

Mad River RM 1.1 – 4.3

Final Design: Basis of Design Report

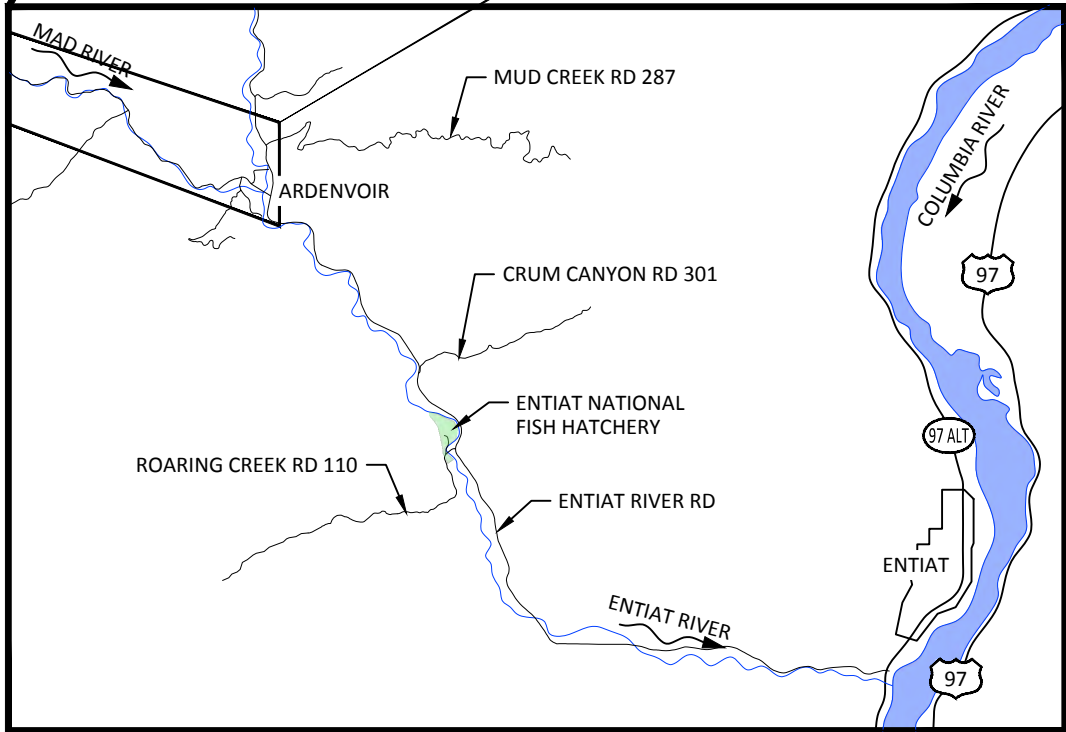
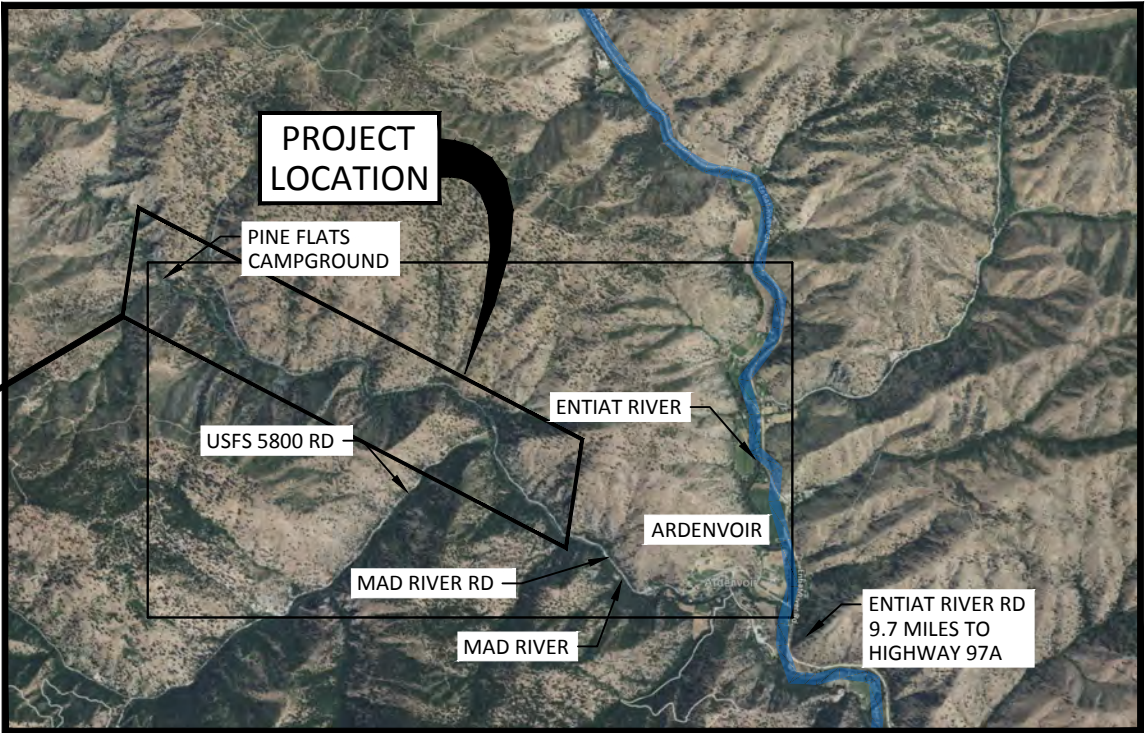
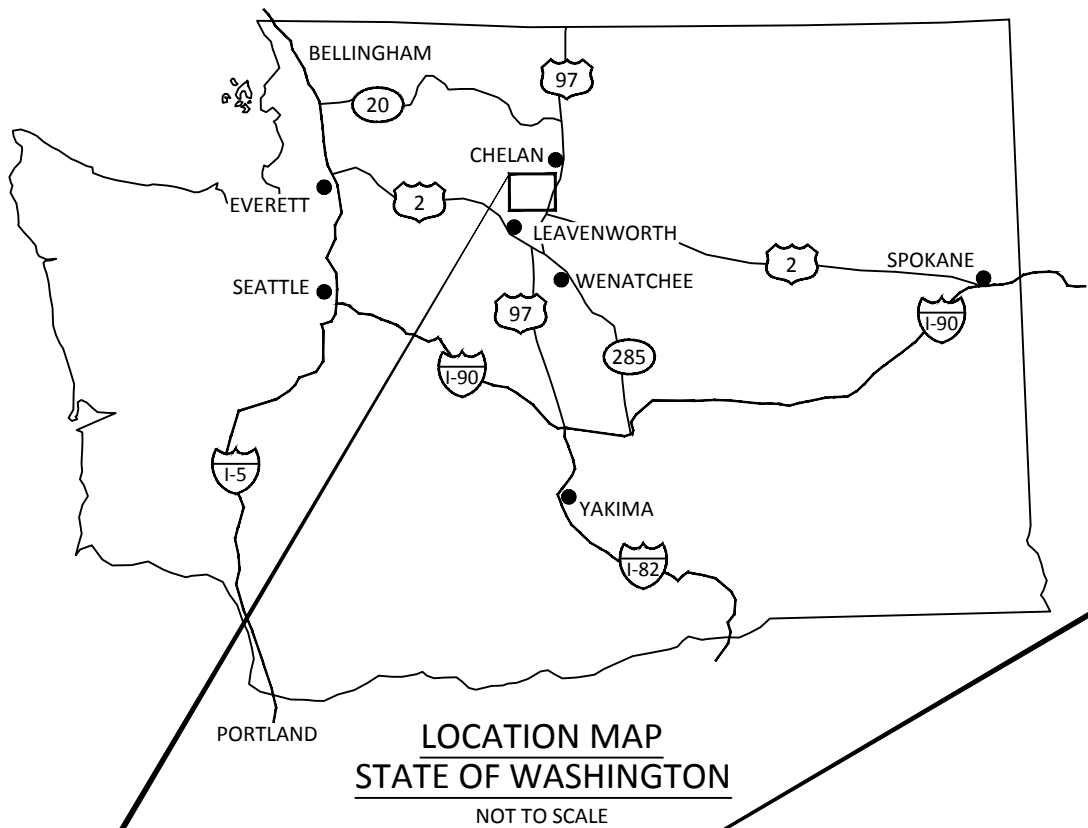
Appendix A:

Final Design Drawing Plan Set

MAD RIVER-RIVER MILE 1.1-4.3

FINAL DESIGN

JANUARY 2024



SITE MAP

SHEET INDEX:

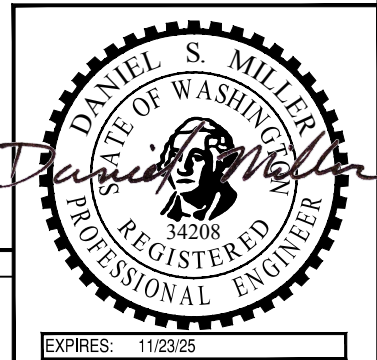
- | | |
|----|--|
| 1 | COVER SHEET, VICINITY, INDEX |
| 2 | HIP MEASURES (1 OF 3) |
| 3 | HIP MEASURES (2 OF 3) |
| 4 | HIP MEASURES (3 OF 3) |
| 5 | GENERAL NOTES AND ABBREVIATIONS |
| 6 | ESTIMATED QUANTITIES |
| 7 | PERMITTING QUANTITIES |
| 8 | PROPOSED IMPROVEMENT AREAS OVERVIEW |
| 9 | PROPOSED CONDITIONS PLAN RIVER MILE 1.0-1.3 |
| 10 | PROPOSED CONDITIONS PLAN RIVER MILE 1.3-1.5 |
| 11 | PROPOSED CONDITIONS PLAN RIVER MILE 1.5-1.6 |
| 12 | PROPOSED CONDITIONS PLAN RIVER MILE 1.7-2.0 |
| 13 | PROPOSED CONDITIONS PLAN RIVER MILE 2.2-2.6 |
| 14 | PROPOSED CONDITIONS PLAN RIVER MILE 2.6-3.0 |
| 15 | PROPOSED CONDITIONS PLAN RIVER MILE 2.7 SIDE CHANNEL |
| 16 | PROPOSED CONDITIONS PLAN RIVER MILE 3.0-3.4 |
| 17 | PROPOSED CONDITONS PLAN RIVER MILE 3.3 SIDE CHANNEL |
| 18 | PROPOSED CONDITIONS PLAN RIVER MILE 3.4-3.75 |
| 19 | PROPOSED CONDITIONS PLAN RIVER MILE 3.8-3.95 |
| 20 | PROPOSED CONDITONS PLAN RIVER MILE 3.95-4.2 |
| 21 | LARGE WOOD STRUCTURE TYPICAL DETAILS (1 OF 3) |

- | | |
|----|---|
| 22 | LARGE WOOD STRUCTURE TYPICAL DETAILS (2 OF 3) |
| 23 | LARGE WOOD STRUCTURE TYPICAL DETAILS (3 OF 3) |
| 24 | SHEET PILE COFFERDAM & TEMPORARY CROSSING DETAILS |
| 25 | PROFILES AND SECTIONS SIDE CHANNELS RM 1.55 & 2.7 |
| 26 | PROFILES AND SECTIONS SIDE CHANNELS RM 3.3 & 3.9 |
| 27 | SPECIFICATIONS (1 OF 3) |
| 28 | SPECIFICATIONS (2 OF 3) |
| 29 | SPECIFICATIONS (3 OF 3) |

IN WATER WORK WINDOW IS JULY 16-31 ⚠

COORDINATES:

LATITUDE 47° 44' 20.95" N
LONGITUDE 120° 22'54.41" W
TOWNSHIP 26N, RANGE 20E, SECTION 19
WATERBODY: MAD RIVER
TRIBUTARY OF: ENTIAI RIVER



1.	BB	02/13/24	UPDATE DATE
NO.	BY	DATE	REVISION DESCRIPTION

CM, BB	PL, DM	PL, DM, MB
DRAWN	DESIGNED	CHECKED
PL, DM	1/23/2024	
APPROVED	DATE	PROJECT

MAD RIVER
RIVER MILE 1.1-4.3
FINAL DESIGN



501 Portway Avenue, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

COVER SHEET, VICINITY, INDEX

SHEET
1 OF 29

z:\clientfiles\w\p\madriver\mh3_4_220265\Drawing\H1 Mad River_PR.dwg - bbroderick - 2/13/24

HIP GENERAL CONSERVATION MEASURES APPLICABLE TO ALL ACTIONS

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

PROJECT DESIGN AND SITE PREPARATION.

1. STATE AND FEDERAL PERMITS.

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

2. TIMING OF IN-WATER WORK.

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

3. CONTAMINANTS.

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

4. SITE LAYOUT AND FLAGGING.

- A. CONSTRUCTION AREAS TO BE CLEARLY FLAGGED PRIOR TO CONSTRUCTION.
- B. AREAS TO BE FLAGGED WILL INCLUDE:
 - 1. SENSITIVE RESOURCE AREAS, SUCH AS AREAS BELOW ORDINARY HIGH WATER, SPAWNING AREAS, SPRINGS, AND WETLANDS;
 - 2. EQUIPMENT ENTRY AND EXIT POINTS;
 - 3. ROAD AND STREAM CROSSING ALIGNMENTS;
 - 4. STAGING, STORAGE, AND STOCKPILE AREAS; AND

5. TEMPORARY ACCESS ROADS AND PATHS.

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

6. TEMPORARY STREAM CROSSINGS.

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

7. STAGING, STORAGE, AND STOCKPILE AREAS.

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

8. EQUIPMENT.

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

- C. EQUIPMENT WILL BE REFUELED IN A VEHICLE STAGING AREA OR IN AN ISOLATED HARD ZONE, SUCH AS A PAVED PARKING LOT OR ADJACENT, ESTABLISHED ROAD (THIS MEASURE APPLIES ONLY TO GAS-POWERED EQUIPMENT WITH TANKS LARGER THAN 5 GALLONS).
- D. BIODEGRADABLE LUBRICANTS AND FLUIDS WILL BE USED ON EQUIPMENT OPERATING IN AND ADJACENT TO THE STREAM CHANNEL AND LIVE WATER.
- E. EQUIPMENT WILL BE INSPECTED DAILY FOR FLUID LEAKS BEFORE LEAVING THE VEHICLE STAGING AREA FOR OPERATION WITHIN 150 FEET OF ANY NATURAL WATER BODY OR WETLAND.
- F. EQUIPMENT WILL BE THOROUGHLY CLEANED BEFORE OPERATION BELOW ORDINARY HIGH WATER, AND AS OFTEN AS NECESSARY DURING OPERATION, TO REMAIN GREASE FREE.

9. EROSION CONTROL.

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

10. DUST ABATEMENT.

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

				CM, BB DRAWN	PL, DM DESIGNED	PL, DM, MB CHECKED
				PL, DM APPROVED	1/23/2024 DATE	
NO.	BY	DATE	REVISION DESCRIPTION			PROJECT

MAD RIVER
RIVER MILE 1.1-4.3
FINAL DESIGN



501 Portway Avenue, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

HIP MEASURES (1 OF 3)

SHEET

2 of 29

z:\clientfiles\w\p\madriver\mh3_4_220265\Drawing\JEL_Mad_River_PR.dwg - bbroderick - 2/13/24

PROJECT DESIGN AND SITE PREPARATION (CONTINUED).											
11. SPILL PREVENTION, CONTROL, AND COUNTER MEASURES.											
A. A DESCRIPTION OF HAZARDOUS MATERIALS THAT WILL BE USED, INCLUDING INVENTORY, STORAGE, AND HANDLING PROCEDURES WILL BE AVAILABLE ON-SITE.											
B. WRITTEN PROCEDURES FOR NOTIFYING ENVIRONMENTAL RESPONSE AGENCIES WILL BE POSTED AT THE WORK SITE.											
C. SPILL CONTAINMENT KITS (INCLUDING INSTRUCTIONS FOR CLEANUP AND DISPOSAL) ADEQUATE FOR THE TYPES AND QUANTITY OF HAZARDOUS MATERIALS USED AT THE SITE WILL BE AVAILABLE AT THE WORK SITE.											
D. WORKERS WILL BE TRAINED IN SPILL CONTAINMENT PROCEDURES AND WILL BE INFORMED OF THE LOCATION OF SPILL CONTAINMENT KITS.											
E. ANY WASTE LIQUIDS GENERATED AT THE STAGING AREAS WILL BE TEMPORARILY STORED UNDER AN IMPERVIOUS COVER, SUCH AS A TARPULIN, UNTIL THEY CAN BE PROPERLY TRANSPORTED TO AND DISPOSED OF AT A FACILITY THAT IS APPROVED FOR RECEIPT OF HAZARDOUS MATERIALS.											
F. PUMPS USED ADJACENT TO WATER SHALL USE SPILL CONTAINMENT SYSTEMS.											
12. INVASIVE SPECIES CONTROL.											
A. PRIOR TO ENTERING THE SITE, ALL VEHICLES AND EQUIPMENT WILL BE POWER WASHED, ALLOWED TO FULLY DRY, AND INSPECTED TO MAKE SURE NO PLANTS, SOIL, OR OTHER ORGANIC MATERIAL ADHERES TO THE SURFACE.											
B. WATERCRAFT, WADERS, BOOTS, AND ANY OTHER GEAR TO BE USED IN OR NEAR WATER WILL BE INSPECTED FOR AQUATIC INVASIVE SPECIES.											
C. WADING BOOTS WITH FELT SOLES ARE NOT TO BE USED DUE TO THEIR PROPENSITY FOR AIDING IN THE TRANSFER OF INVASIVE SPECIES UNLESS DECONTAMINATION PROCEDURES HAVE BEEN APPROVED BY THE EC LEAD.											
WORK AREA ISOLATION AND FISH SALVAGE.											
1. WORK AREA ISOLATION.											
A. ANY WORK AREA WITHIN THE WETTED CHANNEL WILL BE ISOLATED FROM THE ACTIVE STREAM WHENEVER ESA-LISTED FISH ARE REASONABLY CERTAIN TO BE PRESENT, OR IF THE WORK AREA IS LESS THAN 300-FEET UPSTREAM FROM KNOWN SPAWNING HABITATS.											
B. WORK AREA ISOLATION AND FISH SALVAGE ACTIVITIES WILL COMPLY WITH THE IN-WATER WORK WINDOW.											
C. DESIGN PLANS WILL INCLUDE ALL ISOLATION ELEMENTS AND AREAS (COFFER DAMS, PUMPS, DISCHARGE AREAS, FISH SCREENS, FISH RELEASE AREAS, ETC.).											
D. WORK AREA ISOLATION AND FISH CAPTURE ACTIVITIES WILL OCCUR DURING PERIODS OF THE COOLEST AIR AND WATER TEMPERATURES POSSIBLE, NORMALLY EARLY IN THE MORNING VERSUS LATE IN THE DAY, AND DURING CONDITIONS APPROPRIATE TO MINIMIZE STRESS AND DEATH OF SPECIES PRESENT.											
2. FISH SALVAGE.											
A. MONITORING AND RECORDING WILL TAKE PLACE FOR DURATION OF SALVAGE. THE SALVAGE REPORT WILL BE COMMUNICATED TO AGENCIES VIA THE PROJECT COMPLETION FORM (PCF).											
B. SALVAGE ACTIVITIES SHOULD TAKE PLACE DURING CONDITIONS TO MINIMIZE STRESS TO FISH SPECIES, TYPICALLY PERIODS OF THE COOLEST AIR AND WATER TEMPERATURES WHICH OCCUR IN THE MORNING VERSUS LATE IN THE DAY.											
C. SALVAGE OPERATIONS WILL FOLLOW THE ORDERING, METHODS, AND CONSERVATION MEASURES SPECIFIED BELOW:											
1. SLOWLY REDUCE WATER FROM THE WORK AREA TO ALLOW SOME FISH TO LEAVE VOLITIONALLY.											
2. BLOCK NETS WILL BE INSTALLED AT UPSTREAM AND DOWNSTREAM LOCATIONS AND MAINTAINED IN A SECURED POSITION TO EXCLUDE FISH FROM ENTERING THE PROJECT AREA.											
3. BLOCK NETS WILL BE SECURED TO THE STREAM CHANNEL BED AND BANKS UNTIL FISH CAPTURE AND TRANSPORT ACTIVITIES ARE COMPLETE. BLOCK NETS MAY BE LEFT IN PLACE FOR THE DURATION OF THE PROJECT TO EXCLUDE FISH AS LONG AS PASSAGE REQUIREMENTS ARE MET.											
4. NETS WILL BE MONITORED HOURLY DURING IN-STREAM DISTURBANCE.											
5. IF BLOCK NETS REMAIN IN PLACE MORE THAN ONE DAY, THE NETS WILL BE MONITORED AT LEAST DAILY TO ENSURE THEY ARE SECURED AND FREE OF ORGANIC ACCUMULATION. IF BULL TROUT ARE PRESENT, NETS ARE TO BE CHECKED EVERY 4 HOURS FOR FISH IMPINGEMENT.											
6. CAPTURE FISH THROUGH SEINING AND RELOCATE TO STREAMS.											
7. WHILE DEWATERING, ANY REMAINING FISH WILL BE COLLECTED BY HAND OR DIP NETS.											
8. SEINES WITH A MESH SIZE TO ENSURE CAPTURE OF THE RESIDING ESA-LISTED FISH WILL BE USED.											
9. MINNOW TRAPS WILL BE LEFT IN PLACE OVERNIGHT AND USED IN CONJUNCTION WITH SEINING.											
10. ELECTROFISH TO CAPTURE AND RELOCATED FISH NOT CAUGHT DURING SEINING PER ELECTROFISH CONSERVATION MEASURES.											
11. CONTINUE TO SLOWLY DEWATER STREAM REACH.											
12. COLLECT ANY REMAINING FISH IN COLD-WATER BUCKETS AND RELOCATED TO THE STREAM.											
13. LIMIT THE TIME FISH ARE IN A TRANSPORT BUCKET.											
14. MINIMIZE PREDATION BY TRANSPORTING COMPARABLE SIZES IN BUCKETS.											
15. BUCKET WATER TO BE CHANGED EVERY 15 MINUTES OR AERATED.											
16. BUCKETS WILL BE KEPT IN SHADED AREAS OR COVERED.											
17. DEAD FISH WILL NOT BE STORED IN TRANSPORT BUCKETS, BUT WILL BE LEFT ON THE STREAM BANK TO AVOID MORTALITY COUNTING ERRORS.											
D. SALVAGE GUIDELINES FOR BULL TROUT, LAMPREY, MUSSELS, AND NATIVE FISH.											
1. CONDUCT SITE SURVEY TO ESTIMATE SALVAGE NUMBERS.											
2. PRE-SELECT SITE(S) FOR RELEASE AND/OR MUSSEL BED RELOCATION.											
3. SALVAGE OF BULL TROUT WILL NOT TAKE PLACE WHEN WATER TEMPERATURES EXCEED 15 DEGREES CELSIUS.											
4. IF DRAWDOWN LESS THAN 48 HOURS, SALVAGE OF LAMPREY AND MUSSELS MAY NOT BE NECESSARY IF TEMPERATURES SUPPORT SURVIVAL IN SEDIMENTS.											
5. SALVAGE MUSSELS BY HAND, LOCATING BY SNORKELING OR WADING.											
6. SALVAGE LAMPREY BY ELECTROFISHING (SEE ELECTROFISHING FOR LARVAL LAMPREY SETTINGS AND LARVAL LAMPREY DRY SHOCKING SETTINGS).											
7. SALVAGE BONY FISH AFTER LAMPREY WITH NETS OR ELECTROFISHING (SEE ELECTROFISHING FOR APPROPRIATE SETTINGS).											
8. REGULARLY INSPECT DEWATERED SITE SINCE LAMPREY LIKELY TO EMERGE AFTER DEWATERING AND MUSSELS MAY BECOME VISIBLE.											
9. MUSSELS MAY BE TRANSFERRED IN COOLERS.											
10. MUSSELS WILL BE PLACED INDIVIDUALLY TO ENSURE ABILITY TO BURROW INTO NEW HABITAT.											
3. ELECTROFISHING.											
A. INITIAL SITE SURVEY AND INITIAL SETTINGS.											
1. IDENTIFY SPAWNING ADULTS AND ACTIVE REDDS TO AVOID.											
2. RECORD WATER TEMPERATURE. ELECTROFISHING WILL NOT OCCUR WHEN WATER TEMPERATURES ARE ABOVE 18 DEGREES CELSIUS.											
3. IF POSSIBLE, A BLOCK NET WILL BE PLACED DOWNSTREAM AND CHECKED REGULARLY TO CAPTURE STUNNED FISH THAT DRIFT DOWNSTREAM.											
4. INITIAL SETTINGS WILL BE 100 VOLTS, PULSE WIDTH OF 500 MICRO SECONDS, AND PULSE RATE OF 30 HERTZ.											
5. RECORDS FOR CONDUCTIVITY, WATER TEMPERATURE, AIR TEMPERATURE, ELECTROFISHING SETTINGS, ELECTROFISHER MODEL, ELECTROFISHER CALIBRATION, FISH CONDITIONS, FISH MORTALITIES, AND TOTAL CAPTURE RATES WILL BE INCLUDED IN THE SALVAGE LOG BOOK.											
B. ELECTROFISHING TECHNIQUE.											
1. SAMPLING WILL BEGIN USING STRAIGHT DC. POWER WILL REMAIN ON UNTIL THE FISH IS NETTED WHEN USING STRAIGHT DC. GRADUALLY INCREASE VOLTAGE WHILE REMAINING BELOW MAXIMUM LEVELS.											
2. MAXIMUM VOLTAGE WILL BE 1100 VOLTS WHEN CONDUCTIVITY IS <100 MILLISECONDS, 800 VOLTS WHEN CONDUCTIVITY IS BETWEEN 100 AND 300 MILLISECONDS, AND 400 VOLTS WHEN CONDUCTIVITY IS >300 MILLISECONDS.											
3. IF FISH CAPTURE IS NOT SUCCESSFUL USING STRAIGHT DC, THE ELECTROFISHER WILL BE SET TO INITIAL VOLTAGE FOR PDC. VOLTAGE, PULSE WIDTH, AND PULSE FREQUENCY WILL BE GRADUALLY INCREASED WITHIN MAXIMUM VALUES UNTIL CAPTURE IS SUCCESSFUL.											
4. MAXIMUM PULSE WIDTH IS 5 MILLISECONDS. MAXIMUM PULSE RATE IS 70 HERTZ											
5. ELECTROFISHING WILL NOT OCCUR IN ONE AREA FOR AN EXTENDED PERIOD.											
6. THE ANODE WILL NOT INTENTIONALLY COME INTO CONTACT WITH FISH. THE ZONE FOR POTENTIAL INJURY OF 0.5 M FROM THE ANODE WILL BE AVOIDED.											
7. SETTINGS WILL BE LOWERED IN SHALLOWER WATER SINCE VOLTAGE GRADIENTS LIKELY TO INCREASE.											
8. ELECTROFISHING WILL NOT OCCUR IN TURBID WATER WHERE VISIBILITY IS POOR (I.E. UNABLE TO SEE THE BED OF THE STREAM).											
9. OPERATIONS WILL IMMEDIATELY STOP IF MORTALITY OR OBVIOUS FISH INJURY IS OBSERVED. ELECTROFISHING SETTINGS WILL BE REEVALUATED.											
C. SAMPLE PROCESSING.											
1. FISH SHALL BE SORTED BY SIZE TO AVOID PREDATION DURING CONTAINMENT.											
2. SAMPLERS WILL REGULARLY CHECK CONDITIONS OF FISH HOLDING CONTAINERS, AIR PUMPS, WATER TRANSFERS, ETC.											
3. FISH WILL BE OBSERVED FOR GENERAL CONDITIONS AND INJURIES											
4. EACH FISH WILL BE COMPLETELY REVIVED BEFORE RELEASE. ESA-LISTED SPECIES WILL BE PRIORITIZED FOR SUCCESSFUL RELEASE.											
D. BULL TROUT ELECTROFISHING.											
1. ELECTROFISHING FOR BULL TROUT WILL ONLY OCCUR FROM MAY 1 TO JULY 31. NO ELECTROFISHING WILL OCCUR IN ANY BULL TROUT OCCUPIED HABITAT AFTER AUGUST 15. IN FMO HABITATS ELECTROFISHING MAY OCCUR ANY TIME.											
2. ELECTROFISHING OF BULL TROUT WILL NOT OCCUR WHEN WATER TEMPERATURES EXCEED 15 DEGREES CELSIUS.											
E. LARVAL LAMPREY ELECTROFISHING.											
1. PERMISSION FROM EC LEAD WILL BE OBTAINED IF LARVAL LAMPREY ELECTROFISHER IS NOT ONE OF FOLLOWING PRE-APPROVED MODELS: ABP-2 "WISCONSIN", SMITH-ROOT LR-24, OR SMITH-ROOT APEX BACKPACK.											
2. LARVAL LAMPREY SAMPLING WILL INCORPORATE 2-STAGE METHOD: "TICKLE" AND "STUN".											
3. FIRST STAGE: USE 125 VOLT DC WITH A 25 PERCENT DUTY CYCLE APPLIED AT A SLOW RATE OF 3 PULSES PER SECOND. IF TEMPERATURES ARE BELOW 10 DEGREES CELSIUS, VOLTAGE MAY BE INCREASED GRADUALLY (NOT TO EXCEED 200 VOLTS). BURSTED PULSES (THREE SLOW AND ONE SKIPPED) RECOMMENDED TO INCREASE EMERGENCE.											
4. SECOND STAGE (OPTIONAL FOR EXPERIENCED NETTERS): IMMEDIATELY AFTER LAMPREY EMERGE, USE A FAST PULSE SETTING OF 30 PULSES PER SECOND.											
5. USE DIP NETS FOR VISIBLE LAMPREY. SIENES AND FINE MESH NET SWEEPS MAY BE USED IN POOR VISIBILITY.											
6. SAMPLING WILL OCCUR SLOWLY (>60 SECONDS PER METER) STARTING AT UPSTREAM AND WORKING DOWNSTREAM.											
7. MULTIPLE SWEEPS TO OCCUR WITH 15 MINUTES BETWEEN SWEEPS.											
8. POST-DRAWDOWN "DRY-SHOCKING" WILL BE APPLIED IF LARVAL LAMPREY CONTINUE TO EMERGE. ANODES TO BE PLACED ONE METER APART TO SAMPLE ONE SQUARE METER AT A TIME FOR AT LEAST 60 SECONDS. FOR TEMPERATURES LESS THAN 10 DEGREES CELSIUS, MAXIMUM VOLTAGE MAY BE GRADUALLY INCREASED TO 400 VOLTS (DRY-SHOCKING ONLY).											
				CM, BB DRAWN	PL, DM DESIGNED	PL, DM, MB CHECKED	MAD RIVER RIVER MILE 1.1-4.3 FINAL DESIGN		501 Portway Avenue, Suite 101 Hood River, OR 97031 541.386.9003 www.interfluve.com	HIP MEASURES (2 OF 3)	SHEET
											3 of 29
NO.	BY	DATE	REVISION DESCRIPTION	PL, DM APPROVED	1/23/2024 DATE	PROJECT					

