CRITICAL AREAS REPORT AND FINAL CRITICAL AREA MITIGATION PLAN

ORCAS MOON COTTAGES
KIRKLAND, WASHINGTON

Prepared For:
ORCAS MOON, LLC

Prepared By:
TALASAEA CONSULTANTS, INC.

21 July 2016
(Revised 31 October 2018)

Critical Areas Report and Final Critical Area Mitigation Plan

Orcas Moon Cottages Kirkland, Washington

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21 July 2016
(Revised 31 October 2018)

EXECUTIVE SUMMARY

PROJECT NAME:	Orcas Moon Cottages
CLIENT:	Orcas Moon, LLC
SITE LOCATION:	Property is a 2-parcel assemblage (389010-0050 & 389010-0055) located northwest of the intersection of 20th Avenue and 5th Street, and south of Forbes Creek Drive (aka NE 106th Street) in Kirkland, Washington. The Public Land Survey System location of the property is the southwest ¼ of Section 32, T26N, R5E, Willamette Meridian.
PROJECT STAFF:	Bill Shiels, Principal; Ann Olsen, RLA, Senior Project Manager; David R. Teesdale, PWS, Senior Wetland Ecologist, Alicia Bramble Schulz, RLA, Landscape Designer
FIELD SURVEY:	Site was evaluated, and critical areas delineated on 8 and 19 April 2016, 21 December 2016, and 4 October 2017.

DETERMINATION: The Orcas Moon Cottages property is located within a City of Kirkland Primary Basin (Forbes Creek). Three wetlands (Wetlands A, B, and D) and five streams (Streams 1, 2, 3, 4, and 5) were identified on the Orcas Moon Property. One wetland (Wetland C) was identified offsite to the west of the property. Wetland A was identified as a City of Kirkland Type 2 wetland. Wetland B and D were identified as City of Kirkland Type 3 wetlands. The offsite wetland C was rated as a City of Kirkland Type 2 wetland. Type 2 wetlands within a Primary Basin have a 75-foot standard buffer. Type 3 wetlands within a Primary Basin have a 50-foot standard buffer. Four of the five streams were rated as City of Kirkland Class B waters. The fifth stream is rated as a City of Kirkland Class C water. Class B waters within a Primary Basin have a 60-foot standard buffer. Class C waters within a Primary Basin have a 35-foot standard buffer.

HYDROLOGY: Hydrology for Wetlands A, C, and D is provided by shallow groundwater seepage on a slope. Hydrology for Wetland B is supported entirely by stream flow from Stream 4, which is supported by Wetland C.

SOILS: Three soil types are mapped on the property. These are Kitsap silt loam (2 to 8 percent slope), Kitsap silt loam (15 to 30 percent slope), and Indianola loamy sand (5 to 15 percent). These soils are not listed as hydric by the National Technical Committee on Hydric Soils.

VEGETATION: Vegetation within Wetland A is a forested scrub-shrub emergent class wetland with a mixture of sparse herbaceous and scrub-shrub species, with a significant portion of bare soil present. Species include skunk cabbage (*Lysichiton americanus*), piggyback plant (*Tolmiea menziesii*), slough sedge (*Carex obnupta*), field and tall horsetail (*Equisetum arvense* and *E. telmateia*), lady fern (*Athyrium filix-femina*), salmonberry (*Rubus spectabilis*), and young red alder (*Alnus rubra*). Vegetation within Wetland B includes American brooklime (*Veronica americana*), lady fern, piggyback plant, and slough sedge. Vegetation within Wetland C is mostly scrub-shrub species, comprised predominantly of salmonberry, lady fern, skunk cabbage, slough sedge, and red alder.

PROPOSED DEVELOPMENT: The Client proposes to develop the Orcas Moon Project as a cottage unit development. Fourteen (14) units of cottages will be constructed in two separate groups on the property. Spreading the development out into two different groups allows the project to maximize the buildable area outside of steep slope zones. A stormwater combined detention/wet vault is proposed north of the site. The stormwater detention/wetvault will handle all stormwater runoff from proposed paved street, parking, and cottage rooftops.

The potentially undersized pipe currently conveying Stream 2 will be replaced with a larger 18-inch pipe. The inlet of this new pipe will be protected with a trash rack. Additionally, a concrete headwall will be constructed to protect the inlet of the pipe currently conveying Stream 3. This pipe will also be protected by a trash rack. The C, C, and R for this project will stipulate that the pipes be monitoring and maintained at least twice a year to ensure that sediments and debris do not block them.

The proposed development will not directly impact wetlands or streams on the subject property. However, it will be necessary to reduce some critical areas buffers up to one-third, as allowed by Kirkland Zoning Code (KZC)[1]. This is permitted under KZC §90.60(2)(b) and §90.100(1)(b) for buffer reduction with enhancement. Approximately 24,222 sf of buffer will be reduced and 25,080 sf of buffer will be enhanced through a combination of removal of non-native, invasive species, installation of large woody debris, and enhancement planting of native trees, shrubs and groundcover. Enhancement work within the ravines where slopes exceed 40 percent will involve removal of non-native invasive species and stabilizing the slope using jute fabric that is affixed to the soil using stakes or biodegradable staples. Native trees and shrubs shall be planted through the jute fabric. Large woody debris will not be placed in the steep slope areas.

There will be no loss of habitat function of existing wetlands or streams onsite resulting from the proposed development plan. The proposed buffer reduction with enhancement plan will provide improved buffer functions and habitat potential compared to existing conditions. Enhancement plantings and installation of large woody debris will ensure that the functions and services of the enhanced buffer will exceed those of the buffer area lost through reduction.

[1] The project is currently vested under City of Kirkland code as passed on 17 June 2014.

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Chapter 1. INTRODUCTION

1.1 Report Purpose

This report is the result of a critical areas study of the Orcas Moon Cottages property (referred to hereinafter as "Site"). The Site is located within the Forbes Creek basin of Kirkland (**Figure 1**). The purpose of this report is to identify, categorize, and describe existing site conditions, such as wetlands, streams, or other critical habitats, and their respective buffers. The report has been prepared to comply with the requirements of Kirkland Zoning Code Chapter 90 – Drainage Basins[1].

This report will provide and describe the following information:

- General property description and land use;
- Methodology for critical areas investigation;
- Results of critical areas background review and field investigation;
- Regulatory review;
- Proposed Project;
- Construction Sequencing;
- Monitoring Plan;
- Maintenance and Contingencies; and
- Financial Guarantees.

1.2 Statement of Accuracy

Critical areas characterizations and ratings were conducted by trained professionals at Talasaea Consultants, Inc., and adhered to the protocols, guidelines, and generally accepted industry standards available at the time the work was performed. The conclusions in this report are based on the results of analyses performed by Talasaea Consultants and represent our best professional judgment. To that extent and within the limitation of project scope and budget, we believe the information provided herein is accurate and true to the best of our knowledge. Talasaea does not warrant any assumptions or conclusions not expressly made in this report, or based on information or analyses other than what is included herein.

Chapter 2. GENERAL PROPERTY DESCRIPTION AND LAND USE

2.1 Project Location

The Site is located northwest of the intersection of 20th Avenue and 5th Street in the City of Kirkland, Washington (**Figure 2**). The Site extends northward from 20th Avenue to Forbes Creek Drive. The Site includes two tax parcels: Parcel A (3890100055), and Parcel B (3890100050). The Site encompasses approximately 7.1 acres. The Public Land Survey System location of the Site is southwest ¼ of Section 32, T26N, R5E, Willamette Meridian.

2.2 General Property Description

The Site is currently undeveloped and forested with second-growth mixed coniferous and deciduous trees. The topography of the Site is moderately sloped with five ravines

extending generally in a north-south orientation. The Site generally slopes downward from 20th Avenue to Forbes Creek Drive.

2.3 Land Use and Zoning

The Site is zoned RS-12.5 or Single Family Residential. The Site is currently undeveloped. However, a single-family residence and an associated outbuilding did exist on Parcel A prior to 1936 (date of earliest aerial photo available). It appears on this aerial image that some sort of small farming operation occurred on the Site's northeastern corner. Most of the Site's eastern half appears to have been cleared of forest vegetation. The residence was still visible on aerial images as of 1952, but no agricultural activities were occurring on the Site. The area that appeared cleared of trees in the 1936 aerial image is now growing back as forest. This residence was removed from Parcel A by 1977 (the date of the next small-scale aerial image), although its driveway is still present.

Currently, properties to the northeast and south of the Site are developed as single-family residential. Properties to the west and southeast of the Site are currently undeveloped. A majority of the undeveloped land in the vicinity of the Site is currently managed as City of Kirkland park property.

Chapter 3. METHODOLOGY

The critical areas analysis of the Site involved a two-part effort. The first part consisted of a preliminary assessment of the Site and the immediate surrounding area using existing published environmental information. This information includes:

1. Wetland and soils information from resource agencies;
2. Critical areas information from the City of Kirkland and King County;
3. Orthophotography and LIDAR imagery; and,
4. Relevant studies completed or ongoing in the vicinity of the Site.

The second part consisted of site investigations where direct observations and measurements of existing environmental conditions were made. Observations included plant communities, soils, hydrology, and stream conditions. This information was used to help characterize the site and define the limits of critical areas onsite and offsite for regulatory purposes (see **Section 3.2 – Field Investigation** below).

3.1 Background Information Reviewed

Background information from the following sources was reviewed prior to field investigations:

- US Fish and Wildlife Service (USFWS) Wetlands Online Mapper (National Wetlands Inventory) (U.S. Fish and Wildlife Service) (www.wetlandsfws.er.usgs.gov/wtlnds/launch.html);
- Natural Resources Conservation Service, Web Soil Survey (Natural Resources Conservation Service) (www.websoilsurvey.nrcs.usda.gov/app);

- Natural Resources Conservation Service National Hydric Soils List by State (Natural Resources Conservation Service) (www.soils.usda.gov/use/hydric/lists/state.html);
- City of Kirkland GIS database (City of Kirkland, 2015);
- King County GIS database (King County 2015);
- King County iMap online mapping program (King County);
- LIDAR data from King County GIS (2006);
- Orthophotography from Earth Explorer (2016);
- WDFW Priority Habitats and Species (PHS) Database on the Web (Washington State Department of Fish and Wildlife) (wdfw.wa.gov/mapping/phs); and
- Washington Department of Natural Resources Natural Heritage GIS database, 2015;
- Fish usage data from SalmonScape (http://apps.wdfw.wa.gov/salmonscape/map.html); and
- StreamNet (http://www.streamnet.org/data/interactive-maps-and-gis-data/).

3.2 Field Investigation

The Site was evaluated, and critical areas delineated on 8 and 19 April 2016, 21 December 2016, and 4 October 2017. The boundaries of wetlands and the ordinary high water mark (OHWM) of streams were flagged in the field for later professional surveying.

The wetland delineation utilized the routine approach described in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (U.S. Army Corps of Engineers, 2010). The ordinary high water mark (OWHM) for any streams found on the Site was determined and delineated using the methodology described by Washington State Department of Ecology's "*Determining the Ordinary High Water Mark on Streams in Washington State"* (Olson and Stockdale 2010). Wetlands and streams were classified according to City of Kirkland Zoning Code ("City of Kirkland Municipal Code Chapter 90 - Drainage Basins" 2014).

Plant species were identified according to the taxonomy of Hitchcock and Cronquist (Hitchcock, *et al*. 1969). Taxonomic names were updated, and plant wetland status was assigned according to *North American Digital Flora: National Wetland Plant List, Version 2.4.0* (Lichvar, *et al*. 2012). Wetland classes were determined using the U.S. Fish and Wildlife Service's system of wetland classification (Cowardin, *et al*. 1979). Vegetation was considered hydrophytic within a suspected wetland area if greater than 50% of the dominant plant species had a wetland indicator status of facultative or wetter (i.e., facultative, facultative wetland, or obligate wetland).

Wetland hydrology was determined based on the presence of hydrologic indicators listed in the Corps' Regional Supplement. These indicators are separated into Primary Indicators and Secondary Indicators. To confirm the presence of wetland hydrology, one Primary Indicator or two Secondary Indicators must be demonstrated. Indicators of wetland hydrology may include, but are not necessarily limited to; drainage patterns,

drift lines, sediment deposition, watermarks, stream gauge data and flood predictions, historical records, visual observation of saturated soils, and visual observation of inundation.

Soils on the Site were considered hydric if one or more of the hydric soil indicators listed in the Corps' Regional Supplement were present. Indicators include:

- presence of organic soils;
- reduced, depleted or gleyed soils, or
- redoximorphic features in association with reduced soils.

Wetlands were rated using the City of Kirkland's wetland rating system. The wetland field data forms (Plate 26) are contained in **Appendix A**.

Chapter 4. RESULTS

4.1 Analysis of Existing Information

The following sources provided information on site conditions based on data compiled from resource agencies and local government. For the purposes of this report, the term "vicinity" will mean an area within ¼ mile of the Project Site.

4.1.1 USFWS Wetlands Online Mapper (National Wetlands Inventory)

The USFWS Wetlands Online Mapper maps six wetland units within the vicinity of the Site (**Figure 3**). No wetlands are indicated on or extending onto the site. Three of the wetlands are palustrine forested (one is indicated as palustrine forested/scrub-shrub), two are palustrine unconsolidated bottom, and one is a palustrine scrub-shrub wetland.

4.1.2 Natural Resources Conservation Service Web Soil Survey

Three soil types are mapped on the property (**Figure 4**). These are Kitsap silt loam (KpB, 2 to 8 percent slope), Kitsap silt loam (KpD, 15 to 30 percent slope), and Indianola loamy fine sand (InC, 4 to 15 percent).

The Kitsap series is made up of moderately well-drained soils that formed in glacial lake deposits, under a cover of conifers and shrubs. These soils are on terraces and strongly dissected terrace fronts. The surface layer and subsoil are very dark brown and dark yellowish brown silt loam.

The Indianola series is made up of somewhat excessively drained soils that formed under conifers in sandy, recessional, stratified glacial drift. These undulating, rolling, and hummocky soils are on terraces. These soils are generally brown, dark yellowish-brown, and light olive-brown loamy fine sand.

The Kitsap and Indianola soil series are not listed as hydric by the National Technical Committee on Hydric Soils.

4.1.3 StreamNet and SalmonScape GIS Databases

StreamNet and SalmonScape maintain data concerning the usage or potential usage of streams in the Pacific Northwest. Neither SalmonScape nor StreamNet map any fish

species as utilizing any portion of the Site. StreamNet maps Coho (*Oncorhynchus kisutch*) as utilizing Forbes Creek for rearing and migration. No other salmonid species are mapped within the vicinity of the Site.

SalmonScape maps four species utilizing or having the potential to utilize Forbes Creek. These are Fall chinook (*O. tshawytscha*), coho, winter steelhead (*O. mykiss*), and sockeye (*O. nerka*). Coho are indicated as documented rearing. Sockeye are indicated as documented presence. Both Fall chinook and Winter steelhead are indicated as modeled presence[2].

4.1.4 King County Critical Areas GIS Database

King County GIS does not map any critical areas on the Site. However, it does map some features within the vicinity of the Site (**Figure 5**). These features include two water bodies, two streams, a floodway, and a floodplain. One of the streams, which is identified as Forbes Creek, is associated with the floodway and floodplain. The second stream is unnamed on the King County GIS database.

4.1.5 City of Kirkland Critical Areas GIS Database

The City of Kirkland does not map any wetlands on the Site (**Figure 6**). However, it does map two wetlands in the vicinity of the Site. One wetland is located near the southwest property corner on an adjacent parcel (Wetland C). The other wetland is associated with Forbes Creek to the north of the Site. It should be noted that the depiction of the offsite wetlands is based on GIS data that may not be the result of a professional survey. Therefore, the wetlands should be interpreted as generally located for the purposes of determining buffer widths and potential buffer impacts.

The City of Kirkland also maps five streams on the Site and Forbes Creek to the north of the property. At least four more streams are mapped on properties to the east and west of the Site.

Finally, the City of Kirkland maps a floodplain and floodway in the general vicinity of Forbes Creek.

4.2 Analysis of Existing Site Conditions

Three wetlands and five streams were identified during our evaluation of the Site (see **Figure 7** and **Sheet W1.0**). Two of the wetlands and all five streams are located on the Site. An additional wetland (Wetland C) was identified off-site to the west, but was not delineated since we did not have landowner permission to access the wetland (see caveat on GIS-located wetlands discussed in **Section 4.1.5**). It was, however, rated using the City of Kirkland's wetland rating system (Plate 26).

4.2.1 Wetlands

4.2.1.1 Wetland A

Wetland A is an approximately 5,551 sf wetland located near the southwestern corner of the Site (Parcel A). It appears to have been created by a slump in the recent past,

[2] "Modeled presence" indicates that physical parameters of a particular stream may support the presence of a salmonid species, but no actual documentation of their presence exists.

based on the age of the alders growing within Wetland A. The wetland is a slope wetland that provides hydrology for one of the five onsite streams (Stream 3).

Vegetation within Wetland A consists primarily of skunk cabbage (*Lysichiton americanus*), piggyback plant (*Tolmiea menziesii*), slough sedge (*Carex obnupta*), field and tall horsetail (*Equisetum arvense* and *E. telmateia*), lady fern (*Athyrium filix-femina*), salmonberry (*Rubus spectabilis*), and young red alder (*Alnus rubra*).

Wetland A was rated using the City of Kirkland's wetland rating system. The wetland scored 26 points, which satisfies the criteria for characterization as a Type 2 wetland. Type 2 wetlands located within a Primary Basin (Forbes Creek) have a 75-foot standard buffer. Wetland buffers may be modified through buffer reduction with enhancement, provided that the minimum buffer width at any one point is not less than 50 feet.

4.2.1.2 Wetland B

Wetland B is a very small (approximately 120 sf) wetland that formed within an old concrete cistern. The cistern is constructed within the ravine for one of the onsite streams (Stream 4) and may have provided water for the residence that existed on Parcel A. Over time, this cistern has silted in and wetland vegetation has become established. Vegetation in Wetland B consists of American brooklime (*Veronica americana*), lady fern, piggyback plant, and slough sedge.

Wetland B scored 17 points using the City of Kirkland wetland rating system. This satisfies the criteria for characterization as a Type 3 wetland. Type 3 wetlands located within a Primary Basin have a 60-foot standard buffer. Wetland buffers may be modified through buffer reduction with enhancement, provided that the minimum buffer width at any one point is not less than 40 feet.

4.2.1.3 Wetland C (Off Site)

Wetland C is a slope wetland that is located to the west of the southwest property corner. This wetland was not delineated since it resides off property and we did not have landowner permission to access it. However, we estimate its size to be approximately 6,200 sf. Vegetation consists predominantly of salmonberry, lady fern, skunk cabbage, slough sedge, and red alder. Wetland C is the headwaters of one of the onsite streams (Stream 4).

Wetland C scored 25 points using the City of Kirkland wetland rating system. This satisfies the criteria for characterization as a Type 2 wetland. Type 2 wetlands located within a Primary Basin have a 75-foot standard buffer.

4.2.1.4 Wetland D

Wetland D is a small (235 sf total, 120 sf onsite) slope wetland located within the southern portion of the right-of-way for Forbes Creek Drive. Vegetation within the wetland is managed through periodic mowing. However, a small patch of slough sedge was discernable.

Wetland D scored 13 points using the City of Kirkland Wetland rating system. This satisfies the criteria for characterization as a Type 3 wetland. Type 3 wetlands located

within a Primary Basin have a 60-foot standard buffer. Wetland buffers may be modified through buffer reduction with enhancement, provided that the minimum buffer width at any one point is not less than 40 feet.

4.2.2 Streams

All streams identified on the Site generally flow northward towards Forbes Creek Drive and discharge into a ditch on the road's southern side. The combined flow from the streams, along with road runoff, flow into a catch basin located approximately 180 feet west of the Site's northeastern corner. The combined flow is piped under Forbes Creek Drive to a narrow (<2-feet-wide) channel that flows in a northerly direction to Forbes Creek. This channel is likely a Type N water based on the Washington Department of Natural Resources water typing rules (WAC 222-16-030 and 222-16-031).

4.2.2.1 Stream 1

Stream 1 starts at the outfall of a stormwater pipe located on the north side of 20th Avenue (see **Figure 7** and **Sheet W1.0**). The stream flows onto the Site at the southeast property corner and flows in a northerly direction for approximately 50 feet. The stream then flows off property to the east. The stream channel is in a deeply incised ravine that extends north-northwestward from the stormwater outfall.

Stream 1 satisfies the criteria for categorization as a City of Kirkland Class B stream per KMC §90.90.1 (passed 17 June 2014). Class B streams within a Primary Basin have a 60-foot standard buffer. This buffer may be reduced to 40 feet through buffer reduction with enhancement.

4.2.2.2 Stream 2

Stream 2 starts at the outfall of two stormwater pipes located on the north side of 20th Avenue, approximately 170 feet west of the stormwater outfall for Stream 1. As with Stream 1, Stream 2 flows within a deeply incised ravine. The stream flows aboveground for approximately 390 feet where it flows into a buried pipe. The pipe extends to the northeast for approximately 160 feet. The outfall of this pipe is within the channel for Stream 5 (**Section 4.2.2.5**).

Stream 2 satisfies the criteria for categorization as a City of Kirkland Class B stream. Class B streams within a Primary Basin have a 60-foot standard buffer. This buffer may be reduced to 40 feet through buffer reduction with enhancement. There is no buffer requirement for the piped portion of Stream 2. However, stream buffers are measured in all directions from culvert ends.

Erosion was noted by peer consultants around and below the receiving piped segment of Stream 2. Nell Lund states in her July 21, 2017 letter, quoting Elizabeth Torrey of WDFW "…(the culvert) is drastically undersized and cannot handle the volume of the stream systems…". An undersized culvert along with existing seasonal variations in volume of water, sediment and vegetative debris is likely how the erosion formed.

4.2.2.3 Stream 3

Stream 3 starts near the southwest corner of the Site in an area of a previous soil slump (the same slump that likely created Wetland A). There are at least three pipe outfalls mapped to the south of the headwaters of Stream 3. As with Stream 1 and 2, the pipes carry stormwater from the development to the south of 20th Avenue. Stream 3 begins as two separate seeps and one overland runoff from one of the stormwater pipes. The three headwater branches coalesce towards the northern tip of Wetland A. At this point, the combined stream flows in a deeply incised ravine for approximately 260 feet. The stream then enters a buried pipe that extends to the northeast for approximately 230 feet. The pipe then discharges into a roadside ditch along Forbes Creek Drive.

Stream 3 satisfies the criteria for categorization as a City of Kirkland Class B stream. Class B streams within a Primary Basin have a 60-foot standard buffer. This buffer may be reduced to 40 feet through buffer reduction with enhancement. There is no buffer requirement for the piped portion of Stream 3. As stated in the discussion of Stream 2, stream buffers are measured in all directions from culvert ends.

4.2.2.4 Stream 4

The headwaters for Stream 4 are within Wetland C off property to the west. Stream 4 flows onto the Site approximately 110 feet north of the southwest property corner and is contained within a deeply incised ravine for approximately 130 feet (this aboveground portion of Stream 4 includes Wetland B). At this point, the stream enters a buried pipe. The pipe extends to the northeast for approximately 140 feet and discharges into a roadside ditch along Forbes Creek Drive. This ditch collects flows from Streams 2, 3 and 5 as well as Stream 4.

Stream 4 satisfies the criteria for categorization as a City of Kirkland Class B stream. Class B streams within a Primary Basin have a 60-foot standard buffer. This buffer may be reduced to 40 feet through buffer reduction with enhancement. There is no buffer requirement for the piped portion of Stream 4. As stated in the discussion of Stream 2, stream buffers are measured in all directions from culvert ends.

4.2.2.5 Stream 5

Stream 5 starts off property to the east. Prior to the development of subdivision along Forbes Creek Drive adjacent to the east of the Site, Stream 5 did not flow onto the subject property. Stream 5 is collected offsite in a pipe and shunted westward along the south side of the aforementioned subdivision. This pipe discharges into a deeply incised ravine that flows in a westerly direction onto the Site, then flows in a northwesterly direction towards Forbes Creek Drive, and is ultimately conveyed north under Forbes Creek Drive. As previously mentioned, the piped portion of Stream 2 discharges into the onsite portion of the Stream 5 ravine.

Stream 5 satisfies the criteria for categorization as a City of Kirkland Class C stream. Class C streams in a Primary Basin have a 35-foot standard buffer. This buffer may be reduced to 23.3 feet through buffer reduction with enhancement.

Chapter 5. REGULATORY REVIEW

5.1 City of Kirkland Critical Areas Regulations

Wetlands and streams on the Site are subject to City of Kirkland critical areas regulations under Chapter 90 – Drainage Basins[3]. The City of Kirkland currently uses its own wetland rating and water typing systems. The wetland rating system appears to be based on the Washington Department of Ecology's (WDOE) Washington State Wetland Rating System for Western Washington (1993), which is not comparable with the current WDOE Washington State Wetland Rating System for Western Washington (2014). Similarly, their method of water typing for streams is not comparable with the current or previous Washington Department of Natural Resources (WDNR) water typing system, which is promulgated in WAC 222-16-030 and 222-16-031.

Wetland buffers are determined based on the wetland's rating and whether it is located within a Primary Basin or a Secondary Basin. Primary Basins are defined as the basin that supports one of Kirkland's major stream systems. Similarly, stream buffers are based on the stream's class and whether it is located within a Primary Basin.

5.2 State and Federal Regulations

Wetlands and streams on the Site are subject to applicable State and Federal regulations. Wetland impacts are regulated at the Federal level by Sections 404 and 401 of the Clean Water Act. The U.S. Army Corps of Engineers (Corps) is responsible for administering compliance with Section 404 via the issuance of Nationwide or Individual Permits for any fill or dredging activities within wetlands under Corps jurisdiction. Any project that is subject to Section 404 permitting is also required to comply with Section 401 Water Quality Certification, which is administered by the Washington State Department of Ecology (WDOE). No dredging or filling of wetlands is proposed for the current site development plan. Therefore, the project will not need to apply for any Section 404 Nationwide or Individual Permits or Section 401 Water Quality Certification.

Any work within, over, or under the Ordinary High Water Mark of a stream requires a Hydraulic Project Approval (HPA) from the Washington Department of Fish and Wildlife (WDFW), pursuant to the State Hydraulic Code (Chapter 77.55 RCW).

Chapter 6. PROPOSED PROJECT

6.1 Project Description

Orcas Moon, LLC is proposing to develop the Orcas Moon property with 14 units of cottage housing (**Sheet W1.1**). Approximately 23 percent of the Site (approximately 71,220 sf of the approximately 309,162 sf Site) will be developed. The development area will be divided into two separate groups based on available land that is not constrained by steep slopes. For the purposes of this report, the groups will be called Group 1 and Group 2. Group 1 is located in the southwestern portion of the Site adjacent to 20th Avenue. Group 2 is located in the southeastern portion of the Site, also adjacent to 20th Avenue. Group 1 will include 9 cottage units, and Group 2 will provide

[3] The project is currently vested under City of Kirkland code as passed on 17 June 2014.

5 cottage units. Parking for Groups 1 and 2 will be provided through a mixture of covered and uncovered stalls. There will be one covered stall for every cottage unit. Access to the Group 1 and 2 cottage units will be provided by sidewalks from the parking areas.

Two utility easements will be established on the Site to service the two development groups described previously. These easements will provide stormwater and sewer pipe routing to the northern portion of the property. The stormwater pipes will connect with a proposed stormwater vault adjacent to Forbes Creek Drive (this vault will be located outside of existing wetland and stream buffers). A new access road to the stormwater vault will be constructed over the existing driveway off of Forbes Creek Drive (the driveway to the residence depicted on the 1936 and 1952 aerial images). Some buffer reduction with enhancement will be required for the construction of this access road. The sanitary sewer pipes will connect to an existing sewer main located in the roadway for Forbes Creek Drive.

As mentioned in **Section 4.2.2**, three of the five streams onsite flow into 12-inch pipes that carry flow across the northern half of the Site to the roadside ditch along Forbes Creek Drive. Drainage analyses of these pipes indicate the pipe for Stream 2 is insufficiently sized to carry anticipated flows, based on the Rational Method. This 12-inch pipe will be replaced with an 18-inch pipe and the inlet protected by a trash rack. Additionally, a concrete headwall will be constructed at the inlet of the pipe for Stream 3 to help prevent future overland flow and the resultant potential for soil erosion.

6.2 Project Impacts

The project has been designed to avoid all direct impacts to wetlands and streams on the Site. However, it will be necessary to reduce wetland and stream buffers in order to provide the required 10’ yard setbacks (BSBL) for the cottage units, construction of some of the parking areas, and required utilities (such as stormwater and sanitary sewer lines).(**Sheet W1.1**). Buffers will be reduced in these areas of impact and mitigated for using buffer enhancement. Some temporary construction impacts due to utility and stream culvert replacement and will be mitigated for using restoration. In all, there will be several areas on the Site where reduction of buffer will occur. The proposed individual buffer reduction areas are described below.

Approximately 24,222 sf of wetland and stream buffer will be reduced in order to provide sufficient development area for the Site. Wetland buffer reduction with enhancement is permitted under KZC §90.60(2)(a)(2). Stream buffer reduction with enhancement is permitted under KZC §90.100(1)(b). The language used by these two code references is the same, stating:

> “Buffers may be decreased through buffer enhancement. The applicant shall demonstrate that through enhancing the buffer (by removing invasive plants, planting native vegetation, installing habitat features such as downed logs or snags, or other means) the reduced buffer will function at a higher level than the standard existing buffer. A buffer enhancement plan shall at a minimum provide the following: (1) a map locating the specific area of enhancement; (2) a planting

plan that uses native species, including groundcover, shrubs, and trees; and (3) a monitoring and maintenance program prepared by a qualified professional consistent with the standards specified in KZC §90.55(4). Buffers may not be reduced at any point by more than one-third (1/3) of the standards in KZC §90.45(1) for wetlands and KZC §90.90(1) for streams)."

Code provisions for KZC §90.60(2)(a)(2) and §90.100(1)(b) are discussed below (**Section 6.3**).

In addition to the buffer reduction impacts, approximately 2,829 sf of stream buffer will be temporarily impacted. Approximately 1,703 sf of stream buffer will be impacted by the removal and replacement of the undersized pipe for Stream 2. Approximately 315 sf of stream buffer will be impacted for the construction of the proposed headwall on Stream 3[4]. Finally, approximately 811 sf of buffer will be temporarily impacted by utility construction.

6.3 Proposed Buffer Reduction with Enhancement Plan

The proposed mitigation for the buffer reduction will be through buffer enhancement (**Sheet W1.1**). Steep slopes and loamy sand soils occur adjacent to the proposed development area. Based on the recommendation by the project's geotechnical engineer, we do not propose a complete removal of Himalayan blackberry within the buffer. Himalayan blackberry is a non-native, invasive species, but is currently providing valuable soil stabilization functions within the buffer[5].

We propose to enhance, at minimum, the outer 15 feet of the remaining buffer adjacent to the development through a combination of removal of non-native, invasive species, placement of large woody debris, and planting native species of trees and shrubs (**Sheet W3.0**). Enhancement plantings may extend further towards Stream 2 in select areas where the slope of the buffer is less than 40 percent.

We are proposing two different enhancement and planting strategies depending on the slope of the buffer. Where the slope of the buffer is less than 40 percent (Enhancement Strategy 1), enhancement planting will entail removal of non-native blackberry and dense replanting by native trees and shrubs. Where the slope of the buffer is greater than 40-percent (Enhancement Strategy 2), non-native blackberry will be cut back to ground level and the bared soil covered with jute fabric. Enhancement plantings will require installation through the jute fabric. Maintenance and selective removal of new blackberry growth (cutting or selective use of herbicides) in the enhanced steep slope buffer will be required until the blackberry rootstocks are depleted and killed. Large woody debris will not be placed within the enhanced steep slope buffer areas.

The development area of the Site contains sufficient numbers of suitable trees that can be used to create the LWD placements. Tree species to be utilized will include Douglas

[4] The proposed concrete headwall is likely a permanent buffer impact. However, the total area of impact is very small and will not substantially affect the total area of buffer impact. The total area of buffer enhancement being proposed more that accounts for the impact size of the headwall.
[5] Technical Memorandum by Associated Earth Sciences, Inc., dated 25 June 2018 (**Appendix C**).

fir, western redcedar, and western hemlock trees that have a diameter of no less than 20 inches. These trees will be collected whole and selectively cut to create separate pieces of rootwads and down logs. See **Sheet W2.0** for list of trees to be retained as habitat features.

6.3.1 Agency Policies and Guidance

The review processes and decisional criteria for requested modifications to wetland and stream buffers are essentially the same. KZC §90.60(2)(b) describes the review process and decisional criteria for wetland buffer modifications. KZC §90.100(2) describes the review process and decisional criteria for stream buffer modifications. We are providing a paraphrased version of the review process and decisional criteria for both the wetland and stream buffer modification proposals below:

> An improvement or land surface modification shall be approved in a wetland or stream buffer only if:
>
> a. It is consistent with 'Kirkland's Streams, Wetlands, and Wildlife Study' (The Watershed Company, 1998) and the 'Kirkland Sensitive Areas Regulatory Recommendations Report' (Adolfson Associates, Inc. 1998);
>
> *The Site is located within the Forbes Creek Basin. Two wetlands are mapped by the Watershed Company report in the general vicinity of the Site. These are Forbes 1 and Forbes 3. Forbes 1 is described as being relatively high value, despite the amount of development pressure surrounding it. Forbes Creek flows through Forbes 1. Forbes 3, which is located north of Forbes Creek Drive and approximately 880 feet west of the Site, is described as low to moderate quality. An unnamed stream is mapped flowing through Forbes 3, crossing under Forbes Creek Drive, and connecting with Forbes Creek. No wetlands are mapped by the Watershed Company report on the Site. However, it appears that one stream was mapped on the Site. This stream appears to be roughly in line with Stream 2. No other information is provided concerning this stream.*
>
> *General recommendations provided in the Watershed Company report include improvements of stormwater treatment and detention, protection of existing wetlands and streams, wetland enhancements, and improving fish passage issues. Improving fish passage issues is beyond the scope of this project in that no streams with usable fish habitat exist on the Site. The proposed project will, however, utilize the best available technology for stormwater treatment and detention, which will address water quality and hydroperiod issues to a limited extent on Forbes Creek. No direct impacts to wetlands are being proposed, so there is no reason based in the applicable code for enhancing onsite wetlands. Stream and wetland buffers will be maintained.*
>
> *Recent comments provided by the Watershed Company made reference to Washington Department of Ecology (WDOE) guidelines that suggest*

that buffers on steep slopes should be increased to compensate for a reduced ability for steep slope areas to filter out pollutants. While we agree with the concept as outlined by WDOE, we also feel that it does not take into consideration current building standards and stormwater management. An increased buffer width would make sense if pollutants were able to flow off of the developed Site towards a wetland or stream. However, required stormwater infrastructure (curb, gutter, sidewalk, etc.) will capture all precipitation falling on the developed area and direct it towards the proposed stormwater system for the project. CC&R's will be established that will limit the use of fertilizers, herbicides, or pesticides on the project's greenscape. It is our contention, therefore, that increasing the width of the buffer on steep slope areas will not provide any appreciable protection to existing critical areas and is not needed.

The Adolfson report reiterates much of what was stated in the Watershed Company report, with the admonition to provide a "greater degree of protection" to wetlands and streams located within a Primary Basin compared to wetlands and streams located within Secondary Basins. The Site is located within a Primary Basin (Forbes Creek).

The Adolfson report recommends standard buffer widths and setbacks for wetlands and streams located in Primary Basins. Class B streams are recommended to have a 60-foot standard buffer. Class C streams are recommended to have a 35-foot standard buffer. Both of these widths are provided for by the proposed site development, except where buffer reduction with enhancement is proposed.

Buffers for Type 2 and Type 3 wetlands located within a Primary Basin are suggested to be 75 feet and 50 feet, respectively. Both of these buffer widths are provided for by the proposed site development, except where buffer reduction with enhancement is proposed. No direct modification of wetlands is proposed by the current site development plan.

