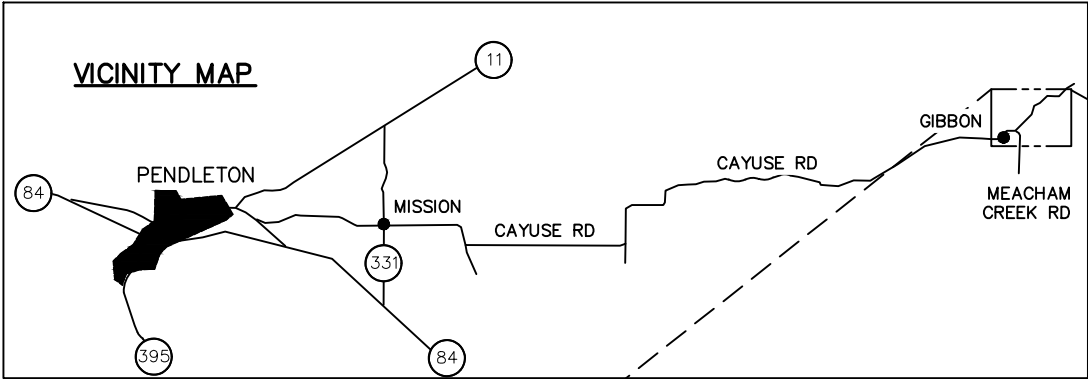


UMATILLA RIVER FISH HABITAT & FLOODPLAIN RESTORATION

CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

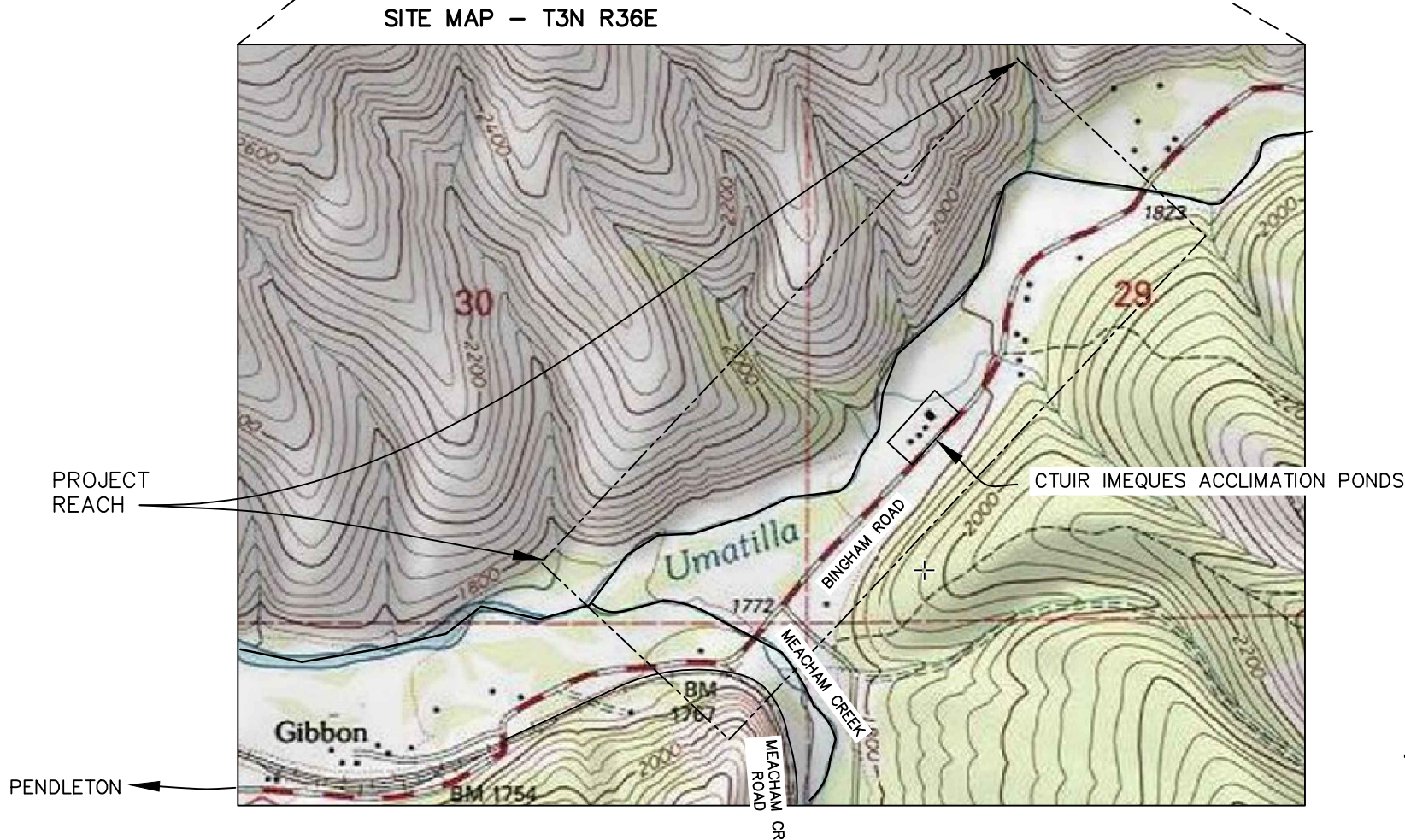
IMEQUES ACCLIMATION FACILITY NEAR GIBBON, OR

PROJECT MANAGER: JUDE LOVE



100% DESIGN

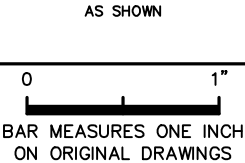
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- NOTES:
- THIS PROJECT WAS DESIGNED IN ACCORDANCE WITH THE BPA HABITAT IMPROVEMENT PROGRAM, PROGRAMMATIC BIOLOGICAL OPINION (HIP4).
 - SEE IMPLEMENTATION PLAN FOR CONSTRUCTION SEQUENCING.

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NO.	DATE	REVISION DESCRIPTION	BY	CHK



CONFEDERATED TRIBES UMATILLA INDIAN RESERVATION

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UMATILLA RIVER/IMEQUES FACILITY
FISH HABITAT/FLOODPLAIN RESTORATION

SHEET INDEX & LOCATION MAP

100% DESIGN

DATE: JAN 27, 2026
SHEET: 1
REV: —

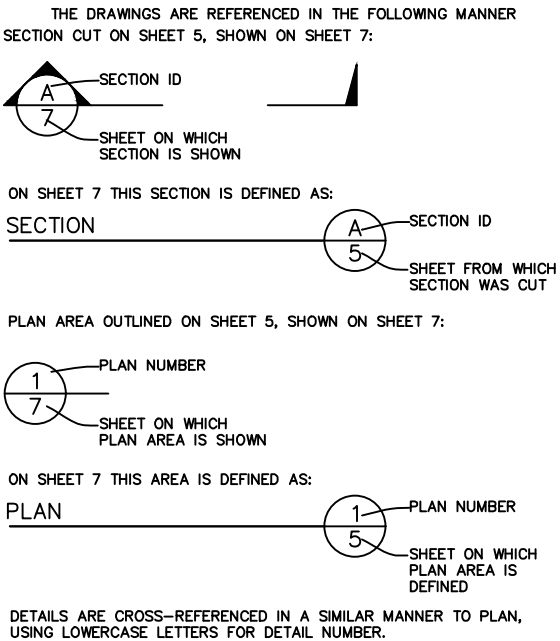
LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	KEY PLAN BORDER		LOW FLOW CHANNEL
	CONTOUR (EXISTING MAJOR)		GRAVEL / COBBLE / RIPRAP
	CONTOUR (EXISTING MINOR)		UNDISTURBED EARTH / RIVERBED
	CONTOUR (PROPOSED MAJOR)		CUT
	CONTOUR (PROPOSED MINOR)		FILL
	PROFILE (EXIST)		WOOD
	PROFILE (PROPOSED)		STAGING AREA
	CHANNEL CENTERLINE		DOUGLAS FIR/PONDEROSA PINE PLANTINGS
	FLOODPLAIN SWALE EDGE		PONDEROSA PINE PLANTINGS
	TOP OF BANK/SLOPE		GRAND FIR UNDERPLANTINGS
	TOE OF BANK/SLOPE		SURVEY CONTROL POINT
	FACULTATIVE WETLAND BOUNDARY		BOULDER
	OBLIGATE WETLAND BOUNDARY		EMBEDDED LOG W/ ROOTWAD
	CHANNEL THALWEG		DEBRIS LOG
	WATER SURFACE		PALS
	ORDINARY HIGH WATER LEVEL		
	100-YR FLOOD EXTENT		
	SILT FENCE		
	ACCESS ROAD		
	POWER LINE		
	PROPERTY LINE		
	WATER SUPPLY PIPE		

ABBREVIATIONS

BM	BENCH MARK	NO	NUMBER
BPA	BONNEVILLE POWER ADMINISTRATION	NTS	NOT TO SCALE
CL	CENTERLINE	OC	ON CENTER
CP	CONTROL POINT	ODOT	OR DEPT OF TRANSPORTATION
CS	CROSS SECTION	OHP	OVERHEAD POWER
CY	CUBIC YARD	OHWL	ORDINARY HIGH WATER LEVEL
DBH	DIA AT BREAST HEIGHT	OHWM	ORDINARY HIGH WATER MARK
DIA	DIAMETER	PALS	POST-ASSISTED LOG STRUCTURE
DS, D/S	DOWNSTREAM	PSI	POUNDS PER SQUARE INCH
DSEL	DOWNSTREAM ELEVATION	RT	RIGHT
DWG	DRAWING	S	SLOPE, SOUTH
E	EAST	SHT	SHEET
EA	EACH	SP	STATE PLANE COORDINATES
EC	EROSION CONTROL	SPEC	SPECIFICATION
ELEV, EL	ELEVATION	STA	STATION
ELJ	ENGINEERED LOG JAM	STD	STANDARD
EXIST	EXISTING	SF	SQUARE FOOT
FT	FOOT, FEET	SY	SQUARE YARD
H, HORZ	HORIZONTAL	TESC	TEMPORARY EROSION AND SEDIMENT CONTROL
HIP	HABITAT IMPROVEMENT PROGRAM	TYP	TYPICAL
ID	IDENTIFICATION, INNER DIA	UGP	UNDERGROUND POWER
IN	INCH, INCHES	USEL	UPSTREAM ELEVATION
L	LENGTH	VAR	VARIES
LB	POUNDS	V, VERT	VERTICAL
LT	LEFT	W	WEST, WIDE
LF	LINEAR FOOT	W/	WITH
LWD	LARGE WOODY DEBRIS	WE	WATER'S EDGE
MAX	MAXIMUM	W/O	WITHOUT
MIN	MINIMUM	WSEL	WATER SURFACE ELEVATION
MISC	MISCELLANEOUS	WT	WEIGHT
MON	MONUMENT	YR	YEAR
N	NORTH		

DRAWING REFERENCES



SURVEY DATUM

SURVEY HORIZONTAL DATUM FOR THIS PROJECT IS OREGON STATE PLANE COORDINATES, NORTH AMERICAN DATUM NAD83/07 US FEET; VERTICAL DATUM IS NAVD88. CONTROL POINT LOCATIONS SHOWN ON SHEET 6 (SEE NOTE 2)

SURVEY CONTROL POINT DATA

PROJECT CONTROL POINTS:	#1	#2	#3
POINT ID#	CP4	CP5	--
NORTHING (FT)	751092.8	753111.0	--
EASTING (FT)	8751119.9	8752206.7	--
ELEVATION (FT; NAVD88)	1974.17	1812.93	--

RESTORATION DESIGN LIMITATIONS

THE DESIGNS ON THESE PLANS ARE BASED IN PART ON ENGINEERING ANALYSES OF MOBILE BOUNDARY RIVER HYDRAULICS AND FLUVIAL GEOMORPHOLOGY, AND THE GOAL OF RESTORING RELATED NATURAL RIVERINE PROCESSES THAT FORM AND MAINTAIN FISH HABITAT. THERE IS INHERENT UNCERTAINTY IN THESE ANALYSES AND GOAL THAT PRECLUDE ASSURING ABSOLUTELY THAT A PROJECT AS DESIGNED WILL NOT BE ASSOCIATED WITH UNANTICIPATED/UNDESIRE CHANNEL CHANGES. CHANNEL ADJUSTMENT OF BED AND BANKS IS THE USUAL RESPONSE TO SPATIAL AND TEMPORAL CHANGES IN FLOW AND SEDIMENT TRANSPORT PATTERNS, IRRESPECTIVE OF WHETHER THE PROJECT IS CONSTRUCTED. UNLESS OTHERWISE NOTED, THE ELEMENTS INCLUDED IN THESE PLANS WERE CONCEIVED AND DESIGNED WITH THE CONCURRENT GOALS OF CHANGING FLOW AND SEDIMENTATION PATTERNS WHILE AT THE SAME TIME REDUCING RISK OF IMPACTS FROM FLOODING OR CHANNEL CHANGES TO THE EXTENT PRACTICABLE AND FEASIBLE. THE DESIGN ACCORDINGLY CANNOT ELIMINATE THESE RISKS COMPLETELY IN BOTH SPACE AND TIME. THE EXISTENCE OF THESE RISKS INCLUDES, BUT IS NOT LIMITED TO, CASES WHERE: (I) AN EVENT UPSTREAM OR DOWNSTREAM SUCH AS A LANDSLIDE, DEBRIS FLOW, CHANNEL AVULSION, SIGNIFICANT BANK EROSION, TREE FALL, OR OTHER NATURAL OR ANTHROPOGENIC EVENT OCCURS IN A WAY THAT AFFECTS THE FLOW RATE AND SEDIMENT DEPOSITION/TRANSPORT/ EROSION RATES AND PATTERNS INTO, THROUGH, AND BELOW THE PROJECT REACH; (II) SOME DEGREE OF BANK EROSION AND/OR TREE FALL OCCURS AT LOCATIONS WITHIN THE PROJECT REACH WHERE RIGID BANK PROTECTION IS NOT DESIGNED SPECIFICALLY; (III) AN UNPREDICTABLE EVENT OCCURS IN THE VICINITY OF A DESIGNED STRUCTURE THAT CAUSES THE RIVER TO PERFORM AN END-RUN AROUND THE STRUCTURE; (IV) THE RIVER ABANDONS THE STRUCTURE THROUGH CHANNEL MIGRATION OR AN AVULSION ASSOCIATED WITH AN EXTREME FLOOD EVENT, OR (V) VANDALISM OCCURS. IN ADDITION, ALL STRUCTURES AND DESIGNS INVOLVING BIODEGRADABLE MATERIALS SUCH AS LOGS HAVE A FIXED MATERIAL LIFESPAN THAT AFFECTS FUTURE PERFORMANCE AND PERSISTENCE, AND THAT IS NOT PREDICTABLE WITH HIGH CERTAINTY. THE DESIGNS ON THESE PLANS WERE DEVELOPED WITH DUE DILIGENCE IN CONSIDERATION OF THESE POTENTIAL OUTCOMES TO THE EXTENT THAT THEIR LIKELIHOOD OF OCCURRING IS REDUCED QUALITATIVELY BUT NOT ELIMINATED QUANTITATIVELY. WHERE FLOODPLAIN CONNECTIVITY OR INCREASED CHANNEL HABITAT COMPLEXITY IS THE GOAL, INCREASED BANK EROSION, AVULSION, AND FLOODING RISKS MAY RESULT IN DIRECT RESPONSE TO THE PROJECT, IN WAYS THAT CANNOT BE PREDICTED WITH ABSOLUTE CERTAINTY.

CONTRACTOR TO VERIFY QUANTITIES AND RESOLVE ANY DISCREPANCIES WITH ENGINEER. SEE NOTE 1

TABLE 1. ESTIMATED QUANTITIES				
PURPOSE	ITEM	SPEC/DIM	AMOUNT	UNIT
PERMIT VOLUMES/AREAS	FLOODPLAIN EARTH BALANCED CUT & FILL VOLUME	-	208	CY
	FLOODPLAIN EARTH CUT, CLEARING/GRUBBING AREA	-	0.24	ACRES
	IN-CHANNEL BALANCED GRAVEL REDISTRIBUTION VOLUME	-	1240	CY
	IN-CHANNEL BALANCED GRAVEL REDISTRIBUTION AREA OF DISTURBANCE	-	0.55	ACRES
	FLOODPLAIN RIPRAP REMOVAL	-	127	CY
	FLOODPLAIN FILL AREA	-	0.17	ACRES
	LOG WORK CUT & FILL AREA	-	0.86	ACRES
	IMPORTED ROCK VOLUME (BOULDERS, ROAD FORD SURFACING)	-	241	CY
	IMPORTED LOG VOLUME	-	962	CY
	VEGETATION CLEARING AREA (INCLUDES ACCESS, WORK AREAS)	-	0.60	ACRES
	TEMPORARY STAGING AREAS (DISTURBED)	-	0.05	ACRES
	TEMPORARY ACCESS ROAD AREA (NEW, NON-COMPACTED)	-	0.11	ACRES
ROCK	TOTAL AREA OF DISTURBANCE	-	2.46	ACRES
	STREAMBED BOULDERS - ARRAYS	4000 LB	54	EA
	STREAMBED BOULDERS -CLUSTERS	3000 LB	108	EA
	AGGREGATE FOR ACCESS ROAD COVER	ANGULAR 6"-MINUS	26	CY
EMBEDDED LOGS	LOGS W/ ROOTWADS	(14"-24") DBH X (30'-35')L	57	EA
	BALLAST BOULDERS	VARIES, SEE TABLE 2	VARIES	EA
POST ASSISTED LOG STRUCTURES	LOG W/ ROOTWAD	(14"-18") DBH X 35'L	24	EA
	LOG W/ ROOTWAD	(12"-14") DBH X (35'-40')L	8	EA
	LOG W/ ROOTWAD	(14"-18") DBH X 20'L	24	EA
	LOG W/ ROOTWAD	MIN 12" DBH X 20'L	72	EA
	MANILA HEMP ROPE	1" DIA	1848	LF
CRIB JAM	LOG W/ ROOTWAD (BUCKED)	(12"-16") DBH X 30'L	8	EA
	LOG W/ ROOTWAD (BUCKED)	(10"-12") X 30'L	2	EA
	LOG W/ ROOTWAD, BRANCHES	(12"-14") DBH X 30'L	7	EA
	VERTICAL BOLES	MIN 12" X 12'L	7	EA
	BALLAST BOULDERS	2000 LB MIN	15	EA
EXPOSED DEBRIS LOGS	LOGS W/ ROOTWADS	(14"-20") DBH X (30'-35')L	166	EA
	VERTICAL BOLES	(10"-12") X 12'L	166	EA
TESC	SILT FENCE	SEE SHEET 7	AS NEEDED	LS
WATER MANAGEMENT	SUPERSACKS/SANDBAGS FOR COFFER DAMS	SEE SHEET 8	AS NEEDED	LS
	PUMP FOR IN-CHANNEL WORK	SEE SHEET 8	AS NEEDED	LS
	PLASTIC SHEETING	SEE SHEET 8	AS NEEDED	SY
VEGETATION/SITE RESTORATION	SEE SHEETS 23 & 24			

NOTES:

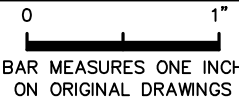
- THE GRADING PLANS HAVE BEEN PREPARED BASED ON LIDAR DATA AND SURVEY INFORMATION COLLECTED VARIOUSLY IN 2020, 2021, AND NOVEMBER 2023. THE EXISTING ELEVATIONS DEPICTED IN THESE PLANS ARE DERIVED BASED ON THOSE DATA. THE DESIGN PROFESSIONAL HAS NOT VERIFIED ANY CHANGES THAT MAY HAVE OCCURRED, AND VOLUMES FOR EXCAVATION AND FILL HAVE BEEN CALCULATED BASED ON GENERAL MACROTOPOGRAPHY RELATIVE TO THE LIDAR DATA, NOT MICROTOPOGRAPHY. COMPARISON OF GROUND TRUTH SURVEY DATA INDICATE THAT THE MAJORITY (70%) OF LIDAR ELEVATIONS ARE GENERALLY WITHIN +/- 0.5 FT OF ACTUAL. THE CONTRACTOR SHALL VERIFY ALL FIELD CONDITIONS AND REPORT ANY DEVIATIONS FROM THESE DRAWINGS TO THE OWNER PRIOR TO COMMENCING ANY WORK, AND MAINTAIN A RECORD OF ACTUAL CUT AND FILL VOLUMES FOR MEASUREMENT AND PAYMENT.
- CONTROL POINTS ARE REBAR ESTABLISHED BY PROFESSIONAL LAND SURVEYOR. CONTROL POINTS ARE INTENDED FOR ESTABLISHING CUT & FILL ELEVATIONS. LOCATIONS OF SPECIFIC PROJECT ELEMENTS WILL BE STAKED OR FLAGGED IN THE FIELD BY THE ENGINEER.

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NO.	DATE	REVISION DESCRIPTION	BY	CHK	

NONE



CONFEDERATED TRIBES UMATILLA INDIAN RESERVATION

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UMATILLA RIVER/IMEQUES FACILITY
FISH HABITAT/FLOODPLAIN RESTORATION

LEGEND, SURVEY DATUM,
SUMMARY OF QUANTITIES
100% DESIGN

DATE: JAN 27, 2026

SHEET: REV:

2

—

HIP GENERAL CONSERVATION MEASURES APPLICABLE TO ALL ACTIONS

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

PROJECT DESIGN AND SITE PREPARATION.

1. STATE AND FEDERAL PERMITS.

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

2. TIMING OF IN–WATER WORK.

- A. OREGON DEPARTMENT OF FISH AND WILDLIFE (ODFW) IN–WATER WORK WINDOW (IWW) OF JULY 1 – AUGUST 16 WILL BE ADHERED TO.
- B. CHANGES TO ESTABLISHED WORK WINDOWS WILL BE APPROVED BY REGIONAL STATE BIOLOGISTS AND BPA’S EC LEAD.
- C. BULL TROUT. FOR AREAS WITH DESIGNATED IN–WATER WORK WINDOWS FOR BULL TROUT OR AREAS KNOWN TO HAVE BULL TROUT, PROJECT PROPONENTS WILL CONTACT THE APPROPRIATE USFWS FIELD OFFICE TO INSURE THAT ALL REASONABLE IMPLEMENTATION MEASURES ARE CONSIDERED AND AN APPROPRIATE IN–WATER WORK WINDOW IS BEING USED TO MINIMIZE PROJECT EFFECTS.
- D. LAMPREY. WORKING IN STREAM OR RIVER CHANNELS THAT CONTAIN PACIFIC LAMPREY WILL BE AVOIDED FROM MARCH 1 TO JULY 1 FOR REACHES <5,000 FEET IN ELEVATION AND FROM MARCH 1 TO AUGUST 1 FOR REACHES >5,000 FEET. IF EITHER TIMEFRAME IS INCOMPATIBLE WITH OTHER OBJECTIVES, THE AREA WILL BE SURVEYED FOR NESTS AND LAMPREY PRESENCE, AND AVOIDED IF POSSIBLE. IF LAMPREYS ARE KNOWN TO EXIST, THE PROJECT SPONSOR WILL UTILIZE DEWATERING AND SALVAGE PROCEDURES (SEE FISH SALVAGE AND ELECTROFISHING SECTIONS) TO MINIMIZE ADVERSE EFFECTS.

3. CONTAMINANTS.

- A. THERE ARE NO DOCUMENTED ACTIVITIES THAT MIGHT BE ASSOCIATED WITH POTENTIAL CONTAMINANT SOURCES.ONSITE.

4. SITE LAYOUT AND FLAGGING.

- A. CONSTRUCTION AREAS TO BE CLEARLY FLAGGED PRIOR TO CONSTRUCTION.
- B. AREAS TO BE FLAGGED WILL INCLUDE:
- 1. SENSITIVE RESOURCE AREAS, SUCH AS AREAS BELOW ORDINARY HIGH WATER, SPAWNING AREAS, SPRINGS, AND WETLANDS;
 - 2. EQUIPMENT ENTRY AND EXIT POINTS;
 - 3. ROAD AND STREAM CROSSING ALIGNMENTS;
 - 4. STAGING, STORAGE, AND STOCKPILE AREAS; AND
 - 5. NO–SPRAY AREAS AND BUFFERS.

5. TEMPORARY ACCESS ROADS AND PATHS.

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

6. TEMPORARY STREAM CROSSINGS.

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

7. STAGING, STORAGE, AND STOCKPILE AREAS.

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

8. EQUIPMENT.

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

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

9. EROSION CONTROL.

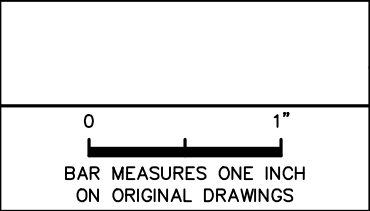
- A. TEMPORARY EROSION CONTROL MEASURES INCLUDE:
- 1. TEMPORARY EROSION CONTROLS WILL BE IN PLACE BEFORE ANY SIGNIFICANT ALTERATION OF THE ACTION SITE AND APPROPRIATELY INSTALLED DOWNSLOPE OF PROJECT ACTIVITY WITHIN THE RIPARIAN BUFFER AREA UNTIL SITE REHABILITATION IS COMPLETE;
 - 2. IF THERE IS A POTENTIAL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

10. DUST ABATEMENT.

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

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CONFEDERATED TRIBES UMATILLA INDIAN RESERVATION

DESIGNED BY: P DEVRIES
DRAWN BY: P DEVRIES
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PROJECT MGR: J KENT

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UMATILLA RIVER/IMEQUES FACILITY
FISH HABITAT/FLOODPLAIN RESTORATION

HIP4 CONSERVATION MEASURES
GENERAL CONSTRUCTION
100% DESIGN

DATE: JAN 27, 2026
SHEET: 3
REV: —

11. SPILL PREVENTION, CONTROL, AND COUNTER MEASURES

- ## 12. INVASIVE SPECIES CONTROL.