z:\clientfiles\w-r\madriver\mh3_4_220265\Drawing\H1 Mad River PR.dwg - bbroderick - 2/13/24

WORK AREA ISOLATION AND FISH SALVAGE (CONTINUED).

4. DEWATERING.

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

CONSTRUCTION AND POST CONSTRUCTION CONSERVATION MEASURES.

1. FISH PASSAGE.

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

2. CONSTRUCTION AND DISCHARGE WATER.

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

3. TIME AND EXTENT OF DISTURBANCE.

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

4. CESSATION OF WORK.

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

5. SITE RESTORATION.

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

6. REVEGETATION.

- A. PLANTING AND SEEDING WILL OCCUR PRIOR TO OR AT THE BEGINNING OF THE FIRST GROWING SEASON AFTER CONSTRUCTION.

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

7. SITE ACCESS AND IMPLEMENTATION MONITORING.

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

8. CWA SECTION 401 WATER QUALITY CERTIFICATION.

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

STAGED REWATERING PLAN.

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

TURBIDITY MONITORING.

- A. RECORD THE READING, LOCATION, AND TIME FOR THE BACKGROUND READING APPROXIMATELY 100 FEET UPSTREAM OF THE PROJECT AREA USING A RECENTLY CALIBRATED TURBIDIMETER OR VIA VISUAL OBSERVATION (SEE THE HIP HANDBOOK TURBIDITY MONITORING SECTION FOR A VISUAL OBSERVATION KEY).
- B. RECORD THE TURBIDITY READING, LOCATION, AND TIME AT THE MEASUREMENT COMPLIANCE LOCATION POINT.
 - 1. 50 FEET DOWNSTREAM FOR STREAMS LESS THAN 30 FEET WIDE.
 - 2. 100 FEET DOWNSTREAM FOR STREAMS BETWEEN 30 AND 100 FEET WIDE.
 - 3. 200 FEET DOWNSTREAM FOR STREAMS GREATER THAN 100 FEET WIDE.
 - 4. 300 FEET FROM THE DISCHARGE POINT OR NONPOINT SOURCE FOR LOCATIONS SUBJECT TO TIDAL OR COASTAL SCOUR.
- C. TURBIDITY SHALL BE MEASURED (BACKGROUND LOCATION AND COMPLIANCE POINTS) EVERY 4 HOURS WHILE WORK IS BEING IMPLEMENTED.
- D. IF THERE IS A VISIBLE DIFFERENCE BETWEEN A COMPLIANCE POINT AND THE BACKGROUND, THE EXCEEDANCE WILL BE NOTED IN THE PROJECT COMPLETION FORM (PCF). ADJUSTMENTS OR CORRECTIVE MEASURES WILL BE TAKEN IN ORDER TO REDUCE TURBIDITY.
- E. IF EXCEEDANCES OCCUR FOR MORE THAN TWO CONSECUTIVE MONITORING INTERVALS (AFTER 8 HOURS), THE ACTIVITY WILL STOP UNTIL THE TURBIDITY LEVEL RETURNS TO BACKGROUND. THE BPA EC LEAD WILL BE NOTIFIED OF ALL EXCEEDANCES AND CORRECTIVE ACTIONS AT PROJECT COMPLETION.
- F. IF TURBIDITY CONTROLS (COFFER DAMS, WADDLES, FENCING, ETC.) ARE DETERMINED INEFFECTIVE, CREWS WILL BE MOBILIZED TO MODIFY AS NECESSARY. OCCURRENCES WILL BE DOCUMENTED IN THE PROJECT COMPLETION FORM (PCF).
- G. FINAL TURBIDITY READINGS, EXCEEDANCES, AND CONTROL FAILURES WILL BE SUBMITTED TO THE BPA EC LEAD USING THE PROJECT COMPLETION FORM (PCF).

				CM, BB	PL, DM	PL, DM, MB
				DRAWN	DESIGNED	CHECKED
				PL, DM	1/23/2024	
NO.	BY	DATE	REVISION DESCRIPTION	APPROVED	DATE	PROJECT

MAD RIVER
RIVER MILE 1.1-4.3
FINAL DESIGN



501 Portway Avenue, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

HIP MEASURES (3 OF 3)

SHEET

4 OF 29

IT IS STRONGLY SUGGESTED THAT THE CONTRACTOR ATTEND A PRE-BID SITE MEETING.

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

ALL WORK SHALL CONFORM TO THE 2024 EDITION OF STANDARD PLANS AND SPECIFICATIONS OF THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT), AND CURRENT LOCAL STANDARDS UNLESS INDICATED OTHERWISE BY THE CONTRACT DOCUMENTS. IN CASE OF A CONFLICT BETWEEN THE REGULATORY STANDARDS OR SPECIFICATIONS, THE MORE STRINGENT SHALL PREVAIL.

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

EXISTING DATA

TOPOGRAPHY AND BATHYMETRY WAS COLLECTED ON OCTOBER 30, 2021 BY NV5G USING RED/GREEN LIDAR. AS DOCUMENTED IN THE REPORT: NV5 GEOSPATIAL, DECEMBER 15, 2022. MAD RIVER, WASHINGTON. TOPOBATHYMETRIC LIDAR TECHNICAL DATA REPORT.

SOILS

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

WETLANDS DELINEATION BY HAMER ENVIRONMENTAL (JUNE 14, 2022)

CONTRACTOR SHALL HAUL SPOILS AND DISPOSE AT THE PRESTON PIT (ENTIAT RIVER ROAD NEAR USFS ROAD 5501, APPROXIMATELY MILE POST 22.4) OR OTHER COMMERICAL PIT.

UTILITIES

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

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

LARGE WOODY MATERIAL

IMPORTED LOGS WILL BE PROVIDED BY THE OWNER. CARE SHALL BE EXERCISED TO PRESERVE ROOTS.

THE CONTRACTOR SHALL HAUL LOGS FROM THE PRESTON PIT TO THE PROJECT SITE.

CONSTRUCTION ACCESS

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

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

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

CONSTRUCTION STAKING

THE OWNER OR DESIGNATED REPRESENTATIVE WILL INSTALL STAKES AND OR FLAGGING TO DELINEATE WETLANDS, EQUIPMENT ENTRY AND EXIT POINTS, STAGING AND STOCKPILE AREAS, AND PROJECT LIMITS. THE OWNER WILL PROVIDE CONTROL POINTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR GRADE STAKING AND 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.

IN WATER WORK WINDOW IS JULY 16-31



ABBREVIATIONS

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



EXPIRES: 11/23/25

z:\clientfiles\w-r\madriver\ph3_4_220265\Drawing\PEL Mad River_PR.dwg - bbroderick - 2/13/24

1.	BB	02/13/24	UPDATE DATE
NO.	BY	DATE	REVISION DESCRIPTION

CM, BB	PL, DM	PL, DM, MB
DRAWN	DESIGNED	CHECKED
PL, DM	1/23/2024	
APPROVED	DATE	PROJECT

MAD RIVER
RIVER MILE 1.1-4.3
FINAL DESIGN

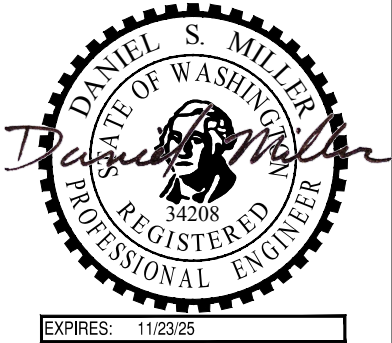


501 Portway Avenue, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

GENERAL NOTES AND
ABBREVIATIONS

z:\client\files\Mad River\Drawings\1.1-4.3\1.1-4.3.dwg - bbroderick - 2/13/24

Plans Sheet	Structure RM	Placed structure type	Floodplain area of disturbance (sq. ft.)	Waterway Impact		Volume in OHW		Wetland impact	
				Vol cut/fill in OHW, (cy)	Area/ bank length (lineal ft)	Logs (cy)	Boulders (cy)	Area (sq ft)	Type
9	1.21	Habitat Boulders	n/a				1.8		
	1.29	Habitat Boulders	n/a				1.8		
10	1.33	Remove concrete sill; boulder ballasted small wood structure	1518	73	220	35	2.7		
	1.39	Boulder ballasted small wood structure	790			35			
	1.43	Bank buried LW structure	680			53			
11	1.50	Bank buried LW structure	870	12	36	106			
	1.52	Boulder ballasted small wood structure	180			35			
	1.55	Side Channel RM 1.55, bank buried small wood structures and outlet cover logs	10979		49	177			
	1.57	Apex LW structure	n/a	8	32	106			
	1.61	Boulder ballasted small wood structure	960			71	2.7		
12	1.76	Boulder ballasted small wood structure	410			71	2.7		
	1.94	Bank buried LW structure	2855	8	40	106			
13	2.27	Habitat boulders	n/a				2.7		
	2.48	Habitat boulders	n/a				2.7		
	2.51	Habitat boulders	n/a				2.7		
	2.59	Habitat boulders	n/a				2.7		
14	2.62	Bank buried LW structure	2225	16	24	141			
	2.70	Island jam	3810				5.3		
15	2.70	Side Channel RM 2.7; bank buried LW structure and floodplain roughness logs	12793		40	106		993	permanent
	2.73	Bank buried LW structure	3690	10	18	88			
16	2.99	Habitat boulders	n/a				6.2		
	3.15	Bank buried LW structure	810	12	12	106	4.4		
	3.32	Outlet cover logs	2210				2.7		
	3.39	Boulder ballasted small wood structure: Bank attached LW	2315				1.8		
17	3.27	Boulder ballasted small wood structures							
	3.30	Side Channel RM 3.3, bank buried small wood structures	2525	24	43	212		989	permanent
	3.29	Apex LW structure	1270	8	37	106		0	
18	3.41	Boulder ballasted small wood structure	1270				2.7	0	
	3.56	Island jam	1450				6.2	0	
	3.58-3.8	Reposition downed trees into stream						0	
19	3.90	Side Channel RM 3.9, bank buried small wood structures and Outlet cover logs	7555		47	230		5529	permanent
	3.88	Bank buried LW structure	1780	16	22	141		950	permanent
	3.91	Apex LW structure	2850	8	37	106		800	permanent
	3.92	Apex LW structure	2850	8	33	106		795	permanent
20	4.09	Apex LW structure and select side channel excavation	12780	8	40	106		1020	50% temporary 50% permanent

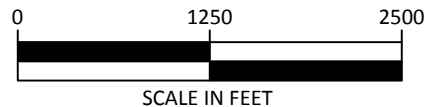


				CM, BB	PL, DM	PL, DM, MB
				DRAWN	DESIGNED	CHECKED
				PL, DM	1/23/2024	
NO.	BY	DATE	REVISION DESCRIPTION	APPROVED	DATE	PROJECT

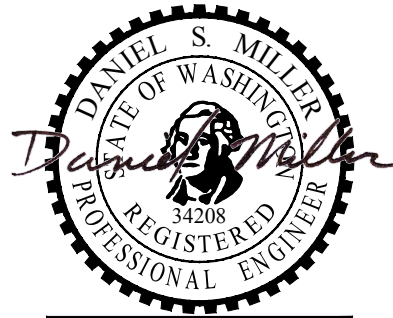
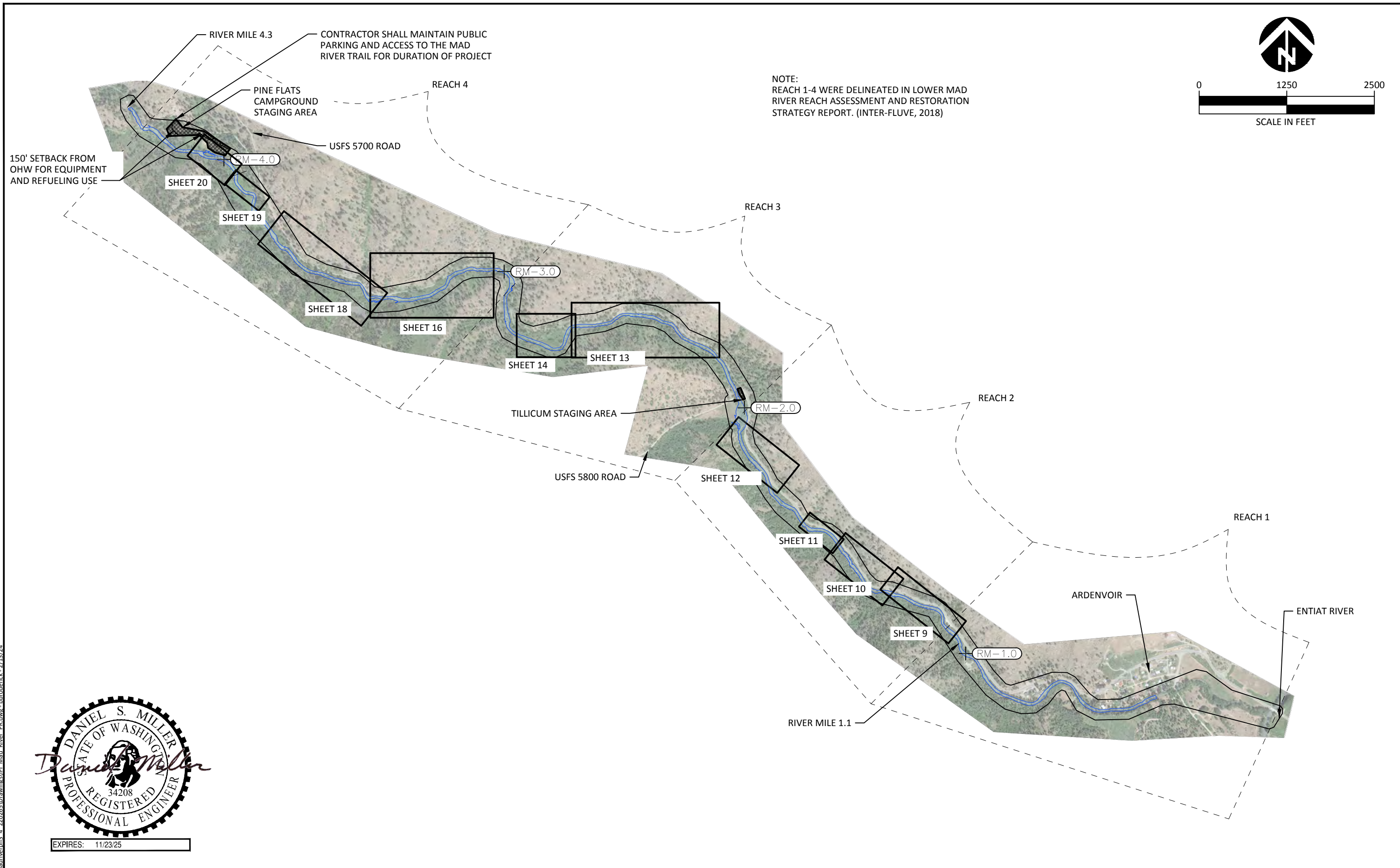
MAD RIVER
RIVER MILE 1.1-4.3
FINAL DESIGN



501 Portway Avenue, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com



NOTE:
REACH 1-4 WERE DELINEATED IN LOWER MAD
RIVER REACH ASSESSMENT AND RESTORATION
STRATEGY REPORT. (INTER-FLUVE, 2018)



EXPIRES: 11/23/25

NO.	BY	DATE	REVISION DESCRIPTION

CM, BB DRAWN	PL, DM DESIGNED	PL, DM, MB CHECKED
PL, DM APPROVED	1/23/2024 DATE	220265 PROJECT

MAD RIVER
RIVER MILE 1.1-4.3
FINAL DESIGN



501 Portway Avenue, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

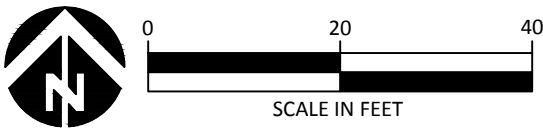
PROPOSED IMPROVEMENT AREAS
OVERVIEW

RIVER MILE 1.29



LEGEND

- EXISTING CONTOURS (2 FT)
- PROPOSED CONTOURS (1 FT)
- - - TAXLOTS
- +— PROPOSED SIDE CHANNEL ALIGNMENT AND STATIONING
- OHW — APPROX. OHW
- - - LIMITS OF DISTURBANCE
- EXISTING 2-YEAR FLOW INUNDATION LIMITS
- + RM-X.X APPROXIMATE RIVER MILE



RIVER MILE 1.21



z:\clientfiles\w\p\madriver\ph3_4_20265\Drawings\PEL Mad River PR.dwg - bbroderick - 2/13/24

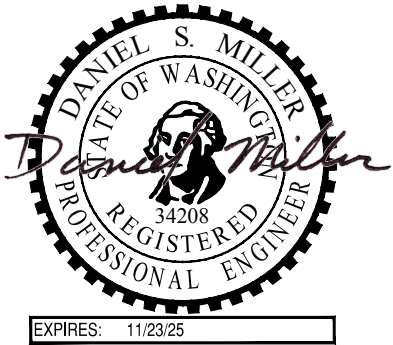
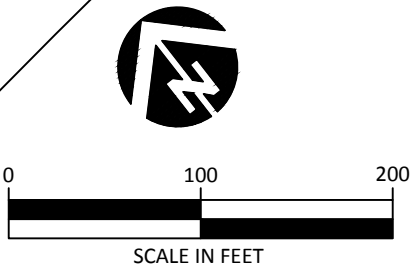
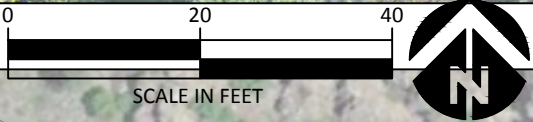
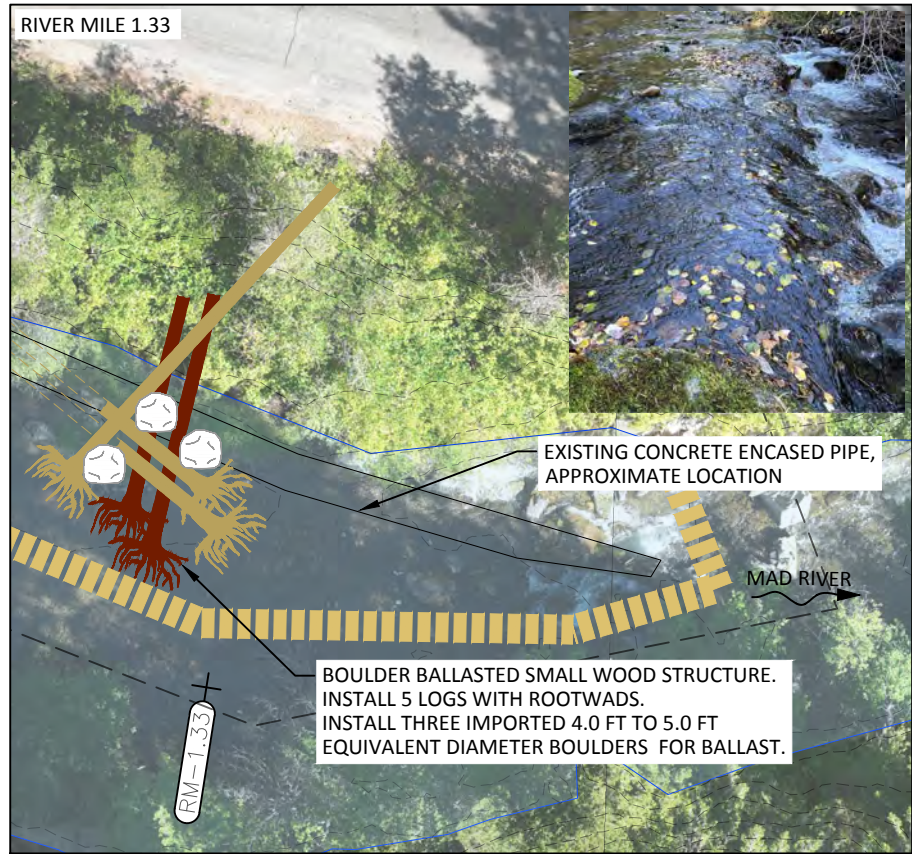
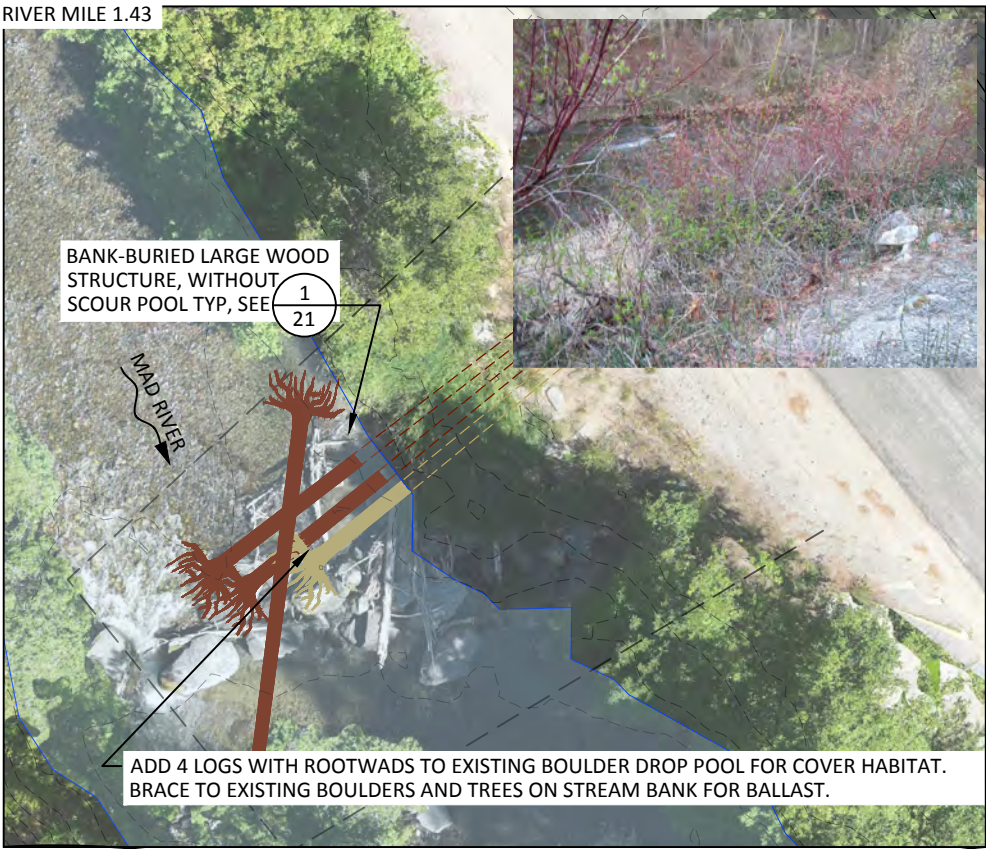
NO.	BY	DATE	REVISION DESCRIPTION	CM, BB	PL, DM	PL, DM, MB
				DRAWN	DESIGNED	CHECKED
				PL, DM	1/23/2024	
				APPROVED	DATE	PROJECT