Finally, the Adolfson report discusses Significant Habitat Areas. The report recommends that the City establish Wildlife Habitat Conservation Areas to protect known populations of Federally- and State-listed threatened or endangered species. The Site has not been designated as a Wildlife Habitat Conservation Area. However, it cannot be ignored that significant wildlife habitat potential is present onsite. The proposed site development plan protects a significant portion of the Site, including the areas with the highest value habitat (steeply sloped ravines and associated wetlands and streams). Approximately 70-percent of the Site will remain undeveloped. This habitat is separated from the main Forbes Creek 1 habitat area by Forbes Creek Drive, but may still provide additional value for birds and other wildlife. Additionally, habitat connections to the undeveloped properties to the east and west will be

maintained. These properties include Crestwoods Park to the east of the Site and Juanita Bay Park to the west (Juanita Bay Park also exists north of Forbes Creek Drive, but is separated from the Site by existing residential development).

b. It will not adversely affect water quality;

All stormwater will be collected within the development and directed via stormwater pipes to a stormwater detention/wet vault to be constructed adjacent to Forbes Creek Drive. The proposed project will not adversely affect the quality of water within Wetlands or associated streams.

c. It will not adversely affect fish, wildlife, or their habitat;

The onsite streams are non-fish-bearing and seasonal. Therefore, there will be no potential for the proposed buffer reduction to affect fish habitat onsite. Additionally, maintaining the existing vegetative cover reduces the potential for erosion of soil on the steep slopes that could impact the quality of water in the onsite streams. These streams eventually combine with Forbes Creek, which is a fish-bearing water. Maintaining high-quality water leaving the Site will ensure that there will be no degradation to fish habitat in Forbes Creek downstream of the Site. Furthermore, the judicious use of large woody debris in the enhancement areas will improve the potential of the buffers to provide habitat for wildlife, including small mammals and birds. The proposed buffer reduction with enhancement will not adversely affect fish, wildlife, or their habitat.

d. It will not have an adverse effect on drainage and/or stormwater detention capabilities;

Hydrology for the onsite wetlands and streams is from stormwater discharge off of 20th Avenue, except for Wetland B. Wetland B receives hydrology from Stream 4, which originates from Wetland C. No work will occur that will alter the sources of hydrology. Stormwater detention for the developed portion of the Site will be provided by a new stormwater detention vault. This vault will be sized in accordance with the City of Kirkland's stormwater design requirements.

e. It will not lead to unstable earth conditions or create an erosion hazard or contribute to scouring actions;

*As stated in our discussion of project impacts in **Section 6.2**, the proposed development will not directly affect areas of steep slopes, which could lead to unstable earth conditions. Grading and filling to create a level building area will be contained within structural walls. All stormwater will be collected onsite and discharged to a stormwater detention vault; no*

undetained stormwater will be allowed to leave the building envelope and flow onto the steep slope areas. The proposed project will not increase the amount of water currently flowing within the onsite stream channels, which could result in increased erosion or scouring actions. The boundaries of all proposed work will be contained within silt fencing and construction limits fencing. No disturbance of soils within identified steep slope areas will occur. Buffer enhancement work will occur within buffer areas identified as having steep slopes. This enhancement work will be limited to an area approximately 15 feet wide measured from the edge of the proposed development and will require the removal of non-native blackberry canes to ground level. The areas where blackberry canes have been removed will be stabilized by installation of jute fabric that is anchored to the soil. Dense enhancement plantings will be made through the jute fabric. No large woody debris will be installed in the areas identified as steep slopes.

f. It will not be materially detrimental to any other property or the City as a whole;

   The proposed development will not be materially detrimental to any other property or the City as a whole. All construction-related work will be in accordance with the City's development regulations and best management practices.

g. Fill material does not contain organic or inorganic material that would be detrimental to water quality or to fish, wildlife, or their habitat;

   Fill material will be from locally sourced clean material. It will not contain organic or inorganic pollutants that could affect fish, wildlife, or their habitats. Best management practices (i.e., silt fencing, straw bales, coir logs, etc.) will be used to prevent any fill material from leaving the development envelope.

h. All exposed areas are stabilized with vegetation normally associated with native stream buffers, as appropriate;

   At the conclusion of construction work, all exposed earth shall be revegetated with native trees, shrubs, and groundcover species suitable for use within stream and wetland buffers associated with slopes where applicable. Steep slope enhancement areas will be stabilized with jute fabric prior to enhancement plantings. Construction and silt fencing shall remain in place until the native vegetation is sufficiently mature to stabilize and protect previously disturbed earth. Construction and silt fencing shall be removed when vegetation maturity has been adequately demonstrated. and

i. There is no practical or feasible alternative development proposal that results in less impact to the buffer.

The proposed site development plan, including the proposed buffer reduction with enhancement plan, represents the minimum impact to buffers that still allows for an economic development of the property in accordance with City of Kirkland development codes and guidelines.

6.3.2 Proposed Site Mitigation – Buffer Enhancement

The proposed development area borders two streams within relatively steep-walled ravines. Much of the buffer area is vegetated with non-native blackberries, which are an undesirable species. We are proposing to limit enhancement activities to within 15 feet of the edge of the proposed development in most cases. The ravine for Stream 2 will have enhancement plantings extending further than the minimum width of 15 feet towards the stream where slopes of the buffer are less than 40 percent. All enhancement will occur adjacent to areas of proposed development where buffers are reduced.

We are proposing two enhancement strategies (Enhancement Strategy 1 and Enhancement Strategy 2) depending on the existing slope of the buffer. The first enhancement strategy will be limited to those buffer areas with a slope of less than 40 percent. The second enhancement strategy will be limited to those buffer areas with a slope greater than 40 percent.

6.3.2.1 Enhancement Strategy 1

Sheet W2.0 shows the location of buffer areas with slopes less than 40 percent (areas indicated by the green fill color). Approximately 17,415 sf of buffer has been identified as suitable for enhancement using Enhancement Strategy 1.

Enhancement Strategy 1 involves the removal of all non-native invasive species within the enhancement area. Non-native blackberries will be completely removed (including roots) by hand to limit the degree of soil disturbance. Large woody debris (in the form of down logs, stumps, and rootwads) will be placed within the buffer enhancement limits. The large woody debris may be modified by the creation of planting pockets as shown on **Sheet W2.0**. Native trees and shrubs will be planted to restore those areas where blackberry was removed within the Enhancement Strategy 1 buffer (see **Sheet W3.0** - Planting Typical 1 on the plan sheets). Planting pockets created in the LWD will be filled with site-sourced, well-composed mulch and planted with either western hemlock or red elderberry.

We believe that the proposed Enhancement Strategy 1, with its combination of removal of non-native species, replanting with native trees, shrubs, and groundcover, and the use of LWD will provide greater buffer habitat value compared with existing conditions.

6.3.2.2 Enhancement Strategy 2

The use of Enhancement Strategy 2 will be limited to those areas of buffer with slopes greater than 40 percent. These are indicated on **Sheet W2.0** by the salmon-colored fill.

Approximately 7,665 sf of buffer has been identified for enhancement using Enhancement Strategy 2.

Enhancement Strategy 2 modifies the control and removal of non-native blackberry due to the potential to create unstable earth conditions that are to be avoided under conditions described in **Section 6.3.1**. Instead, the strategy will cut the blackberry canes to ground level and the cut material removed from the site. Geotech-approved Jute fabric will be placed over the area cleared of blackberry canes and anchored into the soil per installation guidelines by others. Dense enhancement plantings of trees and shrubs shall be installed through the jute fabric. No large woody debris will be placed in areas identified as having slopes over 40 percent.

6.3.3 Conceptual Planting Design

Plant species were chosen for a variety of qualities, including:

- adaptation to specific water regimes;
- value to wildlife;
- value as a physical or visual barrier;
- patterns of growth (structural diversity); and
- aesthetic values.

Native species were chosen to increase both the structural and species diversity of the mitigation areas, thereby increasing the value of the area to wildlife for food and cover.

Sheet W3.0 provides a list of candidate plant species to be used for buffer enhancement. Trees include bitter cherry (*Prunus emarginata*), Douglas fir, western red cedar, and western hemlock. Small trees and shrubs include vine maple (*Acer circinatum*), western hazelnut (*Corylus cornuta*), cascara (*Frangula purshiana*), Indian plum (*Oemleria cerasiformis*), and red elderberry (*Sambucus racemosa*). Massing shrubs include oceanspray (*Holodiscus discolor*), bald-hip rose (*Rosa gymnocarpa*), salmonberry (*Rubus spectabilis*), snowberry (*Symphoricarpos albus*), and evergreen huckleberry (*Vaccinium ovatum*). Groundcover plant species include salal (*Gautheria shallon*) and sword fern (*Polystichum munitum*). Planting quantities and densities are based on the density recommendations of the King County Mitigation Guidelines. Plant materials shall consist of one- and two-gallon container trees and shrubs. See **Sheet W3.1** for proposed tree, shrub, and groundcover quantities.

6.3.4 Temporary Irrigation System

The Client shall water plants immediately upon planting, then provide manual watering or a temporary irrigation system to prevent plant mortality and ensure proper plant establishment. Plants shall receive a minimum of approximately 1-inch of water every week (0.5 inches every 3 days) during the dry season, generally June 15th to October 15th) for the first two years after planting. Watering amounts may need to be increased during prolonged periods of hot, dry weather.

6.4 Fertilizer

The Client shall fertilize all trees and shrubs with a slow-released general-purpose granular fertilizer or slow-release tablets at manufacturer's specified rate at the time of planting.

6.4.1 Mulch

A full 3 inches of medium bark mulch (after settling) shall be around all installed plants and on any disturbed open soil areas. Mulch shall be derived from fir, pine, or hemlock species, and shall not contain trash, rocks, or other debris that may be detrimental to plant growth.

6.4.2 Fence and Signage

An open 2-board critical areas fence shall be installed at the reduced buffer areas adjacent to developed areas, following site preparation, planting, and mulching. Signs shall be provided every 50 feet per the requirements of the City of Kirkland. Location and details of the fence and signage are shown on **Sheet W1.1**.

Chapter 7. CONSTRUCTION SEQUENCING

7.1 Mitigation Construction Sequence

The following provides the general sequence of activities anticipated to be necessary to complete this mitigation project. Some of these activities may be conducted concurrently as the project progresses.

1. Conduct a site meeting between the Contractor, Talasaea Consultants, and the Owner's Representative to review the project plans, work areas, staging/stockpile areas, and material disposal areas.
2. Survey clearing/grading limits per civil engineering plans.
3. Flag existing trees and other vegetation to remain.
4. Install silt fencing, tree protection fencing (if required), and any other erosion and sedimentation control BMPs necessary for work in the project areas per civil plans.
5. Grub out invasive species in buffer areas as shown on clearing and grubbing plan.
6. Install Jute fabric per engineer's specifications.
7. Install habitat features (down logs and stumps). A representative of Talasaea must be present onsite to assist in the placement of habitat features.
8. Mulch all disturbed buffer areas.
9. Complete site cleanup and install plant material as indicated on the planting plan.

7.2 Post-Construction Approval

Following mitigation construction completion, Talasaea Consultants shall notify the City in writing to request a final site inspection for final construction approval. Once the City has approved of the mitigation construction, the monitoring period shall commence.

7.3 Post-Construction Assessment

Once construction is approved by the City, a qualified wetland ecologist or biologist from Talasaea Consultants shall conduct a post-construction assessment. The purpose of this assessment will be to establish baseline conditions at Year 0 of the required monitoring period. A Baseline Assessment report including "as-built" drawings will be submitted to the City. The as-built plans will identify and describe any changes in planting or other features in relation to the original approved plan.

Chapter 8. MONITORING PLAN

8.1 Reporting

The reports will include: 1) Project Overview, 2) Mitigation Requirements, 3) Summary Data, 4) Maps and Plans, and 5) Conclusions. If the performance criteria are met, monitoring for the City will cease at the end of year five, unless objectives are met at an earlier date and the City accepts the mitigation project as successfully completed.

Table 1. Projected Schedule for Performance Monitoring and Maintenance Events

Year	Date	Maintenance Review	Performance Monitoring	Report Due to Agencies
Year 0, As-built and Baseline Assessment	Winter 2019	X	X	X
1	Spring 2020	X	X	
	Fall 2020	X	X	X
2	Spring 2021	X	X	
	Fall 2021	X	X	X
3	Spring 2022	X		
	Fall 2022	X	X	X
4	Spring 2023	X		
	Fall 2023	X	X	X
5	Spring 2024	X		
	Fall 2024	X	X	X*

*Obtain final approval to facilitate bond release from the City of Kirkland (presumes performance criteria are met).

8.2 Monitoring Methods

Vegetation monitoring methods may include counts; photo-points; random sampling; sampling plots, quadrats, or transects; stem density; visual inspection; and/or other methods deemed appropriate by the permitting agencies and the biologist/ecologist. Vegetation monitoring components shall include general appearance, health, mortality, colonization rates, percent cover, percent survival, volunteer plant species, and invasive weed cover.

Permanent vegetation sampling plots, quadrats, and/or transects will be established at selected locations to adequately sample and represent all of the plant communities within the mitigation project areas. The number, exact size, and location of transects, sampling plots, and quadrats will be determined at the time of the baseline assessment.

Percent areal cover of woody vegetation (forested and/or scrub-shrub plant communities) will be evaluated through the use of point-intercept sampling methodology. Using this methodology, a tape will be extended between two permanent markers at each end of an established transect. Trees and shrubs intercepted by the

tape will be identified, and the intercept distance recorded. Percent cover by species will then be calculated by adding the intercept distances and expressing them as a total proportion of the tape length.

The established vegetation sampling locations will be monitored and compared to the baseline data during each performance monitoring event to aid in determining the success of plant establishment. Percent survival of shrubs and trees will be evaluated in a 10-foot-wide strip along each established transect. The species and location of all shrubs and trees within this area will be recorded at the time of the baseline assessment and will be evaluated during each monitoring event to determine percent survival.

8.3 Photo Documentation

Locations will be established within the mitigation areas from which panoramic photographs will be taken throughout the monitoring period. These photographs will document general appearance and relative changes within the plant communities. Review of the photos over time will provide a semi-quantitative representation of the success of the planting plan. Vegetation sampling plot and photo-point locations will be shown on a map and submitted with the baseline assessment report and yearly performance monitoring reports.

8.4 Wildlife

Birds, mammals, reptiles, amphibians, and invertebrates observed in the mitigation areas (either by direct or indirect means) will be identified and recorded during scheduled monitoring events, and at any other times observations are made. Direct observations include actual sightings, while indirect observations include tracks, scat, nests, song, or other indicative signs. The kinds and locations of the habitat with the greatest use by each species will be noted, as will any breeding or nesting activities.

8.5 Water Quality and Site Stability

Water quality will be assessed qualitatively unless it is evident there is a serious problem. In such an event, water quality samples will be taken and analyzed in a laboratory for suspected parameters. Qualitative assessments of water quality include:

- oil sheen or other surface films,
- abnormal color or odor of water,
- stressed or dead vegetation or aquatic fauna,
- turbidity, and
- absence of aquatic fauna.

Observations will be made of the general stability of slopes and soils in the mitigation areas during each monitoring event. Any erosion of soils or slumping of slopes will be recorded and corrective measures will be taken.

8.6 Goals, Objectives, and Performance Standards

This section of the critical areas report addresses the mitigation goals (including requirements of the City of Kirkland and how they are planned to be met), as well as the related objectives and performance standards to which the project is expected to meet. These are described in detail below.

8.6.1 Mitigation Goals

The goal of the mitigation plan is to enhance the functions and services provided by the areas proposed for post-construction buffer. This will be accomplished through the removal of garbage and construction-related debris, removal of non-native invasive plant species, replanting with a variety of native trees and shrubs, and installation of habitat features such as large woody debris.

8.6.2 Mitigation Objectives and Performance Standards

The success of the proposed buffer enhancement plan will be evaluated through the following objectives and performance standards. Mitigation monitoring will be performed by a qualified biologist.

Objective A: Create structural and plant species diversity in the post-construction buffer area.

Performance Standard A1: *At least five (5) species of desirable native woody plants will be present in the enhanced buffer area during the monitoring period. Percent survival of planted woody material must be 100 percent at the end of Year 1 (per contractor warranty), and at least 80 percent for each subsequent year of the monitoring period.*

Objective B: Create additional habitat within the post-construction buffer area.

Performance Standard B1: *Large woody debris, consisting of logs, stumps, and root wads, shall be placed within the enhanced buffer areas. A minimum of twenty (20) pieces of large woody debris will be placed.*

Objective C: Limit the amount of non-native and invasive species in the post-construction buffer area.

Performance Standard C1: *After construction and for the entirety of the monitoring period, non-native, invasive species within the buffer enhancement areas shall be maintained at levels below 10 percent maximum cover. Non-native, noxious species include, but are not limited to, Scot's broom, Himalayan and evergreen blackberry, hedge bindweed, exotic knotweeds, and bittersweet nightshade.*

Chapter 9. MAINTENANCE AND CONTINGENCY

Regular maintenance reviews will be performed according to the schedule presented in **Table 1** to address any conditions that could jeopardize the success of the mitigation project. Following maintenance reviews by the biologist or ecologist, required maintenance on the Site will be implemented within ten (10) business days of submission of a maintenance memo to the maintenance contractor and permittee.

Established performance standards for the project will be compared to the yearly monitoring results to judge the success of the mitigation. If, during the course of the monitoring period, there appears to be a significant problem with achieving the performance standards, the permittee shall work with the permitting agencies to develop

a Contingency Plan in order to get the project back into compliance with the performance standards. Contingency plans can include, but are not limited to, the following actions: additional plant installation, erosion control, modifications to hydrology, and plant substitutions of type, size, quantity, and/or location. If required, a Contingency Plan shall be submitted by December 31st of any year when deficiencies are discovered.

The following list includes examples of maintenance (M) and contingency (C) actions that may be implemented during the course of the monitoring period. This list is not intended to be exhaustive, and other actions may be implemented as deemed necessary.

- During year one, replace all dead woody plant material (M).
- Water all plantings with temporary irrigation at a rate of 1" of water every week between June 15 – October 15 during the first two years after installation, and for the first two years after any replacement plantings (C & M).
- Replace dead plants with the same species or a substitute species that meet the goals and objectives of the mitigation plan, subject to Talasaea and agency approval (C).
- Re-plant area after the reason for failure has been identified (e.g., moisture regime, poor plant stock, disease, shade/sun conditions, wildlife damage, etc.) (C).
- After consulting with City staff, minor excavations, if deemed to be more beneficial to the existing conditions than currently exists, will be made to correct surface drainage patterns (C).
- Remove/control weedy or non-native invasive plants (e.g., Scot's broom, reed canarygrass, Himalayan blackberry, purple loosestrife, Japanese knotweed, etc.) by manual or chemical means approved by permitting agencies. Use of herbicides or pesticides within the mitigation area would only be implemented if other measures failed or were considered unlikely to be successful and would require prior agency approval. All non-native vegetation must be removed and disposed of off-site. (C & M).
- Weed all trees and shrubs up to the dripline and provide 3-inch deep (post-settling) mulch rings 24 inches in diameter for shrubs and 36 inches in diameter for trees (M).
- Remove trash and other debris from the mitigation areas twice a year (M).
- Selectively prune woody plants at the direction of Talasaea Consultants to meet the mitigation plan's goal and objectives (e.g., thinning and removal of dead or diseased portions of trees/shrubs) (M).
- Repair or replace damaged structures including LWD, signs, fences, or bird boxes (M).

Chapter 10. FINANCIAL GUARANTEE

Financial guarantee in the form of a performance or maintenance bond will be required per KZC §90.145, which states:

"The Planning Official shall require a performance or maintenance bond, a performance or maintenance security, a perpetual culvert maintenance agreement, and/or a perpetual landscape maintenance agreement, as determined to be appropriate by the Planning Official, to ensure compliance with any aspect of this chapter or any decision or determination made pursuant to this chapter.

1. Performance or Maintenance Bond or Security Requirement – The performance or maintenance security required by the Planning Official shall be provided in such forms and amounts as the Planning Official deems necessary to assure that all work or actions are satisfactorily completed or maintained in accordance with the approved plans, specifications, permit or approval requirements, and applicable regulations, and to assure that all work or actions not satisfactorily completed or maintained will be corrected to comply with approved plans, specifications, requirements, and regulations to restore environmental damage or degradation, protect fish and wildlife habitat and protect the health, safety, and general welfare of the public.
2. Form of Performance Security – The performance security shall be a surety bond obtained from companies registered as surety in the state or certified as acceptable sureties on federal bonds. In lieu of a surety bond, the Planning Official may allow alternative performance security in the form of an assignment of funds or account, and escrow agreement, an irrevocable letter of credit, or other financial security device in an amount equal to that required for the surety bond. The surety bond or other performance security shall be conditioned on the work being completed or maintained in accordance with requirements, approvals, or permits; on the site being left or maintained in a safe condition; and on the site and adjacent or surrounding areas being restored in the event of damages or other environmental degradation from development or maintenance activities conducted pursuant to the permit or approval.
3. Amount of Performance Security – The amount of the performance or maintenance security shall be 125 percent of the estimated cost, as approved by the Planning Official, of conformance to plans, specifications, and permit or approval requirements under this chapter, including corrective work and compensation, enhancement, mitigation, maintenance, and restoration of sensitive areas. In addition, an administrative deposit shall be paid as required in KZC §175.25. All bond or performance security shall be submitted in their original form with original signatures of authorization.
4. Administration of Performance Security – If during the term of the performance or maintenance security, the Planning Official determines that conditions exist which do not conform with plans, specifications, approval or permit requirements, the Planning Official may issue a stop work order prohibiting any additional work or maintenance until the condition is corrected. The Planning Official may revoke the performance or maintenance security, or a portion thereof, in order to correct conditions that are not in conformance with plans, specifications, approval or permit requirements. The performance or maintenance security may be released upon written notification by the Planning Official, following final site inspection or completion, as appropriate, or

when the Planning Official is satisfied that the work or activity complies with permits or approved requirements.

5. Exemptions for Public Agencies – State agencies and local government bodies, including school districts, shall not be required to secure the performance or maintenance of permit or approval conditions with a surety bond or other financial security device. These public agencies are required to comply with all requirements, terms, and conditions of the permit or approval, and the Planning Official may enforce compliance by withholding certificates of occupancy or occupancy approval, by administrative enforcement action, or by any other legal means."

Chapter 11. SUMMARY

The Orcas Moon Cottages property is an approximately 7.1-acre assemblage of two lots located in Kirkland, Washington. The property is currently undeveloped and forested. Two wetlands and five streams were identified and delineated on the property. A third wetland was identified off property to the west. Orcas Moon, LLC proposes to development of 14 units of cottage housing on the property. The units will be constructed in two groups across the property to take advantage of limited relatively level areas. Approximately 1.6 acres of the approximately 7-acre Site will be developed. The remaining portion (approximately 73 percent of the total Site size) will remain in its natural state. The potentially undersized pipe currently carrying Stream 2 will be removed and replaced with a larger 18-inch diameter pipe. This pipe will be protected at its inlet by a trash rack. Finally, a concrete headwall will be constructed around the inlet of the pipe carrying Stream 3. This headwall will help prevent potential soil erosion should this pipe become temporarily blocked. The C, C, & R for the project will stipulate that the inlets of all three piped streams be monitored and maintained in a free-flowing capacity at least twice a year.

In order for the project to meet specific design standards and economically-feasibility, it will be necessary to reduce stream and wetland buffers adjacent to the development areas. Buffer reductions of up to 1/3rd of the standard buffer width are allowed under City of Kirkland Zoning Code. Total area of buffer reduction is approximately 24,222 sf.

Mitigation for the proposed buffer reduction will be provided through buffer enhancement. Buffer enhancement will be mostly limited to an area extending at least 15 feet away from the proposed development and will follow one of two enhancement strategies based on the presence or absence of steep slopes (slopes greater than 40 percent). Enhancement planting through jute fabric is proposed for buffer areas with slopes greater than 40 percent. Approximately 17,415 sf of non-steep slope buffer will be enhanced using Enhancement Strategy 1. Approximately 7,665 sf of steep slope buffer (greater than 40 percent) will be enhanced using Enhancement Strategy 2. The total area of buffer enhancement is approximately 27,276 sf (Buffer Enhancement Strategies 1 and 2).

Finally, approximately 2,829 sf of buffer will be temporarily impacted during construction. Temporary impacts to buffers will result from the installation of the new 18-inch pipe for Stream 2, the headwall for the pipe carrying Stream 3, and various

utilities. Areas of temporary buffer impact will be mitigated through the restoration of the original (pre-impact) topography and replanting with a variety of native trees and shrubs.

While buffer enhancement is not specifically required where the functions and values of the post-construction buffer area are equal to or greater than the functions and values of the buffer being reduced, the project will still provide habitat improvements. Enhancement will include the removal of non-native, invasive species, installation of habitat features (large woody debris), and enhancement planting with a variety of native trees, shrubs ground cover. The proposed site development plan will not directly impact wetlands or streams onsite.

Chapter 12. REFERENCES

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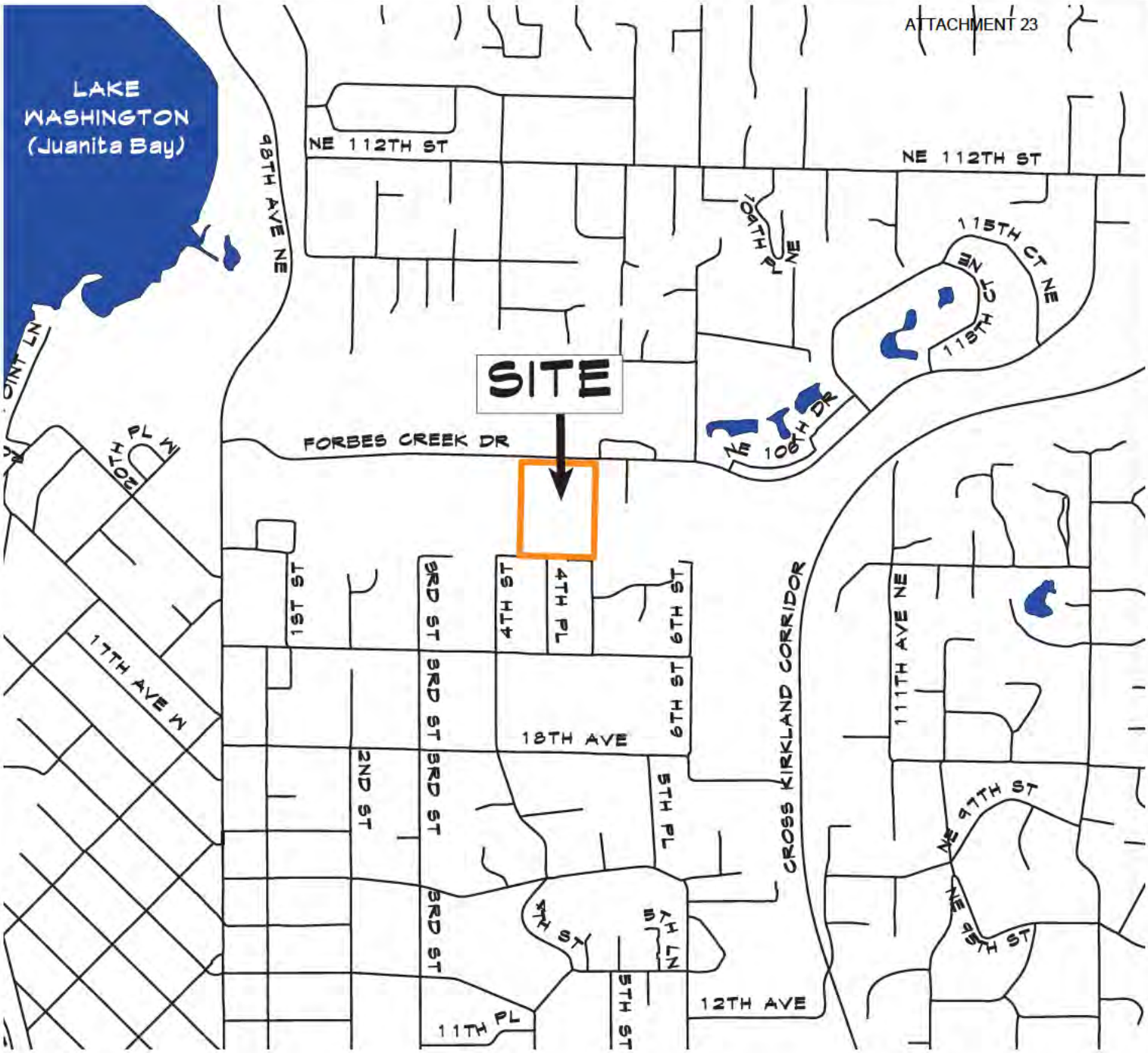
Figures



Property Location: 400 Block of Forbes Creek Drive. T26N, R5E, Section 32, Willamette Meridian.

N

Reference: GIS parcel, road, watercourse, and water body data from City of Kirkland, 2015.

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FIGURE 1

VICINITY MAP
ORCAS MOON PROJECT
KIRKLAND, WASHINGTON

DESIGN	DRAWN	PROJECT
	DRT	518B

SCALE 1 in : 1000 ft

DATE 6 NOV 2017

REVISED

1

N

Reference: GIS parcel and road data from City of Kirkland, 2015.
Aerial image 2012 from Earth Explorer, downloaded 2016.

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FIGURE 2

SITE MAP
ORCAS MOON PROJECT
KIRKLAND, WASHINGTON

DESIGN	DRAWN	PROJECT
	DRT	518B

SCALE
1 in : 200 ft

DATE
6 NOV 2017

REVISED

2

N

Reference: GIS parcel and road data from City of Kirkland, 2015. National Wetlands Inventory GIS data from USFWS, 2012. Aerial image 2012 from Earth Explorer, downloaded 2016.

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FIGURE 3

NWI MAP - KIRKLAND QUADRANGLE
ORCAS MOON PROJECT
KIRKLAND, WASHINGTON

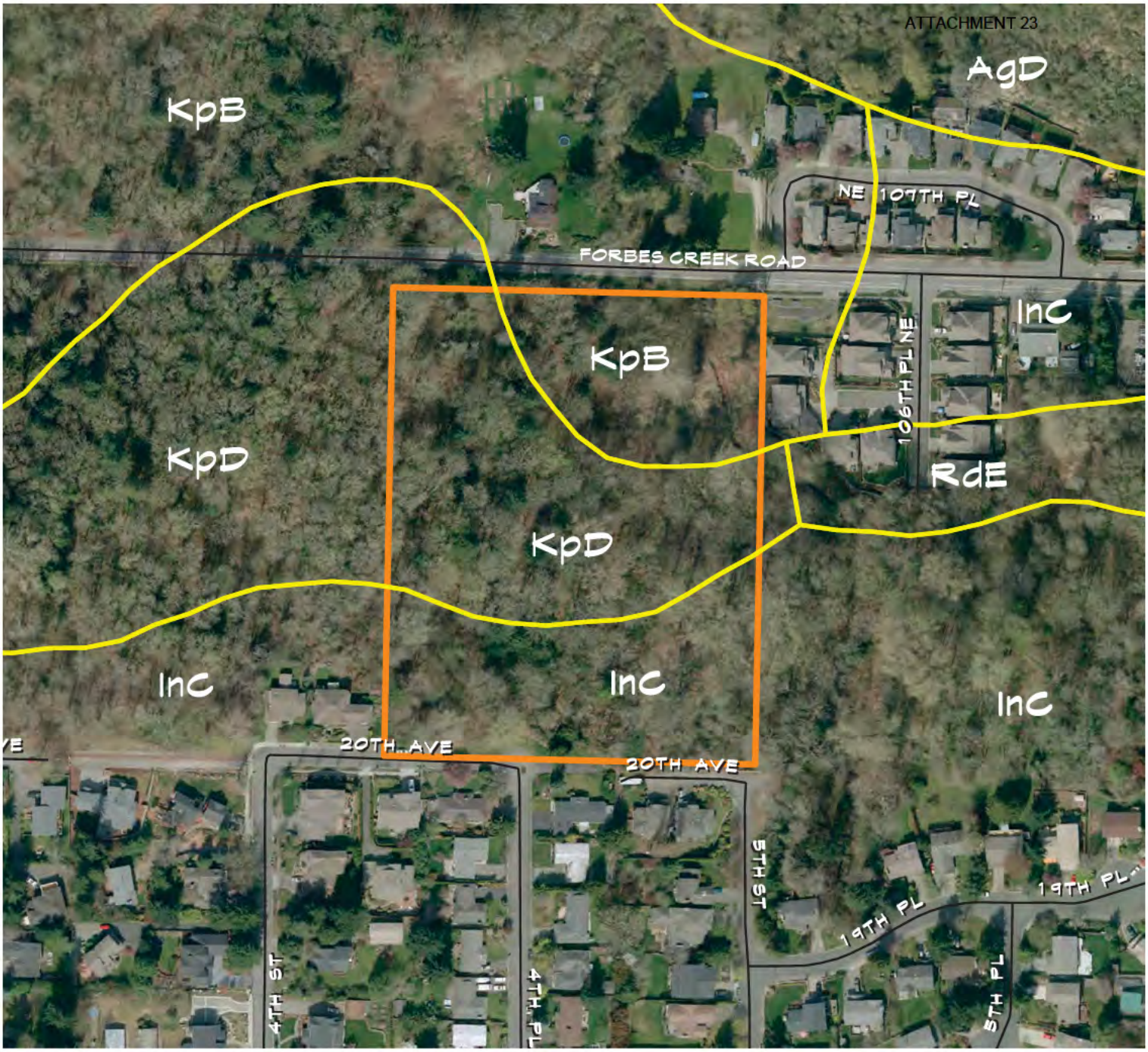
DESIGN	DRAWN	PROJECT
	DRT	518B

SCALE 1 in : 400 ft

DATE 6 NOV 2017

REVISED

3



SOIL KEY

AgD - Alderwood gravelly sandy loam, 15 to 30 percent slope
InC - Indianola lomay sand, 5 to 15 percent slope
KpB - Kitsap silt loam, 2 to 8 percent slope
KpD - Kitsap silt loam, 15 to 30 percent slope

N

Reference: GIS parcel, road, and soil GIS data from City of Kirkland, 2015. Aerial image 2012 from Earth Explorer, downloaded 2016.

