

## CRITICAL AREAS STUDY

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# Issaquah Kelkari

Prepared for:

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February 2016

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Critical Areas Study.

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# CRITICAL AREAS STUDY

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## ISSAQUAH KELKARI

### 1 INTRODUCTION

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Kelkari is a residential community located in the Sunrise neighborhood of south Issaquah, near the intersection of Sunrise Place Southwest and Cabin Creek Lane Southwest.

The Master Site Plan, Site Development Permit, and Binding Site Plan for Kelkari were approved in 1998. The development was approved to be comprised of 189 dwelling units in 9 buildings, each with a proposed height of approximately 50 feet. Phase 1, with 63 dwelling units and the clubhouse, was completed in 1999. This document concerns the Phase 2 and Phase 3 project areas. Phases 2 and 3 will include a total of 75 townhouse style buildings, with a maximum height not to exceed 45 feet.

Wetlands and streams have been identified in the project area. Wetlands and streams are defined as critical areas in Issaquah Municipal Code (IMC) 18.10.390.

IMC 18.10.410.A requires a critical areas study for a development proposal that “includes, is adjacent to, or could have probable significant adverse impacts to critical areas” in order to adequately evaluate the proposal and all probable impacts. This critical areas study is intended to satisfy this requirement for Phase 2 and Phase 3 of Kelkari, provide documentation that demonstrates how the modified townhouse development complies with the prior approvals, and to support the City’s issuance of a State Environmental Policy Act (SEPA) Addendum.

### 2 PROJECT AREA

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#### 2.1 Location

The project area is located in the southern portion of Issaquah, near the base of Squak Mountain. See Figure 1, below.

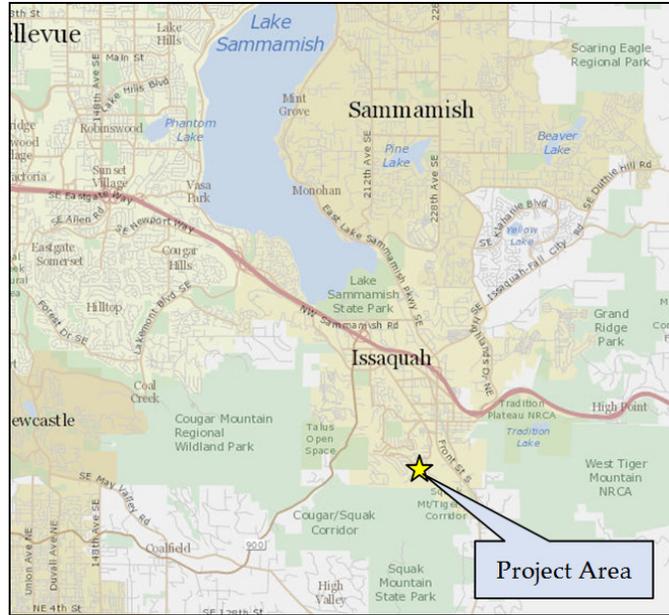


Figure 1. Project vicinity map

More specifically, the project area, which is bisected by Sunrise Place Southwest, is located south of the existing Kelkari development (Phase 1). Phase 2 is located north of Sunrise Place Southwest; Phase 3 is located south of Sunrise Place Southwest. See Figure 2.

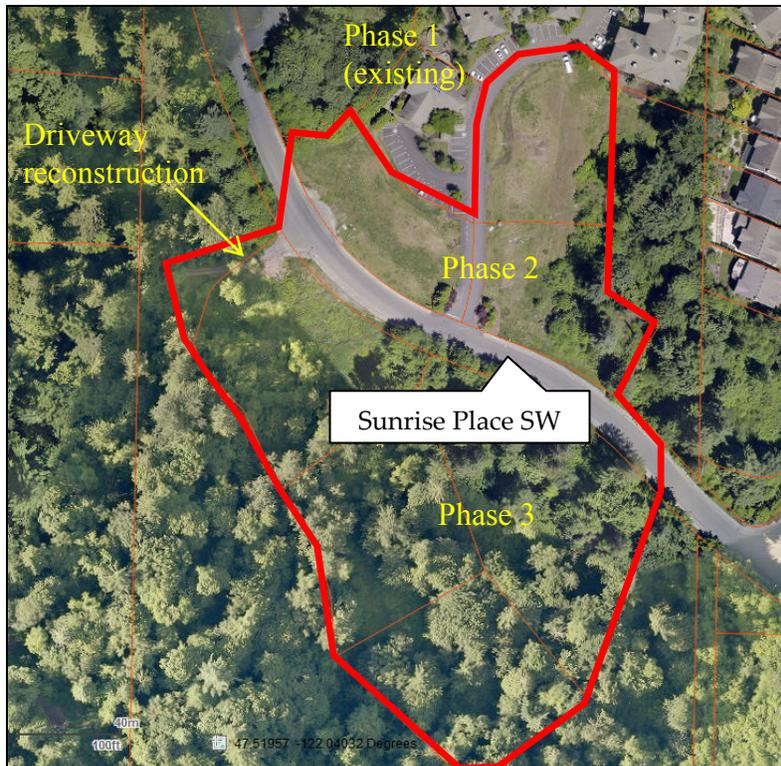


Figure 2. Project location

## 2.2 Environmental Setting

The project is located in Issaquah Creek Drainage Basin; Water Resource Inventory Area 8 (Cedar-Sammamish); Lake Washington Hydrologic Unit (17110012).

The area comprising Phase 2 is mostly mowed lawn, although the eastern portion of this area is situated on a steep forested hillside with a meandering footpath along the eastern perimeter. The area comprising Phase 3 contains a mixture of forested, scrub-shrub and emergent-vegetated areas, dominated by bigleaf maple, red alder, reed canarygrass, and Himalayan blackberry. Understory vegetation beneath the forest canopy is generally sparse. Old decommissioned roads and other previous excavation in this area interrupt the slope as terraces.

Five wetlands and five streams have been identified in the project area (see Appendix A). Wetlands 1, 2, 4, and 5 are located in Phase 3; Wetland 3 is located adjacent to the eastern boundary of Phase 2.

Wetland 1 is a slope-type wetland and exhibits strong hydric soils and hydrophytic vegetation. The wetland is largely forested, but contains patches of scrub-shrub vegetation and a large area of emergent vegetation. Dominant vegetation in the forested and scrub-shrub areas includes western red cedar, vine maple, salmonberry, lady fern, Cooley's hedge nettle and skunk cabbage. The emergent zone at the toe of the slope is dominated by a combination of reed canarygrass and giant horsetail. Due to its geomorphic position, the primary source of hydrology of the slope wetland is groundwater seeps. Several streams are located within Wetland 1: Stream B (see below), which was delineated on the northwestern boundary of Wetland 1, and several other smaller streams that originate within the wetland and sheet flow down the slope into a culvert on Sunrise Place Southwest.

Wetland 2 is a slope-type wetland located at the northwest corner of Phase 3, within a previously cleared area. The outlet of this wetland, outside the wetland boundary, flows to a ditch-line parallel to the driveway. Sources of hydrology include rainwater and groundwater seeps. The wetland consists mainly of herbaceous vegetation with some saplings and shrubs. Dominant hydrophytic vegetation includes western red cedar, black cottonwood, and giant horsetail. Soils are of a highly unusual composition, possibly indicating fill.

Wetland 3 is a slope wetland located just east of Phase 2. In addition to groundwater, the wetland receives water from Wetland 1 through a culvert under Sunrise Place Southwest and from stormwater runoff (via corrugated plastic pipes) from the upland parking lots and lawns on the property. Water leaves the wetland through a culvert under 1<sup>st</sup> Place SE. Dominant

hydrophytic vegetation within the wetland includes red-osier dogwood, lady fern and skunk cabbage. The wetland is largely shaded by trees outside the wetland boundaries, such as bigleaf maple, beaked hazelnut and western hemlock.

Wetlands 4 and 5 are depressional wetlands that formed atop previous logging road cuts and associated compacted soils. Wetlands 4 and 5 likely formed as a result of road construction intercepting shallow groundwater and surface water. Due to compaction of the old roadbed and unmaintained road drainage, water now accumulates and has created wetland conditions. These wetlands generally lack structural and vegetative diversity. Weedy plant assemblages such as reed canarygrass and creeping buttercup are prevalent in Wetlands 4 and 5.

Two streams, Streams A and B, originate within and/or directly adjacent to Wetland 1. Streams A and B merge within Wetland 1, then flow out of Wetland 1 in a northeastern direction and into a culvert beneath Sunrise Place Southwest as the now combined Stream A. Stream A discharges into Wetland 3 on the east side of Sunrise Place Southwest and eventually connects with Issaquah Creek approximately 430 feet east of the Sunrise Place Southwest culvert.

Streams A and B within Wetland 1 are headwater streams that are generally broad, poorly defined, and composed of shallow sheetflow that does not contain sufficient flow or pools to support fish. Downstream of the Sunrise Place Southwest culvert, Stream A is more defined, yet the channel is narrow (approximately two feet wide), relatively steep (approximately 18 percent incline), and does not contain sufficient flows or pools to support fish. Per Washington Department of Natural Resources (WAC 222-16-031), Western Washington streams with an average gradient between 16 and 20 percent must be greater than two feet wide and be supported by a contributing basin more than 50 acres to be presumed fish-bearing. Stream A flows at an average gradient of 18 percent (per LIDAR topography), is approximately two feet wide, and is a headwater stream with a contributing basin limited to a relatively confined area upslope of Wetland 1. The large majority of surface runoff from the northeast portion of Squak Mountain flows towards Cabin Creek just to the north or one of several larger, unnamed Issaquah Creek tributaries to the south. The contributing basin for Stream A is less than approximately five acres, as measured using iMAP LIDAR topography. Based on the combination of these factors, Stream A is not considered fish-bearing. Stream B is a very small tributary to Stream A (approximately 30 feet long) that originates from a groundwater seep just north of Wetland 1. Flow is generally less than one inch deep and less than two feet wide. Stream B is not considered fish-bearing based on insufficient flow and size to support fish.

Issaquah Creek is generally located east of the project area, but is included due to the potential for indirect effects related to stormwater discharges. Issaquah Creek originates in headwaters on Cougar, Squak, and Tiger Mountains and flows generally north and northwest through Issaquah, discharging into Lake Sammamish. Issaquah Creek is a documented spawning stream for several salmonid-fish species, including Chinook salmon, coho salmon, and steelhead. Substrate in Issaquah Creek is considered excellent for spawning, although large woody debris is generally lacking, and pool frequency is below standards (Issaquah 2004).

Generally, the lower portions of Issaquah Creek are subjected to widespread flooding, but water quality is not substantially degraded (Issaquah 2004). Fecal coliform is the primary contaminant in Issaquah Creek, for which the lower portions of the creek are listed on the 303d list. Phosphorous concentrations often exceed recommended limits during storm events, although the elevated phosphorous concentrations are primarily a natural phenomenon in the basin. Dissolved zinc and copper are not particularly problematic in Issaquah Creek, with background levels at 1.6 µg/L for zinc and 2.4 µg/L for copper (Issaquah 2011). Other common water quality concerns, such as temperature and dissolved oxygen, are not significantly degraded in Issaquah Creek (Issaquah 2004).

Cabin Creek is located off-site, approximately 100 feet north of Phase 3. Cabin Creek is identified as fish-bearing (FPARS), although Chinook, coho, and steelhead are not documented in the creek (SalmonScape, PHS Data, WRIA 8 Distribution Maps).

An unnamed stream located just off-site to the south is described in the environmental impact statements for the original development as intermittently flowing. The stream was observed during field investigations. Its ordinary high water mark width was measured at several locations; these measurements were transferred to the site survey, offsetting from the topographically defined centerline approximately 2 to 3 feet to either side. During the rainy season, this stream contains only a few inches of flow, and is too small to support salmonid fish species.

Beyond the immediate project area, the project vicinity includes a generally undeveloped portion of Squak Mountain. Areas closest to the project area are dominated by bigleaf maple, red alder, and black cottonwood in the canopy, with salmonberry, vine maple, and sword fern in the understory. The southwestern portion of the project vicinity (lower Squak Mountain) is composed of a second- and third-growth coniferous forest dominated by Douglas-fir, western red cedar, and bigleaf maple trees, with an understory composed of vine maple, red elderberry, salmonberry, and a dense sword fern

groundcover. Elsewhere, the project vicinity includes high-density residential development, including the previously completed Phase 1, mixed with fragmented coniferous-deciduous forest areas.

