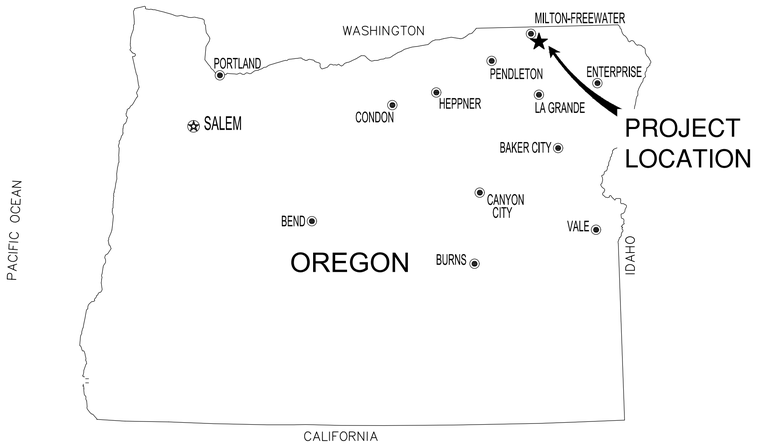
NORTH FORK WALLA WALLA RIVER
RESTORATION DESIGN - RIVER MILE 4.3-5.2

ANY WORK WITHIN THE FLOWING CHANNEL OF THE NORTH FORK WALLA WALLA RIVER MUST BE CONDUCTED BETWEEN JULY 1 AND SEPTEMBER 30



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CONTRACTING AGENCY:
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FUNDING AGENCIES:
BONNEVILLE POWER ADMINISTRATION AND OREGON WATERSHED ENHANCEMENT BOARD

PROPERTY OWNERS:
SAMS FAMILY

ENGINEER:
JACOBS ENGINEERING GROUP
999 W. MAIN ST., SUITE 1200, BOISE ID 83702
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CRAMER & ASSOCIATES, DBA CRAMER FISH SCIENCES
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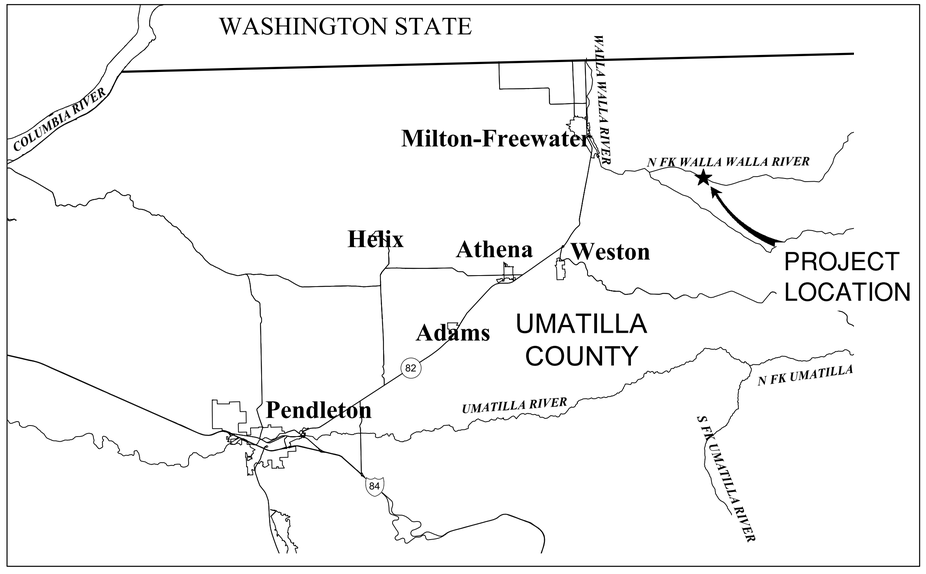
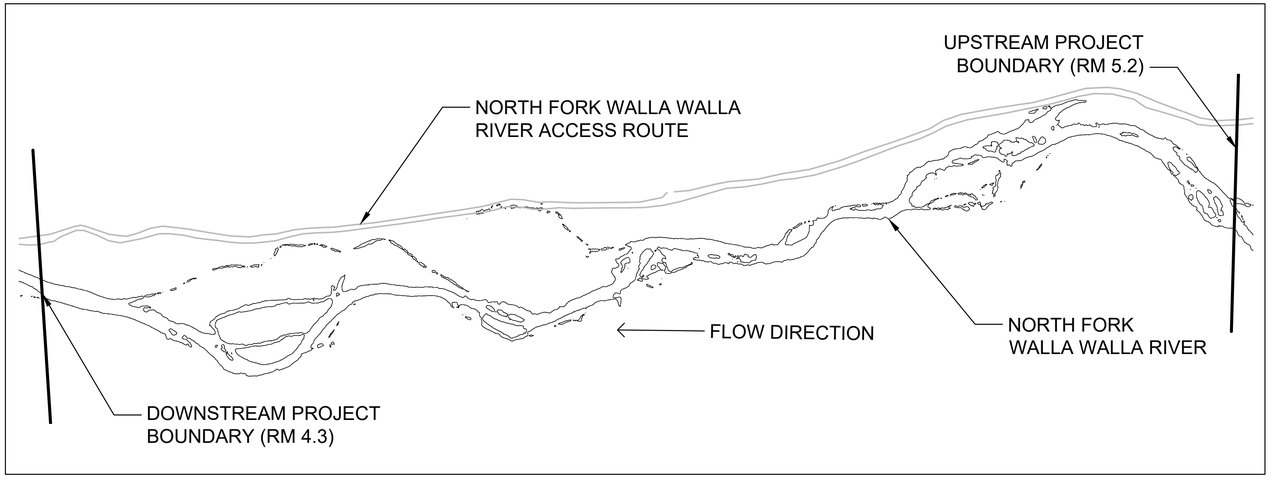


N
LOCATION MAP
NTS



N
VICINITY MAP
NTS

THIS PROJECT WAS DESIGNED IN ACCORDANCE WITH THE BPA HABITAT IMPROVEMENT PROGRAM, PROGRAMMATIC BIOLOGICAL OPINION (HIP 4).

NOT FOR CONSTRUCTION

NO.	DATE	REVISION	BY	APVD
DSGN		WE	DR	KL
			CHK	PR
			APVD	LH

NORTH FORK WALLA WALLA RIVER
RESTORATION DESIGN - RIVER MILE 4.3 - 5.2
WALLA WALLA BASIN WATERSHED COUNCIL
MILTON-FREEWATER, OR

Jacobs

GENERAL
TITLE SHEET
LOCATION MAP
SHEET INDEX

AS SHOWN	
VERIFY SCALE	
BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1"	
DATE	MARCH 2024
PROJ	W3Y00606
DWG	G-01
SHEET	1 of 22

80% Design

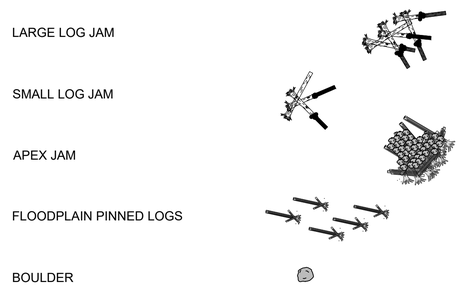
GENERAL NOTES:

1. WORK SHOWN ON THESE PLANS WILL BE PERFORMED FOR THE WALLA WALLA BASIN WATERSHED COUNCIL (WWBWC), HEREIN REFERRED TO AS "CONTRACTING AGENCY." CONTACT INFORMATION FOR CONTRACTING AGENCY'S REPRESENTATIVE IS INCLUDED ON G-01. CONTRACTING AGENCY'S REPRESENTATIVE (OR OTHER PERSONS ASSIGNED BY CONTRACTING AGENCY TO ACT AS CONTRACTING AGENCY'S REPRESENTATIVE) ARE HEREIN REFERRED TO AS THE "CONTRACTING OFFICER."
2. ANY ITEM NOT SPECIFICALLY DISCUSSED IN THE CONTRACT DOCUMENTS FOR THIS PROJECT OR IN NOTES ON SHEETS IN THE DRAWINGS SHALL BE AS DESCRIBED IN THE PROJECT SPECIFICATIONS. CONTRACTOR IS RESPONSIBLE FOR BEING FAMILIAR WITH PROJECT SPECIFICATIONS AND FOR HAVING ACCESS TO THE PROJECT SPECIFICATIONS AT THE PROJECT SITE TO ENSURE THAT CONSTRUCTION OF THE PROJECT IS IN CONFORMANCE WITH THE PROJECT SPECIFICATIONS.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING, AT CONTRACTOR'S EXPENSE, ALL CONSTRUCTION PERMITS AS REQUIRED BY LOCAL, STATE, AND FEDERAL AGENCIES. CONTRACTOR SHALL PROVIDE ALL MATERIAL, LABOR, AND EQUIPMENT REQUIRED TO COMPLY WITH ALL APPLICABLE PERMIT CONDITIONS AND REQUIREMENTS.
4. CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR THE CONDITIONS OF THE PROJECT SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK (SEE GENERAL CONDITIONS).
5. REQUIRED CONSTRUCTION MATERIALS ARE SHOWN ON THE DRAWINGS AND DESCRIBED IN PROJECT SPECIFICATIONS.
6. INFORMATION SHOWN ON THE DRAWINGS SUPERSEDES ANY CONTRADICTORY INFORMATION IN THE PROJECT SPECIFICATIONS.
7. DRAWINGS DO NOT SHOW ALL EXISTING VEGETATION.
8. EXISTING TOPOGRAPHY, STRUCTURES, SITE FEATURES AND PHASED WORK ARE SHOWN SCREENED AND/OR LIGHT-LINED. NEW FINAL GRADE, STRUCTURES AND SITE FEATURES ARE SHOWN HEAVY-LINED.
9. FOR THOSE PORTIONS OF FULL-SIZE DRAWINGS (22X34 INCHES) SHOWING SCALE BARS, THE MAJOR SCALE UNIT EQUALS 1 INCH. ON COMPARABLE PORTIONS OF HALF-SIZE DRAWINGS (11X17 INCHES), THE MAJOR SCALE UNIT EQUALS ½ INCH.
10. ELEVATIONS AND DISTANCES SHOWN ARE IN FEET AND DECIMALS WITH CONTOUR INTERVALS AT 5-FOOT INCREMENTS.
11. ELEVATIONS GIVEN ARE TO FINAL GRADE UNLESS OTHERWISE SHOWN. UNLESS OTHERWISE NOTED, DEPTHS OF FILL ARE FINAL COMPACTED DEPTHS.
12. FINAL GRADING SHALL PROVIDE DRAINAGE AS SHOWN ON DRAWINGS.
13. DIGITAL TERRAIN DATA ARE BASED ON LIDAR COLLECTED ON JUNE 13 2021 BY EAGLE MAPPING INC. THE HORIZONTAL DATUM IS NAD 83 (2011), AND THE VERTICAL DATUM IS NAVD88 (GEOID18). THE PROJECTION FOR THE ORIGINAL LIDAR DATASET WAS UTM 11N, AND THE DATA WAS REPROJECTED TO STATE PLANE OREGON NORTH (LAMBERT CONFORMAL CONIC, EXPRESSED IN INTERNATIONAL FEET) FOR USE ON THIS PROJECT. LIDAR WAS COLLECTED WITH A RIEGL VQ-1560II WHICH OPERATES IN THE NEAR IR WAVELENGTH. SUPPLEMENTAL SURVEY WAS COLLECTED BY CRAMER FISH SCIENCES IN JULY 2023 USING A SURVEY-GRADE REAL-TIME KINEMATIC (RTK) GLOBAL POSITIONING SYSTEM (GPS) UNIT AND/OR A SURVEY-GRADE TOTAL STATION. THESE DATA WERE MERGED WITH EXISTING LIDAR (2021 EAGLE MAPPING) DATA BY JACOBS TO DEFINE THE TOPOGRAPHIC AND BATHYMETRIC SURFACES WITHIN THE PROJECT AREA AT THE TIMES OF THE RESPECTIVE SURVEYS.
14. THE WATERS OF THE UNITED STATES (WOTUS) AND THEIR ASSOCIATED WETLANDS WERE LOCATED WITHIN THE PROPOSED PROJECT AREA BY ECOSYSTEM SCIENCES, LLC IN NOVEMBER 2022 IN ACCORDANCE WITH USACE GUIDELINES ON IDENTIFICATION OF THE ORDINARY HIGH WATER MARK (OHWM) AND IN CONJUNCTION WITH AGENCY CONSULTATION.
15. EXISTING CONDITIONS AT THE TIME OF CONSTRUCTION MAY VARY FROM THOSE SHOWN ON THE DRAWINGS. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS AND ADJUST WORK PLAN ACCORDINGLY PRIOR TO BEGINNING CONSTRUCTION.
16. CONTRACTOR SHALL MAINTAIN, RELOCATE OR REPLACE EXISTING SURVEY MONUMENTS, CONTROL POINTS AND STAKES WHICH ARE DISTURBED OR DESTROYED. CONTRACTOR SHALL PERFORM THE WORK TO PRODUCE THE SAME LEVEL OF ACCURACY AS THE ORIGINAL MONUMENT(S) IN A TIMELY MANNER AND AT THE CONTRACTOR'S EXPENSE.
17. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION STAKING AND LAYOUT.
18. CONTRACTOR SHALL PURSUE WORK IN A CONTINUOUS AND DILIGENT MANNER TO ENSURE TIMELY COMPLETION OF THE PROJECT. ANY WORK WITHIN THE FLOWING CHANNEL OF THE NORTH FORK WALLA WALLA RIVER MUST BE CONDUCTED BETWEEN JULY 1 AND SEPTEMBER 30.
19. CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UTILITIES THAT MAY BE IMPACTED AND PROTECTING UTILITIES DURING CONSTRUCTION. PRIOR TO DIGGING, CONTRACTOR SHALL CALL "DIG SAFELY OREGON" 1-800-332-2344. LOCATING AND PROTECTION OF ALL UTILITIES (PUBLIC AND PRIVATE) IS THE RESPONSIBILITY OF THE CONTRACTOR.
20. CONTRACTOR SHALL PROTECT ALL EXISTING POWER POLES AND OVERHEAD UTILITIES. ALL EQUIPMENT SHALL MAINTAIN A MINIMUM OF 10 FEET OF CLEARANCE HORIZONTALLY AND VERTICALLY FROM POWER LINES, OR MORE AS REQUIRED FOR SAFETY.
21. CONTRACTOR SHALL CONFIRM THE ACCESS POINT, ROUTE(S), AND LOCATION OF STORAGE OF MATERIALS AND EQUIPMENT WITH CONTRACTING OFFICER PRIOR TO TRANSPORTING MATERIALS AND EQUIPMENT TO THE PROJECT SITE.
22. STORING OF ALL EQUIPMENT WILL BE AT THE CONTRACTOR'S RISK AND AT A LOCATION APPROVED BY THE CONTRACTING OFFICER.
23. WATER FOR FIRE PREVENTION AND SUPPRESSION AS WELL AS FOR USE WITH CONSTRUCTION ACTIVITIES SHALL BE SUPPLIED BY THE CONTRACTOR FROM OFF-SITE SOURCE.
24. CONTRACTOR SHALL COORDINATE WITH CONTRACTING OFFICER TO ENSURE FISH SALVAGE WITHIN THE PROJECT SITE HAS BEEN ACCOMPLISHED PRIOR TO CONSTRUCTION ACTIVITIES. FISH SALVAGE WILL BE THE RESPONSIBILITY OF THE CONTRACTING AGENCY.
25. CONTRACTOR SHALL AVOID, PRESERVE, AND PROTECT EXISTING SENSITIVE AREAS SHOWN ON THE DRAWINGS AS "NOT TO BE DISTURBED" OR BEYOND HIGH-VISIBILITY FENCE, OR AS SUBSEQUENTLY MARKED IN THE FIELD BY CONTRACTING OFFICER.
26. CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING AND MAINTAINING EROSION CONTROL DEVICES DURING CONSTRUCTION. EROSION AND SEDIMENT CONTROL AND STREAM MANAGEMENT MEASURES SHALL CONFORM WITH THE APPROVED EROSION/SEDIMENT CONTROL PLAN (ESCP) AS SPECIFIED.
27. ENGINEER RESPONSIBLE FOR THE PREPARATION OF THESE DRAWINGS AND SPECIFICATIONS WILL NOT BE RESPONSIBLE FOR, OR LIABLE FOR, UNAUTHORIZED CHANGES TO, OR USE OF, THESE DRAWINGS. ALL CHANGES TO THE DRAWINGS AND SPECIFICATIONS MUST BE IN WRITING AND APPROVED BY THE ENGINEER RESPONSIBLE FOR THE PREPARATION OF THE DRAWINGS AND SPECIFICATIONS.
28. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY WORK NECESSARY TO MAINTAIN A PASSABLE CONDITION ON THE NORTH FORK WALLA WALLA RIVER ACCESS ROUTE TO ALL CONSTRUCTION VEHICLES AT THE TIME OF CONSTRUCTION AND PLANTING.
29. AT THE END OF THE WORK, CONTRACTOR SHALL RESTORE EXISTING LANDOWNER ACCESS ROUTE TO PRE-PROJECT CONDITIONS OR BETTER WITH PLACED AND COMPACTED FILL, COMPARABLE TO ONSITE MATERIAL, TO ESTABLISH GRADES AND DRIVING SURFACE EASILY PASSABLE TO RESIDENT VEHICLES.

