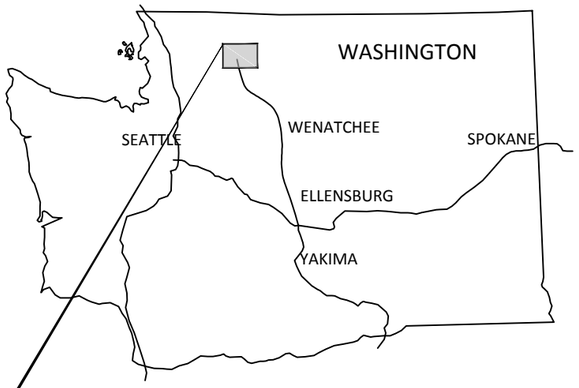
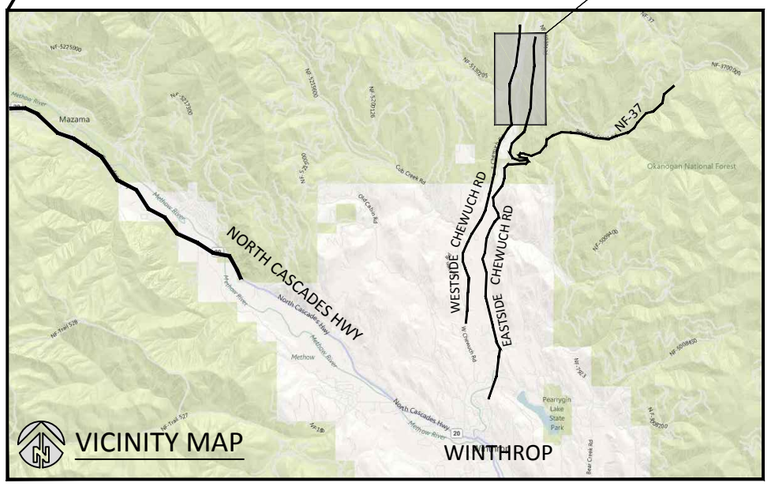
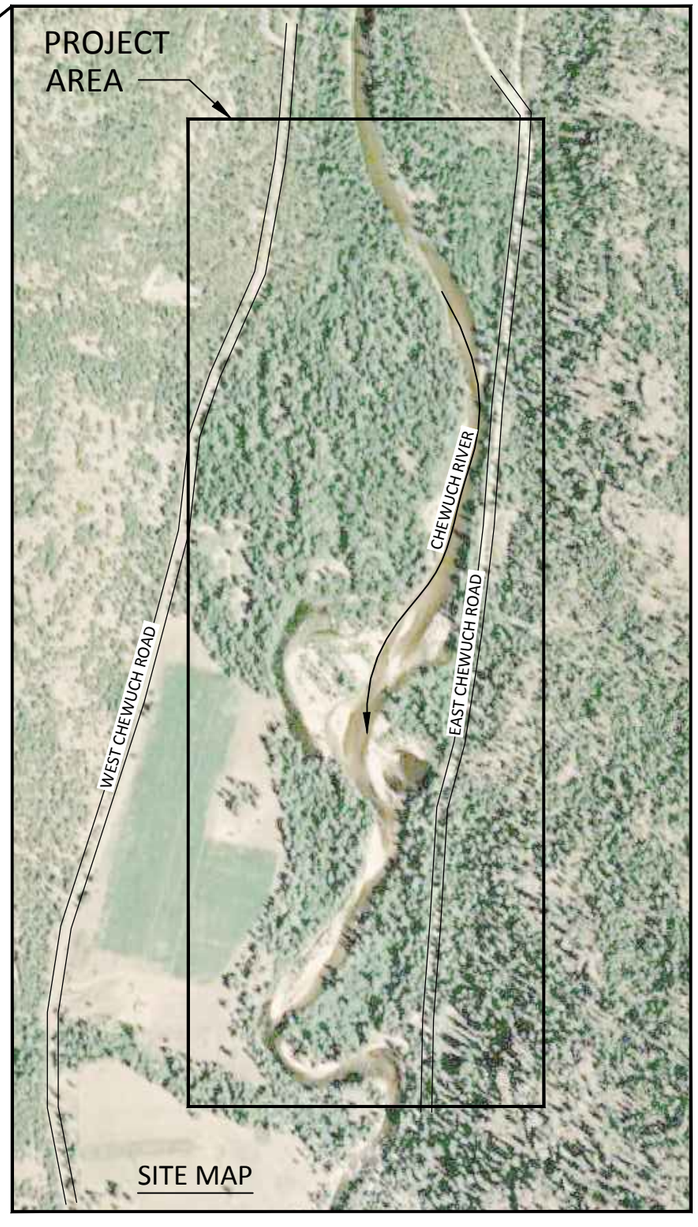
CHEWUCH RIVER RIGHT FISH HABITAT ENHANCEMENT PROJECT

60% DESIGN





VICINITY MAP



SITE MAP

SITE LOCATION:

LATITUDE: 48°36'36.55" NORTH
LONGITUDE: 120°09'50.26" WEST
OKANOGAN COUNTY, WASHINGTON

WATERBODY: CHEWUCH RIVER
TRIBUTARY OF: METHOW RIVER

YAKAMA NATION FISHERIES
2 JOHNSON LANE
WINTHROP WA, 98862

SHEET LIST

1 Cover, Vicinity Map, and Sheet List
2 General Notes
3 Erosion Control and Sedimentation Details
4 Existing Conditions, Ownership, Access and Staging
5 Project Overview and Sheet Index
6 Proposed Side Channel - Downstream
7 Proposed Side Channel - Upstream
8 Side Channel Grading Cross Sections
9 Side Channel Grading Cross Sections
10 Log Installations near Side Channel Outlet
11 Log Structure at Inlet
12 Riverbank Log Structure RR1
13 LWM Typical Details
14 LWM Connections Typical Details
15 Campsite Mitigation
16 Spawning Areas in Relation to Project Sites

NO.	BY	DATE	REVISION DESCRIPTION

DF	MB,MM,CM	MB
DRAWN	DESIGNED	CHECKED
MM	2/10/15	
APPROVED	DATE	PROJECT

CONFEDERATED TRIBES AND BANDS OF THE YAKAMA NATION
CHEWUCH RIVER RIGHT
FISH HABITAT ENHANCEMENT PROJECT 60% DESIGN

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

COVER, VICINITY MAP, AND SHEET LIST

SHEET 1 OF 16

G:\C-D\Chewuch River Right 2014_14026.01\Drawings\01_Chewuch_RiverRight_D.dwg - Mike M - 2/11/2015

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

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

ALL WORK SHALL BE IN COMPLIANCE WITH REQUIREMENTS STATED IN PERMITS ISSUED FOR THIS PROJECT.

WDFW IN-WATER WORK PERIODS

WORK SHALL OCCUR DURING THE PERMITTED IN-WATER WORK PERIOD STATED IN THE HYDRAULIC PROJECT APPROVAL.

EXISTING DATA

TOPOGRAPHIC DATA WAS COLLECTED BY INTER-FLUVE USING RTK AND TOTAL STATION IN OCTOBER, 2010.

HORIZONTAL DATUM: STATE PLANE NAD83 WASHINGTON NORTH
VERTICAL DATUM: NAVD88

HYDROLOGY INFORMATION PROVIDED BY USBR.

HYDRAULIC MODELING BY INTER-FLUVE USING USACE HEC-RAS (4.1.0).

GIS DATA INCLUDING: AERIAL PHOTOGRAPHY, LIDAR, FISH USE, SURFACE SOILS INFORMATION, LAND OWNERSHIP, AND TRANSPORTATION ROUTES PROVIDED BY VARIOUS AGENCIES.

SOILS

SUBSURFACE SOILS ARE EXPECTED TO BE SAND, GRAVEL, COBBLES, BOULDERS. CONTRACTOR SHALL CONDUCT OWN INVESTIGATIONS IF ADDITIONAL DATA IS REQUIRED AT NO ADDITIONAL COST.

UTILITIES

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

THE CONTRACTOR SHALL CALL (800-424-5555) FOR UTILITY LOCATE PRIOR TO CONSTRUCTION

THE CONTRACTOR SHALL IMMEDIATELY CONTACT THE EFFECTED UTILITY SERVICE TO REPORT ANY DAMAGED OR DESTROYED UTILITIES.

THE CONTRACTOR SHALL PROVIDE EQUIPMENT AND LABOR TO AID THE EFFECTED UTILITY SERVICE IN REPAIRING DAMAGED OR DESTROYED UTILITIES AT NO ADDITIONAL COST.

CONSTRUCTION STAKING

OWNER'S REPRESENTATIVE WILL PROVIDE STAKING OF PROJECT LIMITS, GRADE STAKES, AND ELEVATION CONTROL POINTS. SOME FIELD ADJUSTMENTS TO THE LINES AND GRADES ARE TO BE EXPECTED.

CONTRACTOR SHALL MEET WITH THE OWNER AND OWNER'S REPRESENTATIVE TO DEFINE AND MARK LIMITS OF DISTURBANCE PRIOR TO MOBILIZATION OF EQUIPMENT OR MATERIALS ONTO THE SITE.

THE CONTRACTOR SHALL REPLACE DAMAGED OR DESTROYED CONSTRUCTION STAKES AT NO ADDITIONAL COST.

CONSTRUCTION MATERIALS

ALL MATERIALS QUANTITIES ARE BASED ON IN-PLACE CONDITION DETERMINED BY A PRE-PROJECT CONDITION SURVEY COMPARED AGAINST A PROJECT CONDITION SURVEY

CONTRACTOR SHALL ALLOW FOR EXPANSION OF EXCAVATED MATERIAL AND COMPACTION OF PLACED MATERIAL AT NO ADDITIONAL MEASURE OR COST. MEASUREMENT AND PAYMENT SHALL NOT BE BASED ON WEIGHT TICKETS OR TRUCK MEASURE WITHOUT PRIOR WRITTEN APPROVAL.

LOCATION, ALIGNMENT, AND ELEVATION OF LOGS AND LOGS WITH ROOT WADS ARE SUBJECT TO ADJUSTMENT BASED ON FIELD CONDITIONS, AND MATERIAL SIZE.

ANY EXCESS MATERIAL SHALL BE STOCKPILED NEATLY IN AN APPROVED LOCATION OF THE STOCKPILE AND STAGING AREA. AT COMPLETION OF WORK, THE MATERIAL SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE FOR LEGAL DISPOSAL.

CONSTRUCTION ACCESS/TRAFFIC CONTROL

CONTRACTOR SHALL SUBMIT AN ACCESS, STAGING, AND STOCKPILE PLAN TO THE OWNER'S REPRESENTATIVE FOR APPROVAL PRIOR TO MOBILIZATION.

PUBLIC ACCESS TO/ALONG ROADWAYS SHALL BE MAINTAINED AT ALL TIMES.

THE CONTRACTOR IS SOLELY RESPONSIBLE FOR OBTAINING ANY REQUIRED TRAFFIC CONTROL OR ACCESS PERMITS.

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

ALL SAPLINGS AND TREES TO BE TRANSPLANTED OR REMOVED SHALL BE CLEARLY MARKED AND APPROVED BY THE OWNER AND OWNER'S REPRESENTATIVE.

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

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

CONTRACTOR SHALL IMPLEMENT MEASURES TO CONTROL AND MINIMIZE WIND BLOWN DUST FROM THE SITE.

ALL DISTURBED AREAS INCLUDING ROADS, DRIVEWAYS AND ACCESS ROUTES SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER AND RE-VEGETATED PER PLANS.

ALL DISTURBED AREAS OUTSIDE THE LIMITS OF DISTURBANCE SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER AT NO ADDITIONAL COST.

ANY FENCES REMOVED FOR ACCESS OR CONSTRUCTION SHALL BE REPLACED BY THE CONTRACTOR AT NO EXPENSE TO THE OWNER.

STAGING AND STOCKPILE AREAS

STAGING AND STOCKPILE AREAS WILL BE FLAGGED BY THE OWNER.STAGING AREAS USED FOR CONSTRUCTION EQUIPMENT STORAGE, VEHICLE STORAGE, FUELING, SERVICING, AND HAZARDOUS MATERIAL STORAGE SHALL BE 150 FEET OR MORE FROM ANY NATURAL WATER BODY OR WETLAND. NATURAL MATERIALS MAY BE STOCKPILED NEAR INSTALLATION AREAS.

TREE SALVAGE

ALL TREES AND SLASH REMOVED FOR CONSTRUCTION SHALL TEMPORARILY BE STOCKPILED WITHIN LIMITS OF DISTURBANCE. STOCKPILED TREE/SLASH SHALL BE REINCORPORATED INTO FINISHED PROJECT.

ANY REMOVED VEGETATION GREATER THAN 6 INCHES DIAMETER AND 15 FEET LONG SHALL BE INCORPORATED INTO LOG STRUCTURES. CONTRACTOR IS RESPONSIBLE FOR REMOVING SMALLER CLEARING AND GRUBBING DEBRIS FROM THE SITE AND DISPOSING AT A LEGAL LOCATION AT THE END OF THE PROJECT UNLESS DIRECTED BY THE OWNER'S REPRESENTATIVE.

ALL TREES REMOVED WITHIN CLEARING LIMITS SHALL BE REMOVED WHOLE WITH ROOT WAD AND UTILIZED IN THE STREAM CONSTRUCTION AS DIRECTED BY OWNER'S REPRESENTATIVE.

LIVE TREES

ALL TREES NOT MARKED FOR REMOVAL SHALL BE LEFT STANDING UNDISTURBED. AVOID THE DRIPLINE IF POSSIBLE. CONSTRUCTION ACTIVITY SHALL NOT DEBARK OR DAMAGE LIVE TREES.

FISH RESCUE

ALL FISH RESCUE EFFORTS SHALL BE SUPERVISED BY A YAKAMA NATION FISHERIES/AQUATIC BIOLOGIST EXPERIENCED WITH THE COLLECTION AND HANDLING OF SALMONID FISHES FROM CONSTRUCTION SITES.

ALL FISH TRAPPED IN RESIDUAL POOLS WITHIN THE PROJECT AREA WILL BE CAREFULLY COLLECTED BY SEINE AND/OR DIP NETS AND PLACED IN CLEAN TRANSFER CONTAINERS WITH ADEQUATE VOLUME OF FRESH RIVER WATER.

CAPTURED FISH SHALL BE IMMEDIATELY RELEASED INTO RIVER AT AREAS SELECTED BY A YNF BIOLOGIST.