Please see the wetland and stream delineation study (The Watershed Company 2016) for additional details on wetlands and streams in the project area.

### **2.3 Prior Restoration Work**

Under Phase 1 of the Kelkari development, slopes were repaired and restored adjacent to Cabin Creek. This area was inspected for habitat quality and success of the revegetation effort. The hillside was found to be well vegetated with a dense and diverse assemblage of native tree, shrub and groundcover species. See Figure 3. A few areas of blackberry were noted, but were not found to be spreading or otherwise displacing native plants. Installed woody debris is functioning with evidence of wildlife use. Many if not most of the snags remain standing. See Figure 4.



Figure 3. Native vegetation at Cabin Creek restoration site.

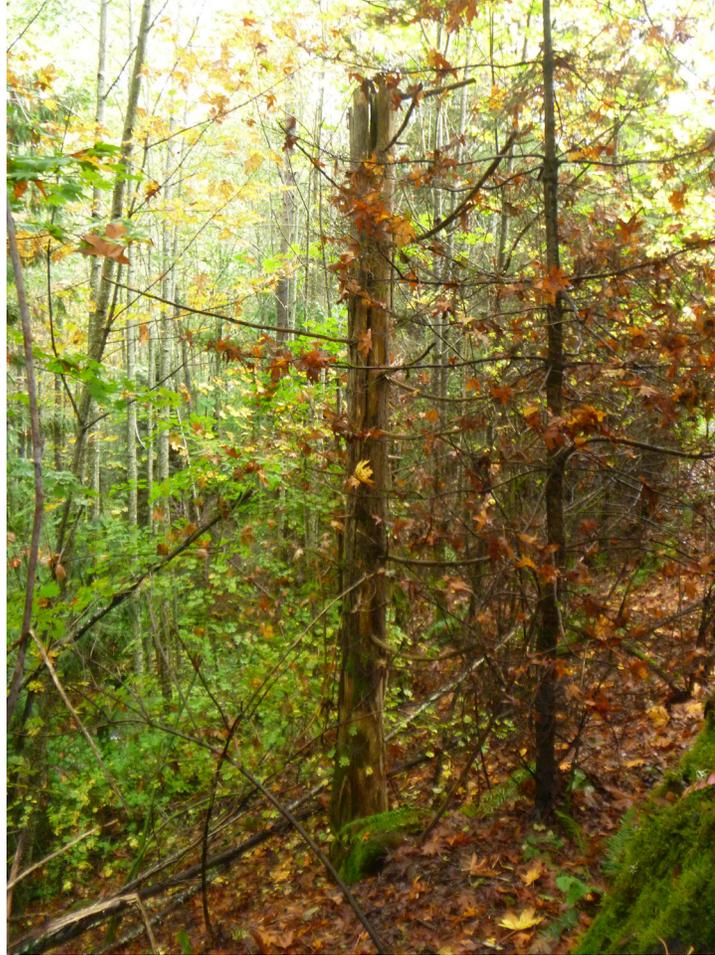


Figure 4. Habitat snags at Cabin Creek restoration site.

### 3 PROJECT DESCRIPTION

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As previously stated, the Master Site Plan, Site Development Permit, and Binding Site Plan for Kulkari were approved in 1998. The development was approved to be composed of 189 dwelling units in 9 buildings, each with a proposed height of approximately 50 feet. Phase 1, with 63 dwelling units and the clubhouse, was completed in 1999. Phases 2 and 3 will include a total of 75 townhouse style buildings, with a maximum height not to exceed 45 feet.

The Phase 2 project area has been cleared, graded, and landscaped. Site improvements (i.e., the main access road and stormwater management system/vault) have been constructed as part of Phase 1 and include accommodation of the future Phase 2. The Phase 3 project area is undeveloped beyond the existing access intersection. Grading to establish lot and roadway

elevations will be moderate, with cuts and fills of 2.0–20.0 feet planned throughout the site.

Four stormwater detention vaults will be constructed as part of the project. Two Phase 2 vaults will provide a capacity of 6,137 cubic feet; two Phase 3 vaults will provide a capacity of 12,661 cubic feet. Water quality treatment will be provided by CONTECH StormFilters containing Phosphosorb media or equivalent. Following retention, stormwater from Phase 2 areas will be discharged into the municipal stormwater system, while Phase 3 areas will discharge partially into the municipal stormwater system and partially through a dispersal trench located above Wetland 1. Use of the dispersal trench will allow a portion of the stormwater to filter through Wetland 1 and a portion of its buffer prior to entering Stream A. This is intended to provide filtration of sediment and pollutants while maintaining hydrology for Wetland 1.

Also included in the proposed project is the reconstruction of a portion of a private residential driveway on an adjacent property just north of Phase 3. The driveway will be reconstructed in its current location and is located approximately 50 to 100 feet south of Cabin Creek. No in-water work is proposed in the creek.

As some impacts to wetlands are anticipated, a wetland mitigation area in Phase 3 is also included as part of the project. Impacts to critical areas, including proposed mitigation, are discussed in detail in the following section.

## 4 CRITICAL AREA IMPACTS

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### 4.1 Impact Avoidance & Minimization

Prior to development and approval of the Master Site Plan, Site Development Permit and Binding Site Plan, three project development alternatives, as well as a no build alternative, were reviewed in-depth in the Draft Environmental Impact Statement (DEIS; 1996) and the Final Environmental Impact Statement (FEIS; 1996) prepared for the project. As stated in the DEIS, “the primary difference between the alternatives is in the number of buildings and their location relative to onsite features such as wetlands, steep slopes, and streams.”

The DEIS and FEIS included discussion concerning how the development alternatives avoided or minimized impacts to critical areas including streams and wetlands. For example, all development alternatives sought to avoid impacts to higher-class wetlands. Unavoidable impacts to critical areas were also evaluated. Based upon the information provided for decision makers in the

DEIS and the FEIS, the development, which approved the direct fill of 0.13 acre of wetlands, was approved in 1998 and the Binding Site Plan was recorded in September 1999. The modified development further avoids and minimizes wetland impacts, with a reduction of direct fill to 0.098 acre.

The recorded Binding Site Plan identified wetland and stream critical areas and depicted associated buffers and building setback lines. The proposed townhouse project has been designed in accordance with the critical area buffers and building setback lines depicted in the Binding Site Plan, except as modified within Parcel B based on a revised wetland mitigation plan. The current proposed wetland mitigation plan will result in an increase in the buffer area for Wetland 1.

Under the approved and current proposal, no direct impacts are proposed to the unnamed stream located at the south end of the project area to the west of Sunrise Place Southwest. The Binding Site Plan does not depict the unnamed stream or any buffers or building setback lines for this stream, but it shows direct impacts to the stream buffer, as the stream is located very near the structure shown on Lot 10 (Binding Site Plan, Sheet 6 of 6).

#### **4.1.1 Stormwater Impacts**

As described in the previous section, four stormwater detention vaults, with a combined storage capacity of 18,798 cubic feet, will be constructed as part of the project. The net result of the proposed detention will be a significant reduction in peak flows discharging into Issaquah Creek. The peak discharge associated with the 100-year storm event will be reduced from 0.79 cfs to 0.49 cfs for Phase 2, and from 1.22 cfs to 0.77 cfs for Phase 3. The proposed stormwater treatment will provide 50 percent removal of phosphorus in accordance with the 1990 King County Stormwater Manual.

#### **4.1.2 Construction Impacts**

Prior to start of construction, vegetation to be retained and any utilities within the excavation limits will be marked. Any utilities in the work area will be relocated prior to the start of construction to avoid the possibility of spills or other environmental hazards. Structural debris will be removed immediately to an approved upland location. Excavated soils will be stored at an appropriate upland location on-site or hauled to a suitable off-site location; soils will be surrounded by silt fencing as necessary to control erosion and prevent silt-laden water from reaching streams or wetlands. Any excess excavation spoils will be disposed of off-site at the contractor's discretion in a manner that does not result in the unauthorized filling of wetlands or in the generation of silt-laden runoff that enters streams or wetlands. Exposed soils in disturbed areas will be covered with straw, wood fiber mulch, compost, plastic sheeting, crushed rock, or equivalent, as needed to prevent erosion. Silt fencing will be established around

all cleared areas, and storm drain inlet protection will be installed in all new catch basins during construction.

## 4.2 Unavoidable Impacts & Mitigation

The approved development included the actual filling and “paper filling” of wetlands. The proposed modified development would also result in the actual filling and “paper filling” of four wetlands. (Paper filling does not mean that a wetland is actually being filled, but that a wetland is being treated as though it were actually being filled in order to reduce or eliminate associated wetland buffer areas.) One wetland would be completely filled, the majority of two wetlands would be paper filled with remaining areas actually filled, and a portion of one other wetland would be paper filled. To compensate for unavoidable impacts, the approved project included a mitigation plan that was approved by the City of Issaquah and US Army Corps of Engineers (NWP issued June 10, 1998). The mitigation area was approximately 5,250 square feet and shown on the Binding Site Plan within Parcel B. The modified project proposes a mitigation plan for the same general location with an increase in mitigation area to 14,223 square feet (see Table 1, below).

Unavoidable project wetland impacts are as follows:

- A portion (2,878 square feet) of **Wetland 1** (16,571 square feet) would be paper filled under the proposal to maintain the Binding Site Plan buffer requirements.
- The majority (1,053 square feet) of **Wetland 2** (1,156 square feet) would be paper filled under the proposal. A portion (103 square feet) of Wetland 2 would be actually filled. While paper filling would eliminate the requirement for a wetland buffer on the eastern side, the functions and values of remaining wetland areas are expected to largely be maintained due to the preservation of the wetland itself and the extensive and high-quality forested conditions located upslope of the wetland, which will provide some continued buffer function. The wetland will also be located above and separated from and the townhouse development by a 6 to 8 foot-tall wall.
- The majority (1,726 square feet) of **Wetland 4** (2,143 square feet) would be paper filled under the proposal. A portion (417 square feet) of Wetland 4 would be filled. While paper filling would eliminate the requirement for a wetland buffer on the eastern side, the functions and values of remaining wetland areas are expected to largely be maintained due to the preservation of the remaining wetland area and the extensive and high-quality forested conditions located upslope of the wetland, which will provide some continued buffer function. The wetland will also be located above and separated from and the townhouse development by a 6 to 8 foot-tall wall.

- All of **Wetland 5** (3,763 square feet) would be completely filled under the proposal.

Compensation for all paper fill impacts would be provided at a 1:1 ratio. Compensation for all actual fill impacts would be mitigated at a 2:1 ratio, consistent with US Army Corps of Engineers requirements.

Wetland fill and paper fill impacts and mitigation are summarized in Table 1, below.

Table 1. Wetland impacts and mitigation

Wetland	Area (SF)	Wetland Fill Impact (SF)	Paper Fill (SF)	Mitigation Ratio	Mitigation Required
#1	16,571	0	2,878	1:1	2,878
#2*	1,156	103	0	2:1	206
#2	1,156	0	1,053	1:1	1,053
#3	3,215	0	0	--	0
#4*	2,143	417	0	2:1	834
#4	2,143	0	1,726	1:1	1,726
#5*	3,763	3,763	0	2:1	7,526
<i>Totals</i>	<i>26,848</i>	<i>4,283</i>	<i>5,657</i>	<i>--</i>	<i>14,223</i>

\*Army Corps ratio

As compensation for impacts, a mitigation plan has been developed that creates 14,223 square feet of wetland by expanding Wetland 1 towards the southeast. Wetland creation would compensate “in kind” for wetland impacts, based on Cowardian classification. Specifically, the mitigation plan seeks to create 9,781 square feet of palustrine shrub-scrub wetland and 4,442 square feet of palustrine emergent wetland. Additionally, the mitigation plan addresses the restoration of 5,454 square feet of temporary buffer disturbance.

The mitigation plan includes extensive vegetation. Proposed planting includes trees (60), shrubs (855), live cuttings (2,400), and emergents and groundcovers (5,000).

