

Appendix A:

Kachess River Bull Trout Habitat Design Project

Final Channel & Floodplain Designs

KACHESS RIVER BULL TROUT HABITAT DESIGN PROJECT

FINAL CHANNEL & FLOODPLAIN DESIGNS

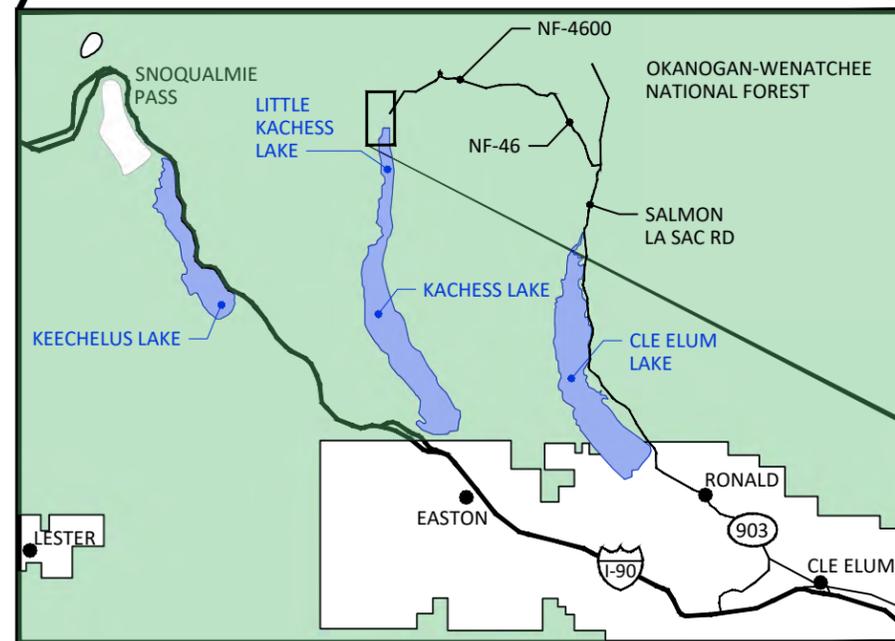
KITTITAS COUNTY, WA

DECEMBER 2021



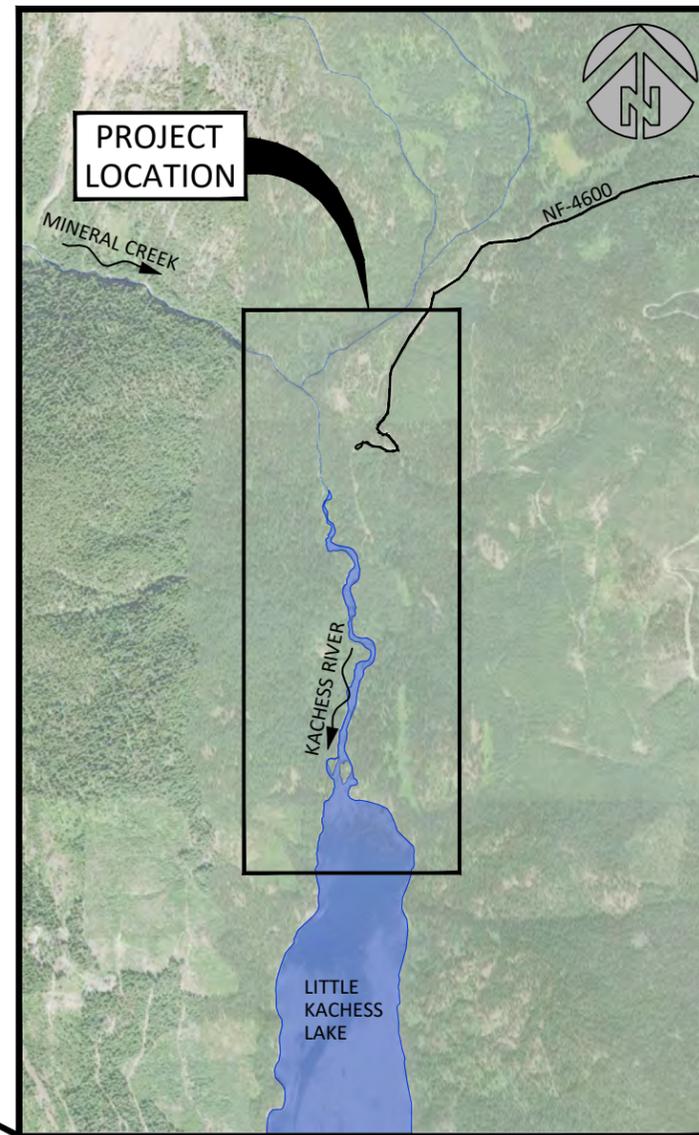
**LOCATION MAP
STATE OF WASHINGTON**

NOT TO SCALE



VICINITY MAP

NOT TO SCALE



SITE MAP

1" = 2500'

COORDINATES:

LATITUDE: 47°24'47"N
LONGITUDE: 121°14'18"W

SECTION 5 & 8, TOWNSHIP 22N,
RANGE 13E

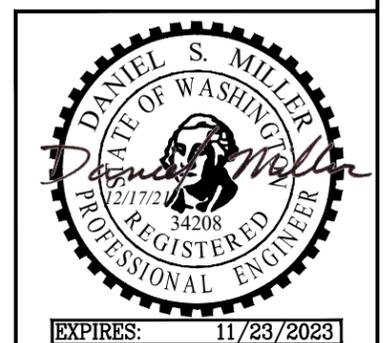
WATERBODY: KACHESS RIVER AND
MINERAL CREEK
TRIBUTARY OF: LITTLE KACHESS LAKE

ABBREVIATIONS

APPROX	APPROXIMATE
BMP	BEST MANAGEMENT PRACTICE
CY	CUBIC YARDS
°	DEGREE
DBH	DIAMETER AT BREAST HEIGHT
E	EAST
EA	EACH
ESC	EROSION AND SEDIMENT CONTROL
' or FT	FOOT
FP	FLOODPLAIN
GIS	GEOGRAPHIC INFORMATION SYSTEM
HEC-RAS	HYDROLOGIC ENGINEERING CENTER'S RIVER ANALYSIS SYSTEM
HWY	HIGHWAY
" or IN	INCH
KCT	KITTITAS CONSERVATION TRUST
LBS	POUNDS
LWM	LARGE WOODY MATERIAL
MAX	MAXIMUM
MIN	MINIMUM
MSF	THOUSAND SQUARE FEET
N	NORTH
NAD83	NORTH AMERICAN DATUM OF 1983
NAV88	NORTH AMERICAN VERTICAL DATUM OF 1988
NF	NATIONAL FOREST
NRCS	NATURAL RESOURCES CONSERVATION SERVICE
OHW	ORDINARY HIGH WATER
%	PERCENT
PLS	PURE LIVE SEED
RD	ROAD
RTK GPS	REAL TIME KINEMATIC GLOBAL POSITIONING SYSTEM
SPCC	SPILL PREVENTION, CONTROL, AND COUNTER MEASURES
STA	STATION
TBD	TO BE DETERMINED
TBM	TEMPORARY BENCHMARK (WOODEN HUB)
TYP	TYPICAL
US	UNITED STATES
USACE	UNITED STATES ARMY CORPS OF ENGINEERS
USFS	UNITED STATES FOREST SERVICE
W	WEST
WDFW	WASHINGTON DEPARTMENT OF FISH AND WILDLIFE
WSDOT	WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
WSE	WATER SURFACE ELEVATION

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EXPIRES: 11/23/2023

NO.	BY	DATE	REVISION DESCRIPTION

SP, NS, SJ	DM, PL, PB, JP	PL, DM, JP
DRAWN	DESIGNED	CHECKED
PL, DM	DECEMBER 2021	180213
APPROVED	DATE	PROJECT

KITTITAS CONSERVATION TRUST
KACHESS RIVER BULL TROUT HABITAT DESIGN PROJECT
FINAL CHANNEL & FLOODPLAIN DESIGNS

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COVER, SHEET INDEX, & VICINITY MAP

SHEET
1 OF 34

CONTRACTOR IS REQUIRED TO ATTEND A MANDATORY 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 CURRENT EDITIONS OF STANDARD PLANS AND SPECIFICATIONS OF THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT), AND 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.

ALL MEASURES FROM ARBO II SHALL BE FOLLOWED.

EXISTING DATA

TOPOGRAPHIC SURVEY COLLECTED BY INTER-FLUVE, INC. USING RTK GPS ON JULY 17-19th 2019, OCTOBER 1st 2019, OCTOBER 10th 2019, AND OCTOBER 27-30th 2020. SURVEY DATA IS REFERENCED TO NAD83 WASHINGTON STATE PLANE, SOUTH ZONE, US FEET, NAVD 88.

HYDRAULIC MODELING BY INTER-FLUVE USING USACE HEC-RAS (5.0.7). MODEL CALIBRATED USING SURVEYED WATER SURFACE ELEVATIONS AND OBSERVED HIGH WATER MARKS.

PROJECT AREA IS ENTIRELY WITHIN OKANOGAN-WENATCHEE NATIONAL FOREST.

HILLSHADE FROM LIDAR DATA COLLECTED AND PROCESSED BY QUANTUM SPATIAL IN 2018.

WATERS OF THE U.S.

THE ORDINARY HIGH WATER (OHW) DISPLAYED IN THE DESIGN PACKAGE WERE DELINEATED BY INTER-FLUVE STAFF IN 2019, AND ARE BASED UPON ANALYSIS, MODELING AND BEST PROFESSIONAL JUDGEMENT.

THESE LINES DO NOT NECESSARILY REPRESENT JURISDICTIONAL BOUNDARIES. IN THE STATE OF WASHINGTON, THE DEPARTMENT OF ECOLOGY AND THE UNITED STATES ARMY CORPS OF ENGINEERS (USACE) HAVE THE FINAL AUTHORITY IN DELINEATING WATERS AND WETLANDS BOUNDARIES.

SOILS

SOILS ONSITE ARE COMPOSED OF VABOS STONY ASHY SANDY LOAM, 25-45 % SLOPE; CRYOFLUVENTS-DYSTROCRYEPTS VOLCANIC ASH, ALLUVIUM AND COBBY ALLUVIUM, 0-3 % SLOPE; VABOS ASHY SANDY LOAM, 20-40 % SLOPE, AND THETIS ASHY SANDY LOAM 25-45 % SLOPE AS MAPPED BY NRCS.

RIVER SUBSTRATE ALLUVIUM IS COBBLE AND SMALL BOULDERS WITH GRAVELS.

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.

IN-WATER WORK PERIODS

WORK SHALL OCCUR DURING THE PERMITTED IN-WATER WORK PERIOD AS STATED IN THE APPLICABLE PERMITS.

FISH RESCUE

KITTITAS CONSERVATION TRUST (KCT) WILL COORDINATE AND BE RESPONSIBLE FOR ALL FISH RESCUE EFFORTS.

CONTRACTOR IS RESPONSIBLE FOR ISOLATING THE CONSTRUCTION LOCATION FROM THE STREAM, ACCORDING TO REGULATORY PROTOCOL AND STANDARDS PROVIDED IN ARBO II. CONTRACTOR WILL COMMUNICATE AND COORDINATE WITH KCT WHEN ISOLATION IS PLANNED TO OCCUR TO FACILITATE THE FISH RESCUE EFFORT PRIOR TO CONSTRUCTION ACTIVITIES AT THE ISOLATED SITE.

CULTURAL RESOURCES

IF ANY ARCHAEOLOGICAL RESOURCES AND/OR ARTIFACTS ARE ENCOUNTERED DURING CONSTRUCTION ALL CONSTRUCTION ACTIVITY SHALL IMMEDIATELY CEASE AND THE OWNER SHALL BE CONTACTED.

CONTRACTOR'S PLANS

CONTRACTOR SHALL PREPARE AND SUBMIT FOR OWNER'S APPROVAL PRIOR TO COMMENCING WORK THE FOLLOWING PLANS:

- ACCESS, STAGING & STOCKPILE, TRAFFIC CONTROL AND TEMPORARY STREAM CROSSING PLAN
- CONSTRUCTION SEQUENCING PLAN
- STREAM DIVERSION, FISH RESCUE, AND SITE DEWATERING PLAN
- EROSION, SEDIMENT, AND DUST CONTROL PLAN
- EARTHWORKS EXCAVATION, PLACEMENT, SALVAGE & REUSE, AND DISPOSAL PLAN

TREE SALVAGE

ALL SAPLING AND TREES TO BE REMOVED SHALL BE APPROVED AND CLEARLY MARKED BY THE OWNER OR OWNER'S REPRESENTATIVE, AND IN ACCORDANCE WITH THE UPPER KACHESS RIVER RESTORATION PROJECT TREE HARVEST SPECIFICATIONS DOCUMENT.

ALL REMOVED VEGETATION SHALL BE INCORPORATED INTO LOG JAM AND FLOODPLAIN ROUGHNESS STRUCTURES AS DIRECTED BY THE OWNER'S REPRESENTATIVE. IF EXCESS VEGETATION MATERIAL NEEDS DISPOSAL OUTSIDE OF CHANNEL WORK, IT SHALL BE DISTRIBUTED ON THE FLOODPLAIN AS DIRECTED BY THE OWNER'S REPRESENTATIVE.

ALL TREES REMOVED WITHIN CLEARING LIMITS SHALL BE REMOVED WHOLE WITH ROOTS INTACT AND UTILIZED IN THE SIDE CHANNEL CONSTRUCTION OR IN MAINSTEM WORK AS DIRECTED BY OWNER'S REPRESENTATIVE.

REMOVE SOIL FROM ROOTS OF SALVAGED TREES BEFORE PLACEMENT IN THE WATERWAY.

TREES REMOVED FROM WITHIN 300-FT OF THE CHANNEL NEED TO BE USED IN THE CHANNEL AND RIPARIAN RESERVE FOR RESTORATION; TREES REMOVED OUTSIDE THE 300-FT BUFFER ARE AVAILABLE FOR MULTI-USE THROUGHOUT THE PROJECT, PER USFS ARBO II PROJECT DESIGN CRITERIA

LIVE TREES

ALL TREES NOT MARKED FOR REMOVAL SHALL BE PRESERVED AND UNDISTURBED. CONSTRUCTION ACTIVITY SHALL NOT DEBARK OR DAMAGE LIVE TREES.

KEEP OUT OF DRIP LINE OF ALL PRESERVED EXISTING TREES.

CONSTRUCTION ACCESS

THE CONTRACTOR IS ADVISED THAT ACCESS TO THE SITE WILL BE BY USFS 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.

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

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

TEMPORARY ACCESS ROUTES IN AREAS PRONE TO INUNDATION DURING THE IN-WATER WORK WINDOW SHALL BE DECOMMISSIONED BEFORE THE END OF THE IN-WATER WORK WINDOW.

WHEN VEGETATION REMOVAL IS REQUIRED, VEGETATION SHALL BE CUT TO GROUND LEVEL (NOT GRUBBED).

THE DECOMMISSIONING OF IMPROVED USFS ROADS AND TEMPORARY ACCESS ROADS WILL BE DONE PER USFS SPECIFICATIONS FOR ML1 AND ML3 ROAD OF THE US DEPT OF TRANSPORTATION, STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS, FP-14. SEE SHEETS 32 AND 34 FOR ROAD DECOMMISSION CLASSIFICATIONS AND DETAIL.

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 RESPONSIBLE 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.

ANY PROPERTY MONUMENTS DISTURBED OR DESTROYED SHALL BE REPLACED BY A WASHINGTON STATE PROFESSIONAL LICENSED SURVEYOR AT CONTRACTOR'S EXPENSE.

STAGING, STORAGE, AND STOCKPILE AREAS

STAGING AREAS (USED FOR CONSTRUCTION EQUIPMENT STORAGE, VEHICLE STORAGE, FUELING, SERVICING, AND HAZARDOUS MATERIAL STORAGE) SHALL BE 150 FEET OR MORE FROM ANY NATURAL WATER BODY OR WETLAND, OR ON AN ADJACENT, ESTABLISHED ROAD AREA IN A LOCATION AND MANNER THAT WILL PRECLUDE EROSION INTO OR CONTAMINATION OF THE STREAM OR FLOODPLAIN.

EXCAVATED MATERIALS SHALL BE STOCKPILED NEATLY IN AN APPROVED LOCATION WITHIN THE STOCKPILE AND STAGING AREAS. EXCESS MATERIAL SHALL BE STOCKPILED NEATLY IN THE DESIGNATED STAGING AREAS 1, 2, 3, OR 4 PER APPROVED SEQUENCING PLAN.

VARIOUS SOIL MATERIAL TYPES OR SIZES SHALL BE SELECTIVELY HANDLED, STOCKPILED, AND HAULED AS NECESSARY FOR REUSE IN PROJECT ELEMENTS OR ON-SITE DISPOSAL.

NATURAL MATERIALS USED FOR IMPLEMENTATION OR ON-SITE DISPOSAL OF AQUATIC RESTORATION, SUCH AS LARGE WOOD, SLASH, ALLUVIUM, AND TOPSOIL, MAY BE STAGED WITHIN THE 100-YEAR FLOODPLAIN.

ANY ALLUVIUM, TOPSOIL, AND NATIVE CHANNEL MATERIAL DISPLACED BY CONSTRUCTION SHALL BE STOCKPILED FOR USE DURING SITE RESTORATION AT A SPECIFICALLY IDENTIFIED AND FLAGGED AREA.

ANY MATERIAL NOT USED IN RESTORATION, AND NOT NATIVE TO THE FLOODPLAIN, SHALL BE REMOVED TO A LOCATION OUTSIDE OF THE 100-YEAR FLOODPLAIN FOR DISPOSAL BY THE CONTRACTOR.

AT COMPLETION OF WORK, REMAINING MATERIAL SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR OBTAINING ANY PERMITS AND FEES REQUIRED FOR LEGAL DISPOSAL.

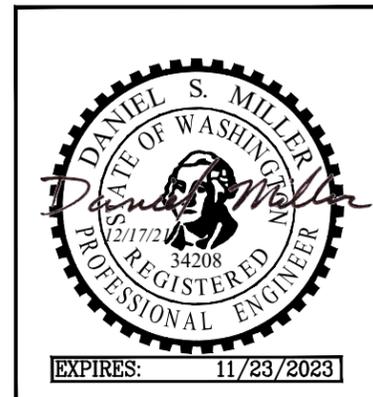
EQUIPMENT

MECHANIZED EQUIPMENT AND VEHICLES SHALL 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).

AVOID SOIL-DISTURBING ACTIONS DURING PERIODS OF HEAVY RAIN OR WET SOILS. OPERATE HEAVY EQUIPMENT WITHIN UNIT BOUNDARIES ONLY WHEN SOIL MOISTURE IS BELOW THE PLASTIC LIMIT. SOIL MOISTURE EXCEEDS THE PLASTIC LIMIT IF THE SOIL CAN BE ROLLED INTO 3mm THREADS WITHOUT BREAKING OR CRUMBLING.

ALL VEHICLES AND OTHER MECHANIZED EQUIPMENT SHALL BE:

- STORED, FUELED, AND MAINTAINED IN A VEHICLE STAGING AREA PLACED 150 FEET OR MORE FROM ANY NATURAL WATER BODY OR WETLAND OR ON AN ADJACENT, ESTABLISHED ROAD AREA
- REFUELED IN A VEHICLE STAGING AREA PLACED 150 FEET OR MORE FROM A NATURAL WATERBODY OR WETLAND, 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)
- BIODEGRADABLE LUBRICANTS AND FLUIDS SHALL BE USED IN EQUIPMENT OPERATING IN AND ADJACENT TO THE STREAM CHANNEL AND LIVE WATER.
- INSPECTED DAILY FOR FLUID LEAKS BEFORE LEAVING THE VEHICLE STAGING AREA FOR OPERATION WITHIN 150 FEET OF ANY NATURAL WATER BODY OR WETLAND
- THOROUGHLY CLEANED BEFORE LEAVING VEHICLE STAGING AREA AND OPERATION BELOW ORDINARY HIGH WATER, AND AS OFTEN AS NECESSARY DURING OPERATION, TO REMAIN GREASE FREE.



NO.	BY	DATE	REVISION DESCRIPTION

SP, NS, SJ DRAWN	DM, PL, PB, JP DESIGNED	PL, DM, JP CHECKED
PL, DM APPROVED	DECEMBER 2021 DATE	180213 PROJECT

KITTITAS CONSERVATION TRUST
KACHESS RIVER BULL TROUT HABITAT DESIGN PROJECT
FINAL CHANNEL & FLOODPLAIN DESIGNS



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GENERAL NOTES (1 OF 2)

EROSION CONTROL

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.

EROSION/SEDIMENTATION CONTROL (ESC) PLAN

THE EROSION AND SEDIMENT CONTROL (ESC) PLAN PROVIDED IS FOR INFORMATIONAL PURPOSES ONLY, THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR PROVIDING EROSION CONTROL MEASURES TO COMPLY WITH APPLICABLE REGULATIONS.

THE GUIDELINES HERE IN ARE PROVIDED TO ASSIST THE CONTRACTOR IN DEVELOPING AND IMPLEMENTING AN ESC PLAN. THE CONTRACTOR'S ESC PLAN SHALL BE SUBMITTED TO AND APPROVED BY THE OWNER PRIOR TO MOBILIZATION.

- A. THE IMPLEMENTATION OF AN ESC PLAN AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE ESC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED AND VEGETATION / LANDSCAPING IS ESTABLISHED.
- B. THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON THIS PLAN SHALL BE CLEARLY FLAGGED IN THE FIELD PRIOR TO CONSTRUCTION. DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE FLAGGED CLEARING LIMITS SHALL BE PERMITTED. THE FLAGGING SHALL BE MAINTAINED BY THE CONTRACTOR FOR THE DURATION OF CONSTRUCTION.

ESC FACILITIES AS APPROXIMATELY SHOWN ON THIS PLAN ARE TO BE CONSTRUCTED PRIOR TO CLEARING AND GRADING ACTIVITIES, AND IN SUCH A MANNER AS TO ENSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DO NOT ENTER THE DRAINAGE SYSTEM.

STABILIZE SOILS AND PROTECT SLOPES

FROM MAY 1 THROUGH SEPTEMBER 30, ALL EXPOSED SOILS SHALL BE PROTECTED FROM EROSION BY MULCHING, PLASTIC SHEETING, HYDROSEED COVERING, OR OTHER APPROVED MEASURES WITHIN THREE DAYS OF GRADING. FROM OCTOBER 1 THROUGH APRIL 30, ALL EXPOSED SOILS MUST BE PROTECTED WITHIN 2 DAYS OF GRADING. SOILS SHALL BE STABILIZED BEFORE A WORK SHUTDOWN, HOLIDAY OR WEEKEND IF NEEDED BASED ON THE WEATHER FORECAST. SOIL STOCKPILES MUST BE STABILIZED AND PROTECTED WITH SEDIMENT TRAPPING MEASURES. MULCH AS SOON AS PRACTICAL ALL DISTURBED AREAS NOT INDICATED IN THE CONTRACT DOCUMENTS FOR OTHER PERMANENT STABILIZATION MEASURES. HAY, STRAW, AND MULCH USED ON SITE MUST BE 99.9% WEED-FREE.

DESIGN, CONSTRUCT, AND PHASE CUT AND FILL SLOPES IN A MANNER THAT WILL MINIMIZE EROSION. REDUCE SLOPE VELOCITIES ON DISTURBED SLOPES BY PROVIDING TEMPORARY BARRIERS. STORMWATER FROM OFF SITE SHOULD BE HANDLED SEPARATELY FROM STORMWATER GENERATED ON SITE.

AFTER FINAL SITE STABILIZATION

ALL TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION IS ACHIEVED OR AFTER THE TEMPORARY BMPS ARE NO LONGER NEEDED. TRAPPED SEDIMENT SHALL BE REMOVED FROM THE SITE OR INCORPORATED INTO FINISHED GRADING. DISTURBED SOIL AREAS RESULTING FROM REMOVAL SHALL BE PERMANENTLY STABILIZED.

DUST CONTROL

THE CONTRACTOR SHALL CONTROL DUST FOR THE DURATION OF THE PROJECT. CONTROL MEASURES SHALL BE IN ACCORDANCE WITH APPLICABLE REGULATIONS.

INVASIVE SPECIES CONTROL

THE FOLLOWING MEASURES WILL BE FOLLOWED TO AVOID INTRODUCTION OF INVASIVE PLANTS AND NOXIOUS WEEDS INTO PROJECT AREAS:
 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.
 WATERCRAFT, WADERS, BOOTS, AND ANY OTHER GEAR TO BE USED IN OR NEAR WATER WILL BE INSPECTED FOR AQUATIC INVASIVE SPECIES.

CONSTRUCTION DEWATERING

CONTRACTOR SHALL PERFORM CONSTRUCTION DEWATERING IN SUCH A MANNER AS TO AVOID THE RELEASE OF TURBID OR SEDIMENT-LADEN WATER IN ORDER TO PREVENT CONTAMINATION OR INCREASE TURBIDITY OF SURFACE WATERS. EXCAVATION OF DEWATERING SUMPS BEYOND LIMITS SHOWN SHALL BE AT NO ADDITIONAL COST TO THE OWNER. SEDIMENT LADEN WATER MAY BE PUMPED TO AN UPLAND DISCHARGE LOCATION AND ALLOWED TO SHEET FLOW THROUGH EXISTING VEGETATION BEFORE INFILTRATING INTO THE GROUND. IF THIS METHOD IS NOT SUFFICIENT TO PREVENT RETURN OF TURBID WATER TO SURFACE WATERS OR SENSITIVE FLOODPLAIN AREAS, A 'DIRT-BAG' OR SEDIMENT RETENTION STRUCTURE MAY BE REQUIRED AS NECESSARY TO COMPLY WITH LAWS AND PERMIT REQUIREMENTS AT NO ADDITIONAL COST TO THE OWNER.

THE CONTRACTOR SHALL PROVIDE, OPERATE AND MAINTAIN ANY NUMBER AND SIZE OF PUMPS AS NECESSARY TO ACHIEVE DEWATERING NEEDS. AT A MINIMUM, CONTRACTOR SHALL PROVIDE A 6" DRI-PRIME DIESEL POWERED PUMP AND A PORTABLE 2" PUMP. ADDITIONAL PUMPS AND OF DIFFERENT CAPACITIES MAY BE REQUIRED AT CONTRACTOR'S EXPENSE.

CONTRACTOR SHALL GAIN OWNER'S APPROVAL OF DISCHARGE LOCATION PRIOR TO OPERATING PUMPS.

- A. THE ESC FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE ESC FACILITIES SHALL BE UPGRADED AS NEEDED AT NO ADDITIONAL COST TO THE OWNER FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT-LADEN WATER DO NOT LEAVE THE SITE.
- B. THE ESC FACILITIES SHALL BE INSPECTED DAILY BY THE CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING.
- C. THE ESC FACILITIES ON INACTIVE SITES SHALL BE INSPECTED AND MAINTAINED A MINIMUM OF ONCE A MONTH OR WITHIN THE 24 HOURS FOLLOWING A STORM EVENT.
- D. STABILIZED CONSTRUCTION ENTRANCES AND ADDITIONAL MEASURES MAY BE REQUIRED AND SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT.

SPILL PREVENTION, CONTROL, AND COUNTER MEASURES

THE USE OF MECHANIZED MACHINERY INCREASES THE RISK FOR ACCIDENTAL SPILLS OF FUEL, LUBRICANTS, HYDRAULIC FLUID, OR OTHER CONTAMINANTS INTO THE RIPARIAN ZONE OR DIRECTLY INTO THE WATER. THE CONTRACTOR SHALL ADHERE TO THE FOLLOWING MEASURES:

A DESCRIPTION OF HAZARDOUS MATERIALS THAT WILL BE USED, INCLUDING INVENTORY, STORAGE, AND HANDLING PROCEDURES WILL BE AVAILABLE ON-SITE.
 WRITTEN PROCEDURES FOR NOTIFYING ENVIRONMENTAL RESPONSE AGENCIES WILL BE POSTED AT THE WORK SITE.

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.

WORKERS WILL BE TRAINED IN SPILL CONTAINMENT PROCEDURES AND WILL BE INFORMED OF THE LOCATION OF SPILL CONTAINMENT KITS.

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.

BIODEGRADABLE HYDRAULIC FLUIDS SHALL BE USED IN ANY VEHICLE THAT WILL BE OPERATED NEAR THE WATER.

INSPECTION AND MAINTENANCE

ALL ESC FACILITIES SHALL BE INSPECTED, MAINTAINED, AND REPAIRED AS NEEDED TO ASSURE CONTINUED PERFORMANCE OF THEIR INTENDED FUNCTION. ALL ESC 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 ESC RECORD

WEEKLY REPORTS SUMMARIZING THE 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 THESE INSPECTIONS SHALL BE PREPARED AND RETAINED ON SITE BY THE CONTRACTOR. IN ADDITION, A RECORD OF THE FOLLOWING DATES SHALL BE INCLUDED IN THE REPORTS:

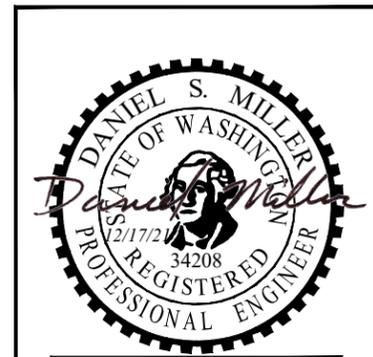
1. WHEN MAJOR GRADING ACTIVITIES OCCUR,
2. DATES OF RAINFALL EVENTS EITHER EXCEEDING 2 HOURS DURATION OR MORE THAN 0.5 INCHES/24 HOURS,
3. WHEN CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE ON SITE, OR ON A PORTION OF THE SITE,
4. WHEN STABILIZATION MEASURES ARE INITIATED FOR PORTIONS OF THE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

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

QUANTITIES

ACTIVITY	BELOW EXISTING OHW		ABOVE EXISTING OHW		DURATION OF IMPACT	NET VOLUME OF MATERIAL PLACED/ REMOVED (CY)	DISTURBANCE AREA (SF)
	CUT (CY)	FILL (CY)	CUT (CY)	FILL (CY)			
HIGH-FLOW SIDE CHANNEL EXCAVATION	44	96	4263	189	TEMPORARY	4022 (REMOVED)	40849
LEVEE REMOVAL	0	0	292	0	PERMANENT	292 (REMOVED)	4475
MAIN CHANNEL LARGE WOOD INSTALLATION EXCAVATION	952	952	0	0	TEMPORARY	0	33200
FLOODPLAIN FLOW ROUTING	0	0	0	300	TEMPORARY	300 (PLACED)	4899
GULLY FILL	0	462	0	218	TEMPORARY	680 (PLACED)	11568
MAGIC CREEK CONNECTOR	0	55	155	100	TEMPORARY	0	5602
TOTAL	996	1565	4710	807		3334 (REMOVED)	100593

NOTE: 2,000 CY OF MATERIAL (MIXED COMPOSITION OF SOIL AND GRAVEL, COBBLE AND/OR BOULDER ADEQUATE) TO BE STORED IN STAGING AREA 2 FOR FUTURE PHASE II ROAD DECOMMISSIONING, IN AREA AND MANNER IDENTIFIED BY OWNER. OTHER EXCESS MATERIAL TO BE DISPOSED OF IN STAGING AREAS 1 AND/OR 3, PER INSTALLATION SEQUENCING PLAN.



