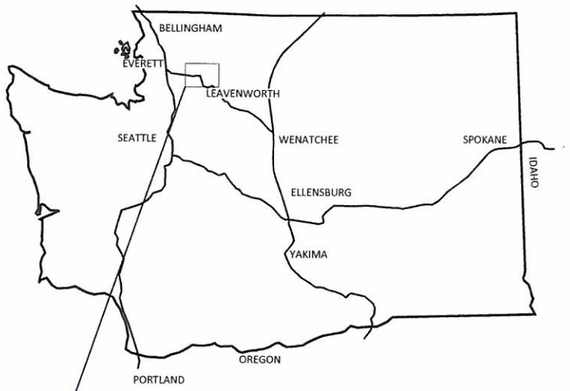
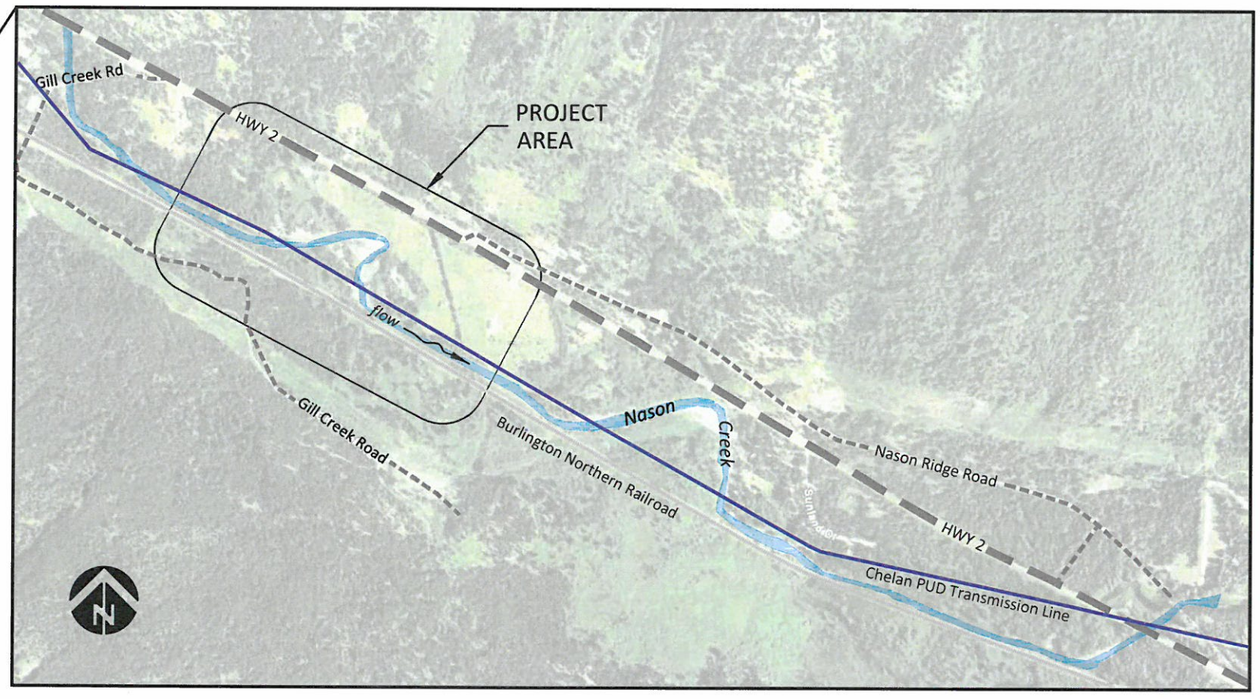
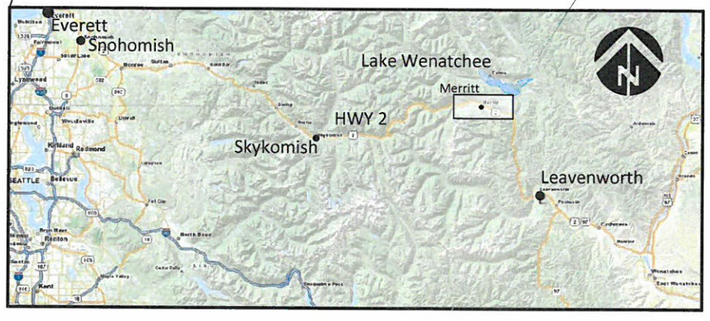
Nason Creek - Lower White Pine Reach Channel and Habitat Enhancement

Chelan County, Washington *March 19, 2013*



STATE OF WASHINGTON





VICINITY MAP

SHEET INDEX

SITE MAP

SITE LOCATION:

LATITUDE: 47°46'39" NORTH
LONGITUDE: 120°49'42" WEST
CHELAN COUNTY, WASHINGTON

WATERBODY: NASON CREEK
TRIBUTARY TO: WENATCHEE RIVER

DANIEL S. MILLER
STATE OF WASHINGTON
34208
REGISTERED PROFESSIONAL ENGINEER
3-19-13

EXPIRES 11-23-13

NO.	BY	DATE	REVISION DESCRIPTION

MWJ	GJ,MB,DM	GJ,DM,MB,RG
DRAWN	DESIGNED	CHECKED
MB	3/19/2013	
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Confederated Tribes and Bands of the Yakama Nation
Nason Creek-Lower White Pine Reach

inter·fluve
1020 Wasco Street, Suite I
Hood River, OR 97031
541.386.9003
www.interfluve.com

COVER, SHEET INDEX AND VICINITY MAP

SHEET 1 OF 18

EXISTING DATA

GENERAL TOPOGRAPHIC INFORMATION IS PROVIDED FROM LIDAR AND SPECIFIC PROJECT AREA SURVEY PERFORMED BY INTER-FLUVE, INC. IN 2011. SURVEY IS BASED ON NAD27 WASHINGTON STATE PLANE, NORTH ZONE COORDINATE SYSTEM. VERTICAL DATUM IS NAVD 88.

SOILS

NASON CREEK GRAVEL AND ALLUVIAL SOILS. NO SOILS INVESTIGATION HAS BEEN CONDUCTED.

UTILITIES

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

THE CONTRACTOR SHALL IMMEDIATELY CONTACT THE AFFECTED UTILITY SERVICE TO REPORT ANY DAMAGED OR DESTROYED UTILITIES. THE CONTRACTOR SHALL PROVIDE EQUIPMENT OR LABOR TO AID THE AFFECTED UTILITY SERVICE IN REPAIRING DAMAGED OR DESTROYED UTILITIES AT NO COST TO THE OWNER.

CONSTRUCTION ACCESS

THE CONTRACTOR SHALL ENTER THE SITE FROM HIGHWAY 2.

THE CONTRACTOR SHALL UTILIZE EXISTING ROADS AND DRIVEWAYS TO ACCESS THE SITE.

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

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

FISH RESCUE

DEWATERING AND FISH RESCUE OPERATIONS WILL BE COMPLETED IN ACCORDANCE WITH THE PROTOCOL II- DEWATERING OUTSIDE HIGH LIKELIHOOD LISTED FISH AREAS METHODS DETAILED IN THE U.S. ARMY CORPS OF ENGINEERS RESTORATION PROGRAMMATIC PERMIT (NMFS REFERENCE NO. 2008/03598) AND/OR THE REQUIREMENTS OF RECEIVED PERMITS.

ALL FISH RESCUE EFFORTS SHALL BE SUPERVISED BY A YAKAMA NATION FISHERIES BIOLOGIST EXPERIENCED WITH THE COLLECTION AND HANDLING OF SALMONID FISHES FROM CONSTRUCTION SITES.

TREE SALVAGE

ANY REMOVED VEGETATION GREATER THAN 6 INCHES DIAMETER AND 15 FEET LONG SHALL BE INCORPORATED INTO LOG JAM STRUCTURES.

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

ALL TREES REMOVED WITHIN CLEARING LIMITS SHALL BE REMOVED WHOLE WITH ROOT WAD 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.

VIBRASONICALLY DRIVEN PILES

ALL VERTICAL PILES SHALL BE INSTALLED USING VIBRASONIC PILE DRIVING EQUIPMENT. INSTALLATION BY EXCAVATION OR HAMMERING SHALL NOT BE ALLOWED.

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

OCCUPATIONAL HEALTH AND SAFETY

CONSTRUCTION WORK AROUND RIVERS AND STREAMS PRESENTS A NUMBER OF WATER HAZARDS INCLUDING DEEP SWIFTLY MOVING WATER; STEEP, SLIPPERY AND UNSTABLE SLOPES; AND UNDERWATER OBSTACLES SUCH AS ROCKS, TREES AND DEBRIS. HAZARDS ASSOCIATED WITH GRADING, EXCAVATION, GRUBBING, CLEARING, CONSTRUCTION OF LARGE WOOD HABITATS AND ENGINEERED LOGJAMS ARE COMPOUNDED IN RIVER ENVIRONMENTS DUE TO LIMITED OPPORTUNITIES FOR DUCK AND COVER AND INCREASED RISK OF SLIPS, TRIPS, AND FALLS. IN ADDITION, LOGGING HAZARDS SUCH AS OVERHEAD SNAGS, TREE FELLING, BUCKING, YARDING, AND SKIDDING ACTIVITIES AND ASSOCIATED HEAVY EQUIPMENT USE IN CONFINED CONSTRUCTION AREAS, AND AT TIMES WITHIN ZONES OF POOR VISIBILITY CAUSED BY VEGETATION, WILL EXIST ON THIS PROJECT.

THE CONTRACTOR IS SOLELY RESPONSIBLE FOR SITE SAFETY AND AS SUCH NEEDS TO DETERMINE WHAT PRECAUTIONS NEED TO BE TAKEN TO AVOID INJURY FOR THE DURATION OF THE CONSTRUCTION PROJECT. IF AT ANYTIME THE CONTRACTOR SEES OR CONSIDERS A CONSTRUCTION TASK UNSAFE THEY ARE RESPONSIBLE FOR STOPPING THAT TASK UNTIL APPROPRIATE MEASURES ARE TAKEN TO ADDRESS THE HAZARD, OR THE END PRODUCT IS MODIFIED FOLLOWING DISCUSSION WITH THE OWNER'S REPRESENTATIVE TO COMPLETE IT SAFELY.

ENGINEERED LOG JAM RIVER OPERATIONS AND MAINTENANCE

THE ENGINEERED LOG JAMS IN THIS DESIGN SET ARE BALLASTED TO REMAIN ON SITE AND ORIENTED TO SHED DEBRIS HOWEVER, THE RIVERINE ENVIRONMENT IS CHAOTIC DURING FLOODING, AND UNFORESEEN ACCUMULATIONS OF WOOD CAN RAFT UP AGAINST CONSTRUCTED LOG JAMS CAUSING THEM TO SHIFT OR TAKE NEW SHAPE. AS NATIVE WOOD ACCUMULATES OR LARGE TREES RAM INTO ENGINEERED JAMS DURING FLOOD FLOWS, THEY CAN CAUSE THE ENGINEERED LOG JAM TO BECOME A GREATER HAZARD TO RIVER USERS OR BECOME AT GREATER RISK OF FAILURE. IT IS RECOMMENDED THAT IF A KNOWN JAM BECOMES A HAZARD TO RIVER USERS OR BECOMES DESTABILIZED THAT IT BE MAINTAINED AND MODIFIED TO MEET PREVIOUS DESIGN OBJECTIVES, ORIENTATIONS, AND STABILITY.

PERMIT COMPLIANCE

THE CONTRACTOR IS RESPONSIBLE FOR HAVING A COPY OF ALL FINAL PERMITS AT THE WORK SITE. ALL PERMIT REQUIREMENTS AND THEIR CORRECT IMPLEMENTATION ARE THE RESPONSIBILITY OF THE CONTRACTOR FOR THE DURATION OF THE CONSTRUCTION WORK. FAILURE TO UNDERSTAND OR CORRECTLY IMPLEMENT PERMIT REQUIREMENTS MAY SUBJECT THE CONTRACTOR TO STATE AND/OR FEDERAL FINES.

DANIEL S. MILLER
STATE OF WASHINGTON
34208
REGISTERED
PROFESSIONAL ENGINEER
3·19·13

EXPIRES 11·23·13

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GENERAL NOTES

CREEK DIVERSION

DIVERSION MAY BYPASS THE CREEK AROUND THE WHOLE PROJECT REACH OR PARTITION DIVERSIONS AROUND SMALLER WORK AREAS AT CONTRACTOR'S DISCRETION.

