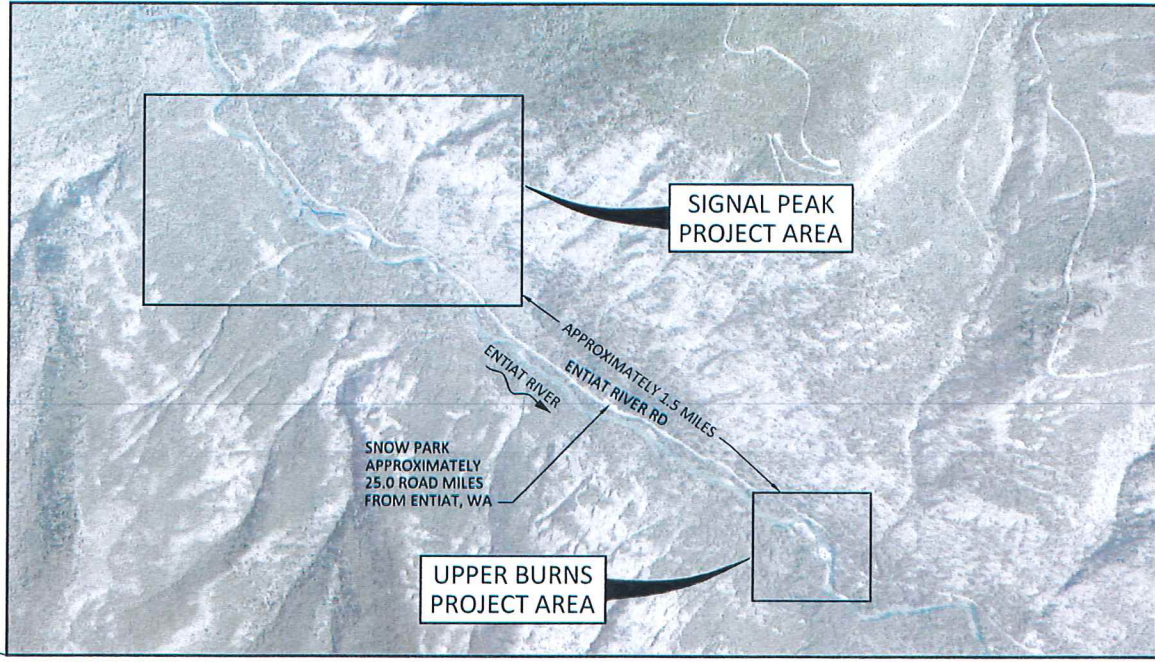
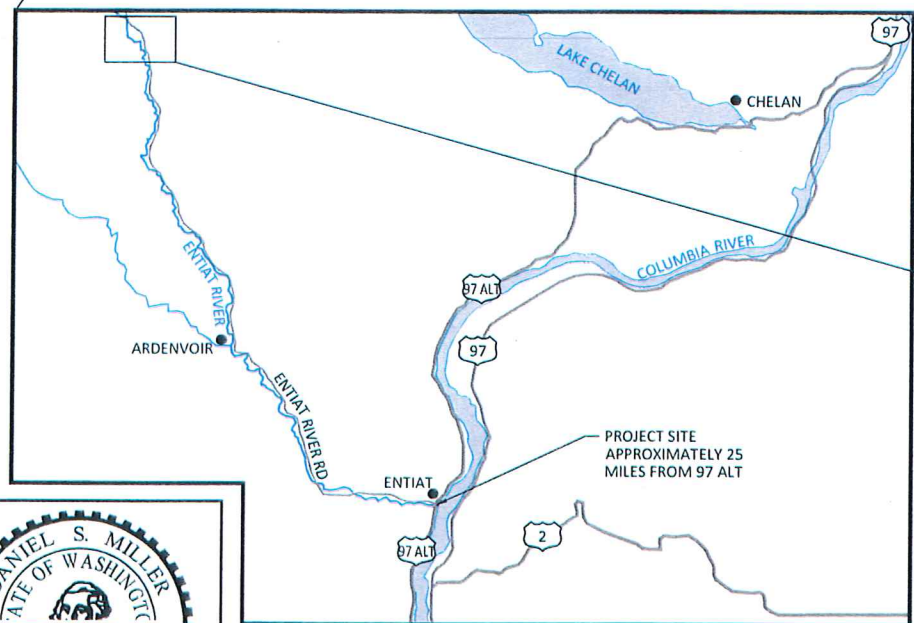
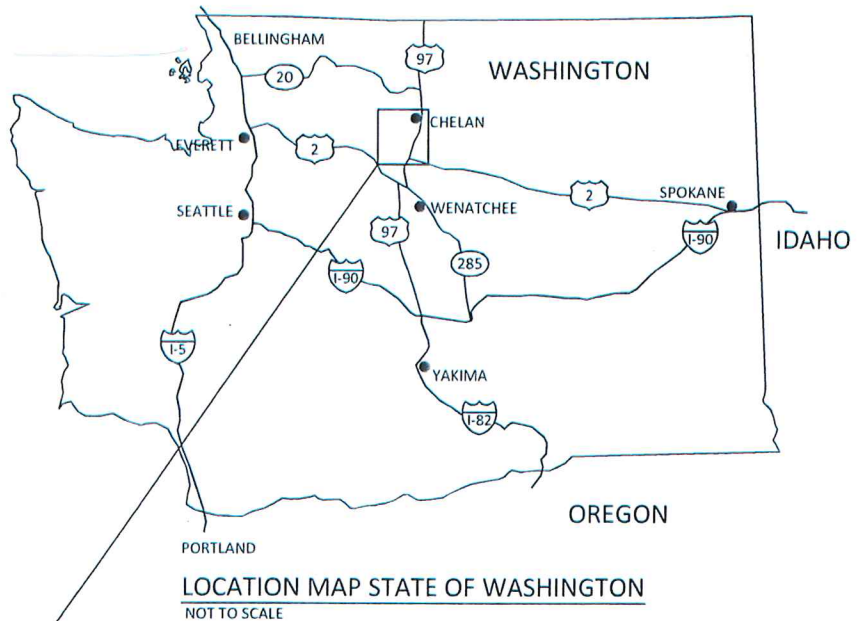


ENTIAT RIVER UPPER STILLWATERS HABITAT ENHANCEMENT PRELIMINARY DESIGN

CHELAN COUNTY, WASHINGTON
JUNE 29, 2015



SHEET INDEX

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PROJECT SITE MAP



SITE LOCATION:

SIGNAL PEAK COORDINATES:
LATITUDE 47°54'57.94" N
LONGITUDE 120°30'02.34" W

UPPER BURNS COORDINATES:
LATITUDE 47°54'17.85" N
LONGITUDE 120°28'29.20" W

WATERBODY: ENTIA RIVER
TRIBUTARY OF: COLUMBIA RIVER

Preliminary
Not for Construction



NO.	BY	DATE	REVISION DESCRIPTION

LK	GJ, DM	GJ, DM
DRAWN	DESIGNED	CHECKED
DM	6/29/15	140205
APPROVED	DATE	PROJECT

YAKAMA NATION FISHERIES
ENTIA UPPER STILLWATERS
HABITAT ENHANCEMENT PROJECT

 501 Portway Avenue, Suite 101
Hood River, OR 97031
543.386.9003
www.interfluve.com

COVER, SHEET INDEX AND
VICINITY MAP

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

WDFW IN-WATER WORK PERIODS

EXISTING DATA

SOILS

UTILITIES

CONSTRUCTION STAKING

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

CONSTRUCTION MATERIALS

CONSTRUCTION ACCESS/TRAFFIC CONTROL

CONSTRUCTION ACCESS/TRAFFIC CONTROL CONTINUED

EROSION CONTROL

EROSION/SEDIMENTATION CONTROL PLAN

EXPIRES:

[illegible]

<u>LK</u> DRAWN	<u>GJ, DM</u> DESIGNED	<u>GJ, DM</u> CHECKED
<u>DM</u> APPROVED	<u>6/29/15</u> DATE	<u>140205</u> PROJECT

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GENERAL NOTES

SHEET

2 OF 12

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 THREE 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 STOCK PILES MUST BE STABILIZED AND PROTECTED WITH SEDIMENT TRAPPING MEASURES. HYDROSEED ALL DISTURBED AREAS AS SOON AS PRACTICAL NOT INDICATED IN THE CONTRACT DOCUMENTS FOR OTHER PERMANENT STABILIZATION MEASURES.

