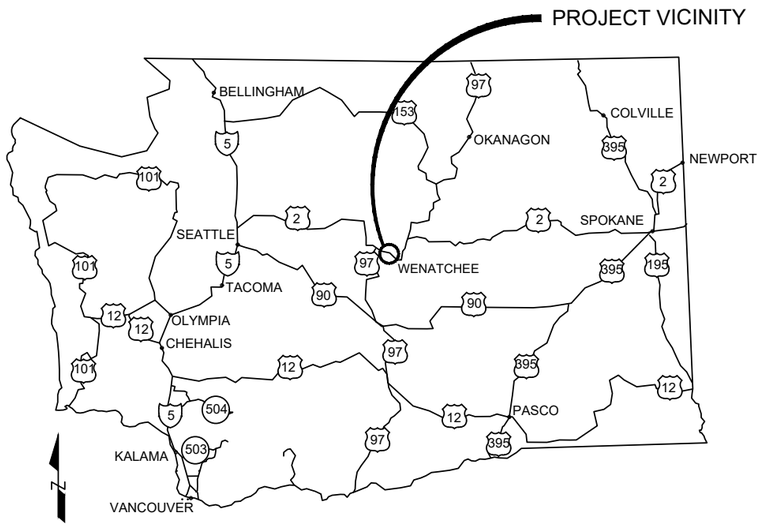
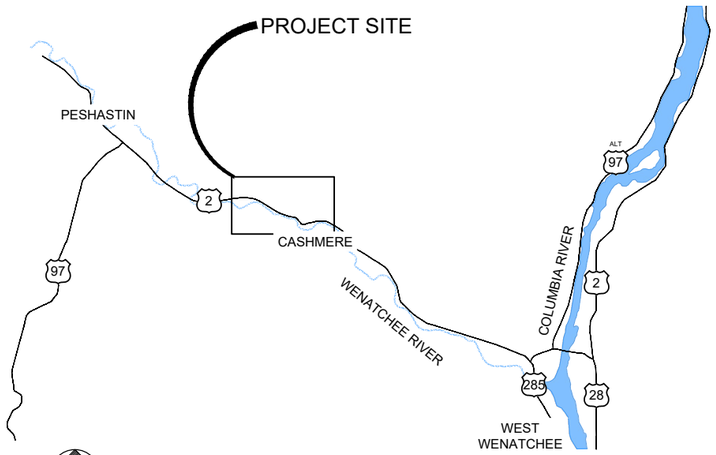
60% DESIGN
SEPTEMBER 2024

GOODWIN SIDE CHANNEL HABITAT RESTORATION PROJECT

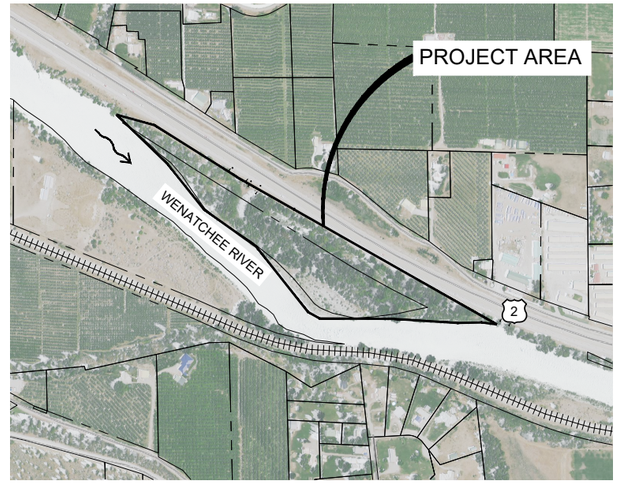
CASCADE FISHERIES
CHELAN COUNTY, WA



REGIONAL MAP
NTS



PROJECT VICINITY
NTS



PROJECT SITE
NTS

PROJECT TEAM

PROJECT CLIENT
CASCADE FISHERIES
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WENATCHEE, WA 98801
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PROJECT INFO

SPATIAL REFERENCE
HORIZONTAL: WASHINGTON STATE PLANE NORTH, US SURVEY FEET
VERTICAL: NAVD88
LIDAR: 2022 TOPOBATHY

PROJECT SITE LOCATION:
CASHMERE, CHELAN COUNTY, WASHINGTON
LATITUDE: 47.529967
LONGITUDE: -120.498273
WATERBODY: WENATCHEE RIVER

SHEET INDEX

WORK PERIODS:

ALL IN-WATER WORK SHALL BE LIMITED TO WDFW APPROVED IN-WATER WINDOW OF JULY 15TH - SEPTEMBER 30TH.

PRELIMINARY NOT FOR CONSTRUCTION

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CASCADE FISHERIES
GOODWIN SIDE CHANNEL
CHELAN COUNTY, WA

COVER & SHEET INDEX

REVISION NUMBER

No.	Date	Revision

Date: 9/26/2024 | Designed By: SR, GL
Drawn By: BB | Checked By: AJ

SCALE: 0 1"

JOB NO. 20220043

SHEET NO. G1.0

1 OF 21

DWG: Z:\Shared\W2\CAD\20220043-Goodwin Side Channel\DWG\SHEETS\G1.0 - COVER.dwg USER: bbennett
DATE: Sep 26, 2024 2:15pm XREFS:GSC-X-TB-W2r-22x34 GSC-X-PLANIMETRICS GSC-X-LEGEND GSC-X-AERIAL

60% DESIGN
SEPTEMBER 2024

GENERAL NOTES:

1. EXISTING CONDITIONS TOPOGRAPHY SHOWN IN PLANS IS 2022 TOPOBATHYMETRIC LIDAR PROVIDED BY THE UNITED STATES BUREAU OF RECLAMATION.
2. HORIZONTAL DATUM IS NAD83 WASHINGTON STATE PLANE NORTH, US SURVEY FT.
3. VERTICAL DATUM IS NAVD88, FT.
4. ALL SCALES SHOWN ARE FOR 22" X 34" SHEETS.
5. THERE WILL BE A SCHEDULED TIME FOR INSPECTION OF ALL EQUIPMENT THAT IS MOBILIZED TO THE SITE BY THE ENGINEER OR OWNER'S REPRESENTATIVE.
6. ALL NON-NATIVE MATERIALS ENCOUNTERED DURING EXCAVATION ACTIVITIES SHALL BE REMOVED FROM THE FLOODPLAIN AND HAULED OFFSITE TO AN APPROVED FACILITY WITH THE EXCEPTION OF RIP RAP THAT MAY BE USED AS BURIED LWD BALLAST OR HABITAT BOULDERS IN LIEU OF IMPORTED BOULDERS.
7. ALL WORK SHALL CONFORM TO THE PLANS & SPECIFICATIONS UNLESS INDICATED OTHERWISE BY CONTRACT DOCUMENTS.
8. EARTHWORK QUANTITIES ARE BASED ON BANK VOLUMES BETWEEN EXISTING GRADE AND FINISH GRADE SURFACES. CONTRACTOR SHALL ALLOW FOR EXPANSION OF EXCAVATED MATERIAL AND COMPACTION OF PLACED MATERIAL AT NO ADDITIONAL COST.
9. DRIVING DIRECTIONS FROM PORTLAND, OREGON:

   FROM WENATCHEE, FOLLOW S MISSION ST AND WA-285N / N WENATCHEE AVE TO US-2W / US-97S FOR APPROX. 3.7 MILES. CONTINUE ON US-2W / US-97N TOWARD CASHMERE FOR APPROX. 12.1 MILES TO TOWN OF DRYDEN. TURN AROUND IN DRYDEN AND TAKE US-2E . US-97N TOWARD CASHMERE FOR APPROX. 3.2 MILES.

   PARK ALONG HIGHWAY SHOULDER AT SITE APPROX. 0.2 MILES WEST OF CASHMERE.

ENGINEERED LOG JAM STRUCTURE SUMMARY TABLE:

DESCRIPTION	QUANTITY
TYPE 1 - APEX LOG JAM	1
TYPE 2 - MARGIN LOG JAM	1
TYPE 3 - SIDE CHANNEL MARGIN JAM	42
TYPE 4 - SIDE CHANNEL APEX JAM	2
TYPE 5 - FLOODPLAIN WOOD	31
TYPE 6 - FLOODFENCE	6

GRADING SUMMARY TABLE:

GRADING AREA	CUT VOLUME (CY)	FILL VOLUME (CY)	NET VOLUME (CY)
PROPOSED CHANNEL AND FLOODPLAIN GRADING	19,700	550	19,150 (CUT)
PROPOSED SPOILS GRADING	0	20,700	20,700 (FILL)
TOTALS	19,700	21,250	**1,550 (FILL)**

FUTURE DESIGN PHASES WILL INCLUDE UPDATED GRADING QUANTITIES WITH BALANCED CUT-FILL VOLUMES AS THE DESIGN DETAILS ARE REFINED.

WORK PERIODS:

1. ALL IN-WATER WORK SHALL BE LIMITED TO WDFW APPROVED IN-WATER WINDOW OF JULY 15TH - SEPTEMBER 30TH.

WATER SURFACE ELEVATIONS:

THE 50% DURATION EXCEEDANCE PROBABILITY FLOW WSE (1,810 CFS) SHOWN THROUGHOUT PLANS WAS DERIVED FROM THE EXISTING CONDITIONS HYDRAULIC MODEL.

