Preliminary Design Report

Adopt A Stream Foundation

February 2014

Prepared by

Brooke Clement & C.K. Eidem

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Introduction

The Adopt A Stream Foundation (AASF) is working closely with the City of Redmond to improve the relationship between the local government and a private landowner along a highly degraded portion of Bear Creek. AASF has encouraged a stream-friendly land ethic with this landowner and has received permission to improve instream and riparian conditions along 350-linear feet of Bear Creek as it runs through the Friendly Village Mobile Home Park in Redmond, WA. The proposed improvements will benefit numerous salmonid species by achieving the following goals and objectives:

1. Build a good relationship with the landowner and help address erosion where it is compatible with stream restoration goals.
    a. Develop a project in an area of landowner concern
2. Increase channel complexity
    a. Install approximately four wood structures using 23 large logs and 17 rootwads
3. Improve channel stability
    a. Grade peninsula to better accommodate seasonal flooding and provide stable planting area for native trees and shrubs
4. Decrease thermal pollution
    a. Establish native plantings along 14,300 sq. ft. of streamside property

Existing Conditions

Friendly Village is a 55+ mobile home park with access to approximately 1,400 linear-feet of highly degraded main stem Bear Creek. Few native trees and shrubs remain in the lawn-dominated riparian area. This reach of Bear Creek (Reach 6) has been identified in various plans as having:

- Decreased floodplain connectivity and decreased off-channel habitat because of channel confinement. Due to development, the channel is somewhat disconnected from its historic flood plain and is constricted by several road crossings which results in reduced habitat conditions and flooding in developed portions of the property.

- Very little large woody debris. Wood is important because it increases channel complexity, contributes to channel stability, develops pools, traps sediment, and reduces water temperature.

- Poor coverage of native riparian vegetation. Restoring riparian vegetation will improve channel stability, provide sources of large woody debris that can contribute to creation of pools, and reduce peak water temperatures that favor non-native species.

Before AASF made contact with the landowner, a significant barrier to any stream restoration at this location was resistance from the landowner due to distrust of local government and a lack of understanding of stream processes. AASF has been working with this landowner on stream restoration projects of increasing size since 2011 to develop this relationship and improve this degraded stream reach. With the successful completion of this project, AASF hopes to pave the way for even more significant improvements to Reach 6 of Bear Creek in the future.

Design Alternatives

While numerous opportunities to improve the conditions of Bear Creek as it runs through Friendly Village are clearly visible to AASF and other agency specialists, the final project site was chosen as a compromise between salmon restoration goals and landowner concerns over stream bank erosion. While the option of solely armoring banks with rock in areas of severe erosion was available, this strategy would not have provided the long-term benefits to fish habitat that AASF desired and may have only exacerbated downstream erosion. In addition, the project area was limited to the left bank due to existing native vegetation and potential storm and sewer infrastructure along the right bank. With these issues in mind, the primary factors debated during the design process include:

- Bank Construction
- Existing Native Vegetation
- Chanel Enhancement
    - LWD Placement
    - Anchoring
- Cost

Three main plans have been considered during the design process. In 2012, AASF proposed a simple design of re-grading the slope to provide a more stable planting area, covering the new stream bank with coir fabric and using willow to help add stability in flood-prone areas (Appendix A). This plan included fairly conservative wood placement along the left bank Ordinary High Water Level and anchoring techniques including cable, rock, Manta Ray Earth Anchors, Duckbill Earth Anchors and a few rebar pins. While this plan was relatively low cost, it would have required the removal of an existing mature cottonwood tree. After review by the SRFB, it was decided that the value of existing mature vegetation was high enough to warrant adjustment to the first design.

The second design incorporated SRFB's concerns and preserved the mature cottonwood tree (Appendix A). In order to do this, however, an existing high-water channel along the left bank would have to be armored and graded carefully to prevent the formation of a year-round side channel. Conservative wood placement was used to achieve this design objective. After review in 2013 by SRFB and WDFW, the suggestion to move the wood to more "aggressive" locations was shared with AASF, inspiring changes for the final design which is described in the following section.

Preferred Alternative

The final design modified the 2013 submittal to WDFW by adjusting the location of the logs so that more instream cover would be provided (Appendix A). Because finalizing project designs and completing cultural reviews required more staff time than anticipated, adjustments were made to the anchoring details to decrease implementation costs. Manta Ray Earth Anchors were removed as an anchoring method due to increased costs of this system. Remaining anchoring strategies include cable, boulder, Duckbill Earth Anchors, and rebar. This final design was reviewed by the WRIA 8 Technical Committee in January 2014 and has also been reviewed by WDFW engineer Bob Barnard and Jay Kidder of Chinook Engineering. AASF is submitting permit applications with these updated designs in Spring 2014.

Design Considerations and Analyses

Bank Construction

The primary goal for bank construction is to provide stable, sloping banks that support long-term native plant establishment. Bank gradient has been adjusted as designs evolved to achieve this objective. After grading is complete, AASF will lay coir fabric, coir logs, straw wattles, and/or similar erosion control materials to help maintain bank stability while native plantings establish. This is a commonly accepted bank stability practice. Native plantings will also span all disturbed soil to reduce the likelihood of future erosion.

Existing Native Vegetation

Because one of the main concerns for the health of Reach 6 is the lack of native vegetation, AASF and project partners prioritized preservation of most existing native vegetation while planning the project.

Channel Enhancement

Large woody debris placement for this project must provide as much instream habitat as possible while preventing the formation of a permanent side channel. Such a side channel would pose a long-term threat to adjacent plantings and residences. While AASF increased the aggressiveness of the proposed wood structures under the advisement of SRFB and WDFW, reviewers should note that slight adjustments to wood placement might be made in the field to ensure both objectives are met. Due to the size of wood installed, a combination of anchoring techniques will be used on the site. In anticipation of this project, AASF has already tested the use of rebar as an anchoring strategy on a smaller, conservative wood project in Friendly Village upstream of the proposed project site. This wood structure, installed in 2012, has held up well to the winter flows of Bear Creek. Other anchoring strategies detailed in the final project plans have been utilized by AASF in similarly-sized projects along Little Bear Creek and Scriber Creek.

Cost

Project costs have limited the project area and the type of anchoring proposed. Expanded planting and LWD placement would benefit Reach 6 of Bear Creek but would require additional funding.

Permitting and Stakeholder Consultation

The primary local stakeholders for this project are the landowner, neighboring residents of the mobile home park, and the City of Redmond. The City of Redmond is fully supportive of this project and has agreed to assist with long-term maintenance and monitoring at the site. The WRIA 8 technical committee and WDFW biologists and engineers have also reviewed plans. AASF anticipates the completion of all required permitting by May 2014.

Designs

See Appendix A.

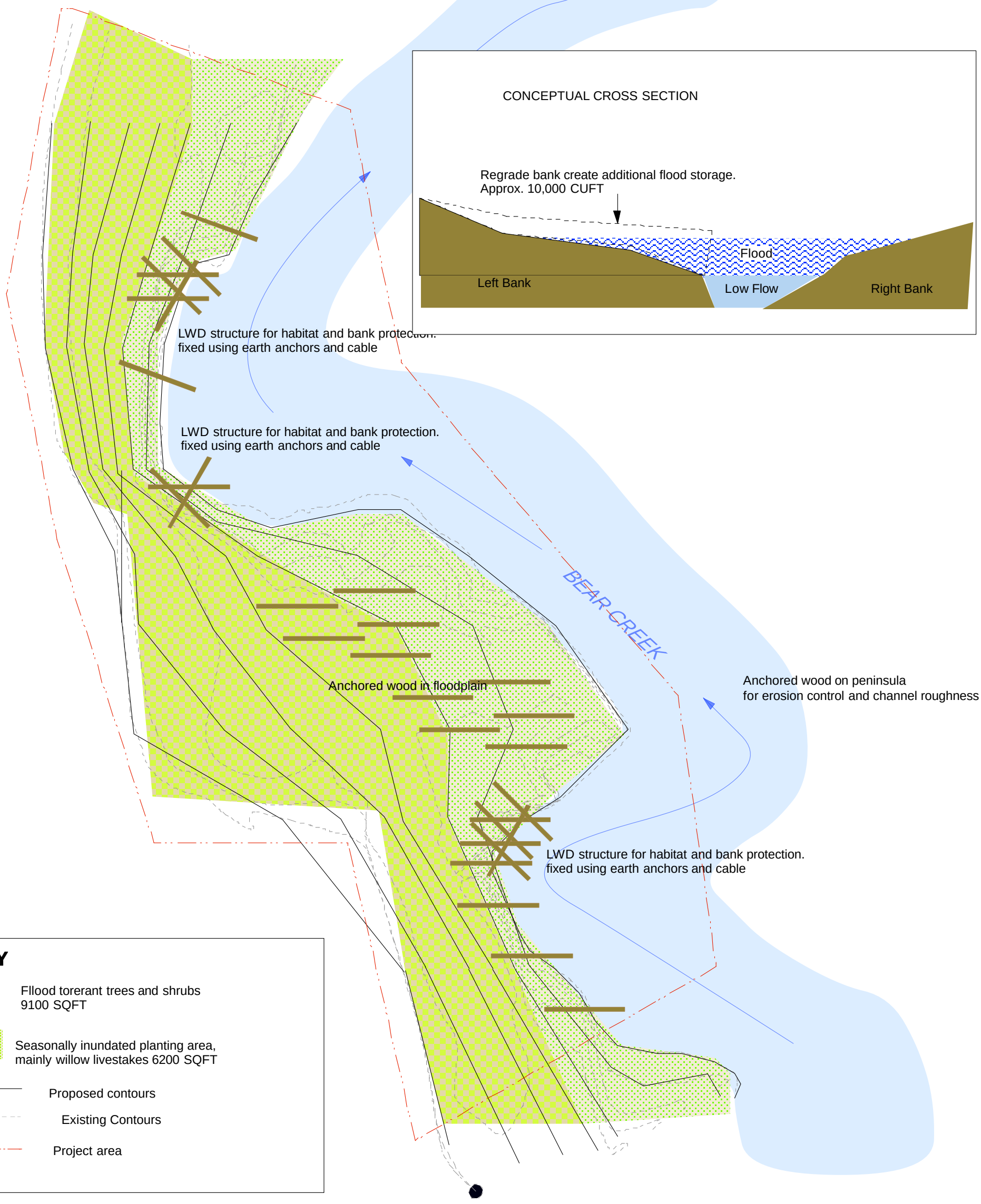
Appendix A: Designs

Included:

- 1st design (2012)
- 2nd design (2013)
- 3rd design (2014)

PRELIMINARY DESIGN

SRFB PROPOSAL
(AASF 2012 BEAR CREEK REACH 6 RESTORATION
12-1282)



KEY

- Fllood torerant trees and shrubs 9100 SQFT
- Seasonally inundated planting area, mainly willow livestakes 6200 SQFT
- Proposed contours
- Existing Contours
- Project area

N

Contour interval 1'
Based on survey January 2012
Relative Benchmark located on pavement

ADOPT A STREAM FOUNDATION

600 128th ST SE
EVERETT WA 98208
425.316.8592
www.streamkeeper.org

"Teaching people to be stewards of their watersheds."