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 (BPMs) 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 IF IN COMPLIANCE WITH ENVIRONMENTAL PERMITS AND REGULATIONS.

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.

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. (SEE CONSTRUCTION DEWATERING).

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

CONSTRUCTION DEWATERING

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

FISH RESCUE

ALL FISH RESCUE EFFORTS SHALL BE SUPERVISED BY A YAKAMA NATION FISHERIES/AQUATIC BIOLOGIST EXPERIENCED WITH THE COLLECTION AND HANDLING OF SALMONID FISHES 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 INTO NEARBY SIMILAR WETLAND OR WENATCHEE RIVER SURFACE WATER.

TREE SALVAGE

ALL TREES AND SLASH REMOVED FOR CONSTRUCTION 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 OR LOG FLOODPLAIN ROUGHNESS, SEE SHEET 9. 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 THE STREAM CONSTRUCTION AS DIRECTED BY OWNER'S REPRESENTATIVE.

LIVE TREES

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

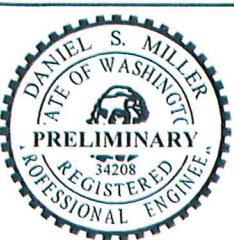
KEEP OUT OF DRIP LINE OF EXISTING TREES TO REMAIN.

ABBREVIATIONS:

APPROX	APPROXIMATE
DBH	DIAMETER AT BREAST HEIGHT
E	EAST
N	NORTH
NTS	NOT TO SCALE
RD	ROAD
RM	RIVER MILE
S	SOUTH
TBD	TO BE DETERMINED
TYP	TYPICAL
W	WEST

NOTE:
ESTIMATED MATERIAL VOLUMES ARE APPROXIMATE IN-PLACE QUANTITY 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.

Location	Item	Quantity	Units
Signal Peak			
Side channel			
	excavation	395	cy
	logs with rootwads	16	ea
	logs without rootwads	12	ea
	piles	18	ea
Side channel inlet jam			
	excavation	650	cy
	fill	550	cy
	logs with rootwads	30	ea
	logs without rootwads	15	ea
	piles	14	ea
Site A - riprap enhancement & jams			
	excavation	0	cy
	riprap enhancement logs with boulders	55	ea
	logs with rootwads	14	ea
	logs without rootwads	6	ea
	bumper log units	3	ea
	boulders	34	ea
	piles	12	ea
Site A - island log jam			
	excavation	325	cy
	fill	300	cy
	logs with rootwads	7	ea
	logs without rootwads	3	ea
	piles	8	ea
Site B - riprap enhancement			
	excavation	0	cy
	riprap enhancement logs with boulders	36	ea
	bumper log units	4	ea
	piles	0	ea
Upper Burns			
Riprap enhancement			
	excavation	0	cy
	riprap enhancement logs with boulders	27	ea
	bumper log units	3	ea
	piles	0	ea
Margin wood (3 structures)			
	excavation	560	cy
	logs with rootwads	12	ea
	logs without rootwads	9	ea
	piles	12	ea



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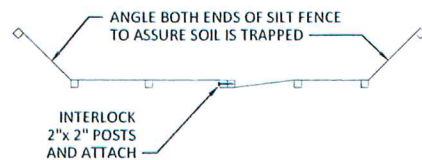
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ENTIAT UPPER STILLWATERS
HABITAT ENHANCEMENT PROJECT

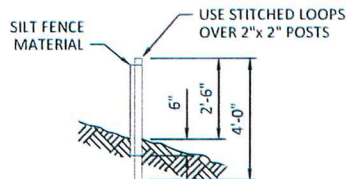


GENERAL NOTES, ESTIMATED
QUANTITIES TABLE AND
ABBREVIATIONS LIST

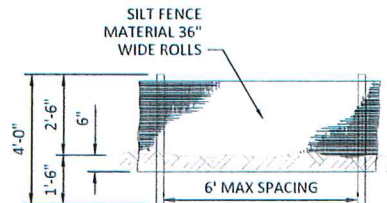
SHEET
3 OF 12



TOP VIEW
NTS



SIDE VIEW
NTS

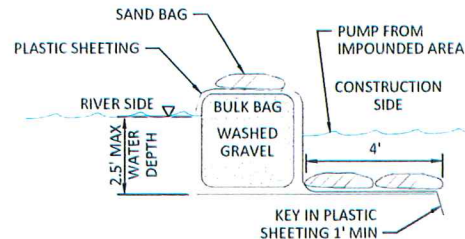


FRONT VIEW
NTS

SILT FENCES GENERAL NOTES:

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 SPICED 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.

1
4
TYPICAL DETAIL - SILT FENCE
NTS

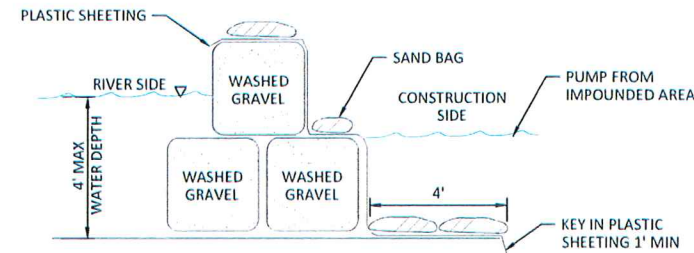


TEMPORARY COFFERDAM SECTION IN
WATER DEPTHS LESS THAN 2.5'
NTS

BULK BAG GENERAL NOTES:

1. BULK BAG COFFERDAM SHALL BE CONSTRUCTED OF SEVERAL UNITS OF BULK BAGS FILLED WITH 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 MINIMUM 4-Feet FROM TOE OF COFFERDAM. THE DRAPED PORTION OF PLASTIC SHEETING SHALL BE PINNED TO THE CHANNEL BED BY MINIMUM TWO ROWS OF STANDARD SANDBAGS.
4. THE CONSTRUCTION SIDE EDGE OF PLASTIC SHEETING SHALL BE TOED INTO THE CHANNEL BED MINIMUM 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.

2
4
TYPICAL DETAIL - BULK BAG COFFERDAM
NTS



TEMPORARY COFFERDAM SECTION IN
WATER DEPTHS GREATER THAN 2.5'
NTS

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 AFTER CONSTRUCTION IS COMPLETED AND TURBIDITY HAS BEEN REMOVED. WASHED GRAVEL SHALL BE REMOVED FROM SITE UNLESS OTHERWISE DIRECTED BY OWNER.
9. 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.
10. 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.