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FIGURE 4

NRCS SOILS DATA
(from City of Kirkland)
ORCAS MOON PROJECT
KIRKLAND, WASHINGTON

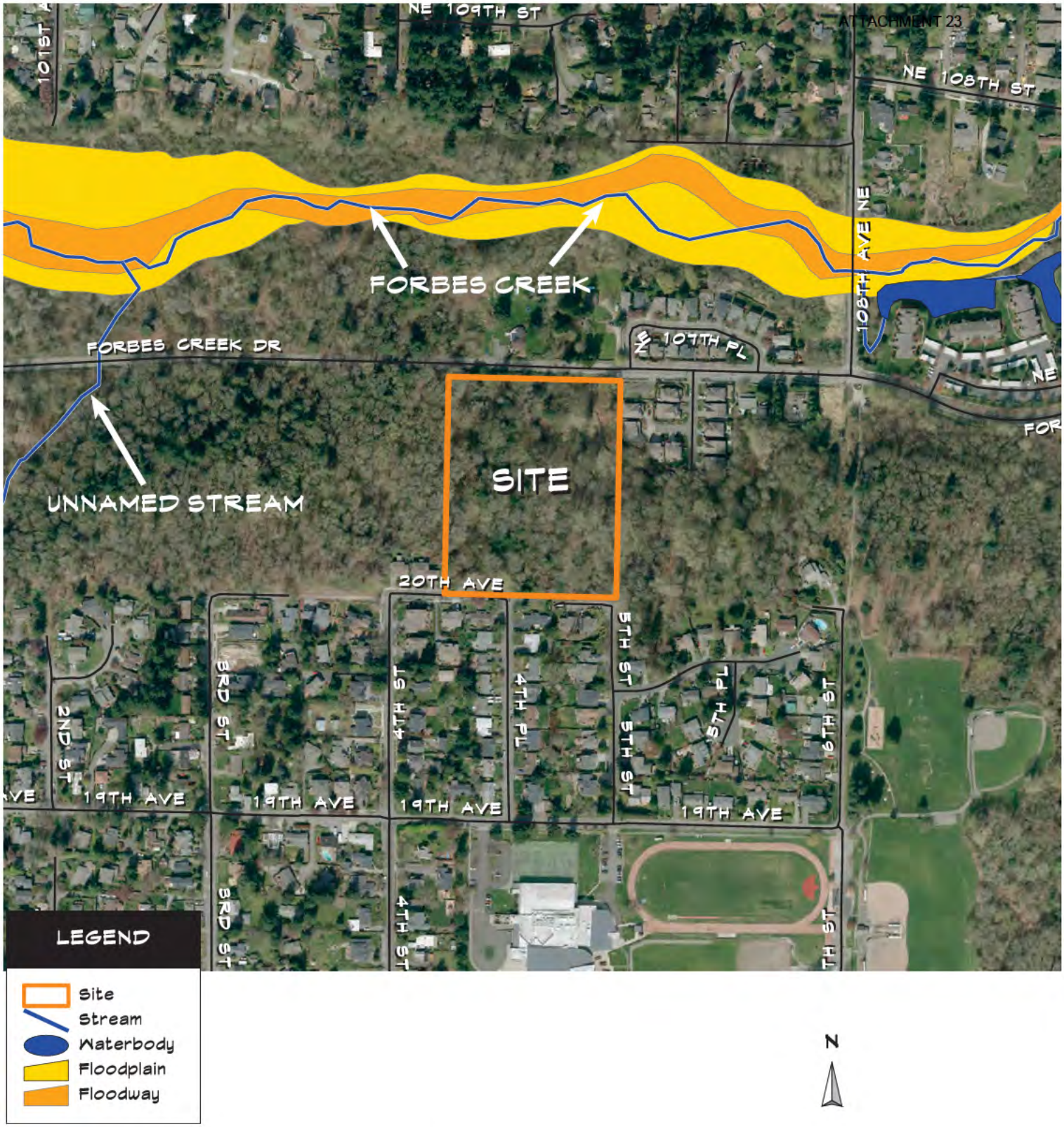
DESIGN	DRAWN	PROJECT
	DRT	518B

SCALE 1 in : 200 ft

DATE 6 NOV 2017

REVISED

4



Reference: GIS parcel and road data from City of Kirkland, 2015. Stream, water body, floodway, and floodplain data from King County GIS, 2015. Aerial image 2012 from Earth Explorer, downloaded 2016

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FIGURE 5

KING COUNTY CRITICAL AREAS
GIS DATA
ORCAS MOON PROJECT
KIRKLAND, WASHINGTON

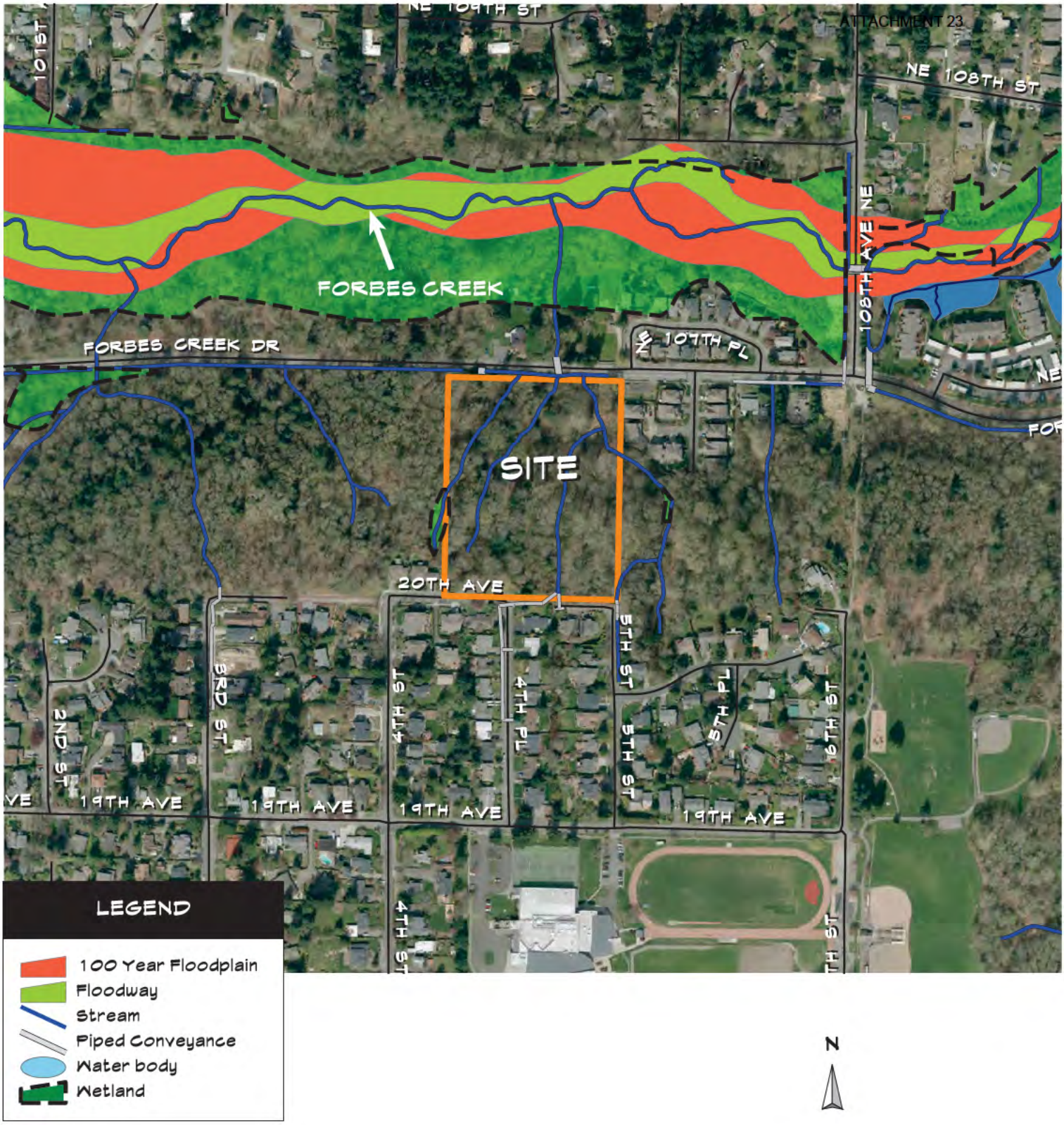
DESIGN	DRAWN	PROJECT
	DRT	518B

SCALE 1 in : 400 ft

DATE 6 NOV 2017

REVISED

5



Reference: GIS parcel, road, stream, wetland, water body, floodplain, and floodway data from City of Kirkland, 2015. Aerial image 2012 from Earth Explorer, 2016.

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FIGURE 6

CITY OF KIRKLAND CRITICAL AREAS GIS DATABASE
ORCAS MOON PROJECT
KIRKLAND, WASHINGTON

DESIGN	DRAWN	PROJECT
	DRT	518B

SCALE 1 in : 400 ft

DATE 6 NOV 2017

REVISED

6

See also Sheet W 1.0.

N

Reference: GIS parcel and wetland data from City of Kirkland, 2015.
Surveyed stream and wetland data provided by Blueline Group, 2016.
Aerial image 2012 from Earth Explorer, downloaded 2016.

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FIGURE 7

WETLAND AND STREAM MAP
ORCAS MOON PROJECT
KIRKLAND, WASHINGTON

DESIGN	DRAWN	PROJECT
	DRT	518B

SCALE 1 in : 100 ft

DATE 6 NOV 2017

REVISED

7

Appendix A

City of Kirkland Wetland Rating Forms (Plate 26)

FILE 318B
wetland A

Chapter 1. **Plate 26**

WETLAND FIELD DATA FORM

(Note: Applicable to Chapter 90 KZC, but not Chapter 83 KZC)

Type 2

WETLAND FIELD DATA FORM

BEGIN BY CHECKING ANY OF THE FOLLOWING (a. – e.) THAT APPLY:

a. The wetland is contiguous to Lake Washington; NO

b. The wetland contains at least 1/4 acre of organic soils, such as peat bogs or mucky soils; NO

c. The wetland is equal to or greater than 10 acres in size and having three or more wetland classes, as defined by the U.S. Fish & Wildlife Service (Cowardin et al., 1979), one of which is open water; NO

d. The wetland has significant habitat value to state or federally listed threatened or endangered wildlife species; or NO

e. The wetland contains state or federally listed threatened or endangered plant species. NO

IF ANY OF THE CRITERIA LISTED ABOVE ARE MET, THEN THE WETLAND IS CONSIDERED TO BE TYPE 1. IF THAT IS THE CASE, PLEASE CONTINUE TO COMPLETE THE ENTIRE FORM, BUT DO NOT ASSIGN POINTS.

IF THE WETLAND DOES NOT MEET THE CRITERIA LISTED ABOVE FOR TYPE 1, COMPLETE THE ENTIRE FORM, USING THE ASSIGNED POINTS TO DETERMINE IF IT IS A TYPE 2 OR TYPE 3 WETLAND.

Type 2 wetlands typically have at least two wetland vegetation classes, are at least partially surrounded by buffers of native vegetation, connected by surface water flow (perennial or intermittent) to other wetlands or streams, and contain or are associated with forested habitat.

1. Total wetland area

Estimate wetland area and score from	Acres	Point Value	Points

choices

>20.00	=	6
10-19.99	=	5
5-9.99	=	4
1-4.99	=	3
0.1-0.99	=	2
<0.1	=	1

2. Wetland classes: Determine the number of wetland classes that qualify, and score according to the table.

		# of Classes		Points
Open Water: if the area of open water is >1/3 acre or >10% of the total wetland area		1	=	1
Aquatic Beds: if the area of aquatic beds is >10% of the open water area or >1/2 acre		2	=	3
Emergent: if the area of emergent class is >1/2 acre or >10% of the total wetland area	X	3	=	5
Scrub-Shrub: if the area of scrub-shrub class is >1/2 acre or >10% of the total wetland area	X	4	=	7
Forested: if the area of forested class is >1/2 acre or >10% of the total wetland area	X	5	=	10

3. Plant species diversity.

For all wetland classes which qualified in 2 above, count the number of different plant species and score according to the table below. You do not have to name them.

e.g., if a wetland has an aquatic bed class with 3 species, and emergent class with 4 species and a scrub-shrub class with 2 species, you would circle 2, 2, and 1 in the second column (below).

Class	# of Species		Point Value
Aquatic Bed	1-2	=	1
	3	=	2
	>3	=	3

Class	# of Species		Point Value
Scrub-Shrub	1-2	=	1
	3-4	=	2
	>4	=	3

NONE

Emergent	1-2	=	1	Forested	1-2	=	1
	3-4	=	2		3-4	=	2
	>4	=	3		>4	=	3

4. Structural diversity.

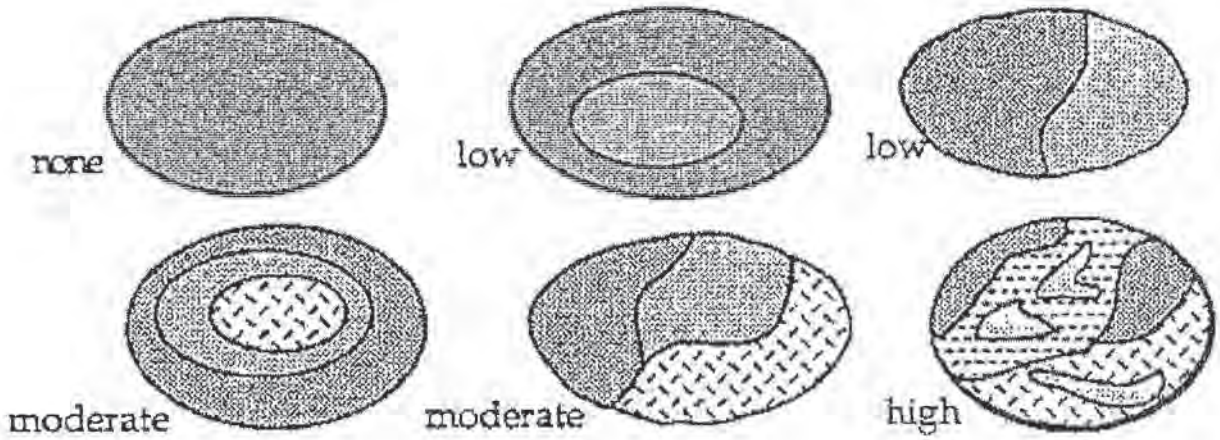
If the wetland has a forested class, add 1 point for each of the following attributes present:

Trees >50' tall	=	1
Trees 20' to 49' tall	=	1
shrubs	=	1
Herbaceous ground cover	=	1

5. Interspection between wetland classes.

Decide from the diagrams below whether interspection between wetland classes is high, moderate, low or none

3	=	High
2	=	Moderate
1	=	Low
0	=	None



6. Habitat features

Add points associated with each habitat feature listed:	= 3
Is there evidence of current use by beavers?	= 2
Is a heron rookery located within 300'?	= 1
Are raptor nest(s) located within 300'?	= 1
Are there at least 2 standing dead trees (snags) per acre?2	= 1
Are there any other perches (wires, poles, or posts)?	= 1
Are there at least 3 downed logs per acre?	= 1

7. Connection to streams

Is the wetland connected at any time of the year via surface water? (score one answer only)

Is the wetland connected at any time of the year via surface water?

To a perennial stream or a seasonal stream with fish	= 5
To a seasonal stream without fish	= 3
Is not connected to any stream	= 0

8. Buffers

Step 1: Estimate (to the nearest 5%) the percentage of each buffer or land-use type (below) that adjoins the wetland boundary. Then multiply these percentages by the factor(s) below and enter result in the column to the right.

	% of Buffer	Step 1	Width Factor	Step 2
Roads, buildings or parking lots	% X 0 =		=	
Lawn, grazed pasture, vineyards or annual crops	% X 1 =		=	
Ungrazed grassland or orchards	% X 2 =		=	
Open water or native grasslands	% X 3 =		=	
Forest or shrub	100 % X 4 =	400 x	2 =	800
			Add buffer total	

Step 2: Multiply result(s) of step 1:

By 1 if buffer width is 25-50'

By 2 if buffer width is 50-100'

By 3 if buffer width is >100'

Enter results and add subscores

Step 3: Score points according to the following table:

Buffer Total

900-1200 = 4

600-899 = 3 800

300-599 = 2

100-299 = 1

9. Connection to other habitat areas:

Is there a riparian corridor to other wetlands within 0.25 of a mile, or a corridor >100' wide with good forest or shrub cover to any other habitat area? = 5

Is there a narrow corridor <100' wide with good cover or a wide corridor >100' wide with low cover to any other habitat area? = 3

Is there a narrow corridor <100' wide with low cover or a significant habitat area within 0.25 mile but no corridor? = 1

Is the wetland and buffer completely isolated by development and/or cultivated agricultural land? = 0

10. Scoring

Add the scores to get a total: 26

Question: Is the total greater than or equal to 22 points?

Answer:

Yes = Type 2

No = Type 3

 TAb-518B
wetland B

Chapter 1. **Plate 26**

WETLAND FIELD DATA FORM

(Note: Applicable to Chapter 90 KZC, but not Chapter 83 KZC)

Type 3

WETLAND FIELD DATA FORM

BEGIN BY CHECKING ANY OF THE FOLLOWING (a. – e.) THAT APPLY:

a. The wetland is contiguous to Lake Washington; NO

b. The wetland contains at least 1/4 acre of organic soils, such as peat bogs or mucky soils; NO

c. The wetland is equal to or greater than 10 acres in size and having three or more wetland classes, as defined by the U.S. Fish & Wildlife Service (Cowardin et al., 1979), one of which is open water; NO

d. The wetland has significant habitat value to state or federally listed threatened or endangered wildlife species; or NO

e. The wetland contains state or federally listed threatened or endangered plant species. NO

IF ANY OF THE CRITERIA LISTED ABOVE ARE MET, THEN THE WETLAND IS CONSIDERED TO BE TYPE 1. IF THAT IS THE CASE, PLEASE CONTINUE TO COMPLETE THE ENTIRE FORM, BUT DO NOT ASSIGN POINTS.

IF THE WETLAND DOES NOT MEET THE CRITERIA LISTED ABOVE FOR TYPE 1, COMPLETE THE ENTIRE FORM, USING THE ASSIGNED POINTS TO DETERMINE IF IT IS A TYPE 2 OR TYPE 3 WETLAND.

Type 2 wetlands typically have at least two wetland vegetation classes, are at least partially surrounded by buffers of native vegetation, connected by surface water flow (perennial or intermittent) to other wetlands or streams, and contain or are associated with forested habitat.

1. Total wetland area

Estimate wetland area and score from	Acres	Point Value	Points

choices

>20.00	=	6
10-19.99	=	5
5-9.99	=	4
1-4.99	=	3
0.1-0.99	=	2
<0.1	=	1

2. Wetland classes: Determine the number of wetland classes that qualify, and score according to the table.

	# of Classes		Points
Open Water: if the area of open water is >1/3 acre or >10% of the total wetland area	1	=	1
Aquatic Beds: if the area of aquatic beds is >10% of the open water area or >1/2 acre	2	=	3
Emergent: if the area of emergent class is >1/2 acre or >10% of the total wetland area	3	=	5
Scrub-Shrub: if the area of scrub-shrub class is >1/2 acre or >10% of the total wetland area	4	=	7
Forested: if the area of forested class is >1/2 acre or >10% of the total wetland area X	5	=	10

3. Plant species diversity.

For all wetland classes which qualified in 2 above, count the number of different plant species and score according to the table below. You do not have to name them.

e.g., if a wetland has an aquatic bed class with 3 species, and emergent class with 4 species and a scrub-shrub class with 2 species, you would circle 2, 2, and 1 in the second column (below).

Class	# of Species		Point Value
Aquatic Bed	1-2	=	1
	3	=	2
	>3	=	3
	none		

Class	# of Species		Point Value
Scrub-Shrub	1-2	=	1
	3-4	=	2
	>4	=	3
	none		

Emergent	1-2	=	1	Forested	1-2	=	1
	3-4	=	2		3-4	=	2
	>4	=	3		>4	=	3

none

4. Structural diversity.

If the wetland has a forested class, add 1 point for each of the following attributes present:

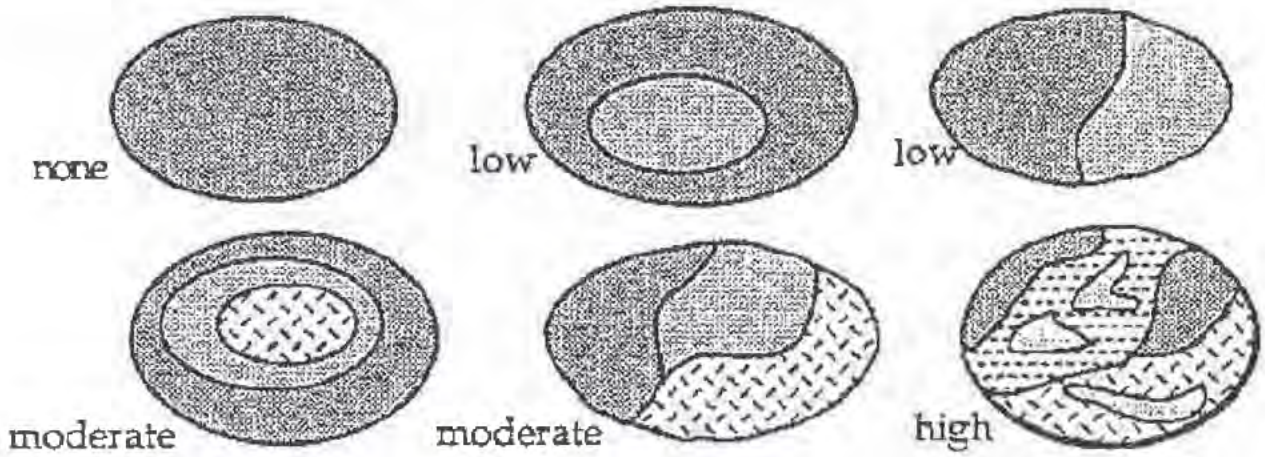
Trees >50′ tall	=	1
Trees 20′ to 49′ tall	=	1
shrubs	=	1
Herbaceous ground cover	=	1

none

5. Interspection between wetland classes.

Decide from the diagrams below whether interspection between wetland classes is high, moderate, low or none

3	=	High
2	=	Moderate
1	=	Low
0	=	None



6. Habitat features

Add points associated with each habitat feature listed:	= 3
Is there evidence of current use by beavers?	= 2
Is a heron rookery located within 300'?	= 1
Are raptor nest(s) located within 300'?	= 1
Are there at least 2 standing dead trees (snags) per acre?2	= 1
Are there any other perches (wires, poles, or posts)?	= 1
Are there at least 3 downed logs per acre?	= 1

7. Connection to streams

Is the wetland connected at any time of the year via surface water? (score one answer only)

Is the wetland connected at any time of the year via surface water?

To a perennial stream or a seasonal stream with fish	= 5
To a seasonal stream without fish	= 3
Is not connected to any stream	= 0

8. Buffers

Step 1: Estimate (to the nearest 5%) the percentage of each buffer or land-use type (below) that adjoins the wetland boundary. Then multiply these percentages by the factor(s) below and enter result in the column to the right.

	% of Buffer Step 1	Width Factor Step 2
Roads, buildings or parking lots	% X 0 =	=
Lawn, grazed pasture, vineyards or annual crops	% X 1 =	=
Ungrazed grassland or orchards	% X 2 =	=
Open water or native grasslands	% X 3 =	=
Forest or shrub	100 % X 4 = 400 x 3	= 1200
		Add buffer total

Step 2: Multiply result(s) of step 1:

By 1 if buffer width is 25-50'

By 2 if buffer width is 50-100'

By 3 if buffer width is >100'

Enter results and add subscores

Step 3: Score points according to the following table:

Buffer Total

900-1200 = 4 1200

600-899 = 3

300-599 = 2

100-299 = 1

9. Connection to other habitat areas:

Is there a riparian corridor to other wetlands within 0.25 of a mile, or a corridor >100′ wide with good forest or shrub cover to any other habitat area? = 5

Is there a narrow corridor <100′ wide with good cover or a wide corridor >100′ wide with low cover to any other habitat area? = 3

Is there a narrow corridor <100′ wide with low cover or a significant habitat area within 0.25 mile but no corridor? = 1

Is the wetland and buffer completely isolated by development and/or cultivated agricultural land? = 0

10. Scoring

Add the scores to get a total: 17

Question: Is the total greater than or equal to 22 points?

Answer:

Yes = Type 2

No = Type 3

TAL-518B
wetland C

Chapter 1. **Plate 26**

WETLAND FIELD DATA FORM

(Note: Applicable to Chapter 90 KZC, but not Chapter 83 KZC)

Type 2

WETLAND FIELD DATA FORM

BEGIN BY CHECKING ANY OF THE FOLLOWING (a. – e.) THAT APPLY:

a. The wetland is contiguous to Lake Washington; NO

b. The wetland contains at least 1/4 acre of organic soils, such as peat bogs or mucky soils; NO

c. The wetland is equal to or greater than 10 acres in size and having three or more wetland classes, as defined by the U.S. Fish & Wildlife Service (Cowardin et al., 1979), one of which is open water; NO

d. The wetland has significant habitat value to state or federally listed threatened or endangered wildlife species; or NO

e. The wetland contains state or federally listed threatened or endangered plant species. NO

IF ANY OF THE CRITERIA LISTED ABOVE ARE MET, THEN THE WETLAND IS CONSIDERED TO BE TYPE 1. IF THAT IS THE CASE, PLEASE CONTINUE TO COMPLETE THE ENTIRE FORM, BUT DO NOT ASSIGN POINTS.

IF THE WETLAND DOES NOT MEET THE CRITERIA LISTED ABOVE FOR TYPE 1, COMPLETE THE ENTIRE FORM, USING THE ASSIGNED POINTS TO DETERMINE IF IT IS A TYPE 2 OR TYPE 3 WETLAND.

Type 2 wetlands typically have at least two wetland vegetation classes, are at least partially surrounded by buffers of native vegetation, connected by surface water flow (perennial or intermittent) to other wetlands or streams, and contain or are associated with forested habitat.

1. Total wetland area

Estimate wetland area and score from	Acres	Point Value	Points

choices

>20.00	=	6
10-19.99	=	5
5-9.99	=	4
1-4.99	=	3
0.1-0.99	=	2
<0.1	=	1

2. Wetland classes: Determine the number of wetland classes that qualify, and score according to the table.

		# of Classes		Points
Open Water: if the area of open water is >1/3 acre or >10% of the total wetland area		1	=	1
Aquatic Beds: if the area of aquatic beds is >10% of the open water area or >1/2 acre		2	=	3
Emergent: if the area of emergent class is >1/2 acre or >10% of the total wetland area	X	3	=	5
Scrub-Shrub: if the area of scrub-shrub class is >1/2 acre or >10% of the total wetland area		4	=	7
Forested: if the area of forested class is >1/2 acre or >10% of the total wetland area	X	5	=	10

3. Plant species diversity.

For all wetland classes which qualified in 2 above, count the number of different plant species and score according to the table below. You do not have to name them.

e.g., if a wetland has an aquatic bed class with 3 species, and emergent class with 4 species and a scrub-shrub class with 2 species, you would circle 2, 2, and 1 in the second column (below).

Class	# of Species		Point Value
Aquatic Bed	1-2	=	1
	3	=	2
	>3	=	3

Class	# of Species		Point Value
Scrub-Shrub	1-2	=	1
	3-4	=	2
	>4	=	3

None

Emergent	1-2	=	1
	3-4	=	2
	>4	=	3

Forested	1-2	=	1
	3-4	=	2
	>4	=	3

4. Structural diversity.

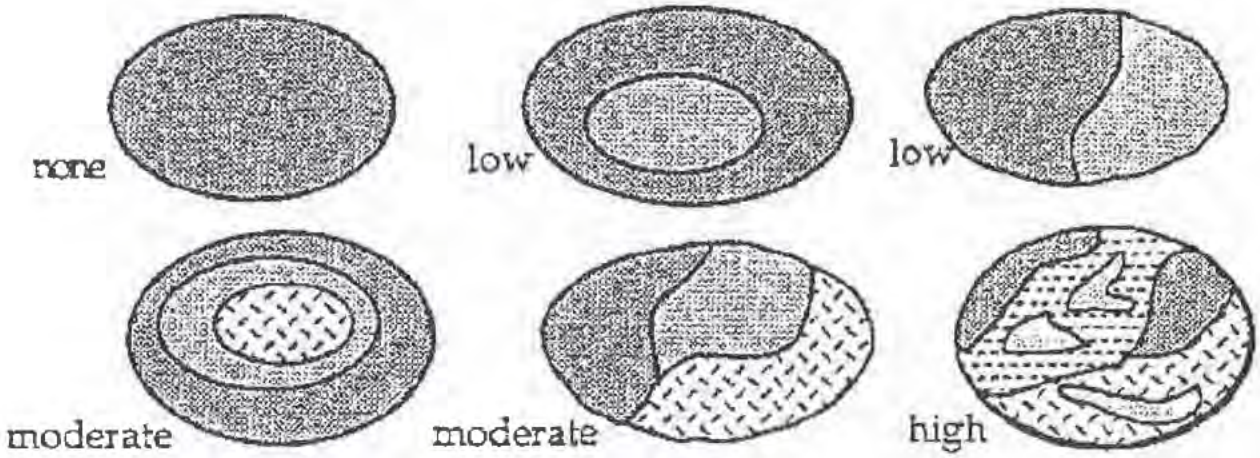
If the wetland has a forested class, add 1 point for each of the following attributes present

Trees >50′ tall	=	1
Trees 20′ to 49′ tall	=	1
shrubs	=	1
Herbaceous ground cover	=	1

5. Interspection between wetland classes.

Decide from the diagrams below whether interspection between wetland classes is high, moderate, low or none

3	=	High
2	=	Moderate
1	=	Low
0	=	None



6. Habitat features

Add points associated with each habitat feature listed:	= 3
Is there evidence of current use by beavers?	= 2
Is a heron rookery located within 300'?	= 1
Are raptor nest(s) located within 300'?	= 1
Are there at least 2 standing dead trees (snags) per acre?2	= 1
Are there any other perches (wires, poles, or posts)?	= 1
Are there at least 3 downed logs per acre?	= 1

7. Connection to streams

Is the wetland connected at any time of the year via surface water? (score one answer only)

Is the wetland connected at any time of the year via surface water?

To a perennial stream or a seasonal stream with fish	= 5
To a seasonal stream without fish	= 3
Is not connected to any stream	= 0

8. Buffers

Step 1: Estimate (to the nearest 5%) the percentage of each buffer or land-use type (below) that adjoins the wetland boundary. Then multiply these percentages by the factor(s) below and enter result in the column to the right.

	% of Buffer	Step 1	Width Factor	Step 2
Roads, buildings or parking lots	% X 0 =		=	
Lawn, grazed pasture, vineyards or annual crops	% X 1 =		=	
Ungrazed grassland or orchards	% X 2 =		=	
Open water or native grasslands	% X 3 =		=	
Forest or shrub	100 % X 4 =	400 X	2 =	800
			Add buffer total	

Step 2: Multiply result(s) of step 1:

By 1 if buffer width is 25-50'

By 2 if buffer width is 50-100'

By 3 if buffer width is >100'

Enter results and add subscores

Step 3: Score points according to the following table:

Buffer Total

900-1200 = 4

600-899 = 3 800

300-599 = 2

100-299 = 1

9. Connection to other habitat areas:

Is there a riparian corridor to other wetlands within 0.25 of a mile, or a corridor >100′ wide with good forest or shrub cover to any other habitat area?	= 5
Is there a narrow corridor <100′ wide with good cover or a wide corridor >100′ wide with low cover to any other habitat area?	= 3
Is there a narrow corridor <100′ wide with low cover or a significant habitat area within 0.25 mile but no corridor?	= 1
Is the wetland and buffer completely isolated by development and/or cultivated agricultural land?	= 0

10. Scoring

Add the scores to get a total: 25

Question: Is the total greater than or equal to 22 points?

Answer:

Yes = Type 2 75' PRIMARY BASIN BUFFER

No = Type 3

TAL-5183
Wetland D

Chapter 1. Plate 26 WETLAND FIELD DATA FORM

(Note: Applicable to Chapter 90 KZC, but not Chapter 83 KZC)

WETLAND FIELD DATA FORM

BEGIN BY CHECKING ANY OF THE FOLLOWING (a. – e.) THAT APPLY:

a. The wetland is contiguous to Lake Washington; No

b. The wetland contains at least 1/4 acre of organic soils, such as peat bogs or mucky soils; No

c. The wetland is equal to or greater than 10 acres in size and having three or more wetland classes, as defined by the U.S. Fish & Wildlife Service (Cowardin et al., 1979), one of which is open water; NO

d. The wetland has significant habitat value to state or federally listed threatened or endangered wildlife species; or No

e. The wetland contains state or federally listed threatened or endangered plant species. No

IF ANY OF THE CRITERIA LISTED ABOVE ARE MET, THEN THE WETLAND IS CONSIDERED TO BE TYPE 1. IF THAT IS THE CASE, PLEASE CONTINUE TO COMPLETE THE ENTIRE FORM, BUT DO NOT ASSIGN POINTS.

IF THE WETLAND DOES NOT MEET THE CRITERIA LISTED ABOVE FOR TYPE 1, COMPLETE THE ENTIRE FORM, USING THE ASSIGNED POINTS TO DETERMINE IF IT IS A TYPE 2 OR TYPE 3 WETLAND.

Type 2 wetlands typically have at least two wetland vegetation classes, are at least partially surrounded by buffers of native vegetation, connected by surface water flow (perennial or intermittent) to other wetlands or streams, and contain or are associated with forested habitat.

1. Total wetland area

Estimate wetland area and score from choices	Acres	Point Value	Points

>20.00	=	6
10-19.99	=	5
5-9.99	=	4
1-4.99	=	3
0.1-0.99	=	2
<0.1	=	1

2. Wetland classes: Determine the number of wetland classes that qualify, and score according to the table.

	# of Classes		Points
Open Water: if the area of open water is >1/3 acre or >10% of the total wetland area	1	=	1
Aquatic Beds: if the area of aquatic beds is >10% of the open water area or >1/2 acre	2	=	3
Emergent: if the area of emergent class is >1/2 acre or >10% of the total wetland area	3	=	5
Scrub-Shrub: if the area of scrub-shrub class is >1/2 acre or >10% of the total wetland area	4	=	7
Forested: if the area of forested class is >1/2 acre or >10% of the total wetland area	5	=	10

3. Plant species diversity.

For all wetland classes which qualified in 2 above, count the number of different plant species and score according to the table below. You do not have to name them.

e.g., if a wetland has an aquatic bed class with 3 species, and emergent class with 4 species and a scrub-shrub class with 2 species, you would circle 2, 2, and 1 in the second column (below).

Class	# of Species		Point Value
Aquatic Bed	1-2	=	1
	3	=	2
	>3	=	3
	NONE		

Class	# of Species		Point Value
Scrub-Shrub	1-2	=	1
	3-4	=	2
	>4	=	3
	NONE		

Emergent	1-2	=	1	Forested	1-2	=	1
	3-4	=	2		3-4	=	2
	>4	=	3		>4	=	3

4. Structural diversity.

If the wetland has a forested class, add 1 point for each of the following attributes present:

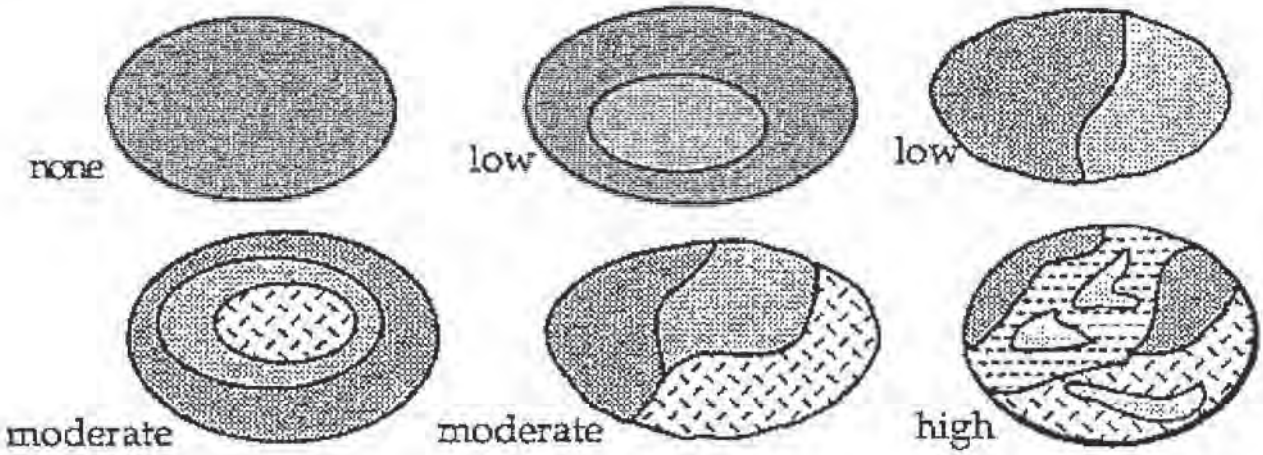
Trees >50′ tall	=	1
Trees 20′ to 49′ tall	=	1
shrubs	=	1
Herbaceous ground cover	=	1

NONE

5. Interspection between wetland classes.

Decide from the diagrams below whether interspection between wetland classes is high, moderate, low or none

3	=	High
2	=	Moderate
1	=	Low
0	=	None



6. Habitat features

Add points associated with each habitat feature listed:	= 3	
Is there evidence of current use by beavers?	= 2	
Is a heron rookery located within 300'?	= 1	NONE
Are raptor nest(s) located within 300'?	= 1	
Are there at least 2 standing dead trees (snags) per acre?2	= 1	
Are there any other perches (wires, poles, or posts)?	= 1	
Are there at least 3 downed logs per acre?	= 1	

7. Connection to streams

Is the wetland connected at any time of the year via surface water? (score one answer only)

Is the wetland connected at any time of the year via surface water?

To a perennial stream or a seasonal stream with fish	= 5
To a seasonal stream without fish	= 3
Is not connected to any stream	= 0

8. Buffers

Step 1: Estimate (to the nearest 5%) the percentage of each buffer or land-use type (below) that adjoins the wetland boundary. Then multiply these percentages by the factor(s) below and enter result in the column to the right.

