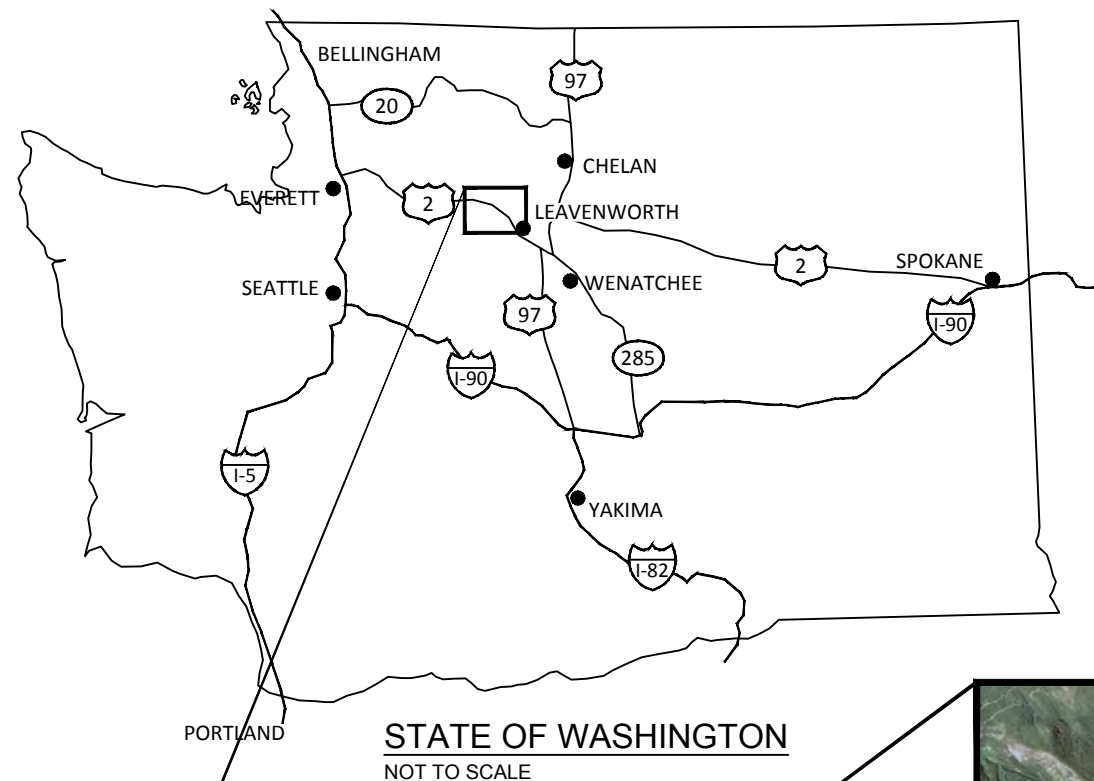


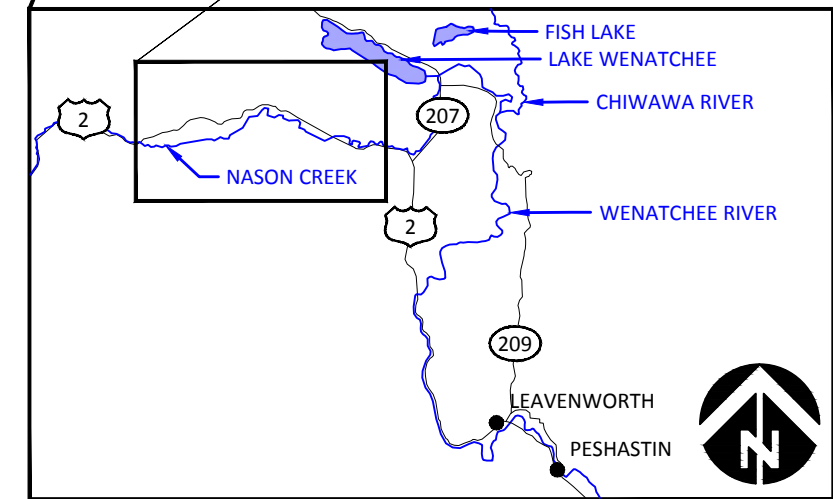
# UPPER NASON CREEK RESTORATION

## PHASE 2 FINAL DESIGN

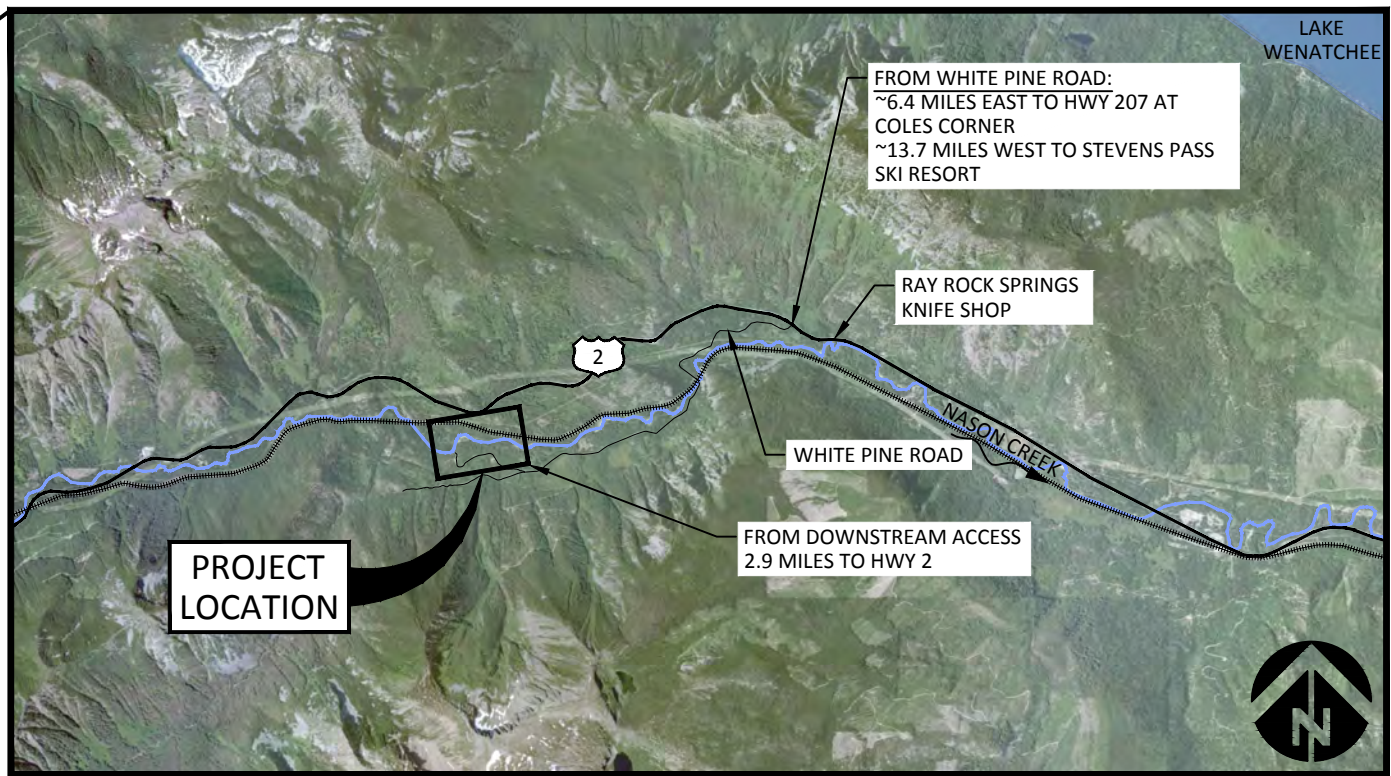
CHELAN COUNTY, WA  
SEPTEMBER 22, 2023



STATE OF WASHINGTON  
NOT TO SCALE



VICINITY MAP  
NOT TO SCALE



SITE MAP  
NOT TO SCALE

COORDINATES:  
LATITUDE: 47°46'41"N  
LONGITUDE: 120°53'32"W

TOWNSHIP 26N, RANGE 16E, SECTION 5 & 6

WATERBODY: NASON CREEK  
TRIBUTARY OF: WENATCHEE RIVER

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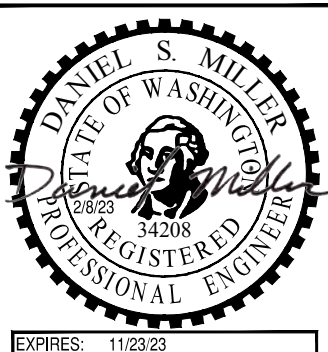
UPPER NASON CREEK RESTORATION  
PHASE 2 FINAL DESIGN  
YAKAMA NATION FISHERIES



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COVER, SHEET INDEX  
AND VICINITY MAP

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

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

EXISTING DATA

TOPOGRAPHIC CONTOURS DISPLAYED IN THIS PLAN SET REPRESENT A COMBINATION OF LIDAR DATA FLOW IN OCTOBER 2018 FOR WASHINGTON DNR AS PART OF THE CHELAN, WASHINGTON DATASET AND LIDAR DATA FLOW BETWEEN JULY - OCTOBER 2015 FOR OREGON DOGAMI AS PART OF THE OREGON LIDAR CONSORTIUM (OLC) CHELAN FEMA STUDY AREA. THESE DATA ARE REFERENCED TO NAD83, STATE PLANE, WASHINGTON NORTH, NAVD88, US SURVEY FEET.

HYDRAULIC MODELING BY INTER-FLUVE USING USACE HEC-RAS 6.1.0.

SOILS

SOILS WITHIN THE PROJECT AREA CONSIST OF AERIC FLUVAQUENTS, SASKA STONY SANDY LOAM AND MOUNTAINEER STONY SANDY LOAM AS MAPPED BY NRCS.

CONTRACTOR SHALL CONDUCT OWN SOILS INVESTIGATIONS AS NEEDED, AT NO ADDITIONAL COST.

WETLANDS DELINEATION HAS BEEN COMPLETED BY HAMER ENVIRONMENTAL DATED JANUARY 14, 2022.

UTILITIES

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

CASCADE MEADOWS CAMP UTILITIES SKETCHES ARE AVAILABLE UPON REQUEST.

THE CONTRACTOR SHALL CALL (800-424-5555 OR 811) FOR UTILITY LOCATE PRIOR TO CONSTRUCTION

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

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

CONSTRUCTION STAKING

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

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

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

CONSTRUCTION MATERIALS

OWNER PROVIDED LOGS, LOGS WITH ROOTWADS AND VERTICAL LOGS WILL BE LOCATED IN A DESIGNATED STOCKPILE/STAGING AREA. CONTRACTOR SHALL PROCURE, PROVIDE AND PLACE SLASH MATERIALS.

LOGS STAGED ARE NOTED ON THE PLANS.

LOCATION, ALIGNMENT, AND ELEVATION OF LOGS AND LOGS WITH ROOTWADS ARE SUBJECT TO FIELD FIT ADJUSTMENT BASED ON FIELD CONDITIONS AND MATERIAL SIZE, PER DIRECTION BY OWNER OR OWNER'S REPRESENTATIVE.

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

CONSTRUCTION ACCESS/TRAFFIC CONTROL

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

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

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

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

AT PROJECT COMPLETION, ROADS AND ACCESS ROUTES SHALL BE CLEANED, GRADED, AND RESURFACED TO PRE-PROJECT CONDITION PER WASHINGTON DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION OR USFS STANDARDS PER JURISDICTION. WORK SHALL BE INCIDENTAL TO MOBILIZATION/DEMOBILIZATION.

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

CONTRACTOR SHALL SEED AND MULCH ALL DISTURBED SURFACES EXCEPT CHANNEL BETWEEN TOPS OF BANK AND EXISTING GRAVEL ROADS. SEED WILL BE PROVIDED BY OWNER. MULCH SHALL BE CERTIFIED WEED AND SEED FREE.

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

STREAM CROSSINGS

CONTRACTOR SHALL USE ONLY TRACKED EQUIPMENT.

CONTRACTOR SHALL CROSS NASON CREEK AT LOCATIONS INDICATED ON THE PLANS; OR AS DIRECTED BY OWNER TO MEET PERMITTING REQUIREMENTS.

FOR GROUPINGS OF SITES ALONG NORTH SIDE OF NASON CREEK THAT ARE ACCESSED BY A COMMON CROSSING POINT:

- A MAXIMUM OF FOUR PIECES OF EQUIPMENT SHALL BE ALLOWED.
- EACH PIECE OF EQUIPMENT SHALL BE ALLOWED ONLY ONE ROUND TRIP CROSSING.
- CONTRACTOR SHALL BRING ALL NECESSARY EQUIPMENT, MATERIALS AND FUEL NECESSARY TO COMPLETE WORK WITH NO GREATER THAN EIGHT ROUND TRIPS FOR EACH GROUPING.

QUANTITIES ESTIMATE

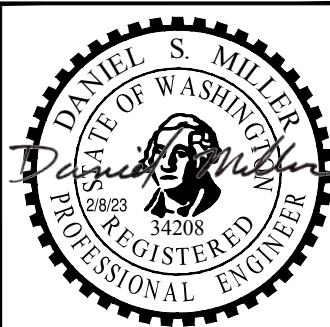
Description	Quantity		Units
	Phase 1	Phase 2	
Apex jam structures	7	5	EA
Deflector jam structures	14	10	EA
Bank buried jam structures	0	1	EA
Habitat cover wood	4	1	EA
Pile ballasted roughness logs	11	3	EA
FP roughness - logs	75	19	EA
FP roughness - piles	69	57	EA
Willow tubelings	1070	230	EA

- ASSUMPTIONS:
- PLANTING PLAN TO BE DESIGNED BY AND REVEGETATION INSTALLED BY WILDLANDS, INC.UNDER SEPARATE CONTRACT.

NOT IN CONTRACT

ABBREVIATIONS

APPROX	APPROXIMATE
BMP	BEST MANAGEMENT PRACTICE
BNSF	BURLINGTON NORTHERN SANTA FE
BPA	BONNEVILLE POWER ADMINISTRATION
CY	CUBIC YARDS
°	DEGREE
DBH	DIAMETER AT BREAST HEIGHT
DIA	DIAMETER
DNR	DEPARTMENT OF NATURAL RESOURCES
DOGAMI	DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
EA	EACH
ELEV	ELEVATION
ESC	EROSION AND SEDIMENT CONTROL
FEMA	FEDERAL EMERGENCY MANAGEMENT AGENCY
FT OR '	FOOT
GIS	GEOGRAPHIC INFORMATION SYSTEM
HWY	HIGHWAY
IN OR '"	INCH
LIDAR	LIGHT DETECTION AND RANGING
LWM	LARGE WOODY MATERIAL
LS	LUMP SUM
MAX	MAXIMUM
MIN	MINIMUM
MP	MILEPOST
MSF	THOUSAND SQUARE FEET
NAD83	NORTH AMERICAN DATUM OF 1983
NAVD88	NORTH AMERICAN VERTICAL DATUM OF 1988
NRCS	NATURAL RESOURCES CONSERVATION SERVICE
OHW	ORDINARY HIGH WATER
OLW	ORDINARY LOW WATER
%	PERCENT
LBS	POUNDS
RD	ROAD
RM	RIVER MILE
RTK GPS	REAL TIME KINEMATIC GLOBAL POSITIONING SYSTEM
STA	STATION
TBD	TO BE DETERMINED
TBM	TEMPORARY BENCHMARK
TYP	TYPICAL
US	UNITED STATES
USACE	UNITED STATES ARMY CORPS OF ENGINEERS
USFS	UNITED STATES FOREST SERVICE
WDFW	WASHINGTON DEPARTMENT OF FISH AND WILDLIFE
WSDOT	WASHINGTON STATE DEPARTMENT OF TRANSPORTATION



NO.	BY	DATE	REVISION DESCRIPTION

NS, CM, DM	LS, DM	LS, DM
DRAWN	DESIGNED	CHECKED
DM	9/22/2023	200236
APPROVED	DATE	PROJECT

UPPER NASON CREEK RESTORATION  
PHASE 2 FINAL DESIGN  
YAKAMA NATION FISHERIES



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GENERAL NOTES, QUANTITIES  
ESTIMATE AND ABBREVIATIONS

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HIP IV GENERAL CONSERVATION MEASURES APPLICABLE TO ALL ACTIONS

THE ACTIVITIES COVERED UNDER THE HIP ARE INTENDED TO PROTECT AND RESTORE FISH AND WILDLIFE HABITAT WITH LONG-TERM BENEFITS TO ESA-LISTED SPECIES. THE FOLLOWING GENERAL CONSERVATION MEASURES (DEVELOPED IN COORDINATION WITH USFWS AND NMFS) WILL BE APPLIED TO ALL ACTIONS OF THIS PROJECT.

PROJECT DESIGN AND SITE PREPARATION.

1. STATE AND FEDERAL PERMITS.

- A. ALL APPLICABLE REGULATORY PERMITS AND OFFICIAL PROJECT AUTHORIZATIONS WILL BE OBTAINED BEFORE PROJECT IMPLEMENTATION.
- B. THESE PERMITS AND AUTHORIZATIONS INCLUDE, BUT ARE NOT LIMITED TO, NATIONAL ENVIRONMENTAL POLICY ACT, NATIONAL HISTORIC PRESERVATION ACT, THE APPROPRIATE STATE AGENCY REMOVAL AND FILL PERMIT, USACE CLEAN WATER ACT (CWA) 404 PERMITS, CWA SECTION 401 WATER QUALITY CERTIFICATIONS, AND FEMA NO-RISE ANALYSES.

2. TIMING OF IN-WATER WORK.

- A. APPROPRIATE STATE (OREGON DEPARTMENT OF FISH AND WILDLIFE (ODFW), WASHINGTON DEPARTMENT OF FISH AND WILDLIFE (WDFW), IDAHO DEPARTMENT OF FISH AND GAME (IDFG), AND MONTANA FISH WILDLIFE AND PARKS (MFWP)) GUIDELINES FOR TIMING OF IN-WATER WORK WINDOWS (IWW) WILL BE FOLLOWED.
- B. CHANGES TO ESTABLISHED WORK WINDOWS WILL BE APPROVED BY REGIONAL STATE BIOLOGISTS AND BPA'S EC LEAD.
- C. BULL TROUT. FOR AREAS WITH DESIGNATED IN-WATER WORK WINDOWS FOR BULL TROUT OR AREAS KNOWN TO HAVE BULL TROUT, PROJECT PROPONENTS WILL CONTACT THE APPROPRIATE USFWS FIELD OFFICE TO INSURE THAT ALL REASONABLE IMPLEMENTATION MEASURES ARE CONSIDERED AND AN APPROPRIATE IN-WATER WORK WINDOW IS BEING USED TO MINIMIZE PROJECT EFFECTS.
- D. LAMPREY. WORKING IN STREAM OR RIVER CHANNELS THAT CONTAIN PACIFIC LAMPREY WILL BE AVOIDED FROM MARCH 1 TO JULY 1 FOR REACHES <5,000 FEET IN ELEVATION AND FROM MARCH 1 TO AUGUST 1 FOR REACHES >5,000 FEET. IF EITHER TIMEFRAME IS INCOMPATIBLE WITH OTHER OBJECTIVES, THE AREA WILL BE SURVEYED FOR NESTS AND LAMPREY PRESENCE, AND AVOIDED IF POSSIBLE. IF LAMPREYS ARE KNOWN TO EXIST, THE PROJECT SPONSOR WILL UTILIZE DEWATERING AND SALVAGE PROCEDURES (SEE FISH SALVAGE AND ELECTROFISHING SECTIONS) TO MINIMIZE ADVERSE EFFECTS.
- E. THE IN-WATER WORK WINDOW WILL BE PROVIDED IN THE CONSTRUCTION PLANS.

3. CONTAMINANTS.

- A. EXCAVATION OF MORE THAN 20 CUBIC YARDS WILL REQUIRE A SITE VISIT AND DOCUMENTED ASSESSMENT FOR POTENTIAL CONTAMINANT SOURCES. THE SITE ASSESSMENT WILL BE STORED WITH PROJECT FILES OR AS AN APPENDIX TO THE BASIS OF DESIGN REPORT.
- B. THE SITE ASSESSMENT WILL SUMMARIZE:
  - 1. THE SITE VISIT, CONDITION OF THE PROPERTY, AND IDENTIFICATION OF ANY AREAS USED FOR VARIOUS INDUSTRIAL PROCESSES;
  - 2. AVAILABLE RECORDS, SUCH AS FORMER SITE USE, BUILDING PLANS, AND RECORDS OF ANY PRIOR CONTAMINATION EVENTS;
  - 3. INTERVIEWS WITH KNOWLEDGEABLE PEOPLE, SUCH AS SITE OWNERS, OPERATORS, OCCUPANTS, NEIGHBORS, OR LOCAL GOVERNMENT OFFICIALS; AND
  - 4. THE TYPE, QUANTITY, AND EXTENT OF ANY POTENTIAL CONTAMINATION SOURCES.

4. SITE LAYOUT AND FLAGGING.

- A. CONSTRUCTION AREAS TO BE CLEARLY FLAGGED PRIOR TO CONSTRUCTION.
- B. AREAS TO BE FLAGGED WILL INCLUDE:
  - 1. SENSITIVE RESOURCE AREAS, SUCH AS AREAS BELOW ORDINARY HIGH WATER, SPAWNING AREAS, SPRINGS, AND WETLANDS;
  - 2. EQUIPMENT ENTRY AND EXIT POINTS;
  - 3. ROAD AND STREAM CROSSING ALIGNMENTS;
  - 4. STAGING, STORAGE, AND STOCKPILE AREAS; AND
  - 5. NO-SPRAY AREAS AND BUFFERS.

5. TEMPORARY ACCESS ROADS AND PATHS.

- A. EXISTING ACCESS ROADS AND PATHS WILL BE PREFERENTIALLY USED WHENEVER REASONABLE, AND THE NUMBER AND LENGTH OF TEMPORARY ACCESS ROADS AND PATHS THROUGH RIPARIAN AREAS AND FLOODPLAINS WILL BE MINIMIZED.
- B. VEHICLE USE AND HUMAN ACTIVITIES, INCLUDING WALKING, IN AREAS OCCUPIED BY TERRESTRIAL ESA-LISTED SPECIES WILL BE MINIMIZED.
- C. TEMPORARY ACCESS ROADS AND PATHS WILL NOT BE BUILT ON SLOPES WHERE GRADE, SOIL, OR OTHER FEATURES SUGGEST A LIKELIHOOD OF EXCESSIVE EROSION OR FAILURE. IF SLOPES ARE STEEPER THAN 30%, THEN THE ROAD WILL BE DESIGNED BY A CIVIL ENGINEER WITH EXPERIENCE IN STEEP ROAD DESIGN.
- D. THE REMOVAL OF RIPARIAN VEGETATION DURING CONSTRUCTION OF TEMPORARY ACCESS ROADS WILL BE MINIMIZED. WHEN TEMPORARY VEGETATION REMOVAL IS REQUIRED, VEGETATION WILL BE CUT AT GROUND LEVEL (NOT GRUBBED).
- E. AT PROJECT COMPLETION, ALL TEMPORARY ACCESS ROADS AND PATHS WILL BE OBLITERATED, AND THE SOIL WILL BE STABILIZED AND REVEGETATED. ROAD AND PATH OBLITERATION REFERS TO THE MOST COMPREHENSIVE DEGREE OF DECOMMISSIONING AND INVOLVES DECOMPACTING THE SURFACE AND DITCH, PULLING THE FILL MATERIAL ONTO THE RUNNING SURFACE, AND RESHAPING TO MATCH THE ORIGINAL CONTOUR.
- F. HELICOPTER FLIGHT PATTERNS WILL BE ESTABLISHED IN ADVANCE AND LOCATED TO AVOID TERRESTRIAL ESA-LISTED SPECIES AND THEIR OCCUPIED HABITAT DURING SENSITIVE LIFE STAGES.

6. TEMPORARY STREAM CROSSINGS.

- A. EXISTING STREAM CROSSINGS OR BEDROCK WILL BE PREFERENTIALLY USED WHENEVER REASONABLE, AND THE NUMBER OF TEMPORARY STREAM CROSSINGS WILL BE MINIMIZED.
- B. TEMPORARY BRIDGES AND CULVERTS WILL BE INSTALLED TO ALLOW FOR EQUIPMENT AND VEHICLE CROSSING OVER PERENNIAL STREAMS DURING CONSTRUCTION. TREATED WOOD SHALL NOT BE USED ON TEMPORARY BRIDGE CROSSINGS OR IN LOCATIONS IN CONTACT WITH OR DIRECTLY OVER WATER.
- C. FOR PROJECTS THAT REQUIRE EQUIPMENT AND VEHICLES TO CROSS IN THE WET:
  - 1. THE LOCATION AND NUMBER OF ALL WET CROSSINGS SHALL BE APPROVED BY THE BPA EC LEAD AND DOCUMENTED IN THE CONSTRUCTION PLANS;
  - 2. VEHICLES AND MACHINERY SHALL CROSS STREAMS AT RIGHT ANGLES TO THE MAIN CHANNEL WHENEVER POSSIBLE;
  - 3. NO STREAM CROSSINGS WILL OCCUR 300 FEET UPSTREAM OR 100 FEET DOWNSTREAM OF AN EXISTING REDD OR SPAWNING FISH; AND
  - 4. AFTER PROJECT COMPLETION, TEMPORARY STREAM CROSSINGS WILL BE OBLITERATED AND BANKS RESTORED.

7. STAGING, STORAGE, AND STOCKPILE AREAS.

- A. STAGING AREAS (USED FOR CONSTRUCTION EQUIPMENT STORAGE, VEHICLE STORAGE, FUELING, SERVICING, AND HAZARDOUS MATERIAL STORAGE) WILL BE 150 FEET OR MORE FROM ANY NATURAL WATER BODY OR WETLAND. STAGING AREAS CLOSER THAN 150 FEET WILL BE APPROVED BY THE EC LEAD.
- B. NATURAL MATERIALS USED FOR IMPLEMENTATION OF AQUATIC RESTORATION, SUCH AS LARGE WOOD, GRAVEL, AND BOULDERS, MAY BE STAGED WITHIN 150 FEET IF CLEARLY INDICATED IN THE PLANS THAT AREA IS FOR NATURAL MATERIALS ONLY.
- C. ANY LARGE WOOD, TOPSOIL, AND NATIVE CHANNEL MATERIAL DISPLACED BY CONSTRUCTION WILL BE STOCKPILED FOR USE DURING SITE RESTORATION AT A SPECIFICALLY IDENTIFIED AND FLAGGED AREA.
- D. ANY MATERIAL NOT USED IN RESTORATION, AND NOT NATIVE TO THE FLOODPLAIN, WILL BE DISPOSED OF OUTSIDE THE 100-YEAR FLOODPLAIN.

8. EQUIPMENT.

- A. MECHANIZED EQUIPMENT AND VEHICLES WILL BE SELECTED, OPERATED, AND MAINTAINED IN A MANNER THAT MINIMIZES ADVERSE EFFECTS ON THE ENVIRONMENT (E.G., MINIMALLY-SIZED, LOW PRESSURE TIRES; MINIMAL HARD-TURN PATHS FOR TRACKED VEHICLES; TEMPORARY MATS OR PLATES WITHIN WET AREAS OR ON SENSITIVE SOILS).
- B. EQUIPMENT WILL BE STORED, FUELED, AND MAINTAINED IN AN CLEARLY IDENTIFIED STAGING AREA THAT MEETS STAGING AREA CONSERVATION MEASURES.

- C. SEE FUELING AREA PROTECTION DETAIL 2, SHEET 6.
- D. BIODEGRADABLE LUBRICANTS AND FLUIDS WILL BE USED ON EQUIPMENT OPERATING IN AND ADJACENT TO THE STREAM CHANNEL AND LIVE WATER.
- E. EQUIPMENT WILL BE INSPECTED DAILY FOR FLUID LEAKS BEFORE LEAVING THE VEHICLE STAGING AREA FOR OPERATION WITHIN 150 FEET OF ANY NATURAL WATER BODY OR WETLAND.
- F. EQUIPMENT WILL BE THOROUGHLY CLEANED BEFORE OPERATION BELOW ORDINARY HIGH WATER, AND AS OFTEN AS NECESSARY DURING OPERATION, TO REMAIN GREASE FREE.

9. EROSION CONTROL.

- A. TEMPORARY EROSION CONTROL MEASURES INCLUDE:
  - 1. TEMPORARY EROSION CONTROLS WILL BE IN PLACE BEFORE ANY SIGNIFICANT ALTERATION OF THE ACTION SITE AND APPROPRIATELY INSTALLED DOWNSLOPE OF PROJECT ACTIVITY WITHIN THE RIPARIAN BUFFER AREA UNTIL SITE REHABILITATION IS COMPLETE;
  - 2. IF THERE IS A POTENTIAL FOR ERODED SEDIMENT TO ENTER THE STREAM, SEDIMENT BARRIERS WILL BE INSTALLED AND MAINTAINED FOR THE DURATION OF PROJECT IMPLEMENTATION;
  - 3. TEMPORARY EROSION CONTROL MEASURES MAY INCLUDE SEDGE MATS, FIBER WATTLES, SILT FENCES, JUTE MATTING, WOOD FIBER MULCH AND SOIL BINDER, OR GEOTEXTILES AND GEOSYNTHETIC FABRIC;
  - 4. SOIL STABILIZATION UTILIZING WOOD FIBER MULCH AND TACKIFIER (HYDRO-APPLIED) MAY BE USED TO REDUCE EROSION OF BARE SOIL IF THE MATERIALS ARE NOXIOUS WEED FREE AND NONTOXIC TO AQUATIC AND TERRESTRIAL ANIMALS, SOIL MICROORGANISMS, AND VEGETATION;
  - 5. SEDIMENT WILL BE REMOVED FROM EROSION CONTROLS ONCE IT HAS REACHED 1/3 OF THE EXPOSED HEIGHT OF THE CONTROL; AND
  - 6. ONCE THE SITE IS STABILIZED AFTER CONSTRUCTION, TEMPORARY EROSION CONTROL MEASURES WILL BE REMOVED.
- B. EMERGENCY EROSION CONTROLS. THE FOLLOWING MATERIALS FOR EMERGENCY EROSION CONTROL WILL BE AVAILABLE AT THE WORK SITE:
  - 1. A SUPPLY OF SEDIMENT CONTROL MATERIALS; AND
  - 2. AN OIL-ABSORBING FLOATING BOOM WHENEVER SURFACE WATER IS PRESENT.