ABBREVIATIONS

AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
AC	ACRE
APPROX	APPROXIMATELY
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
AWPA	AMERICAN WOOD PROTECTION ASSOCIATION
CF	CUBIC FEET
CFS	CUBIC FEET PER SECOND
℄	CENTERLINE
CP	CONTROL POINT
CY	CUBIC YARD
DIA	DIAMETER
DBH	DIAMETER BREAST HEIGHT
E	EAST, EASTING
EA	EACH
EG	EXISTING GRADE
EX, EXST	EXISTING
ELEC	ELECTRIC
EL, ELEV	ELEVATION
EOP	EDGE OF PAVEMENT
EXT	EXTERIOR
FG	FINAL GRADE
FT	FEET
HIP	HABITAT IMPROVEMENT PLAN
HORIZ	HORIZONTAL
HPI	HORIZONTAL POINT OF INTERSECTION
IE	INVERT ELEVATION
INV	INVERT
LF	LINEAL FOOT
LIDAR	LIGHT DETECTION AND RANGING
LS	LUMP SUM
MAX	MAXIMUM
MIN	MINIMUM
N	NORTH, NORTHING
N/A	NOT APPLICABLE
NAD	NORTH AMERICAN DATUM
NAVD	NORTH AMERICAN VERTICAL DATUM
NMFS	NATIONAL MARINE FISHERIES SERVICE
NO	NUMBER
NTS	NOT TO SCALE
OHWM/OHW	ORDINARY HIGH WATER MARK
OPUS	ONLINE POSITIONING USER SERVICE
OSC	OFFICE OF SPECIES CONSERVATION
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
PALS	POST-ASSISTED LOG STRUCTURES
PI	POINT OF INTERSECTION
POB	POINT OF BEGINNING
POE	POINT OF ENDING
PVC	POLYVINYL CHLORIDE
PVI	POINT OF VERTICAL INTERSECTION
R	RADIUS, RANGE
RM	RIVER MILE
SCH	SCHEDULE
SEC	SECTON
SF	SQUARE FOOT
SIM	SIMILAR
STA	STATION
SWPPP	STORM WATER POLLUTION PREVENTION PLAN
SY	SQUARE YARD
T	TOWNSHIP
TEMP	TEMPORARY
TYP	TYPICAL
UG	UNDERGROUND
UON	UNLESS OTHERWISE NOTED
US	UNITED STATES
UV	ULTRAVIOLET
VPI	VERTICAL POINT OF INTERSECTION
VERT	VERTICAL
W/	WITH
WL	WATER LINE, WETLAND
WSE	WATER SURFACE ELEVATION
WTR	WATER
WWBWC	WALLA WALLA BASIN WATERSHED COUNCIL
W/O	WITHOUT
"	INCH, INCHES OR SECOND
'	FOOT, FEET OR MINUTE
°	DEGREE

LEGEND:



QUANTITY SUMMARY

MATERIAL	SIZE	ROOT WAD	QUANTITY
TYPE	LENGTH X DIAM. (FT) /ROCK SIZE	YES/NO	#
SLASH (CY)	< 10 X < 0.5	NO	546
RACKING WOOD	6 - 20 X 0.5 - 1	OPTIONAL	882
LOG TYPE B	25 X 2	YES	10
LOG TYPE C	30 X 2	YES	10
LOG TYPE D	35 X 2	YES	32
LOG TYPE E	40 X 2	YES	120
LOG TYPE F	25 X 2	NO	5
LOG TYPE G	30 X 2	NO	5
LOG PILE	20-25 X 1.0 -1.5	NO	250
BOULDERS	4 MAN	N/A	320
LIVE CUTTING	N/A	N/A	2994
WILLOW TRENCHING (LF)	N/A	N/A	900
SIDE CHANNEL INLET EXCAVATION (CY)	N/A	N/A	391
SIDE CHANNEL EXCAVATION (CY)	N/A	N/A	832
COARSE SIDE CHANNEL STREAMBED MIX (CY)	SPEC: 32.23.23 SECTION 2.06	N/A	550
SIDE CHANNEL SAND LIFTS (CY)	SPEC: 32.23.23 SECTION 2.01	N/A	75
SIDE CHANNEL STREAMBED MIX (CY)	SPEC: 32.23.23 SECTION 2.07	N/A	300
RESEEDING/SITE RESTORATION (ACRE)	N/A	N/A	3.53

NOT FOR CONSTRUCTION

NO.	DATE	DSGN	DR	CHK	APVD
		WE	KL	PR	LH

REVISION BY APVD

NORTH FORK WALLA WALLA RIVER
RESTORATION DESIGN - RIVER MILE 4.3 - 5.2
WALLA WALLA BASIN WATERSHED COUNCIL
MILTON-FREEWATER, OR

Jacobs

GENERAL
LEGEND
ABBREVIATIONS
GENERAL PROJECT NOTES

AS SHOWN
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1"

DATE	MARCH 2024
PROJ	W3Y00606
DWG	G-02
SHEET	2 of 22

80% Design

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. APPROPRIATE STATE (OREGON DEPARTMENT OF FISH AND WILDLIFE (ODFW), WASHINGTON DEPARTMENT OF FISH AND WILDLIFE (WDFW), IDAHO DEPARTMENT OF FISH AND GAME (IDFG), AND MONTANA FISH WILDLIFE AND PARKS (MFWP)) GUIDELINES FOR TIMING OF IN-WATER WORK WINDOWS (IWW) WILL BE FOLLOWED.

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.

E. THE IN-WATER WORK WINDOW WILL BE PROVIDED IN THE CONSTRUCTION PLANS.

3. CONTAMINANTS.

A. EXCAVATION OF MORE THAN 20 CUBIC YARDS WILL REQUIRE A SITE VISIT AND DOCUMENTED ASSESSMENT FOR POTENTIAL CONTAMINANT SOURCES. THE SITE ASSESSMENT WILL BE STORED WITH PROJECT FILES OR AS AN APPENDIX TO THE BASIS OF DESIGN REPORT.

B. THE SITE ASSESSMENT WILL SUMMARIZE:

1. THE SITE VISIT, CONDITION OF THE PROPERTY, AND IDENTIFICATION OF ANY AREAS USED FOR VARIOUS INDUSTRIAL PROCESSES;
2. AVAILABLE RECORDS, SUCH AS FORMER SITE USE, BUILDING PLANS, AND RECORDS OF ANY PRIOR CONTAMINATION EVENTS;
3. INTERVIEWS WITH KNOWLEDGEABLE PEOPLE, SUCH AS SITE OWNERS, OPERATORS, OCCUPANTS, NEIGHBORS, OR LOCAL GOVERNMENT OFFICIALS; AND
4. THE TYPE, QUANTITY, AND EXTENT OF ANY POTENTIAL CONTAMINATION SOURCES.

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 ENVIRONMENTAL COMPLIANCE (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 AN 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.

NOT FOR CONSTRUCTION

NO.	DATE	REVISION	BY	APVD
DSGN		WE	DR	CHK	KL	APVD	PR	LH

NORTH FORK WALLA WALLA RIVER
RESTORATION DESIGN - RIVER MILE 4.3 - 5.2
WALLA WALLA BASIN WATERSHED COUNCIL
MILTON-FREEWATER, OR

Jacobs

GENERAL

HIP GENERAL CONSERVATION MEASURES - 1

N/A

VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1"

DATE	MARCH 2024
PROJ	W3Y00606
DWG	G-03
SHEET	3 of 22

80% Design

PROJECT DESIGN AND SITE PREPARATION (CONTINUED).

11. SPILL PREVENTION, CONTROL, AND COUNTER MEASURES.

A. A DESCRIPTION OF HAZARDOUS MATERIALS THAT WILL BE USED, INCLUDING INVENTORY, STORAGE, AND HANDLING PROCEDURES WILL BE AVAILABLE ON-SITE.

B. WRITTEN PROCEDURES FOR NOTIFYING ENVIRONMENTAL RESPONSE AGENCIES WILL BE POSTED AT THE WORK SITE.

C. SPILL CONTAINMENT KITS (INCLUDING INSTRUCTIONS FOR CLEANUP AND DISPOSAL) ADEQUATE FOR THE TYPES AND QUANTITY OF HAZARDOUS MATERIALS USED AT THE SITE WILL BE AVAILABLE AT THE WORK SITE.

D. WORKERS WILL BE TRAINED IN SPILL CONTAINMENT PROCEDURES AND WILL BE INFORMED OF THE LOCATION OF SPILL CONTAINMENT KITS.

E. ANY WASTE LIQUIDS GENERATED AT THE STAGING AREAS WILL BE TEMPORARILY STORED UNDER AN IMPERVIOUS COVER, SUCH AS A TARPAULIN, UNTIL THEY CAN BE PROPERLY TRANSPORTED TO AND DISPOSED OF AT A FACILITY THAT IS APPROVED FOR RECEIPT OF HAZARDOUS MATERIALS.

F. PUMPS USED ADJACENT TO WATER SHALL USE SPILL CONTAINMENT SYSTEMS.

12. INVASIVE SPECIES CONTROL.

A. PRIOR TO ENTERING THE SITE, ALL VEHICLES AND EQUIPMENT WILL BE POWER WASHED, ALLOWED TO FULLY DRY, AND INSPECTED TO MAKE SURE NO PLANTS, SOIL, OR OTHER ORGANIC MATERIAL ADHERES TO THE SURFACE.

B. WATERCRAFT, WADERS, BOOTS, AND ANY OTHER GEAR TO BE USED IN OR NEAR WATER WILL BE INSPECTED FOR AQUATIC INVASIVE SPECIES.

C. WADING BOOTS WITH FELT SOLES ARE NOT TO BE USED DUE TO THEIR PROPENSITY FOR AIDING IN THE TRANSFER OF INVASIVE SPECIES UNLESS DECONTAMINATION PROCEDURES HAVE BEEN APPROVED BY THE EC LEAD.

WORK AREA ISOLATION AND FISH SALVAGE.

1. WORK AREA ISOLATION.

A. ANY WORK AREA WITHIN THE WETTED CHANNEL WILL BE ISOLATED FROM THE ACTIVE STREAM WHENEVER ESA-LISTED FISH ARE REASONABLY CERTAIN TO BE PRESENT, OR IF THE WORK AREA IS LESS THAN 300-FEET UPSTREAM FROM KNOWN SPAWNING HABITATS.

B. WORK AREA ISOLATION AND FISH SALVAGE ACTIVITIES WILL COMPLY WITH THE IN-WATER WORK WINDOW.

C. DESIGN PLANS WILL INCLUDE ALL ISOLATION ELEMENTS AND AREAS (COFFER DAMS, PUMPS, DISCHARGE AREAS, FISH SCREENS, FISH RELEASE AREAS, ETC.).

D. WORK AREA ISOLATION AND FISH CAPTURE ACTIVITIES WILL OCCUR DURING PERIODS OF THE COOLEST AIR AND WATER TEMPERATURES POSSIBLE, NORMALLY EARLY IN THE MORNING VERSUS LATE IN THE DAY, AND DURING CONDITIONS APPROPRIATE TO MINIMIZE STRESS AND DEATH OF SPECIES PRESENT.

2. FISH SALVAGE.

A. MONITORING AND RECORDING WILL TAKE PLACE FOR DURATION OF SALVAGE. THE SALVAGE REPORT WILL BE COMMUNICATED TO AGENCIES VIA THE PROJECT COMPLETION FORM (PCF).

B. SALVAGE ACTIVITIES SHOULD TAKE PLACE DURING CONDITIONS TO MINIMIZE STRESS TO FISH SPECIES, TYPICALLY PERIODS OF THE COOLEST AIR AND WATER TEMPERATURES WHICH OCCUR IN THE MORNING VERSUS LATE IN THE DAY.

C. SALVAGE OPERATIONS WILL FOLLOW THE ORDERING, METHODS, AND CONSERVATION MEASURES SPECIFIED BELOW:

1. SLOWLY REDUCE WATER FROM THE WORK AREA TO ALLOW SOME FISH TO LEAVE VOLITIONALLY.

2. BLOCK NETS WILL BE INSTALLED AT UPSTREAM AND DOWNSTREAM LOCATIONS AND MAINTAINED IN A SECURED POSITION TO EXCLUDE FISH FROM ENTERING THE PROJECT AREA.

3. BLOCK NETS WILL BE SECURED TO THE STREAM CHANNEL BED AND BANKS UNTIL FISH CAPTURE AND TRANSPORT ACTIVITIES ARE COMPLETE. BLOCK NETS MAY BE LEFT IN PLACE FOR THE DURATION OF THE PROJECT TO EXCLUDE FISH AS LONG AS PASSAGE REQUIREMENTS ARE MET.

4. NETS WILL BE MONITORED HOURLY DURING IN-STREAM DISTURBANCE.

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.

D. SALVAGE GUIDELINES FOR BULL TROUT, LAMPREY, MUSSELS, AND NATIVE FISH.

1. CONDUCT SITE SURVEY TO ESTIMATE SALVAGE NUMBERS.

2. PRE-SELECT SITE(S) FOR RELEASE AND/OR MUSSEL BED RELOCATION.

3. SALVAGE OF BULL TROUT WILL NOT TAKE PLACE WHEN WATER TEMPERATURES EXCEED 15 DEGREES CELSIUS.

4. IF DRAWDOWN LESS THAN 48 HOURS, SALVAGE OF LAMPREY AND MUSSELS MAY NOT BE NECESSARY IF TEMPERATURES SUPPORT SURVIVAL IN SEDIMENTS.

5. SALVAGE MUSSELS BY HAND, LOCATING BY SNORKELING OR WADING.

6. SALVAGE LAMPREY BY ELECTROFISHING (SEE ELECTROFISHING FOR LARVAL LAMPREY SETTINGS AND LARVAL LAMPREY DRY SHOCKING SETTINGS).

7. SALVAGE BONY FISH AFTER LAMPREY WITH NETS OR ELECTROFISHING (SEE ELECTROFISHING FOR APPROPRIATE SETTINGS).

8. REGULARLY INSPECT DEWATERED SITE SINCE LAMPREY LIKELY TO EMERGE AFTER DEWATERING AND MUSSELS MAY BECOME VISIBLE.

9. MUSSELS MAY BE TRANSFERRED IN COOLERS.

10. MUSSELS WILL BE PLACED INDIVIDUALLY TO ENSURE ABILITY TO BURROW INTO NEW HABITAT.

3. ELECTROFISHING.

A. INITIAL SITE SURVEY AND INITIAL SETTINGS.

1. IDENTIFY SPAWNING ADULTS AND ACTIVE REDDS TO AVOID.

2. RECORD WATER TEMPERATURE. ELECTROFISHING WILL NOT OCCUR WHEN WATER TEMPERATURES ARE ABOVE 18 DEGREES CELSIUS.

3. IF POSSIBLE, A BLOCK NET WILL BE PLACED DOWNSTREAM AND CHECKED REGULARLY TO CAPTURE STUNNED FISH THAT DRIFT DOWNSTREAM.

4. INITIAL SETTINGS WILL BE 100 VOLTS, PULSE WIDTH OF 500 MICRO SECONDS, AND PULSE RATE OF 30 HERTZ.

5. RECORDS FOR CONDUCTIVITY, WATER TEMPERATURE, AIR TEMPERATURE, ELECTROFISHING SETTINGS, ELECTROFISHER MODEL, ELECTROFISHER CALIBRATION, FISH CONDITIONS, FISH MORTALITIES, AND TOTAL CAPTURE RATES WILL BE INCLUDED IN THE SALVAGE LOG BOOK.

B. ELECTROFISHING TECHNIQUE.

1. SAMPLING SHOULD BEGIN USING STRAIGHT DC. POWER WILL REMAIN ON UNTIL THE FISH IS NETTED WHEN USING STRAIGHT DC. GRADUALLY INCREASE VOLTAGE WHILE REMAINING BELOW MAXIMUM LEVELS.

2. MAXIMUM VOLTAGE WILL BE 1100 VOLTS WHEN CONDUCTIVITY IS <100 MILLISECONDS, 800 VOLTS WHEN CONDUCTIVITY IS BETWEEN 100 AND 300 MILLISECONDS, AND 400 VOLTS WHEN CONDUCTIVITY IS >300 MILLISECONDS.

3. IF FISH CAPTURE IS NOT SUCCESSFUL USING STRAIGHT DC, THE ELECTROFISHER WILL BE SET TO INITIAL VOLTAGE FOR PDC. VOLTAGE, PULSE WIDTH, AND PULSE FREQUENCY WILL BE GRADUALLY INCREASED WITHIN MAXIMUM VALUES UNTIL CAPTURE IS SUCCESSFUL.

4. MAXIMUM PULSE WIDTH IS 5 MILLISECONDS. MAXIMUM PULSE RATE IS 70 HERTZ

5. ELECTROFISHING WILL NOT OCCUR IN ONE AREA FOR AN EXTENDED PERIOD.

6. THE ANODE WILL NOT INTENTIONALLY COME INTO CONTACT WITH FISH. THE ZONE FOR POTENTIAL INJURY OF 0.5 M FROM THE ANODE WILL BE AVOIDED.

7. SETTINGS WILL BE LOWERED IN SHALLOWER WATER SINCE VOLTAGE GRADIENTS LIKELY TO INCREASE.

8. ELECTROFISHING WILL NOT OCCUR IN TURBID WATER WHERE VISIBILITY IS POOR (I.E. UNABLE TO SEE THE BED OF THE STREAM).

9. OPERATIONS WILL IMMEDIATELY STOP IF MORTALITY OR OBVIOUS FISH INJURY IS OBSERVED. ELECTROFISHING SETTINGS WILL BE REEVALUATED.

C. SAMPLE PROCESSING.

1. FISH SHALL BE SORTED BY SIZE TO AVOID PREDATION DURING CONTAINMENT.

2. SAMPLERS WILL REGULARLY CHECK CONDITIONS OF FISH HOLDING CONTAINERS, AIR PUMPS, WATER TRANSFERS, ETC.

3. FISH WILL BE OBSERVED FOR GENERAL CONDITIONS AND INJURIES

4. EACH FISH WILL BE COMPLETELY REVIVED BEFORE RELEASE. ESA-LISTED SPECIES WILL BE PRIORITIZED FOR SUCCESSFUL RELEASE.

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 ELECTROFISHER IS NOT ONE OF FOLLOWING PRE-APPROVED MODELS: ABP-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).

NOT FOR CONSTRUCTION

NO.	DATE	DSGN	DR	CHK	APVD	BY	APVD
		WE	KL	PR			LH

REVISION

NORTH FORK WALLA WALLA RIVER
RESTORATION DESIGN - RIVER MILE 4.3 - 5.2
WALLA WALLA BASIN WATERSHED COUNCIL
MILTON-FREEWATER, OR

Jacobs

GENERAL
HIP GENERAL CONSERVATION MEASURES - 2

N/A
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
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DATE	MARCH 2024
PROJ	W3Y00606
DWG	G-04
SHEET	4 of 22

80% Design

WORK AREA ISOLATION AND FISH SALVAGE (CONTINUED).

4. DEWATERING.

A. DEWATERING WILL OCCUR AT A RATE SLOW ENOUGH TO ALLOW SPECIES TO NATURALLY MIGRATE OUT OF THE WORK AREA.

B. WHERE A GRAVITY FEED DIVERSION IS NOT POSSIBLE, A PUMP MAY BE USED. PUMPS WILL BE INSTALLED TO AVOID REPETITIVE DEWATERING AND REWATERING.

C. WHEN FISH ARE PRESENT, PUMPS WILL BE SCREENED IN ACCORDANCE WITH NMFS FISH SCREEN CRITERIA. NMFS ENGINEERING REVIEW AND APPROVAL WILL BE OBTAINED FOR PUMPS EXCEEDING 3 CUBIC FEET PER SECOND.

D. DISSIPATION OF FLOW ENERGY AT THE BYPASS OUTFLOW WILL BE PROVIDED TO PREVENT DAMAGE TO THE STREAM CHANNEL AND RIPARIAN VEGETATION.

E. SEEPAGE WATER WILL BE PUMPED TO A TEMPORARY STORAGE AND TREATMENT SITE OF INTO UPLAND AREAS TO ALLOW WATER TO PERCOLATE THROUGH SOIL AND VEGETATION PRIOR TO REENTERING THE STREAM CHANNEL.

CONSTRUCTION AND POST CONSTRUCTION CONSERVATION MEASURES.

1. FISH PASSAGE.

A. FISH PASSAGE WILL BE PROVIDED FOR ADULT AND JUVENILE FISH LIKELY TO BE PRESENT DURING CONSTRUCTION UNLESS PASSAGE DID NOT EXIST BEFORE CONSTRUCTION, THE STREAM IS NATURALLY IMPASSABLE, OR PASSAGE WILL NEGATIVELY IMPACT ESA-LISTED SPECIES OR THEIR HABITAT.

B. FISH PASSAGE ALTERNATIVES WILL BE APPROVED BY THE BPA EC LEAD UNDER ADVISEMENT BY THE NMFS HABITAT BIOLOGIST.

2. CONSTRUCTION AND DISCHARGE WATER.

A. SURFACE WATER MAY BE DIVERTED TO MEET CONSTRUCTION NEEDS ONLY IF DEVELOPED SOURCES ARE UNAVAILABLE OR INADEQUATE.

B. DIVERSIONS WILL NOT EXCEED 10% OF THE AVAILABLE FLOW.

C. CONSTRUCTION DISCHARGE WATER WILL BE COLLECTED AND TREATED TO REMOVE DEBRIS, NUTRIENTS, SEDIMENT, PETROLEUM HYDROCARBONS, METALS, AND OTHER POLLUTANTS.

3. TIME AND EXTENT OF DISTURBANCE.

A. EARTHWORK REQUIRING IN-STREAM MECHANIZED EQUIPMENT (INCLUDING DRILLING, EXCAVATION, DREDGING, FILLING, AND COMPACTING) WILL BE COMPLETED AS QUICKLY AS POSSIBLE.

B. MECHANIZED EQUIPMENT WILL WORK FROM TOP OF BANK UNLESS WORK FROM ANOTHER LOCATION WILL RESULT IN LESS HABITAT DISTURBANCE (TURBIDITY, VEGETATION DISTURBANCE, ETC.).