IN-CHANNEL WORK AREA(S) SHALL BE ISOLATED BY TEMPORARY COFFER DAMS OR DAMS INSTALLED UPSTREAM AND DOWNSTREAM OR AROUND WORK AREA(S).

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.

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 NASON CREEK, A 'DIRT-BAG' OR SEDIMENT RETENTION STRUCTURE MAY BE REQUIRED AS NECESSARY TO COMPLY WITH LAWS AND PERMIT REQUIREMENTS AT NO ADDITIONAL COST.

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.

ESTIMATE OF QUANTITIES

Item	units	Specification	Pilot Channel	Jam A	Jam B	Jam C	Jam D	Bank Regrade	Bar Roughness	Existing Log Jam	Beaver pond	subtotal
Excavation	cy		2810	1240	1310	880	1290	1000	--	--	--	8530
Salvaged gravel/cobble backfill	cy	gravel/cobble	--	890	1000	580	1060	--	--	--	--	3530
Log with rootwad	ea	18" dbh x 30' long	--	--	--	--	--	42	33	--	--	75
Bottom tier: log with rootwad	ea	24" dbh x 30' long	--	18	17	15	13	--	--	--	--	63
Middle tier: log without rootwad	ea	24" dbh x 30' long	--	13	13	11	9	--	--	--	--	46
Top tier: log with rootwad	ea	24" dbh x 30' long	--	12	11	9	12	--	--	--	--	44
Header logs	ea	18" dbh x 30' long	--	12	12	12	10	--	--	--	--	46
Vertical log snag	ea	18" dbh x 25' long	--	20	18	19	16	40	20	12	--	145
Boulders	ea	3.5-ft diameter	--	84	78	66	74	--	--	--	--	302
XL logs with rootwads	ea	36"dbh x 40' long	--	3	2	3	--	--	--	--	--	8
XL log ballast boulders	ea	5-ft diameter	--	12	8	12	--	--	--	--	--	32
Habitat cover logs (beaver pond)	ea	12-18" dbh x 15-30' long	--	--	--	--	--	--	--	--	60	60

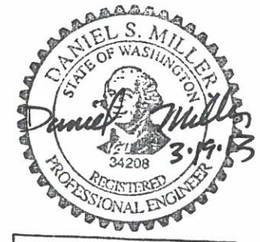
cy = cubic yards
ea - each

NOTES:
1. ALL MATERIALS QUANTITIES ESTIMATES ARE BASED ON IN-PLACE CONDITION DETERMINED BY A PRE-PROJECT CONDITION SURVEY COMPARED AGAINST A WITH-PROJECT CONDITION SURVEY.

2. CONTRACTOR SHALL ALLOW FOR BULKING OF EXCAVATED MATERIAL AND COMPACTION OF PLACED MATERIAL AT NO ADDITIONAL MEASURE OR COST.

3. MEASUREMENTS BY WEIGHT OR TRUCK MEASURE SHALL NOT BE ALLOWED WITHOUT PRIOR WRITTEN APPROVAL.

4. LOG JAM SALVAGED BACKFILL MATERIAL SHALL BE GRAVEL COBBLE FILL. SAND AND SILT SHALL NOT BE USED UNLESS DIRECTED OTHERWISE BY OWNER'S REPRESENTATIVE. JAM BACKFILL VOLUME ESTIMATE IS APPROXIMATE AND MAY VARY BASE ON FIELD INSTALLATION CONDITIONS.



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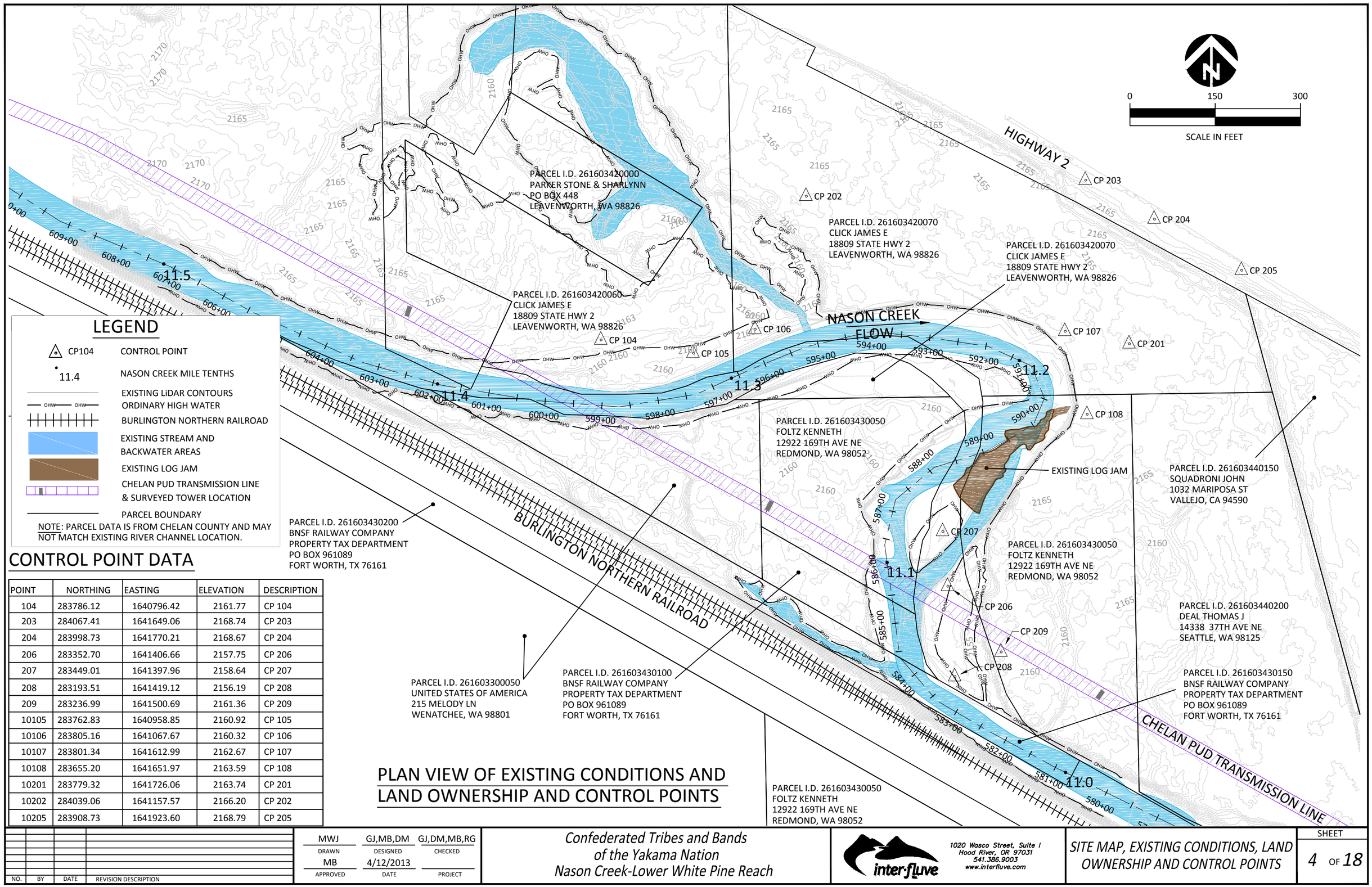
DIVERSION - DEWATERING NOTES AND QUANTITIES

SHEET 3 OF 18



LEGEND

- CP104 — CONTROL POINT
- 11.4 — NASON CREEK MILE TENTHS
- EXISTING LiDAR CONTOURS
- OHW OHW — ORDINARY HIGH WATER
- BURLINGTON NORTHERN RAILROAD
- EXISTING STREAM AND BACKWATER AREAS
- EXISTING LOG JAM
- CHELAN PUD TRANSMISSION LINE & SURVEYED TOWER LOCATION
- PARCEL BOUNDARY

NOTE: PARCEL DATA IS FROM CHELAN COUNTY AND MAY NOT MATCH EXISTING RIVER CHANNEL LOCATION.

CONTROL POINT DATA

POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
104	283786.12	1640796.42	2161.77	CP 104
203	284067.41	1641649.06	2168.74	CP 203
204	283998.73	1641770.21	2168.67	CP 204
206	283352.70	1641406.66	2157.75	CP 206
207	283449.01	1641397.96	2158.64	CP 207
208	283193.51	1641419.12	2156.19	CP 208
209	283236.99	1641500.69	2161.36	CP 209
10105	283762.83	1640958.85	2160.92	CP 105
10106	283805.16	1641067.67	2160.32	CP 106
10107	283801.34	1641612.99	2162.67	CP 107
10108	283655.20	1641651.97	2163.59	CP 108
10201	283779.32	1641726.06	2163.74	CP 201
10202	284039.06	1641157.57	2166.20	CP 202
10205	283908.73	1641923.60	2168.79	CP 205

PLAN VIEW OF EXISTING CONDITIONS AND LAND OWNERSHIP AND CONTROL POINTS

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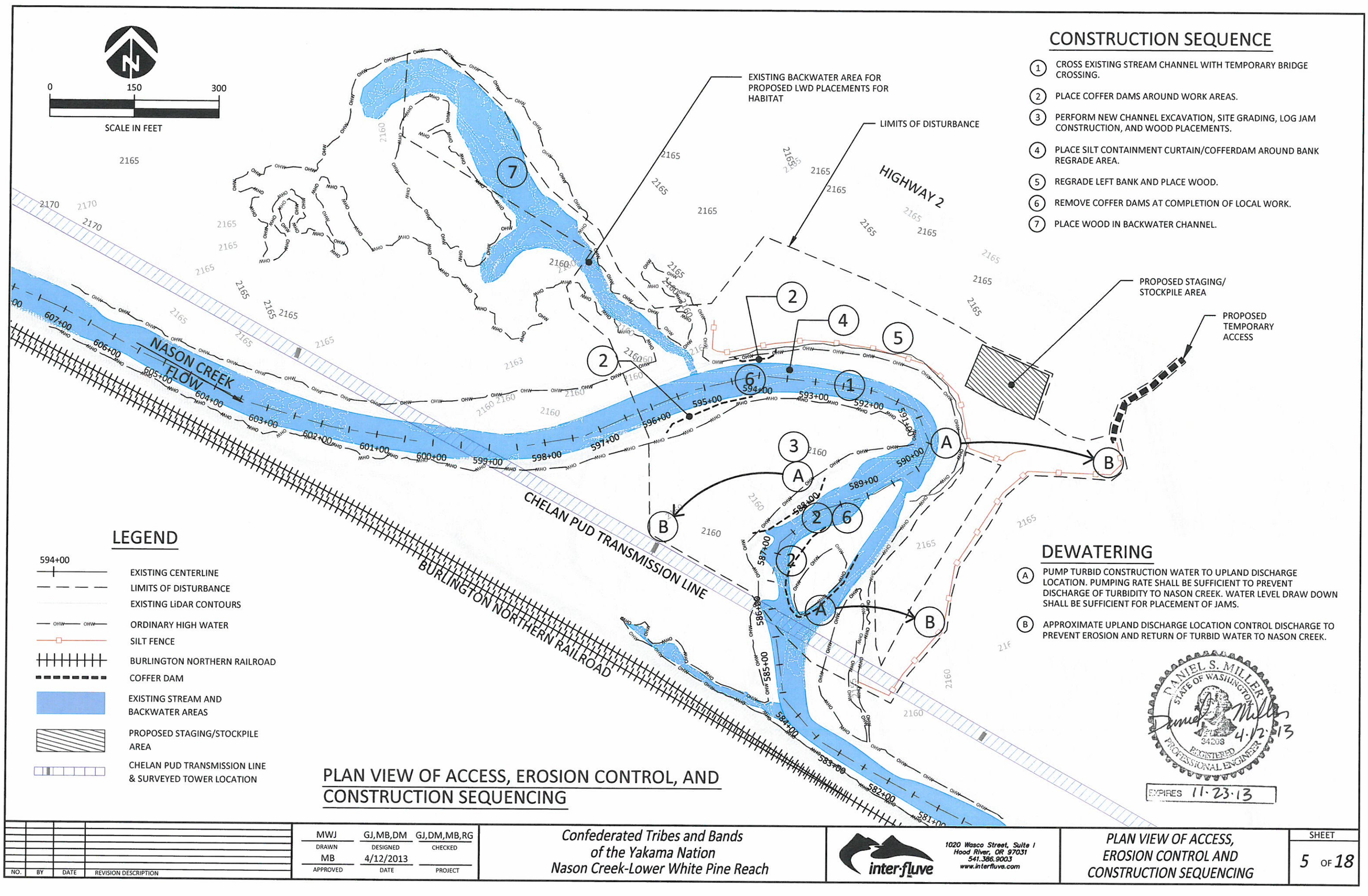
SITE MAP, EXISTING CONDITIONS, LAND OWNERSHIP AND CONTROL POINTS



CONSTRUCTION SEQUENCE

1. CROSS EXISTING STREAM CHANNEL WITH TEMPORARY BRIDGE CROSSING.
2. PLACE COFFER DAMS AROUND WORK AREAS.
3. PERFORM NEW CHANNEL EXCAVATION, SITE GRADING, LOG JAM CONSTRUCTION, AND WOOD PLACEMENTS.
4. PLACE SILT CONTAINMENT CURTAIN/COFFERDAM AROUND BANK REGRADE AREA.
5. REGRADE LEFT BANK AND PLACE WOOD.
6. REMOVE COFFER DAMS AT COMPLETION OF LOCAL WORK.
7. PLACE WOOD IN BACKWATER CHANNEL.

