPDE-4. US Army Engineers Waterways Experiment Station, Vicksburg, MS.

(Corps) US Army Corps of Engineers. 2023. *Antecedent Precipitation Tool (APT) Version 2.0*. Technical and User Guide. Vicksburg, MS. Technical and User Guide. ERDC/TN WRAP-23-2. Vicksburg, MS: US Army Engineer Research and Development Center. http://dx.doi.org/10.21079/11681/47189

Corps. 2010. Reg*ional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)*. Vicksburg, MS.

Cowardin, et al., 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Department of the Interior. FWS/OBS-79/31. December 1979.

Environmental Laboratory. 1987. *Corps of Engineers Wetland Delineation Manual*. Technical Report Y-87-1. Environmental Laboratory, Department of the Army, Corps Waterways Experiment Station, Vicksburg, MS.

Hruby, T. 2014. Washington State Wetland Rating System for Western Washington: 2014 Update. Washington State Dept. of Ecology Publication No. 14-06-029. Olympia, WA.

Lichvar, Tobert W. and J.T. Kartesz, 2014. *National Wetland Plant List, Version 3.0*. U.S. Army Corps of Engineers Engineer Research and Development Center Cold Regions Research and Engineering Laboratory, Hanover NH and BONAP, Chapel Hill, NC. (http://wetland_plants.usace.army.mil)

Munsell Color. 2012. *Munsell Soil Color Book*. Munsell Color, Grand Rapids, MI.

NRCS. 2025. *Web Soil Survey*. United States Department of Agriculture. http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx. Accessed January 2025.

Skagit, County of. *Chapter 14.24. Critical Areas Ordinance.* Title 14 Unified Development Code. Skagit County Code.

(USFWS) United States Fish and Wildlife Service. 2019. *National Wetlands Inventory (NWI) Online Mapper*. http://www.fws.gov/wetlands/Data/Mapper.html. Accessed January 2025.

(WAC) Washington State Administrative Code. *Section 222-16-030 Water Typing System*. Chapter 222-16 Definitions. Title 222 Forest Practices Board. Washington Administrative Code (WAC).

(WDFW) Washington State Department of Fish and Wildlife. 2025a. *Priority Habitat and Species (PHS) Interactive Map*. http://apps.wdfw.wa.gov/phsontheweb/. Accessed January 2025.

WDFW. 2025b. *SalmonScape Online Mapping Application*. http://apps.wdfw.wa.gov/salmonscape/map.html. Accessed January 2025.

WDNR. 2025. *Forest Practices Application Mapping Tool (FPAMT)*. https://fortress.wa.gov/dnr/protectiongis/fpamt/index.html#. Accessed January 2025.

APPENDIX A:
CORPS WETLAND DETERMINATION DATA FORMS

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 25267 - Grip Road Improvements City/County: Skagit County Sampling Date: 9/2/25

Applicant/Owner: Miles Sand and Gravel State: WA Sampling Point: S1

Investigator(s): EC & EP Section, Township, Range: S3, T35N, R4E, W.M,

Landform (hillslope, terrace, etc.): Ravine Local relief (concave, convex, none): Concave Slope (%): 6

Subregion (LRR): LRR-A Lat: 48.553569 Long: -122.282638 Datum: NAD83

Soil Map Unit Name: Hoogdal Silt Loam, 15 to 30 percent slopes NWI classification: R4USBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑ No ☐	**Is the Sampled Area within a Wetland?** Yes ☑ No ☐
Hydric Soil Present?	Yes ☑ No ☐	
Wetland Hydrology Present?	Yes ☑ No ☐	

Remarks:

Data taken inside of Wetland A near WRA2

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5m radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra	35	Y	FAC
2. Populus balsamifera	20	Y	FAC
3. Thuja plicata	10	N	FAC
4. Acer circinatum	10	N	FAC
	65	= Total Cover	
Sapling/Shrub Stratum (Plot size: 3m radius)			
1. Acer circinatum	35	Y	FAC
2. Ribes bracteosum	15	Y	FAC
3. Rubus spectabilis	10	N	FAC
4. Sambucus racemosa	5	N	FACU
5. Lonicera involucrata	5	N	FAC
	70	= Total Cover	
Herb Stratum (Plot size: 1m radius)			
1. Tolmiea menziesii	70	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	70	= Total Cover	
Woody Vine Stratum (Plot size: 3m^2)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 30

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 = 0
FACW species	x 2 = 0
FAC species	x 3 = 0
FACU species	x 4 = 0
UPL species	x 5 = 0
Column Totals: 0 (A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☑ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: S1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 2/2	95	10YR 3/4	5	C	M	Sandy Loam	
14-18	10YR 5/2	90	10YR 3/4	10	C	M	Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☑ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ☑ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☑ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches):

Water Table Present? Yes ☐ No ☑ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches):

Wetland Hydrology Present? Yes ☑ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 25267 - Grip Road Improvements City/County: Skagit County Sampling Date: 9/2/25

Applicant/Owner: Miles Sand and Gravel State: WA Sampling Point: S2

Investigator(s): EC & EP Section, Township, Range: S3, T35N, R4E, W.M,

Landform (hillslope, terrace, etc.): Ravine Local relief (concave, convex, none): Concave Slope (%): 6

Subregion (LRR): LRR-A Lat: 48.553569 Long: -122.282638 Datum: NAD83

Soil Map Unit Name: Hoogdal Silt Loam, 15 to 30 percent slopes NWI classification: R4USBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☑ Hydric Soil Present? Yes ☐ No ☑ Wetland Hydrology Present? Yes ☐ No ☑	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑

Remarks:

Data taken outside of Wetland A near WRA2

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5m radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Populus balsamifera	35	Y	FAC
2. Alnus rubra	15	Y	FAC
3. Thuja plicata	15	Y	FAC
4. Acer circinatum	5	N	FAC
	70	= Total Cover	
Sapling/Shrub Stratum (Plot size: 3m radius)			
1. Acer circinatum	40	Y	FAC
2. Corylus cornuta	25	Y	FACU
3.			
4.			
5.			
	65	= Total Cover	
Herb Stratum (Plot size: 1m radius)			
1. Tolmiea menziesii	25	Y	FAC
2. Polystichum munitum	5	N	FACU
3. Claytonia perfoliata	5	N	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	35	= Total Cover	
Woody Vine Stratum (Plot size: 3m^2)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 65

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 = 0
FACW species	x 2 = 0
FAC species	x 3 = 0
FACU species	x 4 = 0
UPL species	x 5 = 0
Column Totals: 0 (A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☑ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: S2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/3	100					Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☑

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☐ No ☑ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☑

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 25267 - Grip Road Improvements City/County: Skagit County Sampling Date: 9/2/25

Applicant/Owner: Miles Sand and Gravel State: WA Sampling Point: S3

Investigator(s): EC & EP Section, Township, Range: S3, T35N, R4E, W.M,

Landform (hillslope, terrace, etc.): Ravine Local relief (concave, convex, none): Concave Slope (%): 6

Subregion (LRR): LRR-A Lat: 48.553533 Long: -122.282199 Datum: NAD83

Soil Map Unit Name: Hoogdal Silt Loam, 15 to 30 percent slopes NWI classification: R4USBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☑ No ☐ Hydric Soil Present? Yes ☑ No ☐ Wetland Hydrology Present? Yes ☑ No ☐	**Is the Sampled Area within a Wetland?** Yes ☑ No ☐

Remarks:

Data taken along the northern boundary of Wetland B

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5m radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra	35	Y	FAC
2. Thuja plicata	30	Y	FAC
3. Tsuga heterophylla	5	N	FACU
4.			
	70	= Total Cover	
Sapling/Shrub Stratum (Plot size: 3m radius)			
1. Rubus spectabilis	40	Y	FAC
2. Acer circinatum	5	N	FAC
3. Oemleria cerasiformis	5	N	FACU
4. Ilex aquifolium	5	N	FACU
5.			
	55	= Total Cover	
Herb Stratum (Plot size: 1m radius)			
1. Tolmiea menziesii	40	Y	FAC
2. Polystichum munitum	5	N	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	45	= Total Cover	
Woody Vine Stratum (Plot size: 3m^2)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 55

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 = 0
FACW species	x 2 = 0
FAC species	x 3 = 0
FACU species	x 4 = 0
UPL species	x 5 = 0
Column Totals: 0 (A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☑ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: S3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 2/1	92	10YR 4/4	8	C	M	Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ☑ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☑ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☑ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☑ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☑ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches):

Water Table Present? Yes ☐ No ☑ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches):

Wetland Hydrology Present? Yes ☐ No ☑

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Small areas of ponding are present along the primary Stream A channel. Soils near the wetland edge were dry during the September site investigation.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 25267 - Grip Road Improvements City/County: Skagit County Sampling Date: 9/2/25

Applicant/Owner: Miles Sand and Gravel State: WA Sampling Point: S4

Investigator(s): EC & EP Section, Township, Range: S3, T35N, R4E, W.M,

Landform (hillslope, terrace, etc.): Ravine Local relief (concave, convex, none): Concave Slope (%): 6

Subregion (LRR): LRR-A Lat: 48.553533 Long: -122.282199 Datum: NAD83

Soil Map Unit Name: Hoogdal Silt Loam, 15 to 30 percent slopes NWI classification: R4USBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐ No ☑	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐ No ☑	
Wetland Hydrology Present?	Yes ☐ No ☑	

Remarks:

Data taken outside of of Wetland B near the northwest portion of the wetland

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5m radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra	40	Y	FAC
2. Thuja plicata	30	Y	FAC
3. Tsuga heterophylla	20	Y	FACU
4.			
	90	= Total Cover	
Sapling/Shrub Stratum (Plot size: 3m radius)			
1. Acer circinatum	10	Y	FAC
2. Ilex aquifolium	10	Y	FACU
3. Oemleria cerasiformis	1	N	FACU
4.			
5.			
	21	= Total Cover	
Herb Stratum (Plot size: 1m radius)			
1. Rubus ursinus	15	Y	FACU
2. Polystichum munitum	10	Y	FACU
3. Dryopteris expansa	5	N	FACW
4. Tolmiea menziesii	5	N	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	35	= Total Cover	
Woody Vine Stratum (Plot size: 3m^2)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 65

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 48 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species		x 3 =	0
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	0 (A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☐ No ☑

Remarks:

SOIL

Sampling Point: S4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 2/2	100					Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ☐ No ☑

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches):

Water Table Present? Yes ☐ No ☑ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches):

Wetland Hydrology Present? Yes ☐ No ☑

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Small areas of ponding are present along the primary Stream A channel. Soils near the wetland edge were dry during the September site investigation.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 25267 - Grip Road Improvements City/County: Skagit County Sampling Date: 9/2/25

Applicant/Owner: Miles Sand and Gravel State: WA Sampling Point: S5

Investigator(s): EC & EP Section, Township, Range: S3, T35N, R4E, W.M,

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None Slope (%): 50

Subregion (LRR): LRR-A Lat: 48.552861 Long: -122.280977 Datum: NAD83

Soil Map Unit Name: Skipopa silt loam 0 to 3 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☑ No ☐ Hydric Soil Present? Yes ☑ No ☐ Wetland Hydrology Present? Yes ☑ No ☐	**Is the Sampled Area within a Wetland?** Yes ☑ No ☐

Remarks:

Data taken inside of Wetland C near WRCC8

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5m radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 3m radius)			
1. Rubus spectabilis	50	Y	FAC
2. Rubus laciniatus	25	Y	FACU
3. Acer circinatum	15	N	FAC
4.			
5.			
	90	= Total Cover	
Herb Stratum (Plot size: 1m radius)			
1. Phalaris arundinacea	80	Y	FACW
2. Athyrium filix-femina	30	Y	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	110	= Total Cover	
Woody Vine Stratum (Plot size: 3m^2)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 = 0
FACW species	x 2 = 0
FAC species	x 3 = 0
FACU species	x 4 = 0
UPL species	x 5 = 0
Column Totals: 0 (A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☑ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: S5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 2/1	85	10YR 3/4	15	C	M	Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ☑ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☑ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches):

Water Table Present? Yes ☐ No ☑ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches):

Wetland Hydrology Present? Yes ☑ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Presence of hydric soils and hydrophytic plant community led to determination of wetland during dry season. Wetland plant community has a greater prevalence of FAC and wetter plants in lower portions of the slope. Data taken near the upper part of the slope.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 25267 - Grip Road Improvements City/County: Skagit County Sampling Date: 9/2/25

Applicant/Owner: Miles Sand and Gravel State: WA Sampling Point: S6

Investigator(s): EC & EP Section, Township, Range: S3, T35N, R4E, W.M,

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None Slope (%): 50

Subregion (LRR): LRR-A Lat: 48.552861 Long: -122.280977 Datum: NAD83

Soil Map Unit Name: Skipopa silt loam 0 to 3 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☑ Hydric Soil Present? Yes ☐ No ☑ Wetland Hydrology Present? Yes ☐ No ☑	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑

Remarks:

Data taken outside of Wetland C near WRCC8

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5m radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Thuja plicata	60	Y	FAC
2. Tsuga heterophylla	20	Y	FACU
3. Acer circinatum	5	N	FAC
4.			
	85	= Total Cover	
Sapling/Shrub Stratum (Plot size: 3m radius)			
1. Symphoricarpos albus	15	Y	FACU
2. Acer circinatum	10	Y	FAC
3. Rubus spectabilis	5	N	FAC
4.			
5.			
	30	= Total Cover	
Herb Stratum (Plot size: 1m radius)			
1. Polystichum munitum	80	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	80	= Total Cover	
Woody Vine Stratum (Plot size: 3m^2)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 20

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 = 0
FACW species	x 2 = 0
FAC species	x 3 = 0
FACU species	x 4 = 0
UPL species	x 5 = 0
Column Totals: 0 (A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☐ No ☑

Remarks:

SOIL

Sampling Point: S6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 2/2	100					Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ☐ No ☑

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☑ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches):

Water Table Present? Yes ☐ No ☑ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches):

Wetland Hydrology Present? Yes ☐ No ☑

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 25267 - Grip Road Improvements City/County: Skagit County Sampling Date: 9/2/25

Applicant/Owner: Miles Sand and Gravel State: WA Sampling Point: S7

Investigator(s): EC & EP Section, Township, Range: S3, T35N, R4E, W.M,

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None Slope (%): 50

Subregion (LRR): LRR-A Lat: 48.553629 Long: -122.282061 Datum: NAD83

Soil Map Unit Name: Hoogdal silt loam (15 to 30 percent slopes) NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑ No ☐	**Is the Sampled Area within a Wetland?** Yes ☑ No ☐
Hydric Soil Present?	Yes ☑ No ☐	
Wetland Hydrology Present?	Yes ☑ No ☐	

Remarks:

Data taken inside of Wetland D near WRD5

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5m radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Thuja plicata	20	Y	FAC
2. Populus balsamifera	20	Y	FAC
3. Alnus rubra	5	N	FAC
4.			
	45	= Total Cover	
Sapling/Shrub Stratum (Plot size: 3m radius)			
1. Lonicera involucrata	60	Y	FAC
2. Rubus spectabilis	30	Y	FAC
3. Vaccinium parvifolium	5	N	FACU
4.			
5.			
	95	= Total Cover	
Herb Stratum (Plot size: 1m radius)			
1. Athyrium filix-femina	15	Y	FAC
2. Rubus ursinus	5	Y	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	20	= Total Cover	
Woody Vine Stratum (Plot size: 3m^2)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 80

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species		x 3 =	0
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	0 (A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☑ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: S7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/2	90	10YR 4/6	10	C	M	Sandy Loam	
10-16	10YR 3/1	85	10YR 4/6	15	C	M	Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ☑ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☑ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches):

Water Table Present? Yes ☐ No ☑ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches):

Wetland Hydrology Present? Yes ☑ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Presence of hydric soils and hydrophytic plant community led to determination of wetland during dry season. Wetland plant community has a greater prevalence of FAC and wetter plants in lower portions of the slope. Data taken near the upper part of the slope.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 25267 - Grip Road Improvements City/County: Skagit County Sampling Date: 9/2/25

Applicant/Owner: Miles Sand and Gravel State: WA Sampling Point: S8

Investigator(s): EC & EP Section, Township, Range: S3, T35N, R4E, W.M,

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None Slope (%): 50

Subregion (LRR): LRR-A Lat: 48.553629 Long: -122.282061 Datum: NAD83

Soil Map Unit Name: Hoogdal silt loam (15 to 30 percent slopes) NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑ No ☐	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐ No ☑	
Wetland Hydrology Present?	Yes ☐ No ☑	

Remarks:

Data taken outside of Wetland D near WRD5

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5m radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Populus balsamifera	40	Y	FAC
2. Thuja plicata	20	Y	FAC
3. Alnus rubra	10	N	FAC
4. Tsuga heterophylla	5	N	FACU
	75	= Total Cover	
Sapling/Shrub Stratum (Plot size: 3m radius)			
1. Acer circinatum	25	Y	FAC
2. Vaccinium parvifolium	20	Y	FACU
3. Rubus spectabilis	10	N	FAC
4. Lonicera involucrata	5	N	FAC
5.			
	60	= Total Cover	
Herb Stratum (Plot size: 1m radius)			
1. Polystichum munitum	70	Y	FACU
2. Equisetum arvense	1	N	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	71	= Total Cover	
Woody Vine Stratum (Plot size: 3m^2)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 29

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species		x 3 =	0
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	0 (A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☑ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: S8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 2/2	100					Sandy Loam	
4-16	10YR 4/3	100					Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☐ No ☑

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☐ No ☑ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☑

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 25267 - Grip Road Improvements City/County: Skagit County Sampling Date: 9/2/25

Applicant/Owner: Miles Sand and Gravel State: WA Sampling Point: S9

Investigator(s): EC & EP Section, Township, Range: S3, T35N, R4E, W.M,

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None Slope (%): 20

Subregion (LRR): LRR-A Lat: 48.552668 Long: -122.279545 Datum: NAD83

Soil Map Unit Name: Skipopa silt loam 0 to 3 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☑ No ☐ Hydric Soil Present? Yes ☑ No ☐ Wetland Hydrology Present? Yes ☑ No ☐	**Is the Sampled Area within a Wetland?** Yes ☑ No ☐

Remarks:

Data taken inside of Wetland E near the confluence of streams A and B

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5m radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Populus balsamifera	60	Y	FAC
2. Alnus rubra	15	N	FAC
3. Frangula purshiana	5	N	FAC
4.			
	80	= Total Cover	
Sapling/Shrub Stratum (Plot size: 3m radius)			
1. Rubus spectabilis	25	Y	FAC
2. Ribes lacustre	10	Y	FAC
3. Lonicera involucrata	5	N	FAC
4. Rubus laciniatus	5	N	FACU
5.			
	45	= Total Cover	
Herb Stratum (Plot size: 1m radius)			
1. Equisetum arvense	80	Y	FAC
2. Rubus ursinus	5	N	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	85	= Total Cover	
Woody Vine Stratum (Plot size: 3m^2)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 15

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 = 0
FACW species	x 2 = 0
FAC species	x 3 = 0
FACU species	x 4 = 0
UPL species	x 5 = 0
Column Totals: 0 (A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☑ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: S9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/1	85	10YR 3/6	15	C	M	Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Cobble

Depth (inches): 12

Hydric Soil Present? Yes ☑ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☑ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☐ No ☑ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches): _____

Wetland Hydrology Present? Yes ☑ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 25267 - Grip Road Improvements City/County: Skagit County Sampling Date: 9/2/25

Applicant/Owner: Miles Sand and Gravel State: WA Sampling Point: S10

Investigator(s): EC & EP Section, Township, Range: S3, T35N, R4E, W.M,

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None Slope (%): 20

Subregion (LRR): LRR-A Lat: 48.552668 Long: -122.279545 Datum: NAD83

Soil Map Unit Name: Skipopa silt loam 0 to 3 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑ No ☐	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐ No ☑	
Wetland Hydrology Present?	Yes ☐ No ☑	

Remarks:

Data taken outside of Wetland E west of the confluence of streams A and B

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5m radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Populus balsamifera	65	Y	FAC
2. Acer macrophyllum	15	N	FACU
3. Frangula purshiana	5	N	FAC
4. Betula papyrifera	5	N	FAC
	90	= Total Cover	
Sapling/Shrub Stratum (Plot size: 3m radius)			
1. Rubus spectabilis	35	Y	FAC
2.			
3.			
4.			
5.			
	35	= Total Cover	
Herb Stratum (Plot size: 1m radius)			
1. Polystichum munitum	65	Y	FACU
2. Rubus ursinus	15	N	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	80	= Total Cover	
Woody Vine Stratum (Plot size: 3m^2)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 20

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 = 0
FACW species	x 2 = 0
FAC species	x 3 = 0
FACU species	x 4 = 0
UPL species	x 5 = 0
Column Totals: 0 (A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☑ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: S10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 2/2	100					Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☑

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☐ No ☑ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☑

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX B:
DEPARTMENT OF ECOLOGY
WETLAND RATING FORMS AND FIGURES

Wetland name or number A

RATING SUMMARY – Western Washington

Name of wetland (or ID #): 25269 - Wetland A Date of site visit: 9/2/25

Rated by EC Trained by Ecology? ✔ Yes ___No Date of training 10/18

HGM Class used for rating Slope Wetland has multiple HGM classes? ___Y ✔ N

NOTE: **Form is not complete without the required figures** (figures can be combined).
Source of base aerial photo/map Skagit County GIS

OVERALL WETLAND CATEGORY II (based on functions ✔ or special characteristics__)

1. Category of wetland based on FUNCTIONS

_____**Category I** – Total score = 23 - 27

___✔___**Category II** – Total score = 20 - 22

_____**Category III** – Total score = 16 - 19

_____**Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality			Hydrologic			Habitat			
	Circle the appropriate ratings									
Site Potential	H	M	[L]	H	M	[L]	H	[M]	L	
Landscape Potential	H	[M]	L	H	[M]	L	[H]	M	L	
Value	[H]	M	L	[H]	M	L	[H]	M	L	**TOTAL**
Score Based on Ratings	**6**			**6**			**8**			**20**

Score for each function based on three ratings
(order of ratings is not important)

9 = H, H, H
8 = H, H, M
7 = H, H, L
7 = H, M, M
6 = H, M, L
6 = M, M, M
5 = H, L, L
5 = M, M, L
4 = M, L, L
3 = L, L, L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	**I II**
Wetland of High Conservation Value	**I**
Bog	**I**
Mature Forest	**I**
Old Growth Forest	**I**
Coastal Lagoon	**I II**
Interdunal	**I II III IV**
None of the above	✔

Wetland name or number A

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	1
Hydroperiods	H 1.2	1
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	5
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	5
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	1
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	2
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	3
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	4

Wetland name or number A_____

HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

   NO – go to 2 **YES** – the wetland class is **Tidal Fringe** – go to 1.1

   1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

   NO – Saltwater Tidal Fringe (Estuarine) **YES – Freshwater Tidal Fringe**
   If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe, it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.

2. The entire wetland unit is flat, and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

   NO – go to 3 **YES** – The wetland class is **Flats**
   If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet all** of the following criteria?
   The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size,
   At least 30% of the open water area is deeper than 6.6 ft (2 m).

   NO – go to 4 **YES –** The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?
   - ✔ The wetland is on a slope (slope can be very gradual),
   - ✔ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheet flow, or in a swale without distinct banks,
   - ✔ The water leaves the wetland **without being impounded**.

   NO – go to 5 **YES –** The wetland class is **Slope**

   NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

Wetland name or number A_____

5. Does the entire wetland unit **meet all** of the following criteria?
   _ _The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
   ____The overbank flooding occurs at least once every 2 years.

   NO – go to 6 **YES** – The wetland class is **Riverine**

   NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? This means that any outlet, if present, is higher than the interior of the wetland.

   NO – go to 7 **YES** – The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched but has no obvious natural outlet.

   NO – go to 8 **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

   NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated		HGM class to use in rating
Slope + Riverine	☐	Riverine
Slope + Depressional	☐	Depressional
Slope + Lake Fringe	☐	Lake Fringe
Depressional + Riverine along stream within boundary of depression	☐	Depressional
Depressional + Lake Fringe	☐	Depressional
Riverine + Lake Fringe	☐	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	☐	Treat as ESTUARINE

If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.

Wetland name or number A

SLOPE WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

S 1.0. Does the site have the potential to improve water quality?	
S 1.1. Characteristics of the average slope of the wetland: (A 1% slope has a 1 ft vertical change in elevation for every 100 ft of horizontal distance.) ☐ Slope is 1% or less — points = 3 ☐ Slope is > 1%-2% — points = 2 ☐ Slope is > 2%-5% — points = 1 ☑ Slope is greater than 5% — points = 0	**0**
S 1.2. The soil 2 in. below the surface (or duff layer) is true clay or true organic *(use NRCS definitions)*: Yes = 3 [No = 0]	**0**
S 1.3. Characteristics of the plants in the wetland that trap sediments and pollutants: Choose the points appropriate for the description that best fits the plants in the wetland. Dense means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed, and plants are higher than 6 in. ☐ Dense, uncut, herbaceous plants > 90% of the wetland area — points = 6 ☐ Dense, uncut, herbaceous plants > ½ of area — points = 3 ☑ Dense, woody, plants > ½ of area — points = 2 ☐ Dense, uncut, herbaceous plants > ¼ of area — points = 1 ☐ Does not meet any of the criteria above for plants — points = 0	**2**
Total for S 1 — Add the points in the boxes above	**2**

Rating of Site Potential If score is: **__12 = H ___6-11 = M ✔ 0-5 = L** *Record the rating on the first page*

S 2.0. Does the landscape have the potential to support the water quality function of the site?	
S 2.1. Is > 10% of the area within 150 ft on the uphill side of the wetland in land uses that generate pollutants? [Yes = 1] No = 0	**1**
S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1? Other sources Road Litter [Yes = 1] No = 0	**1**
Total for S 2 — Add the points in the boxes above	**2**

Rating of Landscape Potential If score is: **✔ 1-2 = M ___0 = L** *Record the rating on the first page*

S 3.0. Is the water quality improvement provided by the site valuable to society?	
S 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? [Yes = 1] No = 0	**1**
S 3.2. Is the wetland in a basin or sub-basin where water quality is an issue? (At least one aquatic resource in the basin is on the 303(d) list.) [Yes = 1] No = 0	**1**
S 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? (Answer YES if there is a TMDL in development or in effect for the basin in which unit is found.) [Yes = 2] No = 0	**2**
Total for S 3 — Add the points in the boxes above	**4**

Rating of Value If score is: **✔ 2-4 = H ___1 = M ___0 = L** *Record the rating on the first page*

Wetland name or number A_____

SLOPE WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream erosion

S 4.0. Does the site have the potential to reduce flooding and stream erosion?	
S 4.1. Characteristics of plants that reduce the velocity of surface flows during storms: Choose the points appropriate for the description that best fits conditions in the wetland. Stems of plants should be thick enough (usually > $^1/_8$ in), or dense enough, to remain erect during surface flows. ☐ Dense, uncut, **rigid** plants cover > 90% of the area of the wetland — points = 1 ☑ All other conditions — points = 0	**0**

Rating of Site Potential If score is: __**1 = M** ✔**0 = L** *Record the rating on the first page*

S 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	
S 5.1. Is more than 25% of the area within 150 ft upslope of wetland in land uses or cover that generate excess surface runoff? Yes = 1 No = 0	**1**

Rating of Landscape Potential If score is: ✔**1 = M** ___**0 = L** *Record the rating on the first page*

S 6.0. Are the hydrologic functions provided by the site valuable to society?	
S 6.1. Distance to the nearest areas downstream that have flooding problems: ☑ The sub-basin immediately downgradient of site has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds) — points = 2 ☐ Surface flooding problems are in a sub-basin farther downgradient — points = 1 ☐ No flooding problems anywhere downstream — points = 0	**2**
S 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	**0**
Total for S 6 — Add the points in the boxes above	**2**

Rating of Value If score is: ✔**2-4 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

NOTES and FIELD OBSERVATIONS:

Wetland name or number A_____

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

H 1.0. Does the site have the potential to provide habitat?

H 1.1. Structure of plant community: Indicators are Cowardin classes and strata within the Forested class. Check the Cowardin plant classes in the wetland. Up to 10 patches may be combined for each class to meet the threshold of ¼ ac if the unit is at least 2.5 ac, or more than 10% of the unit if it is smaller than 2.5 ac.

____Aquatic bed — 4 structures or more: points = 4
____Emergent — [3 structures: points = 2]
__✔__Scrub-shrub (areas where shrubs have > 30% cover) — 2 structures: points = 1
__✔__Forested (areas where trees have > 30% cover) — 1 structure: points = 0

If the unit has a Forested class, check if:

__✔__The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/groundcover) that each cover 20% within the Forested polygon

2

H 1.2. Hydroperiods

Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland if the unit is < 2.5 ac, or ¼ ac if the unit is at least 2.5 ac to count (see text for descriptions of hydroperiods).

____Permanently flooded or inundated — 4 or more types present: points = 3
____Seasonally flooded or inundated — 3 types present: points = 2
____Occasionally flooded or inundated — [2 types present: points = 1]
__✔__Saturated only — 1 type present: points = 0
____Permanently flowing stream or river in, or adjacent to, the wetland
__✔__Intermittently or seasonally flowing stream in, or adjacent to, the wetland
____**Lake Fringe wetland** — **2 points**
____**Freshwater tidal wetland** — **2 points**

1

H 1.3. Richness of plant species

Count the number of plant species in the wetland that cover at least 10 ft^2.

Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. **Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canada thistle**

If you counted: > 19 species — points = 2
[5 - 19 species] — [points = 1]
< 5 species — points = 0

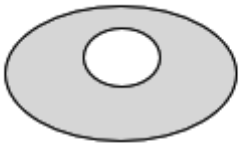
1

H 1.4. Interspersion of habitats

Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. If you have four or more plant classes or three classes and open water, the rating is always high.



None = 0 points

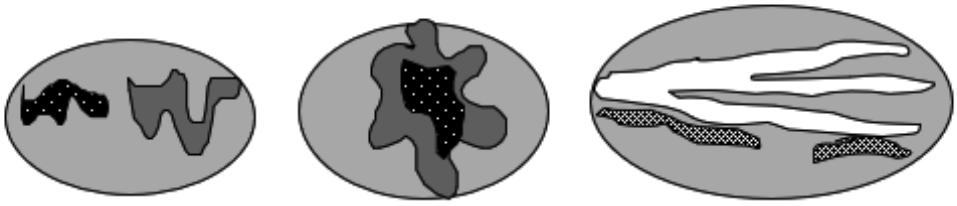


Low = 1 point



Moderate = 2 points

All three diagrams in this row are **High** = 3 points



1

Wetland name or number A

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. The number of checks is the number of points. ✔ Large, downed, woody debris within the wetland (> 4 in. diameter and 6 ft long). ✔ Standing snags (dbh > 4 in.) within the wetland ✔ Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extend at least 3.3 ft (1 m) over open water or a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ___ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet weathered where wood is exposed) ___ At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (structures for egg-laying by amphibians) ✔ Invasive plants cover less than 25% of the wetland area in every stratum of plants (see H 1.1 above for the list of strata and H 1.5 in the manual for the list of aggressive plant species)	**4**
Total for H 1 — Add the points in the boxes above	**9**

Rating of Site Potential If score is: ___**15-18 = H** ✔ **7-14 = M** ___**0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include only habitat polygons accessible from the wetland. *Calculate:* % relatively undisturbed habitat 43 + [(% moderate and low intensity land uses)/2] 5 = 48 % Total accessible habitat is: ✔ > 1/3 (33.3%) of 1 km Polygon — points = 3 ☐ 20-33% of 1 km Polygon — points = 2 ☐ 10-19% of 1 km Polygon — points = 1 ☐ < 10% of 1 km Polygon — points = 0	**3**
H 2.2. Total habitat in 1 km Polygon around the wetland. *Calculate:* % relatively undisturbed habitat 63 + [(% moderate and low intensity land uses)/2] 17 = 80 % ✔ Total habitat > 50% of Polygon — points = 3 ☐ Total habitat 10-50% and in 1-3 patches — points = 2 ☐ Total habitat 10-50% and > 3 patches — points = 1 ☐ Total habitat < 10% of 1 km Polygon — points = 0	**3**
H 2.3. Land use intensity in 1 km Polygon: ☐ > 50% of 1 km Polygon is high intensity land use — points = (- 2) ✔ ≤ 50% of 1 km Polygon is high intensity — points = 0	**0**
Total for H 2 — Add the points in the boxes above	**6**

Rating of Landscape Potential If score is: ✔ **4-6 = H** ___**1-3 = M** ___**< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.* Site meets ANY of the following criteria: — points = 2 ✔ It has 3 or more Priority Habitats within 100 m (see next page) ☐ It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) ☐ It is mapped as a location for an individual WDFW Priority Species ☐ It is a Wetland of High Conservation Value as determined by the Department of Natural Resources data ☐ It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan ☐ Site has 1 or 2 Priority Habitats (listed on next page) within 100 m — points = 1 ☐ Site does not meet any of the criteria above — points = 0	**2**

Rating of Value If score is: ✔ **2 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number A

WDFW Priority Habitats

See complete descriptions of Priority Habitats listed by WDFW, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008 (current year, as revised). Priority Habitat and Species List.[133] This list was updated for consistency with guidance from WDFW.

This question is independent of the land use between the wetland unit and the Priority Habitat. All vegetated wetlands are by definition a Priority Habitat but are not included in this list because they are addressed by this rating system.

Count how many of the following Priority Habitats are within 330 ft (100 m) of the wetland unit:

☐ **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

☐ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife. This habitat automatically counts if mapped on the PHS online map within 100m of the wetland. If not mapped, a determination can be made in the field.

☐ **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

☐ **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.

☐ **Fresh Deepwater:** Lands permanently flooded with freshwater, including environments where surface water is permanent and often deep, so that water, rather than air, is the principal medium within which the dominant organisms live. Substrate does not support emergent vegetation. Do not select if Instream habitat is also present, or if the entire Deepwater feature is included in the wetland unit being rated (such as a pond with a vegetated fringe).

☐ **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.

☑ **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. Do not select if Fresh Deepwater habitat is also present.

☐ **Nearshore:** Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore.

☐ **Old-growth/Mature forests:** Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in. (81 cm) diameter at breast height (dbh) or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in. (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.

[133] http://wdfw.wa.gov/publications/00165/wdfw00165.pdf

Wetland name or number A

☐ **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important. For single oaks or oak stands <0.4 ha in urban areas, WDFW's Management Recommendations for Oregon White Oak[134] provides more detail for determining if they are Priority Habitats

☑ **Riparian:** The area adjacent to freshwater aquatic systems with flowing or standing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

☑ **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in. (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in. (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

☐ **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

☐ **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie.

[134] https://wdfw.wa.gov/publications/00030/wdfw00030.pdf

Wetland name or number A

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt Yes – Go to **SC 1.1** No= **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = **Category I** No – Go to **SC 1.2**	**Cat. I**
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 10% cover of non-native plant species. If non-native species are *Spartina*, see chapter 4.8 in the manual. ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Does the wetland overlap with any known or historical rare plant or rare & high-quality ecosystem polygons on the WNHP Data Explorer?[135] Yes **= Category I** No – Go to **SC 2.2** SC 2.2. Does the wetland have a rare plant species, rare ecosystem (e.g., plant community), or high-quality common ecosystem that may qualify the site as a WHCV? Contact WNHP for resources to help determine the presence of these elements. Yes – Submit data to WA Natural Heritage Program for determination,[136] Go to **SC 2.3** No **= Not a WHCV** SC 2.3. Did WNHP review the site within 30 days and determine that it has a rare plant or ecosystem that meets their criteria? Yes **= Category I** No **= Not a WHCV**	**Cat. I**
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES, you will still need to rate the wetland based on its functions.*** SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in. or more of the first 32 in. of the soil profile? Yes – Go to **SC 3.3** No – Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in. deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes – Go to **SC 3.3** No = **Not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? Yes = **Category I bog** No – Go to **SC 3.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in. deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? Yes = **Category I bog** No **= Not a bog**	**Cat. I**

[135] https://www.dnr.wa.gov/NHPdata

[136] https://www.dnr.wa.gov/Publications/amp_nh_sighting_form.pdf

Wetland name or number A

SC 4.0. Forested Wetlands Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as Priority Habitats? ***If you answer YES, you will still need to rate the wetland based on its functions.*** ☐ **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in. (81 cm) or more. ☐ **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in. (53 cm). Yes = **Category I** No = **Not a forested wetland for this section**	**Cat. I**
SC 5.0. Wetlands in Coastal Lagoons Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? ☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks ☐ The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* ☐ The lagoon retains some of its surface water at low tide during spring tides Yes – Go to **SC 5.1** No = **Not a wetland in a coastal lagoon** SC 5.1. Does the wetland meet all of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species in H 1.5 in the manual). ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetland is larger than $^{1}/_{10}$ ac (4350 ft^2) Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 6.0. Interdunal Wetlands Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer YES, you will still need to rate the wetland based on its habitat functions.*** In practical terms that means the following geographic areas: ☐ Long Beach Peninsula: Lands west of SR 103 ☐ Grayland-Westport: Lands west of SR 105 ☐ Ocean Shores-Copalis: Lands west of SR 115 and SR 109 and Ocean Shores Blvd SW, including lands west of E. Oceans Shores Blvd SW. Yes – Go to **SC 6.1** No = **Not an interdunal wetland for rating** SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? Yes = **Category I** No – Go to **SC 6.2** SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? Yes = **Category II** No – Go to **SC 6.3** SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? Yes = **Category III** No = **Category IV**	**Cat I** **Cat. II** **Cat. III** **Cat. IV**
Category of wetland based on Special Characteristics If you answered No for all types, enter "Not Applicable" on Summary Form	**N/A**

MILES SAND AND GRAVEL - GRIP RD IMPROVEMENTS

WETLAND RATING FIGURE 1- WETLAND A



LEGEND

- EMERGENT VEGETATION
- FORESTED VEGETATION
- SATURATED ONLY
- 150' FROM WL BOUNDARY
- INTERMITTENT STREAM

Scale 1" = 100'

0 100 200

Wetland Resources, Inc.

Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance

9505 19th Avenue S.E. Suite 106 Everett,Washington 98208

Phone: (425) 337-3174

Fax: (425) 337-3045

Email: mailbox@wetlandresources.com

WETLAND RATING

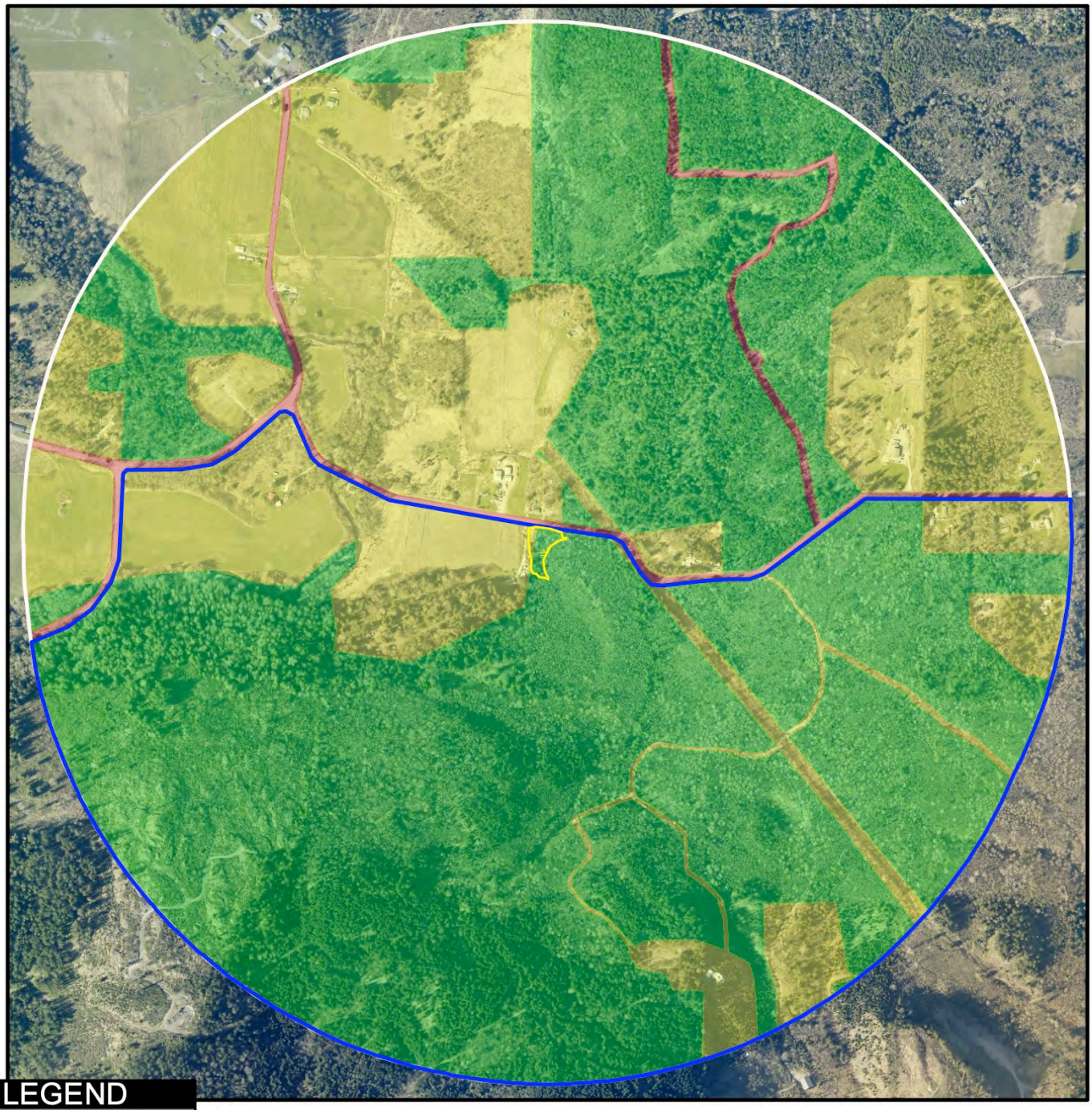
Wetland A

Figure A-1

WRI Job # 25267

Rated by: EC

MILES SAND AND GRAVEL - GRIP RD IMPROVEMENTS
WETLAND RATING FIGURE 2- WETLAND A



LEGEND

- RELATIVELY UNDISTURBED
- LOW/MOD. INTENSITY
- HIGH INTENSITY
- ACCESSIBLE HABITAT
- WETLAND
- 1 KM FROM WETLAND
- CONTRIBUTING BASIN

Scale 1" = 1,000'

0 1,000 2,000

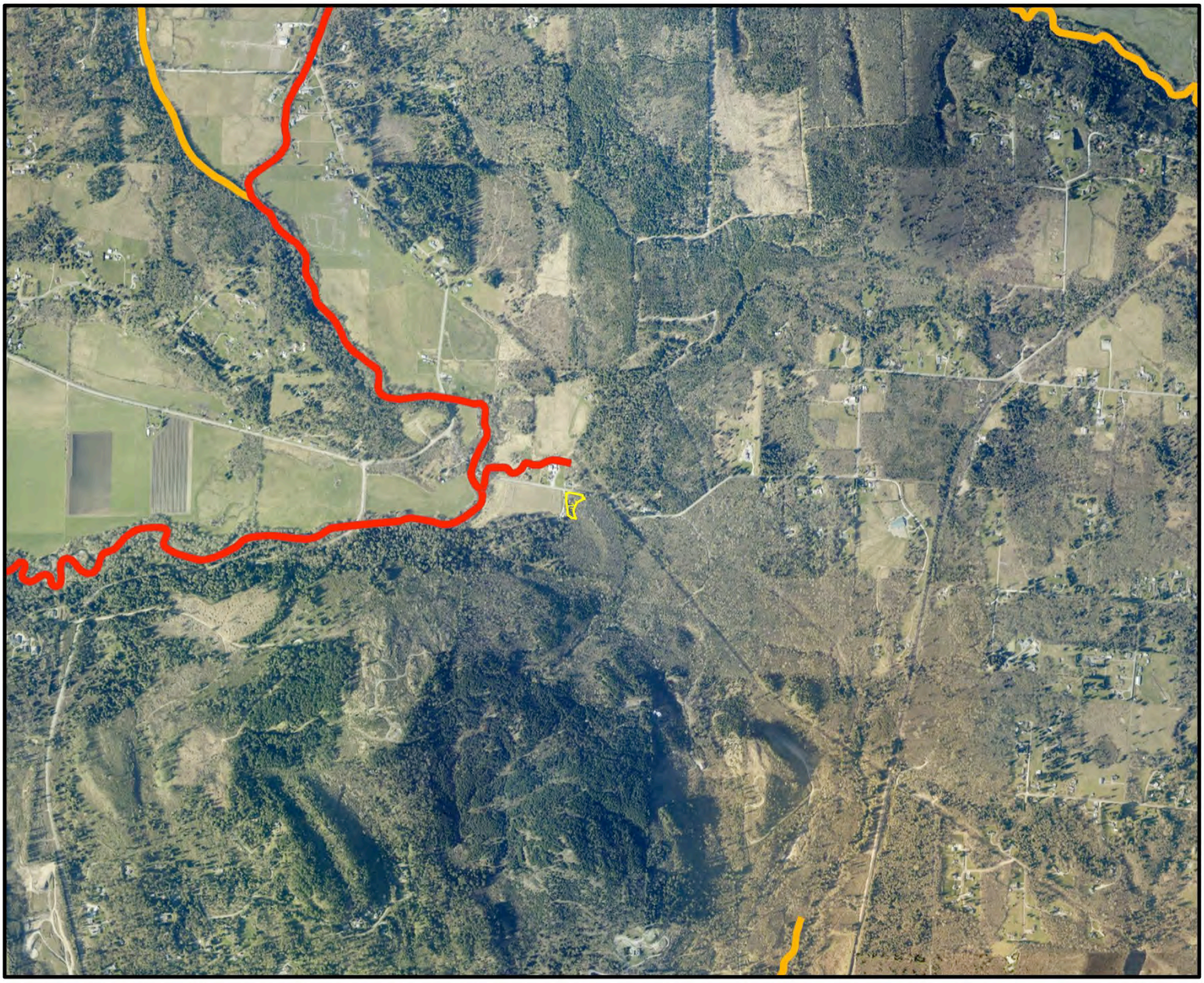
Wetland Resources, Inc.
Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance
9505 19th Avenue S.E. Suite 106 Everett,Washington 98208
Phone: (425) 337-3174
Fax: (425) 337-3045
Email: mailbox@wetlandresources.com

WETLAND RATING
Wetland A

Figure A-2
WRI Job # 25267
Rated by: EC

MILES SAND AND GRAVEL - GRIP RD IMPROVEMENTS

WETLAND RATING FIGURE 3- WETLAND A



LEGEND

- WETLAND
- AQUATIC RESOURCES WITH ACTIVE TMDL
- AQUATIC RESOURCES ON THE 303(d) LIST

Scale 1" = 2,000'

0 2,000 4,000

Wetland Resources, Inc.

Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance

9505 19th Avenue S.E. Suite 106 Everett,Washington 98208

Phone: (425) 337-3174

Fax: (425) 337-3045

Email: mailbox@wetlandresources.com

WETLAND RATING

Wetland A

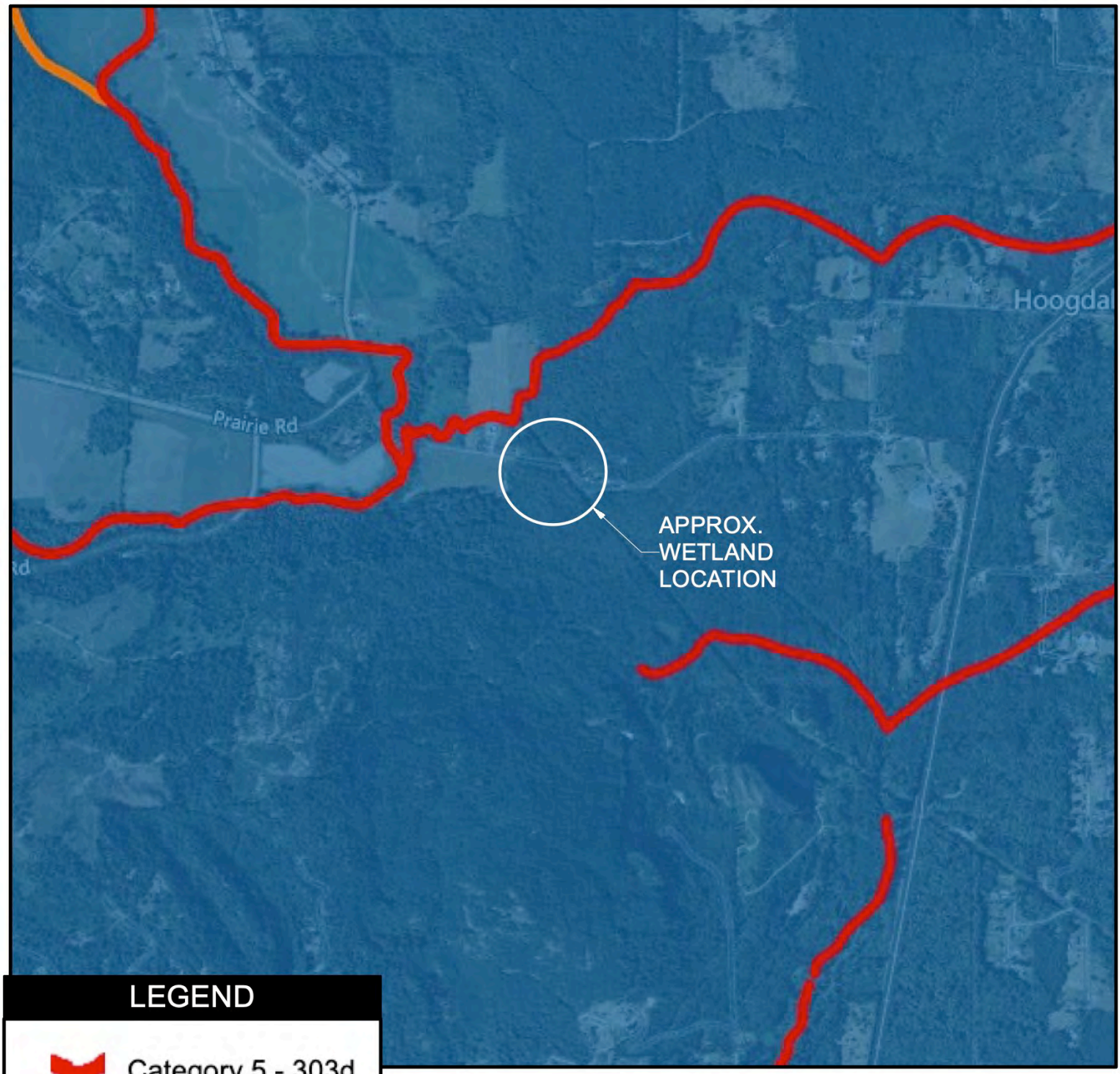
Figure A-3

WRI Job # 25267

Rated by: EC

MILES SAND AND GRAVEL - GRIP RD IMPROVEMENTS

WETLAND RATING FIGURE 4- WETLAND A



LEGEND

- Category 5 - 303d
- Category 4A
- TMDL - Approved
- 4B - Approved

Wetland Resources, Inc.
Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance
9505 19th Avenue S.E. Suite 106 Everett,Washington 98208
Phone: (425) 337-3174
Fax: (425) 337-3045
Email: mailbox@wetlandresources.com

WETLAND RATING
Wetland A

Figure A-4
WRI Job # 25267
Rated by: EC

MILES SAND AND GRAVEL - GRIP RD IMPROVEMENTS

WETLAND RATING FIGURE 5- WETLAND A



LEGEND

- WETLAND
- DENSE WOODY
- DENSE UNCUT HERBACIOUS
- DENSE UNCUT RIDGID

Scale 1" = 100'

0 100 200

Wetland Resources, Inc.

Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance

9505 19th Avenue S.E. Suite 106 Everett,Washington 98208

Phone: (425) 337-3174

Fax: (425) 337-3045

Email: mailbox@wetlandresources.com

WETLAND RATING

Wetland A

Figure A-5

WRI Job # 25267

Rated by: EC

Wetland name or number B

RATING SUMMARY – Western Washington

Name of wetland (or ID #): 25267 - Wetland B Date of site visit: 9/2/25

Rated by EC Trained by Ecology? ✔ Yes ___No Date of training 10/18

HGM Class used for rating **Riverine** Wetland has multiple HGM classes? ___Y ✔ N

NOTE: **Form is not complete without the required figures** (figures can be combined).
Source of base aerial photo/map Skagit County GIS

OVERALL WETLAND CATEGORY II (based on functions ✔ or special characteristics__)

1. Category of wetland based on FUNCTIONS

_____**Category I** – Total score = 23 - 27

__✔__**Category II** – Total score = 20 - 22

_____**Category III** – Total score = 16 - 19

_____**Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality			Hydrologic			Habitat			
	Circle the appropriate ratings									
Site Potential	H	[M]	L	H	[M]	L	H	[M]	L	
Landscape Potential	H	[M]	L	H	[M]	L	[H]	M	L	
Value	[H]	M	L	[H]	M	L	[H]	M	L	**TOTAL**
Score Based on Ratings	**7**			**7**			**8**			**22**

Score for each function based on three ratings (order of ratings is not important)

9 = H, H, H
8 = H, H, M
7 = H, H, L
7 = H, M, M
6 = H, M, L
6 = M, M, M
5 = H, L, L
5 = M, M, L
4 = M, L, L
3 = L, L, L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	**I** **II**
Wetland of High Conservation Value	**I**
Bog	**I**
Mature Forest	**I**
Old Growth Forest	**I**
Coastal Lagoon	**I** **II**
Interdunal	**I** **II** **III** **IV**
None of the above	✔

Wetland name or number B

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	1
Hydroperiods	H 1.2	1
Ponded depressions	R 1.1	5
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	1
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	5
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	5
Map of the contributing basin	R 2.2, R 2.3, R 5.2	2
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	2
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	3
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	4

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

Wetland name or number B

HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

   NO – go to 2 **YES** – the wetland class is **Tidal Fringe** – go to 1.1

   1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

   NO – Saltwater Tidal Fringe (Estuarine) **YES – Freshwater Tidal Fringe**
   If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe, it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.

2. The entire wetland unit is flat, and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

   NO – go to 3 **YES** – The wetland class is **Flats**
   If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet all** of the following criteria?
   - The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size,
   - At least 30% of the open water area is deeper than 6.6 ft (2 m).

   NO – go to 4 **YES –** The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?
   - The wetland is on a slope (slope can be very gradual),
   - The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheet flow, or in a swale without distinct banks,
   - The water leaves the wetland **without being impounded**.

   NO – go to 5 **YES –** The wetland class is **Slope**

   NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

Wetland name or number B

5. Does the entire wetland unit **meet all** of the following criteria?
   _✔_ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
   ___✔___ The overbank flooding occurs at least once every 2 years.

   NO – go to 6 **YES** – The wetland class is **Riverine**

   NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? This means that any outlet, if present, is higher than the interior of the wetland.

   NO – go to 7 **YES** – The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched but has no obvious natural outlet.

   NO – go to 8 **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

   NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated		HGM class to use in rating
Slope + Riverine	☐	Riverine
Slope + Depressional	☐	Depressional
Slope + Lake Fringe	☐	Lake Fringe
Depressional + Riverine along stream within boundary of depression	☐	Depressional
Depressional + Lake Fringe	☐	Depressional
Riverine + Lake Fringe	☐	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	☐	Treat as ESTUARINE

If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.

Wetland name or number B_____

RIVERINE AND FRESHWATER TIDAL FRINGE WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

R 1.0. Does the site have the potential to improve water quality?

R 1.1. Area of surface depressions within the Riverine wetland that can trap sediments during a flooding event:

- ☐ Depressions cover >3/4 area of wetland — points = 8
- ☐ Depressions cover > ½ area of wetland — points = 4
- ☑ Depressions present but cover ≤ ½ area of wetland — points = 2
- ☐ No depressions present — points = 0

2

R 1.2. Structure of plants in the wetland (areas with >90% cover at person height, **not** Cowardin classes)

- ☑ Trees or shrubs > 2/3 area of the wetland — points = 8
- ☐ Trees or shrubs > 1/3 area of the wetland — points = 6
- ☐ Herbaceous plants (> 6 in. high) > 2/3 area of the wetland — points = 6
- ☐ Herbaceous plants (> 6 in. high) > 1/3 area of the wetland — points = 3
- ☐ Trees, shrubs, and ungrazed herbaceous < 1/3 area of the wetland — points = 0

8

Total for R 1 — Add the points in the boxes above — **10**

Rating of Site Potential If score is: __**12-16 = H** ✔**6-11 = M** ___**0-5 = L** *Record the rating on the first page*

R 2.0. Does the landscape have the potential to support the water quality function of the site?

R 2.1. Is the wetland within an incorporated city or within its UGA?	Yes = 2 No = 0	**0**
R 2.2. Does the contributing basin to the wetland include a UGA or incorporated area?	Yes = 1 No = 0	**0**
R 2.3. Does at least 10% of the contributing basin contain tilled fields, pastures, or forests that have been clearcut within the last 5 years?	Yes = 1 No = 0	**0**
R 2.4. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants?	Yes = 1 No = 0	**0**
R 2.5. Are there other sources of pollutants coming into the wetland that are not listed in questions R 2.1-R 2.4? Other sources Roadside Litter	Yes = 1 No = 0	**1**
Total for R 2	Add the points in the boxes above	**1**

Rating of Landscape Potential If score is: __**3-6 = H** ✔**1 or 2 = M** ___**0 = L** *Record the rating on the first page*

R 3.0. Is the water quality improvement provided by the site valuable to society?

R 3.1. Is the wetland along a stream or river that is on the 303(d) list or on a tributary that drains to one within 1 mi?	Yes = 1 No = 0	**1**
R 3.2. Is the wetland along a stream or river that has TMDL limits for nutrients, toxics, or pathogens?	Yes = 1 No = 0	**0**
R 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? (Answer YES if there is a TMDL in development or in effect for the drainage in which the unit is found.)	Yes = 2 No = 0	**2**
Total for R 3	Add the points in the boxes above	**3**

Rating of Value If score is: ✔**2-4 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number B

RIVERINE AND FRESHWATER TIDAL FRINGE WETLANDS

Hydrologic Functions - Indicators that site functions to reduce flooding and stream erosion

R 4.0. Does the site have the potential to reduce flooding and erosion?	
R 4.1. Characteristics of the overbank storage the wetland provides: Estimate the average width of the wetland perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of wetland)/(average width of stream between banks). ☐ If the ratio is more than 20 points = 9 ☐ If the ratio is 10-20 points = 6 ☐ If the ratio is 5-<10 points = 4 ☑ If the ratio is 1-<5 points = 2 ☐ If the ratio is < 1 points = 1	**2**
R 4.2. Characteristics of plants that slow down water velocities during floods: Treat large woody debris as forest or shrub. Choose the points appropriate for the best description (polygons need to have >90% cover at person height. These are NOT Cowardin classes). ☑ Forest or shrub for > 1/3 area OR emergent plants > 2/3 area points = 7 ☐ Forest or shrub for > 1/10 area OR emergent plants > 1/3 area points = 4 ☐ Plants do not meet above criteria points = 0	**7**
Total for R 4 Add the points in the boxes above	**9**

Rating of Site Potential If score is: ☐ **12-16 = H** ☑ **6-11 = M** ☐ **0-5 = L** *Record the rating on the first page*

R 5.0. Does the landscape have the potential to support the hydrologic functions of the site?		
R 5.1. Is the stream or river adjacent to the wetland downcut?	Yes = 0 No = 1	**1**
R 5.2. Does the upgradient watershed include a UGA or incorporated area?	Yes = 1 No = 0	**0**
R 5.3. Is the upgradient stream or river controlled by dams?	Yes = 0 No = 1	**1**
Total for R 5 Add the points in the boxes above		**2**

Rating of Landscape Potential If score is: ☐ **3 = H** ☑ **1 or 2 = M** ☐ **0 = L** *Record the rating on the first page*

R 6.0. Are the hydrologic functions provided by the site valuable to society?	
R 6.1. Distance to the nearest areas downstream that have flooding problems? Choose the description that best fits the site. ☑ The sub-basin immediately downgradient of the wetland has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds) points = 2 ☐ Surface flooding problems are in a sub-basin farther downgradient points = 1 ☐ No flooding problems anywhere downstream points = 0	**2**
R 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	**0**
Total for R 6 Add the points in the boxes above	**2**

Rating of Value If score is: ☑ **2-4 = H** ☐ **1 = M** ☐ **0 = L** *Record the rating on the first page*

Wetland name or number B_____

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

H 1.0. Does the site have the potential to provide habitat?

H 1.1. Structure of plant community: Indicators are Cowardin classes and strata within the Forested class. Check the Cowardin plant classes in the wetland. Up to 10 patches may be combined for each class to meet the threshold of ¼ ac if the unit is at least 2.5 ac, or more than 10% of the unit if it is smaller than 2.5 ac.

____Aquatic bed — 4 structures or more: points = 4
____Emergent — [3 structures: points = 2]
__✔__Scrub-shrub (areas where shrubs have > 30% cover) — 2 structures: points = 1
__✔__Forested (areas where trees have > 30% cover) — 1 structure: points = 0

If the unit has a Forested class, check if:

__✔__The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/groundcover) that each cover 20% within the Forested polygon

2

H 1.2. Hydroperiods

Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland if the unit is < 2.5 ac, or ¼ ac if the unit is at least 2.5 ac to count (see text for descriptions of hydroperiods).

____Permanently flooded or inundated — 4 or more types present: points = 3
____Seasonally flooded or inundated — 3 types present: points = 2
____Occasionally flooded or inundated — 2 types present: points = 1
____Saturated only — [1 type present: points = 0]
____Permanently flowing stream or river in, or adjacent to, the wetland
__✔__Intermittently or seasonally flowing stream in, or adjacent to, the wetland
____**Lake Fringe wetland** — **2 points**
____**Freshwater tidal wetland** — **2 points**

0

H 1.3. Richness of plant species

Count the number of plant species in the wetland that cover at least 10 ft^2.

Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. **Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canada thistle**

If you counted: > 19 species — points = 2
[5 - 19 species] — [points = 1]
< 5 species — points = 0

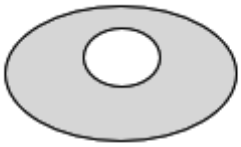
1

H 1.4. Interspersion of habitats

Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. If you have four or more plant classes or three classes and open water, the rating is always high.



None = 0 points

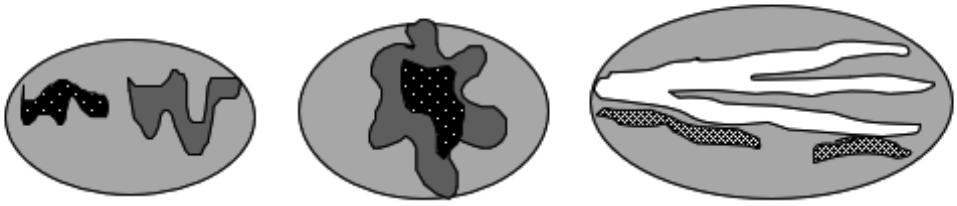


Low = 1 point



Moderate = 2 points

All three diagrams in this row are **High** = 3 points



2

Wetland name or number B

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. The number of checks is the number of points. ✔ Large, downed, woody debris within the wetland (> 4 in. diameter and 6 ft long). ✔ Standing snags (dbh > 4 in.) within the wetland ✔ Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extend at least 3.3 ft (1 m) over open water or a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ___ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet weathered where wood is exposed) ___ At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (structures for egg-laying by amphibians) ✔ Invasive plants cover less than 25% of the wetland area in every stratum of plants (see H 1.1 above for the list of strata and H 1.5 in the manual for the list of aggressive plant species)	**4**
Total for H 1 — Add the points in the boxes above	**9**

Rating of Site Potential If score is: ___**15-18 = H** ✔ **7-14 = M** ___**0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include only habitat polygons accessible from the wetland. *Calculate:* % relatively undisturbed habitat 43 + [(% moderate and low intensity land uses)/2] 7 = 50 % Total accessible habitat is: ✔ > 1/3 (33.3%) of 1 km Polygon — points = 3 ☐ 20-33% of 1 km Polygon — points = 2 ☐ 10-19% of 1 km Polygon — points = 1 ☐ < 10% of 1 km Polygon — points = 0	**3**
H 2.2. Total habitat in 1 km Polygon around the wetland. *Calculate:* % relatively undisturbed habitat 63 + [(% moderate and low intensity land uses)/2] 18 = 81 % ✔ Total habitat > 50% of Polygon — points = 3 ☐ Total habitat 10-50% and in 1-3 patches — points = 2 ☐ Total habitat 10-50% and > 3 patches — points = 1 ☐ Total habitat < 10% of 1 km Polygon — points = 0	**3**
H 2.3. Land use intensity in 1 km Polygon: ☐ > 50% of 1 km Polygon is high intensity land use — points = (- 2) ✔ ≤ 50% of 1 km Polygon is high intensity — points = 0	**0**
Total for H 2 — Add the points in the boxes above	**6**

Rating of Landscape Potential If score is: ✔ **4-6 = H** ___**1-3 = M** ___**< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.* Site meets ANY of the following criteria: — points = 2 ✔ It has 3 or more Priority Habitats within 100 m (see next page) ☐ It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) ☐ It is mapped as a location for an individual WDFW Priority Species ☐ It is a Wetland of High Conservation Value as determined by the Department of Natural Resources data ☐ It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan ☐ Site has 1 or 2 Priority Habitats (listed on next page) within 100 m — points = 1 ☐ Site does not meet any of the criteria above — points = 0	**2**

Rating of Value If score is: ✔ **2 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number B

WDFW Priority Habitats

See complete descriptions of Priority Habitats listed by WDFW, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008 (current year, as revised). Priority Habitat and Species List.[133] This list was updated for consistency with guidance from WDFW.

This question is independent of the land use between the wetland unit and the Priority Habitat. All vegetated wetlands are by definition a Priority Habitat but are not included in this list because they are addressed by this rating system.

Count how many of the following Priority Habitats are within 330 ft (100 m) of the wetland unit:

☐ **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

☐ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife. This habitat automatically counts if mapped on the PHS online map within 100m of the wetland. If not mapped, a determination can be made in the field.

☐ **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

☐ **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.

☐ **Fresh Deepwater:** Lands permanently flooded with freshwater, including environments where surface water is permanent and often deep, so that water, rather than air, is the principal medium within which the dominant organisms live. Substrate does not support emergent vegetation. Do not select if Instream habitat is also present, or if the entire Deepwater feature is included in the wetland unit being rated (such as a pond with a vegetated fringe).

☐ **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.

☑ **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. Do not select if Fresh Deepwater habitat is also present.

☐ **Nearshore:** Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore.

☐ **Old-growth/Mature forests:** Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in. (81 cm) diameter at breast height (dbh) or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in. (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.

[133] http://wdfw.wa.gov/publications/00165/wdfw00165.pdf

Wetland name or number B

☐ **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important. For single oaks or oak stands <0.4 ha in urban areas, WDFW's Management Recommendations for Oregon White Oak[134] provides more detail for determining if they are Priority Habitats

☑ **Riparian:** The area adjacent to freshwater aquatic systems with flowing or standing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

☑ **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in. (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in. (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

☐ **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

☐ **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie.

[134] https://wdfw.wa.gov/publications/00030/wdfw00030.pdf

Wetland name or number B

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt Yes – Go to **SC 1.1** No= **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = **Category I** No – Go to **SC 1.2**	**Cat. I**
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 10% cover of non-native plant species. If non-native species are *Spartina*, see chapter 4.8 in the manual. ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Does the wetland overlap with any known or historical rare plant or rare & high-quality ecosystem polygons on the WNHP Data Explorer?[135] Yes **= Category I** No – Go to **SC 2.2** SC 2.2. Does the wetland have a rare plant species, rare ecosystem (e.g., plant community), or high-quality common ecosystem that may qualify the site as a WHCV? Contact WNHP for resources to help determine the presence of these elements. Yes – Submit data to WA Natural Heritage Program for determination,[136] Go to **SC 2.3** No **= Not a WHCV** SC 2.3. Did WNHP review the site within 30 days and determine that it has a rare plant or ecosystem that meets their criteria? Yes **= Category I** No **= Not a WHCV**	**Cat. I**
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES, you will still need to rate the wetland based on its functions.*** SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in. or more of the first 32 in. of the soil profile? Yes – Go to **SC 3.3** No – Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in. deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes – Go to **SC 3.3** No = **Not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? Yes = **Category I bog** No – Go to **SC 3.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in. deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? Yes = **Category I bog** No **= Not a bog**	**Cat. I**

[135] https://www.dnr.wa.gov/NHPdata

[136] https://www.dnr.wa.gov/Publications/amp_nh_sighting_form.pdf

Wetland name or number B

SC 4.0. Forested Wetlands — **Cat. I**

Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as Priority Habitats? ***If you answer YES, you will still need to rate the wetland based on its functions.***

☐ **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in. (81 cm) or more.

☐ **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in. (53 cm).

Yes = **Category I** | No = **Not a forested wetland for this section**

SC 5.0. Wetlands in Coastal Lagoons — **Cat. I**

Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?

☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks

☐ The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)*

☐ The lagoon retains some of its surface water at low tide during spring tides

Yes – Go to **SC 5.1** | No = **Not a wetland in a coastal lagoon**

SC 5.1. Does the wetland meet all of the following three conditions? — **Cat. II**

☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species in H 1.5 in the manual).

☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland.

☐ The wetland is larger than $^{1}/_{10}$ ac (4350 ft^2)

Yes = **Category I** No = **Category II**

SC 6.0. Interdunal Wetlands — **Cat I**

Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer YES, you will still need to rate the wetland based on its habitat functions.***

In practical terms that means the following geographic areas:

☐ Long Beach Peninsula: Lands west of SR 103

☐ Grayland-Westport: Lands west of SR 105

☐ Ocean Shores-Copalis: Lands west of SR 115 and SR 109 and Ocean Shores Blvd SW, including lands west of E. Oceans Shores Blvd SW.

Yes – Go to **SC 6.1** | No = **Not an interdunal wetland for rating** — **Cat. II**

SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? Yes = **Category I** No – Go to **SC 6.2**

SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? — **Cat. III**

Yes = **Category II** No – Go to **SC 6.3**

SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? — **Cat. IV**

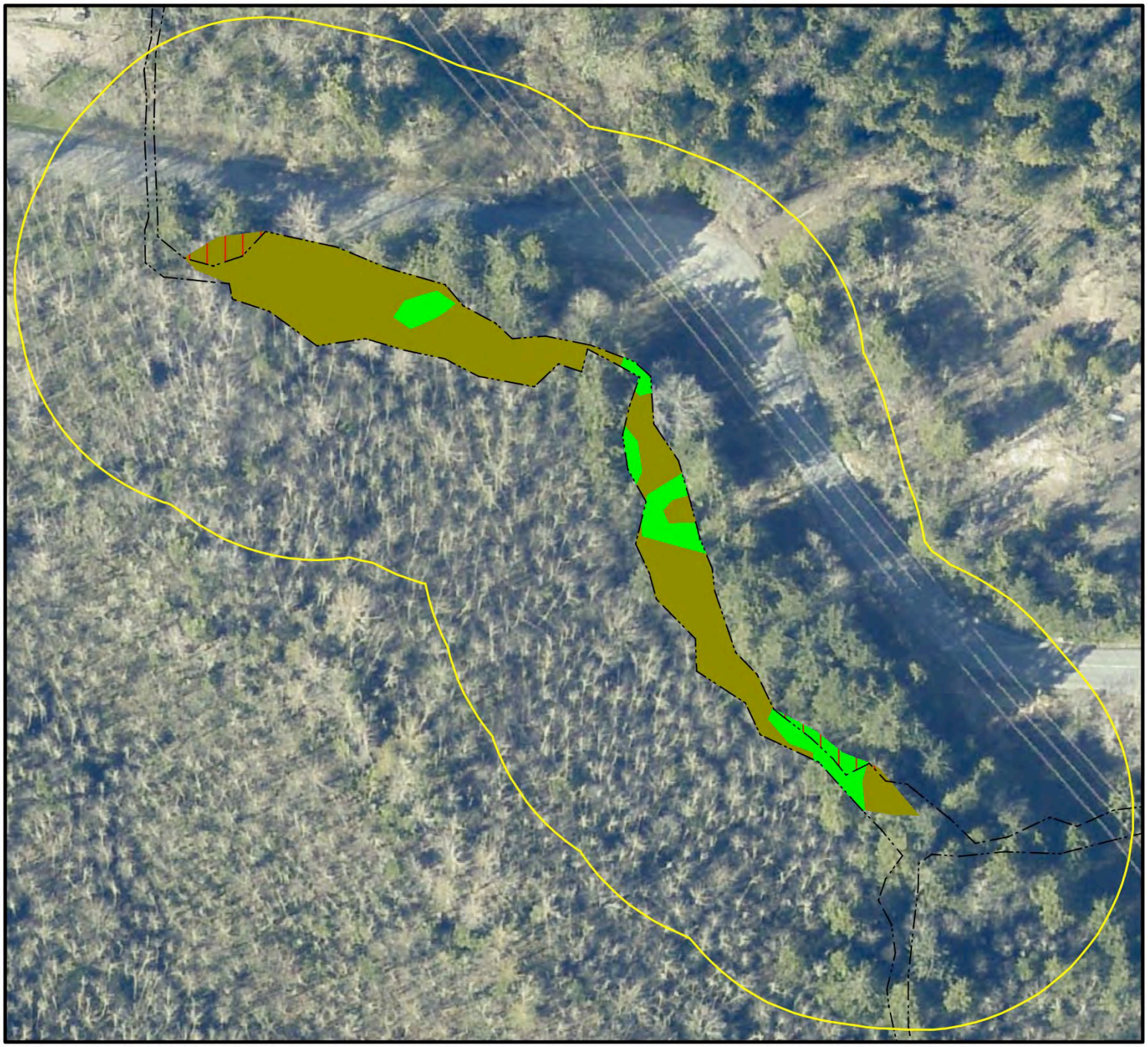
Yes = **Category III** No = **Category IV**

Category of wetland based on Special Characteristics — **N/A**

If you answered No for all types, enter "Not Applicable" on Summary Form

MILES SAND AND GRAVEL - GRIP RD IMPROVEMENTS

WETLAND RATING FIGURE 1- WETLAND B



LEGEND

- SCRUB-SHRUB
- FORESTED VEGETATION
- SATURATED ONLY
- 150' FROM WL BOUNDARY
- INTERMITTENT STREAM

Scale 1" = 100'

0 100 200

Wetland Resources, Inc.

Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance

9505 19th Avenue S.E. Suite 106 Everett,Washington 98208

Phone: (425) 337-3174

Fax: (425) 337-3045

Email: mailbox@wetlandresources.com

WETLAND RATING

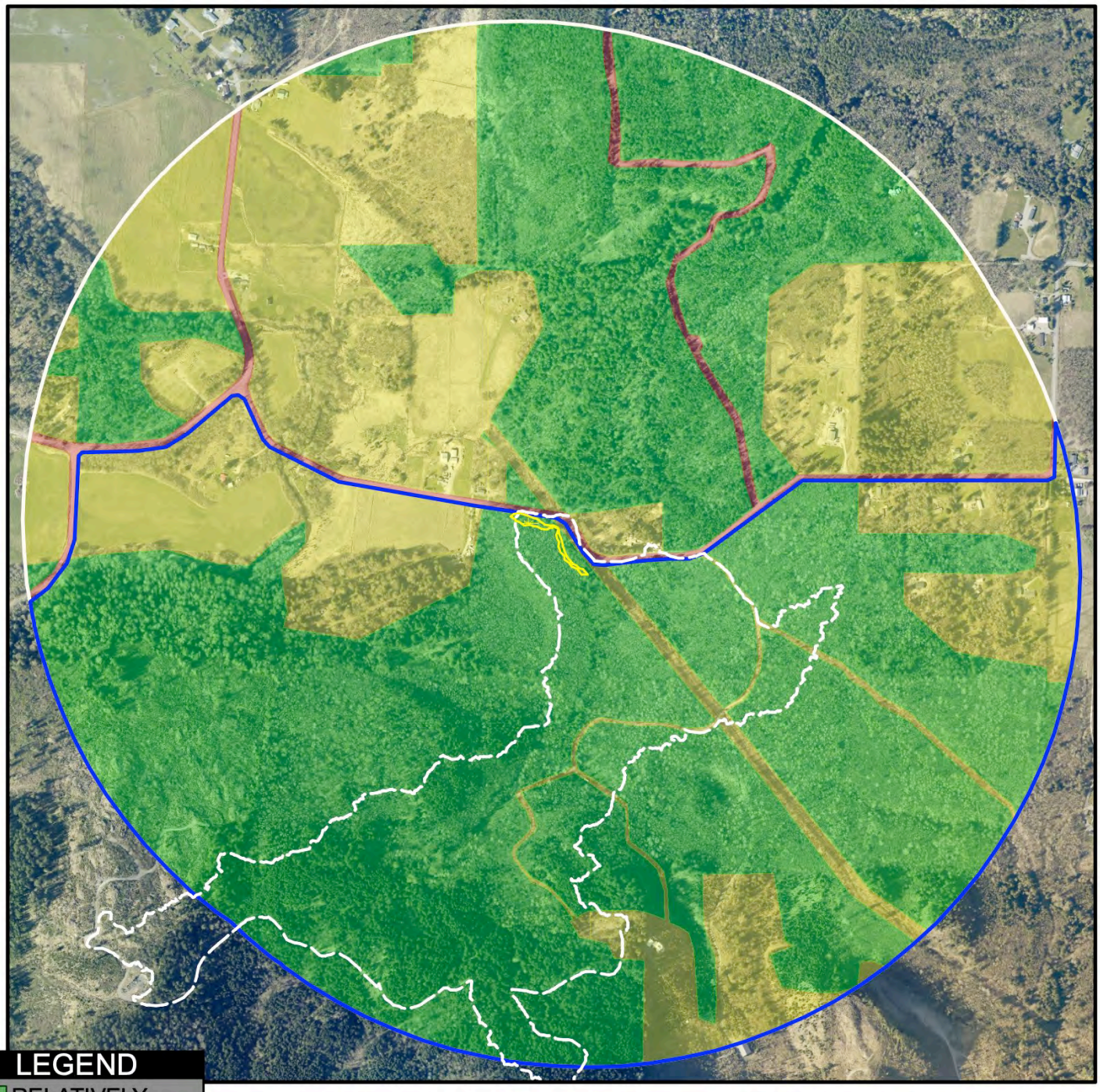
Wetland B

Figure B-1

WRI Job # 25267

Rated by: EC

MILES SAND AND GRAVEL - GRIP RD IMPROVEMENTS
WETLAND RATING FIGURE 2- WETLAND B



LEGEND

- RELATIVELY UNDISTURBED
- LOW/MOD. INTENSITY
- HIGH INTENSITY
- ACCESSIBLE HABITAT
- WETLAND
- 1 KM FROM WETLAND
- CONTRIBUTING BASIN

Scale 1" = 1,000'

0 1,000 2,000

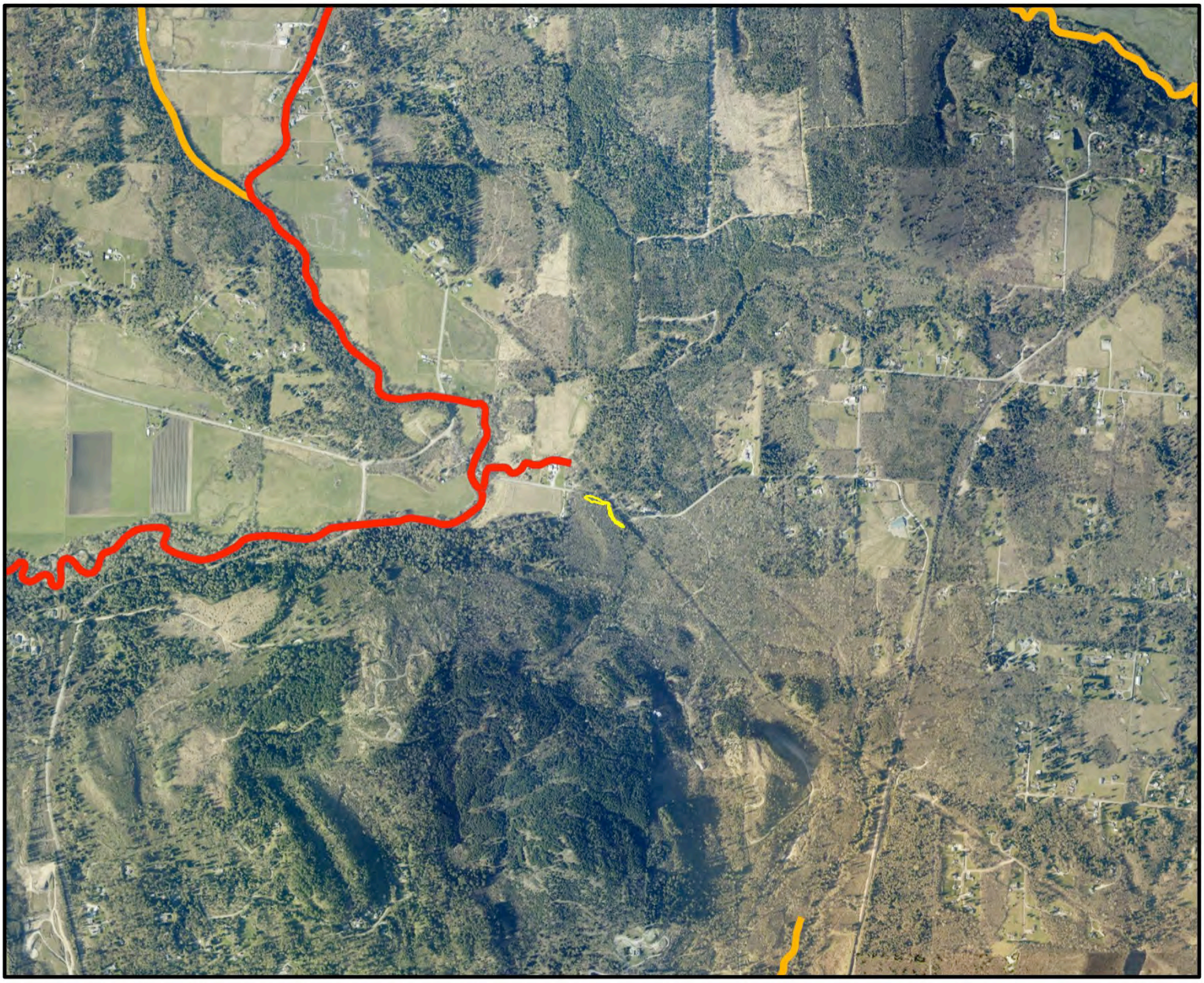
Wetland Resources, Inc.
Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance
9505 19th Avenue S.E. Suite 106 Everett,Washington 98208
Phone: (425) 337-3174
Fax: (425) 337-3045
Email: mailbox@wetlandresources.com

WETLAND RATING
Wetland B

Figure B-2
WRI Job # 25267
Rated by: EC

MILES SAND AND GRAVEL - GRIP RD IMPROVEMENTS

WETLAND RATING FIGURE 3- WETLAND B



LEGEND

- WETLAND
- AQUATIC RESOURCES WITH ACTIVE TMDL
- AQUATIC RESOURCES ON THE 303(d) LIST

Scale 1" = 2,000'

0 2,000 4,000

Wetland Resources, Inc.

Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance

9505 19th Avenue S.E. Suite 106 Everett,Washington 98208

Phone: (425) 337-3174

Fax: (425) 337-3045

Email: mailbox@wetlandresources.com

WETLAND RATING

Wetland B

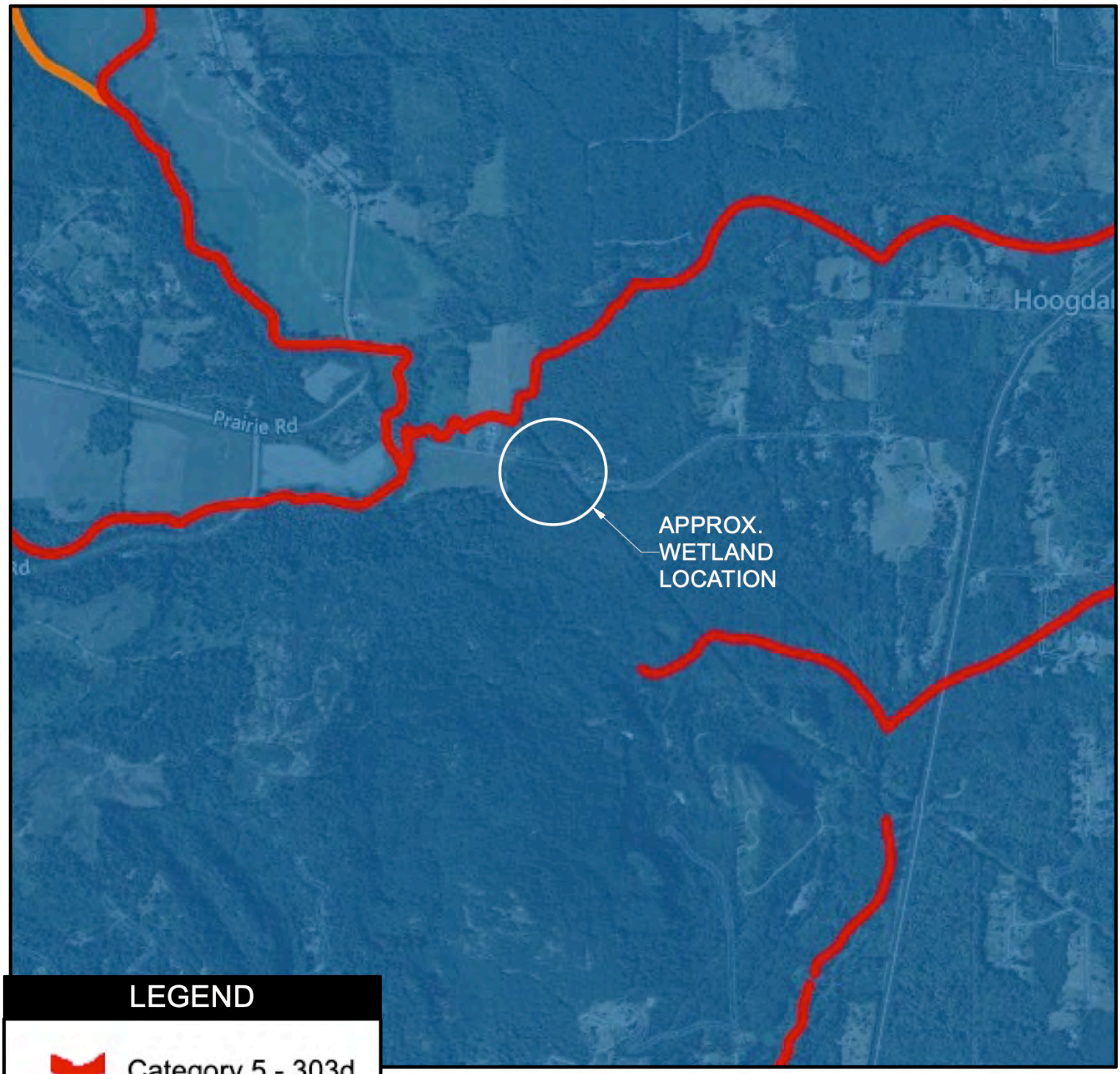
Figure B-3

WRI Job # 25267

Rated by: EC

MILES SAND AND GRAVEL - GRIP RD IMPROVEMENTS

WETLAND RATING FIGURE 4- WETLAND B



LEGEND

- Category 5 - 303d
- Category 4A
- TMDL - Approved
- 4B - Approved

Wetland Resources, Inc.
Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance
9505 19th Avenue S.E. Suite 106 Everett,Washington 98208
Phone: (425) 337-3174
Fax: (425) 337-3045
Email: mailbox@wetlandresources.com

WETLAND RATING
Wetland B

Figure B-4
WRI Job # 25267
Rated by: EC

MILES SAND AND GRAVEL - GRIP RD IMPROVEMENTS

WETLAND RATING FIGURE 5- WETLAND B



LEGEND

- WETLAND
- PONDED DEPRESSIONS
- FOREST OR SCRUB-SHRUB
- HERBACEOUS VEGETATION
- STREAM WIDTH
- WETLAND WIDTH
- INTERMITTENT STREAM

Scale 1" = 100'

0 100 200

Wetland Resources, Inc.

Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance

9505 19th Avenue S.E. Suite 106 Everett,Washington 98208

Phone: (425) 337-3174

Fax: (425) 337-3045

Email: mailbox@wetlandresources.com

WETLAND RATING

Wetland B

Figure B-5

WRI Job # 25267

Rated by: EC

Wetland name or number C

RATING SUMMARY – Western Washington

Name of wetland (or ID #): 25267 - Wetland C Date of site visit: 9/2/25

Rated by EC Trained by Ecology? ✔ Yes ___No Date of training 10/18

HGM Class used for rating Slope Wetland has multiple HGM classes? ___Y ✔ N

NOTE: **Form is not complete without the required figures** (figures can be combined).
Source of base aerial photo/map Skagit County GIS

OVERALL WETLAND CATEGORY II (based on functions ✔ or special characteristics__)

1. Category of wetland based on FUNCTIONS

_____**Category I** – Total score = 23 - 27

___✔___**Category II** – Total score = 20 - 22

_____**Category III** – Total score = 16 - 19

_____**Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality			Hydrologic			Habitat			
										Circle the appropriate ratings
Site Potential	H	M	[L]	H	M	[L]	H	[M]	L	
Landscape Potential	H	[M]	L	H	[M]	L	[H]	M	L	
Value	[H]	M	L	[H]	M	L	[H]	M	L	**TOTAL**
Score Based on Ratings	**6**			**6**			**8**			**20**

Score for each function based on three ratings (order of ratings is not important)

9 = H, H, H
8 = H, H, M
7 = H, H, L
7 = H, M, M
6 = H, M, L
6 = M, M, M
5 = H, L, L
5 = M, M, L
4 = M, L, L
3 = L, L, L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	**I II**
Wetland of High Conservation Value	**I**
Bog	**I**
Mature Forest	**I**
Old Growth Forest	**I**
Coastal Lagoon	**I II**
Interdunal	**I II III IV**
None of the above	✔

Wetland name or number C

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	1
Hydroperiods	D 1.4, H 1.2	1
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	1
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	1
Map of the contributing basin	D 4.3, D 5.3	2
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	2
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	3
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	4

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	1
Hydroperiods	H 1.2	1
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	5
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	5
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	1
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	2
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	3
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	4

Wetland name or number C_____

HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

   NO – go to 2 **YES** – the wetland class is **Tidal Fringe** – go to 1.1

   1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

   NO – Saltwater Tidal Fringe (Estuarine) **YES – Freshwater Tidal Fringe**
   If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe, it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.

2. The entire wetland unit is flat, and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

   NO – go to 3 **YES** – The wetland class is **Flats**
   If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet all** of the following criteria?
   - The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size,
   - At least 30% of the open water area is deeper than 6.6 ft (2 m).

   NO – go to 4 **YES –** The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?
   - The wetland is on a slope (slope can be very gradual),
   - The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheet flow, or in a swale without distinct banks,
   - The water leaves the wetland **without being impounded**.

   NO – go to 5 **YES –** The wetland class is **Slope**

   NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

Wetland name or number C_____

5. Does the entire wetland unit **meet all** of the following criteria?
   _ _The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
   ____The overbank flooding occurs at least once every 2 years.

   NO – go to 6 **YES** – The wetland class is **Riverine**

   NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? This means that any outlet, if present, is higher than the interior of the wetland.

   NO – go to 7 **YES** – The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched but has no obvious natural outlet.

   NO – go to 8 **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

   NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated		HGM class to use in rating
Slope + Riverine	☐	Riverine
Slope + Depressional	☐	Depressional
Slope + Lake Fringe	☐	Lake Fringe
Depressional + Riverine along stream within boundary of depression	☐	Depressional
Depressional + Lake Fringe	☐	Depressional
Riverine + Lake Fringe	☐	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	☐	Treat as ESTUARINE

If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.

Wetland name or number C

SLOPE WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

S 1.0. Does the site have the potential to improve water quality?	
S 1.1. Characteristics of the average slope of the wetland: (A 1% slope has a 1 ft vertical change in elevation for every 100 ft of horizontal distance.) ☐ Slope is 1% or less points = 3 ☐ Slope is > 1%-2% points = 2 ☐ Slope is > 2%-5% points = 1 ☑ Slope is greater than 5% points = 0	**0**
S 1.2. The soil 2 in. below the surface (or duff layer) is true clay or true organic *(use NRCS definitions)*: Yes = 3 [No = 0]	**0**
S 1.3. Characteristics of the plants in the wetland that trap sediments and pollutants: Choose the points appropriate for the description that best fits the plants in the wetland. Dense means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed, and plants are higher than 6 in. ☐ Dense, uncut, herbaceous plants > 90% of the wetland area points = 6 ☐ Dense, uncut, herbaceous plants > ½ of area points = 3 ☑ Dense, woody, plants > ½ of area points = 2 ☐ Dense, uncut, herbaceous plants > ¼ of area points = 1 ☐ Does not meet any of the criteria above for plants points = 0	**2**
Total for S 1 Add the points in the boxes above	**2**

Rating of Site Potential If score is: **__12 = H ___6-11 = M ✔ 0-5 = L** *Record the rating on the first page*

S 2.0. Does the landscape have the potential to support the water quality function of the site?	
S 2.1. Is > 10% of the area within 150 ft on the uphill side of the wetland in land uses that generate pollutants? [Yes = 1] No = 0	**1**
S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1? Other sources Road litter [Yes = 1] No = 0	**1**
Total for S 2 Add the points in the boxes above	**2**

Rating of Landscape Potential If score is: **✔ 1-2 = M ___0 = L** *Record the rating on the first page*

S 3.0. Is the water quality improvement provided by the site valuable to society?	
S 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? [Yes = 1] No = 0	**1**
S 3.2. Is the wetland in a basin or sub-basin where water quality is an issue? (At least one aquatic resource in the basin is on the 303(d) list.) [Yes = 1] No = 0	**1**
S 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? (Answer YES if there is a TMDL in development or in effect for the basin in which unit is found.) [Yes = 2] No = 0	**2**
Total for S 3 Add the points in the boxes above	**4**

Rating of Value If score is: **✔ 2-4 = H ___1 = M ___0 = L** *Record the rating on the first page*

Wetland name or number C

SLOPE WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream erosion

S 4.0. Does the site have the potential to reduce flooding and stream erosion?	
S 4.1. Characteristics of plants that reduce the velocity of surface flows during storms: Choose the points appropriate for the description that best fits conditions in the wetland. Stems of plants should be thick enough (usually > $^1/_8$ in), or dense enough, to remain erect during surface flows. ☐ Dense, uncut, **rigid** plants cover > 90% of the area of the wetland — points = 1 ☑ All other conditions — points = 0	**0**

Rating of Site Potential If score is: __**1 = M** ✔ **0 = L** *Record the rating on the first page*

S 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	
S 5.1. Is more than 25% of the area within 150 ft upslope of wetland in land uses or cover that generate excess surface runoff? Yes = 1 No = 0	**1**

Rating of Landscape Potential If score is: ✔ **1 = M** ___**0 = L** *Record the rating on the first page*

S 6.0. Are the hydrologic functions provided by the site valuable to society?	
S 6.1. Distance to the nearest areas downstream that have flooding problems: ☑ The sub-basin immediately downgradient of site has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds) — points = 2 ☐ Surface flooding problems are in a sub-basin farther downgradient — points = 1 ☐ No flooding problems anywhere downstream — points = 0	**2**
S 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	**0**
Total for S 6 — Add the points in the boxes above	**2**

Rating of Value If score is: ✔ **2-4 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

NOTES and FIELD OBSERVATIONS:

Wetland name or number C_____

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

H 1.0. Does the site have the potential to provide habitat?

