

APPENDIX D

REFERENCE SITE MEMORANDUM

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Date: October 14, 2015

To: Kelly Madalinski, Port of Portland

From: Cascade Environmental Group, LLC

Re: Dahl Beach Reference Sites

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This memo presents four sites selected to serve as restoration design reference for the Dahl Beach Mitigation Project. Sites were selected based on their proximal location to the Mitigation Project site and shared hydrogeomorphic and topographical characteristics. Slope, elevation, substrate type, and vegetation community were assessed at each site; the information was used to inform planting plan species selection and installation elevations on the Project site, as well as weed management planning. Reference site vegetation communities vary in composition and elevation ranges, but several trends were observed and contributed to the development of planting recommendations for the Project site. The observations and related recommendations are presented at the end of this memo. The reference sites are described in detail in the next section, including photographs, and summarized in a table following the descriptions. The location of the reference sites relative to the Project site is depicted in the attached map.

## Reference Site Descriptions

### 1. Maddax Woods – Burnside Park

The Maddax Woods – Burnside Park reference site is located along the Willamette River, on the opposite bank and just downstream of the Mitigation Project. The site is owned and managed by the City of West Linn as a public park. It is characterized by a moderately-to-steeply sloped (10-30%) sand-cobble beach grading to a short vertical bank and a forested river terrace bordered by a steep upland escarpment. Vegetation occurring on the beach (below 14 ft. NAVD88) is very sparse and dominated by weedy, herbaceous species such as prostrate knotweed (*Polygonum aviculare*), tansy ragwort (*Senecio jacobea*), and bird's foot trefoil (*Lotus corniculatus*). Vegetation occurring on the terrace (above 14 ft. NAVD88) consists of black cottonwood (*Populus balsamifera*) forest with emerging Oregon ash (*Fraxinus latifolia*) and an understory dominated by non-native species including Himalayan blackberry (*Rubus armeniacus*), English ivy (*Hedera helix*), wild Clematis (*Clematis vitalba*), and reed canarygrass (*Phalaris arundinacea*); redosier dogwood (*Cornus sericea*) occurs occasionally. Above the floodplain elevation (48 ft. NAVD88), vegetation consists of Douglas fir (*Pseudotsuga menziesii*)/bigleaf maple (*Acer macrophyllum*) forest with an understory dominated by snowberry (*Symphoricarpos albus*) and English ivy.



Photo 1. Maddax Woods–Burnside Park: looking upstream



Photo 2. Maddax Woods–Burnside Park: looking downstream

## 2. Lonesome Bottom

This reference site consists of accreted land on an inside bend of the Willamette River, just upstream of the Mitigation Project; ownership is unknown. It features a gently-to-moderately sloped (5-15%) sand-gravel-cobble beach grading to a broad, flat terrace. Vegetation consists of three distinct communities forming bands stratified by elevation. The lowest elevations (10-11 ft. NAVD88) are colonized by Indian hemp (*Apocynum cannabinum*) along with prostrate knotweed and bird’s foot trefoil. At elevations of 11-15 ft. NAVD88, a sandbar willow (*Salix fluviatilis*) dominated community occurs and includes pennyroyal (*Mentha pelugium*), St. John’s wort (*Hypericum perforatum*), smartweed (*Persicaria* spp.) and beggars tick (*Bidens cernua*). Above 15 ft. NAVD88, young black cottonwood and Oregon ash have established along with St. John’s wort.



Photo 3. Lonesome Bottom: looking downstream



Photo 4. Lonesome Bottom: looking upstream

### 3. Goat Island

Goat Island is a large, undeveloped, low-lying island located in the Willamette River, directly across from the Mitigation Project; it is owned and managed by the Oregon Department of State Lands as a public park. The site consists of a gently-to-moderately sloped cobble-gravel beach (5-20%) grading to a level forested floodplain. Similar to Lonesome Bottom, Goat Island features vegetation communities that are distinctly stratified by elevation. At 10-11 ft. NAVD88, the community is composed of Indian hemp along with *Aster* spp., prostrate knotweed, smartweed, and bird’s foot trefoil along with sandbar willow shoots. The sandbar willow community colonizes the elevations between 11-14 ft. NAVD88 and includes an understory of beggar’s tick, St. John’s wort, tansy ragwort, common plantain (*Plantago lanceolata*), and common evening-primrose (*Oenothera biennis*). Above 14 ft. NAVD88, black cottonwood/Oregon ash forest occurs and includes an understory of Himalayan blackberry, English ivy, and, occasionally, redosier dogwood and Pacific ninebark (*Physocarpus capitata*). Scotch broom (*Cytisus scoparius*) also occurs within this elevation range. At elevations above 30 ft. NAVD88, small groves of bigleaf maple are found along with some snowberry.



Photo 5. Goat Island: looking downstream



Photo 6. Goat Island: looking upstream

### 4. Meldrum Bar Park Beach

This site consists of a stretch of beach upstream of the Mitigation Project in the adjacent Meldrum Bar Park, owned and managed by the City of Gladstone. It is characterized by a moderately to very steeply sloped (15-50%) cobble-gravel beach grading to a high vertical bank and broad river terrace; a distinctive scour line is present at around 13.5 ft. NAVD88. Above the scour line, the beach is sparsely vegetated by weedy species to 20 ft. NAVD88 including Scotch broom (occurring around the 20 ft. mark), prostrate knotweed, evening primrose, and mullein (*Verbascum thapsus*). Above 20 ft. NAVD88, black cottonwood/bigleaf maple forest is present which features occasional Oregon ash, Oregon oak (*Quercus garryana*), and honey locust (*Gleditsia triacanthos*) trees and a non-native dominated understory of Himalayan blackberry, English ivy and false brome (*Brachypodium sylvaticum*); redosier dogwood and hazelnut (*Corylus cornuta*) also occur occasionally.



Photo 7. Meldrum Bar Park Beach: looking upstream



Photo 8. Meldrum Bar Park Beach: looking downstream

### Reference Site Summary Table

Reference Site	ACM Slope Range (%)	Vegetation Community	Elevation Range (ft. NAVD88)
Maddax Woods - Burnside Park	10-30	weedy forbs	<14
		Black cottonwood- Oregon ash/Himalayan blackberry/English ivy	14-48
		Doug fir-bigleaf maple	>48
Lonesome Bottom	5-15	Indian hemp-weedy forbs	10-11
		Sandbar willow/ smartweed	11-15
		Black cottonwood- Oregon ash/St John's wort	15-25
Goat Island	5-20	Indian hemp-weedy forbs	10-11
		Sandbar willow/weedy forbs	11-15
		Black cottonwood- Oregon ash/Himalayan blackberry/English ivy	15-30
		Bigleaf maple/ snowberry	>30
Meldrum Bar Park Beach	15-50	Scotch broom-weedy forbs	14-20
		Black cottonwood/ bigleaf maple-Himalayan blackberry-English ivy	>20



## Key Observations and Applicability to Dahl Beach Mitigation Project Plant Selection

- Observation:** Black cottonwood is the dominant tree species in forested areas on the reference sites, extending from near the scour line to the upper limits of riparian areas. Black cottonwood is known as an aggressive colonizer and will likely spread readily once established.