LEGEND

- 594+00 — EXISTING CENTERLINE
- LIMITS OF DISTURBANCE
- EXISTING LiDAR CONTOURS
- OHW — ORDINARY HIGH WATER
- SILT FENCE
- BURLINGTON NORTHERN RAILROAD
- COFFER DAM
- EXISTING STREAM AND BACKWATER AREAS
- PROPOSED STAGING/STOCKPILE AREA
- CHELAN PUD TRANSMISSION LINE & SURVEYED TOWER LOCATION

DEWATERING

(A) PUMP TURBID CONSTRUCTION WATER TO UPLAND DISCHARGE LOCATION. PUMPING RATE SHALL BE SUFFICIENT TO PREVENT DISCHARGE OF TURBIDITY TO NASON CREEK. WATER LEVEL DRAW DOWN SHALL BE SUFFICIENT FOR PLACEMENT OF JAMS.

(B) APPROXIMATE UPLAND DISCHARGE LOCATION CONTROL DISCHARGE TO PREVENT EROSION AND RETURN OF TURBID WATER TO NASON CREEK.

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4.12.13
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PLAN VIEW OF ACCESS, EROSION CONTROL, AND CONSTRUCTION SEQUENCING

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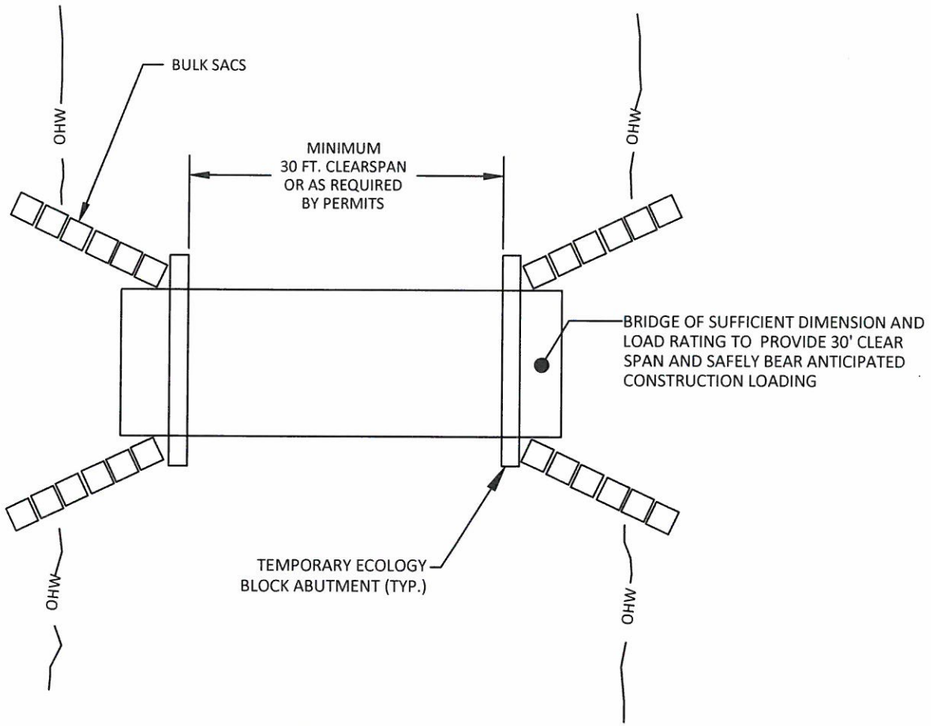
PLAN VIEW OF ACCESS, EROSION CONTROL AND CONSTRUCTION SEQUENCING

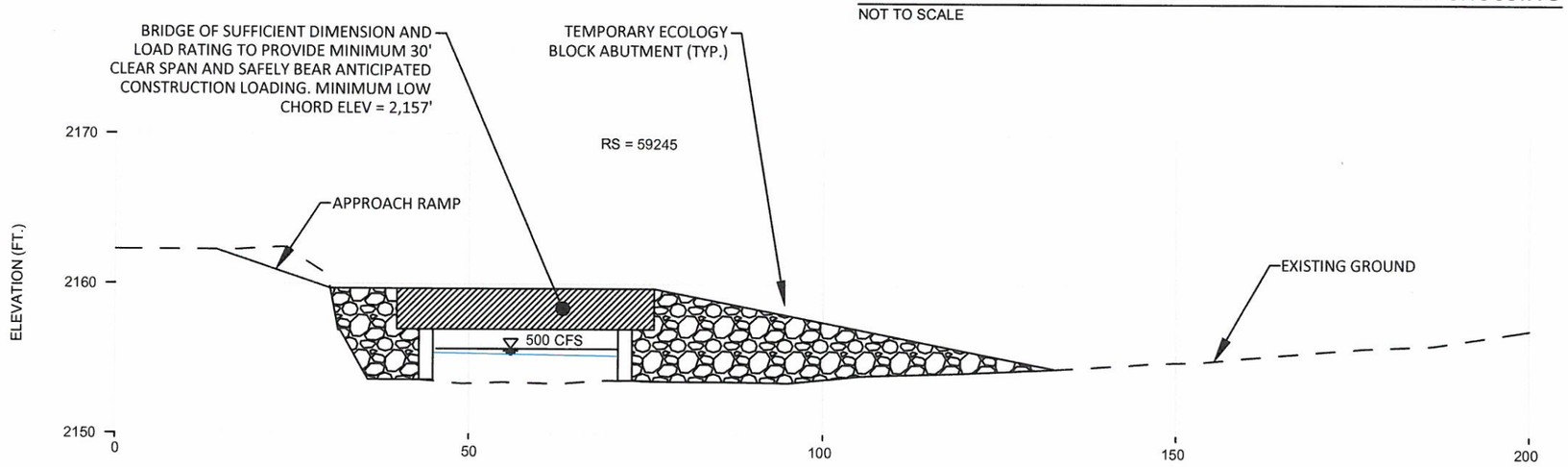
TEMPORARY ACCESS

CONTRACTOR SHALL PROVIDE, INSTALL, MAINTAIN AND REMOVE AT PROJECT COMPLETION TEMPORARY BRIDGE, ABUTMENTS, APPROACH EMBANKMENTS, ETC. AS NEEDED TO PROVIDE TEMPORARY CROSSING OF NASON CREEK.



PLAN VIEW - MODULAR BRIDGE TEMPORARY RIVER CROSSING

NOT TO SCALE



CROSS SECTION - MODULAR BRIDGE TEMPORARY RIVER CROSSING

NOT TO SCALE

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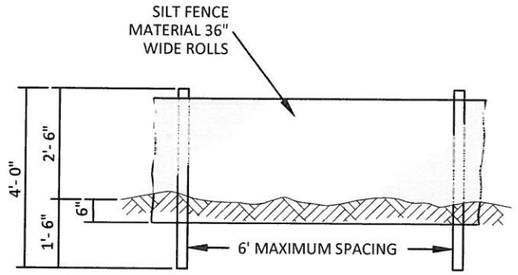
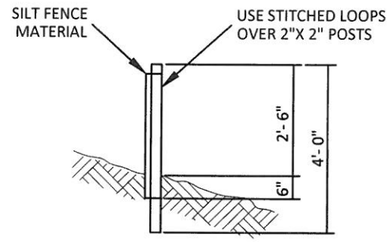
TEMPORARY BRIDGE CROSSING



FRONT VIEW

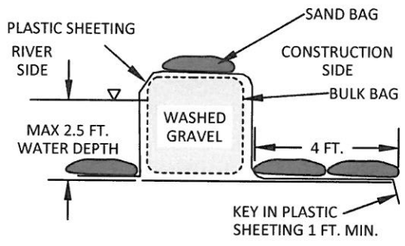


SIDE VIEW
NTS

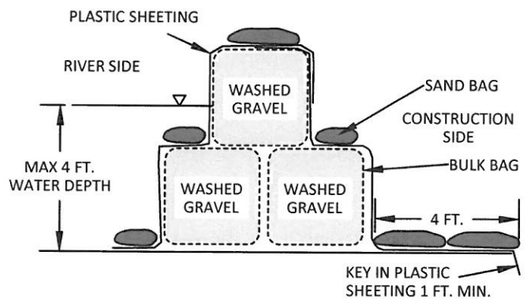
1/7 TYPICAL DETAIL
TEMPORARY SILT FENCE DETAILS
NOT TO SCALE

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 APPROVED BY THE OWNER.
2. THE SILT FENCE IS TO BE INSTALLED AT LOCATIONS SHOWN ON THE PLAN ALONG THE DOWNHILL PERIMETER OF THE LIMITS OF DISTURBANCE. THE FENCE POST 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.
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 UP SLOPE AREA HAS BEEN PERMANENTLY PROTECTED AND STABILIZED, OR AS DIRECTED BY OWNER'S REPRESENTATIVE.



SINGLE LAYER COFFERDAM
(WATER DEPTH LESS THAN 2.5')



STACKED BULK BAG COFFERDAM
(WATER DEPTH GREATER THAN 2.5')

BULK BAG GENERAL NOTES:

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 FROM THE RIVER. 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. THE PLASTIC SHEETING SHALL BE DRAPED ALONG THE CHANNEL BOTTOM ON THE WORK AREA SIDE 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. THE OUTWARD 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.

IF POSSIBLE, THE COFFERDAM SHALL BE EXTENDED ONTO A GRAVEL BAR AND OUT OF THE WATER. IF THE END MUST BE TERMINATED AT THE RIVERBANK, THE COFFERDAM SHALL BE TIGHTLY SEALED TO THE GROUND BY PLASTIC SHEETING AND STANDARD SANDBAGS. MULTIPLE LAYERS OF SHEETING AND SANDBAGS MAY BE REQUIRED TO FORM A WATERTIGHT SEAL.

BULK BAGS SHALL BE WATERPROOF CUBE-SHAPED POLYPROPYLENE WOVEN FABRIC BAGS WITH FULLY OPEN TOP, FLAT BOTTOM, FOUR LOOPS, MINIMUM 2-TON WEIGHT CAPACITY, MINIMUM 5:1 SAFETY FACTOR.

PLASTIC SHEETING SHALL BE MINIMUM 6-MIL THICKNESS. ROLL LENGTH SHALL COVER THE LENGTH OF COFFERDAM WITHOUT SEAMS. FRONT AND BACK PLASTIC SHEETS SHALL OVERLAP ON THE TOP OF THE COFFERDAM.

BULK BAG COFFERDAM SHALL BE COMPLETELY REMOVED AFTER CONSTRUCTION IS COMPLETED AND TURBIDITY HAS BEEN REMOVED.

ALTERNATE COFFERDAM MATERIALS AND CONFIGURATIONS MAY BE ALLOWED BUT SHALL NOT BE IMPLEMENTED WITHOUT REVIEW AND APPROVAL BY THE OWNER OR OWNER'S REPRESENTATIVE. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS AND/OR VENDOR CUT SHEETS FOR SUBSTITUTIONS.

