



Sub-Basin 46a.3 Watercourse Stabilization Critical Areas Study

Prepared for the City of Mercer Island

November 2024

NHC Project: 2008561.01

RH2 Project: 0240025.00



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City of Mercer Island

Sub-Basin 46a.3 Watercourse Stabilization

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Sub-Basin 46a.3 Watercourse Stabilization

Critical Areas Study

Responsible Parties

Applicant	Consulting Design Engineer	Consulting Wetland Ecologist and Geologist
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Preface

This report has been prepared for use by the City of Mercer Island (City). In preparing this report, RH2 Engineering, Inc., (RH2) used site information from the following project efforts: 1) geologically hazardous areas and geologic data review and site investigation completed by RH2 in February 2024; 2) hydraulic, hydrologic, and geomorphic analysis completed by Northwest Hydraulic Consultants, Inc., (NHC) in early 2024; 3) biological critical areas data review, site investigations, and critical areas mapping completed by RH2 in April 2024; 4) site meeting and email follow up with the Washington Department of Fish and Wildlife (WDFW) Area Habitat Biologist in April 2024 and a virtual meeting in September 2024 with WDFW; 5) limited site survey completed by NHC in September 2024; and 6) a virtual meeting with the City’s Building Department staff and the project team in September 2024. Background data, reports, and maps used to prepare this report were obtained from the City, NHC, King County (County), WDFW, the Washington State Department of Natural Resources (DNR), and the Washington State Department of Ecology (Ecology), among others. Findings detailed in this report are based on site conditions observed by RH2, as well as our understanding of federal, state, and local regulations governing critical areas. The critical areas boundaries, classifications, buffers, and report content reflect the City’s Critical Areas Regulations (Chapter 19.07 Mercer Island City Code (MICC)) at the time of this report preparation. These designations may change pending review by the appropriate jurisdictional agencies.

General Information

1. Project Name: Sub-Basin 46a.3 Watercourse Stabilization
2. Name of applicant: City of Mercer Island
3. Name of organization providing this information: RH2
4. Technical Expertise/Qualifications: Resumes for RH2 staff involved in preparing this report are provided in **Appendix A**.

5. Date Prepared: November 27, 2024. This report replaces a preliminary version dated August 2024 and has been updated to reflect final design, including survey, mitigation, and geologically hazardous areas risk discussion.
6. Location of the Proposal: The project site is located within the 53rd Place Open Space, a City-designated natural area accessed along SE 53rd Place between Island Crest Way and E Mercer Way. A Type F stream flows from west to east within this open space area. The City refers to this drainage as Watercourse 46a.3 and the larger drainage basin as Sub-Basin 46a.3. The project involves ravine grade control improvements within approximately 500 linear feet (lf) of Watercourse 46a.3.
7. Identification of the Proposal: The project aims to reduce streambank erosion to improve water quality and stream habitat and reduce City maintenance requirements within Watercourse 46a.3. To this end, proposed improvements will augment existing channel bed structures and install new bed control and toe structures to limit downcutting and bank erosion and increase overall bank stability in Watercourse 46a.3.
8. Description of Existing Site: The 53rd Place Open Space is a natural area containing mixed deciduous-coniferous forests and a steep ravine that conveys the riparian corridor of Watercourse 46a.3 drainage. The riparian corridor includes the Type F stream, tributary drainages, associated groundwater seeps, and wetlands. The open space area is bounded to the north by SE 53rd Place and to the south by a gravel and earthen walking trail within the open space area, and then upslope, single-family residences. Urban development, primarily single- and multi-family residential uses, is prevalent outside of the immediate project footprint.
9. Report Accuracy: This report was prepared to reflect the current project site conditions and proposed improvements, as well as to meet critical area reporting requirements specified in MICC 19.07.110. It also is anticipated this report will be submitted along with state and federal permit submittals. If project conditions and/or project design plans change such that the project would have substantially different effects on critical areas, an addendum to this report and/or an additional critical areas report may be necessary.
10. Site Design and Easements: Design plans are included in **Appendix B**. The 53rd Place Open Space is a City-owned parcel; therefore, no easements are needed for this work.
11. Bibliography: Sources cited are listed in the **References** section.
12. Mitigation Sequencing: Sequencing to demonstrate avoidance and minimization of impacts to regulated critical areas has been conducted per MICC 19.07.100. Additionally, project compliance with MICC 19.07.160 for geological hazards is demonstrated in this report. Project objectives necessitate minor permanent fill in Watercourse 46a.3 and temporary impacts to stream and buffer habitat. Refer to the **Project Impacts and Mitigation** section.

Introduction

Project Background and Description

Watercourse 46a.3 is situated within a steep ravine primarily bounded by the 53rd Place Open Space, in an area that has experienced pre-historic and historic landslide activity. Ongoing erosion of the watercourse results in frequent City maintenance and dredging of the sediment pond on the west side of E Mercer Way, causing adverse impacts to downstream water quality and aquatic habitat. Consequently, the City prioritized the Sub-Basin 46a.3 Watercourse Stabilization project in its Capital Improvement Program (CIP). The City's goals for the project include reducing streambank erosion in Watercourse 46a.3 to improve water quality and stream habitat and to reduce maintenance requirements. The City retained NHC and its subconsultant, RH2, to prepare design plans and construction documents, and support permitting efforts for the project.

The City has implemented various measures to stabilize Watercourse 46a.3 within the past 25 years. In 2000, the City installed numerous rock check dams between Stations 0+00 and 9+50¹ (City of Mercer Island, 2000). In 2008, the City installed storm pipe to divert flows from the contributing drainage north of SE 53rd Place (Tributary 1) and tightline flows to downstream of E Mercer Way, effectively reducing base flow of the watercourse. Since completion of these stabilization measures, the City completed two assessments of the watercourse in 2011 and 2014 as part of its Comprehensive Basin Review and Watercourse Monitoring Program. Both assessments indicated erosion of landslide deposits in the central portion of the watercourse (between Stations 5+00 and 7+00) is a likely source of sediment. These assessments recommended flow bypass and stream stabilization measures in the reach of the stream with active erosion. The 2011 and 2014 assessments led to development of the City's CIP project that is the subject of this report.

To address ongoing erosion and reduce maintenance needs, thereby improving water quality and stream habitat, the project proposes ravine grade control measures. These include augmentation of existing natural channel bed structures, installation of new bed control structures, and installation of toe structures, all aimed at reducing downcutting of the watercourse and increasing overall bank stability. Control structures will be constructed of large woody debris (LWD) (10- to 12-inch logs), racking (4- to 8-inch logs), slash material, coir fabric, burlap sacks, streambed cobble and boulders, and riparian plantings. Proposed improvements are shown in the design plans (**Appendix B**).

Project Location

The project involves work in an approximately 500 lf reach of Watercourse 46a.3 between Stations 4+50 and 9+50. Construction is anticipated within an area covering approximately 14,000 square feet (sf) (0.32 acres (ac)) in and adjacent to the SE 53rd Place Open Space (parcel no. 1924059186). Equipment staging is proposed along SE 53rd Place at the top of the

¹ Stream stationing begins at E Mercer Way and progresses in the upstream direction (west) along the watercourse (**Figure 1**).

ravine slope and within designated upland benches adjacent to the watercourse. The project is in Section 19, Township 24N, Range 05E.

Previous Work

Prior work and studies relevant to Sub-Basin 46a.3 and/or directly related to this project include the following:

- Drainage Basin Improvements, Drainage Basins 48 and 46A – Design Drawings (City of Mercer Island, Public Works Department, 2000).
- Basin Drainage Improvements, Wd524C – Design Drawings (City of Mercer Island, Public Works Department, 2008).
- Comprehensive Basin Review and Watercourse Monitoring, Project Summary Sheet (City of Mercer Island, Public Works Department, 2011).
- *Subbasin 46a.3 Watercourse Stabilization Design Project Preliminary Basis of Design Report* (Preliminary BODR) (NHC, 2024).

Regulatory Requirements

This report has been prepared to meet the requirements of Chapter 19.07 MICC; however, this report also will facilitate review/compliance with applicable state and federal regulations. The following approvals are expected for this project.

- State Environmental Policy Act – City
- Building Permit – City
- Grading Permit – City
- Stormwater Permit – City
- Critical Areas Code (CAC) compliance – City
- Hydraulic Project Approval – WDFW
- Clean Water Act Water Quality Certification (Section 401 Nationwide) – Ecology
- Clean Water Act Fill/Dredge Permit (Section 404 Nationwide) – U.S. Army Corps of Engineers (USACE)

The City has indicated it considers this bank stabilization and stream restoration project to be exempt from the City's CAC per MICC 19.07.120(D). Although exempt, the City requires the preparation of a report that describes on-site critical areas from site investigations and demonstrates reasonable methods to avoid and minimize impacts to critical areas and buffers consistent with MICC 19.07.100. Included in critical areas are geological hazards, which were assessed by RH2, as well as biological critical areas. Impacts and risks associated with the on-site geological hazards are addressed in this report in accordance with MICC 19.07.160(B)(3).

Methods

Background Review

Prior to environmental field investigations, the following background information was reviewed:

- Project area specific and surrounding area data and reports (various sources).
- Existing and historical aerial photography (Google Earth).
- Stream and wetland mapping (City, County, Ecology, WDFW, and U.S. Fish and Wildlife Service (USFWS)).
- Topography and LiDAR (City, County, DNR, U.S. Geological Survey (USGS), and the Puget Sound LiDAR Consortium).
- Floodplain mapping (City, County, and Federal Emergency Management Agency (FEMA)).
- Geologic hazards (DNR and City).
- Fish and wildlife occurrence data (WDFW, National Oceanic and Atmospheric Administration (NOAA) Fisheries, and USFWS).
- Soils data (U.S. Department of Agriculture National Resources Conservation Service (NRCS) Soil Conservation Service).

Field Investigations

Field investigations were completed by the RH2 team as follows:

- Biological critical areas investigation and delineations were completed April 23, and April 24, 2024, by Ms. Alicia Pettibone, Mr. Noah Bloxton, and Mr. Skylar Netherland of RH2.
- Geologic and geologically hazardous areas site investigation was completed February 9, 2024, by Mr. Steve Nelson of RH2.

Information from hydraulic, hydrologic, and geomorphic analysis and site investigations completed by NHC in January and February 2024 also informed RH2 field investigations. The results of these investigations are summarized in the Preliminary BODR (NHC, 2024).

Methodology

Methodology used to delineate and characterize wetlands, streams, and fish and wildlife habitat conservation areas (FWHCAs) is as follows:

- *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)* (USACE Publication ERDC/EL TR-10-3, 2010).
- *Corps of Engineers Wetlands Delineation Manual* (USACE Publication Y-87-1, 1987).

- *Washington State Wetland Rating System for Western Washington: 2014 Update* (Hruby, Ecology Publication 14-06-029, 2014).
- *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin, L., Carter, V., Golet, F., & LaRoe, E., USFWS Publication FWS/OBS-79/31, 1979).
- *A Hydrogeomorphic Classification for Wetlands* (Brinson, USACE Publication WRP-DE-4, 1993).
- Water Typing System (Washington Administrative Code (WAC) 222-16-030).
- *Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State* (Anderson P., Meyer S., Olson P., & Stockdale, E., Ecology Publication 16-06-029, 2016).
- Chapter 19.07 MICC.

Wetlands

Wetland delineations followed the USACE *Corps of Engineers Wetland Delineation Manual - Routine Determination Methods, Subsection 2 – On-Site Inspection Necessary* (USACE, 1987) and *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2)* (USACE, 2010). Delineation of on-site wetlands also was guided by WAC 173-22-035 per MICC 19.07.190.

Wetland test pits were installed in areas within and adjacent to wetlands to determine if wetland parameters had been met. Vegetation, hydrology, and soils were characterized for each test pit and data was recorded on Wetland Determination Data forms. Test pits were staked, labeled, and flagged with neon pink flagging. Wetland boundaries were flagged and labeled with neon pink “Wetland Delineation” flagging.

The following information influenced and/or was considered during wetland delineations:

- The 3-month period prior to field work experienced drier than normal rainfall conditions per calculations using the USACE Antecedent Precipitation Tool and U.S. Drought Index.
- American beaver (*Castor canadensis*) was captured and relocated from the site by the City in the previous 12 months.
- Bank stabilization and habitat restoration efforts were completed on Watercourse 46a.3 in the last 25 years; these activities have the potential to affect riparian habitat and can influence wetland indicators.

Identified wetlands were classified using Ecology’s *Washington State Wetland Rating System for Western Washington* (Hruby, 2014). Wetlands were rated using the Ecology system and classified as Category I through IV based on this rapid functional assessment.

Streams

Streams were typed according to the Washington State Water Typing System (WAC 222-16-030). The stream types described in this report are based on the stream reaches within the study area; downstream reaches may be rated higher.

Ordinary high water mark (OHWM) delineations were completed using Ecology guidance (Anderson, et al., 2016) and the definitions in WAC 173-22-030. Ecology’s OHWM guidance presumes there are three physical criteria within the OHWM definition that apply to all shoreline types (*italics added for emphasis*): “Presence and action of *waters*... mark upon the *soil*...distinct from that of the abutting upland, in respect to *vegetation*...” Ecology states the OHWM is the dynamic boundary between the aquatic and terrestrial environments and, in most cases, is not a static elevation. Regular (ordinary) inundation produces visible abiotic (change in topography or substrate) and biotic (change in vegetation) signs on the landscape. In those cases where an OHWM determination is required, Ecology guidance recommends a systematic approach that involves reviewing available information prior to a site visit (desktop study) and visiting the site to locate the OHWM based on field indicators (field assessment).

Desktop Hydrology Study

Resources, including gage data and aerial photographs, can corroborate field findings but are only tools to help focus the on-site field evaluation of geomorphic and vegetative indicators. An assessment of hydrologic data also can improve the effectiveness of the field assessment.

A desktop hydrologic assessment was conducted by NHC using flow estimates established by a Hydrologic Simulation Program – FORTRAN (HSPF). The peak flows also were reviewed through the USGS StreamStats software but were found to be appreciably lower than the values returned by HSPF; therefore, the HSPF flows were used in design.

The 2-year peak flow, or 50 -percent probability flood, is more frequently cited as the upper limit of the OHWM (Anderson, et al., 2016). In Washington, the 2-year peak flow recurrence interval (or the peak flow that has a 50-percent probability of occurring in any given year; also called “median peak flow” or “50-percent probability peak flow”) provides a reliable upper limit of the OHWM flow range. The HSPF calculated 1.01- and 2-year peak flow estimates for the stream are 0.6 cubic feet per second (cfs) and 1.1 cfs, respectively. These flow estimates correlate to 0.2 and 2.9 feet in elevation. These peak flow estimates and corresponding elevations were generally used to guide OHWM delineations by RH2. The 1.01-year peak flow informed the lower limit of the on-site OHWM, whereas the 2-year peak flow was used as the upper limit for the OHWM delineation.

Field Delineation Methodology

The OHWM is not a static line or elevation and may change over time due to natural events or permitted anthropogenic actions. OHWM determinations for waterways rely on the use of geomorphic and vegetative field indicators, and Ecology protocol requires that the OHWM be based on the physical and biological indicators present at the site. The following key physical and biological indicators and channel features were used to delineate the OHWM:

- A change in prevalent vegetation (especially the lower limit of perennial species and upper limit of inundation-tolerant shrub or tree species).
- The presence or absence of wetlands and hydrophytic (inundation or highflow tolerant) vegetation.
- A change in geomorphic indicators, such as slope or topographic breaks, along the stream banks.

- A change in soils and/or a change in the particle size of bank material, such as the boundary between coarse cobble or gravel with fine-grained sand or silt.
- Undercuts in the bank, which usually reach interior elevation slightly below the bankfull stage.

RH2 delineated the OHWM of Watercourse 46a.3, as well as accessory tributaries, if OHWM indicators were present, from Station 10+00 to Station 4+00. Blue and white stripe flagging was labeled and placed along the OHWM boundary onsite. The OHWM flags were collected with a GPS unit by RH2 for inclusion in the base map.

Fish and Wildlife Habitat Conservation Areas

Designation and typing of FWHCAs is defined in MICC 19.07.170(A). Designated FWHCAs include areas where local, state, or federally protected species have a primary association, areas containing WDFW priority habitats or species occurrences, bald eagle habitat, watercourses, wetlands, and their respective buffers, and biodiversity areas.

RH2 conducted a survey for FWHCAs in proximity to Watercourse 46a.3 and the proposed improvements within the 53rd Place Open Space. During site investigations, RH2 biologists generally surveyed the area, observing, listening for, and recording vegetation communities, wildlife, and evidence of wildlife usage (i.e., nests, tracks, burrows, scat, calls, etc.). Additionally, any observed special habitat features (i.e., LWD, riparian vegetation shading, nesting cavity trees, etc.) that may support FWHCAs were recorded.

The City requires preparation of a Fish and Wildlife Report, including a Habitat Assessment, that characterizes habitats on the site (MICC 19.07.170) unless exempt under MICC 19.07.120. Per MICC 19.07.120 (D)(4), watercourse restoration installed by a public agency is considered exempt, provided compliance with mitigation sequencing (MICC 19.07.100) is demonstrated. This report summarizes existing conditions with respect to FWHCAs, as well as compliance with mitigation sequencing.

Geologically Hazardous Areas

MICC 19.07.160 defines geologically hazardous areas as lands that are susceptible to erosion, landslides, seismic events, or other factors as identified by WAC 365-190-120. These areas may not be suited for development activities because they may pose a threat to public health and safety. Areas susceptible to one or more of the following types of hazards shall be designated as geologically hazardous areas: landslide hazard areas, seismic hazard areas, and erosion hazard areas.

The geohazard assessment was conducted using available geologic and soil maps, available soil boring logs, and LiDAR imagery to indicate topographic and underlying subsurface conditions of the project site. Available geohazard maps prepared by the City and DNR were reviewed in preparation of a geologically hazardous areas site reconnaissance. The site reconnaissance was completed using these available references to observe current, actual field conditions for confirmation of mapped features, and to assess the stability of soil and topographic features.

Per MICC 19.07.120(D)(4), the proposed restoration efforts are exempt, provided mitigation sequencing is (MICC 19.07.100) is demonstrated. This report summarizes existing conditions

with respect to geologic hazards in the project reach, as well as compliance with mitigation sequencing. Additionally, this report provides a statement of risk assessment per MICC 19.07.160(B)(3).

Results

Existing Environmental Data

National Wetland Inventory data shows a riverine wetland where the stream is mapped in the study area. City mapping data shows an un-piped watercourse, the 46a.3 watercourse. County wetland mapping data does not depict any wetlands or streams in the project reach.

DNR's Forest Practices Application and Mapping Tool data shows Watercourse 46a.3 is a Type N water. The City's GIS data shows the stream as a Type Np watercourse with a 60-foot stream buffer. In communications with WDFW's Area Habitat Biologist, typing of the stream was reviewed and WDFW determined the stream meets the criteria of a Type F (fish bearing) stream.

The County shows the project is not within a Critical Aquifer Recharge Area.

The City has mapped the SE 53rd Place Open Space for geohazard conditions and identified areas within the open space exhibiting landslide features (e.g., scarps, mass wasting deposits, etc.), steep slopes, and streams with deep incision channels. Areas upslope of SE 53rd Place are mapped as potential slide hazard areas.

DNR has mapped the SE 53rd Place Open Space as containing areas of landslide deposits on both sides and along Watercourse 46a.3, internal scarps south of the watercourse and flanking scarps on the upper slope above the open space south of the watercourse.

The project reach is not within a mapped FEMA floodway or 100-year floodplain.

The NRCS Soil Survey data shows the entire study area is underlain by the Alderwood gravelly sandy loam soil map unit, which is a moderately well drained soil comprised of gravelly sandy loam atop very gravelly sandy loam. It contains hydric soil components but is not classified as hydric itself. Alderwood gravelly sandy loam soil derives from weathered glacial till geologic units.

The USFWS Information for Planning and Consultation database suggests the following species of conservation concern may utilize the site: North American wolverine (*Gulo gulo luscus*), marbled murrelet (*Brachyramphus marmoratus*), yellow-billed cuckoo (*Coccyzus americanus*), northwestern pond turtle (*Actinemys marmorata*), monarch butterfly (*Danaus plexippus*) and bull trout (*Salvelinus confluentus*). No suitable habitat for the listed species of the area was documented during the site investigation conducted by RH2.

The DNR Natural Heritage Program database does not show any rare or imperiled species or plant communities at the project site. Four species are listed nearby, including branching montia (*Montia diffusa*), Roll's golden log moss (*Brotherella roelloii*), kaernefeltia lichen (*Kaernefeltia californica*), and weak thistle (*Cirsium remotifolium* var. *remotifolium*). None of these species were observed by RH2.

The WDFW Priority Habitats and Species (PHS) database shows the 53rd Place Open Space as a biodiversity area and corridor but does not list any other PHS species or habitats. The Statewide Integrated Fisheries Distribution (SWIFD) mapper does not show any fish species in Watercourse 46a.3. The stream drains to Lake Washington approximately 2,000 feet downstream of the project reach, which is shown on SWIFD to support coho salmon (*Oncorhynchus kisutch*), cutthroat trout (*O. clarkii*), Chinook salmon (*O. tshawytscha*), bull trout, sockeye, kokanee salmon (*O. nerka*), and steelhead trout (*O. mykiss*). The NOAA Fisheries Species and Habitat mapper shows Lake Washington is critical habitat for Chinook salmon and Essential Fish Habitat (EFH) for Chinook and coho salmon and groundfish.

Community science data retrieved from online sources, including eBird and iNaturalist, shows the following vegetation and wildlife observations in the 53rd Place Open Space: Columbian black-tailed deer (*Odocoileus hemionus columbianus*), song sparrow (*Melospiza melodia*), brown creeper (*Certhia americana*), spotted towhee (*Pipilo maculatus*), hairy woodpecker (*Leuconotopicus villosus*), dark-eyed junco (*Junco hyemalis*), Steller's jay (*Cyanocitta stelleri*), chestnut-backed chickadee (*Poecile rufescens*), red-breasted nuthatch (*Sitta canadensis*), Bewick's wren (*Thryomanes bewickii*), American robin (*Turdus migratorius*), house finch (*Haemorhous mexicanus*), black-throated gray warbler (*Setophaga nigrescens*), Wilson's warbler (*Cardellina pusilla*), western tanager (*Piranga ludoviciana*), licorice fern (*Polypodium glycyrrhiza*), Pacific waterleaf (*Hydrophyllum tenuipes*), Pacific bleeding heart (*Dicentra formosa*), whitebark raspberry (*Rubus leucodermis*), as well as many other fungi, macroinvertebrates, and others (eBird, 2024; iNaturalist, 2024).

Relevant background data and maps are contained in **Appendix C**.

General Site Conditions

The 53rd Place Open Space contains mixed deciduous-coniferous forests and a steep ravine that conveys the riparian corridor of the Watercourse 46a.3 drainage. The riparian corridor is relatively intact and pristine (i.e., prevalence of native plant species and habitat), and includes the Type F stream, tributary drainages, associated groundwater seeps, and wetlands. The open space area is bounded to the north by SE 53rd Place and to the south by a gravel and earthen walking trail within the open space area, and then single-family residences further south. Urban development, primarily single- and multi-family residential uses, is prevalent outside of the immediate project footprint.

In addition to stream stabilization efforts (e.g., rock check dams and pipe bypass), the City has completed invasive species removal and native plantings in the 53rd Place Open Space, which was observed by RH2 during site investigations.

Critical areas observed during site investigations include the Watercourse 46a.3 stream, two tributary streams from drainages that cross SE 53rd Place, three seeps along the southern riparian corridor, and two slope wetlands along the northern riparian corridor. The geohazard site reconnaissance observed relict landslide features including hummocky ground, weathered low scarps, and variably dense soil ranging from loose sandy silt slopes to stiff silt.

Site photographs are included in **Appendix D**.

Vegetation

Vegetation communities in the study area include upland forest, the riparian corridor, and two slope wetlands. Vegetation observed in these communities is a combination of native and invasive plant species.

The emergent vegetation strata within the wetland and riparian areas is dominated by field horsetail (*Equisetum arvense*), western skunk cabbage (*Lysichiton americanus*), and creeping buttercup (*Ranunculus repens*). The emergent vegetation stratum is the most widespread and representative layer in the wetland plant community. Scrub-shrub vegetation classes are dominated by salmonberry (*Rubus spectabilis*) and forested vegetation classes are dominated by red alder (*Alnus rubra*).

The riparian community also is composed of more woody species that are less adapted to inundated soil conditions, such as western hemlock (*Tsuga heterophylla*) and bigleaf maple (*Acer macrophyllum*). Vine maple (*Acer circinatum*) and black cottonwood (*Populus balsamifera*) also are present within the riparian community. The composition of the vegetation community in the riparian zone is not strongly indicative of wetland predominance. That is, there is a prevalence of facultative (FAC)² species throughout this vegetation community.

The adjacent upland forest located upslope of the stream corridor is dominated by Western red cedar (*Thuja plicata*), bigleaf maple, sword fern (*Polystichum minutum*), and stinging nettle (*Urtica dioica*). Wild strawberry (*Fragaria vesca*), herb-Robert (*Geranium robertianum*), Western hemlock, and red alder also are widespread throughout the upland forest area.

Native shrub and tree restoration plantings, such as Douglas fir (*Pseudotsuga menziesii*) and Western red cedar, are present on the streambanks both north and south of the project area.

Hydrology

Hydrology in the study area originates primarily from surface water flow associated with Watercourse 46a.3, with contributions from tributary streams flowing from north of SE 53rd Place, groundwater flows (seeps), and precipitation. The project is within the Lake Washington sub-basin of the Cedar-Sammamish watershed (HUC 171100120400) and Watercourse 46a.3 flows to Lake Washington. The headwaters of the stream originate near the

² The USACE maintains a National Wetland Plant List (NWPL) categorizing common hydrophytic plant species based on their affinity for inundated habitats and probability of occurrence within wetlands. The following categories are used:

Indicator Status	Abbreviation	Definitions – Short Version
Obligate	OBL	Almost always occurs in wetlands
Facultative Wetland	FACW	Usually occurs in wetlands, but may occur in non-wetlands
Facultative	FAC	Occurs in wetlands and non-wetlands
Facultative Upland	FACU	Usually occurs in non-wetlands, but may occur in wetlands
Upland	UPL	Almost never occurs in wetlands

Table obtained from USACE. (2023). National Wetland Plant List, Version 3.6. Retrieved from <http://wetland-plants.usace.army.mil/>. USACE Engineer Research and Development Center, Vicksburg, MS.

intersection of Island Crest Way and SE 53rd Place, approximately 700 feet upstream of the project reach. At the west intersection of E Mercer Way, the stream enters a sediment pond with a beehive structure, which allows for settling of sediment conveyed by the stream and transport of flows downstream. Watercourse 46a.3 crosses E Mercer Way via a corrugated metal pipe culvert, outfalling into the ravine downstream. This outfall has a significant water surface drop and is consequently considered a fish passage barrier by WDFW (site ID 920822; **Appendix C**). From E Mercer Way, the stream flows approximately 1,650 feet downstream to outfall into Lake Washington on parcel no. 8661400050.

Soils

Soils encountered through wetland test pits generally displayed fine sand to sandy loam textures. Within wetland areas, silty clay loam and muck textures also were encountered. Substrates in Watercourse 46a.3 were fine sands to sandy loams intermixed with gravels. Soils encountered generally coincided with the Alderwood gravelly loam soil map unit.

Wetlands

Two wetlands were identified and delineated in the project reach, as summarized in **Table 1**. **Figure 1** shows aquatic critical areas delineated by RH2 on the site, including wetland and stream resources. Site investigation data is contained in **Appendix E**.

Table 1
Classification Overview of Delineated Wetlands in the Project Reach

Wetland Name	Size in sf (ac)	Cowardin Classification Code ¹	Hydrogeomorphic Class ² , Subclass	Category	Habitat Score ³
Wetland A	555 (0.01)	PFO1	SLOPE	III	7
Wetland B	3,448 (0.09)	PFO1/PSS6		III	8

¹ Cowardin classification includes class and subclass. PFO1 is palustrine forested broad-leaved deciduous, and PSS6 is palustrine scrub-shrub deciduous.

² Hydrogeomorphic classification based on Brinson (1996) used in the Ecology rating.

³ Habitat score is based on ratings completed by RH2 and summarized in this report.

Wetland A

Wetland A is an approximately 555 (sf) Category III wetland upgradient of the stream and outside the stream’s floodplain. The hydrogeomorphic classification used for categorization is slope, as it is on a slope where water flows through the wetland in one direction and generally leaves without being impounded.


Wetland A is dominated by a broad-leaf deciduous forested vegetation class (Cowardin, et al., 1979). The wetland’s forest cover contained red alder, a scrub-shrub class of salmonberry, and an emergent class dominated by creeping buttercup, field horsetail, and small enchanter’s-nightshade (*Circaea alpina*).

Test pits dug in the wetland displayed sandy loam to sandy clayey loam textures. The soil matrix color was dark grayish brown (10YR 4/2) from the surface to a depth of 16 inches. Faint and distinct redoximorphic concentrations in contrast to the matrix were observed both as concentrations in the matrix and along pore linings. Redox concentrations were common (2 to

20 percent), and fine to very course (less than 2 to less than 76 millimeters) in size. The hydric soil indicator Depleted Matrix (F3) was met. All wetland test pits (TP) met primary soil indicators.

The hydroperiod for Wetland A is saturated only and seasonally flooded or inundated. The primary sources of hydrology are high water table and groundwater seeps, as evidenced by the observed Saturation (A3) and Surface Water (A1) hydrology indicators. All wetland test pits met primary hydrology indicators. **Table 2** provides a summary of Wetland A.

Table 2
Wetland A Overview

Wetland Evaluation Summary		
Wetland Name	Wetland A	
Location	Parcel no. 1924059186 On north slope of stream near Station 6+00	
Local Jurisdiction	King County	
WRIA	8 – Cedar-Sammamish	
Sub-Watershed	Lake Washington	
Ecology Rating (Hruby, 2014)	Category III	
Habitat Score	7	
City Buffer Width	40 feet	
Wetland Size	555 sf	
Cowardin Classification	PFO1	
HGM Classification	Slope	
Associated Waterbody	Watercourse 46a.3	
Data Sheet(s)	TP-1 (in), TP-2 (out)	
Boundary Flag Color	Pink “WETLAND DELINEATION” flagging	
Dominant Vegetation	Red alder and salmonberry	
Soil Indicators	Depleted Matrix (F3)	
Hydrology Indicators	Surface Water (A1) and Saturation (A3)	
Rationale for Delineation	Positive vegetation, soil, and hydrology indicators	
Rationale for Local Rating	Ecology wetland rating results cross-referenced with MICC 19.07.190	

Wetland B

Wetland B is an approximately 3,448 sf Category III wetland located along the north bank of the stream. The hydrogeomorphic classification used for categorization is slope, as it is on a slope and does not impound or impede the water moving through it.

Wetland B is dominated by a scrub-shrub and forested vegetation class (Cowardin, et al., 1979), primarily consisting of salmonberry, red alder, and vine maple. Emergent vegetation in the

canopy or in emergent only areas of the wetland includes stinging nettle, field horsetail, lady fern (*Athyrium felix-femina*), skunk cabbage, and piggyback plant (*Tolmiea menziesii*).

Test pits dug in Wetland B displayed silty muck texture. The soil matrix color was black (10YR 2/1) from the surface to 16 inches. A distinct hydrogen sulfide odor was present when installing the soil test pit. No redoximorphic concentrations were observed. The hydric soil indicators Black Histic (A3) and Hydrogen Sulfide (A4) were met.

The hydroperiods for Wetland B are saturated only, seasonally flooded or inundated, and seasonally flowing stream adjacent to the wetland (i.e., Watercourse 46a.3 and Tributary 2). The primary sources of hydrology are groundwater seeps upgradient and within the wetland and high water table and overbank flooding from the stream (Tributary 2 primarily), as evidenced by the observed Surface Water (A1), High Water Table (A2,) and Saturation (A3) hydrology indicators. **Table 3** provides a summary of Wetland B.

**Table 3
Wetland B Overview**

Wetland Evaluation Summary	
Wetland Name	Wetland B
Location	Parcel no. 1924059186 On north slope of stream near station 5+00
Local Jurisdiction	King County
WRIA	8 – Cedar-Sammamish
Sub-Watershed	Lake Washington
Ecology Rating (Hruby, 2014)	Category III
Habitat Score	8
City Buffer Width	110 feet
Wetland Size	3,448 sf
Cowardin Classification	PFO1/PSS6
HGM Classification	Slope
Associated Waterbody	Watercourse 46a.3 and Tributary 2
Data Sheet(s)	TP-3 (in), TP-4 (out)
Boundary Flag Color	Pink “WETLAND DELINEATION” flagging
Dominant Vegetation	Salmonberry, vine maple, red alder, skunk cabbage
Soil Indicators	Black Histic (A3) and Hydrogen Sulfide (A4) were met
Hydrology Indicators	Surface Water (A1), High Water Table (A2), and Saturation (A3)
Rationale for Delineation	Positive vegetation, soil, and hydrology indicators
Rationale for Local Rating	Ecology wetland rating results cross-referenced with MICC 19.07.190



Wetland Characterization and Functional Assessment

The characterization of wetlands identified on the site is based on wetland ratings completed using Ecology’s *Washington State Wetland Rating System for Western Washington* (Hruby, 2014). This system is designed to provide a rapid, qualitative rating of wetland functions. It does not replace a full assessment of wetland functions. For rating purposes, wetland functions are divided into water quality, hydrologic, and habitat functions. Site potential, landscape potential, and value are assessed for each of these functions. **Table 4** provides a summary of the wetland functions based on the Ecology rating.

Table 4
Qualitative Ratings of Identified Wetlands

Function	Qualitative Rating of Wetland Function	
	A	B
Water Quality Functions		
Site Potential to Improve Water Quality	L	L
Landscape Potential to Support Water Quality Functions	M	M
Value Rating for Water Quality Improvement	H	H
Hydrologic Functions		
Site Potential to Perform Hydrologic Functions	L	L
Landscape Potential to Support Hydrologic Functions	L	M
Value Rating for Hydrologic Functions	L	L
Habitat Functions		
Site Potential to Provide Habitat	L	M
Landscape Potential to Support Habitat Functions	H	H
Value Rating for Habitat Functions	H	H
Total Rating Score	16	18
Wetland Category	III	III

Wetland A

Wetland A has a moderate potential to improve water quality. Wetland A’s site potential to improve water quality is low due to steep slopes and sparse vegetative cover that limit detention and infiltration of surface water. Wetland A also has moderate landscape potential to support water quality because of its proximity to uphill land uses that generate pollutants, including nearby roadways. The value to society of water quality improvements provided by Wetland A is high given that it flows into Lake Washington, which is on the 303(d) list.

The hydrologic functions of Wetland A are low, primarily due to the sparse vegetation structure that provides little flood and erosion control. In addition, much of the area upslope of Wetland A is undeveloped and does not rely on the wetland for natural filtration of excess surface runoff. Furthermore, there are no upstream flood control devices, and no flooding issues are known to occur downstream of the wetland.

Wetland A functions moderately high for providing general habitat since it is within a relatively intact riparian corridor that contains priority habitats and supports urban wildlife. Three

different priority habitats are in the 53rd Place Open Space area or within 330 feet of the wetland, including biodiversity areas and corridors, riparian habitat, and snag and log habitats.

Wetland B

Wetland B has a moderate potential to improve water quality. Like Wetland A, Wetland B's steep slopes and sparse vegetative cover limit detention and infiltration of surface water at the site. Wetland B also has moderate landscape potential to support water quality due to its proximity to uphill land uses that generate pollutants. The value to society of water quality improvements provided by Wetland B is high since it, like Wetland A, flows into Sub-Basin 46a.3 which drains to Lake Washington, a 303(d) listed waterbody.

The hydrologic functions of Wetland B are low to moderate, as the emergent vegetation present within the wetland is of low enough density that it does not provide much potential for aiding in flood control and erosion along the stream or downstream. However, greater than 25 percent of the area upslope of the wetland has the potential to be in uses that generate excess runoff; therefore, the water storage and filtration that is provided by the wetland is of moderate value.

Although Wetland B has simple hydrologic regimes and vegetation communities, it has moderate to high habitat functions because of its ability to provide multiple habitats and habitat features with multiple strata and moderate interspersion of habitat. The wetland supports multiple hydroperiods since the wetland borders Tributary 2 and Watercourse 46a.3. Because the surrounding area of the wetland is low to moderate intensity land uses, Wetland B has a high potential to support habitat functions. Like Wetland A, several priority habitats are in proximity to and directly within the wetland.

Streams

Within the project reach, Watercourse 46a.3 meanders in the 53rd Place Open Space riparian corridor within a well-defined channel. The wetted channel width of the stream in the project reach at the time of site investigations ranged from 2.5 to 6 feet wide, averaging 3.88 feet, and water depths ranged from 1 to 2 inches deep, with 4-inch depths observed in pools. Tributary 2 averages 2.85 feet wide, with a trickle of flow less than 1 inch deep. Similarly, Tributary 3 averaged less than 1 foot wide with water depths of less than 1 inch deep. Tributary drainages originate from upstream of SE 53rd Place SE and flow south-southeast towards Watercourse 46a.3. Tributary 1, which is downstream of the project reach, enters the mainstem stream at about Station 3+00, and was the subject of prior City stormwater infrastructure work. Flows were tightlined to outfall at E Mercer Way, effectively bypassing flows to Tributary 1 significantly. Groundwater seeps (Seep 1 through 3) ranged from 1 to 2 feet wide with water depths less than 1 inch deep.

Below the OHWM of both Watercourse 46a.3 and Tributary 2, sparse vegetation was observed and limited to skunk cabbage. The streambank below the OHWM generally was characterized by the presence of clean gravel and sands, exposed roots, scour lines, and wrack accumulation – all indicators of flowing water. Drainage patterns evidenced by sediment sorting and silt point bars were additional indicators observed below the OHWM.

At the OHWM, prevalent vegetation observed included lady fern, salmonberry, creeping buttercup, English ivy (*Hedera helix*), vine maple, and sword fern. Drainage patterns evidenced by scour also were observed at the OHWM.

Above the OHWM, prevalent vegetation included Western hemlock, Western red cedar, vine maple and red alder, wild strawberry, and stinging nettle. Soil and geomorphic indicators observed above the OHWM included the presence of a hillslope toe. No staining was observed on fixed objects above the OHWM.

Tributary 3 and Seeps 1 through 3 lacked a defined bed and banks; therefore, RH2 collected the stream centerline, instead of delineating the OHWM.

Table 5 provides a summary of stream characteristics observed on the site. **Figure 1** shows the streams delineated in the project reach, and site investigation data is in **Appendix E**.

Table 5

Classification Overview of Delineated Streams in the Project Reach

Stream	Stream Type ²	Stream Length (ft) ³	Shoreline Designation	Required Buffer (ft) ³
Watercourse 46a.3	Type F	1,600	Not designated as shoreline	120
Tributary 2 ¹		110		
Tributary 3	Type Np	85		60
Seep 1	Type Ns	35		
Seep 2		35		
Seep 3		70		

¹ Tributary 1, like Tributary 2, has a defined bed and banks, although the channel has been bypassed for over 15 years. Tributary 1 is conservatively considered a Type F with a 120-foot corresponding buffer.

² Streams were typed in consultation with WDFW as described in this report. It is important to note, these classifications differ from those shown on the City's GIS data.

³ Reflects approximate stream length within the 53rd Place Open Space area.

⁴ Per MICC 19.07.180(C).

Water Quality

Watercourse 46a.3 and the project reach are not listed as impaired under the Ecology 303(d) list (Ecology, 2016). Sedimentation issues resulting from historic landslide activity contribute to impaired turbidity in the lower reaches (downstream of Station 4+00) of the project reach, which was observed by RH2 during site investigations.

Physical Barriers

Two fish passage barriers are shown by WDFW on the Watercourse 46a.3 system, including the culvert at E Mercer Way (WDFW Site ID 920822) and another impassable culvert at the outlet of Tributary 3 (WDFW site ID 920825). No fish were observed within the watercourse during RH2 site investigations. Although the passage barrier at E Mercer Way presently prevents fish access from entering the project reach, WDFW does not recognize human-made barriers in stream typing (Douglas, J., 2024). Consequently, WDFW considers the watercourse a Type F stream with potential salmonid use by steelhead, sea run cutthroat, and resident trout.

Riparian Corridor

Sub-Basin 46a.3 covers approximately 45 acres to the north and south of SE 53rd Place. Watercourse 46a.3 is a narrow, shallow stream with a high gradient. The riparian corridor is primarily native green belt with single-family residences north and south. The existence of the mature riparian vegetation provides LWD recruitment to the stream, organic inputs, shade, and microclimate cooling. Additionally, the riparian corridor provides habitat for myriad wildlife species.

Fish and Wildlife Habitat Conservation Areas

During site investigations, the following wildlife species, or evidence thereof, were observed in the riparian corridor: beaver (removed by the City in 2023), Columbian black-tailed deer, Northern flicker (*Colaptes auratus*), hairy woodpecker, dark-eyed junco, song sparrow, Stellar's jay, spotted towhee, golden-crowned kinglet (*Regulus satrapa*), purple finch (*Haemorhous purpureus*), orange-crowned warbler (*Vermivora celata*), chestnut-backed chickadee, red-breasted nuthatch, barred owl (*Strix varia*), American robin, Wilson's warbler, and brown creeper. Fish were not observed in the watercourse. Although not observed, RH2 anticipates this open space area, particularly the wetland habitat, supports amphibians, such as Pacific tree frogs (*Pseudacris regilla*), newts, and salamanders.

In addition to the wildlife species observed during field investigations, Mercer Island is known to host the following wildlife species: American black bear (*Ursus americanus*), cougar (*Puma noncolor*), muskrat, nutria, racoon, rabbit, and multiple species of owl, coyote, and bobcat.

Habitat in and around the proposed project area consists of relatively old second growth upland and riparian forest associated with Watercourse 46a.3 and the 53rd Place Open Space. Due to the City's designation of the area as an open space, human disturbance near the site is minimal. The 53rd Place Open Space represents a contiguous forested corridor, in proximity to aquatic resources, that provides complex, intact habitat capable of supporting native biodiversity. The overstory is dominated by broadleaved deciduous trees mixed with conifers. Some large trees in the area are impacted by English ivy infestations. Several planted conifer saplings were observed near the site. Large trees provide shading that helps regulate the temperature of Watercourse 46a.3 and benefits instream habitat. The stream system has substantial inputs of organic matter, including plentiful woody debris provided by the surrounding riparian and upland forests. The proposed project site and surrounding area contains a high interspersion of upland and aquatic habitats that are utilized by various birds, mammals, amphibians, and other wildlife.

Listed Species and Habitats

The 53rd Place Open Space, which contains the Watercourse 46a.3 riparian corridor, is a WDFW PHS-listed biodiversity area and corridor. Priority habitats listed by WDFW, biodiversity areas, and wetlands and watercourses are all regulated by the City as FWHCA. MICC 19.07.170(B) states that any development proposed within a FWHCA requires submittal of a wildlife habitat study unless the proposal is specifically exempt per MICC 19.07.120. Demonstration of exemption status for this project is included in this report; therefore, this report summarizes FWHCAs as observed by RH2 and in keeping with the best available science for these habitats.

Table 6 includes a summary of Endangered Species Act (ESA) and state-listed species and sensitive habitats potentially present in the project area. Project minimization measures, impacts, and proposed mitigation are discussed later in this report.

Table 6
Summary of Listed Species and Sensitive Habitats

Common Name	Scientific Name	Listing Agency	ESA Status and Critical Habitat (CH)	State Status
Bull trout	<i>Salvelinus confluentus</i>	USFWS	Threatened; no CH present	Candidate
North American wolverine	<i>Gulo gulo luscus</i>		Threatened; no CH present	Candidate
Marbled murrelet	<i>Brachyramphus marmoratus</i>		Threatened; no CH present	Endangered
Yellow-billed cuckoo	<i>Coccyzus americanus</i>		Threatened; no CH present	Endangered
Northwestern pond turtle	<i>Actinemys marmorata</i>		Proposed Threatened; no CH designated	Candidate
Monarch butterfly	<i>Danaus plexippus</i>		Candidate	Candidate
Chinook salmon (Puget Sound ESU ¹)	<i>Oncorhynchus tshawytscha</i>	NOAA Fisheries	Threatened; CH present in Lake Washington	–
Instream	–	WDFW and City	–	WDFW Priority Habitat
Wetland	–		–	
Riparian	–		–	
Biodiversity Areas and Corridor	–		–	

¹ Under the Endangered Species Act, an evolutionarily significant unit—or ESU—is a Pacific salmon population or group of populations that is substantially reproductively isolated from other conspecific populations and that represents an important component of the evolutionary legacy of the species. (NOAA Fisheries, 2022).

USFWS lists the following threatened, proposed threatened, or candidate species as potentially present near the proposed project site: North American wolverine, marbled murrelet, yellow-billed cuckoo, northwestern pond turtle, bull trout, and monarch butterfly. No presence, suitable habitat, or critical habitat exists for any of the listed species within the Sub-Basin 46a.3 Watercourse Stabilization project area. The project will have no effect on these species. The USFWS Critical Habitat mapper shows Lake Washington is critical habitat for bull trout (USFWS, 2024); however, due to the distance from project activities to listed species waterbodies, existing fish passage barriers on Watercourse 46a.3, and implementation of appropriate minimization measures, project activities will not affect this species or its habitat.

Critical habitat for Chinook salmon (Puget Sound ESU), a NOAA Fisheries ESA-listed species, is present in Lake Washington approximately 2,000 feet downstream of the project reach. Due to the distance from project activities to listed species waterbodies, existing fish passage barriers on Watercourse 46a.3, and implementation of appropriate minimization measures, project activities will not affect this species or its habitat. Additionally, NOAA Fisheries lists Lake Washington as EFH for Chinook and coho salmon and groundfish. No EFH for groundfish or Pacific salmon is located in Watercourse 46a.3.

Erosion control best management practices will be utilized during all ground-disturbing activities to prevent erosion, water runoff, and sedimentation from entering waterbodies, thereby preventing project impacts to Pacific salmon that are present lower in the Watercourse 46a.3 stream profile or that utilize Lake Washington. The project will, through stabilization of the Sub-Basin 46a.3 watercourse, result in a net benefit to water quality at the site and downstream by mitigating sources of turbidity and sedimentation.