H 1.1. Structure of plant community: Indicators are Cowardin classes and strata within the Forested class. Check the Cowardin plant classes in the wetland. Up to 10 patches may be combined for each class to meet the threshold of ¼ ac if the unit is at least 2.5 ac, or more than 10% of the unit if it is smaller than 2.5 ac.

____Aquatic bed — 4 structures or more: points = 4
____Emergent — [3 structures: points = 2]
__✔__Scrub-shrub (areas where shrubs have > 30% cover) — 2 structures: points = 1
__✔__Forested (areas where trees have > 30% cover) — 1 structure: points = 0

If the unit has a Forested class, check if:

__✔__The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/groundcover) that each cover 20% within the Forested polygon

2

H 1.2. Hydroperiods

Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland if the unit is < 2.5 ac, or ¼ ac if the unit is at least 2.5 ac to count (see text for descriptions of hydroperiods).

____Permanently flooded or inundated — 4 or more types present: points = 3
____Seasonally flooded or inundated — 3 types present: points = 2
____Occasionally flooded or inundated — [2 types present: points = 1]
__✔__Saturated only — 1 type present: points = 0
____Permanently flowing stream or river in, or adjacent to, the wetland
__✔__Intermittently or seasonally flowing stream in, or adjacent to, the wetland
____**Lake Fringe wetland** — **2 points**
____**Freshwater tidal wetland** — **2 points**

1

H 1.3. Richness of plant species

Count the number of plant species in the wetland that cover at least 10 ft^2.

Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. **Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canada thistle**

If you counted: > 19 species — points = 2
[5 - 19 species] — [points = 1]
< 5 species — points = 0

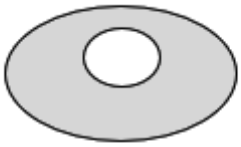
1

H 1.4. Interspersion of habitats

Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. If you have four or more plant classes or three classes and open water, the rating is always high.



None = 0 points

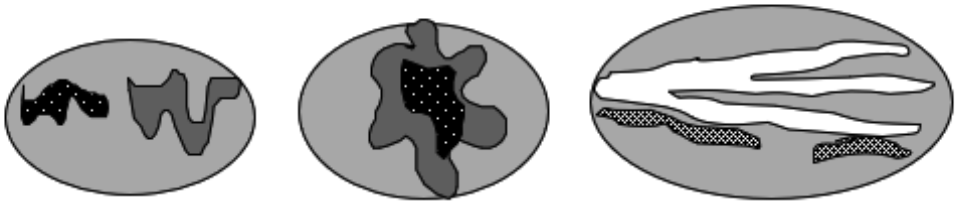


Low = 1 point



Moderate = 2 points

All three diagrams in this row are **High** = 3 points



1

Wetland name or number C

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. The number of checks is the number of points. ✔ Large, downed, woody debris within the wetland (> 4 in. diameter and 6 ft long). ✔ Standing snags (dbh > 4 in.) within the wetland ✔ Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extend at least 3.3 ft (1 m) over open water or a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ___ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet weathered where wood is exposed) ___ At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (structures for egg-laying by amphibians) ___ Invasive plants cover less than 25% of the wetland area in every stratum of plants (see H 1.1 above for the list of strata and H 1.5 in the manual for the list of aggressive plant species)	**3**
Total for H 1 Add the points in the boxes above	**8**

Rating of Site Potential If score is: ___**15-18 = H** ✔ **7-14 = M** ___**0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include only habitat polygons accessible from the wetland. *Calculate:* % relatively undisturbed habitat 45 **+** [(% moderate and low intensity land uses)/2] 8 **=** 53 % Total accessible habitat is: ✔ > 1/3 (33.3%) of 1 km Polygon points = 3 ___ 20-33% of 1 km Polygon points = 2 ___ 10-19% of 1 km Polygon points = 1 ___ < 10% of 1 km Polygon points = 0	**3**
H 2.2. Total habitat in 1 km Polygon around the wetland. *Calculate:* % relatively undisturbed habitat 63 **+** [(% moderate and low intensity land uses)/2] 18 **=** 81 % ✔ Total habitat > 50% of Polygon points = 3 ___ Total habitat 10-50% and in 1-3 patches points = 2 ___ Total habitat 10-50% and > 3 patches points = 1 ___ Total habitat < 10% of 1 km Polygon points = 0	**3**
H 2.3. Land use intensity in 1 km Polygon: ___ > 50% of 1 km Polygon is high intensity land use points = (- 2) ✔ ≤ 50% of 1 km Polygon is high intensity points = 0	**0**
Total for H 2 Add the points in the boxes above	**6**

Rating of Landscape Potential If score is: ✔ **4-6 = H** ___**1-3 = M** ___**< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.* Site meets ANY of the following criteria: points = 2 ✔ It has 3 or more Priority Habitats within 100 m (see next page) ___ It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) ___ It is mapped as a location for an individual WDFW Priority Species ___ It is a Wetland of High Conservation Value as determined by the Department of Natural Resources data ___ It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan ___ Site has 1 or 2 Priority Habitats (listed on next page) within 100 m points = 1 ___ Site does not meet any of the criteria above points = 0	**2**

Rating of Value If score is: ✔ **2 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number C

WDFW Priority Habitats

See complete descriptions of Priority Habitats listed by WDFW, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008 (current year, as revised). Priority Habitat and Species List.[133] This list was updated for consistency with guidance from WDFW.

This question is independent of the land use between the wetland unit and the Priority Habitat. All vegetated wetlands are by definition a Priority Habitat but are not included in this list because they are addressed by this rating system.

Count how many of the following Priority Habitats are within 330 ft (100 m) of the wetland unit:

☐ **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

☐ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife. This habitat automatically counts if mapped on the PHS online map within 100m of the wetland. If not mapped, a determination can be made in the field.

☐ **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

☐ **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.

☐ **Fresh Deepwater:** Lands permanently flooded with freshwater, including environments where surface water is permanent and often deep, so that water, rather than air, is the principal medium within which the dominant organisms live. Substrate does not support emergent vegetation. Do not select if Instream habitat is also present, or if the entire Deepwater feature is included in the wetland unit being rated (such as a pond with a vegetated fringe).

☐ **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.

☑ **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. Do not select if Fresh Deepwater habitat is also present.

☐ **Nearshore:** Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore.

☐ **Old-growth/Mature forests:** Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in. (81 cm) diameter at breast height (dbh) or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in. (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.

[133] http://wdfw.wa.gov/publications/00165/wdfw00165.pdf

Wetland name or number C

☐ **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important. For single oaks or oak stands <0.4 ha in urban areas, WDFW's Management Recommendations for Oregon White Oak[134] provides more detail for determining if they are Priority Habitats

☑ **Riparian:** The area adjacent to freshwater aquatic systems with flowing or standing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

☑ **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in. (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in. (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

☐ **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

☐ **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie.

[134] https://wdfw.wa.gov/publications/00030/wdfw00030.pdf

Wetland name or number C

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt Yes – Go to **SC 1.1** No= **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = **Category I** No – Go to **SC 1.2**	**Cat. I**
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 10% cover of non-native plant species. If non-native species are *Spartina*, see chapter 4.8 in the manual. ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Does the wetland overlap with any known or historical rare plant or rare & high-quality ecosystem polygons on the WNHP Data Explorer?[135] Yes **= Category I** No – Go to **SC 2.2** SC 2.2. Does the wetland have a rare plant species, rare ecosystem (e.g., plant community), or high-quality common ecosystem that may qualify the site as a WHCV? Contact WNHP for resources to help determine the presence of these elements. Yes – Submit data to WA Natural Heritage Program for determination,[136] Go to **SC 2.3** No **= Not a WHCV** SC 2.3. Did WNHP review the site within 30 days and determine that it has a rare plant or ecosystem that meets their criteria? Yes **= Category I** No **= Not a WHCV**	**Cat. I**
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES, you will still need to rate the wetland based on its functions.*** SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in. or more of the first 32 in. of the soil profile? Yes – Go to **SC 3.3** No – Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in. deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes – Go to **SC 3.3** No = **Not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? Yes = **Category I bog** No – Go to **SC 3.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in. deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? Yes = **Category I bog** No **= Not a bog**	**Cat. I**

[135] https://www.dnr.wa.gov/NHPdata

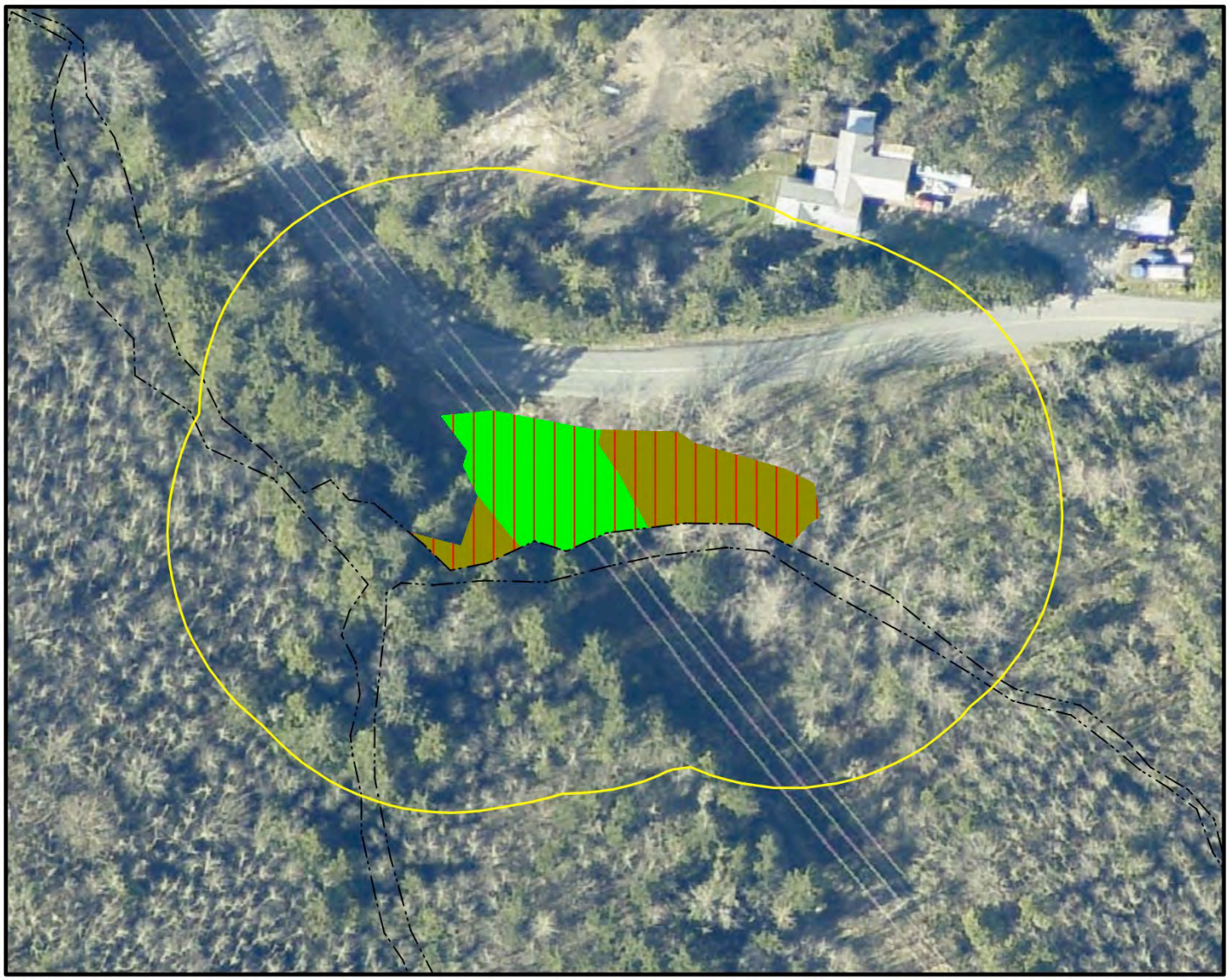
[136] https://www.dnr.wa.gov/Publications/amp_nh_sighting_form.pdf

Wetland name or number C

SC 4.0. Forested Wetlands Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as Priority Habitats? ***If you answer YES, you will still need to rate the wetland based on its functions.*** ☐ **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in. (81 cm) or more. ☐ **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in. (53 cm). Yes = **Category I** No = **Not a forested wetland for this section**	**Cat. I**
SC 5.0. Wetlands in Coastal Lagoons Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? ☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks ☐ The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* ☐ The lagoon retains some of its surface water at low tide during spring tides Yes – Go to **SC 5.1** No = **Not a wetland in a coastal lagoon** SC 5.1. Does the wetland meet all of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species in H 1.5 in the manual). ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetland is larger than $^{1}/_{10}$ ac (4350 ft^2) Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 6.0. Interdunal Wetlands Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer YES, you will still need to rate the wetland based on its habitat functions.*** In practical terms that means the following geographic areas: ☐ Long Beach Peninsula: Lands west of SR 103 ☐ Grayland-Westport: Lands west of SR 105 ☐ Ocean Shores-Copalis: Lands west of SR 115 and SR 109 and Ocean Shores Blvd SW, including lands west of E. Oceans Shores Blvd SW. Yes – Go to **SC 6.1** No = **Not an interdunal wetland for rating** SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? Yes = **Category I** No – Go to **SC 6.2** SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? Yes = **Category II** No – Go to **SC 6.3** SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? Yes = **Category III** No = **Category IV**	**Cat I** **Cat. II** **Cat. III** **Cat. IV**
Category of wetland based on Special Characteristics If you answered No for all types, enter "Not Applicable" on Summary Form	**N/A**

MILES SAND AND GRAVEL - GRIP RD IMPROVEMENTS

WETLAND RATING FIGURE 1- WETLAND C



LEGEND

- SCRUB-SHRUB
- FORESTED VEGETATION
- SATURATED ONLY
- 150' FROM WL BOUNDARY
- INTERMITTENT STREAM

Scale 1" = 100'

0 100 200

Wetland Resources, Inc.

Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance

9505 19th Avenue S.E. Suite 106 Everett,Washington 98208

Phone: (425) 337-3174

Fax: (425) 337-3045

Email: mailbox@wetlandresources.com

WETLAND RATING

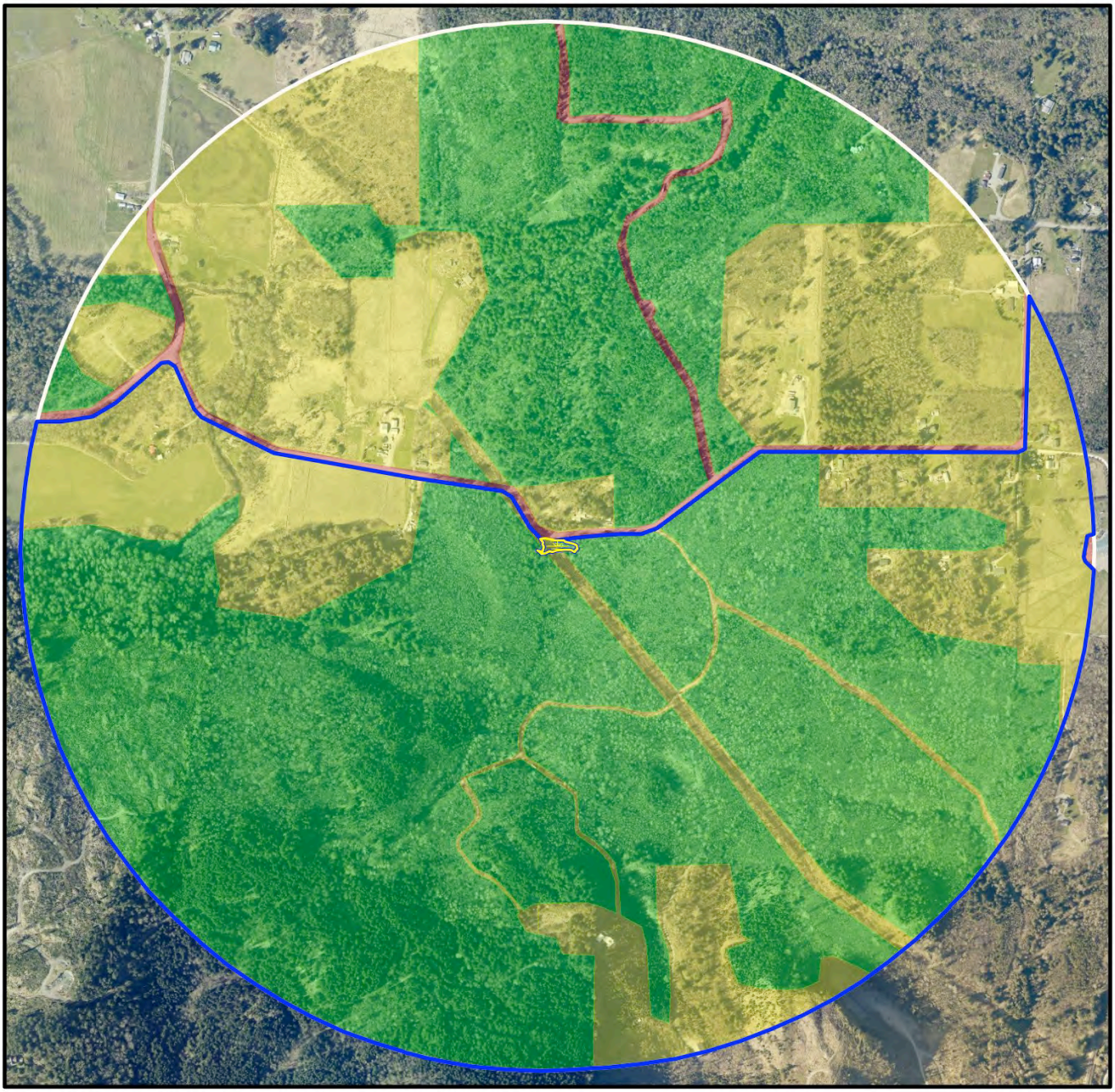
Wetland C

Figure C-1

WRI Job # 25267

Rated by: EC

MILES SAND AND GRAVEL - GRIP RD IMPROVEMENTS
WETLAND RATING FIGURE 2- WETLAND C



LEGEND

- RELATIVELY UNDISTURBED
- LOW/MOD. INTENSITY
- HIGH INTENSITY
- ACCESSIBLE HABITAT
- WETLAND
- 1 KM FROM WETLAND
- CONTRIBUTING BASIN

Scale 1" = 1,000'

0 1,000 2,000

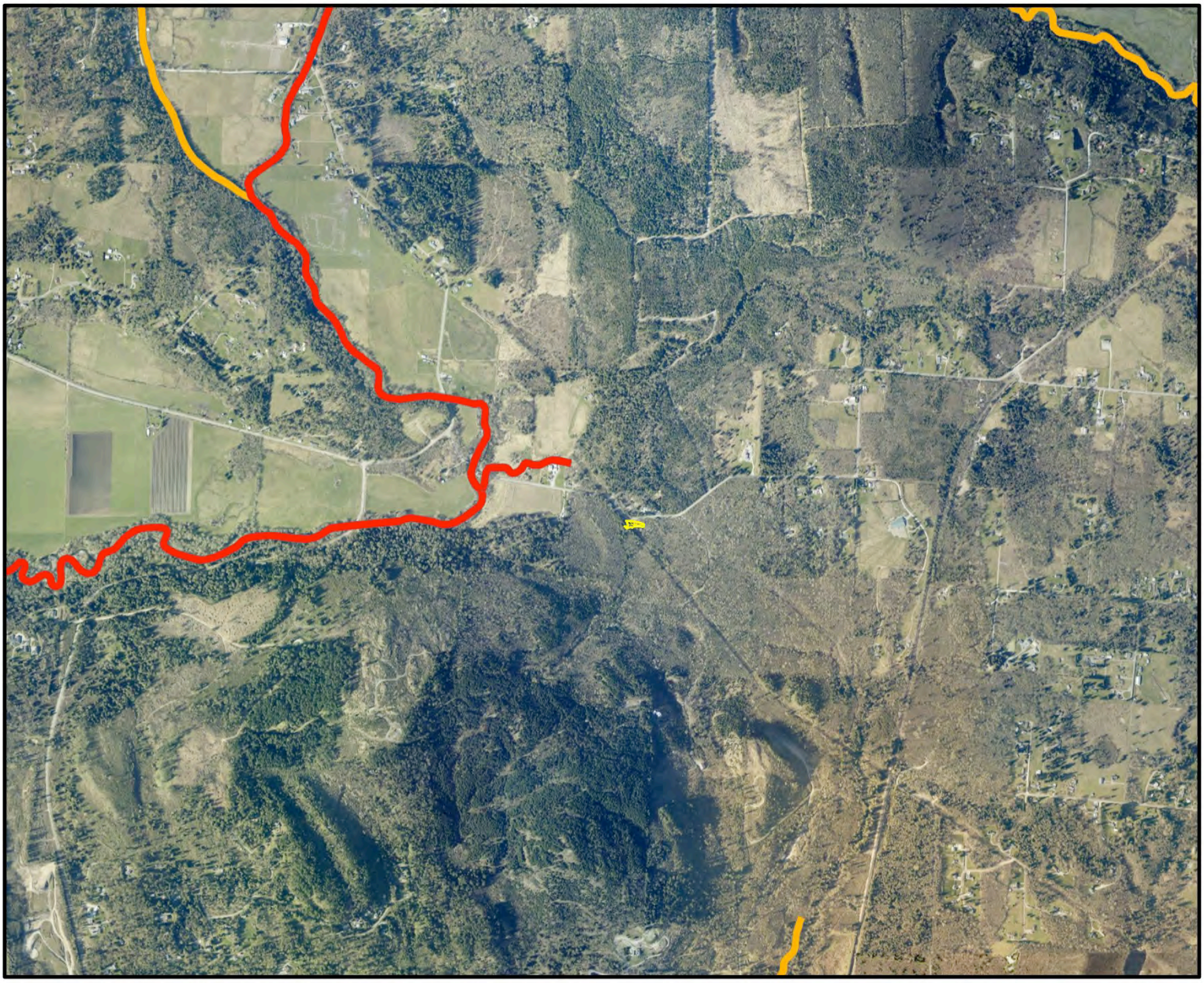
Wetland Resources, Inc.
Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance
9505 19th Avenue S.E. Suite 106 Everett,Washington 98208
Phone: (425) 337-3174
Fax: (425) 337-3045
Email: mailbox@wetlandresources.com

WETLAND RATING
Wetland C

Figure C-2
WRI Job # 25267
Rated by: EC

MILES SAND AND GRAVEL - GRIP RD IMPROVEMENTS

WETLAND RATING FIGURE 3- WETLAND C



LEGEND

WETLAND

AQUATIC RESOURCES WITH ACTIVE TMDL

AQUATIC RESOURCES ON THE 303(d) LIST

Scale 1" = 2,000'

0 2,000 4,000

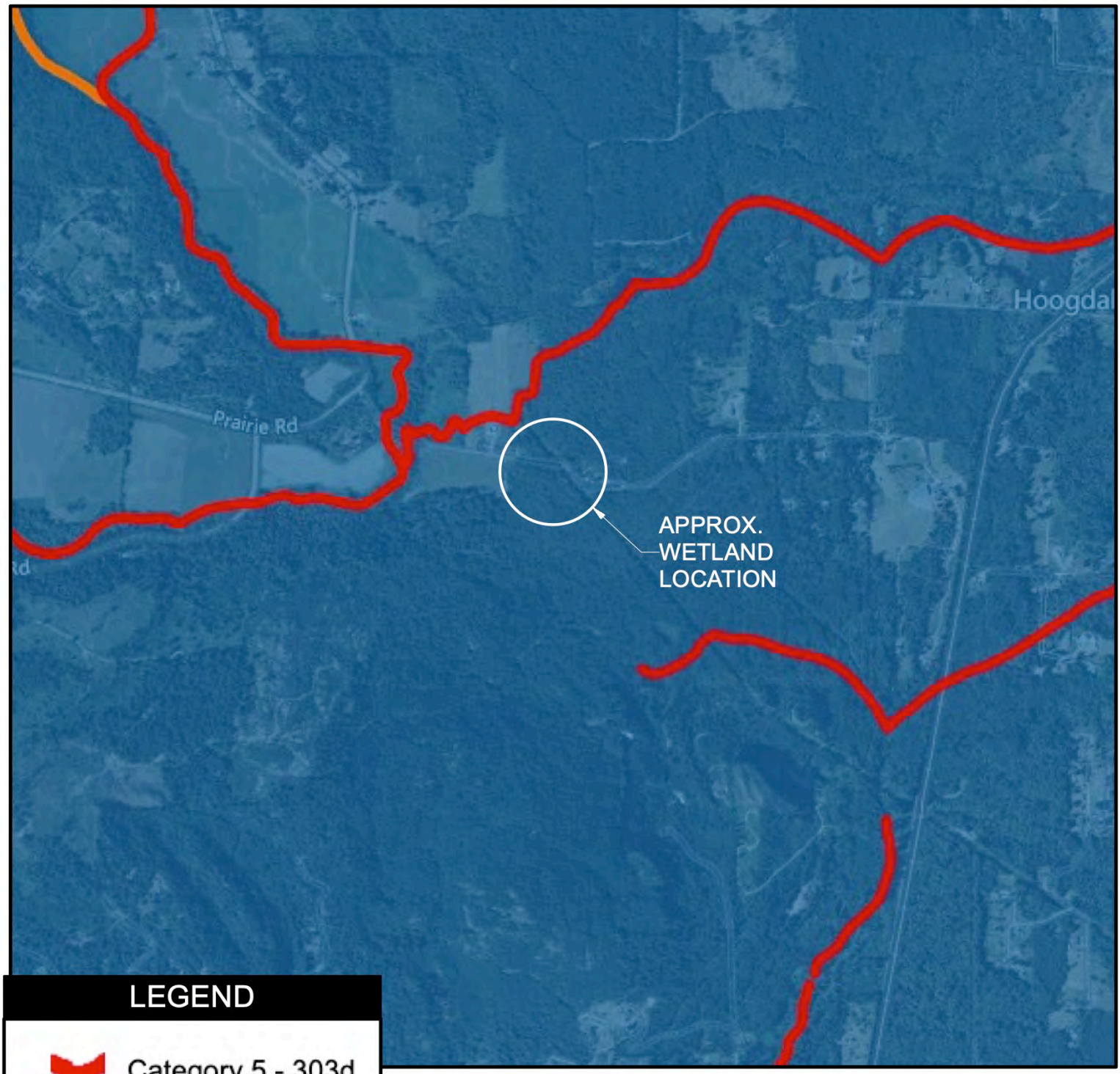
Wetland Resources, Inc.
Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance
9505 19th Avenue S.E. Suite 106 Everett,Washington 98208
Phone: (425) 337-3174
Fax: (425) 337-3045
Email: mailbox@wetlandresources.com

WETLAND RATING
Wetland C

Figure C-3
WRI Job # 25267
Rated by: EC

MILES SAND AND GRAVEL - GRIP RD IMPROVEMENTS

WETLAND RATING FIGURE 4- WETLAND C



LEGEND

- Category 5 - 303d
- Category 4A
- TMDL - Approved
- 4B - Approved

Wetland Resources, Inc.
Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance
9505 19th Avenue S.E. Suite 106 Everett,Washington 98208
Phone: (425) 337-3174
Fax: (425) 337-3045
Email: mailbox@wetlandresources.com

WETLAND RATING
Wetland C

Figure C-4
WRI Job # 25267
Rated by: EC

MILES SAND AND GRAVEL - GRIP RD IMPROVEMENTS

WETLAND RATING FIGURE 5- WETLAND C



LEGEND

- WETLAND
- DENSE WOODY
- DENSE UNCUT HERBACEOUS
- DENSE UNCUT RIDGID

Scale 1" = 100'

0 100 200

Wetland Resources, Inc.

Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance

9505 19th Avenue S.E. Suite 106 Everett,Washington 98208

Phone: (425) 337-3174

Fax: (425) 337-3045

Email: mailbox@wetlandresources.com

WETLAND RATING

Wetland C

Figure C-5

WRI Job # 25267

Rated by: EC

Wetland name or number D

RATING SUMMARY – Western Washington

Name of wetland (or ID #): 25267 - Wetland D Date of site visit: 9/2/25

Rated by EC Trained by Ecology? ✔ Yes ___No Date of training 10/18

HGM Class used for rating Slope Wetland has multiple HGM classes? ___Y ✔ N

NOTE: **Form is not complete without the required figures** (figures can be combined).
Source of base aerial photo/map Skagit County GIS

OVERALL WETLAND CATEGORY II (based on functions ✔ or special characteristics__)

1. Category of wetland based on FUNCTIONS

_____**Category I** – Total score = 23 - 27

___✔___**Category II** – Total score = 20 - 22

_____**Category III** – Total score = 16 - 19

_____**Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality			Hydrologic			Habitat			
										Circle the appropriate ratings
Site Potential	H	M	[L]	H	M	[L]	H	[M]	L	
Landscape Potential	H	[M]	L	H	[M]	L	[H]	M	L	
Value	[H]	M	L	[H]	M	L	[H]	M	L	**TOTAL**
Score Based on Ratings	**6**			**6**			**8**			**20**

Score for each function based on three ratings (order of ratings is not important)

9 = H, H, H
8 = H, H, M
7 = H, H, L
7 = H, M, M
6 = H, M, L
6 = M, M, M
5 = H, L, L
5 = M, M, L
4 = M, L, L
3 = L, L, L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	**I II**
Wetland of High Conservation Value	**I**
Bog	**I**
Mature Forest	**I**
Old Growth Forest	**I**
Coastal Lagoon	**I II**
Interdunal	**I II III IV**
None of the above	✔

Wetland name or number D

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	1
Hydroperiods	D 1.4, H 1.2	1
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	1
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	1
Map of the contributing basin	D 4.3, D 5.3	2
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	2
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	3
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	4

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	1
Hydroperiods	H 1.2	1
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	5
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	5
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	1
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	2
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	3
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	4

Wetland name or number D

HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

   NO – go to 2 **YES** – the wetland class is **Tidal Fringe** – go to 1.1

   1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

   NO – Saltwater Tidal Fringe (Estuarine) **YES – Freshwater Tidal Fringe**
   If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe, it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.

2. The entire wetland unit is flat, and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

   NO – go to 3 **YES** – The wetland class is **Flats**
   If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet all** of the following criteria?
   - The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size,
   - At least 30% of the open water area is deeper than 6.6 ft (2 m).

   NO – go to 4 **YES –** The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?
   - The wetland is on a slope (slope can be very gradual),
   - The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheet flow, or in a swale without distinct banks,
   - The water leaves the wetland **without being impounded**.

   NO – go to 5 **YES –** The wetland class is **Slope**

   NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

Wetland name or number D

5. Does the entire wetland unit **meet all** of the following criteria?
   - The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
   - The overbank flooding occurs at least once every 2 years.

   NO – go to 6 **YES** – The wetland class is **Riverine**

   NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? This means that any outlet, if present, is higher than the interior of the wetland.

   NO – go to 7 **YES** – The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched but has no obvious natural outlet.

   NO – go to 8 **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

   NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated		HGM class to use in rating
Slope + Riverine	☐	Riverine
Slope + Depressional	☐	Depressional
Slope + Lake Fringe	☐	Lake Fringe
Depressional + Riverine along stream within boundary of depression	☐	Depressional
Depressional + Lake Fringe	☐	Depressional
Riverine + Lake Fringe	☐	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	☐	Treat as ESTUARINE

If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.

Wetland name or number D

SLOPE WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

S 1.0. Does the site have the potential to improve water quality?	
S 1.1. Characteristics of the average slope of the wetland: (A 1% slope has a 1 ft vertical change in elevation for every 100 ft of horizontal distance.) ☐ Slope is 1% or less — points = 3 ☐ Slope is > 1%-2% — points = 2 ☐ Slope is > 2%-5% — points = 1 ☑ Slope is greater than 5% — points = 0	**0**
S 1.2. The soil 2 in. below the surface (or duff layer) is true clay or true organic *(use NRCS definitions)*: Yes = 3 [No = 0]	**0**
S 1.3. Characteristics of the plants in the wetland that trap sediments and pollutants: Choose the points appropriate for the description that best fits the plants in the wetland. Dense means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed, and plants are higher than 6 in. ☐ Dense, uncut, herbaceous plants > 90% of the wetland area — points = 6 ☐ Dense, uncut, herbaceous plants > ½ of area — points = 3 ☑ Dense, woody, plants > ½ of area — points = 2 ☐ Dense, uncut, herbaceous plants > ¼ of area — points = 1 ☐ Does not meet any of the criteria above for plants — points = 0	**2**
Total for S 1 — Add the points in the boxes above	**2**

Rating of Site Potential If score is: **__12 = H ___6-11 = M ✔ 0-5 = L** *Record the rating on the first page*

S 2.0. Does the landscape have the potential to support the water quality function of the site?	
S 2.1. Is > 10% of the area within 150 ft on the uphill side of the wetland in land uses that generate pollutants? [Yes = 1] No = 0	**1**
S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1? Other sources Road litter [Yes = 1] No = 0	**1**
Total for S 2 — Add the points in the boxes above	**2**

Rating of Landscape Potential If score is: **✔ 1-2 = M ___0 = L** *Record the rating on the first page*

S 3.0. Is the water quality improvement provided by the site valuable to society?	
S 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? [Yes = 1] No = 0	**1**
S 3.2. Is the wetland in a basin or sub-basin where water quality is an issue? (At least one aquatic resource in the basin is on the 303(d) list.) [Yes = 1] No = 0	**1**
S 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? (Answer YES if there is a TMDL in development or in effect for the basin in which unit is found.) [Yes = 2] No = 0	**2**
Total for S 3 — Add the points in the boxes above	**4**

Rating of Value If score is: **✔ 2-4 = H ___1 = M ___0 = L** *Record the rating on the first page*

Wetland name or number D

SLOPE WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream erosion

S 4.0. Does the site have the potential to reduce flooding and stream erosion?	
S 4.1. Characteristics of plants that reduce the velocity of surface flows during storms: Choose the points appropriate for the description that best fits conditions in the wetland. Stems of plants should be thick enough (usually > $^1/_8$ in), or dense enough, to remain erect during surface flows. ☐ Dense, uncut, **rigid** plants cover > 90% of the area of the wetland — points = 1 ☑ All other conditions — points = 0	**0**

Rating of Site Potential If score is: __**1 = M** ✔ **0 = L** *Record the rating on the first page*

S 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	
S 5.1. Is more than 25% of the area within 150 ft upslope of wetland in land uses or cover that generate excess surface runoff? Yes = 1 No = 0	**1**

Rating of Landscape Potential If score is: ✔ **1 = M** ___**0 = L** *Record the rating on the first page*

S 6.0. Are the hydrologic functions provided by the site valuable to society?	
S 6.1. Distance to the nearest areas downstream that have flooding problems: ☑ The sub-basin immediately downgradient of site has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds) — points = 2 ☐ Surface flooding problems are in a sub-basin farther downgradient — points = 1 ☐ No flooding problems anywhere downstream — points = 0	**2**
S 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	**0**
Total for S 6 — Add the points in the boxes above	**2**

Rating of Value If score is: ✔ **2-4 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

NOTES and FIELD OBSERVATIONS:

Wetland name or number D_____

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

H 1.0. Does the site have the potential to provide habitat?

H 1.1. Structure of plant community: Indicators are Cowardin classes and strata within the Forested class. Check the Cowardin plant classes in the wetland. Up to 10 patches may be combined for each class to meet the threshold of ¼ ac if the unit is at least 2.5 ac, or more than 10% of the unit if it is smaller than 2.5 ac.

____Aquatic bed — 4 structures or more: points = 4
____Emergent — [3 structures: points = 2]
__✔__Scrub-shrub (areas where shrubs have > 30% cover) — 2 structures: points = 1
__✔__Forested (areas where trees have > 30% cover) — 1 structure: points = 0

If the unit has a Forested class, check if:

__✔__The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/groundcover) that each cover 20% within the Forested polygon

2

H 1.2. Hydroperiods

Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland if the unit is < 2.5 ac, or ¼ ac if the unit is at least 2.5 ac to count (see text for descriptions of hydroperiods).

____Permanently flooded or inundated — 4 or more types present: points = 3
____Seasonally flooded or inundated — 3 types present: points = 2
____Occasionally flooded or inundated — [2 types present: points = 1]
__✔__Saturated only — 1 type present: points = 0
____Permanently flowing stream or river in, or adjacent to, the wetland
__✔__Intermittently or seasonally flowing stream in, or adjacent to, the wetland
____**Lake Fringe wetland** — **2 points**
____**Freshwater tidal wetland** — **2 points**

1

H 1.3. Richness of plant species

Count the number of plant species in the wetland that cover at least 10 ft^2.

Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. **Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canada thistle**

If you counted: > 19 species — points = 2
[5 - 19 species] — [points = 1]
< 5 species — points = 0

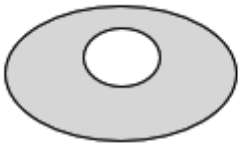
1

H 1.4. Interspersion of habitats

Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. If you have four or more plant classes or three classes and open water, the rating is always high.



None = 0 points

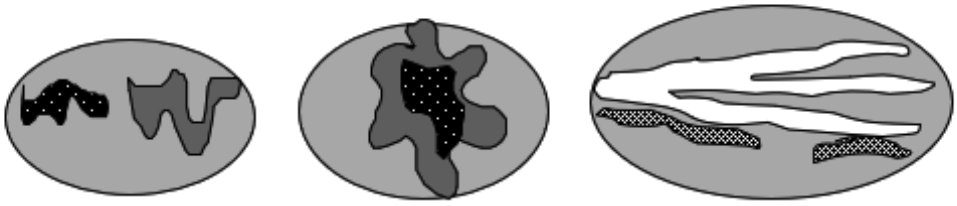


Low = 1 point



Moderate = 2 points

All three diagrams in this row are **High** = 3 points



1

Wetland name or number D

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. The number of checks is the number of points. ✔ Large, downed, woody debris within the wetland (> 4 in. diameter and 6 ft long). ✔ Standing snags (dbh > 4 in.) within the wetland ✔ Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extend at least 3.3 ft (1 m) over open water or a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ___ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet weathered where wood is exposed) ___ At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (structures for egg-laying by amphibians) ___ Invasive plants cover less than 25% of the wetland area in every stratum of plants (see H 1.1 above for the list of strata and H 1.5 in the manual for the list of aggressive plant species)	**3**
Total for H 1 Add the points in the boxes above	**8**

Rating of Site Potential If score is: ___**15-18 = H** ✔ **7-14 = M** ___**0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include only habitat polygons accessible from the wetland. *Calculate:* % relatively undisturbed habitat 42 + [(% moderate and low intensity land uses)/2] 6 = 48 % Total accessible habitat is: ✔ > 1/3 (33.3%) of 1 km Polygon points = 3 ___ 20-33% of 1 km Polygon points = 2 ___ 10-19% of 1 km Polygon points = 1 ___ < 10% of 1 km Polygon points = 0	**3**
H 2.2. Total habitat in 1 km Polygon around the wetland. *Calculate:* % relatively undisturbed habitat 63 + [(% moderate and low intensity land uses)/2] 17 = 80 % ✔ Total habitat > 50% of Polygon points = 3 ___ Total habitat 10-50% and in 1-3 patches points = 2 ___ Total habitat 10-50% and > 3 patches points = 1 ___ Total habitat < 10% of 1 km Polygon points = 0	**3**
H 2.3. Land use intensity in 1 km Polygon: ___ > 50% of 1 km Polygon is high intensity land use points = (- 2) ✔ ≤ 50% of 1 km Polygon is high intensity points = 0	**0**
Total for H 2 Add the points in the boxes above	**6**

Rating of Landscape Potential If score is: ✔ **4-6 = H** ___**1-3 = M** ___**< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.* Site meets ANY of the following criteria: points = 2 ✔ It has 3 or more Priority Habitats within 100 m (see next page) ___ It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) ___ It is mapped as a location for an individual WDFW Priority Species ___ It is a Wetland of High Conservation Value as determined by the Department of Natural Resources data ___ It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan ___ Site has 1 or 2 Priority Habitats (listed on next page) within 100 m points = 1 ___ Site does not meet any of the criteria above points = 0	**2**

Rating of Value If score is: ✔ **2 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number D

WDFW Priority Habitats

See complete descriptions of Priority Habitats listed by WDFW, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008 (current year, as revised). Priority Habitat and Species List.[133] This list was updated for consistency with guidance from WDFW.

This question is independent of the land use between the wetland unit and the Priority Habitat. All vegetated wetlands are by definition a Priority Habitat but are not included in this list because they are addressed by this rating system.

Count how many of the following Priority Habitats are within 330 ft (100 m) of the wetland unit:

☐ **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

☐ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife. This habitat automatically counts if mapped on the PHS online map within 100m of the wetland. If not mapped, a determination can be made in the field.

☐ **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

☐ **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.

☐ **Fresh Deepwater:** Lands permanently flooded with freshwater, including environments where surface water is permanent and often deep, so that water, rather than air, is the principal medium within which the dominant organisms live. Substrate does not support emergent vegetation. Do not select if Instream habitat is also present, or if the entire Deepwater feature is included in the wetland unit being rated (such as a pond with a vegetated fringe).

☐ **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.

☑ **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. Do not select if Fresh Deepwater habitat is also present.

☐ **Nearshore:** Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore.

☐ **Old-growth/Mature forests:** Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in. (81 cm) diameter at breast height (dbh) or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in. (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.

[133] http://wdfw.wa.gov/publications/00165/wdfw00165.pdf

Wetland name or number D

☐ **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important. For single oaks or oak stands <0.4 ha in urban areas, WDFW's Management Recommendations for Oregon White Oak[134] provides more detail for determining if they are Priority Habitats

☑ **Riparian:** The area adjacent to freshwater aquatic systems with flowing or standing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

☑ **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in. (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in. (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

☐ **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

☐ **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie.

[134] https://wdfw.wa.gov/publications/00030/wdfw00030.pdf

Wetland name or number D

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt Yes – Go to **SC 1.1** No= **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = **Category I** No – Go to **SC 1.2**	**Cat. I**
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 10% cover of non-native plant species. If non-native species are *Spartina*, see chapter 4.8 in the manual. ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Does the wetland overlap with any known or historical rare plant or rare & high-quality ecosystem polygons on the WNHP Data Explorer?[135] Yes **= Category I** No – Go to **SC 2.2** SC 2.2. Does the wetland have a rare plant species, rare ecosystem (e.g., plant community), or high-quality common ecosystem that may qualify the site as a WHCV? Contact WNHP for resources to help determine the presence of these elements. Yes – Submit data to WA Natural Heritage Program for determination,[136] Go to **SC 2.3** No **= Not a WHCV** SC 2.3. Did WNHP review the site within 30 days and determine that it has a rare plant or ecosystem that meets their criteria? Yes **= Category I** No **= Not a WHCV**	**Cat. I**
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES, you will still need to rate the wetland based on its functions.*** SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in. or more of the first 32 in. of the soil profile? Yes – Go to **SC 3.3** No – Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in. deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes – Go to **SC 3.3** No = **Not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? Yes = **Category I bog** No – Go to **SC 3.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in. deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? Yes = **Category I bog** No **= Not a bog**	**Cat. I**

[135] https://www.dnr.wa.gov/NHPdata

[136] https://www.dnr.wa.gov/Publications/amp_nh_sighting_form.pdf

Wetland name or number D

SC 4.0. Forested Wetlands Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as Priority Habitats? ***If you answer YES, you will still need to rate the wetland based on its functions.*** ☐ **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in. (81 cm) or more. ☐ **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in. (53 cm). Yes = **Category I** No = **Not a forested wetland for this section**	**Cat. I**
SC 5.0. Wetlands in Coastal Lagoons Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? ☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks ☐ The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* ☐ The lagoon retains some of its surface water at low tide during spring tides Yes – Go to **SC 5.1** No = **Not a wetland in a coastal lagoon** SC 5.1. Does the wetland meet all of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species in H 1.5 in the manual). ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetland is larger than $^{1}/_{10}$ ac (4350 ft^2) Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 6.0. Interdunal Wetlands Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer YES, you will still need to rate the wetland based on its habitat functions.*** In practical terms that means the following geographic areas: ☐ Long Beach Peninsula: Lands west of SR 103 ☐ Grayland-Westport: Lands west of SR 105 ☐ Ocean Shores-Copalis: Lands west of SR 115 and SR 109 and Ocean Shores Blvd SW, including lands west of E. Oceans Shores Blvd SW. Yes – Go to **SC 6.1** No = **Not an interdunal wetland for rating** SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? Yes = **Category I** No – Go to **SC 6.2** SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? Yes = **Category II** No – Go to **SC 6.3** SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? Yes = **Category III** No = **Category IV**	**Cat I** **Cat. II** **Cat. III** **Cat. IV**
Category of wetland based on Special Characteristics If you answered No for all types, enter "Not Applicable" on Summary Form	**N/A**

MILES SAND AND GRAVEL - GRIP RD IMPROVEMENTS

WETLAND RATING FIGURE 1- WETLAND D



LEGEND

- SCRUB-SHRUB
- FORESTED VEGETATION
- SATURATED ONLY
- 150' FROM WL BOUNDARY
- INTERMITTENT STREAM

Scale 1" = 100'

0 100 200

Wetland Resources, Inc.

Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance

9505 19th Avenue S.E. Suite 106 Everett,Washington 98208

Phone: (425) 337-3174

Fax: (425) 337-3045

Email: mailbox@wetlandresources.com

WETLAND RATING

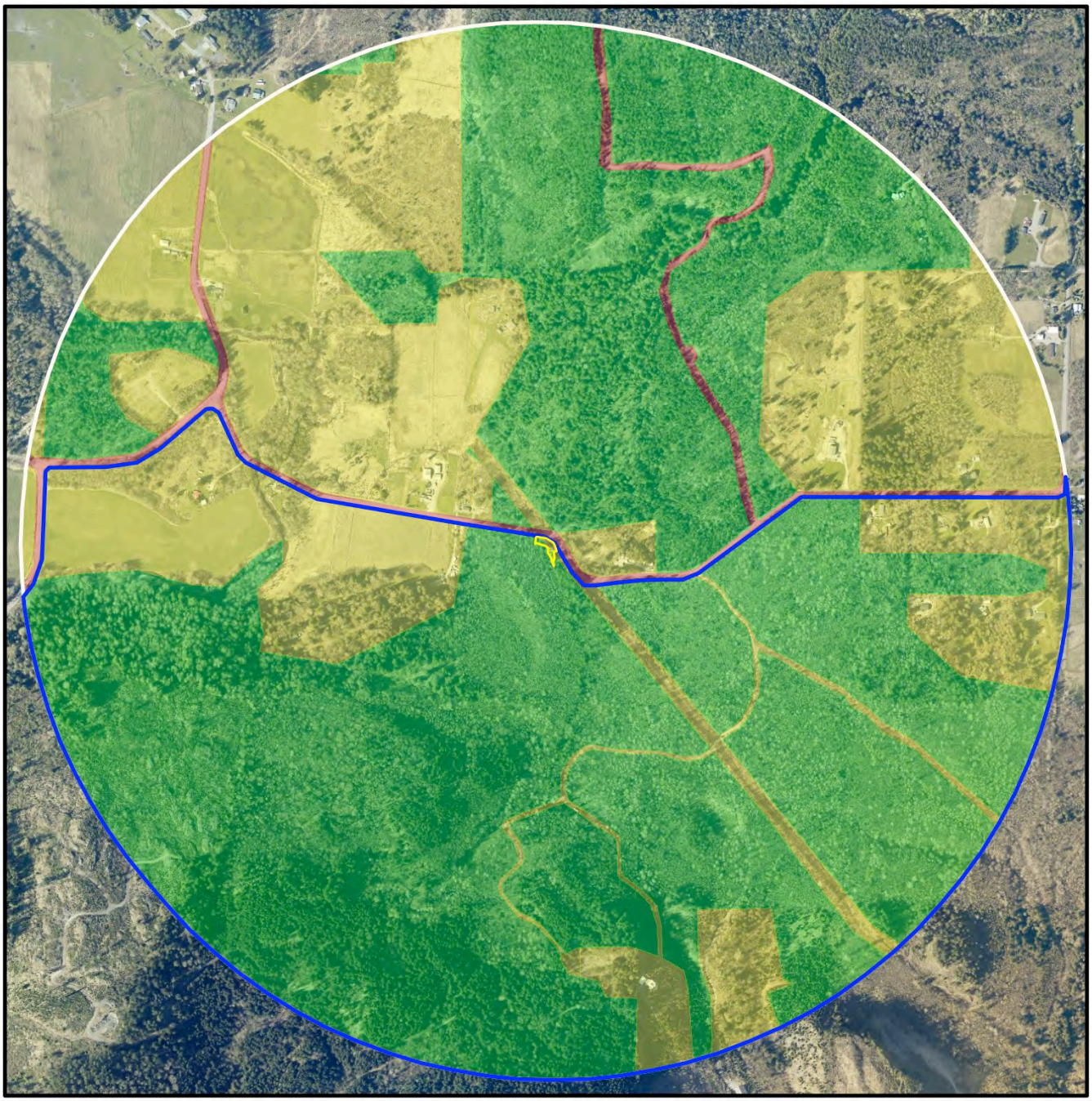
Wetland D

Figure D-1

WRI Job # 25267

Rated by: EC

MILES SAND AND GRAVEL - GRIP RD IMPROVEMENTS
WETLAND RATING FIGURE 2- WETLAND D



LEGEND

- RELATIVELY UNDISTURBED
- LOW/MOD. INTENSITY
- HIGH INTENSITY
- ACCESSIBLE HABITAT
- WETLAND
- 1 KM FROM WETLAND
- CONTRIBUTING BASIN

Scale 1" = 1,000'

0 1,000 2,000

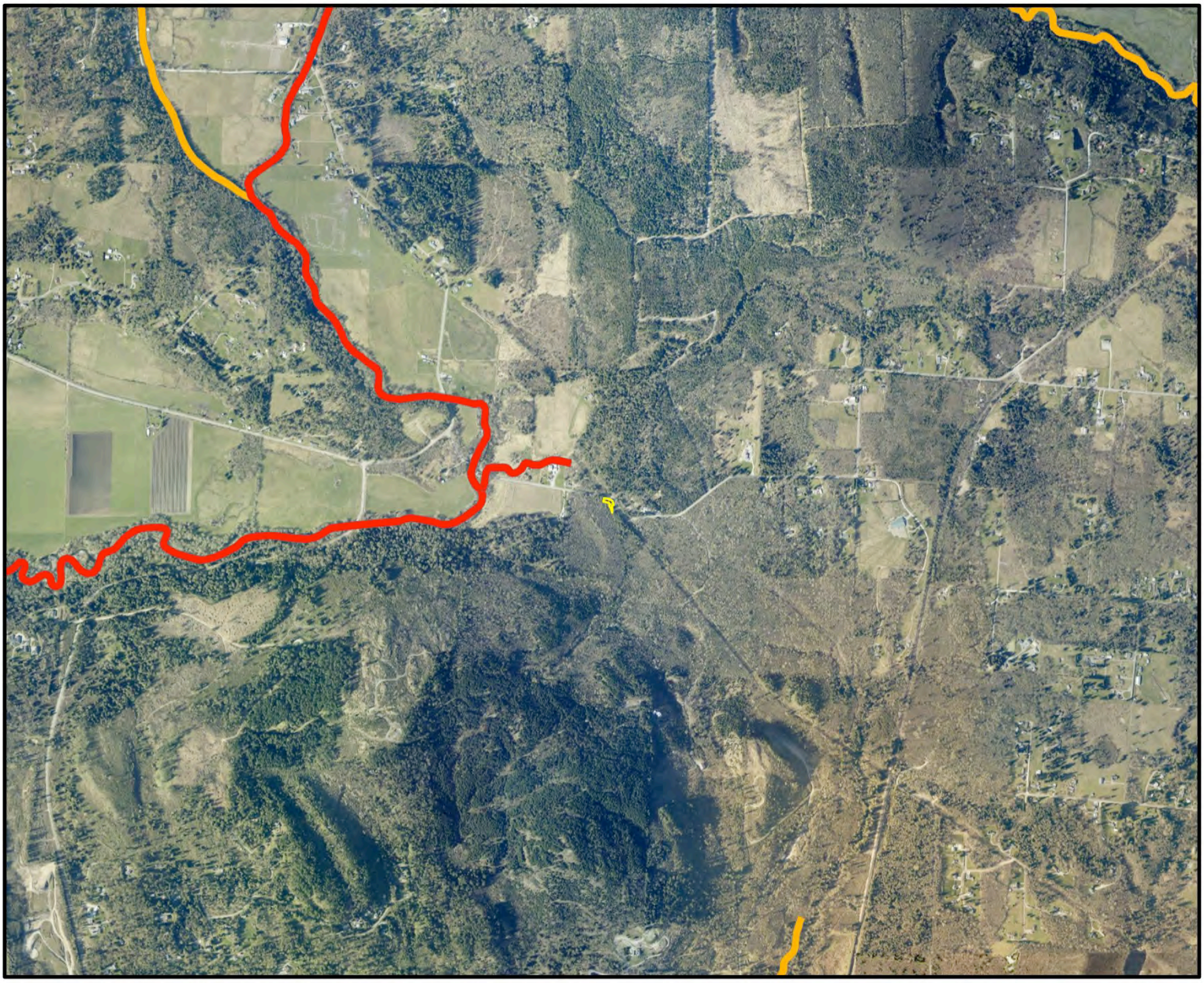
Wetland Resources, Inc.
Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance
9505 19th Avenue S.E. Suite 106 Everett,Washington 98208
Phone: (425) 337-3174
Fax: (425) 337-3045
Email: mailbox@wetlandresources.com

WETLAND RATING
Wetland D

Figure D-2
WRI Job # 25267
Rated by: EC

MILES SAND AND GRAVEL - GRIP RD IMPROVEMENTS

WETLAND RATING FIGURE 3- WETLAND D



LEGEND

- WETLAND
- AQUATIC RESOURCES WITH ACTIVE TMDL
- AQUATIC RESOURCES ON THE 303(d) LIST

Scale 1" = 2,000'

0 2,000 4,000

Wetland Resources, Inc.

Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance

9505 19th Avenue S.E. Suite 106 Everett,Washington 98208

Phone: (425) 337-3174

Fax: (425) 337-3045

Email: mailbox@wetlandresources.com

WETLAND RATING

Wetland D

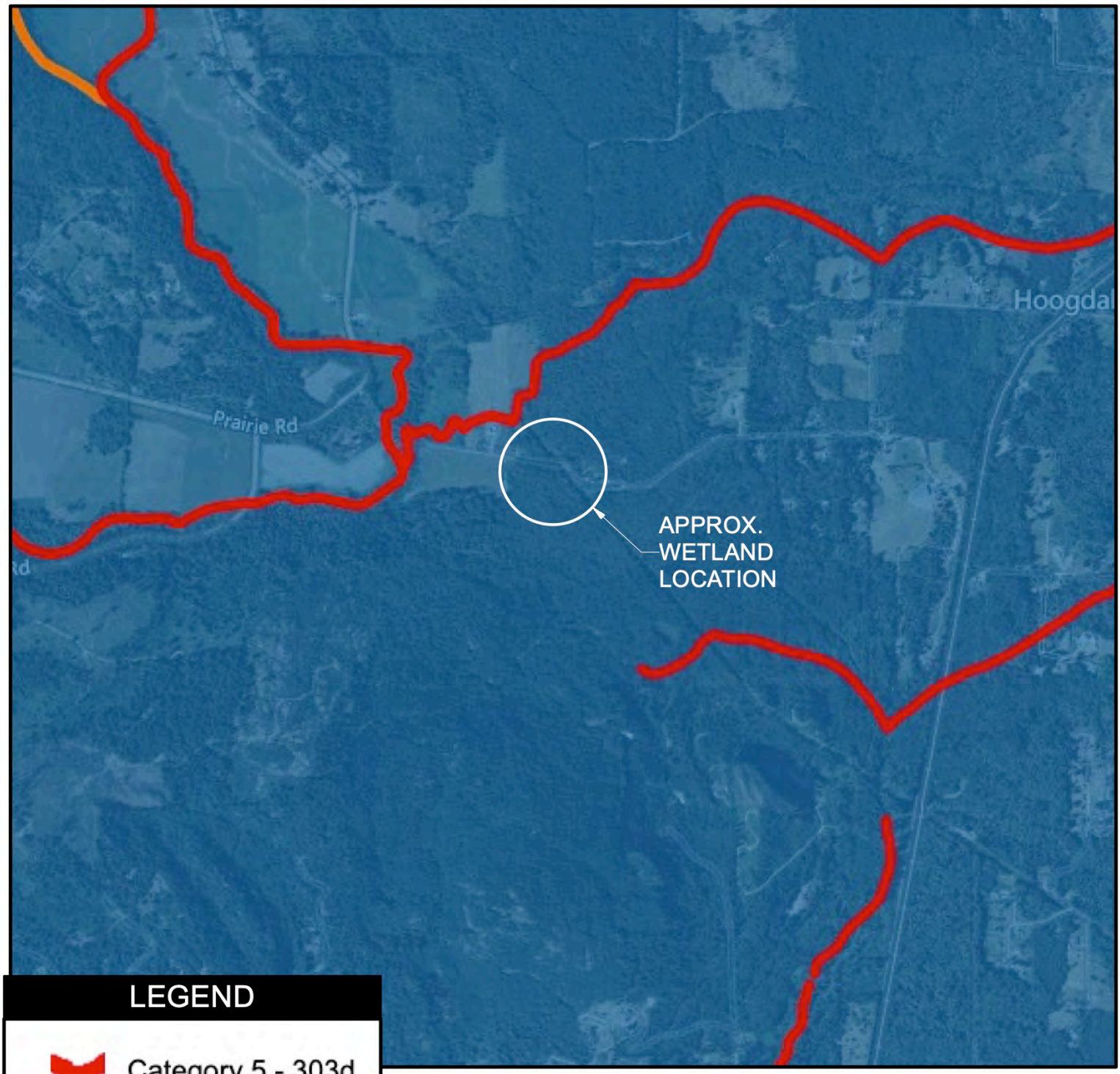
Figure D-3

WRI Job # 25267

Rated by: EC

MILES SAND AND GRAVEL - GRIP RD IMPROVEMENTS

WETLAND RATING FIGURE 4- WETLAND D



LEGEND

- Category 5 - 303d
- Category 4A
- TMDL - Approved
- 4B - Approved

Wetland Resources, Inc.
Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance
9505 19th Avenue S.E. Suite 106 Everett,Washington 98208
Phone: (425) 337-3174
Fax: (425) 337-3045
Email: mailbox@wetlandresources.com

WETLAND RATING
Wetland D

Figure D-4
WRI Job # 25267
Rated by: EC

MILES SAND AND GRAVEL - GRIP RD IMPROVEMENTS

WETLAND RATING FIGURE 5- WETLAND D



LEGEND

- WETLAND
- DENSE WOODY
- DENSE UNCUT HERBACEOUS
- DENSE UNCUT RIDGID

Scale 1" = 100'

0 100 200

Wetland Resources, Inc.

Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance

9505 19th Avenue S.E. Suite 106 Everett,Washington 98208

Phone: (425) 337-3174

Fax: (425) 337-3045

Email: mailbox@wetlandresources.com

WETLAND RATING

Wetland D

Figure D-5

WRI Job # 25267

Rated by: EC

Wetland name or number E

RATING SUMMARY – Western Washington

Name of wetland (or ID #): 25267 - Wetland E Date of site visit: 9/2/25

Rated by EC Trained by Ecology? ✔ Yes ___No Date of training 10/18

HGM Class used for rating **Riverine** Wetland has multiple HGM classes? ___Y ✔ N

NOTE: **Form is not complete without the required figures** (figures can be combined).
Source of base aerial photo/map Skagit County GIS

OVERALL WETLAND CATEGORY **II** (based on functions ✔ or special characteristics__)

1. Category of wetland based on FUNCTIONS

_____**Category I** – Total score = 23 - 27

__✔__**Category II** – Total score = 20 - 22

_____**Category III** – Total score = 16 - 19

_____**Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality			Hydrologic			Habitat			
										Circle the appropriate ratings
Site Potential	H	[M]	L	H	[M]	L	H	[M]	L	
Landscape Potential	H	M	[L]	H	[M]	L	[H]	M	L	
Value	[H]	M	L	[H]	M	L	[H]	M	L	**TOTAL**
Score Based on Ratings	**6**			**7**			**8**			**21**

Score for each function based on three ratings (order of ratings is not important)

9 = H, H, H
8 = H, H, M
7 = H, H, L
7 = H, M, M
6 = H, M, L
6 = M, M, M
5 = H, L, L
5 = M, M, L
4 = M, L, L
3 = L, L, L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	**I** **II**
Wetland of High Conservation Value	**I**
Bog	**I**
Mature Forest	**I**
Old Growth Forest	**I**
Coastal Lagoon	**I** **II**
Interdunal	**I** **II** **III** **IV**
None of the above	✔

Wetland name or number E

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	1
Hydroperiods	H 1.2	1
Ponded depressions	R 1.1	5
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	1
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	5
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	5
Map of the contributing basin	R 2.2, R 2.3, R 5.2	2
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	2
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	3
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	4

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

Wetland name or number E

HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

   NO – go to 2 **YES** – the wetland class is **Tidal Fringe** – go to 1.1

   1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

   NO – Saltwater Tidal Fringe (Estuarine) **YES – Freshwater Tidal Fringe**
   If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe, it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.

2. The entire wetland unit is flat, and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

   NO – go to 3 **YES** – The wetland class is **Flats**
   If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet all** of the following criteria?
   - The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size,
   - At least 30% of the open water area is deeper than 6.6 ft (2 m).

   NO – go to 4 **YES –** The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?
   - The wetland is on a slope (slope can be very gradual),
   - The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheet flow, or in a swale without distinct banks,
   - The water leaves the wetland **without being impounded**.

   NO – go to 5 **YES –** The wetland class is **Slope**

   NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

Wetland name or number E

5. Does the entire wetland unit **meet all** of the following criteria?
   _✔_ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
   ___✔___ The overbank flooding occurs at least once every 2 years.

   NO – go to 6 **YES** – The wetland class is **Riverine**

   NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? This means that any outlet, if present, is higher than the interior of the wetland.

   NO – go to 7 **YES** – The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched but has no obvious natural outlet.

   NO – go to 8 **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

   NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated		HGM class to use in rating
Slope + Riverine	☐	Riverine
Slope + Depressional	☐	Depressional
Slope + Lake Fringe	☐	Lake Fringe
Depressional + Riverine along stream within boundary of depression	☐	Depressional
Depressional + Lake Fringe	☐	Depressional
Riverine + Lake Fringe	☐	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	☐	Treat as ESTUARINE

If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.

Wetland name or number E_____

RIVERINE AND FRESHWATER TIDAL FRINGE WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

R 1.0. Does the site have the potential to improve water quality?

R 1.1. Area of surface depressions within the Riverine wetland that can trap sediments during a flooding event:

- ☐ Depressions cover >3/4 area of wetland — points = 8
- ☐ Depressions cover > ½ area of wetland — points = 4
- ☐ Depressions present but cover ≤ ½ area of wetland — points = 2
- ☑ No depressions present — points = 0

0

R 1.2. Structure of plants in the wetland (areas with >90% cover at person height, **not** Cowardin classes)

- ☑ Trees or shrubs > 2/3 area of the wetland — points = 8
- ☐ Trees or shrubs > 1/3 area of the wetland — points = 6
- ☐ Herbaceous plants (> 6 in. high) > 2/3 area of the wetland — points = 6
- ☐ Herbaceous plants (> 6 in. high) > 1/3 area of the wetland — points = 3
- ☐ Trees, shrubs, and ungrazed herbaceous < 1/3 area of the wetland — points = 0

8

Total for R 1 — Add the points in the boxes above — **8**

Rating of Site Potential If score is: __**12-16 = H** ✔ **6-11 = M** ___**0-5 = L** *Record the rating on the first page*

R 2.0. Does the landscape have the potential to support the water quality function of the site?

R 2.1. Is the wetland within an incorporated city or within its UGA?	Yes = 2 No = 0	**0**
R 2.2. Does the contributing basin to the wetland include a UGA or incorporated area?	Yes = 1 No = 0	**0**
R 2.3. Does at least 10% of the contributing basin contain tilled fields, pastures, or forests that have been clearcut within the last 5 years?	Yes = 1 No = 0	**0**
R 2.4. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants?	Yes = 1 No = 0	**0**
R 2.5. Are there other sources of pollutants coming into the wetland that are not listed in questions R 2.1-R 2.4? Other sources Roadside Litter	Yes = 1 No = 0	**0**
Total for R 2	Add the points in the boxes above	**0**

Rating of Landscape Potential If score is: __**3-6 = H** ___**1 or 2 = M** ✔ **0 = L** *Record the rating on the first page*

R 3.0. Is the water quality improvement provided by the site valuable to society?

R 3.1. Is the wetland along a stream or river that is on the 303(d) list or on a tributary that drains to one within 1 mi?	Yes = 1 No = 0	**1**
R 3.2. Is the wetland along a stream or river that has TMDL limits for nutrients, toxics, or pathogens?	Yes = 1 No = 0	**0**
R 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? (Answer YES if there is a TMDL in development or in effect for the drainage in which the unit is found.)	Yes = 2 No = 0	**2**
Total for R 3	Add the points in the boxes above	**3**

Rating of Value If score is: ✔ **2-4 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number E

RIVERINE AND FRESHWATER TIDAL FRINGE WETLANDS

Hydrologic Functions - Indicators that site functions to reduce flooding and stream erosion

R 4.0. Does the site have the potential to reduce flooding and erosion?

R 4.1. Characteristics of the overbank storage the wetland provides:
Estimate the average width of the wetland perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of wetland)/(average width of stream between banks).

- ☐ If the ratio is more than 20 — points = 9
- ☐ If the ratio is 10-20 — points = 6
- ☐ If the ratio is 5-<10 — points = 4
- ☑ If the ratio is 1-<5 — points = 2
- ☐ If the ratio is < 1 — points = 1

2

R 4.2. Characteristics of plants that slow down water velocities during floods: Treat large woody debris as forest or shrub. Choose the points appropriate for the best description (polygons need to have >90% cover at person height. These are NOT Cowardin classes).

- ☑ Forest or shrub for > $^1/_3$ area OR emergent plants > $^2/_3$ area — points = 7
- ☐ Forest or shrub for > $^1/_{10}$ area OR emergent plants > $^1/_3$ area — points = 4
- ☐ Plants do not meet above criteria — points = 0

7

Total for R 4	Add the points in the boxes above	**9**

Rating of Site Potential If score is: **__12-16 = H ✔ 6-11 = M ___0-5 = L** *Record the rating on the first page*

R 5.0. Does the landscape have the potential to support the hydrologic functions of the site?

R 5.1. Is the stream or river adjacent to the wetland downcut?	Yes = 0 No = 1	**1**
R 5.2. Does the upgradient watershed include a UGA or incorporated area?	Yes = 1 No = 0	**0**
R 5.3. Is the upgradient stream or river controlled by dams?	Yes = 0 No = 1	**1**
Total for R 5	Add the points in the boxes above	**2**

Rating of Landscape Potential If score is: **__3 = H ✔ 1 or 2 = M ___0 = L** *Record the rating on the first page*

R 6.0. Are the hydrologic functions provided by the site valuable to society?

R 6.1. Distance to the nearest areas downstream that have flooding problems?
Choose the description that best fits the site.

- ☑ The sub-basin immediately downgradient of the wetland has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds) — points = 2
- ☐ Surface flooding problems are in a sub-basin farther downgradient — points = 1
- ☐ No flooding problems anywhere downstream — points = 0

2

R 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0 — **0**

Total for R 6	Add the points in the boxes above	**2**

Rating of Value If score is: **✔ 2-4 = H ___1 = M ___0 = L** *Record the rating on the first page*

Wetland name or number E_____

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

H 1.0. Does the site have the potential to provide habitat?

H 1.1. Structure of plant community: Indicators are Cowardin classes and strata within the Forested class. Check the Cowardin plant classes in the wetland. Up to 10 patches may be combined for each class to meet the threshold of ¼ ac if the unit is at least 2.5 ac, or more than 10% of the unit if it is smaller than 2.5 ac.

____Aquatic bed	4 structures or more: points = 4	**1**
____Emergent	3 structures: points = 2	
____Scrub-shrub (areas where shrubs have > 30% cover)	[2 structures: points = 1]	
_✔_Forested (areas where trees have > 30% cover)	1 structure: points = 0	

If the unit has a Forested class, check if:

_✔_The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/groundcover) that each cover 20% within the Forested polygon

H 1.2. Hydroperiods

Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland if the unit is < 2.5 ac, or ¼ ac if the unit is at least 2.5 ac to count (see text for descriptions of hydroperiods).

____Permanently flooded or inundated	4 or more types present: points = 3	**1**
____Seasonally flooded or inundated	3 types present: points = 2	
____Occasionally flooded or inundated	[2 types present: points = 1]	
_✔_Saturated only	1 type present: points = 0	
____Permanently flowing stream or river in, or adjacent to, the wetland		
_✔_Intermittently or seasonally flowing stream in, or adjacent to, the wetland		
____**Lake Fringe wetland**	**2 points**	
____**Freshwater tidal wetland**	**2 points**	

H 1.3. Richness of plant species

Count the number of plant species in the wetland that cover at least 10 ft^2.

Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. **Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canada thistle**

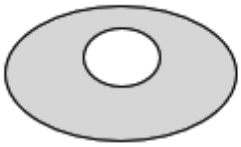
If you counted: > 19 species	points = 2	**1**
[5 - 19 species]	[points = 1]	
< 5 species	points = 0	

H 1.4. Interspersion of habitats

Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. If you have four or more plant classes or three classes and open water, the rating is always high.



None = 0 points

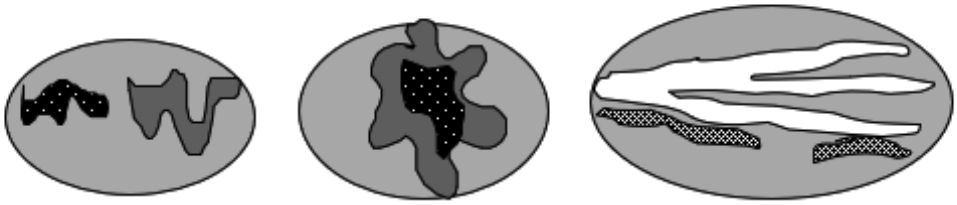


Low = 1 point



Moderate = 2 points

All three diagrams in this row are **High** = 3 points



0

Wetland name or number E

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. The number of checks is the number of points. ✔ Large, downed, woody debris within the wetland (> 4 in. diameter and 6 ft long). ✔ Standing snags (dbh > 4 in.) within the wetland ✔ Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extend at least 3.3 ft (1 m) over open water or a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ___ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet weathered where wood is exposed) ___ At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (structures for egg-laying by amphibians) ✔ Invasive plants cover less than 25% of the wetland area in every stratum of plants (see H 1.1 above for the list of strata and H 1.5 in the manual for the list of aggressive plant species)	**4**
Total for H 1 — Add the points in the boxes above	**7**

Rating of Site Potential If score is: ___**15-18 = H** ✔ **7-14 = M** ___**0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include only habitat polygons accessible from the wetland. *Calculate:* % relatively undisturbed habitat 45 + [(% moderate and low intensity land uses)/2] 9 = 54 % Total accessible habitat is: ✔ > 1/3 (33.3%) of 1 km Polygon — points = 3 ___ 20-33% of 1 km Polygon — points = 2 ___ 10-19% of 1 km Polygon — points = 1 ___ < 10% of 1 km Polygon — points = 0	**3**
H 2.2. Total habitat in 1 km Polygon around the wetland. *Calculate:* % relatively undisturbed habitat 62 + [(% moderate and low intensity land uses)/2] 18 = 80 % ✔ Total habitat > 50% of Polygon — points = 3 ___ Total habitat 10-50% and in 1-3 patches — points = 2 ___ Total habitat 10-50% and > 3 patches — points = 1 ___ Total habitat < 10% of 1 km Polygon — points = 0	**3**
H 2.3. Land use intensity in 1 km Polygon: ___ > 50% of 1 km Polygon is high intensity land use — points = (- 2) ✔ ≤ 50% of 1 km Polygon is high intensity — points = 0	**0**
Total for H 2 — Add the points in the boxes above	**6**

Rating of Landscape Potential If score is: ✔ **4-6 = H** ___**1-3 = M** ___**< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.* Site meets ANY of the following criteria: — points = 2 ✔ It has 3 or more Priority Habitats within 100 m (see next page) ___ It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) ___ It is mapped as a location for an individual WDFW Priority Species ___ It is a Wetland of High Conservation Value as determined by the Department of Natural Resources data ___ It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan ___ Site has 1 or 2 Priority Habitats (listed on next page) within 100 m — points = 1 ___ Site does not meet any of the criteria above — points = 0	**2**

Rating of Value If score is: ✔ **2 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number E

WDFW Priority Habitats

See complete descriptions of Priority Habitats listed by WDFW, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008 (current year, as revised). Priority Habitat and Species List.[133] This list was updated for consistency with guidance from WDFW.

This question is independent of the land use between the wetland unit and the Priority Habitat. All vegetated wetlands are by definition a Priority Habitat but are not included in this list because they are addressed by this rating system.

Count how many of the following Priority Habitats are within 330 ft (100 m) of the wetland unit:

☐ **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

☐ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife. This habitat automatically counts if mapped on the PHS online map within 100m of the wetland. If not mapped, a determination can be made in the field.

☐ **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

☐ **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.

☐ **Fresh Deepwater:** Lands permanently flooded with freshwater, including environments where surface water is permanent and often deep, so that water, rather than air, is the principal medium within which the dominant organisms live. Substrate does not support emergent vegetation. Do not select if Instream habitat is also present, or if the entire Deepwater feature is included in the wetland unit being rated (such as a pond with a vegetated fringe).

☐ **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.

☑ **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. Do not select if Fresh Deepwater habitat is also present.

☐ **Nearshore:** Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore.

☐ **Old-growth/Mature forests:** Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in. (81 cm) diameter at breast height (dbh) or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in. (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.

[133] http://wdfw.wa.gov/publications/00165/wdfw00165.pdf

Wetland name or number E

☐ **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important. For single oaks or oak stands <0.4 ha in urban areas, WDFW's Management Recommendations for Oregon White Oak[134] provides more detail for determining if they are Priority Habitats

☑ **Riparian:** The area adjacent to freshwater aquatic systems with flowing or standing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

☑ **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in. (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in. (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

☐ **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

☐ **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie.

[134] https://wdfw.wa.gov/publications/00030/wdfw00030.pdf

Wetland name or number E

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt Yes – Go to **SC 1.1** No= **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = **Category I** No – Go to **SC 1.2**	**Cat. I**
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 10% cover of non-native plant species. If non-native species are *Spartina*, see chapter 4.8 in the manual. ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Does the wetland overlap with any known or historical rare plant or rare & high-quality ecosystem polygons on the WNHP Data Explorer?[135] Yes **= Category I** No – Go to **SC 2.2** SC 2.2. Does the wetland have a rare plant species, rare ecosystem (e.g., plant community), or high-quality common ecosystem that may qualify the site as a WHCV? Contact WNHP for resources to help determine the presence of these elements. Yes – Submit data to WA Natural Heritage Program for determination,[136] Go to **SC 2.3** No **= Not a WHCV** SC 2.3. Did WNHP review the site within 30 days and determine that it has a rare plant or ecosystem that meets their criteria? Yes **= Category I** No **= Not a WHCV**	**Cat. I**
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES, you will still need to rate the wetland based on its functions.*** SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in. or more of the first 32 in. of the soil profile? Yes – Go to **SC 3.3** No – Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in. deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes – Go to **SC 3.3** No = **Not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? Yes = **Category I bog** No – Go to **SC 3.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in. deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? Yes = **Category I bog** No **= Not a bog**	**Cat. I**

[135] https://www.dnr.wa.gov/NHPdata

[136] https://www.dnr.wa.gov/Publications/amp_nh_sighting_form.pdf

Wetland name or number E

SC 4.0. Forested Wetlands — **Cat. I**

Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as Priority Habitats? ***If you answer YES, you will still need to rate the wetland based on its functions.***

☐ **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in. (81 cm) or more.

☐ **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in. (53 cm).

Yes = **Category I** | No = **Not a forested wetland for this section**

SC 5.0. Wetlands in Coastal Lagoons — **Cat. I**

Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?

☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks

☐ The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)*

☐ The lagoon retains some of its surface water at low tide during spring tides

Yes – Go to **SC 5.1** | No = **Not a wetland in a coastal lagoon**

SC 5.1. Does the wetland meet all of the following three conditions? — **Cat. II**

☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species in H 1.5 in the manual).

☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland.

☐ The wetland is larger than $^{1}/_{10}$ ac (4350 ft^2)

Yes = **Category I** No = **Category II**

SC 6.0. Interdunal Wetlands — **Cat I**

Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer YES, you will still need to rate the wetland based on its habitat functions.***

In practical terms that means the following geographic areas:

☐ Long Beach Peninsula: Lands west of SR 103

☐ Grayland-Westport: Lands west of SR 105

☐ Ocean Shores-Copalis: Lands west of SR 115 and SR 109 and Ocean Shores Blvd SW, including lands west of E. Oceans Shores Blvd SW.

Yes – Go to **SC 6.1** | No = **Not an interdunal wetland for rating** — **Cat. II**

SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? Yes = **Category I** No – Go to **SC 6.2**

SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? — **Cat. III**

Yes = **Category II** No – Go to **SC 6.3**

SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? — **Cat. IV**

Yes = **Category III** No = **Category IV**

Category of wetland based on Special Characteristics — **N/A**

If you answered No for all types, enter "Not Applicable" on Summary Form

MILES SAND AND GRAVEL - GRIP RD IMPROVEMENTS
WETLAND RATING FIGURE 1- WETLAND E



LEGEND

- SCRUB-SHRUB
- FORESTED VEGETATION
- 150' FROM WL BOUNDARY
- INTERMITTENT STREAM

Scale 1" = 100'

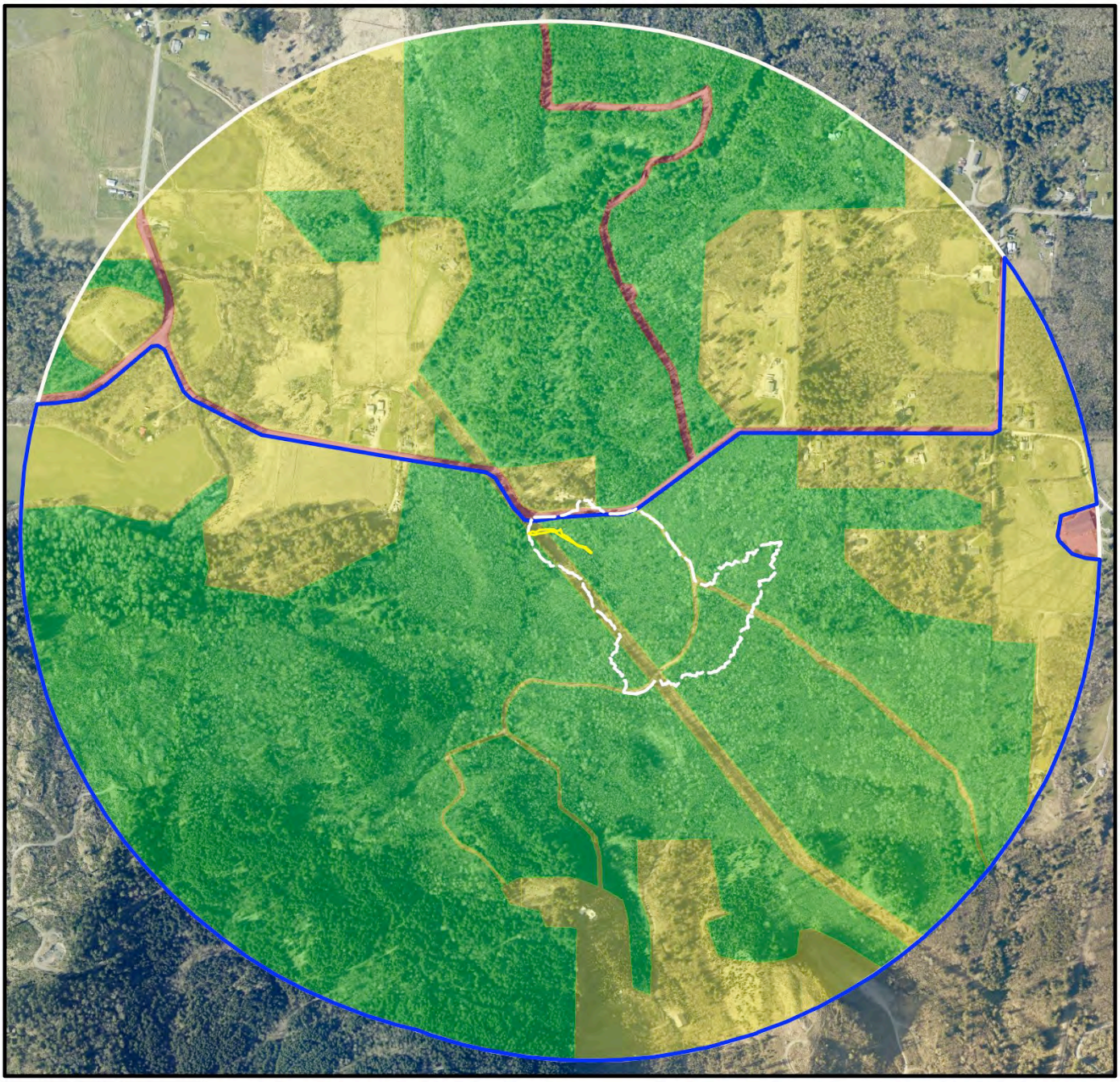
0 100 200

Wetland Resources, Inc.
Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance
9505 19th Avenue S.E. Suite 106 Everett,Washington 98208
Phone: (425) 337-3174
Fax: (425) 337-3045
Email: mailbox@wetlandresources.com

WETLAND RATING
Wetland E

Figure E-1
WRI Job # 25267
Rated by: EC

MILES SAND AND GRAVEL - GRIP RD IMPROVEMENTS
WETLAND RATING FIGURE 2- WETLAND E



LEGEND

- RELATIVELY UNDISTURBED
- LOW/MOD. INTENSITY
- HIGH INTENSITY
- ACCESSIBLE HABITAT
- WETLAND
- 1 KM FROM WETLAND
- CONTRIBUTING BASIN

Scale 1" = 1,000'

0 1,000 2,000

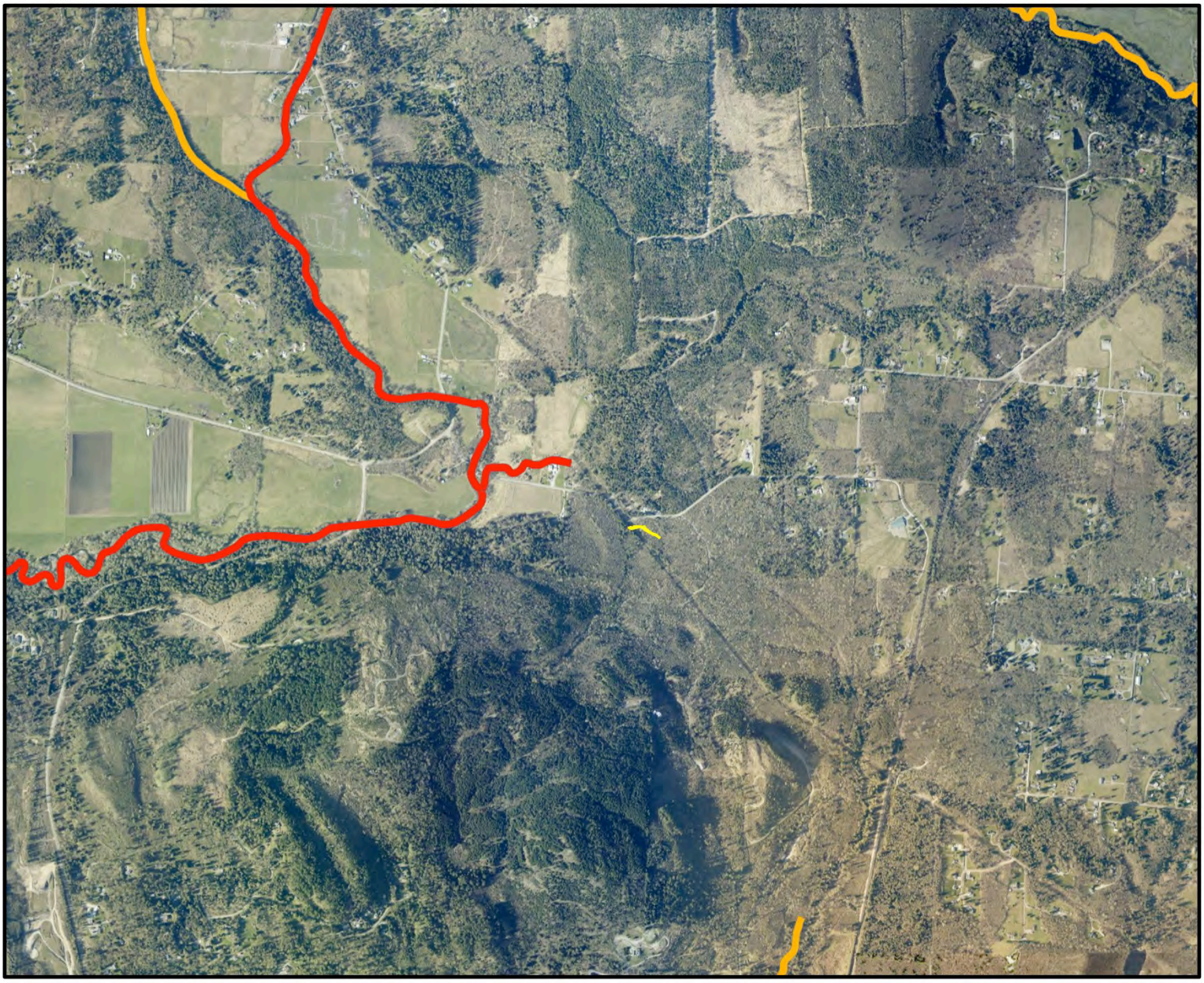
Wetland Resources, Inc.
Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance
9505 19th Avenue S.E. Suite 106 Everett,Washington 98208
Phone: (425) 337-3174
Fax: (425) 337-3045
Email: mailbox@wetlandresources.com

WETLAND RATING
Wetland E

Figure E-2
WRI Job # 25267
Rated by: EC

MILES SAND AND GRAVEL - GRIP RD IMPROVEMENTS

WETLAND RATING FIGURE 3- WETLAND E



LEGEND

WETLAND

AQUATIC RESOURCES WITH ACTIVE TMDL

AQUATIC RESOURCES ON THE 303(d) LIST

Scale 1" = 2,000'

0 2,000 4,000

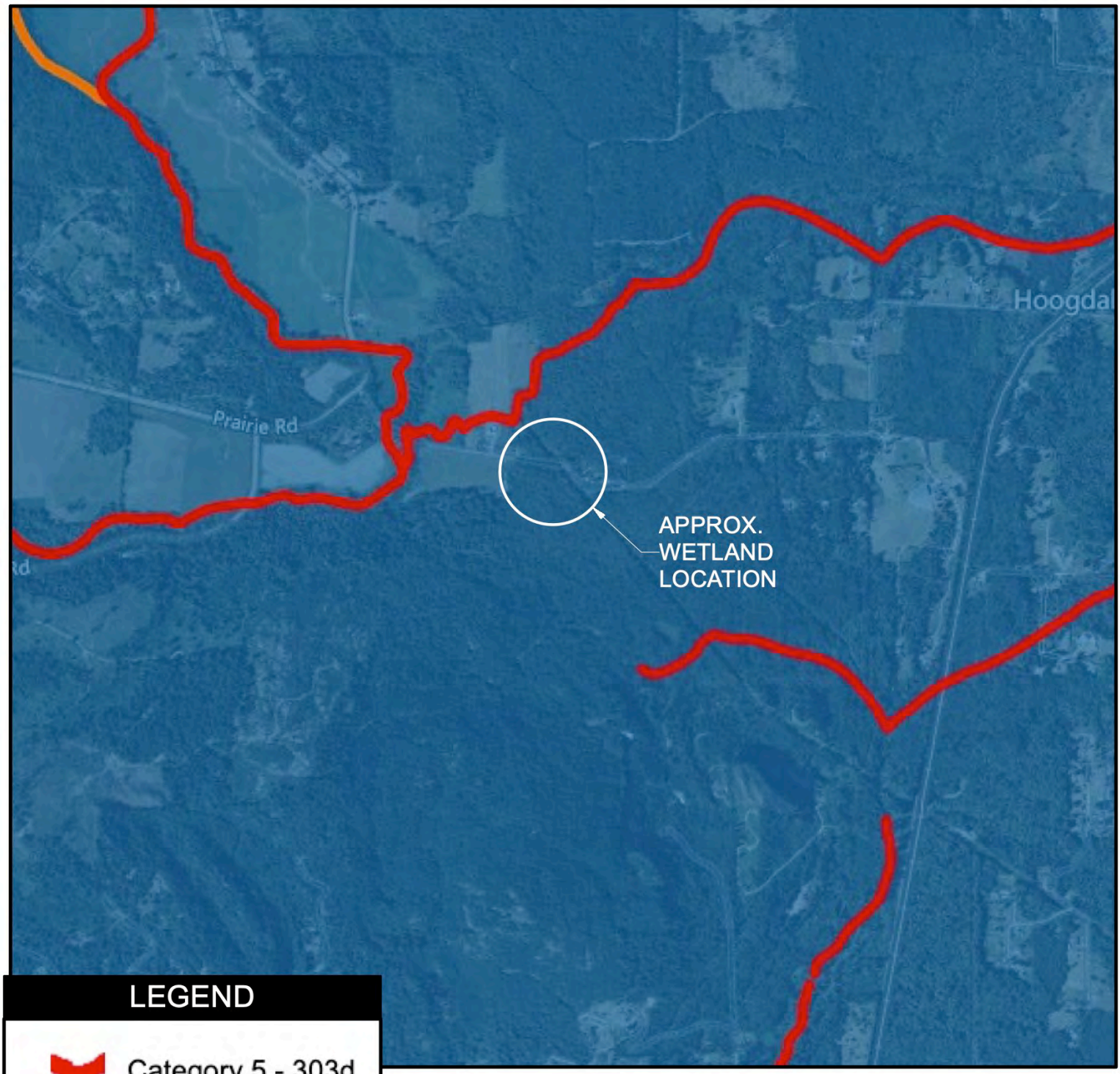
Wetland Resources, Inc.
Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance
9505 19th Avenue S.E. Suite 106 Everett,Washington 98208
Phone: (425) 337-3174
Fax: (425) 337-3045
Email: mailbox@wetlandresources.com

WETLAND RATING
Wetland E

Figure E-3
WRI Job # 25267
Rated by: EC

MILES SAND AND GRAVEL - GRIP RD IMPROVEMENTS

WETLAND RATING FIGURE 4- WETLAND E



LEGEND

- Category 5 - 303d
- Category 4A
- TMDL - Approved
- 4B - Approved

Wetland Resources, Inc.
Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance
9505 19th Avenue S.E. Suite 106 Everett,Washington 98208
Phone: (425) 337-3174
Fax: (425) 337-3045
Email: mailbox@wetlandresources.com

WETLAND RATING
Wetland E

Figure E-4
WRI Job # 25267
Rated by: EC

MILES SAND AND GRAVEL - GRIP RD IMPROVEMENTS

WETLAND RATING FIGURE 5- WETLAND E



LEGEND

- WETLAND
- PONDED DEPRESSIONS
- FOREST OR SCRUB-SHRUB
- HERBACEOUS VEGETATION
- STREAM WIDTH
- WETLAND WIDTH
- INTERMITTENT STREAM

Scale 1" = 100'

0 100 200

Wetland Resources, Inc.

Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance

9505 19th Avenue S.E. Suite 106 Everett,Washington 98208

Phone: (425) 337-3174

Fax: (425) 337-3045

Email: mailbox@wetlandresources.com

WETLAND RATING

Wetland E

Figure E-5

WRI Job # 25267

Rated by: EC

Wetland name or number F

RATING SUMMARY – Western Washington

Name of wetland (or ID #): 25267 - Wetland F Date of site visit: 9/2/25

Rated by EC Trained by Ecology? ✔ Yes ___No Date of training 10/18

HGM Class used for rating **Depressional** Wetland has multiple HGM classes? ✔ Y ____N

NOTE: **Form is not complete without the required figures** (figures can be combined).
Source of base aerial photo/map Skagit County GIS

OVERALL WETLAND CATEGORY __I__ (based on functions ✔ or special characteristics__)

1. Category of wetland based on FUNCTIONS

✔ **Category I** – Total score = 23 - 27

_____ **Category II** – Total score = 20 - 22

_____ **Category III** – Total score = 16 - 19

_____ **Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality			Hydrologic			Habitat			
	Circle the appropriate ratings									
Site Potential	H	[M]	L	H	[M]	L	H	[M]	L	
Landscape Potential	[H]	M	L	H	[M]	L	[H]	M	L	
Value	[H]	M	L	[H]	M	L	[H]	M	L	**TOTAL**
Score Based on Ratings	**8**			**7**			**8**			**23**

Score for each function based on three ratings (order of ratings is not important)

9 = H, H, H
8 = H, H, M
7 = H, H, L
7 = H, M, M
6 = H, M, L
6 = M, M, M
5 = H, L, L
5 = M, M, L
4 = M, L, L
3 = L, L, L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	**I** **II**
Wetland of High Conservation Value	**I**
Bog	**I**
Mature Forest	**I**
Old Growth Forest	**I**
Coastal Lagoon	**I** **II**
Interdunal	**I** **II** **III** **IV**
None of the above	✔

Wetland name or number F_____

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	1
Hydroperiods	D 1.4, H 1.2	1
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	1
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	1
Map of the contributing basin	D 4.3, D 5.3	2
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	2
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	3
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	4

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

Wetland name or number F_____

HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

   NO – go to 2 **YES** – the wetland class is **Tidal Fringe** – go to 1.1

   1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

   NO – Saltwater Tidal Fringe (Estuarine) **YES – Freshwater Tidal Fringe**
   If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe, it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.

2. The entire wetland unit is flat, and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

   NO – go to 3 **YES** – The wetland class is **Flats**
   If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet all** of the following criteria?
   - The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size,
   - At least 30% of the open water area is deeper than 6.6 ft (2 m).

   NO – go to 4 **YES –** The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?
   - The wetland is on a slope (slope can be very gradual),
   - The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheet flow, or in a swale without distinct banks,
   - The water leaves the wetland **without being impounded**.

