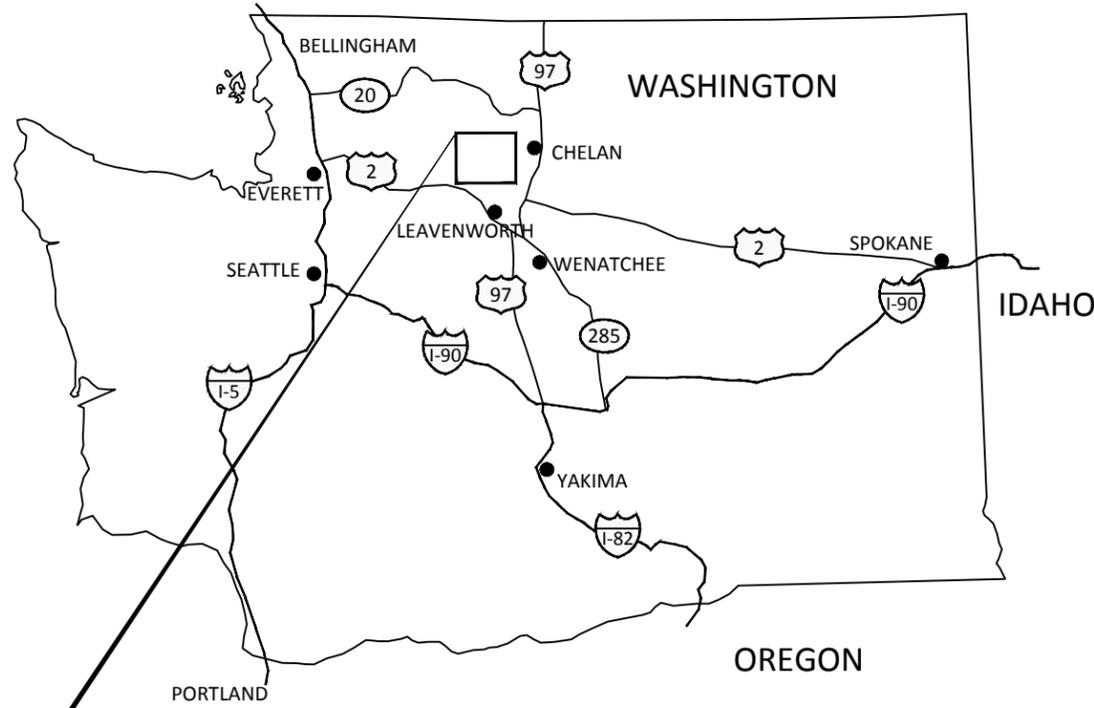
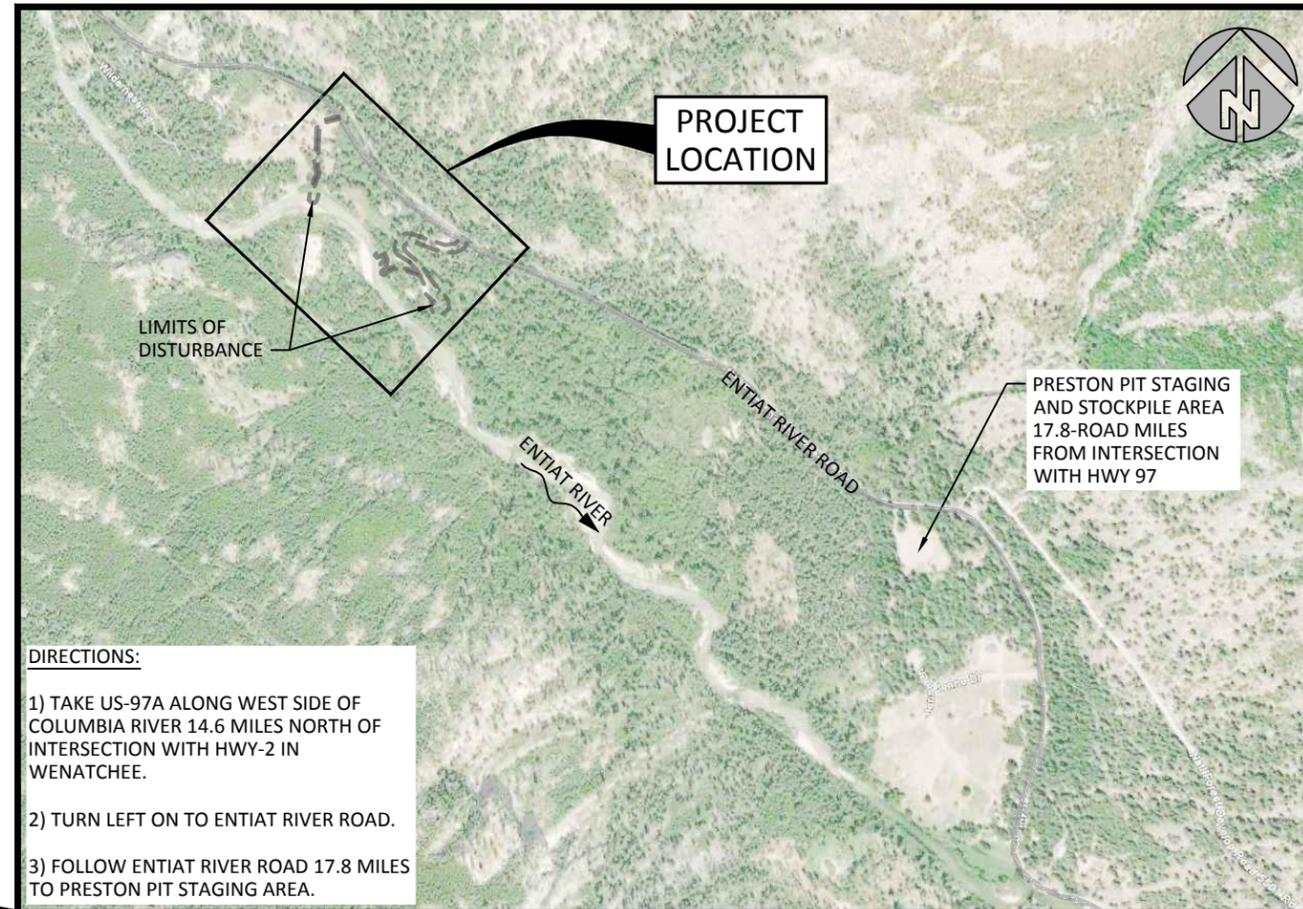


ENTIAT 3D LWM REVISITED PRELIMINARY DESIGN

Chelan County, WA
December 2015



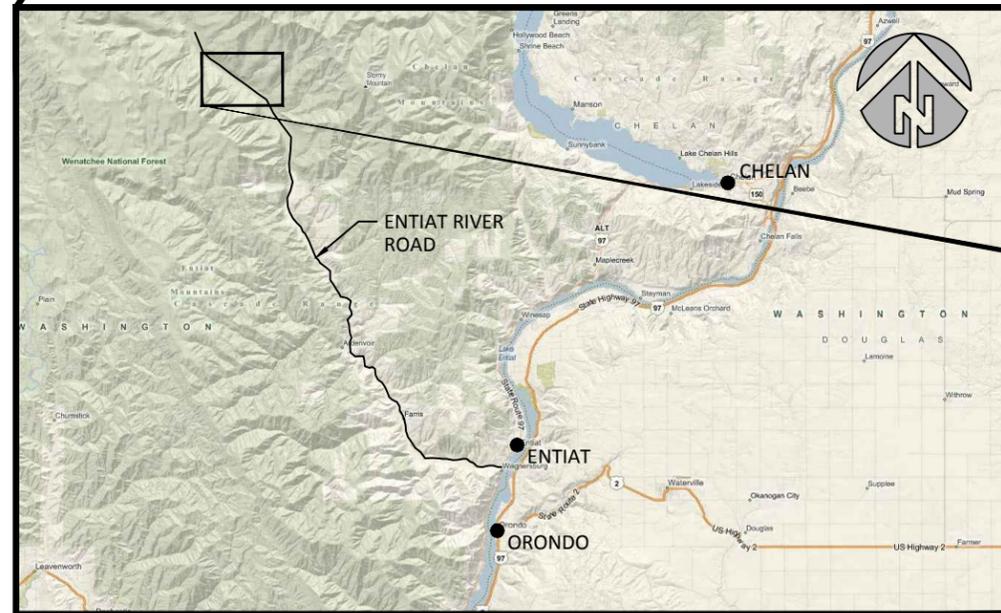
LOCATION MAP
STATE OF WASHINGTON
NOT TO SCALE



SITE MAP
NOT TO SCALE

DIRECTIONS:

- 1) TAKE US-97A ALONG WEST SIDE OF COLUMBIA RIVER 14.6 MILES NORTH OF INTERSECTION WITH HWY-2 IN WENATCHEE.
- 2) TURN LEFT ON TO ENTIAT RIVER ROAD.
- 3) FOLLOW ENTIAT RIVER ROAD 17.8 MILES TO PRESTON PIT STAGING AREA.



VICINITY MAP
NOT TO SCALE

SHEET INDEX:

- 1 COVER, SHEET INDEX AND VICINITY MAP
- 2 GENERAL NOTES
- 3 GENERAL NOTES, ABBREVIATIONS AND QUANTITIES
- 4 EXISTING CONDITIONS SURVEY CONTROL AND TEMPORARY ACCESS
- 5 PROPOSED CONDITIONS
- 6 EROSION CONTROL AND COFFERDAM DETAILS
- 7 ELS 2 EXTENSION JAM DETAILS
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- 11 SUGGESTED CONSTRUCTION OF FORM FOR FES LIFT
- 12 VERTICAL SNAG PULLOUT TESTING DETAILS
- 13 SPECIAL SPECIFICATIONS
- 14 SPECIAL SPECIFICATIONS

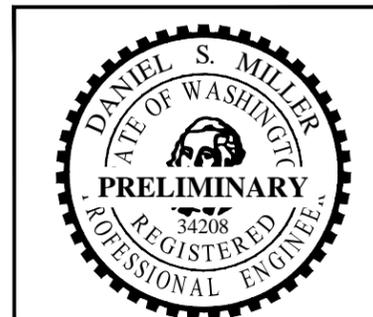
Preliminary
Not for Construction

COORDINATES:

LATITUDE: 47°53'46.93"N
LONGITUDE: 120° 27'21.88"W

TOWNSHIP 28N, RANGE 19E, SECTION 28

WATERBODY: ENTIAT RIVER
TRIBUTARY OF: COLUMBIA RIVER



EXPIRES: 11-23-2017

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NO.	BY	DATE	REVISION DESCRIPTION

NS DRAWN	DM DESIGNED	DM CHECKED
DM APPROVED	12/31/15 DATE	14-02-43 WO3 PROJECT

CONFEDERATED TRIBES AND BANDS OF THE YAKAMA NATION
ENTIAT 3D LWM REVISITED
PRELIMINARY DESIGN



501 Portway Avenue, Suite 101
Hood River, OR 97031
541.386.9003
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COVER, SHEET INDEX AND
VICINITY MAP

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THE OWNER WILL PROVIDE A PRE-BID SITE TOUR. IT IS HIGHLY RECOMMENDED THE CONTRACTOR ATTEND THIS PRE-BID TOUR FOR SITE FAMILIARIZATION AND TO POSE QUESTIONS TO THE OWNER AND OWNER'S REPRESENTATIVE.

THE SELECTED CONTRACTOR SHALL ATTEND A PRE-CONSTRUCTION MEETING WITH OWNER AND OWNER'S REPRESENTATIVE PRIOR TO MOBILIZING TO SITE AND BEGINNING CONSTRUCTION.

ALL WORK SHALL CONFORM TO THE CURRENT EDITIONS OF STANDARD PLANS AND SPECIFICATIONS OF THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT), AND LOCAL STANDARDS UNLESS INDICATED OTHERWISE BY THE CONTRACT DOCUMENTS. IN CASE OF A CONFLICT BETWEEN THE REGULATORY STANDARDS OR SPECIFICATIONS, THE MORE STRINGENT WILL PREVAIL.

WDFW IN-WATER WORK PERIODS

WORK SHALL OCCUR DURING THE PERMITTED IN-WATER WORK PERIOD STATED IN THE HYDRAULIC PROJECT APPROVAL.

EXISTING DATA

TOPOGRAPHIC DATA WAS ORIGINALLY COLLECTED BY INTER-FLUVE USING TOTAL STATION EQUIPMENT IN 2010. PROJECT AREA SURVEY WAS UPDATED BY INTER-FLUVE USING TOTAL STATION EQUIPMENT IN OCTOBER, 2015. SURVEY DATA IS BASED ON A LOCAL COORDINATE SYSTEM.

HYDRAULIC MODELING BY INTER-FLUVE USING USACE HEC-RAS (4.1.0).

SOILS

ENTIAT RIVER GRAVEL AND FLOODPLAIN SOILS. 2011 CONSTRUCTION OF ENGINEERED LOG STRUCTURES 2 AND 3 SHOWED SAND AND SILT WITH A THIN VENEER OF GRAVEL AND COBBLE. A RELIC GRAVEL PIT EXISTS AT THE NORTHWEST END OF THE PROJECT WITH COBBLE, GRAVEL AND SAND ALLUVIAL MATERIAL VISIBLE.

IF ADDITIONAL DATA IS REQUIRED, CONTRACTOR SHALL CONDUCT THEIR OWN INVESTIGATIONS AT NO ADDITIONAL COST.

UTILITIES

THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR HAVING UTILITIES LOCATED PRIOR TO CONSTRUCTION ACTIVITIES.

THE CONTRACTOR SHALL CALL (800-424-5555) FOR UTILITY LOCATE PRIOR TO CONSTRUCTION

THE CONTRACTOR SHALL IMMEDIATELY CONTACT THE AFFECTED UTILITY SERVICE TO REPORT ANY DAMAGED OR DESTROYED UTILITIES.

THE CONTRACTOR SHALL PROVIDE EQUIPMENT AND LABOR TO AID THE AFFECTED UTILITY SERVICE IN REPAIRING DAMAGED OR DESTROYED UTILITIES AT NO ADDITIONAL COST.

CONSTRUCTION STAKING

OWNER'S REPRESENTATIVE WILL PROVIDE STAKING OF PROJECT LIMITS, GRADE STAKES, AND ELEVATION CONTROL POINTS. SOME FIELD ADJUSTMENTS TO THE LINES AND GRADES ARE TO BE EXPECTED.

CONTRACTOR SHALL MEET WITH THE OWNER AND OWNER'S REPRESENTATIVE TO DEFINE AND MARK LIMITS OF DISTURBANCE PRIOR TO MOBILIZATION OF EQUIPMENT OR MATERIALS ONTO THE SITE.

THE CONTRACTOR SHALL REPLACE DAMAGED OR DESTROYED CONSTRUCTION STAKES AT NO ADDITIONAL COST.

Preliminary
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CONSTRUCTION MATERIALS

OWNER PROVIDED LOGS, LOGS WITH ROOTWADS AND VERTICAL SNAGS ARE LOCATED IN THE STOCKPILE/STAGING AREA.

LOCATION, ALIGNMENT, AND ELEVATION OF LOGS AND LOGS WITH ROOT WADS ARE SUBJECT TO ADJUSTMENT BASED ON FIELD CONDITIONS AND MATERIAL SIZE.