MAD RIVER
RIVER MILE 1.1-4.3
FINAL DESIGN



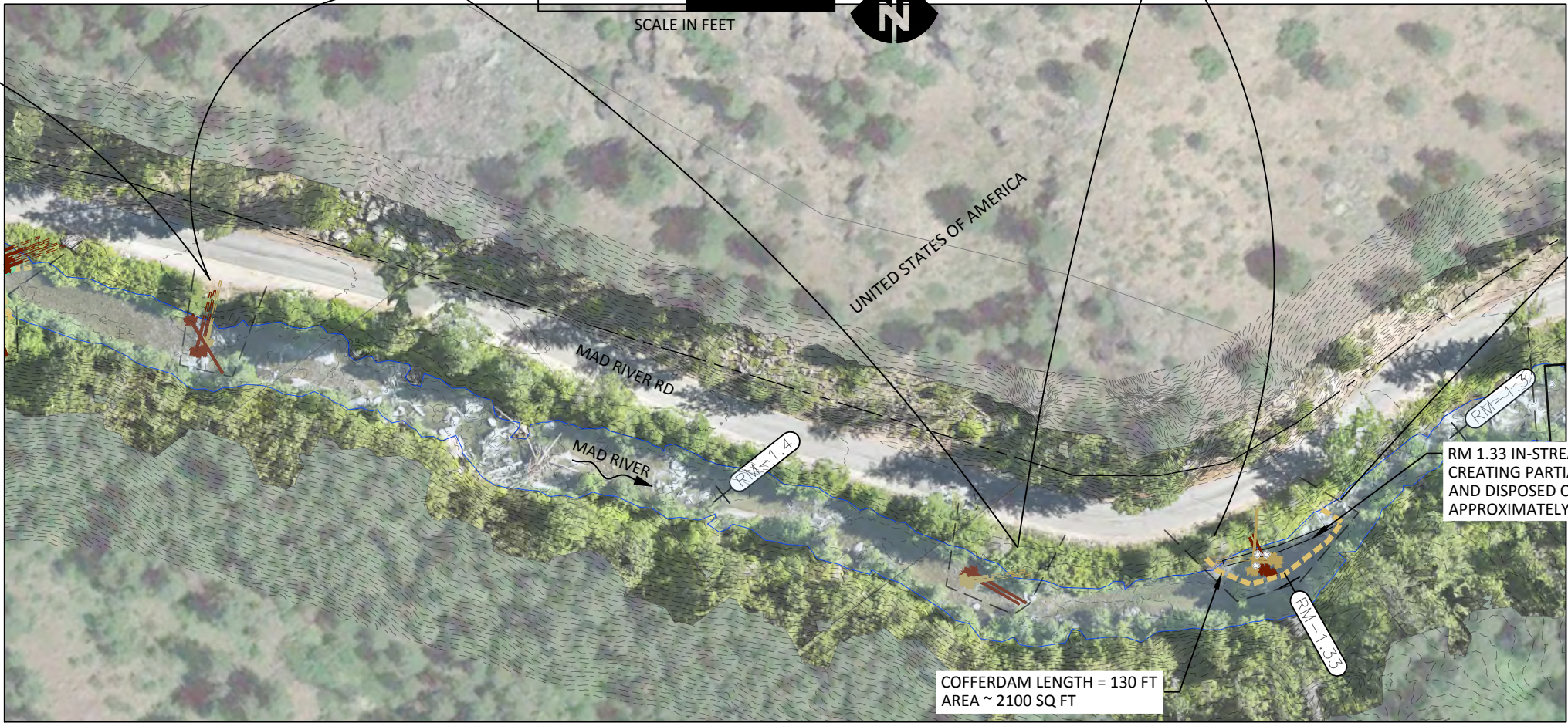
501 Portway Avenue, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

PROPOSED CONDITIONS PLAN
RIVER MILE 1.0-1.3



LEGEND

- EXISTING CONTOURS (2 FT)
- PROPOSED CONTOURS (1 FT)
- TAXLOTS
- PROPOSED SIDE CHANNEL ALIGNMENT AND STATIONING
- APPROX. OHW
- LIMITS OF DISTURBANCE
- EXISTING 2-YEAR FLOW INUNDATION LIMITS
- APPROXIMATE RIVER MILE



RM 1.33 IN-STREAM CONCRETE ENCASED WOOD STAVE PIPE CREATING PARTIAL FISH BARRIER TO BE REMOVED AND DISPOSED OF OFF SITE. APPROXIMATELY 75 FT LONG X 5FT WIDE. DEPTH UNKNOWN

CM, BB	PL, DM	PL, DM, MB
DRAWN	DESIGNED	CHECKED
PL, DM	1/23/2024	
APPROVED	DATE	PROJECT

MAD RIVER
RIVER MILE 1.1-4.3
FINAL DESIGN



501 Portway Avenue, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

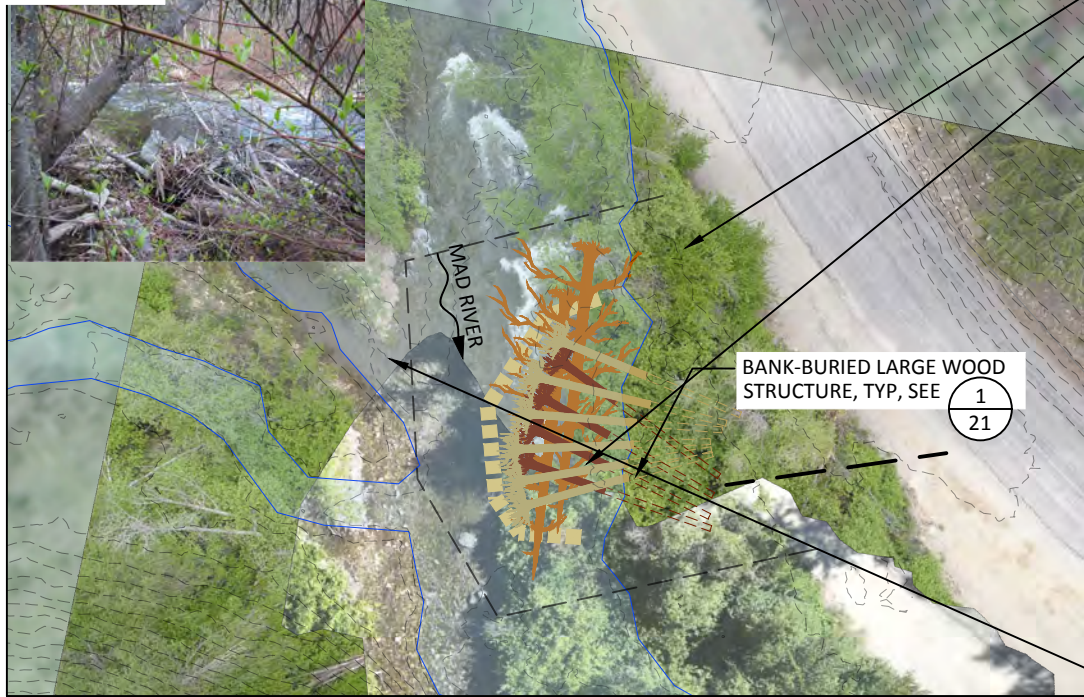
PROPOSED CONDITIONS PLAN
RIVER MILE 1.3-1.5

SHEET

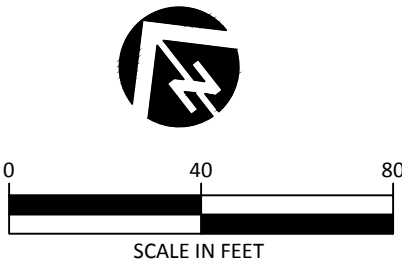
10 OF 29

z:\clientfiles\Mad River\Drawings\1.1-4.3\1.3-1.5\1.3-1.5.dwg - bbroderick - 2/13/24

RIVER MILE 1.94



BOULDER BALLASTED SMALL WOOD STRUCTURE.
INSTALL 4 LOGS WITH ROOTWADS FOR HABITAT ENHANCEMENT.
INSTALL THREE IMPORTED 4.0 FT TO 5.0 FT EQUIVALENT DIAMETER
BOULDERS AND BANK BURIAL FOR BALLAST.
SEE DETAIL 2/22

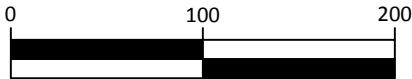


RIVER MILE 1.76



LEGEND

- EXISTING CONTOURS (2 FT)
- PROPOSED CONTOURS (1 FT)
- TAXLOTS
- 2+00 PROPOSED SIDE CHANNEL ALIGNMENT AND STATIONING
- PROPOSED ACCESS
- OHW APPROX. OHW
- LIMITS OF DISTURBANCE
- EXISTING 2-YEAR FLOW INUNDATION LIMITS
- RM-X.X APPROXIMATE RIVER MILE



COFFERDAM LENGTH= 75 FT
AREA ~ 570 SQ FT



EXPIRES: 11/23/25

CM, BB	PL, DM	PL, DM, MB
DRAWN	DESIGNED	CHECKED
PL, DM	1/23/2024	
APPROVED	DATE	PROJECT

MAD RIVER
RIVER MILE 1.1-4.3
FINAL DESIGN

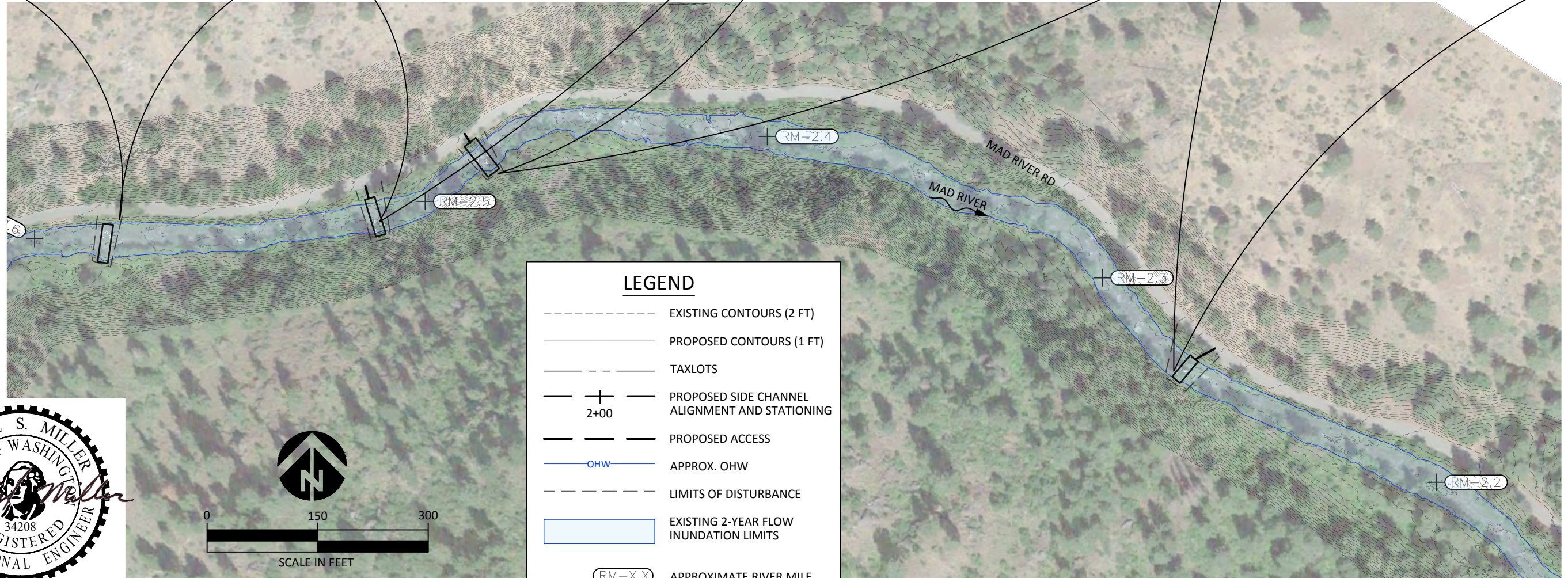
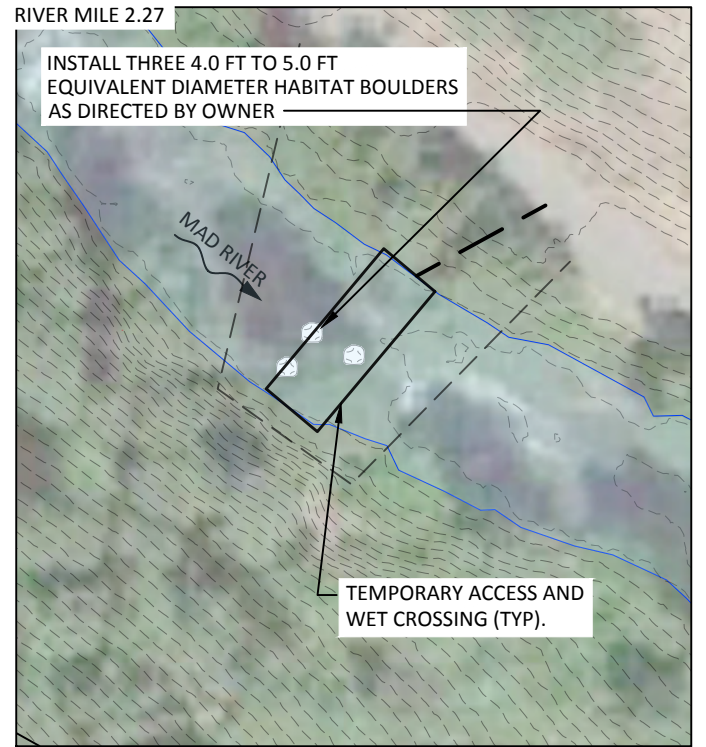
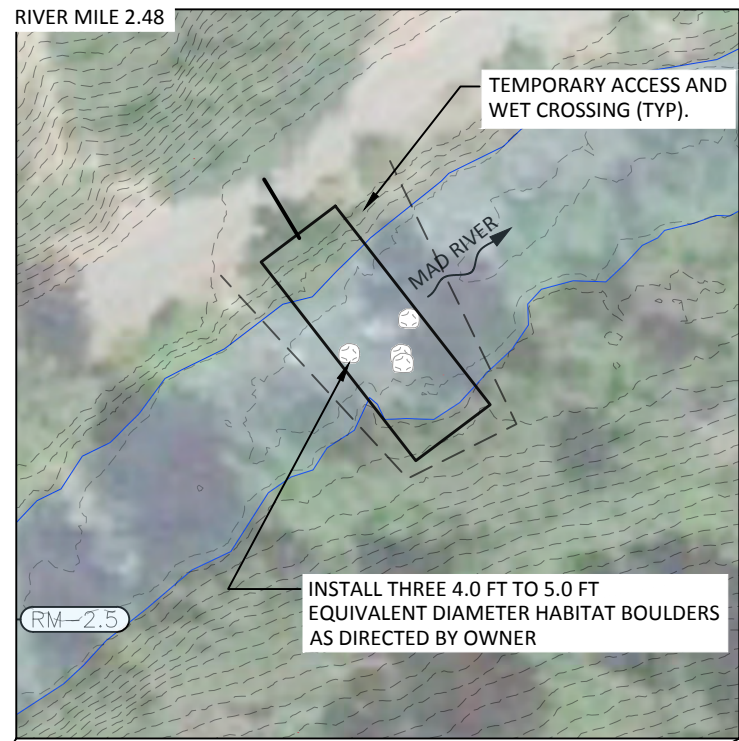
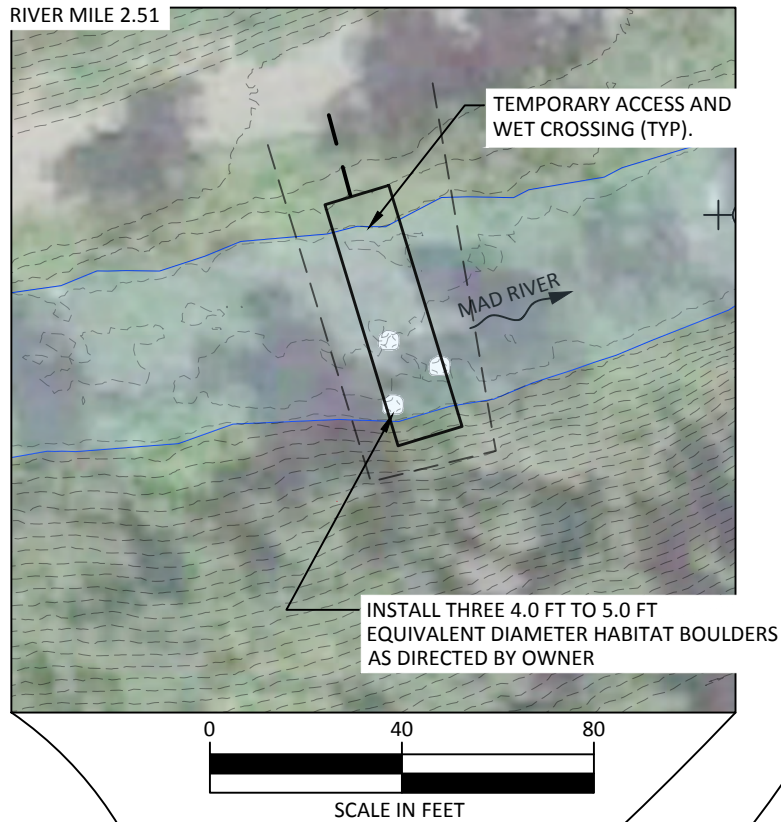
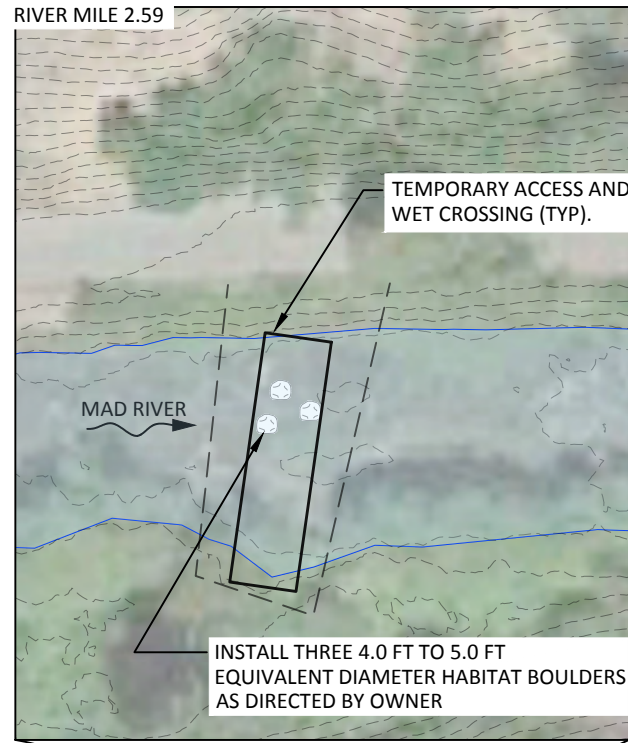


501 Portway Avenue, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

PROPOSED CONDITIONS PLAN
RIVER MILE 1.7-2.0

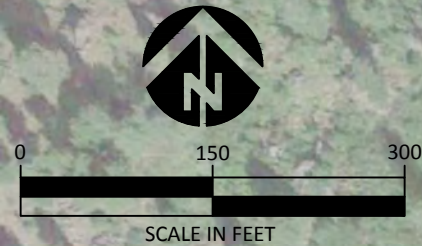
SHEET
12 of 29

Z:\clientfiles\WAP\madriver\ph3_4_220265\Drawings\1\1 Mad River PR.dwg - bbroderick - 2/13/24



LEGEND

- EXISTING CONTOURS (2 FT)
- PROPOSED CONTOURS (1 FT)
- TAXLOTS
- PROPOSED SIDE CHANNEL ALIGNMENT AND STATIONING
- PROPOSED ACCESS
- APPROX. OHW
- LIMITS OF DISTURBANCE
- EXISTING 2-YEAR FLOW INUNDATION LIMITS
- APPROXIMATE RIVER MILE



MAD RIVER RIVER MILE 1.1-4.3 FINAL DESIGN

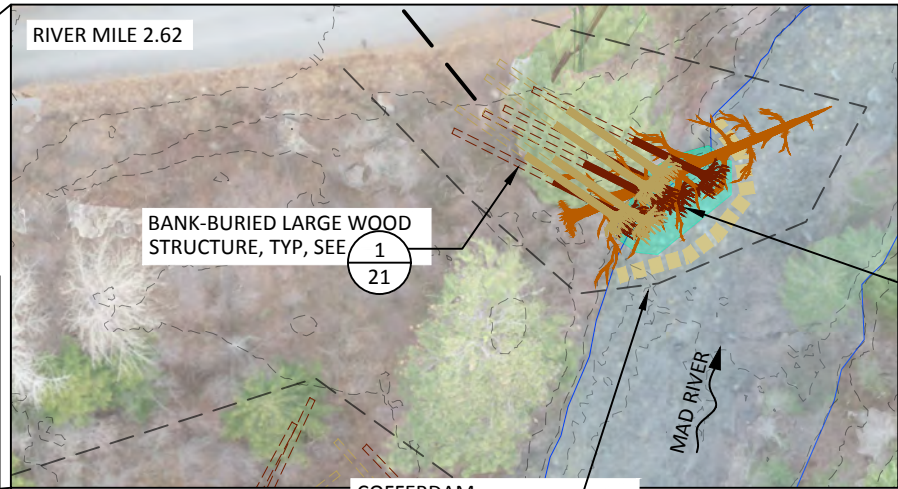
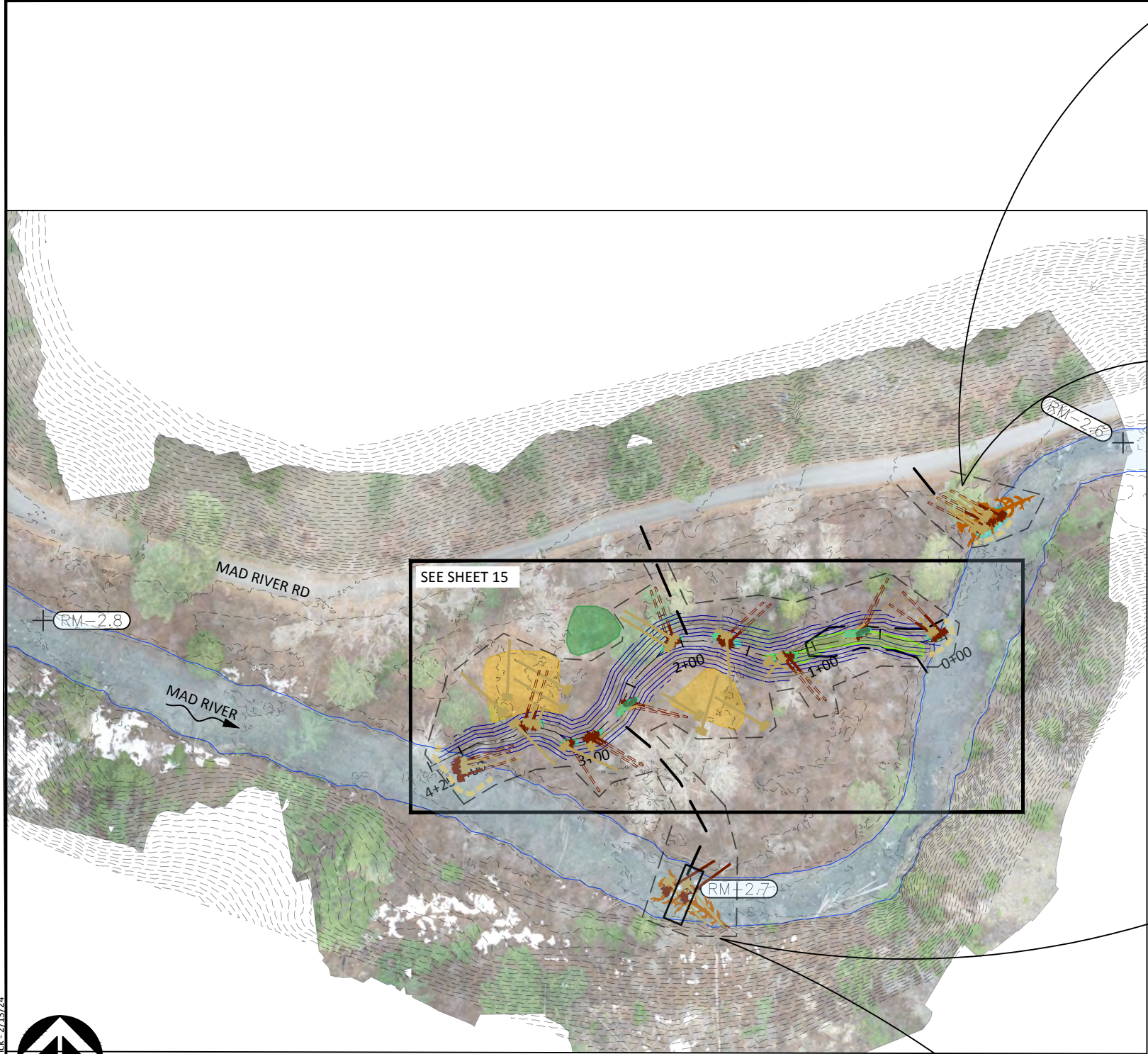


