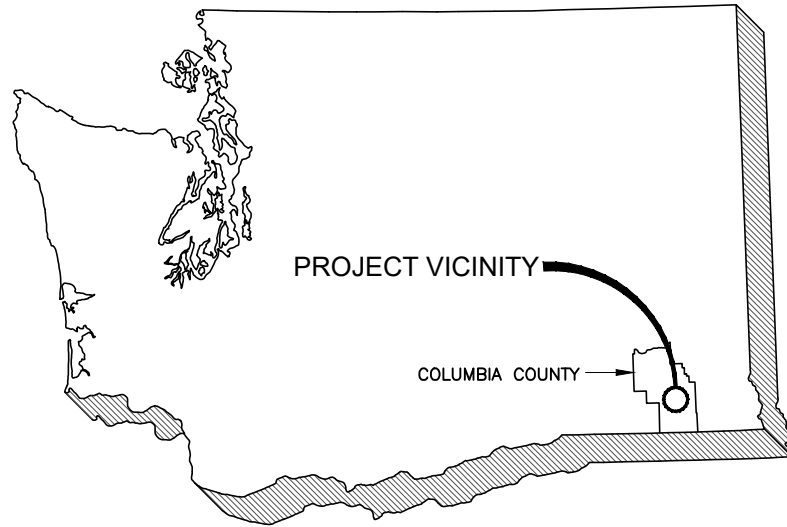


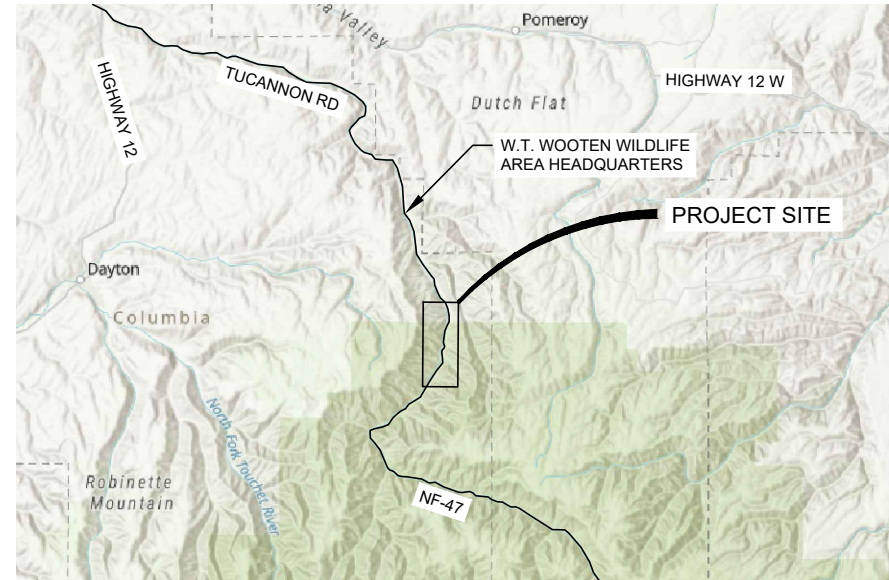
# TUCANNON RIVER BIG FOUR FLOODPLAIN RESTORATION PROJECT (PA 8-10.3) COLUMBIA COUNTY, WA

30% DESIGN  
NOVEMBER 2024

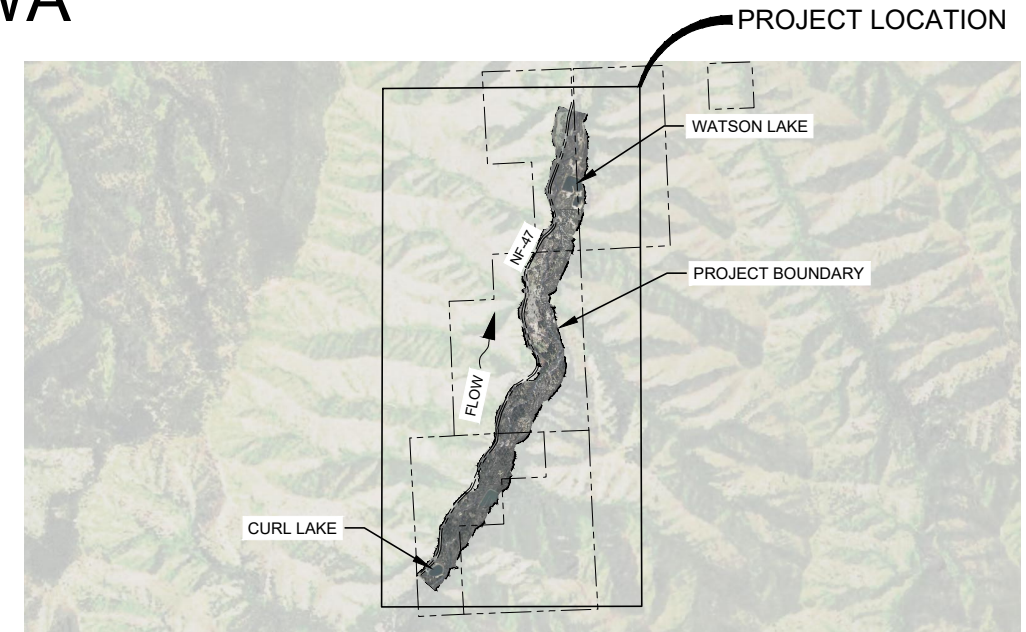
NOT FOR  
CONSTRUCTION



REGIONAL MAP  
NTS



PROJECT VICINITY  
NTS



PROJECT SITE  
NTS



CTUIR  
TUCANNON RIVER  
BIG FOUR (PA 8-10.3)  
COLUMBIA COUNTY, WA

VICINITY MAP &  
SHEET INDEX

**PROJECT TEAM**

**PROJECT SPONSORS (CO-MANAGERS)**  
CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION (CTUIR)  
46411 TIMINE WAY  
PENDLETON, OR 97801  
PROJECT MANAGER - KRIS FISCHER (541) 429-7547



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LAPWAI, ID 83540  
PROJECT MANAGER - LIZ EASTMAN (208) 621-3558



WASHINGTON DEPARTMENT OF FISH AND WILDLIFE (WDFW)  
1340 N 13TH AVE  
WALLA WALLA, WA 99362  
PROJECT MANAGER - DAVE KARL (509) 520-8973



**ENGINEER**  
WOLF WATER RESOURCES, INC  
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1001 SE WATER AVE, SUITE #180  
PORTLAND, OR 97214  
(503) 207-6688

**PROJECT INFO**

**SPATIAL REFERENCE**  
HORIZONTAL:  
NAD 83 WASHINGTON STATE PLANE (POLYCONIC)  
SOUTH ZONE, US FT  
VERTICAL: NAVD88  
LIDAR: QUANTUM DIGITAL TERRAIN MODEL (2020)

**PROJECT SITE LOCATION:**  
TUCANNON RIVER PROJECT AREA 8-10.3  
COLUMBIA COUNTY  
LATITUDE: 46°15'36.7"N  
LONGITUDE: 117°39'55.2"W  
WATERBODY: TUCANNON RIVER

**SHEET INDEX**

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23	C4.8	WOOD DETAILS 6
24	C5.1	ESC DETAILS 1

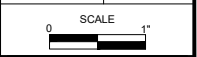
WDFW-APPROVED IN-WATER WORK WINDOW  
JULY 15 TO AUGUST 15



REVISION NUMBER

No.	Date	Revision

Date: 12/02/2024  
Designed By: AJ, AD  
Drawn By: DK  
Checked By: AJ



JOB NO. 20230017.1

SHEET NO. G1.1  
1 OF 24

**GENERAL NOTES:**

- DRIVING DIRECTIONS:
- FOLLOW I-84 E TO I-82 W TOWARDS HERMISTON/UMATILLA. TAKE EXIT 1 FOR US-395 S. FOLLOW US-730 E TO US-12 E. CONTINUE ONTO PATIT ROAD AND FOLLOW UNTIL THE FORK ON THE ROAD. TURN LEFT ONTO HARTSOCK ROAD. KEEP ON HARTSOCK ROAD UNTIL IT REACHES THE TUCANNON ROAD. TURN RIGHT ON TUCANNON ROAD/NF-47 UNTIL REACHING BIG FOUR LAKE.
- TOPOGRAPHY GATHERED BY QUANTUM IN FALL 2020 AND PUBLISHED IN MARCH 2021.
- AERIAL COLLECTED BY CTUIR IN 2021.
- HORIZONTAL DATUM IS NAD83 WASHINGTON STATE PLANE SOUTH, US FT.
- VERTICAL DATUM IS NAVD88, FT.
- ALL SCALES SHOWN ARE FOR 22" X 34" SHEETS.
- 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 CLEANED TO REMOVE MUD AND SOIL PRIOR TO MOBILIZATION INTO THE PROJECT AREA. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT THESE AND ANY ADDITIONAL POLLUTION CONTROL MEASURES HAVE BEEN TAKEN PER THE SPECIFICATIONS.
- ALL NON-NATIVE MATERIALS ENCOUNTERED DURING EXCAVATION ACTIVITIES SHALL BE REMOVED FROM THE FLOODPLAIN WITH THE EXCEPTION OF RIPRAP THAT MAY BE USED AS BURIED LARGE WOOD BALLAST MATERIAL IN LIEU OF IMPORTED BOULDER BALLAST.
- CONTRACTOR STAGING AREAS ARE SHOWN ON SHEET C1.1.
- CONTRACTOR SHALL RESTORE EXISTING ACCESS ROAD AND REMOVE NEW ACCESS ROADS AS SPECIFIED BEFORE COMPLETION OF CONSTRUCTION.
- THE CONTRACTOR SHALL ATTEND A MANDATORY PRE-BID MEETING ON SITE.
- ALL WORK SHALL CONFORM TO THE PLANS & SPECIFICATIONS UNLESS INDICATED OTHERWISE BY CONTRACT DOCUMENTS.
- CONTRACTOR SHALL ALLOW FOR EXPANSION OF EXCAVATED MATERIAL AND COMPACTION OF PLACED MATERIAL AT NO ADDITIONAL COST.
- CONTRACTOR SHALL ATTEND MANDATORY PRE-CONSTRUCTION MEETINGS WITH CTUIR AND THE ENGINEER.

**CONSTRUCTION ACCESS/TRAFFIC CONTROL:**

- CONTRACTOR SHALL SUBMIT AN ACCESS, STAGING, AND STOCKPILE PLAN TO CTUIR FOR APPROVAL PRIOR TO MOBILIZATION.
- 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 EQUIPMENT, MATERIALS, AND PERSONNEL SHALL REMAIN WITHIN THE WORK AREA BOUNDARY.
- 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 (TBD).
- ALL DISTURBED AREAS OUTSIDE THE LIMITS OF DISTURBANCE SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER AT NO ADDITIONAL COST TO THE OWNER.

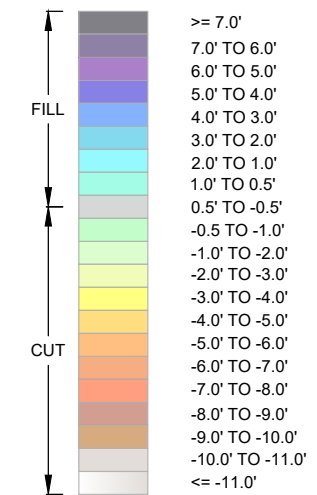
**WORK PERIODS:**

ALL GRADING SHALL BE LIMITED TO WDFW-APPROVED IN-WATER WINDOW OF JULY 15TH - AUGUST 15TH

**LEGEND AND SYMBOLS**

- EXISTING MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING ROAD
- TAXLOTS
- RIVER CENTERLINE
- APPROX OHW
- EXISTING OVERHEAD POWERLINES
- PROJECT BOUNDARY
- LEVEE TO BE REMOVED
- PROPOSED MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- TEMPORARY ACCESS ROUTE
- ESTIMATED WETLAND AREA
- GRADING AREA (FILL)
- GRADING AREA (CUT)
- STAGING AREA
- TEMPORARY CROSSING
- BEAVER DAM ANALOGUE
- CONSTRUCTION SCOUR POOL
- WHS TYPE 1 - LARGE APEX JAM
- WHS TYPE 2 - SMALL APEX JAM
- WHS TYPE 3 - MARGIN JAM
- WHS TYPE 4 - FLOODPLAIN WOOD (1 LOG)
- WHS TYPE 5 - FLOODPLAIN WOOD (2 LOGS)
- WHS TYPE 6 - LOOSE FLOODPLAIN LOGS
- WHS TYPE 7 - CHANNEL SPANNING JAM W/ SALVAGED TREES
- WHS TYPE 8 - CHANNEL SPANNING WOOD STRUCTURE
- WHS TYPE 9 - STRAINER JAM

**GRADING LEGEND:**



**ABBREVIATIONS:**

ABBREVIATION	MEANING
APPROX	APPROXIMATE
BDA	BEAVER DAM ANALOGUE
BFE	BASE FLOOD ELEVATION
BMP	BEST MANAGEMENT PRACTICE
CAR	CONTRACTING AGENCY REPRESENTATIVE
CHNL	CHANNEL
CL	CENTERLINE
CONSTR. CONST	CONSTRUCTION
CTUIR	CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION
CY	CUBIC YARD
DEPT	DEPARTMENT
EG	EXISTING GRADE/GROUND
ELEV, EL	ELEVATION
ESC	EROSION AND SEDIMENT CONTROL
EX, EXIST	EXISTING
FG	FINISHED GRADE/GROUND
FT	FEET
GB	GRADE BREAK
IN	INCHES
IE	INVERT ELEVATION
LBS	POUNDS
LS	LIVESTAKE
LW	LARGE WOOD
MIN	MINIMUM
N/A	NOT AVAILABLE
NIC	NOT IN CONTRACT
NAD83	NORTH AMERICAN DATUM (1983)
NAVD88	NORTH AMERICAN VERTICAL DATUM (1988)
NTS	NOT TO SCALE
OHW	ORDINARY HIGH WATER
OHWM	ORDINARY HIGH WATER MARK
OR	OWNER'S REPRESENTATIVE
PA	(CTUIR) PROJECT AREA
PROP	PROPOSED
PIP	PROTECT IN PLACE
PLS	PURE LIVE SEED
REINF	REINFORCED
REM	RELATIVE ELEVATION MAP
ROW	RIGHT OF WAY
S	SLOPE
SF	SQUARE FEET
SHT	SHEET
SPEC	SPECIFICATION
STA	STATION
STD	STANDARD
SY	SQUARE YARD
TEMP	TEMPORARY
TESC	TEMPORARY EROSION AND SEDIMENT CONTROL
TOB	TOP OF BANK
TOE	TOE OF SLOPE
TOP	TOP OF SLOPE
TYP	TYPICAL
VM	VALLEY MILE
W/	WITH
W/O	WITHOUT
WDFW	WASHINGTON DEPARTMENT OF FISH AND WILDLIFE
WHS	WOOD HABITAT STRUCTURE
WSDOT	WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
WSE	WATER SURFACE ELEVATION