10. DUST ABATEMENT.

- A. THE PROJECT SPONSOR WILL DETERMINE THE APPROPRIATE DUST CONTROL MEASURES BY CONSIDERING SOIL TYPE, EQUIPMENT USAGE, PREVAILING WIND DIRECTION, AND THE EFFECTS CAUSED BY OTHER EROSION AND SEDIMENT CONTROL MEASURES.
- B. WORK WILL BE SEQUENCED AND SCHEDULED TO REDUCE EXPOSED BARE SOIL SUBJECT TO WIND EROSION.
- C. DUST-ABATEMENT ADDITIVES AND STABILIZATION CHEMICALS (TYPICALLY MAGNESIUM CHLORIDE, CALCIUM CHLORIDE SALTS, OR LIGNINSULFONATE) WILL NOT BE APPLIED WITHIN 25 FEET OF WATER OR A STREAM CHANNEL AND WILL BE APPLIED SO AS TO MINIMIZE THE LIKELIHOOD THAT THEY WILL ENTER STREAMS. APPLICATIONS OF LIGNINSULFONATE WILL BE LIMITED TO A MAXIMUM RATE OF 0.5 GALLONS PER SQUARE YARD OF ROAD SURFACE, ASSUMING MIXED 50:50 WITH WATER.
- D. APPLICATION OF DUST ABATEMENT CHEMICALS WILL BE AVOIDED DURING OR JUST BEFORE WET WEATHER, AND AT STREAM CROSSINGS OR OTHER AREAS THAT COULD RESULT IN UNFILTERED DELIVERY OF THE DUST ABATEMENT MATERIALS TO A WATERBODY (TYPICALLY THESE WOULD BE AREAS WITHIN 25 FEET OF A WATERBODY OR STREAM CHANNEL; DISTANCES MAY BE GREATER WHERE VEGETATION IS SPARSE OR SLOPES ARE STEEP).
- E. SPILL CONTAINMENT EQUIPMENT WILL BE AVAILABLE DURING APPLICATION OF DUST ABATEMENT CHEMICALS.
- F. PETROLEUM-BASED PRODUCTS WILL NOT BE USED FOR DUST ABATEMENT.



				NS, CM, DM	LS, DM	LS, DM
				DRAWN	DESIGNED	CHECKED
				DM	9/22/2023	200236
NO.	BY	DATE	REVISION DESCRIPTION	APPROVED	DATE	PROJECT

UPPER NASON CREEK RESTORATION  
PHASE 2 FINAL DESIGN  
YAKAMA NATION FISHERIES



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HIP IV GENERAL CONSERVATION  
MEASURES (1 OF 3)

SHEET

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PROJECT DESIGN AND SITE PREPARATION (CONTINUED).

11. SPILL PREVENTION, CONTROL, AND COUNTER MEASURES.

- A. A DESCRIPTION OF HAZARDOUS MATERIALS THAT WILL BE USED, INCLUDING INVENTORY, STORAGE, AND HANDLING PROCEDURES WILL BE AVAILABLE ON-SITE.
- B. WRITTEN PROCEDURES FOR NOTIFYING ENVIRONMENTAL RESPONSE AGENCIES WILL BE POSTED AT THE WORK SITE.
- C. SPILL CONTAINMENT KITS (INCLUDING INSTRUCTIONS FOR CLEANUP AND DISPOSAL) ADEQUATE FOR THE TYPES AND QUANTITY OF HAZARDOUS MATERIALS USED AT THE SITE WILL BE AVAILABLE AT THE WORK SITE.
- D. WORKERS WILL BE TRAINED IN SPILL CONTAINMENT PROCEDURES AND WILL BE INFORMED OF THE LOCATION OF SPILL CONTAINMENT KITS.
- E. ANY WASTE LIQUIDS GENERATED AT THE STAGING AREAS WILL BE TEMPORARILY STORED UNDER AN IMPERVIOUS COVER, SUCH AS A TARPULIN, UNTIL THEY CAN BE PROPERLY TRANSPORTED TO AND DISPOSED OF AT A FACILITY THAT IS APPROVED FOR RECEIPT OF HAZARDOUS MATERIALS.
- F. PUMPS USED ADJACENT TO WATER SHALL USE SPILL CONTAINMENT SYSTEMS.

12. INVASIVE SPECIES CONTROL.

- A. PRIOR TO ENTERING THE SITE, ALL VEHICLES AND EQUIPMENT WILL BE POWER WASHED, ALLOWED TO FULLY DRY, AND INSPECTED TO MAKE SURE NO PLANTS, SOIL, OR OTHER ORGANIC MATERIAL ADHERES TO THE SURFACE.
- B. WATERCRAFT, WADERS, BOOTS, AND ANY OTHER GEAR TO BE USED IN OR NEAR WATER WILL BE INSPECTED FOR AQUATIC INVASIVE SPECIES.
- C. WADING BOOTS WITH FELT SOLES ARE NOT TO BE USED DUE TO THEIR PROPENSITY FOR AIDING IN THE TRANSFER OF INVASIVE SPECIES UNLESS DECONTAMINATION PROCEDURES HAVE BEEN APPROVED BY THE EC LEAD.

WORK AREA ISOLATION AND FISH SALVAGE.

1. WORK AREA ISOLATION.

- A. ANY WORK AREA WITHIN THE WETTED CHANNEL WILL BE ISOLATED FROM THE ACTIVE STREAM WHENEVER ESA-LISTED FISH ARE REASONABLY CERTAIN TO BE PRESENT, OR IF THE WORK AREA IS LESS THAN 300-FEET UPSTREAM FROM KNOWN SPAWNING HABITATS.
- B. WORK AREA ISOLATION AND FISH SALVAGE ACTIVITIES WILL COMPLY WITH THE IN-WATER WORK WINDOW.
- C. DESIGN PLANS WILL INCLUDE ALL ISOLATION ELEMENTS AND AREAS (COFFER DAMS, PUMPS, DISCHARGE AREAS, FISH SCREENS, FISH RELEASE AREAS, ETC.).
- D. WORK AREA ISOLATION AND FISH CAPTURE ACTIVITIES WILL OCCUR DURING PERIODS OF THE COOLEST AIR AND WATER TEMPERATURES POSSIBLE, NORMALLY EARLY IN THE MORNING VERSUS LATE IN THE DAY, AND DURING CONDITIONS APPROPRIATE TO MINIMIZE STRESS AND DEATH OF SPECIES PRESENT.

2. FISH SALVAGE.

- A. MONITORING AND RECORDING WILL TAKE PLACE FOR DURATION OF SALVAGE. THE SALVAGE REPORT WILL BE COMMUNICATED TO AGENCIES VIA THE PROJECT COMPLETION FORM (PCF).
- B. SALVAGE ACTIVITIES SHOULD TAKE PLACE DURING CONDITIONS TO MINIMIZE STRESS TO FISH SPECIES, TYPICALLY PERIODS OF THE COOLEST AIR AND WATER TEMPERATURES WHICH OCCUR IN THE MORNING VERSUS LATE IN THE DAY.
- C. SALVAGE OPERATIONS WILL FOLLOW THE ORDERING, METHODS, AND CONSERVATION MEASURES SPECIFIED BELOW:
  - 1. SLOWLY REDUCE WATER FROM THE WORK AREA TO ALLOW SOME FISH TO LEAVE VOLITIONALLY.
  - 2. BLOCK NETS WILL BE INSTALLED AT UPSTREAM AND DOWNSTREAM LOCATIONS AND MAINTAINED IN A SECURED POSITION TO EXCLUDE FISH FROM ENTERING THE PROJECT AREA.
  - 3. BLOCK NETS WILL BE SECURED TO THE STREAM CHANNEL BED AND BANKS UNTIL FISH CAPTURE AND TRANSPORT ACTIVITIES ARE COMPLETE. BLOCK NETS MAY BE LEFT IN PLACE FOR THE DURATION OF THE PROJECT TO EXCLUDE FISH AS LONG AS PASSAGE REQUIREMENTS ARE MET.
  - 4. NETS WILL BE MONITORED HOURLY DURING IN-STREAM DISTURBANCE.

- 5. IF BLOCK NETS REMAIN IN PLACE MORE THAN ONE DAY, THE NETS WILL BE MONITORED AT LEAST DAILY TO ENSURE THEY ARE SECURED AND FREE OF ORGANIC ACCUMULATION. IF BULL TROUT ARE PRESENT, NETS ARE TO BE CHECKED EVERY 4 HOURS FOR FISH IMPINGEMENT.
- 6. CAPTURE FISH THROUGH SEINING AND RELOCATE TO STREAMS.
- 7. WHILE DEWATERING, ANY REMAINING FISH WILL BE COLLECTED BY HAND OR DIP NETS.
- 8. SEINES WITH A MESH SIZE TO ENSURE CAPTURE OF THE RESIDING ESA-LISTED FISH WILL BE USED.
- 9. MINNOW TRAPS WILL BE LEFT IN PLACE OVERNIGHT AND USED IN CONJUNCTION WITH SEINING.
- 10. ELECTROFISH TO CAPTURE AND RELOCATED FISH NOT CAUGHT DURING SEINING PER ELECTROFISH CONSERVATION MEASURES.
- 11. CONTINUE TO SLOWLY DEWATER STREAM REACH.
- 12. COLLECT ANY REMAINING FISH IN COLD-WATER BUCKETS AND RELOCATED TO THE STREAM.
- 13. LIMIT THE TIME FISH ARE IN A TRANSPORT BUCKET.
- 14. MINIMIZE PREDATION BY TRANSPORTING COMPARABLE SIZES IN BUCKETS.
- 15. BUCKET WATER TO BE CHANGED EVERY 15 MINUTES OR AERATED.
- 16. BUCKETS WILL BE KEPT IN SHADED AREAS OR COVERED.
- 17. DEAD FISH WILL NOT BE STORED IN TRANSPORT BUCKETS, BUT WILL BE LEFT ON THE STREAM BANK TO AVOID MORTALITY COUNTING ERRORS.

D. SALVAGE GUIDELINES FOR BULL TROUT, LAMPREY, MUSSELS, AND NATIVE FISH.

- 1. CONDUCT SITE SURVEY TO ESTIMATE SALVAGE NUMBERS.
- 2. PRE-SELECT SITE(S) FOR RELEASE AND/OR MUSSEL BED RELOCATION.
- 3. SALVAGE OF BULL TROUT WILL NOT TAKE PLACE WHEN WATER TEMPERATURES EXCEED 15 DEGREES CELSIUS.
- 4. IF DRAWDOWN LESS THAN 48 HOURS, SALVAGE OF LAMPREY AND MUSSELS MAY NOT BE NECESSARY IF TEMPERATURES SUPPORT SURVIVAL IN SEDIMENTS.
- 5. SALVAGE MUSSELS BY HAND, LOCATING BY SNORKELING OR WADING.
- 6. SALVAGE LAMPREY BY ELECTROFISHING (SEE ELECTROFISHING FOR LARVAL LAMPREY SETTINGS AND LARVAL LAMPREY DRY SHOCKING SETTINGS).
- 7. SALVAGE BONY FISH AFTER LAMPREY WITH NETS OR ELECTROFISHING (SEE ELECTROFISHING FOR APPROPRIATE SETTINGS).
- 8. REGULARLY INSPECT DEWATERED SITE SINCE LAMPREY LIKELY TO EMERGE AFTER DEWATERING AND MUSSELS MAY BECOME VISIBLE.
- 9. MUSSELS MAY BE TRANSFERRED IN COOLERS.
- 10. MUSSELS WILL BE PLACED INDIVIDUALLY TO ENSURE ABILITY TO BURROW INTO NEW HABITAT.

3. ELECTROFISHING.

- A. INITIAL SITE SURVEY AND INITIAL SETTINGS.
  - 1. IDENTIFY SPAWNING ADULTS AND ACTIVE REDDS TO AVOID.
  - 2. RECORD WATER TEMPERATURE. ELECTROFISHING WILL NOT OCCUR WHEN WATER TEMPERATURES ARE ABOVE 18 DEGREES CELSIUS.
  - 3. IF POSSIBLE, A BLOCK NET WILL BE PLACED DOWNSTREAM AND CHECKED REGULARLY TO CAPTURE STUNNED FISH THAT DRIFT DOWNSTREAM.
  - 4. INITIAL SETTINGS WILL BE 100 VOLTS, PULSE WIDTH OF 500 MICRO SECONDS, AND PULSE RATE OF 30 HERTZ.
  - 5. RECORDS FOR CONDUCTIVITY, WATER TEMPERATURE, AIR TEMPERATURE, ELECTROFISHING SETTINGS, ELECTROFISHER MODEL, ELECTROFISHER CALIBRATION, FISH CONDITIONS, FISH MORTALITIES, AND TOTAL CAPTURE RATES WILL BE INCLUDED IN THE SALVAGE LOG BOOK.

B. ELECTROFISHING TECHNIQUE.

- 1. SAMPLING WILL BEGIN USING STRAIGHT DC. POWER WILL REMAIN ON UNTIL THE FISH IS NETTED WHEN USING STRAIGHT DC. GRADUALLY INCREASE VOLTAGE WHILE REMAINING BELOW MAXIMUM LEVELS.
- 2. MAXIMUM VOLTAGE WILL BE 1100 VOLTS WHEN CONDUCTIVITY IS <100 MILLISECONDS, 800 VOLTS WHEN CONDUCTIVITY IS BETWEEN 100 AND 300 MILLISECONDS, AND 400 VOLTS WHEN CONDUCTIVITY IS >300 MILLISECONDS.
- 3. IF FISH CAPTURE IS NOT SUCCESSFUL USING STRAIGHT DC, THE ELECTROFISHER WILL BE SET TO INITIAL VOLTAGE FOR PDC. VOLTAGE, PULSE WIDTH, AND PULSE FREQUENCY WILL BE GRADUALLY INCREASED WITHIN MAXIMUM VALUES UNTIL CAPTURE IS SUCCESSFUL.
- 4. MAXIMUM PULSE WIDTH IS 5 MILLISECONDS. MAXIMUM PULSE RATE IS 70 HERTZ
- 5. ELECTROFISHING WILL NOT OCCUR IN ONE AREA FOR AN EXTENDED PERIOD.
- 6. THE ANODE WILL NOT INTENTIONALLY COME INTO CONTACT WITH FISH. THE ZONE FOR POTENTIAL INJURY OF 0.5 M FROM THE ANODE WILL BE AVOIDED.
- 7. SETTINGS WILL BE LOWERED IN SHALLOWER WATER SINCE VOLTAGE GRADIENTS LIKELY TO INCREASE.
- 8. ELECTROFISHING WILL NOT OCCUR IN TURBID WATER WHERE VISIBILITY IS POOR (I.E. UNABLE TO SEE THE BED OF THE STREAM).
- 9. OPERATIONS WILL IMMEDIATELY STOP IF MORTALITY OR OBVIOUS FISH INJURY IS OBSERVED. ELECTROFISHING SETTINGS WILL BE REEVALUATED.

C. SAMPLE PROCESSING.

- 1. FISH SHALL BE SORTED BY SIZE TO AVOID PREDATION DURING CONTAINMENT.
- 2. SAMPLERS WILL REGULARLY CHECK CONDITIONS OF FISH HOLDING CONTAINERS, AIR PUMPS, WATER TRANSFERS, ETC.
- 3. FISH WILL BE OBSERVED FOR GENERAL CONDITIONS AND INJURIES
- 4. EACH FISH WILL BE COMPLETELY REVIVED BEFORE RELEASE. ESA-LISTED SPECIES WILL BE PRIORITIZED FOR SUCCESSFUL RELEASE.

D. BULL TROUT ELECTROFISHING.

- 1. ELECTROFISHING FOR BULL TROUT WILL ONLY OCCUR FROM MAY 1 TO JULY 31. NO ELECTROFISHING WILL OCCUR IN ANY BULL TROUT OCCUPIED HABITAT AFTER AUGUST 15. IN FMO HABITATS ELECTROFISHING MAY OCCUR ANY TIME.
- 2. ELECTROFISHING OF BULL TROUT WILL NOT OCCUR WHEN WATER TEMPERATURES EXCEED 15 DEGREES CELSIUS.

E. LARVAL LAMPREY ELECTROFISHING.

- 1. PERMISSION FROM EC LEAD WILL BE OBTAINED IF LARVAL LAMPREY ELECTROFISHER IS NOT ONE OF FOLLOWING PRE-APPROVED MODELS: ABP-2 "WISCONSIN", SMITH-ROOT LR-24, OR SMITH-ROOT APEX BACKPACK.
- 2. LARVAL LAMPREY SAMPLING WILL INCORPORATE 2-STAGE METHOD: "TICKLE" AND "STUN".
- 3. FIRST STAGE: USE 125 VOLT DC WITH A 25 PERCENT DUTY CYCLE APPLIED AT A SLOW RATE OF 3 PULSES PER SECOND. IF TEMPERATURES ARE BELOW 10 DEGREES CELSIUS, VOLTAGE MAY BE INCREASED GRADUALLY (NOT TO EXCEED 200 VOLTS). BURSTED PULSES (THREE SLOW AND ONE SKIPPED) RECOMMENDED TO INCREASE EMERGENCE.
- 4. SECOND STAGE (OPTIONAL FOR EXPERIENCED NETTERS): IMMEDIATELY AFTER LAMPREY EMERGE, USE A FAST PULSE SETTING OF 30 PULSES PER SECOND.
- 5. USE DIP NETS FOR VISIBLE LAMPREY. SIENES AND FINE MESH NET SWEEPS MAY BE USED IN POOR VISIBILITY.



NO.	BY	DATE	REVISION DESCRIPTION

NS, CM, DM	LS, DM	LS, DM
DRAWN	DESIGNED	CHECKED
DM	9/22/2023	200236
APPROVED	DATE	PROJECT

UPPER NASON CREEK RESTORATION  
PHASE 2 FINAL DESIGN  
YAKAMA NATION FISHERIES



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HIP IV GENERAL CONSERVATION  
MEASURES (2 OF 3)

SHEET  
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**TURBIDITY MONITORING.**

- A. TURBIDITY SHALL BE MONITORED EVERY TWO HOURS DURING CONSTRUCTION BY VISUAL OBSERVATIONS. (SEE THE HIP HANDBOOK TURBIDITY MONITORING SECTION FOR A VISUAL OBSERVATION KEY).
- B. IF THERE IS A VISIBLE DIFFERENCE BETWEEN A COMPLIANCE POINT AND THE BACKGROUND, THE EXCEEDANCE WILL BE NOTED IN THE PROJECT COMPLETION FORM (PCF). ADJUSTMENTS OR CORRECTIVE MEASURES WILL BE TAKEN IN ORDER TO REDUCE TURBIDITY.
- C. IF EXCEEDANCES OCCUR FOR MORE THAN TWO CONSECUTIVE MONITORING INTERVALS (AFTER 4 HOURS), THE ACTIVITY WILL STOP UNTIL THE TURBIDITY LEVEL RETURNS TO BACKGROUND. THE BPA EC LEAD WILL BE NOTIFIED OF ALL EXCEEDANCES AND CORRECTIVE ACTIONS AT PROJECT COMPLETION.
- D. IF TURBIDITY CONTROLS (COFFER DAMS, WADDLES, FENCING, ETC.) ARE DETERMINED INEFFECTIVE, CREWS WILL BE MOBILIZED TO MODIFY AS NECESSARY. OCCURRENCES WILL BE DOCUMENTED IN THE PROJECT COMPLETION FORM (PCF).
- E. FINAL TURBIDITY READINGS, EXCEEDANCES, AND CONTROL FAILURES WILL BE SUBMITTED TO THE BPA EC LEAD USING THE PROJECT COMPLETION FORM (PCF).

8. CWA SECTION 401 WATER QUALITY CERTIFICATION.

- A. THE PROJECT SPONSOR OR DESIGNATED REPRESENTATIVE WILL COMPLETE AND RECORD WATER QUALITY OBSERVATIONS (SEE TURBIDITY MONITORING) TO ENSURE IN-WATER WORK IS NOT DEGRADING WATER QUALITY.
- B. DURING CONSTRUCTION, WATER QUALITY PROVISIONS PROVIDED BY THE OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY, WASHINGTON DEPARTMENT OF ECOLOGY, IDAHO DEPARTMENT OF ENVIRONMENTAL QUALITY WILL BE FOLLOWED.

A. WHEN REINTRODUCING WATER TO DEWATERED AREAS AND NEWLY CONSTRUCTED CHANNELS, A STAGED REWATERING PLAN WILL BE APPLIED.

B. THE FOLLOWING WILL BE APPLIED TO ALL REWATERING EFFORTS. COMPLEX REWATERING EFFORTS MAY REQUIRE ADDITIONAL NOTES OR A DEDICATED SHEET IN THE CONSTRUCTION DETAILS.

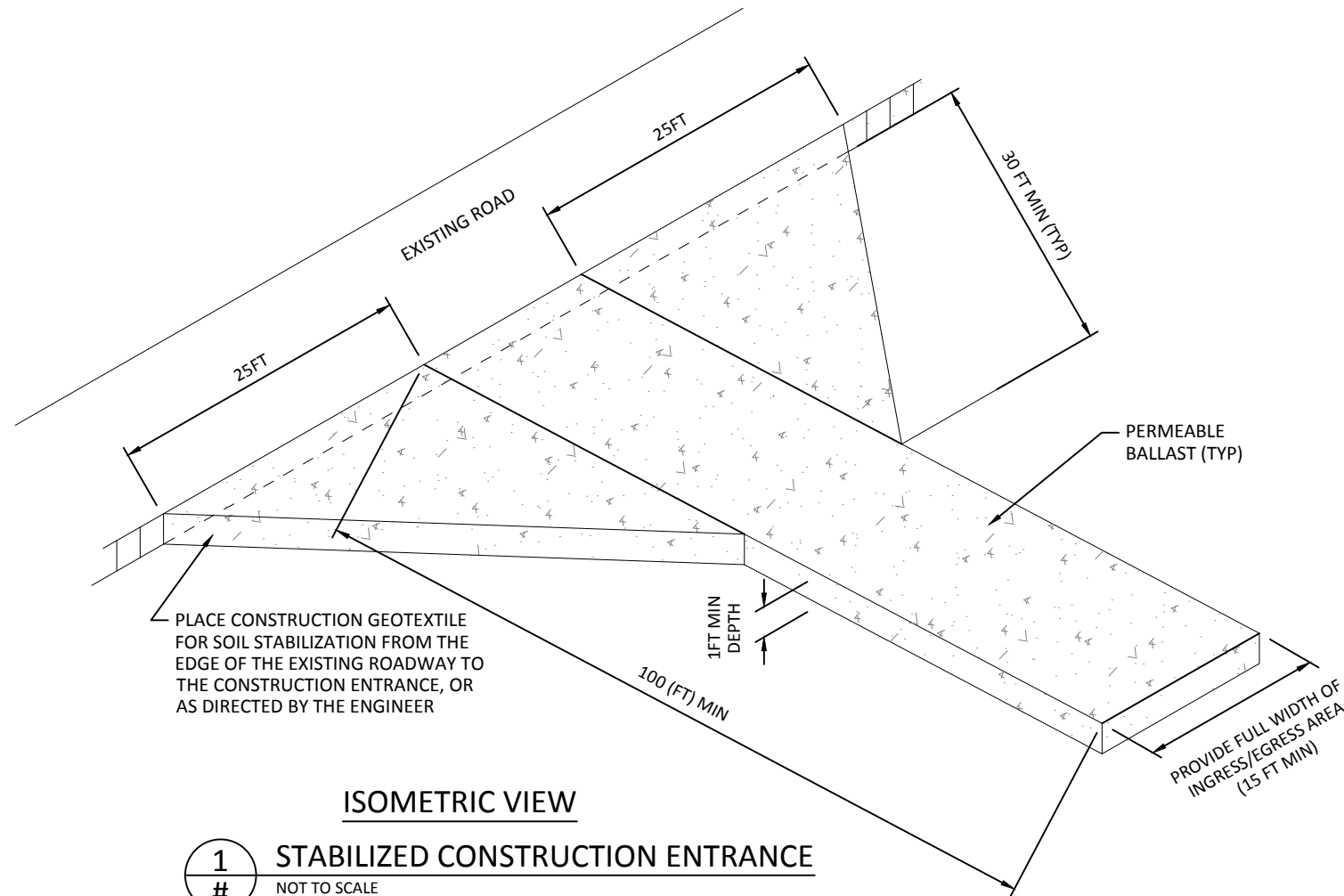
1. TURBIDITY MONITORING PROTOCOL WILL BE APPLIED TO REWATERING EFFORTS.
2. PRE-WASH THE AREA BEFORE REWATERING. TURBID WASH WATER WILL BE DETAINED AND PUMPED TO THE FLOODPLAIN OR SEDIMENT CAPTURE AREAS RATHER THAN DISCHARGING TO FISH-BEARING STREAMS.
3. INSTALL SEINE NETS AT UPSTREAM END TO PREVENT FISH FROM MOVING DOWNSTREAM UNTIL 2/3 OF TOTAL FLOW IS RESTORED TO THE CHANNEL.
4. STARTING IN EARLY MORNING INTRODUCE 1/3 OF NEW CHANNEL FLOW OVER PERIOD OF 1-2 HOURS.
5. INTRODUCE SECOND THIRD OF FLOW OVER NEXT 1 TO 2 HOURS AND BEGIN FISH SALVAGE OF BYPASS CHANNEL IF FISH ARE PRESENT.
6. REMOVE UPSTREAM SEINE NETS ONCE 2/3 FLOW IN REWATERED CHANNEL AND DOWNSTREAM TURBIDITY IS WITHIN ACCEPTABLE RANGE (LESS THAN 40 NTU OR LESS THAN 10% BACKGROUND).
7. INTRODUCE FINAL THIRD OF FLOW ONCE FISH SALVAGE EFFORTS ARE COMPLETE AND DOWNSTREAM TURBIDITY VERIFIED TO BE WITHIN ACCEPTABLE RANGE.
8. INSTALL PLUG TO BLOCK FLOW INTO OLD CHANNEL OR BYPASS. REMOVE ANY REMAINING SEINE NETS.
9. IN LAMPREY SYSTEMS, LAMPREY SALVAGE AND DRY SHOCKING MAY BE NECESSARY.

- A. PROJECT OPERATIONS WILL CEASE WHEN HIGH FLOW CONDITIONS MAY RESULT IN INUNDATION OF THE PROJECT AREA (FLOOD EFFORTS TO DECREASE DAMAGES TO NATURAL RESOURCES PERMITTED).
- B. WATER QUALITY LEVELS EXCEEDED. SEE CWA SECTION 401 WATER QUALITY CERTIFICATION AND TURBIDITY MEASURES.

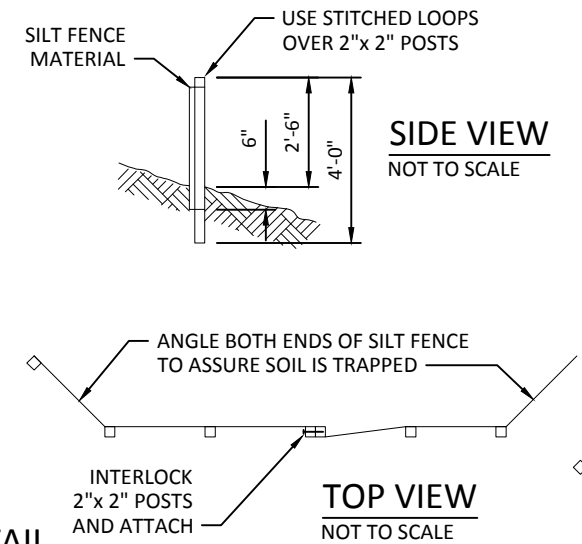
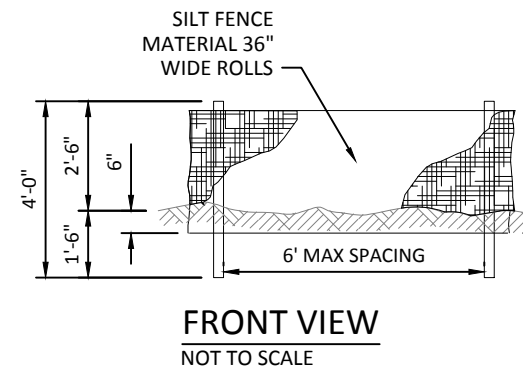
- A. DISTURBED AREAS, STREAM BANKS, SOILS, AND VEGETATION WILL BE CLEANED UP AND RESTORED TO IMPROVED OR PRE-PROJECT CONDITIONS.
- B. PROJECT-RELATED WASTE WILL BE REMOVED.
- C. TEMPORARY ACCESS ROADS AND STAGING WILL BE DECOMPACTED AND RESTORED. SOILS WILL BE LOOSENEED IF NEEDED FOR REVEGETATION OR WATER INFILTRATION.
- D. THE PROJECT SPONSOR WILL RETAIN THE RIGHT OF REASONABLE ACCESS TO THE SITE TO MONITOR AND MAINTAIN THE SITE OVER THE LIFE OF THE PROJECT.