- WORK AREA ISOLATION AND FISH SALVAGE.**

1. WORK AREA ISOLATION.

- ## 2. FISH SALVAGE.

5. IF BLOCK NETS REMAIN IN PLACE MORE THAN ONE DAY, THE NETS WILL BE MONITORED AT LEAST DAILY TO ENSURE THEY ARE SECURED AND FREE OF ORGANIC ACCUMULATION. IF BULL TROUT ARE PRESENT, NETS ARE TO BE CHECKED EVERY 4 HOURS FOR FISH IMPINGEMENT.
6. CAPTURE FISH THROUGH SEINING AND RELOCATE TO STREAMS.
7. WHILE DEWATERING, ANY REMAINING FISH WILL BE COLLECTED BY HAND OR DIP NETS.
8. SEINES WITH A MESH SIZE TO ENSURE CAPTURE OF THE RESIDING ESA-LISTED FISH WILL BE USED.
9. MINNOW TRAPS WILL BE LEFT IN PLACE OVERNIGHT AND USED IN CONJUNCTION WITH SEINING.
10. ELECTROFISH TO CAPTURE AND RELOCATED FISH NOT CAUGHT DURING SEINING PER ELECTROFISH CONSERVATION MEASURES.
11. CONTINUE TO SLOWLY DEWATER STREAM REACH.
12. COLLECT ANY REMAINING FISH IN COLD-WATER BUCKETS AND RELOCATED TO THE STREAM.
13. LIMIT THE TIME FISH ARE IN A TRANSPORT BUCKET.
14. MINIMIZE PREDATION BY TRANSPORTING COMPARABLE SIZES IN BUCKETS.
15. BUCKET WATER TO BE CHANGED EVERY 15 MINUTES OR AERATED.
16. BUCKETS WILL BE KEPT IN SHADED AREAS OR COVERED.
17. DEAD FISH WILL NOT BE STORED IN TRANSPORT BUCKETS, BUT WILL BE LEFT ON THE STREAM BANK TO AVOID MORTALITY COUNTING ERRORS.

- ### 3. ELECTROFISHING.

- ## B. ELECTROFISHING TECHNIQUE.

- ### C. SAMPLE PROCESSING.

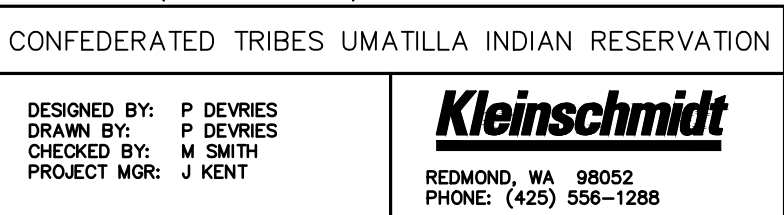
- #### D. BULL TROUT ELECTROFISHING.

1. ELECTROFISHING FOR BULL TROUT WILL ONLY OCCUR FROM MAY 1 TO JULY 31. NO ELECTROFISHING WILL OCCUR IN ANY BULL TROUT OCCUPIED HABITAT AFTER AUGUST 15. IN FMO HABITATS ELECTROFISHING MAY OCCUR ANY TIME.
2. ELECTROFISHING OF BULL TROUT WILL NOT OCCUR WHEN WATER TEMPERATURES EXCEED 15 DEGREES CELSIUS.

- #### E. LARVAL LAMPREY ELECTROFISHING.

1. PERMISSION FROM EC LEAD WILL BE OBTAINED IF LARVAL LAMPREY ELECTROFISHING IS NOT ONE OF FOLLOWING PRE-APPROVED MODELS: APP-2 "WISCONSIN", SMITH-ROOT LR-24, OR SMITH-ROOT APEX BACKPACK.
2. LARVAL LAMPREY SAMPLING WILL INCORPORATE 2-STAGE METHOD: "TICKLE" AND "STUN".
3. FIRST STAGE: USE 125 VOLT DC WITH A 25 PERCENT DUTY CYCLE APPLIED AT A SLOW RATE OF 3 PULSES PER SECOND. IF TEMPERATURES ARE BELOW 10 DEGREES CELSIUS, VOLTAGE MAY BE INCREASED GRADUALLY (NOT TO EXCEED 200 VOLTS). BURSTED PULSES (THREE SLOW AND ONE SKIPPED) RECOMMENDED TO INCREASE EMERGENCE.
4. SECOND STAGE (OPTIONAL FOR EXPERIENCED NETTERS): IMMEDIATELY AFTER LAMPREY EMERGE, USE A FAST PULSE SETTING OF 30 PULSES PER SECOND.
5. USE DIP NETS FOR VISIBLE LAMPREY. SIENES AND FINE MESH NET SWEEPS MAY BE USED IN POOR VISIBILITY.
6. SAMPLING WILL OCCUR SLOWLY (>60 SECONDS PER METER) STARTING AT UPSTREAM AND WORKING DOWNSTREAM.
7. MULTIPLE SWEEPS TO OCCUR WITH 15 MINUTES BETWEEN SWEEPS.
8. POST-DRAWDOWN "DRY-SHOCKING" WILL BE APPLIED IF LARVAL LAMPREY CONTINUE TO EMERGE. ANODES TO BE PLACED ONE METER APART TO SAMPLE ONE SQUARE METER AT A TIME FOR AT LEAST 60 SECONDS. FOR TEMPERATURES LESS THAN 10 DEGREES CELSIUS, MAXIMUM VOLTAGE MAY BE GRADUALLY INCREASED TO 400 VOLTS (DRY-SHOCKING ONLY).

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HIP4 CONSERVATION MEASURES
GENERAL/FISH PROTECTION
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DATE: JAN 27, 2026

SHEET:

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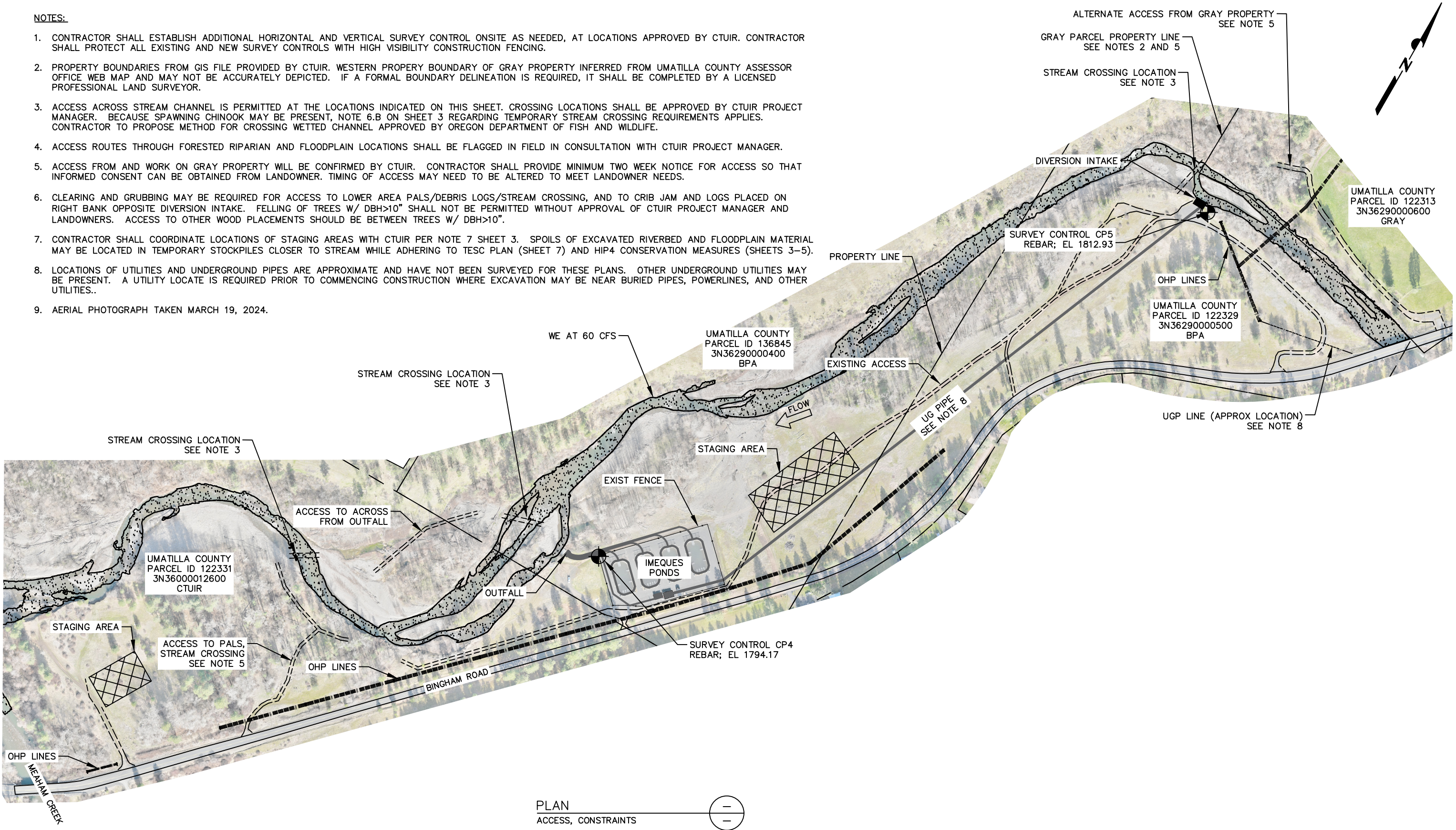
4. DEWATERING.

- CONSTRUCTION AND POST CONSTRUCTION CONSERVATION MEASURES.**

REV:	
—	

NOTES:

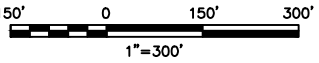
1. CONTRACTOR SHALL ESTABLISH ADDITIONAL HORIZONTAL AND VERTICAL SURVEY CONTROL ONSITE AS NEEDED, AT LOCATIONS APPROVED BY CTUIR. CONTRACTOR SHALL PROTECT ALL EXISTING AND NEW SURVEY CONTROLS WITH HIGH VISIBILITY CONSTRUCTION FENCING.
2. PROPERTY BOUNDARIES FROM GIS FILE PROVIDED BY CTUIR. WESTERN PROPERTY BOUNDARY OF GRAY PROPERTY INFERRED FROM UMATILLA COUNTY ASSESSOR OFFICE WEB MAP AND MAY NOT BE ACCURATELY DEPICTED. IF A FORMAL BOUNDARY DELINEATION IS REQUIRED, IT SHALL BE COMPLETED BY A LICENSED PROFESSIONAL LAND SURVEYOR.
3. ACCESS ACROSS STREAM CHANNEL IS PERMITTED AT THE LOCATIONS INDICATED ON THIS SHEET. CROSSING LOCATIONS SHALL BE APPROVED BY CTUIR PROJECT MANAGER. BECAUSE SPAWNING CHINOOK MAY BE PRESENT, NOTE 6.B ON SHEET 3 REGARDING TEMPORARY STREAM CROSSING REQUIREMENTS APPLIES. CONTRACTOR TO PROPOSE METHOD FOR CROSSING WETTED CHANNEL APPROVED BY OREGON DEPARTMENT OF FISH AND WILDLIFE.
4. ACCESS ROUTES THROUGH FORESTED RIPARIAN AND FLOODPLAIN LOCATIONS SHALL BE FLAGGED IN FIELD IN CONSULTATION WITH CTUIR PROJECT MANAGER.
5. ACCESS FROM AND WORK ON GRAY PROPERTY WILL BE CONFIRMED BY CTUIR. CONTRACTOR SHALL PROVIDE MINIMUM TWO WEEK NOTICE FOR ACCESS SO THAT INFORMED CONSENT CAN BE OBTAINED FROM LANDOWNER. TIMING OF ACCESS MAY NEED TO BE ALTERED TO MEET LANDOWNER NEEDS.
6. CLEARING AND GRUBBING MAY BE REQUIRED FOR ACCESS TO LOWER AREA PALS/DEBRIS LOGS/STREAM CROSSING, AND TO CRIB JAM AND LOGS PLACED ON RIGHT BANK OPPOSITE DIVERSION INTAKE. FELLING OF TREES W/ DBH>10" SHALL NOT BE PERMITTED WITHOUT APPROVAL OF CTUIR PROJECT MANAGER AND LANDOWNERS. ACCESS TO OTHER WOOD PLACEMENTS SHOULD BE BETWEEN TREES W/ DBH>10".
7. CONTRACTOR SHALL COORDINATE LOCATIONS OF STAGING AREAS WITH CTUIR PER NOTE 7 SHEET 3. SPOILS OF EXCAVATED RIVERBED AND FLOODPLAIN MATERIAL MAY BE LOCATED IN TEMPORARY STOCKPILES CLOSER TO STREAM WHILE ADHERING TO TESC PLAN (SHEET 7) AND HIP4 CONSERVATION MEASURES (SHEETS 3-5).
8. LOCATIONS OF UTILITIES AND UNDERGROUND PIPES ARE APPROXIMATE AND HAVE NOT BEEN SURVEYED FOR THESE PLANS. OTHER UNDERGROUND UTILITIES MAY BE PRESENT. A UTILITY LOCATE IS REQUIRED PRIOR TO COMMENCING CONSTRUCTION WHERE EXCAVATION MAY BE NEAR BURIED PIPES, POWERLINES, AND OTHER UTILITIES..
9. AERIAL PHOTOGRAPH TAKEN MARCH 19, 2024.



PLAN
ACCESS, CONSTRAINTS

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1	10/7/24	MODIFIED ACCESS TO DOWNSTREAM WORK AREAS	PDV	
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BAR MEASURES ONE INCH
ON ORIGINAL DRAWINGS

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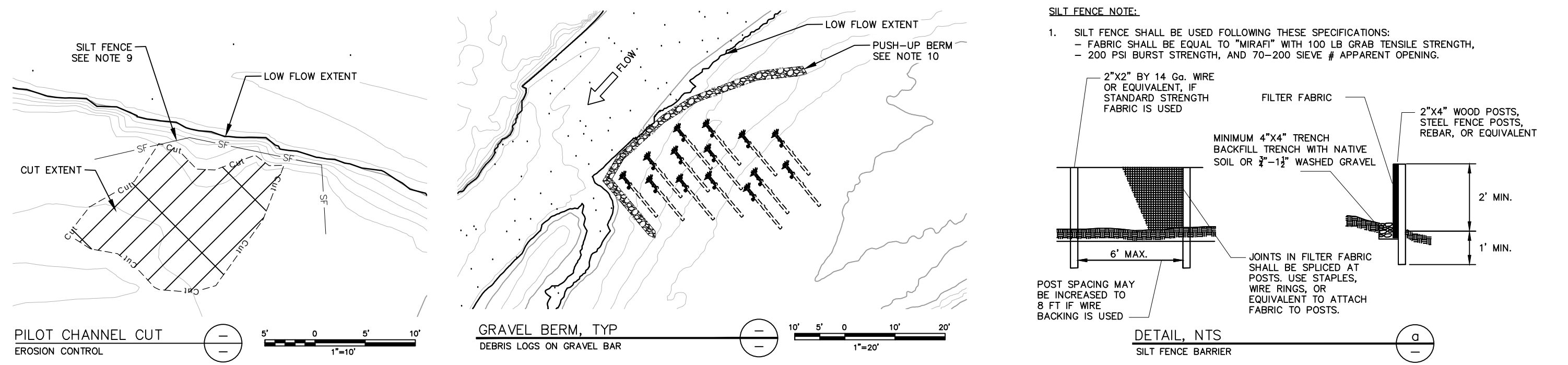
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UMATILLA RIVER/IMEQUES FACILITY
FISH HABITAT/FLOODPLAIN RESTORATION

ACCESS/STAGING, INFRASTRUCTURE
PARCEL BOUNDARIES, MONUMENTS
100% DESIGN

DATE: JAN 27, 2026
SHEET: 6
REV: 1

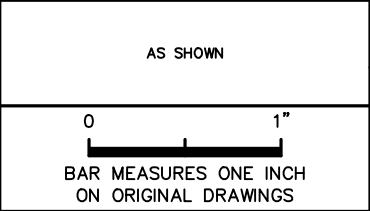


TEMPORARY EROSION AND SEDIMENT CONTROL NOTES

1. THE IMPLEMENTATION OF THESE TESC PLANS AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE TESC FACILITIES SHALL BE REVIEWED AND SUPERVISED BY AN INDIVIDUAL WITH CESCL CERTIFICATION AND EXPERIENCE IN IMPLEMENTING TESC PLANS.
2. BOUNDARIES OF CLEARING LIMITS IN RIPARIAN VEGETATION AREAS SHALL BE APPROVED BY ENGINEER AND/OR OWNER PRIOR TO CONSTRUCTION; DURING CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE CLEARING LIMITS SHALL BE PERMITTED. THE CLEARING LIMITS SHALL BE MONITORED BY OWNER PROJECT MANAGER FOR THE DURATION OF CONSTRUCTION.
3. THE TESC FACILITIES SHOWN ON THIS PLAN MUST BE CONSTRUCTED PRIOR TO OR IN CONJUNCTION WITH ALL CLEARING AND GRADING SO AS TO ENSURE THAT THE TRANSPORT OF SEDIMENT TO SURFACE WATERS, AND ADJACENT PROPERTIES IS MINIMIZED.
4. THE TESC FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR THE ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD THESE TESC FACILITIES SHALL BE UPGRADED BY CONTRACTOR AND APPROVED BY THE ENGINEER AS NEEDED FOR UNEXPECTED STORM EVENTS AND MODIFIED TO ACCOUNT FOR CHANGING SITE CONDITIONS (E.G., INSTALLATION/RELOCATION OF SILT FENCES, ETC.)
5. THE TESC FACILITIES SHALL BE INSPECTED DAILY AND MAINTAINED BY CONTRACTOR TO ENSURE CONTINUED PROPER FUNCTIONING.
6. THE TESC FACILITIES ON INACTIVE SITES SHALL BE INSPECTED AND MAINTAINED A MINIMUM OF ONCE A WEEK OR WITHIN 48 HOURS OF FOLLOWING A STORM EVENT.
7. WHERE TEMPORARY EROSION CONTROL IS REQUIRED, CERTIFIED WEED-FREE STRAW MULCH SHALL BE APPLIED AT A MINIMUM 2-INCH THICKNESS.
8. EROSION CONTROL WILL MEET ALL HIP4 REQUIREMENTS ON SHEET 3.
9. SILT FENCING SHALL BE INSTALLED BELOW TOP OF EXISTING CHANNEL BANK BELOW ELEVATION OF PILOT CHANNEL CUT. CARE SHALL BE TAKEN TO PEEL DIRT AWAY FROM CHANNEL WHILE EXCAVATING TO MINIMIZE MATERIAL FALLING ONTO SILT FENCE BARRIER. MATERIAL WILL BE HAND CLEARED DURING CONSTRUCTION AND BEFORE REMOVING SILT FENCE.
10. AT LOCATIONS WHERE RISK OF DIRTY WATER ENTERING STREAM IS CONSIDERED LIKELY WHEN GRADING OR INSTALLING DEBRIS LOGS, USE EXCAVATOR TO CONSTRUCT MINIMUM 2 FT HIGH PUSH-UP GRAVEL BERM ALONG EDGE OF BAR FOLLOWING TYPICAL PLAN THIS SHEET. MONITOR TURBIDITY DURING GRADING. START EXCAVATION AT DOWNSTREAM END AND WORK IN UPSTREAM DIRECTION. USE EXCAVATED MATERIAL FROM TRENCH FOR BERM MATERIAL.
11. TREE FELLING SHALL NOT CREATE EXCESSIVE STREAM BANK EROSION OR INCREASE THE LIKELIHOOD OF CHANNEL AVULSION DURING HIGH FLOWS. CONFIRM LOCATIONS WITH OWNER PROJECT MANAGER.
12. ALL DISTURBED AREAS SHALL BE SEEDED AT END OF CONSTRUCTION WITH APPROVED NATIVE SEED MIX PER SHEET 23.

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CONFEDERATED TRIBES UMATILLA INDIAN RESERVATION

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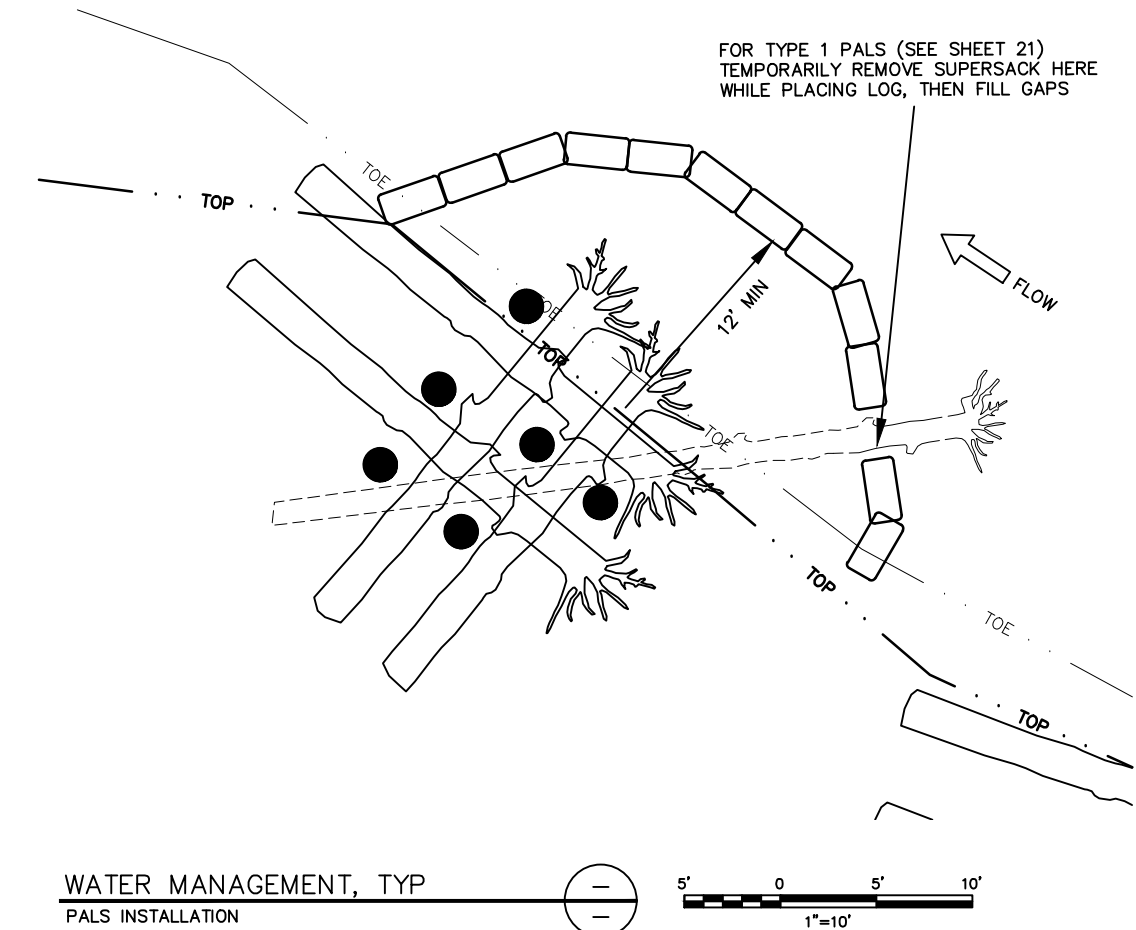
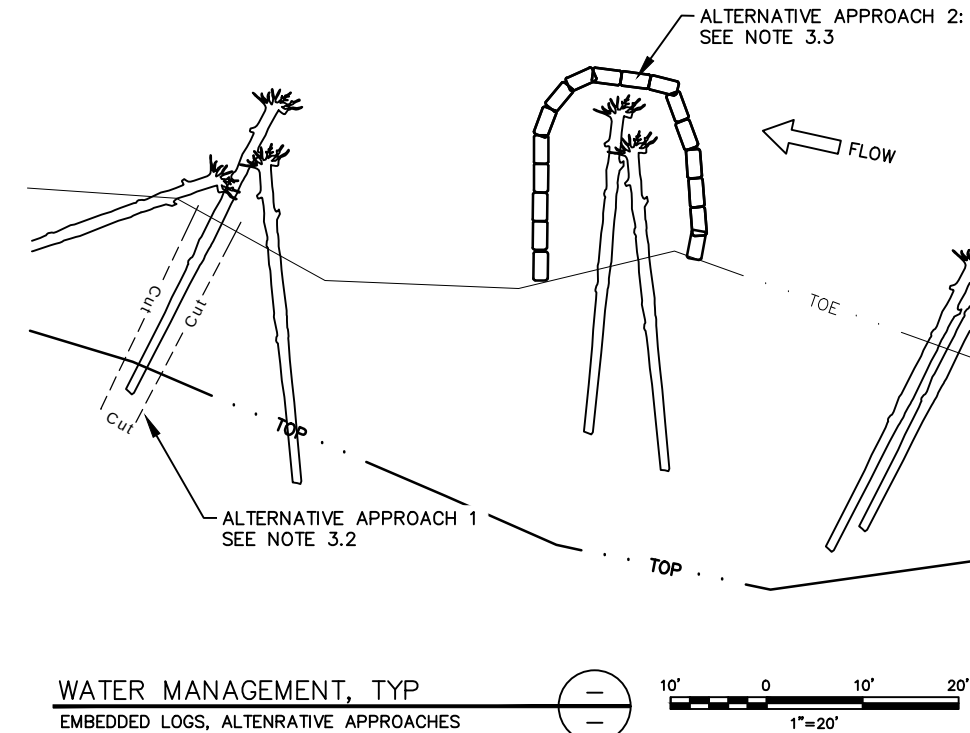
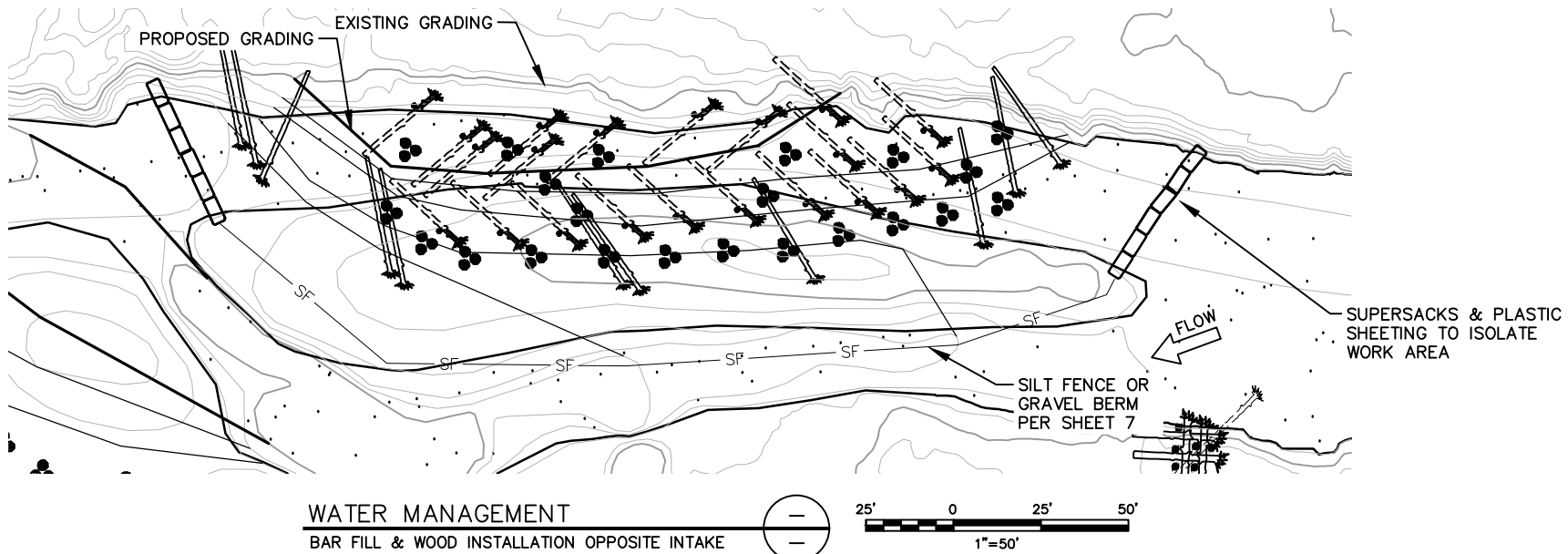
UMATILLA RIVER/IMEQUES FACILITY
FISH HABITAT/FLOODPLAIN RESTORATION