The project reach does not possess the qualities needed to support life history and habitat requirements of any USFWS or NOAA Fisheries ESA-listed species. No direct impacts or delayed consequences are anticipated because of the project. The proposed project will have no adverse effect on EFH for groundfish or Pacific salmon.

WDFW Management Recommendations

WDFW provides guidance for managing biodiversity areas and corridors in its *Landscape Planning for Washington's Wildlife: Managing for Biodiversity in Developing Areas* (WDFW, 2009). WDFW states that the most common effects of human land use changes on wildlife include loss of habitat, fragmentation of habitat, increased road mortality, reduced water quality, and increased competition between introduced and native species. These effects can result in loss of species from an area. WDFW's management recommendations aim to discuss land use planning tools to protect and preserve biodiversity areas and corridors for Washington's wildlife. These include the following general recommendations to protect wildlife in biodiversity areas and corridors:

- Keep large, connected patches of undeveloped native vegetation intact.
- Encourage and maintain low zoning densities within and immediately surrounding high-value habitat areas and encourage maintenance of native vegetation.
- Manage road systems to minimize the number of new roads and new barriers to important animal movement corridors.
- Plan open space to incorporate high-value habitat and corridors for animal movement.
- Zone for higher densities within urban and developed landscapes to avoid sprawl (WDFW, 2009).

The City's designation of the 53rd Place Open Space as a natural open space area is in concert with these WDFW management recommendations, as the wildlife habitat and riparian corridors, as well as the critical areas present in the open space area, are naturally protected from development. The proposed bank stabilization and stream restoration efforts for the Sub-Basin 46a.3 Watercourse Stabilization project also are consistent with preserving the natural character of this open space area, while also addressing ongoing landsliding and resulting water quality issues. Project design through bioengineered techniques and careful construction planning seeks to avoid and minimize temporary and permanent impacts to aquatic resources and habitats, effectively protecting these areas in their natural state. Improvements are proposed that augment the natural processes and habitat (e.g., addition of LWD for streambank protection, bolstering existing natural weirs, etc.). No additional access roads or trails are proposed for construction and design of improvements minimizes the

construction footprint, including tree removal and access for equipment. In this way, the project supports WDFW's management recommendations for biodiversity areas and corridors.

Geologically Hazardous Areas

RH2 and NHC (2024) completed geologic and geotechnical assessments that included a compilation of available geologic, soil, and geologic hazard mapping and data, and a geologic hazard areas site reconnaissance to assess current conditions for comparison to mapped features. RH2 traversed the entire open space area and conducted limited shovel excavations and soil probing to inspect surficial soil characteristics and moisture conditions. In summary, the site is underlain by weathered glacial till units that are either intact or had historically mobilized and weathered in place. The glacial till consists of silt with sand and gravel and occasional cobbles or boulders with local silty sand layers or zones.

Areas of the shallow glacial till unit have been disrupted and covered by historical shallow mass wasting originating from steep slopes surrounding the watercourse. Both the City and DNR have mapped landslide deposits within much of the 53rd Place Open Space. RH2 observed staircase-like, hummocky ground with small, low, scarp-like features within the landslide mapping extents. The features upslope of the active stream corridor included: dry slopes, large diameter trees growing vertically, and absence of springs, all indicating little evidence of recent movement. Large trees were observed growing upon or next to scarp-like features and within hummocky ground, providing evidence of stable slope conditions.

Project Impacts and Mitigation

Project Footprint

The anticipated project footprint is shown on the design plans (**Appendix B**). Together with staging, stockpiling, and stream channel construction areas, the project footprint covers approximately 14,000 sf (0.32 ac), within the 53rd Place Open Space and the right-of-way for SE 53rd Place. Staging/stockpiling and a potential temporary access corridor shown on the design plans reflect the maximum impact anticipated. Exact means and methods for temporary access and staging/stockpiling areas will be determined by the selected contractor in accordance with the final design plans and specifications, approved permit documents, and City approval.

Project construction generally will include limited clearing to establish staging, stockpiling, and access corridors. As conceptualized in the design, staging and stockpiling areas will be established in three designated locations along SE 53rd Place and adjacent to Watercourse 46a.3 from which equipment and materials can be transported utilizing the potential temporary access corridor. This method is intended to minimize access, trampling, clearing, tree and shrub removal, grading, erosion, and other construction impacts to discrete areas to accomplish bank stabilization and grade control objectives. Temporary access corridors will transport LWD, rock, plant, hand tools, and other materials for installation of grade control and bank stabilization and bolstering of existing natural weirs in the channel. Five deciduous and coniferous trees (measuring 8-inch diameter at breast height or smaller) are slated for removal to accommodate the proposed temporary access corridor. It is anticipated these trees will be retained onsite and incorporated into bank stabilization improvements and/or transplanted.

Design plans show a schedule, notes, and details with native plantings for bank stabilization improvements and restoration of temporarily disturbed areas. Restoration with native species also will replace trees proposed for removal by these construction improvements.

Project design avoids construction in delineated wetlands onsite. Work will occur within the channel of Watercourse 46a.3 but is anticipated to be completed during a low flow work window (generally July 1st to September 30th) and utilizing a stream bypass to allow for work in dry stream segments, thereby minimizing water quality and erosion impacts. Improvements to the watercourse involve bioengineered stream and bank stabilization techniques that utilize LWD and streambed rock; by their nature these types of improvements provide a functional uplift to riparian habitat and are self-mitigating. Work also will occur within City-regulated critical areas stream and wetland buffers; however, buffer impacts are temporary as areas will be restored following construction. Impacts to buffers will result from limited clearing to establish staging and stockpiling areas and to install the temporary access corridors.

Geological Hazards Risk Assessment

Proposed locations for staging materials will be in areas of level ground upslope of the stream channel and will not create excessive soil loads that would destabilize soil or slopes. Likewise, the volume and mass of imported material (e.g., boulders, coarse sediment, logs, woody material, etc.) are small relative to the work area and will not create excessive loads or significantly alter surface or subsurface hydrology to a degree that would destabilize soil or slopes. Measures to mitigate erosion risk have been included in the project design and general construction practices; these measures are included in the project design plans (**Appendix B**) and have been further detailed in the **Mitigation Sequencing** section.

Alteration of the mapped landslide areas of the proposed stabilization project is sufficiently local and mitigated such that the proposed stabilization improvements will not adversely impact other critical areas, the subject property, or adjacent properties. The proposed construction practices for stabilization will maintain the current soil and slope stability during construction.

Consequently, the proposed alterations may occur as they meet the criteria listed in MICC 19.07.160(B)(2). In accordance with MICC 19.07.160(3)(c), and as proposed, the project will be designed and constructed in a manner that renders the development as safe as if it were not located in a geologically hazardous area. The project will not adversely impact adjacent properties.

Project Impacts

The following critical areas impacts are anticipated to result from this project (**Table 7**):

- Approximately 500 lf (approximately 8,000 sf) of Watercourse 46a.3 will be temporarily impacted to install grade control LWD, bank stabilization LWD, and bolster existing natural weirs. This work involves the import of 2 tons of streambed boulders and 5 tons of streambed sediment, various sizes and lengths of logs, slash material, coir logs, and log pins. Rock placed in Watercourse 46a.3 to augment existing weirs, approximately 15 cubic yards (cy) of streambed boulders and sediment, will be permanent fill and this work will be permitted through WDFW and USACE.

- Approximately 3,500 sf of stream/wetland buffer will be temporarily cleared to accommodate staging/stockpiling areas. One 8-inch conifer tree will be removed in these buffer areas of the site. Temporary impact areas will be restored with native plantings following construction.

Table 7
Summary of Project Impacts

Impact Category	Project Actions	Type	Total Impact (sf)	Wetland Impact (sf)	Stream Impact (sf)	Buffer Impact (sf)
Clearing	Staging / stockpiling areas	Temporary	3,500	-	-	3,500
Work in watercourse	Stream and bank stabilization LWD and rock installation	Temporary	8,000	-	8,000	-
Fill	Augmenting existing weirs	Permanent	240 ¹	-	240	-
		Total	11,500²	-	-	-

¹ The area of weir impact is counted in the 8,000 sf reported for work within the watercourse, so it is not double counted in the total area reported. Fifteen (15) cy of fill is proposed within the 240 sf footprint for the augmentation of existing weirs.

² The Total Impact area in Table 7 is less than the total impact area for the project as portions of the access corridor and staging area are outside the watercourse and stream/wetland buffers.

Mitigation Sequencing

The project has been designed and implemented in accordance with the City’s mitigation sequencing measures, which are outlined in MICC 19.07.100. The mitigation sequencing sections from the MICC are shown in *italics*, followed by a discussion of how the project complies with the requirements in normal font.

- A. *Avoiding the impact altogether by not taking a certain action or parts of an action. The applicant shall consider reasonable, affirmative steps and make best efforts to avoid critical area impacts. However, avoidance shall not be construed to mean mandatory withdrawal or denial of the development proposal or activity if the proposal or activity is an allowed, permitted, or conditional use in this title. In determining the extent to which the proposal should be redesigned to avoid the impact, the code official may consider the purpose, effectiveness, engineering feasibility, commercial availability of technology, best management practices, safety and cost of the proposal and identified changes to the proposal. Development proposals should seek to avoid, minimize and mitigate overall impacts based on the functions and values of all of the relevant critical areas and based on the recommendations of a critical area study. If impacts cannot be avoided through redesign, use of a setback deviation pursuant to section 19.06.110(C), or because of site conditions or project requirements, the applicant shall then proceed with the sequence of steps in subsections B through E of this section;*

Complete avoidance of work in designated stream, geologic hazards, and stream/wetland buffer areas is not possible to accomplish the proposed stream stabilization project goals. Work in these areas is necessary to stabilize active erosion

and sedimentation issues in this watercourse; however, improvements are being carefully designed to minimize impacts through targeted access, timing restrictions, staging/stockpiling, and applied bioengineering techniques. Work will avoid impacts to on-site delineated wetlands and minimize impacts to associated wetland/stream buffers and tree removal in the 53rd Place Open Space to the maximum extent practicable.

B. Minimizing impacts by limiting the degree or magnitude of the action and its implementation, using a setback deviation pursuant to section 19.06.110(C), using appropriate technology, or by taking affirmative steps to avoid or reduce impacts;

Project design and planning is being completed to minimize impacts to the 53rd Place Open Space, and the geologic hazards and aquatic resources it supports. This is being accomplished by the following specific measures:

- Restricting construction during the wet season (October through April).
- Utilizing bioengineered techniques and natural materials (i.e., LWD, native plants, streambed rock, etc.) to the maximum extent practicable.
- Limiting the bank stabilization project reach to address primarily the areas of active erosion and sedimentation issues. The City, and consultant design team, aim to design improvements to address ongoing erosion, but to do so using a “light touch” approach.
- Limiting staging/stockpiling and temporary construction access locations and approach to minimize clearing, tree and shrub removal, grading, and movement of construction materials, personnel, and equipment.
- Limiting the use of rock to stabilize portions of the stream channel to only that amount necessary to accomplish the project goals.

Construction best management practices will be implemented to minimize impacts to critical areas, including the general construction and temporary erosion, sediment control, and water management notes included on design plans (**Appendix B**).

C. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;

Erosion control blanket and coir fabric logs are shown on the design plans to stabilize construction areas. Coir logs will be planted with live stakes adjacent to bank and toe stabilization LWD to restore temporarily impacted streambank areas. Temporary access corridors and staging/stockpiling areas also will be restored to pre-construction condition through native plantings.

D. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action;

The City presently monitors and maintains the sediment pond at the E Mercer Way intersection, as well as the SE 53rd Place Open Space area. This maintenance and monitoring is expected to continue following this project; however, sediment pond maintenance may be reduced over time following the proposed watercourse stabilization improvements (NHC, 2024). It is anticipated that as part of the City’s existing monitoring and maintenance activities, the City will monitor the LWD and weir

improvements, as well as the progress of native plantings, completed as part of this project. No formal maintenance or monitoring plans are anticipated to be prepared for the project at this time. Improvements are not expected to require regular maintenance or monitoring once established.

E. Compensating for the impact by replacing, enhancing, or providing substitute resources or environments; and/or

Proposed improvements seek to install natural materials to augment the Watercourse 46a.3 riparian corridor and reduce existing erosion and sedimentation issues resulting from landslide activities. Improvements are intended to enhance the stream corridor while also providing stabilization and opportunities for settling of sediment. By nature, these improvements are not considered an adverse, permanent impact to these aquatic areas. Permanent rock placement has been minimized. The stream channel improvements will be stabilized, and streambanks replanted, to re-establish native vegetation in disturbed areas. Temporary staging/stockpiling and access corridors will be restored with native vegetation. Formal mitigation to compensate for adverse, permanent impacts is not warranted.

F. Monitoring the impact and taking appropriate corrective measures to maintain the integrity of compensating measures.

City monitoring of the watercourse is expected to continue following this project. Although no formal maintenance or monitoring plans are anticipated to be prepared for the project at this time, it is recommended that evaluation of the performance of improvements be completed as part of routine City watercourse assessments, performed at least once every five years.

Through demonstration of mitigation sequencing, the proposed Sub-Basin 46a.3 Watercourse Stabilization project is anticipated to qualify as an exempt activity per the City's Critical Areas Code. The project will stabilize a natural watercourse, which conveys drainage from Sub-Basin 46a.3 to Lake Washington (i.e., part of the City's stormwater conveyance in addition to being a natural area). The project is anticipated to meet the "watercourse restoration project to be installed by a public agency" category, meeting MICC 19.07.120(D)(4). Ultimate determination of project compliance will be made by the City's Community Planning and Development Department. This report has documented the results of critical areas investigations to identify and characterize wetlands, streams, FWHCAs, and geologic hazards in the project vicinity, as well as demonstrate project compliance with the City's CAC, including exemptions, risk assessment, and mitigation sequencing.

Conclusion

This report has been supplied to the City to document conditions associated with critical areas present at and adjacent to the Sub-Basin 46a.3 Watercourse Stabilization project site. It is anticipated this report will be finalized with subsequent City review and design efforts, and then provided to WDFW and USACE to facilitate permit approvals for work in the watercourse. This report was prepared to comply with the current laws regulating wetlands, streams, FWHCAs, and geologic hazards. The work completed in preparing this report has conformed to the standard of care employed by environmental professionals. No other representation or warranty is made or implied.

RH2 ENGINEERING, INC.



Alicia Pettibone
Senior Ecologist



Steve Nelson, LHG, LG, LEG
Senior Engineering Geologist



STEPHEN ERIC NELSON

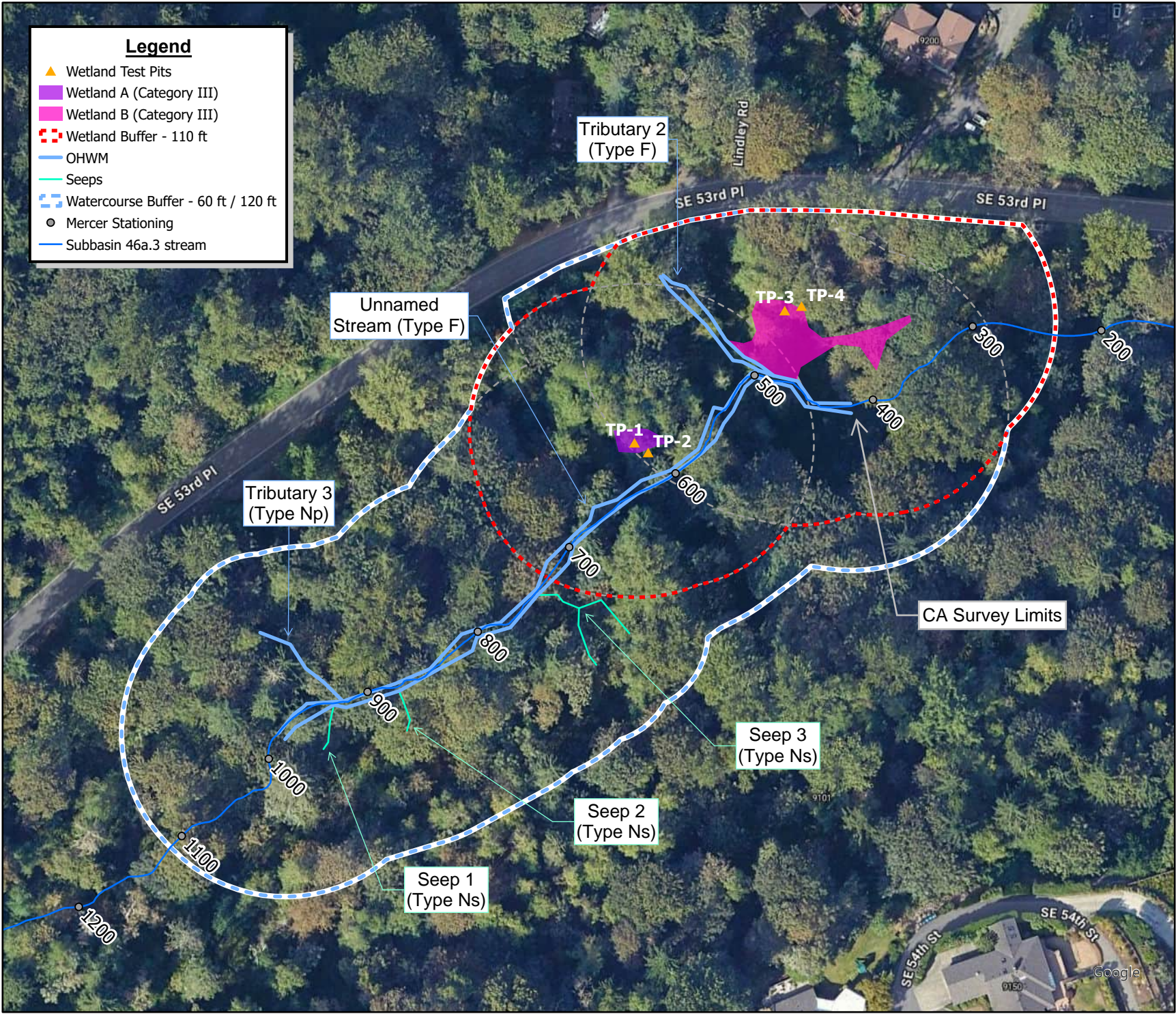
Signed: 11/27/2024

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Figures



Legend

- ▲ Wetland Test Pits
- Wetland A (Category III)
- Wetland B (Category III)
- ▨ Wetland Buffer - 110 ft
- OHW
- Seeps
- ▨ Watercourse Buffer - 60 ft / 120 ft
- Mercer Stationing
- Subbasin 46a.3 stream

This map is a graphic representation derived from the City of Mercer Island Geographic Information System. It was designed and intended for City of Mercer Island staff use only; it is not guaranteed to survey accuracy. This map is based on the best information available on the date shown on this map.

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Vicinity Map



Critical Areas Overview Map
City of Mercer Island
Subbasin 46a.3
Watercourse Stabilization



1 inch : 100 Feet

DRAWING IS FULL SCALE WHEN BAR MEASURES 2"



J:\DATA\INHC\24-0025\GIS\NHC_23-0025_SUB-BASIN_46-3A\APRX BY: NBL\OXTON PLOT DATE: JUN 25, 2024 COORDINATE SYSTEM: NAD 1983 HARN STATEPLANE WASHINGTON NORTH FPS 4601 FEET

Appendix A

Consultant Qualifications



Steve Nelson

LG, LHG, LEG

Hydrogeologist/Engineering Geologist



Steve is a licensed hydrogeologist and engineering geologist with technical and project management experience involving infrastructure siting investigations, geologic hazards, foundation studies, dewatering, watershed planning, hydrology, and infiltration studies. He works with our design teams to contribute his knowledge and expertise of the soil, rock, groundwater, and watershed conditions that will affect the design, construction, and operation of water infrastructure.

Steve participates in analysis and design decisions involving siting, geohazards, constructability, resilience, and integration of infrastructure with the environment to minimize risk and cost and maximize reliability and performance of water and sewer systems. His project expertise includes: geologic and geotechnical characterization of sites for infrastructure development; assessment of geologic hazards and development of mitigation strategies; design, construction and operation of construction dewatering systems; foundation and retaining wall evaluation; feasibility and design of reclaimed water and stormwater infiltration systems; assessment and remediation of contaminated sites; characterization of local and regional groundwater systems for groundwater supply; water supply well design and rehabilitation, construction and testing; wellhead protection analysis and water rights evaluation; and watershed planning, restoration, and improvements.

Representative Project Experience

- On-Call Engineering Services, Grant County Public Utility District No. 2
- General Engineering Services, Northeast Sammamish Sewer and Water District
- General Engineering Services, Port of Chelan County
- Hydrogeologic and Engineering Support for Water Rights Processing, Peterson & Marquis
- Lake Chelan WRIA 47 Long-Term Monitoring Plan and Water Rights Processing, Chelan County Natural Resources Department
- Groundwater Supply Development, City of Fife
- Lake Chelan Long-term Monitoring Plan Completion, Chelan County Natural Resources Department
- Water System Consolidation and Well No. 2 Relocation, City of College Place
- WRIA 47 Watershed Planning Phase 2 Water Quantity and Water, Chelan County Natural Resources Department
- Well No. 8 Design, Nob Hill Water Association
- Master Development Review Team (MDRT), City of Issaquah
- Evans Creek Water Quality and Quantity Monitoring, Union Hill/Northeast Sammamish Sewer and Water District
- WRIA 40A Planning Unit Storage Feasibility Assessment, Chelan County Natural Resources Department
- Red Mountain LID South Project, Kennewick Irrigation District
- Enclosed Conduit System—Phase II, Sunnyside Division Board of Control
- Regional Water Reliability Evaluation, City of Wenatchee

Education

MS Geology
University of Arizona, 1986

BS Geology
California State University,
1981

Licenses

Licensed Hydrogeologist
and Engineering Geologist
1402 (WA)

Registered Geologist
G2386 (OR)

Certified Engineering
Geologist
E2386 (OR)

Professional Geologist
PGL-1733 (ID)

Affiliations

Association of Ground
Water Scientists and
Engineers

American Water
Resources Association

American Water
Works Association

National Ground
Water Association

Experience

38 years of experience
19 years at RH2



Alicia Pettibone

Environmental Project Manager



Alicia manages all permitting work at RH2. She works closely with RH2's staff and clients, as well as regulatory agencies throughout the state, to navigate the regulatory environment. She is adept at facilitating project compliance for critical areas-related projects from start to finish and is often involved with RH2's projects from scoping through construction. In all her work, Alicia strives to deliver environmental services that are high-quality, thorough, and reliable.

Alicia has facilitated approvals through local, state, and federal agencies for the following permits: SEPA; NEPA; Hydraulic Project Approval (HPA); Shoreline Management Act compliance; Critical Areas Ordinance compliance; Endangered Species Act (ESA) compliance; Clean Water Act Section 401, Section 404, and Section 10; NPDES Construction Stormwater General Permit (CSGP); Floodplain Development; Land Use, Site Development, Building, and Construction Permits; and Cultural Resources compliance.

Alicia also leads wetland/stream ecology endeavors at RH2. Her project experience includes wetland and OHWM delineation, classification and functional assessment, regulatory compliance including permit applications and reports, restoration and compensatory mitigation design, construction document preparation, and mitigation monitoring.

Representative Project Experience

- Wetland and OHWM Delineations, Critical Areas Report, Wetland Mitigation Design for the Alger I-5 Water Main Replacement, PUD No. 1 of Skagit County
- Wetland and OHWM Delineation, Critical Areas Report, Wetland Mitigation Design, HPA and Section 404 Permit Support for Sub-basin 46.3a Watercourse Stabilization, City of Mercer Island
- Wetland and OHWM Delineation, Critical Areas Technical Memorandum, SEPA, Clearing and Grading, HPA for the C6 Water Main Connection, Covington Water District
- Wetland and OHWM Delineation, Critical Areas Report, SEPA, Shoreline Permitting, Floodplain Development Permit for Waterfront Park Force Main, City of Leavenworth
- OHWM Delineation, Critical Areas Report, SEPA, Shoreline Permitting, FEMA Habitat Assessment, and Special Use Permit for Old Port Lift Station, City of Olympia
- Wetland and OHWM Delineation, SEPA, Critical Areas Report, NEPA, BA, HPA, Cultural Resources facilitation, and Mitigation Design for Telegraph Road Multimodal Improvements, City of Bellingham
- Wetland and OHWM Delineations, SEPA, Critical Areas Report, Shoreline Exemption, Section 404, HPA, and Mitigation Design for Valencia Street Water Main, City of Bellingham
- Wetland Delineation, Critical Areas Compliance, Compensatory Mitigation Design, Wetland Resource Permitting, Project Management for Center Parkway Roadway Extension, City of Richland
- Wetland Delineation, SEPA, Critical Areas Report, Wetland Mitigation Design, Mitigation Monitoring for the Hawks Prairie Sister Standpipe, City of Lacey
- Wetland and OHWM Delineation, Critical Areas Report, and local permitting for Grainger Springs 2 Booster Pump Station, City of Bonney Lake

Education

BS Environmental Science
Minor, Chemistry
Huxley College of
Environmental Studies
Western Washington
University 2001

Training/Certifications

Wetland Status and Trends,
Swamp School
(2024, 2023, 2022)

Using the 2021 Interagency
Wetland Mitigation Guidance,
Ecology CTP (11/2023)

Western Washington Wetland
Rating System, Ecology CTP
(03/2023)

Know Your Grasses
Workshop, WNPS (07/2021)

Plant Morphology Workshop,
WNPS (11/2020)

Eastern Washington Wetland
Rating System, Ecology CTP
(10/2016)

Using the Credit-Debit Method
for Estimating Mitigation
Needs, Ecology CTP (05/2015)

Affiliations

Northwest Association of
Environmental Professionals

Society of Wetland Scientists

Experience

23 years of experience
23 years at RH2



Noah Bloxton

Environmental Scientist



As a dedicated environmental scientist, Noah supports a variety of RH2's projects through conducting field investigations, preparing technical reports, and drafting permit applications. Having completed the University of Washington Wetland Science and Management Certificate, he has a background in wetland ecology and policy that makes him a great asset for projects requiring critical areas compliance. Prior to joining RH2, Noah conducted field work for local, state, and federal agencies, including restoration monitoring and wildlife surveys. His work at RH2 has included facilitating compliance with SEPA, NEPA, FEMA Floodplain Regulations, Critical Areas Ordinance, Shoreline Management Act, Washington Hydraulic Code, and more.

Representative Project Experience

- SEPA, Wetland Delineation, Wetland Rating, Critical Areas Study, and Public Participation and Communication Plan for Boulevard Park Sewer Extension and Drainage Improvements, Valley View Sewer District
- Wetland and OHWM Delineation, Wetland Rating, and Critical Areas Compliance Assistance for Water Pipeline Relocation at Alger I-5 Interchange, Public Utility District No. 1 of Skagit County
- Wetland and OHWM Delineation, Wetland Rating, and Critical Areas Compliance Assistance for Wellfield 440 Zone Booster Pump Station, City of Blaine
- Water System Locating and Inventory using Trimble GPS for Point Defiance Park Water System, Metropolitan Park District of Tacoma
- SEPA, Shoreline Permitting, FEMA Habitat Assessment, and Special Use Permit for Old Port Lift Station, City of Olympia
- Wetland and OHWM Delineation, Wetland Rating, and Critical Areas Technical Memorandum for Grainger Springs Pump House Replacement, City of Bonney Lake
- SEPA, Shoreline Permitting, OHWM Delineation of the Wenatchee River, and Critical Areas Report for Waterfront Restroom Force Main Relocation, City of Leavenworth
- Wetland Delineation, Wetland Rating, and Critical Areas Compliance Assistance for US 2 and Icicle Road Roundabout, LINK Transit
- SEPA, CUP, Biological Survey, Migratory Bird Treaty Act Compliance, and NEPA Support for Process Water Reuse Facility Improvements Winter Storage, City of Pasco
- SEPA, Wetland Delineation, Wetland Rating, HPA, and Sensitive Areas Compliance Assistance for State Route 169 Water Main Improvements, City of Black Diamond
- SEPA, HPA, Wetland Delineation, Wetland Rating, OHWM Delineation, and Critical Areas Report for Beacon Hill to Skyline View Terrace Water Main, Beacon Hill Water and Sewer District
- Floodplain and Shoreline Permitting Assistance for River Intake Pump Station Discharge Manifold Replacement, Badger Mountain Irrigation District
- Environmental Report for Mosier City Center NEPA Compliance, City of Mosier
- Land Use review and Landscaping Plan Assistance for Southeast Reservoir, City of Yelm
- Wetland Mitigation Monitoring and Report for Hawks Prairie Sister Standpipe, City of Lacey
- Wetland Mitigation Monitoring and Report for Bothell Way NE and NE 195th Circle Rockery Repair, City of Bothell

Education

BS Environmental Science and Natural Resource Management, School of Environmental and Forest Sciences, University of Washington 2021

Trainings/Certifications

Using Field Indicators for Hydric Soils, CTP (10/2023)

Using the Washington Wetland State Wetland Rating System (2014) in Western WA, CTP (03/2023)

Grass, Sedge, and Rush Identification for Western WA Puget Lowland Habitats, CTP (03/2023)

How to Determine the Ordinary High Water Mark, CTP (07/2022)

Wetland Science and Management Certificate, UW (06/2022)

Biological Assessment Author Training, WSDOT H&LP (Certified Junior Author 03/2022)

Affiliations

Society of Wetland Scientists

Experience

4 years of experience
2 years at RH2



Skylar Netherland PWS

Environmental Scientist



Skylar is an accomplished environmental scientist with more than a decade of experience specializing in wetland delineation, wetland permitting, and plant and bird identification. With a strong background in ecology, wetland science, and biology, his expertise extends to navigating the intricate dynamics between clients and regulatory agencies, making sure projects meet deadlines and stay on track. His favorite aspect of his work is contributing to the preservation of the environment and local ecology amidst challenges posed by development and urbanization. Skylar holds a license as a Professional Wetland Scientist, reflecting his commitment to excellence in the field.

In his role at RH2, Skylar contributes to projects that require a unique blend of environmental and engineering expertise, addressing regulatory limitations on design. His work involves regulatory permitting, where RH2's combined environmental capabilities prove invaluable in overcoming significant project hurdles. Skylar is a seasoned professional who brings his wealth of experience and passion for environmental protection to RH2, contributing to our continued success in addressing complex environmental challenges.

Representative Project Experience

- SEPA, Conditional Use Permit, and Fish and Wildlife Habitat Site Assessment Report for Reservoir 10, City of Moses Lake
- Critical Areas Delineations, Wildlife Habitat Survey, HPA, Critical Areas Technical Memorandum for C6 Water Main Connection, Covington Water District
- HPA for NE 140th Street Repair and Replacement, Woodinville Water District
- HPA for Well No. 7 Drilling and Design, City of College Place
- Project Alternatives Permitting Analysis for Water Supply Analysis, City of Kennewick
- HPA for James-Bakerview Intersection, City of Bellingham
- Pre-Application Meeting and Habitat Conservation Plan Coordination for Webster Forest Nursery Expansion, Washington State Department of Natural Resources
- Critical Areas Delineations for Malaga Industrial Cooling Water Facility, Chelan Douglas Regional Port Authority
- Critical Areas Reconnaissance and OWHM Delineation for Water Transmission Main Replacement—Well Site to Mill Street, City of Leavenworth
- Critical Areas Reconnaissance and SEPA for Tanner Trail Extension, City of North Bend
- Artificial Burrow Site Investigation for Process Water Reuse Facility, City of Pasco
- Thousand Acre (+) Residential Land Developments Environmental Surveys with Federal Environmental Permits, including US Army Corps of Engineers (USACE) Nationwide Permits, US Fish and Wildlife Service (USFWS) Endangered Species Review and Impact Mitigation, and NRCS Site Reviews*
- Multi-Agency Coordination to Reclaim, Mitigate, Restore, and Develop Petroleum Contaminated Sites*
- Project Management for Projects Ranging from Single Residence to State-Wide Programs*

*Completed prior to joining RH2

Education

BS Biology
The University of Texas
at Austin 2011

Training/Certifications

Professional Wetland
Scientist #3209

Corrective Action Project
Manager (CAPM)

Ordinary High Water
Mark Training for Western
Washington (05/2024)

Washington State Wetland
Rating System for Western
Washington (04/2024)

Grass, Sedge, and Rush
Identification (03/2024)

Affiliations

Society of Wetland Scientists

Experience

13 years of experience
<1 year at RH2

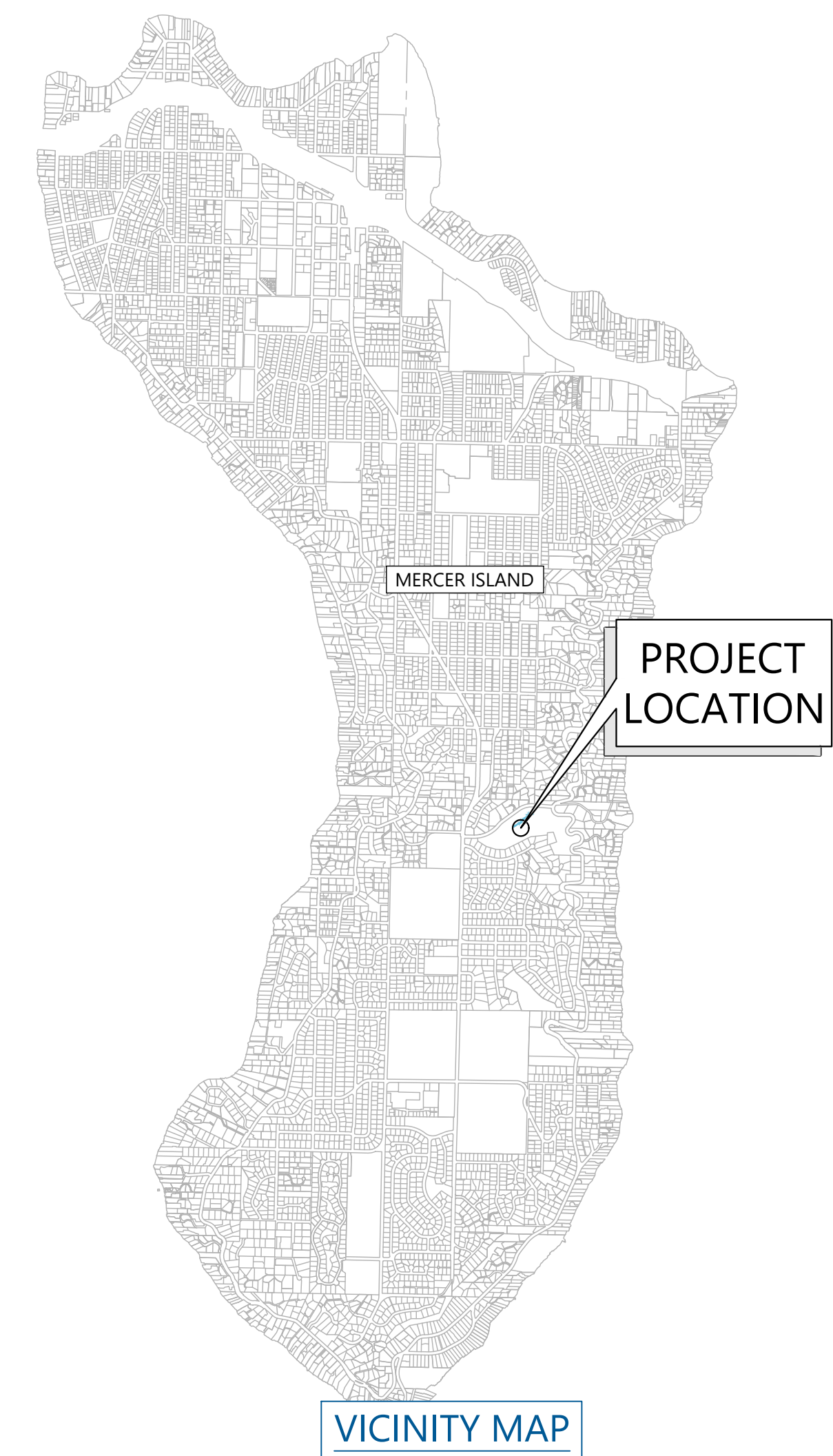
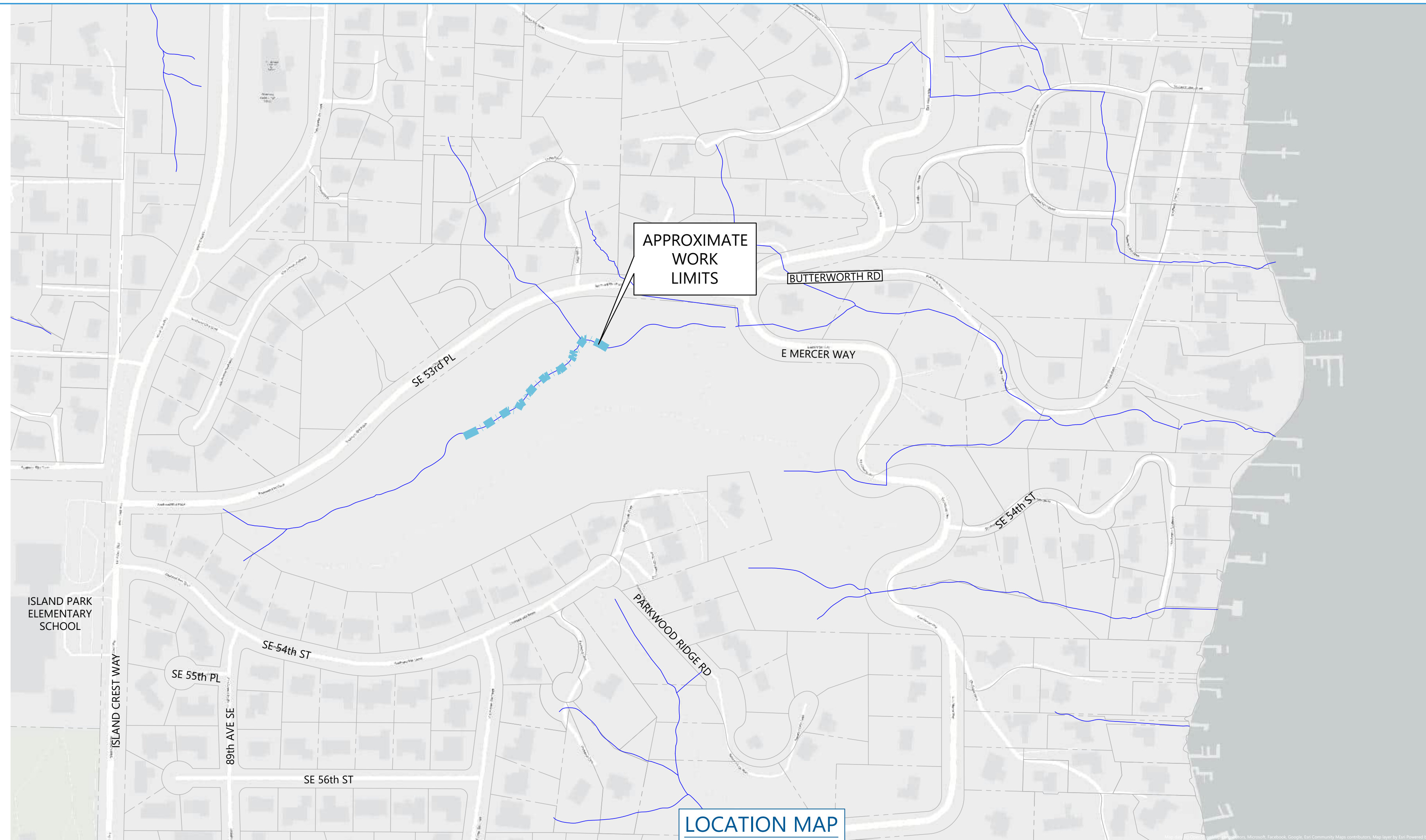
Appendix B

Design Plans

SUBBASIN 46.3 WATER COURSE STABILIZATION PROJECT

60% SUBMITTAL, OCTOBER 2024

SHEET INDEX	
G001	TITLE
G002	GENERAL NOTES
G003	ABBREVIATIONS & LEGEND
G100	EXISTING CONDITIONS, ACCESS, STAGING, & TESC
C101	WATERCOURSE STABILIZATION PLAN
C201	PROFILES
C301	CROSS SECTIONS
D601	DETAILS - TYPE 1 ELJ
D602	DETAILS - TYPE 2 ELJ
D603	MISC WATERCOURSE STABILIZATION DETAILS
D604	TESC DETAILS
L101	PLANTING SCHEDULE AND NOTES
L102	PLANTING DETAILS



XXXXXXXXXX X. XXXXXXXXXXXXXXXX (date)
 XXXXXXXXXXXX Registered
 Professional Engineer #1234567890



CITY OF MERCER ISLAND
 MERCER ISLAND PUBLIC WORKS
 9601 SE 36TH STREET
 MERCER ISLAND, WA 98040
 206-275-7608
 WWW.MERCERISLAND.GOV/PUBLICWORKS



12787 Gateway Drive South Tukwila, Washington 98168
 Phone: (206) 241-6000 www.nhcweb.com

**PRELIMINARY
 NOT FOR
 CONSTRUCTION**

REVISIONS			DRAWING INFORMATION	
##	DATE	DESCRIPTION	DATE	
			16:33:32 20241007	
			STATUS	60% SUBMITTAL
			DESIGNER/DRAFTER	DGH / TS
			CHECKED	VDC
			COORDINATE	WAB3-NF
			FILE NAME	SUBBASIN 46a3 - COVER_R0
			PLOTTED SCALE	0 1/2 1

SUBBASIN 46.3 WATERCOURSE STABILIZATION PROJECT

TITLE

JOB NUMBER 2008561
SHEET NUMBER G001
SHEET 1 OF 13

LAST SAVED BY: drc@mercisland.gov LAST DATE SAVED: 10/07/2024 16:33
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GENERAL NOTES:

- THESE DRAWINGS HAVE BEEN PREPARED FOR THE EXCLUSIVE USE OF CITY OF MERCER ISLAND, HEREAFTER REFERRED TO AS "OWNER" AND THEIR AUTHORIZED AGENTS.
- NORTHWEST HYDRAULIC CONSULTANTS, INC. (NHC) HEREAFTER REFERRED TO AS THE 'ENGINEER' IS RESPONSIBLE FOR PREPARATION OF THESE ORIGINAL DRAWINGS AND ASSOCIATED CONTRACT SPECIFICATIONS. NHC WILL NOT BE RESPONSIBLE FOR, OR LIABLE FOR, UNAUTHORIZED CHANGE, OR USE, OF THESE DRAWINGS WHICH INCLUDES ALTERATION, DELETION, OR EDITING OF THIS DOCUMENT WITHOUT EXPLICIT WRITTEN PERMISSION FROM THE ENGINEER. ANY OTHER UNAUTHORIZED USE OF THIS DOCUMENT IS PROHIBITED.
- CONTRACTOR TO WORK WITHIN HOURS ALLOWED BY CITY ORDINANCES.
- CONTRACTOR SHALL VERIFY EXISTING SITE FEATURES AND DISCUSS POSSIBLE CONSTRUCTION CONFLICTS WITH OWNER REPRESENTATIVE PRIOR TO START OF WORK. ANY FAILURE BY THE CONTRACTOR AND SUBCONTRACTOR(S) TO ACQUAINT THEMSELVES WITH ALL THE AVAILABLE INFORMATION WILL NOT RELIEVE THE CONTRACTOR AND SUBCONTRACTOR(S) FROM RESPONSIBILITY FOR PROPERLY ESTIMATING THE DIFFICULTY AND COST OF SUCCESSFULLY PERFORMING THE WORK.
- UTILITY INFORMATION MAY BE INCOMPLETE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL UTILITIES PRIOR TO PERFORMING ANY WORK.
- THE CONTRACTOR AGREES TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; AND FURTHER AGREES THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS IN ACCORDANCE WITH THE PROVISIONS OUTLINED BY THE PROJECT CONTRACT AND SPECIFICATIONS.
- THE LOCATION OF ALL FEATURES SHOWN IS APPROXIMATE. FIELD VERIFY WITH CITY'S REPRESENTATIVE ALL STRUCTURE LOCATIONS, DIMENSIONS, AND ELEVATIONS PRIOR TO EXCAVATION, ASSEMBLY, AND INSTALLATION OF STRUCTURES.
- CONTRACTOR SHALL PROVIDE 48 HOURS ADVANCE NOTICE TO THE CITY'S REPRESENTATIVE PRIOR TO ANY REQUIRED INSPECTION.
- MINOR MODIFICATIONS ARE EXPECTED TO SUIT JOB SITE DIMENSIONS OR CONDITIONS. SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK. THE OWNER, ENGINEER AND APPROPRIATE REGULATORY AGENCIES SHALL BE NOTIFIED OF ANY OWNER-AUTHORIZED CHANGE RESULTING IN MORE THAN A 10% DESIGN CHANGE OF PROPOSED FOOTPRINT OR THAT SIGNIFICANTLY AFFECTS THE INTENDED BENEFIT OR FUNCTION OF A PROJECT ELEMENT.
- ALL IMPROVEMENTS SHALL BE ACCOMPLISHED UNDER THE APPROVAL, INSPECTION, AND TO THE SATISFACTION OF THE OWNER. IMPROVEMENT CONSTRUCTION SHALL COMPLY WITH THESE PLANS AND THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT) STANDARD PLANS FOR CONSTRUCTION OF ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION, CURRENT EDITION UNLESS NOTED OTHERWISE. ALL REFERENCES TO THE "STANDARD SPECIFICATIONS" SHALL MEAN THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT) STANDARD SPECIFICATIONS FOR CONSTRUCTION OF LOCAL STREETS AND ROADS, CURRENT EDITION. CONSTRUCTION NOT SPECIFIED ON THESE PLANS SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS. THE CONTRACTOR IS OBLIGATED TO BE FAMILIAR WITH APPLICABLE SECTIONS OF THE STANDARD SPECIFICATIONS NOT DISCUSSED IN THE GENERAL NOTES. THE CONTRACT SPECIAL PROVISIONS SHALL SUPERSEDE THOSE OF THE STANDARD SPECIFICATIONS WHERE DISCREPANCIES OCCUR.
- ALL EXISTING SITE FEATURES NOT SPECIFIED FOR REMOVAL SHALL BE PROTECTED DURING CONSTRUCTION.