   NO – go to 5 **YES –** The wetland class is **Slope**

   NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

Wetland name or number F_____

5. Does the entire wetland unit **meet all** of the following criteria?
   - The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
   - The overbank flooding occurs at least once every 2 years.

   NO – go to 6 **YES** – The wetland class is **Riverine**

   NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? This means that any outlet, if present, is higher than the interior of the wetland.

   NO – go to 7 **YES** – The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched but has no obvious natural outlet.

   NO – go to 8 **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

   NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated		HGM class to use in rating
Slope + Riverine	✔	Riverine
Slope + Depressional	✔	Depressional
Slope + Lake Fringe		Lake Fringe
Depressional + Riverine along stream within boundary of depression	✔	Depressional
Depressional + Lake Fringe		Depressional
Riverine + Lake Fringe		Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland		Treat as ESTUARINE

If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.

Wetland name or number F_____

DEPRESSIONAL AND FLATS WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

D 1.0. Does the site have the potential to improve water quality?	
D 1.1. Characteristics of surface water outflows from the wetland: ☐ Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet). points = 3 ☑ Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. points = 2 ☐ Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 1 ☐ Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. points = 1	**2**
D 1.2. The soil 2 in. below the surface (or duff layer) is true clay or true organic *(use NRCS definitions).* Yes = 4 [No = 0]	**0**
D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes): ☑ Wetland has persistent, ungrazed plants > 95% of area points = 5 ☐ Wetland has persistent, ungrazed plants > ½ of area points = 3 ☐ Wetland has persistent, ungrazed plants ≥ 1/10 of area points = 1 ☐ Wetland has persistent, ungrazed plants < 1/10 of area points = 0	**5**
D 1.4. Characteristics of seasonal ponding or inundation: *This is the area that is ponded for at least 2 months. See description in manual.* ☐ Area seasonally ponded is > ½ total area of wetland points = 4 ☐ Area seasonally ponded is ≥ ¼ total area of wetland points = 2 ☑ Area seasonally ponded is < ¼ total area of wetland points = 0	**0**
Total for D 1 Add the points in the boxes above	**7**

Rating of Site Potential If score is: __**12-16 = H** ✔ **6-11 = M** ___**0-5 = L** *Record the rating on the first page*

D 2.0. Does the landscape have the potential to support the water quality function of the site?	
D 2.1. Does the wetland unit receive stormwater discharges? [Yes = 1] No = 0	**1**
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? [Yes = 1] No = 0	**1**
D 2.3. Are there septic systems within 250 ft of the wetland? [Yes = 1] No = 0	**1**
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1-D 2.3? Source_____ [Yes = 1] No = 0	**1**
Total for D 2 Add the points in the boxes above	**4**

Rating of Landscape Potential If score is: ✔ **3 or 4 = H** ___**1 or 2 = M** ___**0 = L** *Record the rating on the first page*

D 3.0. Is the water quality improvement provided by the site valuable to society?	
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? Yes = 1 No = 0	**1**
D 3.2. Is the wetland in a basin or sub-basin where an aquatic resource is on the 303(d) list? Yes = 1 No = 0	**1**
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? (Answer YES if there is a TMDL in development or in effect for the basin in which the unit is found.) Yes = 2 No = 0	**2**
Total for D 3 Add the points in the boxes above	**4**

Rating of Value If score is: ✔ **2-4 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number F_____

DEPRESSIONAL AND FLATS WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream degradation

D 4.0. Does the site have the potential to reduce flooding and erosion?

D 4.1. Characteristics of surface water outflows from the wetland:

- ☐ Wetland is a depression or flat depression with no surface water leaving it (no outlet) points = 4
- ☑ Wetland has an intermittently flowing stream/ditch, OR highly constricted permanently flowing outlet points = 2
- ☐ Wetland is a flat depression (question 7 on key), whose outlet is a permanently flowing ditch points = 1
- ☐ Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 0

2

D 4.2. Depth of storage during wet periods: Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or if dry, the deepest part.

- ☐ Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7
- ☐ Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5
- ☑ Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3
- ☐ The wetland is a "headwater" wetland points = 3
- ☐ Wetland is flat but has small depressions on the surface that trap water points = 1
- ☐ Marks of ponding less than 0.5 ft (6 in) points = 0

3

D 4.3. Contribution of the wetland to storage in the watershed: Estimate the ratio of the area of upstream basin contributing surface water to the area of the wetland unit itself.

- ☐ The area of the basin is less than 10 times the area of the unit points = 5
- ☑ The area of the basin is 10 to 100 times the area of the unit points = 3
- ☐ The area of the basin is more than 100 times the area of the unit points = 0
- ☐ Entire wetland is in the Flats class points = 5

3

Total for D 4 — Add the points in the boxes above — **8**

Rating of Site Potential If score is: __**12-16 = H** ✔**6-11 = M** ___**0-5 = L** *Record the rating on the first page*

D 5.0. Does the landscape have the potential to support hydrologic functions of the site?

D 5.1. Does the wetland receive stormwater discharges? [Yes = 1] No = 0 — **1**

D 5.2. Is >10% of the area within 150 ft of the wetland in land uses that generate excess runoff? [Yes = 1] No = 0 — **1**

D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at >1 residence/ac, urban, commercial, agriculture, etc.)? Yes = 1 [No = 0] — **0**

Total for D 5 — Add the points in the boxes above — **2**

Rating of Landscape Potential If score is: __**3 = H** ✔**1 or 2 = M** ___**0 = L** *Record the rating on the first page*

D 6.0. Are the hydrologic functions provided by the site valuable to society?

D 6.1. Is the unit in a landscape that has flooding problems? Choose the description that best matches conditions around the wetland unit being rated. Do not add points. Choose the highest score if more than one condition is met.

The wetland captures surface water that would otherwise flow downgradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds):

- ☑ • Flooding occurs in a sub-basin that is immediately downgradient of unit. points = 2
- ☐ • Surface flooding problems are in a sub-basin farther downgradient. points = 1
- ☐ • Flooding from groundwater is an issue in the sub-basin. points = 1
- ☐ • The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. *Explain why* _____ points = 0
- ☐ • There are no problems with flooding downstream of the wetland. points = 0

2

D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 [No = 0] — **0**

Total for D 6 — Add the points in the boxes above — **2**

Rating of Value If score is: ✔**2-4 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number F_____

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

H 1.0. Does the site have the potential to provide habitat?

H 1.1. Structure of plant community: Indicators are Cowardin classes and strata within the Forested class. Check the Cowardin plant classes in the wetland. Up to 10 patches may be combined for each class to meet the threshold of ¼ ac if the unit is at least 2.5 ac, or more than 10% of the unit if it is smaller than 2.5 ac.

____Aquatic bed — 4 structures or more: points = 4
____Emergent — [3 structures: points = 2]
__✔__Scrub-shrub (areas where shrubs have > 30% cover) — 2 structures: points = 1
__✔__Forested (areas where trees have > 30% cover) — 1 structure: points = 0

If the unit has a Forested class, check if:

__✔__The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/groundcover) that each cover 20% within the Forested polygon

2

H 1.2. Hydroperiods

Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland if the unit is < 2.5 ac, or ¼ ac if the unit is at least 2.5 ac to count (see text for descriptions of hydroperiods).

____Permanently flooded or inundated — 4 or more types present: points = 3
__✔__Seasonally flooded or inundated — [3 types present: points = 2]
____Occasionally flooded or inundated — 2 types present: points = 1
__✔__Saturated only — 1 type present: points = 0
____Permanently flowing stream or river in, or adjacent to, the wetland
__✔__Intermittently or seasonally flowing stream in, or adjacent to, the wetland
____**Lake Fringe wetland** — **2 points**
____**Freshwater tidal wetland** — **2 points**

2

H 1.3. Richness of plant species

Count the number of plant species in the wetland that cover at least 10 ft^2.

Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. **Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canada thistle**

If you counted: > 19 species — points = 2
[5 - 19 species] — [points = 1]
< 5 species — points = 0

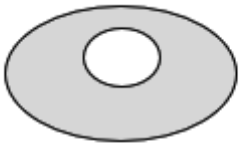
1

H 1.4. Interspersion of habitats

Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. If you have four or more plant classes or three classes and open water, the rating is always high.



None = 0 points

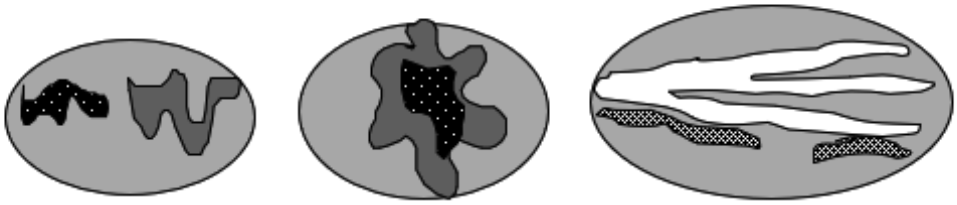


Low = 1 point



Moderate = 2 points

All three diagrams in this row are **High** = 3 points



2

Wetland name or number F_____

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. The number of checks is the number of points. __✔__Large, downed, woody debris within the wetland (> 4 in. diameter and 6 ft long). __✔__Standing snags (dbh > 4 in.) within the wetland __✔__Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extend at least 3.3 ft (1 m) over open water or a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ____Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet weathered where wood is exposed) ____At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (structures for egg-laying by amphibians) ____Invasive plants cover less than 25% of the wetland area in every stratum of plants (see H 1.1 above for the list of strata and H 1.5 in the manual for the list of aggressive plant species)	**3**
Total for H 1 Add the points in the boxes above	**10**

Rating of Site Potential If score is: __**15-18 = H** __✔__**7-14 = M** ___**0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include only habitat polygons accessible from the wetland. *Calculate:* % relatively undisturbed habitat 13 **+** [(% moderate and low intensity land uses)/2] 6 **=** 19 % Total accessible habitat is: ☐ > 1/3 (33.3%) of 1 km Polygon points = 3 ☐ 20-33% of 1 km Polygon points = 2 ☑ 10-19% of 1 km Polygon points = 1 ☐ < 10% of 1 km Polygon points = 0	**1**
H 2.2. Total habitat in 1 km Polygon around the wetland. *Calculate:* % relatively undisturbed habitat 61 **+** [(% moderate and low intensity land uses)/2] 18 **=** 79 % ☑ Total habitat > 50% of Polygon points = 3 ☐ Total habitat 10-50% and in 1-3 patches points = 2 ☐ Total habitat 10-50% and > 3 patches points = 1 ☐ Total habitat < 10% of 1 km Polygon points = 0	**3**
H 2.3. Land use intensity in 1 km Polygon: ☐ > 50% of 1 km Polygon is high intensity land use points = (- 2) ☑ ≤ 50% of 1 km Polygon is high intensity points = 0	**0**
Total for H 2 Add the points in the boxes above	**4**

Rating of Landscape Potential If score is: ✔ **4-6 = H** ___**1-3 = M** ___**< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.* Site meets ANY of the following criteria: points = 2 ☑ It has 3 or more Priority Habitats within 100 m (see next page) ☐ It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) ☐ It is mapped as a location for an individual WDFW Priority Species ☐ It is a Wetland of High Conservation Value as determined by the Department of Natural Resources data ☐ It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan ☐ Site has 1 or 2 Priority Habitats (listed on next page) within 100 m points = 1 ☐ Site does not meet any of the criteria above points = 0	**2**

Rating of Value If score is: ✔ **2 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number F

WDFW Priority Habitats

See complete descriptions of Priority Habitats listed by WDFW, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008 (current year, as revised). Priority Habitat and Species List.[133] This list was updated for consistency with guidance from WDFW.

This question is independent of the land use between the wetland unit and the Priority Habitat. All vegetated wetlands are by definition a Priority Habitat but are not included in this list because they are addressed by this rating system.

Count how many of the following Priority Habitats are within 330 ft (100 m) of the wetland unit:

☐ **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

☐ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife. This habitat automatically counts if mapped on the PHS online map within 100m of the wetland. If not mapped, a determination can be made in the field.

☐ **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

☐ **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.

☐ **Fresh Deepwater:** Lands permanently flooded with freshwater, including environments where surface water is permanent and often deep, so that water, rather than air, is the principal medium within which the dominant organisms live. Substrate does not support emergent vegetation. Do not select if Instream habitat is also present, or if the entire Deepwater feature is included in the wetland unit being rated (such as a pond with a vegetated fringe).

☐ **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.

☑ **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. Do not select if Fresh Deepwater habitat is also present.

☐ **Nearshore:** Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore.

☐ **Old-growth/Mature forests:** Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in. (81 cm) diameter at breast height (dbh) or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in. (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.

[133] http://wdfw.wa.gov/publications/00165/wdfw00165.pdf

Wetland name or number F

☐ **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important. For single oaks or oak stands <0.4 ha in urban areas, WDFW's Management Recommendations for Oregon White Oak[134] provides more detail for determining if they are Priority Habitats

☑ **Riparian:** The area adjacent to freshwater aquatic systems with flowing or standing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

☑ **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in. (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in. (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

☐ **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

☐ **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie.

[134] https://wdfw.wa.gov/publications/00030/wdfw00030.pdf

Wetland name or number F_____

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt Yes – Go to **SC 1.1** No= **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = **Category I** No – Go to **SC 1.2**	**Cat. I**
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 10% cover of non-native plant species. If non-native species are *Spartina*, see chapter 4.8 in the manual. ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Does the wetland overlap with any known or historical rare plant or rare & high-quality ecosystem polygons on the WNHP Data Explorer?[135] Yes **= Category I** No – Go to **SC 2.2** SC 2.2. Does the wetland have a rare plant species, rare ecosystem (e.g., plant community), or high-quality common ecosystem that may qualify the site as a WHCV? Contact WNHP for resources to help determine the presence of these elements. Yes – Submit data to WA Natural Heritage Program for determination,[136] Go to **SC 2.3** No **= Not a WHCV** SC 2.3. Did WNHP review the site within 30 days and determine that it has a rare plant or ecosystem that meets their criteria? Yes **= Category I** No **= Not a WHCV**	**Cat. I**
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES, you will still need to rate the wetland based on its functions.*** SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in. or more of the first 32 in. of the soil profile? Yes – Go to **SC 3.3** No – Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in. deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes – Go to **SC 3.3** No = **Not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? Yes = **Category I bog** No – Go to **SC 3.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in. deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? Yes = **Category I bog** No **= Not a bog**	**Cat. I**

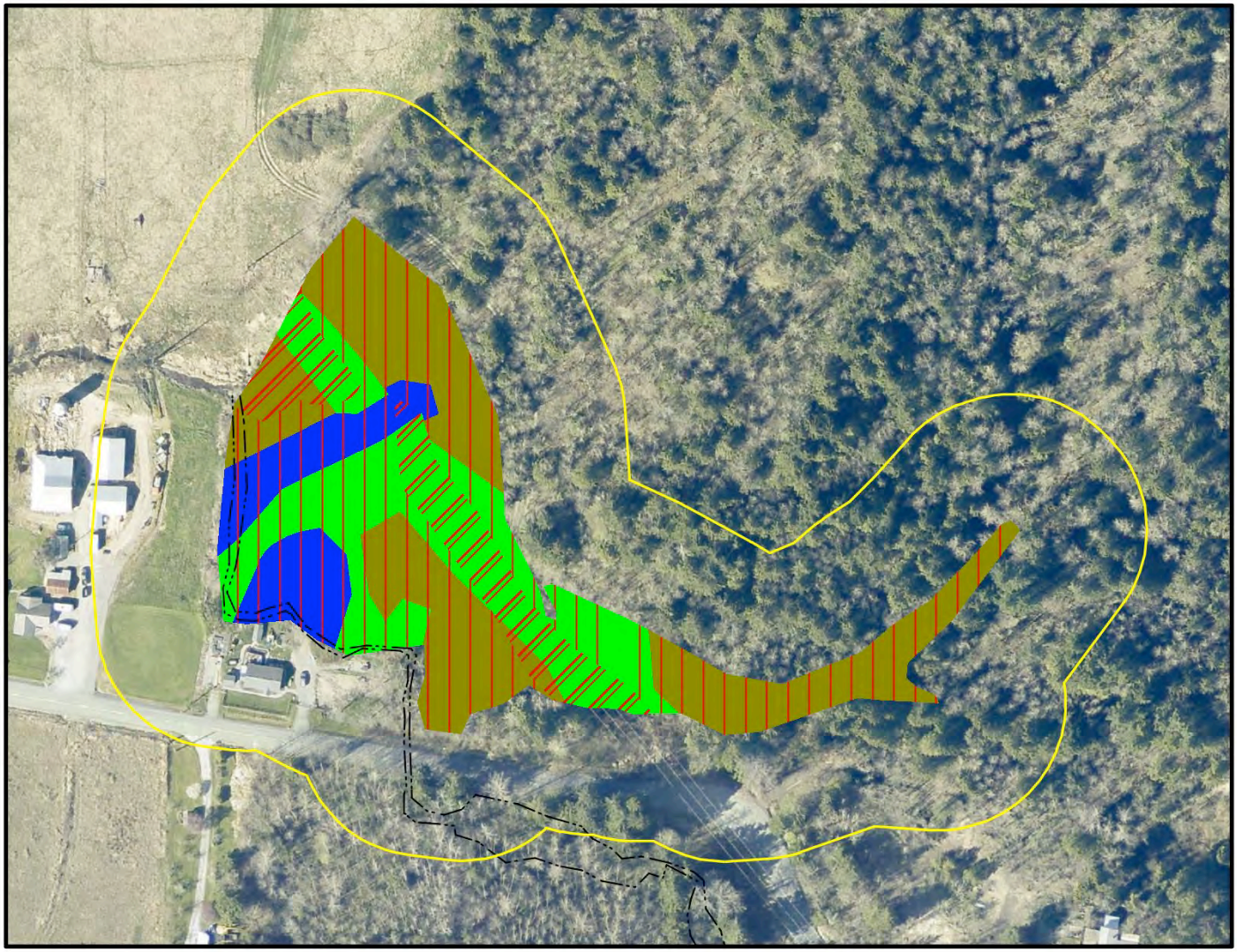
[135] https://www.dnr.wa.gov/NHPdata

[136] https://www.dnr.wa.gov/Publications/amp_nh_sighting_form.pdf

Wetland name or number F_____

SC 4.0. Forested Wetlands Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as Priority Habitats? ***If you answer YES, you will still need to rate the wetland based on its functions.*** ☐ **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in. (81 cm) or more. ☐ **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in. (53 cm). Yes = **Category I** No = **Not a forested wetland for this section**	**Cat. I**
SC 5.0. Wetlands in Coastal Lagoons Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? ☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks ☐ The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* ☐ The lagoon retains some of its surface water at low tide during spring tides Yes – Go to **SC 5.1** No = **Not a wetland in a coastal lagoon** SC 5.1. Does the wetland meet all of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species in H 1.5 in the manual). ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetland is larger than $^{1}/_{10}$ ac (4350 ft^2) Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 6.0. Interdunal Wetlands Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer YES, you will still need to rate the wetland based on its habitat functions.*** In practical terms that means the following geographic areas: ☐ Long Beach Peninsula: Lands west of SR 103 ☐ Grayland-Westport: Lands west of SR 105 ☐ Ocean Shores-Copalis: Lands west of SR 115 and SR 109 and Ocean Shores Blvd SW, including lands west of E. Oceans Shores Blvd SW. Yes – Go to **SC 6.1** No = **Not an interdunal wetland for rating** SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? Yes = **Category I** No – Go to **SC 6.2** SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? Yes = **Category II** No – Go to **SC 6.3** SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? Yes = **Category III** No = **Category IV**	**Cat I** **Cat. II** **Cat. III** **Cat. IV**
Category of wetland based on Special Characteristics If you answered No for all types, enter "Not Applicable" on Summary Form	**N/A**

MILES SAND AND GRAVEL - GRIP RD IMPROVEMENTS
WETLAND RATING FIGURE 1- WETLAND F



LEGEND

- SCRUB-SHRUB
- EMERGENT VEGETATION
- FORESTED VEGETATION
- SATURATED ONLY
- SEASONALLY FLOODED
- 150' FROM WL BOUNDARY
- INTERMITTENT STREAM

Scale 1" = 200'

0 200 400

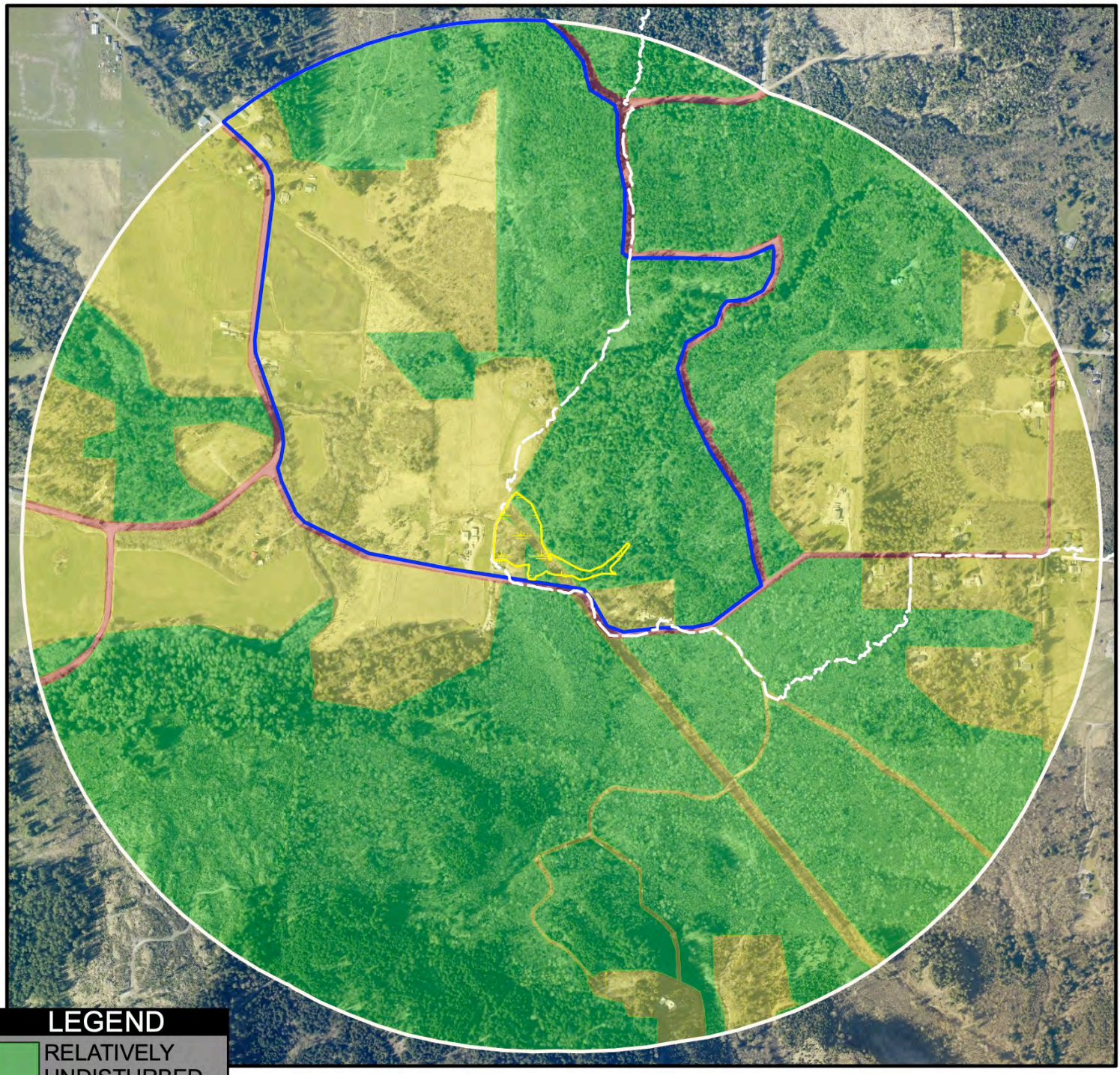
Wetland Resources, Inc.
Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance
9505 19th Avenue S.E. Suite 106 Everett,Washington 98208
Phone: (425) 337-3174
Fax: (425) 337-3045
Email: mailbox@wetlandresources.com

WETLAND RATING
Wetland F

Figure F-1
WRI Job # 25267
Rated by: EC

MILES SAND AND GRAVEL - GRIP RD IMPROVEMENTS

WETLAND RATING FIGURE 2- WETLAND F



LEGEND

- RELATIVELY UNDISTURBED
- LOW/MOD. INTENSITY
- HIGH INTENSITY
- ACCESSIBLE HABITAT
- WETLAND
- 1 KM FROM WETLAND
- CONTRIBUTING BASIN

CONTRIBUTING BASIN AREA RELATIVE TO WETLAND UNIT IS 145:1

Scale 1" = 1,000'

0 1,000 2,000

Wetland Resources, Inc.

Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance

9505 19th Avenue S.E. Suite 106 Everett,Washington 98208

Phone: (425) 337-3174

Fax: (425) 337-3045

Email: mailbox@wetlandresources.com

WETLAND RATING

Wetland F

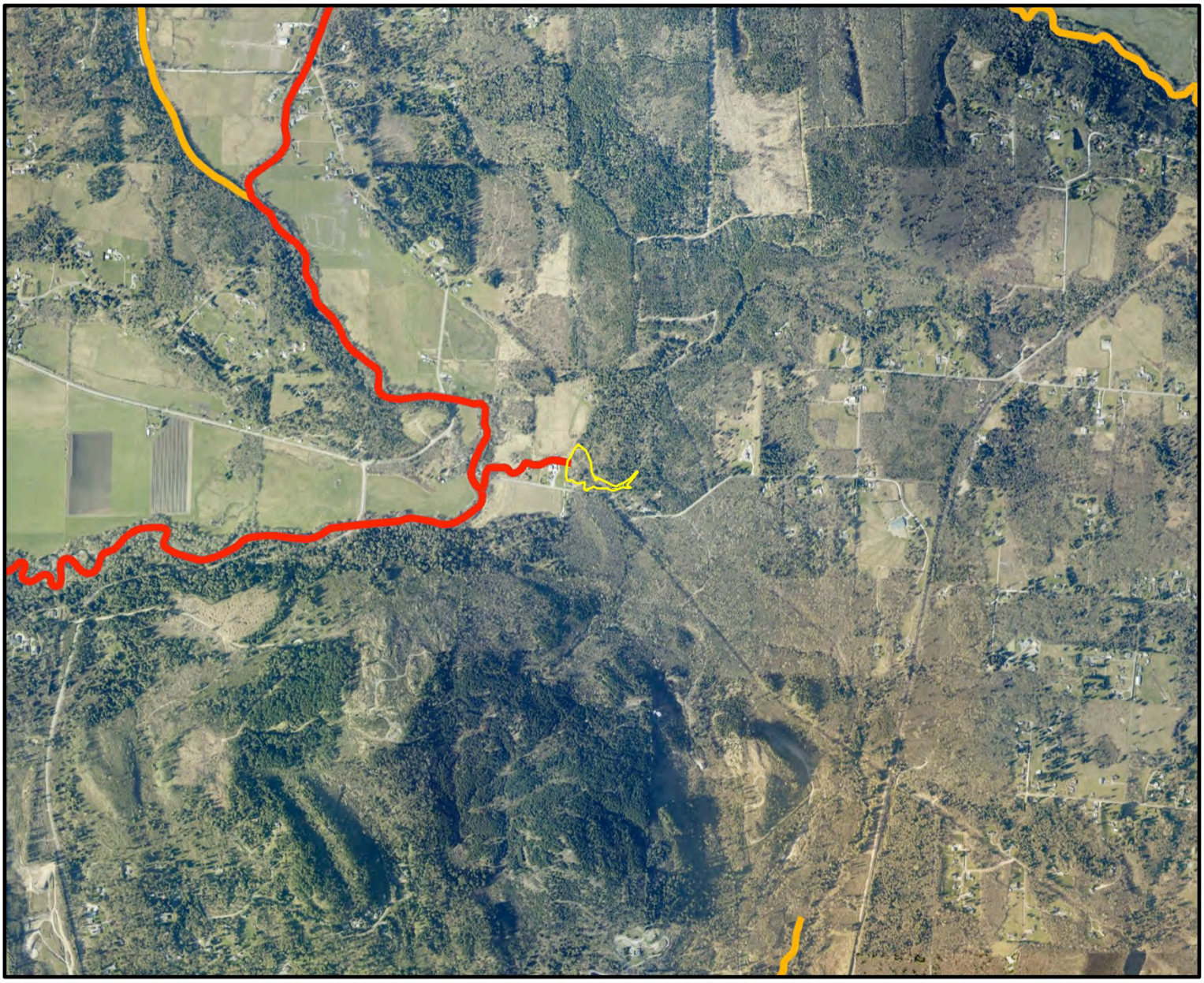
Figure F-2

WRI Job # 25267

Rated by: EC

MILES SAND AND GRAVEL - GRIP RD IMPROVEMENTS

WETLAND RATING FIGURE 3- WETLAND F



LEGEND

- WETLAND
- AQUATIC RESOURCES WITH ACTIVE TMDL
- AQUATIC RESOURCES ON THE 303(d) LIST

Scale 1" = 2,000'

0 2,000 4,000

Wetland Resources, Inc.

Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance

9505 19th Avenue S.E. Suite 106 Everett,Washington 98208

Phone: (425) 337-3174

Fax: (425) 337-3045

Email: mailbox@wetlandresources.com

WETLAND RATING

Wetland F

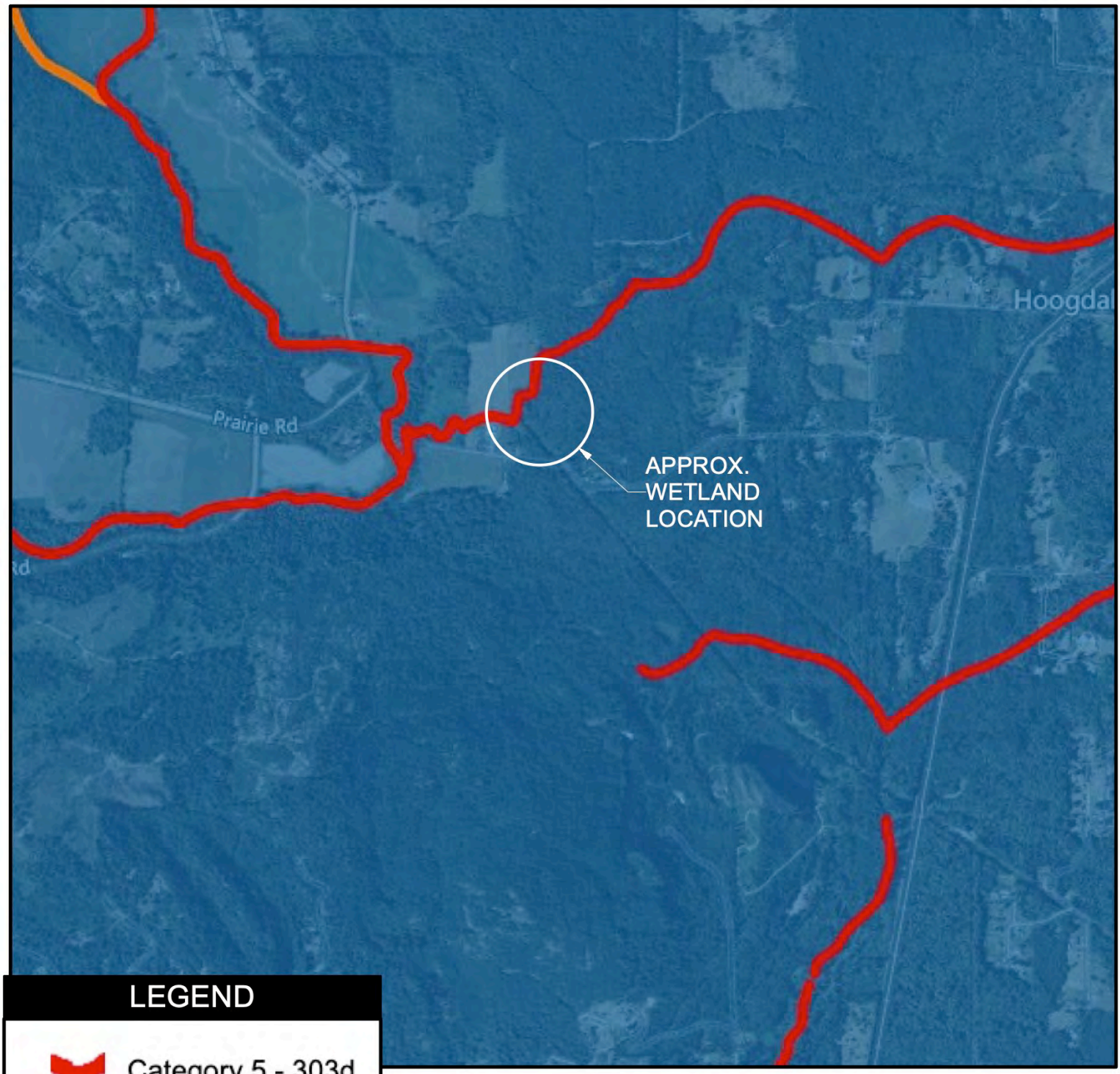
Figure F-3

WRI Job # 25267

Rated by: EC

MILES SAND AND GRAVEL - GRIP RD IMPROVEMENTS

WETLAND RATING FIGURE 4- WETLAND F



LEGEND

- Category 5 - 303d
- Category 4A
- TMDL - Approved
- 4B - Approved

Wetland Resources, Inc.
Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance
9505 19th Avenue S.E. Suite 106 Everett,Washington 98208
Phone: (425) 337-3174
Fax: (425) 337-3045
Email: mailbox@wetlandresources.com

WETLAND RATING
Wetland F

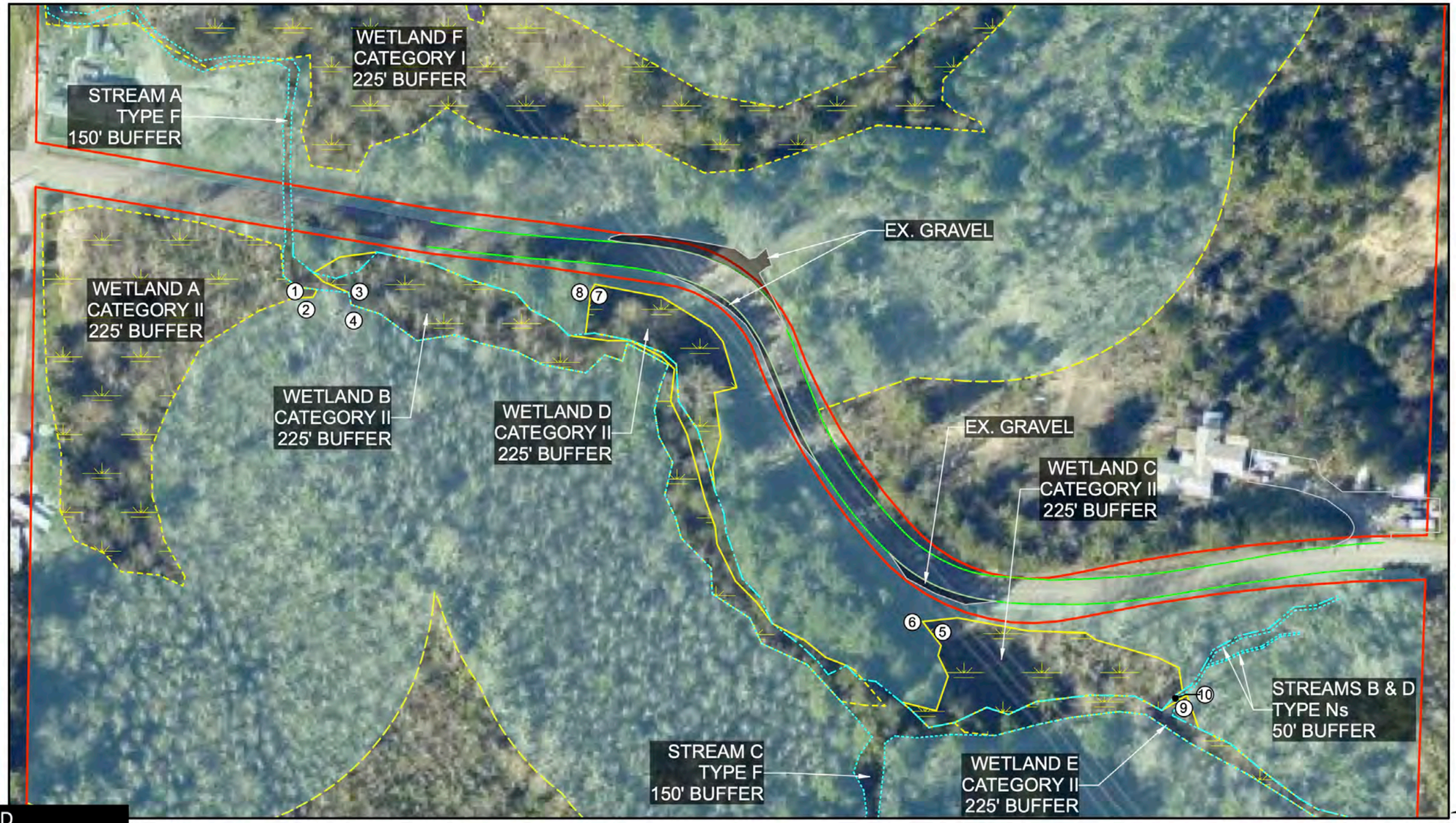
Figure F-4
WRI Job # 25267
Rated by: EC

APPENDIX C:
CRITICAL AREA STUDY MAPS (SHEETS 1 - 2)

CRITICAL AREA STUDY MAPS - EXISTING CONDITIONS

MILES SAND AND GRAVEL - GRIP RD IMPROVEMENTS

PORTION OF SECTION 3, TOWNSHIP 35N, RANGE 4E, W.M.



LEGEND

- WETLAND (DELINEATED)
- WETLAND (ESTIMATED)
- STREAM (DELINEATED)
- STREAM (ESTIMATED)
- BUFFER AREA
- (1) DATA SITES (S1 - S10)

Scale 1" = 100'

0 50 100 150 200

Wetland Resources, Inc.
Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance
9505 19th Avenue S.E. Suite 106 Everett,Washington 98208
Phone: (425) 337-3174
Fax: (425) 337-3045
Email: mailbox@wetlandresources.com

Critical Area Study Maps
Miles Sand and Gravel - Grip Rd
Unincorporated Skagit County

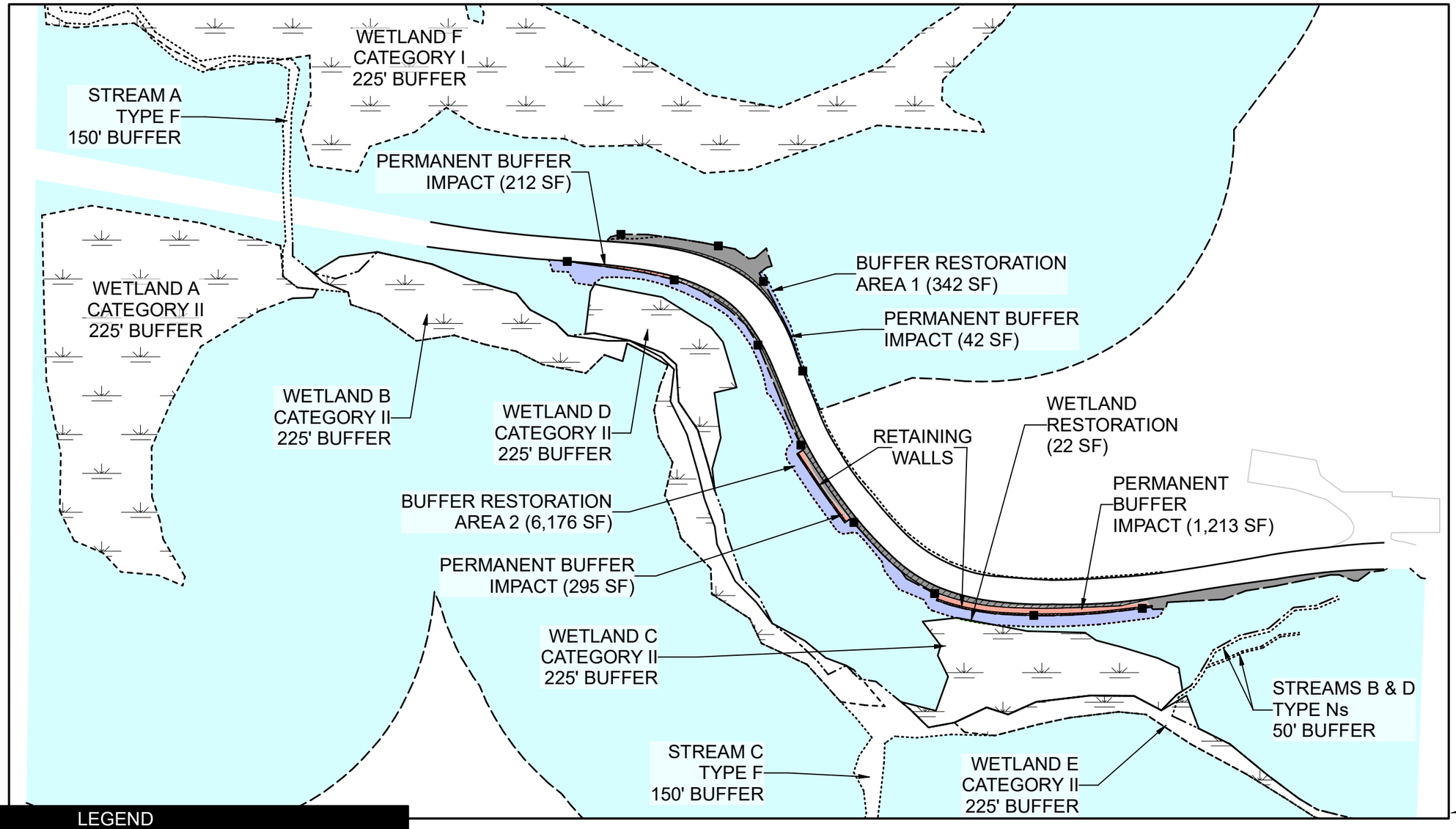
Miles Sand and Gravel
Attn. Brad Barton
400 Valley Avenue NE
Puyallup, WA 98372

Sheet 1/2
WRI #: 25267
Drawn by: EC
Date: 10/29/2025

CRITICAL AREA STUDY MAPS - IMPACTS AND RESTORATION PLAN

MILES SAND AND GRAVEL - GRIP RD IMPROVEMENTS

PORTION OF SECTION 3, TOWNSHIP 35N, RANGE 4E, W.M.



LEGEND

- WETLAND (DELINEATED)
- WETLAND (ESTIMATED)
- STREAM (DELINEATED)
- STREAM (ESTIMATED)
- UNIMPACTED BUFFER AREA
- CRITICAL AREAS MARKER
- PERMANENT BUFFER IMPACTS
- BUFFER RESTORATION
- WETLAND RESTORATION
- MODIFIED BUFFER
- PROP. ROAD EXPANSION

Scale 1" = 100'

0 50 100 150 200

Wetland Resources, Inc.
Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance
9505 19th Avenue S.E. Suite 106 Everett,Washington 98208
Phone: (425) 337-3174
Fax: (425) 337-3045
Email: mailbox@wetlandresources.com

Critical Area Study Maps
Miles Sand and Gravel - Grip Rd
Unincorporated Skagit County

Miles Sand and Gravel
Attn. Brad Barton
400 Valley Avenue NE
Puyallup, WA 98372

Sheet 2/2
WRI #: 25267
Drawn by: EC
Date: 11/4/2025

DRAINAGE REPORT

For
Grip Road
Sta. 23+00 - 30+50
Sedro-Wooley, WA 98284

May 1, 2026

Section 3, Township 35 North, Range 04 East WM

Miles Sand and Gravel
c/o Brad Barton
P.O. Box 280
Mount Vernon, WA 98273
(360) 933-1158

Semrau Engineering & Surveying, PLLC
2118 Riverside Drive, Suite 208
Mount Vernon, WA 98273
C/o John B Semrau, PE & PLS
360-424-9566

Job No. 5166

John B Semrau, PE & PLS

Digitally signed by John B Semrau, PE & PLS
DN: C=US, E=john@semrau.com, O="Semrau Engineering & Surveying, PLLC", CN="John B Semrau, PE & PLS"
Date: 2026.05.04 10:23:32-07'00'

Drainage Report
May 1, 2026

TABLE OF CONTENTS **PAGE**

1.0 Project Overview 3
1.1 Site Location 3
1.2 Vicinity Map 3
1.3 Scope of Work 3
2.0 Site Conditions 4
2.1 Existing Conditions 4
2.2 Existing Hydraulic Features 4
2.3 Threshold Discharge Areas 4
2.4 Soils 4
2.5 Existing Stormwater Discharge Point Inventory 4
2.6 Existing Utilities 5
3.0 Design Standards 5
3.2 Stormwater Management Guidelines
Minimum Requirements 5
3.3.1 MR1: Preparation of Stormwater Site Plans 5
3.3.2 MR2: Construction Stormwater Pollution Prevention Plan (SWPPP) 5
3.3.3 MR3: Source Control of Pollution 5
3.3.4 MR4: Maintaining the Natural Drainage System 6
3.3.5 MR5: Runoff treatment 6
3.3.6 MR6: Flow Control 6
3.3.7 MR7: Wetland Protection 7
3.3.9 MR9: Operation and Maintenance 7
4.0 Developed Conditions 7
6.0 Permits and Associated Reports 8
7.0 Inspection and Maintenance Summary 9

Appendices
A-1 Stormwater Design Documentation Spreadsheet
Figure I-3.1: Flow Chart for Determining Requirements for New Development
A-2 TDA Maps
Existing Site Conditions Map
Proposed Conditions Map
APPENDIX B – SWPPP
TESC Plan
APPENDIX C – Source Control BMPs
APPENDIX D – Construction Plans
APPENDIX E – SCS Soil Data
APPENDIX F– Geotechnical Report
APPENDIX G – WWHM Model

Drainage Report
May 1, 2026

1.0 Project Overview:

1.1 Site Location

This drainage report is for pavement widening along Grip Road, 0.43 miles east of the intersection of Grip Road and Prairie Road, in Skagit County, WA. Design stationing follows the as-built centerline and begins near the intersection with Prairie Road. The Project Area is defined by the start and end of construction/paving, from 23+00 to 30+50, running perpendicular to the existing & proposed right-of-way and including the entire R/W area bounded by those limits. Additional right-of-way is required to include the improvements.

1.2 Vicinity Map



1.3 Scope of Work

The project lies outside any city limits or urban growth areas. This report was prepared to comply with the 2019 WSDOT Highway Runoff Manual M 31-16.05. Miles Sand and Gravel has determined that the truck and pup combinations to be used for hauling gravel from the proposed Grip Road Mine can cross over the centerline or drive on the gravel shoulder of the existing roadway. Proposed widening and lane re-striping is being proposed to eliminate lane crossover. Due to the proposed new hard surface area being over 5,000 square feet, Minimum Requirements 1 through 9 of the SWMM will be addressed.

The project will include variable-width widening with a gravel shoulder from stations 23+00 to Sta. 30+50. The edge of the existing road will be sawcut, and the existing gravel shoulder will be replaced in widening areas. Retaining walls will be placed where necessary. Where retaining walls are necessary, a gravel shoulder will extend from the edge of the new pavement to the proposed retaining wall. The existing centerline stripe will be removed and repainted for a portion of the project.

2.0 Site Conditions

2.1 Existing Conditions

Skagit County iMAP aerial photos show the project area as cleared and active roadway from 1937 to 1969. To the north, P35278 is an undeveloped lot covered in wetland/forest, and P35718 is a single-family residential building on a forested lot. To the South, P35730 bounds the entire project area and is owned by Cougar Peak, LLC, and is undeveloped.

2.2 Existing Hydraulic Features

There are no road crossing culverts in the Project area. There is one driveway culvert in the north ditch near 24+80. The westerly curve is superelevated from approximately 24+00 to 26+00 and sheet flows to the southwest, dispersing through the forest and wetland to a tributary of Sweed Creek. Stormwater runoff from the North is conveyed in a roadside ditch, does not cross the road, and discharges to the north. The grade of the road reverses with the curve of the road. A portion of the superelevated roadway runoff from station 26+00 to approximately station 30+50 also drains to the northerly roadway ditch.

EXISTING CONDITIONS PROJECT AREA: 41,752 SF		**(0.958 Ac)**	
Woods Good Condition	19,863 SF	0.456	47.6%
Roadway (Impervious)	16,918 SF	0.388	40.5%
Gravel Shoulder (Impervious)	4,971 SF	0.114	11.9%

(Refer to Appendix A for a spreadsheet of existing and development conditions.)

2.3 Threshold Discharge Areas

Both runoff areas converge in an existing stream, less than ¼ mile downstream of the project area. This project has only one threshold discharge basin.

2.4 Soils

A web soil survey was done on the USDA Natural Resources Conservation Service website, including soil map and data for the project site. The results are listed below, and additional information can be found in Appendix D.

SCS Soil Info:

#68 –Hoogdal silt loam, 15 to 30 percent slopes
Hydrologic Group C/D
#124 –Skipopa silt loam, 0 to 3 percent slopes
Hydrologic Group D

The Hoogdal soil is silt loam over clay and is considered moderately well drained. The Skipopa soil is ashy silt loam over silty clay and is considered somewhat poorly drained. From the USDA mapping, very little of the site falls under the Skipopa silt loam complex. The majority of the site falls under the Hoogdal silt loam complex.

2.5 Existing Stormwater Discharge Point Inventory

There are two stormwater discharge points for the project area. A roadside ditch to the north, and sheet flow to wetlands to the south.

2.6 Existing Utilities

Two sets of overhead utility lines and poles run along the project area, but will have no meaningful impact on the project area drainage.

3.0 Design Standards

3.2 Stormwater Management Guidelines

Using the 2019 Stormwater Design Documentation Spreadsheet (Appendix A), this project is subject to Minimum requirements 1-9.

MINIMUM REQUIREMENTS

The New Development Flowchart Figure 3-1 – 3-3 (2019 WSDOT Highway Runoff Manual) is included in this report and has been evaluated for the new hard surfaces; therefore, Minimum requirements #1 through #9 apply to new and replaced hard surfaces and converted vegetation areas.

3-3.1 Stormwater Planning

The proposed project will exceed the 2,000 SF threshold for new, replaced, or new plus replaced hard surfaces. A site plan has been prepared. Existing drainage patterns have been maintained – runoff flows to the surrounding wetlands and stream through the use of appropriate BMPs.

3-3.2 Construction Stormwater Pollution Prevention (SWPPP)

The proposed project will result in 2,000 square feet or more of new plus replaced hard surface area, which will require the preparation of a Temporary Erosion and Sediment Control (TESC) plan and Stormwater Pollution Prevention Plan (SWPPP), which together are designed to meet the NPDES requirements. All new development and redevelopment shall comply with Construction SWPPP elements #1 through #13. See SWPPP located in Appendix B for more details.

3-3.3 Source Control of Pollutants

All known, available, and reasonable Source Control BMPs must be applied to all projects, with the appropriate source controls being selected, designed, and maintained in accordance with the Stormwater Management Manual. The intent of Source Control BMPs is to prevent stormwater from coming into contact with pollutants. Operational Source control BMPs considered in this project include:

BMP S101: BMPs for formation of a Pollution Prevention team

BMP S102: BMPs for Preventive Maintenance and Good Housekeeping
BMP S104: BMPs for Spill Prevention and Cleanup
BMP S105: BMPs for Employee Training
BMP S106: BMPs for Inspections
BMP S107: BMPs for Record Keeping
BMP S406: BMPs for Streets and Highways. These are recommendations for preventing or correcting illicit discharges to stormwater or surface water on the jobsite
BMP S407: BMPs for Dust Control at Disturbed Land Areas and Unpaved Roadways and Parking Lots. This will minimize dust generation during the construction process.
BMP S416: BMOs for Maintenance of Roadside Ditches. Existing ditch maintenance and sediment erosion control during construction.

The full text for each of these BMPs is included in this Drainage Report

3-3.4 Maintaining the Natural Drainage System

The proposed plan preserves the natural drainage system. The site presently drains off either side of the road, depending on the superelevation – north drainage to a roadside ditch, and south drainage sheet flows off the shoulder through the wetlands, both joining up in a small natural channel that flows into Swede Creek, which in turn flows into the Samish River. Runoff from proposed site improvements will continue to disperse and flow to Swede Creek through the existing forest, wetlands, and channels. The site layout has been designed to minimize impacts and preserve the natural drainage system. No runoff is expected that would cause an adverse impact on downstream waters or downgradient properties.

3-3.5 Runoff Treatment

Full Dispersion – infeasible – the eastern curve discharging to the north is concentrated in roadside swale, there are no opportunities for full dispersion.

Permeable Pavement – infeasible – soils do not accommodate infiltration, permeable pavement not realistic option for truck traffic.

Bioretention – Bioretention can be used on this project for water quality and flow control.

3-3.6 Flow Control

The project adds more than 5,000 SF of pollution-generating hard surfaces, PGHS, so runoff treatment will be required. Stormwater from the eastern curve flows north to a roadside ditch which will have check dams installed. This will be modeled as a trapezoidal pond in the WWHM model. Stormwater from the eastern curve will be directed to a bioretention facility

located on the south side of the road and sized to provide runoff treatment for the project.

3-3.7 Wetlands Protection

Projects that require Minimum Requirement #7 must be reviewed to determine if Flow Control BMPs are required for the total discharge area (TDA). As this project proposes more than 5,000 SF of effective impervious surfaces, flow control BMPs are required here. Runoff from roadway surfaces will be directed to either the northern roadside swale or to bioretention facility along the southern part of the western curve. WWHM analyses show that we can indeed provide adequate stream protection.

Adjacent wetlands are category 2-4. According to flowchart project will be subject to General Protection, Protection from Pollutants, and Wetland Hydroperiod Protection (Method 1)

General Protection will be provided by wetland buffer maintenance, avoiding compaction and disturbance in the wetland and it's buffer, maintaining natural areas in the wetland and adjacent, runoff treatment and flow control BMPs. Bioretention BMP and trapezoidal pond modeling provide adequate flow dispersal. Underdrain will be discharged through a flow spreader.

Wetland protection from pollutants will be provided by proposed bioretention facilities, roadside swale/check dams and source control BMPs.

Critical areas study reveals depressional and riverine Class 2 wetlands adjacent to project site. For wetland Hydroperiod Protection, this will require a minimum of one year of monitoring followed by continuous simulation modeling of the wetland stage.

3-3.9 Operation and Maintenance

The 2019 Storm Water manual lists maintenance recommendations for subgrade stormwater storage systems and bioretention cells in each BMP's text and states the maintenance standard in Volume V, Appendix A, with inspection frequency and actions required. The Table V Maintenance Standard is included in this report, in Appendix E.

4.0 Developed Conditions

The development will include variable-width widening from station. 23+15 to Sta. 30+45 to build a 34 foot wide roadway section from sta 24+00 to 29+23. The edge of the existing road will be sawcut, and the existing gravel shoulder will be replaced in widening areas. A Soldier Pile retaining wall will be placed on the westerly side to

retain the road widening fill to keep it out of the adjoining wetland area. Where retaining walls are necessary, a gravel shoulder will extend from the edge of the new pavement to the proposed retaining wall. The existing CL stripe will be removed and repainted.

A summary of the proposed surface areas can be seen in the table below. Refer to Appendix A for the spreadsheet of existing and development conditions.

DEVELOPED CONDITION	**PARCEL AREA:**	**41,752 SF**	**0.958 Ac)**
Woods Good Condition	13,852 SF	0.318	33.2%
Existing Roadway to remain	16,633 SF	0.382	39.8%
Gravel Shoulder to remain	1,449 SF	0.033	3.5%
Proposed Pavement	7,085 SF	0.163	17.0%
Proposed Gravel Shoulder	2,709 SF	0.062	6.5%

To mitigate the runoff through the westerly curve, a bioretention facility was selected. The runoff can be collected by adding a curb on the inside of the bend. The bioretention facility was assumed to require underdrains, and a preliminary size was determined through the autopond feature of WWHM. This bioretention can be designed to discharge to the south into the stream buffer or to the west into the north-side roadway ditch.

Right of way is not available on the north side of the roadway, so it was assumed the easterly ditch line would continue to drain northerly. The ditch is too steep for BMPs such as CAVS, so rock check dams were selected to help slow and retain a portion of the runoff. A trapezoidal pond was selected to approximate the storage capacity that a series of rock check dams can provide. If this is the final selected BMP for this side of the roadway, these can be individually modeled in WWHM.

6.0 Permits and Associated Reports

6.2 Permits/Approvals

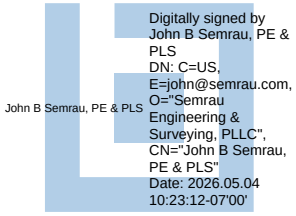
The project will require a grading permit, a critical areas review and approval, and a right-of-way permit for the sitework. A building permit will be required for the construction of the retaining walls.

6.3 Easements

Right-of-way taking is proposed along the southern edge of the project area.

7.0 Inspection and Maintenance Summary

All temporary and permanent erosion and sediment control BMPs shall be maintained and repaired as needed to assure continued performance of their intended function. Maintenance and repair shall be conducted in accordance with each particular BMP specification. Visual monitoring of the BMPs will be conducted at least once every calendar week and within 24 hours of any stormwater or non-stormwater discharge from the site.



APPENDIX A-1

STORMWATER DESIGN DOCUMENTATION SPREADSHEET

Project Title:	**Grip Road Widening**
WSDOT Region:	Northwest
WIN:	
PIN(s):	
Design Manual Used:	Highway Runoff Manual
Manual Publication Year:	2019
Job Number:	5166

2019 HRM Spreadsheet Version 6.3

Is this project in western Washington? **YES**

Existing Impervious Surface

Total Project Area (ft^2)	21,889
acres =	0.503

New Impervious Surface

Total Project Area (ft^2)	6,177
acres =	0.142

Conversion of Native Vegetation to Lawn or Landscaped

Total Project Area (ft^2)	0
acres =	0.000

Conversion of Native Vegetation to Pasture

Total Project Area (ft^2)	0
acres =	0.000

Replaced Impervious Surface

Total Project Area (ft^2)	3,358
acres =	0.077

Land Disturbing Activity

Total Project Area (ft^2)	41,752
acres =	0.958

Is this project a "non-road-related" project? (See HRM Glossary for definition) **NO**

Does any part of the project drain to Puget Sound AND does any TDA in the project exceed runoff treatment or flow control thresholds? **NO**

Description	Project Area	Threshold Area Triggers	HRM Figure 3-1 Step #	Decision Response	HRM Minimum Requirements
New and replace impervious surfaces added to Project	9,535	≥ 2,000 ft^2	2	YES	Apply MR 1-4 to the new and replaced impervious surfaces and land disturbed on the Project
Land disturbing activity for the Project	41,752	≥ 7,000 ft^2	2	YES	Apply MR 1-4 to new and replaced impervious surfaces and land disturbed on the Project
New impervious surface added to Project	6,177	≥ 5,000 ft^2	3	YES	Apply MR 6-9 for new impervious surfaces and converted pervious surfaces on the Project
Conversion of native vegetation to lawn or landscaped area	0	≥ 32,670 ft^2 (3/4 acres)	3	NO	Threshold does not apply since Project already exceeds new impervious surface threshold
Conversion of native vegetation to pasture	0	≥ 108,900 ft^2 (2.5 acres)	3	NO	Threshold does not apply since Project already exceeds new impervious surface threshold
New impervious surfaces add 50% or more to the existing impervious surfaces within the Project limit	28%	New impervious ≥ 5,000 sq. ft AND (New Impervious surface) ≥ 1/2 (Exist Impervious surface)	4	NO	DO NOT apply MR 6-9 to replaced impervious surfaces on Project
For non-road-related Projects, proposed value of improvements greater than replacement value	See HRM Figure 3-1 for complete threshold. Non-road-related project generally refers to rest area, ferry terminals, and maintenance facility Projects.	(New impervious + replaced impervious) ≥ 5,000 sq. ft AND (Proposed value of improvements) ≥ 1/2 (replacement value of existing site)	4	N/A	Check road-related project threshold above

Summary of All Minimum Requirements:

Apply MR 1-4 to New and Replaced impervious surfaces and land disturbed on the Project
Apply MR 6-9 to New impervious surfaces and Converted pervious surfaces on Project
Do not apply Minimum Requirements 6-9 to the replaced impervious surfaces on Project
Complete the Level of Retrofit Tab
Go To the 'Step 5 and 6' tab

MR #	Minimum Requirements	MR #	Minimum Requirements
1	Stormwater Planning	6	Flow Control (Quantity)
2	Construction Stormwater Pollution Prevention	7	Wetlands Protection
3	Source Control of Pollutants	8	Incorporating Approved Basin Plans into Stormwater Management
4	Maintaining the Natural Drainage System	9	Operation and Maintenance
5	Runoff Treatment (quality)		

Project Title: Grip Road Widening
WSDOT Region: Northwest
WIN:
PIN(s):
Design Manual Used: Highway Runoff Manual
Manual Publication Year: 2019
Job Number: 5166

2019 HRM Spreadsheet Version 6.3

Is this project in western Washington? YES

Existing PGIS

Total Project Area (ft^2)	21,889
acres =	0.503

New PGIS

Total Project Area (ft^2)	9,794
acres =	0.225

Conversion of Native Vegetation to PGPS

Total Project Area (ft^2)	6,253
acres =	0.144

Replaced PGIS

Total Project Area (ft^2)	3,358
acres =	0.077

Is this project a "non-road-related" project? (See HRM Glossary for definition) NO

Description	Project Area (ft^2)	Threshold Area (ft^2)	HRM Figure 3-2 Step #	Decision Response	HRM Minimum Requirements
New PGIS added to Project	9,794	≥ 5,000	5	YES	Apply MR 5 for new PGIS and converted PGPS on the Project
Conversion of Native Vegetation to PGPS	6,253	≥ 32,670 (3/4 acres)	5	NO	Threshold does not apply since Project already exceeds new PGIS threshold
New PGIS add 50% or more to the existing PGIS within the Project limit	45%	New PGIS ≥ 5,000 AND (New PGIS) ≥ 1/2 (Exist PGIS)	6	NO	DO NOT apply MR 5 to the replaced PGIS on the Project
For non-road-related Projects, proposed value of improvements greater than replacement value	See HRM Figure 3-1 for complete threshold. Non-road-related Project generally refers to rest area, ferry terminals, and maintenance facility projects.	(New PGIS + replaced PGIS) ≥ 5,000 AND (Proposed value of improvements) ≥ 1/2 (replacement value of existing site)	6	N/A	Check road-related project threshold above

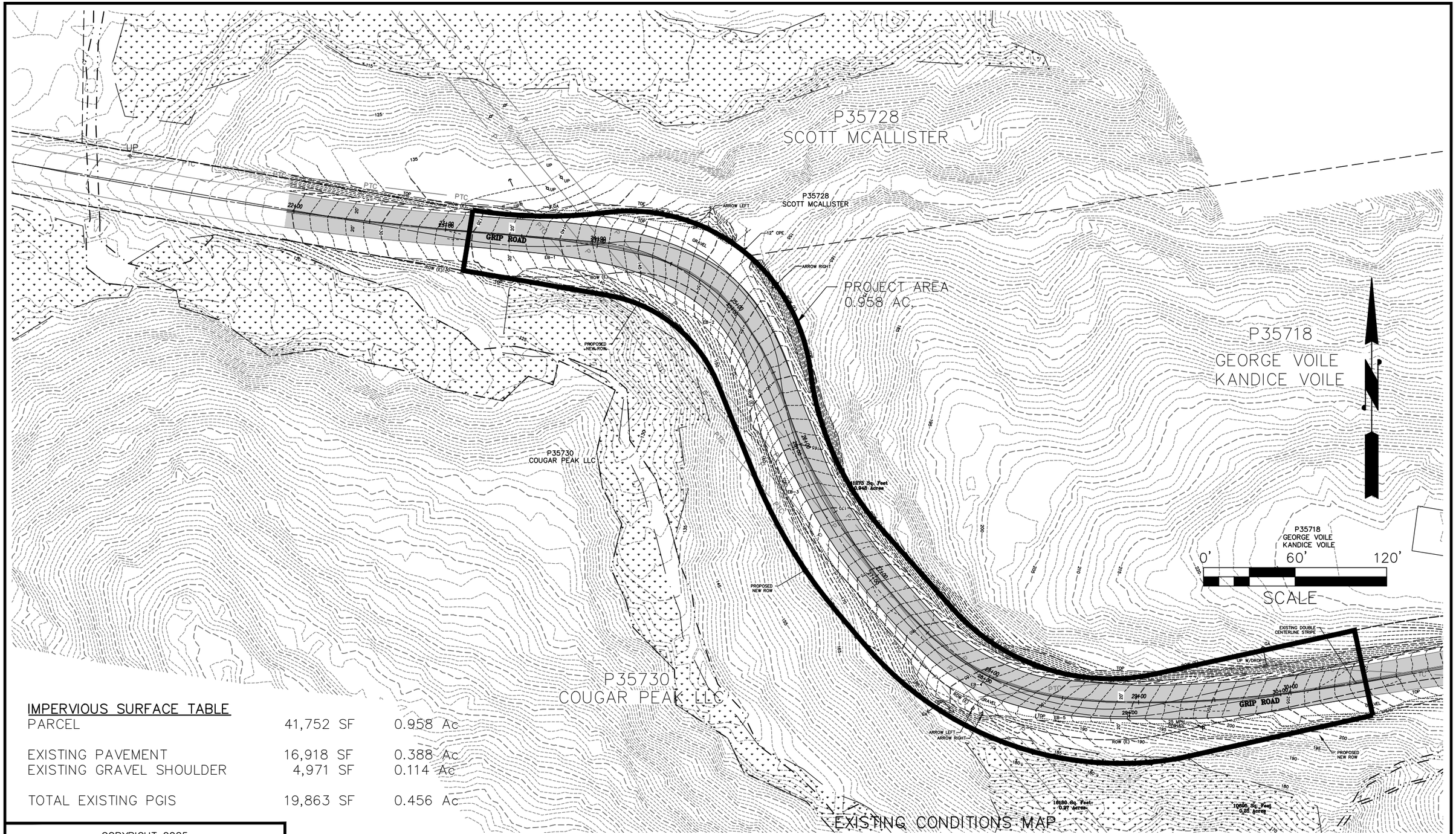
Summary of All Minimum Requirements:

Apply MR 5 to New PGIS and converted PGPS the on Project
Do not apply MR 5 to Replaced PGIS on Project
Complete the Level of Retrofit Tab
Go to Step 7 RT tab

MR #	Minimum Requirements	MR #	Minimum Requirements
1	Stormwater Planning	6	Flow Control (Quantity)
2	Construction Stormwater Pollution Prevention	7	Wetlands Protection
3	Source Control of Pollutants	8	Incorporating Approved Basin Plans into Stormwater Management
4	Maintaining the Natural Drainage System	9	Operation and Maintenance
5	Runoff Treatment (quality)		

APPENDIX A-2

TDA MAPS



IMPERVIOUS SURFACE TABLE

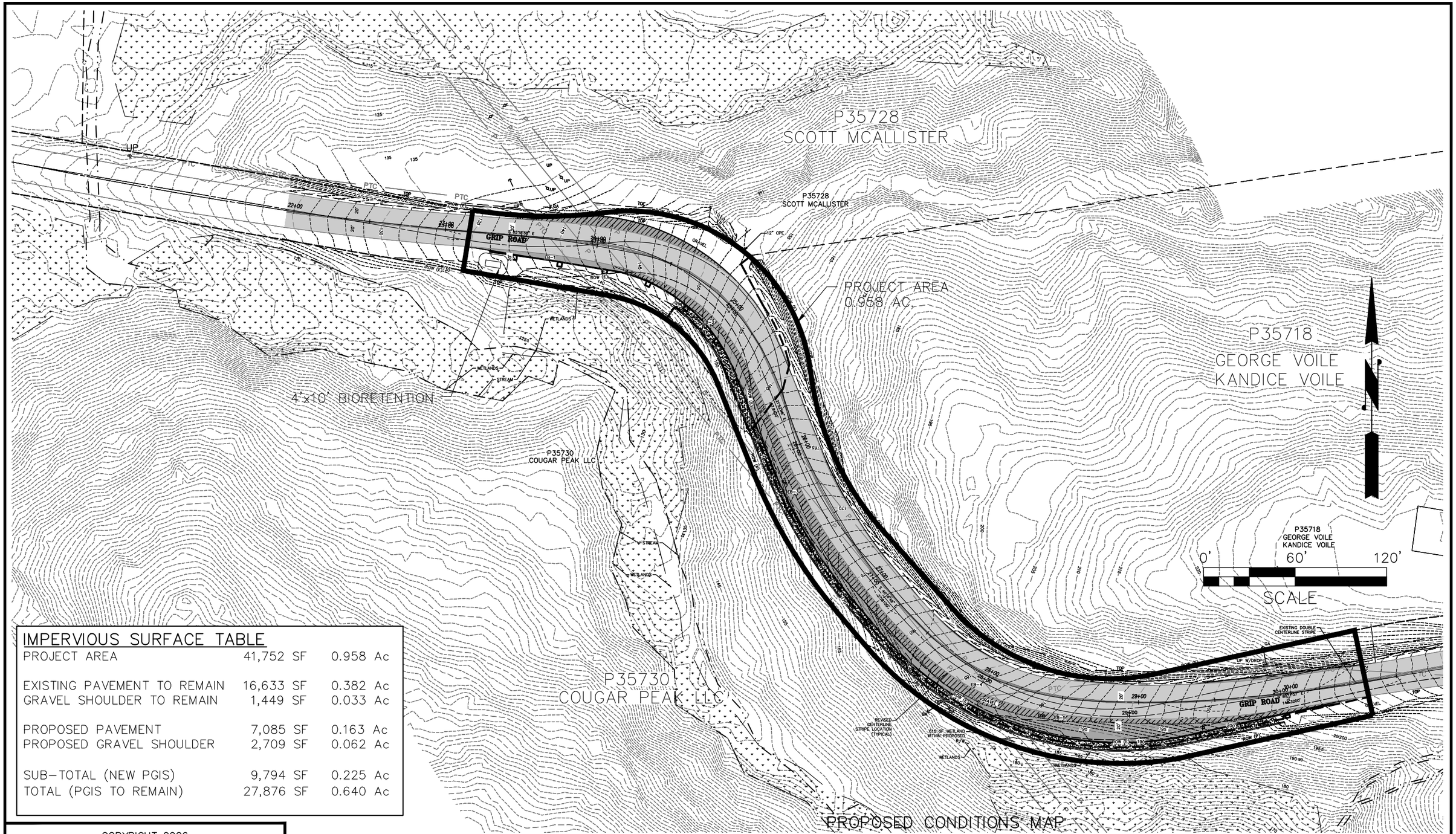
PARCEL	41,752 SF	0.958 Ac
EXISTING PAVEMENT	16,918 SF	0.388 Ac
EXISTING GRAVEL SHOULDER	4,971 SF	0.114 Ac
TOTAL EXISTING PGIS	19,863 SF	0.456 Ac

EXISTING CONDITIONS MAP

COPYRIGHT 2025

SEMRAU ENGINEERING & SURVEYING, PLLC
CIVIL ENGINEERING • LAND SURVEYING • PLANNING
2118 RIVERSIDE DRIVE – SUITE 209
MOUNT VERNON, WA 98273
360-424-9566

NAME: MILES SAND & GRAVEL	ADDRESS: 400 VALLEY AVE. N.E. PUYALLUP, WA 98372	SCALE HORZ: 1" = 60' SCALE VERT: N/A	DATE: 3/26/26
			DRAWING: 5166DR-EX3.DWG
SITE ADDRESS: GRIP ROAD STA. 23+00-30+50	PROPERTY ID: SECTION 3, T. 35 N., R. 4 E., W.M. SKAGIT COUNTY, WASHINGTON	NOTE: IF THIS SHEET IS LESS THAN 11"x 17" THEN SHEET HAS BEEN REDUCED	JOB NO.: 5166
			SHEET: 1



PROPOSED CONDITIONS MAP

IMPERVIOUS SURFACE TABLE

PROJECT AREA	41,752 SF	0.958 Ac
EXISTING PAVEMENT TO REMAIN	16,633 SF	0.382 Ac
GRAVEL SHOULDER TO REMAIN	1,449 SF	0.033 Ac
PROPOSED PAVEMENT	7,085 SF	0.163 Ac
PROPOSED GRAVEL SHOULDER	2,709 SF	0.062 Ac
SUB-TOTAL (NEW PGIS)	9,794 SF	0.225 Ac
TOTAL (PGIS TO REMAIN)	27,876 SF	0.640 Ac

COPYRIGHT 2026

SEMRAU ENGINEERING & SURVEYING, PLLC
CIVIL ENGINEERING • LAND SURVEYING • PLANNING
2118 RIVERSIDE DRIVE – SUITE 209
MOUNT VERNON, WA 98273
360-424-9566

NAME: MILES SAND & GRAVEL	ADDRESS: 400 VALLEY AVE. N.E. PUYALLUP, WA 98372	SCALE HORZ: 1" = 60' SCALE VERT: N/A	DATE: 5/01/2026
SITE ADDRESS: GRIP ROAD STA. 23+00–30+50	PROPERTY ID: SECTION 3, T. 35 N., R. 4 E., W.M. SKAGIT COUNTY, WASHINGTON	NOTE: IF THIS SHEET IS LESS THAN 11"x 17" THEN SHEET HAS BEEN REDUCED	DRAWING: 5166DR–PROP3.DWG
			JOB NO.: 5166
			SHEET: 1

APPENDIX B

SWPPP

SEMRAU ENGINEERING & SURVEYING, P.L.L.C.

Construction Stormwater Pollution Prevention Plan

For

Grip Road Widening

Station 23+00 to Sta. 30+50

Miles Sand and Gravel
c/o Brad Barton
P.O. Box 280
Mount Vernon, WA 98273
(360) 933-1158

SES Job No: 5166

Date	Version
-----	First Submission

Prepared For:

Washington State Department of Ecology
Northwest Regional Office
3190 - 160th Avenue SE
Bellevue, WA 98008-5452
425-649-7000

Prepared By:

Michael Jensen, EIT
John Semrau, PE & PLS #28626
Semrau Engineering and Surveying, PLLC

2118 Riverside Drive, Suite 209, Mount Vernon, WA 98273
(360) 424-9566 • Fax (360) 424-6222

Table of Contents

1.0 INTRODUCTION 2
2.0 SITE DESCRIPTION 2
2.1 Existing Conditions 2
2.2 Site Soils 3
2.3 Proposed Construction Activities 3
3.0 CONSTRUCTION STORMWATER BMPS 3
3.1 The 13 BMP Elements 3
3.1.1 Element #1 – Mark Clearing Limits 3
3.1.2 Element #2 – Establish Construction Access 4
3.1.3 Element #3 – Control Flow Rates 4
3.1.4 Element #4 – Install Sediment Controls 4
3.1.5 Element #5 – Stabilize Soils 4
3.1.6 Element #6 – Protect Slopes 5
3.1.7 Element #7 – Protection Drain Inlets 5
3.1.8 Element #8 – Stabilize Channels and Outlets 5
3.1.9 Element #9 – Control Pollutants 5
3.1.10 Element #10 – Control Dewatering 5
3.1.11 Element #11 – Maintain BMPs 6
3.1.12 Element #12 – Manage the Project 6
3.1.13 Element #13 – Protect Low Impact Development BMPs 6
APPENDIX D – CONSTRUCTION PLANS
APPENDIX E – SCS SOIL REPORT

Introduction

This Construction Stormwater Pollution Prevention Plan is for pavement widening along Grip Road, Sta. 23+00 – 30+50 in Skagit County, WA. The Project Area is defined by the start and end of construction/paving, running perpendicular to the existing & proposed right-of-way and including the entire R/W area bounded by those limits. Widening is proposed due to lane crossover from large trucks.

Construction activities for the project will include 1) sawcut of the existing pavement adjacent to widening, 2) excavation and removal of soil in widening areas to allow for full depth paving , 3) compacting imported fill, 4) construction of retaining walls, and 4) removal of temporary erosion and sediment control devices once vegetative cover is established.

The purpose of the SWPPP is to describe the proposed construction activities and all temporary and permanent erosion and sediment control [TESC] measures, pollution prevention measures, inspection/monitoring activities, and recordkeeping that will be implemented during a maintenance and/or construction project. The objectives of the SWPPP are to:

1. Implement Best Management Practices [BMPs] to prevent erosion and sedimentation, and to identify, reduce, eliminate or prevent stormwater contamination and water pollution from construction activity.

2. Prevent violations of surface water quality, ground water quality, or sediment management standards.

3. Prevent adverse water quality impacts including impacts on beneficial uses of the receiving water by controlling peak flow rates and volumes of stormwater runoff.

This Construction SWPPP was prepared based on the requirements set forth in the 2019 WSDOT Highway Runoff Manual (M 31-16.05).

Site Description

The project area is an existing roadway (approximate width 24'). Access to the project site will be from the existing roadway.

Existing Conditions

The project area consists of a moderately sloped (approximately 10%) roadway with steep embankment slopes. Stormwater runoff from the North is captured in a roadside channel and does not cross the road but joins with the superelevated roadway runoff from station 30+50 to approximately station 26+00. The grade of the road flips with the curve of the road to drain toward the south from station 26+00 to station 23+00 and disperses across existing critical areas/wetlands.

Site Soils

A web soil survey was completed on the USDA Natural Resources Conservation Service website including soil map and data for the project site. The site soils are classified as predominately Hoogdal Silt-Loam, being silt loam over clay with 15 to 30 percent slopes. Hydrologic group is group C/D. This soil is moderately well drained and consists of silt loam over clay. The site may also contain also contain Skipopa Silt Loam, being ashy silt loam over silty clay, Hydrologic Group D, which is somewhat poorly drained.

Proposed Construction Activities

Stormwater from this development will meet the requirements of the 2019 WSDOT Highway Runoff manual. Minimum Requirements 1 through 4 apply.

Construction activities may include:

Stake the construction limits and install BMPs, if necessary.

Landscape and mulch all disturbed areas.

After vegetation has been reestablished, remove temporary erosion and sedimentation control measures.

Construction Stormwater BMPs

The 13 BMP Elements

Element #1 – Mark Clearing Limits

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. All sensitive areas and their buffers, shall be clearly delineated, both in the field and on the plans. In general, natural vegetation and native topsoil shall be retained in an undisturbed state to the maximum extent possible. The BMPs relevant to marking the clearing limits that will be applied may include:

Preserve natural vegetation when possible (BMP C101) and leave a buffer zone (BMP C102).

If a minimum of 25 feet of natural vegetation does not exist, then install one of these 2 BMPs.

Install Silt Fence (BMP C233) per WSDOT Standard Plan I-30.15-

Install wattles (BMP C235) per WSDOT Standard Plan I-30.30-

Element #2 – Establish Construction Access

Construction access or activities occurring on unpaved areas shall be minimized. Where necessary, access points shall be stabilized to minimize the tracking of sediment onto public roads. Wheel

washing, street sweeping, and street cleaning shall be employed to prevent sediment from entering state waters. All wash wastewater shall be controlled on site. The specific BMPs related to establishing construction access to be used may include:

If needed, install wheel washing facility (BMP C106) at appropriate exit location for haul vehicles.

As necessary, clean public roads thoroughly if sediment is tracked off-site.

Element #3 – Control Flow Rates

Sites need to protect downstream properties from erosion and associated discharge of turbid waters due to increases in the velocity and peak flow rate of stormwater. Check dams will be installed in the existing northern earthen swale to slow runoff and allow sedimentation. Wattles will be installed along the project area perimeter to the south to slow flow and prevent erosion of banks outside existing wetlands.

Install Check dams (BMP C207)

Element #4 – Install Sediment Controls

All stormwater runoff from disturbed areas shall disperse into native vegetation. The specific BMPs to be used for controlling sediment may include:

Silt fence and/or straw wattles installed around the construction area as needed.

Maintenance of silt fencing and straw wattles throughout the construction period until vegetation has been reestablished.

Maintenance of vegetative buffers.

Element #5 – Stabilize Soils

Exposed and unworked soils shall be stabilized with the application of effective BMPs to prevent erosion throughout the life of the construction project. The specific BMPs for soil stabilization that may be used include:

Scheduled construction activities will be between June 1st and the end of October.

No soils can remain exposed for more than 2 days from October 1 to April 30 or longer than 7 days the rest of the year.

Exposed soils that will be unworked for more than 7 days shall be protected from erosion forces.

Element #6 – Protect Slopes

Slopes on the roadway embankments are steep but well established in the existing condition. Any impact to these slopes will be designed, constructed, and protected in a manner than minimizes erosion.. The following specific BMPs may be used to protect slopes:

Check Dams (BMP C207)

Silt fence (BMP C233)

Wattles (BMP C235)

Element #7 – Protection Drain Inlets

There are no existing drain inlets in the project area, nor are any proposed. The existing driveway culvert on the north side swale will be protected by:

Check Dams (BMP C207)

Element #8 – Stabilize Channels and Outlets

The existing driveway culvert on the north side swale will be protected by:

Check Dams (BMP C207)

Element #9 – Control Pollutants

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 water, stormwater or groundwater. Good housekeeping and preventative measures will be taken to ensure that the site will be kept clean, well-organized, and free of debris. Appropriate construction BMPs will be used for concrete handling, Saw cutting, and concrete washout. If required, BMPs to be implemented to control specific sources of pollutants are discussed below.

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.
- 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.

Element #10 – Control Dewatering

There is no proposed dewatering as part of construction activities on the project site.

Element #11 – Maintain BMPs

All temporary and permanent erosion and sediment control BMPs shall be maintained and repaired as needed to assure continued performance of their intended function. Maintenance and repair shall be conducted in accordance with each particular BMP specification. Visual monitoring of the BMPs will be conducted at least once every calendar week and within 24 hours of any stormwater or non-stormwater discharge from the site.

All temporary erosion and sediment control BMPs shall be removed within 30 days after the final site stabilization is achieved or after the temporary BMPs are no longer needed. Trapped sediment shall be removed or stabilized on site. Disturbed soil resulting from removal of BMPs or vegetation shall be permanently stabilized.

Element #12 – Manage the Project

Erosion and sediment control BMPs for this project have been designed based on the following principles:

Design the project to fit the existing topography, soils, and drainage patterns.

Schedule major earthwork during the dry season.

Schedule work in stages.

Plan and monitor the project to provide for changes in the erosion and sediment control BMPs whenever 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.

Emphasize erosion control rather than sediment control.

Minimize the extent and duration of the area exposed.

Keep runoff velocities low.

Retain sediment on site.

Thoroughly monitor site and maintain all ESC measures.

Element #13 – Protect Low Impact Development BMPs

No Low Impact Development BMPs are proposed for the project area.

APPENDIX C

SOURCE CONTROL BMPS

IV-1 Source Control BMPs Applicable to All Sites

S101 BMPs for Formation of a Pollution Prevention Team

The pollution prevention team should be responsible for implementing and maintaining all BMPs and treatment for the site. This team should be able to address any corrective actions needed on site to mitigate potential stormwater contamination. The team members should:

- Consist of those people who are familiar with the facility and its operations.
- Possess the knowledge and skills to assess conditions and activities that could impact stormwater quality at your facility, and who can evaluate the effectiveness of control measures.
- Assign pollution prevention team staff to be on duty on a daily basis to cover applicable permittee facilities when those facilities are in operation.
- Have the primary responsibility for developing and overseeing facility activities necessary to comply with stormwater requirements.
- Have access to all applicable permit, monitoring, SWPPP, and other records.
- Be trained in the operation, maintenance and inspections of all BMPs and reporting procedures.
- Establish responsibilities for inspections, operation, maintenance, and emergencies.
- Regularly meet to review overall facility operations and BMP effectiveness.

S102 BMPs for Preventive Maintenance and Good Housekeeping

Preventive maintenance and good housekeeping practices reduce the potential for stormwater to come into contact with pollutants and can reduce maintenance intervals for the drainage system and sewer system.

Applicable BMPs:

- Prevent the discharge of unpermitted liquid or solid wastes, process wastewater, and sewage to groundwater or surface water, or to storm drains that discharge to surface water, or to the ground. Conduct all oily parts cleaning, steam cleaning, or pressure washing of equipment or containers inside a building, or on an impervious contained area, such as a concrete pad. Direct contaminated stormwater from such an area to a sanitary sewer where allowed by local sewer authority, or to other approved treatment.

- Promptly contain and clean up solid and liquid pollutant leaks and spills including oils, solvents, fuels, and dust from manufacturing operations on any exposed soil, vegetation, or paved area.
- If a contaminated surface must be pressure washed, collect the resulting washwater for proper disposal (usually involves plugging storm drains or otherwise preventing discharge, and pumping or vactoring up washwater for discharge to sanitary sewer or for vactor truck transport to a wastewater treatment plant for disposal).
- Do not hose down pollutants from any area to the ground, storm drains, conveyance ditches, or receiving water. Convey pollutants before discharge to a treatment system approved by the local jurisdiction.
- Sweep all appropriate surfaces with vacuum sweepers quarterly, or more frequently as needed, for the collection and disposal of dust and debris that could contaminate storm-water. Use mechanical sweepers, and manual sweeping as necessary to access areas that a vacuum sweeper can't reach to ensure that all surface contaminants are routinely removed.
- Do not pave over contaminated soil unless it has been determined that groundwater has not been and will not be contaminated by the soil. Call Ecology for assistance.
- Construct impervious areas that are compatible with the materials handled. Portland cement concrete, asphalt, or equivalent material may be considered.
- Use drip pans to collect leaks and spills from industrial/commercial equipment such as cranes at ship/boat building and repair facilities, log stackers, industrial parts, and trucks and other vehicles stored outside.
- At industrial and commercial facilities, drain oil and fuel filters before disposal. Discard empty oil and fuel filters, oily rags, and other oily solid waste into appropriately closed and properly labeled containers, and in compliance with the Uniform Fire Code or International Building Code.
- For the storage of liquids, use containers such as steel and plastic drums, that are rigid and durable, corrosion resistant to the weather and fluid content, non-absorbent, water tight, rodent-proof, and equipped with a close fitting cover.
- For the temporary storage of solid wastes contaminated with liquids or other potential pol-luted materials use dumpsters, garbage cans, drums, and comparable containers, which are durable, corrosion resistant, non-absorbent, non-leaking, and equipped with either a solid cover or screen cover to prevent littering. If covered with a screen, the container must be stored under a roof or other form of adequate cover.
- Where exposed to stormwater, use containers, piping, tubing, pumps, fittings, and valves that are appropriate for their intended use and for the contained liquid.
- Clean oils, debris, sludge, etc. from all stormwater BMPs regularly, including catch basins, settling/detention basins, oil/water separators, boomed areas, and conveyance systems, to prevent the contamination of stormwater. Refer to Ecology Requirements for Generators of Dangerous Wastes in I-2.17 Other Regulations and Programs for references to assist in

handling potentially dangerous waste.

- Promptly repair or replace all substantially cracked or otherwise damaged paved secondary containment, high-intensity parking, and any other contributing drainage areas, subjected to pollutant material leaks or spills. Promptly repair or replace all leaking connections, pipes, hoses, valves, etc., that can contaminate stormwater.
- Do not connect floor drains in potential pollutant source areas to storm drains, receiving waters, or to the ground.

Recommended BMPs:

- Where feasible, store potential stormwater pollutant materials inside a building or under a cover and/or containment.
- Minimize use of toxic cleaning solvents, such as chlorinated solvents, and other toxic chemicals.
- Use environmentally safe raw materials, products, additives, etc., such as substitutes for zinc used in rubber production.
- Recycle waste materials such as solvents, coolants, oils, degreasers, and batteries to the maximum extent feasible. Contact Ecology's *Hazardous Waste & Toxics Reduction Program* at the following web address, or your local jurisdiction, for recommendations on recycling or disposal of vehicle waste liquids and other waste materials:

  https://ecology.wa.gov/About-us/Get-to-know-us/Our-Programs/Hazardous-Waste-Toxics-Reduction
- Empty drip pans immediately after a spill or leak is collected in an uncovered area.
- Stencil warning signs at catch basins and drains, e.g., “Dump no waste – Drains to stream”. See S442 BMPs for Labeling Storm Drain Inlets On Your Property.
- Use solid absorbents, e.g., clay and peat absorbents and rags for cleanup of liquid spills/leaks, where practicable.
- Promptly repair/replace/reseal damaged paved areas at industrial facilities.
- Recycle materials, such as oils, solvents, and wood waste, to the maximum extent practicable.

Note: Evidence of stormwater contamination can include the presence of visible sheen, color, or turbidity in the runoff, or present or historical operational problems at the facility. Operators can use simple pH tests, for example with litmus or pH paper. These tests can screen for high or low pH levels (anything outside the 6.5 to 8.5 range) due to contamination of stormwater.

S104 BMPs for Spill Prevention and Cleanup

Description of Pollutant Sources: Spills and leaks can damage public infrastructure, interfere with sewage treatment, and cause a threat to human health or the environment. Spills are often preventable if appropriate chemical and waste handling techniques are practiced effectively and

the spill response plan is immediately implemented. Additional spill control requirements may be required based on the specific activity occurring on site.

Applicable BMPs:

Spill Prevention

- Clearly label or mark all containers that contain potential pollutants.
- Store and transport liquid materials in appropriate containers with tight-fitting lids.
- Place drip pans underneath all containers, fittings, valves, and where materials are likely to spill or leak.
- Use tarpaulins, ground cloths, or drip pans in areas where materials are mixed, carried, and applied to capture any spilled materials.
- Train employees on the safe techniques for handling materials used on the site and to check for leaks and spills.

Spill Plan

- Develop and implement a spill plan and update it annually or whenever there is a change in activities or staff responsible for spill cleanup. Post a written summary of the plan at areas with a high potential for spills, such as loading docks, product storage areas, waste storage areas, and near a phone. The spill plan may need to be posted at multiple locations. Describe the facility, including the owner's name, address, and telephone number; the nature of the facility activity; and the general types of chemicals used at the facility.
- Designate spill response employees to be on-site during business activities. Provide a current list of the names and telephone numbers (home and office) of designated spill response employees who are responsible for implementing the spill plan.
- Provide a site plan showing the locations of storage areas for chemicals, inlets/catch basins, spill kits and other relevant infrastructure or materials information.
- Describe the emergency cleanup and disposal procedures. Note the location of all spill kits in the spill plan.
- List the names and telephone numbers of public agencies to contact in the event of a spill.

Spill Cleanup Kits

- Store all cleanup kits near areas with a high potential for spills so that they are easily accessible in the event of a spill. The contents of the spill kit must be appropriate to the types and quantities of materials stored or otherwise used at the facility, and refilled when the materials are used. Spill kits must be located within 25 feet of all fueling/fuel transfer areas, including on-board mobile fuel trucks.

  Note: Ecology recommends that the kit(s) include salvage drums or containers, such as high density polyethylene, polypropylene or polyethylene sheet-lined steel; polyethylene or

equivalent disposal bags; an emergency response guidebook; safety gloves/clothes/equipment; shovels or other soil removal equipment; and oil containment booms and absorbent pads; all stored in an impervious container.

Spill Cleanup and Proper Disposal of Waste

- Stop, contain, and clean up all spills immediately upon discovery.
- Implement the spill plan immediately.
- Contact the designated spill response employees.
- Block off and seal nearby inlets/catch basins to prevent materials from entering the drainage system or combined sewer.
- Use the appropriate material to clean up the spill.
- Do not use emulsifiers or dispersants such as liquid detergents or degreasers unless disposed of proplerly. Emulsifiers and dispersants are not allowed to be used on surface water, or in a place where they may enter storm drains, surface waters, treatments systems, or sanitary sewers.
- Immediately notify Ecology and the local jurisdiction if a spill has reached or may reach a sanitary or storm sewer, groundwater, or surface water. Notification must comply with state and federal spill reporting requirements.
- Do not wash absorbent material into interior floor drains or inlets/catch basins.
- Place used spill control materials in appropriate containers and dispose of according to regulations.

S105 BMPs for Employee Training

Train all employees that work in pollutant source areas about the following topics:

- Identifying Pollution Prevention Team members.
- Identifying pollutant sources.
- Understanding pollutant control measures.
- Spill prevention and response.
- Emergency response procedures.
- Handling practices that are environmentally acceptable. Particularly those related to vehicle/equipment liquids such as fuels, and vehicle/equipment cleaning.

Additional specialized training may be needed for staff who will be responsible for handling hazardous materials.

S106 BMPs for Inspections

Qualified personnel shall conduct inspections monthly. Make and maintain a record of each inspection on-site. The following requirements apply to inspections:

- Be conducted by someone familiar with the facility's site, operations, and BMPs.
- Verify the accuracy of the pollutant source descriptions in the SWPPP.
- Assess all BMPs that have been implemented for effectiveness and needed maintenance and locate areas where additional BMPs are needed.
- Reflect current conditions on the site.
- Include written observations of the presence of floating materials, suspended solids, oil and grease, discoloration, turbidity and odor in the stormwater discharges; in outside vehicle maintenance/repair; and liquid handling, and storage areas. In areas where acid or alkaline materials are handled or stored use a simple litmus or pH paper to identify those types of stormwater contaminants where needed.
- Eliminate or obtain a permit for unpermitted non-stormwater discharges to storm drains or receiving waters, such as process wastewater and vehicle/equipment washwater.
- Identify actions to address inspection deficiencies.

S107 BMPs for Record Keeping

See the applicable permit for specific record-keeping requirements and retention schedules for the following reports. At a minimum, retain the following reports for five years:

- Inspection reports which should include:
    - Time and date of the inspection
    - Locations inspected
    - Statement on status of compliance with the permit
    - Summary report of any remediation activities required
    - Name, title, and signature of person conducting the inspection
- Reports on spills of oil or hazardous substances in greater than reportable quantities (Code of Federal Regulations Title 40 Parts 302.4 and 117). Report spills of the following: anti-freeze, oil, gasoline, or diesel fuel, that cause:
    - A violation of the State of Washington's Water Quality Standards.
    - A film or sheen upon or discoloration of the waters of the State or adjoining shorelines.
    - A sludge or emulsion to be deposited beneath the surface of the water or upon adjoining shorelines.

To report a spill or to determine if a spill is a substance of a reportable quantity, call the Ecology regional office and ask for an oil spill operations or a dangerous waste specialist:

- **Northwest Region:** (206) 594-0000
- **Southwest Region:** (360) 407-6300
- **Eastern Region:** (509) 329-3400
- **Central Region:** (509) 575-2490

In addition, call the Washington Emergency Management Division at 1-800-258-5990 or 1-800-OILS-911 AND the National Response Center at 1-800-424-8802.

Also, refer to *Focus on Emergency Spill Response* (Ecology, 2013b).

The following is additional recommended record keeping:

Maintain records of all related pollutant control and pollution generating activities such as training, materials purchased, material use and disposal, maintenance performed, etc.

S108 BMPs for Correcting Illicit Discharges to Storm Drains

Description of Pollutant Sources: Illicit discharges are unpermitted sanitary or process wastewater discharges to a storm sewer or to surface water, rather than to a sanitary sewer, industrial process wastewater, or other appropriate treatment. They can also include swimming pool water, filter backwash, cleaning solutions/washwaters, cooling water, etc. Experience has shown that illicit discharges are common, particularly in older buildings.