4. CESSATION OF WORK.

A. PROJECT OPERATIONS WILL CEASE WHEN HIGH FLOW CONDITIONS MAY RESULT IN INUNDATION OF THE PROJECT AREA (FLOOD EFFORTS TO DECREASE DAMAGES TO NATURAL RESOURCES PERMITTED).

B. WATER QUALITY LEVELS EXCEEDED. SEE CWA SECTION 401 WATER QUALITY CERTIFICATION AND TURBIDITY MEASURES.

5. SITE RESTORATION.

A. DISTURBED AREAS, STREAM BANKS, SOILS, AND VEGETATION WILL BE CLEANED UP AND RESTORED TO IMPROVED OR PRE-PROJECT CONDITIONS.

B. PROJECT-RELATED WASTE WILL BE REMOVED.

C. TEMPORARY ACCESS ROADS AND STAGING WILL BE DECOMPACTED AND RESTORED. SOILS WILL BE LOOSENED IF NEEDED FOR REVEGETATION OR WATER INFILTRATION.

D. THE PROJECT SPONSOR WILL RETAIN THE RIGHT OF REASONABLE ACCESS TO THE SITE TO MONITOR AND MAINTAIN THE SITE OVER THE LIFE OF THE PROJECT.

6. REVEGETATION.

A. PLANTING AND SEEDING WILL OCCUR PRIOR TO OR AT THE BEGINNING OF THE FIRST GROWING SEASON AFTER CONSTRUCTION.

B. A MIX OF NATIVE SPECIES (INVASIVE SPECIES NOT ALLOWED) APPROPRIATE TO THE SITE WILL BE USED TO REESTABLISH VEGETATION, PROVIDE SHADE, AND REDUCE EROSION. REESTABLISHED VEGETATION SHOULD BE AT LEAST 70% OF PRE-PROJECT CONDITIONS WITHIN THREE YEARS.

C. VEGETATION SUCH AS WILLOWS, SEDGES, OR RUSH MATS WILL BE SALVAGED FROM DISTURBED OR ABANDONED AREAS TO BE REPLANTED.

D. SHORT-TERM STABILIZATION MEASURE MAY INCLUDE THE USE OF NON-NATIVE STERILE SEED MIX (WHEN NATIVE NOT AVAILABLE), WEED-FREE CERTIFIED STRAW, OR OTHER SIMILAR TECHNIQUES.

E. SURFACE FERTILIZER WILL NOT BE APPLIED WITHIN 50 FEET OF ANY STREAM, WATE BODY, OR WETLAND.

F. FENCING WILL BE INSTALLED AS NECESSARY TO PREVENT ACCESS TO REVEGETATED SITES BY LIVESTOCK OR UNAUTHORIZED PERSONS.

G. INVASIVE PLANTS WILL BE REMOVED OR CONTROLLED UNTIL NATIVE PLANT SPECIES ARE WELL ESTABLISHED (TYPICALLY THREE YEARS POST-CONSTRUCTION).

7. SITE ACCESS AND IMPLEMENTATION MONITORING.

A. THE PROJECT SPONSOR WILL PROVIDE CONSTRUCTION MONITORING DURING IMPLEMENTATION TO ENSURE ALL CONSERVATION MEASURES ARE ADEQUATELY FOLLOWED, EFFECTS TO LISTED SPECIES ARE NOT GREATER THAN PREDICTED, AND INCIDENTAL TAKE LIMITATIONS ARE NOT EXCEEDED.

B. THE PROJECT SPONSOR OR DESIGNATED REPRESENTATIVE WILL SUBMIT THE PROJECT COMPLETION FORM (PCF) WITHIN 30 DAYS OF PROJECT COMPLETION.

8. CWA SECTION 401 WATER QUALITY CERTIFICATION.

A. THE PROJECT SPONSOR OR DESIGNATED REPRESENTATIVE WILL COMPLETE AND RECORD WATER QUALITY OBSERVATIONS (SEE TURBIDITY MONITORING) TO ENSURE IN-WATER WORK IS NOT DEGRADING WATER QUALITY.

B. DURING CONSTRUCTION, WATER QUALITY PROVISIONS PROVIDED BY THE OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY, WASHINGTON DEPARTMENT OF ECOLOGY, IDAHO DEPARTMENT OF ENVIRONMENTAL QUALITY WILL BE FOLLOWED.

STAGED REWATERING PLAN.

A. WHEN REINTRODUCING WATER TO DEWATERED AREAS AND NEWLY CONSTRUCTED CHANNELS, A STAGED REWATERING PLAN WILL BE APPLIED.

B. THE FOLLOWING WILL BE APPLIED TO ALL REWATERING EFFORTS. COMPLEX REWATERING EFFORTS MAY REQUIRE ADDITIONAL NOTES OR A DEDICATED SHEET IN THE CONSTRUCTION DETAILS.

1. TURBIDITY MONITORING PROTOCOL WILL BE APPLIED TO REWATERING EFFORTS.
2. PRE-WASH THE AREA BEFORE REWATERING. TURBID WASH WATER WILL BE DETAINED AND PUMPED TO THE FLOODPLAIN OR SEDIMENT CAPTURE AREAS RATHER THAN DISCHARGING TO FISH-BEARING STREAMS.
3. INSTALL SEINE NETS AT UPSTREAM END TO PREVENT FISH FROM MOVING DOWNSTREAM UNTIL 2/3 OF TOTAL FLOW IS RESTORED TO THE CHANNEL.
4. STARTING IN EARLY MORNING INTRODUCE 1/3 OF NEW CHANNEL FLOW OVER PERIOD OF 1-2 HOURS.
5. INTRODUCE SECOND THIRD OF FLOW OVER NEXT 1 TO 2 HOURS AND BEGIN FISH SALVAGE OF BYPASS CHANNEL IF FISH ARE PRESENT.
6. REMOVE UPSTREAM SEINE NETS ONCE 2/3 FLOW IN REWATERED CHANNEL AND DOWNSTREAM TURBIDITY IS WITHIN ACCEPTABLE RANGE (LESS THAN 40 NTU OR LESS THAN 10% BACKGROUND).
7. INTRODUCE FINAL THIRD OF FLOW ONCE FISH SALVAGE EFFORTS ARE COMPLETE AND DOWNSTREAM TURBIDITY VERIFIED TO BE WITHIN ACCEPTABLE RANGE.
8. INSTALL PLUG TO BLOCK FLOW INTO OLD CHANNEL OR BYPASS. REMOVE ANY REMAINING SEINE NETS.
9. IN LAMPREY SYSTEMS, LAMPREY SALVAGE AND DRY SHOCKING MAY BE NECESSARY.

TURBIDITY MONITORING.

A. RECORD THE READING, LOCATION, AND TIME FOR THE BACKGROUND READING APPROXIMATELY 100 FEET UPSTREAM OF THE PROJECT AREA USING A RECENTLY CALIBRATED TURBIDIMETER OR VIA VISUAL OBSERVATION (SEE THE HIP HANDBOOK TURBIDITY MONITORING SECTION FOR A VISUAL OBSERVATION KEY).

B. RECORD THE TURBIDITY READING, LOCATION, AND TIME AT THE MEASUREMENT COMPLIANCE LOCATION POINT.

1. 50 FEET DOWNSTREAM FOR STREAMS LESS THAN 30 FEET WIDE.
2. 100 FEET DOWNSTREAM FOR STREAMS BETWEEN 30 AND 100 FEET WIDE.
3. 200 FEET DOWNSTREAM FOR STREAMS GREATER THAN 100 FEET WIDE.
4. 300 FEET FROM THE DISCHARGE POINT OR NONPOINT SOURCE FOR LOCATIONS SUBJECT TO TIDAL OR COASTAL SCOUR.

C. TURBIDITY SHALL BE MEASURED (BACKGROUND LOCATION AND COMPLIANCE POINTS) EVERY 4 HOURS WHILE WORK IS BEING IMPLEMENTED.

D. IF THERE IS A VISIBLE DIFFERENCE BETWEEN A COMPLIANCE POINT AND THE BACKGROUND, THE EXCEEDANCE WILL BE NOTED IN THE PROJECT COMPLETION FORM (PCF). ADJUSTMENTS OR CORRECTIVE MEASURES WILL BE TAKEN IN ORDER TO REDUCE TURBIDITY.

E. IF EXCEEDANCES OCCUR FOR MORE THAN TWO CONSECUTIVE MONITORING INTERVALS (AFTER 8 HOURS), THE ACTIVITY WILL STOP UNTIL THE TURBIDITY LEVEL RETURNS TO BACKGROUND. THE BPA EC LEAD WILL BE NOTIFIED OF ALL EXCEEDANCES AND CORRECTIVE ACTIONS AT PROJECT COMPLETION.

F. IF TURBIDITY CONTROLS (COFFER DAMS, WADDLES, FENCING, ETC.) ARE DETERMINED INEFFECTIVE, CREWS WILL BE MOBILIZED TO MODIFY AS NECESSARY. OCCURRENCES WILL BE DOCUMENTED IN THE PROJECT COMPLETION FORM (PCF).

G. FINAL TURBIDITY READINGS, EXCEEDANCES, AND CONTROL FAILURES WILL BE SUBMITTED TO THE BPA EC LEAD USING THE PROJECT COMPLETION FORM (PCF).

NOT FOR CONSTRUCTION

NO.	DATE	REVISION	BY	APVD
DSGN		WE	DR	KL
			CHK	APVD
			PR	LH

NORTH FORK WALLA WALLA RIVER
RESTORATION DESIGN - RIVER MILE 4.3 - 5.2
WALLA WALLA BASIN WATERSHED COUNCIL
MILTON-FREEWATER, OR

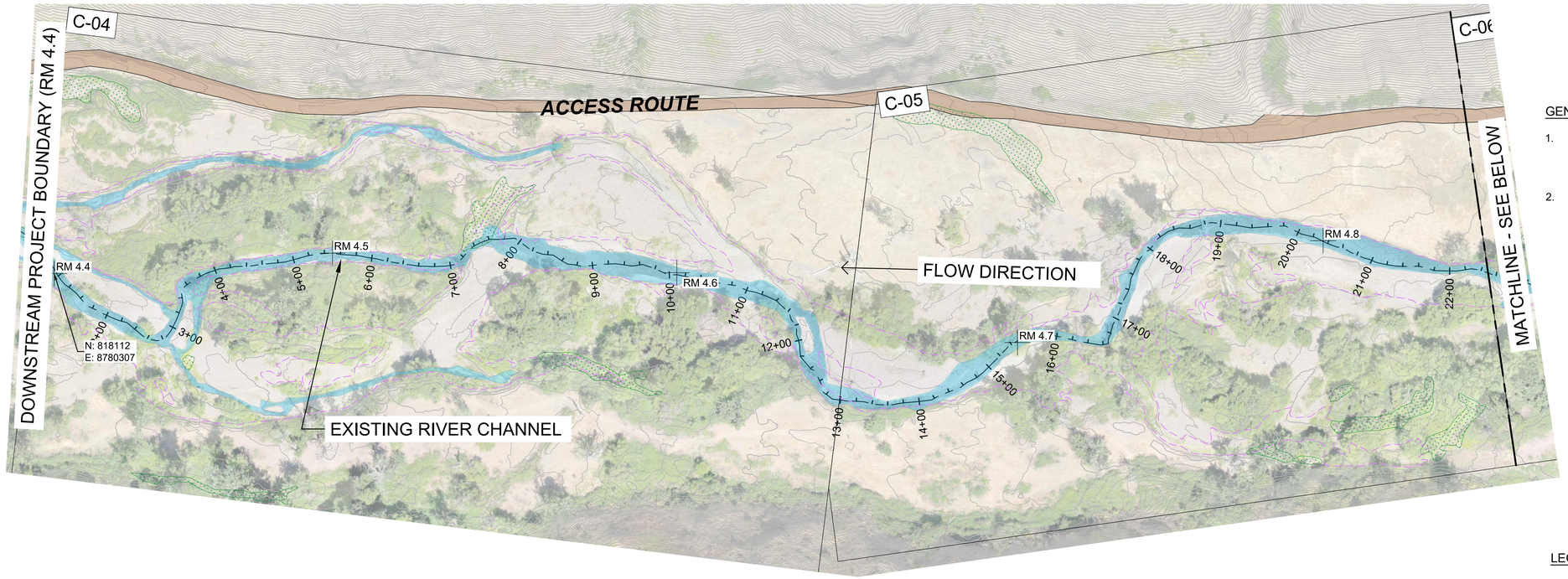
Jacobs

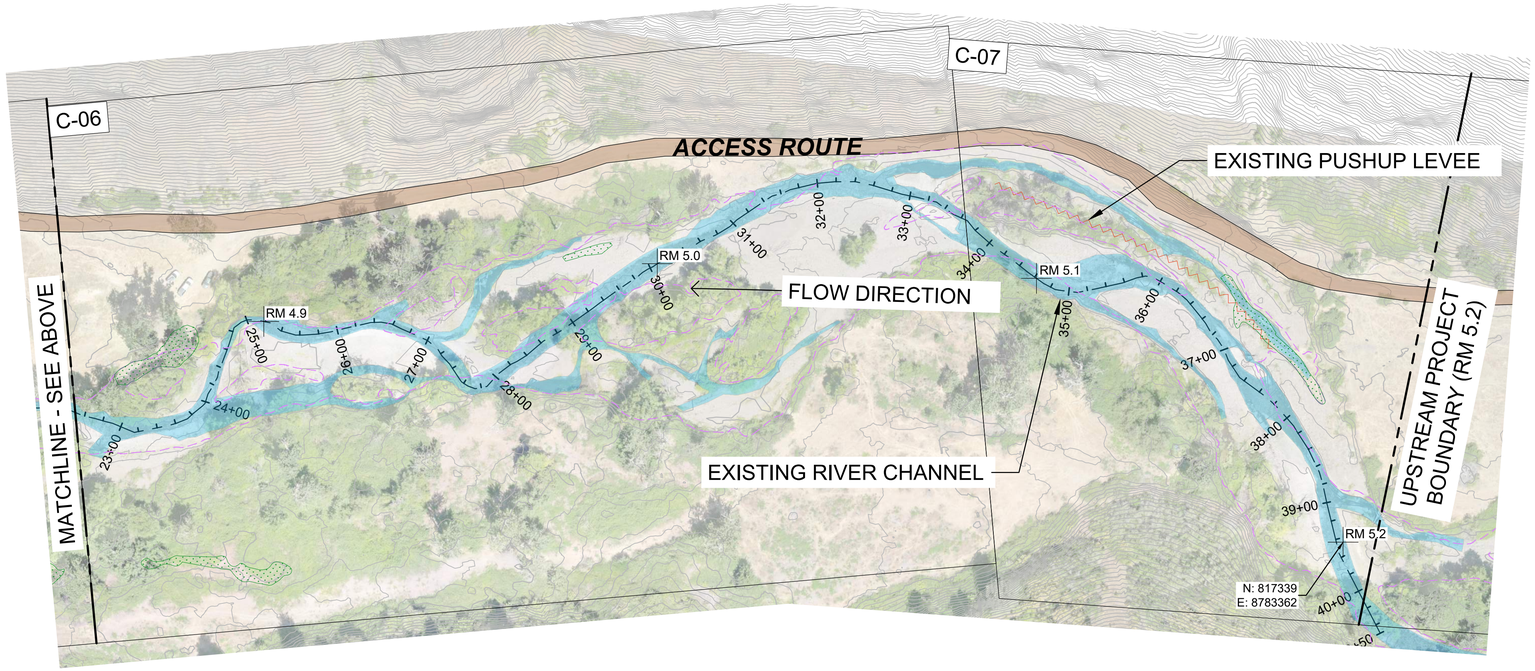
GENERAL
HIP GENERAL CONSERVATION MEASURES - 3

N/A
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1"

DATE	MARCH 2024
PROJ	W3Y00606
DWG	G-05
SHEET	5 of 22

80% Design





N

0 80 160
SCALE IN FEET

GENERAL NOTE:

1. PROPOSED RESTORATION MEASURES DO NOT EXIST BETWEEN RM 4.3 AND 4.4. THEREFORE, THE DRAWING LAYOUTS DEPICT PROJECT START AT RM 4.4.
2. MINOR DISCREPANCIES BETWEEN THE LOW FLOW CHANNEL AND THE OHW INUNDATION BOUNDARY LINES ARE DUE TO DIFFERENT DATA SOURCES AND COLLECTION DATES. SEE GENERAL NOTES 13 AND 14 ON DWG G-02.

LEGEND

- EXISTING ACCESS ROUTE
- LOW FLOW (EXISTING CONDITIONS)
- ORDINARY HIGH WATER
- EXISTING CONTOURS
- EXISTING WETLANDS
- EXISTING THALWEG ALIGNMENT (6+00)

NOT FOR CONSTRUCTION

NO.	DATE	REVISION	BY	APVD
DSGN		DR	CHK	PR
		WE	KL	LH

NORTH FORK WALLA WALLA RIVER
RESTORATION DESIGN - RIVER MILE 4.3 - 5.2
WALLA WALLA BASIN WATERSHED COUNCIL
MILTON-FREEWATER, OR