ANY EXCESS CONSTRUCTION MATERIALS SHALL BE NEATLY STORED AT AN APPROVED STAGING LOCATION. UPON COMPLETION OF THE PROJECT ANY EXCESS MATERIALS, WITH THE EXCEPTION OF ANY LARGE WOODY MATERIAL (LWM), WILL BECOME THE PROPERTY OF THE CONTRACTOR AND HAULED OFFSITE IN A TIMELY MANNER AND LEGALLY DISPOSED OF.

UPON PROJECT COMPLETION, THE CONTRACTOR WILL BE RESPONSIBLE FOR HAULING ANY EXCESS LWM 15FT LENGTH OR GREATER OFFSITE TO THE YAKAMA NATION'S APPROVED LONG-TERM WOOD STAGING AREA LOCATED ALONG HIGHWAY 207 IMMEDIATELY NORTH OF COLES CORNER, UNLESS OTHER ARRANGEMENTS HAVE BEEN MADE WITH YN DESIGNATED REPRESENTATIVE PRIOR TO PROJECT COMPLETION.

CONSTRUCTION ACCESS/TRAFFIC CONTROL

CONTRACTOR SHALL SUBMIT AN ACCESS, STAGING, AND STOCKPILE PLAN TO THE OWNER'S REPRESENTATIVE FOR APPROVAL PRIOR TO MOBILIZATION.

THE CONTRACTOR IS SOLELY RESPONSIBLE FOR OBTAINING ANY REQUIRED TRAFFIC CONTROL OR ACCESS PERMITS.

THE CONTRACTOR IS SOLELY RESPONSIBLE FOR PROVIDING ANY REQUIRED TRAFFIC CONTROL INCLUDING, BUT NOT LIMITED TO, SIGNAGE AND FLAGGERS.

ALL SAPLINGS AND TREES TO BE TRANSPLANTED OR REMOVED SHALL BE CLEARLY MARKED AND APPROVED BY THE OWNER AND OWNER'S REPRESENTATIVE.

ALL EQUIPMENT, MATERIALS AND PERSONNEL SHALL REMAIN WITHIN THE LIMITS OF DISTURBANCE.

THE CONTRACTOR SHALL KEEP THE WORK AREAS IN A NEAT AND SIGHTLY CONDITION FREE OF DEBRIS AND LITTER FOR THE DURATION OF THE PROJECT.

CONTRACTOR SHALL IMPLEMENT MEASURES TO CONTROL AND MINIMIZE WIND BLOWN DUST FROM THE SITE.

AT PROJECT COMPLETION, ROADS AND ACCESS ROUTES SHALL BE CLEANED AND RESURFACED TO PRE-PROJECT CONDITION PER WASHINGTON DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION. CLEANING SHALL BE INCIDENTAL TO MOBILIZATION/DEMobilIZATION.

ALL DISTURBED AREAS INCLUDING, BUT NOT LIMITED TO: ROADS, DRIVEWAYS, TEMPORARY ACCESS ROUTES, STAGING AREAS AND STRUCTURE LOCATIONS NEED TO BE RESTORED TO PRE-PROJECT CONDITION OR BETTER. THIS WILL INCLUDE, BUT NOT LIMITED TO ANY GRADING/BLADING OF DISTURBED AREAS AS WELL AS REMOVAL OF ANY TRASH AND DEBRIS. THE OWNER'S REPRESENTATIVE WILL CONDUCT A FINAL WALK THROUGH WITH THE CONTRACTOR PRIOR TO DEMOBILIZATION. A SEPARATE INDEPENDENT CONTRACTOR WILL HANDLE ALL REVEGETATION EFFORTS POST PROJECT CONSTRUCTION.

ALL DISTURBED AREAS OUTSIDE THE LIMITS OF DISTURBANCE SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER AT NO ADDITIONAL COST.

SPILL POLLUTION AND PREVENTION PLAN (SPCC)

THE CONTRACTOR SHALL PREPARE AND IMPLEMENT A PROJECT-SPECIFIC SPILL PREVENTION, CONTROL, AND COUNTER MEASURES PLAN (SPCC PLAN) FOR THE DURATION OF THE PROJECT. THE CONTRACTOR SHALL SUBMIT THE PLAN TO THE OWNER'S REPRESENTATIVE NO LATER THAN THE DATE OF THE PRE-CONSTRUCTION CONFERENCE. NO ON-SITE CONSTRUCTION ACTIVITIES MAY COMMENCE UNTIL THE CONTRACTING AGENCY ACCEPTS AN SPCC PLAN FOR THE PROJECT.

EROSION CONTROL

CONTRACTOR SHALL BE SOLELY RESPONSIBLE, AT THEIR OWN EXPENSE, FOR PROVIDING AND MAINTAINING ALL NECESSARY EROSION CONTROL FACILITIES TO COMPLY WITH APPLICABLE EROSION

CONTROL REGULATIONS AND TO MAINTAIN CLEAN ACCESS ROUTES FOR DURATION OF PROJECT.

EROSION/SEDIMENTATION CONTROL PLAN

THE EROSION AND SEDIMENT CONTROL (ESC) PLAN PROVIDED IS FOR INFORMATIONAL PURPOSES ONLY, THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR PROVIDING EROSION CONTROL MEASURES TO COMPLY WITH APPLICABLE REGULATIONS.

THE RECOMMENDATIONS FOR AN ESC PLAN INCLUDED HEREIN WILL PROVIDE A GUIDELINE FOR THE CONTRACTOR TO DEVELOP AND IMPLEMENT AN ESC PLAN.

- A. THE IMPLEMENTATION OF AN ESC PLAN AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE ESC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED AND VEGETATION/LANDSCAPING IS ESTABLISHED.
- B. THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON THIS PLAN SHALL BE CLEARLY FLAGGED IN THE FIELD PRIOR TO CONSTRUCTION. DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE FLAGGED CLEARING LIMITS SHALL BE PERMITTED. THE FLAGGING SHALL BE MAINTAINED BY THE CONTRACTOR FOR THE DURATION OF CONSTRUCTION.
- C. ESC FACILITIES, AS APPROXIMATELY SHOWN ON THIS PLAN, ARE TO BE CONSTRUCTED PRIOR TO CLEARING AND GRADING ACTIVITIES IN SUCH A MANNER AS TO ENSURE THAT SEDIMENT AND SEDIMENT-LADEN WATER DO NOT ENTER SURFACE WATERS, THE DRAINAGE SYSTEM, OR VIOLATE APPLICABLE WATER STANDARDS.
- D. THE ESC FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE ESC FACILITIES SHALL BE UPGRADED AS NEEDED AT NO ADDITIONAL COST FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT-LADEN WATER DO NOT LEAVE THE SITE.
- E. THE ESC FACILITIES SHALL BE INSPECTED DAILY BY THE CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING.
- F. THE ESC FACILITIES ON INACTIVE SITES SHALL BE INSPECTED AND MAINTAINED A MINIMUM OF ONCE A MONTH OR WITHIN THE 24 HOURS FOLLOWING A STORM EVENT.
- G. STABILIZED CONSTRUCTION ENTRANCES AND ADDITIONAL MEASURES MAY BE REQUIRED AND SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT TO ENSURE ALL ACCESS ROADS ARE KEPT CLEAN AT NO ADDITIONAL COST.

INSPECTION AND MAINTENANCE

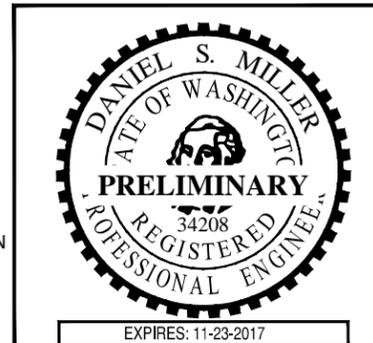
ALL ESC FACILITIES SHALL BE INSPECTED, MAINTAINED, AND REPAIRED AS NEEDED TO ASSURE CONTINUED PERFORMANCE OF THEIR INTENDED FUNCTION. ALL ESC FACILITIES SHALL BE INSPECTED DAILY AND WITHIN 24 HOURS AFTER ANY STORM EVENT GREATER THAN 0.5 INCHES OF RAIN PER 24 HOUR PERIOD AND AFTER EVENTS EXCEEDING 2 HOURS DURATION.

CONTRACTOR'S ESC RECORD

WEEKLY REPORTS SUMMARIZING THE SCOPE OF INSPECTIONS, THE PERSONNEL CONDUCTING THE INSPECTION, THE DATE(S) OF THE INSPECTION, MAJOR OBSERVATIONS RELATING TO THE IMPLEMENTATION OF THE CONTRACTOR'S EROSION AND SEDIMENT CONTROL PLAN, AND ACTIONS TAKEN AS A RESULT OF THESE INSPECTIONS SHALL BE PREPARED AND RETAINED ON SITE BY THE CONTRACTOR. IN ADDITION, A RECORD OF THE FOLLOWING DATES SHALL BE INCLUDED IN THE REPORTS:

1. WHEN MAJOR GRADING ACTIVITIES OCCUR.
2. DATES OF RAINFALL EVENTS EITHER EXCEEDING 2 HOURS DURATION OR MORE THAN 0.5 INCHES/24 HOURS.
3. WHEN CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE ON SITE, OR ON A PORTION OF THE SITE.
4. WHEN STABILIZATION MEASURES ARE INITIATED FOR PORTIONS OF THE SITE.

ESC RECORDS SHALL BE MADE AVAILABLE TO THE OWNER AND OWNER'S REPRESENTATIVE ON REQUEST AND SHALL BE PROVIDED FOR REVIEW AND APPROVAL PRIOR TO APPLICATION FOR PAYMENT.



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ENTIAT 3D LWM REVISITED
PRELIMINARY DESIGN

501 Portway Avenue, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

GENERAL NOTES

STABILIZE SOILS AND PROTECT SLOPES

FROM MAY 1 THROUGH SEPTEMBER 30, ALL EXPOSED SOILS SHALL BE PROTECTED FROM EROSION BY MULCHING, HYDROSEED COVERING, OR OTHER APPROVED MEASURES WITHIN 3 DAYS OF GRADING. FROM OCTOBER 1 THROUGH APRIL 30, ALL EXPOSED SOILS MUST BE PROTECTED WITHIN 2 DAYS OF GRADING. SOILS SHALL BE STABILIZED BEFORE A WORK SHUTDOWN, HOLIDAY OR WEEKEND IF NEEDED BASED ON THE WEATHER FORECAST. SOIL STOCKPILES MUST BE STABILIZED AND PROTECTED WITH SEDIMENT TRAPPING MEASURES. HYDROSEED ALL DISTURBED AREAS NOT INDICATED IN THE CONTRACT DOCUMENTS FOR OTHER PERMANENT STABILIZATION MEASURES AS SOON AS PRACTICAL.

DESIGN, CONSTRUCT, AND PHASE CUT AND FILL SLOPES IN A MANNER THAT WILL MINIMIZE EROSION. REDUCE SLOPE VELOCITIES ON DISTURBED SLOPES BY PROVIDING TEMPORARY BARRIERS. STORMWATER FROM OFF SITE SHOULD BE HANDLED SEPARATELY FROM STORMWATER GENERATED ON SITE.

AFTER FINAL SITE STABILIZATION

ALL TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION IS ACHIEVED OR AFTER THE TEMPORARY BEST MANAGEMENT PRACTICES (BMPs) ARE NO LONGER NEEDED. TRAPPED SEDIMENT SHALL BE REMOVED FROM THE SITE OR INCORPORATED INTO FINISHED GRADING. DISTURBED SOIL AREAS RESULTING FROM REMOVAL SHALL BE PERMANENTLY STABILIZED.

RIVER DIVERSION

DIVERSION MAY BYPASS THE RIVER AROUND SMALLER WORK AREAS AT CONTRACTOR'S DISCRETION.

DEWATERING OF IN-CHANNEL WORK AREA(S) SHALL OCCUR CONCURRENT WITH FISH RESCUE. CONTRACTOR SHALL COORDINATE WITH THE YAKAMA NATION FISHERIES FOR FISH RESCUE. CONTRACTOR SHALL PROVIDE YAKAMA FISHERIES AMPLE TIME TO SCHEDULE FISH RESCUE. IF DIVERSION FAILS DUE TO CONTRACTOR NEGLIGENCE, FISH RESCUE SHALL BE REPEATED BY YAKAMA FISHERIES CREWS AT CONTRACTOR'S EXPENSE.

FISH RESCUE

ALL FISH RESCUE EFFORTS SHALL BE PERFORMED BY A YAKAMA NATION FISHERIES/AQUATIC BIOLOGIST EXPERIENCED WITH THE COLLECTION AND HANDLING OF SALMONIDS FROM CONSTRUCTION SITES.

ALL FISH TRAPPED IN RESIDUAL POOLS WITHIN THE PROJECT AREA WILL BE CAREFULLY COLLECTED BY SEINE AND/OR DIP NETS AND PLACED IN CLEAN TRANSFER CONTAINERS WITH ADEQUATE VOLUME OF FRESH RIVER WATER.

CAPTURED FISH SHALL BE IMMEDIATELY RELEASED DOWNSTREAM OF PROJECT AREA.

TREE SALVAGE

ALL APPROPRIATE TREE SPECIES WITHIN CLEARING LIMITS REMOVED FOR CONSTRUCTION, AS APPROVED BY THE OWNER'S REPRESENTATIVE, SHALL TEMPORARILY BE STOCKPILED WITHIN LIMITS OF DISTURBANCE. STOCKPILED TREE/SLASH SHALL BE REINCORPORATED INTO FINISHED PROJECT.

ANY REMOVED VEGETATION GREATER THAN 6 INCHES DIAMETER AND 15 FEET LONG SHOULD BE INCORPORATED INTO LOG STRUCTURES, SEE SHEET 7. CONTRACTOR IS RESPONSIBLE FOR REMOVING SMALLER CLEARING AND GRUBBING DEBRIS FROM THE SITE AND DISPOSING AT A LEGAL LOCATION AT THE END OF THE PROJECT UNLESS DIRECTED BY THE OWNER'S REPRESENTATIVE.

ALL TREES REMOVED WITHIN CLEARING LIMITS SHALL BE REMOVED WHOLE WITH ROOTWAD AND UTILIZED IN PROJECT CONSTRUCTION AS DIRECTED BY OWNER'S REPRESENTATIVE.

EXISTING TREES ALONG ACCESS ROUTE THROUGH PFEIFFER'S PROPERTY WILL BE REPLACED BY OTHERS.

LIVE TREES

ALL TREES NOT MARKED FOR REMOVAL SHALL BE LEFT STANDING UNDISTURBED. CONSTRUCTION ACTIVITY SHALL NOT DEBARK OR DAMAGE LIVE TREES.

KEEP OUT OF DRIP LINE OF EXISTING TREES TO REMAIN.

CONSTRUCTION DEWATERING

IF ADDITIONAL PUMPING IS REQUIRED TO DEWATER DURING CONSTRUCTION, PUMPED DISCHARGE SHALL RELEASE SEDIMENT-LADEN WATER AT AN UPLAND DISCHARGE LOCATION IN A MANNER THAT DOES NOT CAUSE EROSION, CONTAMINATION, OR INCREASE TURBIDITY OF SURFACE WATERS.

OWNER'S REPRESENTATIVE SHALL APPROVE DEWATERING DISCHARGE LOCATION PRIOR TO IMPLEMENTATION.

