

OREGON



PROJECT LOCATION MAP

1" = 1/2 Mile

This project was designed to comply with Bonneville Power Administration's Habitat Improvement Program Programmatic Biological Opinion (HIP III)

DRAWINGS FOR THE CONSTRUCTION OF THE TAMKALIKS SIDE CHANNEL and FLOODPLAIN RESTORATION

**NEZ PERCE TRIBE
Department of Fisheries Resources Management
Wallowa County, Oregon**

GENERAL NOTES

1. The Contractor will comply with the Terms & Conditions from the BPA Habitat Improvement Program Biologic Opinion (HIP III) that requires the utmost care is taken when construction activity is taking place in or near the waterway.
2. The contractor is responsible for complying with all permits and easements including all federal, state, county, and local permits.
3. Excavation, trenching, shoring, and shielding shall be the responsibility of the contractor performing the work, these drawings are not intended to provide means or methods of construction.
4. All existing conditions are to be verified in the field prior to construction and any adjustments to the drawings shall be made as directed by the USFS project manager
5. Excavation shall meet the requirements of OSHA 29 CFR Part 1926, Subpart P, Excavations. Actual slopes shall not exceed the slopes as indicated on drawings.
6. Protect all trees and land areas marked for protection. Exercise care in areas not so marked to avoid unnecessary damage to natural vegetation.
7. Existing private improvements, which lie within the construction limits, unless otherwise noted will be removed by the owner thereof or abandoned in place.
8. The NPT makes no representations as to the existence or non-existence of utilities. It is the responsibility of land owners or operators to comply with the provisions of ORS 757.541 to 757.571. Land owners or operators and contractors will be liable for any damage resulting from disruption of service caused by construction activities.
9. These drawings and the associated written specifications represent the construction documents. Any deviations from these drawings and associated specifications without written approval from the USFS may result in this project not meeting specifications and may affect the terms and conditions of the construction contract.
10. All construction activities are to be performed and completed with ODF&W in-stream work period for the Wallowa River; July 15th - August 15th.
11. All excess materials and excavation to be placed at location identified by the NPT project manager with coordination with the contractor.

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Designed	Sean Welch PE	1/2018
Drawn	Sean Welch PE	1/2018
Checked		2018
Approved	Sean Welch PE	2018
Title		

PROJECT LOCATION & TITLE PAGE
TAMKALIKS SIDE CHANNEL and FLOODPLAIN RESTORATION
WALLOWA COUNTY, OREGON
NEZ PERCE TRIBE
Department of Fisheries Resources Management



File Name
TAMKALIKS.DWG

Drawing No.
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HIP 3 GENERAL AQUATIC CONSERVATION MEASURES APPLICABLE TO ALL ACTIONS

THE ACTIVITIES COVERED UNDER THE HIP III 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 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.

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.

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

VI. 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 TARPULIN, UNTIL THEY CAN BE PROPERLY TRANSPORTED TO AND DISPOSED OF AT A FACILITY THAT IS APPROVED FOR RECEIPT OF HAZARDOUS MATERIALS.

12) INVASIVE SPECIES CONTROL. THE FOLLOWING MEASURES WILL BE FOLLOWED TO AVOID INTRODUCTION OF INVASIVE PLANTS AND NOXIOUS WEEDS INTO PROJECT AREAS:

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.

Date	02/20/16
Designed	Sean Welch PE
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HIP III CONSERVATION MEASURES PAGE 1
 TAMKALIKS SIDE CHANNEL and FLOODPLAIN RESTORATION
 WALLOWA COUNTY, OREGON
 NEZ PERCE TRIBE
 Department of Fisheries Resources Management



File Name
TAMKALIKS.DWG

Drawing No.
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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](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](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](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 ALTERNATIVES CONSIDERED, 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 HYDROCHIP IINS, METALS AND OTHER POLLUTANTS LIKELY TO BE PRESENT WILL BE PROVIDED.

Date	02/20/16
Designed	Sean Welch PE
Drawn	Sean Welch PE
Checked	
Approved	
Title	

HIP III CONSERVATION MEASURES PAGE 2
 TAMKALIKS SIDE CHANNEL and FLOODPLAIN RESTORATION
 WALLOWA COUNTY, OREGON
 NEZ PERCE TRIBE
 Department of Fisheries Resources Management



File Name
TAMKALIKS.DWG

Drawing No.
3

GENERAL NOTES TO CONTRACTOR

1. THE CONSTRUCTION SPECIFICATIONS AND MATERIAL SPECIFICATIONS DESCRIBE MINIMUM ACCEPTABLE QUALITY OF WORK AND MATERIALS FOR THE PROJECT. IF A CONFLICT ARISES BETWEEN THE DRAWINGS AND SPECIFICATIONS, THE SPECIFICATION GOVERNS THE WORK AND/OR MATERIAL. THE DRAWINGS ARE A VISUAL REPRESENTATION TO COMPLEMENT CONSTRUCTION AND MATERIAL SPECIFICATIONS. THE DRAWINGS INCLUDE LOCATION, PROFILES, SECTIONS, DETAILS AND NOTES NECESSARY TO DESCRIBE THE WORK. IF SITE CONDITIONS WARRANT CHANGES TO THE PLANS, THE PROJECT INSPECTOR RESERVES THE RIGHT TO DIRECT THE CONTRACTOR TO MAKE THESE MODIFICATIONS. NO CHANGES SHALL BE MADE TO THE DRAWINGS OR SPECIFICATIONS WITHOUT PRIOR WRITTEN APPROVAL OF THE PROJECT INSPECTOR.
2. IN THE EVENT THAT A PERMIT CONDITION CONFLICTS WITH THE DRAWINGS AND SPECIFICATIONS, THE ISSUE SHALL BE BROUGHT TO THE ATTENTION OF THE PROJECT INSPECTOR FOR CLARIFICATION PRIOR TO PROCEEDING WITH WORK.
3. THE PROJECT SHALL BE CONSTRUCTED ACCORDING TO THE PROJECT DRAWINGS. THE CONTRACTOR SHALL NOTIFY THE PROJECT INSPECTOR OF ANY CHANGES PRIOR TO IMPLEMENTATION. THE PROJECT INSPECTOR FOR THIS PROJECT SHALL BE RIVER DESIGN GROUP, INC.
4. RIVER DESIGN GROUP MAKES NO REPRESENTATION OF THE EXISTENCE OR NONEXISTENCE OF UTILITIES. CONTRACTOR IS RESPONSIBLE FOR CALLING THE OREGON UTILITY NOTIFICATION CENTER (800-332-2344) AT LEAST TWO WEEKS PRIOR TO DIGGING.
5. COSTS INCURRED DUE TO PROJECT DELAYS RESULTING FROM FAILURE OF THE CONTRACTOR TO MEET THE REQUIREMENTS OF THE GENERAL NOTES TO CONTRACTOR, SAFETY, CONTRACTOR QUALIFICATIONS, MATERIAL SPECIFICATIONS, EQUIPMENT SPECIFICATIONS, CONSTRUCTION SPECIFICATIONS, AND PLAN SET SHALL BE THE EXPENSE OF THE CONTRACTOR.

SAFETY

1. THE CONTRACTOR IS RESPONSIBLE FOR COMPLIANCE WITH ALL STATE AND LOCAL LAWS, ORDINANCES, CODES, AND/OR REGULATIONS APPLICABLE FOR THE PROJECT INSTALLATION. THE PROJECT INSPECTOR WILL DOCUMENT ANY SAFETY VIOLATIONS WITNESSE

CONTRACTOR QUALIFICATIONS

1. THE CONTRACTOR SHALL HAVE AT LEAST TWO (2) YEARS OF RIVER RESTORATION CONSTRUCTION EXPERIENCE AND SHALL HAVE COMPLETED AT LEAST FIVE (5) RIVER RESTORATION PROJECTS. SIMILAR EXPERIENCE WILL BE EVALUATED ON A CASE BY CASE SCENARIO.
2. IF THE CONTRACTOR CHOOSES TO DESIGNATE AN EMPLOYEE WITHOUT QUALIFIED STREAM RESTORATION EXPERIENCE, THE CONTRACTOR SHALL BE ON-SITE AT ALL TIMES WHEN THE EMPLOYEE IS PERFORMING RIVER RESTORATION WORK. FAILURE TO ABIDE BY THIS CONDITION WITHOUT PREVIOUS AGREEMENT WITH THE PROJECT INSPECTOR WOULD BE GROUNDS FOR TERMINATION.
3. THE CONTRACTOR SHALL MAINTAIN AT LEAST \$1,000,000 IN LIABILITY INSURANCE AND HAVE PROOF OF LIABILITY INSURANCE ON-SITE DURING THE ENTIRETY OF PROJECT CONSTRUCTION.
4. THE CONTRACTOR SHALL HAVE PROOF OF WORKER'S COMPENSATION INSURANCE ON-SITE DURING THE ENTIRETY OF PROJECT CONSTRUCTION.
5. COPIES OF ALL PROJECT PERMITS SHALL BE POSTED ON-SITE IN A VISIBLE LOCATION. THE CONTRACTOR SHALL COMPLY WITH THE PROVISIONS OF THE PERMITS. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER OF ANY KNOWN CHANGES OR ACTIVITIES THAT COULD VIOLATE PERMIT REQUIREMENTS PRIOR TO IMPLEMENTATION.

MATERIALS SPECIFICATIONS

1. THE CONTRACTOR SHALL FURNISH ALL MATERIALS NECESSARY TO CONSTRUCT THE PROJECT UNLESS OTHER PROVISIONS HAVE BEEN AGREED UPON PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL DELIVER ALL MATERIALS TO THE DESIGNATED STOCKPILE LOCATIONS LABELED ON THE PLAN SET OR TO A LOCATION SPECIFIED BY THE PROJECT INSPECTOR. IF A MATERIAL SOURCE HAS BEEN PRE-DETERMINED, THE PROJECT INSPECTOR SHALL PROVIDE DIRECTIONS TO THE CONTRACTOR.

2. MATERIAL QUANTITIES, DIMENSIONS AND SIZES SHALL CONFORM TO THE NOTES AND SPECIFICATIONS PROVIDED ON THE PROJECT DRAWINGS OR ON THE MATERIALS LIST.
3. THE PROJECT INSPECTOR SHALL INSPECT AND APPROVE ALL MATERIALS PRIOR TO CONSTRUCTION. IF MATERIALS DO NOT MEET THE MINIMUM REQUIREMENTS SPECIFIED IN THE PROJECT DRAWINGS OR MATERIAL LIST, THE PROJECT INSPECTOR SHALL REJECT THE MATERIALS.