DATE:	3/28/2012
SCALE:	1:300
DRAWN:	CKE,LB
SHEET:	of 1

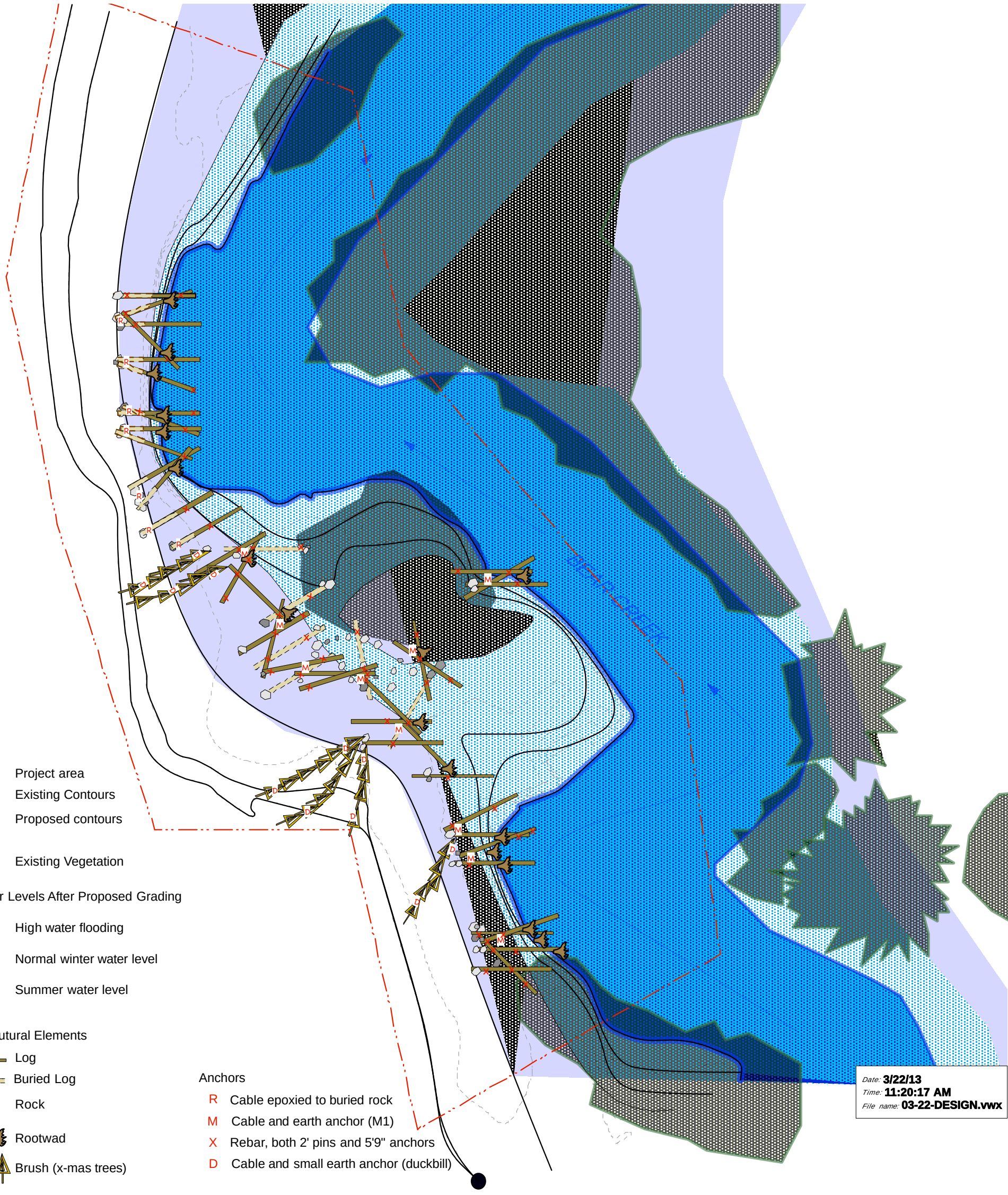
PRELIMINARY DESIGN
BEAR CREEK RESTORATION AT
FRIENDLY VILLAGE
12-1282

18425 NE 95th St.
Redmond, WA 98052

AASF # 1201

DRAFT DESIGN

BEAR CREEK REACH 6 RESTORATION 12-1282



Contour interval 1'
Based on survey January 2012
Relative Benchmark located on pavement

ADOPT A STREAM FOUNDATION

600 128th ST SE
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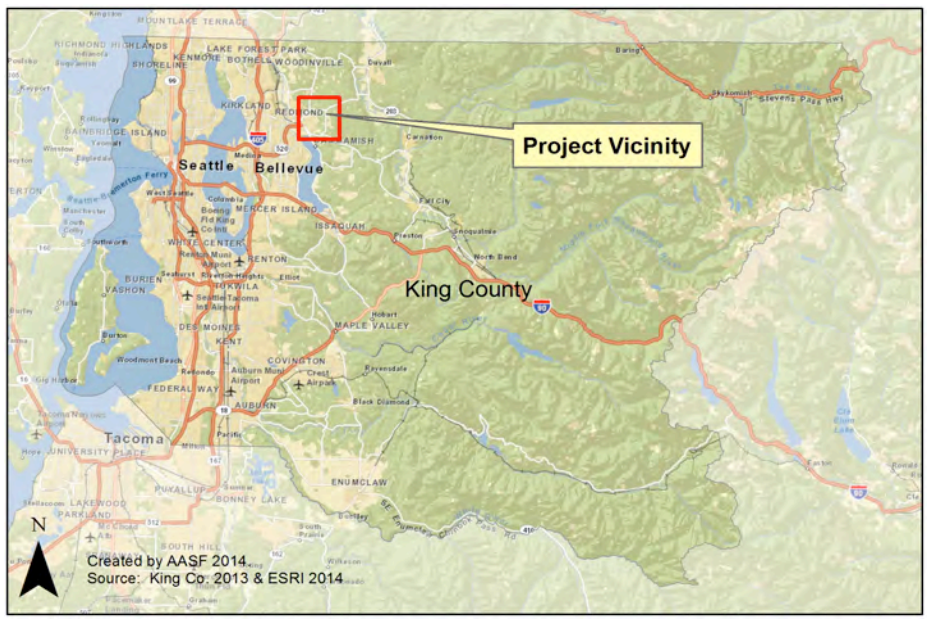
DATE:	3/22/2013
SCALE:	1:300
DRAWN:	CKE,LB
SHEET:	of 1

DRAFT DESIGN
BEAR CREEK RESTORATION AT
FRIENDLY VILLAGE
12-1282

18425 NE 95th St.
Redmond, WA 98052

AASF # 1201

ADOPT A STREAM FOUNDATION
BEAR CREEK REACH 6 RESTORATION 12-1282
FEBRURARY 2014



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DATE:	01/31/13
SCALE:	As Shown
DRAWN:	CKE,LB,BC
SHEET:	1 of 8

FINAL DESIGN
BEAR CREEK RESTORATION AT FRIENDLY VILLAGE
12-1282

18425 NE 95th St.
Redmond, WA 98052

AASF # 1223

Existing Conditions

BEAR CREEK REACH 6 RESTORATION 12-1282

01/31/2013

KEY

Project area

Existing Contours

Proposed contours

Date: **1/22/14**
Time: **2:32:55 PM**
File name: **01 EXISTING.vwx**

0 50 FT

Contour interval 1'
Based on survey January 2012
Relative Benchmark located on pavement

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DATE:	01/31/13
SCALE:	As Shown
DRAWN:	CKE,LB
SHEET:	2 of 8