501 Portway Avenue, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

PROPOSED CONDITONS PLAN RIVER MILE 2.2-2.6

SHEET

13 OF 29

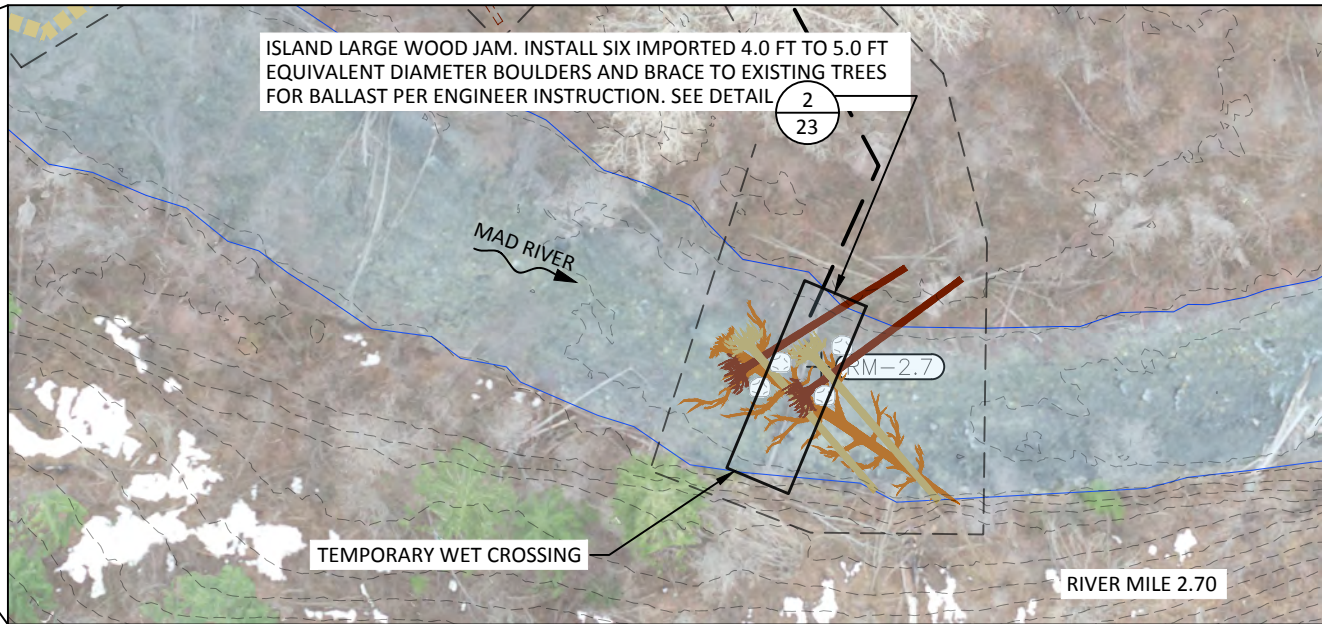


SCALE IN FEET

INSTALL 8 LOGS WITH ROOTWADS. LOG STRUCTURE TO CREATE AND MAINTAIN SCOUR POOL. RL: EXCAVATE SMALL ALCOVE. PLACE SLASH OR TREE TOPS WITHIN ROOTWAD. USE EXISTING LARGE BOULDER AND BURIAL FOR BALLAST.

LEGEND

- EXISTING CONTOURS (2 FT)
- PROPOSED CONTOURS (1 FT)
- - - TAXLOTS
- +— PROPOSED SIDE CHANNEL ALIGNMENT AND STATIONING
- PROPOSED ACCESS
- OHW — APPROX. OHW
- LIMITS OF DISTURBANCE
- [Blue Box] EXISTING 2-YEAR FLOW INUNDATION LIMITS
- [Yellow Box] FLOODPLAIN ROUGHNESS AREA
- [Green Box] ASPEN GROVE
- [Cyan Box] PROPOSED SCOUR POOL
- [Light Green Box] DELINEATED WETLAND
- (RM-X.X) APPROXIMATE RIVER MILE



SCALE IN FEET

EXPIRES: 11/23/25

NO.	BY	DATE	REVISION DESCRIPTION

CM, BB	PL, DM	PL, DM, MB
DRAWN	DESIGNED	CHECKED
PL, DM	1/23/2024	
APPROVED	DATE	PROJECT

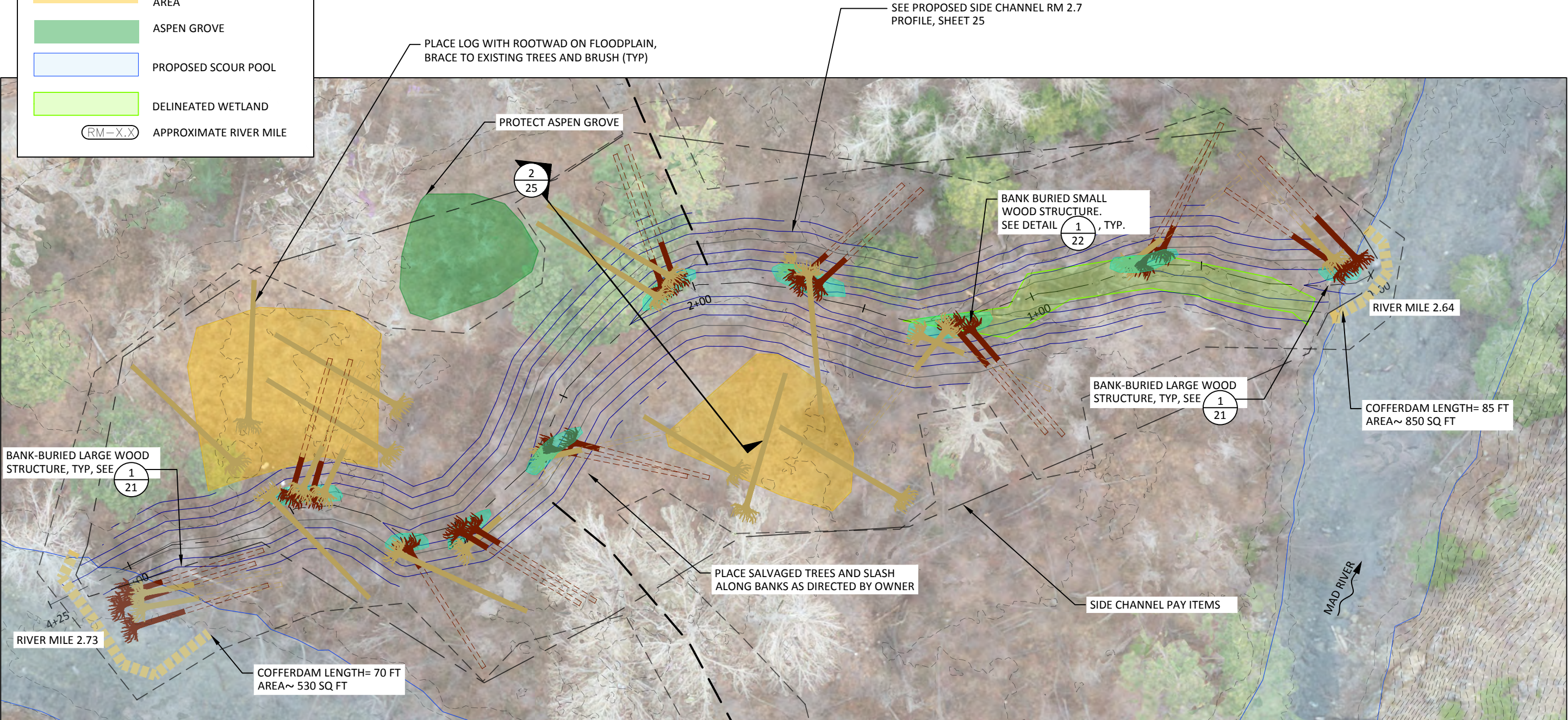
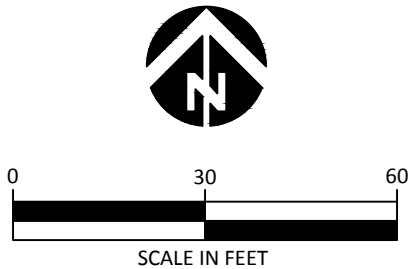
MAD RIVER
RIVER MILE 1.1-4.3
FINAL DESIGN

501 Portway Avenue, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

PROPOSED CONDITIONS PLAN
RIVER MILE 2.6-3.0

LEGEND

- EXISTING CONTOURS (2 FT)
- PROPOSED CONTOURS (1 FT)
- TAXLOTS
- PROPOSED SIDE CHANNEL ALIGNMENT AND STATIONING
- PROPOSED ACCESS
- APPROX. OHW
- LIMITS OF DISTURBANCE
- EXISTING 2-YEAR FLOW INUNDATION LIMITS
- FLOODPLAIN ROUGHNESS AREA
- ASPEN GROVE
- PROPOSED SCOUR POOL
- DELINEATED WETLAND
- APPROXIMATE RIVER MILE



z:\client\files\Mad River\Drawings\1 Mad River PR.dwg - bbroderick - 2/13/24

NO.	BY	DATE	REVISION DESCRIPTION

CM, BB DRAWN	PL, DM DESIGNED	PL, DM, MB CHECKED
PL, DM APPROVED	1/23/2024 DATE	PROJECT

MAD RIVER
RIVER MILE 1.1-4.3
FINAL DESIGN

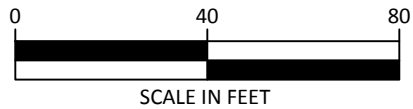


501 Portway Avenue, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

PROPOSED CONDITIONS PLAN
RIVER MILE 2.7 SIDE CHANNEL



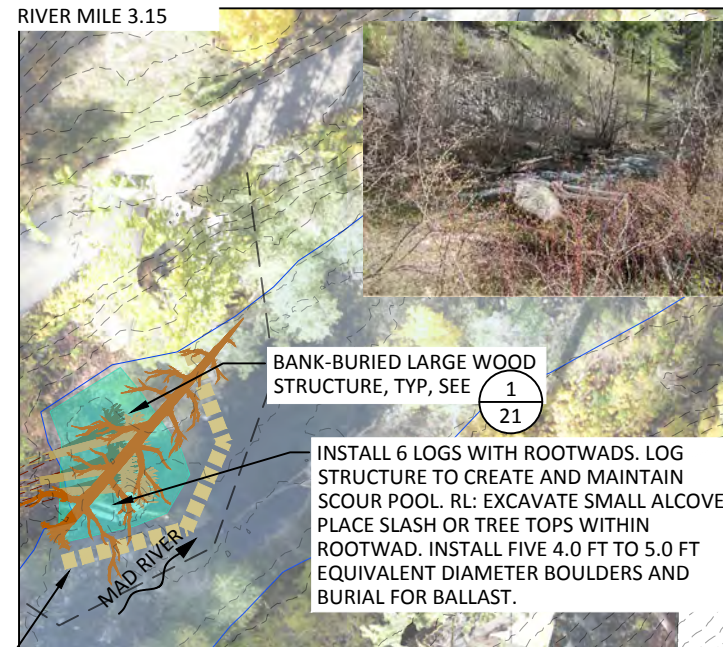
EXPIRES: 11/23/25



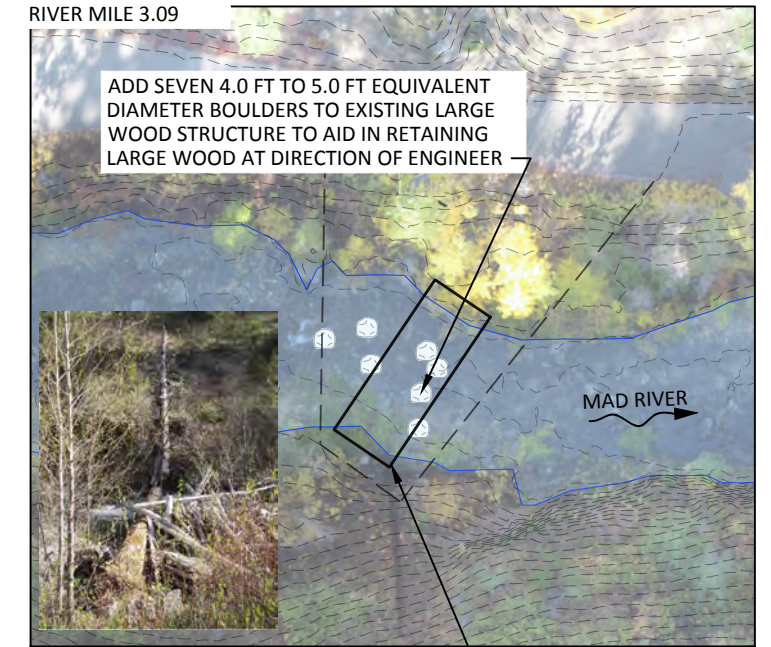
LEGEND

- EXISTING CONTOURS (2 FT)
- PROPOSED CONTOURS (1 FT)
- TAXLOTS
- PROPOSED SIDE CHANNEL ALIGNMENT AND STATIONING
- PROPOSED ACCESS
- APPROX. OHW
- LIMITS OF DISTURBANCE
- EXISTING 2-YEAR FLOW INUNDATION LIMITS
- DELINEATED WETLAND
- APPROXIMATE RIVER MILE (RM-X.X)

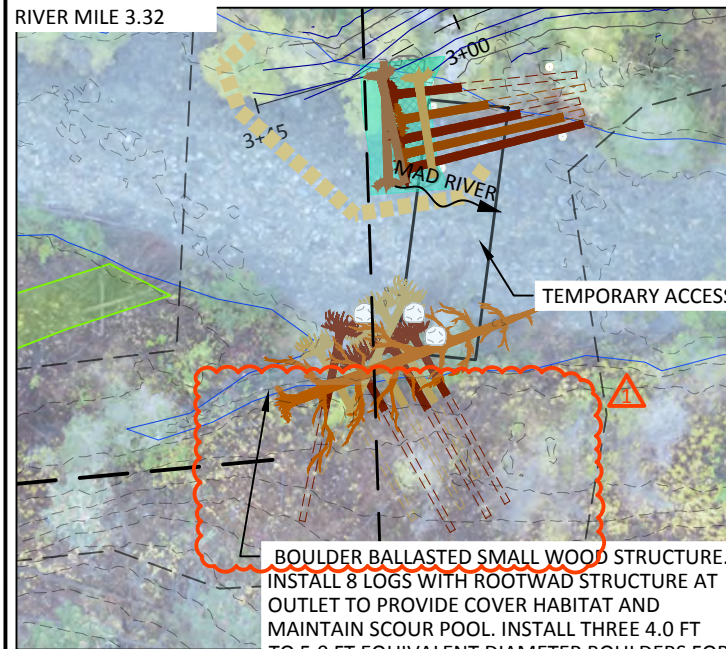
RIVER MILE 3.15



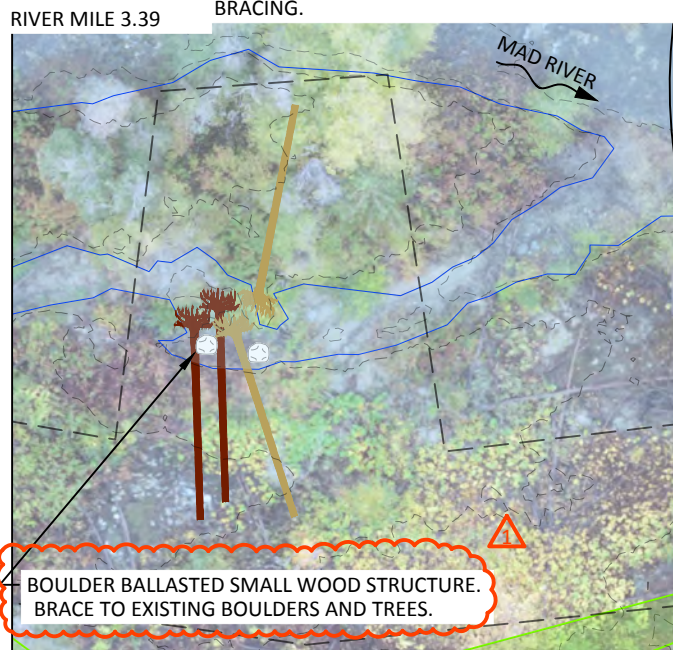
RIVER MILE 3.09



RIVER MILE 3.32



RIVER MILE 3.39



COFFERDAM LENGTH= 80 FT
AREA~ 900 SQ FT

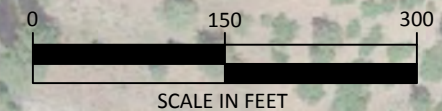
OPTIONAL WET CROSSING AND
ACCESS ROUTE

SEE SHEET 17

TEMPORARY WET CROSSING FOR ACCESS

TEMPORARY ACCESS ROUTE

WET CROSSING



z:\clientfiles\madriver\m3 4 220265\Drawings\NEL Mad River PR.dwg - bbroderick - 2/13/24

NO.	BY	DATE	REVISION DESCRIPTION
1.	BB	02/13/24	UPDATE STRUCTURE & DESCRIPTION

CM, BB	PL, DM	PL, DM, MB
DRAWN	DESIGNED	CHECKED
PL, DM	1/23/2024	
APPROVED	DATE	PROJECT

MAD RIVER
RIVER MILE 1.1-4.3
FINAL DESIGN

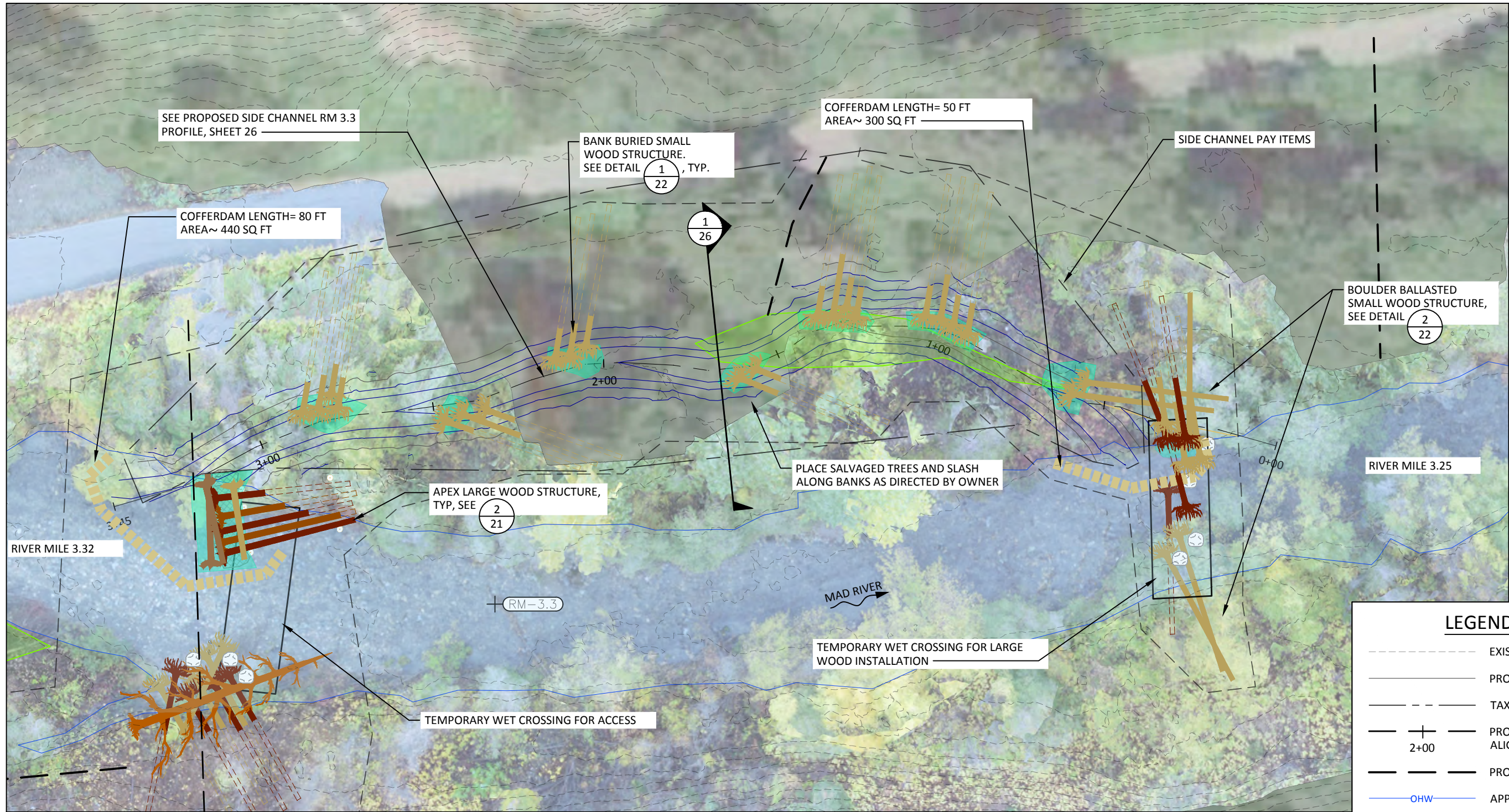


501 Portway Avenue, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

PROPOSED CONDITIONS PLAN
RIVER MILE 3.0-3.4

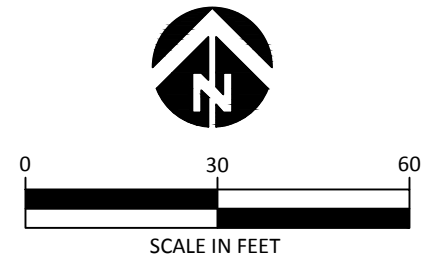
SHEET

16 OF 29



LEGEND

- EXISTING CONTOURS (2 FT)
- PROPOSED CONTOURS (1 FT)
- - - TAXLOTS
- PROPOSED SIDE CHANNEL ALIGNMENT AND STATIONING
- PROPOSED ACCESS
- OHW --- APPROX. OHW
- LIMITS OF DISTURBANCE
- EXISTING 2-YEAR FLOW INUNDATION LIMITS
- PROPOSED SCOUR POOL
- DELINEATED WETLAND
- (RM-X.X) APPROXIMATE RIVER MILE



NO.	BY	DATE	REVISION DESCRIPTION

CM, BB DRAWN	PL, DM DESIGNED	PL, DM, MB CHECKED
PL, DM APPROVED	1/23/2024 DATE	PROJECT

MAD RIVER
RIVER MILE 1.1-4.3
FINAL DESIGN

 501 Portway Avenue, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

PROPOSED CONDITONS PLAN
RIVER MILE 3.3 SIDE CHANNEL

LEGEND

EXISTING CONTOURS (2 FT)

PROPOSED CONTOURS (1 FT)

