

SILVER FALLS PROJECT AREA

Exhibit "E" *Final Design*

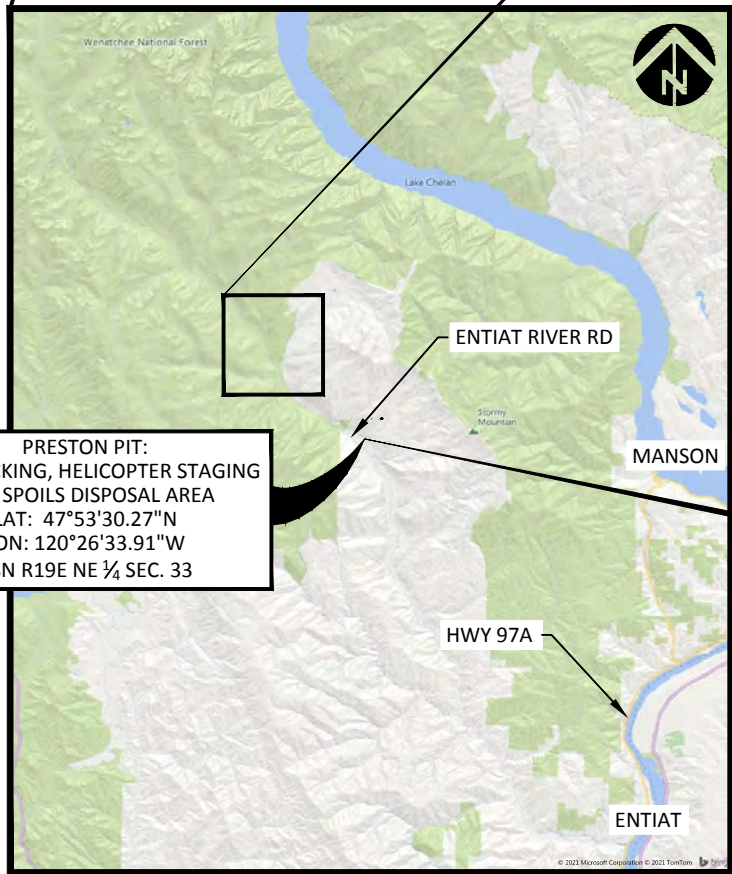
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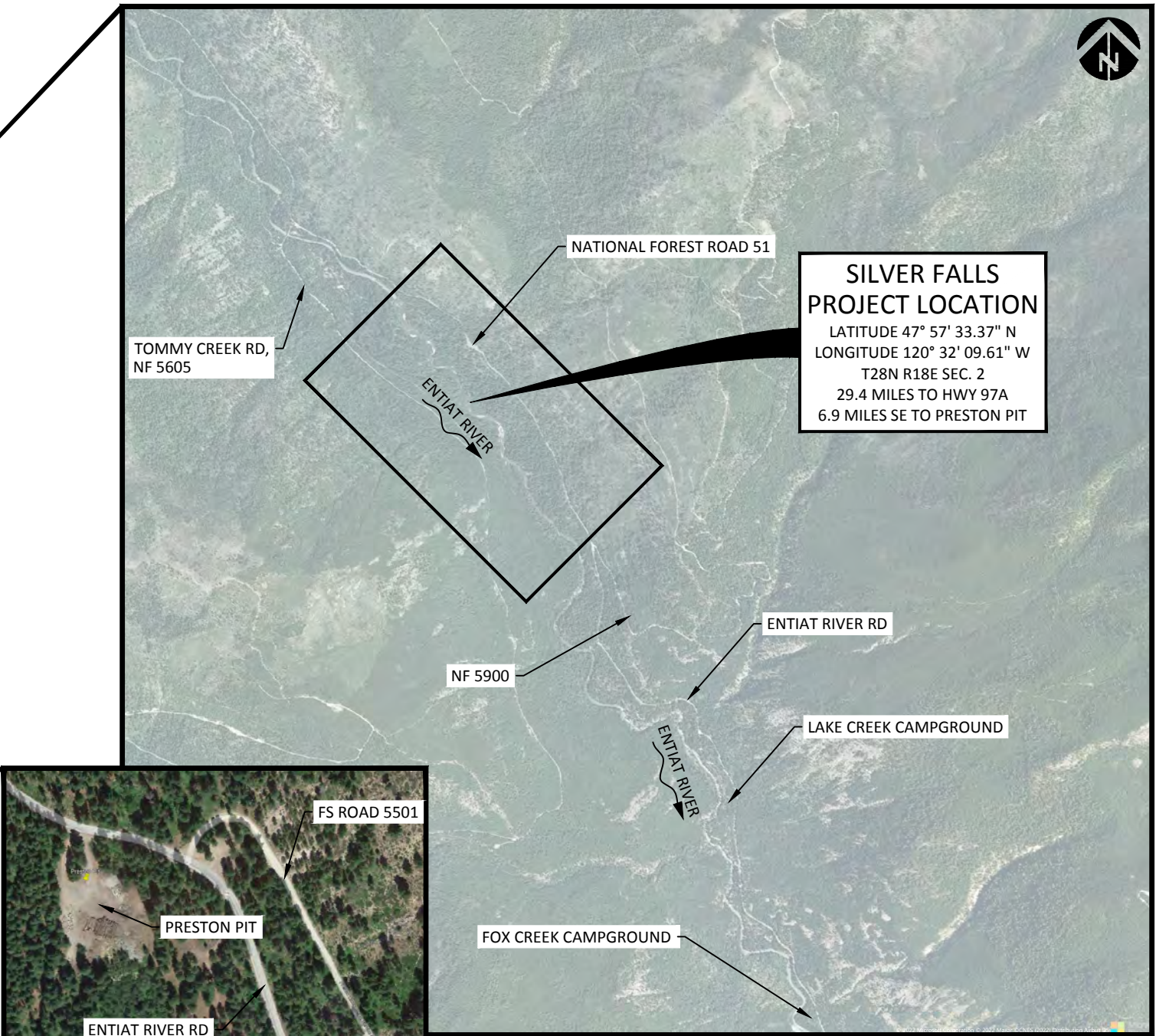
YAKAMA NATION FISHERIES
1885 S. WENATCHEE AVE.
WENATCHEE, WA. 98801

SHEET INDEX

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VICINITY MAP
SCALE 1" = 40000'



SITE MAP
SCALE 1" = 3,000'



PRESTON PIT
NTS

PRESTON PIT:
LWM DECKING, HELICOPTER STAGING
AND SPOILS DISPOSAL AREA
LAT: 47°53'30.27"N
LON: 120°26'33.91"W
T8N R19E NE ¼ SEC. 33

NO.	DATE	REVISION DESCRIPTION	CP	DM	DM, MR
			DRAWN	DESIGNED	CHECKED
			DM	5/13/2022	20-02-35
			APPROVED	DATE	PROJECT

Silver Falls Project Area
Yakama Nation Fisheries Program
Entiat River, Chelan County



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

COVER SHEET, VICINITY
MAPS, & SHEET INDEX

SHEET
1 OF 21



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.

L. STATE AND FEDERAL PERMITS.

3. ALL APPLICABLE REGULATORY PERMITS AND OFFICIAL PROJECT AUTHORIZATIONS WILL BE OBTAINED BEFORE PROJECT IMPLEMENTATION.
3. 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.
3. 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.

1. 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.
3. 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.

- 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.

- G. EXISTING STREAM CROSSINGS OR BEDROCK WILL BE PREFERENTIALLY USED WHENEVER REASONABLE, AND THE NUMBER OF TEMPORARY STREAM CROSSINGS WILL BE MINIMIZED.
- H. 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.
- I. 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.

- 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. EQUIPMENT WILL BE REFUELED IN A VEHICLE STAGING AREA OR IN AN ISOLATED HARD ZONE, SUCH AS A PAVED PARKING LOT OR ADJACENT, ESTABLISHED ROAD (THIS MEASURE APPLIES ONLY TO GAS-POWERED EQUIPMENT WITH TANKS LARGER THAN 5 GALLONS).
- 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.

			CP	DM	DM, MR	<div> <div>Silver Falls Project Area</div> <div>Yakama Nation Fisheries Program</div> <div>Entiat River, Chelan County</div> </div>	 <div> 501 Portway Avenue, Suite 101 Hood River, OR 97031 541.386.9003 www.interfluve.com </div>	<div>HIP GENERAL</div> <div>CONSERVATION MEASURES</div> <div>1 OF 3</div>	SHEET	
			DRAWN	DESIGNED	CHECKED				2 OF 21	
			DM	5/13/2022	20-02-35					
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WORK AREA ISOLATION AND FISH SALVAGE (CONTINUED).

DEWATERING.

- A. DEWATERING WILL OCCUR AT A RATE SLOW ENOUGH TO ALLOW SPECIES TO NATURALLY MIGRATE OUT OF THE WORK AREA.
- B. WHERE A GRAVITY FEED DIVERSION IS NOT POSSIBLE, A PUMP MAY BE USED. PUMPS WILL BE INSTALLED TO AVOID REPETITIVE DEWATERING AND REWATERING.
- C. WHEN FISH ARE PRESENT, PUMPS WILL BE SCREENED IN ACCORDANCE WITH NMFS FISH SCREEN CRITERIA. NMFS ENGINEERING REVIEW AND APPROVAL WILL BE OBTAINED FOR PUMPS EXCEEDING 3 CUBIC FEET PER SECOND.
- D. DISSIPATION OF FLOW ENERGY AT THE BYPASS OUTFLOW WILL BE PROVIDED TO PREVENT DAMAGE TO THE STREAM CHANNEL AND RIPARIAN VEGETATION.
- E. SEEPAGE WATER WILL BE PUMPED TO A TEMPORARY STORAGE AND TREATMENT SITE OF INTO UPLAND AREAS TO ALLOW WATER TO PERCOLATE THROUGH SOIL AND VEGETATION PRIOR TO REENTERING THE STREAM CHANNEL.

CONSTRUCTION AND POST CONSTRUCTION CONSERVATION MEASURES.

FISH PASSAGE.

- A. FISH PASSAGE WILL BE PROVIDED FOR ADULT AND JUVENILE FISH LIKELY TO BE PRESENT DURING CONSTRUCTION UNLESS PASSAGE DID NOT EXIST BEFORE CONSTRUCTION, THE STREAM IS NATURALLY IMPASSABLE, OR PASSAGE WILL NEGATIVELY IMPACT ESA-LISTED SPECIES OR THEIR HABITAT.
- B. FISH PASSAGE ALTERNATIVES WILL BE APPROVED BY THE BPA EC LEAD UNDER ADVISEMENT BY THE NMFS HABITAT BIOLOGIST.

CONSTRUCTION AND DISCHARGE WATER.

- A. SURFACE WATER MAY BE DIVERTED TO MEET CONSTRUCTION NEEDS ONLY IF DEVELOPED SOURCES ARE UNAVAILABLE OR INADEQUATE.
- B. DIVERSIONS WILL NOT EXCEED 10% OF THE AVAILABLE FLOW.
- C. CONSTRUCTION DISCHARGE WATER WILL BE COLLECTED AND TREATED TO REMOVE DEBRIS, NUTRIENTS, SEDIMENT, PETROLEUM HYDROCARBONS, METALS, AND OTHER POLLUTANTS.

TIME AND EXTENT OF DISTURBANCE

- A. EARTHWORK REQUIRING IN-STREAM MECHANIZED EQUIPMENT (INCLUDING DRILLING, EXCAVATION, DREDGING, FILLING, AND COMPACTING) WILL BE COMPLETED AS QUICKLY AS POSSIBLE.
- B. MECHANIZED EQUIPMENT WILL WORK FROM TOP OF BANK UNLESS WORK FROM ANOTHER LOCATION WILL RESULT IN LESS HABITAT DISTURBANCE (TURBIDITY, VEGETATION DISTURBANCE, ETC.).

CESSATION OF WORK.

- 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.

SITE RESTORATION.

- 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.

REVEGETATION.

- A. PLANTING AND SEEDING WILL OCCUR PRIOR TO OR AT THE BEGINNING OF THE FIRST GROWING SEASON AFTER CONSTRUCTION.
- B. A MIX OF NATIVE SPECIES (INVASIVE SPECIES NOT ALLOWED) APPROPRIATE TO THE SITE WILL BE USED TO REESTABLISH VEGETATION, PROVIDE SHADE, AND REDUCE EROSION. REESTABLISHED VEGETATION SHOULD BE AT LEAST 70% OF PRE-PROJECT CONDITIONS WITHIN THREE YEARS.
- C. VEGETATION SUCH AS WILLOWS, SEDGES, OR RUSH MATS WILL BE SALVAGED FROM DISTURBED OR ABANDONED AREAS TO BE REPLANTED.
- D. SHORT-TERM STABILIZATION MEASURE MAY INCLUDE THE USE OF NON-NATIVE STERILE SEED MIX (WHEN NATIVE NOT AVAILABLE), WEED-FREE CERTIFIED STRAW, OR OTHER SIMILAR TECHNIQUES.
- E. SURFACE FERTILIZER WILL NOT BE APPLIED WITHIN 50 FEET OF ANY STREAM, WATE BODY, OR WETLAND.
- F. FENCING WILL BE INSTALLED AS NECESSARY TO PREVENT ACCESS TO REVEGETATED SITES BY LIVESTOCK OR UNAUTHORIZED PERSONS.
- G. INVASIVE PLANTS WILL BE REMOVED OR CONTROLLED UNTIL NATIVE PLANT SPECIES ARE WELL ESTABLISHED (TYPICALLY THREE YEARS
- H. POST-CONSTRUCTION).

SITE ACCESS AND IMPLEMENTATION MONITORING.

- A. THE PROJECT SPONSOR WILL PROVIDE CONSTRUCTION MONITORING DURING IMPLEMENTATION TO ENSURE ALL CONSERVATION MEASURES ARE ADEQUATELY FOLLOWED, EFFECTS TO LISTED SPECIES ARE NOT GREATER THAN PREDICTED, AND INCIDENTAL TAKE LIMITATIONS ARE NOT EXCEEDED.
- B. THE PROJECT SPONSOR OR DESIGNATED REPRESENTATIVE WILL SUBMIT THE PROJECT COMPLETION FORM (PCF) WITHIN 30 DAYS OF PROJECT COMPLETION.

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.


STAGED REWATERING PLAN.

- 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.

TURBIDITY MONITORING.

- A. RECORD THE READING, LOCATION, AND TIME FOR THE BACKGROUND READING APPROXIMATELY 100 FEET UPSTREAM OF THE PROJECT AREA USING A RECENTLY CALIBRATED TURBIDIMETER OR VIA VISUAL OBSERVATION (SEE THE HIP HANDBOOK TURBIDITY MONITORING SECTION FOR A VISUAL OBSERVATION KEY).
- B. RECORD THE TURBIDITY READING, LOCATION, AND TIME AT THE MEASUREMENT COMPLIANCE LOCATION POINT.
 1. 50 FEET DOWNSTREAM FOR STREAMS LESS THAN 30 FEET WIDE.
 2. 100 FEET DOWNSTREAM FOR STREAMS BETWEEN 30 AND 100 FEET WIDE.
 3. 200 FEET DOWNSTREAM FOR STREAMS GREATER THAN 100 FEET WIDE.
 4. 300 FEET FROM THE DISCHARGE POINT OR NONPOINT SOURCE FOR LOCATIONS SUBJECT TO TIDAL OR COASTAL SCOUR.
- C. TURBIDITY SHALL BE MEASURED (BACKGROUND LOCATION AND COMPLIANCE POINTS) EVERY 4 HOURS WHILE WORK IS BEING IMPLEMENTED.
- D. 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.
- E. IF EXCEEDANCES OCCUR FOR MORE THAN TWO CONSECUTIVE MONITORING INTERVALS (AFTER 8 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.
- F. 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).
- G. CONTROL FAILURES WILL BE PERMITTED TO THE BPA EC LEAD USING THE PROJECT COMPLETION FORM (PCF).

			CP	DM	DM, MR	<p align="center">Silver Falls Project Area Yakama Nation Fisheries Program Entiat River, Chelan County</p>  <p>501 Portway Avenue, Suite 101 Hood River, OR 97031 541.386.9003 www.interfluve.com</p>	<p align="center">HIP GENERAL CONSERVATION MEASURES 3 OF 3</p>	<p align="center">SHEET 4 OF 21</p>	
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IT IS STRONGLY SUGGESTED THAT THE CONTRACTOR ATTEND A PRE-BID SITE MEETING.

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

ALL WORK SHALL CONFORM TO THE 2022 EDITION OF STANDARD PLANS AND SPECIFICATIONS OF THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT), AND CURRENT LOCAL STANDARDS UNLESS INDICATED OTHERWISE BY THE CONTRACT DOCUMENTS. IN CASE OF A CONFLICT BETWEEN THE REGULATORY STANDARDS OR SPECIFICATIONS, THE MORE STRINGENT SHALL PREVAIL.

IN CASE OF DISCREPANCY, BETWEEN NOTES, LOCAL REGULATIONS, OR OTHER CONTRACT DOCUMENTATION, CONTRACTOR SHALL OBTAIN CLARIFICATION/DIRECTION FROM OWNER.

EXISTING DATA

TOPOGRAPHIC SURVEY IS REFERENCED TO NAD83 WASHINGTON STATE PLANE, NORTH ZONE US FEET NAVD 88.

HYDRAULIC MODELING BY INTER-FLUVE USING USACE HEC-RAS (5.0.7).

SOILS

ENTIAT RIVER ALLUVIUM (BOULDER/COBBLE/GRAVEL/SAND) AND FLOODPLAIN SOILS (SILT/SAND).

WETLANDS DELINEATION BY HAMER ENVIRONMENTAL (JUNE 2021)

UTILITIES

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

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

LARGE WOODY MATERIAL

IMPORTED LOGS WILL BE PROVIDED BY THE OWNER AND ARE DECKED AT THE PRESTON PIT. CARE SHALL BE EXERCISED TO PRESERVE ROOTS.

LOGS PLACED AND TRANSPORTED FOR TEMPORARY STAGING ON SITE BY HELICOPTER ARE NOTED IN THE PLANS. REMAINING LOGS SHALL BE TRANSPORTED TO THE SITE BY THE CONTRACTOR.

CONTRACTOR SHALL ALLOW TIME FOR HELICOPTER COMPANY TO PLACE LWM AND STAGE LWM FOR CONTRACTOR'S USE IN CONSTRUCTION OF LWM STRUCTURES.