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 FINAL CHANNEL & FLOODPLAIN DESIGNS



GENERAL NOTES (2 OF 2)

REACH 2

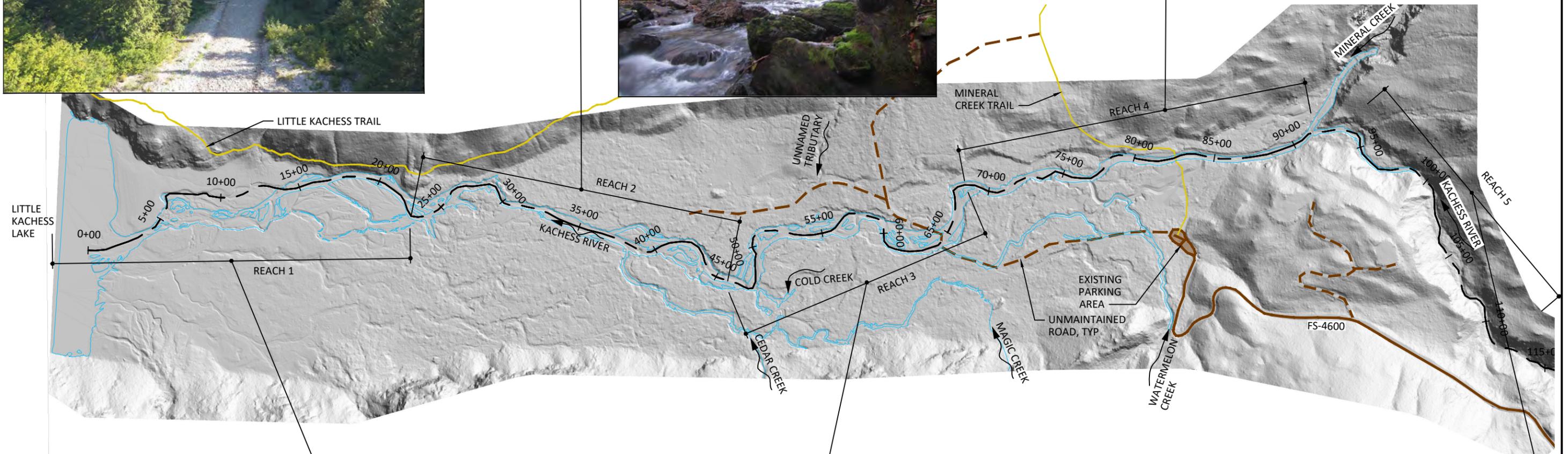
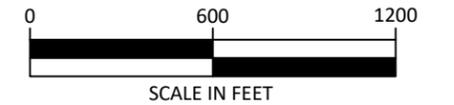


REACH 2
THIS IS A BROAD, OVER-WIDENED, PLANE-BED CHANNEL IN WHICH FLOW RUNS SUB-SURFACE IN THE SUMMER.

REACH 4



REACH 4
THIS REACH IS BANK AND HILLSLOPE CONFINED WITH INCREASED GRADIENT. SURFACE FLOW IS PERENNIAL.



REACH 1



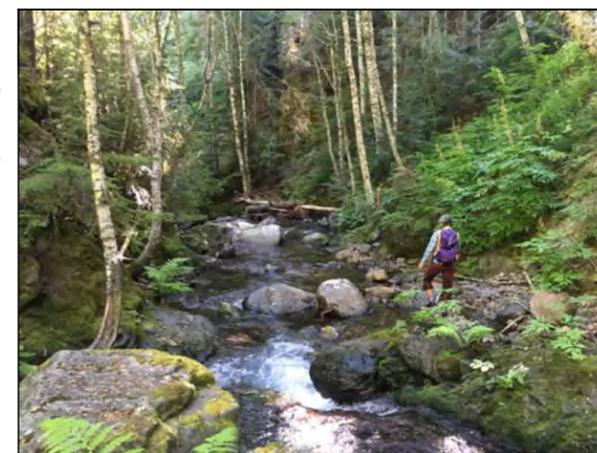
REACH 1
THE KACHESS RIVER DELTA IS EFFECTED BY DAM CONTROLLED SEASONAL LAKE LEVELS. VEGETATION IS LIMITED TO LARGE STUMPS LEFT BEHIND WHEN THE AREA WAS LOGGED. SECTIONS OF THE LOW FLOW CHANNEL SEASONALLY RUN DRY.

REACH 3

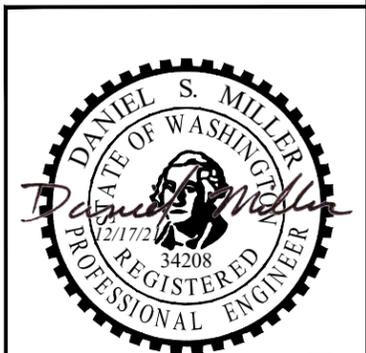


REACH 3
THIS REACH CONTAINS DISCONNECTED SCOUR POOLS FORMED BY KEY PIECES OF LARGE WOOD. THIS REACH IS OVER-WIDENED AND LACKS HABITAT DIVERSITY. MID-CHANNEL BARS ARE PRESENT, BUT VEGETATED ISLANDS HAVE FAILED TO ESTABLISH. FLOW RUNS SUB-SURFACE IN DRY SEASON.

REACH 5



REACH 5
THIS IS A CONFINED REACH WITH INCREASED GRADIENT AND INCREASED HABITAT COMPLEXITY. THE UPSTREAM END IS DEFINED BY A BARRIER FALLS.



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NOTE:
PROJECT AREA IS ENTIRELY WITHIN OKANOGAN-WENATCHEE NATIONAL FOREST.

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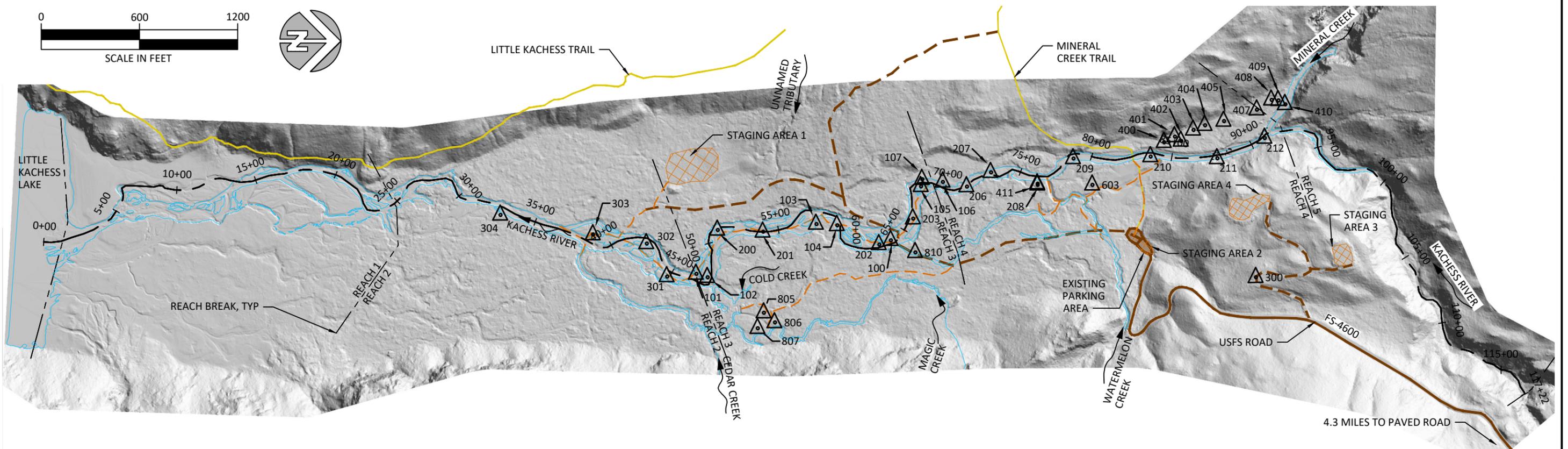
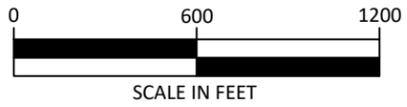


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SITE OVERVIEW

SHEET
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4.3 MILES TO PAVED ROAD

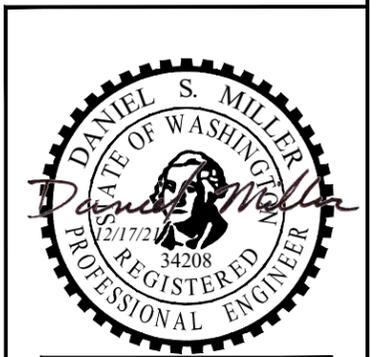
LEGEND

- EXISTING CENTERLINE ALIGNMENT AND STATIONING
- EXISTING OHW - Q1.5
- FOREST SERVICE ROAD - MAINTAINED (USFS GIS)
- FOREST SERVICE ROAD - UNMAINTAINED (USFS GIS)
- TRAIL
- TEMPORARY ACCESS
- STAGING AREA
- CONTROL POINT

SURVEY CONTROL POINTS

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
100	759410.27	1457625.17	2317.06	rebar
101	758220.61	1457827.08	2292.42	tbm
102	758290.07	1457847.23	2292.54	tbm
103	758954.92	1457524.29	2308.64	tbm
104	759082.30	1457533.15	2311.53	tbm
105	759594.86	1457296.22	2325.53	tbm
106	759728.71	1457270.41	2330.42	tbm
107	759602.45	1457253.36	2327.77	tbm
200	758351.76	1457559.98	2299.49	tbm
201	758629.44	1457571.45	2299.46	tbm
202	759338.95	1457649.67	2317.72	tbm
203	759546.51	1457493.60	2321.44	tbm
206	759874.68	1457298.50	2330.96	tbm
207	760021.55	1457211.94	2333.83	tbm
208	760307.28	1457288.63	2344.12	rock
209	760526.31	1457129.16	2349.11	tbm
210	760998.15	1457118.09	2357.37	tbm
211	761405.15	1457129.90	2366.11	tbm
212	761695.81	1457006.17	2373.37	tbm
300	761639.97	1457854.33	2563.07	rebar

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
301	758042.76	1457842.57	2289.16	tbm
302	757918.68	1457640.93	2283.28	tbm
303	757590.63	1457585.99	2280.46	tbm
304	757025.45	1457466.06	2272.92	tbm
400	761080.51	1457031.22	2368.79	tbm
401	761146.02	1456997.12	2369.88	tbm
402	761184.69	1457024.35	2369.95	rebar
403	761259.76	1456956.47	2369.33	tbm
404	761330.34	1456928.11	2373.78	tbm
405	761445.66	1456902.34	2379.26	tbm
407	761648.15	1456834.55	2394.36	tbm
408	761737.53	1456773.89	2395.12	tbm
409	761779.79	1456777.78	2393.60	tbm
410	761821.16	1456802.27	2381.48	tbm
411	760306.49	1457281.12	2343.87	tbm
603	760642.37	1457289.45	2354.88	tbm
805	758633.68	1458063.69	2303.24	tbm
806	758700.20	1458123.28	2305.18	tbm
807	758596.23	1458158.64	2302.98	tbm
810	759559.71	1457698.43	2324.39	tbm



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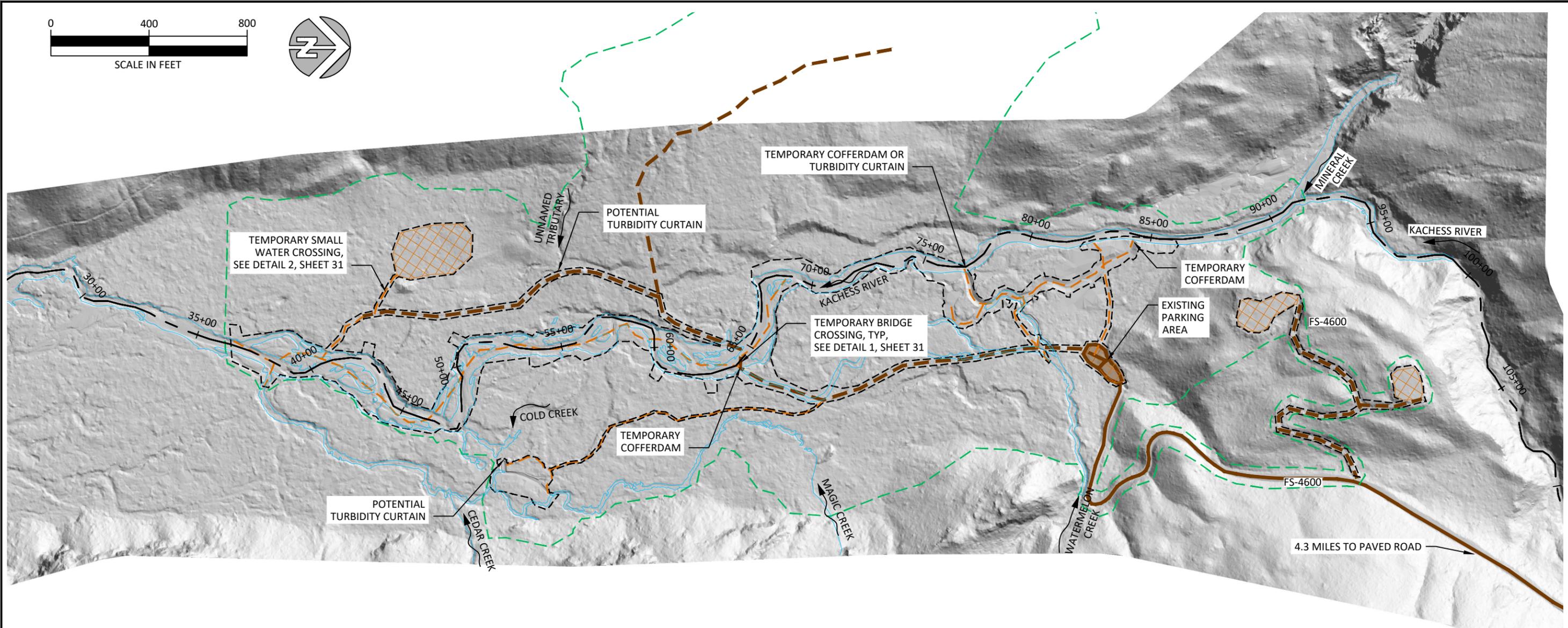
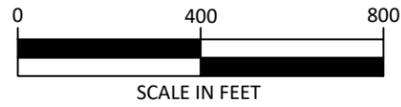
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EXISTING CONDITIONS,
CONTROL POINTS, ACCESS &
STAGING



EROSION CONTROL NOTES:

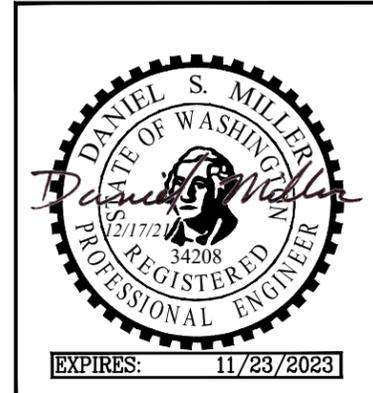
THE CONSTRUCTION CONTRACTOR IS RESPONSIBLE TO PROVIDE AND IMPLEMENT AN EROSION AND SEDIMENT CONTROL PLAN THAT MEETS APPLICABLE REGULATIONS AND PERMIT REQUIREMENTS TO PROTECT ADJACENT WATERS AND LANDS FROM SEDIMENT RUNOFF, TURBIDITY AND WATER QUALITY. THE PLAN MUST FOLLOW THE USFS EROSION CONTROL GUIDELINES (SEE SHEET 3) AND SPECIFICATIONS, AND BE APPROVED BY KCT.

SUGGESTED BMPs INCLUDE:

- PLACE BMPs ALONG DOWNHILL EDGE OF CONSTRUCTION DISTURBANCE UNLESS:
 - OVERLAND FLOW THROUGH VEGETATIVE BUFFER >15-FT WIDE
 - SURFACE WATER >50-FT DISTANT
 - SILT FENCE IF VEGETATIVE BUFFER <15-FT WIDE OR SURFACE WATER WITHIN 50-FT
 - TEMPORARY BRIDGE CROSSING (SEE SHEET 31)
 - COFFERDAMS (SEE SHEET 7)
 - TURBIDITY CURTAIN (SEE SHEET 8)
 - TEMPORARY SMALL WATER CROSSING (SEE SHEET 31)

LEGEND

- 10+00
—|— EXISTING CENTERLINE ALIGNMENT AND STATIONING
- EXISTING OHW - Q1.5
- FOREST SERVICE ROAD - MAINTAINED (USFS GIS)
- - - FOREST SERVICE ROAD - UNMAINTAINED (USFS GIS)
- - - TEMPORARY ACCESS
- ▨ STAGING AREA
- - - AREA OF POTENTIAL EFFECTS (APE) EXTENT
- - - LIMIT OF DISTURBANCE



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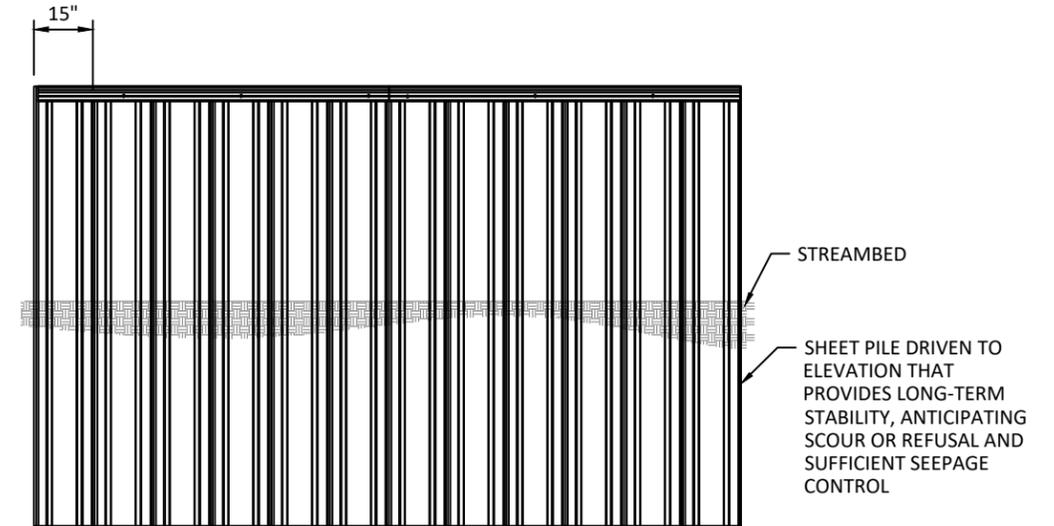
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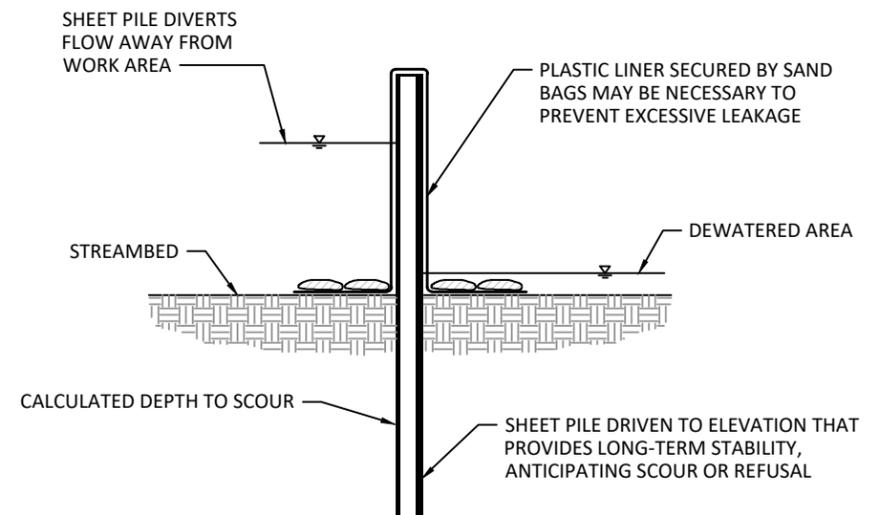


EROSION CONTROL PLAN



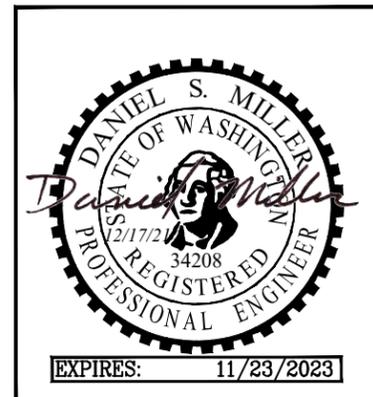
NOTE:
INDIVIDUAL SHEET WEIGHT 45 LBS PER LINEAR FOOT

ELEVATION



SECTION

1
7 TYPICAL DETAIL - SHEET PILE
NOT TO SCALE



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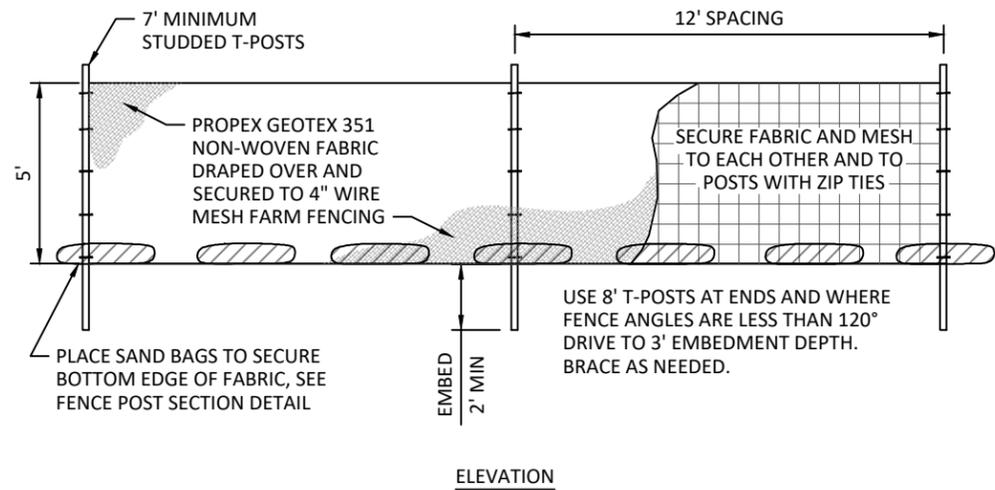


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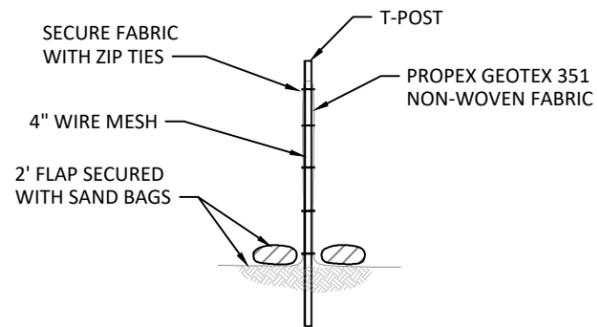


EROSION CONTROL DETAILS
(1 OF 2)

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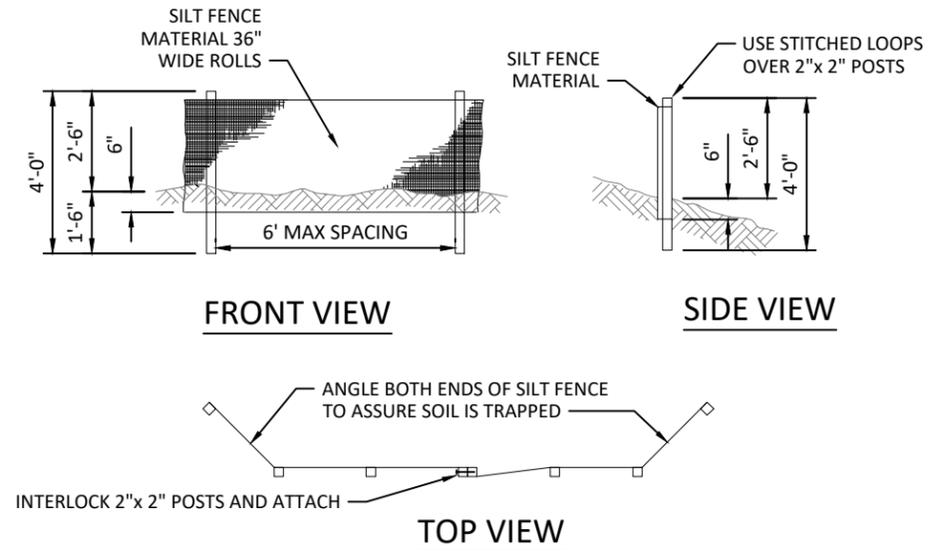


ELEVATION



SECTION

1
8 TYPICAL DETAIL - TURBIDITY CURTAIN
NOT TO SCALE



FRONT VIEW

SIDE VIEW

TOP VIEW

2
8 TYPICAL DETAIL - SILT FENCE
NOT TO SCALE

NOTES:

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 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 18 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 AND MET APPLICABLE PERMIT CONDITIONS, AT NO ADDITIONAL COST TO OWNER, BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN PERMANENTLY PROTECTED AND STABILIZED, OR AS DIRECTED BY OWNER'S REPRESENTATIVE.



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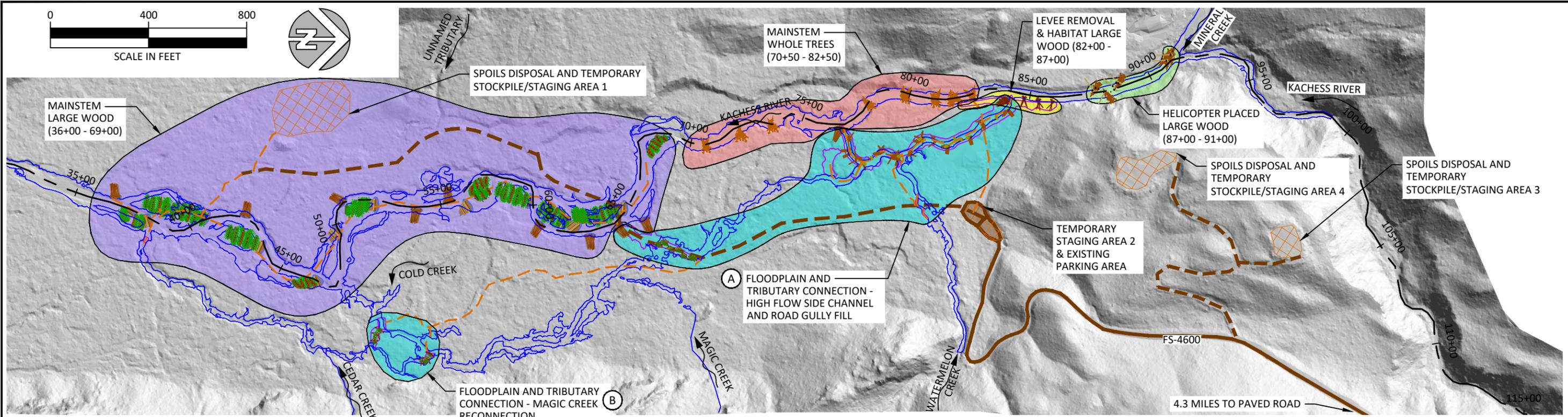


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EROSION CONTROL DETAILS
(2 OF 2)

SHEET
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PROPOSED SEQUENCE AND SEQUENCE RECOMMENDATIONS

SEQUENCE SO THAT AREAS, ONCE TREATED AND REMEDIATED, ARE NOT RE-ENTERED. SHADING DELINEATES PROPOSED PHASING.

MAINSTEM LARGE WOOD (36+00 - 69+00)

1. ESTABLISH ACCESS ROUTE TO STAGING AREA 1 - INCLUDING INSTALLATION OF TEMPORARY TRIBUTARY CROSSING - AND INSTALL TEMPORARY BRIDGE CROSSING AT 65+00. ESTABLISH TEMPORARY ACCESS ROUTE WITHIN DRY MAINSTEM CHANNEL BED BETWEEN STATIONS 36+00 - 69+00.
2. COMPLETE FISH RESCUE IN POOLS AND AREAS PREVIOUSLY IDENTIFIED BY OWNER (INCLUDING POOL AT 47+00) PRIOR TO CONSTRUCTION AS DEFINED BY PERMIT REQUIREMENTS.
3. INSTALL LARGE WOOD AND BAR ROUGHNESS FEATURES, STARTING AT FURTHEST EXTENTS (DOWNSTREAM AND UPSTREAM) OF ACCESS ROUTE AND WORKING BACK TOWARDS THE TEMPORARY BRIDGE EXIT. NOTE - THE BANK BURIED JAM ON RIVER LEFT AT 64+00 WILL BE INSTALLED WHEN THE ROAD GULLY IS FILLED.
4. DECOMPACT TEMPORARY ACCESS ROUTE IN THE DRY MAINSTEM CHANNEL (SCARIFY) WHILE WORKING TOWARDS THE TEMPORARY BRIDGE AT 65+00.
5. IF PHASING ALLOWS, PLACE EXCESS EXCAVATED MATERIALS FROM THE HIGH FLOW SIDE CHANNEL IN STAGING AREA 1, PRIOR TO REMOVING THE TEMPORARY BRIDGE AT 65+00.
6. DECOMPACT (UNCOMPACT) AND REMEDIATE ACCESS ROUTE TO STAGING AREA 1 AND REMOVE TEMPORARY BRIDGE CROSSING

MAINSTEM WHOLE TREES (70+50 - 82+50)

1. INSTALL DURING THINNING OPERATIONS IN PROXIMITY TO CHANNEL.
2. INSTALL AT DIRECTION OF OWNER REPRESENTATIVE (ENGINEER).

LEVEE REMOVAL & MAINSTEM HABITAT LARGE WOOD (RIVER LEFT AT 82+00 - 85+80)

1. IMPLEMENT EROSION CONTROL AS DEFINED BY PERMIT REQUIREMENTS.
2. EXCAVATE EXISTING LEVEE FROM FLOODPLAIN SURFACE.
3. IMPLEMENT FISH RESCUE AS DEFINED BY PERMIT REQUIREMENTS
4. INSTALL GRAVEL RETENTION AND HABITAT LARGE WOOD STRUCTURES INTO THE BANK ON RIVER LEFT, UPSTREAM OF HIGH-FLOW SIDE CHANNEL.
5. REMEDIATE DISTURBED AREA IN ACCORDANCE WITH REVEGETATION PLAN.

MAINSTEM HELICOPTER LARGE WOOD (87+00 - 91+00)

1. LARGE WOOD PLACED BY HELICOPTER INTO THE CHANNEL WITHIN EXISTING LARGE BOULDERS.
2. PLACEMENT OF WOOD TO BE DIRECTED BY OWNER'S REPRESENTATIVE.

FLOODPLAIN AND TRIBUTARY CONNECTION

(A) CONSTRUCT HIGH FLOW SIDE CHANNEL (HFSC) AND ROAD GULLY FILL

1. INSTALL EROSION CONTROL ELEMENTS.
2. ESTABLISH ACCESS ROUTE TO STAGING AREA 3 AND 4 (AS NEEDED).
3. EXCAVATE DOWNSTREAM END OF HFSC (FROM WITHIN THE CHANNEL ROUTE) AND USE SALVAGED GRAVEL, COBBLE AND BOULDER MATERIAL WITH SAND TO INSTALL FLOODPLAIN ROUTING FILL - ACCESSED AT HFSC STATION 2+00 ON SIDE CHANNEL LEFT.
4. WITH COFFER DAM IN PLACE, AS NEEDED FOR PERMIT REQUIREMENTS, INSTALL BANK BURIED LARGE WOOD JAM AT OUTLET OF HFSC. REMOVE COFFER DAM AFTER INSTALLATION.