TAXLOTS

2+00

PROPOSED SIDE CHANNEL
ALIGNMENT AND STATIONING

PROPOSED ACCESS

OHW

APPROX. OHW

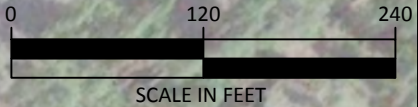
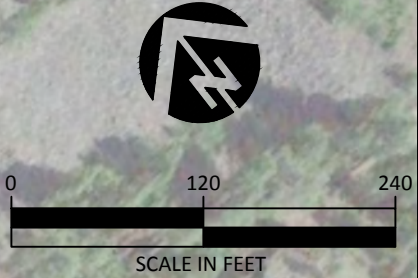
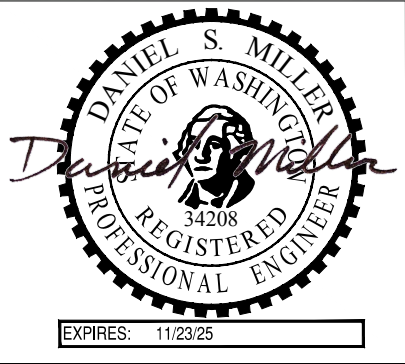
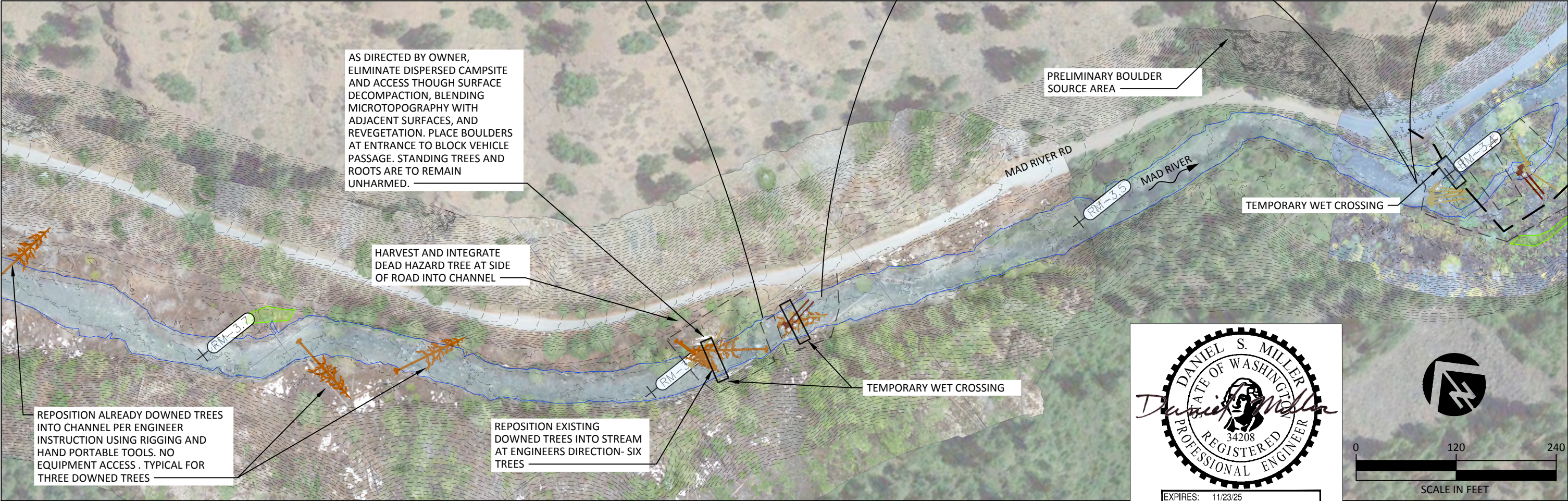
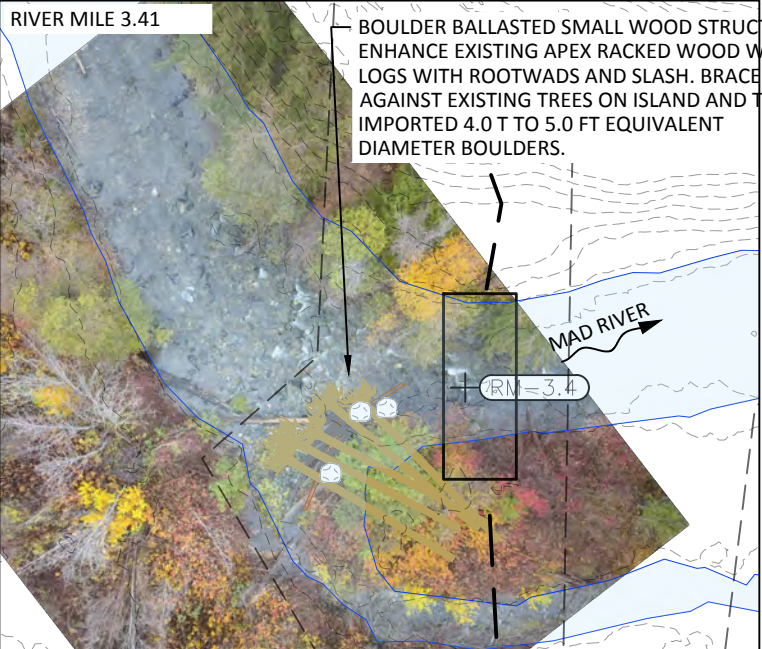
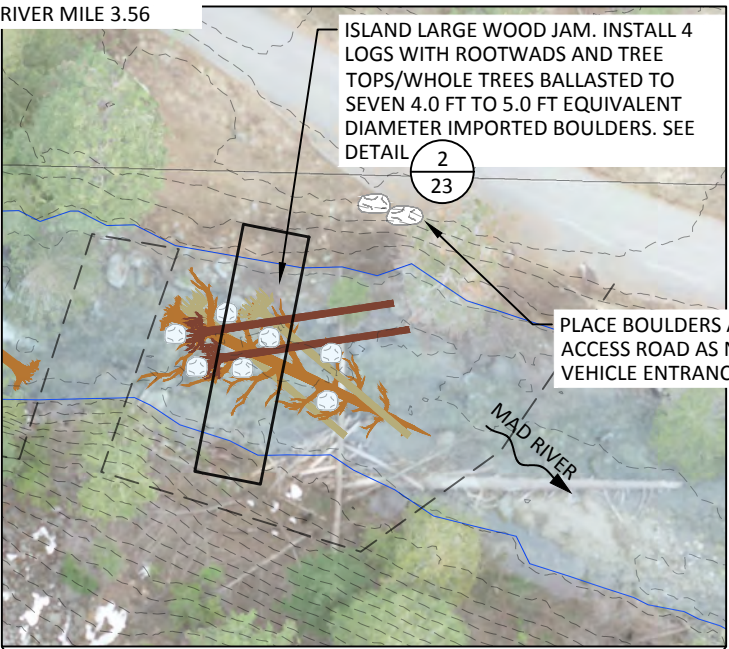
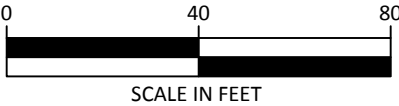
LIMITS OF DISTURBANCE

EXISTING 2-YEAR FLOW
INUNDATION LIMITS

DELINEATED WETLAND

RM-X.X

APPROXIMATE RIVER MILE



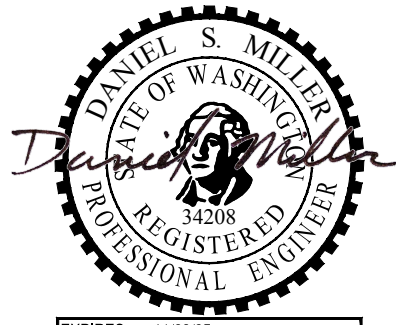
NO.	BY	DATE	REVISION DESCRIPTION

CM, BB DRAWN	PL, DM DESIGNED	PL, DM, MB CHECKED
PL, DM APPROVED	1/23/2024 DATE	PROJECT

MAD RIVER
RIVER MILE 1.1-4.3
FINAL DESIGN

501 Portway Avenue, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

PROPOSED CONDITIONS PLAN
RIVER MILE 3.4-3.75



EXPIRES: 11/23/25

LEGEND

EXISTING CONTOURS (2 FT)

PROPOSED CONTOURS (1 FT)

TAXLOTS

2+00

PROPOSED SIDE CHANNEL
ALIGNMENT AND STATIONING

PROPOSED ACCESS

APPROX. OHW

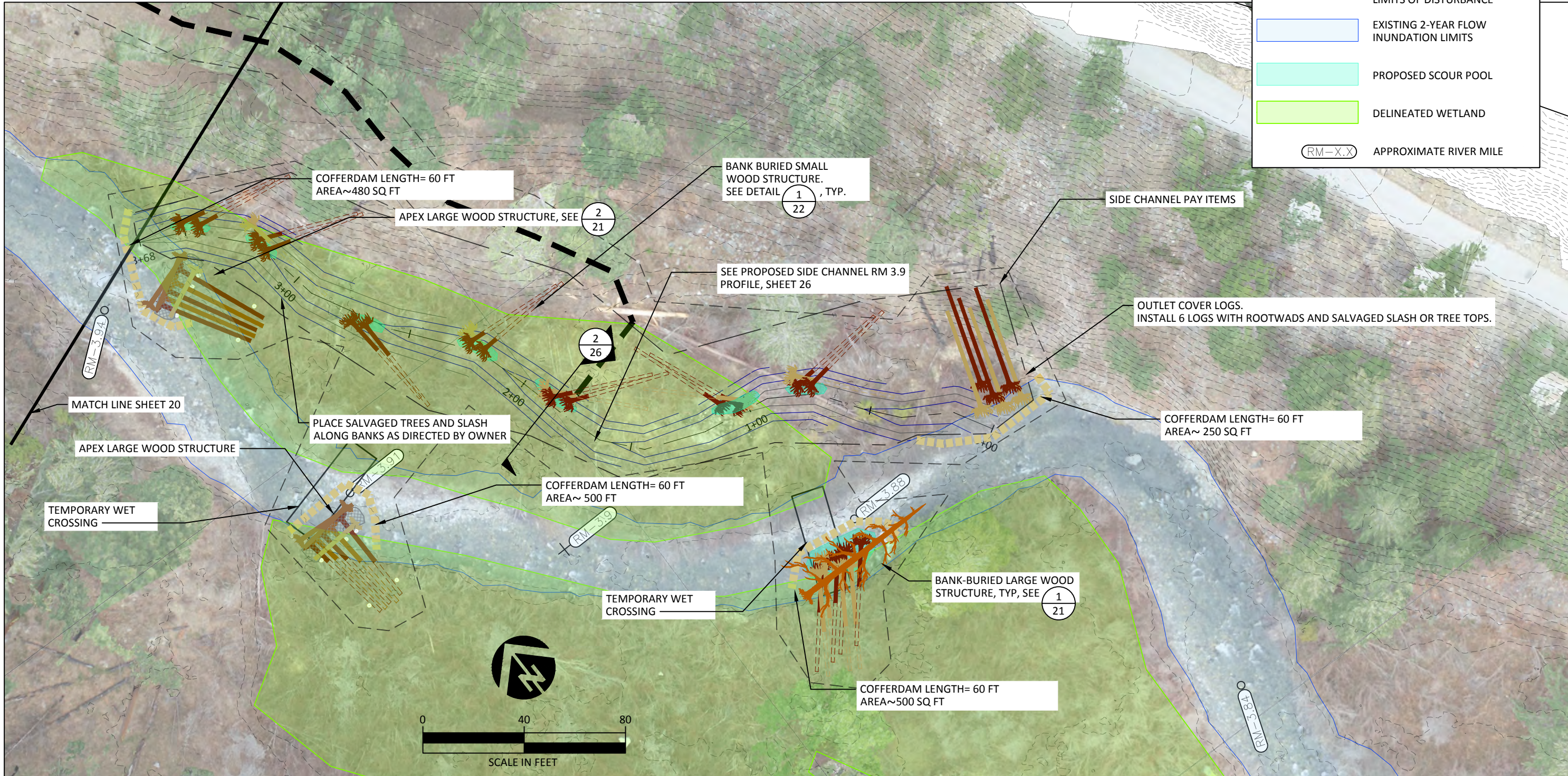
LIMITS OF DISTURBANCE

EXISTING 2-YEAR FLOW
INUNDATION LIMITS

PROPOSED SCOUR POOL

DELINEATED WETLAND

APPROXIMATE RIVER MILE



z:\clientfiles\W\P\madriver\ph3_4_220265\Drawings\PEI Mad River PR.dwg - bbroderick - 2/13/24

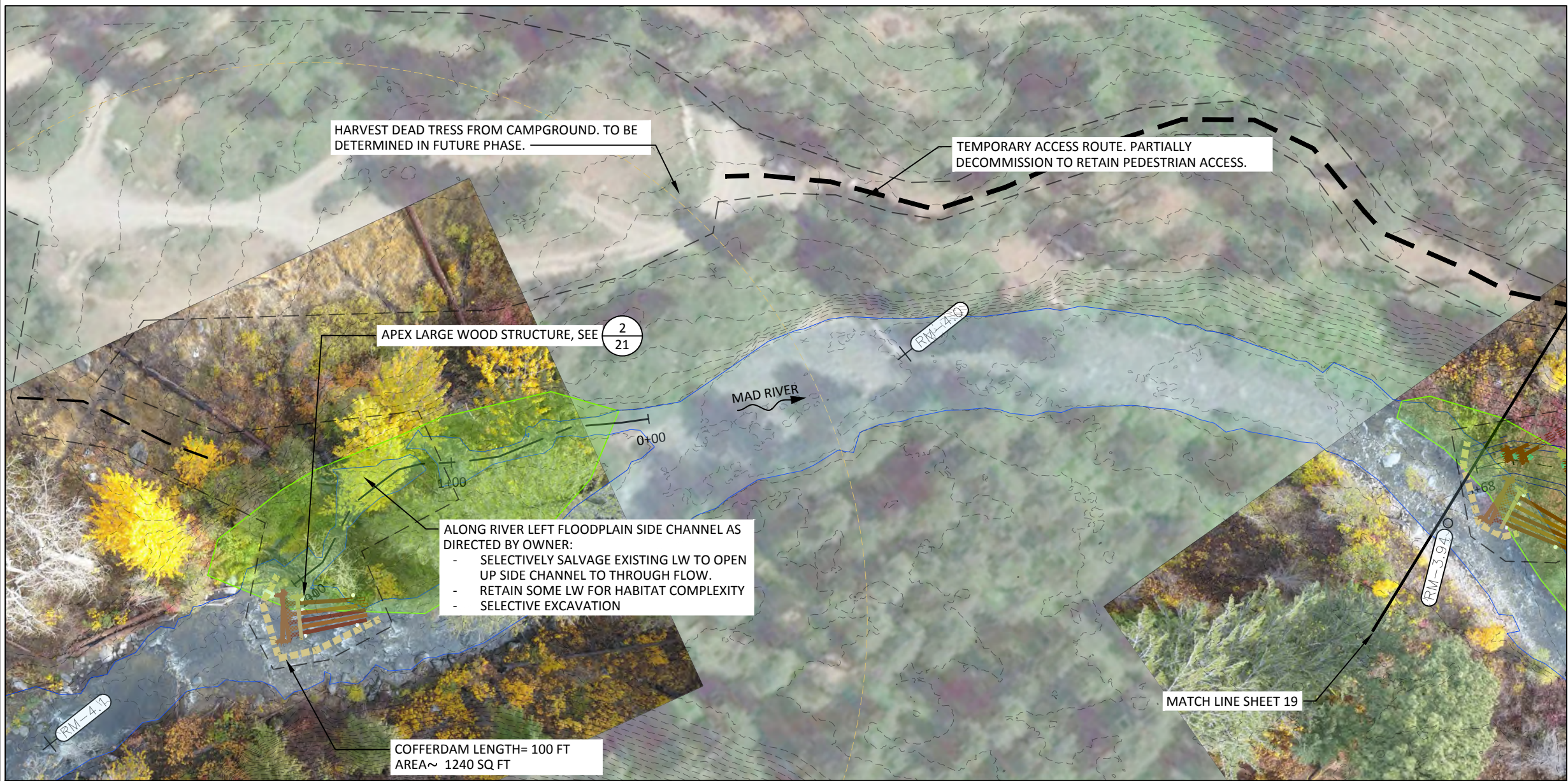
NO.	BY	DATE	REVISION DESCRIPTION

CM, BB DRAWN	PL, DM DESIGNED	PL, DM, MB CHECKED
PL, DM APPROVED	1/23/2024 DATE	PROJECT

MAD RIVER
RIVER MILE 1.1-4.3
FINAL DESIGN

501 Portway Avenue, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

PROPOSED CONDITIONS PLAN
RIVER MILE 3.8-3.95



LEGEND

EXISTING CONTOURS (2 FT)

PROPOSED CONTOURS (1 FT)

TAXLOTS

2+00

PROPOSED SIDE CHANNEL ALIGNMENT AND STATIONING

PROPOSED ACCESS

OHW

APPROX. OHW

LIMITS OF DISTURBANCE

EXISTING 2-YEAR FLOW INUNDATION LIMITS

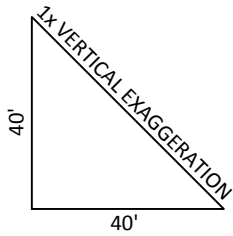
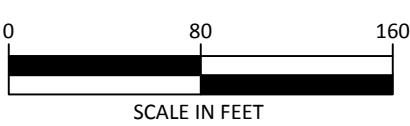
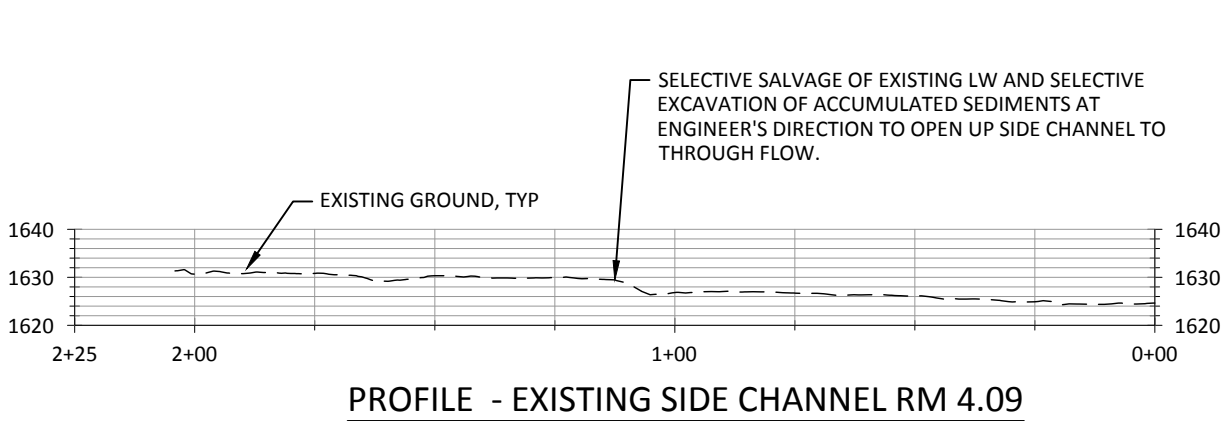
PROPOSED SCOUR POOL

DELINEATED WETLAND

RM-X.X

APPROXIMATE RIVER MILE

PLAN VIEW



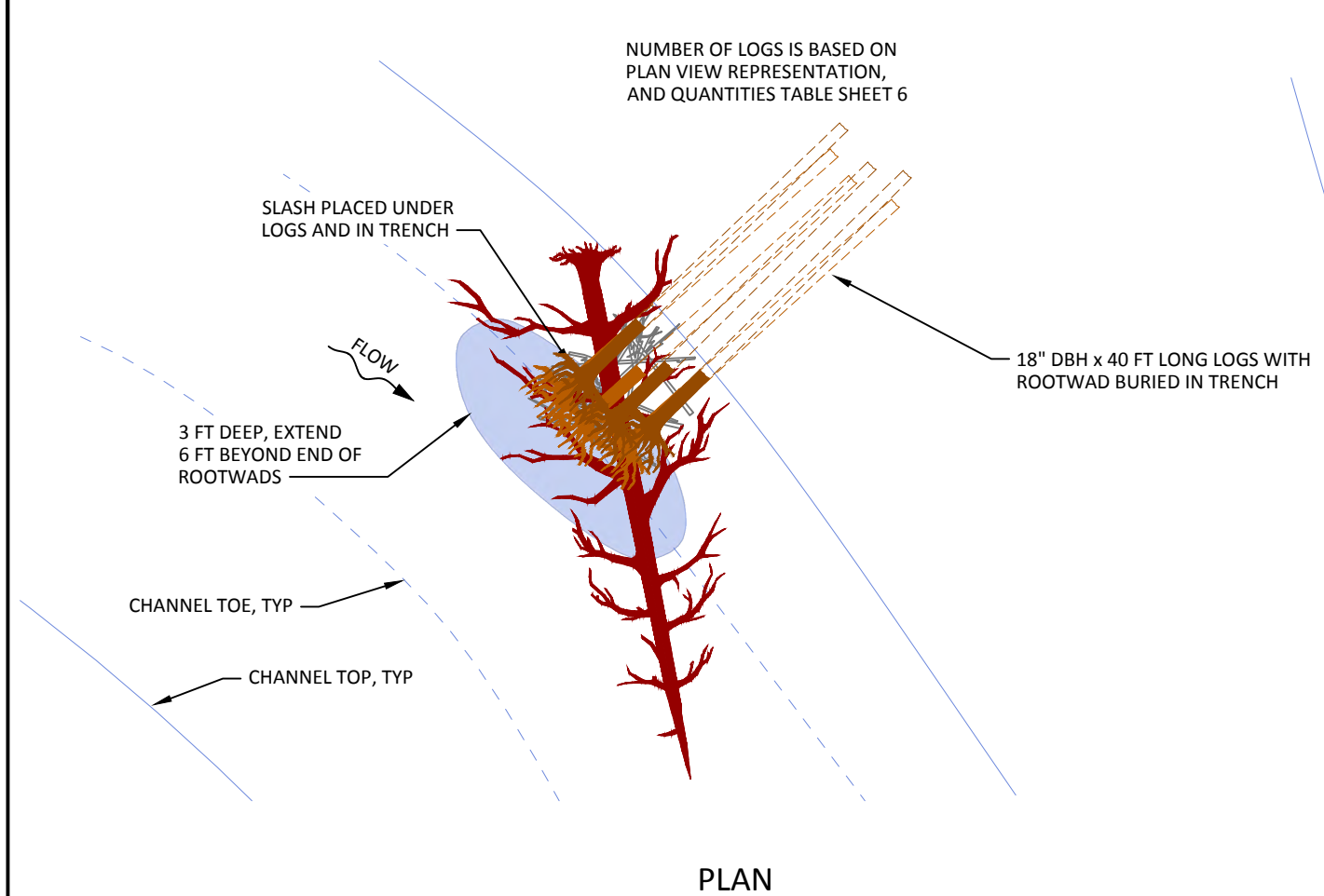
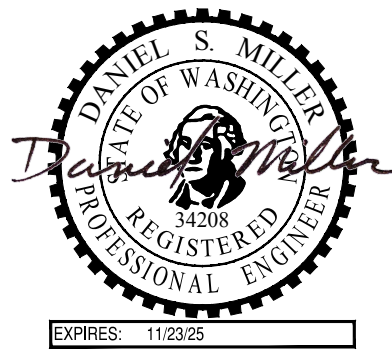
NO.	BY	DATE	REVISION DESCRIPTION

CM, BB	PL, DM	PL, DM, MB
DRAWN	DESIGNED	CHECKED
PL, DM	1/23/2024	
APPROVED	DATE	PROJECT

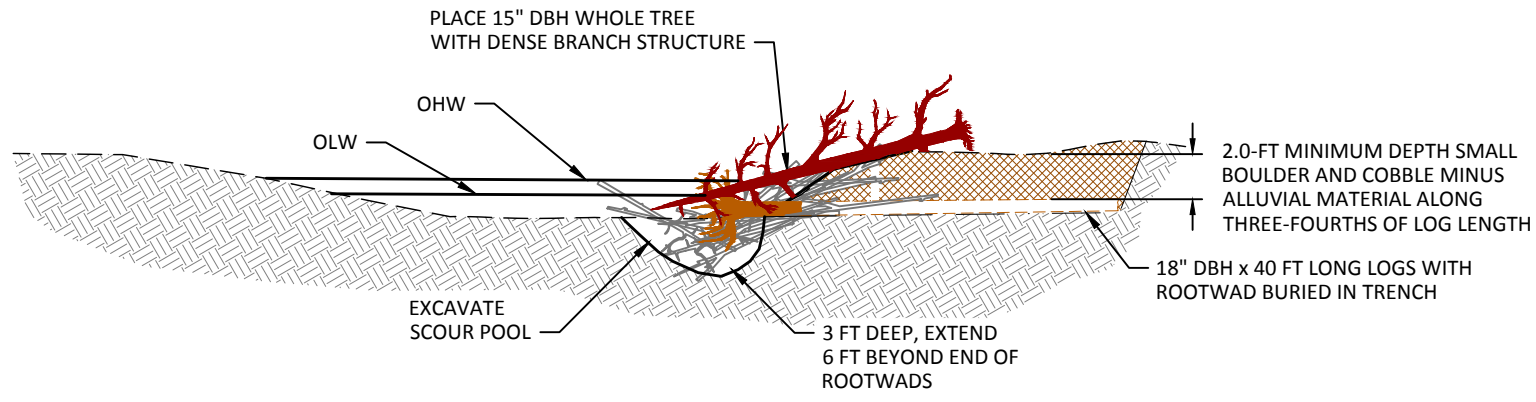
MAD RIVER
RIVER MILE 1.1-4.3
FINAL DESIGN