FINAL DESIGN
BEAR CREEK RESTORATION AT FRIENDLY VILLAGE
12-1282

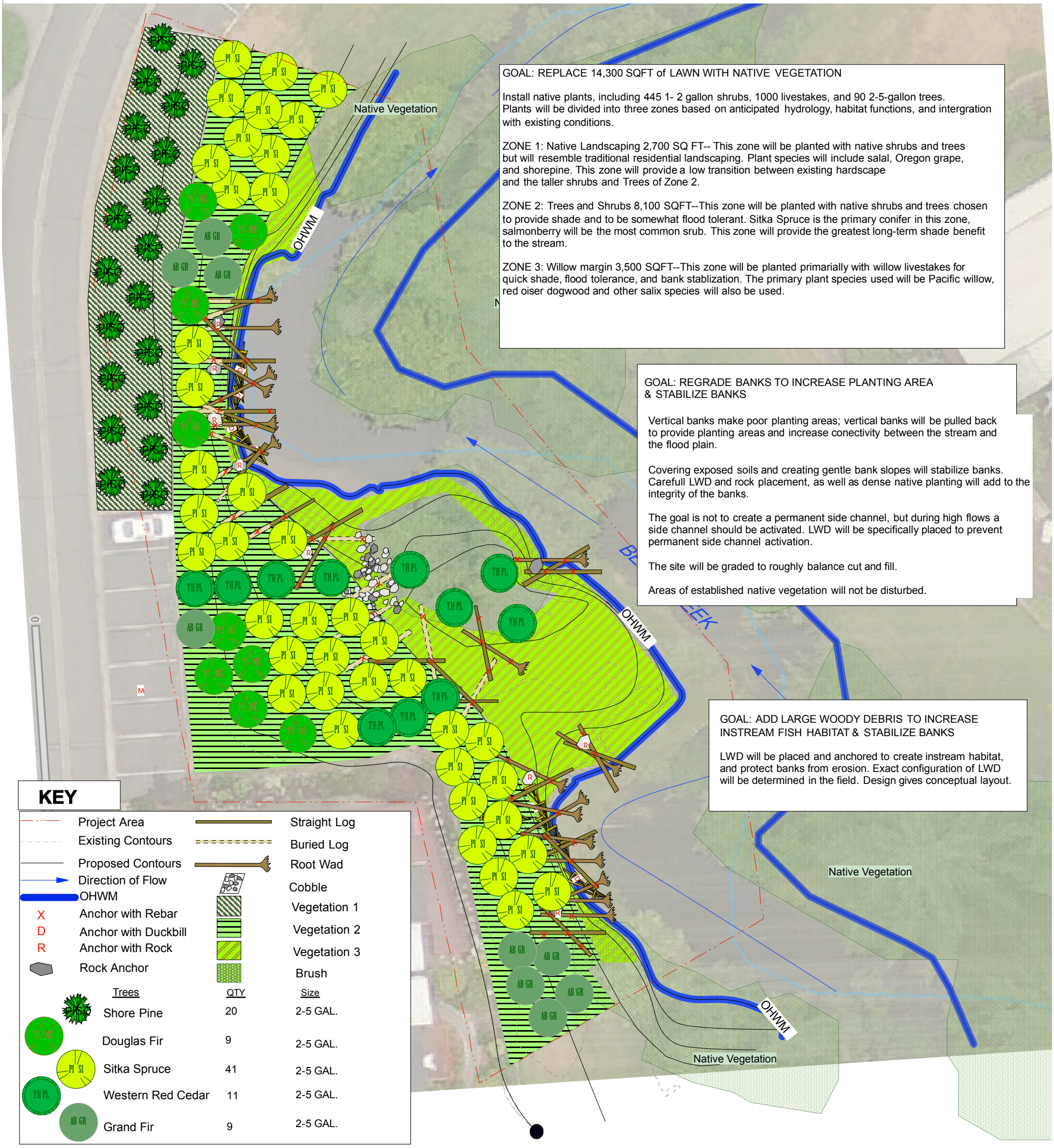
18425 NE 95th St.
Redmond, WA 98052

AASF # 1223

Final Design

BEAR CREEK REACH 6 RESTORATION 12-1282

02/21/2014



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DATE:	02/21/2014
SCALE:	AS SHOWN
DRAWN:	CKE,LB,JN
SHEET:	3 of 8

FINAL DESIGN
BEAR CREEK RESTORATION AT FRIENDLY VILLAGE
12-1282

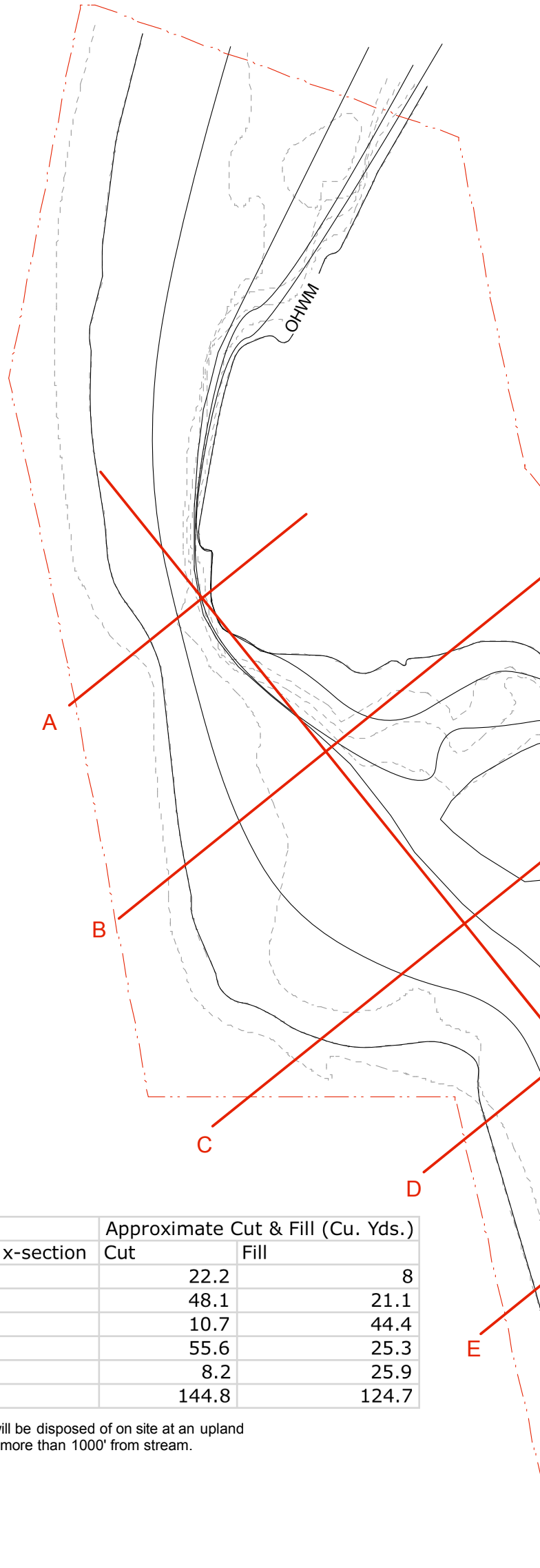
18425 NE 95th St.
Redmond, WA 98052

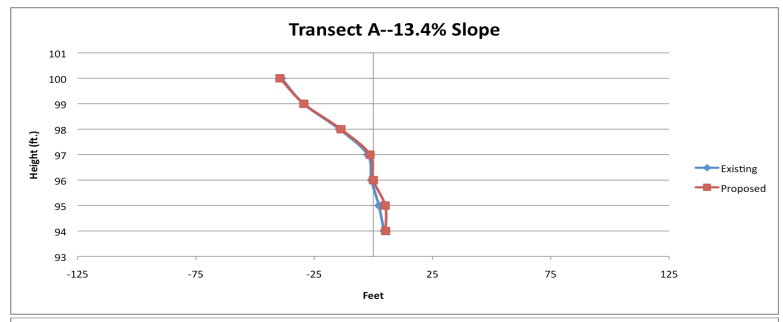
AASF # 1201

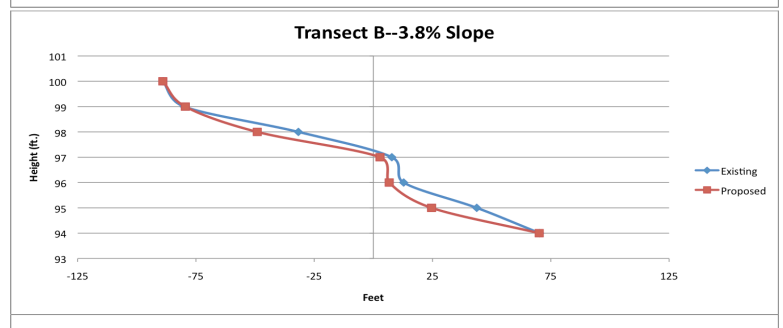
Grading Plan

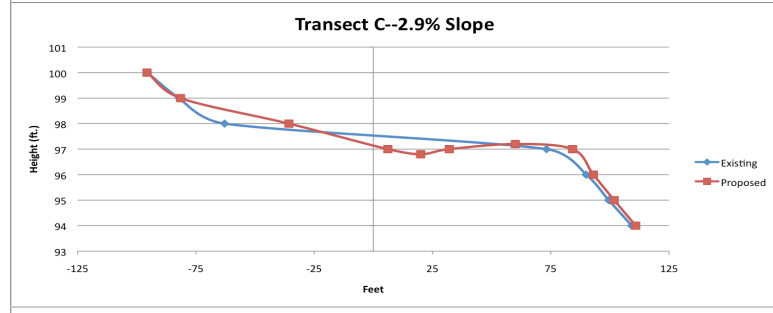
BEAR CREEK REACH 6 RESTORATION 12-1282

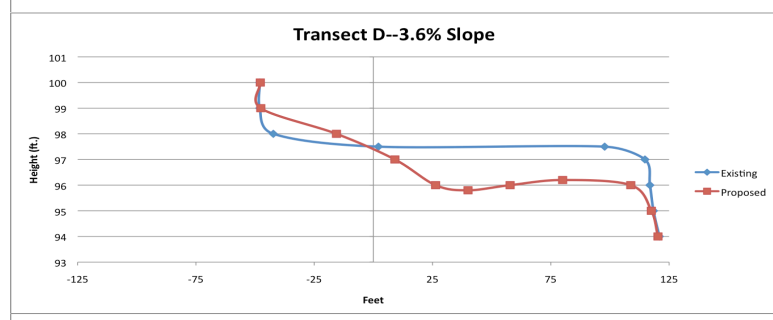
02/21/2014

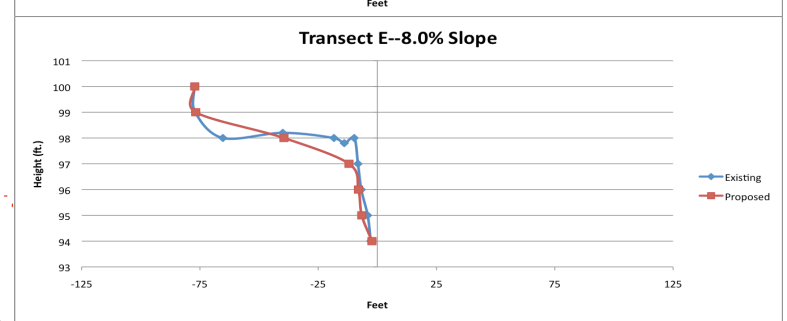












	Approximate Cut & Fill (Cu. Yds.)	
Between x-section	Cut	Fill
A-B	22.2	8
B-C	48.1	21.1
C-D	10.7	44.4
D-E	55.6	25.3
E+	8.2	25.9
Total:	144.8	124.7

Excess soil will be disposed of on site at an upland storage area more than 1000' from stream.