To help ensure the success of the mitigation area, the mitigation plan includes detailed provisions for maintenance and monitoring. Maintenance and monitoring would be provided for a period of five years. Maintenance includes provisions for the removal of competing weeds and plant replacement. Monitoring includes a program to track the success of the mitigation site over time by measuring the degree to which the performance standards in the

mitigation plan are being met, including documentation in an annual monitoring report.

Finally, the mitigation plan includes direction on contingency plans and adaptive management.

## 5 SUMMARY

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The Master Site Plan, Site Development Permit, and Binding Site Plan for Kelkari were approved in 1998. The development was approved to be composed of 189 dwelling units in 9 buildings, each with a proposed height of approximately 50 feet. Phase 1, with 63 dwelling units and the clubhouse, was completed in 1999. This report concerns the Phase 2 and Phase 3 project areas. Phases 2 and 3 will include a total of 75 townhouse style buildings, with a maximum height not to exceed 45 feet.

The Binding Site Plan identified critical areas and depicted associated buffers and building setback lines. The proposed project has been designed in accordance with the critical area buffers and building setback lines depicted in the Binding Site Plan, except as modified to provide an increase in the wetland mitigation area and corresponding buffer and building setback line.

The proposed development would result in the actual filling or “paper filling” of four wetlands. As compensation for impacts, a mitigation plan has been developed that creates 14,223 square feet of wetland by expanding Wetland 1 towards the southeast. To help ensure the success of the mitigation area, the mitigation plan includes detailed provisions for the maintenance and monitoring.

## 6 REFERENCES

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City of Issaquah. The Kelkari Multifamily Residential Development. Draft Environmental Impact Statement. April 1996.

City of Issaquah. The Kelkari Multifamily Residential Development. Final Environmental Impact Statement. July 1996.

City of Issaquah Public Works Engineering Department. June 2004. Stormwater Management Plan 2002.

City of Issaquah Public Works Engineering Department and Resource Conservation Office. May 2011. State of our Waters Fourth Report, Issaquah Aquatic Resources Monitoring Report 1999-2010.

The Watershed Company. February 2016. Kelkari Wetland and Stream Delineation Study.

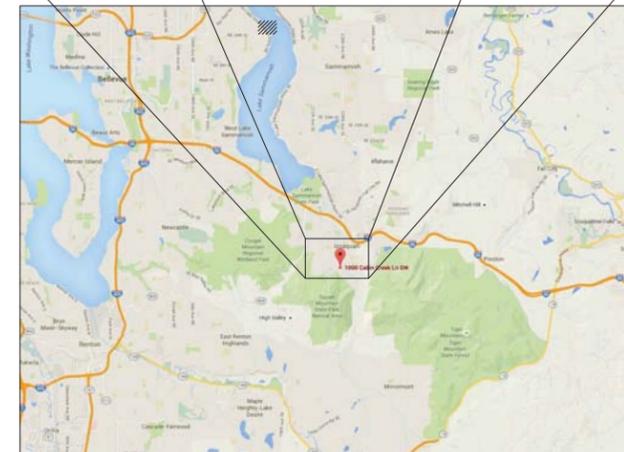


**APPENDIX A.**

**MITIGATION PLAN**

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# ISSAQUAH KELKARI



## VICINITY MAPS

### LEGEND

- WETLAND BOUNDARY, DELINEATED.
- BSP WETLAND BUFFER
- BSP WETLAND OR STREAM BSBL
- BSP STREAM BUFFER
- APPROXIMATE EXISTING STREAM
- PARCEL BOUNDARIES

### SHEET INDEX

- W1 EXISTING CONDITIONS
- W2 IMPACTS AND MITIGATION AREA
- W3 TESC PLAN
- W4 MITIGATION PLAN
- W5 GRADING PLAN
- W6 PLANTING PLAN
- W7 DETAILS AND NOTES (1 OF 2)
- W8 DETAILS AND NOTES (2 OF 2)

### NOTES

1. WETLANDS DELINEATED BY: THE WATERSHED COMPANY ON JULY 6, 7, 9, AND 16, 2015.
2. BASE FILE RECEIVED FROM CORE DESIGN INC. ON DECEMBER 17TH, 2015.
3. BSP: BINDING SITE PLAN
4. BSBL: BUILDING SET BACK LINE

## EXISTING CONDITIONS

SCALE 1"=50'

0' 25' 50' 100' 200'



**KELKARI TOWNHOMES**  
SUNRISE PL. S.W.  
ISSAQUAH, WASHINGTON

IS PROPERTY INVESTMENTS LLC

PROJECT NUMBER: 15-0357  
PROJECT MANAGER: JG  
DRAWN BY: KMB  
PLOT DATE: 2-12-16

SDP/ MSP/ BSP  
MINOR  
AMENDMENT  
APPLICATION  
2-12-16

REVISIONS:  
FEBRUARY 12, 2016  
SDP/ MSP/ BSP MINOR  
AMENDMENT  
APPLICATION



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

Science & Design

SHEET SIZE 24x36

MITIGATION PLAN

W1 OF 8



Mitigation Plan					
	Area (SF)	Wetland Fill Impact (SF)	Paper Fill (SF)	Mitigation Ratio	Mitigation Proposed (SF)
Wetland #1	16,571	0	2,878	1:1	2,878
Wetland #2*	1,156	103	0	2:1	206
Wetland #2	1,156	0	1,053	1:1	1,053
Wetland #3	N/A	0	0	--	0
Wetland #4*	2,143	417	0	2:1	834
Wetland #4	2,143	0	1,726	1:1	1,726
Wetland #5*	3,763	3,763	0	2:1	7,526
<b>Total</b>					<b>14,223</b>

Table does not include areas of temporary impact, which will be restored to existing or better condition.  
 \*Army Corps ratio

- PROPOSED 15' BSBL
- PROPOSED 50' WETLAND BUFFER
- PROPOSED MITIGATION AREA 14,356 SF
- PROPOSED WALL
- PARCEL B BOUNDARY
- EXISTING UNNAMED STREAM

**NOTE**

- BSP: BINDING SITE PLAN
- BSBL: BUILDING SET BACK LINE
- PAPER FILL: EXISTING WETLANDS TO BE COUNTED AS WETLAND BUFFER

**LEGEND**

	WETLAND BOUNDARY, DELINEATED.
	PROPOSED WETLAND BUFFER
	PROPOSED WETLAND BUFFER BSBL
	APPROXIMATE STREAM BUFFER
	APPROXIMATE EXISTING STREAM
	PARCEL BOUNDARIES
	WETLAND FILL IMPACTS
	WETLAND PAPER FILL IMPACTS
	PROPOSED MITIGATION AREA
	FOOT PRINT OF PROPOSED DEVELOPMENT
	TEMPORARY IMPACTS 5,455 SF
	SURVEYED SIGNIFICANT TREE

**KELKARI TOWNHOMES**  
 SUNRISE PL. S.W.  
 ISSAQUAH, WASHINGTON

IS PROPERTY INVESTMENTS LLC

PROJECT NUMBER: 15-0357  
 PROJECT MANAGER: JG  
 DRAWN BY: KMB  
 PLOT DATE: 2-12-16

SDP/ MSP/ BSP MINOR AMENDMENT APPLICATION  
 2-12-16

REVISIONS:  
 FEBRUARY 12, 2016  
 SDP/ MSP/ BSP MINOR AMENDMENT APPLICATION



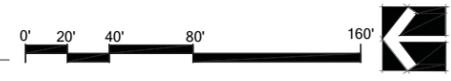
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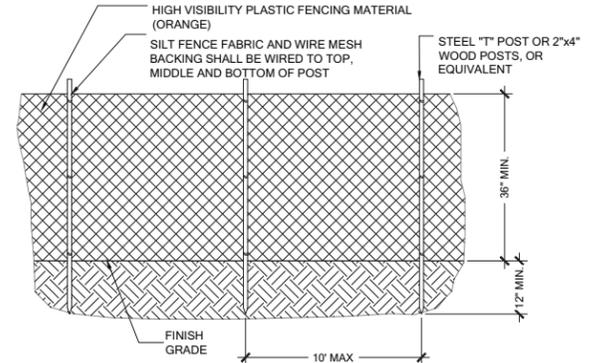
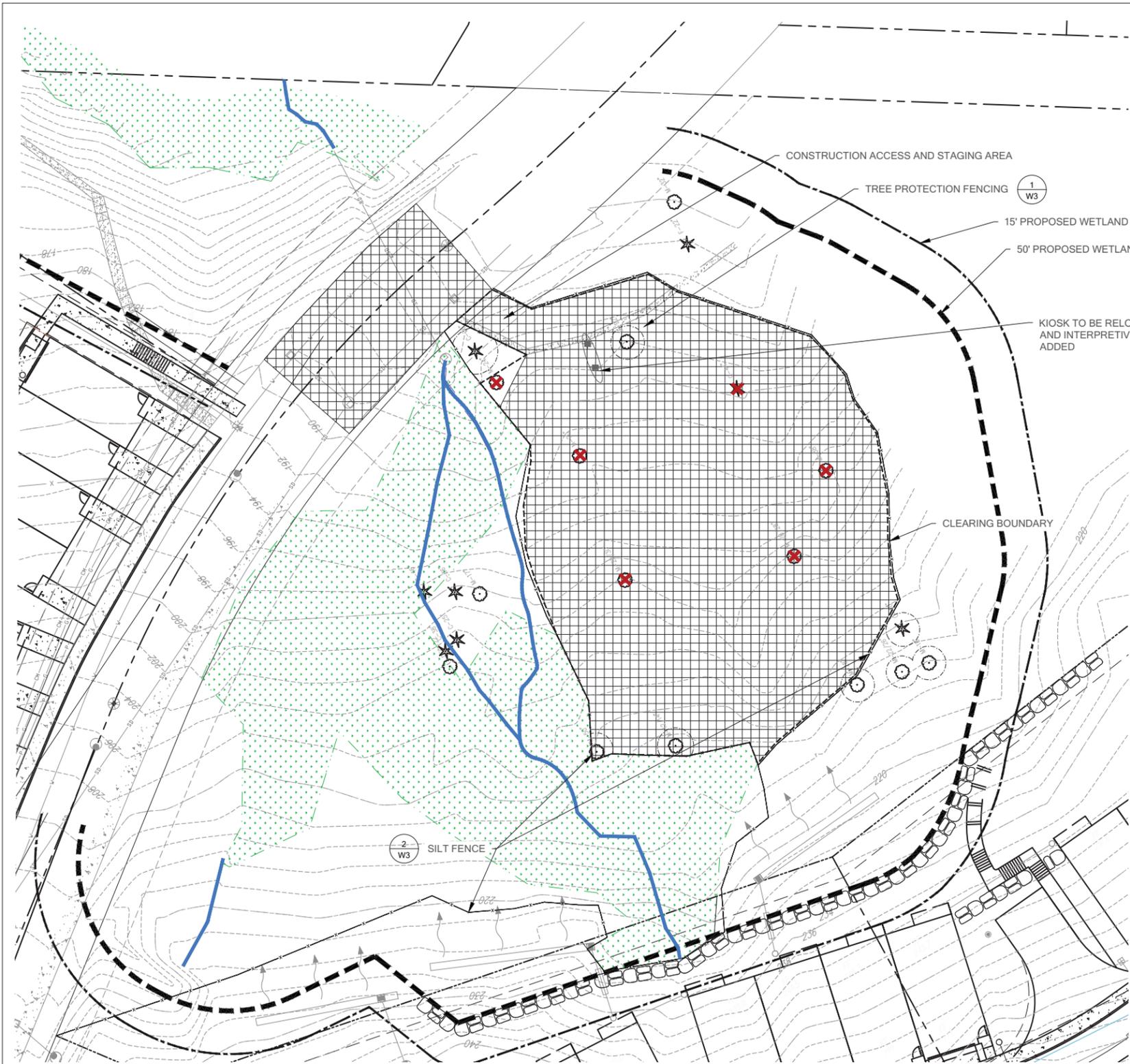
Science & Design

SHEET SIZE 24x36

MITIGATION PLAN

W2 OF 8

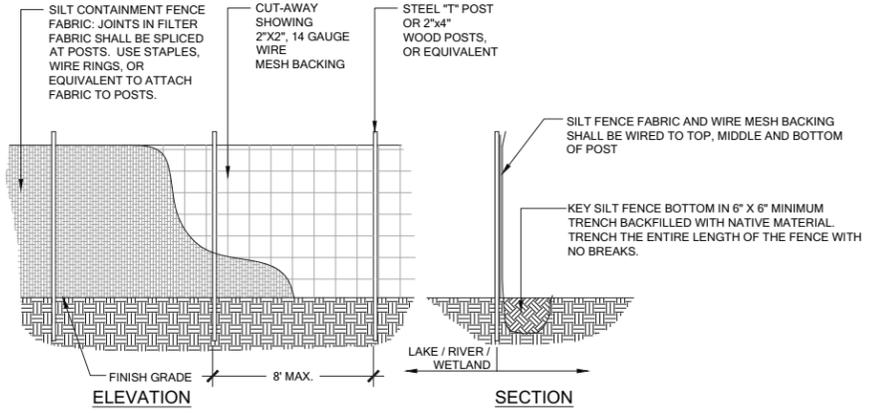




- NOTES:
- DO NOT NAIL OR STAPLE FENCE TO EXISTING TREES OR UTILITY POLES.
  - ANY DAMAGE TO THE FENCE SHALL BE REPAIRED IMMEDIATELY.