501 Portway Avenue, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

PROPOSED CONDITONS PLAN
RIVER MILE 3.95-4.2

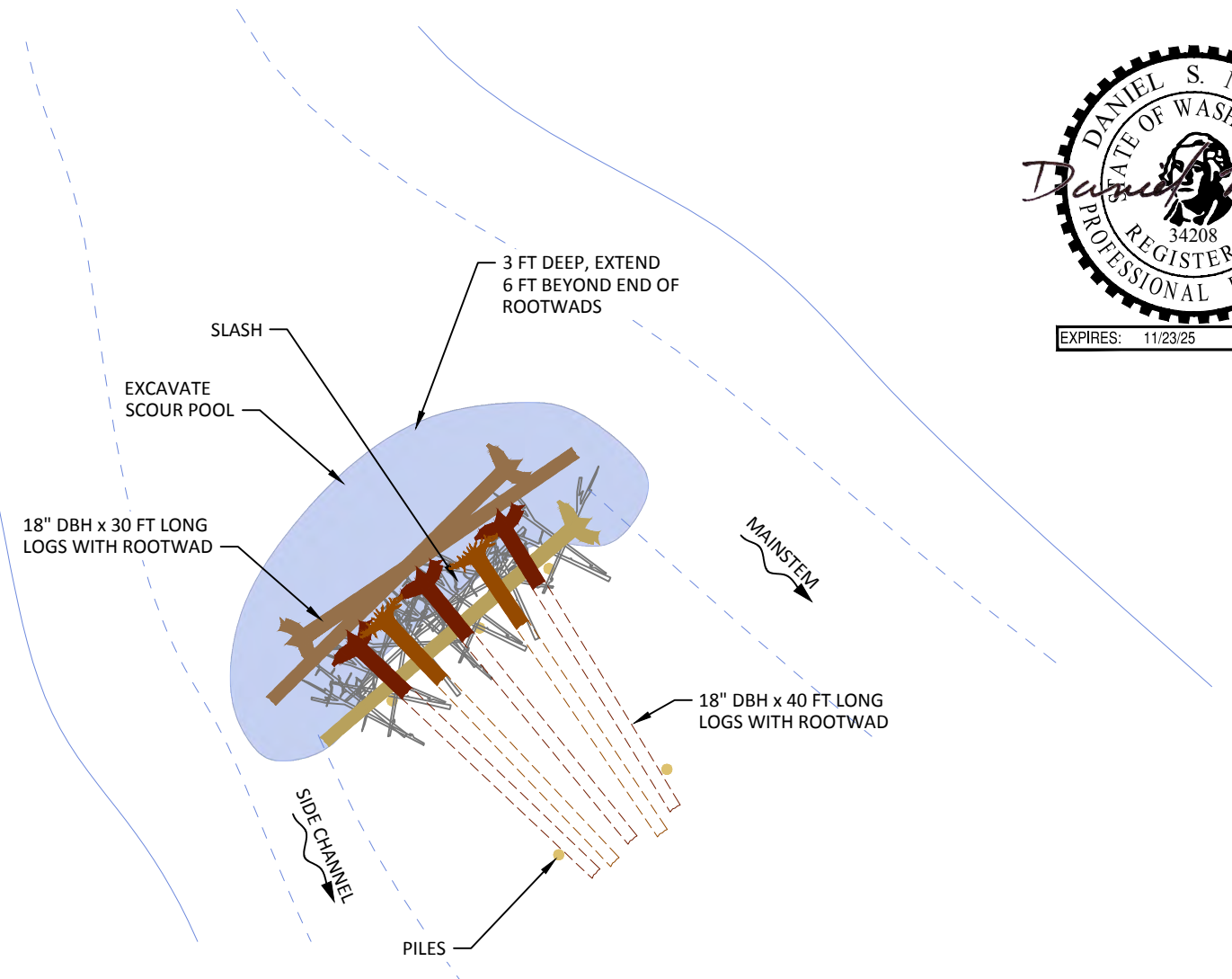


PLAN

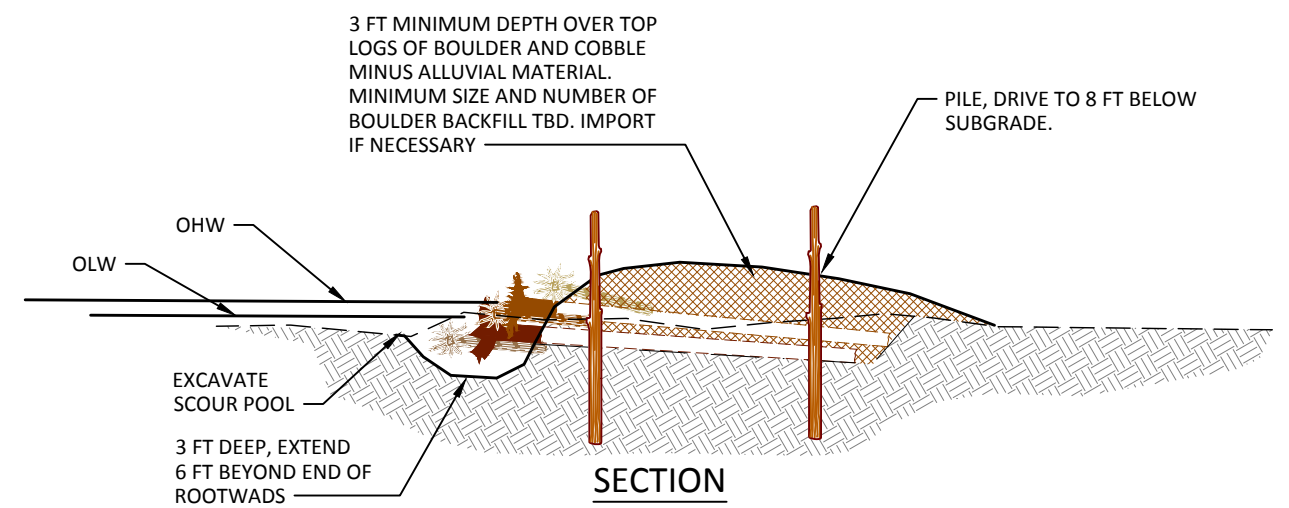


SECTION

1
21
TYPICAL DETAIL - BANK-BURIED LARGE WOOD STRUCTURE
NOT TO SCALE



PLAN



SECTION

2
21
TYPICAL DETAIL - APEX LARGE WOOD STRUCTURE
NOT TO SCALE

z:\client\files\Mad River\Drawings\1.1-4.3\1.1-4.3-1.dwg - bbroderick - 2/13/24

NO.	BY	DATE	REVISION DESCRIPTION

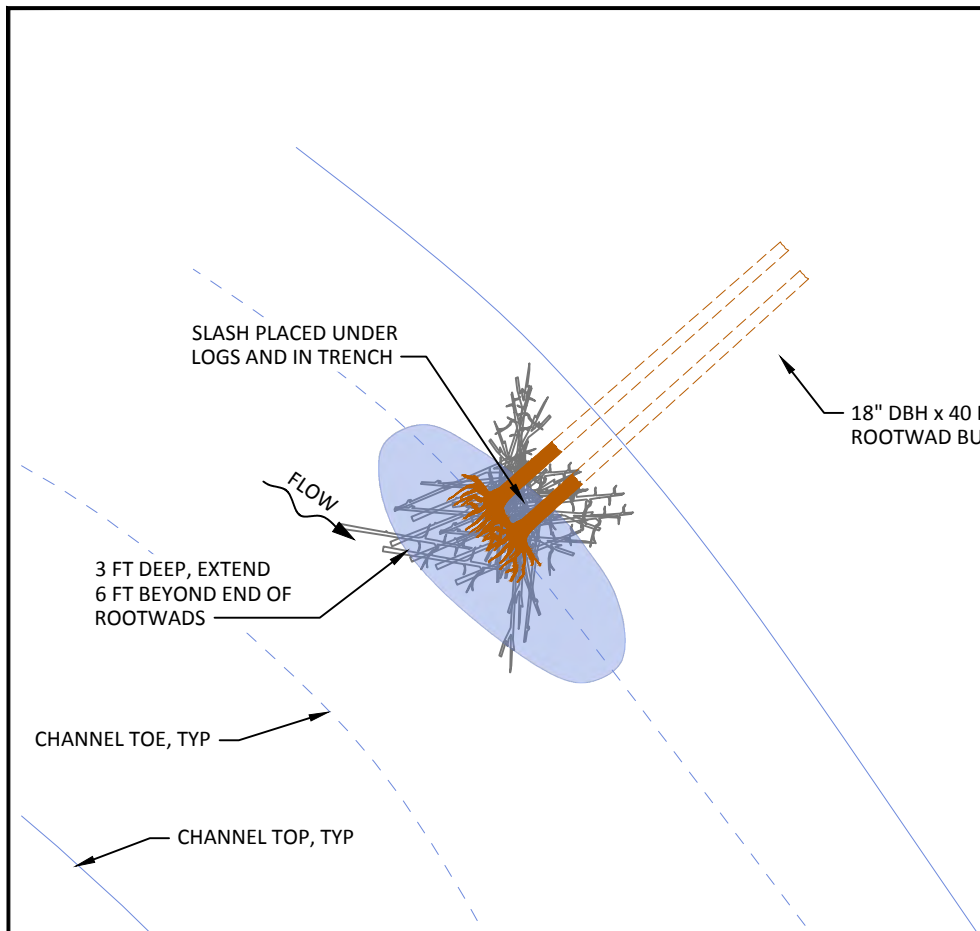
CM, BB DRAWN	PL, DM DESIGNED	PL, DM, MB CHECKED
PL, DM APPROVED	1/23/2024 DATE	PROJECT

MAD RIVER
RIVER MILE 1.1-4.3
FINAL DESIGN

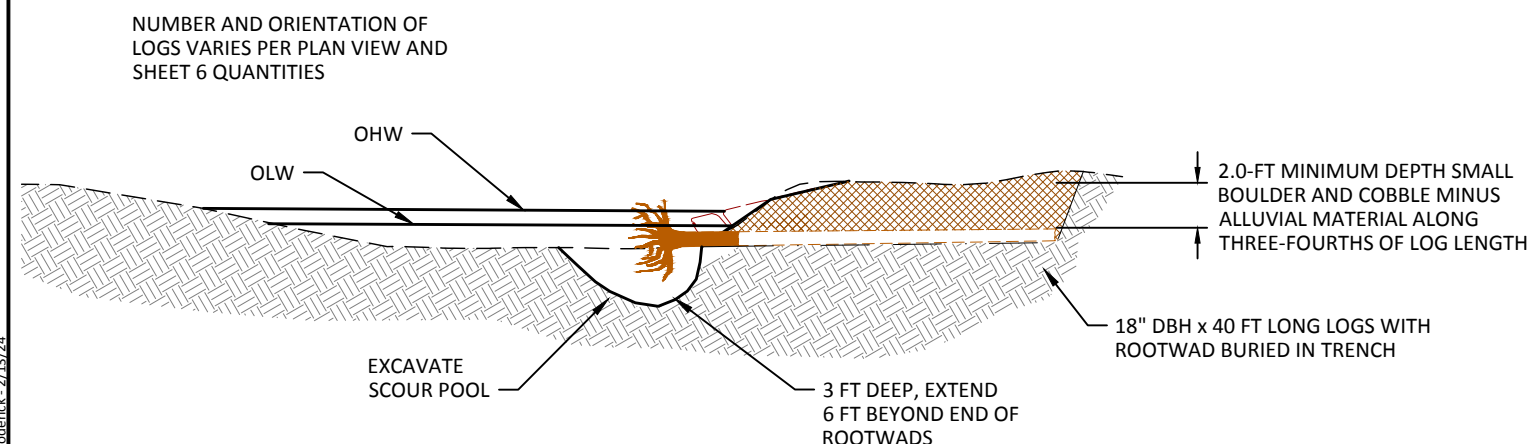


501 Portway Avenue, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

LARGE WOOD STRUCTURE TYPICAL
DETAILS (1 OF 3)

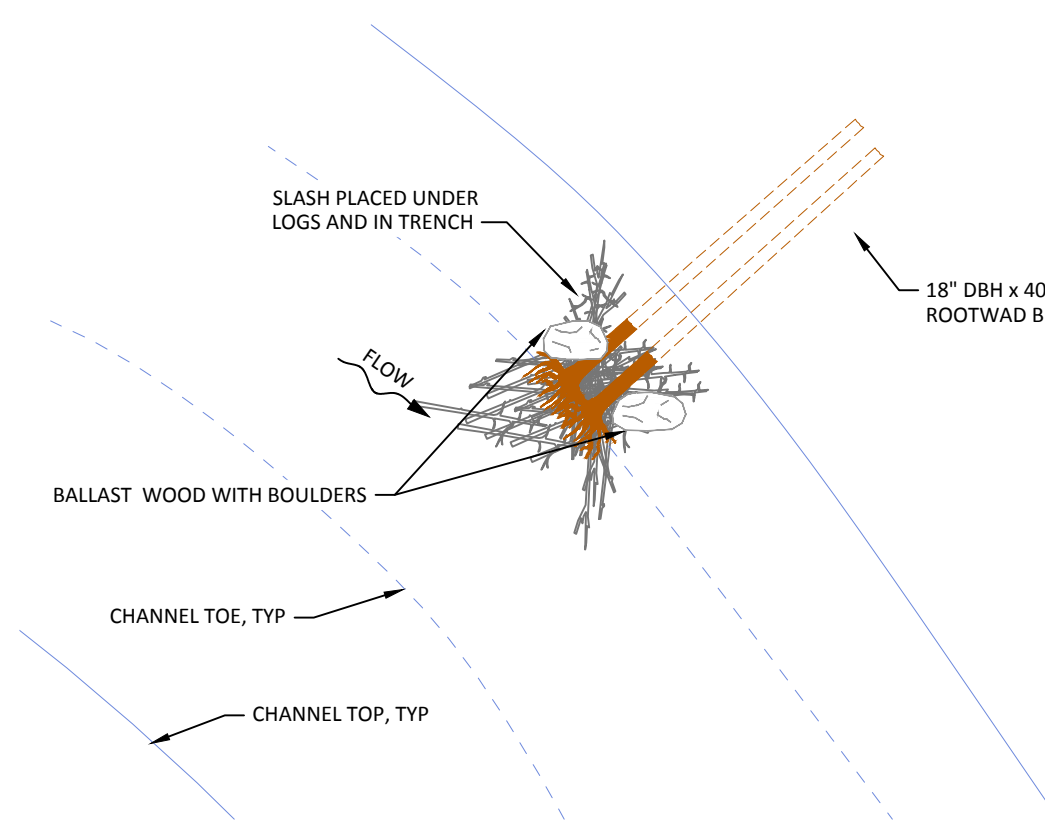


PLAN

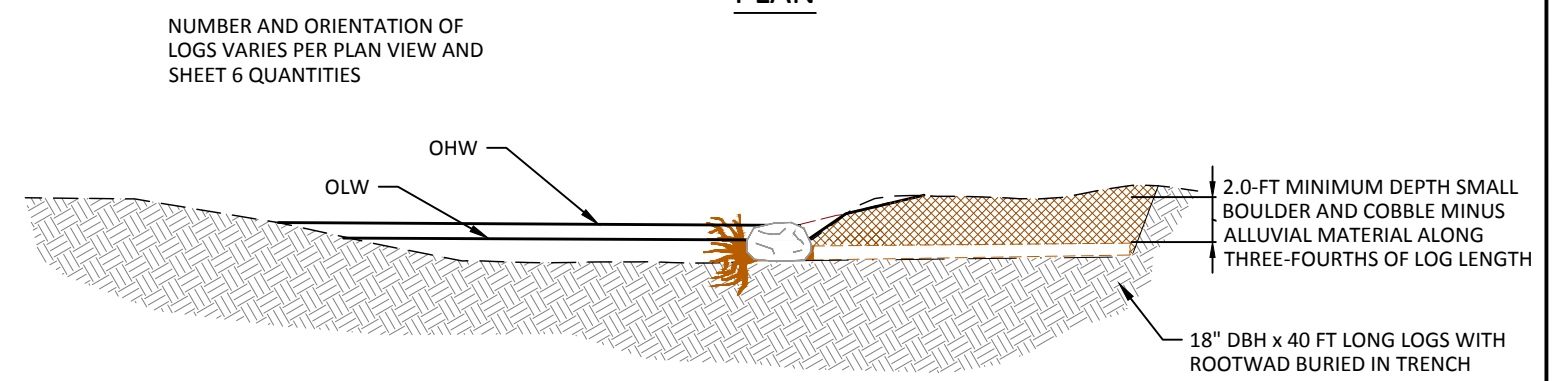


SECTION

1
22 TYPICAL DETAIL - BANK BURIED SMALL WOOD STRUCTURE
NOT TO SCALE

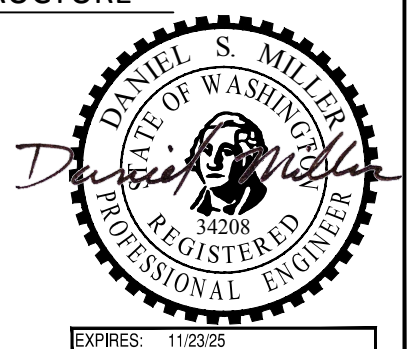


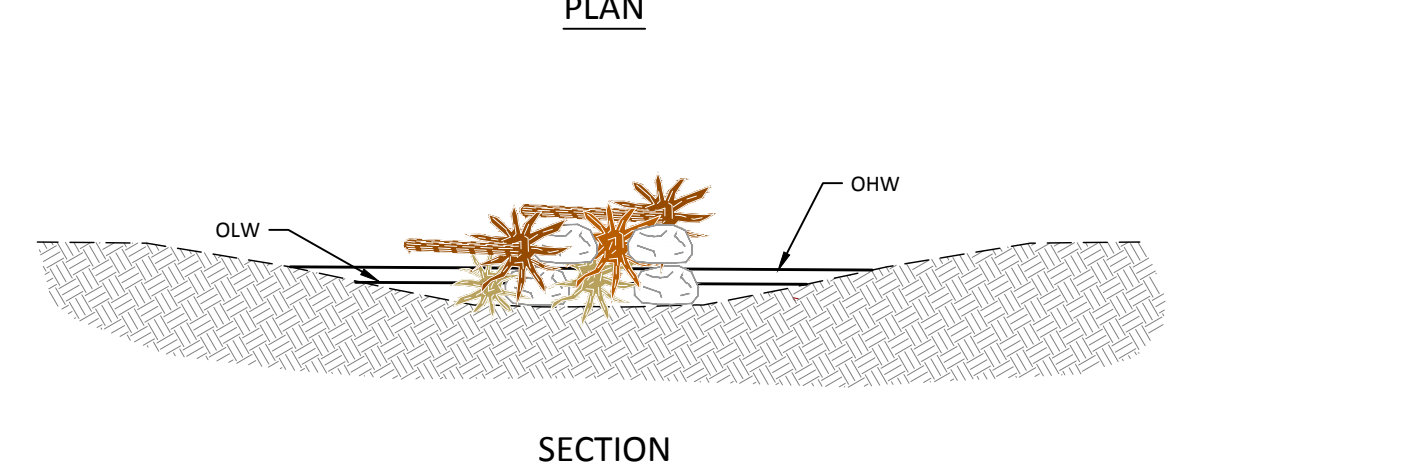
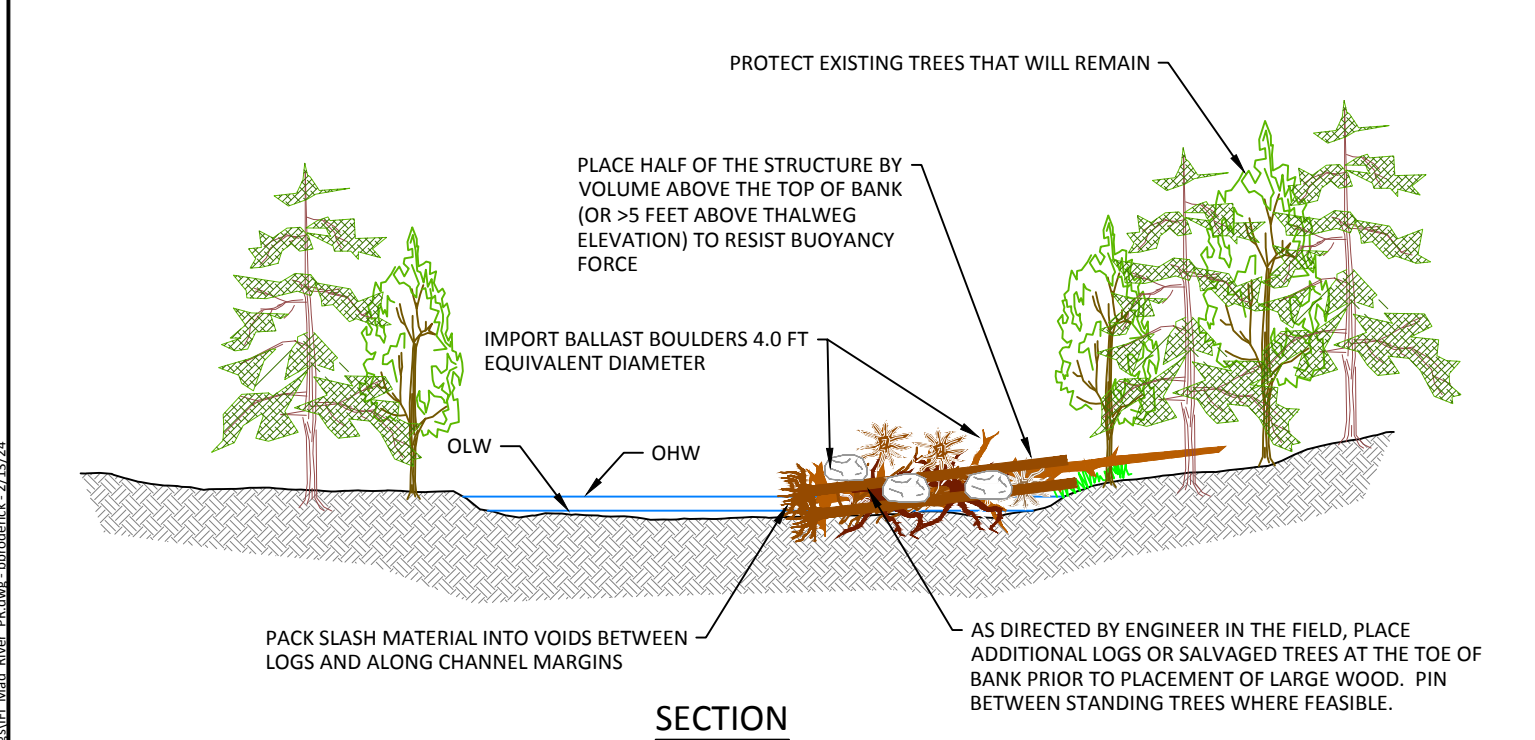
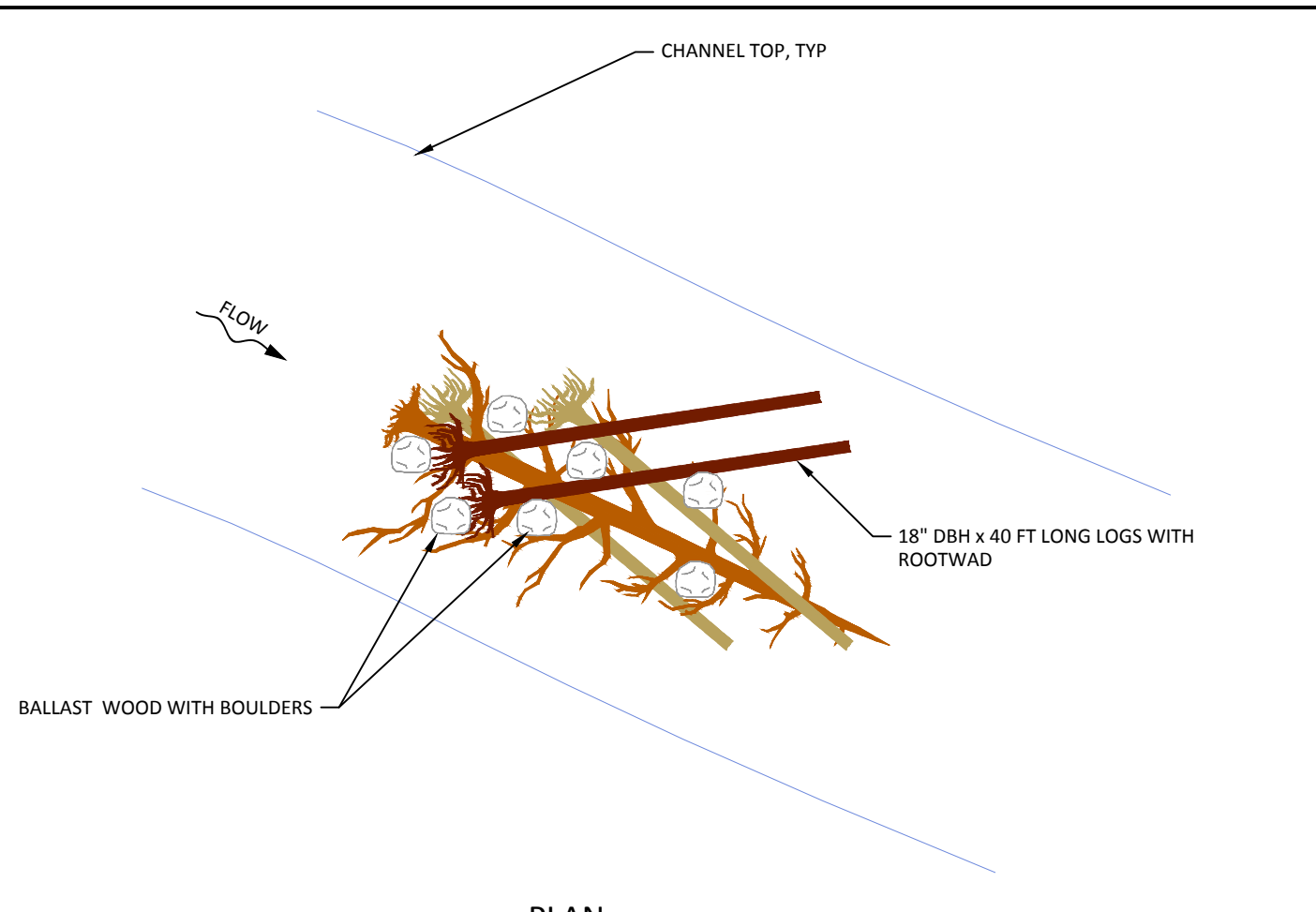
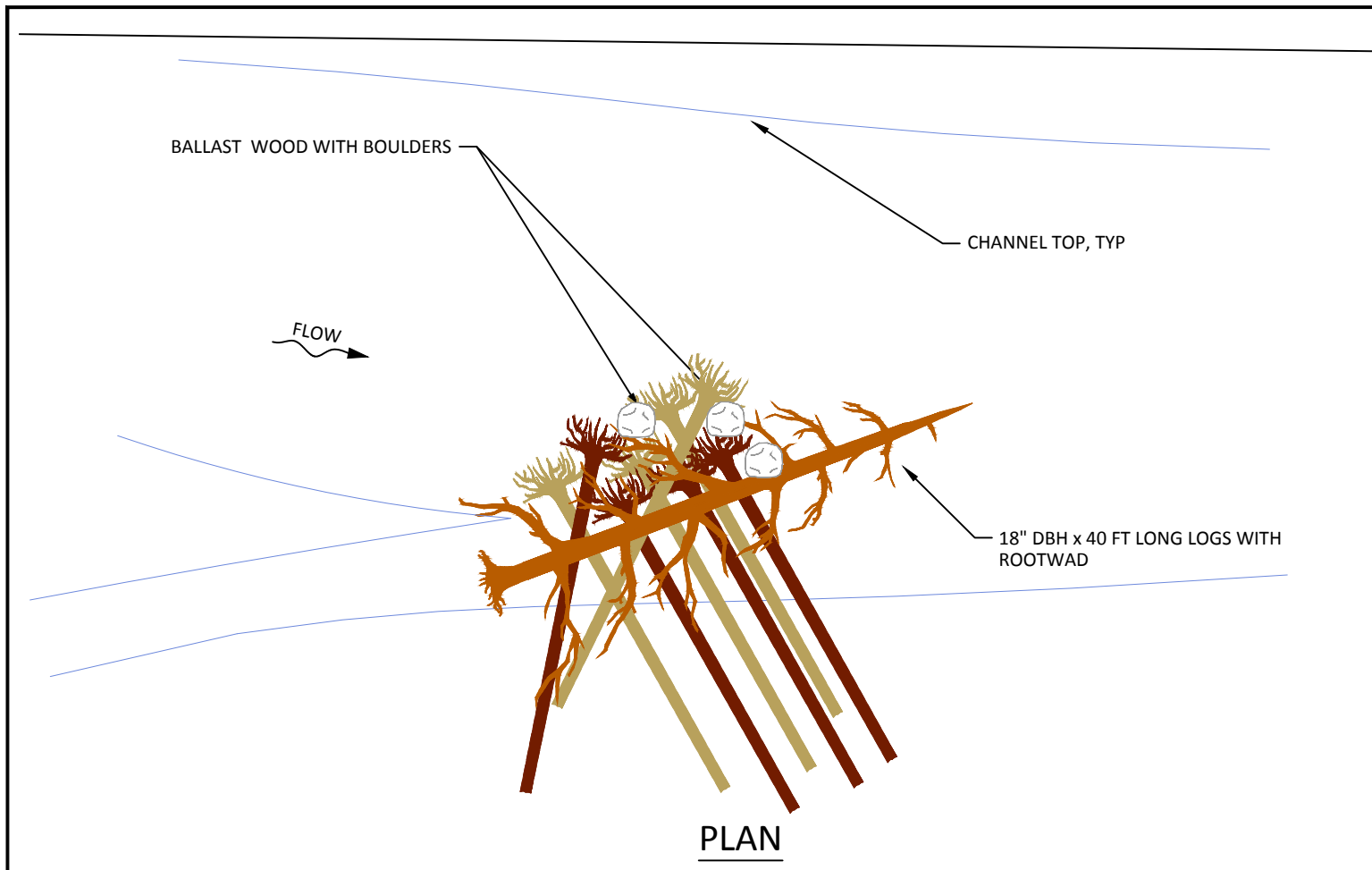
PLAN