**QUANTITIES TABLE**

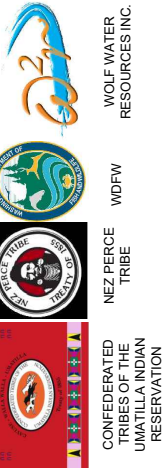
GRADING AREA	AREA (ACRE)	CUT (KCY)	FILL (KCY)	FLOODPLAIN LOGS (~60/AC)
FLOODPLAIN GRADING 1	3.1	9.3	-	186
FLOODPLAIN GRADING 2	0.8	0.9	-	48
FLOODPLAIN GRADING 3	0.8	2.8	-	48
FLOODPLAIN GRADING 4	1.0	2.6	-	60
FLOODPLAIN GRADING 5	2.5	10.8	-	150
FLOODPLAIN GRADING 6	1.1	3.1	-	66
FLOODPLAIN GRADING 7	0.8	2.2	-	48
FLOODPLAIN GRADING 8	2.1	8.9	-	126
FLOODPLAIN GRADING 9	1.7	7.6	-	102
FLOODPLAIN GRADING 10	0.1	0.3	-	6
FLOODPLAIN GRADING 11	0.2	0.2	-	12
FLOODPLAIN GRADING 12	0.2	0.5	-	12
FLOODPLAIN GRADING 13	0.3	0.8	-	18
FLOODPLAIN GRADING 14	6.1	23.7	-	366
FLOODPLAIN GRADING 15	0.8	2.0	-	48
LEVEE REMOVAL AREA 1	0.2	0.5	-	12
LEVEE REMOVAL AREA 2	0.4	0.5	-	24
LEVEE REMOVAL AREA 3	0.1	0.1	-	6
LEVEE REMOVAL AREA 4	0.5	0.5	-	30
CHANNEL FILL 1	2.5	-	14.7	150
CHANNEL FILL 2	1.3	-	7.6	78
CHANNEL FILL 3	1.8	-	8.3	108
CHANNEL FILL 4	2.8	-	13.4	168
CHANNEL FILL 5	0.9	-	4.5	54
CHANNEL FILL 6	0.5	-	1.3	30
CHANNEL FILL 7	2.2	-	12.4	132
CHANNEL FILL 8	0.4	-	1.4	24
CHANNEL FILL 9	1.5	-	8.8	90
CHANNEL FILL 10	0.4	-	1.5	24
LAKE FILL AREA	2.6	-	3.4	156
ADDITIONAL FLOODPLAIN WOOD	10.3	-	-	618
<b>TOTAL</b>	<b>50.0</b>	<b>77.3</b>	<b>77.3</b>	<b>3000</b>

**WOOD QUANTITIES TABLE**

SHEET	WHS TYPE 1 - LARGE APEX JAM	WHS TYPE 2 - SMALL APEX JAM	WHS TYPE 3 - MARGIN JAM	WHS TYPE 7 - CHANNEL SPANNING JAMw/ SALVAGED TREES	WHS TYPE 8 - CHANNEL SPANNING WOOD STRUCTURE	WHS TYPE 9 - STRAINER JAM	BDA (EA)	BDA (LF)
C2.1	1	1	-	2	-	3	1	66
C2.2	-	-	2	2	-	-	3	118
C2.3	-	1	2	1	-	3	3	112
C2.4	-	1	1	2	-	3	8	320
C2.5	-	1	-	2	1	4	5	155
C2.6	-	1	1	2	2	1	7	165
C2.7	-	13	-	6	1	-	4	164
<b>TOTAL</b>	<b>1</b>	<b>18</b>	<b>6</b>	<b>17</b>	<b>4</b>	<b>14</b>	<b>31</b>	<b>1100</b>

**30% DESIGN NOVEMBER 2024**

NOT FOR CONSTRUCTION



CTUIR  
TUCANNON RIVER  
BIG FOUR (PA 8-10.3)  
COLUMBIA COUNTY, WA

**GENERAL NOTES & ABBREVIATIONS**

**REVISION NUMBER**

No.	Date	Revision

Date: 11/27/2024  
Designed By: AJ, AD  
Drawn By: DK  
Checked By: AJ

SCALE: 1" = 100'

JOB NO. 20230017.1

SHEET NO. G1.2

2 OF 24





NOT FOR  
CONSTRUCTION

**4) FISH PASSAGE:** FISH PASSAGE WILL BE PROVIDED FOR ANY ADULT OR JUVENILE FISH LIKELY TO BE PRESENT IN THE PROJECT 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 ESA-LISTED SPECIES OR THEIR HABITAT, A VARIANCE CAN BE REQUESTED FROM THE NMFS BRANCH CHIEF AND THE USFWS 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.

**5) CONSTRUCTION AND DISCHARGE WATER:**

- 1) SURFACE WATER MAY BE DIVERTED TO MEET CONSTRUCTION NEEDS, BUT ONLY IF DEVELOPED SOURCES ARE UNAVAILABLE OR INADEQUATE.
- 2) DIVERSIONS WILL NOT EXCEED 10% OF THE AVAILABLE FLOW.
- 3) ALL CONSTRUCTION DISCHARGE WATER WILL BE COLLECTED AND TREATED USING THE BEST AVAILABLE TECHNOLOGY SUITABLE FOR SITE CONDITIONS.
- 4) TREATMENTS TO REMOVE DEBRIS, NUTRIENTS, SEDIMENT, PETROLEUM HYDROCARBONS, METALS AND OTHER POLLUTANTS LIKELY TO BE PRESENT WILL BE PROVIDED.

**6) MINIMIZE TIME AND EXTENT OF DISTURBANCE:** EARTHWORK (INCLUDING DRILLING, EXCAVATION, DREDGING, FILLING AND COMPACTING) IN WHICH MECHANIZED EQUIPMENT IS USED IN STREAM CHANNELS, RIPARIAN AREAS, AND WETLANDS WILL BE COMPLETED AS QUICKLY AS POSSIBLE. MECHANIZED EQUIPMENT WILL BE USED IN STREAMS ONLY WHEN PROJECT SPECIALISTS BELIEVE THAT SUCH ACTIONS ARE THE ONLY REASONABLE ALTERNATIVE FOR IMPLEMENTATION, OR WOULD RESULT IN LESS SEDIMENT IN THE STREAM CHANNEL OR DAMAGE (SHORT- OR LONG-TERM) TO THE OVERALL AQUATIC AND RIPARIAN ECOSYSTEM RELATIVE TO OTHER ALTERNATIVES. TO THE EXTENT FEASIBLE, MECHANIZED EQUIPMENT WILL WORK FROM THE TOP OF THE BANK, UNLESS WORK FROM ANOTHER LOCATION WOULD RESULT IN LESS HABITAT DISTURBANCE.

**7) CESSATION OF WORK:** PROJECT OPERATIONS WILL CEASE UNDER THE FOLLOWING CONDITIONS:

- 1) HIGH FLOW CONDITIONS THAT MAY RESULT IN INUNDATION OF THE PROJECT AREA, EXCEPT FOR EFFORTS TO AVOID OR MINIMIZE RESOURCE DAMAGE
- 2) WHEN ALLOWABLE WATER QUALITY IMPACTS, AS DEFINED BY THE STATE CWA SECTION 401 WATER QUALITY CERTIFICATION OR HIP TURBIDITY MONITORING PROTOCOL, HAVE BEEN EXCEEDED

**8) SITE RESTORATION:** WHEN CONSTRUCTION IS COMPLETE:

- 1) ALL STREAMBANKS, SOILS, AND VEGETATION WILL BE CLEANED UP AND RESTORED AS NECESSARY USING STOCKPILED LARGE WOOD, TOPSOIL, AND NATIVE CHANNEL MATERIAL.
- 2) ALL PROJECT-RELATED WASTE WILL BE REMOVED.
- 3) ALL TEMPORARY ACCESS ROADS, CROSSINGS, AND STAGING AREAS WILL BE DECOMPACTED AND RECONTOURED. WHEN NECESSARY FOR REVEGETATION AND INFILTRATION OF WATER, COMPACTED AREAS OF SOIL WILL BE LOOSENEED.
- 4) ALL DISTURBED AREAS WILL BE REHABILITATED IN A MANNER THAT RESULTS IN SIMILAR OR IMPROVED CONDITIONS RELATIVE TO PRE-PROJECT CONDITIONS. THIS WILL BE ACHIEVED THROUGH REDISTRIBUTION OF STOCKPILED MATERIALS, SEEDING, AND/OR PLANTING WITH LOCAL NATIVE SEED MIXES OR PLANTS.

**9) REVEGETATION:** LONG-TERM SOIL STABILIZATION OF DISTURBED SITES WILL BE ACCOMPLISHED WITH REESTABLISHMENT OF NATIVE VEGETATION USING THE FOLLOWING CRITERIA:

- 1) PLANTING AND SEEDING WILL OCCUR PRIOR TO OR AT THE BEGINNING OF THE FIRST GROWING SEASON AFTER CONSTRUCTION.
- 2) USE A MIX OF SPECIES, APPROPRIATE TO THE SITE THAT WILL ACHIEVE ESTABLISHMENT, SHADE, AND EROSION CONTROL OBJECTIVES. THESE WOULD, PREFERABLY BE FORB, GRASS, SHRUB, OR TREE SPECIES NATIVE TO THE PROJECT AREA OR REGION.
- 3) VEGETATION, SUCH AS WILLOW, SEDGE AND RUSH MATS, WILL BE SALVAGED FROM DISTURBED OR ABANDONED FLOODPLAINS, STREAM CHANNELS, OR WETLANDS, AND REPLANTED AT THE SITE IN APPROPRIATE LOCATIONS.
- 4) INVASIVE SPECIES WILL NOT BE USED.
- 5) SHORT-TERM STABILIZATION MEASURES MAY INCLUDE THE USE OF NON-NATIVE STERILE SEED MIX (WHEN NATIVE SEEDS ARE NOT AVAILABLE), WEED-FREE CERTIFIED STRAW, JUTE MATTING, AND OTHER SIMILAR TECHNIQUES.
- 6) SURFACE FERTILIZER WILL NOT BE APPLIED WITHIN 50 FEET OF ANY STREAM CHANNEL, WATERBODY, OR WETLAND.
- 7) FENCING WILL BE INSTALLED AS NECESSARY TO PREVENT ACCESS TO REVEGETATED SITES BY LIVESTOCK OR UNAUTHORIZED PERSONS.
- 8) RE-ESTABLISHMENT OF VEGETATION IN DISTURBED AREAS WILL ACHIEVE AT LEAST 70% OF PRE-PROJECT CONDITIONS WITHIN 3 YEARS.
- 9) INVASIVE PLANTS WILL BE REMOVED OR CONTROLLED UNTIL NATIVE PLANT SPECIES ARE ESTABLISHED (TYPICALLY 3 YEARS POST-CONSTRUCTION).

**10) SITE ACCESS:** THE PROJECT SPONSOR WILL RETAIN THE RIGHT OF REASONABLE ACCESS TO THE SITE IN ORDER TO MONITOR THE SUCCESS OF THE PROJECT OVER ITS LIFE.

**11) IMPLEMENTATION MONITORING:** PROJECT SPONSOR STAFF OR THEIR DESIGNATED REPRESENTATIVE WILL PROVIDE IMPLEMENTATION MONITORING BY FILLING OUT THE PROJECT COMPLETION FORM (PCF) TO ENSURE COMPLIANCE WITH THE APPLICABLE BIOP, DEMONSTRATING THAT:

- 1) GENERAL CONSERVATION MEASURES ARE ADEQUATELY FOLLOWED.
- 2) EFFECTS TO LISTED SPECIES ARE NOT GREATER THAN PREDICTED AND INCIDENTAL TAKE LIMITATIONS ARE NOT EXCEEDED.
- 3) TURBIDITY MONITORING IS BEING CONDUCTED IN ACCORDANCE WITH THE HIP TURBIDITY MONITORING PROTOCOL (SECTION 3.3, PG. 44) AND RECORDED IN THE PCF.

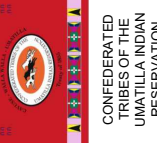
**12) CWA SECTION 401 WATER QUALITY CERTIFICATION:** THE PROJECT SPONSOR OR DESIGNATED REPRESENTATIVE WILL COMPLETE AND RECORD WATER QUALITY OBSERVATIONS TO ENSURE THAT IN-WATER WORK IS NOT DEGRADING WATER QUALITY. DURING CONSTRUCTION, CWA SECTION 401 WATER QUALITY CERTIFICATION PROVISIONS PROVIDED BY THE OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY, WASHINGTON DEPARTMENT OF ECOLOGY, OR IDAHO DEPARTMENT OF ENVIRONMENTAL QUALITY WILL BE FOLLOWED.

**13) STAGED REWATERING PLAN:** WHEN APPROPRIATE, THE PROJECT SPONSOR SHALL IMPLEMENT A STAGED REWATERING PLAN FOR PROJECTS THAT INVOLVE INTRODUCING STREAMFLOW INTO RECENTLY EXCAVATED CHANNELS UNDER THE 2A) IMPROVE SECONDARY CHANNEL AND WETLAND HABITAT ACTIVITY CATEGORY OR 2F) CHANNEL RECONSTRUCTION CATEGORIES. THIS PLAN MAY BE ALTERED ACCORDING TO SITE SPECIFIC CONDITIONS WITH COORDINATION AND FEEDBACK FROM BPA AND THE SERVICES.

- 1) PRE-WASH THE NEWLY-EXCAVATED CHANNEL BEFORE REWATERING. TURBID WASH WATER WILL BE DETAINED AND PUMPED TO THE FLOODPLAIN OR INTO A REACH WITH SEDIMENT CAPTURE DEVICES, RATHER THAN DISCHARGING INTO FISH-BEARING WATERS.
- 2) PREPARE NEW CHANNEL FOR WATER BY INSTALLING SEINE NETS AT THE UPSTREAM END TO PREVENT FISH FROM MOVING DOWNSTREAM INTO THE NEW CHANNEL UNTIL 2/3 OF TOTAL STREAMFLOW IS AVAILABLE IN THAT CHANNEL. STARTING IN THE EARLY MORNING, INTRODUCE 1/3 OF THE FLOW INTO THE NEW CHANNEL OVER A PERIOD OF 1-2 HOURS.
- 3) WHEN REINTRODUCING STREAMFLOW INTO A DEWATERED STREAM REACH, MONITOR FOR TURBIDITY:
  - A) A SAMPLE MUST BE TAKEN TO ESTABLISH BACKGROUND TURBIDITY LEVELS PRIOR TO ANTICIPATED TURBIDITY PULSES. TAKE THE SAMPLE AT AN UNDISTURBED AREA APPROXIMATELY 100 FEET UPSTREAM FROM THE NEWLY EXCAVATED CHANNEL.
  - B) TAKE A SECOND SAMPLE OR OBSERVATION, IMMEDIATELY DOWNSTREAM OF THE NEWLY EXCAVATED CHANNEL, APPROXIMATELY:
    - C) 50 FEET DOWNSTREAM FOR STREAMS THAT ARE LESS THAN 30 FEET WIDE;
    - D) 100 FEET DOWNSTREAM FOR STREAMS BETWEEN 30 AND 100 FEET WIDE;
    - E) 200 FEET DOWNSTREAM FOR STREAMS GREATER THAN 100 FEET WIDE; AND
    - F) 300 FEET FROM THE DISCHARGE POINT OR NONPOINT SOURCE FOR LOCATIONS SUBJECT TO TIDAL OR COASTAL SCOUR.
  - G) A SAMPLE MUST THEN BE TAKEN EVERY 2 HOURS DURING REWATERING AND BE COMPARED AGAINST THE BACKGROUND MEASUREMENT.
  - H) AN EXCEEDANCE OCCURS WHENEVER BOTH OF THE FOLLOWING CONDITIONS ARE EXCEEDED:
    - I) DOWNSTREAM TURBIDITY EXCEEDS 40 NTU (FIGURE 1).
    - J) DOWNSTREAM TURBIDITY EXCEEDS 10% ABOVE BACKGROUND.
  - K) IN AN EXCEEDANCE OCCURS FOR TWO CONSECUTIVE READINGS (4 HOURS), STOP WORK IMMEDIATELY AND TAKE MEASURES TO REDUCE TURBIDITY BEFORE CONTINUING TO REINTRODUCE STREAMFLOW.
- 4) PREPARE TO INTRODUCE THE SECOND 1/3 OF THE FLOW (UP TO A TOTAL OF 2/3) TO THE NEW CHANNEL BY INSTALLING SEINE NETS AT THE UPSTREAM END OF THE OLD CHANNEL IN ORDER TO PREVENT FISH, LARVAL LAMPREY AND FRESHWATER MUSSELS FROM MOVING INTO A PARTIALLY-DEWATERED CHANNEL. INTRODUCE THE SECOND 1/3 OF THE FLOW OVER THE NEXT 1-2 HOURS. SALVAGE FISH FROM THE OLD 10 THE CONTRACTOR MAY FIND IT USEFUL TO HAVE PREWASHED GRAVEL BAGS AVAILABLE ONSITE TO CONTROL THE FLOW OF WATER. CHANNEL AT THIS TIME, SO THAT THE OLD CHANNEL IS FISH-FREE BEFORE DROPPING BELOW 1/3 OF THE FLOW. NOTE: THE FISH WILL BE TEMPORARILY BLOCKED FROM MOVING DOWNSTREAM INTO EITHER CHANNEL UNTIL 2/3 OF THE FLOW HAS BEEN TRANSITIONED TO THE NEW CHANNEL. THIS BLOCKAGE TO DOWNSTREAM FISH PASSAGE IS EXPECTED TO PERSIST FOR ROUGHLY 12 TO 14 HOURS, BUT FISH WILL STILL BE ABLE TO VOLITIONALLY MOVE OUT OF THE CHANNEL IN THE DOWNSTREAM DIRECTION. PERFORM MONITORING AS IN #3 ABOVE.
- 5) AFTER THE SECOND 1/3 OF FLOW IS INTRODUCED OVER 2 HOURS, AND TURBIDITY IS WITHIN 10% OF THE BACKGROUND LEVEL, REMOVE SEINE NETS FROM THE NEW CHANNEL, AND ALLOW FISH TO MOVE DOWNSTREAM BACK INTO THE CHANNEL. INTRODUCE THE FINAL 1/3 OF FLOW. ONCE 100% OF THE FLOW IS IN THE NEW CHANNEL, INSTALL PLUG TO BLOCK FLOW INTO THE OLD CHANNEL AND REMOVE SEINE NETS FROM THE OLD CHANNEL. ADDITIONAL EFFORTS TO SALVAGE LARVAL LAMPREY EMERGING FROM FINE SEDIMENT DEPOSITS SHOULD BE CONDUCTED AFTER THE FLOW IS GONE AND POSSIBLY FOR A FEW HOURS AFTER FLOW IS GONE, AS THE LARVAE WILL CONTINUE TO EMERGE.