**Recommendation:** Plant black cottonwood at the Project site in elevation ranges where there are no existing dominant tree species and allow to spread to other elevations; allow additional native species to establish in other elevation ranges to promote site diversity long term.
- Observation:** Vegetation establishment on the reference sites appears to be related to a combination of beach slope and assumed exposure to higher flow velocities: sites with flatter slopes featured intact sandbar willow communities and vegetation present at lower elevations than sites with steeper slopes.

**Recommendation:** The Bulkhead Removal Area appears too steep to support favorable conditions for sandbar willow based on the proposed finished gradient and the absence of sandbar willow at the Meldrum Bar Park Reference site (adjacent to the Bulkhead Removal Area). Install sandbar willow only at Parking Lot Area where proposed finished gradients are more gradual and employ adaptive management to inform maintenance of plantings.
- Observation:** Himalayan blackberry, English ivy, wild Clematis, and Scotch broom are prevalent on all reference sites and will likely present ongoing management challenges. Non-persistent ruderal forbs are also widespread in areas subject to regular scour.

**Recommendation:** Develop specific strategies for control of Himalayan blackberry and English Ivy; control of non-persistent ruderal forbs, however, will provide little benefit.



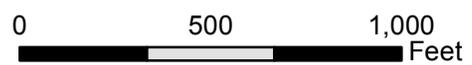
**Legend**

- Mitigation Project Areas
- Reference Sites

Date: 10/16/2015  
 Scale: 1 inch = 500 feet  
 Data Source: ESRI, 2015; Metro, 2012.

## Reference Site Locations

# Dahl Beach Park Mitigation Site



Z:\GIS\89\_DahlBeach\Mapfiles\DahlBeach\_ReferenceSites.mxd

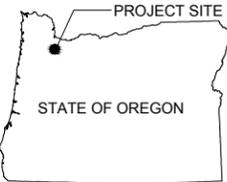
APPENDIX E  
30% DESIGN PLANS

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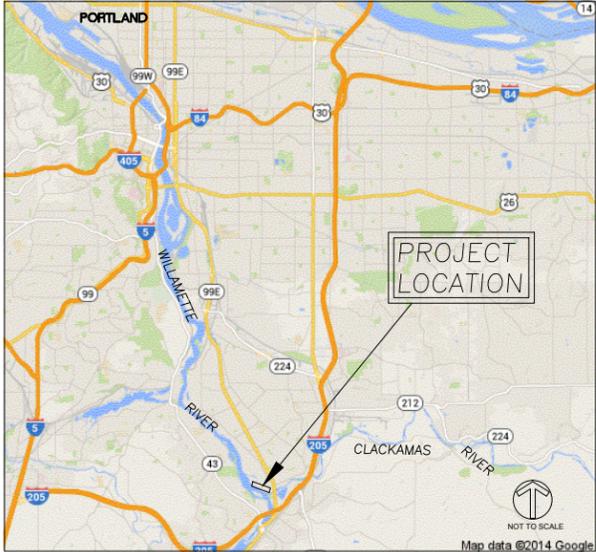
# DAHL BEACH MITIGATION PROJECT

## CITY OF GLADSTONE, OREGON

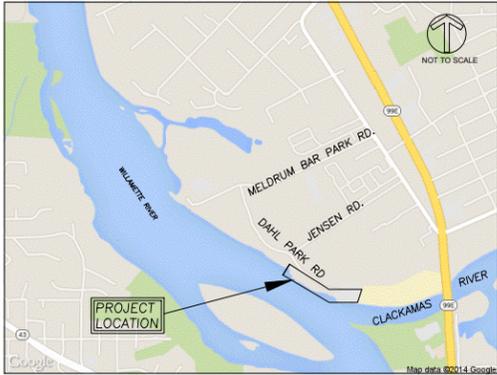
30% DESIGN DRAWINGS  
OCTOBER 2015



LOCATION MAP



VICINITY MAP



SITE MAP

**PROJECT LOCATION:**  
DAHL BEACH MITIGATION PROJECT IS LOCATED IN MELDRUM BAR PARK AND DAHL BEACH PARK, ON DAHL PARK ROAD, IN CLACKAMAS COUNTY, OREGON. LATITUDE = 45.374027°, LONGITUDE = -122.609661°

### SHEET INDEX

SHEET NUMBER	SHEET NAME	SHEET DESCRIPTION
1	G1	COVER
2	G2	NOTES, GENERAL INFORMATION, AND ABBREVIATIONS
3	G3	PROPOSED SITE OVERVIEW
4	C1	GRADING PLAN: PARKING LOT AREA
5	C2	GRADING PLAN: BULKHEAD REMOVAL AREA
6	C3	CROSS SECTION: PARKING LOT AREA
7	C4	CROSS SECTION: BULKHEAD REMOVAL AREA
8	P1	PLANTING PLAN: PARKING LOT AREA
9	P2	PLANTING PLAN: BULKHEAD REMOVAL AREA

### PROJECT TEAM

<p><b>LANDOWNER</b> CITY OF GLADSTONE CONTACT: SCOTT TABOR 525 PORTLAND AVE. GLADSTONE, OR 97027 PH: 503-656-7957</p>	<p><b>SURVEYOR (SITE)</b> WATERWAYS CONSULTING, INC. CONTACT: JOHN DVORSKY 1020 SW TAYLOR, SUITE 380 PORTLAND, OR 97205 PH: 503-227-5979</p>
<p><b>ENVIRONMENTAL CONSULTANT / CIVIL ENGINEER</b> CASCADE ENVIRONMENTAL GROUP CONTACT: BRENT HADDAWAY 222 NW DAVIS ST., SUITE 317 PORTLAND, OR 97209 PH: 503-894-8585</p>	<p><b>SURVEYOR (BATHYMETRY)</b> HYDRO SOLMAR 6635 N. BALTIMORE ST., SUITE 241 PORTLAND, OR 97203 PH: 206-200-7941</p>
	<p><b>GEOTECHNICAL ENGINEER</b> HARTCROWSER CONTACT: JIM ALDERS 300 W. 15TH STREET, SUITE 302 VANCOUVER, WA 98660 PH: 206-826-4476</p>

REVISIONS



DAHL BEACH  
MITIGATION PROJECT

COVER

October 2015

DRAWN BY: AMM  
DESIGNED BY: RPL  
CHECKED BY: BH

SHEET NUMBER

**G1** OF 9  
PROJECT NO.  
00089

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS  
0 1"

PRELIMINARY: NOT FOR CONSTRUCTION

LOCATES (48 HOURS NOTICE REQUIRED PRIOR TO EXCAVATION)