2/7 TYPICAL DETAIL
TEMPORARY COFFERDAM DETAILS
NOT TO SCALE

NO.	BY	DATE	REVISION DESCRIPTION

DRAWN	DESIGNED	CHECKED
MWJ	GJ,MB,DM	GJ,DM,MB,RG
APPROVED	DATE	PROJECT
MB	3/19/2013	

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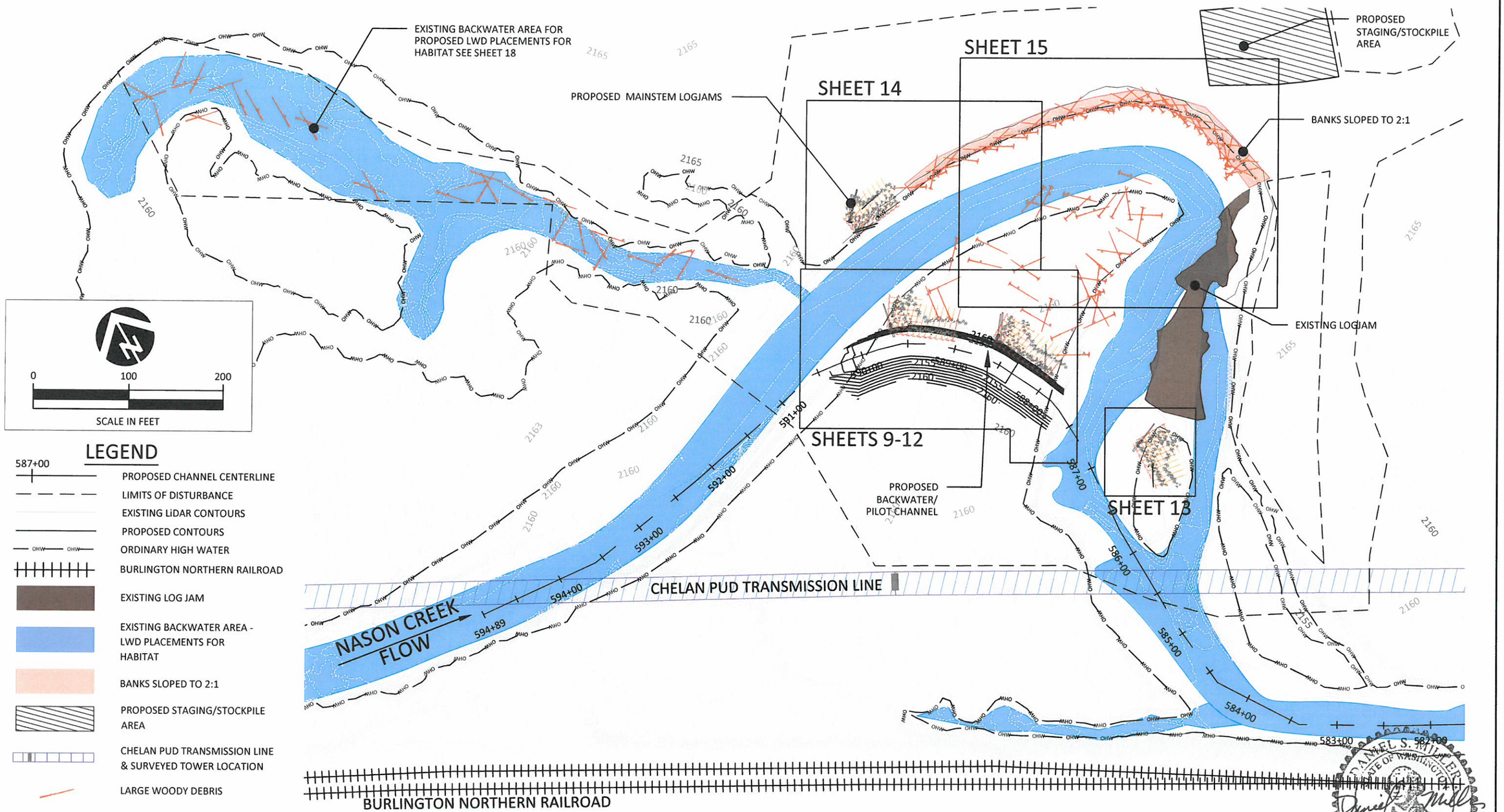
TYPICAL DETAILS EROSION CONTROL

SHEET
7 OF 18



PLAN VIEW OF PROPOSED CONDITIONS

DANIEL S. MILLER
STATE OF WASHINGTON
34208
REGISTERED PROFESSIONAL ENGINEER
4-12-13
EXPIRES 11-23-13

NO.	BY	DATE	REVISION DESCRIPTION

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MB	4/12/2013	
APPROVED	DATE	PROJECT

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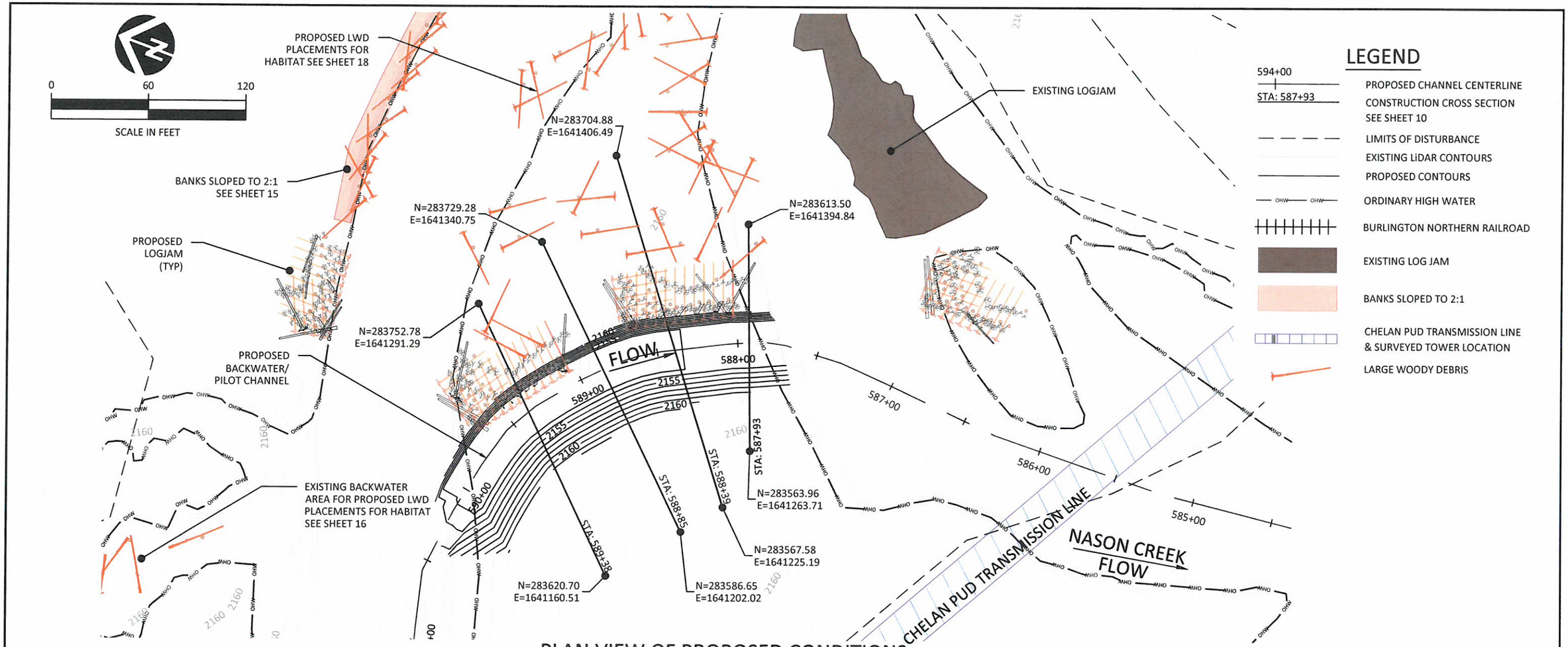
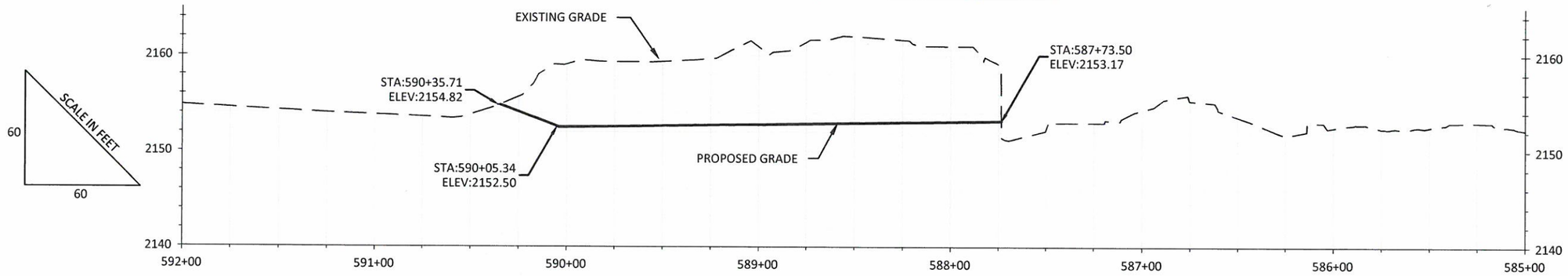
PLAN VIEW OF PROPOSED CONDITIONS

SHEET 8 OF 18



PLAN VIEW OF PROPOSED CONDITIONS



PROFILE OF PROPOSED PILOT CHANNEL CENTERLINE

DANIEL S. MILLER
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REGISTERED PROFESSIONAL ENGINEER
4/12/13
EXPIRES 11-23-13

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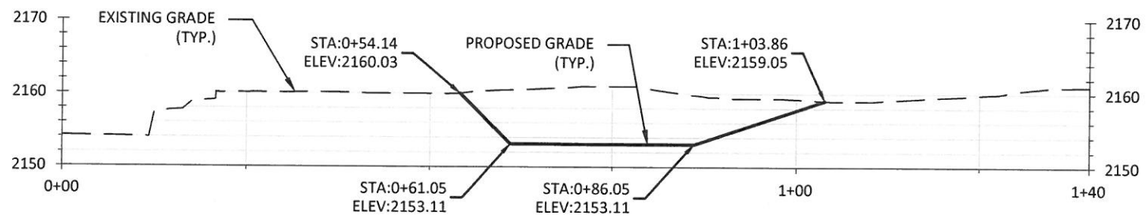
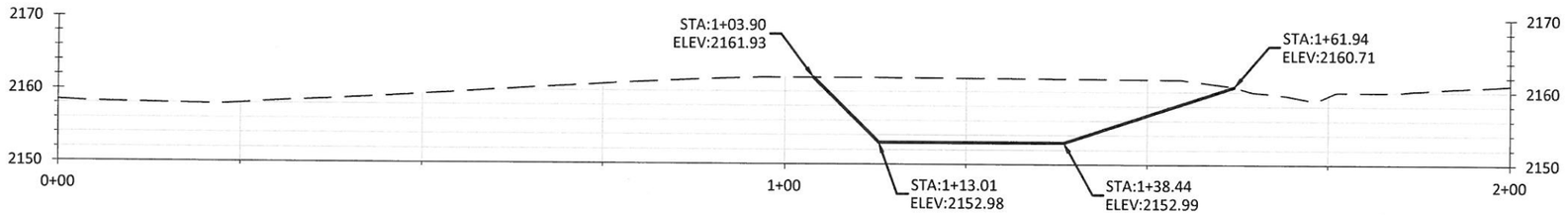
PLAN AND PROFILE PROPOSED CHANNEL

