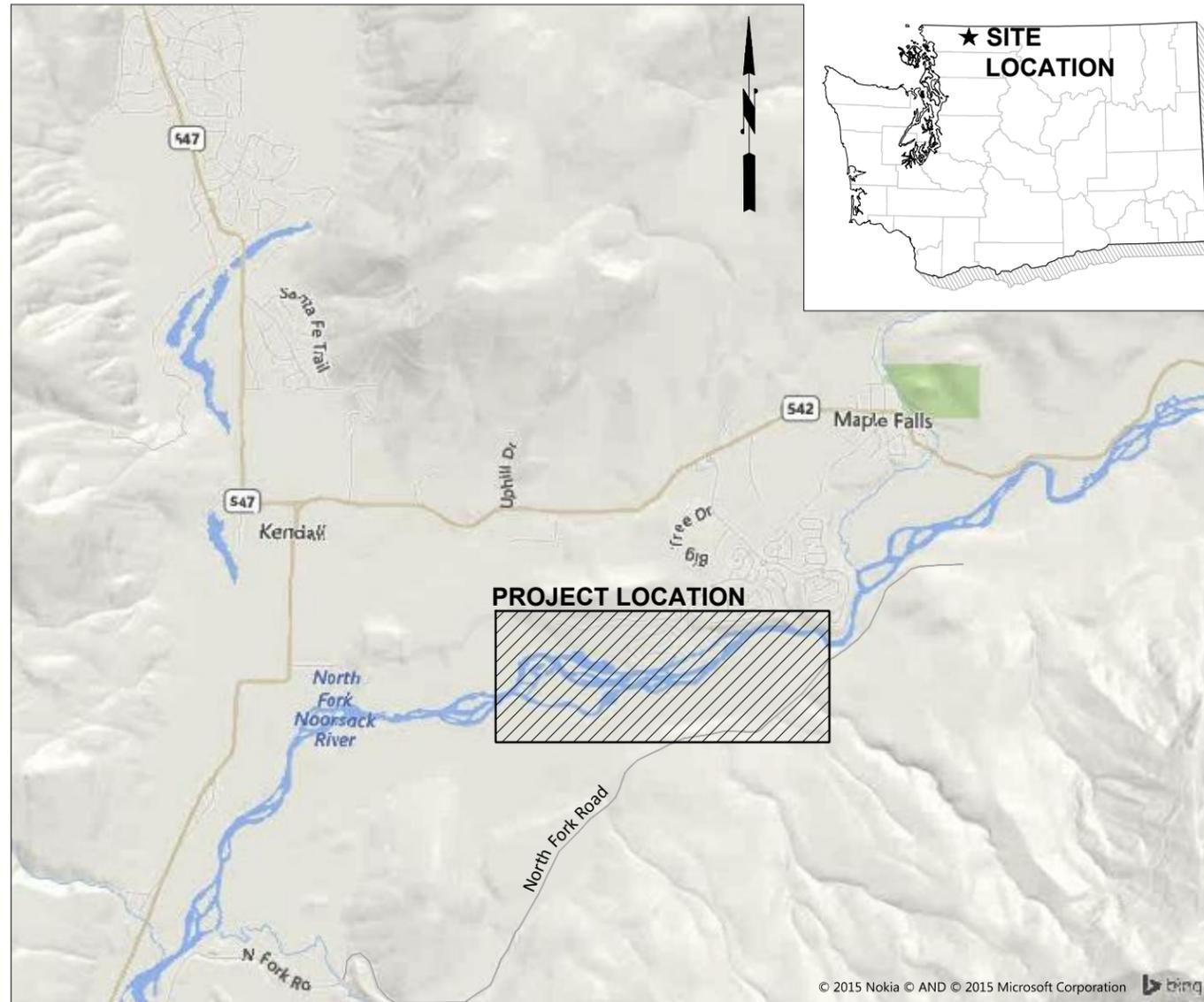


NORTH FORK NOOKSACK RIVER FARMHOUSE REACH RESTORATION PROJECT PHASE 2B WHATCOM COUNTY, WASHINGTON



PROJECT LOCATION

**★ SITE
LOCATION**

SHEET INDEX

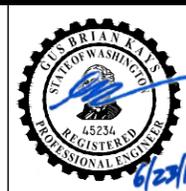
SHEET NO.	DWG NO.	SHEET DESCRIPTION
1	G-1	VICINITY MAP AND SHEET INDEX
2	G-2	EXISTING CONDITIONS
3	C-1	SITE PLAN AND PROPOSED WORK
4	C-2	PHASE 2 PLAN
5	C-3	PHASE 2B PLAN
6	C-4	GENERAL NOTES
7	C-5	FOREST SERVICE STRUCTURE (F.S.S.) DETAILS
8	C-6	WOODY GNARL PLAN AND NOTES
9	C-7	WOODY GNARL LAYERING PLAN
10	ESC-1	TESC PLAN
11	ESC-2	TESC DETAILS

VICINITY MAP
SCALE: 1"=2000'

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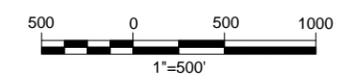
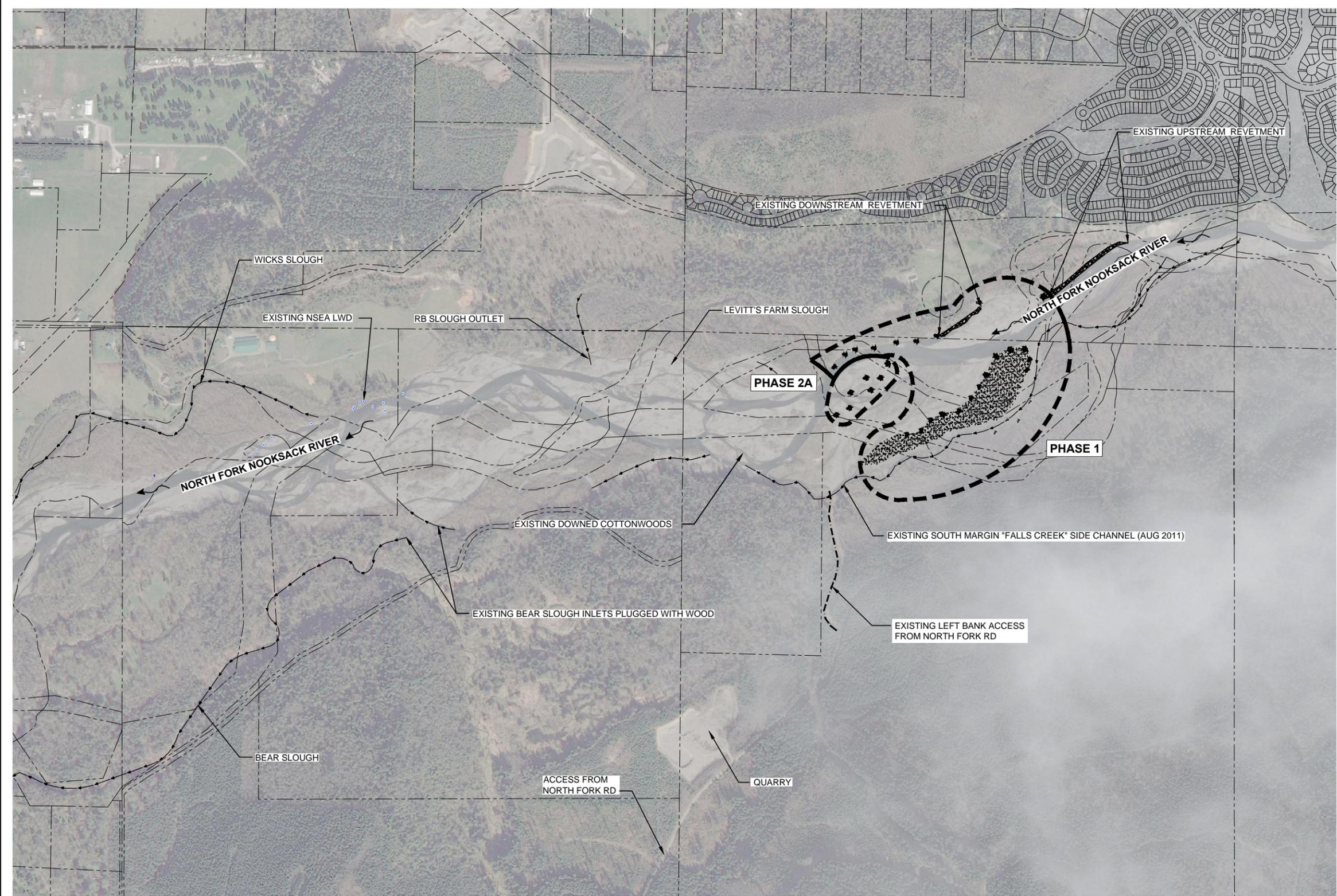
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DESIGNED:	M. BEGGS	DRAWN:	-
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SCALE:	AS NOTED	APPROVED:	-

**NORTH FORK NOOKSACK RIVER
FARMHOUSE REACH RESTORATION PROJECT
PHASE 2B**

 VICINITY MAP AND SHEET INDEX

DATE:	JUNE 2016
PROJECT NO:	14-05804-002
DRAWING NO:	G-1
SHEET NO:	1 OF 11

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LEGEND:

	PARCEL
	EXISTING SIDE CHANNEL (2011)
	EXISTING ACCESS ROAD
	PHASE 1 AND 2A EXTENTS (EXISTING)
	EXISTING NSEA LWD
	APPROX. EXISTING REVETMENT EXTENTS
	POTENTIAL FORESTED ISLAND

NOTES:

1. AERIAL PHOTO FROM MARCH 2016, CURRENT CONDITIONS SHOULD BE VERIFIED.
2. PARCEL LINES PROVIDED BY WHATCOM COUNTY GIS DATA BASE AND ARE APPROXIMATE
3. EXISTING REVETMENT LOCATIONS SHOWN ARE APPROXIMATE.
4. CONSTRUCTION OF PHASE 1 COMPLETED SEPTEMBER 2014. CONSTRUCTION OF PHASE 2A COMPLETED AUGUST 2015.

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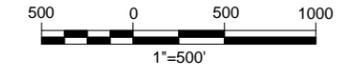


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NORTH FORK NOOKSACK RIVER
FARMHOUSE REACH RESTORATION PROJECT
PHASE 2B