CONTRACTOR SHALL PERFORM CONSTRUCTION DEWATERING IN SUCH A MANNER AS TO AVOID THE RELEASE OF TURBID OR SEDIMENT-LADEN WATER IN ORDER TO PREVENT CONTAMINATION OR INCREASE TURBIDITY OF SURFACE WATERS. SEDIMENT LADEN WATER MAY BE PUMPED TO AN UPLAND DISCHARGE LOCATION AND ALLOWED TO SHEET FLOW THROUGH EXISTING VEGETATION BEFORE INFILTRATING INTO THE GROUND. IF THIS METHOD IS NOT SUFFICIENT TO PREVENT RETURN OF TURBID WATER TO SURFACE WATERS OF THE ENTIAT RIVER AND FLOODPLAIN, A 'DIRT-BAG' OR SEDIMENT RETENTION STRUCTURE MAY BE REQUIRED AS NECESSARY TO COMPLY WITH LAWS AND PERMIT REQUIREMENTS AT NO ADDITIONAL COST.

CONTRACTOR WILL PROVIDE ANY PUMPS, HOSES AND FITTINGS NEEDED TO PERFORM THE DEWATERING. THE PUMP EQUIPMENT SELECTED BY THE CONTRACTOR SHALL BE SUFFICIENT TO DEWATER THE SITE THOROUGHLY.

CONTRACTOR SHALL PROVIDE VISQUEEN OR GEOTEXTILE LINER, PLYWOOD, OR METAL PLATING AS NECESSARY TO DISSIPATE PUMP DISCHARGE JET TO PREVENT EROSION.

WETLANDS AND WATERS OF THE US

THE ORDINARY HIGH WATER (OHW) LINES DISPLAYED IN THIS DESIGN PACKAGE WERE DELINEATED BY INTER-FLUVE STAFF AND ARE BASED UPON ANALYSIS, MODELING, AND BEST PROFESSIONAL JUDGMENT.

THESE DO NOT NECESSARILY REPRESENT JURISDICTIONAL BOUNDARIES. WITHIN THE STATE OF WASHINGTON, THE ARMY CORPS OF ENGINEERS AND THE DEPARTMENT OF ECOLOGY HAVE THE FINAL AUTHORITY IN DETERMINING WATERS AND WETLANDS BOUNDARIES AND REGULATIONS.

QUANTITIES ESTIMATE

Item	Quantity	Unit	Notes
Upstream extension of existing ELS #2: 1 structure			
Large wood (no root wads) hauled from staging and installed	6	EA	--
Large wood (root wads) hauled from staging and installed	9	EA	--
Vertical Log Installation	8	EA	--
Excavation for LWM (assumed ave geometry 35'Wx35'Lx7'D)	320	CY	--
3"-12" Stone for backfill facing	46	CY	--
Imported gravel/cobble & topsoil for LWM trench backfill	240	CY	--
Vegetated FES lift - multiple tiers across width of LWM trench	160	LF	--
Margin wood - downstream from existing ELS #3: 3 structures			
Large wood (no root wads) hauled from staging and installed	1	EA	3
Large wood (root wads) hauled from staging and installed	2	EA	6
Vertical Log Installation	3	EA	9
Excavation for LWM trenches (assumed geometry per log 3'Wx30'Lx5'D)	67	CY	201
Imported gravel/cobble & salvaged fines for LWM trench backfill	63	CY	189
Vegetated FES lift - multiple tiers across width of LWM trench	18	LF	54
Site restoration			
seed and mulch disturbed areas (not on existing roads or staging areas)	14	MSF	--

CY = CUBIC YARDS
EA = EACH
LF = LINEAL FEET
MSF = 1,000 SQUARE FEET

ABBREVIATIONS

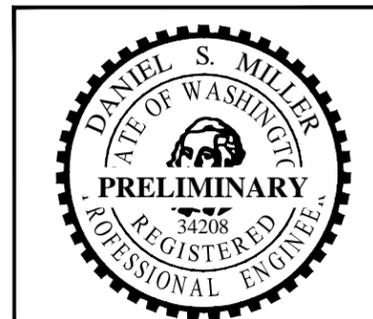
APPROX	APPROXIMATE
BMP	BEST MANAGEMENT PRACTICE
CY	CUBIC YARDS
CO	COUNTY
°	DEGREE
DBH	DIAMETER AT BREAST HEIGHT
ELS	ENGINEERED LOG STRUCTURE
ESC	EROSION AND SEDIMENT CONTROL
FES	FABRIC ENCAPSULATED SOIL
' or FT	FOOT
GPM	GALLONS PER MINUTE
GIS	GEOGRAPHIC INFORMATION SYSTEMS
HWY	HIGHWAY
HRS	HOURS
ID	IDENTIFICATION
" or IN	INCH
LWM	LARGE WOODY MATERIAL
MAX	MAXIMUM
MFR	MANUFACTURER
MIN	MINIMUM
OHW	ORDINARY HIGH WATER
OZ	OUNCE
%	PERCENT
LBS	POUNDS
REF	REFERENCE
RD	ROAD
STD	STANDARD
TBM	TEMPORARY BENCHMARK
TYP	TYPICAL
YD	YARD

Preliminary
Not for Construction

NOTES:

ESTIMATED MATERIAL VOLUMES ARE APPROXIMATE IN-PLACE QUANTITIES AND NOT FACTORED FOR EXPANSION OF EXCAVATED MATERIAL OR COMPACTION OF PLACED MATERIAL. MEASUREMENT AND PAYMENT SHALL NOT BE BASED ON WEIGHT TICKETS OR TRUCK MEASURE WITHOUT PRIOR WRITTEN APPROVAL.

EXCAVATED MATERIAL NOT SUITABLE FOR SALVAGE AND REUSE SHALL BECOME THE PROPERTY OF THE CONTRACTOR FOR LEGAL OFFSITE DISPOSAL



EXPIRES: 11-23-2017

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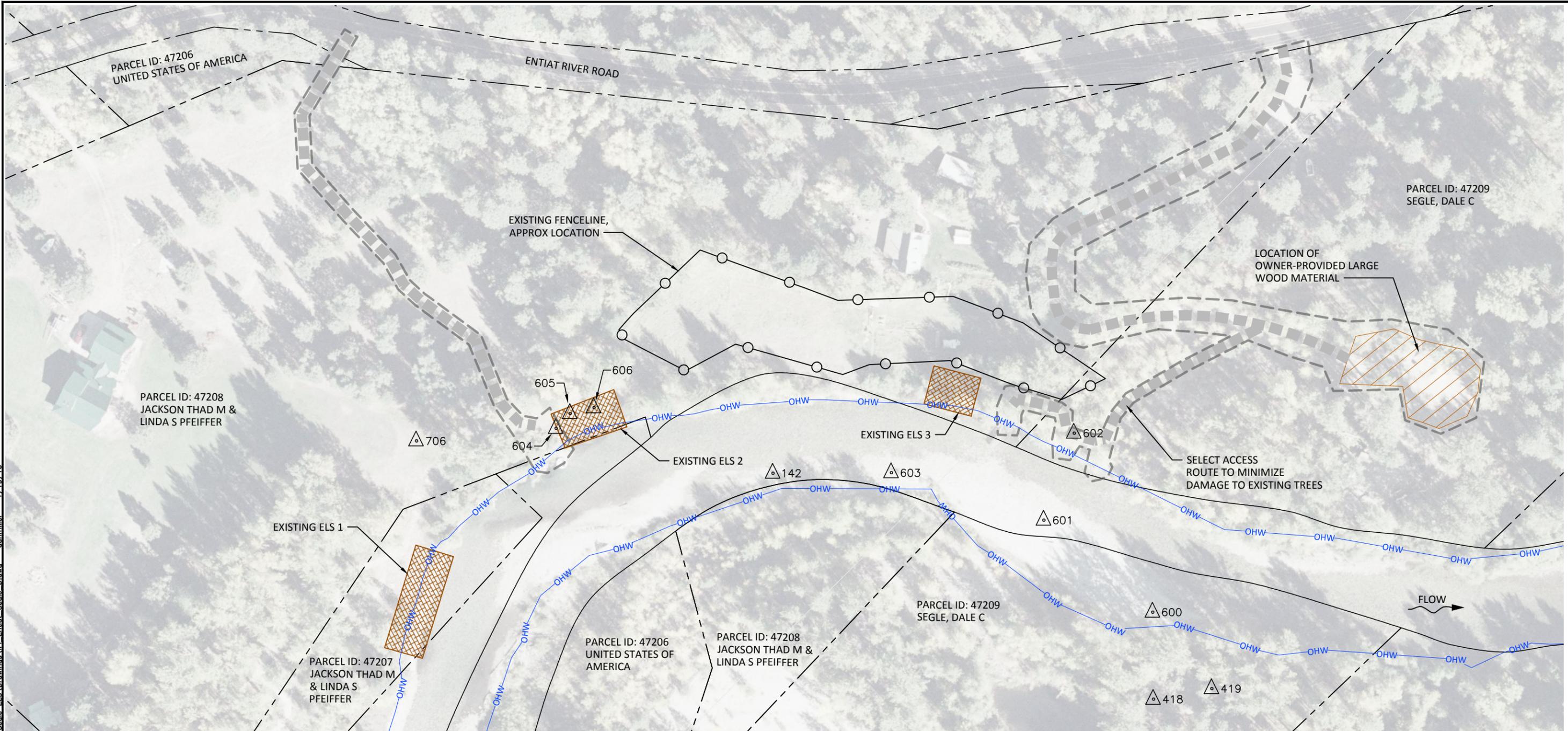
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GENERAL NOTES,
ABBREVIATIONS AND
QUANTITIES

SHEET

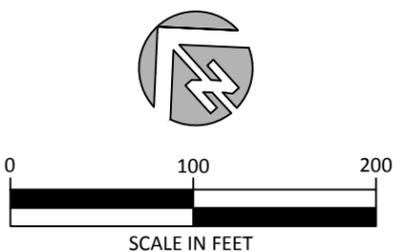
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LEGEND

- EXISTING CONTOURS
- TEMPORARY ACCESS
- LIMITS OF DISTURBANCE
- PROPERTY BOUNDARY, PER CHELAN CO GIS
- ORDINARY HIGH WATER
- EXISTING FENCE LINE, APPROX LOCATION
- SURVEY CONTROL POINT
- TEMPORARY STOCKPILE AND STAGING AREA
- EXISTING ENGINEERED LOG STRUCTURE



Preliminary
Not for Construction

SURVEY CONTROL				
POINT NUMBER	NORTHING	EASTING	ELEVATION	DESCRIPTION
142	17414669.91'	2263983.43'	1720.48'	TBM
418	17414234.02'	2264097.84'	1738.65'	REBAR
419	17414199.94'	2264147.61'	1740.41'	REBAR
600	17414297.52'	2264159.45'	1720.11'	REBAR
601	17414441.91'	2264146.18'	1719.14'	REBAR
602	17414483.04'	2264230.31'	1722.58'	TBM
603	17414585.34'	2264069.59'	1719.93'	TBM
604	17414857.57'	2263858.33'	1728.90'	TBM
605	17414858.27'	2263879.16'	1729.82'	NAIL
606	17414845.43'	2263900.47'	1731.42'	NAIL
706	17414948.50'	2263748.11'	1728.37'	TBM

NOTE:
PROJECT RELATIVE
HORIZONTAL AND
VERTICAL DATUM



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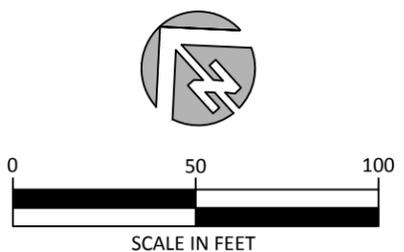
EXISTING CONDITIONS
SURVEY CONTROL AND
TEMPORARY ACCESS

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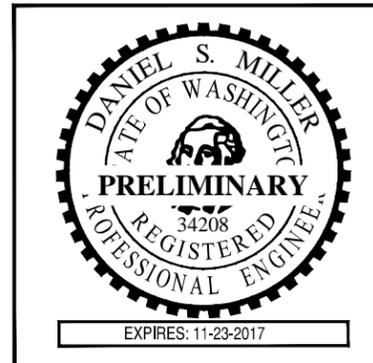


LEGEND

- EXISTING CONTOURS
- TEMPORARY ACCESS
- LIMITS OF DISTURBANCE
- PROPERTY BOUNDARY, PER CHELAN CO GIS
- ORDINARY HIGH WATER
- EXISTING FENCE LINE, APPROX LOCATION
- TEMPORARY COFFERDAM, SEE $\frac{2}{6}$ $\frac{3}{6}$
- TEMPORARY SILT FENCE, SEE $\frac{1}{6}$
- TEMPORARY STOCKPILE AND STAGING AREA
- EXISTING ENGINEERED LOG STRUCTURE



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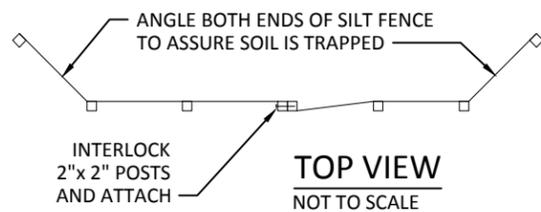
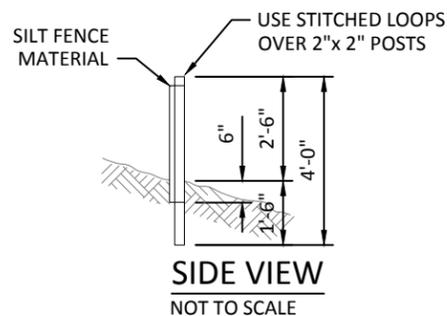
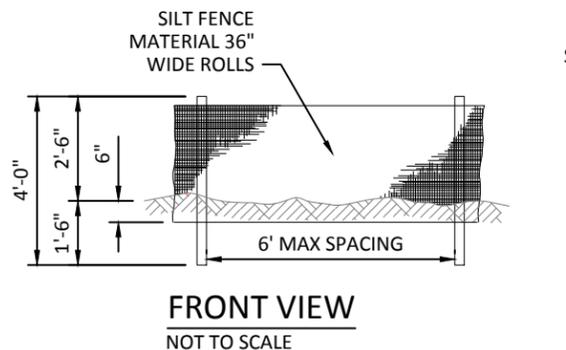
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DM APPROVED	12/31/15 DATE	14-02-43 WO3 PROJECT

CONFEDERATED TRIBES AND BANDS OF THE YAKAMA NATION
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PROPOSED CONDITIONS

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1
6 TYPICAL DETAIL - SILT FENCE
NOT TO SCALE

SILT FENCES:

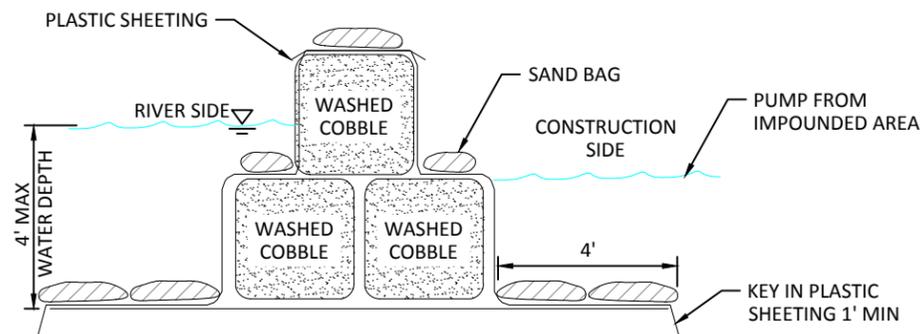
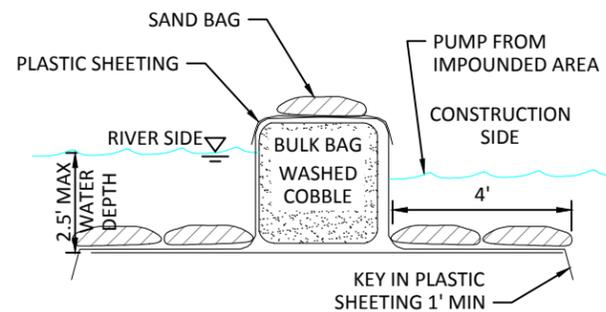
1. THE SILT FENCE SHALL BE PURCHASED IN A CONTINUOUS ROLL CUT TO THE LENGTH OF THE BARRIER TO AVOID USE OF JOINTS. WHEN JOINTS ARE NECESSARY, SILT FENCE SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT POST, WITH A MINIMUM 6 INCH OVERLAP, AND BOTH ENDS SECURELY FASTENED TO THE POST. ALTERNATIVELY, OVERLAP AND INTERLOCK TWO POSTS WITH ATTACHED FABRIC AS REQUIRED TO MEET APPLICABLE REGULATIONS.
2. THE SILT FENCE IS TO BE INSTALLED AT LOCATIONS SHOWN ON THE PLAN ALONG THE DOWNHILL PERIMETER OF CONSTRUCTION AREAS. THE FENCE POSTS SHALL BE SPACED A MAXIMUM OF 6 FEET APART AND DRIVEN SECURELY INTO THE GROUND A MINIMUM OF 24 INCHES.
3. THE SILT FENCE SHALL HAVE A MINIMUM VERTICAL BURIAL OF 6 INCHES. ALL EXCAVATED MATERIAL FROM SILT FENCE INSTALLATION SHALL BE BACK-FILLED AND COMPACTED ALONG THE ENTIRE DISTURBED AREA.
4. STANDARD OR HEAVY DUTY SILT FENCE SHALL HAVE MANUFACTURED STITCHED LOOPS FOR 2 INCHES X 2 INCHES POST INSTALLATION.
5. SILT FENCES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN PERMANENTLY PROTECTED AND STABILIZED, OR AS DIRECTED BY OWNER'S REPRESENTATIVE.

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BULK BAG NOTES:

1. BULK BAG COFFERDAM SHALL BE CONSTRUCTED OF SEVERAL UNITS OF BULK BAGS FILLED WITH WDFW APPROVED 3" MINUS WASHED GRAVEL, AND ABUTTED SIDE BY SIDE TO CREATE A ROW THAT ISOLATES THE CONSTRUCTION SITE.
2. IF WATER DEPTH EXCEEDS 85% OF THE BULK BAG HEIGHT, AN ADDITIONAL TOP ROW OF BULK BAGS SHALL BE INSTALLED, SUPPORTED BY TWO BOTTOM ROWS OF BULK BAGS. BULK BAG COFFERDAM SHALL BE SEALED BY COVERING THE COFFERDAM WITH PLASTIC SHEETING HELD IN PLACE BY STANDARD SANDBAGS PLACED IN ROWS ON TOP OF COFFERDAM, AND AT TOE OF COFFERDAM.
3. THE PLASTIC SHEETING SHALL BE DRAPED ALONG THE CHANNEL BOTTOM ON BOTH SIDES OF THE COFFERDAM WITH OUTWARD EDGE OF SHEETING A MINIMUM OF 4- FEET FROM TOE OF COFFERDAM. THE DRAPED PORTION OF PLASTIC SHEETING SHALL BE PINNED TO THE CHANNEL BED BY A MINIMUM OF TWO ROWS OF STANDARD SANDBAGS.
4. THE CONSTRUCTION SIDE EDGE OF PLASTIC SHEETING SHALL BE TOED INTO THE CHANNEL BED A MINIMUM OF 1-FT. TOEING IN THE OUTWARD EDGE OF PLASTIC SHEETING SHALL OCCUR AFTER THE COFFERDAM IS CLOSED TO PREVENT TURBIDITY RELEASE TO THE WATERWAY.
5. THE TERMINAL ENDS OF BULK BAG COFFERDAM, WHERE IT CONNECTS TO CHANNEL BANK OR HIGH GROUND, SHALL BE SEALED WITH PLASTIC SHEETING AND STANDARD SANDBAGS.
6. BULK BAGS SHALL BE CUBE-SHAPED POLYPROPYLENE WOVEN FABRIC BAGS WITH FULLY OPEN TOP, FLAT BOTTOM, FOUR LOOPS, MINIMUM 2-TON WEIGHT CAPACITY, MINIMUM 5:1 SAFETY FACTOR.
7. PLASTIC SHEETING SHALL BE MINIMUM 6-MIL THICKNESS. ROLL LENGTH SHALL BE LONG ENOUGH TO ENSURE THAT ENTIRE LENGTH OF COFFERDAM WILL BE COVERED WITHOUT A SEAM. MINIMUM 12-FT WIDE ROLL SHALL BE USED FOR SINGLE LAYER BULK BAG COFFERDAM. MINIMUM 16-FT WIDE ROLL SHALL BE USED FOR 2-LAYER STACKED BULK BAG COFFERDAM.
8. BULK BAG COFFERDAM SHALL BE COMPLETELY REMOVED FROM SITE AFTER CONSTRUCTION IS COMPLETED AND TURBIDITY HAS BEEN REMOVED.
9. CONTENTS OF BULK BAGS SHALL BE DISPOSED OF ONSITE AT LOCATIONS SPECIFIED BY OWNER.
10. MEASUREMENT AND PAYMENT FOR BULK BAG COFFERDAM, SAND BAGS, PLASTIC SHEETING, WASHED GRAVEL PLACEMENT, MAINTENANCE AND REMOVAL OF ALL MATERIALS SHALL BE INCIDENTAL TO THE LUMP SUM ALL INCLUSIVE COST FOR DIVERSION AND DEWATERING.
11. ALTERNATE COFFERDAM MATERIALS AND CONFIGURATIONS MAY BE ALLOWED BUT SHALL NOT BE IMPLEMENTED WITHOUT REVIEW AND APPROVAL BY THE OWNER'S REPRESENTATIVE. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS AND/OR VENDOR CUT SHEETS FOR SUBSTITUTIONS.

2
6 TYPICAL DETAIL - TEMPORARY COFFERDAM
NOT TO SCALE

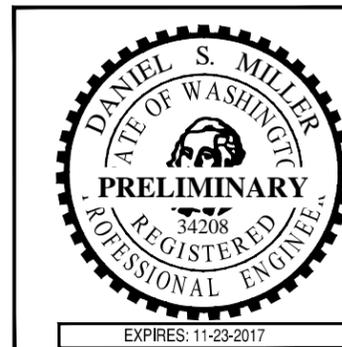


3
6 TYPICAL DETAIL - TEMPORARY COFFERDAM SECTION
IN WATER DEPTHS GREATER THAN 2.5'
NOT TO SCALE

Cofferdam quantities

Item	Quantity	Unit
ELS 2 Extension Jam (1 structure)		
length of cofferdammed area	35	FT
width of cofferdammed area	10	FT
Area of cofferdammed area	350	SF
Habitat Enhancement Wood (3 structures)		
length of individual cofferdammed area	20	FT
width of individual cofferdammed area	10	FT
Subtotal area of individual cofferdammed area	200	SF
Total area of three cofferdammed areas	600	SF

FT = feet
SF = square feet



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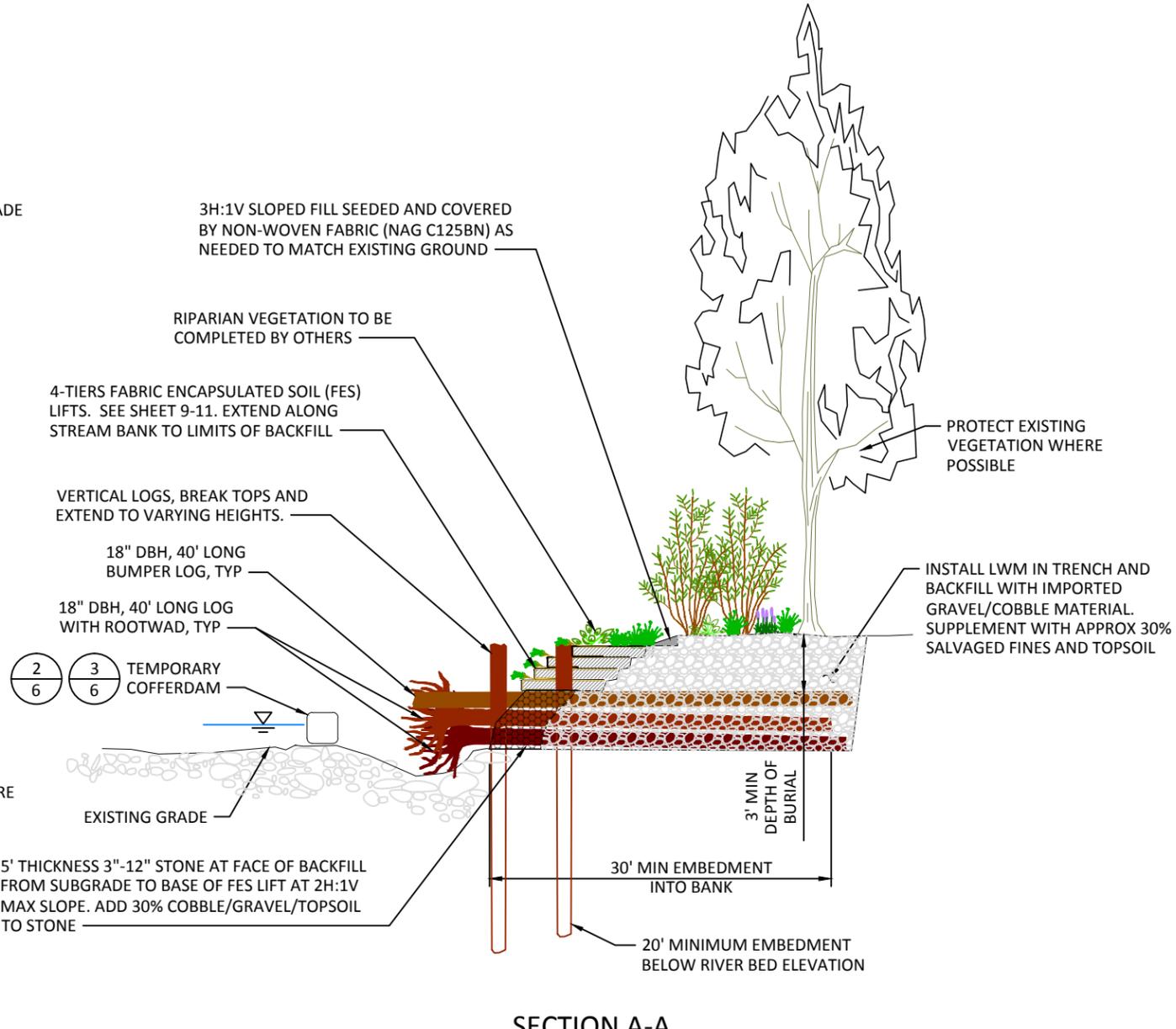
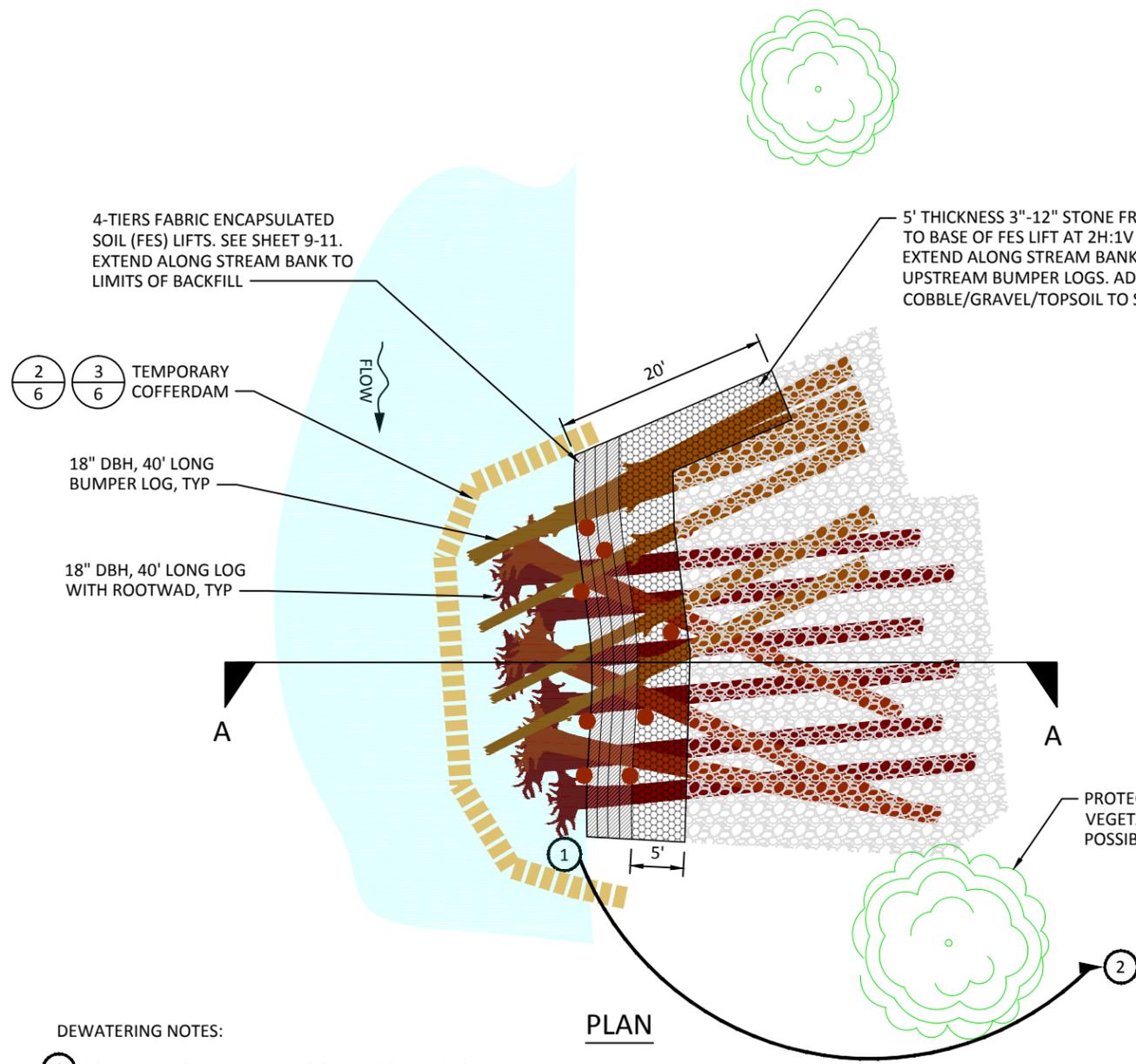
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EROSION CONTROL AND
COFFERDAM DETAILS

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DEWATERING NOTES:

- 1 CONSTRUCTION DEWATERING SUMP. CONTRACTOR SHALL PROVIDE PUMP TO DRAW DOWN WATER LEVEL SUFFICIENTLY FOR PLACEMENT OF LWM.
- 2 CONSTRUCTION DEWATERING DISCHARGE LOCATION. CONTROL DISCHARGE TO PREVENT EROSION AND RETURN OF TURBID WATER TO SURFACE WATERS.