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**1**  
# **STABILIZED CONSTRUCTION ENTRANCE**  
NOT TO SCALE



**3**  
# **TYPICAL SILT FENCE DETAIL**  
NOT TO SCALE

### SILT FENCES:

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

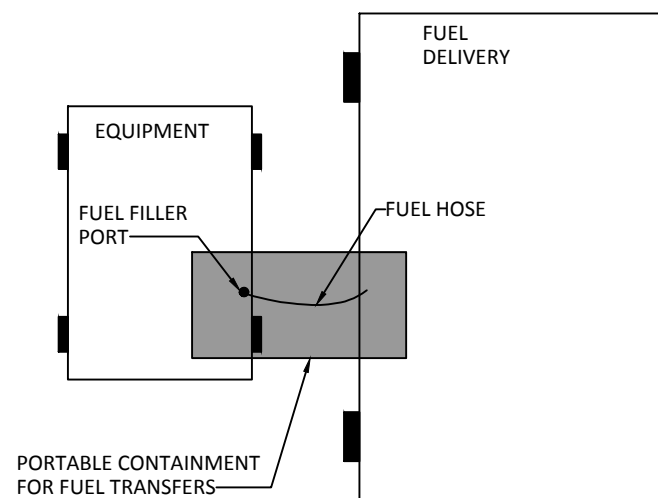
### FUEL HANDLING NOTES:

FUEL WILL BE TRANSPORTED IN A SLIP TANK IN A TRACKED MOROOKA DUMP TRUCK. THE SLIP TANK SHALL BE PLACED ON AN IMPERMEABLE MEMBRANE FOLDED TO FULLY CONTAIN VOLUME OF FUEL TRANSPORTED WITH A MINIMUM OF SIX INCHES OF FREEBOARD. ABSORBENT MATS, PADS AND OTHER MATERIALS SHALL BE DEPLOYED TO CONTAIN ANY SPILLED OR LEAKED FUEL TO PREVENT LEAKAGE FROM THE TRUCK BED.

FUELING OF VEHICLES SHALL CONTAIN LEAKAGE OR DRIPS FROM THE FUELING NOZZLE WITH A FUNNEL OR FUEL CONTAINMENT SYSTEM INCLUDING OIL ABSORBENT PADS AT THE NOZZLE DURING ALL STAGES OF FUELING OPERATIONS. CONTAINMENT SYSTEM AND ABSORBENT PADS SHALL BE USED AT THE FUEL FILLING PORT TO CAPTURE AND CONTAIN ANY SPILLED FUEL. ADDITIONAL IMPERMEABLE MATERIAL SHALL BE PLACED AROUND THE FUEL FILLER PORT WITH OIL ABSORBENT MATERIAL TO CAPTURE ANY SPILLED FUEL.

### VEHICLE STAGING NOTES:

VEHICLES WILL BE PARKED ON DRY GRAVEL BARS AT NIGHT. EACH VEHICLE SHALL HAVE AN IMPERMEABLE MEMBRANE BENEATH THE VEHICLE TO CONTAIN ANY FUEL, OIL OR BIODEGRADABLE HYDRAULIC FLUID LEAKS. THE EDGES OF THE IMPERMEABLE MEMBRANE SHALL BE BERMED WITH SAND BAGS OR LOGS TO CREATE A BASIN PROVIDING A MINIMUM OF SIX INCHES OF FREE BOARD FOR POTENTIAL SPILL VOLUME. ABRASION RESISTANT OIL ABSORBENT MAT MATERIALS SHALL BE PLACED ON THE IMPERMEABLE MEMBRANE TO CAPTURE POTENTIAL LEAKS. MAT MATERIAL SHALL BE 3-PLY POLYPROPYLENE, POLYETHYLENE OR APPROVED EQUAL. A SECOND MAT SHALL BE INSTALLED UNDER THE CARRIAGE AS A DIAPER.

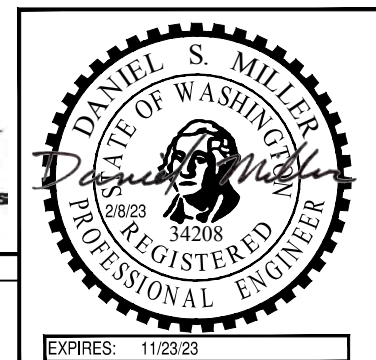


### FUELING NOTES:

CONTRACTOR SHALL PROVIDE ADDITIONAL PROTECTION MEASURES AGAINST FUEL SPILLS IF REFUELING AREA IS WITHIN 150 FT OF A WETLAND AND THE RIVER. ADDITION PROTECTION MEASURES SHALL CONSIST OF:

1. CONTAINMENT EQUIPMENT SHALL BE SIZED TO CONTAIN THE MOST LIKELY VOLUME OF FUEL SPILLED DURING A FUEL TRANSFER.
2. PORTABLE CONTAINMENT EQUIPMENT SHALL BE POSITIONED TO CATCH ANY FUEL SPILLS DUE TO OVERFILLING THE EQUIPMENT AND ANY OTHER SPILLS THAT MAY OCCUR AT OR NEAR THE FUEL FILLER PORT TO THAT EQUIPMENT DURING EACH REFUELING ACTIVITY.
3. PERSONNEL MUST ATTEND TO THE FUELING PROCESS TO ENSURE THAT ANY SPILLS WILL BE OF LIMITED VOLUME.

**2**  
# **FUELING AREA PROTECTION**  
NOT TO SCALE



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UPPER NASON CREEK RESTORATION  
PHASE 2 FINAL DESIGN  
YAKAMA NATION FISHERIES

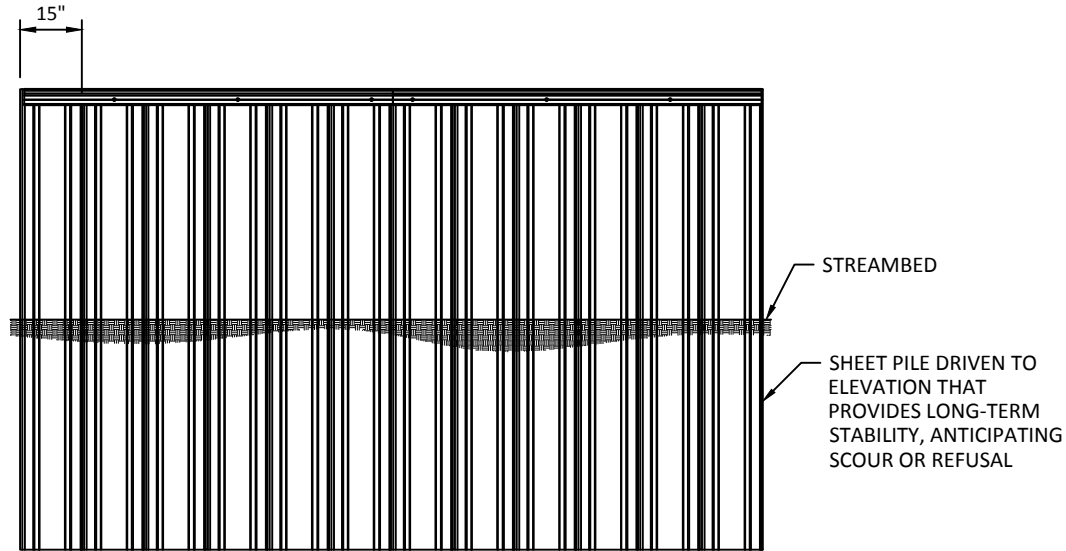


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TYPICAL DETAILS - EROSION CONTROL  
AND ENVIRONMENTAL PROTECTION

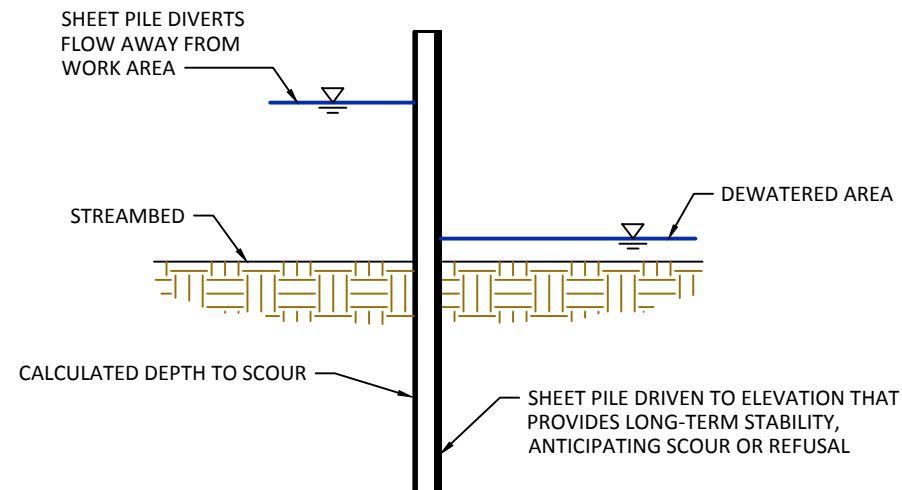
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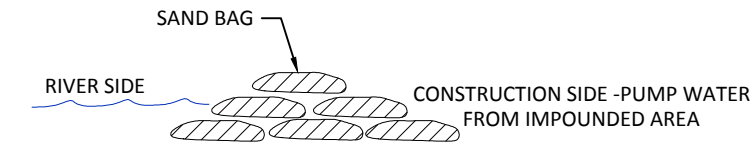
NOTE:  
INDIVIDUAL SHEET WEIGHT 45 LBS PER LINEAR FOOT

ELEVATION



SECTION

1  
# TYPICAL DETAIL - SHEET PILE COFFERDAM  
NOT TO SCALE



2  
# TYPICAL DETAIL - SANDBAG COFFERDAM  
NOT TO SCALE

COFFERDAM NOTES:

1. TEMPORARY SHEET PILE AND PEA GRAVEL FILLED SAND BAGS ARE PRE-APPROVED METHODS OF ISOLATING CONSTRUCTION WATER FROM THE WATERWAY.
2. CONTRACTOR SHALL PROVIDE PUMPING SUFFICIENT FOR A NET INFLOW TO THE WORK AREA, AND DISCHARGE TURBID WATER TO UPLAND FLOODPLAIN.
3. COFFERDAM SHALL BE COMPLETELY REMOVED AFTER CONSTRUCTION IS COMPLETED AND TURBIDITY HAS BEEN REMOVED.

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UPPER NASON CREEK RESTORATION  
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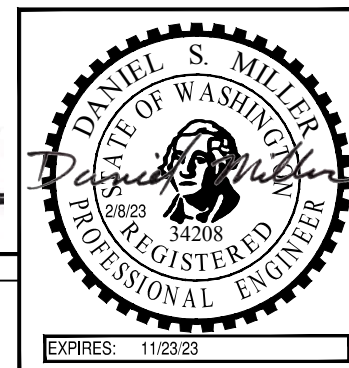


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TYPICAL DETAILS -  
COFFERDAM



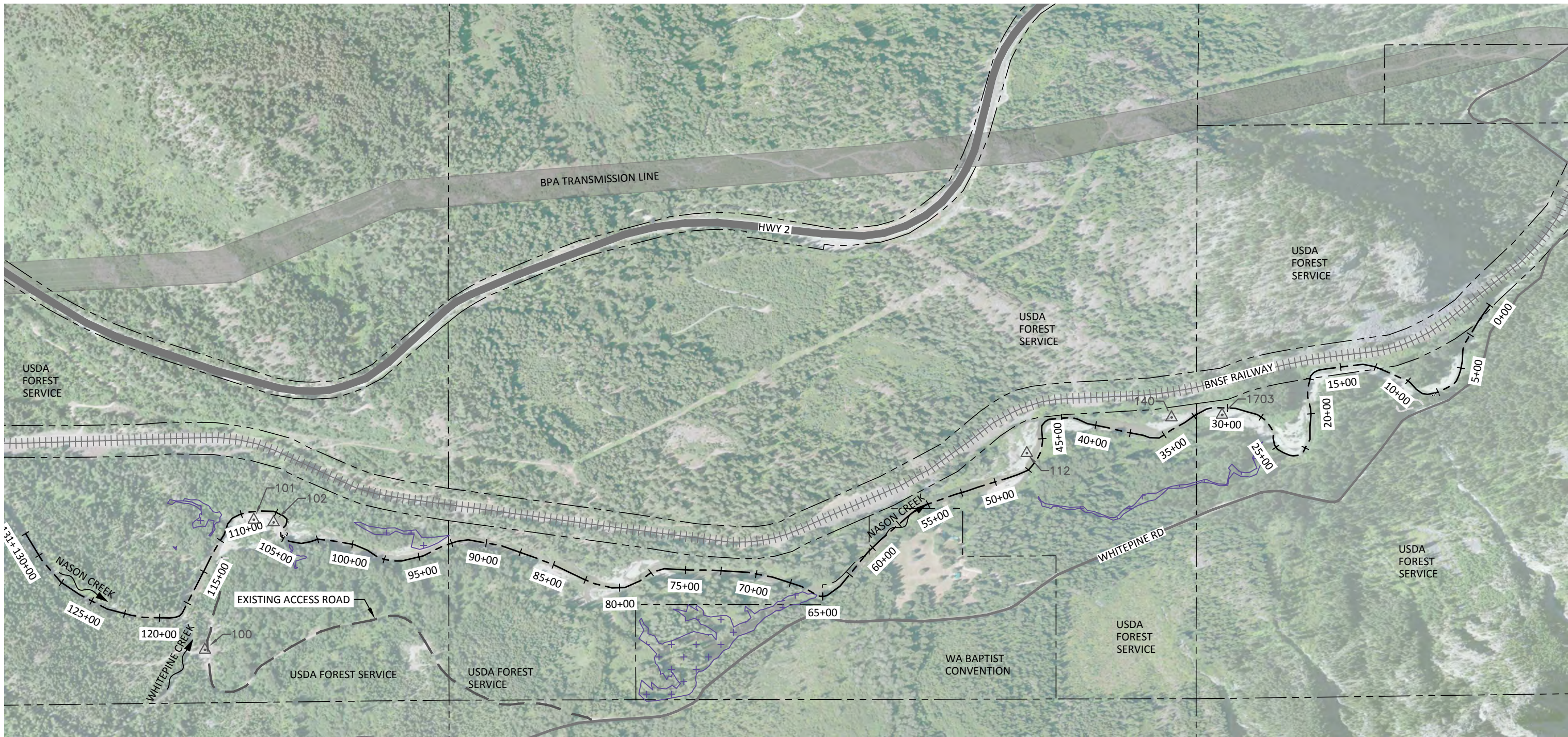
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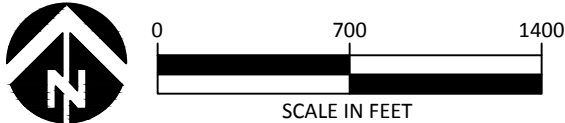
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LEGEND

- TAXLOTS (CHELAN COUNTY GIS)
- BNSF RAILWAY
- EXISTING ACCESS
- 115+00 EXISTING CHANNEL ALIGNMENT AND STATIONING
- EXISTING WETLANDS (HAMER ENVIRONMENTAL)
- CONTROL POINT

CONTROL POINT TABLE				
POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
100	282587.99	1620202.42	2325.70	REBAR
101	283505.86	1620547.84	2306.20	TBM
102	283487.07	1620687.39	2304.84	TBM
112	283976.06	1626006.25	2267.70	TBM
140	284227.76	1627027.69	2264.48	TBM
1703	284247.27	1627384.77	2261.00	REBAR



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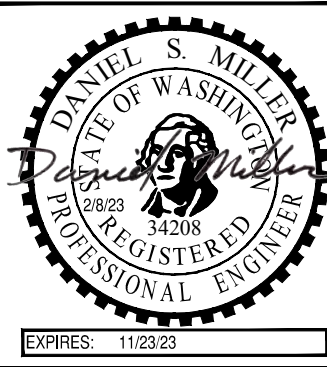
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UPPER NASON CREEK RESTORATION  
PHASE 2 FINAL DESIGN  
YAKAMA NATION FISHERIES

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www.interfluve.com

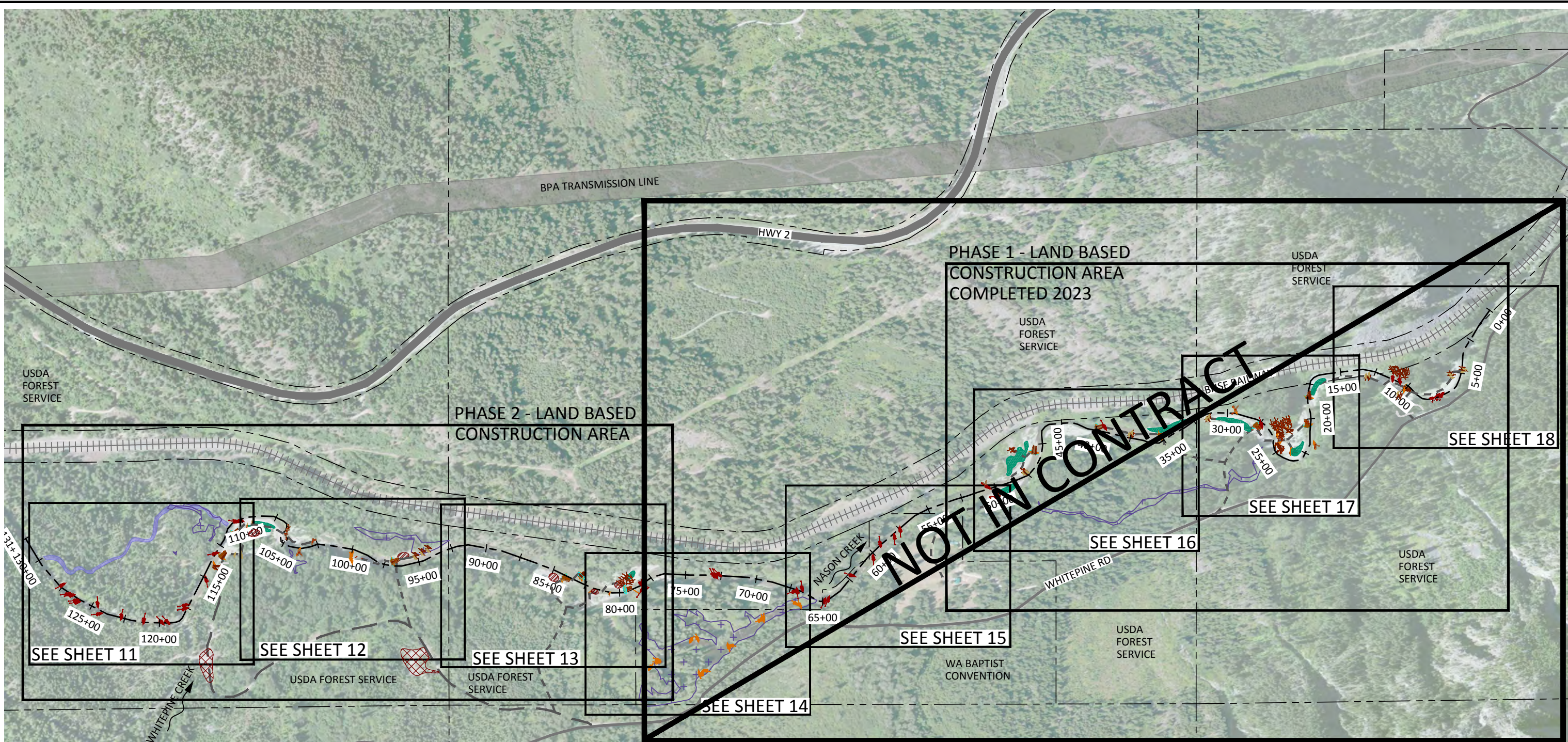
EXISTING CONDITIONS  
& SURVEY CONTROL

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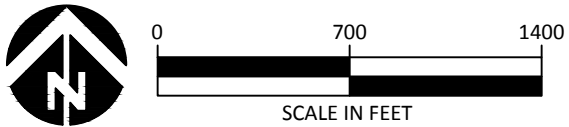
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LEGEND

- TAXLOTS (CHELAN COUNTY GIS)
- ++++ BNSF RAILWAY
- EXISTING ACCESS
- TEMPORARY ACCESS
- 115+00  
--- EXISTING CHANNEL ALIGNMENT AND STATIONING
- ++ ++ ++ ++  
EXISTING WETLANDS (HAMER ENVIRONMENTAL)
- XXXX  
TEMPORARY STAGING AREA

- PHASE 1 - 2023 CONSTRUCTION:
- HELICOPTER PLACED AND PLANTED LWM.
  - WHOLE TREE THINNING
  - LAND BASED CONSTRUCTION DOWNSTREAM FROM CASCADE CHURCH CAMP.
- PHASE 2 - 2024 CONSTRUCTION:
- LAND BASED CONSTRUCTION UPSTREAM FROM CASCADE CHURCH CAMP.



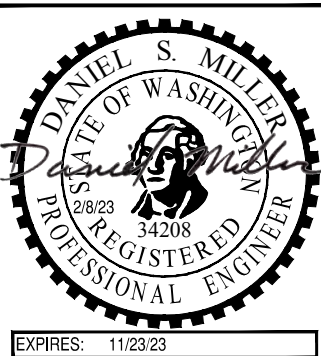
UPPER NASON CREEK RESTORATION  
PHASE 2 FINAL DESIGN  
YAKAMA NATION FISHERIES



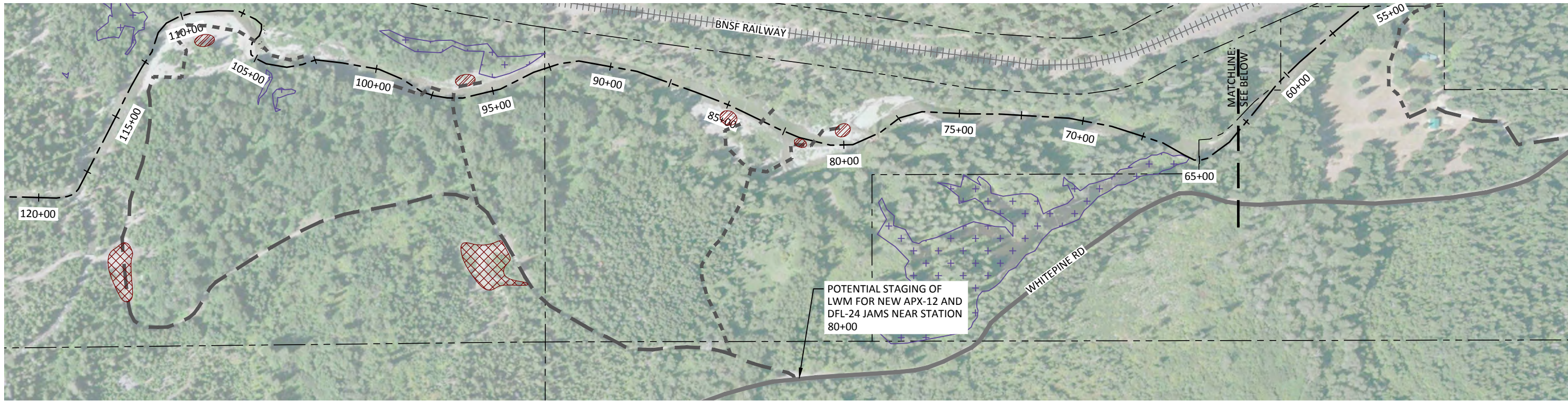
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PROPOSED CONDITIONS  
AND SHEET INDEX

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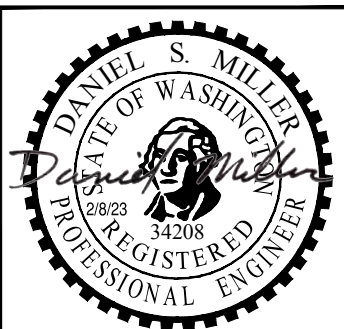
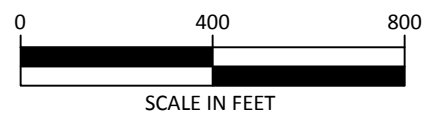
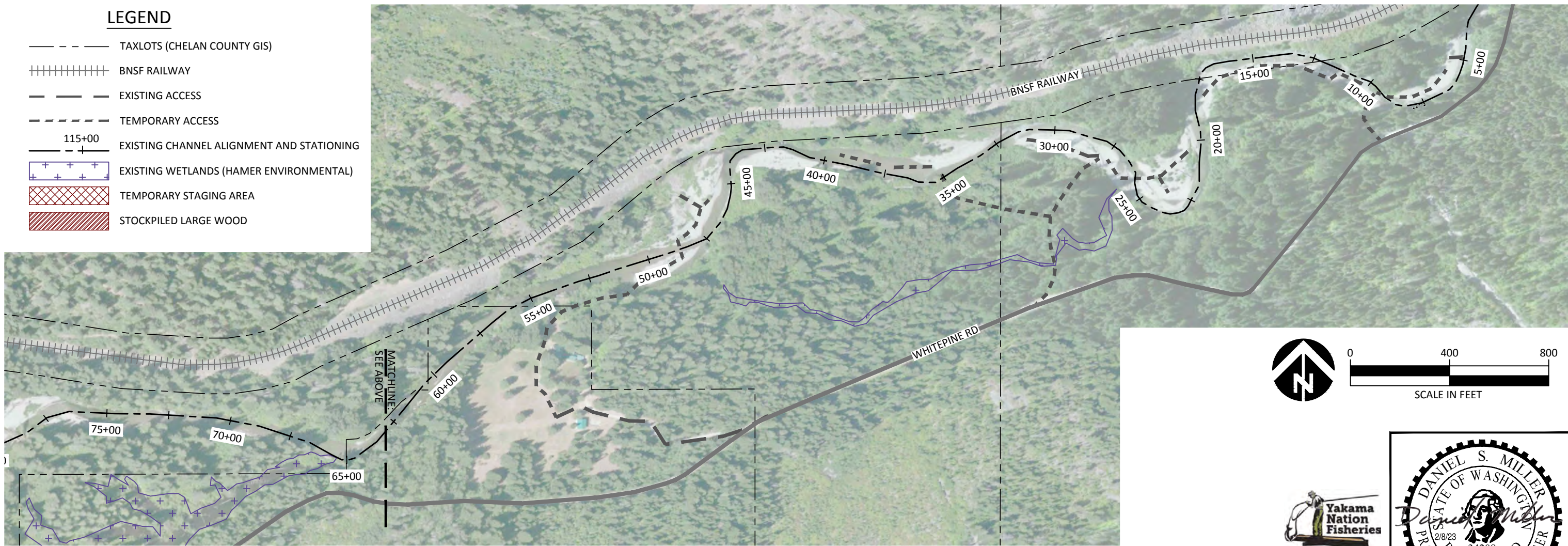






LEGEND

- TAXLOTS (CHELAN COUNTY GIS)
- BNSF RAILWAY
- EXISTING ACCESS
- TEMPORARY ACCESS
- 115+00  
EXISTING CHANNEL ALIGNMENT AND STATIONING
- EXISTING WETLANDS (HAMER ENVIRONMENTAL)
- TEMPORARY STAGING AREA
- STOCKPILED LARGE WOOD



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UPPER NASON CREEK RESTORATION  
PHASE 2 FINAL DESIGN  
YAKAMA NATION FISHERIES



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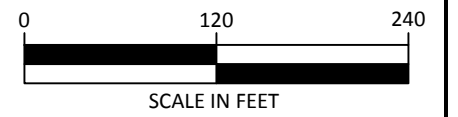
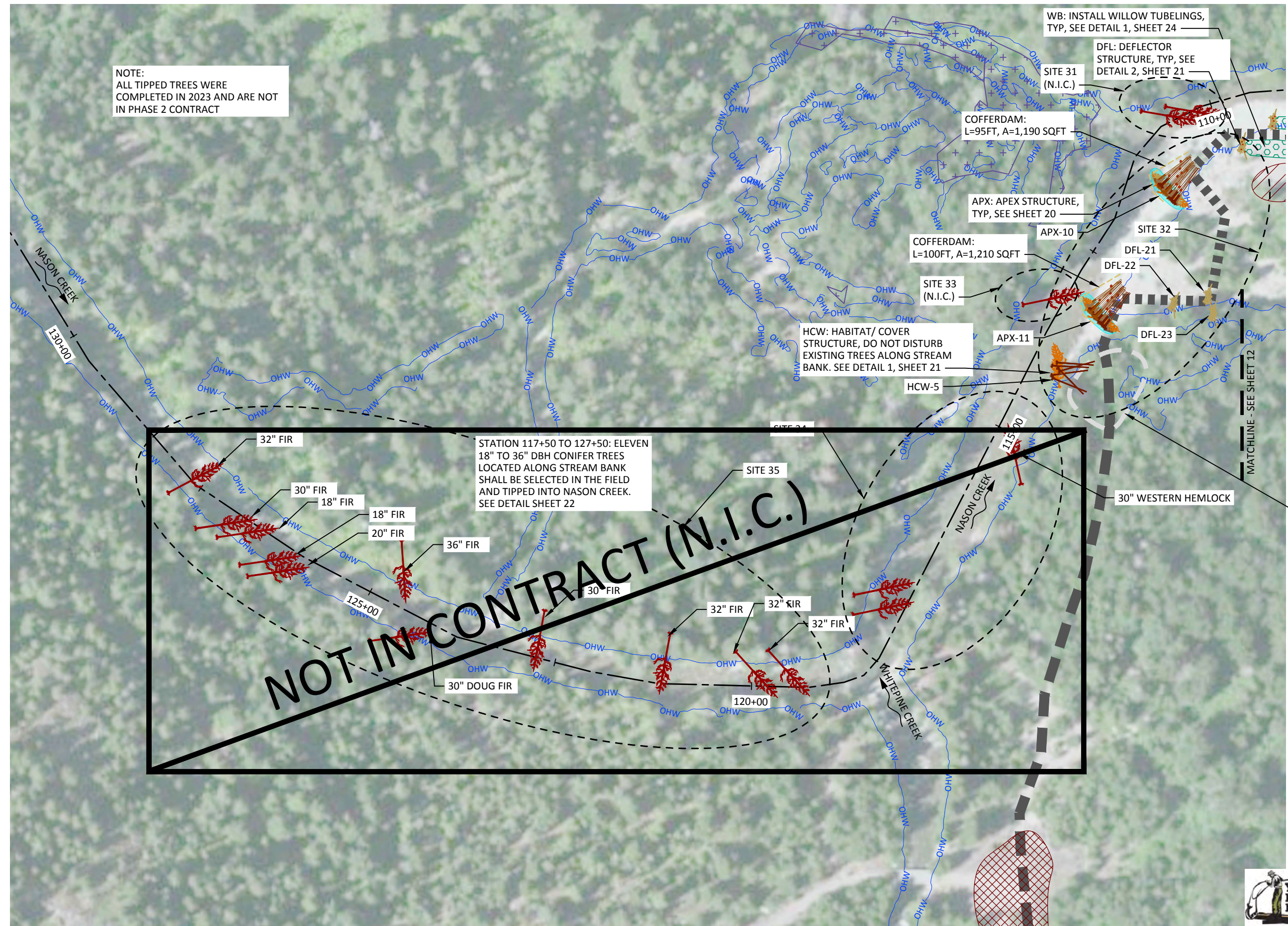
ACCESS PLAN

SHEET  
10 OF 28

EXPIRES: 11/23/23



NOTE:  
ALL TIPPED TREES WERE  
COMPLETED IN 2023 AND ARE NOT  
IN PHASE 2 CONTRACT



**LEGEND**

- EXISTING CONTOURS (2 FT, LIDAR)
- OHW — ORDINARY HIGH WATER
- █ EXISTING ACCESS
- 115+00 EXISTING CHANNEL ALIGNMENT AND STATIONING
- + + + EXISTING WETLANDS (HAMER ENVIRONMENTAL)
- █ TEMPORARY ACCESS
- ▨ TEMPORARY STAGING AREA

AS DIRECTED BY OWNER, ELIMINATE DISPERSED CAMPSITES AND ACCESS THROUGH SURFACE DECOMPACTION, BLENDING MICROTOPOGRAPHY WITH ADJACENT SURFACES, AND REVEGETATION. PLACE BOULDERS AT ENTRANCE TO BLOCK VEHICLE PASSAGE. STANDING TREES AND ROOTS ARE TO REMAIN UNHARMED.