5. WITH COFFER DAM IN PLACE, AS NEEDED FOR PERMIT REQUIREMENTS, EXCAVATE UPSTREAM END OF HFSC (FROM WITHIN THE CHANNEL ROUTE), REMOVE LEVEE AND RECONTOUR BANK, AND INSTALL INLET APEX JAM - USING SALVAGED COBBLE AND BOULDER MATERIAL TO BURY LOGS.

6. CONSTRUCT SMALL SOIL FLOW ISOLATION BERM AT UPSTREAM END OF HFSC, DOWNSTREAM OF INLET APEX JAM. REMOVE UPSTREAM COFFER DAM.
7. INSTALL BANK BURIED JAM (RIVER LEFT AT 64+00) AT OUTLET OF ROAD GULLY, USING HFSC SALVAGED COBBLE AND BOULDER MATERIAL TO BURY LOGS.
8. USE GRAVEL/COBBLE MATERIAL WITH FINES FROM HFSC EXCAVATION TO FILL ROAD GULLY AND RE-ESTABLISH FLOODPLAIN TOPOGRAPHY. INSTALL SNAG FOREST FLOODPLAIN ROUGHNESS IN ROAD GULLY FILL AREA.
9. INSTALL HABITAT LARGE WOOD AND IN SEQUENCE TO ALLOW EQUIPMENT TO BE BACKED OUT OF THE CONSTRUCTED HFSC CHANNEL.
10. HAND REMOVE (SHOVEL) SMALL SOIL BERM CONSTRUCTED AT UPSTREAM END OF HFSC.
11. STOCKPILE EXCESS HFSC CUT MATERIAL IN STAGING AREAS 1, 3, AND 4 - AS DETERMINED BY PHASING AND ENGINEER INSTRUCTION.

(B) CONSTRUCT MAGIC CREEK RECONNECTION - CAN BE CONSTRUCTED SEPARATELY

1. ESTABLISH TEMPORARY ACCESS ROUTE.
2. CONSTRUCT THE MAGIC CREEK CONNECTOR CHANNEL.
3. CLEAR THE UPSTREAM EXISTING DEBRIS PLUG AND REESTABLISH FLOW ROUTING PATHWAY.
4. USE SALVAGED GRAVEL/COBBLE WITH FINES MATERIAL AND LOCALLY GRUBBED TREES AND STUMPS TO CONSTRUCT FLOW ROUTING PLUGS.
5. DECOMPACT (UNCOMPACT) AND REMEDIATE THE TEMPORARY ACCESS ROUTE.

- AFTER ALL FLOODPLAIN TREATMENTS ARE COMPLETED, OBLITERATE THE REMAINING "IMPROVED" SECTION OF FS 4600 TO THE EXISTING PARKING AREA (STAGING AREA 2) AND REVEGETATE.
- CONSTRUCT THE REESTABLISHED FLOW ROUTING PATHWAY OF WATERMELON CREEK THROUGH THE OBLITERATED ROAD. DISTRIBUTE THE CUT MATERIAL LOCALLY ON THE ALLUVIAL FAN OF WATERMELON CREEK OR IN THE ROAD OBLITERATION OBSTACLE BERM SOUTH OF STAGING AREA 3.

PHASING CONSIDERATIONS:

- POTENTIAL TO EXCAVATE PORTION OF HIGH-FLOW SIDE CHANNEL IN PHASE I, LEAVING A MINIMUM OF 50 FEET AT THE UP AND DOWNSTREAM ENDS UN CUT. STORE EXCESS EXCAVATED MATERIALS IN DESIGNATED STAGING AREAS - PRIORITIZING DISPOSAL IN STAGING AREA 1. PLANT BANKS AND INSET FLOODPLAIN OF HIGH-FLOW SIDE CHANNEL.
- CONSTRUCTION OF COMPLETED HIGH FLOW SIDE CHANNEL NEEDS TO BE DONE IN CONJUNCTION WITH THE ROAD GULLY FILL TO ROUTE EXPECTED INCREASE IN FLOODPLAIN FLOW INUNDATION ACROSS THE FLOODPLAIN INSTEAD OF DOWN THE EXISTING ROAD GULLY.
- COORDINATE SO THAT TEMPORARY BRIDGE (AT STATION 65+00) AND ACCESS ROUTES ARE INSTALLED ONCE.
- SEQUENCE SO THAT AREAS, ONCE TREATED, ARE NOT REENTERED.

LEGEND

- 10+00 | EXISTING CENTERLINE ALIGNMENT AND STATIONING
- | PROPOSED CONDITION - Q1.5 MODELED INUNDATION
- | FOREST SERVICE ROAD - MAINTAINED (USFS GIS)
- - - | FOREST SERVICE ROAD - UNMAINTAINED (USFS GIS)
- - - | TEMPORARY ACCESS
- ⊗ | STAGING AREA



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APPROVED	DATE	PROJECT

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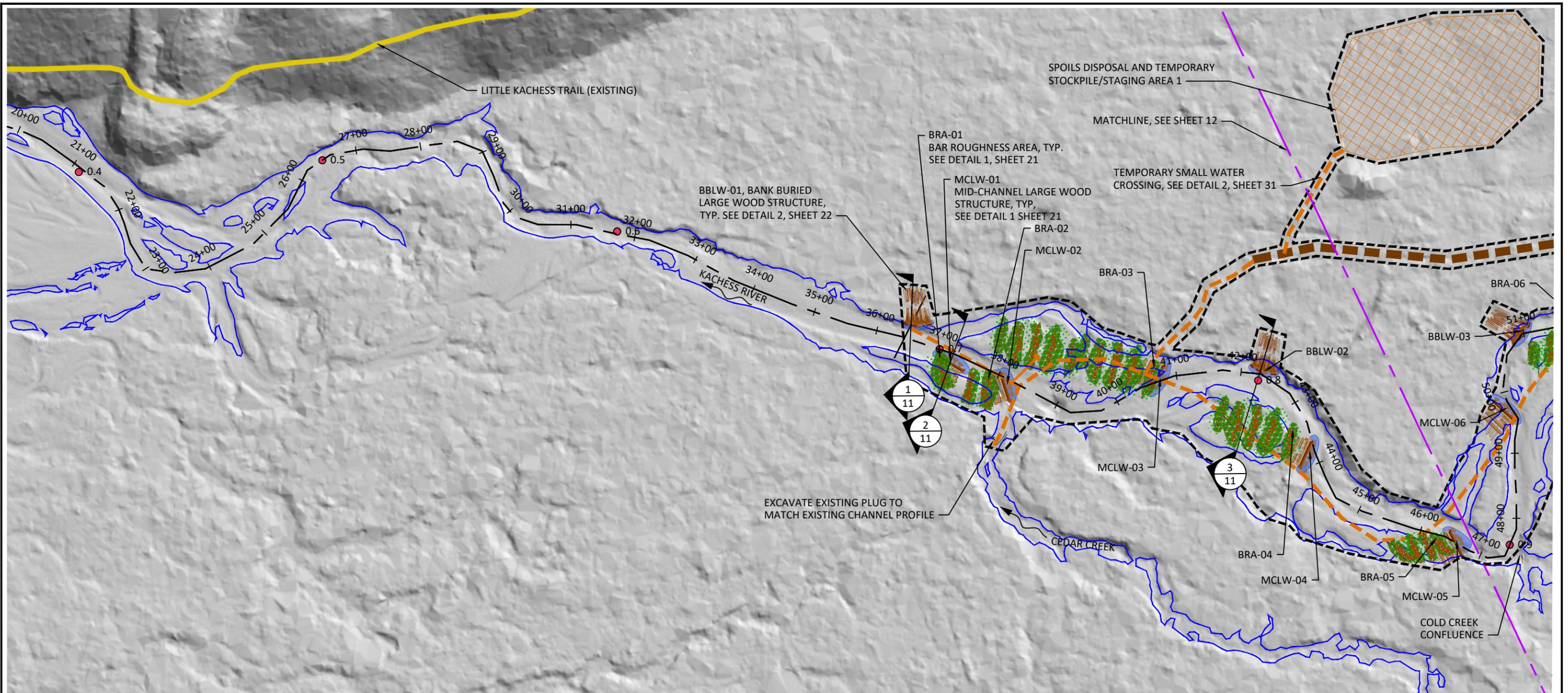


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PROPOSED SEQUENCING

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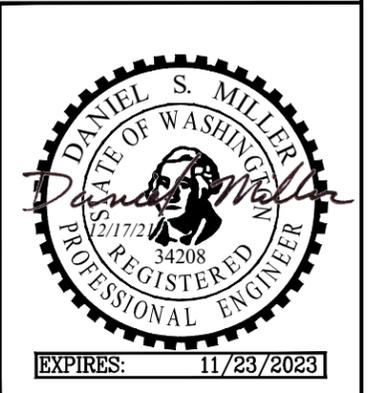
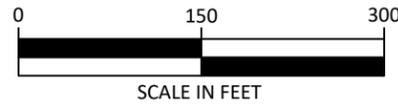


LEGEND

- EXISTING CENTERLINE ALIGNMENT AND STATIONING
- PROPOSED CONDITION Q1.5 MODELED INUNDATION
- FOREST SERVICE ROAD - MAINTAINED (USFS GIS)
- FOREST SERVICE ROAD - UNMAINTAINED (USFS GIS)
- TRAIL
- TEMPORARY ACCESS
- STAGING AREA
- RM RIVER MILE
- LIMIT OF DISTURBANCE

EXCAVATE EXISTING PLUG TO MATCH EXISTING CHANNEL PROFILE

NOTE:
SEE SHEET 30 FOR LARGE WOOD LOCATIONS AND QUANTITIES, BY STRUCTURE.



NO.	BY	DATE	REVISION DESCRIPTION

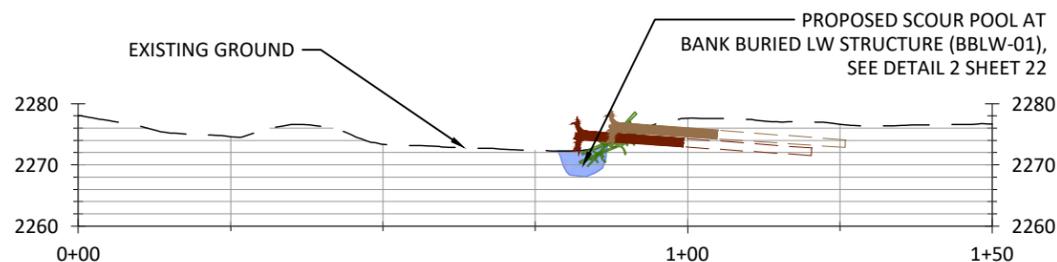
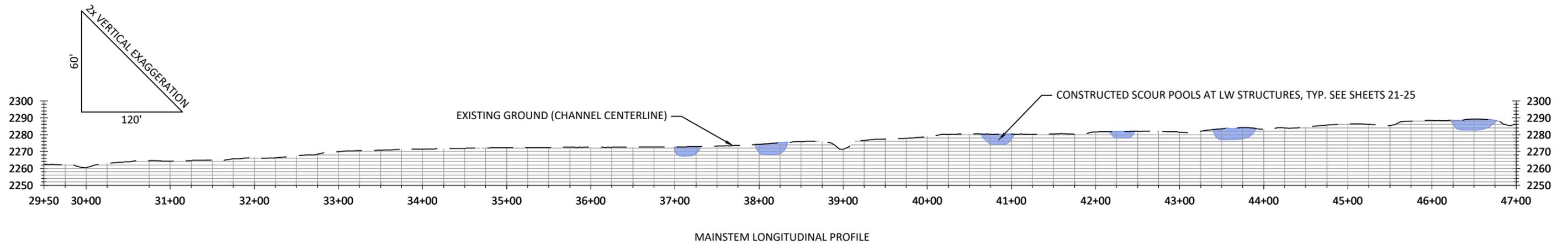
SP, NS, SJ DRAWN	DM, PL, PB, JP DESIGNED	PL, DM, JP CHECKED
PL, DM APPROVED	DECEMBER 2021 DATE	180213 PROJECT

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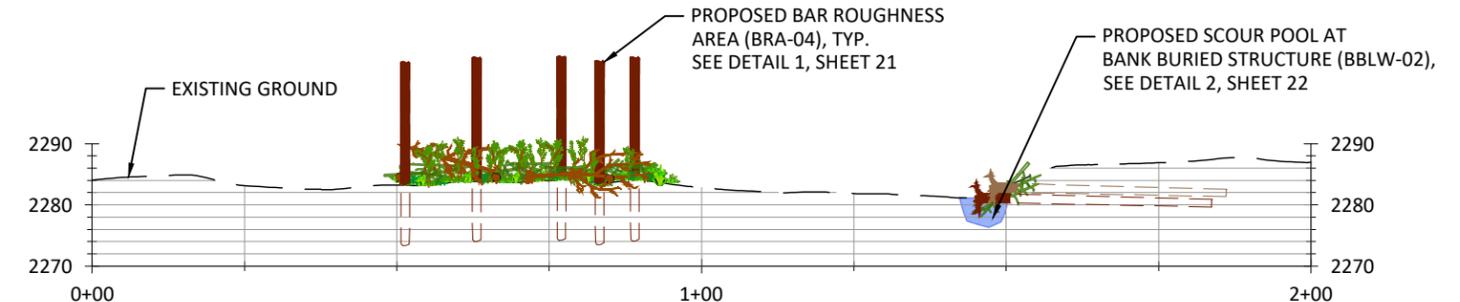
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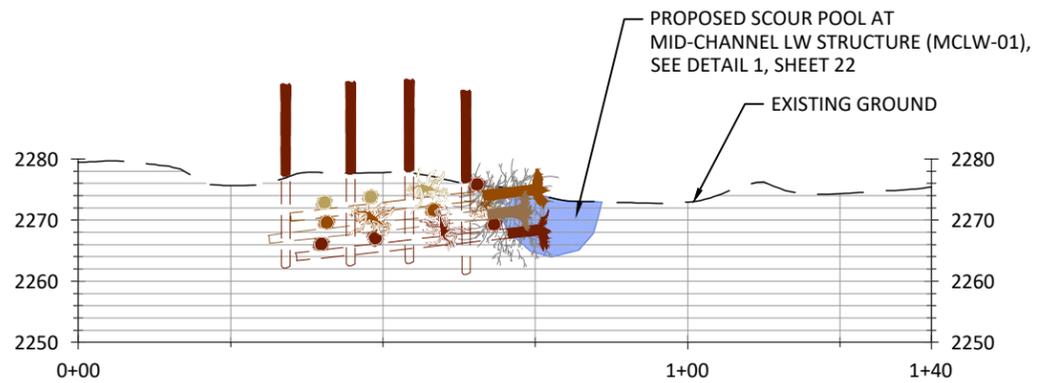
PROPOSED CONDITIONS
36+00 - 47+00



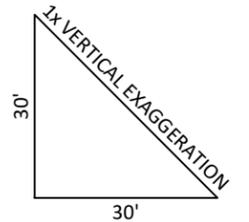
1
11 BANK BURIED LW STRUCTURE WITH POOL



3
11 BAR ROUGHNESS AND BANK BURIED LW STRUCTURE WITH POOL



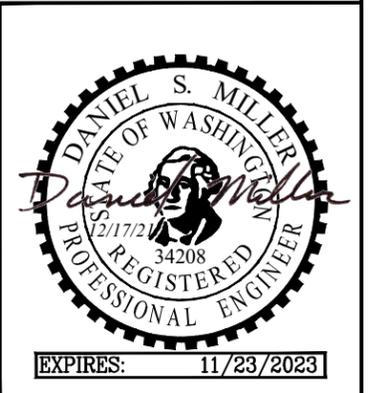
2
11 MID-CHANNEL LW STRUCTURE WITH POOL



LEGEND

- PROPOSED CUT
- PROPOSED FILL

NOTE: CROSS SECTION ORIENTATION IS LEFT TO RIGHT LOOKING DOWNSTREAM.



NO.	BY	DATE	REVISION DESCRIPTION

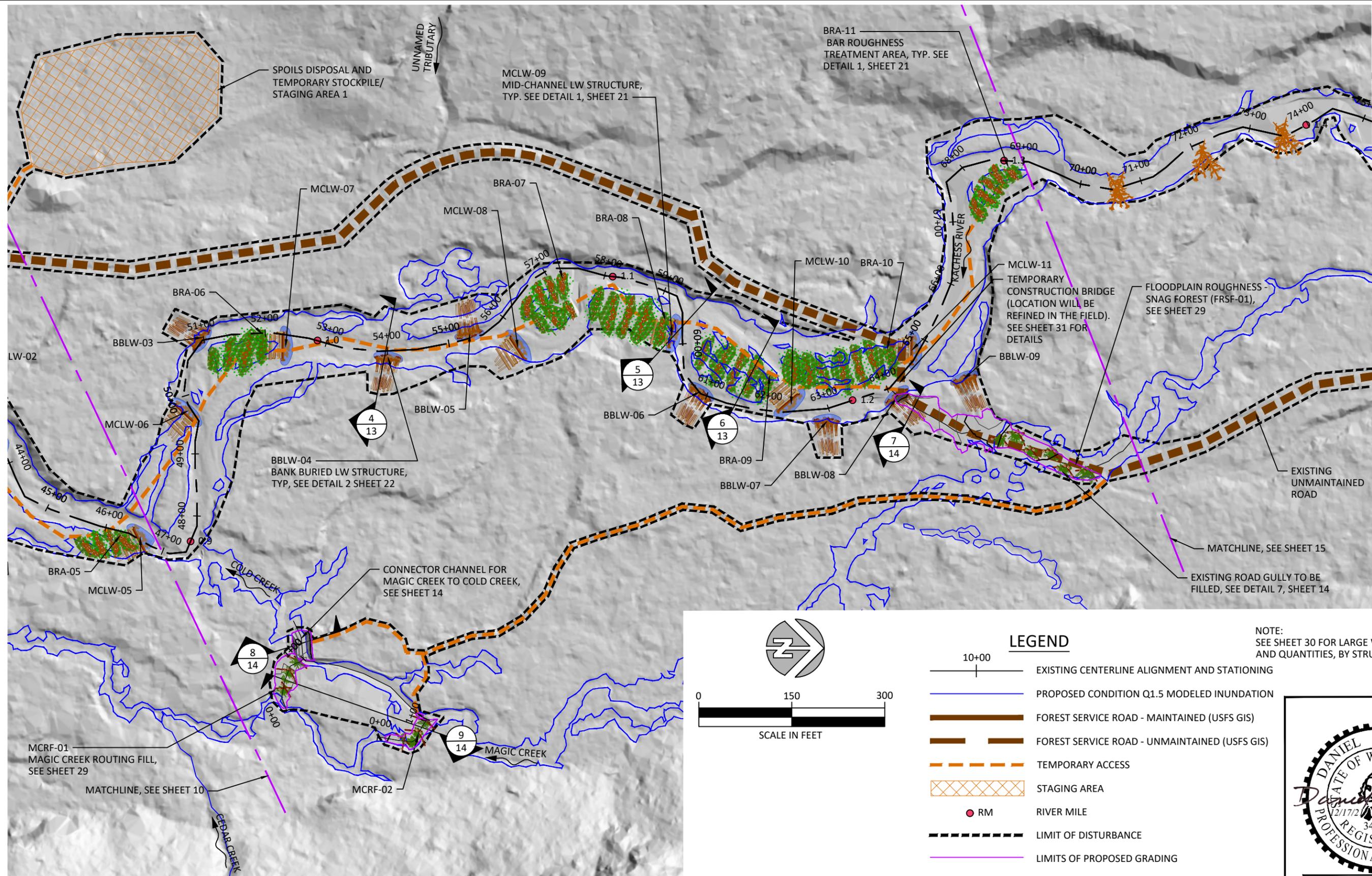
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PL, DM APPROVED	DECEMBER 2021 DATE	180213 PROJECT

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**PROPOSED CHANNEL
PROFILES & SECTIONS**



SPOILS DISPOSAL AND TEMPORARY STOCKPILE/ STAGING AREA 1

MCLW-09 MID-CHANNEL LW STRUCTURE, TYP. SEE DETAIL 1, SHEET 21

BRA-11 BAR ROUGHNESS TREATMENT AREA, TYP. SEE DETAIL 1, SHEET 21

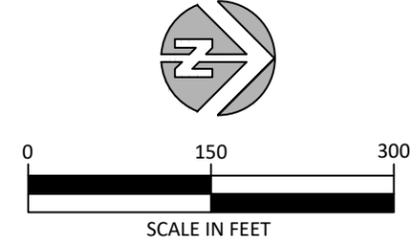
FLOODPLAIN ROUGHNESS - SNAG FOREST (FRSF-01), SEE SHEET 29

BBLW-04 BANK BURIED LW STRUCTURE, TYP. SEE DETAIL 2 SHEET 22

CONNECTOR CHANNEL FOR MAGIC CREEK TO COLD CREEK, SEE SHEET 14

MCRF-01 MAGIC CREEK ROUTING FILL, SEE SHEET 29

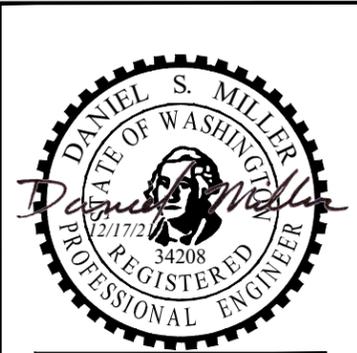
MCRF-02



LEGEND

- 10+00 | EXISTING CENTERLINE ALIGNMENT AND STATIONING
- | PROPOSED CONDITION Q1.5 MODELED INUNDATION
- | FOREST SERVICE ROAD - MAINTAINED (USFS GIS)
- | FOREST SERVICE ROAD - UNMAINTAINED (USFS GIS)
- - - | TEMPORARY ACCESS
- ▨ | STAGING AREA
- RM | RIVER MILE
- - - | LIMIT OF DISTURBANCE
- | LIMITS OF PROPOSED GRADING
- | PROPOSED CONTOURS (1FT)

NOTE: SEE SHEET 30 FOR LARGE WOOD LOCATIONS AND QUANTITIES, BY STRUCTURE.



EXPIRES: 11/23/2023

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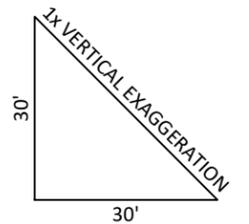
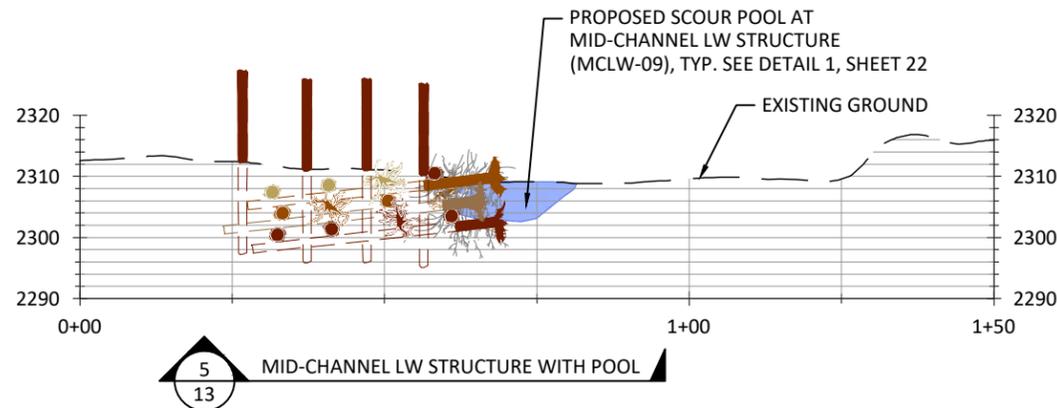
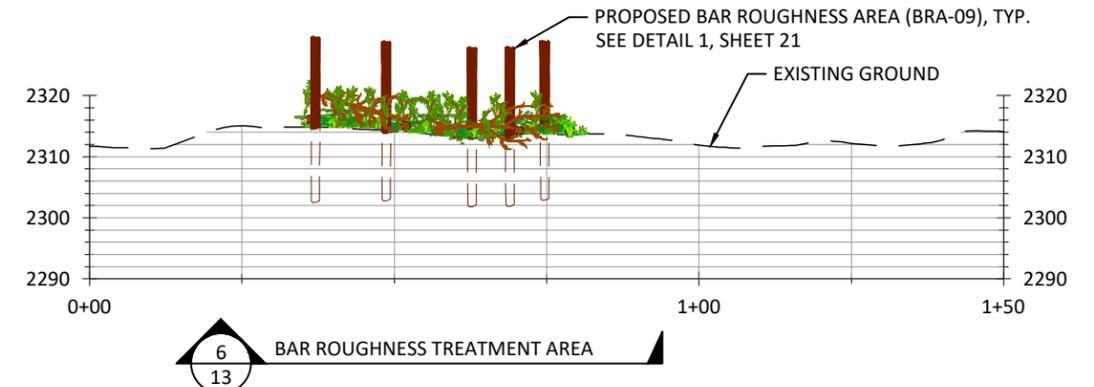
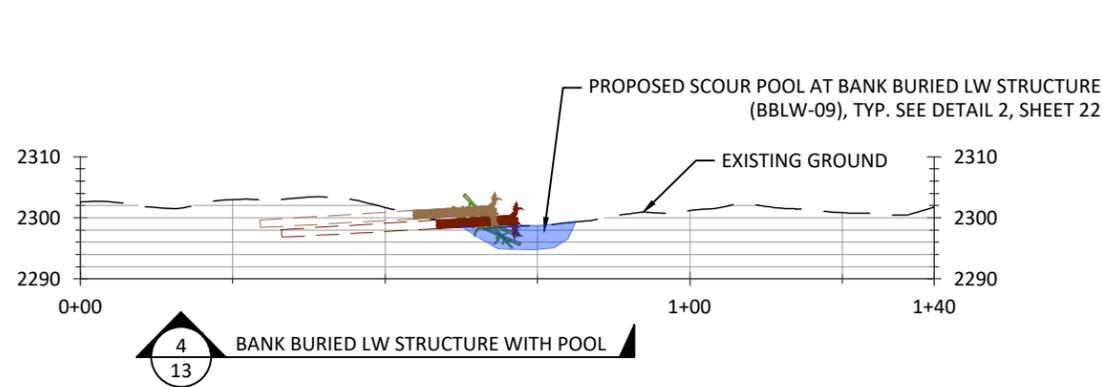
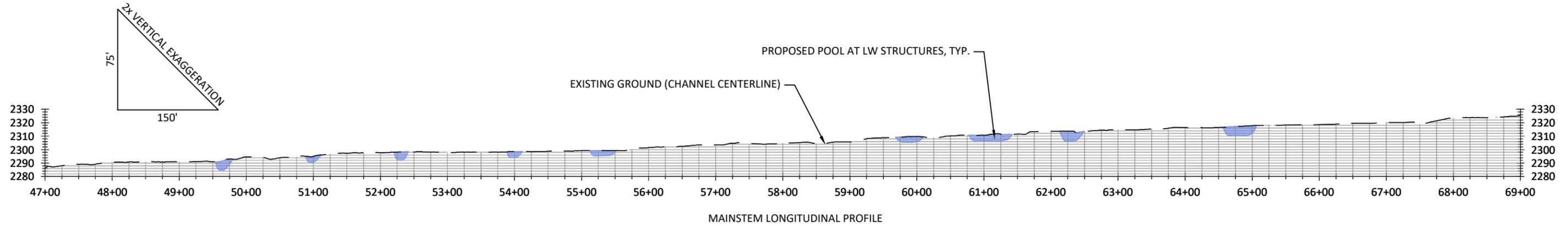
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PL, DM APPROVED	DECEMBER 2021 DATE	180213 PROJECT

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PROPOSED CONDITIONS
47+00 - 69+00



LEGEND

- PROPOSED CUT
- PROPOSED FILL

NOTE: CROSS SECTION ORIENTATION IS LEFT TO RIGHT LOOKING DOWNSTREAM.