EQUIPMENT SPECIFICATIONS

1. THE CONTRACTOR SHALL FURNISH ALL EQUIPMENT NECESSARY TO CONSTRUCT THE PROJECT. AT A MINIMUM, THE CONTRACTOR SHALL PROVIDE THE FOLLOWING EQUIPMENT FOR THIS PROJECT:
EXCAVATOR - THE EQUIPMENT SHALL BE CAPABLE OF MOVING LARGE WOOD (20 FOOT STEMS, WITH A 6 FOOT ATTACHED ROOTWAD WITH A MINIMUM TRUNK DIAMETER OF 2 FEET). THE EQUIPMENT MUST ALSO BE ABLE TO RAISE AND PLACE A 4 FOOT DIAMETER ROCK AT A WEIGHT OF 11,000 LBS. MINIMUM BUCKET VOLUME SHALL BE ONE (1) CUBIC YARD(S). THE BUCKET SHALL BE EQUIPPED WITH A HYDRAULIC THUMB FOR GRASPING LOGS, ROCKS, AND OTHER MATERIALS. THE EQUIPMENT MUST BE CAPABLE OF CROSSING WATER AND WORKING ON OR ADJACENT TO STEEP SLOPES. A CHAIN SHALL BE AVAILABLE FOR ATTACHING CULVERTS, PUMPS AND OTHER EQUIPMENT OR MATERIALS TO THE BUCKET FOR TRANSPORT ON-SITE. OFF-ROAD DUMP TRUCK - TRUCK SHALL HAVE A MINIMUM BED VOLUME OF EIGHT (8) CUBIC YARDS. THE TRUCK SHALL BE CAPABLE OF DRIVING ON NON-ASPHALT SURFACES AND OFF-ROAD SURFACES.
TRASH PUMP - DISCHARGE CAPACITY SHALL BE AT LEAST 450 GPM (1 CFS). TOTAL HEAD LIFT SHALL BE AT LEAST 95 FT. PUMPS SHALL BE EQUIPPED WITH AT LEAST 100 FEET OF 4" DIAMETER OUTLET HOSE. A PIPE WRENCH SHALL BE AVAILABLE FOR ATTACHING HOSES. FUEL AND OIL SHALL BE SUPPLIED FOR THE TRASH PUMPS.
CHAINSAW - THE CHAINSAW MUST BE CAPABLE OF COMPLETELY SAWING LOGS OF THE DIAMETER SPECIFIED IN THE MATERIAL SPECIFICATIONS. ALSO, THE CHAINSAW MUST BE CAPABLE OF SAWING HDPE OR PVC CULVERTS OR PIPES AS NOTED IN THE MATERIAL SPECIFICATIONS.
3. ALL EQUIPMENT SHALL BE WASHED PRIOR TO MOBILIZATION TO THE SITE TO MINIMIZE THE INTRODUCTION OF FOREIGN MATERIALS AND FLUIDS TO THE PROJECT SITE. ALL EQUIPMENT SHALL BE FREE OF OIL, HYDRAULIC FLUID, AND DIESEL FUEL LEAKS. TO PREVENT INVASION OF NOXIOUS WEEDS OR THE SPREAD OF WHIRLING DISEASE SPORES, ALL EQUIPMENT SHALL BE POWER WASHED OR CLEANED TO REMOVE MUD AND SOIL PRIOR TO MOBILIZATION INTO THE PROJECT AREA. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO INSURE THAT ADEQUATE MEASURES HAVE BEEN TAKEN.
4. EQUIPMENT SHALL BE IN A WELL-MAINTAINED CONDITION TO MINIMIZE THE LIKELIHOOD OF A FLUID LEAK. IF A FLUID LEAK DOES OCCUR, THE PROJECT INSPECTOR SHALL BE NOTIFIED IMMEDIATELY, AND ALL WORK CEASED UNTIL THE LEAK HAS BEEN RECTIFIED. AT ALL TIMES DURING THE CONSTRUCTION PHASE, FLUID SPILL CONTAINMENT EQUIPMENT SHALL BE PRESENT ON-SITE AND READY FOR DEPLOYMENT SHOULD AN ACCIDENTAL SPILL OCCUR. PROJECT INSPECTOR RESERVES THE RIGHT TO REFUSE EQUIPMENT THAT DOES NOT MEET THE PREVIOUS CRITERIA.
5. THE CONTRACTOR SHALL MAINTAIN A COMPLETE TOOL SET WITH COMMONLY REPLACED PARTS (E.G. O-RINGS) TO MINIMIZE DOWNTIME IN THE EVENT OF EQUIPMENT MALFUNCTION. THE CONTRACTOR SHALL HAVE AN EMERGENCY SPILL KIT ON SITE DURING THE PROJECT.

MOBILIZATION SPECIFICATIONS

1. ALL MOBILIZATION AND DEMOBILIZATION WILL BE PERFORMED IN A SAFE AND ORDERLY MANNER WITH PARTICULAR CARE NOT TO DAMAGE EXISTING VEGETATION OR UNDUE DISTURBANCE TO THE INGRESS-EGRESS ROUTE.
2. THE CONTRACTOR IS RESPONSIBLE FOR DAMAGE INCURRED TO PROPERTY RESOURCES DURING MOBILIZATION AND DE-MOBILIZATION. VEGETATION THAT MAY BE CAUSE FOR CONCERN DURING MOBILIZATION SHALL BE IDENTIFIED BY THE CONTRACTOR AND FLAGGED BY THE PROJECT INSPECTOR AT THE TIME OF THE PROJECT "WALK THROUGH".
3. INGRESS AND EGRESS ROUTES TO THE PROJECT SITE WILL BE IDENTIFIED DURING THEPROJECT "WALK THROUGH".
4. UPON COMPLETION OF CONSTRUCTION AND DEMOBILIZATION ACTIVITIES THE CONTRACTOR SHALL PERFORM SITE RESTORATION. ALL COMPACTED SURFACES ARE TO BE RIPPED TO A MINIMUM DEPTH OF 4 INCHES FOR SEEDING PREPARATION. ORGANIC CONSTRUCTION DEBRIS SHALL BE PLACED AT THE DIRECTION OF THE PROJECT INSPECTOR ON SURFACES EXPOSED DURING CONSTRUCTION. SITE RESTORATION SHALL BE CERTIFIED COMPLETE IN WRITING BY THE PROJECT INSPECTOR UPON COMPLETION OF CONSTRUCTION ACTIVITIES.

CONSTRUCTION SPECIFICATIONS

1. CONSTRUCTION SHALL OCCUR IN ACCORDANCE WITH THE PROJECT DRAWINGS, CONSTRUCTION SPECIFICATIONS, EQUIPMENT SPECIFICATIONS, MATERIAL SPECIFICATIONS, REVEGETATION SPECIFICATIONS AND GENERAL SPECIFICATIONS.
2. PRIOR TO CONSTRUCTION, CONSTRUCTION AREAS WILL BE STAKED OUT USING A SURVEY GRADE GLOBAL POSITIONING SYSTEM (GPS), TOTAL STATION, OR SURVEY LASER. THE PROJECT INSPECTOR SHALL STAKE THE LOCATIONS OF THE CONSTRUCTION ACCESS, STOCKPILE LOCATIONS, LIMITS OF DISTURBANCE, TEMPORARY DIVERSION CHANNELS, TEMPORARY CULVERTS, PROPOSED CHANNEL CENTERLINE, PROPOSED CHANNEL MARGINS, CHANNEL BED FEATURES, FLOODPLAIN EXTENTS, WETLANDS AND ALL STRUCTURES ACCORDING TO THE PROJECT DRAWINGS. AT A MINIMUM, STAKING OF FEATURES SHALL OCCUR EVERY 25 FEET ALONG THE ALIGNMENT. THE CONTRACTOR SHALL MINIMIZE DISTURBANCE TO GRADE STAKES. IF EXCESSIVE DISTURBANCE TO GRADE STAKES BY THE CONTRACTOR OCCURS, IT SHALL BE THE CONTRACTOR'S EXPENSE TO RE-STAKE THE PROJECT.
3. CONSTRUCTION ACCESS SHALL BE DETERMINED BY THE PROJECT INSPECTOR. CONSTRUCTION EQUIPMENT SHALL NOT CROSS PRIVATE LAND UNLESS PERMISSION IS OBTAINED FROM THE LANDOWNER. THE CONTRACTOR SHALL LEAVE ALL GATES, WHETHER OPEN OR CLOSED, AS FOUND.
4. STREAM CROSSINGS SHALL BE MINIMIZED DURING CONSTRUCTION. IF MULTIPLE CROSSINGS (10 OR MORE) ARE EXPECTED, THE CONTRACTOR SHALL PROVIDE AND INSTALL TEMPORARY CULVERTS SO THAT EQUIPMENT CAN CROSS THE STREAM WITHOUT GENERATING EXCESS TURBIDITY. TEMPORARY CULVERT SIZES SHALL ACCOMMODATE 150% OF EXPECTED BASE FLOW DURING CONSTRUCTION. THE PROJECT INSPECTOR SHALL SPECIFY THE SIZES AND LOCATIONS OF THE TEMPORARY CULVERTS.
5. PRIOR TO CONSTRUCTION, TEMPORARY DIVERSION CHANNELS SHALL BE CONSTRUCTED TO DIVERT WATER AWAY FROM CONSTRUCTION AREAS. TEMPORARY DIVERSION CHANNELS SHALL BE LOCATED AND CONSTRUCTED ACCORDING TO THE DESIGN REPORT OR PLAN SET. TEMPORARY DIVERSION CHANNELS CONSTRUCTED IN FINE SOILS SUCH AS SAND, SILT, OR ORGANIC MATERIAL SHALL BE COMPLETELY LINED WITH FABRIC TO PREVENT EROSION. THE CONTRACTOR SHALL USE "ECO BLOCKS", OR AN APPROVED EQUAL, FOR CONSTRUCTING COFFERDAMS FOR TEMPORARY DIVERSION CHANNELS. THE CONTRACTOR SHALL DIVERT WATER INCREMENTALLY INTO THE TEMPORARY DIVERSION CHANNEL TO MINIMIZE TURBIDITY AND PERMIT FISH TO MOVE OUT OF THE DEWATERED CHANNEL SEGMENTS. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER PRIOR TO DEWATERING CHANNEL SEGMENTS. THE PROJECT INSPECTOR SHALL NOTIFY A QUALIFIED FISH BIOLOGIST OF POSSIBLE FISH RESCUE NEEDS.
6. STRAW BALES AND SILT FENCING SHALL BE AVAILABLE AND INSTALLED BY THE CONTRACTOR IF DEEMED NECESSARY BY THE PROJECT INSPECTOR. CONSTRUCTION FENCING (LIMITS OF DISTURBANCE) SHALL BE INSTALLED BY THE CONTRACTOR IF DEEMED NECESSARY BY THE PROJECT INSPECTOR.
7. EXCAVATION SHALL COMPLY WITH CONSTRUCTION STAKES, TERRAIN SURFACES, AND THE PLAN SET. EXCAVATION SHALL ESTABLISH CHANNEL ELEVATIONS WITHIN 0.2 FEET OF FINAL ELEVATIONS. THE PROJECT INSPECTOR SHALL INSPECT THE CHANNEL EXCAVATION FOR COMPLIANCE WITH THE PLAN SET. ALL EXCAVATED MATERIALS SHALL BE STOCKPILED ON-SITE, ABOVE THE BANKFULL CHANNEL UNTIL HAULED OFF-SITE OR USED ON-SITE. DISTURBANCE TO RIPARIAN VEGETATION, CHANNEL BANKS AND SOD SHALL BE MINIMIZED. EXCAVATED SOD AND RIPARIAN SHRUB TRANSPLANTS SHALL BE CAREFULLY STOCKPILED AND REUSED FOR PLANTING FLOODPLAINS OR STREAM BANKS.
8. AFTER EXCAVATING THE CHANNEL, THE CONTRACTOR SHALL INSTALL THE GRADE CONTROL, BANK STABILIZATION AND HABITAT STRUCTURES USING THE EXCAVATOR. EACH STRUCTURE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LOCATIONS AND SPECIFICATIONS PROVIDED IN THE PLAN SET. THE PROJECT INSPECTOR SHALL INSPECT AND APPROVE ALL STRUCTURES PRIOR TO BACKFILLING.
9. AFTER ALL STRUCTURES ARE INSTALLED, THE CHANNEL WILL BE SHAPED TO WITHIN 0.2 FEET OF THE FINAL ELEVATIONS SPECIFIED ON THE PLAN SET. THE PROJECT INSPECTOR SHALL CHECK THE FINAL ELEVATIONS FOR COMPLIANCE WITH THE PLAN SET. ALL EXCAVATED MATERIALS SHALL BE STOCKPILED AT A LOCATION IDENTIFIED BY THE PROJECT INSPECTOR. DISTURBANCE TO RIPARIAN VEGETATION, CHANNEL BANKS AND SOD SHALL BE MINIMIZED. 10. UPON NOTIFICATION FROM THE PROJECT INSPECTOR, THE CONTRACTOR SHALL DIVERT WATER INCREMENTALLY INTO THE NEW CHANNEL. EFFORTS SHALL BE MADE TO MINIMIZE TURBIDITY AND PERMIT FISH TO MOVE OUT OF THE DEWATERED CHANNEL SEGMENTS.
11. THE CONTRACTOR SHALL REMOVE EXCESS MATERIALS, TEMPORARY CULVERTS AND EQUIPMENT FROM THE SITE. THE CONTRACTOR SHALL REGRADE DISTURBED AREAS AND CONSTRUCTION ACCESS ROADS TO THEIR ORIGINAL GRADES. THE CONTRACTOR SHALL TREAT COMPACTED SOIL AREAS INCLUDING ACCESS ROADS AND MATERIAL STOCKPILE AREAS. THE CONTRACTOR SHALL REMOVE SOIL FROM THE PROJECT SITE IF THE SOIL IS TAINTED WITH PETROLEUM-BASED FLUIDS.