**GENERAL NOTES**

1. THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITIES OR STRUCTURES SHOWN ON THESE PLANS WAS OBTAINED BY A SEARCH OF AVAILABLE RECORDS AND MAY BE AN INCOMPLETE REPRESENTATION. THE CONTRACTOR SHALL PROTECT ALL UTILITIES WHETHER OR NOT THEY ARE SHOWN ON THESE PLANS. THE CONTRACTOR ASSUMES ALL LIABILITY AND RESPONSIBILITY FOR ALL EXISTING UTILITIES.
2. THE CONTRACTOR AGREES TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR THE JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD THE OWNER AND THE OWNER'S REPRESENTATIVE HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPT FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER OR THE OWNER'S REPRESENTATIVE.
3. THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS, DIMENSIONS, AND QUANTITIES AND SHALL REPORT ALL DISCREPANCIES TO THE OWNER'S REPRESENTATIVE PRIOR TO THE COMMENCEMENT OF WORK.
4. CONTRACTORS COMPLETING ANY PORTION OF THIS WORK ARE RESPONSIBLE FOR MEETING ALL PERMIT CONDITIONS, INCLUDING BUT NOT LIMITED TO THOSE FOUND IN LOCAL, STATE, AND FEDERAL PERMITS.
5. CONTRACTOR TO SUBMIT TRAFFIC CONTROL PLAN TO THE CITY AND ENGINEER FOR APPROVAL A MINIMUM OF 4 WEEKS BEFORE COMMENCING WORK.
8. CONTRACTOR IS RESPONSIBLE FOR COORDINATING AND SEQUENCING ALL ASPECTS OF THE WORK.

**GRADING NOTES:**

1. EXISTING AND PROPOSED CONTOURS ARE SHOWN AT 1' INTERVALS.
2. PLACE AND COMPACT ALL FILL ACCORDING TO RECOMMENDATIONS FOUND IN GEOTECH REPORT.
3. AVOID ALL EXISTING TREES TO THE EXTENT POSSIBLE DURING GRADING ACTIVITIES. MINOR ADJUSTMENTS TO GRADING PLAN MAY BE NECESSARY.

**DEMOLITION NOTES:**

1. **BLACKBERRIES.** EXISTING BLACKBERRY PLANTS WILL BE REMOVED THROUGH A COMBINATION OF GRUBBING AND EXCAVATION, AND RE-GROWTH WILL THEN BE TREATED WITH HERBICIDE AS NECESSARY. REGROWTH WILL BE TREATED BY CUTTING BACK CANES AND SPOT TREATING THE CUT STUMPS WITH HERBICIDE. HERBICIDE WILL BE APPLIED WITHIN 20 MINUTES OF CUTTING TO ENSURE EFFECTIVENESS. HERBICIDE USED WILL BE GLYPHOSATE HERBICIDE (I.E., RODEO OR OTHER GLYPHOSATE PRODUCT) LABELED FOR USE IN AQUATIC SITES.
2. **INVASIVE NON-NATIVE VEGETATION.** ALL OTHER INVASIVE NON-NATIVE VEGETATION WILL BE REMOVED IN ACCORDANCE WITH STATE AND LOCAL GUIDELINES AND ACCEPTED BEST PRACTICES FOR INVASIVE SPECIES REMOVAL.
3. **TREES AND DOWNED WOOD.** ALL EXISTING TREES AND DOWNED WOOD SHALL REMAIN IN PLACE UNLESS OTHERWISE NOTED ON PLANS.

**NOTICE TO EXCAVATORS:**

ATTENTION: OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THE RULES BY CALLING THE CENTER.  
(NOTE: THE TELEPHONE NUMBER FOR THE OREGON UTILITY NOTIFICATION CENTER IS 503-232-1987).

POTENTIAL UNDERGROUND FACILITY OWNERS



Call the Oregon One-Call Center  
DIAL 811 or 1-800-332-2344

**NORTHWEST NATURAL GAS LINE**

NOTIFY NORTHWEST NATURAL BEFORE ANY GRADING OR DIGGING ACTIVITIES OCCUR WITHIN 10 FEET OF THE NORTHWEST NATURAL GAS LINE. A NORTHWEST NATURAL REPRESENTATIVE MUST BE ON SITE TO OBSERVE ANY GRADING OR DIGGING THAT OCCURS WITHIN THE EASEMENT.