KEY

- Project area
- Existing Contours
- Proposed contours

0 50 FT

Contour interval 1'
Based on survey January 2012
Relative Benchmark located on pavement

Date: **2/21/14**
Time: **10:57:07 AM**
File name: **04 Grading and Planting.vwx**

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SCALE: AS SHOWN

DRAWN: CKE,LB,BC

SHEET: 4 of 8

FINAL DESIGN
BEAR CREEK RESTORATION AT FRIENDLY VILLAGE
12-1282

18425 NE 95th St.
Redmond, WA 98052

AASF # 1201

Planting Plan

BEAR CREEK REACH 6 RESTORATION 12-1282

02/21/2014

	Shrubs and Trees by Zone			
ZONE 1: 2,700 SQFT				
TYPE	CODE	NAME	SIZE	QTY
Tree	PICO	Shore Pine	2-5 gal	20
Shrub	GASH	Salal	1 gal	150
Shrub	RISA	R.F. Currant	2 gal	20
Shrub	MAAQ	Oregon Grape	2 gal	50
ZONE 2: 8,100 SQFT				
TYPE	CODE	NAME	SIZE	QTY
Tree	PSME	Douglas Fir	2-5 gal	9
Tree	PISI	Sitka Spruce	2-5 gal	41
Tree	THPL	W. Red Cedar	2-5 gal	7
Tree	ABGR	Grand Fir	2-5 gal	9
Shrub	RUSP	Salmonberry	2 gal	85
Shrub	RUPA	Thimbleberry	2 gal	40
Shrub	ACCI	Vine Maple	2 gal	20
Shrub	PHCA	Pacific Ninebar	2 gal	40
Shrub	ROPI	Clustered rose	2 gal	40
ZONE 3: 3,500 SQFT				
TYPE	CODE	NAME	SIZE	QTY
Shrub	COSE	Red-Osier Dog	LS	300
Shrub	SALU	Pacific Willow	LS	700
Tree	THPL	W. Red Cedar	2 gallon	4

KEY

Project Area		Straight Log	
Existing Contours		Buried Log	
Proposed Contours		Root Wad	
Direction of Flow		Cobble	
OHWM		Vegetation 1	
X	Anchor with Rebar	Vegetation 2	
D	Anchor with Duckbill	Vegetation 3	
R	Anchor with Rock	Brush	
	Rock Anchor		

Trees	QTY	Size
Shore Pine	20	2-5 GAL.
Douglas Fir	9	2-5 GAL.
Sitka Spruce	41	2-5 GAL.
Western Red Cedar	11	2-5 GAL.
Grand Fir	9	2-5 GAL.

0 50 FT

Contour interval 1'
Based on survey January 2012
Relative Benchmark located on pavement

Date: **2/21/14**
Time: **3:33:20 PM**
File name: **05 Planting Plan.vwx**

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DATE: 02/21/2014

SCALE: AS SHOWN

DRAWN: CKE,LB

SHEET: 5 of 8

FINAL DESIGN
BEAR CREEK RESTORATION AT FRIENDLY VILLAGE
12-1282

18425 NE 95th St.
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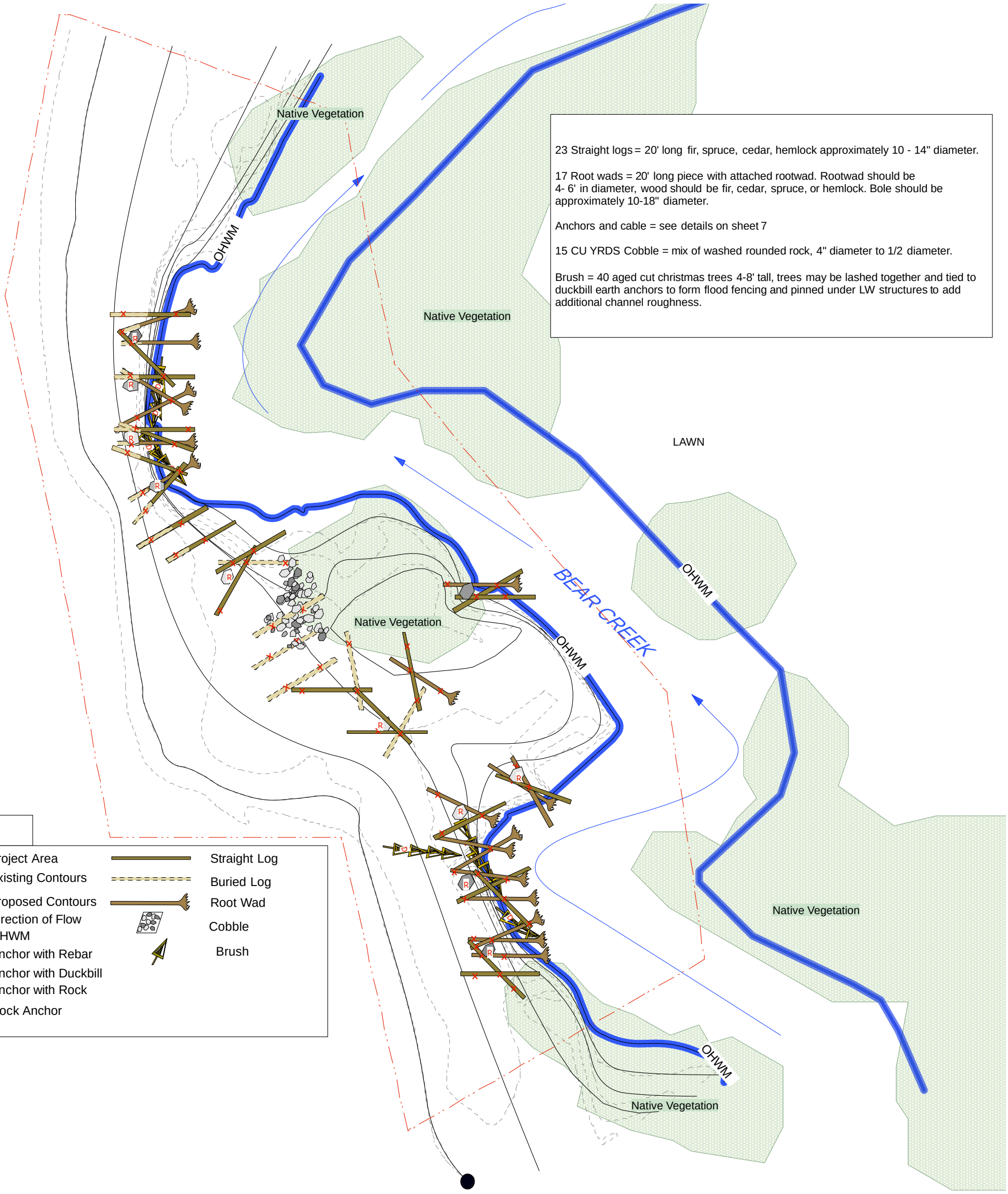
AASF # 1201

Large Wood Plan

BEAR CREEK REACH 6 RESTORATION 12-1282

02/20/2014



23 Straight logs = 20' long fir, spruce, cedar, hemlock approximately 10 - 14" diameter.

17 Root wads = 20' long piece with attached rootwad. Rootwad should be 4- 6' in diameter, wood should be fir, cedar, spruce, or hemlock. Bole should be approximately 10-18" diameter.

Anchors and cable = see details on sheet 7

15 CU YRDS Cobble = mix of washed rounded rock, 4" diameter to 1/2 diameter.

Brush = 40 aged cut christmas trees 4-8' tall, trees may be lashed together and tied to duckbill earth anchors to form flood fencing and pinned under LW structures to add additional channel roughness.

KEY

- Project Area
- Existing Contours
- Proposed Contours
- Direction of Flow
- OHWM
- X Anchor with Rebar
- D Anchor with Duckbill
- R Anchor with Rock
- Rock Anchor
- Straight Log
- Buried Log
- Root Wad
- Cobble
- Brush

0 50 FT

Date: 2/24/14
Time: 2:34:57 PM
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Contour interval 1'
Based on survey January 2012
Relative Benchmark located on pavement

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SCALE: AS SHOWN

DRAWN: CKE,LB,JN

SHEET: 6 of 8

FINAL DESIGN
BEAR CREEK RESTORATION AT FRIENDLY VILLAGE
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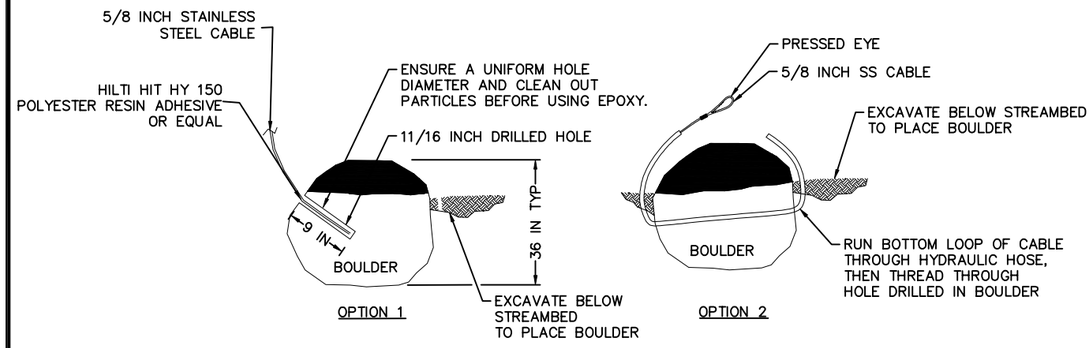
AASF # 1201

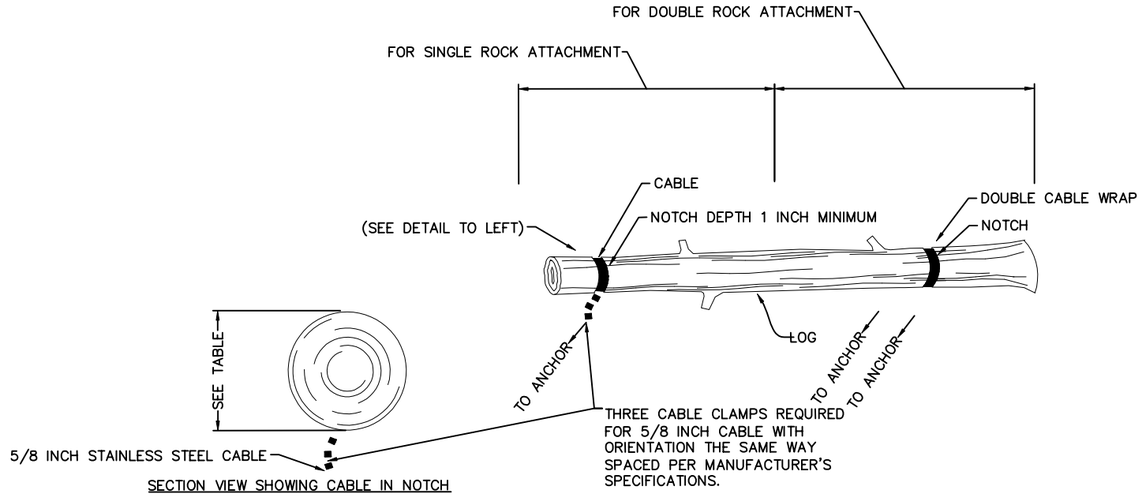


DRILL 11/16–IN HOLE 9–IN DEEP. FILL HOLE WITH HILTI HIT HY150 OR SIMILAR. INSERT CABLE PER MANUFACTURER'S SPECIFICATIONS.