1 TREE PROTECTION FENCING SCALE: NTS

- SILT FENCE MAINTENANCE STANDARDS:
- ANY DAMAGE SHALL BE REPAIRED IMMEDIATELY.
  - SEDIMENT SHALL BE REMOVED WHEN ACCUMULATION EXCEEDS 6" IN DEPTH.



2 SILT FENCE SCALE: NTS

LEGEND	
---	CLEARING BOUNDARY
---	SILT FENCE <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">2 W3</span>
▨	CONSTRUCTION ACCESS AND STAGING AREA
▨	DELINEATED WETLAND BOUNDARY
---	PROPOSED WETLAND BUFFER
---	PROPOSED WETLAND BSBL
---	TREE PROTECTION FENCE <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">1 W3</span>
⊗	TREE TO BE REMOVED

- NOTES
- TESC MEASURE SHOULD REPRESENT MINIMUM PROTECTIONS NECESSARY. CONTRACTOR CAN MODIFY AS NECESSARY DEPENDING ON OTHER TESC MEASURES INSTALLED FOR ADJACENT CONSTRUCTION WORK.

**KELKARI TOWNHOMES**  
 SUNRISE PL. S.W.  
 ISSAQUAH, WASHINGTON

IS PROPERTY INVESTMENTS LLC

PROJECT NUMBER: 15-0357  
 PROJECT MANAGER: JG  
 DRAWN BY: KMB  
 PLOT DATE: 2-12-16

SDP/ MSP/ BSP  
 MINOR  
 AMENDMENT  
 APPLICATION  
 2-12-16

REVISIONS:  
 FEBRUARY 12, 2016  
 SDP/ MSP/ BSP MINOR  
 AMENDMENT  
 APPLICATION



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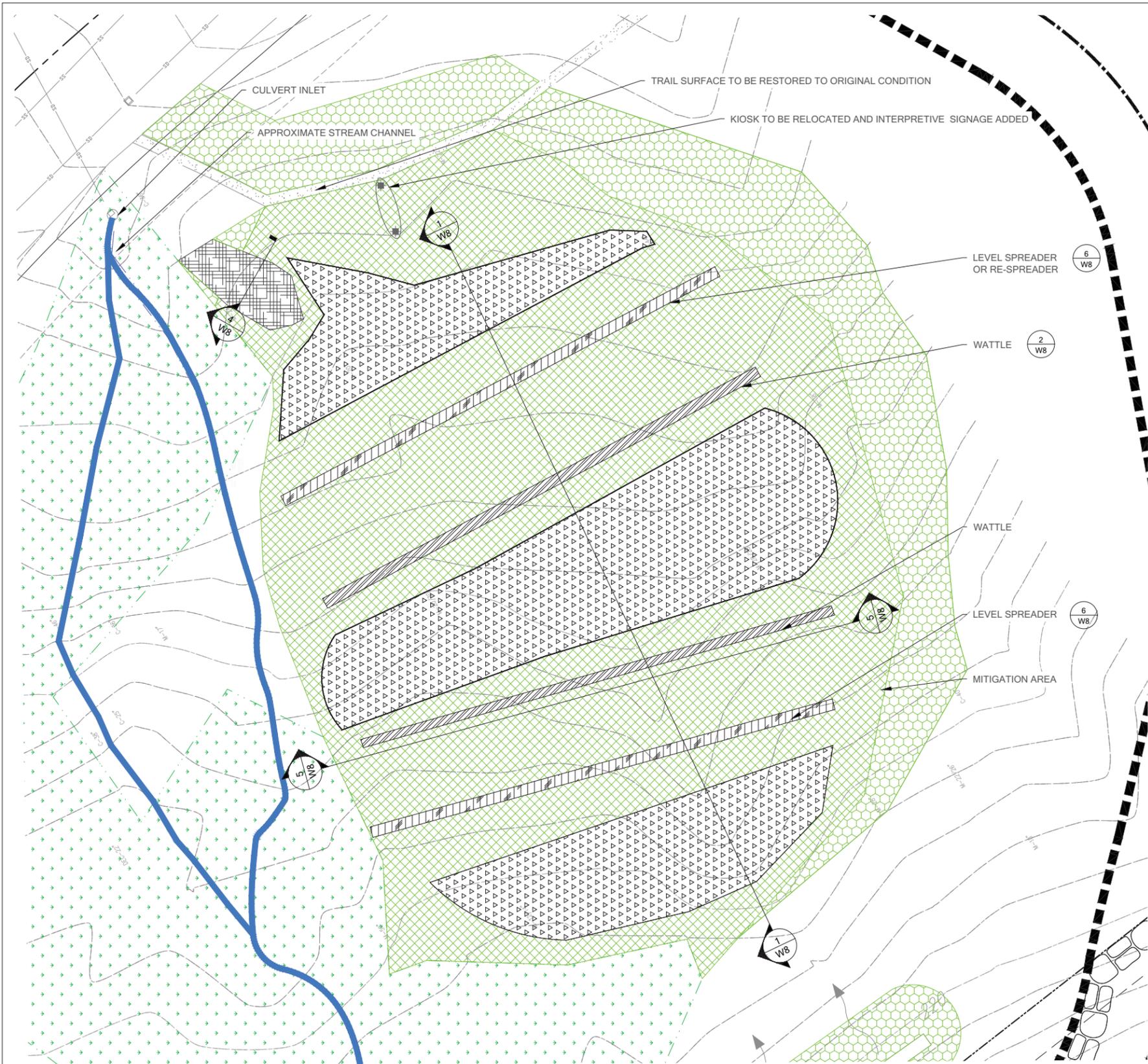
SHEET SIZE 24x36

MITIGATION PLAN

W3 OF 8

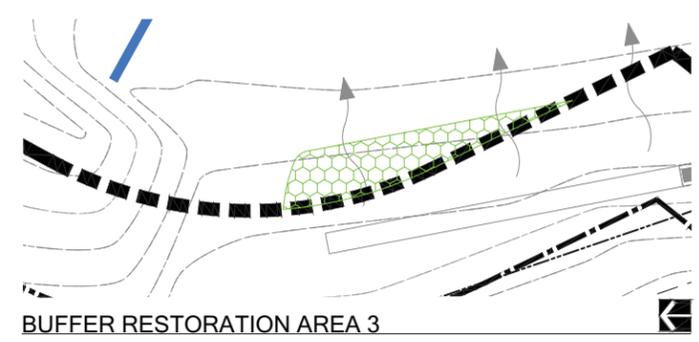
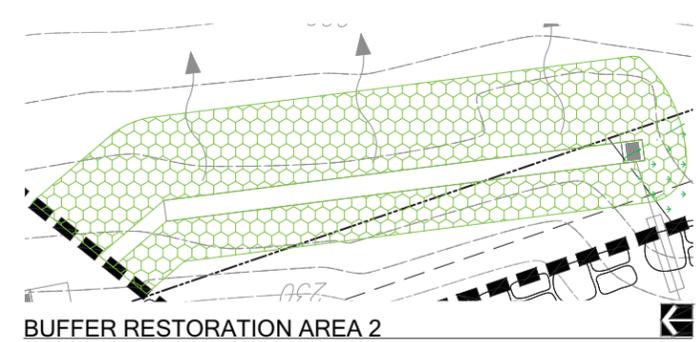
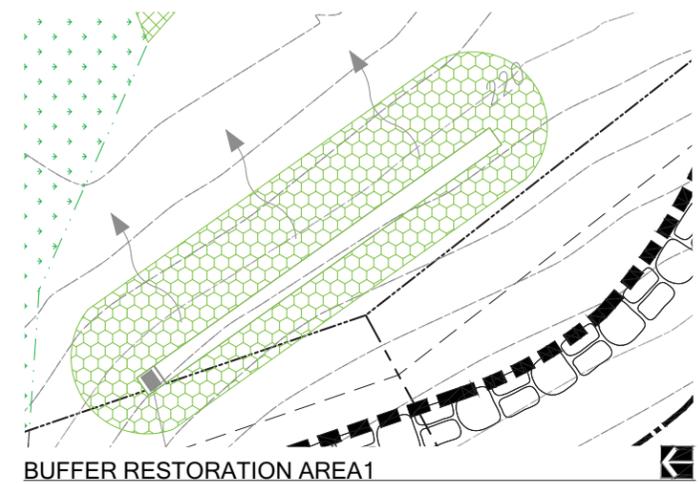
TESC PLAN  
 SCALE 1"=20'





**LEGEND**

- DELINEATED WETLAND BOUNDARY
- PROPOSED WETLAND BUFFER
- PROPOSED WETLAND BUFFER BSBL
- WATTLE ON A SLOPE  $\frac{2}{W8}$
- PROPOSED WETLAND CREATION
- BUFFER RESTORATION AREA
- LEVEL SPREADER  $\frac{6}{W8}$
- PROPOSED EMERGENT WETLAND
- WET CHANNEL CREATION  $\frac{4}{W8}$
- APPROXIMATE EXISTING STREAM



**MITIGATION PLAN**  
SCALE 1"=10'



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MITIGATION PLAN

W4 OF 8



TRAIL SURFACE TO BE RESTORED TO ORIGINAL CONDITION

LIMITS OF GRADING

EMERGENT CREATION

**NOTES**  
 1. WHEN WORKING WITHIN THE DRIP LINE OF THE SURVEYED TREES EXCAVATION AND GRADING SHOULD BE DONE BY HAND.

**LEGEND**

- DELINEATED WETLAND BOUNDARY
- PROPOSED CONTOUR
- +LP 204** PROPOSED SPOT ELEVATION
- LIMIT OF GRADING
- INDEX CONTOUR
- 320** EXISTING CONTOUR