Jacobs

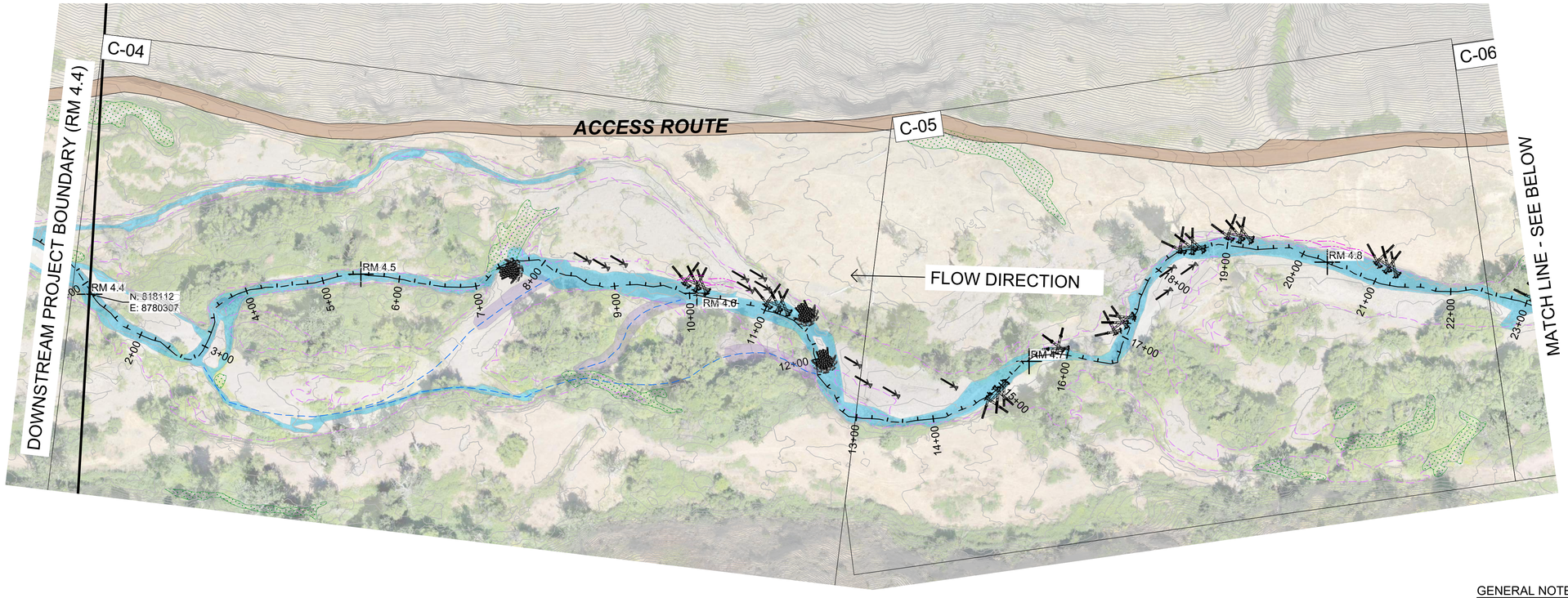
CIVIL

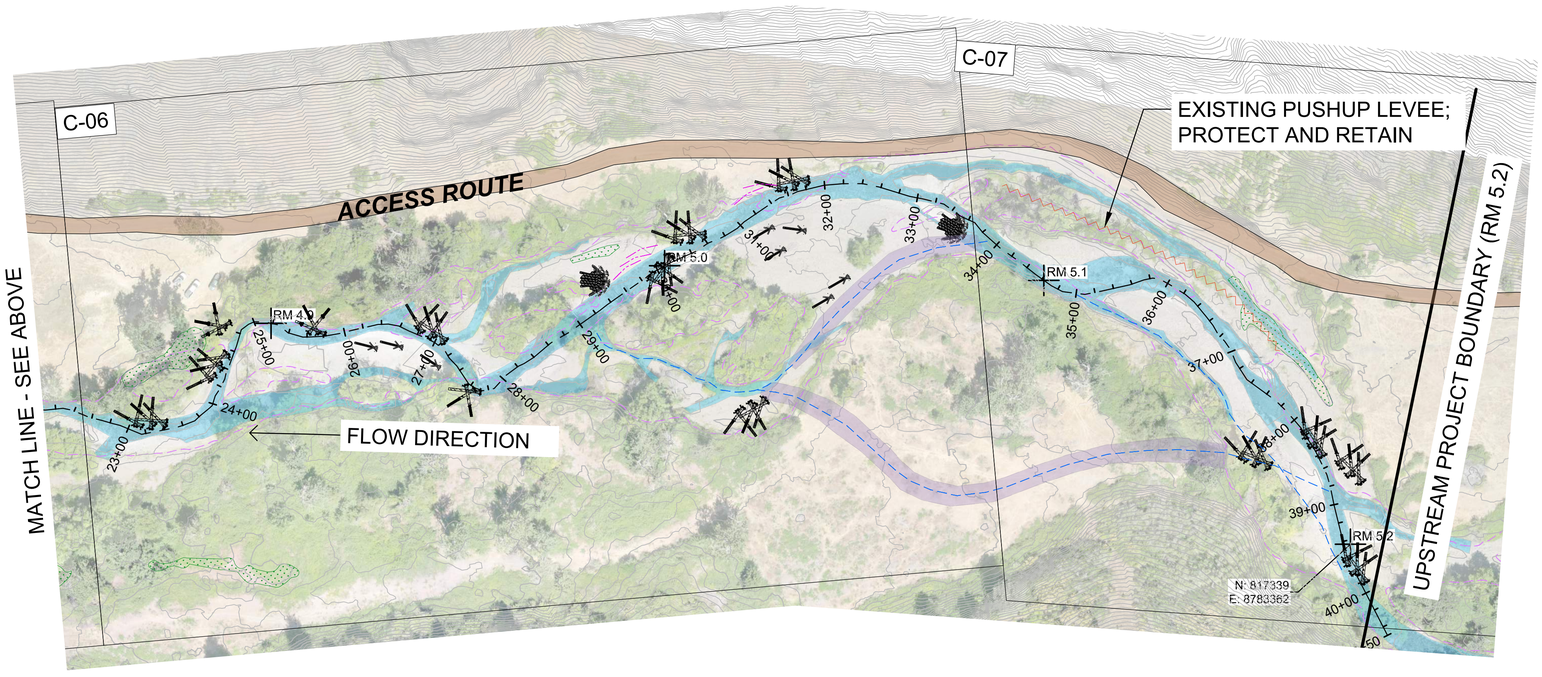
OVERALL EXISTING CONDITIONS SITE PLAN AND PLAN INDEX

AS SHOWN
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1"

DATE	MARCH 2024
PROJ	W3Y00606
DWG	C-01
SHEET	6 of 22

80% Design





GENERAL NOTES:

1. MINOR DISCREPANCIES BETWEEN THE LOW FLOW CHANNEL AND THE OHW INUNDATION BOUNDARY LINES ARE DUE TO DIFFERENT DATA SOURCES AND COLLECTION DATES. SEE GENERAL NOTES 13 AND 14 ON DWG G-02.

2. NATIVE MATERIAL FROM SIDE CHANNEL EXCAVATION TO BE USED AS BACKFILL IN HABITAT STRUCTURES, COARSE STREAMBED MIX, AND STREAMBED MIX WHEREVER POSSIBLE. EXCESS EXCAVATED NATIVE MATERIAL TO BE DISPERSED EVENLY IN THE UPLAND AREAS AT THE DIRECTION OF WWBWC.

LEGEND

- LARGE LOG JAM
- SMALL LOG JAM
- APEX JAM
- FLOODPLAIN PINNED LOGS
- EXISTING ACCESS ROUTE
- LOW FLOW (EXISTING CONDITIONS)
- WILLOW TRENCHING
- EXISTING CONTOURS
- EXISTING WETLANDS
- SIDE CHANNEL EXCAVATION AREA
- ANTICIPATED FUTURE FLOWPATH
- ORDINARY HIGH WATER
- EXISTING THALWEG ALIGNMENT

N

0 80 160
SCALE IN FEET

NOT FOR CONSTRUCTION

NO.	DATE	REVISION	BY	APVD
DSGN		DR	CHK	APVD
		WE	KL	PR
				LH

NORTH FORK WALLA WALLA RIVER
RESTORATION DESIGN - RIVER MILE 4.3 - 5.2
WALLA WALLA BASIN WATERSHED COUNCIL
MILTON-FREEWATER, OR

Jacobs

CIVIL

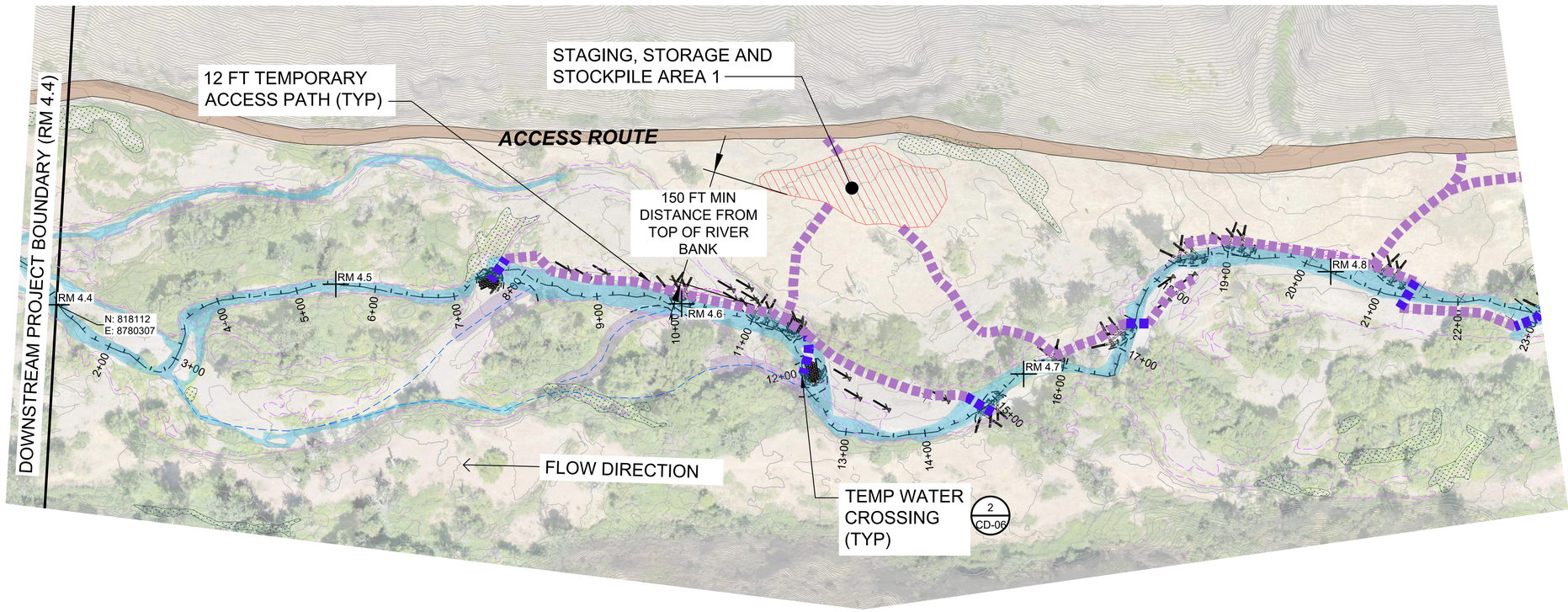
OVERALL PROPOSED TREATMENT SITE PLAN AND PLAN INDEX

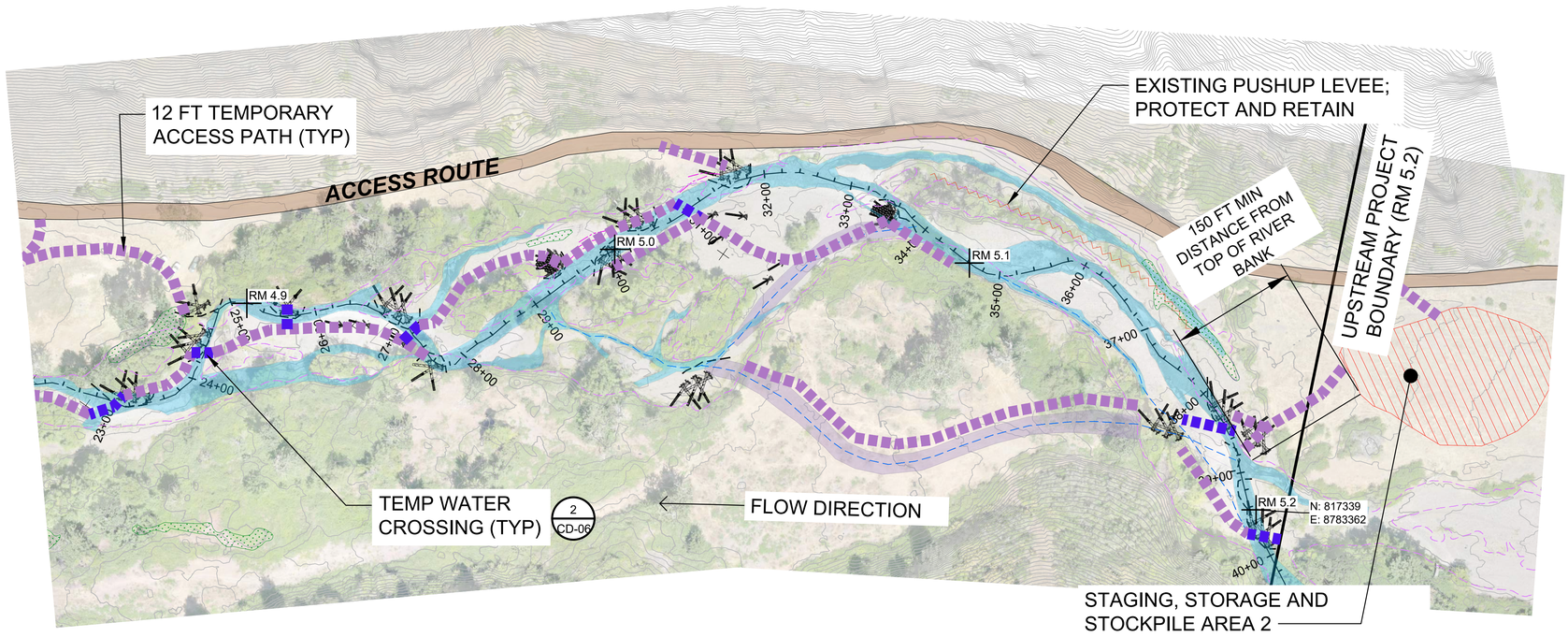
AS SHOWN
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

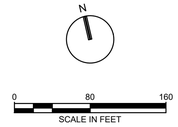
DATE	MARCH 2024
PROJ	W3Y00606
DWG	C-02
SHEET	7 of 22

80% Design

FILENAME: Overall Proposed Treatment Site Plan - C-02.dwg
PLOT DATE: 3/18/2024
PLOT TIME: 11:13:03 AM







GENERAL NOTES:

1. PROPOSED RESTORATION MEASURES DO NOT EXIST BETWEEN RM 4.3 AND 4.4. THEREFORE, THE DRAWING LAYOUTS DEPICT PROJECT START AT RM 4.4.
2. PROPOSED RESTORATION MEASURES DO NOT EXIST DOWNSTREAM OF RM 4.4, BUT STAGING, STORAGE AND STOCKPILE AREA EXISTS SLIGHTLY BEYOND THESE EXTENTS.
3. MINOR DISCREPANCIES BETWEEN THE LOW FLOW CHANNEL AND THE OHW INUNDATION BOUNDARY LINES ARE DUE TO DIFFERENT DATA SOURCES AND COLLECTION DATES. SEE GENERAL NOTES 13 AND 14 ON DWG G-02.
4. NATIVE MATERIAL FROM SIDE CHANNEL EXCAVATION TO BE USED AS BACKFILL IN HABITAT STRUCTURES, COARSE STREAMBED MIX, AND STREAMBED MIX WHEREVER POSSIBLE. EXCESS EXCAVATED NATIVE MATERIAL TO BE DISPERSED EVENLY IN THE UPLAND AREAS AT THE DIRECTION OF WWBWC.

LEGEND

- LARGE LOG JAM
- SMALL LOG JAM
- APEX JAM
- FLOODPLAIN PINNED LOGS
- ACCESS ROUTE
- LOW FLOW (EXISTING CONDITIONS)
- WILLOW TRENCHING
- EXISTING CONTOURS
- WETLANDS
- SIDE CHANNEL EXCAVATION AREA
- ANTICIPATED RIVER CHANNEL
- ORDINARY HIGH WATER
- EXISTING THALWEG STATIONING
- TEMPORARY WATER CROSSING
- TEMPORARY ACCESS PATH
- TEMPORARY STAGING AREA
- TEMPORARY COFFERDAM

NOT FOR CONSTRUCTION

NO.	DATE	REVISION	DR	CHK	APVD	BY	APVD
DSGN			WE	KL	PR		LH

NORTH FORK WALLA WALLA RIVER
RESTORATION DESIGN - RIVER MILE 4.3 - 5.2
WALLA WALLA BASIN WATERSHED COUNCIL
MILTON-FREEWATER, OR

Jacobs

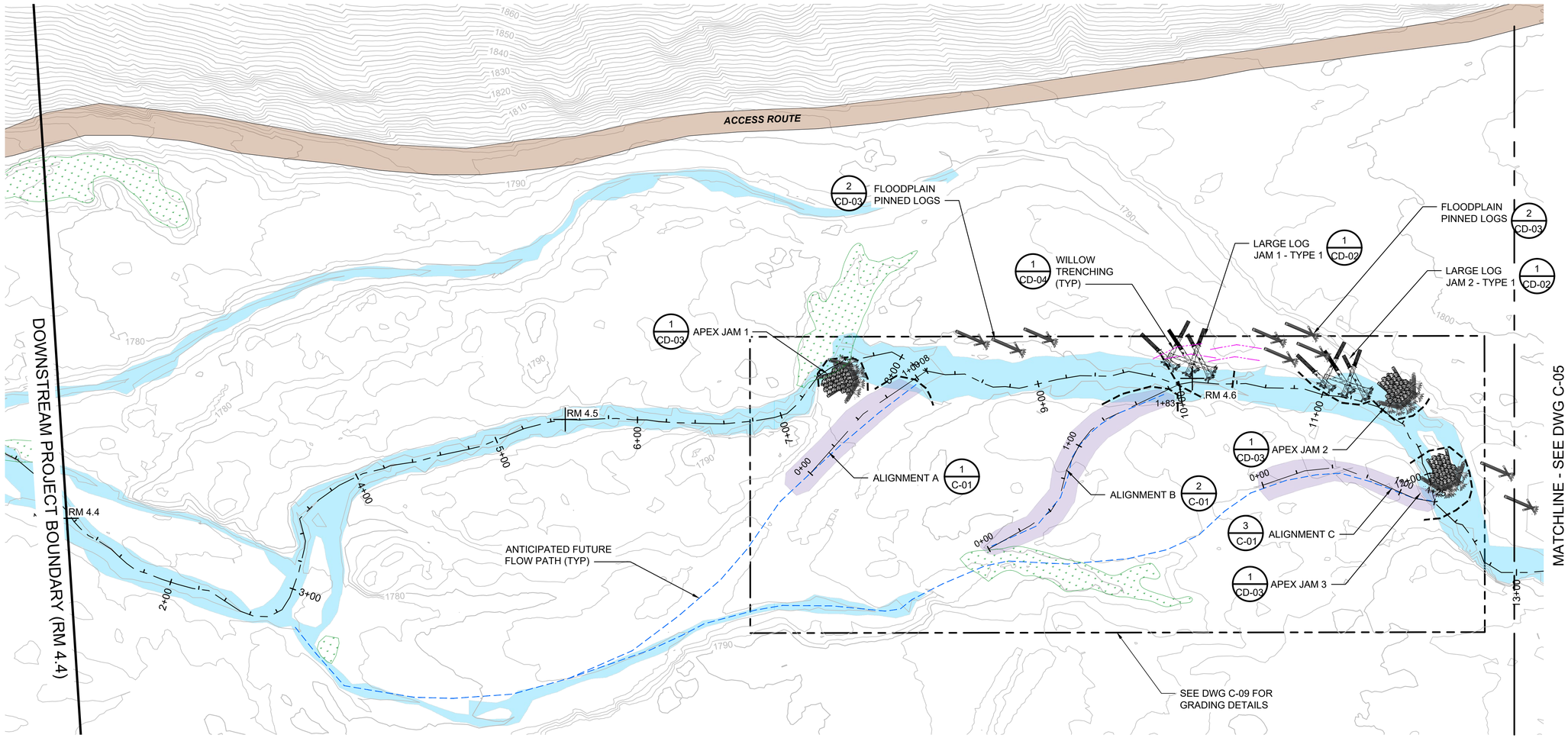
CIVIL

CONSTRUCTION ACCESS, STAGING, AND SITE PREPARATION

AS SHOWN
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	MARCH 2024
PROJ	W3Y00606
DWG	C-03
SHEET	8 of 22

80% Design



GENERAL NOTES:

1. PROPOSED RESTORATION MEASURES DO NOT EXIST BETWEEN RM 4.3 AND 4.4. THEREFORE, THE DRAWING LAYOUTS DEPICT PROJECT START AT RM 4.4.
2. CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR WATER MANAGEMENT DURING CONSTRUCTION TO MEET PERMIT REQUIREMENTS. COFFERDAMS SHOWN ON DRAWINGS ARE EXAMPLES ONLY. DETAIL DEPICTED ON DWG CD-06.
3. MINOR DISCREPANCIES BETWEEN THE LOW FLOW CHANNEL AND THE OHW INUNDATION BOUNDARY LINES ARE DUE TO DIFFERENT DATA SOURCES AND COLLECTION DATES. SEE GENERAL NOTES 13 AND 14 ON DWG G-02.