HELICOPTER LWM PLACEMENT PLANNING MAP WILL BE PROVIDED TO CONTRACTOR.

WHOLE TREE TIPPING: WILL BE COMPLETED BY OTHERS UNDER SEPARATE CONTRACT.

CONSTRUCTION ACCESS

THE CONTRACTOR IS ADVISED THAT ACCESS TO THE SITE WILL BE BY RURAL AND FOREST SERVICE ROADS OF LIMITED WIDTH.

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

THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADHERING TO THE CONSERVATION MEASURES DETAILED IN THE FOREST SERVICE ROAD USE PERMIT.

CONSTRUCTION STAKING

THE OWNER OR DESIGNATED REPRESENTATIVE WILL INSTALL STAKES AND OR FLAGGING TO DELINEATE WETLANDS, EQUIPMENT ENTRY AND EXIT POINTS, STAGING AND STOCKPILE AREAS, AND PROJECT LIMITS. THE OWNER WILL INSTALL GRADE STAKES, AND ELEVATION CONTROL POINTS. THE CONTRACTOR SHALL BE RESPOSIBLE FOR REPLACING DAMAGED OR MISSING STAKES.

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.

SOME FIELD ADJUSTMENTS TO THE LINES AND GRADES ARE TO BE EXPECTED. LOCATION, ALIGNMENT, AND ELEVATION OF LOGS AND LOGS WITH ROOTWADS ARE SUBJECT TO ADJUSTMENT BASED ON FIELD CONDITIONS, AND MATERIAL SIZE.

ABBREVIATIONS

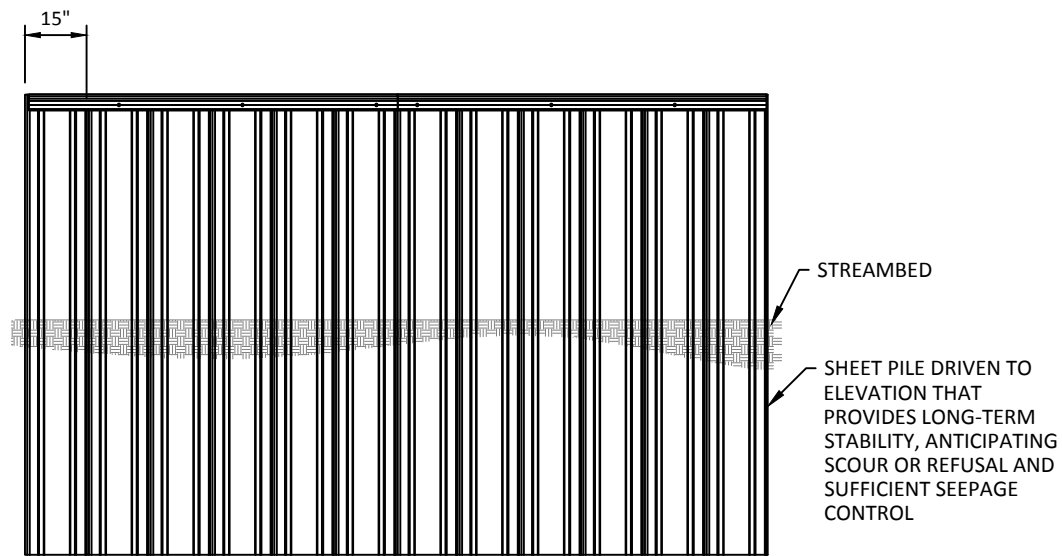
APPROX	APPROXIMATE	INV	INVERT
CY	CUBIC YARDS	LWM	LARGE WOODY MATERIAL
°	DEGREES	MAX	MAXIMUM
DIA or Ø	DIAMETER	MIN	MINIMUM
DBH	DIAMETER AT BREAST HEIGHT	OHW	ORDINARY HIGH WATER
EA	EACH	%	PERCENT
EL or ELEV	ELEVATION	RMx	RIVER MILE x
ESC	EROSION AND SEDIMENT CONTROL	STA	STATION
EXIST	EXISTING	TBD	TO BE DETERMINED
FT or '	FEET	TYP	TYPICAL
FTR	FULLY THREADED ROD	VERT	VERTICAL
HORIZ	HORIZONTAL	WSE	WATER SURFACE ELEVATION
IN or "	INCH	YR	YEAR

Description	Quantity	Units	Notes
Helicopter LWM placement	1	LS	Owner provided logs at Preston Pit: 80 placed plus 122 decked. Contractor shall handle LWM at Preston Pit in support of Helicopter transport and placement.
Tree tipping into channel	1	LS	Tip 36 existing standing trees; by others
Deflector jam structure	3	EA	Install Owner provided logs and salvaged slash and trees
7-log apex jam structure	3	EA	Install Owner provided logs and salvaged slash and trees
5-log apex jam structure	1	EA	Install Owner provided logs and salvaged slash and trees
Bank buried margin jam structure	8	EA	Install Owner provided logs and salvaged slash and trees
Side channels 6 and 7: grading excavation and haul			
Temporary bridge crossing	1	LS	70ft clear span, minimum 1.0ft of free board
Side channel 6 Inlet excavation and haul	235	CY	Haul offsite: dispose and grade at Preston Pit
Side channel 7 Inlet excavation and haul	10	CY	Place with inlet apex jam backfill
Gravel trail reconstruction	2050	LF	Gravel trail: fabric, base and surface course and timber edge
Optional additive alternate items: requires YN approval in writing before implementing			
Apex Jam ballast boulders	35	EA	Salvaged/imported 4ft diameter ballast boulders in Apex Jam at Owner's direction.
Imported boulder backfill	125	CY	Haul cobble to medium boulder sized material from Preston Pit stockpile, install in
			Apex Jam backfill
Imported substrate	100	CY	Assume 100 cy; size TBD based on need, assume 12" minus well graded alluvium.
Campground road asphalt repair/replacement	334	SY	Assume 15ft x 200ft section; base and top course w/3 inch pavement thickness
Campground road gravel repair/replacement	280	CY	Assume 12ft x 3inch x 2,500ft crushed surfacing top course 3/8" minus, bladed,
			compacted

NOTE:

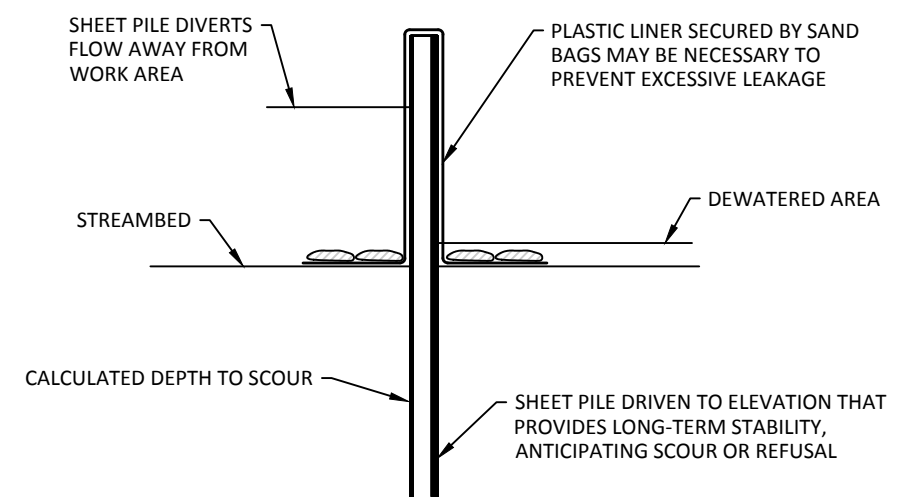
SILVER FALLS QUANTITY SUMMARY TABLE

UNLESS SPECIFIED IN DETAILS,
ALL LOGS WITH ROOTWADS SHALL BE 18" DBH X 40' LONG
ALL LOGS WITHOUT ROOTWADS SHALL BE 18" DBH X 40' LONG



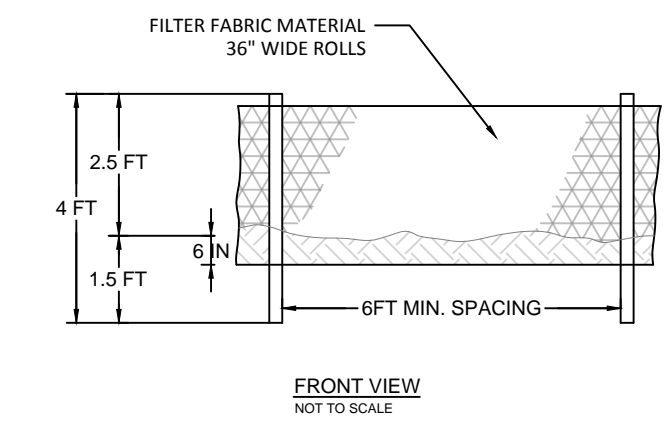
NOTE:
INDIVIDUAL SHEET WEIGHT 45 LBS PER LINEAR FOOT

ELEVATION

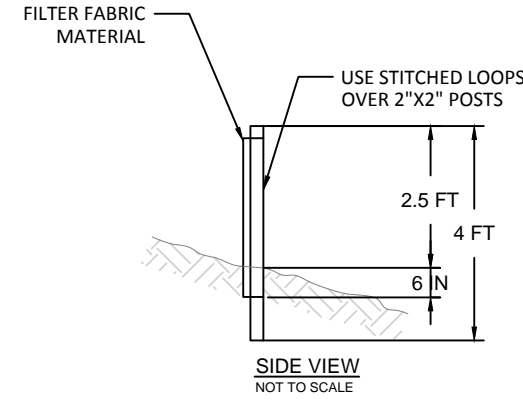


SECTION

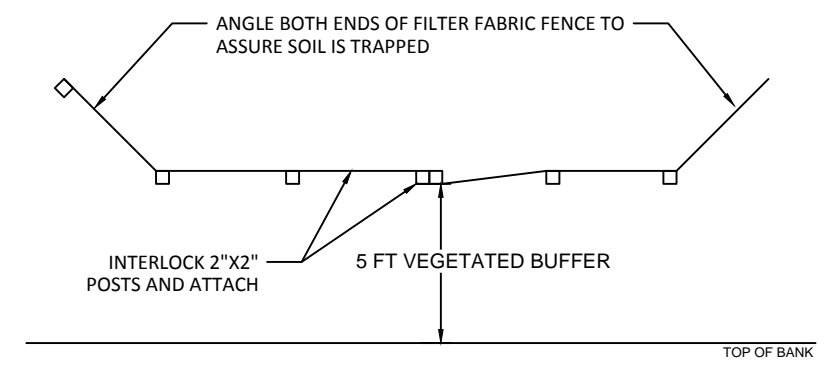
1 TYP TYPICAL DETAIL - SHEET PILE
NOT TO SCALE



FRONT VIEW
NOT TO SCALE



SIDE VIEW
NOT TO SCALE

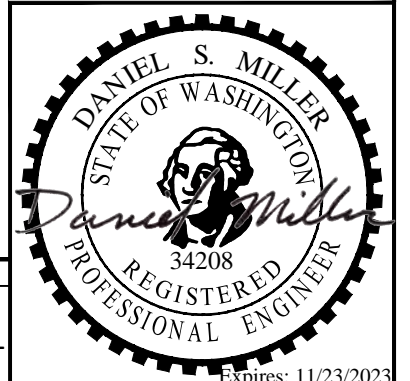


PLAN VIEW
NOT TO SCALE

2 TYP TYPICAL DETAIL - SILT FENCE
NOT TO SCALE

SILT FENCE NOTES

1. THE FILTER FABRIC SHALL BE PURCHASED IN A CONTINUOUS ROLL CUT TO THE LENGTH OF THE BARRIER TO AVOID USE OF JOINTS. WHEN JOINTS ARE NECESSARY, FILTER CLOTH SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT POST, WITH A MINIMUM 6 INCH OVERLAP, AND BOTH ENDS SECURELY FASTENED TO THE POST. ALTERNATIVELY, OVERLAP AND INTERLOCK TWO POSTS WITH ATTACHED FABRIC AS APPROVED BY THE OWNER'S REPRESENTATIVE.
2. THE SILT FENCE IS TO BE INSTALLED AT LOCATIONS SHOWN ON THE PLAN ALONG THE DOWNHILL PERIMETER OF DISTURBED AREAS. THE FENCE POST SHALL BE SPACED A MAXIMUM OF 6 FEET APART AND DRIVEN SECURELY INTO THE GROUND A MINIMUM OF 24 INCHES APART.
3. THE FILTER FABRIC 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 THE OWNER'S REPRESENTATIVE.



NO.	DATE	REVISION DESCRIPTION

CP	DM	DM, MR
DRAWN	DESIGNED	CHECKED
DM	5/13/2022	20-02-35
APPROVED	DATE	PROJECT

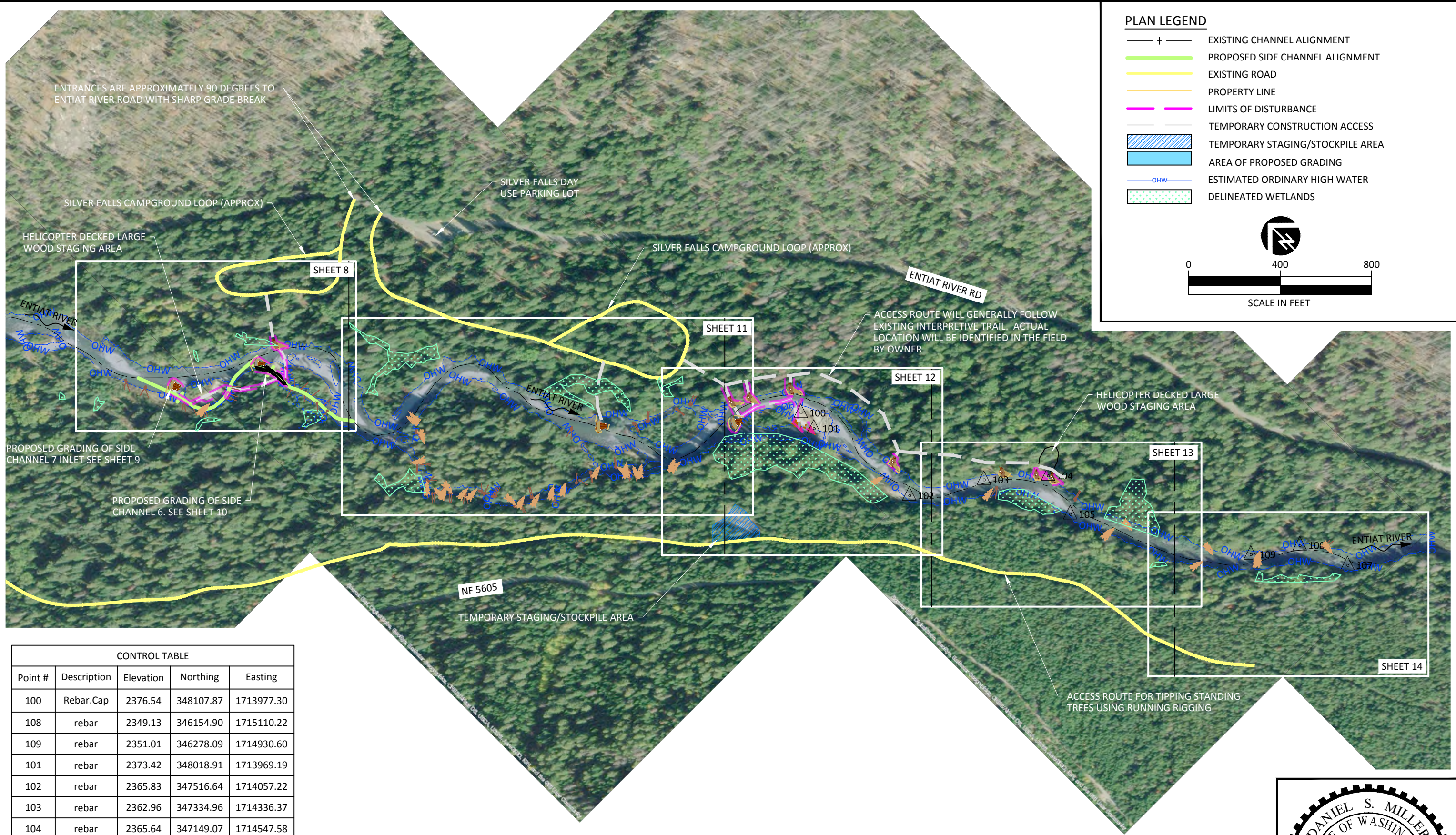
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**STREAM DIVERSION
ESCP BMPS**

SHEET
6 OF 21

Expires: 11/23/2023



CONTROL TABLE				
Point #	Description	Elevation	Northing	Easting
100	Rebar.Cap	2376.54	348107.87	1713977.30
108	rebar	2349.13	346154.90	1715110.22
109	rebar	2351.01	346278.09	1714930.60
101	rebar	2373.42	348018.91	1713969.19
102	rebar	2365.83	347516.64	1714057.22
103	rebar	2362.96	347334.96	1714336.37
104	rebar	2365.64	347149.07	1714547.58
105	rebar	2359.19	346961.02	1714496.67
107	rebar	2346.92	345945.89	1715196.69