TESC, TEMPORARY STOCKPILING
PLAN
100% DESIGN

DATE: JAN 27, 2026
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NOTES:

1. WATER MANAGEMENT IS REQUIRED FOR CONSTRUCTION OF LOG INSTALLATIONS WHERE THERE IS RISK OF TEMPORARY TURBIDITY IMPACT TO WATER QUALITY. WATER MANAGEMENT STRATEGY SHALL BE TO ISOLATE WORK AREAS AND PREVENT DISCHARGE AND SEEPAGE OF DIRTY WATER TO ADJACENT STREAM CHANNEL. IN ALL CASES, SCREENED PUMPS SHALL BE ON SITE AS NEEDED TO EITHER KEEP ISOLATED WORK AREAS SUFFICIENTLY DRY OR MAINTAIN HYDRAULIC GRADIENT FROM CHANNEL TO WORK AREA. PUMPED WATER WILL BE DISCHARGED TO FLOODPLAIN SWALES OR SAND BAG-CONFINED SETTLING/INFILTRATION AREAS IF SWALE OVERFLOWS AND DRAINS TO CHANNEL. THERE SHALL BE A BACKUP PUMP AVAILABLE ON THE PROJECT SITE AS WELL.
2. GENERAL SEQUENCE FOR PALS ISOLATION AND CONSTRUCTION:
 - 2.1. FIRST SWEEP AREA OF FISH USING SEINING AND ELECTROFISHING FOLLOWING HIP4 REQUIREMENTS ON SHEET 4 AND CTUIR FISH SALVAGE IMPLEMENTATION PLAN; WORK IN DOWNSTREAM DIRECTION TO CHASE FISH AWAY.
 - 2.2. STARTING AT UPSTREAM END ON BANK, PLACE SUPERSACKS TO FORM COFFERDAM, WITH POLY SHEETING AND SAND BAGS AT TOE OF COFFERDAM, AROUND EXPECTED EXCAVATION AREA AND WORK BACK TO BANK AT DOWNSTREAM END.
 - 2.3. PERFORM FISH SALVAGE IN ISOLATED WORK AREA FOLLOWING HIP4 REQUIREMENTS ON SHEET 4 AND CTUIR FISH SALVAGE IMPLEMENTATION PLAN. RELEASE FISH TO PROTECTED AREAS DOWNSTREAM WHERE THEY CAN RECOVER.
 - 2.4. USE SCREENED PUMP FOR DEWATERING WORK AREA AS NEEDED FOR SEDIMENT CONTROL AND WORKABILITY, FOLLOWING HIP4 REQUIREMENTS ON SHEET 4, INCLUDING INSTALLING A SCREENED ENCLOSURE AROUND PUMP. DISCHARGE TO FLOODPLAIN SWALE AND CONTAIN --- DO NOT ALLOW DIRTY WATER TO RE-ENTER CHANNEL. MAX RATE ALLOWED PER PUMP = 1350 GPM.
 - 2.5. EXCAVATE FOR VERTICAL BOLE PLACEMENT, USING SCREENED PUMP TO MAINTAIN LOW WATER LEVEL AND MINIMIZE CAVING-IN OF SIDES OF PIT DUE TO SLOSHING.
 - 2.6. PLACE VERTICAL BOLES, BACKFILL WITH SPOILS TO STREAMBED ELEVATION.
 - 2.7. FOR PALS TYPE 1, INSTALL LONG DIAGONAL HORIZONTAL LOG W/ ROOTWAD. DURING PLACEMENT, REMOVE GAP IN SANDBAG COFFER DAM, LOWER LOG INTO POSITION, AND REFORM SEAL ON EACH SIDE OF LOG AFTER PLACEMENT. MAINTAIN PUMPING IF WATER THREATENS TO OVERTOP SANDBAGS AT DOWNSTREAM END.
 - 2.8. CONSTRUCT REMAINING HORIZONTAL LOGS, COMPLETE ROPE WORK, BACKFILL WITH SPOILS. ALLOW WATER TO CLEAR.
 - 2.9. SLOWLY REMOVE SANDBAG COFFERDAM, STARTING AT UPSTREAM END AND ALLOW DIRTY WATER TO DISPERSE WITHOUT EXCEEDING STATE WATER QUALITY CRITERIA.
3. GENERAL SEQUENCE FOR ISOLATING EMBEDDED HABITAT LOG AREAS:
 - 3.1. FIRST SWEEP AREA OF FISH USING SEINING AND ELECTROFISHING FOLLOWING HIP4 REQUIREMENTS ON SHEET 4 AND CTUIR FISH SALVAGE IMPLEMENTATION PLAN; WORK IN DOWNSTREAM DIRECTION TO CHASE FISH AWAY.
 - 3.2. ALTERNATIVE APPROACH 1:
 - 3.2.1. EXCAVATE TRENCH FOR LOG(S), LEAVING A HIGHER MOUND AT WATER'S EDGE UNTIL TRENCH IS READY TO RECEIVE LOG.
 - 3.2.2. SCOOP OUT A SMALL DEPRESSION IN STREAMBED FOR ROOTWAD PLACEMENT
 - 3.2.3. EXCAVATE MOUND, AND WHILE WATER FLOWS INTO TRENCH, QUICKLY PLACE LOG, AND BACKFILL AROUND LOG AT WATER'S EDGE
 - 3.2.4. COMPLETE BACKFILL.
 - 3.3. ALTERNATIVE APPROACH 2:
 - 3.3.1. PLACE SAND BAGS WITH POLYETHYLENE OR FUNCTIONALLY EQUIVALENT IMPERMEABLE SHEETING TO FORM COFFERDAM. ANCHOR SHEETING UNDER SAND BAGS AT TOE OF COFFERDAM, STARTING AT UPSTREAM END AND WORKING IN DOWNSTREAM DIRECTION.
 - 3.3.2. ELECTRO-FISH INSIDE ISOLATED AREA, RELEASE FISH TO PROTECTED AREA WHERE THEY CAN RECOVER.
 - 3.3.3. AS NEEDED, INSTALL AND START PUMP(S) PRIOR TO EXCAVATION; DISCHARGE TO FLOODPLAIN SWALE AND CONTAIN --- DO NOT ALLOW DIRTY WATER TO RE-ENTER CHANNEL.
 - 3.3.4. EXCAVATE TRENCH FOR LOG(S), PLACE LOG(S), BACKFILL WITH SPOILS. ALLOW WATER TO CLEAR.
 - 3.3.5. SLOWLY REMOVE SANDBAG COFFERDAM, STARTING AT UPSTREAM END AND ALLOW DIRTY WATER TO DISPERSE WITHOUT EXCEEDING STATE WATER QUALITY CRITERIA.
4. CRIB JAM SHALL BE CONSTRUCTED FOLLOWING ALTERNATIVE APPROACH 2 AS DESCRIBED IN NOTE 3.3. ALTERNATIVELY, CONTRACTOR MAY BE ABLE TO DIVERT WATER VIA TEMPORARY TRENCH ACROSS LEFT BANK COBBLE BAR TO DISCHARGE DOWNSTREAM OF BEND.
5. TRENCHES FOR DEBRIS LOGS MAY BE EXCAVATED IN WET WITHOUT PUMPING, TAKING CARE TO ALLOW SPOILS WATER TO INFILTRATE OR POND ON BAR WITHOUT RUNNING INTO STREAM
6. FISH SALVAGE WILL BE REQUIRED AT ALL ISOLATION AREAS LEFT INTACT OVERNIGHT, PRIOR TO RESUMING CONSTRUCTION EACH DAY.
7. BOULDER CLUSTERS AND ARRAYS WILL BE INSTALLED USING AN EXCAVATOR FROM SHORE WITHOUT ISOLATION OF PLACEMENT LOCATION.
8. CHANGES TO PLAN AND MATERIALS MUST BE APPROVED BY ENGINEER AND OWNER PROJECT MANAGER.



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AS SHOWN

0 1"
BAR MEASURES ONE INCH
ON ORIGINAL DRAWINGS

CONFEDERATED TRIBES UMATILLA INDIAN RESERVATION

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UMATILLA RIVER/IMEQUES FACILITY
FISH HABITAT/FLOODPLAIN RESTORATION

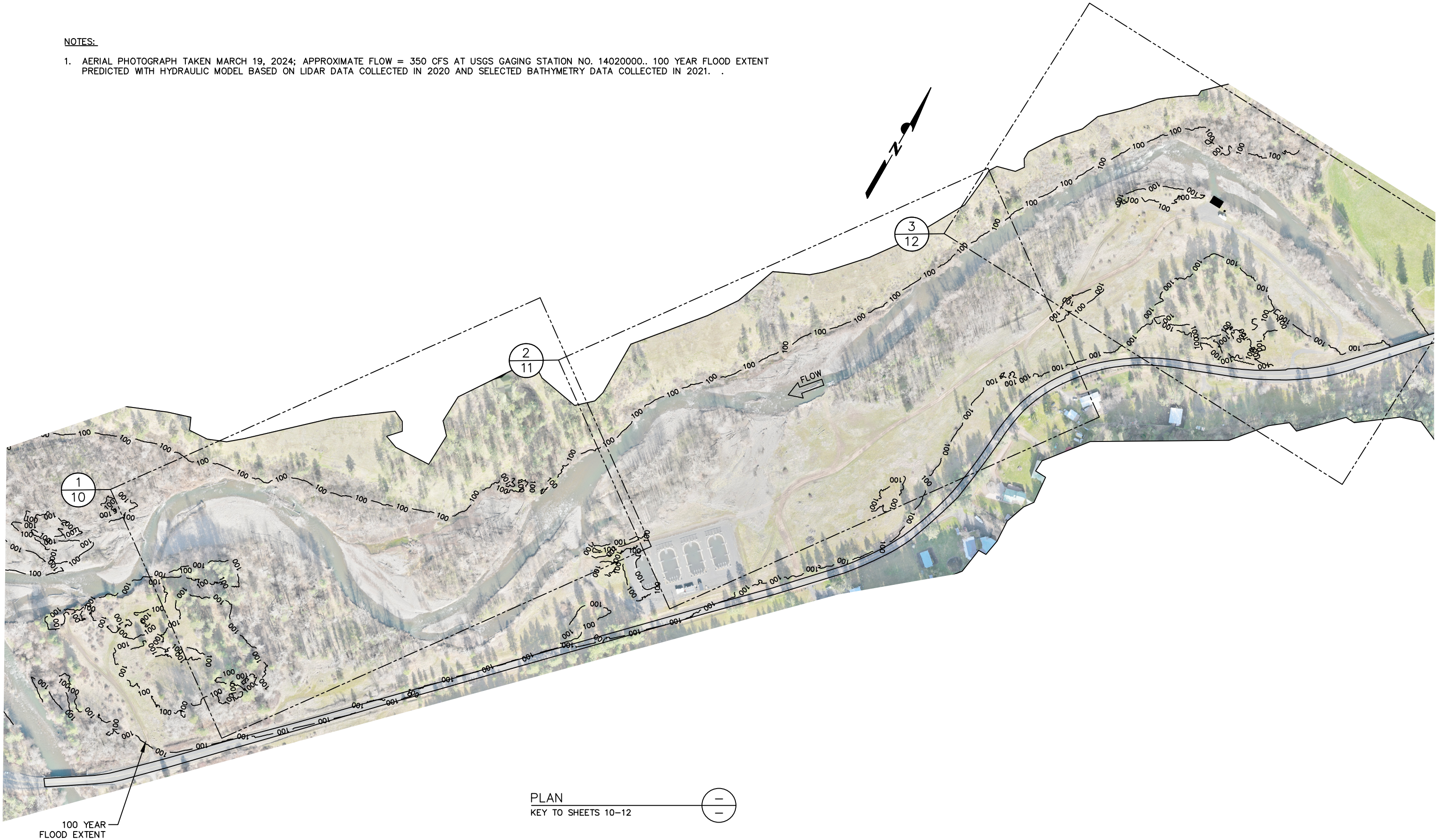
WATER MANAGEMENT PLAN

100% DESIGN

DATE: JAN 27, 2026
SHEET: 8
REV: —

NOTES:

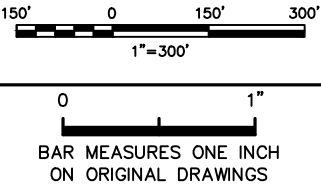
1. AERIAL PHOTOGRAPH TAKEN MARCH 19, 2024; APPROXIMATE FLOW = 350 CFS AT USGS GAGING STATION NO. 14020000.. 100 YEAR FLOOD EXTENT PREDICTED WITH HYDRAULIC MODEL BASED ON LIDAR DATA COLLECTED IN 2020 AND SELECTED BATHYMETRY DATA COLLECTED IN 2021. .



PLAN
KEY TO SHEETS 10-12

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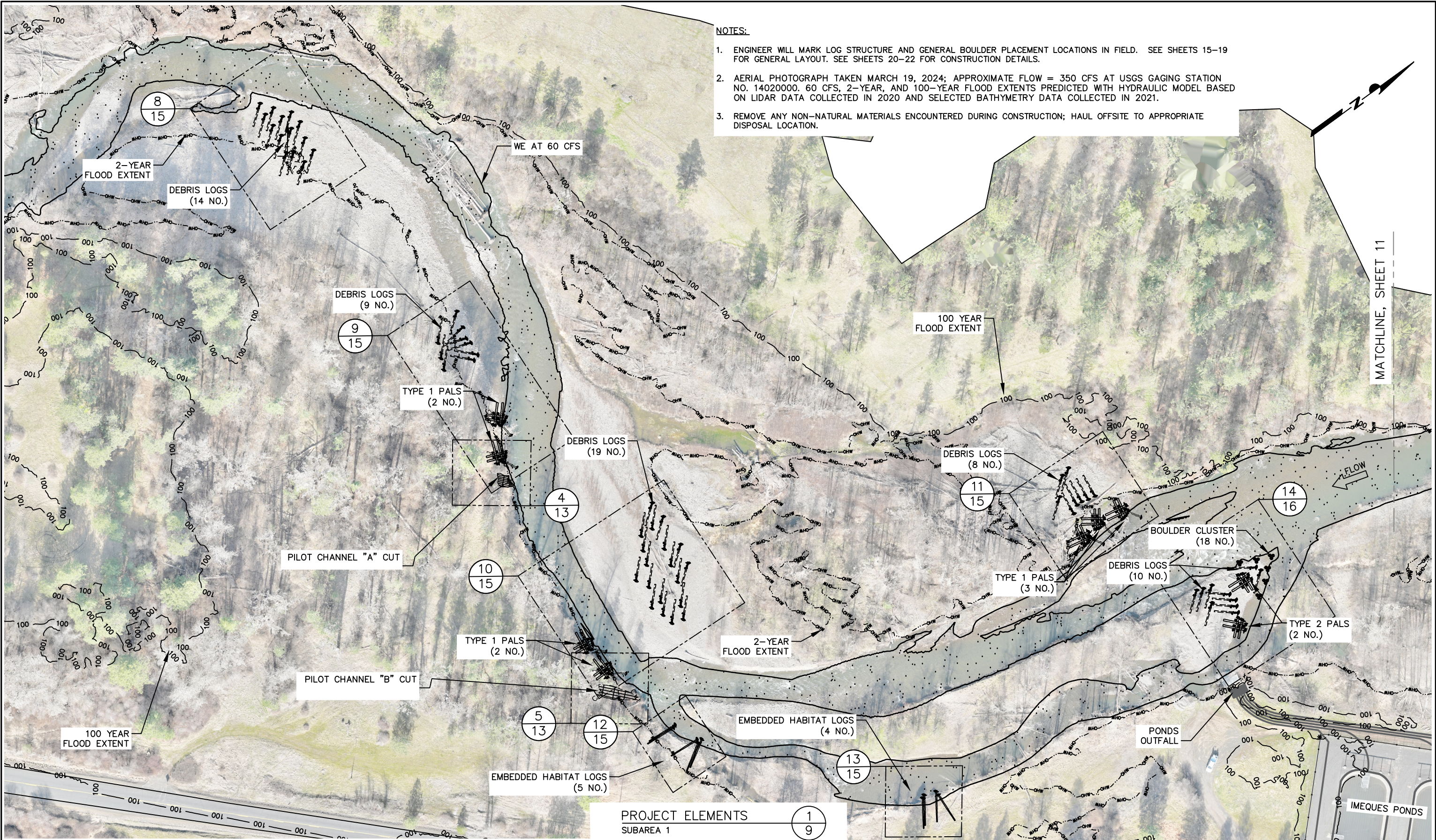
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UMATILLA RIVER/IMEQUES FACILITY
FISH HABITAT/FLOODPLAIN RESTORATION

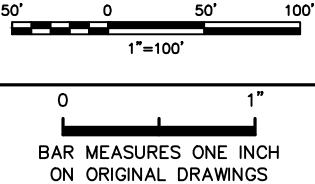
PROJECT ELEMENT PLAN
KEY TO SUBAREA PLAN SHEETS
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1	10/7/24	MODIFIED PALS & EMBEDDED LOG LAYOUTS	PDV	
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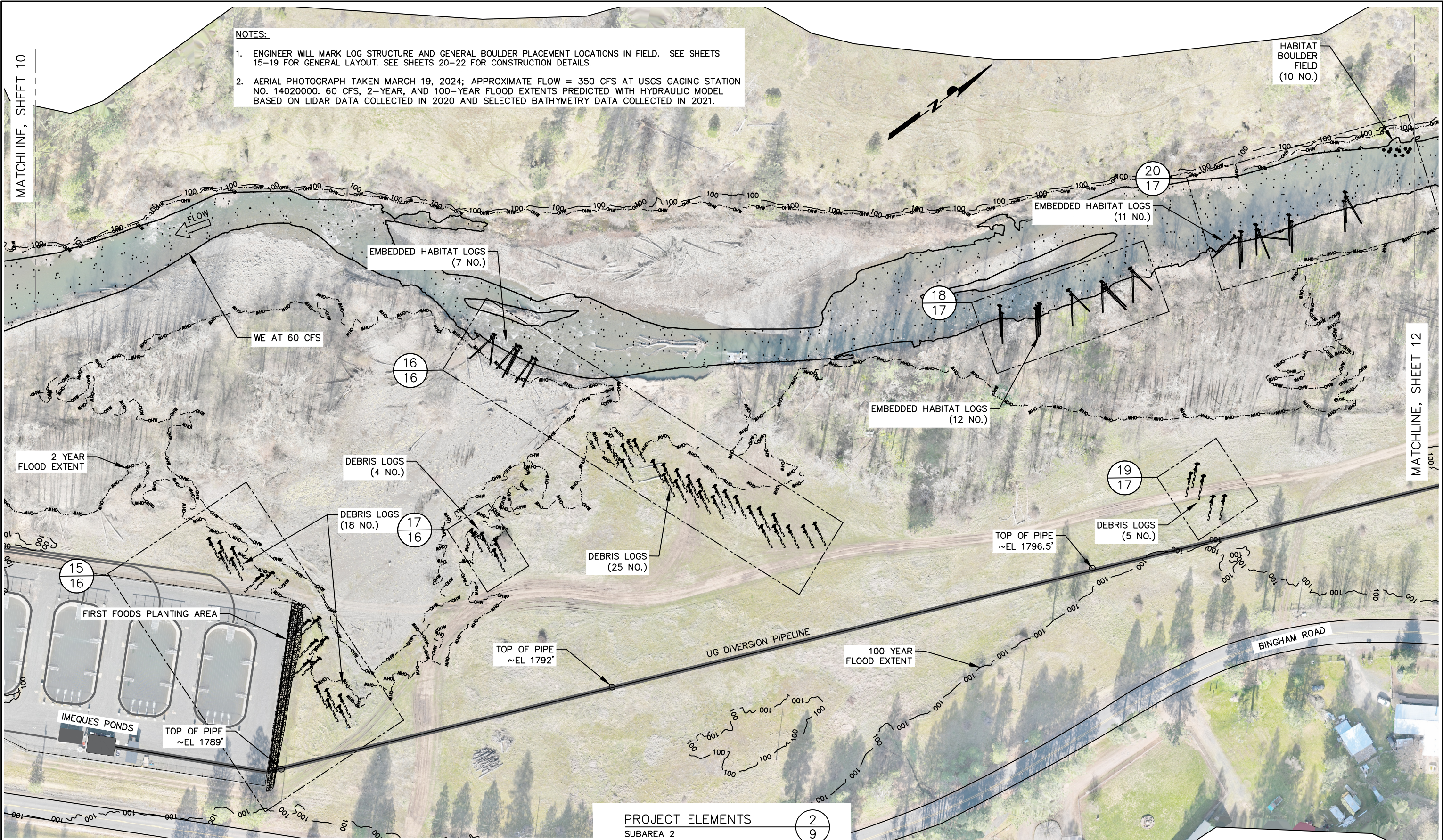
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UMATILLA RIVER/IMEQUES FACILITY
FISH HABITAT/FLOODPLAIN RESTORATION

PROJECT ELEMENTS
PLAN LAYOUT – SUBAREA 1
100% DESIGN

DATE: JAN 27, 2026
SHEET: 10
REV: –



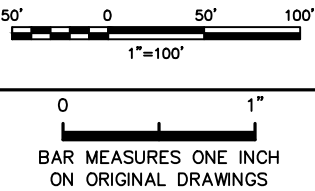
- NOTES:
- ENGINEER WILL MARK LOG STRUCTURE AND GENERAL BOULDER PLACEMENT LOCATIONS IN FIELD. SEE SHEETS 15-19 FOR GENERAL LAYOUT. SEE SHEETS 20-22 FOR CONSTRUCTION DETAILS.
 - AERIAL PHOTOGRAPH TAKEN MARCH 19, 2024; APPROXIMATE FLOW = 350 CFS AT USGS GAGING STATION NO. 14020000. 60 CFS, 2-YEAR, AND 100-YEAR FLOOD EXTENTS PREDICTED WITH HYDRAULIC MODEL BASED ON LIDAR DATA COLLECTED IN 2020 AND SELECTED BATHYMETRY DATA COLLECTED IN 2021.