Pollutant Control Approach: Identify and eliminate unpermitted discharges or obtain an NPDES permit, where necessary, particularly at industrial and commercial facilities.

Applicable Operational BMPs:

- For all real properties, responsible parties must examine their plumbing systems to identify any potential illicit discharges. Review site plans, engineering drawings, or other sources of information for the plumbing systems on the property.
- If an illicit discharge is suspected, trace the source using an appropriate method such as visual reconnaissance, smoke test, flow test, dye test with a nontoxic dye, or closed circuit television (CCTV) inspection. These tests are to be performed by qualified personnel such as a plumbing contractor. Note: Contact Ecology prior to performing a dye test which may result in a discharge to a receiving water.
- If illicit connections are found, permanently plug or disconnect the connections.
- Eliminate prohibited discharges to storm sewer(s), groundwater, or surface water(s).
- Convey unpermitted discharges to a sanitary sewer if allowed by the local sewer authority, or to other approved treatment.

- Consider installing an aircraft de/anti-icing chemical recovery system, or contract with a chemical recycler.

Applicable BMPs for Airport Runways/Taxiways:

- Avoid excessive application of all de/anti-icing chemicals. Do not apply more chemicals than necessary to achieve the necessary amount of ice removal or prevention. The chemicals could contaminate stormwater.
- Store and transfer de/anti-icing materials on an impervious containment pad or an equivalent containment area and/or under cover in accordance with S429 BMPs for Storage or Transfer (Outside) of Solid Raw Materials, Byproducts, or Finished Products. Consider other material storage and transfer approaches only if the de/anti-icer material will not contaminate stormwater.

Recommended Additional BMPs for Airport Runways/Taxiways:

- Include limits on toxic materials and phosphorus in the specifications for de/anti-icers, where applicable.
- Consider using anti-icing materials rather than deicers if it will result in less adverse environmental impact.
- Select cost-effective de/anti-icers that cause the least adverse environmental impact.

S406 BMPs for Streets and Highways

Description of Pollutant Sources: These BMPs apply to the maintenance and deicing/anti-icing of streets and highways. Deicing products can be conveyed during storm events to inlets/catch basins or to receiving waters after application. Leaks and spills of these products can also occur during their handling and storage. Equipment and processes using during maintenance can contribute pollutants such as oil and grease, suspended solids, turbidity, high pH, and metals.

Pollutant Control Approach: Apply good housekeeping practices, preventive maintenance, properly train employees, and use materials that cause less adverse effects on the environment.

Applicable BMPs:

Deicing and Anti-Icing Operations

- Adhere to manufacturer's guidelines and industry standards of use and application.
- Store and transfer deicing and anti-icing materials on impervious containment pads, or an equivalent spill/leak containment area in accordance with S429 BMPs for Storage or Transfer (Outside) of Solid Raw Materials, Byproducts, or Finished Products.
- Sweep/clean up accumulated deicing and anti-icing materials and grit from roads as soon as possible after the road surface clears.

- Minimize use in areas where runoff or spray from the roadway immediately enters sensitive areas such as fish-bearing streams.

Maintenance Operations

- Use drip pans or absorbents wherever concrete, asphalt, asphalt emulsion, paint product, and drips are likely to spill, such as beneath discharge points from equipment.
- Cover and contain nearby storm drains to keep runoff from entering the drainage system.
- Collect and contain all solids, slurry, and rinse water. Do not allow these to enter gutters, storm drains, or drainage ditches or onto the paved surface of a roadway or driveway.
- Designate an area onsite for washing hand tools and collect that water for disposal.
- Conduct all fueling of equipment in accordance with S419 BMPs for Mobile Fueling of Vehicles and Heavy Equipment.
- Do not use diesel fuel for cleaning or prepping asphalt tools and equipment.
- Sweep areas as frequently as needed. Collect all loose aggregate and dust for disposal. Do not hose down areas into storm drains.
- Store all fuel, paint, and other products on secondary containment.
- Conduct paint striping operations during dry weather.

Recommended Additional BMPs:

- Where feasible and practicable, use roadway deicing chemicals that cause the least adverse environmental impact. Apply only as needed using minimum quantities. Consider the Pacific Northwest Snowfighters Qualified Products List when selecting roadway de-icers and anti-icers.
- Intensify roadway and drainage structure cleaning in early spring to help remove particulates from road surfaces.
- Include limits on toxic metals in the specifications for de/anti-icers.
- Install catch basin inserts to collect excess sediment and debris as necessary. Inspect and maintain catch basin inserts to ensure they are working correctly.
- Research admixtures (e.g. corrosion inhibitors, surfactants) to determine what additional pollutants may be an issue. Verify with the local jurisdiction if there are any restrictions on admixtures.

S415 BMPs for Maintenance of Public and Private Utility Corridors and Facilities

Description of Pollutant Sources: Corridors and facilities at petroleum product pipelines, natural gas pipelines, water pipelines, electrical power transmission corridors, and rights-of-way can

IV-4 Soil Erosion, Sediment Control, and Landscaping Source Control BMPs

S407 BMPs for Dust Control at Disturbed Land Areas and Unpaved Roadways and Parking Lots

Note: Contact the local air quality authority for appropriate and required BMPs for dust control to implement at your project site. See the following web address to determine the air quality authority for the project site:

https://ecology.wa.gov/About-us/Our-role-in-the-community/Partnerships-committees/Clean-air-agencies

Description of Pollutant Sources: Dust can cause air and water pollution problems particularly at demolition sites and in arid areas where reduced rainfall exposes soil particles to transport by air.

Pollutant Control Approach: Minimize dust generation and apply environmentally friendly and government approved dust suppressant chemicals, if necessary.

Applicable Operational BMPs:

- Sprinkle or wet down soil or dust with water as long as it does not result in a wastewater discharge.
- Use only dust suppressant chemicals that are approved by the local jurisdiction and/or state government such as those listed in *Methods for Dust Control* (Ecology, 2016b).
- Avoid excessive and repeated applications of dust suppressant chemicals. Time the application of dust suppressants to avoid or minimize their wash-off by rainfall or human activity such as irrigation.
- Apply stormwater containment to prevent the conveyance of sediment into storm drains or receiving waters.
- Protect inlets/catch basins during application of dust suppressants.
- Ecology prohibits the use of motor oil for dust control. Take care when using lignin derivatives and other high BOD chemicals in areas susceptible to contaminating surface water or groundwater.
- Consult with Ecology and the local permitting authority on discharge permit requirements if the dust suppression process results in a wastewater discharge to the ground, groundwater, storm drain, or surface water.
- Street gutters, sidewalks, driveways, and other paved surfaces in the immediate area of the activity must be swept regularly to collect and properly dispose of dust, dirt, loose debris, and garbage.

- Install catch basin filter socks on site and in surrounding catch basins to collect sediment and debris. Maintain the filters regularly to prevent plugging.

Recommended Additional Operational BMPs for Roadways and Other Trafficked Areas:

- Consider limiting use of off-road recreational vehicles on dust generating land.
- Consider graveling or paving unpaved permanent roads and other trafficked areas at municipal, commercial, and industrial areas.
- Consider paving or stabilizing shoulders of paved roads with gravel, vegetation, or local government approved chemicals.
- Encourage use of alternate paved routes, if available.
- Vacuum sweep fine dirt and skid control materials from paved roads soon after winter weather ends or when needed.
- Consider using pre-washed traction sand to reduce dust emissions.

Additional Recommended Operational BMPs for Dust Generating Areas:

- Prepare a dust control plan. Helpful references include: *Control of Open Fugitive Dust Sources* (Cowherd et al., 1988) and *Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures* (USEPA, 1992).
- Limit exposure of soil (dust source) as much as feasible.
- Stabilize dust-generating soil by growing and maintaining vegetation, mulching, topsoiling, and/or applying stone, sand, or gravel.
- Apply windbreaks in the soil such as trees, board fences, tarp curtains, bales of hay, etc.

Note: Construction site dust control is covered in BMP C140: Dust Control.

S408 BMPs for Dust Control at Manufacturing Areas

Note: Contact the local air quality authority for appropriate and required BMPs for dust control to implement at your project site. See the following website to determine the air quality authority for the project site:

https://ecology.wa.gov/About-us/Our-role-in-the-community/Partnerships-committees/Clean-air-agencies

Description of Pollutant Sources: Industrial material handling activities can generate considerable amounts of dust that is typically removed using exhaust systems. Mixing cement and concrete products and handling powdered materials can also generate dust. Particulate materials

- Maintain ditches and culverts at an appropriate frequency to ensure that plugging and flooding across the roadbed, with resulting overflow erosion, does not occur.
- Apply the appropriate BMPs in this Volume for the storage of waste materials that can contaminate stormwater.

Recommended Operational BMPs:

- When selecting utility poles for a specific location, consider the potential environmental effects of the pole or poles during storage, handling, and end-use, as well as its cost, safety, efficacy, and expected life. Use wood products treated with chemical preservatives made in accordance with generally accepted industry standards such as the American Wood Preservers Association Standards (see http://www.awpa.com/standards/). Consider alternative materials or technologies if placing poles in or near an environmentally sensitive area, such as a wetland or a drinking water well. Alternative technologies include poles constructed with material(s) other than wood such as fiberglass composites, metal, or concrete. Consider other technologies and materials, such as sleeves or caissons for wood poles, when they are determined to be practicable and available.
- As soon as practicable remove all litter from wire cutting/replacing operations.
- Implement temporary erosion and sediment control in areas cleared of trees and vegetation and during the construction of new roads.

S416 BMPs for Maintenance of Roadside Ditches

Description of Pollutant Sources: Common road debris including eroded soil, oils, vegetative particles, and heavy metals can be sources of stormwater pollutants.

Pollutant Control Approach: Maintain roadside ditches to preserve the condition and capacity for which they were originally constructed, and to minimize bare or thinly vegetated ground surfaces. Maintenance practices should provide for erosion and sediment control (see S411 BMPs for Landscaping and Lawn / Vegetation Management).

Additional Regulations: Note that work in wet areas may be regulated by local, state, or federal regulations that impose additional obligations on the responsible party. Check with the appropriate authorities prior to beginning work in those areas.

Applicable Operational BMPs:

- Inspect roadside ditches regularly to identify sediment accumulations and localized erosion.
- Clean ditches on a regular basis, as needed. Keep ditches free of rubbish and debris.
- Vegetation in ditches often prevents erosion and cleanses runoff waters. Remove vegetation only when flow is blocked or excess sediments have accumulated. Conduct ditch maintenance (seeding, fertilizer application, harvesting) in late spring and/or early fall, where possible. This allows re-establishment of vegetative cover by the next wet season, thereby minimizing erosion of the ditch as well as making the ditch effective as a biofilter.

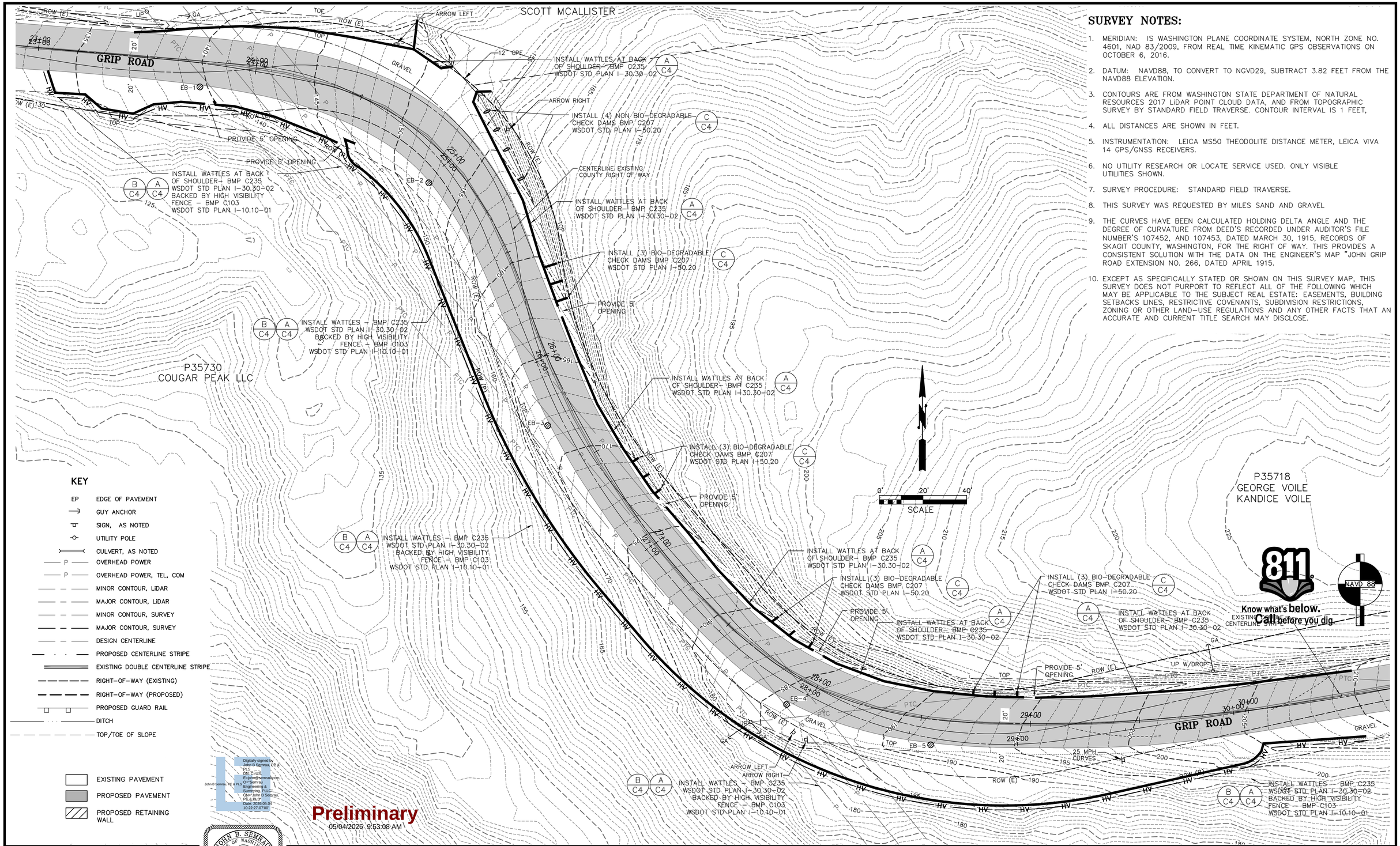
- Do not apply fertilizer unless needed to maintain vegetative growth.
- In the area between the edge of the pavement and the bottom of the ditch, commonly known as the “bare earth zone,” use grass vegetation, wherever possible. Establish vegetation from the edge of the pavement, if possible, or at least from the top of the slope of the ditch.
- Maintain diversion ditches on top of cut slopes constructed to prevent slope erosion by intercepting surface drainage to retain their diversion shape and capability.
- Use temporary erosion and sediment control measures or re-vegetate as necessary to prevent erosion during ditch reshaping.
- Do not leave ditch cleanings on the roadway surfaces. Sweep, collect, and dispose of dirt and debris remaining on the pavement at the completion of ditch cleaning operations as described below:
    - Consider screening roadside ditch cleanings, not contaminated by spills or other releases and not associated with a runoff treatment BMP such as a biofiltration swale, to remove litter. Separate screenings into soil and vegetative matter (leaves, grass, needles, branches, etc.) categories. Compost or dispose of the vegetative matter in a municipal waste landfill. Consult with the jurisdictional health department to discuss use or disposal options for the soil portion. For more information, see Appendix IV-B: Management of Street Waste Solids and Liquids.
    - Roadside ditch cleanings contaminated by spills or other releases known or suspected to contain dangerous waste must be handled following the Dangerous Waste Regulations (Chapter 173 303 WAC). If testing determines materials are not dangerous waste but contaminants are present, consult with the jurisdictional health department for disposal options.
- Examine culverts on a regular basis for scour or sedimentation at the inlet and outlet, and repair as necessary. Give priority to those culverts conveying perennial and/or salmon-bearing streams and culverts near streams in areas of high sediment load, such as those near subdivisions during construction. Maintain trash racks to avoid damage, blockage, or erosion of culverts.

Recommended Treatment BMPs:

Install biofiltration swales and filter strips (see V-8 Biofiltration BMPs) to treat roadside runoff wherever practicable and use engineered topsoils wherever necessary to maintain adequate vegetation. These systems can improve infiltration and stormwater pollutant control upstream of roadside ditches.

APPENDIX D

CONSTRUCTION PLANS



SURVEY NOTES:

1. MERIDIAN: IS WASHINGTON PLANE COORDINATE SYSTEM, NORTH ZONE NO. 4601, NAD 83/2009, FROM REAL TIME KINEMATIC GPS OBSERVATIONS ON OCTOBER 6, 2016.
2. DATUM: NAVD88, TO CONVERT TO NGVD29, SUBTRACT 3.82 FEET FROM THE NAVD88 ELEVATION.
3. CONTOURS ARE FROM WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES 2017 LiDAR POINT CLOUD DATA, AND FROM TOPOGRAPHIC SURVEY BY STANDARD FIELD TRAVERSE. CONTOUR INTERVAL IS 1 FEET,
4. ALL DISTANCES ARE SHOWN IN FEET.
5. INSTRUMENTATION: LEICA MS50 THEODOLITE DISTANCE METER, LEICA VIVA 14 GPS/GNSS RECEIVERS.
6. NO UTILITY RESEARCH OR LOCATE SERVICE USED. ONLY VISIBLE UTILITIES SHOWN.
7. SURVEY PROCEDURE: STANDARD FIELD TRAVERSE.
8. THIS SURVEY WAS REQUESTED BY MILES SAND AND GRAVEL
9. THE CURVES HAVE BEEN CALCULATED HOLDING DELTA ANGLE AND THE DEGREE OF CURVATURE FROM DEED'S RECORDED UNDER AUDITOR'S FILE NUMBER'S 107452, AND 107453, DATED MARCH 30, 1915, RECORDS OF SKAGIT COUNTY, WASHINGTON, FOR THE RIGHT OF WAY. THIS PROVIDES A CONSISTENT SOLUTION WITH THE DATA ON THE ENGINEER'S MAP "JOHN GRIP ROAD EXTENSION NO. 266, DATED APRIL 1915.
10. EXCEPT AS SPECIFICALLY STATED OR SHOWN ON THIS SURVEY MAP, THIS SURVEY DOES NOT PURPORT TO REFLECT ALL OF THE FOLLOWING WHICH MAY BE APPLICABLE TO THE SUBJECT REAL ESTATE: EASEMENTS, BUILDING SETBACKS LINES, RESTRICTIVE COVENANTS, SUBDIVISION RESTRICTIONS, ZONING OR OTHER LAND-USE REGULATIONS AND ANY OTHER FACTS THAT AN ACCURATE AND CURRENT TITLE SEARCH MAY DISCLOSE.

KEY

- EP — EDGE OF PAVEMENT
- GUY ANCHOR
- SIGN, AS NOTED
- UTILITY POLE
- CULVERT, AS NOTED
- P — OVERHEAD POWER
- P — OVERHEAD POWER, TEL, COM
- MINOR CONTOUR, LiDAR
- MAJOR CONTOUR, LiDAR
- MINOR CONTOUR, SURVEY
- MAJOR CONTOUR, SURVEY
- DESIGN CENTERLINE
- PROPOSED CENTERLINE STRIPE
- EXISTING DOUBLE CENTERLINE STRIPE
- RIGHT-OF-WAY (EXISTING)
- RIGHT-OF-WAY (PROPOSED)
- PROPOSED GUARD RAIL
- DITCH
- TOP/TOE OF SLOPE

- EXISTING PAVEMENT
- PROPOSED PAVEMENT
- PROPOSED RETAINING WALL

Digitally signed by John B Semrau, PE & PLS
DN: C=US, E=john@semrau.com, O="Semrau Engineering & Surveying, PLLC", CN="John B Semrau, PE & PLS"
Date: 2026.05.04 10:22:27-07'00'

John B Semrau, PE & PLS

Preliminary
05/04/2026 9:53:08 AM

COPYRIGHT 2026
SEMRAU ENGINEERING & SURVEYING, PLLC
CIVIL ENGINEERING • LAND SURVEYING • PLANNING
2118 RIVERSIDE DRIVE – SUITE 209
MOUNT VERNON, WA 98273
360-424-9566

JOHN B. SEMRAU — STATE OF WASHINGTON — 28626 — REGISTERED PROFESSIONAL LAND SURVEYOR

NO.	DATE	REVISION	BY	REV.

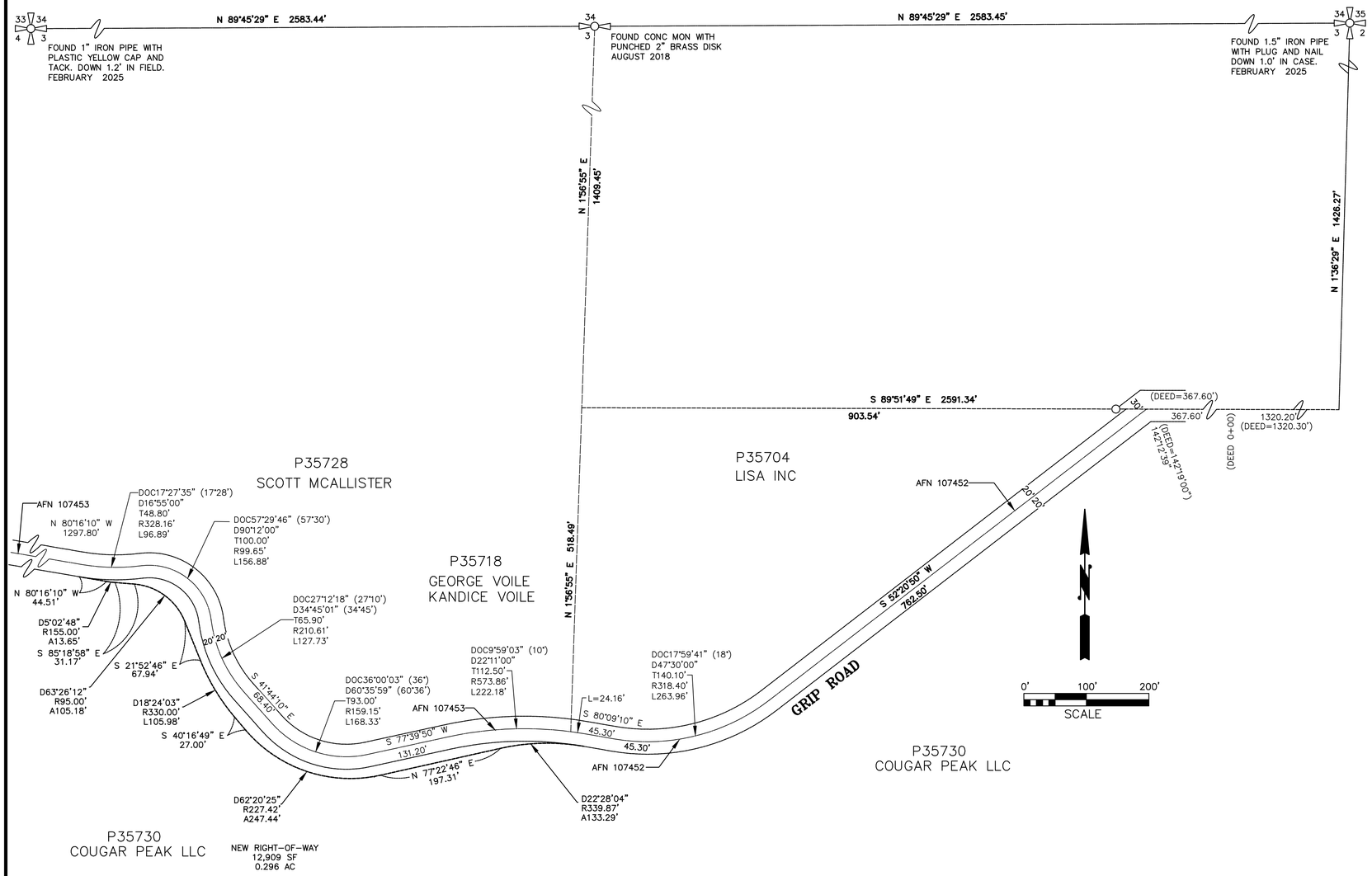
TOPOGRAPHIC SURVEY
OPTION 3 TESCP

SCALES:
HORIZONTAL : 1" = 20'
VERTICAL : N/A

NOTE: IF THIS SHEET IS LESS THAN 22"x 34" THEN SHEET HAS BEEN REDUCED

GRIP ROAD CURVES
MILES SAND AND GRAVEL
SECTION 3, T. 35 N., R. 4 E., W.M.
SKAGIT COUNTY, WASHINGTON

FIELD BK/PG:	342/80-91
DATE:	4/24/2026
DRAWING:	5166RD3-C1-TP.DWG
JOB NO.:	5166
SHEET:	C1



SURVEY NOTES:

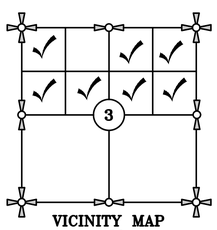
1. MERIDIAN: IS WASHINGTON PLANE COORDINATE SYSTEM, NORTH ZONE NO. 4601, NAD 83/2009, FROM REAL TIME KINEMATIC GPS OBSERVATIONS ON OCTOBER 6, 2016.
2. ALL DISTANCES ARE SHOWN IN FEET.
3. INSTRUMENTATION: LEICA MS50 THEODOLITE DISTANCE METER, LEICA VIVA 14 GPS/GNSS RECEIVERS.
4. SURVEY PROCEDURE: STANDARD FIELD TRAVERSE.
5. THIS SURVEY WAS REQUESTED BY MILES SAND AND GRAVEL
6. THE CURVES HAVE BEEN CALCULATED HOLDING DELTA ANGLE AND THE DEGREE OF CURVATURE FROM DEED'S RECORDED UNDER AUDITOR'S FILE NUMBER'S 107452, AND 107453, DATED MARCH 30, 1915, RECORDS OF SKAGIT COUNTY, WASHINGTON, FOR THE RIGHT OF WAY. THIS PROVIDES A CONSISTENT SOLUTION WITH THE DATA ON THE ENGINEER'S MAP "JOHN GRIP ROAD EXTENSION NO. 266, DATED APRIL 1915.
7. EXCEPT AS SPECIFICALLY STATED OR SHOWN ON THIS SURVEY MAP, THIS SURVEY DOES NOT PURPORT TO REFLECT ALL OF THE FOLLOWING WHICH MAY BE APPLICABLE TO THE SUBJECT REAL ESTATE: EASEMENTS, BUILDING SETBACKS LINES, RESTRICTIVE COVENANTS, SUBDIVISION RESTRICTIONS, ZONING OR OTHER LAND-USE REGULATIONS AND ANY OTHER FACTS THAT AN ACCURATE AND CURRENT TITLE SEARCH MAY DISCLOSE.

KEY:

- ● REBAR SET WITH YELLOW CAP – SEMRAU 28626
- ○ FOUND 1/2" REBAR, MARKED "SKG SURV 17651'
- PROPOSED RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY
- EXISTING RIGHT-OF-WAY
- EXISTING CENTERLINE
- SECTION LINE
- 16TH LINE

SURVEY REFERENCES:

R1 JOHN GRIP ROAD EXTENSION, NO. 266, DATED APRIL 1915
R2 RECORD OF SURVEY AFN 201309160070
R3 RECORD OF SURVEY AFN 200811100128
R4 RECORD OF SURVEY AFN 202101120088
R5 QUIT CLAIM DEED AFN 107452
R6 QUIT CLAIM DEED AFN 107453



Digitally signed by John B Semrau, PE & PLS
DN: C=US, E=john@semrau.com, O="Semrau Engineering & Surveying, PLLC", CN="John B Semrau, PE & PLS"
Date: 2026.05.04 10:22:13-07'00'
John B Semrau, PE & PLS

Preliminary
05/04/2026 9:53:19 AM

COPYRIGHT 2026

SEMRAU ENGINEERING & SURVEYING, PLLC
CIVIL ENGINEERING • LAND SURVEYING • PLANNING
2118 RIVERSIDE DRIVE – SUITE 209
MOUNT VERNON, WA 98273
360-424-9566

JOHN B. SEMRAU STATE OF WASHINGTON 28626 REGISTERED PROFESSIONAL LAND SURVEYOR

NO.	DATE	REVISION	BY	REV.

RIGHT-OF-WAY MAP

SCALES:
HORIZONTAL : 1" = 100'
VERTICAL : N/A
NOTE: IF THIS SHEET IS LESS THAN 22"x 34" THEN SHEET HAS BEEN REDUCED

GRIP ROAD
MILES SAND AND GRAVEL
SECTION 3, T. 35 N., R. 4 E., W.M.
SKAGIT COUNTY, WASHINGTON

FIELD BK/PG:	342/80-91
DATE:	4/23/2026
DRAWING:	5166GRIP24.DWG
JOB NO.:	5166
SHEET:	C2

P35728
SCOTT MCALLISTER

P35730
COUGAR PEAK LLC

P35718
GEORGE VOILE
KANDICE VOILE

NEW DESIGN ALIGNMENT TABLE

LBL	RADIUS	LENGTH	LINE/CHORD DIRECTION	DELTA	DESIGN STA	AS-BUILT STA
					23+00.00	23+00
L1		99.21'	S 85°18'58" E		23+99.21	
C1	125.00'	138.40'		63°26'12"	25+37.61	
L2		67.94'	S 21°52'46" E		16+05.55	
C2	300.00'	96.35'		63°26'12"	27+01.89	
L3		27.00'	S 40°16'49" E		27+28.89	
C3	190.00'	191.94'		57°52'52"	29+20.83	
L4	155.92'		N 81°00'43" E		30+76.75	30+70

0' 20' 40'
SCALE

NOTES:

1. CENTERLINE STATIONING IS A NEW DESIGN CENTERLINE. THE TOPOGRAPHIC SURVEY AND ORIGINAL AUTOTURN ANALYSIS ARE BASED ON THE AS-BUILT CENTERLINE.
2. CURRENT AUTO TURN ANALYSIS FROM DN TRAFFIC CONSULTANTS, GARY A. NORRIS, PE, MEMO DATED JUNE 4, 2025.
3. EXISTING COUNTY RIGHT-OF-WAY IS FROM COUNTY ENGINEERS MAP "JOHN GRIP ROAD EXTENSION" NO. 266 DATED APRIL 1915.

KEY

- GUY ANCHOR
- SIGN
- UTILITY POLE
- CULVERT
- DESIGN CENTERLINE
- PROPOSED CENTERLINE STRIPE
- EXISTING DOUBLE CENTERLINE STRIPE
- RIGHT-OF-WAY (EXISTING)
- RIGHT-OF-WAY (PROPOSED)
- PROPOSED GUARD RAIL (710 LF)
- DITCH
- TOP/TOE OF SLOPE
- EXISTING PAVEMENT
- PROPOSED PAVEMENT (6,582 SF)
- PROPOSED RETAINING WALL – (511' LF)
- WETLANDS
- WETLAND BUFFER

Preliminary
05/04/2026 9:53:30 AM

Digitally signed by John B Semrau, PE & PLS
DN: C=US, E=john@semrau.com, O="Semrau Engineering & Surveying, PLLC", CN="John B Semrau, PE & PLS"
Date: 2026.05.04 10:21:54-07'00'

COPYRIGHT 2026
SEMRAU ENGINEERING & SURVEYING, PLLC
CIVIL ENGINEERING • LAND SURVEYING • PLANNING
2118 RIVERSIDE DRIVE – SUITE 209
MOUNT VERNON, WA 98273
360-424-9566

JOHN B. SEMRAU — STATE OF WASHINGTON — 28626 — REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	REVISION	BY	REV.

OPTION 3
SITE PLAN

SCALES:
HORIZONTAL : 1" = 20'
VERTICAL : N/A
NOTE: IF THIS SHEET IS LESS THAN 22"x 34" THEN SHEET HAS BEEN REDUCED

GRIP ROAD PAVEMENT WIDENING
MILES SAND AND GRAVEL
SECTION 3, T. 35 N., R. 4 E., W.M.
SKAGIT COUNTY, WASHINGTON

FIELD BK/PG:	LL 5-9
DATE:	4/29/2026
DRAWING:	5166RD3.DWG
JOB NO.:	5166
SHEET:	C3

GENERAL/GRADING

1. ALL CONSTRUCTION AND INSTALLATION WORK SHALL CONFORM TO APPLICABLE 2022 STANDARD SPECIFICATIONS AND STANDARD PLANS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION PREPARED BY THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT) AND ACCORDING TO THE RECOMMENDATIONS OF THE MANUFACTURERS OF THE MATERIAL OR EQUIPMENT USED AND IN COMPLIANCE WITH APPLICABLE, FEDERAL, STATE AND/OR COUNTY REGULATIONS, REQUIREMENTS AND STANDARDS, INCLUDING APPLICABLE LABOR LAWS, WASHINGTON INDUSTRIAL SAFETY AND HEALTH ACT, AND OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970.
2. CONTRACTOR IS REQUIRED TO PREPARE FOR AND ATTEND A PRE-CONSTRUCTION MEETING PRIOR TO BEGINNING WORK.
3. CONTRACTOR SHALL PROVIDE TRAFFIC CONTROL AND SIGNING CONFORMING TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), CURRENT EDITION AS MAY BE REQUIRED AT HELMICK ROAD.
4. LOCATIONS OF EXISTING UTILITIES SHOWN HEREON ARE APPROXIMATE, AND ARE NOT NECESSARILY COMPLETE. THE CONTRACTOR SHALL INDEPENDENTLY VERIFY THE ACCURACY OF ALL UTILITY LOCATIONS SHOWN, AND SHALL FURTHER DISCOVER AND AVOID ANY OTHER UTILITIES NOT SHOWN HEREON WHICH MAY BE AFFECTED BY THE IMPLEMENTATION OF THIS PLAN. IF CONFLICTS WITH EXISTING UTILITIES ARISE DURING CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE ENGINEER AND ANY CHANGES REQUIRED SHALL BE APPROVED BY THE DISTRICT PRIOR TO COMMENCEMENT OF RELATED CONSTRUCTION ON THE PROJECT. IF EXISTING UTILITIES ARE DAMAGED BY THE CONTRACTOR, SAID UTILITIES SHALL BE REPAIRED OR REPLACED AT NO ADDITIONAL COST TO THE OWNER OR ENGINEER.
5. CONTRACTOR SHALL UTILIZE THE ONE CALL SYSTEM FOR UTILITY UNDERGROUND LOCATION AND ABIDE BY THE REQUIREMENTS THEREOF. CALL 1-800-424-5555.
6. CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND APPROVALS AND SHALL ABIDE BY THE CONDITIONS AND REQUIREMENTS RELATED TO SAID PERMITS AND APPROVALS.
7. OTHER UTILITIES MAY BE WORKING WITHIN THE LIMITS OF THE PROJECT, INCLUDING, BUT NOT LIMITED TO, PUGET SOUND ENERGY.
8. ALL WORK SHALL BE STAKED BY THE ENGINEER'S SURVEYOR PRIOR TO STARTING CONSTRUCTION. THE CONTRACTOR SHALL PROTECT ALL STAKING AND SURVEY MARKERS DURING THE CONSTRUCTION PERIOD. THE CONTRACTOR SHALL NOTIFY THE ENGINEER A MINIMUM OF 2 WORKING DAYS IN ADVANCE OF ALL REQUESTS FOR CONSTRUCTION STAKING.
9. AN APPROVED COPY OF THESE CONSTRUCTION DRAWINGS MUST BE ON THE JOB SITE WHENEVER CONSTRUCTION IS IN PROGRESS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF CERTIFIED AS-CONSTRUCTED DRAWINGS TO THE ENGINEER UPON COMPLETION OF THE CONSTRUCTION.
10. CONSTRUCTION REVIEW SHALL BE PERFORMED BY THE ENGINEER AND THEIR APPOINTED REPRESENTATIVES. THE CONTRACTOR SHALL PROVIDE 24 HOURS NOTICE IN ADVANCE OF ANY CONSTRUCTION REVIEW OR SPECIAL INSPECTIONS TO BOTH THE ENGINEER AND THE INSPECTOR. THESE MAY BE SCHEDULED AT THE WEEKLY SITE MEETING.
11. NO PART OF THE CONSTRUCTION SHALL BE COVERED, CONCEALED OR PUT INTO USE UNTIL IT HAS BEEN INSPECTED AND ACCEPTED BY THE DISTRICT AND THE ENGINEER.
12. BACKFILL MATERIAL FOR TRENCHES LOCATED IN ROAD RIGHT-OF-WAYS SHALL CONFORM TO WSDOT SECTION 9-03.14(2) SELECT BORROW. BACKFILL MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED EIGHT (8) INCHES LOOSE THICKNESS AND COMPACTED TO 95% OF MAXIMUM DENSITY (ASTM 1557). EACH LIFT SHALL BE COMPACTED PRIOR TO PLACEMENT OF SUCCESSIVE LIFTS.
13. BACKFILL MATERIAL FOR TRENCHES LOCATED OUTSIDE OF ROAD RIGHT-OF-WAYS MAY BE NATIVE MATERIAL WITH WRITTEN APPROVAL OF THE ENGINEER. BACKFILL MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED TWELVE (12) INCHES LOOSE THICKNESS AND COMPACTED TO 90% OF MAXIMUM DRY DENSITY, (ASTM 1557). EACH LIFT SHALL BE COMPACTED PRIOR TO PLACEMENT OF SUCCESSIVE LIFTS. (ALSO SEE OTHER NOTES).
14. THE CONTRACTOR SHALL MAINTAIN THE SITE IN A NEAT AND ORDERLY CONDITION. ALL REFUSE, DEBRIS, AND OTHER OBJECTIONABLE MATERIAL SHALL BE REMOVED AT LEAST WEEKLY, OR MORE OFTEN IF DIRECTED BY THE ENGINEER. ROUTINE AND FINAL CLEANUP ARE TO BE AN INTEGRAL PART OF ALL BID ITEMS.
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONTRACTOR FURNISHED MATERIAL. ALL SUCH MATERIAL WHICH IS DEFECTIVE BY MANUFACTURE OR HAS BEEN DAMAGED IN TRANSIT OR HAS BEEN DAMAGED AFTER DELIVERY SHALL BE REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFE STORAGE OF ALL MATERIALS FURNISHED AND ACCEPTED UNTIL IT HAS BEEN INCORPORATED IN THE COMPLETED PROJECT.
17. SUBSTANTIAL COMPLETION WILL BE DETERMINED BY THE ENGINEER AFTER THE WORK ON THE LEVEE IS COMPLETED AND THE TRAIL CAN BE OPENED AND REMAIN OPEN TO THE PUBLIC.
18. DATUM – NAVD 88. SEE PROJECT BENCHMARK.

(ALSO SEE OTHER NOTES)

EARTHWORK NOTES:

1. ALL EARTHWORK SHALL CONFORM TO DIVISION 2 OF SAID WSDOT STANDARD SPECIFICATIONS.
2. THE CONTRACTOR SHALL COMPLETELY GRADE THE SITE AND MAKE CUTS AND FILLS REQUIRED TO COMPLETELY PREPARE THE SUBGRADES SUITABLE TO SERVE THE FINAL GRADES AND TYPICAL SECTION ESTABLISHED IN THE PLANS.
3. ALL EXCESS SOIL MATERIALS, INCLUDING BUT NOT LIMITED TO TRENCH SPOILS, STRIPPED TOP-SOIL, ORGANIC MATTER, ROAD CUT AND OTHER DEBRIS SHALL BE REMOVED FROM THE SITE AND DISPOSED OF AT LOCATIONS ARRANGED BY THE CONTRACTOR. ALTERNATIVE ARRANGEMENTS FOR CUT AND FILL MATERIAL MAY BE MADE WITH WRITTEN APPROVAL FROM THE OWNER.

WSDOT STANDARD PLANS
STANDARD PLANS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION

B-5.20-01(B-1)	CATCH BASIN TYPE 1
B-30.90-01(B-1z)	MISCELLANEOUS DETAILS FOR MANHOLES AND CATCH BASINS
B-30.10-01(B-2a)	REVERSIBLE FRAME FOR CATCH BASIN OR CONCRETE INLET
B-30.30-01(B-2b)	VANED GRATE FOR CATCH BASIN AND CONCRETE INLET
B-30.40-01(B-2c)	BI-DIRECTIONAL VANED GRATE FOR CATCH BASIN AND INLET
B-30.50-01(B-2d)	HERRINGBONE GRATE FOR CATCH BASIN AND INLET
B-55.20-00(B-11)	PIPE ZONE BEDDING AND BACKFILL
B-15.20-01(B-23a)	MANHOLE TYPE 1
B-30.70-03(B-25)	MANHOLE RING AND COVER
B-85.20-00(B-29)	SIDE SEWER
F-10.12-02(F-1)	CEMENT CONCRETE CURBS
F-30.10-02(F-3)	CEMENT CONCRETE SIDEWALK
F-40.12-02(F-3b)	SIDEWALK PARALLEL RAMP TYPE
F-40.15-02(F-3c)	SIDEWALK PERPENDICULAR RAMP TYPE
M-24.60-03	SYMBOL MARKINGS MISCELLANEOUS

EROSION & SEDIMENTATION CONTROL NOTES

1. CONTRACTOR SHALL PROVIDE EROSION AND SEDIMENTATION CONTROL MEASURES AT ALL TIMES AS NEEDED TO THE SATISFACTION OF THE SKAGIT COUNTY PUBLIC WORKS DEPARTMENT.
2. EROSION CONTROL METHODS AND MATERIALS SHALL MEET REQUIREMENTS OF SECTION 8-01 OF WSDOT STANDARD SPECIFICATIONS AND REQUIREMENTS SET FORTH IN VOLUME II OF THE "STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON (THE TECHNICAL MANUAL)" BY THE WASHINGTON STATE DEPARTMENT OF ECOLOGY, CURRENT EDITION, HEREINAFTER REFERRED TO AS "THE MANUAL." CONTRACTOR SHALL FOLLOW RECOMMENDATIONS MADE BY SUPPLIERS AND MANUFACTURERS OF MATERIALS AND EQUIPMENT USED.
3. CLEARING LIMITS, SETBACKS, BUFFERS, AND SENSITIVE OR CRITICAL AREAS SUCH AS STEEP SLOPES, WETLANDS, WELLHEAD PROTECTION AREAS AND RIPARIAN CORRIDORS SHALL BE CLEARLY MARKED IN THE FIELD BY THE APPLICANT'S SURVEYOR AND INSPECTED BY SKAGIT COUNTY STAFF PRIOR TO COMMENCEMENT OF LAND CLEARING ACTIVITIES.
4. WHERE POSSIBLE, MAINTAIN NATURAL VEGETATION FOR EROSION CONTROL.
5. AS CONSTRUCTION PROGRESSES AND SEASONAL CONDITIONS DICTATE, THE EROSION AND SEDIMENTATION CONTROL FACILITIES SHALL BE MAINTAINED AND/OR MODIFIED AS DIRECTED BY THE SKAGIT COUNTY ENGINEERING DEPARTMENT. FROM OCTOBER 1ST TO APRIL 30TH, NO SOILS SHALL REMAIN UNSTABILIZED FOR MORE THAN 2 DAYS. FROM MAY 1ST TO SEPTEMBER 30TH, NO SOILS SHALL REMAIN UNSTABILIZED FOR MORE THAN 7 DAYS. AT ALL TIMES OF THE YEAR, THE CONTRACTOR SHALL HAVE SUFFICIENT MATERIALS, EQUIPMENT, AND LABOR READILY AVAILABLE TO STABILIZE AND PREVENT EROSION FROM ALL DENUDED AREAS WITHIN 12 HOURS AS SITE AND WEATHER CONDITIONS DICTATE.
6. INSPECTION AND MAINTENANCE. ALL FACILITIES AND INSTALLATIONS CONSTRUCTED AS PART OF THIS PLAN SHALL BE ROUTINELY INSPECTED AND MAINTAINED TO ENSURE THAT SAID FACILITIES ARE ADEQUATELY PERFORMING THEIR INTENDED FUNCTION. AS A MINIMUM, SAID FACILITIES SHALL BE VISUALLY INSPECTED AT LEAST WEEKLY, AND AFTER ANY SIGNIFICANT RAINFALL. IF PROBLEMS OR DEFECTIVE PERFORMANCE OF FACILITIES ARE NOTED, THEY SHALL PROMPTLY BE REPAIRED OR REPLACED.
7. ROAD EMBANKMENTS AND CUT SLOPES, FILL AREAS, AND ALL AREAS WHERE BARE SOIL IS EXPOSED AS A RESULT OF WORK ON THIS PROJECT SHALL BE PROTECTED FROM EROSION. PREPARATION OF SAID EXPOSED SOIL AREAS SHALL CONFORM TO WSDOT SECTION 8-01.3(1), INCLUDING CULTIVATION, COMPACTION, AND PREPARATION. TOPSOIL TYPE B SHALL BE SHALL BE EVENLY SPREAD OVER SAID AREAS TO A DEPTH OF FOUR INCHES. PREPARATION OF SAID EXPOSED SOIL AREAS SHALL OCCUR NOT MORE THAN TWO WEEKS PRIOR TO SEED APPLICATION.
8. SURFACE ROUGHENING. ALL SLOPES STEEPER THAN 3H:1V AND GREATER THAN 5 FEET VERTICAL REQUIRE SURFACE ROUGHENING; EITHER BY STAIR-STEP GRADING, GROOVING, FURROWING, OR TRACKING. AFTER SURFACE ROUGHENING, SLOPES MUST BE STABILIZED BY VEGETATION. REFER TO VOLUME II FOR BMP C130 (SURFACE ROUGHENING) IN THE MANUAL.
9. ALL BARE SOILS SHALL BE COVERED WITH STRAW MULCH AND PERMANENTLY RE-VEGETATED BY SEEDING WITH A MIXTURE OF NATIVE GRASS SPECIES. THIS CAN BE ACCOMPLISHED BY HAND OR HYDROSEEDING.
10. HYDROSEEDING. IF FINISH GRADE ON EXPOSED SOIL AREAS DOES NOT CONTAIN SOIL SUITABLE FOR PLANT GROWTH, 2 TO 6 INCHES OF TOP SOIL SHALL BE PLACED AFTER SURFACE ROUGHENING AND LIGHTLY ROLLED PRIOR TO HYDROSEEDING. HYDROSEEDING SHALL COMPLY WITH SUPPLIER'S RECOMMENDATIONS AND WITH APPLICABLE SECTION OF THE MANUAL AND WSDOT STANDARD SPECIFICATIONS. SEED-SLURRY MIXTURE SHALL INCLUDE A FIBROUS MULCH MATERIAL AND A TACIFIER BONDING AGENT AND BE APPLIED AT A RATE OF 1,500 TO 2,000 POUNDS PER ACRES, OR AS DIRECTED BY SUPPLIER. SEEDED AREAS SHALL BE IRRIGATED AS REQUIRED FOR PROPER GROWTH, ESPECIALLY IF APPLIED IN JULY OR AUGUST. ALTERNATIVELY, JUTE, WOVEN STRAW, OR SYNTHETIC MATS MAY BE USED IN CONJUNCTION WITH CONVENTIONAL SEEDING TECHNIQUES.
11. CONTRACTOR SHALL MAKE EVERY EFFORT TO PREVENT SEDIMENT-LADEN RUNOFF WATER FROM ENTERING THE PUBLIC STORM DRAINAGE SYSTEM AND FROM ENTERING ADJACENT PROPERTY. THIS MAY BE ACCOMPLISHED THROUGH THE USE OF SILT FENCES, INTERCEPTOR DITCHES, STRAW BALES, INLET PROTECTION DEVICES, OR OTHER MEASURES SUFFICIENT TO ASSURE COMPLIANCE WITH THIS SPECIFICATION.
12. SILT FENCING SHOULD BE PLACED ALONG THE STORAGE TANK CONSTRUCTION SITE TO PREVENT POTENTIAL IMPACTS FROM SEDIMENTATION.
13. CONTRACTOR SHALL PROTECT ALL PROPOSED STORM DRAIN INLETS AND ALL EXISTING DOWNSTREAM STORM DRAIN INLETS WITH FILTER FABRIC FENCES OR GRAVEL AND WIRE MESH FILTERS. THE INLET-PROTECTION SHALL REMAIN IN PLACE UNTIL AFTER CONSTRUCTION IS COMPLETED AND THE RISK OF SEDIMENT-LADEN WATER ENTERING THE SYSTEM IS MINIMAL, AS DETERMINED BY THE ENGINEER. IF, IN THE OPINION OF THE COUNTY ENGINEER, THE CONTRACTOR FAILS TO ADEQUATELY PROTECT INLETS, CONTRACTOR SHALL CLEAN AFFECTED STRUCTURES TO THE SATISFACTION OF THE COUNTY ENGINEER.
14. PUBLIC RIGHT-OF-WAYS SHALL BE KEPT CLEAN. TRACKING OF SEDIMENT (MUD) AND DEBRIS FROM THE SITE WILL NOT BE ALLOWED. FAILURE TO COMPLY WITH THIS ITEM MAY RESULT IN ALL WORK ON THE SITE BEING STOPPED UNTIL THE CONDITION IS REMEDIED. IF SEDIMENT AND DEBRIS IS TRANSPORTED ONTO A ROAD SURFACE, THE ROADS SHALL BE CLEANED THOROUGHLY, AT A MINIMUM, AT THE END OF EACH DAY. SEDIMENT SHALL BE REMOVED FROM ROADS BY SHOVELING OR SWEEPING AND BE TRANSPORTED TO A CONTROLLED SEDIMENT DISPOSAL AREA. STREET WASHING SHALL BE ALLOWED ONLY AFTER SEDIMENT IS REMOVED IN THIS MANNER.
15. TEMPORARY EROSION AND SEDIMENT CONTROLS SHOULD BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION IS ACHIEVED OR AFTER THE TEMPORARY CONTROLS ARE NO LONGER NEEDED, WHICHEVER IS LATER. TRAPPED SEDIMENT SHOULD BE REMOVED OR STABILIZED ON SITE. DISTURBED SOILS AREAS SHOULD BE PERMANENTLY STABILIZED.

EROSION & SEDIMENTATION DETAILS

1. WHERE APPLICABLE PER THE TESC PLAN, UTILIZE WSDOT STANDARD DETAILS FOR EROSION CONTROL MEASURES. THESE INCLUDE, BUT MAY NOT BE LIMITED TO:

AS NEEDED:

MISC EROSION CONTROL DETAILS
1-80.10-02

PER PLAN AS NEEDED:

WATTLE INSTALLATION ON SLOPES	1-30.30-02	A / C4
HIGH VISIBILITY FENCE	1-10.10-01	B / C4
CHECK DAMS ON CHANNELS	1-50-20.02	C / C4

Digitally signed by John B Semrau, PE & PLS
DN: C=US, E=jbtn@semrau.com, O="Semrau Engineering & Surveying, PLLC", CN="John B Semrau, PE & PLS"
Date: 2026.05.04 10:21:38-07'00'

John B Semrau, PE & PLS

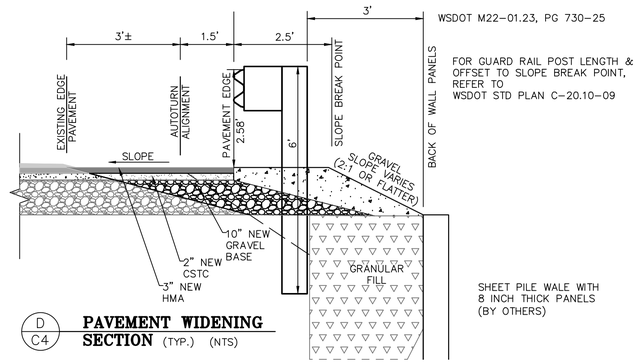
APPROVED FOR CONSTRUCTION

SCP&DS _____ DATE _____

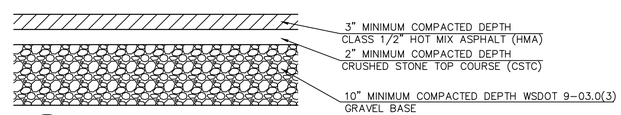
SKAGIT COUNTY STORMWATER STANDARD CONDITIONS

1. IMPERVIOUS HARD SURFACES LIMITED TO WHAT IS SHOWN ON APPROVED SITE PLAN. ANY INCREASE IN HARD SURFACE AND/OR CHANGE IN SURFACES MATERIALS (I.E. GRAVEL TO ASPHALT) SHALL BE REVIEWED AND APPROVED BY SKAGIT COUNTY PDS PRIOR TO MAKING THE REVISION.
2. LAND DISTURBANCE\CLEARING LIMITS ARE LIMITED TO WHAT IS SHOWN ON APPROVED SITE PLAN. ANY INCREASED LAND DISTURBANCE MAY TRIGGER ADDITIONAL REQUIREMENTS AND REVIEW BY SKAGIT COUNTY PDS.
3. SOIL COVER
   ALL EXPOSED SOIL SHALL BE COVERED AND STABILIZED, IF EXPOSED AND UNWORKED FOR MORE THAN THE TIME PERIODS SET BELOW:
   DRY SEASON (MAY 1 – SEPT. 30): 7 DAYS
   WET SEASON (OCT. 1 – APRIL 30): 2 DAYS
4. SOIL EXPORT
   ANY SOIL EXPORTED FROM THE SITE SHALL BE DISPOSED OF AT AN APPROVED LOCATION. ANY OTHER OCATION MAY REQUIRE ADDITIONAL PERMITTING.
5. SKAGIT COUNTY PLANNING & DEVELOPMENT SERVICES HAS REVIEWED WHAT IS REPRESENTED ON THESE PLANS BUT MAKES NO GUARANTEE THAT THE UTILITIES OR IMPROVEMENTS REPRESENTED WILL BE ADEQUATE TO SERVE UNSPECIFIED FUTURE BUILDINGS OR USES.
6. ALL STORM RUNOFF INCLUDING DISPERSION FLOW PATHS SHALL BE ADDRESSED ONSITE.
7. A COPY OF THE APPROVED SITE PLAN(S) AND SWPPP SHALL BE KEPT ONSITE DURING CONSTRUCTION.
8. TESC INSPECTION REQUIRED WITHIN 7 DAYS OF BREAKING GROUND.
9. ANY RETAINING AND\OR LANDSCAPE WALLS GREATER THAN 4 FEET IN HEIGHT (BOTTOM OF FOOTING TO TOP OF WALL), MAY REQUIRE A SEPARATE BUILDING PERMIT. ANY RETAINING AND\OR LANDSCAPE WALL REGARDLESS OF HEIGHT, WHICH SUPPORTS A SURCHARGE MAY REQUIRE ENGINEERING. REFER TO BUILDING CODE REQUIREMENTS FOR ADDITIONAL INFORMATION.
10. REQUIRED FOR PROJECTS LOCATED WITHIN NPDES PERMIT AREA:
    PROJECT REQUIRES A SITE INSPECTION PRIOR TO CLEARING/GRADING AND CONSTRUCTION
11. FINAL INSPECTION OF SITE REQUIRED. INSPECTION SHALL VERIFY ALL EXPOSED/WORKED SOILS HAVE BEEN STABILIZED WITH LANDSCAPING AND/OR HARD SURFACES.
12. PROJECT DEPENDENT NOTES/CONDITIONS
    (COORDINATE WITH SKAGIT COUNTY STORMWATER STAFF):
    ACCOMPANYING ENGINEERING IS AN INTEGRAL PART OF THE APPROVED PLANS. IT IS THE RESPONSIBILITY OF THE BUILDER/OWNER TO READ AND UNDERSTAND THE ENGINEERING AND TO COMPLY WITH ALL REQUIREMENTS/CONDITIONS OF THE ENGINEERING.
13. RIGHT OF ACCESS EASEMENT REQUIRED
    PROVIDE\DEDICATE AN ACCESS AND INSPECTION EASEMENT(S) TO SKAGIT FOR ALL PROPOSED STORMWATER FACILITIES, AS REQUIRED BY SKAGIT COUNTY CODE SECTION 14.32.100. EASEMENT SHALL BE RECORDED WITH SKAGIT COUNTY AUDITOR PRIOR TO FINAL INSPECTION.
14. DRAINAGE EASEMENT REQUIRED
    PROVIDE\DEDICATE A DRAINAGE EASEMENT FOR ALL STORMWATER AND DRAINAGE CONVEYANCE SYSTEMS, AS REQUIRED BY SKAGIT COUNTY CODE SECTION 14.32. EASEMENT SHALL BE RECORDED WITH SKAGIT COUNTY AUDITOR PRIOR TO FINAL INSPECTION.
15. PROVIDE OPERATIONS AND MAINTENANCE (O&M) PLAN/DOCUMENTS FOR THE STORMWATER FACILITY(S) CONSISTENT WITH THE REQUIREMENTS OF SKAGIT COUNTY CODE SECTION 14.32.100. O&M SHALL BE RECORDED WITH SKAGIT COUNTY AUDITOR PRIOR TO FINAL INSPECTION.
16. PROVIDE "AS-BUILT" RECORD DRAWINGS OF THE STORMWATER FACILITY(S) CONSISTENT WITH THE REQUIREMENTS OF SKAGIT COUNTY CODE SECTION 14.32.100.
17. STORMWATER INFILTRATION FACILITIES SHALL BE LOCATED OUTSIDE OF WELL PROTECTION ZONES.
18. INLET\OUTLET PROTECTION REQUIRED FOR ALL PROPOSED STORM CONVEYANCE. THIS REQUIREMENT INCLUDES BUT NOT LIMITED TO DOE BMP C209.

(SkCoPDS, April 2022))



D / C4 **PAVEMENT WIDENING SECTION** (TYP.) (NTS)



C / C4 **COUNTY ROAD PAVING SECTION** (NTS)

SPECIFICATIONS FOR TESTING ASPHALT

1. PRIOR TO PLACEMENT OF PAVEMENT, THE **COUNTY** SHALL MAKE A DETERMINATION OF SUB-GRADE ACCEPTANCE BASED UPON TEST RESULTS AND THE OBSERVATIONS OF A FIRM AND UNYIELDING SURFACE. THE **COUNTY** SHALL ALSO ESTABLISH TEST AREA BOUNDARIES. THE CONTRACTOR SHALL SUPPLY THE **COUNTY** WITH A MIX DESIGN INCLUDING VALUES FOR THE THEORETICAL MAXIMUM DENSITY OF THE ASPHALT BEING USED ON THE PROJECT.
2. SPECIFICATION FOR MINIMUM ALLOWABLE DENSITY FOR ASPHALT IS 91% OF THE THEORETICAL MAXIMUM DENSITY AS DETERMINED BY AASHTO TEST METHOD T209.
3. ACCEPTANCE OF HMA SHALL BE BASED ON WSDOT 5-04.3(8)A.
4. WHEN THE CONTRACTOR INDICATES THAT THE PAVEMENT IS READY FOR ACCEPTANCE OR IT REACHES 175 DEGREES F., WHICHEVER IS SOONER, THE **COUNTY** SHALL TAKE/SUPERVISE 5 NUCLEAR DENSOMETER READINGS AT RANDOM LOCATIONS WITHIN EVERY TEST AREA. A TEST AREA SHALL NOT EXCEED 300 TONS OF ASPHALT, HOWEVER, SMALLER AREAS MAY BE DETERMINED, SUCH AS CUL-DE-SACS MAY BE SINGLED OUT AS A TEST AREA OR INDIVIDUAL STREETS WITHIN A STREET NETWORK MAY BE SINGLED OUT AS TEST AREAS, EVEN THOUGH THESE AREAS WOULD BE LESS THAN 300 TONS.
5. THE RESULTS OF THE DENSOMETER READINGS FOR EACH TEST AREA SHALL BE EVALUATED AND THE AVERAGE APPLIED TO THE ENTIRE TEST AREA. IF THE AVERAGE IS BELOW MINIMUM, THE OWNER MAY REQUEST CORE TESTS TO BE TAKEN AT HIS EXPENSE AND AT LOCATIONS DETERMINED BY **COUNTY** PERSONNEL, WITHIN 24 HOURS OF THE FINAL PAVING OF THE TEST AREA. FIVE CORE TESTS SHALL BE TAKEN FOR EACH TEST AREA AND THE RESULTS EVALUATED AND THE AVERAGE APPLIED TO THE WHOLE TEST AREA.
6. IF THE PAVEMENT IS BELOW MINIMUM COMPACTION SUBSEQUENT TO THE FINAL TESTING PROCEDURES, THE OWNER MAY INCREASE DEPTH OF THE FINAL LIFT OF ASPHALT AS DIRECTED BY THE **COUNTY** ENGINEER, OR PROVIDE PAYMENT TO THE **COUNTY** AS DIRECTED BY THE **COUNTY** ENGINEER.
7. ALL ISOLATED AREAS WITHIN TEST AREAS THAT FALL BELOW 88.0% SHALL BE SUBJECT TO EXTENSIVE TESTING AND SUBSEQUENT REMOVAL OF THE ASPHALT, UNLESS OTHERWISE DIRECTED BY THE **COUNTY** ENGINEER.
8. THE USE OF A CORRECTION FACTOR TO CORRECT DENSITY READINGS OBTAINED FROM THE NUCLEAR DENSOMETER IS ACCEPTABLE UPON AUTHORIZATION BY THE COUNTY ENGINEER IN THE FOLLOWING INSTANCES: 1) FIRST LIFT OVERLAYS ON EXISTING PAVEMENT; 2) FIRST COURSE OVER GRANULAR MATERIAL.

CONCRETE AND PAVING NOTES

1. SUBGRADE PREPARATION SHALL CONFORM TO WSDOT 2-06.
2. SOIL RESIDUAL HERBICIDE SHALL BE APPLIED UNDER ALL NEW PROPOSED ASPHALT SURFACES IN CONFORMANCE WITH WSDOT 5-04.3(5)D.
3. GRAVEL BORROW MATERIAL SHALL MEET WSDOT 9-03.14.
4. CRUSHED SURFACING TOP COURSE (CSTC) SHALL MEET WSDOT 9-03.9(3).
5. CEMENT CONCRETE CURBS AND GUTTERS SHALL USE AIR ENTRAINED CONCRETE CLASS 3000 AND SHALL MEET WSDOT 8-04.
6. CEMENT CONCRETE SIDEWALKS SHALL MEET WSDOT 8-14.
7. CLASS 1/2" PG 64-22 HOT MIX ASPHALT (HMA) SHALL MEET WSDOT 5-04. REQUIREMENTS OF THE AGGREGATE FOR ASPHALT CONCRETE ARE LISTED IN WSDOT 9-03.8. REQUIREMENTS OF THE ASPHALT BINDER SHALL MEET WSDOT 9-02.1(4). REQUIREMENTS OF THE ANTI-STRIPPING ADDITIVE SHALL MEET WSDOT 9-02.4.
8. BITUMINOUS SURFACE TREATMENT (BST) CLASS A SHALL MEET WSDOT 5-02.
9. A FOG SEAL MAY BE REQUIRED IF THE ASPHALT MAT IS TOO OPEN-GRADED IN THE OPINION OF THE **COUNTY** ENGINEER.
10. FINAL ADJUSTMENT OF CATCH BASIN AND MANHOLE TOPS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. CB'S SHALL BE ACCURATELY LOCATED IN THE FIELD SO THAT ALL FRAME SIDES ARE SUPPORTED BY PRECAST BASE SECTIONS OR RISERS.
11. CURB AND SIDEWALK RESTORATION AND CLEANUP IS TO BE IN CONFORMANCE WITH **SKAGIT COUNTY** ENGINEERING DEPARTMENT REQUIREMENTS.
12. NO FINAL LIFT OF ASPHALT AFTER NOV. 1.

Preliminary
05/04/2026 9:53:41 AM

COPYRIGHT 2026
SEMRAU ENGINEERING & SURVEYING, PLLC
CIVIL ENGINEERING • LAND SURVEYING • PLANNING
2118 RIVERSIDE DRIVE – SUITE 209
MOUNT VERNON, WA 98273
360-424-9566

JOHN B. SEMRAU — STATE OF WASHINGTON — 28626 — REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	REVISION	BY	REV.

NOTES & DETAILS

SCALES:
HORIZONTAL : 1" = 20'
VERTICAL : N/A

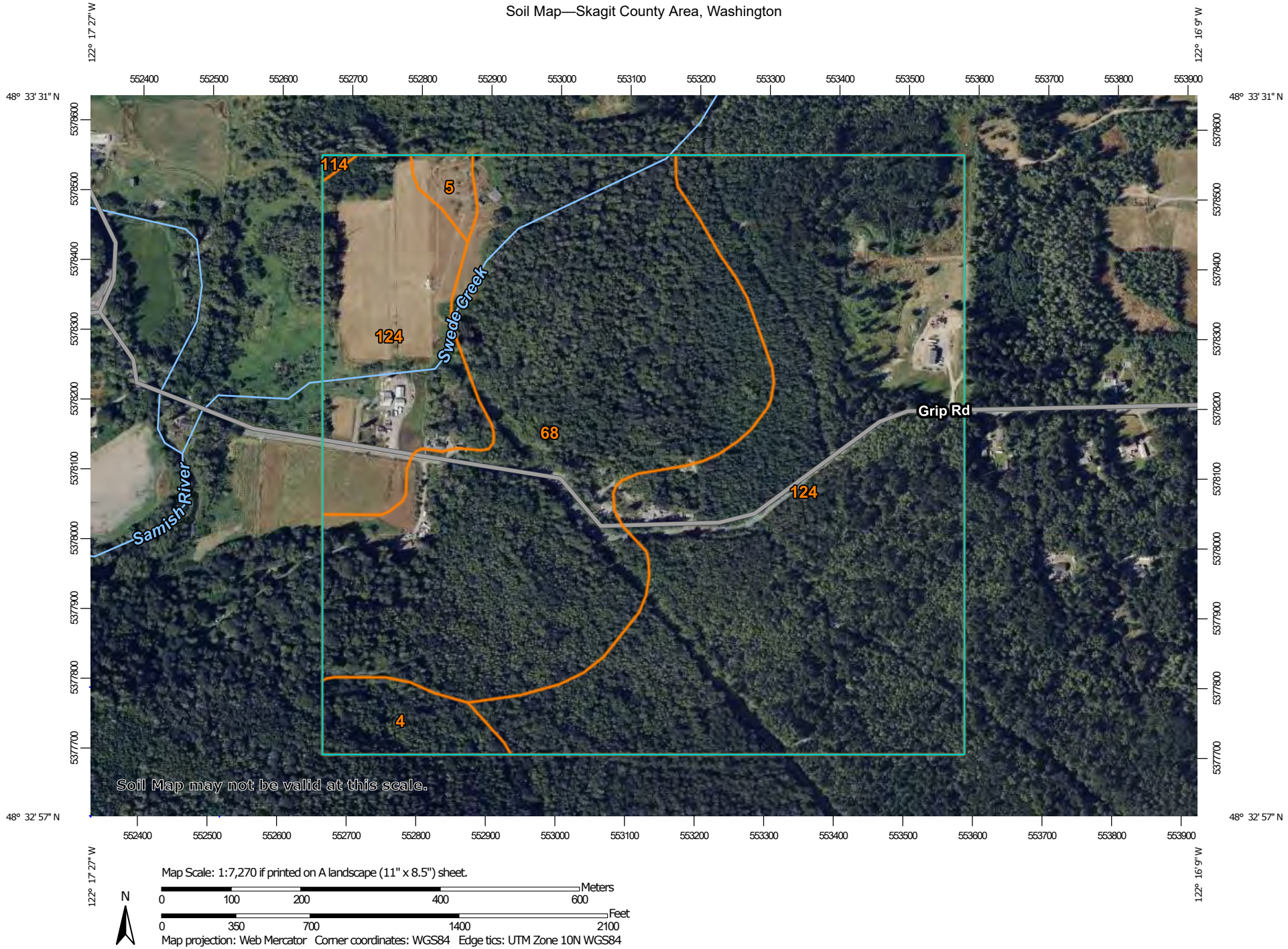
NOTE: IF THIS SHEET IS LESS THAN 22"x 34" THEN SHEET HAS BEEN REDUCED

GRIP ROAD PAVEMENT WIDENING
MILES SAND AND GRAVEL
SECTION 3, T. 35 N., R. 4 E., W.M.
SKAGIT COUNTY, WASHINGTON

FIELD BK/PG:	.
DATE:	4/23/2026
DRAWING:	5166RD2.DWG
JOB NO.:	5166
SHEET:	C4

APPENDIX E

SCS SOIL DATA



Map Scale: 1:7,270 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 350 700 1400 2100

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Skagit County Area, Washington
Survey Area Data: Version 24, Aug 27, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 14, 2022—Sep 1, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
4	Andic Xerochrepts, warm-Rock outcrop complex, 65 to 90 percent slopes	5.8	3.0%
5	Barneston gravelly ashy loam, 0 to 8 percent slopes	1.8	0.9%
68	Hoogdal silt loam, 15 to 30 percent slopes	74.5	37.9%
114	Samish silt loam	0.2	0.1%
124	Skipopa silt loam, 0 to 3 percent slopes	114.2	58.1%
Totals for Area of Interest		**196.6**	**100.0%**

Skagit County Area, Washington

68—Hoogdal silt loam, 15 to 30 percent slopes

Map Unit Setting

National map unit symbol: 2hwq
Elevation: 100 to 300 feet
Mean annual precipitation: 35 to 50 inches
Mean annual air temperature: 50 to 54 degrees F
Frost-free period: 160 to 200 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Hoogdal and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoogdal

Setting

Landform: Upland slopes
Parent material: Loess and glaciolucustrine deposits

Typical profile

H1 - 0 to 6 inches: silt loam
H2 - 6 to 11 inches: silty clay loam
H3 - 11 to 28 inches: silty clay
H4 - 28 to 60 inches: clay

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C/D
Ecological site: F002XA004WA - Puget Lowlands Forest
Forage suitability group: Sloping to Steep Soils (G002XN702WA)
Other vegetative classification: Sloping to Steep Soils (G002XN702WA)

Hydric soil rating: No

Data Source Information

Soil Survey Area: Skagit County Area, Washington
Survey Area Data: Version 24, Aug 27, 2024

Skagit County Area, Washington

124—Skipopa silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2hsf
Elevation: 150 to 450 feet
Mean annual precipitation: 30 to 50 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 160 to 200 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Skipopa and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Skipopa

Setting

Landform: Terraces
Parent material: Volcanic ash and loess over glaciolacustrine deposits

Typical profile

H1 - 0 to 8 inches: ashy silt loam
H2 - 8 to 16 inches: silt loam
H3 - 16 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 12 to 20 inches to abrupt textural change
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: D
Ecological site: F002XA007WA - Puget Lowlands Wet Forest
Forage suitability group: Seasonally Wet Soils (G002XN202WA)
Other vegetative classification: Seasonally Wet Soils (G002XN202WA)
Hydric soil rating: No

Minor Components

Bellingham, undrained
Percent of map unit: 5 percent
Landform: Depressions
Other vegetative classification: Wet Soils (G002XN102WA)
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Skagit County Area, Washington
Survey Area Data: Version 24, Aug 27, 2024

APPENDIX F

GEOTECHNICAL REPORT

associated
earth sciences
incorporated



Subsurface Exploration, Geologic Hazard, and Preliminary Geotechnical Engineering Report

GRIP ROAD WIDENING PROJECT

Skagit County, Washington

Prepared For:

MILES SAND & GRAVEL

Project No. 20130228E002
October 13, 2025

DRAFT



Associated Earth Sciences, Inc.

www.aesgeo.com

Kirkland | Mount Vernon | Tacoma

October 13, 2025
Project No. 20130228E002

Miles Sand & Gravel
PO Box 280
Mount Vernon, Washington 98372

Attention: Brad Barton

Subject: Subsurface Exploration, Geologic Hazard, and Preliminary Geotechnical Engineering Report
Grip Road Widening Project
Skagit County, Washington

Dear Brad Barton:

Associated Earth Sciences, Inc. (AESI) is pleased to present the enclosed copy of the above-referenced report. This report summarizes the results of our subsurface exploration, geologic hazard, and preliminary geotechnical engineering studies and offers geotechnical recommendations for the design of the subject project.

We have enjoyed working with you on this study and are confident that the recommendations presented in this report will aid in the successful completion of your project. If you should have any questions, or if we can be of additional help to you, please do not hesitate to call.

Sincerely,
ASSOCIATED EARTH SCIENCES, INC.
Mount Vernon, Washington

DRAFT

Anthony W. Romanick, P.E.
Associate Engineer

AWR/ld – 20130228E002-002

DRAFT

SUBSURFACE EXPLORATION, GEOLOGIC HAZARD, AND PRELIMINARY GEOTECHNICAL ENGINEERING REPORT

GRIP ROAD WIDENING PROJECT

Skagit County, Washington

DRAFT

Prepared for:
Miles Sand & Gravel
PO Box 280
Mount Vernon, Washington 98372

Prepared by:
Associated Earth Sciences, Inc.
1206 Cleveland Avenue
Mount Vernon, Washington 98273
425-827-7701

October 13, 2025
Project No. 20130228E002

I. PROJECT AND SITE CONDITIONS

1.0 INTRODUCTION

Associated Earth Sciences Inc. (AESI) presents this report which provides the results of our subsurface exploration, geologic hazard, and preliminary geotechnical engineering study for the proposed project. The location of the site is shown on the "Vicinity Map," Figure 1, and the approximate locations of the explorations accomplished for this study are presented on the "Existing Site and Exploration Plan," Figure 2, on the "LiDAR Based Topography," Figure 3, and the "Proposed Site and Exploration Plan," Figure 4. This report is considered preliminary, as the project design was still underway. We recommend that we be allowed to review the recommendations contained in this report and modify them, if necessary, once project plans have been finalized.

1.1 Purpose and Scope

The purpose of this study was to obtain subsurface data to be used in the design of the Grip Road widening project and to assess potential retaining wall options to support the widened road prism and to assess global slope stability. Our study included reviewing available geologic literature, drilling five exploration borings, and performing geologic studies to assess the type, thickness, distribution, and physical properties of the subsurface sediments and shallow groundwater conditions adjacent to the roadway bank. Preliminary geotechnical engineering studies were completed to assess geotechnical design parameters for the wall and geologic hazards associated with the project. This report summarizes our current fieldwork and provides the results of the geologic hazard assessment and recommendations for the road widening and a new permanent cantilever soldier pile wall.

1.2 Authorization

Our study was accomplished in general accordance with our scope of work and cost proposal, dated September 13, 2025. This report has been prepared for the exclusive use of Miles Sand & Gravel and their agents for specific application to this project. Within the limitations of scope, schedule, and budget, our services have been performed in accordance with generally accepted geotechnical engineering and engineering geology practices in effect in this area at the time our report was prepared. No other warranty, express or implied, is made.

2.0 PROJECT AND SITE DESCRIPTION

The project proposes widening portions of the southern and northern shoulders of Grip Road starting about 2,000 feet east of the intersection of Grip Road and Prairie Road. The road

DRAFT

widening will occur over approximately 700 feet of road alignment and will add up to about 10 feet of width or less, on the south side and about 3 feet on a portion of the north side. Slopes are present on either side of Grip Road along the project alignment with inclinations estimated at 1H:1V (Horizontal:Vertical) or less. Properties towards the north and south of the project area are generally large forested private residential lots. A new guardrail will be constructed along a section of the newly widened Grip Road's southern side. As a result of the widening and guardrail, we understand that retaining walls will be needed to support the road prism. Preliminary planning indicates that a retaining wall will be used to support heights of up to 6 feet. The proposed retaining wall will be situated approximately 20 feet from the centerline on the south side of Grip Road and will extend from station 26+36 to station 29+88. Due to the presence of steep slopes near the proposed wall location and normally consolidated and compressible shallow sediments this report provides recommendations for a soldier pile retaining wall to limit shallow impacts to global slope stability and reduce the risk of settlement of the native sediments when compared to a gravity block wall.

Based on the *Skagit County Code* (SCC), the slopes adjacent to the Grip Road subject site lie within Erosion and Landslide Hazard Areas. The slope along the south side of Grip Road trends down and south to a tributary of Swede Creek with up to approximately 30 vertical feet of relief and inclinations as steep as 40 percent along the project alignment. No indications of active stream incision were observed at the toe of the slope south of Grip Road. Slopes north and topographically higher than Grip Road are characterized by inclinations of up to 45 percent with approximately 10 vertical feet of relief. Additionally, based on the review of publicly available data and the results of our subsurface exploration, we have identified a landslide feature along the eastern reaches of the subject site.

DRAFT

3.0 SUBSURFACE EXPLORATION

The subsurface exploration and geologic site reconnaissance was conducted on September 8, 2025, and consisted of advancing five exploration borings to gain subsurface information about the site. The various types of materials and sediments encountered in the explorations, as well as the depths where characteristics of these materials changed, are indicated on the exploration boring logs presented in Appendix A. The depths indicated on the logs where conditions changed may represent gradational variations between sediment types in the field. If changes occurred between sample intervals in our borings, they were interpreted. The locations of the exploration borings are shown on Figure 2 through Figure 4.

The conclusions and recommendations presented in this report are based on the borings completed for this study. The locations and depths of the explorations were completed within site access and budgetary constraints. Because of the nature of exploratory work below ground, interpolation of subsurface conditions between field explorations is necessary. It should be noted that differing subsurface conditions may sometimes be present due to the random nature of

deposition and the alteration of topography by past grading and/or filling. The nature and extent of any variations between the field explorations may not become fully evident until construction. If variations are observed at that time, it may be necessary to re-evaluate specific recommendations in this report and make appropriate changes.

3.1 Exploration Borings

For this study, five hollow-stem auger borings were drilled by Geologic Drill Partners, an independent firm working under subcontract to AESI. The borings for this study were completed by advancing a 6-inch outside-diameter, hollow-stem auger with a tracked drill rig. During the drilling process, samples were obtained at generally 2.5- to 5-foot-depth intervals. After completion of drilling, each borehole was backfilled with bentonite chips and capped at the surface with on-site material.

Disturbed, but representative samples were obtained by using the Standard Penetration Test (SPT) procedure in accordance with *ASTM International* (ASTM) D-1586. This test and sampling method consists of driving a standard 2-inch, outside-diameter, split-barrel sampler a distance of 18 inches into the soil with a 140-pound hammer free-falling a distance of 30 inches. The number of blows for each 6-inch interval is recorded, and the number of blows required to drive the sampler the final 12 inches is known as the Standard Penetration Resistance ("N") or blow count. If a total of 50 blows is recorded at or before the end of one 6-inch interval, the blow count is recorded as the number of blows for the corresponding number of inches of penetration. The resistance, or N-value, provides a measure of the relative density of granular soils or the relative consistency of cohesive soils. These values are plotted on the attached boring logs.

The exploration borings were continuously observed and logged by an experienced geologist from our firm. The samples obtained from the split-barrel sampler were classified in the field and representative portions placed in watertight containers. The samples were then transported to our laboratory for further visual classification. The exploration logs presented Appendix A are based on the N-values, field observations, and drilling action.

4.0 SUBSURFACE CONDITIONS

Subsurface conditions at the project site were inferred from the field exploration accomplished for this study, visual reconnaissance of the site, and review of applicable geologic literature. Generally, our explorations encountered existing fill soils underlain by Everson glaciomarine drift sediments. A thin layer of mass wasting deposits was encountered atop the native sediments EB-4 and EB-5. The following section presents more detailed subsurface information organized from the shallowest (youngest) to the deepest (oldest) sediment types.

DRAFT

4.1 Stratigraphy

Topsoil

All exploration borings were completed off the south edge of the roadway asphalt and encountered 2 to 4 inches of topsoil under grass. Due to its high organic content, topsoil is not considered suitable for use in structural fill applications and should be removed from any planned paving areas.

Fill

Existing fill was encountered directly below the topsoil in all exploration borings. The fill was observed to depths of 7 feet in EB-1 and EB-2, 4.5 feet in EB-4, and 2 feet in EB-3 and EB-5. The existing fill was observed to be loose to medium dense, slightly moist to moist, dark brown to brown with occasional oxidation staining and consisted of silty, gravelly, fine to medium sand or sandy gravel with scattered organics near the surface. In EB-1, EB-2, and EB-4, portions of the existing fill consisted of sandy silt. The existing fill may require some remedial preparation under pavement or other hardscape areas.

Mass Wasting Deposits

Material encountered below the fill in EB-4 and EB-5 was observed to be medium stiff, moist, light brown, silt with a prominent blocky texture and sheared slicken faces. The proximity to steep slopes and relatively low density in combination with the blocky and irregular texture of the material leads us to interpret these sediments as mass wasting deposits. Mass wasting deposits generally describe loose soils which have been deposited by gravity or continuous downslope creep at the base of or along hillsides. The mass wasting deposits extended to a depth of approximately 7 feet below the ground surface in EB-4 and EB-5.

Everson Glaciomarine Drift

All five of our explorations encountered sediments generally consisting of medium stiff to stiff, slightly moist to very moist, silt and clay with occasional gravel dropstones. One sample in EB-2 had blow counts that correlated to soft consistency and two samples in EB-2 had a very stiff consistency. We interpreted these sediments as Everson-age glaciomarine drift. These sediments were observed to extend beyond the depth explored in all explorations. Glaciomarine drift was deposited from the melting of continental glaciers as they "floated" on seawater. All sediments of glacial origin, like Everson glaciomarine drift, may contain large cobbles or boulders at random locations which may be encountered during construction. Mass wasting deposits observed in EB-4 and EB-5 are interpreted to be derived from sediments within this unit.

DRAFT

At the time of exploration, most of the glaciomarine drift sediments encountered were moist to very moist, and therefore will likely require significant drying to be suitable for use in structural fill applications. The Everson glaciomarine drift extended beyond the maximum depth explored of 36.5 feet below the surface.

4.2 Geologic Mapping

Review of the regional geologic map, titled *Geologic Map and Interpreted Geologic History of the Bow and Alger 7.5-minute Quadrangles, Western Skagit County, Washington*, 1998 (J.D. Dragovich, D.K. Norman et al., Washington Division of Geology and Earth Resources, scale 1:24,000) indicates that the area of the subject site is underlain by Everson glaciomarine drift deposits. Our interpretation of the sediments encountered at the subject site is in general agreement with the regional geologic map.

Review of regional soils mapping (*Soil Survey of King County Area, Washington*, U.S. Department of Agriculture [USDA], Soils Conservation Service [SCS] now referred to as Natural Resources Conservation Service [NRCS]) on the NRCS *Web Soil Survey* indicates that the subject site is underlain by Hooda silt loam, 15 to 30 percent slopes. Slope inclinations along the south side of the project alignment are steeper than 15 to 30 percent. Due to the observed inclinations along the road bank, we anticipate that the Hoogdal silt loam will have an erosion hazard of "Severe to very severe," which has a parent material of glaciolacustrine deposits according to the NCRS.

4.3 Hydrology

No groundwater was encountered during our explorations which were completed on September 8, 2025.

Groundwater conditions, including depth and duration and quantity of seepage, should be expected to vary seasonally, and in response to changes in precipitation, soil grain-size distribution, topography, on- and off-site land usage, and other factors.

4.4 Soil Classification and Index Tests

Laboratory analyses for this study consisted of grain-size distribution (sieves) and Atterberg Limits. A summary of the laboratory test results are provided in the sections below and the results are included in Appendix B.

Grain-Size Distribution Testing

Two laboratory grain-size and hydrometer analyses were performed on samples collected from explorations completed for this project. The grain-size distribution test results are included in

DRAFT

Appendix B with soil descriptions based on the ASTM D-2487 Unified Soil Classification System (USCS). Results of the grain-size analyses are summarized in the table below.

Table 1
Summary of Grain-Size Analyses

Exploration Number	Depth (feet)	Geologic Unit	USCS Soil Description	Fines Content (%)
EB-3	10	Everson Glaciomarine Drift	very silty sandy CLAY (CL)	77.8
EB-3	20	Everson Glaciomarine Drift	Sandy silty CLAY (CL)	81.6

USCS = Unified Soil Classification System

Atterberg Limit Test

AESI performed one Atterberg Limit test on a sample of Everson glaciomarine drift obtained from EB-3 at depths of 10 and 20 feet, based on the ASTM D-4318 standard test methods. Both samples plotted below the A line which corresponds to a silt (ML) classification and are considered to be moderately plastic with Plasticity Indices of 13 and 14 for the 20-foot and 10-foot sample, respectively.

DRAFT

II. GEOLOGIC HAZARDS AND MITIGATIONS

The following discussion of potential geologic hazards is based on the geologic and groundwater conditions as observed and discussed herein. Based on the SCC the project site contains areas which meet the Erosion and Landslide Hazard Area criteria.

5.0 LANDSLIDE HAZARDS AND MITIGATION

Section 14.24.410 of the *Skagit County Code* (SCC) defines Landslide Hazards as the following.

(2) Landslide hazards are areas potentially subject to landslides based on a combination of geologic, topographic and hydrologic factors. The following are known or suspected landslide hazards:

- *(a) Areas designated in the Department of Ecology, Coastal Zone Atlas, Washington, Volume Two, Skagit County (1978) as U (Unstable), UB (Unstable Bluff), URS (Unstable Recent Slide), or UOS (Unstable Old Slide).*
- *(b) Slopes having gradients of 15% or greater:*
  - *(i) That intersect geologic contacts with permeable sediments overlying low-permeability sediment or bedrock and springs or groundwater seepage are present; or*
  - *(ii) That are parallel or subparallel to planes of weakness (such as bedding planes, joint systems, and fault planes) in subsurface materials.*
- *(c) Slopes of 40% or steeper and with a vertical relief of 10 feet or more.*
- *(d) Areas of previous failure such as earth slumps, earthflows, mudflows, lahars, debris flows, rock slides, landslides or other failures as observed in the field or as indicated on maps or in technical reports published by the U.S. Geological Survey, the Geology and Earth Resources Division of the Washington Department of Natural Resources, or other documents authorized by government agencies.*
- *(e) Potentially unstable areas resulting from rapid stream incision, stream bank erosion, and undercutting by wave action.*
- *(f) Coastal bluffs.*
- *(g) Slopes with a gradient greater than 80% and subject to rock fall.*
- *(h) Areas that are at risk from snow avalanches.*
- *(i) Areas designated on the Skagit County Alluvial Fan Study Orthophoto Maps as alluvial fans or as identified by the Director during site inspection.*
- *(j) Areas located in a narrow canyon potentially subject to inundation by debris flows or catastrophic flooding.*

DRAFT

(k) Those areas delineated by the U.S. Department of Agriculture's Natural Resources Conservation Service Soil Survey of Skagit County as "severe" (Table 9) limitation for building development.

The project section of Grip Road crosses a generally west- to southwest-facing slope about midway up the slope face. This results in both sides of the road being flanked by slopes. South of Grip Road the slope extends downward some 20 to 30 feet to the bottom of a ravine. Along the east half of the alignment, the slope continues to rise north of the road about 20 feet. General slope inclinations along the slope areas north and south of the slope are about 40 and 45 percent or flatter, respectively.

5.1 Slope Reconnaissance

We completed a limited reconnaissance of the on-site slopes at the time of our exploration on September 8, 2025. Our reconnaissance was limited due to the highly vegetated state of the slopes, steep inclination, and them being situated on privately-owned property. The following is a summary of our visual observations as they were made looking up- and downslope from Grip Road.

- During our site reconnaissance, we observed evidence of tension cracking along the east end of the project alignment, located in the known landslide area shown on Figures 2 and 3. These tension cracks have been sealed and observed to be approximately one-half of an inch wide.

- Trees located on the sloping area at the east end of the project site were generally oriented vertically, suggesting that ongoing, deep-seated slope movement is not occurring at the subject site.

- No springs were observed along the road embankment or within the visible portions of the slope.

5.2 LIDAR Mapping

Light Detection and Ranging (LIDAR) is a remote sensing technology that can be used to generate a detailed expression of ground surface topography even in densely vegetated areas. For this reason, LIDAR-based topographic imagery can be helpful in distinguishing surface features (such as old landslide features) that may otherwise not be easily recognizable. A LIDAR-based shaded relief map of the subject site and surrounding area is included on Figure 3.

DRAFT

Based on our review of the LIDAR image, the slopes along the east end of the project alignment of Grip Road appear to be distinctly hummocky with bowl-shaped edges. We interpret this to be indicative of shallow translational landslide activity. Grip Road was constructed through the landslide feature. The boundaries of the landslide feature can be seen on Figure 3.

The landslide scarp is situated on the north side of the road and the failure extends to the valley bottom with approximately 50 vertical feet of relief on slopes with a current average inclination of approximately 30 percent. Slopes on the central and west portions of the project alignment are characterized by distinctly more "smooth" topography and slope inclinations which are approximately consistent from the top to the toe of the slope. Generally, landslide activity results in terraced terrain towards the lower portions of the failure which is only visible in the east end of the project alignment.

5.3 Slope Stability Analysis

An analysis of overall slope stability was completed using the computer program Slope/W, Version 2024.2.0., by GeoStudio. The program used the Morgenstern-Price method for evaluating a rotational failure. Input parameters for the analysis included slope geometry, geology, groundwater conditions, and soil-strength parameters. Our study included two analyses for two separate cross-sectional areas along the project alignment. Analysis in the two locations included one of the existing slope conditions based on the topography included on Figure 3 along lines A to A' and B to B' which correspond nearest to stations 29+00 and 26+00, respectively. The second analysis completed in each location is based off the proposed conditions presented on the plan set by Semrau Engineering and Surveying dated September 4, 2025. All analyses include the added surcharge of a typical regularly trafficked roadway. Each analysis presents both seismic and static scenarios. These sections were selected because they extend through the steepest portions of the slope and intersect the central-most portions of the project area. The geology of the slope was based on the subsurface conditions encountered in our explorations and slope reconnaissance. All analyses were completed assuming a piezometric surface at the base of the mass wasting deposits along section A to A' and at the base of the existing fill along section B to B' to express a conservative model to accommodate the possibility of perched groundwater conditions. No groundwater was observed in our on-site explorations. Soil-strength parameters used for our analysis were assumed based on typical published values for similar materials and our prior experience. Due to the project plans being preliminary at this time and no pile design has been completed, the resisting forces provided by the proposed soldier pile wall are based on a typical wall design and are not site specific. The soil-strength and pile parameters used for our analysis are summarized below in Table 2 and Table 3, respectively.

DRAFT

Table 2
Summary of Soil-Strength Parameters

Geologic Unit	Effective Friction Angle (degrees)	Cohesion (psf)	Unit Weight (pcf)
Existing Fill	34	25	115
Mass Wasting Deposits	28	25	115
Everson Glaciomarine Drift	28	200	125

psf = pounds per square foot
pcf = pounds per cubic foot

Table 3
Summary of Soldier Pile Wall Parameters

Pile Type	Shear Force (lbf)	Reduction Factor	Pile Spacing (feet)
Steel Soldier Pile	15,000	1.5	5

lbf = found-force

For evaluation of slope stability under seismic conditions, a horizontal ground acceleration of 0.265g was used for our analysis. This value is equivalent to ½ of the peak horizontal ground acceleration based on a seismic event with a 2-percent probability of exceedance in 50 years. A unit weight of 250 pounds per square foot (psf) was used to model the surcharge of the roadway and associated vehicle traffic.

The factor of safety of a slope is the ratio between the forces that resist sliding to the forces that drive sliding. For example, a factor of safety of 1.0 would indicate a slope where the driving forces and the resisting forces are exactly equal. Increasing factor of safety values greater than 1.0 indicate increased stability.

Section 14.24.070 of the SCC requires that the improvements included in the proposed project do not adversely affect the public roadway, nearby properties, mapped environmentally critical areas, or geologic hazard areas. The results of our analysis are interpreted based on comparison of the proposed conditions to the existing conditions.

5.4 Slope Stability Analysis Results

The resulting factors of safety from our global stability analysis are provided in Table 4 below.

DRAFT

Table 4
Minimum Factors of Safety

	Static Factor of Safety Section A-A' (29+00)	Seismic Factor of Safety Section A-A' (29+00)	Static Factor of Safety Section B-B' (26+00)	Seismic Factor of Safety Section B-B' (26+00)
Existing Condition	1.4	0.8	2.0	1.1
Proposed Condition	1.8	1.0	2.0	1.2

The factor of safety values in Table 4 show that the proposed road widening as supported with a soldier pile wall does not lower the stability of the steep slope based on the identical parameters for both the existing and proposed conditions. All iterations of the analyses indicate that the proposed improvements will increase the stability of the slopes along the project alignment.

The results of our stability analysis are provided in Appendix C. These results show the shapes of the potential failures associated with the overall minimum factors of safety.

As with all steep slopes, some risk of landsliding remains. It must be understood that no recommendations or engineering design can yield a guarantee of stable slopes. Our observations, findings, and opinions are a means to identify and reduce the inherent risks to the public as a result of the proposed project.

DRAFT

5.5 Steep Slope Best Management Practices

The following measures should also be incorporated during construction and after completion of the development:

- Site disturbance should be the minimum required to construct the project. Vegetation should be maintained on steep slope areas.

- Stormwater from impervious surfaces should be captured and directed away from steep slopes to an approved drainage facility. Concentrated stormwater should not be allowed to discharge over or onto the steep slope.

- At no time should uncontrolled fill, landscaping waste, or other debris be pushed over the top of the steep slope. Uncontrolled fill on steep slopes may promote landslides or debris flow activity.

- The new soldier pile wall should be designed such that the supportive piles are embedded a minimum of 10 feet into the undisturbed Everson glaciomarine drift sediments, as indicated by the exploration logs presented in Appendix A.

5.6 Landslide Hazard Conclusion

Based on slope inclinations of the slopes north and south of Grip Road and evidence of historic sliding at the east end of the alignment, the slopes adjacent to Grip Road along the project alignment meet the County's criteria for Landslide Hazard areas.

Given the broad nature of the delineated landslide hazard within the project area the ability to mitigate risks associated with landslides occurring along these regional slopes, based on the relative size of the slope complex as compared to the subject site, is limited. Our study focuses on providing support for the road bank along the south side of Grip Road via a new soldier pile wall that is founded in competent native sediments not impacted by past slide events. Because the new proposed wall will drive loads from the retained soil down into the competent native material at depth, impacts to existing local landslide hazard areas will be mitigated. Additionally, section 14.24.070 of the SCC provides exemption requirements for projects within geologic hazards from a geologic hazard review. Specifically, subsection 3 provides exemption for maintenance or repair of existing rights-of-way.

A soldier pile wall founded in the underlying natural sediments will drive loads from the retainment of new structural fill to depth and provide resistance to global slope instability mitigating impacts to the hazard area. Our modeling indicates that the proposed condition with a soldier pile retaining wall will improve global slope factors of safety for the risks associated with the proposed road widening project along the south side of Grip Road. Design details for this wall are discussed within the "Preliminary Design Recommendations" section of this report. This opinion is dependent upon site grading and construction practices being completed in accordance with the geotechnical recommendations presented in this report.

DRAFT

6.0 SEISMIC HAZARDS AND MITIGATION

The following discussion is a general assessment of seismic hazards that is intended to be useful to the project design team in terms of understanding seismic issues, and to the structural engineer for design.