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SILVER FALLS PROPOSED
CONDITIONS OVERVIEW

SHEET
7 OF 21

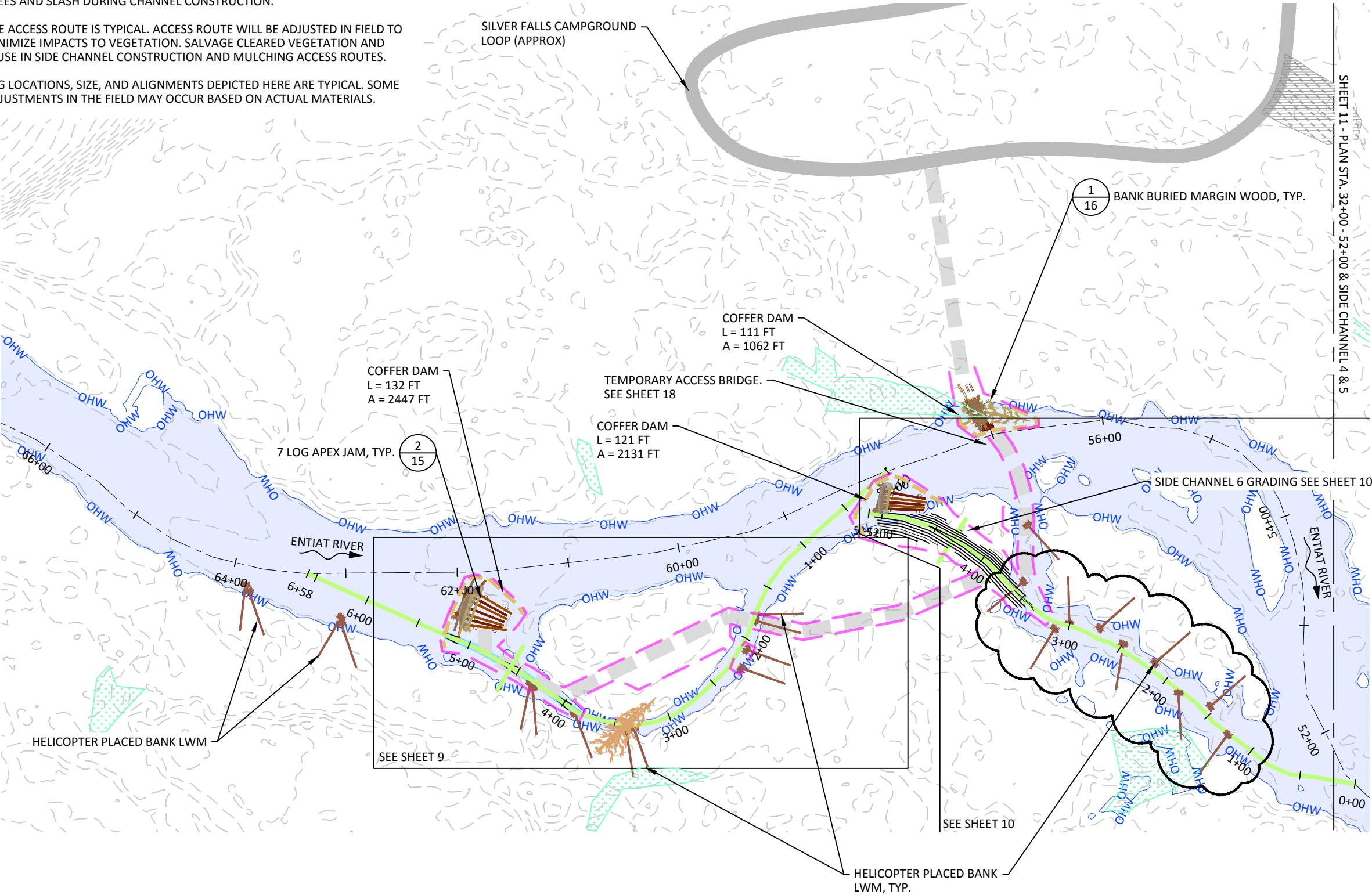
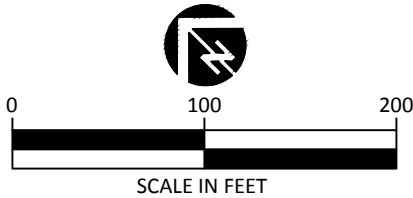


NOTES

1. STANDING TREES TO BE TIPPED WILL BE TIPPED BY OTHERS.
2. PRESERVE TREES OUTSIDE OF THE LIMITS OF DISTURBANCE.
3. ALL TREES AND SHRUBS REMOVED FROM SIDE CHANNEL CONSTRUCTION AREA SHALL BE TEMPORARILY STORED ON FLOODPLAIN TO BE RE-USED AS SALVAGED TREES AND SLASH DURING CHANNEL CONSTRUCTION.
4. THE ACCESS ROUTE IS TYPICAL. ACCESS ROUTE WILL BE ADJUSTED IN FIELD TO MINIMIZE IMPACTS TO VEGETATION. SALVAGE CLEARED VEGETATION AND REUSE IN SIDE CHANNEL CONSTRUCTION AND MULCHING ACCESS ROUTES.
5. LOG LOCATIONS, SIZE, AND ALIGNMENTS DEPICTED HERE ARE TYPICAL. SOME ADJUSTMENTS IN THE FIELD MAY OCCUR BASED ON ACTUAL MATERIALS.

PLAN LEGEND

- EXISTING CHANNEL ALIGNMENT
- PROPOSED SIDE CHANNEL ALIGNMENT
- EXISTING 2 FT CONTOUR
- PROPOSED 1 FT CONTOUR
- LIMITS OF DISTURBANCE
- TEMPORARY CONSTRUCTION ACCESS
- ESTIMATED ORDINARY HIGH WATER
- COFFERDAM
- ESTIMATED ORDINARY HIGH WATER
- AREA OF HELICOPTER LWM PLACEMENT
- DELINEATED WETLANDS
- GROUP CAMPGROUND STAGING AREA



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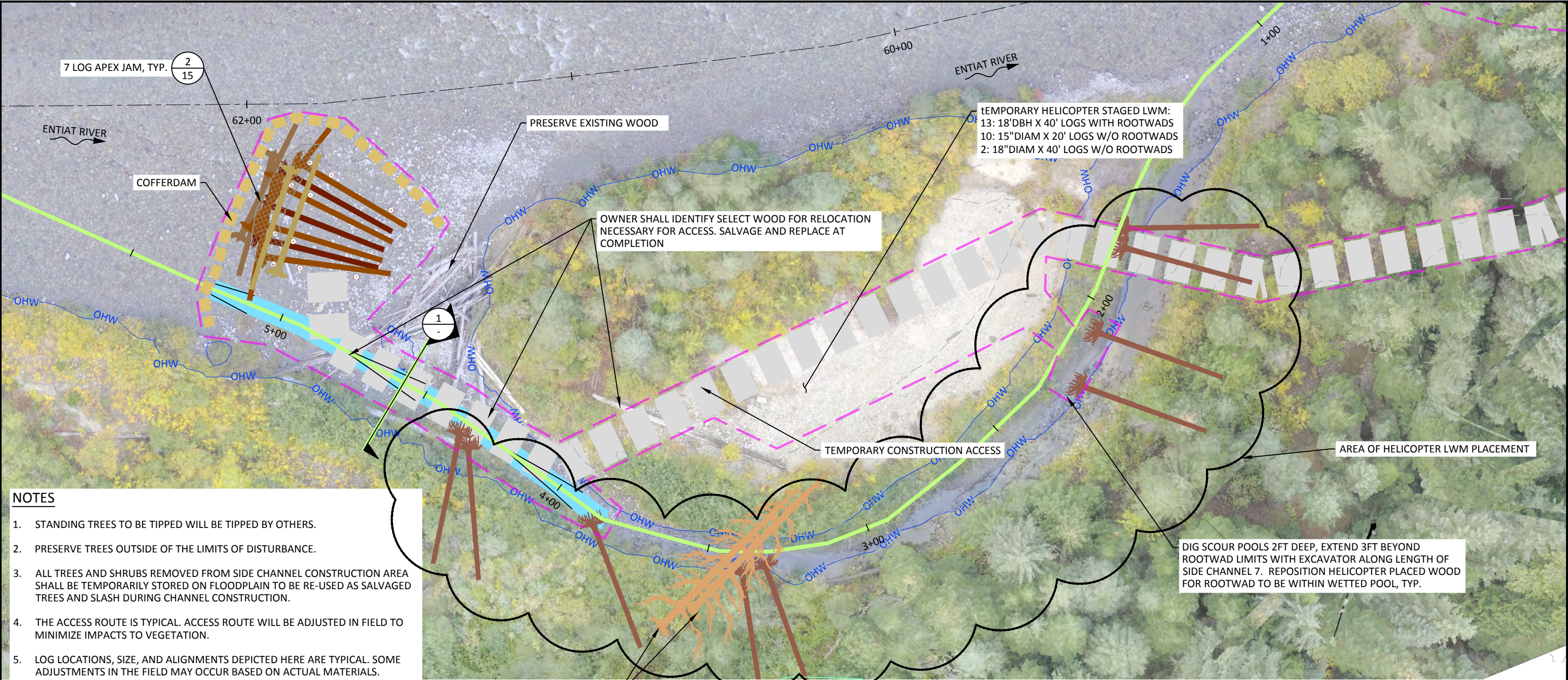


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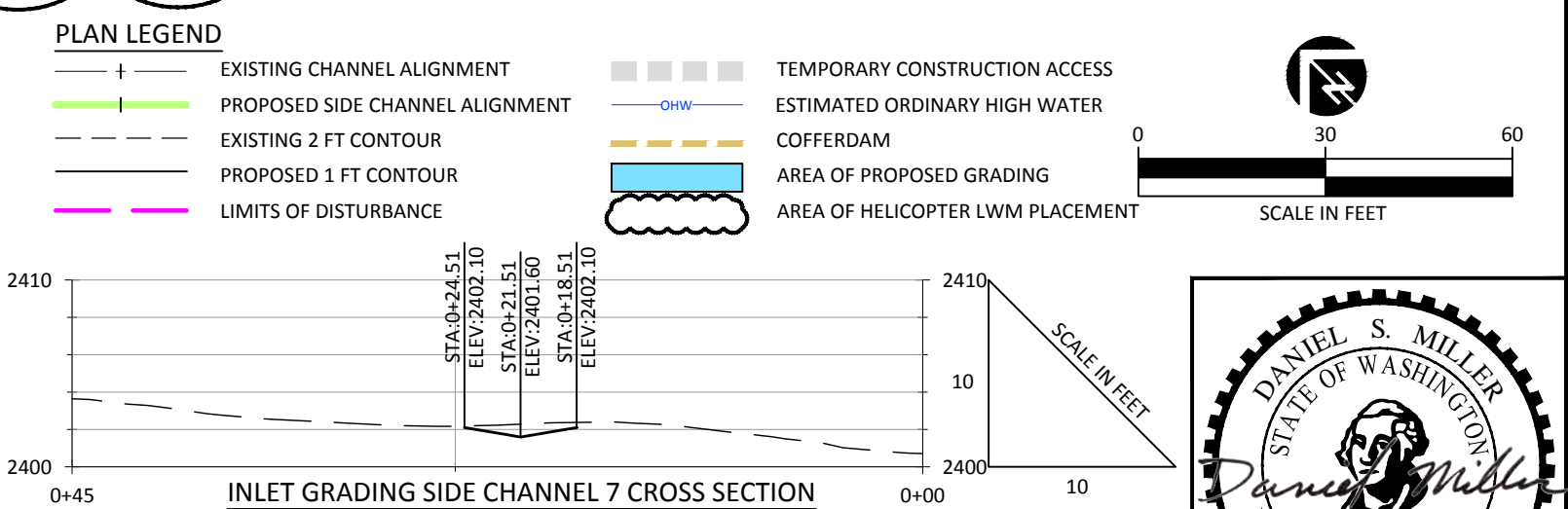
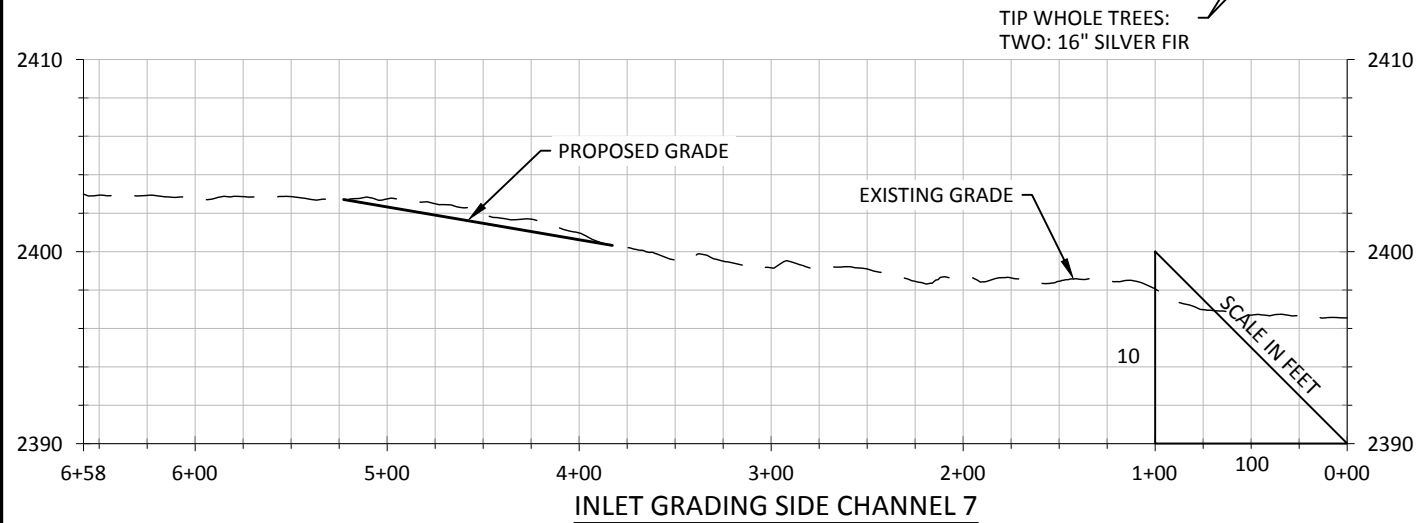
MAINSTEM STA 52+00 -
66+00

SHEET
8 OF 21





- NOTES**
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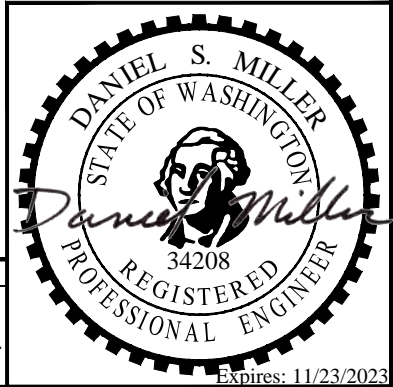
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SIDE CHANNEL 7
PLAN & PROFILE

SHEET
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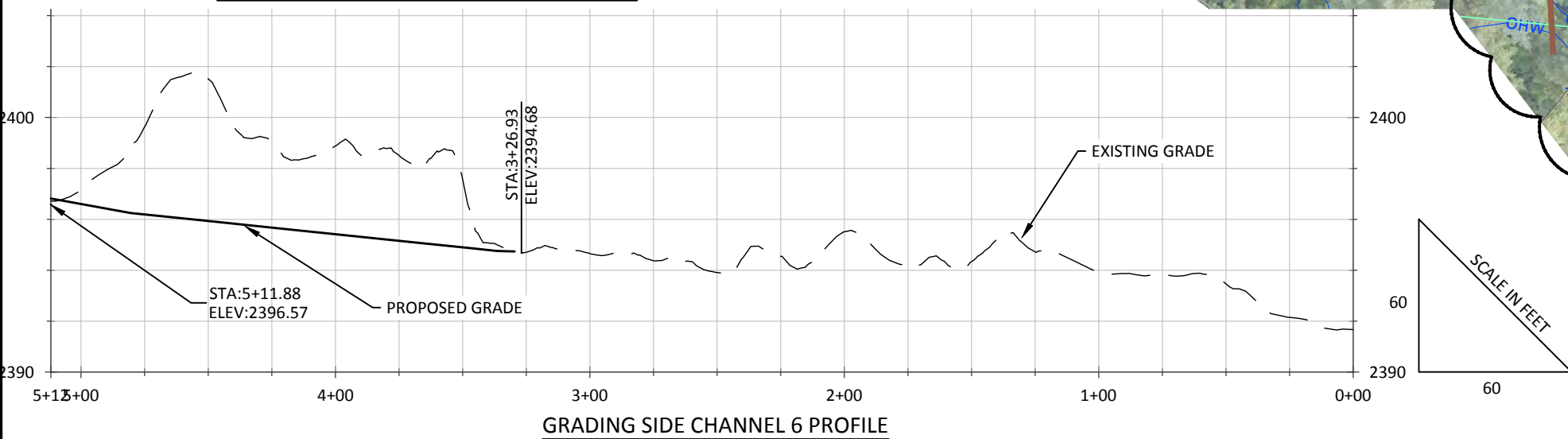
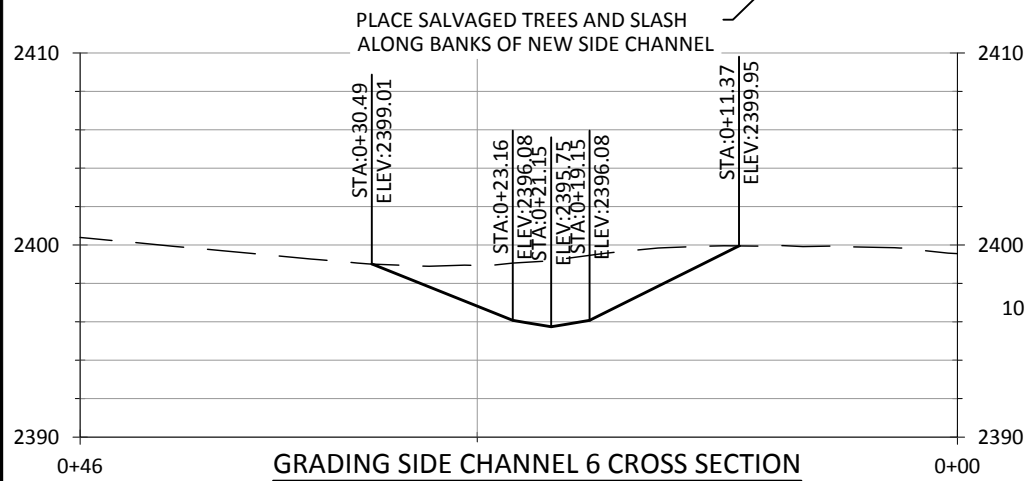


PLAN LEGEND

- EXISTING CHANNEL ALIGNMENT
- SIDE CHANNEL ALIGNMENT
- EXISTING 2 FT CONTOUR
- PROPOSED 1 FT CONTOUR
- LIMITS OF DISTURBANCE
- TEMPORARY CONSTRUCTION ACCESS
- ESTIMATED ORDINARY HIGH WATER
- COFFERDAM
- AREA OF HELICOPTER LWM PLACEMENT
- DELINEATED WETLAND