PROJECT ELEMENTS
SUBAREA 2

2
9

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1	10/7/24	MODIFIED EMBEDDED LOG LAYOUTS	PDV	
NO.	DATE	REVISION DESCRIPTION	BY	CHK



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CHECKED BY: M SMITH
PROJECT MGR: J KENT

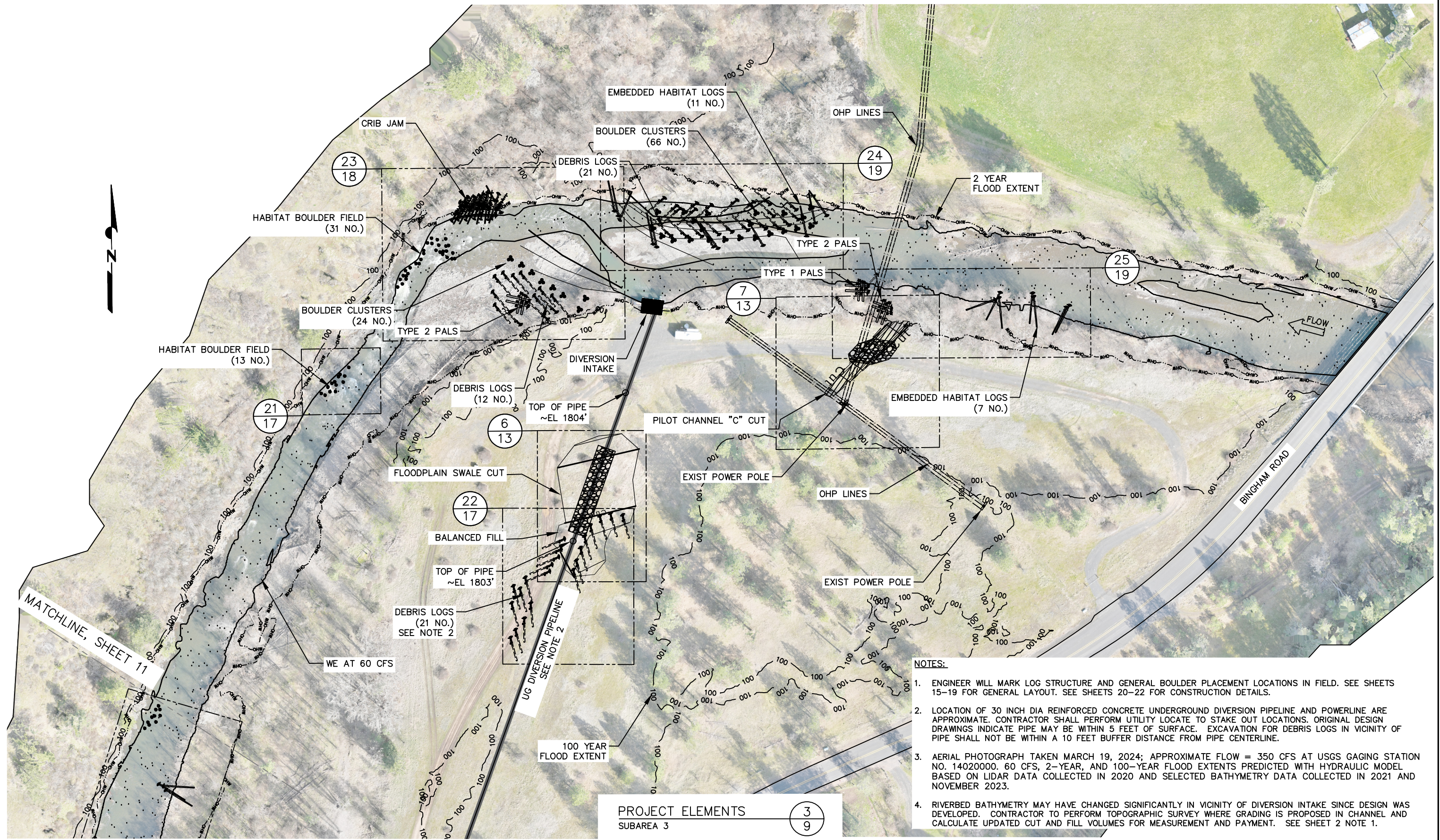
Kleinschmidt

REDMOND, WA 98052
PHONE: (425) 556-1288

UMATILLA RIVER/IMEQUES FACILITY
FISH HABITAT/FLOODPLAIN RESTORATION

PROJECT ELEMENTS
PLAN LAYOUT - SUBAREA 2
100% DESIGN

DATE: JAN 27, 2026
SHEET: 11
REV: -

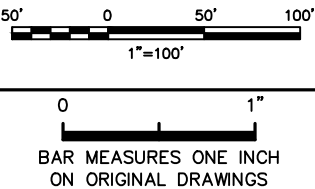


NOTES:

- ENGINEER WILL MARK LOG STRUCTURE AND GENERAL BOULDER PLACEMENT LOCATIONS IN FIELD. SEE SHEETS 15-19 FOR GENERAL LAYOUT. SEE SHEETS 20-22 FOR CONSTRUCTION DETAILS.
- LOCATION OF 30 INCH DIA REINFORCED CONCRETE UNDERGROUND DIVERSION PIPELINE AND POWERLINE ARE APPROXIMATE. CONTRACTOR SHALL PERFORM UTILITY LOCATE TO STAKE OUT LOCATIONS. ORIGINAL DESIGN DRAWINGS INDICATE PIPE MAY BE WITHIN 5 FEET OF SURFACE. EXCAVATION FOR DEBRIS LOGS IN VICINITY OF PIPE SHALL NOT BE WITHIN A 10 FEET BUFFER DISTANCE FROM PIPE CENTERLINE.
- AERIAL PHOTOGRAPH TAKEN MARCH 19, 2024; APPROXIMATE FLOW = 350 CFS AT USGS GAGING STATION NO. 14020000. 60 CFS, 2-YEAR, AND 100-YEAR FLOOD EXTENTS PREDICTED WITH HYDRAULIC MODEL BASED ON LIDAR DATA COLLECTED IN 2020 AND SELECTED BATHYMETRY DATA COLLECTED IN 2021 AND NOVEMBER 2023.
- RIVERBED BATHYMETRY MAY HAVE CHANGED SIGNIFICANTLY IN VICINITY OF DIVERSION INTAKE SINCE DESIGN WAS DEVELOPED. CONTRACTOR TO PERFORM TOPOGRAPHIC SURVEY WHERE GRADING IS PROPOSED IN CHANNEL AND CALCULATE UPDATED CUT AND FILL VOLUMES FOR MEASUREMENT AND PAYMENT. SEE SHEET 2 NOTE 1.

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1	10/7/24	MODIFIED EMBEDDED LOG LAYOUTS	PDV	
NO.	DATE	REVISION DESCRIPTION	BY	CHK



CONFEDERATED TRIBES UMATILLA INDIAN RESERVATION

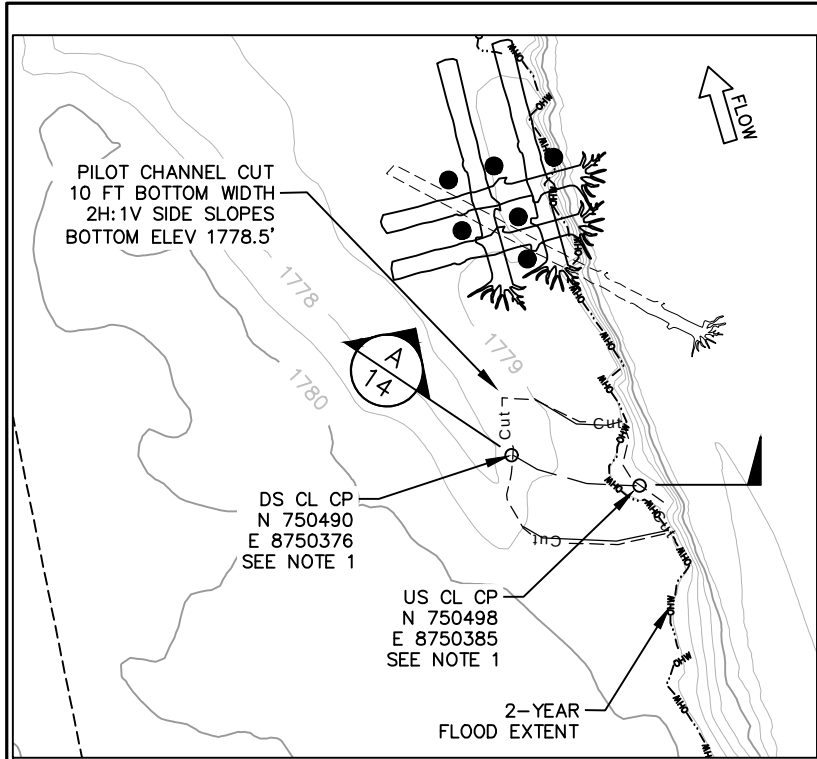
DESIGNED BY: P DEVRIES
DRAWN BY: P DEVRIES
CHECKED BY: M SMITH
PROJECT MGR: J KENT

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UMATILLA RIVER/IMEQUES FACILITY
FISH HABITAT/FLOODPLAIN RESTORATION

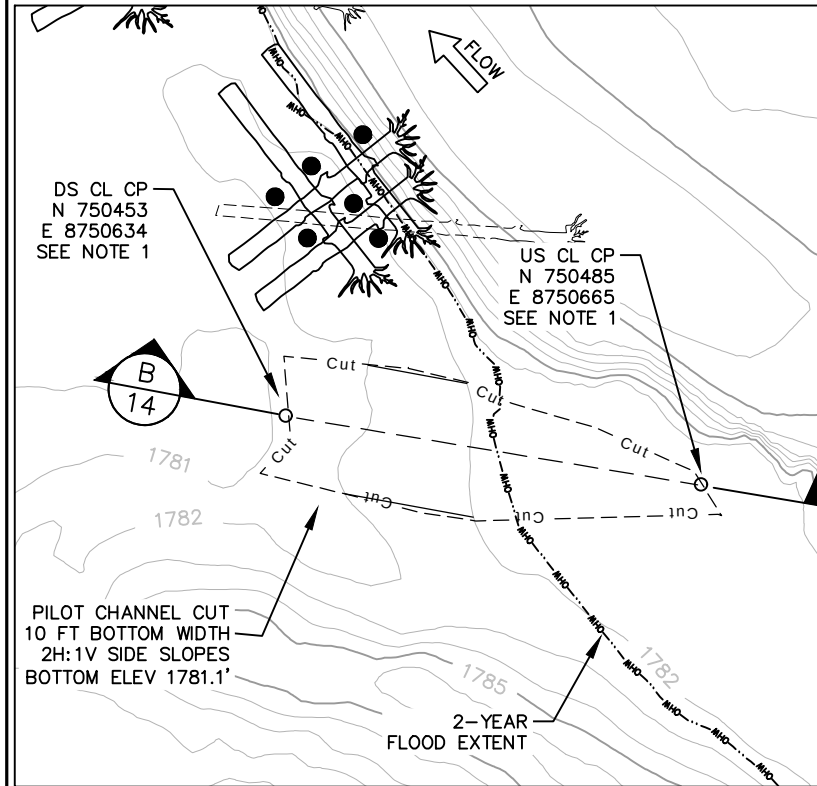
PROJECT ELEMENTS
PLAN LAYOUT - SUBAREA 3
100% DESIGN

DATE: JAN 27, 2026
SHEET: 12
REV: -



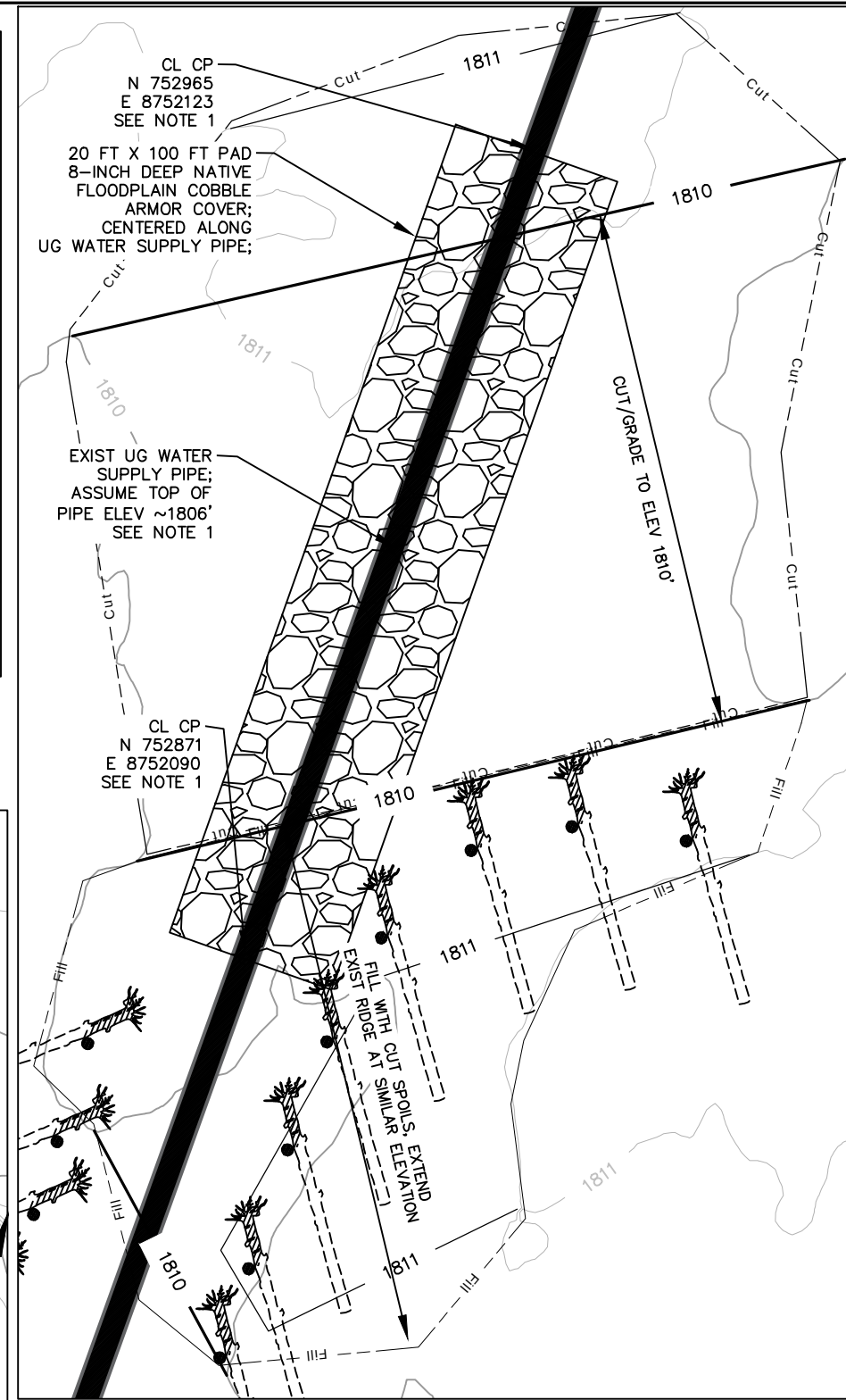
PLAN
PILOT CHANNEL "A" CUT

4
10



PLAN
PILOT CHANNEL "B" CUT

5
10

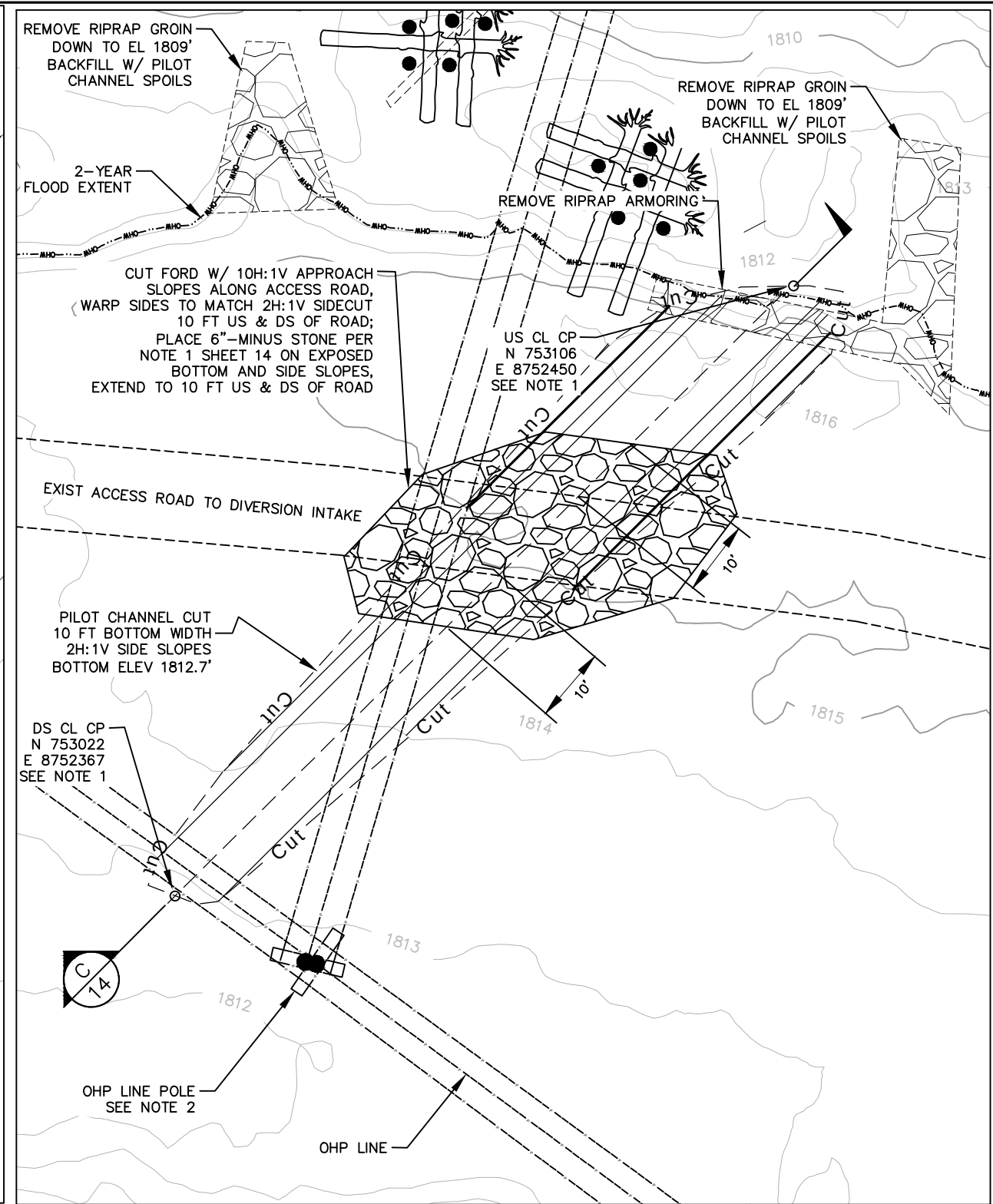


PLAN
GRADING/ARMOR OVER BURIED PIPE

6
12

NOTES:

- COORDINATES OF UPSTREAM AND DOWNSTREAM CUT EXTENTS ARE APPROXIMATE AND ARE PROVIDED AS GUIDANCE. GOAL IS TO CUT DOWN TO ELEVATION SPECIFIED ON SHEET 14 AND ENSURE NO PONDING OCCURS AT DOWNSTREAM END DURING OVERBANK FLOW. CONTRACTOR SHALL PERFORM UTILITY LOCATE TO CONFIRM LOCATION OF PIPELINE. ENGINEER WILL MARK LOCATIONS OF RIPRAP REMOVAL.
- CONTRACTOR SHALL BE FAMILIAR WITH ALL OSHA REGULATIONS REGARDING WORKING UNDER OVERHEAD POWER LINES. MAINTAIN MINIMUM DISTANCE OF 10 FEET BETWEEN EXCAVATOR ARM/BUCKET AND POWER LINES.
- PERFORM GRADING PRIOR TO WOOD PLACEMENT. CONFIRM FINAL GRADING ELEVATIONS WITH ENGINEER IF USING AUTOMATED GPS GRADING CONTROL.

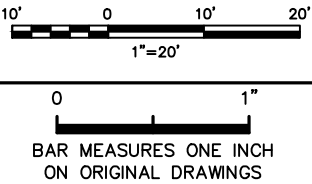


PLAN
PILOT CHANNEL "C" CUT

7
12

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NO.	DATE	REVISION DESCRIPTION	BY	CHK



CONFEDERATED TRIBES UMATILLA INDIAN RESERVATION

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CHECKED BY: M SMITH
PROJECT MGR: J KENT

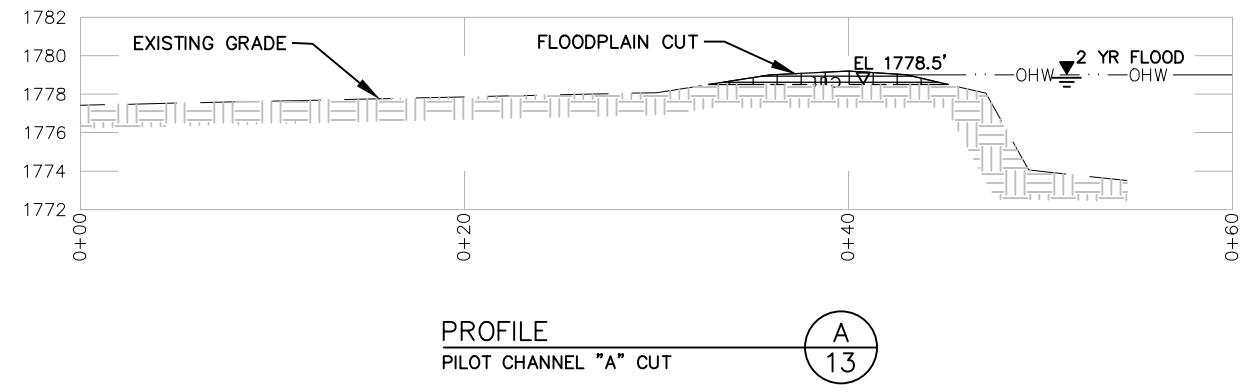
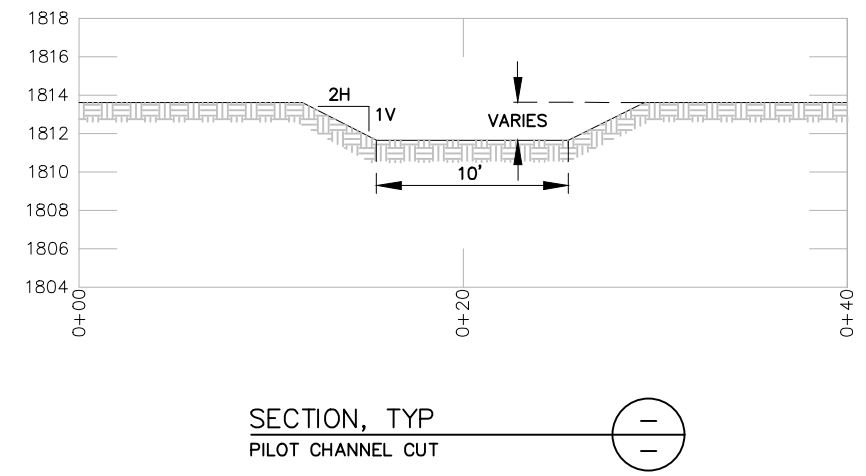
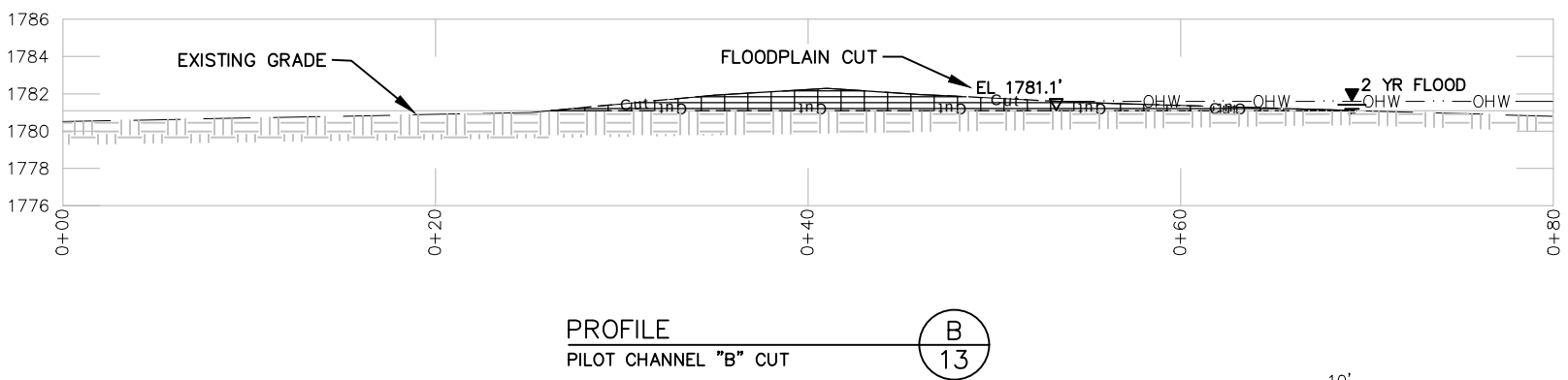
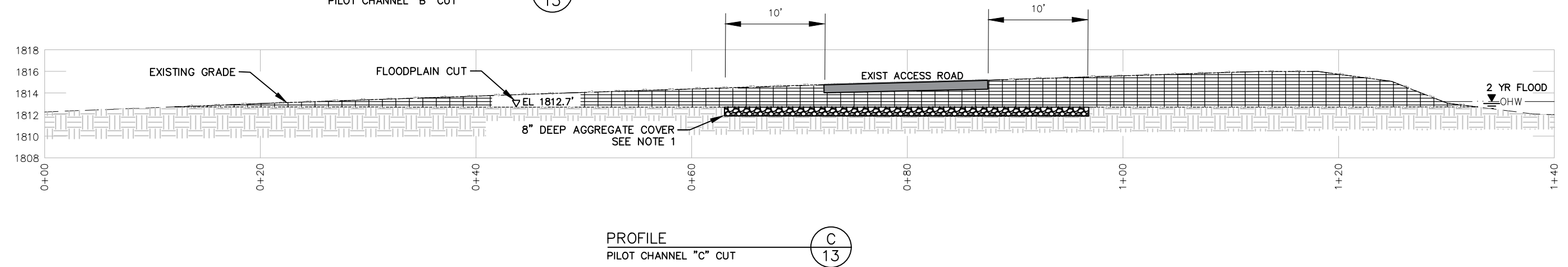
Kleinschmidt

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PHONE: (425) 556-1288

UMATILLA RIVER/IMEQUES FACILITY
FISH HABITAT/FLOODPLAIN RESTORATION

PILOT CHANNEL GRADING
PLAN
100% DESIGN

DATE: JAN 27, 2026
SHEET: 13
REV: —

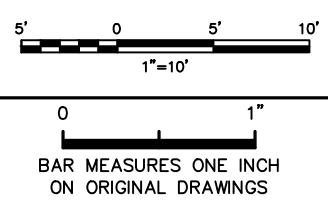


NOTES:

- 1. AT ACCESS ROAD FLOODPLAIN FORD, USE ANGULAR 6"—0 STONE EMBANKMENT AS COVER MATERIAL MEETING ODOT SPECIFICATION 00330.16. FILL VOID SPACES WITH 3 /4" — 0 DENSE—GRADED AGGREGATE PER ODOT SPECIFICATION 02630.10, OR ENIGNEER—APPROVED EQUIVALENT.
- 2. PLACED MATERIAL CAN BE REMOVED IN FUTURE IF DIVERSION INTAKE IS MOVED UPSTREAM TO NEW LOCATION.