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PL, DM APPROVED	DECEMBER 2021 DATE	180213 PROJECT

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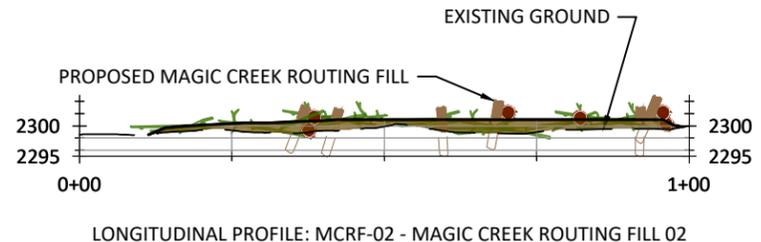
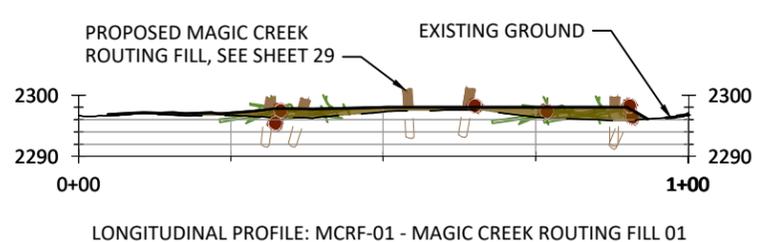
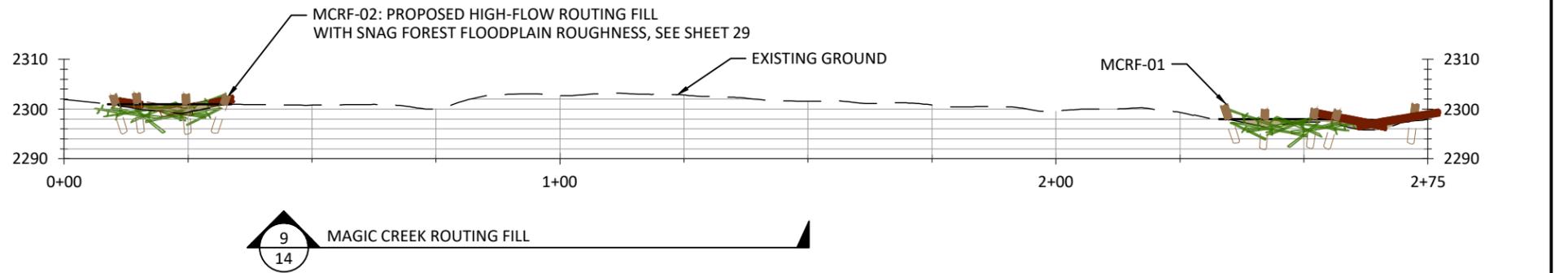
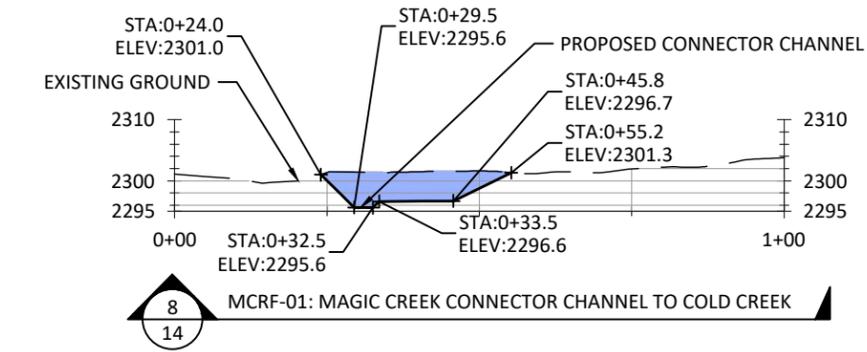
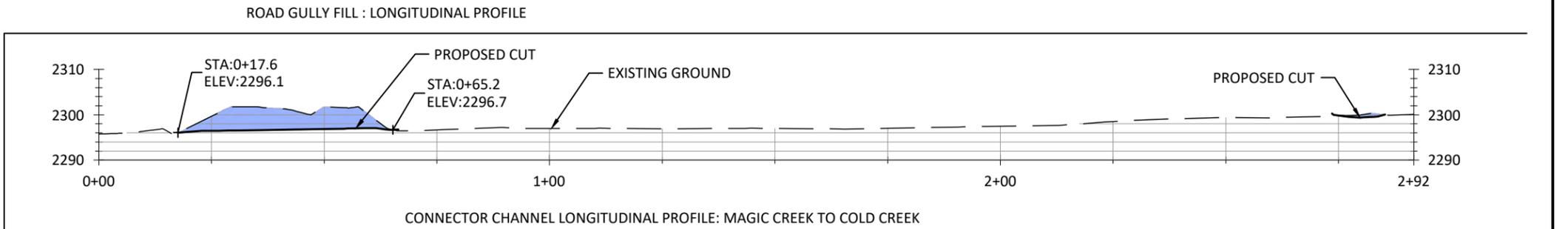
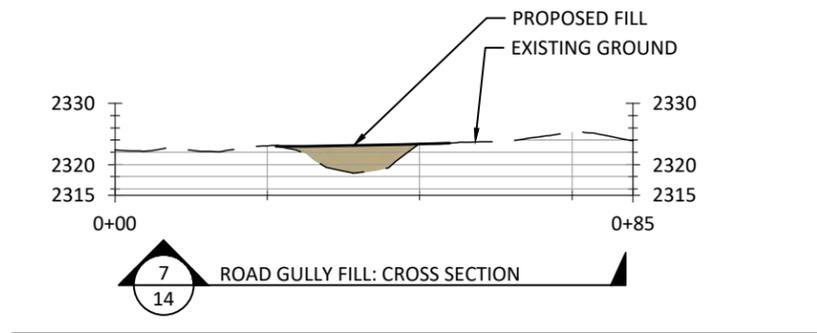
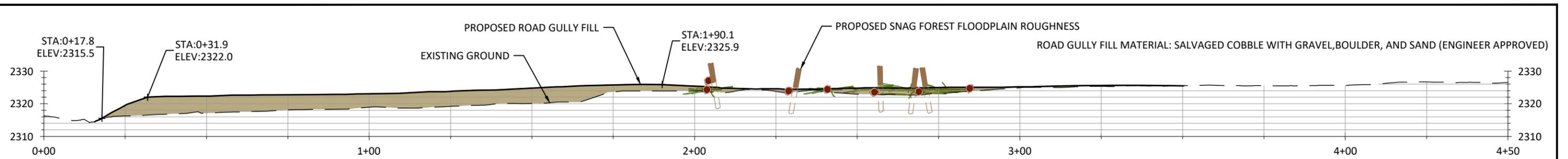


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**PROPOSED CHANNEL
PROFILES & SECTIONS**

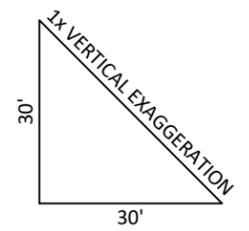
SHEET
13 OF 34



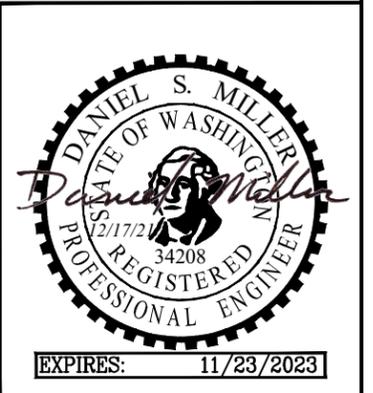
LEGEND

PROPOSED CUT

PROPOSED FILL



NOTE: CROSS SECTION ORIENTATION IS LEFT TO RIGHT LOOKING DOWNSTREAM.



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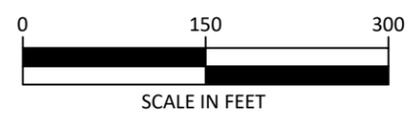
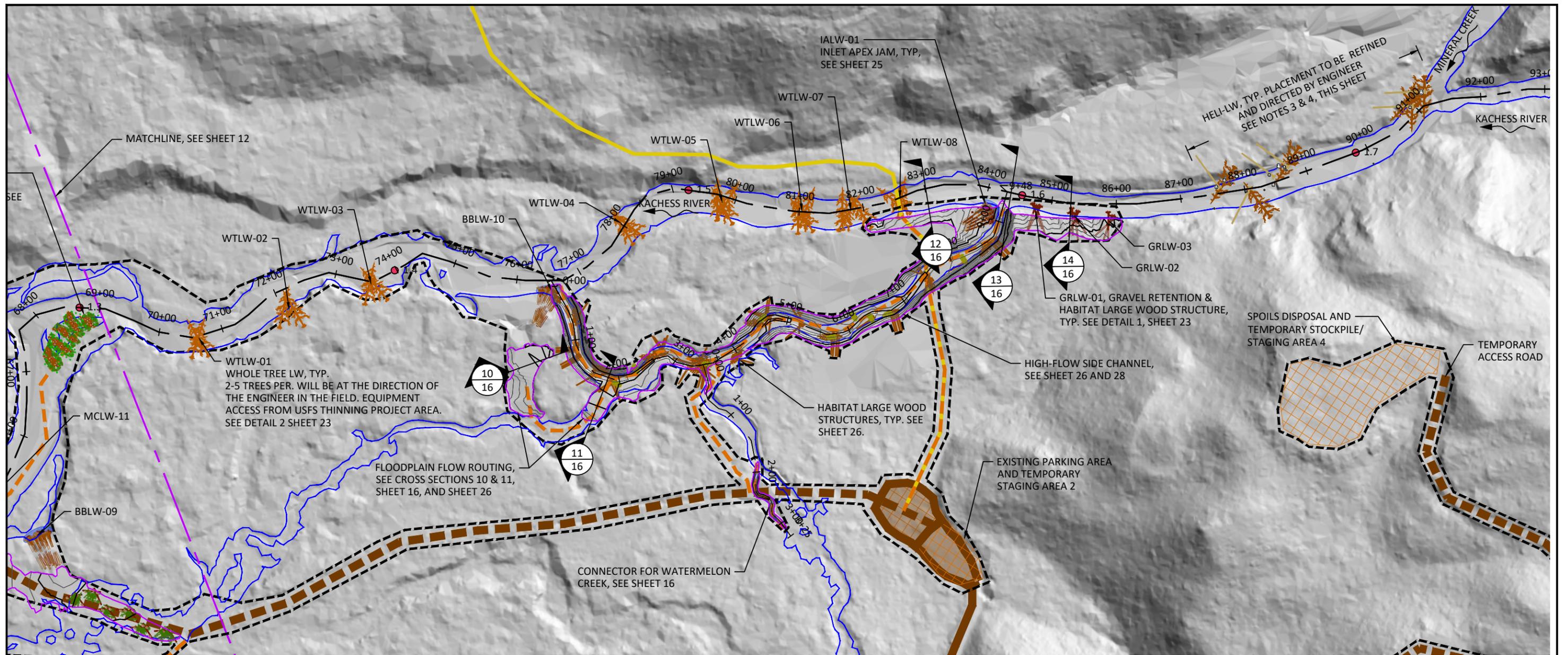
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PROPOSED CONNECTOR CHANNEL PROFILE & SECTION AT ROAD GULLY FILL

SHEET
14 OF 34



LEGEND

- 10+00 EXISTING CENTERLINE ALIGNMENT AND STATIONING
- PROPOSED CONDITION Q1.5 MODELED INUNDATION
- FOREST SERVICE ROAD - MAINTAINED (USFS GIS)
- FOREST SERVICE ROAD - UNMAINTAINED (USFS GIS)
- TEMPORARY ACCESS
- TRAIL
- STAGING AREA
- EXISTING LARGE BOULDERS
- RM RIVER MILE
- LIMIT OF DISTURBANCE
- LIMITS OF PROPOSED GRADING
- PROPOSED CONTOURS (1FT)

- NOTES:**
- SEE SHEET 26 FOR HIGH FLOW SIDE CHANNEL ALIGNMENT AND GRADING.
 - SEE SHEET 30 FOR LARGE WOOD LOCATIONS AND QUANTITIES, BY STRUCTURE.
 - HELICOPTER PLACEMENT OF LARGE WOOD AND WHOLE TREES SHALL BE AT THE DIRECTION OF THE ENGINEER IN THE FIELD. WOOD PLACEMENT AND CONFIGURATIONS MAY VARY BASED ON THE AVAILABLE WOOD MATERIAL SIZES.
 - HELICOPTER PLACED WOOD WILL BE BRACED AGAINST EXISTING TREES AND BOULDERS. GREATER THAN ONE-THIRD OF THE TREE OR LOG LENGTH SHALL BE PLACED ABOVE THE 100-YEAR WATER SURFACE ELEVATION APPROXIMATED AS 6 FEET ABOVE STREAMBED ELEVATION.



NO.	BY	DATE	REVISION DESCRIPTION

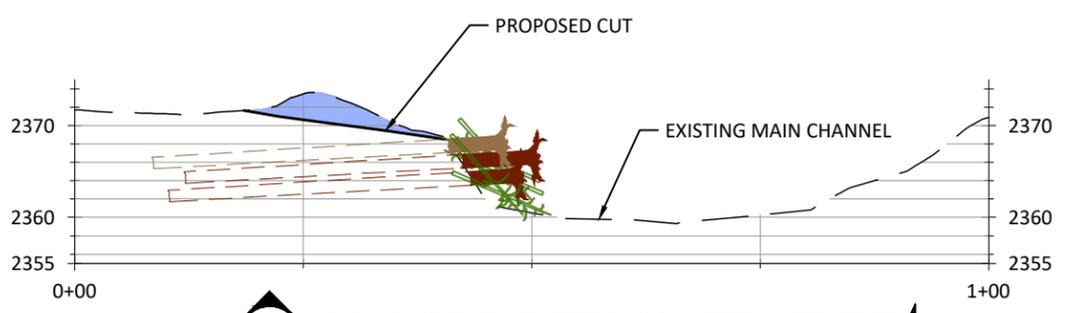
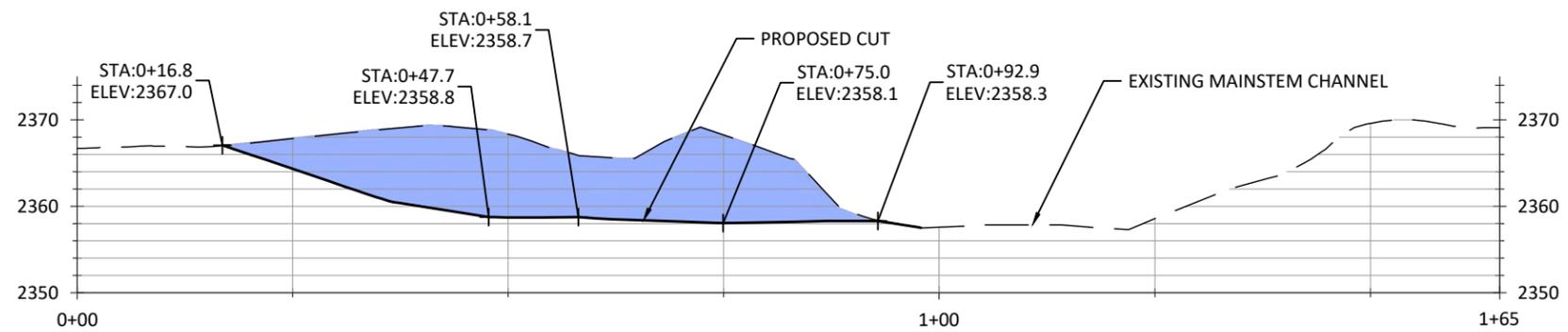
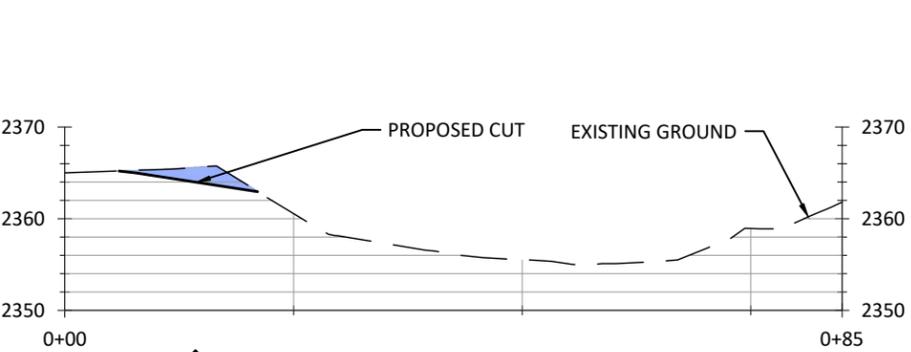
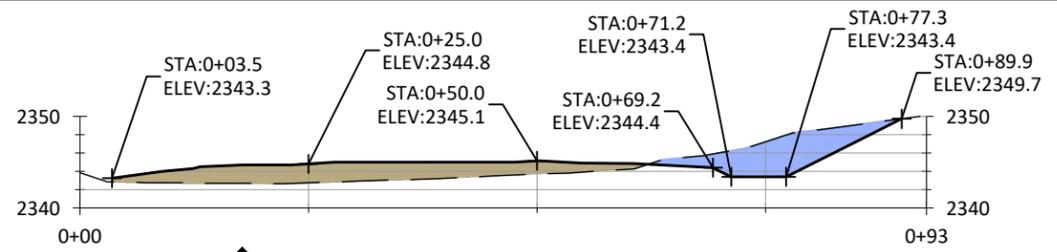
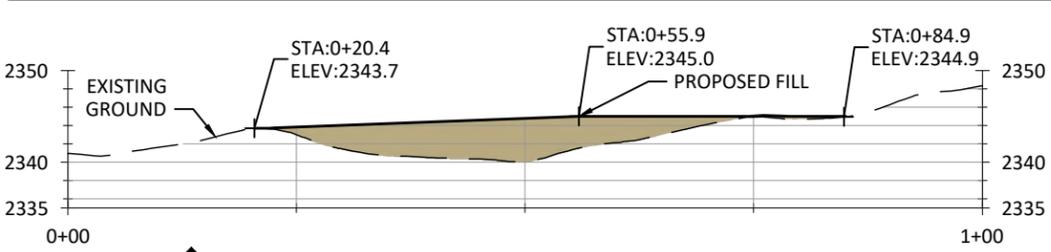
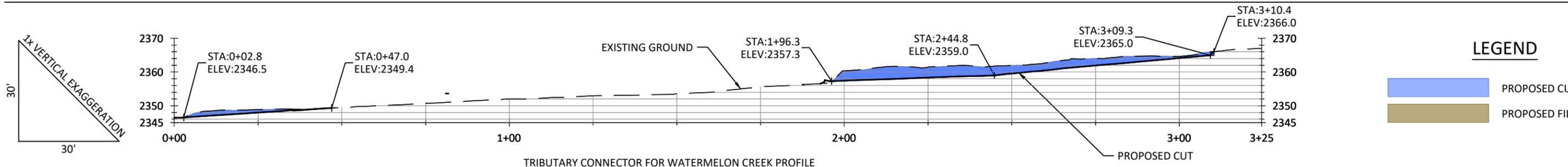
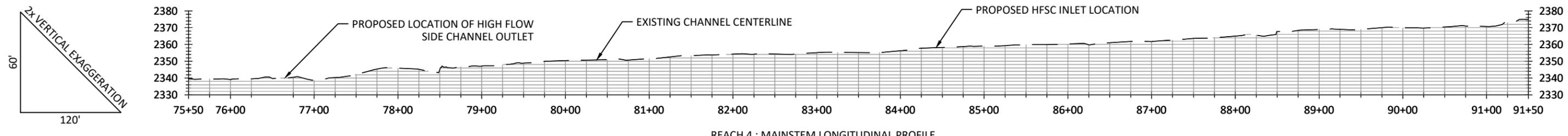
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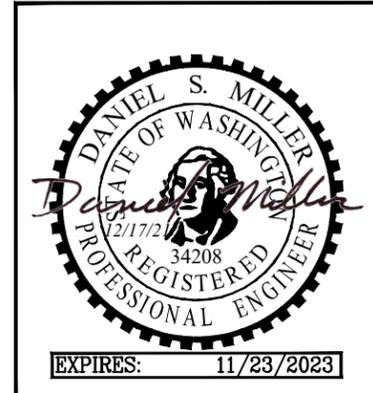
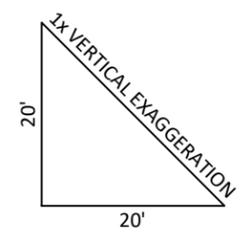
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PROPOSED CONDITIONS
 69+00 - 92+00



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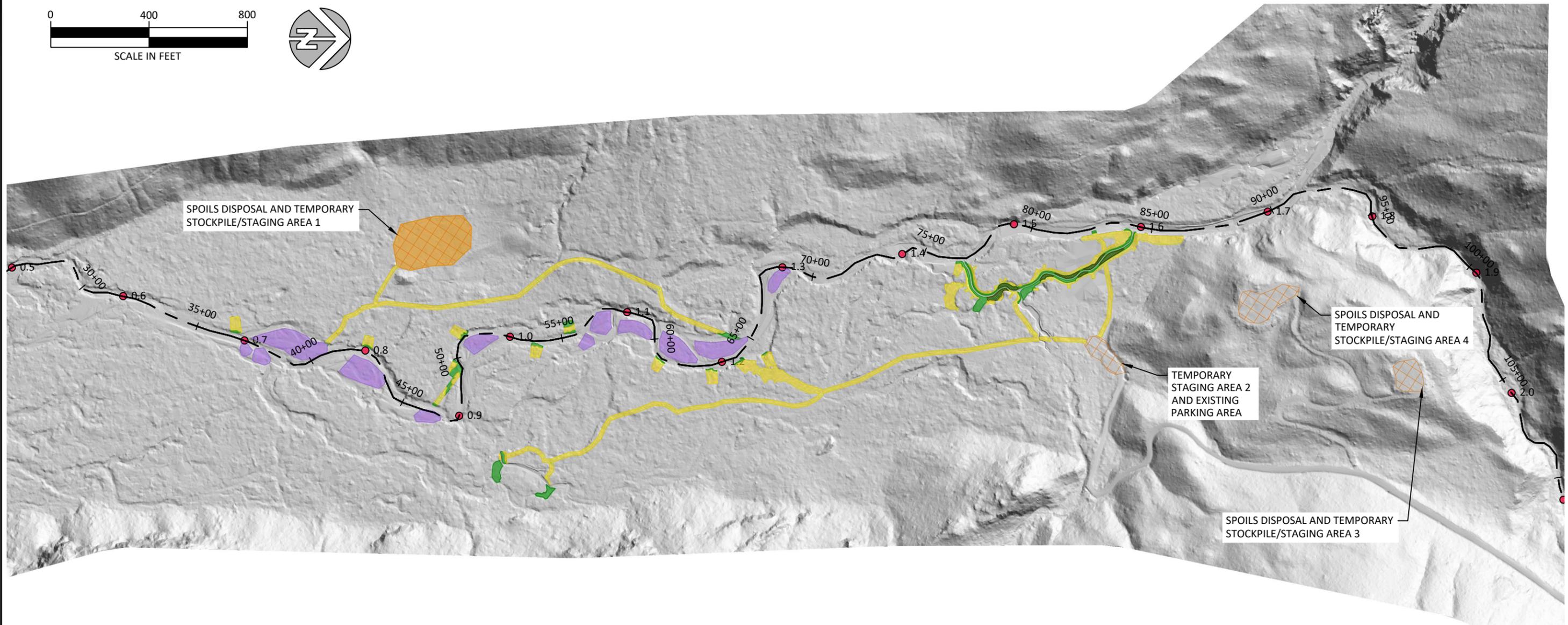
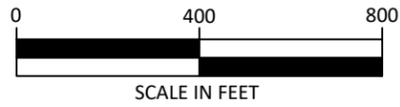
SP, NS, SJ DRAWN	DM, PL, PB, JP DESIGNED	PL, DM, JP CHECKED
PL, DM APPROVED	DECEMBER 2021 DATE	180213 PROJECT

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PROPOSED CHANNEL PROFILES & SECTIONS

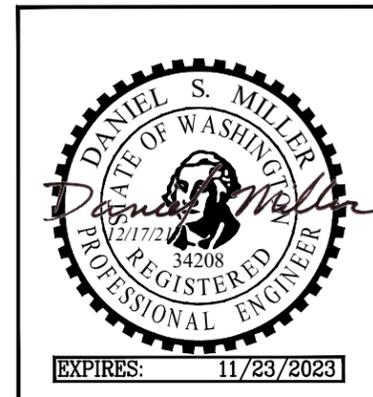


NOTES:

1. SEE SHEET 33 FOR PLANT LIST & TYPICAL REVEGETATION AND TOPSOIL DETAILS
2. STAGING AREA 2, 3, 4 AND RELATED ACCESS ROUTES 6 & 7 TO BE UTILIZED AND THEN DECOMMISSIONED AND REVEGETATED IN PHASE II (NOT THIS DESIGN SET).
3. SEE SHEET 33 FOR TOPSOIL TREATMENT AREA NOTES AND DETAILS.
4. WOODCHIP MULCH RINGS WILL BE INSTALLED AROUND POTTED PLANTS AFTER INSTALLATION TO RETAIN MOISTURE.
5. STRAW MULCH WILL BE INSTALLED OVER ALL DISTURBED AREAS THAT ARE PLANTED OR SEEDED.

LEGEND

- UPLAND REVEGETATION ZONE
- RIPARIAN REVEGETATION ZONE
- BAR STABILITY REVEGETATION ZONE
- UPLAND REVEGETATION ZONE (SEED ONLY)
- TOPSOIL (SEE NOTE 3)
- RIVER MILE
- STAGING AREA



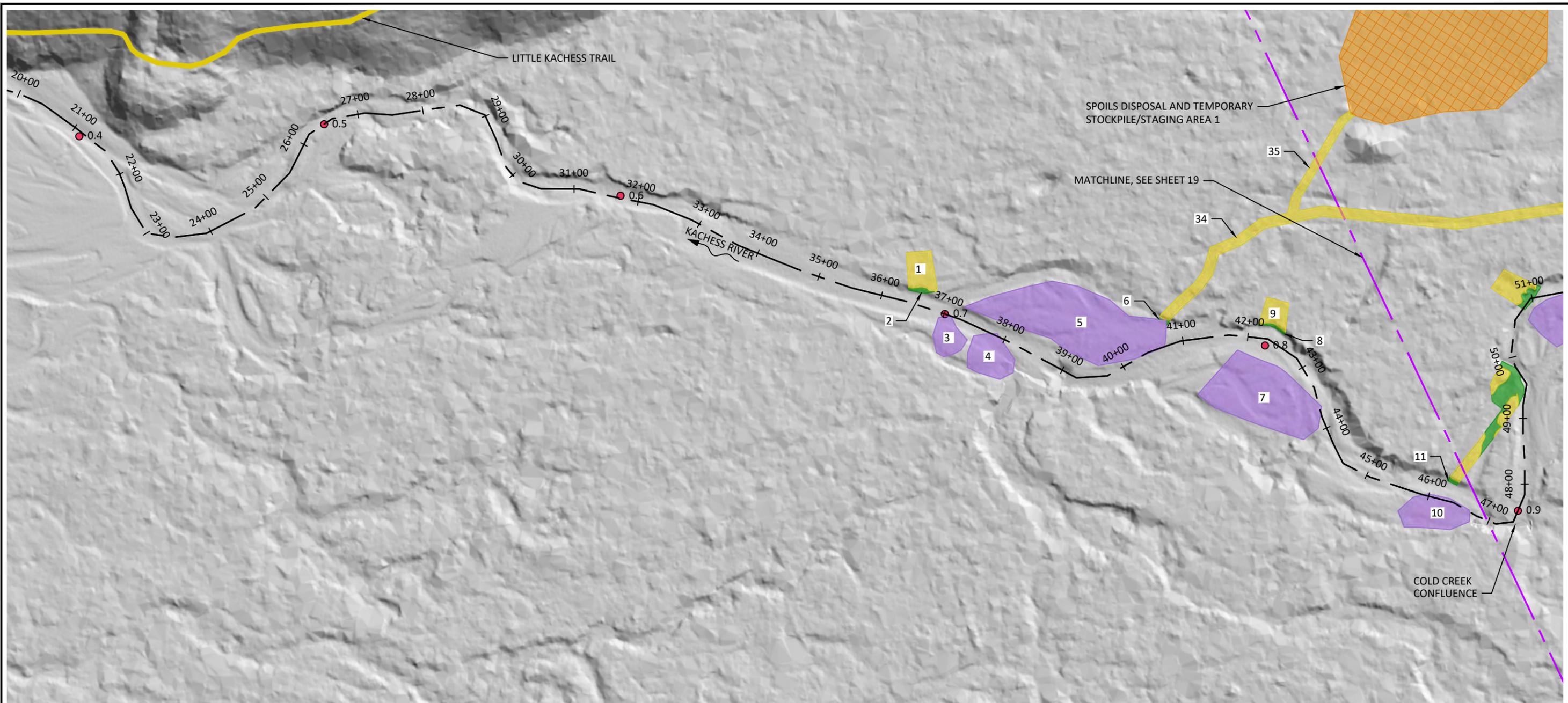
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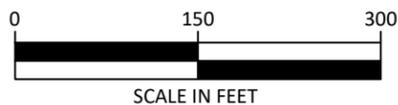
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LEGEND

-  UPLAND REVEGETATION ZONE
-  RIPARIAN REVEGETATION ZONE
-  BAR STABILITY REVEGETATION ZONE
-  UPLAND REVEGETATION ZONE (SEED ONLY)
-  RIVER MILE
-  STAGING AREA



REVEGETATION ZONE AREA			
ID	LAYER	AREA (AC)	AREA (SQ FT)
1	UPLAND	0.0545	2376
2	RIPARIAN	0.0041	178
3	BAR ROUGHNESS	0.0497	2164
4	BAR ROUGHNESS	0.0862	3755
5	BAR ROUGHNESS	0.4797	20897
6	RIPARIAN	0.0007	28
7	BAR ROUGHNESS	0.329	14330
8	RIPARIAN	0.0024	106
9	UPLAND	0.0357	1554
10	BAR ROUGHNESS	0.1017	4432
11	RIPARIAN	0.0019	83

NO.	BY	DATE	REVISION DESCRIPTION

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PL	DECEMBER 2021	180213
APPROVED	DATE	PROJECT

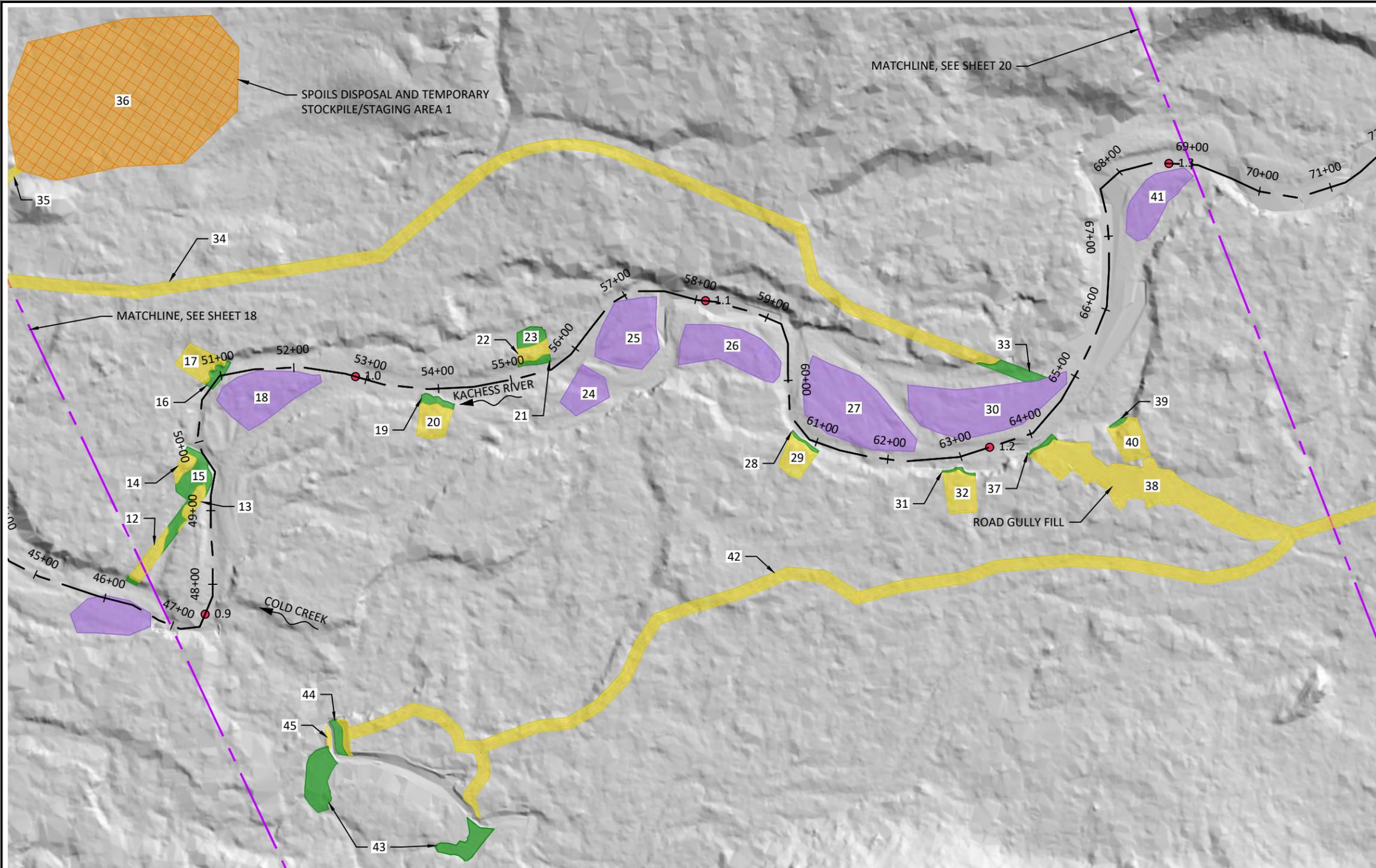
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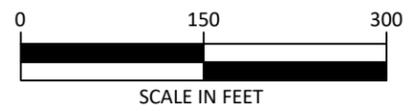
PROPOSED REVEGETATION PLAN (1 OF 3)



REVEGETATION ZONE AREA			
ID	LAYER	AREA (AC)	AREA (SQ FT)
12	UPLAND	0.0259	1127
13	UPLAND	0.0161	703
14	UPLAND	0.0141	616
15	RIPARIAN	0.0569	2477
16	RIPARIAN	0.0129	563
17	UPLAND	0.0424	1846
18	BAR ROUGHNESS	0.1518	6611
19	RIPARIAN	0.0105	458
20	UPLAND	0.0416	1811
21	RIPARIAN	0.0078	340
22	UPLAND	0.0183	799
23	RIPARIAN	0.0202	879
24	BAR ROUGHNESS	0.0614	2675
25	BAR ROUGHNESS	0.1495	6511
26	BAR ROUGHNESS	0.154	6710
27	BAR ROUGHNESS	0.2642	11507
28	RIPARIAN	0.0036	155
29	UPLAND	0.0405	1765
30	BAR ROUGHNESS	0.2623	11427
31	RIPARIAN	0.0026	115
32	UPLAND	0.0515	2242
33	RIPARIAN	0.0244	1061
34	UPLAND	0.685	29840
35	UPLAND	0.0526	2293
36	UPLAND SEED	1.2949	56406
37	RIPARIAN	0.0043	188
38	UPLAND	0.3066	13356
39	RIPARIAN	0.0035	152
40	UPLAND	0.0471	2052
41	BAR ROUGHNESS	0.1014	4418
42	UPLAND	0.5647	24599
43	RIPARIAN	0.1060	4608
44	RIPARIAN	0.0135	586
45	UPLAND	0.0028	120