**GRADING PLAN**  
 SCALE 1"=10'



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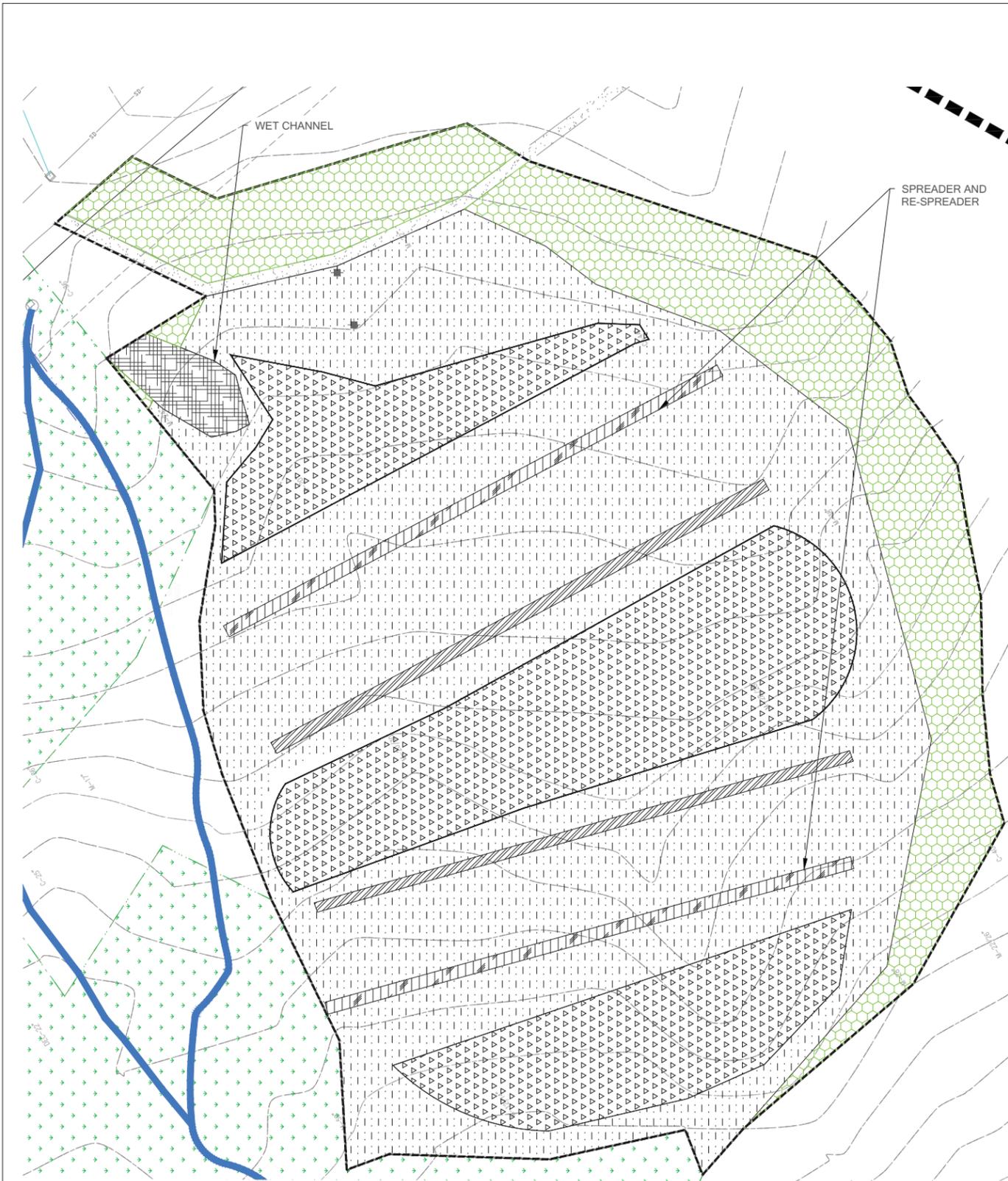
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MITIGATION PLAN

W5 OF 8



**PLANTING SCHEDULE**

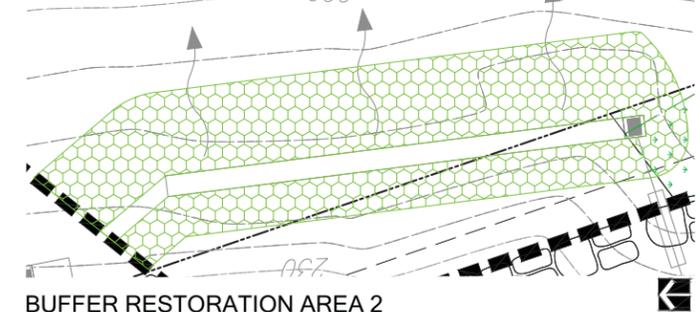
[Green Hatched]	SCRUB SHRUB CREATION	9,731 SF
[Green Triangles]	EMERGENT CREATION	4,442 SF
[Green Hexagons]	BUFFER RESTORATION	5,454 SF
[Diagonal Hatched]	WATTLE	
[Grid Hatched]	WET CHANNEL	

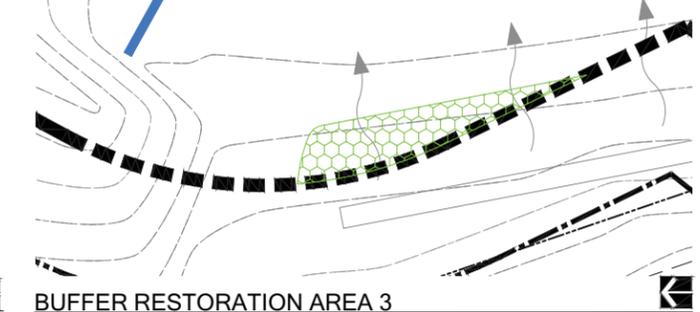
SPECIES/Common Name/ Spacing	QTY	SIZE
<b>BUFFER RESTORATION AREA PLANTING</b>		
<b>TREES/ 9'-0" O.C. SPACING</b>		
THUJA PLICATA / WESTERN REDCEDAR	20	2 GAL.
ACER MACROPHYLLUM / BIG LEAF MAPLE	20	2 GAL.
CORYLUS CORNUTA / BECKED HAZLENUT	20	2 GAL.
<b>SHRUBS/ 6'-0" O.C. SPACING</b>		
ACER CIRCINATUM / VINE MAPLE	45	1 GAL.
SYMPHORICAPOS ALBUS / SNOWBERRY	45	1 GAL.
RUBUS SPECTABILIS / SALMONBERRY	45	1 GAL.
OEMLERIA CERASIFORMIS / OSO BERRY		
<b>SCRUB SHRUB CREATION AREA PLANTING</b>		
<b>SHRUBS/ 4'-0" O.C. SPACING</b>		
ACER CIRCINATUM / VINE MAPLE	120	1 GAL.
LONICERA INVOLUCRATA / BLACK TWINBERRY	120	1 GAL.
PHYSOCARPUS CAPITATUS / PACIFIC NINEBARK	120	1 GAL.
RIBES LACUSTRE / SWAMP GOOSEBERRY	120	1 GAL.
ROSA PISOCARPA / SWAMP ROSE	120	1 GAL.
RUBUS SPECTABILIS / SALMONBERRY	120	1 GAL.
<b>LIVE CUTTINGS / 12" O.C. SPACING / PLANT IN CLUSTERS OF 12-20 CUTTINGS (NOT IN THE WATERCOURSES)</b>		
CORNUS SERICEA / RED-OSIER DOGWOOD	800	3' LENGTH MIN.
SALIX LUCIDA / PACIFIC WILLOW	800	3' LENGTH MIN.
SALIX SITCHENSIS / SITKA WILLOW	800	3' LENGTH MIN.
<b>EMERGENTS &amp; GROUNDCOVER/ 2'-0" O.C. SPACING</b>		
ATHYRIUM FILIX-FEMINA / LADY FERN	1000	PLUG OR 4" POT
CAREX OBNUPTA / SLOUGH SEDGE	1000	PLUG OR 4" POT
CAREX STIPATA / SAWBECK SEDGE	1000	PLUG OR 4" POT
DESCHAMPSIA CEPITOSA / TUFTED HAIRGRASS	1000	PLUG OR 4" POT
SCIRPUS MICROCARPUS / PANICLED BULRUSH	1000	PLUG OR 4" POT



**BUFFER RESTORATION AREA 1**



**BUFFER RESTORATION AREA 2**



**BUFFER RESTORATION AREA 3**

**MITIGATION PLANTING AREA**

**PLANTING PLAN**  
SCALE 1"=10'



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MITIGATION PLAN

W6 OF 8

## EXECUTIVE SUMMARY

THIS PLAN SEEKS TO CREATE NEW WETLAND AND RESTORE TEMPORARY WETLAND BUFFER IMPACTS. THE MITIGATION SERVES AS COMPENSATORY MITIGATION FOR IMPACTS ASSOCIATED WITH A MULTI-FAMILY RESIDENTIAL DEVELOPMENT IN ISSAQUAH.

THE PROPOSED DEVELOPMENT WILL RESULT IN THE PERMANENT WETLAND IMPACTS (FILL), WETLAND PAPER FILL IMPACTS, AND TEMPORARY WETLAND BUFFER IMPACTS. THE PERMANENT WETLAND IMPACTS WILL BE MITIGATED THROUGH WETLAND CREATION AT A 2:1 IMPACT TO CREATION RATIO. IMPACTS ARE PROPOSED IN SCRUB-SHRUB AND EMERGENT WETLAND AREAS, AND APPROPRIATE WETLAND CREATION AREAS WILL BE CREATED IN KIND. WETLAND AREAS PROPOSED FOR "PAPER FILL" ARE NOT ACTUALLY BEING FILLED, BUT RATHER ARE TREATED AS SUCH DUE TO A SIGNIFICANT REDUCTION IN THEIR BUFFERS. THEREFORE, SOME ACTUAL WETLAND AREAS ARE COUNTED ONLY AS BUFFER FOR PURPOSES OF LOCAL PERMITTING. SINCE THESE IMPACTS DO NOT REPRESENT ACTUAL LOSS OF WETLAND AREA, THEY WILL BE MITIGATED THROUGH WETLAND CREATION AT A 1:1 RATIO. TEMPORARY BUFFER IMPACTS, WHICH ARE ANTICIPATED DUE TO GRADING ACTIVITIES AND CONSTRUCTION ACCESS ASSOCIATED WITH THE CONSTRUCTION OF THE WETLAND CREATION AREAS, WILL BE RESTORED WHERE THEY OCCUR AT A 1:1 RATIO. THE TEMPORARY BUFFER IMPACT AREAS INCLUDE IMPACTS IN THE EXPANDED BUFFERS REFLECTING NEW WETLAND CREATION AREAS AND AREAS DISTURBED DUE TO PLACEMENT OF STORM-WATER LEVEL SPREADERS.

PROPOSED IMPACTS AND MITIGATION ARE PRESENTED IN THE TABLE BELOW:

## GOALS

- 1) CREATE 9,781 SQUARE FEET OF PALUSTRINE SCRUB-SHRUB WETLAND.
  - a) RECONTOUR UPLAND AREAS TO CREATE EVEN GRADE AND INTERCEPT AN EXISTING SHALLOW WATER TABLE AND FROM LEVEL SPREADERS CARRYING GROUNDWATER INTERCEPTED FROM BENEATH DEVELOPED AREAS.
  - b) SUPPLEMENT HYDROLOGY THROUGH THE INSTALLATION OF LEVEL SPREADERS THAT DISCHARGE INTERCEPTED SHALLOW GROUNDWATER FROM UPSLOPE DEVELOPED AREAS.
  - c) IMPROVE REVEALED SOILS TO BE SUITABLE FOR NATIVE VEGETATION ESTABLISHMENT.
  - d) ESTABLISH DENSE, NATIVE, SCRUB-SHRUB PLANT COMMUNITY.
  - e) LIMIT INVASION BY NON-NATIVE WEEDS.
- 2) CREATE 4,442 SQUARE FEET OF PALUSTRINE EMERGENT WETLAND.
  - a) RECONTOUR UPLAND AREAS TO INTERCEPT AN EXISTING SHALLOW WATER TABLE. EXCAVATE CONCAVE DEPRESSIONS ON THE SLOPE TO CREATE SHALLOW PONDING WHERE THE EMERGENT COMMUNITIES WILL ESTABLISH.
  - b) SUPPLEMENT HYDROLOGY THROUGH THE INSTALLATION OF LEVEL SPREADERS THAT DISCHARGE INTERCEPTED SHALLOW GROUNDWATER FROM UPSLOPE DEVELOPED AREAS.
  - c) IMPROVE REVEALED SOILS TO BE SUITABLE FOR NATIVE VEGETATION ESTABLISHMENT.
  - d) ESTABLISH DENSE, NATIVE, EMERGENT PLANT COMMUNITY.
  - e) LIMIT INVASION BY NON-NATIVE WEEDS.
- 3) RESTORE FUNCTIONS IN 5,454 SQUARE FEET OF TEMPORARILY DISTURBED WETLAND BUFFER.
  - a) REMOVE AND CONTROL INVASIVE WEEDS.
  - b) PRESERVE EXISTING NATIVE VEGETATION WHERE POSSIBLE.
  - c) ESTABLISH NATIVE TREE AND SHRUB VEGETATION CLASSES IN TEMPORARILY DISTURBED AREAS.

## PERFORMANCE STANDARDS

THE STANDARDS LISTED BELOW WILL BE USED TO JUDGE THE SUCCESS OF THE PLAN OVER TIME. IF THE STANDARDS ARE MET AT THE END OF THE FIVE-YEAR MONITORING PERIOD, THE MITIGATION SITE WILL BE CONSIDERED SUCCESSFUL AND THE PROJECT WILL HAVE MET ALL CRITICAL AREA PERMITTING OBLIGATIONS.