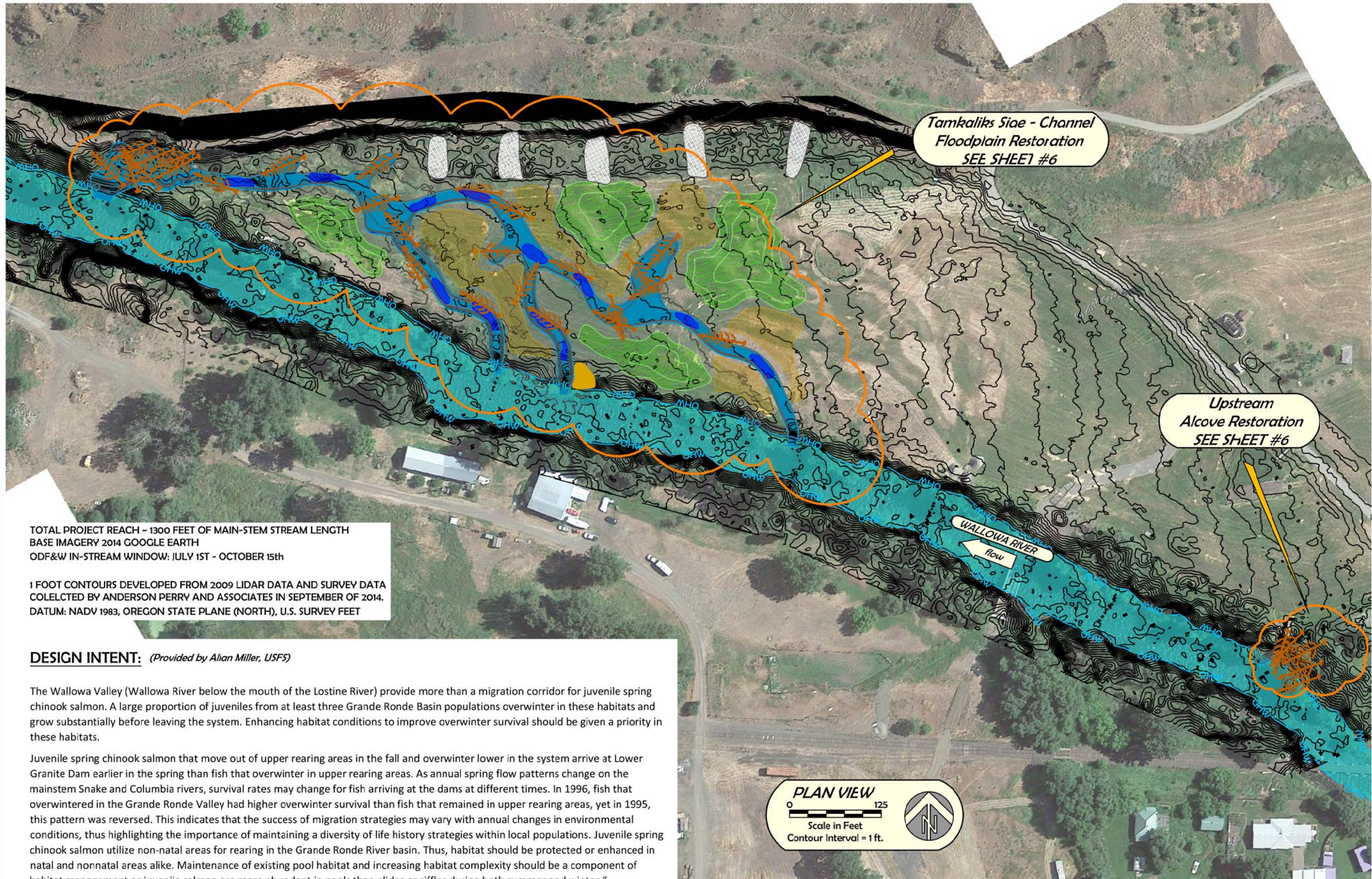
PROJECT SPECIFICATIONS
 TAMKALIKS SIDE CHANNEL and FLOODPLAIN RESTORATION
 WALLOWA COUNTY, OREGON
 NEZ PERCE TRIBE
 Department of Fisheries Resources Management

Date	10/20/09
Designed	Sean Welch PE
Drawn	Sean Welch PE
Checked	
Approved	
Title	



File Name
TAMKALIKS.DWG

Drawing No.
4



TOTAL PROJECT REACH - 1300 FEET OF MAIN-STEM STREAM LENGTH
 BASE IMAGERY 2014 GOOGLE EARTH
 ODF&W IN-STREAM WINDOW: JULY 1ST - OCTOBER 15th

1 FOOT CONTOURS DEVELOPED FROM 2009 LIDAR DATA AND SURVEY DATA
 COLECTED BY ANDERSON PERRY AND ASSOCIATES IN SEPTEMBER OF 2014.
 DATUM: NADV 1983, OREGON STATE PLANE (NORTH), U.S. SURVEY FEET

DESIGN INTENT: *(Provided by Alan Miller, USFS)*

The Wallowa Valley (Wallowa River below the mouth of the Lostine River) provide more than a migration corridor for juvenile spring chinook salmon. A large proportion of juveniles from at least three Grande Ronde Basin populations overwinter in these habitats and grow substantially before leaving the system. Enhancing habitat conditions to improve overwinter survival should be given a priority in these habitats.

Juvenile spring chinook salmon that move out of upper rearing areas in the fall and overwinter lower in the system arrive at Lower Granite Dam earlier in the spring than fish that overwinter in upper rearing areas. As annual spring flow patterns change on the mainstem Snake and Columbia rivers, survival rates may change for fish arriving at the dams at different times. In 1996, fish that overwintered in the Grande Ronde Valley had higher overwinter survival than fish that remained in upper rearing areas, yet in 1995, this pattern was reversed. This indicates that the success of migration strategies may vary with annual changes in environmental conditions, thus highlighting the importance of maintaining a diversity of life history strategies within local populations. Juvenile spring chinook salmon utilize non-natal areas for rearing in the Grande Ronde River basin. Thus, habitat should be protected or enhanced in natal and nonnatal areas alike. Maintenance of existing pool habitat and increasing habitat complexity should be a component of habitat management as juvenile salmon are more abundant in pools than glides or riffles during both summer and winter."

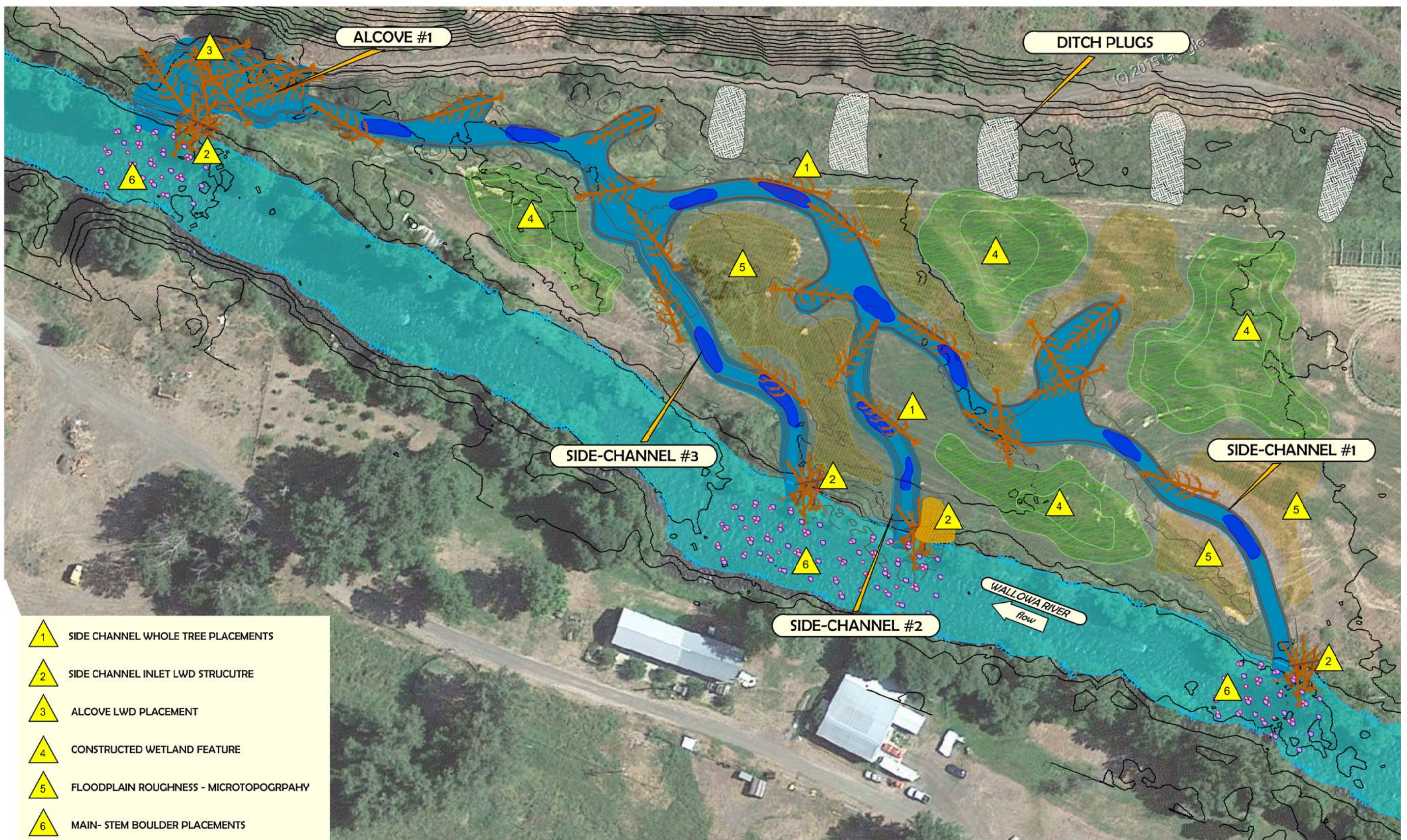
Date	10/2008
Designed	Sean Welch PE
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PROJECT SITE PLAN & OVERVIEW
 TAMKALIKS SIDE CHANNEL and FLOODPLAIN RESTORATION
 WALLOWA COUNTY, OREGON
 NEZ PERCE TRIBE
 Department of Fisheries Resources Management



File Name
 TAMKALIKS.DWG

Drawing No.
5




-  SIDE CHANNEL WHOLE TREE PLACEMENTS
-  SIDE CHANNEL INLET LWD STRUCTURE
-  ALCOVE LWD PLACEMENT
-  CONSTRUCTED WETLAND FEATURE
-  FLOODPLAIN ROUGHNESS - MICROTOPOGRAPHY
-  MAIN-STEM BOULDER PLACEMENTS

PLAN VIEW

0 125

Scale in Feet

Contour Interval = 1 ft.