SECTION

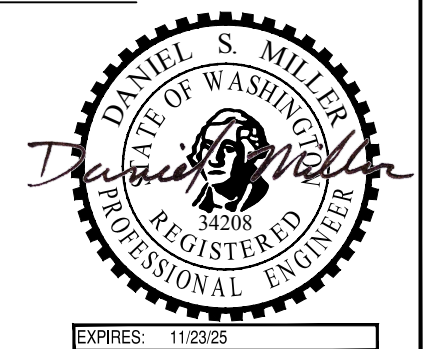
2
22 TYPICAL DETAIL - BOULDER BALLASTED SMALL WOOD STRUCTURE
NOT TO SCALE





1
23
TYPICAL DETAIL - OUTLET COVER LOGS
NOT TO SCALE

2
23
TYPICAL DETAIL - ISLAND JAM LARGE WOOD STRUCTURE
NOT TO SCALE



NO.	BY	DATE	REVISION DESCRIPTION

CM, BB DRAWN	PL, DM DESIGNED	PL, DM, MB CHECKED
PL, DM APPROVED	1/23/2024 DATE	PROJECT

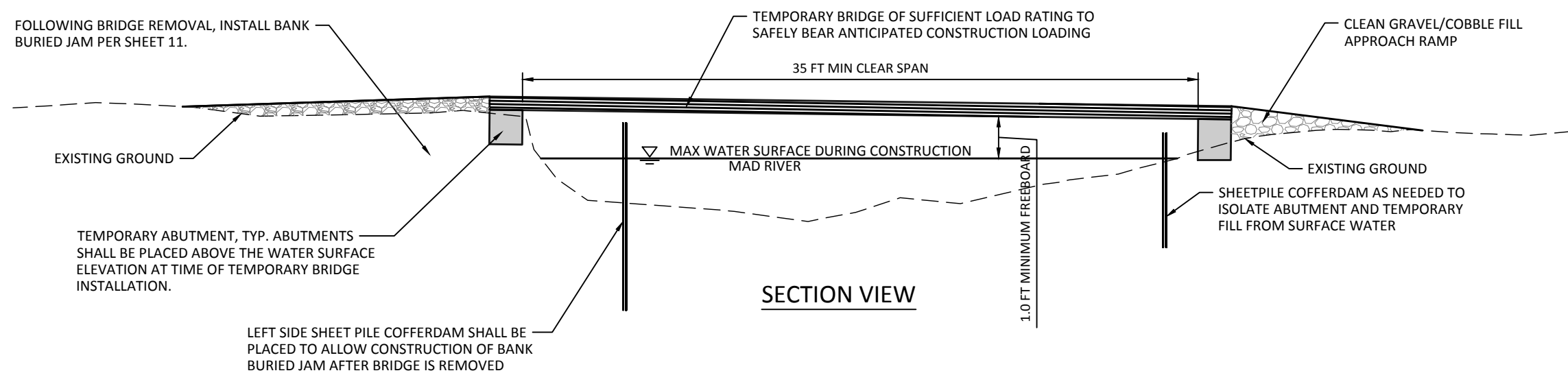
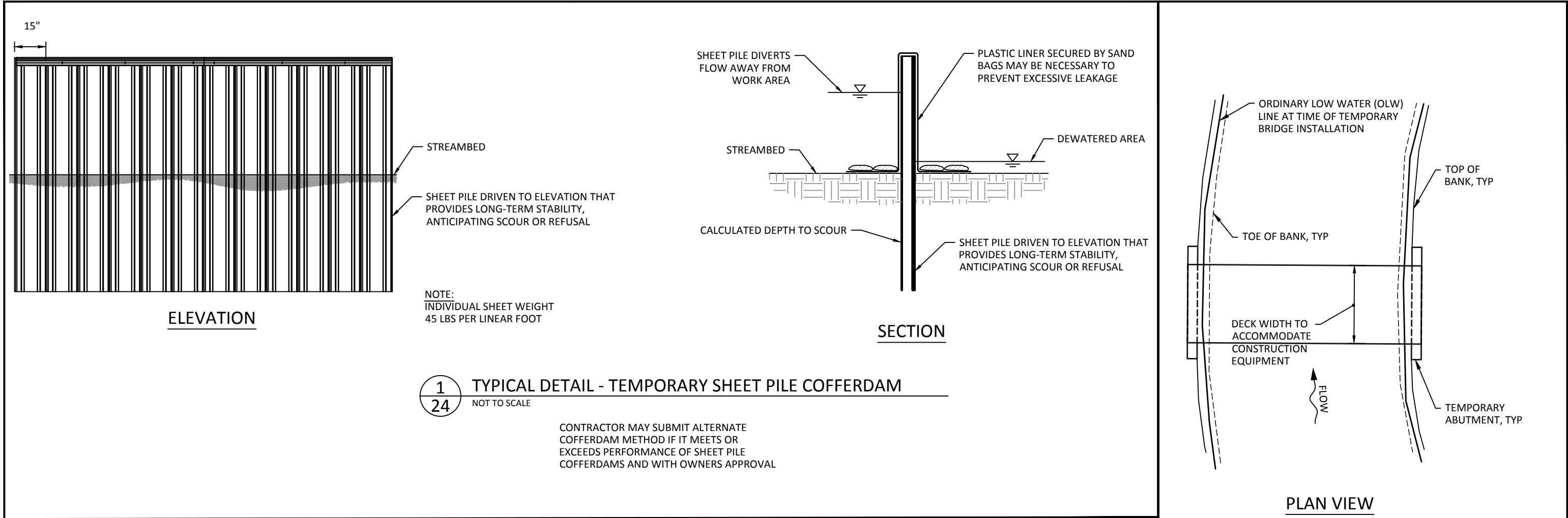
MAD RIVER
RIVER MILE 1.1-4.3
FINAL DESIGN

 501 Portway Avenue, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

LARGE WOOD STRUCTURE TYPICAL
DETAILS (3 OF 3)

SHEET
23 OF 29

z:\clientfiles\madriver\madrivernh3_4_220265\Drawing\ELI_Mad_River_PR.dwg - bbroderick - 2/13/24




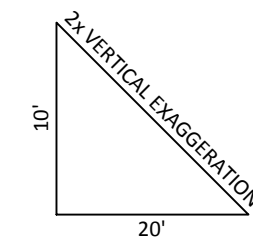
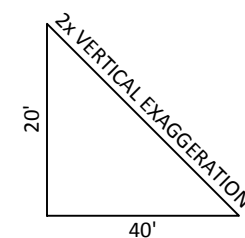
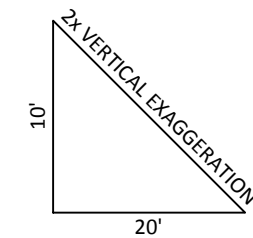
NOTES:

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

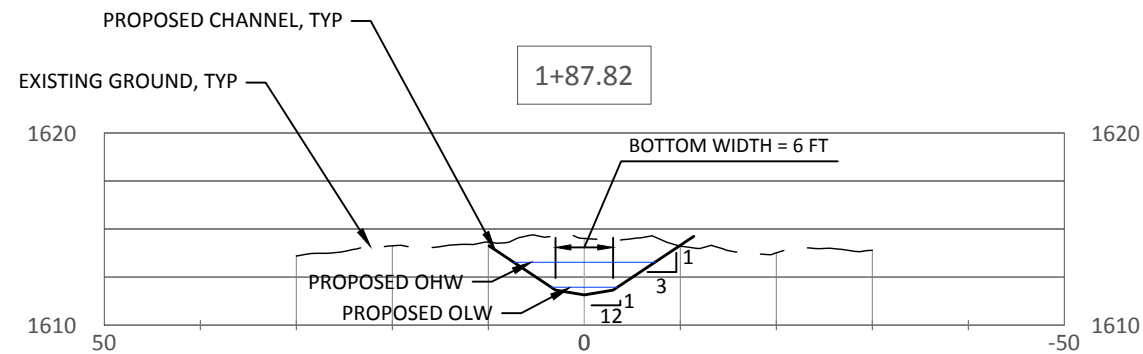
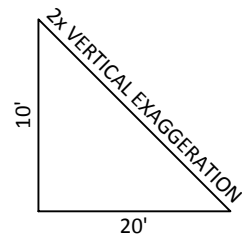


Z:\client\files\Mad River\Drawings\1.1-4.3\1.1-4.3.dwg - bbroderick - 2/13/24

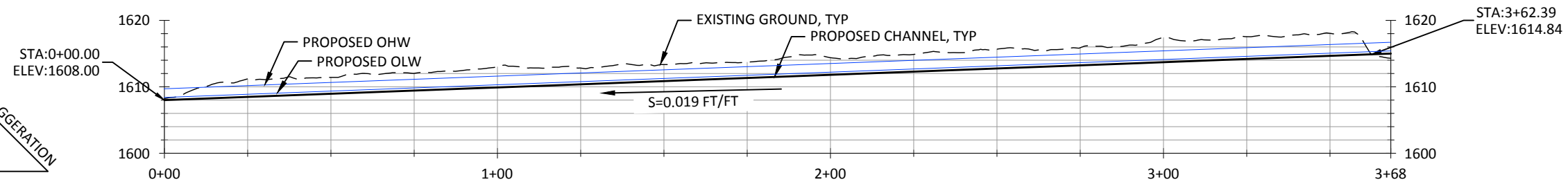
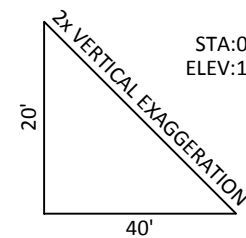
				CM, BB DRAWN	PL, DM DESIGNED	PL, DM, MB CHECKED	MAD RIVER RIVER MILE 1.1-4.3 FINAL DESIGN		501 Portway Avenue, Suite 101 Hood River, OR 97031 541.386.9003 www.interfluve.com	SHEET PILE COFFERDAM & TEMPORARY CROSSING DETAILS	SHEET 24 OF 29
NO.	BY	DATE	REVISION DESCRIPTION	PL, DM APPROVED	1/23/2024 DATE	PROJECT					



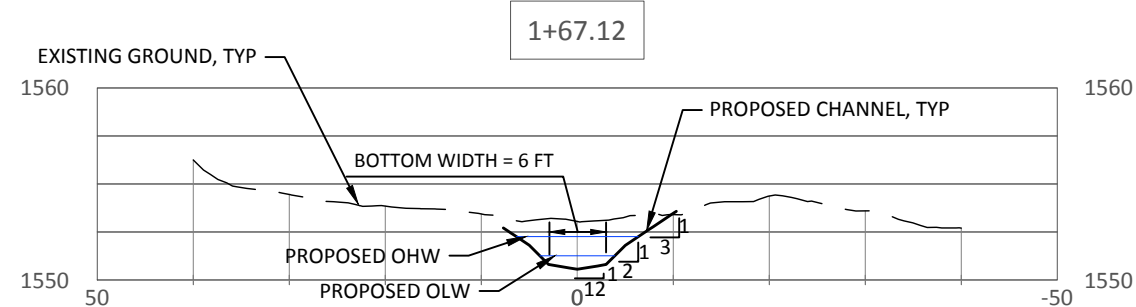
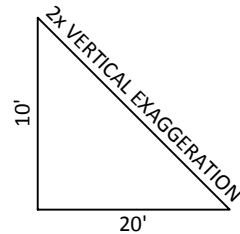
25 OF 29



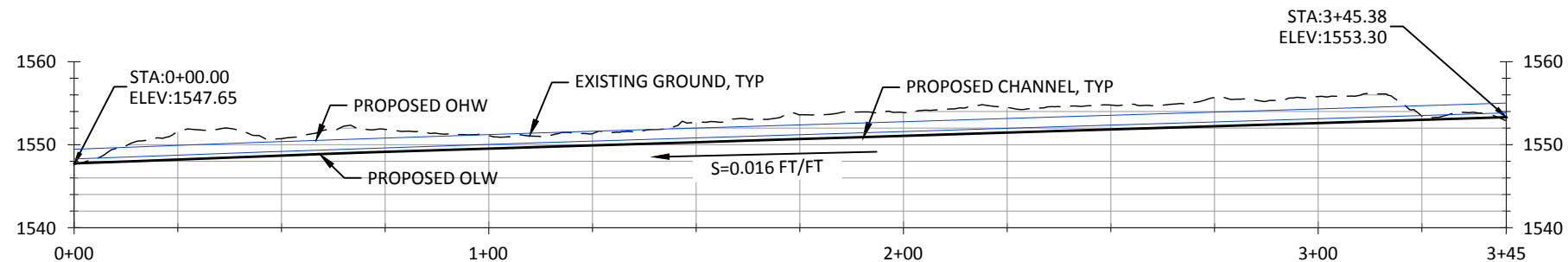
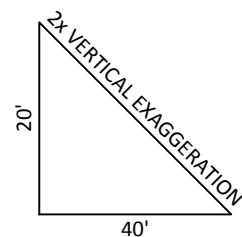
2
19 TYPICAL SECTION - SIDE CHANNEL RM 3.9



PROFILE - PROPOSED SIDE CHANNEL RM 3.9 (L)



1
16 TYPICAL SECTION - SIDE CHANNEL RM 3.3



PROFILE - PROPOSED SIDE CHANNEL RM 3.33

NOTE: CROSS SECTION ORIENTATIONS
ARE LEFT TO RIGHT LOOKING
DOWNSTREAM.



EXPIRES: 11/23/25

Z:\client\files\W\W\madriver\ph3_4_220263\Drawings\1\1 Mad River PR.dwg - bbroderick - 2/13/24

CM, BB	PL, DM	PL, DM, MB
DRAWN	DESIGNED	CHECKED
PL, DM	1/23/2024	
APPROVED	DATE	PROJECT

MAD RIVER
RIVER MILE 1.1-4.3
FINAL DESIGN



501 Portway Avenue, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

PROFILES AND SECTIONS SIDE
CHANNELS RM 3.3 & 3.9

SHEET

26 OF 29

z:\clientfiles\wdr\madriver\h3_4_220265\Drawing\JEL Mad River_PR.dwg - bbroderick - 2/13/24

INTRODUCTION

THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION'S STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION 2024 (WSDOT STANDARD SPECIFICATIONS) SHALL APPLY UNLESS OTHERWISE NOTED IN THE FOLLOWING PROVISIONS. IN CASE OF A CONFLICT BETWEEN THE REGULATORY STANDARDS OR SPECIFICATIONS, THE MORE STRINGENT WILL GOVERN. THE “CONTRACTING AGENCY” OR “OWNER” SHALL BE THE CONFEDERATED TRIBES AND BANDS OF THE YAKAMA NATION. ADDITIONAL SPECIFICATIONS IN THE FOLLOWING CONTRACT SECTIONS ARE INCLUDED FOR ITEMS NOT COVERED BY THE WSDOT STANDARD SPECIFICATIONS.

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

THE IN-WATER WORK WINDOW FOR THIS PROJECT IS JULY 16 - JULY 31. HIGH WATER IN THE RIVER COMMONLY PEAKS DURING LATE MAY TO EARLY JUNE; FLOWS DROP DRAMATICALLY THROUGH THE MONTH OF JULY. WORK MAY OCCUR OUTSIDE OF WATER BEFORE OR AFTER THE IN-WATER WORK WINDOW.

MAD RIVER FLOWS ARE RECORDED AT ARDENVOIR BY USGS (USGS 12452890 MAD RIVER AT ARDENVOIR, WA). CURRENT AND HISTORIC FLOW DATA ARE AVAILABLE AT:
HTTPS://WATERDATA.USGS.GOV/USA/NWIS/UV?12452890.

THIS PROJECT WAS DESIGNED IN ACCORDANCE WITH THE BPA HABITAT IMPROVEMENT PROGRAM (HIP). HIP GENERAL CONSERVATION MEASURES (CMS) ARE INCLUDED ON SHEETS 2-4 OF THE PLANS. SITE SPECIFIC DIRECTION IS ADDED TO THE FOLLOWING PROVISIONS. ANY VARIANCES FROM HIP CMS WILL BE REQUESTED BY OWNER. IN A CASE OF A CONFLICT BETWEEN THE REGULATORY STANDARDS OR SPECIFICATIONS, LOCAL REGULATIONS, OR OTHER CONTRACT DOCUMENTATION, THE MORE STRINGENT WILL GOVERN, UNLESS SPECIFIED IN WRITING BY THE OWNER.

IF WORK ENCOUNTERS ANY OF THE FOLLOWING CULTURAL RESOURCES:

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

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

ITEM 001 - MOBILIZATION

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

CONSTRUCTION REQUIREMENTS

- PRIOR TO ENTERING THE SITE, ALL EQUIPMENT SHALL BE POWER WASHED, BECOME FULLY DRY, AND INSPECTED TO MAKE SURE NO PLANTS, SOIL, OR OTHER ORGANIC MATERIAL ADHERES TO THE SURFACE. IF EQUIPMENT LEAVES THE SITE AND RETURNS, IT SHALL BE REWASHED AND INSPECTED PRIOR TO ACCESSING THE SITE.
- TEMPORARY SITE ACCESS SHALL BE ALONG ACCESS ROUTES AND STAGING AREAS SHOWN IN THE PLANS. THESE ARE APPROXIMATE. ACTUAL DISTURBANCE LIMITS WILL BE STAKED AND FLAGGED IN THE FIELD BY THE OWNER. DESIGNATED DISTURBANCE LIMITS SHALL BE STRICTLY ADHERED TO AND NO LARGE TREES WILL BE IMPACTED WITHOUT PERMISSION FROM THE OWNER.
- DESIGNATED RIVER CROSSINGS ARE SHOWN IN THE PLANS. RIVER CROSSING TO SIDE CHANNEL RM 1.55 SHALL REQUIRE A TEMPORARY BRIDGE AS SPECIFIED IN ITEM 007 TEMPORARY ACCESS BRIDGE. TEMPORARY RIVER CROSSINGS ARE SHOWN ON THE PLANS. NO RIVER CROSSING SHALL BE MADE PRIOR TO APPROVAL BY OWNER.
- CONTRACTOR SHALL OBTAIN PERMIT FROM COUNTY TO OPERATE

HEAVY EQUIPMENT AND WORK WITHIN COUNTY RIGHT OF WAY.

- PRIOR TO DEMOBILIZATION, RUTTING AND DISTURBED GROUND SHALL BE GRADED SMOOTH TO BLEND WITH EXISTING TOPOGRAPHY AND IF DIRECTED BY OWNER, RIPPED TO 18INCHES DEEP TO DECOMPACT SOILS. ACCESS ROUTES, AND STOCKPILE AND STAGING AREAS SHALL BE RETURNED TO ORIGINAL OR BETTER CONDITION. ANY REMOVED OR DAMAGED FENCES SHALL BE REPAIRED OR REPLACED TO PRE-PROJECT CONDITION OR BETTER.
- EXISTING ROADS SHALL BE RESTORED TO PRE-PROJECT OR BETTER CONDITION AS DIRECTED BY OWNER.
- BEFORE THE RELEASE OF FINAL RETAINAGE TO THE CONTRACTOR, THE CONTRACTOR WILL PARTICIPATE IN A WALK-THROUGH WITH THE OWNER AND USFS STAFF TO EVALUATE THE RESTORED AREAS.
- ALL HEAVY EQUIPMENT OPERATING ON PAVEMENT SHALL USE RUBBER MATS OR SIMILAR TO AVOID IMPACTS TO PAVED SURFACE.
- ROAD ASPHALT REPAIR/REPLACEMENT SHALL BE COMPLETED FOR EXISTING PAVED ROAD SECTIONS IDENTIFIED BY COUNTY OR USFS STAFF AND OWNER TO HAVE BEEN DAMAGED BY CONSTRUCTION. BASED ON JURISDICTION OF ROAD, WORK SHALL CONFORM TO COUNTY, STATE OR USFS SPECIFICATIONS IF MORE STRINGENT THAN SPECIFICATIONS HEREIN.

SAND AND GRAVEL MATERIALS EXCAVATED TO SUBGRADE SHALL BE HAULED AND PLACED IN THE PRESTON PIT DISPOSAL AREA. EXISTING ASPHALT SURFACE REMOVED SHALL BE HAULED FOR LEGAL OFF SITE DISPOSAL. CONTRACTOR SHALL REPAIR/REPLACE CRUSHED GRAVEL ROAD BASE PER USFS REQUIREMENTS, INCLUDING WSDOT STANDARD SPECIFICATION 9-03.9(3) CRUSHED SURFACING BASE COURSE AND 3INCH THICKNESS OF ASPHALT OVER ROAD WIDTH. FINISHED GRADE SHALL BE SLOPED PER COUNTY OR USFS CRITERIA TO PROVIDE POSITIVE DRAINAGE OFF ROAD SURFACE.

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

MEASUREMENT AND PAYMENT

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

ITEM 002- TRAFFIC CONTROL

TEMPORARY TRAFFIC CONTROL REQUIREMENTS SHALL INCLUDE BARRICADES AND CONSTRUCTION SIGNAGE AT THE ENTRANCE TO THE PROJECT SITE AND ANY OTHER MEASURES PER STANDARD SPECIFICATIONS SECTION 1-10 AND LOCAL REGULATIONS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN APPLICABLE COUNTY OR US FOREST SERVICE PERMITS.