- PS 1) CREATE 9,781 SQUARE FEET OF PALUSTRINE SCRUB SHRUB WETLAND, AND 4,442 SQUARE FEET OF PALUSTRINE EMERGENT WETLAND.
- a) ESTABLISH WETLAND HYDROLOGY PER DELINEATION MANUAL DEFINITIONS THROUGHOUT THE WETLAND CREATION AREAS. HYDROLOGY TO BE MEASURED BY SHALLOW GROUNDWATER WELLS AS DESCRIBED IN THE MONITORING PLAN SECTION OF THIS PLAN SET.
  - b) ESTABLISH HYDROPHYTIC VEGETATION PER DELINEATION MANUAL DEFINITIONS: (FAC, FACW OR OBL).
  - c) ESTABLISH GREATER THAN 30% COVER OF EACH TARGET VEGETATION CLASS (PSS AND PEM).
  - d) HYDRIC SOILS ARE ASSUMED TO ESTABLISH PROVIDED THE HYDROLOGY STANDARD IS MET.
- PS 2) SURVIVAL/DIVERSITY ACROSS ALL PLANTED MITIGATION AREAS:
- a) 100% SURVIVAL OF ALL WOODY PLANTINGS AT THE END OF YEAR ONE. THIS STANDARD MAY BE MET THROUGH ESTABLISHMENT OF INSTALLED PLANTS OR BY REPLANTING AS NECESSARY TO ACHIEVE THE REQUIRED NUMBERS. AREAS PLANTED ENTIRELY WITH LIVE CUTTINGS SHALL NOT BE HELD TO THE 100% SURVIVAL STANDARD. ANY SUCH AREAS THAT EXHIBIT WIDESPREAD MORTALITY SHALL BE RE-EVALUATED BY THE RESTORATION SPECIALIST TO ASCERTAIN THE SITE-SPECIFIC VIABILITY OF THE CUTTINGS.
  - b) 80% SURVIVAL OF ALL WOODY PLANTINGS AT THE END OF YEAR TWO. THIS STANDARD MAY BE MET THROUGH ESTABLISHMENT OF INSTALLED PLANTS OR BY REPLANTING AS NECESSARY TO ACHIEVE THE REQUIRED NUMBERS. SURVIVAL BEYOND YEAR TWO IS DIFFICULT TO TRACK. THEREFORE, A DIVERSITY STANDARD IS PROPOSED IN PLACE OF SURVIVAL (BELOW). AREAS PLANTED ENTIRELY WITH LIVE CUTTINGS SHALL NOT BE HELD TO THE 80% SURVIVAL STANDARD. ANY SUCH AREAS THAT EXHIBIT WIDESPREAD MORTALITY SHALL BE RE-EVALUATED BY THE RESTORATION SPECIALIST TO ASCERTAIN THE SITE-SPECIFIC VIABILITY OF THE CUTTINGS.
  - c) ESTABLISH AT LEAST 6 NATIVE SHRUB SPECIES IN THE SCRUB-SHRUB WETLAND.
  - d) ESTABLISH AT LEAST 3 NATIVE EMERGENT SPECIES IN THE EMERGENT WETLAND.
  - e) ESTABLISH AT LEAST 2 NATIVE TREE SPECIES AND 4 NATIVE SHRUB SPECIES IN THE RESTORED BUFFER AREA.
- PS 3) NATIVE WOODY VEGETATION COVER IN THE CREATED SCRUB-SHRUB WETLAND AND WETLAND BUFFER RESTORATION AREA:
- a) ACHIEVE AT LEAST 60% COVER OF NATIVE WOODY SPECIES IN PLANTED SCRUB-SHRUB WETLAND AREAS AND RESTORED BUFFER AREAS BY THE END OF YEAR 3. VOLUNTEER SPECIES MAY COUNT TOWARDS THIS STANDARD.
  - b) ACHIEVE AT LEAST 80% COVER OF NATIVE WOODY SPECIES IN PLANTED SCRUB-SHRUB WETLAND AREAS AND RESTORED BUFFER AREAS BY THE END OF YEAR 5. VOLUNTEER SPECIES MAY COUNT TOWARDS THIS STANDARD.
- PS 4) NATIVE EMERGENT COVER IN THE CREATED EMERGENT WETLAND AREA:
- a) ACHIEVE AT LEAST 50% COVER OF NATIVE EMERGENT SPECIES BY YEAR 3.

- b) ACHIEVE AT LEAST 80% COVER OF NATIVE EMERGENT SPECIES BY YEAR 5.
  - c) LEVEL SPREADERS SHALL BE INSTALLED TO AVOID POINT DISCHARGE OF WATER, WHICH COULD RESULT IN CHANNELIZATION BELOW SPREADERS.
- PS 5) INVASIVE SPECIES STANDARDS:
- a) NO MORE THAN 15% COVER OF INVASIVE SPECIES IN ANY OF THE PLANTING AREAS, IN ANY MONITORING YEAR. MORE THAN 10% COVER OF INVASIVE WEEDS IN ANY YEAR WILL TRIGGER MAINTENANCE WEEDING.

## CONTINGENCY PLANS AND ADAPTIVE MANAGEMENT

THESE PLANS HAVE BEEN PREPARED TO ENSURE SUCCESS TO THE MAXIMUM PRACTICABLE EXTENT. HOWEVER, HABITAT CREATION AND ENHANCEMENT IS INHERENTLY UNPREDICTABLE. QUALITY AND CONSISTENCY OF INSTALLATION, MAINTENANCE, WEATHER PATTERN EXTREMES, WILDLIFE DAMAGE, VANDALISM AND OTHER FACTORS CAN SINGLE OR IN COMBINATION CHANGE CONDITIONS AT MITIGATION SITES AND AFFECT EVENTUAL SUCCESS OF THESE PLANS. THEREFORE, ADAPTIVE MANAGEMENT SHOULD BE EMPLOYED TO EVALUATE PROBLEMS AS THEY ARISE AND DEVELOP FLEXIBLE AND PRACTICAL SOLUTIONS. EXAMPLES CAN INCLUDE BUT ARE NOT LIMITED TO PLANT SUBSTITUTION, CHANGES IN TARGET VEGETATION CLASSES, SOIL AMENDMENT, RE-GRADING. AS A LAST RESORT, MODIFICATION OF PERFORMANCE STANDARDS CAN BE NECESSARY. ANY ACTIONS INVOLVING MAJOR DEPARTURES FROM THE ORIGINAL PLAN OR GOALS AND PERFORMANCE STANDARDS SHOULD BE DISCUSSED AND AGREED TO WITH REGULATORY AGENCIES AHEAD OF IMPLEMENTATION.

## AS-BUILT PLAN

AN AS-BUILT PLAN WILL BE PREPARED WITHIN 30 DAYS OF SUBSTANTIALLY COMPLETE CONSTRUCTION OF THE MITIGATION AREA. THE AS-BUILT PLAN WILL DOCUMENT SUBSTANTIAL CONFORMANCE WITH THESE PLANS AND ALSO WILL DISCLOSE ANY SUBSTITUTIONS OR OTHER NON-CRITICAL DEPARTURES. THE AS-BUILT PLAN WILL ESTABLISH TRANSECTS, BASELINE PLANT INSTALLATION QUANTITIES (BASED ON SAMPLE COUNTS OR INVOICES), HYDROLOGY MONITORING WELLS, AND PHOTO POINTS THAT WILL BE USED THROUGHOUT THE MONITORING PERIOD TO MEASURE THE PERFORMANCE STANDARDS OVER TIME.

THE AS-BUILT DOCUMENTATION SHOULD INCLUDE A MARKUP OF THE ORIGINAL PLAN NOTING ANY DEPARTURES, PLUS THE LOCATIONS OF TRANSECTS, WELLS AND PHOTO POINTS.

## MONITORING METHODS

THIS MONITORING PROGRAM IS DESIGNED TO TRACK THE SUCCESS OF THE MITIGATION SITE OVER TIME BY MEASURING THE DEGREE TO WHICH THE PERFORMANCE STANDARDS LISTED ABOVE ARE BEING MET.

### TRANSECTS

DURING THE AS-BUILT INSPECTION, THE RESTORATION SPECIALIST SHALL INSTALL BASELINE MONITORING TRANSECTS. A MINIMUM OF TWO 50-FOOT-LONG TRANSECTS SHALL BE LOCATED IN ETHE CREATED SCRUB SHRUB WETLAND AND WETLAND BUFFER RESTORATION AREAS. DURING EACH MONITORING EVENT PERCENT COVER VALUES WILL BE MEASURED ALONG THE TRANSECTS USING THE LINE-INTERCEPT METHOD. A MINIMUM OF TWO FIVE-FOOT-RADIUS MONITORING PLOTS SHALL BE LOCATED IN EACH EMERGENT WETLAND CREATION AREA (SIX TOTAL). DURING EACH MONITORING EVENT, PERCENT COVER OF EMERGENT PLANT COMMUNITY SHALL BE ESTIMATED AT EACH MONITORING PLOT ACCORDING TO THE COVER CLASS METHOD. AREAS OUTSIDE THE ESTABLISHED TRANSECTS WILL BE VISUALLY MONITORED TO VERIFY THAT PERFORMANCE STANDARDS ARE BEING MET.

PHOTOPOINTS SHALL BE ESTABLISHED AT EITHER END OF ALL TRANSECTS AND AT OTHER REPRESENTATIVE LOCATIONS AS DETERMINED BY THE RESTORATION SPECIALIST.

### HYDROLOGY WELLS

AT LEAST 8 SHALLOW GROUNDWATER WELLS SHALL BE INSTALLED DURING THE AS-BUILT CONDITION. WELLS SHALL BE CONSTRUCTED OF 24-INCH LENGTHS OF 2-INCH DIAMETER PVC PIPE. THE LOWER 18 INCHES SHALL BE PERFORATED BY DRILLING A SERIES OF 1/4-INCH HOLES. WELLS WILL BE INSTALLED TO A DEPTH OF 18 INCHES. EACH WELL SHALL BE FITTED WITH A PIPE END FITTING CAP.

HYDROLOGY WELLS SHALL BE MONITORED WEEKLY (TOTAL OF 6 TIMES PER YEAR) FROM MARCH 1ST THROUGH APRIL 15TH OF THE FIRST TWO YEARS FOLLOWING ACCEPTANCE OF THE AS-BUILT CONDITION. WELLS WILL ALSO BE MONITORED DURING THE SUMMER VEGETATION ASSESSMENT MONITORING VISIT.

OUTSIDE OF HYDROLOGY WELL MONITORING, OTHER PERFORMANCE MONITORING SHALL OCCUR TWICE ANNUALLY FOR FIVE YEARS. A SPRING MONITORING VISIT SHALL RECORD NECESSARY REPLANTING, WEEDING, INVASIVE CONTROL, AND OTHER MAINTENANCE NEEDS. THE RESTORATION SPECIALIST WILL THEN NOTIFY THE OWNER AND/OR MAINTENANCE CREWS OF NECESSARY EARLY SEASON MAINTENANCE. THE SECOND VISIT SHALL OCCUR IN LATE SUMMER OR FALL AND CONTAIN THE BULK OF THE MONITORING WORK. THE ANNUAL MONITORING REPORT WILL RELATE THE FOLLOWING INFORMATION:

- 1) GENERAL SUMMARY OF THE SPRING VISIT.
- 2) HYDROLOGY MEASUREMENT RESULTS.
- 3) FIRST- AND SECOND-YEAR COUNTS OF SURVIVING AND DEAD/DYING WOODY PLANTS BY SPECIES IN THE SCRUB-SHRUB WETLAND CREATION AREA AND THE WETLAND BUFFER RESTORATION AREAS.
- 4) ESTIMATES OF NATIVE WOODY SPECIES COVER ALONG MONITORING USING THE LINE INTERCEPT METHOD IN THE SCRUB-SHRUB WETLAND CREATION AREA AND THE WETLAND BUFFER RESTORATION AREAS.
- 5) ESTIMATES OF INVASIVE SPECIES COVER ALONG RANDOM SUB-TRANSECTS USING THE LINE INTERCEPT METHOD.
- 6) ESTIMATES OF NATIVE EMERGENT SPECIES COVER USING THE COVER CLASS METHOD IN THE PALUSTRINE EMERGENT WETLAND CREATION AREA.
- 7) COUNTS OF ESTABLISHED NATIVE SPECIES TO DETERMINE SITE DIVERSITY, BY MITIGATION AREA TYPE OR PLANTING ZONE.
- 8) NOTES AND/OR SKETCHES OF INVASIVE WEEDS OR BARE AREAS OUTSIDE OF TRANSECTS AND PLOTS.
- 9) PHOTOGRAPHIC DOCUMENTATION FROM TRANSECTS ENDS AND ESTABLISHED REFERENCE POINTS.
- 10) INTRUSIONS INTO THE PLANTING AREAS, VANDALISM, TRASH, AND OTHER ACTIONS DETRIMENTAL TO THE OVERALL HEALTH OF THE MITIGATION AREA.
- 11) RECOMMENDATIONS FOR MAINTENANCE IN THE MITIGATION AREA.