REVISIONS

222 NW Davis St. Suite 317  
Portland, Oregon 97209  
503.894.8585  
www.cascadenv.com

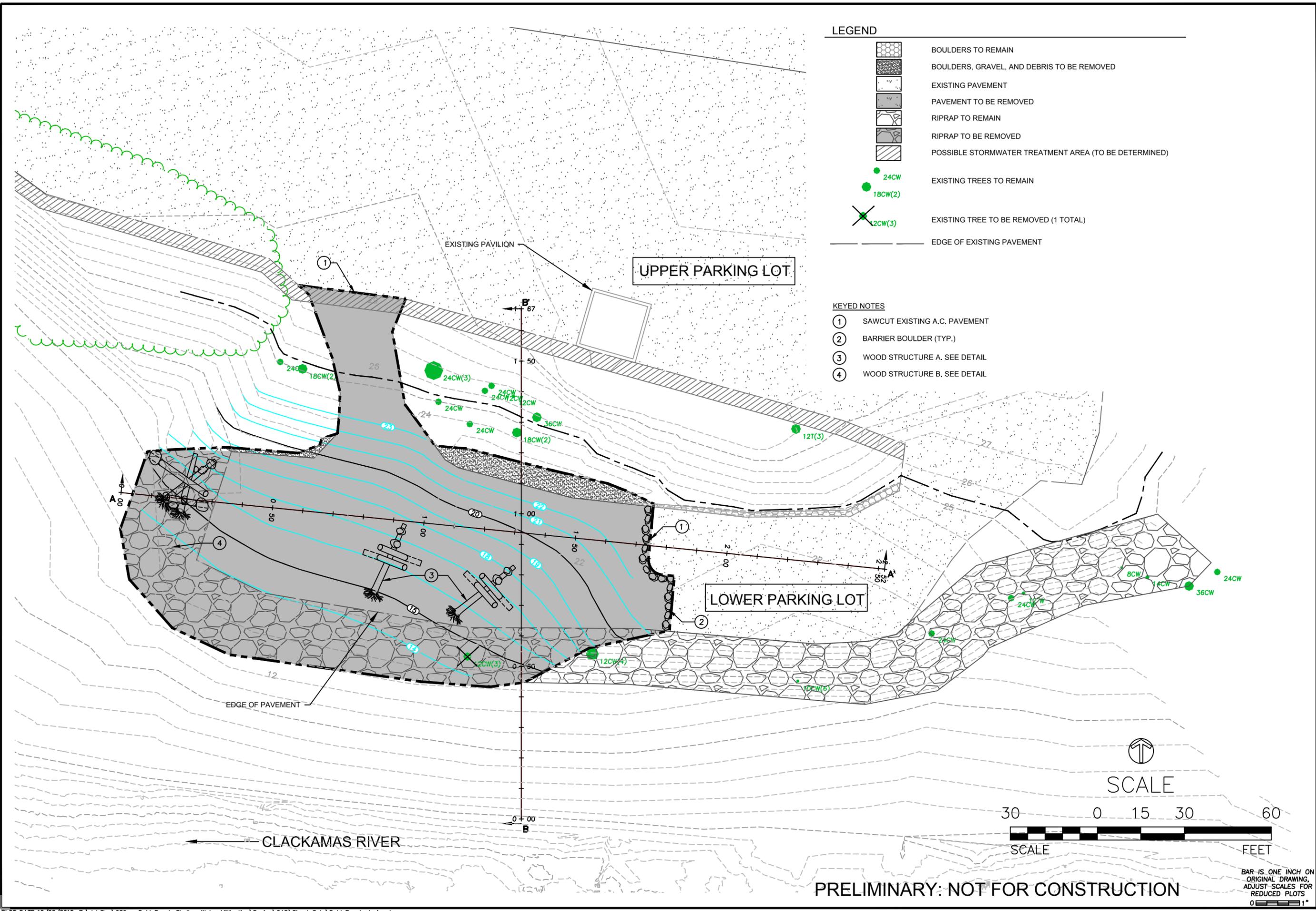
DAHL BEACH  
MITIGATION PROJECT  
GENERAL NOTES  
AND INFORMATION

October 2015  
DRAWN BY: AMM  
DESIGNED BY: RPL  
CHECKED BY: BH  
SHEET NUMBER  
**G2** OF 9  
PROJECT NO.  
00089

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS  
0 1"

**PRELIMINARY: NOT FOR CONSTRUCTION**





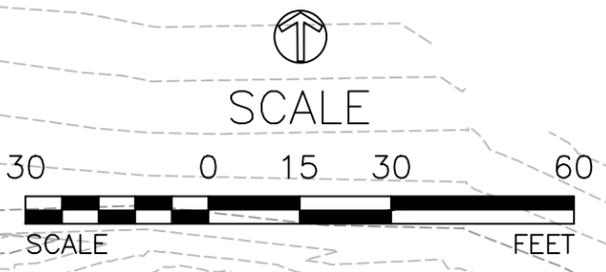
- LEGEND**
- BOULDERS TO REMAIN
  - BOULDERS, GRAVEL, AND DEBRIS TO BE REMOVED
  - EXISTING PAVEMENT
  - PAVEMENT TO BE REMOVED
  - RIPRAP TO REMAIN
  - RIPRAP TO BE REMOVED
  - POSSIBLE STORMWATER TREATMENT AREA (TO BE DETERMINED)
  - EXISTING TREES TO REMAIN
  - EXISTING TREE TO BE REMOVED (1 TOTAL)
  - EDGE OF EXISTING PAVEMENT

- KEYED NOTES**
- ① SAWCUT EXISTING A.C. PAVEMENT
  - ② BARRIER BOULDER (TYP.)
  - ③ WOOD STRUCTURE A. SEE DETAIL
  - ④ WOOD STRUCTURE B. SEE DETAIL

NO.	DATE	DESCRIPTION

**CASCADE**  
ENVIRONMENTAL GROUP  
222NW Davis St., Suite 317  
Portland, Oregon 97209  
503.894.8585  
www.cascadeenv.com

**DAHL BEACH**  
**MITIGATION PROJECT**  
**DEMO AND GRADING PLAN**  
**PARKING LOT PARTIAL REMOVAL**



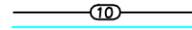
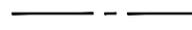
**PRELIMINARY: NOT FOR CONSTRUCTION**

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS

October 2015  
 DRAWN BY: AMM  
 DESIGNED BY: AMM/RPL  
 CHECKED BY: BH  
 SHEET NUMBER  
**C1** OF 9  
 PROJECT NO.  
 00089

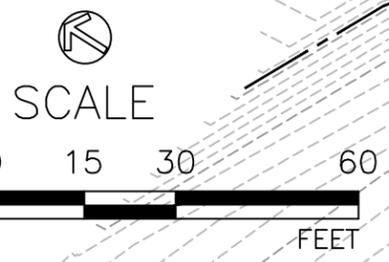
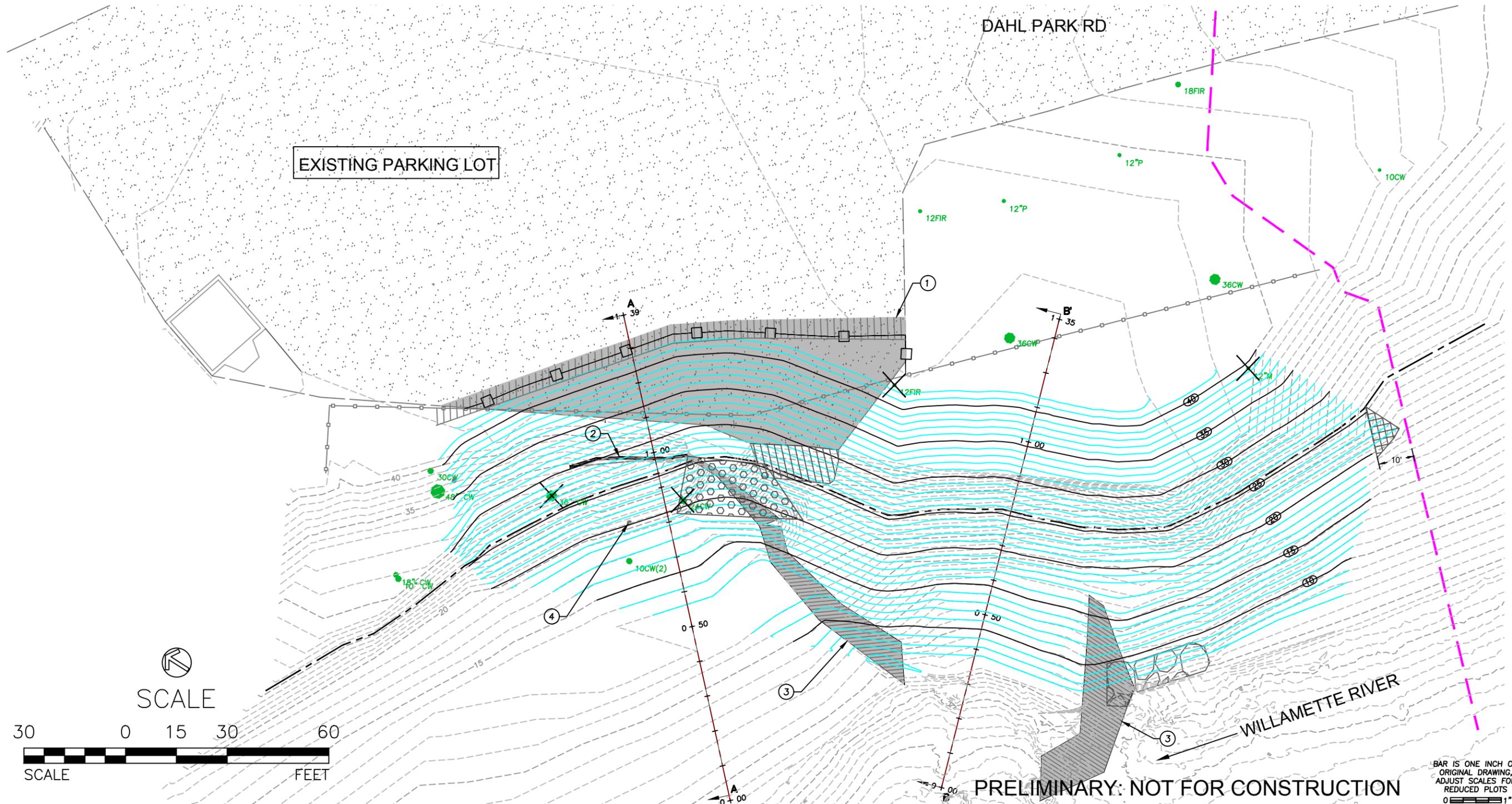
# LEGEND