LEGEND

- LARGE LOG JAM
- SMALL LOG JAM
- APEX JAM
- FLOODPLAIN PINNED LOGS
- EXISTING ACCESS ROUTE
- LOW FLOW (EXISTING CONDITIONS)
- WILLOW TRENCHING
- EXISTING CONTOURS
- EXISTING WETLANDS
- SIDE CHANNEL EXCAVATION AREA
- ANTICIPATED FUTURE FLOWPATH
- ORDINARY HIGH WATER
- EXISTING THALWEG ALIGNMENT
- TEMPORARY COFFERDAM

N

0 40 80
SCALE IN FEET

NOT FOR CONSTRUCTION

NO.	DATE	REVISION	BY	APVD
DSGN	WE	DR	APVD	LH
		CHK	PR	
		KL		

NORTH FORK WALLA WALLA RIVER
RESTORATION DESIGN - RIVER MILE 4.3 - 5.2
WALLA WALLA BASIN WATERSHED COUNCIL
MILTON-FREEWATER, OR

Jacobs

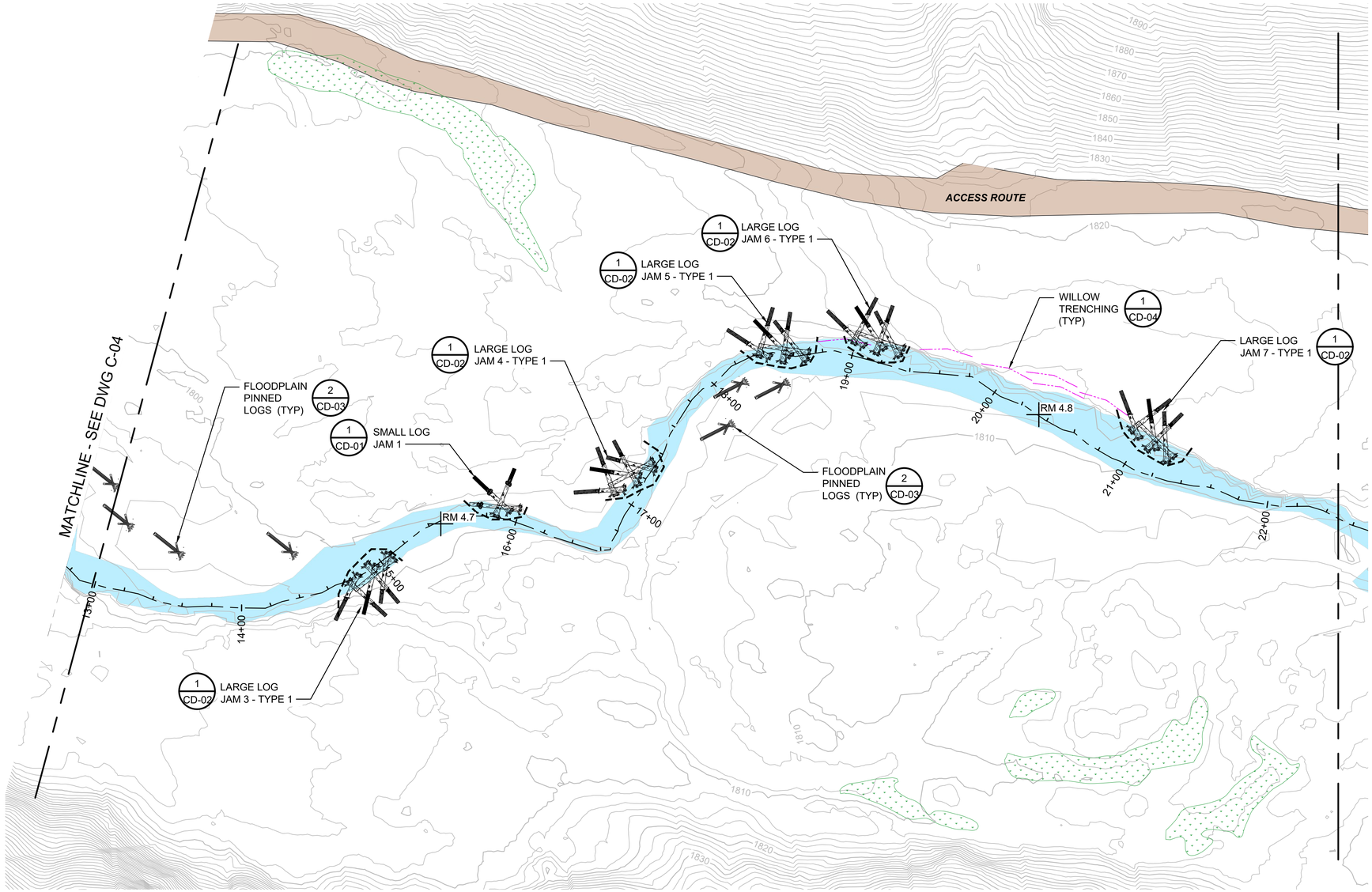
CIVIL

RESTORATION/REVEGETATION PLAN 1

AS SHOWN
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	MARCH 2024
PROJ	W3Y00606
DWG	C-04
SHEET	9 of 22

80% Design



GENERAL NOTES:

1. PROPOSED RESTORATION MEASURES DO NOT EXIST BETWEEN RM 4.3 AND 4.4. THEREFORE, THE DRAWING LAYOUTS DEPICT PROJECT START AT RM 4.4.
2. CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR WATER MANAGEMENT DURING CONSTRUCTION TO MEET PERMIT REQUIREMENTS. COFFERDAMS SHOWN ON DRAWINGS ARE EXAMPLES ONLY. DETAIL DEPICTED ON DWG CD-06.
3. MINOR DISCREPANCIES BETWEEN THE LOW FLOW CHANNEL AND THE OHW INUNDATION BOUNDARY LINES ARE DUE TO DIFFERENT DATA SOURCES AND COLLECTION DATES. SEE GENERAL NOTES 13 AND 14 ON DWG G-02.

LEGEND

- LARGE LOG JAM
- SMALL LOG JAM
- APEX JAM
- FLOODPLAIN PINNED LOGS
- EXISTING ACCESS ROUTE
- LOW FLOW (EXISTING CONDITIONS)
- WILLOW TRENCHING
- EXISTING CONTOURS
- EXISTING WETLANDS
- SIDE CHANNEL EXCAVATION AREA
- ANTICIPATED FUTURE FLOWPATH
- ORDINARY HIGH WATER
- EXISTING THALWEG ALIGNMENT (6+00)
- TEMPORARY COFFERDAM

N

0 40 80
SCALE IN FEET

NOT FOR CONSTRUCTION

NO.	DATE	REVISION	BY	APVD
DSGN		WE	DR	KL
		CHK	APVD	PR
				LH

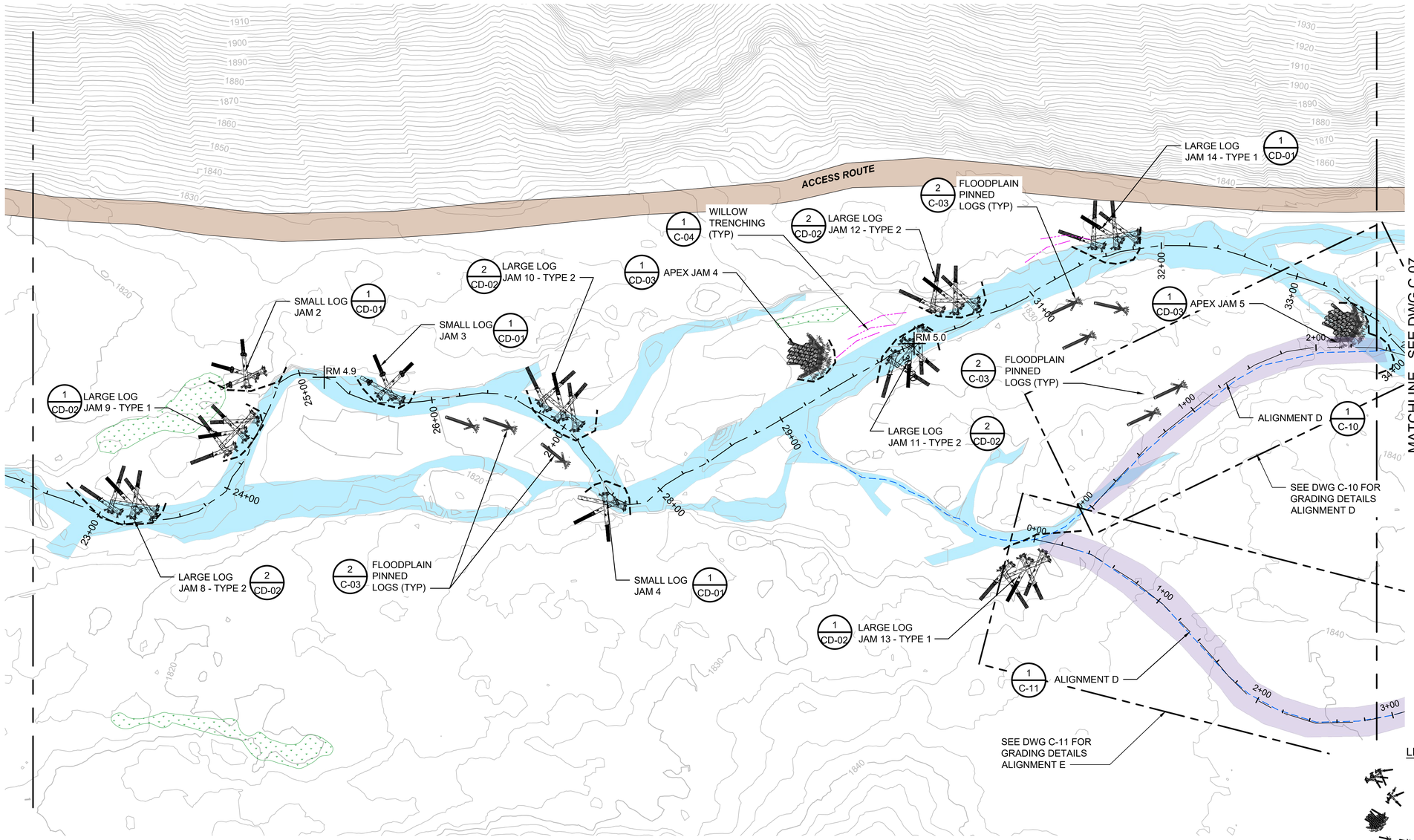
NORTH FORK WALLA WALLA RIVER
RESTORATION DESIGN - RIVER MILE 4.3 - 5.2
WALLA WALLA BASIN WATERSHED COUNCIL
MILTON-FREEWATER, OR

Jacobs

CIVIL
RESTORATION/REVEGETATION PLAN 2

AS SHOWN	
VERIFY SCALE	
BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1"	
DATE	MARCH 2024
PROJ	W3Y00606
DWG	C-05
SHEET	10 of 22

80% Design



LEGEND

- LARGE LOG JAM
- SMALL LOG JAM
- APEX JAM
- FLOODPLAIN PINNED LOGS
- EXISTING ACCESS ROUTE
- LOW FLOW (EXISTING CONDITIONS)
- WILLOW TRENCHING
- EXISTING CONTOURS
- EXISTING WETLANDS
- SIDE CHANNEL EXCAVATION AREA
- ANTICIPATED FUTURE FLOWPATH
- ORDINARY HIGH WATER
- EXISTING THALWEG ALIGNMENT (6+00)
- TEMPORARY COFFERDAM

GENERAL NOTES:

1. PROPOSED RESTORATION MEASURES DO NOT EXIST BETWEEN RM 4.3 AND 4.4. THEREFORE, THE DRAWING LAYOUTS DEPICT PROJECT START AT RM 4.4.
2. CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR WATER MANAGEMENT DURING CONSTRUCTION TO MEET PERMIT REQUIREMENTS. COFFERDAMS SHOWN ON DRAWINGS ARE EXAMPLES ONLY. DETAIL DEPICTED ON DWG CD-06.
3. MINOR DISCREPANCIES BETWEEN THE LOW FLOW CHANNEL AND THE OHW INUNDATION BOUNDARY LINES ARE DUE TO DIFFERENT DATA SOURCES AND COLLECTION DATES. SEE GENERAL NOTES 13 AND 14 ON DWG G-02.

N

0 40 80
SCALE IN FEET

NOT FOR CONSTRUCTION

NO.	DATE	REVISION	BY	APVD
DSGN		WE	DR	PR
			CHK	APVD
			KL	LH

NORTH FORK WALLA WALLA RIVER
RESTORATION DESIGN - RIVER MILE 4.3 - 5.2
WALLA WALLA BASIN WATERSHED COUNCIL
MILTON-FREEWATER, OR

Jacobs

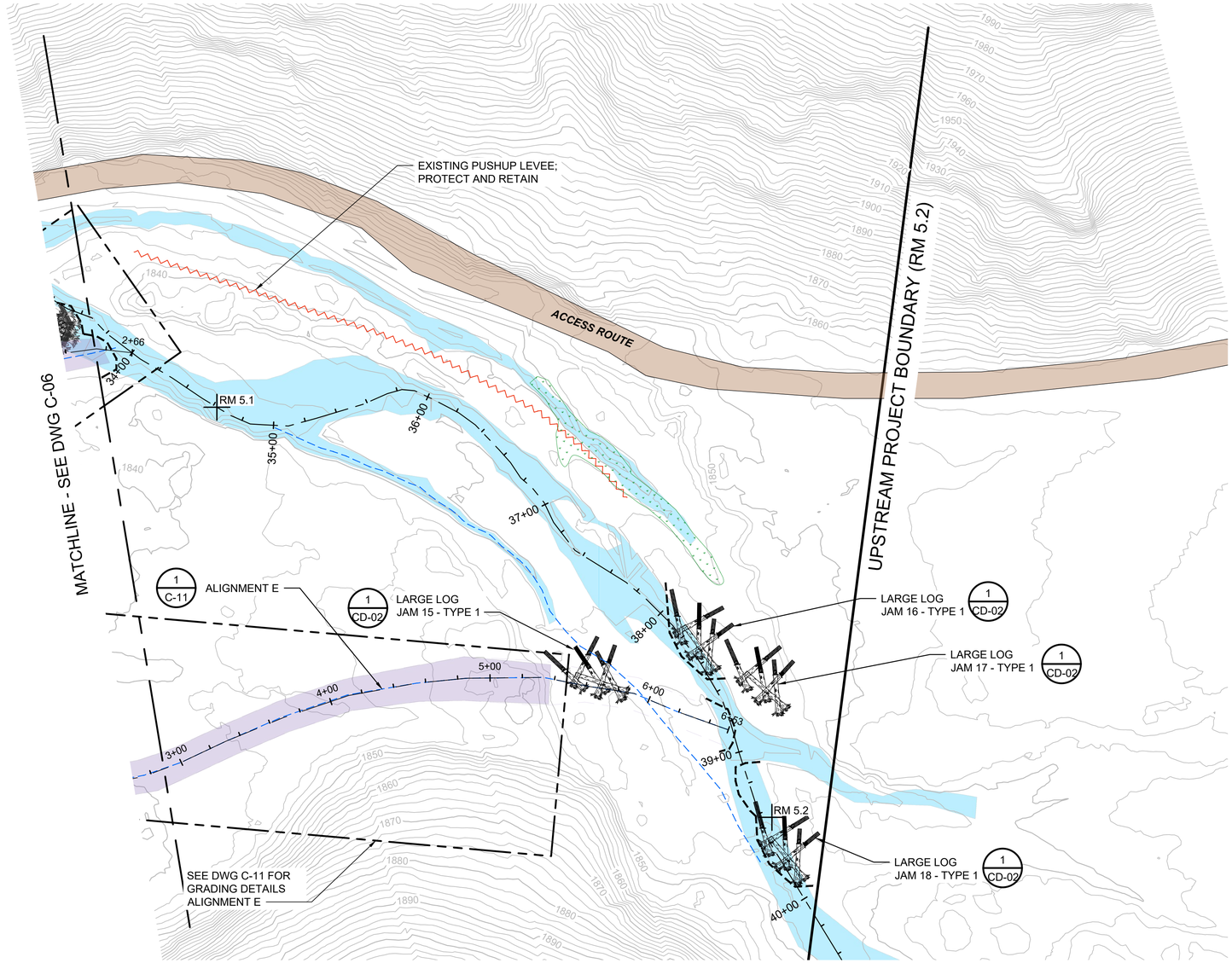
CIVIL

RESTORATION/REVEGETATION PLAN 3

AS SHOWN
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1"

DATE	MARCH 2024
PROJ	W3Y00606
DWG	C-06
SHEET	11 of 22

80% Design



GENERAL NOTES:

1. PROPOSED RESTORATION MEASURES DO NOT EXIST BETWEEN RM 4.3 AND 4.4. THEREFORE, THE DRAWING LAYOUTS DEPICT PROJECT START AT RM 4.4.
2. CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR WATER MANAGEMENT DURING CONSTRUCTION TO MEET PERMIT REQUIREMENTS. COFFERDAMS SHOWN ON DRAWINGS ARE EXAMPLES ONLY. DETAIL DEPICTED ON DWG CD-06.
3. MINOR DISCREPANCIES BETWEEN THE LOW FLOW CHANNEL AND THE OHW INUNDATION BOUNDARY LINES ARE DUE TO DIFFERENT DATA SOURCES AND COLLECTION DATES. SEE GENERAL NOTES 13 AND 14 ON DWG G-02.

LEGEND

- LARGE LOG JAM
- SMALL LOG JAM
- APEX JAM
- FLOODPLAIN PINNED LOGS
- EXISTING ACCESS ROUTE
- LOW FLOW (EXISTING CONDITIONS)
- WILLOW TRENCHING
- EXISTING CONTOURS
- EXISTING WETLANDS
- SIDE CHANNEL EXCAVATION AREA
- ANTICIPATED FUTURE FLOWPATH
- ORDINARY HIGH WATER
- EXISTING THALWEG ALIGNMENT
- TEMPORARY COFFERDAM

N

0 40 80
SCALE IN FEET

NOT FOR CONSTRUCTION

NO.	DATE	REVISION	BY	APVD
DSGN		WE	DR	CHK	KL	APVD	PR		LH

Jacobs

CIVIL

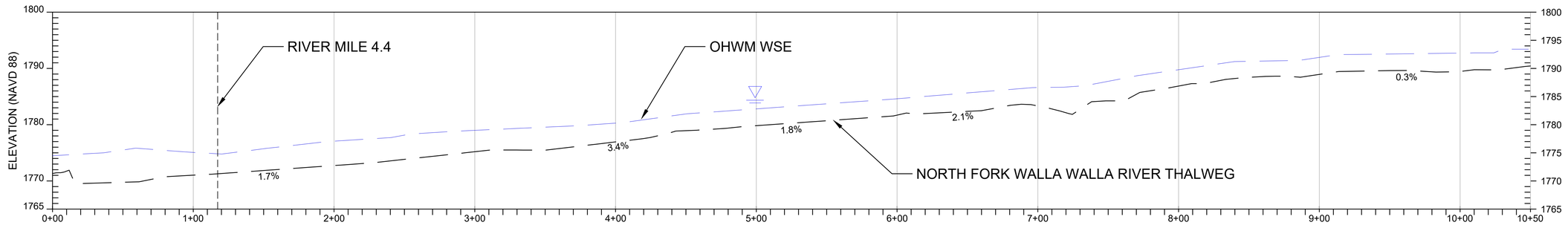
NORTH FORK WALLA WALLA RIVER
RESTORATION DESIGN - RIVER MILE 4.3 - 5.2
WALLA WALLA BASIN WATERSHED COUNCIL
MILTON-FREEWATER, OR

RESTORATION/REVEGETATION PLAN 4

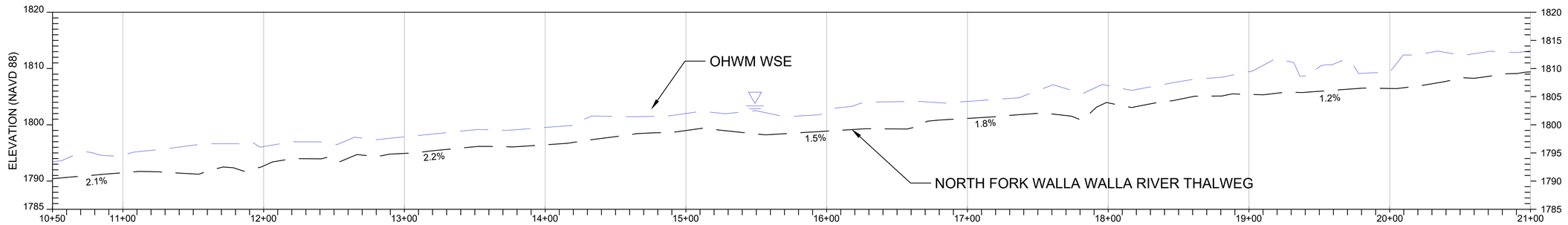
AS SHOWN
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	MARCH 2024
PROJ	W3Y00606
DWG	C-07
SHEET	12 of 22