THE ORDINARY HIGH WATER LINEWORK SHOWN THROUGHOUT PLANS WAS DERIVED FROM FIELD SURVEY DATA AND DESKTOP DELINEATION ANALYSIS PERFORMED BY W2R IN 2023.

LEGEND AND SYMBOLS:

- EX MINOR CONTOUR
- EX MAJOR CONTOUR
- PROP MINOR CONTOUR
- PROP MAJOR CONTOUR
- ORDINARY HIGH WATER EXTENT
- MODELED WATER EXTENT (1,810 CFS)
- FEMA FLOODWAY EXTENTS
- FEMA 100-YEAR FLOODPLAIN EXTENTS
- TAXLOTS
- EXISTING WETLANDS
- EXISTING RAILROAD
- EXISTING ROADWAY
- EXISTING RIP RAP
- EXISTING PONDEROSA PINE
- EXISTING CATCH BASIN
- EXISTING STORM DRAIN OUTLET
- PROPOSED CUT AREA
- PROPOSED FILL AREA
- PROPOSED ROCK INLET
- 150' WATERBODY OFFSET
- TEMPORARY ACCESS ROUTE
- TEMPORARY CONSTRUCTION ENTRANCE
- STAGING AREA
- TEMPORARY COFFER DAM
- TEMPORARY WATTLES

ENGINEERED LOG JAM STRUCTURES

- TYPE 1 - APEX JAM
- TYPE 2 - MARGIN JAM
- TYPE 3 - SIDE CHANNEL MARGIN JAM
- TYPE 4 - SIDE CHANNEL APEX JAM
- TYPE 5 - FLOODPLAIN WOOD
- TYPE 6 - FLOODFENCE

ABBREVIATIONS:

APPROX	APPROXIMATE
APE	APPROXIMATE PROJECT EXTENTS
BMP	BEST MANAGEMENT PRACTICE
BPA	BONNEVILLE POWER ADMINISTRATION
CAR	CONTRACTING AGENCY REPRESENTATIVE
CF	CASCADE FISHERIES
CFS	CUBIC FEET PER SECOND
CHNL	CHANNEL
CL	CENTERLINE
CONSTR	CONSTRUCTION
CWA	CLEAN WATER ACT
CY	CUBIC YARD
DEPT	DEPARTMENT
EG	EXISTING GRADE/GROUND
ELEV, EL	ELEVATION
ELJ	ENGINEERED LOG JAM
ESA	ENDANGERED SPECIES ACT
ESC	EROSION AND SEDIMENT CONTROL
EX, EXIST	EXISTING
FEMA	FEDERAL EMERGENCY MANAGEMENT AGENCY
FG	FINISHED GRADE/GROUND
FT	FEET
GB	GRADE BREAK
HAB	HABITAT
HIP	HABITAT IMPROVEMENT PROGRAM
IN	INCHES
IE	INVERT ELEVATION
IWW	IN WATER WORK
LW	LARGE WOOD
MIN	MINIMUM
NAIP	NATIONAL AGRICULTURE IMAGERY PROGRAM
NAD83	NORTH AMERICAN DATUM (1983)
NAVD88	NORTH AMERICAN VERTICAL DATUM (1988)
NMFS	NATIONAL MARINE FISHERIES SERVICE
NTS	NOT TO SCALE
OHW	ORDINARY HIGH WATER
OHWM	ORDINARY HIGH WATER MARK
PROP	PROPOSED
SPCC	SPILL PREVENTION, CONTROL, AND COUNTERMEASURE
TEMP	TEMPORARY
TESC	TEMPORARY EROSION AND SEDIMENT CONTROL
TOB	TOP OF BANK
TOE	TOE OF SLOPE
TOP	TOP OF SLOPE
TYP	TYPICAL
USBR	UNITED STATES BUREAU OF RECLAMATION
USFWS	UNITED STATES FISH AND WILDLIFE SERVICE
VIF	VERIFY IN FIELD
W/	WITH
W/O	WITHOUT
W2R	WOLF WATER RESOURCES
WDFW	WASHINGTON DEPARTMENT OF FISH AND WILDLIFE
WHS	WOOD HABITAT STRUCTURE
WSDOT	WASHINGTON DEPARTMENT OF TRANSPORTATION
WSE	WATER SURFACE ELEVATION

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GENERAL NOTES & ABBREVIATIONS

REVISION NUMBER

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Date 9/26/2024	Designed By SR, GL
Drawn By BB	Checked By AJ

SCALE 0 1"

JOB NO. 20220043

SHEET NO. G1.1

DWG: Z:\Shared\W2r\CAD\20220043-Goodwin Side Channel\DWG\SHEETS\G1.0 - COVER.dwg USER: bbennett
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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 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.

STEVEN ... PROFESSIONAL ENGINEER
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GOODWIN SIDE CHANNEL
CHELAN COUNTY, WA

HIP
CONSERVATION
NOTES 1

REVISION NUMBER

No.	Date	Revision

Date	Designed By
9/26/2024	SR, GL
Drawn By	Checked By
BB	AJ

SCALE 0 1"

JOB NO. 20220043

SHEET NO. G1.2

DWG: Z:\Shared\W2r\CAD\20220043-Goodwin Side Channel\DWG\SHEETS\G1.X - HIP NOTES.dwg USER: bbennett
DATE: Sep 26, 2024 2:15pm XREFS: GSC-X-TB-W2r-22x34

60% DESIGN
SEPTEMBER 2024

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).

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GOODWIN SIDE CHANNEL
CHELAN COUNTY, WA

HIP CONSERVATION NOTES 2

REVISION NUMBER

No.	Date	Revision

Date 9/26/2024	Designed By SR, GL
Drawn By BB	Checked By AJ

SCALE 0 1"

JOB NO. 20220043

SHEET NO. G1.3

4 OF 21

DWG: Z:\Shared\W2r\CAD\20220043-Goodwin Side Channel\DWG\SHEETS\G1.X - HIP NOTES.dwg USER: bbennett
DATE: Sep 26, 2024 2:15pm XREFS:GSC-X-TB-W2r-22x34

60% DESIGN
SEPTEMBER 2024

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 REPETIVE 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).

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CHELAN COUNTY, WA

HIP CONSERVATION NOTES 3

REVISION NUMBER

No.	Date	Revision

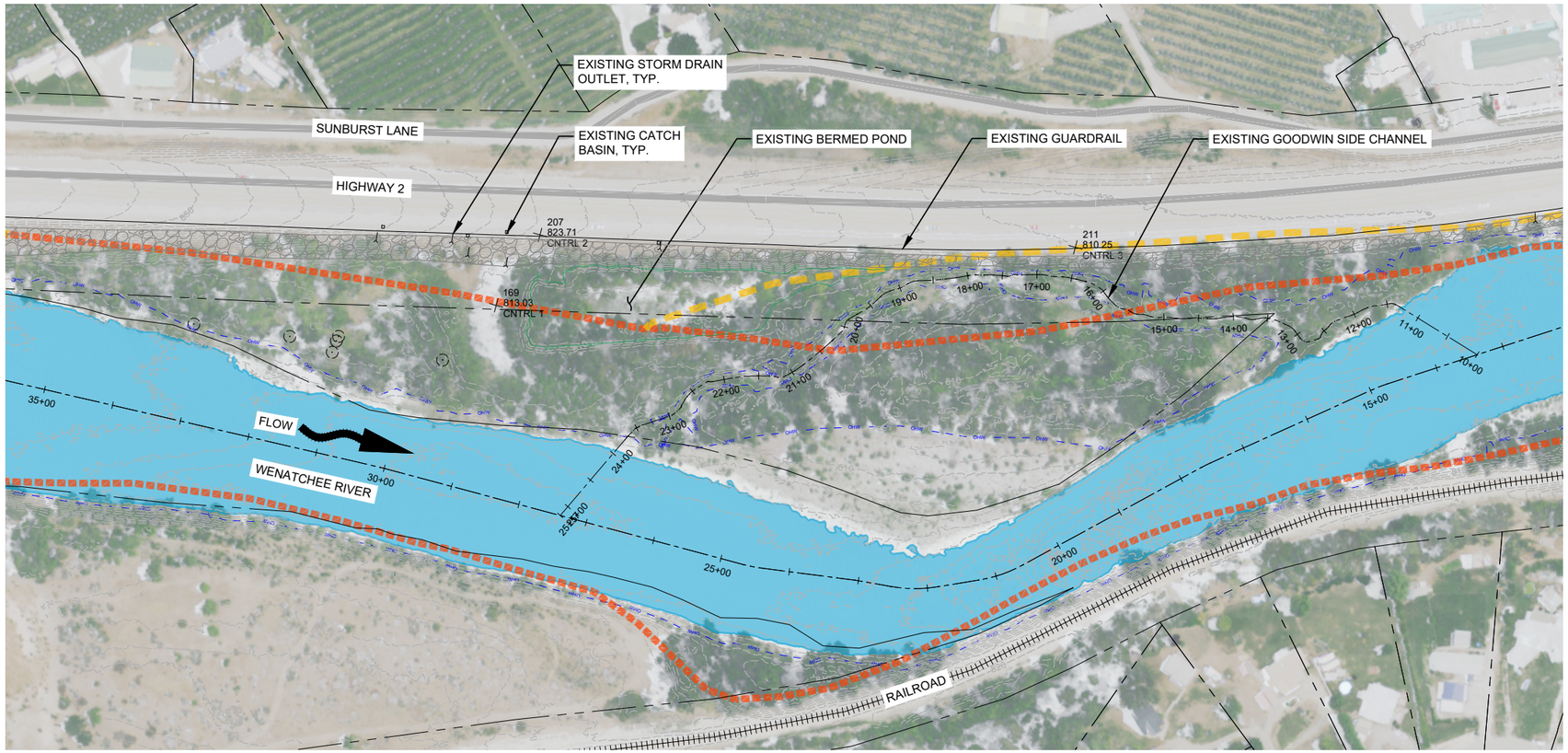
Date 9/26/2024	Designed By SR, GL
Drawn By BB	Checked By AJ