NOTES

- ENGINEER SHALL FLAG SIDE CHANNEL ALIGNMENT
- PRESERVE TREES OUTSIDE OF THE LIMITS OF DISTURBANCE.
- ALL TREES AND SHRUBS REMOVED FROM SIDE CHANNEL CONSTRUCTION AREA SHALL BE TEMPORARILY STORED ON FLOODPLAIN TO BE RE-USED AS SALVAGED TREES AND SLASH DURING CHANNEL CONSTRUCTION.
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APPROVED			DATE	PROJECT
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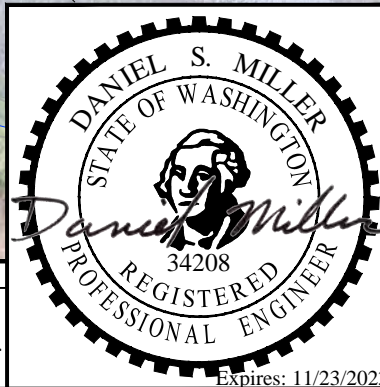
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SIDE CHANNEL 6
PLAN & PROFILE

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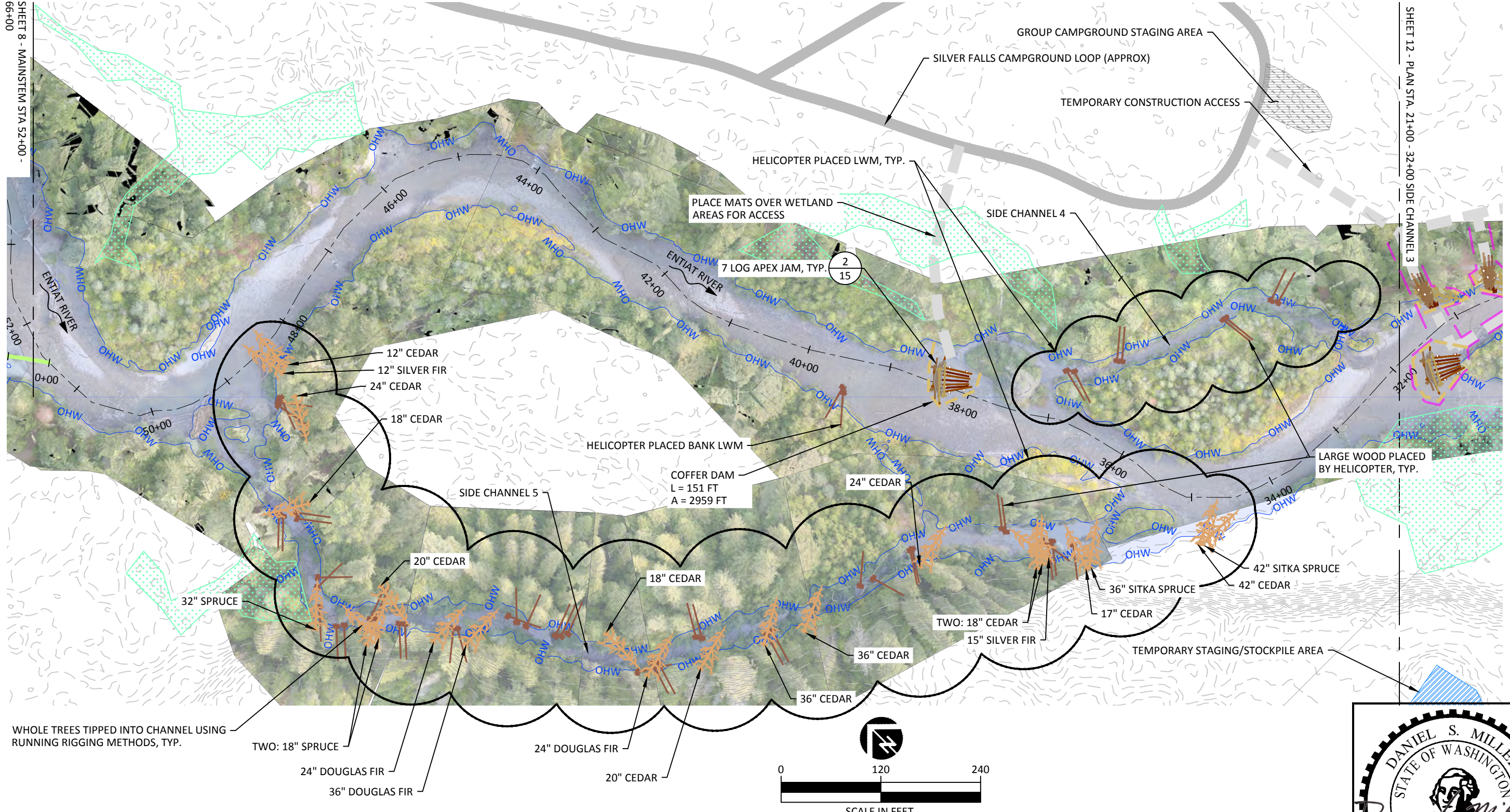


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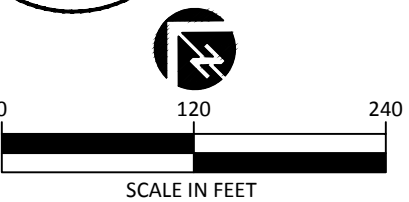
- EXISTING CHANNEL ALIGNMENT
- PROPOSED SIDE CHANNEL ALIGNMENT
- EXISTING 2 FT CONTOUR
- PROPOSED 1 FT CONTOUR
- LIMITS OF DISTURBANCE
- DELINEATED WETLAND
- TEMPORARY CONSTRUCTION ACCESS
- ESTIMATED ORDINARY HIGH WATER
- COFFERDAM
- TEMPORARY STAGING/STOCKPILE AREA
- AREA OF HELICOPTER LWM PLACEMENT
- GROUP CAMPGROUND STAGING AREA

NOTES

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2. PRESERVE TREES OUTSIDE OF THE LIMITS OF DISTURBANCE.
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4. LOG LOCATIONS, SIZE, AND ALIGNMENTS DEPICTED HERE ARE TYPICAL. SOME ADJUSTMENTS IN THE FIELD MAY OCCUR BASED ON ACTUAL MATERIALS.



WHOLE TREES TIPPED INTO CHANNEL USING RUNNING RIGGING METHODS, TYP.



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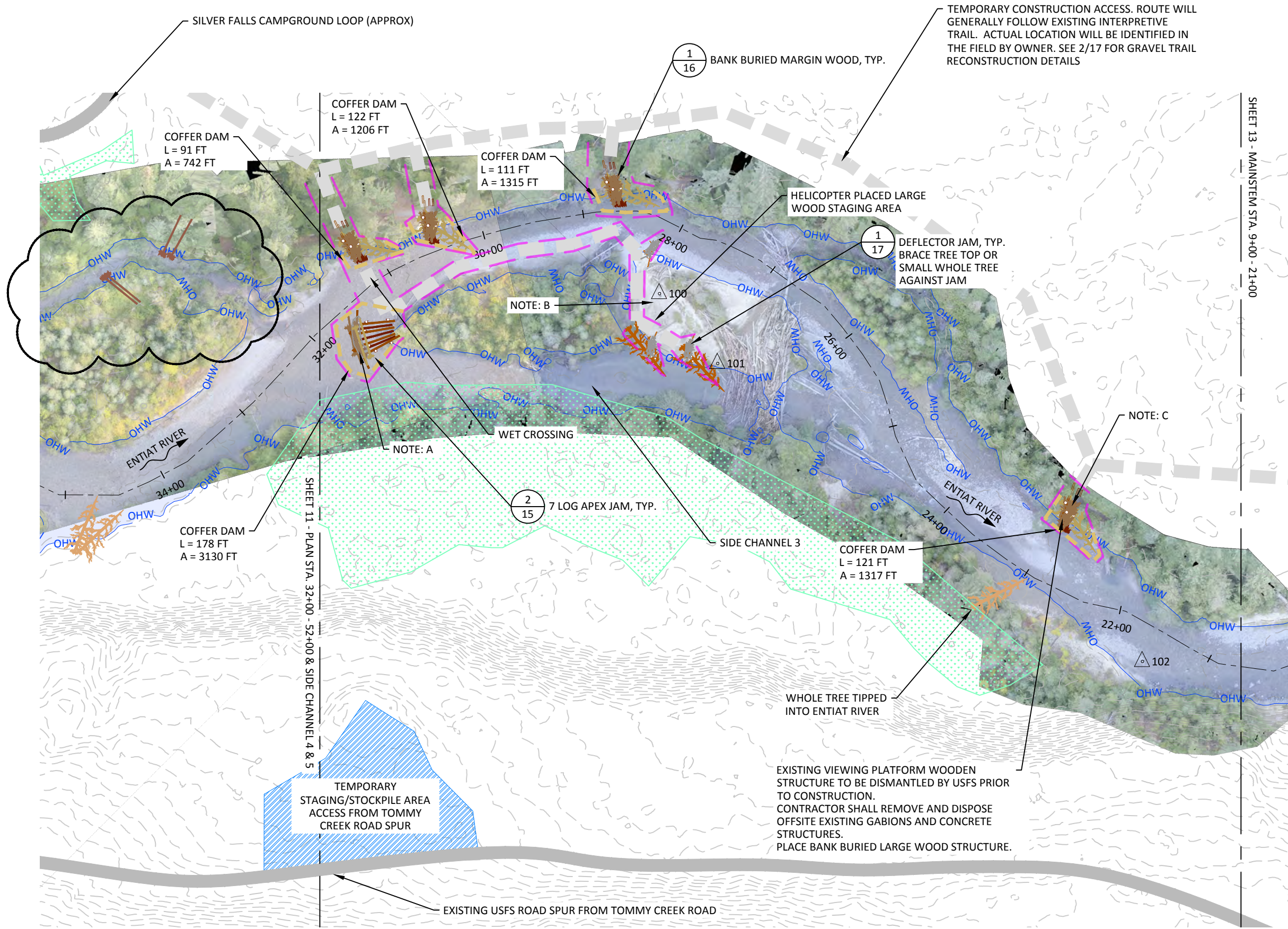
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PLAN STA. 32+00 - 52+00
& SIDE CHANNEL 4 & 5

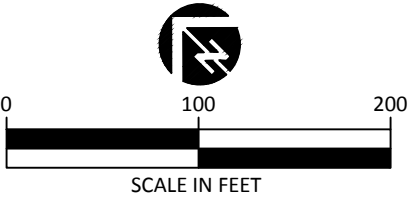
SHEET
11 OF 21

Daniel S. Miller
34208
REGISTERED
PROFESSIONAL ENGINEER
Expires: 11/23/2023



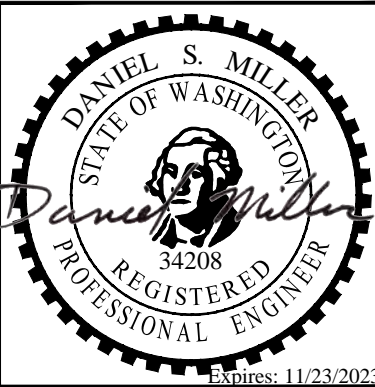
PLAN LEGEND

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- PROPOSED SIDE CHANNEL ALIGNMENT
- EXISTING 2 FT CONTOUR
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- NOTES**
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NOTES A - C	
TEMPORARY HELICOPTER STAGED LWM	
18'DBH X 40' LOGS WITH ROOTWADS:	A=13; B=6; C=2
15" DIAM X 20' LOGS W/O ROOTWADS:	A=10; B=27; C=3
18" DIAM X 40' LOGS W/O ROOTWADS:	A=2; B=0; C=1



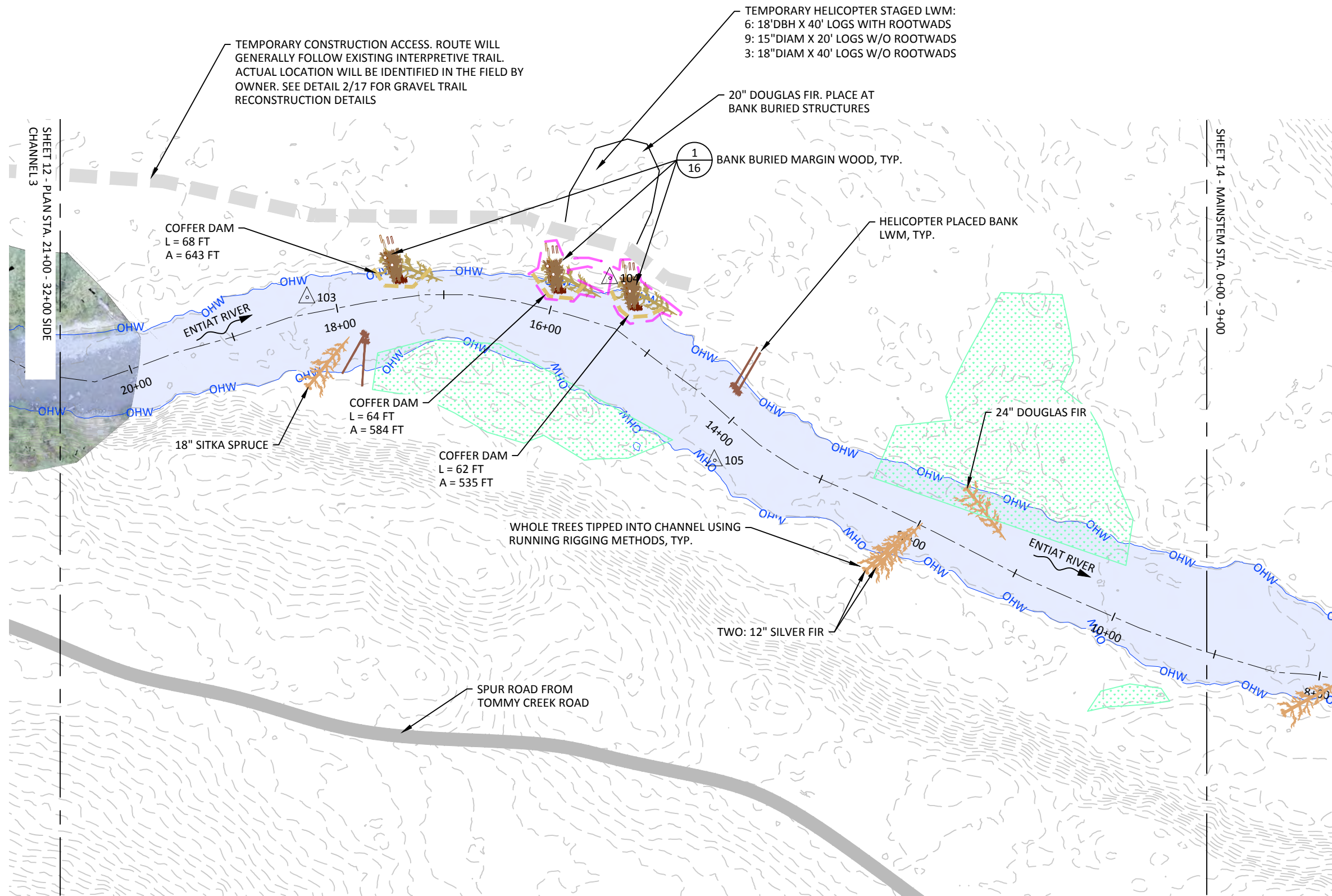
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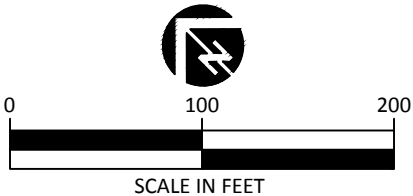
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PLAN STA. 21+00 - 32+00
SIDE CHANNEL 3



PLAN LEGEND

- EXISTING CHANNEL ALIGNMENT
- PROPOSED SIDE CHANNEL ALIGNMENT
- EXISTING 2 FT CONTOUR
- PROPOSED 1 FT CONTOUR
- LIMITS OF DISTURBANCE
- TEMPORARY CONSTRUCTION ACCESS
- ESTIMATED ORDINARY HIGH WATER
- COFFERDAM
- DELINEATED WETLAND



- NOTES**
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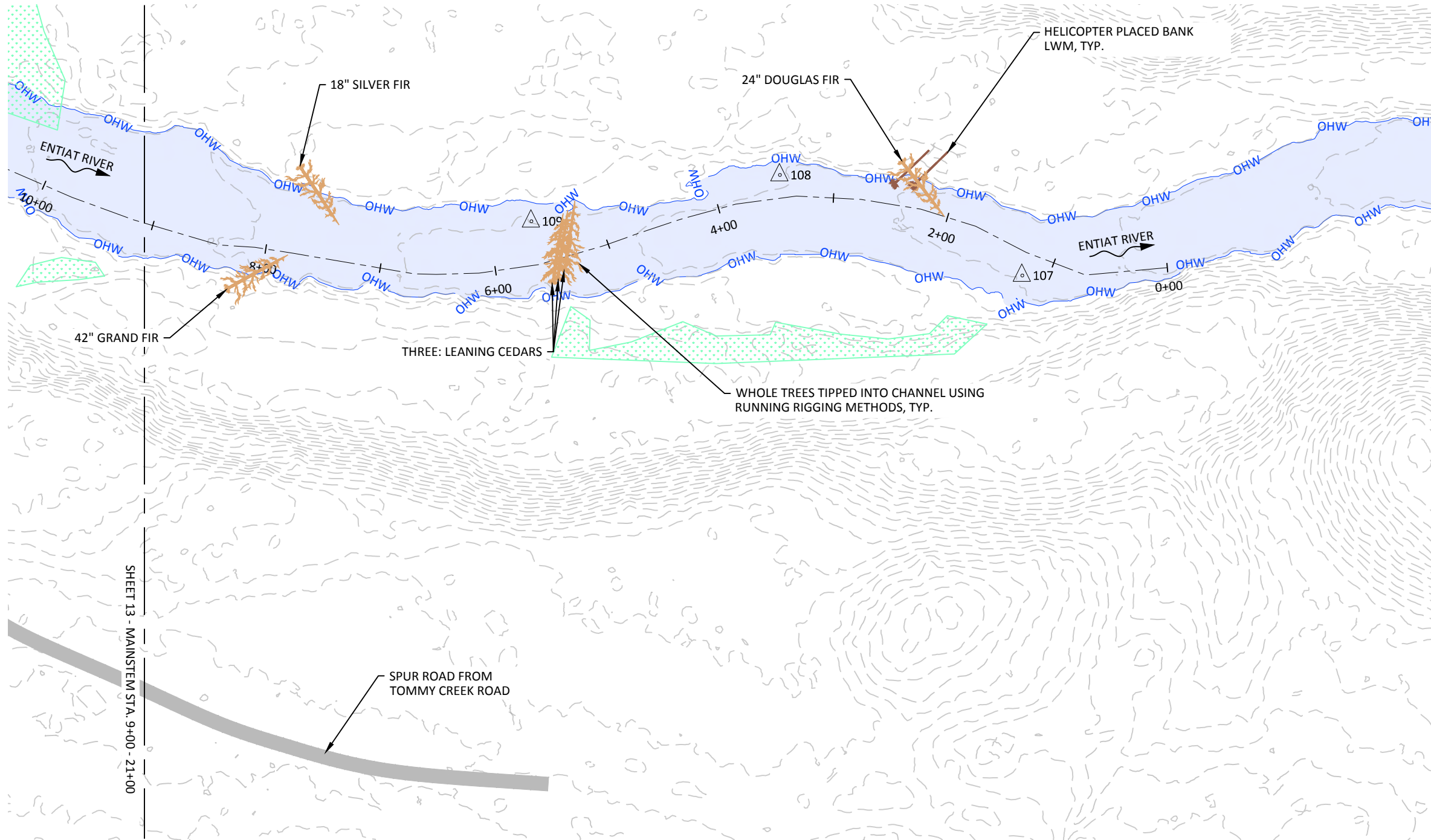
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MAINSTEM STA. 9+00 -
21+00

SHEET
13 OF 21

Expires: 11/23/2023



PLAN LEGEND

EXISTING CHANNEL ALIGNMENT

PROPOSED SIDE CHANNEL ALIGNMENT

EXISTING 2 FT CONTOUR

PROPOSED 1 FT CONTOUR

LIMITS OF DISTURBANCE

TEMPORARY CONSTRUCTION ACCESS

ESTIMATED ORDINARY HIGH WATER

COFFERDAM

DELINEATED WETLAND

0100200

SCALE IN FEET

NOTES

1.