EXISTING CONDITIONS

DATE:	JUNE 2016
PROJECT NO:	14-05804-002
DRAWING NO:	G-2
SHEET NO:	2 OF 11

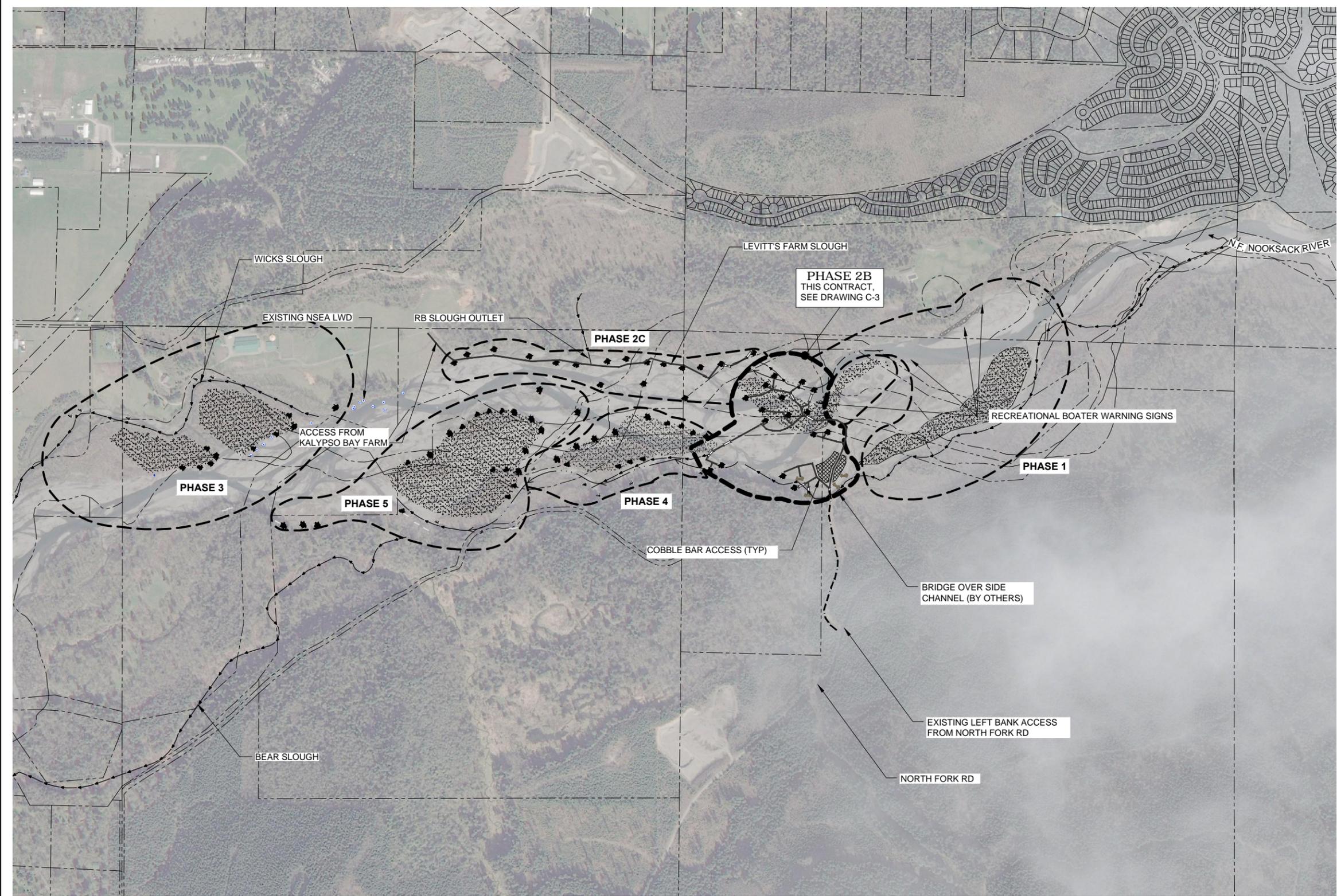


LEGEND:

	PARCEL
	EXISTING SIDE CHANNEL
	EXISTING ACCESS ROAD
	TEMPORARY ACCESS ROAD
	EXISTING NSEA LWD
	POTENTIAL SIDE CHANNEL
	PHASE 2B EXTENTS
	PHASE EXTENTS NOT IN CONTRACT
	POTENTIAL FORESTED ISLAND
	APPROX. EXISTING REVETMENT EXTENTS
	PHASE 2B STAGING AREA
	STRUCTURE TYPE 1
	F.S.S.
	WOODY GNARL
	STRUCTURE TYPE 2
	STRUCTURE TYPE 3

NOTES:

1. AERIAL PHOTO FROM MARCH 2016, CURRENT CONDITIONS SHOULD BE VERIFIED.
2. SEE SHEET C-3 FOR PHASE 2B. PHASING SEQUENCE AND EXTENTS SHOWN FOR PHASES 2C - 5 ARE FOR REFERENCE ONLY. ACTUAL PHASING TO BE COORDINATED WITH ACTIVE WETTED CHANNEL EXTENTS, ACCESS AVAILABILITY, AND CHANNEL RESPONSES TO EARLIER PHASES.
3. PROPOSED FORESTED ISLAND EXTENTS SHOWN ARE APPROXIMATE AND REFLECT POTENTIAL FUTURE CONDITIONS. SECONDARY CHANNELS MAY BIFURCATE ISLANDS AND MAINSTEM ALIGNMENT MAY ADJUST ISLAND SHAPES.



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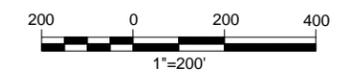


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**NORTH FORK NOOKSACK RIVER
 FARMHOUSE REACH RESTORATION PROJECT
 PHASE 2B**

SITE PLAN AND PROPOSED WORK

DATE:	JUNE 2016
PROJECT NO:	14-05804-002
DRAWING NO:	C-1
SHEET NO:	3 OF 11

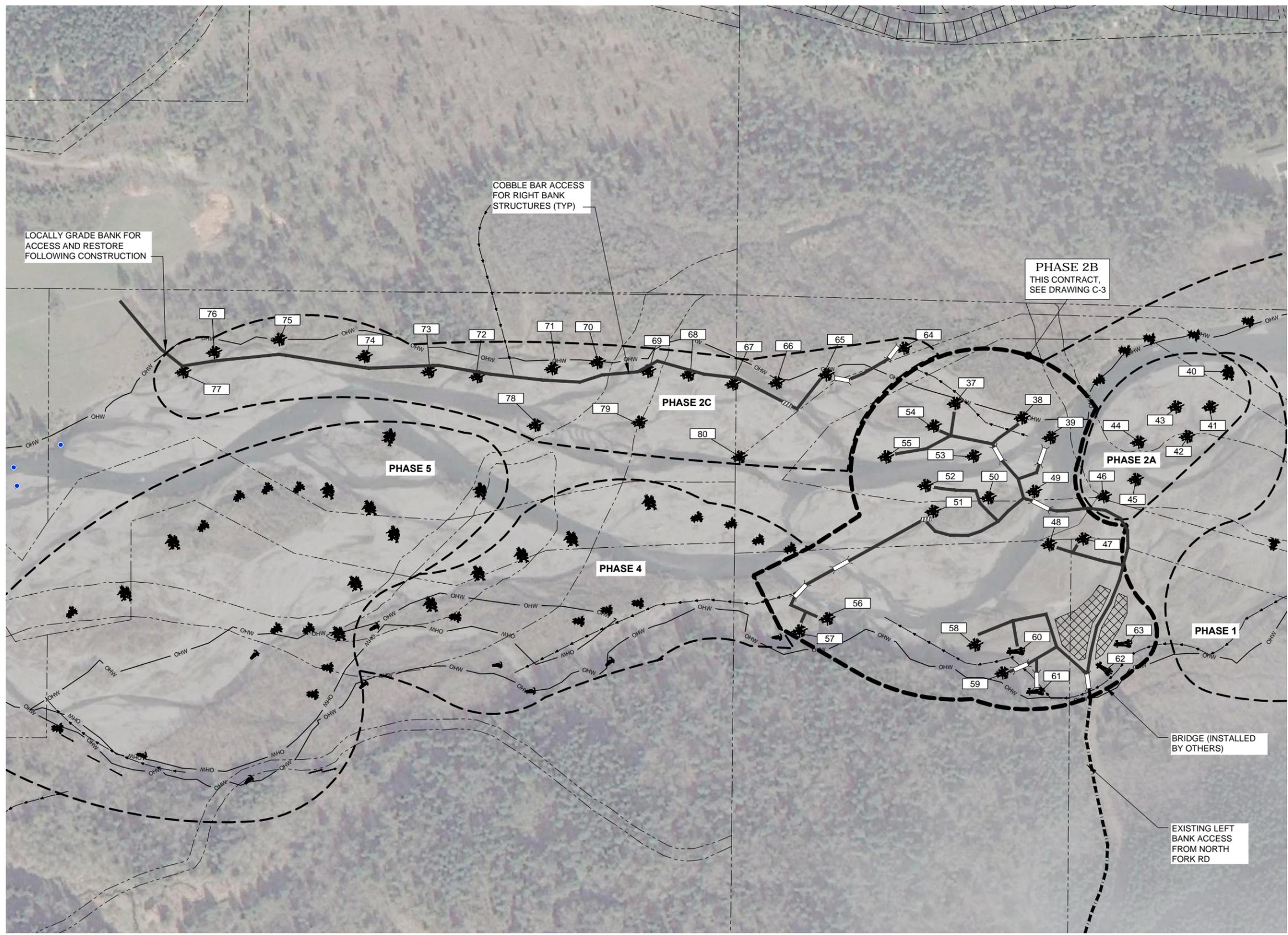


LEGEND:

- APPROXIMATE OHW (NOOKSACK TRIBE)
- PARCEL
- EXISTING SIDE CHANNEL
- EXISTING ACCESS ROAD
- TEMPORARY ACCESS CORRIDORS
- PHASE 2B EXTENTS
- PHASE EXTENTS NOT IN CONTRACT
- TEMPORARY STAGING AREA
- TEMPORARY BRIDGE
- TEMPORARY STEEL ROAD PLATE FOR SIDE CHANNEL CROSSING
- EXISTING NSEA LWD
- STRUCTURE TYPE 1
- STRUCTURE TYPE 2
- F.S.S.
- WOODY GNARL
- STRUCTURE TYPE 3

NOTES:

1. AERIAL PHOTO FROM MARCH 2016, CURRENT CONDITIONS SHOULD BE VERIFIED.
2. SEE SHEET C-3 FOR PHASE 2B. PHASING SEQUENCE AND EXTENTS SHOWN FOR PHASES 2 - 5 ARE FOR REFERENCE ONLY. ACTUAL PHASING TO BE COORDINATED WITH ACTIVE WETTED CHANNEL EXTENTS, ACCESS AVAILABILITY, AND CHANNEL RESPONSES TO EARLIER PHASES.
3. ACCESS TO ELJs MAY REQUIRE TEMPORARY BRIDGES TO CROSS MAIN CHANNEL AND SIDE CHANNELS LOW FLOW.
4. CONTRACTOR SHALL BECOME FAMILIAR WITH VARIABILITY OF NORTH FORK NOOKSACK FLOWS TO BE EXPECTED DURING CONSTRUCTION.
5. CONSTRUCTION AREA INCLUDING STAGING AREAS SHOWN MAY BE INUNDATED DURING HIGHER FLOWS. CONTRACTOR SHALL MONITOR NOAA RIVER FORECAST FOR THE NORTH FORK NOOKSACK RIVER AT GLACIER AND BUTTON UP WORK AND STAGING AREAS WHEN FLOWS THAT MAY INUNDATE WORK AREAS ARE PREDICTED.
6. CONTRACTOR IS RESPONSIBLE FOR REMOVING BRIDGES IF FLOWS ARE PREDICTED THAT WOULD OVERTOP THE BRIDGES.
7. PHASE 2 ELJ NUMBERING CONTINUED FROM PHASE 1 AND 2A.



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NORTH FORK NOOKSACK RIVER
FARMHOUSE REACH RESTORATION PROJECT
 PHASE 2B

