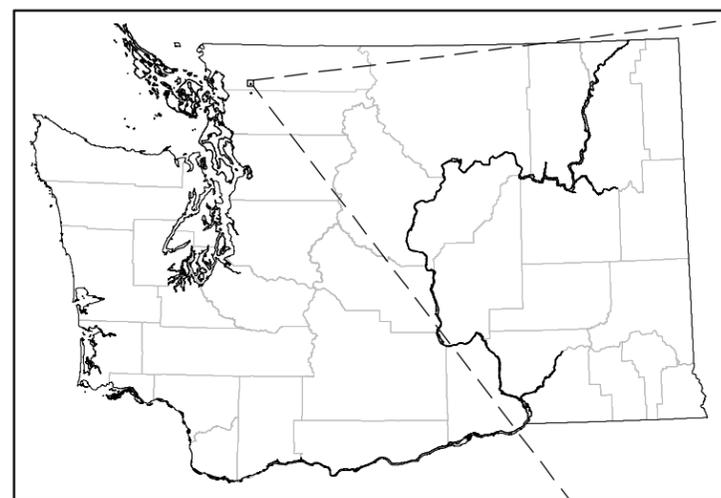
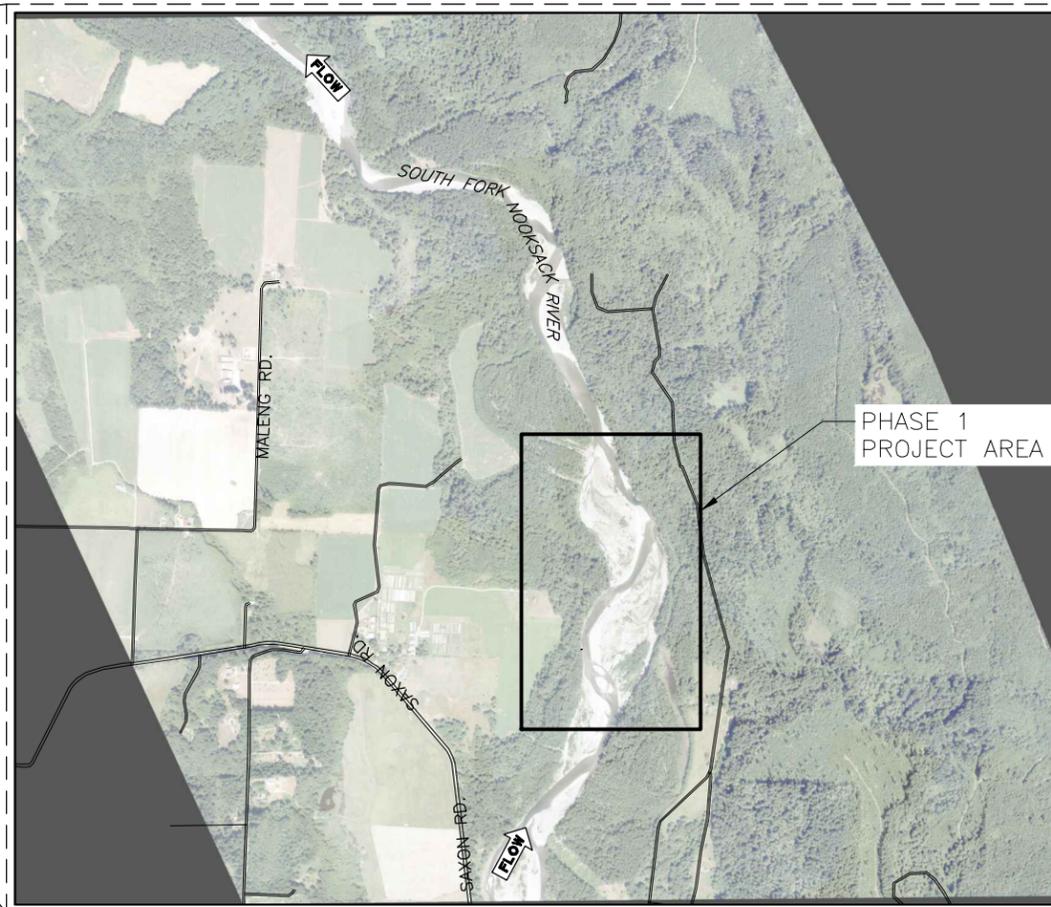


# SOUTH FORK NOOKSACK RIVER NESSET'S REACH RESTORATION, PHASE 1



**WASHINGTON STATE**  
SCALE: 1" = 50 MILES



**VICINITY**  
SCALE: 1" = 1000'

DRAWING LIST	
SHEET NUMBER	SHEET TITLE
1	COVER SHEET
2	GENERAL NOTES
3	LEGEND
4	PHASE 1 SITE PLAN
5	CONTROL DATA
6	TYPE 3 ELJ PLAN & PROFILE
7	TYPE 3 ELJ LAYERING DETAILS
8	ELJ DETAILS
9	PILOT CHANNEL EXCAVATION DETAILS
10	PHASE 1 TESC PLAN
11	TESC DETAILS

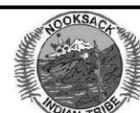
### CONTACT INFORMATION

**NATURAL SYSTEMS DESIGN, INC**  
1900 N NORTHLAKE WAY, SUITE 211  
SEATTLE, WA 98103  
(206) 834-0175

**NOOKSACK INDIAN TRIBE**  
5016 DEMING ROAD  
DEMING, WA 98244  
(360) 592-5176



0 1  
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT PLOTTED TO ORIGINAL SCALE.



NAME OR INITIALS AND DATE		GEOGRAPHIC INFORMATION	
DESIGNED	RLE	LATITUDE	48°41'50"N
CHECKED	TA	LONGITUDE	122°10'02"W
DRAWN	MW	TN/SC/RG	T37N/S16/R5W
CHECKED	RLE	DATE	-

**NESSET'S REACH PHASE 1  
RESTORATION**

**COVER SHEET**

**1**

SHEET 1 OF 11

N:\PROJECTS\NOOKSACK TRIBE\NESSET'S REACH RESTORATION\DESIGN\CAD DWGS - CURRENT\COVER SHEET.DWG, Gary, 5/1/2013, 9:26:19 AM

May-27-2015 - 90% DESIGN

**GENERAL NOTES**

1. THESE PLANS HAVE BEEN PREPARED FOR THE EXCLUSIVE USE OF NOOKSACK INDIAN TRIBE, HEREAFTER REFERRED TO AS "OWNER" AND THEIR AUTHORIZED AGENTS.
2. NATURAL SYSTEMS DESIGN HEREAFTER REFERRED TO AS "ENGINEER" IS RESPONSIBLE FOR THE PREPARATION OF THESE ORIGINAL PLANS AND ASSOCIATED SPECIFICATIONS AND WILL NOT BE RESPONSIBLE FOR, OR LIABLE FOR UNAUTHORIZED CHANGES TO OR USES OF THESE PLANS. ANY USE WHICH INCLUDES ALTERATION, DELETION, OR EDITING OF THIS DOCUMENT WITHOUT EXPLICIT WRITTEN PERMISSION FROM THE ENGINEER, IS STRICTLY PROHIBITED. ANY OTHER UNAUTHORIZED USE OF THIS DOCUMENT IS PROHIBITED.
3. MINOR MODIFICATIONS ARE EXPECTED TO SUIT JOB SITE DIMENSIONS OR CONDITIONS. SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK. THE OWNER, ENGINEER AND APPROPRIATE REGULATORY AGENCIES WILL BE NOTIFIED OF ANY OWNER-AUTHORIZED CHANGE RESULTING IN MORE THAN A 10% DESIGN CHANGE OF PROPOSED FOOTPRINT OR SIGNIFICANTLY AFFECTING THE INTENDED BENEFIT OR FUNCTION OF A PROJECT ELEMENT.
4. THE LOCATION OF ALL FEATURES SHOWN IS APPROXIMATE.
5. THE CONTRACTOR AGREES TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY, AND FURTHER AGREES THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS IN ACCORDANCE WITH THE PROVISIONS OUTLINED BY THE PROJECT CONTRACT AND SPECIFICATIONS.
6. ALL IMPROVEMENTS SHALL BE ACCOMPLISHED UNDER THE APPROVAL, INSPECTION, AND TO THE SATISFACTION OF THE OWNER. IMPROVEMENT CONSTRUCTION SHALL COMPLY WITH THESE PLANS AND THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT) STANDARD PLANS AND SPECIFICATIONS FOR CONSTRUCTION OF ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION, CURRENT EDITION UNLESS NOTED OTHERWISE. ALL REFERENCES TO THE "STANDARD SPECIFICATIONS" SHALL MEAN THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT) STANDARD SPECIFICATIONS FOR CONSTRUCTION OF LOCAL STREETS AND ROADS, CURRENT EDITION. CONSTRUCTION NOT SPECIFIED ON THESE PLANS SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS. THE CONTRACTOR IS OBLIGATED TO BE FAMILIAR WITH APPLICABLE SECTIONS OF THE STANDARD SPECIFICATIONS NOT DISCUSSED IN THE GENERAL NOTES. THE CONTRACT SPECIAL PROVISIONS SHALL SUPERSEDE THOSE OF THE STANDARD SPECIFICATIONS WHERE DISCREPANCIES OCCUR.
7. IT IS THE RESPONSIBILITY OF THE CONTRACTOR AND HIS SUBCONTRACTOR(S) TO EXAMINE THE PROJECT SITE PRIOR TO THE OPENING OF BID PROPOSALS. THE CONTRACTOR SHALL BECOME FAMILIAR WITH THE CONDITIONS UNDER WHICH THE WORK IS TO BE PERFORMED, SUCH AS THE NATURE AND LOCATION OF THE WORK AND THE GENERAL AND LOCAL CONDITIONS, PARTICULARLY THOSE AFFECTING THE AVAILABILITY OF TRANSPORTATION, THE DISPOSAL, HANDLING, AND STORAGE OF MATERIALS, AVAILABILITY OF LABOR, WATER, ELECTRICITY, ROADS, THE UNCERTAINTIES OF WEATHER, THE CONDITIONS OF THE GROUND, SURFACE AND SUBSURFACE MATERIALS, GROUNDWATER, THE EQUIPMENT AND FACILITIES NEEDED FOR AND DURING THE PERFORMANCE OF THE WORK, AND THE COSTS THEREOF. ANY FAILURE BY THE CONTRACTOR AND SUBCONTRACTOR(S) TO ACQUAINT THEMSELVES WITH ALL THE AVAILABLE INFORMATION WILL NOT RELIEVE THE CONTRACTOR AND SUBCONTRACTOR(S) FROM RESPONSIBILITY FOR PROPERLY ESTIMATING THE DIFFICULTY AND COST OF SUCCESSFULLY PERFORMING THE WORK.
8. THE CONTRACTOR IS RESPONSIBLE FOR REVIEWING THE CONTRACT DOCUMENTS AND FOR ALL SUBMITTALS REQUIRED TO THE OWNER FOR REVIEW AND ACCEPTANCE.