G:\CAD\Chewuch River Right-2014_140264\Drawings\18_Chewuch_RiverRight_D.dwg Mike M - 2/11/2015

NO.	BY	DATE	REVISION DESCRIPTION

DF	MB,MM,CM	MB
DRAWN	DESIGNED	CHECKED
MM	2/10/15	
APPROVED	DATE	PROJECT

CONFEDERATED TRIBES AND BANDS OF THE YAKAMA NATION
CHEWUCH RIVER RIGHT
FISH HABITAT ENHANCEMENT PROJECT 60% DESIGN

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

GENERAL NOTES

SHEET
2 OF 16

EROSION/SEDIMENTATION CONTROL (ESC) PLAN

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

THE RECOMMENDATIONS FOR AN ESC PLAN INCLUDED HEREIN WILL PROVIDE A GUIDELINE FOR THE CONTRACTOR TO DEVELOP AND IMPLEMENT AN ESC PLAN.

A. THE IMPLEMENTATION OF AN ESC PLAN AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE ESC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED AND VEGETATION/LANDSCAPING IS ESTABLISHED.

B. THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON THIS PLAN SHALL BE CLEARLY FLAGGED IN THE FIELD PRIOR TO CONSTRUCTION. DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE FLAGGED CLEARING LIMITS SHALL BE PERMITTED. THE FLAGGING SHALL BE MAINTAINED BY THE CONTRACTOR FOR THE DURATION OF CONSTRUCTION.

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

D. THE ESC FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE ESC FACILITIES SHALL BE UPGRADED AS NEEDED AT NO ADDITIONAL COST FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT-LADEN WATER DO NOT LEAVE THE SITE.

E. THE ESC FACILITIES SHALL BE INSPECTED DAILY BY THE CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING.

F. THE ESC FACILITIES ON INACTIVE SITES SHALL BE INSPECTED AND MAINTAINED A MINIMUM OF ONCE A WEEK OR WITHIN THE 24 HOURS FOLLOWING A STORM EVENT.

G. STABILIZED CONSTRUCTION ENTRANCES AND ADDITIONAL MEASURES MAY BE REQUIRED AND SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT TO ENSURE ALL ACCESS ROADS ARE KEPT CLEAN AT NO ADDITIONAL COST.

INSPECTION AND MAINTENANCE

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

CONTRACTOR'S ESC RECORD

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

1. WHEN MAJOR GRADING ACTIVITIES OCCUR.
2. DATES OF RAINFALL EVENTS EITHER EXCEEDING 2 HOURS DURATION OR MORE THAN 0.5 INCHES/24 HOURS.
3. WHEN CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE ON SITE, OR ON A PORTION OF THE SITE.
4. WHEN STABILIZATION MEASURES ARE INITIATED FOR PORTIONS OF THE SITE.
5. ESC RECORDS SHALL BE MADE AVAILABLE TO THE OWNER AND OWNER'S REPRESENTATIVE ON REQUEST AND SHALL BE PROVIDED FOR REVIEW AND APPROVAL PRIOR TO APPLICATION FOR PAYMENT.

STABILIZE SOILS AND PROTECT SLOPES

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

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

AFTER FINAL SITE STABILIZATION

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

CONSTRUCTION DEWATERING

TEMPORARY COFFERDAMS SHALL BE USED TO ISOLATE IN-CHANNEL EXCAVATION AREAS FROM THE RIVER.

DEWATERING OF IN-CHANNEL WORK AREAS SHALL OCCUR CONCURRENT WITH FISH RESCUE. CONTRACTOR SHALL COORDINATE WITH THE YAKAMA NATION FISHERIES FOR FISH RESCUE. CONTRACTOR SHALL PROVIDE YAKAMA FISHERIES AMPLE TIME TO SCHEDULE FISH RESCUE. IF DIVERSION FAILS DUE TO CONTRACTOR NEGLIGENCE, FISH RESCUE SHALL BE REPEATED BY YAKAMA FISHERIES CREWS AT CONTRACTOR'S EXPENSE.

IF ADDITIONAL PUMPING IS REQUIRED TO DEWATER DURING CONSTRUCTION, PUMPED DISCHARGE SHALL RELEASE SEDIMENT-LADEN WATER AT AN UPLAND DISCHARGE LOCATION IN A MANNER THAT DOES NOT CAUSE EROSION, CONTAMINATION OR INCREASE TURBIDITY OF SURFACE WATERS. (SEE CONSTRUCTION DEWATERING).

OWNER'S REPRESENTATIVE SHALL APPROVE DEWATERING DISCHARGE LOCATION PRIOR TO IMPLEMENTATION.

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

CONTRACTOR SHALL PROVIDE VISQUINE OR GEOTEXTILE LINER OR PLYWOOD OR METAL PLATING AS NECESSARY TO DISSIPATE PUMP DISCHARGE JET TO PREVENT EROSION.

EQUIPMENT

BIODEGRADABLE HYDRAULIC FLUID SHALL BE USED IN EACH EXCAVATOR WORKING WITHIN LIVE WATER. MECHANIZED EQUIPMENT AND VEHICLES SHALL BE INSPECTED DAILY FOR LEAKS, AND CLEANED THOROUGHLY BEFORE OPERATION NEAR WATER.

BULK BAG COFFERDAM
(WATER DEPTH LESS THAN 2.5')

STACKED BULK BAG COFFERDAM
(WATER DEPTH LESS THAN 4')

BULK BAG DETAILS

BULK BAG NOTES:

1. BULK BAG COFFERDAM SHALL BE CONSTRUCTED OF SEVERAL UNITS OF BULK BAGS FILLED WITH WASHED SPAWNING GRAVEL, AND ABUTTED SIDE BY SIDE TO CREATE A ROW THAT SEPARATES THE CONSTRUCTION SITE FROM THE RIVER.
2. IF WATER DEPTH EXCEEDS 85% OF THE BULK BAG HEIGHT, AN ADDITIONAL TOP ROW OF BULK BAGS SHALL BE INSTALLED, SUPPORTED BY TWO BOTTOM ROWS OF BULK BAGS.
3. BULK BAG COFFERDAM SHALL BE SEALED BY COVERING THE COFFERDAM WITH PLASTIC SHEETING HELD IN PLACE BY SANDBAGS FILLED WITH PEA GRAVEL. PLACED IN ROWS ON TOP OF COFFERDAM, AND AT TOE OF COFFERDAM. THE PLASTIC SHEETING SHALL BE DRAPED ALONG THE CHANNEL BOTTOM ON BOTH SIDES OF THE COFFERDAM WITH OUTWARD EDGE OF SHEETING MINIMUM 2-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.
4. IF POSSIBLE, THE ENDS OF THE COFFERDAM SHALL BE EXTENDED ONTO A DRY GRAVEL BAR. IF THE END MUST BE TERMINATED AT A WET 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.
5. BULK BAGS 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.
6. 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. TWO LENGTHS OF 12-FT WIDE ROLL SHALL BE USED FOR 2-LAYER STACKED BULK BAG COFFERDAM.
7. CONTRACTOR SHALL PROVIDE PUMPING SUFFICIENT TO LOWER WATER SURFACE IN THE IMPOUNDED AREA IN ORDER TO CAUSE ANY LEAKS UNDER THE COFFERDAM TO PASS WATER TOWARD THE WORK AREA INSTEAD OF FROM THE WORK AREA TO THE RIVER. DISCHARGE TURBID WATER TO UPLAND FLOODPLAIN.
8. BULK BAG COFFERDAM SHALL BE COMPLETELY REMOVED AFTER CONSTRUCTION IS COMPLETED AND TURBIDITY HAS BEEN REMOVED.
9. 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.
10. IF NECESSARY, GAPS BETWEEN BULK BAGS SHALL BE FILLED WITH WASHED GRAVEL TO SEAL AND IMPROVE COFFER DAM. DISPOSAL OF ROCK WASH SHALL BE DETERMINED BY OWNER.

SECTION

TEMPORARY TURBIDITY FENCE DETAILS

NO.	BY	DATE	REVISION DESCRIPTION

DF — DRAWN; MB,MM,CM — DESIGNED; MB — CHECKED
MM — APPROVED; 2/10/15 — DATE; PROJECT

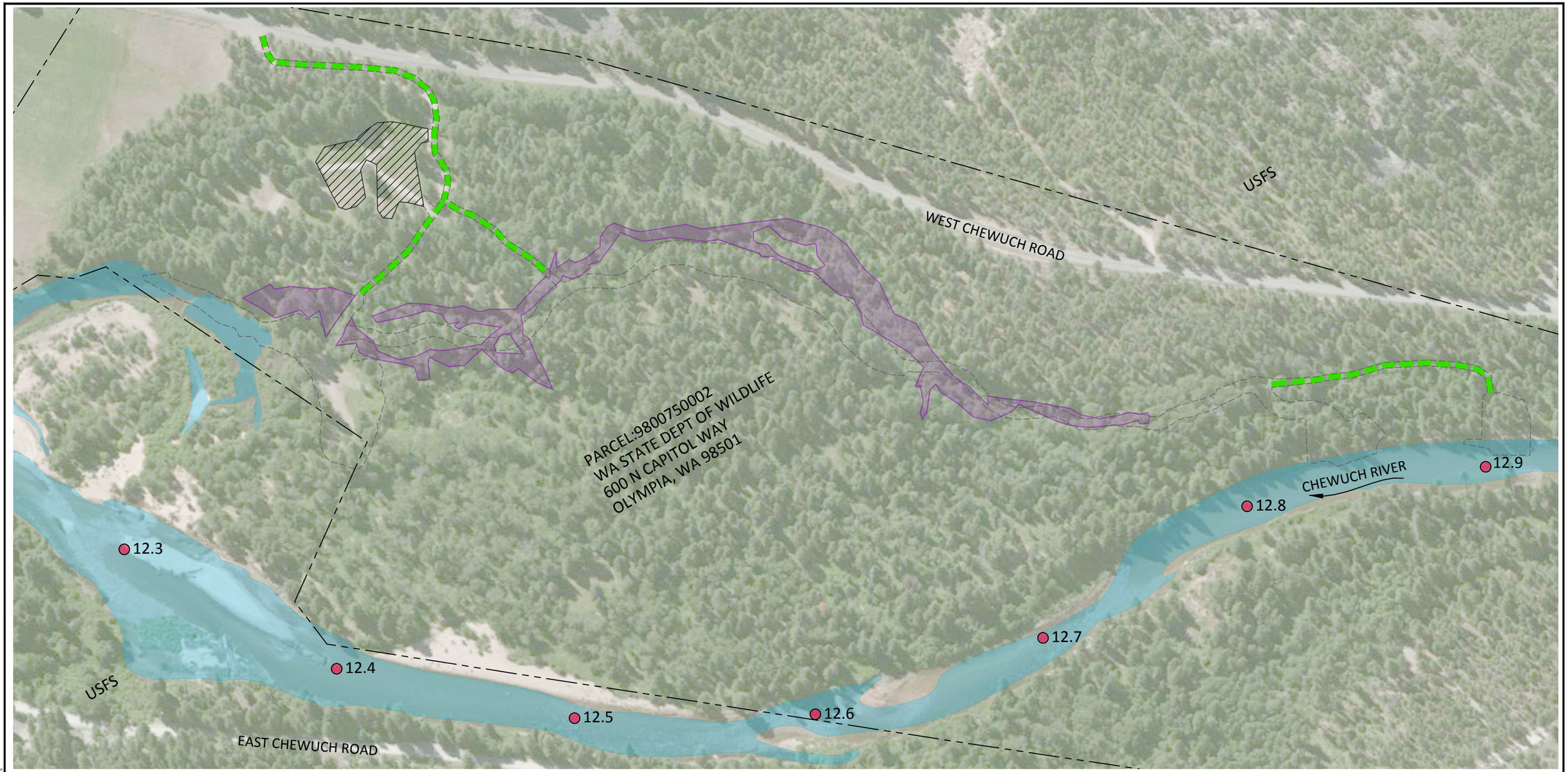
CONFEDERATED TRIBES AND BANDS OF THE YAKAMA NATION
CHEWUCH RIVER RIGHT
FISH HABITAT ENHANCEMENT PROJECT 60% DESIGN

NOT TO SCALE

inter·fluve Inc.
501 Portway Avenue, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

EROSION CONTROL AND SEDIMENTATION DETAILS

G:\C-D\Chewuch River Right 2014_140264\Drawings\IFI_Chewuch_RiverRight_D.dwg - Mike M - 2/11/2015



AERIAL VIEW

LEGEND

- 12.5 RIVER MILE MARKER
- PROPERTY LINES
- LIMITS OF DISTURBANCE
- TEMPORARY ACCESS
- STAGING/STOCKPILE
- WETLAND DELINEATION

0 200 400

SCALE IN FEET

NO.	BY	DATE	REVISION DESCRIPTION

DF	MB,MM,CM	MB
DRAWN	DESIGNED	CHECKED
MM	2/10/15	
APPROVED	DATE	PROJECT

CONFEDERATED TRIBES AND BANDS OF THE YAKAMA NATION
CHEWUCH RIVER RIGHT
FISH HABITAT ENHANCEMENT PROJECT 60% DESIGN

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

EXISTING CONDITIONS, OWNERSHIP, ACCESS AND STAGING

G:\C-D\Chewuch River Right 2014_140264\Drawings\IFI_Chewuch_RiverRight_D.dwg - Mike M - 2/11/2015

CONSTRUCTION QUANTITIES

ITEM	QUANTITY
EXCAVATION	15,000 CY
18-24" DBH x 40' LONG, LOG WITH ROOTWAD	180 EA
18-24" DBH x 40' LONG, LOG WITHOUT ROOTWAD	56 EA

QUANTITIES NOTES:

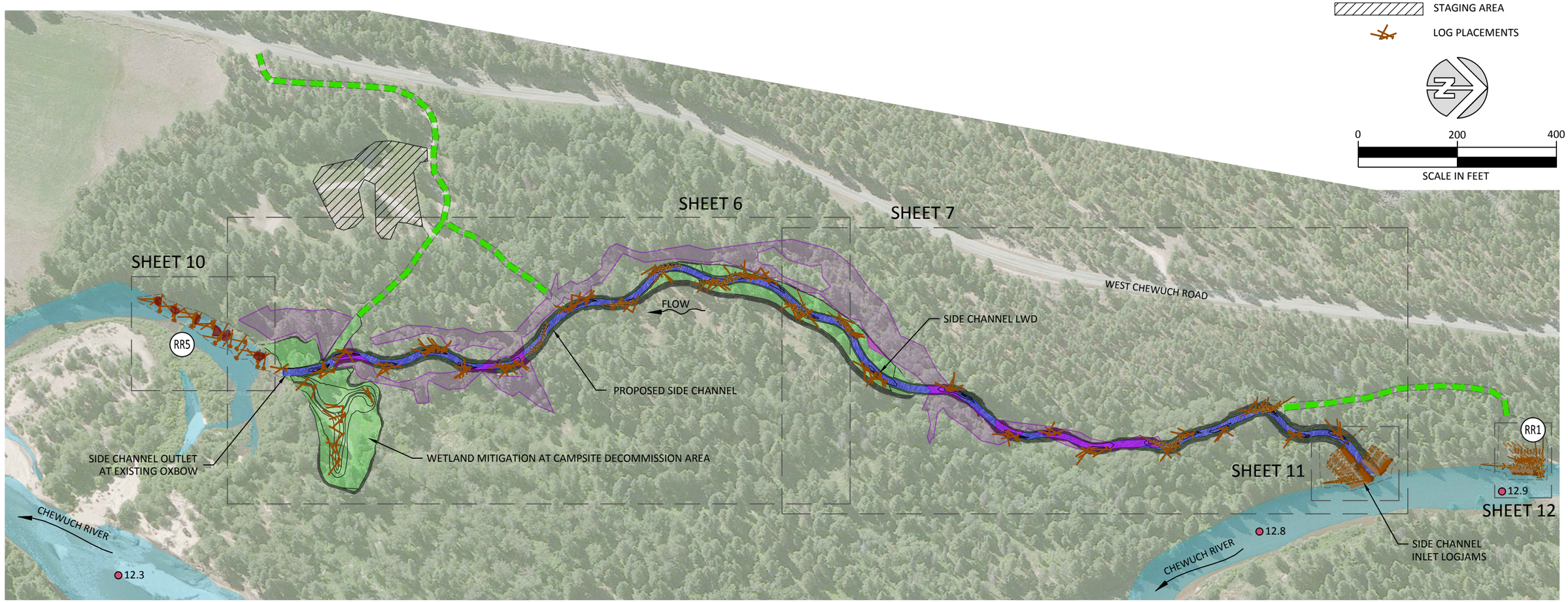
1. ALL MATERIALS QUANTITIES ARE BASED ON IN-PLACE CONDITION DETERMINED BY THE PRE-PROJECT CONDITION COMPARED AGAINST THE PROJECT FINAL CONDITION.
2. CONTRACTOR SHALL ALLOW FOR EXPANSION OF EXCAVATED MATERIAL AND COMPACTION OF PLACED MATERIAL AT NO ADDITIONAL MEASURE OR COST TO THE OWNER.
3. MEASUREMENTS BY WEIGHT OR TRUCK MEASUREMENT SHALL NOT BE ALLOWED WITHOUT PRIOR WRITTEN APPROVAL.
4. SALVAGED TREES SHALL BE INCORPORATED INTO HABITAT STRUCTURES.

LEGEND

- 12.3 — RIVER MILE
- 1 — PROPERTY LINE
- EXISTING MAIN CHANNEL
- PROPOSED SIDE CHANNEL
- WETLAND DELINEATION
- WETLAND IMPACT
- WETLAND CREATION
- STAGING AREA
- LOG PLACEMENTS

0 200 400

SCALE IN FEET



PLAN

NO.	BY	DATE	REVISION DESCRIPTION

DF	MB,MM,CM	MB
DRAWN	DESIGNED	CHECKED
MM	2/10/15	
APPROVED	DATE	PROJECT

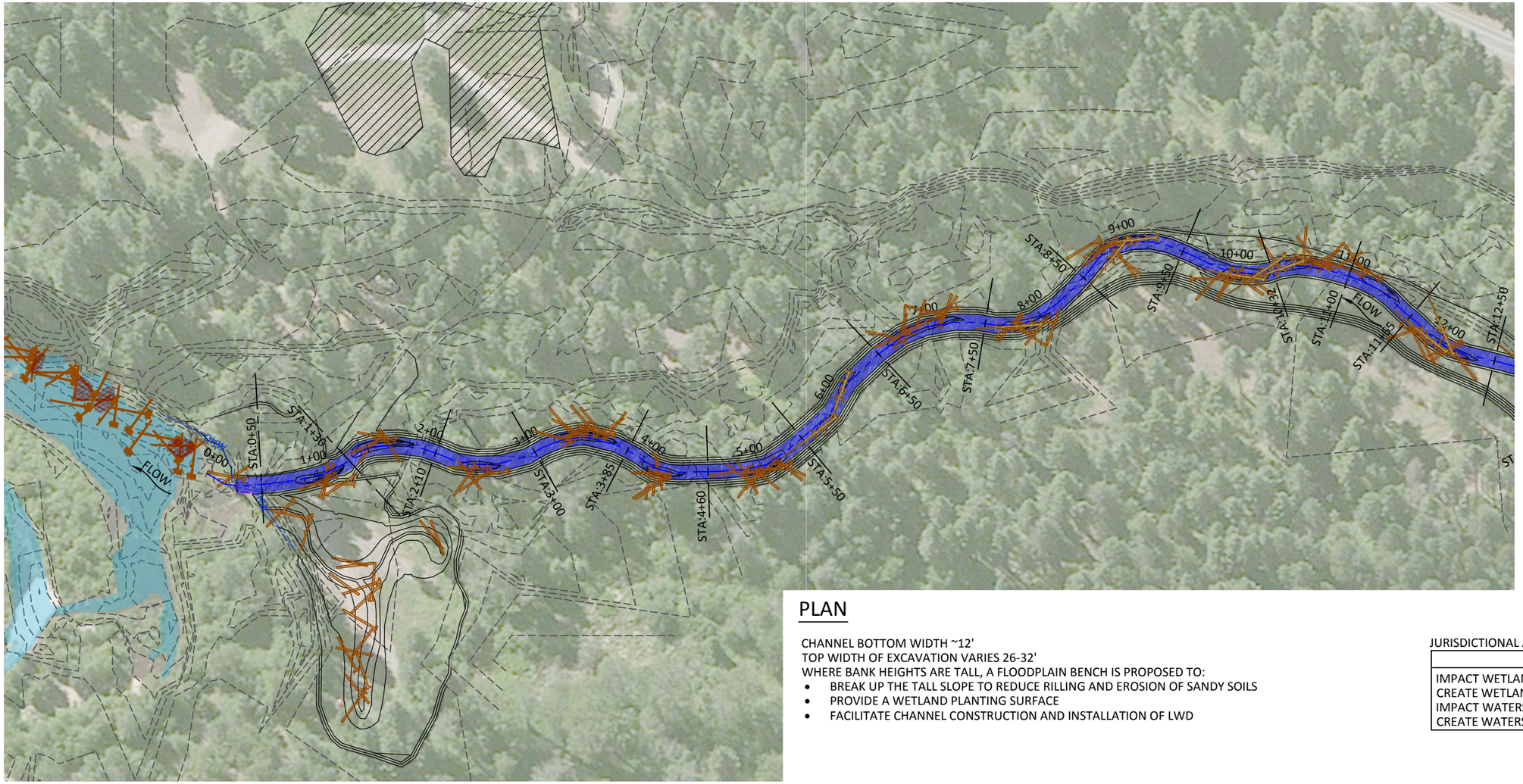
CONFEDERATED TRIBES AND BANDS OF THE YAKAMA NATION
CHEWUCH RIVER RIGHT
FISH HABITAT ENHANCEMENT PROJECT 60% DESIGN

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

PROJECT OVERVIEW AND SHEET INDEX

SHEET 5 OF 16

G:\GIS\Chewuch River Right 2014_16026A\Drawings\MF Chewuch_RiverRight_D.dwg - Miles M - 2/11/2015



0 100 200

SCALE IN FEET

LEGEND

- EXISTING CONTROURS (1-FT INTERVAL)
- PROPOSED CONTOURS (1-FT INTERVAL)
- EXISTING MAIN CHANNEL
- PROPOSED SIDE CHANNEL
- PROPERTY LINE
- STAGING AREA
- STA:11+00 GRADING CROSS SECTION LINE AND STATION ALONG CENTERLINE ALIGNMENT (SEE SHEET 8 AND 9)
- LOG INSTALLATIONS
- SALVAGED TREE PLACEMENT

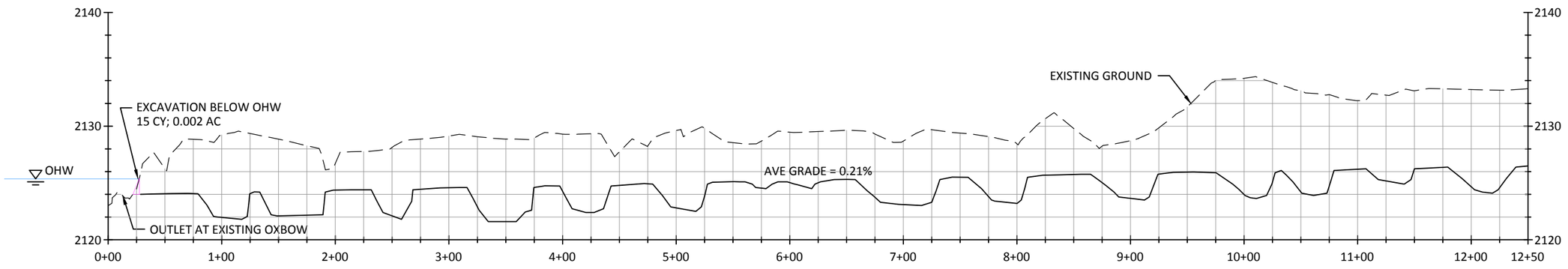
PLAN

CHANNEL BOTTOM WIDTH ~12'
TOP WIDTH OF EXCAVATION VARIES 26-32'
WHERE BANK HEIGHTS ARE TALL, A FLOODPLAIN BENCH IS PROPOSED TO:

- BREAK UP THE TALL SLOPE TO REDUCE RILLING AND EROSION OF SANDY SOILS
- PROVIDE A WETLAND PLANTING SURFACE
- FACILITATE CHANNEL CONSTRUCTION AND INSTALLATION OF LWD

JURISDICTIONAL AREA IMPACTS

	AREA	VOLUME
IMPACT WETLAND	0.26 AC	919 CY CUT
CREATE WETLAND	1.55 AC	-
IMPACT WATERS	0.002 AC	15 CY
CREATE WATERS	1.15 AC	-



PROFILE - SIDE CHANNEL, DOWNSTREAM END

NO.	BY	DATE	REVISION DESCRIPTION

DF (DRAWN)	MB,MM,CM (DESIGNED)	MB (CHECKED)
MM (APPROVED)	2/10/15 (DATE)	(PROJECT)

CONFEDERATED TRIBES AND BANDS OF THE YAKAMA NATION
CHEWUCH RIVER RIGHT
FISH HABITAT ENHANCEMENT PROJECT 60% DESIGN

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

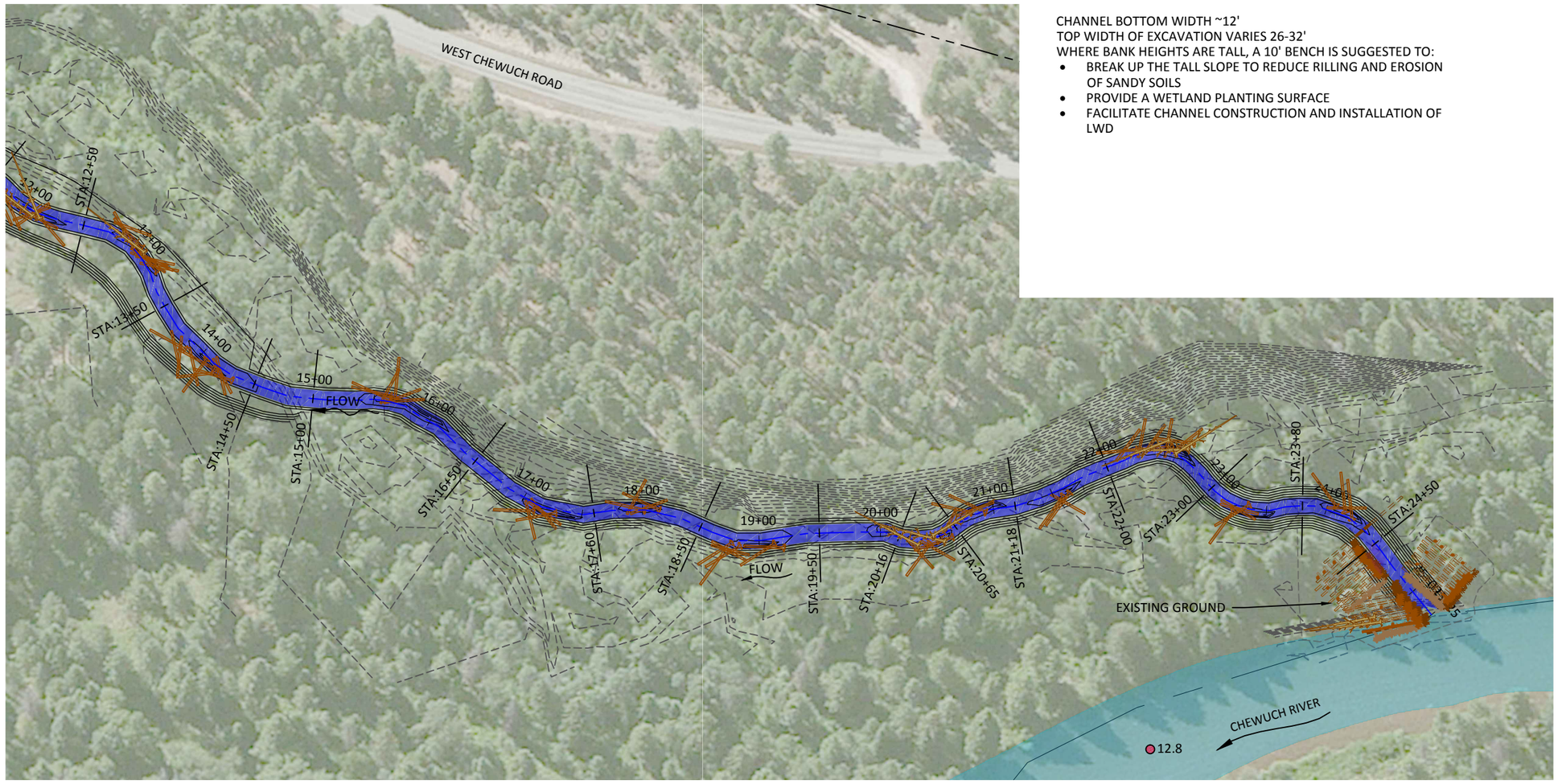
PROPOSED SIDE CHANNEL DOWNSTREAM

SHEET 6 OF 16

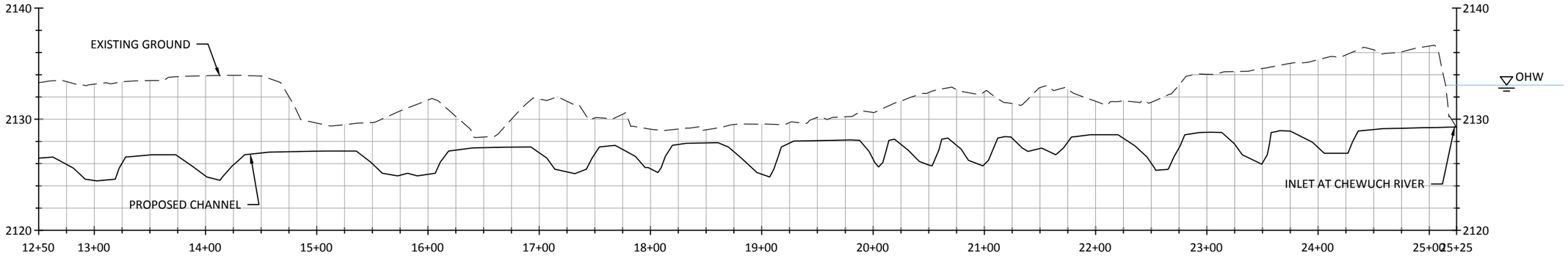
G:\CO\Chewuch River Right 2014 - 140261\Drawings\LWI Chewuch RiverRight - D.dwg - Mike M - 2/17/2015

