

CHEWUCH RIVER MILE 4

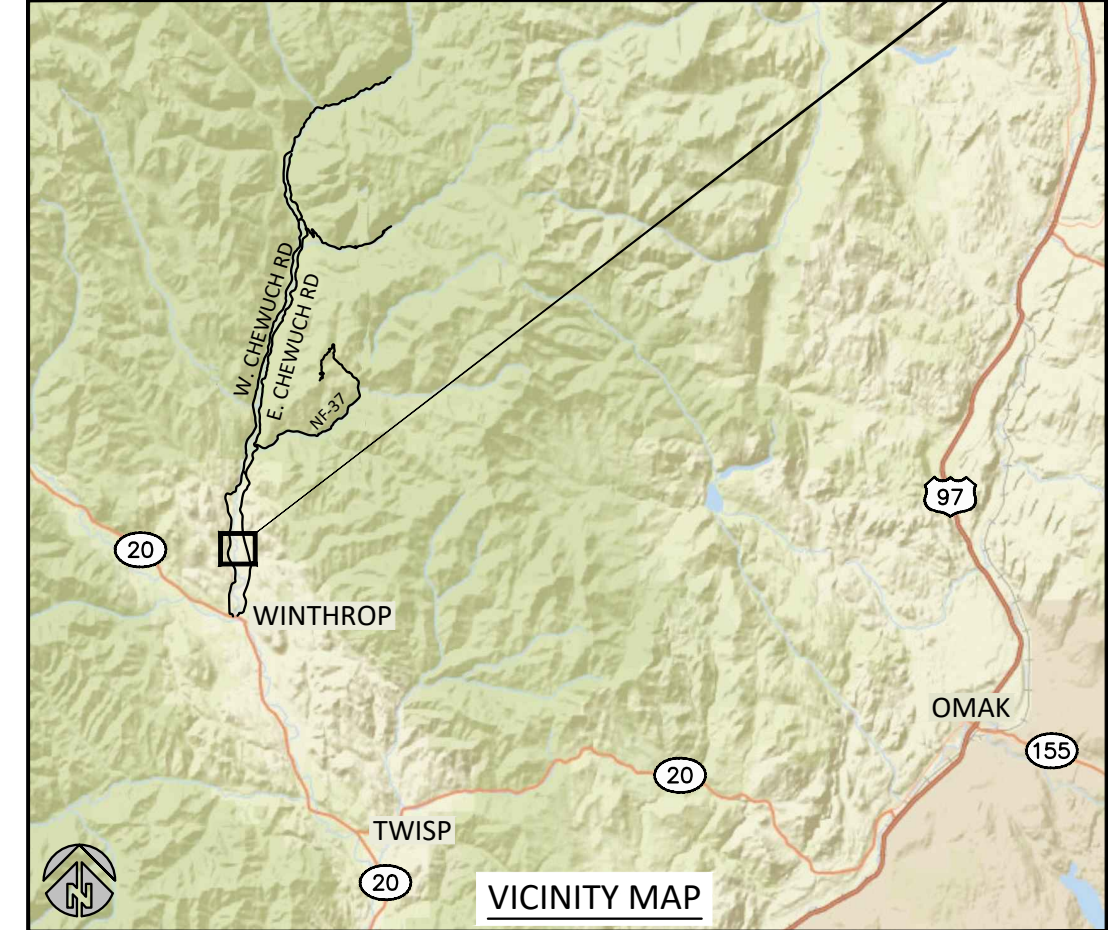
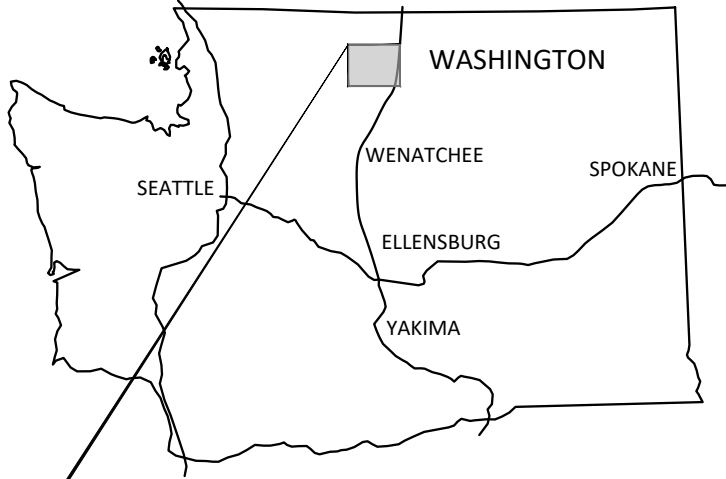
FISH HABITAT ENHANCEMENT PROJECT

Final Design



YAKAMA NATION FISHERIES
2 JOHNSON LANE
WINTHROP WA, 98862

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SITE LOCATION:
LATITUDE: 48°31'16"
LONGITUDE: -120°11'05"
OKANOGAN COUNTY, WASHINGTON

WATERBODY: CHEWUCH RIVER
TRIBUTARY OF: METHOW RIVER



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NO.	BY	DATE	REVISION DESCRIPTION

MM, GS	MB	CB
DRAWN	DESIGNED	CHECKED
----	12/31/19	
APPROVED	DATE	PROJECT

YAKAMA NATION FISHERIES PROGRAM
CHEWUCH RIVER MILE 4.2
FISH HABITAT ENHANCEMENT



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

IT IS STRONGLY SUGGESTED THAT THE CONTRACTOR ATTEND THE PRE-CONSTRUCTION MEETING WITH THE OWNER AND OWNER'S REPRESENTATIVE PRIOR TO BEGINNING CONSTRUCTION. THE PROJECT SITE IS ON PRIVATE PROPERTY. SITE VISITS PRIOR TO THE PRE-CONSTRUCTION MEETING ARE NOT ALLOWED WITHOUT PRIOR PERMISSION FROM THE YAKAMA NATION PROJECT MANAGER.

ALL WORK SHALL CONFORM TO THE 2014 EDITIONS OF STANDARD PLANS AND SPECIFICATIONS OF THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT), AND LOCAL STANDARDS UNLESS INDICATED OTHERWISE BY THE CONTRACT DOCUMENTS. IN CASE OF A CONFLICT BETWEEN THE REGULATORY STANDARDS OR SPECIFICATIONS, THE MORE STRINGENT WILL PREVAIL.

BPA HIP III

THIS PROJECT WAS DESIGNED IN ACCORDANCE WITH THE BPA HABITAT IMPROVEMENT PROGRAM, PROGRAMMATIC BIOLOGICAL OPINION (HIP III). HIP III GENERAL CONSERVATION MEASURES (CMs) ARE INCLUDED ON SHEETS 3 AND 4. SITE SPECIFIC DIRECTION IS INCLUDED IN THE FOLLOWING GENERAL NOTES. ANY VARIANCES FROM HIP III CMs WILL BE REQUESTED BY OWNER. IN CASE OF A CONFLICT BETWEEN THE REGULATORY STANDARDS OR SPECIFICATIONS, LOCAL REGULATIONS, OR OTHER CONTRACT DOCUMENTATION, THE MORE STRINGENT WILL PREVAIL, UNLESS SPECIFIED IN WRITING BY THE OWNER.

EXISTING DATA

TOPOGRAPHIC SURVEY COLLECTED BY INTER-FLUVE, INC. BY RTK GPS AND TOTAL STATION IN 2017-18. REFERENCED TO NAD83 WASHINGTON STATE PLANE, NORTH ZONE US FEET NAVD 88.

CULTURAL RESOURCES

A YAKAMA NATION ARCHEOLOGIST WILL BE ON SITE DURING CONSTRUCTION. ENCOUNTERING THE FOLLOWING CULTURAL RESOURCES REQUIRES THE IMMEDIATE DISCONTINUATION OF ALL GROUND-DISTURBING ACTIVITY:

- 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 AND BONE FRAGMENTS

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 THE ARCHEOLOGIST AND BPA'S CULTURAL RESOURCES STAFF.

INVASIVE SPECIES CONTROL

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.

DISTURBANCE LIMITS

ACCESS ROUTES AND CLEARING LIMITS WILL BE STAKED IN THE FIELD BY THE OWNER PRIOR TO CONSTRUCTION. ACCESS FOR CHANNEL CONSTRUCTION SHALL UTILIZE AN "INSIDE-OUT" APPROACH TO CONSTRUCTION AND HAULING ROUTES, WHICH SHALL REMAIN WITHIN THE CHANNEL CONSTRUCTION FOOTPRINT.

LIVE TREES

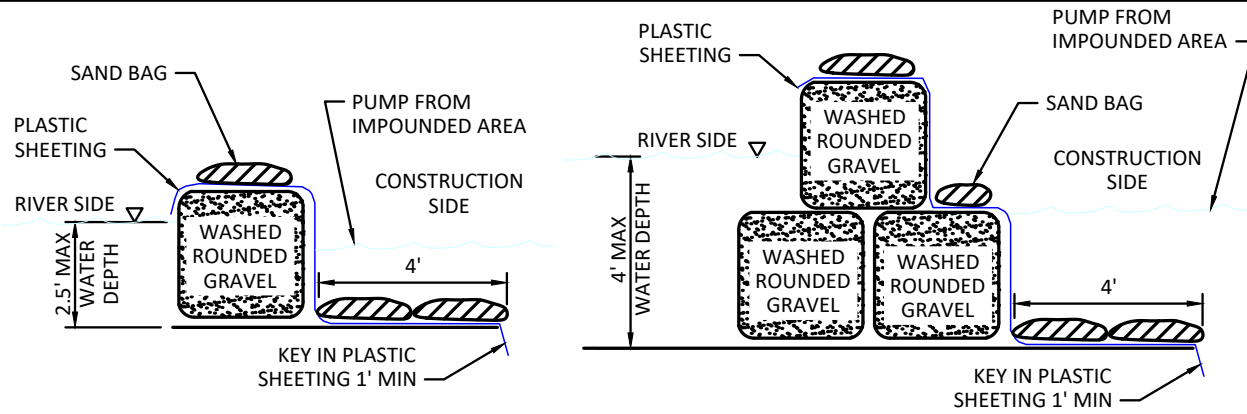
ALL TREES NOT MARKED FOR REMOVAL SHALL BE PRESERVED AND UNDISTURBED. CONSTRUCTION ACTIVITY SHALL NOT DEBARK OR DAMAGE LIVE TREES. KEEP OUT OF DRIP LINE OF ALL PRESERVED EXISTING TREES.

ALL SAPLING AND TREES TO BE REMOVED FOR ACCESS WILL BE APPROVED AND CLEARLY MARKED BY THE OWNER'S REPRESENTATIVE.

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

ABBREVIATIONS

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



SINGLE LAYER COFFERDAM
(WATER DEPTH LESS THAN 2.5')

STACKED BULK BAG COFFERDAM
(WATER DEPTH GREATER THAN 2.5')

TEMPORARY COFFERDAM DETAILS
NOT TO SCALE

COFFERDAM NOTES:

- SEE SHEET 16 FOR ADDITIONAL DETAILS FOR COFFERDAM AND PUMPING.
- BULKBAG COFFERDAM IS A PRE-APPROVED METHOD OF ISOLATING CONSTRUCTION WATER FROM THE WATERWAY. ALTERNATE COFFERDAM MATERIALS AND CONFIGURATIONS MAY BE ALLOWED BUT SHALL NOT BE IMPLEMENTED WITHOUT REVIEW AND APPROVAL BY THE OWNER. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS AND/OR VENDOR CUT SHEETS FOR SUBSTITUTIONS.
- BULKBAG COFFERDAM SHALL BE CONSTRUCTED OF SEVERAL UNITS OF BULK BAGS FILLED WITH WASHED ROUNDED GRAVEL WITH SIZES RANGING 1-3". ABUT FILLED BULK BAGS SIDE BY SIDE TO CREATE A ROW THAT ISOLATES THE CONSTRUCTION SITE FROM THE RIVER.
- IF WATER DEPTH EXCEEDS 85% OF THE BULK BAG HEIGHT, AN ADDITIONAL TOP ROW OF BULKBAGS SHALL BE INSTALLED, SUPPORTED BY TWO BOTTOM ROWS OF BULK BAGS.
- BULKBAG COFFERDAM SHALL BE SEALED BY COVERING THE COFFERDAM WITH PLASTIC SHEETING HELD IN PLACE BY STANDARD SANDBAGS PLACED IN ROWS ON TOP OF COFFERDAM, AND AT TOE OF COFFERDAM. THE PLASTIC SHEETING SHALL BE DRAPED ALONG THE CHANNEL BOTTOM ON THE WORK AREA SIDE OF THE COFFERDAM WITH OUTWARD EDGE OF SHEETING MINIMUM 4-FEET FROM TOE OF COFFERDAM. THE DRAPED PORTION OF PLASTIC SHEETING SHALL BE PINNED TO THE CHANNEL BED BY MINIMUM TWO ROWS OF STANDARD SANDBAGS.
- THE OUTWARD EDGE OF PLASTIC SHEETING ON WORK AREA SIDE SHALL BE TOED INTO THE CHANNEL BED MINIMUM 1-FT. TOEING IN THE OUTWARD EDGE OF PLASTIC SHEETING SHALL OCCUR AFTER THE COFFERDAM IS CLOSED TO PREVENT TURBIDITY RELEASE TO THE WATERWAY.
- IF POSSIBLE, THE COFFERDAM SHALL BE EXTENDED ONTO A GRAVEL BAR AND OUT OF THE WATER. IF THE END MUST BE TERMINATED AT THE RIVERBANK, THE COFFERDAM SHALL BE TIGHTLY SEALED TO THE GROUND BY PLASTIC SHEETING AND STANDARD SANDBAGS. MULTIPLE LAYERS OF SHEETING AND SANDBAGS MAY BE REQUIRED TO FORM A WATERTIGHT SEAL.
- BULKBAGS SHALL BE WATERPROOF CUBE-SHAPED POLYPROPYLENE WOVEN FABRIC BAGS WITH FULLY OPEN TOP, FLAT BOTTOM, FOUR LOOPS, MINIMUM 2-TON WEIGHT CAPACITY, MINIMUM 5:1 SAFETY FACTOR.
- PLASTIC SHEETING SHALL BE MINIMUM 6-MIL THICKNESS. ROLL LENGTH SHALL BE LONG ENOUGH TO ENSURE THAT ENTIRE LENGTH OF COFFERDAM WILL BE COVERED WITHOUT A SEAM. MINIMUM 12-FT WIDE ROLL SHALL BE USED FOR SINGLE LAYER BULK BAG COFFERDAM. MINIMUM 16-FT WIDE ROLL SHALL BE USED FOR 2-LAYER STACKED BULK BAG COFFERDAM.
- CONTRACTOR SHALL PROVIDE PUMPING SUFFICIENT FOR A NET INFLOW TO THE WORK AREA, AND DISCHARGE TURBID WATER TO UPLAND FLOODPLAIN.
- BULKBAG COFFERDAM SHALL BE COMPLETELY REMOVED AFTER CONSTRUCTION IS COMPLETED AND TURBIDITY HAS BEEN REMOVED. UPON OWNER'S REQUEST, BULK BAGS WILL BE OPENED AND ROUNDED GRAVEL APPLIED TO THE RIVER.
- IF NECESSARY, GAPS BETWEEN BULK BAGS MAY BE FILLED WITH WASHED GRAVEL TO SEAL AND IMPROVE COFFERDAM SEAL.