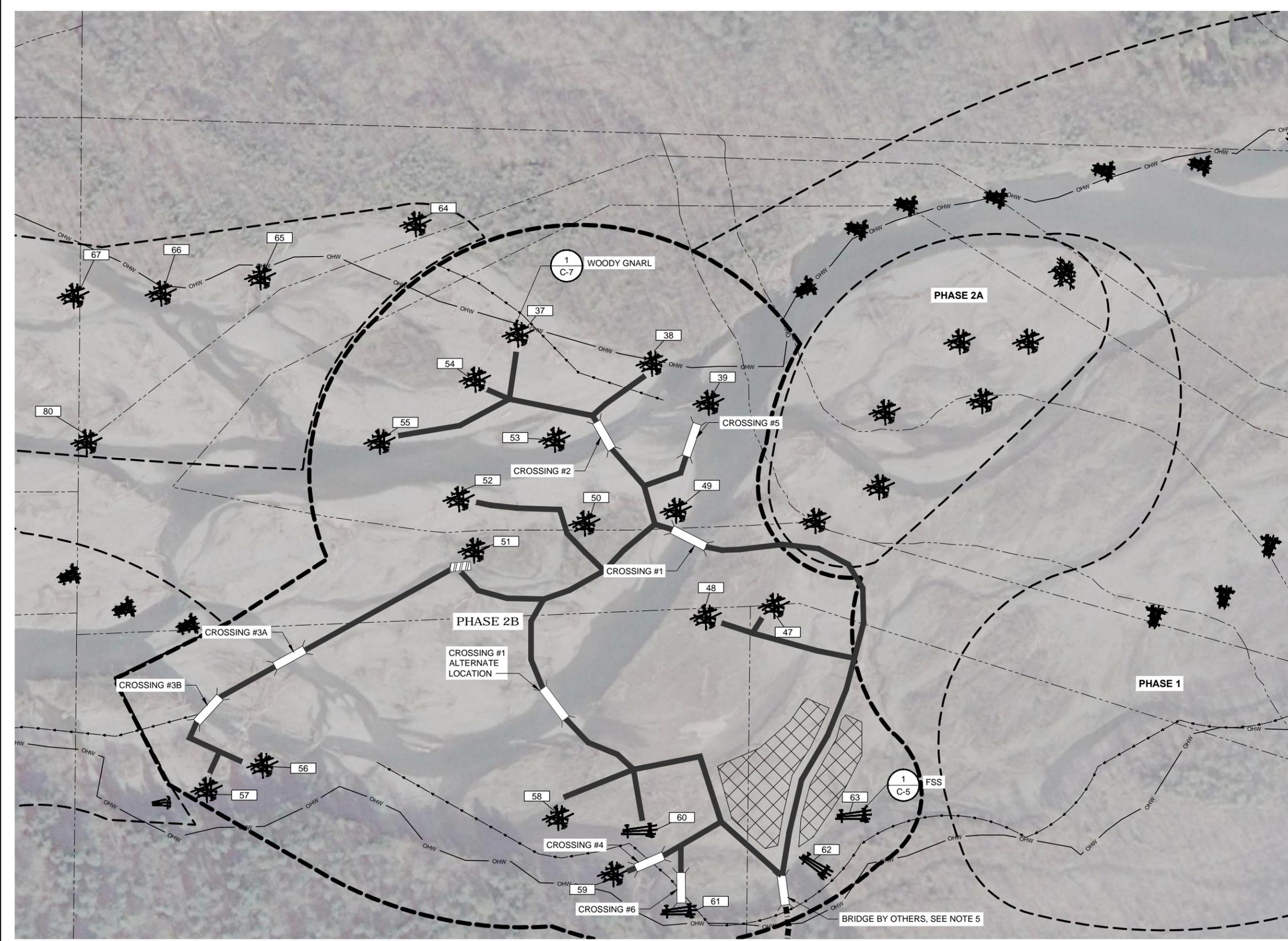
PHASE 2 PLAN

DATE:	JUNE 2016
PROJECT NO:	14-05804-002
DRAWING NO:	C-2
SHEET NO:	4 OF 11

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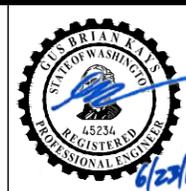
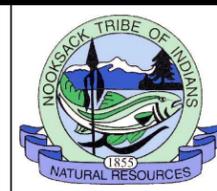
	APPROXIMATE OHW (NOOKSACK TRIBE)
	PARCEL
	EXISTING SIDE CHANNEL
	EXISTING ACCESS ROAD
	TEMPORARY ACCESS CORRIDORS
	PHASE 2B EXTENTS
	PHASE EXTENTS NOT IN CONTRACT
	TEMPORARY STAGING AREA
	TEMPORARY CROSSING
	TEMPORARY STEEL ROAD PLATE FOR SIDE CHANNEL CROSSING
	F.S.S. (ADDITIVE BID ITEMS)
	WOODY GNARL

NOTES:

1. AERIAL PHOTO FROM MARCH 2016, CURRENT CONDITIONS SHOULD BE VERIFIED.
2. ACCESS TO ELJs MAY REQUIRE TEMPORARY BRIDGES TO CROSS MAIN CHANNEL AND SIDE CHANNELS LOW FLOW.
3. CONTRACTOR SHALL BECOME FAMILIAR WITH VARIABILITY OF NORTH FORK NOOKSACK FLOWS TO BE EXPECTED DURING CONSTRUCTION.
4. CONSTRUCTION INCLUDING STAGING AREAS SHOWN MAY BE INUNDATED DURING HIGHER FLOWS. CONTRACTOR SHALL MONITOR NOAA RIVER FORECAST FOR THE NORTH FORK NOOKSACK RIVER AT GLACIER AND BUTTON UP WORK AND STAGING AREAS WHEN FLOWS THAT MAY INUNDATE WORK AREAS ARE PREDICTED.
5. CROSSING LOCATIONS ARE APPROXIMATE. FINAL LOCATIONS WILL BE DEPENDENT ON SITE CONDITIONS. FINAL BRIDGE PLACEMENT SHALL BE VERIFIED WITH TRIBE OR ENGINEER AND SHALL COMPLY WITH WDFW MPA.
6. CONTRACTOR IS RESPONSIBLE FOR REMOVING BRIDGES IF FLOWS ARE PREDICTED THAT WOULD OVERTOP THE BRIDGES.
7. BRIDGE OVER FALLS CREEK SIDE CHANNEL INSTALLED BY OTHERS BUT REMOVED BY CONTRACTOR AT PROJECT END.
8. PHASE 2 ELJ NUMBERING CONTINUED FROM PHASE 1.

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NORTH FORK NOOKSACK RIVER
 FARMHOUSE REACH RESTORATION PROJECT
 PHASE 2B

PHASE 2B PLAN

DATE:	JUNE 2016
PROJECT NO:	14-05804-002
DRAWING NO:	C-3
SHEET NO:	5 OF 11

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GENERAL NOTES:

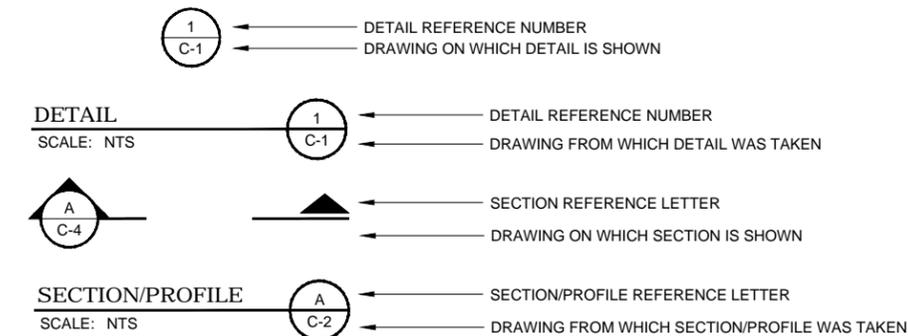
- EQUIPMENT AND MATERIAL STAGING AREAS TO BE LOCATED AS SHOWN ON THE SITE PLAN. EQUIPMENT AND MATERIAL SHALL NOT BE STORED OUTSIDE OF IDENTIFIED STAGING AREA EXTENTS, UNLESS APPROVED BY OWNER OR SITE ENGINEER.
- CONTRACTOR SHALL LIMIT MACHINERY MOVEMENT AND DISTURBANCE TO STAGING AREAS, TEMPORARY ACCESS CORRIDORS, AND WITHIN A 30FT BUFFER AROUND ELJs OR IDENTIFIED AS ACCEPTABLE BY ON-SITE ENGINEER OR OWNER.
- CLEARING LIMITS FOR TEMPORARY ACCESS AND PROPOSED STRUCTURES SHALL BE LIMITED TO THE AREA REQUIRED FOR SAFE EQUIPMENT OPERATION. CLEARING LIMITS SHALL BE FLAGGED BY CONTRACTOR AND APPROVED BY OWNER OR ENGINEER AT LEAST 3 DAYS PRIOR TO CLEARING ACTIVITIES. CLEARING LIMITS SHALL BE FLAGGED TO MINIMIZE THE AREA OF DISTURBANCE.
- CONTRACTOR SHALL PROVIDE 48 HOURS ADVANCE NOTICE TO THE ENGINEER AND OWNER PRIOR TO ANY REQUIRED INSPECTION. GENERAL CONTRACTOR SHALL SUBMIT FOR APPROVAL A CONSTRUCTION SEQUENCE PLAN 5 DAYS PRIOR TO SITE WORK.
- FIELD VERIFY WITH ENGINEER ALL ENGINEERED LOG JAM LOCATIONS, LENGTHS, WIDTHS, AND ELEVATIONS PRIOR TO EXCAVATION, ASSEMBLY, AND INSTALLATION OF EACH STRUCTURE. CONTRACTOR IS RESPONSIBLE FOR INSTALLING AND MAINTAINING A MINIMUM OF TWO OFFSET STAKES PER ELJ.
- EQUIPMENT USED FOR THIS PROJECT SHALL BE FREE OF EXTERNAL PETROLEUM-BASED PRODUCTS WHILE WORKING NEAR ANY SURFACE WATER OR WETLANDS. ACCUMULATION OF SOILS OR DEBRIS SHALL BE REMOVED FROM THE DRIVE MECHANISMS (WHEELS, TRACKS, TIRES, ETC.) AND UNDERCARRIAGE OF EQUIPMENT PRIOR TO ITS WORKING BELOW THE BANKFULL WATER ELEVATION.
- EQUIPMENT SHALL BE CHECKED DAILY FOR LEAKS, AND ANY NECESSARY REPAIRS SHALL BE COMPLETED PRIOR TO COMMENCING WORK ACTIVITIES. SPILL KITS SHALL BE ACCESSIBLE AT ALL TIMES TO EQUIPMENT OPERATORS.
- 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 RIVER, GROUNDWATER, OR WETLANDS.
- 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. WASHINGTON DEPARTMENT OF FISH AND WILDLIFE AND WASHINGTON DEPARTMENT OF ECOLOGY SHALL BE CONTACTED IMMEDIATELY BY THE ENGINEER OR BY HIS/HER DESIGNEE. WORK SHALL NOT RESUME UNTIL FURTHER APPROVAL BY OWNERS REPRESENTATIVE.
- ISOLATION AND EROSION CONTROL METHODS SHALL BE USED TO PROTECT WATER OF THE STATE. EROSION CONTROL MEASURES ARE SHOWN ON DRAWINGS EC-1 AND EC-2. THESE MEASURES ARE INITIAL AND ADDITIONAL MEASURES MAY BE REQUIRED BASED ON MEANS AND METHODS.
- ALTERATION OR DISTURBANCE OF THE BANK AND BANK VEGETATION SHALL BE MINIMIZED TO THAT NECESSARY TO CONSTRUCT THE PROJECT.
- IF HIGH FLOW CONDITIONS THAT MAY CAUSE SILTATION OR EROSION ARE ENCOUNTERED DURING CONSTRUCTION, WORK SHALL STOP AND TEMPORARY BRIDGES SHALL BE REMOVED AS NECESSARY UNTIL THE FLOW SUBSIDES.
- CONTRACTOR SHALL CLEAN AND MAINTAIN BRIDGE DECKS AS NEEDED TO ENSURE SEDIMENT DOES NOT ENTER WATERS OF THE STATE.
- CONTRACTOR SHALL SALVAGE ALL LIVING CONIFERS WITH A DIAMETER OF 2-6" DIAMETER WITHIN THE ELJ CONSTRUCTION FOOTPRINT AND STAGE FOR REPLANTING. CONTRACTOR SHALL REPLANT CONIFERS ON DEPOSITIONAL BARS FOLLOWING COMPLETION OF ELJ CONSTRUCTION WITH GUIDANCE FROM THE OWNER.
- CONTRACTOR SHALL SALVAGE ALL TREES WITH DIAMETER BREAST HEIGHT (DBH) GREATER THAN 10 IN. WITHIN CLEARED AREAS FOR USE IN ELJ STRUCTURES AS RACKING. SMALLER CLEARED DEBRIS SHALL BE SALVAGED FOR USE AS SLASH. EXISTING LOG JAMS OR LARGE WOODY DEBRIS WHICH REQUIRES CLEARING FOR ELJ CONSTRUCTION SHALL BE SALVAGED, STOCKPILED LOCALLY AND RE-PLACED ON THE FINISHED ELJ AS DIRECTED BY OWNER OR ENGINEER.
- EXCAVATIONS THAT HAVE POTENTIAL TO IMPACT THE WETTED CHANNEL OF THE NORTH FORK NOOKSACK SHALL BE ISOLATED FROM THE ACTIVE CHANNEL DURING CONSTRUCTION. ISOLATION MEANS SHALL CONSIST OF SILT BOOMS, BULK BAGS, BLADDER DAMS OR APPROVED EQUAL AS NECESSARY TO PREVENT IMPACTS TO WATER QUALITY. WET EXCAVATION SPOILS SHALL BE MAINTAINED TO ENSURE RUNOFF DOES NOT VIOLATE WATER QUALITY REQUIREMENTS.
- CONTRACTOR SHALL LIMIT TEMPORARY ACCESS ROAD/CORRIDORS TO 16' WIDE.
- ALL LAND OWNER AGREEMENTS, ACCESS EASEMENTS AND PERMITS SHALL BE COORDINATED BY THE OWNER PRIOR TO BEGINNING CONSTRUCTION. COPIES OF AGREEMENTS/PERMITS WILL BE PROVIDED TO CONTRACTOR.
- MARCH 2016 AERIAL IMAGE SHOWN FOR ILLUSTRATION ONLY. CONTRACTOR SHALL VERIFY CURRENT CONDITIONS. FLOW SHOWN IN AERIAL IS APPROXIMATELY 500-700 CFS AT THE NORTH FORK NOOKSACK RIVER NEAR GLACIER GAGE. CONTRACTOR SHALL MONITOR THE NOAA NORTHWEST RIVER FORECAST CENTER WEB SITE DURING CONSTRUCTION AND ADJUST WORK FOR PREDICTED FLOWS THAT MAY INUNDATE OR EFFECT WORK.
- CONTRACTOR SHALL BECOME FAMILIAR WITH VARIABILITY OF NORTH FORK NOOKSACK FLOWS TO BE EXPECTED DURING CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR REMOVING TEMPORARY BRIDGES IF FLOWS ARE PREDICTED THAT WOULD OVERTOP THE BRIDGES.
- RACKING MATERIAL SHALL CONSIST OF INDIVIDUAL LOGS 10-20FT LONG 6-16" DBH. RACKING PLACEMENT SHALL BE COORDINATED WITH LOG LAYER PLACEMENT AND SLASH PLACEMENT TO ENSURE RACKING AND SLASH FILL VOIDS IN FACE OF STRUCTURE. RACKING MATERIAL SHALL BE FREE OF ALL DEBRIS AND TRASH.