STANDING TREES TO BE TIPPED WILL BE TIPPED BY OTHERS.

2.

PRESERVE TREES OUTSIDE OF THE LIMITS OF DISTURBANCE.

3.

THE ACCESS ROUTE IS TYPICAL. ACCESS ROUTE WILL BE ADJUSTED IN FIELD TO MINIMIZE IMPACTS TO VEGETATION.

4.

LOG LOCATIONS, SIZE, AND ALIGNMENTS DEPICTED HERE ARE TYPICAL. SOME ADJUSTMENTS IN THE FIELD MAY OCCUR BASED ON ACTUAL MATERIALS.

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MAINSTEM STA. 0+00 - 9+00

SHEET 14 OF 21

DANIEL S. MILLER

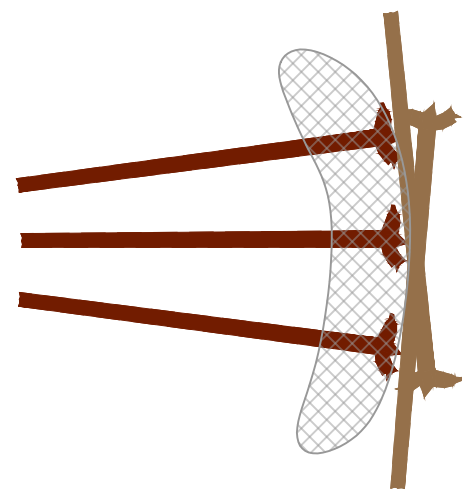
STATE OF WASHINGTON

34208

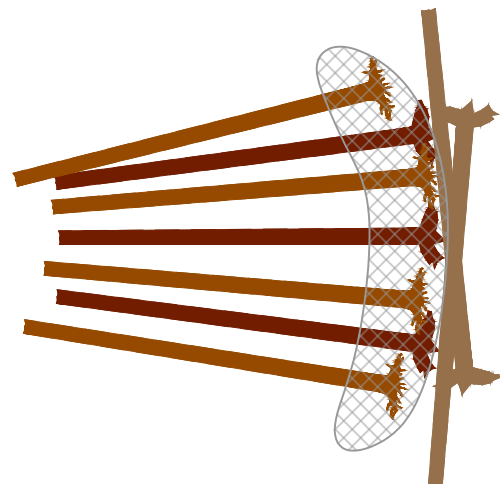
REGISTERED ENGINEER

Expires: 11/23/2023

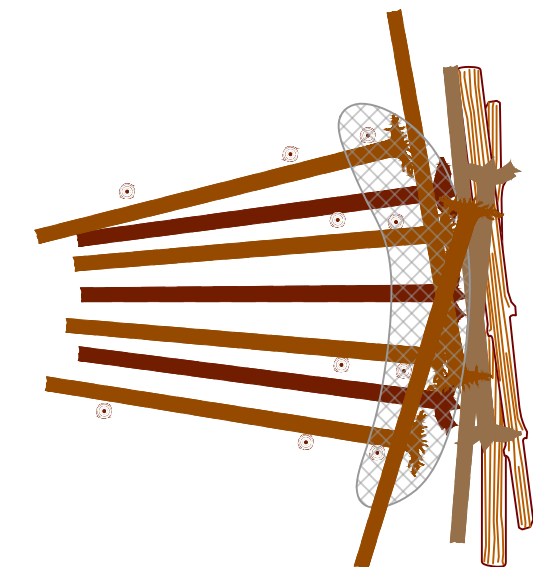
1 APEX LOG JAM SUGGESTED CONSTRUCTION SEQUENCE



- STEP ONE:
- PLACE COFFERDAM IF WORKING IN ACTIVE STREAM FLOW
 - EXCAVATE TO SUBGRADE. EXCAVATE SCOUR POOL
 - PLACE SLASH
 - PLACE BOTTOM TIER OF JAM LOGS AND RACKING LOGS
 - BACKFILL TO TOP OF LOGS. BACKFILL SHALL BE COMPRISED OF SALVAGED GRAVEL/COBBLE MATERIAL. LAYER WITH SLASH ALONG OUTER 8FT OF FILL. PLACE IN LIFTS NO THICKER THAN 18INCHES AND BUCKET COMPACT



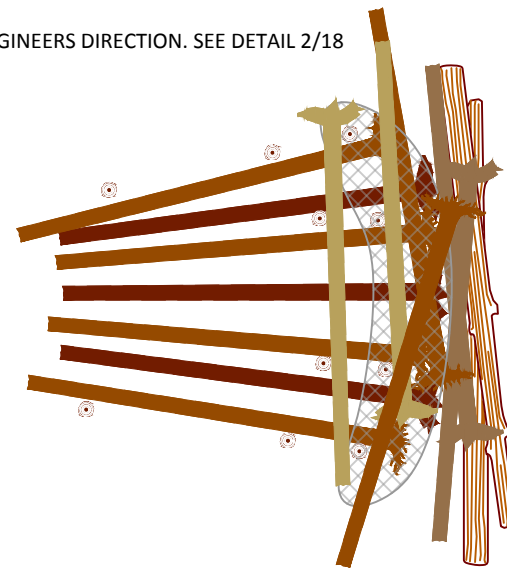
- STEP TWO:
- PLACE SLASH
 - PLACE SECOND TIER OF JAM LOGS
 - 2 LOGS FOR "5 LOG APEX JAM"
 - 4 LOGS FOR "7 LOG APEX JAM"
 - BACKFILL TO TOP OF LOGS



- STEP THREE:
- PLACE RACKING LOGS
 - INSTALL VERTICAL LOGS WITH VIBRATORY PILE DRIVER
 - IF VERTICAL LOGS CANNOT BE DRIVEN WITH VIBRATORY PILE DRIVER - INSTALL VERTICAL LOGS IN STEP ONE BY EXCAVATION AND BACKFILL
 - PLACE SLASH
 - BACKFILL TO COVER DEPTH OVER TOPS OF LOGS

7 LOG APEX MATERIALS:

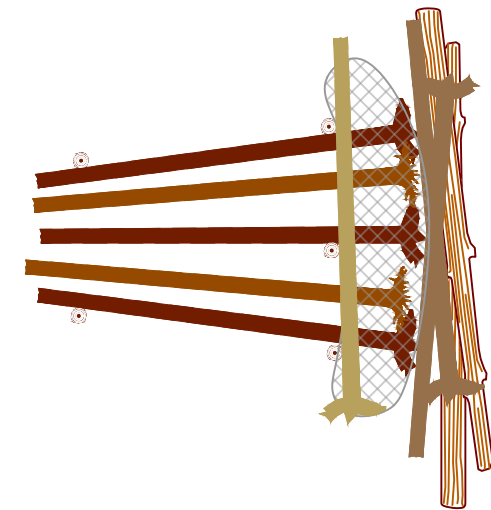
- 13: 18"DBH X 40' LOGS W/ ROOTWADS
- 2: 18"DBH X 40' LOGS W/O ROOTWADS
- 10: 15" DIAMETER VERTICAL LOGS
- SLASH
- 12: BOLTS AT ENGINEERS DIRECTION. SEE DETAIL 2/18



7 LOG APEX LOG JAM

5 LOG APEX MATERIALS:

- 8: 18"DBH X 40' LOGS W/ ROOTWADS
- 2: 18"DBH X 40' LOGS W/O ROOTWADS
- 5: 15" DIAMETER X 20' VERTICAL LOGS
- SLASH
- 12: BOLTS AT ENGINEERS DIRECTION. SEE DETAIL 2/18



5 LOG APEX LOG JAM

2 TYPICAL DETAIL APEX JAM
NOT TO SCALE

BACKFILL WITH SALVAGED GRAVEL, COBBLE ALLUVIAL MATERIAL. 4FT MINIMUM DEPTH OF COVER. REVEGETATED BY OTHERS

BACKFILL SHALL BE COMPRISED OF SALVAGED GRAVEL/COBBLE MATERIAL. LAYER WITH SLASH ALONG OUTER 8FT OF FILL. PLACE IN LIFTS NO THICKER THAN 18INCHES AND BUCKET COMPACT

PROPOSED GROUND

EXISTING GROUND

ROTATION OF LOGS WITH ROOTWADS AND DEPTH AT DOWNSTREAM END VARIES.

SUBGRADE. DEPTH VARIES.

APEX LOG JAM TYPICAL SECTION VIEW

- VERTICAL LOGS:
- 12-16"DIAMETER, 20-25' LONG,
 - EMBED 8FT BELOW SUBGRADE
 - EXTEND 3' TO 5' ABOVE FINISHED GRADE. SNAP OR GRIND TOPS TO REMOVE CUT END

PLACE SLASH UNDER AND BEHIND ROOTWADS

RACKING LOGS WITH ROOTWADS. 12-18"DBH X 30-40' LONG.

OHW

OLW

EXISTING GROUND

EXCAVATE SCOUR POOL:

- 4; TO 5' DEEP
- SLOPED AT 1H:1V
- PLACE SLASH TO BOTTOM OF POOL

JAM LOGS WITH ROOTWADS:

- 18-20" DBH
- 40' LONG
- SOUND, CONIFEROUS SPECIES

NOTE:
OWNER MAY INVOKE OPTIONAL ADDITIVE ALTERNATE ITEMS:
ITEM 016 - APEX JAM BALLAST BOULDERS
ITEM 017 - IMPORTED BOULDER BALLAST

			CP	DM	DM, MR
			DRAWN	DESIGNED	CHECKED
			DM	5/13/2022	20-02-35
			APPROVED	DATE	PROJECT
NO.	DATE	REVISION DESCRIPTION			

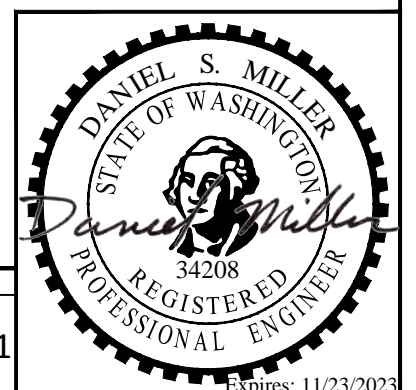
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TYPICAL DETAILS
APEX LOG JAM

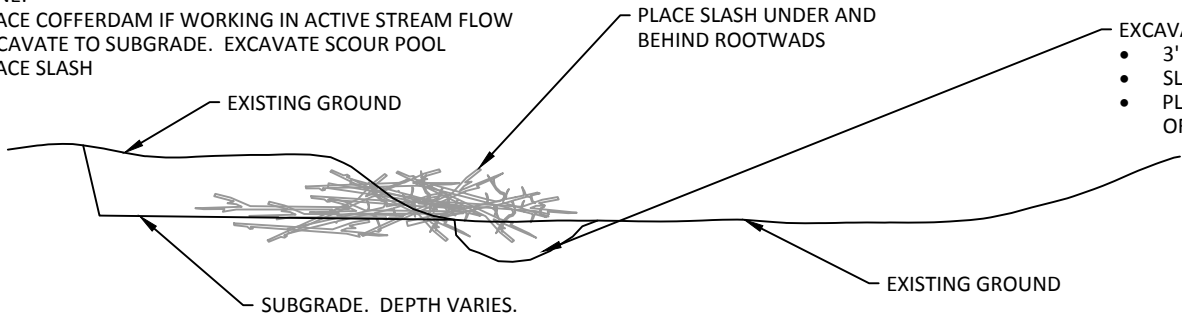
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BANK BURIED MARGIN WOOD SUGGESTED CONSTRUCTION SEQUENCE

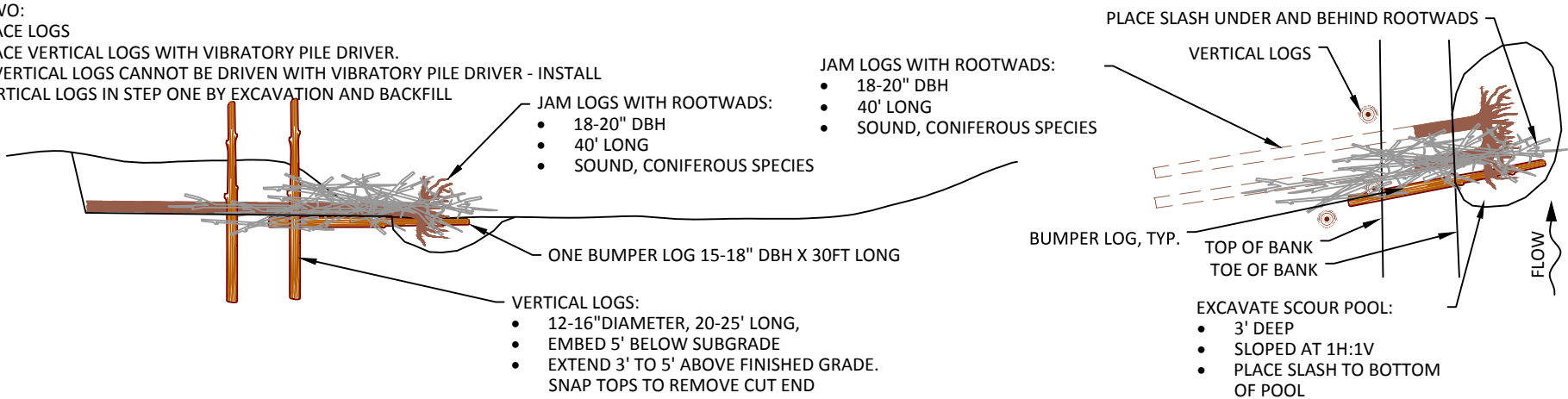
STEP ONE:

- PLACE COFFERDAM IF WORKING IN ACTIVE STREAM FLOW
- EXCAVATE TO SUBGRADE. EXCAVATE SCOUR POOL
- PLACE SLASH



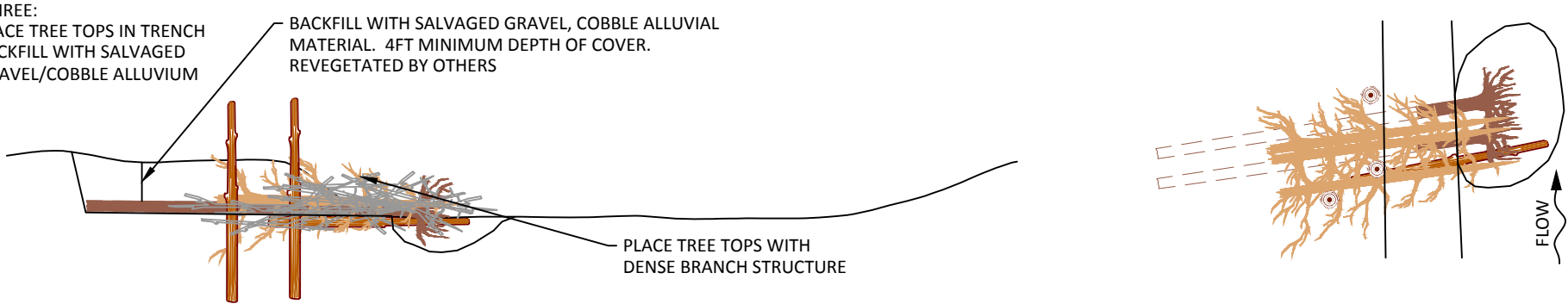
STEP TWO:

- PLACE LOGS
- PLACE VERTICAL LOGS WITH VIBRATORY PILE DRIVER.
- IF VERTICAL LOGS CANNOT BE DRIVEN WITH VIBRATORY PILE DRIVER - INSTALL VERTICAL LOGS IN STEP ONE BY EXCAVATION AND BACKFILL



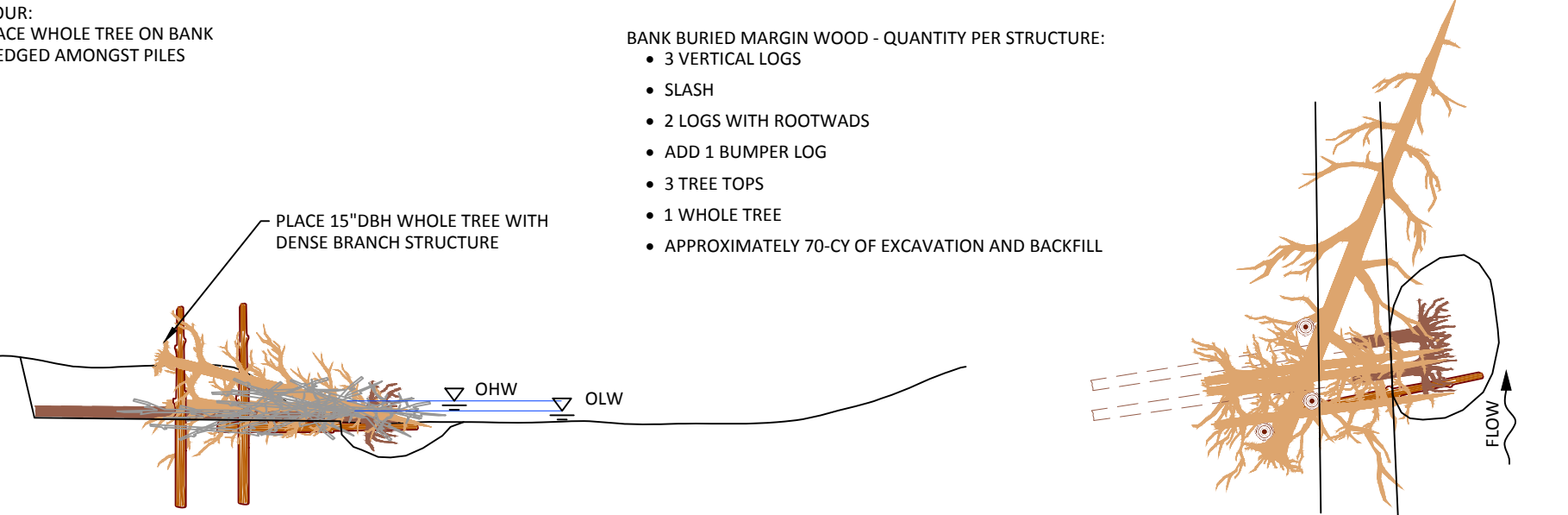
STEP THREE:

- PLACE TREE TOPS IN TRENCH
- BACKFILL WITH SALVAGED GRAVEL/COBBLE ALLUVIUM



STEP FOUR:

- PLACE WHOLE TREE ON BANK WEDGED AMONGST PILES



VERTICAL LOGS

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

RIGGING

RIGGING FOR VERTICAL LOG TESTING SHALL CONFORM TO THE TENSION SCALE MANUFACTURER'S RECOMMENDATIONS.