SECURING CABLE TO BOULDER

1 C1

NTS

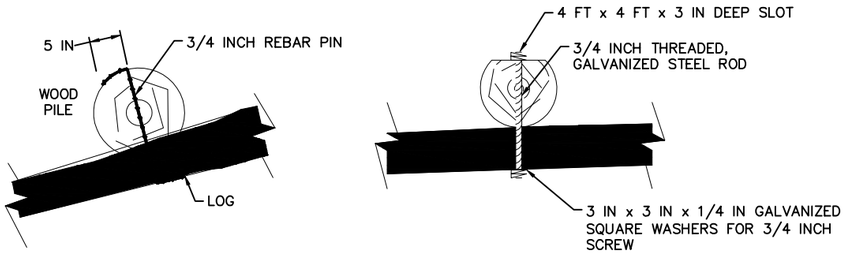


SECTION VIEW SHOWING CABLE IN NOTCH

CABLING DETAIL TO SINGLE OR DOUBLE ANCHORS

2 C1

NTS



DRILL 3/4"–DIAMETER HOLES THROUGH WOOD PILE AND LOG. DRIVE 3/4" REBAR (MINIMUM 2 FEET OR LOG DIAMETER) INTO EACH. BEND REBAR OVER SO NOT EXPOSED.

OPTIONAL BOLTED CONNECTION.
DRILL 3/4 INCH HOLES THROUGH BOTH LOGS. CUT 4 FT x 4 FT X 3 IN DEEP INTO TOP LOG. INSERT 3/4 INCH GALVANIZED THREADED ROD AND ATTACH AT BOTH ENDS WITH WASHERS AND NUTS. MAINTAIN A MINIMUM 15 INCHES FROM END OF WOOD PILE TO PIN LOCATION.

REBAR PIN DETAILS

3 C1

NTS

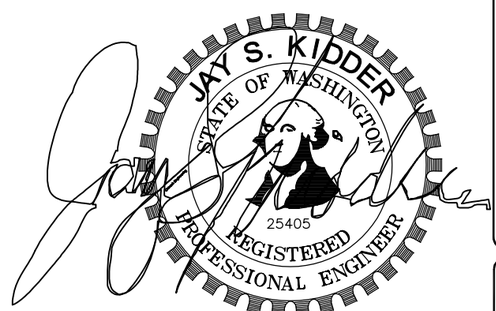
LOD ANCHOR TABLE ASSUMING TWO ROCKS OR M1 PER LOD PIECE (WEIGHT OF EACH ROCK, ROCK DIAMETER)				
	LOG LENGTH (FEET, TIP TO BASE)			
Log Diameter (inches)	10	20	30	40
12	570 lbs 22 inch	1050 lbs 27 inch	1530 lbs 27 inch	
18	1150 lbs 28 inch	1870 lbs 33 inch	2600 lbs 37 inch	3300 lbs 40 inch
24	1630 lbs 31 inch	2600 lbs 36 inch	3500 lbs 41 inch	4500 lbs 44 inch
36	2400 lbs 36 inch	3800 lbs 42 inch	5300 lbs 46 inch	6700 lbs 50 inch

ASSUMPTIONS

1. VALUES ARE FOR EACH ROCK.
2. LOGS HAVE ROOTWADS ATTACHED
3. LOG DIAMETER IS AVERAGE OF BASE AND END

Notes:

1. LOD shall be Douglas Fir, Cedar, Hemlock, or Ponderosa Pine species.
2. All logs shall be 8"-16" dbh and 20' in length unless noted otherwise.
3. Anchors may be rock or manta ray earth anchors as site may require.
4. M1 Manta Ray anchors may be substituted 1 to 1 for rocks up to 3000 lbs and then multiply values of table for larger anchor loads and use multiple M1 anchors.
5. Simpson SET XP may be substituted for Hilti Epoxy.



1" Bar at Original Scale

CHINOOK ENGINEERING
860 Windrose Drive
Coupeville, Washington 98239
(360) 678-4747
Professional Consulting Engineers

REV	DATE	ISSUE	DWG	DES	CHK	APP
1	7-3-2013	Issued for Construction	JSK	JSK	JSK	JSK
2	-	-				
3	-	-				

PROJECT NO. –

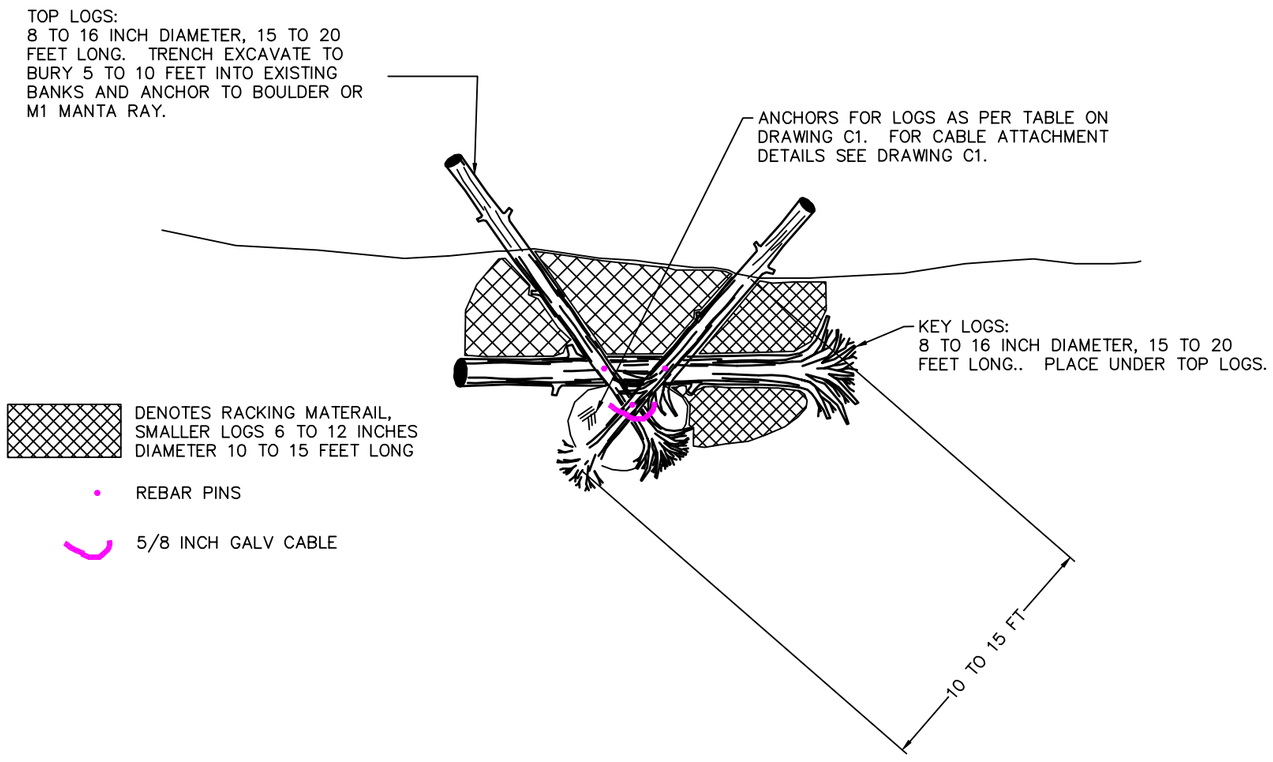
Adopt A Stream Foundation
Bear Creek Restoration At Freindly Village

LOD Anchorage Details
Boulder and Manata Ray Anchors

DRAWING NO.
C-1
1 OF 3

Notes:

1. LOD shall be Douglas Fir, Cedar, Hemlock, or Ponderosa Pine species.
2. All logs shall be 8"-16" dbh and 20' in length unless noted otherwise.
3. Anchors may be rock or manta ray and cables as site may require.



V LOG JAM PLAN DETAIL 1/C2
NTS

CHINOOK ENGINEERING
860 Windrose Drive
Coupeville, Washington 98239
(360) 678-4747
Professional Consulting Engineers

REV	DATE	ISSUE	DWG	DES	CHK	APP
1	7-3-2013	Issued for Construction	JSK	JSK	JSK	JSK
2	-	-				
3	-	-				