**14) HIP TURBIDITY MONITORING PROTOCOL:** THE PROJECT SPONSOR SHALL COMPLETE AND RECORD THE FOLLOWING WATER QUALITY OBSERVATIONS ON THE HIP 4 PROJECT COMPLETION FORM (PCF), IF THE GEOMORPHOLOGY OF THE PROJECT AREA (E.G., SILTY OR CLAYLIKE MATERIALS) OR THE NATURE OF THE ACTION (E.G., LARGE AMOUNTS OF BARE EARTH EXPOSURE) SHALL PRECLUDE THE SUCCESSFUL COMPLIANCE WITH THESE TRIGGERS. NOTIFY YOUR EC LEAD & THE SERVICES IN ADVANCE OF THE LIKELIHOOD OF AN EXCEEDANCE AND SEEK ADDITIONAL RECOMMENDATIONS.

- 1) TAKE A BACKGROUND TURBIDITY MEASUREMENT APPROXIMATELY 100 FEET UPSTREAM FROM THE PROJECT AREA USING A RECENTLY-CALIBRATED TURBIDIMETER. RECORD THE OBSERVATION, LOCATION, AND TIME OF THE BACKGROUND MEASUREMENT BEFORE MONITORING AT THE DOWNSTREAM POINT, KNOWN AS THE MEASUREMENT COMPLIANCE POINT. IF THE BACKGROUND TURBIDITY IS LESS THAN 20 NTU, THEN USE VISUAL OBSERVATIONS (FIGURE 1).
- 2) TAKE A SECOND MEASUREMENT OR OBSERVATION AT THE MEASUREMENT COMPLIANCE POINT, IMMEDIATELY DOWNSTREAM OF THE DISTURBANCE AREA, APPROXIMATELY:
  - A) 50 FEET DOWNSTREAM FOR STREAMS THAT ARE LESS THAN 30 FEET WIDE;
  - B) 100 FEET DOWNSTREAM FOR STREAMS BETWEEN 30 AND 100 FEET WIDE;
  - C) 200 FEET DOWNSTREAM FOR STREAMS GREATER THAN 100 FEET WIDE; AND
  - D) 300 FEET FROM THE DISCHARGE POINT OR NONPOINT SOURCE FOR LOCATIONS SUBJECT TO TIDAL OR COASTAL SCOUR.
  - E) RECORD THE DOWNSTREAM OBSERVATION, LOCATION, AND TIME.
- 3) TURBIDITY SHALL BE MEASURED (STEPS 1-2) EVERY 2 HOURS 1 WHILE WORK IS BEING IMPLEMENTED. THE MONITORING INTERVAL OF 4 HOURS HAS BEEN PROPOSED BUT NOT APPROVED.
- 4) AN EXCEEDANCE OCCURS WHENEVER BOTH OF THE FOLLOWING CONDITIONS ARE EXCEEDED:
  - A) DOWNSTREAM TURBIDITY EXCEEDS 40 NTU.
  - B) DOWNSTREAM TURBIDITY EXCEEDS 10% ABOVE BACKGROUND FIGURE 1 SUGGESTED VISUAL OBSERVATIONAL DIFFERENCES IN TURBIDITY NOTE: FOR ANY STREAM WITH A BACKGROUND TURBIDITY OF 20 NTU OR LESS, IF YOU CANNOT SEE THE BOTTOM IN 2 FEET OF WATER AT EACH 2 HOUR INTERVAL, THEN TURBIDITY HAS LIKELY SURPASSED 40 NTUS AND YOU MUST ADJUST YOUR PROCEDURES. THIS WOULD ALLOW WORK TO CONTINUE WITH A TURBIDITY OF UNDER ABOUT 30-40 NTU. TURBIDITY OVER 40 NTU SHOULD BE AVOIDED.
- 5) IF AN EXCEEDANCE OCCURS THEN ADJUSTMENTS OR CORRECTIVE MEASURES MUST BE TAKEN IN ORDER TO REDUCE TURBIDITY. THE NMFS STAFF BIOLOGISTS OF THE AREA CAN PROVIDE TECHNICAL ASSISTANCE.
- 6) IF EXCEEDANCES OCCUR FOR MORE THAN TWO CONSECUTIVE MONITORING INTERVALS (AFTER 4 HOURS), THE ACTIVITY MUST STOP UNTIL THE TURBIDITY LEVEL RETURNS TO BACKGROUND, AND THE EC LEAD MUST BE NOTIFIED AFTER THE PROJECT IS CONCLUDED. THE EC LEAD SHALL DOCUMENT THE REASONS FOR THE EXCEEDANCES AND THE CORRECTIVE MEASURES TAKEN. THIS IS VERY IMPORTANT AS BPA IS REQUIRED TO REPORT TO THE SERVICES UPON ALL EXCEEDANCES



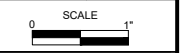
CTUIR  
TUCANNON RIVER  
BIG FOUR (PA 8-10.3)  
COLUMBIA COUNTY, WA

HIP CONSERVATION  
NOTES 3

REVISION NUMBER

No.	Date	Revision

Date: 11/27/2024  
Designed By: AJ, AD  
Drawn By: DK  
Checked By: AJ



JOB NO. 20230017.1

SHEET NO. G1.5

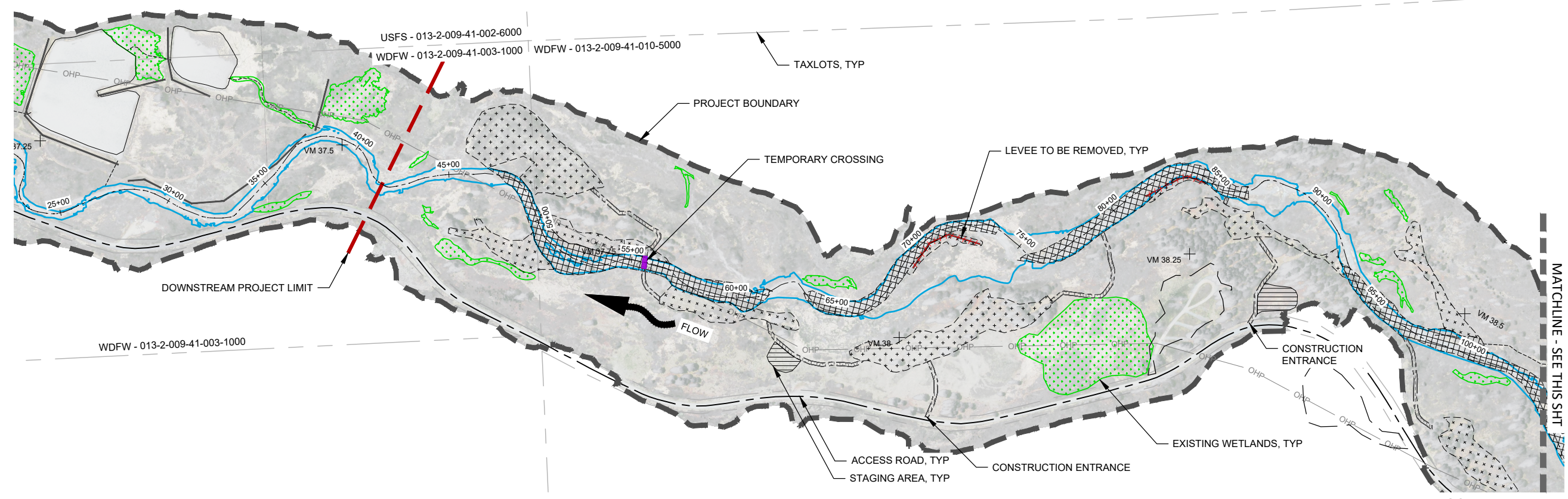
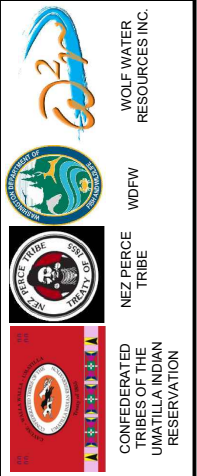
5 OF 24



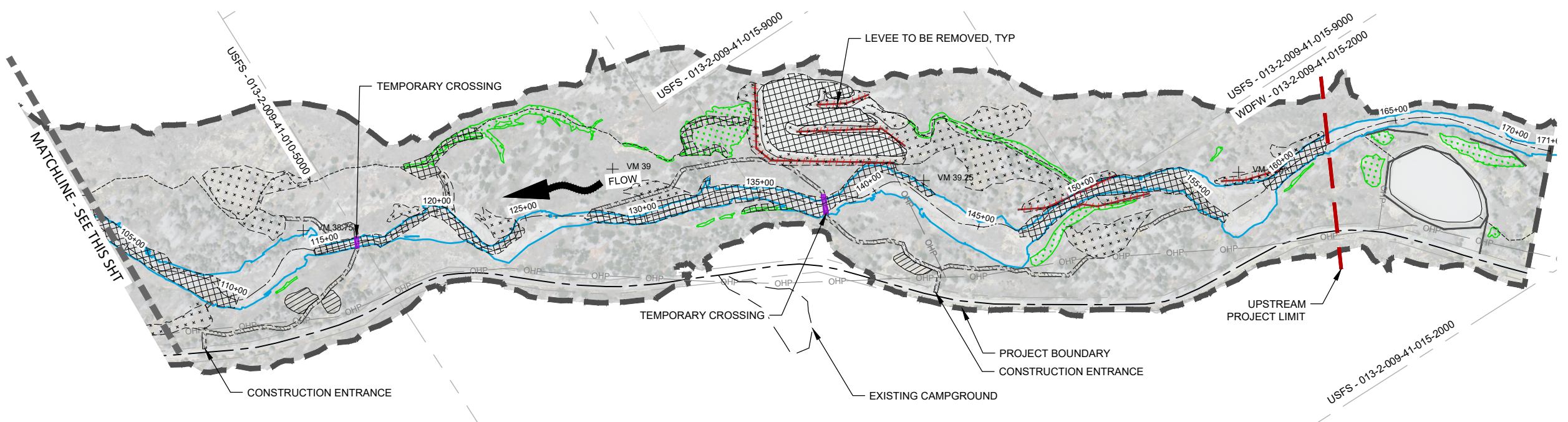
NOTES:

- EQUIPMENT SHALL NOT BE DRIVEN OUTSIDE THE APPROVED ACCESS ROUTES.
- CONTRACTOR SHALL PROVIDE SECONDARY CONTAINMENT FOR ALL EQUIPMENT AND MATERIAL STORAGE IN STAGING AREAS WITHIN 150 FT OF STREAMS AND WETLANDS.
- ALL VEHICLE STAGING AREAS AND REFUELING AREAS SHALL BE ABOVE OHW AND A MINIMUM OF 150 FEET FROM OHW AND WETLAND BOUNDARIES.
- ALL FLOODPLAIN GRADING AREAS SHALL ALSO BE AVAILABLE FOR USE AS STAGING AND STOCKPILE AREAS.

NOT FOR  
CONSTRUCTION



PROPOSED PLAN  
SCALE: 1" = 250'



PROPOSED PLAN  
SCALE: 1" = 250'

LEGEND AND SYMBOLS:

- EXISTING**
- APPROX. OHW EXTENT
  - OHP
  - OVERHEAD POWERLINES
  - ACCESS ROAD
  - ESTIMATED WETLAND AREA
- PROPOSED**
- PROJECT BOUNDARY
  - LEVEE TO BE REMOVED
  - ACCESS ROAD
  - STAGING AREA
  - FILL AREA
  - CUT AREA
  - TEMPORARY CROSSING

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COLUMBIA COUNTY, WA

PROPOSED SITE  
ACCESS & STAGING

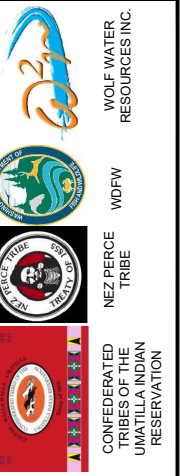
REVISION NUMBER		
No.	Date	Revision

Date	Designed By
11/27/2024	AJ, AD
Drawn By	Checked By
DK	AJ

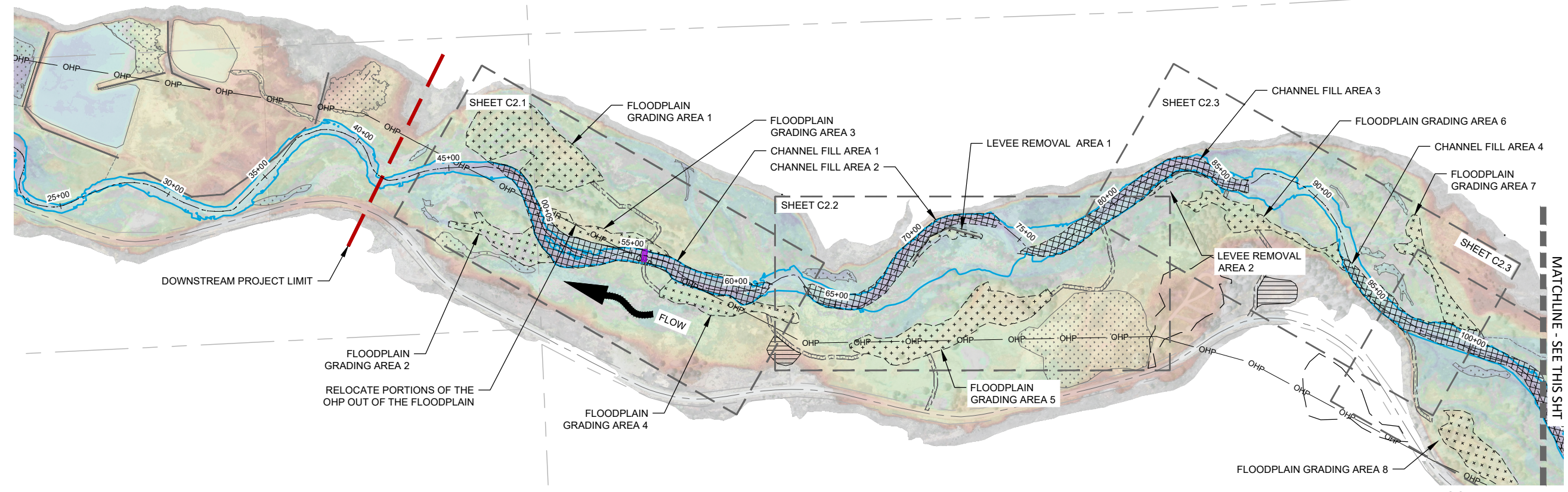
JOB NO.	20230017.1
SHEET NO.	C1.1
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DWG: Z:\Shared\W2\CAD\20230017.1-tucannon river big four\DWGSHEETS\C1.1-BFL-PC ACCESS & STAGING.dwg USER: lboese  
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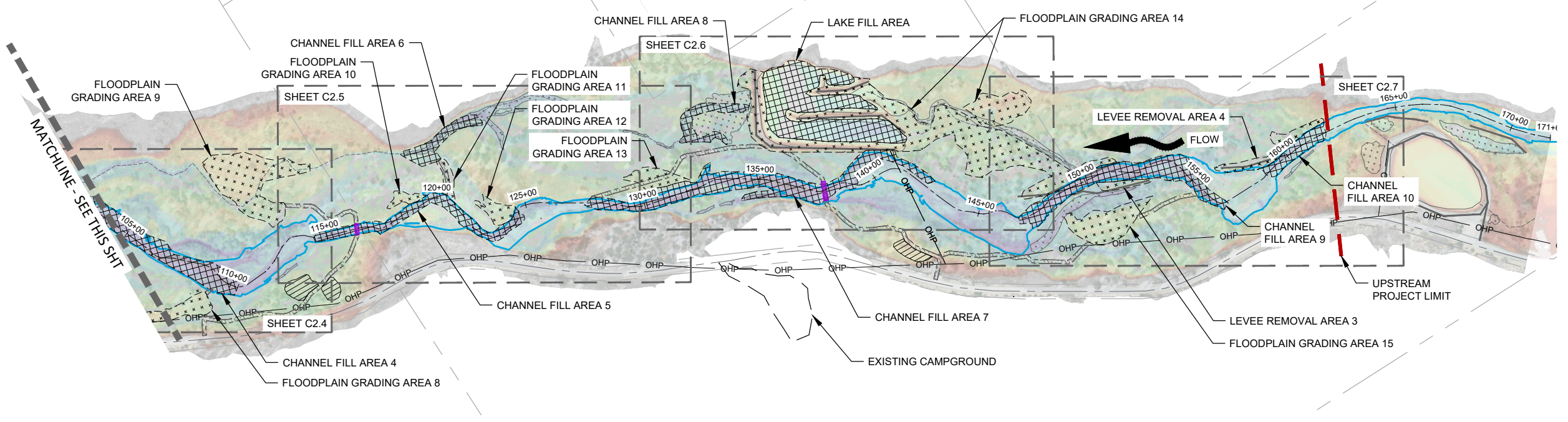
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BIG FOUR (PA 8-10.3)  
COLUMBIA COUNTY, WA