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GENERAL NOTES

SHEET

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HIP 3 GENERAL AQUATIC CONSERVATION MEASURES APPLICABLE TO ALL ACTIONS

THE ACTIVITIES COVERED UNDER THE HIPIII ARE INTENDED TO PROTECT AND RESTORE FISH AND WILDLIFE HABITAT WITH LONG-TERM BENEFITS TO ESA-LISTED SPECIES. TO MINIMIZE THESE SHORT-TERM ADVERSE EFFECTS AND MAKE THEM PREDICTABLE FOR THE PURPOSES OF PROGRAMMATIC ANALYSIS, BPA WILL INCLUDE IN ALL PROJECTS IMPLEMENTED UNDER THIS HIP III PROPOSED ACTION THE FOLLOWING GENERAL CONSERVATION MEASURES (DEVELOPED IN COORDINATION WITH USFWS AND NMFS).

PROJECT DESIGN AND SITE PREPARATION.

1) STATE AND FEDERAL PERMITS. ALL APPLICABLE REGULATORY PERMITS AND OFFICIAL PROJECT AUTHORIZATIONS WILL BE OBTAINED BEFORE PROJECT IMPLEMENTATION. THESE PERMITS AND AUTHORIZATIONS INCLUDE, BUT ARE NOT LIMITED TO, NATIONAL ENVIRONMENTAL POLICY ACT, NATIONAL HISTORIC PRESERVATION ACT, AND THE APPROPRIATE STATE AGENCY REMOVAL AND FILL PERMIT, USACE CLEAN WATER ACT (CWA) 404 PERMITS, AND CWA SECTION 401 WATER QUALITY CERTIFICATIONS.

2) TIMING OF IN-WATER WORK. APPROPRIATE WASHINGTON DEPARTMENT OF FISH AND WILDLIFE (WDFW) GUIDELINES FOR TIMING OF IN-WATER WORK WINDOWS (IWW) WILL BE FOLLOWED. IN-WATER WORK SHALL OCCUR ONLY DURING THE AUTHORIZED PERIOD STATED IN THE HYDRAULIC PROJECT APPROVAL (HPA) ISSUED FOR THIS PROJECT.

A) BULL TROUT - WHILE UTILIZING THE APPROPRIATE STATE DESIGNATED IN-WATER WORK PERIOD WILL LESSEN THE RISK TO BULL TROUT, THIS ALONE MAY NOT BE SUFFICIENT TO ADEQUATELY PROTECT LOCAL BULL TROUT POPULATIONS. THIS IS ESPECIALLY TRUE IF WORK IS OCCURRING IN SPAWNING AND REARING AREAS BECAUSE EGGS, ALEVIN, AND FRY ARE IN THE SUBSTRATE OR CLOSELY ASSOCIATED HABITATS NEARLY YEAR ROUND. SOME AREAS MAY NOT HAVE DESIGNATED IN-WATER WORK WINDOWS FOR BULL TROUT OR IF THEY DO, THEY MAY CONFLICT WITH WORK WINDOWS FOR SALMON AND STEELHEAD. IF THIS IS THE CASE, OR IF PROPOSED WORK IS TO OCCUR WITHIN BULL TROUT SPAWNING AND REARING HABITATS, 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.

B) LAMPREY - THE PROJECT SPONSOR AND/OR THEIR CONTRACTORS WILL AVOID WORKING IN STREAM OR RIVER CHANNELS THAT CONTAIN PACIFIC LAMPREY FROM MARCH 1 TO JULY 1 IN LOW TO MID ELEVATION REACHES (<5,000 FEET). IN HIGH ELEVATION REACHES (>5,000 FEET), THE PROJECT SPONSOR WILL AVOID WORKING IN STREAM OR RIVER CHANNELS FROM MARCH 1 TO AUGUST 1. 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 OUTLINED IN US FISH AND WILDLIFE SERVICE BEST MANAGEMENT PRACTICES TO MINIMIZE ADVERSE EFFECTS TO PACIFIC LAMPREY (2010).

C) EXCEPTIONS TO ODFW, WDFW, MFWP, OR IDFG IN-WATER WORK WINDOWS WILL BE REQUESTED THROUGH THE VARIANCE PROCESS (PAGE 2).

3) CONTAMINANTS. THE PROJECT SPONSOR WILL COMPLETE A SITE ASSESSMENT WITH THE FOLLOWING ELEMENTS TO IDENTIFY THE TYPE, QUANTITY, AND EXTENT OF ANY POTENTIAL CONTAMINATION FOR ANY ACTION THAT INVOLVES EXCAVATION OF MORE THAN 20 CUBIC YARDS OF MATERIAL:

A) A REVIEW OF AVAILABLE RECORDS, SUCH AS FORMER SITE USE, BUILDING PLANS, AND RECORDS OF ANY PRIOR CONTAMINATION EVENTS;

B) A SITE VISIT TO INSPECT THE AREAS USED FOR VARIOUS INDUSTRIAL PROCESSES AND THE CONDITION OF THE PROPERTY;

C) INTERVIEWS WITH KNOWLEDGEABLE PEOPLE, SUCH AS SITE OWNERS, OPERATORS, AND OCCUPANTS, NEIGHBORS, OR LOCAL GOVERNMENT OFFICIALS; AND

D) A SUMMARY, STORED WITH THE PROJECT FILE THAT INCLUDES AN ASSESSMENT OF THE LIKELIHOOD THAT CONTAMINANTS ARE PRESENT AT THE SITE, BASED ON ITEMS 4(A) THROUGH 4(C).

4) SITE LAYOUT AND FLAGGING. PRIOR TO CONSTRUCTION, THE ACTION AREA WILL BE CLEARLY FLAGGED TO IDENTIFY THE FOLLOWING:

A) SENSITIVE RESOURCE AREAS, SUCH AS AREAS BELOW ORDINARY HIGH WATER, SPAWNING AREAS, SPRINGS, AND WETLANDS;

B) EQUIPMENT ENTRY AND EXIT POINTS;

C) ROAD AND STREAM CROSSING ALIGNMENTS;

D) STAGING, STORAGE, AND STOCKPILE AREAS; AND

E) NO-SPRAY AREAS AND BUFFERS.

5) TEMPORARY ACCESS ROADS AND PATHS.

A) EXISTING ACCESS ROADS AND PATHS WILL BE PREFERENTIALLY USED WHENEVER REASONABLE, AND THE NUMBER AND LENGTH OF TEMPORARY ACCESS ROADS AND PATHS THROUGH RIPARIAN AREAS AND FLOODPLAINS WILL BE MINIMIZED TO LESSEN SOIL DISTURBANCE AND COMPACTION, AND IMPACTS TO VEGETATION.

B) 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.

C) 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).

D) 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.

E) TEMPORARY ROADS AND PATHS IN WET AREAS OR AREAS PRONE TO FLOODING WILL BE OBLITERATED BY THE END OF THE IN-WATER WORK WINDOW.

6) TEMPORARY STREAM CROSSINGS.

A) EXISTING STREAM CROSSINGS WILL BE PREFERENTIALLY USED WHENEVER REASONABLE, AND THE NUMBER OF TEMPORARY STREAM CROSSINGS WILL BE MINIMIZED.

B) TEMPORARY BRIDGES AND CULVERTS WILL BE INSTALLED TO ALLOW FOR EQUIPMENT AND VEHICLE CROSSING OVER PERENNIAL STREAMS DURING CONSTRUCTION. TREATED WOOD SHALL NOT BE USED ON TEMPORARY BRIDGE CROSSINGS OR IN LOCATIONS IN CONTACT WITH OR OVER WATER.

C) EQUIPMENT AND VEHICLES WILL CROSS THE STREAM IN THE WET ONLY WHERE:

I. THE STREAMBED IS BEDROCK; OR

II. MATS OR OFF-SITE LOGS ARE PLACED IN THE STREAM AND USED AS A CROSSING.

D) VEHICLES AND MACHINERY WILL CROSS STREAMS AT RIGHT ANGLES TO THE MAIN CHANNEL WHEREVER POSSIBLE.

E) THE LOCATION OF THE TEMPORARY CROSSING WILL AVOID AREAS THAT MAY INCREASE THE RISK OF CHANNEL RE-ROUTING OR AVULSION.

F) POTENTIAL SPAWNING HABITAT (I.E., POOL TAILOUTS) AND POOLS WILL BE AVOIDED TO THE MAXIMUM EXTENT POSSIBLE.

G) NO STREAM CROSSINGS WILL OCCUR AT ACTIVE SPAWNING SITES, WHEN HOLDING ADULT LISTED FISH ARE PRESENT, OR WHEN EGGS OR ALEVINS ARE IN THE GRAVEL. THE APPROPRIATE STATE FISH AND WILDLIFE AGENCY WILL BE CONTACTED FOR SPECIFIC TIMING INFORMATION.

H) AFTER PROJECT COMPLETION, TEMPORARY STREAM CROSSINGS WILL BE OBLITERATED AND THE STREAM CHANNEL 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, OR ON AN ADJACENT, ESTABLISHED ROAD AREA IN A LOCATION AND MANNER THAT WILL PRECLUDE EROSION INTO OR CONTAMINATION OF THE STREAM OR FLOODPLAIN.

B) NATURAL MATERIALS USED FOR IMPLEMENTATION OF AQUATIC RESTORATION, SUCH AS LARGE WOOD, GRAVEL, AND BOULDERS, MAY BE STAGED WITHIN THE 100-YEAR FLOODPLAIN.

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 REMOVED TO A LOCATION OUTSIDE OF THE 100-YEAR FLOODPLAIN FOR DISPOSAL.

8) EQUIPMENT. 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). ALL VEHICLES AND OTHER MECHANIZED EQUIPMENT WILL BE:

A) STORED, FUELED, AND MAINTAINED IN A VEHICLE STAGING AREA PLACED 150 FEET OR MORE FROM ANY NATURAL WATER BODY OR WETLAND OR ON AN ADJACENT, ESTABLISHED ROAD AREA;

B) REFUELED IN A VEHICLE STAGING AREA PLACED 150 FEET OR MORE FROM A NATURAL WATERBODY OR WETLAND, OR IN AN ISOLATED HARD ZONE, SUCH AS A PAVED PARKING LOT OR ADJACENT, ESTABLISHED ROAD (THIS MEASURE APPLIES ONLY TO GAS-POWERED EQUIPMENT WITH TANKS LARGER THAN 5 GALLONS);

C) BIODEGRADABLE LUBRICANTS AND FLUIDS SHALL BE USED ON EQUIPMENT OPERATING IN AND ADJACENT TO THE STREAM CHANNEL AND LIVE WATER.

D) INSPECTED DAILY FOR FLUID LEAKS BEFORE LEAVING THE VEHICLE STAGING AREA FOR OPERATION WITHIN 150 FEET OF ANY NATURAL WATER BODY OR WETLAND; AND

E) THOROUGHLY CLEANED BEFORE OPERATION BELOW ORDINARY HIGH WATER, AND AS OFTEN AS NECESSARY DURING OPERATION, TO REMAIN GREASE FREE.

9) EROSION CONTROL. EROSION CONTROL MEASURES WILL BE PREPARED AND CARRIED OUT, COMMENSURATE IN SCOPE WITH THE ACTION, THAT MAY INCLUDE THE FOLLOWING:

A) TEMPORARY EROSION CONTROLS.

I. 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.

II. 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.

III. TEMPORARY EROSION CONTROL MEASURES MAY INCLUDE FIBER WATTLES, SILT FENCES, JUTE MATTING, WOOD FIBER MULCH AND SOIL BINDER, OR GEOTEXTILES AND GEOSYNTHETIC FABRIC.

IV. 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. SEDIMENT WILL BE REMOVED FROM EROSION CONTROLS ONCE IT HAS REACHED 1/3 OF THE EXPOSED HEIGHT OF THE CONTROL.

IV. 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:

I. A SUPPLY OF SEDIMENT CONTROL MATERIALS; AND

II. AN OIL-ABSORBING FLOATING BOOM WHENEVER SURFACE WATER IS PRESENT.

10) DUST ABATEMENT. 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. IN ADDITION, THE FOLLOWING CRITERIA WILL BE FOLLOWED:

A) WORK WILL BE SEQUENCED AND SCHEDULED TO REDUCE EXPOSED BARE SOIL SUBJECT TO WIND EROSION.

B) 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 A 50:50 (LIGNINSULFONATE TO WATER) SOLUTION.

C) 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).

D) SPILL CONTAINMENT EQUIPMENT WILL BE AVAILABLE DURING APPLICATION OF DUST ABATEMENT CHEMICALS.

E) PETROLEUM-BASED PRODUCTS WILL NOT BE USED FOR DUST ABATEMENT.

11) SPILL PREVENTION, CONTROL, AND COUNTER MEASURES. THE USE OF MECHANIZED MACHINERY INCREASES THE RISK FOR ACCIDENTAL SPILLS OF FUEL, LUBRICANTS, HYDRAULIC FLUID, OR OTHER CONTAMINANTS INTO THE RIPARIAN ZONE OR DIRECTLY INTO THE WATER. ADDITIONALLY, UNCURED CONCRETE AND FORM MATERIALS ADJACENT TO THE ACTIVE STREAM CHANNEL MAY RESULT IN ACCIDENTAL DISCHARGE INTO THE WATER. THESE CONTAMINANTS CAN DEGRADE HABITAT, AND INJURE OR KILL AQUATIC FOOD ORGANISMS AND ESA-LISTED SPECIES. THE PROJECT SPONSOR WILL ADHERE TO THE FOLLOWING 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 TARPAULIN, UNTIL THEY CAN BE PROPERLY TRANSPORTED TO AND DISPOSED OF AT A FACILITY THAT IS APPROVED FOR RECEIPT OF HAZARDOUS MATERIALS.

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HIP-III GENERAL NOTES (1 OF 2)

SHEET

3 OF 17

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APPROVED	DATE	PROJECT

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WORK AREA ISOLATION & FISH SALVAGE.

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. WHEN WORK AREA ISOLATION IS REQUIRED, DESIGN PLANS WILL INCLUDE ALL ISOLATION ELEMENTS, FISH RELEASE AREAS, AND, WHEN A PUMP IS USED TO DEWATER THE ISOLATION AREA AND FISH ARE PRESENT, A FISH SCREEN THAT MEETS NMFS'S FISH SCREEN CRITERIA (NMFS 2011, OR MOST CURRENT). 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.