LEGEND

- UPLAND REVEGETATION ZONE
- RIPARIAN REVEGETATION ZONE
- BAR STABILITY REVEGETATION ZONE
- UPLAND REVEGETATION ZONE (SEED ONLY)
- RM RIVER MILE
- STAGING AREA



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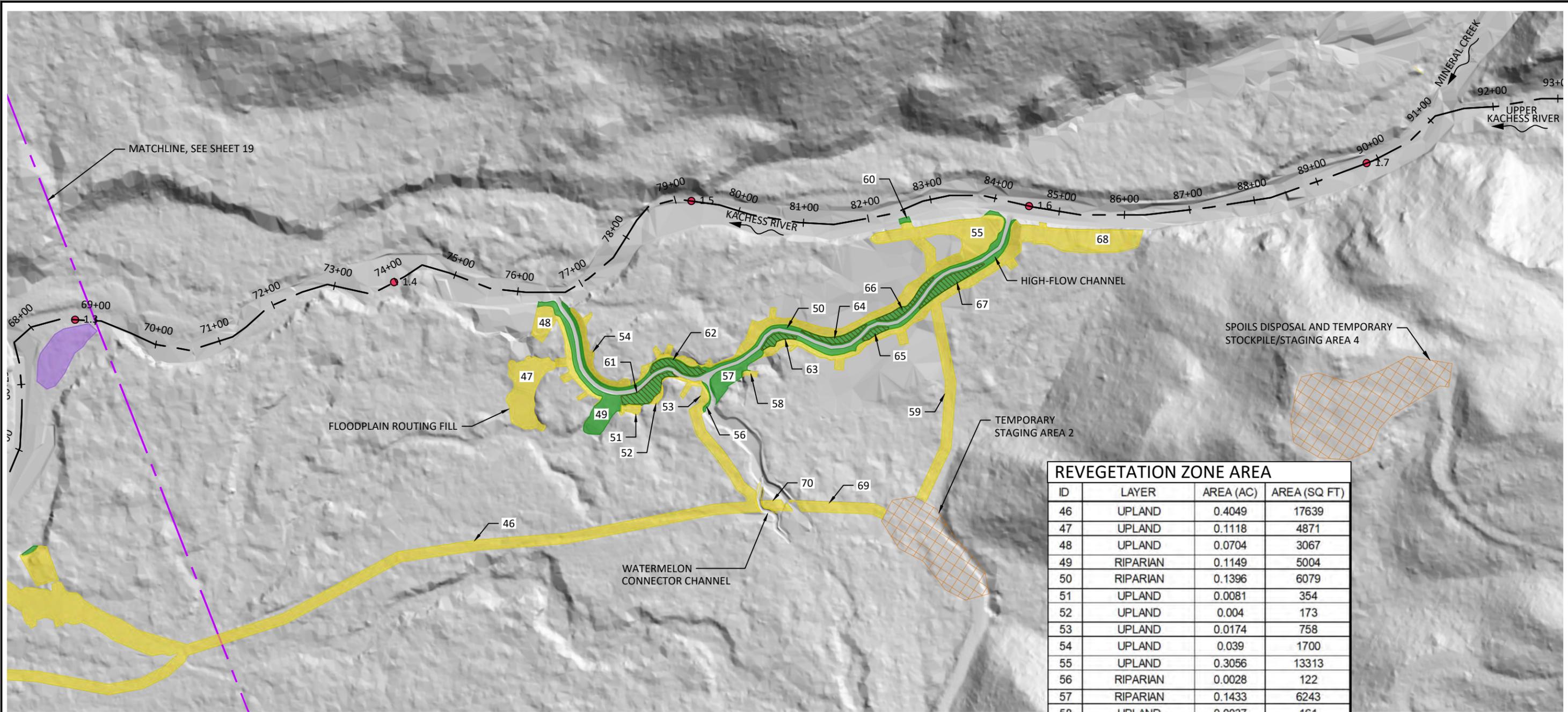
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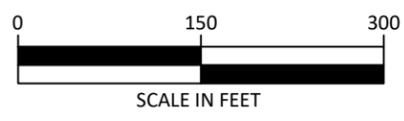
PROPOSED REVEGETATION PLAN
 (2 OF 3)



REVEGETATION ZONE AREA			
ID	LAYER	AREA (AC)	AREA (SQ FT)
46	UPLAND	0.4049	17639
47	UPLAND	0.1118	4871
48	UPLAND	0.0704	3067
49	RIPARIAN	0.1149	5004
50	RIPARIAN	0.1396	6079
51	UPLAND	0.0081	354
52	UPLAND	0.004	173
53	UPLAND	0.0174	758
54	UPLAND	0.039	1700
55	UPLAND	0.3056	13313
56	RIPARIAN	0.0028	122
57	RIPARIAN	0.1433	6243
58	UPLAND	0.0037	161
59	UPLAND	0.2425	10562
60	RIPARIAN	0.0029	124
61	TOPSOIL	0.0346	1509
62	TOPSOIL	0.0213	927
63	TOPSOIL	0.0114	495
64	TOPSOIL	0.0174	757
65	TOPSOIL	0.0073	319
66	TOPSOIL	0.0173	753
67	TOPSOIL	0.0277	1207
68	UPLAND	0.1401	6104
69	UPLAND	0.0491	2139
70	UPLAND	0.0129	560

LEGEND

- UPLAND REVEGETATION ZONE
- RIPARIAN REVEGETATION ZONE
- BAR STABILITY REVEGETATION ZONE
- TOPSOIL (SEE NOTE 3)
- RIVER MILE
- STAGING AREA



NO.	BY	DATE	REVISION DESCRIPTION

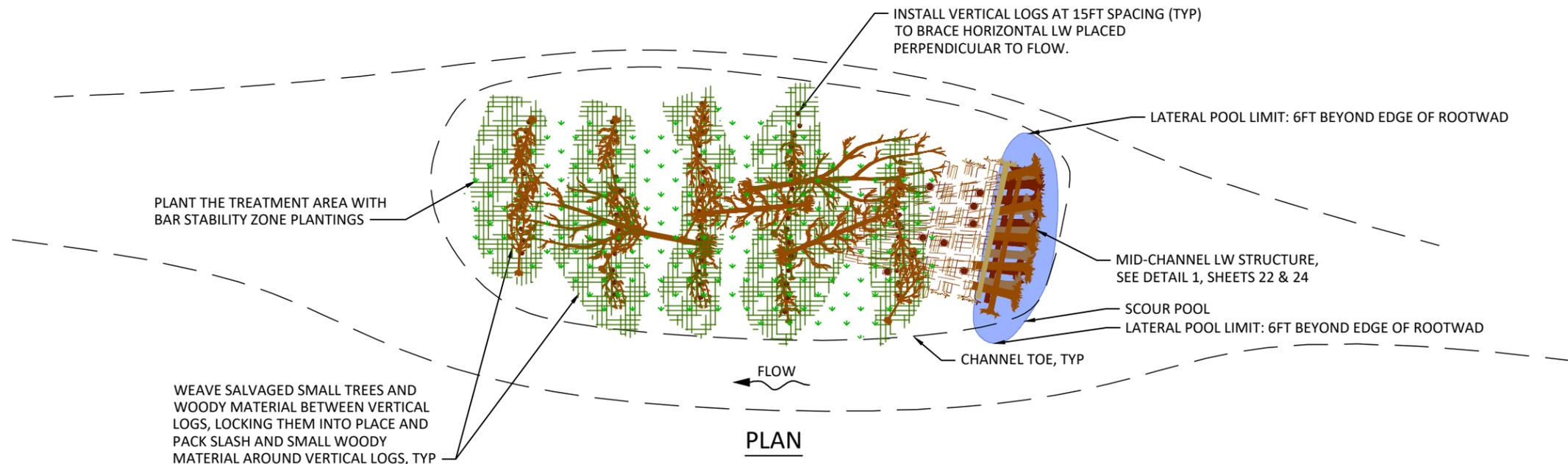
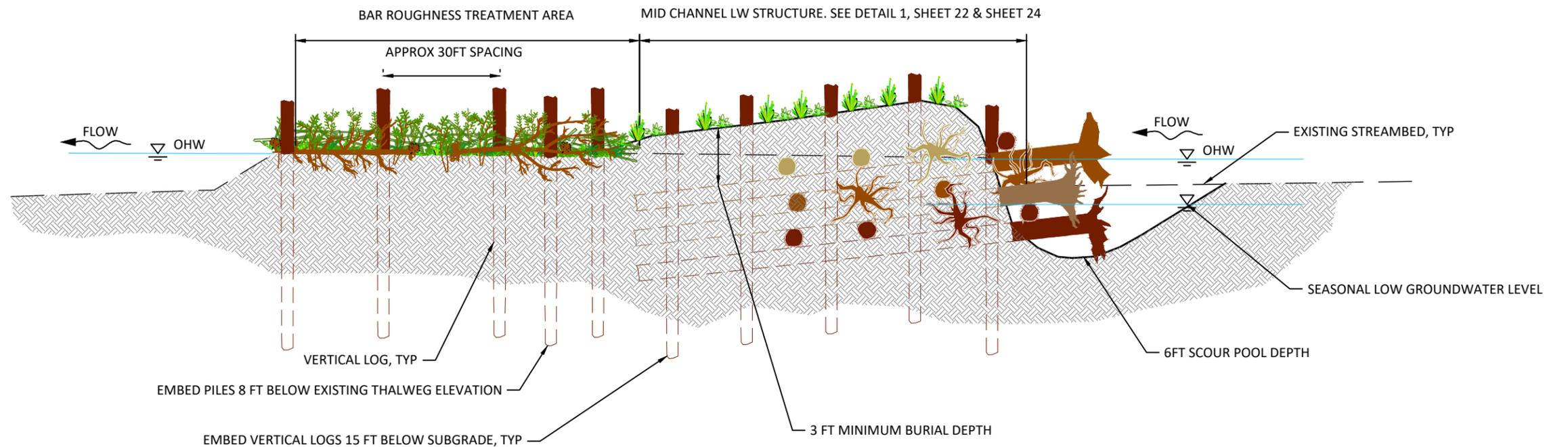
SP, NS, SJ	DM, PL, PB, JP	PL, DM, JP
DRAWN	DESIGNED	CHECKED
PL	DECEMBER 2021	180213
APPROVED	DATE	PROJECT

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 FINAL CHANNEL & FLOODPLAIN DESIGNS

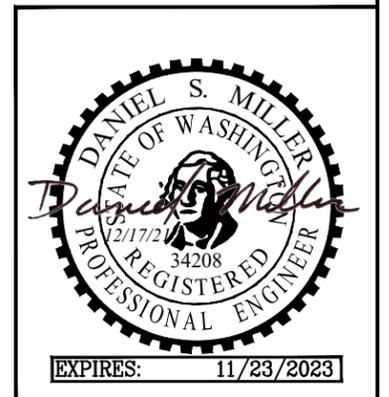
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PROPOSED REVEGETATION PLAN (3 OF 3)



1 MID-CHANNEL LW STRUCTURE AND BAR ROUGHNESS TREATMENT AREA
21 NOT TO SCALE



NO.	BY	DATE	REVISION DESCRIPTION

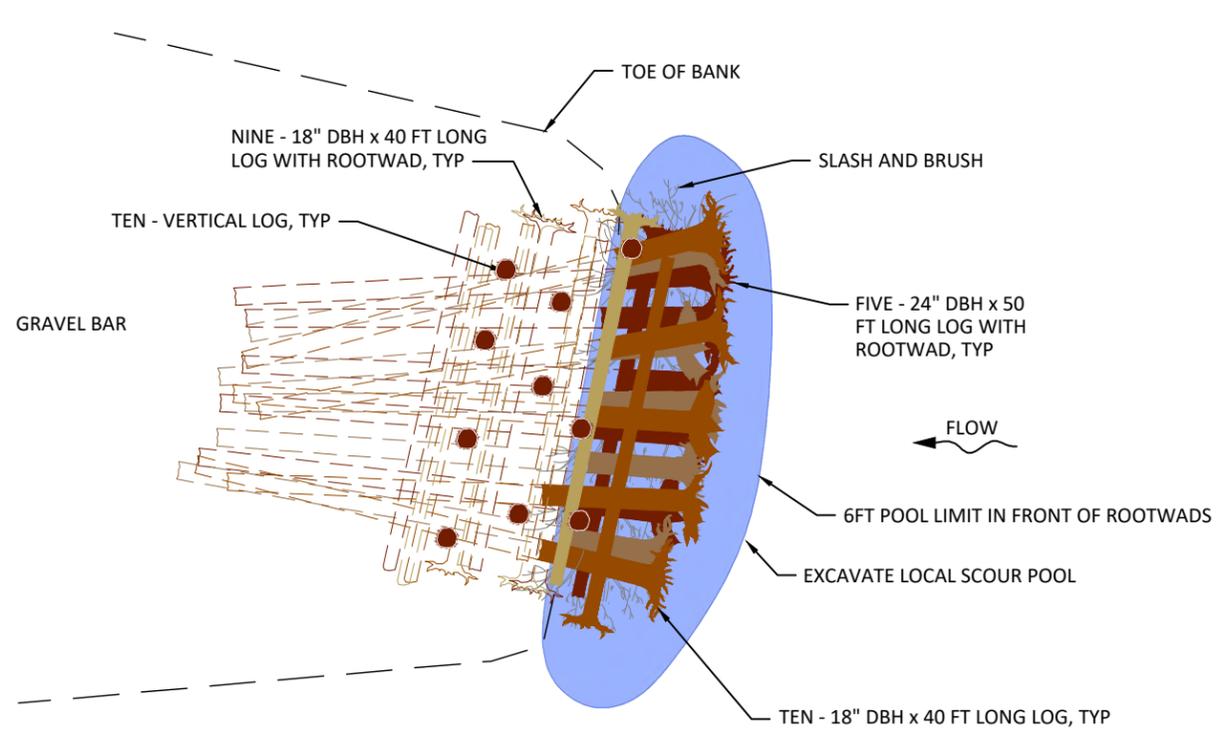
SP, NS, SJ DRAWN	DM, PL, PB, JP DESIGNED	PL, DM, JP CHECKED
PL, DM APPROVED	DECEMBER 2021 DATE	180213 PROJECT

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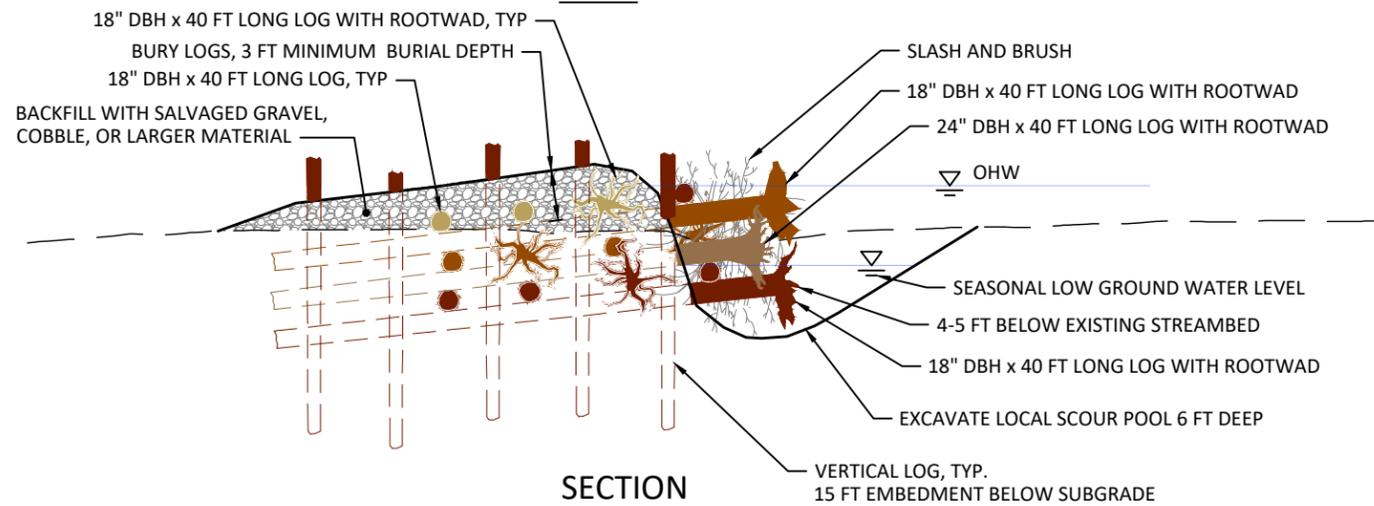
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541.386.9003
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TYPICAL LARGE WOOD
STRUCTURE DETAILS (1 OF 3)

SHEET
21 OF 34



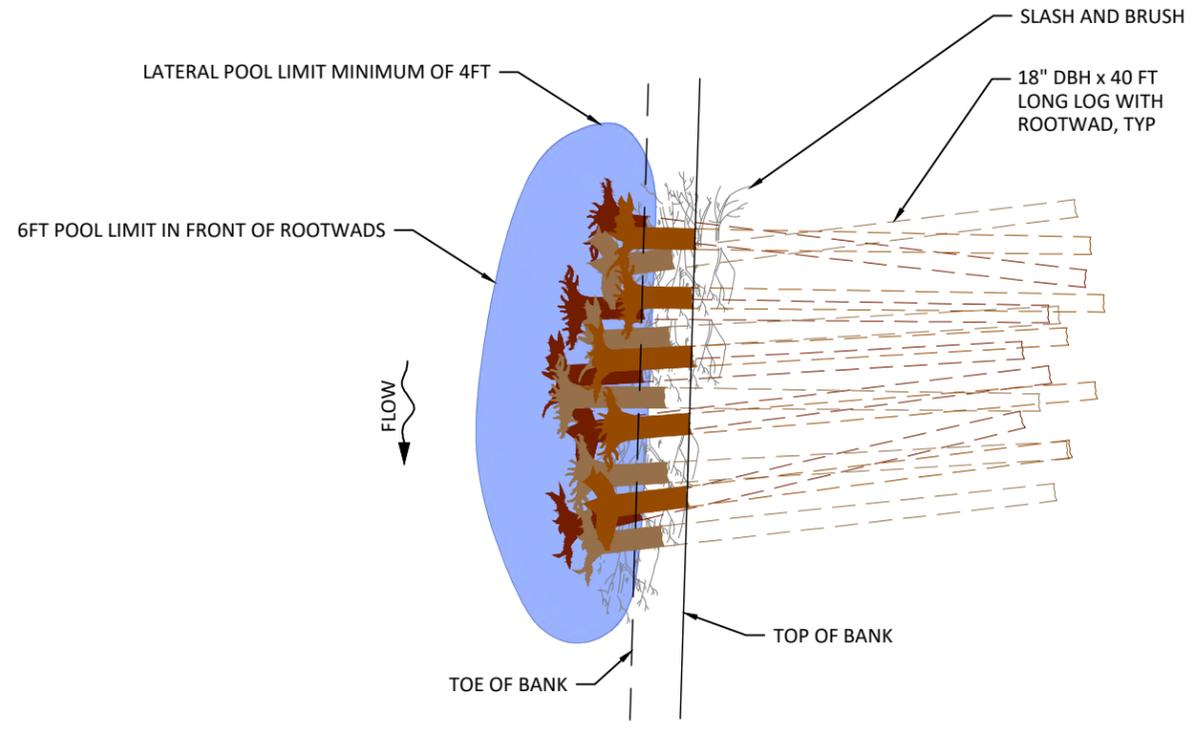
PLAN



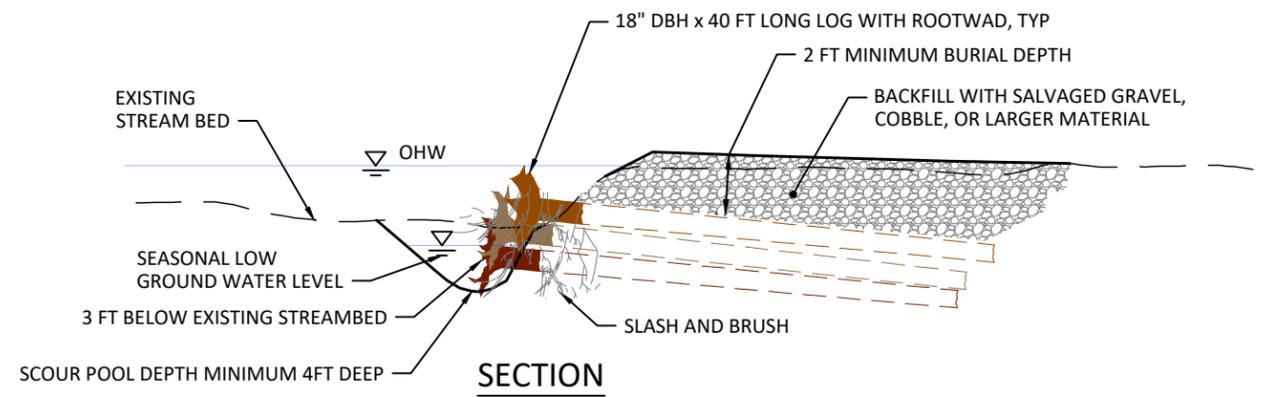
SECTION

NOTE: SEE SHEET 24 FOR MID-CHANNEL JAM LW STRUCTURE CONSTRUCTION SEQUENCE

1
22 MID-CHANNEL LW STRUCTURE
NOT TO SCALE

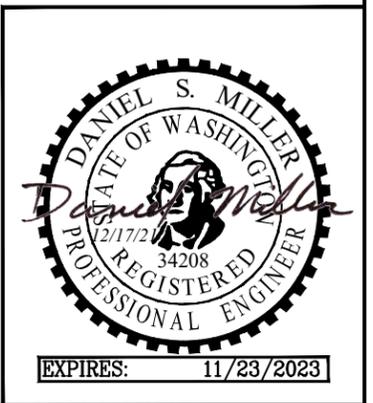


PLAN



SECTION

2
22 BANK BURIED LW STRUCTURE
NOT TO SCALE



NO.	BY	DATE	REVISION DESCRIPTION

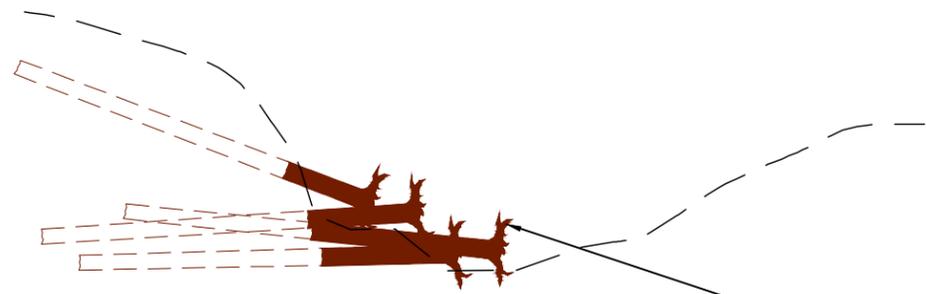
SP, NS, SJ DRAWN	DM, PL, PB, JP DESIGNED	PL, DM, JP CHECKED
PL, DM APPROVED	DECEMBER 2021 DATE	180213 PROJECT

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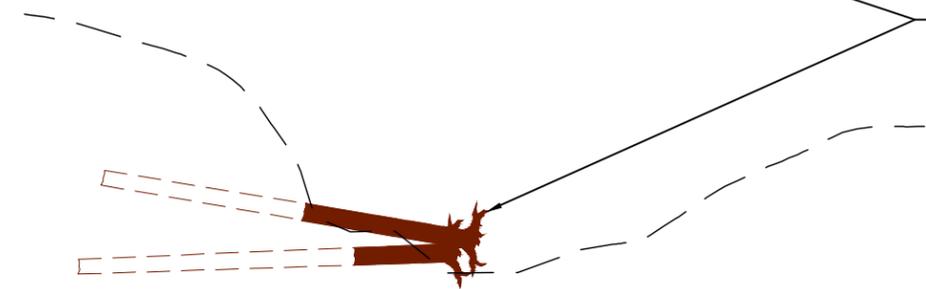
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TYPICAL LARGE WOOD
STRUCTURE DETAILS (2 OF 3)



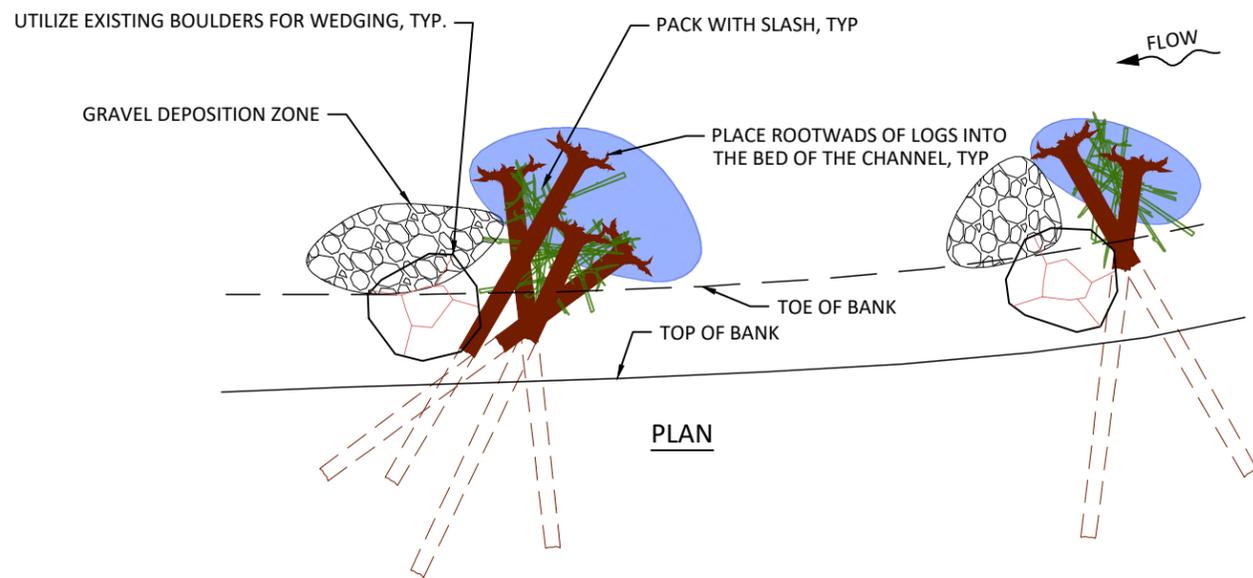
SECTION - FOUR LOG VARIANT



SECTION - TWO LOG VARIANT

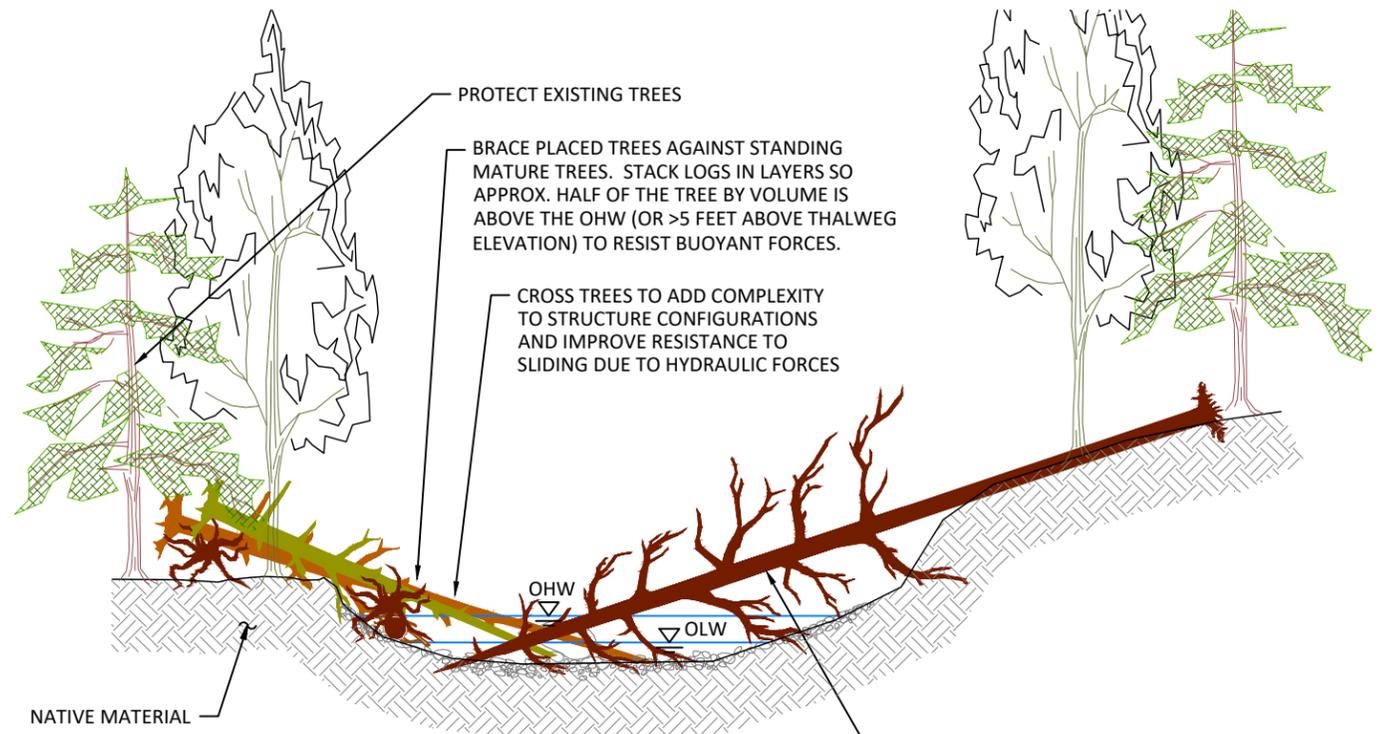
BURIAL OF ROOTWAD LOGS MAY RANGE BETWEEN:
 1) 20FT LONG STEM AT 4FT DEEP OVER TOP OF LOG
 2) 30FT LONG AT 3FT DEEP

BACKFILL WITH SALVAGED GRAVEL/COBBLE OR LARGER MATERIAL, MATCH FINISHED GRADE TO EXISTING GROUND.