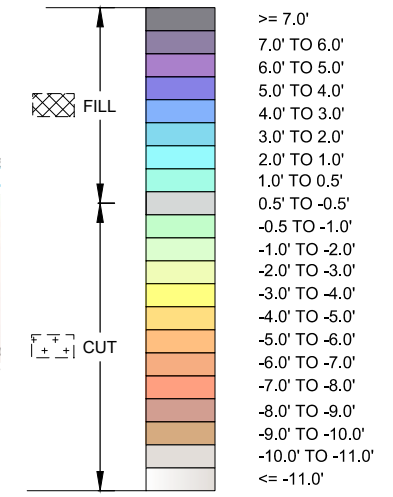


**PROPOSED GRADING OVERVIEW 1**  
SCALE: 1" = 250'



**PROPOSED GRADING OVERVIEW 2**  
SCALE: 1" = 250'

**GRADING LEGEND:**



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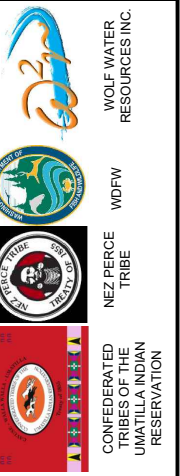
**PROPOSED GRADING  
OVERVIEW**

REVISION NUMBER		
No.	Date	Revision

Date	Designed By
11/27/2024	AJ, AD
Drawn By	Checked By
DK	AJ

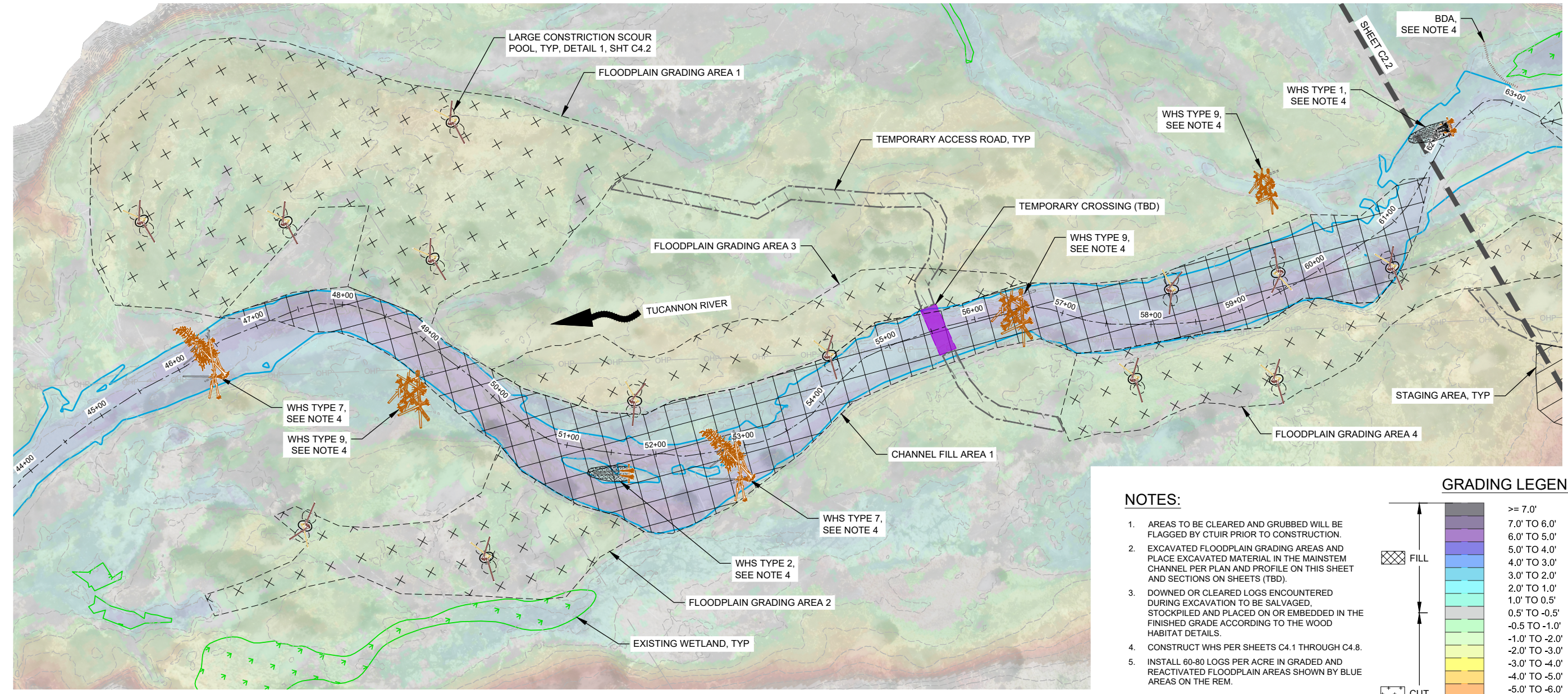
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JOB NO.	20230017.1
SHEET NO.	C2.0
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BIG FOUR (PA 8-10.3)**  
COLUMBIA COUNTY, WA

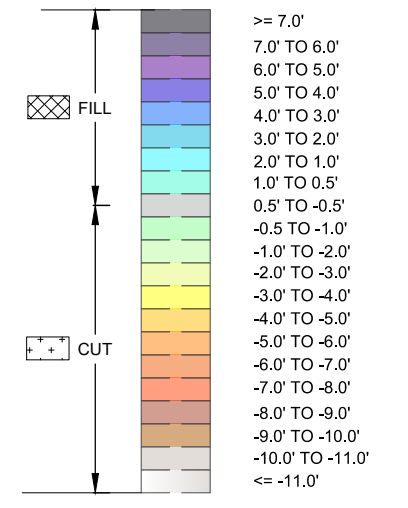
**PLAN & PROFILE 1**



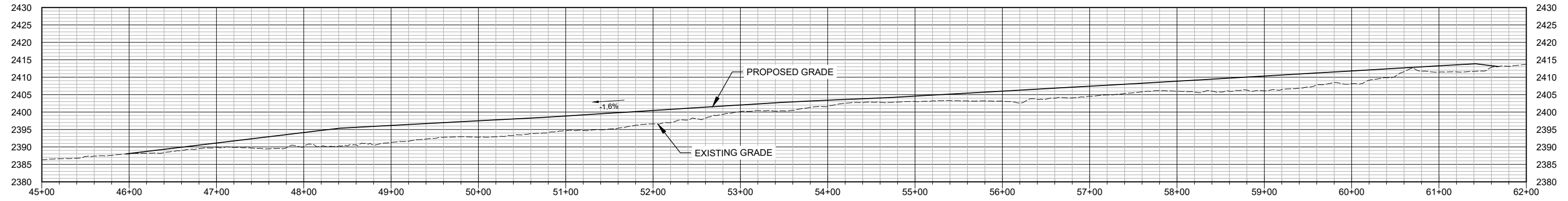
**NOTES:**

1. AREAS TO BE CLEARED AND GRUBBED WILL BE FLAGGED BY CTUIR PRIOR TO CONSTRUCTION.
2. EXCAVATED FLOODPLAIN GRADING AREAS AND PLACE EXCAVATED MATERIAL IN THE MAINSTEM CHANNEL PER PLAN AND PROFILE ON THIS SHEET AND SECTIONS ON SHEETS (TBD).
3. DOWNED OR CLEARED LOGS ENCOUNTERED DURING EXCAVATION TO BE SALVAGED, STOCKPILED AND PLACED ON OR EMBEDDED IN THE FINISHED GRADE ACCORDING TO THE WOOD HABITAT DETAILS.
4. CONSTRUCT WHS PER SHEETS C4.1 THROUGH C4.8.
5. INSTALL 60-80 LOGS PER ACRE IN GRADED AND REACTIVATED FLOODPLAIN AREAS SHOWN BY BLUE AREAS ON THE REM.

**GRADING LEGEND:**



**PLAN 1**  
SCALE: 1" = 60'



**STREAM PROFILE: STA 45+00 TO 62+00**

SCALE: HORIZONTAL 1" = 60'  
VERTICAL EXAGGERATION = 1:4

**REVISION NUMBER**

No.	Date	Revision

Date	Designed By
11/27/2024	AJ, AD
Drawn By	Checked By
DK	AJ



JOB NO. 20230017.1

SHEET NO. C2.1

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DWG: Z:\Shared\W2\CAD\20230017.1-tucannon river big four\DWGS\HETS\C2.1-BFL-GRADING-PLANS&PROF.dwg USER: ibose  
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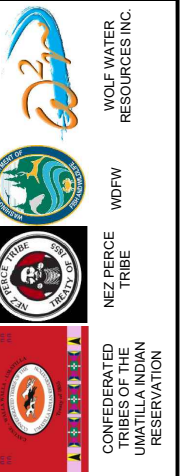








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BIG FOUR (PA 8-10.3)  
COLUMBIA COUNTY, WA

**PLAN & PROFILE 7**

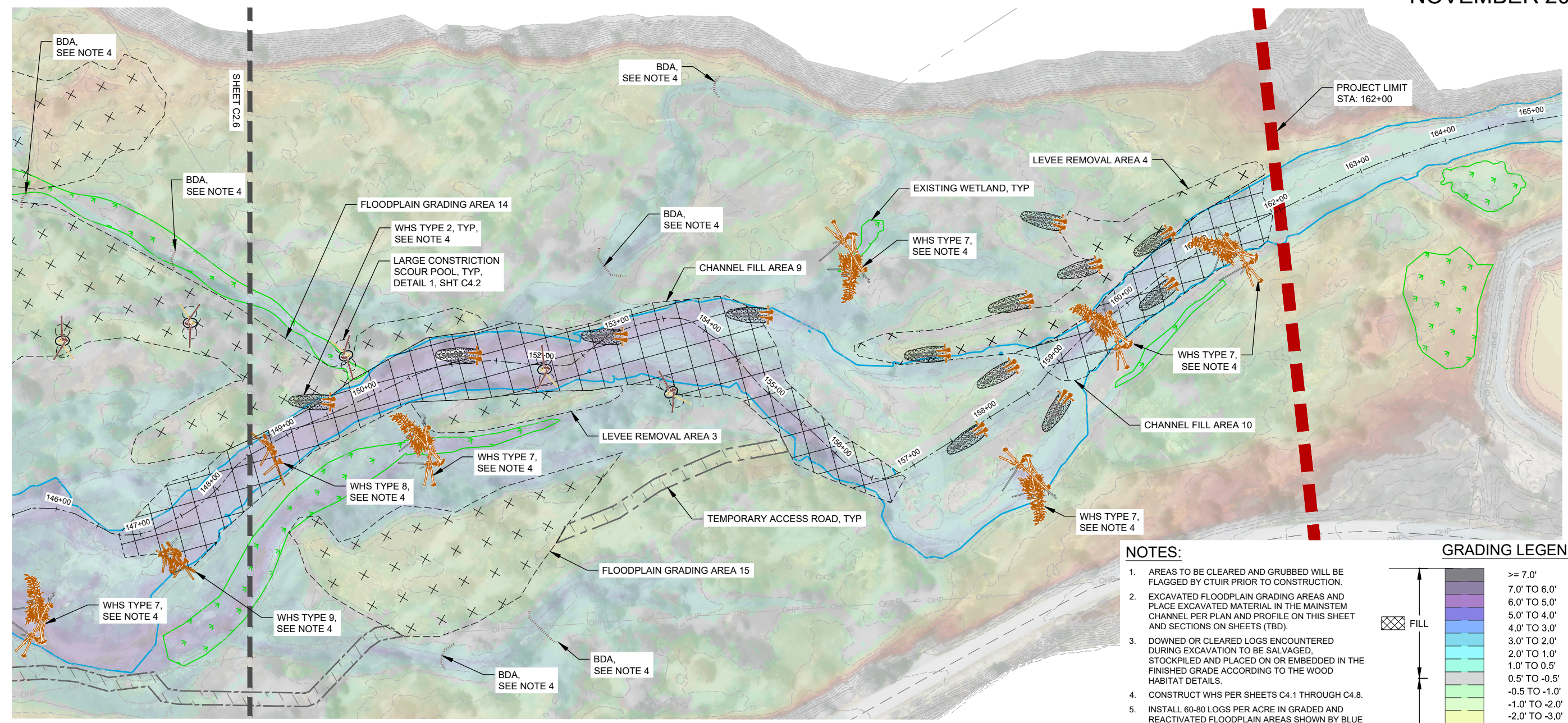
REVISION NUMBER

No.	Date	Revision

Date	Designed By
11/27/2024	AJ, AD
Drawn By	Checked By
DK	AJ

JOB NO.  
20230017.1

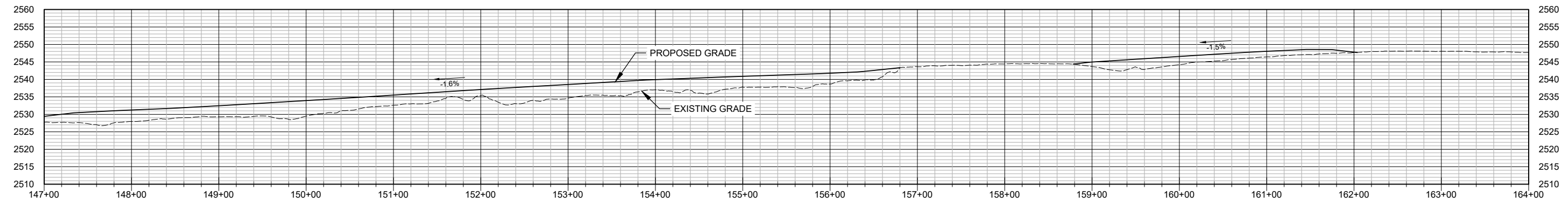
SHEET NO.  
C2.7



**PLAN 7**  
SCALE: 1" = 60'

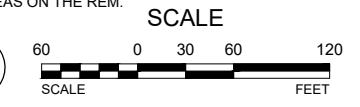
**STREAM PROFILE: STA 147+00 TO 164+00**

SCALE: HORIZONTAL 1" = 60'  
VERTICAL EXAGGERATION = 1:4

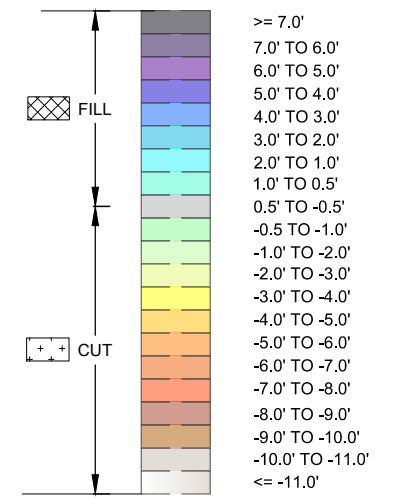


**NOTES:**

- AREAS TO BE CLEARED AND GRUBBED WILL BE FLAGGED BY CTUIR PRIOR TO CONSTRUCTION.
- EXCAVATED FLOODPLAIN GRADING AREAS AND PLACE EXCAVATED MATERIAL IN THE MAINSTEM CHANNEL PER PLAN AND PROFILE ON THIS SHEET AND SECTIONS ON SHEETS (TBD).
- DOWNED OR CLEARED LOGS ENCOUNTERED DURING EXCAVATION TO BE SALVAGED, STOCKPILED AND PLACED ON OR EMBEDDED IN THE FINISHED GRADE ACCORDING TO THE WOOD HABITAT DETAILS.
- CONSTRUCT WHS PER SHEETS C4.1 THROUGH C4.8.
- INSTALL 60-80 LOGS PER ACRE IN GRADED AND REACTIVATED FLOODPLAIN AREAS SHOWN BY BLUE AREAS ON THE REM.