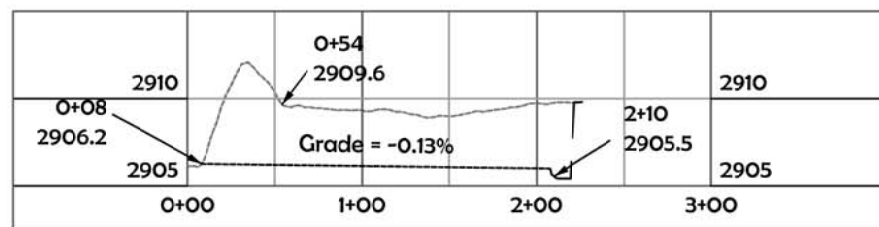
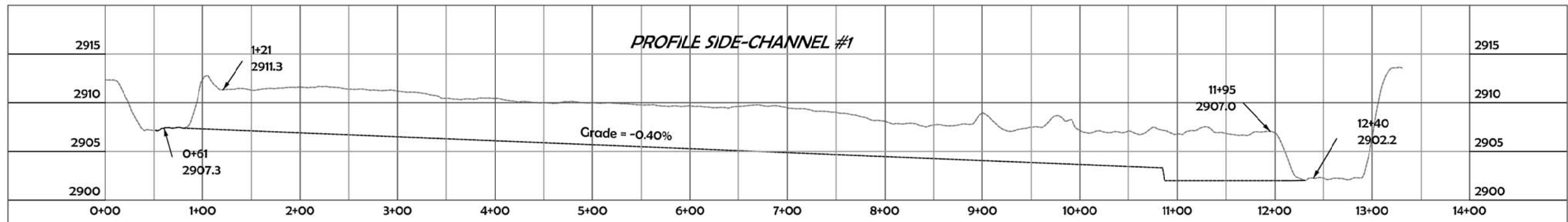
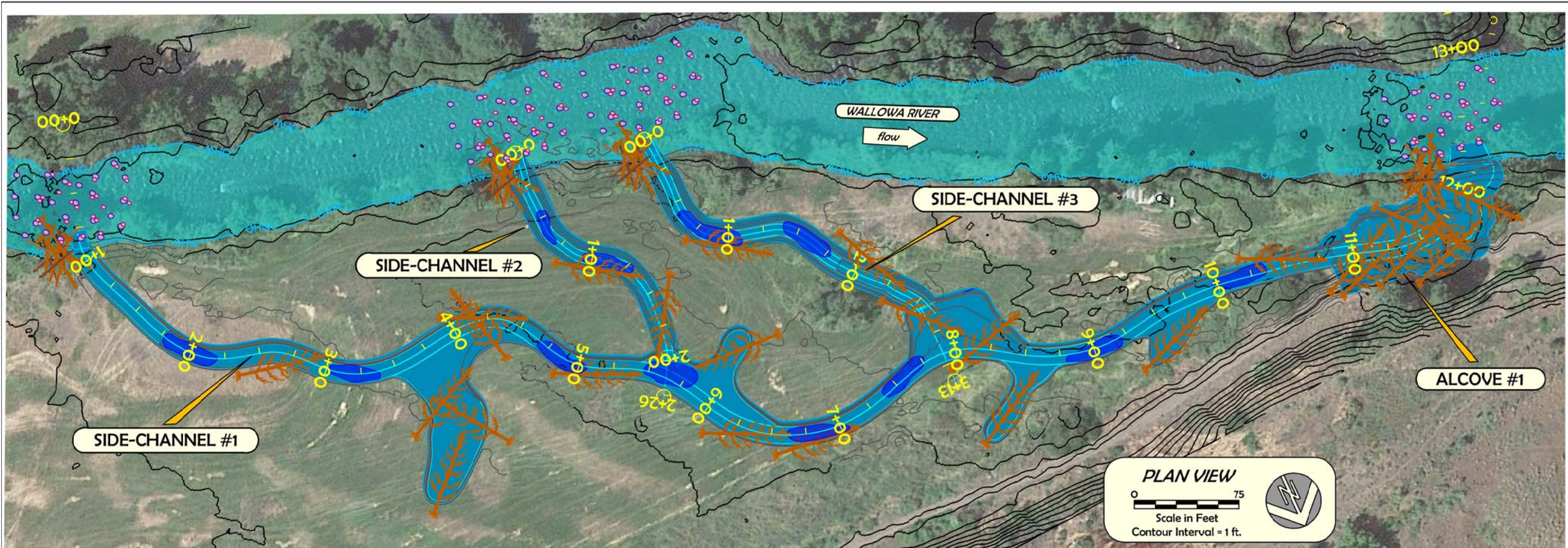


Date	02/20/08
Designed	Sean Welch PE
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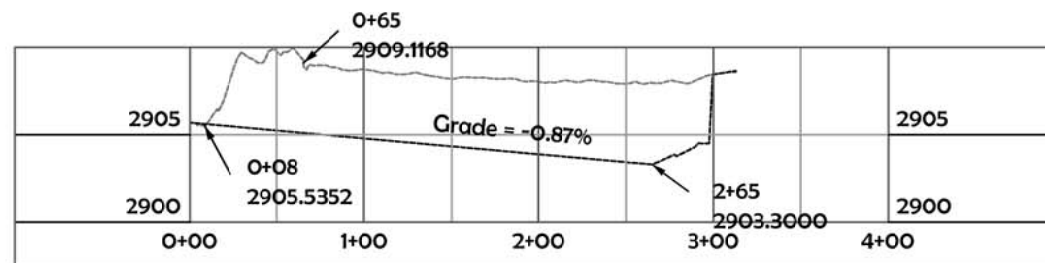
SIDE-CHANNEL RESTORATION SITE PLAN
 TAMKALIKS SIDE CHANNEL and FLOODPLAIN RESTORATION
 WALLOWA COUNTY, OREGON
 NEZ PERCE TRIBE
 Department of Fisheries Resources Management



File Name	TAMKALIKS.DWG
Drawing No.	6
Sheet	6 of 11



PROFILE SIDE-CHANNEL #2



PROFILE SIDE-CHANNEL #3



Date	02/2008
Designed	Sean Welch PE
Drawn	Sean Welch PE
Checked	
Approved	
Title	

PLAN AND PROFILE
 TAMKALIKS SIDE CHANNEL and FLOODPLAIN RESTORATION
 WALLOWA COUNTY, OREGON
 NEZ PERCE TRIBE
 Department of Fisheries Resources Management

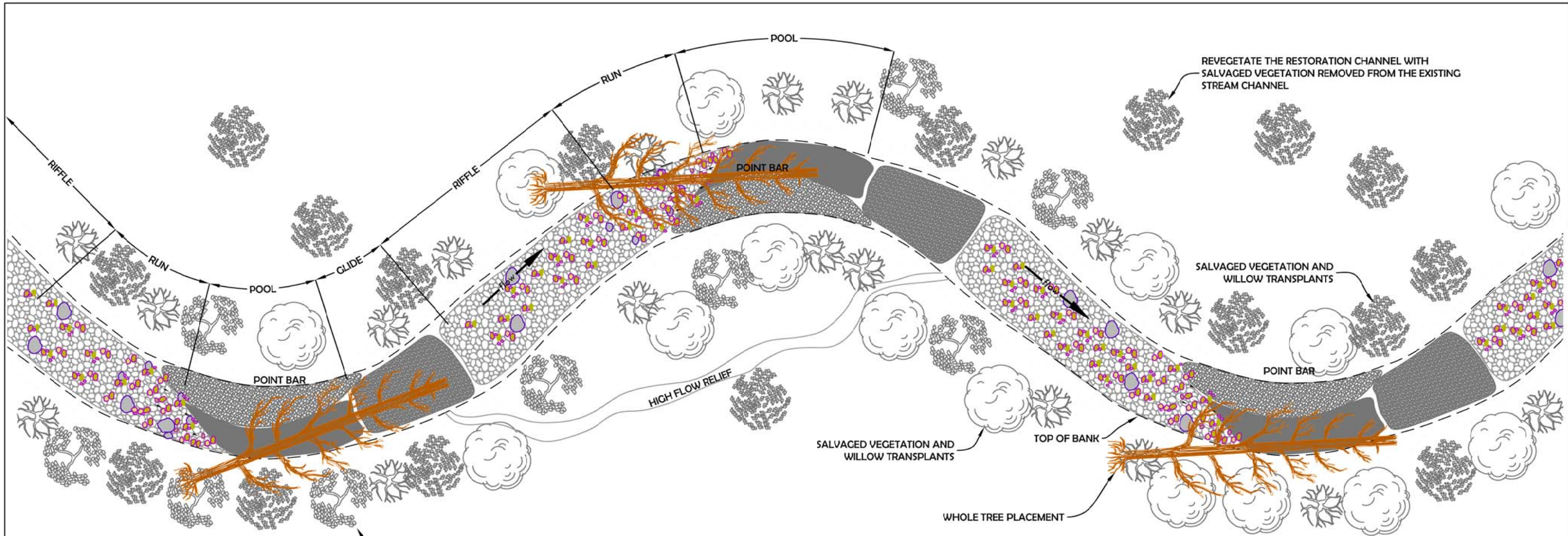


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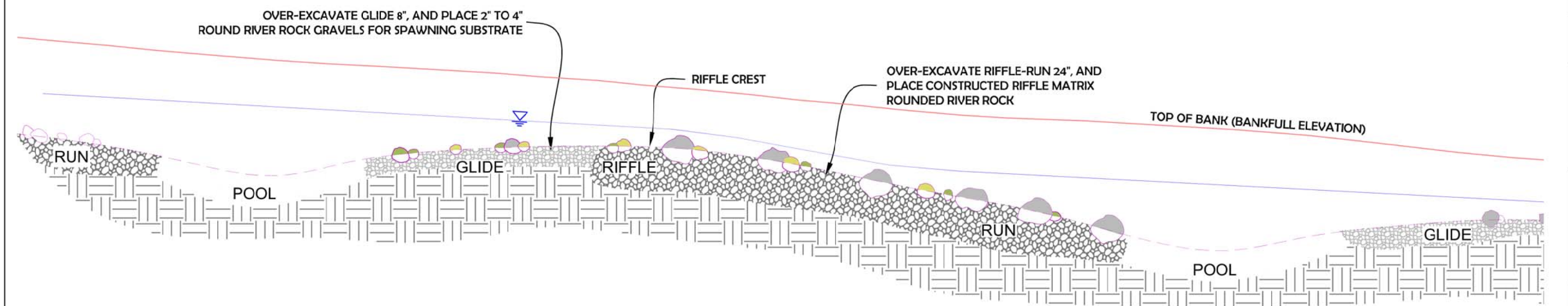
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Sheet 7 of 11



1 TYPICAL CHANNEL LAYOUT
NOT TO SCALE



2 STREAM PROFILE
NOT TO SCALE

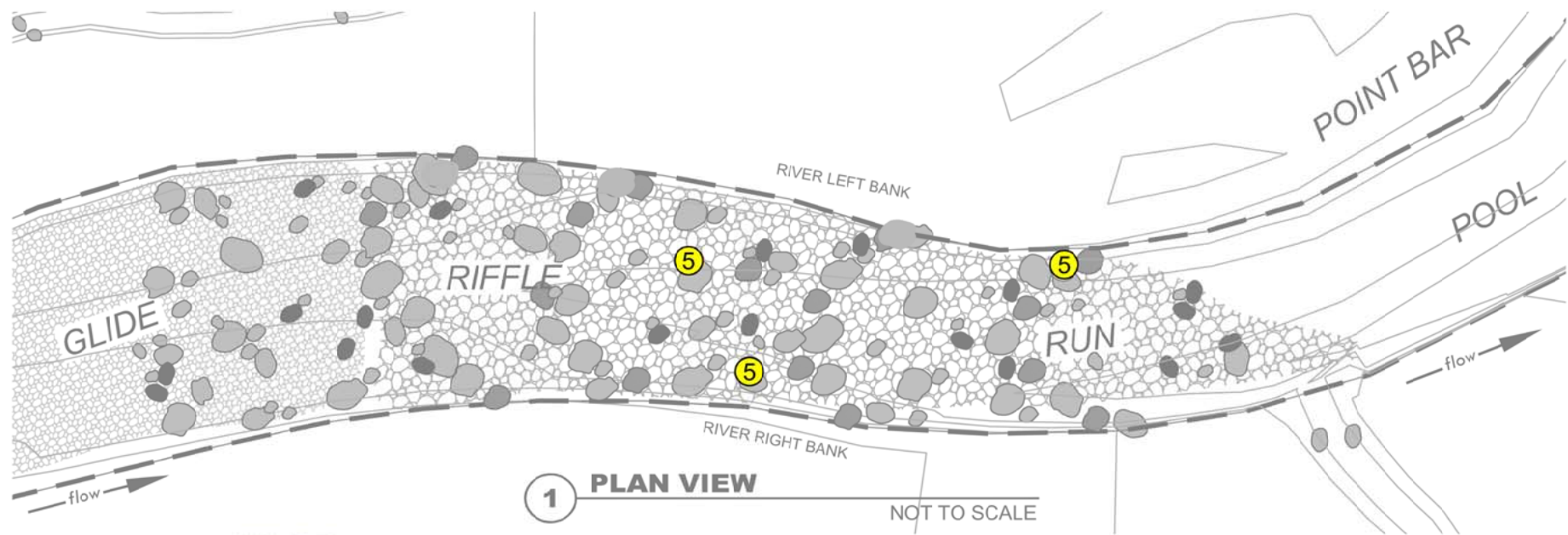
Date	02/2008
Designed	Sean Welch PE
Drawn	Sean Welch PE
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Approved	
Title	

TYPICAL SIDE-CHANNEL LAYOUT
TAMKALIKS SIDE CHANNEL and FLOODPLAIN RESTORATION
WALLOWA COUNTY, OREGON
NEZ PERCE TRIBE
Department of Fisheries Resources Management