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NO.	DATE	REVISION DESCRIPTION	BY	CHK	

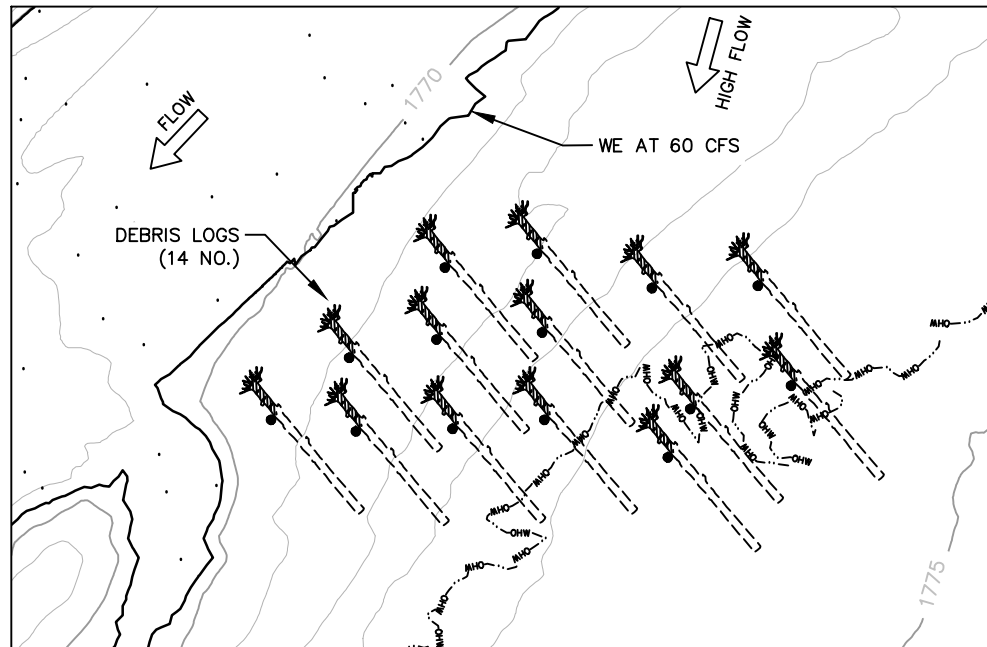


CONFEDERATED TRIBES UMATILLA INDIAN RESERVATION

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PROJECT MGR: J KENT

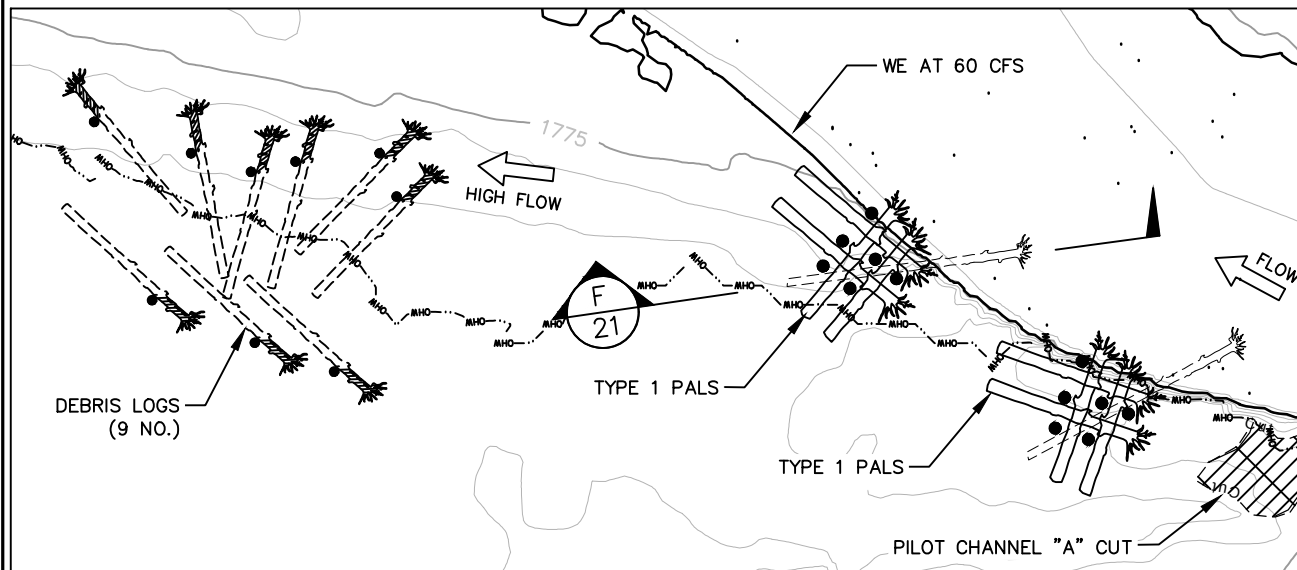
Kleinschmidt
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PHONE: (425) 556-1288

UMATILLA RIVER/IMEQUES FACILITY FISH HABITAT/FLOODPLAIN RESTORATION		
PILOT CHANNEL GRADING SECTIONS 100% DESIGN		DATE: JAN 27, 2026
SHEET: 14		REV: —



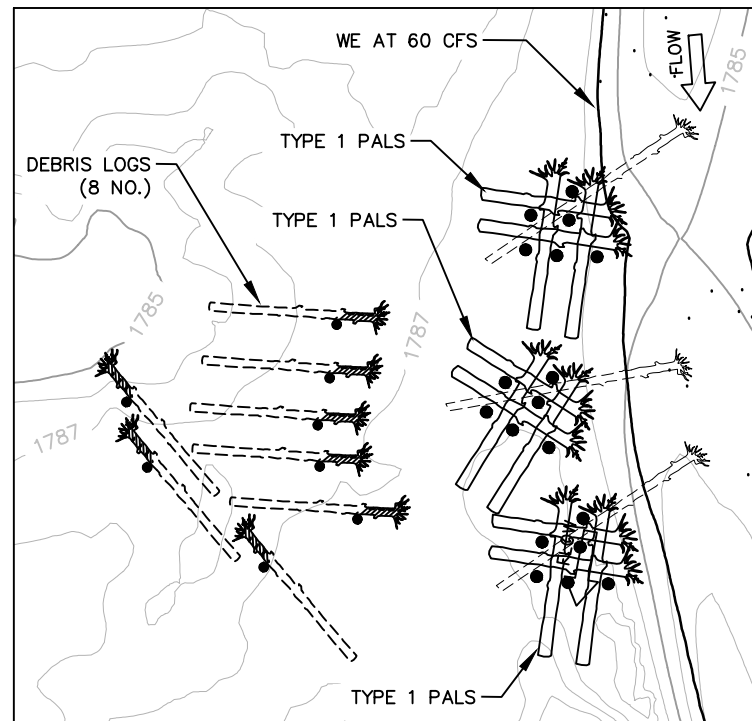
PLAN
FLOODPLAIN CONNECTIVITY

8
10



PLAN
FLOODPLAIN CONNECTIVITY

9
10

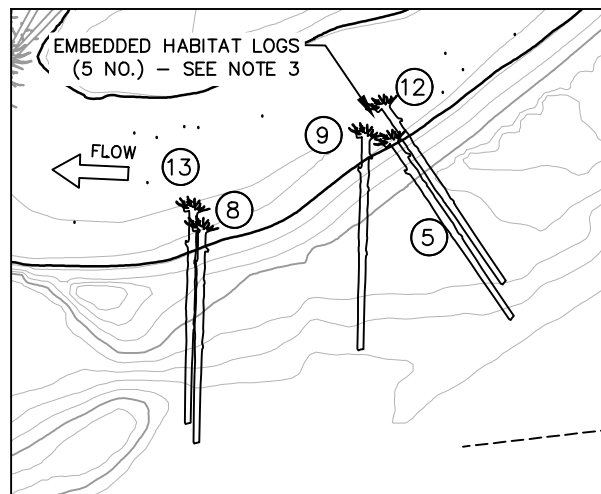


PLAN
INSTREAM HABITAT

11
10

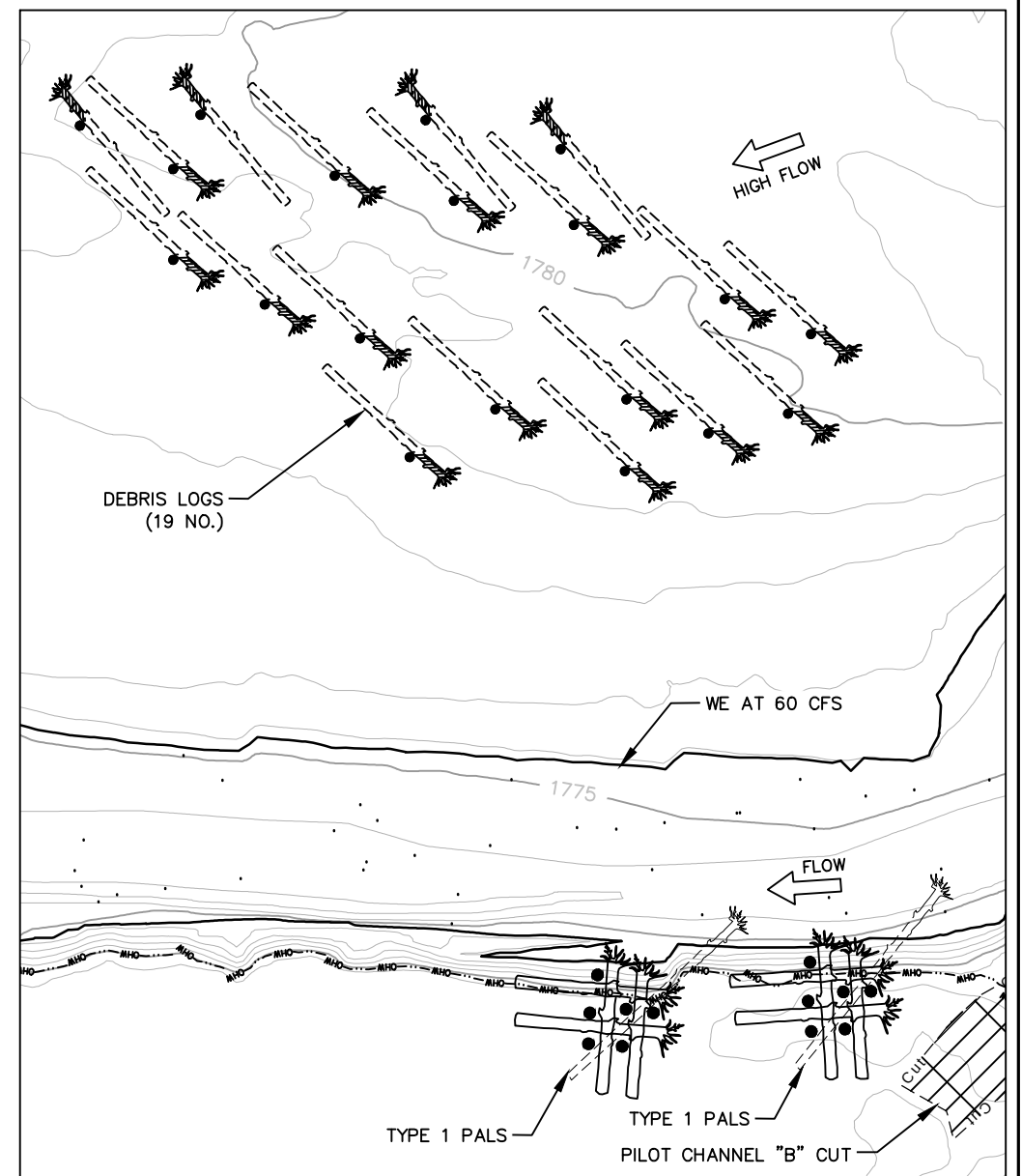
NOTES:

- ENGINEER WILL MARK LOG, PALS, AND GENERAL BOULDER PLACEMENT LOCATIONS IN FIELD. HABITAT LOGS EMBEDDED IN RIVERBANK SHALL BE INSTALLED IN CLEARINGS, WITHOUT SIGNIFICANTLY DISTURBING EXISTING RIPARIAN TREES, WITH ORIENTATIONS GENERALLY AS DEPICTED. SEE SHEETS 20-22 FOR CONSTRUCTION DETAILS AND SPECIFICATIONS
- ELEVATION CONTOURS ARE 1 FT INTERVAL. DATUM = NAVD88.
- CIRCLED NUMBERS IN PLAN EQUAL APPROXIMATE EXPOSED LENGTH OF EMBEDDED HABITAT LOGS INCLUDING ROOTWAD. PIECES SHOULD BE SIZED AND INSTALLED ACCORDINGLY PER SHEET 20. ROOTWADS OF MULTIPLE EMBEDDED HABITAT LOGS AT A GIVEN INSTALLATION LOCATION CAN BE PLACED PARTIALLY OFFSET VERTICALLY.



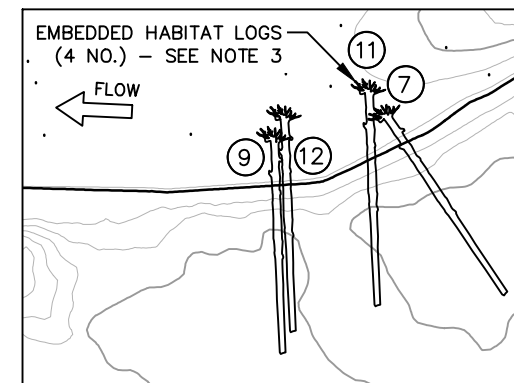
PLAN
INSTREAM HABITAT

12
10



PLAN
FLOODPLAIN CONNECTIVITY

10
10

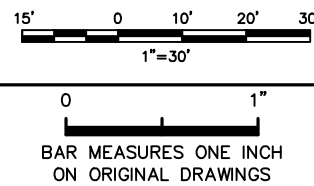


PLAN
INSTREAM HABITAT

13
10

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1	10/7/24	MODIFIED PALS & EMBEDDED LOG LAYOUTS	PDV	
NO.	DATE	REVISION DESCRIPTION	BY	CHK



CONFEDERATED TRIBES UMATILLA INDIAN RESERVATION

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DRAWN BY: P DEVRIES
CHECKED BY: M SMITH
PROJECT MGR: J KENT

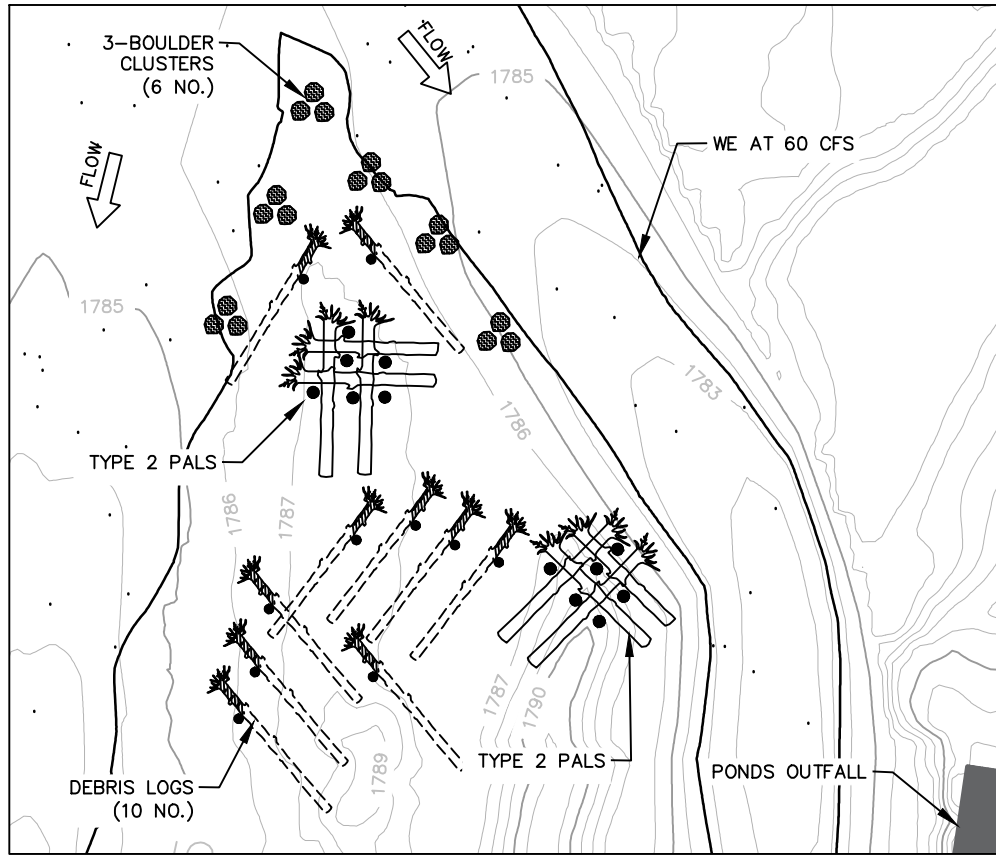
Kleinschmidt

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UMATILLA RIVER/IMEQUES FACILITY
FISH HABITAT/FLOODPLAIN RESTORATION

LARGE WOOD/BOULDER LAYOUT-1
PLAN
100% DESIGN

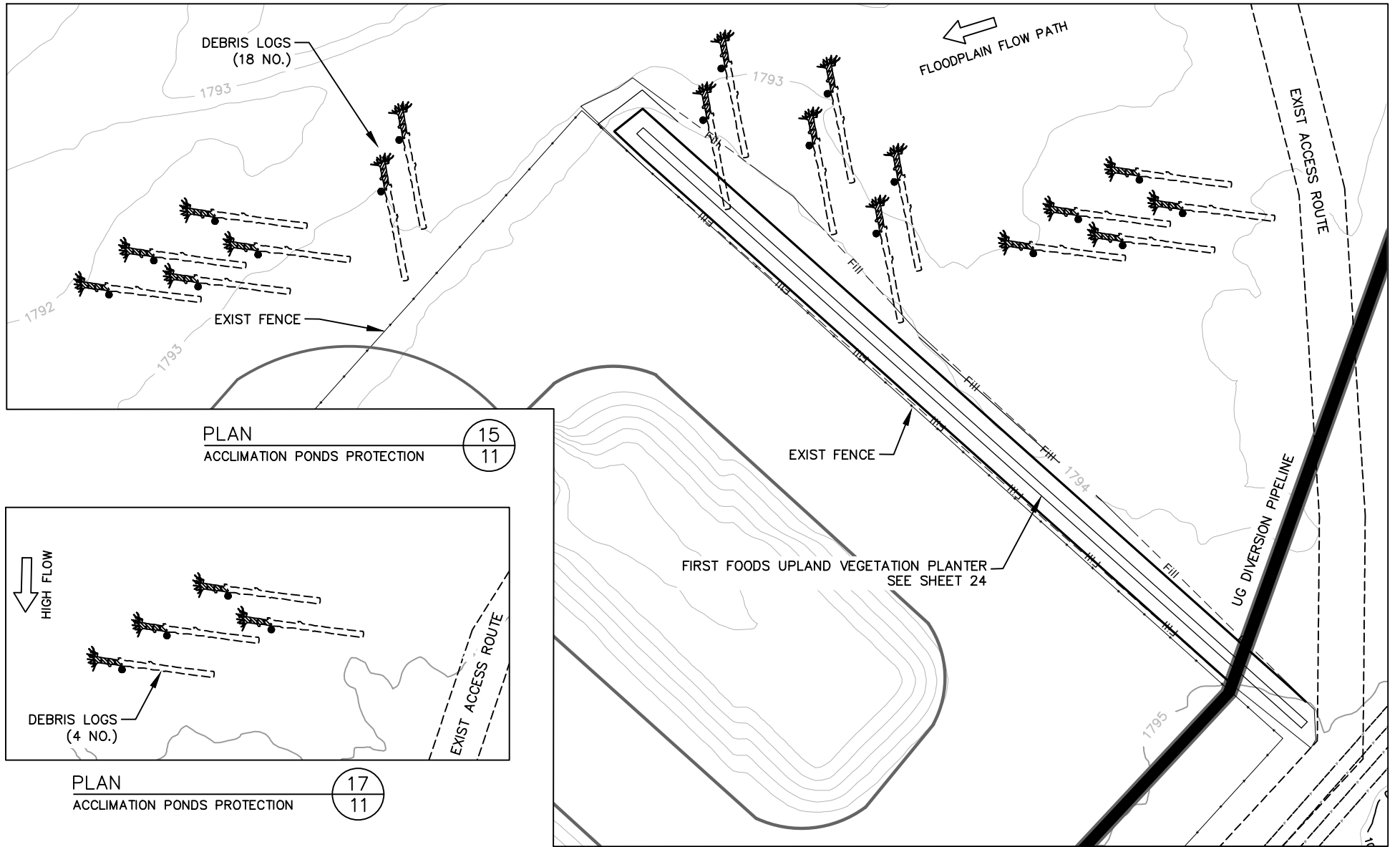
DATE: JAN 27, 2026
SHEET: 15
REV: -



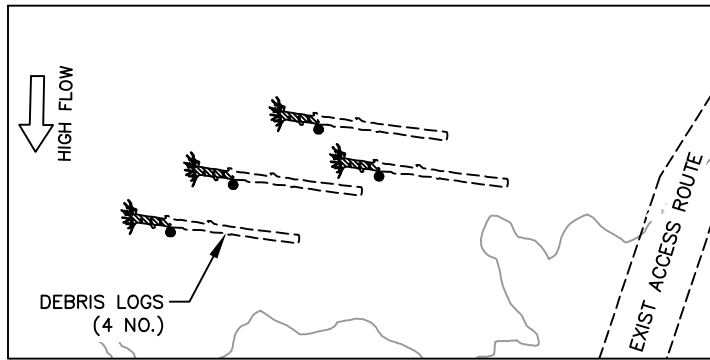
PLAN
ISLAND APEX STABILIZATION

NOTES:

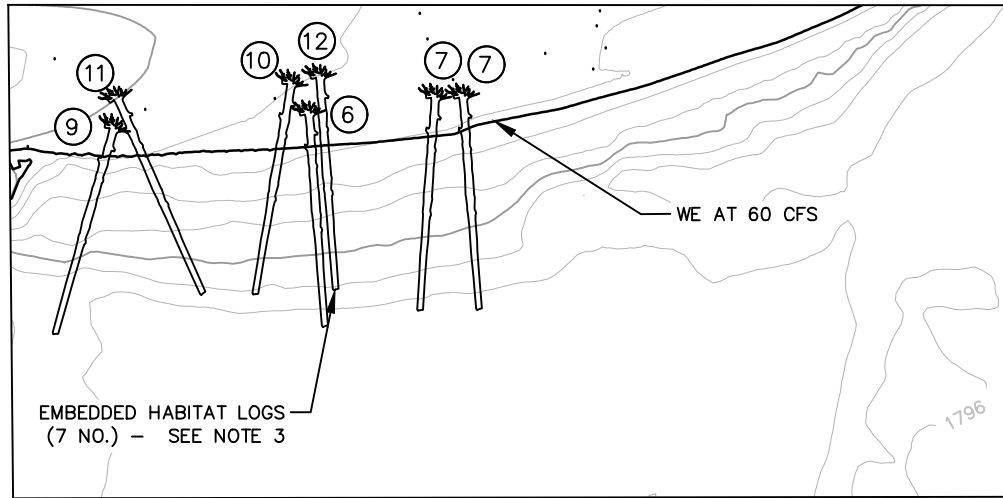
- ENGINEER WILL MARK LOG, PALS, AND GENERAL BOULDER PLACEMENT LOCATIONS IN FIELD. HABITAT LOGS EMBEDDED IN RIVERBANK SHALL BE INSTALLED IN CLEARINGS, WITHOUT SIGNIFICANTLY DISTURBING EXISTING RIPARIAN TREES, WITH ORIENTATIONS GENERALLY AS DEPICTED. SEE SHEETS 20-22 FOR CONSTRUCTION DETAILS AND SPECIFICATIONS
- ELEVATION CONTOURS ARE 1 FT INTERVAL. DATUM = NAVD88.
- CIRCLED NUMBERS IN PLAN EQUAL APPROXIMATE EXPOSED LENGTH OF EMBEDDED HABITAT LOGS INCLUDING ROOTWAD. PIECES SHOULD BE SIZED AND INSTALLED ACCORDINGLY PER SHEET 20. ROOTWADS OF MULTIPLE EMBEDDED HABITAT LOGS AT A GIVEN INSTALLATION LOCATION CAN BE PLACED PARTIALLY OFFSET VERTICALLY.