**PERMIT NOTES**

1. EVERY REASONABLE EFFORT SHALL BE MADE TO CONDUCT THE ACTIVITIES SHOWN IN THESE PLANS, IN A MANNER THAT MINIMIZES THE ADVERSE IMPACT ON WATER QUALITY, FISH AND WILDLIFE, AND THE NATURAL ENVIRONMENT.
2. ALL WORK WILL BE IN COMPLIANCE WITH PERMIT CONDITIONS ISSUED BY VARIOUS REGULATORY AGENCIES. IT IS THE CONTRACTOR'S RESPONSIBILITY TO HAVE COPIES OF ALL PERMITS ON THE JOB SITE, UNDERSTAND AND COMPLY WITH ALL PERMIT CONDITIONS.
3. ALL WORK THAT DISTURBS THE SUBSTRATE, BANK, OR SHORE OF A WATERS OF THE STATE THAT CONTAINS FISH LIFE SHALL BE CONDUCTED ONLY DURING THE WORK PERIOD FOR THAT WATERBODY AS INDICATED IN THE MOST RECENT ALLOWABLE WORK PERIODS FOR HYDRAULIC PROJECTS IN FRESHWATER FOR THE PROJECT AREA. THOSE PORTIONS OF THE PROJECT WORK THAT OCCUR OUTSIDE OR ABOVE THE ORDINARY HIGH WATER MARK (ABOVE THE CORPS JURISDICTIONAL LINE) ARE NOT SUBJECT TO THE WORK PERIODS DESCRIBED ABOVE UNLESS SPECIFIED IN THE RELEVANT PERMITS.
4. ALL ACTIVITIES THAT INVOLVE WORK ADJACENT TO OR WITHIN THE WETTED CHANNEL SHALL, AT ALL TIMES, REMAIN CONSISTENT WITH ALL APPLICABLE WATER QUALITY STANDARDS, EFFLUENT LIMITATION AND STANDARDS OF PERFORMANCE, PROHIBITIONS, PRETREATMENT STANDARDS, AND MANAGEMENT PRACTICES ESTABLISHED PURSUANT TO THE CLEAN WATER ACT OR PURSUANT TO APPLICABLE STATE AND LOCAL LAW.
5. IF AT ANY TIME, AS A RESULT OF PROJECT ACTIVITIES, FISH ARE OBSERVED IN DISTRESS, A FISH KILL OCCURS, OR WATER QUALITY PROBLEMS DEVELOP (INCLUDING EQUIPMENT LEAKS OR SPILLS), OPERATIONS SHALL CEASE AND THE OWNER SHALL BE NOTIFIED IMMEDIATELY.

6. IF, DURING CONSTRUCTION, ARCHAEOLOGICAL REMAINS ARE ENCOUNTERED, CONSTRUCTION IN THE VICINITY SHALL BE HALTED, AND THE STATE OFFICE OF HISTORIC PRESERVATION AND THE OWNER SHALL BE NOTIFIED IMMEDIATELY.

**SURVEY NOTES**

1. UNLESS NOTED OTHERWISE ON THE PLANS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING SURVEY MONUMENTS AND OTHER SURVEY MARKERS DURING CONSTRUCTION.
2. THE CONTRACTOR SHALL MAINTAIN A SET OF PLANS ON THE JOB SHOWING "AS-CONSTRUCTED" CHANGES MADE TO DATE. UPON COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL SUPPLY TO OWNER A SET OF PLANS, MARKED UP TO THE SATISFACTION OF THE OWNER, REFLECTING THE AS-CONSTRUCTED MODIFICATIONS.
3. ELEVATIONS SHOWN ON THE PLANS FOR PIPE INVERTS, TOPS OF BANKS, THALWEG, GRADE CONTROLS, ETC., ARE BASED UPON THE TOPOGRAPHIC INFORMATION SHOWN ON THE PLANS. THE CONTRACTOR SHALL VERIFY ALL NECESSARY SURFACE ELEVATIONS IN THE FIELD AND NOTIFY THE OWNER OF ANY DISCREPANCIES, WHICH MIGHT AFFECT PROPER OPERATION OF THE NEW FACILITIES BEFORE BREAKING GROUND AND PRIOR TO FACILITY INSTALLATION. THE OWNER SHALL BE CONTACTED IN THE EVENT ELEVATIONS ARE INCORRECT SO THAT THE PROPER ADJUSTMENTS CAN BE MADE BY ENGINEER PRIOR TO THE INSTALLATION OF THE FACILITIES, AS SET FORTH IN THE SPECIAL PROVISIONS.
4. LIDAR FOR THIS PROJECT WAS PROVIDED BY PUGET SOUND LIDAR CONSORTIUM BY WATERSHED SCIENCES, INC. AND IS REPRESENTATIVE OF 2013 CONDITIONS. THE VERTICAL DATUM IS NAVD 88 (FT) GEOID03. THE HORIZONTAL DATUM IS NAD 83 (HARN) WASHINGTON STATE PLANE NORTH FIPS 4601, US SURVEY FT. AERIAL IMAGERY IS FROM A 2013 USFS AQUISITION.

**EROSION, SEDIMENT CONTROL AND WATER MANAGEMENT NOTES**

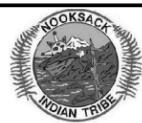
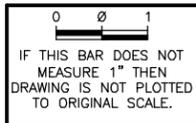
1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING ALL TEMPORARY EROSION CONTROL MEASURES. THE EROSION CONTROL MEASURES SHALL BE IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REQUIREMENTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE AND PERFORMANCE OF THE TEMPORARY EROSION CONTROL MEASURES THROUGHOUT THE DURATION OF THE PROJECT.
2. A SEDIMENT AND EROSION CONTROL PLAN WILL BE DEVELOPED BY THE CONTRACTOR AND SUBMITTED FOR APPROVAL BY OWNER AND/OR THE ENGINEER BEFORE ANY CONSTRUCTION MAY BEGIN. THE SEDIMENT AND EROSION CONTROL PLAN WILL IDENTIFY BEST MANAGEMENT PRACTICES TO ENSURE THAT THE TRANSPORT OF SEDIMENT TO SURFACE WATERS, DRAINAGE SYSTEMS, AND ADJACENT PROPERTIES IS MINIMIZED.
3. ACTIVITIES SHALL BE DESIGNED AND CONSTRUCTED TO AVOID AND MINIMIZE ADVERSE IMPACTS TO WATERS OF THE UNITED STATES TO THE MAXIMUM EXTENT PRACTICAL THROUGH THE USE OF PRACTICAL ALTERNATIVES. ALTERNATIVES THAT SHALL BE CONSIDERED INCLUDE THOSE THAT MINIMIZE THE NUMBER AND EXTENT OF IN-WATER WORK AND EQUIPMENT CROSSINGS OF WETTED CHANNELS.
4. AT NO TIME SHALL SEDIMENT-LADEN WATER BE DISCHARGED OR PUMPED DIRECTLY INTO THE SUBJECT RIVER, STREAM, OR WETLAND. WATER SHALL BE DISCHARGED IN ACCORDANCE WITH REQUIREMENTS SET FORTH IN THE PROJECT PERMITS AND / OR SPECIFICATIONS.
5. IF HIGH WATER LEVEL CONDITIONS THAT CAUSE SILTATION OR EROSION ARE ENCOUNTERED DURING CONSTRUCTION, WORK SHALL STOP UNTIL THE WATER LEVEL SUBSIDES.
6. PERMIT CONDITIONS CONTAIN SPECIFIC REQUIREMENTS FOR THE CONTROL OF EROSION AND TURBIDITY FROM PROJECT OPERATIONS. TURBIDITY WILL BE MONITORED ON A FREQUENT BASIS BY THE PROJECT MANAGEMENT AND INSPECTION STAFF ON-SITE. TURBIDITY AMOUNTS IN EXCESS OF THE PERMITTED CONCENTRATIONS AND/OR DURATIONS WILL CAUSE WORK TO BE STOPPED UNTIL IMPROVED PRACTICES ARE IN EFFECT AND THE PROBLEMS CONTROLLED. THE CONTRACTOR IS COMPLETELY RESPONSIBLE FOR ANY PROJECT DELAYS THAT OCCUR BY NATURE OF THIS FAILURE TO ADEQUATELY CONTAIN SEDIMENT ON-SITE.
7. CONTRACTOR SHALL LIMIT MACHINERY MOVEMENT TO CONSTRUCTION AREAS DEFINED ON SITE PLAN OR IDENTIFIED AS ACCEPTABLE BY THE ENGINEER OR OWNER.
8. ALL EXTERNAL GREASE AND OIL SHALL BE PRESSURE-WASHED OFF THE EQUIPMENT PRIOR TO TRANSPORT TO THE SITE.
9. THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT NO PETROLEUM PRODUCTS, HYDRAULIC FLUID, SEDIMENTS, SEDIMENT-LADEN WATER, CHEMICALS, OR ANY OTHER TOXIC OR DELETERIOUS MATERIALS ARE ALLOWED TO ENTER OR LEACH INTO THE SUBJECT RIVER, STREAM, OR WETLAND.
10. THE CONTRACTOR SHALL HAVE AN EMERGENCY SPILL KIT ONSITE AT ALL TIMES.
11. NO TREES OR WETLAND VEGETATION SHALL BE REMOVED UNLESS THEY ARE SHOWN AND NOTED TO BE REMOVED ON THE PLANS OR AS DIRECTLY SPECIFIED ON-SITE BY THE PROJECT MANAGEMENT STAFF. ALL TREES CONFLICTING WITH GRADING SHALL BE REMOVED. NO GRADING SHALL TAKE PLACE WITHIN THE DRIP LINE OF TREES NOT TO BE REMOVED UNLESS OTHERWISE APPROVED.

12. FOLLOWING CONSTRUCTION, SITE RESTORATION WILL INCLUDE ESTABLISHING LONG-TERM EROSION PROTECTION MEASURES. THESE MEASURES WILL INCLUDE PLANTINGS, EROSION CONTROL FABRIC, SEED, AND MULCH. EQUIPMENT AND EXCESS SUPPLIES WILL BE REMOVED AND THE WORK AREA WILL BE CLEANED. MAINTENANCE ACTIVITIES FOR THE NEWLY CONSTRUCTED RESTORATION PROJECTS ARE ANTICIPATED TO OCCUR PERIODICALLY.

**CONSTRUCTION NOTES**

1. CONTRACT DOCUMENTS REFER TO THESE PLANS.
2. CONTRACTOR SHALL FURNISH ALL MATERIALS, EQUIPMENT, AND LABOR NECESSARY TO COMPLETE ALL WORK AS INDICATED IN THE CONTRACT DOCUMENTS.
3. ANY DISCREPANCIES ARE TO BE BROUGHT TO THE ATTENTION OF THE OWNER PRIOR TO PROCEEDING WITH THE WORK.
4. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY INDICATED OTHERWISE BY THE OWNER OR WHERE LOCAL CODES OR REGULATIONS TAKE PRECEDENCE.
5. ALL WORK PERFORMED AND MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES.
6. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK USING THE BEST SKILLS AND ATTENTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THIS CONTRACT.
7. THE CONTRACTOR SHALL MAKE ALL NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, ROADWAY, DRAINAGE WAYS, PRIVATE BRIDGE, CULVERTS, AND VEGETATION UNTIL SUCH ITEMS ARE TO BE DISTURBED OR REMOVED AS INDICATED ON THE CONTRACT DOCUMENTS.
8. THE CONTRACTOR SHALL KEEP THE JOB SITE CLEAN AND HAZARD FREE. CONTRACTOR SHALL DISPOSE OF ALL DIRT, DEBRIS, AND RUBBISH FOR THE DURATION OF THE WORK. UPON COMPLETION OF WORK, CONTRACTOR SHALL REMOVE ALL MATERIAL AND EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY.
9. NOTES AND DETAILS ON THE PLANS SHALL TAKE PRECEDENCE OVER GENERAL NOTES HEREIN.
10. DIMENSIONS CALLOUTS SHALL TAKE PRECEDENCE OVER SCALES SHOWN ON THE PLANS.
11. THE PLANS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE METHOD OF ALL CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY TO PROTECT THE STRUCTURES, WORKS, AND THE PUBLIC DURING CONSTRUCTION.
12. MATERIAL SHALL NOT BE STORED OUTSIDE OF IDENTIFIED STAGING AREAS. THE CONTRACTOR SHALL USE ONLY DESIGNATED SPECIFIC SITES FOR STORAGE OF EQUIPMENT AND MATERIALS AS SHOWN ON THESE PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SECURITY OF ALL EQUIPMENT AND MATERIALS.