-  EXISTING RIPRAP AND CONCRETE DEBRIS TO BE REMOVED
-  REMOVE EXISTING PIECES OF BROKEN AC PAVEMENT WHERE ENCOUNTERED
-  EXISTING PAVEMENT
-  PAVEMENT TO BE REMOVED. REMOVE BUILDING FOUNDATIONS, CONCRETE, AND RELATED MATERIALS WHERE ENCOUNTERED
-  NW NATURAL GRADING MONITORING ZONE
-  AREA OF STRUCTURAL FILL. STRUCTURAL FILL TO BE COMPOSED OF NATIVE MATERIAL OBTAINED FROM SITE GRADING
-  POSSIBLE STORMWATER TREATMENT AREA (TO BE DETERMINED)

-  EDGE OF EXISTING PAVEMENT
-  NW NATURAL HIGH PRESSURE GAS TRANSMISSION LINE
-  EXISTING CONTOURS
-  PROPOSED CONTOURS
-  OHW LINE (ELEV. 25.4)
-  EXISTING FENCE
-  NEW FENCE
-  EXISTING TREES INTENDED TO REMAIN
-  EXISTING TREE TO BE REMOVED (3 TOTAL)

## KEYED NOTES

- ① SAWCUT EXISTING A.C. PAVEMENT
- ② SHEET PILE SEGMENT INSTALLED PARALLEL TO BANK SHALL BE CUT OFF BELOW FINISH GRADE AND BURIED WITH NATIVE MATERIAL. SEE SECTION A-A'
- ③ REMOVE EXISTING SHEET PILE BULKHEAD AND RELATED CABLE, HARDWARE, AND APPURTENANCES WHERE ENCOUNTERED. SHEETPILE SEGMENTS THAT ARE UNABLE TO BE REMOVED WITHOUT EXTRAORDINARY EFFORT WILL BE CUT 2-3 FEET BELOW GRADE AND BURIED WITH NATIVE MATERIAL
- ④ PROTECT EXISTING PIPE TO REMAIN



**PRELIMINARY: NOT FOR CONSTRUCTION**

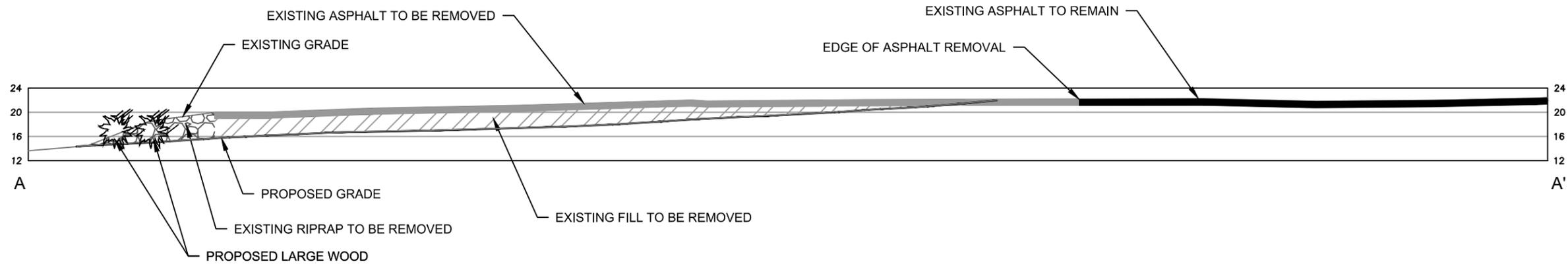
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS

NO.	REVISIONS

**CASCADE**  
ENVIRONMENTAL GROUP  
222NW Davis St., Suite 317  
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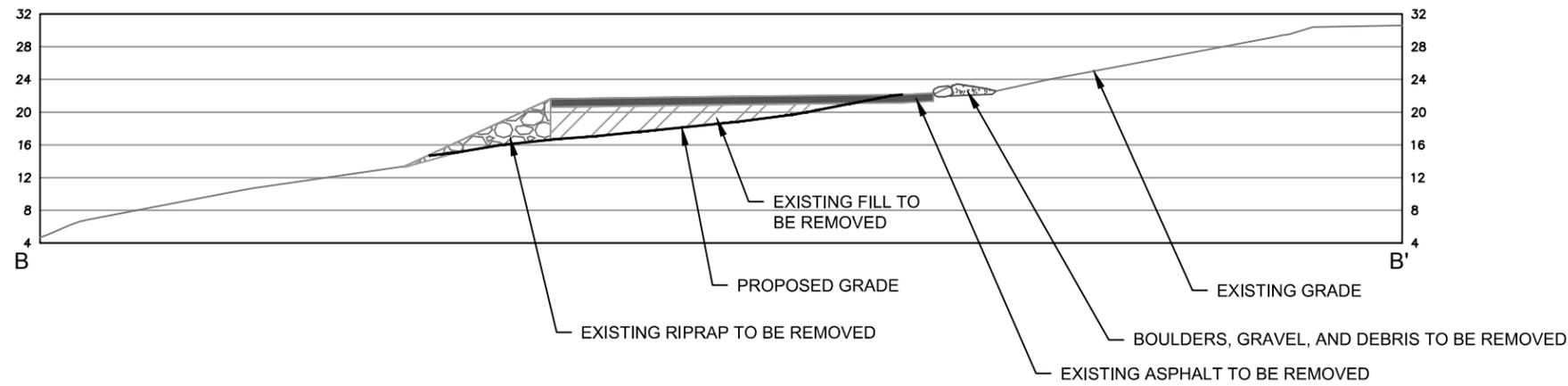
**DAHL BEACH  
MITIGATION PROJECT  
DEMO AND GRADING PLAN  
BULKHEAD REMOVAL AREA**

October 2015  
 DRAWN BY: AMM  
 DESIGNED BY: AMM/RPL  
 CHECKED BY: BH  
 SHEET NUMBER  
**C2** OF 9  
 PROJECT NO.  
 00089



**SECTION A-A'**

SCALE: VERT. 1"=20' HORIZ. 1"=20'



**SECTION B-B'**

SCALE: VERT. 1"=20' HORIZ. 1"=20'