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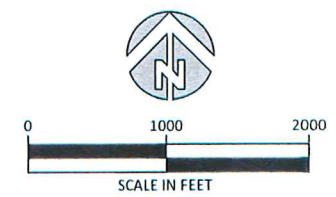
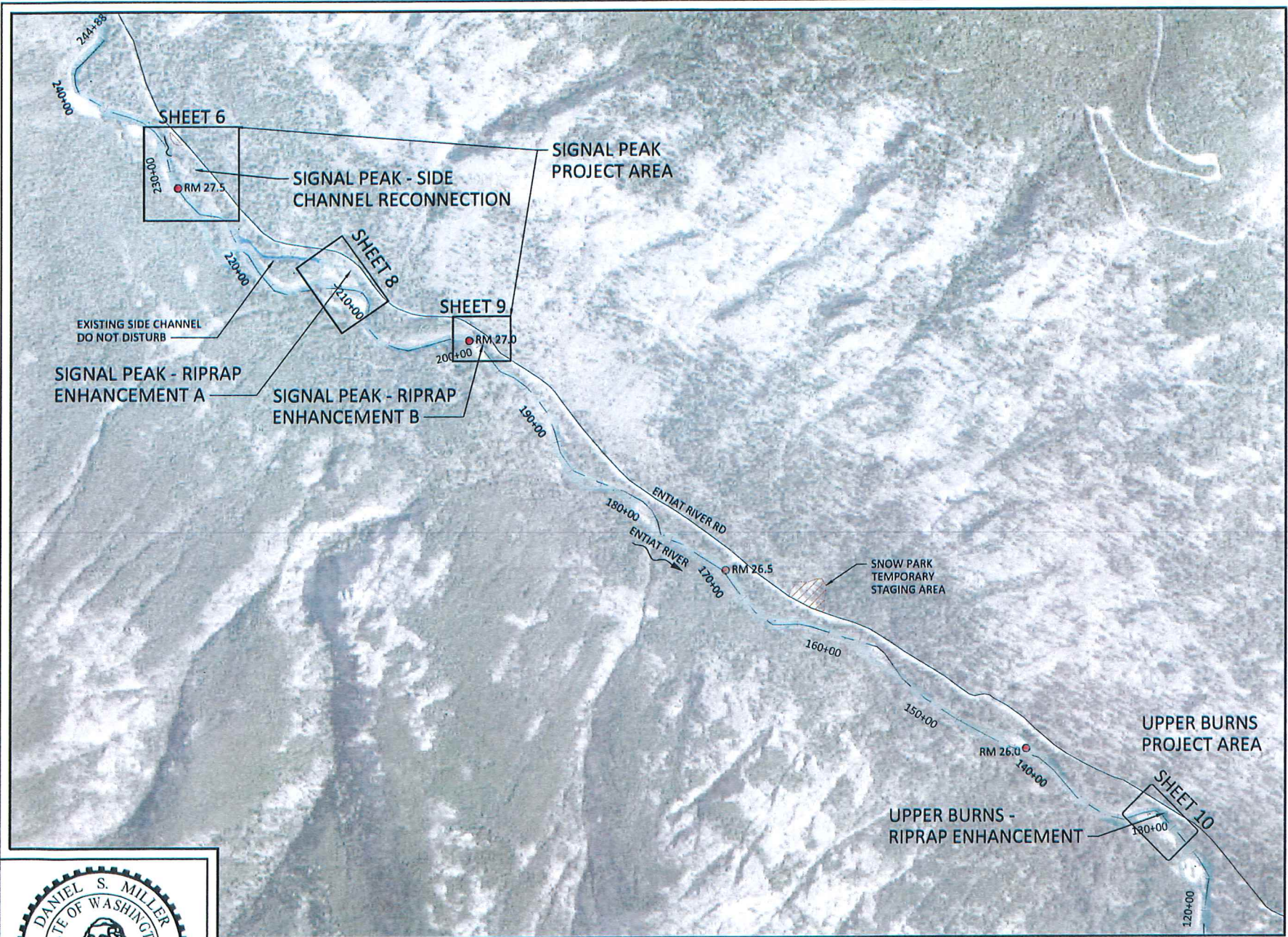
YAKAMA NATION FISHERIES
ENTIAT UPPER STILLWATERS
HABITAT ENHANCEMENT PROJECT



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EROSION CONTROL AND
COFFERDAM DETAILS

SHEET
4 OF 12



LEGEND

- RM 28 RIVER MILE MARKER
- 160+00 ENTIAT RIVER STATIONS
- EXISTING ENTIAT RIVER CHANNEL
- EXISTING ENTIAT SIDE CHANNEL
- ▨ TEMPORARY CONSTRUCTION STAGING

NOTE:

PRESTON PIT STOCKPILE AREA 2.4 MILES SE OF SNOW PARK TEMPORARY STAGING AREA.

Preliminary
Not for Construction

PLAN VIEW



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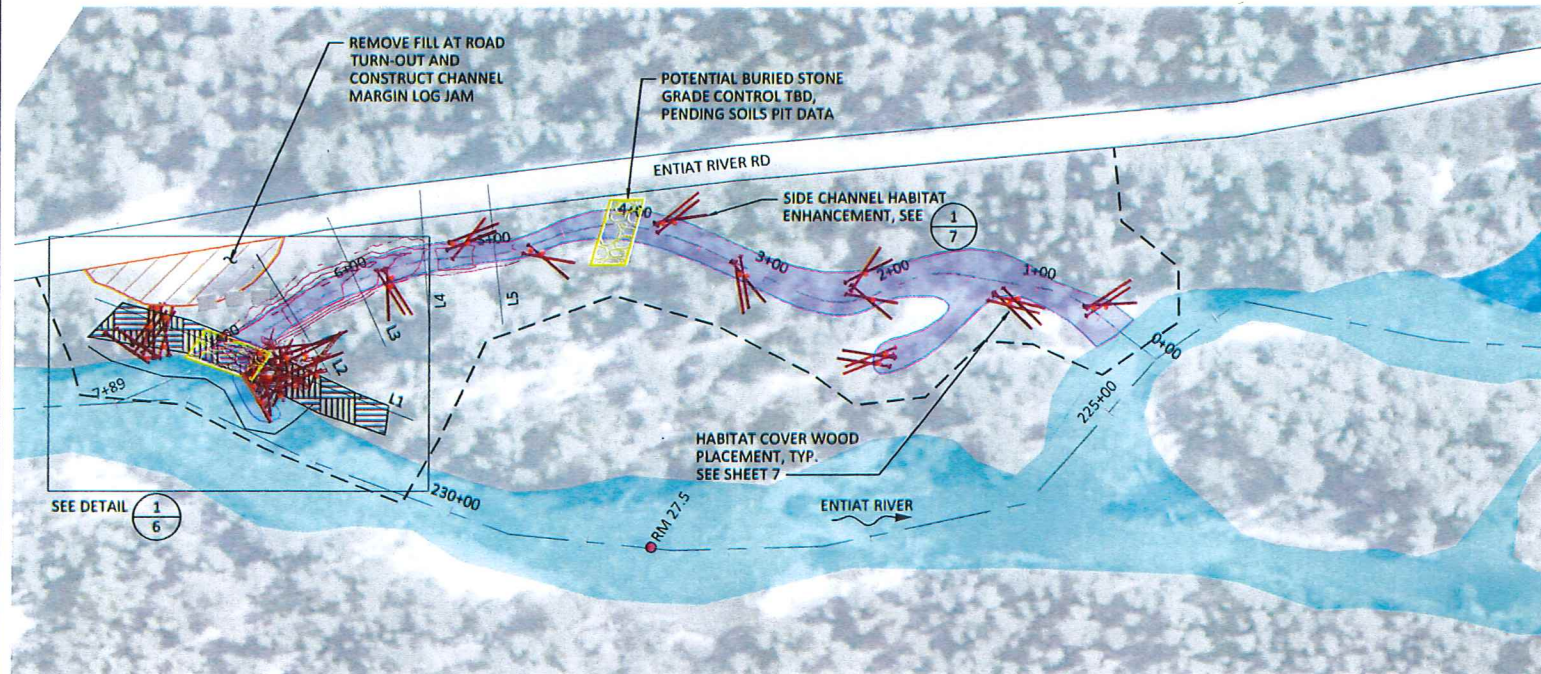
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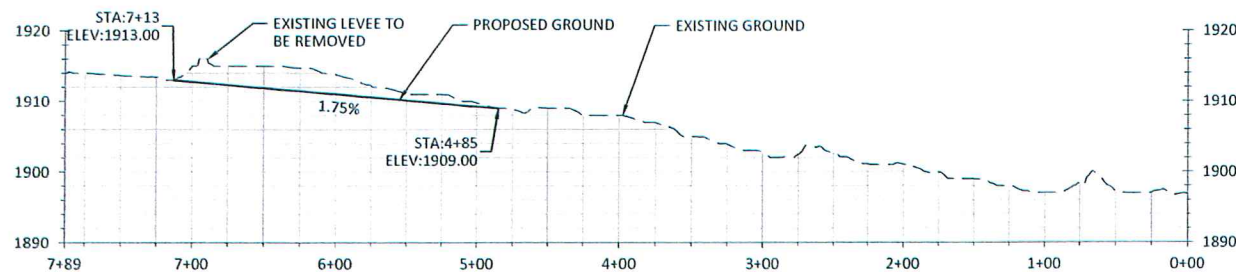
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SITE OVERVIEW AND SHEET
KEY