CHANNEL BOTTOM WIDTH ~12'
TOP WIDTH OF EXCAVATION VARIES 26-32'
WHERE BANK HEIGHTS ARE TALL, A 10' BENCH IS SUGGESTED TO:

- BREAK UP THE TALL SLOPE TO REDUCE RILLING AND EROSION OF SANDY SOILS
- PROVIDE A WETLAND PLANTING SURFACE
- FACILITATE CHANNEL CONSTRUCTION AND INSTALLATION OF LWD



PLAN



PROFILE - SIDE CHANNEL, UPSTREAM END

0 100 200
SCALE IN FEET

LEGEND

- EXISTING CONTROURS (1-FT INTERVAL)
- PROPOSED CONTOURS (1-FT INTERVAL)
- EXISTING MAIN CHANNEL
- PROPOSED SIDE CHANNEL
- PROPERTY LINE
- STAGING AREA
- STA:11+00 GRADING CROSS SECTION LINE AND STATION ALONG CENTERLINE ALIGNMENT (SEE SHEET 8 AND 9)
- LOG INSTALLATIONS
- SALVAGED TREE PLACEMENT

NO.	BY	DATE	REVISION DESCRIPTION

DF	MB,MM,CM	MB
DRAWN	DESIGNED	CHECKED
MM	2/10/15	
APPROVED	DATE	PROJECT

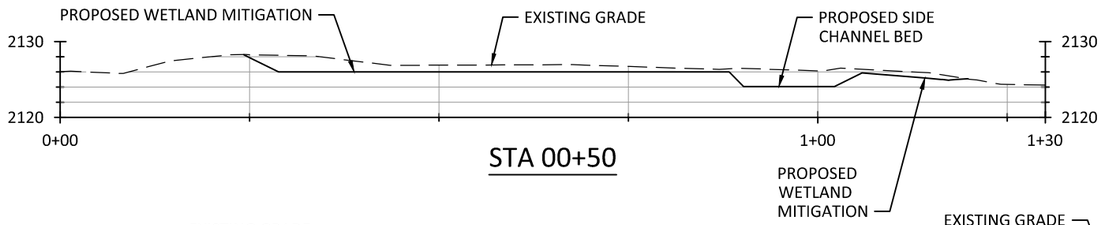
CONFEDERATED TRIBES AND BANDS OF THE YAKAMA NATION
CHEWUCH RIVER RIGHT
FISH HABITAT ENHANCEMENT PROJECT 60% DESIGN

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

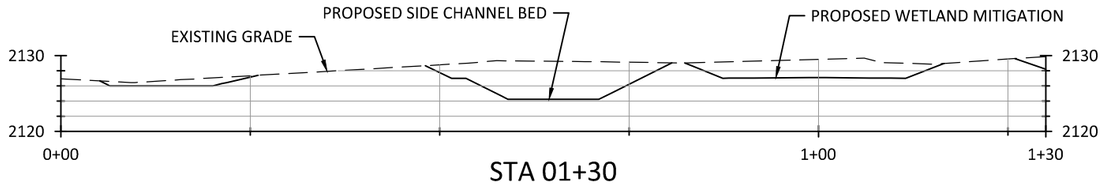
PROPOSED SIDE CHANNEL UPSTREAM

SHEET 7 OF 16

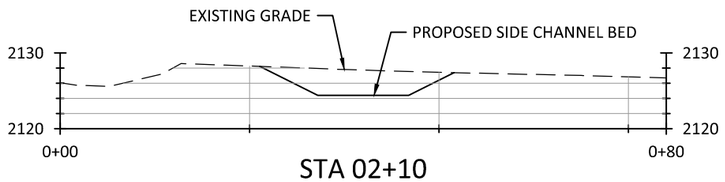
G:\GIS\Chewuch River Right\ 2014 - 140264\Drawings\IFF Chewuch_RiverRight_D.dwg - MikeM - 2/11/2015



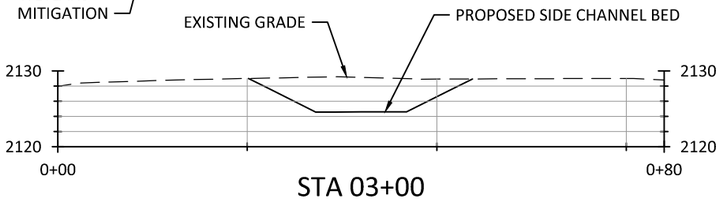
STA 00+50



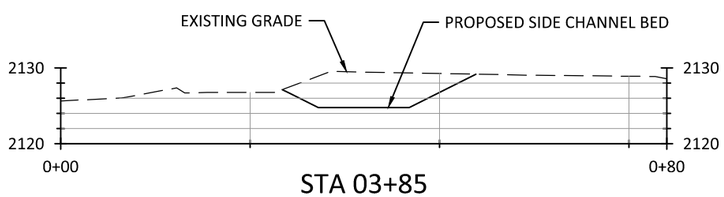
STA 01+30



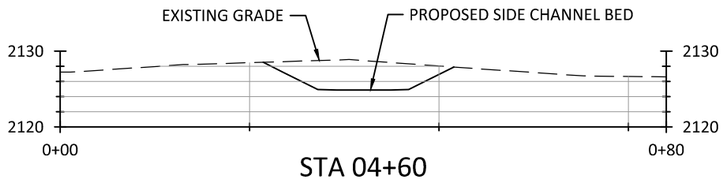
STA 02+10



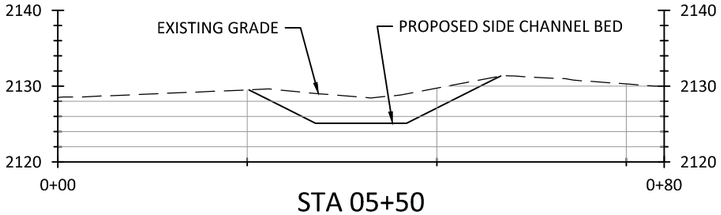
STA 03+00



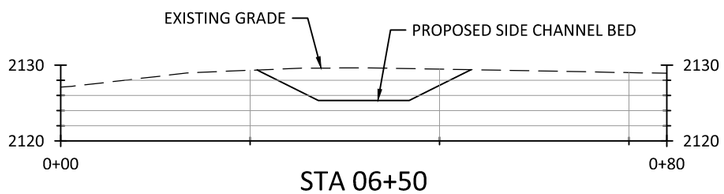
STA 03+85



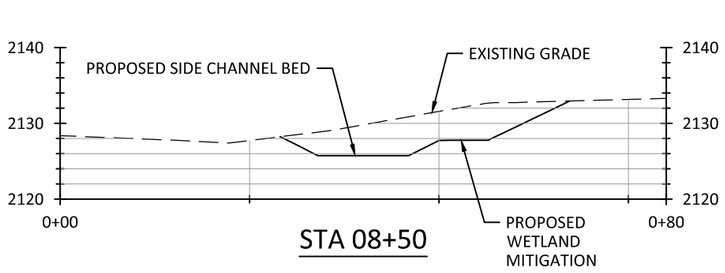
STA 04+60



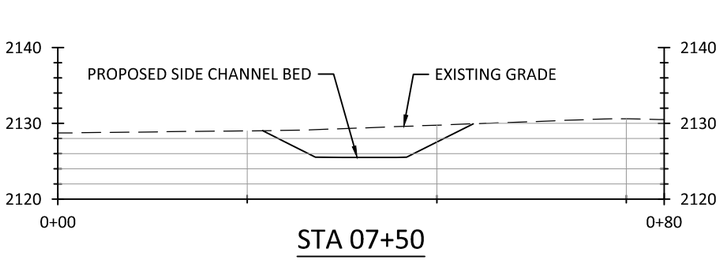
STA 05+50



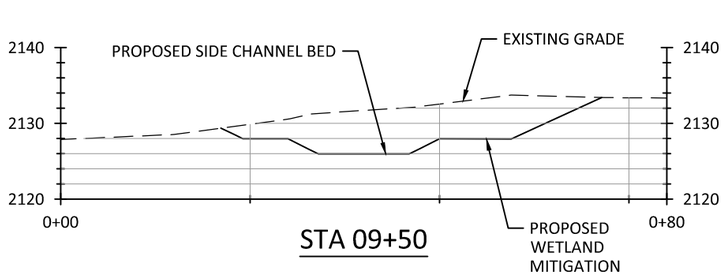
STA 06+50



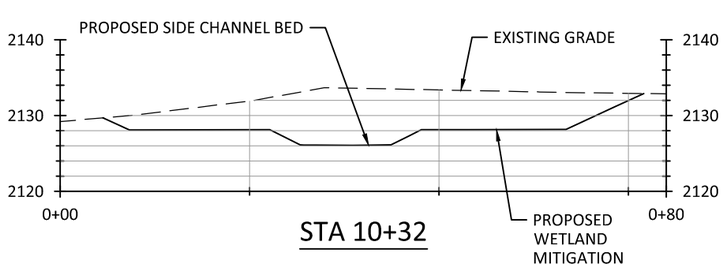
STA 08+50



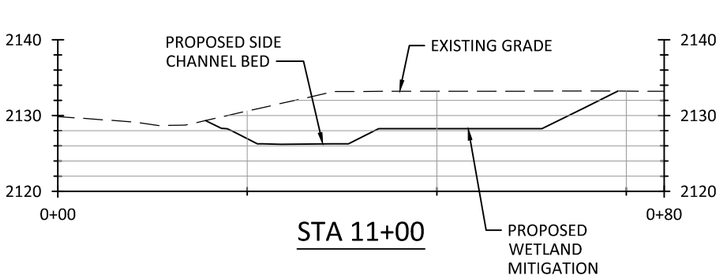
STA 07+50



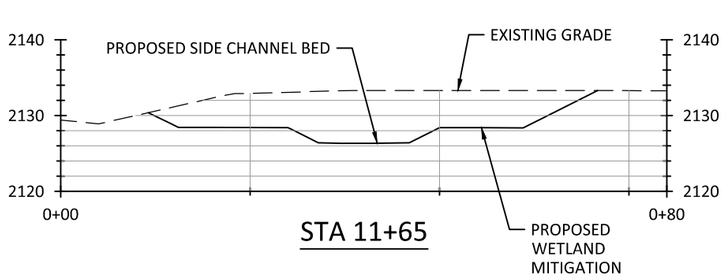
STA 09+50



STA 10+32



STA 11+00



STA 11+65

G:\CO\Chewuch River Right 2014 - 140561\Drawings\LWI Chewuch_RiverRight_O.dwg - Mike M - 2/17/2015

NO.	BY	DATE	REVISION DESCRIPTION

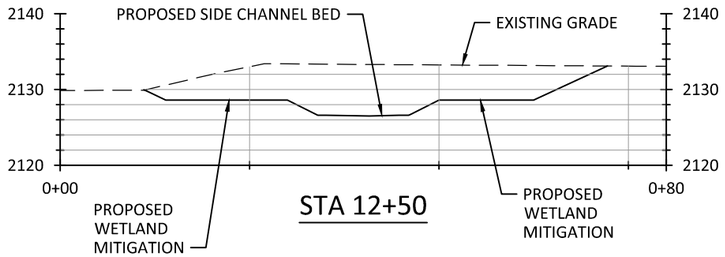
DF	MB,MM,CM	MB
DRAWN	DESIGNED	CHECKED
MM	2/10/15	
APPROVED	DATE	PROJECT

CONFEDERATED TRIBES AND BANDS OF THE YAKAMA NATION
CHEWUCH RIVER RIGHT
FISH HABITAT ENHANCEMENT PROJECT 60% DESIGN

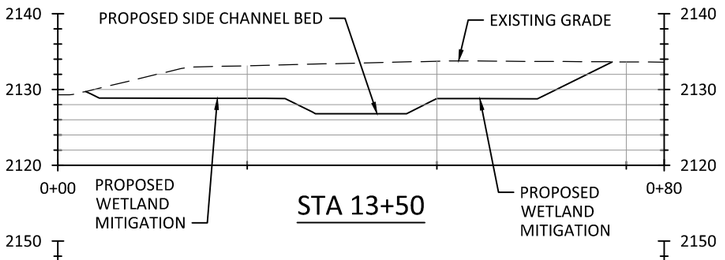
inter·fluve
501 Portway Avenue, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