SURVEY NOTES:

- THE CONTRACTOR WILL BE PROVIDED WITH AN AUTOCAD 2023 DRAWING FILE, WHICH WILL CONTAIN THE EXISTING WATERCOURSE ALIGNMENT TO BE USED FOR CONSTRUCTION STAKING AND LAYOUT.
- CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION OF ALL EXISTING SURVEY MONUMENTS AND OTHER SURVEY MARKERS DURING CONSTRUCTION.
- THE CONTRACTOR SHALL MAINTAIN A SET OF PLANS ON THE JOB SHOWING "AS-BUILT" CHANGES MADE TO DATE. UPON COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL SUPPLY TO OWNER A SET OF PLANS, MARKED UP TO THE SATISFACTION OF THE OWNER, REFLECTING "AS-BUILT" CONDITIONS. SITE TOPOGRAPHY AND BATHYMETRY MAY DIFFER AT TIME OF CONSTRUCTION.
- TOPOGRAPHIC CONTOURS BASED ON 2021 KING COUNTY LIDAR. BATHYMETRIC SURVEY WAS COLLECTED BY NHC AND IS REPRESENTATIVE OF 2024 CHANNEL CONDITIONS.
- HORIZONTAL DATUM: NAD83(11) (WASHINGTON STATE PLANE, NORTH ZONE), U.S. SURVEY FEET. VERTICAL DATUM: NAVD88.

PERMIT NOTES:

- ALL WORK SHALL BE DONE IN COMPLIANCE WITH THE PERMIT CONDITIONS ISSUED BY APPLICABLE REGULATORY AGENCIES. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE HARD COPIES OF ALL PERMITS AT THE JOB SITE, AND TO UNDERSTAND AND COMPLY WITH PERMIT CONDITIONS AND PROVISIONS.
- ALL WORK SHALL COMPLY WITH THE WDFW HPA CONDITIONS AND OTHER PERMIT CONDITIONS. THE CONTRACTOR SHALL MAINTAIN WATER QUALITY STANDARDS AT ALL TIMES.
- ALL ACTIVITIES THAT INVOLVE WORK ADJACENT TO, OR WITHIN THE WETTED CHANNEL SHALL, AT ALL TIMES, REMAIN CONSISTENT WITH ALL APPLICABLE WATER QUALITY STANDARDS; EFFLUENT LIMITATION; AND STANDARDS OF PERFORMANCE, PROHIBITIONS, PRETREATMENT STANDARDS, AND MANAGEMENT PRACTICES ESTABLISHED PURSUANT TO THE CLEAN WATER ACT OR PURSUANT TO APPLICABLE STATE AND LOCAL LAW.
- IF, DURING CONSTRUCTION, ARCHAEOLOGICAL REMAINS ARE ENCOUNTERED, CONSTRUCTION IN THE VICINITY SHALL BE HALTED, AND THE STATE OFFICE OF HISTORIC PRESERVATION AND OWNER NOTIFIED IMMEDIATELY.
- IF AT ANY TIME, AS A RESULT OF PROJECT ACTIVITIES, FISH ARE OBSERVED IN DISTRESS, A FISH KILL OCCURS, OR WATER QUALITY PROBLEMS DEVELOP (INCLUDING EQUIPMENT LEAKS OR SPILLS), OPERATIONS SHALL CEASE AND THE OWNER REPRESENTATIVE NOTIFIED IMMEDIATELY. WASHINGTON DEPARTMENT OF FISH AND WILDLIFE AND WASHINGTON DEPARTMENT OF ECOLOGY WILL BE CONTACTED IMMEDIATELY BY THE OWNER REPRESENTATIVE. WORK SHALL NOT RESUME UNTIL FURTHER APPROVAL BY THE CITY'S REPRESENTATIVE.

EROSION, SEDIMENT CONTROL, AND WATER MANAGEMENT NOTES:

- THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING ALL TEMPORARY EROSION CONTROL MEASURES. THE EROSION CONTROL MEASURES SHALL BE IN ACCORDANCE WITH ALL FEDERAL, STATE, LOCAL REQUIREMENTS, AND APPROVED EROSION CONTROL PLAN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE AND PERFORMANCE OF THE TEMPORARY EROSION CONTROL MEASURES THROUGHOUT THE DURATION OF THE PROJECT.
- A SEDIMENT AND EROSION CONTROL PLAN WILL BE DEVELOPED BY THE CONTRACTOR AND SUBMITTED FOR APPROVAL BY OWNER BEFORE ANY CONSTRUCTION MAY BEGIN. THE SEDIMENT AND EROSION CONTROL PLAN WILL IDENTIFY BEST MANAGEMENT PRACTICES TO ENSURE THAT THE TRANSPORT OF SEDIMENT TO SURFACE WATERS, DRAINAGE SYSTEMS, AND ADJACENT PROPERTIES IS MINIMIZED.
- ACTIVITIES SHALL BE DESIGNED AND CONSTRUCTED TO AVOID AND MINIMIZE ADVERSE IMPACTS TO WATERS OF THE UNITED STATES TO THE MAXIMUM EXTENT PRACTICAL THROUGH THE USE OF PRACTICAL ALTERNATIVES. ALTERNATIVES THAT SHALL BE CONSIDERED INCLUDE THOSE THAT MINIMIZE THE NUMBER AND EXTENT OF IN-WATER WORK AND EQUIPMENT CROSSINGS OF WETTED CHANNELS.
- THE TEMPORARY EROSION AND SEDIMENT CONTROL (TESC) FACILITIES SHOWN ON THESE PLANS MUST BE CONSTRUCTED PRIOR TO OR IN CONJUNCTION WITH ALL CLEARING, GRUBBING, AND GRADING SO AS TO ENSURE THAT THE TRANSPORT OF SEDIMENT TO SURFACE WATERS, DRAINAGE SYSTEMS, AND ADJACENT PROPERTIES IS MINIMIZED.
- NO TREES OR WETLAND VEGETATION SHALL BE REMOVED UNLESS THEY ARE SHOWN AND NOTED TO BE REMOVED ON THE PLANS OR AS DIRECTLY SPECIFIED ON-SITE BY THE CITY'S REPRESENTATIVE. NO GRADING SHALL TAKE PLACE WITHIN THE DRIP LINE OF TREES NOT TO BE REMOVED UNLESS OTHERWISE APPROVED BY THE CITY.
- STABILIZED CONSTRUCTION ENTRANCES AND ROADS SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES, SUCH AS WASH PADS, MAY BE REQUIRED TO ENSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT. WASH PADS ARE NOT PERMITTED TO DISCHARGE TO WETLANDS OR STREAMS.
- EQUIPMENT USED FOR THE PROJECT SHALL BE FREE OF EXTERNAL PETROLEUM-BASED PRODUCTS WHILE WORKING NEAR ANY SURFACE WATER OR WETLANDS. ACCUMULATION OF SOILS OR DEBRIS SHALL BE REMOVED FROM THE DRIVE MECHANISMS (WHEELS, TRACKS, TIRES, ETC.) AND UNDERCARRIAGE OR EQUIPMENT PRIOR TO ITS WORKING BELOW THE ORDINARY HIGH WATER (OHW) ELEVATION.
- EQUIPMENT SHALL BE CHECKED DAILY FOR LEAKS, AND ANY NECESSARY REPAIRS SHALL BE COMPLETED PRIOR TO COMMENCING WORK ACTIVITIES. SPILL KITS SHALL BE ACCESSIBLE AT ALL TIMES TO EQUIPMENT OPERATORS.
- CONTRACTOR IS RESPONSIBLE TO ENSURE THAT NO PETROLEUM PRODUCTS, HYDRAULIC FLUID, SEDIMENTS, SEDIMENT-LADEN WATER, CHEMICALS, OR ANY OTHER TOXIC OR DELETERIOUS MATERIALS ARE ALLOWED TO ENTER OR LEACH INTO THE RIVER, GROUNDWATER, OR WETLANDS.
- COVER, CONTAINMENT, AND PROTECTION FROM VANDALISM SHALL BE PROVIDED FOR ALL CHEMICALS, LIQUID PRODUCTS, PETROLEUM PRODUCTS, AND NON-INERT WASTE PRESENT ON THE SITE (SEE CHAPTER 173-304 WAC FOR DEFINITION OF INERT WASTE). ONSITE FUELING TANKS SHALL INCLUDE SECONDARY CONTAINMENT.
- ALTERATION OR DISTURBANCE OF THE BANK AND BANK VEGETATION SHALL BE MINIMIZED TO THAT NECESSARY FOR THE PROJECT.
- AT NO TIME SHALL SEDIMENT -LADEN WATER BE DISCHARGED OR PUMPED DIRECTLY INTO THE SUBJECT RIVER, STREAM, OR WETLAND. WATER SHALL BE DISCHARGED IN ACCORDANCE WITH REQUIREMENTS SET FORTH IN THE PROJECT PERMITS AND / OR SPECIFICATIONS.
- PERMIT CONDITIONS CONTAIN SPECIFIC REQUIREMENTS FOR THE CONTROL OF EROSION AND TURBIDITY FROM PROJECT OPERATIONS. TURBIDITY WILL BE MONITORED ON A FREQUENT BASIS BY THE PROJECT MANAGEMENT AND INSPECTION STAFF ON-SITE. TURBIDITY AMOUNTS IN EXCESS OF THE PERMITTED CONCENTRATIONS AND/OR DURATIONS WILL CAUSE WORK TO BE STOPPED UNTIL IMPROVED PRACTICES ARE IN EFFECT AND THE PROBLEMS CONTROLLED. THE CONTRACTOR IS COMPLETELY RESPONSIBLE FOR ANY PROJECT DELAYS THAT OCCUR BY NATURE OF THIS FAILURE TO ADEQUATELY CONTAIN SEDIMENT ON-SITE.
- IF HIGH WATER LEVEL CONDITIONS THAT MAY CAUSE SILTATION OR EROSION ARE ENCOUNTERED DURING CONSTRUCTION, WORK SHALL STOP UNTIL THE FLOW SUBSIDES.
- FOLLOWING CONSTRUCTION, CONTRACTOR SHALL RESTORE ALL GRADES AND STABILIZE DISTURBED AREAS. SITE RESTORATION WILL INCLUDE ESTABLISHING LONG-TERM EROSION PROTECTION MEASURES. THESE MEASURES WILL INCLUDE PLANTINGS, EROSION CONTROL FABRIC, SEED, AND MULCH. EQUIPMENT AND EXCESS SUPPLIES WILL BE REMOVED AND THE WORK AREA WILL BE CLEANED. MAINTENANCE ACTIVITIES FOR THE NEWLY CONSTRUCTED RESTORATION PROJECTS ARE ANTICIPATED TO OCCUR PERIODICALLY.
- ALL STOCKPILED MATERIAL SHALL BE STAGED AND MAINTAINED WITH THE CONSTRUCTION LIMITS SHOWN ON THE DRAWINGS.
- EXPOSED SOILS THAT WILL NOT BE DISTURBED FOR TWO CONSECUTIVE DAYS DURING THE WET SEASON (OCTOBER 1 TO APRIL 30) OR SEVEN CONSECUTIVE DAYS IN THE DRY SEASON (MAY 1 TO SEPTEMBER 30) SHALL BE IMMEDIATELY STABILIZED WITH ESC MEASURES (E.G. SEEDING, MULCHING, PLASTIC COVERING).
- PRIOR TO THE BEGINNING OF THE WET SEASON (OCT. 1), ALL DISTURBED AREAS SHALL BE REVIEWED TO IDENTIFY WHICH AREAS CAN BE SEEDED IN PREPARATION FOR WINTER RAINS.

CONSTRUCTION NOTES:

- THE DRAWINGS REPRESENT THE INTENDED OUTCOME OF THE WORK. THEY DO NOT INDICATE THE CONSTRUCTION METHODS TO BE USED. CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY TO PROTECT THE STRUCTURES, WORKS, AND THE PUBLIC DURING CONSTRUCTION.
- ALL WORK PERFORMED AND MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES.
- CONTRACTOR SHALL INSTALL ALL MATERIALS IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS UNLESS SPECIFICALLY INDICATED OTHERWISE BY THE OWNER OR WHERE LOCAL CODES OR REGULATIONS TAKE PRECEDENCE.
- ANY DISCREPANCIES ARE TO BE BROUGHT TO THE ATTENTION OF THE OWNER PRIOR TO PROCEEDING WITH THE WORK.
- THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK USING THE BEST SKILLS AND ATTENTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THIS CONTRACT.
- THE CONTRACTOR SHALL MAKE ALL NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, ROADWAY, DRAINAGE WAYS, PRIVATE BRIDGE, CULVERTS, AND VEGETATION UNTIL SUCH ITEMS ARE TO BE DISTURBED OR REMOVED AS INDICATED ON THE CONTRACT DOCUMENTS.
- THE CONTRACTOR SHALL KEEP THE JOB SITE CLEAN AND HAZARD FREE. CONTRACTOR SHALL DISPOSE OF ALL DIRT, DEBRIS, AND RUBBISH FOR THE DURATION OF THE WORK. UPON COMPLETION OF WORK, CONTRACTOR SHALL REMOVE ALL MATERIAL AND EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY.
- SOILS AT THE SITE CONTAIN SOFT SILT, CLAY AND HIGH GROUNDWATER AND MAY REQUIRE EQUIPMENT MATS TO SUPPORT CONSTRUCTION EQUIPMENT. CONSOLIDATION OF THE GROUND SURFACE SHOULD BE EXPECTED. CONTRACTOR IS RESPONSIBLE FOR DETERMINING NEED FOR, DESIGNING, PROCURING, INSTALLING, USING AND REMOVING ANY EQUIPMENT MATS NEEDED TO ALLOW FOR EQUIPMENT OPERATION SUFFICIENT TO CONSTRUCT THE PROJECT.
- NOTES AND DETAILS ON THE DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL NOTES HEREIN.
- DIMENSIONS CALLOUTS SHALL TAKE PRECEDENCE OVER SCALES SHOWN ON THE DRAWINGS.
- ACCESS AND STAGING AREAS SHOWN ON DRAWINGS ARE POTENTIAL AND ARE REPRESENTATIVE OF THE MAXIMUM AREA TO BE DISTURBED. CONTRACTOR SHALL SUBMIT FOR APPROVAL A CONSTRUCTION ACCESS AND STAGING PLAN 10 DAYS PRIOR TO SITE WORK. CONTRACTOR SHALL STAKE PROPOSED ACCESS AND STAGING AREAS FOR REVIEW AND APPROVAL BY THE CITY'S REPRESENTATIVE PRIOR TO CLEARING. EQUIPMENT AND MATERIAL SHALL NOT BE STORED OUTSIDE THE APPROVED STAGING AREA EXTENTS, UNLESS APPROVED BY THE CITY'S REPRESENTATIVE.
- CONTRACTOR SHALL LIMIT MACHINERY MOVEMENT AND DISTURBANCE TO STAGING AREAS OR TEMPORARY ACCESS CORRIDORS, AS SHOWN ON THE DRAWINGS OR AS APPROVED BY THE OWNER REPRESENTATIVE. CONTRACTOR SHALL MINIMIZE GROUND VIBRATIONS AND DAMAGE TO SLOPES BY UTILIZING APPROPRIATE CONSTRUCTION EQUIPMENT. ALL CONSTRUCTION SHALL BE HAND-PLACED.
- ALL AREAS WITHIN THE CLEARING LIMITS SHALL BE CLEARED AND GRUBBED OF INVASIVE PLANTS ONLY AND HAULED OFFSITE. ROOTS OF INVASIVE PLANTS (EXCLUDING CHERRY LAUREL) SHALL BE GRUBBED FROM THE SOIL AND HAULED OFFSITE. CHERRY LAUREL ROOTS SHALL REMAIN INTACT AND IN THE GROUND FOR EROSION CONTROL PURPOSES. INVASIVE SPECIES INCLUDE BUT ARE NOT LIMITED TO HIMALAYAN BLACKBERRY AND ENGLISH IVY.
- MULCH WILL BE STOCKPILED ALONG ACCESS PATHS BY THE CONTRACTOR AS APPROVED/IDENTIFIED BY THE CITY'S REPRESENTATIVE. THE STOCKPILING OF MULCH SHALL OCCUR AFTER CONSTRUCTION OF ALL THE IN-STREAM STRUCTURES BUT PRIOR TO RESTORATION OF THE ACCESS PATHS AND PROJECT CLOSE OUT.
- CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS AS INDICATED ON DRAWINGS.
- THE CONTRACTOR SHALL PROVIDE THE TEMPORARY ACCESS PLAN TO THE CITY FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.



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			CHECKED	VDC
			COORDINATE	WA83-NF
			FILE NAME	SUBBASIN 46a3 - COVER_R0
			PLOTTED SCALE	0 1/2 1

**SUBBASIN 46.3 WATERCOURSE
 STABILIZATION PROJECT**

NOTES

JOB NUMBER
2008561

SHEET NUMBER

G002

SHEET 2 OF 13

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LEGEND

CONTROL POINTS	
EXISTING TREES	
EXISTING PAVED ROAD	
EXISTING GRAVEL ROAD	
EXISTING CONTOURS (MAJOR)	
EXISTING CONTOURS (MINOR)	
EXISTING EDGE OF WATER (00/00/00)	
EXISTING BUILDINGS & STRUCTURES	
EXISTING RIGHT-OF-WAY	
EXISTING STORM DRAIN	
EXISTING GAS LINE	
EXISTING ORDINARY HIGH WATER MARK	
EXISTING SANITARY SEWER LINE	
EXISTING WATER LINE	
EXISTING PROPERTY LINE	
EXISTING EASEMENT	
EXISTING CATCH BASIN	
EXISTING SANITARY SEWER MANHOLE	
EXISTING WETLAND (APPROX BOUNDARY)	
EXISTING TREE	
EXISTING LARGE DOWNED WOOD	
EXISTING DECIDUOUS TREE	
EXISTING CONIFEROUS TREE	
EXISTING TREE TO BE REMOVED	

LEGEND

CONSTRUCTION BASELINE	
PRESERVATION FENCE	
PRESERVATION FENCE WITH SILT BARRIER	
PROPOSED CONTOUR	
PROPOSED GRADING	
CONSTRUCTION WORK LIMIT	
POTENTIAL TEMPORARY ACCESS ROUTE	
TEMPORARY ROCK CHUTE LOCATION	
PROPOSED TYPE 1 ELJ	
PROPOSED TYPE 2 ELJ	
PROPOSED EXISTING WEIR STABILIZATION	
APPROXIMATE TREE SURVEY EXTENTS	
MAPPED LANDSLIDE	

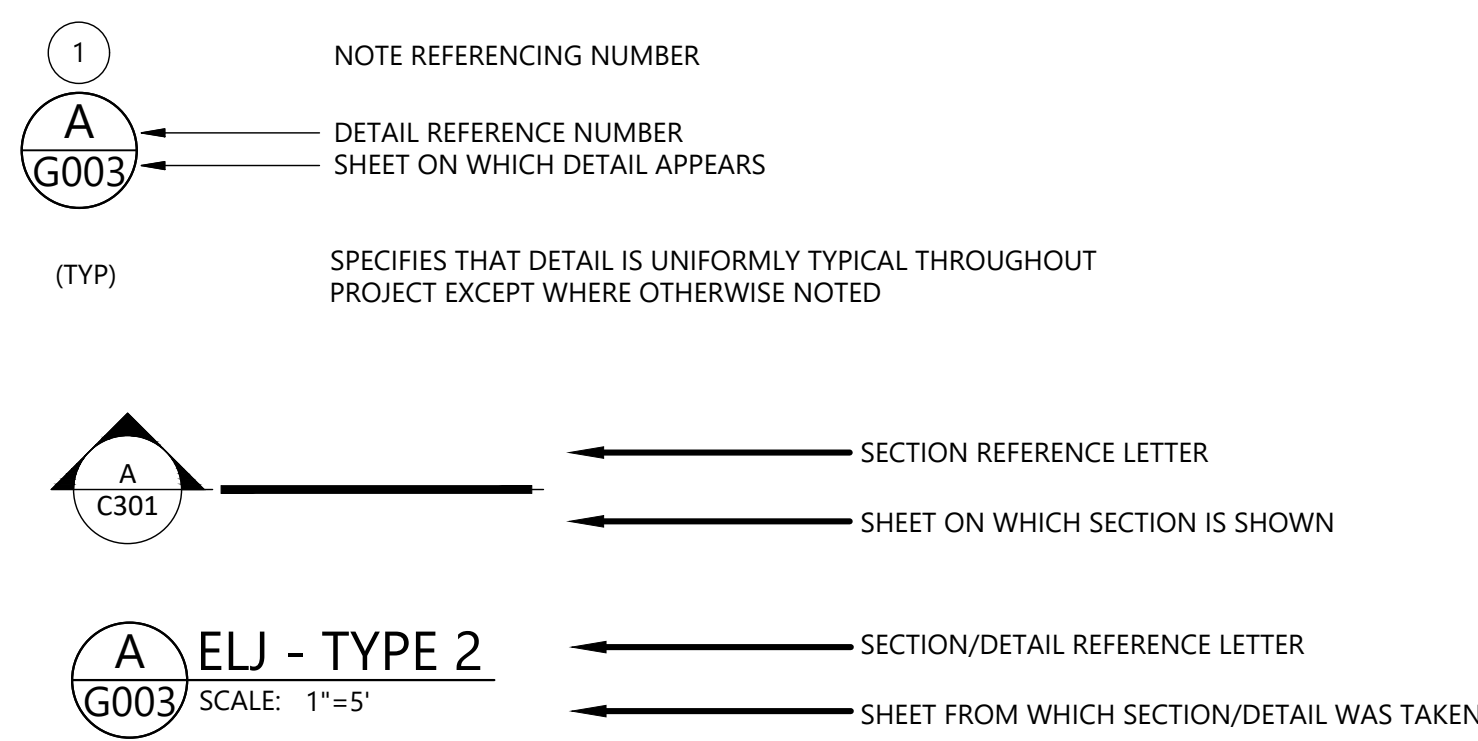
PROPOSED HATCHES

STRUCTURAL BACKFILL	
LOCAL SOIL BACKFILL	
BOULDER/SEDIMENT MIX	
COBBLE/SEDIMENT MIX	
TEMPORARY STAGING AREA	
SLASH	
ROCK CHUTE	

ABBREVIATIONS:

AVE	AVENUE	MC	MAIN CHANNEL
B	BORING LOCATION	MEG	MATCH EXISTING GRADE
BLDG	BUILDING	MW	MONITORING WELL
BFM	BONDED FIBER MATRIX	MUTCD	MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES
BMP(S)	BEST MANAGEMENT PRACTICE(S)	N	NORTH / NORTHING
BP	TEMPORARY BYPASS ROAD	NAD83	NORTH AMERICAN DATUM, 1983
C	CURVE, CUT	NAVD88	NORTH AMERICAN VERTICAL DATUM, 1988
CF	CUBIC FOOT	NE	NORTHEAST
CFS	CUBIC FOOT PER SECOND	NTS	NOT TO SCALE
CLV	CULVERT	NW	NORTHWEST
CPE	CORRUGATED POLYETHYLENE	O.C.	ON CENTER
CSBC	CRUSHED SURFACING BASE COURSE	OHW	ORDINARY HIGH WATER
CSS	CHANNEL SPANNING STRUCTURE	OHWM	ORDINARY HIGH WATER MARK
CSWPPP	CONSTRUCTION STORMWATER POLLUTION PREVENTION PLAN	PL	PROPERTY LINE/ PLACE
CY	CUBIC YARD	PWS	PROFESSIONAL WETLAND SCIENTIST
DBH	DIAMETER BREAST HEIGHT	R	RADIUS
DIA(M)	DIAMETER	RCP	REINFORCED CONCRETE PIPE
DWG	DRAWING	RD	ROAD
E	EAST / EASTING	RM	RIVER MILE
EG	EXISTING GROUND	R/W	RIGHT OF WAY
ELEV	ELEVATION	S.R.	STATE ROUTE
ELJ	ENGINEERED LOG JAM	SB	SUBBASIN
ESC	EROSION SEDIMENT CONTROL	SC	SIDE CHANNEL
EXST	EXISTING	SE	SOUTHEAST
FG	FINISHED GRADE	STA	STATION
F	FILL	STD	STANDARD
FT	FEET	SW	SOUTHWEST
GAL	GALLON	SWDM	SURFACE WATER DESIGN MANUAL
GWSE	GROUNDWATER SURFACE ELEVATION	SWPPP	STORMWATER POLLUTION PREVENTION PLAN
H	HORIZONTAL	TBD	TO BE DETERMINED
HPA	HYDRAULIC PROJECT APPROVAL	TESC	TEMPORARY EROSION AND SEDIMENT CONTROL
ID	IDENTIFIER	TP	TEST PIT
IE	INVERT ELEVATION	TYP	TYP
IN	INCH	U.S.	UNITED STATES
INC	INCORPORATED	UNT	UNNAMED TRIBUTARY
L	LINE	V	VERTICAL
LAT	LATITUDE	WAC	WASHINGTON ADMINISTRATIVE CODE
LF	LINEAR FEET	WDFW	WASHINGTON DEPARTMENT OF FISH AND WILDLIFE
LE	LEVEE EXCAVATION	WQMP	WATER QUALITY MANAGEMENT PLAN
LONG	LONGITUDE	WSDOT	WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
LS	LEVEE SETBACK	WSEL	WATER SURFACE ELEVATION
		YR	YEAR

DETAIL AND SECTION REFERENCING:



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**SUBBASIN 46.3 WATERCOURSE
 STABILIZATION PROJECT**

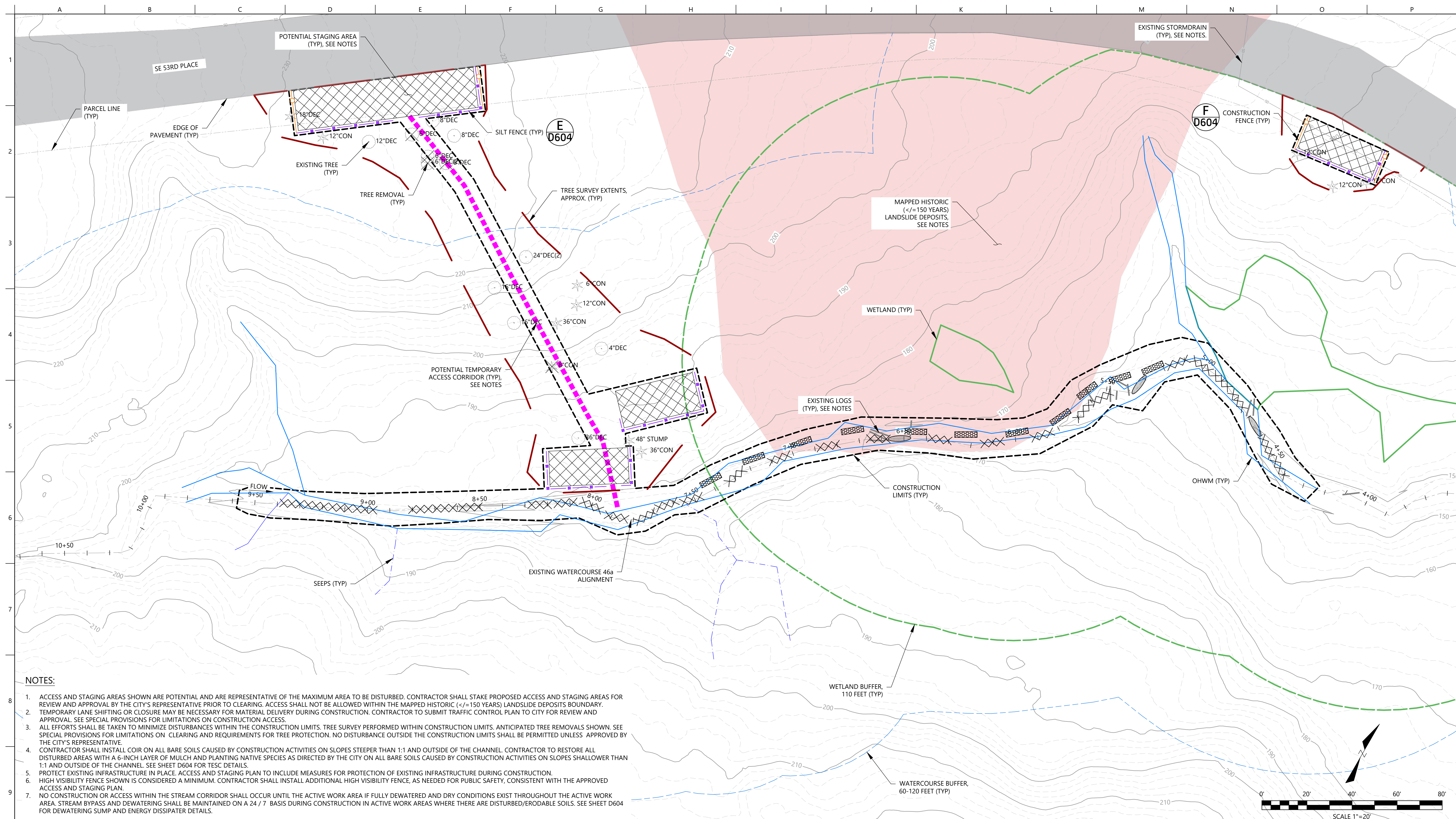
ABBREVIATIONS & LEGEND

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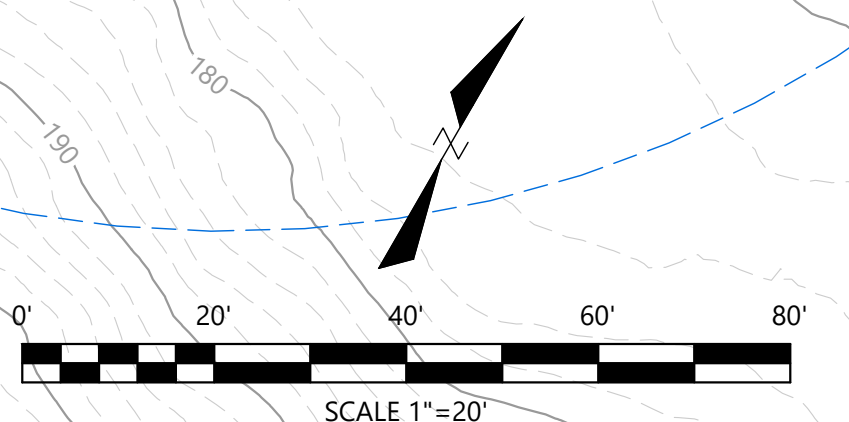
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- NOTES:**
1. ACCESS AND STAGING AREAS SHOWN ARE POTENTIAL AND ARE REPRESENTATIVE OF THE MAXIMUM AREA TO BE DISTURBED. CONTRACTOR SHALL STAKE PROPOSED ACCESS AND STAGING AREAS FOR REVIEW AND APPROVAL BY THE CITY'S REPRESENTATIVE PRIOR TO CLEARING. ACCESS SHALL NOT BE ALLOWED WITHIN THE MAPPED HISTORIC (<=150 YEARS) LANDSLIDE DEPOSITS BOUNDARY.
 2. TEMPORARY LANE SHIFTING OR CLOSURE MAY BE NECESSARY FOR MATERIAL DELIVERY DURING CONSTRUCTION. CONTRACTOR TO SUBMIT TRAFFIC CONTROL PLAN TO CITY FOR REVIEW AND APPROVAL. SEE SPECIAL PROVISIONS FOR LIMITATIONS ON CONSTRUCTION ACCESS.
 3. ALL EFFORTS SHALL BE TAKEN TO MINIMIZE DISTURBANCES WITHIN THE CONSTRUCTION LIMITS. TREE SURVEY PERFORMED WITHIN CONSTRUCTION LIMITS. ANTICIPATED TREE REMOVALS SHOWN. SEE SPECIAL PROVISIONS FOR LIMITATIONS ON CLEARING AND REQUIREMENTS FOR TREE PROTECTION. NO DISTURBANCE OUTSIDE THE CONSTRUCTION LIMITS SHALL BE PERMITTED UNLESS APPROVED BY THE CITY'S REPRESENTATIVE.
 4. CONTRACTOR SHALL INSTALL COIR ON ALL BARE SOILS CAUSED BY CONSTRUCTION ACTIVITIES ON SLOPES STEEPER THAN 1:1 AND OUTSIDE OF THE CHANNEL. CONTRACTOR TO RESTORE ALL DISTURBED AREAS WITH A 6-INCH LAYER OF MULCH AND PLANTING NATIVE SPECIES AS DIRECTED BY THE CITY ON ALL BARE SOILS CAUSED BY CONSTRUCTION ACTIVITIES ON SLOPES SHALLOWER THAN 1:1 AND OUTSIDE OF THE CHANNEL. SEE SHEET D604 FOR TESC DETAILS.
 5. PROTECT EXISTING INFRASTRUCTURE IN PLACE. ACCESS AND STAGING PLAN TO INCLUDE MEASURES FOR PROTECTION OF EXISTING INFRASTRUCTURE DURING CONSTRUCTION.
 6. HIGH VISIBILITY FENCE SHOWN IS CONSIDERED A MINIMUM. CONTRACTOR SHALL INSTALL ADDITIONAL HIGH VISIBILITY FENCE, AS NEEDED FOR PUBLIC SAFETY, CONSISTENT WITH THE APPROVED ACCESS AND STAGING PLAN.
 7. NO CONSTRUCTION OR ACCESS WITHIN THE STREAM CORRIDOR SHALL OCCUR UNTIL THE ACTIVE WORK AREA IS FULLY DEWATERED AND DRY CONDITIONS EXIST THROUGHOUT THE ACTIVE WORK AREA. STREAM BYPASS AND DEWATERING SHALL BE MAINTAINED ON A 24 / 7 BASIS DURING CONSTRUCTION IN ACTIVE WORK AREAS WHERE THERE ARE DISTURBED/ERODABLE SOILS. SEE SHEET D604 FOR DEWATERING SUMP AND ENERGY DISSIPATER DETAILS.




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			PLOTTED SCALE	0 1/2 1

**SUBBASIN 46.3 WATERCOURSE
 STABILIZATION PROJECT**

**EXISTING CONDITIONS, ACCESS, STAGING,
 & TESC**

JOB NUMBER
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SHEET NUMBER
G100

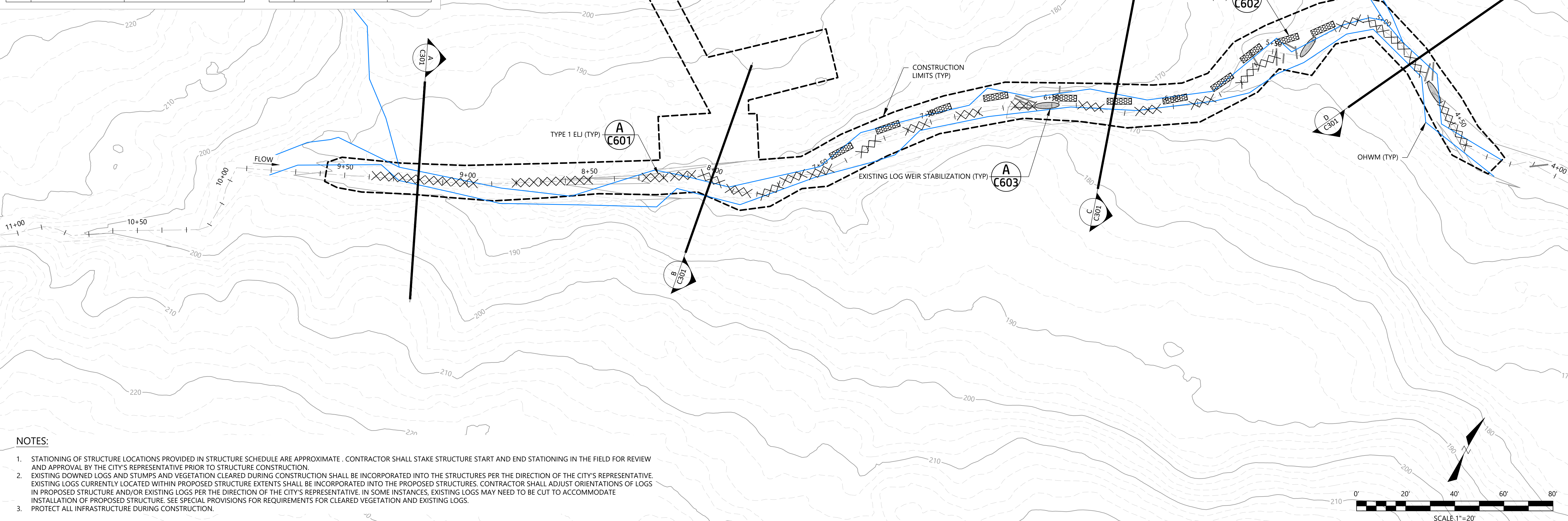
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STRUCTURE SCHEDULE		
Point	Northing/Easting	Description
425	205794.9177,1298907.2246	EXISTING LOG WEIR STABILIZATION
426	205777.9979,1298856.9068	EXISTING LOG WEIR STABILIZATION
427	205706.3476,1298773.4022	EXISTING LOG WEIR STABILIZATION
428	205788.3540,1298856.1827	TYPE 2 ELJ
429	205777.6048,1298845.0871	TYPE 2 ELJ
430	205748.0733,1298833.2285	TYPE 2 ELJ
431	205733.8939,1298817.8386	TYPE 2 ELJ
432	205722.3014,1298798.2165	TYPE 2 ELJ
433	205712.8663,1298777.8482	TYPE 2 ELJ
434	205697.9357,1298754.3490	TYPE 2 ELJ
435	205681.3591,1298737.6037	TYPE 2 ELJ
436	205665.2662,1298722.5029	TYPE 2 ELJ
437	205646.9009,1298711.4904	TYPE 2 ELJ
439	205802.2264,1298895.2008	TYPE 1 ELJ
440	205806.1466,1298872.4657	TYPE 1 ELJ
441	205805.2496,1298883.9107	TYPE 1 ELJ
442	205791.6586,1298917.1713	TYPE 1 ELJ
443	205764.1367,1298837.6766	TYPE 2 ELJ
444	205765.7116,1298842.0957	TYPE 1 ELJ
445	205755.2898,1298839.5484	TYPE 1 ELJ

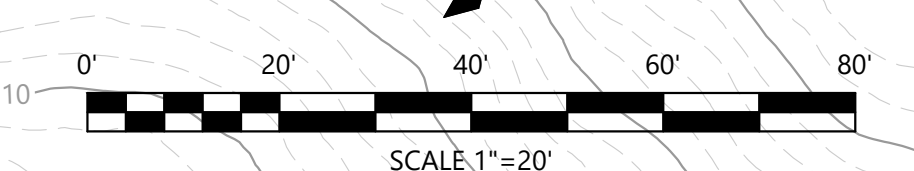
STRUCTURE SCHEDULE		
Point	Northing/Easting	Description
447	205739.2287,1298826.8593	TYPE 1 ELJ
448	205726.1543,1298808.9929	TYPE 1 ELJ
450	205717.0882,1298764.8683	TYPE 1 ELJ
451	205703.0229,1298764.1553	TYPE 1 ELJ
453	205688.1305,1298746.7845	TYPE 1 ELJ
454	205671.8600,1298731.2250	TYPE 1 ELJ
455	205636.7410,1298706.5098	TYPE 1 ELJ
456	205619.0009,1298693.1726	TYPE 1 ELJ
457	205616.0785,1298668.7569	TYPE 1 ELJ
458	205608.4977,1298658.2999	TYPE 1 ELJ
459	205602.5897,1298648.6572	TYPE 1 ELJ
460	205586.1334,1298622.6806	TYPE 1 ELJ
461	205574.2326,1298603.8813	TYPE 1 ELJ
463	205548.1487,1298553.1104	TYPE 1 ELJ
464	205552.9152,1298562.7622	TYPE 1 ELJ
465	205557.4801,1298572.6448	TYPE 1 ELJ
466	205653.7293,1298719.5298	TYPE 1 ELJ
467	205562.2766,1298582.4636	TYPE 1 ELJ
469	205785.7686,1298926.5508	TYPE 1 ELJ
470	205796.6844,1298863.0248	TYPE 1 ELJ

STRUCTURE SCHEDULE		
Point	Northing/Easting	Description
471	205629.0838,1298698.1281	TYPE 1 ELJ
472	205615.9393,1298680.7904	TYPE 1 ELJ
473	205580.0450,1298613.0591	TYPE 1 ELJ



NOTES:

1. STATIONING OF STRUCTURE LOCATIONS PROVIDED IN STRUCTURE SCHEDULE ARE APPROXIMATE. CONTRACTOR SHALL STAKE STRUCTURE START AND END STATIONING IN THE FIELD FOR REVIEW AND APPROVAL BY THE CITY'S REPRESENTATIVE PRIOR TO STRUCTURE CONSTRUCTION.
2. EXISTING DOWNED LOGS AND STUMPS AND VEGETATION CLEARED DURING CONSTRUCTION SHALL BE INCORPORATED INTO THE STRUCTURES PER THE DIRECTION OF THE CITY'S REPRESENTATIVE. EXISTING LOGS CURRENTLY LOCATED WITHIN PROPOSED STRUCTURE EXTENTS SHALL BE INCORPORATED INTO THE PROPOSED STRUCTURES. CONTRACTOR SHALL ADJUST ORIENTATIONS OF LOGS IN PROPOSED STRUCTURE AND/OR EXISTING LOGS PER THE DIRECTION OF THE CITY'S REPRESENTATIVE. IN SOME INSTANCES, EXISTING LOGS MAY NEED TO BE CUT TO ACCOMMODATE INSTALLATION OF PROPOSED STRUCTURE. SEE SPECIAL PROVISIONS FOR REQUIREMENTS FOR CLEARED VEGETATION AND EXISTING LOGS.
3. PROTECT ALL INFRASTRUCTURE DURING CONSTRUCTION.




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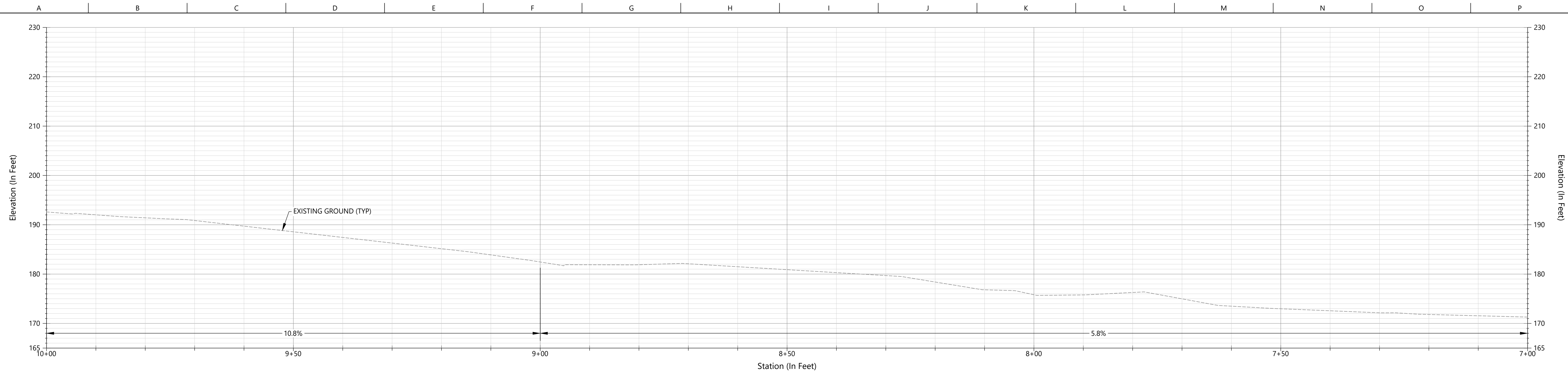
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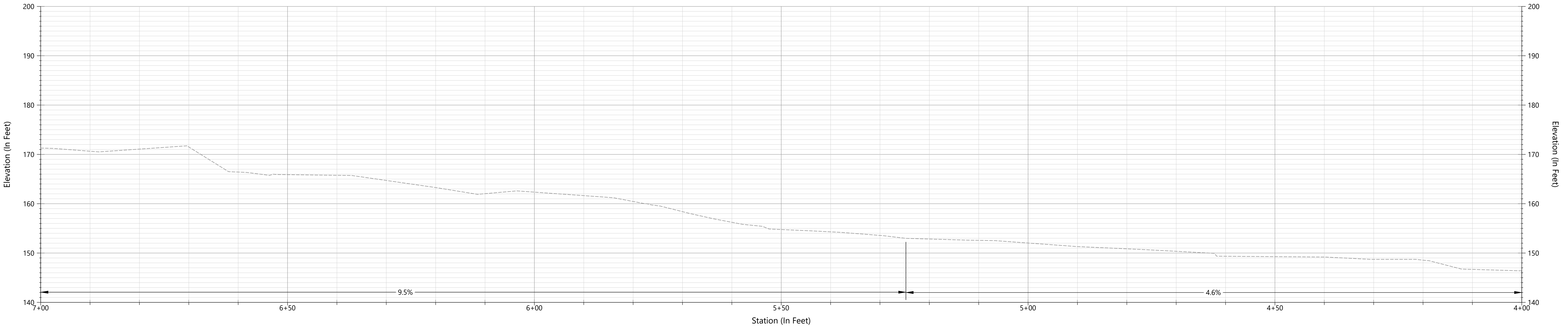
**SUBBASIN 46.3 WATERCOURSE
 STABILIZATION PROJECT**

WATERCOURSE STABILIZATION PLAN

JOB NUMBER 2008561
 SHEET NUMBER **C101**
 SHEET 5 OF 13




CHANNEL PROFILE
SCALE: 1"=10'



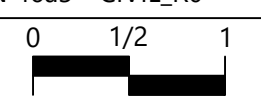
CHANNEL PROFILE
SCALE: 1"=10'

- NOTES:**
- REACH-AVERAGED EXISTING GRADE SLOPES SHOWN.