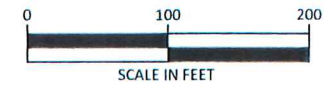
SHEET
5 OF 12



PLAN VIEW

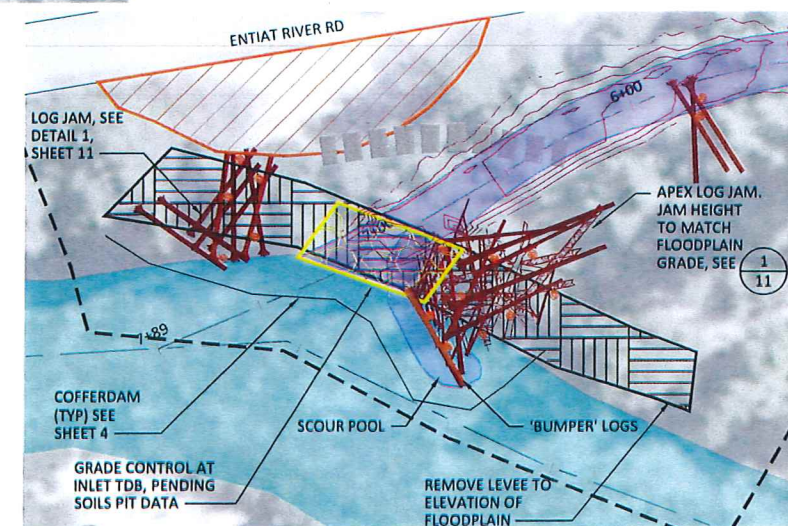


PROFILE VIEW

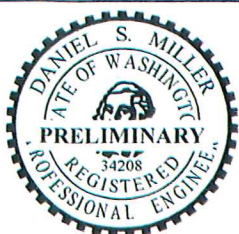


LEGEND

- RM 28 RIVER MILE MARKER
- 160+00 ENTIAT RIVER STATIONS
- LIMITS OF DISTURBANCE
- L1 SIDE CHANNEL CROSS SECTION, SEE (2/7)
- COFFERDAM
- PROPOSED CONTOURS (1 FT)
- EXISTING ENTIAT RIVER CHANNEL
- PROPOSED ENTIAT SIDE CHANNEL
- EXISTING LEVEE TO BE REMOVED
- TEMPORARY CONSTRUCTION STAGING
- TEMPORARY CONSTRUCTION ACCESS
- POTENTIAL GRADE CONTROL
- LARGE WOOD PLACEMENT
- PILING



(1/6) ENLARGED DETAIL - SIDE CHANNEL INLET
1"=50'



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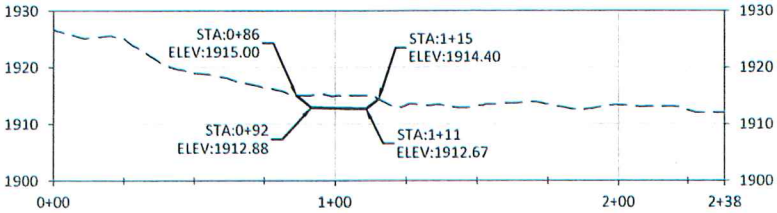
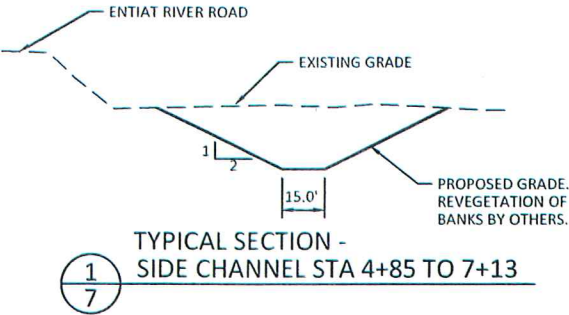
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SIGNAL PEAK SIDE CHANNEL
RECONNECTION

SHEET
6 OF 12

Preliminary
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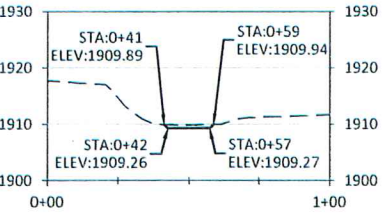
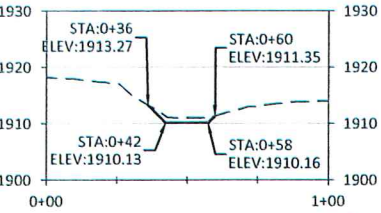
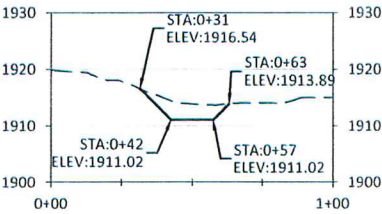
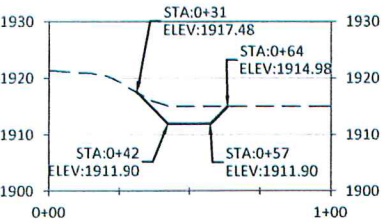
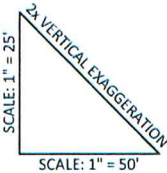
SIDE CHANNEL CROSS SECTIONS			
LINE #	DIRECTION (LEFT TO RIGHT LOOKING DOWNSTREAM)	START POINT	END POINT
L1	S12° 28' 03.54"E	N=335645.11, E=1720678.77	N=335412.73, E=1720730.15
L2	S25° 13' 40.50"W	N=335569.29, E=1720766.82	N=335478.83, E=1720724.19
L3	S32° 14' 57.30"W	N=335542.38, E=1720815.96	N=335457.81, E=1720762.60
L4	S52° 21' 36.55"W	N=335499.45, E=1720867.73	N=335438.38, E=1720788.54
L5	S50° 06' 08.39"W	N=335461.93, E=1720897.70	N=335397.78, E=1720820.98