- NATIONAL MARINE FISHERIES SERVICE. 2011. ANADROMOUS SALMONID PASSAGE FACILITY DESIGN. NORTHWEST REGION. AVAILABLE ONLINE AT:
HTTP://WWW.NWR.NOAA.GOV/SALMON-HYDROPOWER/FERC/UPLOAD/FISH-PASSAGE-DESIGN.PDF
- U.S. FISH AND WILDLIFE SERVICE. 2010. BEST MANAGEMENT PRACTICES TO MINIMIZE ADVERSE EFFECTS TO PACIFIC LAMPREY.
HTTP://WWW.FWS.GOV/PACIFIC/FISHERIES/SPHABCON/LAMPREY/PDF/BEST%20MANAGEMENT%20PRACTICES%20FOR%20PACIFIC%20LAMPREY%20APRIL%202010%20VERSION.PDF

FOR SALVAGE OPERATIONS IN KNOWN BULL TROUT SPAWNING AND REARING HABITAT, ELECTROFISHING SHALL ONLY OCCUR FROM MAY 1 TO JULY 31. NO ELECTROFISHING WILL OCCUR IN ANY BULL TROUT OCCUPIED HABITAT AFTER AUGUST 15. BULL TROUT ARE VERY TEMPERATURE SENSITIVE AND GENERALLY SHOULD NOT BE ELECTROSHOCKED OR OTHERWISE HANDLED WHEN TEMPERATURES EXCEED 15 DEGREES CELSIUS. SALVAGE ACTIVITIES SHOULD TAKE PLACE 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 TO FISH SPECIES PRESENT. SALVAGE OPERATIONS WILL FOLLOW THE ORDERING, METHODOLOGIES, AND CONSERVATION MEASURES SPECIFIED BELOW IN STEPS 1 THROUGH 6. STEPS 1 AND 2 WILL BE IMPLEMENTED FOR ALL PROJECTS WHERE WORK AREA ISOLATION IS NECESSARY ACCORDING TO CONDITIONS ABOVE. ELECTROFISHING (STEP 3) CAN BE IMPLEMENTED TO ENSURE ALL FISH HAVE BEEN REMOVED FOLLOWING STEPS 1 AND 2, OR WHEN OTHER MEANS OF FISH CAPTURE MAY NOT BE FEASIBLE OR EFFECTIVE. DEWATERING AND REWATERING (STEPS 4 AND 5) WILL BE IMPLEMENTED UNLESS WETTED IN-STREAM WORK IS DEEMED TO BE MINIMALLY HARMFUL TO FISH, AND IS BENEFICIAL TO OTHER AQUATIC SPECIES. DEWATERING WILL NOT BE CONDUCTED IN AREAS KNOWN TO BE OCCUPIED BY LAMPREY, UNLESS LAMPREYS ARE SALVAGED USING GUIDANCE SET FORTH IN US FISH AND WILDLIFE SERVICE (2010)3.

- 1) ISOLATE.
- A) BLOCK NETS WILL BE INSTALLED AT UPSTREAM AND DOWNSTREAM LOCATIONS AND MAINTAINED IN A SECURED POSITION TO EXCLUDE FISH FROM ENTERING THE PROJECT AREA.
- B) 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.
- C) IF BLOCK NETS REMAIN IN PLACE MORE THAN ONE DAY, THE NETS WILL BE MONITORED AT LEAST DAILY TO ENSURE THEY ARE SECURED TO THE BANKS AND FREE OF ORGANIC ACCUMULATION. IF THE PROJECT IS WITHIN BULL TROUT SPAWNING AND REARING HABITAT, THE BLOCK NETS MUST BE CHECKED EVERY FOUR HOURS FOR FISH IMPINGEMENT ON THE NET. LESS FREQUENT INTERVALS MUST BE APPROVED THROUGH A VARIANCE REQUEST.
- D) NETS WILL BE MONITORED HOURLY ANYTIME THERE IS INSTREAM DISTURBANCE.
- 2) SALVAGE, AS DESCRIBED BELOW, FISH TRAPPED WITHIN THE ISOLATED WORK AREA WILL BE CAPTURED TO MINIMIZE THE RISK OF INJURY, THEN RELEASED AT A SAFE SITE:
- A) REMOVE AS MANY FISH AS POSSIBLE PRIOR TO DEWATERING.
- B) DURING DEWATERING, ANY REMAINING FISH WILL BE COLLECTED BY HAND OR DIP NETS.
- C) SEINES WITH A MESH SIZE TO ENSURE CAPTURE OF THE RESIDING ESA-LISTED FISH WILL BE USED.
- D) MINNOW TRAPS WILL BE LEFT IN PLACE OVERNIGHT AND USED IN CONJUNCTION WITH SEINING.
- E) IF BUCKETS ARE USED TO TRANSPORT FISH:
- I. THE TIME FISH ARE IN A TRANSPORT BUCKET WILL BE LIMITED, AND WILL BE RELEASED AS QUICKLY AS POSSIBLE;
- II. THE NUMBER OF FISH WITHIN A BUCKET WILL BE LIMITED BASED ON SIZE, AND FISH WILL BE OF RELATIVELY COMPARABLE SIZE TO MINIMIZE PREDATION;
- III. AERATORS FOR BUCKETS WILL BE USED OR THE BUCKET WATER WILL BE FREQUENTLY CHANGED WITH COLD CLEAR WATER AT 15 MINUTE OR MORE FREQUENT INTERVALS.
- IV. BUCKETS WILL BE KEPT IN SHADED AREAS OR WILL BE COVERED BY A CANOPY IN EXPOSED AREAS.
- V. DEAD FISH WILL NOT BE STORED IN TRANSPORT BUCKETS, BUT WILL BE LEFT ON THE STREAM BANK TO AVOID MORTALITY COUNTING ERRORS.
- F) AS RAPIDLY AS POSSIBLE (ESPECIALLY FOR TEMPERATURE-SENSITIVE BULL TROUT), FISH WILL BE RELEASED IN AN AREA THAT PROVIDES ADEQUATE COVER AND FLOW REFUGE. UPSTREAM RELEASE IS GENERALLY PREFERRED, BUT FISH RELEASED DOWNSTREAM WILL BE SUFFICIENTLY OUTSIDE OF THE INFLUENCE OF CONSTRUCTION.
- G) SALVAGE WILL BE SUPERVISED BY A QUALIFIED FISHERIES BIOLOGIST EXPERIENCED WITH WORK AREA ISOLATION AND COMPETENT TO ENSURE THE SAFE HANDLING OF ALL FISH.

- 3) ELECTROFISHING. ELECTROFISHING WILL BE USED ONLY AFTER OTHER SALVAGE METHODS HAVE BEEN EMPLOYED OR WHEN OTHER MEANS OF FISH CAPTURE ARE DETERMINED TO NOT BE FEASIBLE OR EFFECTIVE. IF ELECTROFISHING WILL BE USED TO CAPTURE FISH FOR SALVAGE, THE SALVAGE OPERATION WILL BE LED BY AN EXPERIENCED FISHERIES BIOLOGIST AND THE FOLLOWING GUIDELINES WILL BE FOLLOWED:
- A) THE NMFS'S ELECTROFISHING GUIDELINES (NMFS 2000).
- B) ONLY DIRECT CURRENT (DC) OR PULSED DIRECT CURRENT (PDC) WILL BE USED AND CONDUCTIVITY MUST BE TESTED.
- I. IF CONDUCTIVITY IS LESS THAN 100 MS, VOLTAGE RANGES FROM 900 TO 1100 WILL BE USED.
- II. FOR CONDUCTIVITY RANGES BETWEEN 100 TO 300 MS, VOLTAGE RANGES WILL BE 500 TO 800.
- III. FOR CONDUCTIVITY GREATER THAN 300 MS, VOLTAGE WILL BE LESS THAN 400.
- C) ELECTROFISHING WILL BEGIN WITH A MINIMUM PULSE WIDTH AND RECOMMENDED VOLTAGE AND THEN GRADUALLY INCREASE TO THE POINT WHERE FISH ARE IMMOBILIZED.
- D) THE ANODE WILL NOT INTENTIONALLY CONTACT FISH.
- E) ELECTROFISHING SHALL NOT BE CONDUCTED WHEN THE WATER CONDITIONS ARE TURBID AND VISIBILITY IS POOR. THIS CONDITION MAY BE EXPERIENCED WHEN THE SAMPLER CANNOT SEE THE STREAM BOTTOM IN ONE FOOT OF WATER.
- F) IF MORTALITY OR OBVIOUS INJURY (DEFINED AS DARK BANDS ON THE BODY, SPINAL DEFORMATIONS, DE-SCALING OF 25% OR MORE OF BODY, AND TORPIDITY OR INABILITY TO MAINTAIN UPRIGHT ATTITUDE AFTER SUFFICIENT RECOVERY TIME) OCCURS DURING ELECTROFISHING, OPERATIONS WILL BE IMMEDIATELY DISCONTINUED, MACHINE SETTINGS, WATER TEMPERATURE AND CONDUCTIVITY CHECKED, AND PROCEDURES ADJUSTED OR ELECTROFISHING POSTPONED TO REDUCE MORTALITY.
- 4) DEWATER. DEWATERING, WHEN NECESSARY, WILL BE CONDUCTED OVER A SUFFICIENT PERIOD OF TIME TO ALLOW SPECIES TO NATURALLY MIGRATE OUT OF THE WORK AREA AND WILL BE LIMITED TO THE SHORTEST LINEAR EXTENT PRACTICABLE.
- A) DIVERSION AROUND THE CONSTRUCTION SITE MAY BE ACCOMPLISHED WITH A COFFER DAM AND A BY-PASS CULVERT OR PIPE, OR A LINED, NON-ERODIBLE DIVERSION DITCH. WHERE GRAVITY FEED IS NOT POSSIBLE, A PUMP MAY BE USED, BUT MUST BE OPERATED IN SUCH A WAY AS TO AVOID REPETITIVE DEWATERING AND REWATERING OF THE SITE. IMPOUNDMENT BEHIND THE COFFERDAM MUST OCCUR SLOWLY THROUGH THE TRANSITION, WHILE CONSTANT FLOW IS DELIVERED TO THE DOWNSTREAM REACHES.
- B) ALL PUMPS WILL HAVE FISH SCREENS TO AVOID JUVENILE FISH IMPINGEMENT OR ENTRAINMENT, AND WILL BE OPERATED IN ACCORDANCE WITH NMFS'S CURRENT FISH SCREEN CRITERIA (NMFS 20114, OR MOST RECENT VERSION). IF THE PUMPING RATE EXCEEDS 3 CUBIC FEET SECOND (CFS), A NMFS HYDRO FISH PASSAGE REVIEW WILL BE NECESSARY.
- C) DISSIPATION OF FLOW ENERGY AT THE BYPASS OUTFLOW WILL BE PROVIDED TO PREVENT DAMAGE TO RIPARIAN VEGETATION OR STREAM CHANNEL.
- D) SAFE REENTRY OF FISH INTO THE STREAM CHANNEL WILL BE PROVIDED, PREFERABLY INTO POOL HABITAT WITH COVER, IF THE DIVERSION ALLOWS FOR DOWNSTREAM FISH PASSAGE.
- E) SEEPAGE WATER WILL BE PUMPED TO A TEMPORARY STORAGE AND TREATMENT SITE OR INTO UPLAND AREAS TO ALLOW WATER TO PERCOLATE THROUGH SOIL OR TO FILTER THROUGH VEGETATION PRIOR TO REENTERING THE STREAM CHANNEL.
- 4 NATIONAL MARINE FISHERIES SERVICE. 2011. ANADROMOUS SALMONID PASSAGE FACILITY DESIGN. NORTHWEST REGION. AVAILABLE ONLINE AT:
HTTP://WWW.NWR.NOAA.GOV/SALMON-HYDROPOWER/FERC/UPLOAD/FISH-PASSAGE-DESIGN.PDF
- 5) SALVAGE NOTICE. MONITORING AND RECORDING OF FISH PRESENCE, HANDLING, AND MORTALITY MUST OCCUR DURING THE DURATION OF THE ISOLATION, SALVAGE, ELECTROFISHING, DEWATERING, AND REWATERING OPERATIONS. ONCE OPERATIONS ARE COMPLETED, A SALVAGE REPORT WILL DOCUMENT PROCEDURES USED, ANY FISH INJURIES OR DEATHS (INCLUDING NUMBERS OF FISH AFFECTED), AND CAUSES OF ANY DEATHS.

CONSTRUCTION AND POST-CONSTRUCTION CONSERVATION MEASURES.

- 1) FISH PASSAGE. FISH PASSAGE WILL BE PROVIDED FOR ANY ADULT OR JUVENILE FISH LIKELY TO BE PRESENT IN THE ACTION AREA DURING CONSTRUCTION, UNLESS PASSAGE DID NOT EXIST BEFORE CONSTRUCTION OR THE STREAM IS NATURALLY IMPASSABLE AT THE TIME OF CONSTRUCTION. IF THE PROVISION OF TEMPORARY FISH PASSAGE DURING CONSTRUCTION WILL INCREASE NEGATIVE EFFECTS ON AQUATIC SPECIES OF INTEREST OR THEIR HABITAT, A VARIANCE CAN BE REQUESTED FROM THE NMFS BRANCH CHIEF AND THE FWS FIELD OFFICE SUPERVISOR. PERTINENT INFORMATION, SUCH AS THE SPECIES AFFECTED, LENGTH OF STREAM REACH AFFECTED, PROPOSED TIME FOR THE PASSAGE BARRIER, AND ALTERNATIVESCONSIDERED, WILL BE INCLUDED IN THE VARIANCE REQUEST.
- 2) CONSTRUCTION AND DISCHARGE WATER.
- A) SURFACE WATER MAY BE DIVERTED TO MEET CONSTRUCTION NEEDS, BUT ONLY IF DEVELOPED SOURCES ARE UNAVAILABLE OR INADEQUATE.
- B) DIVERSIONS WILL NOT EXCEED 10% OF THE AVAILABLE FLOW.
- C) ALL CONSTRUCTION DISCHARGE WATER WILL BE COLLECTED AND TREATED USING THE BEST AVAILABLE TECHNOLOGY APPLICABLE TO SITE CONDITIONS.
- D) TREATMENTS TO REMOVE DEBRIS, NUTRIENTS, SEDIMENT, PETROLEUM HYDROCARBONS, METALS AND OTHER POLLUTANTS LIKELY TO BE PRESENT WILL BE PROVIDED.