SURVEY NOTES:

- BASIS OF BEARINGS IS THE WASHINGTON STATE PLANE COORDINATE SYSTEM, NORTH ZONE, N.A.D. 83/91.
- ELEVATIONS ARE BASED ON 2013 LIDAR (NAVD88).
- ELEVATIONS ARE APPROXIMATE AND MAY VARY.

TABLE - VERTICAL LOG DEPTH

STRUCTURE	VERTICAL LOG DEPTH BELOW EXISTING (FT)	
	VERTICAL #4	VERTICAL #6
ELJ 37	14	14
ELJ 38	12	14
ELJ 39	12	12
ELJ 47	14	14
ELJ 48	14	14
ELJ 49	14	14
ELJ 50	13	13
ELJ 51	13	13
ELJ 52	13	13
ELJ 53	12	14
ELJ 54	15	15
ELJ 55	13	13
ELJ 56	14	14
ELJ 57	14	14
ELJ 58	15	11
ELJ 59	11	12



"-" INDICATES THAT THE DETAIL/SECTION IS SHOWN ON THE SAME SHEET
 "TYP" INDICATES THAT THE DETAIL/SECTION IS UNIFORMLY TYPICAL THROUGHOUT PROJECT EXCEPT WHERE OTHERWISE NOTED
 "VAR" SPECIFIES THAT DETAIL/SECTION WAS TAKEN FROM VARIOUS DRAWINGS

NOTE AND DETAIL/SECTION REFERENCING

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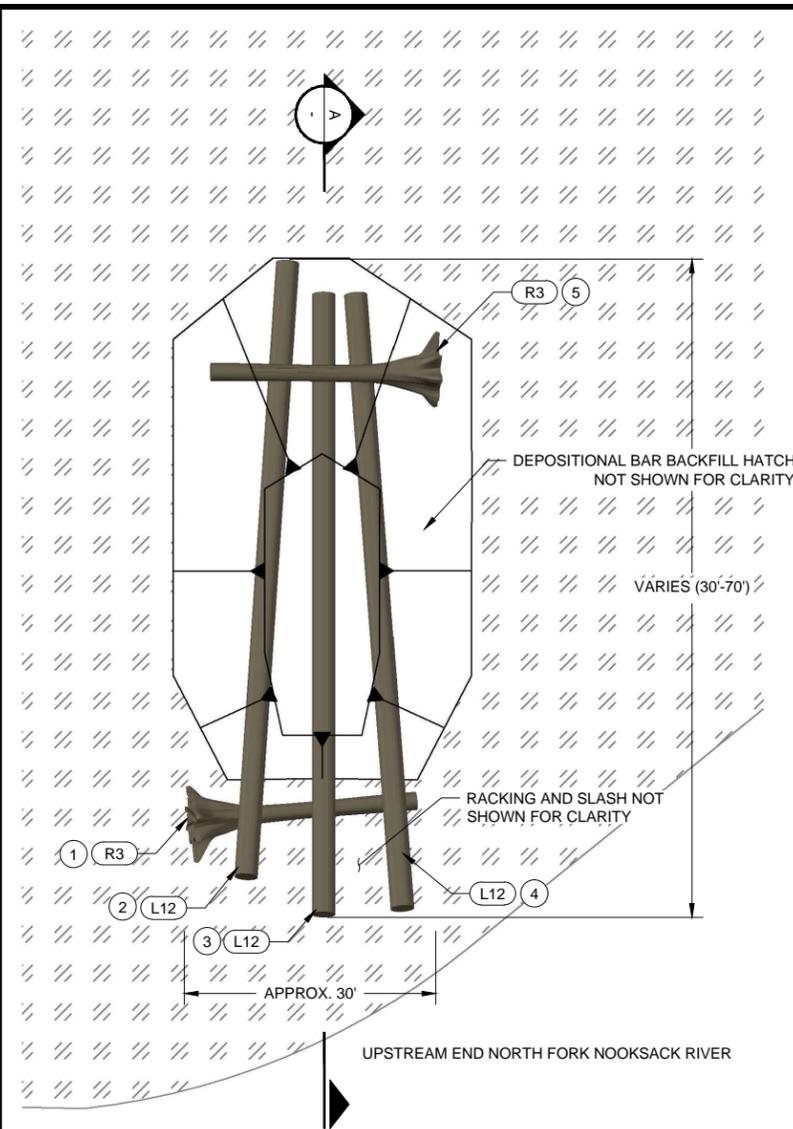
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SCALE: AS NOTED	APPROVED: -

**NORTH FORK NOOKSACK RIVER
 FARMHOUSE REACH RESTORATION PROJECT
 PHASE 2B**

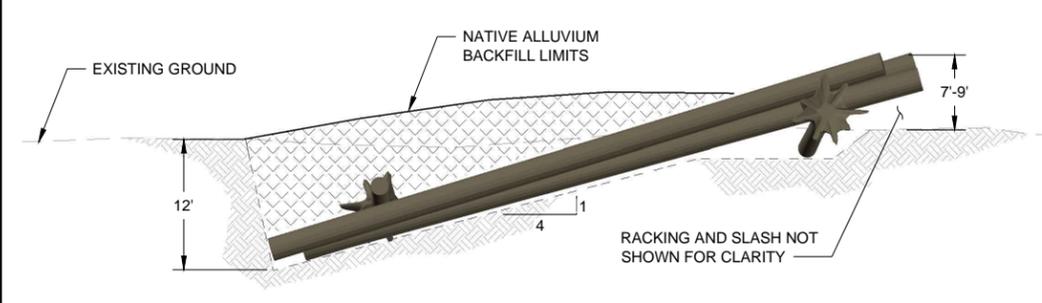
GENERAL NOTES

DATE: JUNE 2016
PROJECT NO: 14-05804-002
DRAWING NO: C-4
SHEET NO: 6 OF 11

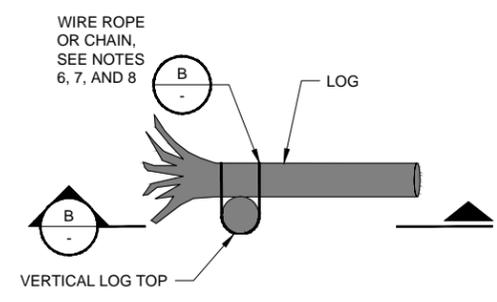
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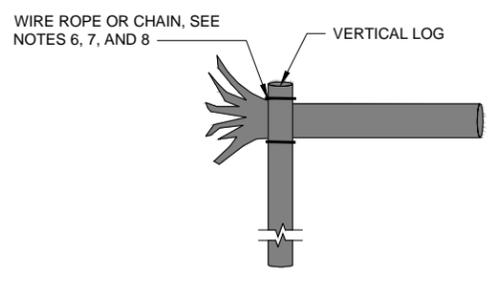
PLAN - F.S.S.
 SCALE: 1" = 10'



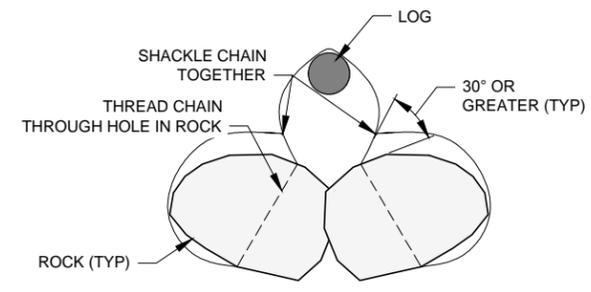
SECTION - F.S.S.
 SCALE: 1" = 10'



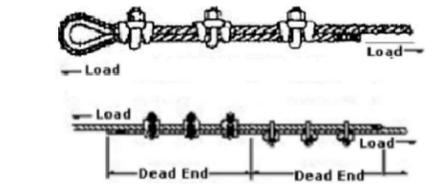
TYPICAL SADDLE LASH PLAN
 SCALE: NTS



TYPICAL SADDLE LASH ELEVATION
 SCALE: NTS



LOG TO ROCK CONNECTION
 SCALE: NTS



WIRE ROPE CLAMP DETAIL
 SCALE: NTS

LEGEND:

- SLOPE LINE
- EXISTING GRADE
- EXCAVATION EXTENTS
- LOG
- KEY LOG ID
- LOG PLACEMENT SEQUENCE NUMBER
- NATIVE ALLUVIUM FILL
- EXISTING COBBLE BAR

- NOTES:**
- CONTRACTOR SHALL VERIFY ACCESS ROAD ALIGNMENT WITH OWNER.
 - CONTRACTOR SHALL PLANT ELJ WITH SALVAGED TREES FOLLOWING CONSTRUCTION.
 - SEE TESC PLAN FOR WATER MANAGEMENT.
 - EXCAVATION SPOILS SHALL BE STOCKPILED TO ALLOW LOG LAYER PLACEMENT AND CONSTRUCTION ACCESS. DISCHARGE FROM SPOILS SHALL NOT ENTER THE WATER.
 - DEPOSITIONAL BAR EXTENTS VARY. DEPOSITIONAL BAR CONSTRUCTED WITH EXCAVATION SPOILS.
 - ALL LOG TO LOG LASHING SHALL BE 1/2" OR 7/16" Ø 6-19 IWRC (IPS) GALVANIZED WIRE ROPE OR 3/8" Ø GRADE 43 NATURAL FINISH CHAIN UNLESS OTHERWISE SPECIFIED IN LAYER PLAN. BOULDER TO LOG LASHING SHALL BE 3/8" Ø GRADE 43 NATURAL FINISH CHAIN. SEE LAYER PLAN FOR LASHING TYPES AND LOCATIONS.
 - ALL CONNECTING HARDWARE SHALL HAVE A RATED WORKING LOAD LIMIT OF EQUAL OR GREATER STRENGTH THAN WIRE ROPE OR CHAIN. ALL WIRE ROPE CLAMPS AND HAND SPLICING SHALL BE PER THE MANUFACTURERS SPECIFICATIONS. LOOSE ENDS SHALL BE TRIMMED PER MANUFACTURERS SPECIFICATIONS OR AS DIRECTED.
 - LASHING (CHAIN OR WIRE ROPE) USED WILL BE DETERMINED BY PERMIT CONDITIONS.