CHOKERS, CABLES AND AND SHACKLES SHALL HAVE MINIMUM WORKING LOAD RATING OF 12 TONS. FITTINGS SHALL BE SIZED ACCORDINGLY.

TESTING

TESTING OF VERTICAL LOGS SHALL BE PERFORMED IN THE PRESENCE OF THE ENGINEER.

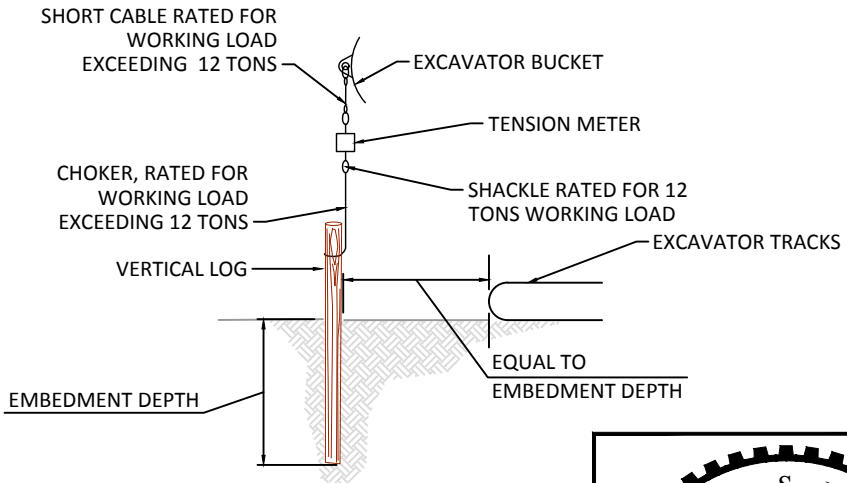
PROOF TESTS SHALL BE MADE AT UP TO FOUR EMBEDMENT DEPTHS FOR EACH VERTICAL LOG. DEPTHS SHALL BE DETERMINED IN THE FIELD. AS A GUIDELINE TEST EMBEDMENT DEPTHS MAY INCLUDE 6', 8', 10', AND 12'.

EACH VERTICAL LOG TEST SHALL HAVE UPWARD LOAD GRADUALLY INCREASED AND AS CLOSELY ALIGNED TO AXIS OF LOG AS POSSIBLE. RECORD THE LOG DIAMETER, EMBEDMENT DEPTH AND MAXIMUM FORCE REQUIRED TO MOVE THE LOG VERTICALLY APPROXIMATELY 1 INCH. THEN DRIVE THE VERTICAL LOG TO A NEW DEPTH TO BE DETERMINED BY THE ENGINEER. APPLY NEW LOAD AND RECORD MAX FORCE THAT CAUSES THE LOG TO MOVE VERTICALLY 1 INCH. REPEAT FOR THIRD AND FOURTH TEST.

EXCAVATOR CONDUCTING PULL OUT LOADING SHALL BE POSITIONED NO CLOSER THAN EMBEDMENT DEPTH OF VERTICAL LOG IF POSSIBLE. IF A CLOSER POSITIONING IS REQUIRED, EXCAVATOR SHALL BE NO CLOSER THAN THAT REQUIRED TO GENERATE DESIRED LOADING WITH DISTANCE FROM VERTICAL LOG NOTED IN THE TEST RECORD. 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.

PULL OUT RESISTANCE READING SHALL BE COMPARED AGAINST EXCAVATOR MAX LIFT OFFSET TABLE.

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.



2 TYPICAL DETAIL PULLOUT TEST NOT TO SCALE

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			DRAWN	DESIGNED	CHECKED
			DM	5/13/2022	20-02-35
NO.	DATE	REVISION DESCRIPTION	APPROVED	DATE	PROJECT

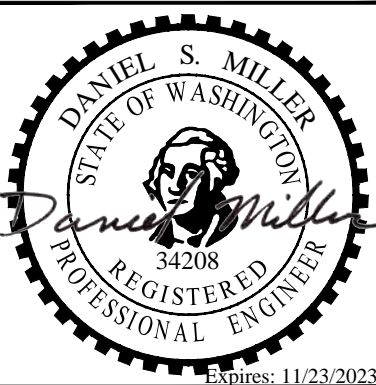
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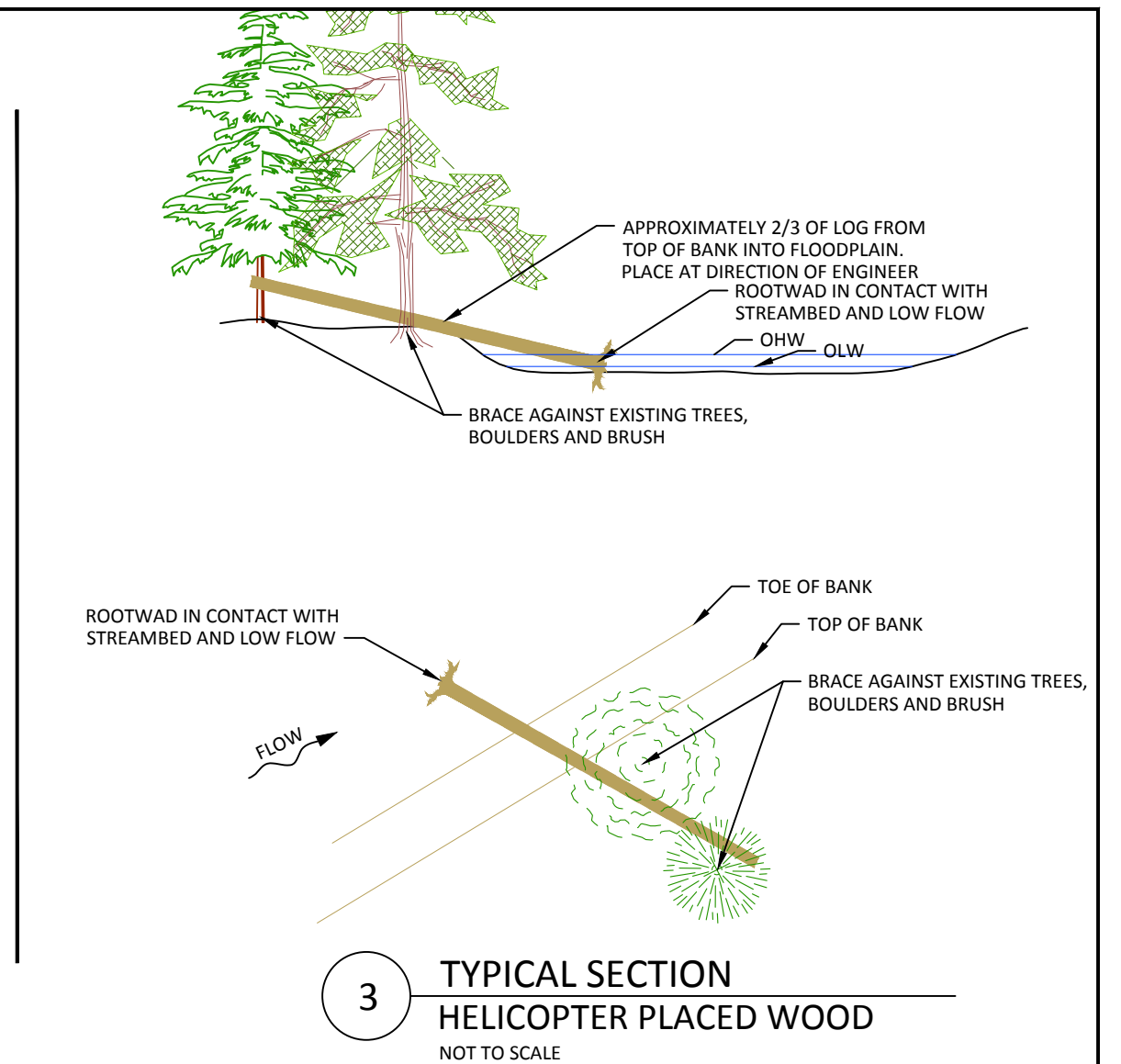


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TYPICAL DETAILS BANK
BURIED MARGIN WOOD

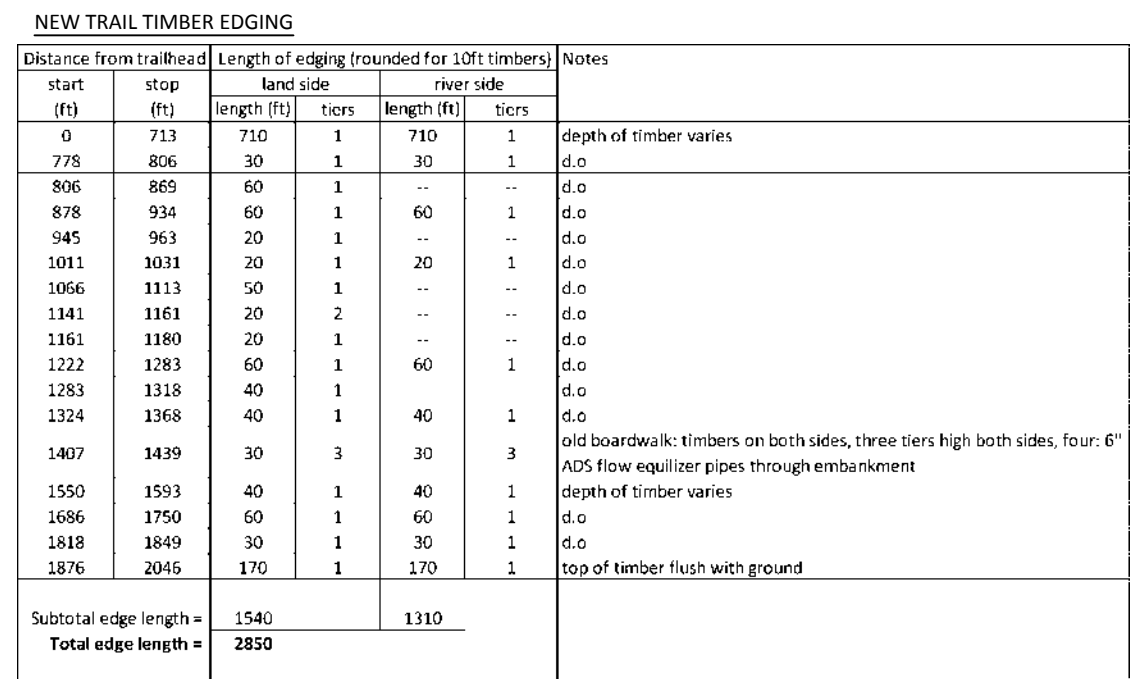
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1 TYPICAL SECTION
DEFLECTOR JAM
NOT TO SCALE

3 TYPICAL SECTION
HELICOPTER PLACED WOOD
NOT TO SCALE



2 TYPICAL SECTION GRAVEL TRAIL RECONSTRUCTION NOT TO SCALE

			CP	DM	DM, MR
			DRAWN	DESIGNED	CHECKED
			DM	5/13/2022	20-02-35
NO.	DATE	REVISION DESCRIPTION	APPROVED	DATE	PROJECT

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Entiat River, Chelan County



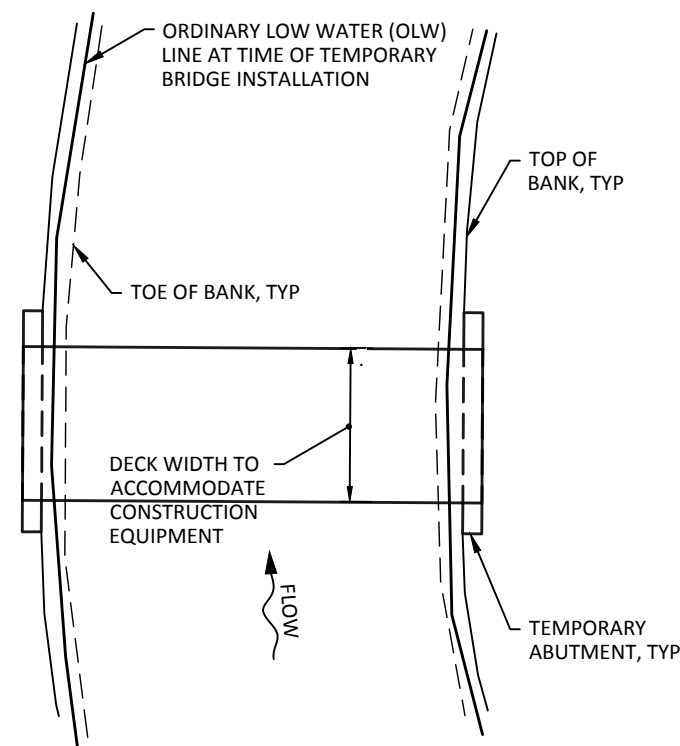
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TYPICAL DETAILS

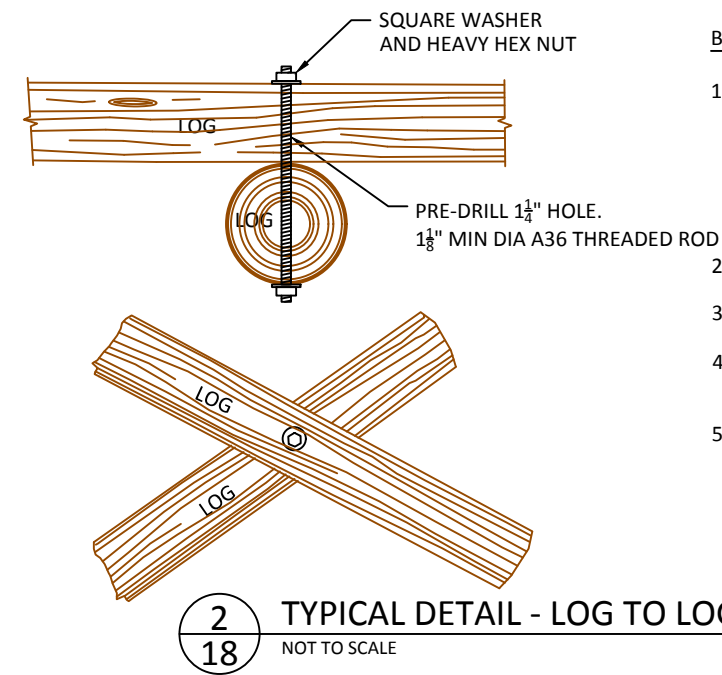
DEFLECTOR JAM

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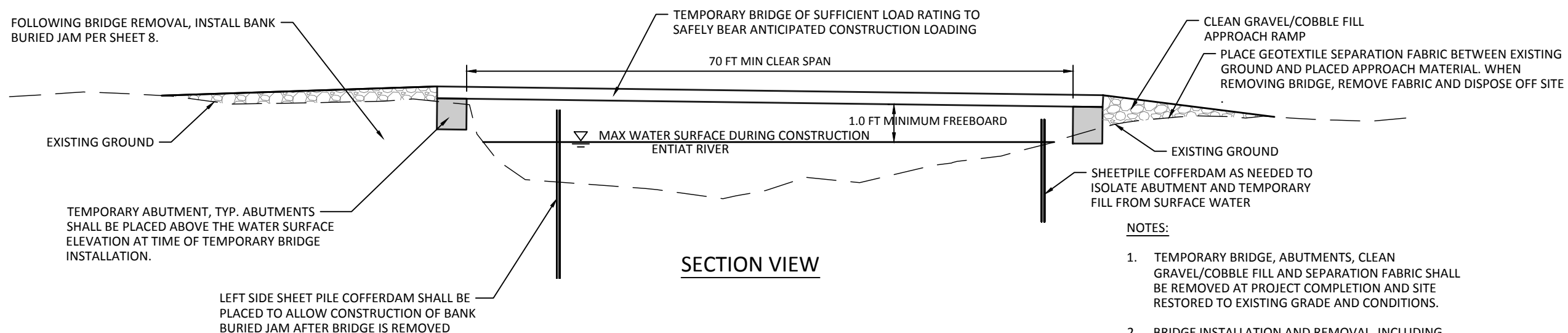


PLAN VIEW



BOLTED CONNECTION NOTES:

1. BOLTS SHALL BE MINIMUM $1\frac{1}{8}$ " DIAMETER THREADED ROD, GRADE A36 STEEL. WASHERS SHALL BE SQUARE PLATE, $3/8$ " x 4 " x 4 " MIN. NUTS SHALL BE HEAVY HEX. ALL HARDWARE SHALL BE PLAIN FINISH.
2. DRILL $1\frac{1}{4}$ " HOLE THROUGH LOGS.
3. INSERT THREADED ROD.
4. INSTALL PLATE WASHERS AND NUTS. SECURE NUTS BY CHISELING THREADS.
5. REMOVE SHARP EDGES.