LEGEND

— PROPOSED GRADE
- - - EXISTING GRADE

NOTE:
SECTION ORIENTATION IS LEFT TO
RIGHT LOOKING DOWNSTREAM



2/7 SIDE CHANNEL CROSS SECTIONS

DANIEL S. MILLER

STATE OF WASHINGTON

PRELIMINARY

34208

REGISTERED

PROFESSIONAL ENGINEER

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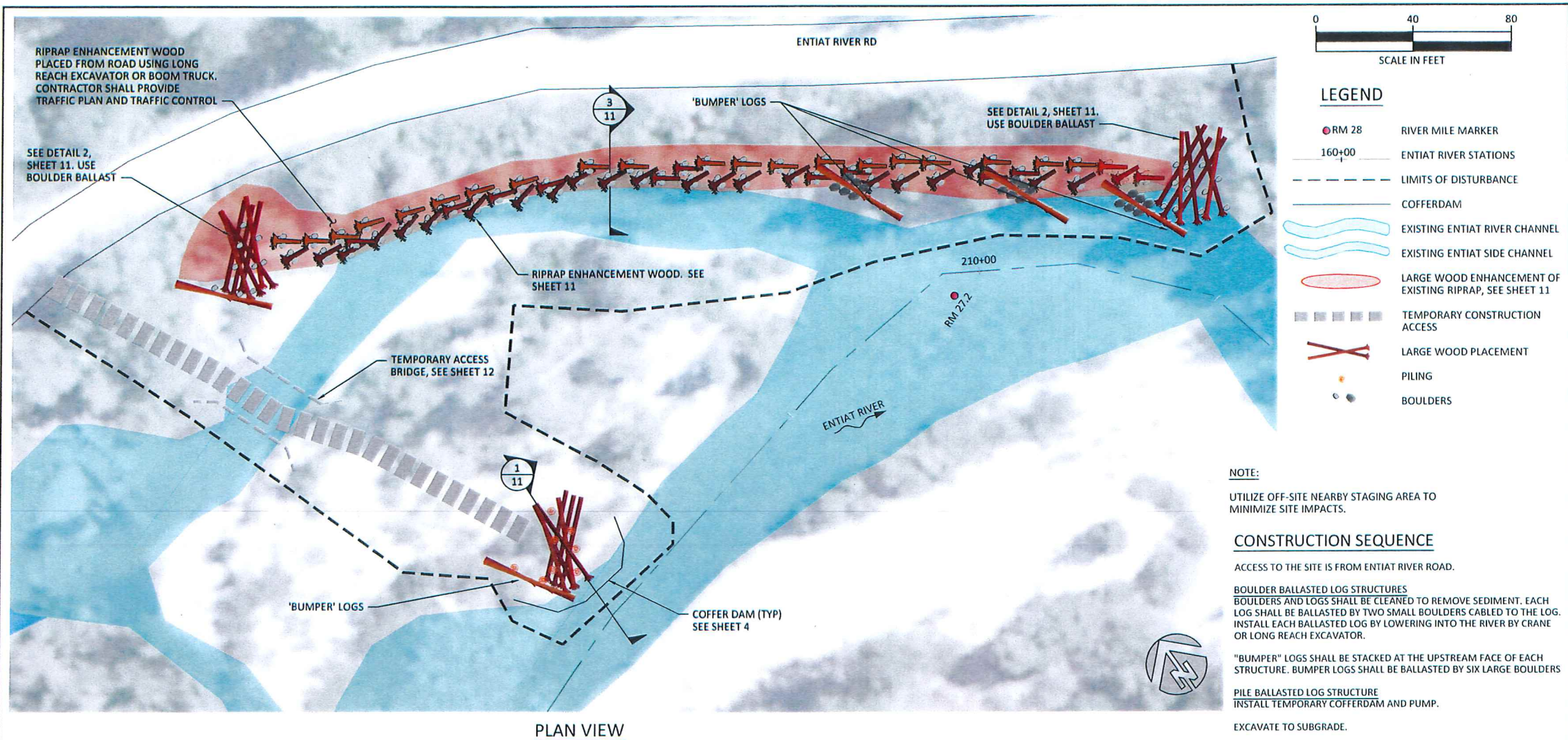
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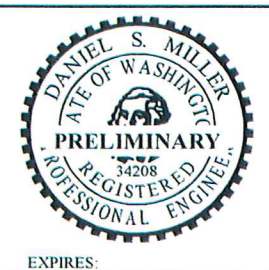
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SIGNAL PEAK SIDE CHANNEL
TYPICAL DETAIL AND SECTIONS

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PLAN VIEW



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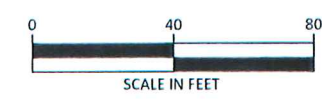
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DRAWN	DESIGNED	CHECKED
DM	6/29/15	140205
APPROVED	DATE	PROJECT

YAKAMA NATION FISHERIES
ENTIAT UPPER STILLWATERS
HABITAT ENHANCEMENT PROJECT

Preliminary
Not for Construction



SIGNAL PEAK RIPRAP
ENHANCEMENT SITE A



LEGEND

- RM 28 RIVER MILE MARKER
- 160+00 ENTIAI RIVER STATIONS
- - - LIMITS OF DISTURBANCE
- EXISTING ENTIAI RIVER CHANNEL
- LARGE WOOD ENHANCEMENT OF EXISTING RIPRAP, SEE SHEET 11
- TEMPORARY CONSTRUCTION ACCESS
- LARGE WOOD PLACEMENT
- BOULDERS

NOTE:

UTILIZE OFF-SITE NEARBY STAGING AREA TO MINIMIZE SITE IMPACTS.