TABLE - F.S.S LOG SCHEDULE:

LOG ID #	DIAMETER (IN)	LENGTH (FT)	ROOTWAD	QUANTITY/ STRUCTURE
R3	16-24	25	YES	2
L12	24-36	30-70	NO	3
TOTAL:				5 TOTAL

TABLE - F.S.S. SLASH SCHEDULE

	QUANTITY/ STRUCTURE (CY)
SLASH	20

TABLE - F.S.S. RACKING SCHEDULE

	QUANTITY/ STRUCTURE
RACKING LOGS	40

No.	REVISION	BY	APP'D	DATE

ONE INCH
 AT FULL SIZE, IF NOT ONE
 INCH SCALE ACCORDINGLY

Know what's below.
 Call before you dig.

DESIGNED: G. KAYS
 DRAWN: E. MARSHALL
 CHECKED: M. BEGGS
 APPROVED: [Signature]

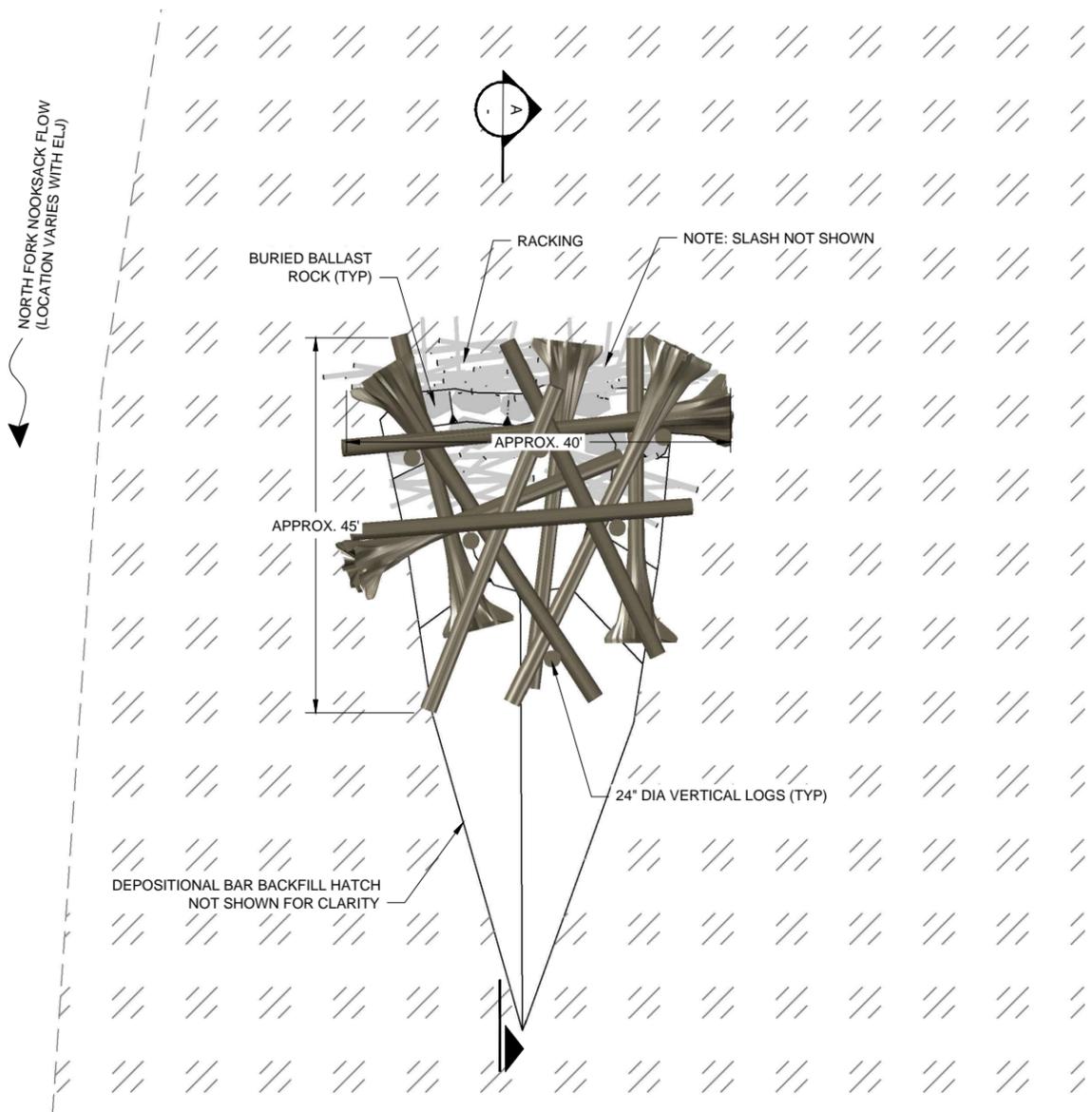
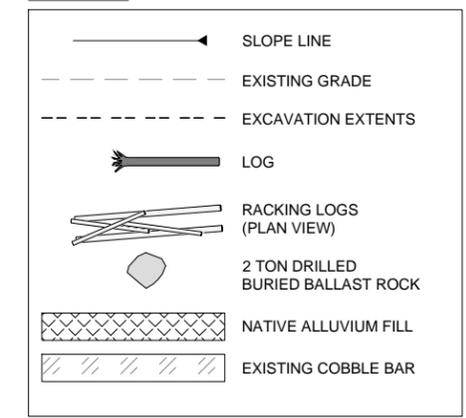
NORTH FORK NOOKSACK RIVER
 FARMHOUSE REACH RESTORATION PROJECT
 PHASE 2B

FOREST SERVICE STRUCTURE (F.S.S.) DETAILS

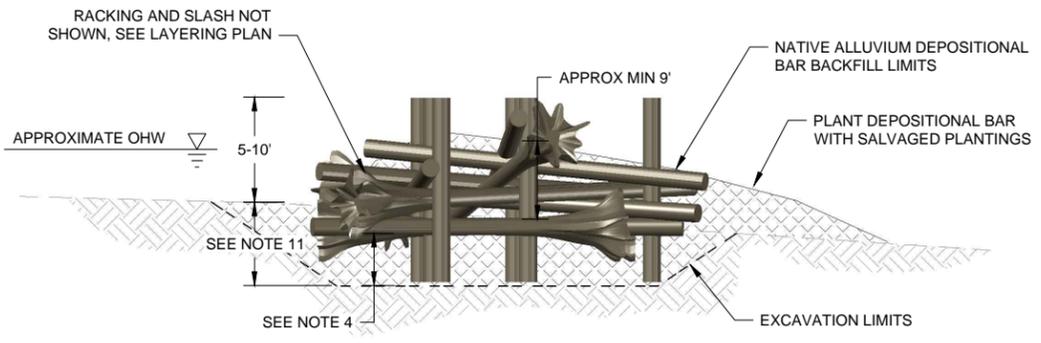
DATE:	JUNE 2016
PROJECT NO:	14-05804-002
DRAWING NO:	C-5
SHEET NO:	7 OF 11

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LEGEND:



TYPICAL WOODY GNARL PLAN
SCALE: 1"=10'



TYPICAL WOODY GNARL SECTION
SCALE: 1"=10'

NOTES:

1. CONTRACTOR SHALL VERIFY ACCESS ROAD ALIGNMENT WITH OWNER.
2. CONTRACTOR SHALL PLANT ELJ WITH SALVAGED TREES FOLLOWING CONSTRUCTION.
3. SEE LAYERING PLAN FOR RACKING AND SLASH PLACEMENT, NUMBERS, AND VOLUMES.
4. ENGINEERED LOG JAM EXCAVATION DEPTH SHALL VARY WITH LOCAL GRADES AND VERTICAL LOG DEPTHS. THE FIRST LOWEST LAYER OF HORIZONTAL LOG LAYERS SHALL BE BE PLACED APPROXIMATELY 5FT UP FROM THE BOTTOM OF THE VERTICAL LOGS.
5. EXCAVATION SPOILS SHALL BE STOCKPILED TO ALLOW LOG LAYER PLACEMENT AND CONSTRUCTION ACCESS. DISCHARGE FROM SPOILS SHALL NOT ENTER THE WATER.
6. DEPOSITIONAL BAR EXTENTS VARY. DEPOSITIONAL BAR CONSTRUCTED WITH EXCAVATION SPOILS.
7. ELJ BACKFILL OVER LOG PLACEMENTS TO BE MAINTAINED ABOVE THE 100 YEAR FLOOD WATER SURFACE TO PRECLUDE OVERTOPPING. CONTRACTOR SHALL MAINTAIN A FINAL ELJ BACKFILL GRADE OVER LOGS OF AT LEAST 5' ABOVE EXISTING COBBLE BAR GRADES AND 1FT ABOVE TOP LAYER OF LOGS.
8. ALL LOG TO LOG LASHING SHALL BE 1/2" OR 7/16" Ø 6-19 IWRC (IPS) GALVANIZED WIRE ROPE OR 3/8" Ø GRADE 43 NATURAL FINISH CHAIN UNLESS OTHERWISE SPECIFIED IN LAYER PLAN. BOULDER TO LOG LASHING SHALL BE 3/8" Ø GRADE 43 NATURAL FINISH CHAIN. SEE LAYER PLAN FOR LASHING TYPES AND LOCATIONS.
9. ALL CONNECTING HARDWARE SHALL HAVE A RATED WORKING LOAD LIMIT OF EQUAL OR GREATER STRENGTH THAN WIRE ROPE OR CHAIN. ALL WIRE ROPE CLAMPS AND HAND SPLICING SHALL BE PER THE MANUFACTURERS SPECIFICATIONS.
10. LASHING (CHAIN OR WIRE ROPE) USED WILL BE DETERMINED BY PERMIT CONDITIONS.
11. ENGINEER SHALL STAKE 2 VERTICAL LOG DEPTHS FOR ELJ'S BASED ON THE RELATIVE DEPTH TO THE ADJACENT CHANNEL BOTTOM. DEPTH SHALL NOT EXCEED 15'. CONTRACTOR SHALL MARK DEPTH OF BURIAL LOCATION ON ALL VERTICAL LOGS PRIOR TO PLACEMENT WITH BLAZE ORANGE MARKING PAINT. SEE VERTICAL LOG DEPTH TABLE ON DRAWING C-4.
12. TWO DRILLED ROCKS PER CHAIN. SEE DETAIL 4/C-5 AND LAYERING PLAN FOR LOCATION AND NUMBER.
13. SHACKLES SHALL BE SAFETY SHACKLES AND THREADS SHALL BE MARRED TO PREVENT REMOVAL OF SHACKLES.

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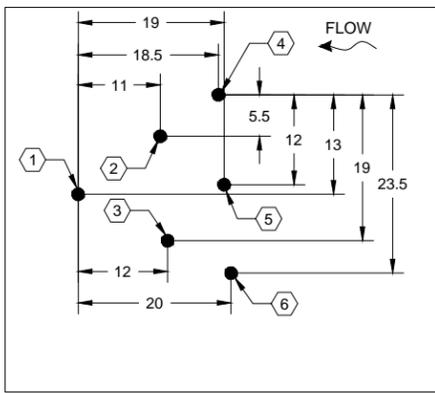
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DESIGNED: M. BEGGS	DRAWN: -
DESIGNED: -	CHECKED: -
SCALE: AS NOTED	APPROVED: -

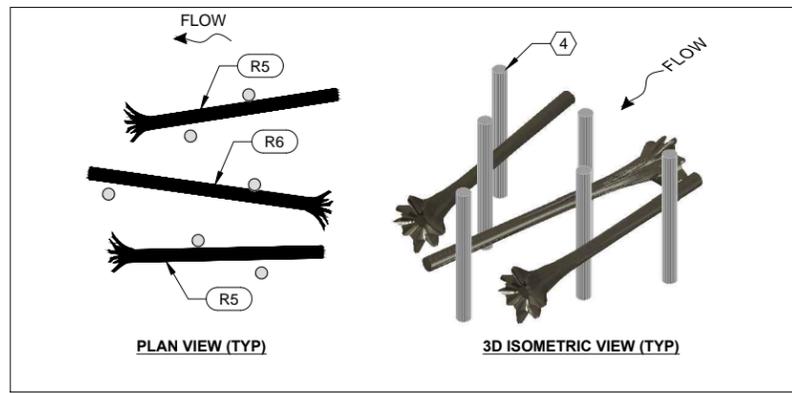
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 FARMHOUSE REACH RESTORATION PROJECT
 PHASE 2B