SIDE CHANNEL GRADING
CROSS SECTIONS

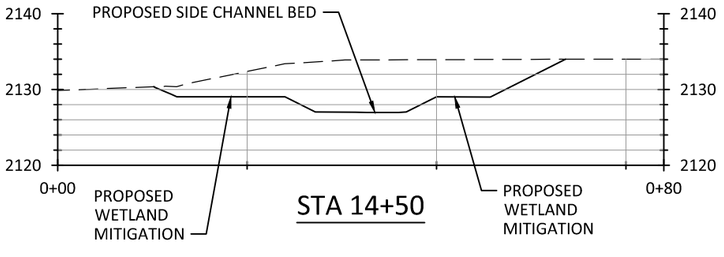
SHEET
8 OF 16



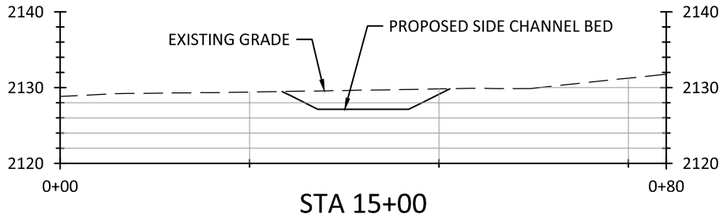
STA 12+50



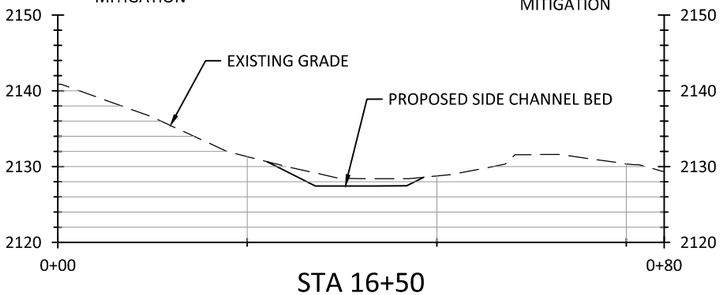
STA 13+50



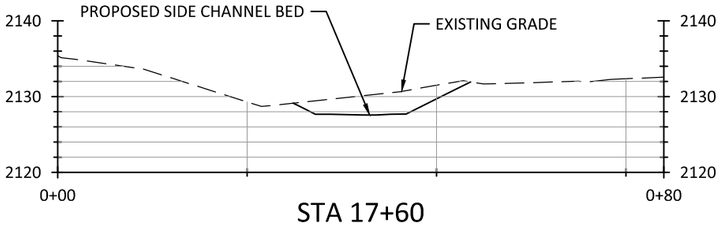
STA 14+50



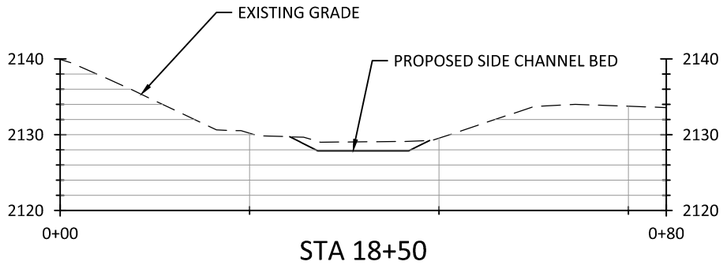
STA 15+00



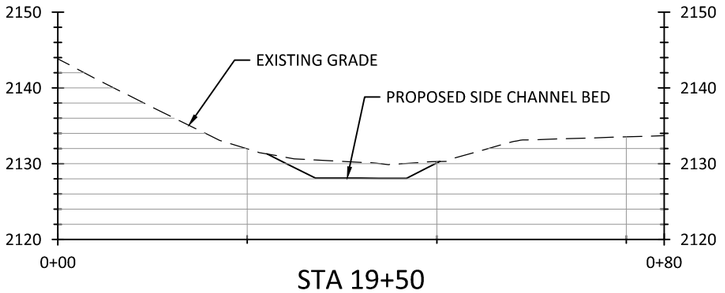
STA 16+50



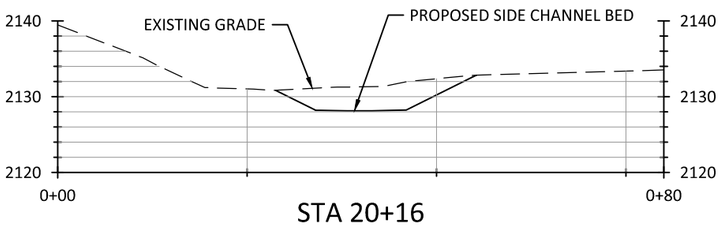
STA 17+60



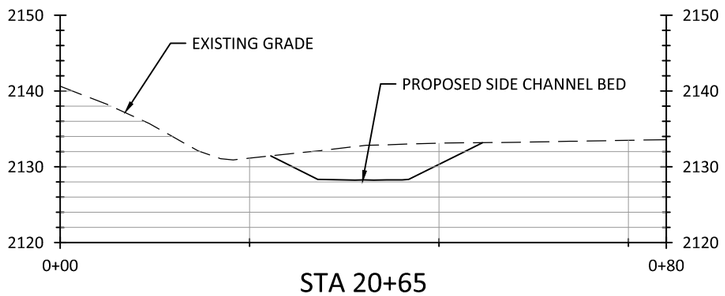
STA 18+50



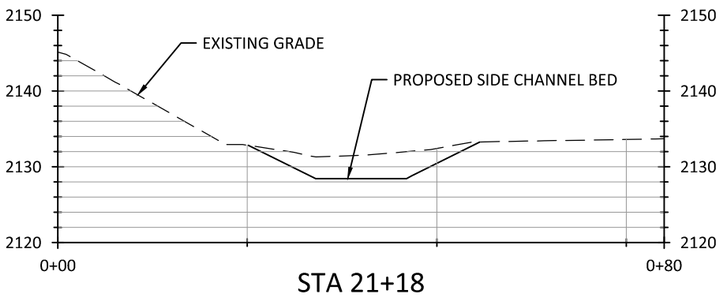
STA 19+50



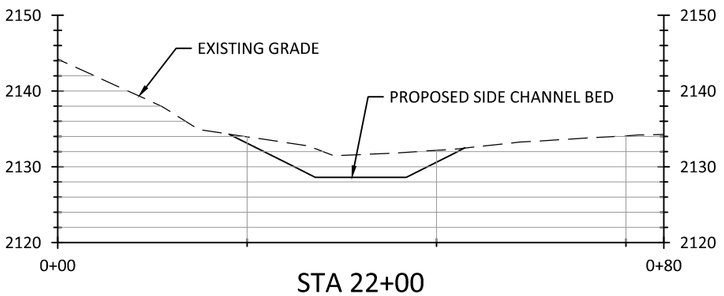
STA 20+16



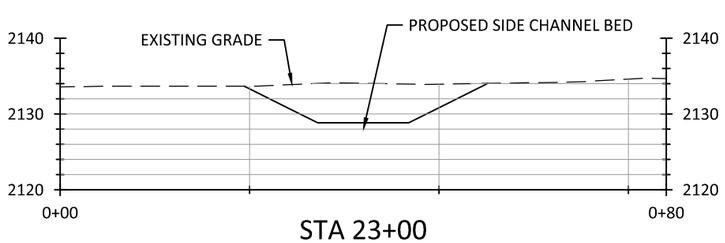
STA 20+65



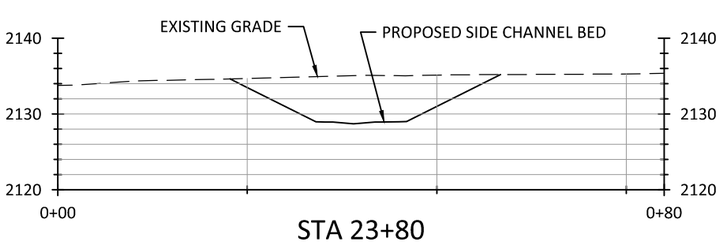
STA 21+18



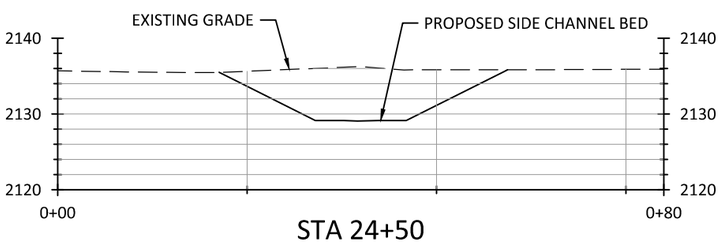
STA 22+00



STA 23+00



STA 23+80



STA 24+50

NO.	BY	DATE	REVISION DESCRIPTION

DRAWN	DESIGNED	CHECKED
DF	MB,MM,CM	MB
APPROVED	DATE	PROJECT
MM	2/10/15	

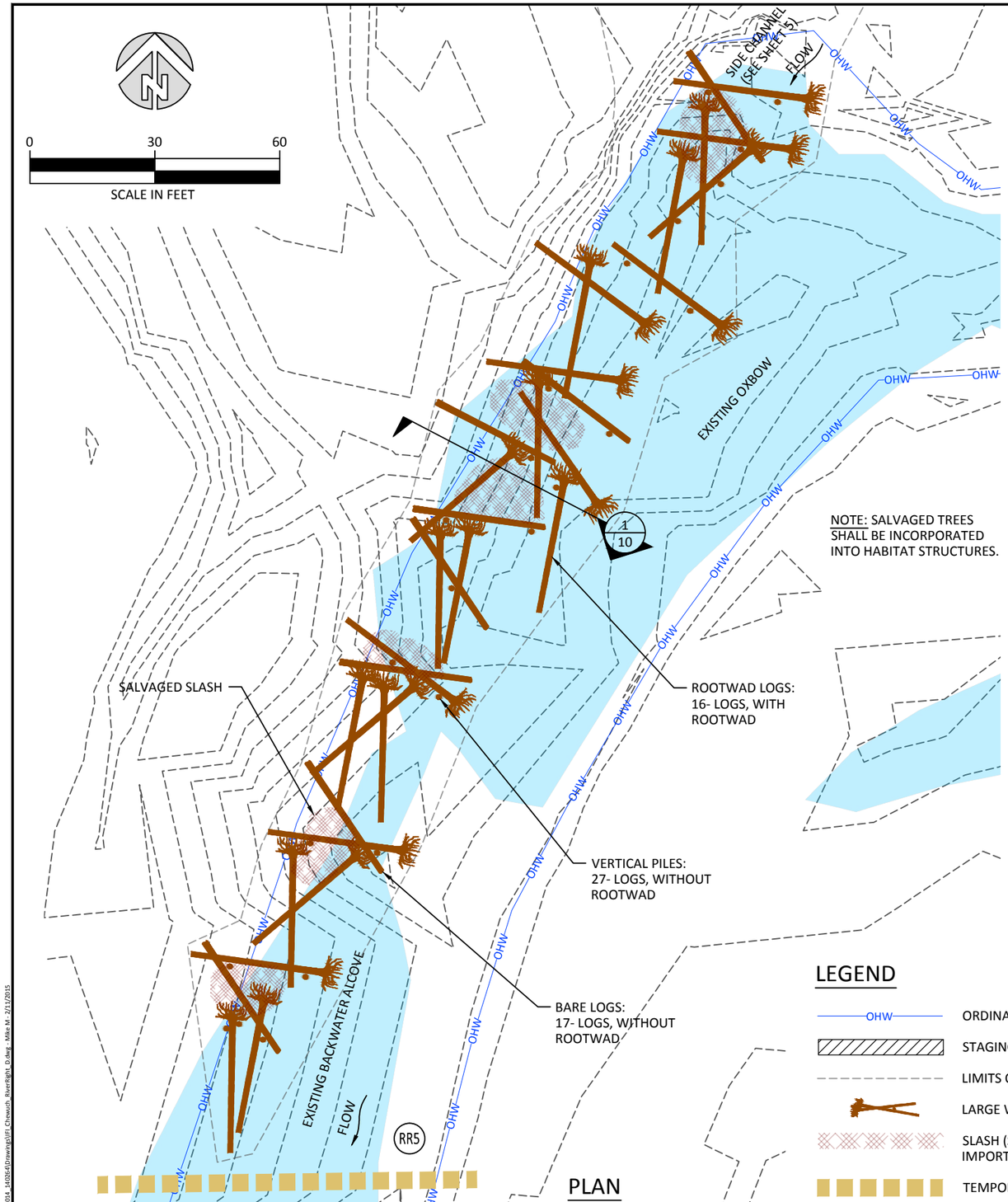
CONFEDERATED TRIBES AND BANDS OF THE YAKAMA NATION
CHEWUCH RIVER RIGHT
FISH HABITAT ENHANCEMENT PROJECT 60% DESIGN

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

SIDE CHANNEL GRADING
CROSS SECTIONS

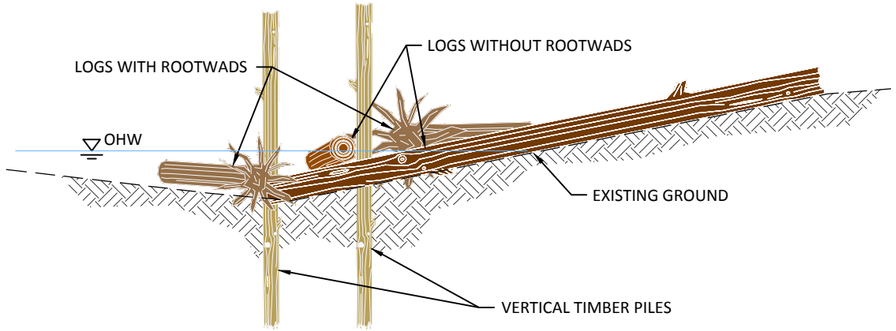
SHEET
9 OF 16

G:\C\CH\Chewuch River Right\ 2014 - 140264\Drawings\Plan Chewuch_RiverRight_0.dwg - Mike.M - 2/11/2015



NOTE: SALVAGED TREES SHALL BE INCORPORATED INTO HABITAT STRUCTURES.

PLAN



1/10 SECTION - UPSTREAM LOG JAM

SCALE: 1" = 10'

CABLING NOT REQUIRED.

SITE RR5 WATERBODY IMPACTS (WITHIN OHW)

ACTIVITY	WATERBODY NAME	IMPACT LOCATION	DURATION OF IMPACT	VOLUME OF MATERIAL PLACED OR REMOVED	AREA (SF) OR LENGTH (LF) OF IMPACT
COFFERDAM IMPOUNDMENT	CHEWUCH RIVER	RIVER	3 DAYS	N/A	24,390 SF
WOOD PLACEMENT	CHEWUCH RIVER	RIVER	PERMANENT	44 CY	1038 SF
BOULDER PLACEMENT *	CHEWUCH RIVER	RIVER	PERMANENT	140 CY	880 SF

* NOTE: 70 BOULDERS WILL ONLY BE USED IF VERTICAL PILES CANNOT BE DRIVEN DUE TO BEDROCK OR LARGE SUBSTRATE. SEE SHEET 14 FOR BOULDER BALLAST DETAILS.