PROJECT NO. –

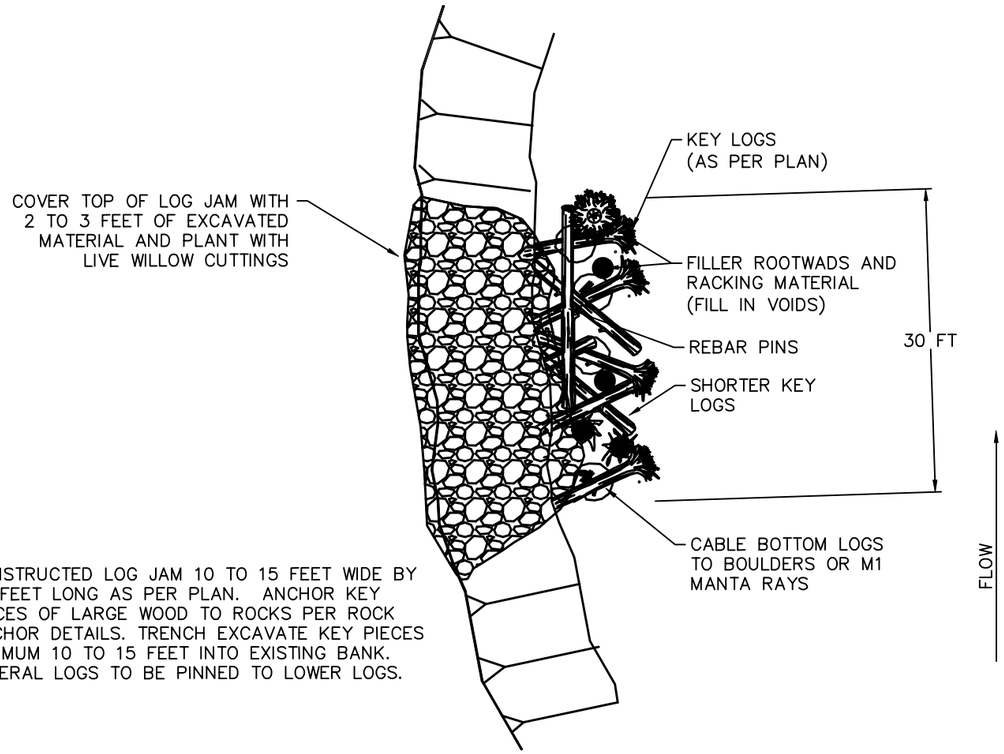
Adopt A Stream Foundation
Bear Creek Restoration At Freindly Village

LOD Anchorage Details
Boulder and Manata Ray Anchors

JAY S. KIDDER
STATE OF WASHINGTON
25405
REGISTERED
PROFESSIONAL ENGINEER

DRAWING NO.
C2
2 OF 3

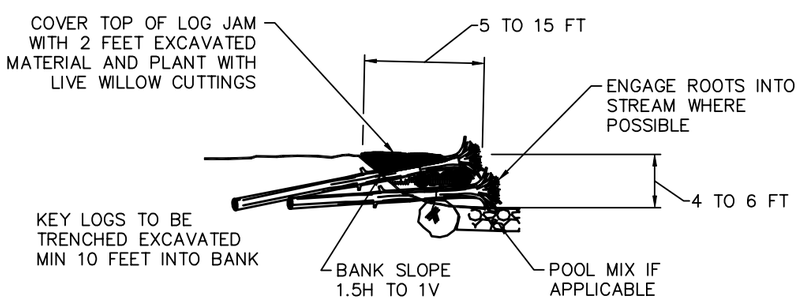
1" Bar at Original Scale



LOG JAM PLAN DETAIL 1 C3
NTS

EXAMPLE LOG JAM PHOTO 2 C3
NTS

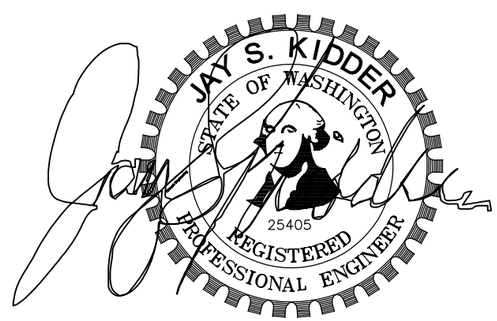
NOTE:
1. THE PHOTO IS AN EXAMPLE OF A LOG JAM STRUCTURE AS DETAILED ON THIS SHEET WITH 8 KEY LOGS.



LOG JAM SECTION DETAIL 3 C3
NTS

Notes:

1. LOD shall be Douglas Fir, Cedar, Hemlock, or Ponderosa Pine species.
2. All logs shall be 8"-16" dbh and 20' in length unless noted otherwise.
3. Anchors may be rock or manta ray and cables as site may require.
4. Log structure size and log quantity shall be as identified in plan. 8 log structure shown but may be as low as 3 logs in quantity.
5. Weave logs in layers as much as possible for strength and erosion resistance.
6. Install M1 Manta Rays 10' of embedment where possible. Where embedment is 5'-10' double the number of M1 anchors.



1" Bar at Original Scale

CHINOOK ENGINEERING
660 Windrose Drive
Coupeville, Washington 98239
(360) 678-4747
Professional Consulting Engineers

REV	DATE	ISSUE	DWG	DES	CHK	APP
1	7-3-2013	Issued for Construction	JSK	JSK	JSK	JSK
2	-	-				
3	-	-				

PROJECT NO. -

Adopt A Stream Foundation
Bear Creek Restoration At Freindly Village

LOD Anchorage Details
Boulder and Manata Ray Anchors

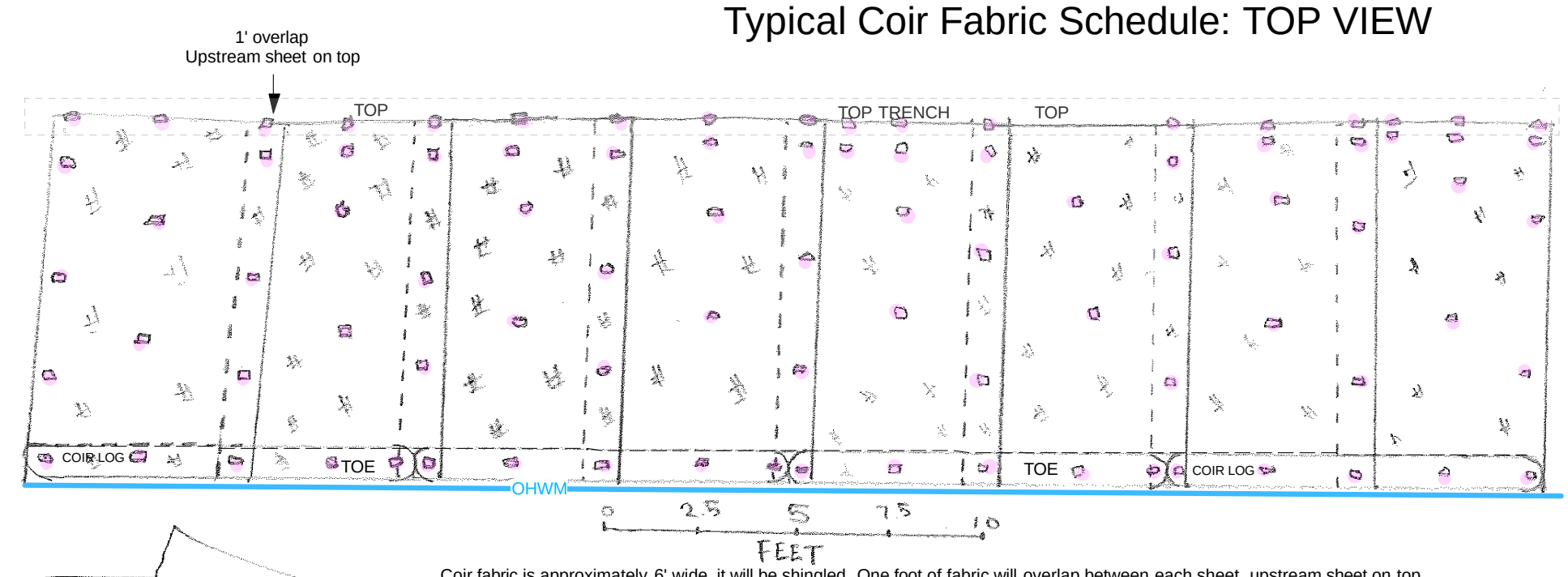
DRAWING NO.
C3
3 OF 3

Details

BEAR CREEK REACH 6 RESTORATION 12-1282

02/25/2014

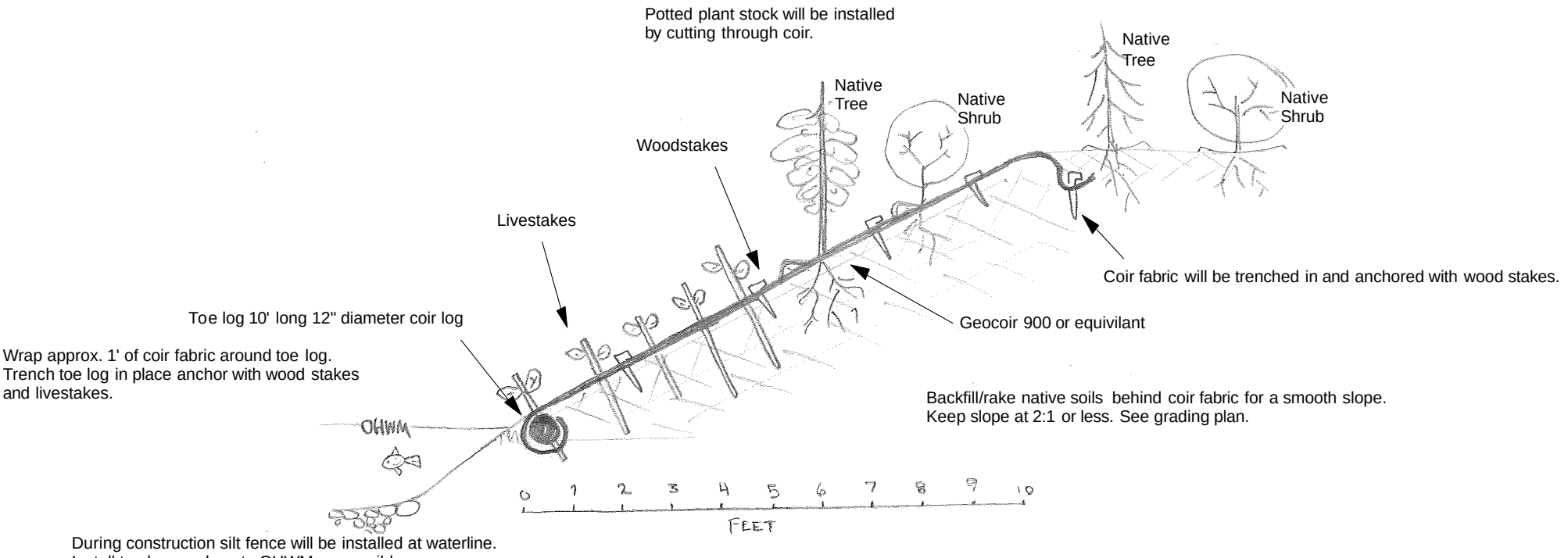
Typical Coir Fabric Schedule: TOP VIEW



Coir fabric is approximately 6' wide, it will be shingled. One foot of fabric will overlap between each sheet, upstream sheet on top.
Each sheet will be measured from toe of slope to top of slope and cut. Accounting for 1 foot overlap on toe and 1' of coir to be buried in top trench.
Ten foot lengths of 12" diameter coir logs will be secureed to tow. Place wood stakes approximately as shown X.