WOODY GNARL PLAN AND NOTES

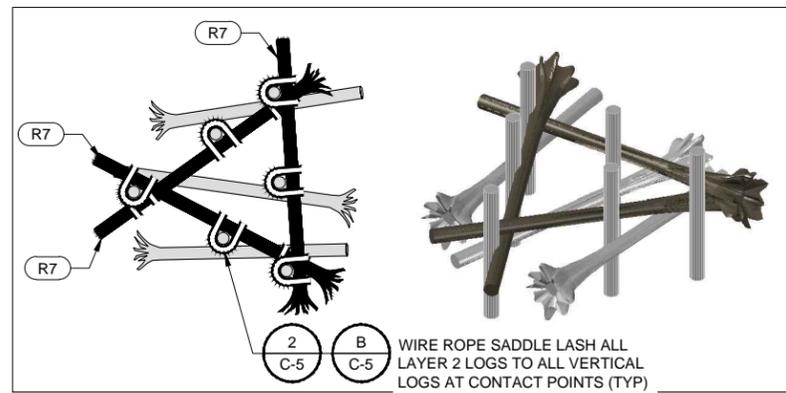
DATE: JUNE 2016
PROJECT NO: 14-05804-002
DRAWING NO: C-6
SHEET NO: 8 OF 11



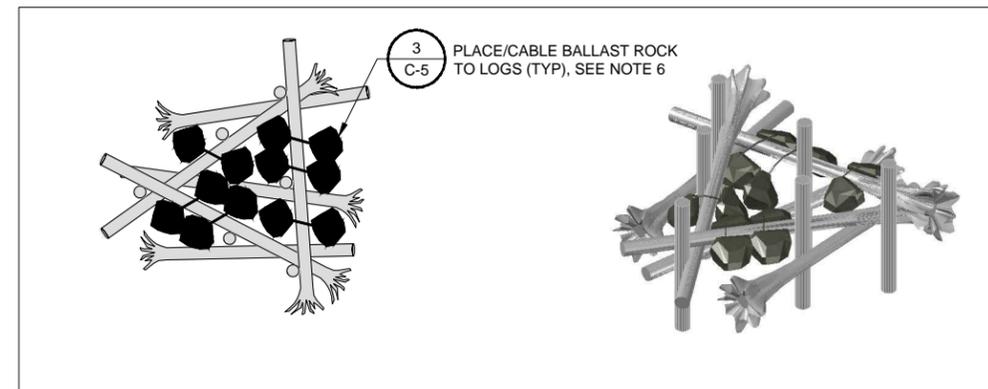
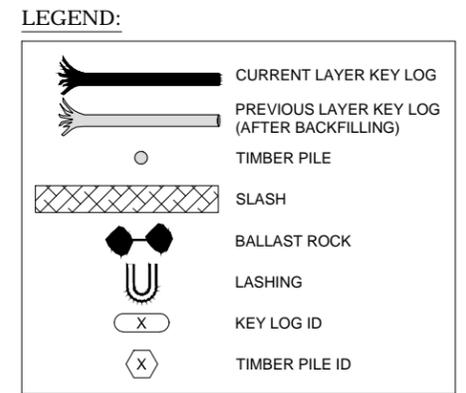
VERTICAL LOG LAYOUT



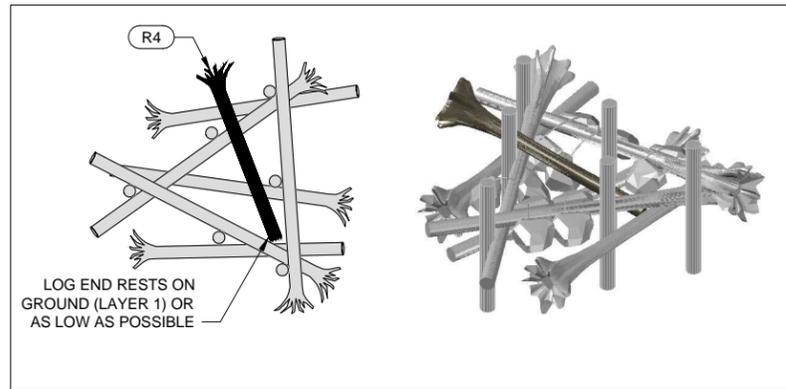
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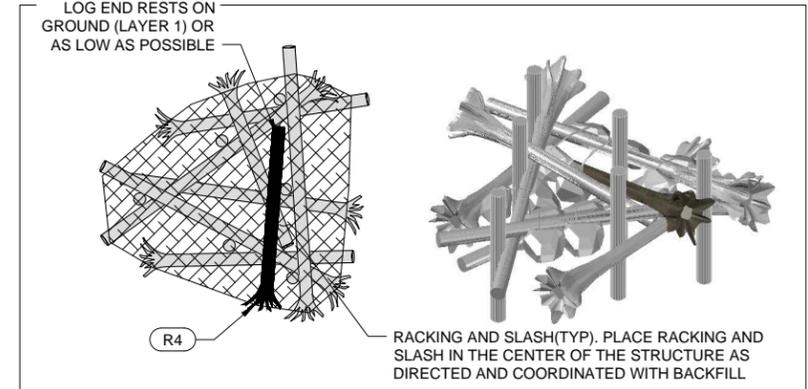
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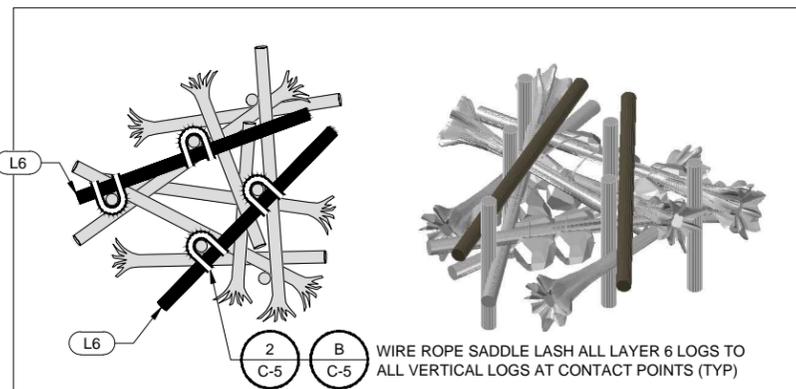
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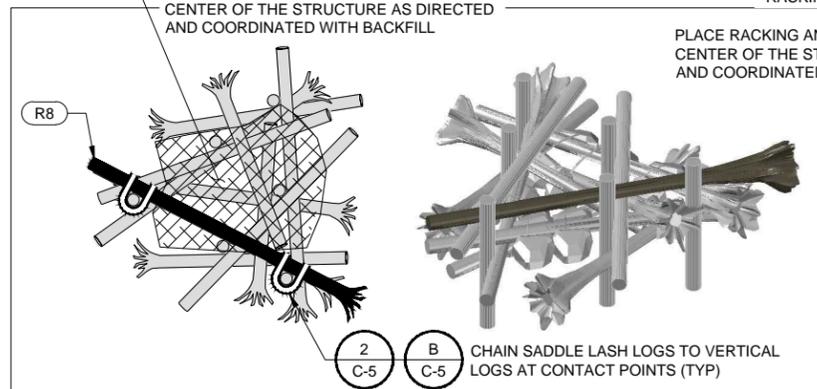
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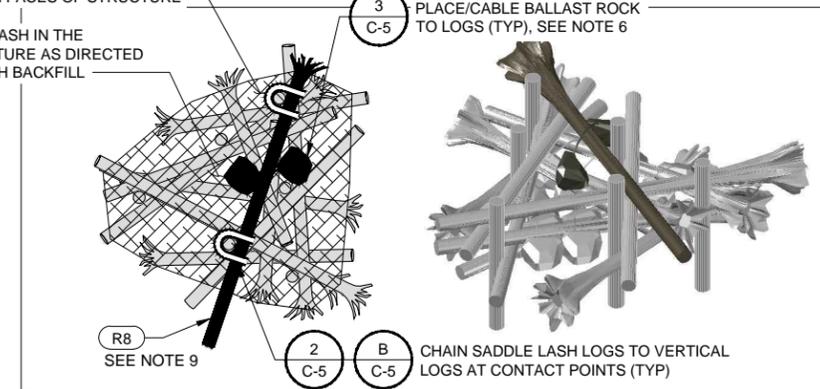
LAYER 5



LAYER 6



LAYER 7



LAYER 8

NOTES:

- 2 VERTICAL LOG LOCATIONS SHALL BE STAKED BY ENGINEER FOR LAYOUT.
- LOG MATERIALS SHALL BE PLACED AT THE LOCATIONS AND ELEVATIONS SPECIFIED ON THE DRAWINGS OR AS DIRECTED BY THE ENGINEER.
- TRIM LOGS AS REQUIRED.
- SLASH AND RACKING TO FILL VOIDS BETWEEN LOG LAYERS. SEQUENCING OF SLASH PLACEMENT MAY NEED TO BE MODIFIED FOR PLACING OF ROCK BALLAST. SUBSEQUENT LOG LAYERS SHALL COMPRESS SLASH AND RACKING PLACED IN PREVIOUS LAYERS. SLASH AND RACKING QUANTITIES MAY BE INCREASED BASED ON SUPPLY AND NEED. OWNER OR ENGINEER WILL NOTIFY CONTRACTOR OF CHANGES.
- PLACE BACKFILL FLUSH WITH LAYER 3 LOGS FOLLOWING LAYER 5 LOG PLACEMENT. BACKFILL EACH FOLLOWING LAYER WITH NATIVE ALLUVIUM BACKFILL FLUSH WITH CURRENT LAYER PRIOR TO PLACEMENT OF SUBSEQUENT LAYER. BUCKET COMPACT BACKFILL.
- PLACE BALLAST ROCKS AS LOW WITHIN THE ELJ AS POSSIBLE AND ENSURE CHAIN BETWEEN BALLAST ROCKS HAS NO SLACK. IF SUFFICIENT BALLAST ROCKS CAN NOT BE PLACED IN LAYER 3, THE REMAINING BALLAST ROCKS SHALL BE PLACED WITHIN THE FIRST SUBSEQUENT LAYER WHERE SPACE IS SUFFICIENT.
- AUGMENT OR DELETE ROCK QUANTITIES AS NEEDED TO MAINTAIN AN ELJ ROCK BALLAST OF 28 TONS
- RACKING, SLASH, LASHINGS, AND BALLAST BOULDERS ONLY SHOWN IN LAYERS WHERE PLACEMENT OCCURS FOR CLARITY.
- WHERE VERTICAL LOGS ARE ADJACENT TO RIVER, PLACE VERTICAL LOGS NEAREST TO RIVER FIRST TO ALLOW ADJUSTMENT OF STRUCTURE LOCATION BASED ON INITIAL VERTICAL LOG(S) PLACEMENT AND CONSTRUCTABILITY.