REVISIONS


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ENVIRONMENTAL GROUP  
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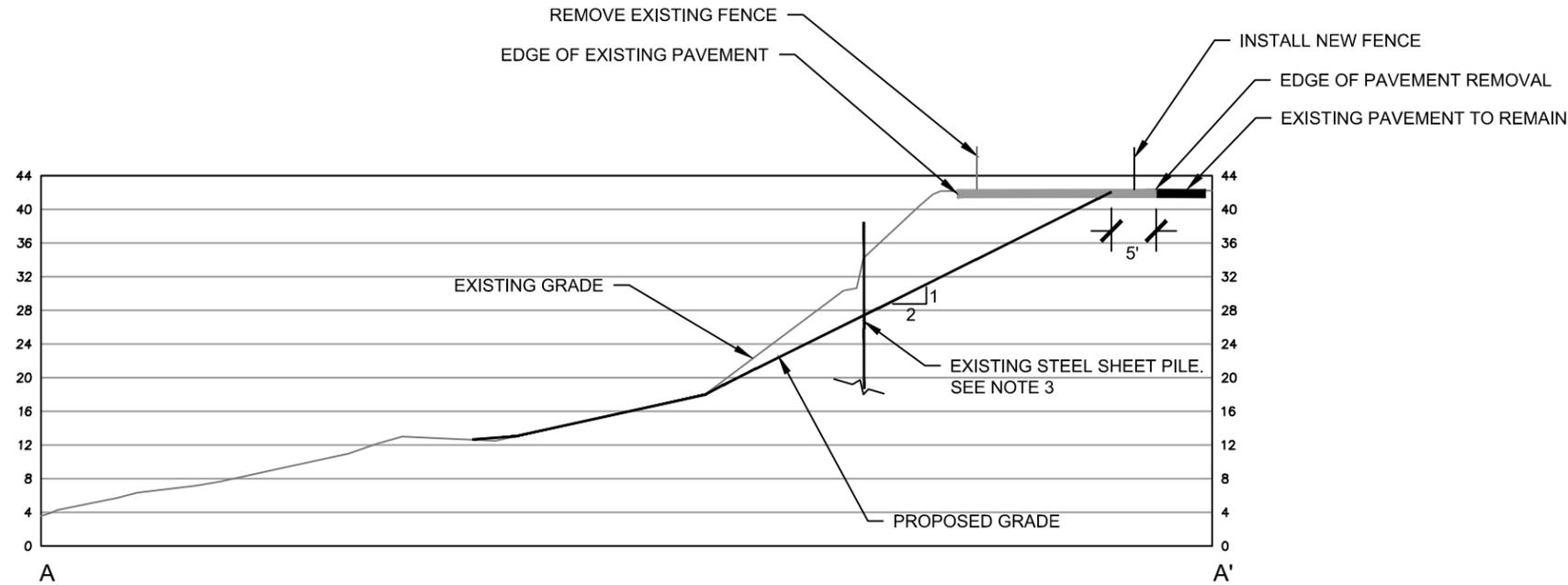
DAHL BEACH  
MITIGATION PROJECT  
SECTIONS  
PARKING LOT PARTIAL REMOVAL

October 2015  
DRAWN BY: AMM  
DESIGNED BY: AMM/RPL  
CHECKED BY: BH

SHEET NUMBER  
**C3** OF 9  
PROJECT NO.  
00089

PRELIMINARY: NOT FOR CONSTRUCTION

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS

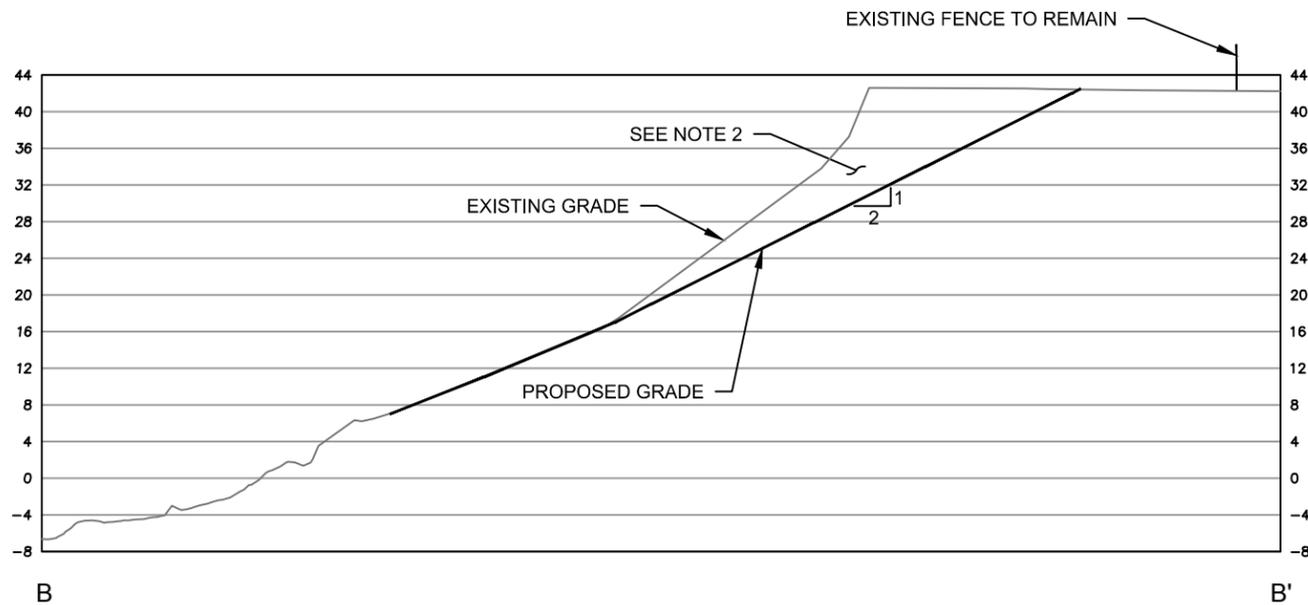


**SECTION A-A'**

SCALE: VERT. 1"=10' HORIZ. 1"=10'

**NOTES**

1. REMOVE EXISTING CABLES, HARDWARE, AND OTHER APPURTENANCES WHERE ENCOUNTERED. IF FEATURE EXTENDS BELOW FINISH GRADE, CUT OFF 2-3 FT BELOW GROUND SURFACE.
2. MASS EXCAVATION MATERIAL EXPECTED TO BE SPREAD ON DOWNSTREAM BEACH AND WASHED OF FINES.
3. CUT EXISTING STEEL SHEET PILE 2 FEET BELOW FINISH GRADE AND BACKFILL WITH NATIVE STRUCTURAL FILL.