Typical Planting Cross Section

Potted plant stock will be installed by cutting through coir.



Date: **2/25/14**
Time: **1:39:52 PM**
File name: **08 DETAILS.vwx**

ADOPT A STREAM FOUNDATION

600 128th ST SE
EVERETT WA 98208
425.316.8592
www.streamkeeper.org

"Teaching people to be stewards of their watersheds."

DATE:	02/25/2014
SCALE:	AS SHOWN
DRAWN:	CKE
SHEET:	8 of 8

FINAL DESIGN
BEAR CREEK RESTORATION AT FRIENDLY VILLAGE
12-1282

18425 NE 95th St.
Redmond, WA 98052

AASF # 1201

Appendix B: Design Review Comments

Included:

- SRFB Early Application Review Panel Comments
- AASF Response to SRFB Comments
- Correspondence

Salmon Recovery Funding Board Individual Comment Form

Lead Entity: Cedar/Sammamish WRIA 8

Project Number: 12-1282

Project Name: Bear Creek Reach 6 Restoration

Project Sponsor: Adopt A Stream Foundation

Grant Manager: Elizabeth Butler

	Date	Status
Early App. Review-Site Visit	5/30/12	**Reviewed**
July Review Panel Mtg.		
Status Options		
REVIEWED	Review Panel has reviewed and provided comments.	
REVIEWED & FLAGGED	Review Panel has flagged this project as needing full panel discussion.	
	Date	**Status**
Post Application	9-27-12	**Clear**
Final	10/31/12	**CLEAR**
Status Options		
POC	Project of Concern	
CLEAR	Project is clear	

Project Summary:

The proposed project will enhance salmon habitat conditions along about 350 lineal feet of Bear Creek located in the Friendly Village mobile home development by regrading an eroding bank, installing large wood structures, and planting a buffer of native riparian vegetation. The project site is located in the fifth highest priority reach of a Tier 1 – Core Chinook use sub-basin.

EARLY APPLICATION REVIEW/SITE VISIT - REVIEW PANEL COMMENTS

Date: 6/5/12

Panel Member(s) Name: Tom Slocum and Steve Toth

Early Project Status: Reviewed

Project Site Visit? Yes (5/30/12)

1. Recommended improvements to make this a technically sound project according to the SRFB's criteria.

The proposal aptly justifies why work on this degraded reach of urban creek supports high priority ecological and social objectives of the WRIA 8 salmon recovery plan. While the proposed habitat enhancement work consists of common and technically straight-forward treatment techniques, the review panel cautions that because of the sub-basin's disrupted hydrology and sediment transport patterns and severe limitations on the ability of the channel to respond to them, the sustainability of any in-channel treatments at the site will be subject to risks that are beyond the scope and budget of this small project to control. In particular, the long term effectiveness of excavating the outside bank of the meander to a sloping bench as a means of stabilizing erosion and providing flood storage is doubtful, given that a few winter high water events could easily erode the bench back to a vertical cut bank. This scenario occurred at the Ohop Creek SRFB restoration project near Eatonville within two years of construction, and the review panel suggests that the sponsor discuss the effectiveness of this technique with the Ohop project sponsor (Nisqually Indian Tribe).

We also caution the sponsor to avoid giving the property owner the impression that regrading the left bank will make a significant reduction in flooding at the site, unless appropriate hydrologic and hydraulic modeling has been completed to

Salmon Recovery Funding Board Individual Comment Form

demonstrate that it will. The review panel's informal field observations suggest that channel constriction by structures immediately downstream of the site will backwater the site during flood conditions, regardless of the proposed bank regrading.

Because of the significant uncertainties associated with the effectiveness and sustainability of the bank regrading component of the design, the review panel suggests that the sponsor focus instead on installing abundant LWD pieces along the existing left bank to enhance salmon habitat complexity and reduce bank erosion. Please also consider the merits of installing a mid channel LWD structure that is positioned to deflect high flows over the point bar on the inside of the meander, and which will further improve habitat complexity. We strongly support the proposed revegetation component of the project, especially if it can retain the existing large cottonwood tree on the left bank.

2. Missing Pre-application information.

In the final proposal, please include sufficient budget to prepare the design and as-built documentation that is required in Manual 18 Appendix D.

3. Staff Comments/Questions:

EARLY APPLICATION REVIEW/SITE VISIT - LEAD ENTITY & PROJECT SPONSOR RESPONSES

Directions: Lead Entity or Sponsor must post their response to Review Panel comments in **PRISM** with document name: Response to Review Panel Comments. Attach this as a separate document in PRISM to become part of your application, and send your grant manager an e-mail.

All Flagged projects will be reviewed at the July 12th full Review Panel meeting. Sponsor responses received no later than one week prior to the meeting will be considered by the Review Panel.

Special Note: To help speed the local and SRFB Review Panel evaluation process, if for any reason throughout the application review process you update your project proposal based on SRFB Review Panel comments please re-attach your proposal in PRISM in WORD "track changes." This step will save time and focus the reviewer on the changes.

Response:
Attach Response to PRISM, and send your Grant Manager an e-mail.
Grant Manager will put in the PRISM attachment number here.

JULY 12TH REVIEW PANEL MEETING - REVIEW PANEL COMMENTS

Date:

Panel Member(s) Name:

Early Project Status:

Project Site Visit?

1. Recommended improvements to make this a technically sound project according to the SRFB's criteria.

Salmon Recovery Funding Board Individual Comment Form

2. Missing Pre-application information.

3. Staff Comments/Questions:

JULY 12TH REVIEW PANEL MEETING - LEAD ENTITY & PROJECT SPONSOR RESPONSES

Directions: Lead Entity or Sponsor must post their response to Review Panel comments in **PRISM** with document name: Response to Review Panel Comments. Attach this as a separate document in PRISM to become part of your application, and send your grant manger an e-mail.

Response:
Attach Response to PRISM, and send your Grant Manager an e-mail.
Grant Manager will put in the PRISM attachment number here.

POST APPLICATION - REVIEW PANEL COMMENTS

Date: 9-27-12

Panel Member(s) Name: Review Panel

Application Project Status: Clear

1. Is this a draft project of concern (POC) according to the SRFB's criteria? (Yes or No) No.

Why?

2. If YES, what would make this a technically sound project according to the SRFB's criteria?

3. If NO, are there ways in which this project could be further improved?

The sponsor submitted detailed responses to the pre-application comments, which adequately address the pre-application concerns. These responses are to be incorporated into the scope of the project.

The sponsor must submit a landowner acknowledgement form into PRISM prior to signing a grant agreement with RCO.

4. Staff Comments/Questions:

POST APPLICATION - LEAD ENTITY & PROJECT SPONSOR RESPONSES

Directions: Lead Entity or Sponsor must post their response to Review Panel comments in **PRISM** with document name: Response to Review Panel Comments. Attach this as a separate document in PRISM to become part of your application, and send your grant manger an e-mail.

Response:
Attach Response to PRISM, and send your Grant Manager an e-mail.

Salmon Recovery Funding Board Individual Comment Form

Grant Manager will put in the PRISM attachment number here.

FINAL REVIEW PANEL COMMENTS

Date: October 31, 2012

Panel Member(s) Name: Technical Review Panel

Final Project Status: Clear

1. Is this a project of concern (POC) according to the SRFB's criteria? (Yes or No)

Why?

2. If YES, what would make this a technically sound project according to the SRFB's criteria?

3. If NO, are there ways in which this project could be further improved?

4. Staff Comments/Questions:

Bear Creek Reach 6 Restoration at Friendly Village

12-1282

AASF Repose to SRFB comments.

Adopt A Stream Foundation (AASF) proposes alterations to the pre proposal based on committee comments and our experience this summer installing LWD upstream on the property. The proposal will be adjusted to accommodate:

- Increased design budget
- More large wood
- Less excavation
- Retain native vegetation

Because the project is small and has limited budget AASF proposes, lower risk, straightforward treatment techniques.

Tom Slocum and Steve Toth provided written review on June 5th , a site visit occurred on May 30th. Committee comments are in italics AASF response follows.

1. **Recommended improvements to make this a technically sound project according to the SRFB's criteria.**

The proposal aptly justifies why work on this degraded reach of urban creek supports high priority ecological and social objectives of the WRIA 8 salmon recovery plan. While the proposed habitat enhancement work consists of common and technically straight-forward treatment techniques, the review panel cautions that because of the sub-basin's disrupted hydrology and sediment transport patterns and severe limitations on the ability of the channel to respond to them, the sustainability of any in-channel treatments at the site will be subject to risks that are beyond the scope and budget of this small project to control. In particular, the long term effectiveness of excavating the outside bank of the meander to a sloping bench as a means of stabilizing erosion and providing flood storage is doubtful, given that a few winter high water events could easily erode the bench back to a vertical cut bank. This scenario occurred at the Ohop Creek SRFB restoration project near Eatonville within two years of construction, and the review panel suggests that the sponsor discuss the effectiveness of this technique with the Ohop project sponsor (Nisqually Indian Tribe).

AASF agrees that the project in the context of a highly altered system cannot control for most geomorphic risks. The excavation is intended facilitate wood installation and provide planting area. Therefore we agree that more emphasis should be on wood and planting and less on excavation. We have left messages with Nisqually staff, but haven't yet had an opportunity to speak in person. AASF will continue to seek the opportunity to learn more about lessons learned at Ohop to inform this design.

The re-graded bank will be protected by increased amounts of LWD. Additional design and review is also necessary. The design and permitting budget will be increased from $4,500 to $12,500. An engineer has been secured to review the design work (as match, approx. $6,000) and may be asked to provide stamped plans if higher risk (e.g. mid channel LWD structures or side channel) techniques are determined to be within design and implementation budget and then employed.

We also caution the sponsor to avoid giving the property owner the impression that regrading the left bank will make a significant reduction in flooding at the site, unless appropriate hydrologic and hydraulic modeling has been completed to demonstrate that it will. The review panel's informal field observations suggest that channel constriction by structures immediately downstream of the site will backwater the site during flood conditions, regardless of the proposed bank regrading.