All of Western Washington is at risk of strong seismic events resulting from movement of the tectonic plates associated with the Cascadia Subduction Zone (CSZ), where the offshore Juan de Fuca plate subducts beneath the continental North American plate. The site lies within a zone of strong potential shaking from subduction zone earthquakes associated with the CSZ. The CSZ can produce earthquakes up to magnitude 9.0, and the recurrence interval is estimated to be on the order of 500 years. Geologists infer the most recent subduction zone earthquake occurred in

1700 (Goldfinger et al., 2012[1]). Three main types of earthquakes are typically associated with subduction zone environments: crustal, intraplate, and interplate earthquakes. Seismic records in the Puget Sound region document a distinct zone of shallow crustal seismicity (e.g., the Seattle Fault Zone [SFZ]). These shallow fault zones may include surficial expressions of previous seismic events, such as fault scarps, displaced shorelines, and shallow bedrock exposures. The shallow fault zones typically extend from the surface to depths ranging from 16 to 19 miles. A deeper zone of seismicity is associated with the subducting Juan de Fuca plate. Subduction zone seismic events produce intraplate earthquakes at depths ranging from 25 to 45 miles beneath the Puget Lowland including the 1949, 7.2-magnitude event; the 1965, 6.5-magnitude event; and the 2001, 6.8-magnitude event and interplate earthquakes at shallow depths near the Washington coast including the 1700 earthquake, which had a magnitude of approximately 9.0. The 1949 earthquake appears to have been the largest in this region during recorded history and was centered in the Olympia area. Evaluation of earthquake return rates indicates that an earthquake of the magnitude between 5.5 and 6.0 is likely within a given 20-year period.

Generally, there are four types of potential geologic hazards associated with large seismic events: 1) surficial ground rupture, 2) seismically induced landslides or lateral spreading, 3) liquefaction, and 4) ground motion. The potential for each of these hazards to adversely impact the proposed project is discussed below.

DRAFT

6.1 Surficial Ground Rupture

Generally, the largest earthquakes that have occurred in the Puget Sound area are sub-crustal events with epicenters ranging from 50 to 70 kilometers in depth. Earthquakes that are generated at such depths usually do not result in fault rupture at the ground surface. We reviewed known faults using the Department of Natural Resources (DNR) interactive geology portal. The DNR's online mapping indicates that the nearest active fault is in the Devils Mountain Fault Zone, approximately 14.5 miles south of the site. Due to the distance from the mapped active faults, the potential for seismically induced ground rupture to adversely affect the proposed project is low, in our opinion.

6.2 Seismically Induced Landslides

It is our opinion that the risk of landslide hazards is not adversely affected by the proposed improvements. The project consists of a new soldier pile wall supported by competent native sediments encountered in our explorations. The wall design will also include seismic loading conditions. Landslide hazards were discussed in greater detail in the "Landslide Hazards and Mitigation" section of this report.

[1] Goldfinger, C., Nelson, C.H., Morey, A.E., Johnson, J.E., Patton, J.R., Karabanov, E., Gutierrez-Pastor, J., Eriksson, A.T., Gracia, E., Dunhill, G., Enkin, R.J., Dallimore, A., and Vallier, T., 2012, *Turbidite Event History—Methods and Implications for Holocene Paleoseismicity of the Cascadia Subduction Zone*: U.S. Geological Survey Professional Paper 1661–F, 170.

6.3 Liquefaction

Liquefaction is a process through which unconsolidated soil loses strength as a result of vibrations, such as those which occur during a seismic event. During normal conditions, the weight of the soil is supported by both grain-to-grain contacts and by the fluid pressure within the pore spaces of the soil below the water table. Extreme vibratory shaking can disrupt the grain-to-grain contact, increase the pore pressure, and result in a temporary decrease in soil shear strength. The soil is said to be liquefied when nearly all of the weight of the soil is supported by pore pressure alone. Liquefaction can result in deformation of the sediment and settlement of overlying structures. Areas most susceptible to liquefaction include those areas underlain by loose to medium dense, sand and coarse silt accompanied by a shallow water table. It is our opinion that there is low risk of liquefaction due to the lack of adverse groundwater conditions at the time of exploration and the high plasticity of the native sediments. No mitigation of liquefaction is warranted.

7.0 EROSION HAZARDS AND MITIGATION

Section *14.24.410 Geologically hazardous areas known or suspected risk states:*

(1) The following are considered known or suspected erosion hazards:

- *a. Areas with gradients greater than or equal to 30%.*
- *b. Areas located within the following map units: No. 1 Andic Cryochrepts, Nos. 3 and 4 Andic Xerocrepts, No. 13 Birdsview, Nos. 47 and 48 Dystric Xerochrepts, Nos. 50 and 51 Dystic Xerorthents, Nos. 63 and 65 Guemes, No. 69 Hoogdal, No. 90 Lithic Haploxerolls, No. 91 Marblemount, No. 99 Mundt and Nos. 150 and 151 Typic Croyorthods or mapped severe **erosion hazard**, as identified in the U.S. Department of Agriculture Natural Resources Conservation Service Soil Survey of Skagit County Area, WA (1989).*
- *c. Coastal beaches or bluffs.*
- *d. Areas designated in the Department of Ecology, Coastal Zone Atlas, Washington, Volume Two Skagit County (1978) as U (Unstable), UB (Unstable Bluff), URS (Unstable Recent Slide), or UOS (Unstable Old Slide).*
- *e. Areas susceptible to rapid stream incision and stream bank **erosion**.*

The NRCS and our on-site explorations indicate that the soils on the site are consistent with the Hoogdal silt loam soil series. The SCC specifies that areas mapped as containing the Hoogdal soil series are considered erosion hazard areas. Additionally, the sediments which underlie the subject site contain significant quantities of clay, silt, and fine sand and are considered to be highly sensitive to disturbance when wet and erosion where it is present below sloping areas.

DRAFT

In order to mitigate erosion hazards and the potential for off-site sediment transport, we recommend the following best management practices (BMPs):

1. To the extent practical, earthwork should be avoided during the wet season, October 1st through April 1st.

2. The winter performance of a site is dependent on a well-conceived plan for control of site erosion and stormwater runoff. The site plan should include ground-cover measures and staging areas. The contractor should be prepared to implement and maintain the required measures to reduce the amount of exposed ground.

3. Temporary erosion and sedimentation control (TESC) elements and perimeter flow control should be established prior to the start of grading.

4. During the wetter months of the year, or when significant storm events are predicted during the summer months, the work area should be stabilized so that if showers do occur, it can receive the rainfall without excessive erosion or sediment transport. The stabilization process should include establishing temporary stormwater conveyance channels through work areas to route runoff to the approved treatment/discharge facilities.

5. All areas of disturbed soil should be revegetated as soon as possible. If it is outside of the growing season, the disturbed areas should be covered with mulch. Straw mulch provides a cost-effective cover measure and can be made wind-resistant with the application of a tackifier after it is placed.

6. Surface runoff and discharge should be controlled during and following development. Uncontrolled discharge may promote erosion and sediment transport.

7. Soils that are to be reused around the site should be stored in such a manner as to reduce erosion from the stockpile. Protective measures may include, but are not limited to, covering stockpiles with plastic sheeting, or the use of silt fences around pile perimeters.

It is our opinion that with the proper implementation of the TESC plans and by field-adjusting appropriate erosion mitigation (BMPs) throughout construction, the potential adverse impacts from erosion hazards on the project may be mitigated. In our opinion, erosion control practices in place at the site at the time of our site visit were suitable for the site conditions.

DRAFT

III. PRELIMINARY DESIGN RECOMMENDATIONS

8.0 INTRODUCTION

The project proposes a new retaining wall on the south side of Grip Road along the project alignment to support the structural fill and road section required for the proposed widening. Our explorations along the project alignment generally found existing fill or a thin layer of mass wasting deposits overlying Everson glaciomarine drift. Due to the presence of compressible soils at shallow depths and steep slopes that meet the County's definition for landslide hazard area, we have provided recommendations in this report for a soldier pile retaining wall. A soldier pile wall will drive loads deeper into the core of the slope while providing resistance to slope instability. Conventional block retaining walls, would add significant surcharge loads to the top of the slope, would have a wider footprint, and would add additional weight to the compressible soils which increases the risk of long-term settlement. Recommendations for the soldier pile wall design and construction are provided in this report.

As previously mentioned, the slope adjacent to Grip Road are considered Erosion and Landslide Hazard Areas. Refer to Sections 5.0 and 7.0 for additional details.

9.0 SITE PREPARATION

Site preparation should include removal of all vegetation, topsoil, and any other deleterious materials in the immediate project area. After stripping of the surfacing material, including asphalt and crushed aggregate, has been completed, any remaining roots and stumps should be removed from structural areas. All soils disturbed by stripping and grubbing operations should be recompacted as described below for structural fill.

9.1 Access and Staging Areas

Consideration should be given to protecting access and staging areas with an appropriate section of crushed rock. Placement of an engineering stabilization fabric (such as Mirafi® 500X or approved equivalent) below the rock will reduce the potential of fine-grained materials pumping up through the crushed rock during wet weather and turning the area to mud. The fabric will also aid in supporting construction equipment, thus reducing the amount of crushed rock required. Crushed rock used for access and staging areas should have a particle size of at least 2 inches.

9.2 Temporary and Permanent Slopes

In our opinion, stable construction slopes should be the responsibility of the contractor and should be determined during construction based on the local conditions encountered at that

DRAFT

time. For planning purposes, we anticipate that temporary, unsupported cut slopes in areas of existing fill, mass wasting deposits, and/or glaciomarine sediments can be made at a maximum slope of 1.5H:1V. Temporary vertical cuts up to 4 feet in height may be planned in all of these materials. Flatter inclinations may be recommended in areas of seepage. As is typical with earthwork operations, some sloughing and raveling may occur, and cut slopes may have to be adjusted in the field. In addition, WISHA/OSHA regulations should be followed at all times.

Permanent cut and structural fill slopes should not exceed an inclination of 2H:1V.

10.0 STRUCTURAL FILL

Placement of structural fill may be necessary to establish desired grades in some areas, or for restoration of roadway areas after wall construction. All references to structural fill in this report refer to subgrade preparation, fill type, and placement and compaction of materials as discussed in this section. If a percentage of compaction is specified under another section of this report, the value given in that section should be used.

10.1 Structural Fill Compaction

Structural fill is defined as non-organic soil, acceptable to the geotechnical engineer, placed in maximum 8-inch loose lifts, with each lift being compacted to at least 95 percent of the modified Proctor maximum dry density using ASTM D-1557 as the standard. The top of the compacted fill should extend horizontally a minimum distance of 3 feet beyond pavement edges before sloping down at an angle no steeper than 2H:1V. Fill slopes should either be overbuilt and trimmed back to final grade or surface-compacted to the specified density.

10.2 Moisture-Sensitive Fill

Soils in which the amount of fine-grained material (smaller than No. 200 sieve) is greater than approximately 5 percent (measured on the minus No. 4 sieve size) should be considered moisture-sensitive. The use of moisture-sensitive soil in structural fills should be limited to favorable dry weather and dry subgrade conditions. Because most of the on-site soils contain high percentages of silt, compaction of these sediments to the recommended minimum density will only be achievable over a narrow range of moisture contents and use of these materials for structural fill is not recommended. Maximum rock size for structural fill applications should be limited to diameters of approximately 6 inches or less.

Construction equipment traversing the site when the silty on-site sediments are very moist or wet can cause considerable disturbance. If fill is required, a select import material consisting of a clean, free-draining gravel and/or sand should be used. Free-draining fill consists of non-organic

DRAFT

soil with the amount of fine-grained material limited to 5 percent by weight when measured on the minus No. 4 sieve fraction.

10.3 Structural Fill Testing

The contractor should note that any proposed fill soils must be evaluated by AESI prior to their use in fills. This would require that we have a sample of the material at least 3 business days in advance to perform a Proctor test and determine its field compaction standard.

A representative from our firm should observe the stripped subgrade and be present during placement of structural fill to observe the work and perform a representative number of in-place density tests. In this way, the adequacy of the earthwork may be evaluated as filling progresses and any problem areas may be corrected at that time. It is important to understand that taking random compaction tests on a part-time basis will not assure uniformity or acceptable performance of a fill. As such, we are available to aid the owner in developing a suitable monitoring and testing frequency.

10.4 Keying and Benching

We recommend that structural fill placed behind the shoring wall, or any fills placed on slopes steeper than 5H:1V, should be tied to firm and unyielding subsoil by appropriate keying and benching, which would be established in the field to suit the particular soil conditions at the time of grading. The keyway will act as a shear key to embed the toe of the new fill into a competent soil layer. Generally, the keyway for slope fills should be at least 4 feet wide and cut into firm and unyielding soils at least 3 feet deep. Level benches would then be cut horizontally across the embankment following the contours of the slope. No specific width is required for the benches, although they are usually a few feet wider than the dozer being used to cut them.

DRAFT

11.0 PERMANENT SOLDIER PILE WALL

This section of the report presents design considerations and criteria for use in the design of the retaining wall. *With this information and other pertinent data, it should be the responsibility of the pile contractor and structural engineer to determine the appropriate design details, construction methods, and procedures for installation of the shoring system*.

We anticipate that the new cantilever soldier pile shoring wall, consisting of wide-flange steel piles, and embedded a minimum of 10 feet into the underlying Everson glaciomarine drift deposits, will provide the necessary lateral support of the existing hillslope along the south side of Grip Road. The slope stability analysis discussed herein uses a vertically oriented soldier pile wall design not including tie-backs. A cantilever soldier pile wall will provide additional resisting forces which will require minimal extension of the construction boundary downslope. Based on

current grades we anticipate the wall will have an exposed height of up to 6 feet or less. Treated timber lagging should be used to support the soil between the piles; plywood should not be used for lagging. A structural engineer should design the wall system based on the soil parameters provided in this report.

The construction sequence for soldier pile shoring systems typically begins with driving or drilling each pile to the minimum specified embedment depth below the base of the final grade under the observation of the geotechnical engineer or designated field representative. Drilled and grouted piles should be allowed to set for at least 72 hours prior to beginning excavation. Treated timber lagging, as specified by the structural engineer, should be installed and backfilled with permeable soils to prevent the buildup of water behind the lagging boards.

We recommend that the temporary cantilever shoring system be designed to resist an active lateral earth pressure of 40H psf, presented as a triangular distribution for a level backslope, where H equals the exposed height of the wall. Where the wall will support a backslope of up to a 2H:1V, we recommend using an active pressure of 65H. It should be considered that existing overhead utilities are situated within the project area and may conflict with pile installation. The active earth pressure acts over the pile spacing above the excavation base.

Lateral resistance of soldier piles may be computed on the basis of allowable passive earth pressure equivalent to 125(D) psf within the fill and/or mass wasting deposits and 200(D) psf within the Everson glaciomarine drift, where D equals the depth of pile embedment in the respective soil unit. This pressure may be considered to be acting against 2 diameters of the soldier pile below the ground surface. The upper 3 feet on the passive side of the piles should be neglected and truncated from a triangular distribution.

Also, in accordance with the 2021 *International Building Code* (IBC), retaining wall design should include seismic surcharges. Based on the site soils and anticipated wall backfill materials, we recommend a seismic surcharge pressure in addition to the equivalent fluid pressure presented above. A rectangular pressure distribution of 12H psf should be included in design. The above pressures are assumed to act over the pile spacing over the exposed section of wall. In addition to the earth pressures discussed above, the soldier piles should be designed to resist a traffic surcharge pressure. Our recommended traffic surcharge pressure is presented graphically on Figure 4.

For design purposes, the vertical load capacity of soldier piles embedded in the Everson glaciomarine drift sediments should be determined based on an allowable adhesion or side friction of 1 kip per square foot (ksf) and an allowable end bearing of 12 ksf.

If adjacent structures, slopes, heavy construction traffic, materials stockpiling, or other substantial surcharges are to be applied during construction, these surcharges should also be included in the design.

DRAFT

We recommend a minimum depth of embedment of 10 feet into the underlying native, undisturbed Everson glaciomarine drift deposits. Soil conditions may differ from those described in this report. All sediments of glacial origin may contain large cobbles or boulders at random locations.

The drilling contractor should be prepared to use casing, drilling slurry, or other methods of stabilizing the hole in the case of caving. If more than 6 inches of standing water or slough is present at the bottom of the boring prior to grout placement, the contractor should be prepared to use a tremie pipe to place grout continuously from the bottom up. Grout may consist of lean-mix concrete or controlled density fill (CDF), as specified by the structural engineer, to ease chipping for lagging installation.

Timber lagging can be designed to resist reduced lateral earth pressures as a result of soil arching between piles. For the site soils, the lagging can be designed to resist 50 percent of the calculated lateral load at any given point. Caving could be experienced when excavating and installing lagging between piles. Overexcavation of soils behind the lagging should be avoided. Excavation should extend just far enough to allow lagging installation. Any void spaces behind lagging should be filled with pea gravel or other suitable free-draining material to prevent caving and loss of support for adjacent ground.

DRAFT

12.0 DRAINAGE CONSIDERATIONS

It is imperative that proper drainage be provided so that hydrostatic pressures do not develop against the walls. For soldier pile walls this would involve installation of a minimum 1-foot-wide blanket drain for the full wall height using permeable material such as imported, washed gravel against the walls. Soil nail walls will require a drainage product such as Mira-Drain drain mats which are installed per the manufacturer's recommendations. The drainage mat would be installed behind the shotcrete in strips that run between the soil nails for the full height of the wall. Stormwater collected from the wall or other site drainage should discharge via tightline drain to an approved receptor. All downspout outfall pipes should be repaired and discharged to a suitable location away from the slope or, if feasible, down to the bottom of the slope.

13.0 PROJECT DESIGN AND CONSTRUCTION MONITORING

We are available to provide geotechnical engineering and monitoring services during construction. Skagit County will likely require geotechnical special inspections during construction. The integrity of the wall depends on proper site preparation and construction procedures. Engineering decisions may have to be made in the field in the event that variations in subsurface conditions become apparent. Construction monitoring services are not part of this

current scope of work. If these services are desired, please let us know, and we will prepare a proposal.

We have enjoyed working with you on this study and are confident that these recommendations will aid in the successful completion of your project. If you should have any questions or require further assistance, please do not hesitate to call.

Sincerely,
ASSOCIATED EARTH SCIENCES, INC.
Mount Vernon, Washington

DRAFT

Forest Gheen-Regouski, G.I.T.
Staff Geologist

DRAFT

Matthew A. Miller, P.E.
Principal Geotechnical Engineer

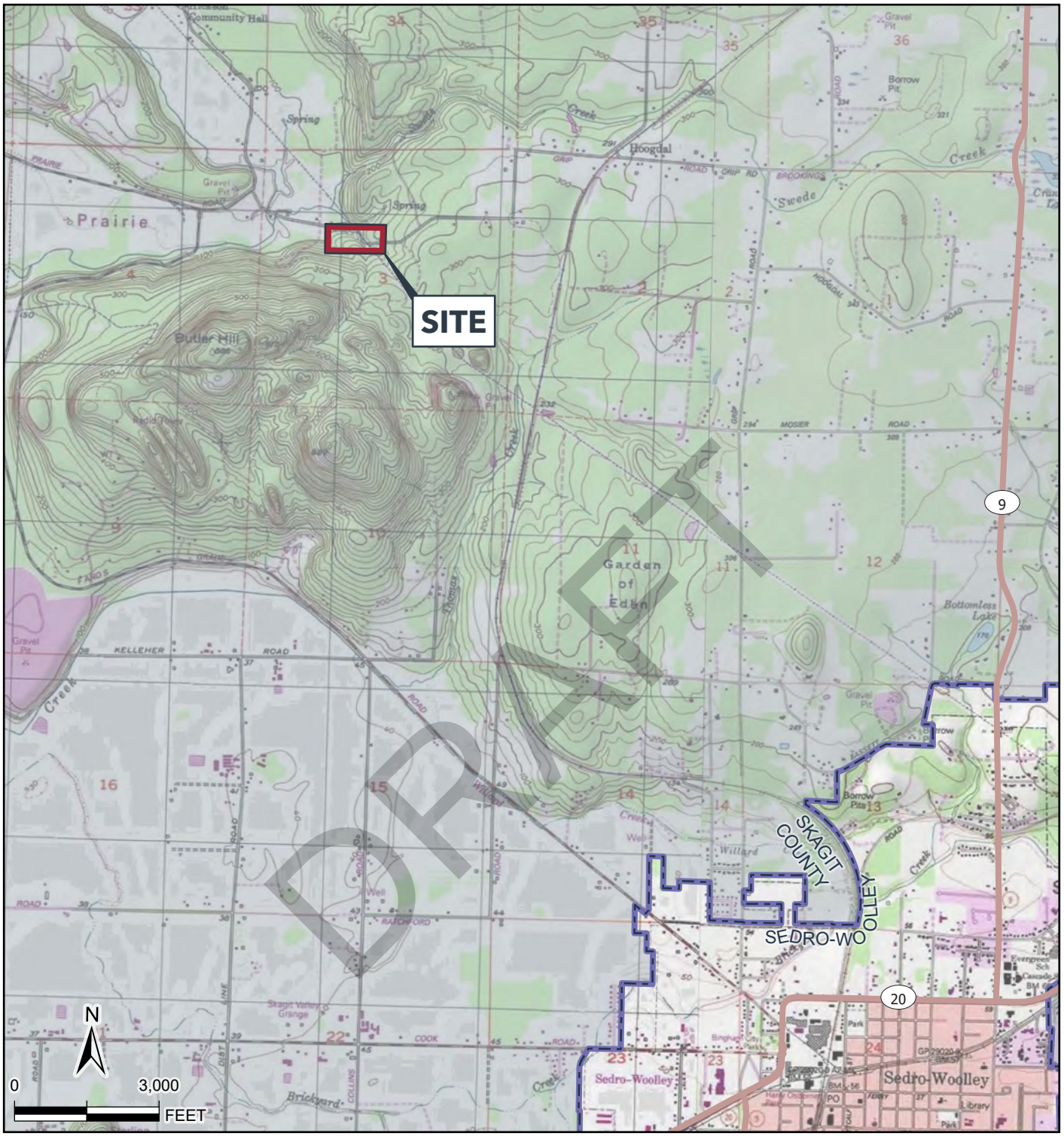
DRAFT

Anthony W. Romanick, P.E.
Associate Engineer

DRAFT

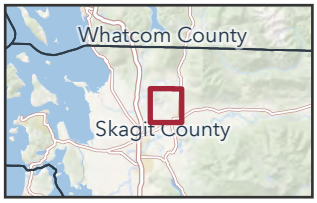
ATTACHMENTS

Figure 1: Vicinity Map
Figure 2: Existing Site and Exploration Plan
Figure 3: LIDAR Based Topography
Figure 4: Proposed Site and Exploration Plan
Appendix A: Exploration Logs
Appendix B: Laboratory Data
Appendix C: Slope Stability Analysis

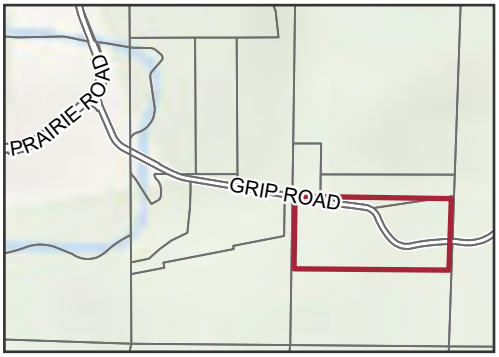


DRAFT

COUNTY LOCALE



LOCATION



ESRI, USGS, NATIONAL GEOGRAPHIC, DELORME, NATURALVUE, I-CUBED, GEBCO: ARCGIS ONLINE BASEMAP. WADOT STATE ROUTES 24K (12/20). SKAGIT CO: PARCELS, ROADS (10/22).

NOTE: LOCATION AND DISTANCES SHOWN ARE APPROXIMATE. BLACK AND WHITE REPRODUCTION OF THIS COLOR ORIGINAL MAY REDUCE ITS EFFECTIVENESS AND LEAD TO INCORRECT INTERPRETATION.

associated earth sciences incorporated

VICINITY MAP

GRIP ROAD WIDENING
SKAGIT COUNTY, WASHINGTON

PROJECT NO.	DATE	FIGURE
20130228E002	9/25	1

G:\GIS_Projects\aY13post07161\30228 Grip Road Mine\APRX\E00212013022 8E002 F1 VM_GripMineRd.aprx | 20130228E002 F1 VM_GripRdMine | 2025-09-10 | jzivkovic



LEGEND

- SITE
- EXPLORATION BORING
- CROSS-SECTION
- CONTOUR 5 FT
- CONTOUR 20 FT
- PARCEL

N

0 120

FEET

DATA SOURCES/REFERENCES:
SKAGIT COUNTY: ROADS (10/22), PARCELS (10/24). AERIAL IMAGERY (2021). WA DOE: STREAMS (5/19). WA DNR LIDAR: NORTH_PUGET_2017 ACQUIRED MARCH TO SEPT 2016, 3' CELL SIZE. CONTOURS DERIVED FROM LIDAR. CASCADES_NORTH_WALI_2023, ACQUIRED 8/31/2022 – 2/24/2023, CALL SIZE 1.5'.

BLACK AND WHITE REPRODUCTION OF THIS COLOR ORIGINAL MAY REDUCE ITS EFFECTIVENESS AND LEAD TO INCORRECT INTERPRETATION. LOCATION AND DISTANCES SHOWN ARE APPROXIMATE.

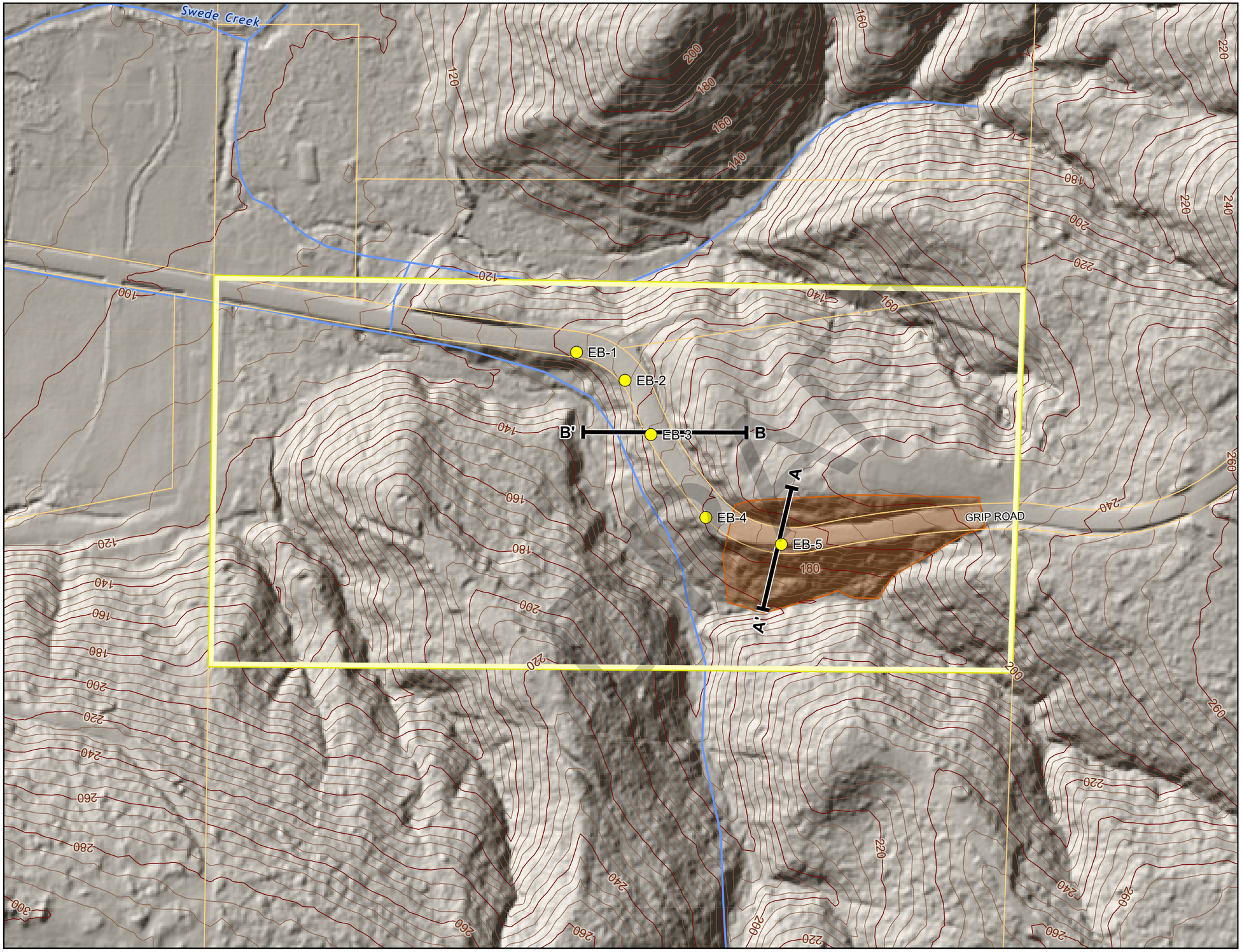
associated earth sciences incorporated

EXISTING SITE AND EXPLORATION PLAN

GRIP ROAD WIDENING
SKAGIT COUNTY, WASHINGTON

PROJECT NO.	DATE	FIGURE
20130228E002	10/25	2

G:\GIS_Projects\aY13\pcsd\07161\30228 Grip Road Mine\APRX\E002\20130228E002 F2 ES_GripRdMine.aprx | 20130228E002 F2 ES_GripRdMine | 2025-10-06 | jziv\kovic



LEGEND

- SITE
- EXPLORATION BORING
- CROSS-SECTION
- CONTOUR 20 FT
- CONTOUR 5 FT
- LANDSLIDE AREA
- PARCEL

N

0 150

FEET

DATA SOURCES/REFERENCES:
SKAGIT COUNTY: ROADS (10/22), PARCELS (10/24). WA DOE: STREAMS (5/19). WA DNR LIDAR: NORTH_PUGET_2017 ACQUIRED MARCH TO SEPT 2016, 3' CELL SIZE. CONTOURS DERIVED FROM LIDAR. CASCADES_NORTH_WALI_2023, ACQUIRED 8/31/2022 – 2/24/2023, CALL SIZE 1.5'.

BLACK AND WHITE REPRODUCTION OF THIS COLOR ORIGINAL MAY REDUCE ITS EFFECTIVENESS AND LEAD TO INCORRECT INTERPRETATION. LOCATION AND DISTANCES SHOWN ARE APPROXIMATE.

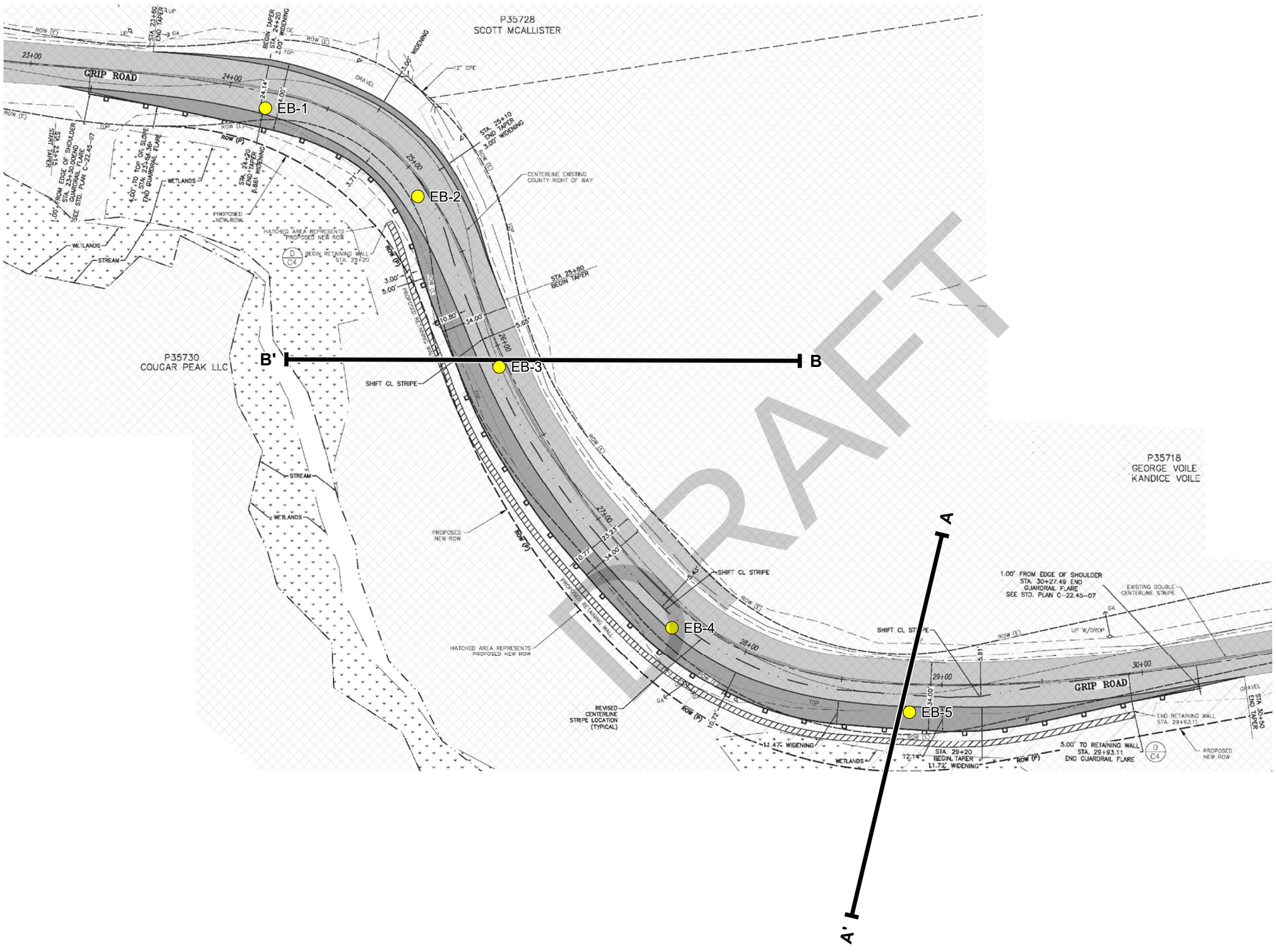
associated earth sciences incorporated

LIDAR BASED TOPOGRAPHY

GRIP ROAD WIDENING
SKAGIT COUNTY, WASHINGTON

PROJECT NO.	DATE	FIGURE
20130228E002	10/25	3

G:\GIS_Projects\aY13\post07\61\30228 Grip Road Mine\APRX\E002\20130228E002 F3 TOPO_GripRdMine.aprx | 20130228E002 F3 TOPO_GripRdMine | 2025-10-06 | zivkovic

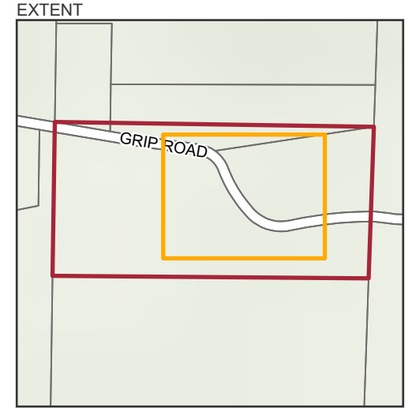


DRAFT

LEGEND

- EXPLORATION BORING
- CROSS-SECTION

EXTENT



N

0 50

FEET

DATA SOURCES/REFERENCES:
SEMRAU ENGINEERING & SURVEYING, PLLC, SITE PLAN AND TESCP, GRIP ROAD PAVEMENT WIDENING - MILES SAND AND GRAVEL, SHEET C3 (9/4/25)

BLACK AND WHITE REPRODUCTION OF THIS COLOR ORIGINAL MAY REDUCE ITS EFFECTIVENESS AND LEAD TO INCORRECT INTERPRETATION. LOCATION AND DISTANCES SHOWN ARE APPROXIMATE.

associated earth sciences incorporated

PROPOSED SITE AND EXPLORATION PLAN

GRIP ROAD WIDENING
SKAGIT COUNTY, WASHINGTON

PROJECT NO.	DATE	FIGURE
20130228E002	10/25	4

G:\GIS_Projects\aY13\post07161\30228 Grip Road Mine\APRX\E002\20130228E002 F4 SP_GripRdMine.aprx | 20130228E002 F4 SP_GripRdMine | 2025-10-06 | jziv\kovic

APPENDIX A

Exploration Logs

DRAFT

Coarse-Grained Soils - More than 50%[1] Retained on No. 200 Sieve	Gravels - More than 50%[1] of Coarse Fraction Retained on No. 4 Sieve	≤5% Fines[2]	GW	Well-graded gravel and gravel with sand, little to no fines
			GP	Poorly-graded gravel and gravel with sand, little to no fines
		≥12% Fines[2]	GM	Silty gravel and silty gravel with sand
			GC	Clayey gravel and clayey gravel with sand
	Sands - 50%[1] or More of Coarse Fraction Passes No. 4 Sieve	≤5% Fines[2]	SW	Well-graded sand and sand with gravel, little to no fines
			SP	Poorly-graded sand and sand with gravel, little to no fines
		≥12% Fines[2]	SM	Silty sand and silty sand with gravel
			SC	Clayey sand and clayey sand with gravel
Fine-Grained Soils - 50%[1] or More Passes No. 200 Sieve	Silts and Clays Liquid Limit Less than 50		ML	Silt, sandy silt, gravelly silt, silt with sand or gravel
			CL	Clay of low to medium plasticity; silty, sandy, or gravelly clay, lean clay
			OL	Organic clay or silt of low plasticity
	Silts and Clays Liquid Limit 50 or More		MH	Elastic silt, clayey silt, silt with micaceous or diatomaceous fine sand or silt
			CH	Clay of high plasticity, sandy or gravelly clay, fat clay with sand or gravel
			OH	Organic clay or silt of medium to high plasticity
Highly Organic Soils			PT	Peat, muck and other highly organic soils

Terms Describing Relative Density and Consistency

Coarse-Grained Soils	Density	SPT[3] blows/foot
	Very Loose	0 to 4
	Loose	4 to 10
	Medium Dense	10 to 30
	Dense	30 to 50
	Very Dense	>50

Fine-Grained Soils	Consistency	SPT[3] blows/foot
	Very Soft	0 to 2
	Soft	2 to 4
	Medium Stiff	4 to 8
	Stiff	8 to 15
	Very Stiff	15 to 30
	Hard	>30

Test Symbols

G = Grain Size
M = Moisture Content
A = Atterberg Limits
C = Chemical
DD = Dry Density
K = Permeability

Component Definitions

Descriptive Term	Size Range and Sieve Number
Boulders	Larger than 12"
Cobbles	3" to 12"
Gravel	3" to No. 4 (4.75 mm)
Coarse Gravel	3" to 3/4"
Fine Gravel	3/4" to No. 4 (4.75 mm)
Sand	No. 4 (4.75 mm) to No. 200 (0.075 mm)
Coarse Sand	No. 4 (4.75 mm) to No. 10 (2.00 mm)
Medium Sand	No. 10 (2.00 mm) to No. 40 (0.425 mm)
Fine Sand	No. 40 (0.425 mm) to No. 200 (0.075 mm)
Silt and Clay	Smaller than No. 200 (0.075 mm)

[4] Estimated Percentage

Component	Percentage by Weight
Trace	<5
Some	5 to <12
Modifier (silty, sandy, gravelly)	12 to <30
Very *modifier* (silty, sandy, gravelly)	30 to <50

Moisture Content

Dry - Absence of moisture, dusty, dry to the touch
Slightly Moist - Perceptible moisture
Moist - Damp but no visible water
Very Moist - Water visible but not free draining
Wet - Visible free water, usually from below water table

Symbols

Sampler Type and Description

- Blows/6" or portion of 6"
- Split-Spoon Sampler (SPT)
- California Sampler
- Ring Sampler
- Continuous Sampling
- Grab Sample
- Portion not recovered

Groundwater depth

- ATD At time of drilling
- Static water level (date)



- Cement grout surface seal
- Bentonite seal
- Filter pack with blank casing section
- Screened casing or Hydrotip with filter pack
- End cap

Classifications of soils in this report are based on visual field and/or laboratory observations, which include density/consistency, moisture condition, grain size, and plasticity estimates and should not be construed to imply field or laboratory testing unless presented herein. Visual-manual and/or laboratory classification methods of ASTM D-2487 and D-2488 were used as an identification guide for the Unified Soil Classification System.

(1) Percentage by dry weight
(2) Combined USCS symbols used for fines between 5% and 12%
(3) (SPT) Standard Penetration Test (ASTM D-1586)
(4) In General Accordance with Standard Practice for Description and Identification of Soils (ASTM D-2488)

DRAFT

associated earth sciences incorporated

EXPLORATION LOG KEY FIGURE: A1

Blocks\ dwg \ log_key 2022.dwg LAYOUT: Layout 5 - 2022 Logdraft

associated earth sciences incorporated

Exploration Boring EB-1

Geologic/Hydrogeologic Evaluation - Grip Road Mine — Sheet: 1 of 2

Skagit County, WA	Start Date: 9/8/25	Logged By: FGR
20130228E002	Ending Date: 9/8/25	Approved By: JHS

Driller/Equipment: Geologic Drill Partners, Inc./Recon Rig
Hammer Weight/Drop: 140#/30"
Hole Diameter (in): 6
Groundwater Depth ATD (ft): Not encountered

Total Depth (ft): 36.5
Ground Surface Elevation (ft): ≈142
Datum: NAVD 88
Groundwater Depth Post Drilling (ft) (Date): ()

Depth (ft)	Sample Type	Sample	% Recovery	Graphic Symbol	Description	Water Level	Blows/6"	Blows/Foot (10 20 30 40 50+)	Other Tests
0		1			**Topsoil/Grass - 2 inches** **Fill** Slightly moist, brown, silty, gravelly, fine to medium SAND; gravel is crushed; unsorted (SM).		3 6 6	12	
2.5		2			Moist, grayish brown with oxidation staining, SILT; occasional organic wood pieces; slightly plastic (ML).		2 2 2	4	
5		3			Moist, bluish gray, SILT; occasional organic stringers; brownish gray in upper 4 inches; slightly plastic (ML).		2 1 2	3	
7.5		4			**Everson Glaciomarine Drift** Moist, light brown, clayey, SILT, trace gravel; plastic; massive (ML).		4 5 6	11	
10		5			As above.		2 5 5	10	
12.5									
15		6			As above; trace organic dark brown staining and coarse sand; rare oxidation staining around organic stringers.		3 5 8	13	
17.5									

DRAFT

10/13/2025

20130228E002

associated earth sciences incorporated

Exploration Boring EB-1

Geologic/Hydrogeologic Evaluation - Grip Road Mine — Sheet: 2 of 2

Skagit County, WA	Start Date: 9/8/25	Logged By: FGR
20130228E002	Ending Date: 9/8/25	Approved By: JHS

Driller/Equipment: Geologic Drill Partners, Inc./Recon Rig
Hammer Weight/Drop: 140#/30"
Hole Diameter (in): 6
Total Depth (ft): 36.5
Ground Surface Elevation (ft): ≈142
Datum: NAVD 88
▼ Groundwater Depth ATD (ft): Not encountered
▽ Groundwater Depth Post Drilling (ft) (Date): ()

Depth (ft)	Sample Type	Sample	% Recovery	Graphic Symbol	Description	Water Level	Blows/6"	Blows/Foot (10 20 30 40 50+)	Other Tests
20		7			Moist, gray, clayey, SILT; rare oxidation staining around organic stringers; effervesces with hydrochloric acid (ML).		2 3 5	8	
22.5									
25		8			As above; trace fine sand; trace dark brown organic staining around stringers.		3 5 7	12	
27.5									
30		9			As above; slightly less moist; slightly blocky texture.		4 3 3	6	
32.5									
35		10			As above; no organics or oxidation.		3 6 2	8	
37.5					No groundwater encountered.				

DRAFT

10/13/2025
20130228E002

associated earth sciences incorporated

Exploration Boring EB-2

Geologic/Hydrogeologic Evaluation - Grip Road Mine — Sheet: 1 of 2

Skagit County, WA	Start Date: 9/8/25	Logged By: FGR
20130228E002	Ending Date: 9/8/25	Approved By: JHS

Driller/Equipment: Geologic Drill Partners, Inc./Recon Rig
Hammer Weight/Drop: 140#/30"
Hole Diameter (in): 6
Total Depth (ft): 26.5
Ground Surface Elevation (ft): ≈152
Datum: NAVD 88
Groundwater Depth ATD (ft): Not encountered
Groundwater Depth Post Drilling (ft) (Date): ()

Depth (ft)	Sample Type	Sample	% Recovery	Graphic Symbol	Description	Water Level	Blows/6"	Blows/Foot (10 20 30 40 50+)	Other Tests
0		1			**Topsoil/Grass - 4 inches** **Fill** Slightly moist, brownish gray, sandy, GRAVEL, some silt; gravel is crushed; unsorted (GM).		6 7 6	13	
2.5		2			Very moist, light brown, SILT; topsoil and crushed rock; little to no recovery (ML). Drill chatter at 3 feet; easy drilling after 3 feet.		4 4 5	9	
5		3			Moist, light brown, GRAVEL, some sand, some silt; gravel is crushed; broken gravel; silt in upper 2 inches; unsorted (GP).		4 6 4	10	
7.5		4			**Everson Glaciomarine Drift** Moist to very moist, light brownish gray, SILT; occasional organic pieces and rootlets; plastic; possible original grade due to rootlets (ML).		0 1 2	3	
10		5			Moist, light brown with minor oxidation staining, clayey, SILT; massive (ML).		3 5 6	11	
12.5									
15		6			As above.		6 10 13	23	
17.5									

DRAFT

10/13/2025

20130228E002

associated earth sciences incorporated

Exploration Boring EB-2

Geologic/Hydrogeologic Evaluation - Grip Road Mine — Sheet: 2 of 2

Skagit County, WA	Start Date: 9/8/25	Logged By: FGR
20130228E002	Ending Date: 9/8/25	Approved By: JHS

Driller/Equipment: Geologic Drill Partners, Inc./Recon Rig
Hammer Weight/Drop: 140#/30"
Hole Diameter (in): 6
Groundwater Depth ATD (ft): Not encountered

Total Depth (ft): 26.5
Ground Surface Elevation (ft): ≈152
Datum: NAVD 88
Groundwater Depth Post Drilling (ft) (Date): ()

Depth (ft)	Sample Type	Sample	% Recovery	Graphic Symbol	Description	Water Level	Blows/6"	Blows/Foot (10 20 30 40 50+)	Other Tests
20		7			Moist, gray, clayey, SILT; massive; plastic; effervesces with hydrochloric acid (ML).		5 8 8	16	
22.5									
25		8			As above.		3 3 4	7	
					No groundwater encountered.				
27.5									
30									
32.5									
35									
37.5									

DRAFT

10/13/2025

20130228E002

associated earth sciences incorporated

Exploration Boring EB-3

Geologic/Hydrogeologic Evaluation - Grip Road Mine — Sheet: 1 of 2

Skagit County, WA	Start Date: 9/8/25	Logged By: FGR
20130228E002	Ending Date: 9/8/25	Approved By: JHS

Driller/Equipment: Geologic Drill Partners, Inc./Recon Rig
Hammer Weight/Drop: 140#/30"
Hole Diameter (in): 6
Groundwater Depth ATD (ft): Not encountered

Total Depth (ft): 26.5
Ground Surface Elevation (ft): ≈165
Datum: NAVD 88
Groundwater Depth Post Drilling (ft) (Date): ()

Depth (ft)	Sample Type	Sample	% Recovery	Graphic Symbol	Description	Water Level	Blows/6"	Blows/Foot (10 20 30 40 50+)	Other Tests
0		1			**Topsoil/Grass - 2 inches** **Fill** Slightly moist, sandy, GRAVEL, some silt; gravel is crushed and broken; unsorted (GM-GP).		3 4 3	7	
2.5		2			**Everson Glaciomarine Drift** Slightly moist, light brown with minor oxidation, SILT; massive; very difficult to remove SPT from auger; rare 45 degree fractures and slicken faces (ML).		3 4 6	10	
5		3			Moist, light brown, SILT; plastic; massive (ML).		5 6 7	13	
7.5		4			As above.		3 6 8	14	
10		5			As above.		4 5 7	12	
12.5									
15		6			As above; becoming gray.		3 4 5	9	
17.5									

DRAFT

10/13/2025

20130228E002

associated earth sciences incorporated

Exploration Boring EB-3

Geologic/Hydrogeologic Evaluation - Grip Road Mine — Sheet: 2 of 2

Skagit County, WA	Start Date: 9/8/25	Logged By: FGR
20130228E002	Ending Date: 9/8/25	Approved By: JHS

Driller/Equipment: Geologic Drill Partners, Inc./Recon Rig
Hammer Weight/Drop: 140#/30"
Hole Diameter (in): 6
Groundwater Depth ATD (ft): Not encountered

Total Depth (ft): 26.5
Ground Surface Elevation (ft): ≈165
Datum: NAVD 88
Groundwater Depth Post Drilling (ft) (Date): ()

Depth (ft)	Sample Type	Sample	% Recovery	Graphic Symbol	Description	Water Level	Blows/6"	Blows/Foot (10 20 30 40 50+)	Other Tests
20		7			Moist, gray, clayey, SILT; plastic; massive; effervesces with hydrochloric acid (ML).		3 3 4	7	
22.5									
25		8			As above.		3 3 6	9	
					No groundwater encountered.				
27.5									
30									
32.5									
35									
37.5									

DRAFT

10/13/2025

20130228E002

associated earth sciences incorporated

Exploration Boring EB-4

Geologic/Hydrogeologic Evaluation - Grip Road Mine — Sheet: 1 of 2

Skagit County, WA	Start Date: 9/8/25	Logged By: FGR
20130228E002	Ending Date: 9/5/25	Approved By: JHS

Driller/Equipment: Geologic Drill Partners, Inc./Recon Rig
Hammer Weight/Drop: 140#/30"
Hole Diameter (in): 6
Total Depth (ft): 36.5
Ground Surface Elevation (ft): ≈180
Datum: NAVD 88
Groundwater Depth ATD (ft): Not encountered
Groundwater Depth Post Drilling (ft) (Date): ()

Depth (ft)	Sample Type	Sample	% Recovery	Graphic Symbol	Description	Water Level	Blows/6"	Blows/Foot (10 20 30 40 50+)	Other Tests
0		1			**Topsoil/Grass - 2 inches** **Fill** Slightly moist, light brown, sandy, GRAVEL, some silt; gravel is broken and crushed; unsorted (GP).		4 8 9	17	
2.5		2			Moist, oxidized orangish brown, sandy, SILT; occasional rootlets; brick and charcoal; unsorted (ML).		3 3 3	6	
5		3			**Mass Wasting Deposit** Moist, light brown, SILT; slightly disturbed; blocky texture; plastic (ML).		3 3 4	7	
7.5		4			**Everson Glaciomarine Drift** Moist, light brown, SILT; massive (ML).		2 4 8	12	
10		5			Moist, gray, clayey, SILT; plastic; massive; effervesces with hydrochloric acid (ML).		4 4 6	10	
12.5									
15		6			As above.		3 3 4	7	
17.5									

DRAFT

10/13/2025
20130228E002

associated earth sciences incorporated

Exploration Boring EB-4

Geologic/Hydrogeologic Evaluation - Grip Road Mine — Sheet: 2 of 2

Skagit County, WA	Start Date: 9/8/25	Logged By: FGR
20130228E002	Ending Date: 9/5/25	Approved By: JHS

Driller/Equipment: Geologic Drill Partners, Inc./Recon Rig
Hammer Weight/Drop: 140#/30"
Hole Diameter (in): 6
Total Depth (ft): 36.5
Ground Surface Elevation (ft): ≈180
Datum: NAVD 88
▼ Groundwater Depth ATD (ft): Not encountered
▽ Groundwater Depth Post Drilling (ft) (Date): ()

Depth (ft)	Sample Type	Sample	% Recovery	Graphic Symbol	Description	Water Level	Blows/6"	Blows/Foot (10 20 30 40 50+)	Other Tests
20		7			As above; single broken gravel mid sample.		3 3 3	6	
22.5									
25		8			As above.		2 2 4	6	
27.5									
30		9			As above.		2 3 3	6	
32.5									
35		10			As above.		2 3 4	7	
37.5					No groundwater encountered.				

DRAFT

10/13/2025
20130228E002

associated earth sciences incorporated

Exploration Boring EB-5

Geologic/Hydrogeologic Evaluation - Grip Road Mine — Sheet: 1 of 2

Skagit County, WA	Start Date: 9/8/25	Logged By: FGR
20130228E002	Ending Date: 9/8/25	Approved By: JHS

Driller/Equipment: Geologic Drill Partners, Inc./Recon Rig
Hammer Weight/Drop: 140#/30"
Hole Diameter (in): 6
Groundwater Depth ATD (ft): Not encountered

Total Depth (ft): 26.5
Ground Surface Elevation (ft): ≈192
Datum: NAVD 88
Groundwater Depth Post Drilling (ft) (Date): ()

Depth (ft)	Sample Type	Sample	% Recovery	Graphic Symbol	Description	Water Level	Blows/6"	Blows/Foot (10 20 30 40 50+)	Other Tests
0		1			**Topsoil/Grass - 2 inches** **Fill** Slightly moist, light brown and black, sandy, GRAVEL, some silt; gravel is crushed and broken; unsorted (GP).		7 7 6	13	
2.5		2			**Mass Wasting Deposit** Moist, light brown, sandy, SILT; occasional charcoal; unsorted (ML).		3 2 4	6	
5		3			As above; disturbed appearance.		4 7 4	11	
7.5					**Everson Glaciomarine Drift** Slightly moist, light brown, SILT; slightly fractured texture; rare slicken faces; blocky; massive (ML).				
10		4			Moist, light brown, clayey, SILT; plastic; massive (ML).		2 2 3	5	
12.5									
15		5			As above.		3 3 2	5	
17.5									

DRAFT

10/13/2025
20130228E002

associated earth sciences incorporated

Exploration Boring EB-5

Geologic/Hydrogeologic Evaluation - Grip Road Mine — Sheet: 2 of 2

Skagit County, WA	Start Date: 9/8/25	Logged By: FGR
20130228E002	Ending Date: 9/8/25	Approved By: JHS

Driller/Equipment: Geologic Drill Partners, Inc./Recon Rig
Hammer Weight/Drop: 140#/30"
Hole Diameter (in): 6
Groundwater Depth ATD (ft): Not encountered

Total Depth (ft): 26.5
Ground Surface Elevation (ft): ≈192
Datum: NAVD 88
Groundwater Depth Post Drilling (ft) (Date): ()

Depth (ft)	Sample Type	Sample	% Recovery	Graphic Symbol	Description	Water Level	Blows/6"	Blows/Foot (10 20 30 40 50+)	Other Tests
20		6			Moist, gray, clayey, SILT; plastic; massive; effervesces with hydrochloric acid (ML).		2 3 4	7	
22.5									
25		7			As above.		2 3 3	6	
					No groundwater encountered.				
27.5									
30									
32.5									
35									
37.5									

DRAFT

10/13/2025

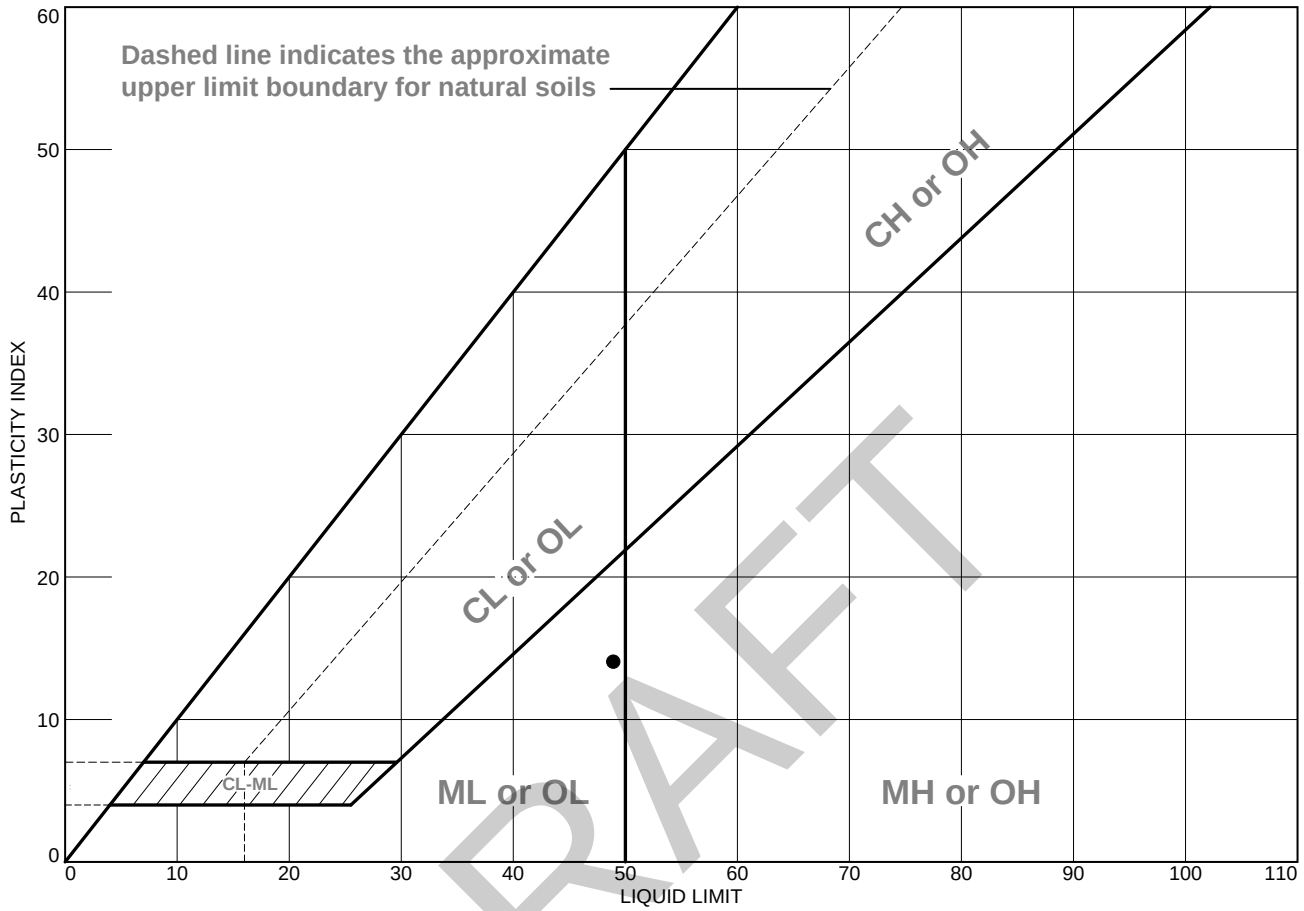
20130228E002

APPENDIX B

Laboratory Data

DRAFT

LIQUID AND PLASTIC LIMITS TEST REPORT



DRAFT

	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	very silty sandy CLAY	49	35	14	84.7	77.8	ML

Project No. 20130228 **Client:** Miles Sand and Gravel

Project: Grip Road Mine

●**Location:** Onsite **Depth:** 10' **Sample Number:** EB-3

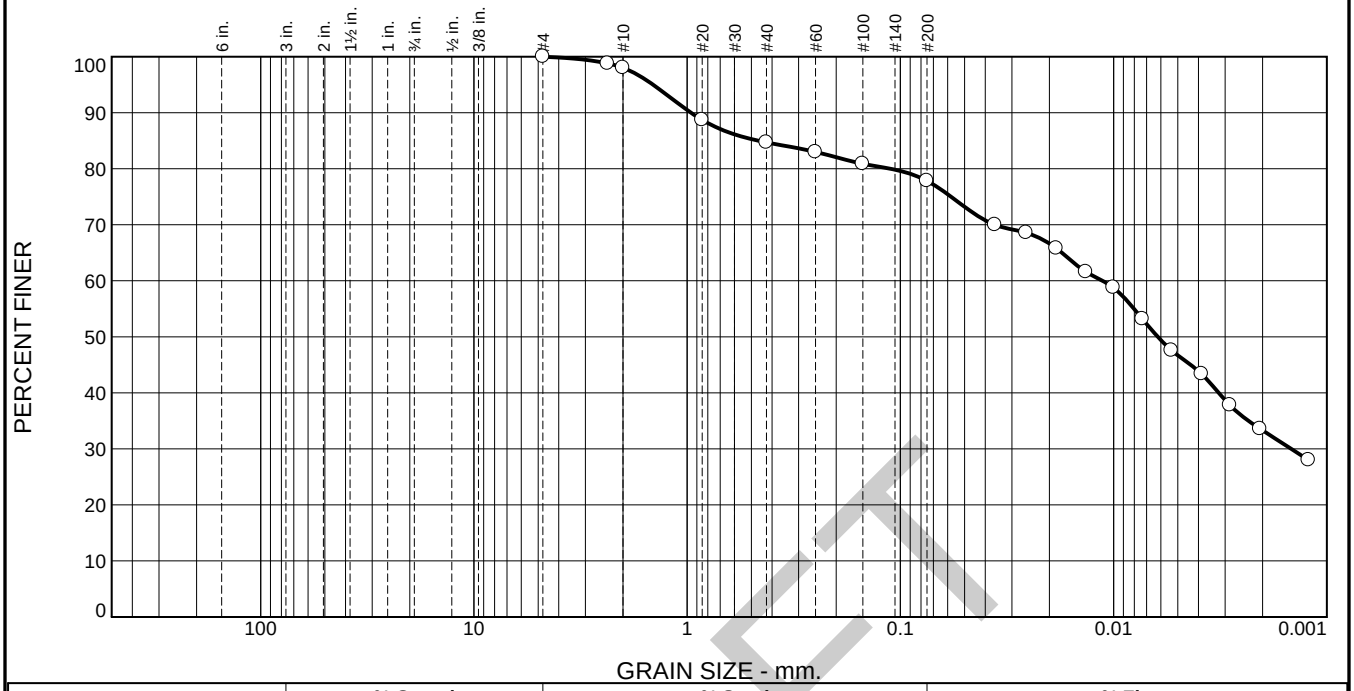
Remarks:

associated earth sciences incorporated

Figure

Tested By: FEW **Checked By:** FGR/TR

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	2.0	13.3	6.9	31.1	46.7

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	100.0		
#8	98.8		
#10	98.0		
#20	88.7		
#40	84.7		
#60	83.0		
#100	80.9		
#200	77.8		
0.0360 mm.	70.0		
0.0257 mm.	68.6		
0.0185 mm.	65.8		
0.0135 mm.	61.6		
0.0100 mm.	58.8		
0.0073 mm.	53.2		
0.0053 mm.	47.6		
0.0039 mm.	43.4		
0.0028 mm.	37.8		
0.0021 mm.	33.6		
0.0012 mm.	28.0		

* (no specification provided)

Material Description

very silty sandy CLAY

Atterberg Limits (ASTM D 4318)

PL= 35 **LL=** 49 **PI=** 14

Classification

USCS (D 2487)= ML **AASHTO (M 145)=** A-7-5(13)

Coefficients

D_{90}= 0.9596 D_{85}= 0.4635 D_{60}= 0.0113
D_{50}= 0.0062 D_{30}= 0.0015 D_{15}=
D_{10}= C_u= C_c=

Remarks

Date Received: 9-9-2025 **Date Tested:** 9-18-2025

Tested By: FEW

Checked By: FGR/TR

Title:

Location: Onsite
Sample Number: EB-3 **Depth:** 10'

Date Sampled: 9-8-2025

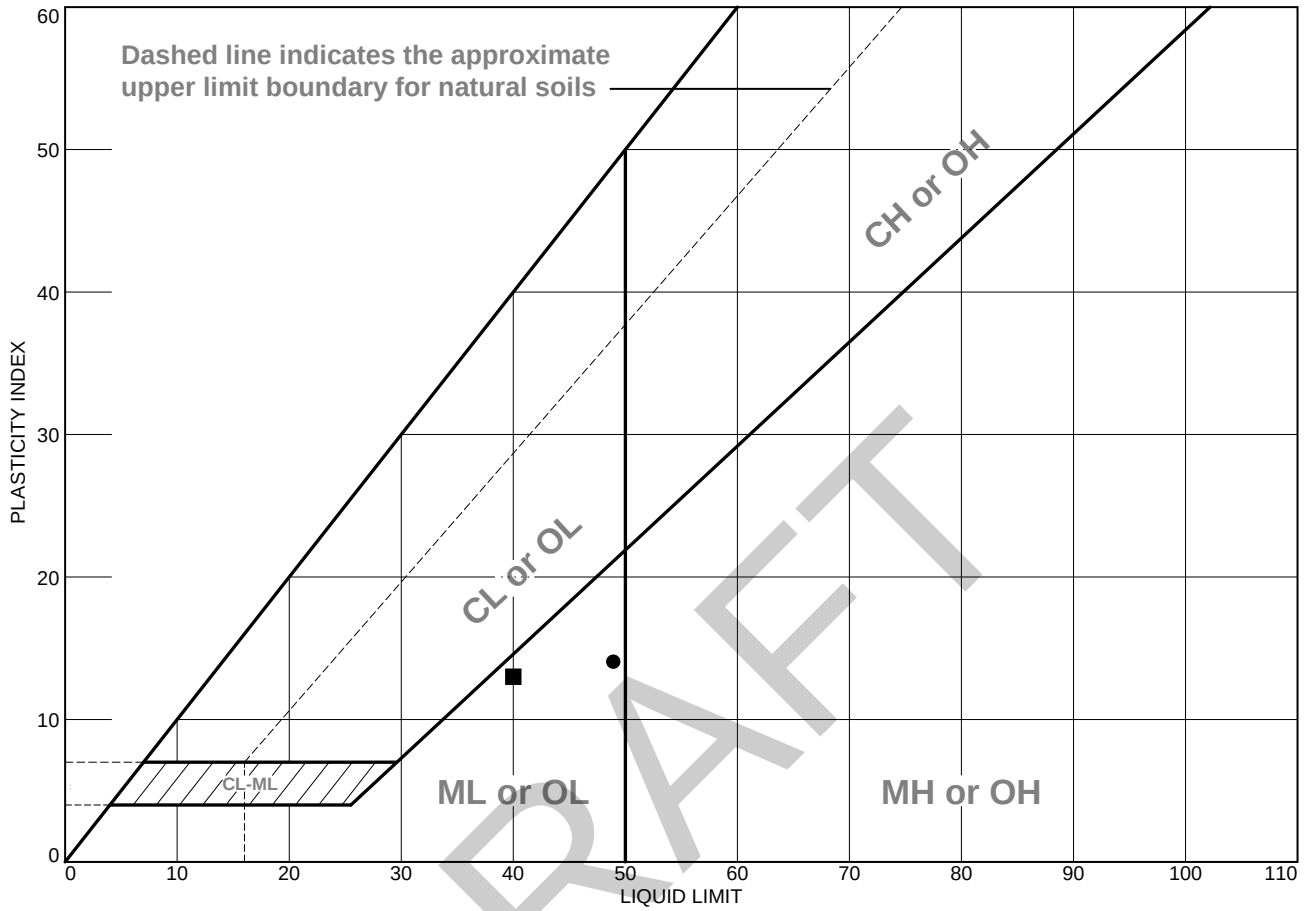
associated earth sciences incorporated

Client: Miles Sand and Gravel
Project: Grip Road Mine

Project No: 20130228 E002 **Figure**

DRAFT

LIQUID AND PLASTIC LIMITS TEST REPORT



DRAFT

	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	very silty sandy CLAY	49	35	14	84.7	77.8	ML
■	sandy silty CLAY	40	27	13	88.1	81.6	ML

Project No. 20130228 **Client:** Miles Sand and Gravel

Project: Grip Road Mine

●**Location:** Onsite **Depth:** 10' **Sample Number:** EB-3

■**Location:** Onsite **Depth:** 20' **Sample Number:** EB-3

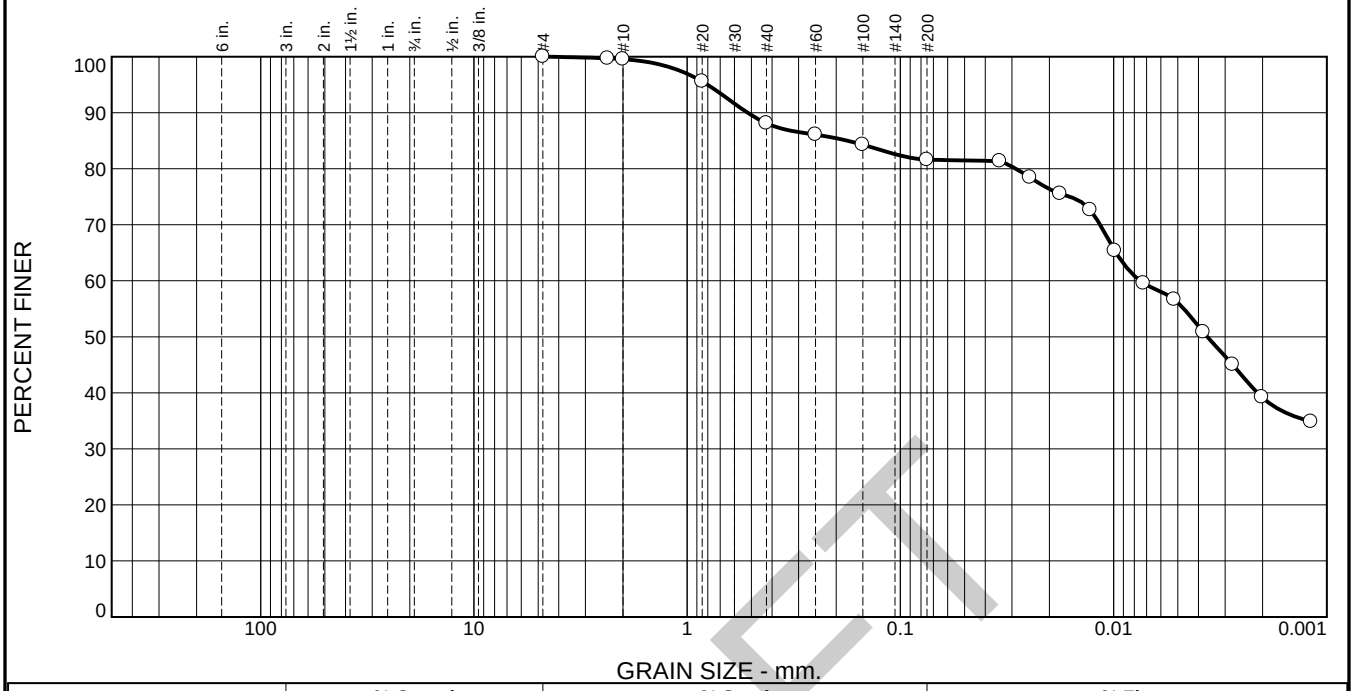
Remarks:

associated earth sciences incorporated

Figure

Tested By: FEW **Checked By:** FGR/TR

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.4	11.5	6.5	25.5	56.1

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	100.0		
#8	99.7		
#10	99.6		
#20	95.6		
#40	88.1		
#60	86.1		
#100	84.3		
#200	81.6		
0.0341 mm.	81.4		
0.0247 mm.	78.5		
0.0178 mm.	75.5		
0.0129 mm.	72.6		
0.0099 mm.	65.4		
0.0072 mm.	59.6		
0.0052 mm.	56.7		
0.0038 mm.	50.8		
0.0028 mm.	45.0		
0.0020 mm.	39.2		
0.0012 mm.	34.9		

* (no specification provided)

Material Description

sandy silty CLAY

Atterberg Limits (ASTM D 4318)

PL= 27 **LL=** 40 **PI=** 13

Classification

USCS (D 2487)= ML **AASHTO (M 145)=** A-6(11)

Coefficients

D_{90}= 0.5206 D_{85}= 0.1776 D_{60}= 0.0075
D_{50}= 0.0036 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Date Received: 9-9-2025 **Date Tested:** 10-8-2025

Tested By: FEW

Checked By: FGR/TR

Title:

Location: Onsite
Sample Number: EB-3 **Depth:** 20'

Date Sampled: 9-8-2025

associated earth sciences incorporated

Client: Miles Sand and Gravel
Project: Grip Road Mine

Project No: 20130228 E002 **Figure**

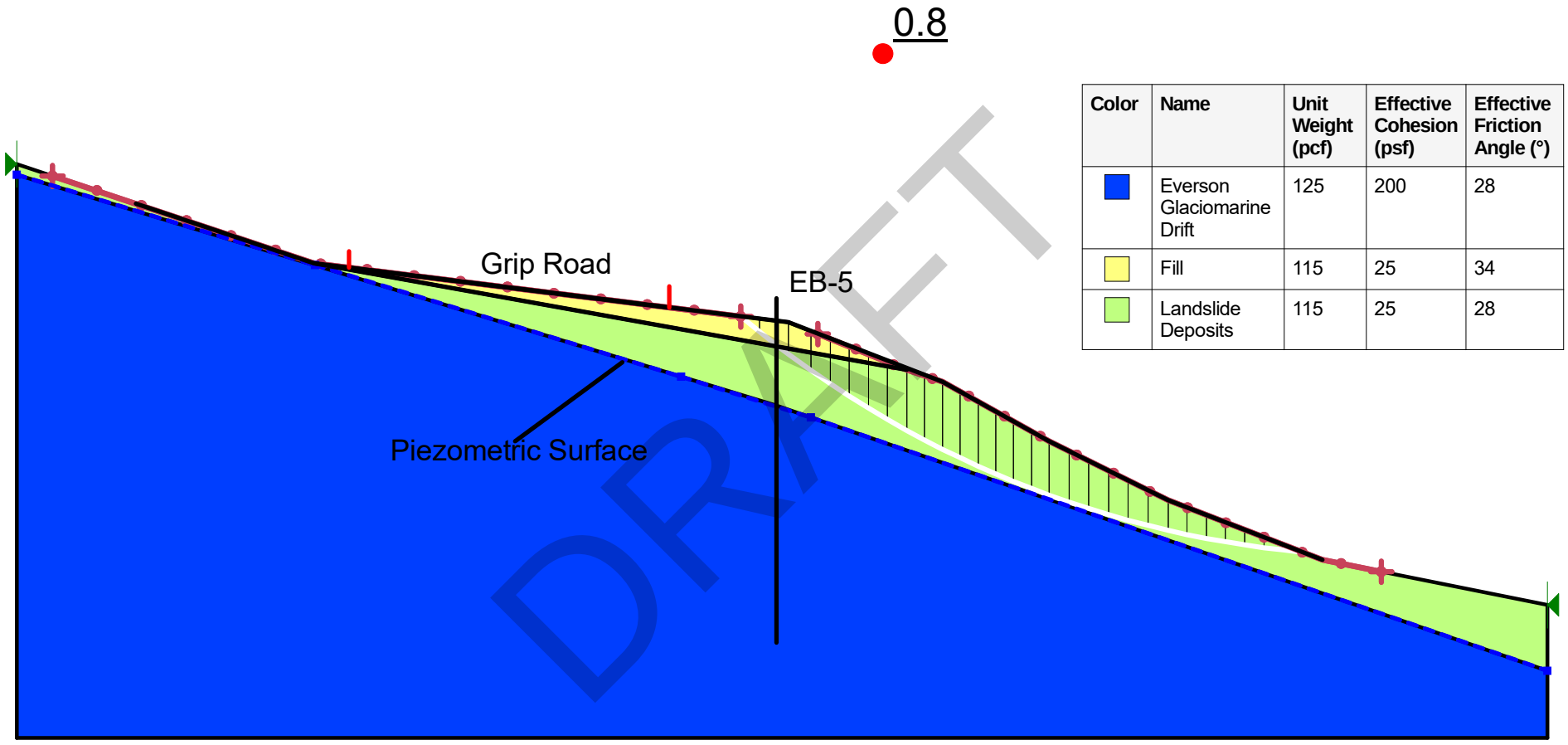
DRAFT

APPENDIX C

Slope Stability Analysis

DRAFT

General Settings:
Analysis Type: Morgenstern-Price
Direction of movement: Left to Right
Slip Surface Option: Entry and Exit
Horz Seismic Coef.: 0.265



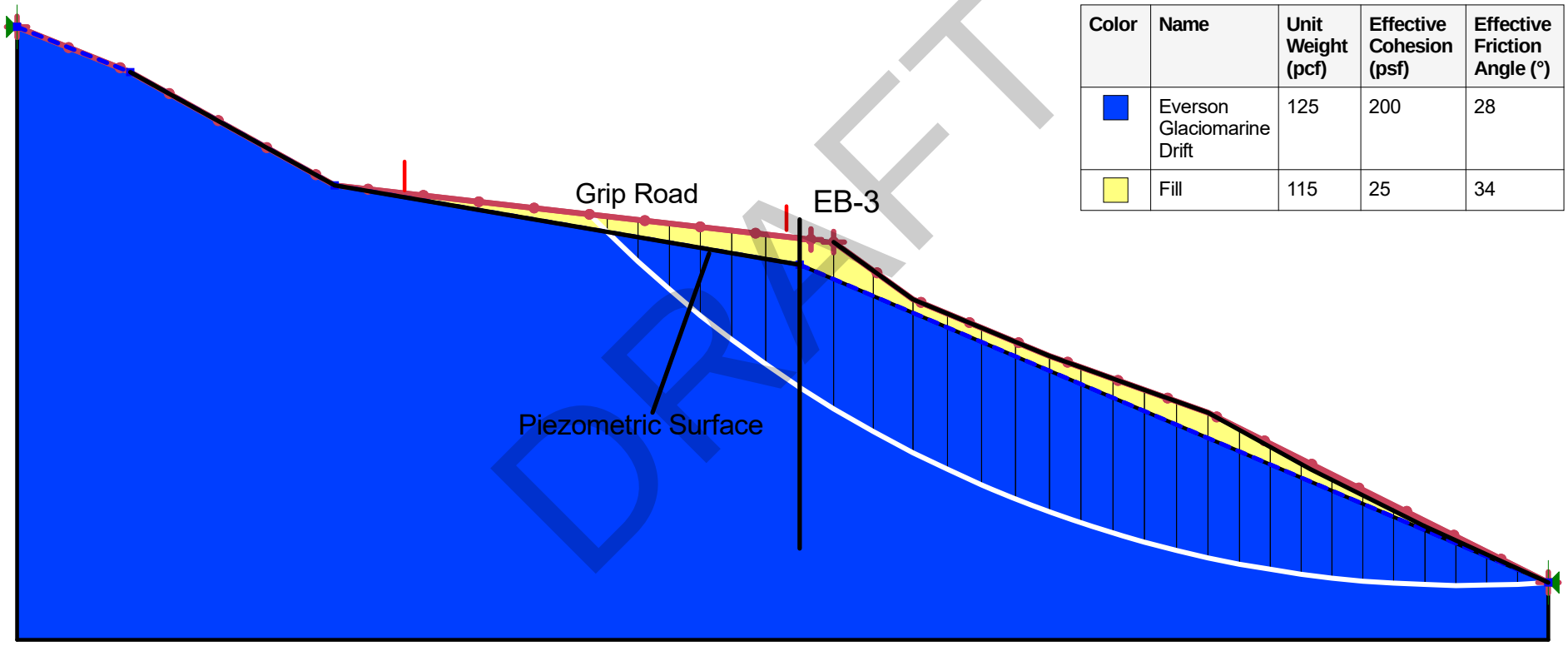
Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Everson Glaciomarine Drift	125	200	28
	Fill	115	25	34
	Landslide Deposits	115	25	28

Existing Seismic Conditions A-A'

Grip Road Widening
Date: 10/02/2025
Scale: 1:161

General Settings:
Analysis Type: Morgenstern-Price
Direction of movement: Left to Right
Slip Surface Option: Entry and Exit
Horz Seismic Coef.: 0.265

1.1



Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Everson Glaciomarine Drift	125	200	28
	Fill	115	25	34

DRAFT

B

B'

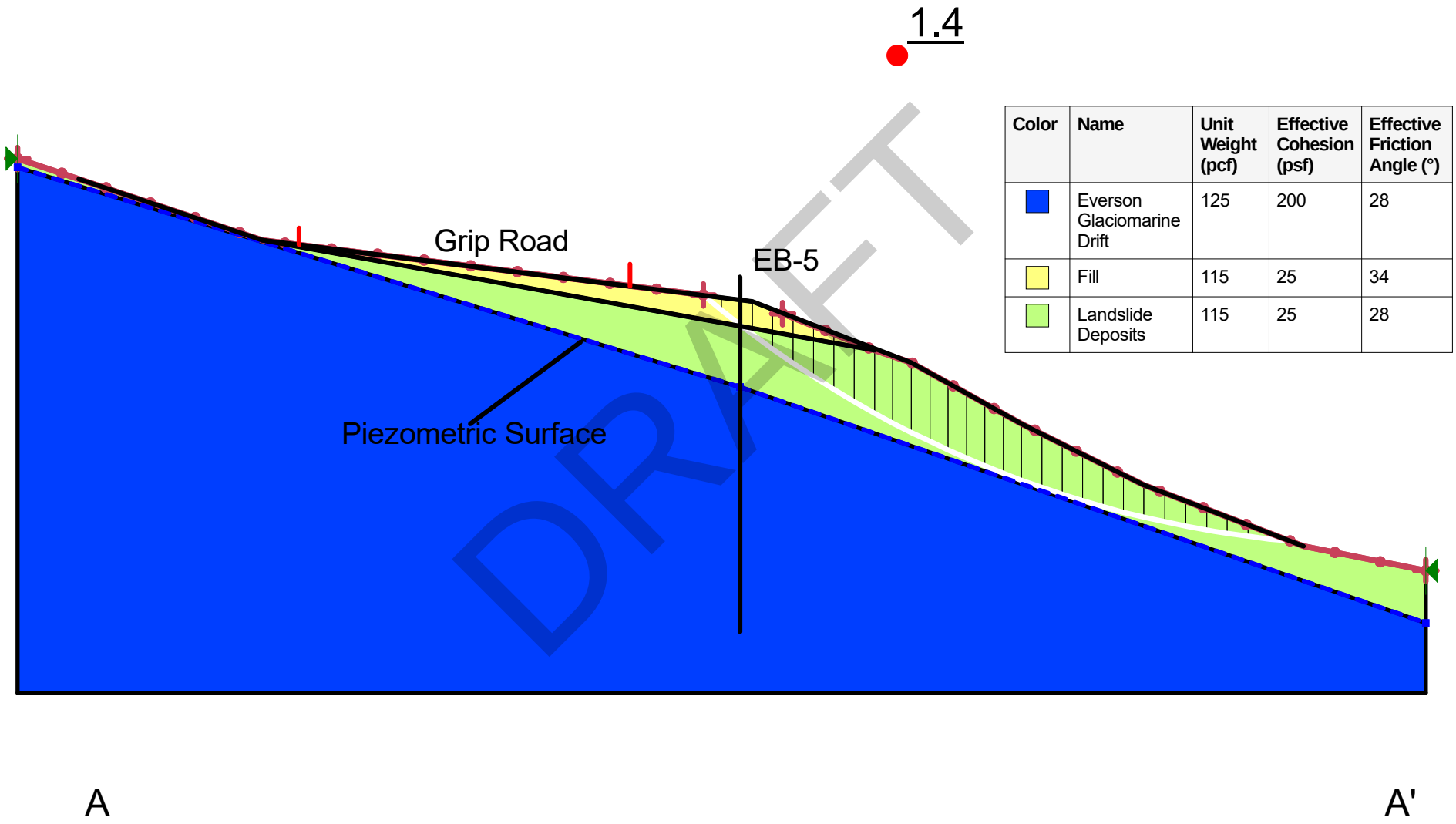
Existing Seismic Conditions B-B'

Grip Road Widening

Date: 10/02/2025

Scale: 1:169

General Settings:
Analysis Type: Morgenstern-Price
Direction of movement: Left to Right
Slip Surface Option: Entry and Exit
Horz Seismic Coef.:



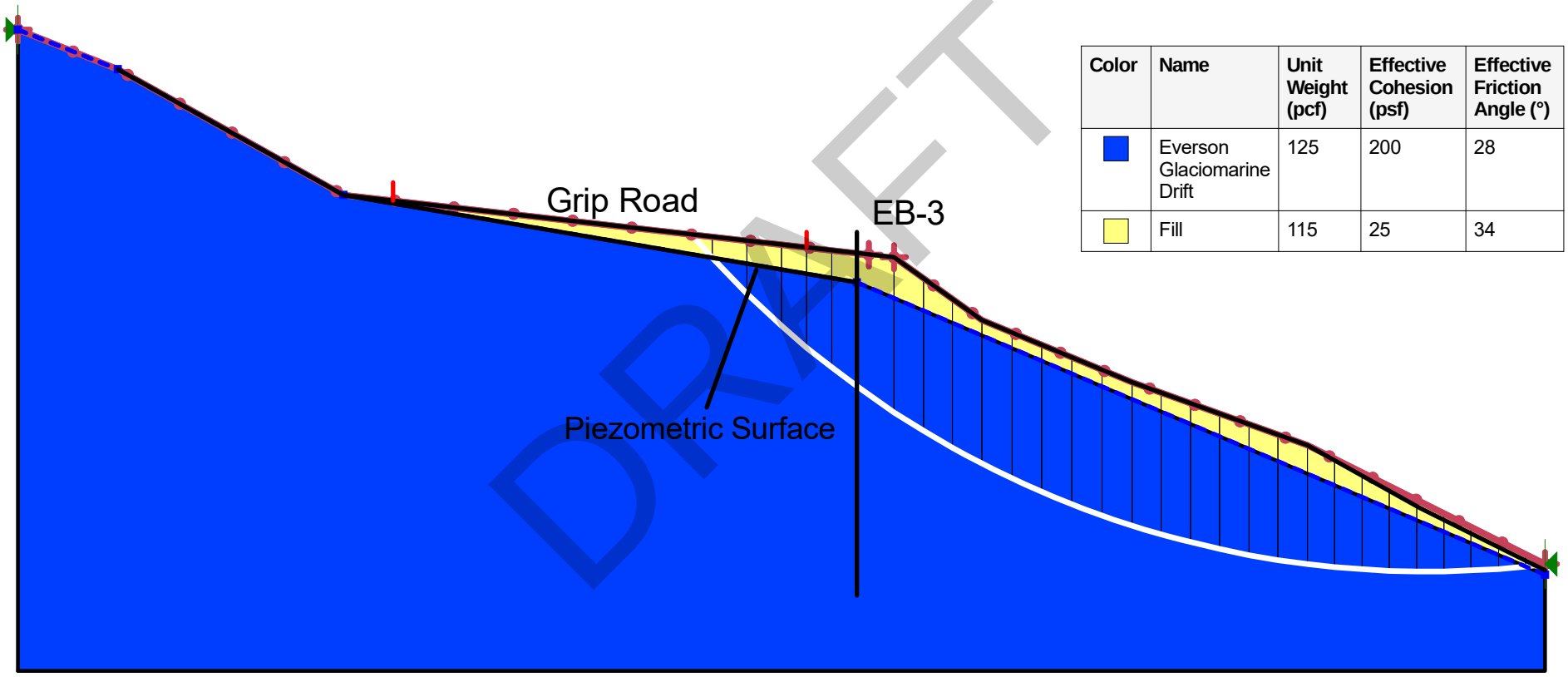
Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Everson Glaciomarine Drift	125	200	28
	Fill	115	25	34
	Landslide Deposits	115	25	28

Existing Static Conditions A-A'

Grip Road Widening
Date: 10/02/2025
Scale: 1:145

General Settings:
Analysis Type: Morgenstern-Price
Direction of movement: Left to Right
Slip Surface Option: Entry and Exit
Horz Seismic Coef.:

2.0



DRAFT

Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Everson Glaciomarine Drift	125	200	28
	Fill	115	25	34

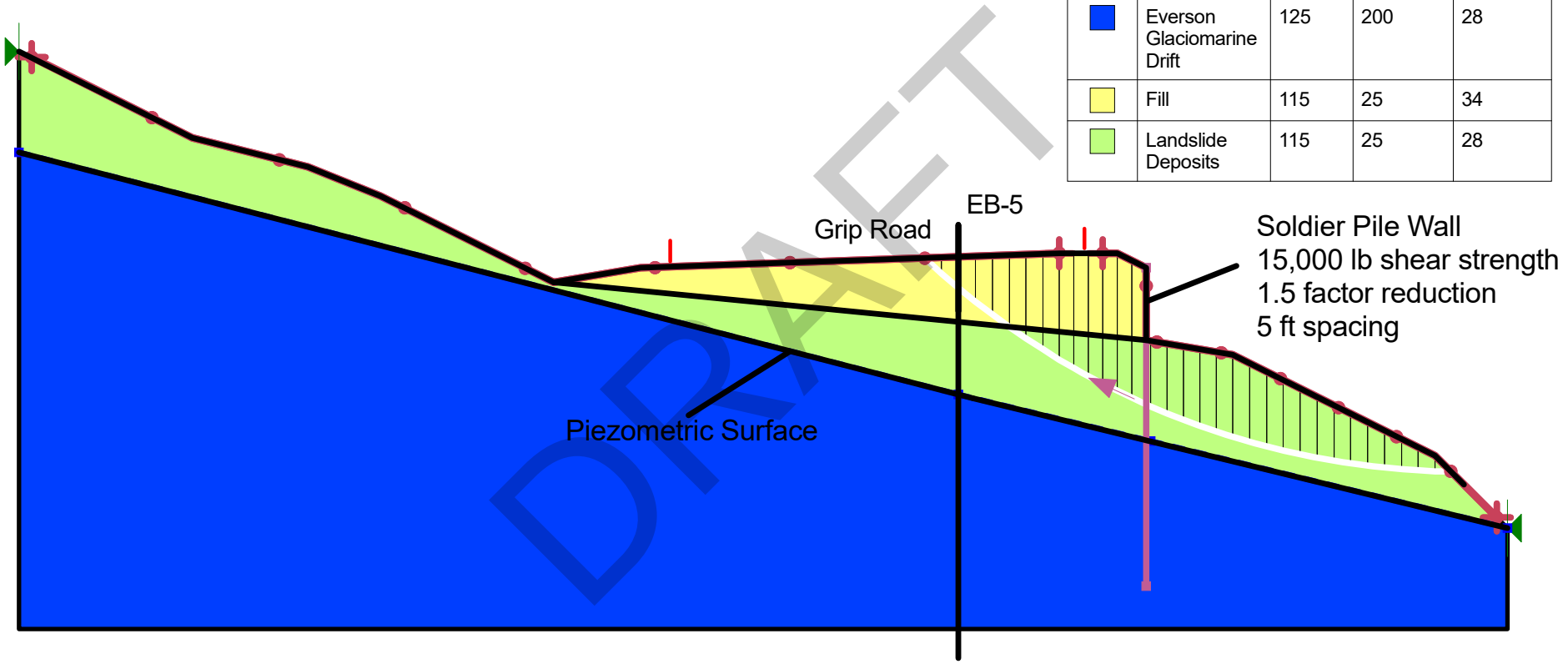
Existing Static Conditions B-B'

Grip Road Widening
Date: 10/02/2025
Scale: 1:153

General Settings:
Analysis Type: Morgenstern-Price
Direction of movement: Left to Right
Slip Surface Option: Entry and Exit
Horz Seismic Coef.: 0.265

1.0

Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Everson Glaciomarine Drift	125	200	28
	Fill	115	25	34
	Landslide Deposits	115	25	28



DRAFT

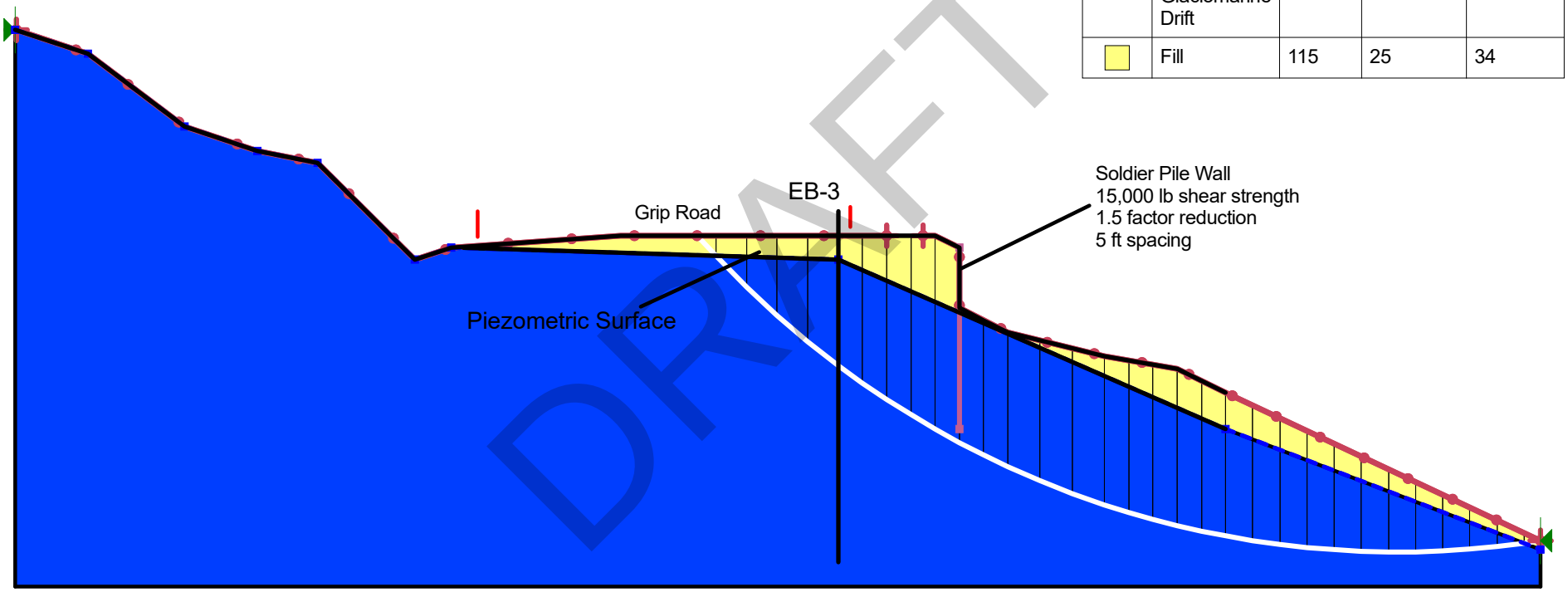
Proposed Seismic Conditions A-A' (29+00)

Grip Road Widening
Date: 10/02/2025
Scale: 1:133

General Settings:
Analysis Type: Morgenstern-Price
Direction of movement: Left to Right
Slip Surface Option: Entry and Exit
Horz Seismic Coef.: 0.265

1.2

Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Everson Glaciomarine Drift	125	200	28
	Fill	115	25	34



DRAFT

Proposed Seismic Conditions B-B' (26+00)