SCALE 0 1"

JOB NO. 20220043

SHEET NO. G1.4

60% DESIGN
SEPTEMBER 2024



NOTES:

1. EXISTING TOPOGRAPHY DERIVED FROM 2022 TOPOBATHY LIDAR DEVELOPED BY USBR.
2. FLOODWAY AND FLOODPLAIN LINEWORK DOWNLOADED FROM FEMA FLOOD MAP SERVICE CENTER.
3. RAILROAD, ROADWAY, AND TAXLOT LINEWORK DOWNLOADED FROM CHELAN COUNTY GIS.
4. EXISTING WETLAND EXTENTS DELINEATED BY W2R IN 2023.
5. WATER EXTENTS SHOWN ARE FROM THE EXISTING CONDITIONS HYDRAULIC MODEL FOR THE 50% DURATION EXCEEDENCE FLOW (1,810 CFS).
6. ORDINARY HIGH WATER EXTENTS SHOWN ARE DERIVED FROM FIELD SURVEY DATA AND DESKTOP DELINEATION ANALYSIS PERFORMED BY W2R IN 2023.

LEGEND:

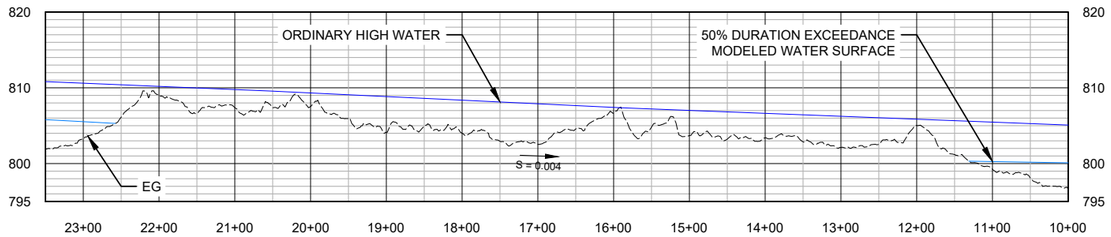
- EX MINOR CONTOUR
- EX MAJOR CONTOUR
- ORDINARY HIGH WATER EXTENT
- MODELED WATER EXTENT (1,810 CFS)
- FEMA FLOODWAY EXTENTS
- FEMA 100-YEAR FLOODPLAIN EXTENTS
- TAXLOTS
- EXISTING WETLANDS
- EXISTING RAILROAD
- EXISTING ROADWAY
- EXISTING RIP RAP
- EXISTING PONDEROSA PINE
- EXISTING CATCH BASIN
- EXISTING STORM DRAIN OUTLET

SCALE
100 0 50 100 200
SCALE FEET

EXISTING CONDITIONS PLAN

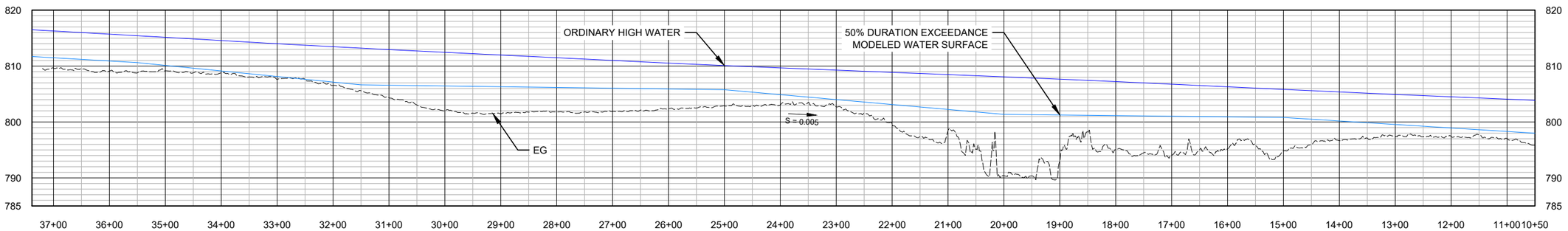
SCALE: 1"=100"

CONTROL POINTS				
POINT #	DESCRIPTION	ELEVATION	NORTHING	EASTING
169	CNTRL 1	813.026	193806.5173	1722775.4770
207	CNTRL 2	823.707	193862.6338	1722880.4320
211	CNTRL 3	810.254	193463.2259	1723536.5070



EXISTING GOODWIN SIDE CHANNEL PROFILE

HORIZONTAL SCALE: 1"=100"
VERTICAL SCALE: 1'=10'



EXISTING WENATCHEE RIVER PROFILE

HORIZONTAL SCALE: 1"=100"
VERTICAL SCALE: 1'=10'

STEVEN ROBERT LEE
STATE OF WASHINGTON
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EXISTING CONDITIONS PLAN & PROFILE

REVISION NUMBER

No.	Date	Revision

Date: 9/26/2024
Designed By: SR, GL
Drawn By: BB
Checked By: AJ
SCALE: 0 1"

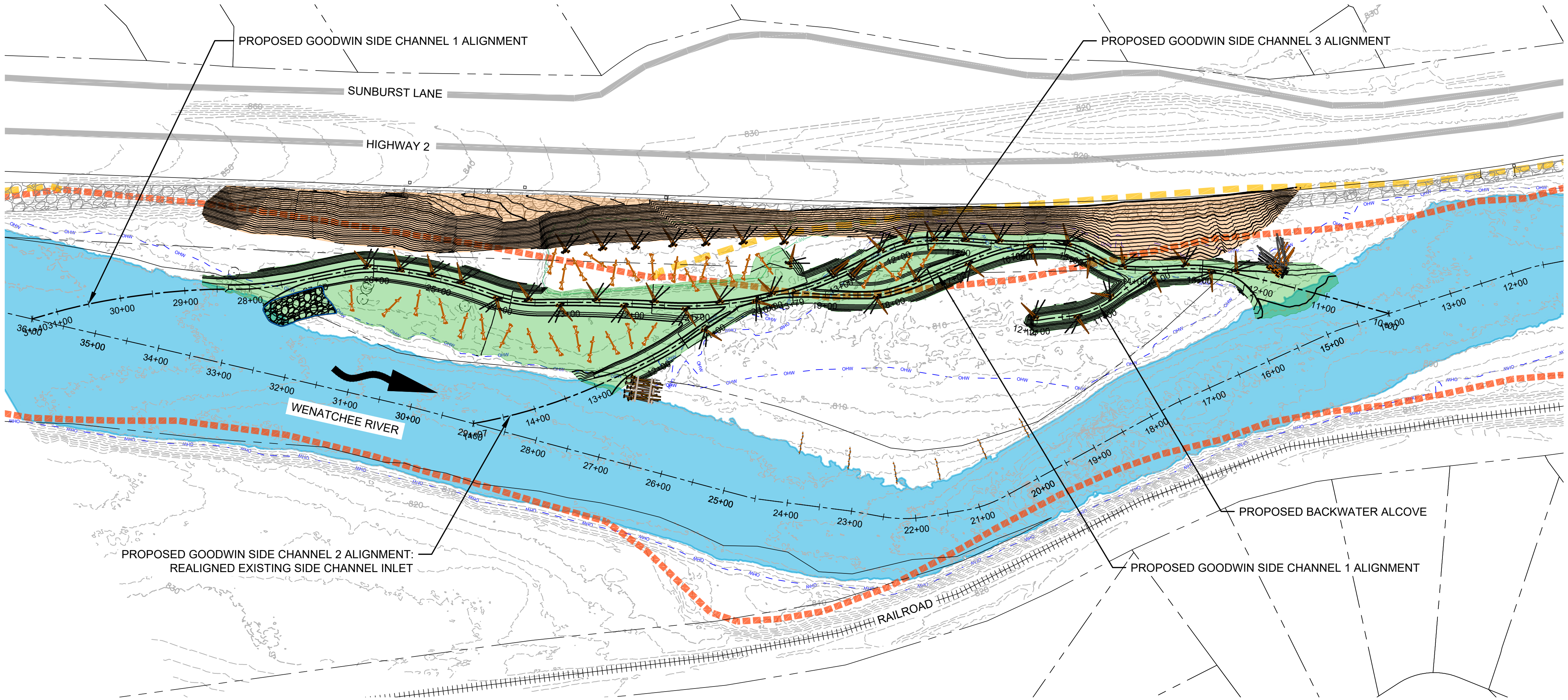
JOB NO. 20220043

SHEET NO. C1.0

6 OF 21

DWG: Z:\Share\W2r\CAD\20220043-Goodwin Side Channel\DWG\SHEETS\C1.0.dwg USER: bbennett
DATE: Sep 26, 2024 2:16pm XREFS:GSC-X-PLANIMETRICS GSC-X-TB-W2r-22x34 GSC-X-LEGEND GSC-X-FEMA GSC-X-OHW GSC-X-AERIAL