NO.	BY	DATE	REVISION DESCRIPTION

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----	12/31/19	
APPROVED	DATE	PROJECT

YAKAMA NATION FISHERIES PROGRAM

CHEWUCH RIVER MILE 4.2

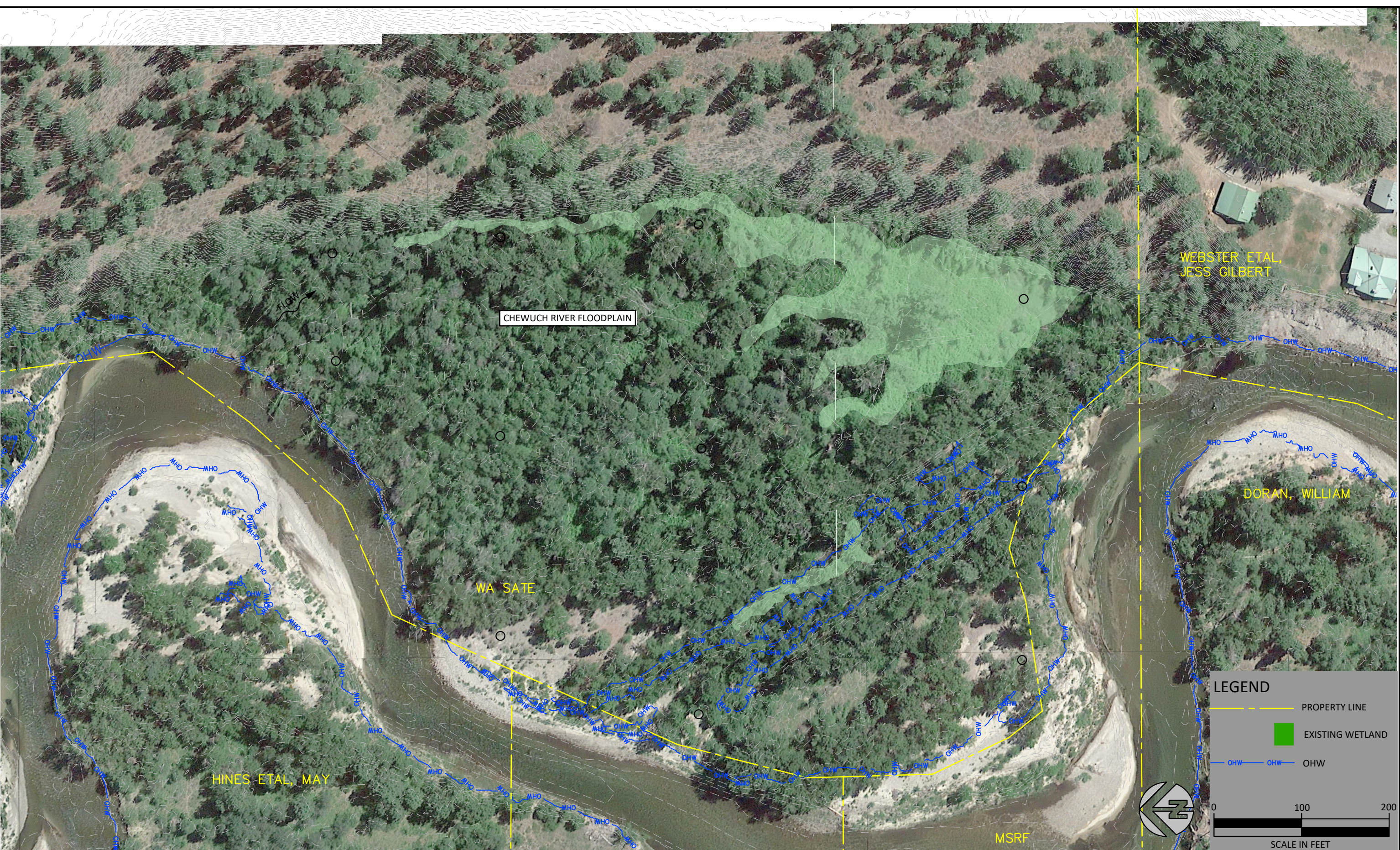
FISH HABITAT ENHANCEMENT



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HIP-III GENERAL NOTES (2 OF 2)	4 OF 17

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LEGEND

- PROPERTY LINE
- EXISTING WETLAND
- OHW — OHW — OHW

0 100 200
SCALE IN FEET

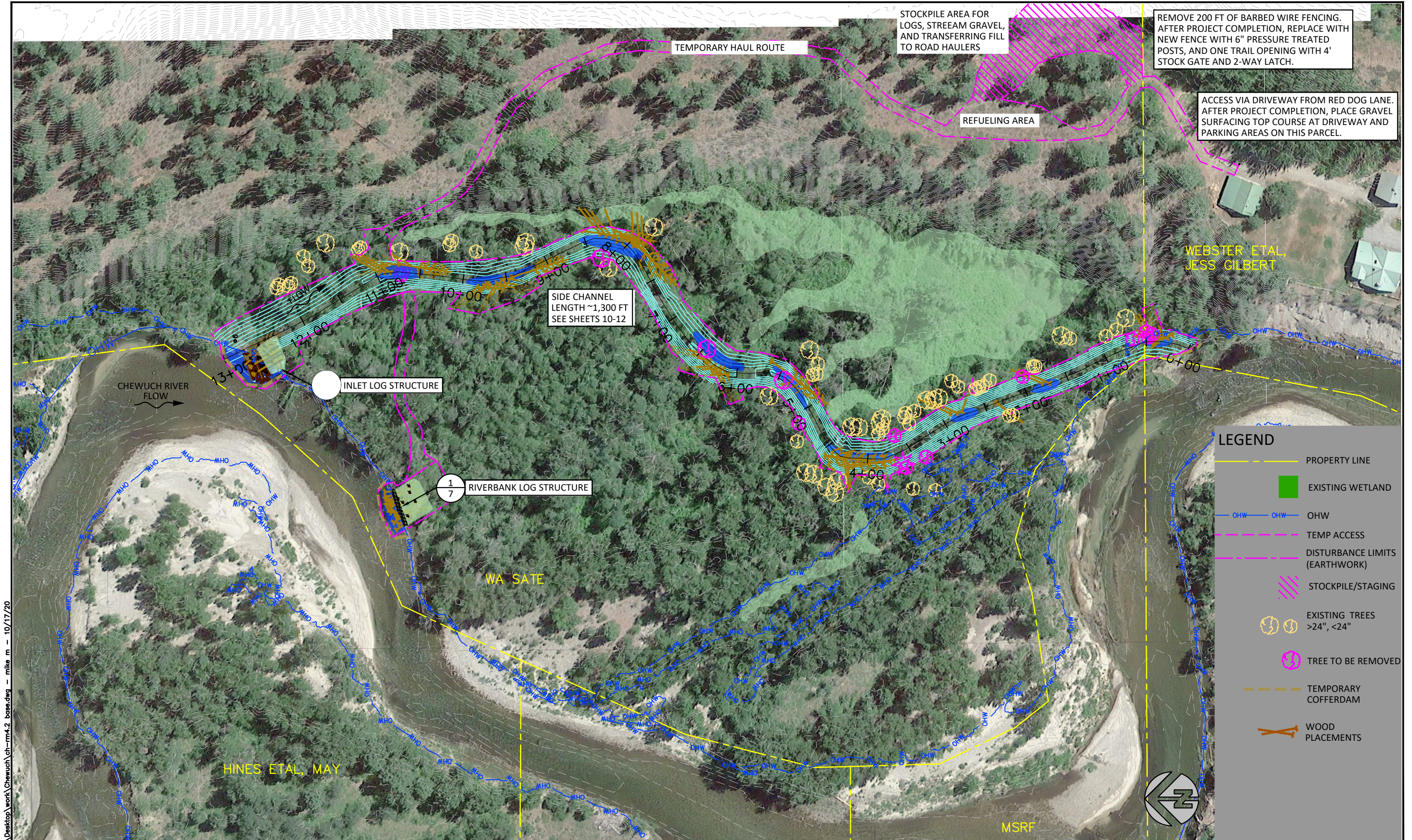
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**YAKAMA NATION FISHERIES PROGRAM
CHEWUCH RIVER MILE 4.2
FISH HABITAT ENHANCEMENT**

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**PROJECT SITE
EXISTING CONDITIONS**



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CHEWUCH RIVER MILE 4.2
FISH HABITAT ENHANCEMENT

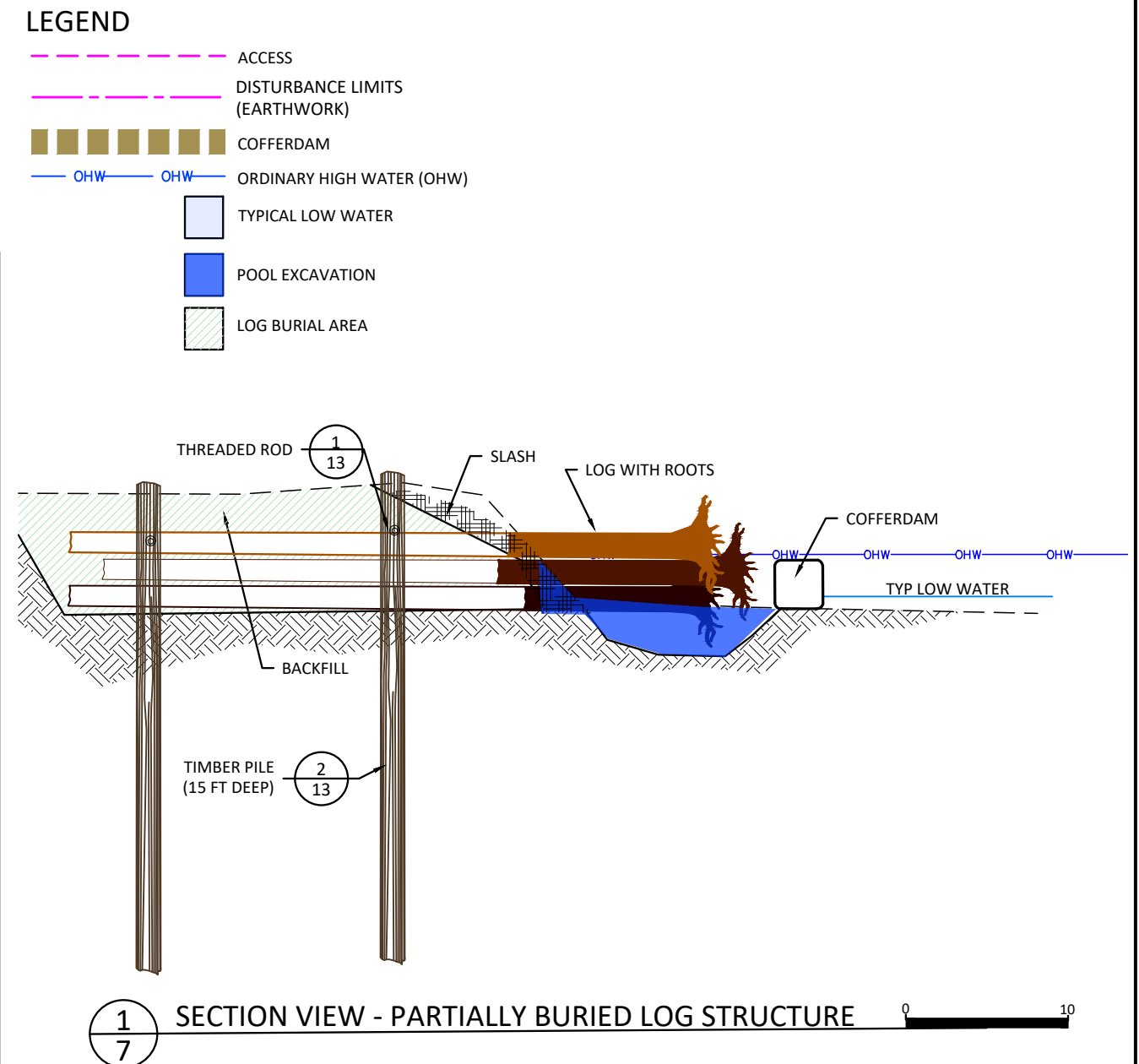
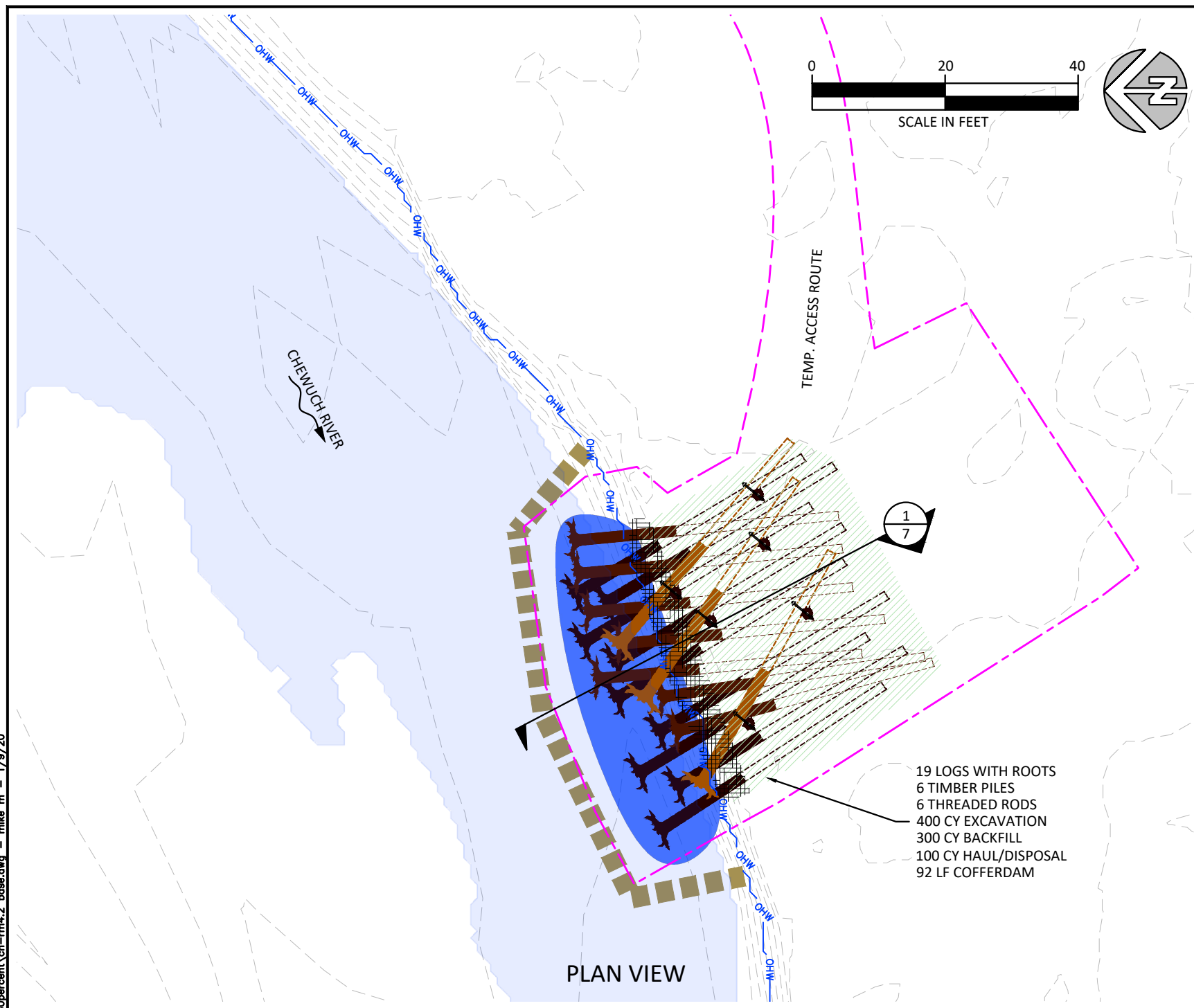


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PROJECT SITE
DESIGN OVERVIEW

SHEET

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- ### NOTES
1. RIVERBANK LOG STRUCTURE IS IN-WATER WORK TO BE PERFORMED DURING THE AUTHORIZED IN -WATER WORK WINDOW.
 2. LOG LOCATIONS, SIZE, AND ALIGNMENTS DEPICTED HERE ARE TYPICAL. SOME ADJUSTMENTS IN THE FIELD MAY OCCUR BASED ON ACTUAL MATERIALS.
 3. SHURBS AND SLASH GENERATED FROM SITE ACCESS SHALL BE INCORPORATED INTO THE STRUCTURES AS SLASH. INSTALL SLASH LOOSELY BETWEEN LOGS NEAR THE WATERWARD EDGE OF THE STRUCTURE. DO NOT BURY SLASH.
 4. BACKFILL USING COARSE MATERIALS (COBBLE) ON LOWER LEVEL AND ON WATERWARD EDGE. PLACE FINER MATERIAL (SAND) ON UPPER LAYER. BUCKET COMPACT FILL IN 12" LIFTS.
 5. VARY THE APPEARANCE OF TIMBER PILES BY INSTALLING THEM AT ANGLES AND WITH DIFFERENT TOP HEIGHTS. BREAK OR ROUGHEN THE TOP OF PILES FOR A NATURAL APPEARANCE. PILES SHALL BE INSTALLED BY VIBRATORY DRIVER. PILE DEPTH SHALL BE MINIMUM 15'. FINAL DEPTH TO BE DETERMINED BY PULLOUT TEST RESULTS.