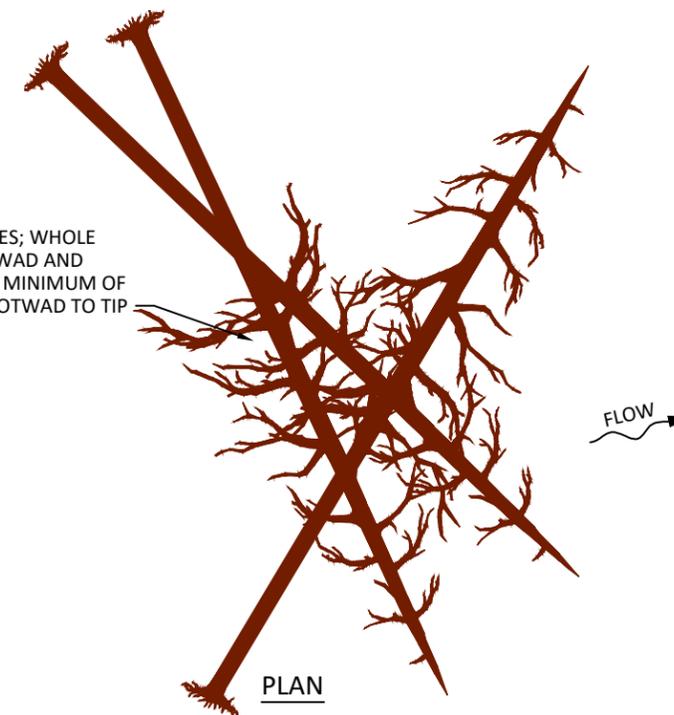
PLAN

1
23 TYPICAL DETAIL - GRAVEL RETENTION/HABITAT LARGE WOOD STRUCTURE
NOT TO SCALE



SECTION

PLACE 2-5 WHOLE TREES; WHOLE TREES INCLUDE ROOTWAD AND BRANCHES AND ARE A MINIMUM OF 60-FT LONG FROM ROOTWAD TO TIP

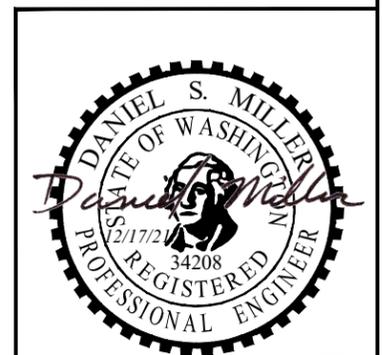


PLAN

2
23 TYPICAL SECTION - WHOLE TREE PLACEMENT
NOT TO SCALE

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. PLACEMENT AND CONFIGURATION AT DIRECTION OF ENGINEER.



EXPIRES: 11/23/2023

NO.	BY	DATE	REVISION DESCRIPTION

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PL, DM APPROVED	DECEMBER 2021 DATE	180213 PROJECT

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TYPICAL LARGE WOOD
 STRUCTURE DETAILS (3 OF 3)

SHEET
 23 OF 34

PLACE SLASH TO FILL MINIMUM TWO-THIRDS OF OPENING BETWEEN ALL LOGS. SLASH SHALL BE 3" DIAMETER BY 12' LONG MINIMUM

BOTTOM TIER: 18" DBH BY 40' LONG DOUGLAS FIR LOG WITH ROOTWAD

PLACE MINIMUM OF TEN: 5-8" DIAMETER BY 20-30' LONG TREE TOPS

EXCAVATED SCOUR POOL 6FT LIMIT IN FRONT OF ROOTWADS

STEP 1:
PLACE COFFERDAM WHEN CONSTRUCTING IN OR NEAR WETTED AREAS. EXCAVATE TO SUBGRADE. EXCAVATE SCOUR POOL: 6' DEEP BY 6' WIDE TO WIDTH OF JAM PLUS 10' (PERPENDICULAR TO FLOW) BY 6' LONG (PARALLEL TO FLOW). PLACE TREE TOPS UNDER BOTTOM TIER LOGS DOWNSTREAM OF ROOTWADS. PLACE BOTTOM TIER OF LOGS (18" DBH, 40' LONG) AND SLASH.

PLACE SLASH TO FILL MINIMUM TWO-THIRDS OF OPENING BETWEEN ALL LOGS. SLASH SHALL BE 3" DIAMETER BY 12' LONG MINIMUM

PLACE MINIMUM OF TEN: 5-8" DIAMETER BY 20-30' LONG TREE TOPS

VERTICAL PILES: 16" DBH x 30' LONG, 15' MIN EMBEDMENT BELOW SUBGRADE

15"-18" DBH x 40' LONG DOUGLAS FIR LOG WITH ROOTWAD

STEP 2:
BACKFILL FROM ROOTWAD LENGTH OF BOTTOM TIER LOG AND DEPTH TO TOPS OF LOGS WITH SALVAGED ALLUVIAL MATERIAL. FILL VOIDS OF SLASH AND BUCKET COMPACT. PLACE CROSS LOGS (18IN DBH, 40' LONG) AND VERTICAL PILES 16" DBH, 30' LONG). PLACE SLASH BETWEEN CROSS LOGS.

PLACE SLASH TO FILL MINIMUM TWO-THIRDS OF OPENING BETWEEN ALL LOGS. SLASH SHALL BE 3" DIAMETER BY 12' LONG MINIMUM

MIDDLE TIER: 24" DBH 50' LONG DOUGLAS FIR LOG WITH ROOTWAD

STEP 3:
BACKFILL TO TOPS OF CROSS LOGS WITH SALVAGED ALLUVIAL MATERIAL. FILL VOIDS OF SLASH AND BUCKET COMPACT. PLACE MIDDLE TIER OF LOGS (24" DBH, 50' LONG) AND SLASH.

PLACE SLASH TO FILL MINIMUM TWO-THIRDS OF OPENING BETWEEN ALL LOGS. SLASH SHALL BE 3" DIAMETER BY 12' LONG MINIMUM

PLACE MINIMUM OF TEN: 5-8" DIAMETER BY 20-30' LONG TREE TOPS

15"-18" DBH 40' LONG DOUGLAS FIR LOG WITH ROOTWAD

STEP 4:
BACKFILL TO TOPS OF MIDDLE TIER LOGS WITH SALVAGED ALLUVIAL MATERIAL. FILL VOIDS OF SLASH AND BUCKET COMPACT. PLACE CROSS LOGS (18IN DBH, 40' LONG). PLACE SLASH BETWEEN CROSS LOGS.

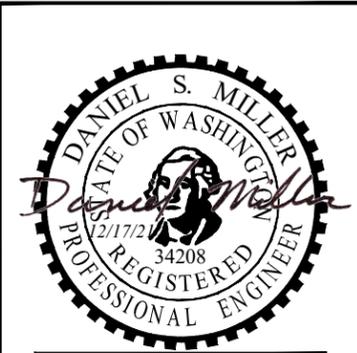
TOP TIER: 18" DBH 40' LONG DOUGLAS FIR LOG WITH ROOTWAD

STEP 5:
BACKFILL TO TOPS OF CROSS LOGS WITH SALVAGED ALLUVIAL MATERIAL. FILL VOIDS OF SLASH AND BUCKET COMPACT. PLACE TOP TIER OF LOGS (18IN DBH, 40' LONG).

18" DBH 40' LONG DOUGLAS FIR LOG WITH ROOTWAD

STEP 6:
BACKFILL TO TOPS OF TOP TIER LOGS WITH SALVAGED ALLUVIAL MATERIAL. BUCKET COMPACT. PLACE CROSS LOGS (18IN DBH, 40' LONG).

STEP 7:
BACKFILL TO TOPS OF CROSS LOGS WITH SALVAGED ALLUVIAL MATERIAL. BUCKET COMPACT BACKFILL IN 8" LIFTS AND BUCKET COMPACT TO MINIMUM 3.0' COVER DEPTH OVER TOP LOGS.



NO.	BY	DATE	REVISION DESCRIPTION

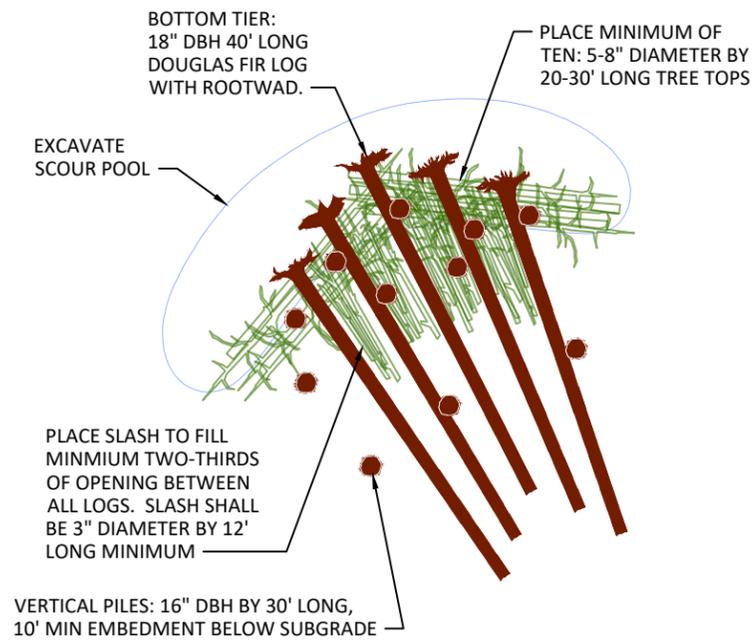
SP, NS, SJ DRAWN	DM, PL, PB, JP DESIGNED	PL, DM, JP CHECKED
PL, DM APPROVED	DECEMBER 2021 DATE	180213 PROJECT

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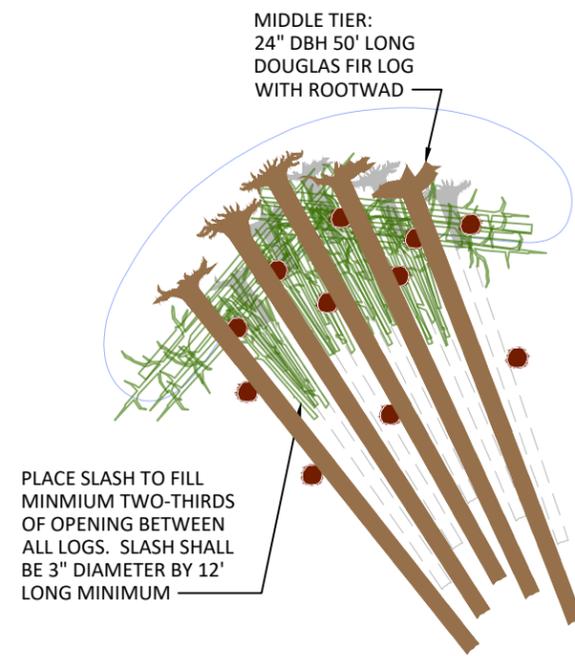
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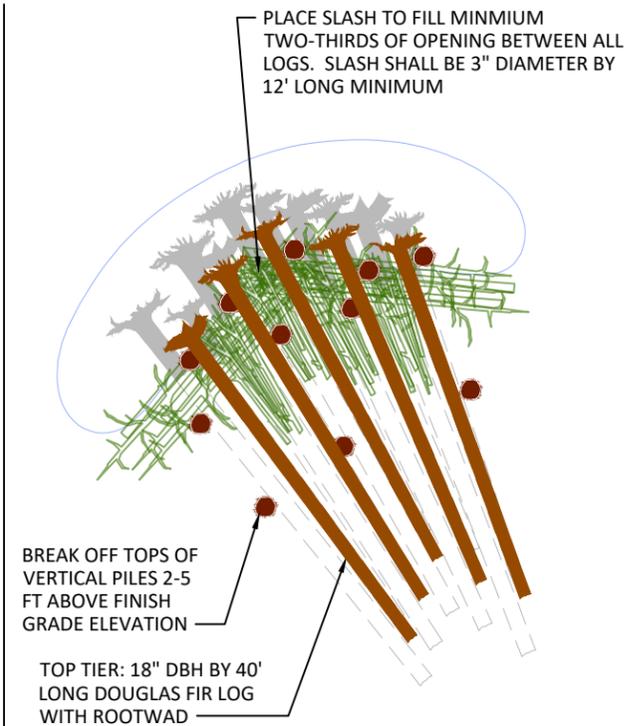
**MID-CHANNEL JAM LW
STRUCTURE CONSTRUCTION
SEQUENCE**



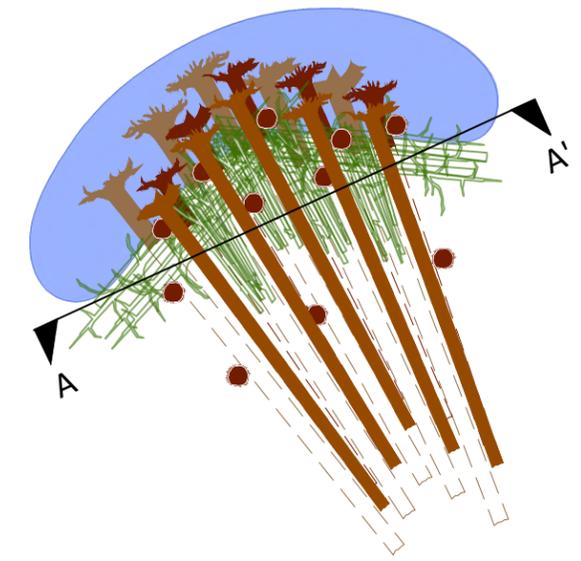
- STEP 1:**
- PLACE COFFERDAM
 - EXCAVATE TO SUBGRADE.
 - EXCAVATE SCOUR POOL: 6' DEEP BY 6' WIDE (PERPENDICULAR TO FLOW) BY 6' LONG (PARALLEL TO FLOW)
 - PLACE TREE TOPS UNDER BOTTOM TIER OF LOGS DOWNSTREAM OF ROOTWADS
 - PLACE BOTTOM TIER OF LOGS: 18IN DBH, 40' LONG.
 - PLACE SLASH BETWEEN LOGS



- STEP 2:**
- BACKFILL FROM ROOTWAD LENGTH OF LOG AND DEPTH TO TOPS OF BOTTOM TIER LOGS WITH SALVAGED GRAVELLY COBBLE ALLUVIAL MATERIAL. FILL VOIDS OF SLASH AND BUCKET COMPACT
 - PLACE TREE TOPS UNDER MIDDLE TIER OF LOGS DOWNSTREAM OF ROOTWADS
 - PLACE MIDDLE TIER OF LOGS: 24IN DBH, 50' LONG
 - PLACE SLASH BETWEEN LOGS

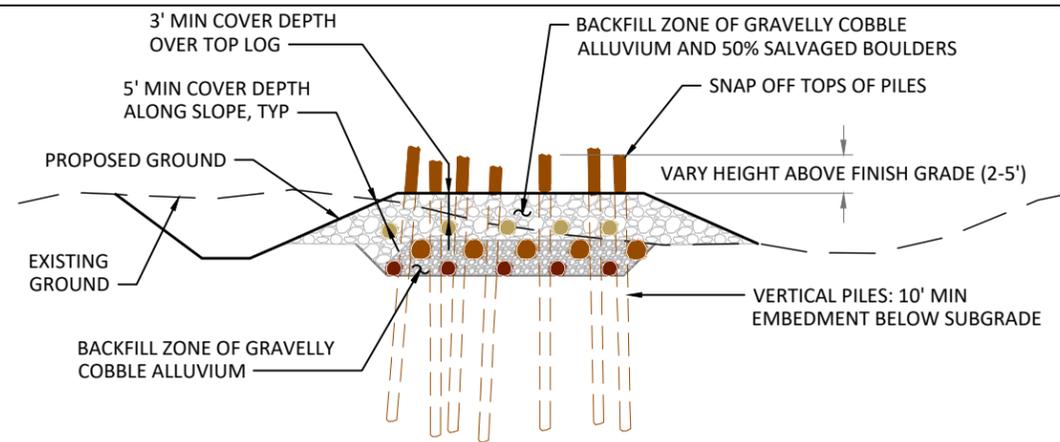


- STEP 3:**
- BACKFILL TO TOPS OF MIDDLE TIER LOGS WITH SALVAGED GRAVELLY COBBLE ALLUVIAL MATERIAL. FILL VOIDS OF SLASH AND BUCKET COMPACT
 - PLACE TREE TOPS UNDER TOP TIER OF LOGS DOWNSTREAM OF ROOTWADS
 - PLACE TOP TIER OF LOGS: 18IN DBH, 40' LONG
 - PLACE SLASH BETWEEN LOGS



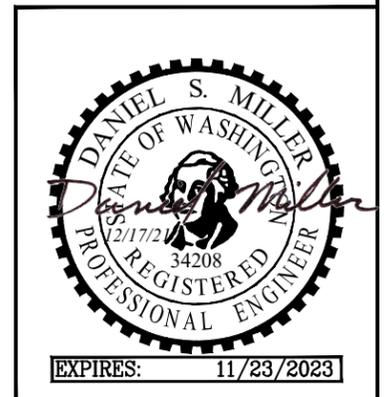
CONSTRUCTION SEQUENCE

NOT TO SCALE



TYPICAL SECTION A-A'

NOT TO SCALE



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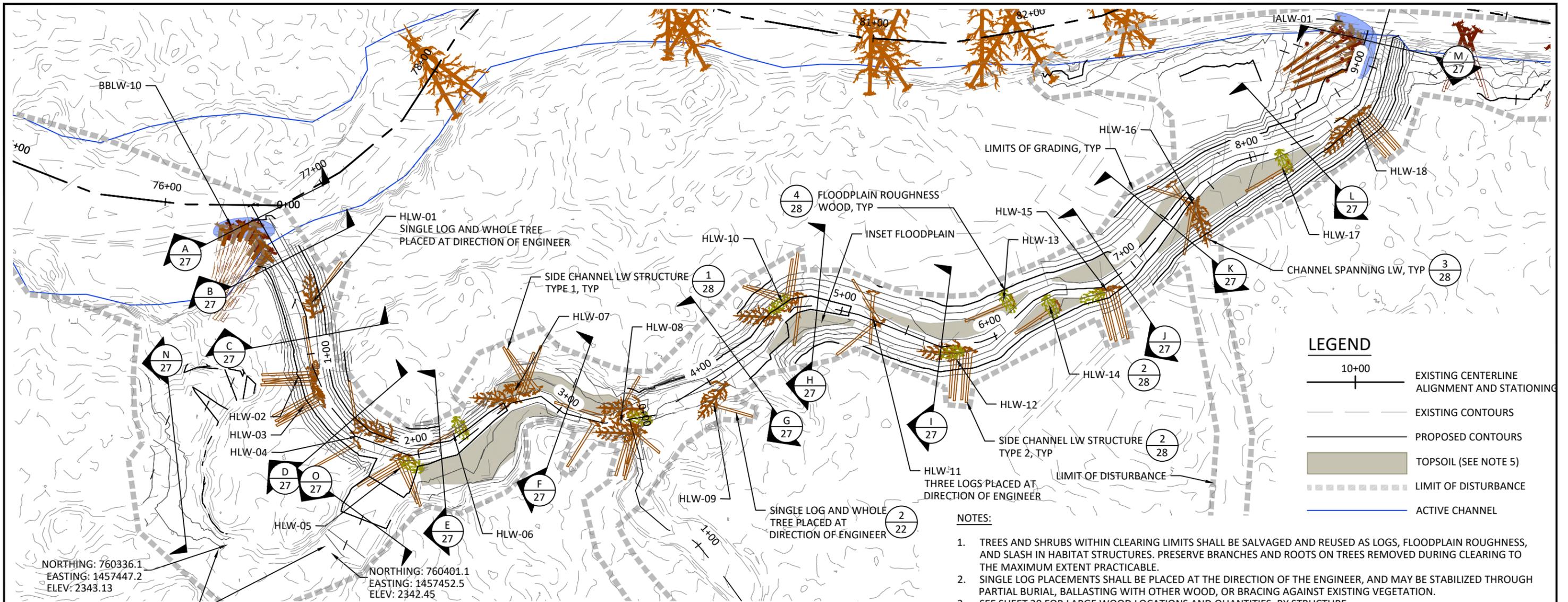
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PL, DM APPROVED	DECEMBER 2021 DATE	180213 PROJECT

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**INLET APEX LW STRUCTURE
CONSTRUCTION SEQUENCE**



LEGEND

- 10+00 ——— EXISTING CENTERLINE ALIGNMENT AND STATIONING
- — — — — EXISTING CONTOURS
- — — — — PROPOSED CONTOURS
- █ TOPSOIL (SEE NOTE 5)
- LIMIT OF DISTURBANCE
- ACTIVE CHANNEL

- NOTES:**
- TREES AND SHRUBS WITHIN CLEARING LIMITS SHALL BE SALVAGED AND REUSED AS LOGS, FLOODPLAIN ROUGHNESS, AND SLASH IN HABITAT STRUCTURES. PRESERVE BRANCHES AND ROOTS ON TREES REMOVED DURING CLEARING TO THE MAXIMUM EXTENT PRACTICABLE.
 - SINGLE LOG PLACEMENTS SHALL BE PLACED AT THE DIRECTION OF THE ENGINEER, AND MAY BE STABILIZED THROUGH PARTIAL BURIAL, BALLASTING WITH OTHER WOOD, OR BRACING AGAINST EXISTING VEGETATION.
 - SEE SHEET 30 FOR LARGE WOOD LOCATIONS AND QUANTITIES, BY STRUCTURE.
 - SEE SHEETS 15, 16 & 27 FOR PROPOSED CROSS SECTIONS AND PROFILES OF HIGH-FLOW CHANNEL.
 - TOPSOIL TREATMENT AREA NOTE: THE SUBSOIL WHERE TOPSOIL IS TO BE PLACED SHALL BE TILLED TO A DEPTH OF 1 FT. TOPSOIL SHALL BE EVENLY SPREAD OVER THE SPECIFIED AREA TO THE DEPTH SHOWN IN THE PLANS, AND SHALL BE INCORPORATED WITH SUBSOIL TO A DEPTH OF 1 FOOT. FINISHED GRADE OF THE TOPSOIL TREATMENT AREAS SHALL BE EQUIVALENT TO FINISHED GRADE AS SHOWN ON THE GRADING CROSS SECTIONS. TOPSOIL TREATMENT AREAS SHALL BE COMPACTED TO 80% STANDARD PROCTOR. SEE SHEETS 19, 20, & 33 FOR TOPSOIL TREATMENT AREAS.
 - OWNER WILL IDENTIFY CHANNEL ALIGNMENT IN THE FIELD.
 - EXCAVATED MATERIAL MAY REQUIRE SORTING. UTILIZE LARGE COBBLES AND BOULDERS TO CREATE CHANNEL BED HABITAT COMPLEXITY AND BRACE LW - AT THE DIRECTION OF THE ENGINEER.

SIDE CHANNEL LARGE WOOD PLACEMENT

HIGH-FLOW SIDE CHANNEL ALIGNMENT

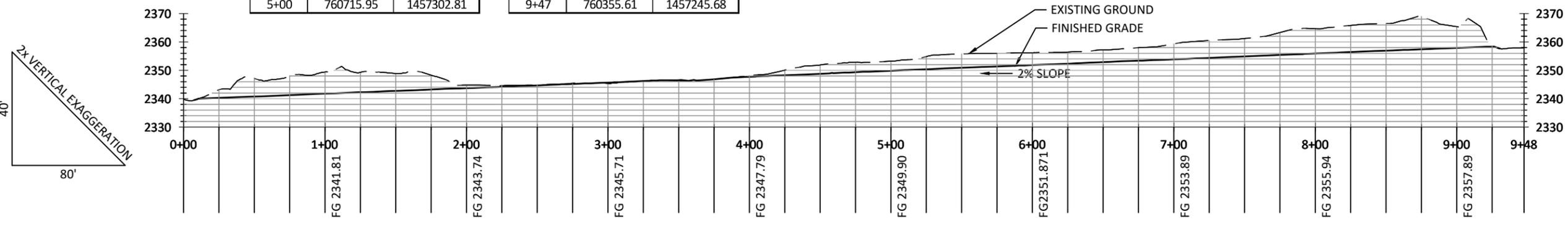
STATION	NORTHING	EASTING
0+00	760351.24	1457237.81
1+00	760388.06	1457329.49
2+00	760454.66	1457391.23
3+00	760541.64	1457364.06
4+00	760633.93	1457346.48
5+00	760715.95	1457302.81

STATION	NORTHING	EASTING
6+00	760811.03	1457318.47
7+00	760896.17	1457274.27
8+00	760968.59	1457208.53
9+00	761043.96	1457152.85
9+47	760355.61	1457245.68

NORTHING: 760336.1
EASTING: 1457447.2
ELEV: 2343.13

NORTHING: 760401.1
EASTING: 1457452.5
ELEV: 2342.45

PROPOSED FLOODPLAIN FLOW ROUTING FILL, SEE TYPICAL CROSS SECTIONS 10 & 11, SHEET 16

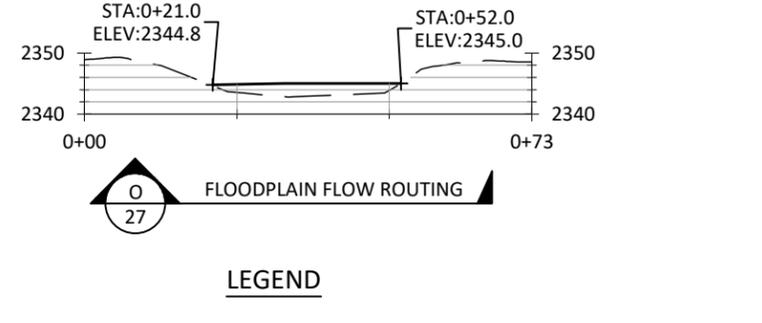
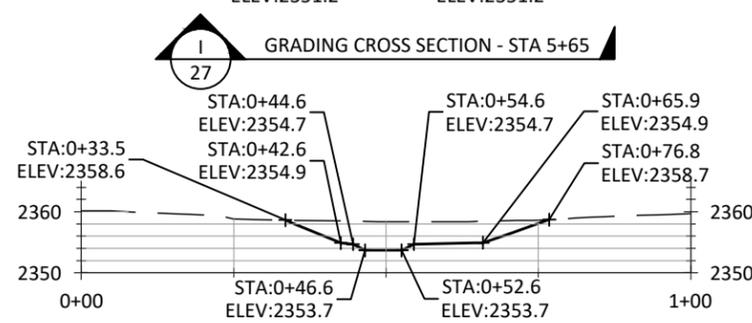
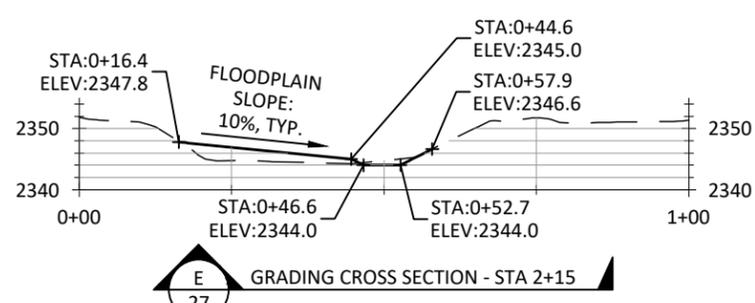
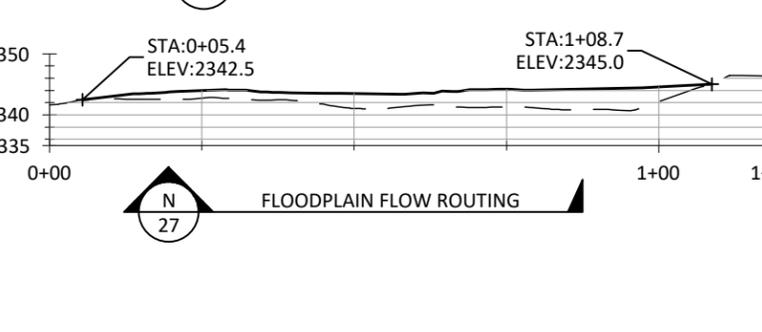
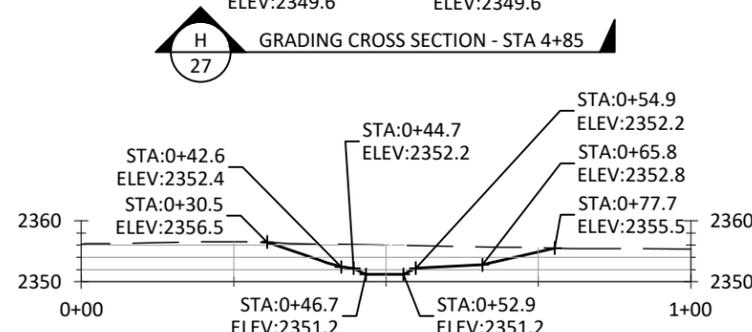
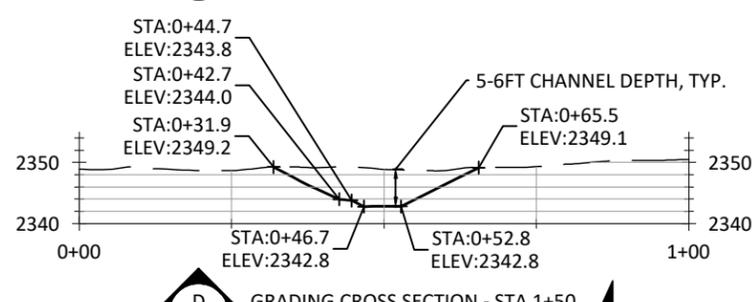
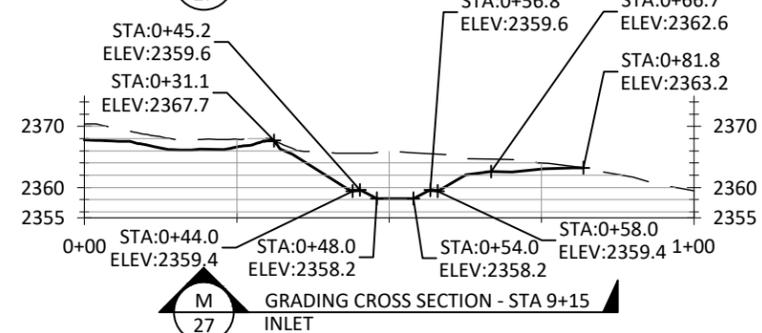
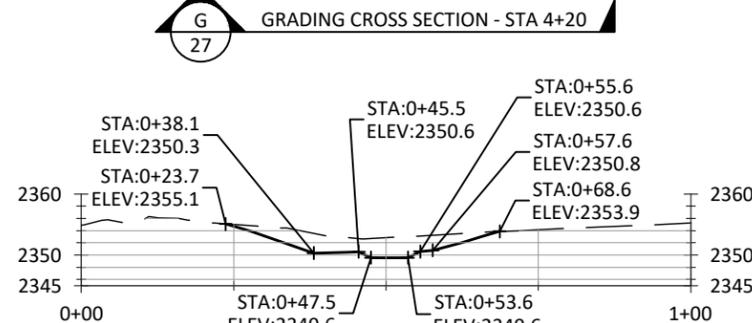
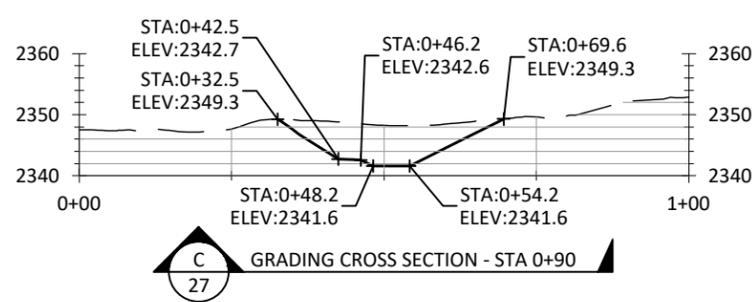
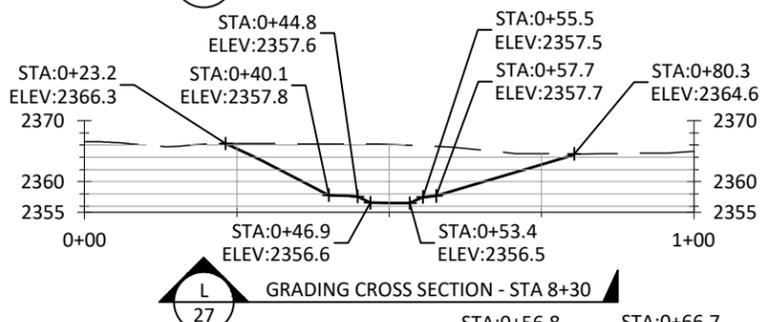
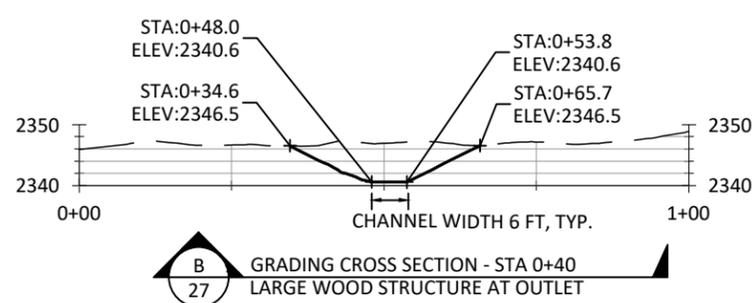
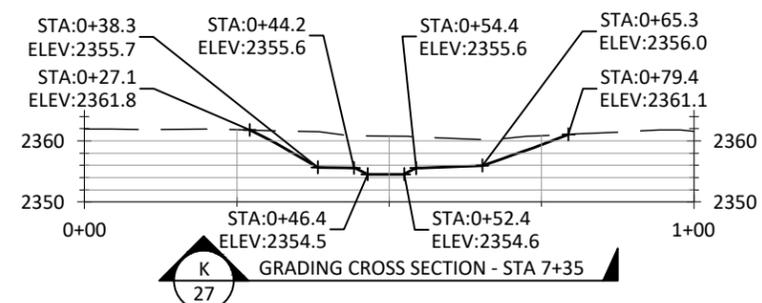
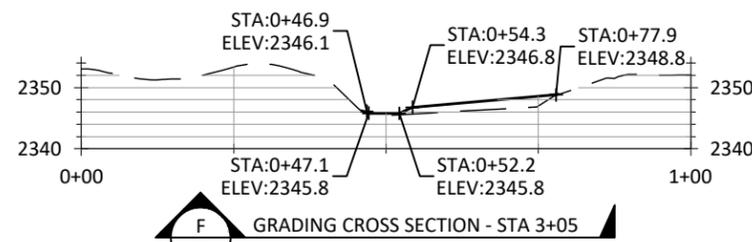
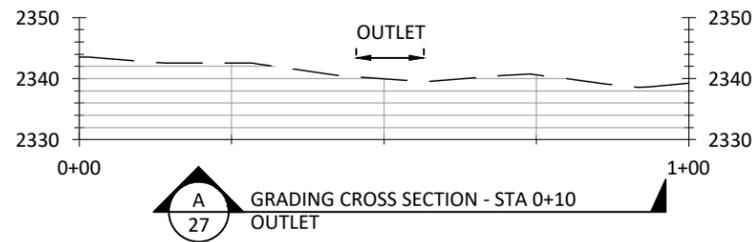