60% DESIGN
SEPTEMBER 2024



PROPOSED CONDITIONS OVERVIEW

SCALE: 1"=100'

LEGEND:

- EX MINOR CONTOUR
- EX MAJOR CONTOUR
- ORDINARY HIGH WATER EXTENT
- MODELED WATER EXTENT (1,810 CFS)
- FEMA FLOODWAY EXTENTS
- FEMA 100-YEAR FLOODPLAIN EXTENTS
- TAXLOTS
- EXISTING WETLANDS
- EXISTING RAILROAD
- EXISTING ROADWAY
- EXISTING RIP RAP
- EXISTING PONDEROSA PINE
- EXISTING CATCH BASIN
- EXISTING STORM DRAIN OUTLET
- PROPOSED CUT AREA
- PROPOSED FILL AREA
- PROPOSED ROCK INLET

ENGINEERED LOG JAM STRUCTURES

- TYPE 1 - APEX JAM
- TYPE 2 - MARGIN JAM
- TYPE 3 - SIDE CHANNEL MARGIN JAM
- TYPE 4 - SIDE CHANNEL APEX JAM
- TYPE 5 - FLOODPLAIN WOOD
- TYPE 6 - FLOODFENCE

PROPOSED CONDITIONS NOTES:

1. EXISTING TOPOGRAPHY DERIVED FROM 2022 TOPOBATHY LIDAR DEVELOPED BY USBR.
2. FLOODWAY AND FLOODPLAIN LINEWORK DOWNLOADED FROM FEMA FLOOD MAP SERVICE CENTER.
3. RAILROAD, ROADWAY, AND TAXLOT LINEWORK DOWNLOADED FROM CHELAN COUNTY GIS.
4. EXISTING WETLAND EXTENTS DELINEATED BY W2R IN 2023.
5. WATER EXTENTS SHOWN ARE FROM THE EXISTING CONDITIONS HYDRAULIC MODEL FOR THE 50% DURATION EXCEEDENCE FLOW (1,810 CFS).
6. ORDINARY HIGH WATER EXTENTS SHOWN ARE DERIVED FROM FIELD SURVEY DATA AND DESKTOP DELINEATION ANALYSIS PERFORMED BY W2R IN 2023.
7. FOR ACCESS, STAGING, TEMP EROSION AND SEDIMENTATION CONTROL, SEE SHEETS C5.0 - C5.2.
8. CONSTRUCT CHANNELS PER PLANS, PROFILES, AND SECTIONS ON SHEETS C2.1, C2.2, AND C3.0.
9. CONSTRUCT ENGINEERED LOG JAMS PER PLANS ON SHEETS C2.1 AND C2.2, AND DETAILS ON SHEETS C4.0 - C4.4.
10. REVEGETATE SITE PER SHEET C6.1.
11. AVOID DISTURBANCE TO AREAS OF EXISTING VEGETATION IDENTIFIED BY CAR. PRESERVE EXISTING TREES/VEGETATION IN EXCAVATION, FILL, HAULING, AND STAGING AREAS. WHERE DISTURBANCE TO EXISTING VEGETATION IS UNAVOIDABLE, SALVAGE AND RE-USE FOR SITE RESTORATION AT DIRECTION OF CAR.
12. SALVAGE AND STOCKPILE BOULDERS ENCOUNTERED DURING FLOODPLAIN AND CHANNEL EXCAVATION FOR REUSE AS BACKFILL IN ENGINEERED LOG JAMS, OR FOR INCORPORATION IN RESTORATION ELEMENTS AS DIRECTION BY THE CAR.
13. SALVAGE AND STOCKPILE LARGE WOOD PIECES 6 INCHES OR GREATER DBH AND/OR 10 FEET OR GREATER IN LENGTH ENCOUNTERED DURING SITE CLEARING AND FLOODPLAIN AND CHANNEL EXCAVATION. REUSE IN ENGINEERED LOG JAMS AS RACKING, OR IN SITE RESTORATION, AS DIRECTED BY THE CAR.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR WORK AREA ISOLATION AND/OR STREAM DIVERSIONS. TEMPORARY COFFER DAMS SHOWN IN THESE PLANS ARE CONCEPTUAL ONLY. THE CONTRACTOR SHALL ASSESS CONDITIONS IN THE FIELD TO DETERMINE OPTIMAL WATER MANAGEMENT TECHNIQUES AND SEQUENCING.

SCALE

100 0 50 100 200

SCALE FEET

WOLF WATER RESOURCES, INC.
1001 SE WATER AVE, SUITE #180
PORTLAND, OR 97214
503.207.6688

CASCADE FISHERIES
25 N WENATCHEE AVE, SUITE #203
WENATCHEE, WA 98801
509.476.3444

CASCADE FISHERIES
GOODWIN SIDE CHANNEL
CHELAN COUNTY, WA

PROPOSED CONDITIONS OVERVIEW

REVISION NUMBER

No.	Date	Revision

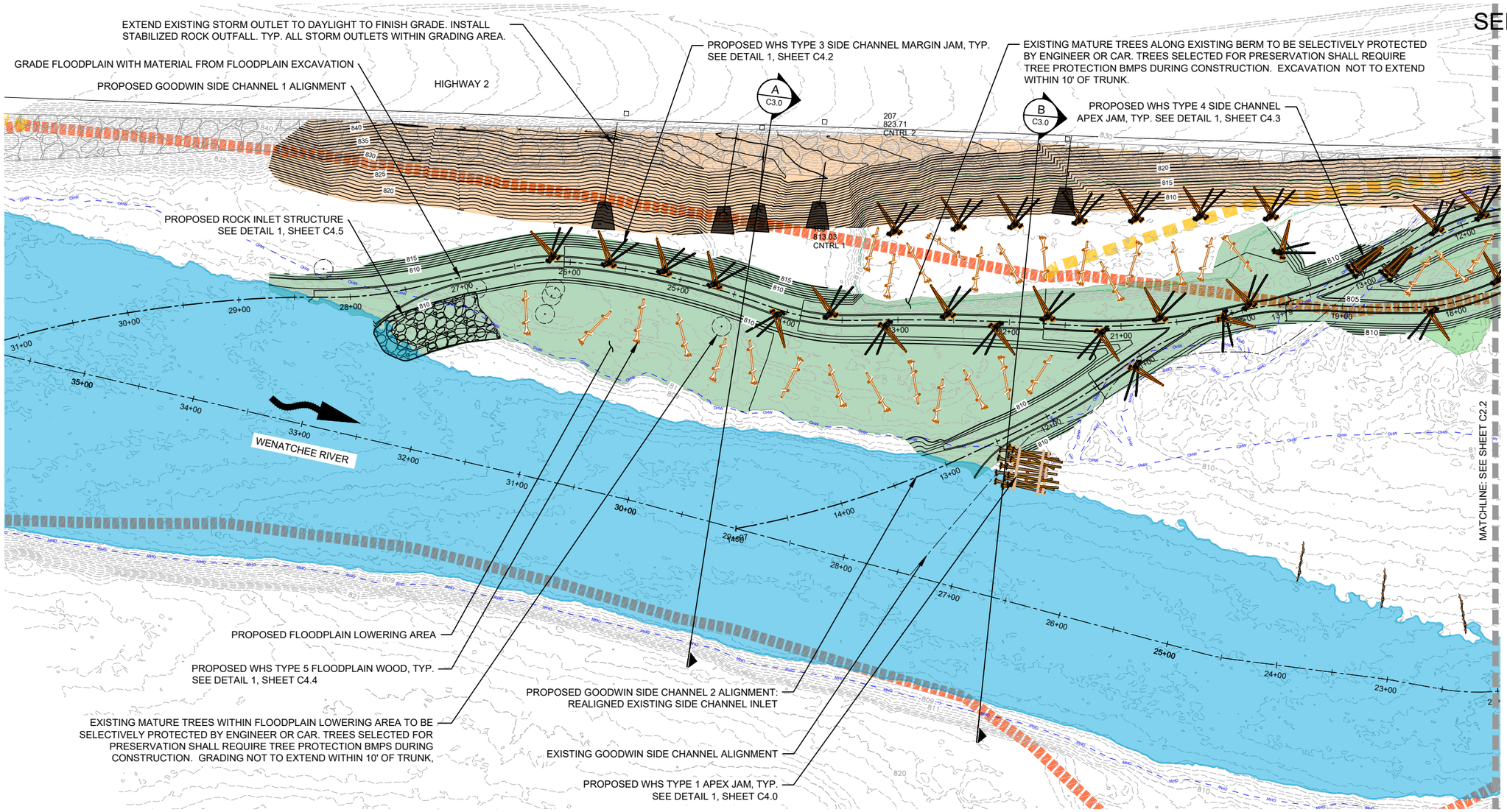
Date	Designed By
9/26/2024	SR, GL
Drawn By	Checked By
BB	AJ

JOB NO. 20220043

SHEET NO. C2.0

DWG: Z:\Shared\W2r\CAD\20220043-Goodwin Side Channel\DWG\SHEETS\C2.0.dwg USER: bbennett
DATE: Sep 26, 2024 2:17pm XREFS: GSC-X-PLANIMETRICS GSC-X-TB-W2r-22x34 GSC-X-LEGEND GSC-X-FEMA GSC-X-OHW GSC-X-DESIGN GSC-X-WOOD-60%