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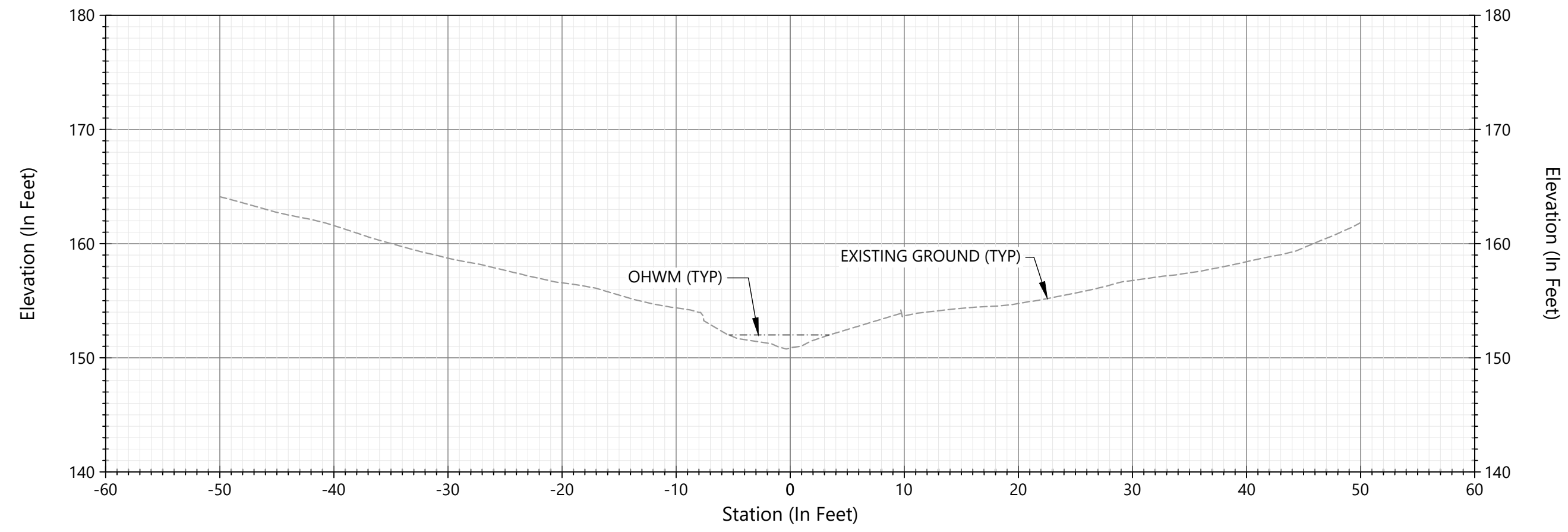
**SUBBASIN 46.3 WATERCOURSE
STABILIZATION PROJECT**

PROFILES

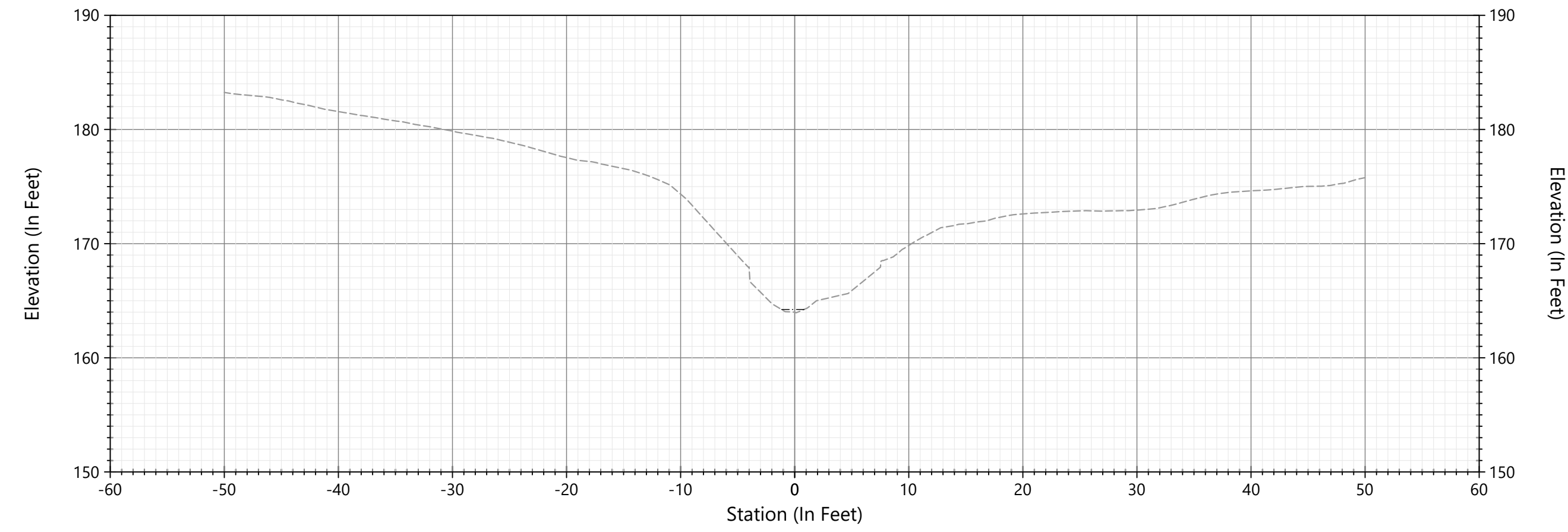
JOB NUMBER
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SHEET NUMBER
C201
SHEET 6 OF 13

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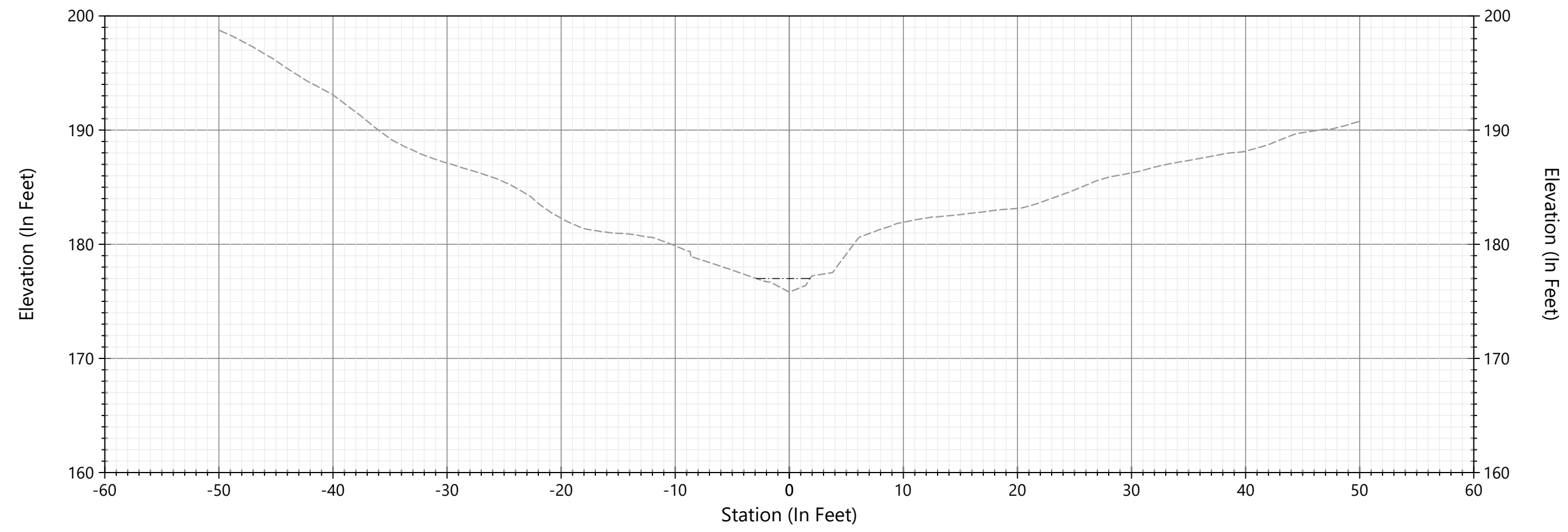
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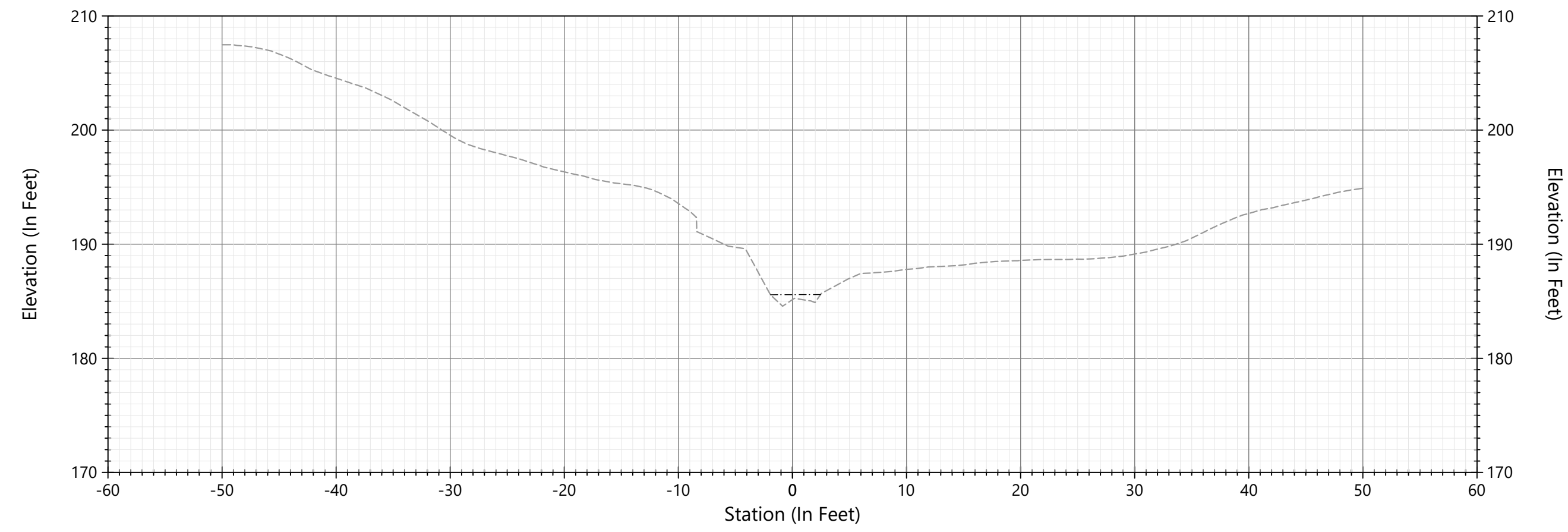
A STA 4+80
 C301 SCALE: 1"=10'



B STA 6+25
 C301 SCALE: 1"=10'



C STA 8+00
 C301 SCALE: 1"=10'



D STA 9+20
 C301 SCALE: 1"=10'



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**SUBBASIN 46.3 WATERCOURSE
 STABILIZATION PROJECT**

CROSS SECTIONS

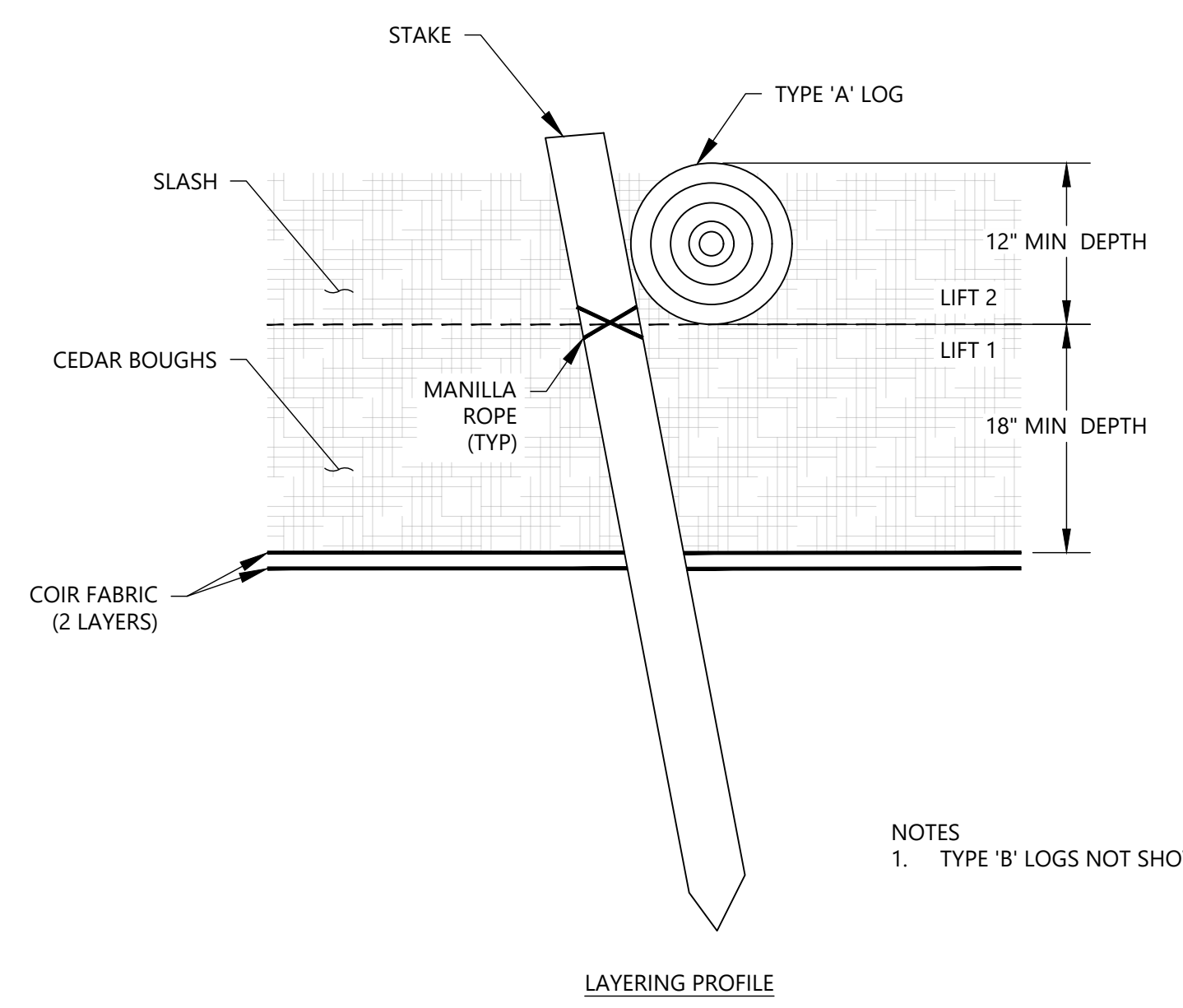
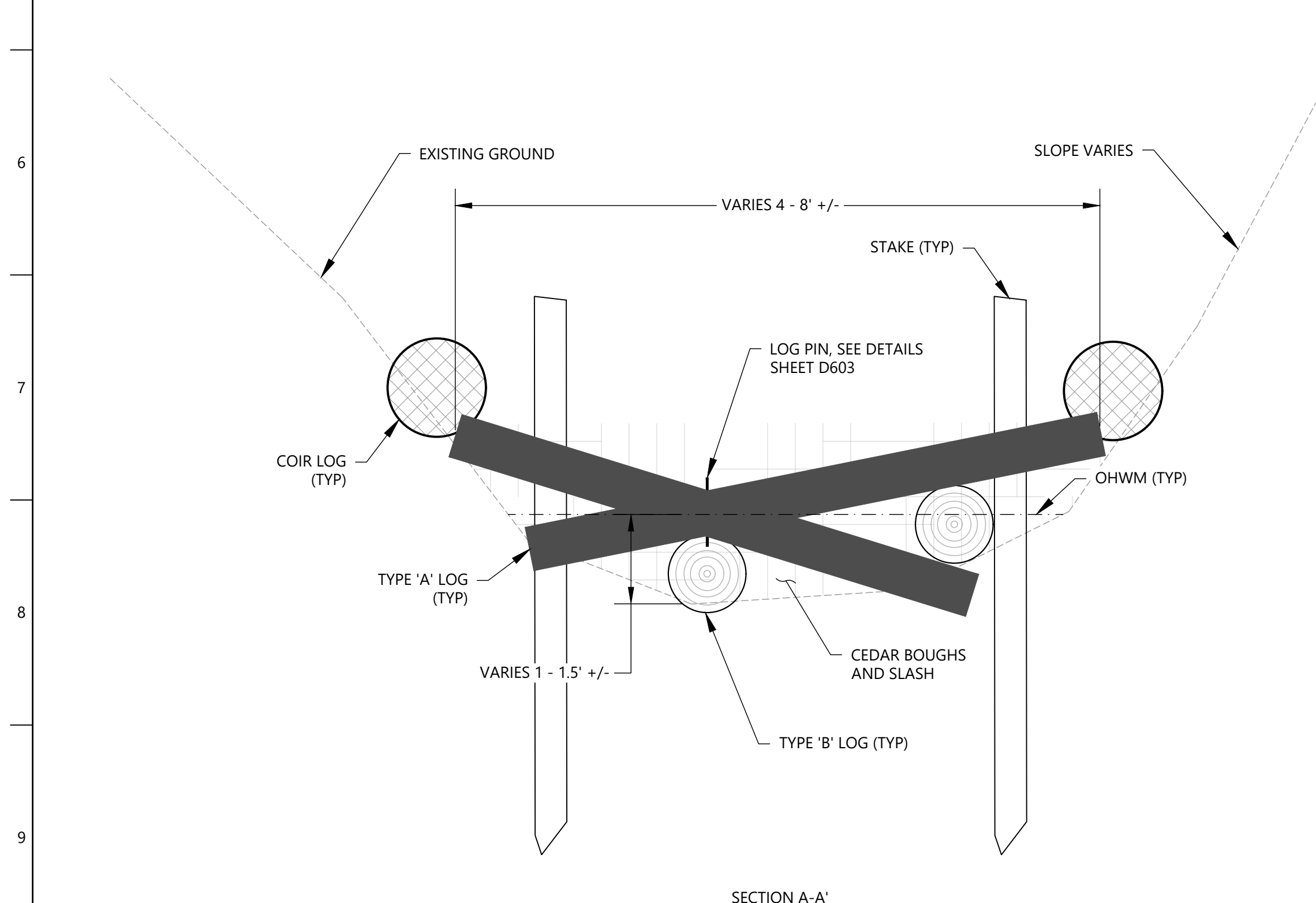
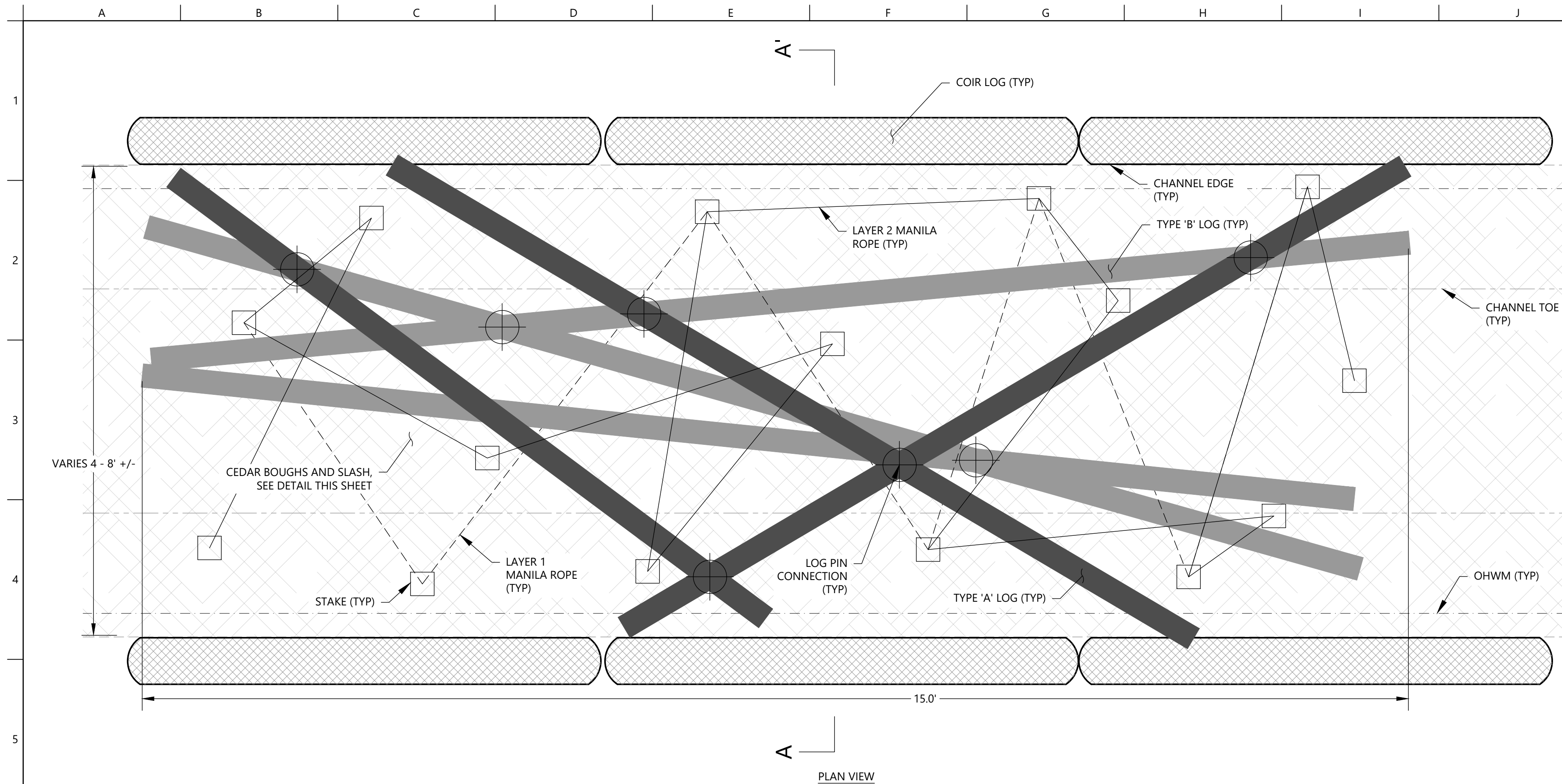
JOB NUMBER

2008561

SHEET NUMBER

C301

SHEET 7 OF 13




TYPE 1 ELJ MATERIALS SCHEDULE (PER EACH)			
LOG ID	MATERIAL	UNITS	QTY
A	15' LONG, 12"Ø LOGS	EA	3
B	10' LONG, 10"Ø LOGS	EA	3
	CEDAR BOUGHS	CY	7
	SLASH	CY	5
	COIR 900 (INC 1" WOOD STAKES & U-STAPLES)	SY	34
	LOG PINS	EA	7
	2"x2"x36" DOUGLAS FIR STAKES	EA	14
	MANILA ROPE - 5/8"	LF	260
	COIR LOG	LF	30

- TYPICAL TYPE 1 ELJ INSTALLATION SEQUENCE (1-7)**
- CEDAR BOUGHS TO BE MINIMUM 10' LONG AND 2" TO 2½" Ø MEASURED AT CUT END.
 - CONSTRUCTION SEQUENCE:
 - LAY 2 LAYERS OF COIR FABRIC ON CHANNEL BED (15'x10' NOMINAL). SHINGLE IN UPSTREAM DIRECTION, OVERLAP MIN. 5 FEET.
 - PLACE 'TYPE B' LOGS, ADJUSTING ORIENTATION AS DIRECTED BY CITY'S REPRESENTATIVE TO ACCOMMODATE SITE CONDITIONS AND INSTALL ALL LOG-LOG CONNECTIONS.
 - LAY LIFT 1 OF BOUGHS ON COIR FABRIC AND WITHIN 'TYPE B' LOGS. STARTING AT DOWNSTREAM END AND WORKING UPSTREAM. VARY BOUGH ORIENTATION TO ENTANGLE BOUGHS IN 18" THICK LAYER.
 - INSTALL STAKES AND FASTEN LAYER 1 MANILA ROPE, INTERWEAVING BETWEEN LOGS AND BOUGHS AS SHOWN.
 - PLACE 12"-THICK COMPRESSED LAYER OF SLASH OVER LAYER 1 LOGS AND BOUGHS AND FILL VOIDS WITHIN LAYER 1.
 - PLACE 'TYPE A' LOGS, ADJUSTING ORIENTATION AS DIRECTED BY CITY'S REPRESENTATIVE TO ACCOMMODATE SITE CONDITIONS.
 - INSTALL ALL LAYER 2 LOG-LOG CONNECTIONS TO TIGHTLY ANCHOR LOGS.
 - FASTEN LAYER 2 MANILA ROPE, INTERWEAVING BETWEEN LOGS AS SHOWN.
 - PLACEMENT AND LOCATIONS OF ALL ELEMENTS ARE APPROXIMATE AND MAY VARY AS DIRECTED BY CITY'S REPRESENTATIVE.
 - STRUCTURE LENGTH 15'. SEE SCHEDULE OF STRUCTURES FOR STRUCTURAL LOCATIONS.
 - DOUGLAS FIR 2"x2"x36" STAKE EMBEDDED IN 18" (MIN) IN CHANNEL BED. STAKES PLACED AT NOMINAL 4 FOOT IN IRREGULAR LAYOUT AS DIRECTED BY CITY'S REPRESENTATIVE.
 - MANILA ROPE 5/8" Ø. WIND TIGHT TWO TIMES AROUND EACH STAKE. TIE OFF WITH DOUBLE HALF-KNOT ON A STAKE APPROXIMATELY EVERY 20' OF ROPE. ENSURE ROPE IS SNUG TO CEDAR BOUGHS AND SLASH LAYERS. WEAVE BACK AND FORTH BETWEEN STAKES TO CREATE IRREGULAR GRID.
 - COIR LOG SHALL BE INSTALLED OVERLAPPING SLASH AND EXISTING BANK SLOPE SOIL SO THAT AT LEAST 50% OF LOG IS IN CONTACT WITH EXISTING SOIL. INSTALL LIVE DOGWOOD AND WILLOW STAKES INTO COIR LOG. SEE DETAILS SHEET L102.

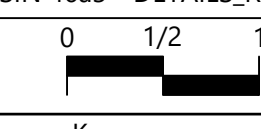
NOTES
1. TYPE 'B' LOGS NOT SHOWN FOR CLARITY.

A
D601 ELJ - TYPE 1
SCALE: 1"=5'

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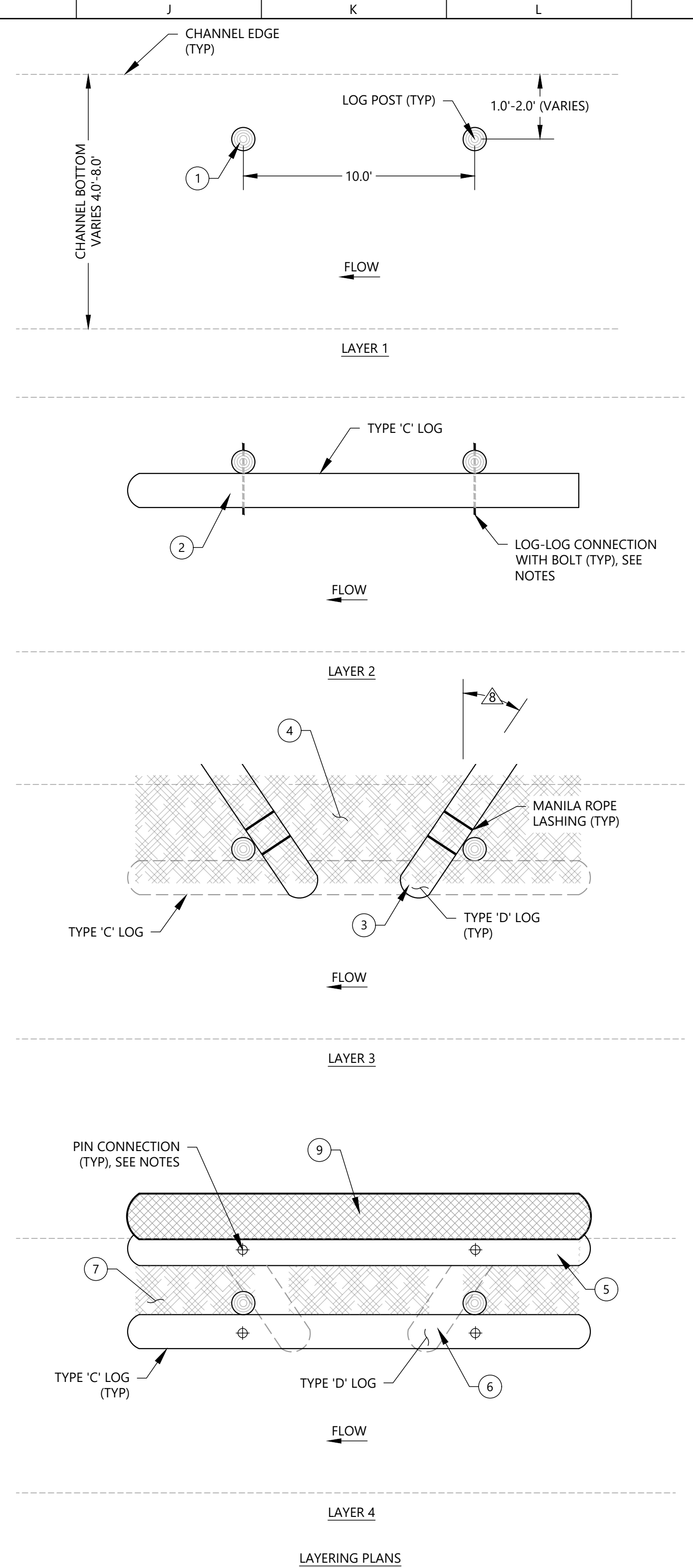
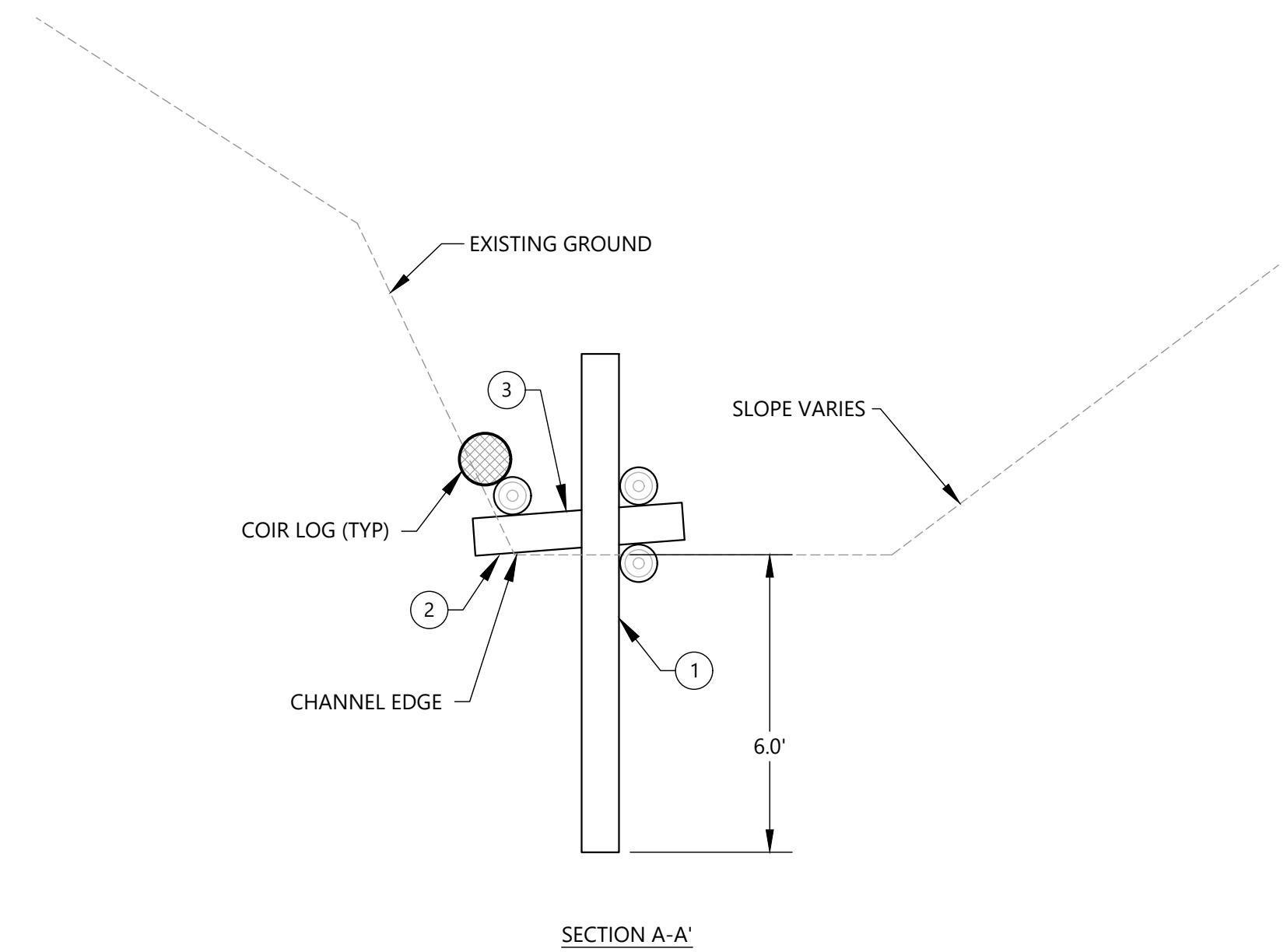
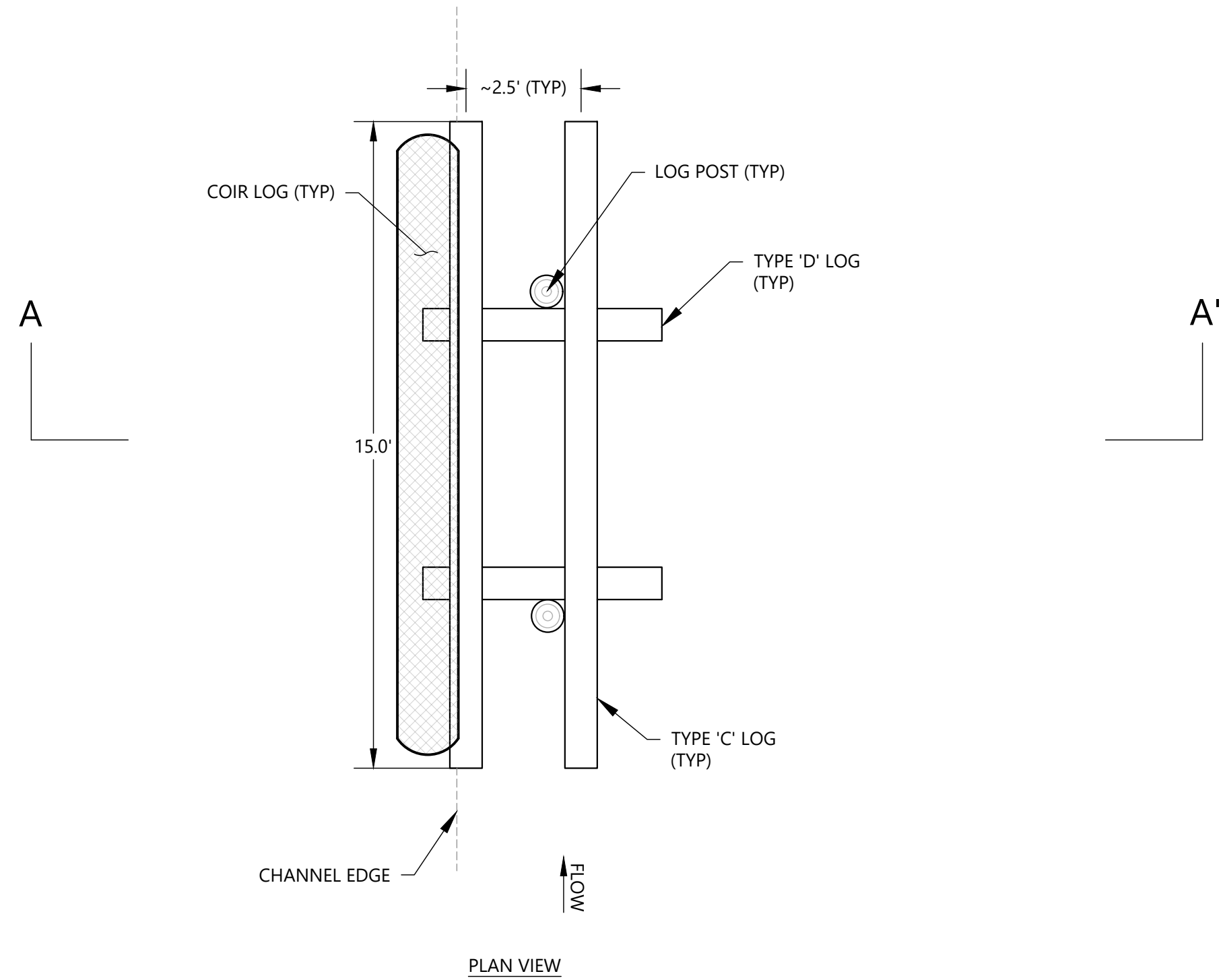
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			PLOTTED SCALE	

**SUBBASIN 46.3 WATERCOURSE
STABILIZATION PROJECT**

DETAILS - TYPE 1 ELJ

JOB NUMBER
2008561
SHEET NUMBER
D601
SHEET 8 OF 13



TYPE 2 ELJ MATERIALS SCHEDULE (PER EACH)			
LOG ID	MATERIAL	QUANTITY	UNITS
C	12"x10' LOG POST	2	EA
C	12"x15' LOG	3	EA
D	12"x5' LOG	2	EA
	SLASH	7	CY
	LOG PIN (#5 REBAR 3.5')	2	EA
	LOG PIN (#5 REBAR 2.5')	4	EA
	MANILA ROPE - 5/8"	4	EA
	COIR LOG	15	LF

- NOTES
- POSTS MAY BE EMBEDDED BY AUGERING OR OTHER METHOD APPROVED BY CITY'S REPRESENTATIVE THAT MAINTAINS STABLE SUBSOILS, EXCAVATION AND BACKFILL SHALL NOT BE ALLOWED. ALL POSTS LOCATIONS TO BE STAKED BY CONTRACTOR PRIOR TO INSTALLATION FOR REVIEW AND APPROVAL, BY CITY'S REPRESENTATIVE, LOCATIONS MAY BE ADJUSTED BY CITY'S REPRESENTATIVE TO ACCOMMODATE CONDITIONS AT TIME OF CONSTRUCTION.
 - EMBED TYPE 'C' LOG 6" INTO STREAM CHANNEL AND FASTEN TO POSTS WITH LOG-LOG CONNECTION WITH BOLT (2.5' LENGTH) (SEE DETAILS, SHEET D603).
 - PLACE TYPE 'D' LOG AND VARY ANGLE TO SITE CONDITIONS AND DISTANCE FROM TOE OF SLOPE. LASH TYPE 'D' LOGS TO POST WITH MANILA ROPE 3/8" DIA.
 - PLACE 2' LAYER OF SLASH AFTER TYPE 'D' LOG INSTALLED. TUCK INTO VOIDS UNDER TYPE 'D' LOG.
 - PLACE TYPE 'C' LOG AND MAKE LOG PIN CONNECTION (3.5' LENGTH) TO BASE TYPE 'C' LOG.
 - PLACE TYPE 'C' LOG AND ADJUST TO REST ON TOP TYPE 'D' LOG. CONNECT WITH LOG PIN CONNECTION (2.5' LENGTH).
 - PLACE 12" LAYER OF SLASH BETWEEN HEADER AND REAR LOG.
 - LOGS CAN BE INSTALLED 0-45° FROM HORIZONTAL, AS DIRECTED BY CITY'S REPRESENTATIVE.
 - INSTALL COIR LOG OVERLAPPING SLASH AND EXISTING BANK SLOPE SOIL SO THAT AT LEAST 50% OF LOG IS IN CONTACT WITH EXISTING SOIL. INSTALL LIVE DOGWOOD AND WILLOW STAKES INTO COIR LOG. SEE DETAILS SHEET L102.
 - SLASH FILL ALL VOIDS IN STRUCTURE UP TO TOP OF TOP LOGS. SLASH SHALL BE COMPACTED TO ENSURE NO GAPS GREATER THAN 3 CUBIC INCHES.

NOTES:
1. SLASH AND CONNECTIONS NOT SHOWN ON PLAN AND SECTION FOR CLARITY.

A TYPE 2 ELJ
D602 SCALE: 1"=4'

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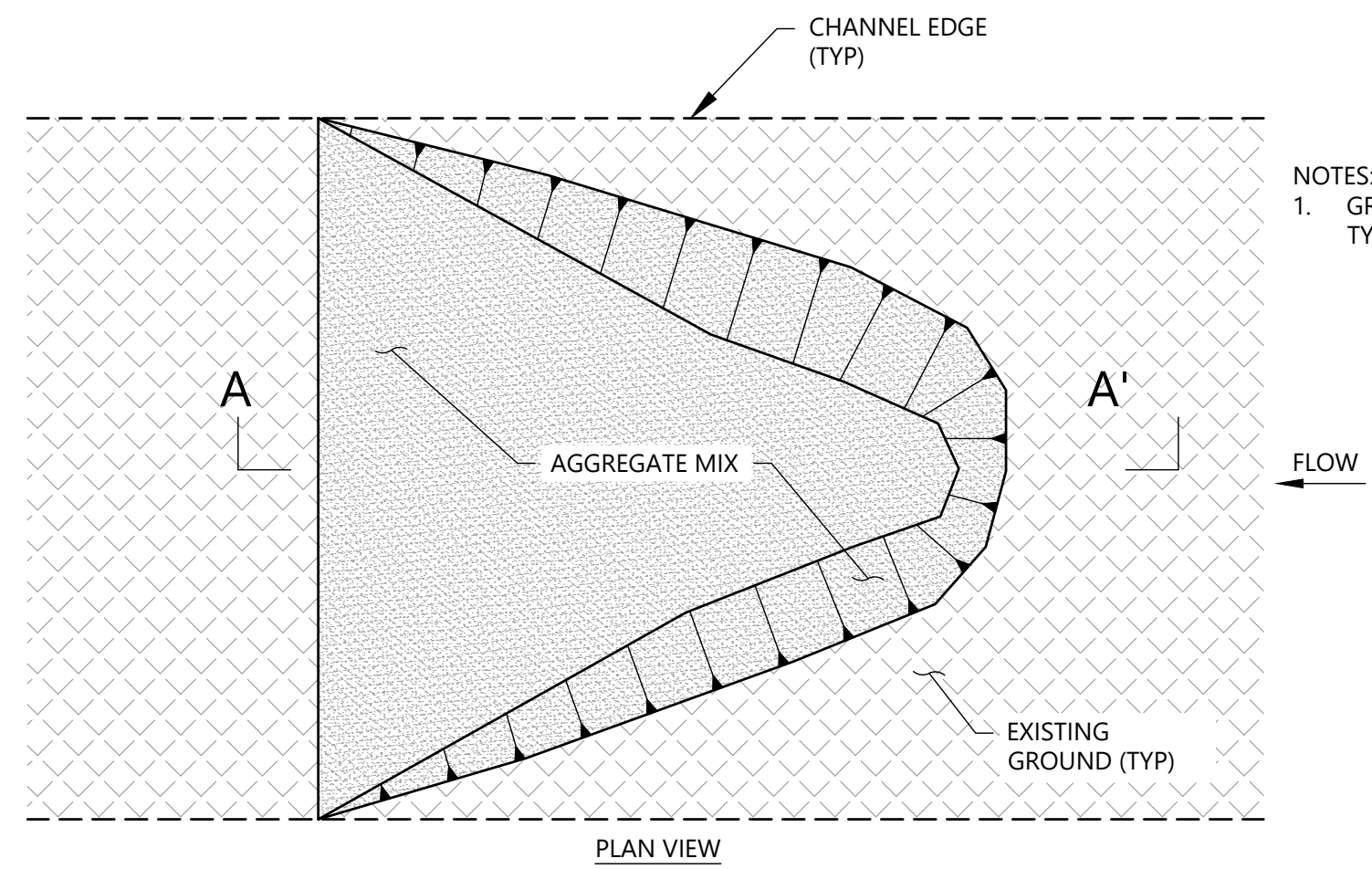
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			FILE NAME	SUBBASIN 46a3 - DETAILS_R0a
			PLOTTED SCALE	0 1/2 1

SUBBASIN 46.3 WATERCOURSE
STABILIZATION PROJECT
DETAILS - TYPE 2 ELJ

JOB NUMBER
2008561
SHEET NUMBER
D602
SHEET 9 OF 13

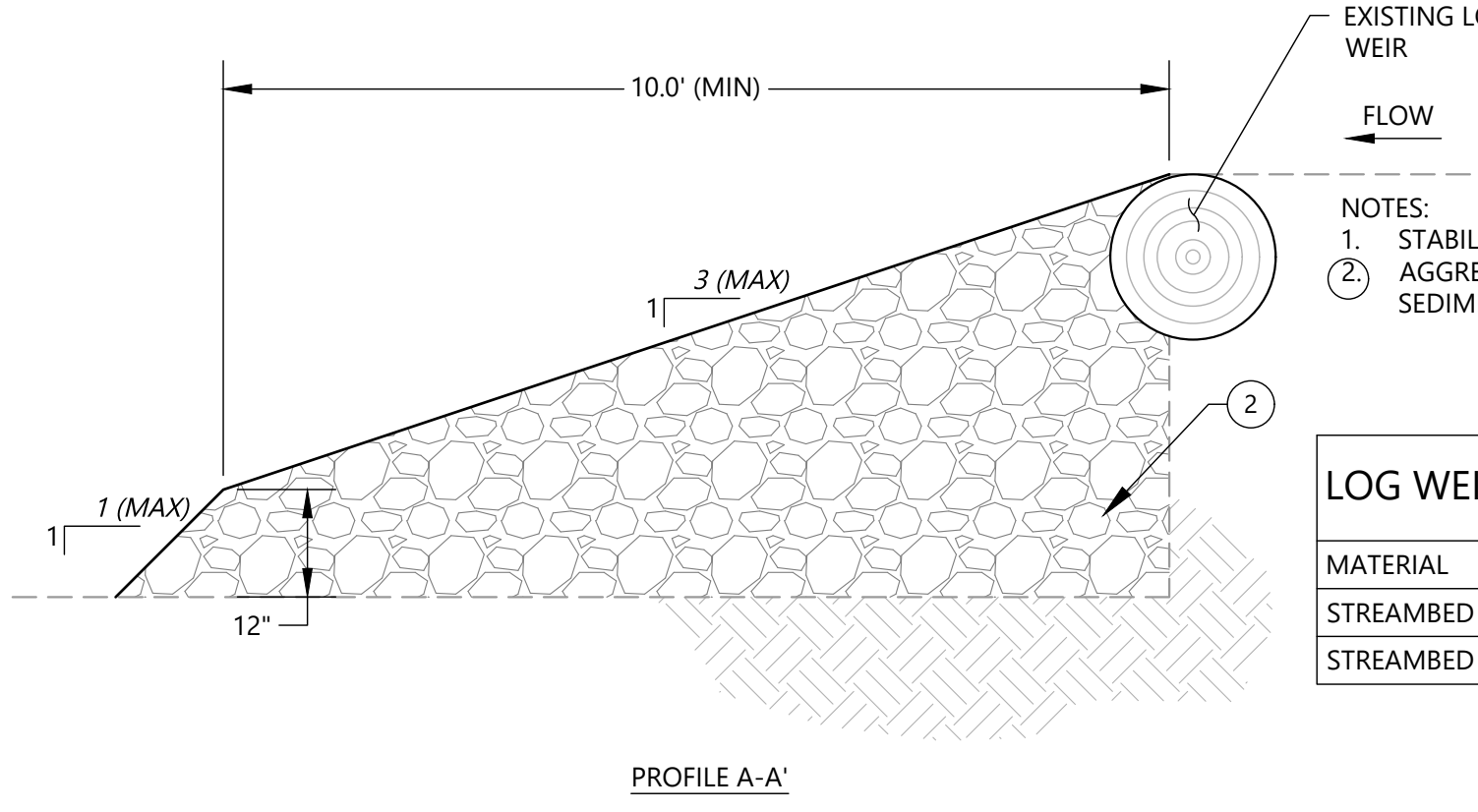


NOTES:
1. GRADING CUT LINES REPRESENTATIVE OF TYPICAL EXISTING GROUND CONDITIONS.