	% of Buffer	Step 1	Width Factor	Step 2
Roads, buildings or parking lots	50 % X 0 =	0	=	
Lawn, grazed pasture, vineyards or annual crops	% X 1 =		=	
Ungrazed grassland or orchards	% X 2 =		=	
Open water or native grasslands	% X 3 =		=	
Forest or shrub	50 % X 4 =	200 x 3	=	600
			Add buffer total	

Step 2: Multiply result(s) of step 1:

By 1 if buffer width is 25-50′

By 2 if buffer width is 50-100′

By 3 if buffer width is >100′

Enter results and add subscores

Step 3: Score points according to the following table:

Buffer Total

900-1200 = 4

600-899 = 3

300-599 = 2

100-299 = 1

9. Connection to other habitat areas:

Is there a riparian corridor to other wetlands within 0.25 of a mile, or a corridor >100′ wide with good forest or shrub cover to any other habitat area? = 5

Is there a narrow corridor <100′ wide with good cover or a wide corridor >100′ wide with low cover to any other habitat area? = 3

Is there a narrow corridor <100′ wide with low cover or a significant habitat area within 0.25 mile but no corridor? = 1

Is the wetland and buffer completely isolated by development and/or cultivated agricultural land? = 0

10. Scoring

Add the scores to get a total: 13

Question: Is the total greater than or equal to 22 points?

Answer:

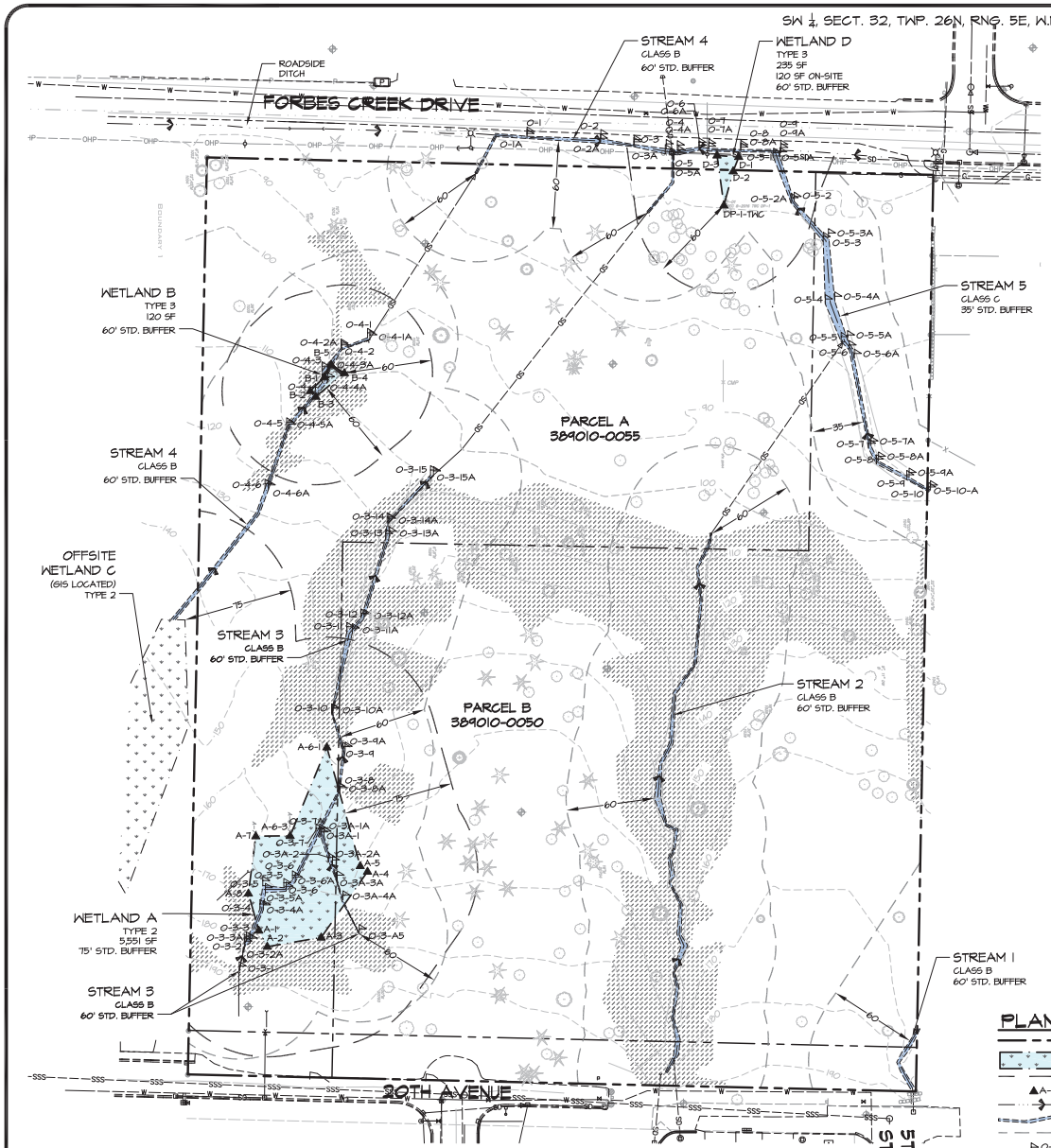
Yes = Type 2

No = Type 3

APPENDIX B

FINAL CRITICAL AREAS MITIGATION PLAN

Sheet W1.0. Existing Conditions Plan
Sheet W1.1. Proposed Site Plan, Impacts & Mitigation Overview
Sheet W2.0. Clearing, Grubbing, and Habitat Feature Plan
Sheet W2.1. Habitat Feature Sections, Details and Notes
Sheet W3.0. Planting Plan
Sheet W3.1. Planting Plan, Plant Schedule, Details and Notes
Sheet W3.2. Planting Specifications
Sheet W4.0. Goals, Objectives & Bond Quantity Worksheet



EXISTING CONDITIONS PLAN

GRAPHIC SCALE (IN FEET)
0 20 40 80
SCALE: 1"=40'
NORTH

VICINITY MAP

NTS

SOURCE: GOOGLE MAPS; WWW.MAPS.GOOGLE.COM (ACCESSED 5/28/2017)

NORTH

CONTACTS

APPLICANT

NAME:	ORCAS MOON, LLC
ADDRESS:	P.O. BOX 2710 REDMOND, WA 98073
PHONE:	(206) 550-5560
CONTACT:	ROBERT LONDO

SURVEYOR

NAME:	AXIS SURVEY & MAPPING
ADDRESS:	15241 NE 90TH ST REDMOND, WA 98052
PHONE:	(425) 823-5100
CONTACT:	STEVE PHILLIPS, PLS

ENGINEER

NAME:	THE BLUELINE GROUP
ADDRESS:	25 CENTRAL WAY KIRKLAND, WA 98033
PHONE:	(425) 216-4051
CONTACT:	NICK RASOR, PE

ENVIRONMENTAL CONSULTANT

NAME:	TALASAEA CONSULTANTS, INC.
ADDRESS:	15020 BEAR CREEK RD. NE WOODINVILLE, WA 98077
PHONE:	(425) 861-7550
CONTACT:	ANN OLSEN, SENIOR PROJECT MANAGER DAVID TEESDALE, PWS, SENIOR WETLAND ECOLOGIST

SHEET INDEX

PLAN LEGEND

- PROPERTY LINE
- EXISTING WETLAND
- WETLAND BUFFER - STANDARD
- A-# WETLAND FLAG LOCATION
- STREAM CENTERLINE
- STREAM ORDINARY HIGH WATER MARK (OHWM)
- STREAM BUFFER - STANDARD
- O-# OHWM FLAG
- DITCH CENTERLINE
- CRITICAL SLOPE AREA (SEE GEOTECHNICAL REPORT)
- 100 EXISTING 10-FT CONTOURS
- CONIFER DECID. EXISTING TREES

Know what's below. Call before you dig.

NOTES

1. SURVEY PROVIDED BY AXIS SURVEY AND MAPPING, 15241 NE 90TH ST REDMOND, WA 98052, (425) 823-5100
2. SITE PLAN PROVIDED BY THE BLUELINE GROUP, 25 CENTRAL WAY KIRKLAND, WA 98033, (425) 216-4051.
3. GEOTECHNICAL REPORT PROVIDED BY ASSOCIATED EARTH SCIENCES INC. 911 FIFTH AVENUE KIRKLAND, WA 98033, (425) 827-7701.
4. SOURCE DRAWING WAS MODIFIED BY TALASAEA CONSULTANTS FOR VISUAL ENHANCEMENT.
5. THIS PLAN IS AN ATTACHMENT TO THE CRITICAL AREAS REPORT PREPARED BY TALASAEA CONSULTANTS IN OCTOBER, 2018.

APPROVED FOR CONSTRUCTION

BY:

CITY OF KIRKLAND PLANNING AND BUILDING DEPT.

DATE:

TALASAEA CONSULTANTS, INC.
Resource & Environmental Planning
15020 Bear Creek Road Northeast - Woodinville, Washington 98077
Bus (425) 861-7550 - Fax (425) 861-9548

FINAL CRITICAL AREAS MITIGATION PLAN
EXISTING CONDITIONS PLAN
ORCAS MOON COTTAGES
KIRKLAND, WASHINGTON

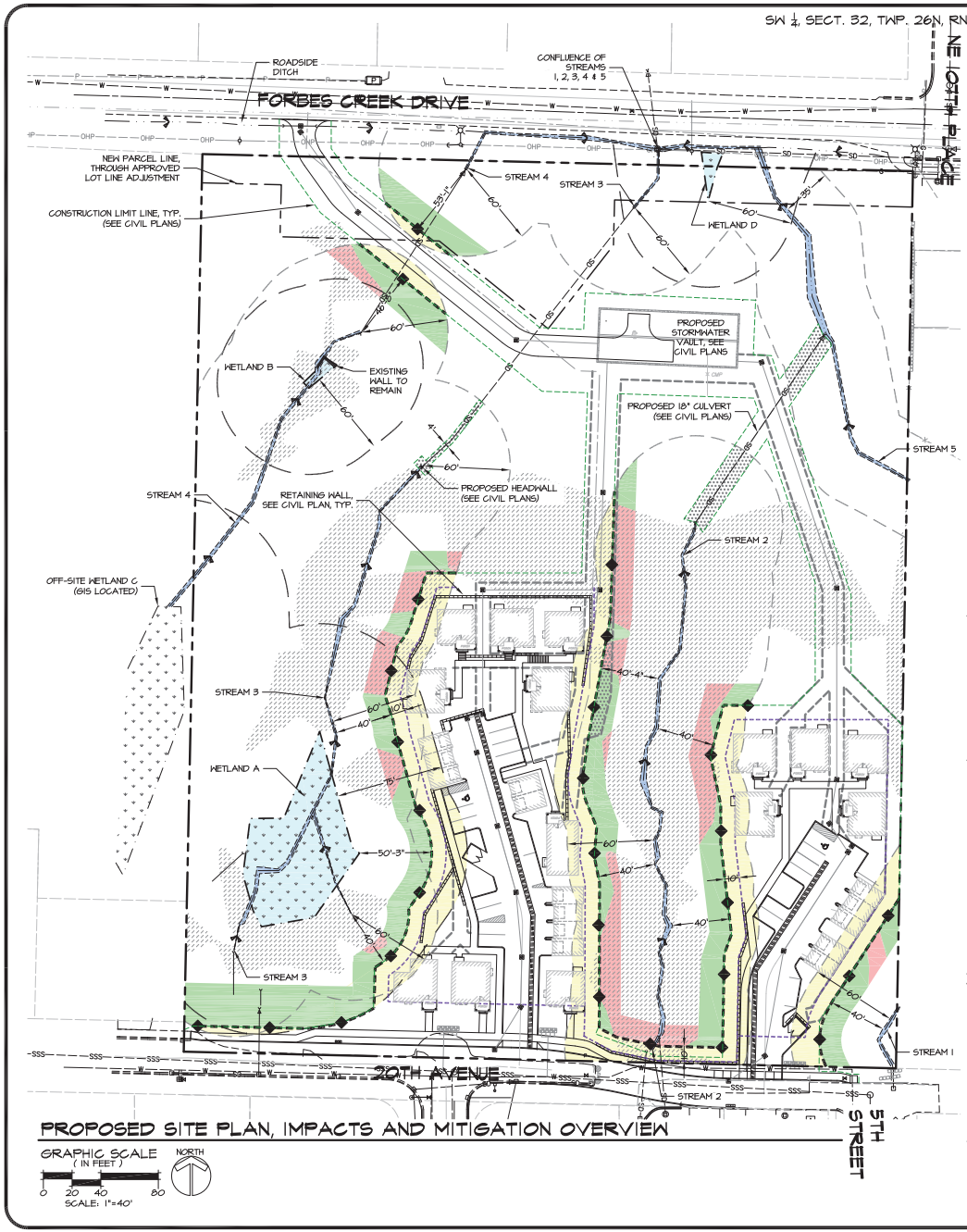
Revisions	Date	By
UPDATED SURVEY	A0/OA	10/17/17
CITY COMMENTS	A0/OA	11/9/17
CITY COMMENTS	ABS	11/20/18
CITY COMMENTS	ABS	11/26/18
CITY COMMENTS	ABS	10/31/18

Date	5/31/2017
Scale	AS SHOWN
Designed	AO/DT
Drawn	MH/ABS
Checked	AO
Approved	BS

Project # 518B

Sheet # W1.0

SW ¼, SECT. 32, TWP. 26N, RNG. 5E, W.M.



PROPOSED SITE PLAN, IMPACTS AND MITIGATION OVERVIEW

IMPACTS LEGEND

BUFFER REDUCTION*	24,222 SF
TEMPORARY CONSTRUCTION IMPACTS	2,829 SF
TOTAL IMPACTS:	27,051 SF

* ANY BUFFER REDUCTION SHALL NOT EXCEED ONE-THIRD (⅓) BUFFER WIDTH PER KZC 90.45(1) (WETLANDS) AND KZC 90.90(1) (STREAMS)

MITIGATION LEGEND

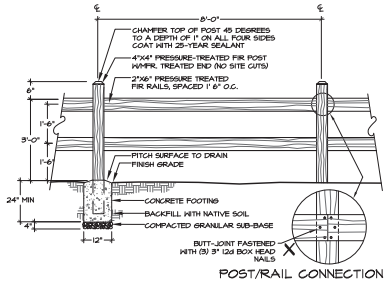
BUFFER ENHANCEMENT (STRATEGY 1)	17,415 SF
BUFFER ENHANCEMENT (STRATEGY 2)	7,665 SF
TOTAL BUFFER ENHANCEMENT**:	25,080 SF
RESTORATION OF TEMPORARY CONSTRUCTION IMPACTS	2,829 SF
TOTAL MITIGATION:	27,909 SF

** < 1:1 MITIGATION RATIO (REDUCTION TO ENHANCEMENT)

PLAN LEGEND

- PROPERTY LINE
- EXISTING WETLAND
- WETLAND BUFFER - STANDARD
- STREAM CENTERLINE
- STREAM ORDINARY HIGH WATER MARK (OHWM)
- STREAM BUFFER - STANDARD
- POST CONSTRUCTION BUFFER, LOCATION OF 2-BOARD FENCE, SEE DETAIL 1/W1
- CRITICAL AREAS SIGN - SEE DETAIL 2/W1
- 10' BUILDING SET BACK LINE (BSBL)
- DITCH CENTERLINE
- UTILITY EASEMENT
- CRITICAL SLOPE AREA (SEE GEOTECHNICAL REPORT)

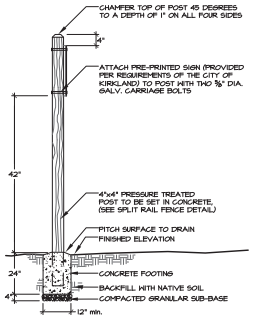
NOTE: WHERE APPLICABLE, CRITICAL AREA FENCE SHALL BE DESIGNATED AS THE SAFETY FENCING ON ADJACENT PROPOSED WALLS. SEE CIVIL PLANS.



NOTES:
1. RAIL FENCE TO ALIGN WITH LAND GRADIENT.
2. TREAT WITH CLEAR PRESERVATIVE UPON COMPLETION OF INSTALLATION.
3. ALL FASTENERS TO BE GALVANIZED STEEL.

1 OPEN 2-BOARD FENCE DETAIL

N.T.S.



NOTE: CRITICAL AREA SIGNS SHALL BE PLACED 50' APART.

2 CRITICAL AREA SIGN DETAIL

N.T.S.

NOTES

1. SURVEY PROVIDED BY AXIS SURVEY AND MAPPING, 15241 NE 40TH ST REDMOND, WA 98052, (425) 823-5700
2. SITE PLAN PROVIDED BY THE BLUELINE GROUP, 25 CENTRAL WAY KIRKLAND, WA 98033, (425) 216-4051.
3. GEOTECHNICAL REPORT PROVIDED BY ASSOCIATED EARTH SCIENCES INC. 911 FIFTH AVENUE KIRKLAND, WA 98033, (425) 827-7701.
4. SOURCE DRAWING WAS MODIFIED BY TALASAEA CONSULTANTS FOR VISUAL ENHANCEMENT.
5. THIS PLAN IS AN ATTACHMENT TO THE CRITICAL AREAS REPORT PREPARED BY TALASAEA CONSULTANTS IN OCTOBER, 2018.

APPROVED FOR CONSTRUCTION

BY:

CITY OF KIRKLAND PLANNING AND BUILDING DEPT.

DATE:

811 Know what's below. Call before you dig.

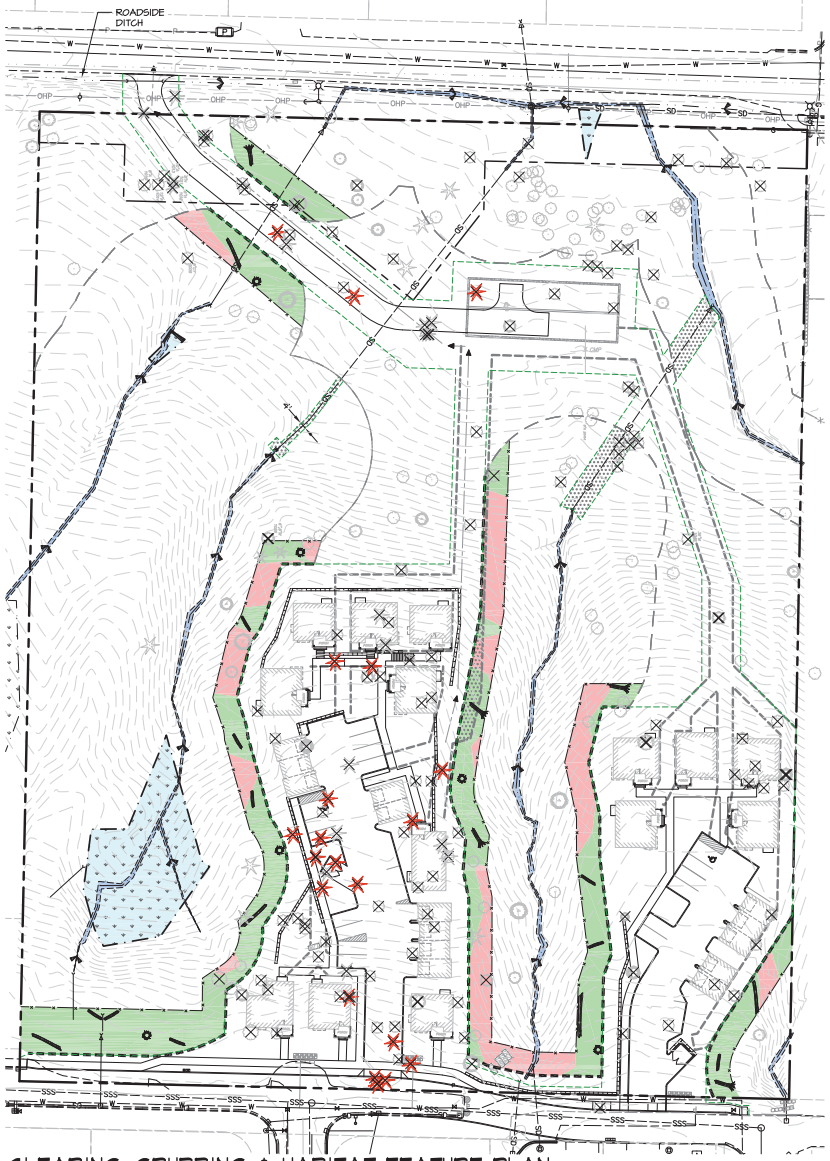
TALASAEA CONSULTANTS, INC.
Resource & Environmental Planning
15200 Bear Creek Road Northeast - Woodinville, Washington 98077
Bus (425) 861-7800 - Fax (425) 861-7848

FINAL CRITICAL AREAS MITIGATION PLAN
PROPOSED SITE PLAN, IMPACTS AND MITIGATION OVERVIEW
ORCAS MOON COTTAGES
KIRKLAND, WASHINGTON

Revisions	Date	By
UPDATED SURVEY	AO/OA	10/17/17
CITY COMMENTS	AO/OA	11/9/17
CITY COMMENTS	ABS	11/20/18
CITY COMMENTS	ABS	11/26/18
CITY COMMENTS	ABS	10/31/18

Date	5/31/2017
Scale	AS SHOWN
Designed	AO/DT
Drawn	MV/ABS
Checked	AO
Approved	BS
Project #	518B
Sheet #	W1.1

SW ¼, SECT. 32, TWP. 26N, RNG. 5E, W.M.



CLEARING, GRUBBING & HABITAT FEATURE PLAN

GRAPHIC SCALE (IN FEET) 0 20 40 80
SCALE: 1"=40'
NORTH

TREE LIST FOR LARGE WOODY DEBRIS RECRUITMENT

TREE NO.	DBH	Species	Viable Tree	Retain
20297	18	Douglas-fir	NO	LWD
20357	14	Douglas-fir		LWD
20362	10,14,14"	Western red-cedar		LWD
20543	20	Western red-cedar		LWD
20548	14	Western red-cedar		LWD
20667	16	Western hemlock		LWD
20682	24	Douglas-fir		LWD
20684	24	Western red-cedar		LWD
20689	26	Western red-cedar		LWD
20690	18	Western red-cedar		LWD
20694	18	Western red-cedar		LWD
20695	16	Western hemlock		LWD
20696	14	Western red-cedar		LWD
20700	20	Western red-cedar		LWD
20741	18	Western red-cedar		LWD
20742	22	Western red-cedar		LWD
20743	16	Western red-cedar		LWD
22119	14	Western hemlock	NO	LWD
22120	18	Western red-cedar		LWD
22121	18	Western red-cedar		LWD

NOTE: SEE CIVIL PLANS FOR ADDITIONAL INFORMATION REGARDING TREES TO BE SAVED FOR MITIGATION

CLEARING AND GRUBBING LEGEND

CLEARING COORDINATED BY OTHERS. (SEE CIVIL PLANS)	2,829 SF
CLEAR & GRUB NON-NATIVE AND INVASIVE SPECIES. CLEARING METHODS TO BE DETERMINED DEPENDING UPON ACCESS.	17,415 SF
CUT INVASIVE SPECIES DOWN TO GROUND-LEVEL WITHIN AREAS OF GREATER THAN 40% SLOPES. MAINTAIN ROOTS TO AID IN SOIL STABILITY	7,665 SF
TOTAL CLEARING AND GRUBBING:	27,909 SF

HABITAT FEATURE LEGEND

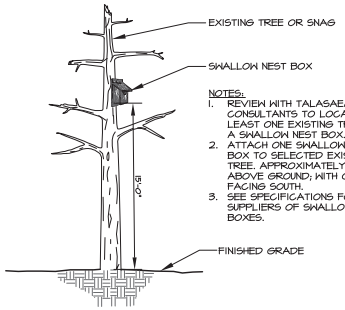
- CLEARING LIMITS - SEE CIVIL PLANS
- SILT FENCE; SEE DETAIL 3/W2.0
- JUTE FABRIC/STEEP SLOPES; SEE EXAMPLE 1/W2.1
- LARGE WOODY DEBRIS: LOGS AND ROOTWADS
- LARGE WOODY DEBRIS: STUMP WITH PLANTING POCKETS - SEE DETAIL 2/W2.0

NOTE: SEE NOTES FOR CLEARING, GRUBBING AND HABITAT FEATURE INSTALLATION ON SHEET W2.1.

FINAL LARGE WOODY DEBRIS QUANTITY AND PLACEMENT TO BE DETERMINED IN FIELD.

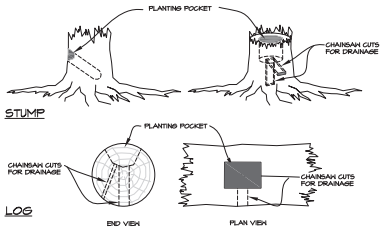
PLAN LEGEND

- PROPERTY LINE
- EXISTING WETLAND
- STREAM CENTERLINE
- STREAM ORDINARY HIGH WATER MARK (OHWM)
- POST CONSTRUCTION BUFFER
- POST CONSTRUCTION BUFFER/ 2-BOARD FENCE; SEE DETAIL 1/W2.1
- DITCH CENTERLINE
- UTILITY EASEMENT
- EXISTING 2-FT CONTOURS
- CONIFER DECID. — EXISTING TREES TO REMAIN
- CONIFER DECID. — EXISTING TREES TO BE REMOVED (SEE CIVIL PLANS)
- CONIFER — EXISTING TREES TO BE STOCKPILED FOR LARGE WOODY DEBRIS RECRUITMENT. SEE CIVIL PLANS FOR SPECIFIC TREE NUMBER LOCATIONS.



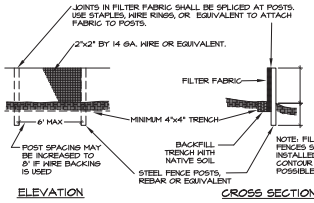
NOTES:
1. REVIEW WITH TALASAEA CONSULTANTS TO LOCATE AT LEAST ONE EXISTING TREE FOR A SWALLOW NEST BOX.
2. ATTACH ONE SWALLOW NEST BOX TO SELECTED EXISTING TREE. APPROXIMATELY 15 FEET ABOVE GROUND; WITH OPENING FACING SOUTH.
3. SEE SPECIFICATIONS FOR SUPPLIERS OF SWALLOW NEST BOXES.

1 NEST BOX INSTALLATION DETAIL
SCALE: NTS



NOTE: SEE PLANT SCHEDULE FOR POCKET PLANT SPECIES SELECTION

2 STUMP WITH PLANTING POCKETS DETAIL
1"=1'



SILT FENCE MAINTENANCE STANDARDS:
1. ANY DAMAGE SHALL BE REPAIRED IMMEDIATELY.
2. IF CONCENTRATED FLOWS ARE EVIDENT UP-SLOPE OF THE FENCE, THEY MUST BE INTERCEPTED AND CONVEYED TO A SEDIMENT POND.
3. CONTRACTOR SHALL CHECK THE UP-SLOPE SIDE OF THE FENCE FOR SIGNS OF CLOGGING AND SUBSEQUENT CHANNELIZATION OF FLOWS PARALLEL TO THE FENCE. IF THIS OCCURS, REPLACE THE FENCE AND/OR REMOVE THE TRAPPED SEDIMENT.
4. SEDIMENT SHALL BE REMOVED WHEN ACCUMULATION EXCEEDS 6" IN DEPTH.

3 SILT FENCE DETAIL
SCALE: NTS

811 Know what's below. Call before you dig.

NOTES

1. SURVEY PROVIDED BY AXIS SURVEY AND MAPPING, 15241 NE 90TH ST REDMOND, WA 98052, (425) 823-5100
2. SITE PLAN PROVIDED BY THE BLUELINE GROUP, 25 CENTRAL WAY KIRKLAND, WA 98033, (425) 216-4051.
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APPROVED FOR CONSTRUCTION

BY:

CITY OF KIRKLAND PLANNING AND BUILDING DEPT.

DATE:

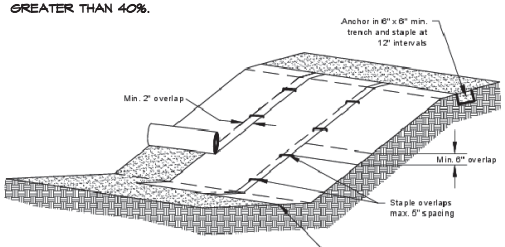
TALASAEA CONSULTANTS, INC.
Resource & Environmental Planning
15000 Bear Creek Road Northeast - Woodinville, Washington 98077
Bus (425) 861-7800 - Fax (425) 861-7848

FINAL CRITICAL AREAS MITIGATION PLAN
CLEARING, GRUBBING & HABITAT FEATURE PLAN
ORCAS MOON COTTAGES
KIRKLAND, WASHINGTON

Revisions		Date	By
UPDATED SURVEY		AO/OA	10/17/17
CITY COMMENTS		AO/OA	11/9/17
CITY COMMENTS		ABS	11/20/18
CITY COMMENTS		ABS	11/25/18
CITY COMMENTS		ABS	10/31/18

Date	5/31/2017
Scale	AS SHOWN
Designed	AO/DT
Drawn	MN/ABS
Checked	AO
Approved	BS
Project #	518B
Sheet #	W2.0

DISCLAIMER: THIS DETAIL IS PROVIDED FOR PLANNING PURPOSES ONLY. ALL DETAILS AND PLANS FOR SLOPE STABILIZATION SHALL BE REVIEWED AND APPROVED BY THE GEO-TECHNICAL ENGINEER PRIOR TO THE START OF ANY CLEARING OR GRUBBING ACTIVITIES ON SLOPES GREATER THAN 40%.



Notes:
1. Slope surface shall be smooth before placement for proper soil contact.
2. Stapling pattern as per manufacturer's recommendations.
3. Do not stretch blankets/mattings tight - allow the rolls to mold to any irregularities.
4. For slopes less than 3H:1V, rolls may be placed in horizontal strips.
5. If there is a berm at the top of the slope, anchor upslope of the berm.
6. Lime, fertilize, and seed before installation. Planting of shrubs, trees, etc. should occur after installation.

NOT TO SCALE

DEPARTMENT OF ECOLOGY State of Washington

Slope Installation

Revised June 2016

DEPARTMENT OF ECOLOGY INSTALLATION NOTES FOR JUTE NETS AND/OR BLANKETS ON SLOPES:

1. UPON COMPLETION OF CLEARING AND/OR FINAL GRADING, TRACK WALK UP AND DOWN THE SLOPE.
2. DIG A SMALL TRENCH, APPROXIMATELY 12 INCHES WIDE BY 6 INCHES DEEP ALONG THE TOP OF THE SLOPE.
3. INSTALL THE LEADING EDGE OF THE NET/BLANKET INTO THE SMALL TRENCH AND STAPLE APPROXIMATELY EVERY 18 INCHES. NOTE: USE BIODEGRADABLE STAKES TO SECURE NETTING.
4. ROLL THE NET/BLANKET SLOWLY DOWN THE SLOPE AS THE INSTALLER WALKS BACKWARD. NOTE: THE NET/BLANKET RESTS AGAINST THE INSTALLER'S LEGS. STAPLES ARE INSTALLED AS THE NET/BLANKET IS UNROLLED. IT IS CRITICAL THAT THE PROPER STAPLE PATTERN IS USED FOR THE NET/BLANKET BEING INSTALLED. THE NET/BLANKET IS NOT TO BE ALLOWED TO ROLL DOWN THE SLOPE ON ITS OWN AS THIS STRETCHES THE NET/BLANKET, MAKING IT IMPOSSIBLE TO MAINTAIN SOIL CONTACT. IN ADDITION, NO ONE IS ALLOWED TO WALK ON THE NET/BLANKET AFTER IT IS IN PLACE.
5. IF THE NET/BLANKET IS NOT LONG ENOUGH TO COVER THE ENTIRE SLOPE LENGTH, THE TRAILING EDGE OF THE UPPER NET/BLANKET SHOULD OVERLAP THE LEADING EDGE OF THE LOWER NET/BLANKET AND BE STAPLED. ON STEEPER SLOPES, THIS OVERLAP SHOULD BE INSTALLED IN A SMALL TRENCH, STAPLED, AND COVERED WITH SOIL.
6. USE JUTE MATTING IN CONJUNCTION WITH MULCH (BMP C121: MULCHING). EXCELSIOR, WOVEN STRAW BLANKETS AND COIR (COCONUT FIBER) BLANKETS MAY BE INSTALLED WITHOUT MULCH. THERE ARE MANY OTHER TYPES OF EROSION CONTROL NETS AND BLANKETS ON THE MARKET THAT MAY BE APPROPRIATE IN CERTAIN CIRCUMSTANCES.
7. MULCH MAY BE NECESSARY TO PREVENT EROSION DUE TO JUTE MATTING WITH A FAIRLY OPEN STRUCTURE. CONTRACTOR AND OWNER MAY SELECT JUTE BLANKETS WHICH TYPICALLY DO NOT REQUIRE MULCH BECAUSE THEY USUALLY PROVIDE COMPLETE PROTECTION OF THE SURFACE.

NOTE: DUE TO THE VARIETY OF PRODUCTS AVAILABLE, CONSULT THE MANUFACTURER'S INFORMATION AND REQUEST A SITE VISIT WITH CIVIL ENGINEER AND/OR GEOTECHNICAL CONSULTANT TO ENSURE THAT THE PRODUCT SPECIFIED IS APPROPRIATE. INFORMATION IS ALSO AVAILABLE IN SECTION 3.2.4 OF WSDOT'S TRAINING MANUAL FOR THE CONSTRUCTION SITE EROSION AND SEDIMENT CONTROL CERTIFICATION COURSE (WSDOT, N.D.).

1 JUTE NETTING MAT INSTALLATION NOTES & DETAIL

SCALE: NTS

NOTES FOR CLEARING, GRUBBING, AND HABITAT FEATURE INSTALLATION

PART 1: GENERAL

1.1 SEQUENCING

A. GENERAL CONSTRUCTION:
1. CONTRACTOR SHALL GIVE TALASAEA CONSULTANTS, AND/OR PROJECT ECOLOGIST, A MINIMUM OF TEN (10) DAYS NOTICE PRIOR TO BEGINNING CONSTRUCTION TO COORDINATE ENHANCEMENT WORK AREA.
2. NO CONSTRUCTION WORK SHALL COMMENCE UNTIL THERE IS A MEETING BETWEEN THE CLIENT, TALASAEA CONSULTANTS, GENERAL, CLEARING, AND/OR EARTHWORK CONTRACTORS, AND THE LANDSCAPE CONTRACTOR. THE APPROVED PLANS AND SPECIFICATIONS SHALL BE REVIEWED TO ENSURE THAT ALL PARTIES INVOLVED UNDERSTAND THE CONSTRUCTION DOCUMENTS, SPECIFICATIONS AND SITE CONSTRAINTS.
3. LOCATIONS OF EXISTING UTILITIES SHALL BE OBTAINED FROM AVAILABLE RECORDS AND SHOULD BE CONSIDERED APPROXIMATE ONLY AND NOT NECESSARILY COMPLETE. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO: (1) INDEPENDENTLY VERIFY THE ACCURACY OF UTILITY LOCATIONS AND (2) DISCOVER AND AVOID ANY UTILITIES WITHIN THE MITIGATION PLAN AREA(S) THAT ARE NOT SHOWN, BUT WHICH MAY BE AFFECTED BY IMPLEMENTATION OF THE PLAN. SUCH AREA(S) ARE TO BE CLEARLY MARKED IN THE FIELD.
4. A COPY OF THE APPROVED PLANS MUST BE ON SITE WHENEVER CONSTRUCTION IS IN PROGRESS, AND SHALL REMAIN ON SITE UNTIL PROJECT COMPLETION.
5. CONSTRUCTION MUST BE PERFORMED IN ACCORDANCE WITH ALL AGENCY STANDARDS, RULES, CODES, PERMIT CONDITIONS, AND/OR OTHER APPLICABLE ORDINANCES AND POLICIES.
6. THE PROJECT OWNER/APPLICANT IS RESPONSIBLE FOR OBTAINING ANY OTHER RELATED OR REQUIRED PERMITS PRIOR TO THE START OF CONSTRUCTION.
7. A QUALIFIED ECOLOGIST SHALL BE ON SITE, AS NECESSARY, TO MONITOR MITIGATION CONSTRUCTION AND APPROVE MINOR REVISIONS TO THE PLAN.
8. DURING CONSTRUCTION, THE CONTRACTOR MUST USE MATERIALS AND CONSTRUCTION METHODS THAT PREVENT TOXIC SUBSTANCES AND OTHER POLLUTANTS FROM ENTERING MITIGATION AREAS OR OTHER NATURAL WATERS OF THE STATE.
9. PREVENTATIVE MEASURES SHALL BE USED TO PROTECT EXISTING STORM DRAINAGE SYSTEMS, EXISTING UTILITIES, AND ROADS.
10. THE CONTRACTOR SHALL PROVIDE SEDIMENT AND EROSION CONTROLS AROUND THE PROJECT AREA PRIOR TO SOIL DISTURBANCE FROM CONSTRUCTION ACTIVITY.