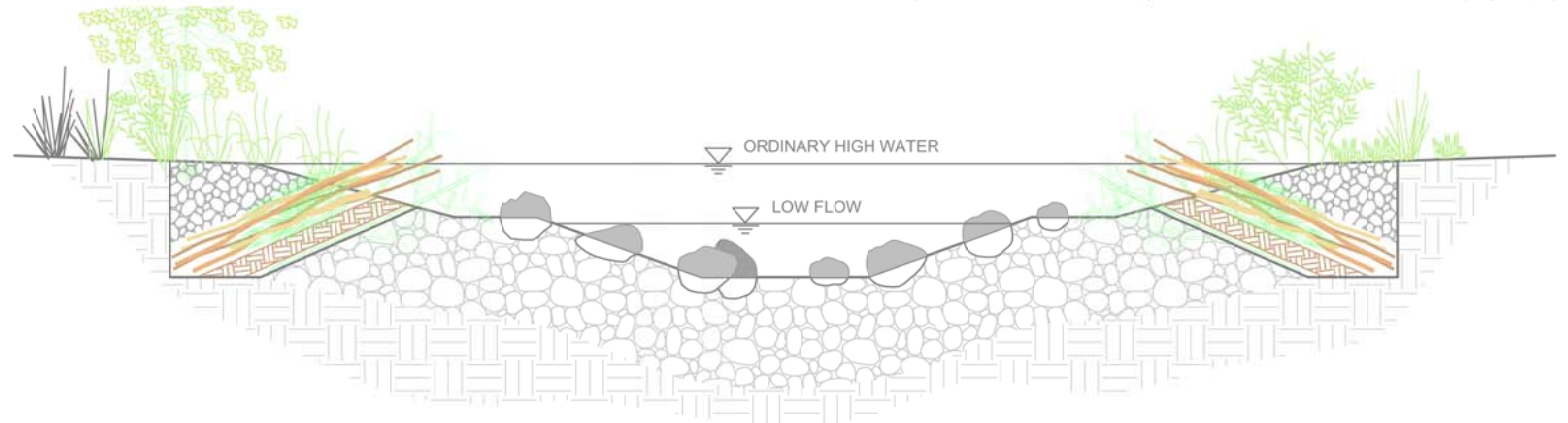


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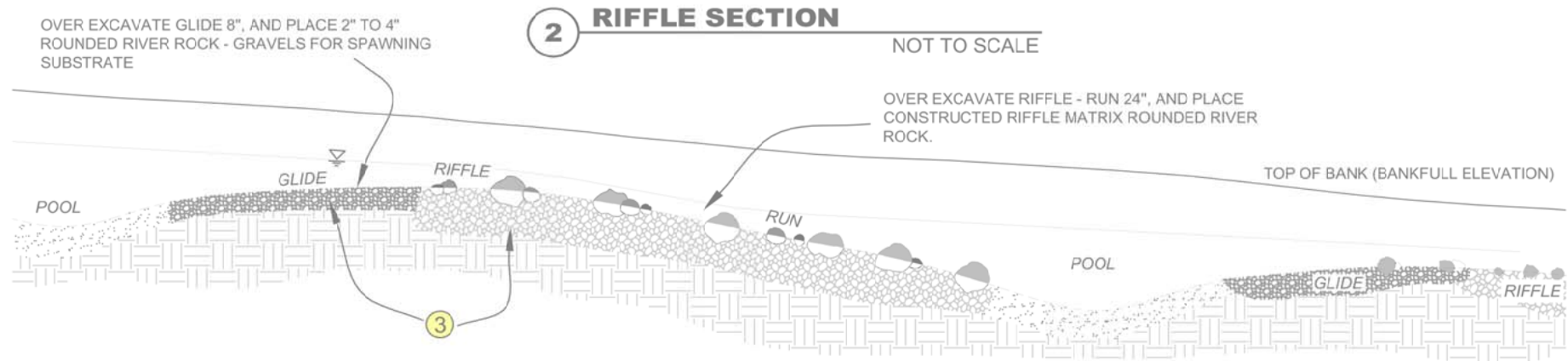
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1 PLAN VIEW NOT TO SCALE



2 RIFFLE SECTION NOT TO SCALE



3 RIFFLE-RUN PROFILE NOT TO SCALE

6 ENGINEERED RIFFLE MATRIX GRADATION

PERCENT PASSING	LOWER LIMIT (INCHES)	UPPER LIMIT (INCHES)
100	17	22.5
85	14.5	20
50	11	17
30	6.5	10.5
15	3.5	5.5

MATRIX THICKNESS (T) = 24 INCHES

GENERAL NOTES:

BOULDER PLACEMENT BEGINS NEAR THE DOWNSTREAM END OF THE GLIDE TO PROVIDE LARGE SCALE ROUGHNESS DURING HIGH FLOW AND HYDRAULIC VARIABILITY UNDER LOW FLOW CONDITIONS. HYDRAULIC EFFECT INCLUDES SPAWNING MATERIAL RETENTION AND DEPOSITION ALONG GLIDE FACE. ELEMENTS PLACED ALONG THE RIFFLE AND RUN PROVIDE DISRUPTION OF AVERAGE VELOCITY GRADIENTS AND SERVE A GRADE CONTROL FUNCTION FOR THE OVERALL GEOMORPHIC UNIT. PARTICULAR CARE SHOULD BE EMPLOYED WITH ELEMENT PLACEMENT TO REINFORCE THE RUN - POOL TRANSITIONAL SLIP FACE.

CONSTRUCTION NOTES:

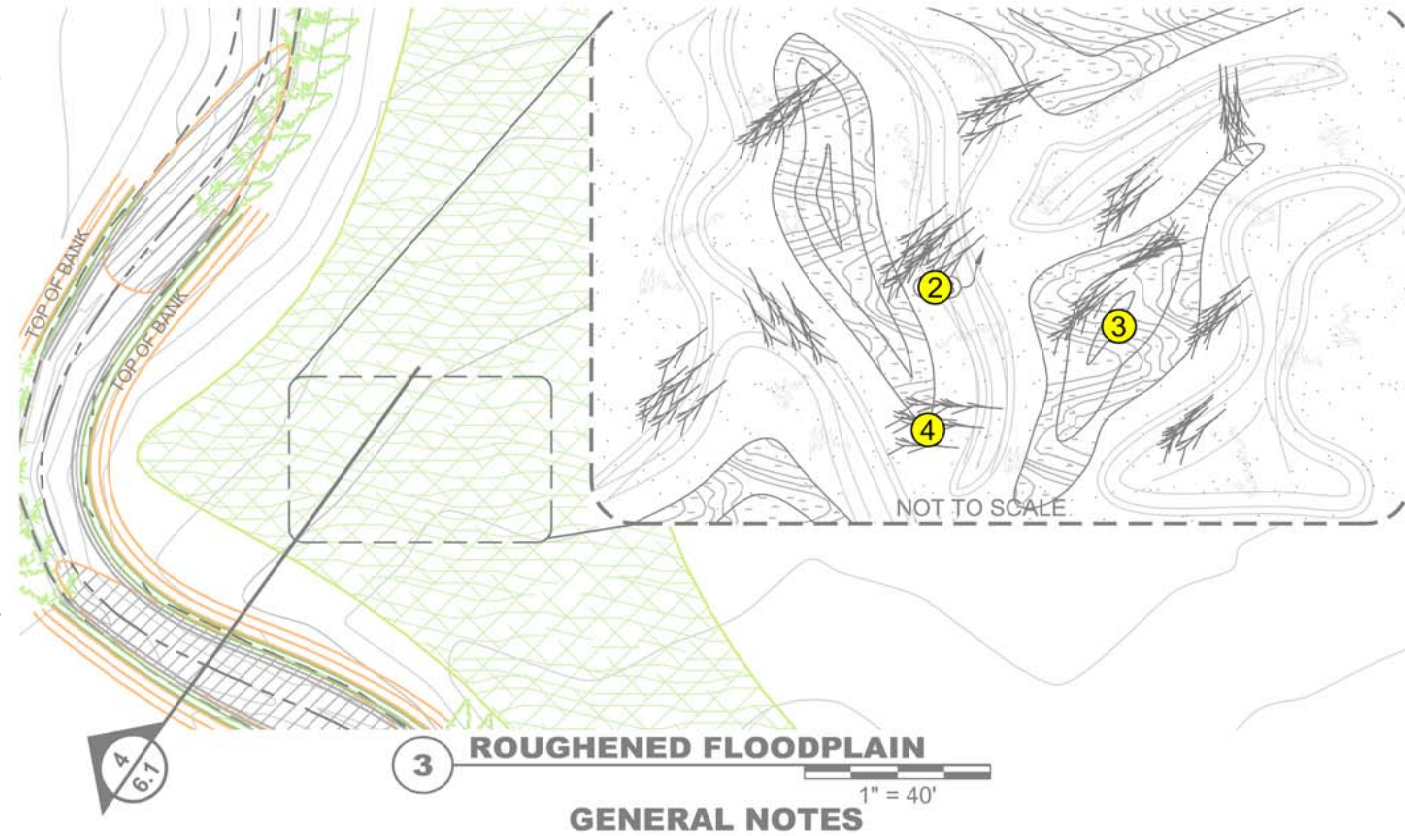
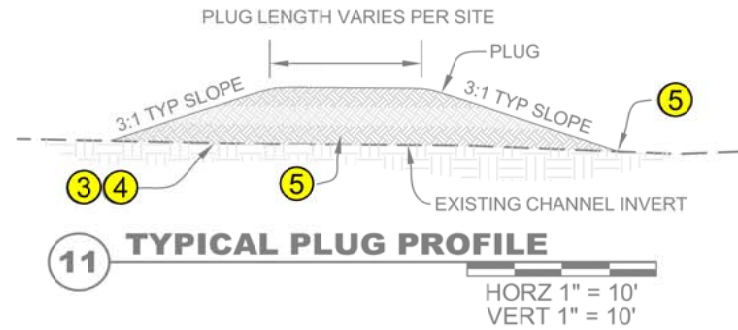
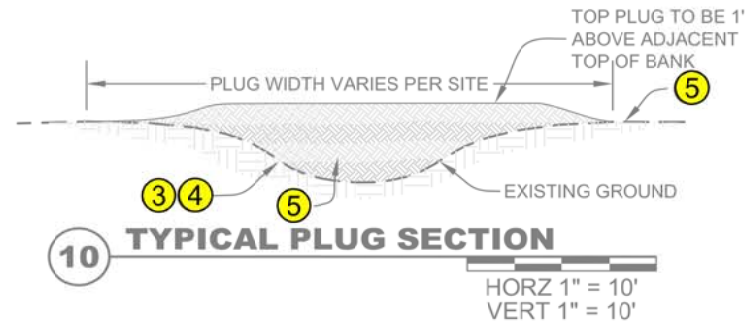
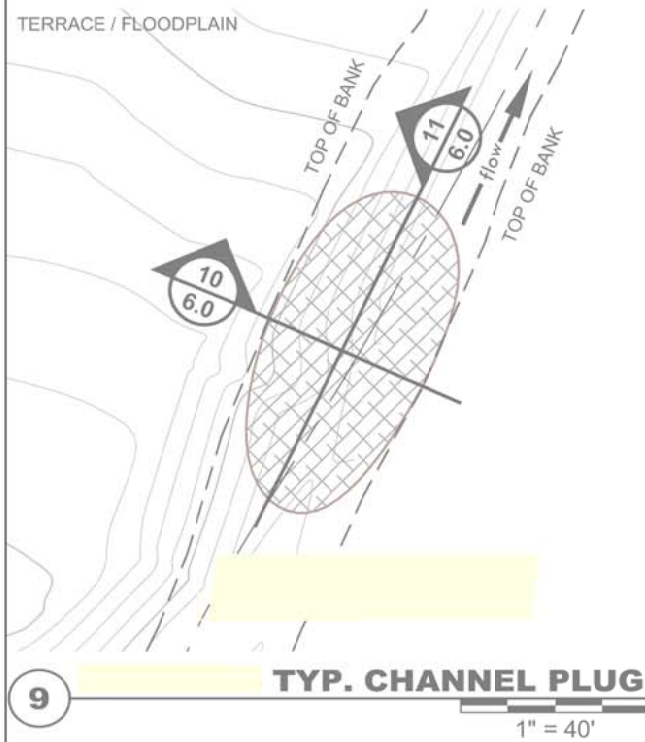
- ROCK MATERIALS SHALL BE OF THE GRADATION SHOWN ON THE DRAWINGS. MATRIX ROCK SHALL BE SUBANGULAR TO ROUNDED IN SHAPE RIVER COBBLE WHERE INDIVIDUAL ROCK FRAGMENTS ARE FREE FROM SHARP ANGLES AND SMOOTHLY ROUNDED. ROCK SHALL BE FORM AN APPROVED SOURCE, AND SHALL BE SOUND, DENSE (SG=2.65) AND FREE FROM CRACKS, SEAMS OR OTHER DEFECTS CONDUCTIVE TO ACCELERATED WEATHERING. ROCK MATERIALS SHALL BE WASHED, "CLEAN", AND OTHERWISE FREE OF FINES PRIOR TO PLACEMENT SO THAT PLACEMENT ENSURES ROCK-TO-ROCK CONTACT.
- MATRIX PACK MATERIAL IS A SAND/SILT MIXTURE PLACED INTO THE MATRIX ROCK SEPARATELY. THE PACK MATERIAL IS PLACED AFTER MATRIX ROCK PLACEMENT AND IS "WASHED-IN" USING WATER. MATRIX PACK MATERIAL GRADATION AND PLACEMENT METHOD ARE SPECIFIED ON THE DRAWINGS.
- GLIDE-RIFFLE-RUN COMPLEXES SHALL BE OVEREXCAVATED TO COMPENSATE FOR DESIGN BED AS INDICATED ON THE DRAWINGS. EXCAVATED FOUNDATION TO BE CLEAR OF ORGANIC DEBRIS, DEWATERED AND UNIFORM TO FACILITATE MATRIX PLACEMENT. THE RIFFLE STRUCTURE SHALL BE CONSTRUCTED TO THE FULL COARSE THICKNESS IN ONE OPERATION AND IN A MANNER THAT PREVENTS DISPLACEMENT OF THE UNDERLYING MATERIALS. MATRIX ROCK SHALL BE PLACED IN A MANNER THAT WILL ENSURE THAT THE ROCK IS REASONABLY HOMOGENEOUS WITH LARGER ROCKS UNIFORMLY DISTRIBUTED AND FIRMLY IN CONTACT WITH ONE ANOTHER WITH GAPS LESS THAN TWO INCHES. THE SMALLER ROCKS ARE GRADED TO FILL THE VOIDS BETWEEN THE LARGER ROCKS. INDIVIDUAL LAYERS SHALL NOT BE MORE THAN 1 FOOT BEFORE COMPACTION.
- COMPACTION SHALL BE PERFORMED BY SUCCESSIVE PASSES OF CONSTRUCTION EQUIPMENT TO A CONDITION WHERE DIFFERENTIAL SETTLEMENT OF THE LAYER IS MINIMIZED AND THE PLACED MATRIX MATERIAL IS CONSOLIDATED. MATRIX PACK MATERIAL SHALL BE SPREAD ACROSS AND WORKED INTO THE PLACED MATRIX. PRESSURE WASHING SHALL BE PERFORMED TO DRIVE MATRIX PACK MATERIAL INTO MATRIX VOIDS. SUCCESSFUL WASHING WILL BE DETERMINED BY MINIMIZATION OF VOIDS WITHIN PLACED MATRIX SUCH THAT PONDING OCCURS ON TOP OF LIFT WITH LITTLE TO NO PERCOLATION LOSSES OCCURRING THROUGH CONSTRUCTED STREAMBED. LAYER SHALL BE WORKED WITH EQUIPMENT TO ENSURE MINIMIZATION OF VOIDS AND TO PROVIDE COMPACTION. CERTIFICATION OF CONSTRUCTED RIFFLE MATRIX TO BE PROVIDED BY THE PROJECT INSPECTOR PRIOR TO BOULDER ELEMENT PLACEMENT. BOULDER ELEMENT PLACEMENT SHALL BE PERFORMED AFTER MATRIX CONSTRUCTION IS COMPLETE.
- DISTRIBUTED BOULDER PLACEMENTS ARE TO BE PLACED IN RANDOM PATTERNS THAT REPLICATE NATURAL STREAM CONDITIONS AND AS DIRECTED BY THE PROJECT INSPECTOR. EMBEDMENT SHALL BE A MINIMUM OF 50% OF EFFECTIVE BOULDER DIAMETER.
- SEE GRADATION SCHEDULES ON THIS SHEET FOR CONSTRUCTED RIFFLE MATRIX GRADATION AND HABITAT BOULDER SIZE REQUIREMENTS.