**SECTION B-B'**

SCALE: VERT. 1"=10' HORIZ. 1"=10'

REVISIONS


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ENVIRONMENTAL GROUP  
222 NW Davis St. Suite 317  
Portland, Oregon 97209  
503.894.8585  
www.cascadeenv.com

DAHL BEACH  
MITIGATION PROJECT  
SECTIONS  
BULKHEAD REMOVAL AREA

October 2015  
DRAWN BY: AMM  
DESIGNED BY: AMM/RPL  
CHECKED BY: BH

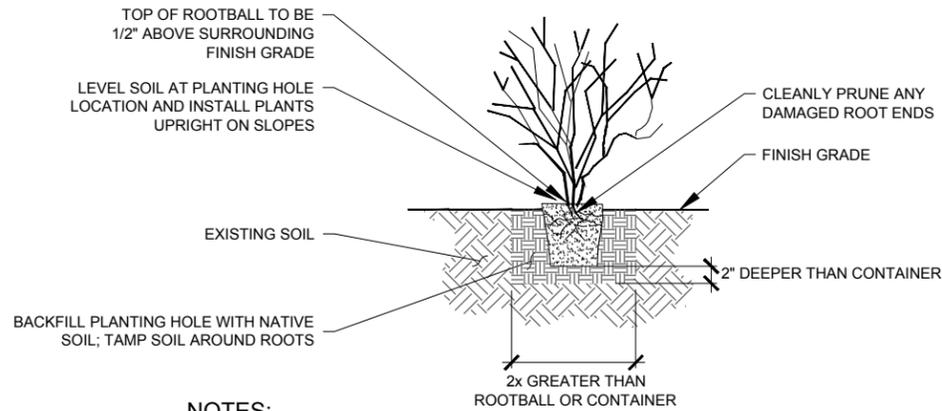
SHEET NUMBER  
**C4** OF 9  
PROJECT NO.  
00089

PRELIMINARY: NOT FOR CONSTRUCTION

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS

**PLANTING NOTES**

1. PLANTING AREAS WILL BE STAKED IN THE FIELD BY A QUALIFIED WETLAND SPECIALIST PRIOR TO COMMENCEMENT OF PLANTING OPERATIONS
2. ALL TREES AND SHRUBS TO BE 1 GALLON CONTAINER SIZE
3. PLANT ALL TREES AT 10' O.C. AND ALL SHRUBS AT 4' O.C.
4. SEED ALL AREAS OF EARTHWORK OR DISTURBANCE WITH APPROPRIATE SEED MIX
5. A NW NATURAL REPRESENTATIVE MUST BE ON SITE DURING ANY DIGGING OR PLANTING ACTIVITY WITHIN 10 FEET OF THE GAS TRANSMISSION LINE (NEAR THE BULKHEAD REMOVAL AREA). CONTACT NW NATURAL 48 HOURS PRIOR TO WORK IN THIS AREA.



**NOTES:**

1. SEE SPECIFICATIONS FOR BACKFILL REQUIREMENTS

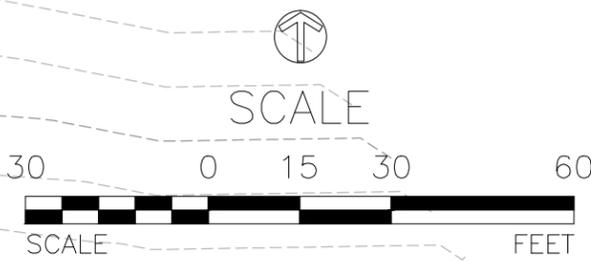
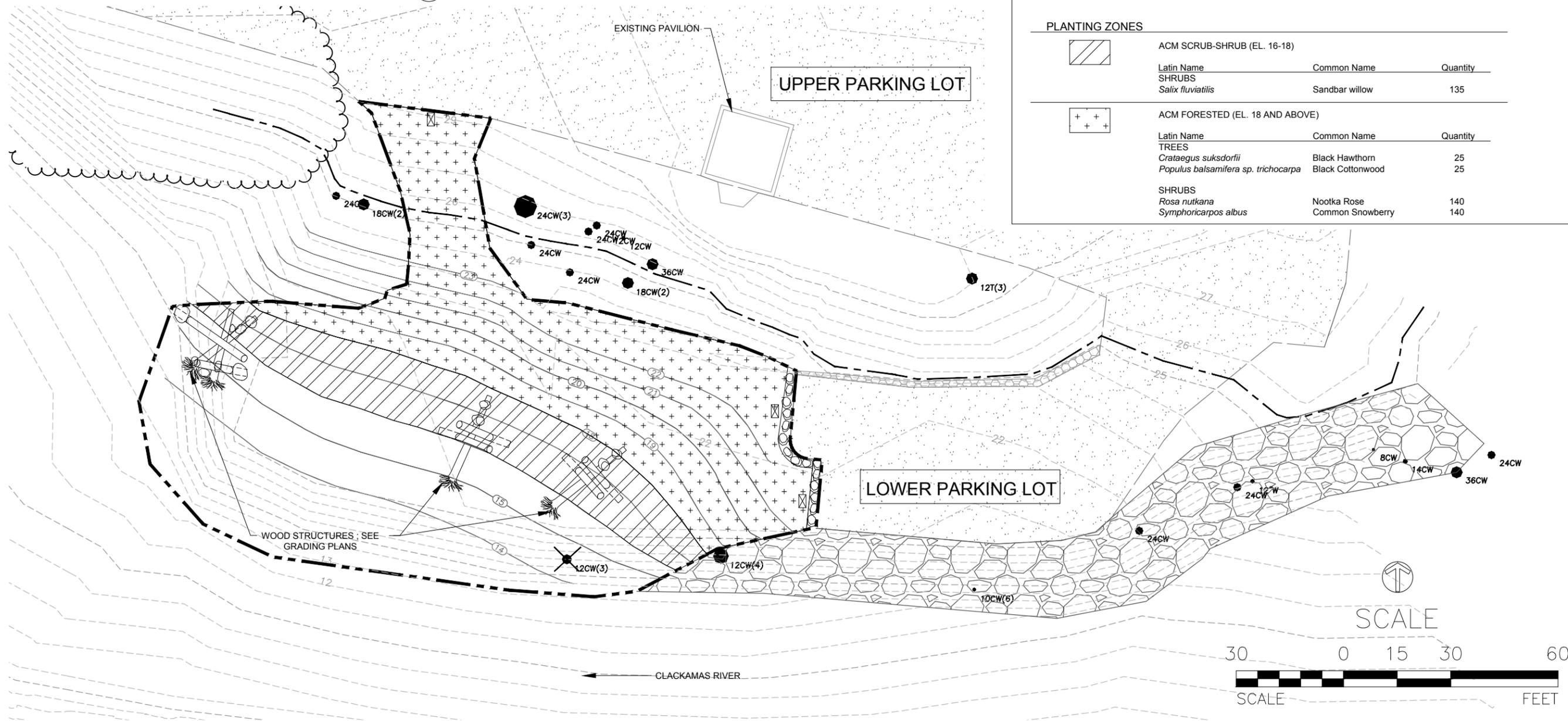
**1 1 GALLON TREE & SHRUB PLANTING**  
Not to Scale

**PLANTING LEGEND**

- BOULDERS TO REMAIN
- PAVEMENT TO REMAIN
- RIPRAP TO REMAIN
- EXISTING TREES TO REMAIN
- EXISTING TREES TO REMAIN
- EXISTING TREE TO BE REMOVED (1 TOTAL)
- EDGE OF PAVEMENT
- EXISTING CONTOURS
- PROPOSED CONTOURS
- BOULDER BARRIER; SEE GRADING PLANS
- PROPOSED HABITAT AREA SIGNAGE (3 TOTAL)