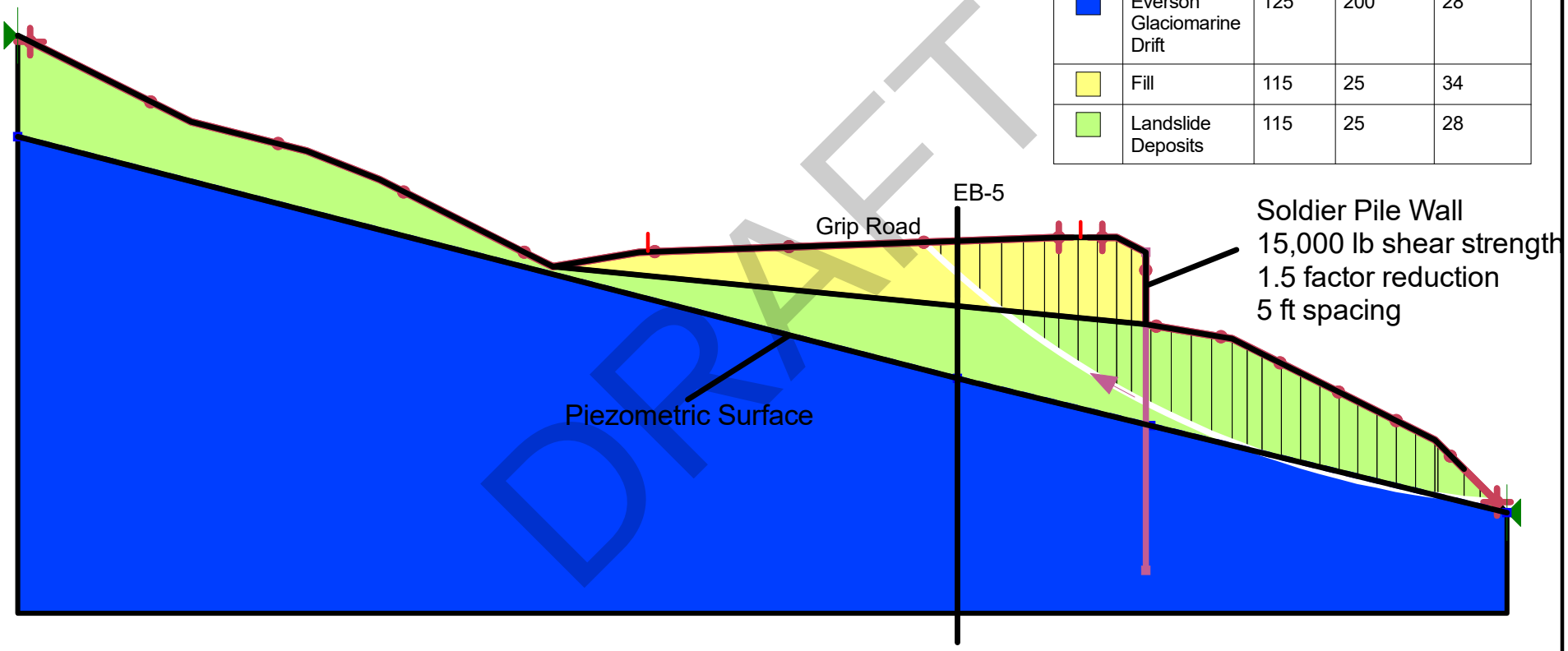
Grip Road Widening

Date: 10/02/2025

Scale: 1:158

General Settings:
Analysis Type: Morgenstern-Price
Direction of movement: Left to Right
Slip Surface Option: Entry and Exit
Horz Seismic Coef.:
1.8

Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Everson Glaciomarine Drift	125	200	28
	Fill	115	25	34
	Landslide Deposits	115	25	28



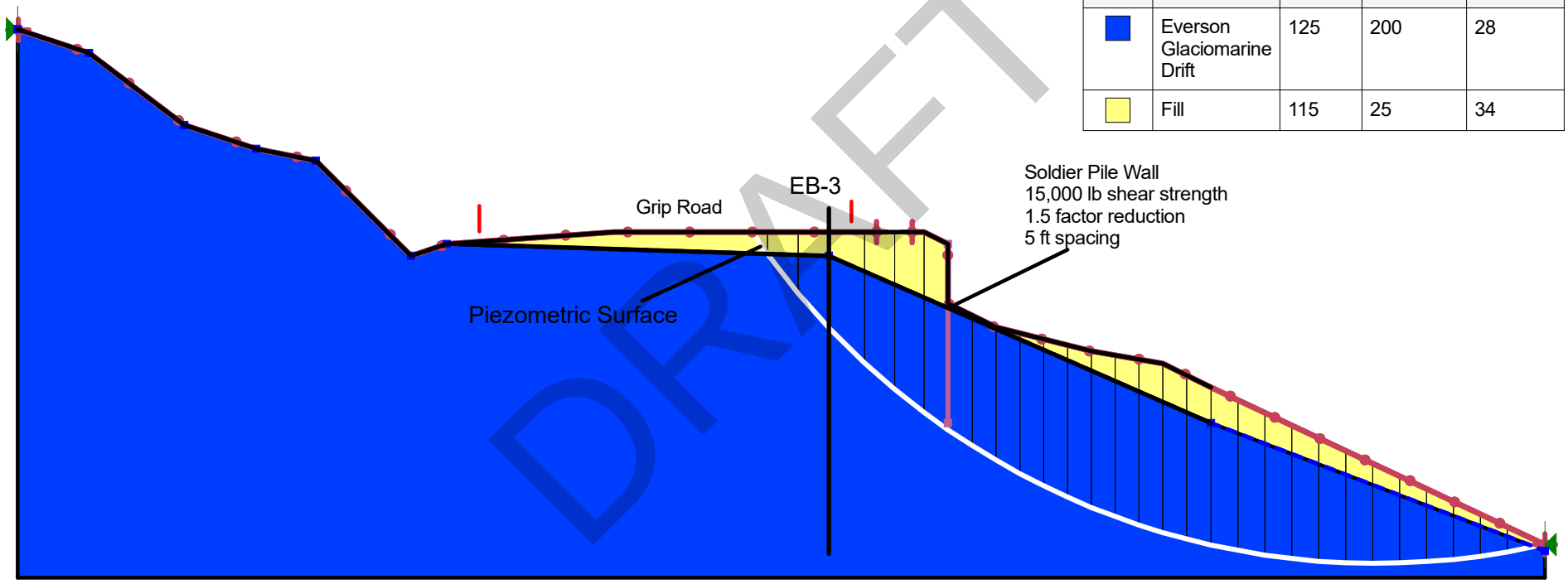
Proposed Static Conditions A-A' (29+00)

Grip Road Widening
Date: 10/02/2025
Scale: 1:131

General Settings:
Analysis Type: Morgenstern-Price
Direction of movement: Left to Right
Slip Surface Option: Entry and Exit
Horz Seismic Coef.:

2.0

Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Everson Glaciomarine Drift	125	200	28
	Fill	115	25	34



DRAFT

Proposed Static Conditions B-B' (26+00)

Grip Road Widening
Date: 10/02/2025
Scale: 1:160

APPENDIX G

WWHM MODELS

WWHM2012

PROJECT REPORT

General Model Information

WWHM2012 Project Name: 5166PROP-OPTION 3
Site Name:
Site Address:
City:

Report Date:	5/1/2026
Gage:	Burlington
Data Start:	1948/10/01
Data End:	2009/09/30
Timestep:	15 Minute
Precip Scale:	1.000
Version Date:	2024/06/28
Version:	4.3.1

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Landuse Basin Data
Predeveloped Land Use

Exist TDA

Bypass: No

GroundWater: No

Pervious Land Use	acre
C, Forest, Mod	0.456
Pervious Total	0.456

Impervious Land Use	acre
ROADS MOD	0.502
Impervious Total	0.502
Basin Total	0.958

Element Flow Componants:

Surface	Interflow	Groundwater
Componant Flows To:		
POC 1	POC 1	

Mitigated Land Use

Western Curve

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
C, Forest, Mod	0.056
Pervious Total	0.056

Impervious Land Use	acre
ROADS MOD	0.225
Impervious Total	0.225
Basin Total	0.281

Element Flow Componants:

Surface	Interflow	Groundwater

Componant Flows To:

Surface retention	1	Surface retention	1

East Curve Shoulder

Bypass:	No
Impervious Land Use	acre
ROADS MOD	0.039

Element Flow Componant:
Surface
Componant Flows To:
East Curve Pervious

East Curve Pervious

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
C, Forest, Mod	.104

Element Flow Componants:

Surface	Interflow	Groundwater

Componant Flows To:

POC 1	POC 1

East Curve

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
C, Forest, Mod	0.136
Pervious Total	0.136

Impervious Land Use	acre
ROADS MOD	0.398
Impervious Total	0.398
Basin Total	0.534

Element Flow Componants:

Surface	Interflow	Groundwater
Componant Flows To:		
East Curve Check Dams	East Curve Check Dams	

Routing Elements
Predeveloped Routing

Mitigated Routing

Bioretention 1

Bottom Length:	10.00 ft.
Bottom Width:	4.00 ft.
Material thickness of first layer:	0.25
Material type for first layer:	SMMWW 12 in/hr
Material thickness of second layer:	1.5
Material type for second layer:	SMMWW 12 in/hr
Material thickness of third layer:	1.5
Material type for third layer:	GRAVEL
Infiltration On	
Infiltration rate:	0.05
Infiltration safety factor:	0.5
Wetted surface area On	
Total Volume Infiltrated (ac-ft.):	8.722
Total Volume Through Riser (ac-ft.):	0.532
Total Volume Through Facility (ac-ft.):	33.805
Percent Infiltrated:	25.8
Total Precip Applied to Facility:	1.796
Total Evap From Facility:	0.626
Underdrain used	
Underdrain Diameter (feet):	0.25
Orifice Diameter (in.):	0.5
Offset (in.):	9
Flow Through Underdrain (ac-ft.):	24.551
Total Outflow (ac-ft.):	33.805
Percent Through Underdrain:	72.63
Discharge Structure	
Riser Height:	1 ft.
Riser Diameter:	6 in.
Element Outlets:	
Outlet 1	Outlet 2
Outlet Flows To:	

Bioretention Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.0159	0.0000	0.0000	0.0000
0.0522	0.0158	0.0000	0.0000	0.0000
0.1044	0.0154	0.0000	0.0000	0.0000
0.1566	0.0151	0.0001	0.0000	0.0000
0.2088	0.0147	0.0001	0.0000	0.0000
0.2610	0.0143	0.0001	0.0000	0.0000
0.3132	0.0140	0.0002	0.0000	0.0000
0.3654	0.0136	0.0002	0.0000	0.0000
0.4176	0.0133	0.0003	0.0000	0.0000
0.4698	0.0129	0.0003	0.0001	0.0001
0.5220	0.0126	0.0004	0.0001	0.0001
0.5742	0.0122	0.0004	0.0001	0.0001
0.6264	0.0119	0.0005	0.0001	0.0001
0.6786	0.0116	0.0005	0.0001	0.0001
0.7308	0.0113	0.0006	0.0001	0.0001
0.7830	0.0109	0.0007	0.0001	0.0001
0.8352	0.0106	0.0007	0.0001	0.0001
0.8874	0.0103	0.0008	0.0001	0.0001

0.9396	0.0100	0.0009	0.0001	0.0001
0.9918	0.0097	0.0010	0.0001	0.0001
1.0440	0.0094	0.0011	0.0001	0.0001
1.0962	0.0091	0.0012	0.0001	0.0001
1.1484	0.0088	0.0013	0.0001	0.0001
1.2005	0.0085	0.0014	0.0001	0.0001
1.2527	0.0083	0.0015	0.0001	0.0001
1.3049	0.0080	0.0016	0.0001	0.0001
1.3571	0.0077	0.0017	0.0001	0.0001
1.4093	0.0075	0.0018	0.0001	0.0001
1.4615	0.0072	0.0019	0.0001	0.0001
1.5137	0.0069	0.0021	0.0001	0.0001
1.5659	0.0067	0.0022	0.0002	0.0002
1.6181	0.0064	0.0024	0.0002	0.0002
1.6703	0.0062	0.0025	0.0002	0.0002
1.7225	0.0060	0.0027	0.0002	0.0002
1.7747	0.0057	0.0028	0.0002	0.0002
1.8269	0.0055	0.0030	0.0002	0.0002
1.8791	0.0053	0.0031	0.0002	0.0002
1.9313	0.0051	0.0033	0.0002	0.0002
1.9835	0.0048	0.0035	0.0002	0.0002
2.0357	0.0046	0.0036	0.0002	0.0002
2.0879	0.0044	0.0038	0.0002	0.0002
2.1401	0.0042	0.0040	0.0002	0.0002
2.1923	0.0040	0.0042	0.0002	0.0002
2.2445	0.0038	0.0044	0.0002	0.0002
2.2967	0.0036	0.0046	0.0002	0.0002
2.3489	0.0035	0.0048	0.0003	0.0003
2.4011	0.0033	0.0051	0.0003	0.0003
2.4533	0.0031	0.0053	0.0003	0.0003
2.5055	0.0029	0.0055	0.0003	0.0003
2.5577	0.0028	0.0058	0.0003	0.0003
2.6099	0.0026	0.0060	0.0003	0.0003
2.6621	0.0025	0.0063	0.0003	0.0003
2.7143	0.0023	0.0065	0.0003	0.0003
2.7665	0.0022	0.0068	0.0003	0.0003
2.8187	0.0020	0.0071	0.0003	0.0003
2.8709	0.0019	0.0073	0.0003	0.0003
2.9231	0.0017	0.0076	0.0003	0.0003
2.9753	0.0016	0.0079	0.0004	0.0004
3.0275	0.0015	0.0082	0.0004	0.0004
3.0797	0.0014	0.0086	0.0004	0.0004
3.1319	0.0012	0.0089	0.0004	0.0004
3.1841	0.0011	0.0092	0.0004	0.0004
3.2363	0.0010	0.0095	0.0004	0.0004
3.2500	0.0009	0.0096	0.0004	0.0004

Bioretention Surface Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
3.2500	0.015915	0.009638	0.0000	0.0111	0.0000
3.3022	0.016298	0.010478	0.0000	0.0111	0.0000
3.3544	0.016686	0.011339	0.0000	0.0111	0.0000
3.4066	0.017078	0.012220	0.0000	0.0111	0.0000
3.4588	0.017475	0.013122	0.0000	0.0111	0.0000
3.5110	0.017876	0.014045	0.0000	0.0111	0.0001
3.5632	0.018282	0.014988	0.0000	0.0111	0.0001
3.6154	0.018693	0.015953	0.0000	0.0111	0.0001
3.6676	0.019107	0.016940	0.0000	0.0111	0.0001

3.7198	0.019527	0.017948	0.0000	0.0111	0.0001
3.7720	0.019951	0.018979	0.0000	0.0111	0.0001
3.8242	0.020379	0.020031	0.0000	0.0111	0.0001
3.8764	0.020812	0.021106	0.0000	0.0111	0.0001
3.9286	0.021249	0.022204	0.0000	0.0111	0.0001
3.9808	0.021691	0.023325	0.0000	0.0111	0.0002
4.0330	0.022137	0.024469	0.0000	0.0111	0.0002
4.0852	0.022588	0.025636	0.0000	0.0111	0.0002
4.1374	0.023044	0.026827	0.0000	0.0111	0.0002
4.1896	0.023503	0.028042	0.0000	0.0111	0.0002
4.2418	0.023968	0.029281	0.0000	0.0111	0.0002
4.2940	0.024437	0.030544	0.0000	0.0111	0.0002
4.3462	0.024910	0.031832	0.0000	0.0111	0.0002
4.3984	0.025388	0.033144	0.0000	0.0111	0.0003
4.4505	0.025870	0.034482	0.0000	0.0111	0.0003
4.5027	0.026357	0.035845	0.0000	0.0111	0.0003
4.5549	0.026849	0.037234	0.0000	0.0111	0.0003
4.6071	0.027345	0.038648	0.0000	0.0111	0.0003
4.6593	0.027845	0.040089	0.0000	0.0111	0.0003
4.7115	0.028350	0.041555	0.0000	0.0111	0.0003
4.7500	0.028725	0.042653	0.0000	0.0111	0.0000

East Curve Check Dams

Bottom Length:	48.00 ft.	
Bottom Width:	10.00 ft.	
Depth:	1 ft.	
Volume at riser head:	0.0129 acre-feet.	
Infiltration On		
Infiltration rate:	0.05	
Infiltration safety factor:	0.5	
Wetted surface area On		
Total Volume Infiltrated (ac-ft.):		6.371
Total Volume Through Riser (ac-ft.):		52.43
Total Volume Through Facility (ac-ft.):		58.801
Percent Infiltrated:		10.83
Total Precip Applied to Facility:		0
Total Evap From Facility:		0
Side slope 1:	2 To 1	
Side slope 2:	0.0833 To 1	
Side slope 3:	1 To 1	
Side slope 4:	0.0833 To 1	
Discharge Structure		
Riser Height:	1 ft.	
Riser Diameter:	100 in.	
Notch Type:	Rectangular	
Notch Width:	1.000 ft.	
Notch Height:	0.900 ft.	
Element Outlets:		
Outlet 1	Outlet 2	
Outlet Flows To:		

Pond Hydraulic Table

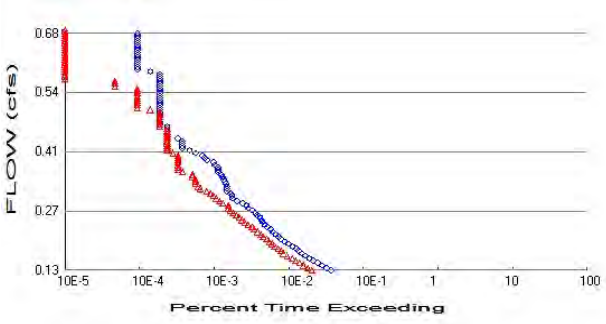
Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
151.00	0.011	0.000	0.000	0.000
151.01	0.011	0.000	0.000	0.000
151.02	0.011	0.000	0.000	0.000
151.03	0.011	0.000	0.000	0.000
151.04	0.011	0.000	0.000	0.000
151.06	0.011	0.000	0.000	0.000
151.07	0.011	0.000	0.000	0.000
151.08	0.011	0.000	0.000	0.000
151.09	0.011	0.001	0.000	0.000
151.10	0.011	0.001	0.000	0.000
151.11	0.011	0.001	0.003	0.000
151.12	0.011	0.001	0.011	0.000
151.13	0.011	0.001	0.020	0.000
151.14	0.011	0.001	0.031	0.000
151.16	0.011	0.001	0.043	0.000
151.17	0.011	0.001	0.057	0.000
151.18	0.011	0.002	0.072	0.000
151.19	0.011	0.002	0.088	0.000
151.20	0.011	0.002	0.105	0.000
151.21	0.011	0.002	0.123	0.000
151.22	0.011	0.002	0.142	0.000
151.23	0.011	0.002	0.162	0.000
151.24	0.011	0.002	0.182	0.000
151.26	0.011	0.002	0.204	0.000

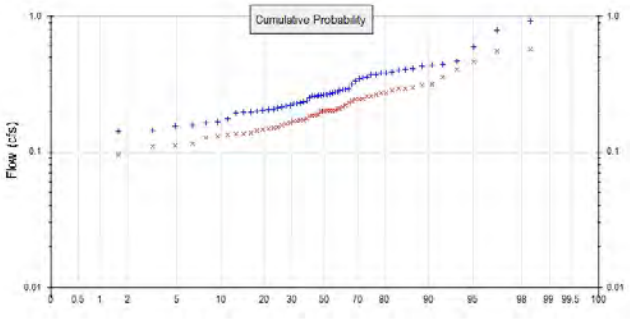
151.27	0.011	0.003	0.226	0.000
151.28	0.011	0.003	0.249	0.000
151.29	0.012	0.003	0.273	0.000
151.30	0.012	0.003	0.297	0.000
151.31	0.012	0.003	0.323	0.000
151.32	0.012	0.003	0.348	0.000
151.33	0.012	0.003	0.375	0.000
151.34	0.012	0.004	0.402	0.000
151.36	0.012	0.004	0.430	0.000
151.37	0.012	0.004	0.458	0.000
151.38	0.012	0.004	0.487	0.000
151.39	0.012	0.004	0.517	0.000
151.40	0.012	0.004	0.547	0.000
151.41	0.012	0.004	0.577	0.000
151.42	0.012	0.005	0.609	0.000
151.43	0.012	0.005	0.640	0.000
151.44	0.012	0.005	0.673	0.000
151.46	0.012	0.005	0.706	0.000
151.47	0.012	0.005	0.739	0.000
151.48	0.012	0.005	0.773	0.000
151.49	0.012	0.005	0.807	0.000
151.50	0.012	0.005	0.842	0.000
151.51	0.012	0.006	0.877	0.000
151.52	0.012	0.006	0.913	0.000
151.53	0.012	0.006	0.949	0.000
151.54	0.012	0.006	0.986	0.000
151.56	0.012	0.006	1.023	0.000
151.57	0.012	0.006	1.061	0.000
151.58	0.013	0.006	1.099	0.000
151.59	0.013	0.007	1.138	0.000
151.60	0.013	0.007	1.177	0.000
151.61	0.013	0.007	1.216	0.000
151.62	0.013	0.007	1.256	0.000
151.63	0.013	0.007	1.297	0.000
151.64	0.013	0.007	1.337	0.000
151.66	0.013	0.007	1.378	0.000
151.67	0.013	0.008	1.420	0.000
151.68	0.013	0.008	1.462	0.000
151.69	0.013	0.008	1.504	0.000
151.70	0.013	0.008	1.547	0.000
151.71	0.013	0.008	1.590	0.000
151.72	0.013	0.008	1.634	0.000
151.73	0.013	0.009	1.678	0.000
151.74	0.013	0.009	1.722	0.000
151.76	0.013	0.009	1.767	0.000
151.77	0.013	0.009	1.812	0.000
151.78	0.013	0.009	1.858	0.000
151.79	0.013	0.009	1.904	0.000
151.80	0.013	0.009	1.950	0.000
151.81	0.013	0.010	1.996	0.000
151.82	0.013	0.010	2.043	0.000
151.83	0.013	0.010	2.091	0.000
151.84	0.013	0.010	2.138	0.000
151.86	0.013	0.010	2.187	0.000
151.87	0.013	0.010	2.235	0.000
151.88	0.014	0.011	2.284	0.000
151.89	0.014	0.011	2.333	0.000
151.90	0.014	0.011	2.382	0.000

151.91	0.014	0.011	2.432	0.000
151.92	0.014	0.011	2.482	0.000
151.93	0.014	0.011	2.533	0.000
151.94	0.014	0.011	2.584	0.000
151.96	0.014	0.012	2.635	0.000
151.97	0.014	0.012	2.686	0.000
151.98	0.014	0.012	2.738	0.000
151.99	0.014	0.012	2.790	0.000
152.00	0.014	0.012	2.843	0.000
152.01	0.014	0.012	2.946	0.000

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 0.456
Total Impervious Area: 0.502

Mitigated Landuse Totals for POC #1
Total Pervious Area: 0.296
Total Impervious Area: 0.662

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	Flow(cfs)
2 year	0.264169
5 year	0.375311
10 year	0.459702
25 year	0.579347
50 year	0.678403
100 year	0.786379

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)
2 year	0.195329
5 year	0.275569
10 year	0.334913
25 year	0.417213
50 year	0.484003
100 year	0.555632

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	Predeveloped	Mitigated
1949	0.413	0.296
1950	0.174	0.136
1951	0.401	0.256
1952	0.373	0.266
1953	0.437	0.308
1954	0.265	0.152
1955	0.198	0.145
1956	0.124	0.096
1957	0.466	0.274
1958	0.202	0.138

1959	0.276	0.169
1960	0.285	0.203
1961	0.196	0.134
1962	0.287	0.201
1963	0.211	0.157
1964	0.266	0.185
1965	0.591	0.407
1966	0.194	0.160
1967	0.403	0.282
1968	0.374	0.271
1969	0.226	0.147
1970	0.440	0.315
1971	0.287	0.186
1972	0.141	0.111
1973	0.256	0.213
1974	0.197	0.168
1975	0.383	0.461
1976	0.431	0.357
1977	0.213	0.151
1978	0.382	0.247
1979	0.258	0.188
1980	0.261	0.292
1981	0.292	0.201
1982	0.256	0.189
1983	0.248	0.169
1984	0.233	0.199
1985	0.354	0.230
1986	0.206	0.144
1987	0.204	0.137
1988	0.350	0.291
1989	0.228	0.183
1990	0.262	0.219
1991	0.344	0.244
1992	0.330	0.202
1993	0.145	0.110
1994	0.164	0.126
1995	0.156	0.115
1996	0.387	0.243
1997	0.787	0.572
1998	0.277	0.203
1999	0.153	0.092
2000	0.313	0.258
2001	0.230	0.169
2002	0.166	0.131
2003	0.217	0.164
2004	0.922	0.556
2005	0.266	0.199
2006	0.274	0.207
2007	0.235	0.176
2008	0.221	0.235
2009	0.266	0.208

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	0.9223	0.5717
2	0.7866	0.5558
3	0.5907	0.4609

4	0.4658	0.4067
5	0.4405	0.3573
6	0.4371	0.3154
7	0.4310	0.3080
8	0.4126	0.2963
9	0.4034	0.2918
10	0.4012	0.2915
11	0.3870	0.2823
12	0.3827	0.2737
13	0.3825	0.2708
14	0.3737	0.2663
15	0.3732	0.2580
16	0.3541	0.2559
17	0.3497	0.2470
18	0.3441	0.2440
19	0.3296	0.2428
20	0.3134	0.2351
21	0.2915	0.2300
22	0.2874	0.2187
23	0.2873	0.2134
24	0.2851	0.2081
25	0.2767	0.2065
26	0.2758	0.2033
27	0.2739	0.2032
28	0.2663	0.2017
29	0.2661	0.2013
30	0.2659	0.2012
31	0.2648	0.1995
32	0.2617	0.1991
33	0.2609	0.1885
34	0.2578	0.1877
35	0.2560	0.1863
36	0.2558	0.1847
37	0.2484	0.1827
38	0.2355	0.1756
39	0.2331	0.1694
40	0.2305	0.1693
41	0.2276	0.1688
42	0.2259	0.1681
43	0.2214	0.1638
44	0.2172	0.1604
45	0.2130	0.1571
46	0.2111	0.1521
47	0.2057	0.1507
48	0.2036	0.1468
49	0.2020	0.1452
50	0.1980	0.1439
51	0.1974	0.1375
52	0.1958	0.1366
53	0.1935	0.1363
54	0.1744	0.1344
55	0.1660	0.1310
56	0.1643	0.1256
57	0.1564	0.1150
58	0.1532	0.1112
59	0.1447	0.1103
60	0.1411	0.0956
61	0.1237	0.0925

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.1321	795	438	55	Pass
0.1376	692	385	55	Pass
0.1431	593	335	56	Pass
0.1486	519	298	57	Pass
0.1542	453	264	58	Pass
0.1597	403	236	58	Pass
0.1652	356	204	57	Pass
0.1707	323	183	56	Pass
0.1762	288	167	57	Pass
0.1817	271	155	57	Pass
0.1873	240	138	57	Pass
0.1928	215	127	59	Pass
0.1983	188	117	62	Pass
0.2038	168	109	64	Pass
0.2093	155	97	62	Pass
0.2149	143	90	62	Pass
0.2204	131	82	62	Pass
0.2259	123	73	59	Pass
0.2314	110	69	62	Pass
0.2369	101	61	60	Pass
0.2425	97	55	56	Pass
0.2480	93	50	53	Pass
0.2535	88	46	52	Pass
0.2590	81	42	51	Pass
0.2645	77	38	49	Pass
0.2700	69	35	50	Pass
0.2756	61	33	54	Pass
0.2811	58	33	56	Pass
0.2866	52	28	53	Pass
0.2921	43	25	58	Pass
0.2976	38	23	60	Pass
0.3032	37	21	56	Pass
0.3087	35	19	54	Pass
0.3142	32	17	53	Pass
0.3197	32	14	43	Pass
0.3252	32	13	40	Pass
0.3307	31	12	38	Pass
0.3363	30	12	40	Pass
0.3418	29	12	41	Pass
0.3473	28	11	39	Pass
0.3528	27	11	40	Pass
0.3583	24	8	33	Pass
0.3639	24	7	29	Pass
0.3694	24	7	29	Pass
0.3749	22	7	31	Pass
0.3804	21	7	33	Pass
0.3859	17	7	41	Pass
0.3914	16	7	43	Pass
0.3970	15	7	46	Pass
0.4025	12	6	50	Pass
0.4080	10	5	50	Pass
0.4135	8	5	62	Pass
0.4190	8	5	62	Pass

0.4246	8	5	62	Pass
0.4301	8	5	62	Pass
0.4356	7	5	71	Pass
0.4411	5	5	100	Pass
0.4466	5	5	100	Pass
0.4521	5	5	100	Pass
0.4577	5	5	100	Pass
0.4632	5	4	80	Pass
0.4687	4	4	100	Pass
0.4742	4	4	100	Pass
0.4797	4	4	100	Pass
0.4853	4	4	100	Pass
0.4908	4	4	100	Pass
0.4963	4	4	100	Pass
0.5018	4	3	75	Pass
0.5073	4	2	50	Pass
0.5129	4	2	50	Pass
0.5184	4	2	50	Pass
0.5239	4	2	50	Pass
0.5294	4	2	50	Pass
0.5349	4	2	50	Pass
0.5404	4	2	50	Pass
0.5460	4	2	50	Pass
0.5515	4	2	50	Pass
0.5570	4	1	25	Pass
0.5625	4	1	25	Pass
0.5680	4	1	25	Pass
0.5736	4	0	0	Pass
0.5791	4	0	0	Pass
0.5846	4	0	0	Pass
0.5901	3	0	0	Pass
0.5956	2	0	0	Pass
0.6011	2	0	0	Pass
0.6067	2	0	0	Pass
0.6122	2	0	0	Pass
0.6177	2	0	0	Pass
0.6232	2	0	0	Pass
0.6287	2	0	0	Pass
0.6343	2	0	0	Pass
0.6398	2	0	0	Pass
0.6453	2	0	0	Pass
0.6508	2	0	0	Pass
0.6563	2	0	0	Pass
0.6618	2	0	0	Pass
0.6674	2	0	0	Pass
0.6729	2	0	0	Pass
0.6784	2	0	0	Pass

Water Quality

Water Quality BMP Flow and Volume for POC #1

On-line facility volume:	0 acre-feet
On-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.
Off-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.

Model Default Modifications

Total of 0 changes have been made.

PERLND Changes

No PERLND changes have been made.

IMPLND Changes

No IMPLND changes have been made.

Appendix
Predeveloped Schematic



Mitigated Schematic



Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2009 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   5166PROP-OPTION 3.wdm
MESSU       25   Pre5166PROP-OPTION 3.MES
            27   Pre5166PROP-OPTION 3.L61
            28   Pre5166PROP-OPTION 3.L62
            30   POC5166PROP-OPTION 31.dat
END FILES

OPN SEQUENCE
    INGRP               INDELT 00:15
      PERLND      11
      IMPLND       2
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Exist TDA                  MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                        in  out           ***
   11     C, Forest, Mod          1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   11         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   11         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO
```

```
  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   11         0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   11              0       4.5      0.08       400       0.1       0.5     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   11              0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   11            0.2       0.5      0.35         6       0.5       0.7
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
             ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   11              0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
    2      ROADS/MOD              1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    2         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    2         0    0    4    0    0    4    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    2         0    0    0    0    0
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    2            400      0.05       0.1      0.08
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    2              0         0
```

```
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    2             0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Exist TDA***
PERLND  11                       0.456     COPY   501     12
PERLND  11                       0.456     COPY   501     13
IMPLND   2                       0.502     COPY   501     15

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG           ***
                                       in  out                              ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *       *  *  *  *  *        ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                     ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><
```

```
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1              PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1              IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.76           PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.76           IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    501 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2009 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   5166PROP-OPTION 3.wdm
MESSU       25   Mit5166PROP-OPTION 3.MES
            27   Mit5166PROP-OPTION 3.L61
            28   Mit5166PROP-OPTION 3.L62
            30   POC5166PROP-OPTION 31.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND      11
      IMPLND       2
      IMPLND      16
      RCHRES       1
      RCHRES       2
      PERLND      38
      RCHRES       3
      COPY         1
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title---------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Surface retention  1        MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                          in  out           ***
   11     C, Forest, Mod          1    1    1    1   27    0
   38     C, Forest, Mod          1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   11         0    0    1    0    0    0    0    0    0    0    0    0
```

```
   38         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   11         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   38         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   11         0    0    0    0    0    0    0    0    0    0    0
   38         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   11              0       4.5      0.08       400       0.1       0.5     0.996
   38              0       4.5      0.08       400       0.1       0.5     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   11              0         0         2         2         0         0         0
   38              0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   11            0.2       0.5      0.35         6       0.5       0.7
   38            0.2       0.5      0.35         6       0.5       0.7
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS       AGWS      GWVS
   11              0         0         0         0       2.5          1         0
   38              0         0         0         0       2.5          1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
    2      ROADS/MOD              1    1    1   27    0
   16      ROADS/MOD              1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    2         0    0    1    0    0    0
   16         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    2         0    0    4    0    0    4    1    9
   16         0    0    4    0    0    0    1    9
  END PRINT-INFO
```

```
  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    2         0    0    0    0    0
   16         0    0    0    0    0
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    2            400      0.05       0.1      0.08
   16            400      0.05       0.1      0.08
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    2              0         0
   16              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    2              0         0
   16              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Western Curve***
PERLND  11                       0.056     RCHRES   1      2
PERLND  11                       0.056     RCHRES   1      3
IMPLND   2                       0.225     RCHRES   1      5
East Curve Shoulder***
IMPLND  16                       0.375     PERLND  38     50
East Curve***
PERLND  11                       0.136     RCHRES   3      2
PERLND  11                       0.136     RCHRES   3      3
IMPLND   2                       0.398     RCHRES   3      5
East Curve Pervious***
PERLND  38                       0.104     COPY   501     12
PERLND  38                       0.104     COPY   501     13

******Routing******
PERLND  11                       0.056     COPY     1     12
IMPLND   2                       0.225     COPY     1     15
PERLND  11                       0.056     COPY     1     13
RCHRES   1                           1     RCHRES   2      8
IMPLND  16                       0.039     COPY     1     15
PERLND  11                       0.136     COPY     1     12
IMPLND   2                       0.398     COPY     1     15
PERLND  11                       0.136     COPY     1     13
RCHRES   2                           1     COPY   501     17
RCHRES   1                           1     COPY   501     17
RCHRES   3                           1     COPY   501     17
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
```

```
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<-----------------><---> User T-series  Engl Metr LKFG            ***
                                      in  out                               ***
    1     Surface retentio-006    3    1    1    1   28    0    1
    2     Bioretention  1         2    1    1    1   28    0    1
    3     East Curve Check-013    2    1    1    1   28    0    1
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
    1         1    0    0    0    0    0    0    0    0    0
    2         1    0    0    0    0    0    0    0    0    0
    3         1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
    1         4    0    0    0    0    0    0    0    0    0    1    9
    2         4    0    0    0    0    0    0    0    0    0    1    9
    3         4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
          FG FG FG FG  possible  exit  *** possible  exit      possible  exit
           *  *  *  *    *  *  *  *  *      *  *  *  *  *         ***
    1        0  1  0  0    4  5  6  0  0       0  0  0  0  0       2  2  2  2  2
    2        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
    3        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN      DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->      ***
    1             1      0.01       0.0       0.0       0.0       0.0
    2             2      0.01       0.0       0.0       0.0       0.0
    3             3      0.01       0.0     151.0       0.5       0.0
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                     ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
         *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
    1           0         4.0  5.0  6.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    2           0         4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    3           0         4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
  FTABLE      2
   64    5
     Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
      (ft)   (acres) (acre-ft)   (cfs)     (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.015915  0.000000  0.000000  0.000000
  0.052198  0.015815  0.000023  0.000000  0.000000
  0.104396  0.015437  0.000049  0.000000  0.000000
  0.156593  0.015064  0.000077  0.000000  0.000000
  0.208791  0.014695  0.000108  0.000000  0.000000
```

```
  0.260989  0.014331  0.000142  0.000000  0.000000
  0.313187  0.013972  0.000179  0.000000  0.000040
  0.365385  0.013617  0.000219  0.000000  0.000044
  0.417582  0.013266  0.000261  0.000000  0.000047
  0.469780  0.012920  0.000308  0.000000  0.000051
  0.521978  0.012578  0.000357  0.000000  0.000054
  0.574176  0.012241  0.000410  0.000000  0.000058
  0.626374  0.011909  0.000467  0.000000  0.000062
  0.678571  0.011580  0.000527  0.000000  0.000066
  0.730769  0.011257  0.000592  0.000000  0.000070
  0.782967  0.010938  0.000660  0.000000  0.000074
  0.835165  0.010623  0.000732  0.000000  0.000078
  0.887363  0.010313  0.000808  0.000000  0.000083
  0.939560  0.010008  0.000888  0.000000  0.000087
  0.991758  0.009707  0.000973  0.000000  0.000092
  1.043956  0.009410  0.001062  0.000000  0.000097
  1.096154  0.009118  0.001156  0.000000  0.000101
  1.148352  0.008830  0.001255  0.000000  0.000106
  1.200549  0.008547  0.001358  0.000000  0.000112
  1.252747  0.008269  0.001466  0.000000  0.000117
  1.304945  0.007995  0.001579  0.000000  0.000122
  1.357143  0.007725  0.001697  0.000000  0.000127
  1.409341  0.007460  0.001820  0.000000  0.000133
  1.461538  0.007200  0.001949  0.000000  0.000139
  1.513736  0.006944  0.002083  0.000000  0.000144
  1.565934  0.006692  0.002223  0.000000  0.000150
  1.618132  0.006445  0.002368  0.000000  0.000156
  1.670330  0.006203  0.002519  0.000000  0.000162
  1.722527  0.005965  0.002676  0.000000  0.000169
  1.774725  0.005731  0.002823  0.000000  0.000175
  1.826923  0.005502  0.002977  0.000000  0.000181
  1.879121  0.005278  0.003135  0.000000  0.000188
  1.931319  0.005058  0.003300  0.000000  0.000195
  1.983516  0.004842  0.003470  0.000000  0.000202
  2.035714  0.004631  0.003646  0.000000  0.000208
  2.087912  0.004425  0.003828  0.000000  0.000215
  2.140110  0.004223  0.004017  0.000000  0.000223
  2.192308  0.004025  0.004211  0.000000  0.000230
  2.244505  0.003832  0.004412  0.000000  0.000237
  2.296703  0.003644  0.004619  0.000000  0.000245
  2.348901  0.003460  0.004832  0.000000  0.000252
  2.401099  0.003280  0.005052  0.000000  0.000260
  2.453297  0.003105  0.005279  0.000000  0.000268
  2.505495  0.002935  0.005513  0.000000  0.000276
  2.557692  0.002769  0.005753  0.000535  0.000284
  2.609890  0.002607  0.006000  0.001213  0.000292
  2.662088  0.002450  0.006255  0.001831  0.000300
  2.714286  0.002298  0.006516  0.002366  0.000309
  2.766484  0.002150  0.006785  0.002830  0.000317
  2.818681  0.002007  0.007061  0.003236  0.000326
  2.870879  0.001868  0.007345  0.003599  0.000334
  2.923077  0.001733  0.007636  0.003928  0.000343
  2.975275  0.001603  0.007935  0.004231  0.000352
  3.027473  0.001478  0.008242  0.004513  0.000361
  3.079670  0.001357  0.008556  0.004778  0.000370
  3.131868  0.001241  0.008878  0.005030  0.000380
  3.184066  0.001129  0.009209  0.005270  0.000389
  3.236264  0.001021  0.009547  0.005504  0.000399
  3.250000  0.000918  0.009867  0.010727  0.000401
  END FTABLE  2
  FTABLE      1
   30    6
     Depth      Area    Volume  Outflow1  Outflow2  Outflow3  Velocity  Travel
Time***
      (ft)   (acres) (acre-ft)   (cfs)      (cfs)     (cfs)   (ft/sec)
(Minutes)***
  0.000000  0.000918  0.000000  0.000000  0.000000  0.000010
  0.052198  0.016298  0.000841  0.000000  0.011128  0.000010
  0.104396  0.016686  0.001702  0.000000  0.011128  0.000019
  0.156593  0.017078  0.002583  0.000000  0.011128  0.000029
```

```
0.208791  0.017475  0.003485  0.000000  0.011128  0.000039
0.260989  0.017876  0.004407  0.000000  0.011128  0.000049
0.313187  0.018282  0.005351  0.000000  0.011128  0.000060
0.365385  0.018693  0.006316  0.000000  0.011128  0.000070
0.417582  0.019107  0.007302  0.000000  0.011128  0.000080
0.469780  0.019527  0.008311  0.000000  0.011128  0.000091
0.521978  0.019951  0.009341  0.000000  0.011128  0.000102
0.574176  0.020379  0.010394  0.000000  0.011128  0.000113
0.626374  0.020812  0.011469  0.000000  0.011128  0.000123
0.678571  0.021249  0.012566  0.000000  0.011128  0.000134
0.730769  0.021691  0.013687  0.000000  0.011128  0.000146
0.782967  0.022137  0.014831  0.000000  0.011128  0.000157
0.835165  0.022588  0.015998  0.000000  0.011128  0.000168
0.887363  0.023044  0.017189  0.000000  0.011128  0.000180
0.939560  0.023503  0.018404  0.000000  0.011128  0.000191
0.991758  0.023968  0.019643  0.000000  0.011128  0.000203
1.043956  0.024437  0.020906  0.048682  0.011128  0.000215
1.096154  0.024910  0.022194  0.152027  0.011128  0.000227
1.148352  0.025388  0.023507  0.263649  0.011128  0.000239
1.200549  0.025870  0.024845  0.347141  0.011128  0.000251
1.252747  0.026357  0.026208  0.395861  0.011128  0.000263
1.304945  0.026849  0.027596  0.434821  0.011128  0.000276
1.357143  0.027345  0.029011  0.470566  0.011128  0.000288
1.409341  0.027845  0.030451  0.503781  0.011128  0.000301
1.461538  0.028350  0.031918  0.534938  0.011128  0.000313
1.500000  0.028725  0.033015  0.564377  0.011128  0.000323
END FTABLE  1
FTABLE      3
 91    5
   Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
    (ft)   (acres) (acre-ft)   (cfs)     (cfs)   (ft/sec)    (Minutes)***
0.000000  0.011019  0.000000  0.000000  0.000000
0.011111  0.011056  0.000123  0.000000  0.000279
0.022222  0.011094  0.000246  0.000000  0.000280
0.033333  0.011131  0.000369  0.000000  0.000281
0.044444  0.011168  0.000493  0.000000  0.000282
0.055556  0.011205  0.000617  0.000000  0.000282
0.066667  0.011242  0.000742  0.000000  0.000283
0.077778  0.011279  0.000867  0.000000  0.000284
0.088889  0.011317  0.000993  0.000000  0.000285
0.100000  0.011354  0.001119  0.000000  0.000286
0.111111  0.011391  0.001245  0.003900  0.000287
0.122222  0.011428  0.001372  0.011031  0.000288
0.133333  0.011465  0.001499  0.020266  0.000289
0.144444  0.011503  0.001627  0.031201  0.000290
0.155556  0.011540  0.001755  0.043605  0.000291
0.166667  0.011577  0.001883  0.057320  0.000292
0.177778  0.011614  0.002012  0.072232  0.000293
0.188889  0.011651  0.002141  0.088250  0.000294
0.200000  0.011689  0.002271  0.105304  0.000295
0.211111  0.011726  0.002401  0.123333  0.000296
0.222222  0.011763  0.002531  0.142288  0.000297
0.233333  0.011800  0.002662  0.162126  0.000297
0.244444  0.011837  0.002794  0.182808  0.000298
0.255556  0.011875  0.002925  0.204302  0.000299
0.266667  0.011912  0.003057  0.226578  0.000300
0.277778  0.011949  0.003190  0.249609  0.000301
0.288889  0.011986  0.003323  0.273372  0.000302
0.300000  0.012024  0.003456  0.297844  0.000303
0.311111  0.012061  0.003590  0.323006  0.000304
0.322222  0.012098  0.003724  0.348839  0.000305
0.333333  0.012135  0.003859  0.375327  0.000306
0.344444  0.012172  0.003994  0.402452  0.000307
0.355556  0.012210  0.004130  0.430202  0.000308
0.366667  0.012247  0.004265  0.458561  0.000309
0.377778  0.012284  0.004402  0.487518  0.000310
0.388889  0.012321  0.004538  0.517059  0.000311
0.400000  0.012359  0.004675  0.547175  0.000312
0.411111  0.012396  0.004813  0.577853  0.000312
0.422222  0.012433  0.004951  0.609084  0.000313
```

```
  0.433333  0.012471  0.005089  0.640859  0.000314
  0.444444  0.012508  0.005228  0.673167  0.000315
  0.455556  0.012545  0.005367  0.706001  0.000316
  0.466667  0.012582  0.005507  0.739352  0.000317
  0.477778  0.012620  0.005647  0.773212  0.000318
  0.488889  0.012657  0.005787  0.807574  0.000319
  0.500000  0.012694  0.005928  0.842431  0.000320
  0.511111  0.012731  0.006069  0.877775  0.000321
  0.522222  0.012769  0.006211  0.913600  0.000322
  0.533333  0.012806  0.006353  0.949899  0.000323
  0.544444  0.012843  0.006496  0.986667  0.000324
  0.555556  0.012881  0.006639  1.023897  0.000325
  0.566667  0.012918  0.006782  1.061584  0.000326
  0.577778  0.012955  0.006926  1.099723  0.000327
  0.588889  0.012993  0.007070  1.138307  0.000328
  0.600000  0.013030  0.007214  1.177333  0.000328
  0.611111  0.013067  0.007359  1.216794  0.000329
  0.622222  0.013104  0.007505  1.256687  0.000330
  0.633333  0.013142  0.007651  1.297007  0.000331
  0.644444  0.013179  0.007797  1.337749  0.000332
  0.655556  0.013216  0.007943  1.378909  0.000333
  0.666667  0.013254  0.008090  1.420482  0.000334
  0.677778  0.013291  0.008238  1.462465  0.000335
  0.688889  0.013328  0.008386  1.504854  0.000336
  0.700000  0.013366  0.008534  1.547644  0.000337
  0.711111  0.013403  0.008683  1.590833  0.000338
  0.722222  0.013440  0.008832  1.634416  0.000339
  0.733333  0.013478  0.008981  1.678389  0.000340
  0.744444  0.013515  0.009131  1.722751  0.000341
  0.755556  0.013552  0.009282  1.767496  0.000342
  0.766667  0.013590  0.009433  1.812622  0.000343
  0.777778  0.013627  0.009584  1.858126  0.000344
  0.788889  0.013664  0.009735  1.904005  0.000344
  0.800000  0.013702  0.009887  1.950255  0.000345
  0.811111  0.013739  0.010040  1.996873  0.000346
  0.822222  0.013777  0.010193  2.043857  0.000347
  0.833333  0.013814  0.010346  2.091204  0.000348
  0.844444  0.013851  0.010500  2.138911  0.000349
  0.855556  0.013889  0.010654  2.186975  0.000350
  0.866667  0.013926  0.010808  2.235394  0.000351
  0.877778  0.013963  0.010963  2.284165  0.000352
  0.888889  0.014001  0.011119  2.333286  0.000353
  0.900000  0.014038  0.011274  2.382754  0.000354
  0.911111  0.014076  0.011431  2.432567  0.000355
  0.922222  0.014113  0.011587  2.482722  0.000356
  0.933333  0.014150  0.011744  2.533217  0.000357
  0.944444  0.014188  0.011902  2.584050  0.000358
  0.955556  0.014225  0.012060  2.635218  0.000359
  0.966667  0.014263  0.012218  2.686720  0.000360
  0.977778  0.014300  0.012377  2.738553  0.000360
  0.988889  0.014337  0.012536  2.790715  0.000361
  1.000000  0.014375  0.012695  2.843204  0.000362
  END FTABLE  3
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1              PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1              IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.76           PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.76           IMPLND   1 999 EXTNL  PETINP
WDM      2 PREC     ENGL    1              RCHRES   1     EXTNL  PREC
WDM      1 EVAP     ENGL    0.5            RCHRES   1     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.76           RCHRES   2     EXTNL  POTEV

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
```

```
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
RCHRES   2 HYDR   RO     1 1        1      WDM   1000 FLOW     ENGL      REPL
RCHRES   2 HYDR   O      1 1        1      WDM   1006 FLOW     ENGL      REPL
RCHRES   2 HYDR   O      2 1        1      WDM   1007 FLOW     ENGL      REPL
RCHRES   2 HYDR   STAGE  1 1        1      WDM   1001 STAG     ENGL      REPL
RCHRES   1 HYDR   STAGE  1 1        1      WDM   1002 STAG     ENGL      REPL
RCHRES   1 HYDR   O      1 1        1      WDM   1003 FLOW     ENGL      REPL
COPY     1 OUTPUT MEAN   1 1     48.4      WDM    701 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    801 FLOW     ENGL      REPL
RCHRES   3 HYDR   RO     1 1        1      WDM   1004 FLOW     ENGL      REPL
RCHRES   3 HYDR   O      1 1        1      WDM   1008 FLOW     ENGL      REPL
RCHRES   3 HYDR   O      2 1        1      WDM   1009 FLOW     ENGL      REPL
RCHRES   3 HYDR   STAGE  1 1        1      WDM   1005 STAG     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>             <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK        2
PERLND     PWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    2

  MASS-LINK        3
PERLND     PWATER IFWO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    3

  MASS-LINK        5
IMPLND     IWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    5

  MASS-LINK        8
RCHRES     OFLOW  OVOL   2                 RCHRES         INFLOW IVOL
  END MASS-LINK    8

  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15

  MASS-LINK       17
RCHRES     OFLOW  OVOL   1                 COPY           INPUT  MEAN
  END MASS-LINK   17

  MASS-LINK       50
IMPLND     IWATER SURO                     PERLND         EXTNL  SURLI
  END MASS-LINK   50


END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

Disclaimer

Legal Notice

This program and accompanying documentation are provided 'as-is' without warranty of any kind. The entire risk regarding the performance and results of this program is assumed by End User. Clear Creek Solutions Inc. and the governmental licensee or sublicensees disclaim all warranties, either expressed or implied, including but not limited to implied warranties of program and accompanying documentation. In no event shall Clear Creek Solutions Inc. be liable for any damages whatsoever (including without limitation to damages for loss of business profits, loss of business information, business interruption, and the like) arising out of the use of, or inability to use this program even if Clear Creek Solutions Inc. or their authorized representatives have been advised of the possibility of such damages. Software Copyright © by : Clear Creek Solutions, Inc. 2005-2026; All Rights Reserved.

Clear Creek Solutions, Inc.
6200 Capitol Blvd. Ste F
Olympia, WA. 98501
Toll Free 1(866)943-0304
Local (360)943-0304

www.clearcreeksolutions.com

A. Background

1. Name of proposed project, if applicable:
Grip Road Pavement Widening.

2. Name of applicant:
Miles Sand and Gravel

3. Address and phone number of applicant and contact person:
Applicant: Brad Barton, Miles Sand and Gravel PO Box 280, Mount Vernon, WA 98273; 360-757-3121

4. Date checklist prepared: October 5, 2026

5. Agency requesting checklist:
Skagit County Planning Department

6. Proposed timing of schedule (including phasing, if applicable): After approval of related permits below.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.
The project is related to Conditions in the SUP and MDNS listed in 8 below.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.
Skagit County Planning & Development Services Sepa Mitigated Determination of Nonsignificance (MDNS) For: Concrete Nor'West/Miles Sand & Gravel File#: PL16-0097 (Special Use Permit) & File#: PL16-0098 (Forest Practice Conversion) ("2016 MDNS);

Mining Special Use Permit (SUP) application; and) PL22-0142 Appeal of the Mitigated Determination) PL16-0097 of Non-Significance (MDNS);) PL16-0098 and the Forest Practice).;

Drainage Report For Grip Road Sta. 23+00 - 30+50 Sedro-Wooley, WA 98284; Semrau Engineering & Surveying, PLLC ("Drainage Report");

Critical Area Study & Mitigation Plan For Miles Sand And Gravel Grip Road Improvements Skagit County, Wa; Wetland Resources, Inc. Project #25267, November 4, 2025 ("Critical Area and Mitigation Report")

Subsurface Exploration, Geologic Hazard, and Preliminary Geotechnical Engineering Report, Grip Road Widening Project Skagit County, Washington, Associated Earth Sciences (AESI), Draft, October 13, 2025 ("AESI Report")

Truck Path Summary, DN Traffic Consultants, June 4, 2025 (Sta 22+00 to 31+00 Grip Road, Truck and Pup, AutoTurn)

Grip Road Widening Plans, Sheets C1 to C7, Semrau Engineering & Surveying, PLLC, May 4, 2026

Revised Option 3 Site Plan, Sheet C3, Grip Road Pavement Widening, Semrau Engineering & Surveying, PLLC,

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

No, we are not aware of any other pending applications directly affecting the subject property.

10. List any government approvals or permits that will be needed for your proposal, if known.

Public Works Permits; Grading; Building (for soldier pile retaining walls); Critical Areas; Land Disturbance (appears to fall below the Exemption); Stormwater approval (County); Construction Stormwater Permit.

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

The roadway will be expanded to 34 feet in width with two 11-foot drive lanes and two 6-foot shoulders. The shoulders will include 4 feet of pavement and 2 feet of gravel as a transition to the existing open ditch drainage. Widening the roadway will require 550 LF of concrete faced sheet pile retaining wall. The wall will vary in height from 2 feet to 6 feet with an average height of 4 feet. In conjunction with the roadway work, the proposal would improve the driveway access at station 35+10 with a tapered access and approximately 2360 square feet of paving over the existing gravel surface.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

Grip Road, 0.43 miles east of the intersection of Grip Road and Prairie Road, in Skagit County, WA. Design stationing follows the as-built centerline and begins near the intersection with Prairie Road. The Project Area is defined by the start and end of construction/paving, from 23+00 to 30+50, running perpendicular to the existing & proposed right-of-way and including the entire R/W area bounded by those limits.

B. Environmental Elements

1. Earth

a. General description of the site:

The road rises about 12% west to east through the project. The sides of the road vary with the north flat to sloping down in the western portion to rising along the eastern end while the southern side generally slopes down.

Circle or highlight one: Flat, rolling, hilly, steep slopes, mountainous, other:

b. What is the steepest slope on the site (approximate percent slope)?

The slope along the south side of Grip Road trends down and south to a tributary of Swede Creek with up to approximately 30 vertical feet of relief and inclinations as steep as 40 percent along the project alignment. Slopes north and topographically higher than Grip Road are characterized by inclinations of up to 45 percent with approximately 10 vertical feet of relief.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them, and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.

There are two soil types covering the project area. The west end of the project is underlain by Skipopa silt loam, 0 to 3 percent slopes. This is a very deep, somewhat poorly drained soil. It formed in a mantle of loess and volcanic ash underlain by glaciolacustrine sediment. Permeability of this Skipopa soil is very slow. Runoff is slow, and the hazard of water erosion is slight. This unit is used mainly as hayland and pastureland. If adequately drained, the unit is also suited to climatically adapted cultivated crops. It is also used as woodland and homesites. The eastern part of the the project is underlain by Hoogdal silt loam, 15 to 30 percent slopes. This very deep, moderately well drained soil is on short upland slopes. It formed in loess and glaciolacustrine sediment. Permeability of this Hoogdal soil is slow. This unit is used mainly as woodland. It is also used as hayland. pastureland, and homesites. The project does not plan on removing any significant amount of these soils.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

Analysis of LIDAR image shows the slopes along the east end of the project alignment of Grip Road appear to be distinctly hummocky with bowl-shaped edges. AESI interpret this to be indicative of shallow translational landslide activity. Grip Road was constructed through the landslide feature.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill.

Fill behind the sheet pile wall to widen the roadway will require 650 CY to 750 CY of gravel fill from a local gravel mine.

f. Could erosion occur because of clearing, construction, or use? If so, generally describe.

Without mitigation erosion and runoff could occur when any pavement is removed and when existing shoulders and other areas to be paved have unsuitable materials removed during construction.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

The project area (41,752 sf) is presently 40.5% paved and 11.9% gravel. Upon Completion it will be 49.9% paved and 15.9% gravel.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any.

Stability: The new soldier pile wall should be designed such that the supportive piles are embedded a minimum of 10 feet into the undisturbed Everson glaciomarine drift sediments. With this approach the new proposed wall will drive loads from the retained soil down into the competent native material at depth and impacts to existing local landslide hazard areas will be mitigated. AESI's analysis found that factors of safety for the risks associated with the proposed road widening project would improve over current conditions with the use of the soldier pile walls in the areas within the historical shall landslide area.

Erosion: The project will employ multiple Best Management Practices (BMPs). These will include at a minimum sediment controls, soil stabilization, applicable slope protection, and maintenance. Exposed non-gravel or paved areas will be seeded and those areas will be monitored and maintained until vegetation is sufficient to provide long-term protection.

2. Air

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.

Wheeled and tracked diesel equipment will be used for the construction. The soldier piles will be placed with a vibratory hammer on an excavator. The emissions from this equipment will be short term. The maintenance will not create an increase in the use of diesel equipment or other emission sources.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

No, there are no off-site sources of emissions or odor that would affect the proposal.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

Emissions are controlled by using equipment that meets applicable regulatory requirements.

3. Water

a. Surface:

1. Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into. Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

There is one Category I wetland, 5 Category II wetlands, 2 Type F, and 2 Type NS streams within 300 feet of the Project area. The 2 Type F streams are tributaries to Swede Creek which is a tributary to the Samish River.

No work is proposed in any of the waters. The project as proposed will increase the surface area of Grip Road by 2,611 square feet. A total of 308 square feet of the expansion is proposed in currently functioning buffer areas. An additional 408 square feet of permanent impacts to buffer areas are required for construction of the two proposed retaining walls. Finally, the space between the retaining walls and the expanded road surface (totaling 1,046 square feet) will be considered permanent impacts because it will be functionally separated from adjacent wetland and stream areas. In total, 1,762 square feet of permanent impacts to buffer are proposed. These impacts cannot be restored and there is no suitable on-site location to provide buffer mitigation.

2. Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

No fill or dredge material is proposed to be placed in any wetlands for the proposed project.

3. Will the proposal require surface water withdrawals or diversions? Give a general description, purpose, and approximate quantities if known.

The proposal will not require surface water withdrawals or diversions.

4. **Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.**

Yes, the road is in the 100 year floodplain of the Samish River.

5. **Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.**

No, the proposal does not entail discharge of any waste materials to surface waters.

b. Ground:

1. **Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give a general description, purpose, and approximate quantities if known.**

The project does not use water from any source.

2. **Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (domestic sewage; industrial, containing the following chemicals…; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.**

The project is a small expansion of an existing road. There are no discharges proposed other than stormwater.

c. Water Runoff (including stormwater):

1. **Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.**

Stormwater is generated from the road surface. The proposed plan preserves the natural drainage system. The site presently drains off either side of the road, depending on the superelevation – north drainage to a roadside ditch, and south drainage sheet flows off the shoulder through the wetlands, both joining up in a small natural channel that flows into Swede Creek, which in turn flows into the Samish River. Stormwater from the eastern curve flows north to the existing roadside ditch. Stormwater from the western curve will continue to sheet flow southerly into the existing riparian area. The westerly gravel shoulder area between the guard rail and the retaining wall will be permeable and continue to contribute to the westerly riparian area.

2. **Could waste materials enter ground or surface waters? If so, generally describe.**

Treated runoff from proposed site improvements will continue to disperse and flow to Swede Creek through the existing forest, wetlands, and channels.

3. **Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.**

The site layout has been designed to minimize impacts and preserve the natural drainage system. Wetland protection from pollutants will be provided by proposed bioretention facilities, roadside swale/check dams and source control BMPs.

d. **Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any:**

Please refer to responses c 1-3 above.

4. Plants

a. **Check the types of vegetation found on the site:**

☐ **deciduous tree: alder, maple, aspen, other**

☐ **evergreen tree: fir, cedar, pine, other**

X shrubs

X grass

☐ **pasture**

☐ **crop or grain**

☐ **orchards, vineyards, or other permanent crops.**

☐ **wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other**

☐ **water plants: water lily, eelgrass, milfoil, other**

X other types of vegetation

b. What kind and amount of vegetation will be removed or altered?

The proposed development requires 6,518 square feet of temporary buffer impacts across two areas and 22 square feet of temporary wetland impacts along the north edge of Wetland C. Plants removed are grasses, shrubs and a large presence of invasive Himalayan blackberry, cut-leaf blackberry, and English holly.

c. List threatened and endangered species known to be on or near the site.

There are no endangered plant species known to be on or near the site.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any.

About 6,540 square feet of buffer area and a small wetland edge (340 sf) will be replanted with native species including Western red cedar, Big leaf maple, Douglas fir Pseudotsuga, Salmonberry, Beaked hazelnut, Thimbleberry, Snowberry, Vine maple Acer, Swordfern, and Red-osier dogwood totaling over 280 individual plants. This is detailed in the Critical Area and Mitigation Report.

e. List all noxious weeds and invasive species known to be on or near the site.

Himalayan blackberry, cut-leaf blackberry, and English holly.

5. Animals

a. List any birds and other animals that have been observed on or near the site or are known to be on or near the site.

Examples include:

- **Birds: hawk, heron, eagle, songbirds, other:**
- **Mammals: deer, bear, elk, beaver, other:**
- **Fish: bass, salmon, trout, herring, shellfish, other:**

The on-site wetlands its associated buffer contain resources for wildlife such as food, water, thermal cover, and refuge in close proximity. Given the habitat available, the following mammalian species may use the area: bats (Myotis spp.), bobcat (Lynx rufus), coyote (Canis latrans), raccoon (Procyon lotor), black bear (Ursus americanus), cougar (Puma concolor), beaver (Castor canadensis), shrews (Sorex spp.), Mountain beaver (Aplodontia rufa), skunks (Mephitis spp.), deer mouse (Peromyscus maniculatus), eastern cottontail rabbit (Sylvilagus floridanus), moles (Scapanus spp.), squirrels (Sciuris griseus, Tamiasciurus douglasii), and Virginia opossum (Didelphis virginiana). The following avian species are expected to use the area: American Crow (Corvus brachyrhynchos), Steller's Jay (Cyanocitta stelleri), Black-capped Chickadee (Poecile atricapillus), Bushtit (Psaltriparus minimus), Northern Flicker (Colaptes auratus), Hairy Woodpecker (Picoides villosus), Red-breasted Nuthatch (Sitka canadensis), Brown Creeper (Certhia americana), Varied Thrush (Ixoreus naevius), and Wood Duck (Aix sponsa). Other wildlife expected to use this site include garter snakes (Thamnophis spp.), and northwestern salamander (Ambystoma gracile). (These lists are not meant to be all-inclusive and may omit species that currently utilize or could utilize the site.)

SalmonScape depicts the presence of multiple salmonid species in adjacent streams including Chinook (Oncorhynchus tshawytscha), Steelhead (O. mykiss), Pink (O. gorbuscha), Coho (O. kisutch) and cutthroat trout (O. clarkii).

b. List any threatened and endangered species known to be on or near the site.

Puget Sound Chinook and Puget Sound Steelhead.

c. Is the site part of a migration route? If so, explain.

The Pacific Flyway migration route covers all of western Washington state. The site is not, however, identified in any areas of specific use (as are areas further to the west that are used by migrating swans and snow geese, for example).

d. Proposed measures to preserve or enhance wildlife, if any.

The buffer plantings should provide improved habitat in the long-term.

e. List any invasive animal species known to be on or near the site.

There are no invasive animal species known to be at or near the site.

6. Energy and natural resources

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

Diesel powered equipment will be used to construct the road improvements.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

The project will have no impact on potential solar energy use near the site.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any.

The project has minimal energy impacts.

7. Environmental health

a. **Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur because of this proposal? If so, describe.**

Fuel or oil spills from equipment used in the construction of the improvements are the only environmental risks associated with the project,

1. **Describe any known or possible contamination at the site from present or past uses.**

There is no known contamination at the site.

2. **Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.**

There are no hazardous conditions that would affect the project.

3. **Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.**

The project does not use or entail hazardous chemicals other than equipment fuel and lubricants during construction.

4. **Describe special emergency services that might be required.**

No special emergency services are necessitated by the project.

5. **Proposed measures to reduce or control environmental health hazards, if any.**

Use of best management practices including prevention measures and use of spill kits.

b. Noise

1. **What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?**

Other than existing traffic there are no noise generators in the area that would affect the project.

2. **What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site)?**

Noise will be generated by equipment excavating widening areas, placing gravel subbase and shoulders, paving and driving the soldier piles for the retaining walls. Noise would occur during County allowed construction hours.

3. **Proposed measures to reduce or control noise impacts, if any:**

The project is short-term so the impacts will be temporary.

8. Land and shoreline use

a. **What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses because of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use?**

The project area is an existing County Road and will remain as such with slightly widened edges in place. The adjacent lands are zoned Rural Residential Reserve. The road widening will not affect the adjacent properties other than by increasing the safety of the road. The project site has not been used as working farmland or working forest land in the recent past.

1. **Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how?**

The proposal will improve the ability of oversized equipment to safely use the road.

b. **Describe any structures on the site.**

The project site is an existing road.

c. **Will any structures be demolished? If so, what?**

There are no structures at the site.

d. **What is the current zoning classification of the site?**

Rural Residential Reserve.

e. **What is the current comprehensive plan designation of the site?**

Rural.

f. **If applicable, what is the current shoreline master program designation of the site?**

N/A

g. **Has any part of the site been classified as a critical area by the city or county? If so, specify.**

Adjacent wetlands and streams are designated critical areas. A portion of the proposed soldier pile wall is above a steep slope, the slopes adjacent to Grip Road along the project alignment meet the County's criteria for Landslide Hazard areas, and the area underlain by Hoogdal soils are classified as an erosion hazard area.

h. **Approximately how many people would reside or work in the completed project?**

The completed project is a widened road with no residents or workers.

i. **Approximately how many people would the completed project displace?**

No one will be displaced by the project.

j. **Proposed measures to avoid or reduce displacement impacts, if any.**

N/A

k. **Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any.**

N/A The project is a road improvement.

l. **Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any:**

The project does not impact agricultural or forest lands.

9. Housing

a. **Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.**

The project does not entail housing as it is a road improvement.

b. **Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.**

The project is within an existing road so no housing is impacted.

c. **Proposed measures to reduce or control housing impacts, if any:**

N/A There are no housing impacts.

10. Aesthetics

a. **What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?**

The project is a road. The only structure is a soldier pile retaining wall that is lower than the road.

b. **What views in the immediate vicinity would be altered or obstructed?**

The project does not construct anything within anyone's line of sight.

c. **Proposed measures to reduce or control aesthetic impacts, if any:**

N/A The project is a slight widening of an existing road.

11. Light and glare

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

The project is a slight widening of an existing road and does not introduce new light.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

No, the project will not create new light or glare that would be a safety hazard or interfere with views.

c. What existing off-site sources of light or glare may affect your proposal?

There are no off-site sources of light or glare that would affect the proposal.

d. Proposed measures to reduce or control light and glare impacts, if any:

No measures are needed as there are no impacts.

12. Recreation

a. What designated and informal recreational opportunities are in the immediate vicinity?

There are no designated or identified recreational opportunities in the immediate project vicinity.

b. Would the proposed project displace any existing recreational uses? If so, describe.

N/A

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

N/A

13. Historic and cultural preservation

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers? If so, specifically describe.

No there is nothing at or near the site eligible for listing in national, state, or local preservation registers.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

No landmarks, features or other evidence of historic use or occupation are evident. The Washington Department of Archaeology and Historic Preservation WISAARD site did not identify anything in the vicinity of the project.

c. **Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.**

Washington Department of Archaeology and Historic Preservation WISAARD site did not identify anything in the vicinity of the project.

d. **Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.**

No measures are needed. Excavation is shallow and mostly in existing road shoulder. The likelihood of encountering anything requiring protection is extremely remote.

14. Transportation

a. **Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.**

The project is in Grip Road as described in A. 12 of this Checklist.

b. **Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?**

No, the site is not served by public transit. The nearest transit stop by road is over six miles away in Sedro Woolley.

c. **Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle, or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).**

The project is a road improvement. Please refer to A. 11 of this checklist for the detailed description.

d. **Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.**

No, the project is a road improvement.

e. **How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates?**

The project itself does no generate trips.

f. **Will the proposal interfere with, affect, or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.**

The project will widen to curves making movement of agricultural and forest products safer.

g. **Proposed measures to reduce or control transportation impacts, if any:**

The project purpose is to control transportation impacts, specifically allowing longer legal truck configurations to travel through the corners without crossing over lanes or using the shoulders.

15. Public services

a. **Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.**

This road improvement project will not create a need for other public services.

b. **Proposed measures to reduce or control direct impacts on public services, if any.**

No impacts on services result from the project so no measures are needed.

16. Utilities

a. **Circle utilities currently available at the site: electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other:**

b. **Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.**

No utilities are needed for the project. The existing local electric service lines will need to be relocated on new poles or underground.

Signature

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

X

Type name of signee: Brad Barton

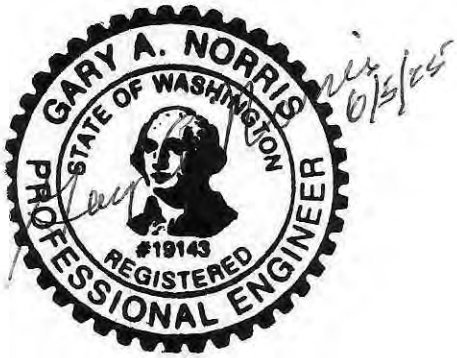
Position and agency/organization:
Vice President / Miles Sand & Gravel Company

Date submitted:
10/5/2026

SAVE PRINT

DNraffic CONSULTANTS
Transportation Engineers and Planners
PO Box 547
Preston, Washington 98050

Memorandum



Date: June 4, 2025

To: John B Semrau, PE & PLS
Semrau Engineering & Surveying

From: Gary A. Norris, PE, PTOE, RSP2i
DN Traffic Consultants, Inc

Subject: Miles Sand and Gravel Mine

RE: Truck Path Summary

The following memorandum was prepared to summarize the impact of the Dump Truck with Pup for the eastbound and westbound vehicle swept paths between station 22+00 and 31+00 along Grip Road for the Miles Sand and Gravel Mine.

The dimensions of the dump truck with pup are shown in Figure 1.

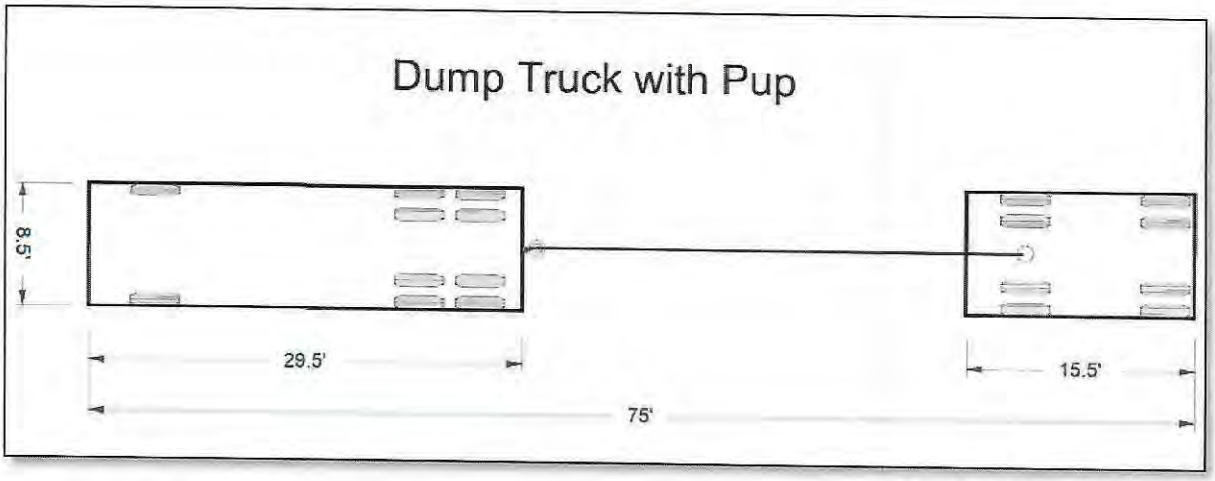


Figure 1: Dump Truck Dimensions

Initially, at the September 22nd Hearing, the applicant submitted an auto turn analysis representing the path of the worst-case vehicle in terms of encroachment over the centerline or over the existing edge of pavement. Using "auto turn" a CADD developed vehicle path was developed for the subject vehicle. A vehicle swept path was developed for this dump truck for both directions. The result of the analysis showed the design vehicle encroaching on the center line or over the edge of pavement on both the

north and south side of the roadway through the east and west curves along Grip Road (Figure 2). As a result, Miles Sand and Gravel agreed to prepare plans and specs to widen the roadway where the design vehicle encroached on the centerline or the edge of pavement.

As a result of the analysis, it was determined Grip Road should be widened on the south side of the westerly curve between STA 23+15 and STA 25+90 and on the south side of the easterly curve between STA 25+90 and STA 25+21. The easterly curve should be widened on the north side between STA 27+10 and STA 28+79. The centerline should be relocated southwesterly between STA 27+10 to STA 28+79.

With the widening of the pavement both in the eastbound "West" curve, the widening of the eastbound lane in both the "west" and "east" curves, and the shifting of the centerline alignment south and west (Figure 3), neither trucking scenario results in a cross-over of the center line or the fog line in the areas mention in the previous auto-turn study.

Attachments:

Figure 2, Auto-Turn exhibit "Existing", 9/13/22
Figure 3, Auto-turn Exhibit "Proposed", 5/27/25

TRUCK/PUP VEHICLE PATHS
GRIP ROAD

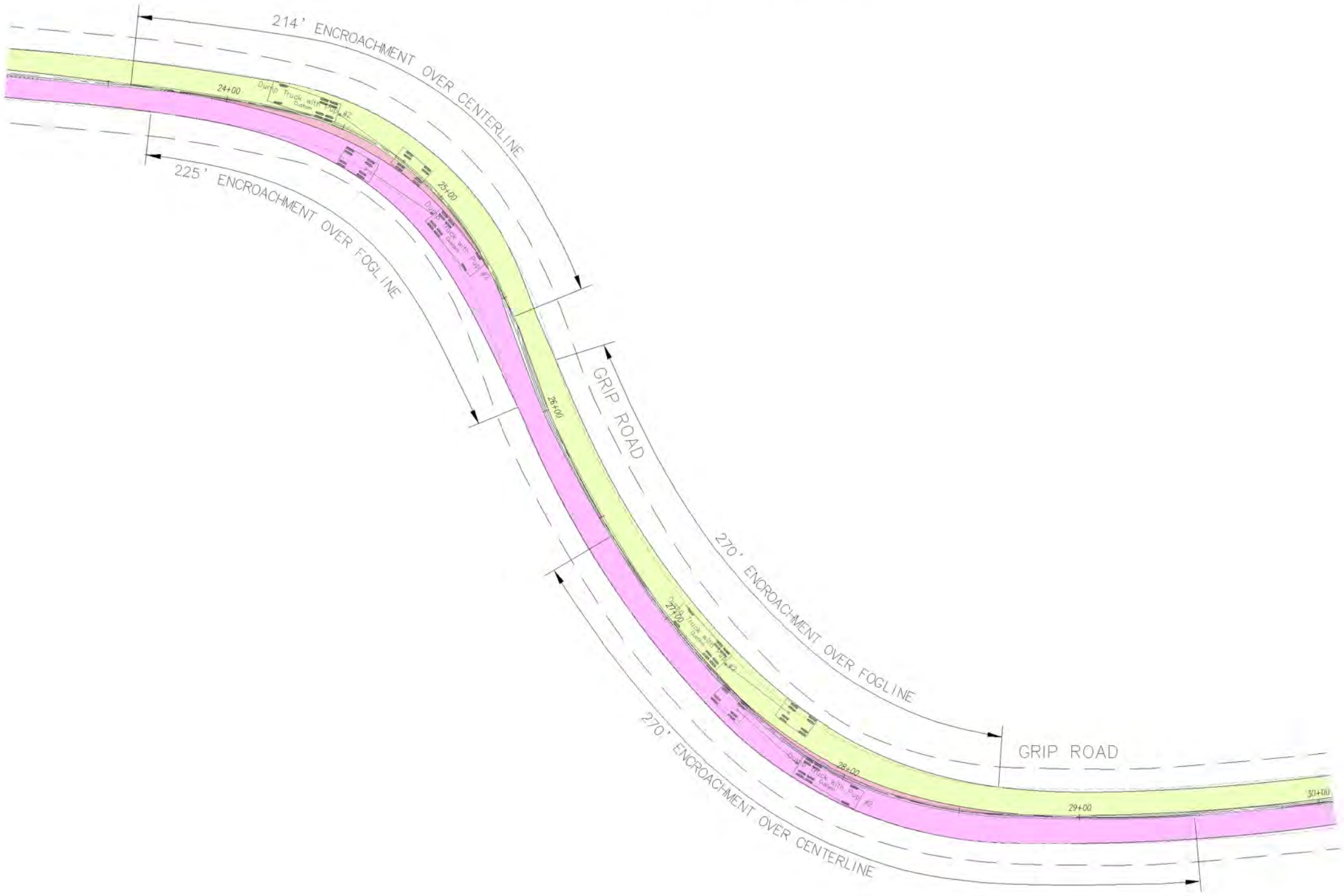


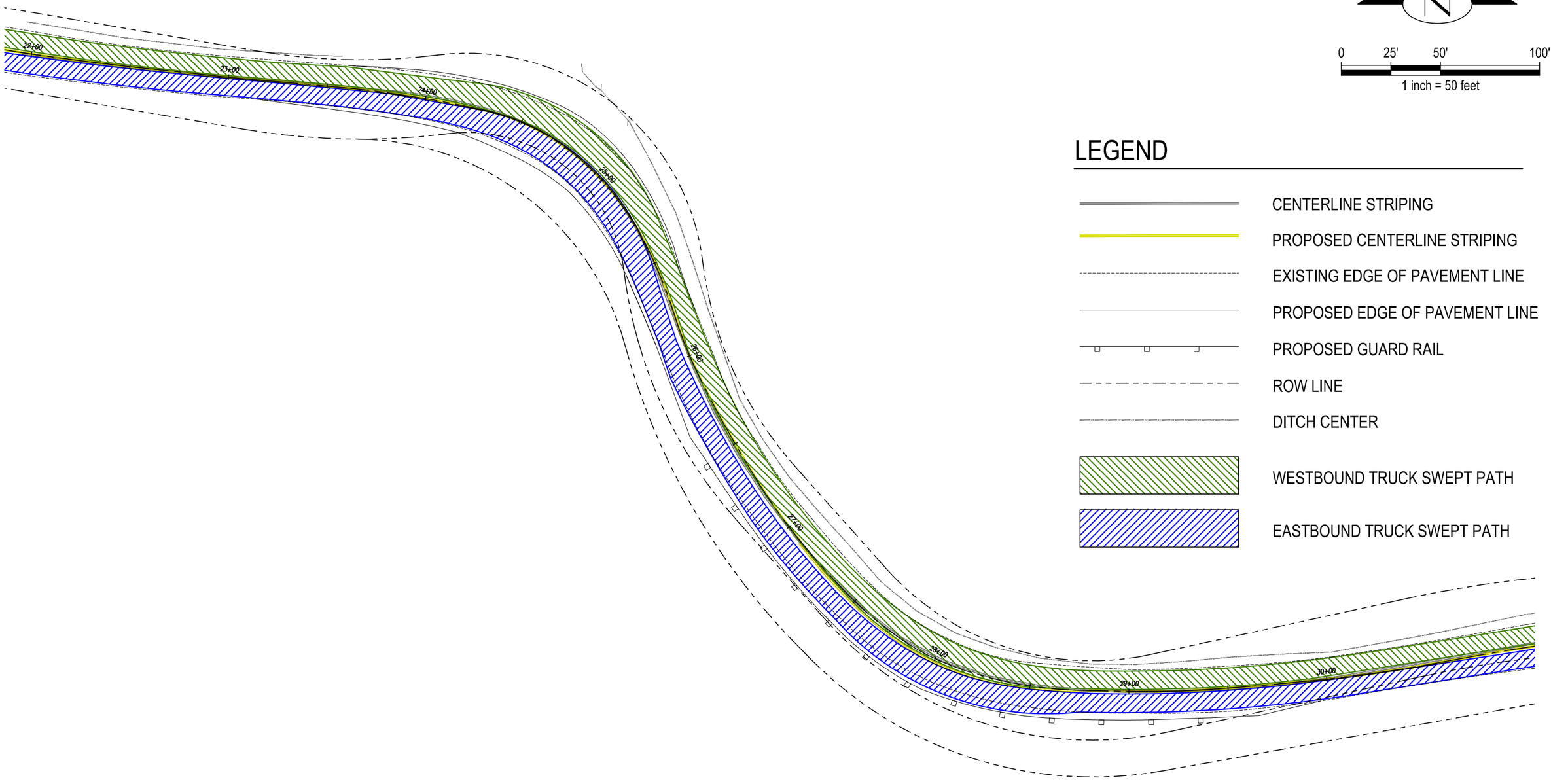
FIGURE 2

9–13–2022

DN TRAFFIC CONSULTANTS

8316 - 309th Avenue SE Preston, WA 98050

Info@dntraffic consultants.com



0 25' 50' 100'

1 inch = 50 feet

LEGEND

- CENTERLINE STRIPING
- PROPOSED CENTERLINE STRIPING
- EXISTING EDGE OF PAVEMENT LINE
- PROPOSED EDGE OF PAVEMENT LINE
- PROPOSED GUARD RAIL
- ROW LINE
- DITCH CENTER
- WESTBOUND TRUCK SWEPT PATH
- EASTBOUND TRUCK SWEPT PATH

Project Title: GRIP ROAD	Drawing Title: DUMP TRUCK WITH PUP #1 SWEPT TURN PATHS	ASI/RFI/CSK Number:
Client: DN TRAF FIGURE 3 ULTANTS	kpff 1601 5th Avenue, Suite 1600 Seattle, WA 98101 206.622.5822 www.kpff.com	Drawing Reference: / Scale: 1"=50'
		Date: 5/27/25 / Drawn/Ck'd By: WHL

May 27, 2025 - 5:21pm WinnieL \\kpff.com\civil\250000+\250999\2500030 Grip Rd\CADD\Design\Exhibits\Dump Truck with Pup #1\Grip Road Autoturn (2025-05-19).dwg

P35728
SCOTT MCALLISTER

P35730
COUGAR PEAK LLC

P35718
GEORGE VOILE
KANDICE VOILE

NEW DESIGN ALIGNMENT TABLE

LBL	RADIUS	LENGTH	LINE/CHORD DIRECTION	DELTA	DESIGN STA	AS-BUILT STA
					23+00.00	23+00
L1		99.21'	S 85°18'58" E		23+99.21	
C1	125.00'	138.40'		63°26'12"	25+37.61	
L2		67.94'	S 21°52'46" E		16+05.55	
C2	300.00'	96.35'		63°26'12"	27+01.89	
L3		27.00'	S 40°16'49" E		27+28.89	
C3	190.00'	191.94'		57°52'52"	29+20.83	
L4	155.92'		N 81°00'43" E		30+76.75	30+70

0' 20' 40'
SCALE

NOTES:

1. CENTERLINE STATIONING IS A NEW DESIGN CENTERLINE. THE TOPOGRAPHIC SURVEY AND ORIGINAL AUTOTURN ANALYSIS ARE BASED ON THE AS-BUILT CENTERLINE.
2. CURRENT AUTO TURN ANALYSIS FROM DN TRAFFIC CONSULTANTS, GARY A. NORRIS, PE, MEMO DATED JUNE 4, 2025.
3. EXISTING COUNTY RIGHT-OF-WAY IS FROM COUNTY ENGINEERS MAP "JOHN GRIP ROAD EXTENSION" NO. 266 DATED APRIL 1915.

KEY

- GUY ANCHOR
- SIGN
- UTILITY POLE
- CULVERT
- DESIGN CENTERLINE
- PROPOSED CENTERLINE STRIPE
- EXISTING DOUBLE CENTERLINE STRIPE
- RIGHT-OF-WAY (EXISTING)
- RIGHT-OF-WAY (PROPOSED)
- PROPOSED GUARD RAIL (710 LF)
- DITCH
- TOP/TOE OF SLOPE
- EXISTING PAVEMENT
- NEW FULL DEPTH PAVEMENT (2,060 SF)
- CONVERSION OF GRAVEL TO PAVEMENT (3,034 SF)
- PAVEMENT REMOVAL (1,169 SF)
- PERMEABLE GRAVEL (3,745 SF)

Digitally signed by John B Semrau, PE & PLS
DN: C=US, E=john@jbsemrau.com, O="Semrau Engineering & Surveying, PLLC", CN="John B Semrau, PE & PLS"
Date: 2025.07.17 15:19:17-07'00'
John B Semrau, PE & PLS

COPYRIGHT 2026
SEMRAU ENGINEERING & SURVEYING, PLLC
CIVIL ENGINEERING • LAND SURVEYING • PLANNING
2118 RIVERSIDE DRIVE – SUITE 209
MOUNT VERNON, WA 98273
360-424-9566

JOHN B. SEMRAU — STATE OF WASHINGTON — 28626 — REGISTERED PROFESSIONAL ENGINEER

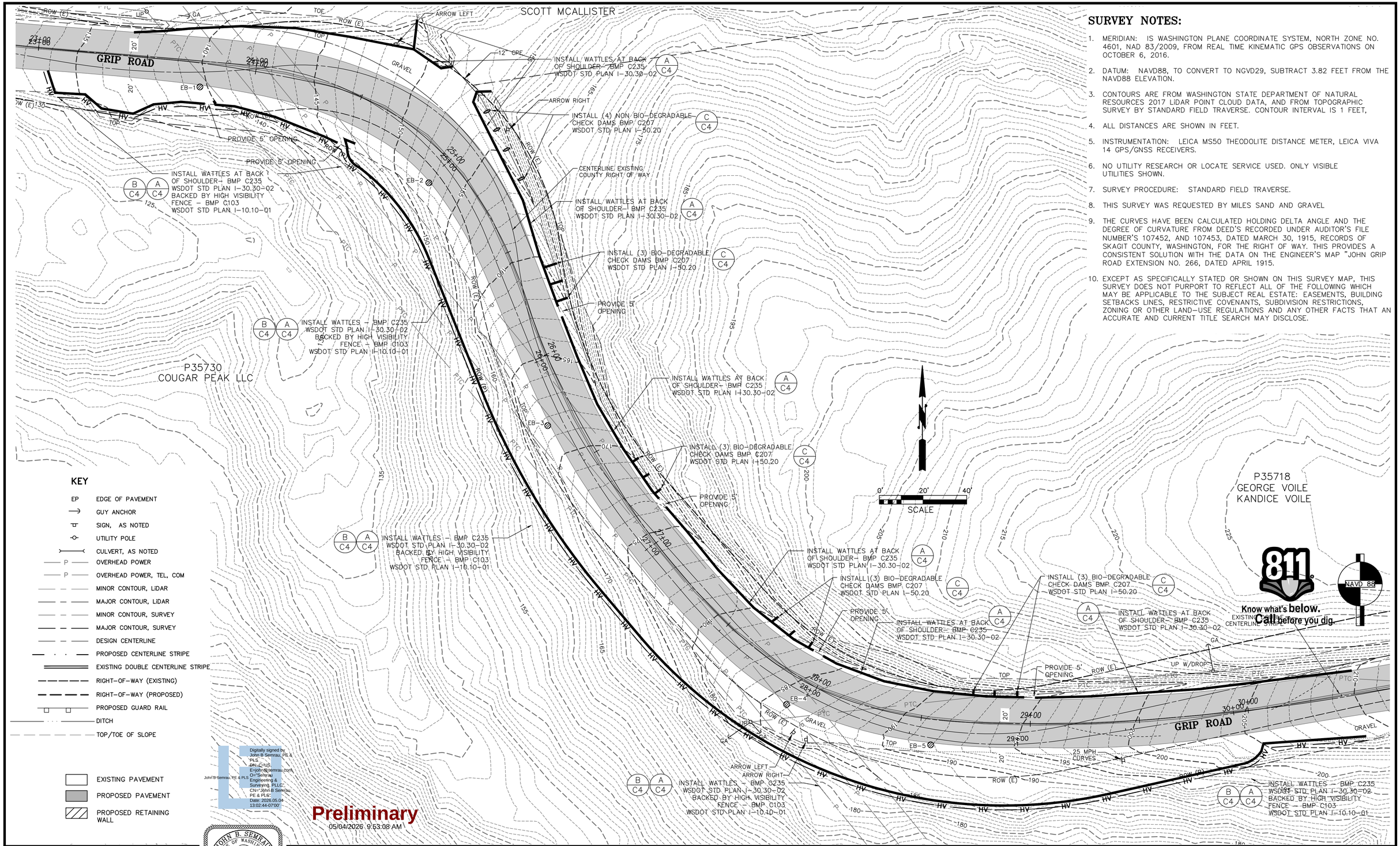
NO.	DATE	REVISION	BY	REV.

OPTION 3
SITE PLAN

SCALES:
HORIZONTAL : 1" = 20'
VERTICAL : N/A
NOTE: IF THIS SHEET IS LESS THAN 22"x 34" THEN SHEET HAS BEEN REDUCED

GRIP ROAD PAVEMENT WIDENING
MILES SAND AND GRAVEL
SECTION 3, T. 35 N., R. 4 E., W.M.
SKAGIT COUNTY, WASHINGTON

FIELD BK/PG:	LL 5-9
DATE:	7/17/2026
DRAWING:	5166RD3.DWG
JOB NO.:	5166
SHEET:	C3



SURVEY NOTES:

1. MERIDIAN: IS WASHINGTON PLANE COORDINATE SYSTEM, NORTH ZONE NO. 4601, NAD 83/2009, FROM REAL TIME KINEMATIC GPS OBSERVATIONS ON OCTOBER 6, 2016.
2. DATUM: NAVD88, TO CONVERT TO NGVD29, SUBTRACT 3.82 FEET FROM THE NAVD88 ELEVATION.
3. CONTOURS ARE FROM WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES 2017 LiDAR POINT CLOUD DATA, AND FROM TOPOGRAPHIC SURVEY BY STANDARD FIELD TRAVERSE. CONTOUR INTERVAL IS 1 FEET,
4. ALL DISTANCES ARE SHOWN IN FEET.
5. INSTRUMENTATION: LEICA MS50 THEODOLITE DISTANCE METER, LEICA VIVA 14 GPS/GNSS RECEIVERS.
6. NO UTILITY RESEARCH OR LOCATE SERVICE USED. ONLY VISIBLE UTILITIES SHOWN.
7. SURVEY PROCEDURE: STANDARD FIELD TRAVERSE.
8. THIS SURVEY WAS REQUESTED BY MILES SAND AND GRAVEL
9. THE CURVES HAVE BEEN CALCULATED HOLDING DELTA ANGLE AND THE DEGREE OF CURVATURE FROM DEED'S RECORDED UNDER AUDITOR'S FILE NUMBER'S 107452, AND 107453, DATED MARCH 30, 1915, RECORDS OF SKAGIT COUNTY, WASHINGTON, FOR THE RIGHT OF WAY. THIS PROVIDES A CONSISTENT SOLUTION WITH THE DATA ON THE ENGINEER'S MAP "JOHN GRIP ROAD EXTENSION NO. 266, DATED APRIL 1915.
10. EXCEPT AS SPECIFICALLY STATED OR SHOWN ON THIS SURVEY MAP, THIS SURVEY DOES NOT PURPORT TO REFLECT ALL OF THE FOLLOWING WHICH MAY BE APPLICABLE TO THE SUBJECT REAL ESTATE: EASEMENTS, BUILDING SETBACKS LINES, RESTRICTIVE COVENANTS, SUBDIVISION RESTRICTIONS, ZONING OR OTHER LAND-USE REGULATIONS AND ANY OTHER FACTS THAT AN ACCURATE AND CURRENT TITLE SEARCH MAY DISCLOSE.

KEY

- EP — EDGE OF PAVEMENT
- GUY ANCHOR
- SIGN, AS NOTED
- UTILITY POLE
- CULVERT, AS NOTED
- P — OVERHEAD POWER
- P — OVERHEAD POWER, TEL, COM
- MINOR CONTOUR, LIDAR
- MAJOR CONTOUR, LIDAR
- MINOR CONTOUR, SURVEY
- MAJOR CONTOUR, SURVEY
- DESIGN CENTERLINE
- PROPOSED CENTERLINE STRIPE
- EXISTING DOUBLE CENTERLINE STRIPE
- RIGHT-OF-WAY (EXISTING)
- RIGHT-OF-WAY (PROPOSED)
- PROPOSED GUARD RAIL
- DITCH
- TOP/TOE OF SLOPE

- EXISTING PAVEMENT
- PROPOSED PAVEMENT
- PROPOSED RETAINING WALL

Digitally signed by John B Semrau, PE & PLS
DN: C=US, E=john@semrau.com, O=Semrau Engineering & Surveying, PLLC, CN="John B Semrau PE & PLS"
Date: 2026.05.04 13:02:44-07'00'
John B Semrau, PE & PLS

Preliminary
05/04/2026 9:53:08 AM

COPYRIGHT 2026
SEMRAU ENGINEERING & SURVEYING, PLLC
CIVIL ENGINEERING • LAND SURVEYING • PLANNING
2118 RIVERSIDE DRIVE – SUITE 209
MOUNT VERNON, WA 98273
360-424-9566

JOHN B. SEMRAU — STATE OF WASHINGTON — 38626 — REGISTERED PROFESSIONAL LAND SURVEYOR

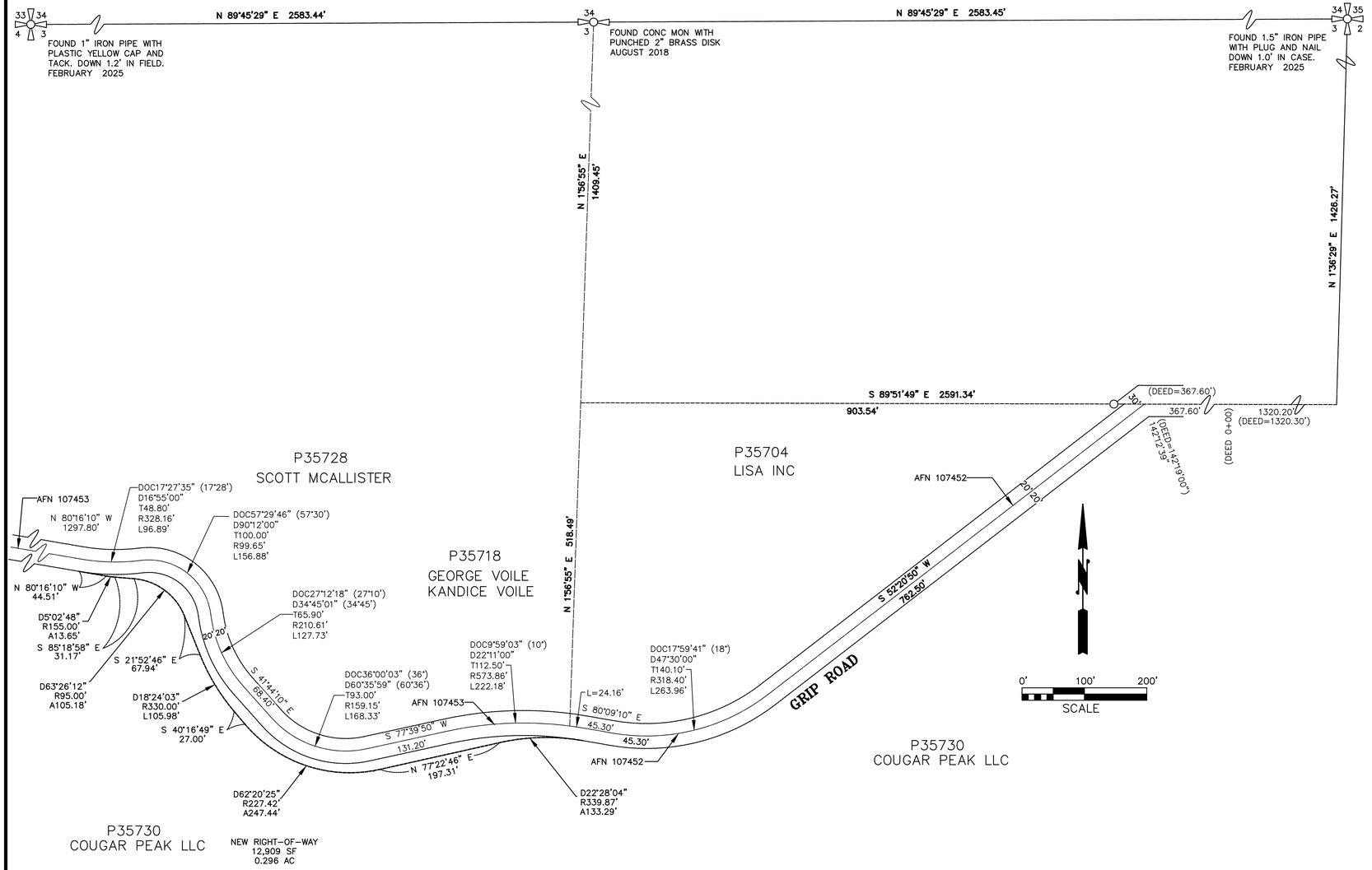
NO.	DATE	REVISION	BY	REV.