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CHEWUCH RIVER MILE 4.2
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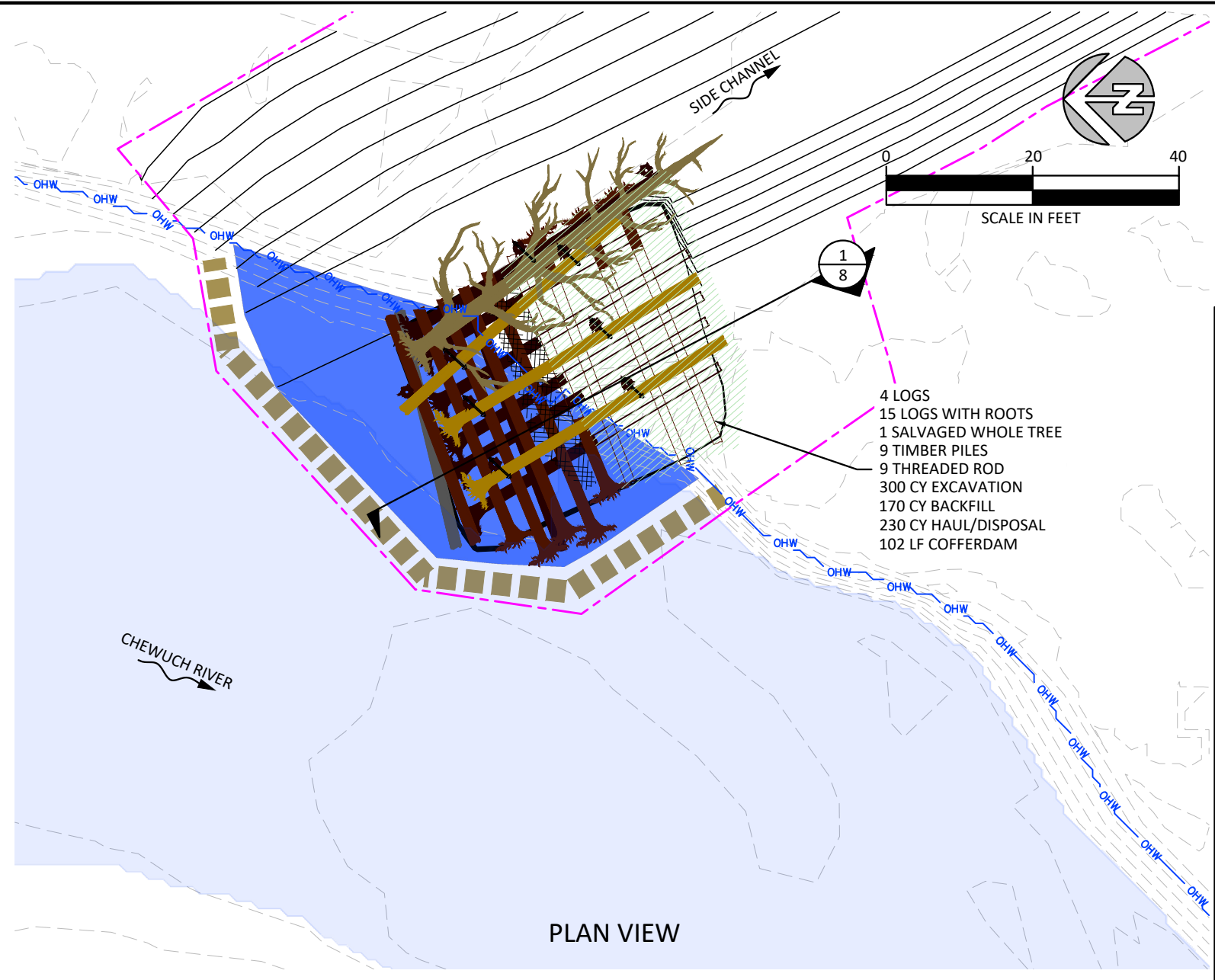
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RIVERBANK LOG STRUCTURE

SHEET

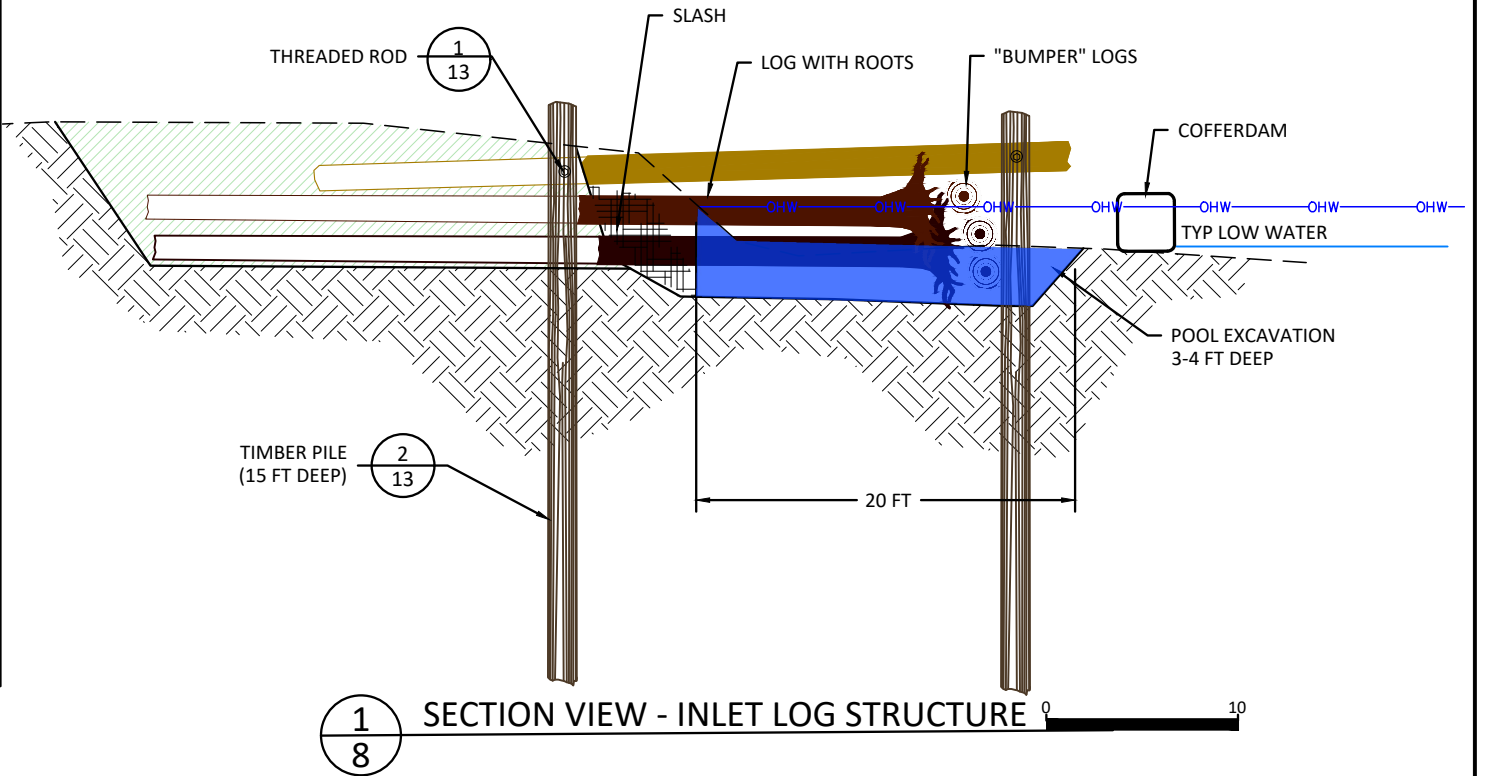
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LEGEND

- ACCESS
- DISTURBANCE LIMITS (EARTHWORK)
- COFFERDAM
- OHW
- ORDINARY HIGH WATER (OHW)
- TYPICAL LOW WATER
- POOL EXCAVATION
- LOG BURIAL AREA



NOTES

1. INLET LOG STRUCTURE IS IN-WATER WORK TO BE PERFORMED DURING THE AUTHORIZED IN-WATER WORK WINDOW.
2. LOG LOCATIONS, SIZE, AND ALIGNMENTS DEPICTED HERE ARE TYPICAL. SOME ADJUSTMENTS IN THE FIELD MAY OCCUR BASED ON ACTUAL MATERIALS.
3. SHURBS AND SLASH GENERATED FROM SITE ACCESS SHALL BE INCORPORATED INTO THE STRUCTURES AS SLASH. INSTALL SLASH LOOSELY BETWEEN LOGS NEAR THE WATERWARD EDGE OF THE STRUCTURE. DO NOT BURY SLASH.
4. BACKFILL USING COARSE MATERIALS (COBBLE) ON LOWER LEVEL AND ON WATERWARD EDGE. PLACE FINER MATERIAL (SAND) ON UPPER LAYER. BUCKET COMPACT FILL IN 12" LIFTS.
5. VARY THE APPEARANCE OF TIMBER PILES BY INSTALLING THEM AT ANGLES AND WITH DIFFERENT TOP HEIGHTS. BREAK OR ROUGHEN THE TOP OF PILES FOR A NATURAL APPEARANCE. PILES SHALL BE INSTALLED BY VIBRATORY DRIVER. PILE DEPTH SHALL BE MINIMUM 15'. FINAL DEPTH TO BE DETERMINED BY PULLOUT TEST RESULTS.

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INLET LOG STRUCTURE

SHEET
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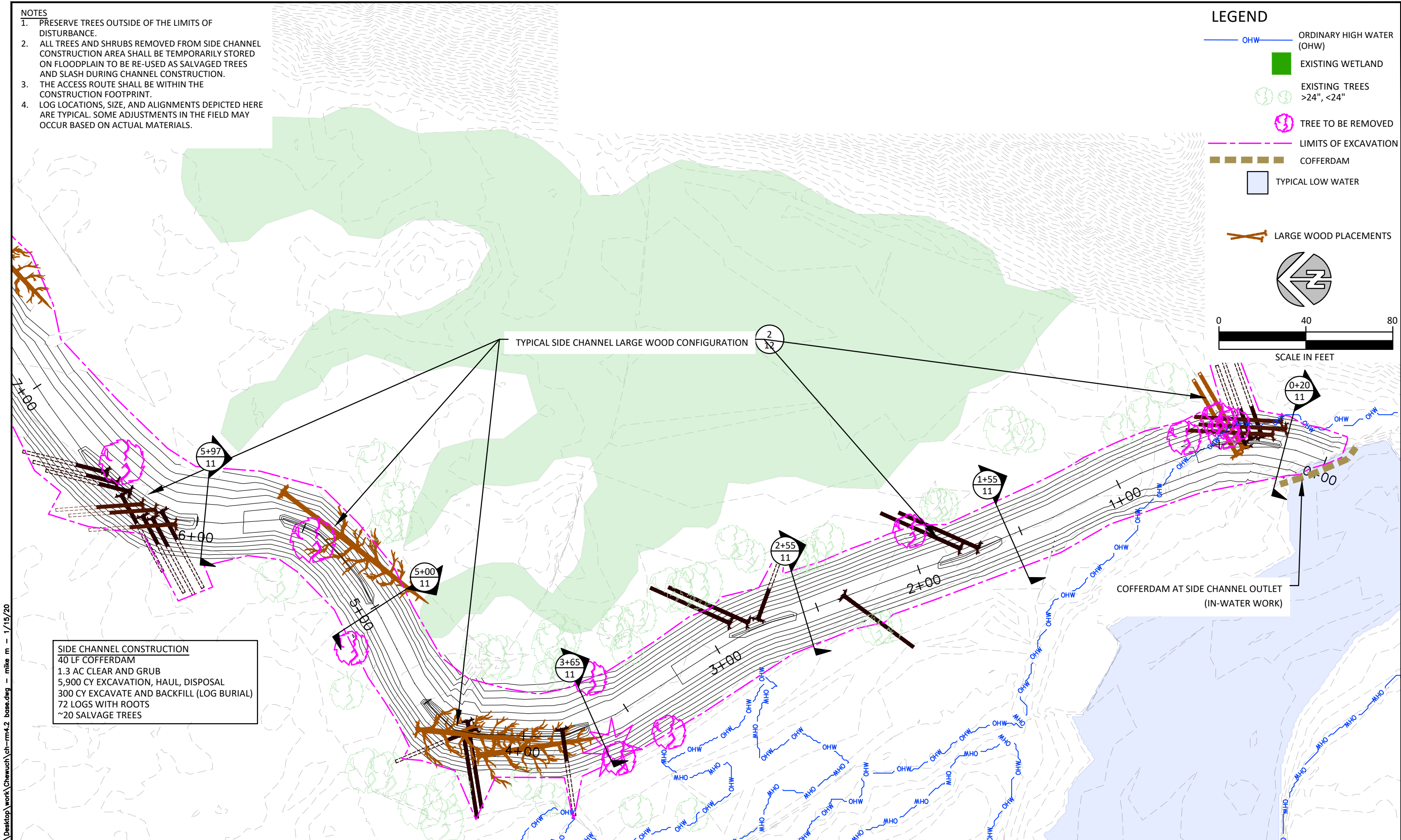
- NOTES
1. PRESERVE TREES OUTSIDE OF THE LIMITS OF DISTURBANCE.
 2. ALL TREES AND SHRUBS REMOVED FROM SIDE CHANNEL CONSTRUCTION AREA SHALL BE TEMPORARILY STORED ON FLOODPLAIN TO BE RE-USED AS SALVAGED TREES AND SLASH DURING CHANNEL CONSTRUCTION.
 3. THE ACCESS ROUTE SHALL BE WITHIN THE CONSTRUCTION FOOTPRINT.
 4. LOG LOCATIONS, SIZE, AND ALIGNMENTS DEPICTED HERE ARE TYPICAL. SOME ADJUSTMENTS IN THE FIELD MAY OCCUR BASED ON ACTUAL MATERIALS.