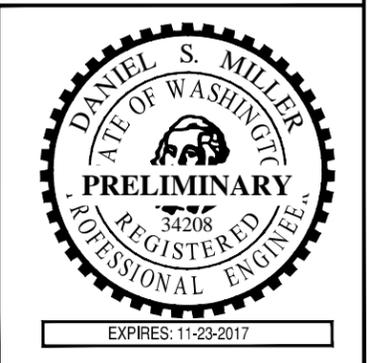
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1
7

ELS 2 EXTENSION JAM
NOT TO SCALE

NOTES:
ALL VERTICAL LOGS SHALL BE INSTALLED USING VIBRATORY PILE DRIVING EQUIPMENT. INSTALLATION BY EXCAVATION, HAMMERING OR VIBRATORY PLATE COMPACTOR SHALL NOT BE ALLOWED.

ACCEPTABLE MINIMUM VIBRATORY PILE DRIVING EQUIPMENT SHALL INCLUDE: HMC MOVAC SONIC SIDE GRIP VIBRATORY PILE DRIVER-MODEL SP80 OR EQUIVALENT.



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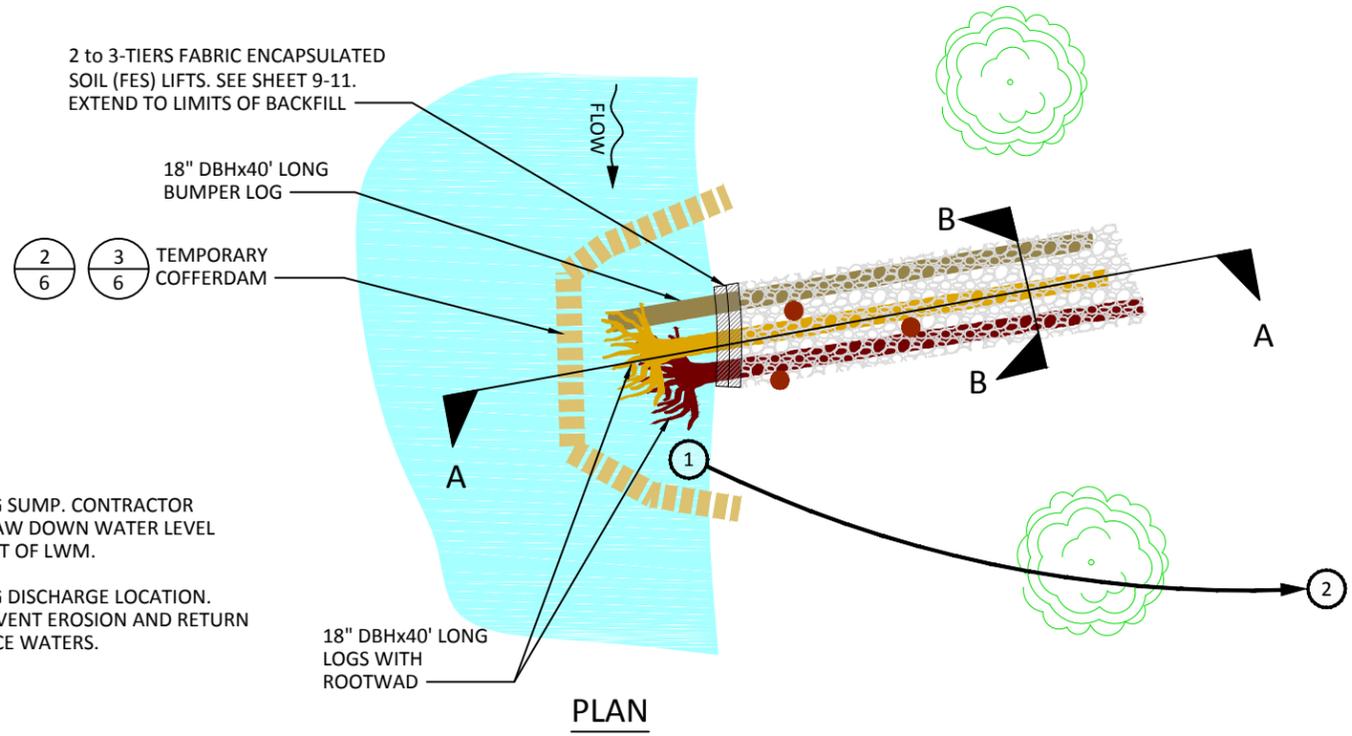
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ELS 2 EXTENSION JAM DETAILS

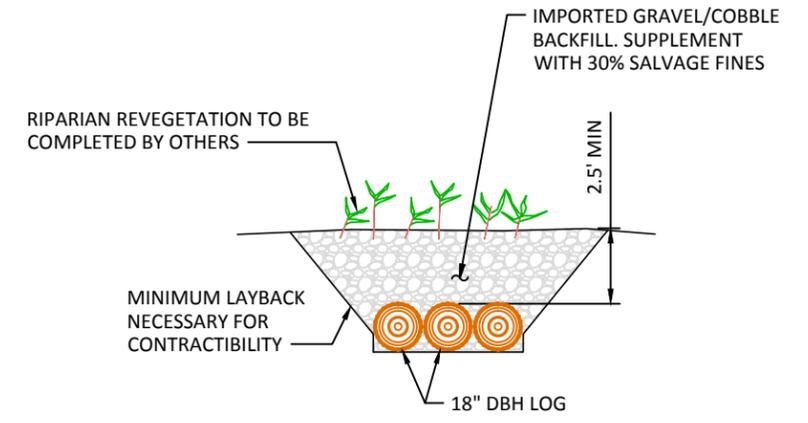
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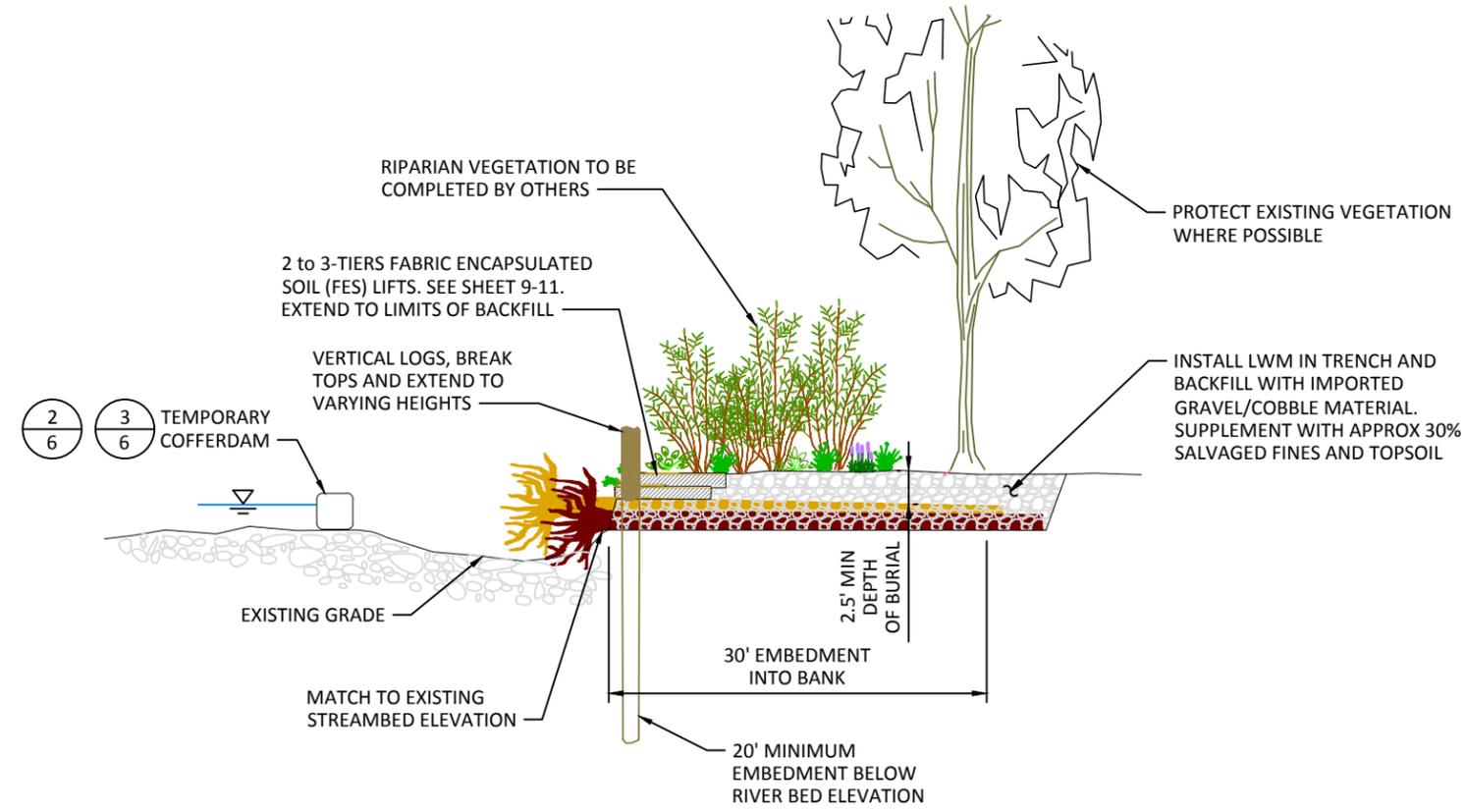
DEWATERING NOTES:

- 1 CONSTRUCTION DEWATERING SUMP. CONTRACTOR SHALL PROVIDE PUMP TO DRAW DOWN WATER LEVEL SUFFICIENTLY FOR PLACEMENT OF LWM.
- 2 CONSTRUCTION DEWATERING DISCHARGE LOCATION. CONTROL DISCHARGE TO PREVENT EROSION AND RETURN OF TURBID WATER TO SURFACE WATERS.

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SECTION B-B

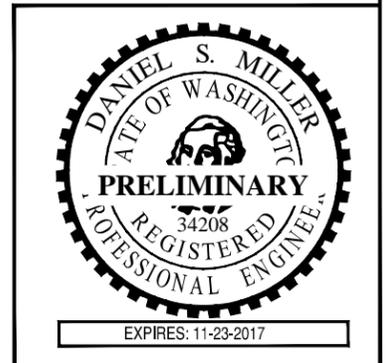


SECTION A-A

NOTES:
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ACCEPTABLE MINIMUM VIBRATORY PILE DRIVING EQUIPMENT SHALL INCLUDE: HMC MOVAC SONIC SIDE GRIP VIBRATORY PILE DRIVER-MODEL SP80 OR EQUIVALENT.

1 TYPICAL DETAIL - HABITAT ENHANCEMENT WOOD
8 NOT TO SCALE



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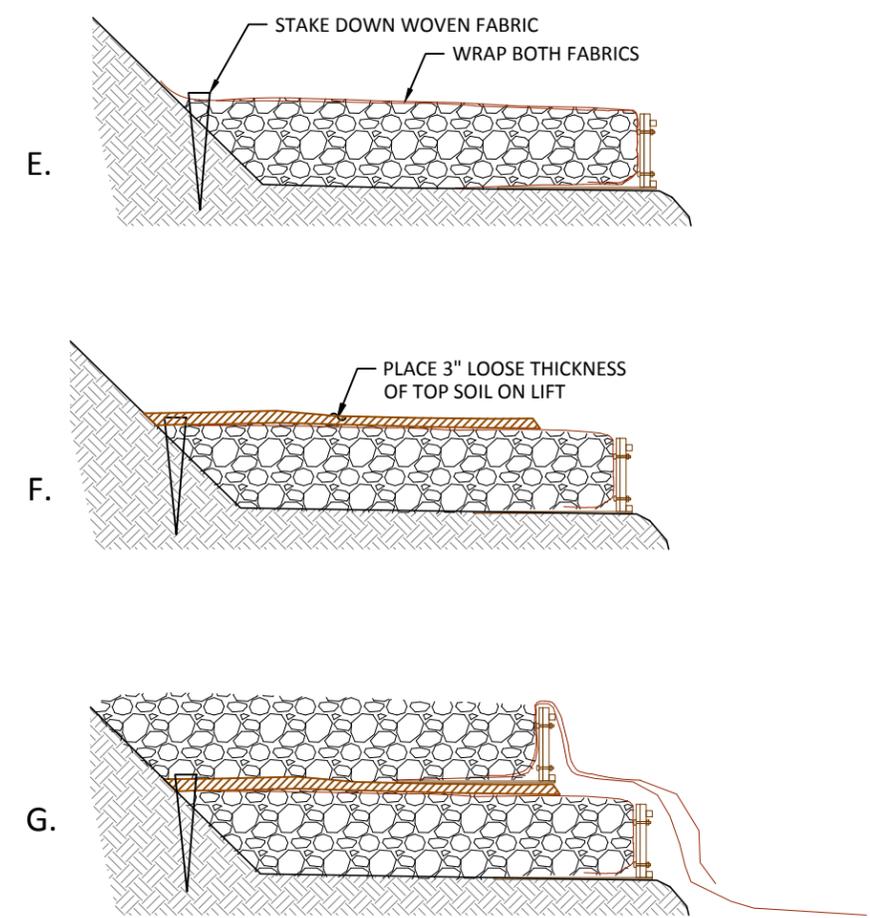
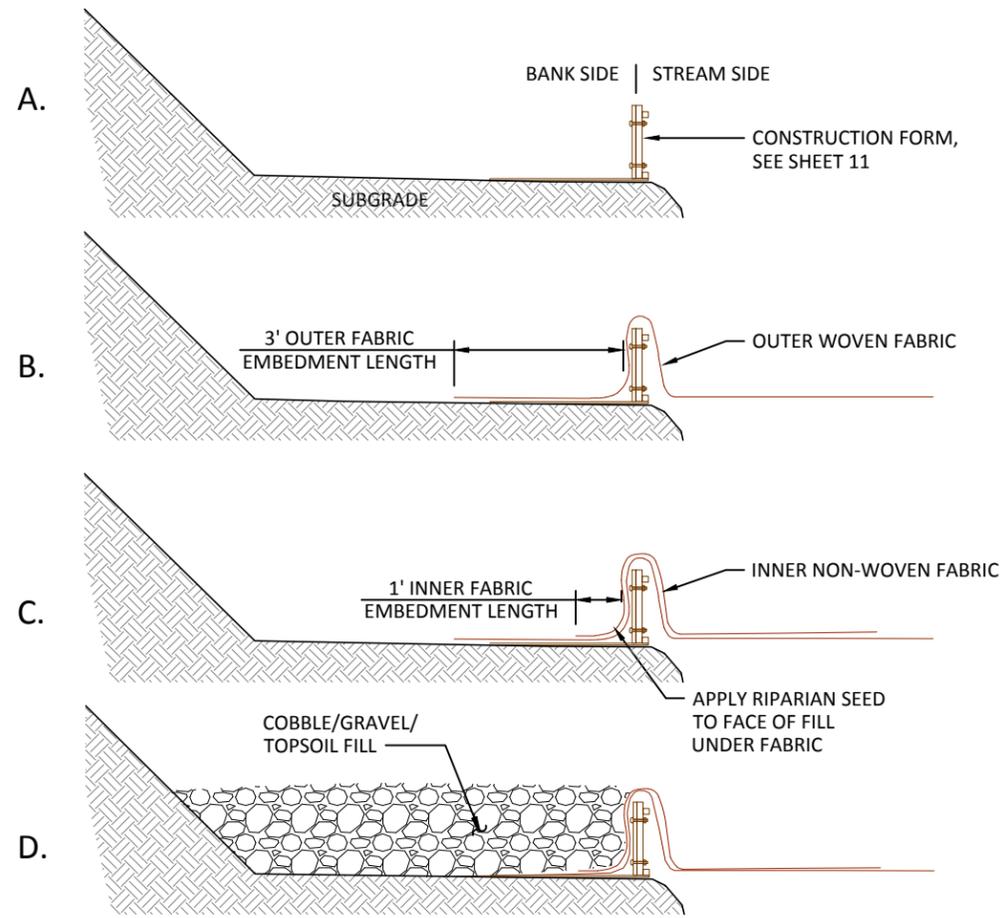
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HABITAT ENHANCEMENT
WOOD DETAILS

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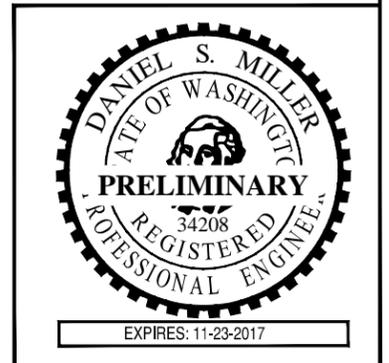


NOTE:
ORDINARY HIGH WATER (OHW)
ELEVATION IS BELOW FES LIFTS.