GENERAL AGGREGATE MIX PLACEMENT EXTENTS

EXAMPLE PHOTO (STA 4+35)

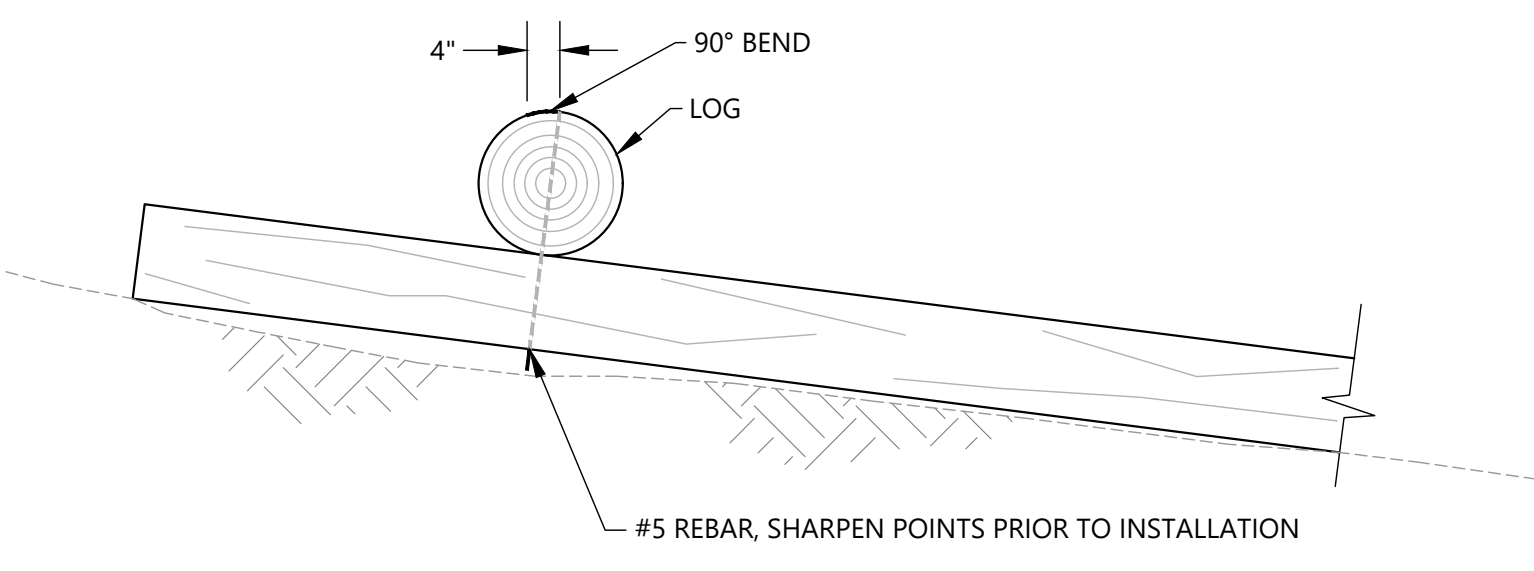


NOTES:
1. STABILIZE EXISTING LOG WEIR WITH AGGREGATE.
2. AGGREGATE SHALL BE 70/30 MIX OF STREAMBED SEDIMENT AND STREAMBED BOULDERS.

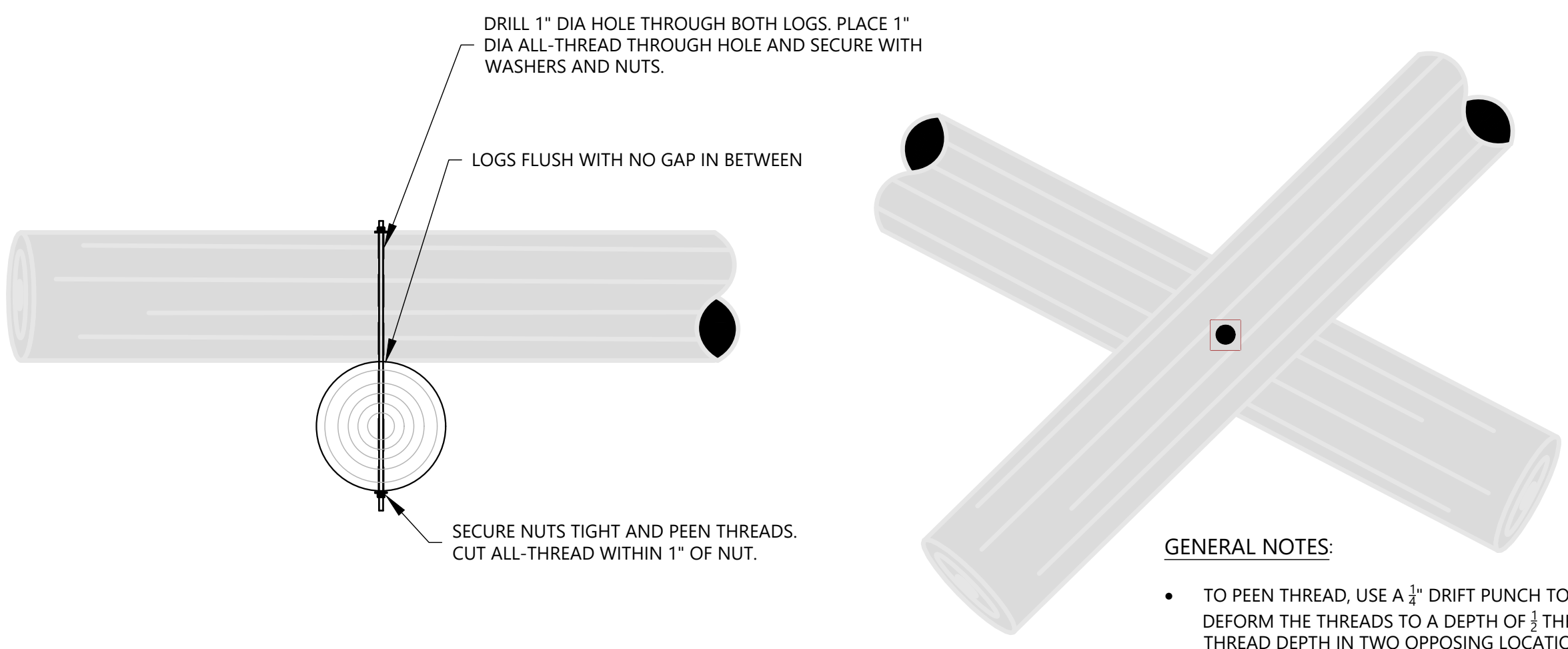
LOG WEIR STABILIZATION SCHEDULE (PER EACH)

MATERIAL	QUANTITY	UNITS
STREAMBED BOULDER	2	TN
STREAMBED SEDIMENT	5	TN

A LOG WEIR STABILIZATION
D603 SCALE: 1"=2'



C LOG PIN
D603 SCALE: 1"=2'



D LOG-LOG CONNECTION WITH BOLT DETAIL
D603 SCALE: 1"=2'

GENERAL NOTES:
• TO PEEN THREAD, USE A 3/4" DRIFT PUNCH TO A DEFORM THE THREADS TO A DEPTH OF 1/2 THE THREAD DEPTH IN TWO OPPOSING LOCATIONS IMMEDIATELY AGAINST THE NUT.

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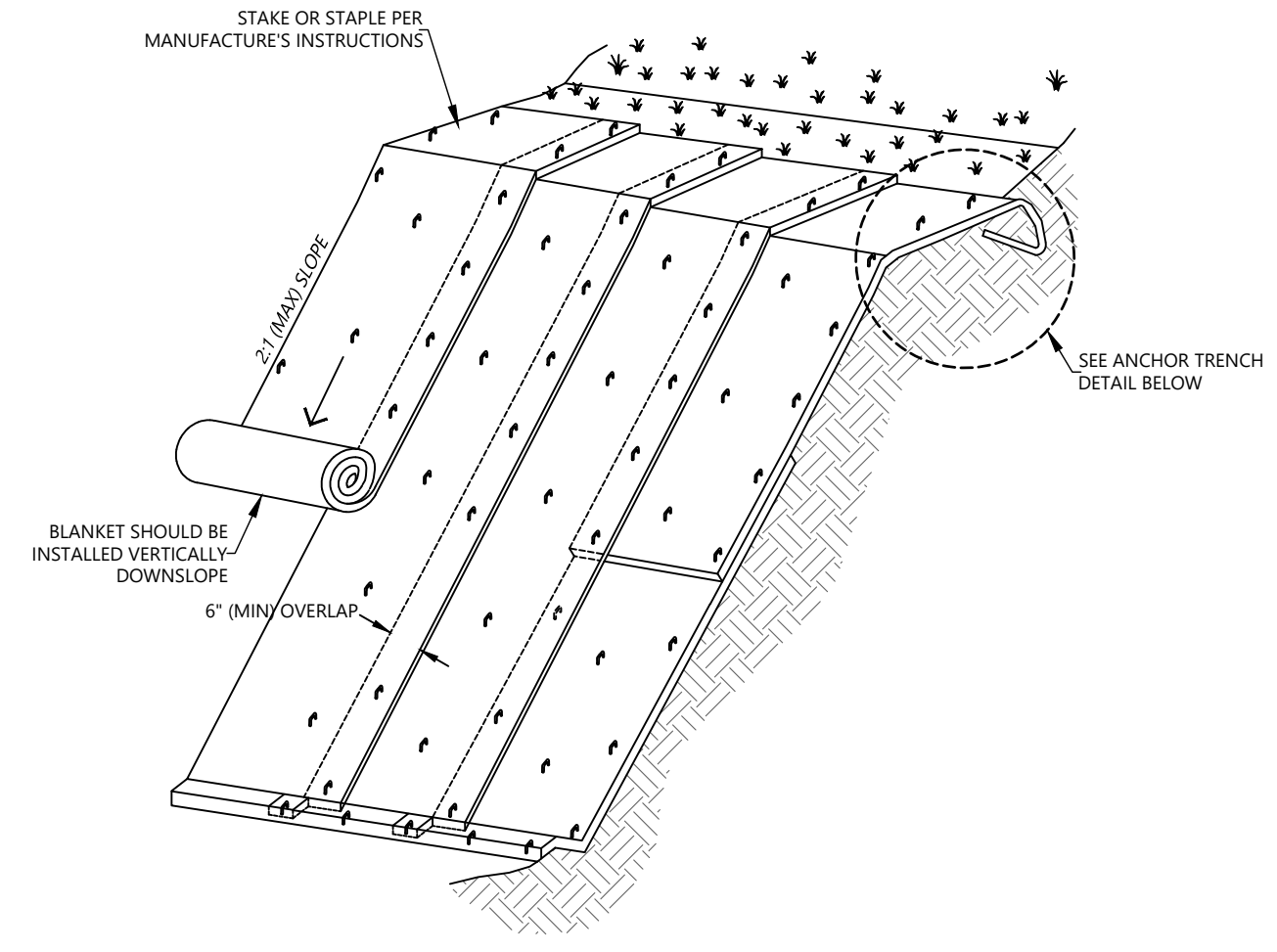
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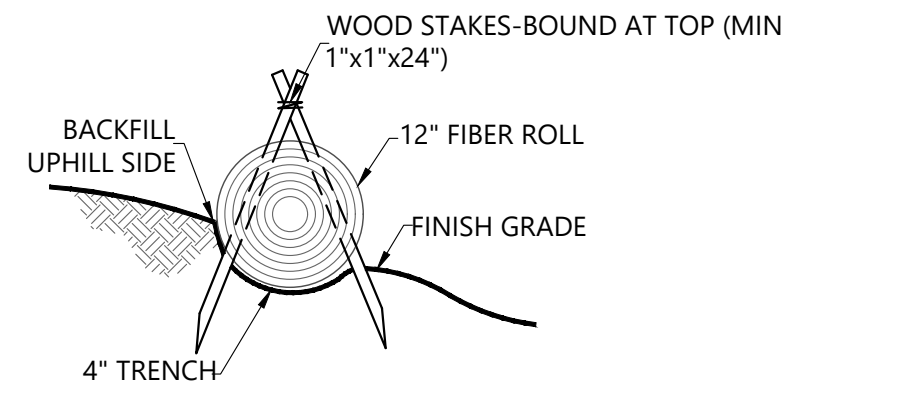
SUBBASIN 46.3 WATERCOURSE
STABILIZATION PROJECT
MISC WATERCOURSE STABILIZATION DETAILS

JOB NUMBER
2008561
SHEET NUMBER
D603
SHEET 10 OF 13



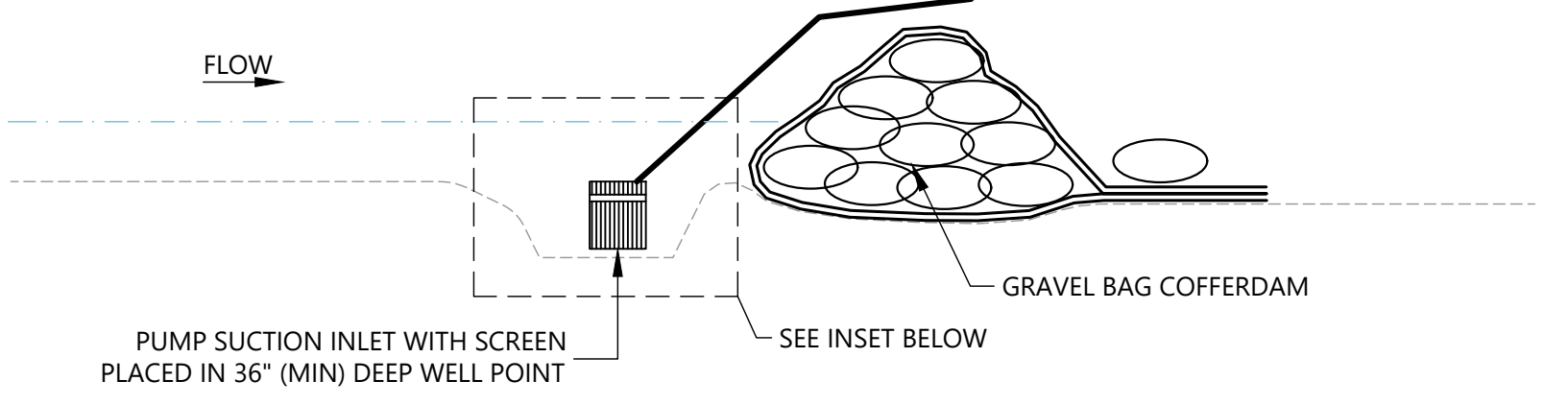
- NOTES:**
- SLOPE SURFACE SHALL BE FREE OF ROCKS, VEGETATION, STICKS, AND DEBRIS. MATS/ BLANKETS SHALL HAVE GOOD SOIL CONTACT. SCARIFY AND/OR TILL SLOPE SURFACE 12\"/>
 - LAY BLANKETS LOOSELY AND STAKE OR STAPLE AS NEEDED TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH OR TWIST.
 - EROSION CONTROL BLANKETS SHOULD BE USED IN CONJUNCTION WITH REVEGETATION (SEEDING OR PLUG PLANTING) TO SPECIFICATIONS OF REVEGETATION PLAN FOR PROJECT.
 - HAND WALK BLANKET DOWN SLOPE AS BLANKET IS STAKED OR STAPLED TO PREVENT STRETCHING.
 - DO NOT WALK ON BLANKET ONCE IN PLACE.
 - ALL ANCHORS SHALL BE INSTALLED PERPENDICULAR TO SLOPE.
 - DRAWING ADAPTED FROM: CALIFORNIA STORMWATER QUALITY ASSOCIATION, 2003, STORMWATER BEST MANAGEMENT PRACTICE HANDBOOK EC-7 GEOTEXTILES AND MATS.

A EROSION CONTROL BLANKET
D604 SCALE: NOT TO SCALE

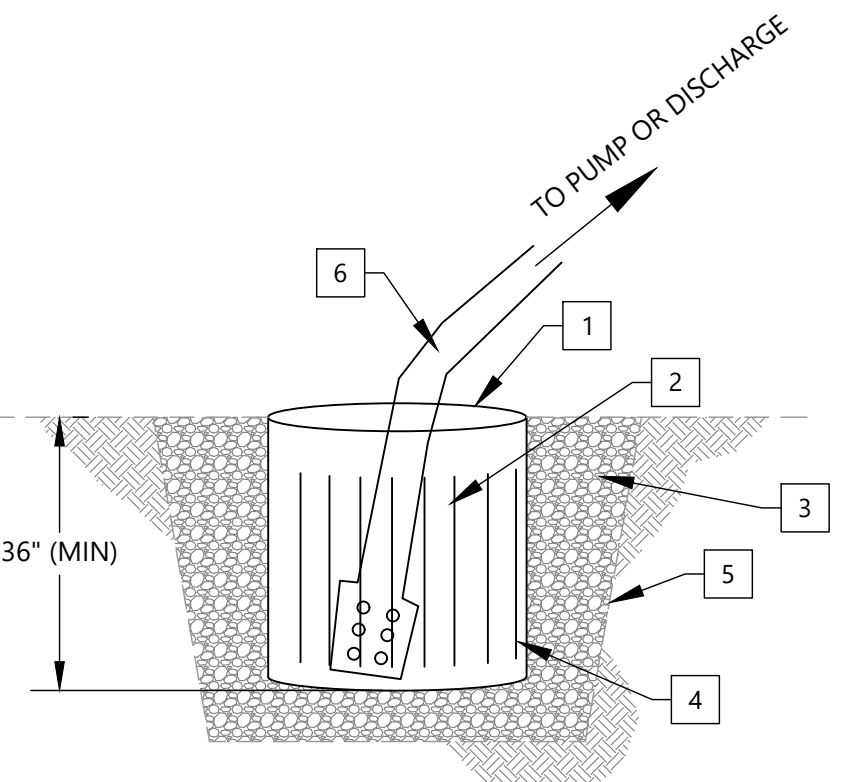


- NOTES:**
- FIBER ROLL SHALL BE MADE FROM 100% MATTRESS GRADE COCONUT FIBER AND BOUND BY HIGH STRENGTH COIR NETTING, AND HAVE A MINIMUM WEIGHT OF 5 LBS PER LINEAL FOOT.
 - FIBER ROLLS ON SLOPES SHALL BE INSTALLED ON CONTOUR. SPACING BETWEEN FIBER ROLLS SHALL BE A MAXIMUM OF 10' FOR SLOPES GREATER THAN 2:1 AND 20' FOR SLOPES LESS THAN 2:1.
 - ABUTTING ENDS OF INDIVIDUAL FIBER ROLLS SHALL BE OVERLAPPED A MINIMUM OF 18\"/>

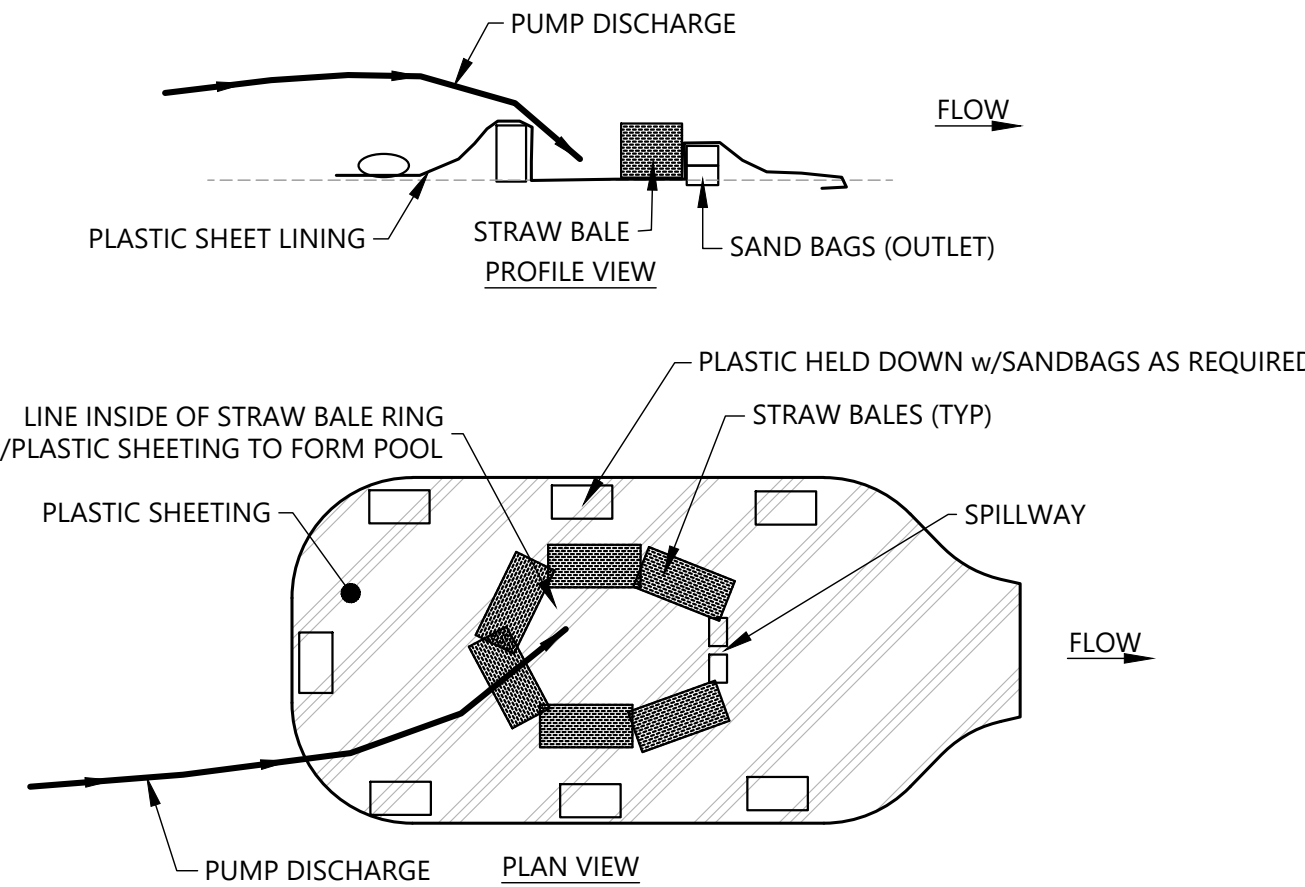
B COIR FABRIC LOGS
D604 SCALE: NOT TO SCALE



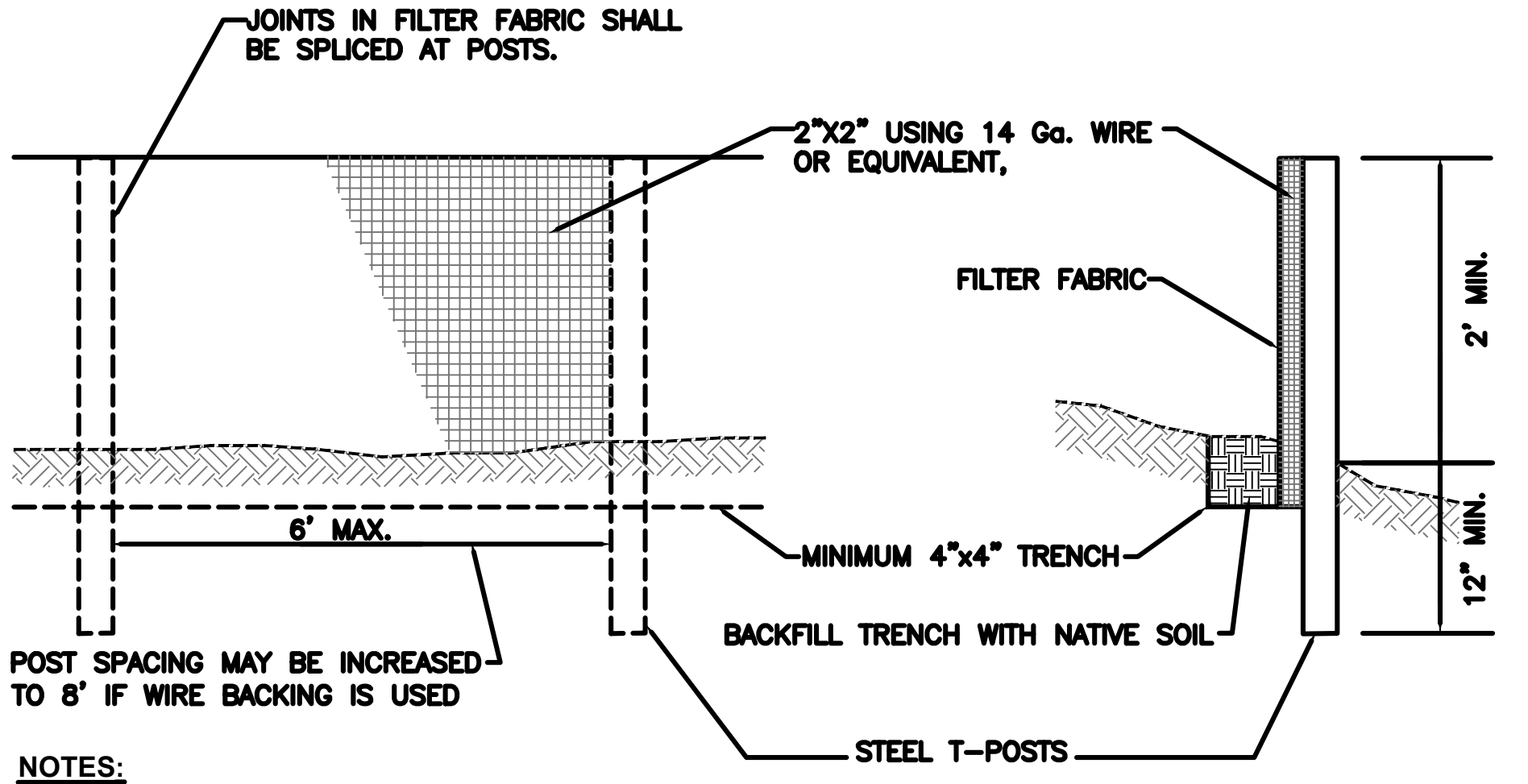
- NOTES:**
- CORRUGATED PLASTIC OR METAL PIPE 36\"/>
 - 3/4\"/>
 - WIRE SCREEN 1/2\"/>
 - PUMP SECTION INLET OR ELECTRIC SUBMERSIBLE PUMP WITH 1\"/>



C DEWATERING SUMP
D604 SCALE: NOT TO SCALE

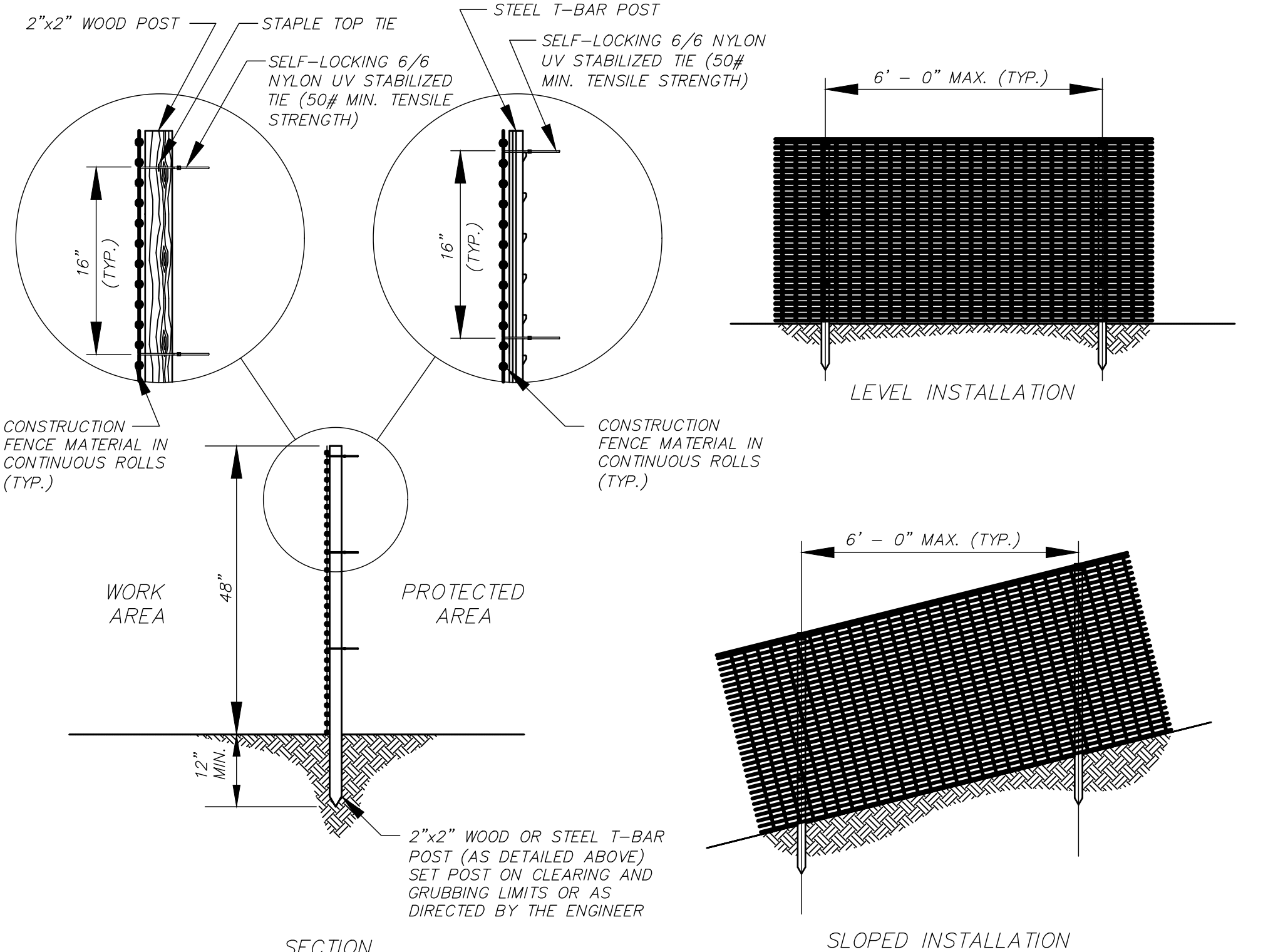


D ENERGY DISSIPATOR
D604 SCALE: NOT TO SCALE



- NOTES:**
- INSTALL SILT FENCE ALONG CONTOUR.

E SILT FENCE
D604 SCALE: NOT TO SCALE



F CONSTRUCTION FENCE
D604 SCALE: NOT TO SCALE

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			PLOTTED SCALE	0 1/2 1

**SUBBASIN 46.3 WATERCOURSE
STABILIZATION PROJECT**
TESC DETAILS

JOB NUMBER
2008561
SHEET NUMBER
D604
SHEET 11 OF 13

PLANTING AND TREE REPLACEMENT LEGEND								
ESTIMATED AREA	COMMON NAME	SCIENTIFIC NAME	QTY	SIZE	SPACING DIAMETER	PLANT INDICATOR	HEIGHT AT MATURITY	PLANTING NOTES
TEMPORARY CONSTRUCTION CORRIDOR REVEGETATION								
6,000 SF ¹	TREES							
	DOUGLAS FIR	<i>PSEUDOTSUGA MENZIESII</i>	4	2 GALLON	20 FT O.C.	FACU	220 FT	PLANT INDIVIDUAL TREES IN THE AREAS DISTURBED BY CONSTRUCTION AND PER THE DIRECTION OF THE OWNER. PLANT CEDAR AND SPRUCE IN LOWER ELEVATIONS NEAR THE WATERCOURSE. PLANT FIR, HEMLOCK, AND MAPLE IN UPPER ELEVATIONS OF THE OPEN SPACE AREA.
	WESTERN HEMLOCK	<i>TSUGA HETEROPHYLLA</i>	4			FACU	200 FT	
	BIG-LEAF MAPLE	<i>ACER MACROPHYLLUM</i>	4			FACU	100 FT	
	WESTERN RED CEDAR	<i>THUJA PLICATA</i>	4			FAC	180 FT	
	SITKA SPRUCE	<i>PICEA SITCHENSIS</i>	4			FAC	100 FT	
	SHRUBS/HERBACEOUS							
	BEAKED HAZELNUT	<i>CORYLUS CORNUTA</i>	12	1 GALLON	6 FT O.C.	FACU	20 FT	PLANT IN SINGLE SPECIES CLUSTERS OF 3 TO 6, INTERSPERSED AROUND TREES AND OTHER SHRUBS, IN THE AREAS DISTURBED BY CONSTRUCTION AND PER THE DIRECTION OF THE OWNER. PLANT CASCARA, HAWTHORN, MAPLE, SALMONBERRY AND LADY FERN IN LOWER ELEVATIONS NEAR THE WATERCOURSE. PLANT HAZELNUT, OSOBERY, OREGON GRAPE AND SWORD FERN IN UPPER ELEVATIONS OF THE OPEN SPACE AREA.
	OSOBERY	<i>OEMLERIA CERASIFORMIS</i>	12			FACU	16 FT	
	TALL OREGON GRAPE	<i>MAHONIA AQUIFOLIUM</i>	20			FACU	6 FT	
	SWORD FERN	<i>POLYSTICHUM MUNITUM</i>	20			FACU	5 FT	
	CASCARA	<i>FRANGULA PURSHIANA</i>	12			FAC	30 FT	
	VINE MAPLE	<i>ACER CIRCINATUM</i>	12			FAC	25 FT	
	BLACK HAWTHORN	<i>CRATAEGUS DOUGLASII</i>	12			FAC	20 FT	
SALMONBERRY	<i>RUBUS SPECTABILIS</i>	20	FAC			10 FT		
LADY FERN	<i>ATHYRIUM FILIX-FEMINA</i>	20	FAC			5 FT		
STREAM CORRIDOR REVEGETATION								
1,030 LF	LIVE STAKES							
	PACIFIC WILLOW	<i>SALIX LUCIDA-LASIANDRA</i>	40	LIVE STAKE	3 FT O.C.	FACW	45 FT	STAKE INTO COIR LOGS PLACED ADJACENT TO ELJ'S. ALTERNATE PLACEMENT OF STAKE SPECIES TO ENSURE WILLOW AND DOGWOOD ARE PLANTED THE ENTIRE LENGTH OF THE STREAM CORRIDOR.
	SITKA WILLOW	<i>SALIX SITCHENSIS</i>	40			FACW	24 FT	
	RED OSIER DOGWOOD	<i>CORNUS ALBA</i>	40			FACW	18 FT	

¹ ESTIMATED AREA REFLECTS APPROXIMATE AREA OF TEMPORARY CONSTRUCTION CORRIDOR DISTURBANCE. THE OWNER WILL PROVIDE DIRECTION FOR ACTUAL PLACEMENT OF PLANTINGS TO RESTORE THE TEMPORARY CONSTRUCTION CORRIDOR.
² RESEED DISTURBED AREAS WITH NATIVE SEED MIX PER THE CITY'S DIRECTION.

PLANTING & TREE REPLACEMENT NOTES	
GENERAL PLANTING NOTES:	
THE CONTRACTOR SHALL COORDINATE PLANTING ACTIVITIES AND ULTIMATE LOCATIONS/AREAS WITH THE OWNER, INCLUDING SCHEDULING AND ATTENDING A PRE-PLANTING MEETING, SUCCESSFUL PLANT INSTALLATION, CITY ACCEPTANCE POST-PLANTING, AND CARE OF THE LANDSCAPED AREAS FOR A ONE-YEAR PLANT ESTABLISHMENT PERIOD. FOLLOWING THE PLANT ESTABLISHMENT PERIOD, THE CITY OR ITS ASSIGNS WILL ASSUME CARE OF THE SITE.	
PLANT IN THE WET SEASON, AFTER OCTOBER 15. PLANTING DURING THE WET SEASON WILL MINIMIZE TRANSPLANT SHOCK AND SUPPLEMENTAL CARE FOR NEW PLANTINGS.	
THE CONTRACTOR SHALL HANDLE AND CARE FOR PLANT STOCK STORED ON-SITE FOR LONGER THAN ONE WEEK. THIS INCLUDES, BUT IS NOT LIMITED TO, WATER PLANTINGS, WRAP / WET LIVE STAKES, AND PROTECT PLANTS FROM DAMAGE BY ELEMENTS, VANDALISM, ETC.	
THE CONTRACTOR SHALL WARRANT ALL PLANT MATERIALS TO REMAIN HEALTHY AND ALIVE FOR A PERIOD OF ONE YEAR FOLLOWING SUCCESSFUL INSTALLATION ACCEPTANCE. DURING THIS PERIOD, THE CONTRACTOR SHALL GENERALLY CARE FOR PLANTINGS, MAINTAIN THE LANDSCAPED AREAS, AND ENSURE PLANTINGS RECEIVE ADEQUATE IRRIGATION.	
THE CITY WILL PROVIDE A PLANTING PLAN AT THE TIME OF PLANTING TO SHOW LOCATIONS FOR NEW PLANTS. PLANT PROCUREMENT, HANDLING AND STORAGE, AND INSTALLATION SHALL BE SUBJECT TO CITY REVIEW, DIRECTION, AND APPROVAL.	
SEQUENCING:	
1. GENERAL LANDSCAPING SEQUENCING IS DETAILED BELOW; HOWEVER, THE CONTRACTOR SHALL DETERMINE EXECUTABLE MEANS AND METHODS.	
2. THE CONTRACTOR SHALL SECURE ALL PLANT MATERIAL, SOILS, AND MULCH PRIOR TO BEGINNING WORK. SUBMIT NURSERY AVAILABILITY, TOPSOIL, AND MULCH SPECIFICATION SHEETS TO THE CITY FOR PRIOR APPROVAL.	
3. NOTIFY THE CITY 72 HOURS IN ADVANCE OF ANTICIPATED PLANTING ACTIVITIES. MEET WITH CITY STAFF AND ITS ASSIGNS PRIOR TO THE START OF LANDSCAPING. ENSURE ALL PARTIES UNDERSTAND PREFERENCES FOR PLANTING, SOIL AMENDMENT, ETC.	
4. PREPARE AREAS TO BE PLANTED PER PLANS AND PLANTING PLAN PROVIDED BY THE CITY. CLEARING AND GRUBBING SHALL ONLY OCCUR IN AREAS TO BE PLANTED. RETAIN AND PROTECT EXISTING TREE AND SHRUB VEGETATION FROM TRAMPLING, ROOT DAMAGE, ETC. PLANTING SHALL BE COMPLETED BY HAND, UTILIZING HAND- AND LIGHT-DUTY EQUIPMENT.	
5. HAND-EXCAVATE PLANTING PITS. GRUB ROOTS AND RHIZOMES TO ACCOMMODATE AN AREA OF TWO TIMES PLANTING PITS. NATIVE SOILS FREE OF INVASIVE RHIZOMES/ROOT CROWNS ARE ACCEPTABLE FOR PLANTING PITS. DISPOSE OF INVASIVE ROOTS/RHIZOMES OFF-SITE. HAND-MIX NATIVE SOIL AND IMPORTED TOPSOIL TO BACKFILL PLANTING PITS. INSTALL TREE AND SHRUB PLANT MATERIAL PER THE DETAILS (L102). BACKFILL PLANTING PITS AND HAND-FORM MULCH WATERING BASINS PER THE DETAILS (L102).	
6. INSTALL LIVE STAKES PER LEGEND AND DETAILS (L102). ENSURE LIVE STAKES ARE INSTALLED THROUGH COIR LOGS INTO NATIVE SOIL.	
7. THOROUGHLY WATER-IN ALL INSTALLED PLANT MATERIAL. CONTINUE WATERING AT A RATE SUFFICIENT TO ENSURE PLANTINGS BECOME ESTABLISHED.	
8. INSTALL WILDLIFE PROTECTION CAGES PER DETAIL (L102).	
9. NOTIFY THE CITY UPON COMPLETION OF PLANT INSTALLATION TO ARRANGE FOR INSPECTION AND POST-PLANTING ACCEPTANCE.	
IRRIGATION:	
THE LANDSCAPE CONTRACTOR SHALL PROVIDE TEMPORARY SEASONAL WATER TO PROPOSED PLANTINGS. WATER SHALL BE SUPPLIED VIA WATER TRUCK AND/OR TEMPORARY HOSES AND CONNECTION TO ONSITE HYDRANT. COORDINATE WITH THE CITY TO ESTABLISH THE PREFERRED METHOD, CONNECTION POINT, AND METERING NEEDS. AT THE TIME OF PLANTING, WITHIN THE 30-DAY PERIOD POST-PLANTING, AND THROUGHOUT THE SUMMER MONTHS (JULY 1 TO SEPTEMBER 30), THE CONTRACTOR SHALL PROVIDE SUPPLEMENTAL IRRIGATION FOR PLANTINGS TO AID IN ESTABLISHMENT AND REDUCTION OF TRANSPLANT SHOCK. SUPPLEMENTAL SEASONAL WATERING IS RECOMMENDED FOR A MINIMUM OF TWO YEARS POST-PLANTING. IT IS ASSUMED THAT THE CITY OR ITS ASSIGNS WILL PROVIDE SUPPLEMENTAL IRRIGATION FOLLOWING THE FIRST YEAR OF LANDSCAPE-CONTRACTOR PROVIDED PLANT ESTABLISHMENT.	

QUESTION FOR CITY: DOES THE CITY TYPICALLY INCLUDE PLANT ESTABLISHMENT PERIOD?

QUESTION FOR CITY: VERIFY HOW PLANTINGS WILL BE IRRIGATED.