CONSTRUCTION QUANTITIES

ITEM	QUANTITY
18-24" DBH x 40' LONG, LOG WITH ROOTWAD	16 EA
18-24" DBH x 40' LONG, LOG WITHOUT ROOTWAD	44 EA

LEGEND

- OHW — ORDINARY HIGH WATER
- STAGING/STOCKPILE
- LIMITS OF DISTURBANCE
- LARGE WOODY MATERIAL
- SLASH (SALVAGED OR IMPORTED)
- TEMPORARY COFFERDAM

QUANTITIES NOTES:

1. ALL MATERIALS QUANTITIES ARE BASED ON IN-PLACE CONDITION DETERMINED BY THE PRE-PROJECT CONDITION COMPARED AGAINST THE PROJECT FINAL CONDITION.
2. CONTRACTOR SHALL ALLOW FOR EXPANSION OF EXCAVATED MATERIAL AND COMPACTION OF PLACED MATERIAL AT NO ADDITIONAL MEASURE OR COST TO THE OWNER.
3. MEASUREMENTS BY WEIGHT OR TRUCK MEASUREMENT SHALL NOT BE ALLOWED WITHOUT PRIOR WRITTEN APPROVAL.

NO.	BY	DATE	REVISION DESCRIPTION

DF	MB,MM,CM	MB
DRAWN	DESIGNED	CHECKED
MM	2/10/15	
APPROVED	DATE	PROJECT

CONFEDERATED TRIBES AND BANDS OF THE YAKAMA NATION
CHEWUCH RIVER RIGHT
FISH HABITAT ENHANCEMENT PROJECT 60% DESIGN

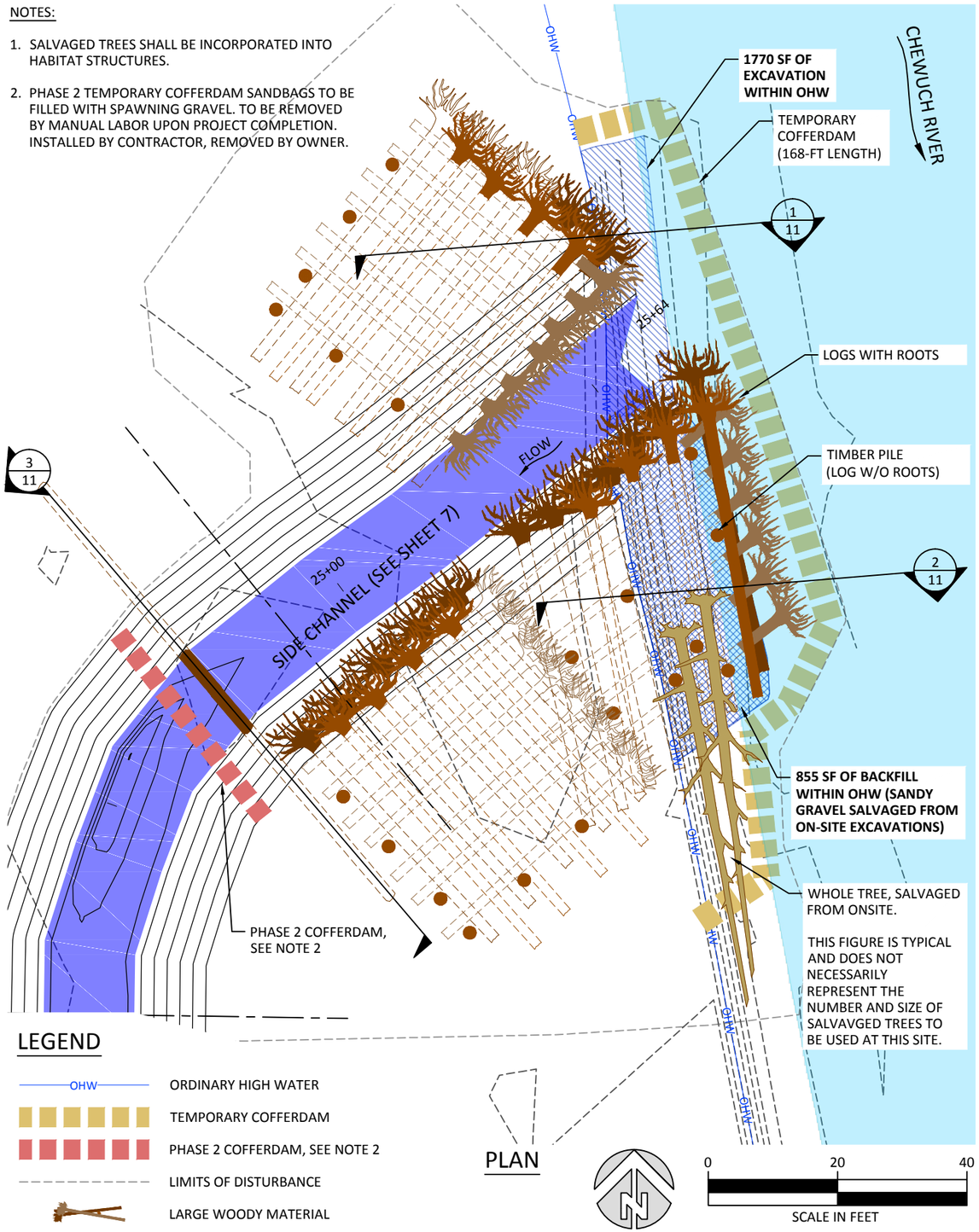
inter·fluve
501 Portway Avenue, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

LOG INSTALLATIONS NEAR SIDE CHANNEL OUTLET

G:\C-D\Chewuch River Right 2014_140264\Drawings\IFI_Chewuch_RiverRight_D.dwg - Mike M - 2/11/2015

NOTES:

1. SALVAGED TREES SHALL BE INCORPORATED INTO HABITAT STRUCTURES.
2. PHASE 2 TEMPORARY COFFERDAM SANDBAGS TO BE FILLED WITH SPAWNING GRAVEL. TO BE REMOVED BY MANUAL LABOR UPON PROJECT COMPLETION. INSTALLED BY CONTRACTOR, REMOVED BY OWNER.

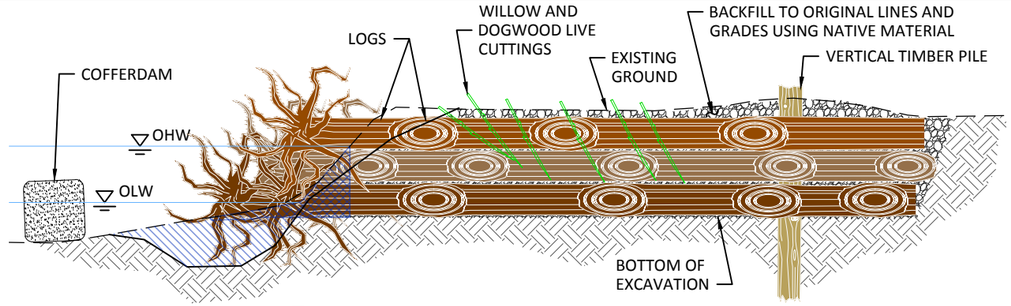


PLAN

0 20 40
SCALE IN FEET

LEGEND

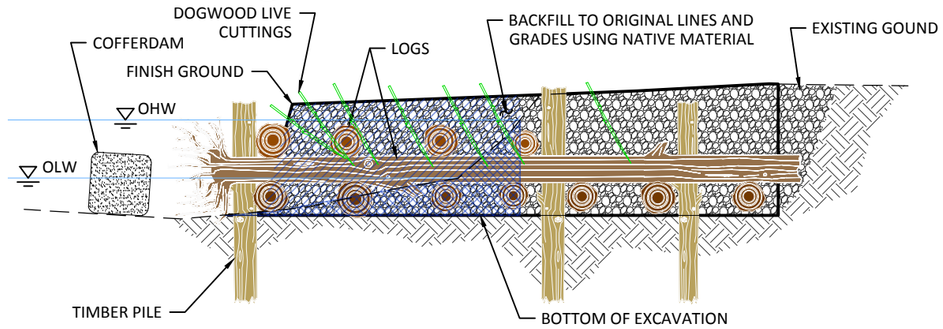
- OHW — ORDINARY HIGH WATER
- TEMPORARY COFFERDAM
- PHASE 2 COFFERDAM, SEE NOTE 2
- LIMITS OF DISTURBANCE
- LARGE WOODY MATERIAL



1/11 SECTION - UPSTREAM LOG STRUCTURE
SCALE: 1" = 10'

EXCAVATION BELOW OHW

FILL BELOW OHW



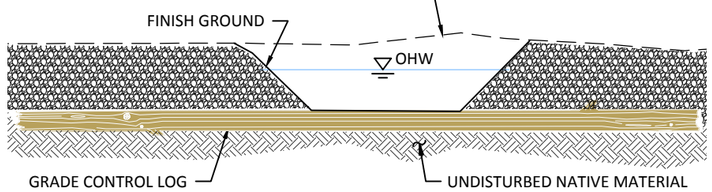
2/11 SECTION - DOWNSTREAM LOG STRUCTURE
SCALE: 1" = 10'

CONSTRUCTION QUANTITIES

ITEM	QUANTITY
EXCAVATION	1419 CY
BACKFILL	1436 CY
SOIL DISPLACED BY LWD	218 CY
LOGS WITH ROOTS; 18-24" DBH x 40' LONG,	48 EA
LOGS; 18-24" DBH x 40' LONG	24 EA

QUANTITIES NOTES:

1. ALL MATERIALS QUANTITIES ARE BASED ON IN-PLACE CONDITION DETERMINED BY THE PRE-PROJECT CONDITION COMPARED AGAINST THE PROJECT FINAL CONDITION.
2. CONTRACTOR SHALL ALLOW FOR EXPANSION OF EXCAVATED MATERIAL AND COMPACTION OF PLACED MATERIAL AT NO ADDITIONAL MEASURE OR COST TO THE OWNER.
3. MEASUREMENTS BY WEIGHT OR TRUCK MEASUREMENT SHALL NOT BE ALLOWED WITHOUT PRIOR WRITTEN APPROVAL.



3/11 SECTION - GRADE CONTROL LOG
SCALE: 1" = 10'

0 10 20
SCALE IN FEET

SIDE CHANNEL INLET WATERBODY IMPACTS (WITHIN OHW)

ACTIVITY	WATERBODY NAME	IMPACT LOCATION	DURATION OF IMPACT	VOLUME OF MATERIAL PLACED OR REMOVED	AREA (SF) OR LENGTH (LF) OF IMPACT
COFFERDAM IMPOUNDMENT	CHEWUCH RIVER	RIVER	3 DAYS	N/A	2426 SF
EXCAVATION	CHEWUCH RIVER	RIVER	PERMANENT*	67 CY	1770 SF
WOOD PLACEMENT	CHEWUCH RIVER	RIVER	PERMANENT	29 CY	782 SF
BACKFILL	CHEWUCH RIVER	RIVER	PERMANENT	330 CY	1407 SF

* EXCAVATION WITHIN OHW IS PERMANENT EXCEPT FOR THAT PORTION REPLACED BY BACKFILL

NO.	BY	DATE	REVISION DESCRIPTION

DF	MB,MM,CM	MB
DRAWN	DESIGNED	CHECKED
MM	2/10/15	
APPROVED	DATE	PROJECT

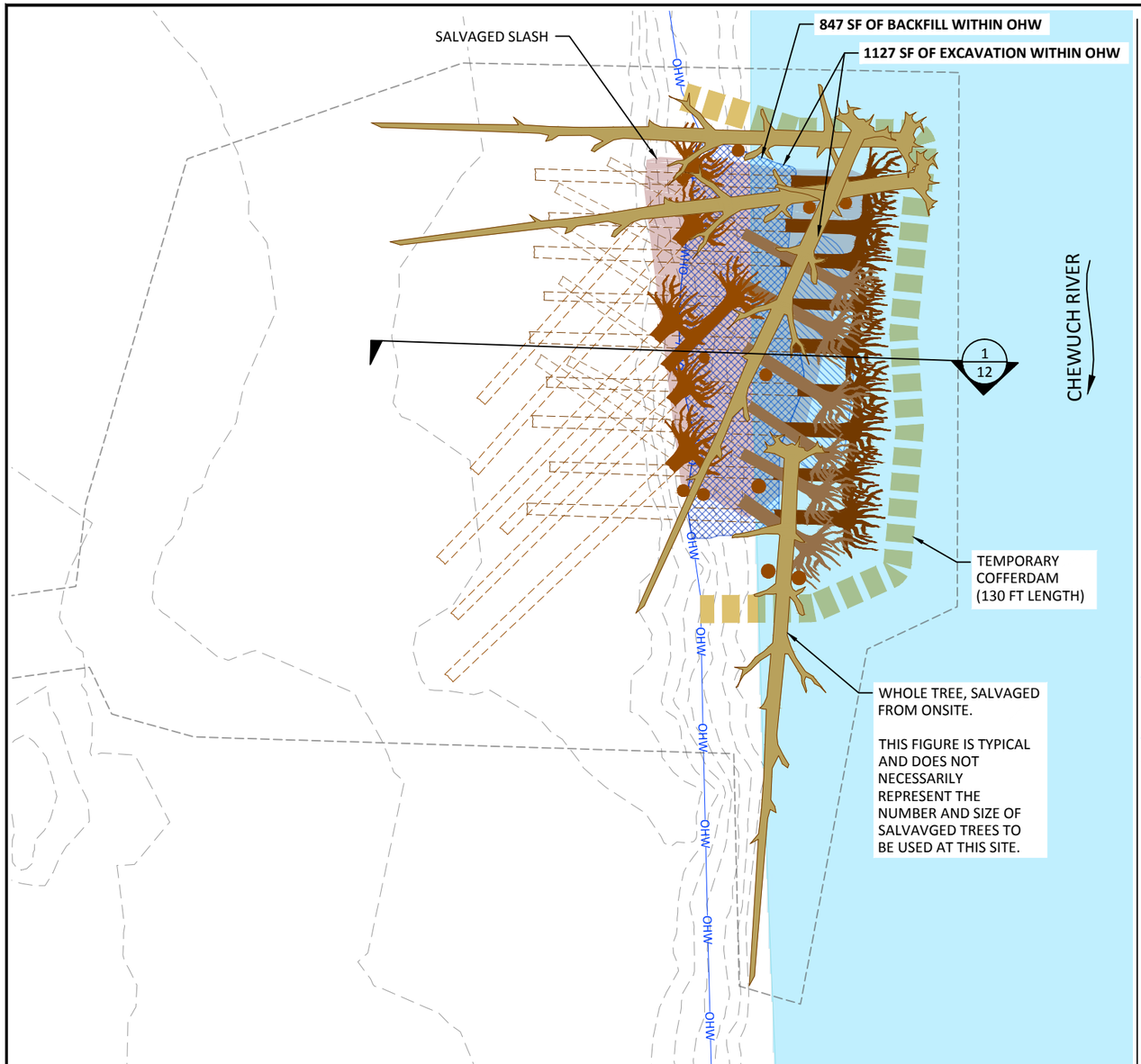
CONFEDERATED TRIBES AND BANDS OF THE YAKAMA NATION
CHEWUCH RIVER RIGHT
FISH HABITAT ENHANCEMENT PROJECT 60% DESIGN