TOPOGRAPHIC SURVEY
OPTION 3 TESCP

SCALES:
HORIZONTAL : 1" = 20'
VERTICAL : N/A
NOTE: IF THIS SHEET IS LESS THAN 22"x 34" THEN SHEET HAS BEEN REDUCED

GRIP ROAD CURVES
MILES SAND AND GRAVEL
SECTION 3, T. 35 N., R. 4 E., W.M.
SKAGIT COUNTY, WASHINGTON

FIELD BK/PG:	342/80-91
DATE:	4/24/2026
DRAWING:	5166RD3-C1-TP.DWG
JOB NO.:	5166
SHEET:	C1



SURVEY NOTES:

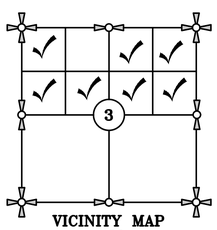
1. MERIDIAN: IS WASHINGTON PLANE COORDINATE SYSTEM, NORTH ZONE NO. 4601, NAD 83/2009, FROM REAL TIME KINEMATIC GPS OBSERVATIONS ON OCTOBER 6, 2016.
2. ALL DISTANCES ARE SHOWN IN FEET.
3. INSTRUMENTATION: LEICA MS50 THEODOLITE DISTANCE METER, LEICA VIVA 14 GPS/GNSS RECEIVERS.
4. SURVEY PROCEDURE: STANDARD FIELD TRAVERSE.
5. THIS SURVEY WAS REQUESTED BY MILES SAND AND GRAVEL
6. THE CURVES HAVE BEEN CALCULATED HOLDING DELTA ANGLE AND THE DEGREE OF CURVATURE FROM DEED'S RECORDED UNDER AUDITOR'S FILE NUMBER'S 107452, AND 107453, DATED MARCH 30, 1915, RECORDS OF SKAGIT COUNTY, WASHINGTON, FOR THE RIGHT OF WAY. THIS PROVIDES A CONSISTENT SOLUTION WITH THE DATA ON THE ENGINEER'S MAP "JOHN GRIP ROAD EXTENSION NO. 266, DATED APRIL 1915.
7. EXCEPT AS SPECIFICALLY STATED OR SHOWN ON THIS SURVEY MAP, THIS SURVEY DOES NOT PURPORT TO REFLECT ALL OF THE FOLLOWING WHICH MAY BE APPLICABLE TO THE SUBJECT REAL ESTATE: EASEMENTS, BUILDING SETBACKS LINES, RESTRICTIVE COVENANTS, SUBDIVISION RESTRICTIONS, ZONING OR OTHER LAND-USE REGULATIONS AND ANY OTHER FACTS THAT AN ACCURATE AND CURRENT TITLE SEARCH MAY DISCLOSE.

KEY:

- ● REBAR SET WITH YELLOW CAP – SEMRAU 28626
- ○ FOUND 1/2" REBAR, MARKED "SKG SURV 17651'
- PROPOSED RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY
- EXISTING RIGHT-OF-WAY
- EXISTING CENTERLINE
- SECTION LINE
- 16TH LINE

SURVEY REFERENCES:

R1 JOHN GRIP ROAD EXTENSION, NO. 266, DATED APRIL 1915
R2 RECORD OF SURVEY AFN 201309160070
R3 RECORD OF SURVEY AFN 200811100128
R4 RECORD OF SURVEY AFN 202101120088
R5 QUIT CLAIM DEED AFN 107452
R6 QUIT CLAIM DEED AFN 107453



Digitally signed by John B Semrau, PE & PLS
DN: C=US, E=jbs@semrau.com, O="Semrau Engineering & Surveying, PLLC", CN="John B Semrau, PE & PLS"
Date: 2026.05.04 13:02:31-07'00'

Preliminary
05/04/2026 9:53:19 AM

COPYRIGHT 2026

SEMRAU ENGINEERING & SURVEYING, PLLC
CIVIL ENGINEERING • LAND SURVEYING • PLANNING
2118 RIVERSIDE DRIVE – SUITE 209
MOUNT VERNON, WA 98273
360-424-9566

JOHN B. SEMRAU STATE OF WASHINGTON 28626 REGISTERED PROFESSIONAL LAND SURVEYOR

NO.	DATE	REVISION	BY	REV.

RIGHT-OF-WAY MAP

SCALES:
HORIZONTAL : 1" = 100'
VERTICAL : N/A
NOTE: IF THIS SHEET IS LESS THAN 22"x 34" THEN SHEET HAS BEEN REDUCED

GRIP ROAD
MILES SAND AND GRAVEL
SECTION 3, T. 35 N., R. 4 E., W.M.
SKAGIT COUNTY, WASHINGTON

FIELD BK/PG:	342/80-91
DATE:	4/23/2026
DRAWING:	5166GRIP24.DWG
JOB NO.:	5166
SHEET:	C2

P35728
SCOTT MCALLISTER

P35730
COUGAR PEAK LLC

P35718
GEORGE VOILE
KANDICE VOILE

GRIP ROAD

BEGIN TAPER
STA. 23+97.58
6.79' WIDENING

EXISTING GRAVEL TO FULL DEPTH PAVING – 601 SF

12" CPE

STA. 23+50 END TAPER

STA. 23+15 START TAPER

1.00' FROM EDGE OF SHOULDER STA. 23+20.00END GUARDRAIL FLARE SEE STD. PLAN C–22.45–07

5.96' TO TOP OF SLOPE STA. 23+64.36 END GUARDRAIL FLARE

STA. 24+00.58 END TAPER 4.03' WIDENING

BEGIN RETAINING WALL STA. 24+68

WETLANDS

STREAM

PROPOSED FULL DEPTH PAVING – 6,320 SF

PROPOSED GRAVEL SHOULDER – 2,709 SF

REMOVE EX. GRAVEL 2,757 SF

PROPOSED RETAINING WALL

SHIFT CL STRIPE

REVISED CENTERLINE STRIPE LOCATION (TYPICAL)

615 SF WETLAND WITHIN PROPOSED R/W

REMOVE EX. ASPHALT 285 SF

STA 29+23 BEGIN TAPER 13.19' WIDENING

PROPOSED FULL DEPTH PAVING – 164 SF UP W/DROP

EQUATION STATION
AS–BUILT 30+70.00
DESIGN CENTERLINE 30+76.75

STA 30+65 END TAPER

STA 30+45 END TAPER

END RETAINING WALL STA 30+00

5.00' TO RETAINING WALL STA 30+00 GUARDRAIL FLARE

NAVD 88

0' 20' 40'
SCALE

NEW DESIGN ALIGNMENT TABLE

LBL	RADIUS	LENGTH	LINE/CHORD DIRECTION	DELTA	DESIGN STA	AS–BUILT STA
					23+00.00	23+00
L1		99.21'	S 85°18'58" E		23+99.21	
C1	125.00'	138.40'		63°26'12"	25+37.61	
L2		67.94'	S 21°52'46" E		16+05.55	
C2	300.00'	96.35'		63°26'12"	27+01.89	
L3		27.00'	S 40°16'49" E		27+28.89	
C3	190.00'	191.94'		57°52'52"	29+20.83	
L4	155.92'		N 81°00'43" E		30+76.75	30+70

KEY

- GUY ANCHOR
- SIGN
- UTILITY POLE
- CULVERT
- DESIGN CENTERLINE
- PROPOSED CENTERLINE STRIPE
- EXISTING DOUBLE CENTERLINE STRIPE
- RIGHT–OF–WAY (EXISTING)
- RIGHT–OF–WAY (PROPOSED)
- PROPOSED GUARD RAIL (710 LF)
- DITCH
- TOP/TOE OF SLOPE
- EXISTING PAVEMENT
- PROPOSED PAVEMENT (6,582 SF)
- PROPOSED RETAINING WALL – (511' LF)
- WETLANDS
- WETLAND BUFFER

NOTES:

1. CENTERLINE STATIONING IS A NEW DESIGN CENTERLINE. THE TOPOGRAPHIC SURVEY AND ORIGINAL AUTOTURN ANALYSIS ARE BASED ON THE AS–BUILT CENTERLINE.
2. CURRENT AUTO TURN ANALYSIS FROM DN TRAFFIC CONSULTANTS, GARY A. NORRIS, PE, MEMO DATED JUNE 4, 2025.
3. EXISTING COUNTY RIGHT–OF–WAY IS FROM COUNTY ENGINEERS MAP "JOHN GRIP ROAD EXTENSION" NO. 266 DATED APRIL 1915.

Preliminary
05/04/2026 9:53:30 AM

Digitally signed by John B Semrau, PE & PLS
DN: C=US, E=john@semrau.com, O="Semrau Engineering & Surveying, PLLC", CN=John B Semrau, PE & PLS
Date: 2026.05.04 13:02:17-07'00'

COPYRIGHT 2026
SEMRAU ENGINEERING & SURVEYING, PLLC
CIVIL ENGINEERING • LAND SURVEYING • PLANNING
2118 RIVERSIDE DRIVE – SUITE 209
MOUNT VERNON, WA 98273
360–424–9566

JOHN B. SEMRAU — STATE OF WASHINGTON — 28626 — REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	REVISION	BY	REV.

OPTION 3
SITE PLAN

SCALES:
HORIZONTAL : 1" = 20'
VERTICAL : N/A

NOTE: IF THIS SHEET IS LESS THAN 22"x 34" THEN SHEET HAS BEEN REDUCED

GRIP ROAD PAVEMENT WIDENING
MILES SAND AND GRAVEL
SECTION 3, T. 35 N., R. 4 E., W.M.
SKAGIT COUNTY, WASHINGTON

FIELD BK/PG:	LL 5–9
DATE:	4/29/2026
DRAWING:	5166RD3.DWG
JOB NO.:	5166
SHEET:	C3

GENERAL/GRADING

1. ALL CONSTRUCTION AND INSTALLATION WORK SHALL CONFORM TO APPLICABLE 2022 STANDARD SPECIFICATIONS AND STANDARD PLANS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION PREPARED BY THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT) AND ACCORDING TO THE RECOMMENDATIONS OF THE MANUFACTURERS OF THE MATERIAL OR EQUIPMENT USED AND IN COMPLIANCE WITH APPLICABLE, FEDERAL, STATE AND/OR COUNTY REGULATIONS, REQUIREMENTS AND STANDARDS, INCLUDING APPLICABLE LABOR LAWS, WASHINGTON INDUSTRIAL SAFETY AND HEALTH ACT, AND OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970.
2. CONTRACTOR IS REQUIRED TO PREPARE FOR AND ATTEND A PRE-CONSTRUCTION MEETING PRIOR TO BEGINNING WORK.
3. CONTRACTOR SHALL PROVIDE TRAFFIC CONTROL AND SIGNING CONFORMING TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), CURRENT EDITION AS MAY BE REQUIRED AT HELMICK ROAD.
4. LOCATIONS OF EXISTING UTILITIES SHOWN HEREON ARE APPROXIMATE, AND ARE NOT NECESSARILY COMPLETE. THE CONTRACTOR SHALL INDEPENDENTLY VERIFY THE ACCURACY OF ALL UTILITY LOCATIONS SHOWN, AND SHALL FURTHER DISCOVER AND AVOID ANY OTHER UTILITIES NOT SHOWN HEREON WHICH MAY BE AFFECTED BY THE IMPLEMENTATION OF THIS PLAN. IF CONFLICTS WITH EXISTING UTILITIES ARISE DURING CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE ENGINEER AND ANY CHANGES REQUIRED SHALL BE APPROVED BY THE DISTRICT PRIOR TO COMMENCEMENT OF RELATED CONSTRUCTION ON THE PROJECT. IF EXISTING UTILITIES ARE DAMAGED BY THE CONTRACTOR, SAID UTILITIES SHALL BE REPAIRED OR REPLACED AT NO ADDITIONAL COST TO THE OWNER OR ENGINEER.
5. CONTRACTOR SHALL UTILIZE THE ONE CALL SYSTEM FOR UTILITY UNDERGROUND LOCATION AND ABIDE BY THE REQUIREMENTS THEREOF. CALL 1-800-424-5555.
6. CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND APPROVALS AND SHALL ABIDE BY THE CONDITIONS AND REQUIREMENTS RELATED TO SAID PERMITS AND APPROVALS.
7. OTHER UTILITIES MAY BE WORKING WITHIN THE LIMITS OF THE PROJECT, INCLUDING, BUT NOT LIMITED TO, PUGET SOUND ENERGY.
8. ALL WORK SHALL BE STAKED BY THE ENGINEER'S SURVEYOR PRIOR TO STARTING CONSTRUCTION. THE CONTRACTOR SHALL PROTECT ALL STAKING AND SURVEY MARKERS DURING THE CONSTRUCTION PERIOD. THE CONTRACTOR SHALL NOTIFY THE ENGINEER A MINIMUM OF 2 WORKING DAYS IN ADVANCE OF ALL REQUESTS FOR CONSTRUCTION STAKING.
9. AN APPROVED COPY OF THESE CONSTRUCTION DRAWINGS MUST BE ON THE JOB SITE WHENEVER CONSTRUCTION IS IN PROGRESS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF CERTIFIED AS-CONSTRUCTED DRAWINGS TO THE ENGINEER UPON COMPLETION OF THE CONSTRUCTION.
10. CONSTRUCTION REVIEW SHALL BE PERFORMED BY THE ENGINEER AND THEIR APPOINTED REPRESENTATIVES. THE CONTRACTOR SHALL PROVIDE 24 HOURS NOTICE IN ADVANCE OF ANY CONSTRUCTION REVIEW OR SPECIAL INSPECTIONS TO BOTH THE ENGINEER AND THE INSPECTOR. THESE MAY BE SCHEDULED AT THE WEEKLY SITE MEETING.
11. NO PART OF THE CONSTRUCTION SHALL BE COVERED, CONCEALED OR PUT INTO USE UNTIL IT HAS BEEN INSPECTED AND ACCEPTED BY THE DISTRICT AND THE ENGINEER.
12. BACKFILL MATERIAL FOR TRENCHES LOCATED IN ROAD RIGHT-OF-WAYS SHALL CONFORM TO WSDOT SECTION 9-03.14(2) SELECT BORROW. BACKFILL MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED EIGHT (8) INCHES LOOSE THICKNESS AND COMPACTED TO 95% OF MAXIMUM DENSITY (ASTM 1557). EACH LIFT SHALL BE COMPACTED PRIOR TO PLACEMENT OF SUCCESSIVE LIFTS.
13. BACKFILL MATERIAL FOR TRENCHES LOCATED OUTSIDE OF ROAD RIGHT-OF-WAYS MAY BE NATIVE MATERIAL WITH WRITTEN APPROVAL OF THE ENGINEER. BACKFILL MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED TWELVE (12) INCHES LOOSE THICKNESS AND COMPACTED TO 90% OF MAXIMUM DRY DENSITY, (ASTM 1557). EACH LIFT SHALL BE COMPACTED PRIOR TO PLACEMENT OF SUCCESSIVE LIFTS. (ALSO SEE OTHER NOTES).
14. THE CONTRACTOR SHALL MAINTAIN THE SITE IN A NEAT AND ORDERLY CONDITION. ALL REFUSE, DEBRIS, AND OTHER OBJECTIONABLE MATERIAL SHALL BE REMOVED AT LEAST WEEKLY, OR MORE OFTEN IF DIRECTED BY THE ENGINEER. ROUTINE AND FINAL CLEANUP ARE TO BE AN INTEGRAL PART OF ALL BID ITEMS.
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONTRACTOR FURNISHED MATERIAL. ALL SUCH MATERIAL WHICH IS DEFECTIVE BY MANUFACTURE OR HAS BEEN DAMAGED IN TRANSIT OR HAS BEEN DAMAGED AFTER DELIVERY SHALL BE REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFE STORAGE OF ALL MATERIALS FURNISHED AND ACCEPTED UNTIL IT HAS BEEN INCORPORATED IN THE COMPLETED PROJECT.
17. SUBSTANTIAL COMPLETION WILL BE DETERMINED BY THE ENGINEER AFTER THE WORK ON THE LEVEE IS COMPLETED AND THE TRAIL CAN BE OPENED AND REMAIN OPEN TO THE PUBLIC.
18. DATUM – NAVD 88. SEE PROJECT BENCHMARK.

(ALSO SEE OTHER NOTES)

EARTHWORK NOTES:

1. ALL EARTHWORK SHALL CONFORM TO DIVISION 2 OF SAID WSDOT STANDARD SPECIFICATIONS.
2. THE CONTRACTOR SHALL COMPLETELY GRADE THE SITE AND MAKE CUTS AND FILLS REQUIRED TO COMPLETELY PREPARE THE SUBGRADES SUITABLE TO SERVE THE FINAL GRADES AND TYPICAL SECTION ESTABLISHED IN THE PLANS.
3. ALL EXCESS SOIL MATERIALS, INCLUDING BUT NOT LIMITED TO TRENCH SPOILS, STRIPPED TOP-SOIL, ORGANIC MATTER, ROAD CUT AND OTHER DEBRIS SHALL BE REMOVED FROM THE SITE AND DISPOSED OF AT LOCATIONS ARRANGED BY THE CONTRACTOR. ALTERNATIVE ARRANGEMENTS FOR CUT AND FILL MATERIAL MAY BE MADE WITH WRITTEN APPROVAL FROM THE OWNER.

WSDOT STANDARD PLANS
STANDARD PLANS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION

B-5.20-01(B-1)	CATCH BASIN TYPE 1
B-30.90-01(B-1z)	MISCELLANEOUS DETAILS FOR MANHOLES AND CATCH BASINS
B-30.10-01(B-2a)	REVERSIBLE FRAME FOR CATCH BASIN OR CONCRETE INLET
B-30.30-01(B-2b)	VANED GRATE FOR CATCH BASIN AND CONCRETE INLET
B-30.40-01(B-2c)	BI-DIRECTIONAL VANED GRATE FOR CATCH BASIN AND INLET
B-30.50-01(B-2d)	HERRINGBONE GRATE FOR CATCH BASIN AND INLET
B-55.20-00(B-11)	PIPE ZONE BEDDING AND BACKFILL
B-15.20-01(B-23a)	MANHOLE TYPE 1
B-30.70-03(B-25)	MANHOLE RING AND COVER
B-85.20-00(B-29)	SIDE SEWER
F-10.12-02(F-1)	CEMENT CONCRETE CURBS
F-30.10-02(F-3)	CEMENT CONCRETE SIDEWALK
F-40.12-02(F-3b)	SIDEWALK PARALLEL RAMP TYPE
F-40.15-02(F-3c)	SIDEWALK PERPENDICULAR RAMP TYPE
M-24.60-03	SYMBOL MARKINGS MISCELLANEOUS

EROSION & SEDIMENTATION CONTROL NOTES

1. CONTRACTOR SHALL PROVIDE EROSION AND SEDIMENTATION CONTROL MEASURES AT ALL TIMES AS NEEDED TO THE SATISFACTION OF THE SKAGIT COUNTY PUBLIC WORKS DEPARTMENT.
2. EROSION CONTROL METHODS AND MATERIALS SHALL MEET REQUIREMENTS OF SECTION 8-01 OF WSDOT STANDARD SPECIFICATIONS AND REQUIREMENTS SET FORTH IN VOLUME II OF THE "STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON (THE TECHNICAL MANUAL)" BY THE WASHINGTON STATE DEPARTMENT OF ECOLOGY, CURRENT EDITION, HEREINAFTER REFERRED TO AS "THE MANUAL." CONTRACTOR SHALL FOLLOW RECOMMENDATIONS MADE BY SUPPLIERS AND MANUFACTURERS OF MATERIALS AND EQUIPMENT USED.
3. CLEARING LIMITS, SETBACKS, BUFFERS, AND SENSITIVE OR CRITICAL AREAS SUCH AS STEEP SLOPES, WETLANDS, WELLHEAD PROTECTION AREAS AND RIPARIAN CORRIDORS SHALL BE CLEARLY MARKED IN THE FIELD BY THE APPLICANT'S SURVEYOR AND INSPECTED BY SKAGIT COUNTY STAFF PRIOR TO COMMENCEMENT OF LAND CLEARING ACTIVITIES.
4. WHERE POSSIBLE, MAINTAIN NATURAL VEGETATION FOR EROSION CONTROL.
5. AS CONSTRUCTION PROGRESSES AND SEASONAL CONDITIONS DICTATE, THE EROSION AND SEDIMENTATION CONTROL FACILITIES SHALL BE MAINTAINED AND/OR MODIFIED AS DIRECTED BY THE SKAGIT COUNTY ENGINEERING DEPARTMENT. FROM OCTOBER 1ST TO APRIL 30TH, NO SOILS SHALL REMAIN UNSTABILIZED FOR MORE THAN 2 DAYS. FROM MAY 1ST TO SEPTEMBER 30TH, NO SOILS SHALL REMAIN UNSTABILIZED FOR MORE THAN 7 DAYS. AT ALL TIMES OF THE YEAR, THE CONTRACTOR SHALL HAVE SUFFICIENT MATERIALS, EQUIPMENT, AND LABOR READILY AVAILABLE TO STABILIZE AND PREVENT EROSION FROM ALL DENUDED AREAS WITHIN 12 HOURS AS SITE AND WEATHER CONDITIONS DICTATE.
6. INSPECTION AND MAINTENANCE. ALL FACILITIES AND INSTALLATIONS CONSTRUCTED AS PART OF THIS PLAN SHALL BE ROUTINELY INSPECTED AND MAINTAINED TO ENSURE THAT SAID FACILITIES ARE ADEQUATELY PERFORMING THEIR INTENDED FUNCTION. AS A MINIMUM, SAID FACILITIES SHALL BE VISUALLY INSPECTED AT LEAST WEEKLY, AND AFTER ANY SIGNIFICANT RAINFALL. IF PROBLEMS OR DEFECTIVE PERFORMANCE OF FACILITIES ARE NOTED, THEY SHALL PROMPTLY BE REPAIRED OR REPLACED.
7. ROAD EMBANKMENTS AND CUT SLOPES, FILL AREAS, AND ALL AREAS WHERE BARE SOIL IS EXPOSED AS A RESULT OF WORK ON THIS PROJECT SHALL BE PROTECTED FROM EROSION. PREPARATION OF SAID EXPOSED SOIL AREAS SHALL CONFORM TO WSDOT SECTION 8-01.3(1), INCLUDING CULTIVATION, COMPACTION, AND PREPARATION. TOPSOIL TYPE B SHALL BE SHALL BE EVENLY SPREAD OVER SAID AREAS TO A DEPTH OF FOUR INCHES. PREPARATION OF SAID EXPOSED SOIL AREAS SHALL OCCUR NOT MORE THAN TWO WEEKS PRIOR TO SEED APPLICATION.
8. SURFACE ROUGHENING. ALL SLOPES STEEPER THAN 3H:1V AND GREATER THAN 5 FEET VERTICAL REQUIRE SURFACE ROUGHENING; EITHER BY STAIR-STEP GRADING, GROOVING, FURROWING, OR TRACKING. AFTER SURFACE ROUGHENING, SLOPES MUST BE STABILIZED BY VEGETATION. REFER TO VOLUME II FOR BMP C130 (SURFACE ROUGHENING) IN THE MANUAL.
9. ALL BARE SOILS SHALL BE COVERED WITH STRAW MULCH AND PERMANENTLY RE-VEGETATED BY SEEDING WITH A MIXTURE OF NATIVE GRASS SPECIES. THIS CAN BE ACCOMPLISHED BY HAND OR HYDROSEEDING.
10. HYDROSEEDING. IF FINISH GRADE ON EXPOSED SOIL AREAS DOES NOT CONTAIN SOIL SUITABLE FOR PLANT GROWTH, 2 TO 6 INCHES OF TOP SOIL SHALL BE PLACED AFTER SURFACE ROUGHENING AND LIGHTLY ROLLED PRIOR TO HYDROSEEDING. HYDROSEEDING SHALL COMPLY WITH SUPPLIER'S RECOMMENDATIONS AND WITH APPLICABLE SECTION OF THE MANUAL AND WSDOT STANDARD SPECIFICATIONS. SEED-SLURRY MIXTURE SHALL INCLUDE A FIBROUS MULCH MATERIAL AND A TACIFIER BONDING AGENT AND BE APPLIED AT A RATE OF 1,500 TO 2,000 POUNDS PER ACRES, OR AS DIRECTED BY SUPPLIER. SEEDED AREAS SHALL BE IRRIGATED AS REQUIRED FOR PROPER GROWTH, ESPECIALLY IF APPLIED IN JULY OR AUGUST. ALTERNATIVELY, JUTE, WOVEN STRAW, OR SYNTHETIC MATS MAY BE USED IN CONJUNCTION WITH CONVENTIONAL SEEDING TECHNIQUES.
11. CONTRACTOR SHALL MAKE EVERY EFFORT TO PREVENT SEDIMENT-LADEN RUNOFF WATER FROM ENTERING THE PUBLIC STORM DRAINAGE SYSTEM AND FROM ENTERING ADJACENT PROPERTY. THIS MAY BE ACCOMPLISHED THROUGH THE USE OF SILT FENCES, INTERCEPTOR DITCHES, STRAW BALES, INLET PROTECTION DEVICES, OR OTHER MEASURES SUFFICIENT TO ASSURE COMPLIANCE WITH THIS SPECIFICATION.
12. SILT FENCING SHOULD BE PLACED ALONG THE STORAGE TANK CONSTRUCTION SITE TO PREVENT POTENTIAL IMPACTS FROM SEDIMENTATION.
13. CONTRACTOR SHALL PROTECT ALL PROPOSED STORM DRAIN INLETS AND ALL EXISTING DOWNSTREAM STORM DRAIN INLETS WITH FILTER FABRIC FENCES OR GRAVEL AND WIRE MESH FILTERS. THE INLET-PROTECTION SHALL REMAIN IN PLACE UNTIL AFTER CONSTRUCTION IS COMPLETED AND THE RISK OF SEDIMENT-LADEN WATER ENTERING THE SYSTEM IS MINIMAL, AS DETERMINED BY THE ENGINEER. IF, IN THE OPINION OF THE COUNTY ENGINEER, THE CONTRACTOR FAILS TO ADEQUATELY PROTECT INLETS, CONTRACTOR SHALL CLEAN AFFECTED STRUCTURES TO THE SATISFACTION OF THE COUNTY ENGINEER.
14. PUBLIC RIGHT-OF-WAYS SHALL BE KEPT CLEAN. TRACKING OF SEDIMENT (MUD) AND DEBRIS FROM THE SITE WILL NOT BE ALLOWED. FAILURE TO COMPLY WITH THIS ITEM MAY RESULT IN ALL WORK ON THE SITE BEING STOPPED UNTIL THE CONDITION IS REMEDIED. IF SEDIMENT AND DEBRIS IS TRANSPORTED ONTO A ROAD SURFACE, THE ROADS SHALL BE CLEANED THOROUGHLY, AT A MINIMUM, AT THE END OF EACH DAY. SEDIMENT SHALL BE REMOVED FROM ROADS BY SHOVELING OR SWEEPING AND BE TRANSPORTED TO A CONTROLLED SEDIMENT DISPOSAL AREA. STREET WASHING SHALL BE ALLOWED ONLY AFTER SEDIMENT IS REMOVED IN THIS MANNER.
15. TEMPORARY EROSION AND SEDIMENT CONTROLS SHOULD BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION IS ACHIEVED OR AFTER THE TEMPORARY CONTROLS ARE NO LONGER NEEDED, WHICHEVER IS LATER. TRAPPED SEDIMENT SHOULD BE REMOVED OR STABILIZED ON SITE. DISTURBED SOILS AREAS SHOULD BE PERMANENTLY STABILIZED.

EROSION & SEDIMENTATION DETAILS

1. WHERE APPLICABLE PER THE TESC PLAN, UTILIZE WSDOT STANDARD DETAILS FOR EROSION CONTROL MEASURES. THESE INCLUDE, BUT MAY NOT BE LIMITED TO:

AS NEEDED:

MISC EROSION CONTROL DETAILS
1-80.10-02

PER PLAN AS NEEDED:

WATTLE INSTALLATION ON SLOPES	1-30.30-02	A / C4
HIGH VISIBILITY FENCE	1-10.10-01	B / C4
CHECK DAMS ON CHANNELS	1-50-20.02	C / C4

Digitally signed by John B Semrau, PE & PLS
DN: C=US, E=john@semrau.com, O="Semrau Engineering & Surveying, PLLC", CN="John B Semrau, PE & PLS"
Date: 2026.05.04 13:02:03-07'00'

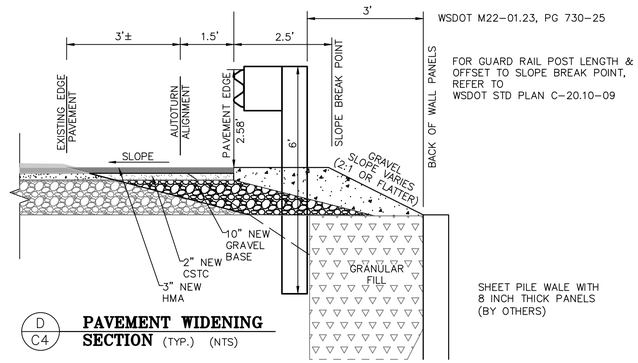
APPROVED FOR CONSTRUCTION

SCP&DS _____ DATE _____

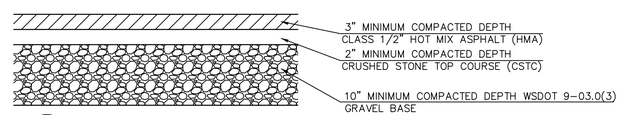
SKAGIT COUNTY STORMWATER STANDARD CONDITIONS

1. IMPERVIOUS HARD SURFACES LIMITED TO WHAT IS SHOWN ON APPROVED SITE PLAN. ANY INCREASE IN HARD SURFACE AND/OR CHANGE IN SURFACES MATERIALS (I.E. GRAVEL TO ASPHALT) SHALL BE REVIEWED AND APPROVED BY SKAGIT COUNTY PDS PRIOR TO MAKING THE REVISION.
2. LAND DISTURBANCE\CLEARING LIMITS ARE LIMITED TO WHAT IS SHOWN ON APPROVED SITE PLAN. ANY INCREASED LAND DISTURBANCE MAY TRIGGER ADDITIONAL REQUIREMENTS AND REVIEW BY SKAGIT COUNTY PDS.
3. SOIL COVER
   ALL EXPOSED SOIL SHALL BE COVERED AND STABILIZED, IF EXPOSED AND UNWORKED FOR MORE THAN THE TIME PERIODS SET BELOW:
   DRY SEASON (MAY 1 – SEPT. 30): 7 DAYS
   WET SEASON (OCT. 1 – APRIL 30): 2 DAYS
4. SOIL EXPORT
   ANY SOIL EXPORTED FROM THE SITE SHALL BE DISPOSED OF AT AN APPROVED LOCATION. ANY OTHER OCATION MAY REQUIRE ADDITIONAL PERMITTING.
5. SKAGIT COUNTY PLANNING & DEVELOPMENT SERVICES HAS REVIEWED WHAT IS REPRESENTED ON THESE PLANS BUT MAKES NO GUARANTEE THAT THE UTILITIES OR IMPROVEMENTS REPRESENTED WILL BE ADEQUATE TO SERVE UNSPECIFIED FUTURE BUILDINGS OR USES.
6. ALL STORM RUNOFF INCLUDING DISPERSION FLOW PATHS SHALL BE ADDRESSED ONSITE.
7. A COPY OF THE APPROVED SITE PLAN(S) AND SWPPP SHALL BE KEPT ONSITE DURING CONSTRUCTION.
8. TESC INSPECTION REQUIRED WITHIN 7 DAYS OF BREAKING GROUND.
9. ANY RETAINING AND\OR LANDSCAPE WALLS GREATER THAN 4 FEET IN HEIGHT (BOTTOM OF FOOTING TO TOP OF WALL), MAY REQUIRE A SEPARATE BUILDING PERMIT. ANY RETAINING AND\OR LANDSCAPE WALL REGARDLESS OF HEIGHT, WHICH SUPPORTS A SURCHARGE MAY REQUIRE ENGINEERING. REFER TO BUILDING CODE REQUIREMENTS FOR ADDITIONAL INFORMATION.
10. REQUIRED FOR PROJECTS LOCATED WITHIN NPDES PERMIT AREA:
    PROJECT REQUIRES A SITE INSPECTION PRIOR TO CLEARING/GRADING AND CONSTRUCTION
11. FINAL INSPECTION OF SITE REQUIRED. INSPECTION SHALL VERIFY ALL EXPOSED/WORKED SOILS HAVE BEEN STABILIZED WITH LANDSCAPING AND/OR HARD SURFACES.
12. PROJECT DEPENDENT NOTES/CONDITIONS
    (COORDINATE WITH SKAGIT COUNTY STORMWATER STAFF):
    ACCOMPANYING ENGINEERING IS AN INTEGRAL PART OF THE APPROVED PLANS. IT IS THE RESPONSIBILITY OF THE BUILDER/OWNER TO READ AND UNDERSTAND THE ENGINEERING AND TO COMPLY WITH ALL REQUIREMENTS/CONDITIONS OF THE ENGINEERING.
13. RIGHT OF ACCESS EASEMENT REQUIRED
    PROVIDE\DEDICATE AN ACCESS AND INSPECTION EASEMENT(S) TO SKAGIT FOR ALL PROPOSED STORMWATER FACILITIES, AS REQUIRED BY SKAGIT COUNTY CODE SECTION 14.32.100. EASEMENT SHALL BE RECORDED WITH SKAGIT COUNTY AUDITOR PRIOR TO FINAL INSPECTION.
14. DRAINAGE EASEMENT REQUIRED
    PROVIDE\DEDICATE A DRAINAGE EASEMENT FOR ALL STORMWATER AND DRAINAGE CONVEYANCE SYSTEMS, AS REQUIRED BY SKAGIT COUNTY CODE SECTION 14.32. EASEMENT SHALL BE RECORDED WITH SKAGIT COUNTY AUDITOR PRIOR TO FINAL INSPECTION.
15. PROVIDE OPERATIONS AND MAINTENANCE (O&M) PLAN/DOCUMENTS FOR THE STORMWATER FACILITY(S) CONSISTENT WITH THE REQUIREMENTS OF SKAGIT COUNTY CODE SECTION 14.32.100. O&M SHALL BE RECORDED WITH SKAGIT COUNTY AUDITOR PRIOR TO FINAL INSPECTION.
16. PROVIDE "AS-BUILT" RECORD DRAWINGS OF THE STORMWATER FACILITY(S) CONSISTENT WITH THE REQUIREMENTS OF SKAGIT COUNTY CODE SECTION 14.32.100.
17. STORMWATER INFILTRATION FACILITIES SHALL BE LOCATED OUTSIDE OF WELL PROTECTION ZONES.
18. INLET\OUTLET PROTECTION REQUIRED FOR ALL PROPOSED STORM CONVEYANCE. THIS REQUIREMENT INCLUDES BUT NOT LIMITED TO DOE BMP C209.

(SkCoPDS, April 2022))



D / C4 **PAVEMENT WIDENING SECTION** (TYP.) (NTS)



C / C4 **COUNTY ROAD PAVING SECTION** (NTS)

SPECIFICATIONS FOR TESTING ASPHALT

1. PRIOR TO PLACEMENT OF PAVEMENT, THE **COUNTY** SHALL MAKE A DETERMINATION OF SUB-GRADE ACCEPTANCE BASED UPON TEST RESULTS AND THE OBSERVATIONS OF A FIRM AND UNYIELDING SURFACE. THE **COUNTY** SHALL ALSO ESTABLISH TEST AREA BOUNDARIES. THE CONTRACTOR SHALL SUPPLY THE **COUNTY** WITH A MIX DESIGN INCLUDING VALUES FOR THE THEORETICAL MAXIMUM DENSITY OF THE ASPHALT BEING USED ON THE PROJECT.
2. SPECIFICATION FOR MINIMUM ALLOWABLE DENSITY FOR ASPHALT IS 91% OF THE THEORETICAL MAXIMUM DENSITY AS DETERMINED BY AASHTO TEST METHOD T209.
3. ACCEPTANCE OF HMA SHALL BE BASED ON WSDOT 5-04.3(8)A.
4. WHEN THE CONTRACTOR INDICATES THAT THE PAVEMENT IS READY FOR ACCEPTANCE OR IT REACHES 175 DEGREES F., WHICHEVER IS SOONER, THE **COUNTY** SHALL TAKE/SUPERVISE 5 NUCLEAR DENSOMETER READINGS AT RANDOM LOCATIONS WITHIN EVERY TEST AREA. A TEST AREA SHALL NOT EXCEED 300 TONS OF ASPHALT, HOWEVER, SMALLER AREAS MAY BE DETERMINED, SUCH AS CUL-DE-SACS MAY BE SINGLED OUT AS A TEST AREA OR INDIVIDUAL STREETS WITHIN A STREET NETWORK MAY BE SINGLED OUT AS TEST AREAS, EVEN THOUGH THESE AREAS WOULD BE LESS THAN 300 TONS.
5. THE RESULTS OF THE DENSOMETER READINGS FOR EACH TEST AREA SHALL BE EVALUATED AND THE AVERAGE APPLIED TO THE ENTIRE TEST AREA. IF THE AVERAGE IS BELOW MINIMUM, THE OWNER MAY REQUEST CORE TESTS TO BE TAKEN AT HIS EXPENSE AND AT LOCATIONS DETERMINED BY **COUNTY** PERSONNEL, WITHIN 24 HOURS OF THE FINAL PAVING OF THE TEST AREA. FIVE CORE TESTS SHALL BE TAKEN FOR EACH TEST AREA AND THE RESULTS EVALUATED AND THE AVERAGE APPLIED TO THE WHOLE TEST AREA.
6. IF THE PAVEMENT IS BELOW MINIMUM COMPACTION SUBSEQUENT TO THE FINAL TESTING PROCEDURES, THE OWNER MAY INCREASE DEPTH OF THE FINAL LIFT OF ASPHALT AS DIRECTED BY THE **COUNTY** ENGINEER, OR PROVIDE PAYMENT TO THE **COUNTY** AS DIRECTED BY THE **COUNTY** ENGINEER.
7. ALL ISOLATED AREAS WITHIN TEST AREAS THAT FALL BELOW 88.0% SHALL BE SUBJECT TO EXTENSIVE TESTING AND SUBSEQUENT REMOVAL OF THE ASPHALT, UNLESS OTHERWISE DIRECTED BY THE **COUNTY** ENGINEER.
8. THE USE OF A CORRECTION FACTOR TO CORRECT DENSITY READINGS OBTAINED FROM THE NUCLEAR DENSOMETER IS ACCEPTABLE UPON AUTHORIZATION BY THE COUNTY ENGINEER IN THE FOLLOWING INSTANCES: 1) FIRST LIFT OVERLAYS ON EXISTING PAVEMENT; 2) FIRST COURSE OVER GRANULAR MATERIAL.

CONCRETE AND PAVING NOTES

1. SUBGRADE PREPARATION SHALL CONFORM TO WSDOT 2-06.
2. SOIL RESIDUAL HERBICIDE SHALL BE APPLIED UNDER ALL NEW PROPOSED ASPHALT SURFACES IN CONFORMANCE WITH WSDOT 5-04.3(5)D.
3. GRAVEL BORROW MATERIAL SHALL MEET WSDOT 9-03.14.
4. CRUSHED SURFACING TOP COURSE (CSTC) SHALL MEET WSDOT 9-03.9(3).
5. CEMENT CONCRETE CURBS AND GUTTERS SHALL USE AIR ENTRAINED CONCRETE CLASS 3000 AND SHALL MEET WSDOT 8-04.
6. CEMENT CONCRETE SIDEWALKS SHALL MEET WSDOT 8-14.
7. CLASS 1/2" PG 64-22 HOT MIX ASPHALT (HMA) SHALL MEET WSDOT 5-04. REQUIREMENTS OF THE AGGREGATE FOR ASPHALT CONCRETE ARE LISTED IN WSDOT 9-03.8. REQUIREMENTS OF THE ASPHALT BINDER SHALL MEET WSDOT 9-02.1(4). REQUIREMENTS OF THE ANTI-STRIPPING ADDITIVE SHALL MEET WSDOT 9-02.4.
8. BITUMINOUS SURFACE TREATMENT (BST) CLASS A SHALL MEET WSDOT 5-02.
9. A FOG SEAL MAY BE REQUIRED IF THE ASPHALT MAT IS TOO OPEN-GRADED IN THE OPINION OF THE **COUNTY** ENGINEER.
10. FINAL ADJUSTMENT OF CATCH BASIN AND MANHOLE TOPS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. CB'S SHALL BE ACCURATELY LOCATED IN THE FIELD SO THAT ALL FRAME SIDES ARE SUPPORTED BY PRECAST BASE SECTIONS OR RISERS.
11. CURB AND SIDEWALK RESTORATION AND CLEANUP IS TO BE IN CONFORMANCE WITH **SKAGIT COUNTY** ENGINEERING DEPARTMENT REQUIREMENTS.
12. NO FINAL LIFT OF ASPHALT AFTER NOV. 1.

Preliminary
05/04/2026 9:53:41 AM

COPYRIGHT 2026
SEMRAU ENGINEERING & SURVEYING, PLLC
CIVIL ENGINEERING • LAND SURVEYING • PLANNING
2118 RIVERSIDE DRIVE – SUITE 209
MOUNT VERNON, WA 98273
360-424-9566

JOHN B. SEMRAU STATE OF WASHINGTON 28626 REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	REVISION	BY	REV.

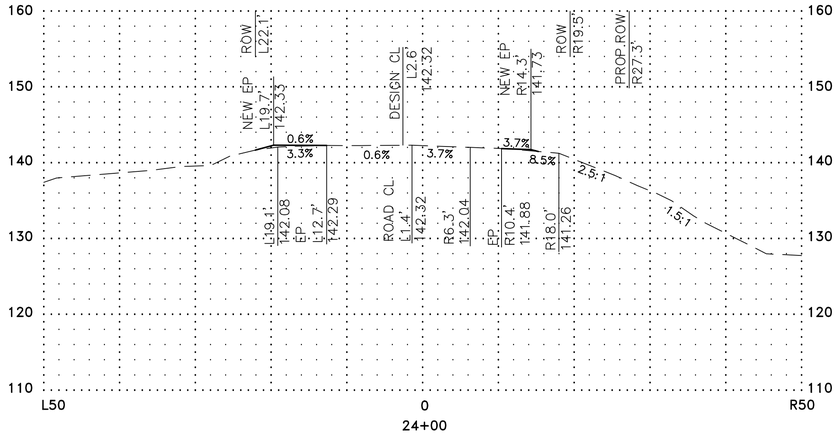
NOTES & DETAILS

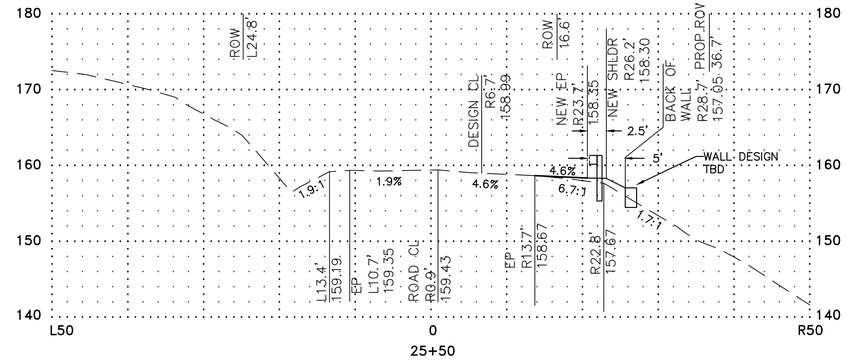
SCALES:
HORIZONTAL : 1" = 20'
VERTICAL : N/A

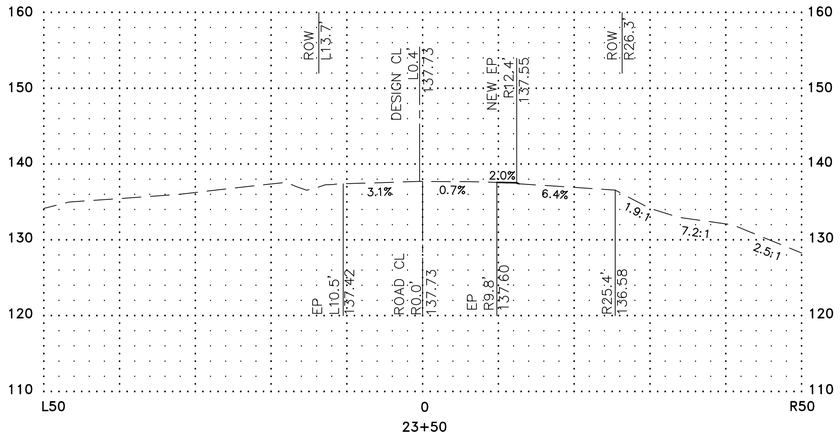
NOTE: IF THIS SHEET IS LESS THAN 22"x 34" THEN SHEET HAS BEEN REDUCED

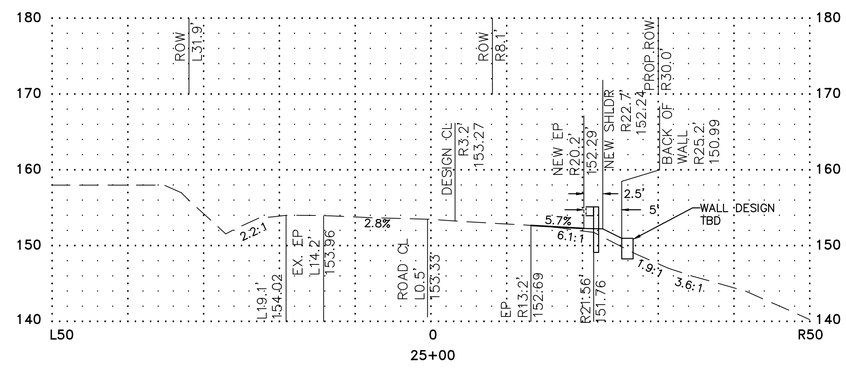
GRIP ROAD PAVEMENT WIDENING
MILES SAND AND GRAVEL
SECTION 3, T. 35 N., R. 4 E., W.M.
SKAGIT COUNTY, WASHINGTON

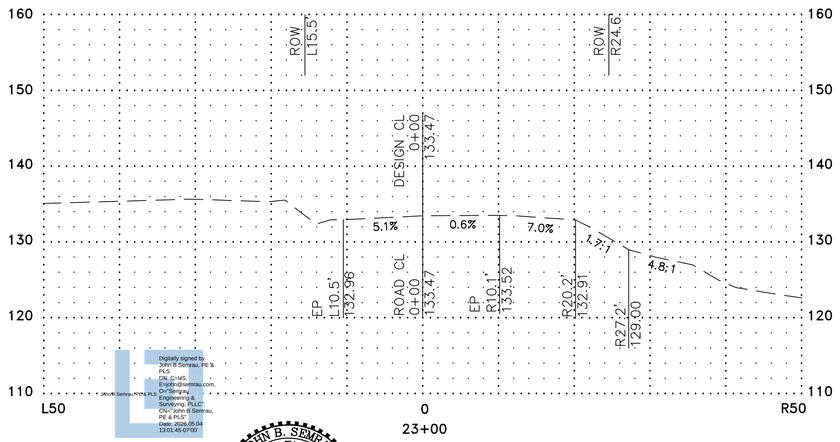
FIELD BK/PG:	.
DATE:	4/23/2026
DRAWING:	5166RD2.DWG
JOB NO.:	5166
SHEET:	C4

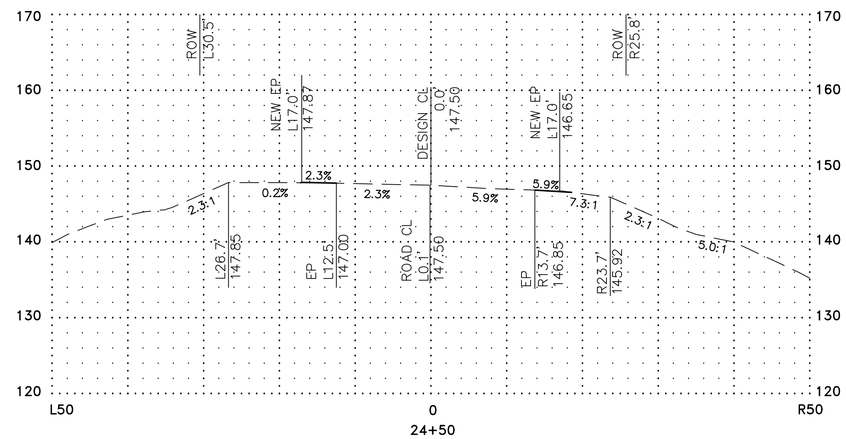












Digitally signed by John B Semrau, PE & PLS
DN: C=WS, E=jbs@semrau.com, O="Singing Engineering & Surveying, PLLC", CN="John B Semrau, PE & PLS"
Date: 2026.05.04 13:01:45-07'00'

Preliminary
05/04/2026 1:00:11 PM

COPYRIGHT 2025
SEMRAU ENGINEERING & SURVEYING, PLLC
CIVIL ENGINEERING • LAND SURVEYING • PLANNING
2118 RIVERSIDE DRIVE – SUITE 208
MOUNT VERNON, WA 98273
360-424-9566

JOHN B. SEMRAU
STATE OF WASHINGTON
28626
REGISTERED
PROFESSIONAL ENGINEER

NO.	DATE	REVISION	BY	REV.

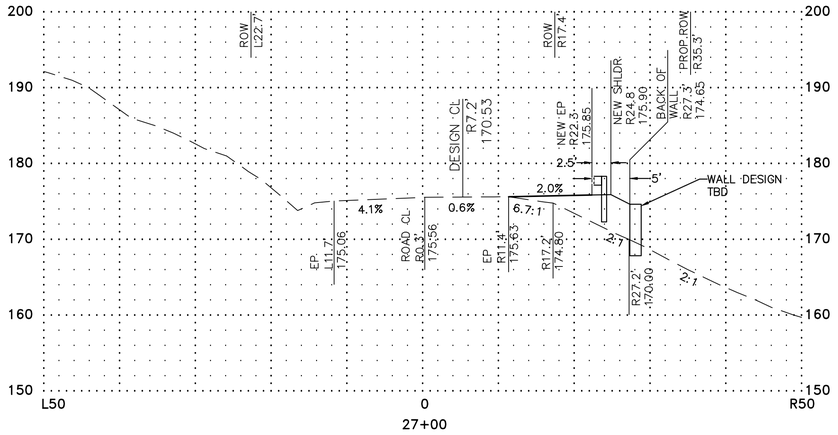
OPTION 3 CROSS SECTIONS 23+00 TO 25+50

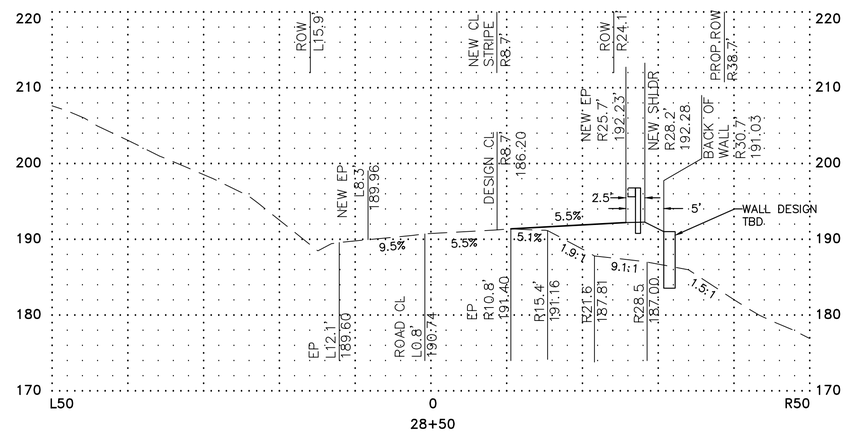
SCALES:
HORIZONTAL : 1" = 10'
VERTICAL : N/A
NOTE: IF THIS SHEET IS LESS THAN 22"x 34" THEN SHEET HAS BEEN REDUCED

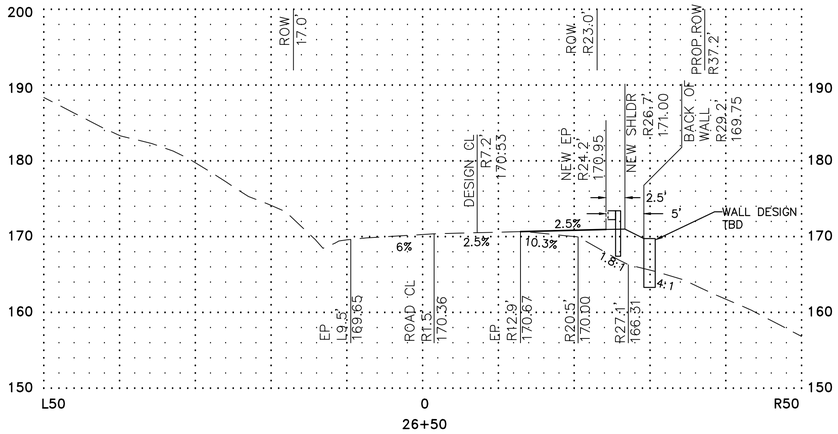
GRIP ROAD PAVEMENT WIDENING
MILES SAND & GRAVEL
SECTION 3, T. 35 N., R. 4 E., W.M.
SKAGIT COUNTY, WASHINGTON

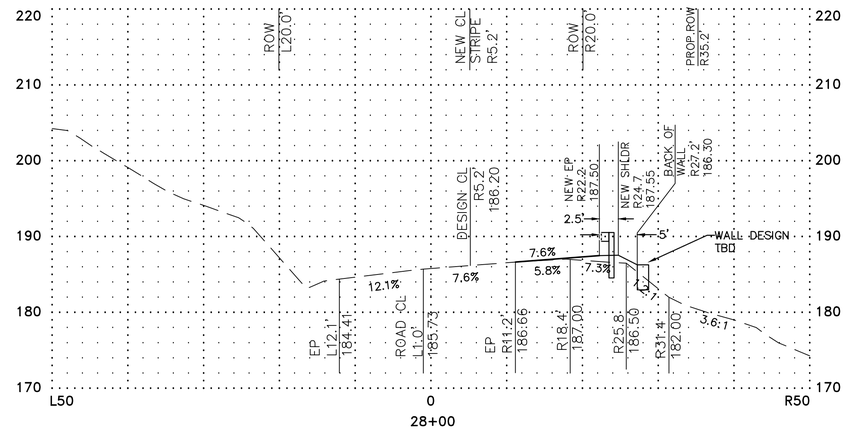
FIELD BK/PG:	.
DATE:	4/30/2026
DRAWING:	5166RD3-XS.DWG
JOB NO.:	5166
SHEET:	C5

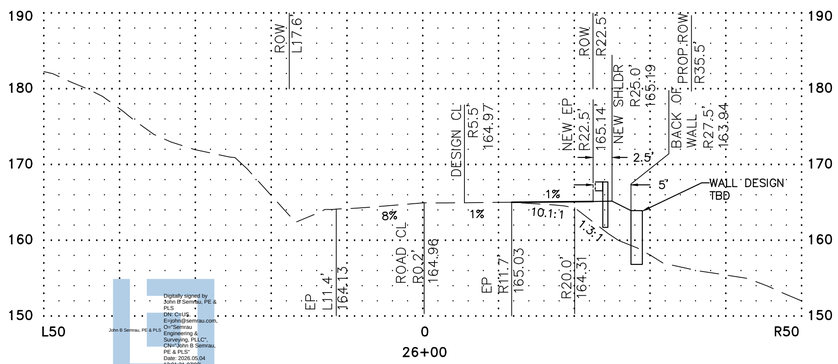
NAVD 88

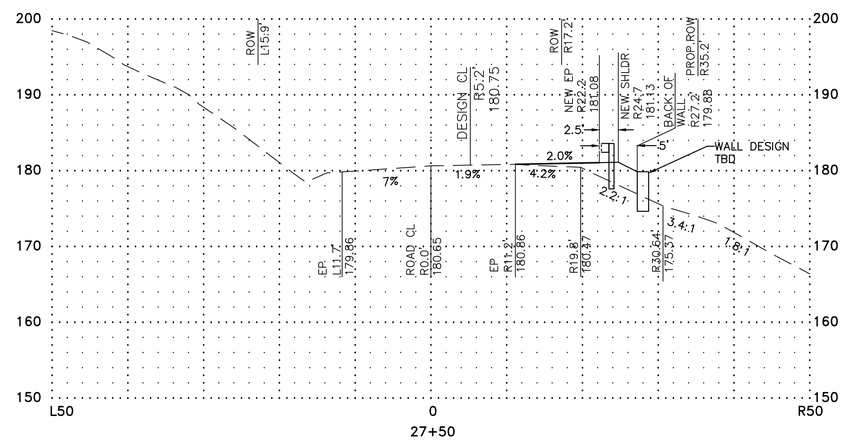












NAVD 88

Digitally signed by John B Semrau, PE & PLS
DN: C=US, E=jsemrau@semrau.com, O=Semrau Engineering & Surveying, PLLC, CN=John B Semrau, PE & PLS
Date: 2026.05.04 13:01:33-07'00'

Preliminary
05/04/2026 1:00:20 PM

COPYRIGHT 2025

SEMRAU ENGINEERING & SURVEYING, PLLC
CIVIL ENGINEERING • LAND SURVEYING • PLANNING
2118 RIVERSIDE DRIVE – SUITE 208
MOUNT VERNON, WA 98273
360-424-9566

JOHN B. SEMRAU — STATE OF WASHINGTON — 28626 — REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	REVISION	BY	REV.

OPTION 3 CROSS SECTIONS 26+00 TO 28+50

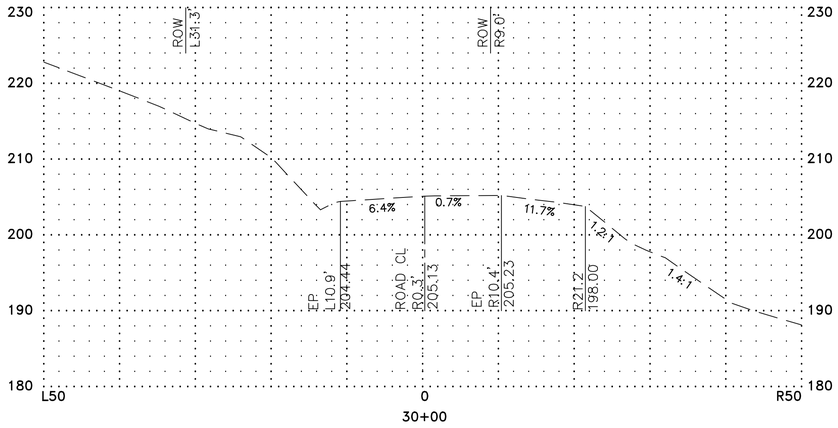
SCALES:
HORIZONTAL : 1" = 10'
VERTICAL : N/A

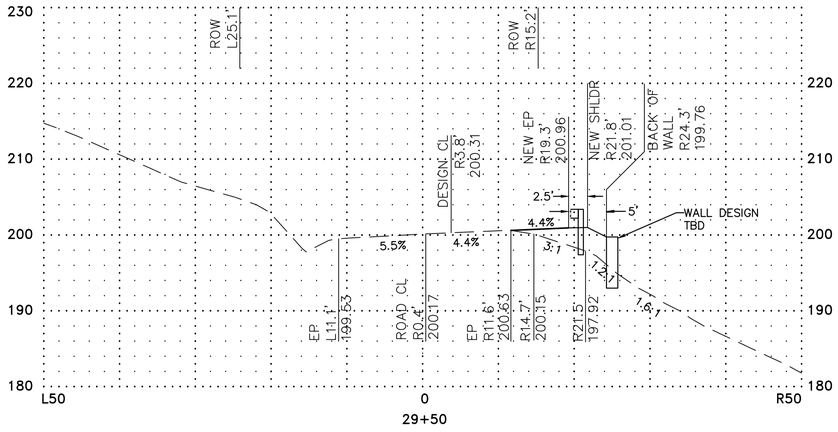
NOTE: IF THIS SHEET IS LESS THAN 22"x 34" THEN SHEET HAS BEEN REDUCED

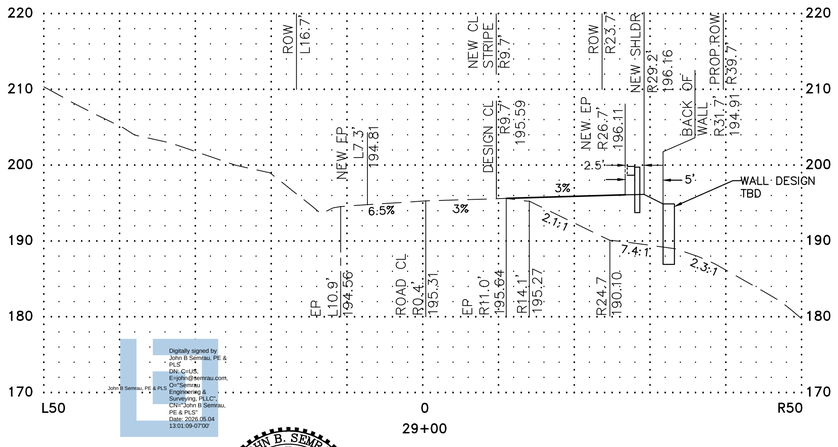
GRIP ROAD PAVEMENT WIDENING MILES SAND & GRAVEL

SECTION 3, T. 35 N., R. 4 E., W.M.
SKAGIT COUNTY, WASHINGTON

FIELD BK/PG:	.
DATE:	4/30/2026
DRAWING:	5166RD3-XS.DWG
JOB NO.:	5166
SHEET:	C6







Digitally signed by John B Semrau, PE & PLS
DN: C=US, E=john@semrau.com, O=Semrau Engineering & Surveying, PLLC, CN="John B Semrau, PE & PLS"
Date: 2026.05.04 13:01:09-07'00'
John B Semrau, PE & PLS

Preliminary
05/04/2026 1:00:30 PM

NAVD 88

COPYRIGHT 2025
SEMRAU ENGINEERING & SURVEYING, PLLC
CIVIL ENGINEERING • LAND SURVEYING • PLANNING
2118 RIVERSIDE DRIVE – SUITE 208
MOUNT VERNON, WA 98273
360-424-9566

JOHN B. SEMRAU
STATE OF WASHINGTON
28626
REGISTERED
PROFESSIONAL ENGINEER

NO.	DATE	REVISION	BY	REV.

OPTION 3 CROSS SECTIONS 29+00 TO 30+00

SCALES:
HORIZONTAL : 1" = 10'
VERTICAL : N/A
NOTE: IF THIS SHEET IS LESS THAN 22"x 34" THEN SHEET HAS BEEN REDUCED

GRIP ROAD PAVEMENT WIDENING MILES SAND & GRAVEL
SECTION 3, T. 35 N., R. 4 E., W.M.
SKAGIT COUNTY, WASHINGTON

FIELD BK/PG:	.
DATE:	4/30/2026
DRAWING:	5166RD3-XS.DWG
JOB NO.:	5166
SHEET:	C7

associated
earth sciences
incorporated



Subsurface Exploration, Geologic Hazard, and Preliminary Geotechnical Engineering Report

GRIP ROAD WIDENING PROJECT

Skagit County, Washington

Prepared For:

MILES SAND & GRAVEL

Project No. 20130228E002
October 13, 2025

DRAFT



Associated Earth Sciences, Inc.

www.aesgeo.com

Kirkland | Mount Vernon | Tacoma

October 13, 2025
Project No. 20130228E002

Miles Sand & Gravel
PO Box 280
Mount Vernon, Washington 98372

Attention: Brad Barton

Subject: Subsurface Exploration, Geologic Hazard, and Preliminary Geotechnical Engineering Report
Grip Road Widening Project
Skagit County, Washington

Dear Brad Barton:

Associated Earth Sciences, Inc. (AESI) is pleased to present the enclosed copy of the above-referenced report. This report summarizes the results of our subsurface exploration, geologic hazard, and preliminary geotechnical engineering studies and offers geotechnical recommendations for the design of the subject project.

We have enjoyed working with you on this study and are confident that the recommendations presented in this report will aid in the successful completion of your project. If you should have any questions, or if we can be of additional help to you, please do not hesitate to call.

Sincerely,
ASSOCIATED EARTH SCIENCES, INC.
Mount Vernon, Washington

DRAFT

Anthony W. Romanick, P.E.
Associate Engineer

AWR/ld – 20130228E002-002

DRAFT

SUBSURFACE EXPLORATION, GEOLOGIC HAZARD, AND PRELIMINARY GEOTECHNICAL ENGINEERING REPORT

GRIP ROAD WIDENING PROJECT

Skagit County, Washington

DRAFT

Prepared for:
Miles Sand & Gravel
PO Box 280
Mount Vernon, Washington 98372

Prepared by:
Associated Earth Sciences, Inc.
1206 Cleveland Avenue
Mount Vernon, Washington 98273
425-827-7701

October 13, 2025
Project No. 20130228E002

I. PROJECT AND SITE CONDITIONS

1.0 INTRODUCTION

Associated Earth Sciences Inc. (AESI) presents this report which provides the results of our subsurface exploration, geologic hazard, and preliminary geotechnical engineering study for the proposed project. The location of the site is shown on the "Vicinity Map," Figure 1, and the approximate locations of the explorations accomplished for this study are presented on the "Existing Site and Exploration Plan," Figure 2, on the "LiDAR Based Topography," Figure 3, and the "Proposed Site and Exploration Plan," Figure 4. This report is considered preliminary, as the project design was still underway. We recommend that we be allowed to review the recommendations contained in this report and modify them, if necessary, once project plans have been finalized.

1.1 Purpose and Scope

The purpose of this study was to obtain subsurface data to be used in the design of the Grip Road widening project and to assess potential retaining wall options to support the widened road prism and to assess global slope stability. Our study included reviewing available geologic literature, drilling five exploration borings, and performing geologic studies to assess the type, thickness, distribution, and physical properties of the subsurface sediments and shallow groundwater conditions adjacent to the roadway bank. Preliminary geotechnical engineering studies were completed to assess geotechnical design parameters for the wall and geologic hazards associated with the project. This report summarizes our current fieldwork and provides the results of the geologic hazard assessment and recommendations for the road widening and a new permanent cantilever soldier pile wall.

1.2 Authorization

Our study was accomplished in general accordance with our scope of work and cost proposal, dated September 13, 2025. This report has been prepared for the exclusive use of Miles Sand & Gravel and their agents for specific application to this project. Within the limitations of scope, schedule, and budget, our services have been performed in accordance with generally accepted geotechnical engineering and engineering geology practices in effect in this area at the time our report was prepared. No other warranty, express or implied, is made.

2.0 PROJECT AND SITE DESCRIPTION

The project proposes widening portions of the southern and northern shoulders of Grip Road starting about 2,000 feet east of the intersection of Grip Road and Prairie Road. The road

DRAFT

widening will occur over approximately 700 feet of road alignment and will add up to about 10 feet of width or less, on the south side and about 3 feet on a portion of the north side. Slopes are present on either side of Grip Road along the project alignment with inclinations estimated at 1H:1V (Horizontal:Vertical) or less. Properties towards the north and south of the project area are generally large forested private residential lots. A new guardrail will be constructed along a section of the newly widened Grip Road's southern side. As a result of the widening and guardrail, we understand that retaining walls will be needed to support the road prism. Preliminary planning indicates that a retaining wall will be used to support heights of up to 6 feet. The proposed retaining wall will be situated approximately 20 feet from the centerline on the south side of Grip Road and will extend from station 26+36 to station 29+88. Due to the presence of steep slopes near the proposed wall location and normally consolidated and compressible shallow sediments this report provides recommendations for a soldier pile retaining wall to limit shallow impacts to global slope stability and reduce the risk of settlement of the native sediments when compared to a gravity block wall.

Based on the *Skagit County Code* (SCC), the slopes adjacent to the Grip Road subject site lie within Erosion and Landslide Hazard Areas. The slope along the south side of Grip Road trends down and south to a tributary of Swede Creek with up to approximately 30 vertical feet of relief and inclinations as steep as 40 percent along the project alignment. No indications of active stream incision were observed at the toe of the slope south of Grip Road. Slopes north and topographically higher than Grip Road are characterized by inclinations of up to 45 percent with approximately 10 vertical feet of relief. Additionally, based on the review of publicly available data and the results of our subsurface exploration, we have identified a landslide feature along the eastern reaches of the subject site.

DRAFT

3.0 SUBSURFACE EXPLORATION

The subsurface exploration and geologic site reconnaissance was conducted on September 8, 2025, and consisted of advancing five exploration borings to gain subsurface information about the site. The various types of materials and sediments encountered in the explorations, as well as the depths where characteristics of these materials changed, are indicated on the exploration boring logs presented in Appendix A. The depths indicated on the logs where conditions changed may represent gradational variations between sediment types in the field. If changes occurred between sample intervals in our borings, they were interpreted. The locations of the exploration borings are shown on Figure 2 through Figure 4.

The conclusions and recommendations presented in this report are based on the borings completed for this study. The locations and depths of the explorations were completed within site access and budgetary constraints. Because of the nature of exploratory work below ground, interpolation of subsurface conditions between field explorations is necessary. It should be noted that differing subsurface conditions may sometimes be present due to the random nature of

deposition and the alteration of topography by past grading and/or filling. The nature and extent of any variations between the field explorations may not become fully evident until construction. If variations are observed at that time, it may be necessary to re-evaluate specific recommendations in this report and make appropriate changes.

3.1 Exploration Borings

For this study, five hollow-stem auger borings were drilled by Geologic Drill Partners, an independent firm working under subcontract to AESI. The borings for this study were completed by advancing a 6-inch outside-diameter, hollow-stem auger with a tracked drill rig. During the drilling process, samples were obtained at generally 2.5- to 5-foot-depth intervals. After completion of drilling, each borehole was backfilled with bentonite chips and capped at the surface with on-site material.

Disturbed, but representative samples were obtained by using the Standard Penetration Test (SPT) procedure in accordance with *ASTM International* (ASTM) D-1586. This test and sampling method consists of driving a standard 2-inch, outside-diameter, split-barrel sampler a distance of 18 inches into the soil with a 140-pound hammer free-falling a distance of 30 inches. The number of blows for each 6-inch interval is recorded, and the number of blows required to drive the sampler the final 12 inches is known as the Standard Penetration Resistance ("N") or blow count. If a total of 50 blows is recorded at or before the end of one 6-inch interval, the blow count is recorded as the number of blows for the corresponding number of inches of penetration. The resistance, or N-value, provides a measure of the relative density of granular soils or the relative consistency of cohesive soils. These values are plotted on the attached boring logs.

The exploration borings were continuously observed and logged by an experienced geologist from our firm. The samples obtained from the split-barrel sampler were classified in the field and representative portions placed in watertight containers. The samples were then transported to our laboratory for further visual classification. The exploration logs presented Appendix A are based on the N-values, field observations, and drilling action.

4.0 SUBSURFACE CONDITIONS

Subsurface conditions at the project site were inferred from the field exploration accomplished for this study, visual reconnaissance of the site, and review of applicable geologic literature. Generally, our explorations encountered existing fill soils underlain by Everson glaciomarine drift sediments. A thin layer of mass wasting deposits was encountered atop the native sediments EB-4 and EB-5. The following section presents more detailed subsurface information organized from the shallowest (youngest) to the deepest (oldest) sediment types.

DRAFT

4.1 Stratigraphy

Topsoil

All exploration borings were completed off the south edge of the roadway asphalt and encountered 2 to 4 inches of topsoil under grass. Due to its high organic content, topsoil is not considered suitable for use in structural fill applications and should be removed from any planned paving areas.

Fill

Existing fill was encountered directly below the topsoil in all exploration borings. The fill was observed to depths of 7 feet in EB-1 and EB-2, 4.5 feet in EB-4, and 2 feet in EB-3 and EB-5. The existing fill was observed to be loose to medium dense, slightly moist to moist, dark brown to brown with occasional oxidation staining and consisted of silty, gravelly, fine to medium sand or sandy gravel with scattered organics near the surface. In EB-1, EB-2, and EB-4, portions of the existing fill consisted of sandy silt. The existing fill may require some remedial preparation under pavement or other hardscape areas.

Mass Wasting Deposits

Material encountered below the fill in EB-4 and EB-5 was observed to be medium stiff, moist, light brown, silt with a prominent blocky texture and sheared slicken faces. The proximity to steep slopes and relatively low density in combination with the blocky and irregular texture of the material leads us to interpret these sediments as mass wasting deposits. Mass wasting deposits generally describe loose soils which have been deposited by gravity or continuous downslope creep at the base of or along hillsides. The mass wasting deposits extended to a depth of approximately 7 feet below the ground surface in EB-4 and EB-5.

Everson Glaciomarine Drift

All five of our explorations encountered sediments generally consisting of medium stiff to stiff, slightly moist to very moist, silt and clay with occasional gravel dropstones. One sample in EB-2 had blow counts that correlated to soft consistency and two samples in EB-2 had a very stiff consistency. We interpreted these sediments as Everson-age glaciomarine drift. These sediments were observed to extend beyond the depth explored in all explorations. Glaciomarine drift was deposited from the melting of continental glaciers as they "floated" on seawater. All sediments of glacial origin, like Everson glaciomarine drift, may contain large cobbles or boulders at random locations which may be encountered during construction. Mass wasting deposits observed in EB-4 and EB-5 are interpreted to be derived from sediments within this unit.

DRAFT

At the time of exploration, most of the glaciomarine drift sediments encountered were moist to very moist, and therefore will likely require significant drying to be suitable for use in structural fill applications. The Everson glaciomarine drift extended beyond the maximum depth explored of 36.5 feet below the surface.

4.2 Geologic Mapping

Review of the regional geologic map, titled *Geologic Map and Interpreted Geologic History of the Bow and Alger 7.5-minute Quadrangles, Western Skagit County, Washington*, 1998 (J.D. Dragovich, D.K. Norman et al., Washington Division of Geology and Earth Resources, scale 1:24,000) indicates that the area of the subject site is underlain by Everson glaciomarine drift deposits. Our interpretation of the sediments encountered at the subject site is in general agreement with the regional geologic map.

Review of regional soils mapping (*Soil Survey of King County Area, Washington*, U.S. Department of Agriculture [USDA], Soils Conservation Service [SCS] now referred to as Natural Resources Conservation Service [NRCS]) on the NRCS *Web Soil Survey* indicates that the subject site is underlain by Hooda silt loam, 15 to 30 percent slopes. Slope inclinations along the south side of the project alignment are steeper than 15 to 30 percent. Due to the observed inclinations along the road bank, we anticipate that the Hoogdal silt loam will have an erosion hazard of "Severe to very severe," which has a parent material of glaciolacustrine deposits according to the NCRS.

4.3 Hydrology

No groundwater was encountered during our explorations which were completed on September 8, 2025.

Groundwater conditions, including depth and duration and quantity of seepage, should be expected to vary seasonally, and in response to changes in precipitation, soil grain-size distribution, topography, on- and off-site land usage, and other factors.

4.4 Soil Classification and Index Tests

Laboratory analyses for this study consisted of grain-size distribution (sieves) and Atterberg Limits. A summary of the laboratory test results are provided in the sections below and the results are included in Appendix B.

Grain-Size Distribution Testing

Two laboratory grain-size and hydrometer analyses were performed on samples collected from explorations completed for this project. The grain-size distribution test results are included in

DRAFT

Appendix B with soil descriptions based on the ASTM D-2487 Unified Soil Classification System (USCS). Results of the grain-size analyses are summarized in the table below.

Table 1
Summary of Grain-Size Analyses

Exploration Number	Depth (feet)	Geologic Unit	USCS Soil Description	Fines Content (%)
EB-3	10	Everson Glaciomarine Drift	very silty sandy CLAY (CL)	77.8
EB-3	20	Everson Glaciomarine Drift	Sandy silty CLAY (CL)	81.6

USCS = Unified Soil Classification System

Atterberg Limit Test

AESI performed one Atterberg Limit test on a sample of Everson glaciomarine drift obtained from EB-3 at depths of 10 and 20 feet, based on the ASTM D-4318 standard test methods. Both samples plotted below the A line which corresponds to a silt (ML) classification and are considered to be moderately plastic with Plasticity Indices of 13 and 14 for the 20-foot and 10-foot sample, respectively.

DRAFT

II. GEOLOGIC HAZARDS AND MITIGATIONS

The following discussion of potential geologic hazards is based on the geologic and groundwater conditions as observed and discussed herein. Based on the SCC the project site contains areas which meet the Erosion and Landslide Hazard Area criteria.

5.0 LANDSLIDE HAZARDS AND MITIGATION

Section 14.24.410 of the *Skagit County Code* (SCC) defines Landslide Hazards as the following.

(2) Landslide hazards are areas potentially subject to landslides based on a combination of geologic, topographic and hydrologic factors. The following are known or suspected landslide hazards:

- *(a) Areas designated in the Department of Ecology, Coastal Zone Atlas, Washington, Volume Two, Skagit County (1978) as U (Unstable), UB (Unstable Bluff), URS (Unstable Recent Slide), or UOS (Unstable Old Slide).*
- *(b) Slopes having gradients of 15% or greater:*
  - *(i) That intersect geologic contacts with permeable sediments overlying low-permeability sediment or bedrock and springs or groundwater seepage are present; or*
  - *(ii) That are parallel or subparallel to planes of weakness (such as bedding planes, joint systems, and fault planes) in subsurface materials.*
- *(c) Slopes of 40% or steeper and with a vertical relief of 10 feet or more.*
- *(d) Areas of previous failure such as earth slumps, earthflows, mudflows, lahars, debris flows, rock slides, landslides or other failures as observed in the field or as indicated on maps or in technical reports published by the U.S. Geological Survey, the Geology and Earth Resources Division of the Washington Department of Natural Resources, or other documents authorized by government agencies.*
- *(e) Potentially unstable areas resulting from rapid stream incision, stream bank erosion, and undercutting by wave action.*
- *(f) Coastal bluffs.*
- *(g) Slopes with a gradient greater than 80% and subject to rock fall.*
- *(h) Areas that are at risk from snow avalanches.*
- *(i) Areas designated on the Skagit County Alluvial Fan Study Orthophoto Maps as alluvial fans or as identified by the Director during site inspection.*
- *(j) Areas located in a narrow canyon potentially subject to inundation by debris flows or catastrophic flooding.*

DRAFT

(k) Those areas delineated by the U.S. Department of Agriculture's Natural Resources Conservation Service Soil Survey of Skagit County as "severe" (Table 9) limitation for building development.

The project section of Grip Road crosses a generally west- to southwest-facing slope about midway up the slope face. This results in both sides of the road being flanked by slopes. South of Grip Road the slope extends downward some 20 to 30 feet to the bottom of a ravine. Along the east half of the alignment, the slope continues to rise north of the road about 20 feet. General slope inclinations along the slope areas north and south of the slope are about 40 and 45 percent or flatter, respectively.

5.1 Slope Reconnaissance

We completed a limited reconnaissance of the on-site slopes at the time of our exploration on September 8, 2025. Our reconnaissance was limited due to the highly vegetated state of the slopes, steep inclination, and them being situated on privately-owned property. The following is a summary of our visual observations as they were made looking up- and downslope from Grip Road.

- During our site reconnaissance, we observed evidence of tension cracking along the east end of the project alignment, located in the known landslide area shown on Figures 2 and 3. These tension cracks have been sealed and observed to be approximately one-half of an inch wide.

- Trees located on the sloping area at the east end of the project site were generally oriented vertically, suggesting that ongoing, deep-seated slope movement is not occurring at the subject site.

- No springs were observed along the road embankment or within the visible portions of the slope.

5.2 LIDAR Mapping

Light Detection and Ranging (LIDAR) is a remote sensing technology that can be used to generate a detailed expression of ground surface topography even in densely vegetated areas. For this reason, LIDAR-based topographic imagery can be helpful in distinguishing surface features (such as old landslide features) that may otherwise not be easily recognizable. A LIDAR-based shaded relief map of the subject site and surrounding area is included on Figure 3.

DRAFT

Based on our review of the LIDAR image, the slopes along the east end of the project alignment of Grip Road appear to be distinctly hummocky with bowl-shaped edges. We interpret this to be indicative of shallow translational landslide activity. Grip Road was constructed through the landslide feature. The boundaries of the landslide feature can be seen on Figure 3.

The landslide scarp is situated on the north side of the road and the failure extends to the valley bottom with approximately 50 vertical feet of relief on slopes with a current average inclination of approximately 30 percent. Slopes on the central and west portions of the project alignment are characterized by distinctly more "smooth" topography and slope inclinations which are approximately consistent from the top to the toe of the slope. Generally, landslide activity results in terraced terrain towards the lower portions of the failure which is only visible in the east end of the project alignment.

5.3 Slope Stability Analysis

An analysis of overall slope stability was completed using the computer program Slope/W, Version 2024.2.0., by GeoStudio. The program used the Morgenstern-Price method for evaluating a rotational failure. Input parameters for the analysis included slope geometry, geology, groundwater conditions, and soil-strength parameters. Our study included two analyses for two separate cross-sectional areas along the project alignment. Analysis in the two locations included one of the existing slope conditions based on the topography included on Figure 3 along lines A to A' and B to B' which correspond nearest to stations 29+00 and 26+00, respectively. The second analysis completed in each location is based off the proposed conditions presented on the plan set by Semrau Engineering and Surveying dated September 4, 2025. All analyses include the added surcharge of a typical regularly trafficked roadway. Each analysis presents both seismic and static scenarios. These sections were selected because they extend through the steepest portions of the slope and intersect the central-most portions of the project area. The geology of the slope was based on the subsurface conditions encountered in our explorations and slope reconnaissance. All analyses were completed assuming a piezometric surface at the base of the mass wasting deposits along section A to A' and at the base of the existing fill along section B to B' to express a conservative model to accommodate the possibility of perched groundwater conditions. No groundwater was observed in our on-site explorations. Soil-strength parameters used for our analysis were assumed based on typical published values for similar materials and our prior experience. Due to the project plans being preliminary at this time and no pile design has been completed, the resisting forces provided by the proposed soldier pile wall are based on a typical wall design and are not site specific. The soil-strength and pile parameters used for our analysis are summarized below in Table 2 and Table 3, respectively.

DRAFT

Table 2
Summary of Soil-Strength Parameters

Geologic Unit	Effective Friction Angle (degrees)	Cohesion (psf)	Unit Weight (pcf)
Existing Fill	34	25	115
Mass Wasting Deposits	28	25	115
Everson Glaciomarine Drift	28	200	125

psf = pounds per square foot
pcf = pounds per cubic foot

Table 3
Summary of Soldier Pile Wall Parameters

Pile Type	Shear Force (lbf)	Reduction Factor	Pile Spacing (feet)
Steel Soldier Pile	15,000	1.5	5

lbf = found-force

For evaluation of slope stability under seismic conditions, a horizontal ground acceleration of 0.265g was used for our analysis. This value is equivalent to ½ of the peak horizontal ground acceleration based on a seismic event with a 2-percent probability of exceedance in 50 years. A unit weight of 250 pounds per square foot (psf) was used to model the surcharge of the roadway and associated vehicle traffic.

The factor of safety of a slope is the ratio between the forces that resist sliding to the forces that drive sliding. For example, a factor of safety of 1.0 would indicate a slope where the driving forces and the resisting forces are exactly equal. Increasing factor of safety values greater than 1.0 indicate increased stability.

Section 14.24.070 of the SCC requires that the improvements included in the proposed project do not adversely affect the public roadway, nearby properties, mapped environmentally critical areas, or geologic hazard areas. The results of our analysis are interpreted based on comparison of the proposed conditions to the existing conditions.

5.4 Slope Stability Analysis Results

The resulting factors of safety from our global stability analysis are provided in Table 4 below.

DRAFT

Table 4
Minimum Factors of Safety

	Static Factor of Safety Section A-A' (29+00)	Seismic Factor of Safety Section A-A' (29+00)	Static Factor of Safety Section B-B' (26+00)	Seismic Factor of Safety Section B-B' (26+00)
Existing Condition	1.4	0.8	2.0	1.1
Proposed Condition	1.8	1.0	2.0	1.2

The factor of safety values in Table 4 show that the proposed road widening as supported with a soldier pile wall does not lower the stability of the steep slope based on the identical parameters for both the existing and proposed conditions. All iterations of the analyses indicate that the proposed improvements will increase the stability of the slopes along the project alignment.

The results of our stability analysis are provided in Appendix C. These results show the shapes of the potential failures associated with the overall minimum factors of safety.

As with all steep slopes, some risk of landsliding remains. It must be understood that no recommendations or engineering design can yield a guarantee of stable slopes. Our observations, findings, and opinions are a means to identify and reduce the inherent risks to the public as a result of the proposed project.

DRAFT

5.5 Steep Slope Best Management Practices

The following measures should also be incorporated during construction and after completion of the development:

- Site disturbance should be the minimum required to construct the project. Vegetation should be maintained on steep slope areas.

- Stormwater from impervious surfaces should be captured and directed away from steep slopes to an approved drainage facility. Concentrated stormwater should not be allowed to discharge over or onto the steep slope.

- At no time should uncontrolled fill, landscaping waste, or other debris be pushed over the top of the steep slope. Uncontrolled fill on steep slopes may promote landslides or debris flow activity.

- The new soldier pile wall should be designed such that the supportive piles are embedded a minimum of 10 feet into the undisturbed Everson glaciomarine drift sediments, as indicated by the exploration logs presented in Appendix A.

5.6 Landslide Hazard Conclusion

Based on slope inclinations of the slopes north and south of Grip Road and evidence of historic sliding at the east end of the alignment, the slopes adjacent to Grip Road along the project alignment meet the County's criteria for Landslide Hazard areas.

Given the broad nature of the delineated landslide hazard within the project area the ability to mitigate risks associated with landslides occurring along these regional slopes, based on the relative size of the slope complex as compared to the subject site, is limited. Our study focuses on providing support for the road bank along the south side of Grip Road via a new soldier pile wall that is founded in competent native sediments not impacted by past slide events. Because the new proposed wall will drive loads from the retained soil down into the competent native material at depth, impacts to existing local landslide hazard areas will be mitigated. Additionally, section 14.24.070 of the SCC provides exemption requirements for projects within geologic hazards from a geologic hazard review. Specifically, subsection 3 provides exemption for maintenance or repair of existing rights-of-way.

A soldier pile wall founded in the underlying natural sediments will drive loads from the retainment of new structural fill to depth and provide resistance to global slope instability mitigating impacts to the hazard area. Our modeling indicates that the proposed condition with a soldier pile retaining wall will improve global slope factors of safety for the risks associated with the proposed road widening project along the south side of Grip Road. Design details for this wall are discussed within the "Preliminary Design Recommendations" section of this report. This opinion is dependent upon site grading and construction practices being completed in accordance with the geotechnical recommendations presented in this report.

DRAFT

6.0 SEISMIC HAZARDS AND MITIGATION

The following discussion is a general assessment of seismic hazards that is intended to be useful to the project design team in terms of understanding seismic issues, and to the structural engineer for design.

All of Western Washington is at risk of strong seismic events resulting from movement of the tectonic plates associated with the Cascadia Subduction Zone (CSZ), where the offshore Juan de Fuca plate subducts beneath the continental North American plate. The site lies within a zone of strong potential shaking from subduction zone earthquakes associated with the CSZ. The CSZ can produce earthquakes up to magnitude 9.0, and the recurrence interval is estimated to be on the order of 500 years. Geologists infer the most recent subduction zone earthquake occurred in

1700 (Goldfinger et al., 2012[1]). Three main types of earthquakes are typically associated with subduction zone environments: crustal, intraplate, and interplate earthquakes. Seismic records in the Puget Sound region document a distinct zone of shallow crustal seismicity (e.g., the Seattle Fault Zone [SFZ]). These shallow fault zones may include surficial expressions of previous seismic events, such as fault scarps, displaced shorelines, and shallow bedrock exposures. The shallow fault zones typically extend from the surface to depths ranging from 16 to 19 miles. A deeper zone of seismicity is associated with the subducting Juan de Fuca plate. Subduction zone seismic events produce intraplate earthquakes at depths ranging from 25 to 45 miles beneath the Puget Lowland including the 1949, 7.2-magnitude event; the 1965, 6.5-magnitude event; and the 2001, 6.8-magnitude event and interplate earthquakes at shallow depths near the Washington coast including the 1700 earthquake, which had a magnitude of approximately 9.0. The 1949 earthquake appears to have been the largest in this region during recorded history and was centered in the Olympia area. Evaluation of earthquake return rates indicates that an earthquake of the magnitude between 5.5 and 6.0 is likely within a given 20-year period.

Generally, there are four types of potential geologic hazards associated with large seismic events: 1) surficial ground rupture, 2) seismically induced landslides or lateral spreading, 3) liquefaction, and 4) ground motion. The potential for each of these hazards to adversely impact the proposed project is discussed below.

DRAFT

6.1 Surficial Ground Rupture

Generally, the largest earthquakes that have occurred in the Puget Sound area are sub-crustal events with epicenters ranging from 50 to 70 kilometers in depth. Earthquakes that are generated at such depths usually do not result in fault rupture at the ground surface. We reviewed known faults using the Department of Natural Resources (DNR) interactive geology portal. The DNR's online mapping indicates that the nearest active fault is in the Devils Mountain Fault Zone, approximately 14.5 miles south of the site. Due to the distance from the mapped active faults, the potential for seismically induced ground rupture to adversely affect the proposed project is low, in our opinion.

6.2 Seismically Induced Landslides

It is our opinion that the risk of landslide hazards is not adversely affected by the proposed improvements. The project consists of a new soldier pile wall supported by competent native sediments encountered in our explorations. The wall design will also include seismic loading conditions. Landslide hazards were discussed in greater detail in the "Landslide Hazards and Mitigation" section of this report.

[1] Goldfinger, C., Nelson, C.H., Morey, A.E., Johnson, J.E., Patton, J.R., Karabanov, E., Gutierrez-Pastor, J., Eriksson, A.T., Gracia, E., Dunhill, G., Enkin, R.J., Dallimore, A., and Vallier, T., 2012, *Turbidite Event History—Methods and Implications for Holocene Paleoseismicity of the Cascadia Subduction Zone*: U.S. Geological Survey Professional Paper 1661–F, 170.

6.3 Liquefaction

Liquefaction is a process through which unconsolidated soil loses strength as a result of vibrations, such as those which occur during a seismic event. During normal conditions, the weight of the soil is supported by both grain-to-grain contacts and by the fluid pressure within the pore spaces of the soil below the water table. Extreme vibratory shaking can disrupt the grain-to-grain contact, increase the pore pressure, and result in a temporary decrease in soil shear strength. The soil is said to be liquefied when nearly all of the weight of the soil is supported by pore pressure alone. Liquefaction can result in deformation of the sediment and settlement of overlying structures. Areas most susceptible to liquefaction include those areas underlain by loose to medium dense, sand and coarse silt accompanied by a shallow water table. It is our opinion that there is low risk of liquefaction due to the lack of adverse groundwater conditions at the time of exploration and the high plasticity of the native sediments. No mitigation of liquefaction is warranted.

7.0 EROSION HAZARDS AND MITIGATION

Section *14.24.410 Geologically hazardous areas known or suspected risk states:*

(1) The following are considered known or suspected erosion hazards:

- *a. Areas with gradients greater than or equal to 30%.*
- *b. Areas located within the following map units: No. 1 Andic Cryochrepts, Nos. 3 and 4 Andic Xerocrepts, No. 13 Birdsview, Nos. 47 and 48 Dystric Xerochrepts, Nos. 50 and 51 Dystic Xerorthents, Nos. 63 and 65 Guemes, No. 69 Hoogdal, No. 90 Lithic Haploxerolls, No. 91 Marblemount, No. 99 Mundt and Nos. 150 and 151 Typic Croyorthods or mapped severe **erosion hazard**, as identified in the U.S. Department of Agriculture Natural Resources Conservation Service Soil Survey of Skagit County Area, WA (1989).*
- *c. Coastal beaches or bluffs.*
- *d. Areas designated in the Department of Ecology, Coastal Zone Atlas, Washington, Volume Two Skagit County (1978) as U (Unstable), UB (Unstable Bluff), URS (Unstable Recent Slide), or UOS (Unstable Old Slide).*
- *e. Areas susceptible to rapid stream incision and stream bank **erosion**.*

The NRCS and our on-site explorations indicate that the soils on the site are consistent with the Hoogdal silt loam soil series. The SCC specifies that areas mapped as containing the Hoogdal soil series are considered erosion hazard areas. Additionally, the sediments which underlie the subject site contain significant quantities of clay, silt, and fine sand and are considered to be highly sensitive to disturbance when wet and erosion where it is present below sloping areas.

DRAFT

In order to mitigate erosion hazards and the potential for off-site sediment transport, we recommend the following best management practices (BMPs):

1. To the extent practical, earthwork should be avoided during the wet season, October 1st through April 1st.

2. The winter performance of a site is dependent on a well-conceived plan for control of site erosion and stormwater runoff. The site plan should include ground-cover measures and staging areas. The contractor should be prepared to implement and maintain the required measures to reduce the amount of exposed ground.

3. Temporary erosion and sedimentation control (TESC) elements and perimeter flow control should be established prior to the start of grading.

4. During the wetter months of the year, or when significant storm events are predicted during the summer months, the work area should be stabilized so that if showers do occur, it can receive the rainfall without excessive erosion or sediment transport. The stabilization process should include establishing temporary stormwater conveyance channels through work areas to route runoff to the approved treatment/discharge facilities.