HIGH-FLOW SIDE CHANNEL LONGITUDINAL PROFILE

NO.	BY	DATE	REVISION DESCRIPTION

SP, NS, SJ DRAWN	DM, PL, PB, JP DESIGNED	PL, DM, JP CHECKED
PL, DM APPROVED	DECEMBER 2021 DATE	180213 PROJECT

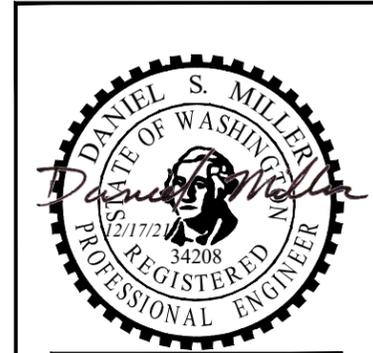
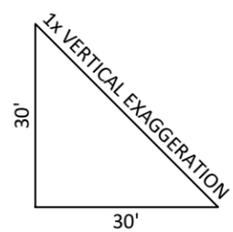
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GRADING CROSS SECTION END POINT COORDINATE TABLE			
SECTION	STATION	NORTHING	EASTING
A	0+00	760312.04	1457269.13
A	1+00	760401.41	1457224.26
B	0+00	760326.79	1457294.92
B	1+00	760416.16	1457250.05
C	0+00	760337.57	1457328.32
C	1+00	760435.96	1457310.47
D	0+00	760372.09	1457406.09
D	1+00	760447.82	1457340.78
E	0+00	760471.96	1457438.51
E	1+00	760465.58	1457338.71
F	0+00	760529.24	1457413.38
F	1+00	760562.26	1457318.99
G	0+00	760681.91	1457374.27
G	1+00	760622.61	1457293.75
H	0+00	760696.34	1457349.16
H	1+00	760705.82	1457249.61
I	0+00	760771.20	1457374.81
I	1+00	760783.88	1457275.62
J	0+00	760915.45	1457322.06
J	1+00	760858.64	1457239.76
K	0+00	760956.21	1457280.50
K	1+00	760878.82	1457217.16
L	0+00	761031.19	1457235.90
L	1+00	760963.42	1457162.36
M	0+00	761037.82	1457219.34
M	1+00	761063.51	1457042.39
N	0+00	760298.55	1457333.66
N	1+19	760311.29	1457451.60
O	0+00	760391.10	1457408.33
O	1+00	760449.66	1457452.59

NOTE: CROSS SECTION ORIENTATION IS LEFT TO RIGHT LOOKING DOWNSTREAM.

LEGEND
 ——— PROPOSED
 - - - - - EXISTING GROUND



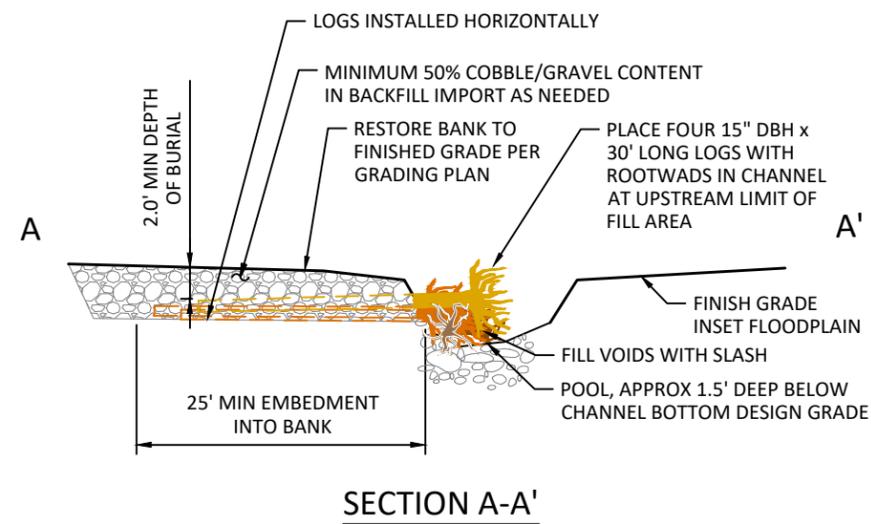
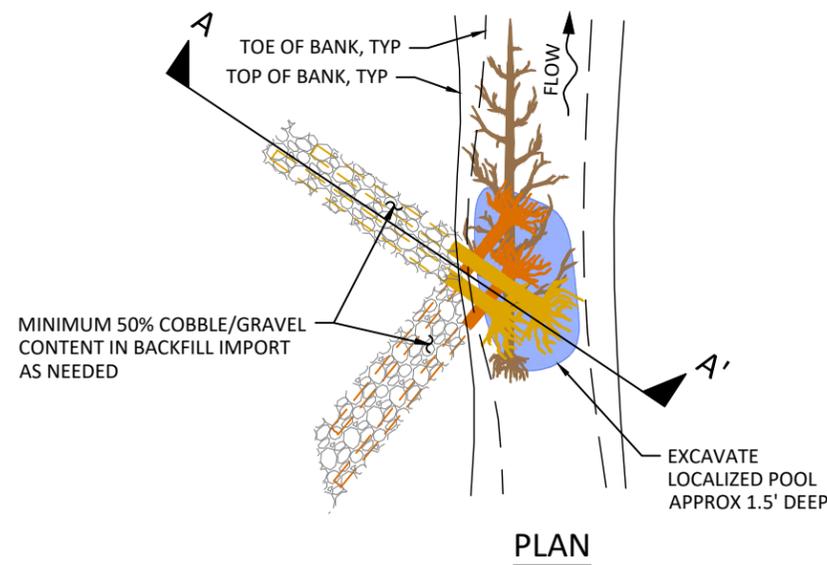
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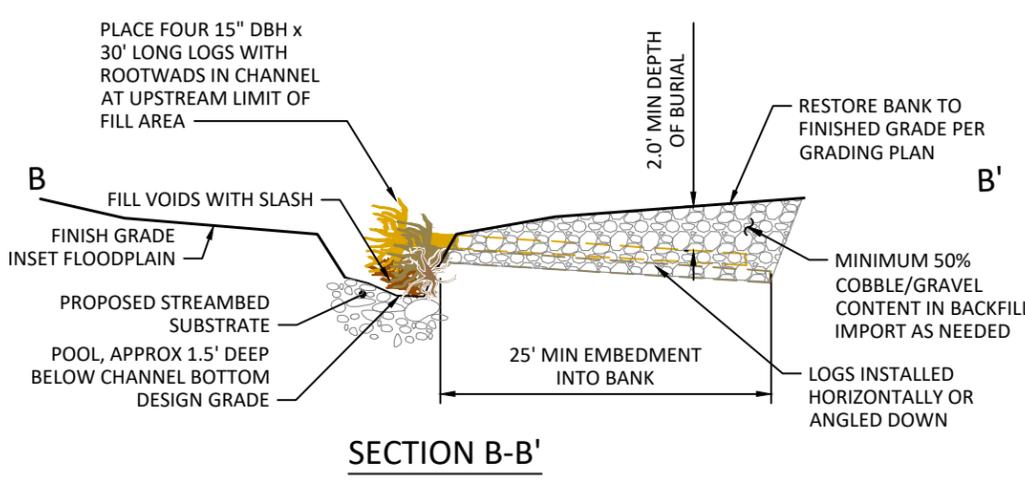
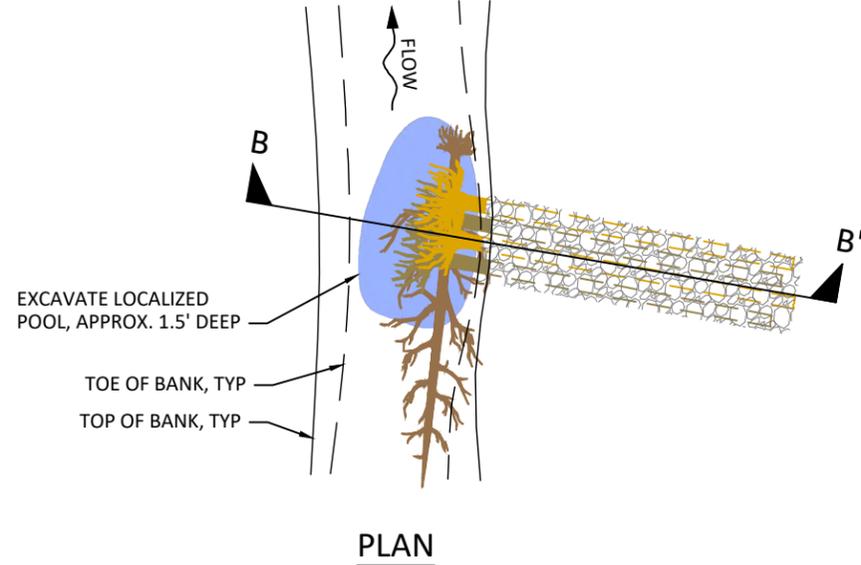
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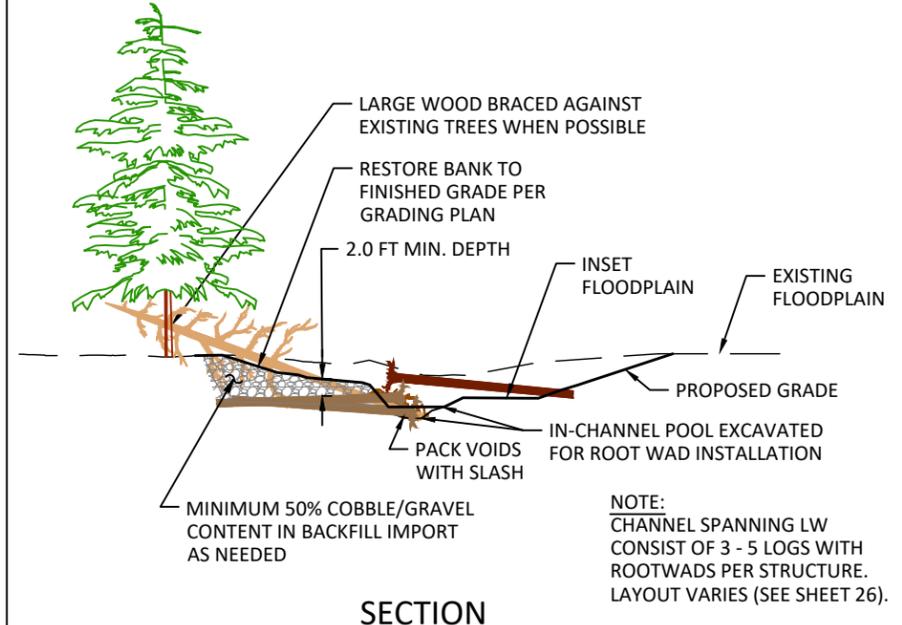
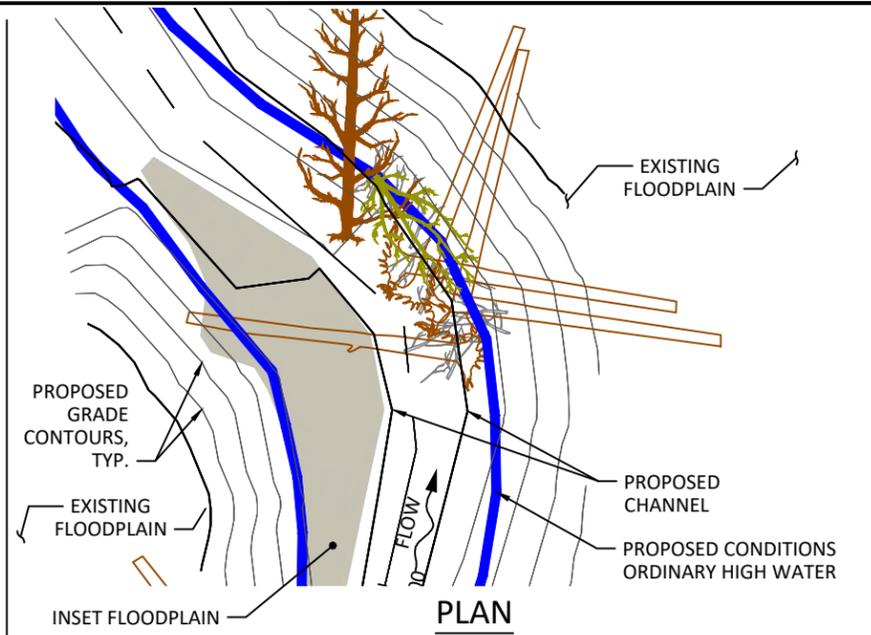




1
28 TYPE 1 LWM STRUCTURE DETAIL
NOT TO SCALE

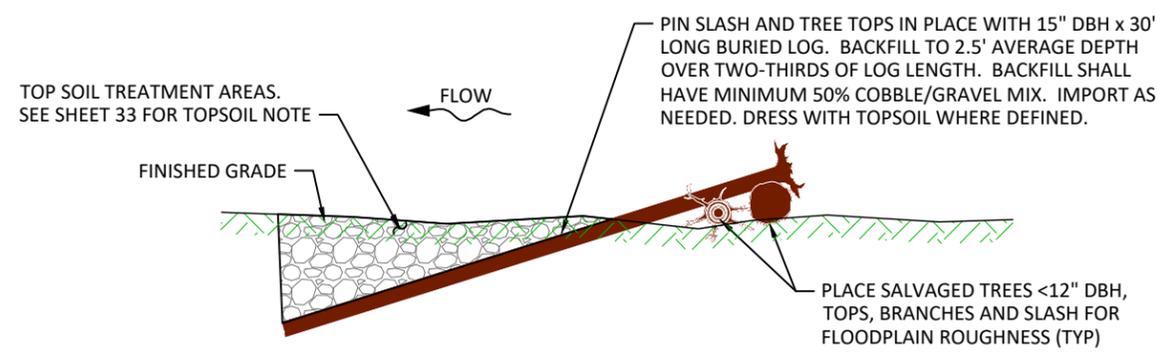


2
28 TYPE 2 LWM STRUCTURE DETAIL
NOT TO SCALE

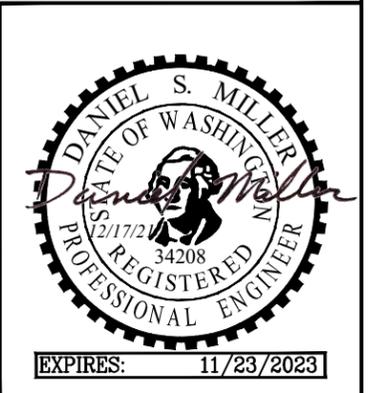


3
28 TYPICAL DETAIL - CHANNEL SPANNING LW
NOT TO SCALE

NOTE:
SPECIFIC ORIENTATION OF LOGS AND BALLAST MATERIALS MAY VARY FROM TYPICAL DRAWINGS DUE TO LOCAL SITE CONDITIONS AS DIRECTED BY THE OWNER AT NO ADDITIONAL COST TO THE OWNER.



4
28 TYPICAL SECTION - FLOODPLAIN ROUGHNESS WOOD
NOT TO SCALE



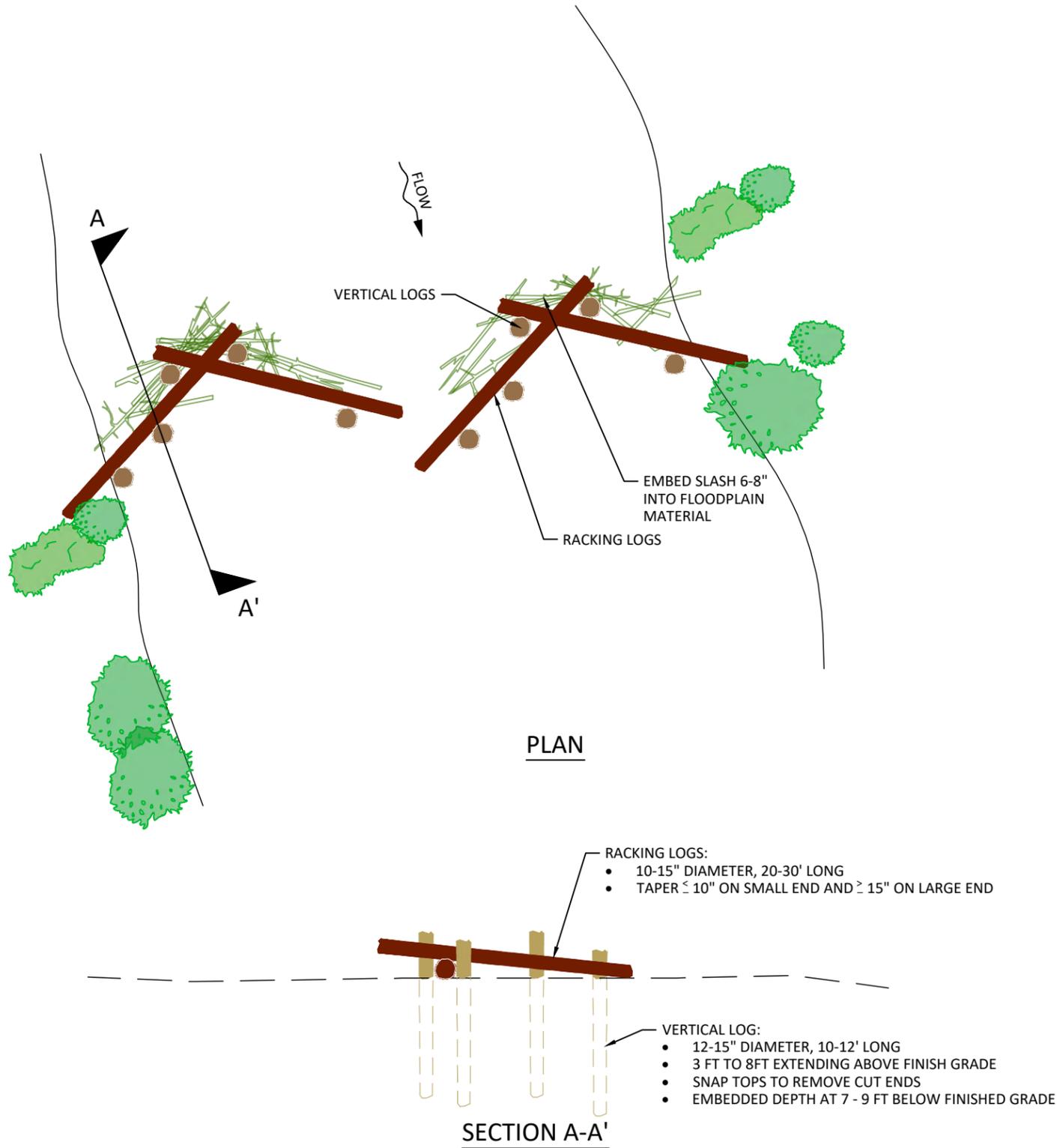
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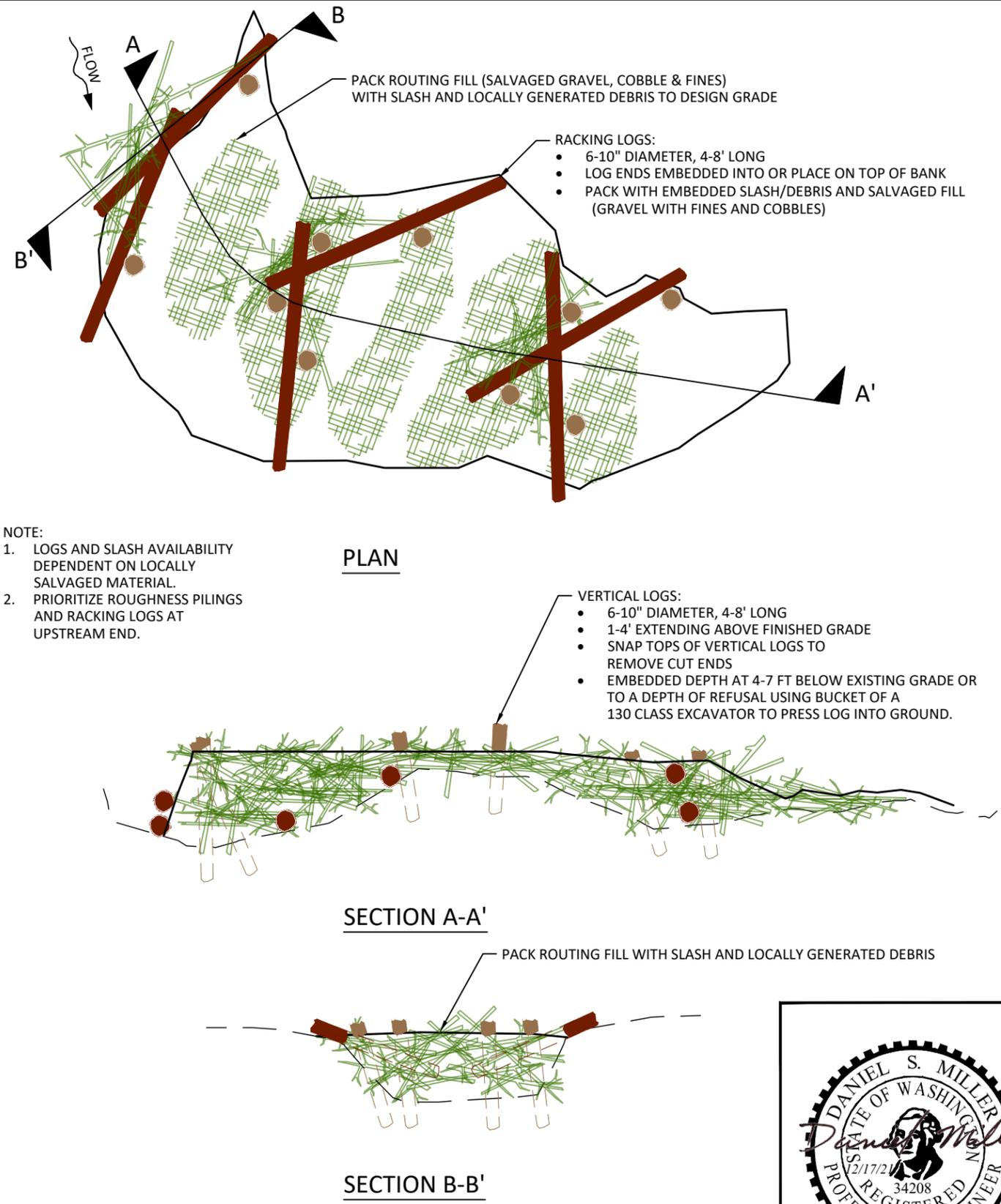
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TYPICAL SIDE CHANNEL LARGE WOOD DETAILS



1
29 TYPICAL DETAIL - SNAG FOREST - FLOODPLAIN ROUGHNESS
NOT TO SCALE



2
29 TYPICAL DETAIL - MAGIC CREEK CONNECTOR ROUTING FILL
NOT TO SCALE



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TYPICAL DETAILS - SNAG FOREST & MAGIC CREEK

Mid-Channel Large Wood Structures								
Code	Location *			Large Wood				
	Northing	Easting	Stationing	18"x40' root wads	24"x50' root wads	16-18"x30' pilings	Tree Tops 5-8"x20-30'	slash
MCLW-01	757449.6	1457583.9	37+00	22	5	10	20	yes
MCLW-02	757533.4	1457621.8	38+00	22	5	10	20	yes
MCLW-03	757768.7	1457613.2	40+70	22	5	10	20	yes
MCLW-04	757997.6	1457728.3	44+00	22	5	10	20	yes
MCLW-05	758224.1	1457869.2	46+50	22	5	10	20	yes
MCLW-06	758301.6	1457664.9	50+00	22	5	10	20	yes
MCLW-07	758460.4	1457561.6	52+30	22	5	10	20	yes
MCLW-08	758834.3	1457566.5	56+00	22	5	10	20	yes
MCLW-09	759082.4	1457547.1	59+50	22	5	10	20	yes
MCLW-10	759275.3	1457661.9	62+50	22	5	10	20	yes
MCLW-11	759470.8	1457576.5	65+00	22	5	10	20	yes

* Northing and Easting at middle of rootwads

Inlet Apex Large Wood Structure								
Code	Location *			Large Wood				
	Northing	Easting	Stationing	18"x40' root wads	24"x50' root wads	16-18"x30' pilings	Tree Tops 5-8"x30'	slash
IALW-01	761033.6	1457137.7	84+10	10	5	12	10	yes

* Northing and Easting at middle of rootwads

Floodplain Roughness - Snag Forest						
Code	Location *			Large Wood		
	Northing	Easting	Stationing	15"x20-30' log	15"x10-12' pilings	slash
FRSF-01	759690.2	1457752.8	na	12	30	yes

* Northing and Easting at middle of feature

Whole Tree Large Wood Structure				
Code	Location (approximate)*			Large Wood
	Northing	Easting	Stationing	Whole Tree
WTLW-01	759805.7	1457321.9	70+60	3-5
WTLW-02	759945.3	1457279.1	72+00	3-5
WTLW-03	760072.8	1457240.3	73+70	3-5
WTLW-04	760459.6	1457150.2	78+00	3-5
WTLW-05	760616.5	1457119.1	79+90	3-5
WTLW-06	760739.9	1457134.3	81+00	3-5
WTLW-07	760815.6	1457133.8	81+80	3-5
WTLW-08	760891.5	1457115.5	82+50	2

* Northing and Easting at middle structure. Final location to be guided by engineer or KCT in the field.

Bar Roughness Area Large Wood and Live Planting						
Code	Location*			Large Wood		
	Northing	Easting	Stationing	16-18"x30' pilings	Tree Tops 5-8"x20-30'	slash
BRA-01	757432.5	1457571.5	37+00	6	3	yes
BRA-02	757528.4	1457602.7	38+00	12	8	yes
BRA-03	757779.1	1457594.2	40+50	60	40	yes
BRA-04	758006.2	1457714.1	44+00	30	20	yes
BRA-05	758215.2	1457849.1	46+50	24	15	yes
BRA-06	758421.3	1457542.4	52+30	24	15	yes
BRA-07	758907.3	1457455.7	57+30	42	28	yes
BRA-08	759092.6	1457525.3	59+50	30	20	yes
BRA-09	759290.9	1457646.8	62+50	30	20	yes
BRA-10	759474.4	1457552.9	65+00	42	28	yes
BRA-11	759627.8	1457283.3	68+70	30	20	yes

* Northing and Easting at the upstream West corner pile.