- ABBREVIATIONS:
- APX = APEX
  - DFL = DEFLECTOR JAM
  - HCW = HABITAT COVER WOOD
  - HELI-LW = HELICOPTER PLACED WOOD
  - PBRW = PILE BALLASTED ROUGHNESS WOOD
  - PILE = VERTICAL LOG
  - WB = WILLOW TUBELINGS
  - VRW = VEGETATION BRACED ROUGHNESS WOOD

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PROPOSED CONDITIONS  
PLAN (1 OF 8)

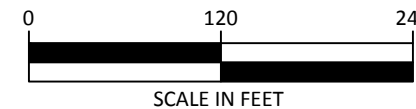
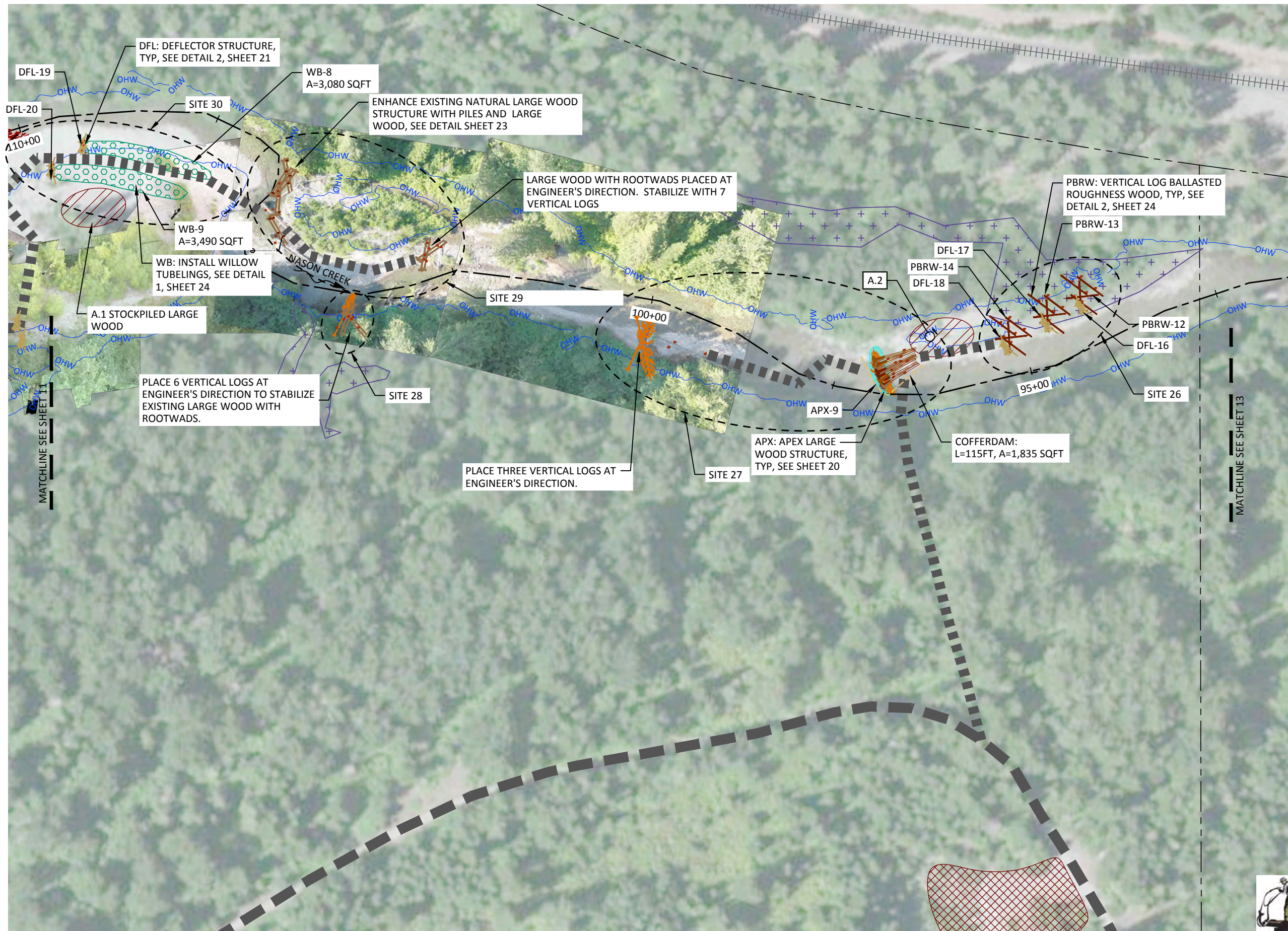
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Yakama Nation Fisheries



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SCALE IN FEET

## LEGEND

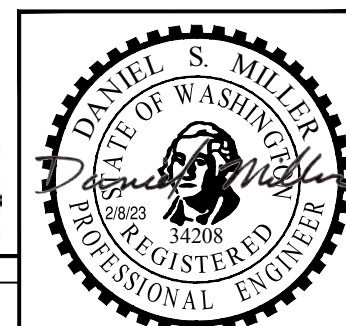
- EXISTING CONTOURS (2 FT, LIDAR)
- - - TAXLOTS (CHELAN COUNTY GIS)
- ||||| BNSF RAILWAY
- OHW --- ORDINARY HIGH WATER
- EXISTING ACCESS
- 100+00 --- EXISTING CHANNEL ALIGNMENT AND STATIONING
- + + + EXISTING WETLANDS (HAMER ENVIRONMENTAL)
- TEMPORARY ACCESS
- TEMPORARY STAGING AREA
- STOCKPILED LARGE WOOD

## STAGED WOOD

SITE	LOGS	LOGS W/ ROOTWADS	PILES
A.1	0	60	100
A.2	15	21	52

NOTE:  
ACCESS ROUTES WILL BE DETERMINED IN THE FIELD BY OWNER TO MINIMIZE FLOODPLAIN IMPACTS.

ABBREVIATIONS:  
APX = APEX  
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UPPER NASON CREEK RESTORATION  
PHASE 2 FINAL DESIGN  
YAKAMA NATION FISHERIES



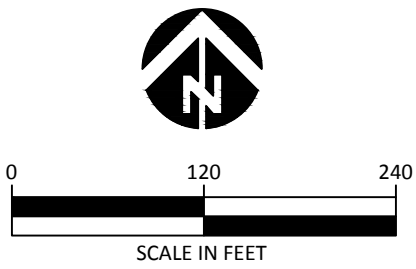
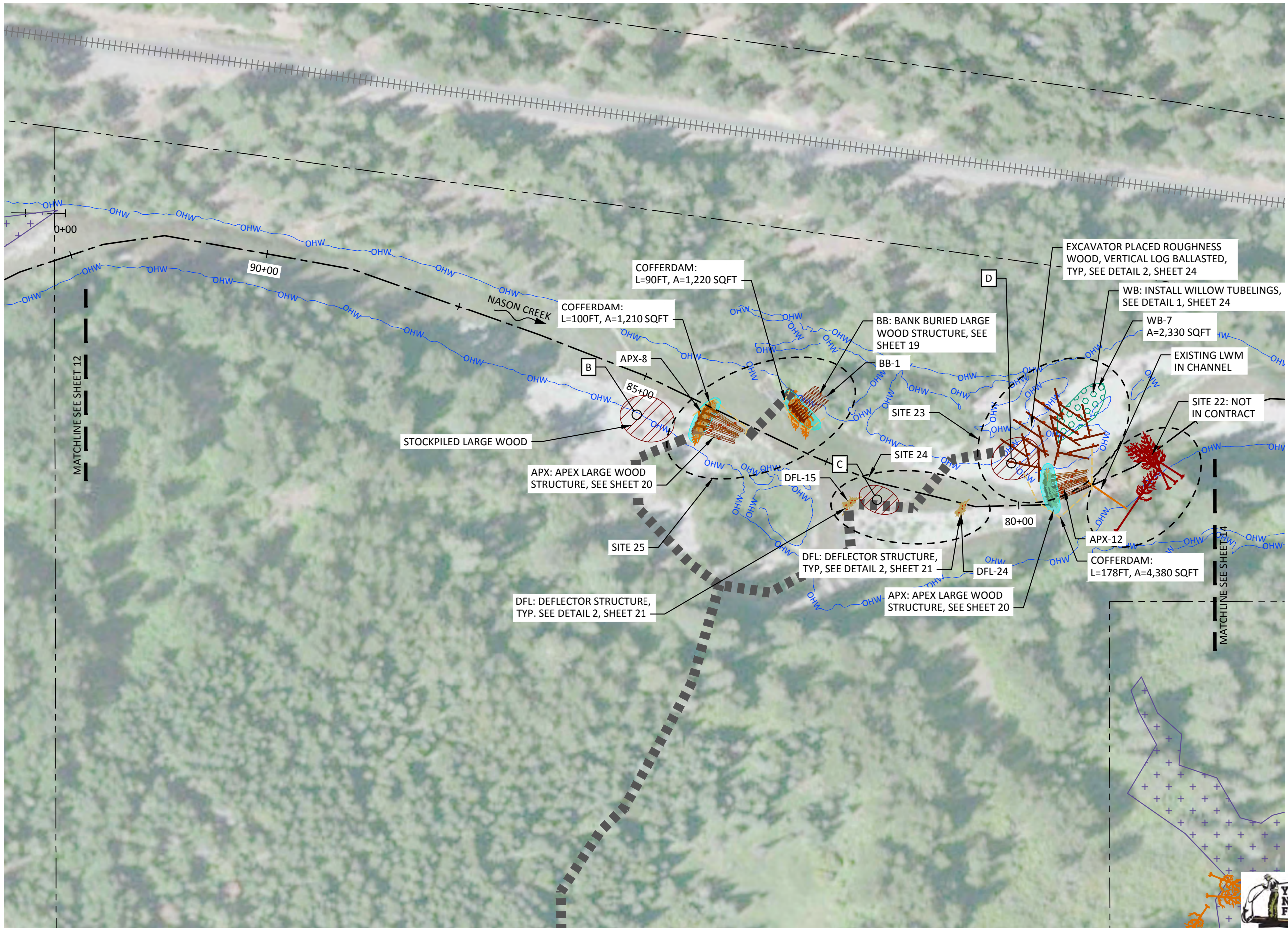
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PROPOSED CONDITIONS  
PLAN (2 OF 8)

SHEET  
12 OF 28

EXPIRES: 11/23/23





LEGEND

- EXISTING CONTOURS (2 FT, LIDAR)
- - - TAXLOTS (CHELAN COUNTY GIS)
- ++++ BNSF RAILWAY
- OHW --- ORDINARY HIGH WATER
- 80+00 EXISTING CHANNEL ALIGNMENT AND STATIONING
- 0+00 PROPOSED ALIGNMENT
- + + + EXISTING WETLANDS (HAMER ENVIRONMENTAL)
- TEMPORARY ACCESS
- STOCKPILED LARGE WOOD

STAGED WOOD

SITE	LOGS	LOGS W/ ROOTWADS	PILES
B	0	23	16
C	0	2	9
D	19	2	29

- NOTES:
- CONTRACTOR TO HAUL OWNER PROVIDER WOOD STAGED AT WHITE PINE WOOD TO APEX-12 AND DFL-24.
  - ACCESS ROUTES WILL BE DETERMINED IN THE FIELD BY OWNER TO MINIMIZE FLOODPLAIN IMPACTS.

- ABBREVIATIONS:
- APX = APEX
  - DFL = DEFLECTOR JAM
  - HCW = HABITAT COVER WOOD
  - HELI-LW = HELICOPTER PLACED WOOD
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  - VRW = VEGETATION BRACED ROUGHNESS WOOD



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APPROVED	DATE	PROJECT

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PHASE 2 FINAL DESIGN  
YAKAMA NATION FISHERIES

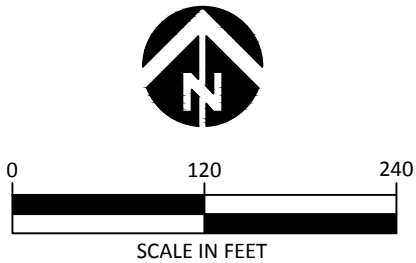
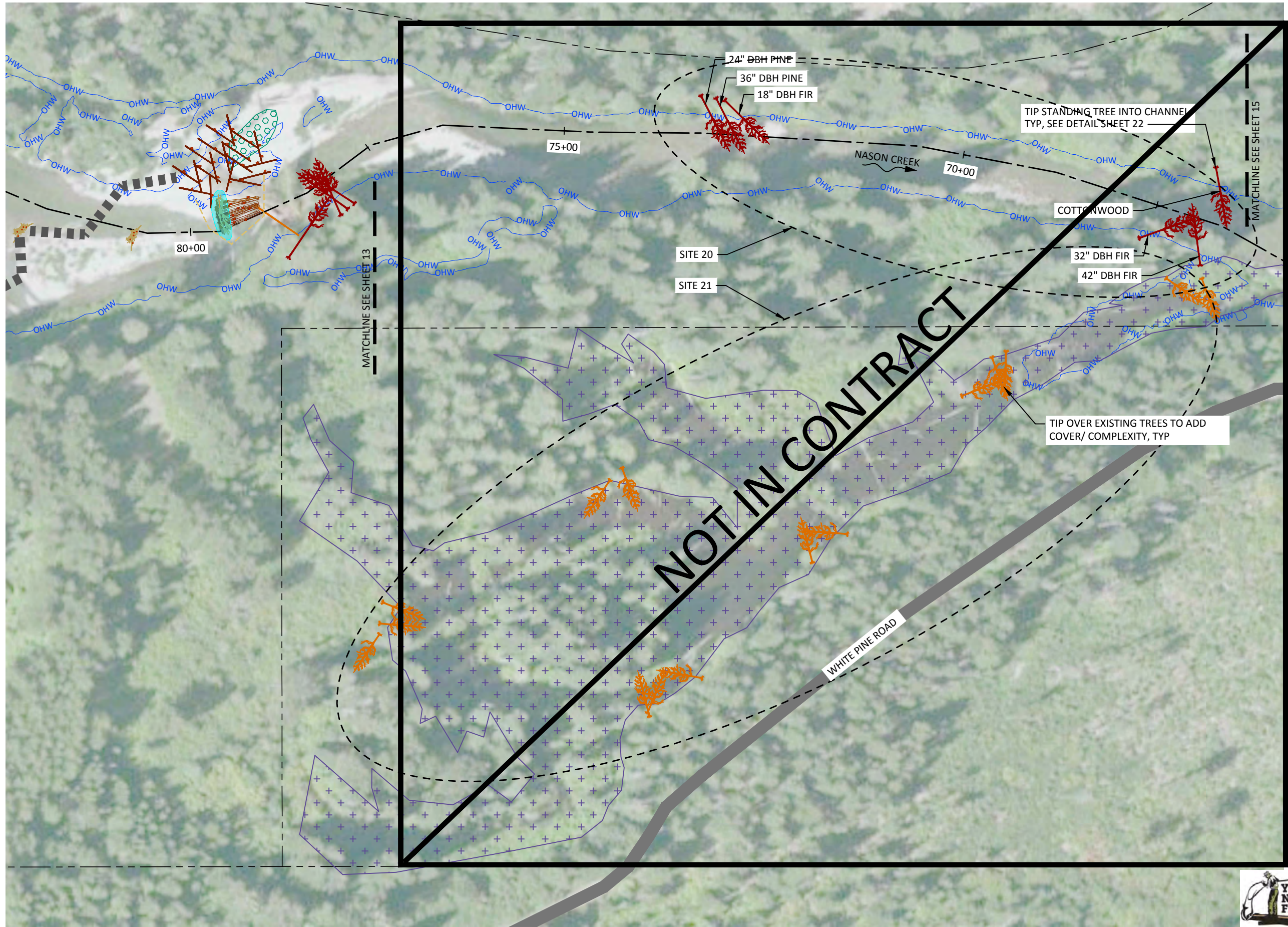
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PROPOSED CONDITIONS  
PLAN (3 OF 8)

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LEGEND

- EXISTING CONTOURS (2 FT, LIDAR)
- - - TAXLOTS (CHELAN COUNTY GIS)
- OHW — ORDINARY HIGH WATER
- 70+00 EXISTING CHANNEL ALIGNMENT AND STATIONING
- + + + EXISTING WETLANDS (HAMER ENVIRONMENTAL)



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UPPER NASON CREEK RESTORATION  
PHASE 2 FINAL DESIGN  
YAKAMA NATION FISHERIES



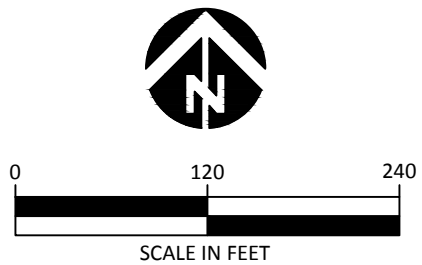
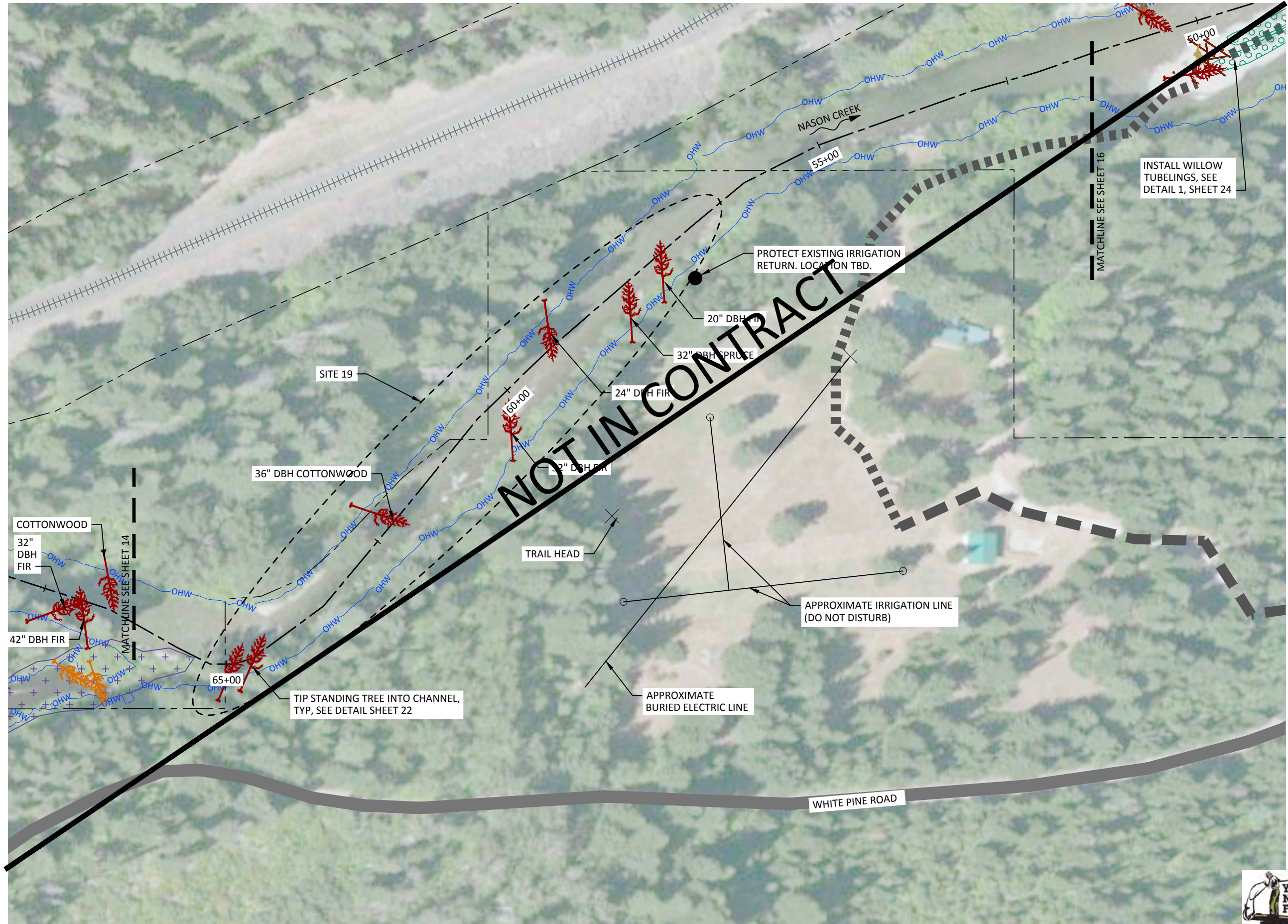
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PROPOSED CONDITIONS  
PLAN (4 OF 8)

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EXPIRES: 11/23/23





LEGEND

- EXISTING CONTOURS (2 FT, LIDAR)
- - - TAXLOTS (CHELAN COUNTY GIS)
- ++++ BNSF RAILWAY
- OHW ORDINARY HIGH WATER
- 60+00 EXISTING CHANNEL ALIGNMENT AND STATIONING
- + + + EXISTING WETLANDS (HAMER ENVIRONMENTAL)
- TEMPORARY ACCESS

NOTE:  
ACCESS ROUTES WILL BE DETERMINED IN THE FIELD BY OWNER TO MINIMIZE FLOODPLAIN IMPACTS.



UPPER NASON CREEK RESTORATION  
PHASE 2 FINAL DESIGN  
YAKAMA NATION FISHERIES



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PROPOSED CONDITIONS  
PLAN (5 OF 8)

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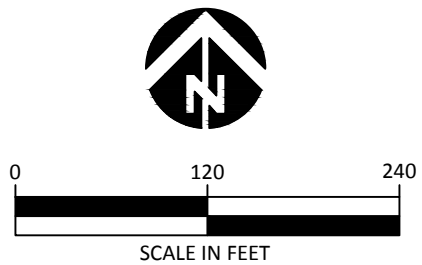
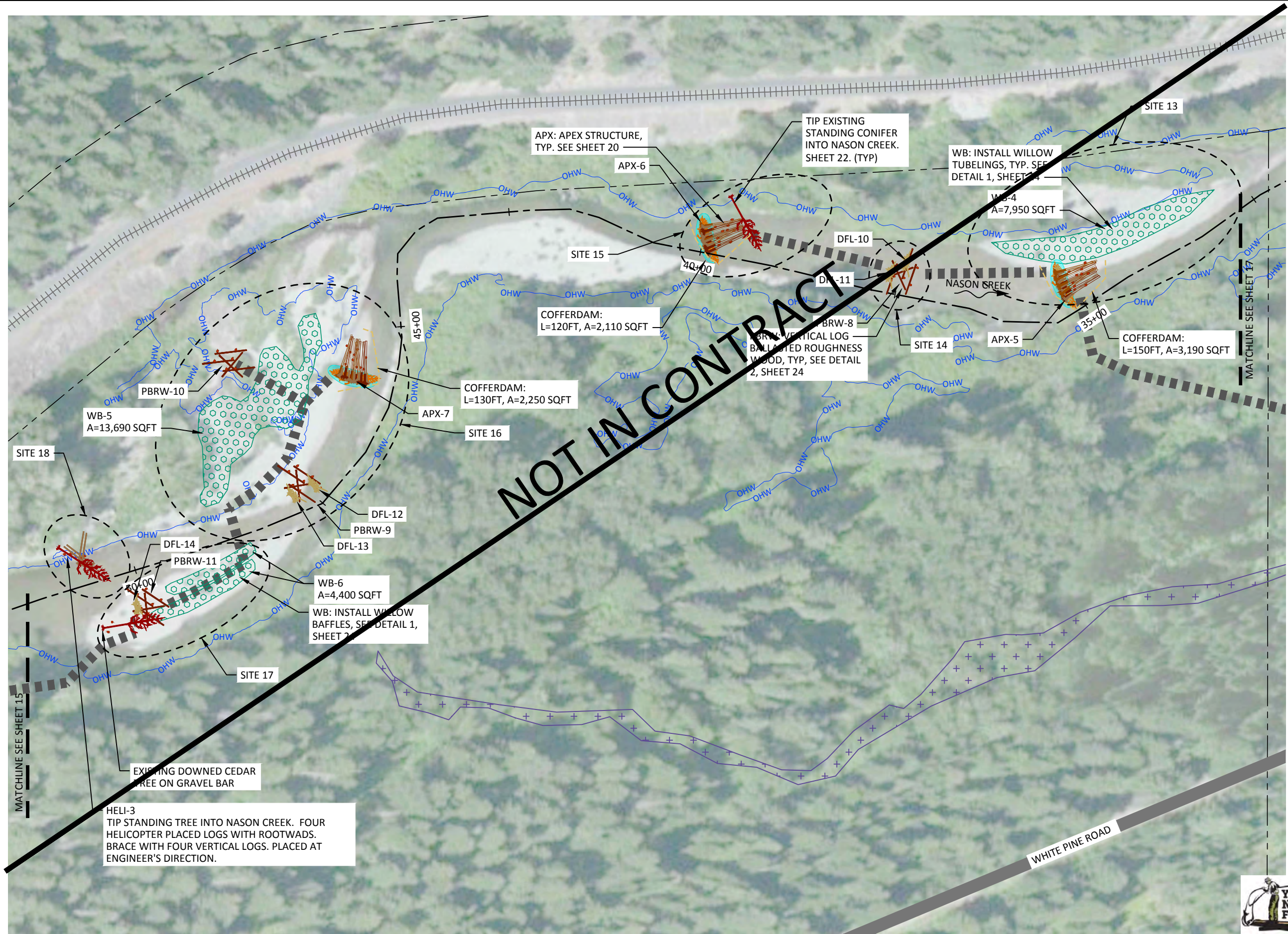
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LEGEND

- EXISTING CONTOURS (2 FT, LIDAR)
- TAXLOTS (CHELAN COUNTY GIS)
- BNSF RAILWAY
- OHW ORDINARY HIGH WATER
- 40+00 EXISTING CHANNEL ALIGNMENT AND STATIONING
- EXISTING WETLANDS (HAMER ENVIRONMENTAL)
- TEMPORARY ACCESS

NOTE:  
ACCESS ROUTES WILL BE DETERMINED IN THE FIELD BY OWNER TO MINIMIZE FLOODPLAIN IMPACTS.