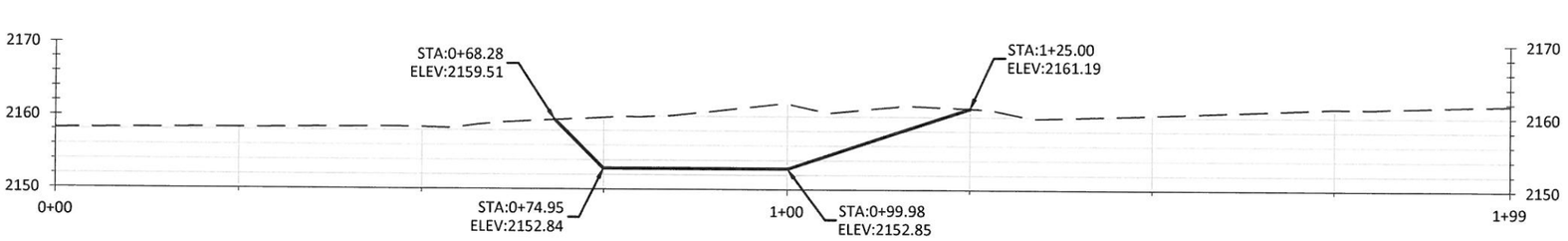
SHEET 9 OF 18



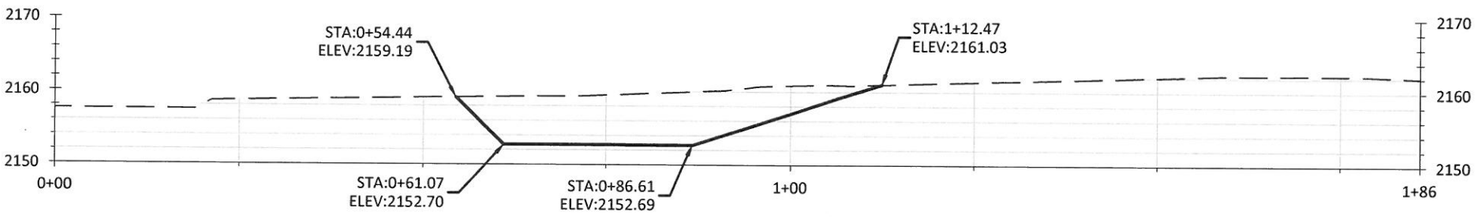
CONSTRUCTION CROSS-SECTION: STA. 587+93



CONSTRUCTION CROSS-SECTION: STA. 588+39



CONSTRUCTION CROSS-SECTION: STA. 588+85



CONSTRUCTION CROSS-SECTION: STA. 589+38

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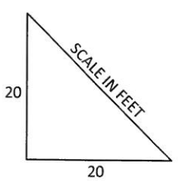

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MB	3/19/2013	
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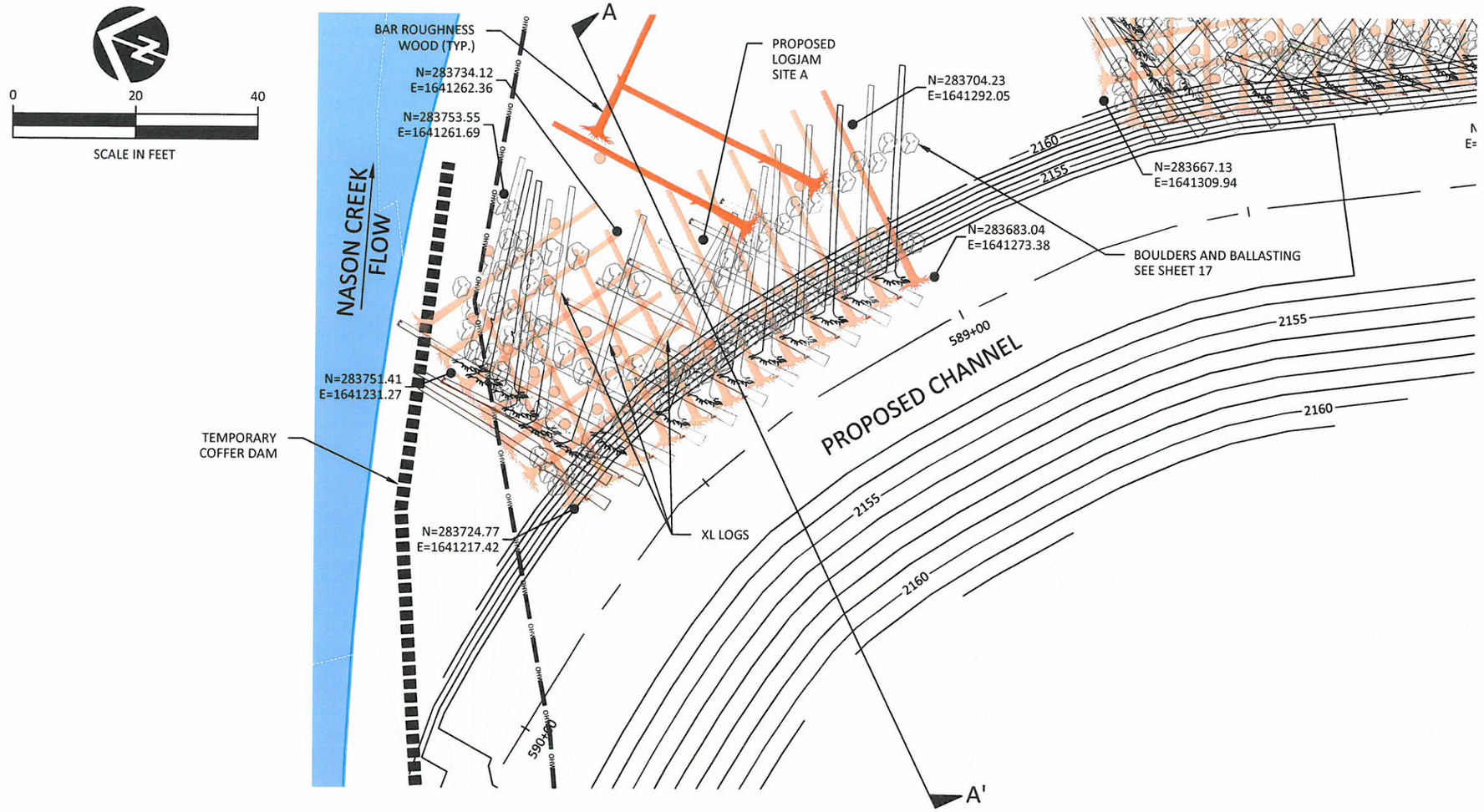
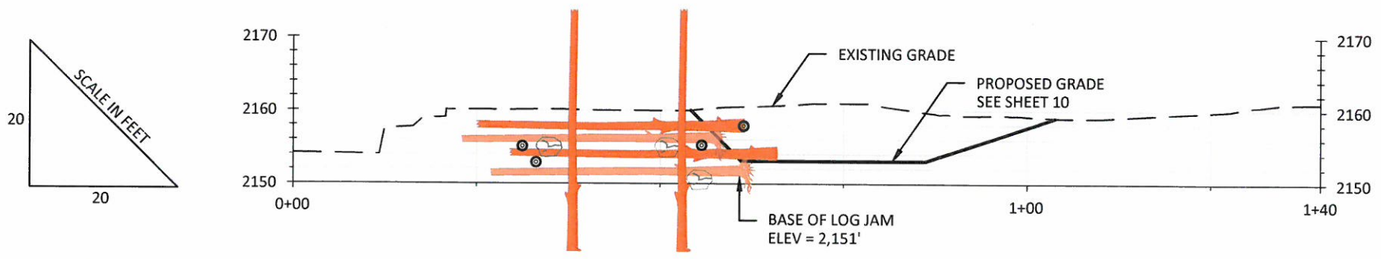
GRADING CROSS-SECTIONS

SHEET
10 OF 18



NOTES:
1. SEE SHEET 16 FOR TYPICAL CONSTRUCTION SEQUENCE.
2. JAM MAY BE SHIFTED IN THE FIELD TO ACCOUNT FOR CHANGES IN NASON CREEK.
3. QUANTITIES ESTIMATE SHOWN ON SHEET 3.

PLAN VIEW OF PROPOSED CONDITIONS SITE A



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SECTION A-A' VIEW OF PROPOSED LOG JAM SITE A

NO.	BY	DATE	REVISION DESCRIPTION

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APPROVED	DATE	PROJECT
MB	3/19/2013	

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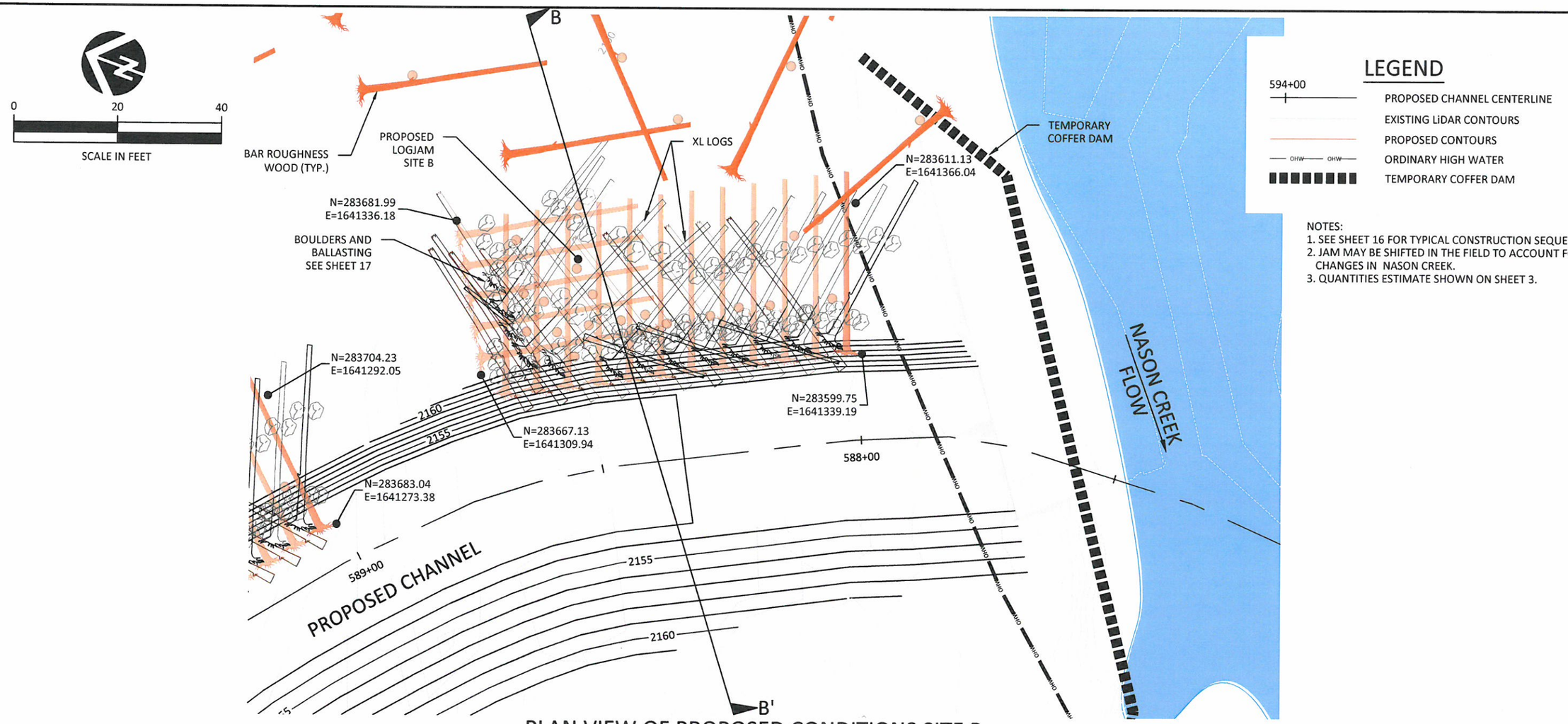
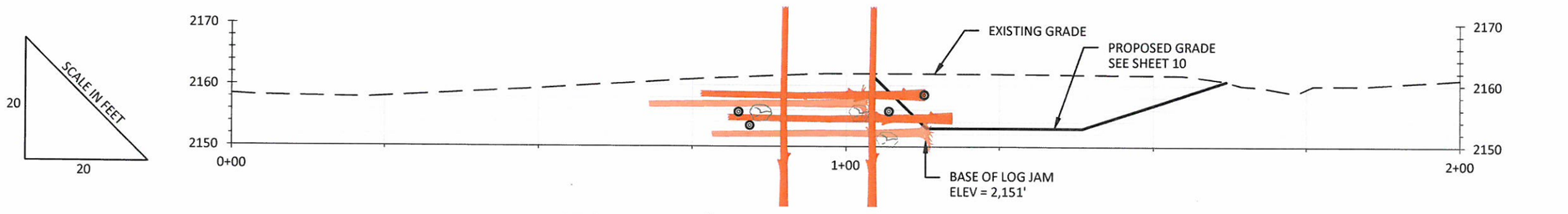
PLAN AND PROFILE VIEW SITE A