GENERAL INSTRUCTIONS FOR CONSTRUCTING FABRIC WRAPPED LIFTS

- LIFTS WILL BE CONSTRUCTED TO ENCAPSULATE TRENCH BACKFILL. EXTEND TO WIDTH OF EXCAVATED TRENCH AND BACKFILL.
- UNROLL THE OUTER FABRIC (WOVEN COIR) PARALLEL TO THE LONG AXIS OF THE CHANNEL AND POSITION IT SO THAT 3 FEET EXTENDS FOR EMBEDMENT ON THE BANK SIDE OF THE FORMS (FIG B), AND A MINIMUM 3 FEET EXTENDS LENGTHWISE BEYOND THE LAST FORM FOR OVERLAP. EXTEND FABRIC 3 FEET BEYOND ENDS OF FES LIFT TO BOX-FOLD ENDS. DRAPE THE REMAINDER OF THE FABRIC OVER THE TOP OF THE FORMS ON THE STREAM SIDE (FIG B).
- UNROLL THE INNER FABRIC (NON-WOVEN COIR) OVER THE TOP OF THE OUTER FABRIC AND POSITION IT SO THAT AT LEAST 1 FOOT OF THE INNER FABRIC EXTENDS AS AN EMBEDMENT LENGTH ON THE BANK SIDE OF THE FORMS (FIG C). DRAPE THE REMAINDER OF THE FABRIC OVER THE TOP OF THE FORMS ON THE STREAM SIDE AND ALIGN THE LONG EDGES OF THE INNER AND OUTER FABRICS. STRETCH AND PULL THE FABRIC LAYERS TO REMOVE WRINKLES.
- PLACE COBBLE GRAVEL MIX WITH APPROX 30% TOPSOIL FILL OVER THE FABRIC ON THE BANK SIDE OF THE FORMS TO A COMPACTED DEPTH OF 12 INCHES.
- RIPARIAN SEED SHALL BE PLACED ON SOIL AND BENEATH FABRIC ON ALL EXPOSED SURFACES.
- FOLD THE LOOSE ENDS OF THE TWO FABRIC LAYERS BACK OVER THE COMPACTED FILL MATERIAL AND STRETCH TIGHTLY TO REMOVE WRINKLES (FIG E). SECURE WITH WOODEN STAKES.
- PLACE 3" OF LOOSE TOPSOIL ON LIFT. REPEAT STEPS 2-6 TO REACH FULL BANK HEIGHT.
- ON THE TOP LIFT, EXCAVATE A KEY TRENCH 1.5 FEET WIDE AND 0.5 FEET DEEP ALONG THE LAND-WARD EDGE OF THE OUTER FABRIC LAYER, PARALLEL TO THE FORMS. SECURE FABRIC IN THE KEY TRENCH WITH WOODEN STAKES.
- BACKFILL & COMPACT THE KEY TRENCH WITH TOPSOIL AND CONTINUE TO APPLY TOPSOIL TO SMOOTHLY MERGE WITH EXISTING CONTOURS.

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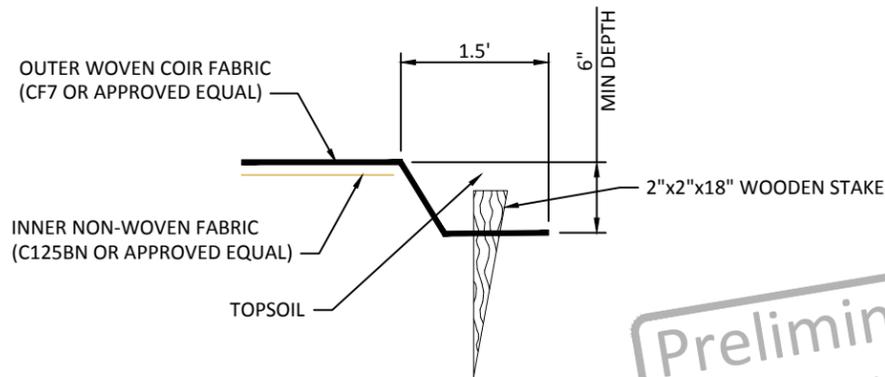
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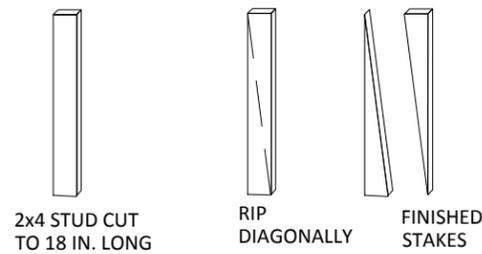
FES LIFT CONSTRUCTION
SEQUENCE

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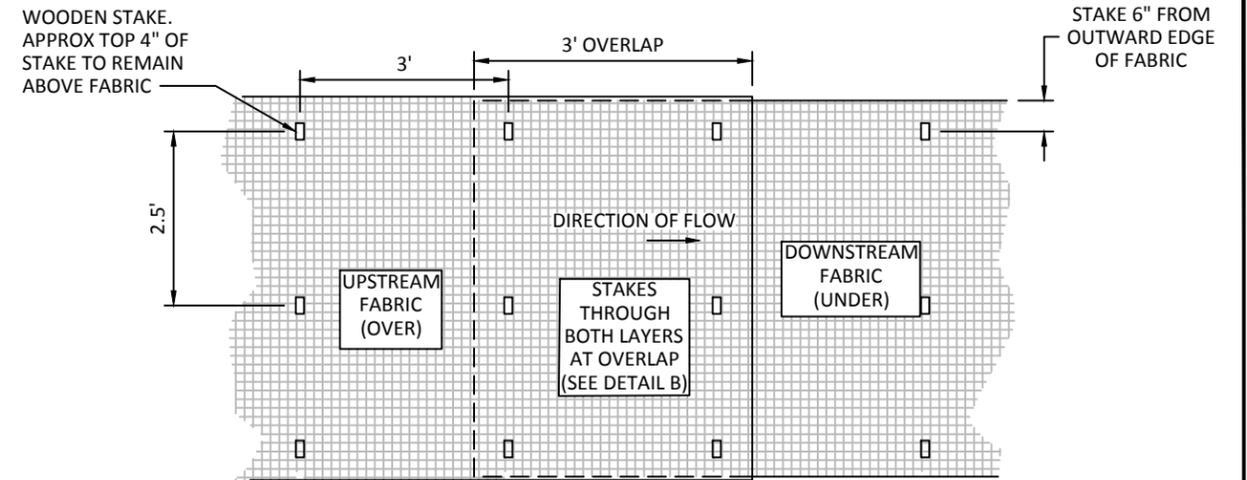


A
10 FABRIC EDGE
NOT TO SCALE

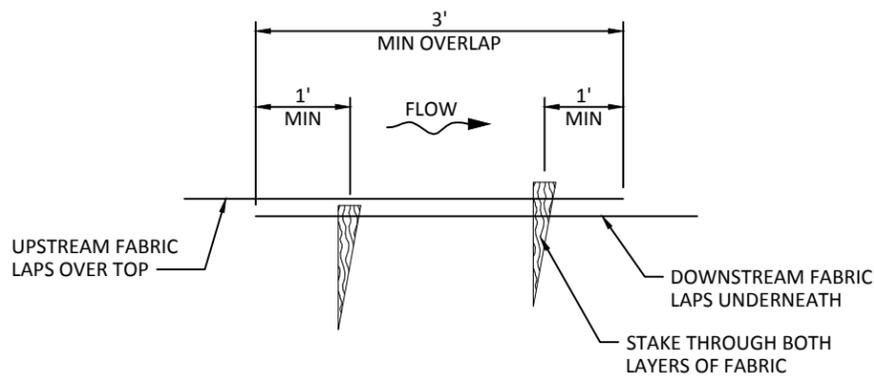
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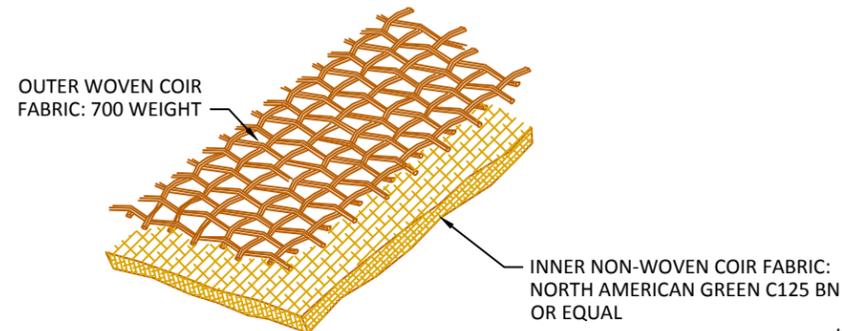
B
10 WOODEN STAKE CONSTRUCTION
NOT TO SCALE