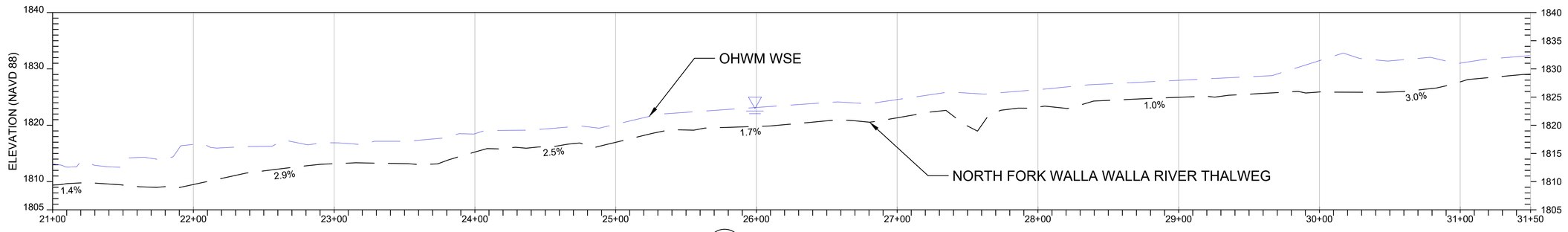
80% Design



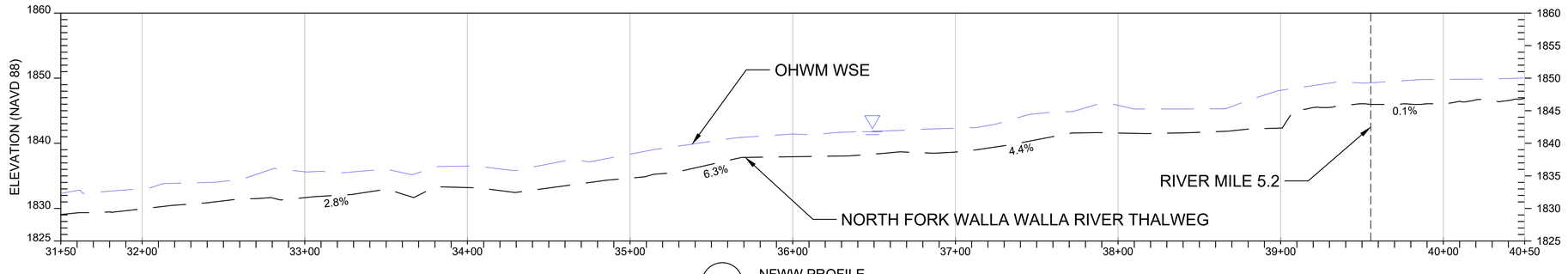
1 NFWW PROFILE
H: 1" = 40'
V: 1" = 10'



2 NFWW PROFILE
H: 1" = 40'
V: 1" = 10'



3 NFWW PROFILE
H: 1" = 40'
V: 1" = 10'



4 NFWW PROFILE
H: 1" = 40'
V: 1" = 10'

GENERAL NOTE:

1. THE ORDINARY HIGH WATER MARK (OHWM) WATER SURFACE ELEVATION (WSE) IN PROFILES 1 THROUGH 4 IS APPROXIMATED FROM THE OHW SURVEYED BOUNDARY LINE. SEE GENERAL NOTE 14 FOR DETAILS.

NOT FOR CONSTRUCTION

NO.	DATE	DSGN	DR	CHK	APVD	BY	REVISION
		WE	KL	PR	LH	APVD	

NORTH FORK WALLA WALLA RIVER
RESTORATION DESIGN - RIVER MILE 4.3 - 5.2
WALLA WALLA BASIN WATERSHED COUNCIL
MILTON-FREEWATER, OR

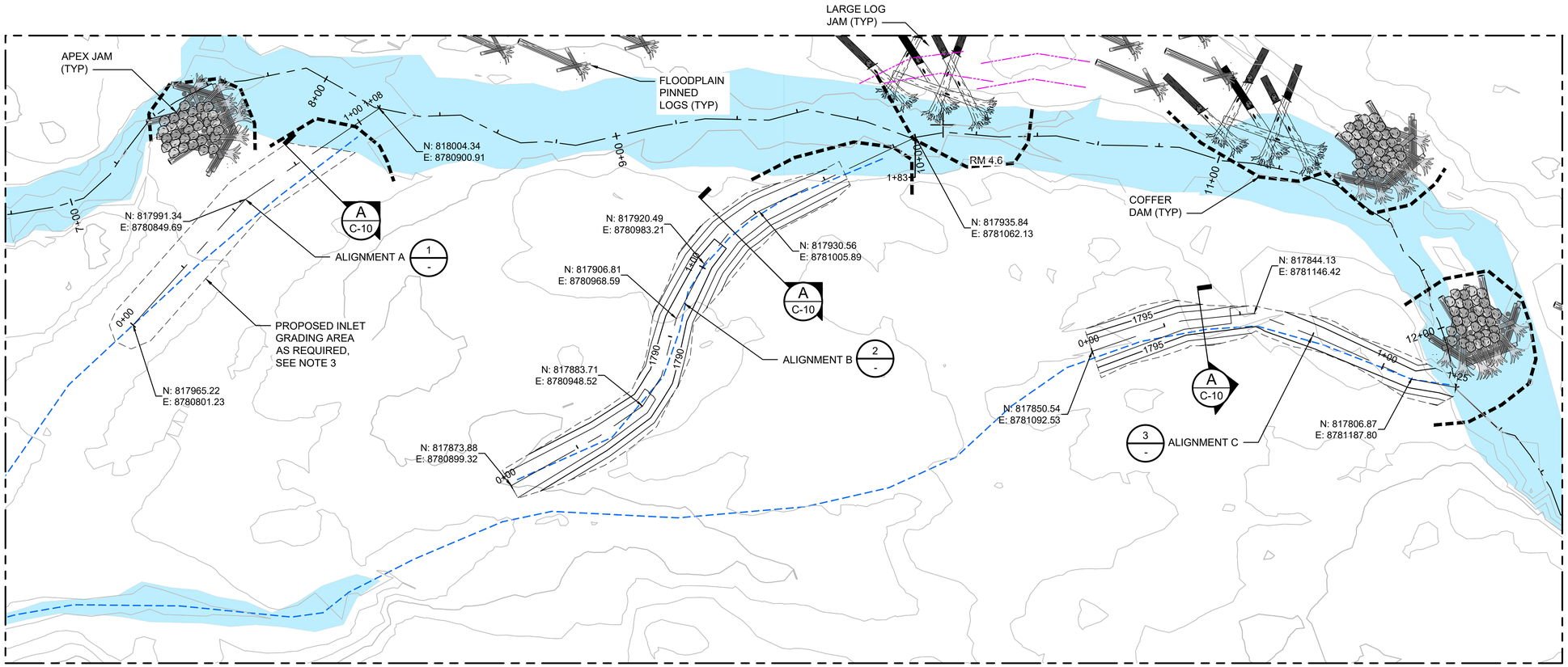
Jacobs

CIVIL

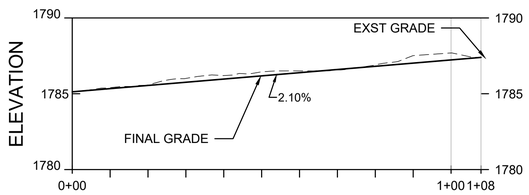
ORDINARY HIGH WATER AT THALWEG PROFILE

AS SHOWN	
VERIFY SCALE	
BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1"	
DATE	MARCH 2024
PROJ	W3Y00606
DWG	C-08
SHEET	13 of 22

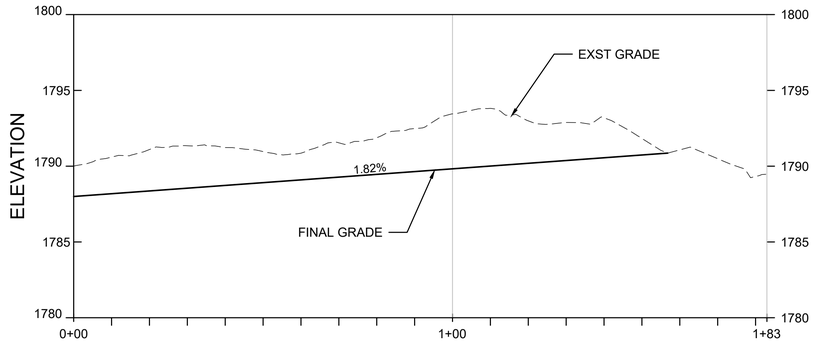
80% Design



PLAN



1 PROFILE
ALIGNMENT A



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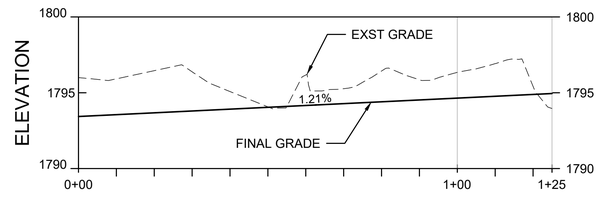
ALIGNMENT B



3 PROFILE
ALIGNMENT C

CONSTRUCTION NOTES:

1. SEE DETAIL A ON SHEET C-10 FOR TYPICAL SECTION PERTAINING TO INLET GRADING FOR ALIGNMENTS A, B, AND C GRADING ACTIVITIES.
2. NATIVE MATERIAL FROM ALL SIDE CHANNEL EXCAVATION ACTIVITIES TO BE USED AS BACKFILL IN HABITAT STRUCTURES, COARSE STREAMBED MIX, SAND LIFTS, AND STREAMBED MIX WHEREVER POSSIBLE. ANY ADDITIONAL EXCESS MATERIAL TO BE DISPERSED EVENLY IN THE UPLAND AREAS AT THE DIRECTION OR WWBWC.
3. SIGNIFICANT SHIFTS IN THE CHANNEL BED HAVE OCCURRED SINCE THE TIME OF THE TOPOGRAPHIC SURVEY WHERE INLET GRADING FOR ALIGNMENT A IS PROPOSED. AS A RESULT, ADDITIONAL EARTHWORK MAY BE REQUIRED TO ACHIEVE FINAL GRADE ELEVATIONS THAN WHAT IS SHOWN.

N

HORZ 0 20 40
VERT 0 5 10
SCALE IN FEET

NOT FOR CONSTRUCTION

NO.	DATE	REVISION	BY	APVD
DSGN		WE	DR	KL
			CHK	PR
			APVD	LH

NORTH FORK WALLA WALLA RIVER
RESTORATION DESIGN - RIVER MILE 4.3 - 5.2
WALLA WALLA BASIN WATERSHED COUNCIL
MILTON-FREEWATER, OR

Jacobs

CIVIL

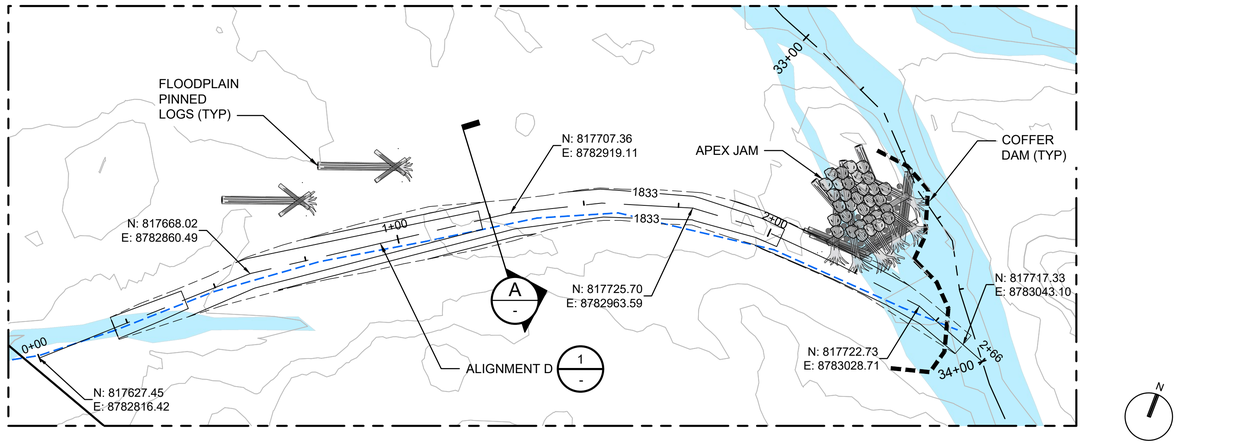
INLET GRADING - ALIGNMENTS A, B, AND C

AS SHOWN
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	MARCH 2024
PROJ	W3Y00606
DWG	C-09
SHEET	14 of 22

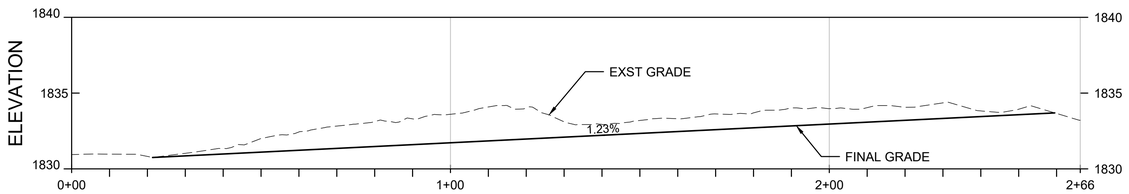
80% Design

FILENAME: W3Y00606-C-09 - C-11 RESTORATION GRADING PLAN AND PROFILES.dwg
PLOT DATE: 3/15/2024
PLOT TIME: 3:27:20 PM

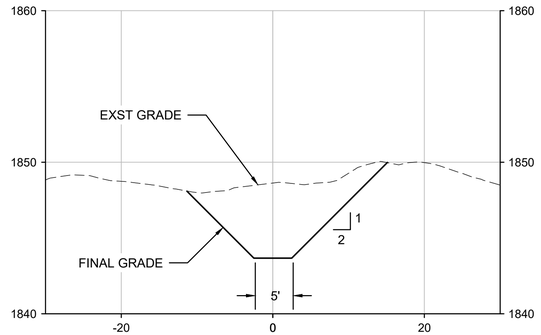


PLAN

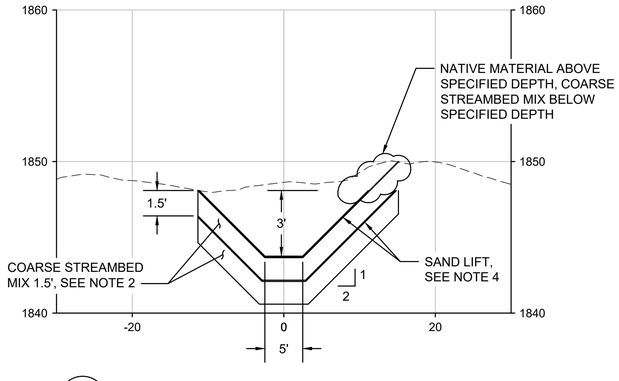
HORZ 0 20 40
VERT 0 5 10
SCALE IN FEET



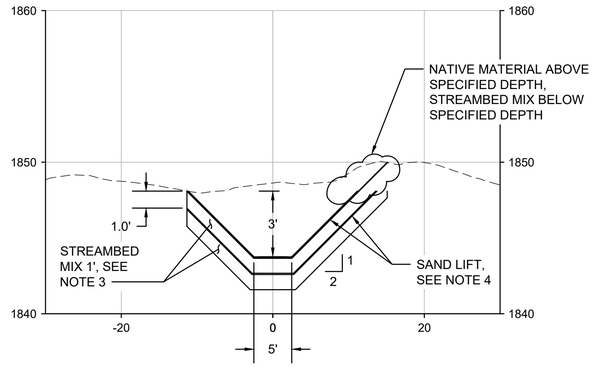
1 PROFILE
ALIGNMENT D



A TYPICAL INLET GRADING CROSS SECTION
ALIGNMENTS A, B, C, AND D
C-09, C-10



B TYPICAL COARSE STREAMBED CROSS SECTION
C-11



C TYPICAL STREAMBED CROSS SECTION
C-11

CONSTRUCTION NOTES:

1. SEE DETAIL A ON THIS SHEET FOR TYPICAL SECTION PERTAINING TO INLET GRADING FOR ALIGNMENT D GRADING ACTIVITIES.
2. NATIVE MATERIAL FROM ALL SIDE CHANNEL EXCAVATION ACTIVITIES TO BE USED AS BACKFILL IN HABITAT STRUCTURES, COARSE STREAMBED MIX, SAND LIFTS, AND STREAMBED MIX WHEREVER POSSIBLE. ANY ADDITIONAL EXCESS MATERIAL TO BE DISPERSED EVENLY IN THE UPLAND AREAS AT THE DIRECTION OR WWBWC.

SECTION NOTES:

1. THESE SECTIONS ARE REPRESENTATIVE OF GRADING FOR BOTTOM WIDTH AND SIDE SLOPES. SEE INDIVIDUAL PROFILES FOR ACTUAL ELEVATIONS.
2. SEE SPECIFICATION SECTION FOR COARSE STREAMBED MIX GRADATION.
3. SEE SPECIFICATION SECTION FOR STREAMBED MIX GRADATION.
4. SAND LIFT WIDTH VARIES FROM 1" - 4" AS NEEDED TO SEAL CHANNEL BED. WASH SAND INTO VOID SPACE UNTIL SEALED AND BED HOLDS WATER.