SHEET 11 OF 18



PLAN VIEW OF PROPOSED CONDITIONS SITE B



SECTION B-B' VIEW OF PROPOSED LOG JAM SITE B

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MB	3/19/2013	
APPROVED	DATE	PROJECT

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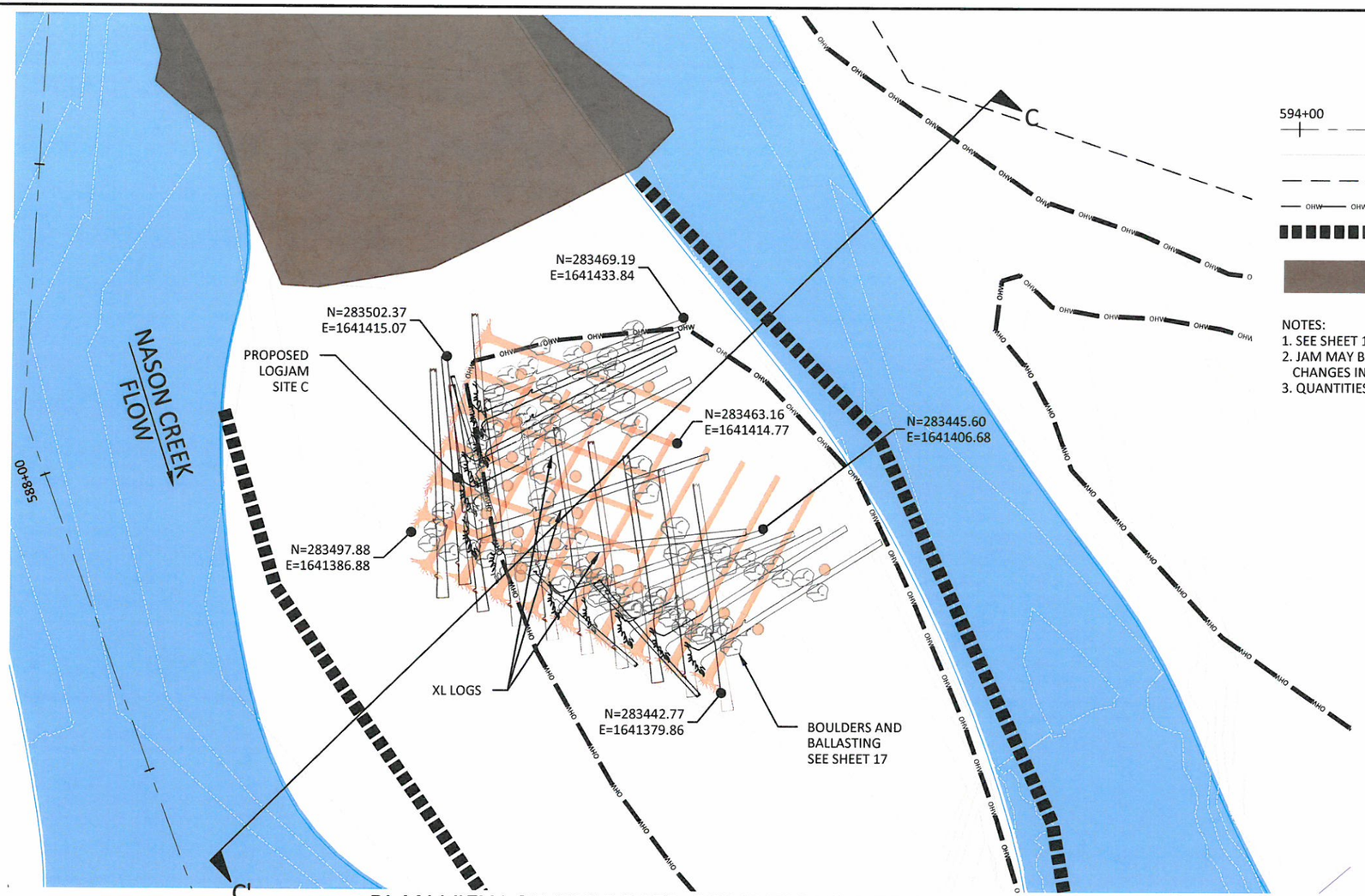
PLAN AND PROFILE VIEW SITE B

SHEET 12 OF 18

0 20 40

SCALE IN FEET



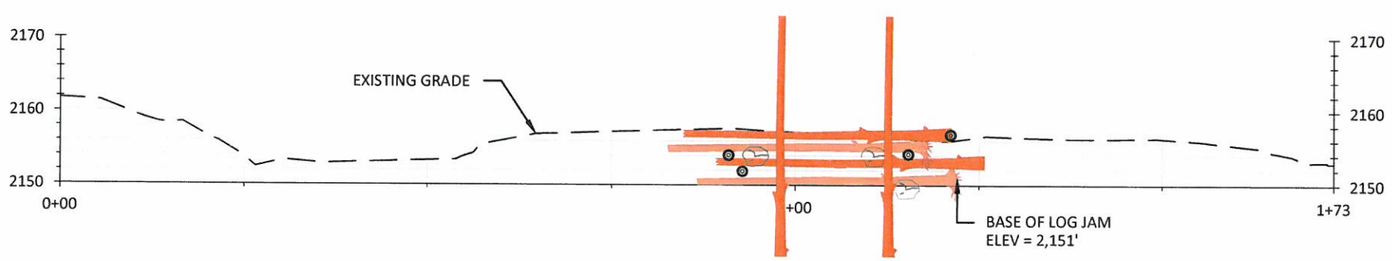
LEGEND

- 594+00 — EXISTING CENTERLINE
- EXISTING LiDAR CONTOURS
- LIMITS OF DISTURBANCE
- ORDINARY HIGH WATER
- TEMPORARY COFFER DAM
- EXISTING LOG JAM

NOTES:
1. SEE SHEET 16 FOR TYPICAL CONSTRUCTION SEQUENCE.
2. JAM MAY BE SHIFTED IN THE FIELD TO ACCOUNT FOR CHANGES IN NASON CREEK.
3. QUANTITIES ESTIMATE SHOWN ON SHEET 3.

PLAN VIEW OF PROPOSED CONDITIONS SITE C

20 SCALE IN FEET 20



SECTION C-C' VIEW OF PROPOSED LOG JAM SITE C

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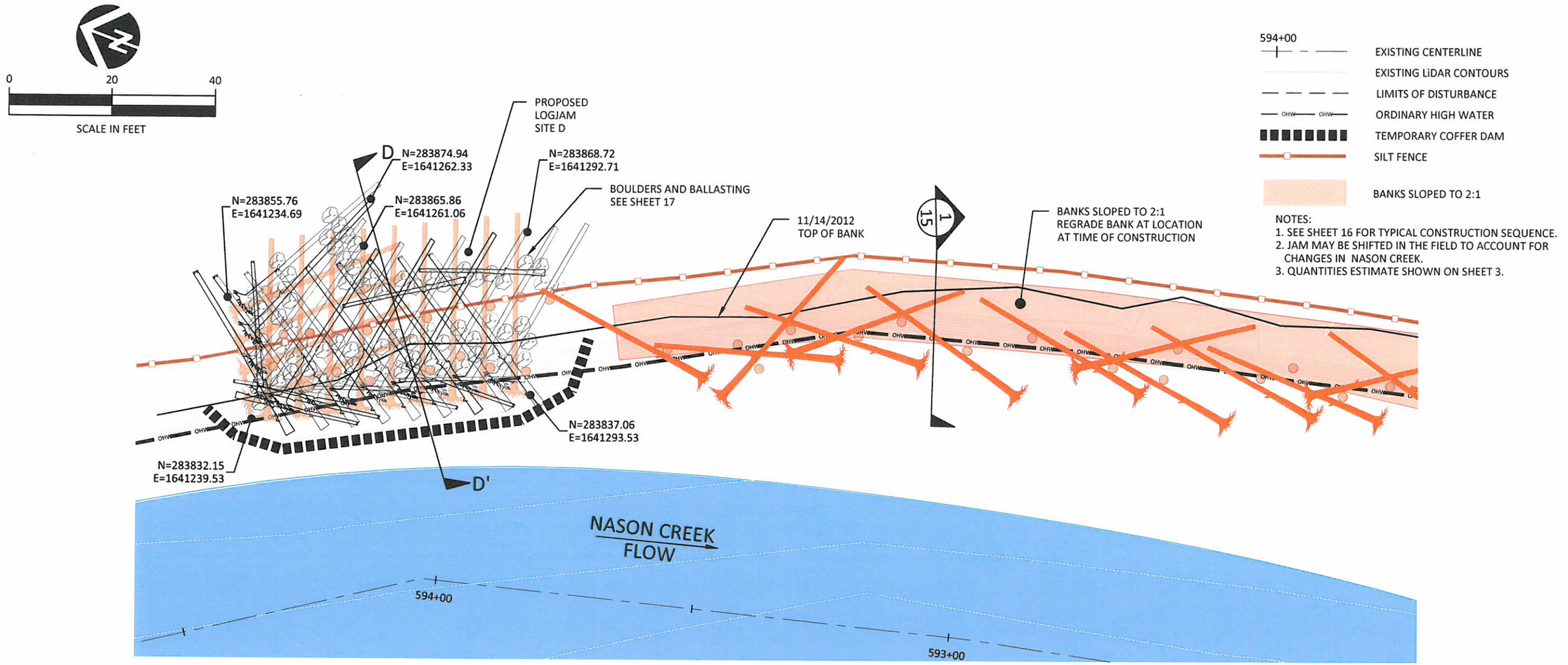
PLAN AND PROFILE VIEW SITE C

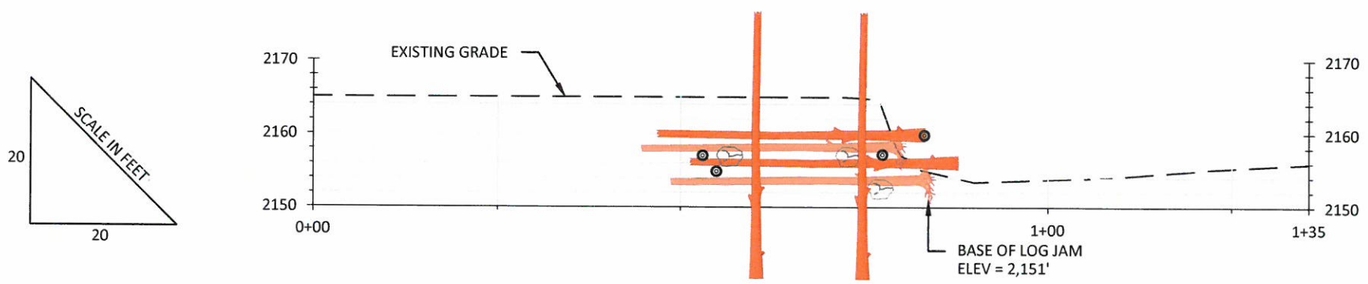
SHEET 13 OF 18



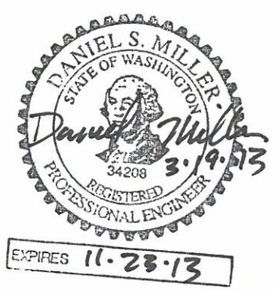
PLAN VIEW OF PROPOSED CONDITIONS SITE D

LEGEND

NOTES:
1. SEE SHEET 16 FOR TYPICAL CONSTRUCTION SEQUENCE.
2. JAM MAY BE SHIFTED IN THE FIELD TO ACCOUNT FOR CHANGES IN NASON CREEK.
3. QUANTITIES ESTIMATE SHOWN ON SHEET 3.