CITY OF MERCER ISLAND
 MERCER ISLAND PUBLIC WORKS
 9601 SE 36TH STREET
 MERCER ISLAND, WA 98040
 206-275-7608
 WWW.MERCERISLAND.GOV/PUBLICWORKS

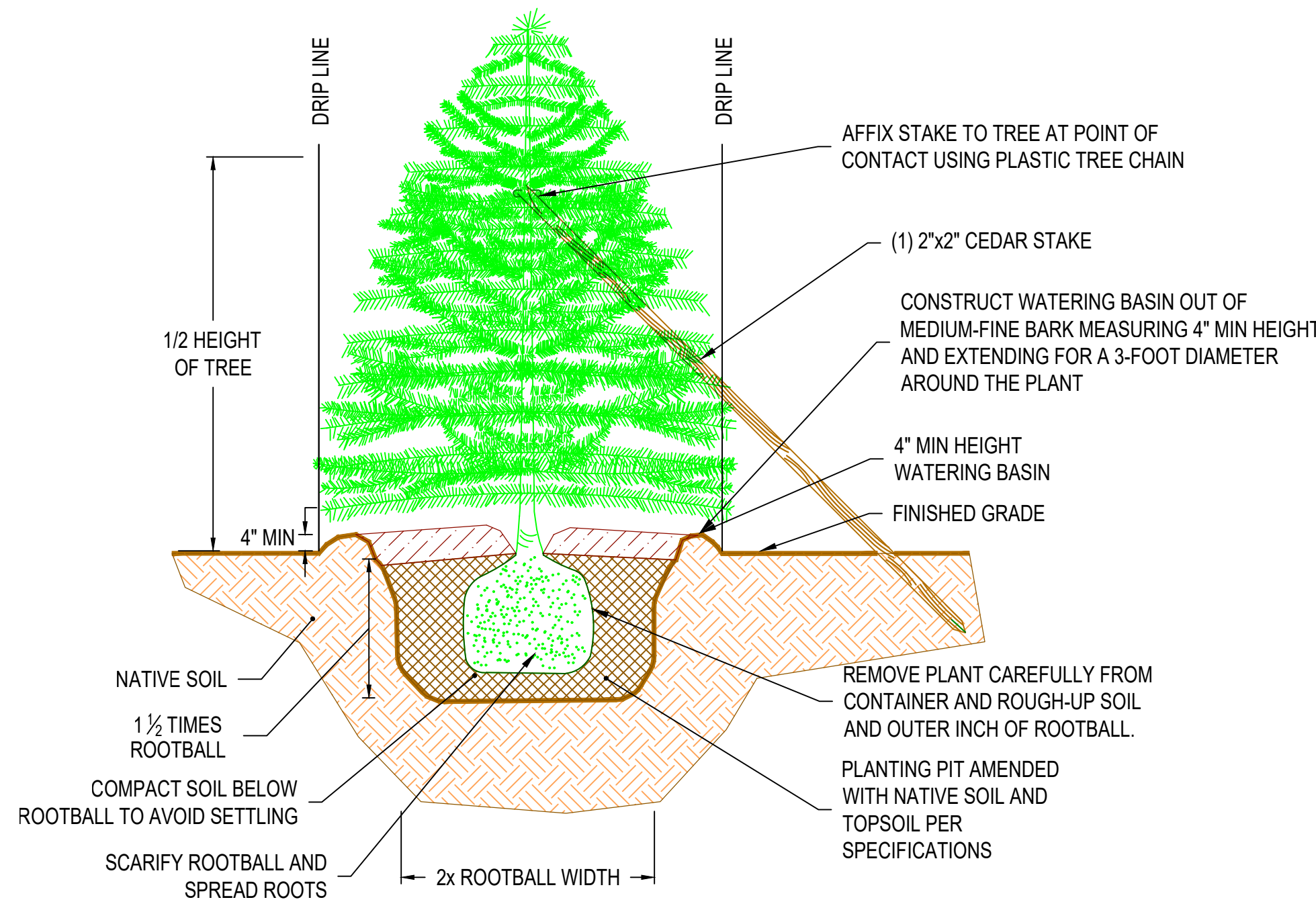


PRELIMINARY
 NOT FOR
 CONSTRUCTION

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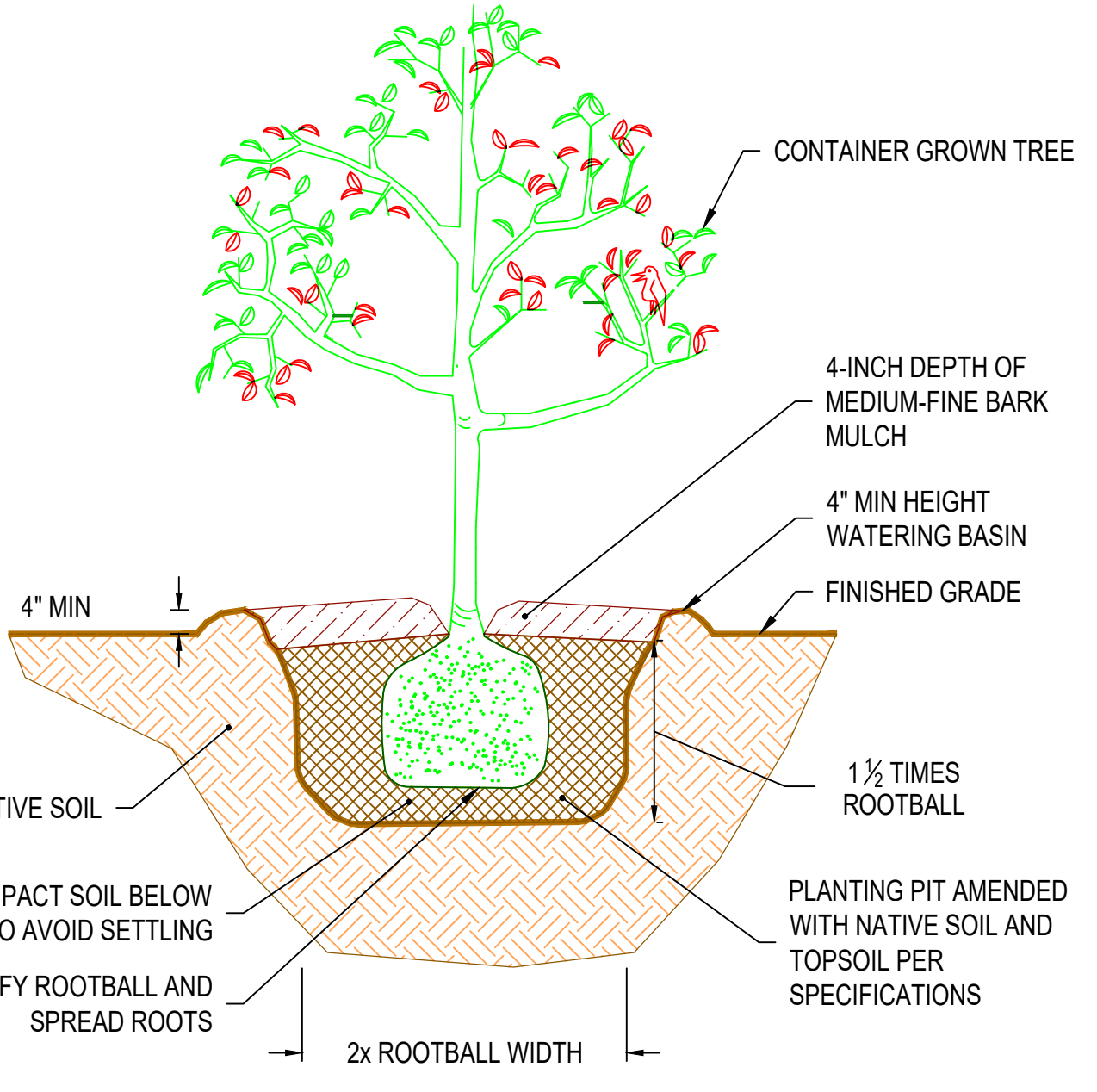
SUBBASIN 46.3 WATERCOURSE
 STABILIZATION PROJECT
 PLANTING SCHEDULE AND NOTES

JOB NUMBER
 2008561
(RH2 JOB NO. 24-0025)
 SHEET NUMBER
L101
 SHEET xx OF 11

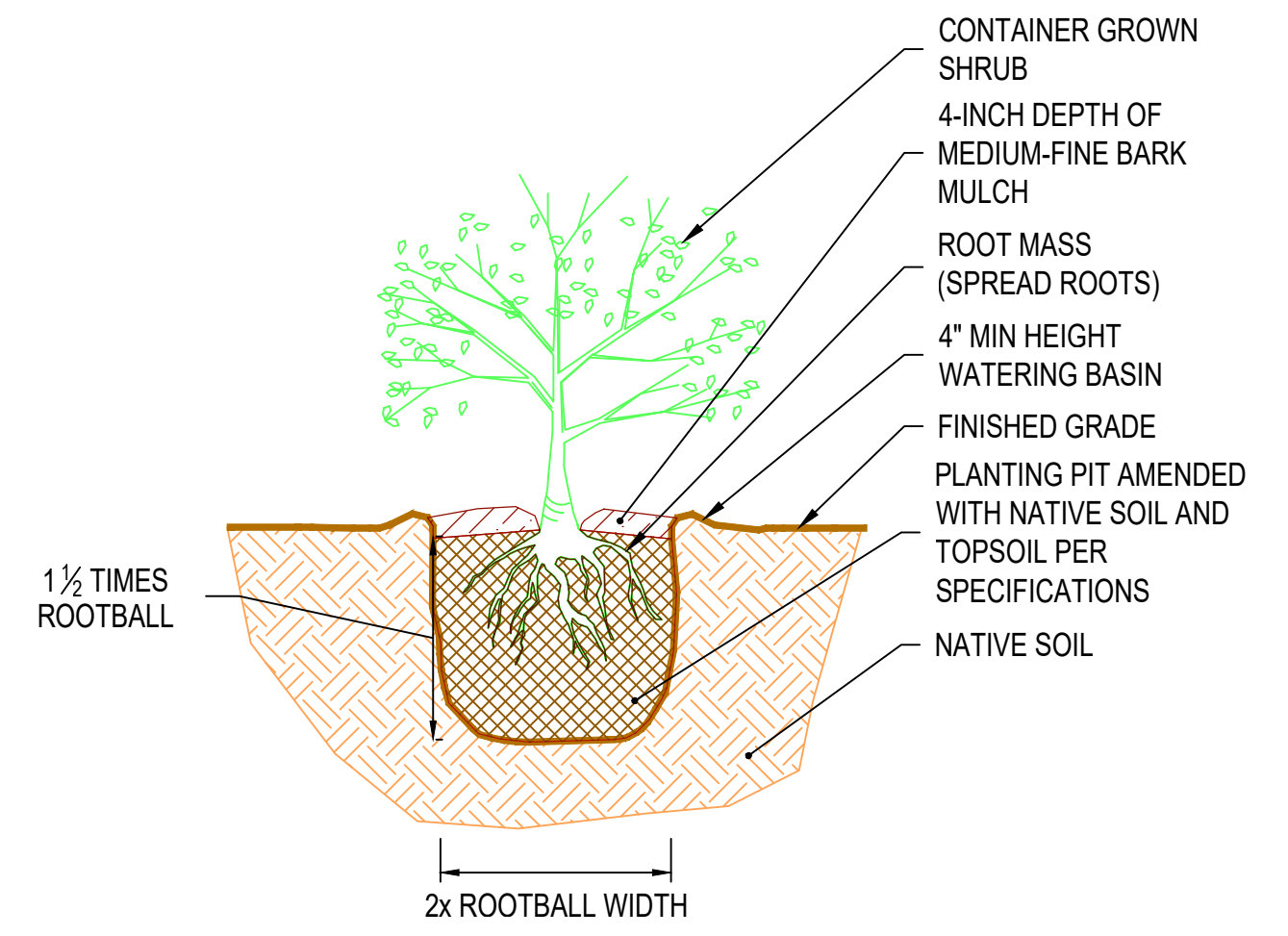


EVERGREEN TREE PLANTING DETAIL
NOT TO SCALE

- NOTES:
1. ALL PLANT MATERIAL MUST BE KEPT MOIST.
 2. PLACE ALL PLANTS SO THE ROOT COLLAR IS LEVEL WITH FINISHED GRADE.
 3. AMEND PLANTING PITS WITH NATIVE SOIL AND TOPSOIL PER SPECIFICATIONS.
 4. ENSURE NATIVE SOILS USED IN PLANTING PITS ARE FREE OF RHIZOMES AND ROOTS. ADD TOPSOIL AS NEEDED TO BACKFILL PIT.
 5. FORM A WATERING BASIN 4 INCHES ABOVE FINISHED GRADE.
 6. INSTALL 4-INCH DEPTH OF MULCH WITHIN WATERING BASIN. DO NOT ALLOW MULCH TO TOUCH TRUNK.

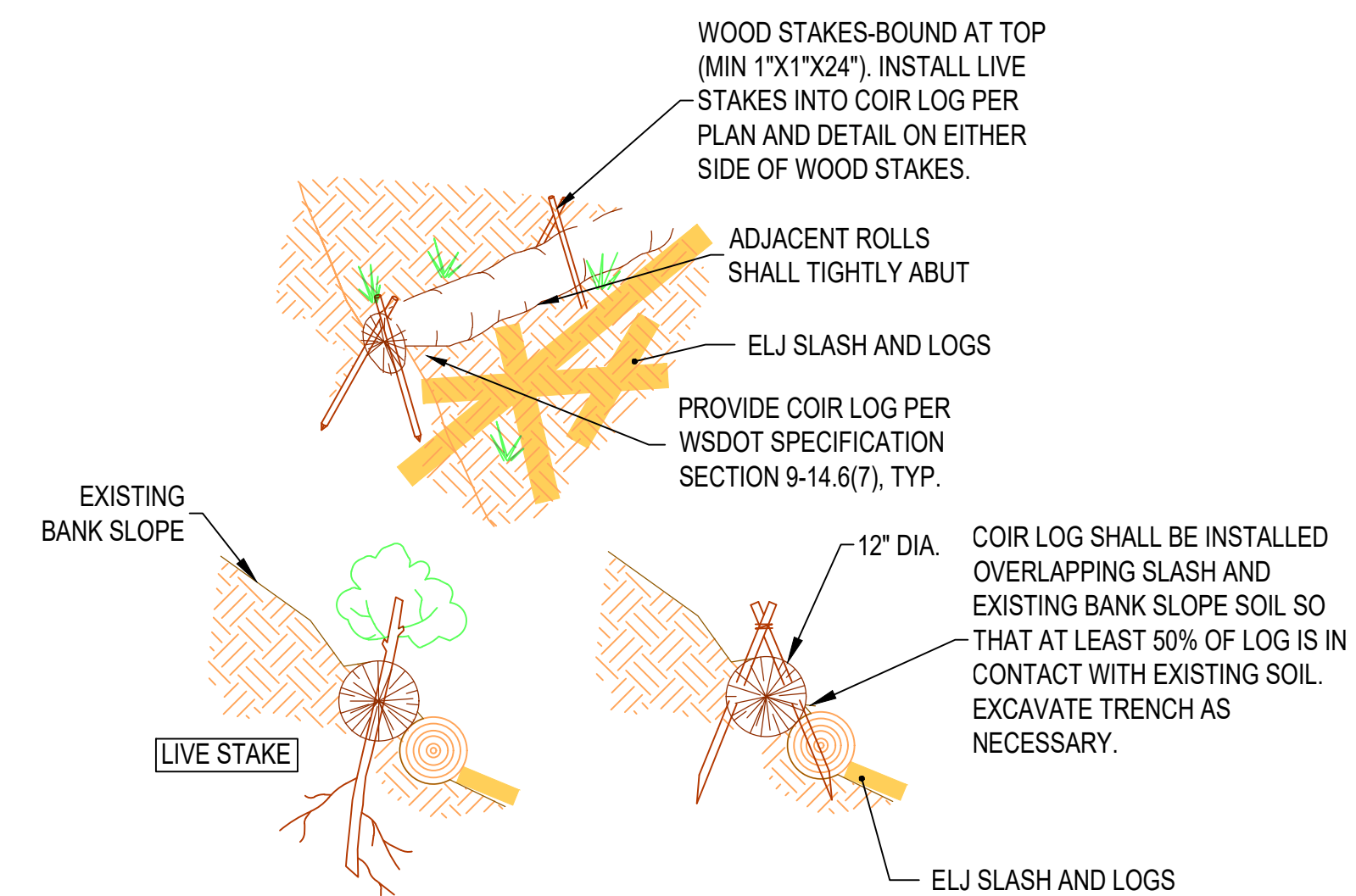


DECIDUOUS TREE AND SHRUB PLANTING DETAIL
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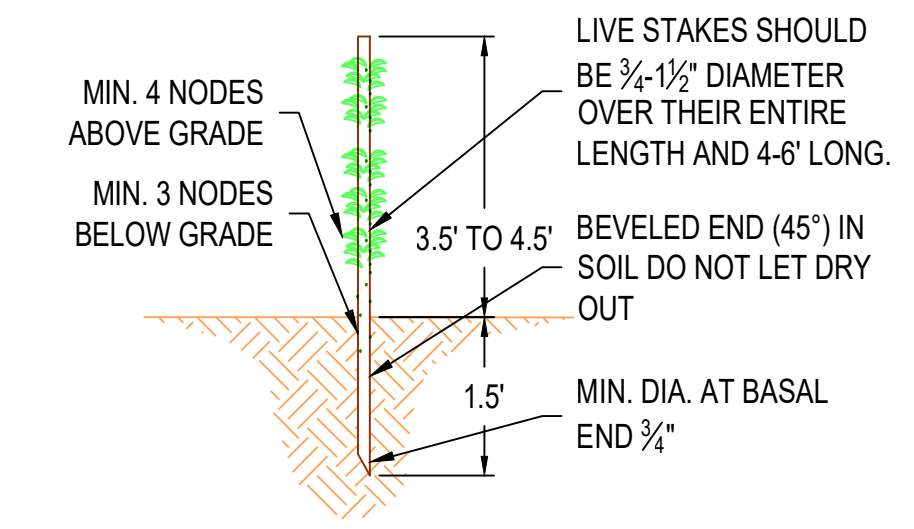
WILDLIFE PROTECTION DETAIL
NOT TO SCALE

QUESTION FOR CITY: WILDLIFE PROTECTION CAGES DESIRED AROUND ALL SHRUBS AND TREES OR JUST TREES?

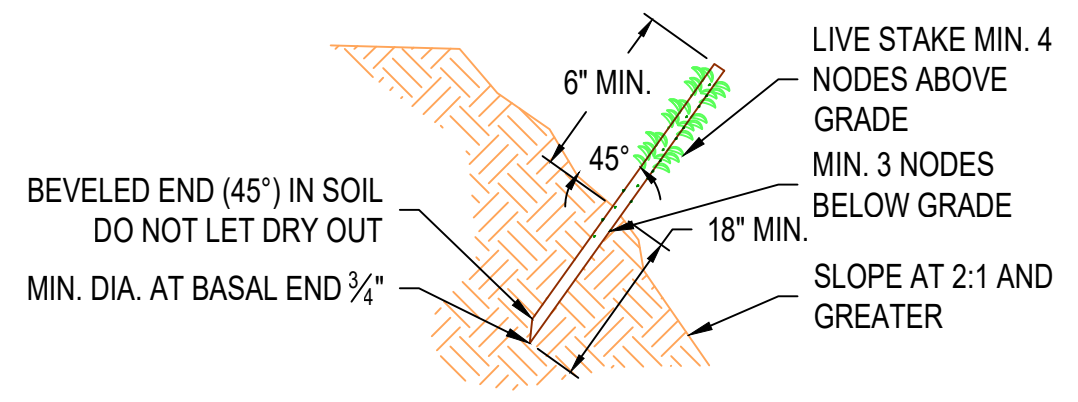


COIR LOG DETAIL
NOT TO SCALE

- LIVE STAKE NOTES:
1. SOURCE LIVE STAKES FROM SITES NATIVE TO THE PACIFIC NORTHWEST.
 2. KEEP LIVE STAKES MOIST AT ALL TIMES. LIVE STAKES ARE HIGHLY PERISHABLE AND MUST BE STORED PROPERLY BEFORE PLANTING. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.
 3. INSTALL LIVE STAKES IN GROWTH POSITION. IF BOTTOM END OF STAKE HAS DRIED OUT, CUT FRESH END PRIOR TO INSTALLING.
 4. INSTALL LIVE STAKES AT 2' O.C. SPACING OFFSET ALTERNATE ROWS AT 18" (SEE DETAIL). MIN. EMBEDMENT OF ALL STAKES IS 18".
 5. LIVE STAKES MAY BE POUNDED DIRECTLY INTO VERY SOFT SOIL. FOR COMPACT OR GRAVELLY SOILS, OR INSTALLATION THROUGH COIR LOGS, FORM HOLE IN SUBGRADE WITH REBAR OR STEEL BAR SIZED TO ACCOMMODATE THE DIAMETER OF THE LIVE STAKE. CAREFULLY PLANT STAKE IN HOLE. DO NOT BREAK LEAF NODES. INSTALL STAKES WITH A MINIMUM OF 3 NODES BELOW GRADE AND 4 NODES ABOVE GRADE. BACKFILL HOLE AND TAMP TO FILL VOID SPACES.



HORIZONTAL GRADIENT



SLOPE GRADIENT
LIVE STAKE PLANTING DETAIL
NOT TO SCALE

CITY OF MERCER ISLAND
MERCER ISLAND PUBLIC WORKS
9601 SE 36TH STREET
MERCER ISLAND, WA 98040
206-275-7608
WWW.MERCERISLAND.GOV/PUBLICWORKS



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NOT FOR
CONSTRUCTION

REVISIONS			DRAWING INFORMATION	
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			CHECKED	ALP
			COORDINATE	----
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			PLOTTED SCALE	0 1/2 1

**SUBBASIN 46.3 WATERCOURSE
STABILIZATION PROJECT**
PLANTING DETAILS

JOB NUMBER
2008561
(RH2 JOB NO. 24-0025)
SHEET NUMBER
L102
SHEET xx OF 11

Appendix C

Background Maps and Data

Subbasin 46a.3

1990



Subbasin 46a.3

2002



Google Earth

Image U.S. Geological Survey



1000 ft

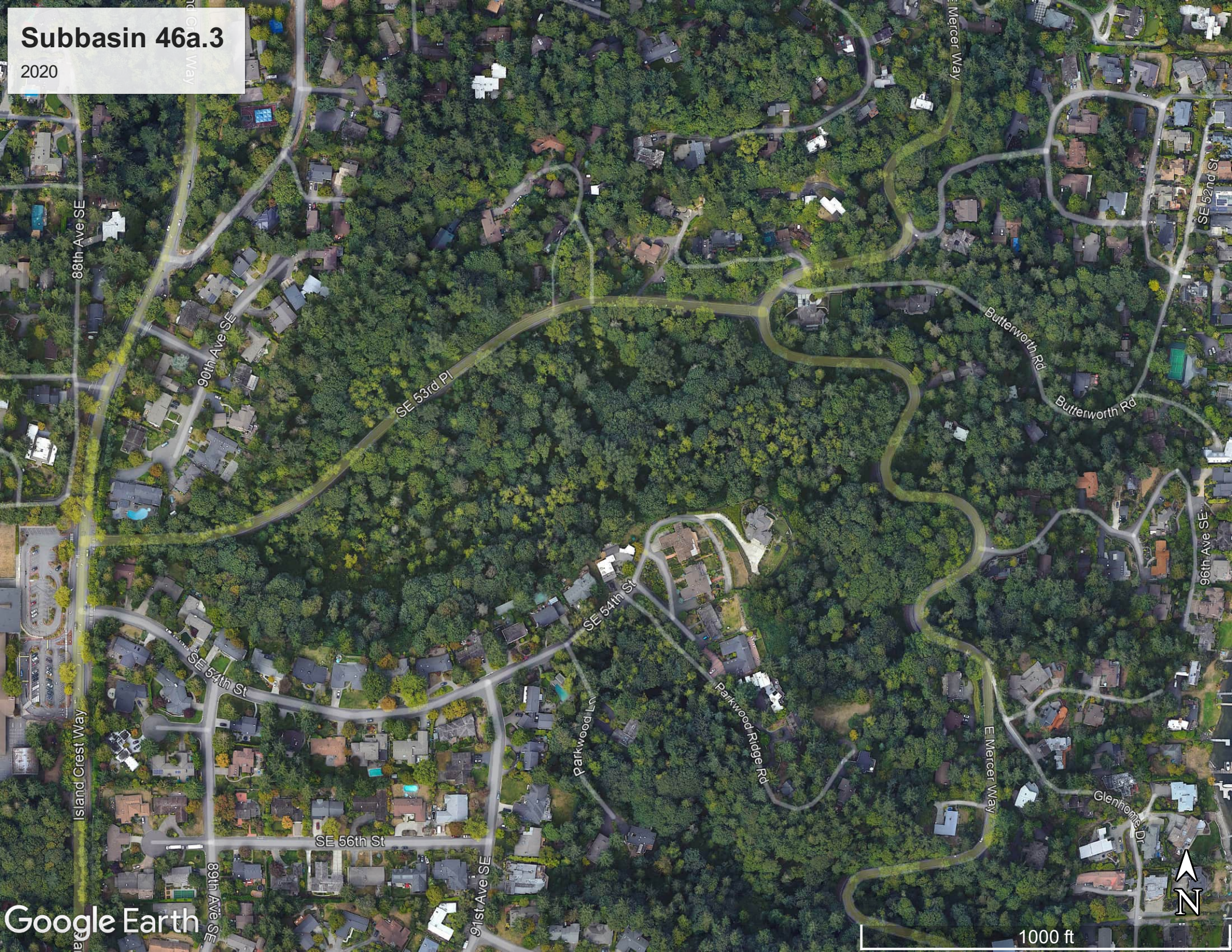
Subbasin 46a.3

2010



Subbasin 46a.3

2020



88th Ave SE

90th Ave SE

SE 53rd Pl

Mercer Way

SE 52nd St

Butterworth Rd

Butterworth Rd

96th Ave SE

SE 54th St

Parkwood Ridge Rd

E Mercer Way

Glenhome Dr

Island Crest Way

SE 54th St

SE 56th St

91st Ave SE

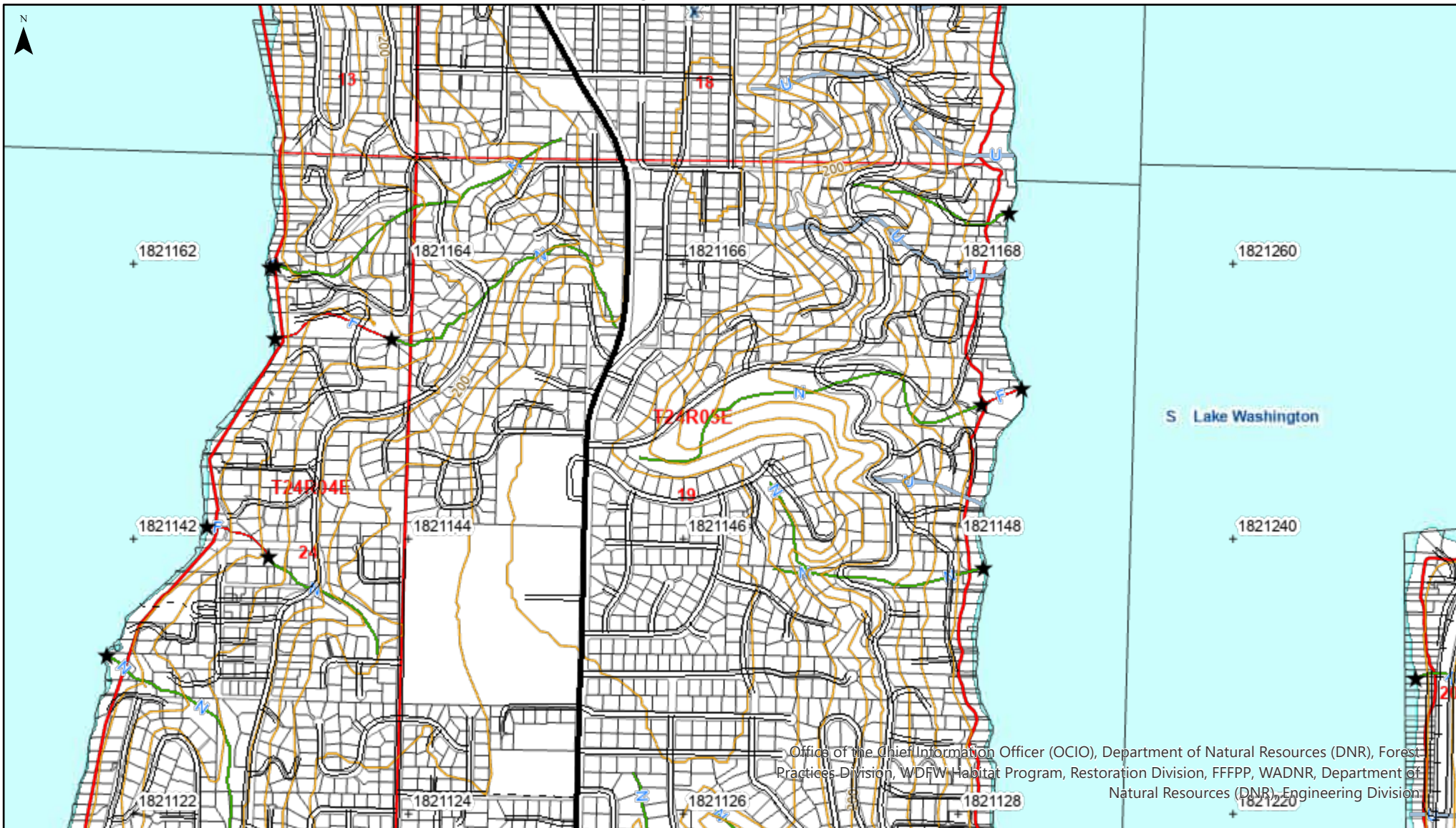
89th Ave SE

Google Earth

1000 ft



Forest Practices Activity Map - Application



Office of the Chief Information Officer (OCIO), Department of Natural Resources (DNR), Forest Practices Division, WDFW Habitat Program, Restoration Division, FFPP, WADNR, Department of Natural Resources (DNR), Engineering Division

Map Symbols	
~ ~ ~	Harvest Boundary
- - -	Road Construction
~ ~ ~	Stream
[Cross-hatched box]	RMZ / WMZ Buffers
X	Rock Pit
●	Landing
▽	Waste Area
🌲	Clumped WRTS/GRTS
🏠	Existing Structure

Additional Information

Legal Description
S20 T24.0N R05.0E, S13 T24.0N R04.0E, S19 T24.0N R05.0E, S18 T24.0N R05.0E, S24 T24.0N R04.0E







































Extreme care was used during the compilation of this map to ensure its accuracy. However, due to changes in data and the need to rely on outside information, the Department of Natural Resources cannot accept responsibility for errors or omissions, and therefore, there are no warranties that accompany this material.

Approximate Scale 1:12,000

0 500 1,000 2,000 Feet

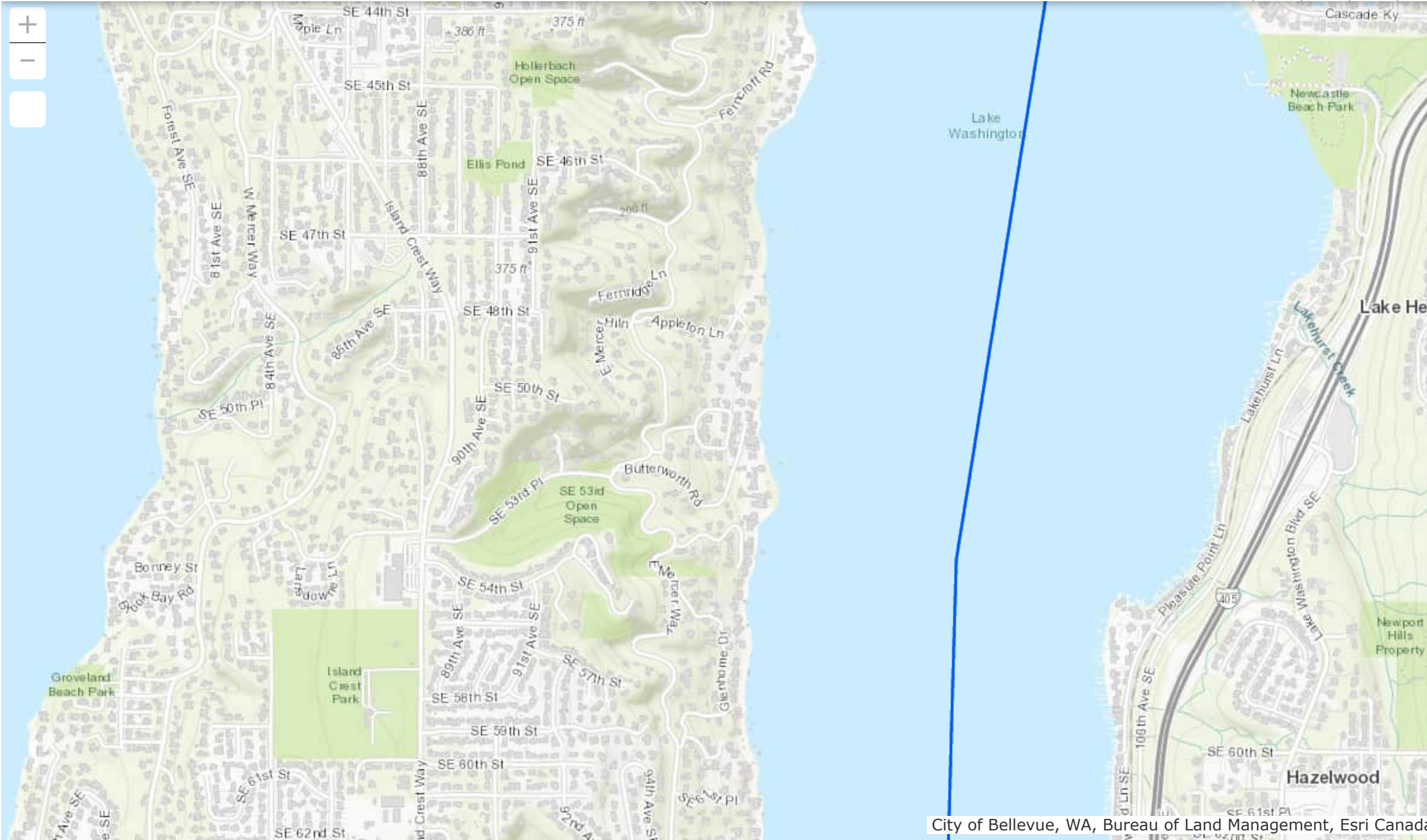
Date: 7/23/2024 Time: 9:48 AM

Legend

- | | | | | | |
|---|--|---|------------------------------|---|-----------------------------------|
|  | Fish Passable |  | Orphaned |  | Public Land Survey Sections |
|  | Fish Barrier RMAP Obligation |  | Paved Road |  | Public Land Survey Townships |
|  | Fish Barrier Deferred or Not RMAP Obligation |  | Unpaved Road/Surface Unknown |  | Tribal Cultural Resource Contacts |
|  | No Fish |  | Trail |  | County Tax Parcels |
|  | Fish Passable |  | Railroad |  | Other Impoundments |
|  | Fish Barrier |  | Railroad Grade |  | Open Freshwater |
|  | No Fish |  | 40 ft. Contours |  | Subject to Inundation |
|  | |  | Type S |  | Glacier / Snowfield |
|  | |  | Type F |  | Wet Area |
|  | Map Registration Tics |  | Type N, Np, Ns |  | Open Saltwater |
|  | Water Type Breaks (FP) |  | U, unknown |  | Artificial Feature |
|  | Abandoned |  | X, non-typed per WAC 222-16 |  | County Boundaries |



Search for a location



Legend

Salmon and Steelhead (April 2023)

Fall Chinook

- Documented Presence
- Documented Spawning
- Documented Rearing
- Presumed Presence (All Types)
- Gradient Accessible, Presence
- Potential Presence (All Types)
- Document Historic Presence (All Types)
- Transported Presence
- Transported Spawning
- Artificial Presence
- Artificial Spawning

Coho

- Documented Presence
- Documented Spawning
- Documented Rearing
- Presumed Presence (All Types)
- Gradient Accessible, Presence
- Potential Presence (All Types)
- Document Historic Presence (All Types)
- Transported Presence
- Transported Spawning
- Transported Rearing
- Artificial Presence
- Artificial Spawning
- Artificial Rearing

Kokanee

- Documented Presence
- Documented Spawning
- Presumed Presence (All Types)
- Potential: Blocked (All Types)

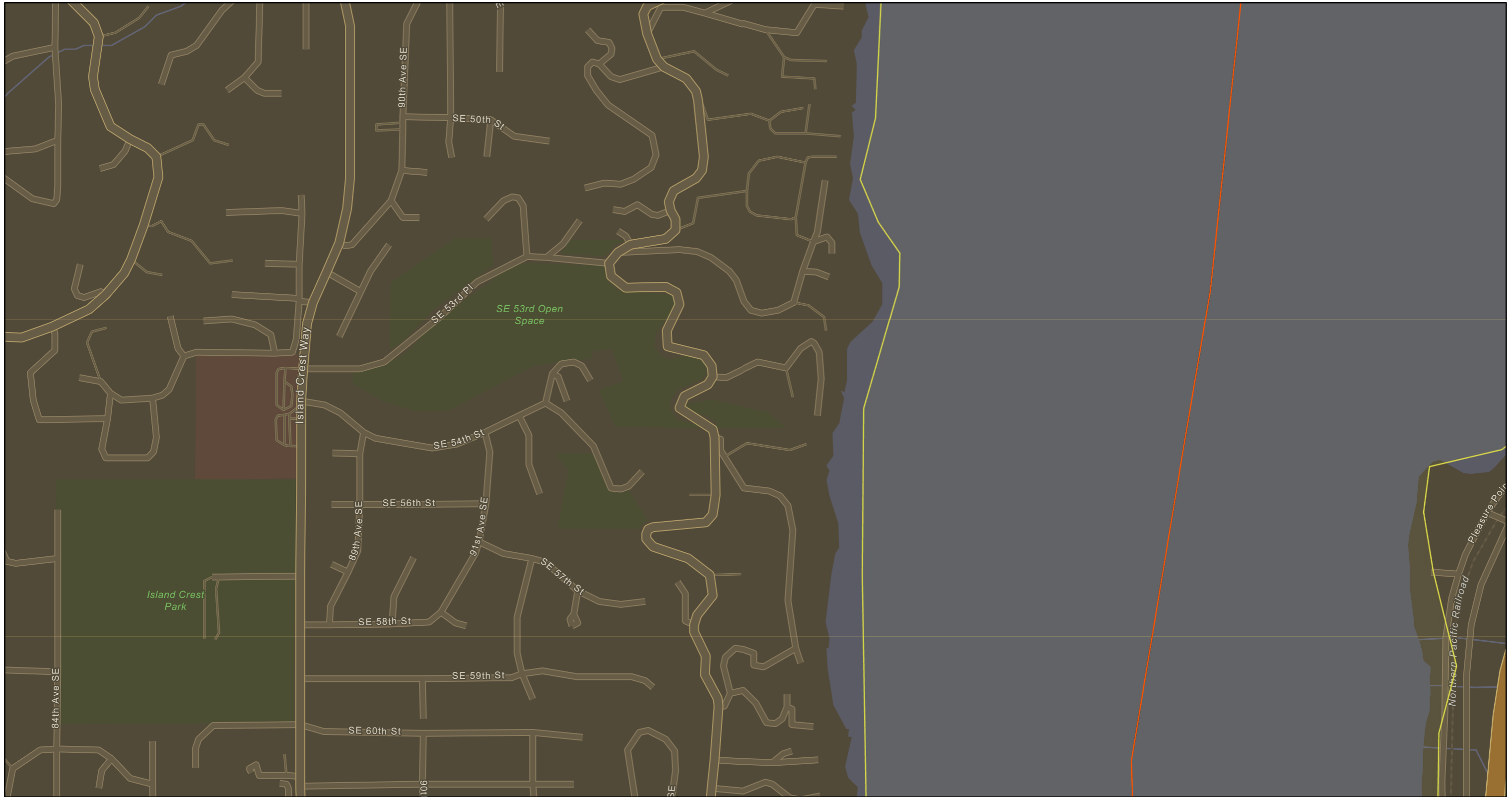
Sockeye

- Documented Presence
- Documented Spawning
- Documented Rearing
- Presumed Presence (All Types)
- Gradient Accessible, Presence

City of Bellevue, WA, Bureau of Land Management, Esri Canada




0.2mi
-122.211445 47.560026 Degrees

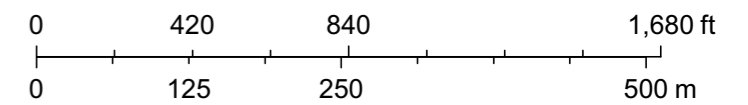
NMFS West Coast Region, Species and Habitat App - Map Export



7/19/2024, 3:34:48 PM

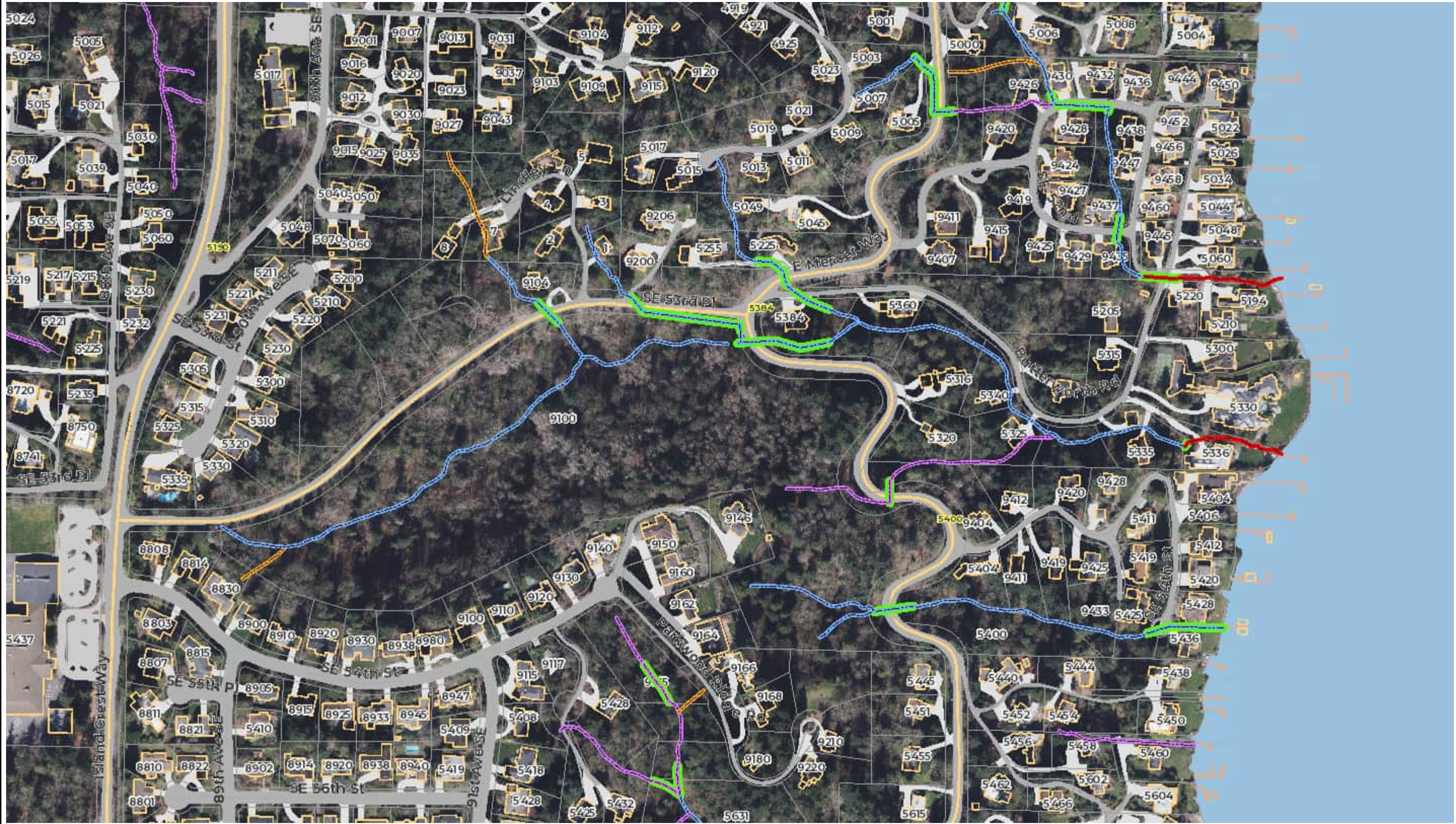
1:9,173

-  **All WCR critical habitat line 20230717**
-  **EFH - Highly Migratory Species, Coastal Pelagic Species, Groundfish**
-  **EFH - Salmon**



Esri Community Maps Contributors, City of Bellevue, WA, King County, WA State Parks GIS, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA, USFWS, NOAA National Marine Fisheries Service, West Coast Region, NOAA

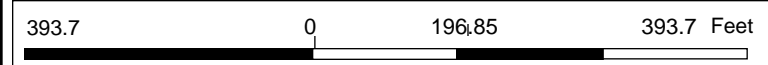
Subbasin 46.3a WtrCrs Stabilization



Legend

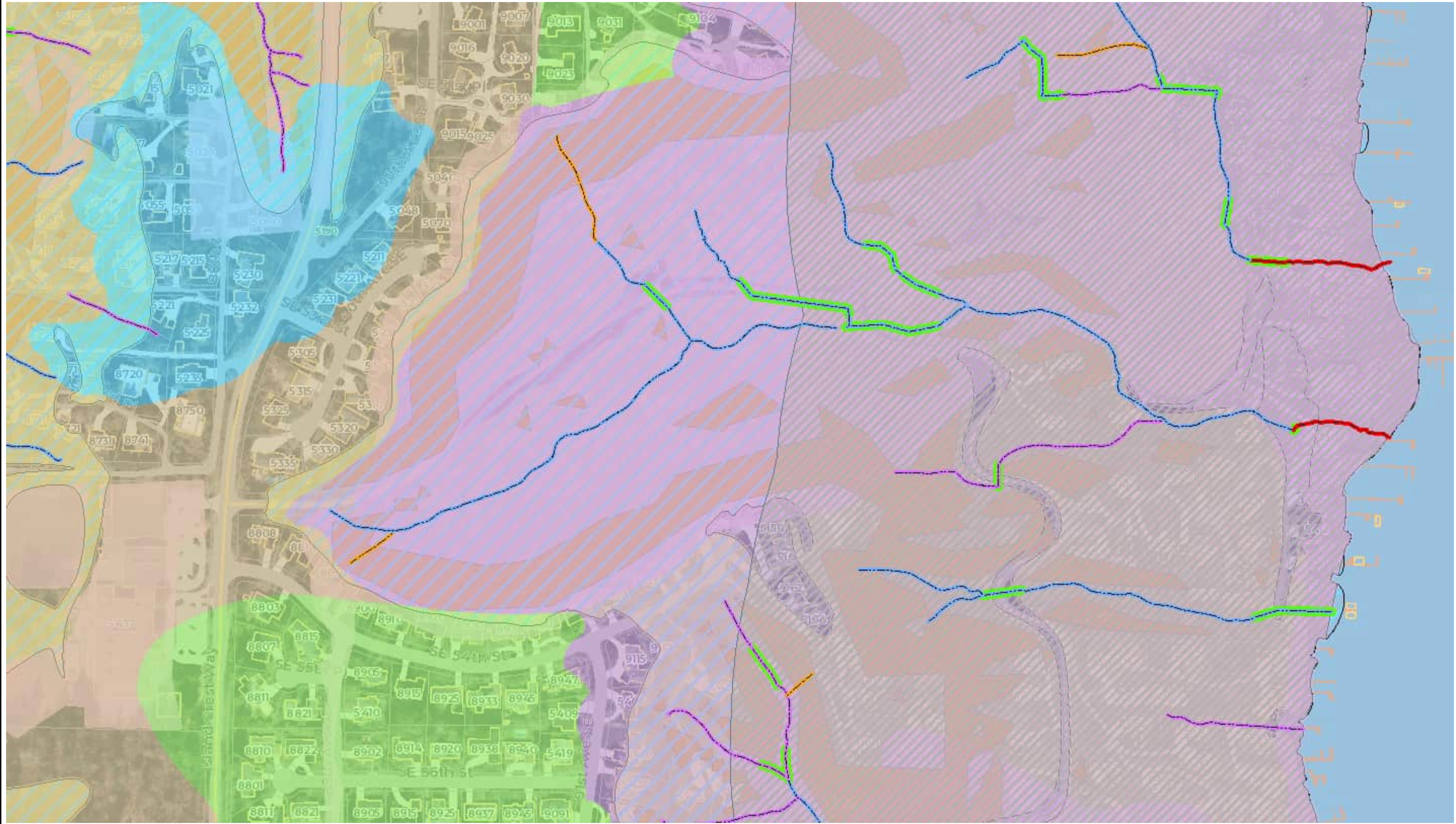
- Unpiped Watercourse
 - Type "F" = Fish
 - Type "Np" = Non-Fish
 - Type "Ns" = Non-Fish
 - Type "Np" (Unverified)
 - Type "Ns" (Unverified)
- Piped Watercourse
- Address
- Building
- Property Line
- Docks
- Freeway
- Major Street
- Street
- Paved Driveway
- Paved Road
- Paved Parking Area
- Lake Washington
- March 2020
- Red: Band_1
- Green: Band_2
- Blue: Band_3

1: 3,088



Disclaimer: These maps were developed by the City of Mercer Island and are intended to be a general purpose digital reference tool. These maps are not an accepted legal instrument for describing, establishing, recording or maintaining descriptions for property concerns or boundaries. The City makes no representation or warranty with respect to the accuracy or currency of these data sets, especially in regard to labeling of surveyed dimensions, or agreement with official sources such as records of survey, or mapped locations of features.