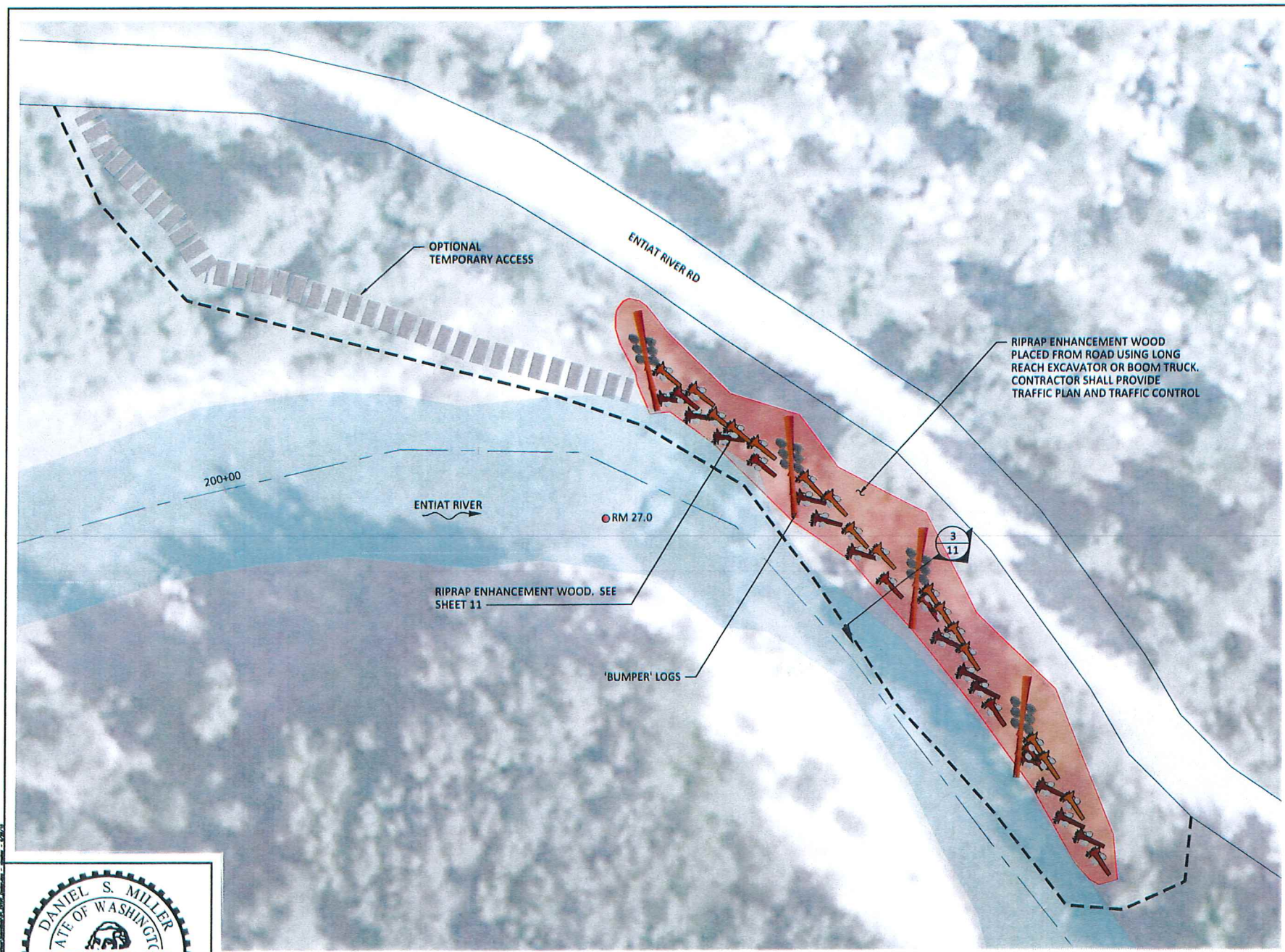
CONSTRUCTION SEQUENCE NOTES:

ACCESS TO THE SITE IS FROM ENTIAI RIVER ROAD.

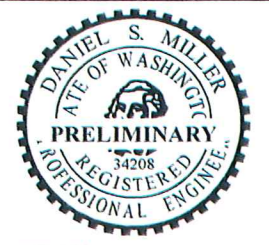
RIPRAP ENHANCEMENT LOGS (SEE SHEET 11)
CONSTRUCTION SHALL OCCUR FROM THE TOP OF A RIPRAP ROAD EMBANKMENT. BOULDERS AND LOGS SHALL BE CLEANED TO REMOVE SEDIMENT. EACH LOG SHALL BE BALLASTED BY TWO 32in BOULDERS CABLED TO THE 15-18in DBH X 12ft LONG LOG. INSTALL EACH BALLASTED LOG BY LOWERING INTO THE RIVER BY BOOM TRUCK, CRANE OR LONG REACH EXCAVATOR.

'BUMPER' LOGS SHALL BE STACKED AS SHOWN AND ANGLED DOWNSTREAM. BUMPER LOGS SHALL BE 18in DBH, 30ft LONG, DIAMETER BALLASTED BY SIX 3ft DIAM BOULDERS.

Preliminary
Not for Construction



PLAN VIEW



EXPIRES:

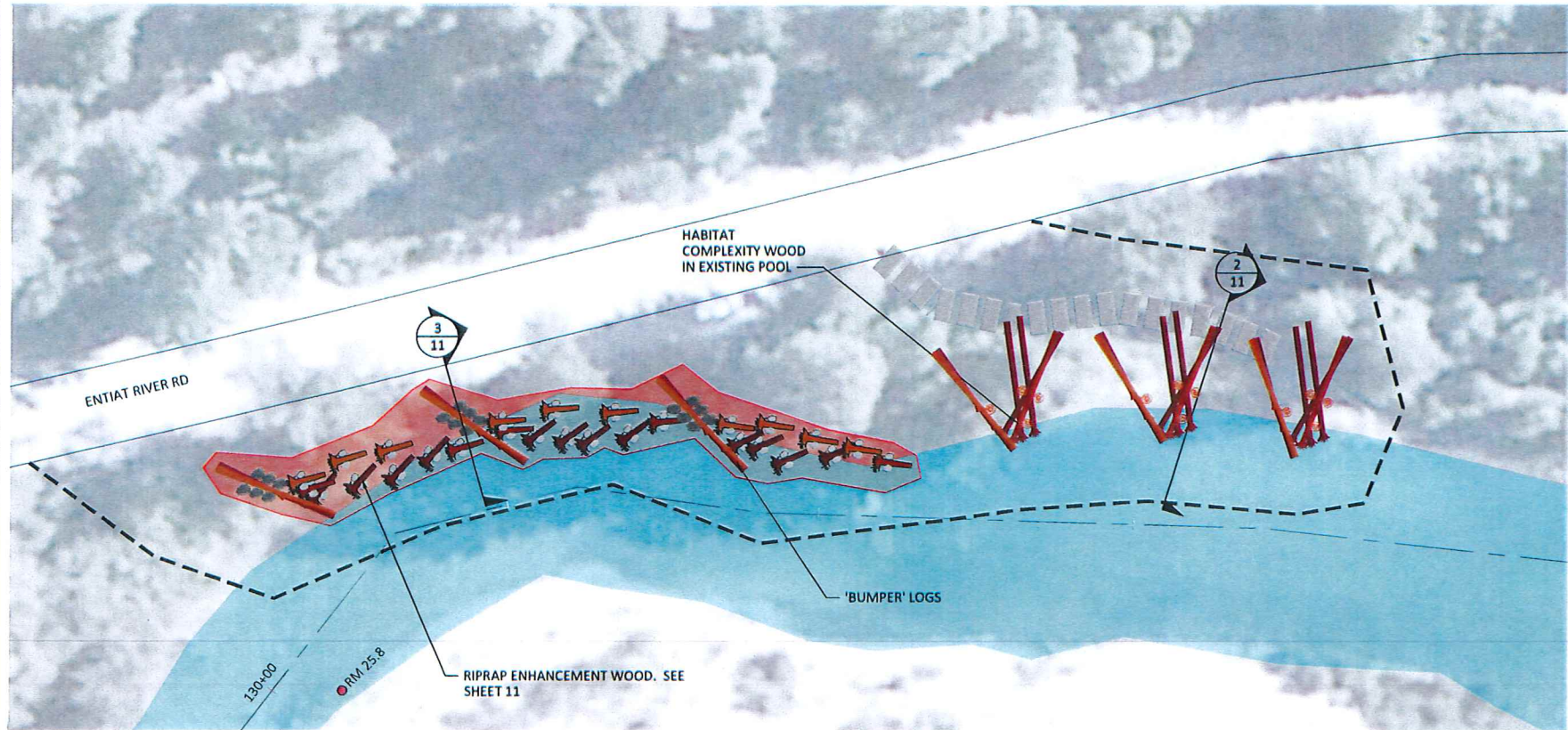
NO.	BY	DATE	REVISION DESCRIPTION

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DM	6/29/15	140205
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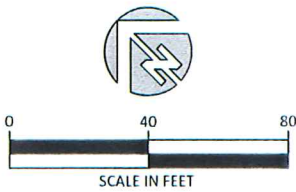
YAKAMA NATION FISHERIES
ENTIAI UPPER STILLWATERS
HABITAT ENHANCEMENT PROJECT