ABBREVIATIONS:  
APX = APEX  
DFL = DEFLECTOR JAM  
HCW = HABITAT COVER WOOD  
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VRW = VEGETATION BRACED ROUGHNESS WOOD

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UPPER NASON CREEK RESTORATION  
PHASE 2 FINAL DESIGN  
YAKAMA NATION FISHERIES

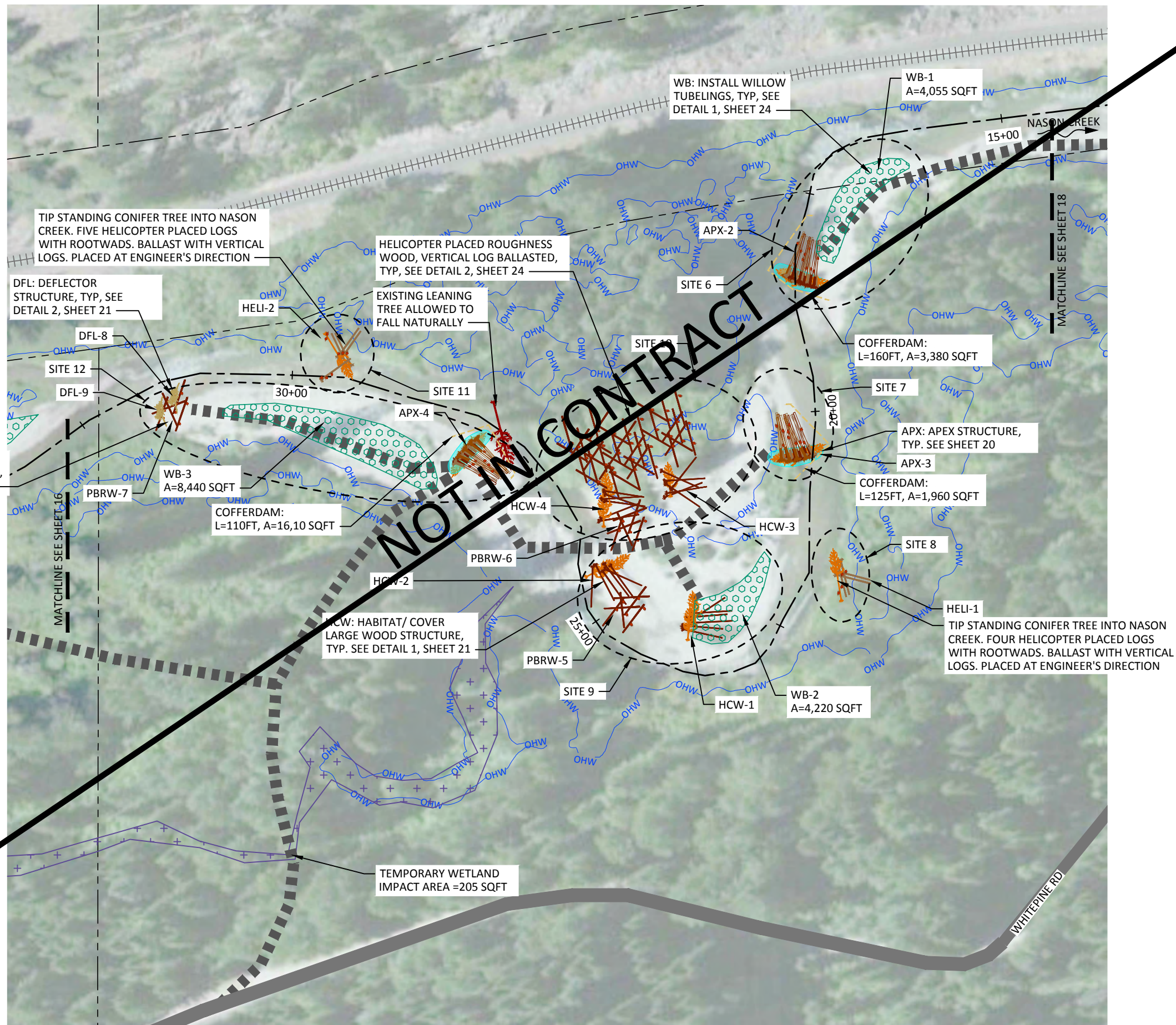
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PROPOSED CONDITIONS  
PLAN (6 OF 8)

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NOTE:  
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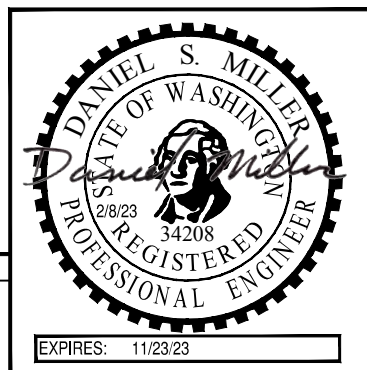
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PHASE 2 FINAL DESIGN  
YAKAMA NATION FISHERIES



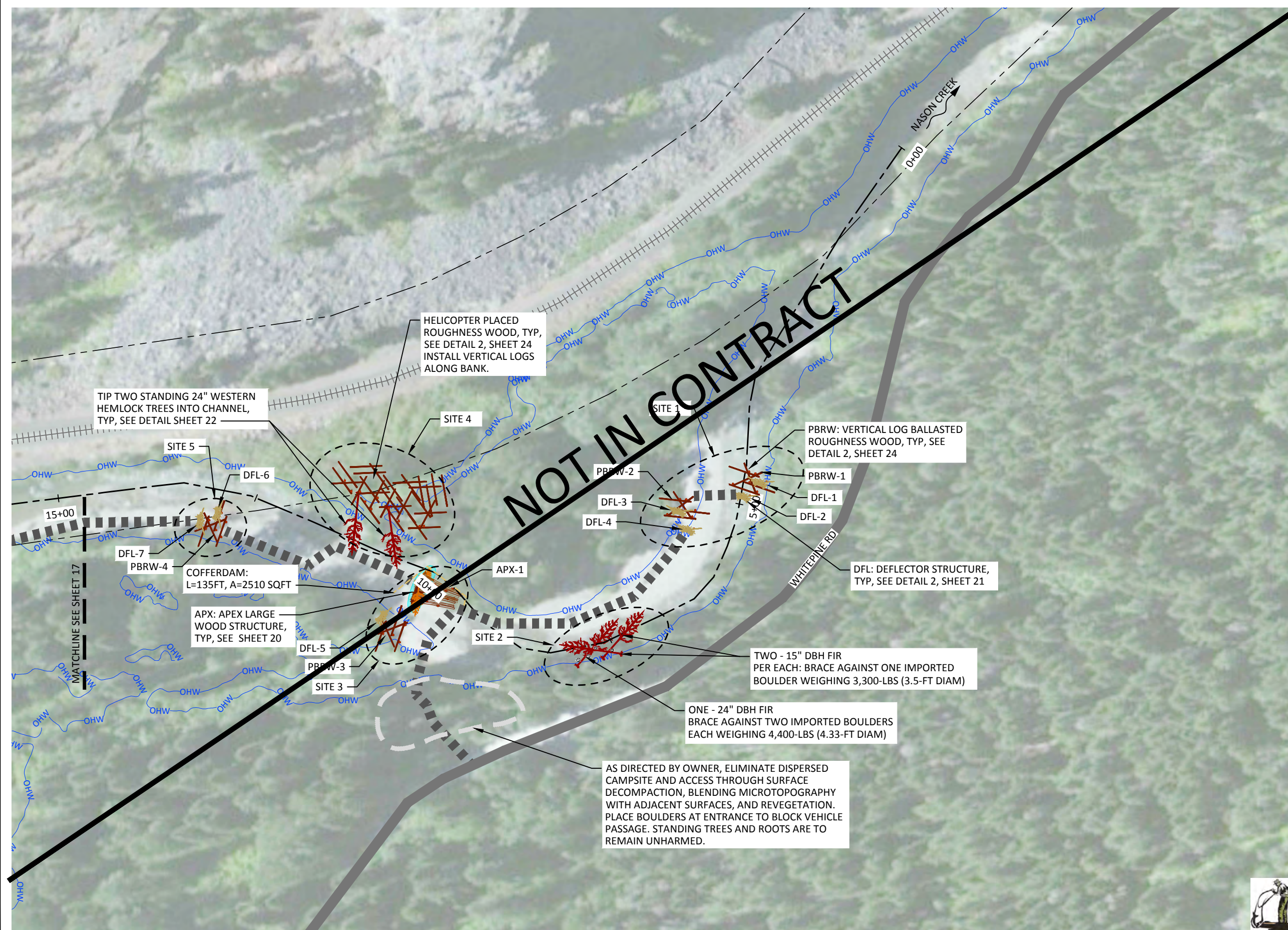
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PROPOSED CONDITIONS  
PLAN (7 OF 8)

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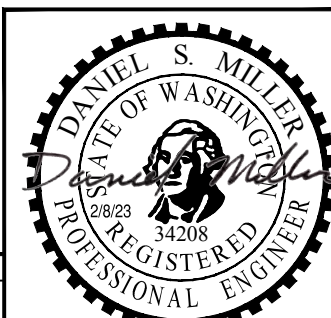




## LEGEND

**NOTE:**  
ACCESS ROUTES WILL BE DETERMINED IN  
THE FIELD BY OWNER TO MINIMIZE  
FLOODPLAIN IMPACTS.

**ABBREVIATIONS:**  
**APX = APEX**  
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**PILE = VERTICAL LOG**  
**WB = WILLOW TUBELINGS**  
**VRW = VEGETATION BRACED ROUGHNESS WOOD**



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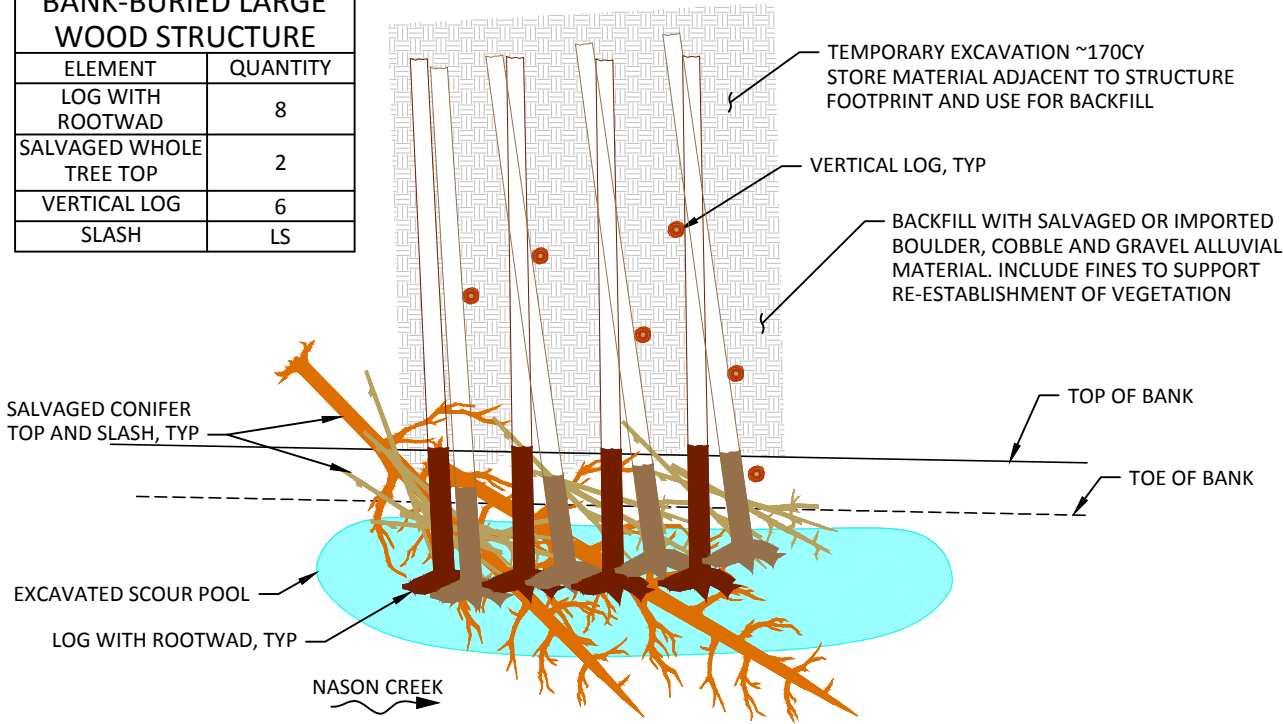
PROPOSED CONDITIONS  
PLAN (8 OF 8)

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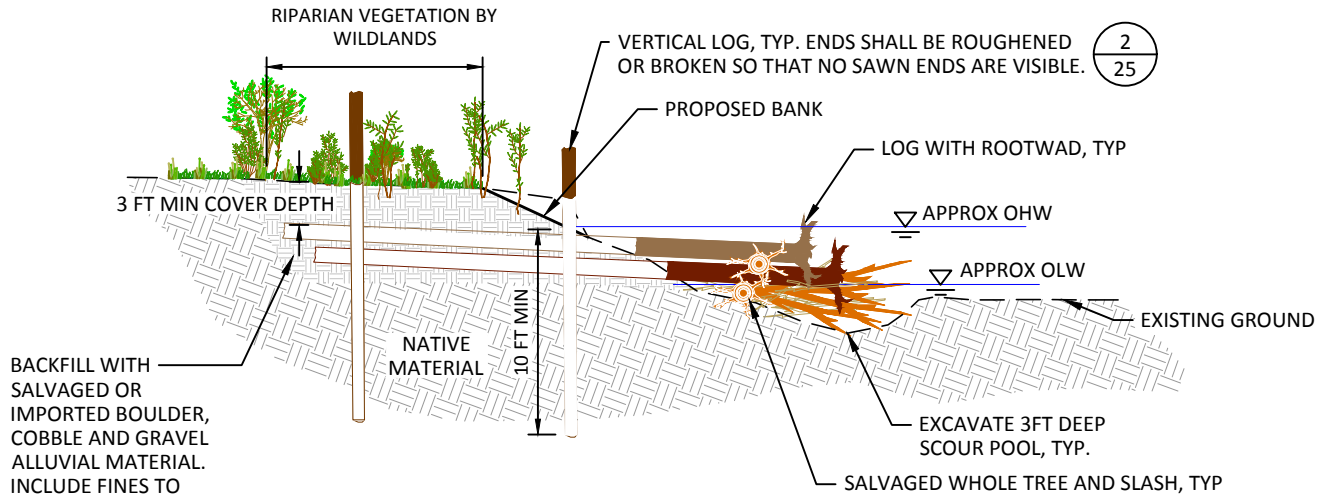
EXPIRES: 11/23/23



BANK-BURIED LARGE WOOD STRUCTURE	
ELEMENT	QUANTITY
LOG WITH ROOTWAD	8
SALVAGED WHOLE TREE TOP	2
VERTICAL LOG	6
SLASH	LS

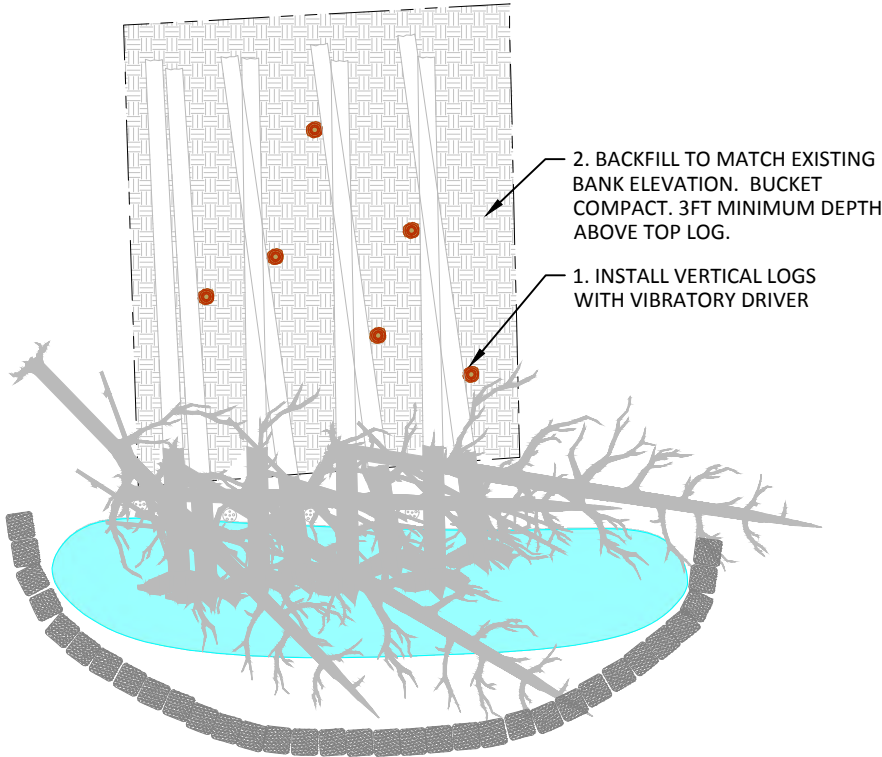
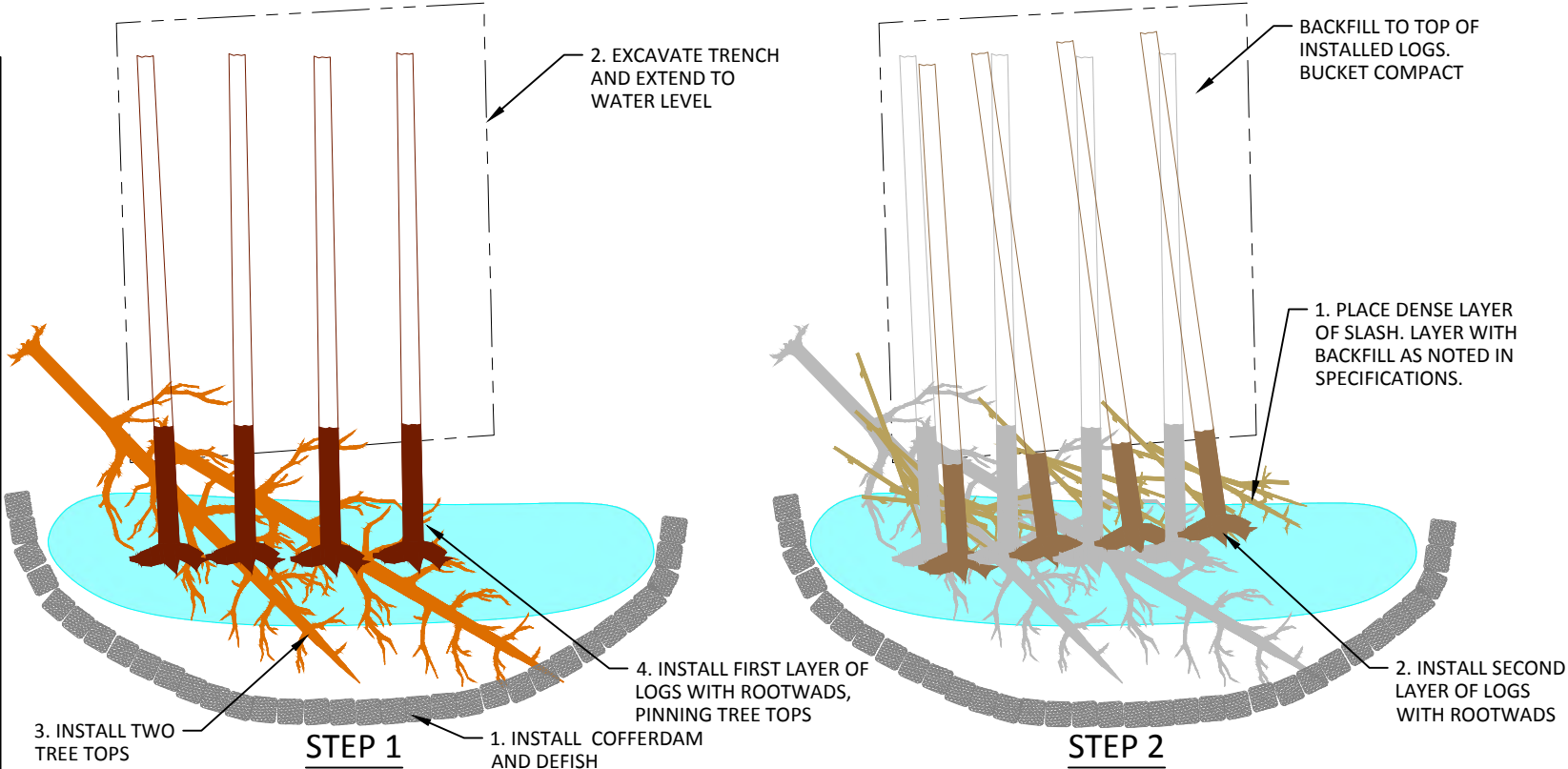


PLAN VIEW



SECTION VIEW

NOTE: VARY THE APPEARANCE OF VERTICAL LOGS BY INSTALLING THEM AT ANGLES AND WITH DIFFERENT TOP HEIGHTS. BREAK OR ROUGHEN THE TOP OF VERTICAL LOGS FOR A NATURAL APPEARANCE. VERTICAL LOGS SHALL BE INSTALLED BY VIBRATORY DRIVER.



STEP 3

SUGGESTED CONSTRUCTION SEQUENCE

1/19 TYPICAL DETAIL - BANK-BURIED STRUCTURE  
NOT TO SCALE

UPPER NASON CREEK RESTORATION  
PHASE 2 FINAL DESIGN  
YAKAMA NATION FISHERIES



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TYPICAL DETAILS - LARGE WOOD  
STRUCTURES (1 OF 5)



SHEET  
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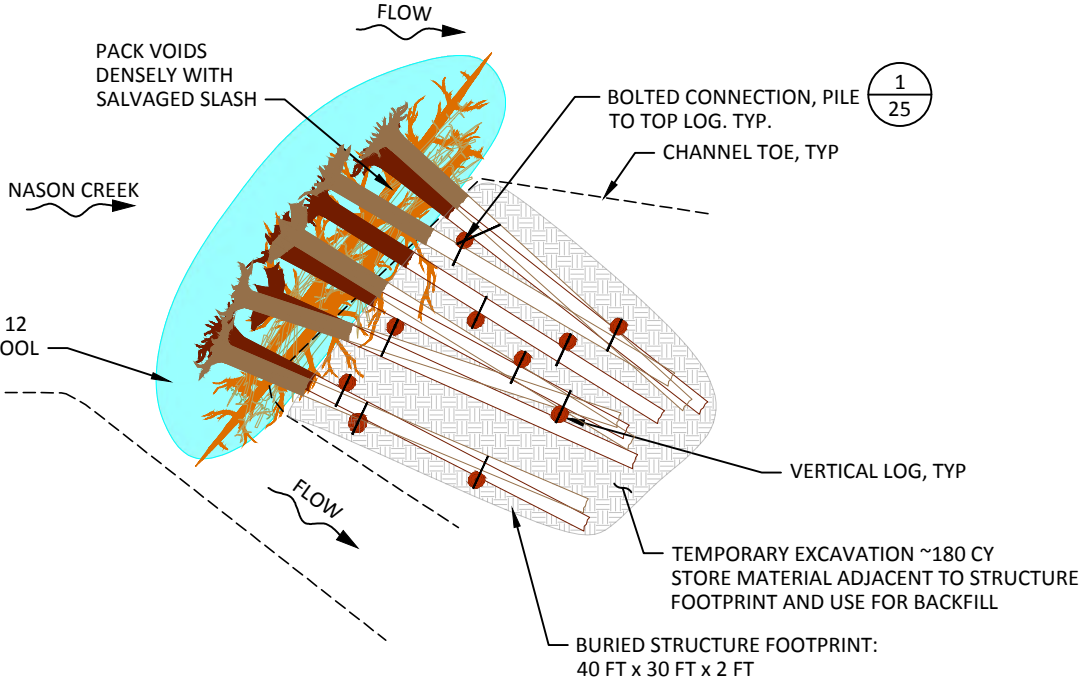
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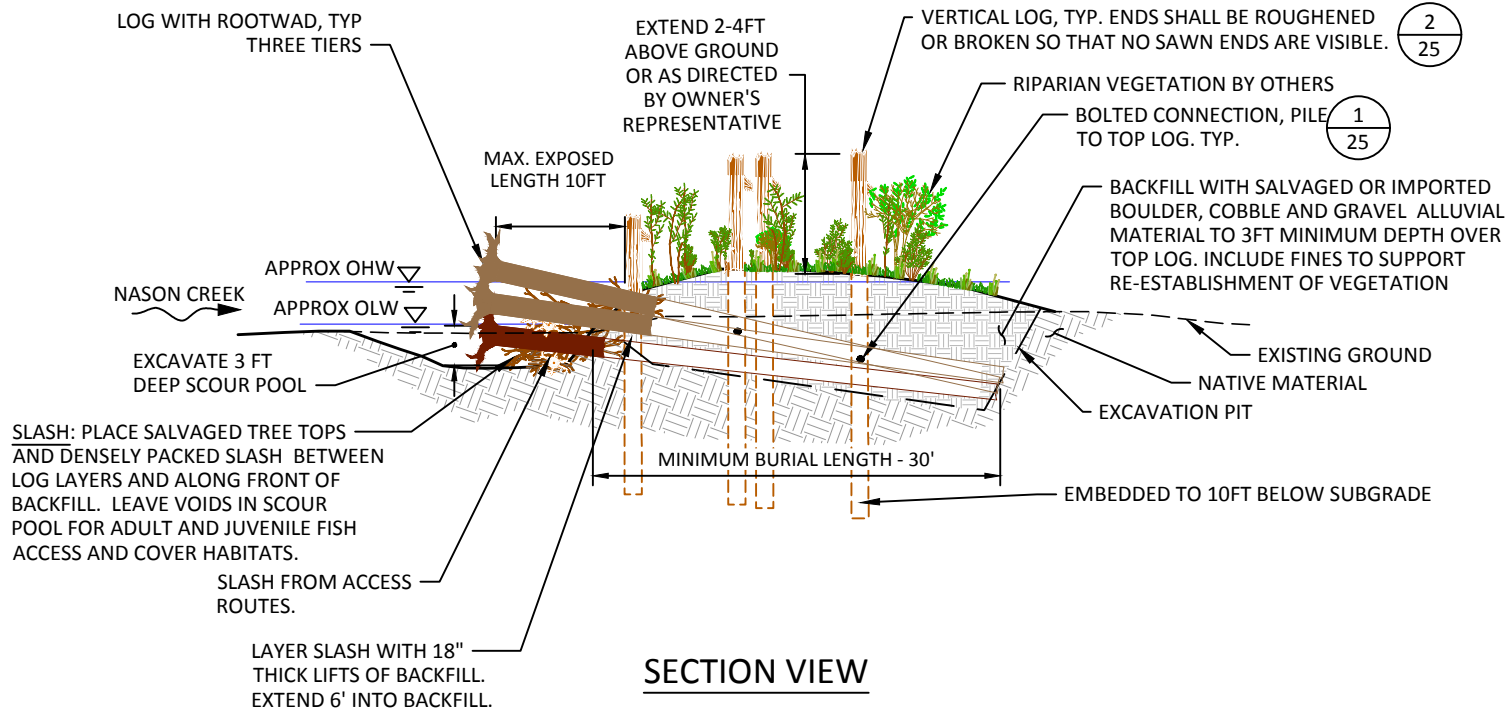
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APEX LARGE WOOD STRUCTURE	
ELEMENT	QUANTITY
LOG WITH ROOTWAD	15
VERTICAL LOG & BOLT	10
TREE TOPS	2
SLASH	LS



PLAN VIEW

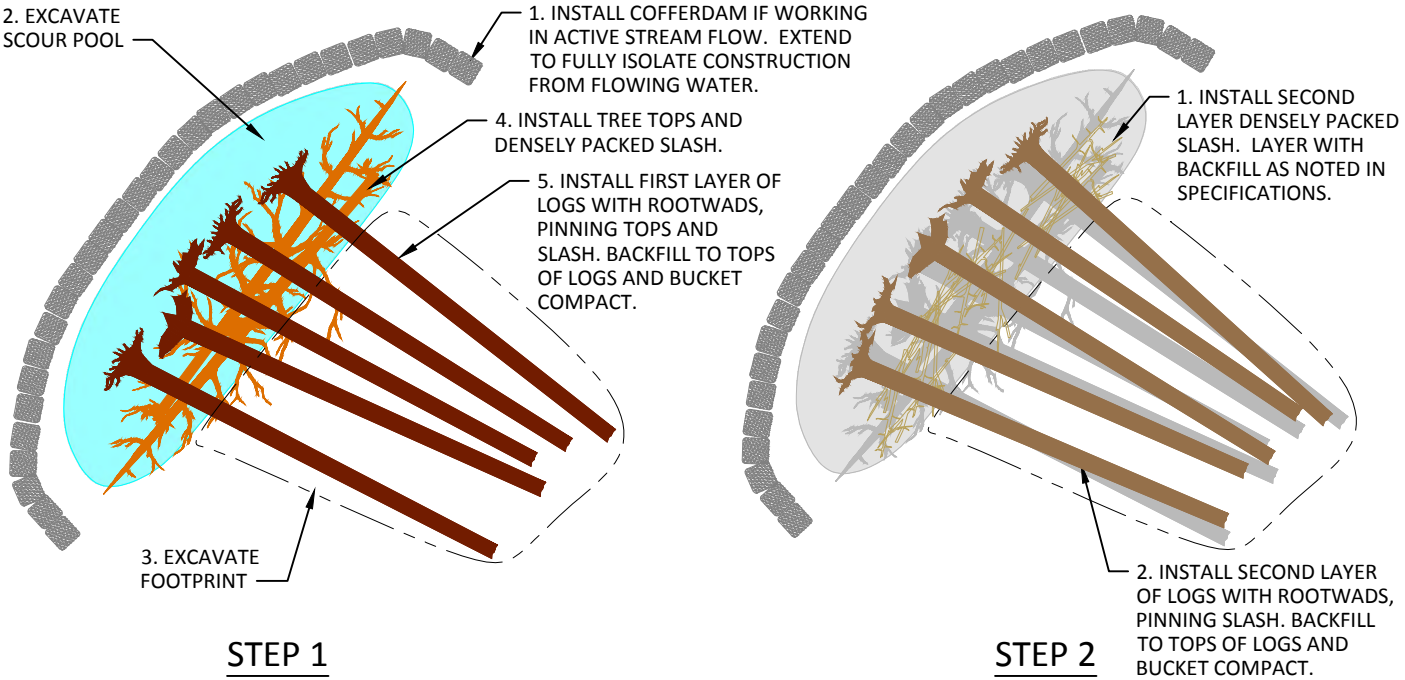


SECTION VIEW

NOTES:

- VARY THE APPEARANCE OF VERTICAL LOGS BY INSTALLING THEM AT ANGLES AND WITH DIFFERENT TOP HEIGHTS. BREAK OR ROUGHEN THE TOP OF VERTICAL LOGS FOR A NATURAL APPEARANCE. VERTICAL LOGS SHALL BE INSTALLED BY VIBRATORY DRIVER. SEE SHEET 25

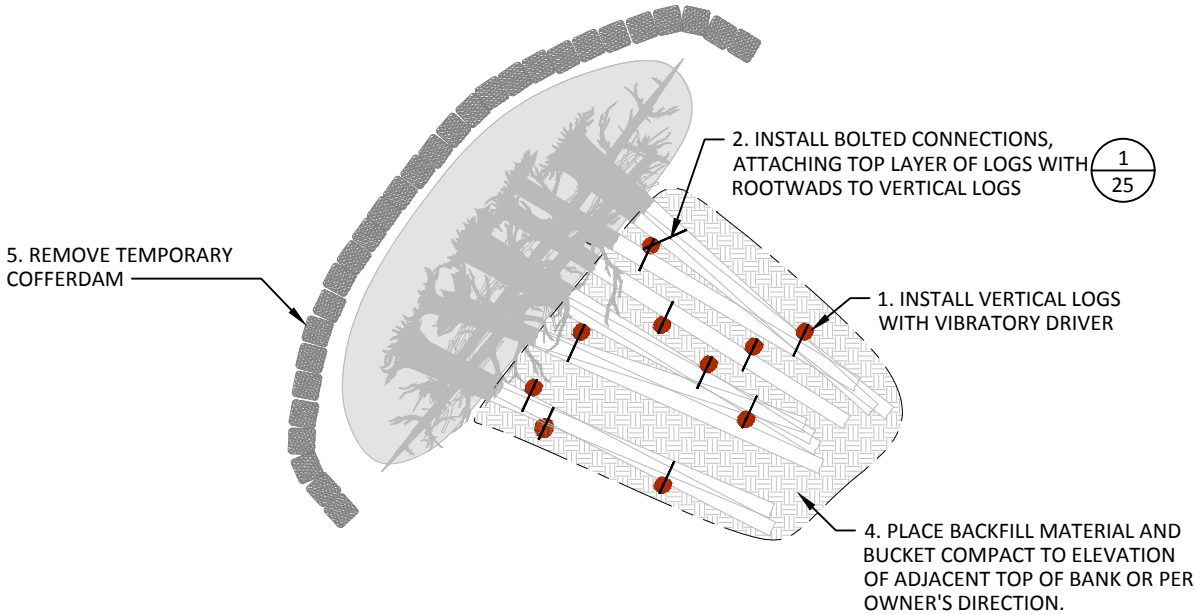
1  
20 TYPICAL DETAIL - APEX STRUCTURE  
NOT TO SCALE



STEP 1

STEP 2

STEP 3:  
REPEAT STEP 2 FOR THIRD TIER LOGS.