SECTION VIEW OF PROPOSED LOG JAM SITE D



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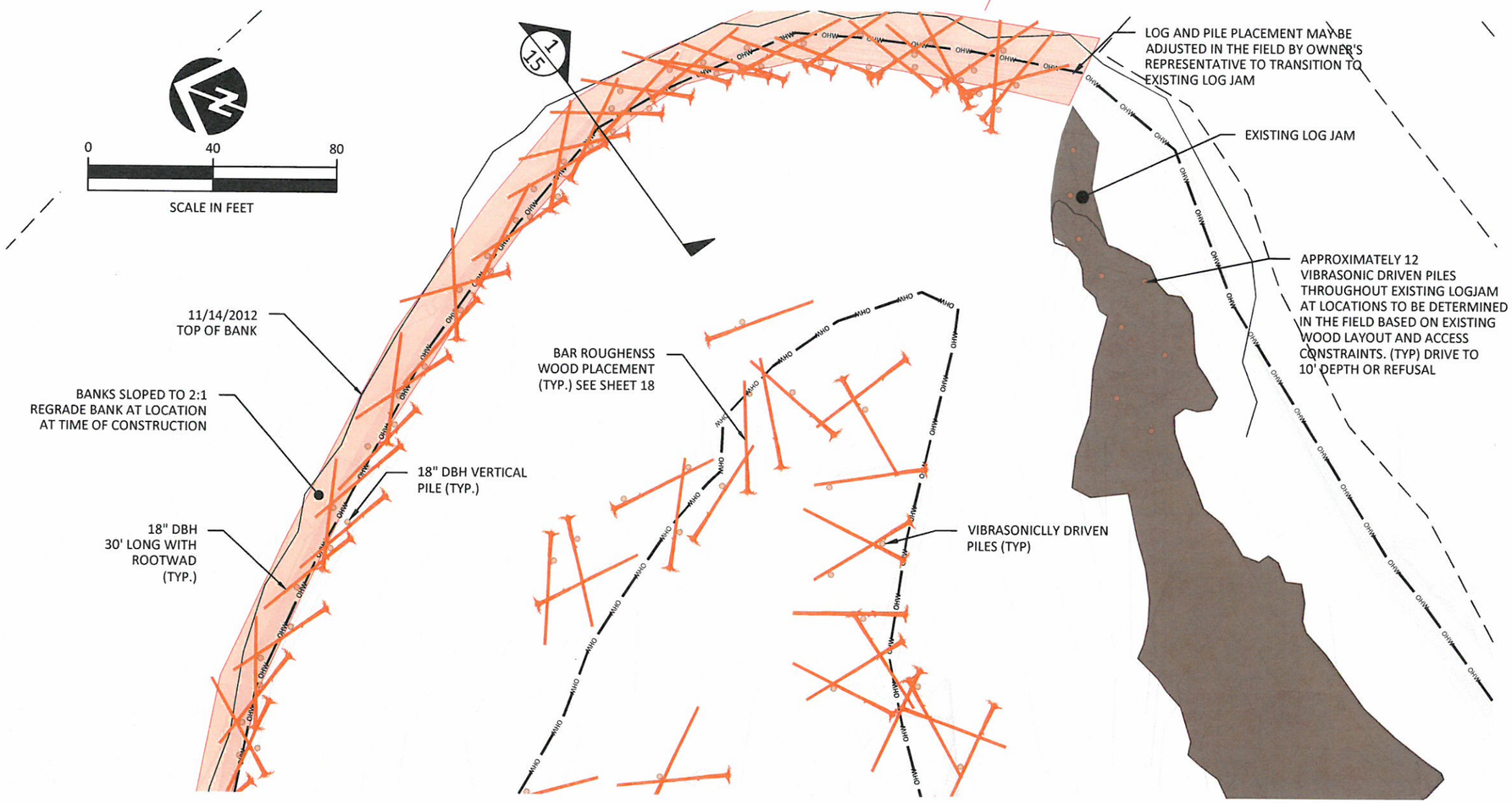
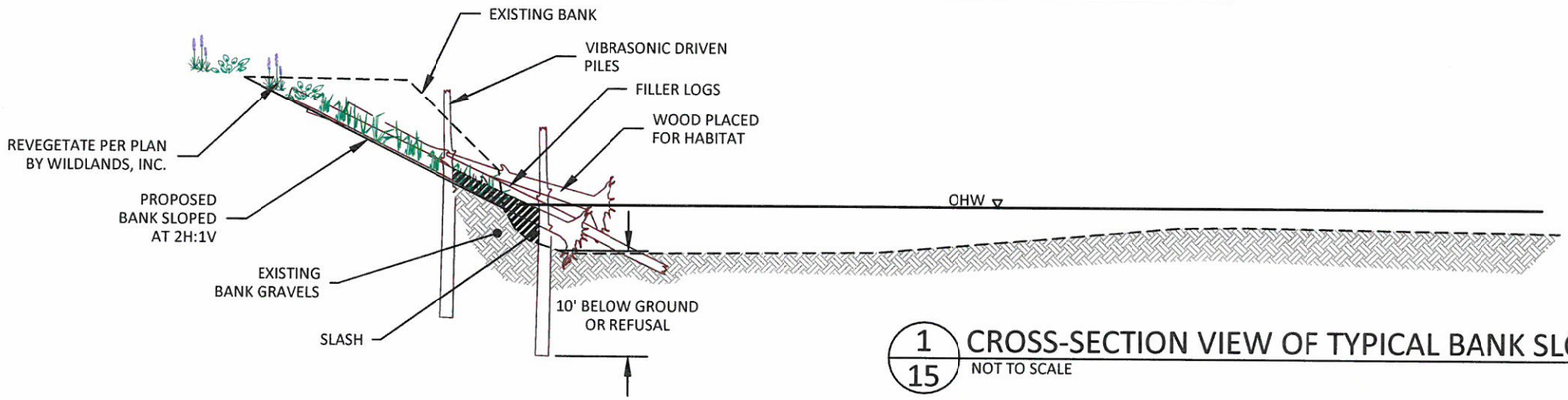
PLAN AND PROFILE VIEW SITE D

SHEET 14 OF 18



PLAN VIEW OF TYPICAL BANK SLOPING



1/15 CROSS-SECTION VIEW OF TYPICAL BANK SLOPING
NOT TO SCALE

LEGEND

- LIMITS OF DISTURBANCE
- EXISTING LiDAR CONTOURS
- ORDINARY HIGH WATER
- TEMPORARY COFFER DAM
- EXISTING LOG JAM
- BANKS SLOPED TO 2:1
- LARGE WOODY DEBRIS

NOTES:
1. LOG AND PILE QUANTITIES ESTIMATE SHOWN ON SHEET 3.
2. CABLE LOGS TO VERTICAL PILES AND AT LOG-TO-LOG CONNECTIONS (SEE SHEET 18).
3. CONTRACTOR SHALL COORDINATE WITH OWNER FOR PLACEMENT OF SEED AND EROSION CONTROL FABRICS ON 2:1 BANKS.

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3.19.13
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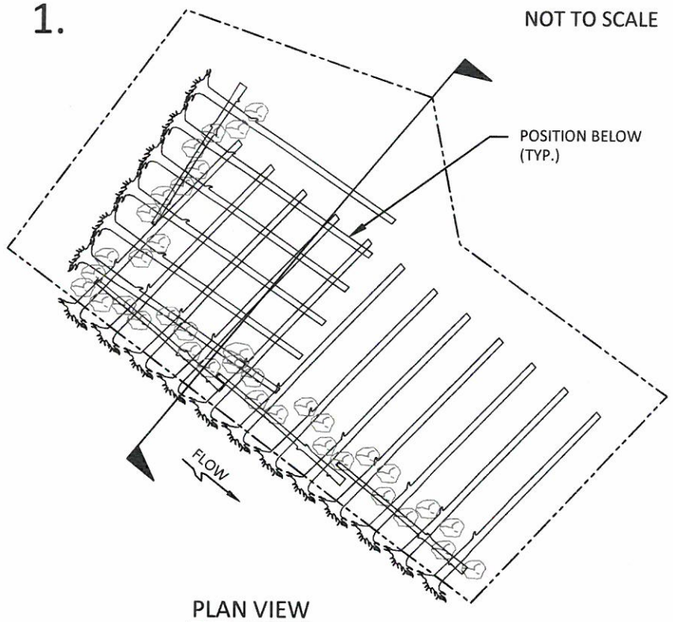
PLAN VIEW OF PROPOSED CONDITIONS BANK TREAMENT

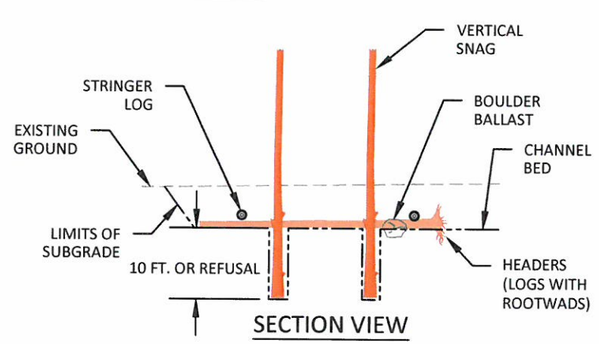
SHEET 15 OF 18

1.

NOT TO SCALE



PLAN VIEW



SECTION VIEW

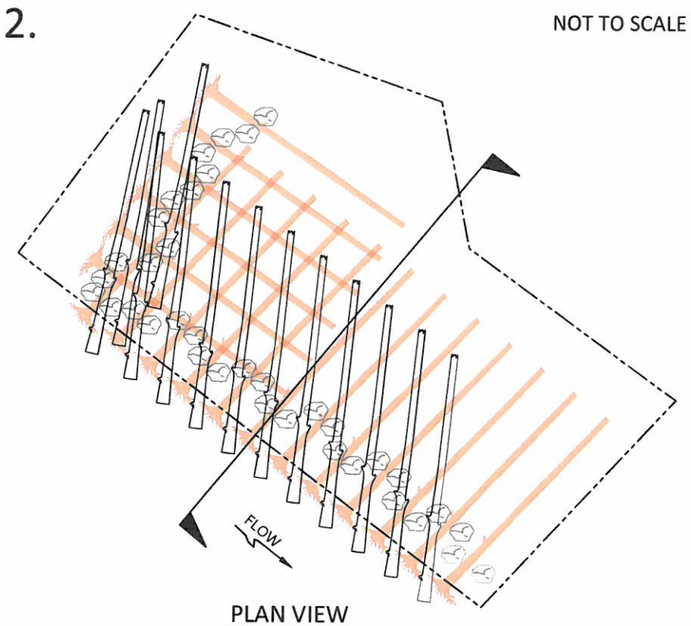
AS DIRECTED BY OWNER'S REPRESENTATIVE:

BOTTOM TIER:

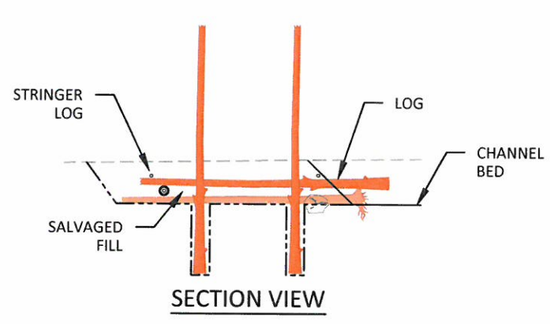
1. INSTALL BOTTOM TIER OF LOGS AT 6-FT CENTER-TO-CENTER SPACING.
2. OVERLAPPING LOGS AT UPSTREAM END OF JAM SHALL HAVE LOGS ORIENTED PARALLEL WITH FLOW PLACED BENEATH LOGS PERPENDICULAR TO FLOW.
3. INSTALL TWO 3.5-FT DIAMETER BOULDERS PER LOG. CABLE TO LOG (SHEET 17).
4. **INSTALL VERTICAL SNAGS. VIBRASONICALLY DRIVE TO 10-FT – OR REFUSAL – BELOW SUBGRADE.**
5. CABLE LOG-TO-LOG CONNECTIONS.
6. BACKFILL AND COMPACT WITH SALVAGED GRAVEL & COBBLE MATERIAL TO TOP OF TIER.
7. SILT AND SAND MATERIALS SHALL NOT BE USED FOR BACKFILL UNLESS DIRECTED BY OWNER'S REPRESENTATIVES.

2.