MEASUREMENT AND PAYMENT

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

ITEM 003- TESC, SPCC PLAN AND IMPLEMENTATION

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

AND AS AMENDED BY THESE SPECIAL PROVISIONS.

- THE CONTRACTOR SHALL SUBMIT A TESC FOR THE PROJECT TO THE OWNER FOR APPROVAL. THE TESC MUST SATISFY THE REQUIREMENTS OF THE WASHINGTON DEPARTMENT OF ECOLOGY NPDES STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY AND ALL OTHER APPLICABLE PERMITS. THE CONTRACTOR SHALL USE MEASURES OF THEIR OWN DESIGN TO ENSURE SATISFACTORY PERFORMANCE AND THAT THE EROSION CONTROL REQUIREMENTS OF ALL APPLICABLE PERMITS ARE MET. THE CONTRACTOR SHALL BE NAMED AS THE PERMIT HOLDER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING, INSPECTING AND FILING REPORTS, MAINTAINING, REPLACING, AND REMOVING TESC AND SPCC MEASURES. THE PLAN SHALL INCLUDE THE NAME, ADDRESS AND 24-HOUR CONTACT NUMBER OF THE PERSON RESPONSIBLE FOR EROSION PREVENTION AND SEDIMENT CONTROL MEASURES.
- A SPILL CONTAINMENT KIT SHALL BE ON SITE AND CREWS SHALL BE TRAINED IN ITS USE.
- BIODEGRADABLE HYDRAULIC FLUID SHALL BE INSTALLED INTO EACH PIECE OF HEAVY MACHINERY WORKING WITHIN 50 FEET OF THE RIVER.
- CONTRACTOR WILL BE REQUIRED TO APPLY FOR AN INDUSTRIAL FIRE PROTECTION LEVEL (IFPL) 3 WAIVER IN THE EVENT THAT DEPARTMENT OF NATURAL RESOURCES DECLARES THE IFPL LEVEL HAS BEEN INCREASED TO LEVEL 3. REGARDLESS OF IFPL LEVELS, A FIRE CONTAINMENT KIT INCLUDING SHOVELS AND FIRE EXTINGUISHERS WILL BE KEPT WHERE ANY CONSTRUCTION ACTIVITIES ARE TAKING PLACE AND AT THE REFUELING LOCATION.

INSPECTION AND MAINTENANCE

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

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

CONTRACTOR'S MEETINGS AND TESC RECORDS

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

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

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

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

MEASUREMENT AND PAYMENT

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

ITEM 004 - CLEARING AND GRUBBING

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

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

MEASUREMENT AND PAYMENT

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

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

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

CM, BB

DRAWN

PL, DM

DESIGNED

PL, DM, MB

CHECKED

PL, DM

APPROVED

1/23/2024

DATE

PROJECT

MAD RIVER

RIVER MILE 1.1-4.3

FINAL DESIGN



501 Portway Avenue, Suite 101

Hood River, OR 97031

541.386.9003

www.interfluve.com

SPECIFICATIONS (1 OF 3)

EXPIRES: 11/23/25

SHEET

27 OF 29

z:\clientfiles\w-r\madriver\mh3_4_220265\Drawings\IEL Mad River_PR.dwg - bbroderick - 2/13/24

ITEM 005 - COFFERDAM AND DIVERSION

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

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

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

THE WORK INCLUDES COORDINATING WITH THE OWNER FOR FISH SALVAGE AND RELOCATION ACTIVITIES. EXCAVATION OR LOG PLACEMENT SHALL NOT OCCUR UNTIL THE OWNER COMPLETES FISH SALVAGE. THE CONTRACTOR SHALL PROVIDE MINIMUM 2 DAYS ADVANCE NOTICE TO THE OWNER BEFORE EACH COFFERDAM INSTALLATION DATE. THE CONTRACTOR SHALL PROVIDE OWNER ACCESS TO COFFERDAMS AND SUPPORTING STAFF FOR OWNER'S DEFISHING. THE CONTRACTOR IS ADVISED THAT FISH RESCUE MAY TAKE APPROXIMATELY 4 HOURS PER COFFERDAM.

MATERIALS

THE CONTRACTOR SHALL PROVIDE ALL REQUIRED MATERIALS FOR THE PROJECT.

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

CONSTRUCTION REQUIREMENTS

THE CONTRACTOR SHALL ISOLATE THE WORK AREA FROM THE RIVER BY INSTALLING COFFERDAM PER THE PLANS. NO TURBIDITY FROM CONSTRUCTION ACTIVITIES SHALL ENTER THE RIVER. COFFERDAMS SHOWN IN THE PLANS ARE A SUGGESTED METHOD. IF CONTRACTOR ELECTS TO USE ALTERNATE METHOD(S) FOR TEMPORARY COFFERDAMS, CONTRACTOR SHALL PROVIDE TO THE OWNER A COFFERDAM/DIVERSION PLAN FOR REVIEW PRIOR TO IMPLEMENTATION.

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

MEASUREMENT AND PAYMENT

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

ITEM 006 - PUMPING

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

MATERIALS

CONTRACTOR SHALL PROVIDE SUFFICIENT SIZE AND NUMBERS OF PUMPS TO DEWATER COFFERDAMS AND CONTROL TURBIDITY FOR THE PROJECT AND ENCOUNTERED FLOWS AND GROUNDWATER CONDITIONS. CONTRACTOR SHALL PROVIDE A MINIMUM OF ONE 6” TRASH PUMP WITH PUMPING CAPACITY GREATER THAN 600 GPM, ASSUMING 12 FEET OF VERTICAL LIFT AND 300 FEET OF DISCHARGE HOSE. ADDITIONAL PUMPS SHALL BE PROVIDED BY CONTRACTOR AS NEEDED AT NO ADDITIONAL COST

1. EACH WATER INTAKE SHALL HAVE A FISH SCREEN INSTALLED, OPERATED AND MAINTAINED ACCORDING TO NMFS’ FISH SCREEN CRITERIA (NMFS 1997; NMFS 2008). NO PUMPING CAN OCCUR UNTIL FISH SCREEN HAS BEEN APPROVED BY OWNER PRIOR TO INSTALLATION.
2. PUMPS SHALL BE PLACED WITHIN A CONTAINER TO CONTAIN FUEL OR OIL SPILLS. OIL ABSORBENT DIAPERS SHALL BE STORED AT EACH PUMP.
3. THE CONTRACTOR SHALL PROVIDE ENVIRONMENTAL PROTECTION MEASURES SUCH AS STRAW BALES, PERFORATED PIPE FOR DISCHARGE FLOW DISTRIBUTORS, GEOTEXTILES, FILTER BAGS, OR OTHER MEANS OF CONTROLLING DISCHARGE WATER AND TURBIDITY. NO TURBIDITY SHALL BE ALLOWED TO ENTER THE RIVER OR WETLANDS.
4. TO HELP PREVENT TURBIDITY FROM LEAKING THROUGH COFFERDAMS, THE CONTRACTOR SHALL OPERATE 6” TRASH PUMP TO LOWER THE WATER SURFACE WITHIN THE ISOLATED AREA AND DISCHARGE TO AN INFILTRATION AREA.

ENVIRONMENTAL PROTECTION MEASURES

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

MEASUREMENT AND PAYMENT

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

ITEM 007 - TEMPORARY ACCESS BRIDGE

A TEMPORARY BRIDGE, SHALL BE REQUIRED TO CROSS THE MAD RIVER TO ACCESS SIDE CHANNEL RM 1.55 AT LOCATION SHOWN IN THE PLANS. CONTRACTOR SHALL SUBMIT AN ACCESS PLAN INCLUDING DRAWINGS SHOWING DETAILS OF PROPOSED METHODS FOR PROVIDING ACCESS FOR EQUIPMENT, INCLUDING LOADED HAUL TRUCKS, TO THE SITES. REVIEW AND APPROVAL OF THE PLAN SHALL NOT RELIEVE THE CONTRACTOR FROM FULL RESPONSIBILITY FOR THE ADEQUACY AND SAFETY OF THE CROSSING.

TEMPORARY BRIDGE SHALL PROVIDE MINIMUM 35-FT CLEAR SPAN AND MINIMUM OF 1.0-FT OF FREEBOARD FROM LOW CHORD TO MAXIMUM WATER SURFACE ELEVATION. ABUTMENTS SHALL BE PROVIDED AS NECESSARY FOR THE BRIDGE SYSTEM. SHEET PILE COFFERDAM SHALL BE USED AS NECESSARY TO ISOLATE DISTURBED SURFACES FROM FLOWING WATER AND PREVENT TURBIDITY FROM ENTERING THE MAD RIVER. THE RIVER LEFT COFFERDAM MAY BE SET TO ALLOW CONSTRUCTION OF THE RIVER LEFT BANK BURIED LWM STRUCTURE AFTER REMOVAL OF THE TEMPORARY BRIDGE. STANDING WATER WITHIN COFFERDAMS SHALL BE DEFISHED BY OWNER PER DE-FISHING PLAN. APPROACH RAMPS TO THE BRIDGE SHALL BE CLEAN ALLUVIAL MATERIAL. COFFERDAM AND BRIDGE SHALL BE REMOVED AT PROJECT COMPLETION.

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

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

MEASUREMENT AND PAYMENT

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

ITEMS 008-012 - LOG STRUCTURES

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

- ITEM 008 - APEX LARGE WOOD STRUCTURE
- ITEM 009 - ISLAND JAM
- ITEM 010 - BANK BURIED LARGE WOOD STRUCTURE
- ITEM 011 - BOULDER BALLASTED SMALL WOOD STRUCTURE
- ITEM 012 - HABITAT BOULDER

MATERIALS

LOG STRUCTURES SHALL BE CONSTRUCTED OF LARGE WOODY MATERIAL (LWM), EXCAVATION AND BACKFILL, SLASH, SALVAGED TREE TOPS, WHOLE TREES AND - IF DIRECTED BY OWNER, OPTIONAL ADDITIVE ITEMS: ITEM 018 - JAM BALLAST BOULDERS AND/OR ITEM 019 - IMPORTED BOULDER BACKFILL.

LWM INCLUDES: LOGS WITH ROOTWADS, LOGS WITHOUT ROOTWADS, AND PILES.

LWM IS SUPPLIED BY THE OWNER AND IS DECKED AT THE PRESTON PIT LOCATED ON THE ENTIAT RIVER ROAD IMMEDIATELY WEST OF THE INTERSECTION WITH US FOREST SERVICE 5501 ROAD; APPROXIMATELY 12.8 MILES WEST OF THE INTERSECTION WITH THE MAD RIVER ROAD.

THE CONTRACTOR SHALL LOAD AND HAUL LWM FROM THE OWNER'S STOCKPILE AT PRESTON PIT. QUANTITIES TO BE MOVED TO EACH SITE ARE SHOWN IN THE PLANS.

OWNER SUPPLIED LWM WILL HAVE THE FOLLOWING CHARACTERISTICS:

1. LOGS WITH ROOTWADS: 40' LONG AND 18"-24” DBH.
2. LOGS WITHOUT ROOTWADS: 40' LONG AND >18" DBH.
3. PILES: 20' LONG AND 15” DIAMETER IN MIDDLE OF LOG.

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

CONTRACTOR SHALL PROCURE, IMPORT, HAUL AND PLACE HABITAT BOULDERS. UNLESS NOTED HEREIN, HABITAT BOULDERS SHALL MEET WSDOT STANDARD SPECIFICATION 9-13.1. HABITAT BOULDERS SHALL BE MINIMUM 4FT EQUIVALENT DIAMETER WITH SPECIFIC GRAVITY OF 2.65 OR GREATER AND SHALL WEIGH NO LESS THAN 5,500 POUNDS DRY WEIGHT PER EACH. HABITAT BOULDERS SHALL BE ROUNDED TO SUBANGULAR.

CONSTRUCTION REQUIREMENTS

EXISTING CONCRETE , ASPHALT AND OTHER DEBRIS ENCOUNTERED IN EXCAVATION AREAS SHALL BE HAULED AND DISPOSED OF OFFSITE AT A COMMERCIAL WASTE FACILITY.

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

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

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

- a. MINIMUM OF 800 KN (80 TONS) OF CENTRIFUGAL FORCE.
- b. SIDE GRIP WITH MINIMUM 16” SPACE BETWEEN ENDS OF JAWS SO THAT 16” DIAMETER LOG WILL FIT INTO THE JAWS WITHOUT NEEDING TO SLIDE THE GRIP OVER THE END AND DOWN THE LOG.
- c. PRE-APPROVED PILE DRIVERS INCLUDE: MOVAX SP-80, GRIZZLY MG90, OR EQUIVALENT.



1.	BB	02/13/24	UDPATE TEXT
NO.	BY	DATE	REVISION DESCRIPTION

CM, BB	PL, DM	PL, DM, MB
DRAWN	DESIGNED	CHECKED
PL, DM	1/23/2024	
APPROVED	DATE	PROJECT

MAD RIVER
RIVER MILE 1.1-4.3
FINAL DESIGN



501 Portway Avenue, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

SPECIFICATIONS (2 OF 3)

z:\clientfiles\wdr\madriver\mh3_4_220265\Drawing\NEL Mad River_PR.dwg - bbroderick - 2/13/24

TESTING: AT EACH LOG STRUCTURE SITE, A MINIMUM OF ONE PILE SHALL BE TESTED FOR PULLOUT RESISTANCE. EACH TEST WILL REQUIRE UP TO FOUR INDIVIDUAL PULLS, EACH AT A DEEPER DEPTH. SEE DETAILS IN PLANS. THE CONTRACTOR SHALL PROVIDE THE TENSION LINK, METER, AND ASSOCIATED HARDWARE (RATED 12 TON).
SLASH: SLASH SHALL BE INCORPORATED INTO LOG STRUCTURES AS SHOWN IN THE PLANS AND DIRECTED BY THE OWNER. INTERMINGLE, STACK, AND RACK SLASH MATERIAL TO THE INSTALLED LWM AND PILE TO EMULATE NATURAL ACCUMULATIONS OF WOOD MATERIAL.

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

EARTHWORK: WHERE PARTIAL BURIAL OF LWM IS REQUIRED, EXCAVATE TO SUBGRADE AND STOCKPILE MATERIAL WITHIN THE DESIGNATED DISTURBANCE AREA. SORT MATERIALS BY GENERAL SIZES, SEPARATING PILES FOR COARSE AND FINE MATERIAL. BACKFILL THE LWM AS EACH LAYER IS INSTALLED. USE COARSE FILL ALONG EXTERIOR OF FILL ZONE AND ALONG WATERWARD EDGE, AND FINER MATERIALS WITHIN INTERIOR OF FILL ZONE. SILT AND SAND SHALL NOT BE USED FOR BACKFILL AND SHALL BE HAULED FROM THE SITE; CONTRACTOR SHALL SALVAGE OR IMPORT GRAVEL/COBBLE ALLUVIUM FOR BACKFILL AT NO ADDITIONAL COST. WHERE POOL EXCAVATION IS INCLUDED, EXCAVATED MATERIAL SHALL BE SALVAGED AND PLACED AS BACKFILL IN LWM STRUCTURE. BACKFILL ALONG WATERWARD EDGE SHALL BE LAYERED WITH SLASH WITH LIFTS NO THICKER THAN 18INCHES AND BUCKET COMPACTED. SLASH SHALL EXTEND 10FT MINIMUM INTO FILL. BACKFILL THE LOGS AS EACH LAYER IS INSTALLED. NO CULTURAL STAFF MONITORING IS REQUIRED FOR THIS PROJECT.

MEASUREMENT AND PAYMENT

MEASUREMENT AND PAYMENT SHALL BE MADE PER EACH STRUCTURE FOR:

- ITEM 008 - APEX LARGE WOOD STRUCTURE
- ITEM 009 - ISLAND JAM

MEASUREMENT AND PAYMENT SHALL BE MADE BY NUMBER OF LOGS WITHIN STRUCTURES FOR:

- ITEM 010 - BANK BURIED LARGE WOOD STRUCTURE
- ITEM 011 - BOULDER BALLASTED SMALL WOOD STRUCTURE

MEASUREMENT AND PAYMENT SHALL BE MADE FOR EACH BOULDER FOR:

- ITEM 012 - HABITAT BOULDER

THE CONTRACT PRICE SHALL BE FULL COMPENSATION FOR ALL COSTS INCURRED FOR EQUIPMENT, MATERIALS AND LABOR FOR HANDLING, LOADING AND HAULING LWM FROM STOCKPILE AREAS, EXCAVATING TO SUBGRADE, SELECTIVE HANDLING OF EXCAVATED MATERIALS AND BACKFILL, SALVAGE OR IMPORT OF SUITABLE BACKFILL MATERIAL, INSTALLING AND SECURING LWM, PILES, SLASH AND SALVAGED TREE TOPS AS OUTLINED IN THE PLANS. EARTHWORK, HAUL AND DISPOSAL OF FILL AND CONCRETE. INSTALLING SLASH AND SALVAGED TREES SHALL BE INCIDENTAL TO. SELECT EXCAVATION AT RM 4.09 SHALL BE INCIDENTAL TO APEX LARGE WOOD STRUCTURE.

ITEMS 013-016 - SIDE CHANNEL

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

- ITEM 013 SIDE CHANNEL RM 1.55
- ITEM 014 SIDE CHANNEL RM 2.70
- ITEM 015 SIDE CHANNEL RM 3.30
- ITEM 016 SIDE CHANNEL RM 3.90

WORK SHALL CONSIST OF EXCAVATING, LOADING AND HAULING SPOILS TO OFFSITE DISPOSAL AREA PLACEMENT AND GRADING TO BLEND TO EXISTING CONTOURS. OFFSITE DISPOSAL AREA IS THE PRESTON PIT OR COMMERCIALLY LICENSED GRAVEL YARD. SPECIFIC LOCATION AND GRADING WILL BE DIRECTED BY THE OWNER IN THE FIELD. SPOILS SHALL

BE PLACED IN DESIGNATED SPOILS AREAS OR OTHERWISE DISPOSED OF IN ACCORDANCE WITH SECTION 2-03 OF THE STANDARD SPECIFICATIONS, AND AS AMENDED BY THESE SPECIAL PROVISIONS.

- OWNER'S REPRESENTATIVE WILL FLAG IN THE FIELD THE ALIGNMENT OF SIDE CHANNELS FOR EXCAVATION. CONTRACTOR SHALL PROVIDE SURVEY EQUIPMENT AND CONDUCT STAKEOUT AND SURVEY TO DETERMINE ELEVATIONS. EXISTING ELEVATION CONTROL POINTS ARE LOCATED NEARBY.
- PORTIONS OF WORK MAY BE IN WATER. THE CONTRACTOR IS ADVISED THAT GROUNDWATER MAY BE ENCOUNTERED THROUGHOUT EXCAVATION AREAS. PUMPING AND TESC SHALL BE IMPLEMENTED AS NECESSARY.
- THIS ITEM INCLUDES HAULING OF MATERIAL EXCAVATED FROM SIDE CHANNELS TO THE PRESTON PIT LOCATED ALONG ENTIAT RIVER ROAD APPROXIMATELY 12.8 MILES WEST OF INTERSECTION WITH MAD RIVER ROAD. EXCAVATED MATERIAL MAY BE REQUIRED AS SALVAGED BACKFILL IN STRUCTURES.
- THIS ITEM INCLUDES DETAIL GRADING TO SHAPE THE CHANNEL, INCLUDING CREATING POOLS AND FLOODPLAIN AND WETLAND ALCOVES, AS SHOWN IN THE PLANS, SCOUR POOLS SHALL BE OVER-EXCAVATED INTO THE STREAM BED TO PROVIDE ROOM TO INSTALL LOGS WITH ROOTS AND SALVAGED TREES.
- CONTRACTOR SHALL NOTIFY THE OWNER WHEN EACH SIDE CHANNEL HAS BEEN EXCAVATED TO LIMITS SHOWN ON THE PLANS. THE OWNER'S REPRESENTATIVE SHALL INSPECT THE EXPOSED BED MATERIAL BEFORE THE CONTRACTOR PROCEEDS WITH FINE GRADING.
- CONTRACTOR SHALL ALLOW OWNER'S REPRESENTATIVE TIME TO INSPECT SOILS EXPOSED AT FINISHED GRADE AND DETERMINE IF OPTIONAL ADDITIVE ALTERNATE ITEM 020 - IMPORTED SUBSTRATE IS REQUIRED. IF SO, CONTRACTOR SHALL COMPLETE IMPORTED SUBSTRATE BEFORE PLACING SALVAGED SLASH, TREE TOPS AND TREES.
- CONTRACTOR SHALL INSTALL LARGE WOOD STRUCTURES INCLUDING: BANK BURIED SMALL WOOD STRUCTURES, OUTLET COVER WOOD AND FLOODPLAIN ROUGHNESS LOGS AS SHOWN ON THE PLANS, ENUMERATED ON SHEET 6, AND APPROVED BY OWNER/ENGINEER.
- INSTALLATION OF SALVAGED SLASH, TREE TOPS AND TREES AT DIRECTION OF OWNER ALONG CONSTRUCTED SIDE CHANNEL.
- NO WORK SHALL OCCUR OUTSIDE OF THE LIMITS OF DISTURBANCE SHOWN IN THE PLANS UNLESS AUTHORIZED BY THE OWNER.

MEASUREMENT AND PAYMENT

SIDE CHANNEL EXCAVATION AND HAUL WILL BE MEASURED BY 1 LUMP SUM MEASUREMENT AND PAYMENT FOR:

- ITEM 013 SIDE CHANNEL RM 1.55
- ITEM 014 SIDE CHANNEL RM 2.70
- ITEM 015 SIDE CHANNEL RM 3.30
- ITEM 016 SIDE CHANNEL RM 3.90

EXCAVATION, HAUL, DISPOSAL, GRADING OF DISPOSED SPOILS, FORMING OF CHANNEL FEATURES; PLACEMENT OF SALVAGED SLASH, TREE TOPS AND TREES;INSTALLATION OF BANK BURIED SMALL WOOD STRUCTURES, OUTLET COVER LOG STRUCTURES AND FLOODPLAIN ROUGHNESS LOGS; AND, EXCAVATION OF SCOUR POOL AND EXCAVATION AND BACKFILL OF LOGS SHALL BE INCIDENTAL TO THIS ITEM. NO ADDITIONAL COMPENSATION WILL BE MADE FOR EXCAVATED MATERIAL THAT IS OVER EXCAVATED OR STOCKPILED, RE-EXCAVATED, AND MOVED AGAIN.

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

ITEM 017 - CONCRETE REMOVAL

CONTRACTOR SHALL REMOVE EXISTING CONCRETE STRUCTURE AT RM 1.33 FROM STREAM BED AND FLOODPLAIN TERRACE. STRUCTURE DIMENSIONS SHOWN ON PLANS ARE APPROXIMATE AND DEPTH OF STRUCTURE IS UNKNOWN. CONTRACTOR SHALL HAUL CONCRETE AND DEBRIS FROM SITE AND DISPOSE OF AT AN OFFSITE COMMERCIAL WASTE MANAGEMENT FACILITY.

MEASUREMENT AND PAYMENT

CONCRETE REMOVAL SHALL BE MEASURED AND PAID FOR AS ONE LUMP SUM. PAYMENT SHALL BE FULL COMPENSATION FOR ALL EQUIPMENT. LABOR, TOOLS AND MATERIALS NECESSARY TO COMPLETE THE WORK

OPTIONAL ADDITIVE ALTERNATE ITEMS

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

ITEM 018 - JAM BALLAST BOULDERS

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

MEASUREMENT AND PAYMENT

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

ITEM 019 - IMPORTED BOULDER BACKFILL

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


MEASUREMENT AND PAYMENT

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

ITEM 020 - IMPORTED SUBSTRATE

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

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

- BY VOLUME, THE COARSE SUBSTRATE MIX SHALL CONSIST OF 75% STREAMBED SEDIMENT (WSDOT 9-03.11(1)) MIXED WITH 25% 12-INCH MINUS STREAMBED COBBLE (WSDOT 9-03.11(4)) 
- CONTRACTOR SHALL MIX COARSE SUBSTRATE MATERIALS AND NOTIFY OWNER FOR INSPECTION BEFORE PLACING IN THE SIDE CHANNEL.

MEASUREMENT AND PAYMENT

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

ITEM 021 - REPOSITION DOWNED TREES (RM 3.58-3.8)

CONTRACTOR SHALL USE RUNNING RIGGING AND MAN-PORTABLE TOOLS TO REPOSITION EXISTING DOWNED TREES LOCATED ON THE FLOODPLAIN. TREES SHALL BE MOVED INTO THE MAD RIVER CHANNEL AT DIRECTION OF ENGINEER. NO MOTORIZED EQUIPMENT IS ALLOWED IN THE MAD RIVER CHANNEL AND FLOODPLAIN.

MEASUREMENT AND PAYMENT

MEASUREMENT AND PAYMENT SHALL BE PER EACH OF DOWNED TREES MOVED INTO THE MAD RIVER CHANNEL. PAYMENT SHALL BE FULL COMPENSATION FOR ALL COST INCURRED TO MOVE LOGS INTO POSITION.



1.	BB	02/13/24	UPDATE WSDOT SPECIFICATION REFERENCE
NO.	BY	DATE	REVISION DESCRIPTION

CM, BB	PL, DM	PL, DM, MB
DRAWN	DESIGNED	CHECKED
PL, DM	1/23/2024	
APPROVED	DATE	PROJECT

MAD RIVER
RIVER MILE 1.1-4.3
FINAL DESIGN



501 Portway Avenue, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

SPECIFICATIONS (3 OF 3)