N:\PROJECTS\NOOKSACK TRIBE\NESSET'S REACH RESTORATION\DESIGN\CAD DWGS - CURRENT NOTES AND LEGEND.DWG, Sep. 5/1/2013, 9:26:19 AM



NAME OR INITIALS AND DATE		GEOGRAPHIC INFORMATION	
DESIGNED	RLE	LATITUDE	48°41'50"N
CHECKED	TA	LONGITUDE	122°10'02"W
DRAWN	MW	TN/SC/RG	T37N/S16/RSW
CHECKED	RLE	DATE	-

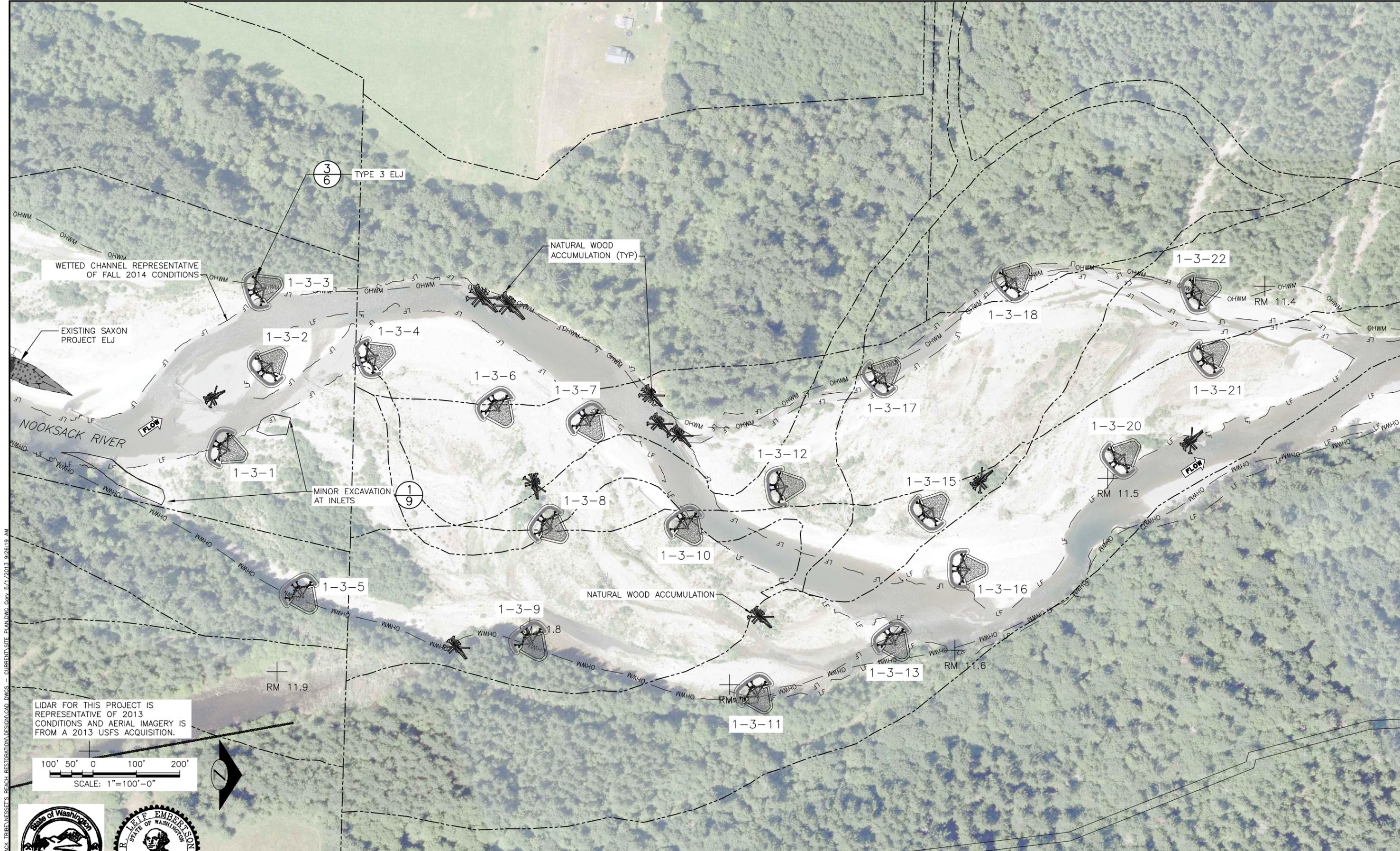
**NESSET'S REACH PHASE 1 RESTORATION**

**GENERAL NOTES**

**2**  
SHEET **2** OF **11**

**May-27-2015 - 90% DESIGN**





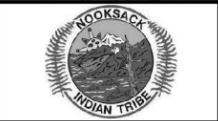
NA\PROJECTS\NOOKSACK TRIBE\NESSET'S REACH RESTORATION\DESIGN\CAD DWGS - CURRENT\SITE PLANNING\G01\_2013\_926:19 AM

May-27-2015 - 90% DESIGN

Timothy B. Abbe

R. Jeff Emberson  
Professional Engineer

0 1  
 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT PLOTTED TO ORIGINAL SCALE.



NAME OR INITIALS AND DATE		GEOGRAPHIC INFORMATION	
DESIGNED	RLE	LATITUDE	48°41'50"N
CHECKED	TA	LONGITUDE	122°10'02"W
DRAWN	MW	TN/SC/RG	T37N/S16/RSW
CHECKED	RLE	DATE	

**NESSET'S REACH PHASE 1 RESTORATION**

**PHASE 1 SITE PLAN**

**4**  
 SHEET 4 OF 11

TYPE 3 ELJ STRUCTURE SCHEDULE

STRUCTURE LABEL *	1-3-1	1-3-2	1-3-3	1-3-4	1-3-5	1-3-6	1-3-7	1-3-8	1-3-9	1-3-10	1-3-11	1-3-12	1-3-13	1-3-15	1-3-16	1-3-17	1-3-18	1-3-20	1-3-21	1-3-22
GROUND ELEVATION** AT STRUCTURE (ft)	340.2	336.9	338.7	340.3	339.1	339.1	335.5	337.9	335.3	334.9	334.4	335.9	330.1	335.2	332.2	332.2	331.2	331.7	332.7	329.2
ADJACENT CHANNEL BED ELEVATION AT STRUCTURE (ft)	335.3	335.0	335.0	334.2	334.6	333.3	332.5	332.7	332.7	331.4	330.6	330.6	329.7	329.1	329.7	329.7	328.0	328.0	327.2	327.2
TOP LOG ELEVATION (ft)	342.3	342.0	342.0	342.3	341.6	341.1	339.5	339.9	339.7	338.4	337.6	337.9	336.7	337.2	336.7	336.7	335.0	335.0	334.7	334.2
STRUCTURE BOTTOM ELEVATION (ft)	332.3	332.0	332.0	331.2	331.6	330.3	329.5	329.7	329.7	328.4	327.6	327.6	326.7	326.1	326.7	326.7	325.0	325.0	324.2	324.2
MINIMUM POST TIP ELEVATION (ft)	322.3	322.0	322.0	321.2	321.6	320.3	319.5	319.7	319.7	318.4	317.6	317.6	316.7	316.1	316.7	316.7	315.0	315.0	314.2	314.2
MINIMUM PILE TIP ELEVATION (ft)	314.3	314.0	314.0	313.2	313.6	312.3	311.5	311.7	311.7	310.4	309.6	309.6	308.7	308.1	308.7	308.7	307.0	307.0	306.2	306.2
POST/PILE TOP ELEVATION (ft)	344.3	344.0	344.0	343.2	343.6	342.3	341.5	341.7	341.7	340.4	339.6	339.6	338.7	338.1	338.7	338.7	337.0	337.0	336.2	336.2
AVERAGE SEPTEMBER WATER SURFACE ELEVATION (ft)	338.3	338.0	338.0	336.6	338.0	336.4	336.1	336.1	336.1	335.0	334.7	334.7	334.0	332.8	332.8	332.8	331.3	331.4	330.2	330.2

\* - Label format: (<Phase>-<ELJ type>-<ELJ number>)  
 \*\* - All elevations in this table are relative to NAVD88

TYPE 3 ELJ LOG SCHEDULE

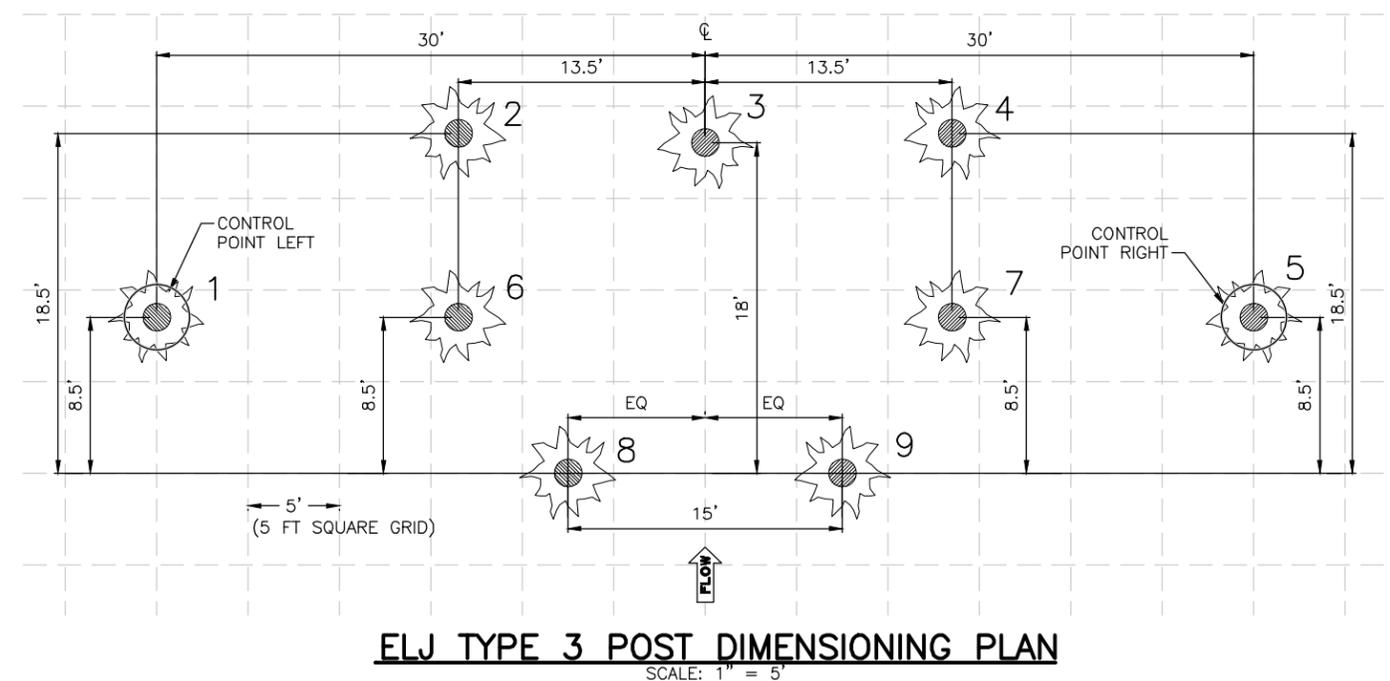
LOG ID	DIA* (IN)	LENGTH** (FT)	ROOTWAD (Y/N)	QUANTITY PER STRUCTURE	PHASE 1 TOTAL (20 STRUCTURES)
4	18	40	N	1	20
5	18	50	Y	2	40
7	18	50	N	2	40
9	24	40	Y	4	80
11	18	30	Y	4	80
12***	18 (PT) 15 (PL)	25 (PT) 30 (PL)	Y (PT) N (PL)	9	180
A	6 MIN 12 MAX	5 MIN 40 MAX		150 CUBIC YARDS	3000 CUBIC YARDS

\* DIAMETER AT BREAST HEIGHT  
 \*\* TOTAL LENGTH INCLUDING ROOTWAD  
 \*\*\* (PT) = POST; (PL) = PILE.