**PLANTING ZONES**

Latin Name	Common Name	Quantity
<b>ACM SCRUB-SHRUB (EL. 16-18)</b>		
<b>SHRUBS</b>		
<i>Salix fluviatilis</i>	Sandbar willow	135
<b>ACM FORESTED (EL. 18 AND ABOVE)</b>		
<b>TREES</b>		
<i>Crataegus suksdorfii</i>	Black Hawthorn	25
<i>Populus balsamifera sp. trichocarpa</i>	Black Cottonwood	25
<b>SHRUBS</b>		
<i>Rosa nutkana</i>	Nootka Rose	140
<i>Symphoricarpos albus</i>	Common Snowberry	140



**PRELIMINARY: NOT FOR CONSTRUCTION**

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS

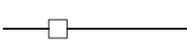
REVISIONS	DATE	DESCRIPTION

**CASCADE ENVIRONMENTAL GROUP**  
222 NW Davis St., Suite 317  
Portland, Oregon 97209  
503.894.8585  
www.cascadeenv.com

**DAHL BEACH MITIGATION PROJECT  
PLANTING PLAN  
PARKING LOT PARTIAL REMOVAL**

October 2015  
DRAWN BY: AMM  
DESIGNED BY: AMM/TS  
CHECKED BY: BH  
SHEET NUMBER  
**P1** OF 9  
PROJECT NO. 00089

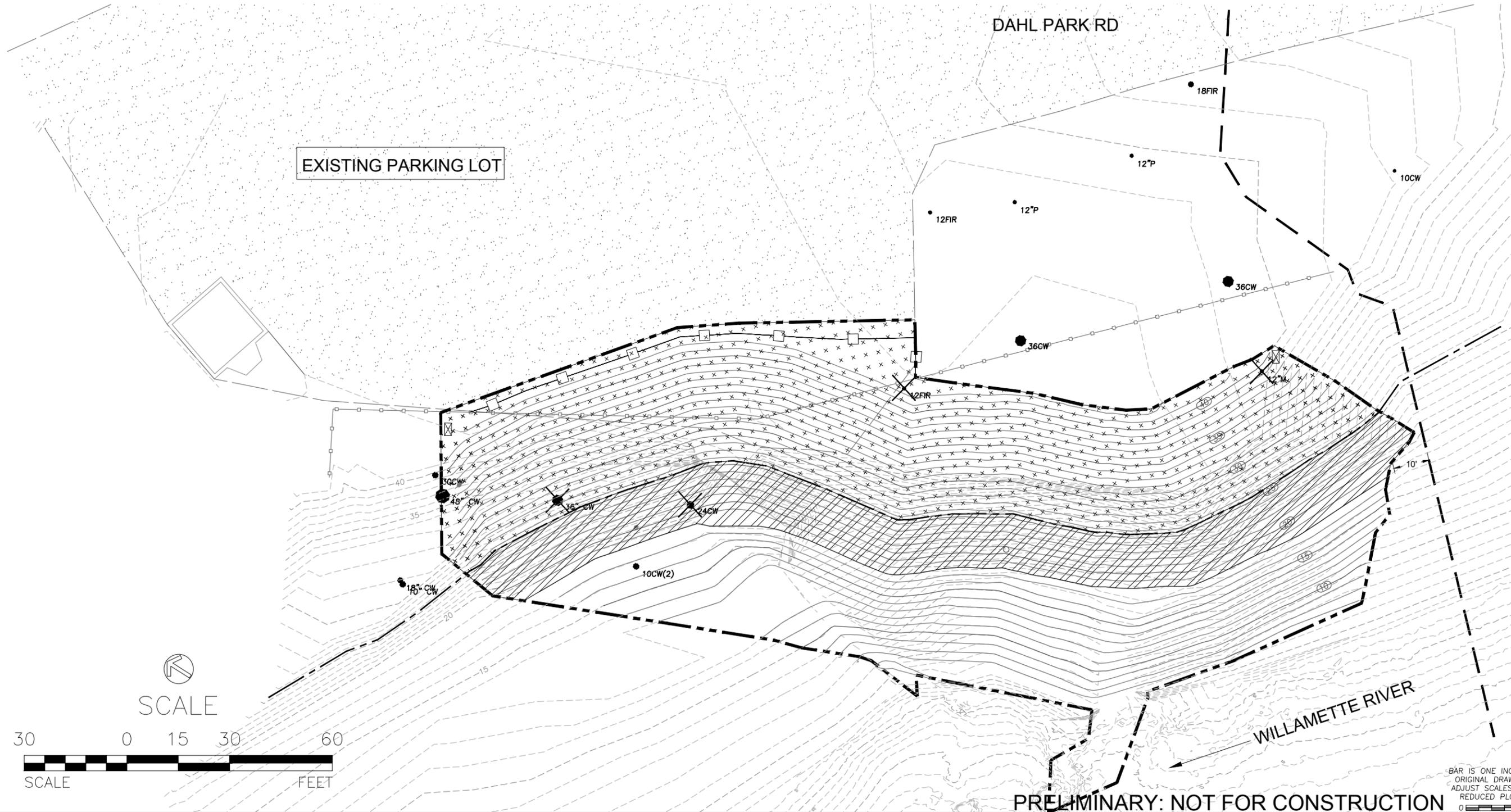
**PLANTING LEGEND**

-  EXISTING PAVEMENT TO REMAIN
-  -25- EXISTING CONTOURS
-  NW NATURAL HIGH PRESSURE GAS TRANSMISSION LINE
-  (10) PROPOSED CONTOURS
-  24CW EXISTING TREES TO REMAIN
-  EXISTING FENCE
-  18CW(2) EXISTING TREE TO BE REMOVED (3 TOTAL)
-  NEW FENCE
-  PROPOSED HABITAT AREA SIGNAGE (2 TOTAL)

SEE SHEET P1 FOR PLANTING NOTES

**PLANTING ZONES**

RIPARIAN (EL. 25.4 AND ABOVE)		
Latin Name	Common Name	Quantity
<b>TREES</b>		
<i>Acer marcophyllum</i>	Big-leaf Maple	100
<i>Pseudotsuga menziesii</i>	Douglas Fir	100
<b>SHRUBS</b>		
<i>Berberis aquifolium</i>	Tall Oregon Grape	250
<i>Symphoricarpos albus</i>	Common Snowberry	250
ACM FORESTED (EL. 18-25.4)		
Latin Name	Common Name	Quantity
<b>TREES</b>		
<i>Crataegus douglasii</i>	Black Hawthorn	20
<i>Populus balsamifera sp. trichocarpa</i>	Black Cottonwood	20
<b>SHRUBS</b>		
<i>Rosa nutkana</i>	Nootka Rose	115
<i>Symphoricarpos albus</i>	Common Snowberry	115



REVISIONS


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**DAHL BEACH  
MITIGATION PROJECT  
PLANTING PLAN  
BULKHEAD REMOVAL AREA**

October 2015  
 DRAWN BY: AMM  
 DESIGNED BY: AMM/TS  
 CHECKED BY: BH  
 SHEET NUMBER  
**P2** OF 9  
 PROJECT NO.  
 00089

**PRELIMINARY: NOT FOR CONSTRUCTION**

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS

# APPENDIX F

# GEOMORPHOLOGY REPORT

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This page is a placeholder. The report will be available the first week of November 2015.