STEP 4

SUGGESTED CONSTRUCTION SEQUENCE

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PHASE 2 FINAL DESIGN  
YAKAMA NATION FISHERIES



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TYPICAL DETAILS - LARGE WOOD  
STRUCTURES (2 OF 5)



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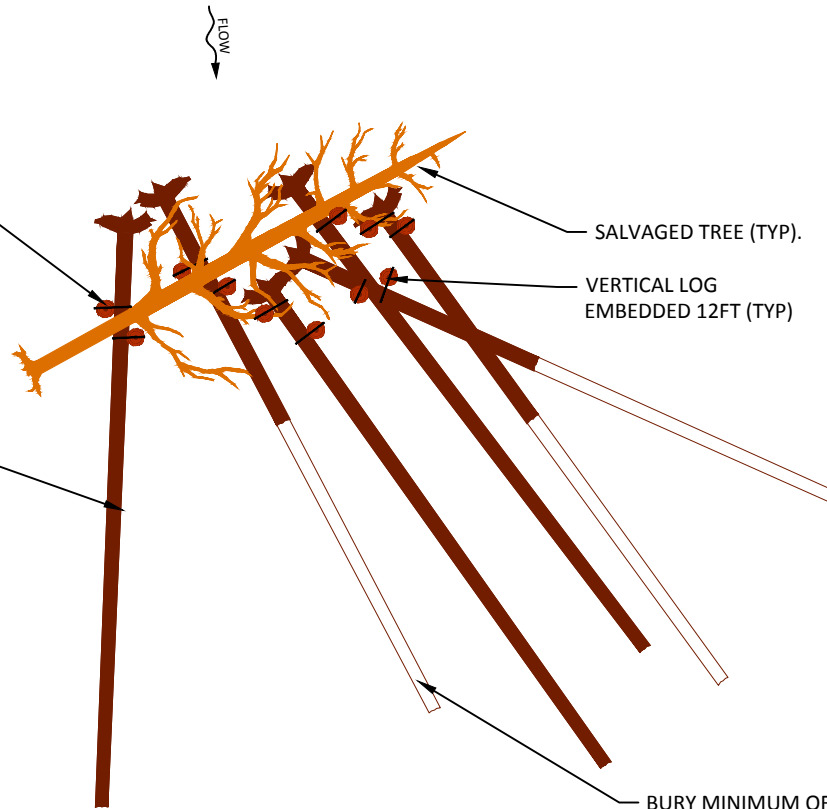


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1  
25

INSTALL BOLTED CONNECTIONS, ATTACHING TOP LAYER OF LOGS WITH ROOTWADS TO VERTICAL LOGS

18IN DBH X 40FT LONG LOG WITH ROOTWAD PLACED ON STREAMBED OR BAR SURFACE. (TYP).



1  
21

HABITAT/ COVER STRUCTURE PLAN VIEW  
NOT TO SCALE

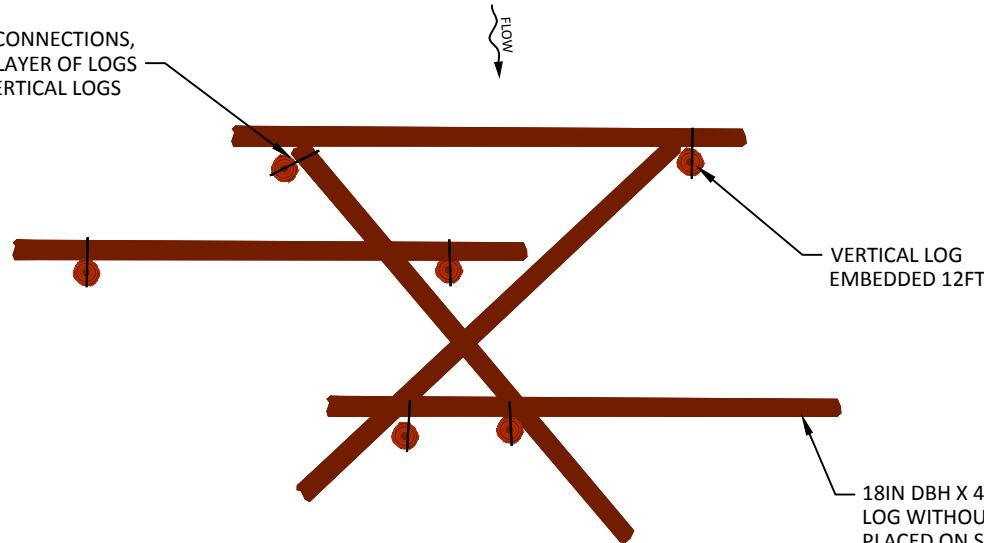
BURY MINIMUM OF THREE LOGS WITH NO LESS THAN 7 CY OF BACKFILL TOTAL. USE PARTIALLY BURIED LOGS TO PIN OTHER LOGS AND TREE TOP.

### HABITAT/ COVER LARGE WOOD STRUCTURE

ELEMENT	QUANTITY
LOG WITH ROOTWAD	6
VERTICAL LOG	11
BOLTS	11
SALVAGED WHOLE TREE /TOP	1

1  
25

INSTALL BOLTED CONNECTIONS, ATTACHING TOP LAYER OF LOGS WITH LOGS TO VERTICAL LOGS



3  
21

PILE BALLASTED ROUGHNESS WOOD - PLAN VIEW  
NOT TO SCALE

VERTICAL LOG EMBEDDED 12FT

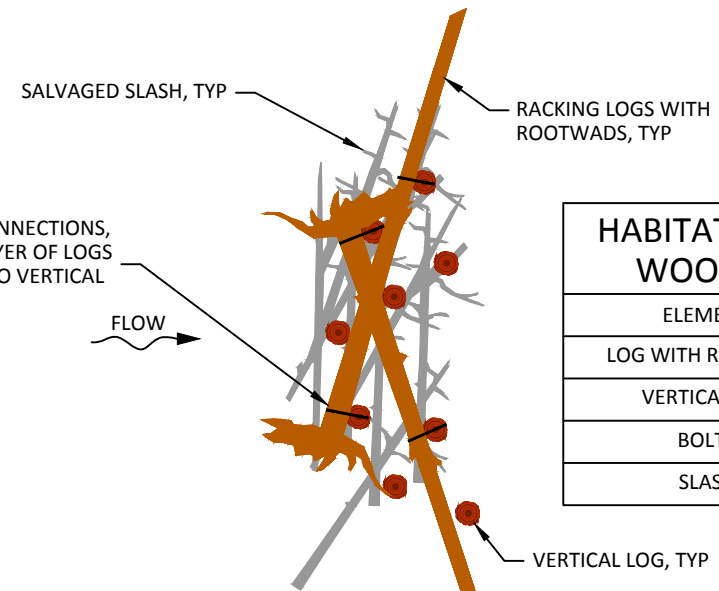
18IN DBH X 40FT LONG LOG WITHOUT ROOTWAD PLACED ON STREAMBED OR BAR SURFACE. (TYP).

### PILE BALLASTED ROUGHNESS WOOD

ELEMENT	QUANTITY
LOG WITHOUT ROOTWAD	5
VERTICAL LOG	6
BOLTS	6

1  
25

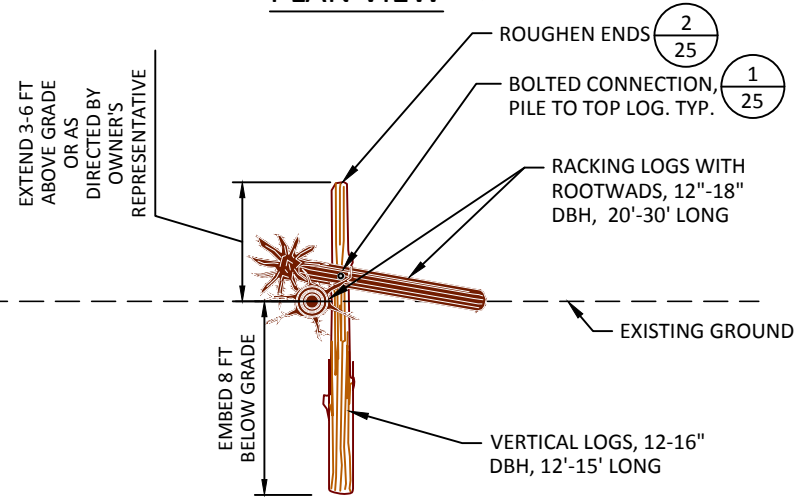
INSTALL BOLTED CONNECTIONS, ATTACHING TOP LAYER OF LOGS WITH ROOTWADS TO VERTICAL LOGS



PLAN VIEW

### HABITAT/ COVER LARGE WOOD STRUCTURE

ELEMENT	QUANTITY
LOG WITH ROOTWAD	2
VERTICAL LOG	9
BOLTS	4
SLASH	1



SECTION VIEW

2  
21

TYPICAL DETAIL - DEFLECTOR STRUCTURE  
NOT TO SCALE



NS, CM, DM	LS, DM	LS, DM
DRAWN	DESIGNED	CHECKED
DM	9/22/2023	200236
APPROVED	DATE	PROJECT

UPPER NASON CREEK RESTORATION  
PHASE 2 FINAL DESIGN  
YAKAMA NATION FISHERIES



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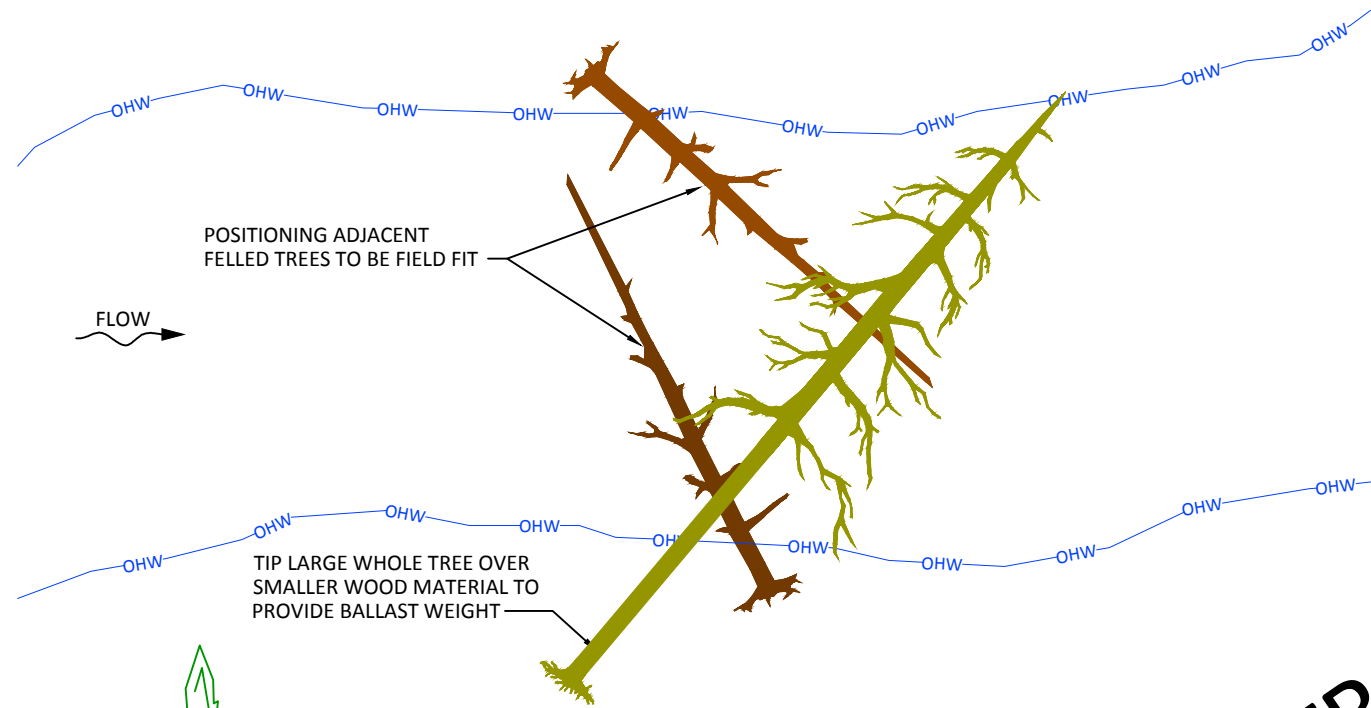
TYPICAL DETAILS - LARGE WOOD  
STRUCTURES (3 OF 5)

SHEET  
21 OF 28

EXPIRES: 11/23/23



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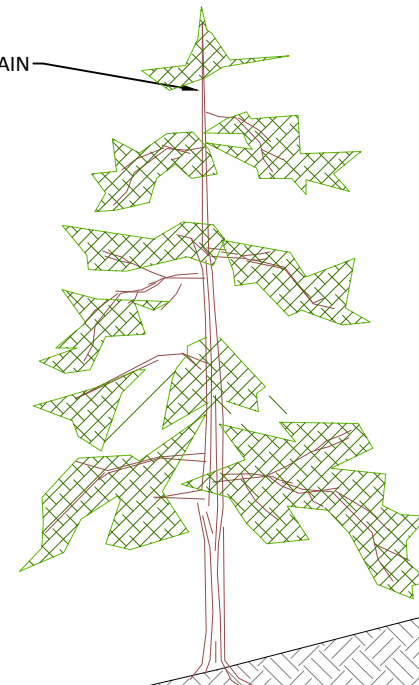
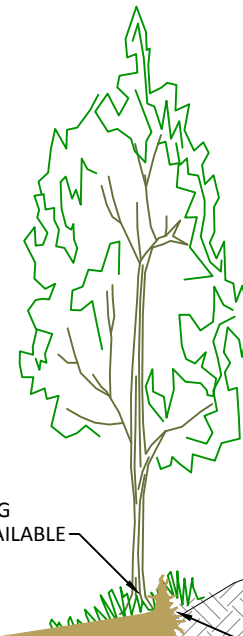
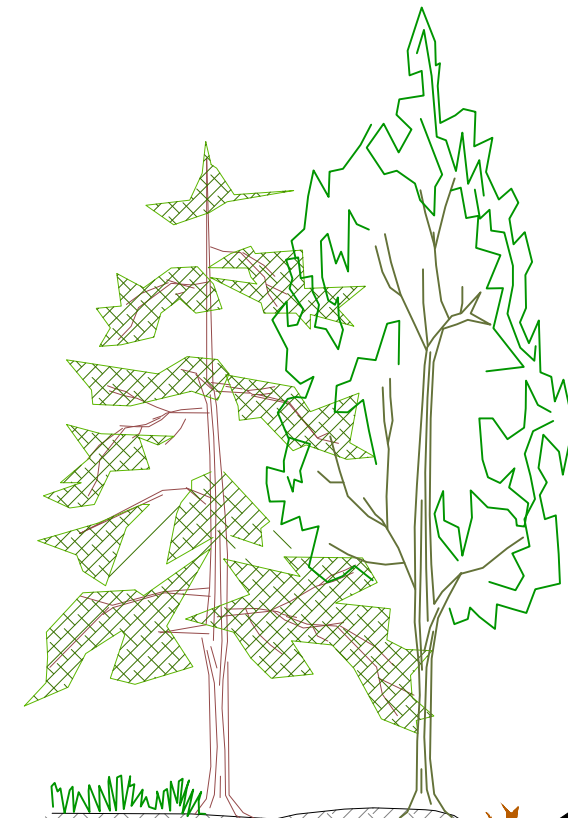
PLAN VIEW

NOTES:

1. SPECIFIC ORIENTATION OF LOGS MAY VARY FROM TYPICAL DRAWINGS DEPENDING ON SIZE AND SHAPE OF MATERIAL DELIVERED OR SALVAGED.
2. BRACING TO EXISTING TREES WILL OCCUR AT LOCATIONS IDENTIFIED IN THE FIELD.
3. TREES TO BE SELECTED IN THE FIELD AND TIPPED INTO NASON CREEK AND BEAVER POND AT DIRECTION OF ENGINEER CROWNER.

NOT IN CONTRACT

PROTECT EXISTING TREES THAT WILL REMAIN

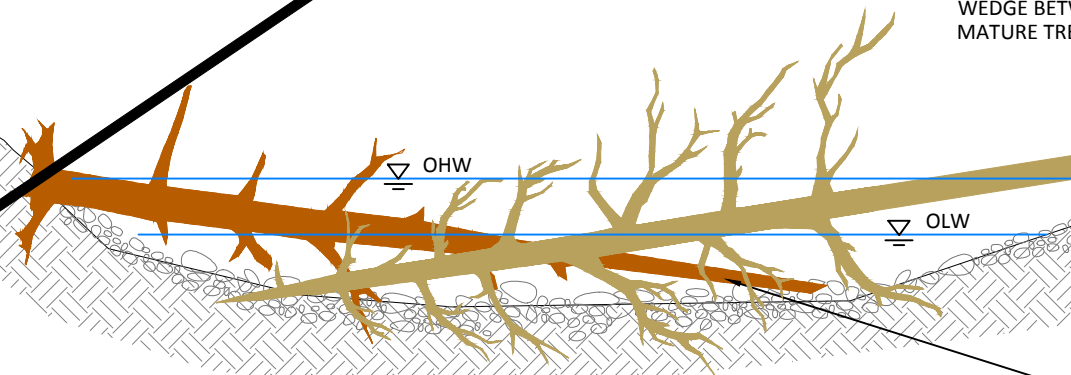


WEDGE BETWEEN EXISTING MATURE TREES WHEN AVAILABLE

TREES SHALL BE TIPPED WITH ROOTWAD INTACT.

PLACE ONE-THIRD OF THE STRUCTURE BY VOLUME ABOVE THE TOP OF BANK (OR >5 FEET ABOVE THALWEG ELEVATION) TO RESIST BUOYANCY FORCE

TIP TREE(S) INTO CHANNEL TO PROVIDE IN-STREAM HABITAT



SECTION VIEW

1  
22

TYPICAL DETAIL - TIPPED TREE STRUCTURE

NOT TO SCALE



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DRAWN	DESIGNED	CHECKED
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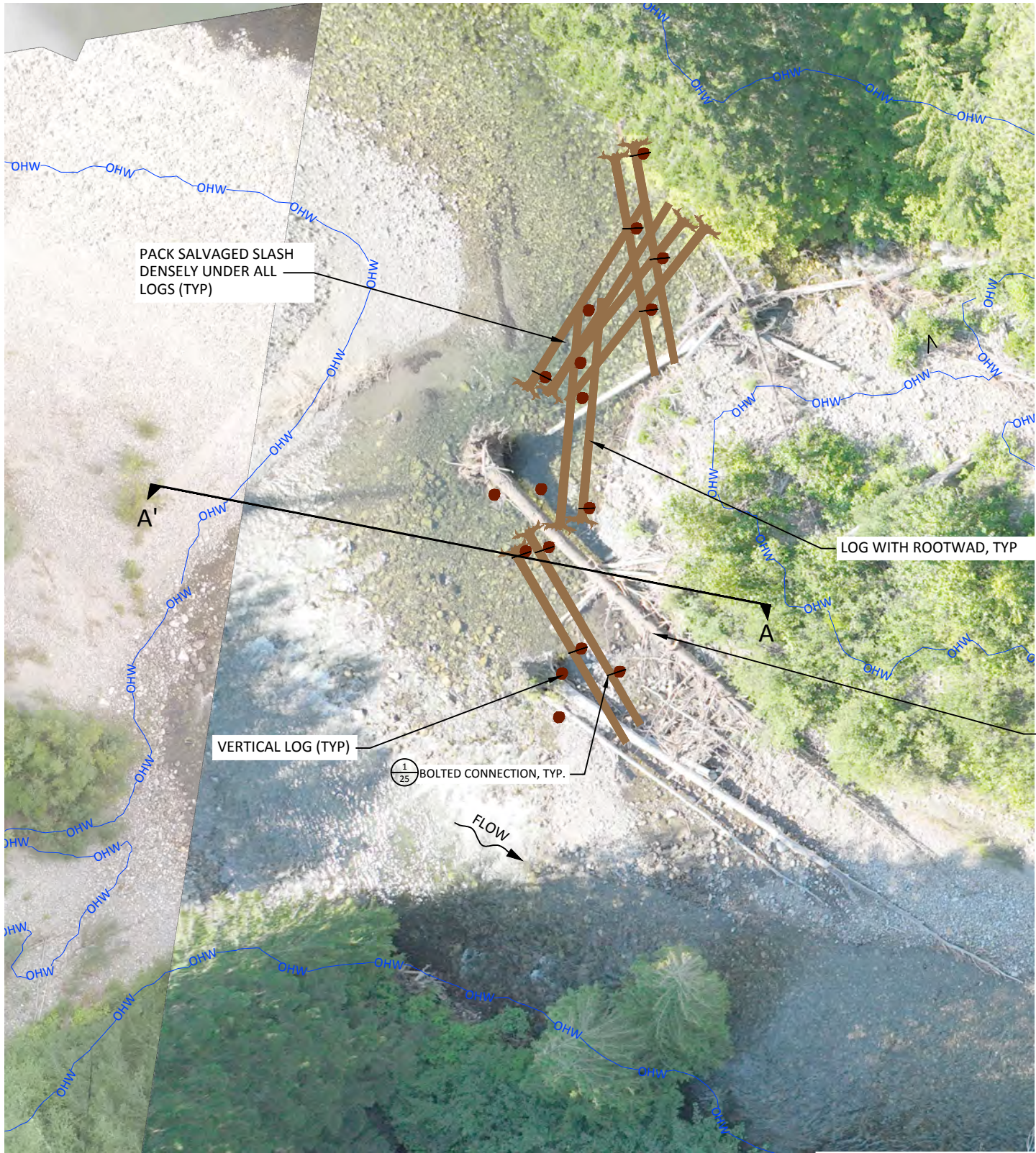
TYPICAL DETAIL - LARGE WOOD  
STRUCTURES (4 OF 5)

SHEET

22 OF 28

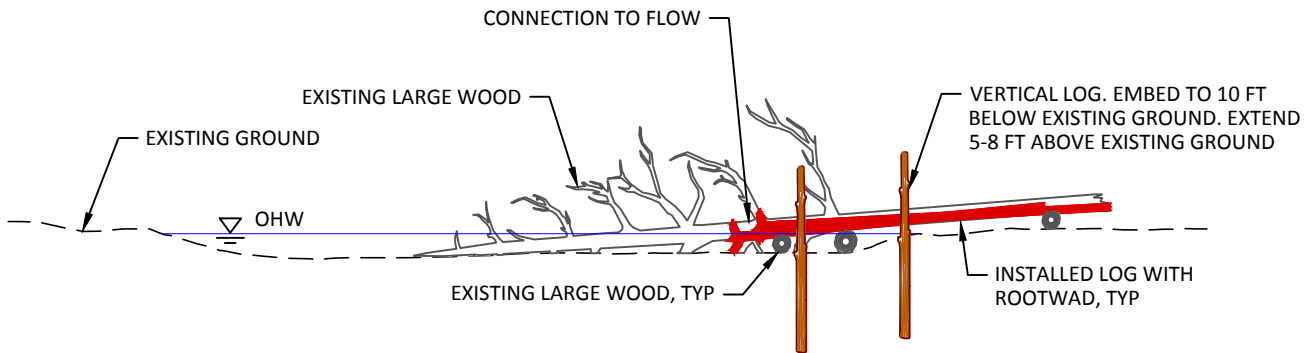
EXPIRES: 11/23/23





AERIAL IMAGE DATE: 7/26/2022

PLAN



SECTION A - A'

LOG JAM ENHANCEMENT

ELEMENT	QUANTITY
LOG WITH ROOTWAD	10
VERTICAL LOG	16
BOLTS	11
SLASH	1

1  
23

DETAIL - EXISTING LOG JAM ENHANCEMENT

1" = 25'

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TYPICAL DETAIL - LARGE WOOD  
STRUCTURES (5 OF 5)

SHEET

23 OF 28



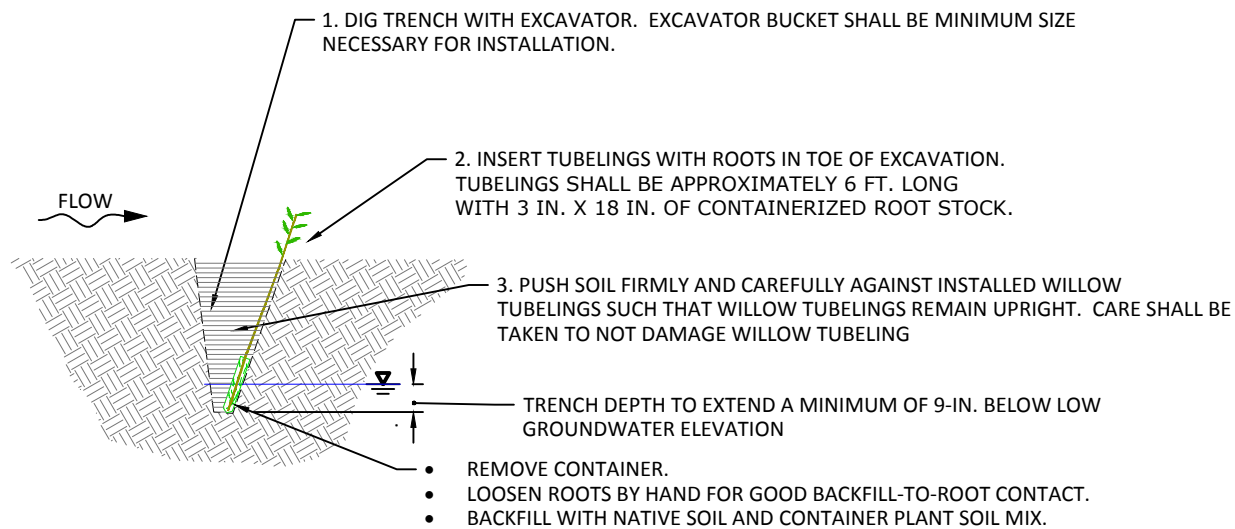
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DM APPROVED	9/22/2023 DATE	200236 PROJECT



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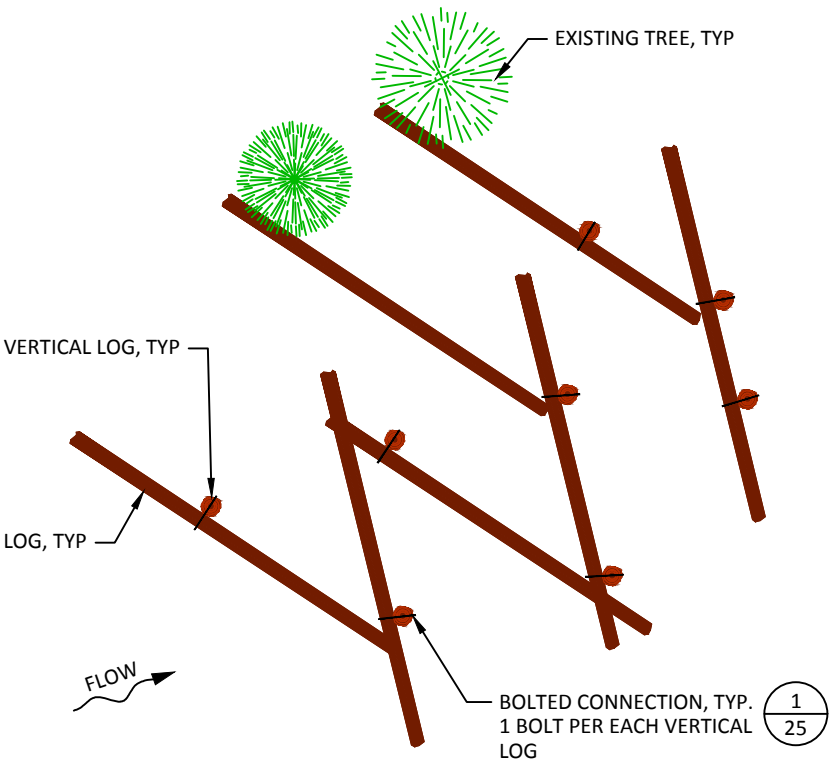


TUBELING SPECIES SHALL BE A MIX OF:  
60% SITKA WILLOW, *Salix sitchensis*  
30% MACKENZIE WILLOW, *Salix proluxa*  
10% SANDBAR WILLOW, *SALIX EXIGUA*

NOTES:

1. TUBELINGS SHALL BE PLANTED ALONG LINES ALIGNED PERPENDICULAR TO ANTICIPATED FLOW DIRECTION AND SPACED AT 10 FOOT INTERVALS AS MARKED BY OWNER OR ENGINEER.
2. INSTALL TUBELINGS AT 4 FT SPACING ON ALIGNMENT PERPENDICULAR TO ANTICIPATED FLOW.
3. ROOTS OF ALL WILLOWS TUBELINGS SHALL BE THOROUGHLY WETTED IMMEDIATELY PRIOR TO INSTALLATION
4. EXCAVATE PLANTING HOLE TO 9 INCHES BELOW WATER TABLE DEPTH. PUMP WATER INTO PLANTING HOLE. INSTALL WILLOW TUBELING IN TOE OF EXCAVATION.
5. ALTERNATE PUMPING WATER INTO TRENCH AND BACKFILLING COMPACT SOIL IN 2 FOOT LIFTS TO IMPROVE STEM TO SOIL CONTACT.
6. "WATER IN" FINISHED TUBELING INSTALLATION UNTIL WATER VISIBLY "BUBBLES" ON SURFACE.