THE CONSTRUCTION SITE SHALL BE DEWATERED AND KEPT FREE OF STANDING WATER OR EXCESSIVELY MUDDY CONDITIONS AS NEEDED FOR PROPER EXECUTION OF THE CONSTRUCTION WORK.

Date	10/20/08
Designed	Sean Welch PE
Drawn	Sean Welch PE
Checked	
Approved	
Title	

CONSTRUCTED RIFFLE - SUBSTRATE
 TAMKALIKS SIDE CHANNEL and FLOODPLAIN RESTORATION
 WALLOWA COUNTY, OREGON
 NEZ PERCE TRIBE
 Department of Fisheries Resources Management





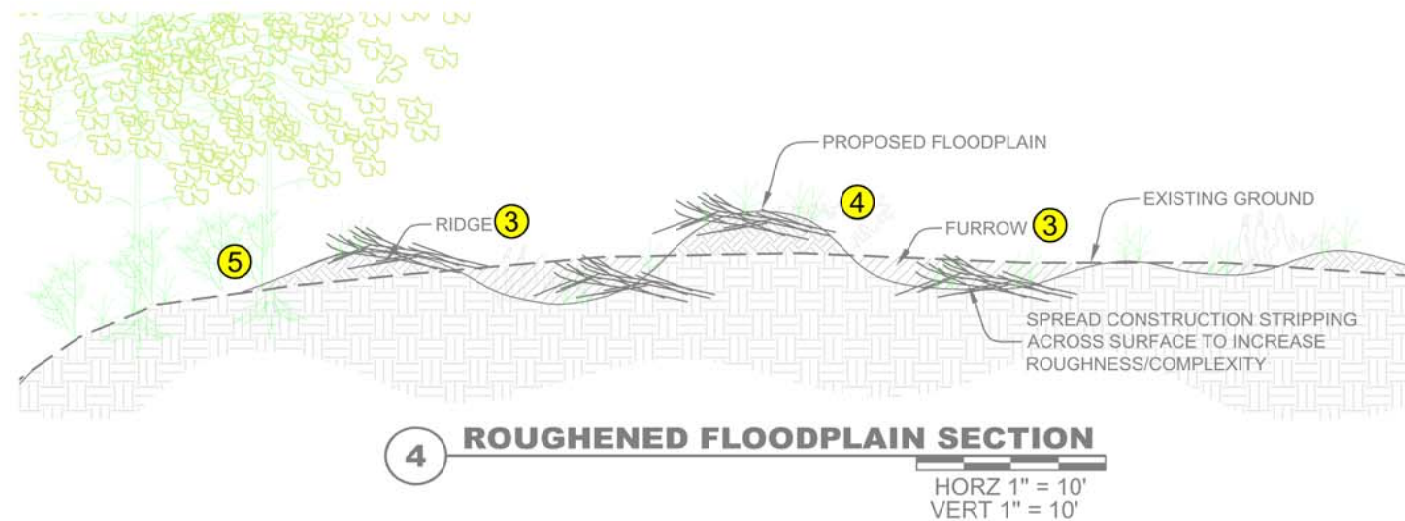
CONSTRUCTION NOTES:

- 1 PLUG AND BLENDED TERRACE FOOTPRINT TO BE STRIPPED OF ORGANIC MATERIALS, DEBRIS, VEGETATION, DEWATERED TO A UNIFORM CONDITION TO FACILITATE PLACEMENT AND EXECUTION OF THE FIRST LAYER OF COMPACTED FILL. STRIPPED MATERIALS TO BE STAGED AT A NEARBY LOCATION FOR SPREADING ACROSS CONSTRUCTED AND DISTURBED SURFACES.
- 2 AFTER STRIPPING, THE FOUNDATION SHALL BE SCARIFIED OR PLOWED TO A MINIMUM DEPTH OF 2 INCHES. ALL FOUNDATION EXCAVATION AND/OR PREPARATION SHALL BE COMPLETED BEFORE PLACING FILL. THE FOUNDATION AREA SHALL THEN BE BONDED AND COMPACTED WITH THE FIRST LAYER OF EARTH FILL. FILL MATERIAL SHALL BE OBTAINED FROM APPROVED EXCAVATION OR BORROW AREAS AND WILL BE FREE FROM LENSES, POCKETS, STREAKS OR LAYERS OF MATERIALS DIFFERING SUBSTANTIALLY FROM SURROUNDING MATERIAL.
- 3 FILL SHALL BE PLACED IN APPROXIMATELY EQUAL HORIZONTAL LAYERS SUCH THAT THE DISTRIBUTION OF MATERIAL IS ESSENTIALLY UNIFORM THROUGHOUT THE STRUCTURE FOOTPRINT. FILL LAYER THICKNESS BEFORE COMPACTION SHALL NOT EXCEED 6 INCHES FOR MACHINE COMPACTION OR 4 INCHES BEFORE COMPACTION WITH HAND-DIRECTED POWER TAMPERS. FILL SHALL BE COMPACTED TO A DENSITY EQUIVALENT TO THAT OF THE SURROUNDING FILL BY MEANS OF HAND TAMPING, POWER TAMPERS, PLATE VIBRATORS OR MACHINE COMPACTION. THE SELECTION, BLENDING, ROUTING AND DISPOSITION OF MATERIALS WITHIN CONSTRUCTED FILLS SHALL BE SUBJECT TO THE APPROVAL OF THE PROJECT INSPECTOR.
- 4 FILL MATERIAL SHALL BE BROUGHT TO THE ALLOWED MOISTURE CONDITION BEFORE COMPACTION. MATERIAL THAT IS TOO WET OR TOO DRY IS NOT ALLOWED AS FILL MATERIAL AND SHALL BE REMOVED FROM THE SITE. IF THE TOP SURFACE OF A PRECEDING LAYER OR FOUNDATION IS TOO DRY, THE SURFACE SHALL BE SCARIFIED AND MOISTENED PRIOR TO PLACEMENT OF FILL MATERIAL. ACCEPTABLE MOISTURE CONTENT WILL BE DETERMINED BY VISUAL INSPECTION BY THE PROJECT INSPECTOR
- 5 DITCH PLUG TRANSITIONS SHALL BLEND TO EXISTING TOPOGRAPHY AT CATCHLINE..