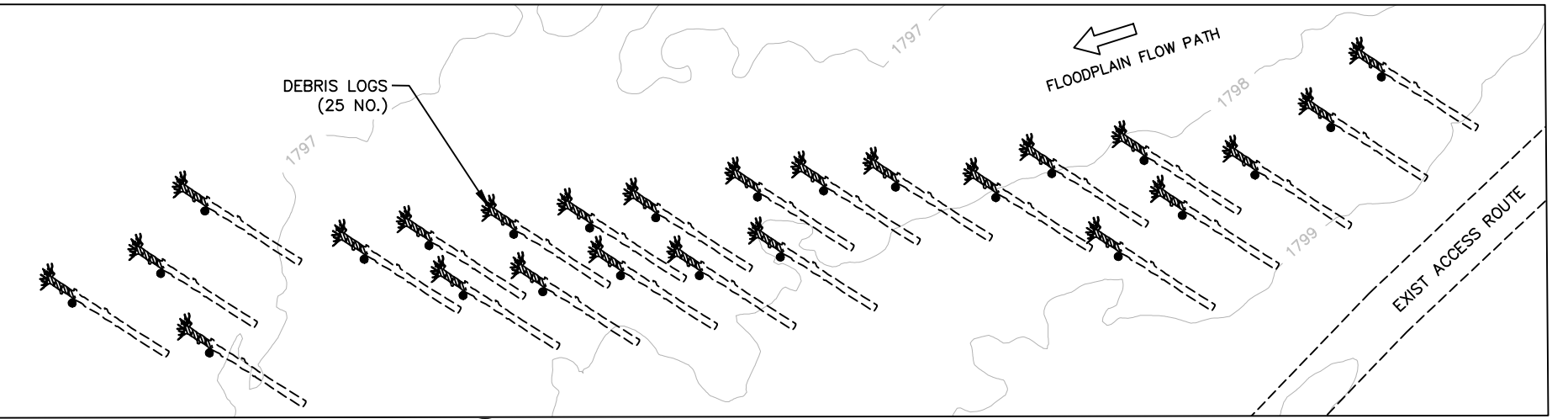
PLAN
ACCLIMATION PONDS PROTECTION



PLAN
ACCLIMATION PONDS PROTECTION



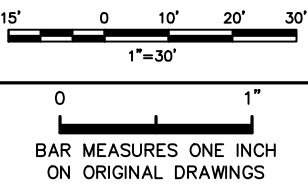
EMBEDDED HABITAT LOGS
(7 NO.) - SEE NOTE 3



PLAN
PONDS PROTECTION/INSTREAM HABITAT

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NO.	DATE	REVISION DESCRIPTION	BY	CHK
1	10/7/24	MODIFIED EMBEDDED LOG LAYOUTS	PDV	



CONFEDERATED TRIBES UMATILLA INDIAN RESERVATION

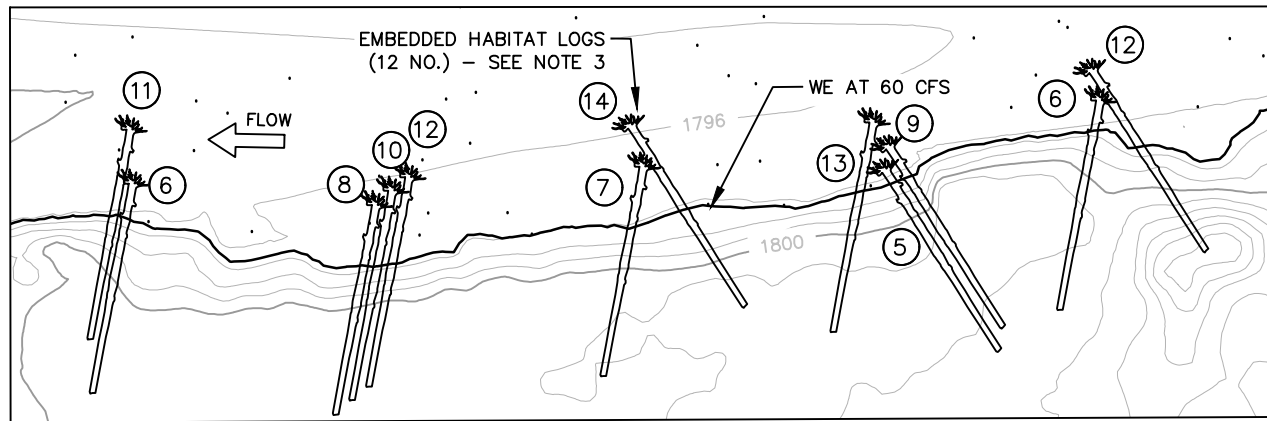
DESIGNED BY: P DEVRIES
DRAWN BY: P DEVRIES
CHECKED BY: M SMITH
PROJECT MGR: J KENT

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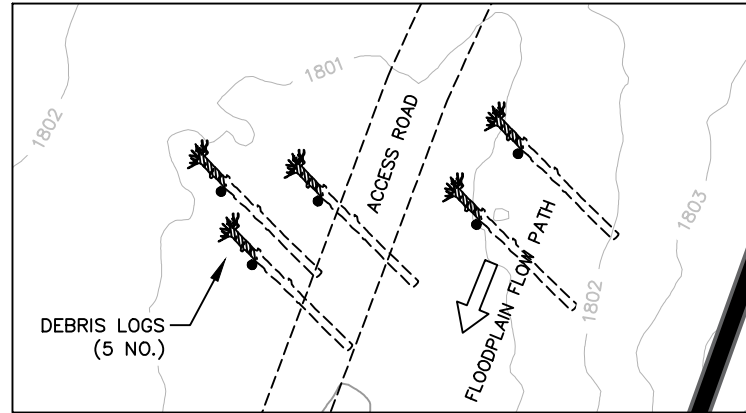
UMATILLA RIVER/IMEQUES FACILITY
FISH HABITAT/FLOODPLAIN RESTORATION

LARGE WOOD/BOULDER LAYOUT-2
PLAN
100% DESIGN

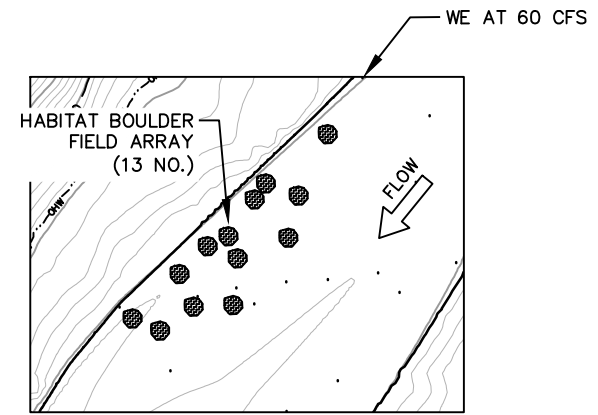
DATE: JAN 27, 2026
SHEET: 16
REV: -



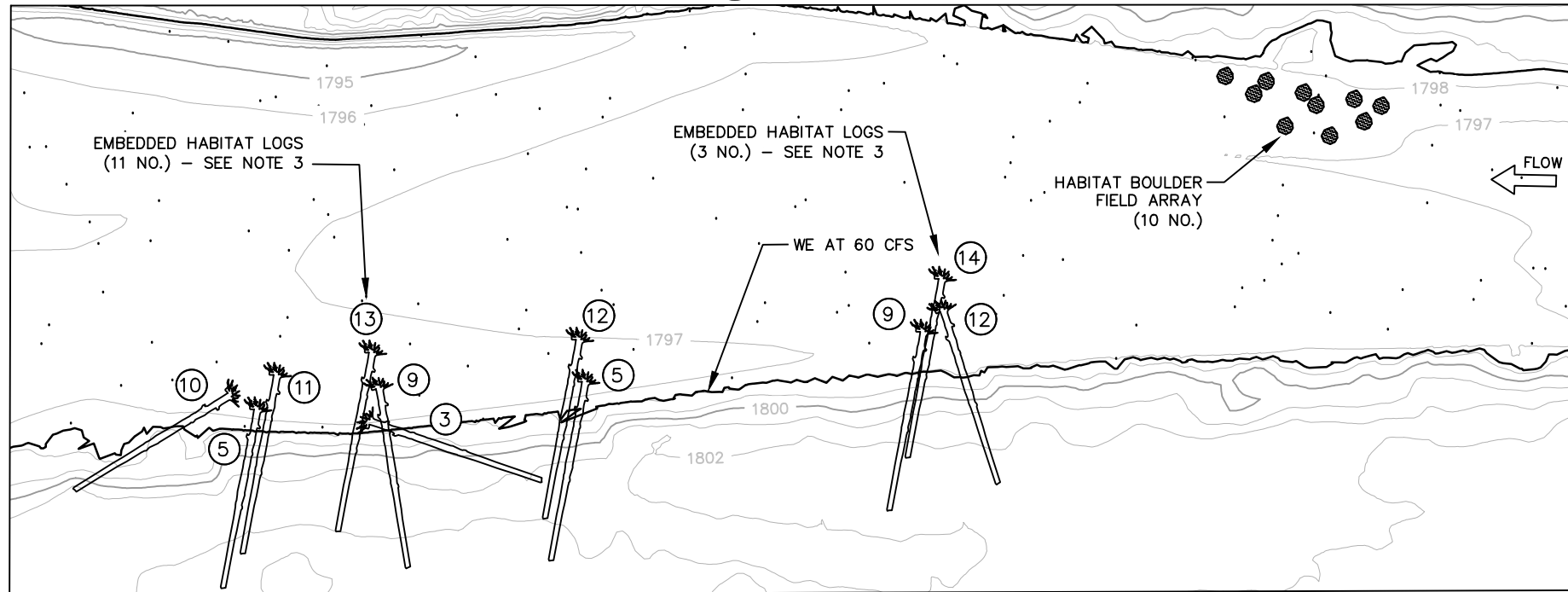
PLAN
INSTREAM HABITAT



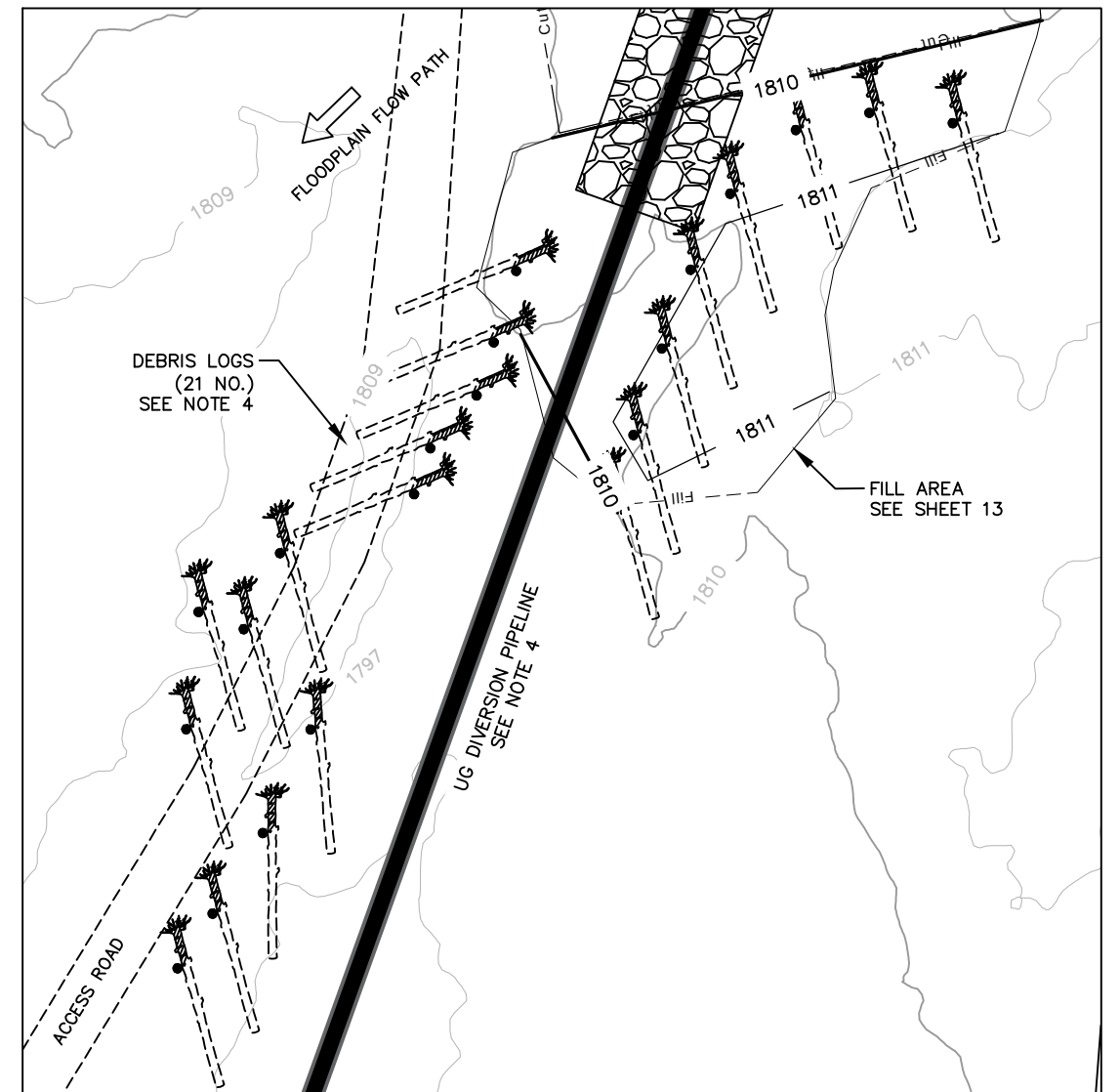
PLAN
ACCLIMATION PONDS PROTECTION



PLAN
INSTREAM HABITAT



PLAN
INSTREAM HABITAT



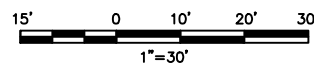
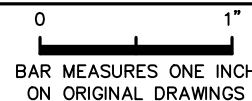
PLAN
ACCLIMATION PONDS PROTECTION

NOTES:

- ENGINEER WILL MARK LOG AND GENERAL BOULDER PLACEMENT LOCATIONS IN FIELD. HABITAT LOGS EMBEDDED IN RIVERBANK SHALL BE INSTALLED IN CLEARINGS, WITHOUT SIGNIFICANTLY DISTURBING EXISTING RIPARIAN TREES, WITH ORIENTATIONS GENERALLY AS DEPICTED. SEE SHEETS 20-22 FOR CONSTRUCTION DETAILS AND SPECIFICATIONS
- ELEVATION CONTOURS ARE 1 FT INTERVAL. DATUM = NAVD88
- CIRCLED NUMBERS IN PLAN EQUAL APPROXIMATE EXPOSED LENGTH OF EMBEDDED HABITAT LOGS INCLUDING ROOTWAD. PIECES SHOULD BE SIZED AND INSTALLED ACCORDINGLY PER SHEET 20. ROOTWADS OF MULTIPLE EMBEDDED HABITAT LOGS AT A GIVEN INSTALLATION LOCATION CAN BE PLACED PARTIALLY OFFSET VERTICALLY.
- CONTRACTOR TO PERFORM UTILITY LOCATE OF PIPELINE AND AVOID EXCAVATING WITHIN 10 FEET EITHER SIDE.

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1	10/7/24	MODIFIED EMBEDDED LOG & DEBRIS LOG LAYOUTS	PDV	
NO.	DATE	REVISION DESCRIPTION	BY	CHK



CONFEDERATED TRIBES UMATILLA INDIAN RESERVATION

DESIGNED BY: P DEVRIES
DRAWN BY: P DEVRIES
CHECKED BY: M SMITH
PROJECT MGR: J KENT

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UMATILLA RIVER/IMEQUES FACILITY
FISH HABITAT/FLOODPLAIN RESTORATION

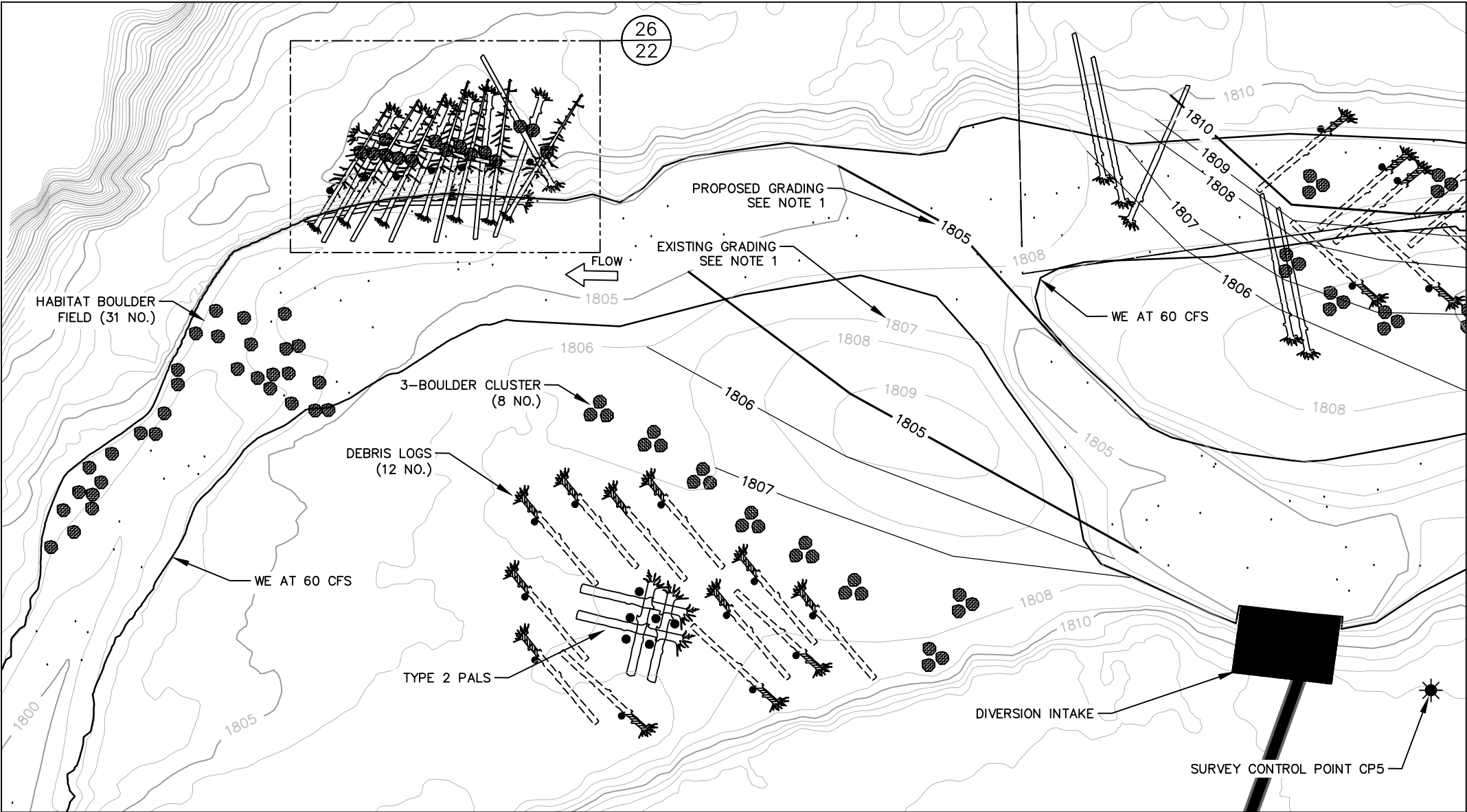
LARGE WOOD/BOULDER LAYOUT-3
PLAN
100% DESIGN

DATE: JAN 27, 2026

SHEET: REV:

17

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PLAN
INSTREAM HABITAT. CHANNEL MODS

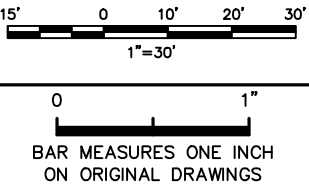
23
12

NOTES:

1. RIVERBED TOPOGRAPHY WILL HAVE CHANGED IN THE VICINITY OF THE DIVERSION INTAKE BY THE TIME OF CONSTRUCTION. OUTLINE OF WATER'S EDGE AT 60 CFS IS APPROXIMATE, BASED ON UPSTREAM AND DOWNSTREAM HYDRAULIC MODELING AND A SURVEY OF TOPOGRAPHY AROUND THE ISLAND AND COBBLE BAR PERFORMED IN NOVEMBER 2023. GRADING WILL USE AVAILABLE MATERIAL REMNANT ONSITE FROM PREVIOUS GRADING IN FRONT OF THE DIVERSION INTAKE AND ON THE DOWNSTREAM LEFT BANK COBBLE BAR AT DIRECTION OF ENGINEER TO CREATE A SURFACE THAT APPROXIMATES THE PROPOSED GRADING SHOWN ON THIS SHEET AND ON SHEET 19. GRADING IS TO BE COMPLETED PRIOR TO PLACEMENT OF LOGS AND BOULDERS. ENGINEER WILL MARK LOG STRUCTURE AND BOULDER PLACEMENT LOCATIONS IN CUT AND FILL AREAS AFTER GRADING IS COMPLETED.
2. LOCATIONS OF CRIB JAM AND BOULDERS DEPICTED ON THIS SHEET ARE APPROXIMATE. ENGINEER WILL MARK CRIB JAM STRUCTURE AND GENERAL BOULDER PLACEMENT LOCATIONS IN FIELD BASED ON SITE CONDITIONS IN THE YEAR OF CONSTRUCTION. SEE SHEETS 20-22 FOR CONSTRUCTION DETAILS AND SPECIFICATIONS
3. ELEVATION CONTOURS ARE 1 FT INTERVAL. DATUM = NAVD88.

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NO.	DATE	REVISION DESCRIPTION	BY	CHK	



CONFEDERATED TRIBES UMATILLA INDIAN RESERVATION

DESIGNED BY: P DEVRIES
DRAWN BY: P DEVRIES
CHECKED BY: M SMITH
PROJECT MGR: J KENT

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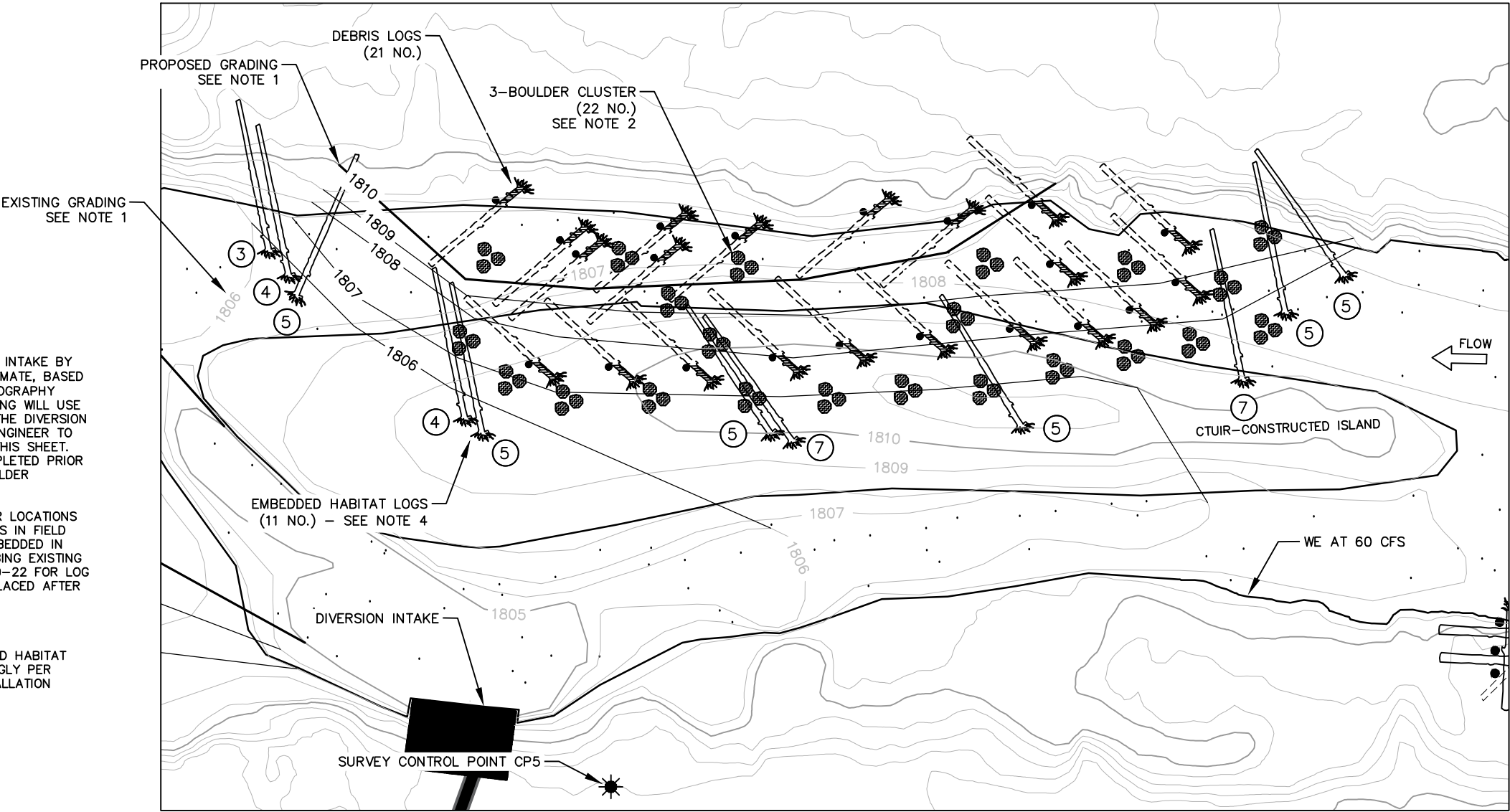
UMATILLA RIVER/IMEQUES FACILITY
FISH HABITAT/FLOODPLAIN RESTORATION