60% DESIGN
SEPTEMBER 2024



PROPOSED CONDITIONS PLAN

SCALE: 1"=50"

SCALE
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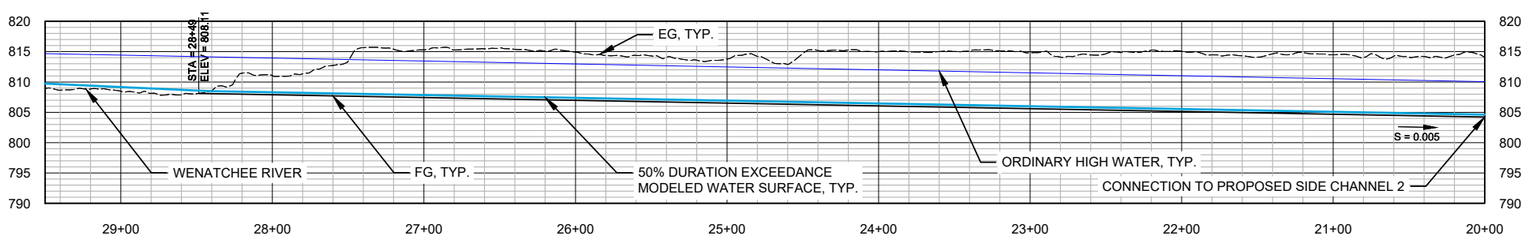
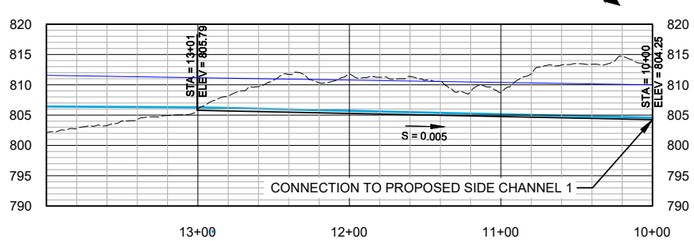
SCALE FEET



PROPOSED GOODWIN SIDE CHANNEL 1 PROFILE

HORIZONTAL SCALE: 1"=50"
VERTICAL SCALE: 1"=12.5'



PROPOSED GOODWIN SIDE CHANNEL 2 PROFILE

HORIZONTAL SCALE: 1"=50"
VERTICAL SCALE: 1"=12.5'

WOLF WATER RESOURCES, INC.
1001 SE WATER AVE, SUITE #180
PORTLAND, OR 97214
503.207.6688

CASCADE FISHERIES
25 N WENATCHEE AVE, SUITE #203
WENATCHEE, WA 98801
509.476.3444

CASCADE FISHERIES
GOODWIN SIDE CHANNEL
CHELAN COUNTY, WA

PROPOSED CONDITIONS PLAN & PROFILE 1

REVISION NUMBER

No.	Date	Revision

Date 9/26/2024 | Designed By SR, GL
Drawn By BB | Checked By AJ

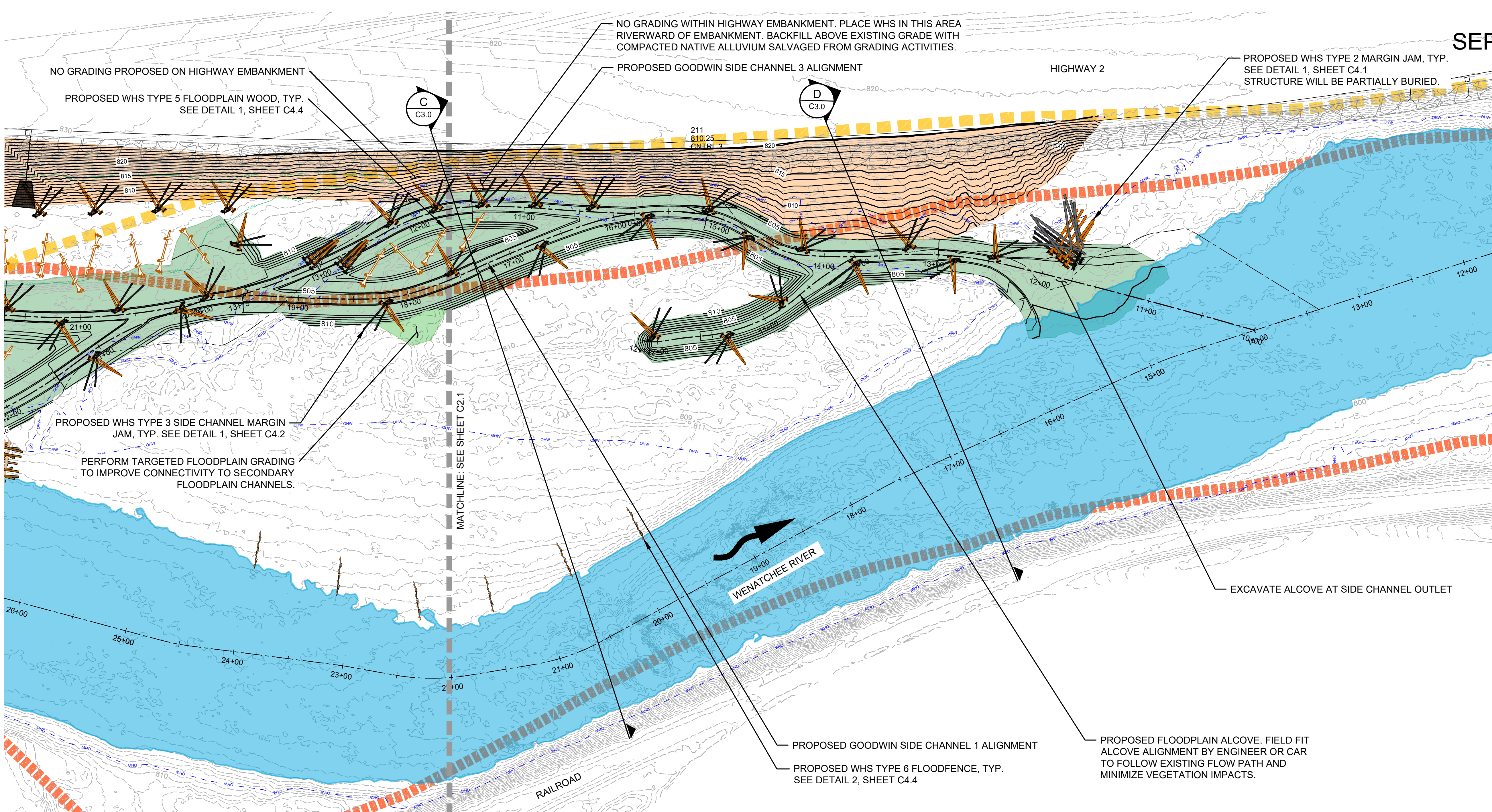
SCALE 0 1"

JOB NO. 20220043

SHEET NO. C2.1

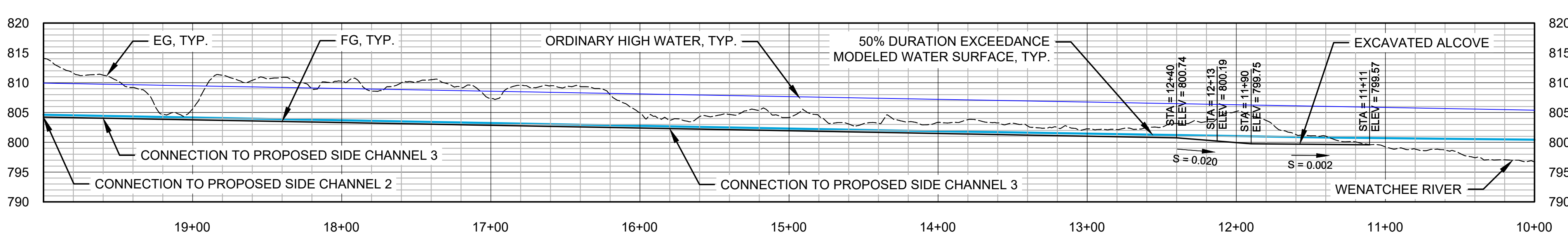
8 OF 21

60% DESIGN
SEPTEMBER 2024



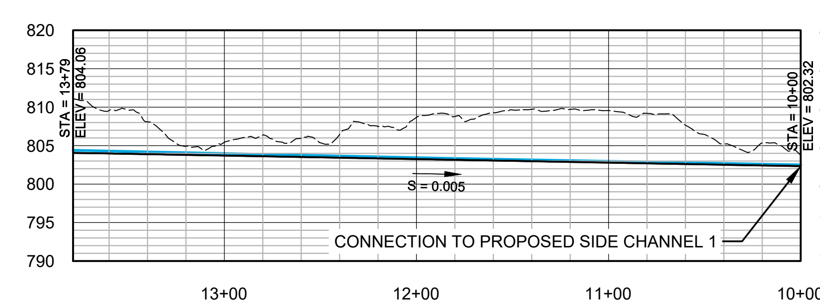
PROPOSED CONDITIONS PLAN

SCALE: 1"=50'



PROPOSED GOODWIN SIDE CHANNEL 1 PROFILE

HORIZONTAL SCALE: 1"=50'
VERTICAL SCALE: 1"=12.5'