B. MITIGATION CONSTRUCTION: THE FOLLOWING PROVIDES THE GENERAL SEQUENCE OF ACTIVITIES ANTICIPATED TO BE NECESSARY TO COMPLETE THIS MITIGATION PROJECT. SOME OF THESE ACTIVITIES MAY BE CONDUCTED CONCURRENTLY AS THE PROJECT PROGRESSES.
1. CONDUCT A SITE MEETING BETWEEN THE CONTRACTOR, TALASAEA CONSULTANTS, AND THE OWNER'S REPRESENTATIVE TO REVIEW THE PROJECT PLANS, WORK AREAS, STAGING/STOCKPILE AREAS, AND MATERIAL DISPOSAL AREAS.
2. SURVEY CLEARING/GRADING LIMITS PER CIVIL ENGINEERING PLANS.
3. FLAG EXISTING TREES AND OTHER VEGETATION TO REMAIN.
4. INSTALL SILT FENCING, TREE PROTECTION FENCING (IF REQUIRED), AND ANY OTHER EROSION AND SEDIMENTATION CONTROL BMPS NECESSARY FOR WORK IN THE PROJECT AREAS PER CIVIL PLANS.
5. GRUB OUT INVASIVE SPECIES IN BUFFER AREAS AS DETERMINED BY TALASAEA IN THE FIELD.
6. INSTALL JUTE FABRIC IN AREAS WITH SLOPES OVER 40%. MATERIALS, AND DETAILS OF INSTALLATION SHALL BE APPROVED BY PROJECT CIVIL ENGINEER AND/OR GEOTECHNICAL ENGINEER.
7. INSTALL HABITAT FEATURES (DOWN LOGS, ROOTWADS AND STUMPS). A REPRESENTATIVE OF TALASAEA MUST BE PRESENT ONSITE TO ASSIST IN THE PLACEMENT OF HABITAT FEATURES.
8. MULCH ALL GRUBBED & PLANTED BUFFER AREAS.
9. COMPLETE SITE CLEANUP AND INSTALL PLANT MATERIAL AS INDICATED ON THE PLANTING PLAN.
10. INSTALL OPEN 2-BOARD FENCE AND CRITICAL AREA SIGNS.

1.2 PROJECT CONDITIONS

A. PROTECTION AND MAINTENANCE OF OFF-SITE AREAS: CONTRACTOR SHALL ENSURE THAT CONSTRUCTION RELATED ACTIVITIES DO NOT DAMAGE OFF-SITE FEATURES OR ADJACENT VEGETATION. TALASAEA CONSULTANTS SHALL BE NOTIFIED IMMEDIATELY IF ACCIDENTAL DAMAGE OCCURS. CONTRACTOR SHALL COMPLY WITH THE GOVERNING JURISDICTION'S CODES REGARDING STREET MAINTENANCE/CLEANING DURING CONSTRUCTION.

B. PLAN CHANGES AND MODIFICATIONS: ANY ADDITIONAL CHANGES OR MODIFICATIONS TO THE MITIGATION PLANS OR SPECIFICATIONS MUST RECEIVE PRIOR APPROVAL FROM THE OWNER'S REPRESENTATIVE, TALASAEA CONSULTANTS, AND APPLICABLE AGENCIES.

1.3 WARRANTY

A. WARRANTY TERMS AND CONDITIONS: A CONTRACTOR-PROVIDED WARRANTY SHALL EXTEND FOR A PERIOD OF ONE YEAR FROM THE DATE OF PHYSICAL COMPLETION. PHYSICAL COMPLETION FOR THE WORK OF THIS SECTION IS THE DATE WHEN ALL CLEARING/GRUBBING, HABITAT FEATURE PLACEMENT, PLANTING, IRRIGATION, AND RELATED PHASES OF SUCH WORK HAVE BEEN COMPLETED AND ARE ACCEPTABLE TO THE OWNER'S REPRESENTATIVE, TALASAEA CONSULTANTS, AND APPLICABLE AGENCIES.

PART 2: PRODUCTS AND MATERIALS

2.1 HABITAT FEATURES

A. DOWN LOGS/ROOTWADS: DOWN LOGS SHALL BE SITE SOURCED WOOD MATERIAL OF CONIFER SPECIES, HAVE A 10 FOOT MINIMUM LENGTH, WITH OR WITHOUT ROOTS, AND A MINIMUM DIAMETER OF 14 INCHES. BARK SHALL BE KEPT INTACT. ENDS THAT HAVE BEEN CUT SHALL BE DISTRESSED AND NOT BLUNT.

B. STUMPS: STUMPS SHALL BE SITE SOURCED MATERIAL OF COTTONWOOD, CEDAR OR FIR SPECIES. STUMPS SHALL BE PART-DECAYED, RELOCATED STUMPS OR CUT LIVE ROOTWADS WITH A MINIMUM OF THREE FEET OF TRUNK GREATER THAN 6 INCHES IN DIAMETER. ENDS THAT HAVE BEEN CUT SHALL BE DISTRESSED AND NOT BLUNT. TREAT PLANTING POCKETS WITH COMPOSTED MULCH. PLANT POCKET PER PLAN.

2.3 TOPSOIL

A. TOPSOIL: TOPSOIL THAT HAS BEEN STOCKPILED ON-SITE FOR REUSE IN PROJECT AREA(S) OR IMPORTED FROM OFF-SITE SOURCES SHALL BE FERTILE, FRIABLE, SANDY LOAM SURFACE SOIL, FREE OF SUBSOIL, CLAY LUMPS, BRUSH, WEEDS, ROOTS, STUMPS, STONES LARGER THAN 1 INCH IN ANY DIMENSION, LITTER, OR ANY OTHER EXTRANEOUS OR TOXIC MATTER HARMFUL TO PLANT GROWTH.

B. ORGANIC CONTENT: IMPORTED TOPSOIL SHALL CONSIST OF ORGANIC MATERIALS AMENDED AS NECESSARY TO PRODUCE A BULK ORGANIC CONTENT OF AT LEAST 10 PERCENT AND NOT GREATER THAN 20 PERCENT, AS DETERMINED BY AASHTO-T-194.

2.4 MULCH

A. BARK OR WOODCHIP MULCH SHALL BE DERIVED FROM DOUGLAS FIR, PINE, OR HEMLOCK SPECIES. THE MULCH SHALL NOT CONTAIN RESIN, TANNIN, OR OTHER COMPOUNDS IN QUANTITIES THAT WOULD BE DETRIMENTAL TO ANIMAL, PLANT LIFE OR WATER QUALITY. SANDUST SHALL NOT BE USED AS MULCH.

B. MULCH SHALL BE MEDIUM-COARSE GROUND WITH AN APPROXIMATELY 3-INCH MINUS PARTICLE SIZE. FINE PARTICLES SHALL BE MINIMIZED SO THAT NOT MORE THAN 30% BY LOOSE VOLUME, WILL PASS THROUGH A US NO. 4 SIEVE.

PART 3: EXECUTION

A. SURVEY/STAKE/FLAG LIMITS OF CLEARING:
1. COORDINATE WITH CIVIL PLANS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO REQUEST THAT TALASAEA CONSULTANTS REVIEW PRIOR TO STAKING ENHANCEMENT AREAS.

B. FLAG AND PROTECT EXISTING VEGETATION TO REMAIN:
1. CONTRACTOR SHALL BE RESPONSIBLE FOR AVOIDING DISTURBANCE TO EXISTING VEGETATION LOCATED OUTSIDE THE CLEARING LIMITS. NO REMOVAL OF ANY VEGETATION SHALL OCCUR WITHOUT PRIOR APPROVAL BY TALASAEA CONSULTANTS.

C. CONTRACTOR SHALL EXERCISE CARE TO PREVENT INJURY TO THE TRUNK, ROOTS, AND BRANCHES OF TREES AND SHRUBS TO REMAIN. ANY WOODY PLANT TO REMAIN THAT IS DAMAGED DURING CONSTRUCTION SHALL BE TREATED IMMEDIATELY AFTER DAMAGE OCCURS, AND TALASAEA CONSULTANTS SHALL BE NOTIFIED OF INCIDENT.

D. PLACE EROSION CONTROL MEASURES:
1. CONTRACTOR SHALL COORDINATE WITH CIVIL PLANS TO INSTALL SILT FENCING PRIOR TO ANY MITIGATION CONSTRUCTION ACTIVITY. OTHER EROSION CONTROL MEASURES SHALL BE INSTALLED AS NECESSARY OR AS REQUIRED. TALASAEA CONSULTANTS SHALL VERIFY AND APPROVE EROSION CONTROL MEASURES FOR MITIGATION WORK.
2. CONTRACTOR SHALL MAINTAIN EROSION CONTROL MEASURES FOR THE DURATION OF THE PROJECT. THESE MEASURES SHALL REMAIN IN PLACE UNTIL AUTHORIZATION IS GIVEN. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO REMOVE ALL EROSION CONTROL MEASURES WITHIN AND/OR ADJACENT TO SENSITIVE AREAS WHEN AUTHORIZED.
3. AS CONSTRUCTION PROGRESSES AND SEASONAL CONDITIONS DICTATE, EROSION CONTROL FACILITIES SHALL BE MAINTAINED AND/OR ALTERED AS REQUIRED BY TALASAEA CONSULTANTS TO ENSURE CONTINUED EROSION/SEDIMENTATION CONTROL.
4. WHERE POSSIBLE, NATURAL GROUNDCOVER VEGETATION SHALL BE MAINTAINED FOR EROSION CONTROL.

D. INVASIVE/NON-NATIVE VEGETATION REMOVAL FROM MITIGATION AREAS:
1. AS SHOWN ON SHEET W2.0, CONTRACTOR SHALL CLEAR & GRUB NON-NATIVE AND INVASIVE SPECIES WITHIN DESIGNATED AREAS. CLEARING METHODS TO BE DETERMINED DEPENDING UPON ACCESS, AS DEFINED BY PROJECT ECOLOGIST IN THE FIELD WITH CONTRACTOR.
2. INVASIVE/NON-NATIVE VEGETATION SHALL BE REMOVED BY HAND WITH MINIMAL DISTURBANCE TO THE EXISTING NATIVE VEGETATION TO REMAIN. IN AREAS OF GREATER THAN 40% SLOPES, MAINTAIN ROOTS TO AID IN SOIL STABILITY CUT INVASIVE SPECIES DOWN TO GROUND-LEVEL.
3. ALL GRUBBED VEGETATION SHALL BE EXPORTED FROM THE SITE AND DISPOSED OF IN AN APPROVED MANNER FOLLOWING ALL APPLICABLE LOCAL/STATE/FEDERAL REGULATIONS.

F. TOPSOIL

A. IN ALL BUFFER MITIGATION AREAS TO BE PLANTED, EXISTING SOIL SHALL BE AMENDED WITH HIGH QUALITY TOPSOIL (IMPORTED) TO PROVIDE A 3:1 MAX. GRADE IN ENHANCEMENT AREAS PER PLAN.

B. HABITAT FEATURES: PLACE HABITAT FEATURES UPON COMPLETION OF TOPSOIL AND/OR SOIL AMENDMENT PLACEMENT, AS DEPICTED ON THE MITIGATION PLANS AND DETAILS. TALASAEA CONSULTANTS SHALL APPROVE LOCATIONS PRIOR TO PLACEMENT.
1. DOWN LOGS: TO CUT/BREAK DOWN LOGS, FIRST SCORE THE LOG AT THE DESIRED LENGTH BY MECHANICAL MEANS, THEN SNAP THE LOG AT THE SCORED LOCATION TO CREATE A NATURAL LOOK TO THE BREAK. THEST BROKEN ENDS TO DISGUISE SAW CUTS. HABITAT FEATURES THAT HAVE BEEN CUT SHALL HAVE NO BLUNT ENDS.
2. STUMPS: STUMPS SHALL BE SET UPRIGHT.
3. BOULDERS: IF AVAILABLE, BOULDERS SHALL BE PLACED IN PILES AT LEAST 2 ROCKS DEEP (5 ROCK MIN. PER PILE), IN A MANNER THAT PROVIDES BOTH PHYSICAL STABILITY AND LARGE INTERNAL VOIDS.

I. MULCH CLEARED/GRUBBED BUFFER AREAS: TALASAEA CONSULTANTS SHALL BE PROVIDED A MULCH SAMPLE PRIOR TO IT BEING DELIVERED TO THE SITE. NO BUFFER AREAS SHALL BE SEEDED. CONTRACTOR SHALL SPREAD MULCH OVER ALL CLEARED BUFFER AREAS TO ACHIEVE A UNIFORM DEPTH OF 3 INCHES. NOTE: 3-INCH DEPTH IS THE MINIMUM AFTER SETTLING. IF MULCH IS INSTALLED BY BLOWER TRUCK IT SHALL BE INSTALLED AT A 4-INCH DEPTH TO PROVIDE A MINIMUM 3-INCH DEPTH AFTER SETTLING. NOT GRADED BUFFER AREAS SHALL BE MULCHED BY PLANTING RING PER PLANTING DETAILS 1-3; SHEET W3.1.

J. INSPECTIONS: PRIOR TO PLANT INSTALLATION, TALASAEA CONSULTANTS SHALL APPROVE ALL CLEARING/GRUBBING WORK AND HABITAT FEATURE PLACEMENT. IF ITEMS ARE TO BE CORRECTED, A PUNCH LIST SHALL BE PREPARED BY TALASAEA CONSULTANTS AND SUBMITTED TO THE CONTRACTOR FOR COMPLETION. AFTER PUNCH LIST ITEMS HAVE BEEN COMPLETED, TALASAEA CONSULTANTS SHALL REVIEW THE PROJECT FOR FINAL ACCEPTANCE OF PUNCH LIST ITEMS, AND PLANTING MAY THEN PROCEED.

K. SOIL STABILIZATION: IF THERE IS A DELAY IN CONSTRUCTION FOR ANY REASON, CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE OF EROSION CONTROL MEASURES, DRAINAGE, AND TEMPORARY IRRIGATION DURING CONSTRUCTION DELAY PERIOD, UNLESS OTHERWISE STATED IN WRITING.

NOTES

1. SURVEY PROVIDED BY AXIS SURVEY AND MAPPING, 15241 NE 90TH ST REDMOND, WA 98052, (425) 823-5100
2. SITE PLAN PROVIDED BY THE BLUELINE GROUP, 25 CENTRAL WAY KIRKLAND, WA 98033, (425) 216-4051.
3. GEOTECHNICAL REPORT PROVIDED BY ASSOCIATED EARTH SCIENCES INC. 911 FIFTH AVENUE KIRKLAND, WA 98033, (425) 827-7701.
4. SOURCE PLANTING WAS MODIFIED BY TALASAEA CONSULTANTS FOR VISUAL ENHANCEMENT.
5. THIS PLAN IS AN ATTACHMENT TO THE CRITICAL AREAS REPORT PREPARED BY TALASAEA CONSULTANTS IN OCTOBER, 2018.

Know what's below. Call before you dig.

APPROVED FOR CONSTRUCTION

BY:

CITY OF KIRKLAND PLANNING AND BUILDING DEPT.

DATE:

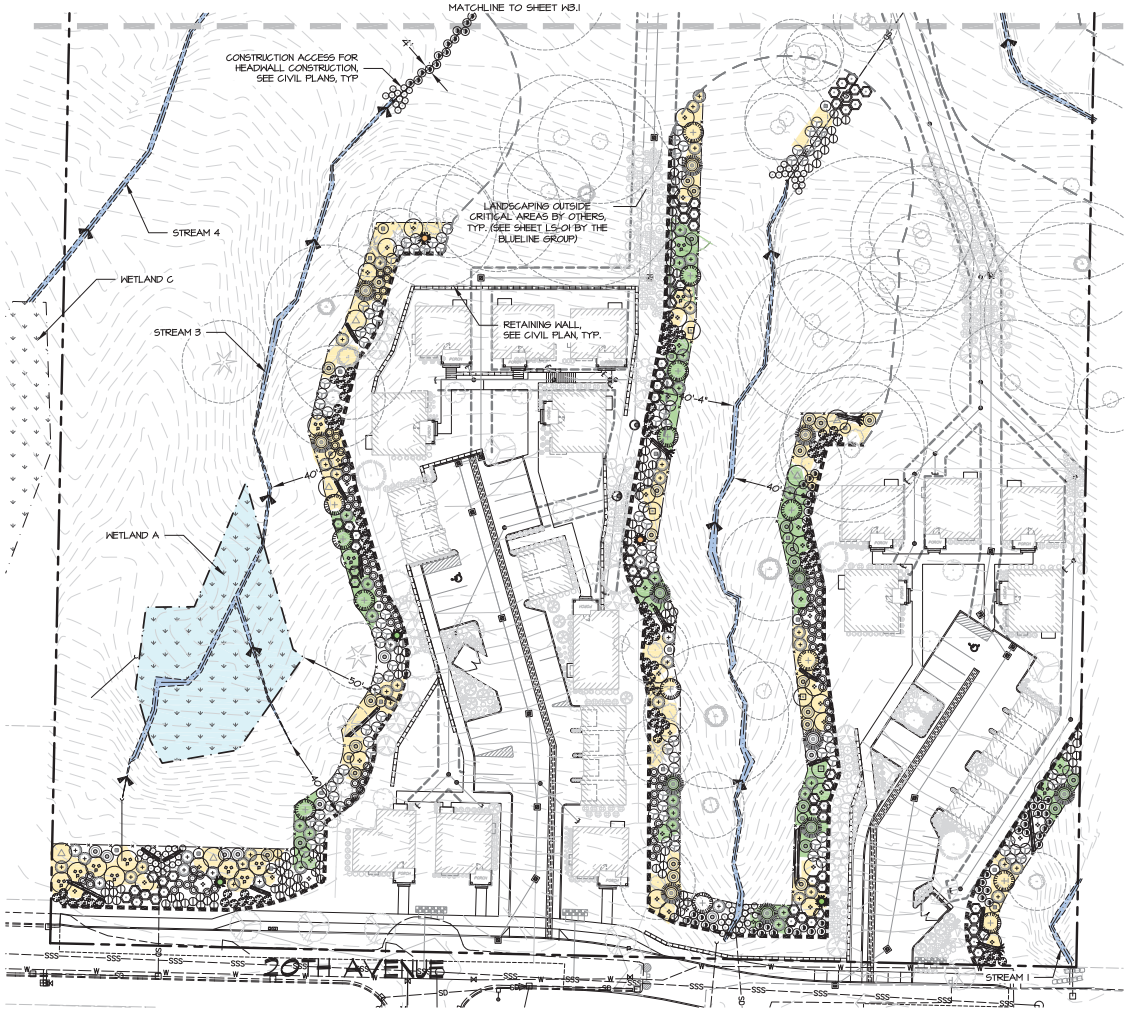
TALASAEA CONSULTANTS, INC.
Resource & Environmental Planning
15000 Bear Creek Road Northeast - Woodinville, Washington 98077
Bus (425) 881-7800 - Fax (425) 881-7848

FINAL CRITICAL AREAS MITIGATION PLAN
HABITAT FEATURE SECTIONS, DETAILS AND NOTES
ORCAS MOON COTTAGES
KIRKLAND, WASHINGTON

Revisions	Date	By
UPDATED SURVEY	10/17/17	AO/OA
CITY COMMENTS	11/9/17	AO/OA
CITY COMMENTS	7/20/18	ABS
CITY COMMENTS	7/25/18	ABS
CITY COMMENTS	10/31/18	ABS

Date	5/31/2017
Scale	AS SHOWN
Designed	AO/OT
Drawn	MJ/ABS
Checked	AO
Approved	BS
Project #	518B
Sheet #	W2.1

SW ¼, SECT. 32, TWP. 26N, RNG. 5E, W.M.



PLANTING PLAN

GRAPHIC SCALE (IN FEET)
0 15 30 60
SCALE: 1"=30'
NORTH

PLAN LEGEND

- PROPERTY LINE
- EXISTING WETLAND
- STREAM CENTERLINE
- STREAM ORDINARY HIGH WATER MARK (OHWM)
- POST CONSTRUCTION BUFFER
- POST CONSTRUCTION BUFFER/ 2-BOARD FENCE; SEE DETAIL 1/W1.1
- SILT FENCE; SEE DETAIL 3/W2.0
- DITCH CENTERLINE
- UTILITY EASEMENT (SEE CIVIL PLANS)
- EXISTING 2-FT CONTOURS
- EXISTING TREES TO REMAIN

CONIFER DECID.

PLANT LIST

TREES

SCIENTIFIC NAME	COMMON NAME
PRUNUS EMARGINATA	BITTERCHERRY
PSEUDOTSUGA MENZIESII	DOUGLAS FIR
PSEUDOTSUGA MENZIESII	DOUGLAS FIR
THUJA PLICATA	WESTERN REDCEDAR
THUJA PLICATA	WESTERN REDCEDAR
TSUGA HETEROPHYLLA	WESTERN HEMLOCK

SMALL TREES & LARGE SHRUBS

SCIENTIFIC NAME	COMMON NAME
ACER CIRCINATUM	VINE MAPLE
CORYLUS CORNUTA	WESTERN HAZELNUT
FRANGULA PURSHIANA	CASCARA
HOLODISCUS DISCOLOR	OCEANSPRAY
OEMLERIA CERASIFORMIS	INDIAN PLUM
SAMBUCUS RACEMOSA	RED ELDERBERRY

MASSING SHRUBS

SCIENTIFIC NAME	COMMON NAME
CORNUS ALBA	RED-OSIER DOGWOOD
ROSA GYMNOCARPA	BALD-HIP ROSE
RUBUS PARVIFLORUS	THIMBLEBERRY
SYMPHORICARPOS ALBUS	COMMON SNOWBERRY
VACCINIUM OVATUM	EVERGREEN HUCKLEBERRY
VACCINIUM PARVIFOLIUM	RED HUCKLEBERRY

GROUNDCOVER

SCIENTIFIC NAME	COMMON NAME
POLYSTICHUM MUNITUM	SWORD FERN
GAULTHERIA SHALLON	SALAL

GENERAL PLANT INSTALLATION NOTES

1. PLANT TREE AND/OR SHRUB 1/2" HIGHER THAN DEPTH GROWN AT NURSERY.
2. FOR CONTAINER TREES AND/OR SHRUBS, SCORE FOUR SIDES OF ROOTBALL PRIOR TO PLANTING. BUTTERFLY ROOTBALL IF ROOT CIRCLING IS EVIDENT.
3. AFTER PLANTING, STAKE TREES ONLY IF NECESSARY (E.G. IF THEY ARE LEANING OR DROOPING OR ARE LOCATED IN EXPOSED AREAS).
4. TREE STAKES TO BE VERTICAL, PARALLEL, EVEN-TOPPED, UNSCARRED AND DRIVEN INTO UNDISTURBED SUBGRADE. REMOVE AFTER ONE YEAR.
5. WATER IMMEDIATELY AND THOROUGHLY, HEAVIER AT FIRST, 2 OR 3 TIMES PER WEEK TO PROVIDE 1" OF WATER TO PLANTS EACH WEEK THROUGH THE DRY SEASON, THEN LESS UNTIL ESTABLISHED. PROVIDE ON-GRADE OVERHEAD SPRAY IRRIGATION, IF NEEDED. TEMPORARY SYSTEM, TO BE REMOVED TWO YEARS AFTER PLANTING, OR AS DIRECTED BY TALASAEA.
6. FERTILIZE ALL TREES AND SHRUBS WITH AN APPROVED SLOW RELEASE FERTILIZER APPLIED AT MANUFACTURER'S SUGGESTED RATES.

Know what's **below.** **Call** before you dig.

NOTES

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APPROVED FOR CONSTRUCTION

BY:

CITY OF KIRKLAND PLANNING AND BUILDING DEPT.

DATE:

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FINAL CRITICAL AREAS MITIGATION PLAN
PLANTING PLAN
ORCAS MOON COTTAGES
KIRKLAND, WASHINGTON

Revisions	Date	By
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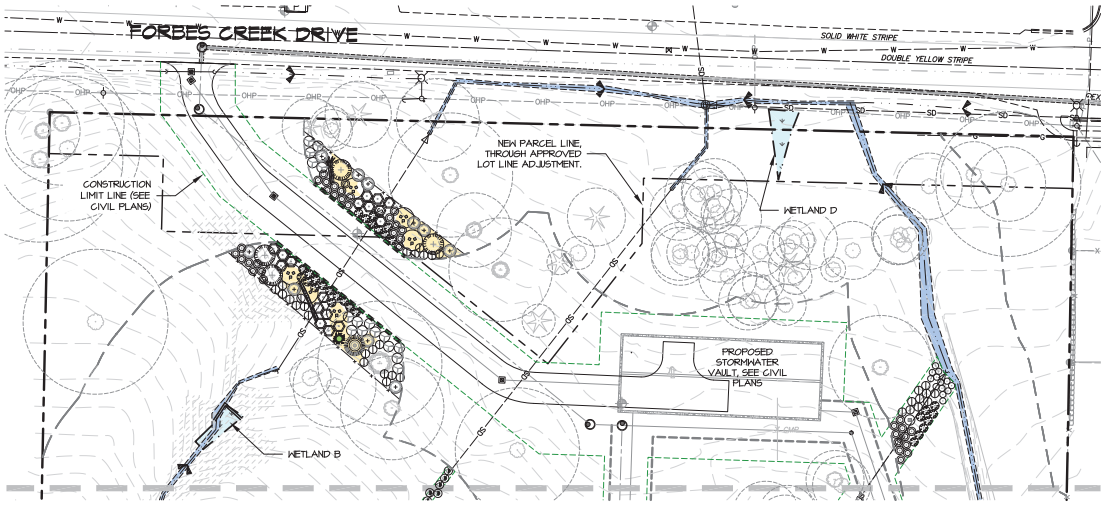
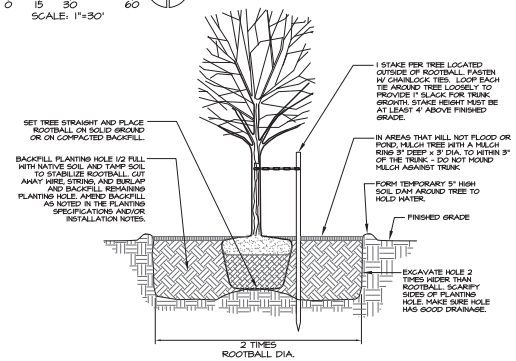


PLANTING PLAN

GRAPHIC SCALE (IN FEET) 0 15 30 60 — SCALE: 1"=30'

NORTH



1 B&B TREE PLANTING DETAIL.
NTS

PLAN LEGEND

- PROPERTY LINE
- EXISTING WETLAND
- STREAM CENTERLINE
- STREAM ORDINARY HIGH WATER MARK (OHWM)
- POST CONSTRUCTION BUFFER
- POST CONSTRUCTION BUFFER/ 2-BOARD FENCE; SEE DETAIL 1/W1.1
- SILT FENCE; SEE DETAIL 3/W2.0
- DITCH CENTERLINE
- UTILITY EASEMENT (SEE CIVIL PLANS)
- EXISTING 2-FT CONTOURS
- CONIFER DECID. — EXISTING TREES TO REMAIN

NOTE: WHERE APPLICABLE, CRITICAL AREA FENCE SHALL BE DESIGNATED AS THE SAFETY FENCING ON ADJACENT PROPOSED WALLS. SEE CIVIL PLANS.

PLANT SCHEDULE

TREES

SCIENTIFIC NAME	COMMON NAME	WL STATUS	QTY.	SIZE (MIN)	SPACING	NOTES
PRUNUS EMARGINATA	BITTERCHERRY	FACU	4	4-5' HT.	AS SHOWN	SINGLE TRUNK, WELL BRANCHED
PSEUDOTSUGA MENZIESII	DOUGLAS FIR	FACU	70	2-3' HT.	AS SHOWN	B&B, FULL & BUSHY
PSEUDOTSUGA MENZIESII	DOUGLAS FIR	FACU	18	4-5' HT.	AS SHOWN	B&B, FULL & BUSHY
THUJA PLICATA	WESTERN REDCEDAR	FAC	37	2-3' HT.	AS SHOWN	B&B, FULL & BUSHY
THUJA PLICATA	WESTERN REDCEDAR	FAC	13	4-5' HT.	AS SHOWN	B&B, FULL & BUSHY
TSUGA HETEROPHYLLA	WESTERN HEMLOCK	FACU	2	2-3' HT.	AS SHOWN	PLANT IN STUMP POCKET SEE DETAIL 2; W2.0

SMALL TREES & LARGE SHRUBS

SCIENTIFIC NAME	COMMON NAME	WL STATUS	QTY.	SIZE (MIN)	SPACING	NOTES
ACER CIRCINATUM	VINE MAPLE	FAC	43	4' HT.	AS SHOWN	SINGLE TRUNK, WELL BRANCHED
CORYLUS CORNUTA	WESTERN HAZELNUT	FACU	19	4' HT.	AS SHOWN	SINGLE TRUNK, WELL BRANCHED
FRANGULA PURSHIANA	CASCARA	FAC	6	5' HT	AS SHOWN	SINGLE TRUNK, WELL BRANCHED
HOLODISCUS DISCOLOR	OCEANSPRAY	FACU	83	24" HT.	5' O.C.	MULTI-CANE (3 MIN.)
OEMLERIA CERASIFORMIS	INDIAN PLUM	FACU	118	24" HT.	5' O.C.	MULTI-CANE (3 MIN.)
SAMBUCUS RACEMOSA	RED ELDERBERRY	FACU	23	24" HT.	5' O.C.	MULTI-CANE (3 MIN.)

MASSING SHRUBS

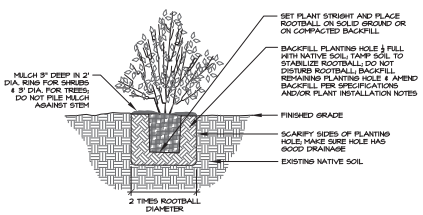
SCIENTIFIC NAME	COMMON NAME	WL STATUS	QTY.	SIZE (MIN)	SPACING	NOTES
CORNUS ALBA	RED-OSIER DOGWOOD	FACW	80	18" HT.	4' O.C.	MULTI-CANE (3 MIN.)
ROSA GYMNOCARPA	BALD-HIP ROSE	FACU	121	18" HT.	4' O.C.	MULTI-CANE (3 MIN.)
RUBUS PARVIFLORUS	THIMBLEBERRY	FACU	59	18" HT.	4' O.C.	MULTI-CANE (3 MIN.)
SYMPHORICARPOS ALBUS	COMMON SNOWBERRY	FACU	139	18" HT.	4' O.C.	MULTI-CANE (3 MIN.)
VACCINIUM OVATUM	EVERGREEN HUCKLEBERRY	FACU	121	1 GAL.	4' O.C.	FULL & BUSHY
VACCINIUM PARVIFOLIUM	RED HUCKLEBERRY	FACU	4	1 GAL.	AS SHOWN	PLANT IN STUMP POCKET SEE DETAIL 2; W2.0

GROUNDCOVER

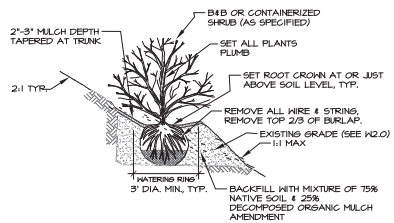
SCIENTIFIC NAME	COMMON NAME	WL STATUS	QTY.	SIZE (MIN)	SPACING	NOTES
POLYSTICHUM MUNITUM	SWORD FERN	FACU	208	1 GAL.	36" O.C.	FULL & BUSHY
GAULTHERIA SHALLON	SALAL	FACU	1,079	1 GAL.	24" O.C.	FULL & BUSHY

GENERAL PLANT INSTALLATION NOTES

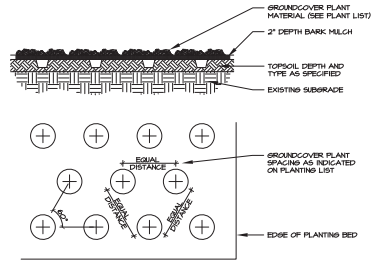
1. PLANT TREE AND/OR SHRUB 1/2" HIGHER THAN DEPTH GROWN AT NURSERY.
2. FOR CONTAINER TREES AND/OR SHRUBS, SCORE FOUR SIDES OF ROOTBALL PRIOR TO PLANTING. BUTTERFLY ROOTBALL IF ROOT CIRCLING IS EVIDENT.
3. AFTER PLANTING, STAKE TREES ONLY IF NECESSARY (E.G. IF THEY ARE LEANING OR DROOPING OR ARE LOCATED IN EXPOSED AREAS).
4. TREE STAKES TO BE VERTICAL, PARALLEL, EVEN-TOPPED, UNSCARRED AND DRIVEN INTO UNDISTURBED SUBGRADE. REMOVE AFTER ONE YEAR.
5. WATER IMMEDIATELY AND THOROUGHLY. HEAVIER AT FIRST, 2 OR 3 TIMES PER WEEK TO PROVIDE 1" OF WATER TO PLANTS EACH WEEK THROUGH THE DRY SEASON, THEN LESS UNTIL ESTABLISHED. PROVIDE ON-GRADE OVERHEAD SPRAY IRRIGATION, IF NEEDED. TEMPORARY SYSTEM, TO BE REMOVED TWO YEARS AFTER PLANTING, OR AS DIRECTED BY TALASAEA.
6. FERTILIZE ALL TREES AND SHRUBS WITH AN APPROVED SLOW RELEASE FERTILIZER APPLIED AT MANUFACTURER'S SUGGESTED RATES.



2 CONTAINER STOCK PLANTING DETAIL
N.T.S.



3 SLOPE PLANTING DETAIL
1"=1'



4 GROUNDCOVER INSTALLATION DETAIL
NTS

NOTES

1. SURVEY PROVIDED BY AXIS SURVEY AND MAPPING, 15241 NE 90TH ST REDMOND, WA 98052, (425) 823-5100
2. SITE PLAN PROVIDED BY THE BLUELINE GROUP, 25 CENTRAL WAY KIRKLAND, WA 98033, (425) 216-4051.
3. GEOTECHNICAL REPORT PROVIDED BY ASSOCIATED EARTH SCIENCES INC. 911 FIFTH AVENUE KIRKLAND, WA 98033, (425) 827-7701.
4. SOURCE DRAWING WAS MODIFIED BY TALASAEA CONSULTANTS FOR VISUAL ENHANCEMENT.
5. THIS PLAN IS AN ATTACHMENT TO THE CRITICAL AREAS REPORT PREPARED BY TALASAEA CONSULTANTS IN OCTOBER, 2018.

APPROVED FOR CONSTRUCTION

BY:

CITY OF KIRKLAND PLANNING AND BUILDING DEPT.