UPON APPROVAL OF FINAL PLUG, EMBANKMENT AND BLENDED TERRACE CONSTRUCTION, STRIPPED MATERIALS FROM STRUCTURE FOOTPRINT PREPARATION SHALL BE SPREAD ACROSS CONSTRUCTED AND DISTURBED SURFACES AT DIRECTION OF THE PROJECT INSPECTOR

CONSTRUCTION NOTES:

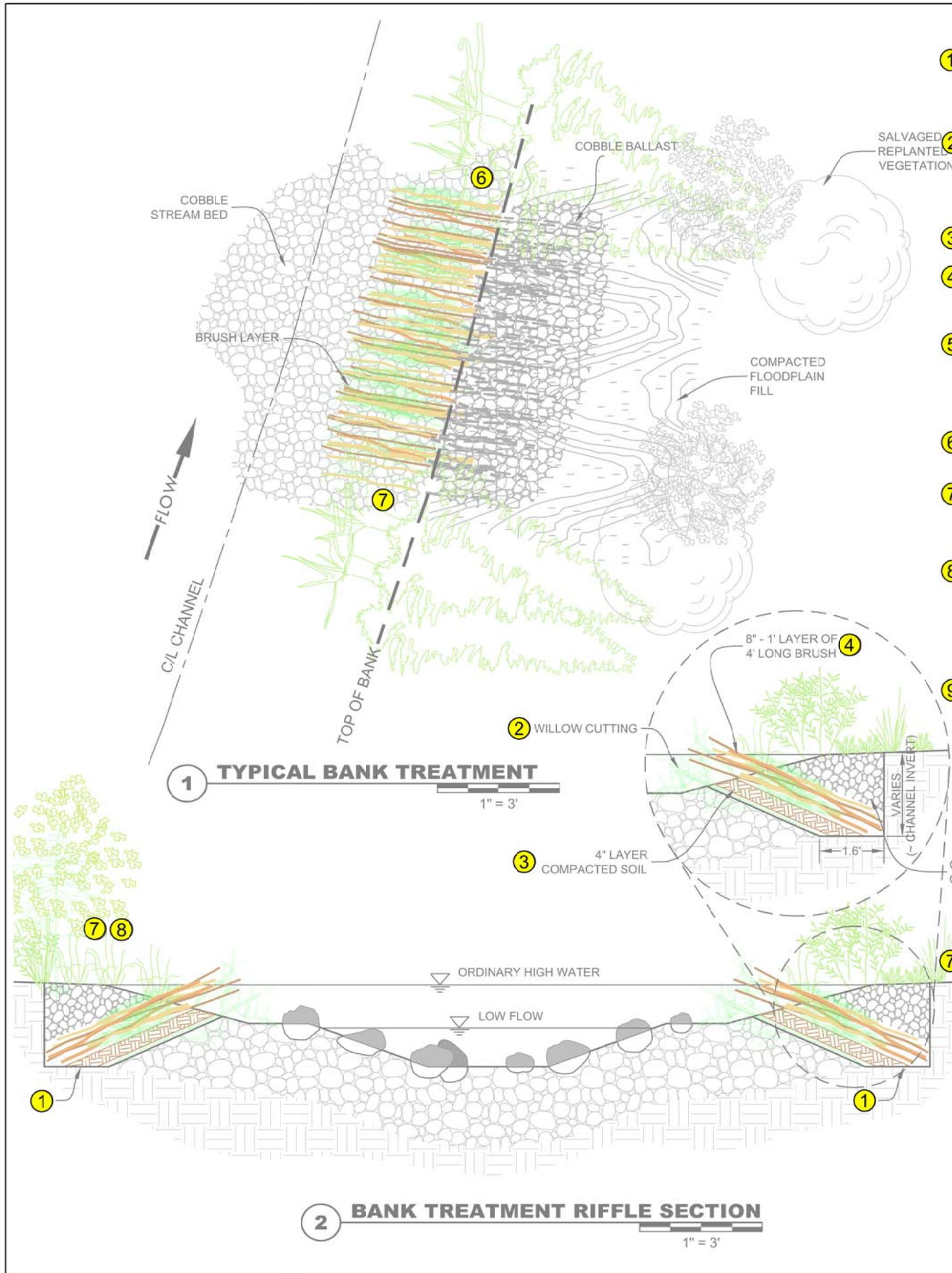
- 1 ROUGHENED FLOODPLAIN CONSISTS OF EXCAVATING RIDGES AND FURROWS UPON FLOODPLAIN SURFACES AND EXCAVATING WOOD DEBRIS INTO THE CONSTRUCTED FEATURES.
- 2 CONTRACTOR SHALL CONSTRUCT FURROWS AND RIDGES THE FLOODPLAIN AS SHOWN ON THE DRAWINGS. ROUGHENED FLOODPLAIN SHALL EXTEND OVER THE ENTIRE FLOODPLAIN SURFACE IN EACH TREATMENT AREA. APPROXIMATELY 20 PERCENT OF THE TOTAL SURFACE AREA OF EACH TREATMENT AREA SHALL CONSIST OF FURROWS AND APPROXIMATELY 20 PERCENT SHALL CONSIST OF RIDGES.
- 3 FURROW DEPTHS SHALL BE 1.0 FEET BELOW THE FLOODPLAIN SURFACE GRADE FIVE (5) FEET LONG BY THREE (3) FEET WIDE. RIDGES SHOULD BE 1.0 FEET ABOVE SURFACE GRADE BE THREE (3) FEET WIDE AND FIVE (5) FEET LONG. COMPLETED SURFACE SHALL BE COMPLEX AND IRREGULAR.
- 4 CONTRACTOR SHALL THEN PLACE SMALL LWD (4-8 INCH DIAMETER 6-10 FEET LONG) AND BRUSH DEBRIS (2-6 INCH DIAMETER 5-8 FEET LONG WITH LIMBS) WITHIN THE ROUGHENED FLOODPLAIN TREATMENT AREA AS SHOWN ON THE DRAWINGS. SMALL LWD AND BRUSH DEBRIS SHALL BE BURIED 30-50% OF STEM LENGTH WITHIN THE FLOODPLAIN SURFACE. PLACEMENT DENSITY SHALL BE AT A DISTANCE OF 30 FEET FOR SMALL LWD AND 20 FEET FOR BRUSH DEBRIS OR AS DIRECTED BY THE PROJECT INSPECTOR.
- 5 COMPLETED ROUGHENED FLOODPLAIN SURFACE SHALL BE RE-VEGETATED WITH SALVAGED OR TRANSPLANTED VEGETATION AT LOCATIONS IDENTIFIED BY THE PROJECT INSPECTOR. SEEDING SHALL BE PERFORMED ON CONSTRUCTION SURFACES ACCORDING TO THE PROJECT RE-VEGETATION PLAN.



Date	02/2018
Designed	Sean Welch PE
Drawn	Sean Welch PE
Checked	
Approved	
Title	

DITCH PLUG AND ROUGHENED FLOODPLAINS
 TAMKALIKS SIDE CHANNEL and FLOODPLAIN RESTORATION
 WALLOWA COUNTY, OREGON
 NEZ PERCE TRIBE
 Department of Fisheries Resources Management





CONSTRUCTION NOTES:

- 1 EXCAVATE STRUCTURE FOUNDATION FOOTPRINT PER DIMENSIONS SHOWN ON THE DRAWINGS. EXCAVATED MATERIALS ARE TO BE STAGED FOR BALLAST AND BACKFILL ON BRUSH LAYER. STRUCTURE FOOTPRINT AND EXCAVATIONS TO CONFORM TO STRUCTURE DIMENSIONS, OVER EXCAVATION AND DISTURBANCE OF IN-SITU MATERIALS OUTSIDE OF STRUCTURE FOOTPRINT IS NOT ALLOWED. EXCAVATION SHALL TIE INTO CONSTRUCTED BED MATRIX SUBSTRATE.
- 2 WILLOW CUTTINGS SHALL BE PLACED AT 6 TO 12 INCHES ON-CENTER ALONG THE BASE OF THE EXCAVATION. THE CUTTINGS SHALL BE 3/4 TO 3 INCHES IN TRUNK DIAMETER AND FROM 3.5 TO 4 FEET IN LENGTH. CUTTINGS SHALL RETAIN ALL SIDE BRANCHES BUT WILL HAVE THE TOP FOOT OF THE LAST YEAR'S GROWTH REMOVED. THE CUTTINGS SHOULD BE SOAKED IN WATER FOR A MINIMUM OF FIVE DAYS AND A MAXIMUM OF FOURTEEN DAYS PRIOR TO PLANTING TO ENHANCE STEM MOISTURE AND RAPID ROOT DEVELOPMENT FOLLOWING PLANTING.
- 3 A 4" LAYER OF LOOSE EARTH SHALL BE PLACED OVER WILLOW CUTTINGS TO SUPPORT ESTABLISHMENT
- 4 INSTALL DEBRIS AND SLASH INCLUDING TREE BRANCHES, STEMS, JUNIPER LIMBS AND GENERAL BRUSH TO FORM A COMPACTED 8 TO 10 INCH BRUSH LAYER. MATERIAL SHOULD BE BETWEEN 3.5 AND 4 FEET IN LENGTH AND CONSIST OF A RANGE OF STEM DIAMETERS BETWEEN 2 TO 4". MATERIAL CAN BE EITHER LIVE OR DEAD.
- 5 BRUSH LAYERING BACKFILL SHALL BE PLACED IN INCREMENTAL LIFTS. FILL LAYER THICKNESS BEFORE COMPACTION SHALL NOT EXCEED 6 INCHES FOR MACHINE COMPACTION OR 4 INCHES BEFORE COMPACTION WITH HAND-DIRECTED POWER TAMPERS. FILL SHALL BE COMPACTED TO A DENSITY EQUIVALENT TO THAT OF THE SURROUNDING IN-SITU MATERIAL BY MEANS OF HAND TAMPING, POWER TAMPERS, PLATE VIBRATORS OR MACHINE COMPACTION. FINAL FILL ELVATIONS TO MATCH DESIGN GRADE AS IDENTIFIED IN THE PLANS.
- 6 UPSTREAM AND DOWNSTREAM TRANSITIONS SHALL TAPER INTO CONSTRUCTED BANKLINES TO PROTECT BRUSH LAYERING TIE IN POINTS. TRANSITIONS SHALL BE CONSTRUCTED AT THE DIRECTION OF THE PROJECT INSPECTOR.
- 7 TRANSPLANTS FOR CLUMP PLANTING SHALL CONSIST OF A CONTIGUOUS MASS OF ABOVE-GROUND AND BELOW-GROUND PORTIONS OF MULTIPLE OR SINGLE STEMMED WILLOWS. SOIL BOUND BY ROOTS SHALL BE CONSIDERED A COMPONENT OF THE TRANSPLANT. THE TRANSPLANT SHALL CONTAIN STEMS OR TRUNKS THAT ASCEND 4 TO 8 FEET FROM THE TOP OF THE ROOT CROWN, AND HAVE A MINIMUM OF 2 VIABLE AXILLARY BUDS.
- 8 PLANTING HOLE SHALL BE DEEP ENOUGH TO ENSURE THAT 1/4 TO 1/2 OF THE ROOT MASS IN THE LOW WATER TABLE. THE PLANTING HOLE SHALL BE BACK-FILLED TWO-THIRDS FULL WITH THE SOIL EXCAVATED FROM THE PLANTING HOLE. ONCE THE CLUMP IS PLACED IN THE PLANTING HOLE, THE HOLE SHALL BE FILLED WITH WATER TO ELIMINATE AIR POCKETS AROUND ROOTS. AFTER THE HOLE HAS DRAINED, ADD MORE SOIL AND WATER MIX UNTIL SATURATED BACKFILL MATERIAL COVERS THE TOP OF ROOT CROWN TO A MINIMUM DEPTH OF 2 INCHES. AFTER FREE WATER HAS DRAINED, BACKFILL HOLE WITH REMAINING SOIL TO FINISH GRADE. EACH TRANSPLANT SHALL BE THOROUGHLY WATERED AFTER PLANTING.
- 9 NOTIFY THE PROJECT INSPECTOR OF ANY PROPOSED CHANGES PRIOR TO IMPLEMENTATION. THE PROJECT INSPECTOR RESERVES THE RIGHT TO MODIFY STRUCTURE DESIGN SPECIFICATIONS DURING CONSTRUCTION IF WARRANTED DUE TO UNFORESEEN CONDITIONS