## CONSTRUCTION NOTES AND SPECIFICATIONS

### WORK SEQUENCE

NOTE: SPECIFICATIONS FOR ITEMS IN BOLD CAN BE FOUND UNDER "MATERIAL SPECIFICATIONS AND DEFINITIONS."

THE WATERSHED COMPANY PERSONNEL, OR OTHER PERSONS QUALIFIED TO EVALUATE ENVIRONMENTAL RESTORATION PROJECTS, SHALL MONITOR:

- 1) CLEARING AND GRADE STAKING.
- 2) ROUGH AND FINAL GRADING INCLUDING EXCAVATION AND SPOIL PLACEMENT.
- 3) SOIL DE-COMPACTION, AMENDMENT AND/OR IMPORTATION.
- 4) PLANT INSPECTIONS:
  - a) PLANT DELIVERY INSPECTION.
  - b) 50% PLANT INSTALLATION/LAYOUT INSPECTION.
  - c) 100% PLANT INSTALLATION INSPECTION.

### GENERAL WORK SEQUENCE

### GRADING:

- 1) SURVEY AND STAKE THE LIMITS OF THE WETLAND CREATION AREAS.
- 2) INSTALL TEMPORARY EROSION AND STORM WATER CONTROL BMPS, INCLUDING SILT FENCING AROUND THE PERIMETER OF THE WORK AREA.
- 3) SURVEY AND STAKE CUT DEPTHS FOR ALL WETLAND CREATION DEPRESSIONS. CLEAR TREES AND BRUSH, AS NECESSARY.
- 4) ROUGH GRADE THE WETLAND CREATION AREAS AT THE DIRECTION OF THE RESTORATION SPECIALIST.
- 5) GRADING SPOILS TO BE REMOVED FROM SITE.
- 6) FINALIZE WETLAND AND UPLAND GRADING, AMENDING ALL GRADED AREAS TO MEET THE FOLLOWING CRITERIA:
  - THE CREATED SCRUB-SHRUB WETLAND AND CREATED EMERGENT WETLAND SOILS SHALL BE AMENDED WITH

COMPOST TO ACHIEVE AT LEAST 45% ORGANIC MATERIAL IN THE UPPER 9 INCHES (397 CUBIC YARDS).

- 7) ALL GRADING AREAS AND MACHINERY ROUTES TO BE DE-COMPACTED AS NECESSARY IN PREPARATION FOR PLANTING. DECOMPACTING SHALL BE BY ROTO-TILLER OR SIMILAR METHOD THAT DECONSOLIDATES THE UPPER 9 INCHES OF SOIL.
- 8) INSTALL LEVEL SPREADERS, RE-SPREADERS, AND WATTLES PER PLANS (SHEETS W6 & W8).
- 9) WITHIN ONE WEEK OF GRADING ACCEPTANCE BY THE RESTORATION SPECIALIST, STABILIZE ALL GRADED AND DE-COMPACTED AREAS WITH WOOD CHIP MULCH TO AN AVERAGE DEPTH OF 4 INCHES (122 CUBIC YARDS). EXCEPTIONS: THE EMERGENT WETLAND CREATION AREAS SHALL NOT RECEIVE MULCH.

### PLANTING:

- 1) ALL PREPARATION AND PLANTING SHALL TAKE PLACE DURING THE DORMANT SEASON (OCTOBER THROUGH APRIL) FOR BEST SURVIVAL, EXCEPT FOR EMERGENT SPECIES. PLANTING OF EMERGENT SPECIES SHALL TAKE PLACE FROM MARCH 1ST THROUGH JUNE 15TH. THE RESTORATION SPECIALIST MAY APPROVE PLANTING OUTSIDE OF THESE TIMES BASED ON FAVORABLE WEATHER CONDITIONS DURING THE PLANTING PERIOD.
- 2) REMOVE ALL INVASIVE WEEDS AND WEED ROOTS FROM ENTIRE PLANTING AREA AS DIRECTED BY THE RESTORATION SPECIALIST. AVOID DAMAGE TO EXISTING NATIVE VEGETATION.
- 3) DE-COMPACT SOIL AS NEEDED ACROSS THE ENTIRE PLANTING AREA USING A ROTOTILLER OR SIMILAR METHOD. ALL MACHINERY ROUTES AND ACCESS ROADS THROUGH PLANTED AREAS SHALL BE DECOMPACTED.
- 4) INSTALL VEGETATION PER THE PLANTING PLANS AND PLANTING DETAILS.
- 5) INSTALL BLANKET APPLICATION OF WOOD CHIP MULCH IN THE CREATED SCRUB-SHRUB WETLAND AREAS AND THE WETLAND BUFFER RESTORATION AREAS. SEE PLANTING DETAILS FOR MULCH SPECIFICATIONS.
- 6) THE RESTORATION SPECIALIST SHALL INSPECT: ALL PLANT MATERIAL PRIOR TO INSTALLATION, AT 50% PLANT LAYOUT/INSTALLATION AND AT 100% PLANT INSTALLATION
- 7) DUE TO EXISTING SITE CONDITIONS (RELATIVELY HIGH GROUNDWATER TABLE, OVERHANGING FOREST CANOPY), A TEMPORARY IRRIGATION SYSTEM IS LIKELY NOT REQUIRED. SUPPLEMENTAL IRRIGATION IN TARGETED AREAS MAY BE NECESSARY AT THE DIRECTION OF THE RESTORATION SPECIALIST FROM JUNE 1 THROUGH SEPTEMBER 30.

## MAINTENANCE

THIS SITE WILL BE MAINTAINED FOR FIVE YEARS FOLLOWING COMPLETION OF THE CONSTRUCTION. SPECIFICATIONS IN BOLD CAN BE FOUND UNDER "MATERIAL SPECIFICATIONS AND DEFINITIONS."

- 1) AT LEAST TWICE-YEARLY, HAND REMOVE ALL COMPETING WEEDS AND WEED ROOTS FROM BENEATH EACH INSTALLED PLANT AND ANY DESIRABLE VOLUNTEER VEGETATION TO A DISTANCE OF 18 INCHES FROM THE MAIN PLANT STEM. WEEDING SHOULD OCCUR AS NEEDED DURING THE SPRING AND SUMMER. FREQUENT WEEDING WILL RESULT IN LOWER MORTALITY AND LOWER PLANT REPLACEMENT COSTS OR,
- 2) ALTERNATIVELY, SHOULD HAND WEEDING PROVE UNMANAGEABLE, THE RESTORATION SPECIALIST MAY AUTHORIZE THE LIMITED USE OF AN AQUATIC USE-APPROVED HERBICIDE TO CONTROL COMPETITIVE WEEDS AT THE BASE OF INSTALLED VEGETATION. ONLY INDIVIDUALS WHO ARE STATE-LICENSED HERBICIDE APPLICATORS MAY CONDUCT HERBICIDE TREATMENTS. APPLICATIONS SHOULD BE DONE BETWEEN MID-SPRING AND MID-SUMMER TO MAXIMIZE UPTAKE BY PLANTS.
- 3) DO NOT WEED THE AREA NEAR THE PLANT BASES WITH STRING TRIMMER (WEED WHACKER). NATIVE PLANTS ARE EASILY DAMAGED OR KILLED, AND WEEDS EASILY RECOVER AFTER TRIMMING.
- 4) APPLY SLOW RELEASE GRANULAR FERTILIZER TO EACH INSTALLED WOODY PLANT ANNUALLY IN THE SPRING (BY JUNE 1) OF YEARS TWO THROUGH FIVE BUT NOT IN YEAR ONE.
- 5) MULCH THE WEEDED AREAS BENEATH EACH WOODY PLANT WITH WOOD CHIP MULCH AS NECESSARY TO MAINTAIN A MINIMUM FOUR-INCH THICK, 18-INCH DIAMETER MULCH RING.
- 6) PROVIDE SUPPLEMENTAL IRRIGATION IN TARGETED AREAS USING A WATERING TRUCK, BACKPACKS, OR SIMILAR METHOD AT THE DISCRETION OF THE RESTORATION SPECIALIST.
- 7) FOLLOW THE RECOMMENDATIONS NOTED IN THE SPRING MONITORING SITE VISIT.
- 8) ALL PLANT REPLACEMENT SHALL TAKE PLACE DURING THE FOLLOWING TIMES FOR BEST SURVIVAL:
  - a) ONE- AND TWO-GALLON CONTAINER PLANTS MAY BE INSTALLED BETWEEN OCTOBER 1ST AND MARCH 31ST.
  - b) EMERGENT PLUGS MAY BE INSTALLED BETWEEN MARCH AND JULY 1ST.
  - c) LIVE STAKES (CUTTINGS) MAY BE INSTALLED BETWEEN OCTOBER 1ST AND MARCH 31ST.
  - d) THE RESTORATION SPECIALIST MAY APPROVE PLANTING OUTSIDE OF THE ABOVE TIMES ON A CASE-BY-CASE BASIS, DEPENDING ON THE LOCATION, EXTENT AND SPECIFIC SEASONAL CONDITIONS.
- 9) INVASIVE SPECIES MAINTENANCE PLAN:
  - a) HIMALAYAN/EVERGREEN BLACKBERRY, SCOTCH BROOM AND OTHER INVASIVE WOODY VEGETATION SHALL BE GRUBBED OUT BY HAND ON AN ONGOING BASIS, BEING CAREFUL TO GRUB OUT ROOTS EXCEPT WHERE SUCH WORK WILL JEOPARDIZE THE ROOTS OF INSTALLED NATIVE OR VOLUNTEER NATIVE PLANTS.
  - b) REED CANARYGRASS CAN BE PULLED BY HAND IF FOUND AS INDIVIDUAL STALKS OR SMALL CLUMPS. LARGER CLUMPS MAY REQUIRE USE OF AN HERBICIDE APPROVED FOR USE IN AQUATIC AREAS USING A TARGETED METHOD, SUCH AS SPOT SPRAY. ONLY INDIVIDUALS WHO ARE STATE-LICENSED HERBICIDE APPLICATORS MUST CONDUCT HERBICIDE TREATMENTS. APPLICATIONS SHOULD BE DONE BETWEEN MID-SPRING AND LATE-SUMMER TO MAXIMIZE UPTAKE BY PLANTS.
  - c) ONCE PER YEAR, VINES AND THICKETS ENCRORCHING FROM OUTSIDE OF THE PLANTED AREA ARE TO BE CUT BACK TO AT LEAST TEN FEET FROM THE PLANTED AREA.

## MATERIAL SPECIFICATIONS AND DEFINITIONS

- 1) WOOD CHIP MULCH: COARSE WOODCHIP MULCH APPROXIMATELY ONE TO THREE INCHES IN MAXIMUM DIMENSION (NOT SAWDUST OR COARSE HOG FUEL). THIS MATERIAL IS SOLD AS "ANIMAL FRIENDLY HOG FUEL" AT PACIFIC TOPSOILS [(800) 884-7645]. MULCH SHALL NOT CONTAIN APPRECIABLE QUANTITIES OF GARBAGE, PLASTIC, METAL, SOIL, AND DIMENSIONAL LUMBER OR CONSTRUCTION/DEMOLITION DEBRIS. QUANTITY REQUIRED: 122 CUBIC YARDS.
- 2) FERTILIZER: SLOW RELEASE, GRANULAR FERTILIZER SUCH AS OSMOCOTE™ OR EQUAL PRODUCT. MOST RETAIL NURSERIES CARRY THIS PRODUCT. FOLLOW MANUFACTURER'S INSTRUCTIONS FOR APPLICATION. KEEP FERTILIZER IN A WEATHER-TIGHT CONTAINER WHILE ON SITE. NOTE THAT FERTILIZER IS TO BE APPLIED ONLY IN YEARS TWO, THREE, FOUR AND FIVE AND NOT IN THE FIRST YEAR. FERTILIZER SHALL NOT BE PLACED IN INUNDATED AREAS.
- 3) COMPOST: CEDAR GROVE COMPOST OR EQUIVALENT PRODUCT. 100% VEGETABLE COMPOST WITH NO APPRECIABLE QUANTITIES OF SAND, GRAVEL, SAWDUST, OR OTHER NON-ORGANIC MATERIALS. AMENDMENT QUANTITY REQUIRED FOR CONSTRUCTION: 397 CUBIC YARDS.
- 4) RESTORATION SPECIALIST: THE WATERSHED COMPANY PERSONNEL OR OTHER PERSONS QUALIFIED TO EVALUATE ENVIRONMENTAL RESTORATION PROJECTS.