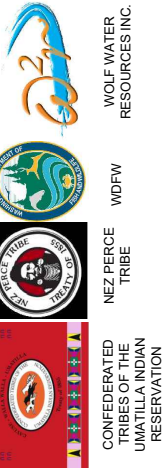
**GRADING LEGEND:**



DWG: Z:\Shared\W2\CAD\20230017.1-tucannon river big four\DWGS\SHETS\C2.1-BFL-GRADING-PLANS&PROF.dwg USER: ibose  
 DATE: Nov 27, 2024 11:08am XREFS:X-TB-W2-22x34 X-AERIAL X-EG X-LEGEND X-WHS



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**TUCANNON RIVER**  
BIG FOUR (PA 8-10.3)  
COLUMBIA COUNTY, WA

**GRADING DETAILS 2**

REVISION NUMBER

No.	Date	Revision

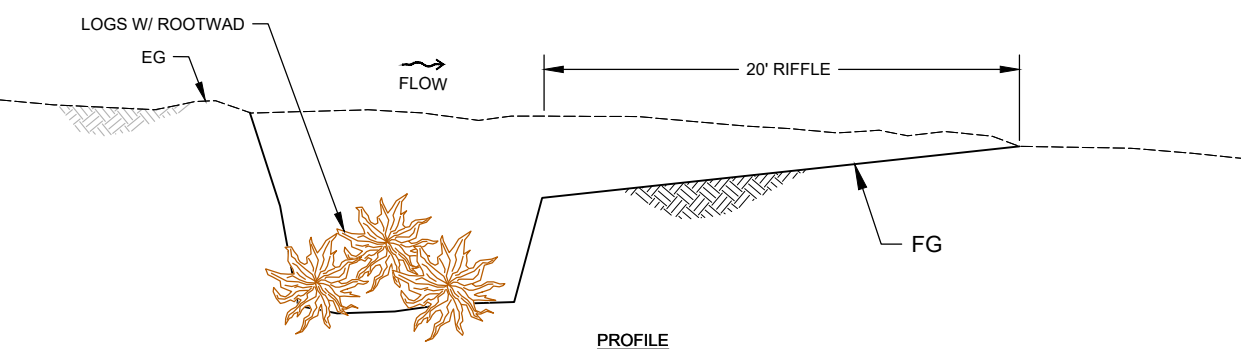
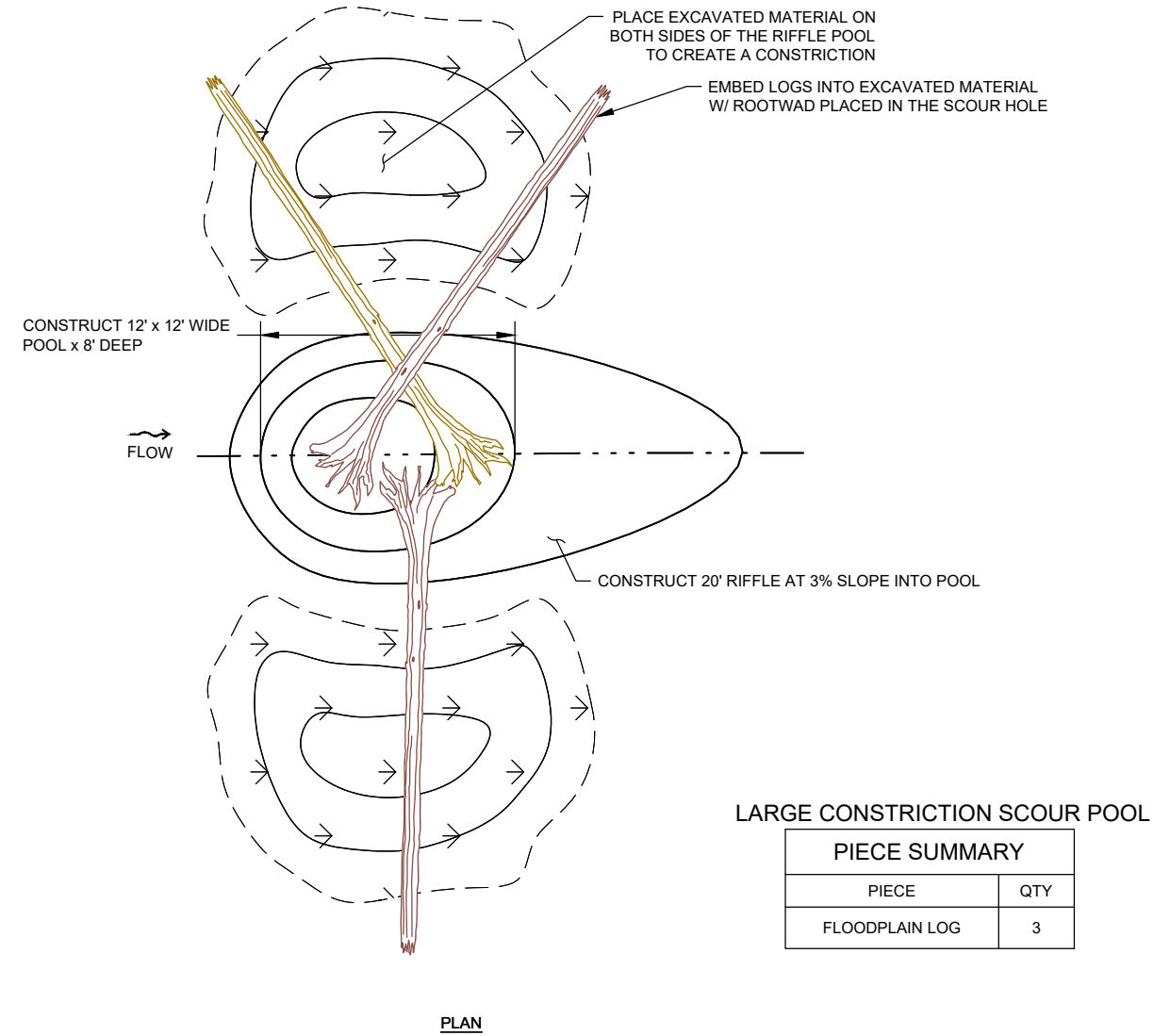
Date: 11/27/2024  
Designed By: AJ, AD  
Drawn By: DK  
Checked By: AJ

SCALE  
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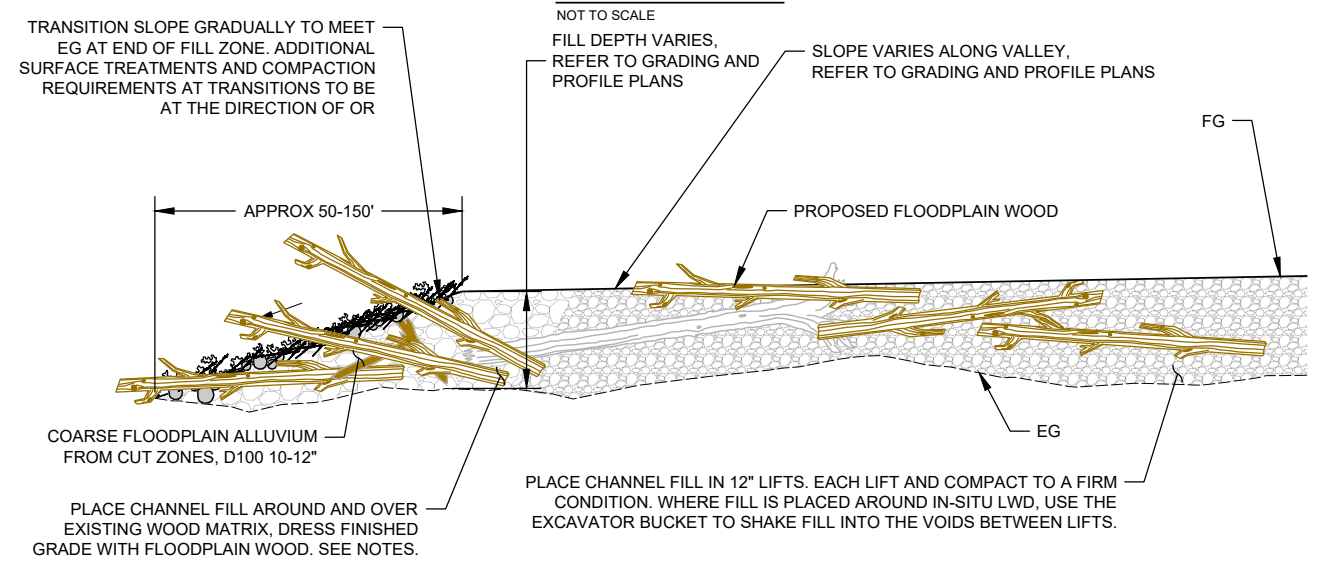
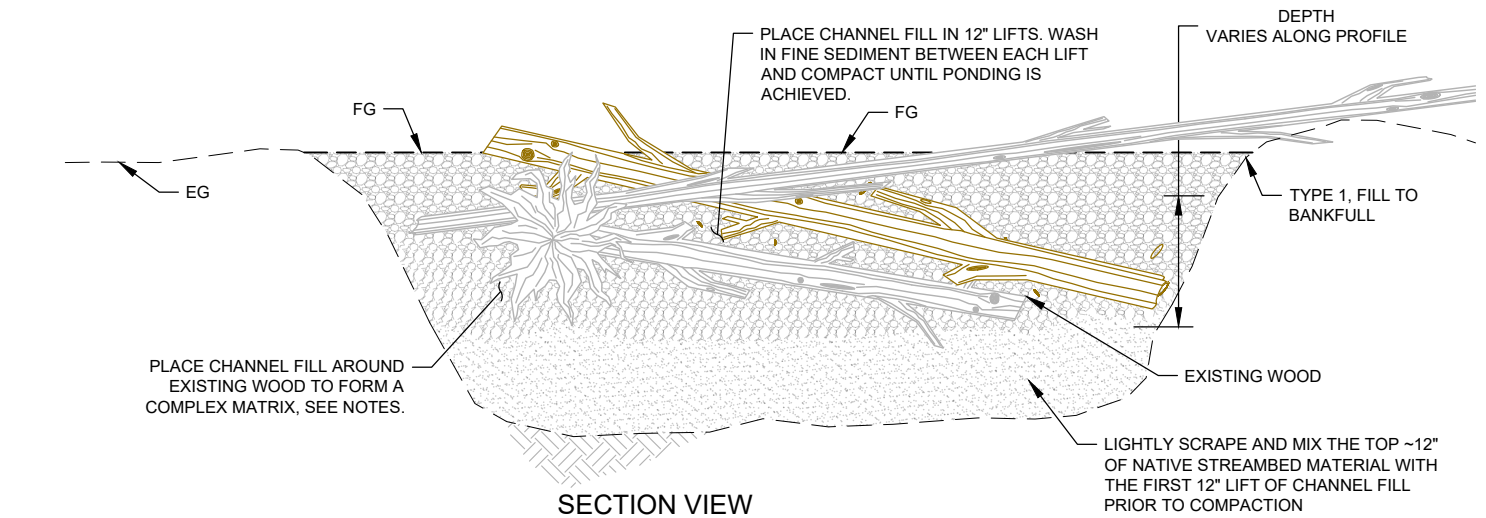
JOB NO. 20230017.1

SHEET NO. C4.2

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**1** LARGE CONSTRICTION SCOUR POOL  
NOT TO SCALE



**2** CHANNEL FILL TYPE 1 TYPICAL DETAIL  
NOT TO SCALE

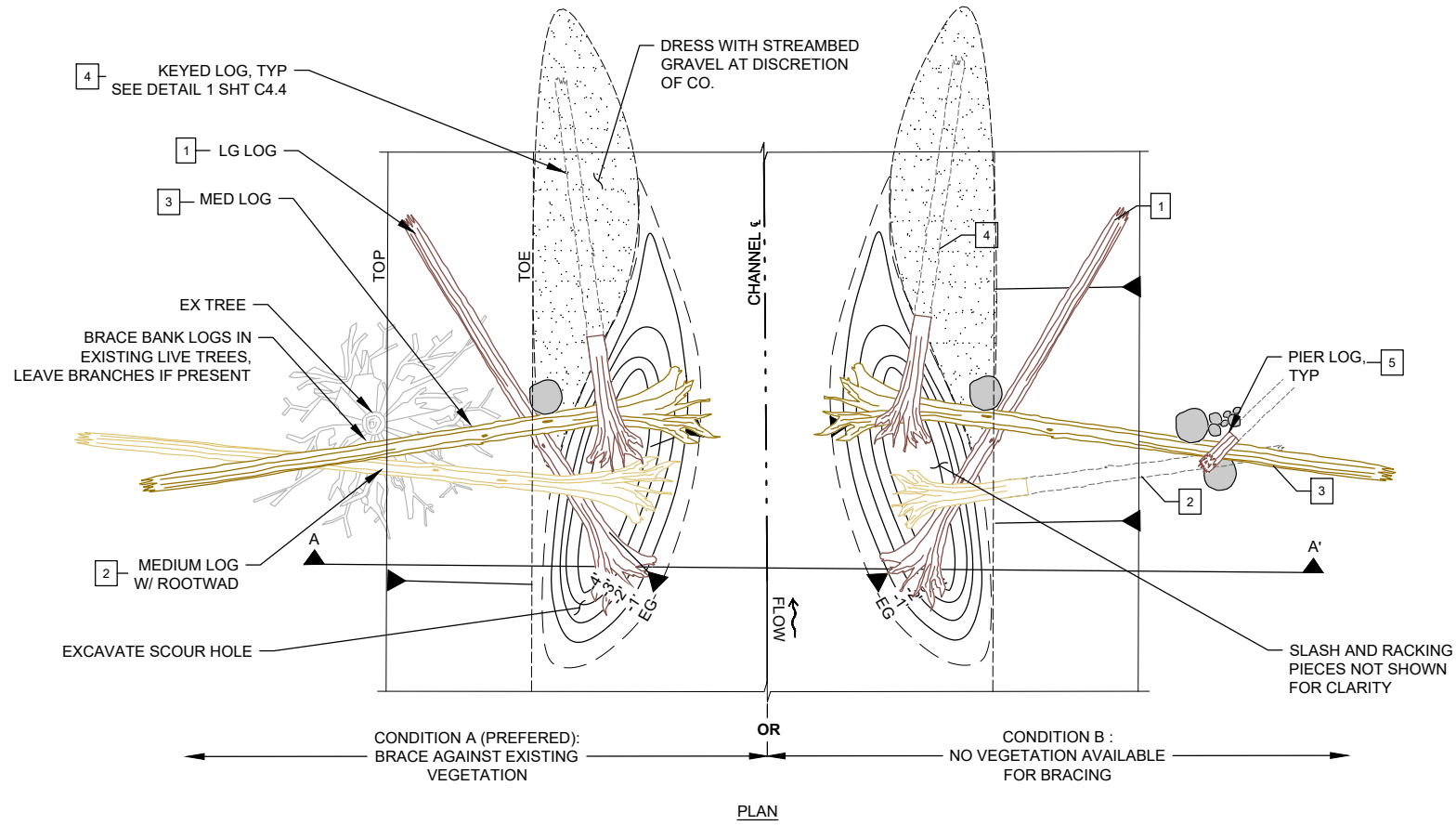
**CHANNEL FILL ZONE NOTES:**

- CHANNEL FILL SHALL CONSIST OF ALLUVIUM (NATIVE SANDS, GRAVELS, COBBLES AND BOULDERS) HARVESTED FROM EXCAVATION OF FLOODPLAIN GRADING AREAS, MATERIAL SHALL BE APPROVED BY ENGINEER PRIOR TO PLACEMENT.
- ALL FILL MATERIAL SHALL BE PLACED IN SUCH A MANNER THAT ALL VOIDS ARE FILLED WITH THE FINE-GRAINED MATERIALS TO PROVIDE A WELL GRADED COMPACT MASS.
- CHANNEL FILL SHALL BE PLACED TO THE ELEVATIONS AND EXTENTS SHOWN ON THE PLANS. CHANNEL FILL SHALL BE PLACED IN 12-INCH LIFTS AND COMPACTED WITH EXCAVATOR BUCKET OR TRACKED OVER TO FIRM CONDITION. FILL SHALL BE PLACED OVER AND AROUND EXISTING LARGE WOOD. BETWEEN LIFTS, SHAKE EXISTING WOOD PIECES WITH EXCAVATOR BUCKET TO WORK FILL MATERIAL INTO VOIDS, FORMING A COMPLEX WOOD/COBBLE MATRIX. FOLLOWING FILL TO FINISH GRADES, DRESS RESULTING TOE OF SLOPE WITH 4 TO 8 INCHES OF LOOSE NATIVE STREAMED MATERIALS AND ENSURE THAT IT BLENDS WITH THE NATIVE TOPOGRAPHY. CONFIRM THE FINISHED FILL INSTALLATION WITH CR AND ENGINEER.
- RE-ARRANGEMENT AND PLACEMENT OF LARGE WOOD IN FILL AREAS IS SUBJECT TO CHANGE AT DIRECTION OF CR.