LARGE WOOD/BOULDER LAYOUT-4
PLAN & INSTREAM GRADING PLAN
100% DESIGN

DATE: JAN 27, 2026
SHEET: 18
REV: -

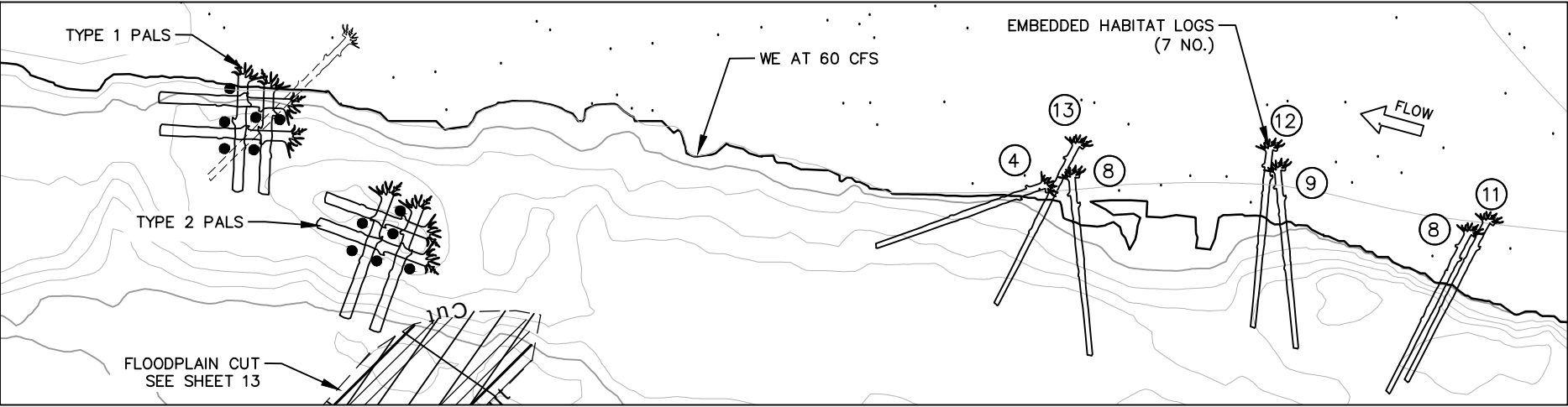
NOTES:

1. RIVERBED TOPOGRAPHY WILL HAVE CHANGED IN THE VICINITY OF THE DIVERSION INTAKE BY THE TIME OF CONSTRUCTION. OUTLINE OF WATER'S EDGE AT 60 CFS IS APPROXIMATE, BASED ON UPSTREAM AND DOWNSTREAM HYDRAULIC MODELING AND A SURVEY OF TOPOGRAPHY AROUND THE ISLAND AND COBBLE BAR PERFORMED IN NOVEMBER 2023. GRADING WILL USE AVAILABLE MATERIAL REMNANT ONSITE FROM PREVIOUS GRADING IN FRONT OF THE DIVERSION INTAKE AND ON THE DOWNSTREAM LEFT BANK COBBLE BAR AT DIRECTION OF ENGINEER TO CREATE A SURFACE THAT APPROXIMATES THE PROPOSED GRADING SHOWN ON THIS SHEET. SEE SHEET 2 NOTE 1 REGARDING GRADING QUANTITIES. GRADING IS TO BE COMPLETED PRIOR TO PLACEMENT OF LOGS AND BOULDERS. ENGINEER WILL MARK LOG AND BOULDER PLACEMENT LOCATIONS IN CUT AND FILL AREAS AFTER GRADING IS COMPLETED.
2. LOCATIONS AOF EMBEDDED LOGS AND PALS DEPICTED ON THIS SHEET AT OTHER LOCATIONS ARE APPROXIMATE. ENGINEER WILL MARK LOG AND PALS PLACEMENT LOCATIONS IN FIELD BASED ON SITE CONDITIONS IN THE YEAR OF CONSTRUCTION. HABITAT LOGS EMBEDDED IN RIVERBANK SHALL BE INSTALLED IN CLEARINGS, WITHOUT SIGNIFICANTLY DISTURBING EXISTING RIPARIAN TREES, WITH ORIENTATIONS GENERALLY AS DEPICTED. SEE SHEETS 20-22 FOR LOG CONSTRUCTION DETAILS AND SPECIFICATIONS. BOULDER CLUSTERS SHALL BE PLACED AFTER INSTALLING LOGS.
3. ELEVATION CONTOURS ARE 1 FT INTERVAL. DATUM = NAVD88.
4. CIRCLED NUMBERS IN PLAN EQUAL APPROXIMATE EXPOSED LENGTH OF EMBEDDED HABITAT LOGS INCLUDING ROOTWAD. PIECES SHOULD BE SIZED AND INSTALLED ACCORDINGLY PER SHEET 20. ROOTWADS OF MULTIPLE EMBEDDED HABITAT LOGS AT A GIVEN INSTALLATION LOCATION CAN BE PLACED PARTIALLY OFFSET VERTICALLY.



PLAN
INSTREAM HABITAT. CHANNEL MODS

24
12

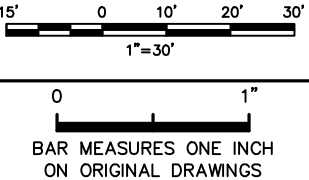


PLAN
INSTREAM HABITAT, HIGH FLOW SPLIT

25
12

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1	10/7/24	MODIFIED EMBEDDED LOG LAYOUTS	PDV	
NO.	DATE	REVISION DESCRIPTION	BY	CHK



CONFEDERATED TRIBES UMATILLA INDIAN RESERVATION

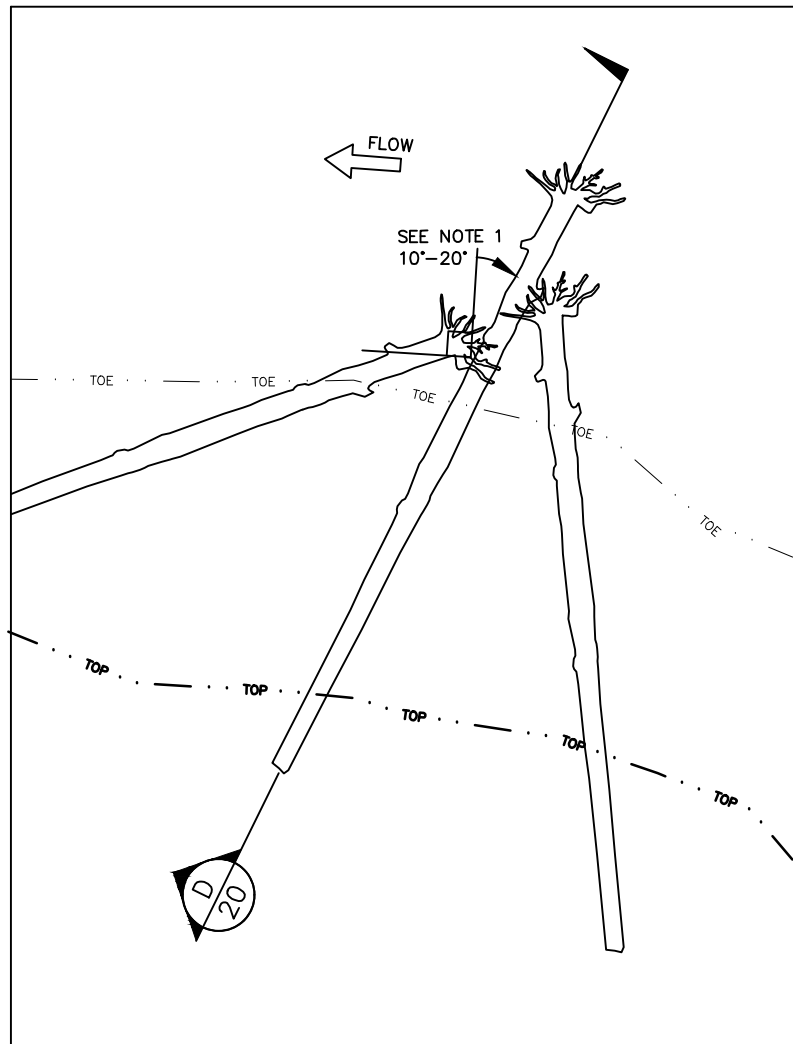
DESIGNED BY: P DEVRIES
DRAWN BY: P DEVRIES
CHECKED BY: M SMITH
PROJECT MGR: J KENT

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REDMOND, WA 98052
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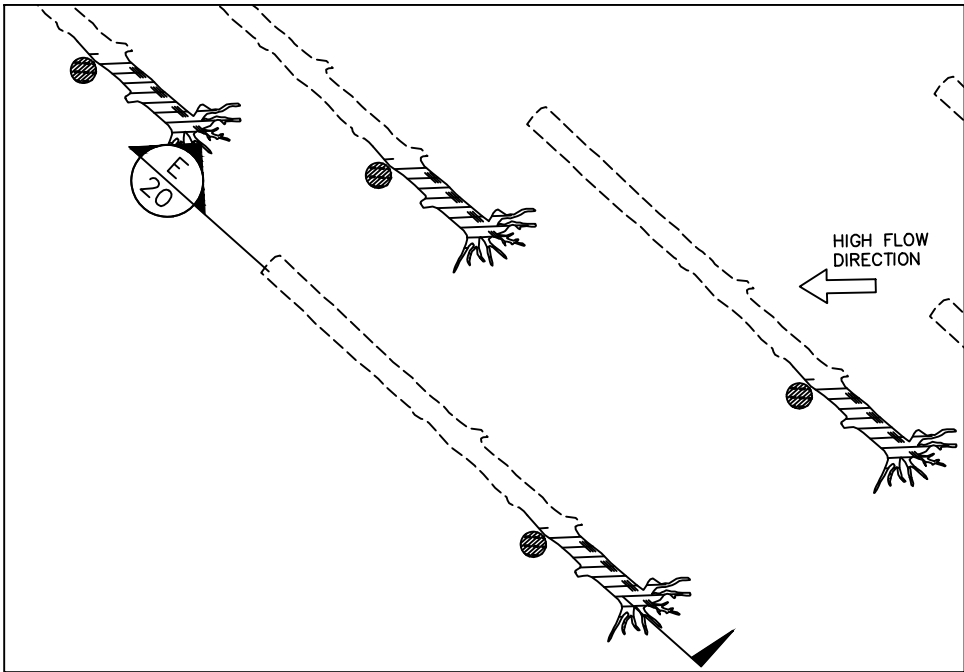
UMATILLA RIVER/IMEQUES FACILITY
FISH HABITAT/FLOODPLAIN RESTORATION

LARGE WOOD/BOULDER LAYOUT-5
PLAN & INSTREAM GRADING PLAN
100% DESIGN

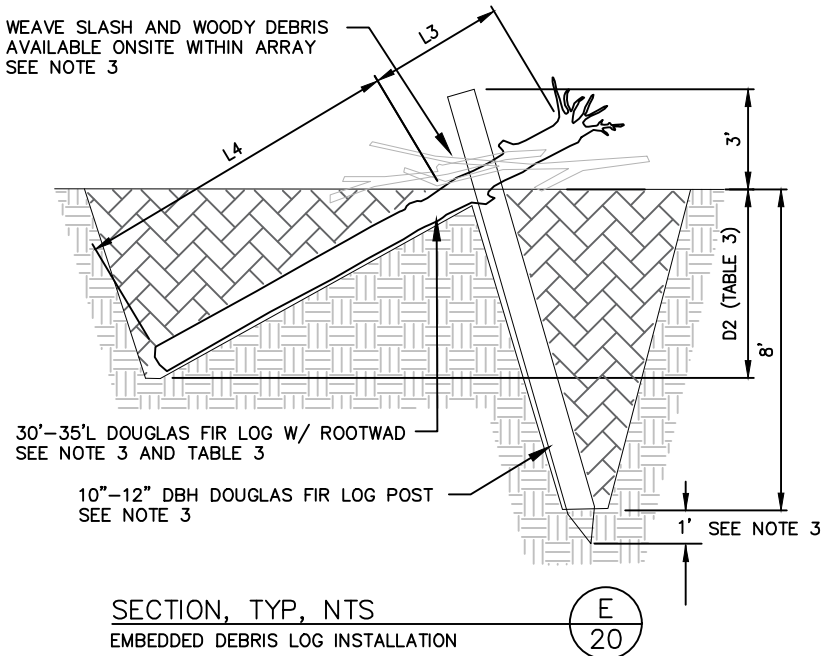
DATE: JAN 27, 2026
SHEET: 19
REV: -



PLAN, TYP
EMBEDDED HABITAT LOG



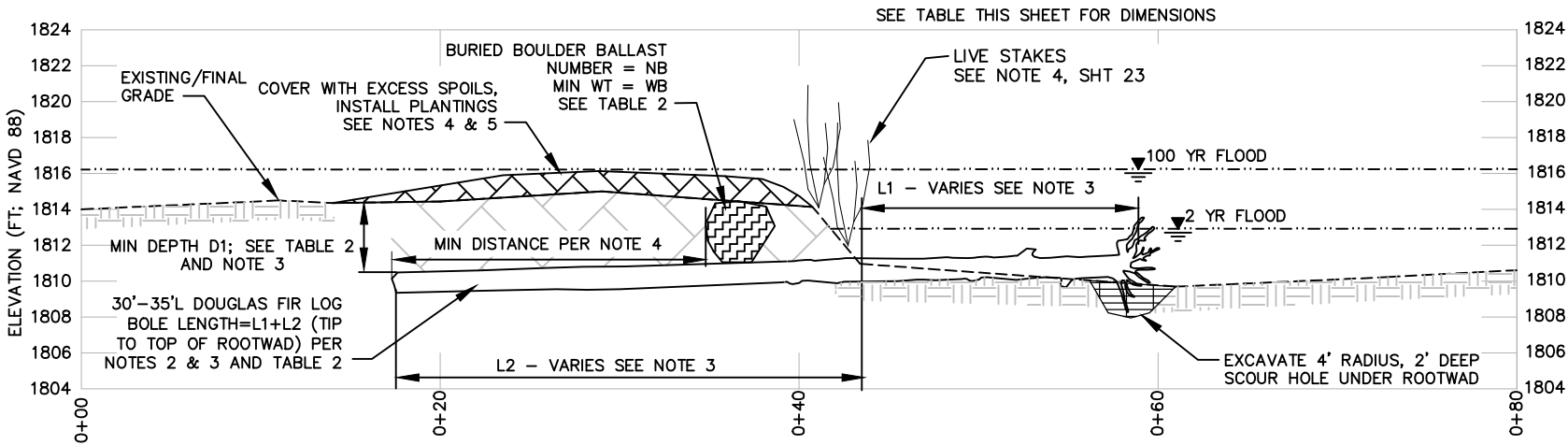
PLAN, TYP
EMBEDDED DEBRIS LOG



SECTION, TYP, NTS
EMBEDDED DEBRIS LOG INSTALLATION

EMBEDDED DEBRIS LOG NOTES:

1. ALL DEBRIS LOG LOCATIONS WILL BE STAKED IN FIELD BY ENGINEER. POST LOG IS TO BE LOCATED ON DOWNSTREAM SIDE OF LOG WITH ROOTWAD. ORIENTATION SHALL VARY TO EXTENT PRACTICABLE.
2. SIZES OF DEBRIS LOGS TO BE INSTALLED SHALL VARY AT EACH GENERAL LOCATION WITHIN THE RANGE 14"-20" DBH, AND SHALL REFLECT AVAILABILITY OF MATERIALS. CONTRACTOR SHALL RANDOMIZE DISTRIBUTION AND MINIMIZE UNIFORMITY OF LOG SIZES. ALL LOGS SHALL BE DOUGLAS FIR, PONDEROSA PINE, OR ENGINEER-APPROVED EQUIVALENT.
3. LOG INSTALLATION DIMENSIONS SHALL REFLECT DBH PER TABLE 3. EXCAVATE HOLE FOR POST TO ~8' DEPTH, SHARPEN END OF BOLE WITH CHAIN SAW AND PUSH IN A MINIMUM OF 1', THEN BACKFILL AS NEEDED. EXCAVATE SLOPING TRENCH FOR EXPOSED LOG TO DESIGN DEPTH D2 AND LENGTH L4. PLACE LOG W/ ROOTWAD AND COMPLETE BACKFILL. RACK/WEAVE LOOSE LOGS AND SLASH AGAINST UPSTREAM SIDE.



SECTION, TYP
EMBEDDED HABITAT LOG INSTALLATION

TABLE 2. EMBEDDED HABITAT LOG DIMENSIONS & SUPPLEMENTAL BOULDER BALLAST REQUIREMENTS

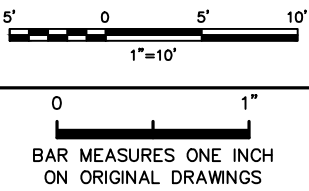
DBH (IN)	30 FT LOG		35 FT LOG		MIN D1 (FT)	MIN BALLAST	
	EXPOSED (L1)	EMBEDDED (L2)	EXPOSED (L1)	EMBEDDED (L2)		WB (LB)	NB
14	8	22	10	25	2	0	0
14	12	18	15	20	4	0	0
16	8	22	10	25	3	0	0
16	12	18	14	21	6	0	0
18	8	22	10	25	4	0	0
18	11	19	14	21	6	0	0
20	8	22	10	25	5	0	0
20	11	19	14	21	6	1500	1
22	8	22	10	25	6	0	0
22	11	19	14	21	6	3500	1
24	8	22	10	25	6	1500	1
24	11	19	14	21	6	3000	2

TABLE 3. EMBEDDED DEBRIS LOG INSTALLATION SPECIFICATIONS

DBH (IN)	SHORTEST TOTAL LENGTH (FT)		LONGEST TOTAL LENGTH (FT)		MIN DEPTH D2 (FT)
	L3 (MAX)	L4 (MIN)	L3 (MAX)	L4 (MIN)	
14	3	12	6	15	5
16	3	13	6	15	6
18	3	15	6	18	6
20	3	18	6	21	6

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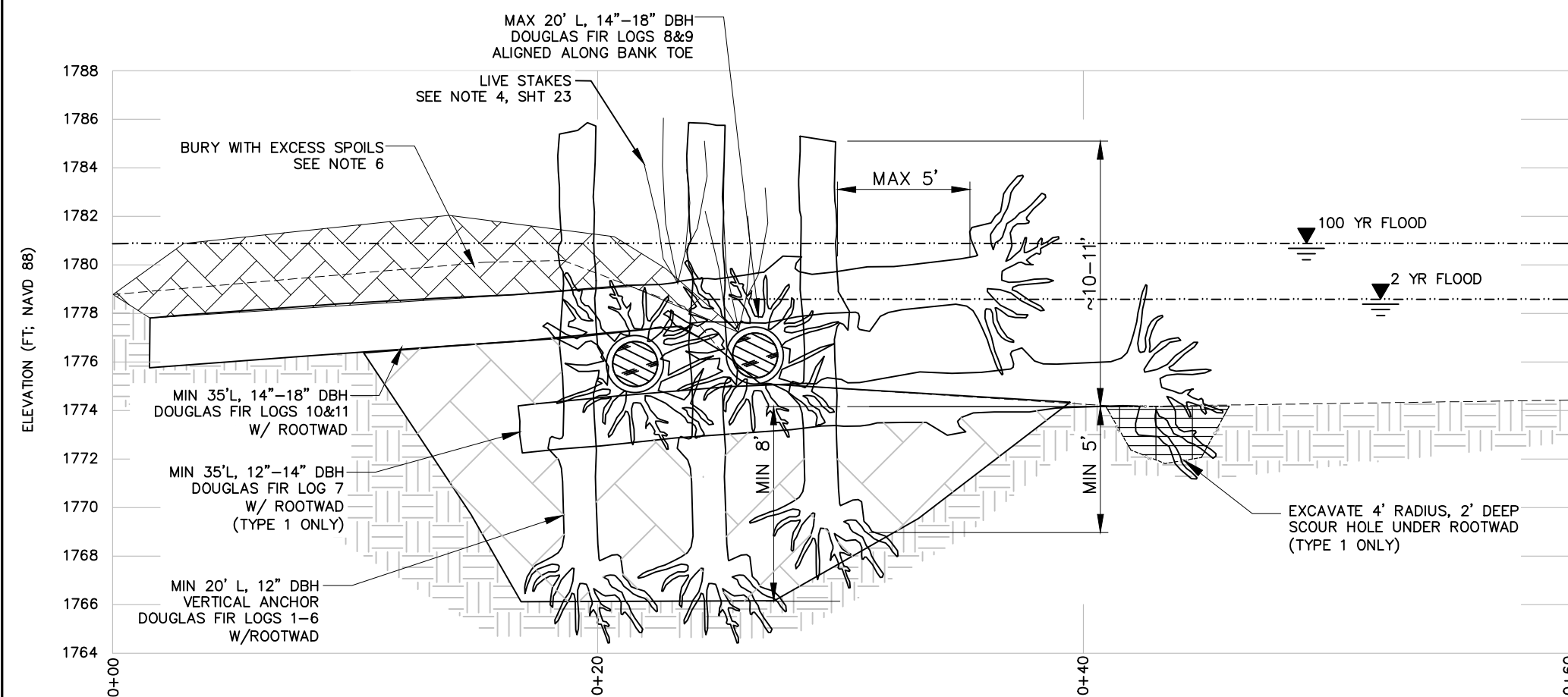
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UMATILLA RIVER/IMEQUES FACILITY
FISH HABITAT/FLOODPLAIN RESTORATION

EMBEDDED HABITAT/DEBRIS LOGS
PLAN, SECTION (TYP)
100% DESIGN

DATE: JAN 27, 2026
SHEET: 20
REV: -



SECTION, TYP
PALS- EDGE OF CHANNEL

PALS CONSTRUCTION NOTES

1. LOCATION OF PALS WILL BE STAKED AND FLAGGED IN FIELD BY ENGINEER.
2. PALS CONSTRUCTED ALONG WATER'S EDGE (TYPE 1) SHALL INCLUDE UNDERLYING LOG 7 PROTRUDING INTO CHANNEL AS DEPICTED ON PLAN AND SECTION THIS SHEET. PALS CONSTRUCTED ON GRAVEL BARS AND FLOODPLAIN BENCHES (TYPE 2) SHALL EXCLUDE LOG 7 AS PART OF STRUCTURE.
3. FOR TYPE 1 PALS CONSTRUCTED ALONG WATER'S EDGE, INSTALL SANDBAG COFFERDAM FOLLOWING GENERAL WATER MANAGEMENT AND FISH SALVAGE CONSERVATION MEASURES DESCRIBED ON SHEETS 3, 4, 8. ALLOW FOR CAVING-IN ON STREAM SIDE DURING EXCAVATION FOR VERTICAL BOLE PLACEMENT.
4. ORDER OF INSTALLATION INDICATED BY LOG NUMBERS ON PLAN THIS SHEET. WHERE FEASIBLE, SCREENED PUMPS MAY BE USED TO MAINTAIN LOWER WATER LEVEL WHILE EXCAVATING HOLE FOR VERTICAL ANCHOR LOGS 1-6; SEE SHEET 8. FOR CONSTRUCTABILITY, LOG 1 MAY BE PLACED SHALLOWER THAN THE OTHERS AS SHOWN IN SECTION THIS SHEET. AFTER VERTICAL ANCHOR LOGS ARE PLACED, BACKFILL TO STREAMBED LEVEL. PLACE HORIZONTAL LOGS 7, 8, 9 SEQUENTIALLY, BACKFILLING IN LAYERS. MAKE GAP IN SANDBAG COFFER DAM FOR LOG 7.
5. TIE ALL LOGS TOGETHER USING 1" DIA MANILA HEMP ROPE, MINIMUM THREE (3) WRAPS AROUND LOGS BEFORE TYING OFF LOOSELY WITH CARRICK BEND KNOT. DO NOT OVERTIGHTEN (ROPE WILL SHRINK 10-15% IN LENGTH WHEN WET).
6. BACKFILL OVER HORIZONTAL LOGS 10, 11 AND EXPOSED ROPE WITH SPOILS FROM EXCAVATION.
7. ADD LOOSE SLASH & RACKING WOOD BETWEEN AND ON UPSTREAM SIDE OF VERTICAL BOLES.
8. CONTRACTOR SHALL BE FAMILIAR WITH ALL OSHA REGULATIONS REGARDING WORKING UNDER OVERHEAD POWER LINES. MAINTAIN MINIMUM DISTANCE OF 10 FEET BETWEEN EXCAVATOR ARM/BUCKET AND POWER LINES

BOULDER PLACEMENT NOTES:

1. BOULDER FIELD LOCATION SHALL BE MARKED IN THE FIELD BY ENGINEER. BOULDER FIELD LOCATIONS SHALL BE INDICATED AS A GENERAL AREA FOR PLACEMENT. 3-BOULDER CLUSTERS SHALL BE CENTERED AROUND MARKED LOCATION.
2. BOULDERS SHALL BE HARD, SOUND, AND DURABLE MATERIAL, FREE FROM SEAMS, CRACKS, AND OTHER DEFECTS TENDING TO DESTROY ITS RESISTANCE TO WEATHER, AND HAVE A SPECIFIC GRAVITY GREATER THAN 2.5.
3. HABITAT BOULDER FIELD STONES SHALL WEIGH AT LEAST 4000 LB AND BE SUB-ANGULAR TO ROUNDED. BOULDERS IN CLUSTERS SHALL WEIGH AT LEAST 3000 LB AND BE SUB-ANGULAR.
4. BOULDERS SHALL BE WORKED INTO THE SURROUNDING SUBSTRATE, WITH SHORT AXIS ORIENTED VERTICALLY, AND EMBEDDED AT LEAST ONE-THIRD OF SHORT AXIS DIMENSION BELOW SURROUNDING GRADE.