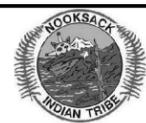
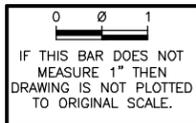
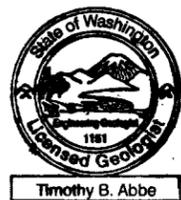
TYPE 3 ELJ LOCATION CONTROL POINTS

STRUCTURE LABEL	CONTROL POINT LEFT		CONTROL POINT RIGHT	
	NORTHING	EASTING	NORTHING	EASTING
1-3-1	*	*	*	*
1-3-2	*	*	*	*
1-3-3	*	*	*	*
1-3-4	*	*	*	*
1-3-5	*	*	*	*
1-3-6	*	*	*	*
1-3-7	*	*	*	*
1-3-8	*	*	*	*
1-3-9	*	*	*	*
1-3-10	*	*	*	*
1-3-11	*	*	*	*
1-3-12	*	*	*	*
1-3-13	*	*	*	*
1-3-15	*	*	*	*
1-3-16	*	*	*	*
1-3-17	*	*	*	*
1-3-18	*	*	*	*
1-3-20	*	*	*	*
1-3-21	*	*	*	*
1-3-22	*	*	*	*

\* Locations to be finalized at final submittal



N:\PROJECTS\NOOKSACK TRIBE\NESSET'S REACH RESTORATION\DESIGN\CAD DWGS - CURRENT NOTES AND LEGEND.DWG, 5/1/2013, 9:26:19 AM



NAME OR INITIALS AND DATE	GEOGRAPHIC INFORMATION
DESIGNED: RLE	LATITUDE: 48°41'50"N
CHECKED: TA	LONGITUDE: 122°10'02"W
DRAWN: MW	TN/SC/RG: T37N/S16/RSW
CHECKED: RLE	DATE: -

NESSET'S REACH PHASE 1 RESTORATION

CONTROL DATA

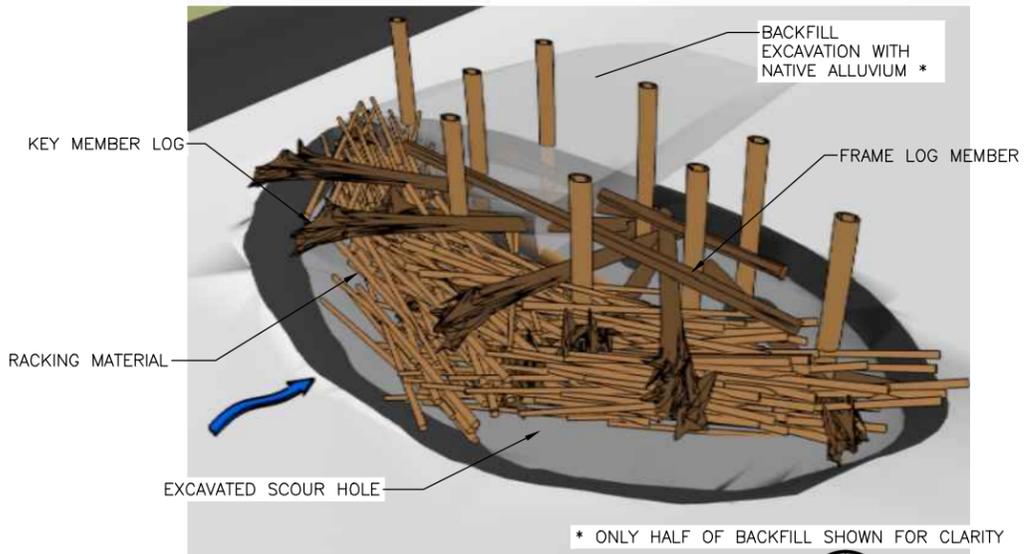
5  
SHEET 5 OF 11

May-27-2015 - 90% DESIGN

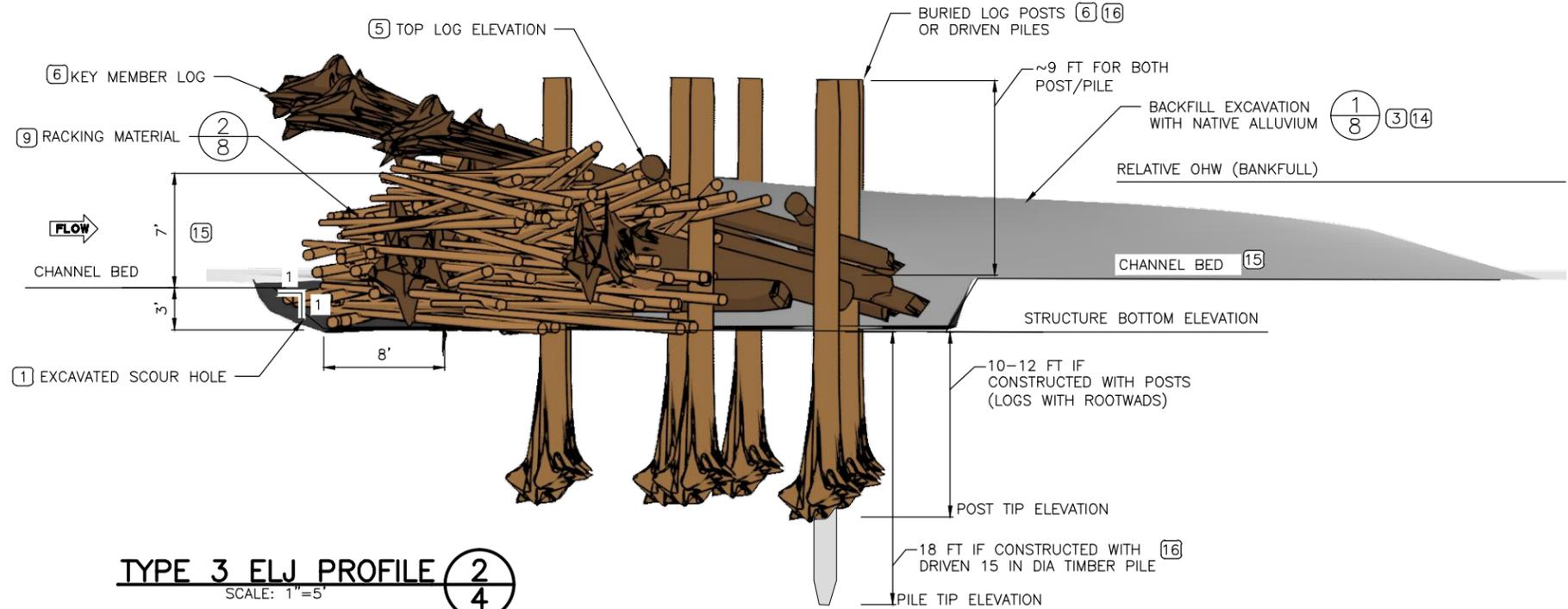
**TYPE 3 ELJ STRUCTURE NOTES**

- ① EXCAVATE IN FRONT OF LOGJAM FOR PLACEMENT OF RACKING MATERIAL. EXCAVATION AREA SHALL NOT BE BACKFILLED WITH ALLUVIUM, BUT LEFT AS A SCOUR HOLE.
2. EXCAVATION SPOILS SHALL BE STAGED ACCORDING TO THE SWPPP. SPOILS SHALL ALSO BE STOCKPILED TO ALLOW LOG LAYER PLACEMENT AND CONSTRUCTION ACCESS.
- ③ BACKFILL EXTENTS MAY VARY AND TO BE CONSTRUCTED WITH NATIVE ALLUVIUM FROM EXCAVATION SPOILS.
4. BACKFILL EACH STRUCTURE LAYER WITH NATIVE ALLUVIUM FLUSH WITH THE CURRENT LAYER PRIOR TO PLACEMENT OF THE SUBSEQUENT LAYER.
- ⑤ TOP LOG ELEVATION TO BE ACHIEVED, OR EXCEEDED, AS SPECIFIED REGARDLESS OF ACTUAL LOG DIAMETERS USED OR STACKING ARRANGEMENT.
- ⑥ ALL LARGE WOOD DIMENSIONS DO NOT INCLUDE BARK THICKNESS.
7. COVER TOP OF BACKFILL AREA OF STRUCTURES 6-12 INCHES WITH LOOSE WOOD DEBRIS AND CHIPS.
8. LASH FRAME LOG MEMBERS PER INSTRUCTIONS ON LAYERING PLAN TO VERTICAL POSTS WITH  $\frac{3}{8}$  INCH STEEL CHAIN. TIGHTEN CHAIN TO APPROXIMATELY 500-POUNDS TENSION.
- ⑨ RACKING MATERIAL SHALL CONSIST OF APPROXIMATELY 150 CU. YDS PER STRUCTURE WITH 6" - 12" DBH AND 5-40 FEET LENGTH. RACKING PLACEMENT SHALL OCCUR WITH EACH LAYER PLACEMENT TO ENSURE RACKING MATERIAL EXTENDS THROUGH STRUCTURE AND PINNED IN PLACE BY SUBSEQUENT LAYERS.

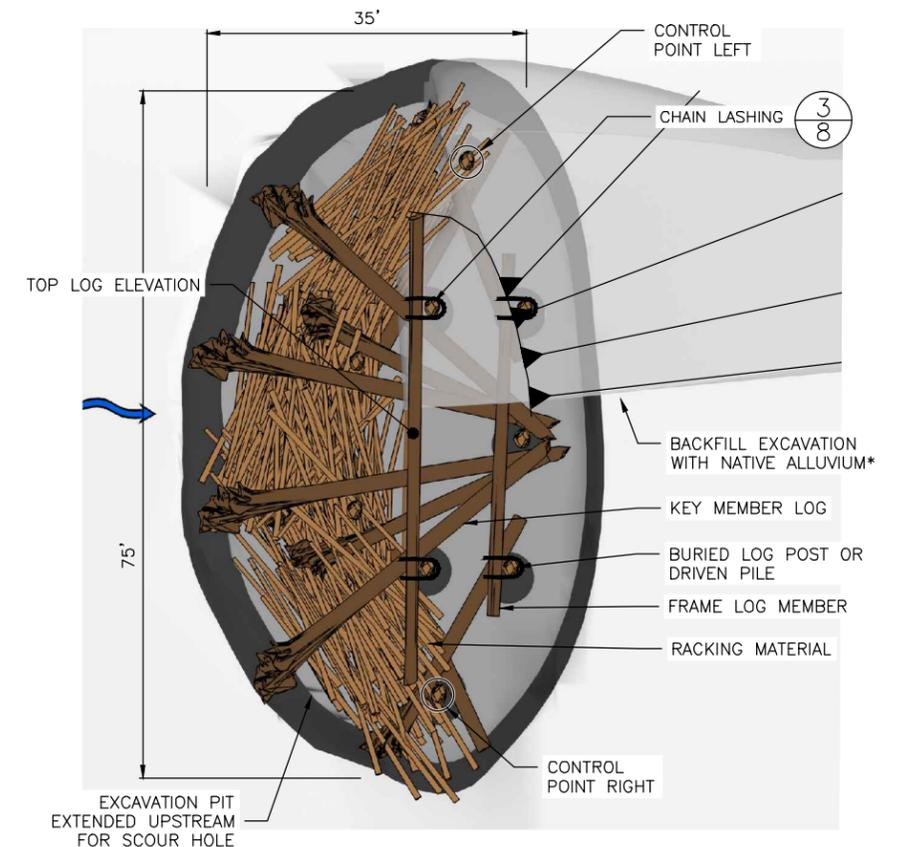
10. THE CONTRACTOR SHALL FIELD VERIFY WITH THE OWNER REPRESENTATIVE OR ENGINEER ALL STRUCTURE LOCATIONS, PILE LOCATIONS, LENGTHS, WIDTHS AND ELEVATIONS PRIOR TO EXCAVATION, ASSEMBLY AND INSTALLATION OF EACH STRUCTURE.
11. LOCATIONS FOR ALL STRUCTURE PLACEMENTS WILL BE STAKED IN FIELD BY THE ENGINEER PRIOR TO START OF CONSTRUCTION.
12. EXCAVATION LIMITS SHALL BE FIELD VERIFIED BY THE OWNER REPRESENTATIVE OR ENGINEER PRIOR TO EXCAVATION COMMENCING AND PLACEMENT OF ANY LARGE WOOD.
13. THE WOOD LAYER PLACEMENT IN EACH LOGJAM LAYER SHALL BE FIELD VERIFIED BY ON-SITE OWNER REPRESENTATIVE PRIOR TO BACKFILLING.
- ⑭ BACKFILL NOT TO EXCEED TOP ELEVATION. EXCESS BACKFILL TO BE PLACED DOWNSTREAM OF FINISHED ELJ AS NOURISHMENT BAR AS DIRECTED BY OWNER REPRESENTATIVE.
- ⑮ CHANNEL BED ELEVATION IS REPRESENTATIVE OF A LOCAL AVERAGE CHANNEL BED AT RIFFLES. CHANNEL BED ELEVATION SHOULD NOT BE TAKEN IN POOLS. IN MOST INSTANCES CHANNEL BED IS NOT REPRESENTATIVE OF GROUND ELEVATION AT STRUCTURE. SEE STRUCTURE SCHEDULE FOR ELEVATION CONTROL DATA.
- ⑯ 15-IN DIA TIMBER PILES DRIVEN 21 FT BELOW CHANNEL BOTTOM (18 FT BELOW BOTTOM ELEVATION) CAN BE SUBSTITUTED FOR BURIED LOG POST AS APPROVED BY OWNER REPRESENTATIVE OR ENGINEER.