SECTION VIEW

NOTES:

1. TEMPORARY BRIDGE, ABUTMENTS, CLEAN GRAVEL/COBBLE FILL AND SEPARATION FABRIC SHALL BE REMOVED AT PROJECT COMPLETION AND SITE RESTORED TO EXISTING GRADE AND CONDITIONS.
2. BRIDGE INSTALLATION AND REMOVAL, INCLUDING ABUTMENTS, SHALL BE ACCOMPLISHED WITH NO MORE THAN FOUR (4) EQUIPMENT CROSSINGS THROUGH THE CHANNEL.

1
TYP TYPICAL DETAIL - TEMPORARY CROSSING
NOT TO SCALE

NO.	DATE	REVISION DESCRIPTION

CP	DM	DM, MR
DRAWN	DESIGNED	CHECKED
DM	5/13/2022	20-02-35
APPROVED	DATE	PROJECT

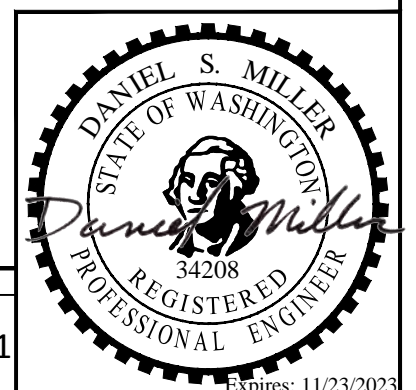
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TYPICAL DETAILS
TEMPORARY CROSSING

SHEET
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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 16 - 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. ENTIAT RIVER FLOWS ARE RECORDED NEAR RIVER MILE (RM) 10 AT ARDENVOIR BY USGS (USGS 12452800 ENTIAT RIVER NEAR ARDENVOIR, WA). CURRENT AND HISTORIC FLOW DATA ARE AVAILABLE AT: [HTTPS://WATERDATA.USGS.GOV/USA/NWIS/UV?12452800](https://waterdata.usgs.gov/usa/nwis/uv?12452800) .

THIS PROJECT WAS DESIGNED IN ACCORDANCE WITH THE BPA HABITAT IMPROVEMENT PROGRAM (HIP). HIP GENERAL CONSERVATION MEASURES (CMS) ARE INCLUDED ON SHEETS 2-4 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

THIS ITEM SHALL CONSIST OF PREPARATION WORK AND OPERATIONS PERFORMED BY THE CONTRACTOR IN ACCORDANCE WITH CHELAN COUNTY AND 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.
3. PLACE TEMPORARY WETLAND MAT WHERE ACCESS ROADS CROSS EXISTING WETLANDS TO LIMIT IMPACT. STEEL ROADWAY PLATES ARE ONE APPROVED MAT.

4. DESIGNATED RIVER CROSSINGS IN TWO LOCATIONS ARE SHOWN IN THE PLANS. RIVER CROSSING TO SIDE CHANNELS 6 AND 7 SHALL REQUIRE A TEMPORARY BRIDGE AS SPECIFIED IN ITEM 007 TEMPORARY ACCESS BRIDGE. RIVER CROSSING TO SIDE CHANNEL 3 SHALL BE LIMITED TO 4 ROUND TRIP WET PASSES. NO RIVER CROSSING SHALL BE MADE PRIOR TO APPROVAL BY OWNER.
5. 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.
6. IF DIRECTED BY OWNER, THE PORTIONS OF THE ACCESS ROUTES THAT FOLLOW EXISTING ROADS SHALL BE REMEDIATED AS SPECIFIED IN OPTIONAL ADDITIVE ITEMS: ITEM 020 - ROAD ASPHALT REPAIR/REPLACEMENT AND ITEM 021 - ROAD CRUSHED GRAVEL REPAIR/REPLACEMENT.
7. 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

MOBILIZATION 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. WITHHOLDING OF PARTIAL PAYMENT WILL OCCUR IF LIMITS OF DISTURBANCE ARE NOT ADHERED TO. PAYMENT SHALL BE CONSIDERED FULL COMPENSATION FOR ALL EQUIPMENT, LABOR, TOOLS, MATERIALS, AND INCIDENTALS NECESSARY TO COMPLETE THIS WORK AS SPECIFIED.

ITEM 002- TRAFFIC CONTROL

TEMPORARY TRAFFIC CONTROL REQUIREMENTS SHALL INCLUDE BARRICADES AND CONSTRUCTION SIGNAGE 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.

MEASUREMENT AND PAYMENT

TRAFFIC CONTROL 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. PAYMENT SHALL BE CONSIDERED FULL COMPENSATION ACQUIRING RIGHT-OF-WAY PERMIT, AS WELL AS ALL EQUIPMENT, LABOR, TOOLS, MATERIALS, AND INCIDENTALS NECESSARY TO COMPLETE THIS WORK AS SPECIFIED.

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.
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 DEPARTMENT OF NATURAL RESOURCES 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.

CONTRACTOR'S MEETINGS AND TESC RECORDS

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.

THE CONTRACTOR SHALL SUBMIT WEEKLY REPORTS TO THE OWNER. 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, SIDE CHANNEL EXCAVATION 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. 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 THE SIDE CHANNEL AND 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) 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 AND SIDE CHANNEL EXCAVATION AND HAUL AND 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.

			CP	DM	DM, MR
			DRAWN	DESIGNED	CHECKED
			DM	5/13/2022	20-02-35
			APPROVED	DATE	PROJECT
NO.	DATE	REVISION DESCRIPTION			


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Expires: 11/23/2023

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, AND AROUND TEMPORARY ACCESS BRIDGE ABUTMENTS.

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 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 MINIMUM 2 DAYS 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 MAY TAKE APPROXIMATELY 4 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. COFFERDAMS SHOWN IN THE PLANS ARE A SUGGESTED METHOD. IF CONTRACTOR ELECTS TO USE ALTERNATE METHOD(S) FOR TEMPORARY COFFERDAMS, CONTRACTOR SHALL PROVIDE TO THE OWNER A COFFERDAM/DIVERSION PLAN FOR REVIEW PRIOR TO IMPLEMENTATION.

COORDINATION WITH FISH RESCUE: THE CONTRACTOR SHALL PROVIDE MINIMUM 2 DAYS ADVANCE NOTICE TO THE OWNER BEFORE EACH COFFERDAM INSTALLATION DATE. THE CONTRACTOR SHALL UNDERSTAND THAT COFFERDAM INSTALLATION REQUIRES COORDINATION WITH THE OWNER AND ONLY AFTER THE OWNER HAS COMPLETED FISH RESCUE CAN THE COFFERDAMS BE COMPLETED. THE CONTRACTOR IS ADVISED THAT FISH RESCUE MAY TAKE UP TO 4 HOURS PER COFFERDAM.

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 ONE 6” TRASH PUMP WITH PUMPING CAPACITY GREATER THAN 600 GPM, ASSUMING 12 FEET OF VERTICAL LIFT AND 300 FEET OF DISCHARGE HOSE. ADDITIONAL PUMPS SHALL BE PROVIDED BY CONTRACTOR AS NEEDED AT NO ADDITIONAL COST

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 THE RIVER OR WETLANDS.
4. TO HELP PREVENT TURBIDITY FROM LEAKING THROUGH COFFERDAMS, THE CONTRACTOR SHALL OPERATE 6” TRASH PUMP TO LOWER THE WATER SURFACE WITHIN THE ISOLATED AREA AND DISCHARGE TO AN INFILTRATION AREA.

ENVIRONMENTAL PROTECTION MEASURES

- a. IF OBSERVED OR MEASURED TURBIDITY DOWNSTREAM OF COFFERDAM OR PUMP DISCHARGE IS MORE THAN 10% ABOVE THE UPSTREAM BACKGROUND VISUAL OBSERVATION OR MEASUREMENT - OR EXCEEDS APPLICABLE PERMITS AND REGULATIONS - THE ACTIVITY MUST BE MODIFIED TO REDUCE TURBIDITY. CONTINUE TO MONITOR EVERY 2 HOURS AS LONG AS INSTREAM ACTIVITY CONTINUES.
- b. IF EXCEEDANCES OCCUR FOR MORE THAN TWO CONSECUTIVE MONITORING INTERVALS (AFTER 4 HOURS), THE ACTIVITY MUST STOP UNTIL THE TURBIDITY LEVEL RETURNS TO BACKGROUND, AND THE EC LEAD MUST BE NOTIFIED WITHIN 48 HOURS.
- c. IF AT ANY TIME, MONITORING, INSPECTIONS, OR OBSERVATIONS/SAMPLES SHOW THAT THE TURBIDITY CONTROLS ARE INEFFECTIVE, IMMEDIATELY STOP WORK AND MOBILIZE WORK CREWS TO REPAIR, REPLACE, OR REINFORCE CONTROLS AS NECESSARY. ADDITIONAL AND ALTERNATIVE METHODS, SUCH AS PUMPING INTO STILLING BASINS OR FILTRATION GEOTEXTILE FABRIC SHALL BE REQUIRED AT THE CONTRACTOR'S EXPENSE.

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 AS SPECIFIED FOR THE ENTIRETY OF THE PROJECT. PAYMENT WILL BE MADE IN ACCORDANCE WITH SECTION 1-04.1 FOR THE FOLLOWING BID ITEMS: “PUMPING” PER LUMP SUM.

ITEM 007 - TEMPORARY ACCESS BRIDGE

A TEMPORARY BRIDGE, SHALL BE REQUIRED TO CROSS THE ENTIAT RIVER TO ACCESS SIDE CHANNELS 6 AND 7 AT LOCATION SHOWN IN THE PLANS. CONTRACTOR SHALL SUBMIT AN ACCESS PLAN INCLUDING DRAWINGS SHOWING DETAILS OF PROPOSED METHODS FOR PROVIDING ACCESS FOR EQUIPMENT, INCLUDING LOADED HAUL TRUCKS, TO THE SITES. REVIEW AND APPROVAL OF THE PLAN SHALL NOT RELIEVE THE CONTRACTOR FROM FULL RESPONSIBILITY FOR THE ADEQUACY AND SAFETY OF THE CROSSING.

TEMPORARY BRIDGE SHALL PROVIDE 70-FT CLEAR SPAN AND MINIMUM OF 1.0-FT OF FREEBOARD FROM LOW CHORD TO MAXIMUM WATER SURFACE ELEVATION. ABUTMENTS SHALL BE PROVIDED AS NECESSARY FOR THE

BRIDGE SYSTEM. SHEET PILE COFFERDAM SHALL BE USED AS NECESSARY TO ISOLATE DISTURBED SURFACES FROM FLOWING WATER AND PREVENT TURBIDITY FROM ENTERING THE ENTIAT RIVER. THE RIVER LEFT COFFERDAM MAY BE SET TO ALLOW CONSTRUCTION OF THE RIVER LEFT BANK BURIED LWM STRUCTURE AFTER REMOVAL OF THE TEMPORARY BRIDGE. STANDING WATER WITHIN COFFERDAMS SHALL BE DEFISHED BY OWNER PER DE-FISHING PLAN. APPROACH RAMPS TO THE BRIDGE SHALL BE CLEAN ALLUVIAL MATERIAL. RIVER RIGHT APPROACH RAMP SHALL HAVE GEOTEXTILE SEPARATION FABRIC PLACED ON EXISTING GROUND AND UNDER APPROACH RAMP MATERIAL. APPROACH RAMP MATERIAL, FILTER FABRIC, COFFERDAM AND BRIDGE SHALL BE REMOVED AT PROJECT COMPLETION.

THE CONSTRUCTION CONTRACTOR SHALL ALLOW THE BRIDGE TO BE USED BY A SEPARATE VEGETATION CONTRACTOR SO THAT THEY MAY STOCKPILE PLANTS AND SUPPLIES IN THE PROJECT AREA FOR LATER REVEGETATION EFFORTS. SCHEDULING FOR THIS WILL BE COORDINATED BETWEEN THE OWNER AND THE CONSTRUCTION CONTRACTOR.

THE TEMPORARY BRIDGE SHALL BE REMOVED BEFORE THE END OF THE IN-WATER WORK WINDOW.

MEASUREMENT AND PAYMENT

"TEMPORARY ACCESS BRIDGE" WILL BE MEASURED AND PAID FOR BY LUMP SUM. INSTALLATION OF THE TEMPORARY BRIDGE, REMOVAL, MAINTENANCE, AND ASSOCIATED ITEMS SUCH AS ABUTMENTS, FOOTINGS, RAMPS, AND SEDIMENT AND WATER CONTROLS SHALL BE INCLUDED IN THIS ITEM.

ITEM 008 - 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 PRESTON PIT 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 SORT LWM AT THE PRESTON PIT TO FACILITATE AND EXPEDITE HELICOPTER OPERATIONS. CONTRACTOR SHALL 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.

ITEMS 009 - TREE TIPPING

TIPPING OF WHOLE TREES SHOWN IN THE PLANS IS NOT INCLUDED IN CONTRACT. THIS WORK WILL BE COMPLETED BY OTHERS.

ITEMS 010-013 - 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” INCLUDES:

- ITEM 010 - DEFLECTOR JAM
- ITEM 011 - 7-LOG APEX JAM
- ITEM 012 - 5-LOG APEX JAM
- ITEM 013 - BANK BURIED MARGIN JAM

MATERIALS

LOG STRUCTURES SHALL BE CONSTRUCTED OF LARGE WOODY MATERIAL (LWM), EXCAVATION AND BACKFILL, SLASH, SALVAGED TREE TOPS, WHOLE TREES AND - IF DIRECTED BY OWNER, OPTIONAL ADDITIVE ITEMS: ITEM 017 - APEX JAM BALLAST BOULDERS AND/OR ITEM 018 - IMPORTED BOULDER

BACKFILL. LWM INCLUDES: LOGS WITH ROOTWADS, LOGS WITHOUT ROOTWADS, AND VERTICAL LOGS. LWM IS SUPPLIED BY THE OWNER AND IS DECKED AT THE PRESTON PIT APPROXIMATELY 6 MILES EAST OF THE PROJECT.

A NUMBER OF LWM WILL BE TRANSPORTED AND TEMPORARILY DECKED THROUGH THE PROJECT AREA BY HELICOPTER AS NOTED IN THE PLANS FOR INSTALLATION BY CONTRACTOR. A NUMBER OF LWM WILL BE PLACED BY HELICOPTER AS NOTED IN THE PLANS SOME HELICOPTER PLACED LWM WILL REQUIRE EXCAVATION OF A SCOUR POOL AND POSITIONING OF LOGS BY CONTRACTOR AS NOTED IN THE PLANS. THE CONTRACTOR SHALL LOAD AND HAUL REMAINING LWM FROM THE OWNER'S STOCKPILE. QUANTITIES TO BE MOVED TO EACH SITE ARE SHOWN IN 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" DBH.
3. VERTICAL LOGS: 20' LONG AND 15” DIAMETER IN MIDDLE OF LOG.

SLASH: INCLUDES SHRUBS, TREES <6" DBH AND TREE TOPS REMOVED FROM ACCESS ROUTES AND EXCAVATION AREAS. SALVAGED TREE: INCLUDES TREES >6" DBH REMOVED FROM ACCESS ROUTES AND EXCAVATION AREAS.

APEX JAMS AND DEFLECTOR LOGS MAY REQUIRE BOLTED CONNECTIONS PER DIRECTION OF THE ENGINEER AS A FIELD FIT ITEM. BOLTED CONNECTIONS SHALL BE AS SPECIFIED ON SHEET 18 OF THE PLANS. QUANTITIES OF BOLTED CONNECTIONS ARE SPECIFIED ON THE APEX JAM AND DEFLECTOR JAM DETAILS.

CONSTRUCTION REQUIREMENTS

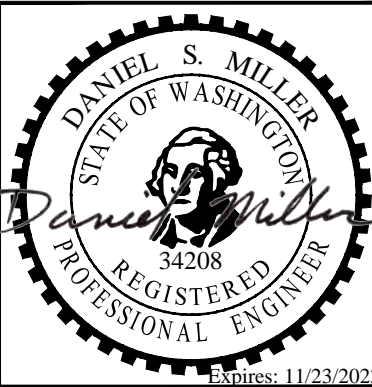
EXISTING GABIONS, CONCRETE BLOCKS, ASPHALT AND OTHER DEBRIS ENCOUNTERED IN EXCAVATION AREAS SHALL BE HAULED AND DISPOSED OF OFFSITE.

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. THE ENDS OF CUT LOGS WILL BE INCORPORATED INTO LOG STRUCTURES AS SLASH.

VERTICAL LOGS: 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.



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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).

SLASH: 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 10FT MINIMUM INTO FILL. BACKFILL THE LOGS AS EACH LAYER IS INSTALLED. A CULTURAL STAFF PERSON WILL BE PRESENT ON SITE DURING ALL EXCAVATION ACTIVITIES.

AT PROJECT COMPLETION, CONTRACTOR SHALL RESTORE THE PRESTON PIT BY REMOVING DEBRIS, NEATLY STOCKPILING MATERIALS APPROVED BY OWNER TO REMAIN AND GRADING SMOOTH AND BLENDING TO EXISTING TOPOGRAPHY.

MEASUREMENT AND PAYMENT

MEASUREMENT AND PAYMENT SHALL BE MADE PER EACH STRUCTURE FOR:

- ITEM 010 - DEFLECTOR JAM
- ITEM 011 - 7-LOG APEX JAM
- ITEM 012 - 5-LOG APEX JAM
- ITEM 013 - BANK BURIED MARGIN JAM

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, BOLTED CONNECTIONS, SLASH AND SALVAGED TREE TOPS AS OUTLINED IN THE PLANS. EARTHWORK, LWM HANDLING IN SUPPORT OF HELICOPTER OPERATIONS, HAUL AND DISPOSAL OF FILL, GABIONS, CONCRETE. ASPHALT & DEBRIS AND INSTALLING SLASH AND SALVAGED TREES SHALL BE INCIDENTAL TO “LOG STRUCTURE”.