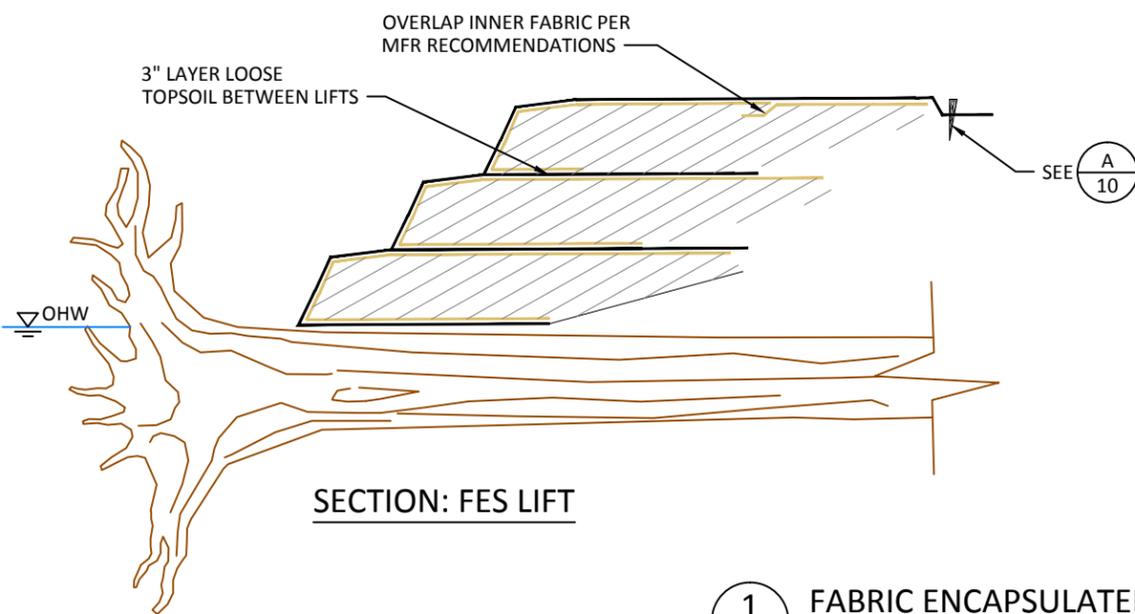
E
10 FABRIC LAYOUT AND STAKING DETAIL
NOT TO SCALE



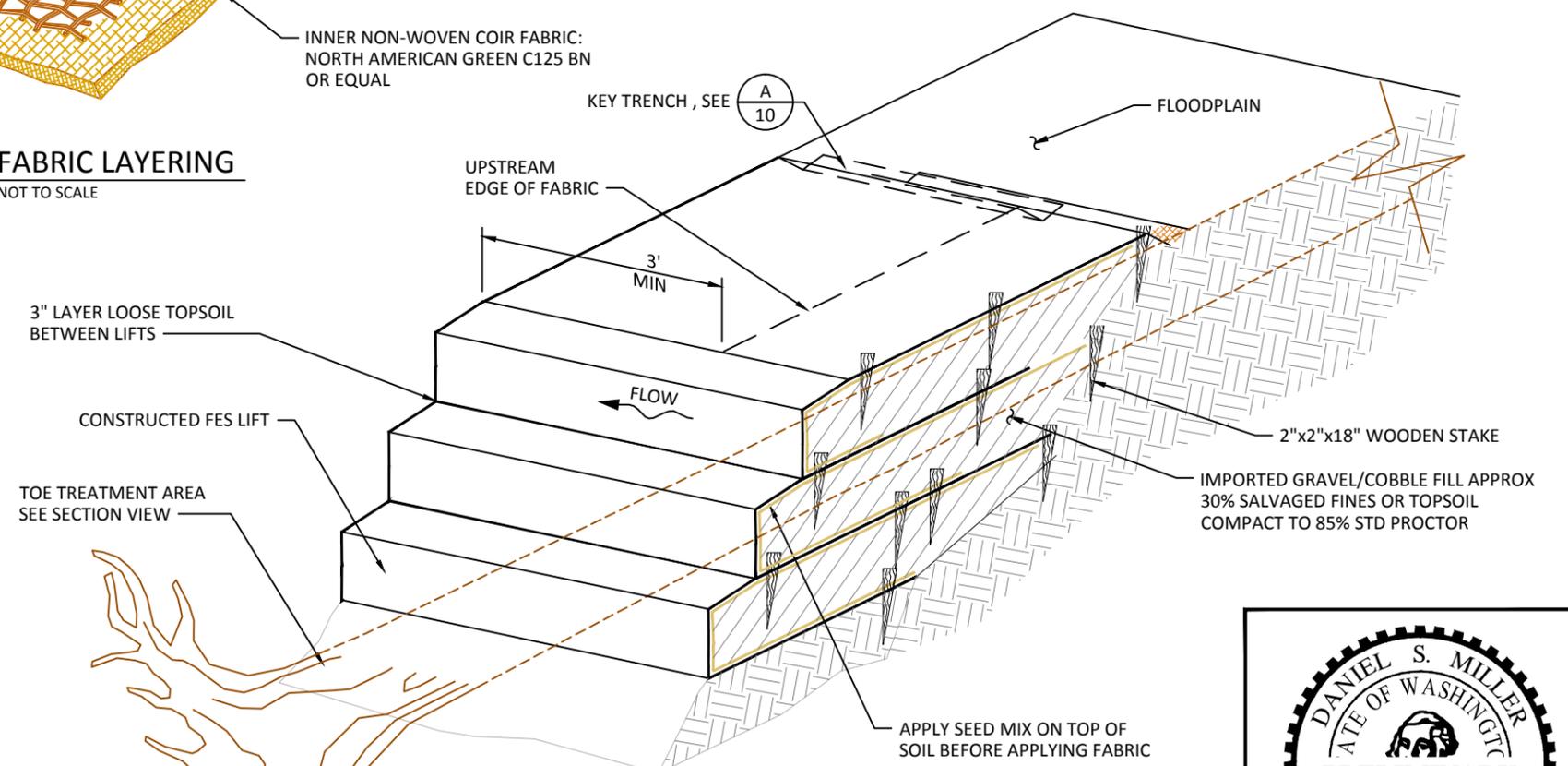
C
10 FABRIC OVERLAP
NOT TO SCALE



D
10 FABRIC LAYERING
NOT TO SCALE

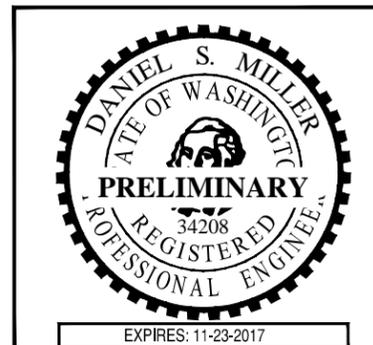


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10 FABRIC ENCAPSULATED SOIL (FES) LIFT
NOT TO SCALE



ISOMETRIC: FES LIFT

NOTE:
SEED MIX WILL BE PROVIDED BY YN.
SEED MIX SHALL BE INSTALLED BY CONTRACTOR



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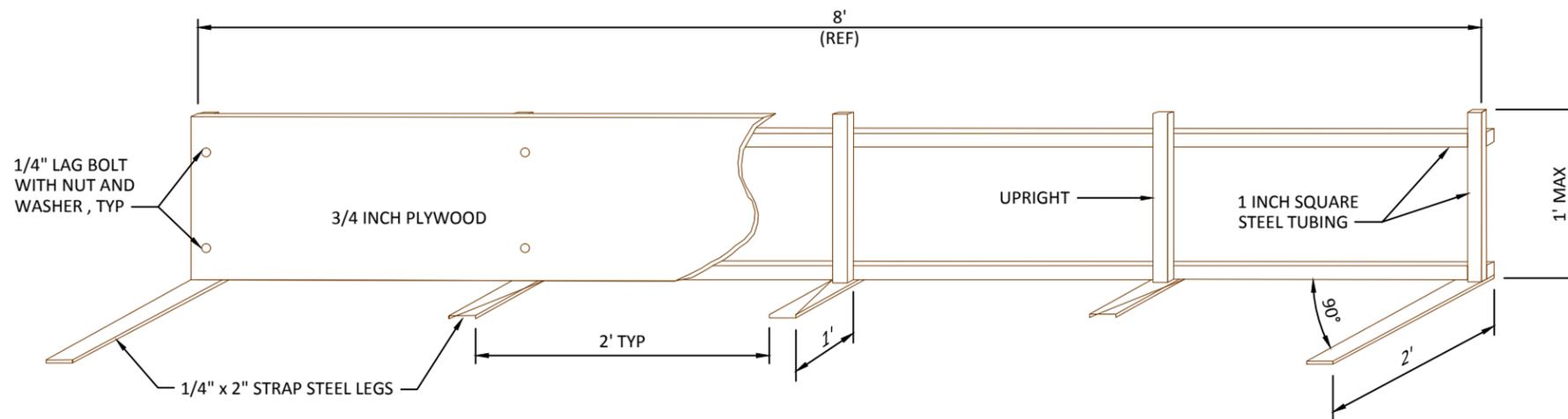
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FES LIFT DETAILS

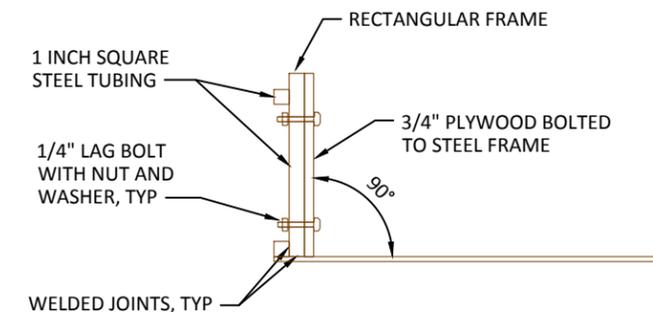
SHEET

10 OF 14

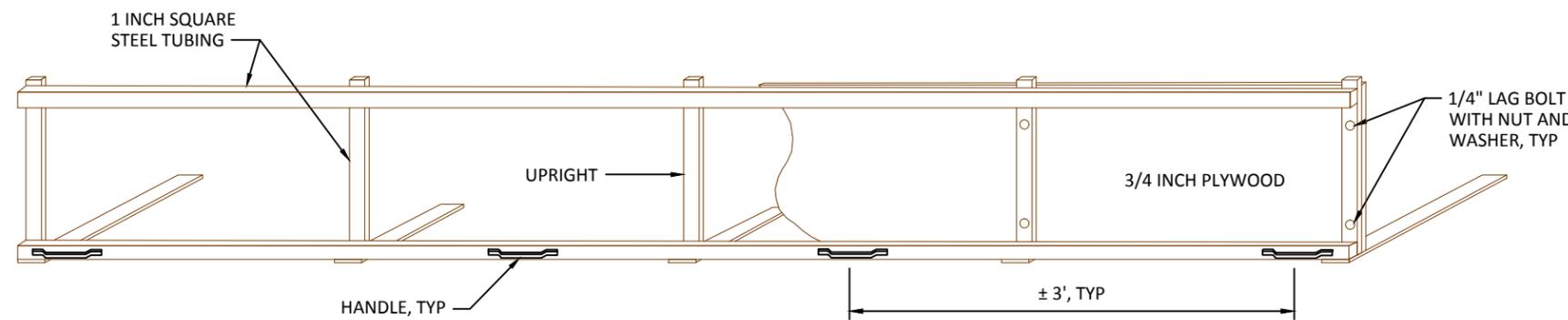
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ISOMETRIC VIEW FROM REAR



END VIEW



ISOMETRIC VIEW FROM FRONT

GENERAL NOTES ON FABRICATION OF FORMS

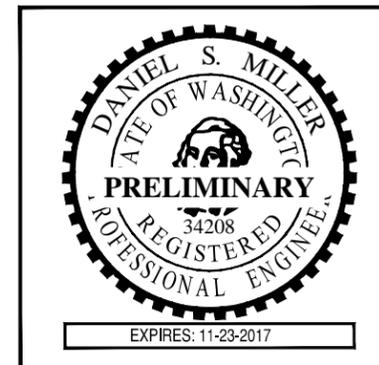
FOR FABRIC WRAPPED SOIL CONSTRUCTION

1. FABRICATE FORMS BY WELDING 1 INCH TUBULAR STEEL TOGETHER TO CREATE A 1x8 FOOT RECTANGULAR FRAMEWORK.
2. WELD LENGTHS OF 1/4x2 INCH STEEL STRAP AT 90 DEGREES TO THE FRAME EVERY 2 FEET.
3. ATTACH A PIECE OF 3/4 INCH PLYWOOD TO THE FRAME USING 1/4 INCH DIAMETER LAG BOLTS OR EQUIVALENT.
4. REMOVAL AND TRANSPORT OF THE FORMS IS FACILITATED IF HEAVY DUTY HANDLES ARE ATTACHED TO THE FRAME AS SHOWN.

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Not for Construction

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11

FABRIC WRAPPED SOIL CONSTRUCTION FORM
NOT TO SCALE



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**SUGGESTED CONSTRUCTION
OF FORM FOR FES LIFT**

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VERTICAL LOGS

ALL VERTICAL LOGS SHALL BE INSTALLED USING VIBRATORY PILE DRIVING EQUIPMENT. INSTALLATION BY EXCAVATION, HAMMERING OR VIBRATORY PLATE COMPACTOR SHALL NOT BE ALLOWED.

ACCEPTABLE MINIMUM VIBRATORY PILE DRIVING EQUIPMENT SHALL INCLUDE: HMC MOVAX SONIC SIDE GRIP VIBRATORY PILE DRIVER - MODEL SP80 OR EQUIVALENT.

VERTICAL LOGS SHALL BE A MAXIMUM OF 16" DIAMETER AT BREAST HEIGHT, WITH NO BARK.

RIGGING

RIGGING FOR VERTICAL LOG TESTING SHALL CONFORM TO THE TENSION SCALE MANUFACTURER'S RECOMMENDATIONS.

CHOKERS, CABLES AND SHACKLES SHALL HAVE MINIMUM WORKING LOAD RATING OF 12 TONS. FITTINGS SHALL BE SIZED ACCORDINGLY

TESTING

TESTING OF VERTICAL LOGS SHALL BE PERFORMED IN THE PRESENCE OF THE ENGINEER.

EACH VERTICAL LOG TEST SHALL HAVE UPWARD LOAD GRADUALLY INCREASED AND AS CLOSELY ALIGNED TO AXIS OF VERTICAL LOG AS POSSIBLE. RECORD THE VERTICAL LOG DIAMETER, EMBEDMENT DEPTH AND MAXIMUM FORCE REQUIRED TO MOVE THE VERTICAL LOG. UP TO A TOTAL OF THREE LOADINGS MAY BE REQUIRED AT EACH EMBEDMENT DEPTH.

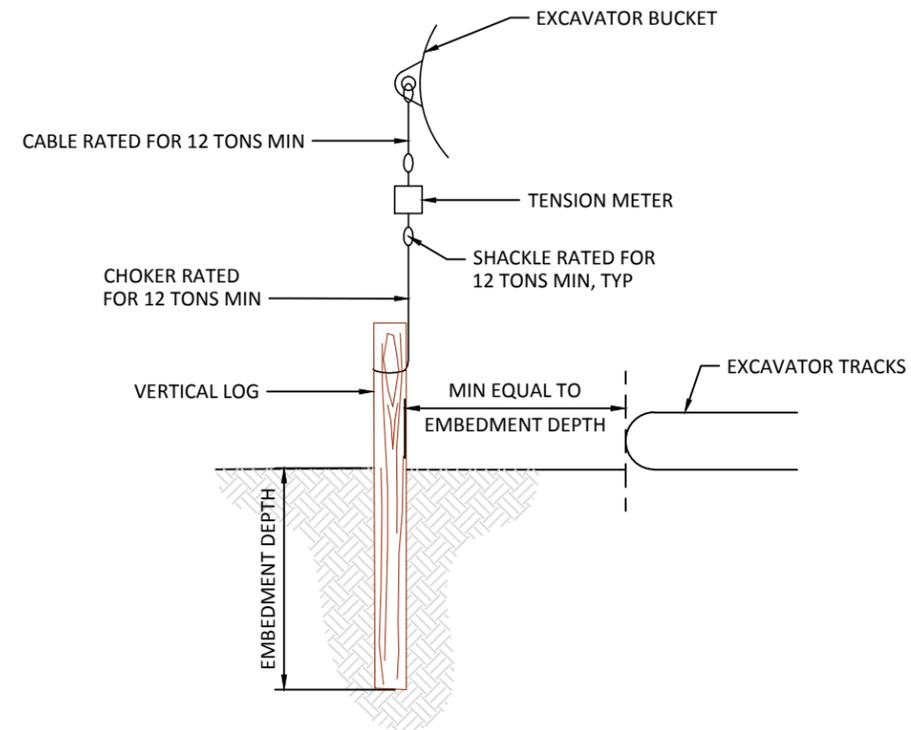
PROOF TESTS SHALL BE MADE AT UP TO FOUR EMBEDMENT DEPTHS TO BE DETERMINED IN THE FIELD. AS A GUIDELINE TEST EMBEDMENT DEPTHS MAY INCLUDE 6', 8', 10', AND 12'.

EXCAVATOR CONDUCTING PULL OUT LOADING SHALL BE POSITIONED NO CLOSER THAN EMBEDMENT DEPTH OF VERTICAL LOG IF POSSIBLE. IF A CLOSER POSITIONING IS REQUIRED, EXCAVATOR SHALL BE NO CLOSER THAN THAT REQUIRED TO GENERATE DESIRED LOADING WITH DISTANCE FROM VERTICAL LOG NOTED IN THE TEST RECORD.

PULL OUT RESISTANCE READING SHALL BE COMPARED AGAINST EXCAVATOR MAX LIFT OFFSET TABLE.

1 VERTICAL LOG PER HABITAT ENHANCEMENT WOOD STRUCTURE AND 2 VERTICAL LOGS FOR THE ELS 2 EXTENSION JAM SHALL BE PROOF TESTED. IF RESULTS VARY MORE THAN 50% THEN IT SHOULD BE ANTICIPATED THAT UP TO 25% OF THE PRODUCTION VERTICAL LOGS SHALL BE PROOF TESTED.

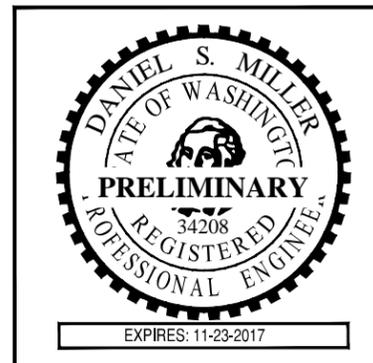
CONSTRUCTED DRIVEN VERTICAL LOG EMBEDMENT DEPTH SPECIFIED IN THE PLANS MAY BE REDUCED OR INCREASED, PENDING PULL OUT TEST RESULTS, AT NO ADDITIONAL COST.



VERTICAL LOG PULLOUT TESTING

NOT TO SCALE

Preliminary
Not for Construction



NO.	BY	DATE	REVISION DESCRIPTION

NS DRAWN	DM DESIGNED	DM CHECKED
DM APPROVED	12/31/15 DATE	14-02-43 WO3 PROJECT

CONFEDERATED TRIBES AND BANDS OF THE YAKAMA NATION
ENTIAT 3D LWM REVISITED
PRELIMINARY DESIGN



interfluve
501 Portway Avenue, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

VERTICAL SNAG PULLOUT
TESTING DETAILS

SHEET
12 OF 14

Provisions

INTRODUCTION

The Washington State Department of Transportation's Standard Specifications for Road, Bridge and Municipal Construction 2014 (WSDOT Standard Specifications) shall apply unless otherwise noted in the following special provisions. The "Contracting Agency" or "Owner" shall be the Confederated Tribes and Bands of the Yakama Nation. Additional specifications in the following contract sections are included for items not covered by the WSDOT Standard Specifications.

DIVISION 1 - GENERAL REQUIREMENTS

Sections 1-02, 1-03, and 1-08 (except 1-08.6, 1-08.7, 1-08.8) of the Standard Specifications do not apply.

ESC, SPCC PLAN AND IMPLEMENTATION

Description

This work shall provide for preparation, implementation, and removal of a temporary Erosion Sediment Control (ESC) plan and for the preparation and implementation of a Spill Prevention Control and Countermeasure (SPCC) plan in accordance with Section 1-07.15 of the Standard Specifications, and as amended by these special provisions.