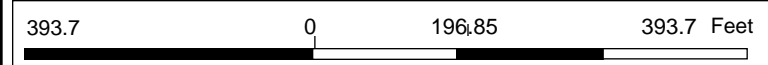
Notes



Legend

- Unpiped Watercourse
 - Type "F" = Fish
 - Type "Np" = Non-Fish
 - Type "Ns" = Non-Fish (Unverified)
 - Type "Np" (Unverified)
 - Type "Ns" (Unverified)
- Piped Watercourse
- Wind Exposure
 - Wind Speed-Up
 - 1.0
 - 1.3
 - 1.6
 - 1.9
- Potential Slide
- Steep Slope
- Seismic
- Erosion
- Address
- Building
- Property Line
- Docks
- Freeway
- Major Street
- Street
- Paved Driveway
- Paved Road
- Paved Parking Area
- Lake Washington
- March 2020
 - Red: Band_1
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1: 3,088





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Notes



September 12, 2023

Wetlands



- | | | | | | |
|---|--------------------------------|---|-----------------------------------|---|----------|
|  | Estuarine and Marine Deepwater |  | Freshwater Emergent Wetland |  | Lake |
|  | Estuarine and Marine Wetland |  | Freshwater Forested/Shrub Wetland |  | Other |
| | |  | Freshwater Pond |  | Riverine |

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

King County iMap: Sensitive Areas



Legend

-  Parcels
-  Erosion hazard (1990 SAO)

EagleView Technologies, Inc., King County, King County

The information included on this map has been compiled by King County staff from a variety of sources and is subject to change without notice. King County makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a survey product. King County shall not be liable for any general, special, indirect, incidental, or consequential damages including, but not limited to, lost revenues or lost profits resulting from the use or misuse of the information contained on this map. Any sale of this map or information on this map is prohibited except by written permission of King County.

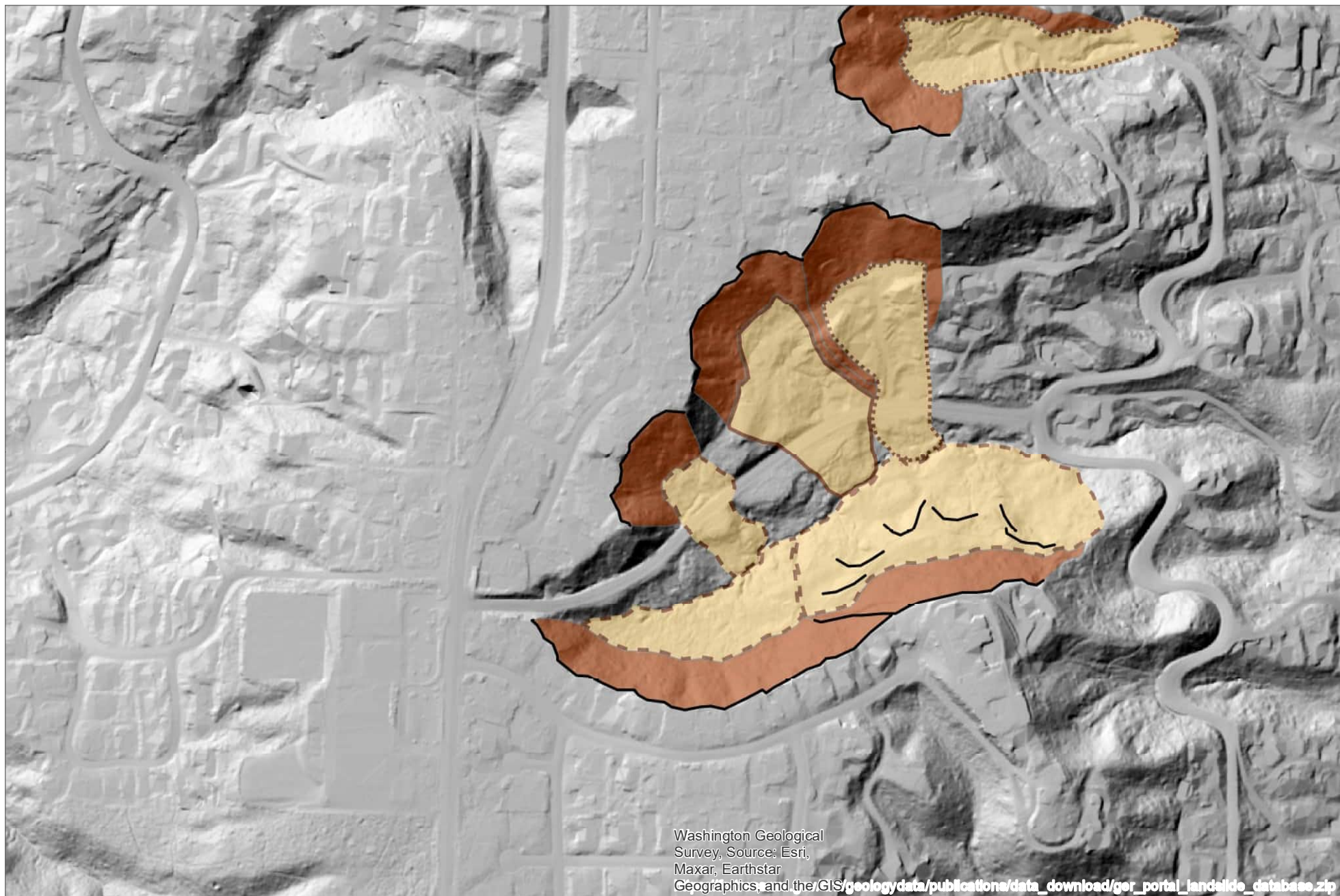
Date: 7/15/2024

Notes:



King County

Mercer Island



Washington Geological Survey, Source: Esri, Maxar, Earthstar Geographics, and the GIS/geologydata/publications/data_download/ger_portal_landslide_database.zip



WASHINGTON STATE DEPARTMENT OF
NATURAL RESOURCES
WASHINGTON GEOLOGICAL SURVEY

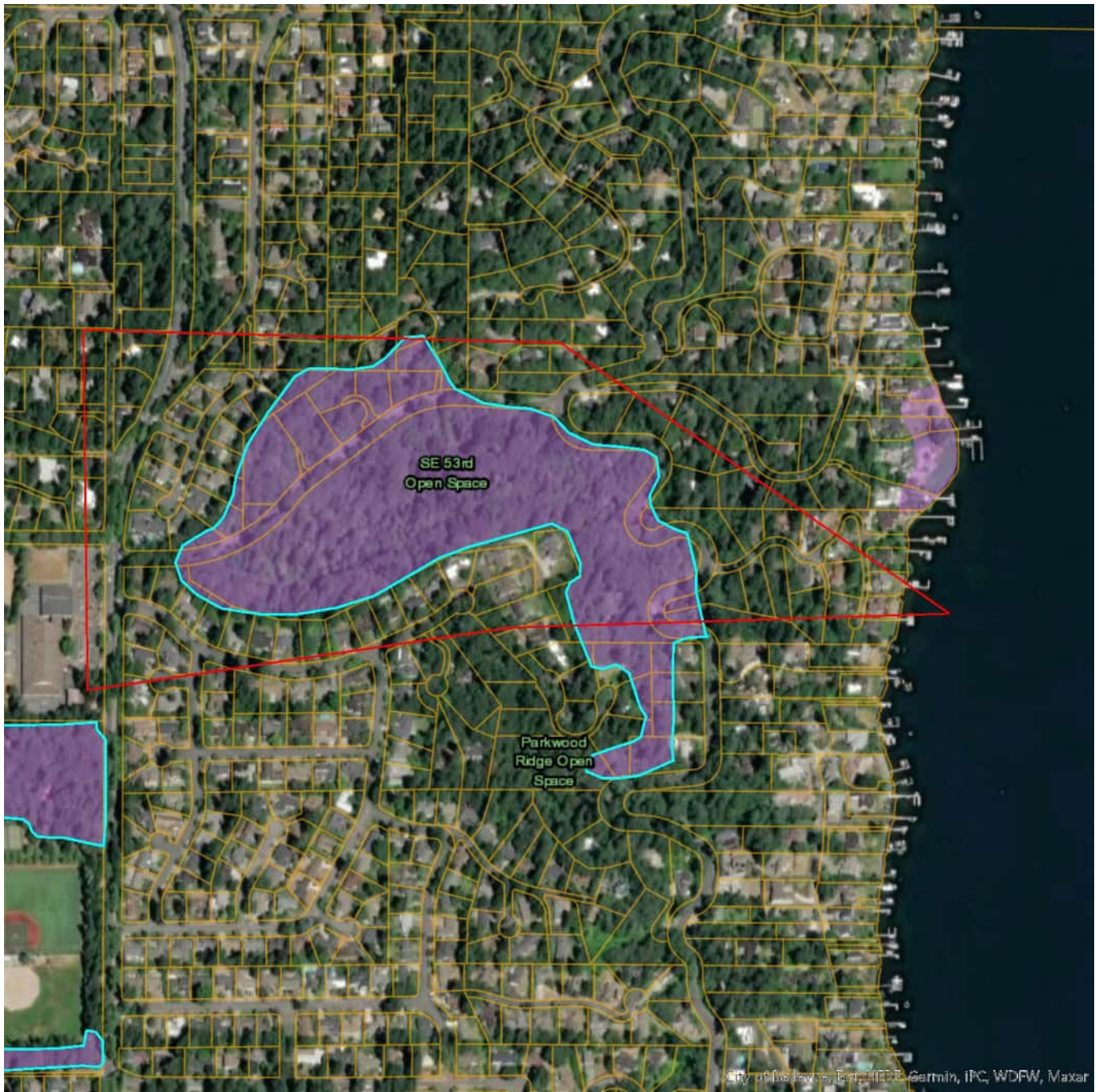
Geology Portal

0 0.045 0.09 0.18 Miles





Priority Habitats and Species on the Web



Report Date: 09/12/2023

User Comments/Notes:

Sub-basin 46.3a Watercourse Stabilization Design

PHS Species/Habitats Overview:

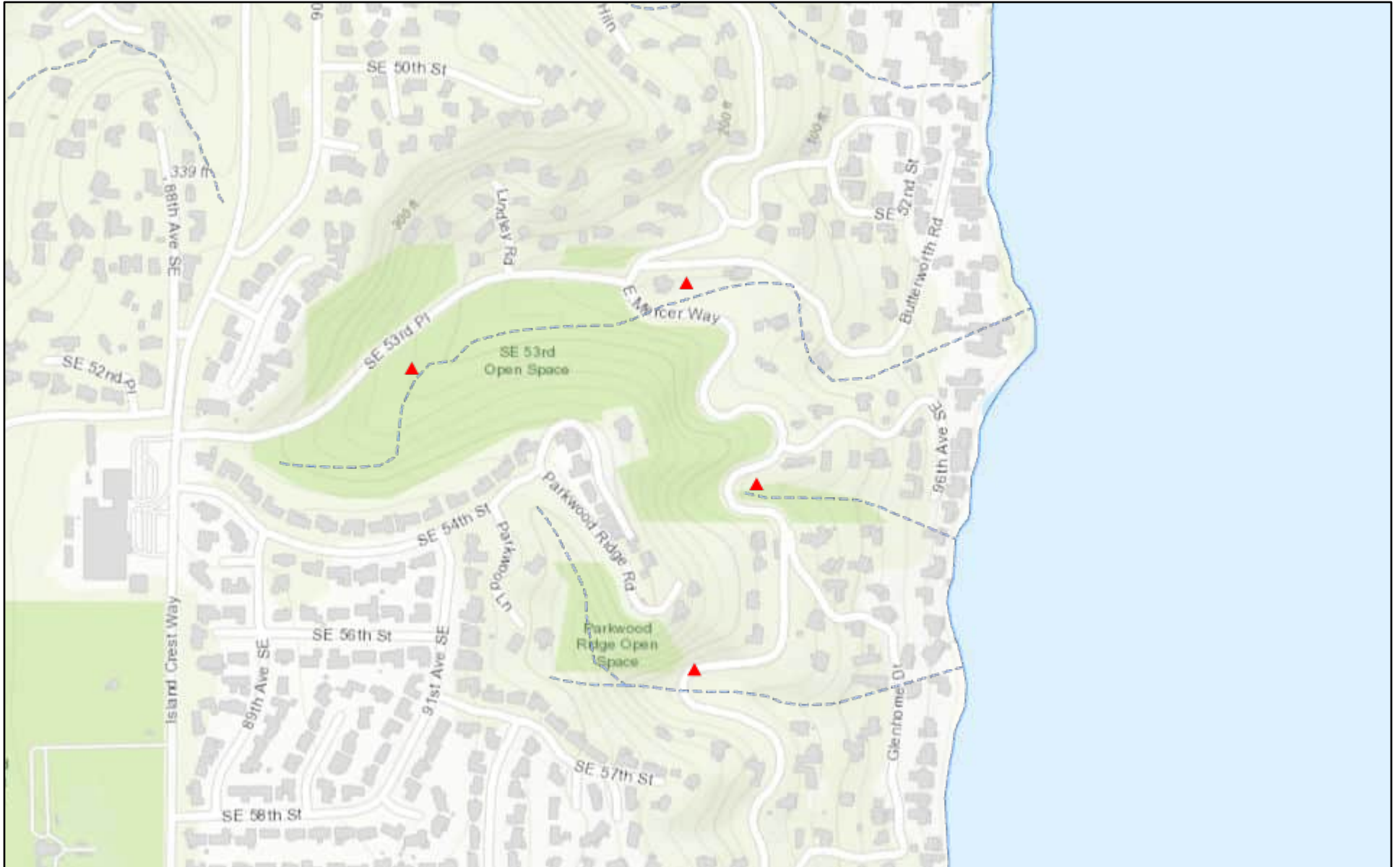
Occurrence Name	Federal Status	State Status	Sensitive Location
Biodiversity Areas And Corridor	N/A	N/A	No

PHS Species/Habitats Details:

Biodiversity Areas And Corridor	
Priority Area	Terrestrial Habitat
Site Name	MERCER ISLAND OPEN SPACE AREAS.
Accuracy	1/4 mile (Quarter Section)
Notes	RELATIVELY DENSELY FORESTED TRACTS. SOME STEEP HILLSIDES.
Source Record	902041
Source Dataset	PHSREGION
Source Name	MULLER, TED
Source Entity	WA Dept. of Fish and Wildlife
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://wdfw.wa.gov/publications/pub.php?id=00023
Geometry Type	Polygons

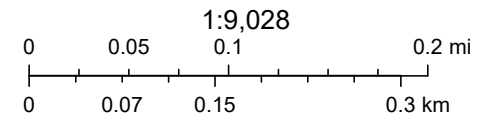
DISCLAIMER. This report includes information that the Washington Department of Fish and Wildlife (WDFW) maintains in a central computer database. It is not an attempt to provide you with an official agency response as to the impacts of your project on fish and wildlife. This information only documents the location of fish and wildlife resources to the best of our knowledge. It is not a complete inventory and it is important to note that fish and wildlife resources may occur in areas not currently known to WDFW biologists, or in areas for which comprehensive surveys have not been conducted. Site specific surveys are frequently necessary to rule out the presence of priority resources. Locations of fish and wildlife resources are subject to variation caused by disturbance, changes in season and weather, and other factors. WDFW does not recommend using reports more than six months old.

Subbasin 46a.3



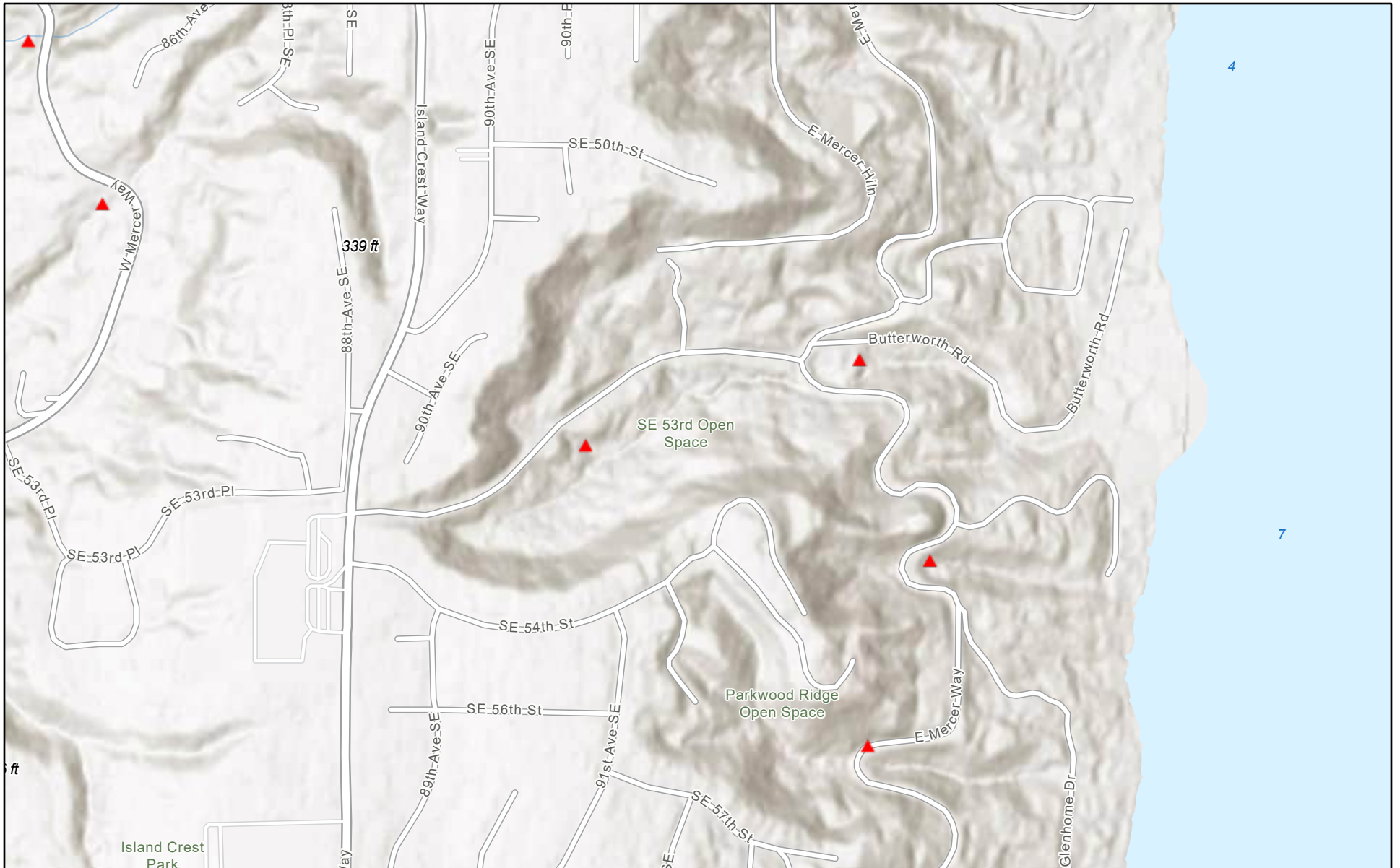
July 15, 2024

▲ Total Fish Passage Blockage



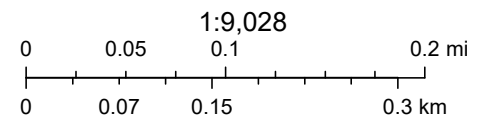
Restoration Division of the DFW Habitat Program, City of Bellevue, WA,
County of King, Bureau of Land Management, Esri Canada, Esri, HERE,

Washington State Fish Passage



9/15/2023, 2:52:32 PM

▲ Total Fish Passage Blockage



Restoration Division of the DFW Habitat Program, Esri, NASA, NGA, USGS, FEMA, Esri Community Maps Contributors, City of Bellevue, WA, King

WDFW



Washington Department of Fish and Wildlife

Fish Passage & Diversion Screening Inventory Database Report Cover Sheet

The following report is extracted from the Washington Department of Fish and Wildlife's (WDFW) Fish Passage and Diversion Screening Inventory Database (FPDSI). WDFW makes every attempt to keep these reports in sync with FPDSI; however, the dynamic nature of the data and workflows associated with maintaining the database may result in short-term differences.

Users are encouraged to contact WDFW to discuss appropriate use of the data and how we can assist with fish passage barrier removal or inventory. Please visit the Fish Passage web site for contact information at: <https://wdfw.wa.gov/species-habitats/habitat-recovery/fish-passage/about>

Disclaimers:

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- Bankfull width measurements included in these reports should not be used for fish passage crossing design. They are solely for assessment purposes.
- The barrier status reported in this document is based on the swimming abilities of adult salmonids. Passabilities are a qualitative value, and should not be interpreted as a quantitative calculation. Please see page 1-4 of the Fish Passage Inventory, Assessment and Prioritization Manual for further clarification: <https://wdfw.wa.gov/publications/02061>
- EXIF data presented with Image Reports may be erroneous due to camera battery failures and resetting of camera clock functions.

Abbreviations:

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The FPDSI database often uses default values such as '-99.99' or '-999' to represent null values.

WDFW Fish Passage and Diversion Screening Inventory Database

Site Description Report

Site ID

Project

Mitigated

Geographic Coordinates

Latitude (WGS 84):	<input type="text" value="47.556079"/>
Longitude (WGS 84):	<input type="text" value="-122.214006"/>
East (NAD 83 HARN):	<input type="text" value="1,217,192.4"/>
North (NAD 83 HARN):	<input type="text" value="815,212.6"/>

Waterbody

Stream:	<input type="text" value="unnamed"/>
Tributary To:	<input type="text" value="Lake Washington"/>
WRIA:	<input type="text" value="08"/>
River Mile:	<input type="text" value="-999.99"/>
Fish Use Potential:	<input type="text" value="Yes"/>
FUP Criteria:	<input type="text" value="Physical"/>

General Location

Road Name:	<input type="text" value="Mercer Way E"/>
Mile Post:	<input type="text" value="-999.99"/>
County:	<input type="text" value="King"/>
WDFW Region:	<input type="text" value="4"/>

Owner

Type:	<input type="text" value="City"/>
Name:	<input type="text" value="City of Mercer Island"/>

PI Species

<input type="checkbox"/> Sockeye	<input type="checkbox"/> Chinook	<input checked="" type="checkbox"/> Sea Run Cutthroat
<input type="checkbox"/> Pink	<input type="checkbox"/> Coho	<input checked="" type="checkbox"/> Resident Trout
<input type="checkbox"/> Chum	<input checked="" type="checkbox"/> Steelhead	<input type="checkbox"/> Bull Trout

Associated Features

<input type="checkbox"/> Culvert	<input checked="" type="checkbox"/> Dam	<input type="checkbox"/> Natural Barrier	<input type="checkbox"/> Diversion
<input type="checkbox"/> Non-Culvert Xing	<input type="checkbox"/> Other	<input type="checkbox"/> Fishway	

Location/Directions

The culvert is located under a sharp turn in Mercer Way E just south of the intersection with Butterworth Rd. The outlet is approx. 60 m east of the dam inlet parallel to Mercer Way E.

Site Comments

11/21/2021

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WDFW Fish Passage and Diversion Screening Inventory Database

Dam Assessment Report

Site ID: 920822			
Latitude: 47.556079	Stream: unnamed	WRIA: 08	
Longitude: -122.214006	Trib To: Lake Washington	Fish Use Potential: Yes	

Data Source

Organization:	Washington Department of Fish and Wildlife		
Field Crew:	Barrett;Metzger;Rains	Review Date:	3/25/2015

Description

Dam Name:		Type:	Other	Operated:	
Reservoir Name:		Span:	Full	Fishway Present:	No
Primary Purpose:	Flood Control	Outlet:	Culvert		

Assessment Parameters

Length (m):	1.2
Height (m):	1.95
Water Surface Difference (m):	1.95
Plunge Pool Depth (m):	-99.99



Results

Barrier:	Yes
Reason:	WS Drop
Passability (%):	0
Recheck:	

Description

Standpipe inlet with a collection pool u/s. Trash rack on the inlet. Culvert outlet (RND, CST, Span=0.42, Rise=0.56, Length=74.61, Slope=5.7, Outfall drop = 1.4 m, Roadfill depth = 7 m, Bankfull = 1.1 m)

Comments

Outlet culvert is dented. Outlets onto rip-rap so the hydraulic drop was taken to the first resting pool. Two stormwater run-off pipes on the LB at the outlet.

11/21/2021

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WDFW Fish Passage and Diversion Screening Inventory Database
Dam Assessment Report

Site ID: 920822			
Latitude: 47.556079	Stream: unnamed	WRIA: 08	
Longitude: -122.214006	Trib To: Lake Washington	Fish Use Potential: Yes	

Potential Habitat Gain

Survey Type:	<input type="text"/>	Rearing (sq m):	<input type="text"/>	Length (m):	<input type="text"/>
Significant Reach:	<input type="text" value="Unknown"/>	Spawning (sq m):	<input type="text"/>	PI Total:	<input type="text"/>

11/21/2021

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**WDFW Fish Passage and Diversion Screening Inventory Database
Image Report - Active**

Site ID: 920822	Stream: unnamed	WRIA: 08
Latitude: 47.556079	Tributary To: Lake Washington	Fish Use Potential: Yes
Longitude: -122.214006		

Associated Features

<input type="checkbox"/> Culvert	<input checked="" type="checkbox"/> Dam	<input type="checkbox"/> Natural Barrier	<input type="checkbox"/> Diversion
<input type="checkbox"/> Non-Culvert Xing	<input type="checkbox"/> Other	<input type="checkbox"/> Fishway	



11/21/2021

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Washington Department of Fish and Wildlife

Fish Passage & Diversion Screening Inventory Database Report Cover Sheet

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The FPDSI database often uses default values such as '-99.99' or '-999' to represent null values.

WDFW Fish Passage and Diversion Screening Inventory Database

Site Description Report

Site ID

Project

Mitigated

Geographic Coordinates

Latitude (WGS 84):	<input type="text" value="47.555224"/>
Longitude (WGS 84):	<input type="text" value="-122.218081"/>
East (NAD 83 HARN):	<input type="text" value="1,216,179.6"/>
North (NAD 83 HARN):	<input type="text" value="814,922.7"/>

Waterbody

Stream:	<input type="text" value="unnamed"/>
Tributary To:	<input type="text" value="Lake Washington"/>
WRIA:	<input type="text" value="08"/>
River Mile:	<input type="text" value="-999.99"/>
Fish Use Potential:	<input type="text" value="Yes"/>
FUP Criteria:	<input type="text" value="Physical"/>

General Location

Road Name:	<input type="text" value="53rd PI SE"/>
Mile Post:	<input type="text" value="-999.99"/>
County:	<input type="text" value="King"/>
WDFW Region:	<input type="text" value="4"/>

Owner

Type:	<input type="text" value="City"/>
Name:	<input type="text" value="City of Mercer Island"/>

PI Species

<input type="checkbox"/> Sockeye	<input type="checkbox"/> Chinook	<input type="checkbox"/> Sea Run Cutthroat
<input type="checkbox"/> Pink	<input type="checkbox"/> Coho	<input checked="" type="checkbox"/> Resident Trout
<input type="checkbox"/> Chum	<input type="checkbox"/> Steelhead	<input type="checkbox"/> Bull Trout

Associated Features

<input type="checkbox"/> Culvert	<input checked="" type="checkbox"/> Dam	<input type="checkbox"/> Natural Barrier	<input type="checkbox"/> Diversion
<input type="checkbox"/> Non-Culvert Xing	<input type="checkbox"/> Other	<input type="checkbox"/> Fishway	

Location/Directions

Site Comments

Only fish bearing approx. 30 m u/s. Greater than 12% gradient.
--

11/21/2021

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WDFW Fish Passage and Diversion Screening Inventory Database

Dam Assessment Report

Site ID: 920825		
Latitude: 47.555224	Stream: unnamed	WRIA: 08
Longitude: -122.218081	Trib To: Lake Washington	Fish Use Potential: Yes

Data Source

Organization:	Washington Department of Fish and Wildlife		
Field Crew:	Barrett;Metzger;Rains	Review Date:	3/26/2015

Description

Dam Name:		Type:	Concrete	Operated:	Year Round
Reservoir Name:		Span:	Full	Fishway Present:	No
Primary Purpose:	Flood Control	Outlet:	Culvert		

Assessment Parameters

Length (m):	1.6
Height (m):	-999.99
Water Surface Difference (m):	1.55
Plunge Pool Depth (m):	-99.99



Results

Barrier:	Yes
Reason:	WS Drop
Passability (%):	0
Recheck:	

Description

Inaccessible capped standpipe u/s. Outlets into RND CST culvert (Span - 0.65, Rise - 0.77, Water Depth in Culvert - 0.01, Outlet hydraulic drop - 0.55, Length - 32.56, Slope - 18%, BFW - 0.78).

Comments

Could not access the inside of the standpipe to collect height information.

11/21/2021

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WDFW Fish Passage and Diversion Screening Inventory Database
Dam Assessment Report

Site ID: 920825			
Latitude: 47.555224	Stream: unnamed	WRIA: 08	
Longitude: -122.218081	Trib To: Lake Washington	Fish Use Potential: Yes	

Potential Habitat Gain

Survey Type:	<input type="text"/>	Rearing (sq m):	<input type="text"/>	Length (m):	<input type="text"/>
Significant Reach:	<input type="text" value="No"/>	Spawning (sq m):	<input type="text"/>	PI Total:	<input type="text"/>

11/21/2021

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**WDFW Fish Passage and Diversion Screening Inventory Database
Image Report - Active**

Site ID: 920825	Stream: unnamed	WRIA: 08
Latitude: 47.555224	Tributary To: Lake Washington	Fish Use Potential: Yes
Longitude: -122.218081		

Associated Features

<input type="checkbox"/> Culvert	<input checked="" type="checkbox"/> Dam	<input type="checkbox"/> Natural Barrier	<input type="checkbox"/> Diversion
<input type="checkbox"/> Non-Culvert Xing	<input type="checkbox"/> Other	<input type="checkbox"/> Fishway	



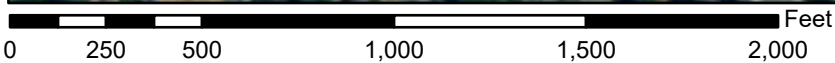
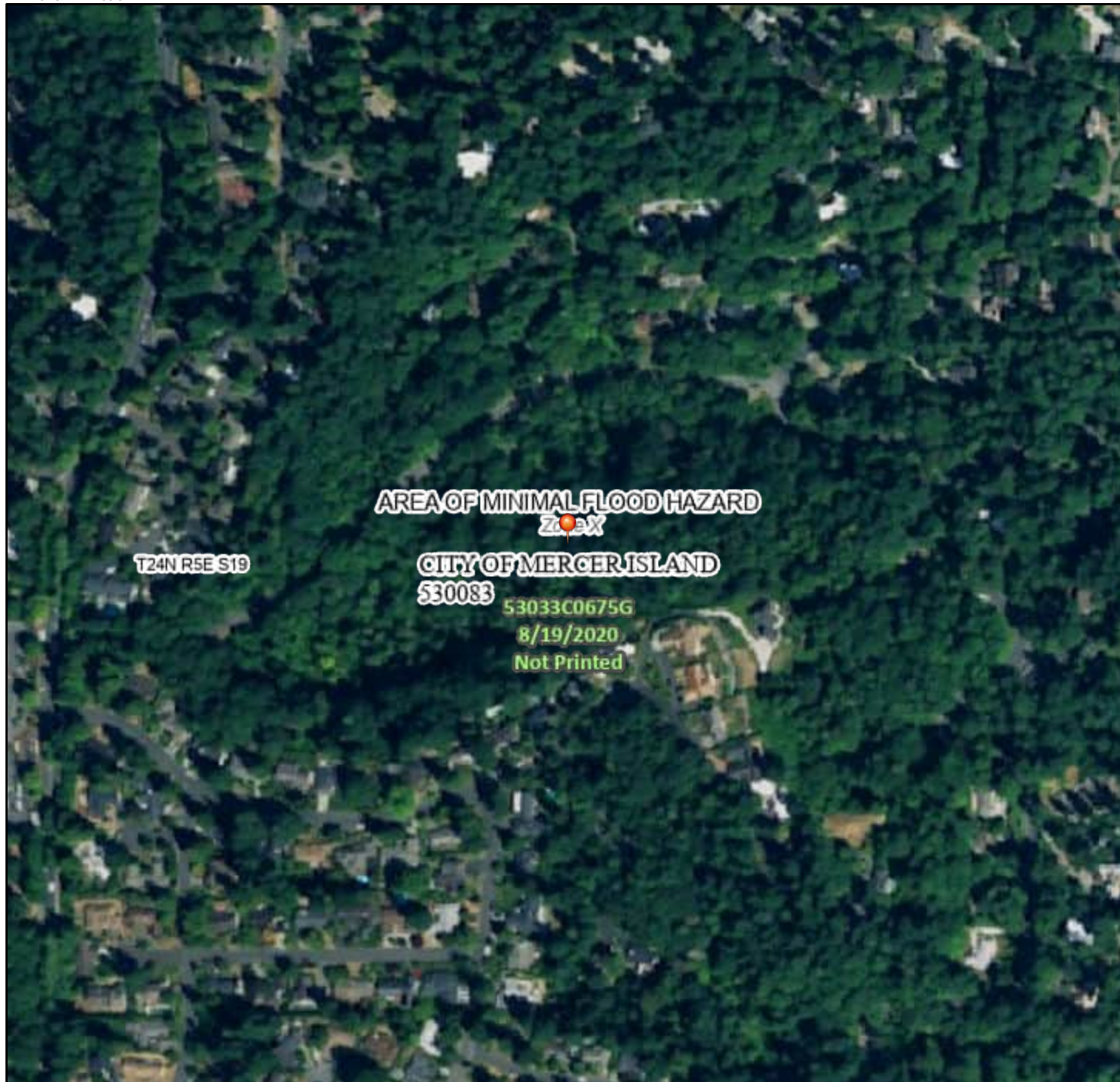
11/21/2021

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National Flood Hazard Layer FIRMMette



122°13'19"W 47°33'31"N



1:6,000

122°12'42"W 47°33'6"N

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) <i>Zone A, V, A99</i>
		With BFE or Depth <i>Zone AE, AO, AH, VE, AR</i>
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile <i>Zone X</i>
		Future Conditions 1% Annual Chance Flood Hazard <i>Zone X</i>
		Area with Reduced Flood Risk due to Levee. See Notes. <i>Zone X</i>
		Area with Flood Risk due to Levee <i>Zone D</i>
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard <i>Zone X</i>
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard <i>Zone D</i>
		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5 Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
MAP PANELS		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
		Digital Data Available
		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **7/15/2024 at 4:16 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for King County Area, Washington



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

Custom Soil Resource Report

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

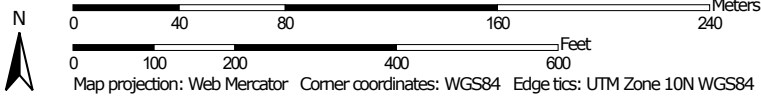
The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map




Soil Map may not be valid at this scale.

Map Scale: 1:2,850 if printed on A landscape (11" x 8.5") sheet.




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: King County Area, Washington
 Survey Area Data: Version 19, Aug 29, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 1, 2023—Sep 1, 2023

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
AgC	Alderwood gravelly sandy loam, 8 to 15 percent slopes	15.2	88.1%
AmB	Arents, Alderwood material, 0 to 6 percent slopes	2.1	11.9%
Totals for Area of Interest		17.3	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

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onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

King County Area, Washington

AgC—Alderwood gravelly sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2t626
Elevation: 50 to 800 feet
Mean annual precipitation: 20 to 60 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 160 to 240 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Alderwood and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Alderwood

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Nose slope, talf
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Glacial drift and/or glacial outwash over dense glaciomarine deposits

Typical profile

A - 0 to 7 inches: gravelly sandy loam
Bw1 - 7 to 21 inches: very gravelly sandy loam
Bw2 - 21 to 30 inches: very gravelly sandy loam
Bg - 30 to 35 inches: very gravelly sandy loam
2Cd1 - 35 to 43 inches: very gravelly sandy loam
2Cd2 - 43 to 59 inches: very gravelly sandy loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 20 to 39 inches to densic material
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 18 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: B
Ecological site: F002XA004WA - Puget Lowlands Forest
Forage suitability group: Limited Depth Soils (G002XN302WA), Limited Depth Soils (G002XS301WA), Limited Depth Soils (G002XF303WA)

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Other vegetative classification: Limited Depth Soils (G002XN302WA), Limited Depth Soils (G002XS301WA), Limited Depth Soils (G002XF303WA)
Hydric soil rating: No

Minor Components

Indianola

Percent of map unit: 5 percent
Landform: Terraces, kames, eskers
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Everett

Percent of map unit: 5 percent
Landform: Moraines, eskers, kames
Landform position (two-dimensional): Shoulder, footslope
Landform position (three-dimensional): Base slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Shalcar

Percent of map unit: 3 percent
Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Norma

Percent of map unit: 2 percent
Landform: Drainageways, depressions
Landform position (three-dimensional): Dip
Down-slope shape: Linear, concave
Across-slope shape: Concave
Hydric soil rating: Yes

AmB—Arents, Alderwood material, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: 1hm5p
Elevation: 160 to 590 feet
Mean annual precipitation: 35 to 60 inches
Mean annual air temperature: 50 degrees F
Frost-free period: 150 to 200 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Arents, alderwood material, and similar soils: 100 percent

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Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Arents, Alderwood Material

Setting

Landform: Till plains

Parent material: Basal till

Typical profile

H1 - 0 to 26 inches: gravelly sandy loam

H2 - 26 to 60 inches: very gravelly sandy loam

Properties and qualities

Slope: 0 to 6 percent

Depth to restrictive feature: 20 to 40 inches to densic material

Drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)

Depth to water table: About 16 to 36 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Very low (about 2.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4s

Hydrologic Soil Group: B/D

Hydric soil rating: No

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- United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084>

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United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

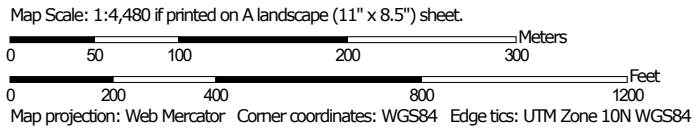
United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

Hydric Rating by Map Unit—King County Area, Washington




Soil Map may not be valid at this scale.









MAP LEGEND

Area of Interest (AOI)







 Area of Interest (AOI)

Soils







Soil Rating Polygons

-  Hydric (100%)
-  Hydric (66 to 99%)
-  Hydric (33 to 65%)
-  Hydric (1 to 32%)
-  Not Hydric (0%)
-  Not rated or not available


Soil Rating Lines

-  Hydric (100%)
-  Hydric (66 to 99%)
-  Hydric (33 to 65%)
-  Hydric (1 to 32%)
-  Not Hydric (0%)
-  Not rated or not available






Soil Rating Points

-  Hydric (100%)
-  Hydric (66 to 99%)
-  Hydric (33 to 65%)
-  Hydric (1 to 32%)
-  Not Hydric (0%)
-  Not rated or not available


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: King County Area, Washington
 Survey Area Data: Version 19, Aug 29, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 1, 2023—Sep 1, 2023

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.

Hydric Rating by Map Unit

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AgC	Alderwood gravelly sandy loam, 8 to 15 percent slopes	5	37.1	37.8%
AkF	Alderwood and Kitsap soils, very steep	0	1.6	1.7%
AmB	Arents, Alderwood material, 0 to 6 percent slopes	0	31.3	31.9%
KpD	Kitsap silt loam, 15 to 30 percent slopes	3	28.1	28.6%
Totals for Area of Interest			98.1	100.0%

Description

This rating indicates the percentage of map units that meets the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric soil or not hydric. Map units that are made up dominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up dominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is rated based on its respective components and the percentage of each component within the map unit.

The thematic map is color coded based on the composition of hydric components. The five color classes are separated as 100 percent hydric components, 66 to 99 percent hydric components, 33 to 65 percent hydric components, 1 to 32 percent hydric components, and less than one percent hydric components.

In Web Soil Survey, the Summary by Map Unit table that is displayed below the map pane contains a column named 'Rating'. In this column the percentage of each map unit that is classified as hydric is displayed.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) 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 (Federal Register, 1994). Under natural conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

References:

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

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Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

Rating Options

Aggregation Method: Percent Present

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Appendix D

Site Photographs

Site Photographs — Sub-Basin 46a.3 Watercourse Stabilization Design — Mercer Island

Critical Areas Delineations and Geologic Hazard Site Visit— Photos taken February 9, 2024 and April 23-24, 2024



View facing downstream at Station 10+00 along stream.



View of Seep 1 entering the Sub-Basin 46a.3 Stream.



View facing up Tributary 3.



View facing downstream at Station 9+00 along stream.



View facing up Seep 2 from the Sub-Basin 46a.3 Stream.



View facing downstream at Station 8+00 along stream.

Site Photographs — Sub-Basin 46a.3 Watercourse Stabilization Design — Mercer Island

Critical Areas Delineations and Geologic Hazard Site Visit— Photos taken February 9, 2024 and April 23-24, 2024



View facing up Seep 3 from the Sub-Basin 46a.3 Stream.



View facing downstream at Station 7+00 along stream.



View facing downstream at Station 6+00 along stream.



View facing downstream at Station 5+00 along stream.



A view facing up Tributary 2 from the Sub-Basin 46a.3 Stream.



View facing downstream at Station 4+00 along stream.

Site Photographs — Sub-Basin 46a.3 Watercourse Stabilization Design — Mercer Island

Critical Areas Delineations and Geologic Hazard Site Visit— Photos taken February 9, 2024 and April 23-24, 2024



Left: Tributary 1, downstream of the project reach, showing base flows and facing Watercourse 46a.3 in the background.



Right: Loose soil near Watercourse 46a.3 stream channel.



A general view of Wetland A (Cat. III).



Wetland B (Cat. III) from Watercourse 46a.3.



A view of the sediment pond at E Mercer Way, facing upstream.



Sandy soil in central 53rd Place Open Space area, north of Watercourse 46a.3, facing east.

Site Photographs — Sub-Basin 46a.3 Watercourse Stabilization Design — Mercer Island

Critical Areas Delineations and Geologic Hazard Site Visit— Photos taken February 9, 2024 and April 23-24, 2024



Left: Sandy silt soil exposed on scarp-like feature.



Right: Silty soil near Watercourse 46a.3 channel in hummocky ground.



Trees growing on scarp-like feature.



Stiff silty soil in Watercourse 46a.3 stream channel.



Vertical tree perched above scarp-like feature.



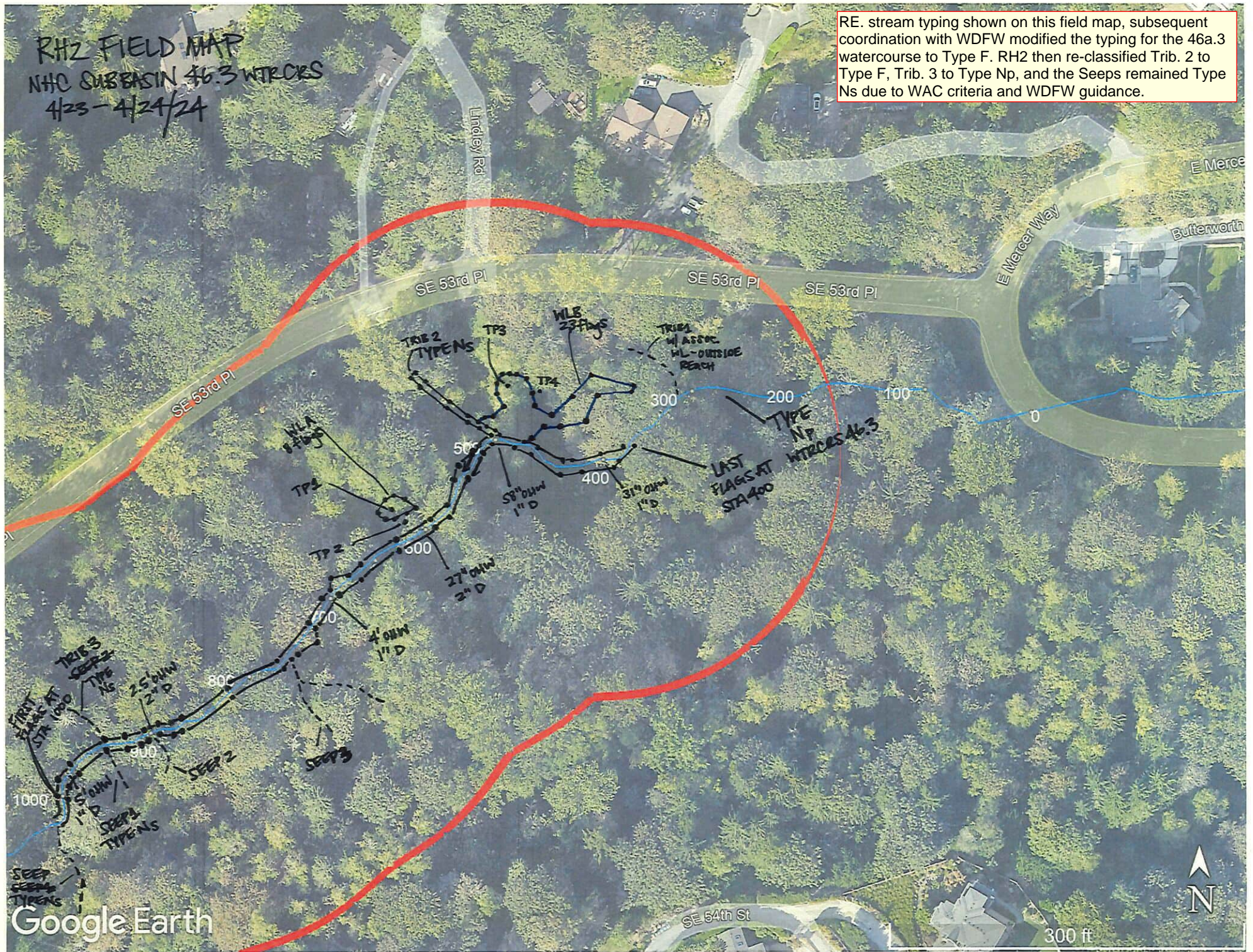
Vertical trees and dry soil in south central 53rd Place Open Space area.