HORZ 0 10 20
VERT 0 5 10
SCALE IN FEET

NOT FOR CONSTRUCTION

NO.	DATE	REVISION	BY	APVD
DSGN		DR	CHK	APVD
		WE	KL	PR
				LH

NORTH FORK WALLA WALLA RIVER
RESTORATION DESIGN - RIVER MILE 4.3 - 5.2
WALLA WALLA BASIN WATERSHED COUNCIL
MILTON-FREEWATER, OR

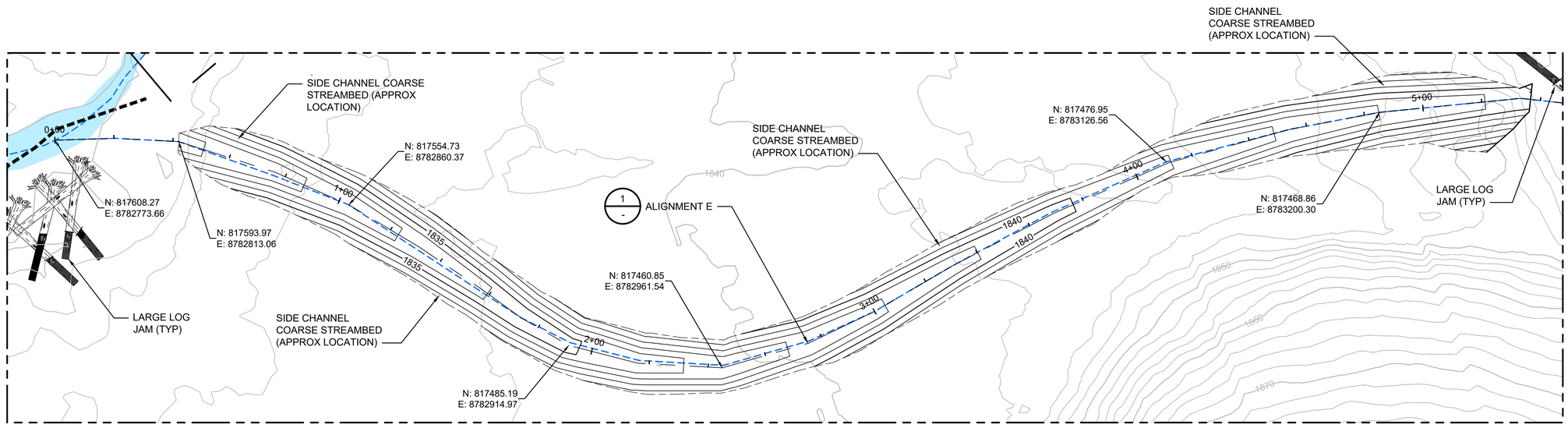
Jacobs

CIVIL
INLET GRADING - ALIGNMENT D AND ALL TYPICAL CROSS SECTIONS

AS SHOWN
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	MARCH 2024
PROJ	W3Y00606
DWG	C-10
SHEET	15 of 22

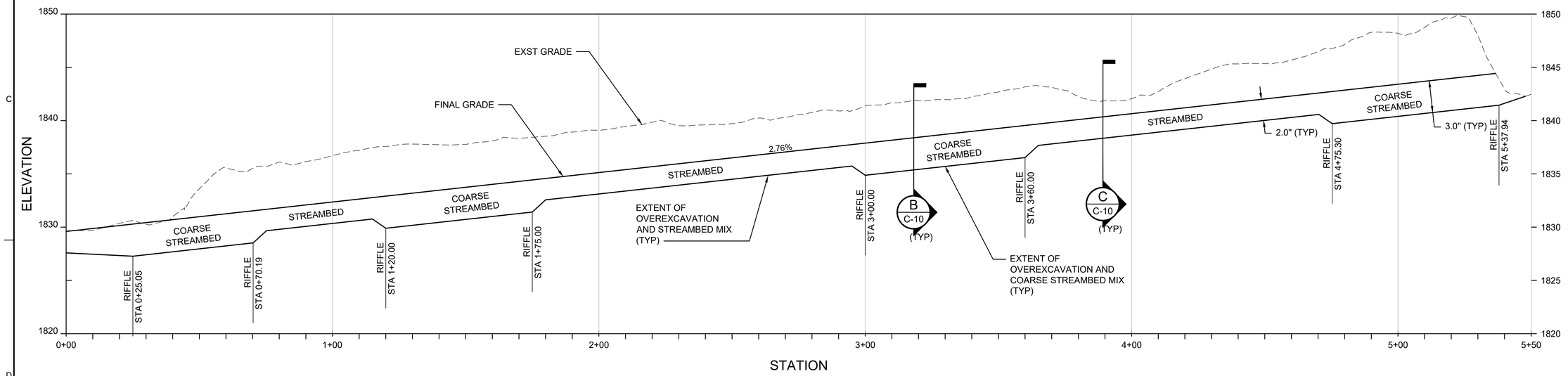
80% Design



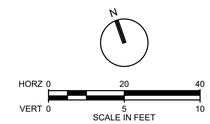
PLAN

CONSTRUCTION NOTES:

1. SEE TYPICAL COARSE STREAMBED SECTION B ON SHEET C-10 AND TYPICAL STREAMBED SECTION B ON SHEET C-10 FOR ALIGNMENT E GRADING.
2. NATIVE MATERIAL FROM ALL SIDE CHANNEL EXCAVATION ACTIVITIES TO BE USED AS BACKFILL IN HABITAT STRUCTURES, COARSE STREAMBED MIX, SAND LIFTS, AND STREAMBED MIX WHEREVER POSSIBLE. ANY ADDITIONAL EXCESS MATERIAL TO BE DISPERSED EVENLY IN THE UPLAND AREAS AT THE DIRECTION OR WWBWC.



1 PROFILE
ALIGNMENT E



NOT FOR CONSTRUCTION

NO.	DATE	DSGN	DR	CHK	APVD	BY	APVD
		WE	KL	PR			LH

REVISION

NORTH FORK WALLA WALLA RIVER
RESTORATION DESIGN - RIVER MILE 4.3 - 5.2
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Jacobs

CIVIL

SIDE CHANNEL GRADING - ALIGNMENT E

AS SHOWN	
VERIFY SCALE	
BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1"	
DATE	MARCH 2024
PROJ	W3Y00606
DWG	C-11
SHEET	16 of 22

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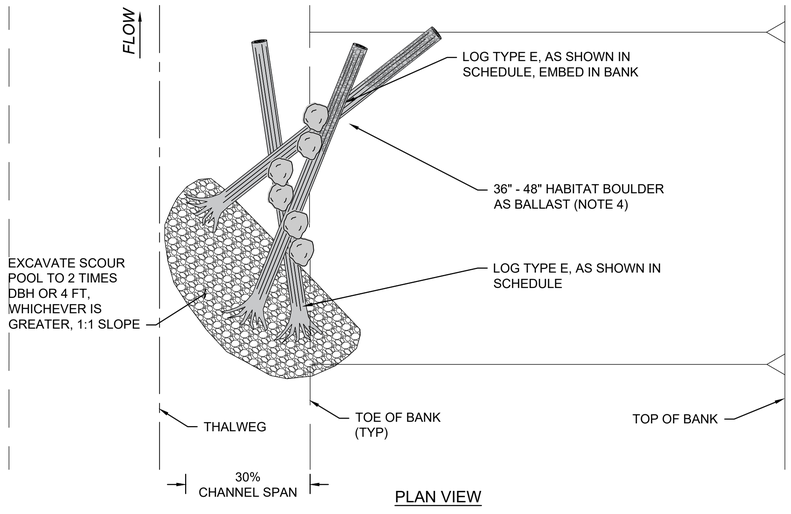
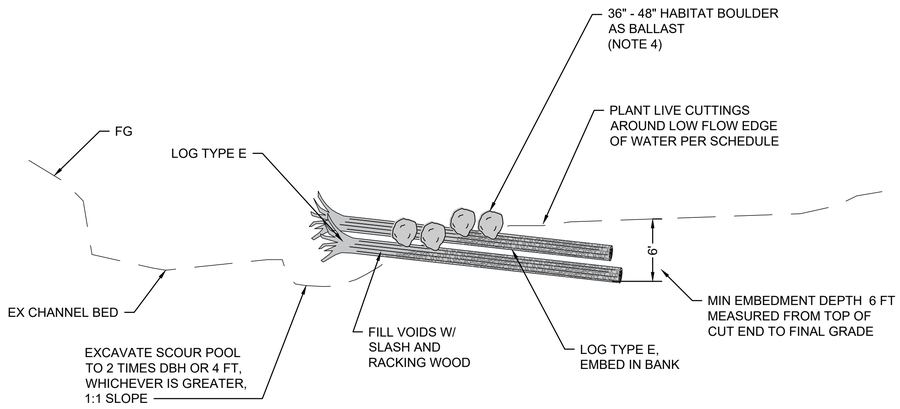


PLAN VIEW



SECTION VIEW

1 SMALL LOG JAM
TYPICAL DETAILS

SCALE:1" = 10'

SMALL LOG JAM				
NUMBER OF STRUCTURES:	4			
MATERIAL	SIZE	ROOT WAD	QUANTITY PER STRUCTURE	TOTAL
TYPE	LENGTH X DIAM / ROCK SIZE DIAM	YES/NO	EA/ CY	EA/CY
LOG TYPE E (EA)	40 X 1.75	YES	3	12
RACKING WOOD (EA)	6-10 X 0.66-0.83	OPTIONAL	15	60
SLASH (CY)	< 10 X < 0.5	NO	8	32
HABITAT BOULDER (EA)	36" - 48"	N/A	6	24
LIVE CUTTING (EA)	N/A	N/A	5	20

1 SMALL LOG JAM SCHEDULE
TYPICAL DETAILS

NOTES:

1. CONTRACTOR TO CONSTRUCT WOOD STRUCTURES AS DESCRIBED IN DRAWINGS AND SPECIFICATIONS. CONTRACTING OFFICER WILL PROVIDE FIELD GUIDANCE AND APPROVAL OF INSTALLED STRUCTURES.
2. ALL LOGS SHOWN ARE TYPE E, AS SHOWN IN THE SMALL LOG JAM SCHEDULE.
3. ALL LOGS TYPE E WILL HAVE ROOTWADS AND WILL BE LOCALLY AVAILABLE CONIFER SPECIES (E.G. PINUS PONDEROSA).
4. INTERMEDIATE AXIS OF HABITAT BOULDERS SHALL BE 36-48" ON AVERAGE.

NOT FOR CONSTRUCTION

NO.	DATE	DSGN	DR	CHK	APVD	BY	APVD
		TKR	TKR	PR	LH		

REVISION

NORTH FORK WALLA WALLA RIVER
RESTORATION DESIGN - RIVER MILE 4.3 - 5.2
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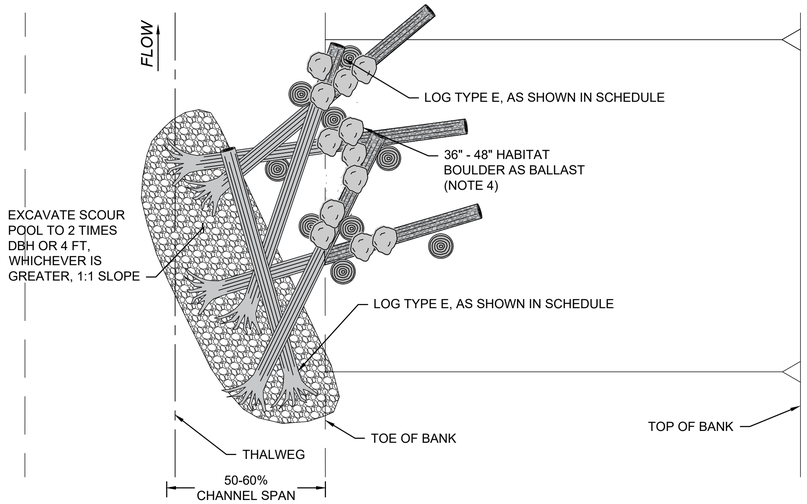
CIVIL
LARGE WOOD
SMALL LOG JAM

AS SHOWN
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

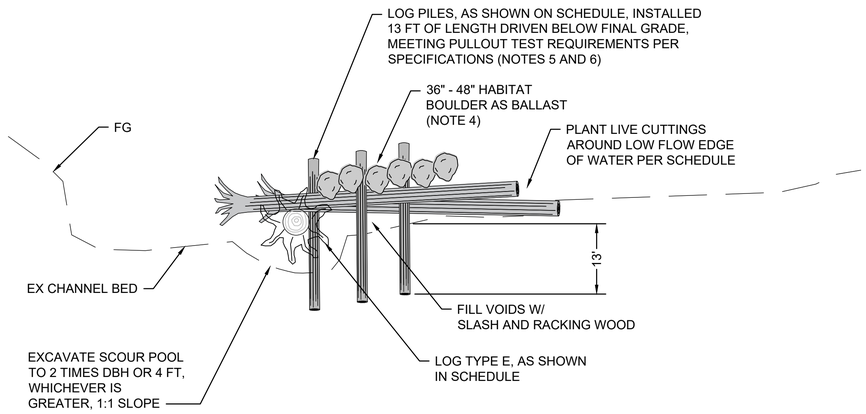
DATE	MARCH 2024
PROJ	W3Y00606
DWG	CD-01
SHEET	17 of 22

80% Design

LARGE LOG JAM TYPE 1: TYPE 1 JAMS HAVE BEEN SPECIFIED IN LOCATIONS WHERE VERTICAL PILES ARE TO BE DRIVEN AS PART OF STRUCTURE INSTALLATION. TYPE 1 JAMS ARE SHOWN ON RESTORATION/VEGETATION PLAN SHEETS. SEE NOTE 6.



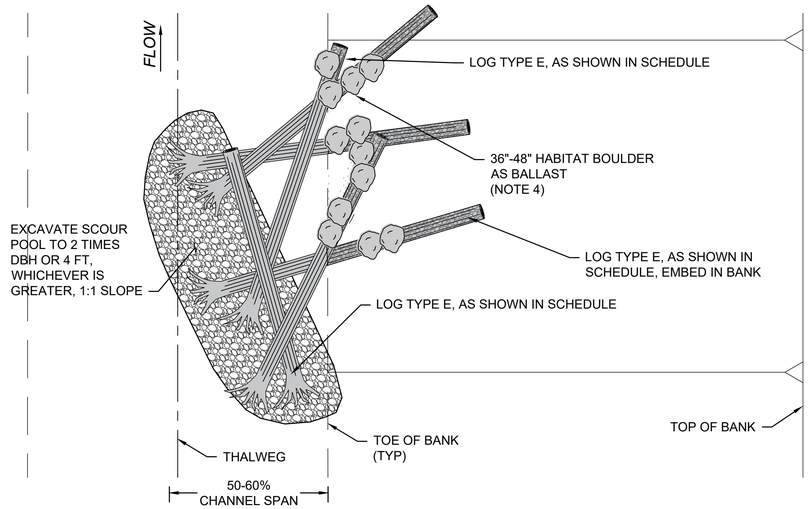
PLAN VIEW



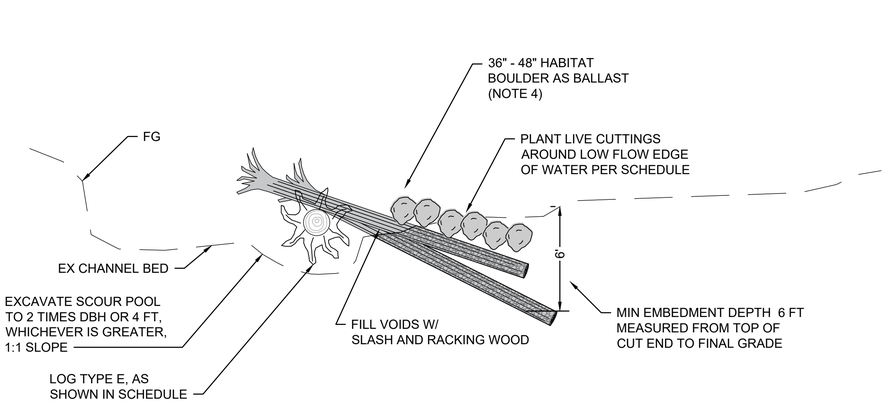
SECTION VIEW

1 LARGE LOG JAM - TYPE 1 (VERTICAL PILES)
TYPICAL DETAILS
SCALE:1" = 10'

LARGE LOG JAM TYPE 2: TYPE 2 JAMS HAVE BEEN IDENTIFIED ON RESTORATION/VEGETATION PLAN SHEETS IN LOCATIONS WHERE VERTICAL PILES ARE NOT DRIVEN AS PART OF STRUCTURE INSTALLATION.



PLAN VIEW



SECTION VIEW

2 LARGE LOG JAM - TYPE 2 (BURIED BALLAST)
TYPICAL DETAILS
SCALE:1" = 10'

NOTES:

1. WOOD STRUCTURES WILL REQUIRE FIELD ADJUSTMENTS AS DESCRIBED BY WWBWC.
2. ALL LOGS SHOWN ARE TYPE E, AS SHOWN IN THE LARGE LOG JAM TYPE 1 AND TYPE 2 SCHEDULES.
3. ALL LOGS TYPE E WILL HAVE ROOTWADS AND WILL BE LOCALLY AVAILABLE CONIFER SPECIES (E.G. PINUS PONDEROSA).
4. INTERMEDIATE AXIS OF HABITAT BOULDERS SHALL BE 36-48" ON AVERAGE AND CONSISTENT WITH SPECIFICATIONS
5. LOG PILES ON LARGE LOG JAM TYPE 1: IF MINIMUM EMBEDMENT DEPTH REQUIREMENT OR PULLOUT TEST RESISTANCE VALUE IS NOT ACHIEVED FIRST BY VIBRATORY PILE DRIVING, SEE SPECIFICATIONS FOR ALTERNATIVE INSTALLATION.
6. ALL LARGE LOG JAM (TYPE 1) LOG PILES MUST BE DRIVEN 13 FEET BELOW FINAL GRADE.

LARGE LOG JAM TYPE 1				
NUMBER OF STRUCTURES:	14			
MATERIAL	SIZE	ROOT WAD	QUANTITY PER STRUCTURE	TOTAL
TYPE	LENGTH X DIAM / ROCK SIZE DIAM	YES/NO	EA/CY	EA/CY
LOG TYPE E (EA)	40 X 1.75	YES	6	84
LOG PILE (EA)	20-25 X 1.0 -1.5	NO	9	126
RACKING WOOD (EA)	6-10 X 0.66-0.83	OPTIONAL	30	420
SLASH (CY)	< 10 X < 0.5	NO	16	224
HABITAT BOULDER (EA)	36" - 48"	N/A	12	168
LIVE CUTTING (EA)	N/A	N/A	10	140

1 LARGE LOG JAM - TYPE 1 SCHEDULE
TABLE

LARGE LOG JAM TYPE 2				
NUMBER OF STRUCTURES:	4			
MATERIAL	SIZE	ROOT WAD	QUANTITY PER STRUCTURE	TOTAL
TYPE	LENGTH X DIAM / ROCK SIZE DIAM	YES/NO	EA/CY	EA/CY
LOG TYPE E (EA)	40 X 2	YES	6	24
RACKING WOOD (EA)	6-10 X 0.66-0.83	OPTIONAL	30	120
SLASH (CY)	< 10 X < 0.5	NO	16	64
HABITAT BOULDER (EA)	36" - 48"	N/A	12	48
LIVE CUTTING (EA)	N/A	N/A	10	40

2 LARGE LOG JAM - TYPE 2 SCHEDULE
TABLE

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		DR	TKR	CHK	APVD
		TKR		PR	LH

NORTH FORK WALLA WALLA RIVER
RESTORATION DESIGN - RIVER MILE 4.3 - 5.2
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MILTON-FREEWATER, OR

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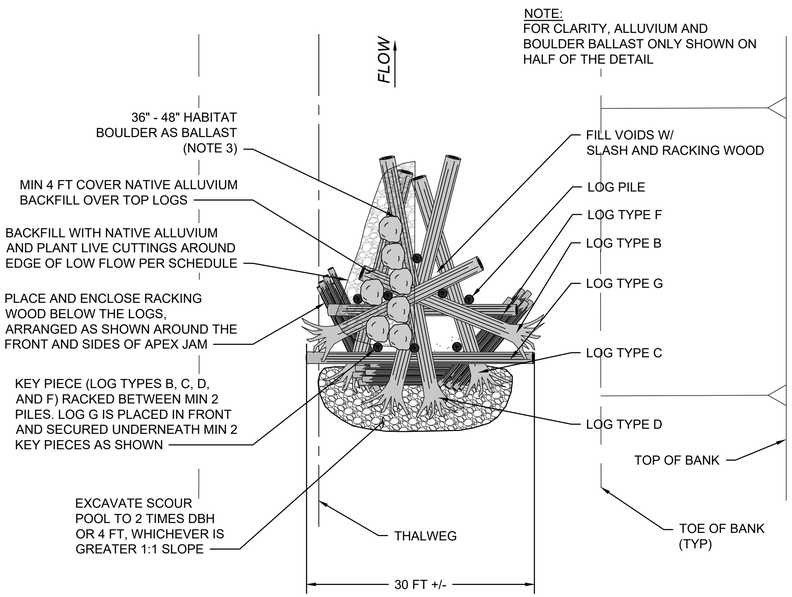
CIVIL
LARGE WOOD
LARGE LOG JAM

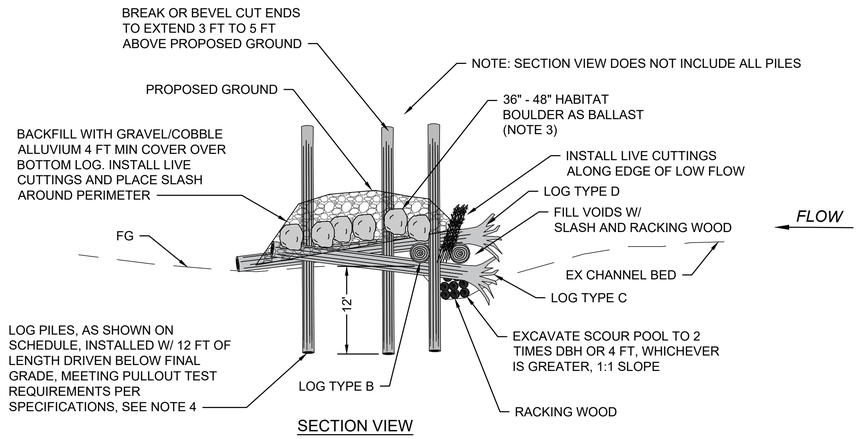
AS SHOWN
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1"

DATE	MARCH 2024
PROJ	W3Y00606
DWG	CD-02
SHEET	18 of 22

80% Design



PLAN VIEW



SECTION VIEW

1 ENGINEERED LOG JAM - APEX JAM

TYPICAL DETAILS

NOT TO SCALE

APEX JAM				
NUMBER OF STRUCTURES:	5			
MATERIAL	SIZE	ROOT WAD	QUANTITY PER STRUCTURE	TOTAL
TYPE	LENGTH X DIAM / ROCK SIZE DIAM	YES/NO	EA/CY	EA/CY
LOG TYPE F (EA)	25 X 2	NO	1	5
LOG TYPE B (EA)	25 X 1.75	YES	2	10
LOG TYPE G (EA)	30 X 2	NO	1	5
LOG TYPE C (EA)	30 X 1.75	YES	2	10
LOG TYPE D (EA)	40 X 1.75	YES	2	10
RACKING WOOD (EA)	6-10 X 0.66-0.83	OPTIONAL	30	150
SLASH (CY)	< 10 X < 0.5	NO	32	160
LOG PILE (EA)	20-25 X 1.0 -1.5	NO	16	80
HABITAT BOULDER (EA)	36" - 48"	N/A	16	80
LIVE CUTTING (EA)	N/A	N/A	10	50

1 APEX JAM SCHEDULE

TABLE

NOTES:

1. WOOD STRUCTURES WILL REQUIRE FIELD ADJUSTMENTS AS DESCRIBED BY WWBWC.
2. ALL LOGS WILL BE LOCALLY AVAILABLE CONIFER SPECIES (E.G. PINUS PONDEROSA).
3. HABITAT BOULDERS SHALL BE 36" - 48" ON AVERAGE AND CONSISTENT WITH SPECIFICATIONS
4. LOG PILES ON APEX JAM: IF MINIMUM EMBEDMENT DEPTH REQUIREMENT OR PULLOUT TEST RESISTANCE VALUE IS NOT ACHIEVED FIRST BY PILE DRIVING, SEE SPECIFICATIONS FOR ALTERNATIVE INSTALLATION.