1. Biodegradable hydraulic fluid shall be installed into each piece of heavy machinery working within 50 feet of the Entiat River.
2. Silt fence or cofferdams shall be installed between water and work areas shown in the plans.
3. Staging, stockpile, and access areas are shown in the plans. The irregular shape of these areas is intended to provide large areas but that also avoid impacts to existing trees. The owner will flag a corridor to delineate trees that shall be avoided. The contractor shall install high visibility fence along the flagged corridor. Areas within the footprint of project earthwork can also be used as staging & stockpile areas.
4. This item includes erosion control measures, including the maintenance or replacement of spent erosion control measures.

Measurement

"ESC, SPCC Plan and Implementation," including the above amendments to the item will be measured by lump sum.

Payment

Payment will be made in accordance with Section 1-09.9 for the following bid items: "ESC, SPCC Plan and Implementation" per lump sum.

MOBILIZATION

This item consists of work in accordance with Section 1-09.7 of the Standard Specifications.

Removal of excess LWM to the Preston Pit at project completion shall be incidental to "Mobilization".

Measurement

"Mobilization" will be measured by lump sum. Demobilization shall be incidental to "Mobilization".

Payment

"Mobilization", lump sum.

TRAFFIC CONTROL

Temporary traffic control requirements shall include barricades and construction signage at the entrance to the project site and any other measures per Section 1-10 and local regulations.

Measurement

"Traffic Control" will be measured by lump sum.

Payment

"Traffic Control", lump sum.



DIVISION 2 - EARTHWORK

CLEARING AND GRUBBING

This item consists of clearing and grubbing for construction as shown on the plans including those areas required for temporary access routes and in accordance with Section 2-01 of the Standard Specifications, and as amended by these special provisions.

1. Areas for clearing and grubbing shall be the minimum necessary and within the limits of disturbance shown on the plans. These areas will be flagged in the field by the owner prior to clearing and grubbing work. Clearing and grubbing shall not occur outside of the designated limits.
2. Disturbance to river banks and riparian vegetation shall be minimized and shall only include those areas marked by the owner.
3. Included in this item are the removal and salvage of trees, varying in size. Salvaged trees shall be reused as woody material. Trees to be salvaged will be identified in the field by the owner's representative.
4. Shrubs removed during clearing and grubbing shall be left on site and placed outside of the limits of disturbance to be used as slash during installation of LWM.
5. Vegetation protection and restoration per Section 1-07.16(2) shall be incidental to clearing and grubbing.

Measurement

Removal and salvage of trees and shrubs shall be considered incidental to clearing and grubbing bid item. Measurement and compensation for the installation of salvaged trees is described under "LWM" and paid under that item. No additional compensation will be allowed.

"Clearing and Grubbing," including the above amendments to the item will be measured by lump sum.

Payment

Payment will be made in accordance with Section 1-09.9 for the following bid items: "Clearing and Grubbing" per lump sum.

COFFERDAM

This section is added.

8-31.1 Description

The work consists of furnishing, installing, monitoring, maintaining, and removing cofferdams, and coordinating with the owner for fish salvage relocation activities.

8-31.2 Materials

8-31.2(1) The contractor shall provide all required materials for the project. Materials for bulk bag cofferdam are described in the project plans.

8-31.2(2) If contractor elects to use an alternate method for temporary cofferdam, contractor shall provide to the owner shop drawings and/or vendor cut sheets for substitutions and submit cofferdam/diversion plan for review prior to implementation.

8-31.3 Construction Requirements

8-31.3(1) Cofferdams

The contractor shall isolate the work area from the waterway by installing cofferdams per the plans. No turbidity from construction activities shall enter the waterway. Cofferdams shown on the plans are a suggested method. Contractor shall determine own method and submit a cofferdam and diversion plan for review and approval.

If bulk bag cofferdam is the selected method, bulk bag cofferdam construction requirements are described in the plans.

8-31.3(2) Coordination with Fish Rescue

The contractor shall provide minimum 3 days advance notice to the owner before each cofferdam installation date. The contractor shall understand that cofferdam installation requires coordination with the

owner and only after the owner has completed fish rescue can the cofferdams be completed.

8-31.4 Measurement

Measurement will be based on the item from the bid list installed and the work for that portion completed.

"Cofferdam" will be measured by lump sum.

8-31.5 Payment

Payment will be made in accordance with Section 1-09.9 for the following bid items: "Cofferdam" per lump sum.

PUMPING

This section is added.

8-32.1 Description

The work consists of furnishing, monitoring, operating, maintaining, and removing pumps, and installation of control of water BMPs.

8-32.2 Materials

8-32.2(1) One 6" pump, with pumping capacity greater than 600 gpm, assuming 12 feet of vertical lift and 300 feet of discharge hose. To prevent turbidity from entering the river, pumps may need to run 24 hrs or until water is clear. Pumps shall have soundproofing. Electric pumps with generators and quiet packs are a preferred and approved method.

8-32.2(2) 500 feet of 6 inch discharge hose.

8-32.2(3) One or more 2-inch (or larger) trash pumps, with at least 200 feet of discharge hose.

8-32.2(4) Environmental protection measures such as straw bales, perforated pipe for discharge flow distributors, geotextiles, filter bags, or other means of controlling water and turbidity. No turbidity shall be allowed to enter the river or surface waters.

8-32.3 Construction Requirements

8-32.3(1) Pumps

Groundwater and surface waters are expected to be encountered during excavations. Pumping shall prevent groundwater that has mixed with construction water from entering the river and dewater construction areas.

1. To help prevent turbidity from leaking through the cofferdams at the downstream end of the project, the contractor shall provide and operate 6" pump(s) to lower the water surface within the isolated area and discharge to an infiltration area.
2. Construction water shall be pumped away from work areas and be infiltrated into the ground and without entering the waterway.

8-32.3(2) Environmental Protection Measures

If infiltration becomes an ineffective means to control turbidity, additional and alternative methods, such as pumping into stilling basins or filtration geotextile fabric shall be required at the contractor's expense.

8-32.4 Measurement

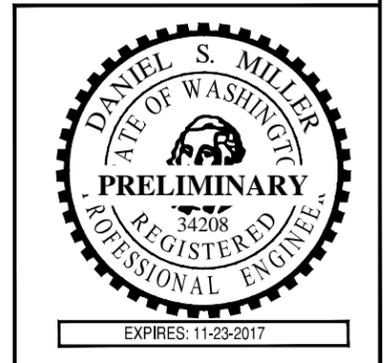
Measurement will be based on the item from the bid list installed and the work for that portion completed.

"Pumping" will be measured by lump sum.

8-32.5 Payment

Payment will be made in accordance with Section 1-09.9 for the following bid items: "Pumping" per lump sum

The unit contract prices for "Pumping" shall be full compensation for all costs incurred for equipment, materials and labor for furnishing, installing, operating, securing, maintaining and removal of pumping equipment as outlined in the plans. If additional environmental protection measures are required to control turbidity, they shall be considered incidental to pumping and no additional compensation will be made.



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NO.	BY	DATE	REVISION DESCRIPTION

NS	DM	DM
DRAWN	DESIGNED	CHECKED
DM	12/31/15	14-02-43 WO3
APPROVED	DATE	PROJECT

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LWM
This section is added.

8-33.1 Description
All references to large woody material (LWM); logs; logs with root wads; vertical logs; excavation; backfill; imported gravel/cobble with fines or topsoil; salvaged trees; or slash within the plans and these special provisions shall be considered work associated with this item. This item consists of installing LWM and includes movement from stockpiles to installation areas, excavation and backfill to partially bury LWM and installation of vertical snags as shown on the plans.

8-33.2 Materials

8-33.2(1) Logs
Logs have been supplied by the owner to the site staging area shown on the plans and consist of logs, logs with root wads, and vertical snags. Quantities of owner supplied logs are shown on sheet 3 quantities estimate.

8-33.2(2) Salvaged Trees
Trees flagged by the owner for clearing from the access route will be alder and miscellaneous species 6inch DBH or greater.

8-33.2(5) Slash
Slash will be brush and small trees up to 6inch DBH cleared from the access route and excavation areas.

8-33.3 Construction Requirements

8-33.3 (1) Locations of logs, logs with root wads and vertical logs shall generally be as indicated on the plans. However, final location will depend upon the size, shape and quantity of material delivered or salvaged. Installation of LWM shall be understood to require a "fit in the field" approach as directed by the owner's representative.

8-33.3 (2) LWM shall be stabilized as shown in the plans and directed by the owner's representative.

8-33.3 (3) Vertical logs shall be placed in approximate numbers indicated on the plans at specific locations in the field as directed by the owner's representative. Vertical logs shall be installed using vibratory pile driving equipment. Pre-approved equipment includes HMC Movac sonic side grip Model SP80 or approved equal. Installation by hammer pile driver, vibratory plate compactor or excavation shall not be allowed. Vertical snags shall require embedment depth as indicated on the plans. Vertical snags will be tested as indicated on the plans. Vertical snags shall have broken tops, and diversity in angles and heights above ground to provide a natural appearance.

8-33.3(4) Slash shall be pulled from stockpiles outside of limits of disturbance and incorporated into LWM structures or spread onto the constructed surfaces.

8-33.4 Measurement
"LWM" will be measured by lump sum.

Measurement shall include all items required to place and install logs including but not limited to: 1) excavation, haul and off-site disposal of unsuitable material, 2) import of gravel and cobble mixed with approximately 30% of fines or topsoil for burial of logs and 3) installation of LWM, logs, logs with rootwads, vibratory driven vertical logs, vertical log testing and vertical log top treatments.

8-33.5 Payment
Payment will be made for the bid item "LWM" per lump sum.

The unit contract prices for "LWM" shall be full compensation for all costs incurred for equipment, materials and labor for installing and securing LWM as outlined in the plan.

Preliminary
Not for Construction

Fabric Encapsulated Soil (FES) Lifts

This section is added.

8-34.1 Description
All reference to fabric encapsulated soil (FES) lifts, FES lifts or FES shall include placement of biodegradable fabric encapsulated soil lifts along the stream bank face within the back fill area for LWM placements. FES lifts are a combination of excavation, non-woven and woven coir fabrics, construction forms, fill, seeding and wooden stakes arranged as shown on the plans. The contractor shall provide all labor, materials, and equipment necessary for the construction and installation of FES Lifts as shown on the plans.

8-34.2 Materials

8-34.2 (1) Coir Fabric
Coir fabrics shall consist of 100% biodegradable materials. Nylon or synthetic fiber material in any of the coir fabrics is not acceptable. Only those coir fabrics specified will be accepted unless otherwise reviewed and approved by the owner.

Each roll of coir fabric shall be packaged individually in a suitable sheet, wrapper, or container to protect the fabric from damage to ultraviolet light, moisture, and mud during normal storage and handling.

Each roll of coir fabric shall be identified with a tag or label securely affixed to the outside of the roll on one end. The label shall include the manufacturer or supplier, the style number, and the roll and lot numbers.

Store all coir fabrics elevated off the ground and ensure that they are adequately covered to protect the material from damage and exposure to moisture and sunlight. Protect coir fabrics from sharp objects which may damage the fabric. Coir fabrics damaged during transport, storage or placement shall be replaced at the contractors expense.

The owner may randomly select and obtain samples from rolls of coir fabric after arrival on the site and prior to installation to compare to previously submitted samples.

8-34.2 (1a) Non-woven Coir Fabric
The non-woven coir fabric shall be North American Green (NAG) style C125BN 100% biodegradable coconut fiber mat or equal as reviewed and approved by the owner. The fabric shall be delivered in 2 meter (minimum) roll widths and shall meet or exceed the following criteria:

Thickness	ASTM D1777	0.251 inches
Dry Tensile Strength	ASTM D4632	20.7 lbs
Elongation	ASTM D463	26.6%
Wet Tensile Strength	ASTM D4632	22.2 lbs
Elongation	ASTM D4632	14.1%
Weight	ASTM D3776	10.7 oz/yd
Open Area	Measured	7%
Roll Width	Measured	2 meters (minimum)
Roll Length	Measured	108 feet

8-34.2 (1b) Woven Coir Fabric
The woven coir fabric shall be a high strength 700 weight coir (100% coconut fiber), continuously woven mat with no seams and the following minimum average roll properties:

Thickness	ASTM D1777	0.35 inches
Wet Tensile Strength	ASTM D4595	1488 lb/ft x 1032 lb/ft
Weight	ASTM D3776	23 oz/yd
Open Area	Measured	48%, maximum
Roll Width	Measured	4 meters
Roll Length	Measured	25 meters

The woven coir fabric shall have no seams and shall be Bon Terra CF-7, DeKoWe 700, Nedra KoirMat 700, Rolanka BioDMat 70 or, approved equal.

8-34.2 (2) Wood Stakes
Wood stakes shall be used to anchor all coir fabrics. Stakes shall be wooden stakes solid and free of knots or defects. Stakes shall be minimum 18" in length. Stakes shall be wedge shaped with a minimum equivalent diameter equal to 1.5" at the top and should come to a point at the bottom. Stakes should be constructed by cutting a standard grade 2"x 4" lumber lengthwise along the diagonal to create wedge shaped stakes or by some other method resulting in a stake of dimensions reviewed and approved by the owner.

8-34.3 Construction Requirements

FES lifts shall be constructed as shown on the design plans and specified below.

1. FES lifts shall be placed along the river bank the full width of the trench excavated (subgrade) for placement of LWM.
2. Place forms along the bank in locations to achieve the lines and grades shown on the plans.
3. Roll woven coir fabric along the streambank and place fabric against the subgrade and (vertical) form face with embedment lengths as shown on the plans.
4. Roll non-woven coir fabric along the streambank and place on top of the woven coir fabric to achieve the embedment length shown on the plans.
5. Remove all wrinkles in coir fabric and ensure that fabrics rest tightly against the subgrade and form face with the proper embedment lengths. Allow excess coir fabric to drape over the form toward the stream channel.
6. Apply seed mix provide by the owner to that portion of non-woven coir fabric that is placed against the vertical face of the form.
7. Place the appropriate soil and compact to 85% standard proctor. Soil lift shall be a maximum 1.0 foot thick.
8. Apply seed mix provided by the owner as shown on the plans to the soil lift.
9. Pull coir fabrics that are draped over the form back over seeded soil. Pull coir fabrics tight and stake according to the specifications and plans.
10. Remove forms. Note, forms can be removed by hand, or pried with a bar if necessary. Contractor shall not use equipment to remove forms.
11. Repeat 2-10, above, to achieve the lines and grade shown on the plans.

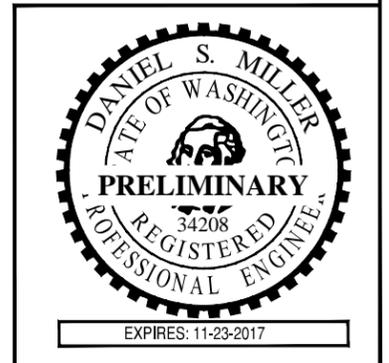
Finished FES lifts shall have no loose coir fabric. Areas with loose coir fabric shall be staked with tapered wooden stakes to hold coir fabrics firmly to underlying soil. If coir fabric folds are required around channel bends, the fold shall be in the direction of flow and coir fabric shall be staked at the folds.

8-34.4 Measurement

Measurement for FES lifts shall be lump sum. All equipment, labor and materials required to complete FES lifts shall be incidental to "FES Lifts".

8-34.5 Payment

Payment shall be lump sum for item "FES Lifts".



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