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

LOG STRUCTURE AT INLET

SHEET 11 OF 16

G:\CO\Chewuch River Right 2014 - 140261\Drawings\LWI Chewuch RiverRight - D.dwg - Mike M - 2/17/2015



PLAN (RR1)

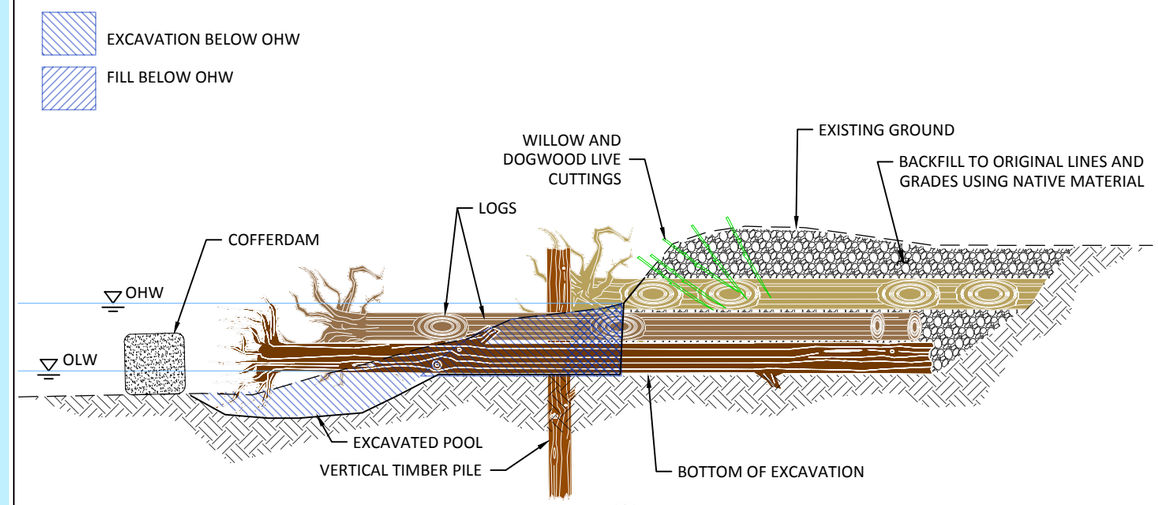
LEGEND

- OHW — ORDINARY HIGH WATER
- TEMPORARY COFFERDAM
- STAGING/STOCKPILE
- LIMITS OF DISTURBANCE
- LARGE WOODY MATERIAL
- SLASH (SALVAGED OR IMPORTED)

0 20 40
SCALE IN FEET

CONSTRUCTION QUANTITIES	
ITEM	QUANTITY
EXCAVATION	696 CY
BACKFILL	696 CY
SOIL DISPLACED BY LWD	73 CY
18-24" DBH x 40' LONG, LOG WITH ROOTWAD	21 EA
18-24" DBH x 40' LONG, LOG WITHOUT ROOTWAD	6 EA

QUANTITIES NOTES:
1. ALL MATERIALS QUANTITIES ARE BASED ON IN-PLACE CONDITION DETERMINED BY THE PRE-PROJECT CONDITION COMPARED AGAINST THE PROJECT FINAL CONDITION.
2. CONTRACTOR SHALL ALLOW FOR EXPANSION OF EXCAVATED MATERIAL AND COMPACTION OF PLACED MATERIAL AT NO ADDITIONAL MEASURE OR COST TO THE OWNER.
3. MEASUREMENTS BY WEIGHT OR TRUCK MEASUREMENT SHALL NOT BE ALLOWED WITHOUT PRIOR WRITTEN APPROVAL.



1/12 SECTION
SCALE: 1" = 10'

0 10 20
SCALE IN FEET

SITE RR1 WATERBODY IMPACTS (WITHIN OHW)

ACTIVITY	WATERBODY NAME	IMPACT LOCATION	DURATION OF IMPACT	VOLUME OF MATERIAL PLACED OR REMOVED	AREA (SF) OR LENGTH (LF) OF IMPACT
COFFERDAM IMPOUNDMENT	CHEWUCH RIVER	RIVER	3 DAYS	N/A	2500 SF
EXCAVATION	CHEWUCH RIVER	RIVER	PERMANENT*	106 CY	1127 SF
WOOD PLACEMENT	CHEWUCH RIVER	RIVER	PERMANENT	51 CY	845 SF
BACKFILL	CHEWUCH RIVER	RIVER	PERMANENT	15 CY	847 SF

* EXCAVATION WITHIN OHW IS PERMANENT EXCEPT FOR THAT PORTION REPLACED BY BACKFILL

NO.	BY	DATE	REVISION DESCRIPTION

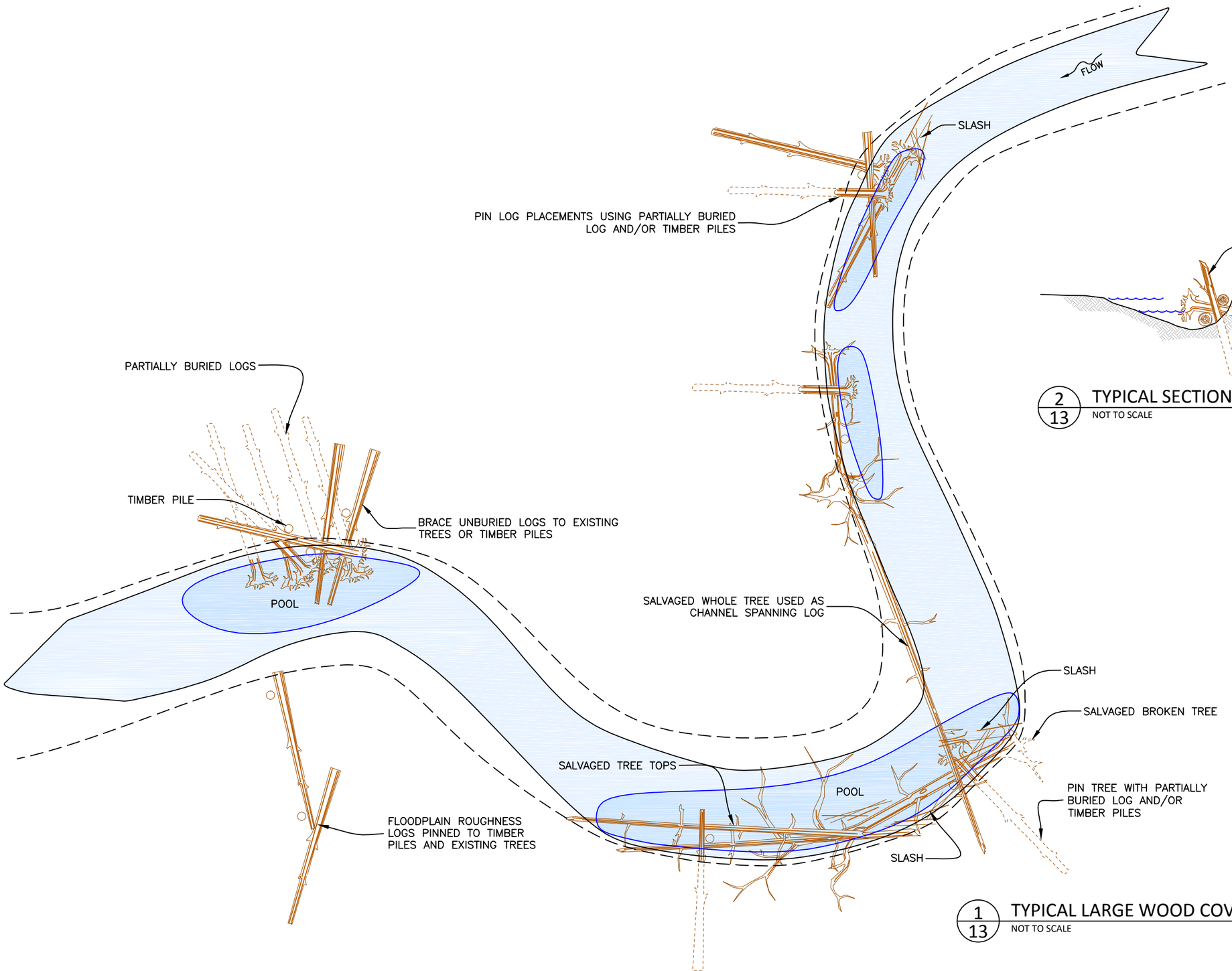
DF	MB,MM,CM	MB
DRAWN	DESIGNED	CHECKED
MM	2/10/15	
APPROVED	DATE	PROJECT

CONFEDERATED TRIBES AND BANDS OF THE YAKAMA NATION
CHEWUCH RIVER RIGHT
FISH HABITAT ENHANCEMENT PROJECT 60% DESIGN

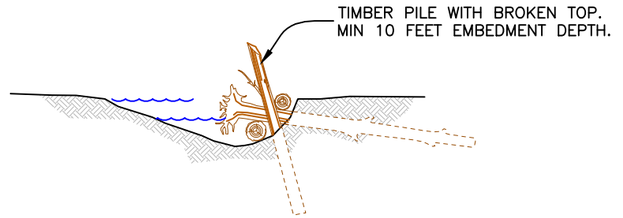
inter·fluve
501 Portway Avenue, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

RIVERBANK BANK LOG
STRUCTURE RR1

G:\C-D\Chewuch River Right 2014_140264\Drawings\IFI_Chewuch_RiverRight_D.dwg - Mike M - 2/11/2015



1/13 TYPICAL LARGE WOOD COVER HABITAT
NOT TO SCALE



2/13 TYPICAL SECTION - SIDE CHANNEL LARGE WOOD
NOT TO SCALE

NO.	BY	DATE	REVISION DESCRIPTION

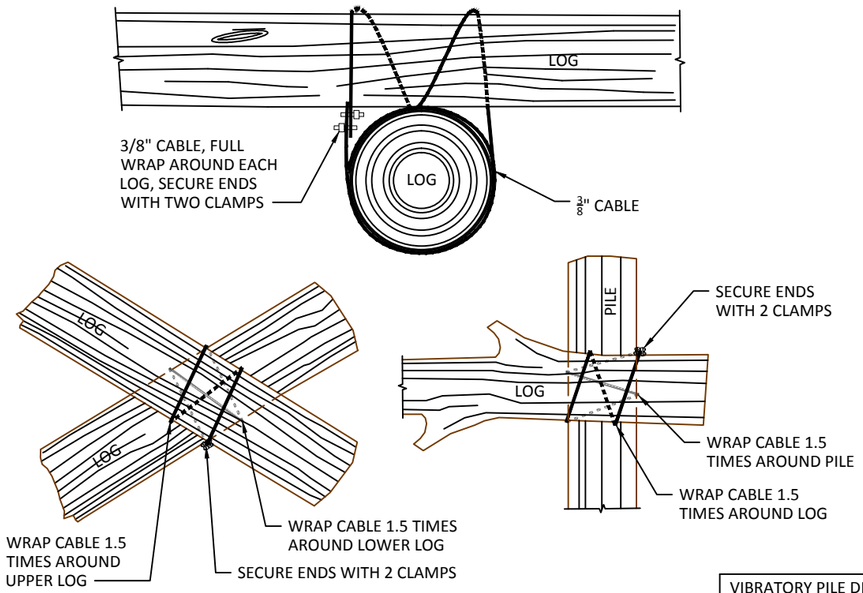
DRAWN	DESIGNED	CHECKED
DF	MB,MM,CM	MB
APPROVED	DATE	PROJECT
MM	9/23/14	

CONFEDERATED TRIBES AND BANDS OF THE YAKAMA NATION
CHEWUCH RIVER RIGHT
FISH ENHANCEMENT PROJECT

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

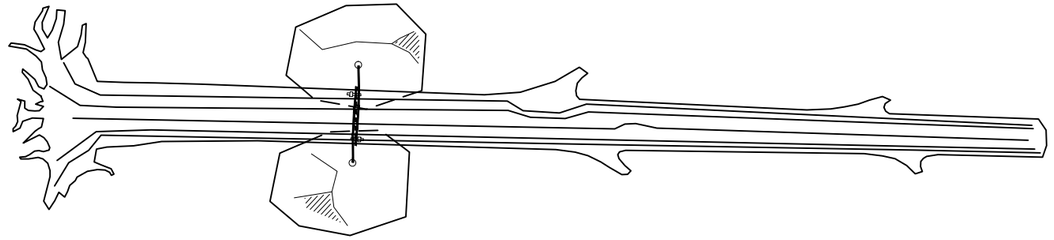
LWM TYPICAL DETAILS

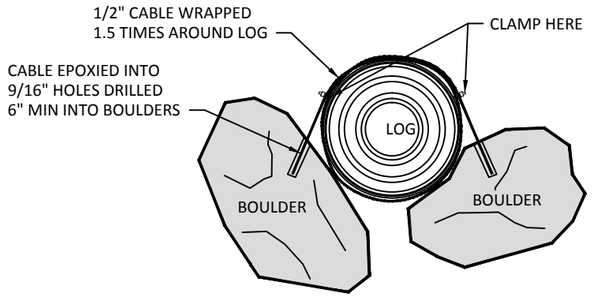
SHEET
13 OF 16



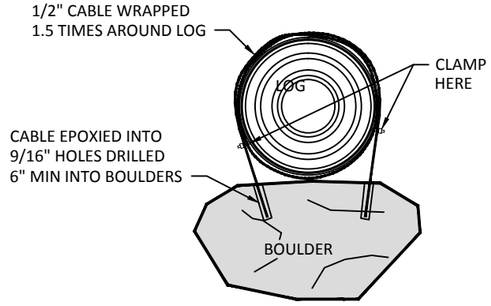
1/14 TYPICAL LOG CABLING (SITE D ONLY)
NOT TO SCALE

VIBRATORY PILE DRIVING SHALL BE THE PRIMARY METHOD OF STABILIZATION. BOULDER BALLAST SHALL ONLY BE USED AFTER EXPRESSED PERMISSION FROM THE OWNER IF PILE DRIVING IS NOT POSSIBLE.