Date	10/20/08
Designed	Sean Welch PE
Drawn	Sean Welch PE
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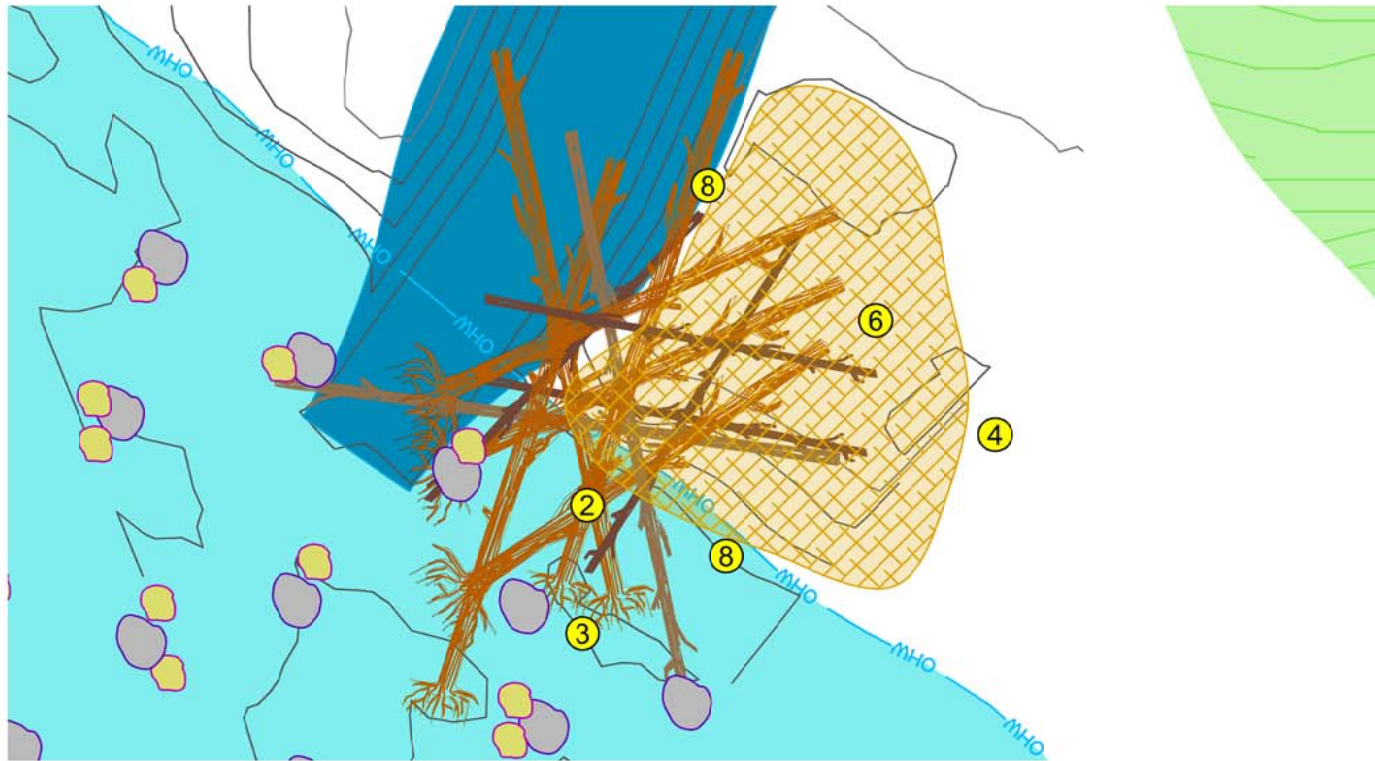
BANKLINE ROUGHNESS TREATMENT
 TAMKALIKS SIDE CHANNEL and FLOODPLAIN RESTORATION
 WALLOWA COUNTY, OREGON
 NEZ PERCE TRIBE
 Department of Fisheries Resources Management



File Name
TAMKALIKS.DWG

Drawing No.
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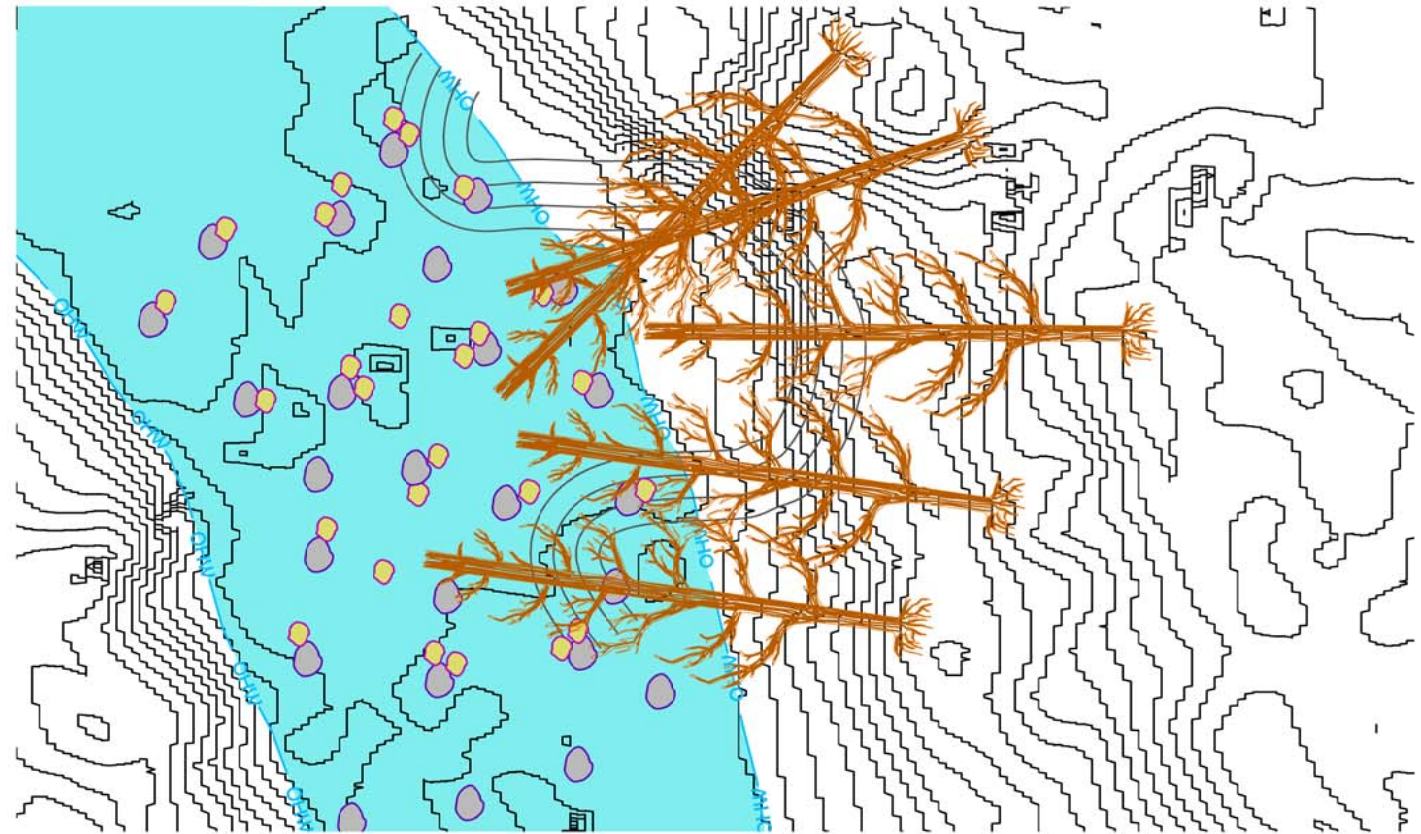
Sheet 10 of 11



CONSTRUCTION NOTES:

- 1 CONSTRUCTION ACTIVITY TO BE SUPERVISED BY THE PROJECT INSPECTOR. CENTERLINE, OFFSET AND GRADING LIMIT STAKES WILL BE PROVIDED. SPECIAL ATTENTION SHALL BE TAKEN TO OPERATE EQUIPMENT IN A SAFE AND EFFICIENT MANNER WITH MINIMAL DISTURBANCE OUTSIDE OF GRADING LIMITS UNLESS OTHERWISE SPECIFIED. UTMOST CARE SHALL BE EMPLOYED TO ENSURE EXCAVATED MATERIALS FROM BANK SHAPING AND LOG JAM CONSTRUCTION DO NOT ENTER RIVER OR INCREASE AMBIENT TURBIDITY LEVELS.
- 2 CONSTRUCT LARGE WOOD STRUCTURE FOR SCOUR-POOL MAINTENANCE AND FISH HABITAT ENHANCEMENT. THE STRUCTURE SHALL BE CONSTRUCTED FROM JUNIPER MATERIALS PROVIDED ONSITE. LIMBS AND BRANCHES SHALL BE INTACT TO THE FULLEST EXTENT POSSIBLE. STRUCTURE MEMBERS ARE TO BE A MINIMUM OF 1.5' STEM DIAMETER; 12' STEM LENGTH WITH 3' EFFECTIVE DIAMETER ROOTWAD AS INDICATED ON PROJECT QUANTITIES AND PLANS.
- 3 EXCAVATE A STRUCTURE FOUNDATION INTO THE STREAMBED AND WITHIN STREAMBANK TO PLACE BASE MEMBERS OF LOG JAMS. BURY ROOTWAD 3' INTO STREAMBED. USE EXCAVATED GRAVELS TO BACKFILL AROUND BASE MEMBERS AT DIRECTION OF PROJECT INSPECTOR.
- 4 ALL WORK AROUND EXISTING BANK TO BE PERFORMED IN A SAFE AND CONSCIENTIOUS MANNER WITH A MINIMUM ALLOWANCE FOR DISTURBED BANK MATERIAL ENTERING RIVER DURING CONSTRUCTION ACTIVITIES.
- 5 ANCHOR ROW 1 MEMBER TO ROW 2 MEMBER AND 2 TO ROW 3 MEMBERS ON UP TO ROW 5 MEMBER PER LOG TO LOG ANCHOR DETAIL. PRE-DRILL 2" HOLE AND USE 1-1/2 INCH TYPE A 449 TYPE 3 WEATHERING STEEL, THREADED STEEL ROD. BOLT MEMBERS TOGETHER WITH HEAVY PLATE WASHERS AND NUTS (A563B HEX HEAD NUT, GRADE A, AND 4" OD PLATE WASHERS)
- 6 ALL MATERIALS GENERATED FROM FOUNDATION AND POOL EXCAVATIONS SHALL BE PLACED WITHIN BANK KEY OF LARGE WOOD STRUCTURE AND BETWEEN RACKED MEMBERS TO FILL VOIDS AND INCREASE STRUCTURAL MASS.
- 7 BACKFILL WITHIN STRUCTURE AND STRUCTURE KEY SHALL BE COMPACTED TO DENSITY OF IN-SITU MATERIAL. BACKFILL AND COMPACTION TO BE INSPECTED AND APPROVED BY PROJECT INSPECTOR.
- 8 GRADE BANKLINE MARGINS AT UPSTREAM AND DOWNSTREAM ENDS OF STRUCTURE TO REDUCE POTENTIAL FOR SCOUR AND FLANKING AT DIRECTION OF PROJECT INSPECTOR.
- 9 EXPOSED BUTT ENDS OF ALL LARGE WOOD SHALL BE ROUGHENED AND BROKEN. EXPOSED SAWED BUTT ENDS ARE NOT ACCEPTED.
- 10 SPREAD STRIPPED ORGANIC MATERIALS FROM FOUNDATION EXCAVATIONS ACROSS DISTURBED AREAS AND BANKLINE-STRUCTURE INTERFACE AT DIRECTION OF THE PROJECT INSPECTOR.

PLANT SALVAGED VEGETATION FROM CONSTRUCTION ACTIVITIES WITHIN DISTURBED AREAS AND BANKLINE-



CONSTRUCTION NOTES:

- 1 ROUGHENED FLOODPLAIN CONSISTS OF EXCAVATING RIDGES AND FURROWS UPON FLOODPLAIN SURFACES AND EXCAVATING WOOD DEBRIS INTO THE CONSTRUCTED FEATURES.
- 2 CONTRACTOR SHALL CONSTRUCT FURROWS AND RIDGES THE FLOODPLAIN AS SHOWN ON THE DRAWINGS. ROUGHENED FLOODPLAIN SHALL EXTEND OVER THE ENTIRE FLOODPLAIN SURFACE IN EACH TREATMENT AREA. APPROXIMATELY 20 PERCENT OF THE TOTAL SURFACE AREA OF EACH TREATMENT AREA SHALL CONSIST OF FURROWS AND APPROXIMATELY 20 PERCENT SHALL CONSIST OF RIDGES.
- 3 FURROW DEPTHS SHALL BE 1.0 FEET BELOW THE FLOODPLAIN SURFACE GRADE FIVE (5) FEET LONG BY THREE (3) FEET WIDE. RIDGES SHOULD BE 1.0 FEET ABOVE SURFACE GRADE BE THREE (3) FEET WIDE AND FIVE (5) FEET LONG. COMPLETED SURFACE SHALL BE COMPLEX AND IRREGULAR.
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- 5 COMPLETED ROUGHENED FLOODPLAIN SURFACE SHALL BE RE-VEGETATED WITH SALVAGED OR TRANSPLANTED VEGETATION AT LOCATIONS IDENTIFIED BY THE PROJECT INSPECTOR. SEEDING SHALL BE PERFORMED ON CONSTRUCTION SURFACES ACCORDING TO THE PROJECT RE-VEGETATION PLAN.



Date	10/2008
Designed	Sean Welch PE
Drawn	Sean Welch PE
Checked	
Approved	
Title	

LWD & ALCOVE DETAIL
 TAMKALIKS SIDE CHANNEL and FLOODPLAIN RESTORATION
 WALLOWA COUNTY, OREGON
 NEZ PERCE TRIBE
 Department of Fisheries Resources Management



File Name
TAMKALIKS.DWG

Drawing No.

12

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