DATE:

811 Know what's below. Call before you dig.

TALASAEA CONSULTANTS, INC.
Resource & Environmental Planning
15000 Bear Creek Road Northeast ~ Woodinville, Washington 98077
Phone (425) 861-7800 ~ Fax (425) 861-7848

FINAL CRITICAL AREAS MITIGATION PLAN
PLANTING PLAN, PLANT SCHEDULE, DETAILS AND NOTES
ORCAS MOON COTTAGES
KIRKLAND, WASHINGTON

Revisions	Date	By
UPDATED SURVEY	10/17/17	AO/CA
CITY COMMENTS	11/9/17	AO/CA
CITY COMMENTS	7/20/18	ABS
CITY COMMENTS	7/25/18	ABS
CITY COMMENTS	10/31/18	ABS

Date	5/31/2017
Scale	AS SHOWN
Designed	AO/DT
Drawn	MH/ABS
Checked	AO
Approved	BS
Project #	518B
Sheet #	W3.1

PLANTING SPECIFICATIONS

PART 1: GENERAL

1.1 SEQUENCING

A. GENERAL CONSTRUCTION

1. CONTRACTOR SHALL GIVE TALASAEA CONSULTANTS A MINIMUM OF TEN (10) DAYS NOTICE PRIOR TO COMMENCING CONSTRUCTION.
2. NO CONSTRUCTION WORK SHALL COMMENCE UNTIL THERE IS A MEETING BETWEEN THE CLIENT, TALASAEA CONSULTANTS, THE GENERAL, CLEARING, AND/OR EARTHWORK CONTRACTORS, AND THE LANDSCAPE CONTRACTOR. THE APPROVED PLANS AND SPECIFICATIONS SHALL BE REVIEWED TO ENSURE THAT ALL PARTIES INVOLVED UNDERSTAND THE INTENT AND THE SPECIFIC DETAILS RELATED TO THE CONSTRUCTION DOCUMENTS, SPECIFICATIONS, AND SITE CONSTRAINTS.
3. LOCATIONS OF EXISTING UTILITIES HAVE BEEN ESTABLISHED BY FIELD SURVEY OR OBTAINED FROM AVAILABLE RECORDS AND SHOULD BE CONSIDERED APPROXIMATE ONLY AND NOT NECESSARILY COMPLETE. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO: (1) INDEPENDENTLY VERIFY THE ACCURACY OF UTILITY LOCATIONS, AND (2) DISCOVER AND AVOID ANY UTILITIES WITHIN THE MITIGATION AREA(S) THAT ARE NOT SHOWN, BUT WHICH MAY BE AFFECTED BY IMPLEMENTATION OF THE PLAN. SUCH AREA(S) ARE TO BE CLEARLY MARKED IN THE FIELD. TALASAEA CONSULTANTS SHALL RESOLVE ANY CONFLICTS WITH THE APPROVED GRADING PLAN PRIOR TO START OF CONSTRUCTION.
4. A COPY OF THE APPROVED PLANS MUST BE ON SITE WHENEVER CONSTRUCTION IS IN PROGRESS, AND SHALL REMAIN ON SITE UNTIL PROJECT COMPLETION.
5. CONSTRUCTION MUST BE PERFORMED IN ACCORDANCE WITH ALL AGENCY STANDARDS, RULES, CODES, PERMIT CONDITIONS, AND/OR OTHER APPLICABLE ORDINANCES AND POLICIES.
6. THE PROJECT OWNER/APPLICANT IS RESPONSIBLE FOR OBTAINING ANY OTHER RELATED OR REQUIRED PERMITS PRIOR TO THE START OF CONSTRUCTION.
7. A QUALIFIED WETLAND CONSULTANT SHALL BE ON SITE, AS NECESSARY, TO MONITOR CONSTRUCTION AND APPROVE MINOR REVISIONS TO THE PLAN.
8. DURING CONSTRUCTION, THE CONTRACTOR MUST USE MATERIALS AND CONSTRUCTION METHODS THAT PREVENT TOXIC SUBSTANCES AND OTHER POLLUTANTS FROM ENTERING MITIGATION AREAS OR OTHER NATURAL WATERS OF THE STATE.
9. PREVENTATIVE MEASURES SHALL BE USED TO PROTECT EXISTING STORM DRAINAGE SYSTEMS, EXISTING UTILITIES, AND ROADS.
10. PROVIDE SEDIMENT AND EROSION CONTROLS AROUND THE PROJECT AREA PRIOR TO SOIL DISTURBANCE FROM CONSTRUCTION ACTIVITY.

B. MITIGATION CONSTRUCTION: THE FOLLOWING PROVIDES THE GENERAL SEQUENCE OF ACTIVITIES ANTICIPATED TO BE NECESSARY TO COMPLETE THE PLANTING PORTION OF THE MITIGATION PROJECT. SOME OF THESE ACTIVITIES MAY BE CONDUCTED CONCURRENTLY AS THE PROJECT PROGRESSES.

1. CONDUCT A SITE MEETING BETWEEN THE CONTRACTOR, TALASAEA CONSULTANTS, AND THE OWNER'S REPRESENTATIVE TO REVIEW THE PROJECT PLANS, STAGING/STOCKPILE AREAS, AND MATERIAL DISPOSAL AREAS.
2. PLANT TREES AND SHRUBS AS INDICATED ON MITIGATION PLANS.
3. PLANT WETLAND EMERGENTS AND STAKES (CUTTINGS).
4. MULCH PLANTS INSTALLED IN NON-GRADED BUFFER AREAS.
5. INSTALL TEMPORARY IRRIGATION SYSTEM AND PROGRAM FOR 0.5 INCHES OF WATER EVERY 3 DAYS.
6. INSTALL FENCING AND CRITICAL AREA PROTECTION SIGNS (IF REQUIRED).

1.2 SUBMITTALS

A. PRODUCT DATA: FURNISH THE FOLLOWING WITH EACH PLANT MATERIAL DELIVERY:

1. INVOICES INDICATING SIZES AND VARIETY OF PLANT MATERIAL.
2. CERTIFICATES OF INSPECTION REQUIRED BY STATE AND FEDERAL AGENCIES.

B. QUALITY CONTROL SUBMITTALS:

1. PRIOR TO DELIVERY OF MATERIALS, CERTIFICATES OF COMPLIANCE ATTESTING THAT MATERIALS MEET THE SPECIFIED REQUIREMENTS SHALL BE FURNISHED FOR THE FOLLOWING: PLANTS, TOPSOIL, FERTILIZER, AND ORGANIC MULCH. CERTIFIED COPIES OF THE MATERIAL CERTIFICATES SHALL INCLUDE THE FOLLOWING:
   a. PLANT MATERIALS: BOTANICAL NAME, COMMON NAME, SIZE, QUANTITY BY SPECIES, AND LOCATION WHERE GROWN.
   b. IMPORTED TOPSOIL: PARTICLE SIZE, PH, ORGANIC MATTER CONTENT, TEXTURAL CLASS, SOLUBLE SALTS, CHEMICAL AND MECHANICAL ANALYSES.
   c. FERTILIZER: CHEMICAL ANALYSIS AND PERCENT COMPOSITION.
   d. IMPORTED MULCH: COMPOSITION AND SOURCE.

1.3 REFERENCES

A. SIZE AND GRADING STANDARDS: SHALL CONFORM TO THE CURRENT EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK, PUBLISHED BY THE AMERICAN NURSERY AND LANDSCAPE ASSOCIATION.

1.4 QUALITY ASSURANCE

A. WORKER'S QUALIFICATIONS: THE PERSONS PERFORMING THE PLANTING AND THEIR SUPERVISOR(S) SHALL BE PERSONALLY EXPERIENCED WITH PLANTING AND CARING FOR PLANT MATERIAL, AND SHALL HAVE BEEN REGULARLY EMPLOYED BY A COMPANY ENGAGED IN PLANTING AND CARING FOR PLANT MATERIAL FOR A MINIMUM OF 2 YEARS.

B. PLANT MATERIAL: ALL PLANT MATERIALS SHALL BE LOCALLY GROWN OR REGIONALLY ACCLIMATIZED TO THE PACIFIC NORTHWEST.

1.5 DELIVERY, INSPECTION, STORAGE AND HANDLING

A. DELIVERY: A DELIVERY SCHEDULE SHALL BE PROVIDED AT LEAST 10 CALENDAR DAYS PRIOR TO THE FIRST DAY OF DELIVERY. PLANT MATERIALS SHALL BE DELIVERED TO THE JOB SITE NOT MORE THAN 7 WORKING DAYS PRIOR TO THEIR RESPECTIVE PLANTING DATES.

B. PROTECTION DURING DELIVERY: PLANT MATERIAL SHALL BE PROTECTED DURING DELIVERY TO PREVENT DESICCATION AND DAMAGE TO THE BRANCHES, TRUNK, ROOT SYSTEM, OR EARTH BALL. BRANCHES SHALL BE PROTECTED BY TYING-IN. EXPOSED BRANCHES SHALL BE COVERED DURING TRANSPORT.

C. FERTILIZER: FERTILIZER SHALL BE DELIVERED IN MANUFACTURER'S STANDARD SIZED BAGS SHOWING WEIGHT, ANALYSIS, AND MANUFACTURER'S NAME. STORE UNDER A WATERPROOF COVER OR IN A DRY PLACE AS DESIGNATED BY THE OWNER'S REPRESENTATIVE.

D. INSPECTION: ALL PLANT MATERIALS SHALL BE INSPECTED UPON ARRIVAL AT THE JOB SITE BY THE OWNER'S REPRESENTATIVE FOR CONFORMITY TO TYPE AND QUANTITY WITH REGARD TO THEIR RESPECTIVE SPECIFICATIONS.

E. MULCH: A MULCH SAMPLE SHALL BE INSPECTED BY TALASAEA CONSULTANTS PRIOR TO THE MULCH BEING DELIVERED TO THE SITE.

F. STORAGE:

1. PLANT MATERIAL NOT INSTALLED ON THE DAY OF ARRIVAL AT THE SITE SHALL BE STORED AND PROTECTED IN DESIGNATED AREAS. PLANTS STORED ON THE PROJECT SITE SHALL BE PROTECTED FROM EXTREME WEATHER CONDITIONS BY INSULATING THE ROOTS, ROOT BALLS OR CONTAINERS WITH SAWDUST, SOIL, COMPOST, BARK OR WOODCHIPS. PLANT MATERIAL SHALL BE PROTECTED FROM DIRECT EXPOSURE TO WIND AND SUN. BARE-ROOT PLANT MATERIAL SHALL BE HEELED-IN. CUTTINGS AND EMERGENT PLANTS MUST BE PROTECTED FROM DRYING AT ALL TIMES AND SHALL BE HEELED-IN WITH MOIST SOIL OR OTHER INSULATING MATERIAL. ALL PLANT MATERIAL STORED ON-SITE SHALL BE WATERED DAILY UNTIL INSTALLED.
2. STORAGE OF OTHER MATERIALS SHALL BE IN DESIGNATED AREAS.

1.6 SCHEDULING

A. PLANTING SEASON: INSTALL WOODY PLANTS BETWEEN OCTOBER 1 AND FEBRUARY 15 WHENEVER THE TEMPERATURE IS ABOVE 32 DEGREES F AND THE SOIL IS IN A WORKABLE CONDITION, UNLESS OTHERWISE APPROVED IN WRITING. CUTTINGS SHALL ONLY BE USED IF PLANTING OCCURS BETWEEN DECEMBER 1ST AND APRIL 1ST.

B. PLANT INSTALLATION: EXCEPT FOR CONTAINER-GROWN PLANT MATERIAL, THE MAXIMUM TIME BETWEEN THE DIGGING AND INSTALLATION OF PLANT MATERIAL SHALL BE 21 DAYS. THE MAXIMUM TIME BETWEEN PLANT INSTALLATION AND MULCH PLACEMENT SHALL BE 72 HOURS.

1.7 WARRANTY

A. WARRANTY PERIOD: THE CONTRACTOR-PROVIDED WARRANTY SHALL EXTEND FOR A PERIOD OF ONE YEAR FROM THE DATE OF PHYSICAL COMPLETION. PHYSICAL COMPLETION FOR THE WORK OF THIS SECTION IS THE DATE WHEN ALL GRADING, PLANTING, IRRIGATION, AND RELATED WORK HAS BEEN COMPLETED AND IS ACCEPTED BY THE OWNER'S REPRESENTATIVE, TALASAEA CONSULTANTS, AND APPLICABLE AGENCIES.

B. WARRANTY TERMS: CONTRACTOR'S WARRANTY SHALL INCLUDE REPLACEMENT OF PLANTS DUE TO MORTALITY (SAME SIZE AND SPECIES SHOWN ON THE DRAWINGS). PLANTS REPLACED UNDER THIS WARRANTY SHALL BE WARRANTED FOR AN ADDITIONAL YEAR AFTER REPLACEMENT.

C. EXCEPTIONS: LOSS DUE TO EXCESSIVELY SEVERE CLIMATOLOGICAL CONDITIONS (SUBSTANTIATED BY 10-YEAR RECORDED WEATHER CHARTS), OR CASES OF NEGLECT BY OWNER, OR CASES OF ABUSE/DAMAGE BY OTHERS.

PART 2: PRODUCTS AND MATERIALS

2.1 PLANTS

A. GENERAL: ALL PLANT MATERIAL WILL CONFORM TO THE VARIETIES SPECIFIED OR SHOWN IN THE PLANT LIST(S) INDICATED ON THE MITIGATION PLANS AND BE TRUE TO BOTANICAL NAME AS LISTED IN: HITCHCOCK, C.L., AND A. CRONQUIST. 1973. FLORA OF THE PACIFIC NORTHWEST. UNIVERSITY OF WASHINGTON PRESS.

B. SHRUBS AND TREES:

1. TALASAEA SHALL EXAMINE PLANT MATERIAL PRIOR TO PLANTING. ANY MATERIAL NOT MEETING THE REQUIRED SPECIFICATIONS SHALL BE IMMEDIATELY REMOVED FROM THE SITE AND REPLACED WITH LIKE MATERIAL THAT MEETS THE REQUIRED STANDARDS. PLANT MATERIAL SHALL MEET THE REQUIREMENTS OF STATE AND FEDERAL LAWS WITH RESPECT TO PLANT DISEASE AND INFESTATIONS. INSPECTION CERTIFICATES, REQUIRED BY LAW, SHALL ACCOMPANY EACH AND EVERY SHIPMENT AND SHALL BE SUBMITTED TO TALASAEA UPON CONTRACTOR'S RECEIPT OF PLANT MATERIAL.
2. PLANT MATERIALS SHALL BE LOCALLY GROWN (WESTERN WASHINGTON, WESTERN OREGON, OR WESTERN BC), HEALTHY, BUSHY, IN VIGOROUS GROWING CONDITION, AND GUARANTEED TO BE TRUE TO SIZE, NAME, AND VARIETY. IF REPLACEMENT OF PLANT MATERIAL IS NECESSARY DUE TO CONSTRUCTION DAMAGE OR PLANT FAILURE WITHIN ONE YEAR OF INSTALLATION, THE SIZES, SPECIES, AND QUANTITIES SHALL BE EQUAL TO SPECIFIED PLANTS, AS INDICATED ON THE PLANS.
3. PLANTS SHALL BE NURSERY GROWN, WELL-ROOTED, OF NORMAL GROWTH AND CHARACTER, AND FREE FROM DISEASE OR INFESTATION. TALASAEA CONSULTANTS RESERVES THE RIGHT TO REQUIRE REPLACEMENT OR SUBSTITUTION OF ANY PLANTS DEEMED UNSUITABLE.
4. TREES SHALL HAVE UNIFORM BRANCHING, SINGLE STRAIGHT TRUNKS (UNLESS SPECIFIED AS MULTI-STEM, MULTI-CANE, OR MULTI-TRUNK), AND AN INTACT AND UNDAMAGED CENTRAL LEADER. CONTAINER STOCK SHALL HAVE BEEN GROWN IN A CONTAINER FOR AT LEAST ONE FULL GROWING SEASON AND SHALL HAVE A WELL DEVELOPED ROOT SYSTEM. PLANT MATERIAL THAT IS ROOT-BOUND OR HAS DAMAGED ROOT ZONES OR BROKEN ROOT BALLS WILL NOT BE ACCEPTED.
5. CONIFEROUS TREES SHALL BE NURSERY GROWN, FULL AND BUSHY, WITH UNIFORM BRANCHING AND A NATURAL, NON-SHEARED FORM. ORIGINAL CENTRAL LEADER MUST BE HEALTHY AND UNDAMAGED. MAXIMUM GAP BETWEEN BRANCHING SHALL NOT EXCEED 9 INCHES, AND LENGTH OF TOP LEADER SHALL NOT EXCEED 12 INCHES.
6. SHRUBS SHALL HAVE A MINIMUM OF THREE STEMS AND SHALL BE A MINIMUM HEIGHT OF 18 INCHES.
7. TREES AND SHRUBS SHALL HAVE DEVELOPED ROOT AND BRANCH SYSTEMS. DO NOT PRUNE BRANCHES BEFORE DELIVERY.
8. NATIVE PLANT CUTTINGS SHALL BE GROWN AND COLLECTED IN THE MARITIME PACIFIC NORTHWEST. CUTTINGS SHALL BE OF ONE TO TWO-YEAR-OLD WOOD, ½ INCH DIAMETER MINIMUM. CUTTINGS SHALL BE A MINIMUM OF 4 FEET IN LENGTH WITH 4 LATERAL BUDS EXPOSED ABOVE GROUND AFTER PLANTING. THE TOP OF EACH CUTTING SHALL BE A MINIMUM OF 1 INCH ABOVE A LEAF BUD, THE BOTTOM CUT 2 INCHES BELOW A BUD. THE BASAL ENDS OF THE CUTTINGS SHALL BE CUT AT A 45 DEGREE ANGLE AND MARKED CLEARLY SO THAT THE ROOTING END IS PLANTED IN THE SOIL. CUTTINGS MUST BE KEPT COVERED AND MOIST DURING STORAGE AND TRANSPORT, AND NO CUTTINGS SHALL BE STORED MORE THAN THREE DAYS FROM DATE OF CUTTING. CUTTINGS SHALL ONLY BE USED IF PLANTING OCCURS BETWEEN DECEMBER 1ST AND APRIL 1ST. FOR PLANTING BETWEEN APRIL 1ST AND DECEMBER 1ST, CONTAINER PLANTS SHALL BE USED.
9. PLANTS SHALL BE FREE OF SPLITS AND CHECKS, BARK ABRASIONS, AND DISFIGURING KNOTS.
10. FOR DECIDUOUS PLANTS, BUDS SHALL BE INTACT AND REASONABLY CLOSED AT TIME OF PLANTING, IF DORMANT.
11. BALLED AND BURLAPPED PLANTS SHALL HOLD A NATURAL BALL. MANUFACTURED ROOT BALLS ARE UNACCEPTABLE.
12. PLANTS SHALL CONFORM TO SIZES INDICATED ON THE PLANT SCHEDULE. PLANTS MAY BE LARGER THAN THE MINIMUM SIZES SPECIFIED.

C. WETLAND EMERGENT PLANTS:

1. SPECIES OF EMERGENT PLANTS SHALL BE PROVIDED AS DESCRIBED ON THE MITIGATION PLANS.
2. HERBACEOUS PLANTS SPECIFIED AS CLUMP DIVISIONS SHALL BE WELL-ROOTED PORTIONS OF MATURE PLANTS WITH A MINIMUM HEIGHT OF 6 INCHES OF VIGOROUS, VEGETATIVE GROWTH ABOVE THE GROUND SURFACE. OTHER HERBACEOUS PLANTS, OTHER THAN CLUMP DIVISIONS, SHALL BE DORMANT PROPAGULES SUCH AS RHIZOMES, TUBERS, CORMS, AND BULBS. PROPAGULE SHOOTS SHALL EXHIBIT TURGOR AND BE LIGHT IN COLOR, AND PROPAGULE BODIES SHALL BE RIGID TO THE TOUCH. IF THE BODIES OF THE PROPAGULES ARE SOFT AND MUSHY AND THE SHOOTS LACK TURGOR AND ARE DARK IN COLOR, THE PLANT MATERIALS SHALL BE REJECTED.
3. RHIZOMES, TUBERS, CORMS, AND BULBS SHALL HAVE A MINIMUM DIAMETER OF 1½ INCHES.

D. NOXIOUS SPECIES: ALL PLANT STOCK AND OTHER RE-VEGETATION MATERIALS SHALL BE FREE FROM THE SEED OR OTHER PLANT COMPONENTS OF ANY NOXIOUS OR INVASIVE SPECIES, AS IDENTIFIED BY THE KING COUNTY NOXIOUS WEED CONTROL BOARD.

E. SUBSTITUTIONS: SUBSTITUTIONS WILL NOT BE PERMITTED WITHOUT A WRITTEN REQUEST AND APPROVAL FROM THE OWNER'S REPRESENTATIVE, TALASAEA CONSULTANTS, AND APPLICABLE AGENCIES.

2.2 PLANTING SOIL

A. TOPSOIL: IF SUITABLE STOCKPILED NATIVE TOPSOIL IS NOT AVAILABLE FOR MITIGATION PLANTINGS, TOPSOIL SHALL BE OBTAINED FROM OUTSIDE SOURCES. STOCKPILED OR IMPORTED TOPSOIL SHALL BE FERTILE, FRIABLE, SANDY LOAM SURFACE SOIL, FREE OF SUBSOIL, CLAY LUMPS, BRUSH, WEEDS, ROOTS, STUMPS, STONES LARGER THAN 1 INCH IN ANY DIMENSION, LITTER, OR ANY OTHER EXTRANEOUS OR TOXIC MATTER HARMFUL TO PLANT GROWTH.

B. ORGANIC CONTENT: IMPORTED TOPSOIL SHALL CONSIST OF ORGANIC MATERIALS AMENDED AS NECESSARY TO PRODUCE A BULK ORGANIC CONTENT OF AT LEAST 10 PERCENT AND NOT GREATER THAN 20 PERCENT, AS DETERMINED BY AASHTO-T-194.

C. COMPOST: COMPOST SHALL MEET THE DEFINITION FOR COMPOSTED MATERIALS AS DEFINED BY THE WASHINGTON STATE DEPARTMENT OF ECOLOGY.

D. SOIL AMENDMENTS: WOODY PLANTINGS SHALL BE FERTILIZED WITH A SLOW-RELEASE GENERAL GRANULAR FERTILIZER (16-16-16), OR SLOW-RELEASE FERTILIZER TABLETS, WITH APPLICATION RATES AS SPECIFIED BY MANUFACTURER. FERTILIZER SHALL BE APPLIED AFTER PLANTING PIT IS BACKFILLED (OR DURING BACKFILL IN THE CASE OF TABLETS), AND PRIOR TO APPLICATION OF MULCH. FERTILIZER SHALL NOT BE APPLIED BETWEEN NOVEMBER AND MARCH.

2.3 MULCH

A. BARK OR WOODCHIP MULCH SHALL BE DERIVED FROM DOUGLAS FIR, PINE, OR HEMLOCK SPECIES. THE MULCH SHALL NOT CONTAIN RESIN, TANNIN, OR OTHER COMPOUNDS IN QUANTITIES THAT WOULD BE DETRIMENTAL TO ANIMAL, PLANT LIFE, OR WATER QUALITY. SAWDUST SHALL NOT BE USED AS MULCH.

B. MULCH SHALL BE MEDIUM-COARSE GROUND WITH AN APPROXIMATELY 3-INCH MINUS PARTICLE SIZE. FINE PARTICLES SHALL BE MINIMIZED SO THAT NOT MORE THAN 30%, BY LOOSE VOLUME, WILL PASS THROUGH A US NO. 4 SIEVE.

2.4 MISCELLANEOUS MATERIALS

A. STAKES, DEADMEN AND GUY STAKES: SOUND, DURABLE, WESTERN RED CEDAR, OR OTHER APPROVED WOOD, FREE OF INSECT OR FUNGUS INFESTATION.

B. CHAIN-LOCK TREE TIES: ½-INCH WIDE, PLASTIC.

PART 3: EXECUTION

3.1 SOIL PREPARATION

A. PLANTING AREA CONDITIONS: CONTRACTOR SHALL VERIFY THAT PLANT INSTALLATION CONDITIONS ARE SUITABLE WITHIN THE PROJECT AREA(S). ANY UNSATISFACTORY CONDITIONS SHALL BE CORRECTED PRIOR TO START OF WORK. WHEN CONDITIONS DETRIMENTAL TO PLANT GROWTH ARE ENCOUNTERED, SUCH AS RUBBLE FILL, POOR DRAINAGE, COMPACTED SOILS, SIGNIFICANT EXISTING OR INVASIVE VEGETATION, OR OTHER OBSTRUCTIONS, CONTRACTOR SHALL NOTIFY TALASAEA CONSULTANTS PRIOR TO PLANTING. THE BEGINNING OF WORK BY THE CONTRACTOR CONSTITUTES ACCEPTANCE OF CONDITIONS AS SATISFACTORY.

B. PLANTING IN UNDISTURBED, NON-GRADED AREAS: PLANTS INSTALLED IN UNDISTURBED AREAS SHALL BE INTEGRATED WITH EXISTING NATIVE VEGETATION AND PLANTED IN A RANDOM, NATURALISTIC PATTERN. PRIOR TO INSTALLATION OF PLANTINGS, ALL CONSTRUCTION DEBRIS, TRASH, AND NON-NATIVE INVASIVE PLANT MATERIAL SHALL BE REMOVED FROM THE PROJECT AREA. IN NON-GRADED AREAS, TREES AND SHRUBS SHALL BE PIT PLANTED AS SHOWN IN TYPICAL PLANTING DETAILS. PLANTING PITS SHALL BE BACKFILLED WITH A 50/50 MIXTURE OF IMPORTED, WEED-FREE TOPSOIL AND THE SOIL FROM THE PLANTING PIT.

C. PLANTING IN GRADED AREAS: IN GRADED PLANTING AREAS PLANTS SHALL BE INSTALLED IN NEWLY PLACED TOPSOIL.

D. SOIL DECOMPACTION/SCARIFICATION: SOILS IN GRADED/DISTURBED AREAS THAT ARE COMPACTED AND UNSUITABLE FOR PROPER PLANT GROWTH SHALL BE DECOMPACTED AND/OR SCARIFIED TO A MINIMUM DEPTH OF 6 INCHES PRIOR TO TOPSOIL INSTALLATION.

3.2 PLANTING

A. PLANT LAYOUT: PROPOSED LOCATIONS OF TREES AND SHRUBS SHALL BE STAKED AND IDENTIFIED WITH AN APPROVED CODING SYSTEM OR BY PLACEMENT OF THE ACTUAL PLANT MATERIAL. FOR LARGE GROUPINGS OF A SINGLE SPECIES OF SHRUB, LANDSCAPE CONTRACTOR MAY STAKE THE PLANTING BOUNDARIES.

B. OBTAIN LAYOUT APPROVAL FROM TALASAEA CONSULTANTS PRIOR TO EXCAVATION OF PLANTING PITS.

C. PLANTING PIT DIMENSIONS:

1. PIT DEPTH: NOT TO EXCEED THE ROOT BALL OR CONTAINER DEPTH.
2. PIT WIDTH: MEASURED AT THE GROUND SURFACE, 2 TIMES THE WIDTH OF THE ROOT BALL OR CONTAINER, AS INDICATED IN TYPICAL PLANTING DETAILS.
   a. BARE-ROOT PLANTS: DIAMETER EQUAL TO THE WIDTH OF THE ROOT SPREAD.

D. SETTING PLANTS:

1. BALLED PLANTS: SET PLANTS IN POSITION AND BACKFILL 1/2 DEPTH OF BALL. COMPLETELY REMOVE CAGE AND TWINE FROM PLANT AND PULL BURLAP DOWN AS FAR AS POSSIBLE. COMPLETE BACKFILL AND SETTLE WITH WATER. ROOT COLLAR SHALL REMAIN 1 INCH ABOVE ADJACENT GRADE.
2. BARE-ROOT PLANTS: PRUNE BRUISED OR BROKEN ROOTS. SET PLANT IN POSITION AND PLACE WETLAND PLANTING SOIL AROUND ROOTS. USE CARE TO AVOID BRUISING OR BREAKING ROOTS WHEN FIRMING SOIL. SETTLE WITH WATER.
3. SHRUB/TREE PLANTING: SHRUB AND TREE STOCK SHALL BE PLANTED IN HAND-DUG HOLES ACCORDING TO PLANTING DETAILS SHOWN ON THE MITIGATION PLANS. SHRUB AND TREE ROOT BALLS SHALL BE SET SO THAT ROOT COLLARS ARE 1 INCH ABOVE ADJACENT GRADE. ALL BACKFILL SHALL BE GENTLY TAMPED IN PLACE.
4. SURFACE FINISH: FORM A SAUCER AS INDICATED ON TYPICAL PLANTING DETAILS, OR AS DIRECTED. GRADE SOIL TO FORM A BASIN ON THE LOWER SIDE OF SLOPE PLANTINGS TO CATCH AND RETAIN WATER.
5. IN FORESTED AREAS, CONTRACTOR SHALL LOOSELY TIE A 2 FOOT PIECE OF BIODEGRADABLE FLAGGING TO THE TOP PORTION (NOT THE CENTRAL LEADER) OF ALL PLANTED VEGETATION TO FACILITATE POST-CONSTRUCTION PERFORMANCE AND MAINTENANCE REVIEW BY TALASAEA CONSULTANTS AND REGULATORY AGENCIES.
6. ACTUAL PLANT SYMBOL QUANTITIES SHOWN ON THE PLANS SHALL PREVAIL OVER QUANTITIES SHOWN ON THE PLANT SCHEDULE IN THE EVENT OF A DISCREPANCY.

E. MULCHING:

1. GRADED BUFFER AREAS: ARE MULCHED PRIOR TO PLANT INSTALLATION AS DIRECTED IN THE GRADING SPECIFICATIONS.
2. NON-GRADED BUFFER AREAS: PROVIDE A 36-INCH DIAMETER, 3-INCH DEEP MULCH RING AROUND THE BASE OF EACH TREE, AND A 24-INCH DIAMETER, 3-INCH DEEP MULCH RING AROUND THE BASE OF EACH SHRUB.
3. WATER PLANTS THOROUGHLY AFTER MULCHING.

F. PRUNING: PRUNE IMMEDIATELY AFTER PLANTING ONLY AS DIRECTED BY TALASAEA CONSULTANTS.

G. TREE STAKES AND TIES: STAKE DECIDUOUS AND EVERGREEN TREES 4 FEET OR OVER IN HEIGHT WITH ONE (1) STAKE PER TREE. STAKE TREES IMMEDIATELY AFTER PLANTING. PLACE STAKE AT THE OUTER EDGE OF THE ROOTS OR BALL, IN LINE WITH THE PREVAILING WIND, AND AT A 10 DEGREE ANGLE FROM THE TREE TRUNK. LOOSELY ATTACH STAKE TO TREE USING CHAIN-LOCK TIES; TREE SHOULD BE ABLE TO SWAY.

H. INSTALLING TEMPORARY IRRIGATION

1. GENERAL REQUIREMENTS: CONTRACTOR SHALL PROVIDE AN ABOVE-GROUND TEMPORARY IRRIGATION SYSTEM CAPABLE OF FULL HEAD-TO-HEAD COVERAGE OF ALL PLANTED PROJECT AREAS (ENHANCEMENT PLANTINGS WITHIN EXISTING VEGETATED WETLAND AREAS MAY NOT NEED COVERAGE BY TEMPORARY IRRIGATION SYSTEM, TALASAEA CONSULTANTS SHALL CONFIRM AREAS OF COVERAGE FOR TEMPORARY IRRIGATION SYSTEM). THE TEMPORARY IRRIGATION SYSTEM SHALL EITHER UTILIZE CONTROLLER AND POINT OF CONNECTION (POC) FROM THE SITE IRRIGATION SYSTEM OR SHALL INCLUDE A SEPARATE POC AND CONTROLLER WITH A BACKFLOW PREVENTION DEVICE PER WATER JURISDICTION INSPECTION AND APPROVAL. THE SYSTEM SHALL BE ZONED TO PROVIDE OPTIMAL PRESSURE AND UNIFORMITY OF COVERAGE, AS WELL AS SEPARATION BETWEEN AREAS OF FULL SUN AND SHADE AND FOR SLOPES IN EXCESS OF 5 PERCENT. THE SYSTEM SHALL BE OPERATIONAL FOR A MINIMUM OF THE FIRST TWO GROWING SEASONS AFTER PLANTING (THE FIRST TWO YEARS OF THE PERFORMANCE MONITORING PERIOD), OR LONGER IF REQUIRED TO ENSURE PROPER PLANT ESTABLISHMENT. THE SYSTEM SHALL BE REMOVED UPON FINAL APPROVAL OF THE MITIGATION PROJECT AT THE END OF THE PERFORMANCE MONITORING PERIOD.
2. SYSTEM DESIGN AND MATERIALS: ELECTRONIC VALVES SHALL BE THE SAME MANUFACTURER AS THOSE USED FOR THE SITE IRRIGATION SYSTEM, OR SHALL BE RAIN BIRD PEB SERIES OR EQUAL IF SYSTEM IS NOT CONTIGUOUS WITH THE SITE SYSTEM. VALVES SHALL BE SIZED TO ACCOMMODATE PRESSURE AND ZONE CONSUMPTION REQUIREMENTS OF THE SYSTEM AND SHALL BE INSTALLED BELOW GRADE IN CARSON (OR EQUAL) VALVE BOXES. WIRING SHALL BE INSULATED MULTI-STRAND, TAPED TO THE MAIN AT 6-INCH INTERVALS WITH DUCT TAPE WRAPS. ON-GRADE MAIN AND LATERAL LINES SHALL BE CLASS 200 PVC BELL PIPE WITH SOLVENT WELDED FITTINGS, SECURED IN-PLACE WITH WIRE STAPLES WHERE NECESSARY ON SLOPED AREAS. LINES SHALL BE PLACED 12 INCHES BELOW GRADE IN 4 INCH PCV SLEEVES WHERE VEHICULAR OR MAINTENANCE ACCESS IS NEEDED ACROSS LINES TO THE PROJECT AREA(S). MAXIMUM MAIN LINE SIZE SHALL BE 1½ INCHES AND MAY BE LOOPED BACK TO THE POC TO REDUCE PRESSURE LOSS. LATERAL LINES SHALL BE SIZED IN DECREASING DOWNSTREAM ORDER PER RAIN BIRD DESIGN STANDARDS; THE MINIMUM LATERAL SIZE SHALL BE ¾ INCH. HEADS SHALL BE ROTOR OR IMPACT TYPE INSTALLED 4 FEET ABOVE FINISHED GRADE ON 2-INCH DIAMETER WOOD TREE STAKES. STAKES SHALL BE SECURE IN THE GROUND, EMBEDDED TO A MINIMUM DEPTH OF 24 INCHES. HEADS AND ¾ INCH PVC RISERS SHALL BE SECURED TO STAKES WITH CONSTRICTING HOSE CLAMPS; NO FUNNY PIPE SHALL BE USED. HEADS AND NOZZLES SHALL PROVIDE MATCHED PRECIPITATION RATES FOR EACH ZONE.
3. PROGRAMMING: IRRIGATION SYSTEM SHALL BE PROGRAMMED TO PROVIDE APPROXIMATELY 1/2 INCH OF WATER EVERY THREE DAYS DURING THE DRY SEASON (APPROXIMATELY JUNE 15TH TO OCTOBER 15TH). IRRIGATION AMOUNTS IN ZONES LOCATED IN THE SHADE OR ON STEEP SLOPES MAY BE REDUCED IF APPROVED BY TALASAEA CONSULTANTS OR THE PROJECT ECOLOGIST/BIOLOGIST.
4. WATER AND POWER SUPPLY FOR SYSTEM: THE OWNER SHALL PROVIDE WATER AND ELECTRICITY FOR THE SYSTEM.
5. AS-BUILT DRAWING: A CHART DESCRIBING THE LOCATION OF ALL INSTALLED OR OPEN ZONES AND CORRESPONDING CONTROLLER NUMBERS SHALL BE PROVIDED BY THE CONTRACTOR AND PLACED INSIDE THE CONTROLLER AND GIVEN TO THE OWNER'S REPRESENTATIVE.
6. WARRANTY: THE IRRIGATION SYSTEM SHALL INCLUDE A ONE-YEAR WARRANTY AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP FROM THE DATE OF FINAL PROJECT ACCEPTANCE. THE WARRANTY SHALL INCLUDE SYSTEM ACTIVATION AND WINTERIZATION FOR THE FIRST YEAR AND IMMEDIATE REPAIR OF THE SYSTEM IF IT IS OBSERVED TO BE MALFUNCTIONING.

I. CRITICAL AREAS FENCE AND SIGNS: INSTALL CRITICAL AREAS FENCE AND CRITICAL AREAS SIGNS WHERE SHOWN ON PLANS PER INSTALLATION DETAILS PROVIDED ON PLANS.

J. RESTORE EXISTING NATURAL OR LANDSCAPED AREAS:

1. EXISTING NATURAL OR LANDSCAPED AREAS THAT ARE DAMAGED DURING CONSTRUCTION SHALL BE RESTORED TO THEIR ORIGINAL CONDITION, UNLESS IMPROVEMENTS OR MODIFICATIONS ARE SPECIFIED FOR THOSE AREAS.
2. CONTRACTOR SHALL EXERCISE CARE TO PREVENT INJURY TO THE TRUNK, ROOTS, OR BRANCHES OF ANY TREES OR SHRUBS THAT ARE TO REMAIN. ANY LIVING, WOODY PLANT THAT IS DAMAGED DURING CONSTRUCTION SHALL BE TREATED WITHIN 24 HOURS OF OCCURRENCE, AND TALASAEA CONSULTANTS SHALL BE NOTIFIED IMMEDIATELY OF THE INCIDENT. DAMAGE TREATMENT SHALL INCLUDE EVENLY CUTTING BROKEN BRANCHES, BROKEN ROOTS, AND DAMAGED TREE BARK. INJURED PLANTS SHALL BE THOROUGHLY WATERED AND ADDITIONAL MEASURES SHALL BE TAKEN, AS APPROPRIATE, TO AID IN PLANT SURVIVAL.