NOT FOR CONSTRUCTION

NO.	DATE	DSGN	REVISION	BY	APVD
		TKR		DR	APVD
				CHK	PR
				TKR	LH

NORTH FORK WALLA WALLA RIVER
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APEX JAM

AS SHOWN

VERIFY SCALE

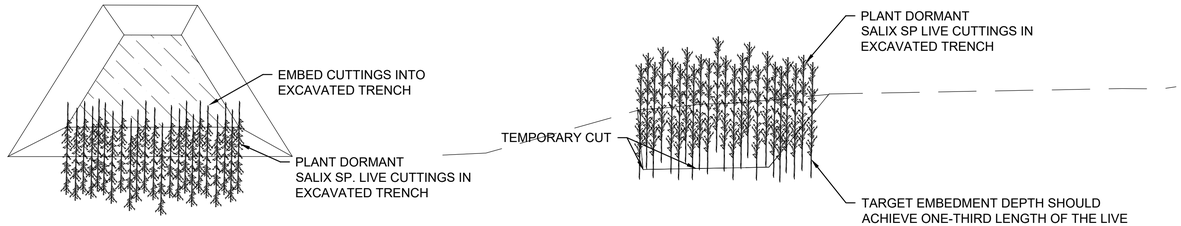
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	MARCH 2024
PROJ	W3Y00606
DWG	CD-03
SHEET	19 of 22

80% Design

WILLOW TRENCH				
TOTAL LENGTH OF FEATURE (LF)	900			
MATERIAL	SIZE	ROOT WAD	QUANTITY PER STRUCTURE	TOTAL QUANTITY
TYPE	LENGTH X DIAM / ROCK SIZE DIAM	YES/NO	FT/EA	SF/EA
EARTHWORK (SF)	N/A	N/A	3	2700
LIVE CUTTING (EA)	N/A	N/A	3	2700

1 WILLOW TRENCHING SCHEDULE
TABLE

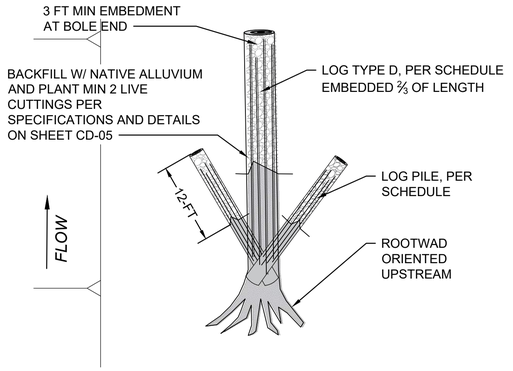


PLAN VIEW

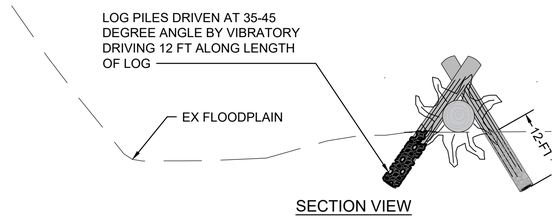
SECTION VIEW

1. WILLOW TRENCHING DETAIL SHOWN ON THIS SHEET PERTINENT TO PLANTINGS WHICH ARE NOT INTEGRAL TO LWM STRUCTURES OR ROUGHNESS FEATURES. PLANTINGS ASSOCIATED WITH FLOODPLAIN ROUGHNESS FEATURES AND HABITAT STRUCTURES SHOWN ON SHEET CD-05
2. EXCAVATE TRENCH TO A DEPTH INFORMED BY TEST PITS IN LOCATIONS DEPICTED ON DRAWINGS. NOTE THAT FINAL TRENCHING LOCATIONS MAY BE FIELD ADJUSTED AT THE DIRECTION OF WWBWC DURING THE TIME OF PLANTING.
3. EMBED WILLOW CUTTINGS INTO TRENCH OR INSTALL USING A STINGER IF COBBLES ARE TOO COARSE TO PENETRATE.
4. BACKFILL WITH CUT MATERIAL.

1 FLOODPLAIN ROUGHNESS - WILLOW TRENCHING
TYPICAL DETAILS
NOT TO SCALE



PLAN VIEW



SECTION VIEW

FLOODPLAIN PINNED LOG				
NUMBER OF STRUCTURES:	22			
MATERIAL	SIZE	ROOT WAD	QUANTITY PER STRUCTURE	TOTAL QUANTITY
TYPE	LENGTH X DIAM / ROCK SIZE DIAM	YES/NO	EA	EA/CY
LOG TYPE D (EA)	35 X 1.75	YES	1	22
LOG PILE (EA)	15 X 1.0	NO	2	44
SLASH (CY)	< 10 X < 0.5	NO	3	66
LIVE CUTTING (EA)	N/A	N/A	2	44
RACKING WOOD (EA)	6-10 X 0.66-0.83	OPTIONAL	6	132

2 FLOODPLAIN PINNED LOGS SCHEDULE
TABLE

2 FLOODPLAIN ROUGHNESS - FLOODPLAIN PINNED LOGS
TYPICAL DETAILS
NOT TO SCALE

NOT FOR CONSTRUCTION

NO.	DATE	DSGN	DR	CHK	APVD	BY	APVD
		TKR	TKR	PR	LH		

REVISION

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FLOODPLAIN ROUGHNESS WILLOW TRENCHING AND FLOODPLAIN PINNED LOGS

AS SHOWN
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

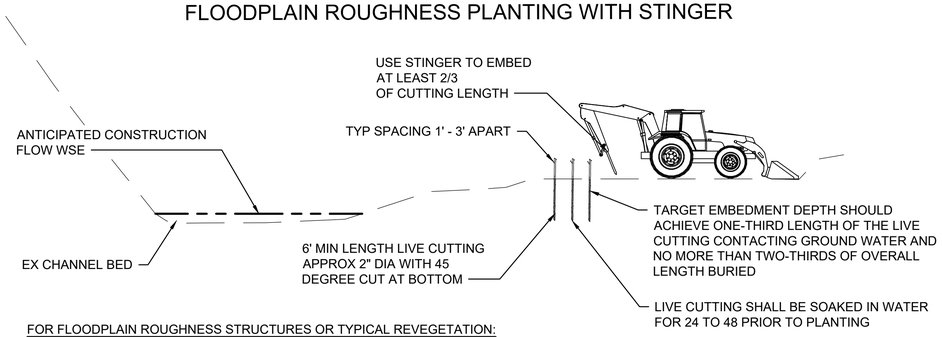
DATE	MARCH 2024
PROJ	W3Y00606
DWG	CD-04
SHEET	20 of 22

80% Design

SITE RESTORATION NOTES:

1. UPON COMPLETION OF EARTHWORK AND PLACEMENT OF STRUCTURES, SITE RESTORATION WILL BE COMPLETED IN COMPLIANCE WITH HABITAT IMPROVEMENT PROGRAM (HIP) MEASURES, REFER TO DWGS G-03 THRU G-05. SITE RESTORATION WILL REQUIRE COORDINATION BETWEEN THE CONTRACTOR AND CONTRACTING OFFICER.
2. GROUND SURFACES (WITH SOILS) IMPACTED BY PROJECT-RELATED ACTIVITIES WILL BE GRADED TO PROVIDE STABILITY FOR APPROVAL BY CONTRACTION OFFICER. CONTRACTING OFFICER WILL BE RESPONSIBLE FOR SEEDING.
3. WHERE ONLY COARSE RIVER COBBLE (LACKING SOILS) IS PRESENT, INSTEAD. CONTRACTOR WILL GRADE TO PRE-PROJECT CONDITIONS.
4. TOTAL APPROXIMATE RESTORATION AREA: 3.53 ACRES.

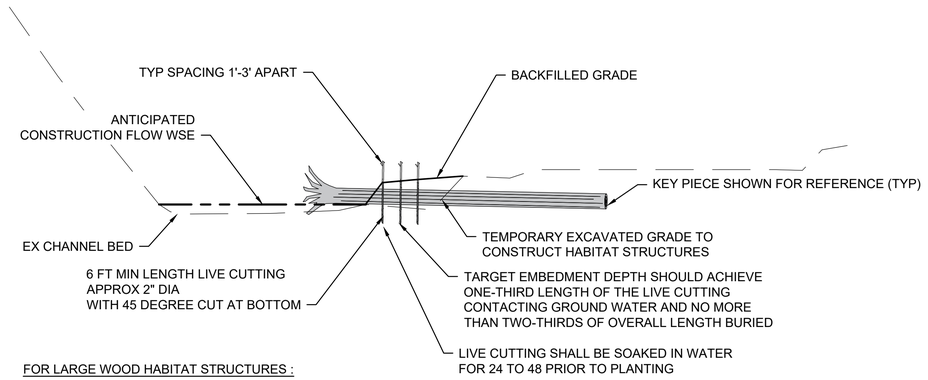
FLOODPLAIN ROUGHNESS PLANTING WITH STINGER



FOR FLOODPLAIN ROUGHNESS STRUCTURES OR TYPICAL REVEGETATION:

1. FLOODPLAIN ROUGHNESS WILLOW CUTTING INSTALLATIONS ARE CONTINGENT UPON TEST PIT RESULTS, PER SPECIFICATIONS. THESE RESULTS WILL INFORM WWBWC WHERE THE WATER TABLE IS LOCATED IN RELATION TO FLOODPLAIN ROUGHNESS FEATURES NEAR THE TIME OF CONSTRUCTION.
2. THIS DETAIL PERTAINS TO THE FOLLOWING FLOODPLAIN ROUGHNESS FEATURES- INCLUDING: ROUGHENED GROUND, PINNED LOGS, AND WILLOW TRENCHING. WHERE EXCAVATION AND BACKFILL IS NOT POSSIBLE TO GET CUTTINGS DOWN TO DESIRED DEPTHS, PLANTING WITH A STINGER IS RECOMMENDED AS SHOWN.
3. FOLLOWING COMPLETION OF THE FLOODPLAIN ROUGHNESS FEATURE, USE STINGER TO PLANT SPECIFIED LIVE CUTTING SPECIES. 1'-3' APART EMBEDDING UP TO 5 FEET OR 6" BELOW WATER TABLE ENCOUNTERED AT TIME OF CONSTRUCTION.
4. BACKFILL FLOODPLAIN ROUGHNESS OR BLEND DISTURBED ALLUVIUM.

HABITAT STRUCTURE PLANTING



FOR LARGE WOOD HABITAT STRUCTURES :

1. EXCAVATE TEMPORARY GRADE FOR HABITAT STRUCTURE INSTALLATION.
2. INSTALL HABITAT STRUCTURE KEY PIECES AND BACKFILL.
3. PLANT SPECIFIED LIVE CUTTINGS AT THE TARGET EMBEDMENT DEPTH AROUND LOW FLOW EDGE OF WATER. BACKFILL AROUND LIVE CUTTINGS AND HABITAT STRUCTURES.
4. PLACE BALLAST BOULDERS AND BACKFILL REMAINDER OF NATIVE ALLUVIUM TO PROVIDE THOROUGH SUBSTRATE CONTACT WITH LIVE CUTTING.

1 PLANTING METHODS
TYPICAL DETAILS
NOT TO SCALE

NOT FOR CONSTRUCTION

NO.	DATE	DSGN	DR	TKR	REVISION	CHK	TKR	PR	APVD	BY	APVD
											LH

NORTH FORK WALLA WALLA RIVER
RESTORATION DESIGN - RIVER MILE 4.3 - 5.2
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SITE RESTORATION AND PLANTING DETAILS

80% Design

AS SHOWN
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

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PROJ	W3Y00606
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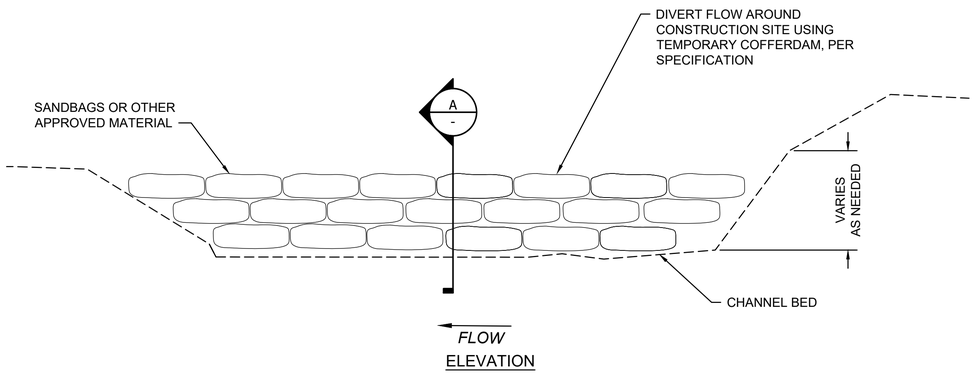
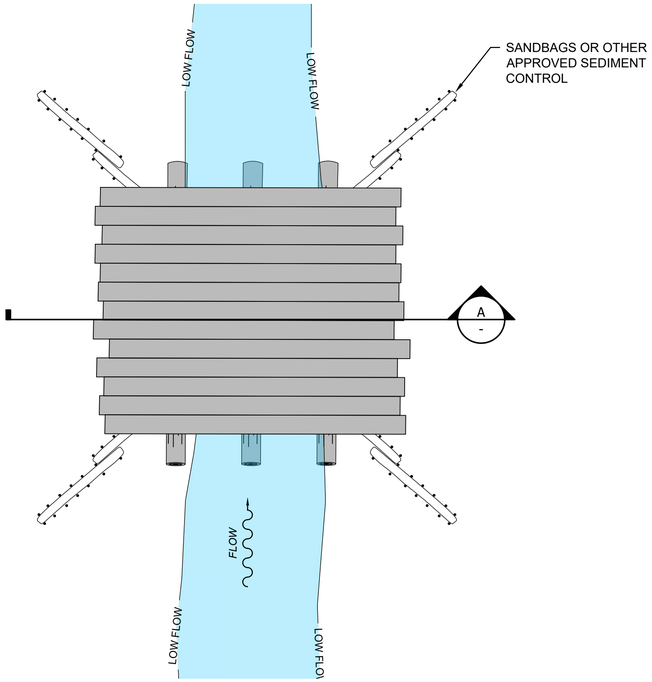
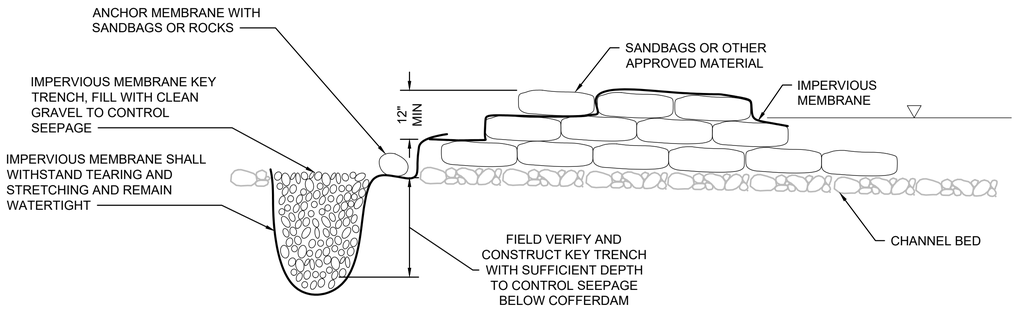
SHEET	21 of 22



ELEVATION



PLAN VIEW



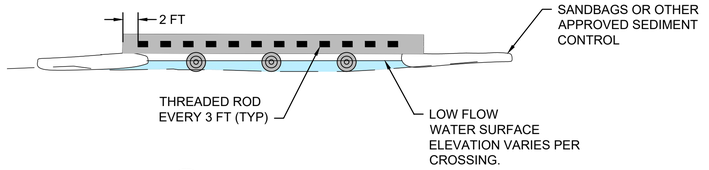
A SECTION VIEW

NOTE:

1. SANDBAGS FILLED WITH SMALL CLEAN GRAVELS OR OTHER EQUIVALENT MATERIAL THAT MEETS PERMIT REQUIREMENTS.

1 FLOW ISOLATION
TYPICAL DETAILS

NOT TO SCALE



A SECTION VIEW

NOTES:

1. 2.5' DIAMETER UNTREATED LOGS LAY PARALLEL TO FLOW ALONG THE BOTTOM OF TEMPORARY CROSSING.
2. TEMPORARY WATER CROSSING, CONSTRUCT PER PROJECT SPECIFICATIONS.

2 TEMPORARY WATER CROSSING
TYPICAL DETAILS

NOT TO SCALE

NOT FOR CONSTRUCTION

NO.	DATE	DSGN	DR	TKR	REVISION	CHK	TKR	PR	APVD	BY	APVD
											LH

NORTH FORK WALLA WALLA RIVER
RESTORATION DESIGN - RIVER MILE 4.3 - 5.2
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Jacobs

CIVIL
TEMPORARY FLOW ISOLATION AND TEMPORARY WATER CROSSING DETAILS

AS SHOWN
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	MARCH 2024
PROJ	W3Y00606
DWG	CD-06
SHEET	22 of 22

80% Design