1  
24 TYPICAL DETAIL - WILLOW TUBELING  
NOT TO SCALE



PLAN - VERTICAL LOG BALLASTED

2  
24 TYPICAL DETAIL - ROUGHNESS WOOD  
NOT TO SCALE

NO.	BY	DATE	REVISION DESCRIPTION

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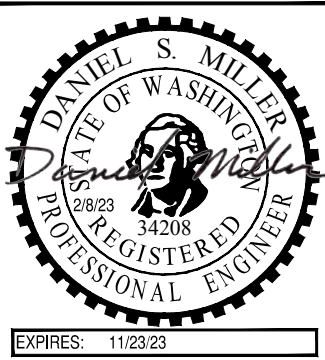
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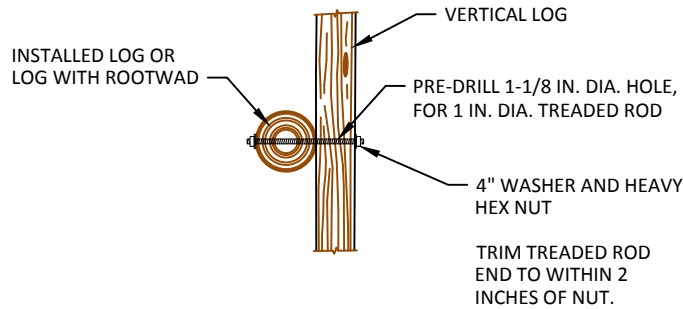
TYPICAL DETAILS - GRAVEL BAR  
ROUGHNESS FEATURES

SHEET  
24 OF 28





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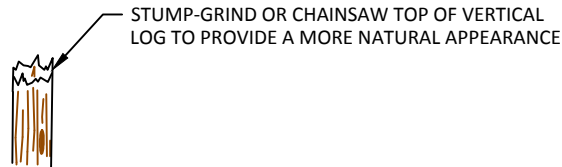
1  
25

TYPICAL DETAIL - BOLTED CONNECTIONS

NOT TO SCALE

NOTES:

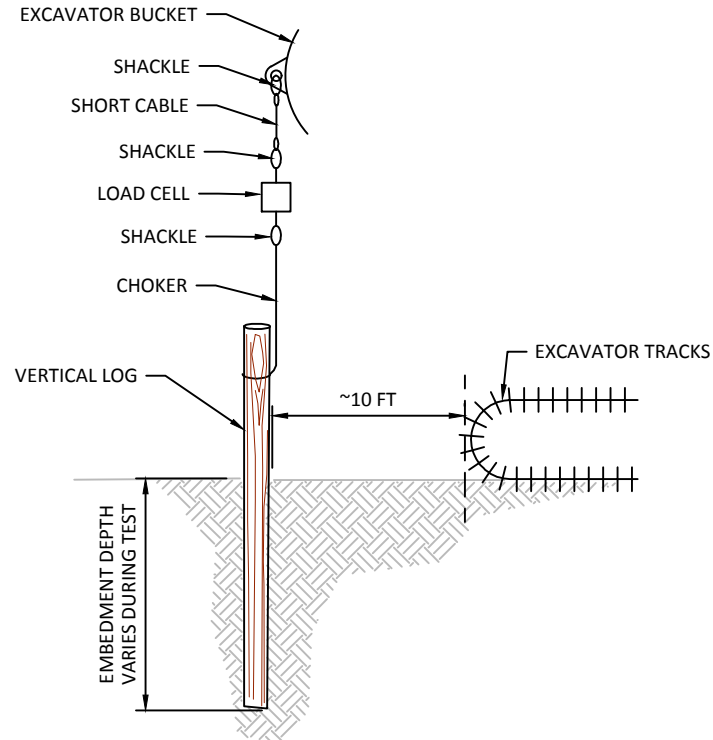
1. DRILL 1-1/8" DIA HOLE THROUGH LOGS.
2. INSERT 1" DIA TREADED ROD.
3. INSTALL HEAVY STEEL WASHERS HEAVY HEX NUTS. SECURE NUTS BY CHISELING THREADS OR MUSHROOMING EXPOSED ENDS OF ROD.
4. FILE OR GRIND OFF SHARP EDGES



2  
25

TYPICAL DETAIL - ROUGHENED END, VERTICAL LOG

NOT TO SCALE



3  
25

TYPICAL DETAIL - VERTICAL LOG PULL OUT TEST

NOT TO SCALE

NOTES:

GENERAL

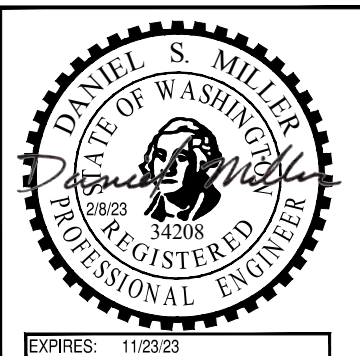
1. THE RESULTS OF ON-SITE PULLOUT TESTS WILL INFORM THE ENGINEER OF THE ACTUAL PERFORMANCE OF SUBSURFACE SOILS, WHICH WILL INFORM THE REQUIRED EMBEDMENT DEPTH. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR SITE SAFETY.

RIGGING

1. RIGGING FOR VERTICAL LOG TESTING SHALL CONFORM TO THE TENSION SCALE MANUFACTURER'S RECOMMENDATIONS.
2. CHOKERS, CABLES AND AND SHACKLES SHALL HAVE WORKING LOAD RATING OF 12 TONS. FITTINGS SHALL BE SIZED ACCORDINGLY.
3. CONTRACTOR SHALL SUPPLY: LOAD METER, CHOKERS, CABLES, SHACKLES, OTHER REQUIRED MATERIALS, EXCAVATOR OPERATOR AND LABOR TO CONDUCT TESTING.

TESTING

1. TESTING OF VERTICAL LOGS SHALL BE PERFORMED IN THE PRESENCE OF THE ENGINEER. UP TO FOUR LOAD TESTS SHALL BE APPLIED TO EACH TESTED VERTICAL LOG. EACH OF THE FOUR LOAD TESTS SHALL BE APPLIED TO THE VERTICAL LOG WITH A DIFFERENT INSTALLED DEPTH. DEPTHS SHALL BE DETERMINED IN THE FIELD. AS A GUIDELINE, TEST EMBEDMENT DEPTHS MIGHT INCLUDE 8 FT, 10 FT, 11 FT, AND 12 FT.
2. EACH VERTICAL LOG TEST SHALL HAVE UPWARD LOAD GRADUALLY INCREASED AND ALIGNED TO THE LONG AXIS OF THE VERTICAL LOG. RECORD THE VERTICAL LOG DIAMETER, EMBEDMENT DEPTH AND MAXIMUM FORCE REQUIRED TO MOVE THE VERTICAL LOG VERTICALLY APPROXIMATELY 1 INCH. THEN DRIVE THE VERTICAL LOG TO A NEW DEPTH. APPLY NEW LOAD AND RECORD MAX FORCE THAT CAUSES THE VERTICAL LOG TO MOVE VERTICALLY 1 INCH. REPEAT FOR THIRD AND FOURTH TEST.
3. EXCAVATOR SHALL BE NO CLOSER TO VERTICAL LOG THAN NEEDED TO GENERATE DESIRED LOADING. LIMIT COMPRESSIVE LOADING OF THE TRACKS ON THE GROUND BY DRIVING THE EXCAVATOR ONTO LOGS LAID ON THE GROUND TO DISTRIBUTE THE WEIGHT OVER A LARGER AREA. NOTE MACHINE SIZE AND DISTANCE FROM VERTICAL LOG TO NEAR EDGE OF EXCAVATOR TRACKS DURING TESTING.
4. UP TO 10% OF PRODUCTION VERTICAL LOGS SHALL BE PROOF TESTED. IF RESULTS VARY MORE THAN 50% THEN IT SHOULD BE ANTICIPATED THAT UP TO 25% OF THE PRODUCTION VERTICAL LOGS SHALL BE PROOF TESTED.
5. VERTICAL LOG EMBEDMENT DEPTH SPECIFIED IN THESE DRAWINGS MIGHT BE INCREASED AT NO ADDITIONAL COST TO THE OWNER PENDING PULL OUT TEST RESULTS . ASSUMED RESISTANCE IS 20,000 POUNDS. IF TESTING REVEALS FIELD PULLOUT RESISTANCE VALUES THAT ARE LESS THAN THE ASSUMED VALUES, VERTICAL LOGS MAY BE REQUIRED TO BE DRIVEN UP TO 5 FT DEEPER THAN INDICATED IN PLANS.



				NS, CM, DM	LS, DM	LS, DM
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TYPICAL DETAILS - LARGE WOOD  
STRUCTURE BALLASTING

SHEET  
25 OF 28



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**INTRODUCTION**  
THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION'S STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION 2022 (WSDOT STANDARD SPECIFICATIONS) SHALL APPLY UNLESS OTHERWISE NOTED IN THE FOLLOWING PROVISIONS. IN CASE OF A CONFLICT BETWEEN THE REGULATORY STANDARDS OR SPECIFICATIONS, THE MORE STRINGENT WILL GOVERN. THE “CONTRACTING AGENCY” OR “OWNER” SHALL BE THE CONFEDERATED TRIBES AND BANDS OF THE YAKAMA NATION. ADDITIONAL SPECIFICATIONS IN THE FOLLOWING CONTRACT SECTIONS ARE INCLUDED FOR ITEMS NOT COVERED BY THE WSDOT STANDARD SPECIFICATIONS.

SECTIONS 1-02, 1-03, AND 1-08 (EXCEPT 1-08.6, 1-08.7, 1-08.8) OF THE STANDARD SPECIFICATIONS DO NOT APPLY.

THE IN-WATER WORK WINDOW FOR THIS PROJECT IS JULY 1 - JULY 31. HIGH WATER IN THE RIVER COMMONLY PEAKS DURING LATE MAY TO EARLY JUNE; FLOWS DROP DRAMATICALLY THROUGH THE MONTH OF JULY. WORK MAY OCCUR OUTSIDE OF WATER BEFORE OR AFTER THE IN-WATER WORK WINDOW. NASON CREEK FLOWS ARE RECORDED BY WASHINGTON DEPARTMENT OF ECOLOGY NEAR THE MOUTH. CURRENT AND HISTORIC FLOW DATA ARE AVAILABLE AT:

HTTPS://APPS.ECOLOGY.WA.GOV/CONTINUOUSFLOWANDWQ/STATIONDETAILS?STA=45J070

THIS PROJECT WAS DESIGNED IN ACCORDANCE WITH THE BPA HABITAT IMPROVEMENT PROGRAM (HIP). HIP GENERAL CONSERVATION MEASURES (CMS) ARE INCLUDED ON SHEETS 3-5 OF THE PLANS. SITE SPECIFIC DIRECTION IS ADDED TO THE FOLLOWING PROVISIONS. ANY VARIANCES FROM HIP CMS WILL BE REQUESTED BY OWNER. IN A CASE OF A CONFLICT BETWEEN THE REGULATORY STANDARDS OR SPECIFICATIONS, LOCAL REGULATIONS, OR OTHER CONTRACT DOCUMENTATION, THE MORE STRINGENT WILL GOVERN, UNLESS SPECIFIED IN WRITING BY THE OWNER.

ALL EXCAVATION ACTIVITY WILL BE MONITORED BY A CULTURAL RESOURCE SPECIALIST. IF WORK ENCOUNTERS ANY OF THE FOLLOWING CULTURAL RESOURCES:

- NATIVE AMERICAN CULTURAL ARTIFACTS (EXAMPLE: FLAKES, ARROWHEADS, STONE TOOLS, BONE TOOLS, POTTERY, ETC.)
- HISTORIC ERA ARTIFACTS (EXAMPLE: BUILDING FOUNDATIONS, HOMESTEADS, SHIPWRECKS, MINING CAMPS, ETC.)
- HUMAN SKELETAL REMAINS OR BONE FRAGMENTS

IMMEDIATELY DISCONTINUE ALL GROUND-DISTURBING ACTIVITY. DO NOT TOUCH OR MOVE THE OBJECTS AND MAINTAIN THE CONFIDENTIALITY OF THE SITE. FOLLOW THE PROCEDURES LISTED IN THE BPA INADVERTENT DISCOVERY PROCEDURE AND AWAIT FURTHER DIRECTION FROM BPA'S CULTURAL RESOURCES STAFF.

**ITEM 001 - MOBILIZATION AND TRAFFIC CONTROL**

THIS ITEM SHALL CONSIST OF PREPARATION WORK AND OPERATIONS PERFORMED BY THE CONTRACTOR IN ACCORDANCE WITH U.S. FOREST SERVICE (USFS) ROAD REQUIREMENTS, THE PROVISIONS OF SECTION 1-09.7 OF THE WSDOT STANDARD SPECIFICATIONS, AND AS AMENDED BY THESE SPECIAL PROVISIONS.

**CONSTRUCTION REQUIREMENTS**

1. PRIOR TO ENTERING THE SITE, ALL EQUIPMENT SHALL BE POWER WASHED, BECOME FULLY DRY, AND INSPECTED TO MAKE SURE NO PLANTS, SOIL, OR OTHER ORGANIC MATERIAL ADHERES TO THE SURFACE. IF EQUIPMENT LEAVES THE SITE AND RETURNS, IT SHALL BE REWASHED AND INSPECTED PRIOR TO ACCESSING THE SITE.
2. TEMPORARY SITE ACCESS SHALL BE ALONG ACCESS ROUTES AND STAGING AREAS SHOWN IN THE PLANS. THESE ARE APPROXIMATE. ACTUAL DISTURBANCE LIMITS WILL BE STAKED AND FLAGGED IN THE FIELD BY THE OWNER. DESIGNATED DISTURBANCE LIMITS SHALL BE STRICTLY ADHERED TO AND NO LARGE TREES WILL BE IMPACTED WITHOUT PERMISSION FROM THE OWNER.

TEMPORARY TRAFFIC CONTROL REQUIREMENTS SHALL INCLUDE BARRICADES AND CONSTRUCTION SIGNAGE AT THE WHITE PINE ROAD INTERSECTION WITH HIGHWAY 2 AND AT THE ENTRANCE TO THE PROJECT

SITE AND ANY OTHER MEASURES PER STANDARD SPECIFICATIONS SECTION 1-10 AND LOCAL REGULATIONS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN APPLICABLE COUNTY OR US FOREST SERVICE PERMITS. CONTRACTOR SHALL PROVIDE ACCESS TO THE CASCADE MEADOWS CHURCH CAMP AS REQUIRED BY OWNER.

**MEASUREMENT AND PAYMENT**

MOBILIZATION AND TRAFFIC CONTROL SHALL BE MEASURED AND PAID FOR BY LUMP SUM. PARTIAL PAYMENTS WILL BE MADE IN ACCORDANCE WITH SECTION 1-09.9 OF THE STANDARD SPECIFICATIONS. PAYMENT SHALL BE CONSIDERED FULL COMPENSATION FOR ACQUIRING RIGHT-OF-WAY PERMIT, ALL EQUIPMENT, LABOR, TOOLS, MATERIALS, AND INCIDENTALS NECESSARY TO COMPLETE THIS WORK AS SPECIFIED.

**ITEM 002- MEETINGS, DEMOBILIZATION AND SITE CLEANUP**

THE CONTRACTOR SHALL MEET WITH THE OWNER AND OWNER'S REPRESENTATIVE AT THE BEGINNING OF EACH WORK WEEK TO DISCUSS: WORK COMPLETED DURING THE PRIOR WEEK, WORK ANTICIPATED IN THE NEXT WEEK, CONSTRUCTION SCHEDULE, WORK SITE ORGANIZATION, ACCESS ROUTES, CONSTRUCTION TECHNIQUES, LANDOWNER CONSIDERATIONS, BIOLOGICAL OBJECTIVES, LOGISTICS AND OTHER TOPICS PERTINENT TO IMPLEMENTATION OF THE PROJECT.

CONTRACTOR TO REMOVE ALL FLAGGING ONCE APPROVED BY OWNER/OWNER'S REPRESENTATIVE.

CONTRACTOR SHALL SPREAD OWNER-PROVIDED SEED. CONTRACTOR SHALL INSTALL CONTRACTOR-PROVIDED CERTIFIED WEED FREE AND SEED FREE MULCH AS DIRECTED BY OWNER OR REPRESENTATIVE.

PRIOR TO DEMOBILIZATION, RUTTING AND DISTURBED GROUND SHALL BE GRADED SMOOTH TO BLEND WITH EXISTING TOPOGRAPHY AND IF DIRECTED BY OWNER, RIPPED TO 18INCHES DEEP TO DECOMPACT SOILS. ACCESS ROUTES, AND STOCKPILE AND STAGING AREAS SHALL BE RETURNED TO ORIGINAL OR BETTER CONDITION. ANY REMOVED OR DAMAGED FENCES SHALL BE REPAIRED OR REPLACED TO PRE-PROJECT CONDITION OR BETTER.

IF DIRECTED BY OWNER, THE PORTIONS OF THE ACCESS ROUTES THAT FOLLOW EXISTING ROADS SHALL BE REGRADED.

ROADS USED FOR HAULING MATERIALS SHALL BE MAINTAINED BY BLADING AND WATERING. THE FOLLOWING U.S.F.S. SPECIFICATIONS SHALL BE USED FOR THIS WORK. UPON COMPLETION OF INSTREAM WORK, A FINAL BLADING OF ROAD USE SHALL BE REQUIRED.

**BLADING  
DESCRIPTION**

THIS WORK CONSISTS OF SURFACE BLADING THE TRAVELED WAY TO A CONDITION TO FACILITATE TRAFFIC AND PROVIDE PROPER DRAINAGE. BLADING INCLUDES SHAPING THE CROWN OR SLOPE OF TRAVELED WAY, AND DRAINAGE DIPS, IN ACCORDANCE WITH THIS SPECIFICATION. WATERING SHALL BE INCIDENTAL TO THIS ITEM.

**MAINTENANCE REQUIREMENTS**

- A. GENERAL-
  1. BLADE AND SHAPE THE EXISTING TRAVELED WAY AND SHOULDERS, INCLUDING TURNOUTS UNLESS OTHERWISE ORDERED, TO PRODUCE A SURFACE WHICH IS UNIFORM, CONSISTENT TO GRADE, AND CROWNED OR CROSS-SLOPED AS INDICATED BY THE CHARACTER OF THE EXISTING SURFACE, UNLESS OTHERWISE SPECIFIED. THOROUGHLY LOOSEN SURFACING MATERIAL TO NO LESS THAN 2 INCHES DEPTH OR THE DEPTH OF POTHOLES OR CORRUGATIONS.
  2. APPLY WATER DURING BLADING WHEN SUFFICIENT MOISTURE IS NOT PRESENT TO PREVENT SURFACE MATERIAL SEGREGATION. WATER SUPPLY, HAULING, AND APPLICATION SHALL BE IN ACCORDANCE WITH WATER SUPPLY AND WATERING SECTION BELOW.
  3. SHAPE EXISTING NATIVE ROCK OR AGGREGATE SURFACED DRAINAGE

DIPS TO DIVERT SURFACE RUNOFF TO EXISTING OUTLET DEVICES, DITCHES, AND DISCHARGE LOCATIONS.

4. ESTABLISH A BLADING PATTERN WHICH PROVIDES A UNIFORM DRIVING SURFACE, RETAINS THE SURFACING ON THE ROADBED, AND PROVIDES A THOROUGH MIXING OF THE MATERIALS WITHIN THE COMPLETED SURFACE WIDTH. UPON FINAL BLADING, NO DISTURBED ROCK SHALL PROTRUDE MORE THAN 2 INCHES ABOVE THE ADJACENT SURFACE UNLESS OTHERWISE SPECIFIED. REMOVE AND PLACE OUTSIDE THE ROADBED MATERIAL NOT MEETING THIS DIMENSION SO AS NOT TO OBSTRUCT DRAINAGEWAYS OR STRUCTURES. THIS MATERIAL MAY BE SCATTERED OFF THE ROADBED IF THERE IS FREE DRAINAGE.

**B. ROUTINE BLADING**

SHAPE ROADBED WIDTH IN EXCESS OF THE DIMENSIONS SHOWN ONLY AS NEEDED TO PROVIDE DRAINAGE AWAY FROM THE TRAVELED WAY. DO NOT REMOVE ESTABLISHED GRASSES AND OTHER VEGETATION FROM THE EXCESS WIDTH EXCEPT AS INCIDENTAL TO PROVIDING DRAINAGE OR UNLESS OTHERWISE DIRECTED.

**C. UNDERCUTTING - UNDERCUTTING ROADWAY BACK SLOPE IS NOT PERMITTED.**

**D. INTERSECTIONS - AT INTERSECTIONS, BLADE THE ROADBEDS OF SIDE ROADS WHICH ARE NOT CLOSED OR RESTRICTED FROM VEHICULAR USE TO ENSURE SMOOTH TRANSITIONS.**

**E. CLEANING OF STRUCTURES - DO NOT ALLOW MATERIALS RESULTING FROM WORK UNDER THIS SECTION TO REMAIN ON OR IN STRUCTURES, SUCH AS BRIDGES, CULVERTS, CATTLE GUARDS, OR DRAINAGE DIPS.**

**F. SMOOTH BLADING - SMOOTH BLADING MAY BE USED AS AN INTERIM MEASURE TO REMOVE LOOSE SURFACING MATERIAL FROM THE WHEEL PATHS AND STORE IT IN A RECOVERABLE WINDROW UNTIL BLADE PROCESSING, AS DESCRIBED IN THIS SECTION, IS FEASIBLE. WATERING WILL NOT BE REQUIRED FOR SMOOTH BLADING. ACCOMPLISH SMOOTH BLADING WITHOUT DISTORTING THE EXISTING CROSS-SLOPE OR CROWN OF THE TRAVELED WAY.**

MOVE AND STORE LOOSE SURFACING MATERIALS ON THE HIGH SIDE OF SUPER-ELEVATED CURVES AND SECTIONS WITH UNIFORM INSLOPE OR OUTSLOPE. IN CROWNED SECTIONS, STORE THE MATERIAL ON EITHER OR BOTH SIDES AS ELECTED. WINDROW AND PLACE STORED MATERIALS TO PROVIDE NOT LESS THAN 12 FEET OF SMOOTH TRAVELED WAY ON ONE-LANE SEGMENTS. CUT HOLES THROUGH WINDROWS, WHICH MAY COLLECT WATER ON THE ROAD, FOR DRAINAGE AT LEAST EVERY 500 FEET.

**G. SIGNING - PLACE SUITABLE TEMPORARY TRAFFIC WARNING SIGNS AT EACH END OF THE WORK AREA. SUCH SIGNING SHALL CONFORM TO THE FEDERAL HIGHWAY ADMINISTRATION'S PUBLICATION “MANUAL FOR UNIFORM TRAFFIC CONTROL DEVICES”, OR MUTCD. AN APPROPRIATE SIGN IS THE W21-3, MEASURING 36”X36”, “ROAD MACHINERY AHEAD”, BLACK TEXT ON REFLECTIVE ORANGE BACKGROUND. SUCH SIGNING SHOULD BE PLACED ON TEMPORARY SUPPORTS, WHERE IT IS READILY VISIBLE TO ONCOMING TRAFFIC BUT DOES NOT POSE A HAZARD TO VEHICLES.**

**WATER SUPPLY AND WATERING**

**DESCRIPTION**

THIS WORK CONSISTS OF PROVIDING FACILITIES TO FURNISH AN ADEQUATE WATER SUPPLY, HAULING AND APPLYING WATER.

**MATERIALS**

IF THE PERMITTEE ELECTS TO PROVIDE WATER FROM OTHER THAN DESIGNATED SOURCES, THE PERMITTEE IS RESPONSIBLE TO OBTAIN THE RIGHT TO USE THE WATER, INCLUDING ANY COST FOR ROYALTIES INVOLVED. THE RATE OF APPLICATIONS IS BASED ON GROUND CONDITIONS.

**EQUIPMENT**

**A. MOBILE WATERING EQUIPMENT SHALL HAVE WATERTIGHT TANKS.**

**B. THE WATER TENDER MUST HAVE CONTROLS IN THE CAB FOR OPENING AND CLOSING WATER FLOW, TO PREVENT PONDING AND WASHING AT THE BEGINNING AND ENDING OF WORK AREAS.**

**C. AN AIR GAP OR POSITIVE ANTI-SIPHON DEVICE SHALL BE PROVIDED BETWEEN THE WATER SOURCE AND THE VEHICLE BEING LOADED IF THE VEHICLE HAS BEEN USED FOR OTHER THAN WATER HAUL, IF THE SOURCE IS A DOMESTIC POTABLE WATER SUPPLY, OR THE WATER IS USED FOR TANK MIXING WITH ANY OTHER MATERIALS.**

**D. THE DESIGNATED WATER SOURCE MAY REQUIRE SOME WORK PRIOR TO THEIR USE. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING APPROPRIATE HARDWARE TO CONNECT TO EXISTING INFRASTRUCTURE. CONTRACTOR SHALL BE RESPONSIBLE FOR LANDOWNER COORDINATION AND APPROVALS.**

**E. THE INTAKE OF ANY PUMP USED FOR WATER SUPPLY FROM DESIGNATED FISH BEARING STREAMS OR OTHER WATER BODIES SHALL HAVE A FISH SCREEN INSTALLED, OPERATED AND MAINTAINED ACCORDING TO NMFS' FISH SCREEN CRITERIA (NMFS 1997; NMFS 2008).BEFORE THE RELEASE OF FINAL RETAINAGE TO THE CONTRACTOR, THE CONTRACTOR WILL PARTICIPATE IN A WALK-THROUGH WITH THE OWNER AND USFS STAFF TO EVALUATE THE RESTORED AREAS.**

**MEASUREMENT AND PAYMENT**

MEETINGS, DEMOBILIZATION, ROAD GRADING AND SITE CLEANUP SHALL BE MEASURED AND PAID FOR BY LUMP SUM. PARTIAL PAYMENTS WILL BE MADE AS IN ACCORDANCE WITH SECTION 1-09.9 OF THE STANDARD SPECIFICATIONS. WITHHOLDING OF PARTIAL PAYMENT WILL OCCUR IF LIMITS OF DISTURBANCE ARE NOT ADHERED TO. PAYMENT SHALL BE CONSIDERED FULL COMPENSATION AS WELL AS ALL EQUIPMENT, LABOR, TOOLS, MATERIALS, AND INCIDENTALS NECESSARY TO COMPLETE THIS WORK AS SPECIFIED.



				NS, CM, DM DRAWN	LS, DM DESIGNED	LS, DM CHECKED
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SPECIFICATIONS (1 OF 3)

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ITEM 003- TESC, SPCC PLAN AND IMPLEMENTATION

THIS WORK SHALL PROVIDE FOR PREPARATION, IMPLEMENTATION, AND REMOVAL OF A TEMPORARY EROSION SEDIMENT CONTROL (TESC) PLAN AND FOR THE PREPARATION AND IMPLEMENTATION OF A SPILL PREVENTION CONTROL AND COUNTERMEASURE (SPCC) PLAN IN ACCORDANCE WITH SECTION 1-07.15 OF THE STANDARD SPECIFICATIONS, AND AS AMENDED BY THESE SPECIAL PROVISIONS.