DWG: Z:\Shared\W2\CAD\20230017.1 - Tucannon river big four\DWG\SHEETS\C4.X-BF- GRADING DETAILS.dwg USER: ibose  
DATE: Nov 27, 2024 11:08am XREFS: X-TB-W2-22x34

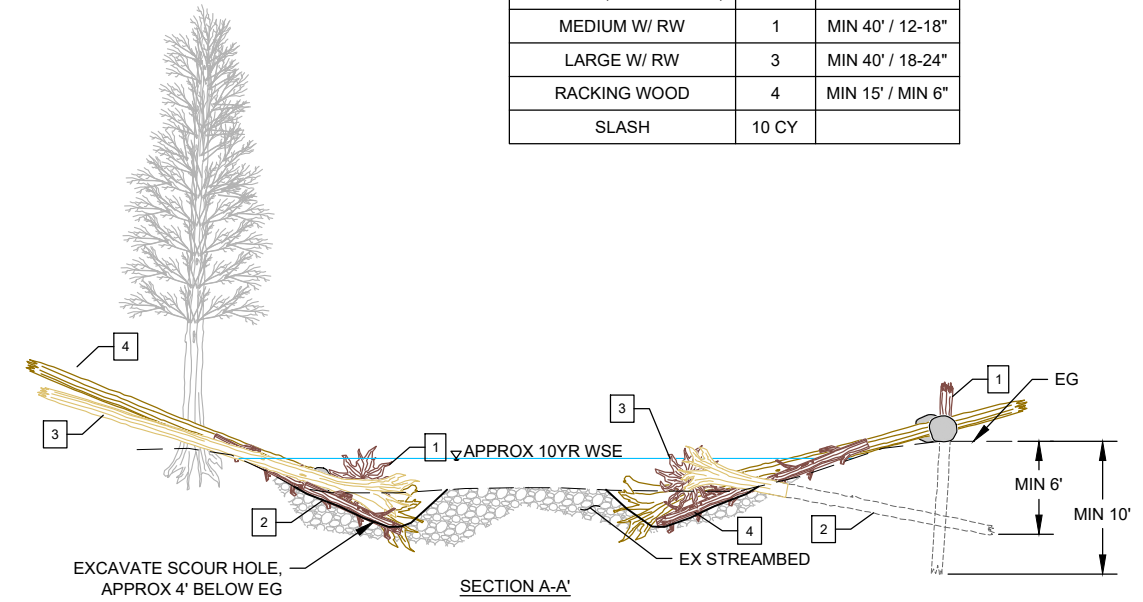


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CONSTRUCTION



WHS TYPE 3

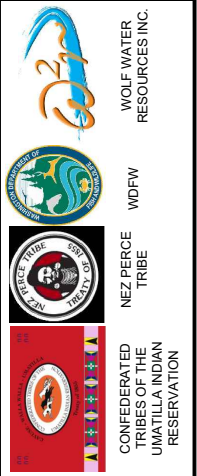
Piece Summary		
Piece	QTY	LENGTH / DBH
PIER LOG (CONDITION B)	1	MIN 20' / MIN 10"
MEDIUM W/ RW	1	MIN 40' / 12-18"
LARGE W/ RW	3	MIN 40' / 18-24"
RACKING WOOD	4	MIN 15' / MIN 6"
SLASH	10 CY	



1 WHS TYPE 3 - MARGIN JAM  
NOT TO SCALE

LOG INSTALLATION NOTES:

- NATIVE STREAMBED BACKFILL SHALL BE PLACED IN 12" LIFTS AND COMPACTED TO FIRM UNYIELDING CONDITION.
  - CONTRACTOR TO COORDINATE LOG PLACEMENT WITH ENGINEER PRIOR TO CONSTRUCTION. ENGINEER SHALL APPROVE PLACEMENT BEFORE COMPLETION.
  - WHERE POSSIBLE, LOGS PROTRUDING FROM BANK SHALL BE PLACED CANTILEVERED BETWEEN EXISTING LIVE TREES. THE SUPPORTING TREE NEAREST TO THE BANK SHALL BE ON THE DOWNSTREAM SIDE OF THE LOGS.
  - EMBEDDED LOGS SHALL BE INSTALLED BY EXCAVATING A TRENCH, PLACING THE LOG, BACKFILLING, AND MACHINE COMPACTING BACKFILL PER SPECIFICATIONS. WHERE EXCAVATION IS NOT POSSIBLE LOG ENDS SHALL BE TIED INTO NATIVE MATERIAL AND BURIED WITH NATIVE MATERIAL PER SPECIFICATIONS.
  - SALVAGE ADJACENT BOULDERS FOR USE IN STRUCTURE.
  - FOR BURIED KEYED LOGS EMBED A MINIMUM OF 2/3 THE TOTAL LENGTH OF THE LOG. MIN 6" COVER AT STEM TIP (MEASURED FROM EG).
  - EMBED ROOTWAD AS NEEDED TO ACHIEVE REQUIRED BURIAL DEPTH AND ALLOW FOR FULL CONTACT BETWEEN THE BOTTOM OF THE LOG AND THE BOTTOM OF THE CHANNEL. BACKFILL AROUND ROOTWAD WITH NATIVE STREAMBED MATERIAL.
  - SEE SPECIFICATIONS FOR TREE SPECIES. KEYED LOG DIAMETER MEASURED AT BREAST HEIGHT (DBH) AND LENGTH AS SHOWN ON PLANS.
  - CRUSH ALL EXPOSED SAW-CUT FACES.
- # DENOTES PLACEMENT ORDER



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TUCANNON RIVER  
BIG FOUR (PA 8-10.3)  
COLUMBIA COUNTY, WA

WOOD DETAILS 2

REVISION NUMBER

No.	Date	Revision

Date	11/27/2024	Designed By	AJ, AD
Drawn By	DK	Checked By	AJ

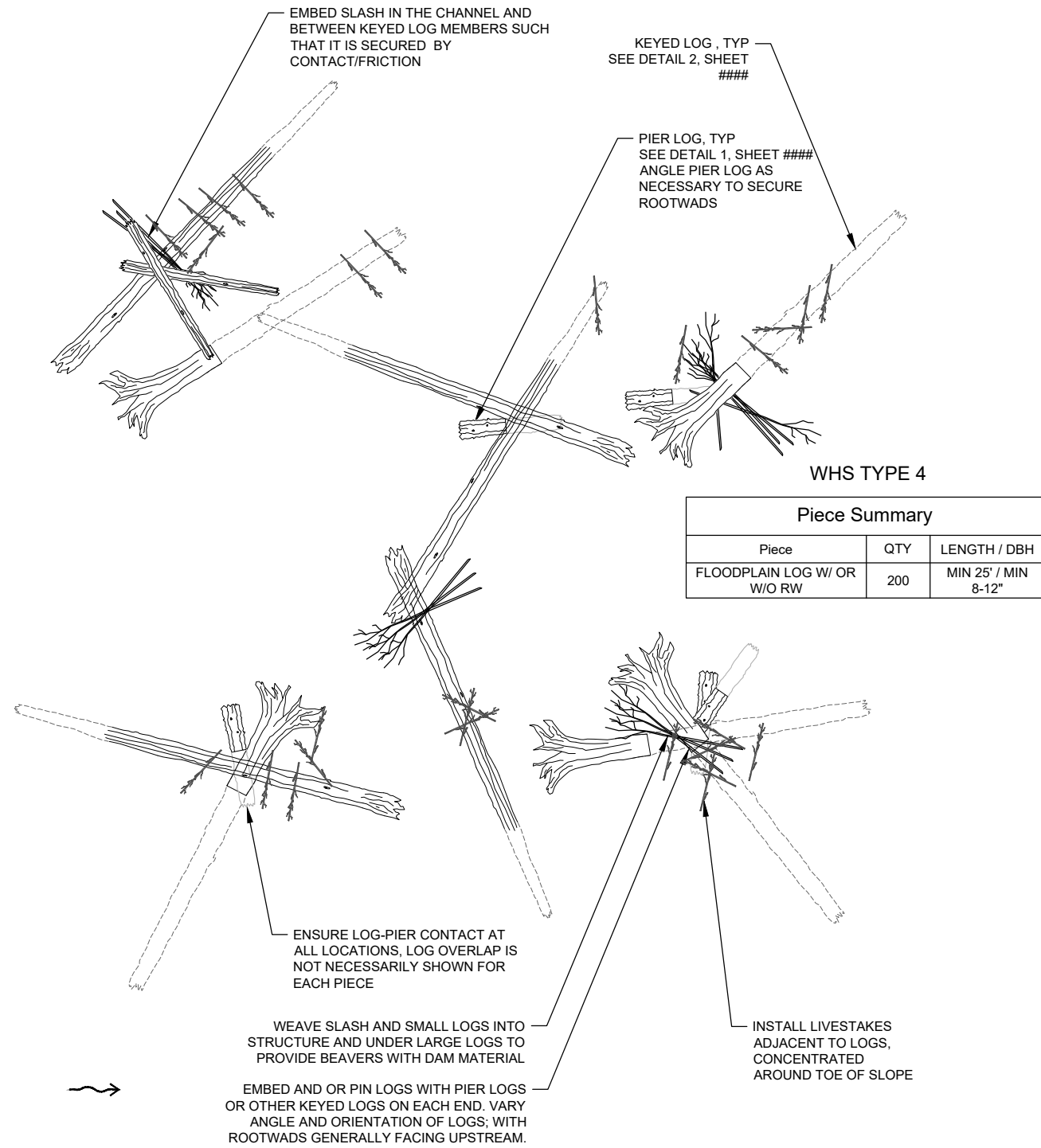


JOB NO. 20230017.1

SHEET NO. C4.4

DWG: Z:\Shared\W2\CAD\20230017.1-tucannon river big four\DWGS\DETAILS\C4.X-BFL-HABITAT-WOOD DETAILS.dwg USER: ibose DATE: Nov 27, 2024 11:08am XREFS: X-TB-W2-22x34

WOOD COMPLEX CONTINUES THROUGHOUT FLOODPLAIN



WOOD COMPLEX CONTINUES THROUGHOUT FLOODPLAIN

1. CONTRACTOR TO COORDINATE LOG PLACEMENT WITH OR PRIOR TO CONSTRUCTION. NOT ALL FLOODPLAIN LOGS ARE SHOWN SHOWN ON PLANS.
2. FLOODPLAIN LOG SUMMARY TABLE LENGTH AND DBH ARE APPROXIMATE. FLOODPLAIN LOGS ARE TO BE DISTRIBUTED THROUGHOUT THE FLOODPLAIN. APPROXIMATELY HALF OF THE FLOODPLAIN LOGS SHALL BE EMBEDDED TO 2/3 OF THE LOG LENGTH OR AS DIRECTED IN THE FIELD BY THE OR.

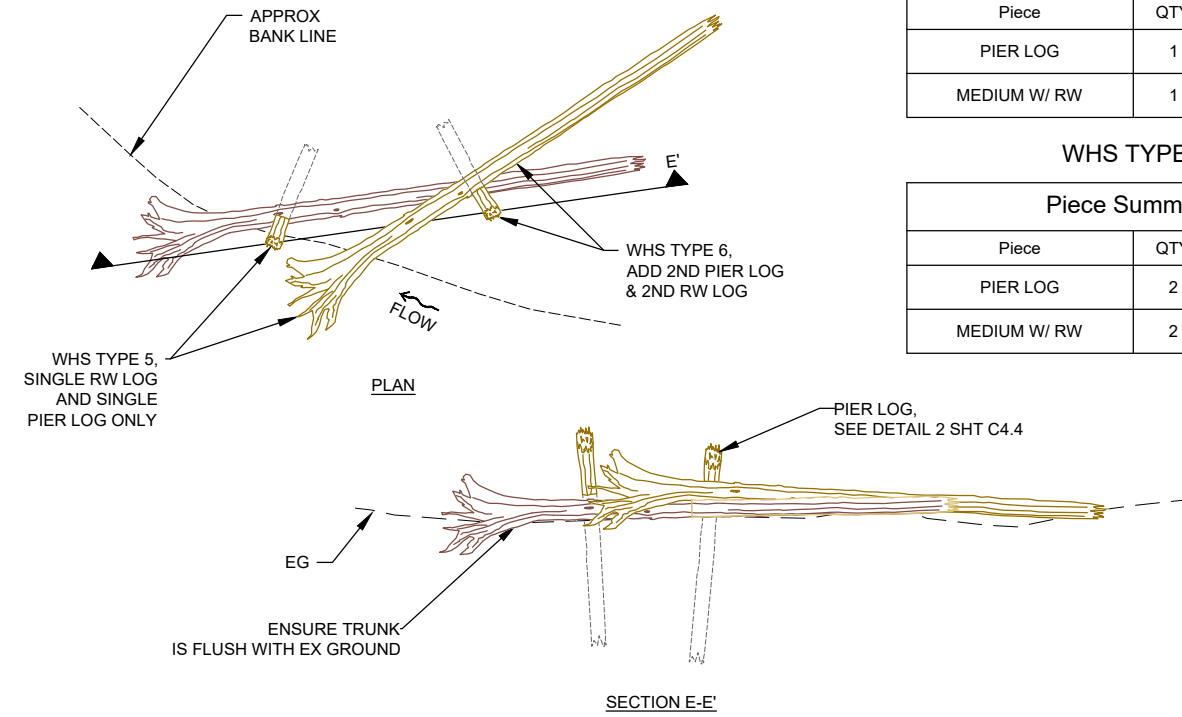
**1** WHS TYPE 4 - FLOODPLAIN LOGS  
NOT TO SCALE

WHS TYPE 5

Piece Summary		
Piece	QTY	LENGTH / DBH
PIER LOG	1	MIN 20' / MIN 10"
MEDIUM W/ RW	1	MIN 40' / MIN 12-18"