**KELKARI TOWNHOMES**  
SUNRISE PL. S.W.  
ISSAQUAH, WASHINGTON

## IS PROPERTY INVESTMENTS LLC

PROJECT NUMBER: 15-0357  
PROJECT MANAGER: JG  
DRAWN BY: KMB  
PLOT DATE: 2-12-16

## SDP/ MSP/ BSP MINOR AMENDMENT APPLICATION 2-12-16

### REVISIONS:

FEBRUARY 12, 2016  
SDP/ MSP/ BSP MINOR AMENDMENT APPLICATION

**THE WATERSHED COMPANY**

750 Sixth Street South  
Kirkland WA 98033

p 425.822.5242 / 425.827.8136  
www.watershedco.com

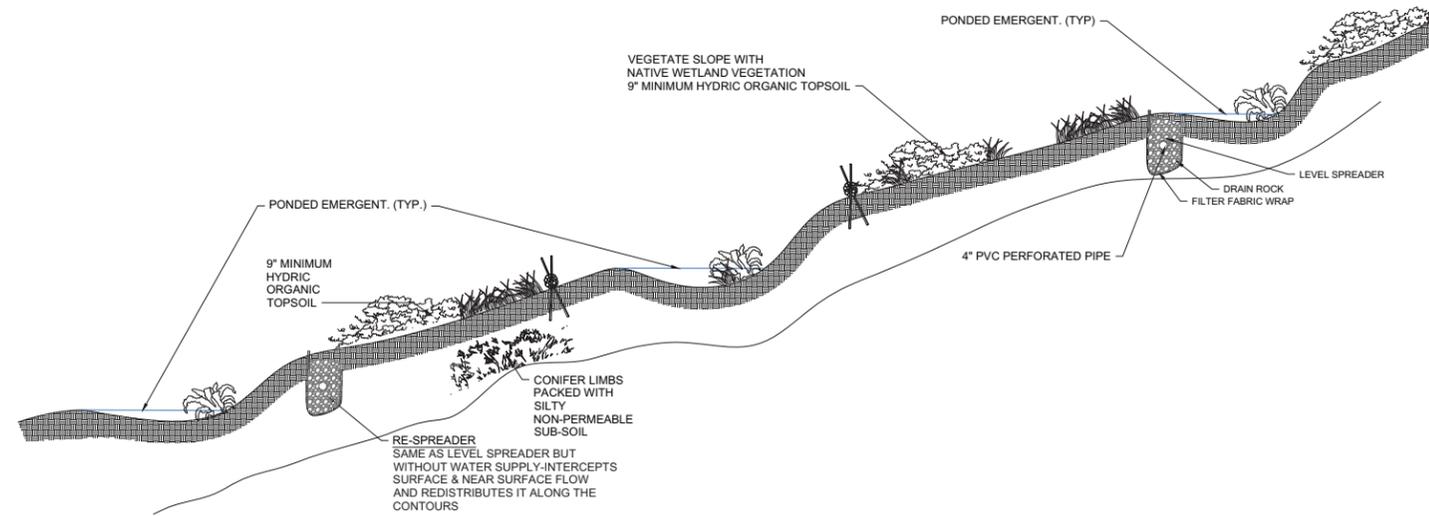
Science & Design

SHEET SIZE 24x36

## MITIGATION PLAN

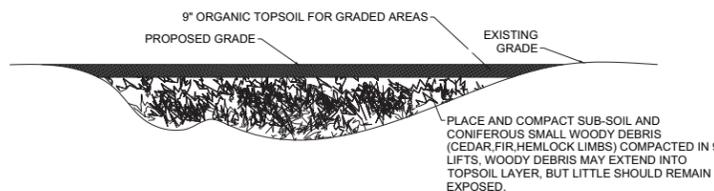
## W7 OF 8

# DETAILS AND PLANT INSTALL NOTES (1 OF 2)



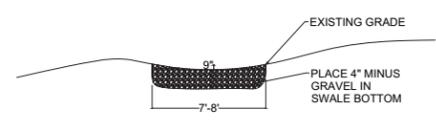
1 PROFILE OF HILLSIDE

Scale: NTS



3 FILL SECTION

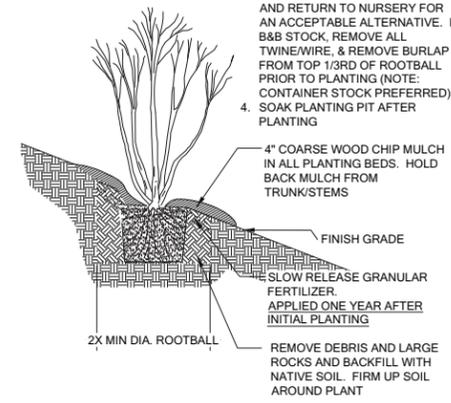
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4 WET CHANNEL SECTION

Scale: NTS

- NOTES:
1. PLANTING PIT SHALL NOT BE LESS THAN (2) TIMES THE WIDTH OF THE ROOT BALL DIA
  2. LOOSEN SIDES AND BOTTOM OF PLANT PIT
  3. REMOVE FROM POT & ROUGH-UP ROOT BALL BEFORE INSTALLING. IF PLANT IS EXCEPTIONALLY ROOT-BOUND OR CONTAINS CIRCLING ROOTS, DO NOT PLANT AND RETURN TO NURSERY FOR AN ACCEPTABLE ALTERNATIVE. IF B&B STOCK, REMOVE ALL TWINE/WIRE, & REMOVE BURLAP FROM TOP 1/3RD OF ROOTBALL PRIOR TO PLANTING (NOTE: CONTAINER STOCK PREFERRED)
  4. SOAK PLANTING PIT AFTER PLANTING

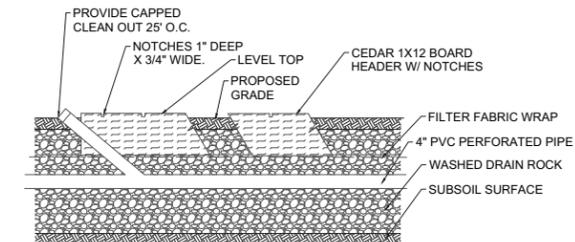


7 PLANTING ON A SLOPE

SCALE: NTS

2 WATTLE

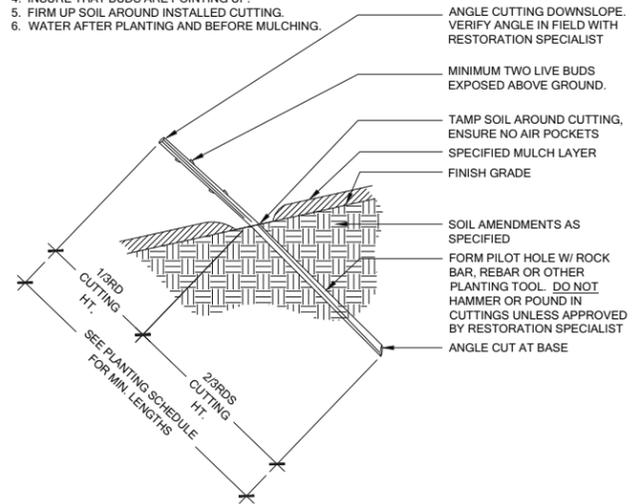
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5 LEVEL SPREADER ELEVATION

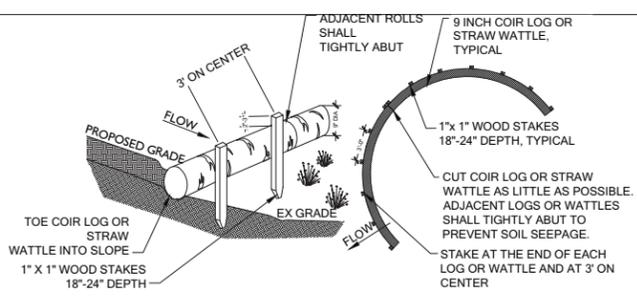
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- NOTES:
1. INSTALL HARDWOOD CUTTINGS DURING THEIR DORMANCY. DO NOT ALLOW THEM TO DRY OUT.
  2. CUTTINGS SHALL BE 3/4" TO 1" IN DIAMETER OR APPROVED EQUIVALENT.
  3. INSTALL TO MIN. 2/3RDS DEPTH INTO SOIL. USE TRIANGULAR SPACING. SEE PLANTING SCHEDULE FOR SPACING.
  4. INSURE THAT BUDS ARE POINTING UP.
  5. FIRM UP SOIL AROUND INSTALLED CUTTING.
  6. WATER AFTER PLANTING AND BEFORE MULCHING.



8 LIVE STAKE PLANTING ON A SLOPE

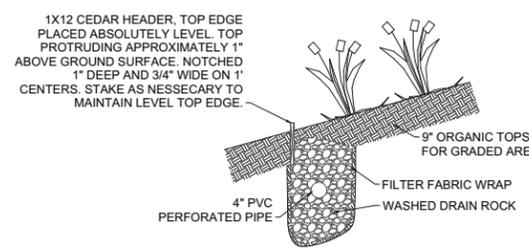
SCALE: NTS



NOTES

1. COIR LOG OR STRAW WATTLE SHALL BE INSTALLED PRIOR TO PLACEMENT OF HUMMOCK SOIL FROM STREAM EXCAVATION.
2. COIR LOG OR STRAW WATTLE SHALL BE 9 INCH IN DIAMETER.
3. STAKING: WOODEN STAKES ARE RECOMMENDED TO SECURE THE COIR LOG OR STRAW WATTLE. BE SURE TO USE A STAKE THAT IS LONG ENOUGH TO PROTRUDE SEVERAL INCHES ABOVE THE COIR LOG OR STRAW WATTLE. 18" IS A GOOD LENGTH FOR HARD, ROCKY SOIL; FOR SOFT LOAMY SOIL, USE A 24" STAKE.
4. WHEN INSTALLING RUNNING LENGTHS OF COIR LOG OR STRAW WATTLE, BUTT THE SECOND LOG TIGHTLY AGAINST THE FIRST; DO NOT OVERLAP THE ENDS.
5. STAKE THE LOGS OR WATTLES AT EACH END AND THREE (3) FEET ON CENTER. STAKES SHOULD BE DRIVEN OUTSIDE THE THE COIR LOG OR STRAW WATTLE, BUT CLOSE ENOUGH TO HOLD IT IN PLACE. LEAVE 2 - 3 INCHES OF THE STAKE PROTRUDING ABOVE THE COIR LOG OR STRAW WATTLE. A HEAVY SEDIMENT LOAD WILL TEND TO PICK UP THE COIR LOG OR STRAW WATTLE AND COULD PULL IT OFF THE STAKES IF THEY ARE DRIVEN DOWN TOO LOW.
6. WHEN COIR LOG OR STRAW WATTLE ARE USED FOR FLAT GROUND APPLICATIONS, DRIVE THE STAKES STRAIGHT DOWN; WHEN INSTALLING COIR LOG OR STRAW WATTLE ON SLOPES, DRIVE THE STAKES PERPENDICULAR TO THE SLOPE. DRIVE THE FIRST END STAKE OF THE SECOND COIR LOG OR STRAW WATTLE AT AN ANGLE TOWARD THE FIRST COIR LOG OR STRAW WATTLE IN ORDER TO HELP ABUT THEM TIGHTLY TOGETHER.

PLAN



6 LEVEL SPREADER SECTION

Scale: NTS