2/14 DOUBLE BOULDER BALLAST
NOT TO SCALE



3/14 SINGLE BOULDER BALLAST
NOT TO SCALE

LOG CABLING

DESCRIPTION

THIS WORK CONSISTS OF ANCHORING LARGE WOOD WITH CABLE AND PILES AS REQUIRED TO PROVIDE ADEQUATE BALLAST FOR STRUCTURAL STABILITY.

MATERIALS

CABLE SHALL BE 3/8 INCH GALVANIZED, STEEL CORE WIRE ROPE.

CLAMPS SHALL BE CROSBY CLIPS, G-450, OR APPROVED EQUAL. MINIMUM OF 2 CLAMPS PER CONNECTION.

CONSTRUCTION

FINAL POSITIONING OF THE ANCHORED STRUCTURES SHALL BE IN THE APPROXIMATE LOCATION AS SHOWN ON THE PLANS.

LOGS SHALL BE TOUCHING. CABLE SHALL BE WRAPPED ONE FULL WRAP AROUND EACH LOG. PULL TIGHT AND INSTALL CLAMPS. CLAMPS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDED CLAMP SIZE AND SPACING FOR THE SIZE AND LOAD RATING OF THE CABLE BEING USED.

VIBRATORY PILE DRIVING

DESCRIPTION

THIS WORK CONSISTS OF INSTALLING LOGS VERTICALLY AS WOODEN PILES WHERE SHOWN ON THE PLANS. INSTALLATION SHALL BE WITH VIBRATORY PILE DRIVER.

MATERIALS

LOG PILES SHALL BE 12-18" DIAMETER AT BUTT END AND MINIMUM 10" DIAMETER AT SCALED END. EACH LOG PILE SHALL BE MINIMUM 30' LONG.

CONSTRUCTION

FINAL POSITIONING OF LOG PILES SHALL BE IN THE APPROXIMATE LOCATIONS SHOWN ON THE PLANS.

EACH PILE SHALL BE INSTALLED BY VIBRATORY PILE DRIVER TO A DEPTH EXCEEDING 13' BELOW GROUND SURFACE. IF PILES CANNOT MEET THE DEPTH REQUIREMENT, BOULDERS SHALL BE USED IN LIEU OF PILES.

BOULDER BALLAST

DESCRIPTION

THIS WORK CONSISTS OF ANCHORING LARGE WOOD WITH CABLE AND BOULDERS AS REQUIRED TO PROVIDE ADEQUATE BALLAST FOR STRUCTURAL STABILITY.

MATERIALS

BOULDERS SHALL BE NON-FRACTURED STONE WITH A MINIMUM SPECIFIC GRAVITY OF 2.65.

CABLE SHALL BE 1/2 INCH GALVANIZED, STEEL CORE,WIRE ROPE.

CLAMPS SHALL BE CROSBY CLIPS, G-450, OR APPROVED EQUAL. MINIMUM OF 2 CLAMPS PER CONNECTION.

EPOXY FOR ANCHORING SHALL BE HILTI HIT RE 500 ADHESIVE OR APPROVED EQUAL IF SUBMERGED DURING INSTALLATION, OR HILTI HIT-HY150 OR APPROVED EQUAL IF DRY INSTALLATION.

CONSTRUCTION

DRILL HOLES IN SOLID ROCK AND AVOID ANY CRACKS OR FRACTURES. HOLES SHALL BE 9/16 INCH IN DIAMETER. HOLES SHALL BE DRILLED 6 INCHES, MINIMUM, INTO ROCK.

HOLES SHALL BE CLEANED OF LOOSE ROCK FRAGMENTS AND DUST WITH A BRUSH AND AIR BLASTS. INSTALL EPOXY PER MANUFACTURER'S RECOMMENDATIONS.

CABLE SHALL BE WRAPPED ONE FULL WRAP AROUND LOG BEFORE ENDS ARE INSERTED INTO THE DRILLED HOLES FILLED WITH EPOXY. DIP CABLE INTO ACETONE AND WIPE CABLE WITH CLEAN RAG TO REMOVE OIL AND RESIDUE. ALLOW ACETONE TO AIR-DRY PRIOR TO INSERTION INTO EPOXY FILLED HOLE. FILL HOLES WITH ENOUGH EPOXY TO ENSURE COMPLETE COVERAGE WITH EPOXY. INSERT CABLE INTO HOLE SO THAT END OF CABLE HITS THE BOTTOM OF THE HOLE. AS AN INDICATOR THAT ENBOUGH EPOXY WAS INJECTED, A SMALL AMOUNT OF EXCESS EPOXY SHALL BE PUSHED OUT OF THE TOP OF THE HOLE AS CABLE IS SEATED IN HOLE.

LOGS AND BOULDERS SHALL BE TOUCHING. PULL CABLE TIGHT AND INSTALL CLAMPS. CLAMPS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDED CLAMP SIZE AND SPACING FOR THE SIZE AND LOAD RATING OF THE CABLE BEING USED.

NO.	BY	DATE	REVISION DESCRIPTION

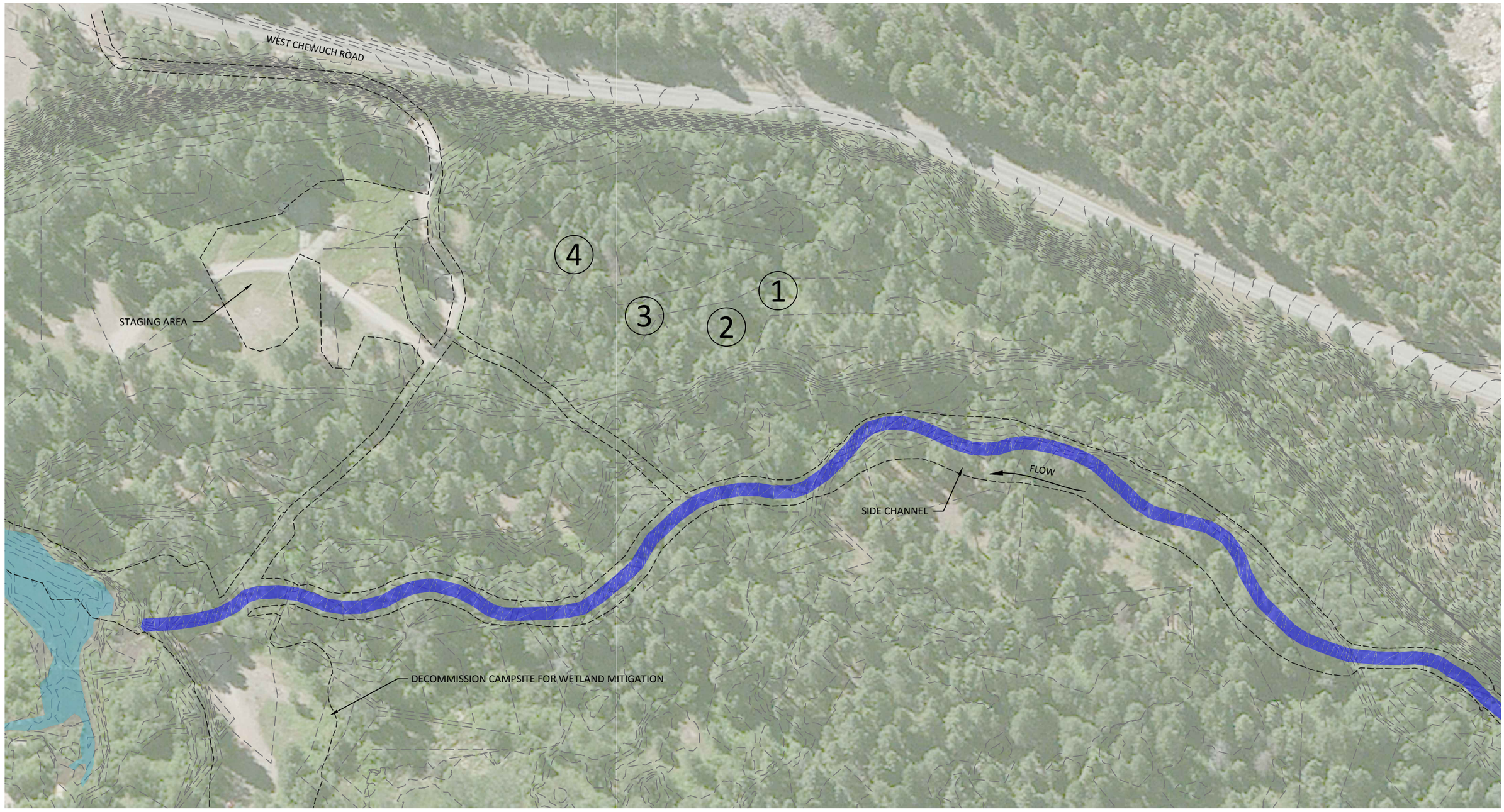
DRAWN	DESIGNED	CHECKED
DF	MB,MM,CM	MB
APPROVED	DATE	PROJECT
MM	9/23/14	

CONFEDERATED TRIBES AND BANDS OF THE YAKAMA NATION
CHEWUCH RIVER RIGHT
FISH ENHANCEMENT PROJECT

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

LWM CONNECTIONS TYPICAL DETAILS

SHEET
14 OF 16



LEGEND

HABITAT PROJECT LIMITS

\# CAMPSITE

0 100 200

SCALE IN FEET

PLAN

WDFW TO PROVIDE CONSTRUCTION GUIDELINES

NO.	BY	DATE	REVISION DESCRIPTION

DF DRAWN	MB,MM,CM DESIGNED	MB CHECKED
MM APPROVED	2/10/15 DATE	PROJECT

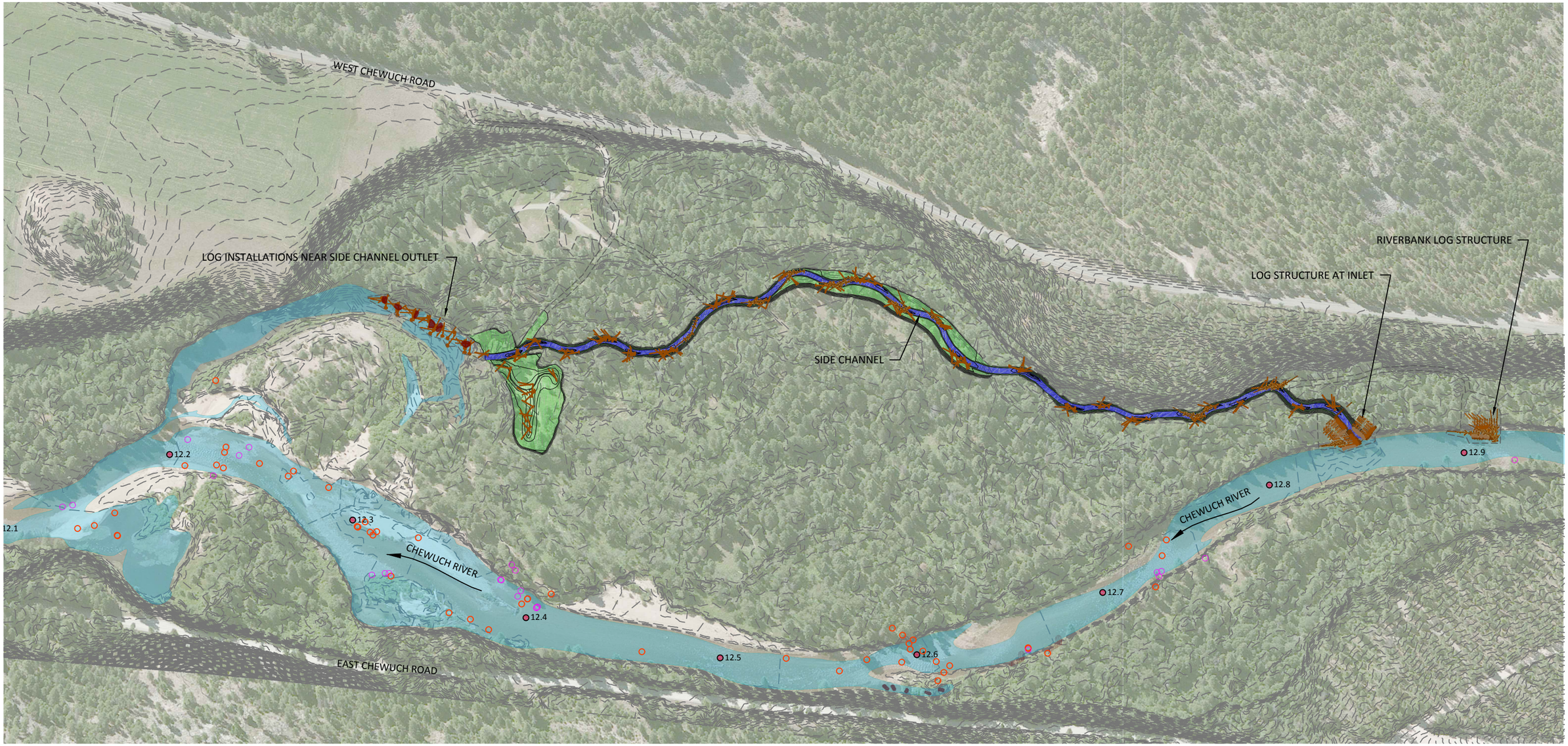
CONFEDERATED TRIBES AND BANDS OF THE YAKAMA NATION
CHEWUCH RIVER RIGHT
FISH HABITAT ENHANCEMENT PROJECT 60% DESIGN

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

CAMPSITE MITIGATION

SHEET 15 OF 16

G:\CAD\Chewuch River Right 2014_14025A\Drawings\SF\ Chewuch_RiverRight_D.dwg - Mike M - 2/11/2015



PLAN

LEGEND

- 12.5 RIVER MILE MARKER
- LIMITS OF DISTURBANCE
- PROPOSED SIDE CHANNEL
- PROPOSED LOG PLACEMENTS
- STEELHEAD REDD (2005-2012)
- SPRING CHINOOK REDD (2005-2012

0 250 500
SCALE IN FEET

NO.	BY	DATE	REVISION DESCRIPTION

DF	MB,MM,CM	MB
DRAWN	DESIGNED	CHECKED
MM	2/10/15	
APPROVED	DATE	PROJECT

CONFEDERATED TRIBES AND BANDS OF THE YAKAMA NATION
CHEWUCH RIVER RIGHT
FISH HABITAT ENHANCEMENT PROJECT 60% DESIGN

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

SPAWNING AREAS IN RELATION TO PROJECT SITES

SHEET 16 OF 16

G:\CD\Chewuch River Right 2014_140264\Drawings\IFI_Chewuch_RiverRight_D.dwg - Mike M - 2/11/2015