1. THE CONTRACTOR SHALL SUBMIT A TESC FOR THE PROJECT TO THE OWNER FOR APPROVAL. THE TESC MUST SATISFY THE REQUIREMENTS OF THE WASHINGTON DEPARTMENT OF ECOLOGY NPDES STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY AND ALL OTHER APPLICABLE PERMITS. THE TESC INCLUDED IN THE DRAWINGS AND DESCRIBED HEREIN IS INTENDED TO PROVIDE A BASELINE FOR SEDIMENT AND EROSION CONTROL AND DOES NOT ENSURE THAT THE STANDARDS ESTABLISHED BY ANY APPLICABLE PERMITS WILL BE MET. THE CONTRACTOR MAY USE THESE MEASURES OR ALTERNATIVE MEASURES OF THEIR OWN DESIGN TO ENSURE SATISFACTORY PERFORMANCE AND THAT THE EROSION CONTROL REQUIREMENTS OF ALL APPLICABLE PERMITS ARE MET. THE CONTRACTOR SHALL BE NAMED AS THE PERMIT HOLDER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING, INSPECTING AND FILING REPORTS, MAINTAINING, REPLACING, AND REMOVING TESC AND SPCC MEASURES. THE PLAN SHALL INCLUDE THE NAME, ADDRESS AND 24-HOUR CONTACT NUMBER OF THE PERSON RESPONSIBLE FOR EROSION PREVENTION AND SEDIMENT CONTROL MEASURES.
2. A SPILL CONTAINMENT KIT SHALL BE ON SITE AND CREWS SHALL BE TRAINED IN ITS USE. A SPILL CONTAINMENT KIT SHALL BE KEPT ON HAND WITH EQUIPMENT ACCESSING NASON CREEK.
3. BIODEGRADABLE HYDRAULIC FLUID SHALL BE INSTALLED INTO EACH PIECE OF HEAVY MACHINERY WORKING WITHIN 50 FEET OF THE RIVER.
4. CONTRACTOR WILL BE REQUIRED TO APPLY FOR AN INDUSTRIAL FIRE PROTECTION LEVEL (IFPL) 3 WAIVER IN THE EVENT THAT USFS DECLARES THE IFPL LEVEL HAS BEEN INCREASED TO LEVEL 3. REGARDLESS OF IFPL LEVELS, A FIRE CONTAINMENT KIT INCLUDING SHOVELS AND FIRE EXTINGUISHERS WILL BE KEPT WHERE ANY CONSTRUCTION ACTIVITIES ARE TAKING PLACE AND AT THE REFUELING LOCATION.

INSPECTION AND MAINTENANCE

THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE AT OWN EXPENSE FOR PROVIDING AND MAINTAINING ALL NECESSARY EROSION CONTROL FACILITIES TO COMPLY WITH APPLICABLE EROSION CONTROL REGULATIONS AND TO MAINTAIN CLEAN ACCESS ROUTES.

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

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

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

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

MEASUREMENT AND PAYMENT

“TESC, SPCC PLAN AND IMPLEMENTATION,” INCLUDING THE ABOVE AMENDMENTS TO THE ITEM WILL BE MEASURED AND PAID FOR BY LUMP SUM. PAYMENT SHALL BE CONSIDERED FULL COMPENSATION FOR ALL EQUIPMENT, LABOR, TOOLS, MATERIALS, AND INCIDENTALS NECESSARY TO COMPLETE THIS WORK AS SPECIFIED.

ITEM 004 - CLEARING AND GRUBBING

THIS ITEM CONSISTS OF CLEARING AND GRUBBING FOR CONSTRUCTION AS SHOWN IN THE PLANS INCLUDING THOSE AREAS REQUIRED FOR TEMPORARY ACCESS ROUTES AND IN ACCORDANCE WITH SECTION 2-01 OF THE STANDARD SPECIFICATIONS, AND AS AMENDED BY THESE SPECIAL PROVISIONS.

1. CLEARING AND GRUBBING SHALL BE LIMITED TO APPROVED ACCESS ROUTES AND LWM STRUCTURE AREAS AS SHOWN IN THE PLANS. LIMITS OF DISTURBANCE EXTENTS MAY BE ADJUSTED BY THE OWNER TO REDUCE DAMAGE TO THE ENVIRONMENT. THE FINAL AREAS WILL BE FLAGGED IN THE FIELD BY THE OWNER PRIOR TO CLEARING AND GRUBBING WORK. CLEARING AND GRUBBING SHALL NOT OCCUR OUTSIDE OF THE DESIGNATED LIMITS.
2. BRUSH, SHRUBS AND TREES SHALL BE CLEARED BY CUTTING AT GROUND LEVEL AS DIRECTED BY OWNER. GRUBBING SHALL ONLY OCCUR TO VEGETATION SPECIFIED BY OWNER.
3. INCLUDED IN THIS ITEM ARE TREES VARYING IN SIZE IDENTIFIED BY THE OWNER FOR REMOVAL AND SALVAGE. TREE SPECIES INCLUDE CONIFEROUS AND DECIDUOUS. REMOVED TREES SHALL BE SALVAGED FOR INSTALLATION AS LARGE WOODY MATERIAL DURING CONSTRUCTION OF LOG STRUCTURES. FOR CONIFEROUS TREES, THE CONTRACTOR SHALL EXCAVATE TO LOOSEN SOIL AROUND EACH ROOTWAD AND THEN PUSH OVER TREES IN ORDER TO SALVAGE LOGS WITH INTACT ATTACHED ROOTS. DECIDUOUS TREES MAY BE CUT AT THE STUMP WITH ROOTS LEFT UNGRUBBED. SALVAGED TREES SHALL BE TEMPORARILY STOCKPILED WITHIN PROJECT LIMITS OF DISTURBANCE.
4. TREES AND SHRUBS SMALLER THAN 12” DBH THAT ARE REMOVED DURING CLEARING AND GRUBBING SHALL BE SALVAGED AND USED AS SLASH DURING INSTALLATION OF CHANNEL LWM AND FLOODPLAIN ROUGHNESS LWM. UNUSED EXCESS SLASH MAY REMAIN ON SITE AND SHALL BE EVENLY DISTRIBUTED.
5. VEGETATION PROTECTION AND RESTORATION PER SECTION 1-07.16(2) OF THE STANDARD SPECIFICATIONS SHALL BE INCIDENTAL TO CLEARING AND GRUBBING.

MEASUREMENT AND PAYMENT

REMOVAL AND SALVAGE OF TREES AND SHRUBS SHALL BE CONSIDERED INCIDENTAL TO CLEARING AND GRUBBING.

INSTALLATION OF THE SALVAGED TREES IS DESCRIBED UNDER LOG STRUCTURES SHALL BE INCIDENTAL TO THOSE ITEMS. NO ADDITIONAL COMPENSATION WILL BE ALLOWED.

MEASUREMENT AND PAYMENT FOR CLEARING AND GRUBBING SHALL BE BY THE LUMP SUM CONTRACT PRICE FOR “CLEARING AND GRUBBING”. PAYMENT SHALL BE CONSIDERED FULL COMPENSATION FOR ALL EQUIPMENT, LABOR, TOOLS, MATERIALS, AND INCIDENTALS NECESSARY TO COMPLETE THIS WORK AS SPECIFIED.

ITEM 005 - COFFERDAM AND DIVERSION

THIS ITEM CONSISTS OF PROVIDING AND INSTALLING, MAINTAINING, AND REMOVING MEASURES TO BYPASS THE SURFACE WATERS OF THE STREAM AROUND IN-CHANNEL WORK AREAS, AND TO PREVENT TURBIDITY FROM ENTERING THE RIVER. COFFERDAM LOCATIONS ARE AT LOG STRUCTURE SITES WHERE EXCAVATIONS ARE REQUIRED TO BE ISOLATED FROM SURFACE WATER.

ITEM 005 - COFFERDAM AND DIVERSION (CONT'D)

COFFERDAM CONSTRUCTED OF SHEET PILE SHOWN IN THE PLANS IS ONE ACCEPTABLE METHOD. THE CONTRACTOR MAY USE THIS METHOD OR PROPOSE A DIFFERENT METHOD THAT PROVIDES EQUAL OR BETTER ISOLATION OF THE WORK AREA FROM THE FLOW. IF A DIFFERENT METHOD IS PROPOSED, CONTRACTOR SHALL SUBMIT DRAWINGS SHOWING DETAILS OF PROPOSED METHODS FOR PROVIDING TEMPORARY ISOLATION OF SURFACE WATER DURING CONSTRUCTION ACTIVITIES. REVIEW AND APPROVAL OF THE COFFERDAM PLAN SHALL NOT RELIEVE THE CONTRACTOR FROM FULL RESPONSIBILITY FOR THE ADEQUACY OF COFFERDAM WORK IF THE PROPOSED PLAN IS NOT SUCCESSFUL AT PROPERLY ISOLATING THE WORK AREA. SHEET PILE INSTALLED BY VIBRATORY DRIVER IS A PRE-APPROVED COFFERDAM METHOD. DRIVING SHEET PILE BY IMPACT HAMMER IS NOT ACCEPTABLE.

COFFERDAMS SHALL BE SUITABLY OFFSET FROM WORK AREA SO AS TO NOT INTERFERE WITH LOG PLACEMENT OR LIMIT SCOUR POOL EXCAVATION.

THE WORK INCLUDES COORDINATING WITH THE OWNER FOR FISH SALVAGE AND RELOCATION ACTIVITIES. EXCAVATION OR LOG PLACEMENT SHALL NOT OCCUR UNTIL THE OWNER COMPLETES FISH SALVAGE. THE CONTRACTOR SHALL PROVIDE SUFFICIENT ADVANCE NOTICE TO THE OWNER BEFORE EACH COFFERDAM INSTALLATION DATE. THE CONTRACTOR SHALL PROVIDE OWNER ACCESS TO COFFERDAMS AND SUPPORTING STAFF FOR OWNER'S DEFISHING. THE CONTRACTOR IS ADVISED THAT FISH RESCUE WILL NOT OCCUR ON SATURDAYS OR SUNDAYS AND MAY TAKE SEVERAL HOURS PER COFFERDAM.

MATERIALS

THE CONTRACTOR SHALL PROVIDE ALL REQUIRED MATERIALS FOR THE PROJECT.

SANDBAGS SHALL BE FILLED WITH PEA GRAVEL OR STREAM GRAVEL. USING **SAND WILL NOT BE ALLOWED.**

CONSTRUCTION REQUIREMENTS

THE CONTRACTOR SHALL ISOLATE THE WORK AREA FROM THE RIVER BY INSTALLING COFFERDAM PER THE PLANS. NO TURBIDITY FROM CONSTRUCTION ACTIVITIES SHALL ENTER THE RIVER.

MEASUREMENT AND PAYMENT

“COFFERDAM AND DIVERSION,” INCLUDING THE ABOVE AMENDMENTS TO THE ITEM WILL BE MEASURED BY LUMP SUM. PAYMENT SHALL BE CONSIDERED FULL COMPENSATION FOR ALL EQUIPMENT, LABOR, TOOLS, MATERIALS, AND INCIDENTALS NECESSARY TO COMPLETE THIS WORK AS SPECIFIED FOR THE ENTIRETY OF THE PROJECT. PAYMENT WILL BE MADE IN ACCORDANCE WITH SECTION 1-04.1 FOR THE FOLLOWING BID ITEMS: “COFFERDAM” PER LUMP SUM.

ITEM 006 - PUMPING

THIS ITEM INCLUDES DEWATERING AND CONTROLLING TURBIDITY WITHIN CONSTRUCTION AREAS ISOLATED FROM THE RIVER BY COFFERDAMS. THE WORK CONSISTS OF FURNISHING, MONITORING, OPERATING, MAINTAINING, AND REMOVING PUMPS, COORDINATING WITH THE OWNER FOR FISH SALVAGE RELOCATION ACTIVITIES, AND INSTALLATION OF CONTROL OF WATER BMPs.

MATERIALS

CONTRACTOR SHALL PROVIDE SUFFICIENT SIZE AND NUMBERS OF PUMPS TO DEWATER COFFERDAMS AND CONTROL TURBIDITY FOR THE PROJECT AND ENCOUNTERED FLOWS AND GROUNDWATER CONDITIONS. CONTRACTOR SHALL PROVIDE A MINIMUM OF TWO 3” TRASH PUMPS, OR AS NECESSARY TO PROVIDE PUMPING CAPACITY GREATER THAN 600 GPM, ASSUMING 10 FEET OF VERTICAL LIFT AND 300 FEET OF DISCHARGE HOSE. ADDITIONAL PUMPS SHALL BE PROVIDED BY CONTRACTOR AS NEEDED AT NO ADDITIONAL COST

ITEM 006 - PUMPING (CONT'D)

1. EACH WATER INTAKE SHALL HAVE A FISH SCREEN INSTALLED, OPERATED AND MAINTAINED ACCORDING TO NMFS' FISH SCREEN CRITERIA (NMFS 1997; NMFS 2008). NO PUMPING CAN OCCUR UNTIL FISH SCREEN HAS BEEN APPROVED BY OWNER PRIOR TO INSTALLATION.
2. PUMPS SHALL BE PLACED WITHIN A CONTAINER TO CONTAIN FUEL OR OIL SPILLS. OIL ABSORBENT DIAPERS SHALL BE STORED AT EACH PUMP.
3. THE CONTRACTOR SHALL PROVIDE ENVIRONMENTAL PROTECTION MEASURES SUCH AS STRAW BALES, PERFORATED PIPE FOR DISCHARGE FLOW DISTRIBUTORS, GEOTEXTILES, FILTER BAGS, OR OTHER MEANS OF CONTROLLING DISCHARGE WATER AND TURBIDITY. NO TURBIDITY SHALL BE ALLOWED TO ENTER SURFACE WATERS OR WETLANDS.
4. TO HELP PREVENT TURBIDITY FROM LEAKING THROUGH COFFERDAMS, THE CONTRACTOR SHALL OPERATE PUMP(S) TO LOWER THE WATER SURFACE WITHIN THE ISOLATED AREA AND DISCHARGE TO AN INFILTRATION AREA.

ENVIRONMENTAL PROTECTION MEASURES

TURBIDITY MONITORING AND CORRECTION SHALL CONFORM TO BPA HIP CONSERVATION MEASURES. SEE SHEET 5.

MEASUREMENT AND PAYMENT

“PUMPING,” INCLUDING THE ABOVE AMENDMENTS TO THE ITEM WILL BE MEASURED BY LUMP SUM. PAYMENT SHALL BE CONSIDERED FULL COMPENSATION FOR ALL EQUIPMENT, LABOR, TOOLS, MATERIALS, AND INCIDENTALS NECESSARY TO COMPLETE THIS WORK AND MEET PERFORMANCE CRITERIA AS SPECIFIED FOR THE ENTIRETY OF THE PROJECT. PAYMENT WILL BE MADE IN ACCORDANCE WITH SECTION 1-04.1 OF THE STANDARD SPECIFICATIONS FOR THE FOLLOWING BID ITEMS: “PUMPING” PER LUMP SUM.

ITEM 007 - HELICOPTER LWM PLACEMENT

HELICOPTER TRANSPORT AND PLACEMENT OF LARGE WOODY MATERIAL (LWM) WILL OCCUR AS SHOWN IN THE PLANS. THE OWNER WILL CONTRACT DIRECTLY WITH A HELICOPTER COMPANY TO TRANSPORT LWM FROM THE LWM STOCKPILE AREA. THE HELICOPTER COMPANY WILL PLACE LWM DIRECTLY AS SHOWN IN THE PLANS. IN ADDITION, THE HELICOPTER COMPANY WILL TRANSPORT LWM AND PLACE IN TEMPORARY STOCKPILE AREAS FOR SUBSEQUENT PLACEMENT BY THE CONTRACTOR. TEMPORARY STAGING OF WOOD BY HELICOPTER IS SHOWN IN THE PLANS.

CONTRACTOR SHALL HANDLE AND STAGE LWM AT THE STAGING AREA TO FACILITATE AND EXPEDITE HELICOPTER OPERATIONS. CONTRACTOR SHALL PROVIDE MINIMUM ONE EXCAVATOR AND OPERATOR FOR MINIMUM OF THREE DAYS OF HELICOPTER OPERATIONS. EXCAVATOR SHALL BE SIZED TO EASILY HANDLING DENSE LOGS 24INCH DBH BY 40FEET LONG. CONTRACTOR SHALL OTHERWISE ADJUST SCHEDULE AND EQUIPMENT AND PERSONNEL OPERATIONS TO NOT INTERFERE WITH HELICOPTER FLIGHTS AND PLACEMENTS.

MEASUREMENT AND PAYMENT

NO MEASUREMENT OR PAYMENT SHALL BE MADE TO CONTRACTOR FOR HELICOPTER LWM PLACEMENT. WORK SHALL BE INCIDENTAL TO LOG STRUCTURES.



				NS, CM, DM DRAWN	LS, DM DESIGNED	LS, DM CHECKED
				DM APPROVED	9/22/2023 DATE	200236 PROJECT
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ITEMS 008-014 - LOG STRUCTURES

“LOG STRUCTURES” INCLUDES ALL WORK ASSOCIATED WITH HAULING, HANDLING AND INSTALLATION OF LWM, SALVAGED TREES AND SLASH. THIS ITEM INCLUDES EXCAVATION AND BACKFILL TO PARTIALLY BURY LWM, AND HAUL AND DISPOSAL OF SURPLUS EXCAVATED MATERIAL. COFFERDAM AND PUMPING ARE REQUIRED AT DESIGNATED “LOG STRUCTURES” SHOWN IN THE PLANS.

“LOG STRUCTURES” INCLUDE:

- ITEM 008 - APEX JAM
- ITEM 009 - DEFLECTOR JAM
- ITEM 010 - BANK BURIED MARGIN JAM
- ITEM 011 - HABITAT COVER STRUCTURE
- ITEM 012 - PILE (VERTICAL LOG) BALLASTED ROUGHNESS LOGS
- ITEM 013 - FLOODPLAIN ROUGHNESS WOOD (LOGS)
- ITEM 014 - VERTICAL LOGS (PILES): TO STABILIZE FLOODPLAIN ROUGHNESS WOOD, EXISTING JAMS AND HELICOPTER PLACED WOOD

MATERIALS

LOG STRUCTURES SHALL BE CONSTRUCTED OF LARGE WOODY MATERIAL (LWM), EXCAVATION AND BACKFILL, SALVAGED SLASH, SALVAGED TREE TOPS, WHOLE TREES. BOLTED CONNECTIONS SHALL BE INSTALLED PER PLANS. LWM INCLUDES: LOGS WITH ROOTWADS, LOGS WITHOUT ROOTWADS, AND VERTICAL LOGS. LWM IS SUPPLIED BY THE OWNER AND IS DECKED AT THE LWM STAGING AREAS AS SHOWN ON THE PLANS.

OWNER SUPPLIED LWM WILL HAVE THE FOLLOWING CHARACTERISTICS:

1. LOGS WITH ROOTWADS: 40' LONG AND 18"-24" DBH.
2. LOGS WITHOUT ROOTWADS: 40' LONG AND ~18"-24" DBH.
3. VERTICAL LOGS: 30' LONG AND 15" DIAMETER IN MIDDLE OF LOG.

SLASH: INCLUDES SHRUBS, TREES <12" DBH AND TREE TOPS REMOVED FROM ACCESS ROUTES AND EXCAVATION AREAS. SALVAGED TREE: INCLUDES TREES >12" DBH REMOVED FROM ACCESS ROUTES AND EXCAVATION AREAS.

CONSTRUCTION REQUIREMENTS

LOCATIONS FOR PLACEMENT AND DETAILS OF CONSTRUCTION FOR EACH STRUCTURE TYPE ARE SHOWN IN THE PLANS. FINAL LOCATION AND INSTALLATION WILL DEPEND UPON THE SIZE, SHAPE AND QUANTITY OF MATERIAL DELIVERED OR SALVAGED. INSTALLATION OF LWM SHALL BE UNDERSTOOD TO REQUIRE A “FIT IN THE FIELD” APPROACH AS DIRECTED BY THE OWNER. LWM SHALL BE STABILIZED BY PARTIAL BURIAL, BRACING AGAINST VERTICAL LOGS AND BRACING AGAINST EXISTING TREES OR BOULDERS AS SHOWN IN THE PLANS.

VERTICAL LOGS (PILES): CONSTRUCTION OF VERTICAL LOGS SHALL INCLUDE ON-SITE MOVEMENT AND INSTALLATION OF VERTICAL LOGS TO DESIGNATED SITES SHOWN IN THE PLANS. VERTICAL LOGS SHALL BE PER THE APPROXIMATE NUMBERS AND QUANTITIES INDICATED ON THE PLANS. SPECIFIC LOCATIONS SHALL BE DETERMINED IN THE FIELD AND DIRECTED BY THE OWNER. THE REQUIRED EMBEDMENT DEPTH IS INDICATED ON THE PLANS. EACH VERTICAL LOG SHALL HAVE A "BROKEN TOP" BY STUMP-GRINDING OR MAKING MULTIPLE PLUNGE CUTS WITH CHAIN SAW TO PROVIDE A ROUGHENED OR RAGGED END.

VERTICAL LOGS SHALL BE INSTALLED BY VIBRATORY PILE DRIVER MEETING OR EXCEEDING THE FOLLOWING CHARACTERISTICS:

- a. MINIMUM OF 800 KN (80 TONS) OF CENTRIFUGAL FORCE.
- b. SIDE GRIP WITH MINIMUM 16” SPACE BETWEEN ENDS OF JAWS SO

THAT 16” DIAMETER LOG WILL FIT INTO THE JAWS WITHOUT NEEDING TO SLIDE THE GRIP OVER THE END AND DOWN THE LOG.

c. PRE-APPROVED PILE DRIVERS INCLUDE: MOVAX SP-80, GRIZZLY MG90, OR EQUIVALENT.

TESTING: AT EACH LOG STRUCTURE SITE, A MINIMUM OF ONE VERTICAL LOG SHALL BE TESTED FOR PULLOUT RESISTANCE. EACH TEST WILL REQUIRE UP TO FOUR INDIVIDUAL PULLS, EACH AT A DEEPER DEPTH. SEE DETAILS IN PLANS. THE CONTRACTOR SHALL PROVIDE THE TENSION LINK, METER, AND ASSOCIATED HARDWARE (RATED 12 TON).

SALVAGED SLASH: SHALL BE INCORPORATED INTO LOG STRUCTURES AS SHOWN IN THE PLANS AND DIRECTED BY THE OWNER. INTERMINGLE, STACK, AND RACK SLASH MATERIAL TO THE INSTALLED LWM AND VERTICAL LOGS TO EMULATE NATURAL ACCUMULATIONS OF WOOD MATERIAL.

SALVAGED TREE: ANY TREES CLEARED FOR ACCESS OR ALREADY DOWNED TREES IMMEDIATELY ADJACENT TO CONSTRUCTION SITE AND REQUIRING MOVEMENT FOR SITE ACCESS MAY BE INCORPORATED, AS DIRECTED BY THE OWNER. SALVAGED TREE TOPS MAY BE USED AS SLASH.

EARTHWORK: WHERE PARTIAL BURIAL OF LWM IS REQUIRED, EXCAVATE TO SUBGRADE AND STOCKPILE MATERIAL WITHIN THE DESIGNATED DISTURBANCE AREA. SORT MATERIALS BY GENERAL SIZES, SEPARATING PILES FOR COARSE AND FINE MATERIAL. BACKFILL THE LWM AS EACH LAYER IS INSTALLED. USE COARSE FILL ALONG EXTERIOR OF FILL ZONE AND ALONG WATERWARD EDGE, AND FINER MATERIALS WITHIN INTERIOR OF FILL ZONE. WHERE POOL EXCAVATION IS INCLUDED, EXCAVATED MATERIAL SHALL BE SALVAGED AND PLACED AS BACKFILL IN LWM STRUCTURE. BACKFILL ALONG WATERWARD EDGE SHALL BE LAYERED WITH SLASH WITH LIFTS NO THICKER THAN 18INCHES AND BUCKET COMPACTED. SLASH SHALL EXTEND 6FT MINIMUM INTO FILL. BACKFILL THE LOGS AS EACH LAYER IS INSTALLED. A CULTURAL STAFF PERSON WILL BE PRESENT ON SITE DURING ALL EXCAVATION ACTIVITIES.

BOLTED CONNECTIONS SHALL BE INSTALLED AS NOTED ON DETAILS. BOLTS SHALL BE INSTALLED PER PLANS OR AS DIRECTED BY OWNER.

AT PROJECT COMPLETION, CONTRACTOR SHALL RESTORE THE LWM STAGING AREAS BY REMOVING DEBRIS AND GRADING SMOOTH AND BLENDING TO EXISTING TOPOGRAPHY.

MEASUREMENT AND PAYMENT

MEASUREMENT AND PAYMENT SHALL BE MADE PER EACH STRUCTURE FOR:

- ITEM 008 - APEX JAM
- ITEM 009 - DEFLECTOR JAM
- ITEM 010 - BANK BURIED MARGIN JAM
- ITEM 011 - HABITAT COVER STRUCTURE
- ITEM 012 - PILE (VERTICAL LOG) BALLASTED ROUGHNESS LOGS
- ITEM 013 - FLOODPLAIN ROUGHNESS WOOD (LOGS)
- ITEM 014 - VERTICAL LOGS (PILES): TO STABILIZE FLOODPLAIN ROUGHNESS WOOD, EXISTING JAMS AND HELICOPTER PLACED WOOD

THE CONTRACT PRICE FOR “LOG STRUCTURE” SHALL BE FULL COMPENSATION FOR ALL COSTS INCURRED FOR EQUIPMENT, MATERIALS AND LABOR FOR HANDLING, LOADING AND HAULING LWM FROM STOCKPILE AREAS, EXCAVATING TO SUBGRADE, SELECTIVE HANDLING OF EXCAVATED MATERIALS AND BACKFILL, INSTALLING AND SECURING LWM, VERTICAL LOGS, SLASH AND SALVAGED TREE TOPS AS OUTLINED IN THE PLANS. EARTHWORK, **LWM HANDLING OF HELICOPTER STAGED LARGE WOOD**, HAUL AND DISPOSAL OF FILL AND INSTALLING SLASH AND SALVAGED TREES SHALL BE INCIDENTAL TO “LOG STRUCTURE”.

ITEM 015 - WILLOW TUBELINGS

WILLOW TUBELINGS SHALL BE INSTALLED AS SHOWN ON THE PLANS. WILLOW TUBELINGS SHALL BE PLACED AT 4 FT SPACING ALONG ALIGNMENTS PERPENDICULAR TO ANTICIPATED FLOW. ALIGNMENTS OF WILLOW TUBELINGS SHALL BE SPACED AT 10-FT INTERVALS. LIVE WILLOW TUBELINGS WILL BE PROVIDED AND MAINTAINED BY THE OWNER AT A PROJECT STAGING AREA TO BE DESIGNATED BY THE OWNER, ON THE DAY OF INSTALLATION THE CONTRACTOR SHALL RECEIVE TUBELINGS FROM OWNER AND SHALL HANDLE, WATER, AND INSTALL PER SUPPLIER'S SPECIFICATIONS. CONTRACTOR SHALL USE MINIMUM SIZED BUCKET FOR EXCAVATION AND BACKFILL. CONTRACTOR SHALL HANDLE AND INSTALL TO MINIMIZE DAMAGE TO WILLOW TUBELINGS. DAMAGED TUBELINGS SHALL BE REPLACED AT CONTRACTOR'S EXPENSE.

MEASUREMENT AND PAYMENT FOR WILLOW TUBELINGS SHALL BE PER EACH INSTALLED WILLOW TUBELING CONFORMING TO PLANS, SPECIFICATIONS AND SUPPLIER'S SPECIFICATIONS AND RECOMMENDATIONS. THE CONTRACT PRICE FOR “WILLOW TUBELINGS” SHALL BE FULL COMPENSATION FOR ALL COSTS INCURRED FOR EQUIPMENT, MATERIALS AND LABOR.

ITEM 016 - OPERATIONS WITHIN BNSF RIGHT OF WAY

CONTRACTOR SHALL OBTAIN AND PAY FOR ALL COSTS ASSOCIATED WITH NECESSARY PERMITS, CERTIFICATIONS, INSURANCE AND OTHER BNSF REQUIREMENTS FOR OPERATIONS WITHIN BNSF RIGHT OF WAY (SHEETS 17 AND 18).

CONTRACTOR SHALL PROVIDE PAYMENT FOR BNSF RAIL FLAGGER FOR MINIMUM THREE DAYS OF FLAGGING AT APPROXIMATELY \$1,800/DAY.

CONTRACTOR SHALL OBTAIN BNSF TEMPORARY OCCUPANCY PERMIT AND/OR CONTRACTOR RIGHT OF WAY ENTRY PERMITTING FEE IS APPROXIMATELY \$2,500.

CONTRACTOR SHALL PROVIDE PROTECTIVE LIABILITY INSURANCE AS REQUIRED BY BNSF.

CONTRACTOR PERSONNEL OPERATING WITHIN BNSF RIGHT OF WAY SHALL OBTAIN SAFETY TRAINING AND CERTIFICATION AVAILABLE THROUGH BNSF.RAILPERMITTING.COM

CONTRACTOR WILL WORK WITH OWNER AND BNSF REPRESENTATIVE IMMEDIATELY UPON REWARD OF CONSTRUCTION CONTRACT.

ITEM 017 - REMOVAL AND DISPOSAL OF CAMPER

A DERELICT CAMPER TRAILER LOCATED AT THE CHURCH CAMP STAGING AREA SHALL BE REMOVED AND DISPOSED OF OFFSITE. THE CAMPER CONTAINS ASBESTOS AS REPORTED BY ASBESTOS CENTRAL, LLC. REPORT IS AVAILABLE FROM THE YAKAMA NATION UCHRP. CONTRACTOR SHALL CONTRACT WITH A LICENSED ABATEMENT COMPANY FOR LEGAL REMOVAL AND DISPOSAL OF ASBESTOS. CONTRACTOR SHALL ATTAIN WRITTEN DOCUMENTATION OF ASBESTOS ABATEMENT. CONTRACTOR SHALL HAUL AND DISPOSE OF TRAILER IN LEGAL OFFSITE LOCATION.



NO.	BY	DATE	REVISION DESCRIPTION

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DM	9/22/2023	200236
APPROVED	DATE	PROJECT

UPPER NASON CREEK RESTORATION  
PHASE 2 FINAL DESIGN  
YAKAMA NATION FISHERIES



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SPECIFICATIONS (3 OF 3)

SHEET  
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