NOT TO SCALE



PLAN VIEW



SECTION VIEW

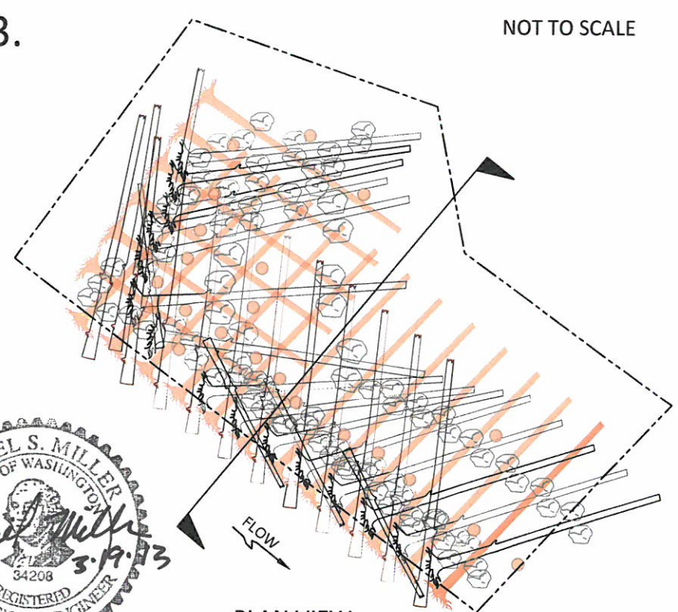
AS DIRECTED BY OWNER'S REPRESENTATIVE:

MIDDLE TIER:

1. INSTALL STRINGER LOGS ON TOP OF THE BOTTOM TIER.
2. INSTALL MIDDLE TIER OF LOGS AT 6-FT CENTER-TO-CENTER SPACING.
3. CABLE LOG-TO-LOG CONNECTIONS (SHEET 17).
4. BACKFILL AND COMPACT WITH SALVAGED GRAVEL & COBBLE MATERIAL TO TOP OF TIER.
5. SILT AND SAND MATERIALS SHALL NOT BE USED FOR BACKFILL UNLESS DIRECTED BY OWNER'S REPRESENTATIVES.

3.

NOT TO SCALE



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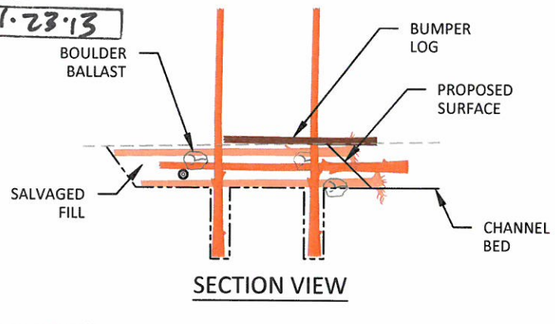
PLAN VIEW



SECTION VIEW

AS DIRECTED BY OWNER'S REPRESENTATIVE:

TOP TIER:

1. INSTALL TOP TIER OF LOGS AT 6-FT CENTER-TO-CENTER SPACING.
2. FOR STANDARD SIZED ROOTWADS - INSTALL FOUR 3.5-FT DIAMETER BOULDERS PER LOG. CABLE TO LOG (SHEET 17).
3. **FOR EXTRA-LARGE ROOTWADS – INSTALL FOUR 5-FT DIAMETER BOULDERS PER LOG. USE TWO SETS OF** CABLE PER BOULDER PAIR.
4. PLACE TOP BUMPER LOGS.
5. CABLE LOG-TO-LOG CONNECTIONS (SHEET 17).
6. BACKFILL AND COMPACT WITH SALVAGED GRAVEL & COBBLE MATERIAL TO MATCH EXISTING GRADE.
7. SILT AND SAND MATERIALS SHALL NOT BE USED FOR BACKFILL UNLESS DIRECTED BY OWNER'S REPRESENTATIVES.

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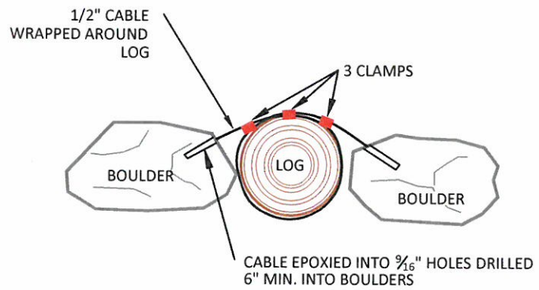
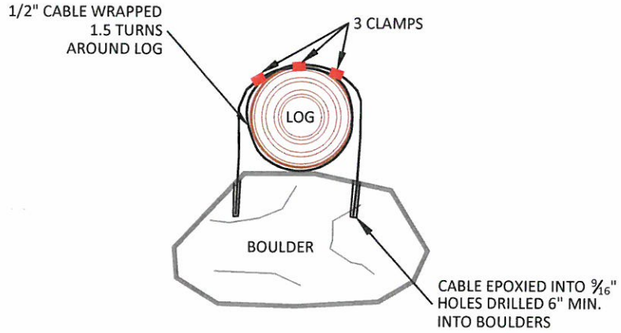
TYPICAL LARGE WOOD INSTALLATION AND SEQUENCING

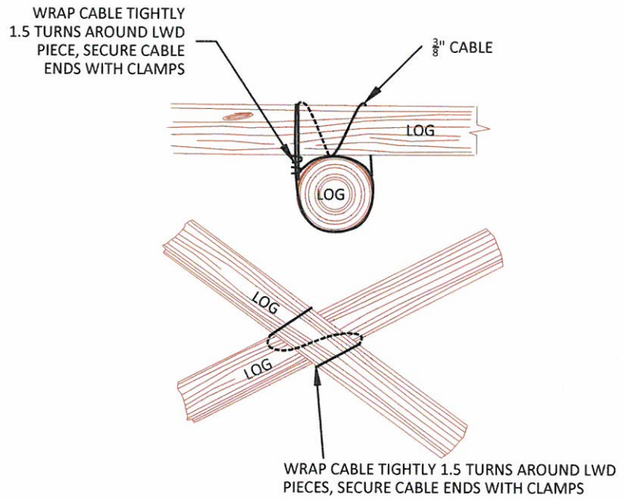
SHEET 16 OF 18



1/17 BOULDER BALLAST DETAIL
NOT TO SCALE



2/17 OPTION SINGLE BOULDER BALLAST CONNECTION
NOT TO SCALE



3/17 LOG CABLING DETAIL
NOT TO SCALE

BOULDER BALLAST NOTES

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 OR GRANITE WITH A MINIMUM SPECIFIC GRAVITY OF 2.65. STANDARD SIZED BOULDERS = 3.5' DIAMETER, EXTRA LARGE BOULDERS = 5' DIAMETER.

CABLE SHALL BE ½" GALVANIZED, STEEL CORE WIRE ROPE.

CLAMPS SHALL BE ZINC PLATED COPPER AND SHALL MEET THE PERFORMANCE REQUIREMENTS OF MILITARY STANDARD MS-51844, REV. C, SLEEVES, SWAGING-WIRE ROPE. MINIMUM OF 3 CLAMPS PER CONNECTION.

EPOXY FOR ANCHORING SHALL BE HILTI HIT RE 500 ADHESIVE FOR SUBMERGED CONDITIONS AND HILTI-HY 150 MAX-SD FOR DAMP HOLE OR DRY CONDITIONS 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.

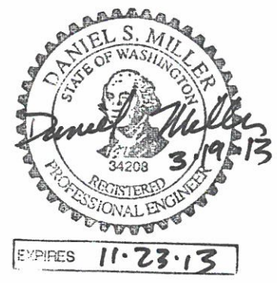
BALLAST BOULDERS SHALL BE SECURED AS SHOWN ON THE PLANS.

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 ONCE 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.

MINIMUM 3 CLAMPS PER CONNECTION. CLAMPS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATION, SPACING AND CLAMP TOOL DIAMETER FOR THE SIZE AND LOAD RATING OF THE CABLE BEING USED. SWAGING TOOL SHALL BE CHECKED FOR PROPER COMPRESSION, ACCORDING TO MANUFACTURER'S RECOMMENDATIONS, USING A GAUGE PROVIDED BY THE MANUFACTURER OF THE CLAMP FITTINGS BEING INSTALLED.

EXTRA LARGE ROOTWADS AND BALLAST BOULDERS ON LOG JAMS A-C SHALL HAVE TWO SETS OF CABLE RESTRAINTS PER BOULDER PAIR. CABLE SHALL BE GLUED 10" INTO BOULDERS.



NO.	BY	DATE	REVISION DESCRIPTION

DRAWN	DESIGNED	CHECKED
MWJ	GJ,MB,DM	GJ,DM,MB,RG
APPROVED	DATE	PROJECT
MB	3/19/2013	

Confederated Tribes and Bands of the Yakama Nation
Nason Creek-Lower White Pine Reach

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Hood River, OR 97031
541.386.9003
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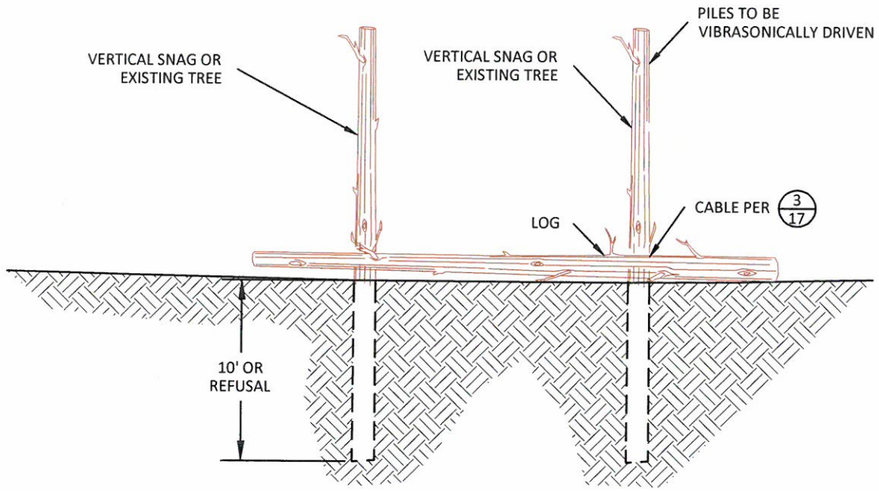
TYPICAL WOOD AND BOULDER BALLAST INSTALLATION DETAILS

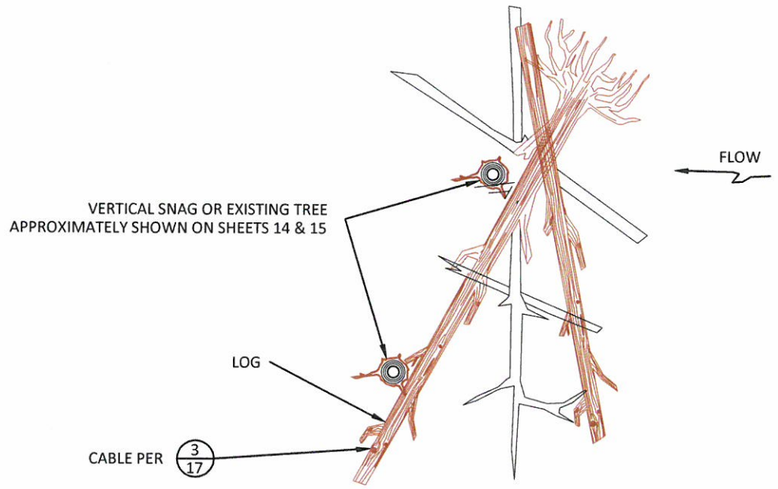


SECTION VIEW
TYPICAL LOGS SECURED AT VERTICAL SNAG
NOT TO SCALE

NOTES:

SPECIFIC ORIENTATION OF LOGS AND MATERIALS MAY VARY FROM TYPICAL DRAWINGS DEPENDING ON SIZE AND SHAPE OF MATERIAL DELIVERED OR SALVAGED.

BRACING TO EXISTING TREES OR INSTALLED VERTICAL LOGS WILL OCCUR AT LOCATIONS IDENTIFIED IN THE FIELD TO PROVIDE HORIZONTAL STABILITY. FILLER LOGS AND TREE TOPS WILL BE INSTALLED AT "RACKING" LOCATIONS TO EMULATE NATURAL DEBRIS. THESE PIECES ARE TO BE CONSIDERED MOBILE AND TRANSIENT, AND MAY BECOME LOOSE, DISPLACED, REPLACED, OR ACCUMULATED ONTO DURING FLOODING.



PLAN VIEW
TYPICAL FLOODPLAIN WOOD ROUGHNESS
NOT TO SCALE

DANIEL S. MILLER
STATE OF WASHINGTON
34208
REGISTERED
PROFESSIONAL ENGINEER
3·19·13
EXPIRES 11·23·13

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TYPICAL WOOD INSTALLATION DETAILS

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