SIGNAL PEAK RIPRAP
ENHANCEMENT SITE B



PLAN VIEW



LEGEND

- RM 28 RIVER MILE MARKER
- 160+00 ENTIAT RIVER STATIONS
- - - LIMITS OF DISTURBANCE
- EXISTING ENTIAT RIVER CHANNEL
- LARGE WOOD ENHANCEMENT OF EXISTING RIPRAP, SEE SHEET 9
- TEMPORARY CONSTRUCTION ACCESS
- LARGE WOOD PLACEMENT
- PILING
- BOULDERS

NOTE:

UTILIZE OFF-SITE NEARBY STAGING AREA TO MINIMIZE SITE IMPACTS.

CONSTRUCTION SEQUENCE NOTES:

ACCESS TO THE SITE IS FROM ENTIAT RIVER ROAD.

RIPRAP ENHANCEMENT LOGS (SEE SHEET 11)
CONSTRUCTION SHALL OCCUR FROM THE TOP OF A RIPRAP ROAD EMBANKMENT. BOULDERS AND LOGS SHALL BE CLEANED TO REMOVE SEDIMENT. EACH LOG SHALL BE BALLASTED BY TWO 32in BOULDERS CABLED TO THE 15-18in DBH X 12ft LONG LOG. INSTALL EACH BALLASTED LOG BY LOWERING INTO THE RIVER BY BOOM TRUCK, CRANE OR LONG REACH EXCAVATOR.

'BUMPER' LOGS SHALL BE STACKED AS SHOWN AND ANGLED DOWNSTREAM. BUMPER LOGS SHALL BE 18in DBH, 30ft LONG, DIAMETER BALLASTED BY SIX 3ft DIAM BOULDERS.

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EXPIRES:

NO.	BY	DATE	REVISION DESCRIPTION

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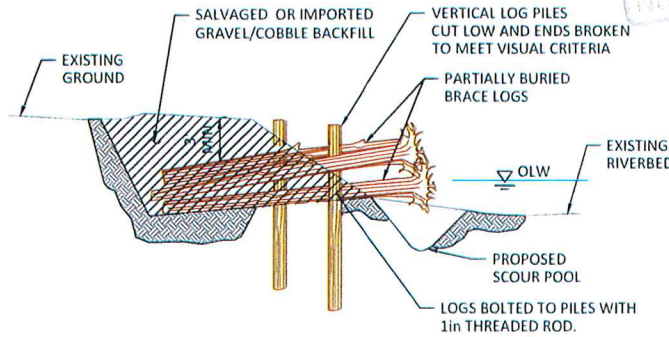
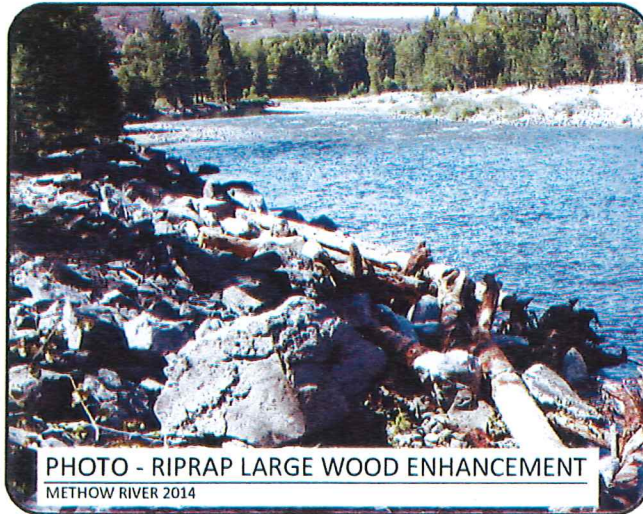
YAKAMA NATION FISHERIES
ENTIAT UPPER STILLWATERS
HABITAT ENHANCEMENT PROJECT



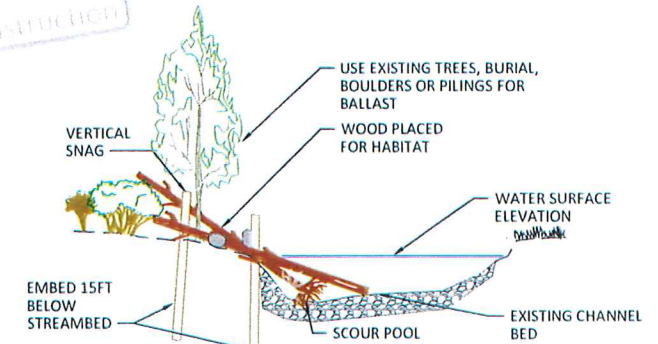
501 Fortway Avenue, Suite 101
Hood River, OR 97031
541 386-9603
www.interfluve.com

UPPER BURNS RIPRAP
ENHANCEMENT AND LOG
JAMS

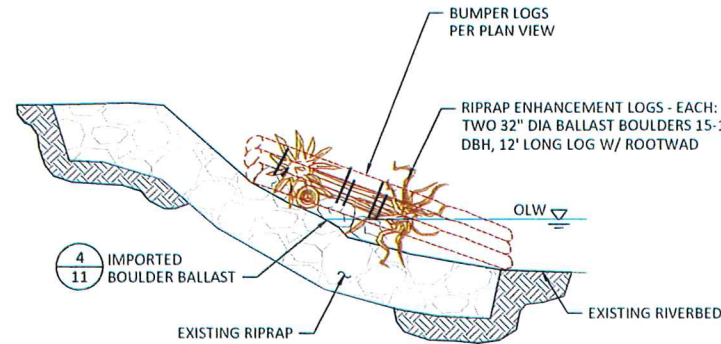
SHEET
10 OF 12



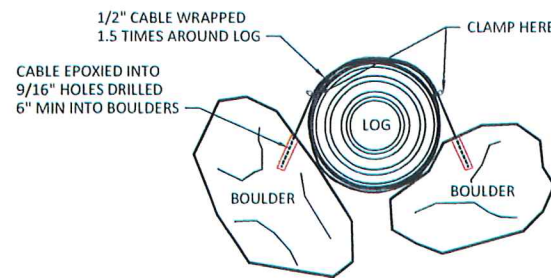
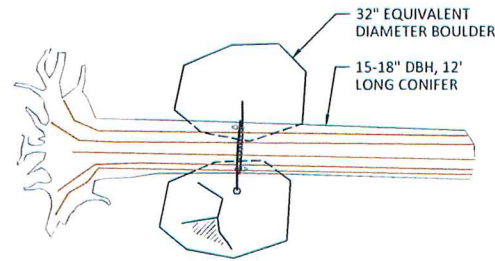
1 SECTION - PILE AND BURIAL BALLASTED STRUCTURE
11 NOT TO SCALE



2 SECTION - HABITAT COMPLEXITY LOG JAM
11 NOT TO SCALE



3 SECTION - RIPRAP LARGE WOOD ENHANCEMENT
11 NOT TO SCALE



4 BOULDER BALLAST DETAIL
11 NOT TO SCALE

DESCRIPTION
THIS WORK CONSISTS OF INSTALLING LOGS WITH ROOT WADS INTO ANCHORED LOG STRUCTURES AS SHOWN ON THE PLANS AND AS DIRECTED BY THE OWNERS REPRESENTATIVE.