LEGEND

- OHW — ORDINARY HIGH WATER (OHW)
- EXISTING WETLAND
- EXISTING TREES >24", <24"
- TREE TO BE REMOVED
- LIMITS OF EXCAVATION
- COFFERDAM
- TYPICAL LOW WATER
- LARGE WOOD PLACEMENTS

SCALE IN FEET

0 40 80



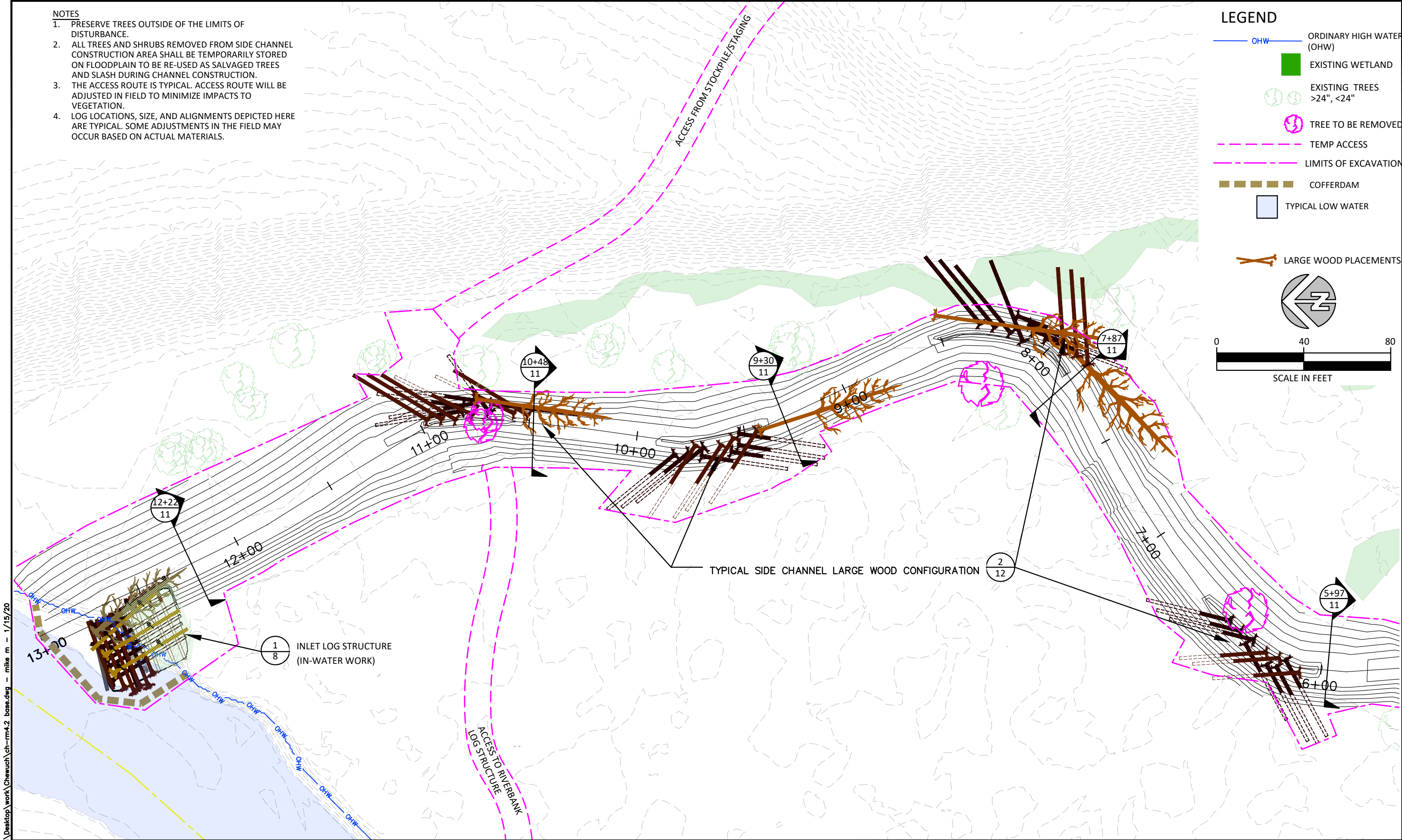
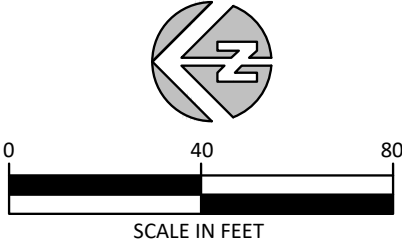
SIDE CHANNEL CONSTRUCTION
40 LF COFFERDAM
1.3 AC CLEAR AND GRUB
5,900 CY EXCAVATION, HAUL, DISPOSAL
300 CY EXCAVATE AND BACKFILL (LOG BURIAL)
72 LOGS WITH ROOTS
~20 SALVAGE TREES

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

LEGEND

- OHW — ORDINARY HIGH WATER (OHW)
- EXISTING WETLAND
- EXISTING TREES >24", <24"
- TREE TO BE REMOVED
- TEMP ACCESS
- LIMITS OF EXCAVATION
- COFFERDAM
- TYPICAL LOW WATER
- LARGE WOOD PLACEMENTS



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YAKAMA NATION FISHERIES PROGRAM
CHEWUCH RIVER MILE 4.2
FISH HABITAT ENHANCEMENT

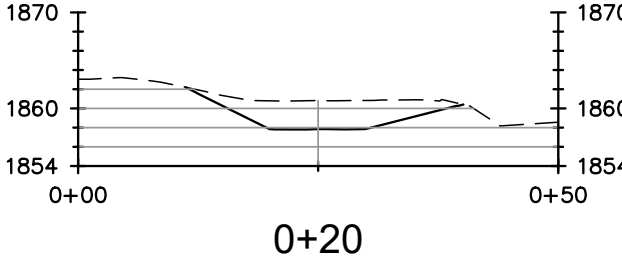
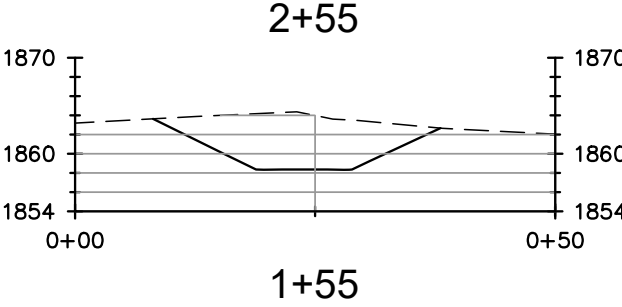
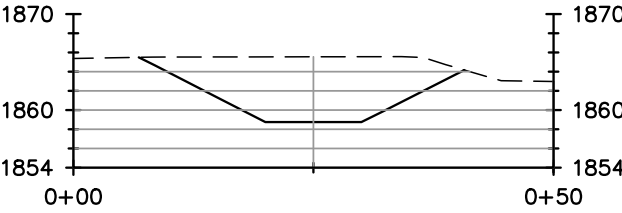
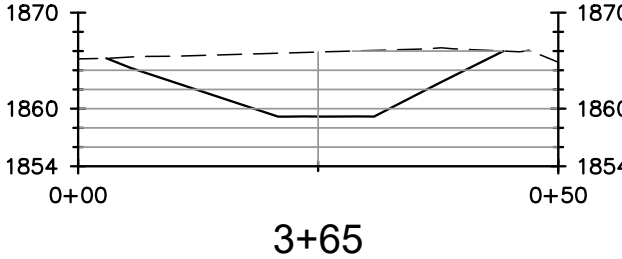
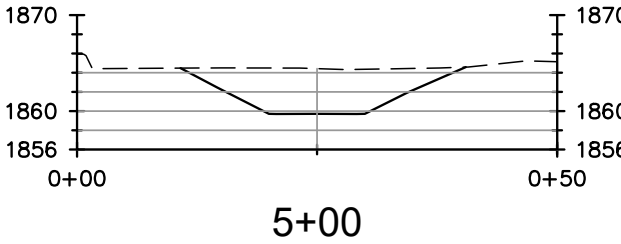
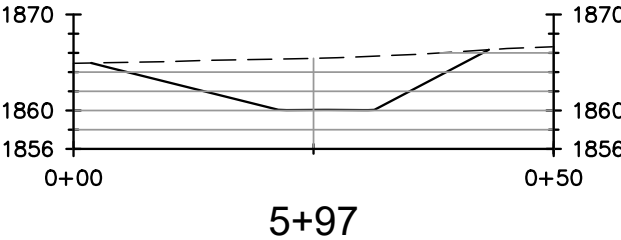
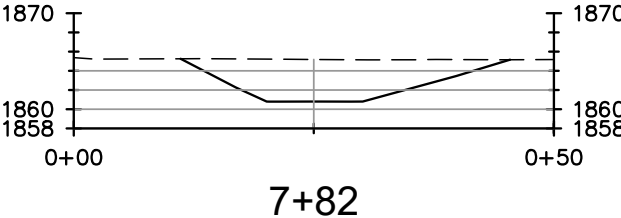
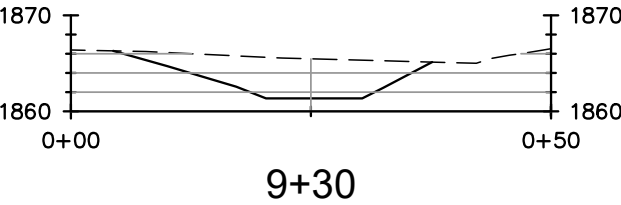
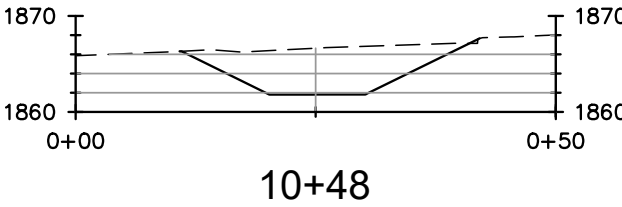
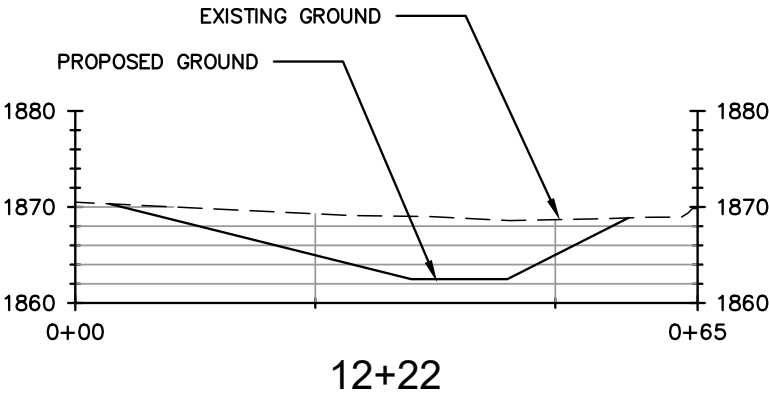


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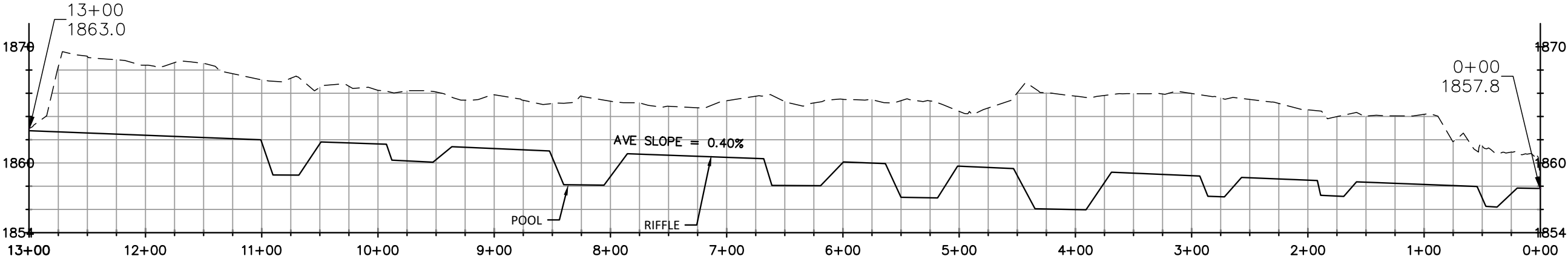
SIDE CHANNEL PLAN VIEW
7+00 TO 13+00

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SECTION VIEWS ARE LOOKING DOWNSTREAM.
SEE SHEETS 9-10 FOR SECTION LOCATIONS.



SECTION VIEWS



PROFILE VIEW - SIDE CHANNEL CENTERLINE

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FISH HABITAT ENHANCEMENT



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SIDE CHANNEL PROFILE AND CROSS
SECTIONS

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11 OF 17

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STREAMBED SEDIMENT 9-03.11 (1)

Sieve Size	Percent Passing
2 1/2"	99-100
2"	65-95
1"	50-85
No. 4	26-44
No. 40	16 max.
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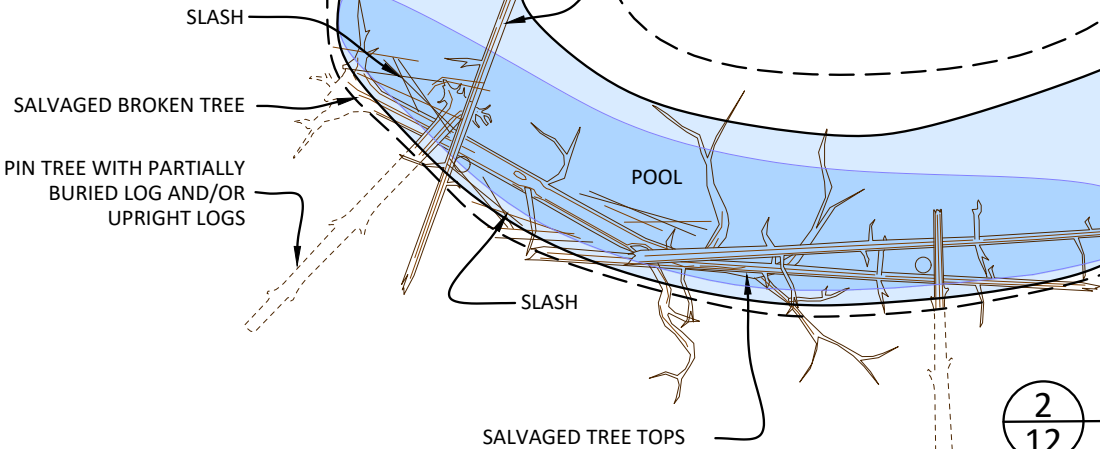
WHERE SAND OR SOFT SOILS ARE ENCOUNTERED AT FINISH GRADE, OVEREXCAVATE 6" AND APPLY 6" LAYER OF STREAMBED SEDIMENT



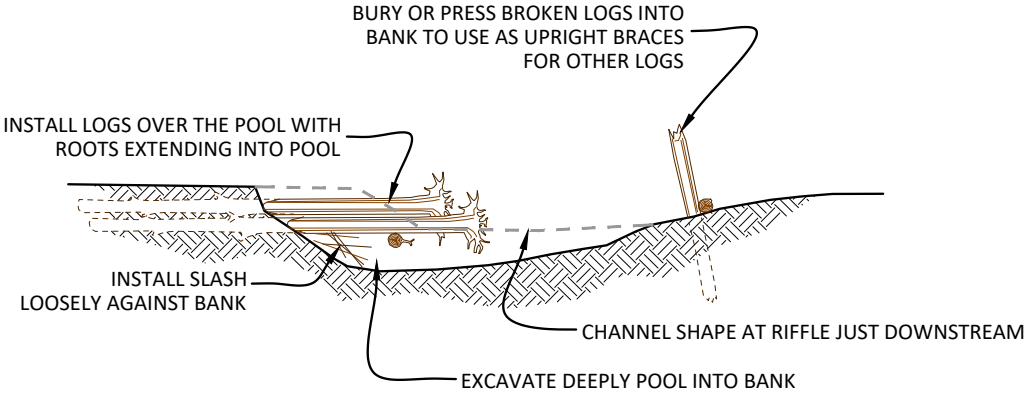
1
12 PROFILE VIEW - TYPICAL POOL AND RIFFLE
NOT TO SCALE

NOTES:

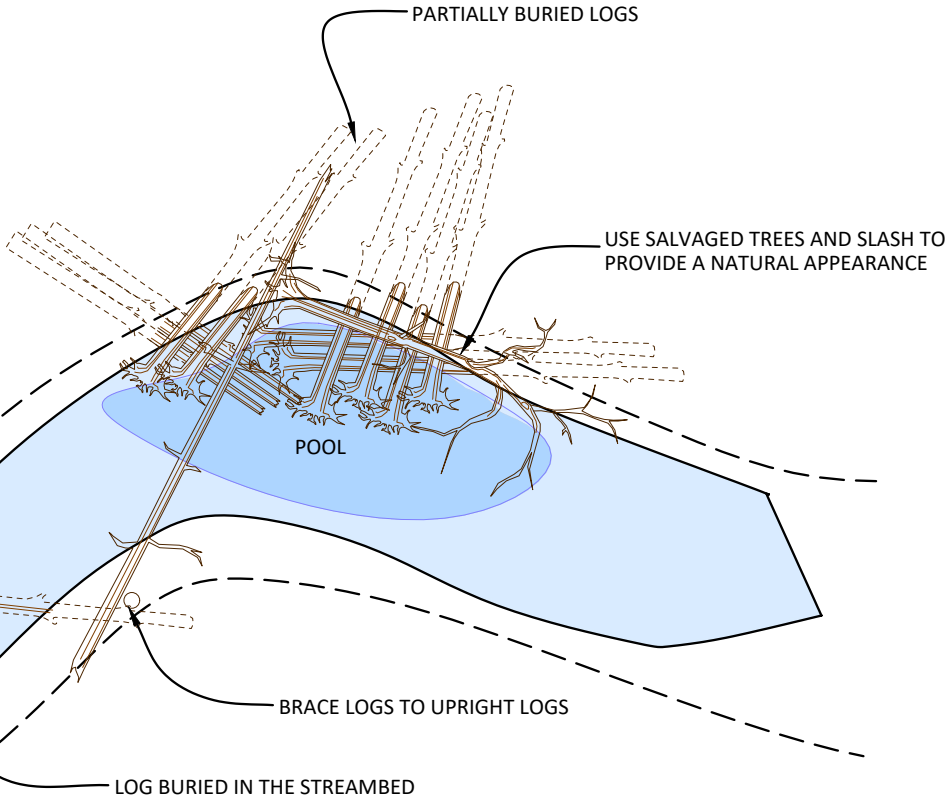
1. TREES AND SHRUBS WITHIN CLEARING LIMITS SHALL BE SALVAGED AND REUSED AS LOGS AND SLASH IN HABITAT STRUCTURES. TO THE EXTENT PRACTICABLE, PRESERVE BRANCHES AND ROOTS ON TREES REMOVED DURING CLEARING AND GRUBBING.
2. WOOD STRUCTURES SHALL BE STABILIZED. STABILIZATION METHODS INCLUDE PARTIAL BURIAL, BRACING AGAINST STANDING TREES, OR TIMBER PILES.



2
12 PLAN VIEW- TYPICAL SIDE CHANNEL LARGE WOOD CONFIGURATIONS
NOT TO SCALE



3
12 SECTION VIEW - TYPICAL POOL AND LWD
NOT TO SCALE



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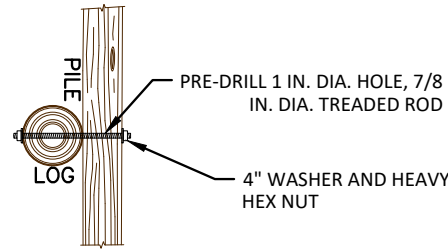
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TYPICAL SECTIONS

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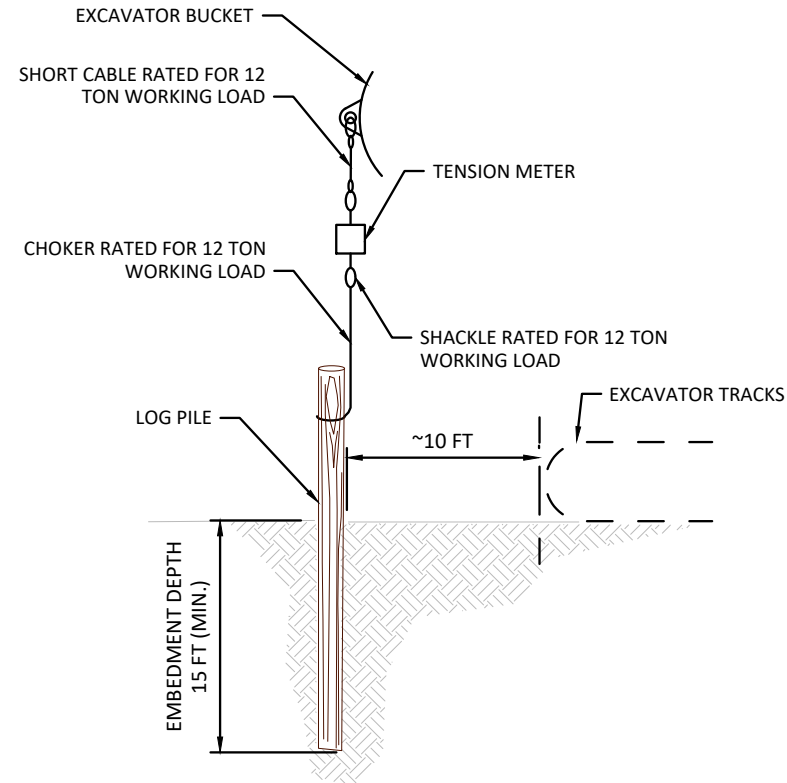


1
13 TYPICAL DETAIL
LOG-PILE CONNECTIONS
NOT TO SCALE

BOLTED CONNECTION NOTES

PIN LOGS TO LOGS

1. DRILL 1" DIA HOLE THROUGH LOGS.
2. INSERT 7/8" DIA TREADED ROD.
3. INSTALL STEEL PLATES AND HEAVY HEX NUTS. SECURE NUTS BY CHISELING THREADS OR MUSHROOMING EXPOSED ENDS OF ROD.
4. FILE OR GRIND OFF SHARP EDGES



2
13 TYPICAL DETAIL
PILE PULL OUT TEST
NOT TO SCALE

TIMBER PILE NOTES:

GENERAL

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

RIGGING

1. RIGGING FOR PILE TESTING SHALL CONFORM TO THE TENSION SCALE MANUFACTURER'S RECOMMENDATIONS.
2. CHOKERS, CABLES AND AND SHACKLES SHALL HAVE MINIMUM WORKING LOAD RATING OF 12 TONS. FITTINGS SHALL BE SIZED ACCORDINGLY.

TESTING

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

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DETAILS

SHEET

13 OF 17

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Provisions				ITEM 002 – MOBILIZATION				ITEM 005 – CHANNEL EXCAVATION INCL. HAUL			
INTRODUCTION				This item shall consist of preparation work and operations performed by the Contractor in accordance with the provisions of Section 1–09.7 of the Washington Department of Transportation Standard Specifications (Standard Specifications), and as amended by these Special Provisions.				This item is applicable to excavation at the Side Channel site.			
The Washington State Department of Transportation’s Standard Specifications for Road, Bridge and Municipal Construction 2014 (WSDOT Standard Specifications) shall apply unless otherwise noted in the following Special Provisions. 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.				1. Temporary site access shall be along alignments shown in the plans. Minor deviations to the alignments may occur as directed by the Owner to preserve sensitive areas or trees, or to avoid damage to other features identified in the field. Deviations from the alignments shown in the plans shall be approved by Owner prior to use.				1. Portions of work will be in water. The Contractor is advised that shallow groundwater may be encountered throughout excavation areas.			
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.				2. Prior to demobilization, staging areas and site temporary access routes shall be ripped to decompact soils to 18” or greater depth.				2. This item includes “Cofferdam” and “Pumping”. See Special Provisions (Sheet 16).			
The in–water work window is July 1 – July 30, 2021. The construction window is July 12 – August 13, 2021. Therefore, in–water work shall occur between July 12 and July 30.				3. The contractor shall remove and haul away 200 feet of barbed wire fence, and upon demobilization, replace the fence with new fencing, supported by at least four 6” diameter or 6”x6” pressure treated posts and diagonal bracing, and provide one opening with a 4’ stock gate and a 2–way gate latch for trail use.				3. This item includes hauling of excavated material to an off–site disposal site provided by the Contractor. The unit contract price per cubic yard shall include “Haul”.			
The project shall be completed by August 16.				4. An entrance log archway has been temporarily removed from the driveway to facilitate construction access. Upon demobilization, the contractor shall design and install a new 14’ high log archway. Logs for archway will be supplied by the Owner.				4. This item includes detail grading to shape the channel, including creating pools within the channel, as shown in the Plans. Pools shall be over–excavated into the streambank to provide room to install logs with roots and salvaged trees.			
Work shall be only 7am to 7pm, 5 days per week (Mon–Fri).				5. Approximately 10 dead cottonwood trees near the archway installation area shall be removed and hauled to the channel work area to be incorporated as salvaged trees in channel construction.				5. No work shall occur outside of the limits of disturbance shown in the Plans unless authorized by the Owner.			
ITEM 001– TESC, SPCC PLAN AND IMPLEMENTATION				<u>Measurement and Payment</u>				6. A cultural staff person will be present on site during all excavation activities.			
<u>Description</u>				Payment for Mobilization shall be by the lump sum contract price for, ‘Mobilization’, partial payments will be made as in accordance with Section 1–09.9 of the Standard Specifications. Payment shall be considered full compensation for all equipment, labor, tools, materials, and incidentals necessary to complete this work as specified.				<u>Measurement</u>			
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.				ITEM 003 – TRAFFIC CONTROL				“Channel Excavation Incl. Haul” will be measured by cubic yard. All excavated material will be measured in the position it occupied before the excavation was performed. An original ground measurement was taken using digital terrain modeling survey techniques. The original ground will be compared with the planned finished section shown in the Plans. Slope/ground intercept points defining the limits of the measurement will be as staked by the Owner. No additional compensation will be made for excavated material that is stockpiled, re–excavated, and moved again.			
1. The Contractor shall submit a TESC for the project to the Owner for approval. The TESC must satisfy the requirements of the Washington Department of Ecology NPDES Stormwater General Permit for Construction Activity and all other applicable permits. The TESC included in the Drawings and described herein is intended to provide a baseline for sediment and erosion control and does not ensure that the standards established by any applicable permits will be met. The Contractor may use these measures or alternative measures of his 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.				Temporary traffic control requirements shall include measures per Section 1–10 and local regulations. It is the Contractor’s responsibility to obtain County permit.				”Cofferdams” at the inlet and outlet of Side Channel, and ”Pumping” associated with preventing turbidity from entering the river, shall be incidental to “Channel Excavation Incl. Haul”.			
2. A spill Containment Kit shall be on site and crews shall be trained in its use.				<u>Measurement</u>				<u>Payment</u>			
3. Biodegradable Hydraulic Fluid shall be installed into each piece of heavy machinery working within 50 feet of the river.				“Traffic Control” 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. Payment will be made in accordance with Section 1–04.1 for the following bid items: “Channel Excavation Incl. Haul” per cubic yard.			
4. Provide certified weed–free straw, and apply it as a 3” layer to all disturbed ground. Disturbed ground estimated to be 2.2 acres. Disturbed ground exceeding 2.2 acres shall also be treated with seed and mulch at no cost to the owner. Seed mix will be provided by the Owner.				ITEM 004 – CLEARING AND GRUBBING				ITEM 006 – STREAMBED SEDIMENT			
<u>Measurement</u>				This item consists of clearing and grubbing for construction as shown on 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.				<u>Description</u>			
“TESC, SPCC Plan and Implementation,” including the above amendments to the item will be measured by lump sum.				1. Areas for Clearing and Grubbing are shown in the Plans. Adjustments to alignments and 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.				Streambed Sediment shall be installed as ‘Select Material’ where finish grade soils are found to be too sandy or soft. In such cases, a subgrade shall be prepared by overexcavating 6” and installing streambed sediment. This work consists of furnishing and installing channel lining material on prepared subgrade or base in accordance with these Specifications and as established by the Engineer.			
<u>Payment</u>				2. Included in this item are the removal and salvage of approximately 40 trees, varying in size from 12” to 36” diameter at breast height (dbh). Salvaged Trees shall be installed as large woody material during construction of the Side Channel Site. To the maximum practicable extent, the Contractor shall excavate to loosen soil around each rootwad and then push over the trees in order to salvage logs with intact attached roots. Salvaged Trees may be temporarily stockpiled outside of the clearing limits but within reach of the excavator during side channel construction.				<u>Materials</u>			
Payment shall be considered full compensation for all equipment, labor, tools, materials, and incidentals necessary to complete this work as specified. Payment will be made in accordance with Section 1–04.1 for the following bid items: “TESC, SPCC Plan and Implementation” per lump sum.				3. Trees and shrubs smaller than 12” dbh that are removed during clearing and grubbing shall be left on site, placed outside of limits of disturbance, to be used as slash during installation of Logs. Unused excess slash may remain on site. Slash remaining on site shall not be in left in large individual piles, but shall be evenly distributed.				Materials shall meet the requirements of the following sections:			
				4. Vegetation protection and restoration per Section 1–07.16(2) shall be incidental to Clearing and Grubbing.				1. Streambed Sediment shall be a mix of rounded rock meeting the gradation requirements of 9–03.11(1) and quality requirements of 9–03.11.			
				<u>Measurement</u>				<u>Construction Requirements</u>			
				Removal and Salvage of trees and shrubs shall be considered incidental to Clearing and Grubbing.				The depth of burial and thickness of the Streambed Sediment layer may be adjusted to achieve the finished grades specified in the Plans, however excess material that is used to fill over–excavation of subgrade or that results in higher grades than designed shall not be paid without prior approval of the Owner.			
				Measurement and compensation for the installation of the salvaged trees is described under “Logs” and paid under that item. No additional compensation will be allowed.				The Contractor shall excavate to subgrade where the placement of Streambed Sediment is found to be needed by the Engineer. The excavation shall be kept dewatered until Streambed Sediment is placed.			
				“Clearing and Grubbing,” including the above amendments to the item will be measured by lump sum.				<u>Measurement</u>			
				<u>Payment</u>				Streambed Sediment shall be measured per cubic yard, complete in place.			
				Payment will be made in accordance with Section 1–09.9 for the following bid items: “Clearing and Grubbing” per lump sum.				<u>Payment</u>			
								Payment will be made in accordance with Section 1–04.1, for the following Bid items:			
								The Contract unit price per cubic yard for “Streambed Sediment” shall be full compensation for all labor, materials, tools and equipment necessary to satisfactorily procure, deliver, stockpile, haul, and construct and place Streambed Sediment, excavation to subgrade, and disposal of excavated materials, as set forth in these specifications, and as directed by the Engineer.			

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ITEM 007 – LOGS {SIDE CHANNEL SITE}

Description

Logs includes all work associated with delivery and installation of logs with roots, bumper logs, upright logs, timber piles, threaded rod, salvaged trees at the Side Channel Site

This item includes movement of materials from stockpiles to the project site and to installation areas, and excavation and backfill to partially bury Logs.

Materials

Logs and Logs with roots will be supplied by the Owner. The Contractor shall load and haul the logs from the Owner’s stockpile at 1215 E Methow Valley Hwy, Twisp, WA, 13 miles from the project site. Quantities for each site are shown in the Plans.