**TYPE 3 ELJ PERSPECTIVE** ①/④  
NOT TO SCALE



**TYPE 3 ELJ PROFILE** ②/④  
SCALE: 1"=5'



**TYPE 3 ELJ PLAN** ③/④  
SCALE: 1"=10'

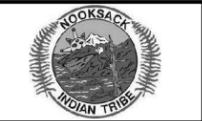
\* ONLY HALF OF BACKFILL SHOWN FOR CLARITY

N:\PROJECTS\NOOKSACK TRIBE\NESSET'S REACH RESTORATION\DESIGN\CAD DWGS - CURRENT\TYPE 3 ELJ.DWG Rev. 5/1/2013 9:26:19 AM

Timothy B. Abbe

R. Jeff Emberton  
REGISTERED PROFESSIONAL ENGINEER  
45447

0 8 1  
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT PLOTTED TO ORIGINAL SCALE.

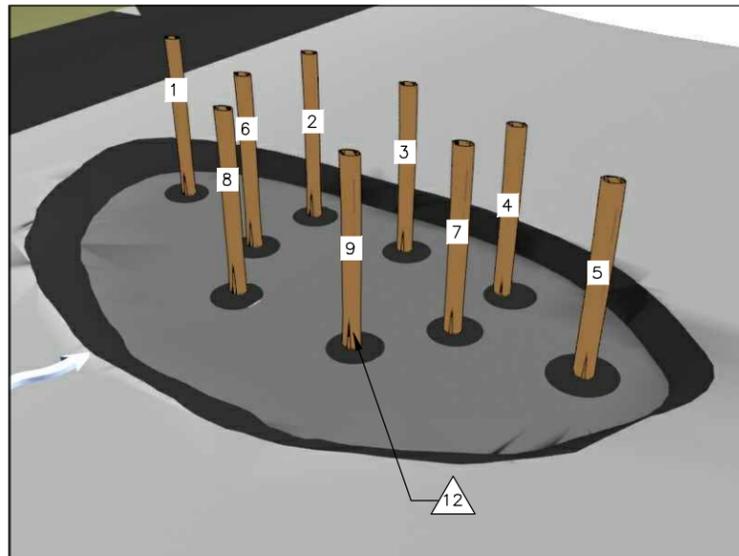


NAME OR INITIALS AND DATE		GEOGRAPHIC INFORMATION	
DESIGNED	RLE	LATITUDE	48°41'50"N
CHECKED	TA	LONGITUDE	122°10'02"W
DRAWN	MW	TN/SC/RG	T37N/S16/RSW
CHECKED	RLE	DATE	-