Appendix E

Site Investigation Data and Maps

RH2 FIELD MAP
NHC SUBBASIN 46.3 WTRCRS
4/23 - 4/24/24

RE. stream typing shown on this field map, subsequent coordination with WDFW modified the typing for the 46a.3 watercourse to Type F. RH2 then re-classified Trib. 2 to Type F, Trib. 3 to Type Np, and the Seeps remained Type Ns due to WAC criteria and WDFW guidance.



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

Project/Site: Subbasin 4b3a Watercourse Stabilization City/County: City of Mercer Island Sampling Date: 4/23/2024
 Applicant/Owner: City of Mercer Island State: WA Sampling Point: TP-1
 Investigator(s): A. Pettibone, S. Netherland, N. Blosom Section, Township, Range: 17, 24 North, 05 East
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 20
 Subregion (LRR): LRR A - WMVC Lat: 47.5556446 Long: -122.2169474 Datum: WGS 84
 Soil Map Unit Name: Alderwood gravelly sandy loam 8-15% slopes NWI classification: WA
 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 <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: <div style="border: 1px solid black; height: 20px; width: 100%; margin-top: 5px;"></div>	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Alnus rubra</u>	<u>40</u>	<u>Y</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
<u>40</u> = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Rubus spectabilis</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>10</u> = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Equisetum arvense</u>	<u>25</u>	<u>Y</u>	<u>FAC</u>	
2. <u>Ranunculus repens</u>	<u>40</u>	<u>Y</u>	<u>FAC</u>	
3. <u>Rubus ursinus</u>	<u>15</u>	<u>N</u>	<u>FACU</u>	
4. <u>Cardamine pennsylvanica</u>	<u>2</u>	<u>N</u>	<u>FACW</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>82</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
<u>0</u> = Total Cover				
% Bare Ground in Herb Stratum <u>18</u>				
Remarks: <u>"Abnormally dry" conditions documented per US Drought Monitor & APT confirmed conditions w/ "drier than normal" rating</u>				
				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

SOIL

Sampling Point: TP-1

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR 4/2	100					Silt lo	
3-13	10YR 4/2	60	2.5Y 4/1	20	D	M	Silt lo	Coarse to very coarse Fine to medium
			10YR 5/6	20	C	M, PL		
13-16	10YR 4/2	75	7.5YR 4/4	5	C	m	Silt lo	Very coarse Coarse to very coarse Redox features were common, fine, and faint to distinct in appearance
			2.5Y 4/1	20	D	m		

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

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

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)	

Indicators for Problematic Hydric Soils³:

³Indicators 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)		Secondary Indicators (2 or more required)
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		

Field Observations:

Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>0.5</u>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>14</u>	
Saturation Present? (includes capillary fringe) Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>12</u>	

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

Remarks:
Surface water at site approximately 1/2" deep and ~ 8 ft from test pit,

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

Project/Site: Subbasin 46.3a Watercourse Stabilization City/County: City of Mercer Island Sampling Date: 4/23/2024
 Applicant/Owner: City of Mercer Island State: WA Sampling Point: TP-2
 Investigator(s): A. Pettibone, S. Neffland, N. Blaxton Section, Township, Range: 19, 24 North, 05 East
 Landform (hillslope, terrace, etc.): Hill Slope Local relief (concave, convex, none): Convex Slope (%): 30
 Subregion (LRR): LRR A – WMVC Lat: 47.5556255 Long: -122.2169046 Datum: NAD 83
 Soil Map Unit Name: Alderwood gravelly sandy loam 8-15% slopes NWI classification: _____
 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 <input checked="" type="checkbox"/>	No _____	Is the Sampled Area within a Wetland?	Yes _____	No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes _____	No <input checked="" type="checkbox"/>			
Wetland Hydrology Present?	Yes _____	No <input checked="" type="checkbox"/>			
Remarks:					

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:	
1. <u>Adiantum rubrum</u>	<u>15</u>	<u>Y</u>	<u>FAC</u>	Number of Dominant Species That Are OBL, FACW, or FAC:	<u>5</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata:	<u>5</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC:	<u>100</u> (A/B)
4. _____	_____	_____	_____		
				<u>15</u> = Total Cover	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet:	
1. <u>Rubus spectabilis</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>	Total % Cover of:	Multiply by:
2. <u>Thuja plicata</u>	<u>5</u>	<u>Y</u>	<u>FAC</u>	OBL species _____	x 1 = _____
3. _____	_____	_____	_____	FACW species _____	x 2 = _____
4. _____	_____	_____	_____	FAC species _____	x 3 = _____
5. _____	_____	_____	_____	FACU species _____	x 4 = _____
				<u>15</u> = Total Cover	
6. _____	_____	_____	_____	UPL species _____	x 5 = _____
7. _____	_____	_____	_____	Column Totals:	(A) _____ (B) _____
8. _____	_____	_____	_____	Prevalence Index = B/A = _____	
9. _____	_____	_____	_____	Hydrophytic Vegetation Indicators:	
10. _____	_____	_____	_____	<input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation	
11. _____	_____	_____	_____	<input checked="" type="checkbox"/> 2 - Dominance Test is >50%	
				<input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹	
				<input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)	
				<input type="checkbox"/> 5 - Wetland Non-Vascular Plants ¹	
				<input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)	
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.					
Woody Vine Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Present?	
1. _____	_____	_____	_____	Yes <input checked="" type="checkbox"/>	No _____
2. _____	_____	_____	_____		
				<u>0</u> = Total Cover	
% Bare Ground in Herb Stratum <u>15</u>					
Remarks:					
<u>"Abnormally dry" conditions documented per US Drought Monitor & APT confirmed conditions w/ "drier than normal" rating</u>					

SOIL

Sampling Point: TP-2

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10YR 3/2						loam	
4-14	10YR 4/3						salo	
14-16	10YR 4/3	96	10YR 4/2	2	D	M	Cl Lo	Very coarse
			7.5 YR 4/4	2	C	M		Coarse
								Redox features were
								fine, fine, and faint to
								distinct in appearance

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

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

Indicators for Problematic Hydric Soils³:

- | | | |
|--|---|---|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Sandy Redox (S5) | <input type="checkbox"/> 2 cm Muck (A10) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Stripped Matrix (S6) | <input type="checkbox"/> Red Parent Material (TF2) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) | <input type="checkbox"/> Very Shallow Dark Surface (TF12) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Matrix (F3) | |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Redox Dark Surface (F6) | ³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) | <input type="checkbox"/> Depleted Dark Surface (F7) | |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | <input type="checkbox"/> Redox Depressions (F8) | |

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)

Secondary Indicators (2 or more required)

- | | | |
|--|---|--|
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) | <input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Salt Crust (B11) | <input type="checkbox"/> Drainage Patterns (B10) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Aquatic Invertebrates (B13) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) | <input type="checkbox"/> Geomorphic Position (D2) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) | <input type="checkbox"/> Shallow Aquitard (D3) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) | <input type="checkbox"/> FAC-Neutral Test (D5) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) | <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A) |
| <input type="checkbox"/> Surface Soil Cracks (B6) | <input type="checkbox"/> Other (Explain in Remarks) | <input type="checkbox"/> Frost-Heave Hummocks (D7) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | | |

Field Observations:

Surface Water Present? Yes _____ No Depth (inches): _____
 Water Table Present? Yes _____ No Depth (inches): _____
 Saturation Present? Yes No _____ Depth (inches): 16"
 (includes capillary fringe)

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: Sub-basin 46.3a Watercourse 046. City/County: M-I/King Sampling Date: 4/23/24
 Applicant/Owner: City of Mercer Island State: WA Sampling Point: TP-3
 Investigator(s): a. pettibone, v. blorton, s. netherland, RHZ Section, Township, Range: 19, 24 North, 05 East
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): slope Slope (%): 15%
 Subregion (LRR): LRR A - WMVC Lat: 47.559204 Long: -122.2164904 Datum: _____
 Soil Map Unit Name: Alderwood gravelly sandy loam 8-15% slopes NWI classification: NA
 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 <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: _____ _____	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>alnus mbra</u>	<u>40%</u>	<u>Y</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
2. <u>acer circinatum</u>	<u>10%</u>	<u>Y</u>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
<u>50%</u> = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
<u>37%</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. <u>rubus spectabilis</u>	<u>30%</u>	<u>Y</u>	<u>FACW</u>	
2. <u>picea sitchensis</u>	<u>5%</u>	<u>N</u>	<u>FAC</u>	
3. <u>Thuja plicata</u>	<u>2%</u>	<u>N</u>	<u>FAC</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>37%</u> = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>athynium felix-femina</u>	<u>5%</u>	<u>Y</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0' ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ 5 - 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.
2. <u>equisetum arvense</u>	<u>5%</u>	<u>Y</u>	<u>FAC</u>	
3. <u>urtica dioica</u>	<u>3%</u>	<u>N</u>	<u>FAC</u>	
4. <u>tolmiea menziesii</u>	<u>7%</u>	<u>Y</u>	<u>FAC</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>20%</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>15'</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____ = Total Cover				
% Bare Ground in Herb Stratum <u>80%</u>				

Remarks:
"Abnormally dry" conditions documented per US Drought Monitor
"Drier than Normal" conditions per APF

SOIL

Sampling Point: TP-3

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-16"	10YR 2/1	100%	—	—	—	—	stly muck	mostly muck, but a little gums

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

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

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)
<input checked="" type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)	

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)	Secondary Indicators (2 or more required)
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	
<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	
<input type="checkbox"/> Salt Crust (B11)	
<input type="checkbox"/> Aquatic Invertebrates (B13)	
<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	
<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>1"</u>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>12"</u>	
Saturation Present? (includes capillary fringe) Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>10"</u>	

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: Sub-basin 46.32 Watercourse Stabilization City/County: Mercer Island / King Sampling Date: 4/23/24
 Applicant/Owner: _____ State: WA Sampling Point: TP-4
 Investigator(s): 2. pethibone, n bloxton, s. netherland Section, Township, Range: 19, 24 North, 05 East
 Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): slope Slope (%): 2090
 Subregion (LRR): LRR A - WMVC Lat: 47.5559366 Long: -122.2104389 Datum: _____
 Soil Map Unit Name: Alderwood gravelly sandy loam 8-15% slopes NWI classification: NA
 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 <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks: 	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status		
1. <u>tsuga heterophylla</u>	<u>15%</u>	<u>Y</u>	<u>FACU</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50%</u> (A/B)	
2. <u>acer circinatum</u>	<u>5%</u>	<u>N</u>	<u>FAC</u>		
3. <u>acer macrophyllum</u>	<u>30%</u>	<u>Y</u>	<u>FACU</u>		
4. _____	_____	_____	_____		
= Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status		
1. <u>rubus spectabilis</u>	<u>40%</u>	<u>Y</u>	<u>FAC</u>		Hydrophytic Vegetation Indicators: ___ 1 - Rapid Test for Hydrophytic Vegetation ___ 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ 5 - 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.
2. <u>acer circinatum</u>	<u>15%</u>	<u>Y</u>	<u>FAC</u>		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
= Total Cover				Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>	
Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status		
1. <u>urtica dioica</u>	<u>10%</u>	<u>Y</u>	<u>FAC</u>		Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>
2. <u>polystichum munitum</u>	<u>40%</u>	<u>Y</u>	<u>FACU</u>		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
9. _____	_____	_____	_____		
10. _____	_____	_____	_____		
11. _____	_____	_____	_____		
= Total Cover				Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>	
Woody Vine Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status		
1. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>	
2. _____	_____	_____	_____		
= Total Cover				Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>	
% Bare Ground in Herb Stratum <u>50%</u>					
Remarks: "Abnormally dry" conditions per US Drought Monitor "Drier than Normal" conditions per APT					

SOIL

Sampling Point: TP-4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-8"	10YR 3/2	100%	—	—	—	—	loam	fine fibrous roots
8-10"	2.5Y 4/3	99%	10YR 3/6	1%	C	M	SiClLo	fine, few, prominent redox
10-16"	10YR 4/3	100%	—	—	—	—	SLo	cobbles
								redox features more
								few, fine and faint
								in appearance.

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8)	Indicators for Problematic Hydric Soils³: <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)
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³Indicators 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) <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) <input type="checkbox"/> Salt Crust (B11) <input type="checkbox"/> Aquatic Invertebrates (B13) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) <input type="checkbox"/> Other (Explain in Remarks)	Secondary Indicators (2 or more required) <input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A) <input type="checkbox"/> Frost-Heave Hummocks (D7)
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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 <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland name or number A

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Subbasin 46.3a Wetlands - Wetland A Date of site visit: 4/23/24

Rated by S. Netherland, D. Pettibone, n. bloxton Trained by Ecology? Yes No Date of training 4/13/24
3/2023

HGM Class used for rating sope 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 ESRI Maps

OVERALL WETLAND CATEGORY III (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			
	<i>Circle the appropriate ratings</i>									
Site Potential	H	M	<u>L</u>	H	M	<u>L</u>	H	M	<u>L</u>	
Landscape Potential	H	<u>M</u>	L	H	<u>M</u>	<u>L</u>	<u>H</u>	M	L	
Value	<u>H</u>	M	L	H	M	<u>L</u>	<u>H</u>	M	L	TOTAL
Score Based on Ratings	6			3			7			16

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	N/A			

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 <i>(can be added to map of hydroperiods)</i>	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland <i>(can be added to another figure)</i>	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 <i>(can be added to another figure)</i>	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream <i>(can be added to another figure)</i>	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 <i>(can be added to another figure)</i>	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	2
Plant cover of dense trees, shrubs, and herbaceous plants	S 1.3	3
Plant cover of dense, rigid trees, shrubs, and herbaceous plants <i>(can be added to figure above)</i>	S 4.1	3
Boundary of 150 ft buffer <i>(can be added to another figure)</i>	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	4
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	5
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	6

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	0
Slope is > 1%-2%	points = 2	
Slope is > 2%-5%	points = 1	
Slope is greater than 5% ✓	points = 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	1
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	
Total for S 1	Add the points in the boxes above	1

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 _____	Yes = 1 No = 0 ✓	0
Total for S 2	Add the points in the boxes above	1

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	0
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	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 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 All other conditions	points = 1 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
---	----------------

0

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	0
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	0

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.

<input type="checkbox"/> Aquatic bed	4 structures or more: points = 4	1
<input type="checkbox"/> Emergent	3 structures: points = 2	
<input type="checkbox"/> Scrub-shrub (areas where shrubs have > 30% cover)	2 structures: <u>points = 1</u>	
<input checked="" type="checkbox"/> Forested (areas where trees have > 30% cover)	1 structure: points = 0	
<i>If the unit has a Forested class, check if:</i>		
<input checked="" type="checkbox"/> 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).

<input type="checkbox"/> Permanently flooded or inundated	4 or more types present: points = 3	1
<input checked="" type="checkbox"/> Seasonally flooded or inundated	3 types present: points = 2	
<input type="checkbox"/> Occasionally flooded or inundated	<input checked="" type="checkbox"/> 2 types present: <u>points = 1</u>	
<input checked="" type="checkbox"/> Saturated only	1 type present: points = 0	
<input type="checkbox"/> Permanently flowing stream or river in, or adjacent to, the wetland		
<input type="checkbox"/> Intermittently or seasonally flowing stream in, or adjacent to, the wetland		
<input type="checkbox"/> Lake Fringe wetland	2 points	
<input type="checkbox"/> Freshwater tidal wetland	2 points	

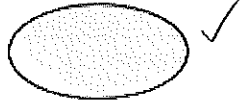
H 1.3. Richness of plant species

Count the number of plant species in the wetland that cover at least 10 ft². 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**

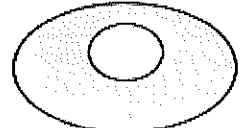
If you counted: > 19 species *alder, piggyback, equisetum, fagaria, almonberry,* points = 2
 5 - 19 species *artics, lady fern* points = 1
 < 5 species points = 0

H 1.4. Interspersion of habitats

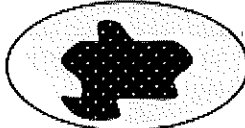
Decide from the diagrams below whether interspersions among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. If you have four or more plant classes or three classes and open water, the rating is always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



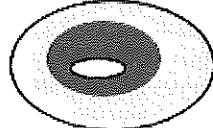
None = 0 points



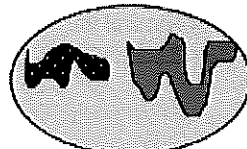
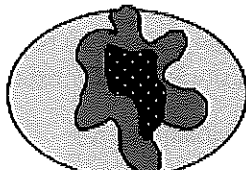
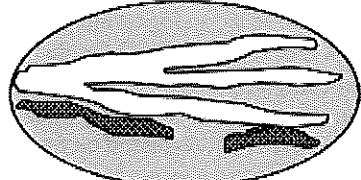
Low = 1 point



Moderate = 2 points



All three diagrams in this row are High = 3 points

Wetland name or number A

<p>H 1.5. Special habitat features:</p> <p>Check the habitat features that are present in the wetland. The number of checks is the number of points.</p> <p><input checked="" type="checkbox"/> Large, downed, woody debris within the wetland (> 4 in. diameter and 6 ft long).</p> <p><input type="checkbox"/> Standing snags (dbh > 4 in.) within the wetland</p> <p><input type="checkbox"/> 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)</p> <p><input type="checkbox"/> 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)</p> <p><input type="checkbox"/> 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)</p> <p><input checked="" type="checkbox"/> 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)</p>	2
<p>Total for H 1</p>	5

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

<p>H 2.0. Does the landscape have the potential to support the habitat functions of the site?</p>	
<p>H 2.1. Accessible habitat (include only habitat polygons accessible from the wetland.)</p> <p>Calculate: % relatively undisturbed habitat <u>5</u> + [(% moderate and low intensity land uses)/2] <u>45</u> = <u>50</u> %</p> <p>Total accessible habitat is:</p> <p><input checked="" type="checkbox"/> > 1/3 (33.3%) of 1 km Polygon points = 3</p> <p><input type="checkbox"/> 20-33% of 1 km Polygon points = 2</p> <p><input type="checkbox"/> 10-19% of 1 km Polygon points = 1</p> <p><input type="checkbox"/> < 10% of 1 km Polygon points = 0</p>	3
<p>H 2.2. Total habitat in 1 km Polygon around the wetland.</p> <p>Calculate: % relatively undisturbed habitat <u>5</u> + [(% moderate and low intensity land uses)/2] <u>45</u> = <u>50</u> %</p> <p>Total habitat > 50% of Polygon points = 3</p> <p>Total habitat 10-50% and in 1-3 patches <input checked="" type="checkbox"/> points = 2</p> <p>Total habitat 10-50% and > 3 patches points = 1</p> <p>Total habitat < 10% of 1 km Polygon points = 0</p>	2
<p>H 2.3. Land use intensity in 1 km Polygon:</p> <p>> 50% of 1 km Polygon is high intensity land use points = (-2)</p> <p>≤ 50% of 1 km Polygon is high intensity <input checked="" type="checkbox"/> points = 0</p>	0
<p>Total for H 2</p>	5

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

<p>H 3.0. Is the habitat provided by the site valuable to society?</p>	
<p>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.</p> <p>Site meets ANY of the following criteria: points = 2</p> <p><input checked="" type="checkbox"/> It has 3 or more Priority Habitats within 100 m (see next page)</p> <p><input type="checkbox"/> It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists)</p> <p><input type="checkbox"/> It is mapped as a location for an individual WDFW Priority Species</p> <p><input type="checkbox"/> It is a Wetland of High Conservation Value as determined by the Department of Natural Resources data</p> <p><input type="checkbox"/> 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</p> <p>Site has 1 or 2 Priority Habitats (listed on next page) within 100 m points = 1</p> <p>Site does not meet any of the criteria above points = 0</p>	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 Rating System for Western WA: 2014 Update
Rating Form – Version 2, July 2023

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 Oak¹³⁴ 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 Rating System for Western WA: 2014 Update
Rating Form – Version 2, July 2023

Wetland name or number A

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type	Category
<i>Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.</i>	
<p>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</p> <p style="text-align: right;">Yes – Go to SC 1.1 No = Not an estuarine wetland</p>	
<p>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?</p> <p style="text-align: right;">Yes = Category I No – Go to SC 1.2</p>	Cat. I
<p>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 <i>Spartina</i>, 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.</p> <p style="text-align: right;">Yes = Category I No = Category II</p>	Cat. I Cat. II
<p>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</p> <p style="text-align: right;">Yes = Category I No – Go to SC 2.2</p> <p>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 – <u>Submit data to WA Natural Heritage Program for determination</u>,¹³⁶ Go to SC 2.3 No = Not a WHCV</p> <p>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?</p> <p style="text-align: right;">Yes = Category I No = Not a WHCV</p>	Cat. I
<p>SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? <i>Use the key below. If you answer YES, you will still need to rate the wetland based on its functions.</i></p> <p>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</p> <p>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</p> <p>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.</p> <p>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</p>	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

<p>SC 4.0. Forested Wetlands</p> <p>Does the wetland have at least <u>1 contiguous acre</u> of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as Priority Habitats? <i>If you answer YES, you will still need to rate the wetland based on its functions.</i></p> <ul style="list-style-type: none"> — 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). <p style="text-align: right;">Yes = Category I No = Not a forested wetland for this section</p>	<p>Cat. I</p>
<p>SC 5.0. Wetlands in Coastal Lagoons</p> <p>Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?</p> <ul style="list-style-type: none"> — 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 (<i>needs to be measured near the bottom</i>) — The lagoon retains some of its surface water at low tide during spring tides <p>Yes – Go to SC 5.1 No = Not a wetland in a coastal lagoon</p> <p>SC 5.1. Does the wetland meet all of the following three conditions?</p> <ul style="list-style-type: none"> — 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 ft²) <p>Yes = Category I No = Category II</p>	<p>Cat. I</p> <p>Cat. II</p>
<p>SC 6.0. Interdunal Wetlands</p> <p>Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? <i>If you answer YES, you will still need to rate the wetland based on its habitat functions.</i></p> <p>In practical terms that means the following geographic areas:</p> <ul style="list-style-type: none"> — 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. <p style="text-align: right;">Yes – Go to SC 6.1 No = Not an interdunal wetland for rating</p> <p>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)?</p> <p style="text-align: right;">Yes = Category I No – Go to SC 6.2</p> <p>SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger?</p> <p style="text-align: right;">Yes = Category II No – Go to SC 6.3</p> <p>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?</p> <p style="text-align: right;">Yes = Category III No = Category IV</p>	<p>Cat I</p> <p>Cat. II</p> <p>Cat. III</p> <p>Cat. IV</p>
<p>Category of wetland based on Special Characteristics</p> <p>If you answered No for all types, enter "Not Applicable" on Summary Form</p>	<p>N/A</p>

Wetland name or number B

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Subbasin 46.3a Wetces - Wetland B Date of site visit: 4/23/24

Rated by S. Netherland, D. Pettibone, N. Block Trained by Ecology? Yes No Date of training 4/19/24

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 ESRI Maps

OVERALL WETLAND CATEGORY III (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			
<i>Circle the appropriate ratings</i>										
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	
Score Based on Ratings	6			4			8			18

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	N/A

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 <i>(can be added to map of hydroperiods)</i>	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland <i>(can be added to another figure)</i>	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 <i>(can be added to another figure)</i>	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream <i>(can be added to another figure)</i>	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 <i>(can be added to another figure)</i>	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	2
Plant cover of dense trees, shrubs, and herbaceous plants	S 1.3	3
Plant cover of dense, rigid trees, shrubs, and herbaceous plants <i>(can be added to figure above)</i>	S 4.1	3
Boundary of 150 ft buffer <i>(can be added to another figure)</i>	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	4
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	5
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	6

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

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% <u>points = 0</u>	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 <u>No = 0</u>	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 <u>points = 2</u> 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	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 <u>No = 0</u>	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 _____ Yes = 1 <u>No = 0</u>	0
Total for S 2	1

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 <u>No = 0</u>	0
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 <u>No = 0</u>	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 <u>No = 0</u>	2
Total for S 3	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

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
 All other conditions

points = 1
 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)
 Surface flooding problems are in a sub-basin farther downgradient
 No flooding problems anywhere downstream

points = 2
 points = 1
 points = 0 0

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

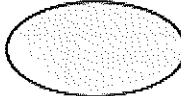
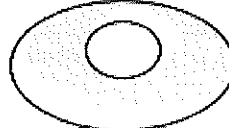
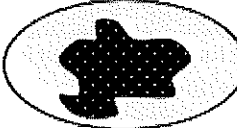
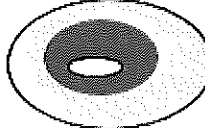
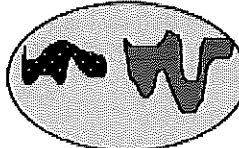
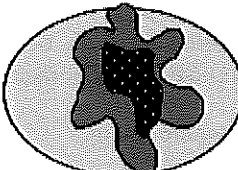
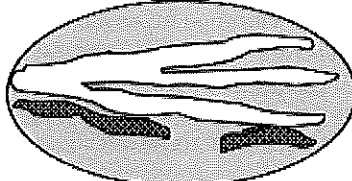
0

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 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?	
<p>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.</p> <p> <input type="checkbox"/> Aquatic bed <input type="checkbox"/> Emergent <input checked="" type="checkbox"/> Scrub-shrub (areas where shrubs have > 30% cover) <input checked="" type="checkbox"/> Forested (areas where trees have > 30% cover) <input checked="" type="checkbox"/> If the unit has a Forested class, check if: <input checked="" type="checkbox"/> The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/groundcover) that each cover 20% within the Forested polygon </p> <p style="text-align: right;"> 4 structures or more: points = 4 <input checked="" type="checkbox"/> 3 structures: points = 2 2 structures: points = 1 1 structure: points = 0 </p>	2
<p>H 1.2. Hydroperiods</p> <p>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).</p> <p> <input type="checkbox"/> Permanently flooded or inundated <input checked="" type="checkbox"/> Seasonally flooded or inundated <input type="checkbox"/> Occasionally flooded or inundated <input checked="" type="checkbox"/> Saturated only <input type="checkbox"/> Permanently flowing stream or river in, or adjacent to, the wetland <input checked="" type="checkbox"/> Intermittently or seasonally flowing stream in, or adjacent to, the wetland <input type="checkbox"/> Lake Fringe wetland <input type="checkbox"/> Freshwater tidal wetland </p> <p style="text-align: right;"> 4 or more types present: points = 3 <input checked="" type="checkbox"/> 3 types present: points = 2 <input type="checkbox"/> 2 types present: points = 1 <input type="checkbox"/> 1 type present: points = 0 </p> <p style="text-align: right;"> 2 points 2 points </p>	2
<p>H 1.3. Richness of plant species</p> <p>Count the number of plant species in the wetland that cover at least 10 ft². 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</p> <p>If you counted: > 19 species <input checked="" type="checkbox"/> 5 - 19 species <input type="checkbox"/> < 5 species</p> <p style="text-align: center;"> <i>aldoe, skunk cabbage, salmonberry, vine maple, equisetum, piggyback plant</i> </p> <p style="text-align: right;"> points = 2 <input checked="" type="checkbox"/> points = 1 points = 0 </p>	1
<p>H 1.4. Interspersion of habitats</p> <p>Decide from the diagrams below whether interspersions 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.</p> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  <p>None = 0 points</p> </div> <div style="text-align: center;">  <p>Low = 1 point</p> </div> <div style="text-align: center;">  <p>Moderate = 2 points</p> </div> <div style="text-align: center;">  </div> </div> <div style="display: flex; justify-content: space-around; align-items: flex-end; margin-top: 20px;"> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> </div> <p>All three diagrams in this row are High = 3 points</p>	2

Wetland name or number B

<p>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. <input checked="" type="checkbox"/> Large, downed, woody debris within the wetland (> 4 in. diameter and 6 ft long). <input checked="" type="checkbox"/> Standing snags (dbh > 4 in.) within the wetland <input type="checkbox"/> 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) <input type="checkbox"/> 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) <input type="checkbox"/> 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) <input checked="" type="checkbox"/> 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)</p>		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

<p>H 2.0. Does the landscape have the potential to support the habitat functions of the site?</p>		
<p>H 2.1. Accessible habitat (include only habitat polygons accessible from the wetland. <i>Calculate:</i> % relatively undisturbed habitat ___ + [(% moderate and low intensity land uses)/2] ___ = ___ % Total accessible habitat is: > 1/3 (33.3%) of 1 km Polygon 20-33% of 1 km Polygon 10-19% of 1 km Polygon < 10% of 1 km Polygon</p>		<p style="font-size: 1.2em;">3</p>
<p>H 2.2. Total habitat in 1 km Polygon around the wetland. <i>Calculate:</i> % relatively undisturbed habitat ___ + [(% moderate and low intensity land uses)/2] ___ = ___ % Total habitat > 50% of Polygon Total habitat 10-50% and in 1-3 patches Total habitat 10-50% and > 3 patches Total habitat < 10% of 1 km Polygon</p>		<p style="font-size: 1.2em;">2</p>
<p>H 2.3. Land use intensity in 1 km Polygon: > 50% of 1 km Polygon is high intensity land use ≤ 50% of 1 km Polygon is high intensity</p>		<p style="font-size: 1.2em;">0</p>
Total for H 2	Add the points in the boxes above	5

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

<p>H 3.0. Is the habitat provided by the site valuable to society?</p>		
<p>H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? <i>Choose only the highest score that applies to the wetland being rated.</i> Site meets ANY of the following criteria: <input checked="" type="checkbox"/> It has 3 or more Priority Habitats within 100 m (see next page) <input type="checkbox"/> It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) <input type="checkbox"/> It is mapped as a location for an individual WDFW Priority Species <input type="checkbox"/> It is a Wetland of High Conservation Value as determined by the Department of Natural Resources data <input type="checkbox"/> 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 Site does not meet any of the criteria above</p>		<p style="font-size: 1.2em;">2</p>

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 2.1 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 Oak¹³⁴ 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 Rating System for Western WA: 2014 Update
Rating Form – Version 2, July 2023

Wetland name or number B

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type	Category
<i>Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.</i>	
<p>SC 1.0. Estuarine wetlands</p> <p>Does the wetland meet the following criteria for Estuarine wetlands?</p> <ul style="list-style-type: none"> — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt <p style="text-align: right;">Yes – Go to SC 1.1 No = Not an estuarine wetland</p>	
<p>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?</p> <p style="text-align: right;">Yes = Category I No = Go to SC 1.2</p>	Cat. I
<p>SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions?</p> <ul style="list-style-type: none"> — 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 <i>Spartina</i>, 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. <p style="text-align: right;">Yes = Category I No = Category II</p>	Cat. I Cat. II
<p>SC 2.0. Wetlands of High Conservation Value (WHCV)</p> <p>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</p> <p style="text-align: right;">Yes = Category I No – Go to SC 2.2</p> <p>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.</p> <p style="text-align: right;">Yes – <u>Submit data to WA Natural Heritage Program for determination</u>,¹³⁶ Go to SC 2.3 No = Not a WHCV</p> <p>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?</p> <p style="text-align: right;">Yes = Category I No = Not a WHCV</p>	Cat. I
<p>SC 3.0. Bogs</p> <p>Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? <i>Use the key below. If you answer YES, you will still need to rate the wetland based on its functions.</i></p> <p>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?</p> <p style="text-align: right;">Yes – Go to SC 3.3 No – Go to SC 3.2</p> <p>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?</p> <p style="text-align: right;">Yes – Go to SC 3.3 No = Not a bog</p> <p>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?</p> <p style="text-align: right;">Yes = Category I bog No – Go to SC 3.4</p> <p>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.</p> <p>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?</p> <p style="text-align: right;">Yes = Category I bog No = Not a bog</p>	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

<p>SC 4.0. Forested Wetlands</p> <p>Does the wetland have at least <u>1 contiguous acre</u> of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as Priority Habitats? <i>If you answer YES, you will still need to rate the wetland based on its functions.</i></p> <ul style="list-style-type: none"> — 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). <p style="text-align: right;">Yes = Category I No = Not a forested wetland for this section</p>	Cat. I
<p>SC 5.0. Wetlands in Coastal Lagoons</p> <p>Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?</p> <ul style="list-style-type: none"> — 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 (<i>needs to be measured near the bottom</i>) — The lagoon retains some of its surface water at low tide during spring tides <p>Yes – Go to SC 5.1 No = Not a wetland in a coastal lagoon</p> <p>SC 5.1. Does the wetland meet all of the following three conditions?</p> <ul style="list-style-type: none"> — 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 unmowed grassland. — The wetland is larger than 1/10 ac (4350 ft²) <p>Yes = Category I No = Category II</p>	Cat. I Cat. II
<p>SC 6.0. Interdunal Wetlands</p> <p>Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? <i>If you answer YES, you will still need to rate the wetland based on its habitat functions.</i></p> <p>In practical terms that means the following geographic areas:</p> <ul style="list-style-type: none"> — 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. <p style="text-align: right;">Yes – Go to SC 6.1 No = Not an interdunal wetland for rating</p> <p>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</p> <p>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</p> <p>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</p>	Cat I Cat. II Cat. III Cat. IV
<p>Category of wetland based on Special Characteristics If you answered No for all types, enter "Not Applicable" on Summary Form</p>	N/A

Figure 1. Cowardin Classes and 150 ft Buffer



Legend

- RH2 Delineated Wetlands
- Wetland Test Pits
- 150 ft Buffer
- Seeps (Type Ns)
- Subbasin 46a.3 stream
- Mercer Stationing

Cowardin Classes

- Emergent
- Forested
- Scrub-Shrub



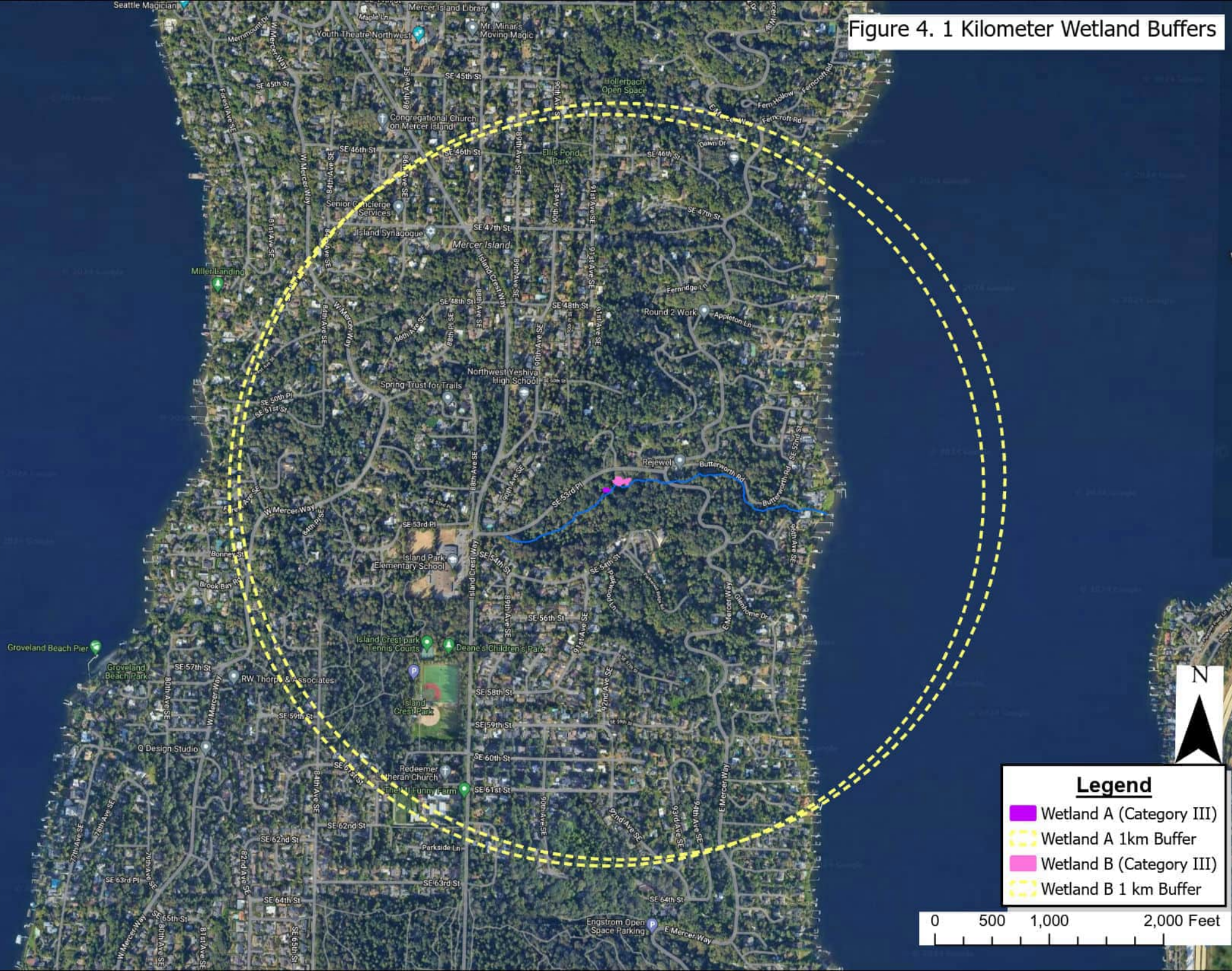
Figure 2. Wetland Hydroperiods



Figure 3. Plant Cover



Figure 4. 1 Kilometer Wetland Buffers

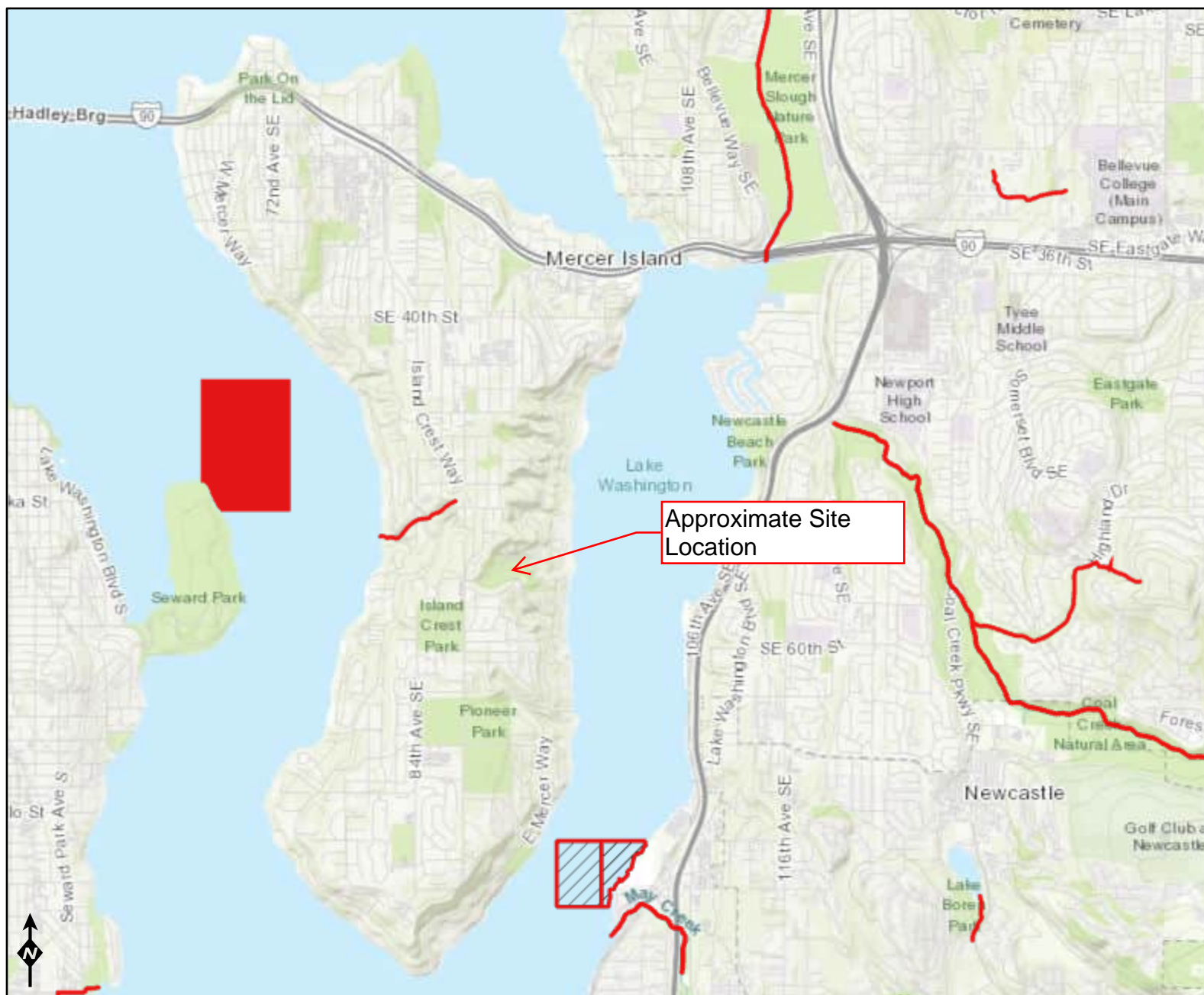


Legend

- Wetland A (Category III)
- Wetland A 1km Buffer
- Wetland B (Category III)
- Wetland B 1 km Buffer







0 500 1,000 2,000 Feet

Figure 5 - 303(d) Waters









Assessed Water/Sediment

Water

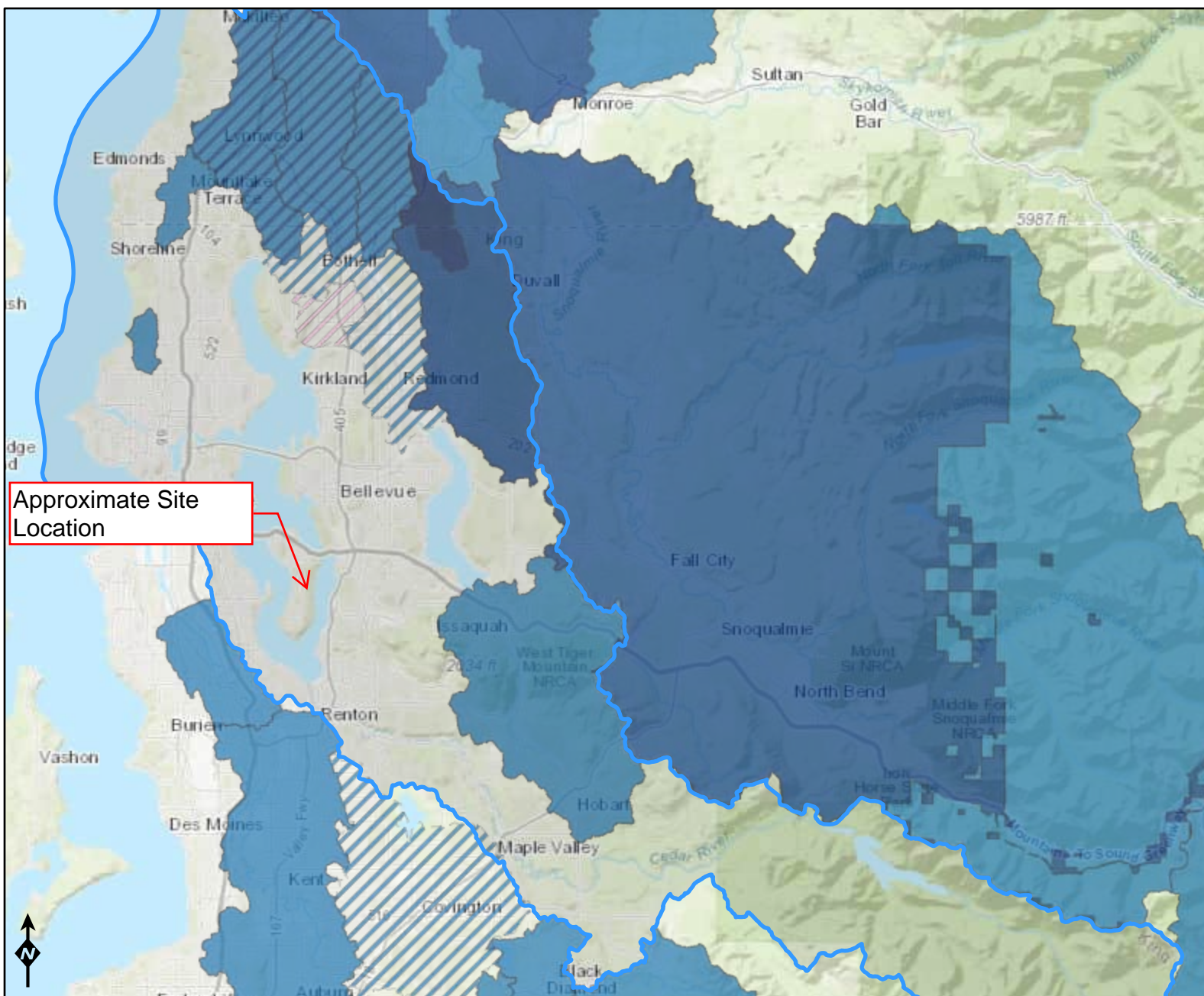
-  Category 5 - 303d
-  Category 4C
-  Category 4B
-  Category 4A
-  Category 2
-  Category 1

Sediment

-  Category 5 - 303d
-  Category 4C
-  Category 4B
-  Category 4A
-  Category 2
-  Category 1

Approximate Site Location

Figure 6 - TMDL's for WRIA 8 Map



WQ Improvement Projects

-  TMDL - Approved
-  4B - Approved
-  STI - Approved
-  ARP - Approved
-  TMDL - In Development
-  STI - In Development
-  ARP - In Development

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and