WHS TYPE 6

Piece Summary		
Piece	QTY	LENGTH / DBH
PIER LOG	2	MIN 20' / MIN 10"
MEDIUM W/ RW	2	MIN 40' / MIN 12-18"



**2** WHS TYPE 5 & 6 - FLOODPLAIN LOG  
NOT TO SCALE



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BIG FOUR (PA 8-10.3)  
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WOOD DETAILS 3

REVISION NUMBER

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Drawn By	DK	Checked By	AJ

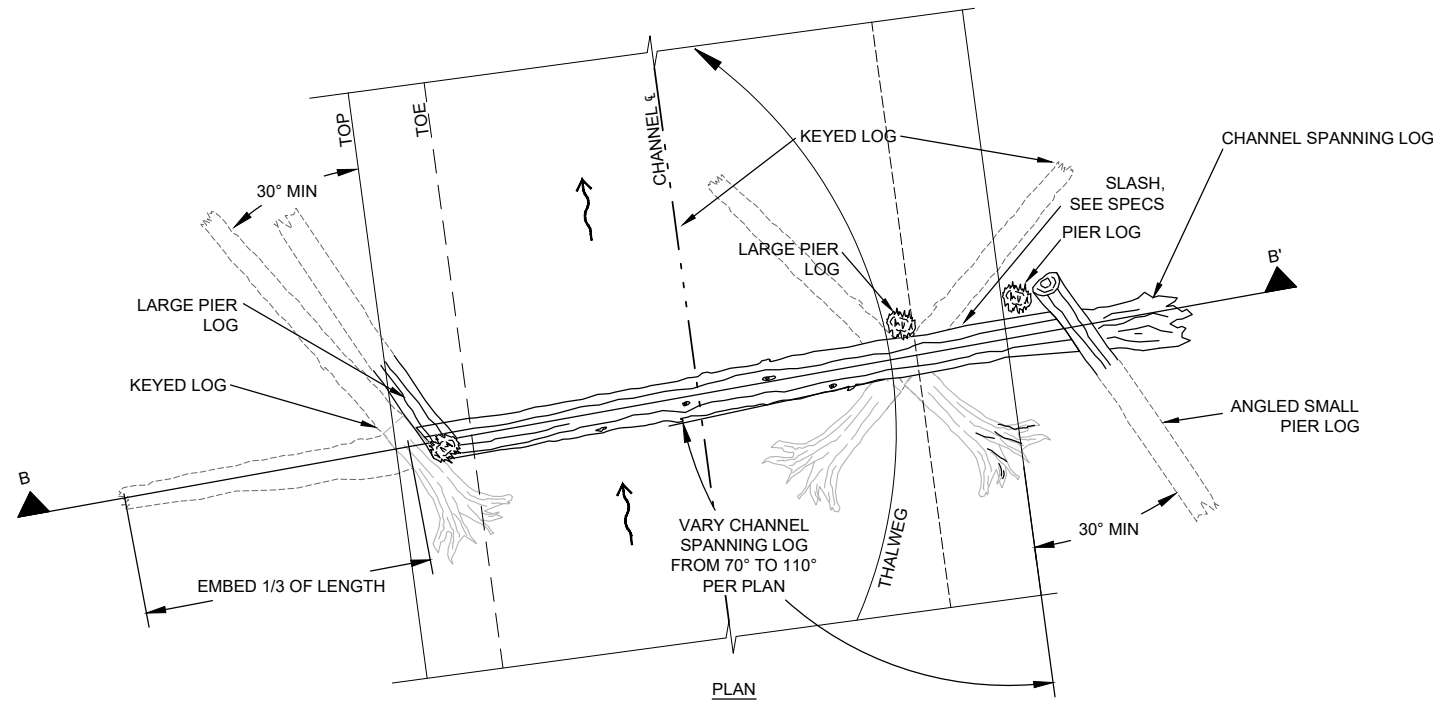
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JOB NO. 20230017.1

SHEET NO. C4.5

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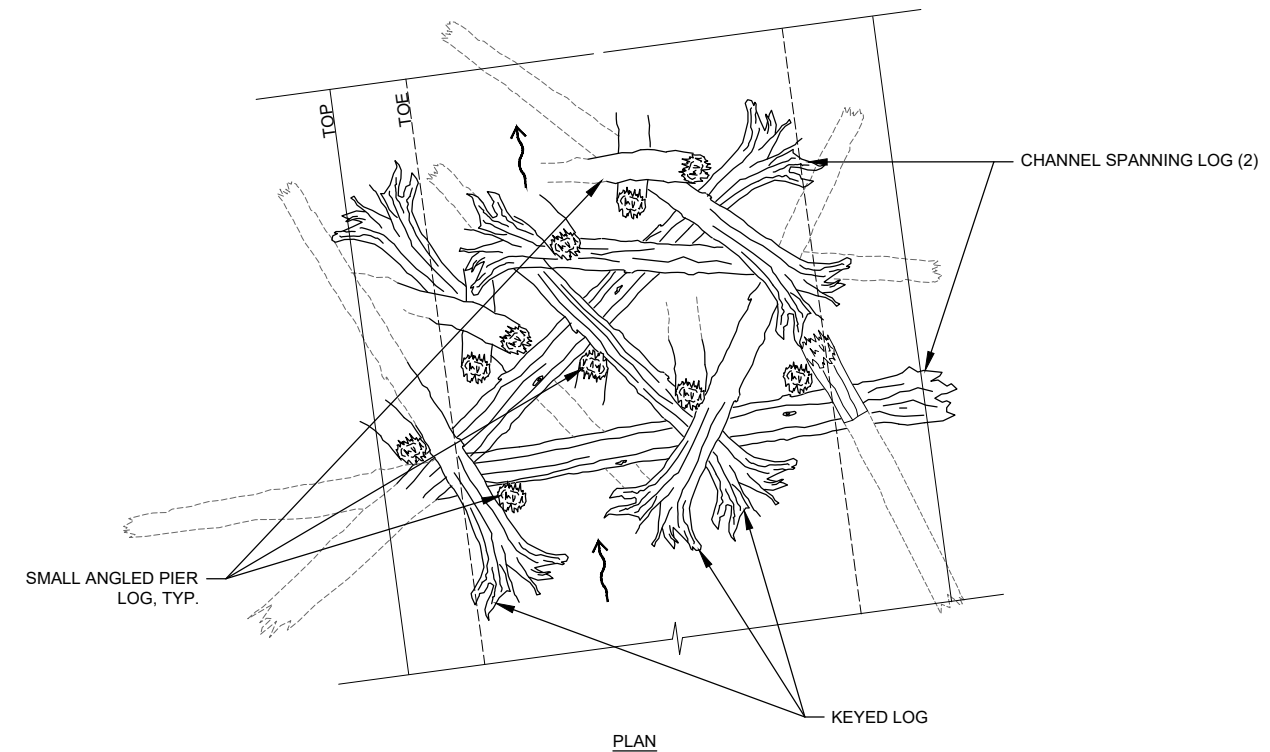
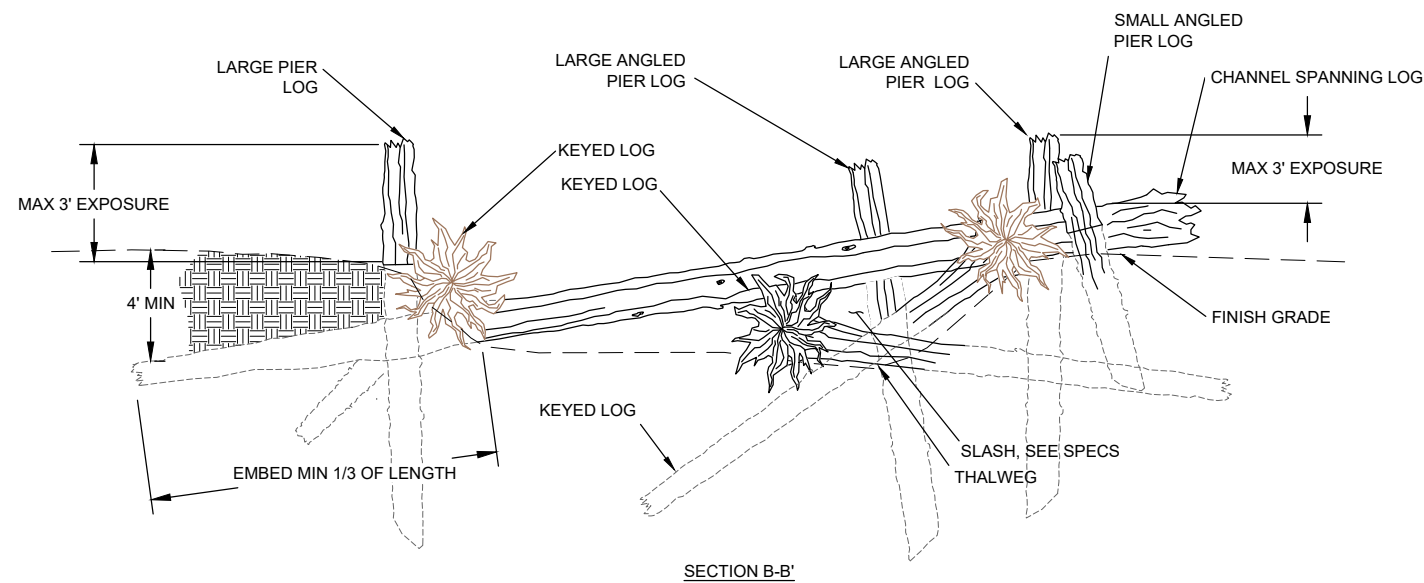




**LOG INSTALLATION NOTES:**

1. SELECT NATIVE BACKFILL SHALL BE PLACED IN 12" LIFTS AND COMPACTED TO FIRM CONDITION.
2. CONTRACTOR TO COORDINATE LOG PLACEMENT WITH ENGINEER PRIOR TO CONSTRUCTION. PLACEMENT CAN BE FIELD FIT, BUT THE ENGINEER OR CAR SHALL APPROVE FINAL STRUCTURE ORIENTATION AND LOCATION BEFORE COMPLETION.
3. WHERE POSSIBLE, LOGS PROTRUDING FROM BANK SHALL BE PLACED CANTILEVERED BETWEEN EXISTING LIVE TREES. THE SUPPORTING TREE NEAREST TO THE BANK SHALL BE ON THE DOWNSTREAM SIDE OF THE LOGS.
4. EMBEDDED LOGS SHALL BE INSTALLED BY EXCAVATING A TRENCH, PLACING THE LOG, BACKFILLING, AND MACHINE COMPACTING BACKFILL PER SPECIFICATIONS. WHERE EXCAVATION IS NOT POSSIBLE LOG ENDS SHALL BE TIED INTO NATIVE MATERIAL AND BURIED WITH NATIVE MATERIAL PER SPECIFICATIONS.
5. FOR BURIED KEYED LOGS EMBED A MINIMUM OF 2/3 THE TOTAL LENGTH OF THE LOG.
6. EMBED ROOTWAD AS NEEDED TO ACHIEVE REQUIRED BURIAL DEPTH AND ALLOW FOR FULL CONTACT BETWEEN THE BOTTOM OF THE LOG AND THE BOTTOM OF THE CHANNEL. BACKFILL AROUND ROOTWAD WITH SELECT NATIVE BACKFILL.
7. KEYED LOG DIAMETER MEASURED AT BREST HEIGHT (DBH) AND LENGTH AS SHOWN ON PLANS.
8. CRUSH ALL EXPOSED SAW-CUT FACES

# DENOTES PLACEMENT ORDER



1 WHS TYPE 8 - CHANNEL SPANNING WOOD STRUCTURE  
NOT TO SCALE

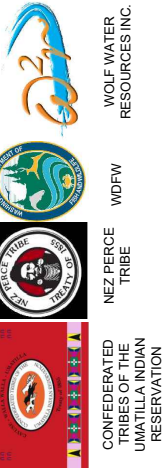
2 WHS TYPE 9 - STRAINER JAM  
NOT TO SCALE

**WHS TYPE 5**

Piece Summary		
Piece	QTY	LENGTH / DBH
Keyed	3	16' / 18-30"
Channel Spanning	1	40' / 16-24"
Small Pier	1	12-18' / 6-14"
Large Pier	3	12-18' / 16-24"

**WHS TYPE 6**

Piece Summary		
Piece	QTY	LENGTH / DBH
Keyed	6	16' / 18-30"
Channel Spanning	2	40' / 16-24"
Small Pier	11	12-18' / 6-14"



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BIG FOUR (PA 8-10.3)  
COLUMBIA COUNTY, WA

**WOOD DETAILS 5**

**REVISION NUMBER**

No.	Date	Revision

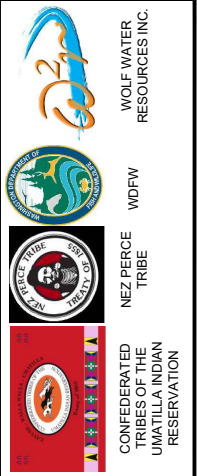
Date: 11/27/2024  
Designed By: AJ, AD  
Drawn By: DK  
Checked By: AJ

SCALE  
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JOB NO. 20230017.1

SHEET NO. C4.7  
22 OF 24

NOT FOR  
CONSTRUCTION

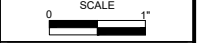


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COLUMBIA COUNTY, WA

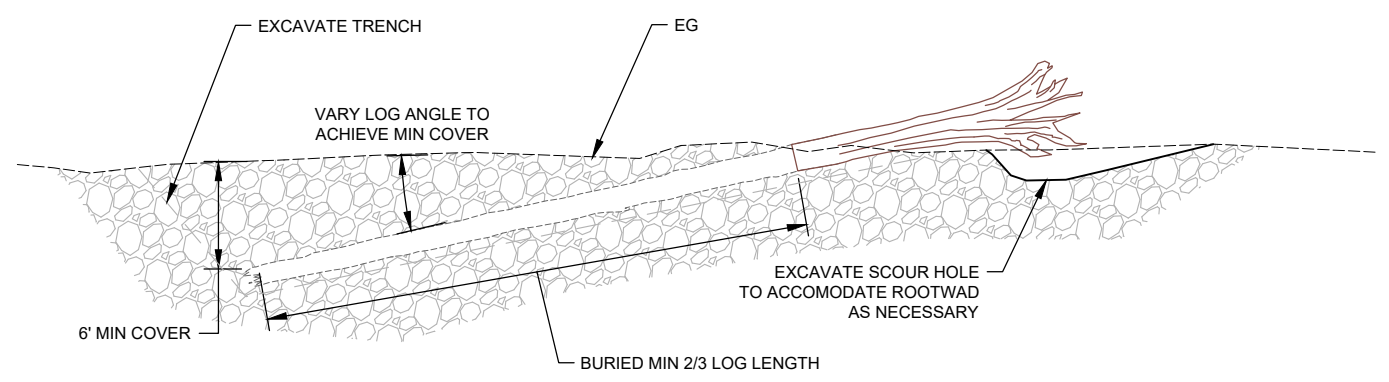
**WOOD DETAILS 6**

REVISION NUMBER	
No.	Date

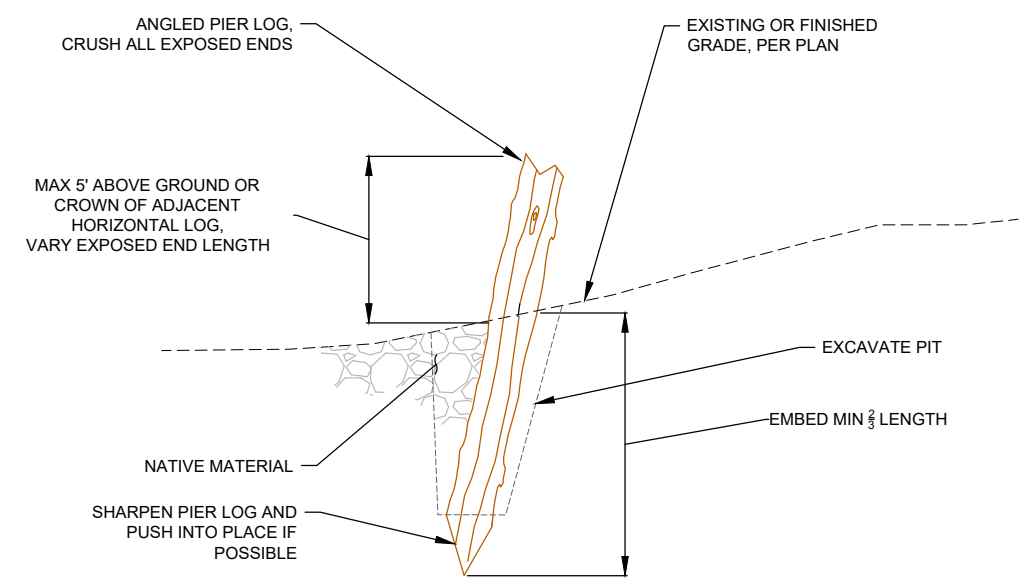
Date	11/27/2024	Designed By	AJ, AD
Drawn By	DK	Checked By	AJ