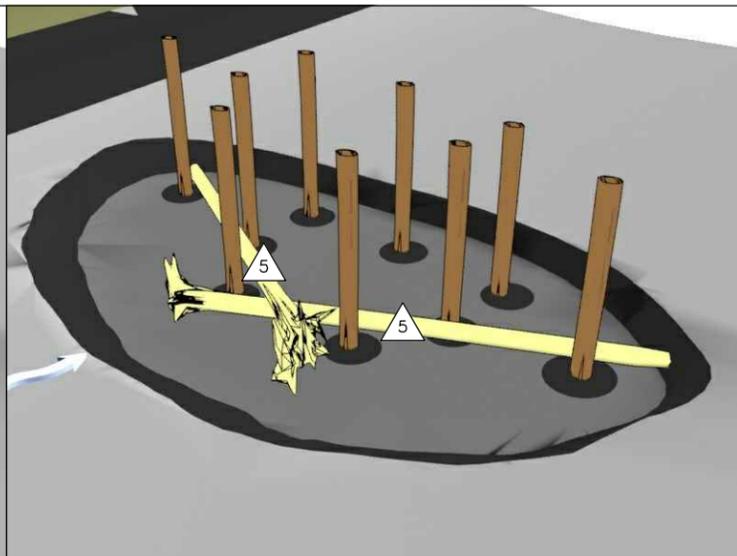
**NESSET'S REACH PHASE 1 RESTORATION**

**TYPE 3 ELJ PLAN & PROFILE**

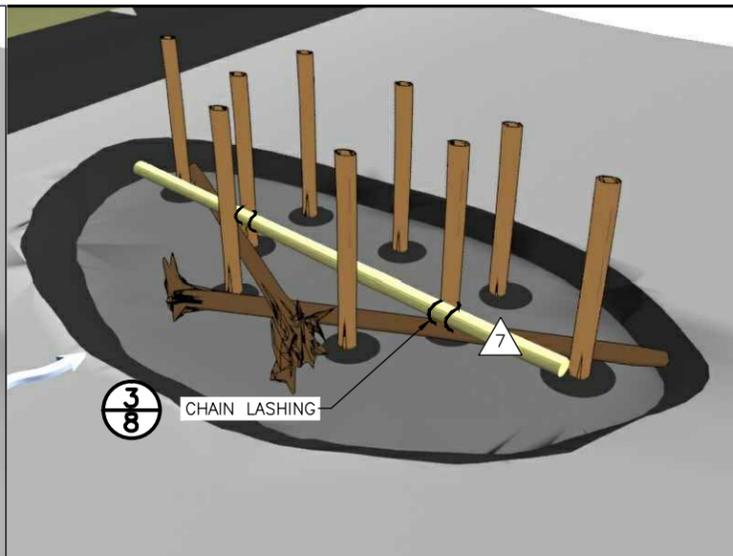
May-27-2015 - 90% DESIGN



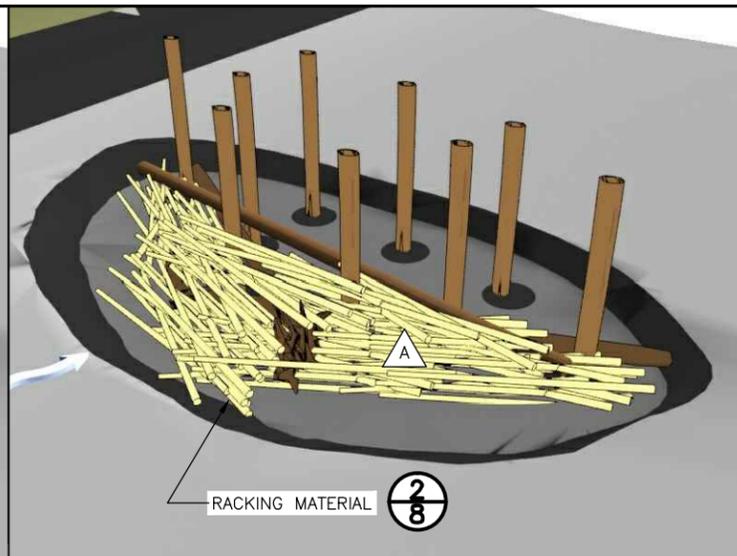
LAYER 0  
EXCAVATE, PLACE, AND BACKFILL NINE VERTICAL LOG POSTS



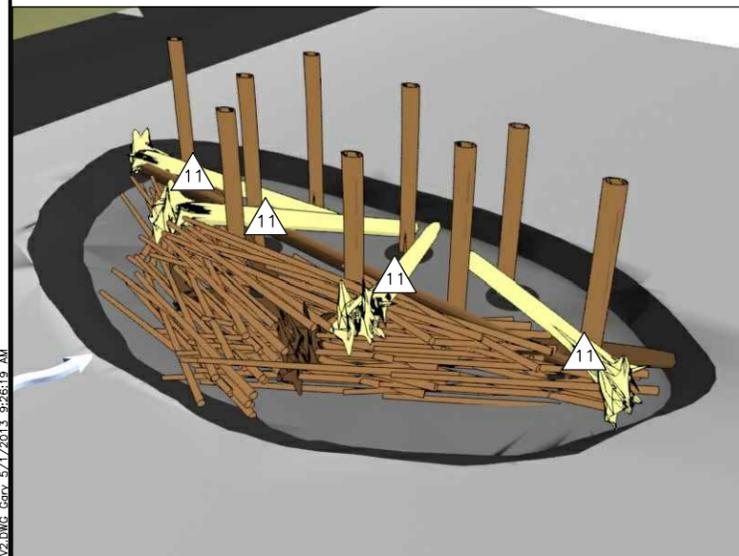
LAYER 1  
PLACE TWO FRAME LOG MEMBERS



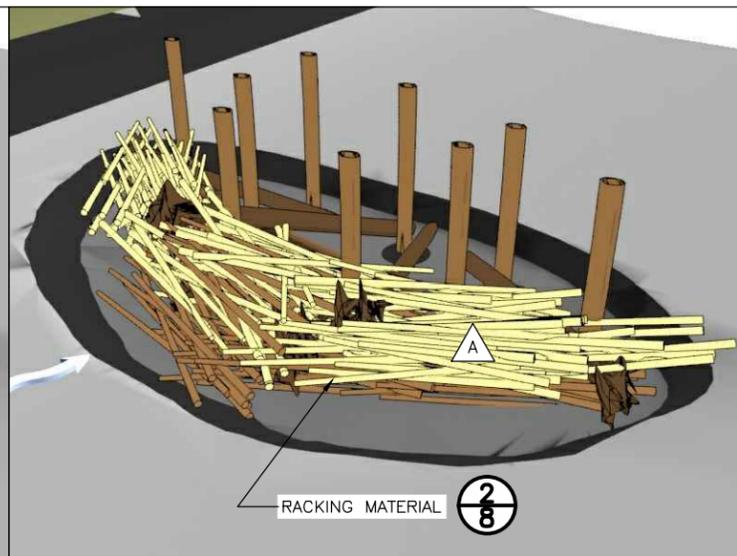
LAYER 2  
PLACE ONE FRAME LOG MEMBER AND CHAIN LASH TO VERTICAL POSTS



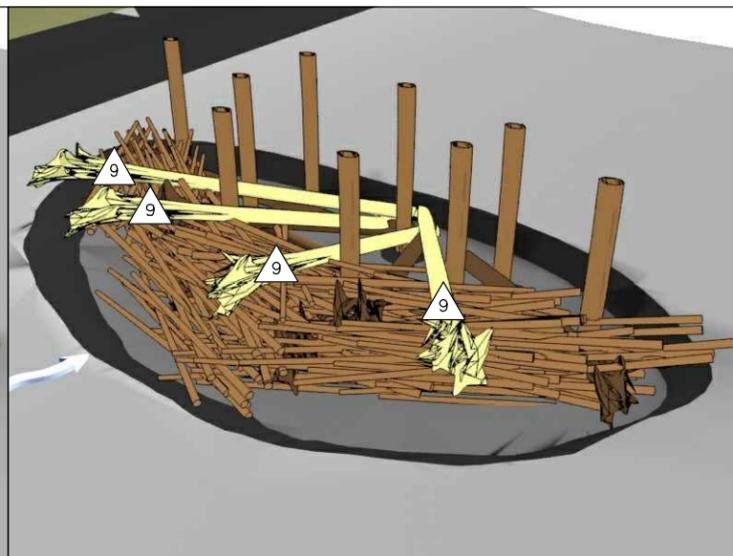
LAYER 3  
PLACE RACKING MATERIAL INTERLOCKED AND TIGHT



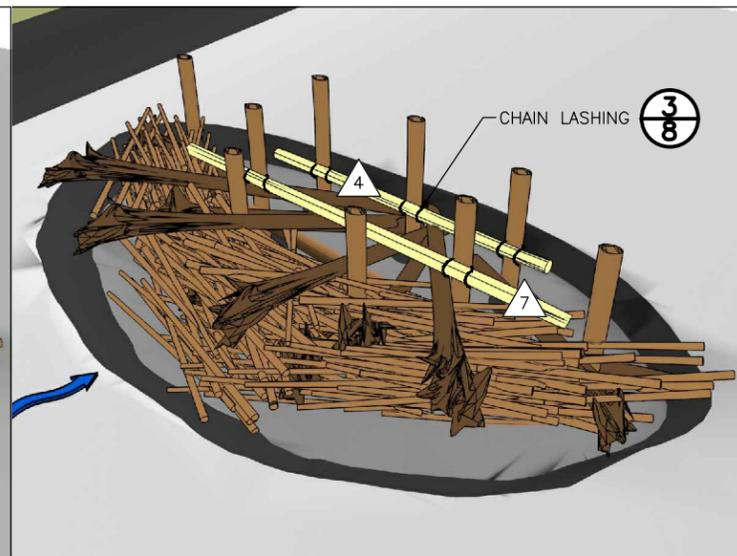
LAYER 4  
PLACE ROOTWAD MEMBERS AND SECURE LOWER LAYER OF RACKING



LAYER 5  
PLACE SECOND LAYER OF RACKING, INTERMIX WITH EXISTING RACKING AND ROOTWADS

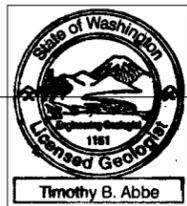


LAYER 6  
PLACE ROOTWAD MEMBERS SECURING RACKING

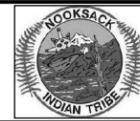


LAYER 7  
PLACE TWO FRAME LOG MEMBERS AND CHAIN LASH TO VERTICAL POSTS

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IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT PLOTTED TO ORIGINAL SCALE.

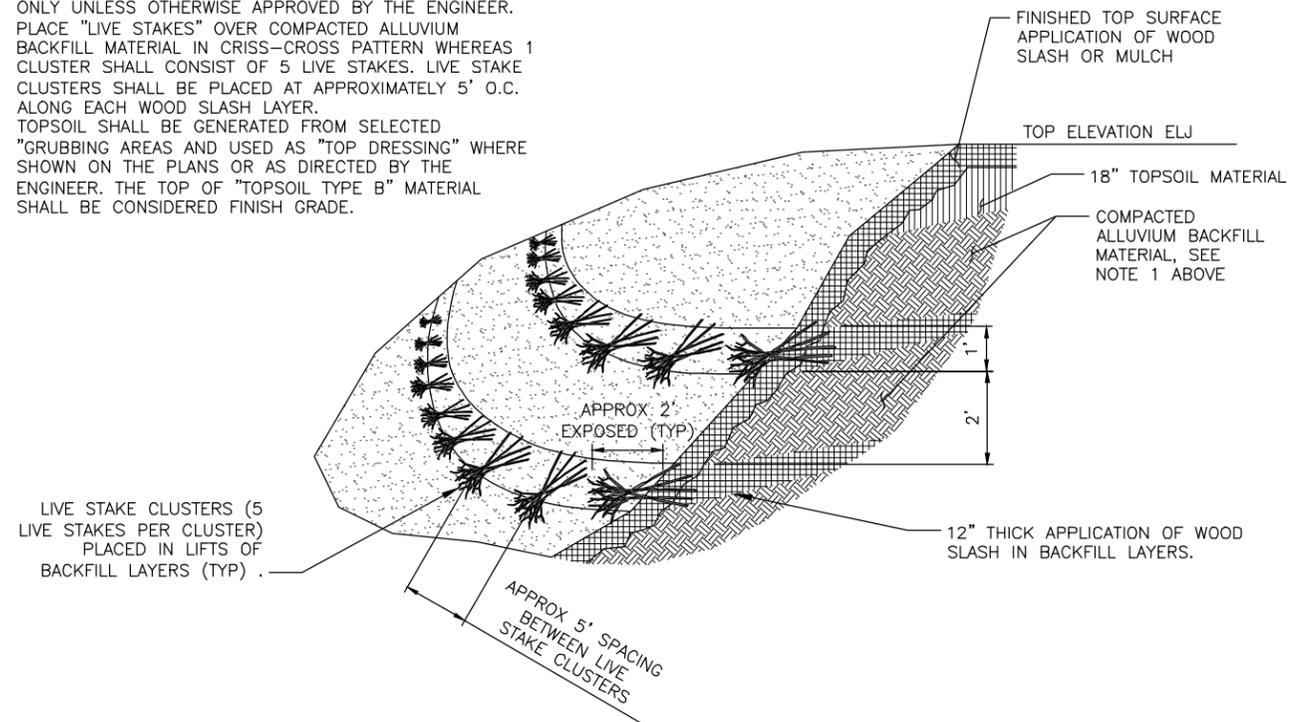


NAME OR INITIALS AND DATE	GEOGRAPHIC INFORMATION
DESIGNED _____	LATITUDE _____
CHECKED _____	LONGITUDE _____
DRAWN _____	TN/SC/RG _____
CHECKED _____	DATE _____

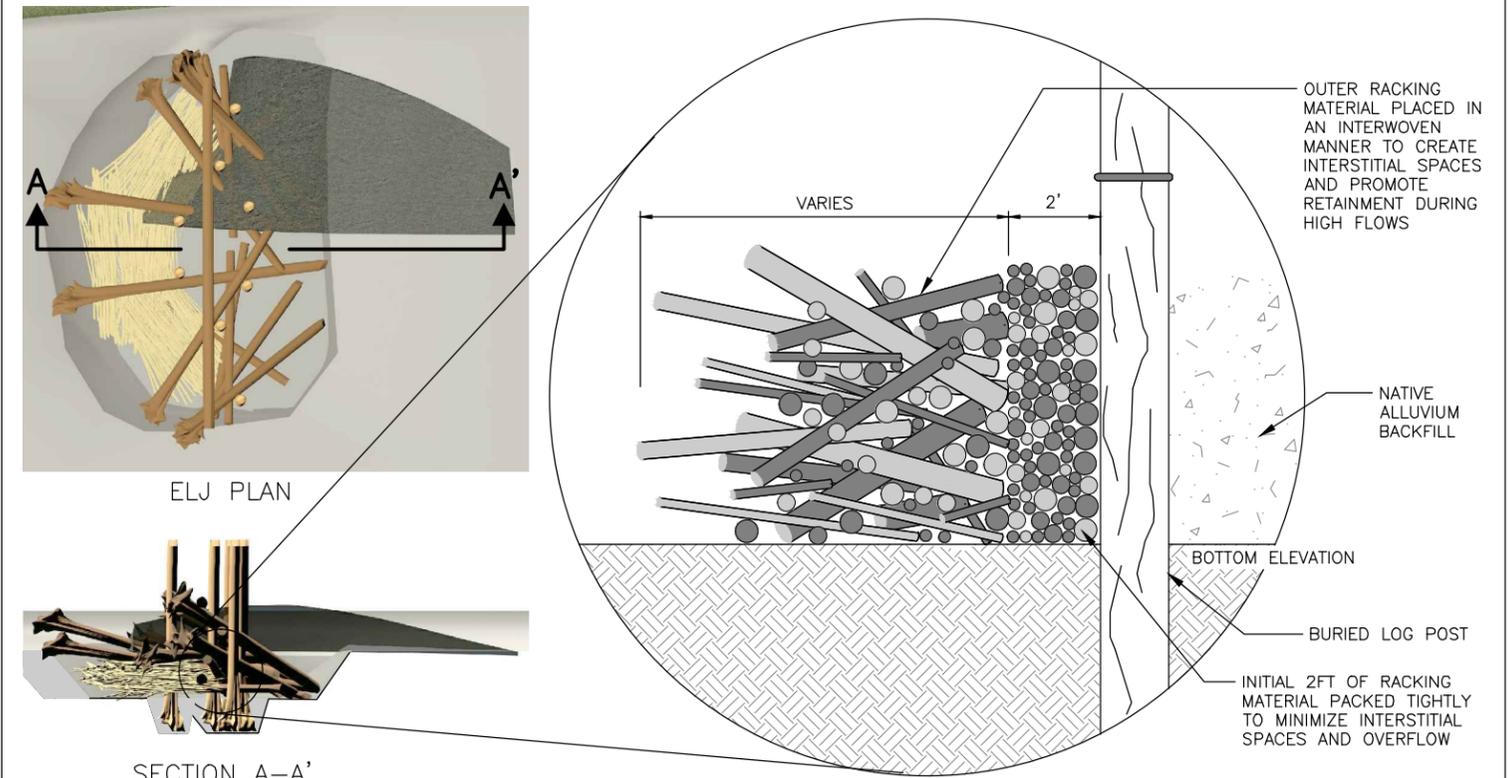
May-27-2015

**GENERAL ELJ BACKFILL LAYERING NOTES:**

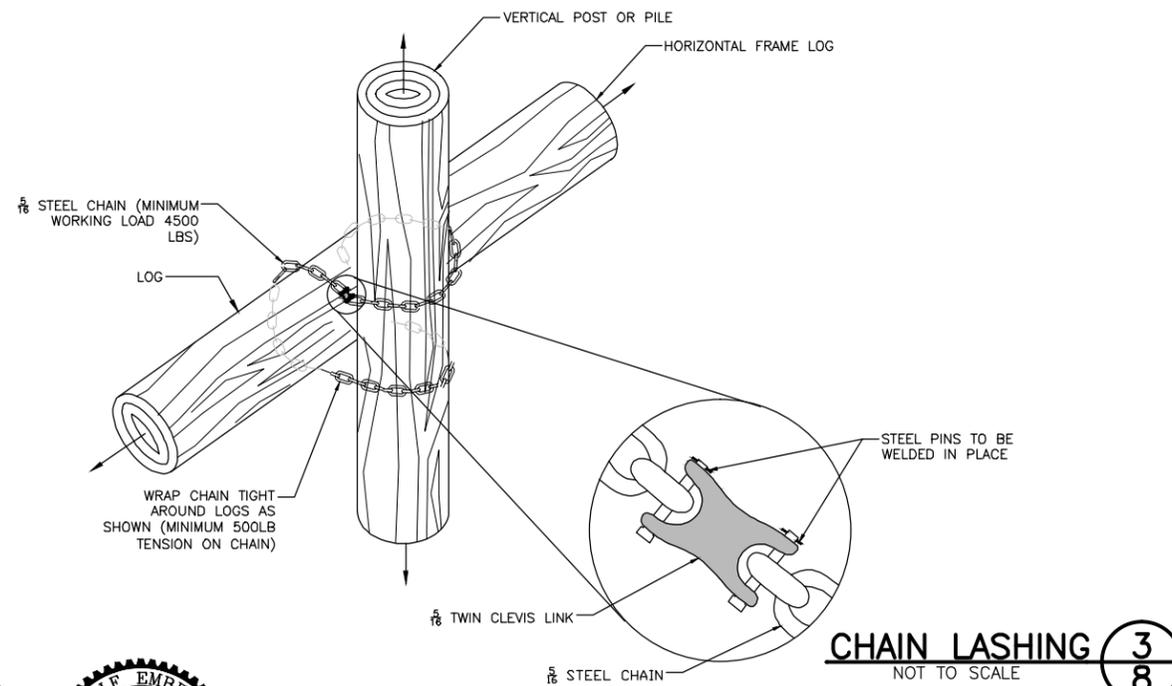
1. COMPACTION OF ALLUVIUM BACKFILL MATERIAL IN ALL ELJ'S SHALL BE IN "FIRM AND UNYIELDING" LIFTS, TO THE SATISFACTION OF THE ENGINEER, USING HOE-PACK OR APPROVED EQUAL. BACKFILL MATERIAL SHALL BE TAKEN FROM STOCKPILED ALLUVIUM FROM EXCAVATION ONLY UNLESS OTHERWISE APPROVED BY THE ENGINEER.
2. PLACE "LIVE STAKES" OVER COMPACTED ALLUVIUM BACKFILL MATERIAL IN CRISS-CROSS PATTERN WHEREAS 1 CLUSTER SHALL CONSIST OF 5 LIVE STAKES. LIVE STAKE CLUSTERS SHALL BE PLACED AT APPROXIMATELY 5' O.C. ALONG EACH WOOD SLASH LAYER.
3. TOPSOIL SHALL BE GENERATED FROM SELECTED "GRUBBING AREAS AND USED AS "TOP DRESSING" WHERE SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. THE TOP OF "TOPSOIL TYPE B" MATERIAL SHALL BE CONSIDERED FINISH GRADE.