5. All areas of disturbed soil should be revegetated as soon as possible. If it is outside of the growing season, the disturbed areas should be covered with mulch. Straw mulch provides a cost-effective cover measure and can be made wind-resistant with the application of a tackifier after it is placed.

6. Surface runoff and discharge should be controlled during and following development. Uncontrolled discharge may promote erosion and sediment transport.

7. Soils that are to be reused around the site should be stored in such a manner as to reduce erosion from the stockpile. Protective measures may include, but are not limited to, covering stockpiles with plastic sheeting, or the use of silt fences around pile perimeters.

It is our opinion that with the proper implementation of the TESC plans and by field-adjusting appropriate erosion mitigation (BMPs) throughout construction, the potential adverse impacts from erosion hazards on the project may be mitigated. In our opinion, erosion control practices in place at the site at the time of our site visit were suitable for the site conditions.

DRAFT

III. PRELIMINARY DESIGN RECOMMENDATIONS

8.0 INTRODUCTION

The project proposes a new retaining wall on the south side of Grip Road along the project alignment to support the structural fill and road section required for the proposed widening. Our explorations along the project alignment generally found existing fill or a thin layer of mass wasting deposits overlying Everson glaciomarine drift. Due to the presence of compressible soils at shallow depths and steep slopes that meet the County's definition for landslide hazard area, we have provided recommendations in this report for a soldier pile retaining wall. A soldier pile wall will drive loads deeper into the core of the slope while providing resistance to slope instability. Conventional block retaining walls, would add significant surcharge loads to the top of the slope, would have a wider footprint, and would add additional weight to the compressible soils which increases the risk of long-term settlement. Recommendations for the soldier pile wall design and construction are provided in this report.

As previously mentioned, the slope adjacent to Grip Road are considered Erosion and Landslide Hazard Areas. Refer to Sections 5.0 and 7.0 for additional details.

9.0 SITE PREPARATION

Site preparation should include removal of all vegetation, topsoil, and any other deleterious materials in the immediate project area. After stripping of the surfacing material, including asphalt and crushed aggregate, has been completed, any remaining roots and stumps should be removed from structural areas. All soils disturbed by stripping and grubbing operations should be recompacted as described below for structural fill.

9.1 Access and Staging Areas

Consideration should be given to protecting access and staging areas with an appropriate section of crushed rock. Placement of an engineering stabilization fabric (such as Mirafi® 500X or approved equivalent) below the rock will reduce the potential of fine-grained materials pumping up through the crushed rock during wet weather and turning the area to mud. The fabric will also aid in supporting construction equipment, thus reducing the amount of crushed rock required. Crushed rock used for access and staging areas should have a particle size of at least 2 inches.

9.2 Temporary and Permanent Slopes

In our opinion, stable construction slopes should be the responsibility of the contractor and should be determined during construction based on the local conditions encountered at that

DRAFT

time. For planning purposes, we anticipate that temporary, unsupported cut slopes in areas of existing fill, mass wasting deposits, and/or glaciomarine sediments can be made at a maximum slope of 1.5H:1V. Temporary vertical cuts up to 4 feet in height may be planned in all of these materials. Flatter inclinations may be recommended in areas of seepage. As is typical with earthwork operations, some sloughing and raveling may occur, and cut slopes may have to be adjusted in the field. In addition, WISHA/OSHA regulations should be followed at all times.

Permanent cut and structural fill slopes should not exceed an inclination of 2H:1V.

10.0 STRUCTURAL FILL

Placement of structural fill may be necessary to establish desired grades in some areas, or for restoration of roadway areas after wall construction. All references to structural fill in this report refer to subgrade preparation, fill type, and placement and compaction of materials as discussed in this section. If a percentage of compaction is specified under another section of this report, the value given in that section should be used.

10.1 Structural Fill Compaction

Structural fill is defined as non-organic soil, acceptable to the geotechnical engineer, placed in maximum 8-inch loose lifts, with each lift being compacted to at least 95 percent of the modified Proctor maximum dry density using ASTM D-1557 as the standard. The top of the compacted fill should extend horizontally a minimum distance of 3 feet beyond pavement edges before sloping down at an angle no steeper than 2H:1V. Fill slopes should either be overbuilt and trimmed back to final grade or surface-compacted to the specified density.

10.2 Moisture-Sensitive Fill

Soils in which the amount of fine-grained material (smaller than No. 200 sieve) is greater than approximately 5 percent (measured on the minus No. 4 sieve size) should be considered moisture-sensitive. The use of moisture-sensitive soil in structural fills should be limited to favorable dry weather and dry subgrade conditions. Because most of the on-site soils contain high percentages of silt, compaction of these sediments to the recommended minimum density will only be achievable over a narrow range of moisture contents and use of these materials for structural fill is not recommended. Maximum rock size for structural fill applications should be limited to diameters of approximately 6 inches or less.

Construction equipment traversing the site when the silty on-site sediments are very moist or wet can cause considerable disturbance. If fill is required, a select import material consisting of a clean, free-draining gravel and/or sand should be used. Free-draining fill consists of non-organic

DRAFT

soil with the amount of fine-grained material limited to 5 percent by weight when measured on the minus No. 4 sieve fraction.

10.3 Structural Fill Testing

The contractor should note that any proposed fill soils must be evaluated by AESI prior to their use in fills. This would require that we have a sample of the material at least 3 business days in advance to perform a Proctor test and determine its field compaction standard.

A representative from our firm should observe the stripped subgrade and be present during placement of structural fill to observe the work and perform a representative number of in-place density tests. In this way, the adequacy of the earthwork may be evaluated as filling progresses and any problem areas may be corrected at that time. It is important to understand that taking random compaction tests on a part-time basis will not assure uniformity or acceptable performance of a fill. As such, we are available to aid the owner in developing a suitable monitoring and testing frequency.

10.4 Keying and Benching

We recommend that structural fill placed behind the shoring wall, or any fills placed on slopes steeper than 5H:1V, should be tied to firm and unyielding subsoil by appropriate keying and benching, which would be established in the field to suit the particular soil conditions at the time of grading. The keyway will act as a shear key to embed the toe of the new fill into a competent soil layer. Generally, the keyway for slope fills should be at least 4 feet wide and cut into firm and unyielding soils at least 3 feet deep. Level benches would then be cut horizontally across the embankment following the contours of the slope. No specific width is required for the benches, although they are usually a few feet wider than the dozer being used to cut them.

DRAFT

11.0 PERMANENT SOLDIER PILE WALL

This section of the report presents design considerations and criteria for use in the design of the retaining wall. *With this information and other pertinent data, it should be the responsibility of the pile contractor and structural engineer to determine the appropriate design details, construction methods, and procedures for installation of the shoring system*.

We anticipate that the new cantilever soldier pile shoring wall, consisting of wide-flange steel piles, and embedded a minimum of 10 feet into the underlying Everson glaciomarine drift deposits, will provide the necessary lateral support of the existing hillslope along the south side of Grip Road. The slope stability analysis discussed herein uses a vertically oriented soldier pile wall design not including tie-backs. A cantilever soldier pile wall will provide additional resisting forces which will require minimal extension of the construction boundary downslope. Based on

current grades we anticipate the wall will have an exposed height of up to 6 feet or less. Treated timber lagging should be used to support the soil between the piles; plywood should not be used for lagging. A structural engineer should design the wall system based on the soil parameters provided in this report.

The construction sequence for soldier pile shoring systems typically begins with driving or drilling each pile to the minimum specified embedment depth below the base of the final grade under the observation of the geotechnical engineer or designated field representative. Drilled and grouted piles should be allowed to set for at least 72 hours prior to beginning excavation. Treated timber lagging, as specified by the structural engineer, should be installed and backfilled with permeable soils to prevent the buildup of water behind the lagging boards.

We recommend that the temporary cantilever shoring system be designed to resist an active lateral earth pressure of 40H psf, presented as a triangular distribution for a level backslope, where H equals the exposed height of the wall. Where the wall will support a backslope of up to a 2H:1V, we recommend using an active pressure of 65H. It should be considered that existing overhead utilities are situated within the project area and may conflict with pile installation. The active earth pressure acts over the pile spacing above the excavation base.

Lateral resistance of soldier piles may be computed on the basis of allowable passive earth pressure equivalent to 125(D) psf within the fill and/or mass wasting deposits and 200(D) psf within the Everson glaciomarine drift, where D equals the depth of pile embedment in the respective soil unit. This pressure may be considered to be acting against 2 diameters of the soldier pile below the ground surface. The upper 3 feet on the passive side of the piles should be neglected and truncated from a triangular distribution.

Also, in accordance with the 2021 *International Building Code* (IBC), retaining wall design should include seismic surcharges. Based on the site soils and anticipated wall backfill materials, we recommend a seismic surcharge pressure in addition to the equivalent fluid pressure presented above. A rectangular pressure distribution of 12H psf should be included in design. The above pressures are assumed to act over the pile spacing over the exposed section of wall. In addition to the earth pressures discussed above, the soldier piles should be designed to resist a traffic surcharge pressure. Our recommended traffic surcharge pressure is presented graphically on Figure 4.

For design purposes, the vertical load capacity of soldier piles embedded in the Everson glaciomarine drift sediments should be determined based on an allowable adhesion or side friction of 1 kip per square foot (ksf) and an allowable end bearing of 12 ksf.

If adjacent structures, slopes, heavy construction traffic, materials stockpiling, or other substantial surcharges are to be applied during construction, these surcharges should also be included in the design.

DRAFT

We recommend a minimum depth of embedment of 10 feet into the underlying native, undisturbed Everson glaciomarine drift deposits. Soil conditions may differ from those described in this report. All sediments of glacial origin may contain large cobbles or boulders at random locations.

The drilling contractor should be prepared to use casing, drilling slurry, or other methods of stabilizing the hole in the case of caving. If more than 6 inches of standing water or slough is present at the bottom of the boring prior to grout placement, the contractor should be prepared to use a tremie pipe to place grout continuously from the bottom up. Grout may consist of lean-mix concrete or controlled density fill (CDF), as specified by the structural engineer, to ease chipping for lagging installation.

Timber lagging can be designed to resist reduced lateral earth pressures as a result of soil arching between piles. For the site soils, the lagging can be designed to resist 50 percent of the calculated lateral load at any given point. Caving could be experienced when excavating and installing lagging between piles. Overexcavation of soils behind the lagging should be avoided. Excavation should extend just far enough to allow lagging installation. Any void spaces behind lagging should be filled with pea gravel or other suitable free-draining material to prevent caving and loss of support for adjacent ground.

DRAFT

12.0 DRAINAGE CONSIDERATIONS

It is imperative that proper drainage be provided so that hydrostatic pressures do not develop against the walls. For soldier pile walls this would involve installation of a minimum 1-foot-wide blanket drain for the full wall height using permeable material such as imported, washed gravel against the walls. Soil nail walls will require a drainage product such as Mira-Drain drain mats which are installed per the manufacturer's recommendations. The drainage mat would be installed behind the shotcrete in strips that run between the soil nails for the full height of the wall. Stormwater collected from the wall or other site drainage should discharge via tightline drain to an approved receptor. All downspout outfall pipes should be repaired and discharged to a suitable location away from the slope or, if feasible, down to the bottom of the slope.

13.0 PROJECT DESIGN AND CONSTRUCTION MONITORING

We are available to provide geotechnical engineering and monitoring services during construction. Skagit County will likely require geotechnical special inspections during construction. The integrity of the wall depends on proper site preparation and construction procedures. Engineering decisions may have to be made in the field in the event that variations in subsurface conditions become apparent. Construction monitoring services are not part of this

current scope of work. If these services are desired, please let us know, and we will prepare a proposal.

We have enjoyed working with you on this study and are confident that these recommendations will aid in the successful completion of your project. If you should have any questions or require further assistance, please do not hesitate to call.

Sincerely,
ASSOCIATED EARTH SCIENCES, INC.
Mount Vernon, Washington

DRAFT

Forest Gheen-Regouski, G.I.T.
Staff Geologist

DRAFT

Matthew A. Miller, P.E.
Principal Geotechnical Engineer

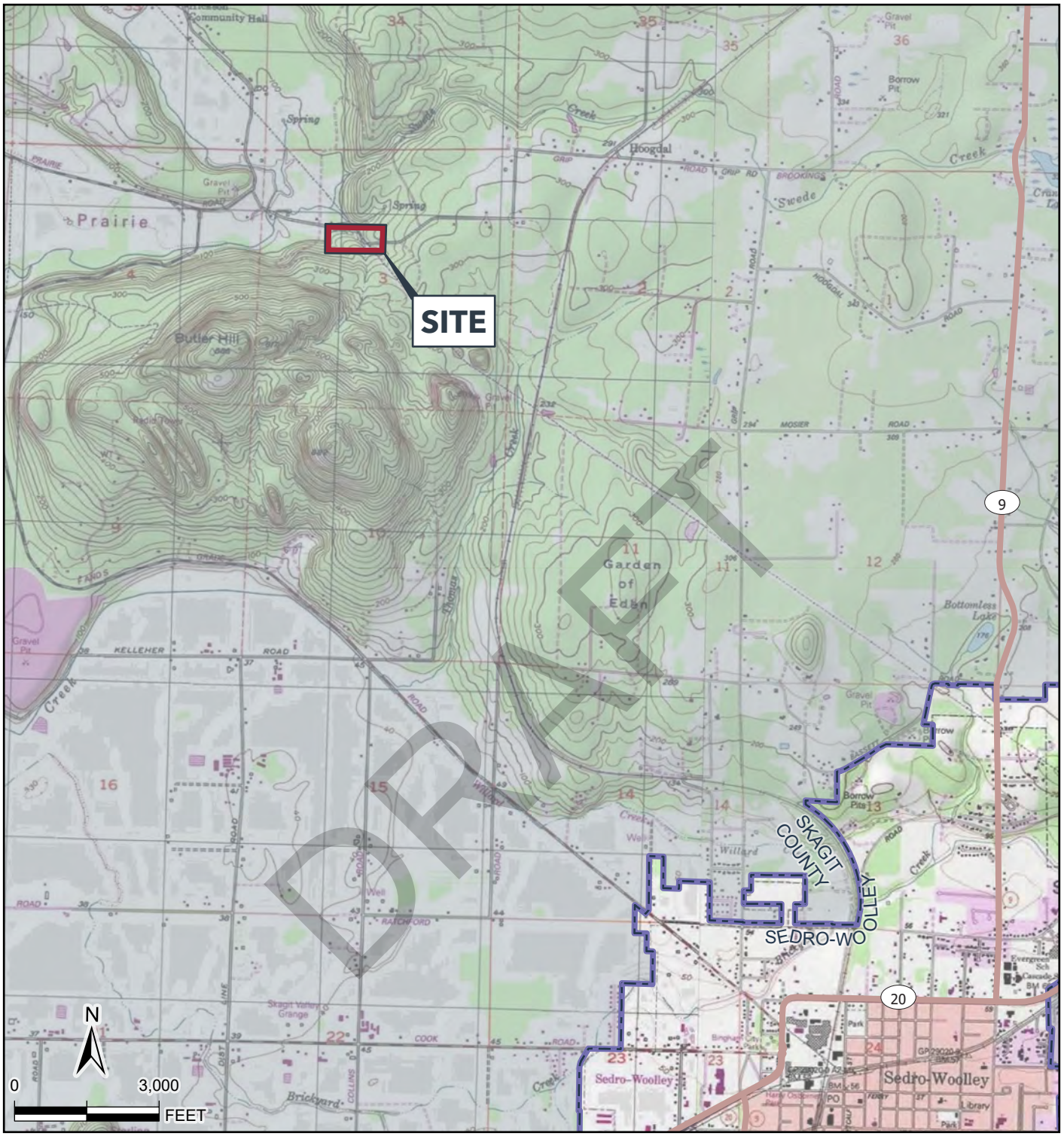
DRAFT

Anthony W. Romanick, P.E.
Associate Engineer

DRAFT

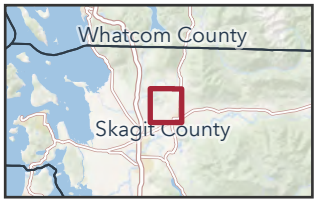
ATTACHMENTS

Figure 1: Vicinity Map
Figure 2: Existing Site and Exploration Plan
Figure 3: LIDAR Based Topography
Figure 4: Proposed Site and Exploration Plan
Appendix A: Exploration Logs
Appendix B: Laboratory Data
Appendix C: Slope Stability Analysis

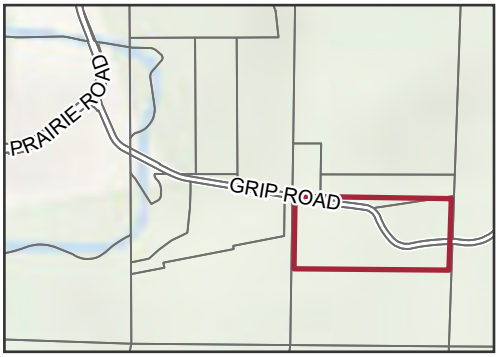


DRAFT

COUNTY LOCALE



LOCATION



ESRI, USGS, NATIONAL GEOGRAPHIC, DELORME, NATURALVUE, I-CUBED, GEBCO: ARCGIS ONLINE BASEMAP. WADOT STATE ROUTES 24K (12/20). SKAGIT CO: PARCELS, ROADS (10/22).

NOTE: LOCATION AND DISTANCES SHOWN ARE APPROXIMATE. BLACK AND WHITE REPRODUCTION OF THIS COLOR ORIGINAL MAY REDUCE ITS EFFECTIVENESS AND LEAD TO INCORRECT INTERPRETATION.

associated earth sciences incorporated

VICINITY MAP

GRIP ROAD WIDENING
SKAGIT COUNTY, WASHINGTON

PROJECT NO.	DATE	FIGURE
20130228E002	9/25	1

G:\GIS_Projects\aY13post07161\30228 Grip Road Mine\APRX\E00212013022 8E002 F1 VM_GripMineRd.aprx | 20130228E002 F1 VM_GripRdMine | 2025-09-10 | jzivkovic



LEGEND

- SITE
- EXPLORATION BORING
- CROSS-SECTION
- CONTOUR 5 FT
- CONTOUR 20 FT
- PARCEL

N

0 120

FEET

DATA SOURCES/REFERENCES:
SKAGIT COUNTY: ROADS (10/22), PARCELS (10/24). AERIAL IMAGERY (2021). WA DOE: STREAMS (5/19). WA DNR LIDAR: NORTH_PUGET_2017 ACQUIRED MARCH TO SEPT 2016, 3' CELL SIZE. CONTOURS DERIVED FROM LIDAR. CASCADES_NORTH_WALI_2023, ACQUIRED 8/31/2022 – 2/24/2023, CALL SIZE 1.5'.

BLACK AND WHITE REPRODUCTION OF THIS COLOR ORIGINAL MAY REDUCE ITS EFFECTIVENESS AND LEAD TO INCORRECT INTERPRETATION. LOCATION AND DISTANCES SHOWN ARE APPROXIMATE.

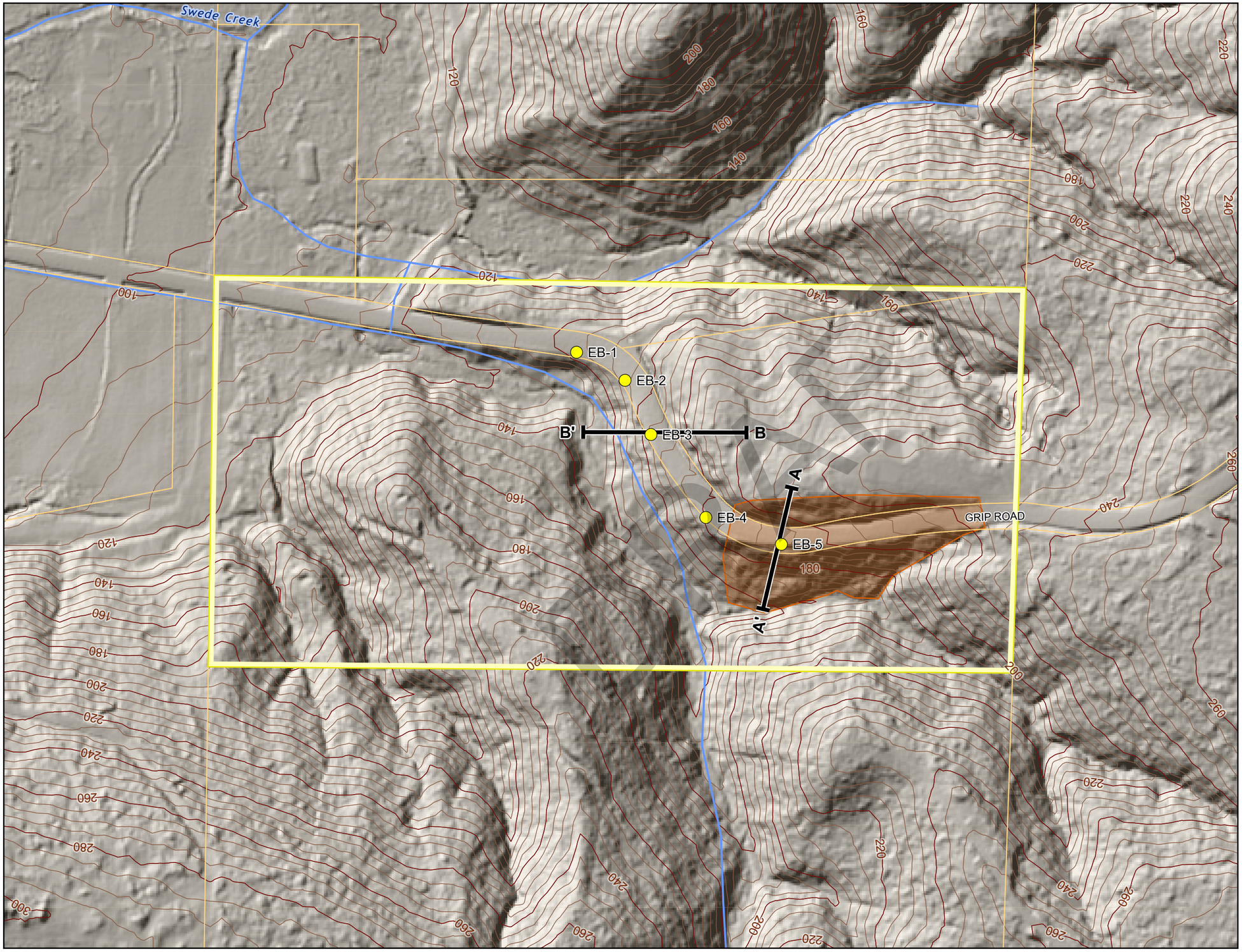
associated earth sciences incorporated

EXISTING SITE AND EXPLORATION PLAN

GRIP ROAD WIDENING
SKAGIT COUNTY, WASHINGTON

PROJECT NO.	DATE	FIGURE
20130228E002	10/25	2

G:\GIS_Projects\aY13\pcsd\07161\30228 Grip Road Mine\APRX\E002\20130228E002 F2 ES_GripRdMine.aprx | 20130228E002 F2 ES_GripRdMine | 2025-10-06 | jziv\kovic



LEGEND

- SITE
- EXPLORATION BORING
- CROSS-SECTION
- CONTOUR 20 FT
- CONTOUR 5 FT
- LANDSLIDE AREA
- PARCEL

N

0 150

FEET

DATA SOURCES/REFERENCES:
SKAGIT COUNTY: ROADS (10/22), PARCELS (10/24). WA DOE: STREAMS (5/19). WA DNR LIDAR: NORTH_PUGET_2017 ACQUIRED MARCH TO SEPT 2016, 3' CELL SIZE. CONTOURS DERIVED FROM LIDAR. CASCADES_NORTH_WALI_2023, ACQUIRED 8/31/2022 – 2/24/2023, CALL SIZE 1.5'.

BLACK AND WHITE REPRODUCTION OF THIS COLOR ORIGINAL MAY REDUCE ITS EFFECTIVENESS AND LEAD TO INCORRECT INTERPRETATION. LOCATION AND DISTANCES SHOWN ARE APPROXIMATE.

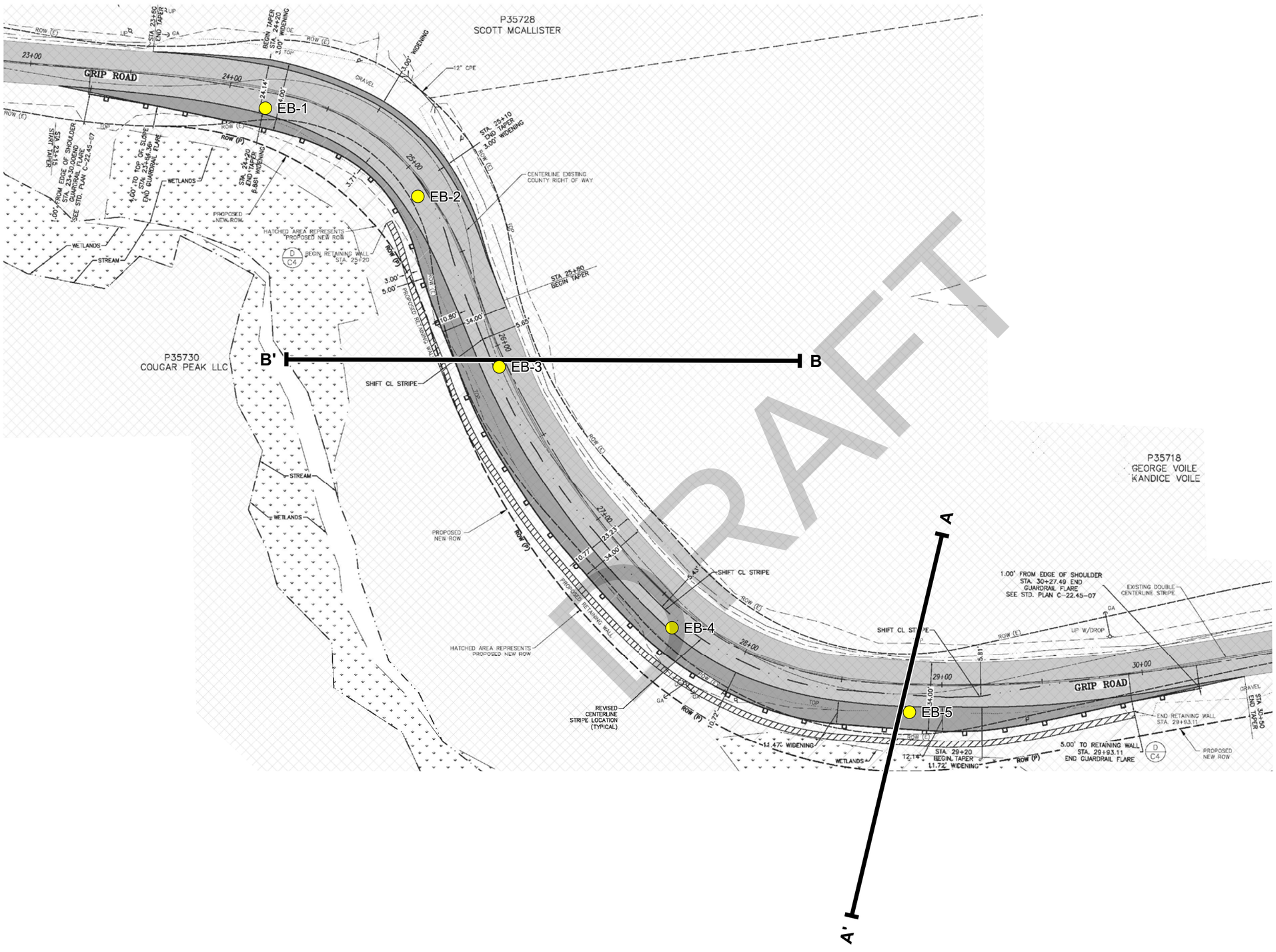
associated earth sciences incorporated

LIDAR BASED TOPOGRAPHY

GRIP ROAD WIDENING
SKAGIT COUNTY, WASHINGTON

PROJECT NO.	DATE	FIGURE
20130228E002	10/25	3

G:\GIS_Projects\aY13\post07\61\30228 Grip Road Mine\APRX\E002\20130228E002 F3 TOPO_GripRdMine.aprx | 20130228E002 F3 TOPO_GripRdMine | 2025-10-06 | zivkovic

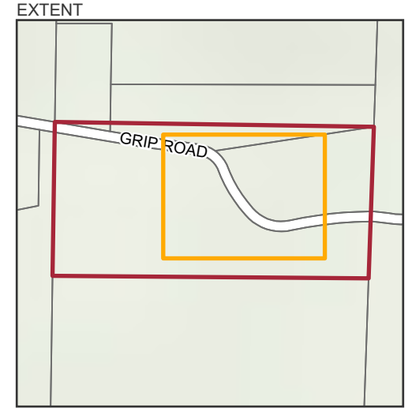


DRAFT

LEGEND

- EXPLORATION BORING
- CROSS-SECTION

EXTENT



N

0 50

FEET

DATA SOURCES/REFERENCES:
SEMRAU ENGINEERING & SURVEYING, PLLC, SITE PLAN AND TESCP, GRIP ROAD PAVEMENT WIDENING - MILES SAND AND GRAVEL, SHEET C3 (9/4/25)

BLACK AND WHITE REPRODUCTION OF THIS COLOR ORIGINAL MAY REDUCE ITS EFFECTIVENESS AND LEAD TO INCORRECT INTERPRETATION. LOCATION AND DISTANCES SHOWN ARE APPROXIMATE.

associated earth sciences incorporated

PROPOSED SITE AND EXPLORATION PLAN

GRIP ROAD WIDENING
SKAGIT COUNTY, WASHINGTON

PROJECT NO.	DATE	FIGURE
20130228E002	10/25	4

G:\GIS_Projects\aY13\post07161\30228 Grip Road Mine\APRX\E002\20130228E002 F4 SP_GripRdMine.aprx | 20130228E002 F4 SP_GripRdMine | 2025-10-06 | jziv\kovic

APPENDIX A

Exploration Logs

DRAFT

Coarse-Grained Soils - More than 50%[1] Retained on No. 200 Sieve	Gravels - More than 50%[1] of Coarse Fraction Retained on No. 4 Sieve	≤5% Fines[2]	GW	Well-graded gravel and gravel with sand, little to no fines
			GP	Poorly-graded gravel and gravel with sand, little to no fines
		≥12% Fines[2]	GM	Silty gravel and silty gravel with sand
			GC	Clayey gravel and clayey gravel with sand
	Sands - 50%[1] or More of Coarse Fraction Passes No. 4 Sieve	≤5% Fines[2]	SW	Well-graded sand and sand with gravel, little to no fines
			SP	Poorly-graded sand and sand with gravel, little to no fines
		≥12% Fines[2]	SM	Silty sand and silty sand with gravel
			SC	Clayey sand and clayey sand with gravel
Fine-Grained Soils - 50%[1] or More Passes No. 200 Sieve	Silts and Clays Liquid Limit Less than 50		ML	Silt, sandy silt, gravelly silt, silt with sand or gravel
			CL	Clay of low to medium plasticity; silty, sandy, or gravelly clay, lean clay
			OL	Organic clay or silt of low plasticity
	Silts and Clays Liquid Limit 50 or More		MH	Elastic silt, clayey silt, silt with micaceous or diatomaceous fine sand or silt
			CH	Clay of high plasticity, sandy or gravelly clay, fat clay with sand or gravel
			OH	Organic clay or silt of medium to high plasticity
Highly Organic Soils			PT	Peat, muck and other highly organic soils

Terms Describing Relative Density and Consistency

Coarse-Grained Soils	Density	SPT[3] blows/foot
	Very Loose	0 to 4
	Loose	4 to 10
	Medium Dense	10 to 30
	Dense	30 to 50
	Very Dense	>50

Fine-Grained Soils	Consistency	SPT[3] blows/foot
	Very Soft	0 to 2
	Soft	2 to 4
	Medium Stiff	4 to 8
	Stiff	8 to 15
	Very Stiff	15 to 30
	Hard	>30

Test Symbols

G = Grain Size
M = Moisture Content
A = Atterberg Limits
C = Chemical
DD = Dry Density
K = Permeability

Component Definitions

Descriptive Term	Size Range and Sieve Number
Boulders	Larger than 12"
Cobbles	3" to 12"
Gravel	3" to No. 4 (4.75 mm)
Coarse Gravel	3" to 3/4"
Fine Gravel	3/4" to No. 4 (4.75 mm)
Sand	No. 4 (4.75 mm) to No. 200 (0.075 mm)
Coarse Sand	No. 4 (4.75 mm) to No. 10 (2.00 mm)
Medium Sand	No. 10 (2.00 mm) to No. 40 (0.425 mm)
Fine Sand	No. 40 (0.425 mm) to No. 200 (0.075 mm)
Silt and Clay	Smaller than No. 200 (0.075 mm)

[4] Estimated Percentage

Component	Percentage by Weight
Trace	<5
Some	5 to <12
Modifier (silty, sandy, gravelly)	12 to <30
Very *modifier* (silty, sandy, gravelly)	30 to <50

Moisture Content

Dry - Absence of moisture, dusty, dry to the touch
Slightly Moist - Perceptible moisture
Moist - Damp but no visible water
Very Moist - Water visible but not free draining
Wet - Visible free water, usually from below water table

Symbols

Sampler Type and Description

- Blows/6" or portion of 6"
- Split-Spoon Sampler (SPT)
- California Sampler
- Ring Sampler
- Continuous Sampling
- Grab Sample
- Portion not recovered

Groundwater depth

- ATD At time of drilling
- Static water level (date)



- Cement grout surface seal
- Bentonite seal
- Filter pack with blank casing section
- Screened casing or Hydrotip with filter pack
- End cap

Classifications of soils in this report are based on visual field and/or laboratory observations, which include density/consistency, moisture condition, grain size, and plasticity estimates and should not be construed to imply field or laboratory testing unless presented herein. Visual-manual and/or laboratory classification methods of ASTM D-2487 and D-2488 were used as an identification guide for the Unified Soil Classification System.

(1) Percentage by dry weight
(2) Combined USCS symbols used for fines between 5% and 12%
(3) (SPT) Standard Penetration Test (ASTM D-1586)
(4) In General Accordance with Standard Practice for Description and Identification of Soils (ASTM D-2488)

DRAFT

associated earth sciences incorporated

EXPLORATION LOG KEY FIGURE: A1

Blocks\ dwg \ log_key 2022.dwg LAYOUT: Layout 5 - 2022 Logdraft

associated earth sciences incorporated

Exploration Boring EB-1

Geologic/Hydrogeologic Evaluation - Grip Road Mine — Sheet: 1 of 2

Skagit County, WA	Start Date: 9/8/25	Logged By: FGR
20130228E002	Ending Date: 9/8/25	Approved By: JHS

Driller/Equipment: Geologic Drill Partners, Inc./Recon Rig
Hammer Weight/Drop: 140#/30"
Hole Diameter (in): 6
Groundwater Depth ATD (ft): Not encountered

Total Depth (ft): 36.5
Ground Surface Elevation (ft): ≈142
Datum: NAVD 88
Groundwater Depth Post Drilling (ft) (Date): ()

Depth (ft)	Sample Type	Sample	% Recovery	Graphic Symbol	Description	Water Level	Blows/6"	Blows/Foot (10 20 30 40 50+)	Other Tests
0		1			**Topsoil/Grass - 2 inches** **Fill** Slightly moist, brown, silty, gravelly, fine to medium SAND; gravel is crushed; unsorted (SM).		3 6 6	12	
2.5		2			Moist, grayish brown with oxidation staining, SILT; occasional organic wood pieces; slightly plastic (ML).		2 2 2	4	
5		3			Moist, bluish gray, SILT; occasional organic stringers; brownish gray in upper 4 inches; slightly plastic (ML).		2 1 2	3	
7.5		4			**Everson Glaciomarine Drift** Moist, light brown, clayey, SILT, trace gravel; plastic; massive (ML).		4 5 6	11	
10		5			As above.		2 5 5	10	
12.5									
15		6			As above; trace organic dark brown staining and coarse sand; rare oxidation staining around organic stringers.		3 5 8	13	
17.5									

DRAFT

10/13/2025

20130228E002

associated earth sciences incorporated

Exploration Boring EB-1

Geologic/Hydrogeologic Evaluation - Grip Road Mine — Sheet: 2 of 2

Skagit County, WA	Start Date: 9/8/25	Logged By: FGR
20130228E002	Ending Date: 9/8/25	Approved By: JHS

Driller/Equipment: Geologic Drill Partners, Inc./Recon Rig
Hammer Weight/Drop: 140#/30"
Hole Diameter (in): 6
Total Depth (ft): 36.5
Ground Surface Elevation (ft): ≈142
Datum: NAVD 88
▼ Groundwater Depth ATD (ft): Not encountered
▽ Groundwater Depth Post Drilling (ft) (Date): ()

Depth (ft)	Sample Type	Sample	% Recovery	Graphic Symbol	Description	Water Level	Blows/6"	Blows/Foot (10 20 30 40 50+)	Other Tests
20		7			Moist, gray, clayey, SILT; rare oxidation staining around organic stringers; effervesces with hydrochloric acid (ML).		2 3 5	8	
22.5									
25		8			As above; trace fine sand; trace dark brown organic staining around stringers.		3 5 7	12	
27.5									
30		9			As above; slightly less moist; slightly blocky texture.		4 3 3	6	
32.5									
35		10			As above; no organics or oxidation.		3 6 2	8	
37.5					No groundwater encountered.				

DRAFT

10/13/2025
20130228E002

associated earth sciences incorporated

Exploration Boring EB-2

Geologic/Hydrogeologic Evaluation - Grip Road Mine — Sheet: 1 of 2

Skagit County, WA	Start Date: 9/8/25	Logged By: FGR
20130228E002	Ending Date: 9/8/25	Approved By: JHS

Driller/Equipment: Geologic Drill Partners, Inc./Recon Rig
Hammer Weight/Drop: 140#/30"
Hole Diameter (in): 6
Total Depth (ft): 26.5
Ground Surface Elevation (ft): ≈152
Datum: NAVD 88
Groundwater Depth ATD (ft): Not encountered
Groundwater Depth Post Drilling (ft) (Date): ()

Depth (ft)	Sample Type	Sample	% Recovery	Graphic Symbol	Description	Water Level	Blows/6"	Blows/Foot (10 20 30 40 50+)	Other Tests
0		1			**Topsoil/Grass - 4 inches** **Fill** Slightly moist, brownish gray, sandy, GRAVEL, some silt; gravel is crushed; unsorted (GM).		6 7 6	13	
2.5		2			Very moist, light brown, SILT; topsoil and crushed rock; little to no recovery (ML). Drill chatter at 3 feet; easy drilling after 3 feet.		4 4 5	9	
5		3			Moist, light brown, GRAVEL, some sand, some silt; gravel is crushed; broken gravel; silt in upper 2 inches; unsorted (GP).		4 6 4	10	
7.5		4			**Everson Glaciomarine Drift** Moist to very moist, light brownish gray, SILT; occasional organic pieces and rootlets; plastic; possible original grade due to rootlets (ML).		0 1 2	3	
10		5			Moist, light brown with minor oxidation staining, clayey, SILT; massive (ML).		3 5 6	11	
12.5									
15		6			As above.		6 10 13	23	
17.5									

DRAFT

10/13/2025

20130228E002

associated earth sciences incorporated

Exploration Boring EB-2

Geologic/Hydrogeologic Evaluation - Grip Road Mine — Sheet: 2 of 2

Skagit County, WA	Start Date: 9/8/25	Logged By: FGR
20130228E002	Ending Date: 9/8/25	Approved By: JHS

Driller/Equipment: Geologic Drill Partners, Inc./Recon Rig
Hammer Weight/Drop: 140#/30"
Hole Diameter (in): 6
Groundwater Depth ATD (ft): Not encountered

Total Depth (ft): 26.5
Ground Surface Elevation (ft): ≈152
Datum: NAVD 88
Groundwater Depth Post Drilling (ft) (Date): ()

Depth (ft)	Sample Type	Sample	% Recovery	Graphic Symbol	Description	Water Level	Blows/6"	Blows/Foot (10 20 30 40 50+)	Other Tests
20		7			Moist, gray, clayey, SILT; massive; plastic; effervesces with hydrochloric acid (ML).		5 8 8	16	
22.5									
25		8			As above.		3 3 4	7	
					No groundwater encountered.				
27.5									
30									
32.5									
35									
37.5									

DRAFT

10/13/2025

20130228E002

associated earth sciences incorporated

Exploration Boring EB-3

Geologic/Hydrogeologic Evaluation - Grip Road Mine — Sheet: 1 of 2

Skagit County, WA	Start Date: 9/8/25	Logged By: FGR
20130228E002	Ending Date: 9/8/25	Approved By: JHS

Driller/Equipment: Geologic Drill Partners, Inc./Recon Rig
Hammer Weight/Drop: 140#/30"
Hole Diameter (in): 6
Groundwater Depth ATD (ft): Not encountered

Total Depth (ft): 26.5
Ground Surface Elevation (ft): ≈165
Datum: NAVD 88
Groundwater Depth Post Drilling (ft) (Date): ()

Depth (ft)	Sample Type	Sample	% Recovery	Graphic Symbol	Description	Water Level	Blows/6"	Blows/Foot (10 20 30 40 50+)	Other Tests
0		1			**Topsoil/Grass - 2 inches** **Fill** Slightly moist, sandy, GRAVEL, some silt; gravel is crushed and broken; unsorted (GM-GP).		3 4 3	7	
2.5		2			**Everson Glaciomarine Drift** Slightly moist, light brown with minor oxidation, SILT; massive; very difficult to remove SPT from auger; rare 45 degree fractures and slicken faces (ML).		3 4 6	10	
5		3			Moist, light brown, SILT; plastic; massive (ML).		5 6 7	13	
7.5		4			As above.		3 6 8	14	
10		5			As above.		4 5 7	12	
12.5									
15		6			As above; becoming gray.		3 4 5	9	
17.5									

DRAFT

10/13/2025

20130228E002

associated earth sciences incorporated

Exploration Boring EB-3

Geologic/Hydrogeologic Evaluation - Grip Road Mine — Sheet: 2 of 2

Skagit County, WA	Start Date: 9/8/25	Logged By: FGR
20130228E002	Ending Date: 9/8/25	Approved By: JHS

Driller/Equipment: Geologic Drill Partners, Inc./Recon Rig
Hammer Weight/Drop: 140#/30"
Hole Diameter (in): 6
Groundwater Depth ATD (ft): Not encountered

Total Depth (ft): 26.5
Ground Surface Elevation (ft): ≈165
Datum: NAVD 88
Groundwater Depth Post Drilling (ft) (Date): ()

Depth (ft)	Sample Type	Sample	% Recovery	Graphic Symbol	Description	Water Level	Blows/6"	Blows/Foot (10 20 30 40 50+)	Other Tests
20		7			Moist, gray, clayey, SILT; plastic; massive; effervesces with hydrochloric acid (ML).		3 3 4	7	
22.5									
25		8			As above.		3 3 6	9	
					No groundwater encountered.				
27.5									
30									
32.5									
35									
37.5									

DRAFT

10/13/2025

20130228E002

associated earth sciences incorporated

Exploration Boring EB-4

Geologic/Hydrogeologic Evaluation - Grip Road Mine — Sheet: 1 of 2

Skagit County, WA	Start Date: 9/8/25	Logged By: FGR
20130228E002	Ending Date: 9/5/25	Approved By: JHS

Driller/Equipment: Geologic Drill Partners, Inc./Recon Rig
Hammer Weight/Drop: 140#/30"
Hole Diameter (in): 6
Total Depth (ft): 36.5
Ground Surface Elevation (ft): ≈180
Datum: NAVD 88
Groundwater Depth ATD (ft): Not encountered
Groundwater Depth Post Drilling (ft) (Date): ()

Depth (ft)	Sample Type	Sample	% Recovery	Graphic Symbol	Description	Water Level	Blows/6"	Blows/Foot (10 20 30 40 50+)	Other Tests
0		1			**Topsoil/Grass - 2 inches** **Fill** Slightly moist, light brown, sandy, GRAVEL, some silt; gravel is broken and crushed; unsorted (GP).		4 8 9	17	
2.5		2			Moist, oxidized orangish brown, sandy, SILT; occasional rootlets; brick and charcoal; unsorted (ML).		3 3 3	6	
5		3			**Mass Wasting Deposit** Moist, light brown, SILT; slightly disturbed; blocky texture; plastic (ML).		3 3 4	7	
7.5		4			**Everson Glaciomarine Drift** Moist, light brown, SILT; massive (ML).		2 4 8	12	
10		5			Moist, gray, clayey, SILT; plastic; massive; effervesces with hydrochloric acid (ML).		4 4 6	10	
12.5									
15		6			As above.		3 3 4	7	
17.5									

DRAFT

10/13/2025
20130228E002

associated earth sciences incorporated

Exploration Boring EB-4

Geologic/Hydrogeologic Evaluation - Grip Road Mine — Sheet: 2 of 2

Skagit County, WA	Start Date: 9/8/25	Logged By: FGR
20130228E002	Ending Date: 9/5/25	Approved By: JHS

Driller/Equipment: Geologic Drill Partners, Inc./Recon Rig
Hammer Weight/Drop: 140#/30"
Hole Diameter (in): 6
Total Depth (ft): 36.5
Ground Surface Elevation (ft): ≈180
Datum: NAVD 88
▼ Groundwater Depth ATD (ft): Not encountered
▽ Groundwater Depth Post Drilling (ft) (Date): ()

Depth (ft)	Sample Type	Sample	% Recovery	Graphic Symbol	Description	Water Level	Blows/6"	Blows/Foot (10 20 30 40 50+)	Other Tests
20		7			As above; single broken gravel mid sample.		3 3 3	6	
22.5									
25		8			As above.		2 2 4	6	
27.5									
30		9			As above.		2 3 3	6	
32.5									
35		10			As above.		2 3 4	7	
37.5					No groundwater encountered.				

DRAFT

10/13/2025
20130228E002

associated earth sciences incorporated

Exploration Boring EB-5

Geologic/Hydrogeologic Evaluation - Grip Road Mine — Sheet: 1 of 2

Skagit County, WA	Start Date: 9/8/25	Logged By: FGR
20130228E002	Ending Date: 9/8/25	Approved By: JHS

Driller/Equipment: Geologic Drill Partners, Inc./Recon Rig
Hammer Weight/Drop: 140#/30"
Hole Diameter (in): 6
Groundwater Depth ATD (ft): Not encountered

Total Depth (ft): 26.5
Ground Surface Elevation (ft): ≈192
Datum: NAVD 88
Groundwater Depth Post Drilling (ft) (Date): ()

Depth (ft)	Sample Type	Sample	% Recovery	Graphic Symbol	Description	Water Level	Blows/6"	Blows/Foot (10 20 30 40 50+)	Other Tests
0		1			**Topsoil/Grass - 2 inches** **Fill** Slightly moist, light brown and black, sandy, GRAVEL, some silt; gravel is crushed and broken; unsorted (GP).		7 7 6	13	
2.5		2			**Mass Wasting Deposit** Moist, light brown, sandy, SILT; occasional charcoal; unsorted (ML).		3 2 4	6	
5		3			As above; disturbed appearance.		4 7 4	11	
7.5					**Everson Glaciomarine Drift** Slightly moist, light brown, SILT; slightly fractured texture; rare slicken faces; blocky; massive (ML).				
10		4			Moist, light brown, clayey, SILT; plastic; massive (ML).		2 2 3	5	
12.5									
15		5			As above.		3 3 2	5	
17.5									

DRAFT

10/13/2025
20130228E002

associated earth sciences incorporated

Exploration Boring EB-5

Geologic/Hydrogeologic Evaluation - Grip Road Mine — Sheet: 2 of 2

Skagit County, WA	Start Date: 9/8/25	Logged By: FGR
20130228E002	Ending Date: 9/8/25	Approved By: JHS

Driller/Equipment: Geologic Drill Partners, Inc./Recon Rig
Hammer Weight/Drop: 140#/30"
Hole Diameter (in): 6
Groundwater Depth ATD (ft): Not encountered

Total Depth (ft): 26.5
Ground Surface Elevation (ft): ≈192
Datum: NAVD 88
Groundwater Depth Post Drilling (ft) (Date): ()

Depth (ft)	Sample Type	Sample	% Recovery	Graphic Symbol	Description	Water Level	Blows/6"	Blows/Foot (10 20 30 40 50+)	Other Tests
20		6			Moist, gray, clayey, SILT; plastic; massive; effervesces with hydrochloric acid (ML).		2 3 4	7	
22.5									
25		7			As above.		2 3 3	6	
					No groundwater encountered.				
27.5									
30									
32.5									
35									
37.5									

DRAFT

10/13/2025

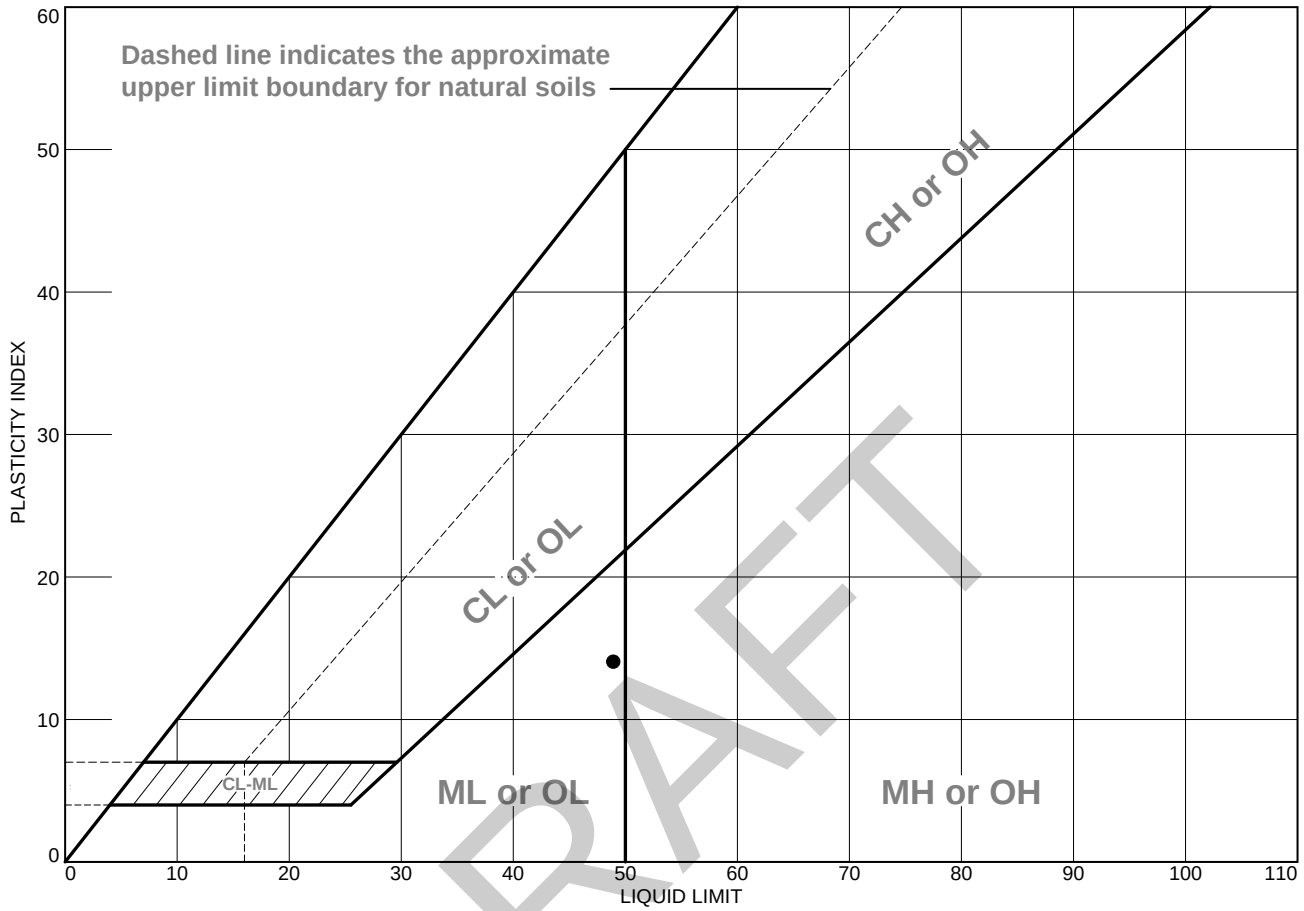
20130228E002

APPENDIX B

Laboratory Data

DRAFT

LIQUID AND PLASTIC LIMITS TEST REPORT



DRAFT

	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	very silty sandy CLAY	49	35	14	84.7	77.8	ML

Project No. 20130228 **Client:** Miles Sand and Gravel

Project: Grip Road Mine

●**Location:** Onsite **Depth:** 10' **Sample Number:** EB-3

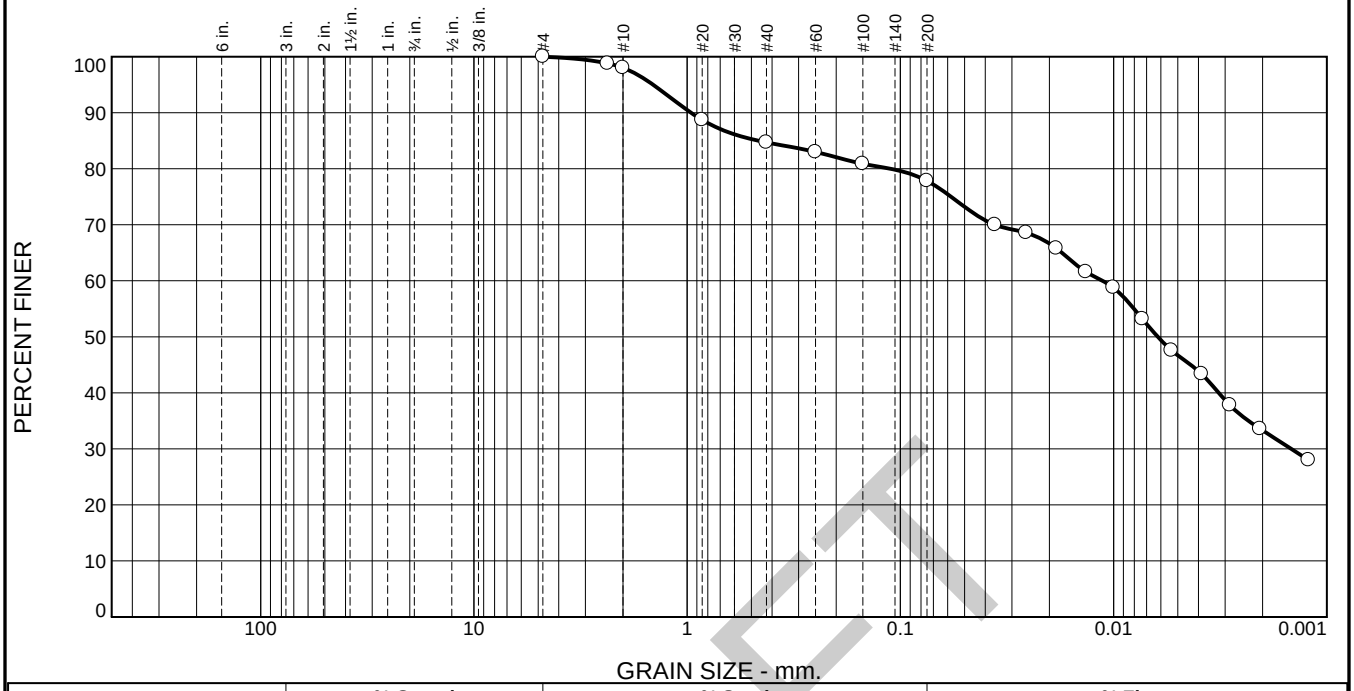
Remarks:

associated earth sciences incorporated

Figure

Tested By: FEW **Checked By:** FGR/TR

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	2.0	13.3	6.9	31.1	46.7

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	100.0		
#8	98.8		
#10	98.0		
#20	88.7		
#40	84.7		
#60	83.0		
#100	80.9		
#200	77.8		
0.0360 mm.	70.0		
0.0257 mm.	68.6		
0.0185 mm.	65.8		
0.0135 mm.	61.6		
0.0100 mm.	58.8		
0.0073 mm.	53.2		
0.0053 mm.	47.6		
0.0039 mm.	43.4		
0.0028 mm.	37.8		
0.0021 mm.	33.6		
0.0012 mm.	28.0		

* (no specification provided)

Material Description

very silty sandy CLAY

Atterberg Limits (ASTM D 4318)

PL= 35 **LL=** 49 **PI=** 14

Classification

USCS (D 2487)= ML **AASHTO (M 145)=** A-7-5(13)

Coefficients

D_{90}= 0.9596 D_{85}= 0.4635 D_{60}= 0.0113
D_{50}= 0.0062 D_{30}= 0.0015 D_{15}=
D_{10}= C_u= C_c=

Remarks

Date Received: 9-9-2025 **Date Tested:** 9-18-2025

Tested By: FEW

Checked By: FGR/TR

Title:

Location: Onsite
Sample Number: EB-3 **Depth:** 10'

Date Sampled: 9-8-2025

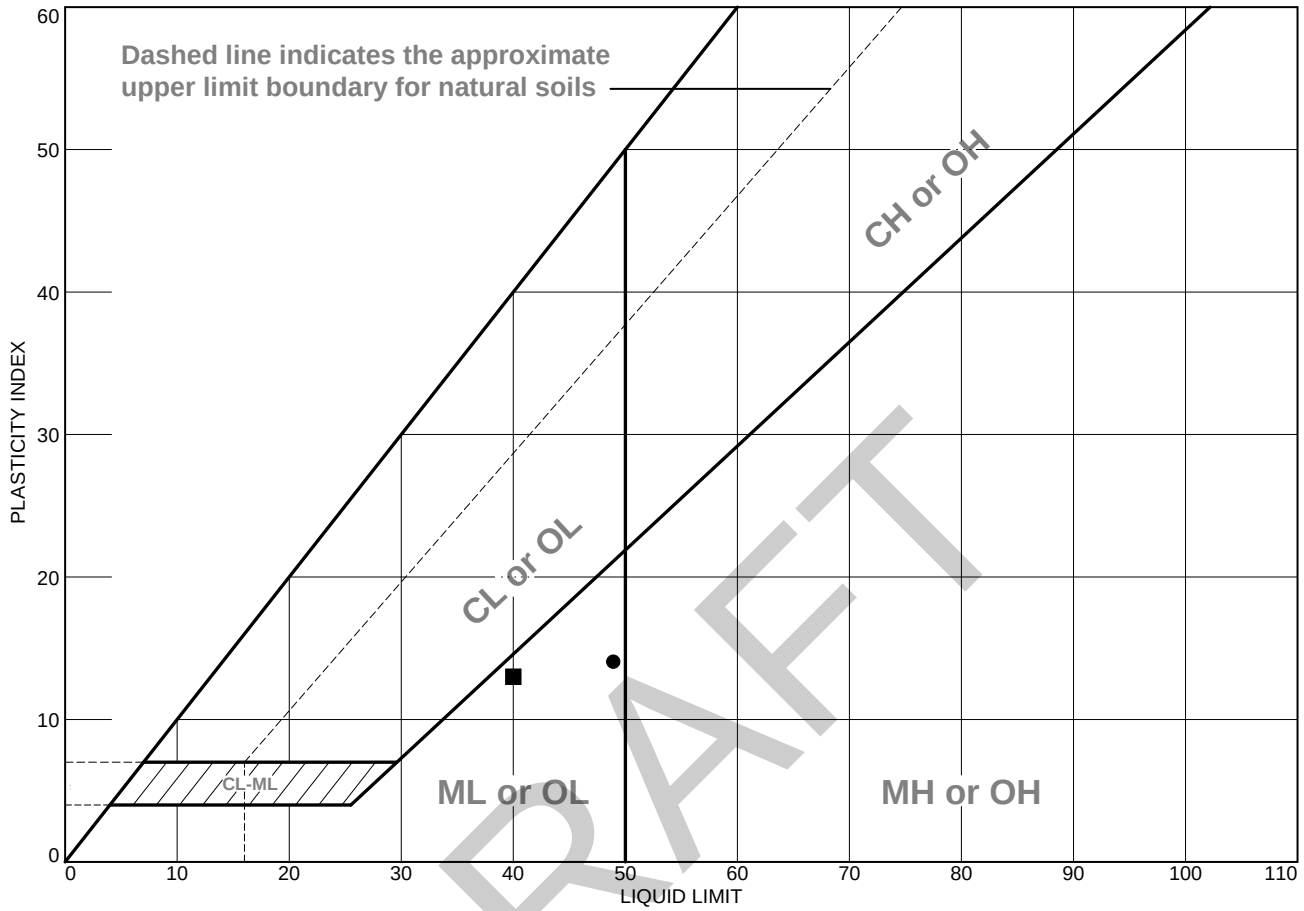
associated earth sciences incorporated

Client: Miles Sand and Gravel
Project: Grip Road Mine

Project No: 20130228 E002 **Figure**

DRAFT

LIQUID AND PLASTIC LIMITS TEST REPORT



DRAFT

	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	very silty sandy CLAY	49	35	14	84.7	77.8	ML
■	sandy silty CLAY	40	27	13	88.1	81.6	ML

Project No. 20130228 **Client:** Miles Sand and Gravel

Project: Grip Road Mine

●**Location:** Onsite **Depth:** 10' **Sample Number:** EB-3

■**Location:** Onsite **Depth:** 20' **Sample Number:** EB-3

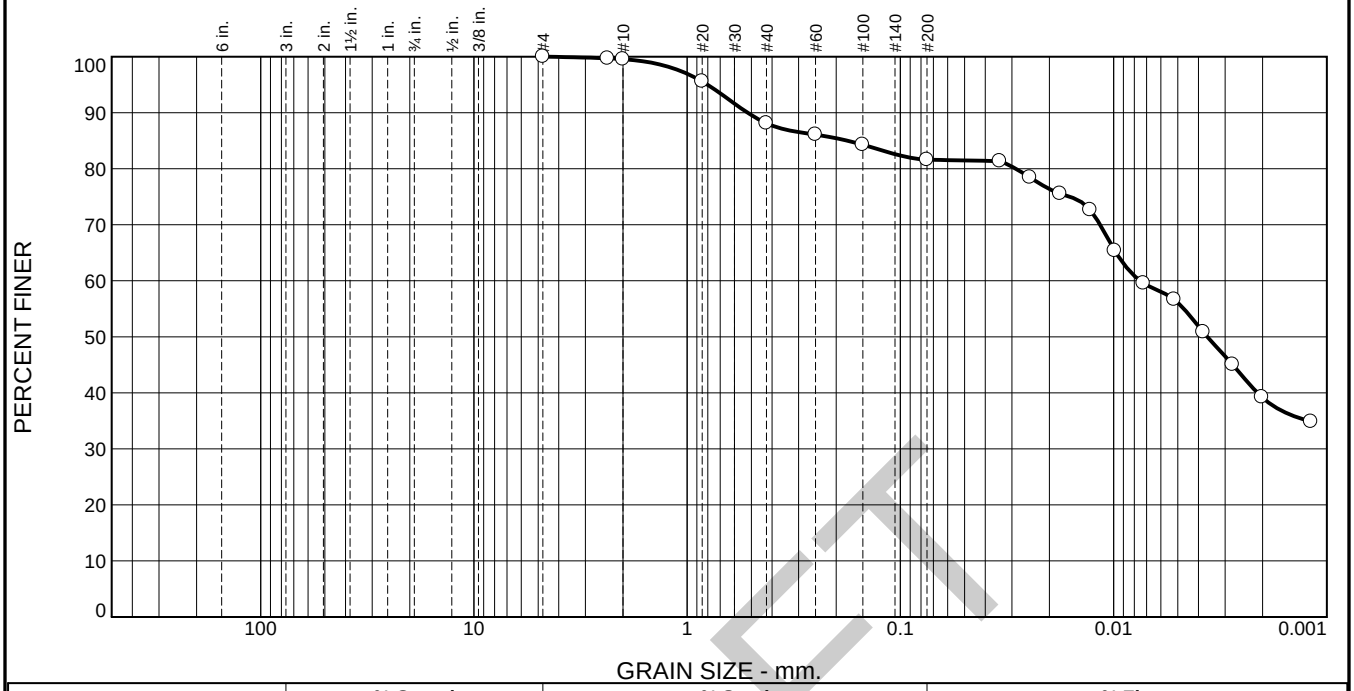
Remarks:

associated earth sciences incorporated

Figure

Tested By: FEW **Checked By:** FGR/TR

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.4	11.5	6.5	25.5	56.1

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	100.0		
#8	99.7		
#10	99.6		
#20	95.6		
#40	88.1		
#60	86.1		
#100	84.3		
#200	81.6		
0.0341 mm.	81.4		
0.0247 mm.	78.5		
0.0178 mm.	75.5		
0.0129 mm.	72.6		
0.0099 mm.	65.4		
0.0072 mm.	59.6		
0.0052 mm.	56.7		
0.0038 mm.	50.8		
0.0028 mm.	45.0		
0.0020 mm.	39.2		
0.0012 mm.	34.9		

* (no specification provided)

Material Description

sandy silty CLAY

Atterberg Limits (ASTM D 4318)

PL= 27 **LL=** 40 **PI=** 13

Classification

USCS (D 2487)= ML **AASHTO (M 145)=** A-6(11)

Coefficients

D_{90}= 0.5206 D_{85}= 0.1776 D_{60}= 0.0075
D_{50}= 0.0036 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Date Received: 9-9-2025 **Date Tested:** 10-8-2025

Tested By: FEW

Checked By: FGR/TR

Title:

Location: Onsite
Sample Number: EB-3 **Depth:** 20'

Date Sampled: 9-8-2025

associated earth sciences incorporated

Client: Miles Sand and Gravel
Project: Grip Road Mine

Project No: 20130228 E002 **Figure**

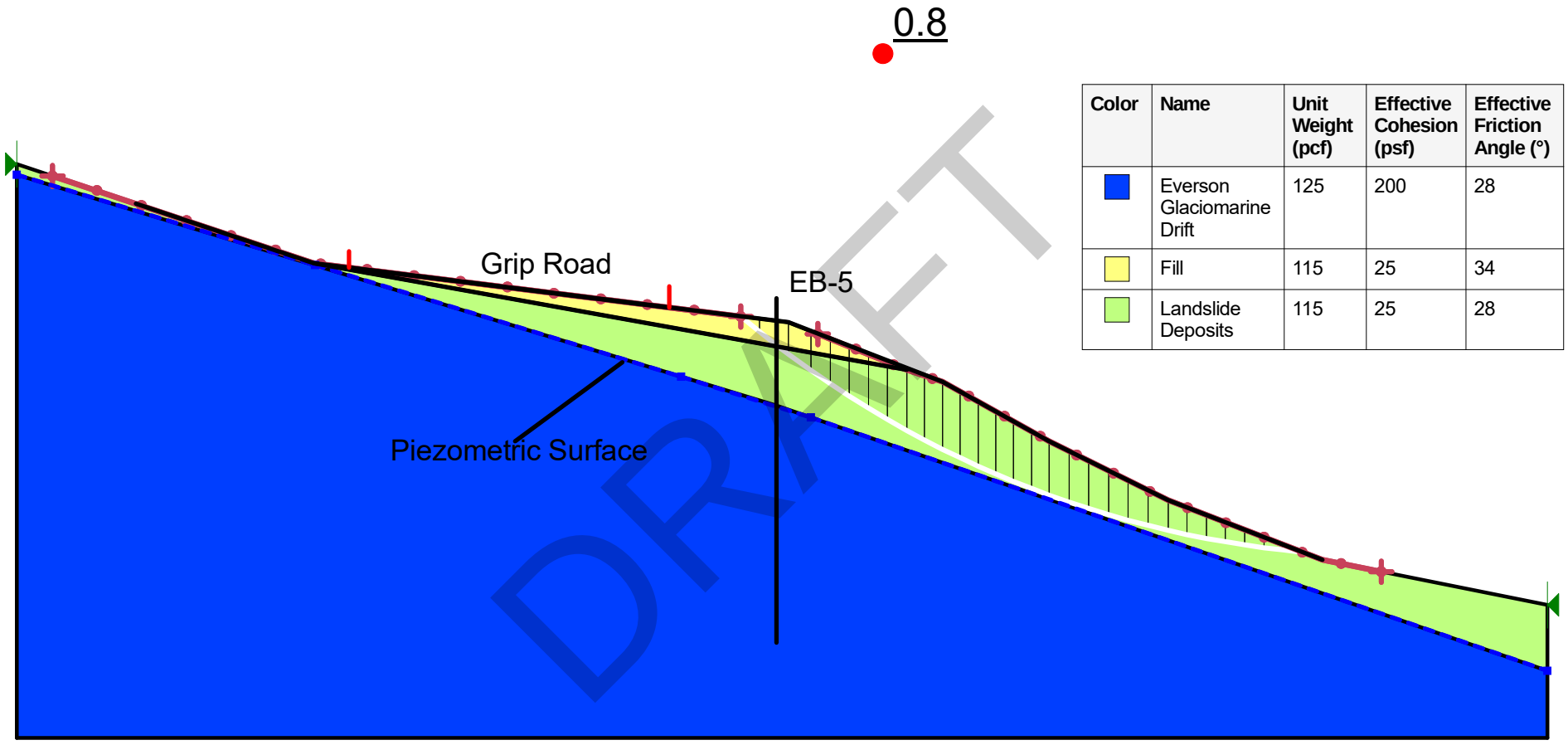
DRAFT

APPENDIX C

Slope Stability Analysis

DRAFT

General Settings:
Analysis Type: Morgenstern-Price
Direction of movement: Left to Right
Slip Surface Option: Entry and Exit
Horz Seismic Coef.: 0.265



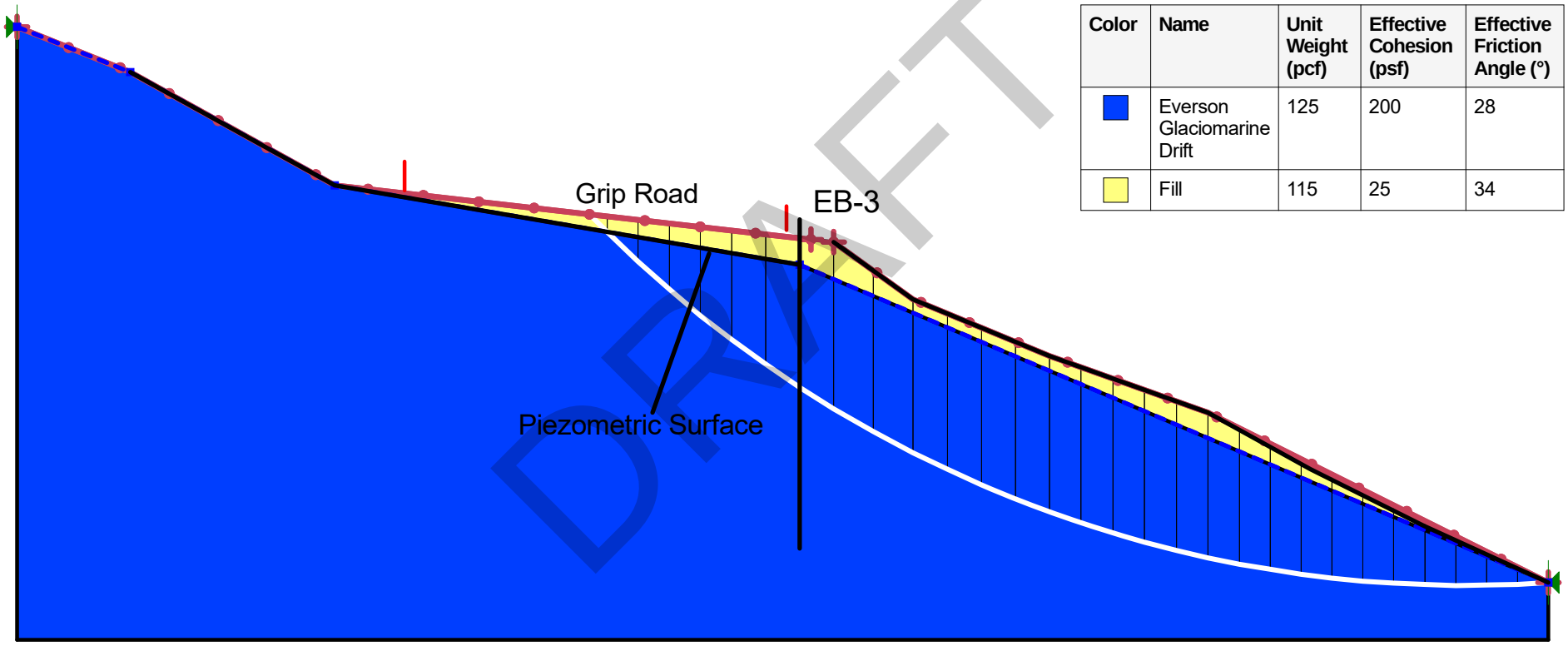
Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Everson Glaciomarine Drift	125	200	28
	Fill	115	25	34
	Landslide Deposits	115	25	28

Existing Seismic Conditions A-A'

Grip Road Widening
Date: 10/02/2025
Scale: 1:161

General Settings:
Analysis Type: Morgenstern-Price
Direction of movement: Left to Right
Slip Surface Option: Entry and Exit
Horz Seismic Coef.: 0.265

1.1



Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Everson Glaciomarine Drift	125	200	28
	Fill	115	25	34

DRAFT

B

B'

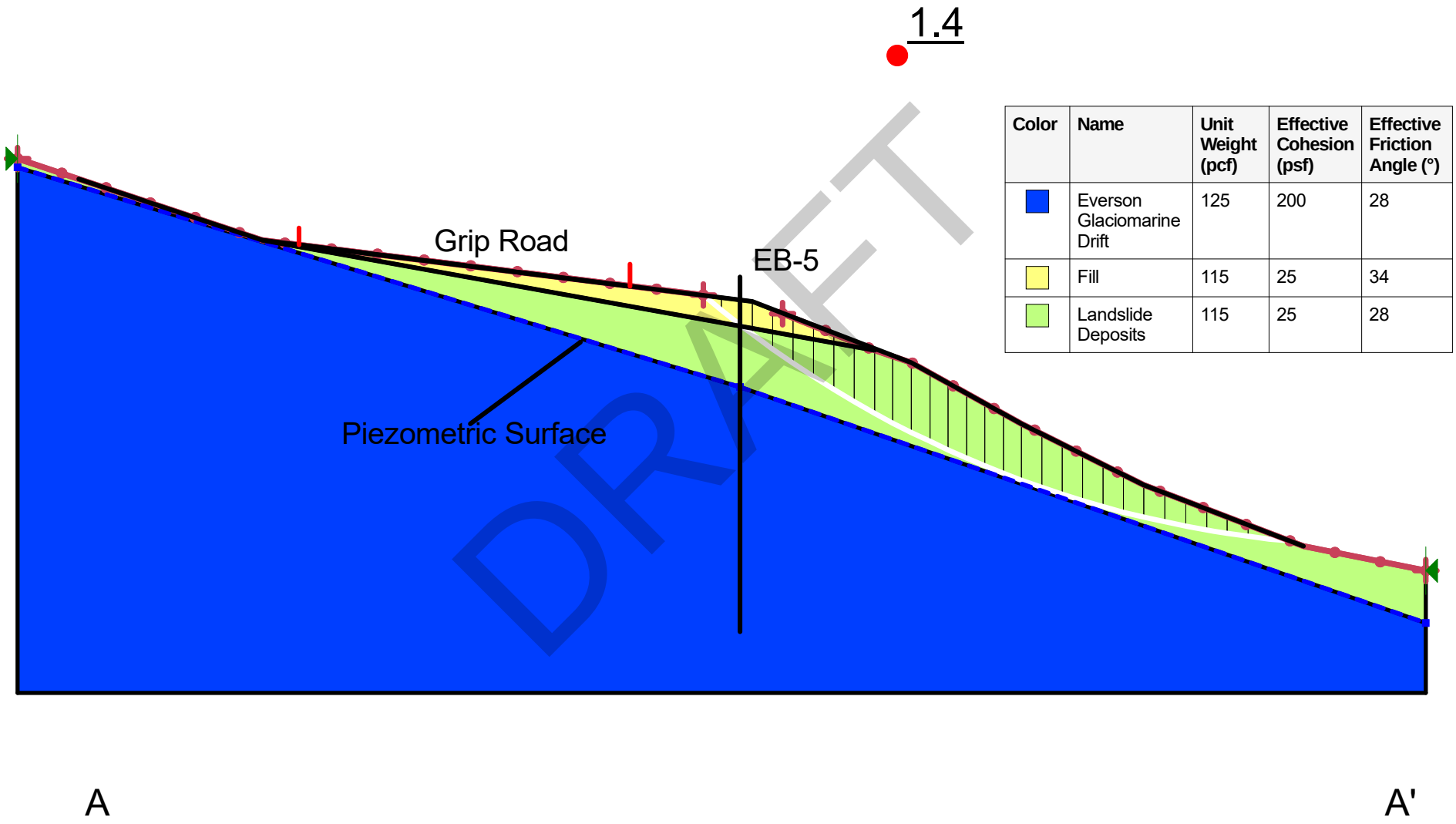
Existing Seismic Conditions B-B'

Grip Road Widening

Date: 10/02/2025

Scale: 1:169

General Settings:
Analysis Type: Morgenstern-Price
Direction of movement: Left to Right
Slip Surface Option: Entry and Exit
Horz Seismic Coef.:



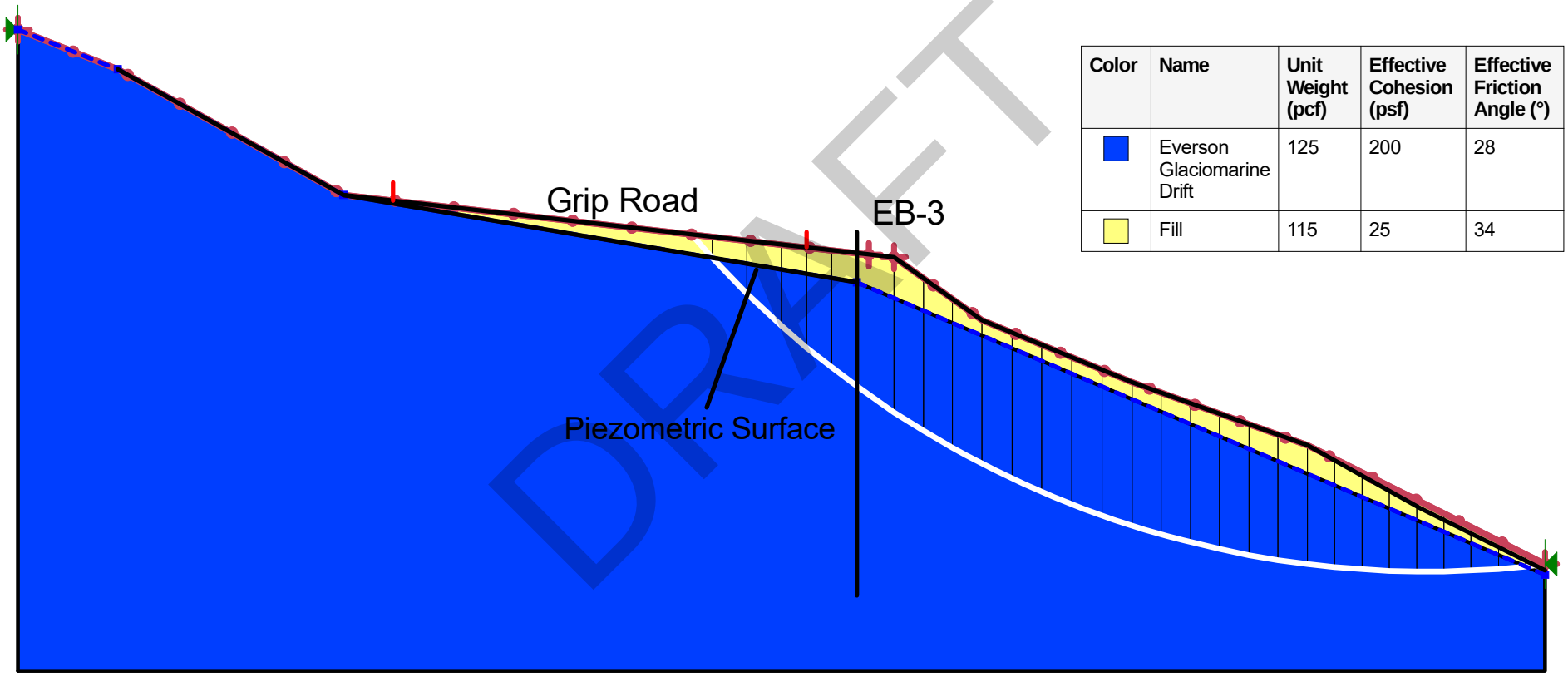
Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Everson Glaciomarine Drift	125	200	28
	Fill	115	25	34
	Landslide Deposits	115	25	28

Existing Static Conditions A-A'

Grip Road Widening
Date: 10/02/2025
Scale: 1:145

General Settings:
Analysis Type: Morgenstern-Price
Direction of movement: Left to Right
Slip Surface Option: Entry and Exit
Horz Seismic Coef.:

2.0



DRAFT

Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Everson Glaciomarine Drift	125	200	28
	Fill	115	25	34

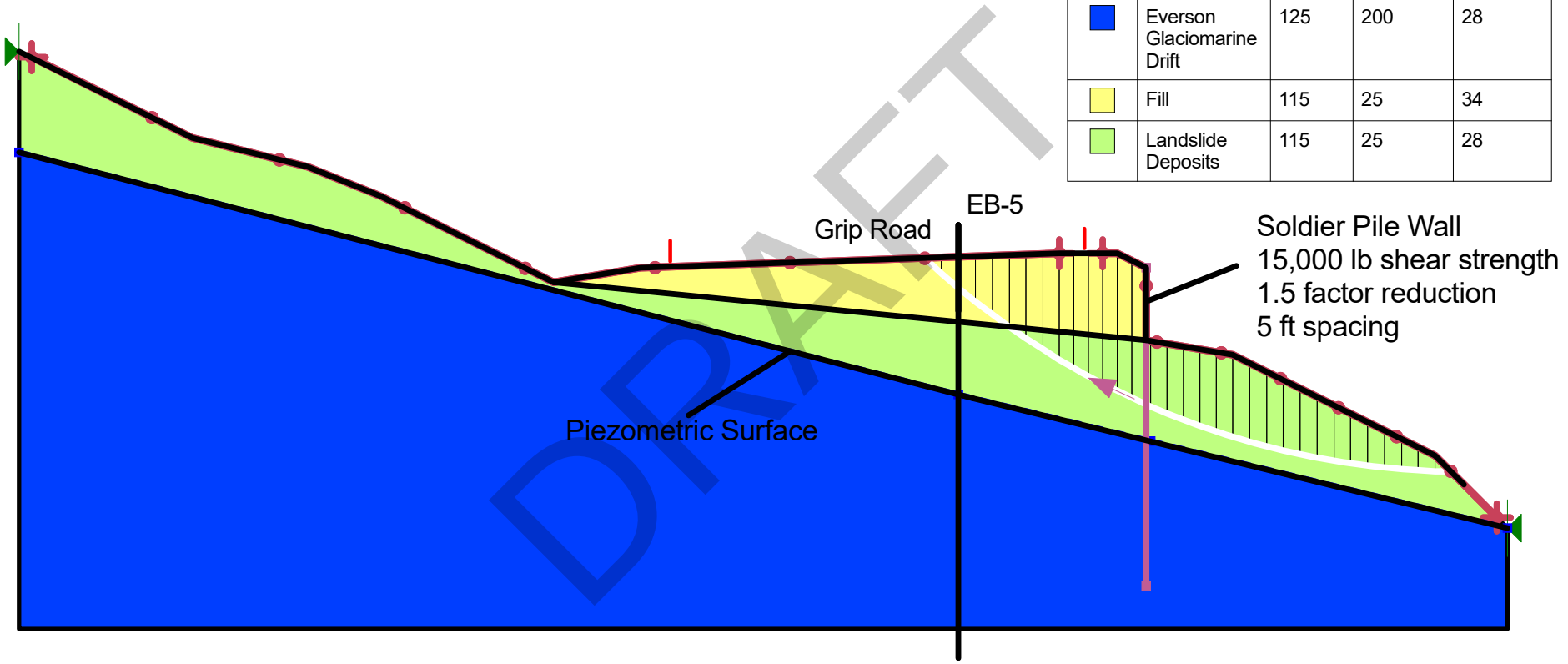
Existing Static Conditions B-B'

Grip Road Widening
Date: 10/02/2025
Scale: 1:153

General Settings:
Analysis Type: Morgenstern-Price
Direction of movement: Left to Right
Slip Surface Option: Entry and Exit
Horz Seismic Coef.: 0.265

1.0

Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Everson Glaciomarine Drift	125	200	28
	Fill	115	25	34
	Landslide Deposits	115	25	28



DRAFT

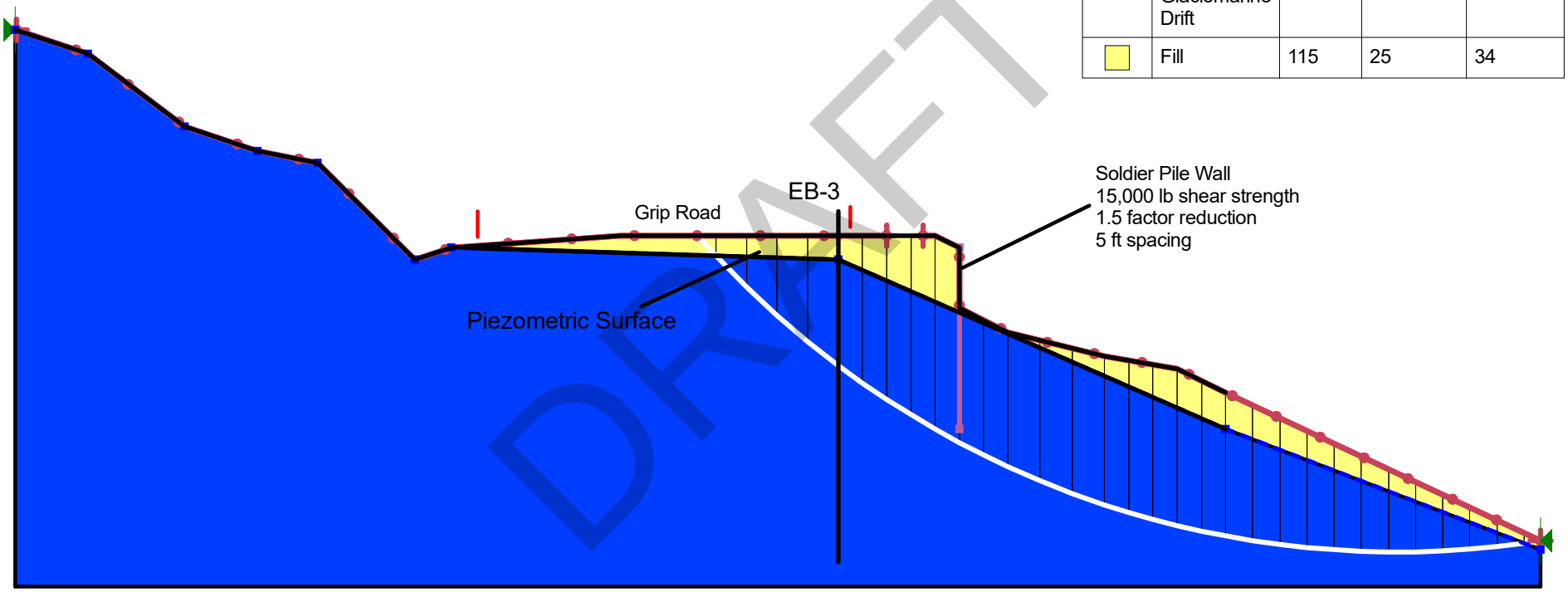
Proposed Seismic Conditions A-A' (29+00)

Grip Road Widening
Date: 10/02/2025
Scale: 1:133

General Settings:
Analysis Type: Morgenstern-Price
Direction of movement: Left to Right
Slip Surface Option: Entry and Exit
Horz Seismic Coef.: 0.265

1.2

Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Everson Glaciomarine Drift	125	200	28
	Fill	115	25	34



DRAFT

Proposed Seismic Conditions B-B' (26+00)

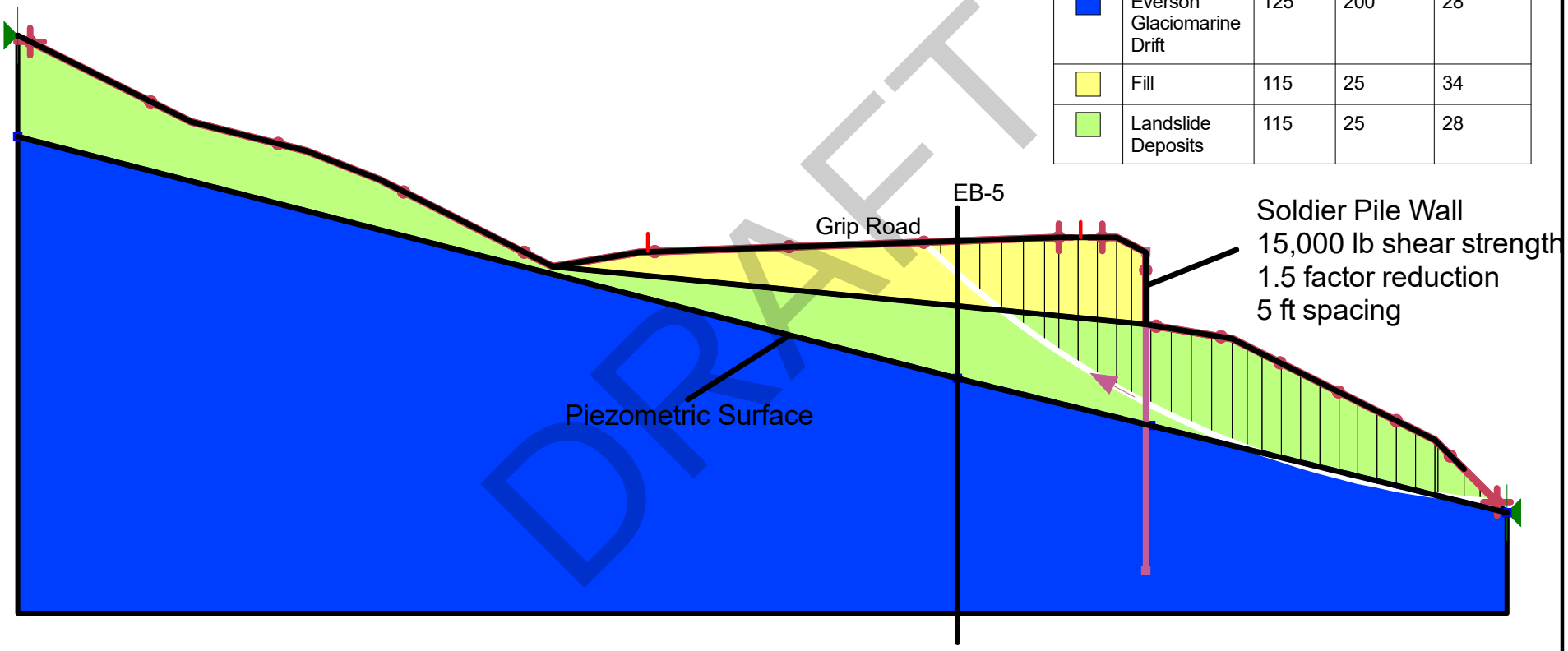
Grip Road Widening

Date: 10/02/2025

Scale: 1:158

General Settings:
Analysis Type: Morgenstern-Price
Direction of movement: Left to Right
Slip Surface Option: Entry and Exit
Horz Seismic Coef.:
1.8

Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Everson Glaciomarine Drift	125	200	28
	Fill	115	25	34
	Landslide Deposits	115	25	28



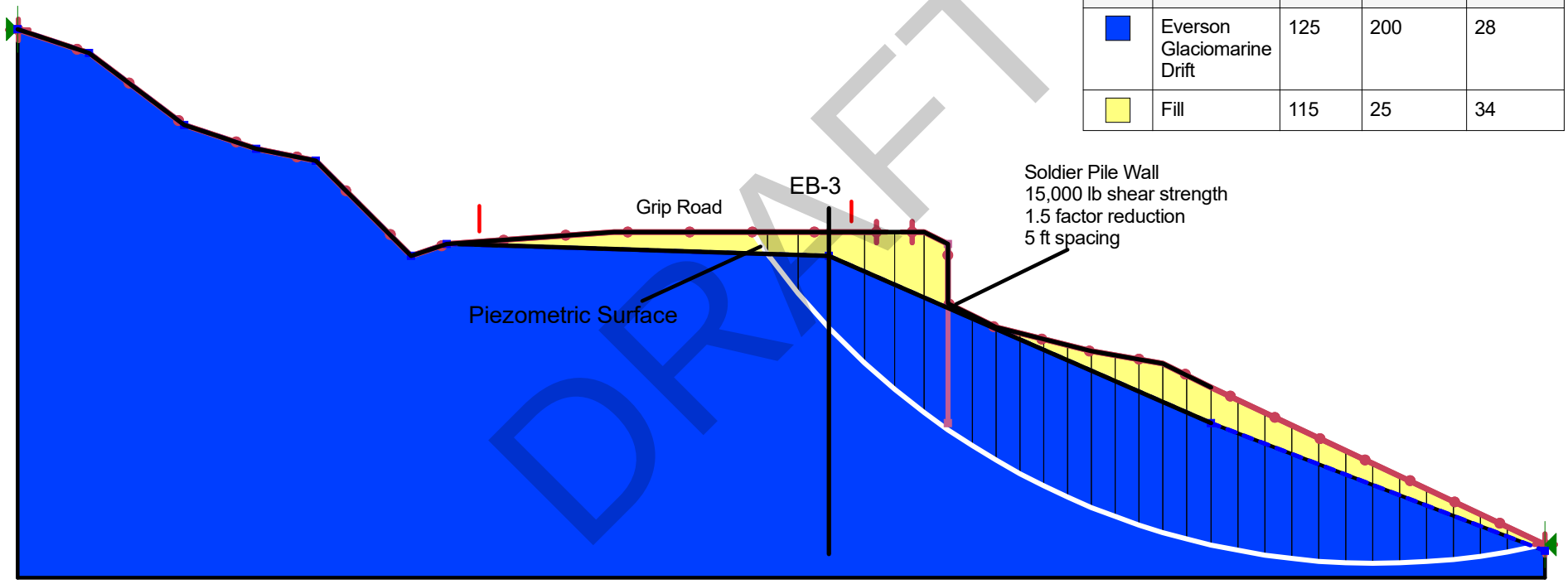
Proposed Static Conditions A-A' (29+00)

Grip Road Widening
Date: 10/02/2025
Scale: 1:131

General Settings:
Analysis Type: Morgenstern-Price
Direction of movement: Left to Right
Slip Surface Option: Entry and Exit
Horz Seismic Coef.:

2.0

Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Everson Glaciomarine Drift	125	200	28
	Fill	115	25	34



DRAFT

Proposed Static Conditions B-B' (26+00)

Grip Road Widening
Date: 10/02/2025
Scale: 1:160