Magic Creek Routing					
Code	Location*			Large Wood	
	Northing	Easting	Stationing	6-10" x 4-8' salvaged logs	slash
MCRF-01	758456.7	1458096.0	na	+/- 32	yes
MCRF-02	758667.9	1458188.1	na	+/- 24	yes

* Northing and Easting at middle of feature

Habitat Large Wood - High-flow Side Channel							
Code	Type (sheet 28)	Location*			Large Wood		
		Northing	Easting	Stationing	15"x30' root wad	Whole Trees	Tree Tops
HLW-01	Eng	760389.2	145729.4	0+60	1	1	yes
HLW-02	2	760379.9	1457344.2	1+15	5	2	yes
HLW-03	2	760383.4	1457361.5	1+25	4	0	yes
HLW-04	CSLW	760416.7	1457380.4	1+60	2	1	yes
HLW-05	1	760442.7	1457400.6	1+90	4	0	yes
HLW-06	FPRW	760476.1	1457378.6	2+30	1	0	yes
HLW-07	1	760514.4	1457351.5	2+70	4	1	yes
HLW-08	CSLW	760579.2	1457371.4	3+40	8	2	yes
HLW-09	Eng	760637.0	11457360.5	4+00	1	1	yes
HLW-10	CSLW	760679.3	1457297.6	4+60	5	1	yes
HLW-11	Eng	760735.5	1457308.0	5+20	3	0	yes
HLW-12	2	760786.8	1457333.1	5+70	4	1	yes
HLW-13	FPRW	760816.0	1457296.5	6+15	1	0	yes
HLW-14	FPRW	760844.2	1457300.2	6+40	1	0	yes
HLW-15	2	760879.5	1457290.2	6+70	4	0	yes
HLW-16	CSLW	760933.3	1457237.1	7+50	3	1	yes
HLW-17	FPRW	760988.3	1457215.2	8+15	1	0	yes
HLW-18	2	761034.0	1457183.7	8+60	4	1	yes

* Northing and Easting at middle of structure. Final location to be guided by engineer in the field. FPRW = Floodplain Roughness Wood; CSLW = Channel Spanning LW; Eng = placed at direction of engineer

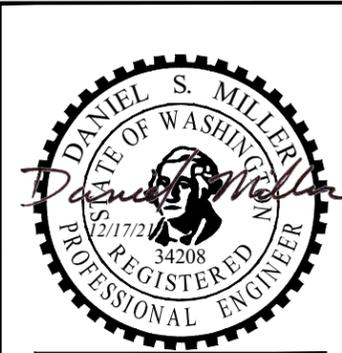
Gravel Retention & Habitat Large Wood Structures				
Code	Location*			Large Wood
	Northing	Easting	Stationing	18"x40' root wads
GRHLW-01	761102.0	1457137.3	84+75	4
GRHLW-02	761160.8	1457145.0	85+40	4
GRHLW-03	761217.3	1457151.4	85+90	4

* Northing and Easting at center of rootwads

Bank Buried Large Wood Structure					
Code	Location*			Large Wood	
	Northing	Easting	Stationing	18"x40' root wads	slash
BBLW-01	757400.2	1457530.3	36+70	15	yes
BBLW-02	757930.3	1457605.4	42+50	15	yes
BBLW-03	758325.7	1457546.6	51+00	15	yes
BBLW-04	758625.0	1457579.0	53+75	15	yes
BBLW-05	758756.4	1457543.9	55+50	15	yes
BBLW-06	759127.0	1457641.3	60+70	15	yes
BBLW-07	759331.9	1457690.2	62+60	15	yes
BBLW-08	759444.6	1457654.0	63+80	15	yes
BBLW-09	759553.6	1457623.6	64+70	15	yes
BBLW-10	760352.0	1457253.8	76+50	15	yes

* Northing and Easting at middle of rootwads

Helicopter Large Wood		
Code	Location	Large Wood
HLW	Location: Associated with existing large boulders and live trees on the banks for ballasting. Placement to be refined and directed by the engineer.	Whole Trees and/or 18"x40' root wads, 3-5 each cluster



EXPIRES: 11/23/2023

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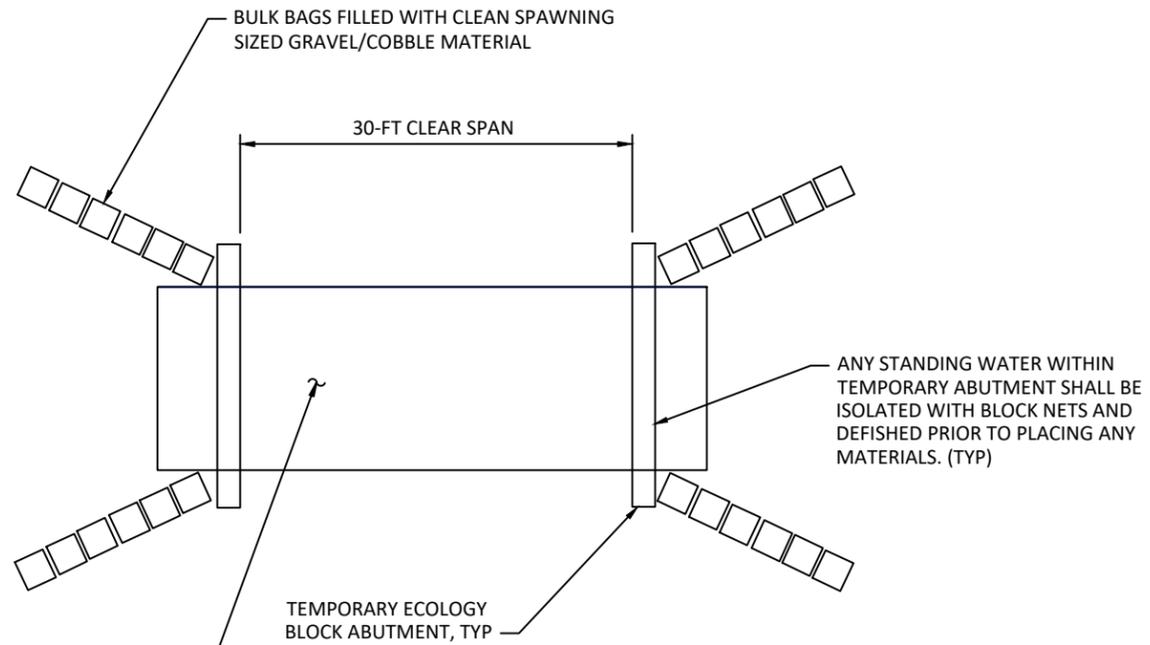
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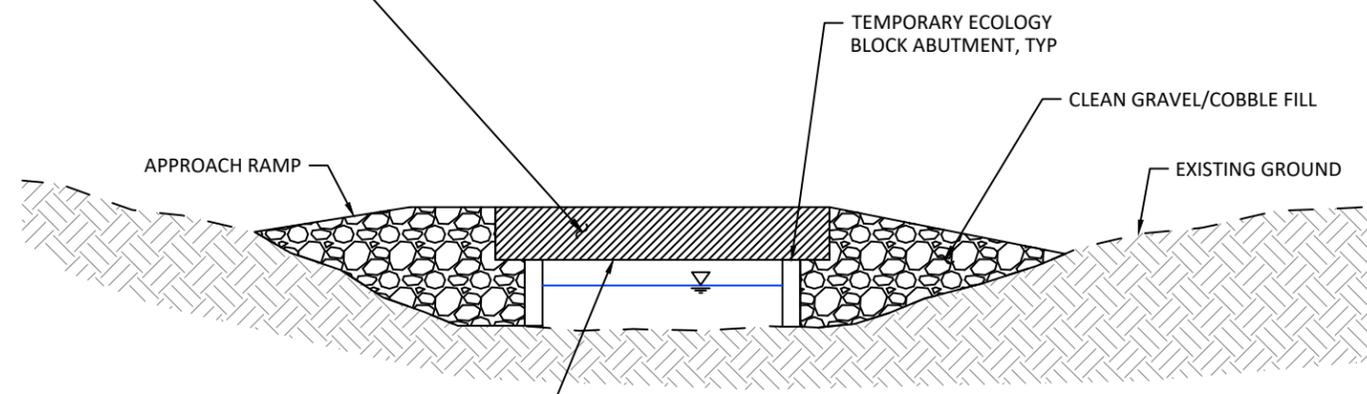
LARGE WOOD QUANTITIES



TEMPORARY BRIDGE OF SUFFICIENT DIMENSION AND LOAD RATING TO PROVIDE CLEAR SPAN AND SAFELY BEAR ANTICIPATED CONSTRUCTION LOADING AND PASS ANTICIPATED FLOWS DURING CONSTRUCTION WITH MINIMUM 1FT FREEBOARD.

PLAN VIEW

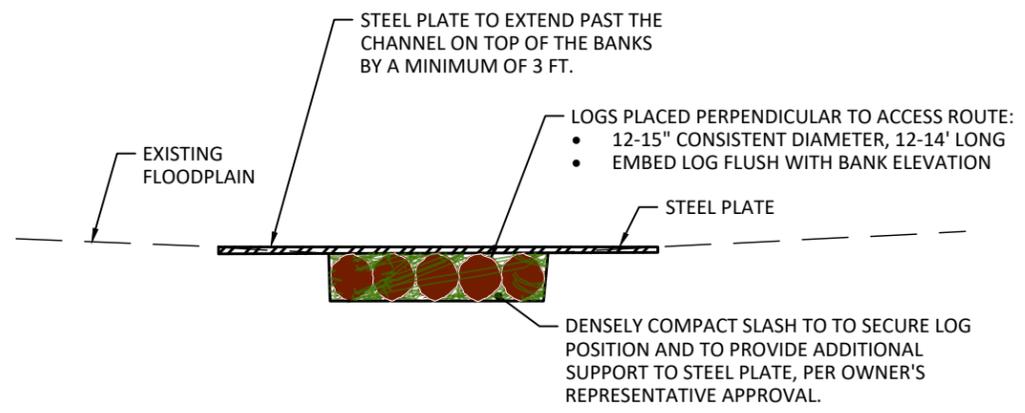
- NOTES:**
- TEMPORARY BRIDGE, ECOLOGY BLOCK ABUTMENTS, CLEAN GRAVEL/COBBLE FILL AND BULK BAGS SHALL BE REMOVED AT PROJECT COMPLETION AND SITE RESTORED TO PRE-PROJECT GRADE AND CONDITIONS.
 - CONTRACTOR MAY PROPOSE ALTERNATE TEMPORARY ACCESS BRIDGE CONFIGURATION. OWNER SHALL PROVIDE WRITTEN APPROVAL PRIOR TO ACCEPTANCE.



LOW CHORD OF BRIDGE SHALL BE MINIMUM OF 3-FT ABOVE AVERAGE STREAMBED ELEVATION

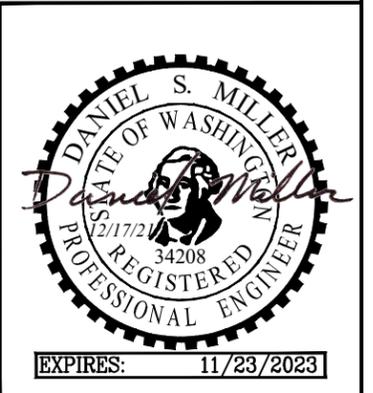
SECTION VIEW

1
31 NOT TO SCALE
TYPICAL DETAIL - TEMPORARY CONSTRUCTION BRIDGE



SECTION

2
31 NOT TO SCALE
TYPICAL DETAIL - TEMPORARY SMALL WATER CROSSING



NO.	BY	DATE	REVISION DESCRIPTION

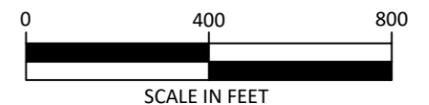
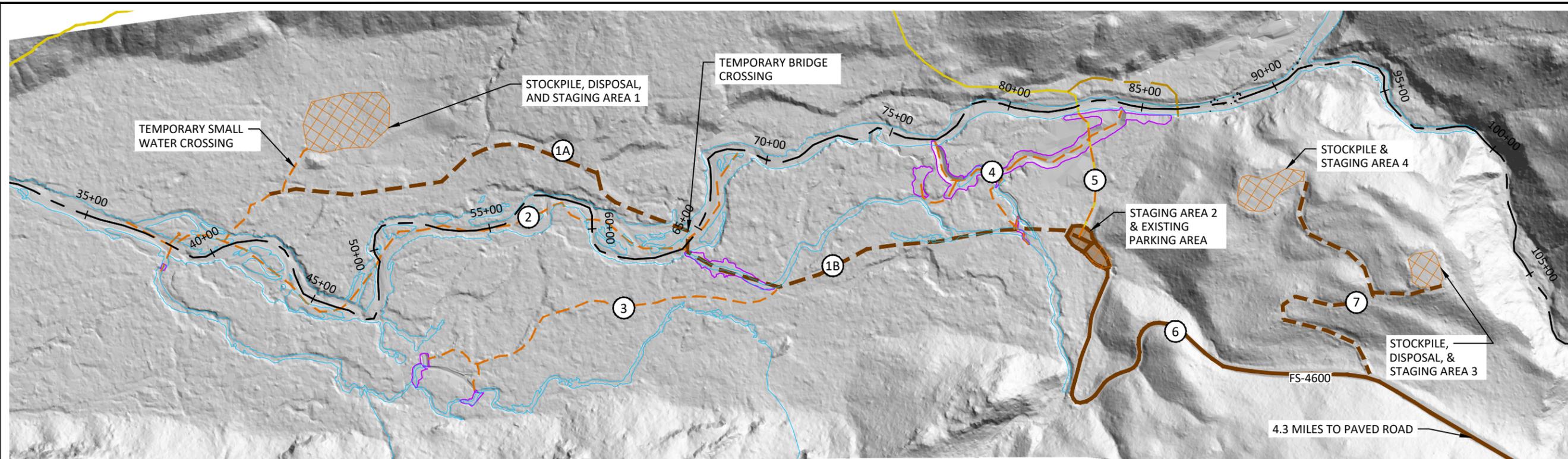
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**PROPOSED, SUGGESTED
TEMPORARY ACCESS DETAILS**



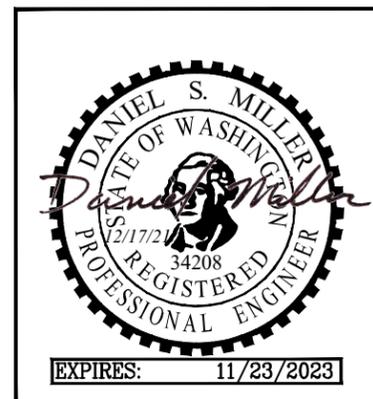
Access Roads	Type	Project Access Type	Length (FT)	Description	Decomission Y/N
1A	USFS ML-1	Existing Unmaintained	1730	Existing unmaintained road grade and new temporary access route connections and spurs to channel and staging area 1. Includes temporary small water crossing(s).	Y
1B	USFS ML-1	Existing Unmaintained	1635	Existing unmaintained road grade to be re-opened and used as temporary access route.	Y
2	new temporary	Temporary	2330	Defined route over bars in dry channel bed.	Y
3	new temporary	Temporary	1435	Unmaintained logging road grade and new temporary access route.	Y
4	new temporary	Temporary	900	New temporary access route.	Y
5	new temporary	Temporary	9250	Existing unmaintained graded route and new temporary access route.	Y
6	USFS ML-3	Existing Maintained	3405	Existing maintained (FS 4600) gravel road. No improvements expected. Leave in same or better condition (ML-3).	N
7	USFS ML-1	Existing Unmaintained	1620	Existing unmaintained road grade and spur road to staging areas. Improve to basic function to access staging areas 3 and 4. Leave as ML-1 (to be upgraded to ML-3 in future; not as part of this project)	N

NOTE: SEE GENERAL NOTES (SHEETS 2&3) FOR TREE SALVAGE, CONSTRUCTION ACCESS, STAGING, STORAGE, AND STOCKPILE INFORMATION.

LEGEND

- 10+00 | ———— EXISTING CENTERLINE ALIGNMENT AND STATIONING
- EXISTING OHW - Q1.5
- FOREST SERVICE ROAD - MAINTAINED (USFS GIS)
- FOREST SERVICE ROAD - UNMAINTAINED (USFS GIS)
- TRAIL
- - - - - TEMPORARY ACCESS
- ▨ TEMPORARY STAGING AREA

Staging Areas	Description	Area (SF)	Activities and Remediation
1	Existing Landing	56405	Clear vegetation as necessary for vehicle access and staging of equipment and materials, and disposal of excess native cut material. After construction, decompact and seed with native vegetation.
2	Existing Parking & Trailhead	12320	Clear vegetation as necessary for vehicle access and staging of equipment and materials. After construction, regrade to pre-construction existing conditions.
3	Existing Landing	12900	Clear vegetation as necessary for vehicle access and staging of equipment and materials, and disposal of excess native cut material.
4	Existing Landing	21850	Clear vegetation as necessary for vehicle access and staging of equipment and materials, and storage of excess native cut material.



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**ROAD AND STAGING AREA
TREATMENT**

SHEET
32 OF 34

Seed mixes

Bar stability zone seed mix: 2.2 acres		
COMMON NAME	SCIENTIFIC NAME	PLS lbs./AC
Blue wildrye (Upper Yakima biotype)	<i>Elymus glaucus</i>	14
Lakeshore sedge	<i>Carex lenticularis</i>	2
Slender hairgrass (Upper Yakima biotype)	<i>Deschampsia elongata</i>	4
Total PLS/ac		20.0

Riparian seed mix: 0.6 acres		
COMMON NAME	SCIENTIFIC NAME	PLS lbs./AC
Blue wildrye (Upper Yakima biotype)	<i>Elymus glaucus</i>	14
Lakeshore sedge	<i>Carex lenticularis</i>	2
Slender hairgrass (Upper Yakima biotype)	<i>Deschampsia elongata</i>	4
Total PLS/ac		20.0

Upland seed mix: 5.7 acres		
COMMON NAME	SCIENTIFIC NAME	PLS lbs./AC
Blue wildrye (Upper Yakima biotype)	<i>Elymus glaucus</i>	14
California brome (Upper Yakima or Reecer biotype)	<i>Bromus carinatus</i>	10
Spike bentgrass (Upper Yakima biotype)	<i>Agrostis exarata</i>	2
Slender hairgrass (Upper Yakima biotype)	<i>Deschampsia elongata</i>	3
Western yarrow	<i>Achillea millefolium</i>	0.5
Total PLS/ac		29.5

Live plants

Bar stability zone plantings: 2.2 acres					
COMMON NAME	SCIENTIFIC NAME	TYPE	SIZE	SPACING (FT) (OC)	QUANTITY (EA)
Sitka willow	<i>Salix sitchensis</i>	Live Stake	5-6', 3/4" to 1-1/2" dia	3	3,993
Scouler's willow	<i>Salix scouleriana</i>	Live Stake	5-6', 3/4" to 1-1/2" dia	3	3,993
Red-osier dogwood	<i>Cornus stolonifera</i>	Live Stake	5-6', 3/4" to 1-1/2" dia	6	2,662

Riparian live plantings: 0.6 acres					
COMMON NAME	SCIENTIFIC NAME	TYPE	SIZE	SPACING (FT) (OC)	QUANTITY (EA)
Sitka alder	<i>Alnus viridis</i>	Potted stock	40 cubic inch container	12	91
Douglas maple	<i>Acer glabrum</i>	Potted stock	40 cubic inch container	12	91
Red elderberry	<i>Sambucus racemosa</i>	Potted stock	0.75 gallon container	6	182
Vine maple	<i>Acer circinatum</i>	Potted stock	0.75 gallon container	6	182
Scouler's willow	<i>Salix scouleriana</i>	Live Stake	5-6', 3/4" to 1-1/2" dia	6	182

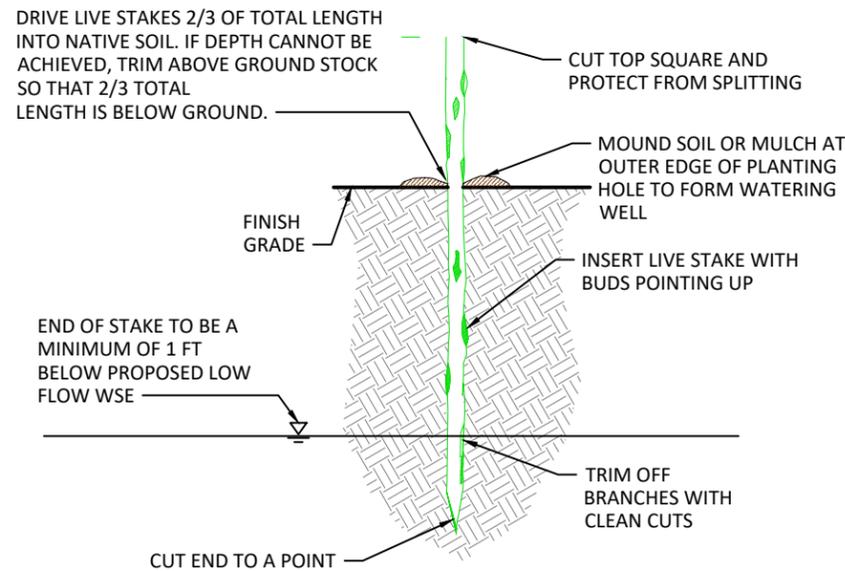
Upland live plantings: 3.8 acres					
COMMON NAME	SCIENTIFIC NAME	TYPE	SIZE	SPACING (FT) (OC)	QUANTITY (EA)
Douglas fir	<i>Pseudotsuga menziesii</i>	Potted stock	0.75 gallon container	16	216
Black cottonwood	<i>Populus trichocarpa</i>	Potted stock &/or live stakes	40 cubic inch container, 5-6', 2-3" diameter	16	216
Douglas maple	<i>Acer glabrum</i>	Potted stock	40 cubic inch container	16	216
Thimbleberry	<i>Rubus parviflorus</i>	Potted stock	40 cubic inch container	8	970
Red elderberry	<i>Sambucus racemosa</i>	Potted stock	0.75 gallon container	8	970

IMPORTED TOPSOIL TREATMENT AREA

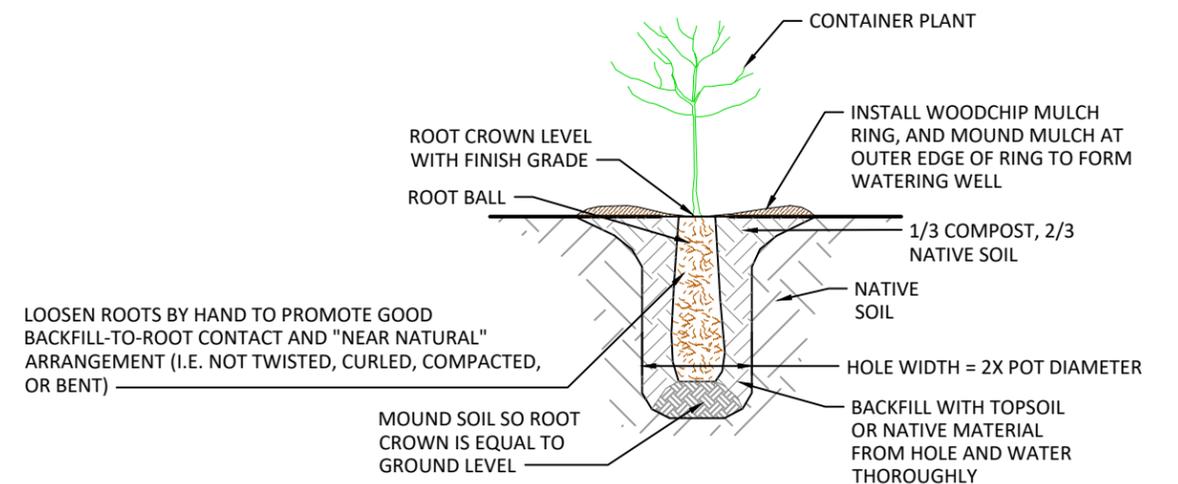
Area (AC)	Depth (FT)	Volume (CY)
0.14	0.33	75

NOTE:

- THE SUBSOIL WHERE TOPSOIL IS TO BE PLACED SHALL BE TILLED TO A DEPTH OF 1 FT. TOPSOIL SHALL BE EVENLY SPREAD OVER THE SPECIFIED AREA TO THE DEPTH SHOWN IN THE PLANS, AND SHALL BE INCORPORATED WITH SUBSOIL TO A DEPTH OF 1 FOOT. FINISHED GRADE OF THE TOPSOIL TREATMENT AREAS SHALL BE EQUIVALENT TO FINISHED GRADE AS SHOWN ON THE GRADING CROSS SECTIONS. TOPSOIL TREATMENT AREAS SHALL BE COMPACTED TO 80% STANDARD PROCTOR.



1
33
TYPICAL DETAIL - LIVE STAKE
NOT TO SCALE



2
33
TYPICAL DETAIL - POTTED STOCK INSTALLATION
NOT TO SCALE

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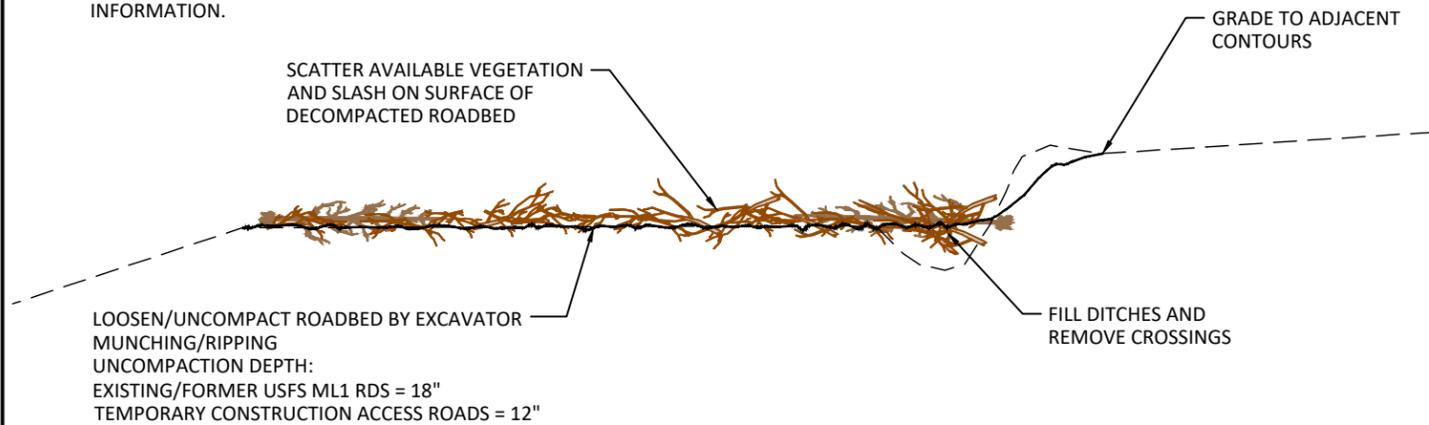
PLANT LIST & TYPICAL REVEGETATION DETAILS

ROAD TREATMENTS:

THE DECOMMISSIONING OF UNMAINTAINED USFS ROADS AND TEMPORARY ACCESS ROADS WILL BE DONE PER USFS SPECIFICATIONS FOR ML1 AND ML3 ROAD DECOMMISSIONING. SEE USFS SUPPLEMENTAL SPECIFICATIONS ATTACHED AND US DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION, STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS, FP-14. FOUND AT [HTTPS://HIGHWAYS.DOT.GOV/FEDERAL-LANDS/SPECS](https://highways.dot.gov/federal-lands/specs)

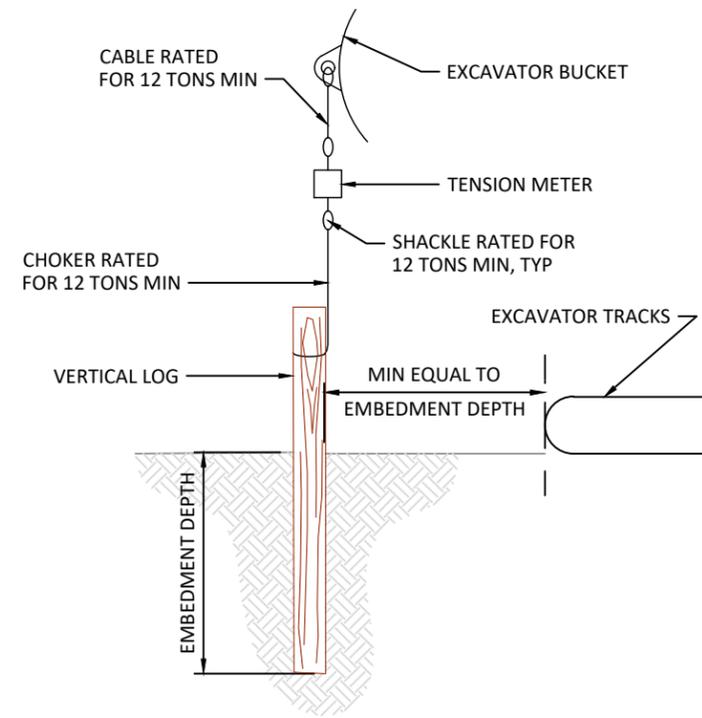
- **TEMPORARY ACCESS ROUTES** ARE CLEARED AND IMPROVED TO A MINIMAL STANDARD TO ALLOW EQUIPMENT ACCESS - WITH DESIGN STANDARDS SUFFICIENT TO PROTECT RESOURCES - FOLLOWED BY DECOMMISSION, DECOMPACTION, AND SEEDING WITH NATIVE VEGETATION.
- **EXISTING ROUTES** ARE CLEARED AND IMPROVED TO A MINIMAL STANDARD TO ALLOW EQUIPMENT ACCESS - WITH STANDARDS SUFFICIENT TO PROTECT RESOURCES.

SEE GENERAL NOTES (SHEETS 2&3) AND SPECIFICATION DOCUMENTS FOR TREE SALVAGE, CONSTRUCTION ACCESS, STAGING, STORAGE, AND STOCKPILE INFORMATION.



NOTES:

- DECOMPACT OR LOOSEN THE ROADBED VIA RIPPING/MUNCHING THE SURFACE INTO AN UNCOMPACTED CONDITION TO PROMOTE VEGETATION ESTABLISHMENT.
 - MUNCHING IS THE PRACTICE OF DIGGING HOLES, THEN DUMPING THE MATERIAL INTO THE HOLE LEAVING IT IN AN UNCOMPACTED CONDITION. THE HOLES MAY BE RANDOMLY SPACED, BUT ACROSS THE ENTIRE WIDTH OF THE ROADBED.
 - RIPPING IS THE PRACTICE OF BREAKING UP THE SOIL BY FRACTURING OR TILLING.
- REMOVE ALL EXISTING CULVERTS AND DRAINAGE STRUCTURES.
- SCATTER ANY AVAILABLE SLASH ON OBLITERATED ROADWAY.
- ELIMINATE ALL RUTS AND LOW SPOTS THAT COULD HOLD OR DIRECT WATER.
- EFFECTIVELY CLOSE THE ROAD BY INSTALLING AN EARTHEN BERM AT THE ENTRANCE AND OBLITERATING ROADWAY TO APPROXIMATE GROUND CONTOURS WHERE DESIGNATED.



VERTICAL LOG PULLOUT TESTING

NOT TO SCALE

VERTICAL LOGS

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

ACCEPTABLE MINIMUM VIBRATORY PILE DRIVING EQUIPMENT SHALL INCLUDE: HMC MOVAX SONIC SIDE GRIP VIBRATORY PILE DRIVER - MODEL SP80, GRIZZLY MG90, OR EQUIVALENT.

VERTICAL LOGS SHALL BE A MAXIMUM OF 16" DIAMETER AT BREAST HEIGHT, WITH NO BARK.

RIGGING

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

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

TESTING

CONTRACTOR SHALL PROVIDE TENSIO METER AND ALL RIGGING REQUIRED FOR TESTING.

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

EACH VERTICAL LOG TEST SHALL HAVE UPWARD LOAD GRADUALLY INCREASED AND AS CLOSELY ALIGNED TO AXIS OF VERTICAL LOG AS POSSIBLE. RECORD THE VERTICAL LOG DIAMETER, EMBEDMENT DEPTH AND MAXIMUM FORCE REQUIRED TO MOVE THE VERTICAL LOG. UP TO A TOTAL OF THREE LOADINGS MAY BE REQUIRED AT EACH EMBEDMENT DEPTH.

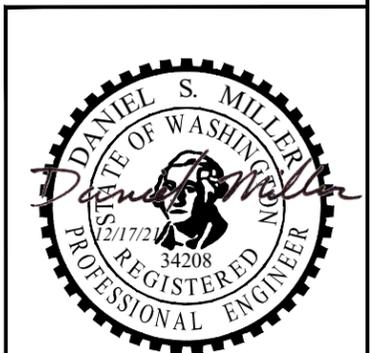
PROOF TESTS SHALL BE MADE AT UP TO FOUR EMBEDMENT DEPTHS TO BE DETERMINED IN THE FIELD. AS A GUIDELINE TEST EMBEDMENT DEPTHS MAY INCLUDE 6', 8', 10', AND 12'.

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. RECORD DISTANCE FROM VERTICAL LOG TO FRONT EDGE OF TRACKS.

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

2 VERTICAL LOGS PER LOG JAM (MCLW, IALW, AND BBLW) AND 5% OF VERTICAL LOGS IN BAR ROUGHNESS AREAS 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.

CONSTRUCTED DRIVEN VERTICAL LOG EMBEDMENT DEPTH SPECIFIED IN THE PLANS MAY BE REDUCED OR INCREASED, PENDING PULL OUT TEST RESULTS, AT NO ADDITIONAL COST TO THE OWNER.



EXPIRES: 11/23/2023

NO.	BY	DATE	REVISION DESCRIPTION

SP, NS, SJ DRAWN	DM, PL, PB, JP DESIGNED	PL, JP CHECKED
PL, JP APPROVED	DECEMBER 2021 DATE	180213 PROJECT

KITTITAS CONSERVATION TRUST
KACHESS RIVER BULL TROUT HABITAT DESIGN PROJECT
FINAL CHANNEL & FLOODPLAIN DESIGNS



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**ROAD DECOMMISSIONING
DETAIL & VERTICAL LOG
PULLOUT TESTING**

SHEET
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