**ELJ BACKFILL LAYERING DETAIL 1/8**  
NOT TO SCALE



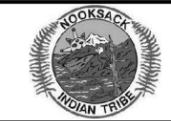
**RACKING MATERIAL DETAIL 2/8**  
NOT TO SCALE



**CHAIN LASHING 3/8**  
NOT TO SCALE



0 1  
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT PLOTTED TO ORIGINAL SCALE.



NAME OR INITIALS AND DATE	GEOGRAPHIC INFORMATION
DESIGNED RLE	LATITUDE 48°41'50"N
CHECKED TA	LONGITUDE 122°10'02"W
DRAWN MW	TN/SC/RG 137N/S16/RSW
CHECKED RLE	DATE

**NESSET'S REACH PHASE 1 RESTORATION**

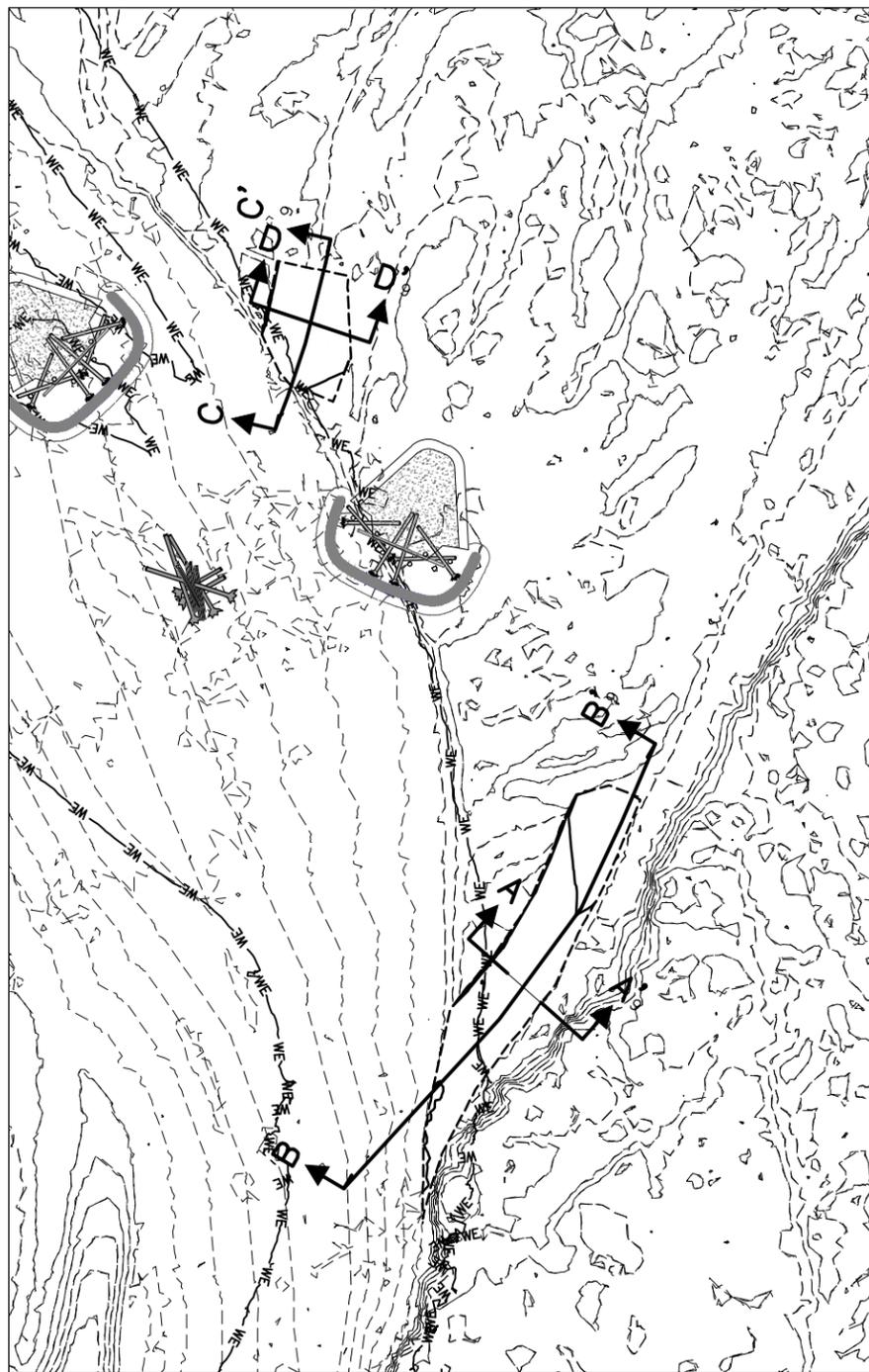
**ELJ DETAILS**

**8**  
SHEET 8 OF 11

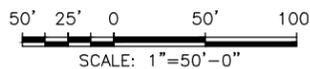
NA\PROJECTS\NOOKSACK\_TREACH\NESSET'S\_REACH\_RESTORATION\DESIGN\CAD\_DRAWINGS - CURRENT RESTORATION\DESIGN\CAD\_DRAWINGS - 5/1/2013 9:26:19 AM

May-27-2015 - 90% DESIGN

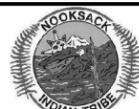
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**PILOT CHANNEL PLAN DETAIL 1/9**  
SCALE: 1" = 50'



0 50 100  
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT PLOTTED TO ORIGINAL SCALE.

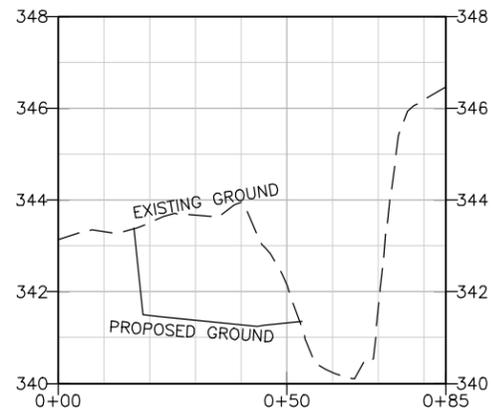


NAME OR INITIALS AND DATE		GEOGRAPHIC INFORMATION	
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CHECKED	TA	LONGITUDE	122°10'02"W
DRAWN	MW	TN/SC/RG	T37N/S16/RSW
CHECKED	RLE	DATE	

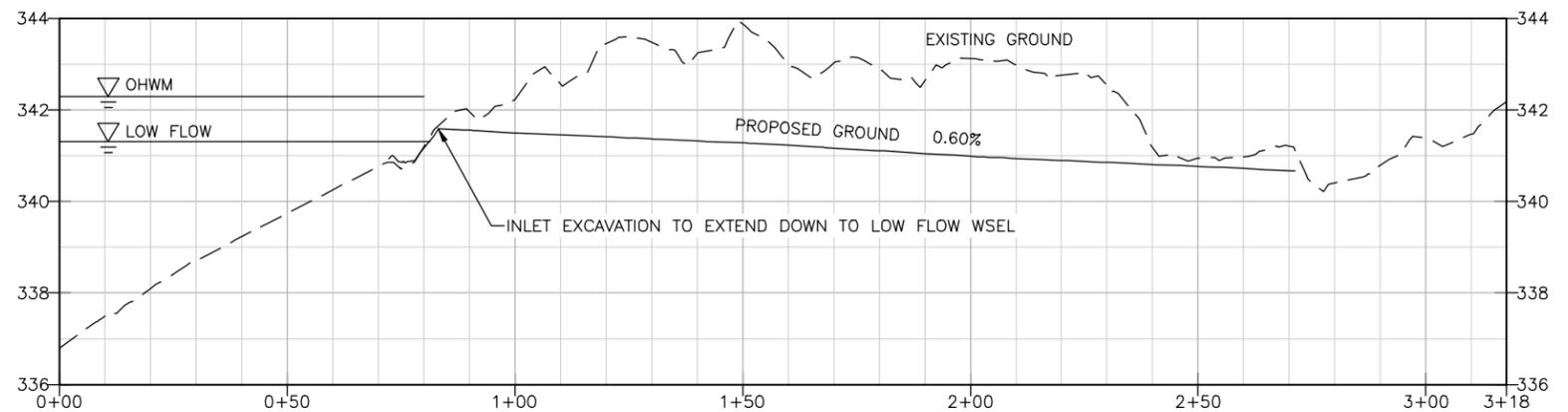
**NESSET'S REACH PHASE 1 RESTORATION**

**PILOT CHANNEL EXCAVATION DETAILS**

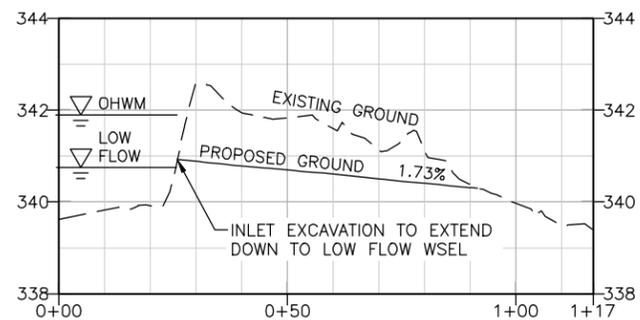
**9**  
SHEET 9 OF 11



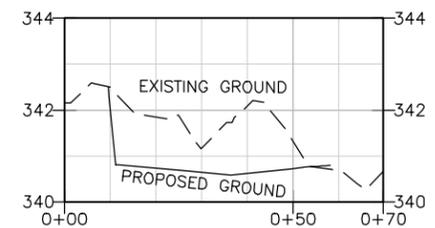
**SECTION A-A' 9**  
SCALE: H: 1" = 20' V: 1" = 2'



**SECTION B-B' 9**  
SCALE: H: 1" = 20' V: 1" = 2'



**SECTION C-C' 9**  
SCALE: H: 1" = 20' V: 1" = 2'



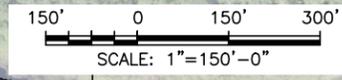
**SECTION D-D' 9**  
SCALE: H: 1" = 20' V: 1" = 2'

- NOTES**
- CUT VOLUME FOR UPSTREAM PILOT CHANNEL: 305 CY
  - CUT VOLUME FOR DOWNSTREAM PILOT CHANNEL: 100 CY
  - EXTENT OF CUT SHALL BE ADJUSTED BY ENGINEER PRIOR TO CONSTRUCTION.
  - PILOT CHANNELS BASED UPON 2013 LIDAR. ADJUSTMENTS SHOULD BE EXPECTED AT TIME OF CONSTRUCTION.
  - EXCAVATION MATERIAL TO BE PLACED BEHIND ELJ 1-3-1 AND 1-3-5 AS GRAVEL NOURISHMENT BARS.

May-27-2015 - 90% DESIGN

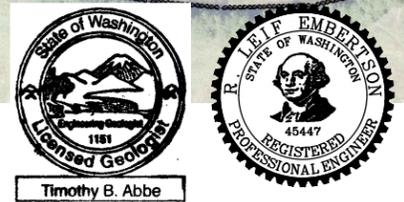


LIDAR FOR THIS PROJECT IS REPRESENTATIVE OF 2013 CONDITIONS AND AERIAL IMAGERY IS FROM A 2013 USFS ACQUISITION.