TABLE - WOODY GNARL LOG SCHEDULE:

LOG ID #	DIAMETER (IN)	LENGTH (FT)	ROOTWAD	QUANTITY/ STRUCTURE
R4	18-24	30	YES	2
R5	18-24	35	YES	2
L6	18-24	40	NO	2
R6	18-24	40	YES	1
R7	18-24	45	YES	3
R8	18-24	50	YES	2
TOTAL:				12 TOTAL
VERTICAL LOG 1	24	20	NO	1
VERTICAL LOG 2-6	24	25	NO	5
TOTAL:				18 PER STRUCTURE

TABLE - WOODY GNARL SLASH SCHEDULE

	QUANTITY/ STRUCTURE (CY)
SLASH	70-80

TABLE - WOODY GNARL RACKING SCHEDULE

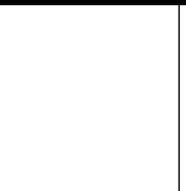
	QUANTITY/ STRUCTURE
RACKING LOGS	70

TABLE - WOODY GNARL ROCK SCHEDULE

	WEIGHT (TONS)	QUANTITY/ STRUCTURE
BALLAST ROCKS	2	14

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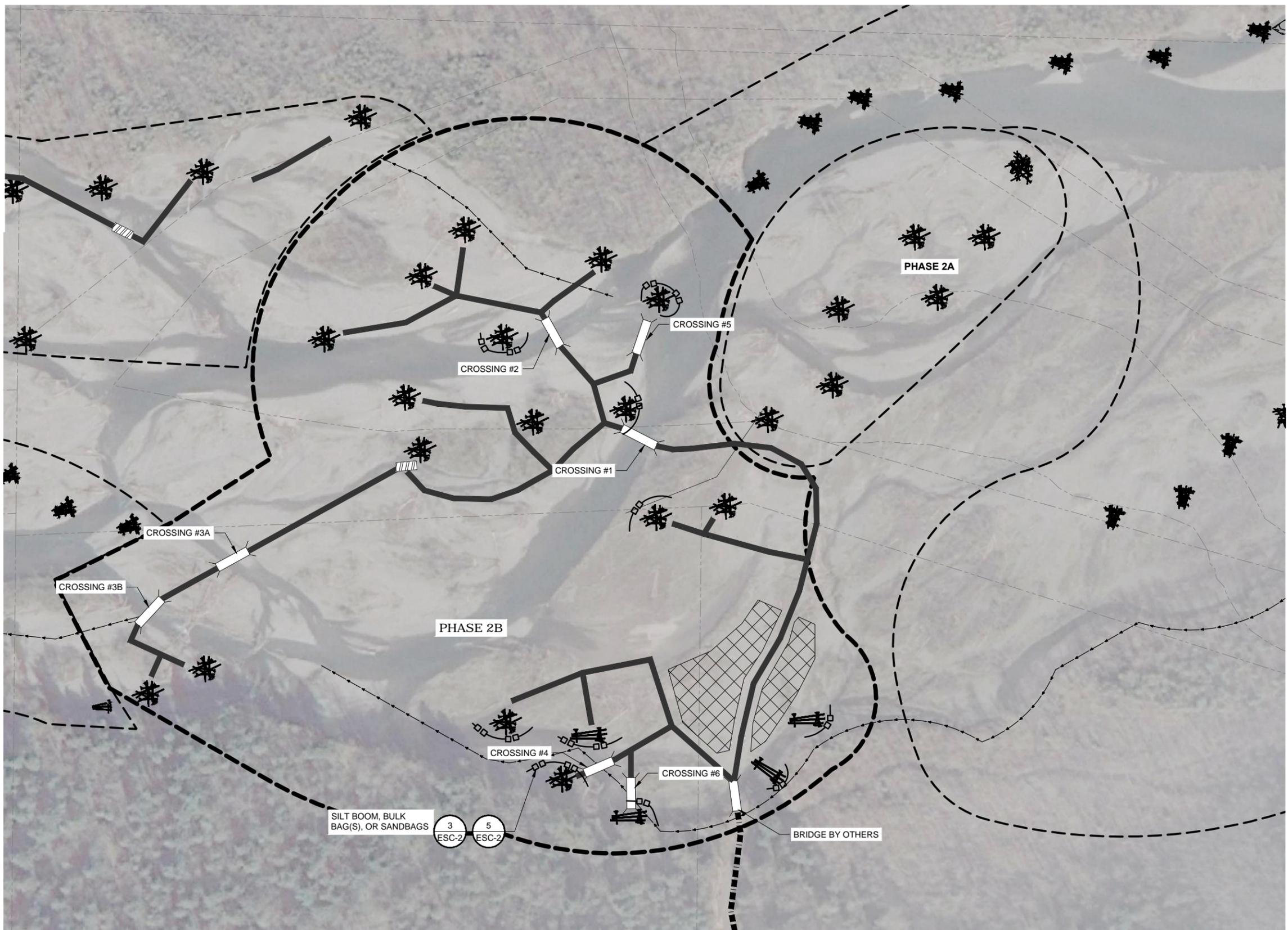


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DESIGNED: M. BEGGS	DRAWN: -
DESIGNED: -	CHECKED: -
SCALE: AS NOTED	APPROVED: -

NORTH FORK NOOKSACK RIVER
 FARMHOUSE REACH RESTORATION PROJECT
 PHASE 2B
 WOODY GNARL LAYERING PLAN

DATE: JUNE 2016
PROJECT NO: 14-05804-002
DRAWING NO: C-7
SHEET NO: 9 OF 11

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100 0 100 200
1"=100'

LEGEND:

- OHW — APPROXIMATE OHW (NOOKSACK TRIBE)
- - - - - PARCEL
- ← - - - - - EXISTING SIDE CHANNEL
- - - - - EXISTING ACCESS ROAD
- — — — — TEMPORARY ACCESS CORRIDORS
- — — — — PHASE 2B EXTENTS
- - - - - PHASE EXTENTS NOT IN CONTRACT
- - - - - - BULK BAGS/SAND BAGS
- ▨ TEMPORARY STAGING AREA
- ⌌ TEMPORARY CROSSING
- ▨▨▨ TEMPORARY STEEL ROAD PLATE FOR SIDE CHANNEL CROSSING
- 🌲 FSS
- 🌲 WOODY GNARL

EROSION AND SEDIMENT CONTROL NOTES:

1. THE IMPLEMENTATION OF EROSION AND SEDIMENT CONTROL (ESC) PLANS AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF ESC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ALL CONSTRUCTION IS APPROVED.
2. THE ESC FACILITIES MUST BE CONSTRUCTED PRIOR TO OR IN CONJUNCTION WITH ALL CLEARING AND GRADING SO AS TO ENSURE THAT THE TRANSPORT OF SEDIMENT TO SURFACE WATERS, DRAINAGE SYSTEMS, AND ADJACENT PROPERTIES IS MINIMIZED.
3. THE ESC FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM ANTICIPATED FOR SITE CONDITIONS, DURING THE CONSTRUCTION PERIOD. THESE ESC FACILITIES SHALL BE ADAPTED AND UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS AND MODIFIED TO ACCOUNT FOR CHANGING SITE CONDITIONS.
4. ANY AREAS OF EXPOSED SOILS THAT WILL NOT BE DISTURBED FOR SEVEN DAYS SHALL BE IMMEDIATELY STABILIZED WITH THE APPROVED ESC METHODS
5. ANY AREA NEEDING ESC MEASURES THAT DO NOT REQUIRE IMMEDIATE ATTENTION SHALL BE ADDRESSED WITHIN SEVEN (7) DAYS.
6. THE ESC FACILITIES ON INACTIVE SITES SHALL BE INSPECTED BY THE CONTRATORS CESCL AND MAINTAINED WITHIN TWENTY FOUR (24) HOURS FOLLOWING A STORM EVENT.
7. WHERE STEEL PLATES (ROAD PLATES) ARE USED TO CROSS SIDE CHANNEL FLOW, PLATES SHALL SPAN FULL WETTED WIDTH. STEEL PLATES NEEDED FOR THIS SHOULD BE SUPPLIED BY CONTRACTOR.
8. TEMPORARY BRIDGES SUPPLIED BY CONTRACTOR AND SHALL BE INSTALLED BANK TO BANK AS DIRECTED BY WDFW HPA.
9. WHERE STRAW MULCH FOR TEMP EROSION CONTROL IS NEEDED IT SHALL BE APPLIED AT A MIN 3" THICK USING CERTIFIED WEED-FREE STRAW.

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SILT BOOM, BULK BAG(S), OR SANDBAGS
 3 ESC-2 5 ESC-2