PROPOSED GOODWIN SIDE CHANNEL 3 PROFILE

HORIZONTAL SCALE: 1"=50'
VERTICAL SCALE: 1"=12.5'

WOLF WATER RESOURCES, INC.
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CASCADE FISHERIES
GOODWIN SIDE CHANNEL
CHELAN COUNTY, WA

PROPOSED CONDITIONS PLAN & PROFILE 2

REVISION NUMBER

No.	Date	Revision

Date: 9/26/2024 | Designed By: SR, GL | Drawn By: BB | Checked By: AJ

JOB NO. 20220043

SHEET NO. C2.2

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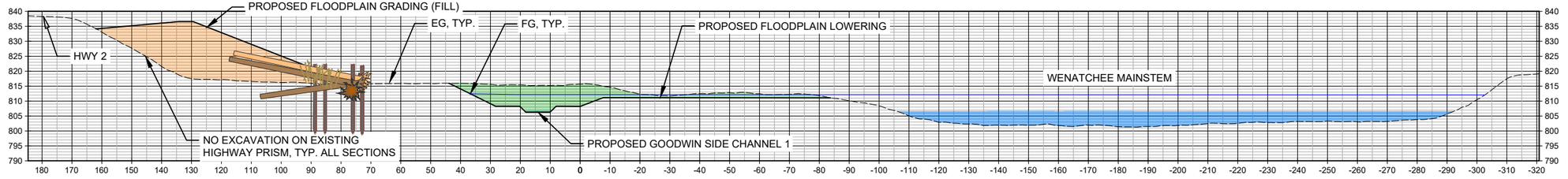

A C3.0 FLOODPLAIN SECTION A (GOODWIN SC STA 24+50)

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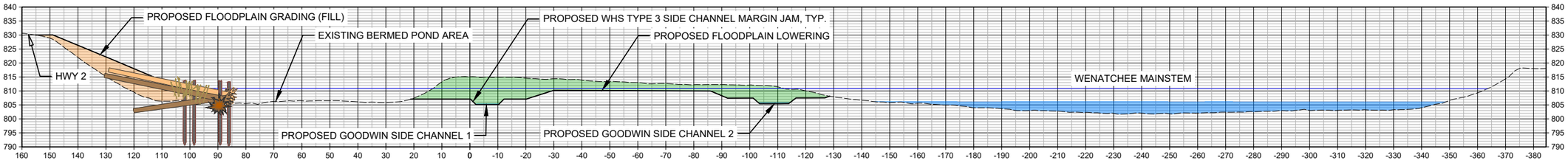
SCALE: VERTICAL 1" = 20'



B C3.0 FLOODPLAIN SECTION B (GOODWIN SC STA 22+00)

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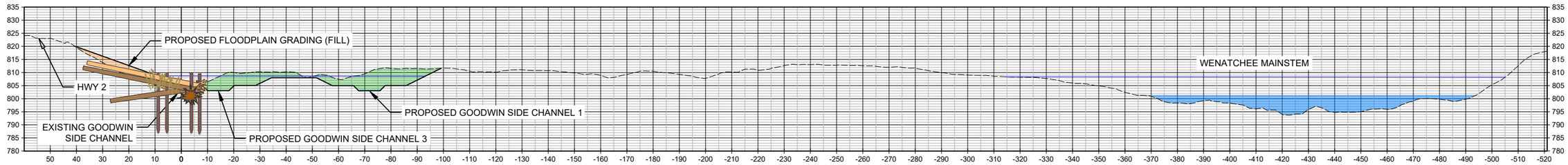
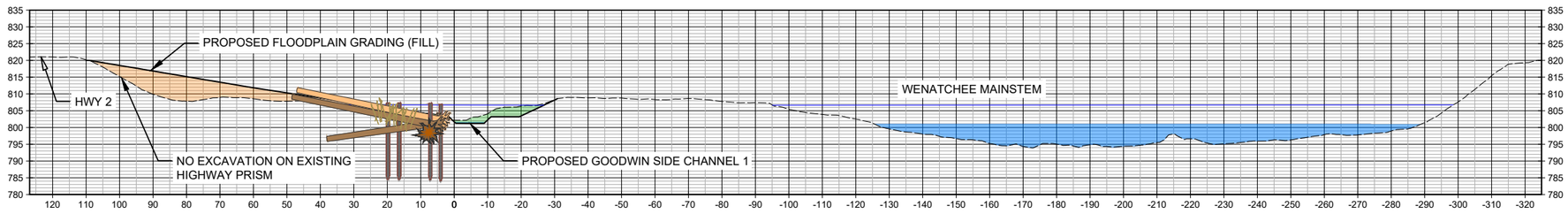
SCALE: VERTICAL 1" = 20'



C C3.0 FLOODPLAIN SECTION C (GOODWIN SC STA 17+50)

SCALE: HORIZONTAL 1" = 20'
SCALE: VERTICAL 1" = 20'

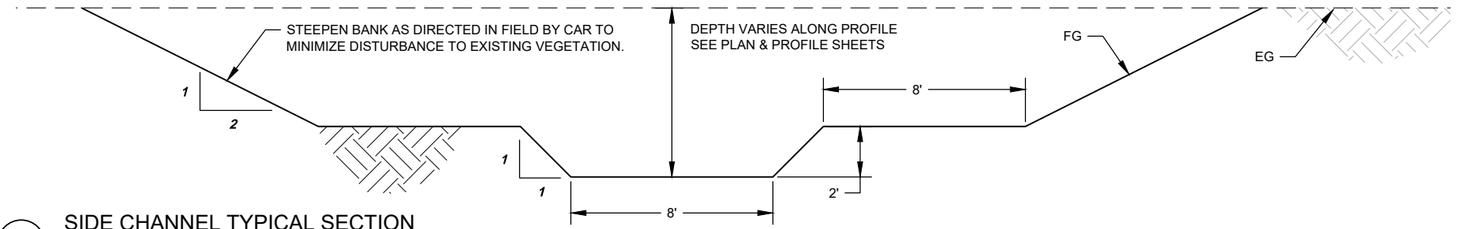


D C3.0 FLOODPLAIN SECTION D (GOODWIN SC STA 13+50)

SCALE: HORIZONTAL 1" = 20'
SCALE: VERTICAL 1" = 20'

LEGEND:

- EXISTING CONDITIONS ORDINARY HIGH WATER SURFACE
- EXISTING CONDITIONS 50% DURATION EXCEEDANCE MODELED WATER SURFACE (1,810 CFS)
- PROPOSED CUT AREA
- PROPOSED FILL AREA



1 SIDE CHANNEL TYPICAL SECTION

NOT TO SCALE

60% DESIGN
SEPTEMBER 2024

PRELIMINARY NOT FOR CONSTRUCTION

STEVEN RUSH — STATE OF WASHINGTON — PROFESSIONAL ENGINEER

WOLF WATER RESOURCES, INC.
1001 SE WATER AVE, SUITE #180
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509.476.3444

CASCADE FISHERIES
GOODWIN SIDE CHANNEL
CHELAN COUNTY, WA

FLOODPLAIN SECTIONS

REVISION NUMBER

No.	Date	Revision

Date: 9/26/2024 | Designed By: SR, GL
Drawn By: BB | Checked By: AJ

SCALE: 0 1"