- 1.Logs: Owner supplied Logs will have the following characteristics:

Logs: 40’ long and >12” diameter at scaled end.
Logs with Roots: 40’ long and 18–24” dbh.
- 2.The Contractor shall make up to 20 Upright Logs by breaking 10–15 feet off of the cut end of imported Logs with Roots.
- 3.Salvaged Trees: Salvaged Trees are whole trees including roots, salvaged from the clearing limits of side channel work. Tree species may include deciduous and coniferous varieties.
- 4.Slash: Slash includes shrubs and small trees removed within the clearing limits.
- 5.Threaded Rod: Install threaded rod, washers, and nuts as specified in the Plans.

Construction Requirements

Logs: Installation locations of Logs and Logs with Roots shall generally be as indicated on the Plans. However, final location will depend upon the size, and shape of supplied materials. Installation of Logs shall be understood to require a “fit in the field” approach as directed by the Owner. Logs shall be stabilized by partial burial and/or bracing provided by Upright Logs or standing trees.

Salvaged Trees: Salvaged trees shall be installed as directed by the Owner. Care shall be taken when moving and installing salvaged trees so that branches and roots remain attached to the tree. Salvaged Trees shall be stabilized by partial burial, bracing to Upright Logs or standing trees, or held down by other partially buried logs. Some Salvaged Trees shall be moved up to 500 feet to their installation sites.

Slash: Slash cleared from within the clearing shall be incorporated into log structures as directed by the Owner. Intermingle, stack, and rack slash material to the installed logs and piles to emulate natural accumulations of wood material.

Earthwork: Where partial burial of logs is required, excavate trench or pit as directed by the Owner. Stockpile the fill within the designated disturbance area. Backfill the logs as each layer is installed. A cultural staff person will be present on site during all excavation activities.

Coordination with vegetation contractor: Construction contractor will coordinate with the Owner and the revegetation contractor to schedule hauling of reveg supplies to locations within the site.

Measurement

Measurement will be based on the portion of work completed, measured as each completed site.

“Logs” will be measured by lump sum.

Payment

The contract price for “Logs” shall be full compensation for all costs incurred for equipment, materials and labor for loading and hauling logs from stockpile areas, and installing logs. Payment will be made in accordance with Section 1–09.9 for the following bid items: “Logs” as lump sum.

ITEM 008–009 – LOG STRUCTURE

Description

Log Structure includes Inlet Log Structure and Riverbank Log Structure as shown in Plans.

“Log Structure” includes all work associated with delivery and onsite movement and installation of, logs, logs with roots, timber piles, whole trees, salvaged trees, slash, bumpers, and securing with threaded rod in the Plans. This item includes movement from stockpiles to installation areas, excavation and backfill to partially bury “Log Structure”, hauling and disposal of excess fill. Cofferdam and pumping are required at “Log Structure”.

This item includes movement of materials from stockpiles to the project site and to installation areas, and excavation and backfill to partially bury Logs.

Materials

Logs, Logs with roots, and Timber Piles will be supplied by the Owner. The Contractor shall load and haul the logs from the Owner’s stockpile at 1215 E Methow Valley Hwy, Twisp, WA, 13 miles from the project site. Quantities for each site are shown in the Plans.

- 1.Logs: Owner supplied Logs will have the following characteristics:

Logs with Roots: 40’ long and 18–24” dbh.
Logs: 40’ long and 12–18” diameter at scaled end.
- 2.Timber Piles: Quantities for each site are shown in the Plans. Timber Piles will have the following characteristics: 40’ long and 16” diameter in middle of log.
- 3.Salvaged Trees: Salvaged Trees are whole trees including roots salvaged from within the limits of disturbance of side channel. Tree species may include deciduous and coniferous varieties.
- 4.Slash: Slash includes shrubs and small (<12” dia) trees removed within the clearing limits, or provided by the Owner at stockpiles near the sites.
- 5.Threaded Rod: Install threaded rod, washers, and nuts as specified in the Plans.

Construction Requirements

See Special Provisions (Sheet 16) for “Cofferdam” and “Pumping”.

Logs: Locations of Logs and Logs with Roots shall generally be as indicated on the Plans. However, final location will depend upon the size, shape and quantity of material delivered or salvaged. Installation of Logs shall be understood to require a “fit in the field” approach as directed by the Owner. Logs shall be stabilized by partial burial and/or bracing provided by Timber Piles. Some Logs shall be secured to Timber Piles or other Logs via Fully Threaded Rod. The ends of cut logs shall not be left on site, but shall be disposed of off site at the Contractor’s expense.

Timber Piles: Construction of Timber Piles shall include on–site movement and installation of timber piles to designated sites shown in the Plans. Timber 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. Installed Timber Piles shall also have the following field–directed characteristics:

- c. Timber Piles shall be installed at various angles and with varying heights above ground to break up a uniform appearance.
- d. Each Timber Pile log shall have a broken top unless directed otherwise by the Owner’s Representative. The preferred method shall be to break off the top 4–8 feet before installing the pile. Grinding or making multiple plunge cuts with chain saw to provide a roughened top are other acceptable methods.

Timber Piles shall be installed by vibratory hammer. Vibratory hammer shall have 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.

At each pile installation 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 tensiometer and associated hardware.

Install threaded rod where shown in the Plans or as directed by Owner.

Salvaged Trees: Salvaged trees shall be installed in log structures as shown in the Plans or as directed by the Owner. Care shall be taken when moving and installing salvaged trees so that branches and roots remain attached to the tree. Salvaged Trees shall be stabilized by partial burial, bracing to Timber Piles or standing trees, or held down by other partially buried logs.

Slash: Slash cleared from within the clearing shall be incorporated into log structures as directed by the Owner.

Intermingle, stack, and rack slash material to the installed logs and piles to emulate natural accumulations of wood material.

Earthwork: Where partial burial of logs is required, excavate to subgrade. Stockpile the fill within the designated disturbance area. Sort materials by general sizes, separating piles for coarse and fine material. Backfill the logs as each layer is installed. Use coarse fill in lower layer and along waterward edge, and finer materials on top layer. Load and haul excess fill to the fill site provided by the Owner. A cultural staff person will be present on site during all excavation activities.

Measurement

Measurement will be based on the completed site.

“Log Structure” will be measured by lump sum.

Payment

Payment will be made in accordance with Section 1–09.9 for the following bid items: “Log Structure” as lump sum per site. {Logs for Side Channel Site is not included in this item}. {“Cofferdam” and “Pumping” shall be incidental to “Log Structure”}.

The contract price for “Log Structure” shall be full compensation for all costs incurred for equipment, materials and labor for loading and hauling logs from stockpile areas, installing and securing logs, timber piles, and salvaged trees as outlined in the plans. Earthwork, installing slash and threaded rod shall be incidental to Log Structures.

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SPECIFICATIONS (2 OF 4)

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COFFERDAM {Incidental to other items}

Description

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 as follows:

- 1.Upstream end of Side Channel
- 2.Downstream end of Side Channel
- 3.Riverbank Log Structure

Cofferdam 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.

Materials

The Contractor shall provide all required materials for the project. If Bulk Bag Cofferdam is the method to be used, see details for Bulk Bag Cofferdams on the Plans.

Sandbags 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 on 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.

- 1.Cofferdam
 - a. Construction methods for Bulk Bag Cofferdams are described in the project plans.
- 2.Coordination with Fish Rescue

a. 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 2 days per cofferdam.

Measurement and Payment

Cofferdam shall be incidental to "Channel Excavation Incl. Haul" and "Log Structure".

PUMPING {Incidental to other items}

This item includes dewatering and controlling turbidity within construction areas isolated from the river by Cofferdams.

Description

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

- 1.Two 6" trash pumps, each with pumping capacity greater than 600 gpm, assuming 12 feet of vertical lift and 300 feet of discharge hose. To prevent turbidity from entering the river, pumps may need to run 24 hrs or until water is clear. Pumps shall have soundproofing. Electric pumps with generators and quiet packs are a preferred and pre-approved method.
- 2.One or more 2" pump(s) with 100 feet of discharge hose for each pump.
- 3.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.
- 4.Pumps shall be placed within rigid or flexible pool to contain fuel or oil spills. Diapers shall be stored at each pump.
- 5.Environmental Protection Measures such as straw bales, perforated pipe for discharge flow distributors, geotextiles, filter bags, or other means of controlling water and turbidity. No turbidity shall be allowed to enter the river or wetlands.

Construction Requirements

- 1.Pumps
 - a. Groundwater will be encountered during excavations. During construction of side-channel, construction water shall be pumped away from work areas to be infiltrated into the ground and without entering the river.
 - b. To help prevent turbidity from leaking through cofferdams, the contractor shall provide and operate 6" trash pump(s) 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, 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 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

Measurement will be based on the item from the bid list installed and the work for that portion completed. The unit contract prices for "Pumping" shall be full compensation for all costs incurred for equipment, materials and labor for furnishing, installing, securing, maintaining and removal of pumping equipment as outlined in the plans. If additional environmental protection measures are required to control turbidity, they shall be considered incidental to pumping and no additional compensation will be made.

Pumping shall be incidental to "Channel Excavation Incl. Haul" and "Log Structure".

NO.	BY	DATE	REVISION DESCRIPTION

MM, GS	MB	CB
DRAWN	DESIGNED	CHECKED
----	12/31/19	
APPROVED	DATE	PROJECT

YAKAMA NATION FISHERIES PROGRAM

CHEWUCH RIVER MILE 4.2

FISH HABITAT ENHANCEMENT



501 Portway Avenue, Suite 101
Hood River, OR 97031
541.386.9003
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SPECIFICATIONS (3 OF 4)

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ITEM 010 - ROAD MAINTENANCE AND DUST ABATEMENT

Red Dog Lane will be used to haul fill to the designated disposal site. The gravel roadway used for hauling shall be maintained by blading and watering. Additionally, upon completion of instream work, a final blading of Red Dog Lane and driveway shall be required beginning at the end of pavement and extending approximately 3/4 miles to the driveway and parking areas at the site. Sheet 1 of the Plans shows the extents of Red Dog Lane and driveway that shall have Road Maintenance and Dust Abatement. The following U.S.F.S. specifications shall be used for this work.

811 BLADING (2/02)

Description

This work consists of surface blading the traveled way to a condition to facilitate traffic and provide proper drainage. Blading includes shaping the crown or slope of traveled way, and drainage dips, in accordance with this specification. Watering shall be incidental to this item.

Maintenance Requirements

- A. General-
1. Blade and shape the existing traveled way and shoulders, including turnouts unless otherwise ordered, to produce a surface which is uniform, consistent to grade, and crowned or cross-sloped as indicated by the character of the existing surface, unless otherwise specified. Thoroughly loosen surfacing material to no less than 2 inches depth or the depth of potholes or corrugations.

2. Apply water during blading when sufficient moisture is not present to prevent surface material segregation. Water supply, hauling, and application shall be in accordance with Section 891 (see below).

3. Shape existing native rock or aggregate surfaced drainage dips to divert surface runoff to existing outlet devices, ditches, and discharge locations.

4. Establish a blading pattern which provides a uniform driving surface, retains the surfacing on the roadbed, and provides a thorough mixing of the materials within the completed surface width. Upon final blading, no disturbed rock shall protrude more than 2 inches above the adjacent surface unless otherwise specified. Remove and place outside the roadbed material not meeting this dimension so as not to obstruct drainageways or structures. This material may be scattered off the roadbed if there is free drainage.
- B. Routine Blading
- Shape roadbed width in excess of the dimensions shown only as needed to provide drainage away from the traveled way. Do not remove established grasses and other vegetation from the excess width except as incidental to providing drainage or unless otherwise directed.
- C. Undercutting - Undercutting roadway back slope is not permitted.
- D. Intersections - At intersections, blade the roadbeds of side roads which are not closed or restricted from vehicular use to ensure smooth transitions.
- E. Cleaning of Structures - Do not allow materials resulting from work under this Section to remain on or in structures, such as bridges, culverts, cattle guards, or drainage dips.
- F. Smooth blading - Smooth blading may be used as an interim measure to remove loose surfacing material from the wheel paths and store it in a recoverable windrow until blade processing, as described in this section, is feasible. Watering will not be required for smooth blading. Accomplish smooth blading without distorting the existing cross-slope or crown of the traveled way.
- Move and store loose surfacing materials on the high side of super-elevated curves and sections with uniform inslope or outslope. In crowned sections, store the material on either or both sides as elected. Windrow and place stored materials to provide not less than 12 feet of smooth traveled way on one-lane segments. Cut holes through windrows, which may collect water on the road, for drainage at least every 500 feet.
- G. Signing - Place suitable temporary traffic warning signs at each end of the work area. Such signing shall conform to the Federal Highway Administration's publication "Manual for Uniform Traffic Control Devices", or MUTCD. An appropriate sign is the W21-3, measuring 36"x36", "ROAD MACHINERY AHEAD", black text on reflective orange background. Such signing should be placed on temporary supports, where it is readily visible to oncoming traffic but does not pose a hazard to vehicles.

Measurement

"Road Maintenance and Dust Abatement" will be lump sum. Water Supply and Watering shall be incidental to this item.

Payment

"Road Maintenance and Dust Abatement", lump sum.

891 WATER SUPPLY AND WATERING (2/02)

Description

This work consists of providing facilities to furnish an adequate water supply, hauling and applying water. Watering shall occur at ALL times that haul trucks are working. Watering shall extend from the intersection of Red Dog Lane and East Chewuch Road to the stockpile area, and along temporary construction access routes.

Materials

If the Permittee elects to provide water from other than designated sources, the Permittee is responsible to obtain the right to use the water, including any cost for royalties involved. The rate of applications is based on ground conditions.

Furnishing a suitable and adequate water source shall be the contractor's responsibility.

Equipment

- A. Mobile watering equipment shall have watertight tanks.
- B. The water tender must have controls in the cab for opening and closing water flow, to prevent ponding and washing at the beginning and ending of work areas.
- C. An air gap or positive anti-siphon device shall be provided between the water source and the vehicle being loaded if the vehicle has been used for other than water haul, if the source is a domestic potable water supply, or the water is used for tank mixing with any other materials.
- D. The designated water source may require some work prior to their use. Contractor shall be responsible for obtaining appropriate hardware to connect to existing infrastructure. The landowner requires 72 hours advance notice prior to use.
- E. The intake of any pump used for water supply from designated fish bearing streams or other water bodies shall have a fish screen installed, operated and maintained according to NMFS' fish screen criteria (NMFS 1997; NMFS 2008).

ITEM 011 - CRUSHED SURFACING TOP COURSE

Where directed by the Owner, a less than 2" thick compacted course of 5/8" Crushed Surfacing Top Course shall be installed to restore or improve driveways and parking areas. Where directed by the Owner, Crushed Surfacing Top Course may be used to repair sections of Red Dog Lane. Watering of the road surface during installation and compaction shall be included.

Measurement

Crushed Surfacing Top Course, mixed by road mix method, will be measured per cubic yard. Measurement will be made in the hauling conveyance at the point of delivery.

Payment

The Contract unit price per cubic yard for "Crushed Surfacing Top Course" shall be full compensation for all labor, materials, tools and equipment necessary to satisfactorily procure, deliver, stockpile, haul, and construct and place Crushed Surfacing Top Course.

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