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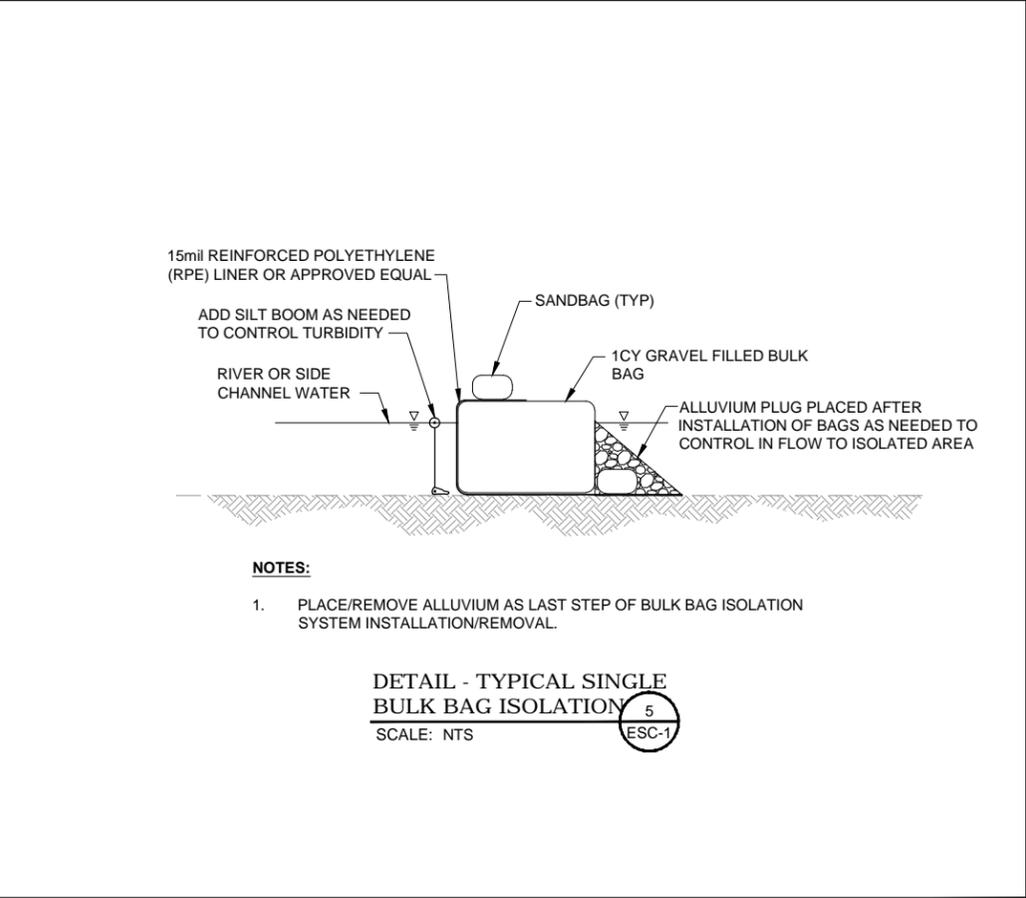
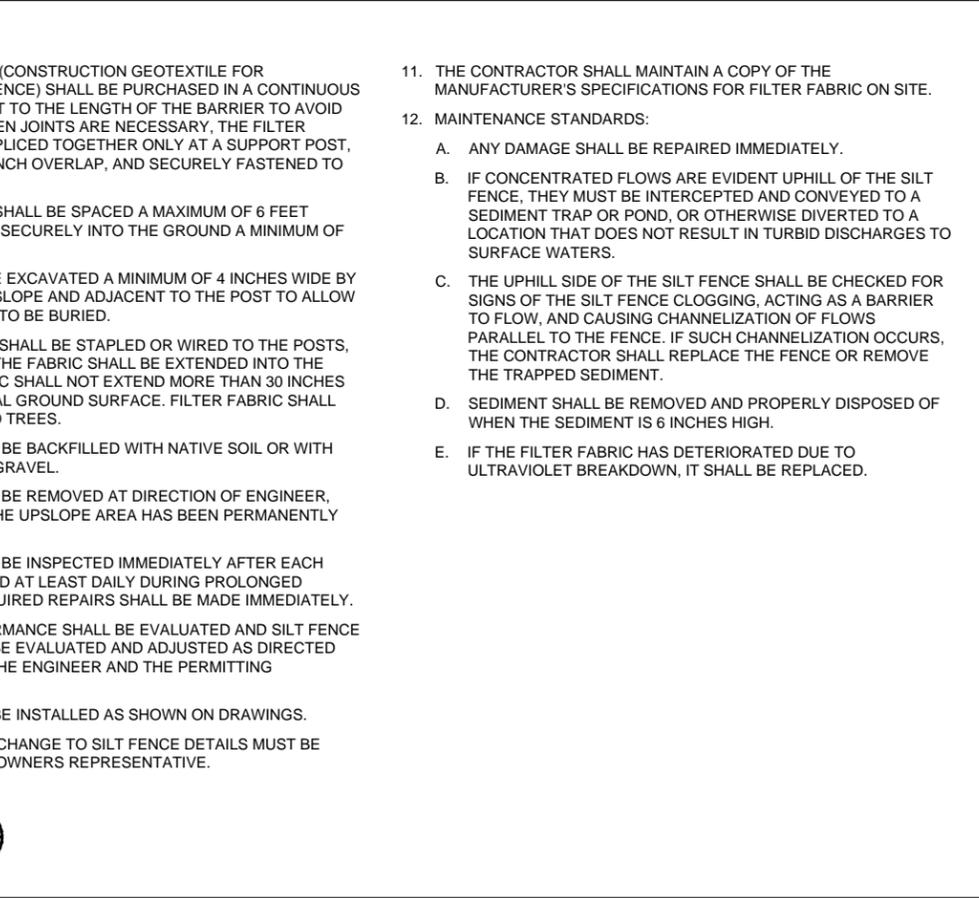
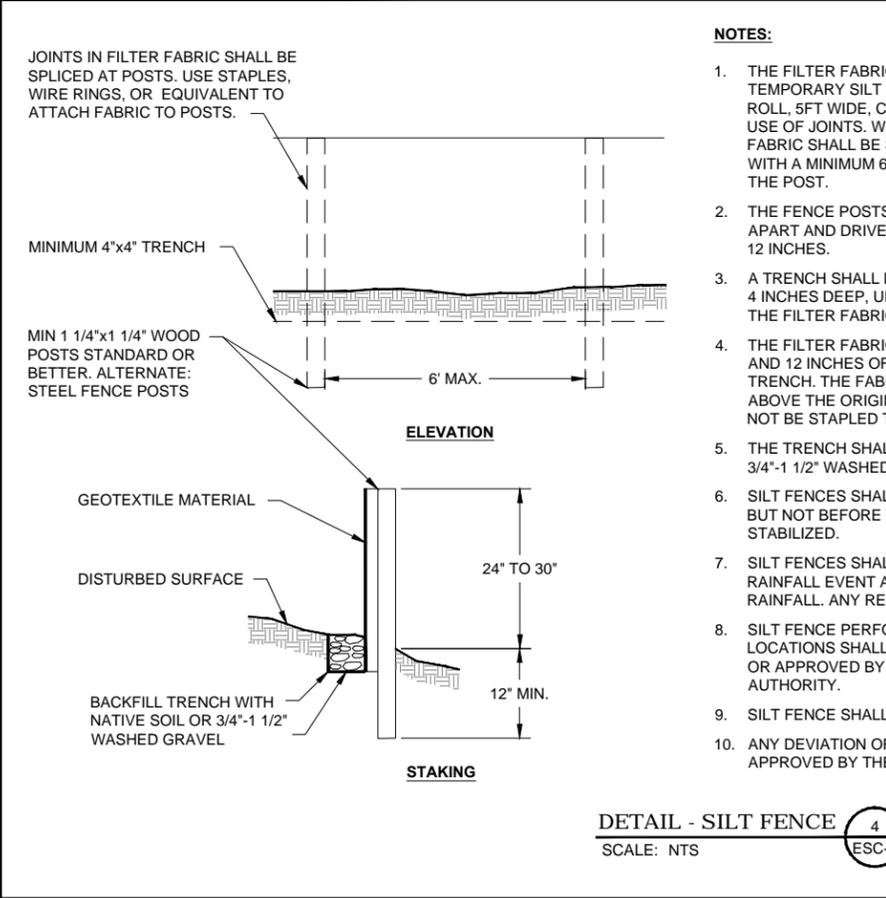
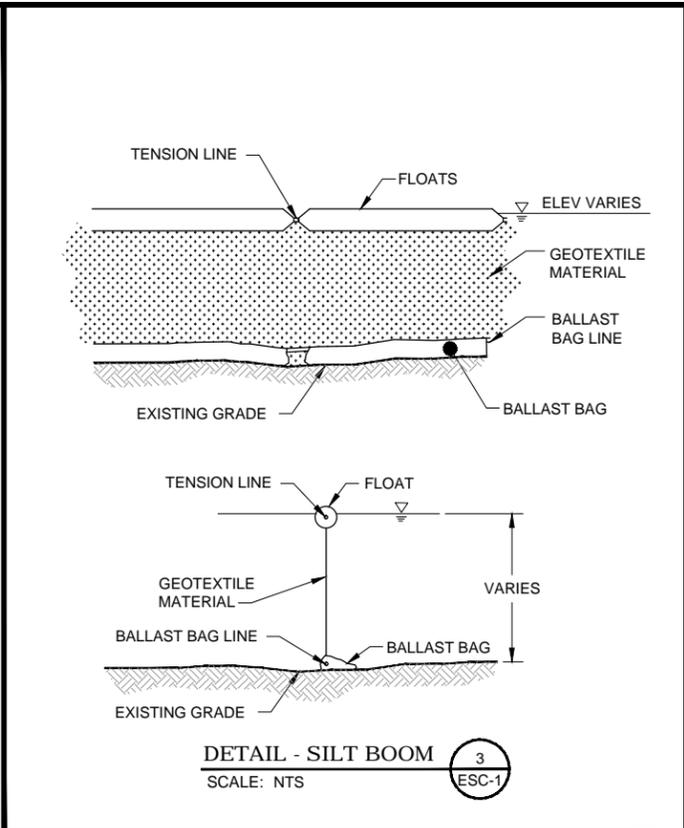
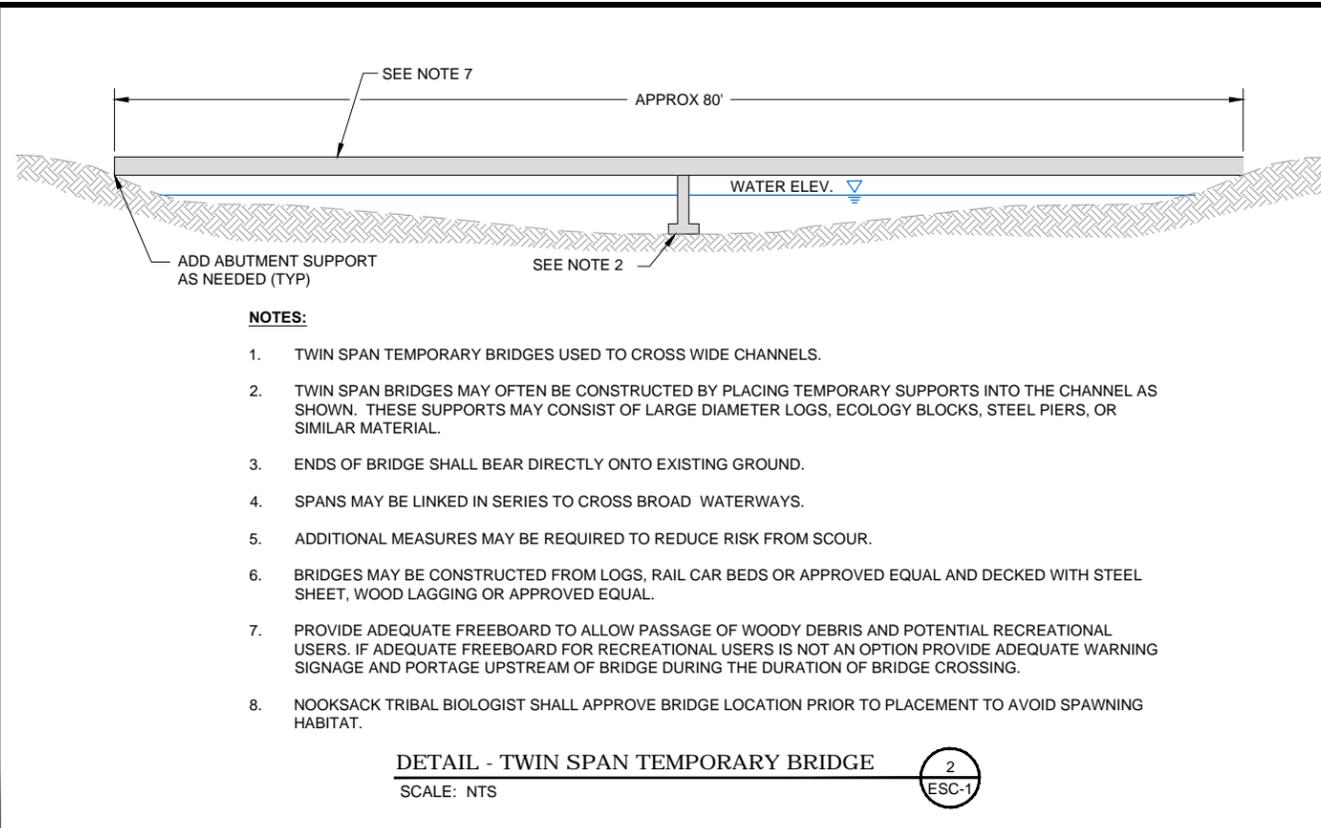
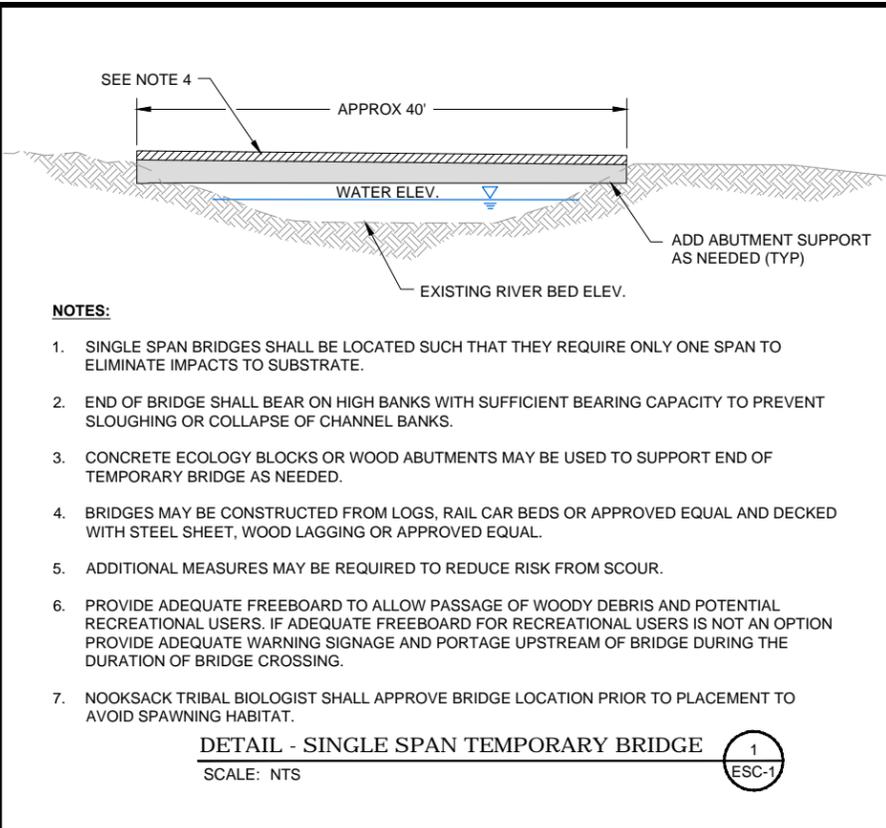
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DESIGNED:	M. BEGGS	DRAWN:	-
DESIGNED:	-	CHECKED:	-
SCALE:	AS NOTED	APPROVED:	-

NORTH FORK NOOKSACK RIVER
 FARMHOUSE REACH RESTORATION PROJECT
 PHASE 2B

TESC PLAN

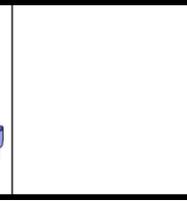
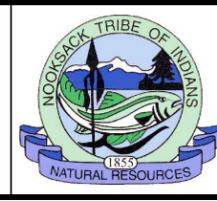
DATE:	JUNE 2016
PROJECT NO:	14-05804-002
DRAWING NO:	ESC-1
SHEET NO:	10 OF 11

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NORTH FORK NOOKSACK RIVER FARMHOUSE REACH RESTORATION PROJECT PHASE 2B

TESC DETAILS

DATE: JUNE 2016
PROJECT NO: 14-05804-002
DRAWING NO: ESC-2
SHEET NO: 11 OF 11