JOB NO. 20220043

SHEET NO. C3.0

10 OF 21

DWG: Z:\Shared\W2x\CAD\20220043-Goodwin Side Channel\DWG\SHEETS\C3.0.dwg USER: bbennett
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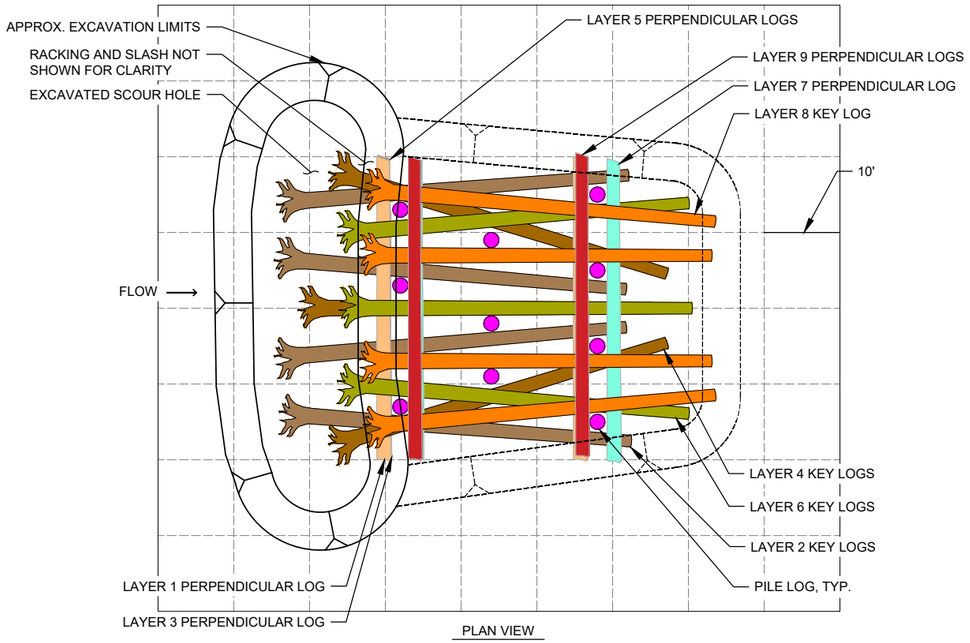
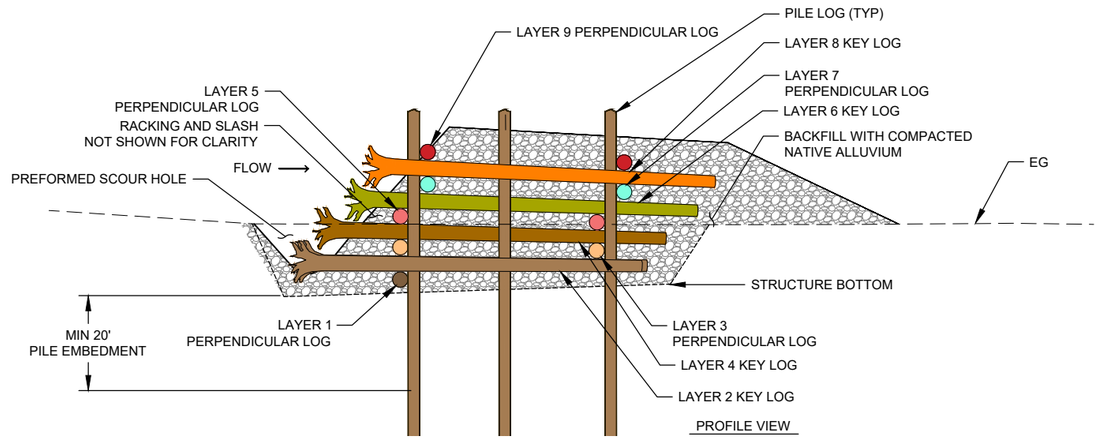
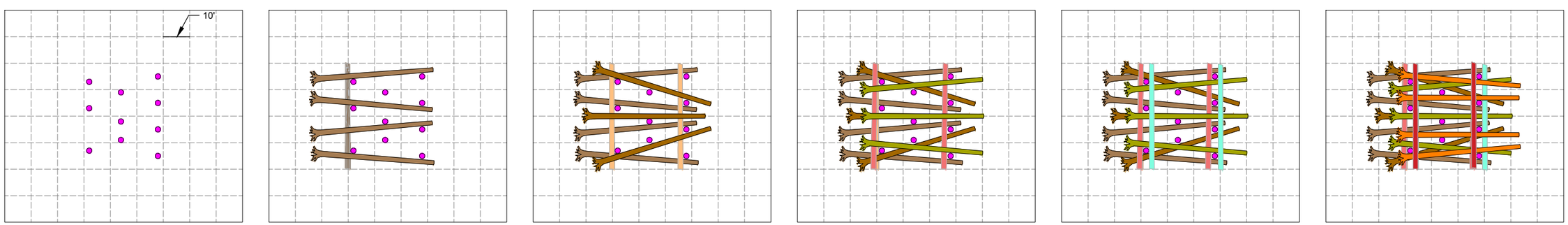


PLAN VIEW



PROFILE VIEW



SEQUENCING
1" = 20'

1 WHS TYPE 1 - APEX JAM
1" = 10'

LOG INSTALLATION NOTES:

1. COORDINATE FINAL STRUCTURE LOCATION IN FIELD WITH ENGINEER AND CAR.
2. CONTRACTOR SHALL EXCAVATE TO THE STRUCTURE BOTTOM ELEVATION AND MAINTAIN A DEWATERED WORK AREA SO LAYERING AND CONNECTIONS CAN BE MADE PER SEQUENCING SHEETS (TO BE ADDED AT FINAL DESIGN).
3. EXCAVATED NATIVE ALLUVIUM TO BE STOCKPILED FOR USE IN STRUCTURE BACKFILL. TOPSOIL, SAND, NATIVE COBBLES, AND BOULDERS SHALL BE STOCKPILED IN SEPARATE PILES. NATIVE COBBLES SHALL BE PRIORITIZED FOR USE IN STRUCTURE BACKFILL. TOPSOIL AND SAND SHALL BE USED FOR TOPDRESSING OF BACKFILL MOUND. BOULDERS GREATER THAN 24" DIA. ENCOUNTERED DURING STRUCTURE EXCAVATION SHALL BE SALVAGED AND PLACED AS DIRECTED BY ENGINEER.
4. CONTRACTOR SHALL INSTALL PILES AS THE PRIMARY STRUCTURAL ELEMENT OF THE ELJ. LOG MEMBERS SECURED TO ELJ WITH STRUCTURAL CONNECTIONS.
5. PILES TO BE DRIVEN TO MINIMUM DEPTH SHOWN IN PLANS. IF MINIMUM EMBEDMENT CANNOT BE MET BY PILE DRIVING, CONTRACTOR SHALL OVER EXCAVATE AS NEEDED TO ACHIEVE MINIMUM EMBEDMENT. IF OVER EXCAVATION IS REQUIRED TO ACHIEVE MINIMUM EMBEDMENT DEPTH, PILE SHALL CONSIST OF ROOTWAD POST.
6. INSTALL RACKING LOGS AND SLASH WITH EACH LAYER PLACEMENT TO ENSURE SLASH EXTENDS THROUGH STRUCTURE, FILL VOIDS BETWEEN LOGS AND IS PINNED IN PLACE BY SUBSEQUENT LAYERS.
7. BACKFILL STRUCTURE WITH COMPACTED MIX OF COMPACTED NATIVE ALLUVIUM AND SALVAGED BOULDERS.
8. POINT OF REFERENCE FOR LOCATION AND PILE LAYOUT SHALL BE UTILIZED FOR PLACEMENT OF STRUCTURES. POINT FILE SHALL BE PROVIDED TO CONTRACTOR PRIOR TO CONSTRUCTION.
9. REFER TO PLAN SHEETS FOR TOP OF STRUCTURE ELEVATION. FINAL STRUCTURE TOP ELEVATION TO BE ACHIEVED AS SPECIFIED REGARDLESS OF ACTUAL LOG DIAMETERS USED FOR STACKING ARRANGEMENT.

WHS TYPE 1

Piece Summary				
LAYER	SIZE (DBH)	MIN LENGTH (FT)	ROOTWAD	QUANTITY
1	18" - 24"	40'	NO	1
2	18" - 24"	45'	YES	4
3	18" - 24"	40'	NO	2
4	18" - 24"	45'	YES	3
5	18" - 24"	40'	NO	2
6	18" - 24"	45'	YES	3
7	18" - 24"	40'	NO	2
8	18" - 24"	45'	YES	4
9	18" - 24"	40'	NO	2
PILES	18" - 21"	45'	NO	10
RACKING	6" - 12"	20'	OPTIONAL	80
SLASH (CY)	1" - 6"	6'	-	50
LIVE STAKES	1.5" - 3"	10' - 15'	-	50

60% DESIGN
SEPTEMBER 2024

PRELIMINARY NOT FOR CONSTRUCTION
STEVEN RODEL — STATE OF WASHINGTON — PROFESSIONAL ENGINEER

WOLF WATER RESOURCES, INC.
1001 SE WATER AVE, SUITE #180
PORTLAND, OR 97214
503.207.6688

CASCADE FISHERIES
25 N WENATCHEE AVE, SUITE #203
WENATCHEE, WA 98801
509.476.3444

CASCADE FISHERIES
GOODWIN SIDE CHANNEL
CHELAN COUNTY, WA

WOOD HABITAT STRUCTURE DETAILS 1

REVISION NUMBER

No.	Date	Revision

Date 9/26/2024 | Designed By SR, GL
Drawn By BB | Checked By AJ
SCALE 0 1"