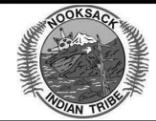


- NOTES:**
- ① LOG STAGING, EQUIPMENT REFUELING, AND STAGING AREA.
  - ② ELJ TO BE ASSEMBLED IN WETTED CHANNEL. FINAL DETERMINATION TO BE COMPLETED PRIOR TO CONSTRUCTION BY OWNER AND PERMITTING BIOLOGIST. ASSEMBLY TO BE COMPLETED BY MACHINERY LOCATED ON DRY GRAVEL BAR.
  - ③ PHASE 2 PROJECT AREA
  - ④. LOW FLOW CHANNEL APPROXIMATE AND TO BE VERIFIED PRIOR TO CONSTRUCTION.
  - ⑤ MINOR WATER ISOLATION OF WORK AREA USING TEMPORARY COFFERDAM MAYBE REQUIRED DEPENDING ON LOCATION OF LOW FLOW CHANNEL AND STREAMFLOW STAGE AT THE TIME OF CONSTRUCTION.

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IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT PLOTTED TO ORIGINAL SCALE.

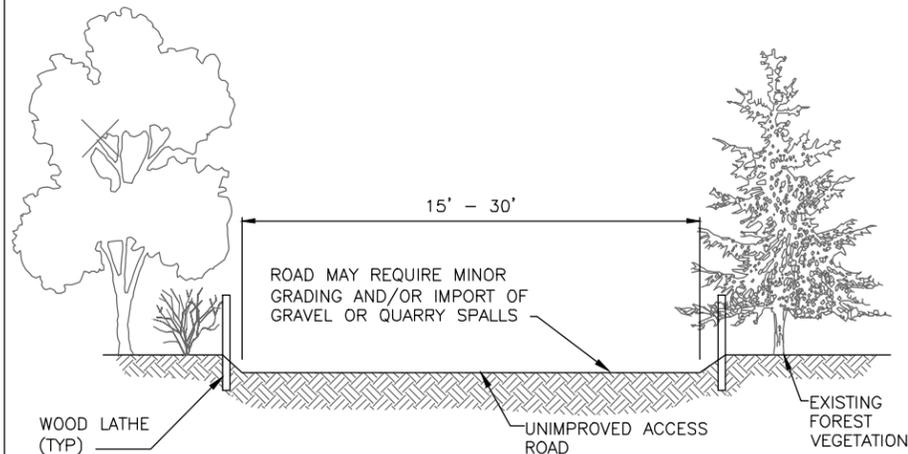


NAME OR INITIALS AND DATE		GEOGRAPHIC INFORMATION	
DESIGNED	RLE	LATITUDE	48°41'50"N
CHECKED	TA	LONGITUDE	122°10'02"W
DRAWN	MW	TN/SC/RG	T37N/S16/R5W
CHECKED	RLE	DATE	

## NESSET'S REACH PHASE 1 RESTORATION

### PHASE 1 TESC PLAN

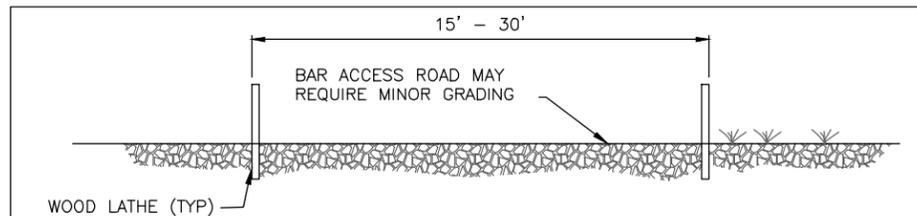
Jun-05-2015 - 90% DESIGN



**NOTES FOR TEMPORARY CLEARED ACCESS**

1. CLEARED ACCESS TO BE ROUTED TO MINIMIZE VEGETATION DISTURBANCE AND FOREST CLEARING.
2. CONTRACTOR SHALL MARK CLEARING LIMITS WITH FLAGGING. CLEARING LIMITS TO BE APPROVED BY ENGINEER PRIOR TO ANY CLEARING ACTIVITIES.
3. ANY TREES GREATER THAN 18" Ø SHALL BE REMOVED W/ ROOTWADS INTACT AND STOCKPILED FOR USE IN LOGJAM CONSTRUCTION.
4. TREES AND SHRUBS WITH 6"-18" Ø SHALL BE STOCKPILED FOR USE AS RACKING MATERIAL IN LOGJAM CONSTRUCTION.
5. REMAINDER OF VEGETATION AND ORGANIC SOIL SHALL BE GRUBBED, STOCKPILED AND BROADCASTED ON ROAD ALIGNMENT FOLLOWING TERMINATION OF WORK.
6. ACCESS SHALL BE MAINTAINED BY MINOR GRADING AND IMPORTATION OF WOOD CHIPS, GRAVEL AND/OR QUARRY SPALLS.
7. CLEARED ACCESS SHALL BE SCARIFIED AND DECONSTRUCTED TO PREVENT FUTURE ACCESS AT THE TERMINATION OF WORK.
8. REVEGETATION ROAD ALIGNMENT FOLLOWING CONSTRUCTION WILL BE PERFORMED BY CONTRACTOR.
9. ALL GRAVEL OR QUARRY SPALLS PLACED SHALL BE UNDERLAIN WITH A GEOTEXTILE AND REMOVED AT TERMINATION OF WORK IF UTILIZED.

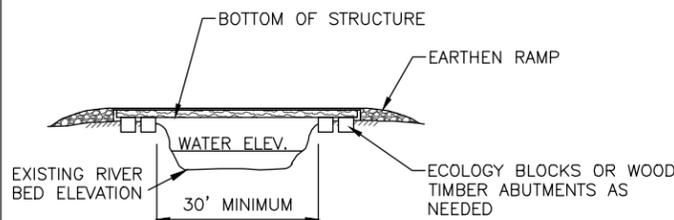
**TEMPORARY CLEARED ACCESS 1**  
SCALE: NTS



**NOTES FOR TEMPORARY BAR ACCESS**

1. BAR ACCESS TO BE ROUTED TO MINIMIZE VEGETATION DISTURBANCE.
2. CONTRACTOR SHALL STAKE EDGES OF PROPOSED BAR ACCESS FOR APPROVAL BY ENGINEER.
3. EQUIPMENT SHALL OPERATE ONLY WITHIN STAKED BAR ACCESS ALIGNMENT OR OTHER DEFINED PROJECT AREAS.
4. BAR ACCESS SHALL BE DECOMPACTED TO 18 INCH DEPTH AT TERMINATION OF WORK.

**TEMPORARY BAR ACCESS 4**  
SCALE: NTS



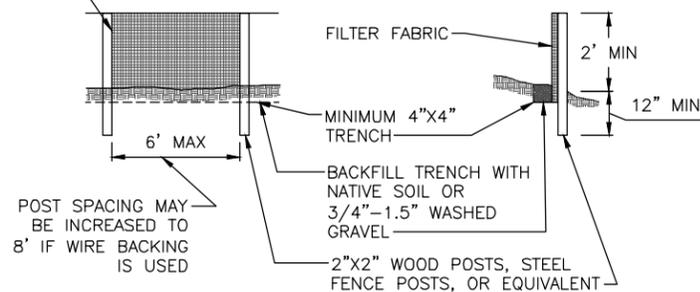
**NOTES:**

1. CONTRACTOR TO DESIGN TEMPORARY BRIDGE.
2. END OF BRIDGE SHALL BEAR ON HIGH BANKS WITH SUFFICIENT BEARING CAPACITY TO PREVENT SLOUGHING OR COLLAPSE OF SIDE CHANNEL BANKS.
3. CONCRETE ECOLOGY BLOCKS OR WOOD ABUTMENTS MAY BE USED TO SUPPORT ENDS OF TEMPORARY BRIDGE AS NEEDED.
4. BRIDGES MAY BE CONSTRUCTED FROM LOGS, RAIL CAR BEDS OR APPROVED EQUAL AND DECKED WITH STEEL SHEET, WOOD LAGGING OR APPROVED EQUAL.



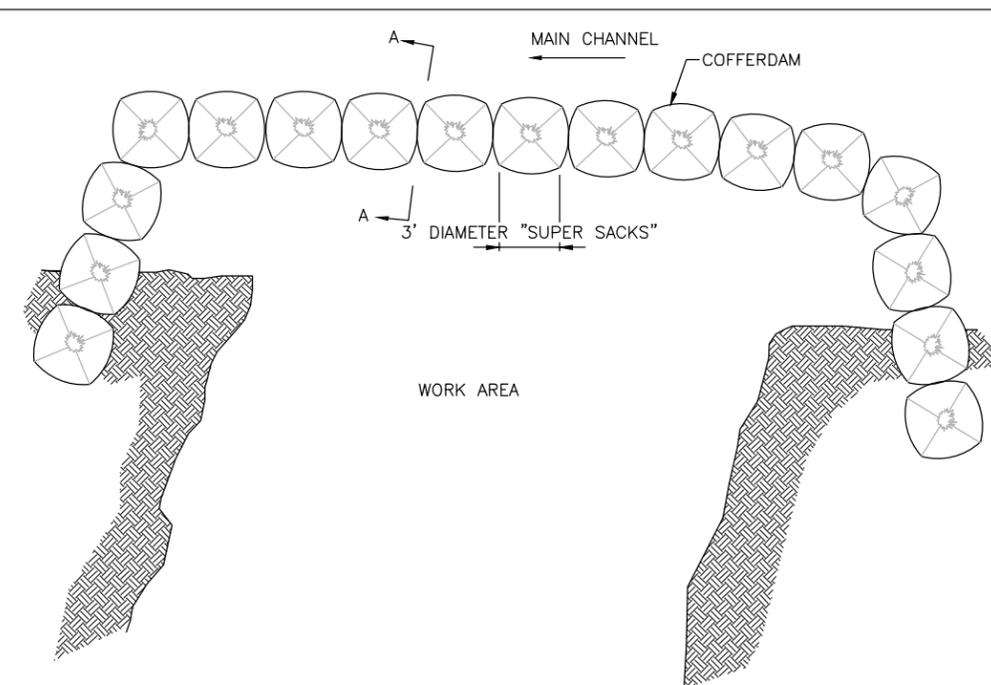
**TEMPORARY BRIDGE 2**  
SCALE: NTS

JOINTS IN FILTER FABRIC SHALL BE SPLICED AT POSTS. USE STAPLES, WIRE RINGS OR EQUIVALENT TO ATTACH FABRIC TO POSTS WITH A MINIMUM 4" OVERLAP



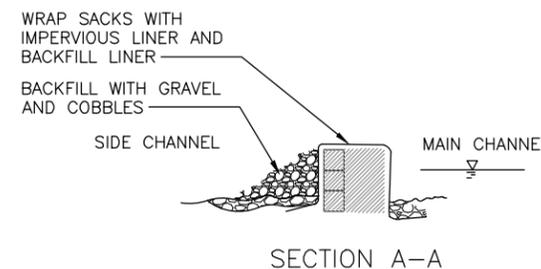
REFERENCE; WASHINGTON STATE DEPARTMENT OF ECOLOGY STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON (FIGURE 4-19)

**TEMPORARY SILT FENCE 3**  
SCALE: NTS

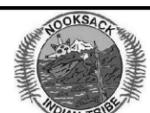
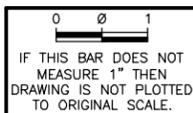


**NOTES:**

1. WRAP "SUPER SACKS WITH IMPERVIOUS PLASTIC LINER TO PREVENT SEEPAGE.
2. BACKFILL THE DOWNSTREAM SIDE COFFER DAM WITH NATIVE, ADJACENT ALLUVIUM.
3. USE "SUPER SACKS" AS BUTTRESSES AS REQUIRED.



**COFFERDAM 5**  
SCALE: NTS



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CHECKED	TA	LONGITUDE	122°10'02"W
DRAWN	MW	TN/SC/RG	137N/S16/RSW
CHECKED	RLE	DATE	-

**NESSET'S REACH PHASE 1 RESTORATION**

**TESC DETAILS**

**11**  
SHEET **11** OF **11**

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