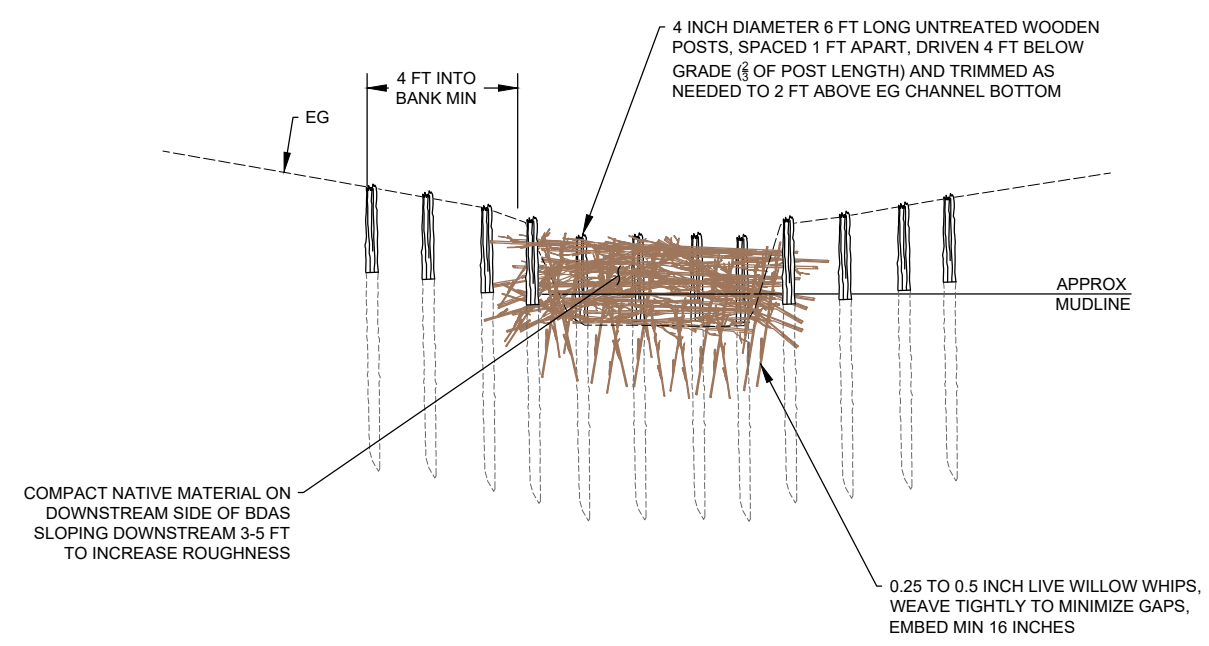
JOB NO.  
20230017.1  
SHEET NO.  
C4.8  
23 OF 24



**1 SINGLE KEYED LOG**  
NOT TO SCALE



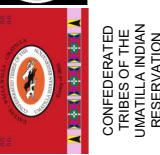
**2 PIER LOG**  
NOT TO SCALE



**3 BEAVER DAM ANALOGUE (BDA)**  
NOT TO SCALE

DWG: Z:\Shared\W2\CAD\20230017.1 - Tucannon river big four\DWGSHEETS\C4.X-BFL - HABITAT-WOOD DETAILS.dwg USER: ibose DATE: Nov 27, 2024 11:09am XREFS: X-TB-W2-22x34

NOT FOR  
CONSTRUCTION



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**TUCANNON RIVER**  
BIG FOUR (PA 8-10.3)  
COLUMBIA COUNTY, WA

**ESC DETAILS 1**

REVISION NUMBER

No.	Date	Revision

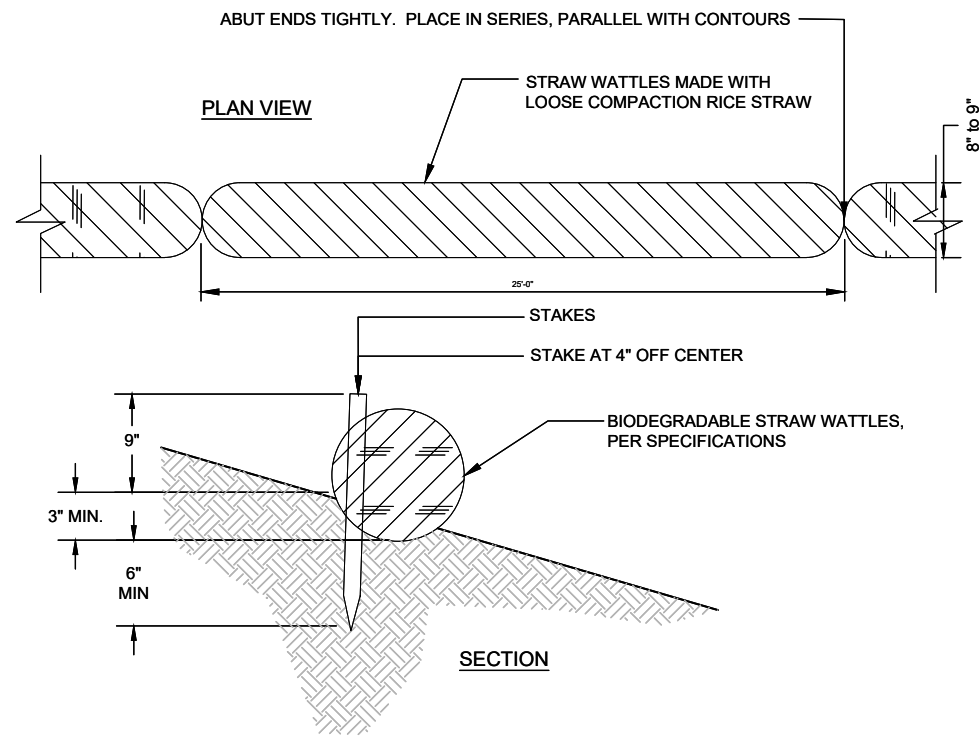
Date: 11/27/2024  
Designed By: AJ, AD  
Drawn By: DK  
Checked By: AJ

SCALE  
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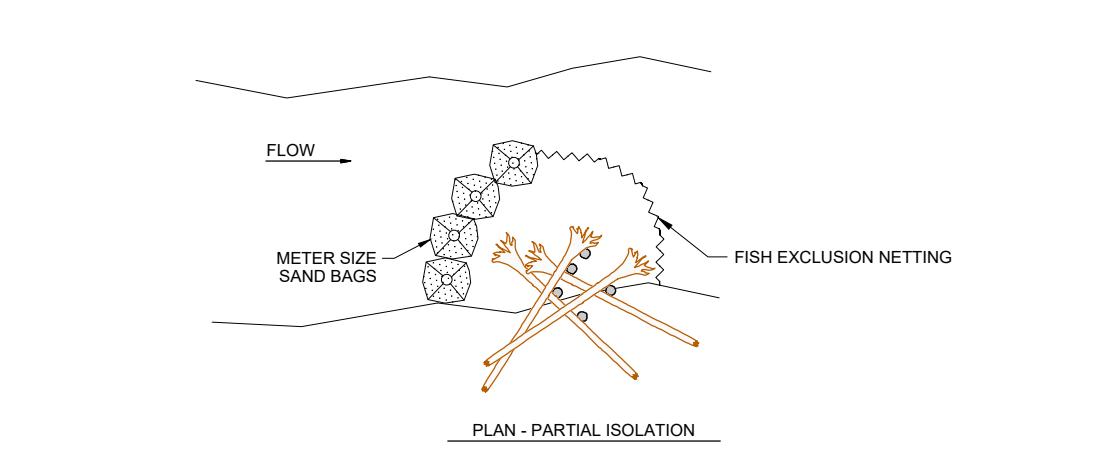
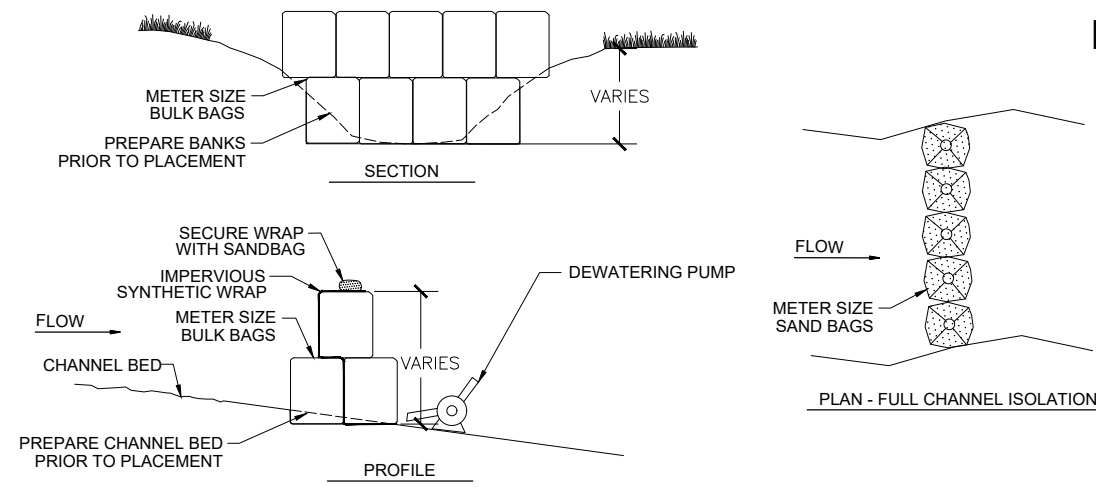
JOB NO.  
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SHEET NO.  
C5.1

24 OF 24

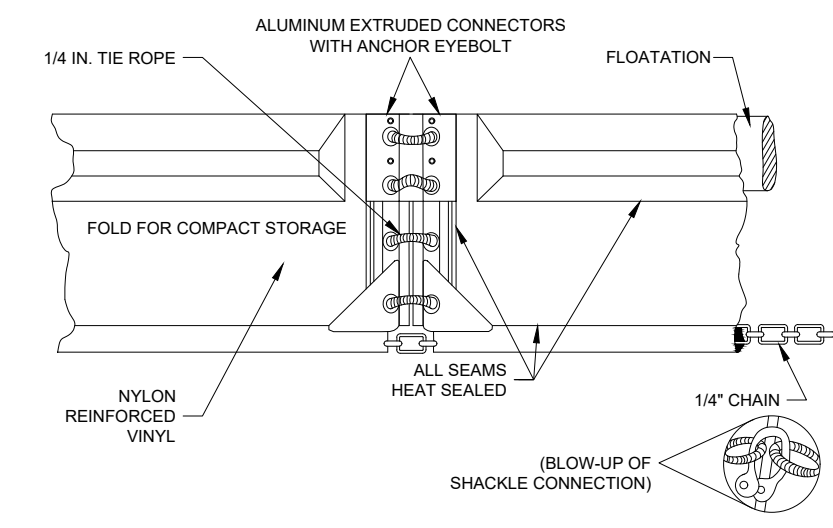
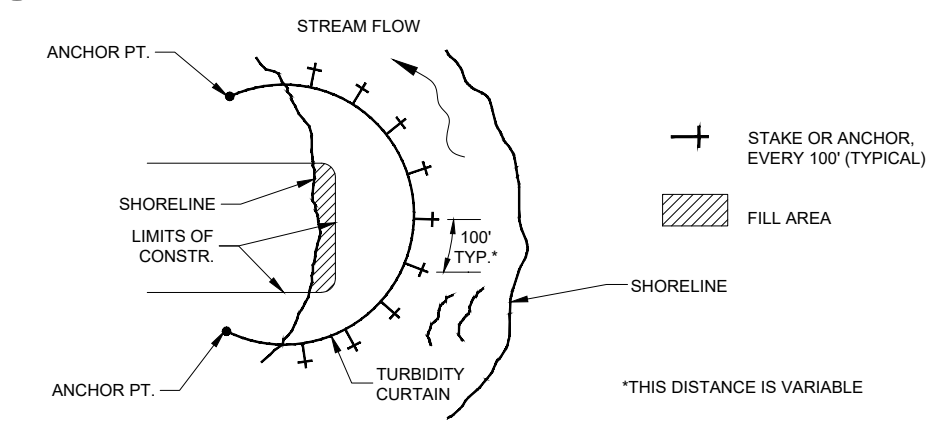


1 STRAW WATTLES  
NOT TO SCALE



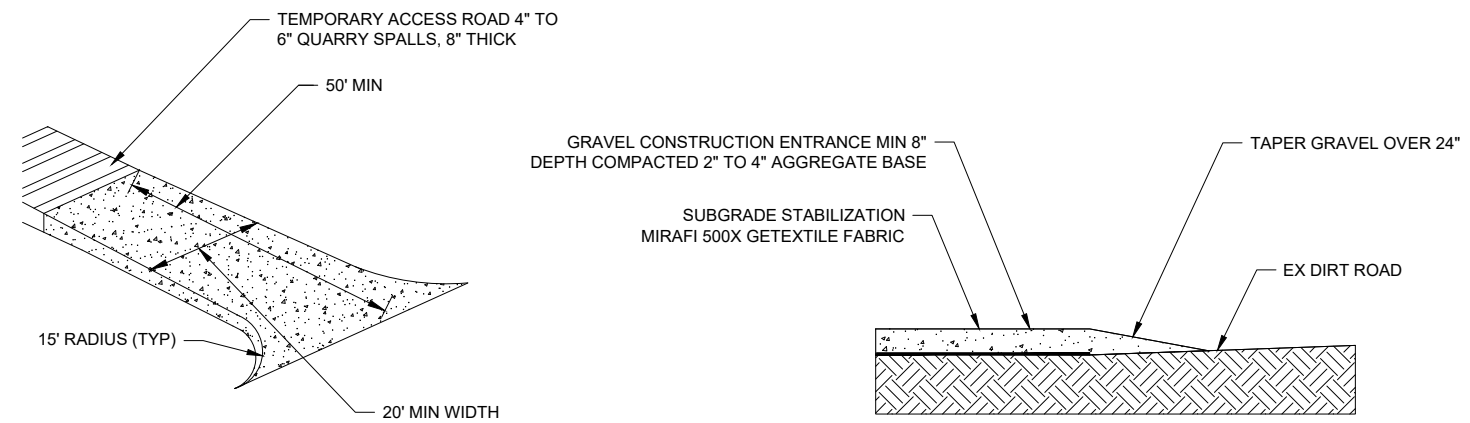
- NOTE:
- CONSTRUCTION CREWS SHALL INSTALL BULK BAG COFFER DAMS AS SHOWN ON PLANS OR AS NECESSARY TO ISOLATE THE EXCAVATION AREAS.
  - IN ADDITION TO BULK BAGS, USE AN IMPERVIOUS SYNTHETIC LINER TO REDUCE PERMEABILITY OF BLUK BAG COFFER DAM.
  - HEIGHT OF THE BULK BAG COFFER DAMS SHALL BE HIGH ENOUGH TO PREVENT BYPASS FLOWS FROM ENTERING THE ISOLATED WORK AREA. DAM HEIGHTS AND MATERIALS SHALL BE INCLUDED IN THE CONTRACTOR'S WORK CONTAINMENT AND DEWATERING PLAN.

2 TEMPORARY BULK BAG COFFER DAM  
NOT TO SCALE



- NOTES FOR TURBIDITY CURTAIN:
- INSTALL TYPE 2 TURBIDITY CURTAIN PER SPECIFICATIONS AND MANUFACTURER INSTRUCTIONS.

3 TURBIDITY CURTAIN  
NOT TO SCALE



4 TEMPORARY CONSTRUCTION ENTRANCE  
NOT TO SCALE

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