ITEMS 014-015 - SIDE CHANNEL EXCAVATION AND HAUL

SIDE CHANNEL EXCAVATION AND HAUL INCLUDES EXCAVATION, HAUL AND PLACEMENT FOR CONSTRUCTION OF:

- ITEM 014 SIDE CHANNEL 6
- ITEM 015 SIDE CHANNEL 7

WORK SHALL CONSIST OF EXCAVATING, LOADING AND HAULING SPOILS TO OFFSITE DISPOSAL AREA PLACEMENT AND GRADING TO BLEND TO EXISTING CONTOURS. OFFSITE DISPOSAL AREA IS THE PRESTON PIT. SPECIFIC LOCATION AND GRADING WILL BE DIRECTED BY THE OWNER IN THE FIELD. SPOILS SHALL BE PLACED IN DESIGNATED SPOILS AREAS OR OTHERWISE DISPOSED OF IN ACCORDANCE WITH SECTION 2-03 OF THE STANDARD SPECIFICATIONS, AND AS AMENDED BY THESE SPECIAL PROVISIONS.

1. OWNER'S REPRESENTATIVE WILL FLAG IN THE FIELD THE ALIGNMENT OF SIDE CHANNELS 6 AND 7 FOR EXCAVATION. CONTRACTOR SHALL PROVIDE SURVEY EQUIPMENT AND CONDUCT STAKEOUT AND SURVEY TO DETERMINE ELEVATIONS. EXISTING ELEVATION CONTROL POINTS

- ARE LOCATED NEARBY.
2. PORTIONS OF WORK MAY BE IN WATER. THE CONTRACTOR IS ADVISED THAT GROUNDWATER MAY BE ENCOUNTERED THROUGHOUT EXCAVATION AREAS. PUMPING AND TESC SHALL BE IMPLEMENTED AS NECESSARY.
3. THIS ITEM INCLUDES HAULING OF MATERIAL EXCAVATED FROM SIDE CHANNEL 6 TO THE PRESTON PIT APPROXIMATELY 6 MILES EAST OF THE PROJECT SITE. EXCAVATED MATERIAL MAY BE REQUIRED AS SALVAGED BACKFILL IN APEX LOG STRUCTURES. SIDE CHANNEL 7 EXCAVATED MATERIAL WILL BE INCORPORATED WITH THE SIDE CHANNEL 7 INLET APEX JAM.
4. THIS ITEM INCLUDES DETAIL GRADING TO SHAPE THE CHANNEL, INCLUDING CREATING POOLS AND FLOODPLAIN AND WETLAND ALCOVES, AS SHOWN IN THE PLANS. POOLS SHALL BE OVER-EXCAVATED INTO THE STREAMBANK TO PROVIDE ROOM TO INSTALL LOGS WITH ROOTS AND SALVAGED TREES.
5. CONTRACTOR SHALL NOTIFY THE OWNER WHEN EACH SIDE CHANNEL HAS BEEN EXCAVATED TO LIMITS SHOWN ON THE PLANS. THE OWNER'S REPRESENTATIVE SHALL INSPECT THE EXPOSED BED MATERIAL BEFORE THE CONTRACTOR PROCEEDS WITH FINE GRADING.
6. CONTRACTOR SHALL ALLOW OWNER'S REPRESENTATIVE TIME TO INSPECT SOILS EXPOSED AT FINISHED GRADE AND DETERMINE IF OPTIONAL ADDITIVE ALTERNATE ITEM 019 - IMPORTED SUBSTRATE IS REQUIRED. IF SO, CONTRACTOR SHALL COMPLETE IMPORTED SUBSTRATE BEFORE PLACING SALVAGED SLASH, TREE TOPS AND TREES.
7. INSTALLATION OF SALVAGED SLASH, TREE TOPS AND TREES AT DIRECTION OF OWNER ALONG CONSTRUCTED SIDE CHANNEL.
8. NO WORK SHALL OCCUR OUTSIDE OF THE LIMITS OF DISTURBANCE SHOWN IN THE PLANS UNLESS AUTHORIZED BY THE OWNER.
9. A CULTURAL STAFF PERSON WILL BE PRESENT ON SITE DURING ALL EXCAVATION ACTIVITIES.

MEASUREMENT AND PAYMENT

SIDE CHANNEL EXCAVATION AND HAUL WILL BE MEASURED BY CUBIC YARD OF MATERIAL EXCAVATED FROM SIDE CHANNEL 6. SIDE CHANNEL 7 EXCAVATED MATERIALS SHALL BE INCIDENTAL TO ITEM 011 - 7 LOG APEX JAM. ALL EXCAVATED MATERIAL WILL BE MEASURED IN THE POSITION IT OCCUPIED BEFORE THE EXCAVATION WAS PERFORMED. AN ORIGINAL GROUND MEASUREMENT WAS TAKEN USING DIGITAL TERRAIN MODELING SURVEY TECHNIQUES. THE ORIGINAL GROUND WILL BE COMPARED WITH THE PLANNED FINISHED SECTION SHOWN IN THE PLANS. NO ADJUSTMENT TO MEASUREMENT SHALL BE MADE FOR EXPANSION OF MATERIAL. HAUL, DISPOSAL, GRADING OF DISPOSED SPOILS, FORMING OF CHANNEL FEATURES AND PLACEMENT OF SALVAGED SLASH, TREE TOPS AND TREES SHALL BE INCIDENTAL TO THIS ITEM. NO ADDITIONAL COMPENSATION WILL BE MADE FOR EXCAVATED MATERIAL THAT IS OVER EXCAVATED OR STOCKPILED, RE-EXCAVATED, AND MOVED AGAIN.

PAYMENT SHALL BE CONSIDERED FULL COMPENSATION FOR ALL EQUIPMENT, LABOR, TOOLS, MATERIALS, AND INCIDENTALS NECESSARY TO COMPLETE THIS WORK AS SPECIFIED.

ITEM 016 - GRAVEL TRAIL RECONSTRUCTION

GRAVEL TRAIL RECONSTRUCTION SHALL INCLUDE PROCURING, DELIVERING AND INSTALLATION OF MATERIALS AND CONSTRUCTION OF GRAVEL TRAIL PER USFS DETAILS SUMMARIZED IN THE PLANS. SAND AND GRAVEL MATERIALS EXCAVATED TO SUBGRADE SHALL BE HAULED AND PLACED IN THE PRESTON PIT DISPOSAL AREA. EXISTING ASPHALT SURFACE REMOVED SHALL BE HAULED FOR LEGAL OFF SITE DISPOSAL. TRAIL SHALL FOLLOW AN ALIGNMENT IDENTIFIED BY USFS STAFF AND OWNER. TIMBER EDGING SHALL BE INSTALLED AS NOTED IN PLANS AND AS DIRECTED BY USFS STAFF AND OWNER.

MEASUREMENT AND PAYMENT

GRAVEL TRAIL RECONSTRUCTION SHALL BE MEASURED AND PAID FOR PER LINEAL FOOT OF COMPLETED GRAVEL TRAIL. PAYMENT WILL BE FULL

COMPENSATION FOR ALL COSTS INCURRED FOR EXCAVATING TO SUBGRADE AND DISPOSAL OF EXCAVATED MATERIALS, LEGAL OFFSITE DISPOSAL OF OLD ASPHALT MATERIALS, PROCURING, DELIVERY, HANDLING, STOCKPILING, PLACING FILTER FABRIC, AGGREGATES, TIMBER EDGING AND APPURTENANT MATERIALS.

OPTIONAL ADDITIVE ALTERNATE ITEMS

FOLLOWING ARE OPTIONAL ADDITIVE ALTERNATE ITEMS. OWNER SHALL DETERMINE IF ITEMS ARE REQUIRED, QUANTITIES AND LOCATIONS FOR PLACEMENTS. OWNER SHALL PROVIDE WRITTEN AUTHORIZATION TO IMPLEMENT THESE ITEMS PRIOR TO PROCUREMENT, TRANSPORT, HANDLING OR INSTALLATION.

ITEM 017 - APEX JAM BALLAST BOULDERS

OWNER SHALL DETERMINE IF APEX JAM BALLAST BOULDERS (BOULDERS) ARE REQUIRED. CONTRACTOR SHALL PROCURE BY SALVAGE OR IMPORT, HAUL AND PLACE BOULDERS. UNLESS NOTED HEREIN, BOULDERS SHALL MEET WSDOT STANDARD SPECIFICATION 9-13.1. BOULDERS SHALL BE 4FT EQUIVALENT DIAMETER WITH SPECIFIC GRAVITY OF 2.65 OR GREATER AND SHALL WEIGH NO LESS THAN 5,500 POUNDS DRY WEIGHT PER EACH. BOULDERS SHALL BE ROUNDED TO SUBANGULAR.

MEASUREMENT AND PAYMENT

BALLAST BOULDERS SHALL BE MEASURED AND PAID FOR PER EACH BOULDER. PAYMENT WILL BE FULL COMPENSATION FOR ALL COSTS INCURRED FOR SALVAGE OR IMPORT OF BOULDERS, HAULING, STOCKPILING AND PLACING.

ITEM 018 - IMPORTED BOULDER BACKFILL

OWNER SHALL DETERMINE IF IMPORTED BOULDER BACKFILL IS REQUIRED FOR BACKFILL ON APEX JAM STRUCTURES. THIS MATERIAL IS COMPRISED OF COBBLE TO MEDIUM SIZED BOULDERS THAT IS CURRENTLY STOCKPILED AT THE PRESTON PIT STAGING AREA. CONTRACTOR SHALL HAUL AND PLACE IMPORTED BOULDER BACKFILL IN APEX JAM STRUCTURES AS DIRECTED BY ENGINEER.

MEASUREMENT AND PAYMENT

IMPORTED BOULDER BACKFILL SHALL BE MEASURED AND PAID FOR PER CUBIC YARD PLACED. PAYMENT WILL BE FULL COMPENSATION FOR ALL COSTS INCURRED FOR IMPORTED BOULDER BACKFILL, HAULING, STOCKPILING AND PLACING.

ITEM 019 - IMPORTED SUBSTRATE

IMPORTED SUBSTRATE SHALL INCLUDE IMPORTING ALLUVIAL SUBSTRATE MATERIAL AS DIRECTED BY OWNER. THIS ITEM INCLUDES EXCAVATION TO SUBGRADE OF SUBSTRATE AND HAUL AND DISPOSAL OF EXCAVATED MATERIALS IN PRESTON PIT DISPOSAL AREA, PROCURING, DELIVERY, HANDLING, STOCKPILING, MIXING, AND PLACING THE SUBSTRATE MATERIAL IN THE SIDE CHANNEL SEGMENTS.

SIZE AND GRADATION OF IMPORTED SUBSTRATE SHALL BE DETERMINED FOLLOWING INSPECTION OF SOILS EXPOSED AT FINISHED GRADE. IMPORTED SUBSTRATE SHALL BE IN ACCORDANCE WITH SECTION 9-03.11 OF THE STANDARD SPECIFICATIONS, MINIMUM SPECIFIC GRAVITY =2.65, AND AS AMENDED BY THESE SPECIAL PROVISIONS.

1. BY VOLUME, THE COARSE SUBSTRATE MIX SHALL CONSIST OF 75% STREAMBED SEDIMENT (WSDOT 9-03.11(1)) MIXED WITH 25% 12-INCH MINUS STREAMBED COBBLE (WSDOT 9-03.11(2)).
2. CONTRACTOR SHALL MIX COARSE SUBSTRATE MATERIALS AND NOTIFY OWNER FOR INSPECTION BEFORE PLACING IN THE SIDE CHANNEL.

MEASUREMENT AND PAYMENT

IMPORTED SUBSTRATE SHALL BE MEASURED AND PAID FOR BY CUBIC YARD OF PLACED MATERIAL. PAYMENT WILL BE FULL COMPENSATION FOR ALL COSTS INCURRED FOR EXCAVATING TO SUBGRADE AND DISPOSAL OF EXCAVATED MATERIALS, PROCURING, DELIVERY, HANDLING, STOCKPILING, MIXING, AND PLACING THE SUBSTRATE MATERIAL.

ITEM 020 - ROAD ASPHALT REPAIR/REPLACEMENT

ROAD ASPHALT REPAIR/REPLACEMENT SHALL BE COMPLETED FOR EXISTING PAVED ROAD SECTIONS IDENTIFIED BY USFS STAFF AND OWNER TO HAVE BEEN DAMAGED BY CONSTRUCTION. SAND AND GRAVEL MATERIALS EXCAVATED TO SUBGRADE SHALL BE HAULED AND PLACED IN THE PRESTON PIT DISPOSAL AREA. EXISTING ASPHALT SURFACE REMOVED SHALL BE HAULED FOR LEGAL OFF SITE DISPOSAL. CONTRACTOR SHALL REPAIR/REPLACE CRUSHED GRAVEL ROAD PER USFS REQUIREMENTS, INCLUDING WSDOT STANDARD SPECIFICATION 9-03.9(3) CRUSHED SURFACING BASE COURSE AND 3INCH THICKNESS OF ASPHALT OVER TYPICAL 12FT ROAD WIDTH. FINISHED GRADE SHALL BE SLOPED PER USFS CRITERIA TO PROVIDE POSITIVE DRAINAGE OFF ROAD SURFACE.

MEASUREMENT AND PAYMENT

ROAD ASPHALT REPAIR/REPLACEMENT SHALL BE MEASURED AND PAID FOR PER SQUARE YARD AREA OF COMPLETED TREATMENT AREA. PAYMENT WILL BE FULL COMPENSATION FOR ALL COSTS INCURRED FOR EXCAVATING TO SUBGRADE AND DISPOSAL OF EXCAVATED MATERIALS, LEGAL OFFSITE DISPOSAL OF OLD ASPHALT MATERIALS, PROCURING, DELIVERY, HANDLING, STOCKPILING, MIXING, AND PLACING THE SUBSTRATE MATERIAL.

ITEM 021 - ROAD CRUSHED GRAVEL REPAIR/REPLACEMENT

ROAD CRUSHED GRAVEL REPAIR/REPLACEMENT SHALL BE COMPLETED IN EXISTING ROAD SECTIONS IDENTIFIED BY USFS STAFF AND OWNER TO HAVE BEEN DAMAGED BY CONSTRUCTION. CONTRACTOR SHALL REPAIR/REPLACE CRUSHED GRAVEL ROAD PER USFS REQUIREMENTS. ROAD SECTION SHALL INCLUDE WSDOT STANDARD SPECIFICATION 9-03.9(3) CRUSHED SURFACING BASE COURSE AND 3INCHES CRUSHED SURFACING TOP COURSE OVER TYPICAL 12FT ROAD WIDTH. AGGREGATE SHALL BE WETTED AND COMPACTED TO 95% STANDARD PROCTOR. FINISHED GRADE SHALL BE SLOPED PER USFS CRITERIA TO PROVIDE POSITIVE DRAINAGE OFF ROAD SURFACE.

MEASUREMENT AND PAYMENT

ROAD CRUSHED GRAVEL REPAIR/REPLACEMENT SHALL BE MEASURED AND PAID FOR PER CUBIC YARD INSTALLED VOLUME. PAYMENT WILL BE FULL COMPENSATION FOR ALL COSTS INCURRED FOR EXCAVATING TO SUBGRADE AND DISPOSAL OF EXCAVATED MATERIALS, PROCURING, DELIVERY, HANDLING, STOCKPILING, MIXING, AND PLACING THE SUBSTRATE MATERIAL.

			CP	DM	DM, MR
			DRAWN	DESIGNED	CHECKED
			DM	5/13/2022	20-02-35
			APPROVED	DATE	PROJECT
NO.	DATE	REVISION DESCRIPTION			

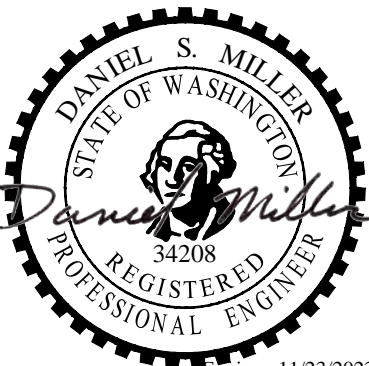
Silver Falls Project Area
Yakama Nation Fisheries Program
Entiat River, Chelan County



501 Portway Avenue, Suite 101
Hood River, OR 97031
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SPECIFICATIONS
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SHEET
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Silver Falls - interpretive trail.

Station from trailhead		Surface	
start	stop	length	type
0	452	452	pavement
452	669	217	gravel
669	1413	744	pavement
1413	1446	33	boardwalk
1446	1826	380	pavement
1826	2050	224	gravel
Surface		total length	
pavement		1576 ft	
gravel		441 ft	
boardwalk		33 ft	

Silver Falls - interpretive trail.

Station from trailhead		Length of timber edging along				Rounding for 10ft timbers				Notes
start	stop	land side	tiers	river side	tiers	land side	tiers	river side	tiers	
0	713	713	1	713	1	710	1	710	1	depth of timber varies d.o d.o d.o d.o d.o d.o d.o d.o d.o d.o d.o d.o old boardwalk: timbers on both sides, three tiers high both sides, four: 6" ADS flow equilizer pipes through embankment depth of timber varies d.o d.o top of timber flush with ground
778	806	28	1	28	1	30	1	30	1	
806	869	63	1	--	--	60	1	--	--	
878	934	56	1	56	1	60	1	60	1	
945	963	18	1	--	--	20	1	--	--	
1011	1031	20	1	20	1	20	1	20	1	
1066	1113	47	1	--	--	50	1	--	--	
1141	1161	20	2	--	--	20	2	--	--	
1161	1180	19	1	--	--	20	1	--	--	
1222	1283	61	1	61	1	60	1	60	1	
1283	1318	35	1	--	--	40	1	--	--	
1324	1368	44	1	44	1	40	1	40	1	
1407	1439	32	3	32	3	30	3	30	3	
1550	1593	43	1	43	1	40	1	40	1	
1686	1750	64	1	64	1	60	1	60	1	
1818	1849	31	1	31	1	30	1	30	1	
1876	2046	170	1	170	1	170	1	170	1	
Subtotal length =		1548		1326		1540		1310		
Total length =		2874				2850				

Project Wood Tallies:

Feature	Total Installed	Helicopter Staged Wood	Hauled LWM
Piles: 15" x 20' log w/o rootwad	86	64	22
Rootwads: 18" x 40' log with rootwad	69	48	21
Bumper Logs: 18" x 30-40' log w/o rootwad	22	10	12
Subtotal LWM hauled/flown	177	122	55

*** (Note: These quantities do not include the additional 80 logs with rootwads placed by the helicopter) ***