MATERIALS
ANCHORS FOR THIS WORK WILL CONSIST OF CABLED BOULDERS. BOULDERS SHALL BE NON-FRACTURED BASALT WITH A MINIMUM SPECIFIC GRAVITY OF 2.65.

CABLE SHALL BE 3/4" GALVANIZED, STEEL CORE WIRE ROPE.

CLAMPS SHALL BE CROSBY CLIPS, G-450, OR APPROVED EQUAL. MINIMUM OF 2 CLAMPS PER ANCHOR POINT.

EPOXY FOR ANCHORING SHALL BE HILTI HIT RE 500 ADHESIVE OR APPROVED EQUAL.

CONSTRUCTION
FINAL POSITIONING OF THE ANCHORED LOG STRUCTURES SHALL BE IN THE APPROXIMATE LOCATION AS SHOWN ON THE PLANS AND AS APPROVED IN THE FIELD BY THE OWNERS REPRESENTATIVE.

BALLAST BOULDERS SHALL BE SECURED AS SHOWN ON THE PLANS.

DRILL HOLES IN SOLID ROCK AND AVOID ANY CRACKS OR FRACTURES. HOLES SHALL BE 9/16 INCH IN DIAMETER. HOLES MUST BE DRILLED 6 INCHES, MINIMUM, INTO ROCK. HOLES MUST BE CLEANED OF LOOSE ROCK FRAGMENTS AND POWDER WITH A BRUSH AND WATER. HOLES MUST BE CLEAN OF ALL DUST, DEBRIS, OIL, AND SOAP RESIDUES. THE HOLES MUST FLUSH CLEAR TO INSURE NO MATERIAL EXISTS BETWEEN THE CABLE, EPOXY, AND ROCK SURFACE. INSTALL EPOXY PER MANUFACTURER'S RECOMMENDATIONS.

CABLE SHALL BE WRAPPED 1.5 TIMES AROUND LOG BEFORE ENDS ARE INSERTED INTO THE DRILLED HOLES FILLED WITH EPOXY. WIPE CABLE WITH CLEAN ACETONE SOAKED RAG TO REMOVE OILS AND GREASES PRIOR TO INSERTION INTO EPOXY FILLED HOLE. FILL DRILL HOLES ENOUGH TO ENSURE COMPLETE COVERAGE WITH EPOXY. INSERT CABLE INTO HOLE SO THAT END OF CABLE HITS THE BOTTOM OF THE HOLE. EXCESS EPOXY SHOULD COME OUT OF THE TOP OF THE HOLE AS CABLE IS SEATED IN DRILL HOLE.

CLAMPS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATION, SPACING AND CLAMP SIZE FOR THE SIZE AND LOAD RATING OF THE CABLE BEING USED.



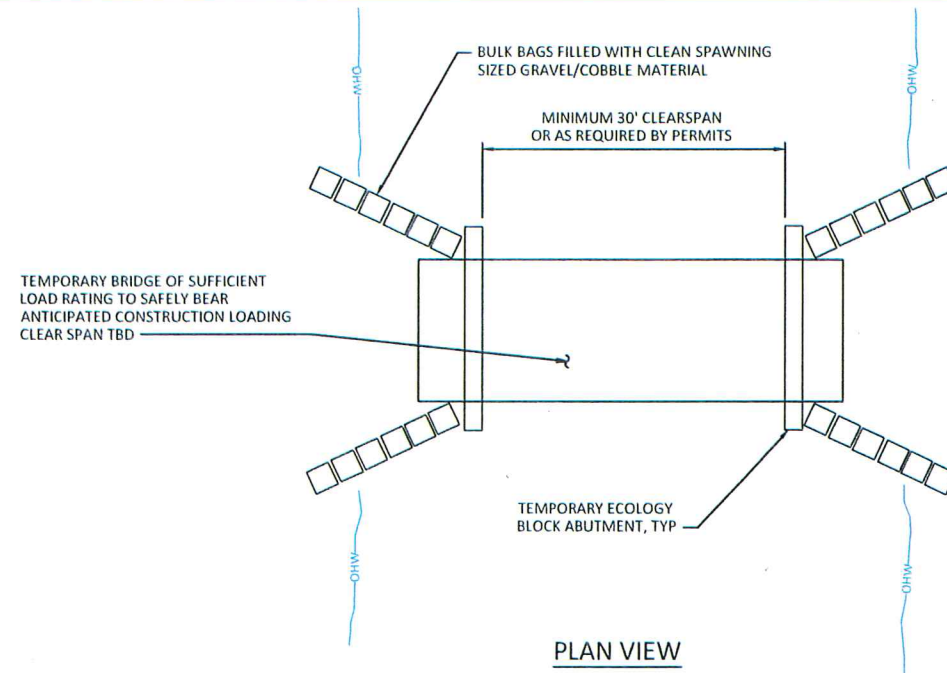
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YAKAMA NATION FISHERIES
ENTIAI UPPER STILLWATERS
HABITAT ENHANCEMENT PROJECT

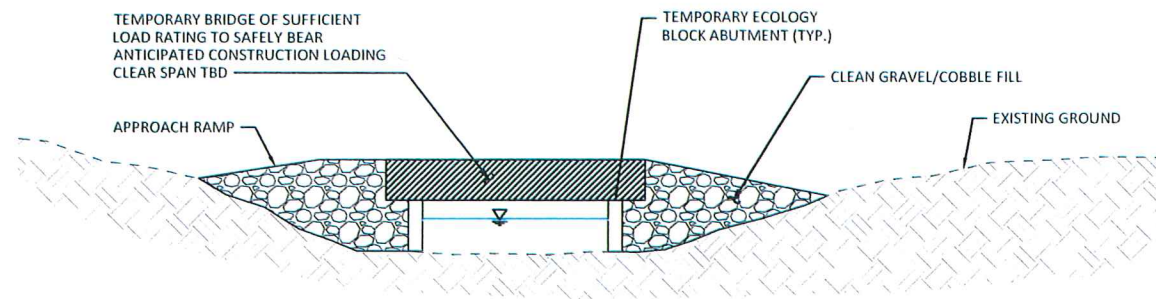


RIPRAP ENHANCEMENT AND
LOG JAM DETAILS



PLAN VIEW

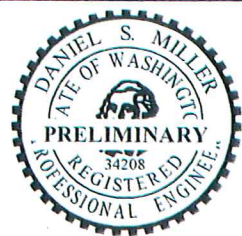
NOTE:
TEMPORARY BRIDGE, ECOLOGY
BLOCK ABUTMENTS, CLEAN
GRAVEL/COBBLE FILL AND BULK
BAGS SHALL BE REMOVED AT
PROJECT COMPLETION AND SITE
RESTORED TO PRE-PROJECT GRADE
AND CONDITIONS.



SECTION VIEW

Preliminary
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1
12 TEMPORARY BRIDGE CROSSING
NOT TO SCALE



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YAKAMA NATION FISHERIES
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TEMPORARY ACCESS BRIDGE
TYPICAL DETAILS

SHEET
12 OF 12