AASF concurs with that assessment. The property owner is aware that this project will not make a significant reduction in flooding. Our position is that the project will marginally increase flood storage at the site and it should be managed as a frequently flooded area, that is, planted with native vegetation and allow for controlled channel change. We have also advocated that all frequently flooded areas on the property should be managed as such. He is also aware that downstream constrictions affect flooding and will continue to backwater his property especially the project area.

Because of the significant uncertainties associated with the effectiveness and sustainability of the bank regrading component of the design, the review panel suggests that the sponsor focus instead on installing abundant LWD pieces along the existing left bank to enhance salmon habitat complexity and reduce bank erosion. Please also consider the merits of installing a mid channel LWD structure that is positioned to deflect high flows over the point bar on the inside of the meander, and which will further improve habitat complexity.

Conceptually the plans have been changed to de-emphasize excavation and instead spend additional resources on LWD. However, re-grading the bank especially on the outside bend will be necessary to eliminate sheer banks. A gradual slope will allow for properly installed LWD structures and provide expanded planting areas. During the site visit the committee suggested a side channel on the left bank in the project area. AASF will explore a full (year round) side channel during final design; currently it is not the preferred option due to limited space on the left bank and increased implementation and engineering cost. A high flow channel near the left bank (winter channel) will likely be part of the final design but it will be subject to cost and design constraints.

Based on our experience installing LWD this summer at this site the design will need to account for very sandy alluvial soils. Rebar anchoring will not be effective - earth anchors will need to be sized appropriately for conditions which means larger earth anchors. Longer logs are needed at this site in order to provide year round habitat benefits. Length is important so that the longs can be interacting with the water in the summer low flows and be securely anchored on the bank even in higher winter flows. A minimum of 20' appears to be necessary due to dramatically different summer and winter flows. Long logs and bigger earth anchors will have some affect on the quantity of wood used to remain within budget.

We strongly support the proposed revegetation component of the project, especially if it can retain the existing large cottonwood tree on the left bank.

Native vegetation will be retained in the project area as appropriate. The large cottonwood tree and surrounding shrubs will be preserved.

2. Missing Pre-application information.

In the final proposal, please include sufficient budget to prepare the design and as-built documentation that is required in Manual 18 Appendix D

Subject: FW: FV technical committee meeting notes
Date: Wednesday, February 26, 2014 8:24 AM
From: Adopt A Stream <ckeidem@streamkeeper.org>
To: Brooke Clement <brookec@streamkeeper.org>

These are from the January 8 WRIA 8 tech committee meeting.

------ Forwarded Message
From: Walter Rung <walterr@streamkeeper.org>
Date: Thu, 09 Jan 2014 09:11:59 -0800
To: "C.K. Eidem" <ckeidem@streamkeeper.org>
Subject: FV technical committee meeting notes

CK,

Here are the comments I wrote done from the meeting.

-To avoid sweepers that might potentially clog the channel, use Pacific Willow
-To reduce herbivoury from beavers place live stakes in concentric circles to protect the live stakes inside the circle from beavers
-Kidder suggested the "average in method" what's being removed vs. what's being put in, to show no net-gain
-Plastic triangles (cellular confinement systems?) placed in banks
-Use rounded boulders (5 man rock)
-Coir logs at toe and coir on bank
-Christa ask about why you removed the brush revetments, maybe put those back in the plans

-Walt

------ End of Forwarded Message

Subject: FW: HPA 130950, Friendly Village
Date: Wednesday, February 26, 2014 8:27 AM
From: Adopt A Stream <ckeidem@streamkeeper.org>
To: Brooke Clement <brookec@streamkeeper.org>

------ Forwarded Message
From: "C.K. Eidem" <ck.eidem@gmail.com>
Date: Tue, 9 Jul 2013 10:19:52 -0700
To: Walter Rung <walterr@streamkeeper.org>, "C.K. Eidem" <ckeidem@streamkeeper.org>, "Cc: Heller, Christa H (DFW)" <Christa.Heller@dfw.wa.gov>, "Butler, Elizabeth (RCO)" <elizabeth.butler@rco.wa.gov>
Subject: Re: FW: HPA 130950, Friendly Village

Jamie,

Thanks for discussing the project with me this morning. I would be very happy to discuss the project in more depth with you and a WDFW engineer next week. Please extend your 45 day review period to accommodate further review.

I feel like we can address all of your concerns. Walter will be contacting Bob to provide any documentation we have. He will also contact Jay Kidder, our engineer, so he can be on site to discuss his review of our plans and provide his anchoring schematics. I suggest we invite City of Redmond as well since they will be the local jurisdiction that can waive SEPA, and because they have been involved from the beginning.

I am currently on paternity leave; if you need to reach me please call my personal cell at 425.346.1548. Thank you.

CK Eidem

On Tue, Jul 9, 2013 at 8:53 AM, Walter Rung <walterr@streamkeeper.org> wrote:

> ------ Forwarded Message
> **From:** "Bails, Jamie L (DFW)" <Jamie.Bails@dfw.wa.gov <http://Jamie.Bails@dfw.wa.gov> >
> **Date:** Mon, 8 Jul 2013 20:51:32 +0000
> **To:** CK Eidem <ckeidem@streamkeeper.org <http://ckeidem@streamkeeper.org> >

Cc: "Heller, Christa H (DFW)" <Christa.Heller@dfw.wa.gov <http://Christa.Heller@dfw.wa.gov> >, "Butler, Elizabeth (RCO)" <elizabeth.butler@rco.wa.gov <http://elizabeth.butler@rco.wa.gov> >, Walter Rung <walterr@streamkeeper.org <http://walterr@streamkeeper.org> >
Subject: HPA 130950, Friendly Village

Hi CK, Last week Christa and I visited the project site to review the designs. We have serious concerns with the project design and the benefit of the LWD to reduce erosion and provide fish habitat. We are asking our engineer, Bob Barnard, to review the designs and to make a site visit so that we can better address these elements of the project. We hope that you will be able to join us. After Bob visits the site, we will set up a meeting to review and modify this design so that it can be permitted.

This project is currently beyond the size and scale of FHE Streamlined projects. I'm not sure if you have talked with King County about granting the SEPA exemption, but I won't issue a Streamlined permit without their consent. Also, WDFW doesn't permit new channels to be created under the FHE streamlined process, as proposed for this project. To qualify, all elements of the project must meet the criteria.

In the future, it is very helpful if you could discuss the project design with the AHB in the early design stages. If I had known about this project last year as it was going through the SRFB process, we could have aided you in designing an LWD placement project that addressed erosion issues at the site, met the FHE process as well as improve fish refuge with LWD.

I look forward to discussing this project with you.

Sincerely, Jamie

Jamie Bails
Area Habitat Biologist
WRIA 7 and Whidbey Island
Washington Department of Fish and Wildlife

16018 Mill Creek Blvd, Mill Creek, WA 98012
425-379-2309 <tel:425-379-2309>

------ End of Forwarded Message

------ End of Forwarded Message

Appendix C: Technical Specifications

Included:

- WSDOT General Specifications

Adopt A Stream Foundation projects are consistent with WSDOT standard Specifications, unless specified on site designs. A citation for the WSDOT Standard Specifications and the most commonly used specs by AASF are listed below.

Washington State Department of Transportation (2005). *Standard Specifications for Road Bridge and Municipal Construction 2014.* Amended January 6, 2014. Washington State Department of Printing, (Division 9, materials) pg. 726-812.

-Streambed Cobble 9-03.11(2) pg. 744

-Erosion control Fabric (coir) 9-14.5(2), pg.808

-Coir Log 9-14.5(7), pg.810

- Straw 9-14.4(1) pg. 802

- **Wattles** 9-14.5(5) pg. 809

Appendix D: Construction Costs

Included:

- Friendly Village Cost Estimates

FV Reach 6 Stream Restoration

Labor	**Price**	**Unit**	**Quantity**	**Total**
Administration, Reporting	50	Hour	20	$1,000
AASF Instream	1800	Crew Day	13	$23,400
Subtotal				**$24,400**

Materials	**Price**	**Unit**	**Quantity**	**Total**
Rock	500	5 rocks	2	$1,000
Rebar 8'	2.5	each	80	$200
Straw bails	11	each	5	$55
Straw Wattles	0.95	per foot	150	$143
Sand Bags wash pea gravel 100bags	375	per/pallet	1	$375
Plastic wrap	100	roll	1	$100
Silt Fence 48" wire attached	0.62	per foot	300	$186
Coir Matting 900	1.8	per square yd.	1200	$2,160
Coir Logs	4.9	linear foot	150	$735
Expoxy	40	tube	10	$400
Cable 5/8th	1.41	per foot	1000	$1,410
Wood Stakes	1	per stake	500	$500
Fish Mix Habitat Rock Placeholder	52	yard	10	$520
Misc. Material	500	per	1	$500
Trees	15	plant	100	$1,500
Livestakes	1	plant	1000	$1,000
Shrubs	4	plant	450	$1,800
LWD (straight logs)	150	log	23	$3,450
LWD (Rootwads)	350	log	17	$5,950
Sub total				**$21,984**

Equipment Rental	**Price**	**Unit**	**Quantity**	**Total**
Generator4000 watt	55	week	4	220
Rotohammer	150	week	1	$150
TB175 or equivalent	3000	month	0.5	$1,500
PUMP/TRASH/3"	447	month	0.5	$224
3" Suction Hose	97	month	0.5	$49
SAW/CUT OFF/CONCRETE/HAND/12"/GAS	199	week	1	$199
Dumpster Hungary Buzzard	685	load	5	$3,425
Delivery fees	55	per machine	1	$55
Fuel	4.5	gallon	100	$450
Subtotal	0.2			$5,901.00
5% misc. rental fees	0.05			$295
Tax and Insurance at 20%	0.2			$1,180
Total				**$13,647.25**

Travel	**Price**	**Unit**	**Quantity**	**Total**
Mileage	0.55	per mile	1500	
			Sub Total	**$60,030.75**
Contingency				
			Total	**$60,030.75**

Trees	12	8080	56.11111111
Srubs	4.3	11000	594.9161709
Willow	1.5	3550	1577.777778

Appendix E: Other Report Deliverables

- Contract Bidding Documents—Not Applicable. AASF plans to complete construction work using our experienced staff.
- Construction Permits—In Process.