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AS SHOWN

0 1"
BAR MEASURES ONE INCH
ON ORIGINAL DRAWINGS

CONFEDERATED TRIBES UMATILLA INDIAN RESERVATION

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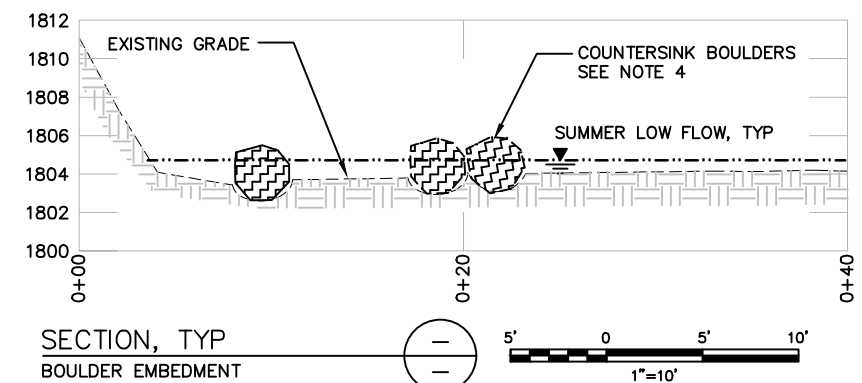
UMATILLA RIVER/IMEQUES FACILITY
FISH HABITAT/FLOODPLAIN RESTORATION

PALS, BOULDER ARRAYS
PLAN, SECTION (TYP)
100% DESIGN

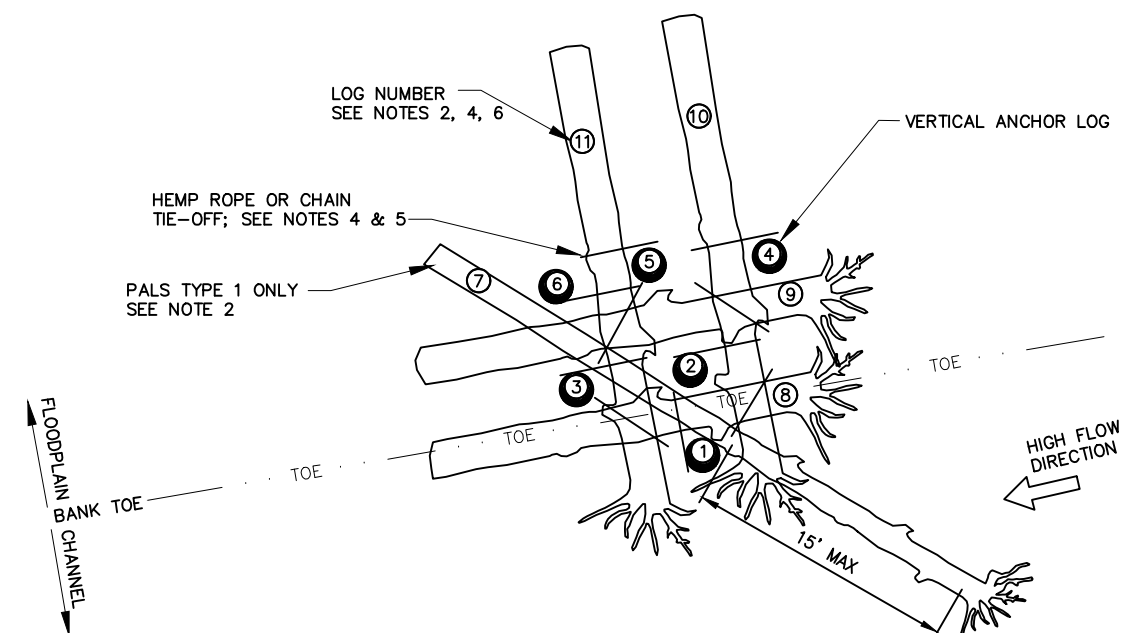
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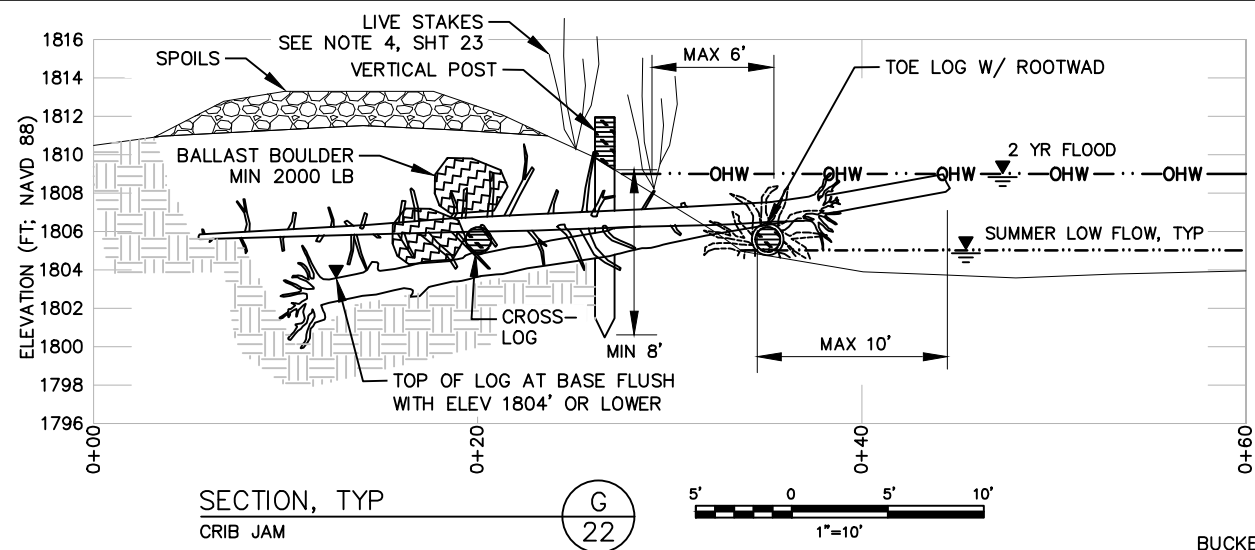
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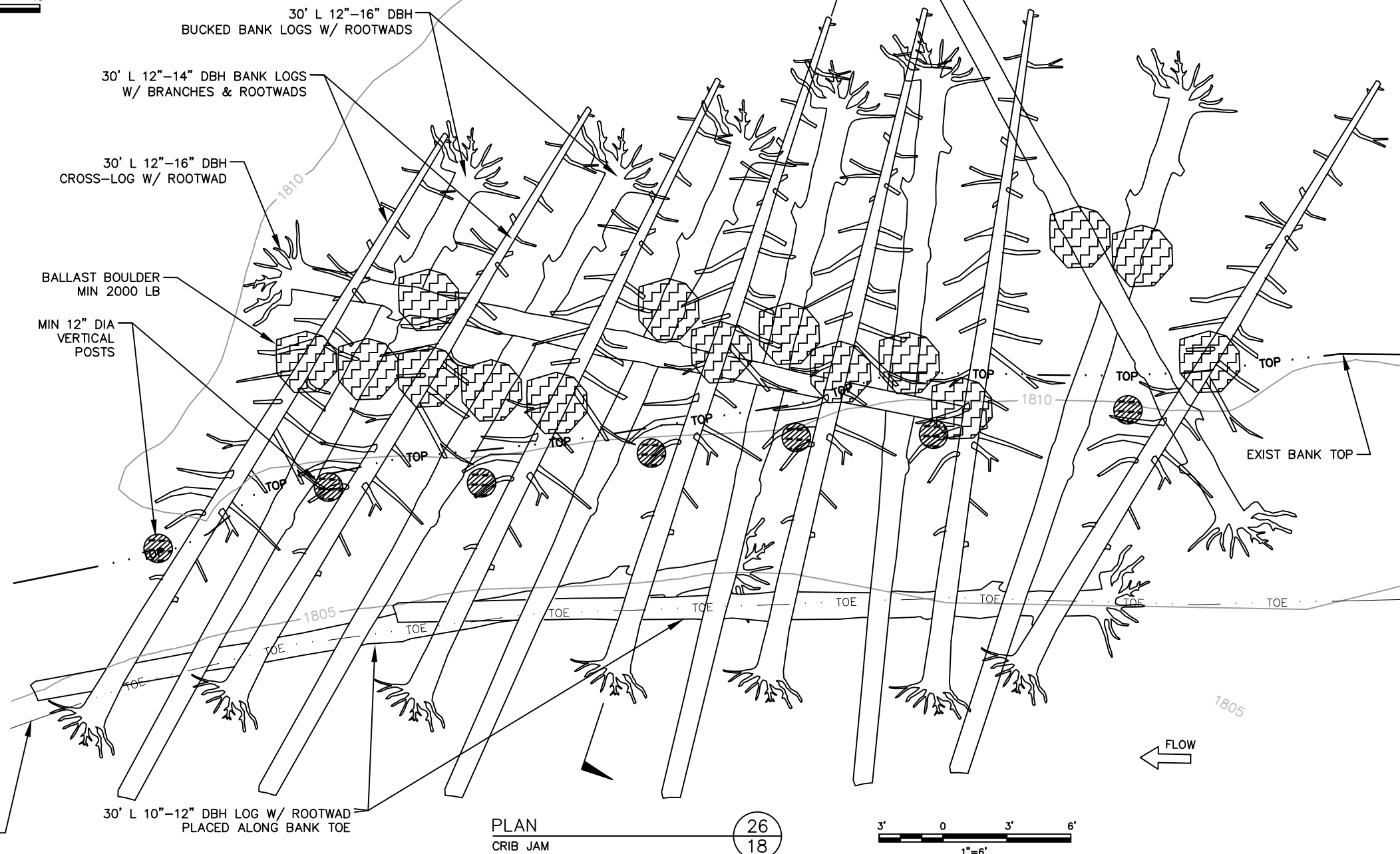
PLAN, TYP
3-BOULDER CLUSTER ORIENTATION



PLAN, TYP
PALS CONSTRUCTION



1. INSTALL VERTICAL BOLES. DIG TRENCH TO WITHIN 2 FEET OF TARGET DEPTH, SHARPEN POINT AT END, DRIVE INTO GROUND TO TARGET DEPTH, PARTIALLY BACKFILL TRENCH.
 2. LAY DOWN BANK TOE LOGS ALONG TOE OF RIVERBANK, PLACE ROOTWADS INTO EXCAVATED DEPRESSIONS IN RIVERBED SO THAT TRUNK OF DOWNSTREAM LOG LIES ON SUBSTRATE. HOLD DOWN LOGS AS NEEDED. DIG TRENCH FOR FIRST BANK LOG DOWN TO ELEV 1802' AT ROOTWAD END AND INSTALL WITH BUTT END RESTING ON BANK TOE LOG..
 3. DIG TRENCHES FOR BANK LOGS. PLACE UPSTREAM LOG ON UPSTREAM SIDE OF BOLE, RESTING ON FIRST BANK LOG PLACED IN STEP 2 AND WITH BUTT END RESTING AT ELEV 1802'. PLACE FIVE DOWNSTREAM LOGS AGAINST DOWNSTREAM SIDE OF VERTICAL BOLES. PLACE BALLAST BOULDERS. SEE SECTION G ABOVE.
 4. BACKFILL AS NEEDED, THEN PLACE CROSS LOG WITH ROOTWAD ON TOP OF LOGS, PLACE BALLAST BOULDERS ON TOP OF BANK LOGS.
 5. PLACE LOGS WITH ROOTWADS AND BRANCHES ON TOP, ON UPSTREAM SIDE OF VERTICAL BOLES. PLACE BALLAST BOULDERS ON TOP WITH BACKFILL.
- PLAN
SUGGESTED CONSTRUCTION SEQUENCE



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0 1"

BAR MEASURES ONE INCH
ON ORIGINAL DRAWINGS

CONFEDERATED TRIBES UMATILLA INDIAN RESERVATION

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UMATILLA RIVER/IMEQUES FACILITY
FISH HABITAT/FLOODPLAIN RESTORATION

CRIB JAM
PLAN, SECTION, DETAILS
100% DESIGN

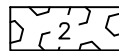
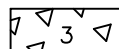
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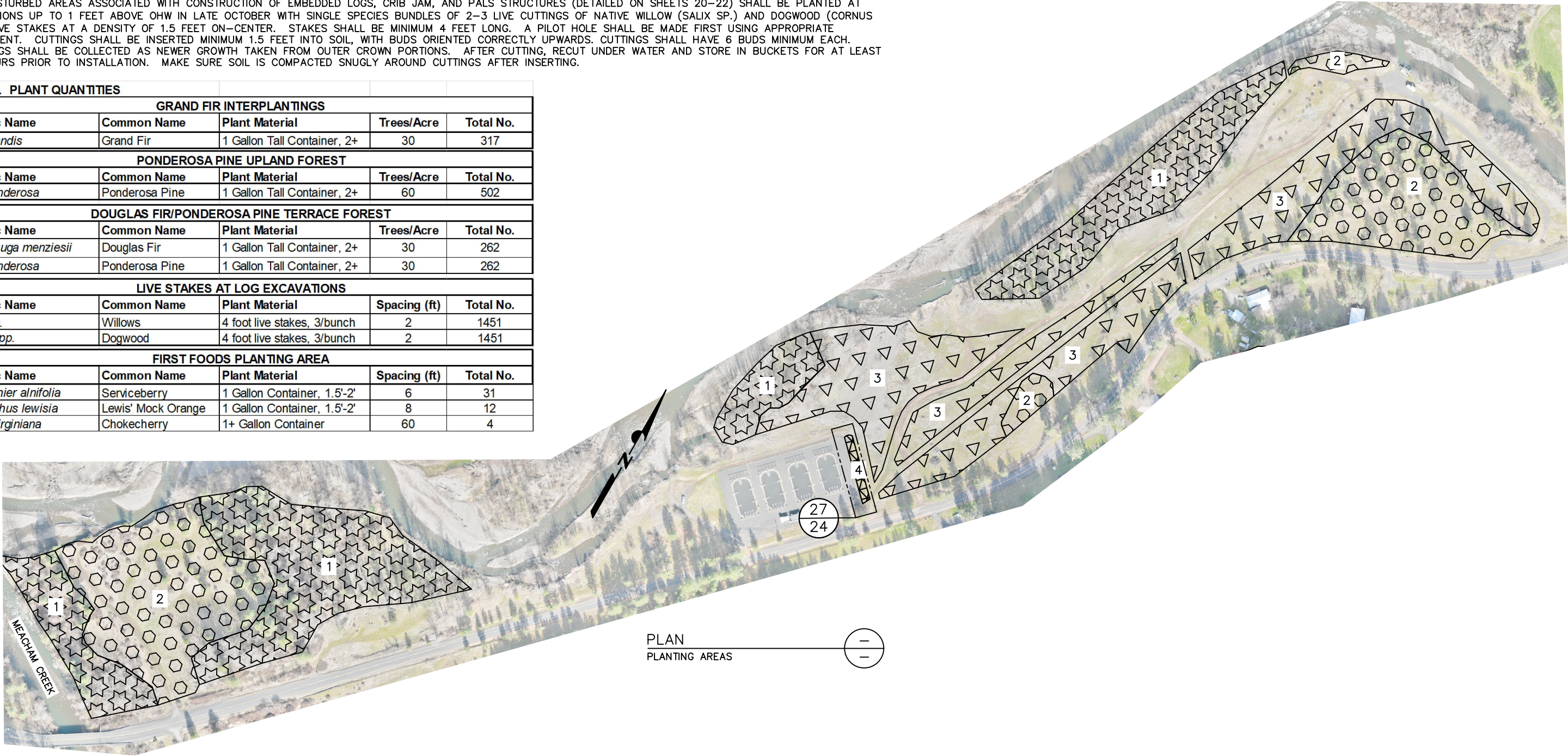
NOTES:

1. FOREST PLANTING AREAS DEPICT GENERAL EXTENT OF PLANTING AREAS, AND WILL BE FLAGGED OR OTHERWISE MARKED IN THE FIELD BY PROJECT FOREST ECOLOGIST. GRAND FIR, DOUGLAS FIR, PONDEROSA PINE SEEDLINGS (2+ STOCK) WILL BE PLANTED AT SPECIFIC LOCATIONS STAKED FOR EACH TREE BY FOREST ECOLOGIST BASED ON A SURVEY OF SUITABLE PLANTING SITE SOIL AND HYDROLOGIC CONDITIONS. PLANT MATERIAL SHOULD BE LOCAL SEED PROVENANCE STOCK.
2. PLANTING OPERATIONS WILL OCCUR IN LATE MARCH/EARLY APRIL. FOREST ECOLOGIST SHALL INSPECT AND APPROVE PLANTS PRIOR TO PLANTING, AND SUPERVISE PLANTING OPERATIONS. ALL CONTAINER PLANTS SHALL BE WATERED AS NEEDED DURING THE FIRST SUMMER AFTER PLANTING/SEEDING.
3. ALL DISTURBED GROUND SHALL BE SEEDED WITH LOCAL NATIVE GRASS SEED MIX AFTER CONSTRUCTION IS COMPLETED, AS FOLLOWS:
- 3.1. STREAMBANKS AND EXCAVATED FLOODPLAINS: RECOMMENDED SPECIES MIX & APPLICATION RATES = MOUNTAIN BROME (BROMUS MARGINATUS – 2 LB/ACRE), IDAHO FESCUE (FESTUCA IDAHOENSIS – 2 LB/ACRE), TUFTED HAIRGRASS (DESCHAMPسيا CESPITOSA – 1 LB/ACRE), BASIN WILD RYE (LEYMUS CINEREUS – 4 LB/ACRE), STREAMBANK WHEATGRASS (ELYMUS LANCEOLATUS – 4 LB/ACRE), AND SLENDER WHEATGRASS (ELYMUS TRACHYULUS – 2 LB/ACRE).
- 3.2. UPLAND AND OTHER DISTURBED GROUND: RECOMMENDED SPECIES MIX & APPLICATION RATES = MOUNTAIN BROME (BROMUS MARGINATUS – 2 LB/ACRE) AND IDAHO FESCUE (FESTUCA IDAHOENSIS – 2 LB/ACRE).
4. ALL DISTURBED AREAS ASSOCIATED WITH CONSTRUCTION OF EMBEDDED LOGS, CRIB JAM, AND PALS STRUCTURES (DETAILED ON SHEETS 20–22) SHALL BE PLANTED AT ELEVATIONS UP TO 1 FEET ABOVE OHW IN LATE OCTOBER WITH SINGLE SPECIES BUNDLES OF 2–3 LIVE CUTTINGS OF NATIVE WILLOW (SALIX SP.) AND DOGWOOD (CORNUS SP.) LIVE STAKES AT A DENSITY OF 1.5 FEET ON-CENTER. STAKES SHALL BE MINIMUM 4 FEET LONG. A PILOT HOLE SHALL BE MADE FIRST USING APPROPRIATE EQUIPMENT. CUTTINGS SHALL BE INSERTED MINIMUM 1.5 FEET INTO SOIL, WITH BUDS ORIENTED CORRECTLY UPWARDS. CUTTINGS SHALL HAVE 6 BUDS MINIMUM EACH. CUTTINGS SHALL BE COLLECTED AS NEWER GROWTH TAKEN FROM OUTER CROWN PORTIONS. AFTER CUTTING, RECUT UNDER WATER AND STORE IN BUCKETS FOR AT LEAST 12 HOURS PRIOR TO INSTALLATION. MAKE SURE SOIL IS COMPACTED SNUGLY AROUND CUTTINGS AFTER INSERTING.

TABLE 4. PLANT QUANTITIES				
GRAND FIR INTERPLANTINGS				
Scientific Name	Common Name	Plant Material	Trees/Acre	Total No.
<i>Abies grandis</i>	Grand Fir	1 Gallon Tall Container, 2+	30	317
PONDEROSA PINE UPLAND FOREST				
Scientific Name	Common Name	Plant Material	Trees/Acre	Total No.
<i>Pinus ponderosa</i>	Ponderosa Pine	1 Gallon Tall Container, 2+	60	502
DOUGLAS FIR/PONDEROSA PINE TERRACE FOREST				
Scientific Name	Common Name	Plant Material	Trees/Acre	Total No.
<i>Pseudotsuga menziesii</i>	Douglas Fir	1 Gallon Tall Container, 2+	30	262
<i>Pinus ponderosa</i>	Ponderosa Pine	1 Gallon Tall Container, 2+	30	262
LIVE STAKES AT LOG EXCAVATIONS				
Scientific Name	Common Name	Plant Material	Spacing (ft)	Total No.
<i>Salix spp.</i>	Willows	4 foot live stakes, 3/bunch	2	1451
<i>Cornus spp.</i>	Dogwood	4 foot live stakes, 3/bunch	2	1451
FIRST FOODS PLANTING AREA				
Scientific Name	Common Name	Plant Material	Spacing (ft)	Total No.
<i>Amelanchier alnifolia</i>	Serviceberry	1 Gallon Container, 1.5'-2'	6	31
<i>Philadelphus lewisia</i>	Lewis' Mock Orange	1 Gallon Container, 1.5'-2'	8	12
<i>Prunus virginiana</i>	Chokecherry	1+ Gallon Container	60	4

KEY TO FOREST RESTORATION ZONES

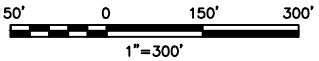
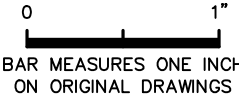
-  1
- GRAND FIR INTERPLANTINGS IN EXISTING FLOODPLAIN FOREST
-  2
- PONDEROSA PINE UPLAND FOREST
-  3
- DOUGLAS FIR/PONDEROSA PINE TERRACE FOREST
-  4
- FIRST FOODS CULTURAL PLANTINGS



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UMATILLA RIVER/IMEQUES FACILITY
FISH HABITAT/FLOODPLAIN RESTORATION

PLANTING, SITE RESTORATION – 1
PLAN, DETAILS
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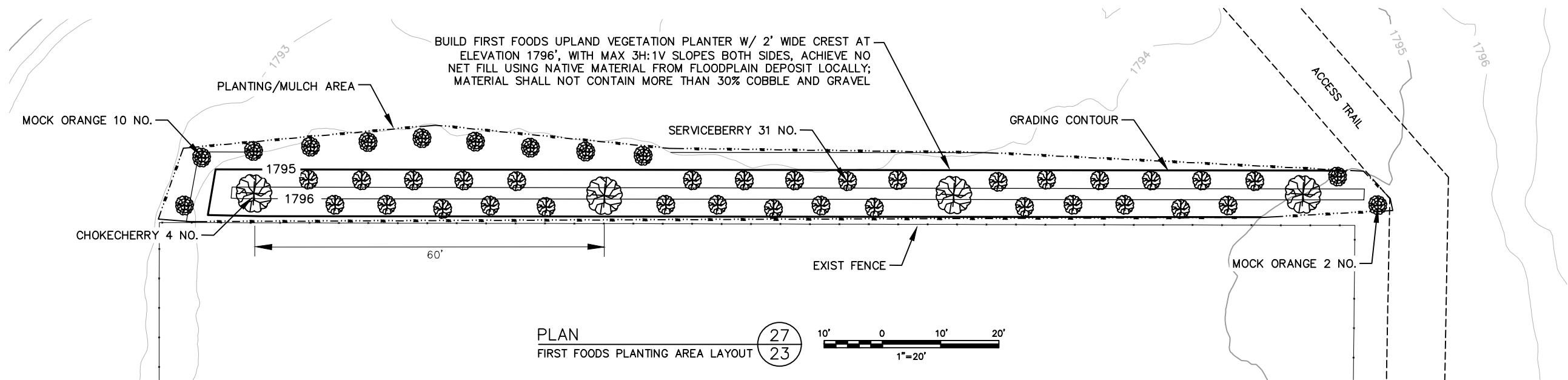
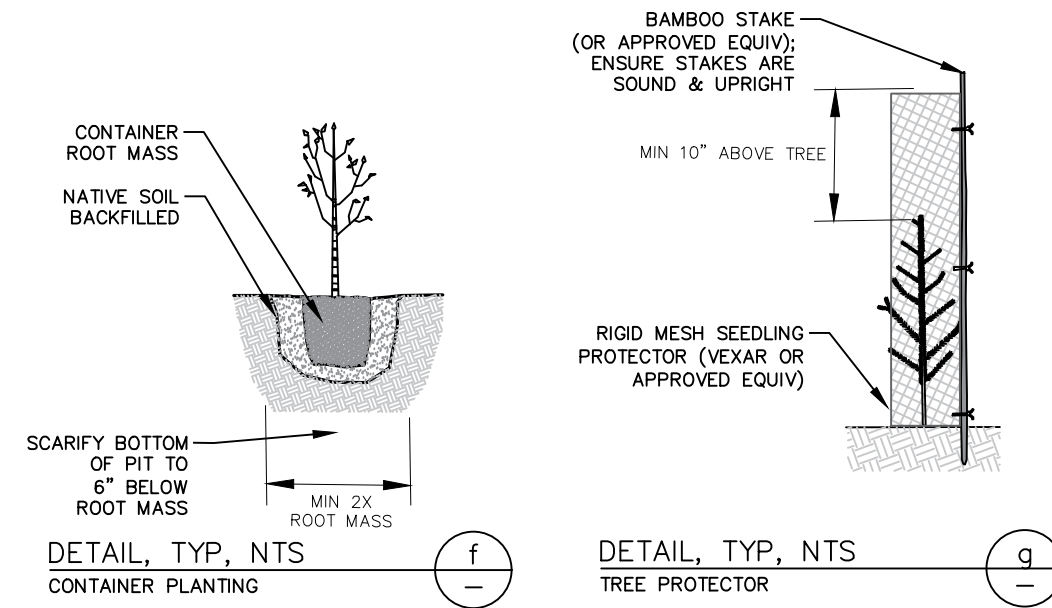
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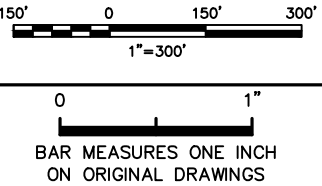
NOTES:

1. ALL TREES SHALL BE INSTALLED WITH TREE PROTECTOR MESH PER DETAIL THIS SHEET. USE CABLE TIES TO FIX MESH SECURELY TO STAKE. ALL CONTAINER PLANTS SHALL BE PLANTED PER DETAIL THIS SHEET.
2. PLANTING ZONE 4 SHALL BE CONSTRUCTED BORROWING LOCAL FLOODPLAIN SUBSTRATE AS INDICATED THIS SHEET. COVER AREA WITH MINIMUM 8 CY OF BARK MULCH AND WATER THOROUGHLY IMMEDIATELY AFTER PLANTING IN EARLY SPRING. PLANTING STOCK SHALL BE PROVIDED BY CTUIR.



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UMATILLA RIVER/IMEQUES FACILITY FISH HABITAT/FLOODPLAIN RESTORATION	
PLANTING, SITE RESTORATION — 2 PLAN, DETAILS 100% DESIGN	DATE: JAN 27, 2026 SHEET: 24 REV: —