K. FINAL INSPECTION AND APPROVAL: THE CONTRACTOR SHALL NOTIFY TALASAEA CONSULTANTS IN WRITING AT LEAST TEN DAYS PRIOR TO THE REQUESTED DATE OF A PROJECT COMPLETION INSPECTION. IF ITEMS ARE TO BE CORRECTED, A PUNCH LIST SHALL BE PREPARED BY TALASAEA CONSULTANTS AND SUBMITTED TO THE CONTRACTOR FOR COMPLETION. AFTER PUNCH LIST ITEMS HAVE BEEN COMPLETED, TALASAEA CONSULTANTS SHALL REVIEW THE PROJECT AGAIN FOR FINAL ACCEPTANCE OF PLAN IMPLEMENTATION. IF PUNCH LIST ITEMS REQUIRE PLANT REPLACEMENT, AND THE INSPECTION OCCURS OUTSIDE OF A SUITABLE PLANTING SEASON, PLANTS SHALL BE REPLACED DURING THE NEXT PLANTING SEASON.

L. AS-BUILT PLAN: CONTRACTOR IS RESPONSIBLE FOR VERIFYING PLANT LOCATIONS AND QUANTITIES ON THE PLANT SCHEDULE WITH THOSE REPRESENTED AS SYMBOLS ON THE MITIGATION PLANS. CONTRACTOR SHALL KEEP A COMPLETE SET OF PRINTS AT THE JOB SITE DURING CONSTRUCTION FOR THE PURPOSE OF RECORDING IN-THE-FIELD CHANGES OR MODIFICATIONS TO THE APPROVED PLANS. THIS INFORMATION SHALL BE UPDATED ON A DAILY BASIS AS NECESSARY.

PART 4: ONE YEAR CONTRACTOR WARRANTY

NOTE: THESE MAINTENANCE SPECIFICATIONS APPLY TO THE ONE-YEAR CONTRACTOR WARRANTY PERIOD ONLY. IF THIS MITIGATION PROJECT REQUIRES LONG-TERM PERFORMANCE MONITORING, AS DETERMINED BY THE GOVERNING JURISDICTION, THE MAINTENANCE SPECIFICATIONS AND GUIDELINES ASSOCIATED WITH THE PERFORMANCE MONITORING STANDARDS ARE INCLUDED IN THE MITIGATION REPORT ASSOCIATED WITH THIS PLAN SET, AND MAY ALSO BE INCLUDED ON A SEPARATE PLAN SHEET IF REQUIRED.

A. REVIEW OF MAINTENANCE REQUIREMENTS: CONTRACTOR SHALL REVIEW LANDSCAPE MAINTENANCE RECOMMENDATIONS WITH A QUALIFIED WETLAND BIOLOGIST FROM TALASAEA CONSULTANTS WHO IS FAMILIAR WITH THE STATED GOALS AND OBJECTIVES OF THE PROJECT PLAN.

B. MAINTENANCE ACTIVITIES: CONTRACTOR SHALL MAINTAIN TREES AND SHRUBS FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE IN ORDER TO MAINTAIN HEALTHY GROWTH AND HABITAT DIVERSITY. MAINTENANCE ACTIVITIES SHALL INCLUDE, BUT ARE NOT LIMITED TO: (A) REPLACING PLANTS DUE TO MORTALITY, (B) TIGHTENING AND REPAIRING TREE STAKES, (C) RESETTING PLANTS TO PROPER GRADES AND UPRIGHT POSITIONS, AND (D) CORRECTING DRAINAGE PROBLEMS AS REQUIRED.

C. IRRIGATION:

1. SYSTEM MAINTENANCE AND REPAIR: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ACTIVATING, WINTERIZING, MAINTAINING, AND CONTINUALLY VERIFYING THE ADEQUATE OPERATION OF THE TEMPORARY IRRIGATION SYSTEM FOR THE FIRST GROWING SEASON FOLLOWING INSTALLATION. SYSTEM FUNCTION (INCLUDING ELECTRONIC VALVE AND CONTROLLER FUNCTION) SHALL BE INSPECTED FOR OPERATION AND FULL COVERAGE OF ALL PLANTED AREAS DURING EACH MAINTENANCE VISIT. THE SYSTEM SHALL BE REPAIRED IMMEDIATELY IF FOUND TO BE DAMAGED OR MALFUNCTIONING. SYSTEM SHALL BE PROGRAMMED AND MAINTAINED TO PROVIDE APPROXIMATELY ½ INCH OF WATER EVERY THREE DAYS.

D. STAKE AND TIE REMOVAL: CONTRACTOR SHALL REMOVE TREE STAKES AND TIES ONE YEAR AFTER INSTALLATION, UNLESS RECEIVING WRITTEN PERMISSION FROM TALASAEA CONSULTANTS TO DELAY REMOVAL OF STAKES AND TIES

E. EROSION AND DRAINAGE: CONTRACTOR SHALL CORRECT EROSION AND DRAINAGE PROBLEMS AS REQUIRED.

F. IRRIGATION SYSTEM REMOVAL: CONTRACTOR SHALL REMOVE IRRIGATION SYSTEM APPROXIMATELY 2 YEARS AFTER PLANTING, OR AS APPROVED BY TALASAEA CONSULTANTS.

G. FINAL MAINTENANCE INSPECTION AND APPROVAL: UPON COMPLETION OF THE ONE-YEAR MAINTENANCE PERIOD, AN INSPECTION BY TALASAEA CONSULTANTS SHALL BE CONDUCTED TO CONFIRM THAT THE PROJECT AREA WAS PROPERLY MAINTAINED. IF ITEMS ARE TO BE CORRECTED, A PUNCH LIST SHALL BE PREPARED AND SUBMITTED TO THE CONTRACTOR FOR CORRECTION. UPON CORRECTION OF THE PUNCH LIST ITEMS, THE PROJECT SHALL BE REVIEWED BY TALASAEA CONSULTANTS FOR FINAL CLOSEOUT OF PLAN IMPLEMENTATION.

H. ADD THE FOLLOWING NOTE IF NO IRRIGATION WILL BE INSTALLED:
WATERING: THE CONTRACTOR SHALL PROVIDE MANUAL WATERING OF THE MITIGATION PLANTINGS BETWEEN JUNE 15TH AND OCTOBER 15TH. SUPPLEMENTAL WATERING MAY ALSO BE REQUIRED IF HOT, DRY WEATHER OCCURS EITHER BEFORE OR AFTER THESE DATES. DURING THE FIRST YEAR AFTER INSTALLATION, PLANTINGS SHALL BE WATERED A MINIMUM OF ONE INCH PER WEEK. WATERING FREQUENCY MAY BE INCREASED AS NECESSARY DURING PROLONGED PERIODS OF HOT, DRY WEATHER TO PREVENT PLANT MORTALITY.

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NOTES

1. SURVEY PROVIDED BY AXIS SURVEY AND MAPPING, 15241 NE 90TH ST REDMOND, WA 98052, (425) 823-5700
2. SITE PLAN PROVIDED BY THE BLUELINE GROUP, 25 CENTRAL WAY KIRKLAND, WA 98033, (425) 216-4051.
3. GEOTECHNICAL REPORT PROVIDED BY ASSOCIATED EARTH SCIENCES INC. 911 FIFTH AVENUE KIRKLAND, WA 98033, (425) 827-7701.
4. SOURCE DRAWING WAS MODIFIED BY TALASAEA CONSULTANTS FOR VISUAL ENHANCEMENT.
5. THIS PLAN IS AN ATTACHMENT TO THE CRITICAL AREAS REPORT PREPARED BY TALASAEA CONSULTANTS IN OCTOBER, 2018.

APPROVED FOR CONSTRUCTION

BY: ____________________

CITY OF KIRKLAND PLANNING AND BUILDING DEPT.

DATE: ____________________

TALASAEA
CONSULTANTS, INC.
Resource & Environmental Planning
15020 Bear Creek Road Northeast - Woodinville, Washington 98077
Bus (425) 861-7550 - Fax (425) 861-7549

FINAL CRITICAL AREAS MITIGATION PLAN
PLANTING SPECIFICATIONS
ORCAS MOON COTTAGES
KIRKLAND, WASHINGTON

Revisions	Date	By
UPDATED SURVEY	AO/OA	10/17/17
CITY COMMENTS	AO/OA	11/9/17
CITY COMMENTS	ABS	7/20/18
CITY COMMENTS	ABS	7/25/18
CITY COMMENTS	ABS	10/31/18

Date 5/31/2017
Scale NTS
Designed AO/DT
Drawn MW/ABS
Checked AO
Approved BS

Project # 518B

Sheet # W3.2

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MAINTENANCE AND MONITORING PLAN

ONCE CONSTRUCTION IS APPROVED BY THE CITY, A QUALIFIED WETLAND ECOLOGIST OR BIOLOGIST FROM TALASAEA CONSULTANTS SHALL CONDUCT A POST-CONSTRUCTION ASSESSMENT. THE PURPOSE OF THIS ASSESSMENT WILL BE TO ESTABLISH BASELINE CONDITIONS AT YEAR 0 OF THE REQUIRED MONITORING PERIOD. A BASELINE ASSESSMENT REPORT INCLUDING AS-BUILT DRAWINGS WILL BE SUBMITTED TO THE CITY. THE AS-BUILT PLANS WILL IDENTIFY AND DESCRIBE ANY CHANGES IN PLANTING OR OTHER FEATURES IN RELATION TO THE ORIGINAL APPROVED PLAN.

CHAPTER 2. MONITORING PLAN

2.1 REPORTING

THE REPORTS WILL INCLUDE: 1) PROJECT OVERVIEW, 2) MITIGATION REQUIREMENTS, 3) SUMMARY DATA, 4) MAPS AND PLANS, AND 5) CONCLUSIONS. IF THE PERFORMANCE CRITERIA ARE MET, MONITORING FOR THE CITY WILL CEASE AT THE END OF YEAR FIVE, UNLESS OBJECTIVES ARE MET AT AN EARLIER DATE AND THE CITY ACCEPTS THE MITIGATION PROJECT AS SUCCESSFULLY COMPLETED.

TABLE 1. PROJECTED SCHEDULE FOR PERFORMANCE MONITORING AND MAINTENANCE EVENTS

Table 1. Projected Schedule for Performance Monitoring and Maintenance Events

Year	Date	Maintenance Review	Performance Monitoring	Report Due to Agencies
Year 0, As-built and Baseline Assessment	Winter 2019	X	X	X
1	Spring 2020	X	X	
	Fall 2020	X	X	X
2	Spring 2021	X	X	
	Fall 2021	X	X	X
3	Spring 2022	X		
	Fall 2022	X	X	X
4	Spring 2023	X		
	Fall 2023	X	X	X
5	Spring 2024	X		
	Fall 2024	X	X	X*

*Obtain final approval to facilitate bond release from the City of Kirkland (presumes performance criteria are met).

2.2 MONITORING METHODS

VEGETATION MONITORING METHODS MAY INCLUDE COUNTS; PHOTO-POINTS; RANDOM SAMPLING; SAMPLING PLOTS, QUADRATS, OR TRANSECTS; STEM DENSITY; VISUAL INSPECTION; AND/OR OTHER METHODS DEEMED APPROPRIATE BY THE PERMITTING AGENCIES AND THE BIOLOGIST/ECOLOGIST. VEGETATION MONITORING COMPONENTS SHALL INCLUDE GENERAL APPEARANCE, HEALTH, MORTALITY, COLONIZATION RATES, PERCENT COVER, PERCENT SURVIVAL, VOLUNTEER PLANT SPECIES, AND INVASIVE WEED COVER.

PERMANENT VEGETATION SAMPLING PLOTS, QUADRATS, AND/OR TRANSECTS WILL BE ESTABLISHED AT SELECTED LOCATIONS TO ADEQUATELY SAMPLE AND REPRESENT ALL OF THE PLANT COMMUNITIES WITHIN THE MITIGATION PROJECT AREAS. THE NUMBER, EXACT SIZE, AND LOCATION OF TRANSECTS, SAMPLING PLOTS, AND QUADRATS WILL BE DETERMINED AT THE TIME OF THE BASELINE ASSESSMENT.

PERCENT AREAL COVER OF WOODY VEGETATION (FORESTED AND/OR SCRUB-SHRUB PLANT COMMUNITIES) WILL BE EVALUATED THROUGH THE USE OF POINT-INTERCEPT SAMPLING METHODOLOGY. USING THIS METHODOLOGY, A TAPE WILL BE EXTENDED BETWEEN TWO PERMANENT MARKERS AT EACH END OF AN ESTABLISHED TRANSECT. TREES AND SHRUBS INTERCEPTED BY THE TAPE WILL BE IDENTIFIED, AND THE INTERCEPT DISTANCE RECORDED. PERCENT COVER BY SPECIES WILL THEN BE CALCULATED BY ADDING THE INTERCEPT DISTANCES AND EXPRESSING THEM AS A TOTAL PROPORTION OF THE TAPE LENGTH.

THE ESTABLISHED VEGETATION SAMPLING LOCATIONS WILL BE MONITORED AND COMPARED TO THE BASELINE DATA DURING EACH PERFORMANCE MONITORING EVENT TO AID IN DETERMINING THE SUCCESS OF PLANT ESTABLISHMENT. PERCENT SURVIVAL OF SHRUBS AND TREES WILL BE EVALUATED IN A 10-FOOT-WIDE STRIP ALONG EACH ESTABLISHED TRANSECT. THE SPECIES AND LOCATION OF ALL SHRUBS AND TREES WITHIN THIS AREA WILL BE RECORDED AT THE TIME OF THE BASELINE ASSESSMENT AND WILL BE EVALUATED DURING EACH MONITORING EVENT TO DETERMINE PERCENT SURVIVAL.

2.3 PHOTO DOCUMENTATION

LOCATIONS WILL BE ESTABLISHED WITHIN THE MITIGATION AREAS FROM WHICH PANORAMIC PHOTOGRAPHS WILL BE TAKEN THROUGHOUT THE MONITORING PERIOD. THESE PHOTOGRAPHS WILL DOCUMENT GENERAL APPEARANCE AND RELATIVE CHANGES WITHIN THE PLANT COMMUNITIES. REVIEW OF THE PHOTOS OVER TIME WILL PROVIDE A SEMI-QUANTITATIVE REPRESENTATION OF THE SUCCESS OF THE PLANTING PLAN. VEGETATION SAMPLING PLOT AND PHOTO-POINT LOCATIONS WILL BE SHOWN ON A MAP AND SUBMITTED WITH THE BASELINE ASSESSMENT REPORT AND YEARLY PERFORMANCE MONITORING REPORTS.

2.4 WILDLIFE

BIRDS, MAMMALS, REPTILES, AMPHIBIANS, AND INVERTEBRATES OBSERVED IN THE MITIGATION AREAS (EITHER BY DIRECT OR INDIRECT MEANS) WILL BE IDENTIFIED AND RECORDED DURING SCHEDULED MONITORING EVENTS, AND AT ANY OTHER TIMES OBSERVATIONS ARE MADE. DIRECT OBSERVATIONS INCLUDE ACTUAL SIGHTINGS, WHILE INDIRECT OBSERVATIONS INCLUDE TRACKS, SCAT, NESTS, SONG, OR OTHER INDICATIVE SIGNS. THE KINDS AND LOCATIONS OF THE HABITAT WITH THE GREATEST USE BY EACH SPECIES WILL BE NOTED, AS WILL ANY BREEDING OR NESTING ACTIVITIES.

2.5 WATER QUALITY AND SITE STABILITY

WATER QUALITY WILL BE ASSESSED QUALITATIVELY UNLESS IT IS EVIDENT THERE IS A SERIOUS PROBLEM. IN SUCH AN EVENT, WATER QUALITY SAMPLES WILL BE TAKEN AND ANALYZED IN A LABORATORY FOR SUSPECTED PARAMETERS. QUALITATIVE ASSESSMENTS OF WATER QUALITY INCLUDE:

- OIL SHEEN OR OTHER SURFACE FILMS,
- ABNORMAL COLOR OR ODOR OF WATER,
- STRESSED OR DEAD VEGETATION OR AQUATIC FAUNA,
- TURBIDITY, AND
- ABSENCE OF AQUATIC FAUNA.

OBSERVATIONS WILL BE MADE OF THE GENERAL STABILITY OF SLOPES AND SOILS IN THE MITIGATION AREAS DURING EACH MONITORING EVENT. ANY EROSION OF SOILS OR SLUMPING OF SLOPES WILL BE RECORDED AND CORRECTIVE MEASURES WILL BE TAKEN.

MITIGATION GOALS, OBJECTIVES & PERFORMANCE STANDARDS

GOALS, OBJECTIVES & PERFORMANCE STANDARDS

THIS SECTION OF THE CRITICAL AREAS REPORT ADDRESSES THE MITIGATION GOALS (INCLUDING REQUIREMENTS OF THE CITY OF KIRKLAND AND HOW THEY ARE PLANNED TO BE MET), AS WELL AS THE RELATED OBJECTIVES AND PERFORMANCE STANDARDS TO WHICH THE PROJECT IS EXPECTED TO MEET. THESE ARE DESCRIBED IN DETAIL BELOW.

1 GOALS

THE GOAL OF THE MITIGATION PLAN IS TO ENHANCE THE FUNCTIONS AND SERVICES PROVIDED BY THE AREAS PROPOSED FOR POST-CONSTRUCTION BUFFER. THIS WILL BE ACCOMPLISHED THROUGH THE REMOVAL OF GARBAGE AND CONSTRUCTION-RELATED DEBRIS, REMOVAL OF NON-NATIVE INVASIVE PLANT SPECIES, REPLANTING WITH A VARIETY OF NATIVE TREES AND SHRUBS, AND INSTALLATION OF HABITAT FEATURES SUCH AS LARGE WOODY DEBRIS.

1.1 MITIGATION OBJECTIVES AND PERFORMANCE STANDARDS

THE SUCCESS OF THE PROPOSED BUFFER ENHANCEMENT PLAN WILL BE EVALUATED THROUGH THE FOLLOWING OBJECTIVES AND PERFORMANCE STANDARDS. MITIGATION MONITORING WILL BE PERFORMED BY A QUALIFIED BIOLOGIST.

OBJECTIVE A: CREATE STRUCTURAL AND PLANT SPECIES DIVERSITY IN THE POST-CONSTRUCTION BUFFER AREA.

PERFORMANCE STANDARD A1: AT LEAST FIVE (5) SPECIES OF DESIRABLE NATIVE WOODY PLANTS WILL BE PRESENT IN THE ENHANCED BUFFER AREA DURING THE MONITORING PERIOD. PERCENT SURVIVAL OF PLANTED WOODY MATERIAL MUST BE 100 PERCENT AT THE END OF YEAR 1 (PER CONTRACTOR WARRANTY), AND AT LEAST 80 PERCENT FOR EACH SUBSEQUENT YEAR OF THE MONITORING PERIOD.

OBJECTIVE B: CREATE ADDITIONAL HABITAT WITHIN THE POST-CONSTRUCTION BUFFER AREA.

PERFORMANCE STANDARD B1: LARGE WOODY DEBRIS, CONSISTING OF LOGS, STUMPS, AND ROOT WADS, SHALL BE PLACED WITHIN THE ENHANCED BUFFER AREAS. A MINIMUM OF TWELVE (12) PIECES OF LARGE WOODY DEBRIS WILL BE PLACED.

OBJECTIVE C: LIMIT THE AMOUNT OF NON-NATIVE AND INVASIVE SPECIES IN THE POST-CONSTRUCTION BUFFER AREA.

PERFORMANCE STANDARD C1: AFTER CONSTRUCTION AND FOR THE ENTIRETY OF THE MONITORING PERIOD, NON-NATIVE, INVASIVE SPECIES WITHIN THE BUFFER ENHANCEMENT AREAS SHALL BE MAINTAINED AT LEVELS BELOW 10 PERCENT MAXIMUM COVER. NON-NATIVE, NOXIOUS SPECIES INCLUDE, BUT ARE NOT LIMITED TO, SCOT'S BROOM, HIMALAYAN AND EVERGREEN BLACKBERRY, HEDGE BINDWEED, EXOTIC KNOTWEEDS, AND BITTERSWEET NIGHTSHADE.

MAINTENANCE AND CONTINGENCY

REGULAR MAINTENANCE REVIEWS WILL BE PERFORMED ACCORDING TO THE SCHEDULE PRESENTED IN TABLE 1 TO ADDRESS ANY CONDITIONS THAT COULD JEOPARDIZE THE SUCCESS OF THE MITIGATION PROJECT. FOLLOWING MAINTENANCE REVIEWS BY THE BIOLOGIST OR ECOLOGIST, REQUIRED MAINTENANCE ON THE SITE WILL BE IMPLEMENTED WITHIN TEN (10) BUSINESS DAYS OF SUBMISSION OF A MAINTENANCE MEMO TO THE MAINTENANCE CONTRACTOR AND PERMITTEE.

ESTABLISHED PERFORMANCE STANDARDS FOR THE PROJECT WILL BE COMPARED TO THE YEARLY MONITORING RESULTS TO JUDGE THE SUCCESS OF THE MITIGATION. IF, DURING THE COURSE OF THE MONITORING PERIOD, THERE APPEARS TO BE A SIGNIFICANT PROBLEM WITH ACHIEVING THE PERFORMANCE STANDARDS, THE PERMITTEE SHALL WORK WITH THE PERMITTING AGENCIES TO DEVELOP A CONTINGENCY PLAN IN ORDER TO GET THE PROJECT BACK INTO COMPLIANCE WITH THE PERFORMANCE STANDARDS. CONTINGENCY PLANS CAN INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING ACTIONS: ADDITIONAL PLANT INSTALLATION, EROSION CONTROL, MODIFICATIONS TO HYDROLOGY, AND PLANT SUBSTITUTIONS OF TYPE, SIZE, QUANTITY, AND/OR LOCATION. IF REQUIRED, A CONTINGENCY PLAN SHALL BE SUBMITTED BY DECEMBER 31ST OF ANY YEAR WHEN DEFICIENCIES ARE DISCOVERED.

THE FOLLOWING LIST INCLUDES EXAMPLES OF MAINTENANCE (M) AND CONTINGENCY (C) ACTIONS THAT MAY BE IMPLEMENTED DURING THE COURSE OF THE MONITORING PERIOD. THIS LIST IS NOT INTENDED TO BE EXHAUSTIVE, AND OTHER ACTIONS MAY BE IMPLEMENTED AS DEEMED NECESSARY.

- DURING YEAR ONE, REPLACE ALL DEAD WOODY PLANT MATERIAL (M).
- WATER ALL PLANTINGS AT A RATE OF 1A OF WATER EVERY WEEK BETWEEN JUNE 15 – OCTOBER 15 DURING THE FIRST TWO YEARS AFTER INSTALLATION, AND FOR THE FIRST TWO YEARS AFTER ANY REPLACEMENT PLANTINGS (C & M).
- REPLACE DEAD PLANTS WITH THE SAME SPECIES OR A SUBSTITUTE SPECIES THAT MEET THE GOALS AND OBJECTIVES OF THE MITIGATION PLAN, SUBJECT TO TALASAEA AND AGENCY APPROVAL (C).
- RE-PLANT AREA AFTER THE REASON FOR FAILURE HAS BEEN IDENTIFIED (E.G., MOISTURE REGIME, POOR PLANT STOCK, DISEASE, SHADE/SUN CONDITIONS, WILDLIFE DAMAGE, ETC.) (C).
- AFTER CONSULTING WITH CITY STAFF, MINOR EXCAVATIONS, IF DEEMED TO BE MORE BENEFICIAL TO THE EXISTING CONDITIONS THAN CURRENTLY EXISTS, WILL BE MADE TO CORRECT SURFACE DRAINAGE PATTERNS (C).
- REMOVE/CONTROL WEEDY OR NON-NATIVE INVASIVE PLANTS (E.G., SCOT'S BROOM, REED CANARYGRASS, HIMALAYAN BLACKBERRY, PURPLE LOOSESTRIFE, JAPANESE KNOTWEED, ETC.) BY MANUAL OR CHEMICAL MEANS APPROVED BY PERMITTING AGENCIES. USE OF HERBICIDES OR PESTICIDES WITHIN THE MITIGATION AREA WOULD ONLY BE IMPLEMENTED IF OTHER MEASURES FAILED OR WERE CONSIDERED UNLIKELY TO BE SUCCESSFUL, AND WOULD REQUIRE PRIOR AGENCY APPROVAL. ALL NON-NATIVE VEGETATION MUST BE REMOVED AND DISPOSED OF OFF-SITE. (C & M).
- WEED ALL TREES AND SHRUBS TO THE DRIPLINE AND PROVIDE 3-INCH DEEP MULCH RINGS 24 INCHES IN DIAMETER FOR SHRUBS AND 36 INCHES IN DIAMETER FOR TREES (M).
- REMOVE TRASH AND OTHER DEBRIS FROM THE MITIGATION AREAS TWICE A YEAR (M).
- SELECTIVELY PRUNE WOODY PLANTS AT THE DIRECTION OF TALASAEA CONSULTANTS TO MEET THE MITIGATION PLAN'S GOAL AND OBJECTIVES (E.G., THINNING AND REMOVAL OF DEAD OR DISEASED PORTIONS OF TREES/SHRUBS) (M).
- REPAIR OR REPLACE DAMAGED STRUCTURES INCLUDING SIGNS, FENCES, OR BIRD BOXES (M).

FINANCIAL GUARANTEE

FINANCIAL GUARANTEE IN THE FORM OF A PERFORMANCE OR MAINTENANCE BOND WILL BE REQUIRED PER KZC §90.145, WHICH STATES:

@THE PLANNING OFFICIAL SHALL REQUIRE A PERFORMANCE OR MAINTENANCE BOND, A PERFORMANCE OR MAINTENANCE SECURITY, A PERPETUAL CULVERT MAINTENANCE AGREEMENT, AND/OR A PERPETUAL LANDSCAPE MAINTENANCE AGREEMENT, AS DETERMINED TO BE APPROPRIATE BY THE PLANNING OFFICIAL, TO ENSURE COMPLIANCE WITH ANY ASPECT OF THIS CHAPTER OR ANY DECISION OR DETERMINATION MADE PURSUANT TO THIS CHAPTER.

1. PERFORMANCE OR MAINTENANCE BOND OR SECURITY REQUIREMENT - THE PERFORMANCE OR MAINTENANCE SECURITY REQUIRED BY THE PLANNING OFFICIAL SHALL BE PROVIDED IN SUCH FORMS AND AMOUNTS AS THE PLANNING OFFICIAL DEEMS NECESSARY TO ASSURE THAT ALL WORK OR ACTIONS ARE SATISFACTORILY COMPLETED OR MAINTAINED IN ACCORDANCE WITH THE APPROVED PLANS, SPECIFICATIONS, PERMIT OR APPROVAL REQUIREMENTS, AND APPLICABLE REGULATIONS, AND TO ASSURE THAT ALL WORK OR ACTIONS NOT SATISFACTORILY COMPLETED OR MAINTAINED WILL BE CORRECTED TO COMPLY WITH APPROVED PLANS, SPECIFICATIONS, REQUIREMENTS, AND REGULATIONS TO RESTORE ENVIRONMENTAL DAMAGE OR DEGRADATION, PROTECT FISH AND WILDLIFE HABITAT AND PROTECT THE HEALTH, SAFETY, AND GENERAL WELFARE OF THE PUBLIC.
2. FORM OF PERFORMANCE SECURITY - THE PERFORMANCE SECURITY SHALL BE A SURETY BOND OBTAINED FROM COMPANIES REGISTERED AS SURETY IN THE STATE OR CERTIFIED AS ACCEPTABLE SURETIES ON FEDERAL BONDS. IN LIEU OF A SURETY BOND, THE PLANNING OFFICIAL MAY ALLOW ALTERNATIVE PERFORMANCE SECURITY IN THE FORM OF AN ASSIGNMENT OF FUNDS OR ACCOUNT, AND ESCROW AGREEMENT, AN IRREVOCABLE LETTER OF CREDIT, OR OTHER FINANCIAL SECURITY DEVICE IN AN AMOUNT EQUAL TO THAT REQUIRED FOR THE SURETY BOND. THE SURETY BOND OR OTHER PERFORMANCE SECURITY SHALL BE CONDITIONED ON THE WORK BEING COMPLETED OR MAINTAINED IN ACCORDANCE WITH REQUIREMENTS, APPROVALS, OR PERMITS; ON THE SITE BEING LEFT OR MAINTAINED IN A SAFE CONDITION; AND ON THE SITE AND ADJACENT OR SURROUNDING AREAS BEING RESTORED IN THE EVENT OF DAMAGES OR OTHER ENVIRONMENTAL DEGRADATION FROM DEVELOPMENT OR MAINTENANCE ACTIVITIES CONDUCTED PURSUANT TO THE PERMIT OR APPROVAL.
3. AMOUNT OF PERFORMANCE SECURITY - THE AMOUNT OF THE PERFORMANCE OR MAINTENANCE SECURITY SHALL BE 125 PERCENT OF THE ESTIMATED COST, AS APPROVED BY THE PLANNING OFFICIAL, OF CONFORMANCE TO PLANS, SPECIFICATIONS, AND PERMIT OR APPROVAL REQUIREMENTS UNDER THIS CHAPTER, INCLUDING CORRECTIVE WORK AND COMPENSATION, ENHANCEMENT, MITIGATION, MAINTENANCE, AND RESTORATION OF SENSITIVE AREAS. IN ADDITION, AN ADMINISTRATIVE DEPOSIT SHALL BE PAID AS REQUIRED IN KZC §175.25. ALL BOND OR PERFORMANCE SECURITY SHALL BE SUBMITTED IN THEIR ORIGINAL FORM WITH ORIGINAL SIGNATURES OF AUTHORIZATION.
4. ADMINISTRATION OF PERFORMANCE SECURITY - IF DURING THE TERM OF THE PERFORMANCE OR MAINTENANCE SECURITY, THE PLANNING OFFICIAL DETERMINES THAT CONDITIONS EXIST WHICH DO NOT CONFORM WITH PLANS, SPECIFICATIONS, APPROVAL OR PERMIT REQUIREMENTS, THE PLANNING OFFICIAL MAY ISSUE A STOP WORK ORDER PROHIBITING ANY ADDITIONAL WORK OR MAINTENANCE UNTIL THE CONDITION IS CORRECTED. THE PLANNING OFFICIAL MAY REVOKE THE PERFORMANCE OR MAINTENANCE SECURITY, OR A PORTION THEREOF, IN ORDER TO CORRECT CONDITIONS THAT ARE NOT IN CONFORMANCE WITH PLANS, SPECIFICATIONS, APPROVAL OR PERMIT REQUIREMENTS. THE PERFORMANCE OR MAINTENANCE SECURITY MAY BE RELEASED UPON WRITTEN NOTIFICATION BY THE PLANNING OFFICIAL, FOLLOWING FINAL SITE INSPECTION OR COMPLETION, AS APPROPRIATE, OR WHEN THE PLANNING OFFICIAL IS SATISFIED THAT THE WORK OR ACTIVITY COMPLIES WITH PERMITS OR APPROVED REQUIREMENTS.
5. EXEMPTIONS FOR PUBLIC AGENCIES - STATE AGENCIES AND LOCAL GOVERNMENT BODIES, INCLUDING SCHOOL DISTRICTS, SHALL NOT BE REQUIRED TO SECURE THE PERFORMANCE OR MAINTENANCE OF PERMIT OR APPROVAL CONDITIONS WITH A SURETY BOND OR OTHER FINANCIAL SECURITY DEVICE. THESE PUBLIC AGENCIES ARE REQUIRED TO COMPLY WITH ALL REQUIREMENTS, TERMS, AND CONDITIONS OF THE PERMIT OR APPROVAL, AND THE PLANNING OFFICIAL MAY ENFORCE COMPLIANCE BY WITHHOLDING CERTIFICATES OF OCCUPANCY OR OCCUPANCY APPROVAL, BY ADMINISTRATIVE ENFORCEMENT ACTION, OR BY ANY OTHER LEGAL MEANS.

BOND QUANTITY WORKSHEET

King County

Department of Permitting and Environmental Review
35030 SE Douglas St, Suite 210
Snoqualmie, WA 98065-9266
206-296-6600 TTY Relay: 711

Critical Areas Mitigation
Bond Quantity Worksheet

C24 09/05/2013
ls-wks-sensitiveEBC.xls
ls-wks-sensitiveEBQ.pdf

Project Name: Orcas Moon Cottages | **Date:** 3-Oct-18 | **Prepared by:** Talasaea Consultants, Inc.

Project Number: TAL-518B | **Project Descriptor:** Residential

Location: 20th Ave. & 6th St. Kirkland, WA | **Applicant:** Orcas Moon, LLC. | **Phone:** (206) 556-5580

PLANT MATERIALS (includes labor cost for plant installation)

Type	Unit Price	Unit	Quantity	Descriptor	Cost
PLANTS: Container, 1 gallon, medium soil	$11.50	Each	1811.00		$ 20,826.50
PLANTS: Container, 2 gallon, medium soil	$20.00	Each	333.00		$ 6,660.00
PLANTS: Container, 5 gallon, medium soil	$36.00	Each	103.00		$ 3,708.00
				TOTAL	$ 31,194.50

INSTALLATION COSTS (LABOR, EQUIPMENT, & OVERHEAD)

Type	Unit Price	Unit			Cost
Labor, general (landscape/planting installation)	$40.00	HR	40.00		$ 1,600.00
Labor, general (contractor)	$40.00	HR	280.00		$ 11,200.00
Labor: Consultant, supervising	$50.00	HR	20.00		$ 1,100.00
Irrigation - temporary	$3,000.00	Acre	0.50		$ 1,500.00
				TOTAL	$ 15,426.00

HABITAT STRUCTURES*

ITEMS	Unit Cos	Unit			Cost
Facilities (willow)	$ 2.00	Each			$
Log, whole wads, 18"-24" dia., 30'long	$540.00	Each	12.00		$ 6,480.00
Log w/ root wads, 18"-24" dia., 30'long	$460.00	Each	5.00		$ 2,300.00
Root wads	$162.00	Each	3.00		$ 486.00
* All costs include delivery and installation				TOTAL	$ 8,219.00

EROSION CONTROL

ITEMS	Unit Cos	Unit			Cost
Mulch, by hand, wood chips, 2" deep	$3.25	SY	2113.00		$ 6,897.25
Haulingand disposal	$20.40	CY	300.00		$ 6,120.00
Topsoil, delivered and spread	$35.73	CY	185.80		$ 6,631.49
				TOTAL	$ 19,648.74

GENERAL ITEMS

ITEMS	Unit Cos	Unit			Cost
Fencing, split rail, 3' high (2-rail)	$10.54	LF	1459.00		$ 15,482.16
Fencing, temporary (VSPF)	$1.20	LF			$
Signs, sensitive area boundary (inc. backing, post, installation)	$28.50	Each	28.00		$ 798.00
				TOTAL	$ 16,281.16

OTHER (Construction Cost Subtotal) $ 88,768.40

ITEMS	Percentage of Construction Cost	Unit			Cost
Mobilization	10%	1			$ 8,876.85
Contingency	30%	1			$ 26,630.55
				TOTAL	$ 35,488.40

MAINTENANCE AND MONITORING — NOTE: Projects with multiple permit requirements may be required to have longer monitoring and maintenance terms. This will be evaluated on a case-by-case basis for development applications. Monitoring and maintenance ranges may be assessed anywhere here.

Maintenance, annual (by owner or consultant)					
Larger than 5,000 sqft but < 1 acre - buffer mitigation only	$ 350.00	EACH	5.00 (3 hrs @ 45/hr)		$ 1,800.00
Monitoring, annual (by owner or consultant)					
Larger than 5,000 sqft but < 1 acre with wetland or aquatic area impacts	$ 900.00	EACH	5.00 (10 hrs @ $90/hr)		$ 4,500.00
				TOTAL	$ 6,300.00

Total $133,497.50

NOTES

1. SURVEY PROVIDED BY AXIS SURVEY AND MAPPING, 15241 NE 90TH ST REDMOND, WA 98052, (425) 823-5100
2. SITE PLAN PROVIDED BY THE BLUELINE GROUP, 25 CENTRAL WAY KIRKLAND, WA 98033, (425) 216-4091.
3. GEOTECHNICAL REPORT PROVIDED BY ASSOCIATED EARTH SCIENCES INC. 911 FIFTH AVENUE KIRKLAND, WA 98033, (425) 827-7701.
4. SOURCE DRAWING WAS MODIFIED BY TALASAEA CONSULTANTS FOR VISUAL ENHANCEMENT.
5. THIS PLAN IS AN ATTACHMENT TO THE CRITICAL AREAS REPORT PREPARED BY TALASAEA CONSULTANTS IN OCTOBER, 2018.

APPROVED FOR CONSTRUCTION

BY:

CITY OF KIRKLAND PLANNING AND BUILDING DEPT.

DATE:

811 Know what's below. Call before you dig.

TALASAEA CONSULTANTS, INC.
Resource & Environmental Planning
15000 Bear Creek Road Northeast - Woodinville, Washington 98077
Fax (425) 861-7860 - Fax (425) 861-7848

FINAL CRITICAL AREAS MITIGATION PLAN
GOALS, OBJECTIVES & BOND QUANTITY WORKSHEET
ORCAS MOON COTTAGES
KIRKLAND, WASHINGTON

Revisions	Date	By
UPDATED SURVEY	10/17/17	AO/OA
CITY COMMENTS	11/9/17	AO/OA
CITY COMMENTS	7/20/18	ABS
CITY COMMENTS	7/25/18	ABS
CITY COMMENTS	10/3/18	ABS

Date 5/31/2017
Scale NTS
Designed AO/DT
Drawn MM/ABS
Checked AO
Approved BS

Project # 518B

Sheet # W4.0

APPENDIX C

TECHNICAL MEMORANDUM BY ASSOCIATED EARTH SCIENCES, INC.

associated earth sciences incorporated

Technical Memorandum

Date:	June 25, 2018	**Project Manager:**	Jeffrey P. Laub, L.G., L.E.G.
To:	Orcas Moon, LLC P.O. Box 2710 Redmond, Washington 98073	**Principal in Charge:**	Bruce L. Blyton, P.E.
Attn:	Mr. Robert Londo	**Project Name:**	Londo Forbes Creek
Address:	rl@londotiberio.com	**Project No:**	160384E001

Subject: Wetland Buffer Enhancement (Vegetation Removal) on Slopes

You have requested that Associated Earth Sciences, Inc. (AESI) provide an opinion letter regarding the removal of existing vegetation from steep slopes at the proposed "Orcas Moon Cottages" residential project located near the intersection of 20th Avenue and 4th Place in Kirkland, Washington. We have previously issued our "Subsurface Exploration, Geologic Hazard, and Geotechnical Engineering Report," dated February 20, 2018, for the subject project. For our use in preparing this memorandum, we have been provided with a "Buffer Enhancement Plan," prepared by Blueline and dated June 22, 2018, showing the proposed wetland buffer enhancement areas relative to steeply sloping (>40%) terrain at the subject site.

We understand that, as a part of wetland buffer enhancement elements required by the City of Kirkland, invasive plants (e.g., Himalayan blackberries) are to be removed and replaced with native vegetation. The steeply sloping (>40%) terrain at the site is predominantly vegetated with ferns, other understory plants, brush (including blackberry brambles), and trees. This vegetation serves to protect the face of the slopes from soil erosion. We recommend that, for the portions of the buffer enhancement areas over steeply sloping terrain, this vegetation remain in place to provide root support for the near-surface soils along the slopes. For portions of the buffer enhancement areas over gently to moderately sloping terrain (i.e., less than 40%), we recommend that the planting plan associated with the buffer enhancement be implemented as soon as practical and that, prior to the establishment of the new plantings, the temporary erosion control recommendations presented in our February 20, 2018 report and appropriate best management practices (BMPs) be followed.

We trust this information meets your current needs. Please do not hesitate to contact us if you require additional information or have any questions.

JPL/ms
160384E001-6
Projects\20160384\KE\WP

APPENDIX D

BUFFER EVALUATION WORKSHEET

TAL-518B
Orcas Moon
Stream 2

Assessment Group	Assessment Parameter	Existing Condition Score	Mitigated Condition Score
Water Quality	Stormwater Inputs	1	4
	Slope of Buffer	2	2
	Vegetation Types	0	0
	Microtopography Features	0	0
Water Quality Assessment Group Total		**3**	**6**
Hydrology	Slope of Buffer	1	1
	Vegetation Types	1	1
	Leaf Litter and Duff	0	0
Hydrology Assessment Group Total		**2**	**2**
Habitat	Existing Buffer Width	2	0
	Priority Species	0	0
	Land Use Intensity	0	0
	Trophic Levels	2	3
Habitat Assessment Group Total		**4**	**3**
Buffer Functional Assessment Total Score		**9**	**11**

Buffer Evaluation Worksheet Orcas Moon

TAL-518B Mitigated Conditions: Buffer for Stream 2

Water Quality Score	6
Hydrology Score	2
Habitat Score	3
Total Score	**11**

WATER QUALITY

Number of Stormwater Inputs (check all that count)			
	Roads (one point)	☑	
	Landscaping (one point)	☐	
	Pets (one point)	☐	
	Other Human Related Inputs (one point)	☐	
	Buffer Isolated from Stormwater Inputs (three points)	☑	
Stormwater Input Points			4

Slope of Buffer (Check only one)			
Shallow (<5%) (Score x 3)	Predominantly Sandy Soil (2 points)	☐	
	Predominantly Silty Soil (1 point)	☐	
	Predominantly Clayey Soil (0 points)	☐	
Moderate (5% to 15%) (Score x2)	Predominantly Sandy Soil (2 points)	☐	
	Predominantly Silty Soil (1 point)	☐	
	Predominantly Clayey Soil (0 points)	☐	
Steep (>15%) (Score x 1)	Predominantly Sandy Soil (2 points)	☑	
	Predominantly Silty Soil (1 point)	☐	
	Predominantly Clayey Soil (0 points)	☐	
Buffer Slope Points (Including multiplier)			2

Vegetation Types (Check only one)			
	Mostly Herbaceous (1 point)	☐	
	Mostly Woody (0 points)	☑	
	Sparsely Vegetated (-1 point)	☐	
Vegetation Types Points			0

Microtopography Features (Check one)			
	Few Microtopographic Features (0 points)	☑	
	Evident Microtopographic Features (1 point)	☐	
Microtopography Features			0

TOTAL WATER QUALITY SCORE	**6**

HYDROLOGY

Slope of Buffer (Check only one)			
Shallow (<5%) (Score x 3)	Predominantly Silty Soil (2 points)	☐	
	Predominantly Sandy Soil (1 point)	☐	
	Predominantly Clayey Soil (0 points)	☐	
Moderate (5% to 15%) (Score x2)	Predominantly Silty Soil (2 points)	☐	
	Predominantly Sandy Soil (1 point)	☐	
	Predominantly Clayey Soil (0 points)	☐	
Steep (>15%) (Score x 1)	Predominantly Silty Soil (2 points)	☐	
	Predominantly Sandy Soil (1 point)	☑	
	Predominantly Clayey Soil (0 points)	☐	
Buffer Slope Points (Including multiplier)			1

Vegetation Types (Check only one)		
	Mostly Herbaceous (2 points)	☐
	Mostly Scrub-shrub (1 point)	☑
	Mostly Forest (0 points)	☐
Vegetation Types Points		1

Leaf Litter and Duff (Check only one)		
	Sparse (<1 inch) (0 points)	☑
	Moderate (1 to 2 inches) (1 point)	☐
	Deep (>2 inches) (2 points)	☐
Leaf Litter and Duff Points		0

TOTAL HYDROLOGY SCORE	**2**

HABITAT

Existing Buffer Width		
	Narrow (<50 feet) (0 points)	☑
	Moderate (50 to 100 feet) (1 point)	☐
	Wide (>100 feet) (2 points)	☐
Existing Buffer Width Points		0

Priority Species (Select all that apply)		
	Priority Species Present (1 point)	☐
	Priority Species Utilize Buffer (1 point)	☐
	Priority Species has Area Requirement (STOP - need subsequent evaluation)	☐
Priority Species Points		0

Buffer Evaluation Worksheet Orcas Moon

TAL-518B Existing Conditions: Buffer for Stream 2

Water Quality Score	3
Hydrology Score	2
Habitat Score	4
Total Score	**9**

WATER QUALITY

Number of Stormwater Inputs (check all that count)			
	Roads (one point)	☑	
	Landscaping (one point)	☐	
	Pets (one point)	☐	
	Other Human Related Inputs (one point)	☐	
	Buffer Isolated from Stormwater Inputs (three points)	☐	
Stormwater Input Points			1

Slope of Buffer (Check only one)			
Shallow (<5%) (Score x 3)	Predominantly Sandy Soil (2 points)	☐	
	Predominantly Silty Soil (1 point)	☐	
	Predominantly Clayey Soil (0 points)	☐	
Moderate (5% to 15%) (Score x2)	Predominantly Sandy Soil (2 points)	☐	
	Predominantly Silty Soil (1 point)	☐	
	Predominantly Clayey Soil (0 points)	☐	
Steep (>15%) (Score x 1)	Predominantly Sandy Soil (2 points)	☑	
	Predominantly Silty Soil (1 point)	☐	
	Predominantly Clayey Soil (0 points)	☐	
Buffer Slope Points (Including multiplier)			2

Vegetation Types (Check only one)			
	Mostly Herbaceous (1 point)	☐	
	Mostly Woody (0 points)	☑	
	Sparsely Vegetated (-1 point)	☐	
Vegetation Types Points			0

Microtopography Features (Check only one)			
	Few Microtopographic Features (0 points)	☑	
	Evident Microtopographic Features (1 point)	☐	
Microtopography Features			0

TOTAL WATER QUALITY SCORE	**3**

HYDROLOGY

Slope of Buffer (Check only one)			
Shallow (<5%) (Score x 3)	Predominantly Silty Soil (2 points)	☐	
	Predominantly Sandy Soil (1 point)	☐	
	Predominantly Clayey Soil (0 points)	☐	
Moderate (5% to 15%) (Score x2)	Predominantly Silty Soil (2 points)	☐	
	Predominantly Sandy Soil (1 point)	☐	
	Predominantly Clayey Soil (0 points)	☐	
Steep (>15%) (Score x 1)	Predominantly Silty Soil (2 points)	☐	
	Predominantly Sandy Soil (1 point)	☑	
	Predominantly Clayey Soil (0 points)	☐	
Buffer Slope Points (Including multiplier)			1

Vegetation Types (Check only one)		
	Mostly Herbaceous (2 points)	☐
	Mostly Scrub-shrub (1 point)	☑
	Mostly Forest (0 points)	☐
Vegetation Types Points		1

Leaf Litter and Duff (Check only one)		
	Sparse (<1 inch) (0 points)	☑
	Moderate (1 to 2 inches) (1 point)	☐
	Deep (>2 inches) (2 points)	☐
Leaf Litter and Duff Points		0

TOTAL HYDROLOGY SCORE	**2**

HABITAT

Existing Buffer Width		
	Narrow (<50 feet) (0 points)	☐
	Moderate (50 to 100 feet) (1 point)	☐
	Wide (>100 feet) (2 points)	☑
Existing Buffer Width Points		2

Priority Species (Select all that apply)		
	Priority Species Present (1 point)	☐
	Priority Species Utilize Buffer (1 point)	☐
	Priority Species has Area Requirement (STOP - need subsequent evaluation)	☐
Priority Species Points		0

Land Use Intensity (Check only one)			
	Low (2 points)	☐	
	Moderate (1 point)	☐	
	High (0 points)	☑	
Land Use Intensity Points			0

Trophic Levels (Check only one)			
Low Wetland Trophic Diversity (Score x1)	Low Buffer Trophic Diversity (1 point)	☐	
	Moderate Buffer Trophic Diversity (2 points)	☑	
	High Buffer Trophic Diversity (3 points)	☐	
Moderate Wetland Trophic Diversity (Score x2)	Low Buffer Trophic Diversity (1 point)	☐	
	Moderate Buffer Trophic Diversity (2 points)	☐	
	High Buffer Trophic Diversity (3 points)	☐	
High Wetland Trophic Diversity (Score x3)	Low Buffer Trophic Diversity (1 point)	☐	
	Moderate Buffer Trophic Diversity (2 points)	☐	
	High Buffer Trophic Diversity (3 points)	☐	
Trophic Level Points (Including multiplier)			2

TOTAL HABITAT POINTS	**4**

Land Use Intensity (Check only one)			
	Low (2 points)	☐	
	Moderate (1 point)	☐	
	High (0 points)	☑	
Land Use Intensity Points			0

Trophic Levels (Check only one)			
Low Wetland Trophic Diversity (Score x1)	Low Buffer Trophic Diversity (1 point)	☐	
	Moderate Buffer Trophic Diversity (2 points)	☐	
	High Buffer Trophic Diversity (3 points)	☑	
Moderate Wetland Trophic Diversity (Score x2)	Low Buffer Trophic Diversity (1 point)	☐	
	Moderate Buffer Trophic Diversity (2 points)	☐	
	High Buffer Trophic Diversity (3 points)	☐	
High Wetland Trophic Diversity (Score x3)	Low Buffer Trophic Diversity (1 point)	☐	
	Moderate Buffer Trophic Diversity (2 points)	☐	
	High Buffer Trophic Diversity (3 points)	☐	
Trophic Level Points (Including multiplier)			3

TOTAL HABITAT POINTS	**3**

THE WATERSHED COMPANY

SCIENCE & DESIGN

September 2, 2016

Susan Lauinger
City of Kirkland
Planning and Community Development
123 Fifth Avenue
Kirkland, WA 98125

Re: Orcas Moon Property
Stream & Wetland Delineation & Buffer Modification Review
The Watershed Company Ref. No.: 160622.6

Dear Susan:

This letter presents the findings of an environmental review of a stream and wetland delineation and classification study and buffer modification plan completed by Talasaea Consultants, Inc. on behalf of Orcas Moon LLC. The study area is located on two undeveloped properties between 20th Avenue and Forbes Creek Drive (Parcel numbers 389010-0050 and -0055). The following document was reviewed for this study:

- *Critical Areas Report, Orcas Moon Property, Kirkland, WA. (Prepared by Talasaea Consultants, Inc. July 21, 2016)*

I visited the site on August 25, 2016 to verify the stream and wetland boundaries and classification findings and review the proposed buffer modification reported by Talasaea.

I also reviewed on-file critical area information for the Crestwoods at Forbes Creek development (TWC Ref. No. 060701.25), which abuts the northeast corner of the subject property. City records for the adjacent Crestwoods at Forbes Creek development document a Type 3 wetland with a 50-foot buffer approximately 120-feet to the east; this wetland buffer does not encumber the subject property. Stream 5 from the current Talasaea report is documented in the Crestwoods file as a Class C seasonal non-fish bearing stream with a 35-foot buffer.

750 Sixth Street South | Kirkland, WA 98033
p 425.822.5242 | f 425.827.8136 | watershedco.com

Stream & Wetland Delineation Study Review

Wetlands

Delineated wetland boundaries were field-verified following the Corps Manual and Regional Supplement. Wetland determination data sheets were not provided in the report. Wetland ratings were reviewed using the City of Kirkland's Wetland Field Data Form. The subject property is in the Forbes Creek basin, a primary basin.

Wetland A

Based on the provided survey and observed field flagging, the delineated wetland boundary appears to be accurate. Regarding the wetland rating, I have scoring differences and do not agree with the Talasaea Reported Type 3 rating for Wetland A. This wetland scores 24 points; it is a Type 2 wetland (see attached rating form). In the City of Kirkland, Type 2 wetlands in a primary basin require a 75 foot buffer.

Wetland B

I agree with the delineated boundary of Wetland B. I answered some rating questions differently than reported by Talasaea, but agree this wetland scores 17 points and it is a Type 3 wetland. As reported, Type 3 wetlands in a primary basin requires a 50 foot buffer.

Wetland C

Offsite Wetland C is accurately depicted and classified. It is a Type 2 wetland with a 75 foot buffer as reported by Talasaea.

Additional Wetland Area

Wetland vegetation was observed along Forbes Creek Drive, west of Stream 5. The area is characterized by Pacific willow, red alder, hawthorn, red-osier dogwood, and lady fern. Some small-fruited bulrush is present approaching the ditched stream along Forbes Creek Drive. Soils exhibit the Redox Dark Surface (F6) hydric soil indicator. Soils were moist, but not saturated at the time of my site visit. Two secondary wetland hydrology indicators were present, Geomorphic Position (D2) and FAC-Neutral Test (D5). This is a jurisdictional wetland (see DP-1, marked with yellow- and black-stripped flagging in the field).

Streams

Stream flags are present. However, only the center-line of each stream was flagged. Per KZC 90.90, "*Stream buffers shall be measured from each side of the top of the slope of the channel of the stream except that where streams enter or exit pipes, the buffer shall be measured in all directions from the pipe opening (see Plates 16 and 16A of Chapter 180 KZC).*" Consistent with past approved Kirkland projects the "top of the slope of the channel" has been consistently interpreted as corresponding to the state definition of Ordinary High Water Mark (WAC 173-22-030).

The classification of each stream was reviewed. The Talasaea Report classifies all onsite streams as Class B, but does not state how the streams meet Class B categorization criteria. Based on the topography survey and field observations, Streams 1 through 5 are estimated to have a gradient of 20 to 30 percent. Stream widths vary from approximately one to six feet wide. Streams 1 through 4 were flowing on the day of my site visit. Stream 5 was dry. I agree Streams 1, 2, 3 and 4 are perennial non-salmonid streams; they are Class B streams with a 50-foot buffer as reported by Talasaea. However, Stream 5 was previously documented as a seasonal non-salmonid stream; it has a 35-foot buffer.

Piped segments of Streams 2, 3 and 4 were field reviewed. Two notable differences were observed. First, the mapped pipe for Stream 2 is exposed and an open channel is present parallel to the pipe, down to Stream 5. This pipe does not appear to be functioning as intended. The Stream 2 channel below the pipe was dry on the day on my site visit. Second, a culvert and short open stream channel was observed at the north end of the property, about 150 feet west of the northeast corner. This channel was flagged 'Stream 3," but it doesn't appear on the provided survey.

Lastly, city maps document a ditched stream along Forbes Creek Drive at the north end of the property. This stream, its classification, and the associated onsite buffer should be included in the Critical Areas Report.

Buffer Modification Plan Review

The buffer modification plan and accompanying report needs to address the criteria in KZC 90.100. KZC 90.100(2)(b) states in part:

> *"An improvement or land surface modification shall be approved in a wetland buffer only if:*
>
> *1) It is consistent with Kirkland's Streams, Wetlands and Wildlife Study (The Watershed Company, 1998) and the Kirkland Sensitive Areas Regulatory Recommendations Report (Adolfson Associates, Inc., 1998);*
>
> *2) It will not adversely affect water quality;*
>
> *3) It will not adversely affect fish, wildlife, or their habitat;*
>
> *4) It will not have an adverse effect on drainage and/or storm water detention capabilities;*
>
> *5) It will not lead to unstable earth conditions or create an erosion hazard;*
>
> *6) It will not be materially detrimental to any other property or the City as a whole;*

7) Fill material does not contain organic or inorganic material that would be detrimental to water quality or to fish, wildlife, or their habitat;

8) All exposed areas are stabilized with vegetation normally associated with native wetland buffers, as appropriate; and

9) There is no practicable or feasible alternative development proposal that results in less impact to the buffer.

As part of the modification request, the applicant shall submit a report prepared by a qualified professional and fund a review of this report by the City's wetland consultant. The report shall assess the habitat, water quality, storm water detention, ground water recharge, and erosion protection functions of the buffer; assess the effects of the proposed modification on those functions; and address the nine (9) criteria listed in this subsection (2)(b) of this section."

The submitted report does not address the nine criteria above as required by city code.

The submitted plan does not meet the content requirements in KZC 90.55(4), which states:

"The mitigation plan shall consist of a description of the existing functions and values of the wetlands and buffers affected by the proposed project, the nature and extent of impacts to those areas, and the mitigation measures to offset those impacts. The mitigation plan shall also contain a drawing that illustrates the compensatory mitigation elements. The plan and/or drawing shall list plant materials and other habitat features to be installed."

To clearly illustrate the required plan elements, a mitigation plan set consisting of 1) an existing conditions map, 2) a proposed impacts figure, 3) a proposed mitigation map including a planting plan and habitat features as applicable, and 4) maintenance and monitoring notes, must be submitted.

The submitted plan does not include fence details as required under KZC 90.50 and KZC 90.95.

The project area, including the proposed buffer modification, is mapped within a landslide hazard area, and designated as high risk (Kirkland Maps, GIS). A significant portion of the proposed buffer addition is within designated steep slopes, as depicted on the site survey. Functional replacement at a one-to-one ratio is not sufficient when moderately sloped buffer loss is replaced with steep slope buffer gain. A review of best available science (BAS) tells us that, "effectiveness of buffers at removing pollutants before they enter a wetland decreases as the slope increases" (Ecology Publication No. 05-06-008). Ecology recommends increasing the buffer by 50 percent when the slope is greater than 30 percent. Additionally, standard buffer widths presume an intact native

plant community. Although the proposed buffer addition areas are forest, patches of understory are dominated by non-native blackberry vines. To ensure buffer functions and values are maintained, the revised mitigation plan must consider steep slopes and the existing vegetative condition.

The proposed site development must also comply with KZC, Chapter 85 – Geologically Hazardous Areas.

Recommendations

Specifically, the following study corrections are recommended:

Stream & Wetland Delineation Study

- Delineate and survey the ordinary high water mark, left and right banks, of all onsite streams.
- Include the ditched stream along Forbes Creek Drive in the delineation and survey map, including buffer width.
- Update the classification and buffer of Stream 5 to match previously recorded information and current site observations.
- Review the portion of Stream 2 shown as piped. Based on field observations, an open channel is present below the pipe; delineate and survey open stream channel ordinary high water mark.
- Review open channel originating from a culvert at the north end of the property and flagged as 'Stream 3.' It is not shown on the provided survey. Delineate and survey open stream channel ordinary high water mark.
- Delineate, classify and survey the wetland area identified at the north end of the property, west of Stream 5.
- Update the critical areas overview map to include all relevant stream and wetland survey data and document all associated on-site buffer and building setback encumbrances.

Buffer Modification Plan

- Update the Critical Areas Report to reflect the delineation study revisions noted above.
- Revise the Critical Areas Report to address the KZC 90.100(2)(b) requirements.
- Provide a mitigation plan that meets the content requirements in KZC 90.55(4).
- Show fencing details on the mitigation plan per KZC 90.50 and KZC 90.95.
- Revise the proposed buffer averaging approach to rectify functional losses due to steep slopes and existing non-native vegetation.
- Recommend salvaging some trees within the building footprint for large woody debris placement in buffer areas.
- Provide a bond quantity worksheet

I recommend that the City accept the Talasaea report once the corrections listed above are implemented. Please call if you have any questions or if I can provide you with any additional information.

Sincerely,

Nell Lund, PWS
Senior Ecologist

Enclosures

SEC 32, TWP 26, RGE 5, W.M.

Forbes Creek Cottage Max Development Calculations

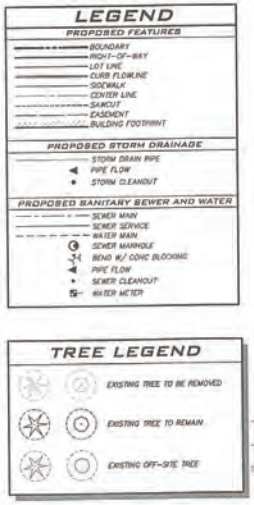
Total Site Area:	289,221	SF
ROW Dedication	3,822	SF
Sensitive Area Only (Wetland / Stream):	11,151	SF
Unmodified Buffer Area:	167,367	SF
Buildable Area:	106,881	SF
Percent of Site in Sensitive Area Buffer:	57.87%	
Minimum Lot Size:	12,500	SF
Development Factor:	50.00%	
Maximum Development Potential:	**15.25**	**DU**

Out Parcel Calculations

Total Site Area:	19,937	SF
ROW Dedication	990	SF
Sensitive Area Only (Wetland / Stream):	47	SF
Unmodified Buffer Area:	3,409	SF
Buildable Area:	16,478	SF
Percent of Site in Sensitive Area Buffer:	17.10%	
Minimum Lot Size:	12,500	SF
Development Factor:	80.00%	
Maximum Development Potential:	**1.54**	**DU**

Forbes Creek Cottage Calculations

Max Homes Permited	15	Homes
Homes Proposed	15	Homes
Open Space Required - 400 S.F Per Unit		
Total Open Space Required	6,000	S.F.
Total Open Space Proposed	8,700	S.F.
Parking Required - 2 Spaces per Unit + 10% Guest		
Parking Required	33	Spaces
Parking Provided	34	Spaces



Field Sketch - Mark-up by The Watershed Co. site visit: 8/25/16 Ref. No. 160622.6

*DP-1 meets wetland criteria.

BLUELINE

SCALE: AS NOTED
PROJECT MANAGER: TODD OBERG, PE
PROJECT ENGINEER: TODD OBERG, PE
DESIGNER: PJ COLLERAN, PLA, AICP
ISSUE DATE: 7/27/2016

NO	DATE	BY	REVISIONS

INTERGRATED DEVELOPMENT PLAN
ORCAS MOON COTTAGES
PARCEL # 3890100050
CITY OF KIRKLAND WASHINGTON

JOB NUMBER: 12-248
SHEET NAME: IDP-01
SHT 1 OF 1

THE WATERSHED COMPANY
750 Sixth Street South
Kirkland, Washington 98033
(425) 822-5242
watershedco.com

WETLAND DETERMINATION DATA FORM

Western Mountains, Valleys, and Coast Supplement to the 1987 COE Wetlands Delineation Manual

ATTACHMENT 24

DP- 1

Project Site:	**Parcels 389010-0050 and -0055**	Sampling Date:	**8/25/2016**
Applicant/Owner:	**Orcas Moon LLC**	Sampling Point:	DP- **1**
Investigator:	**N. Lund**	City/County:	**Kirkland / King County**
Sect., Township, Range:	S **32** T **26** R **5**	State:	**WA**
Landform (hillslope, terrace, etc): **hillslope**	Slope (%): **<5%**	Local relief (concave, convex, none): **concave**	
Subregion (LRR): **A**	Lat:	Long:	Datum:
Soil Map Unit Name: **KpB (Kitsap silt loam)**		NWI classification: **None**	

Are climatic/hydrologic conditions on the site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks.)
Are "Normal Circumstances" present on the site? ☒ Yes ☐ No
Are Vegetation☐, Soil ☐, or Hydrology ☐ significantly disturbed?
Are Vegetation☐, Soil ☐, or Hydrology ☐ naturally problematic (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ☒	No ☐	**Is the Sampling Point within a Wetland?** Yes ☒ No ☐
Hydric Soils Present?	Yes ☒	No ☐	
Wetland Hydrology Present?	Yes ☒	No ☐	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5m diam.)	Absolute % Cover	Dominant Species?	Indicator Status
1. ***Alnus rubra***	**30**	**Y**	**FAC**
2. ***Salix lucida spp. lasiandra***	**15**	**Y**	**FACW**
3.			
4.			
	45	= Total Cover	
Sapling/Shrub Stratum (Plot size: 3m diam.)			
1. ***Crataegus douglasii***	**50**	**Y**	**FAC**
2. ***Cornus sericea***	**50**	**Y**	**FACW**
3. ***Rubus spectabilis***	**10**	**N**	**FAC**
4.			
5.			
	110	= Total Cover	
Herb Stratum (Plot size: 1m diam.)			
1. ***Athyrium filix-femina***	**5**	**Y**	**FAC**
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	5	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
		= Total Cover	
% Bare Ground in Herb Stratum:			

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC:	**5**	(A)
Total Number of Dominant Species Across All Strata:	**5**	(B)
Percent of Dominant Species that are OBL, FACW, or FAC:	**100**	(A/B)

Prevalence Index Worksheet

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

Prevalence Index = B / A =

Hydrophytic Vegetation Indicators

- ☒ Dominance test is > 50%
- ☐ Prevalence test is ≤ 3.0 *
- ☐ Morphological Adaptations * (provide supporting data in remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants *
- ☐ Problematic Hydrophytic Vegetation * (explain)

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks:

SOIL

Sampling Point – DP- 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) ATTACHMENT 24

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-8	**2.5Y 3/1**	**100**					**Sandy loam**	
8-14	**10YR 3/2**	**95**	**10YR 3/6**	**5**	**C**	**M**	**Sandy loam**	

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

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

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

Indicators for Problematic Hydric Soils[3]

- ☐ 2cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)
- ☐

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

Restrictive Layer (if present):
Type:
Depth (inches):

Hydric soil present? Yes ☒ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required):

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

Field Observations

Surface Water Present?	Yes ☐	No ☒	Depth (in):
Water Table Present?	Yes ☐	No ☒	Depth (in):
Saturation Present? (includes capillary fringe)	Yes ☐	No ☒	Depth (in):

Wetland Hydrology Present? Yes ☒ No ☐

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

Remarks: **Dry summer season, soil moist, not saturated.**
Secondary indicators present.

TWC Ref. No. 160622.6

Wetland A

ATTACHMENT 24

Type 2

WETLAND FIELD DATA FORM – Orcas Moon property located at
4xx **20th Ave. Kirkland, WA 98033.**

Rating done on 8/25/16 by The Watershed Company. NL

WETLAND FIELD DATA FORM

BEGIN BY CHECKING ANY OF THE FOLLOWING (a. – e.) THAT APPLY:

a. The wetland is contiguous to Lake Washington;

b. The wetland contains at least 1/4 acre of organic soils, such as peat bogs or mucky soils;

c. The wetland is equal to or greater than 10 acres in size and having three or more wetland classes, as defined by the U.S. Fish & Wildlife Service (Cowardin et al., 1979), one of which is open water;

d. The wetland has significant habitat value to state or federally listed threatened or endangered wildlife species; or

e. The wetland contains state or federally listed threatened or endangered plant species.

IF ANY OF THE CRITERIA LISTED ABOVE ARE MET, THEN THE WETLAND IS CONSIDERED TO BE TYPE 1. IF THAT IS THE CASE, PLEASE CONTINUE TO COMPLETE THE ENTIRE FORM, BUT DO NOT ASSIGN POINTS.

IF THE WETLAND DOES NOT MEET THE CRITERIA LISTED ABOVE FOR TYPE 1, COMPLETE THE ENTIRE FORM, USING THE ASSIGNED POINTS TO DETERMINE IF IT IS A TYPE 2 OR TYPE 3 WETLAND.

Type 2 wetlands typically have at least two wetland vegetation classes, are at least partially surrounded by buffers of native vegetation, connected by surface water flow (perennial or intermittent) to other wetlands or streams, and contain or are associated with forested habitat.

1. Total wetland area

Estimate wetland area and score from choices Acres		Point Value	**Points**
>20.00	=	6	
10-19.99	=	5	
5-9.99	=	4	
1-4.99	=	3	
0.1-0.99	=	2	
<0.1	=	1	

2 **(points)**

2. Wetland classes: Determine the number of wetland classes that qualify, and score according to the table.

	# of Classes		Points
Open Water: if the area of open water is >1/3 acre or >10% of the total wetland area	1	=	1
Aquatic Beds: if the area of aquatic beds is >10% of the **open water** area **or** >1/2 acre	2	=	3
Emergent: if the area of emergent class is >1/2 acre **or** >10% of the total wetland area	3	=	5
Scrub-Shrub: if the area of scrub-shrub class is >1/2 acre **or** >10% of the total wetland area	4	=	7
Forested: if the area of forested class is >1/2 acre or >10% of the total wetland area	5	=	10

1 **(points)**

3. Plant species diversity.

For all wetland classes which qualified in 2 above, count the number of different plant species and score according to the table below. You do not have to name them.

e.g., if a wetland has an aquatic bed class with 3 species, and emergent class with 4 species and a scrub-shrub class with 2 species, you would circle 2, 2, and 1 in the second column (below).

Class	# of Species	Point Value	Class	# of Species	Point Value
Aquatic Bed	1-2	= 1	Scrub-Shrub	1-2	= 1
	3	= 2		3-4	= 2
	>3	= 3		>4	= 3
Emergent	1-2	= 1	Forested	1-2	= 1
	3-4	= 2		3-4	= 2
	>4	= 3		>4	= 3

3 **(points)**

4. Structural diversity.

If the wetland has a forested class, add 1 point for each of the following attributes present:

Trees >50′ tall = 1
Trees 20′ to 49′ tall = 1
shrubs = 1
Herbaceous ground cover = 1

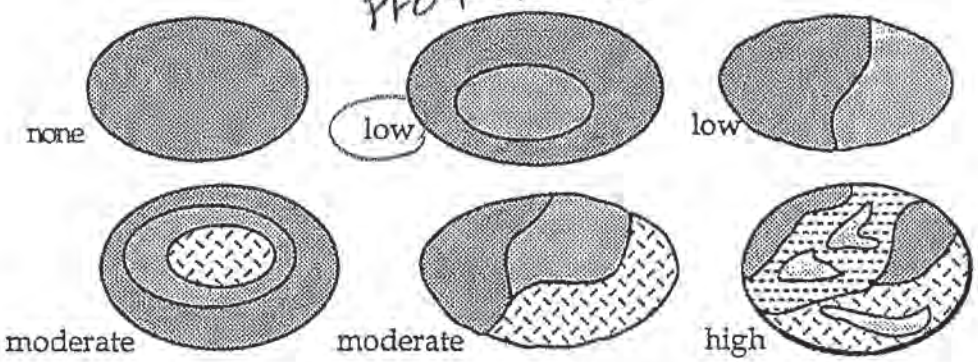
4 **(points)**

5. Intersperesion between wetland classes.

Decide from the diagrams below whether interspection between wetland classes is high, moderate, low or none

3 = High
2 = Moderate
1 = Low
0 = None

PFO + stream



1 **(points)**

6. Habitat features

Add points associated with each habitat feature listed:

Is there evidence of current use by beavers?	= 3
Is a heron rookery located within 300'?	= 2
Are raptor nest(s) located within 300'?	= 1
X Are there at least 2 standing dead trees (snags) per acre?	= 1
Are there any other perches (wires, poles, or posts)?	= 1
X Are there at least 3 downed logs per acre?	= 1

2 **(points)**

7. Connection to streams

Is the wetland connected at any time of the year via surface water? **(score one answer only)**

Is the wetland connected at any time of the year via surface water?

To a perennial stream or a seasonal stream *with* fish	= 5
To a seasonal stream *without* fish	= 3
Is not connected to any stream	= 0

3 **(points)**

Wetland A

8. Buffers

Step 1: Estimate (to the nearest 5%) the percentage of each buffer or land-use type (below) that adjoins the wetland boundary. Then multiply these percentages by the factor(s) below and enter result in the column to the right.

	% of Buffer		Step 1	Width Factor		Step 2
Roads, buildings or parking lots	____ %	X 0 =	____	____	=	____
Lawn, grazed pasture, vineyards or annual crops	____ %	X 1 =	____	____	=	____
Ungrazed grassland or orchards	____ %	X 2 =	____	____	=	____
Open water or native grasslands	____ %	X 3 =	____	____	=	____
Forest or shrub	100 %	X 4 =	400	2	=	800

Add buffer total ____

Step 2: Multiply result(s) of step 1:

By 1 if buffer width is 25-50′

X By 2 if buffer width is 50-100′

By 3 if buffer width is >100′

Enter results and add subscores

Step 3: Score points according to the following table:

Buffer Total

900-1200 = 4

600-899 = 3

300-599 = 2

100-299 = 1

3 **(points)**

9. Connection to other habitat areas:

Is there a riparian corridor to other wetlands within 0.25 of a mile, or a corridor >100′ wide with good forest or shrub cover to any other habitat area? ✓ = 5

Is there a narrow corridor <100′ wide with good cover or a wide corridor >100′ wide with low cover to any other habitat area? = 3

Is there a narrow corridor <100′ wide with low cover or a significant habitat area within 0.25 mile but no corridor? = 1

Is the wetland and buffer completely isolated by development and/or cultivated agricultural land? = 0

5 **(points).**

10. Scoring

Add the scores to get a total: 24

Question: Is the total greater than or equal to 22 points? Yes.

Answer:

Yes = Type 2

No = Type 3

4