JOB NO. 20220043

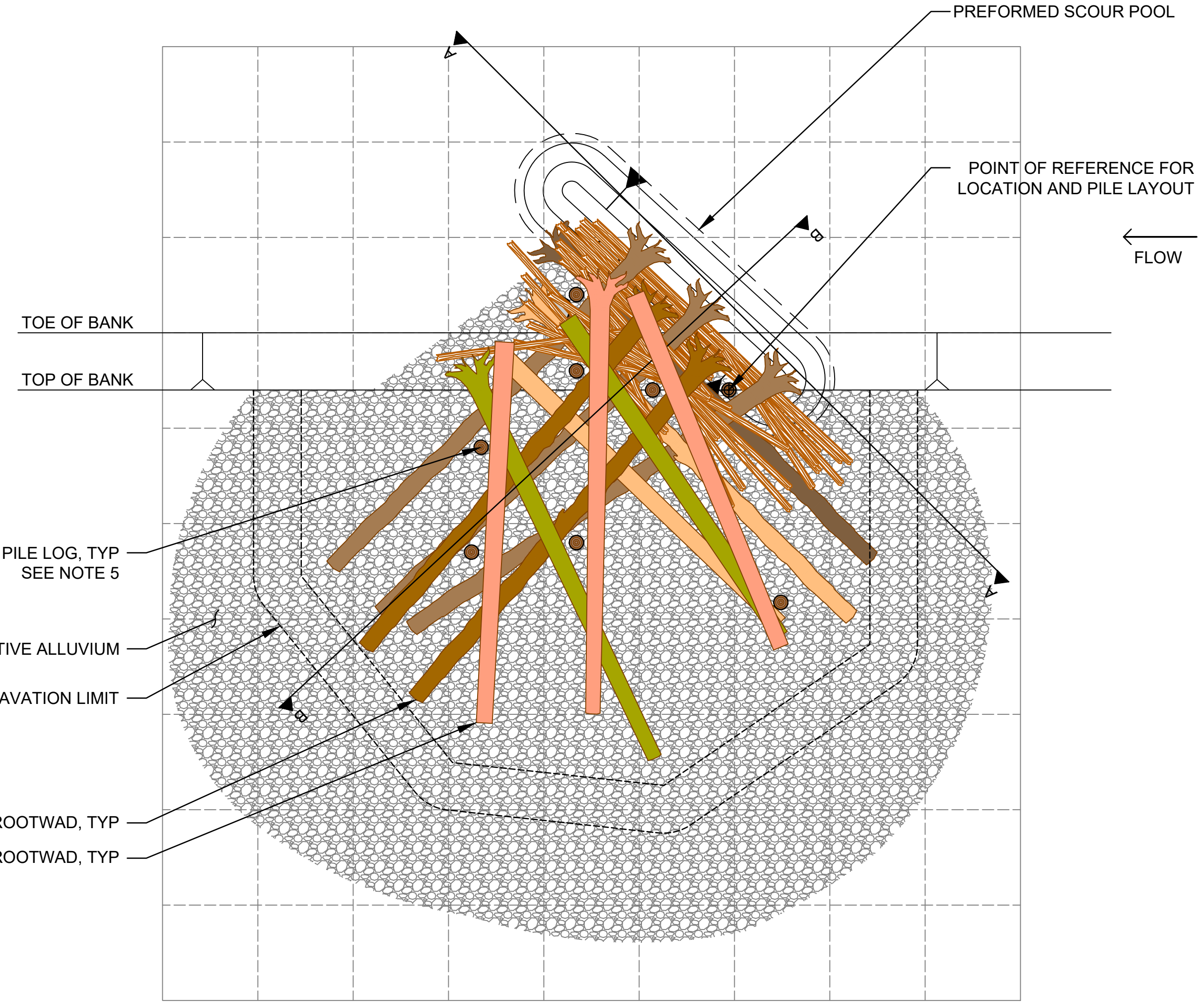
SHEET NO. C4.0
11 OF 21

DWG: Z:\Shared\W2x\CAD\20220043-Goodwin Side Channel\DWG\SHEETS\C4.0.dwg USER: bbennett
DATE: Sep 26, 2024 2:19pm XREFS:GSC-X-TB-W2r-22x34

60% DESIGN
SEPTEMBER 2024

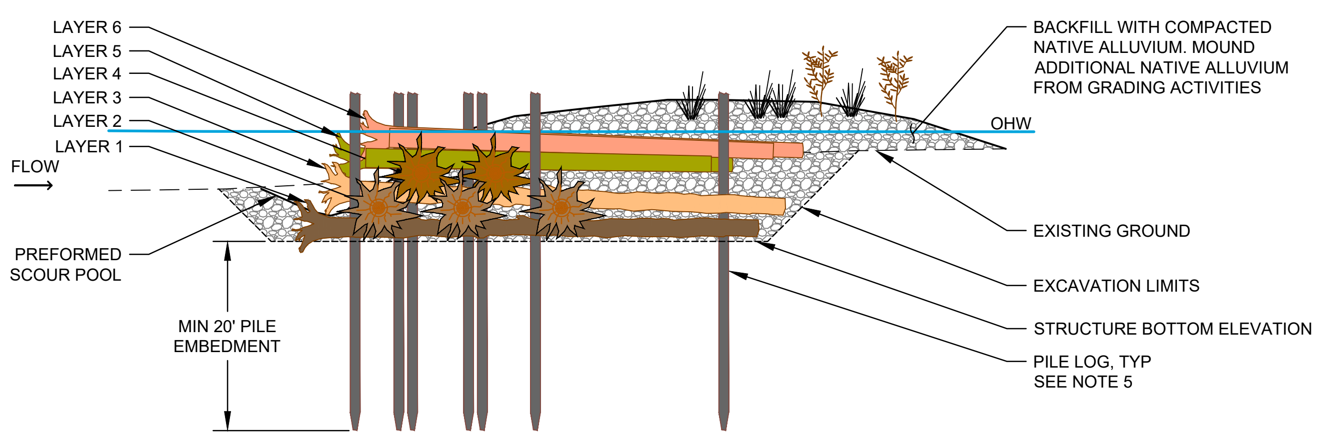
LOG INSTALLATION NOTES:

1. COORDINATE FINAL STRUCTURE LOCATION IN FIELD WITH ENGINEER AND CAR.
2. CONTRACTOR SHALL EXCAVATE TO THE STRUCTURE BOTTOM ELEVATION AND MAINTAIN A DEWATERED WORK AREA SO LAYERING AND CONNECTIONS CAN BE MADE PER SEQUENCING SHEETS (TO BE ADDED AT FINAL DESIGN).
3. EXCAVATED NATIVE ALLUVIUM TO BE STOCKPILED FOR USE IN STRUCTURE BACKFILL. TOPSOIL, SAND, NATIVE COBBLES, AND BOULDERS SHALL BE STOCKPILED IN SEPARATE PILES. NATIVE COBBLES SHALL BE PRIORITIZED FOR USE IN STRUCTURE BACKFILL. TOPSOIL AND SAND SHALL BE USED FOR TOPDRESSING OF BACKFILL MOUND. BOULDERS GREATER THAN 24" DIA. ENCOUNTERED DURING STRUCTURE EXCAVATION SHALL BE SALVAGED AND PLACED AS DIRECTED BY ENGINEER.
4. CONTRACTOR SHALL INSTALL PILES AS THE PRIMARY STRUCTURAL ELEMENT OF THE ELJ. LOG MEMBERS SECURED TO ELJ WITH STRUCTURAL CONNECTIONS.
5. PILES TO BE DRIVEN TO MINIMUM DEPTH SHOWN IN PLANS. IF MINIMUM EMBEDMENT CANNOT BE MET BY PILE DRIVING, CONTRACTOR SHALL OVER EXCAVATE AS NEEDED TO ACHIEVE MINIMUM EMBEDMENT. IF OVER EXCAVATION IS REQUIRED TO ACHIEVE MINIMUM EMBEDMENT DEPTH, PILE SHALL CONSIST OF ROOTWAD POST.
6. INSTALL RACKING LOGS AND SLASH WITH EACH LAYER PLACEMENT TO ENSURE SLASH EXTENDS THROUGH STRUCTURE, FILL VOIDS BETWEEN LOGS AND IS PINNED IN PLACE BY SUBSEQUENT LAYERS.
7. BACKFILL STRUCTURE WITH COMPACTED MIX OF COMPACTED NATIVE ALLUVIUM AND SALVAGED BOULDERS.
8. POINT OF REFERENCE FOR LOCATION AND PILE LAYOUT SHALL BE UTILIZED FOR PLACEMENT OF STRUCTURES. POINT FILE SHALL BE PROVIDED TO CONTRACTOR PRIOR TO CONSTRUCTION.
9. REFER TO PLAN SHEETS FOR TOP OF STRUCTURE ELEVATION. FINAL STRUCTURE TOP ELEVATION TO BE ACHIEVED AS SPECIFIED REGARDLESS OF ACTUAL LOG DIAMETERS USED FOR STACKING ARRANGEMENT.

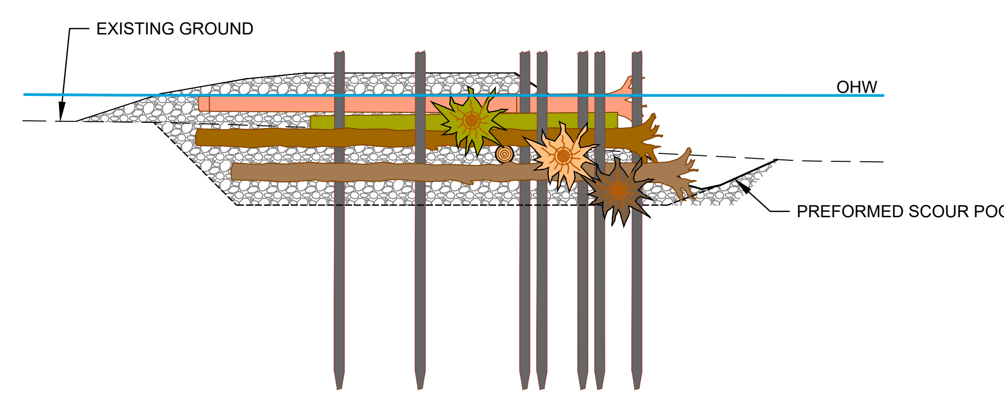


WHS TYPE 2

Piece Summary				
LAYER	SIZE (DBH)	MIN LENGTH (FT)	ROOTWAD	QUANTITY
1	18" - 24"	45'	YES	1
2	18" - 24"	45'	YES	3
3	18" - 24"	45'	YES	1
3	18" - 24"	45'	NO	1
4	18" - 24"	45'	YES	2
5	18" - 24"	45'	YES	1
5	18" - 24"	45'	NO	1
6	18" - 24"	45'	YES	1
6	18" - 24"	45'	NO	2
PILES	18" - 21"	45'	NO	8
RACKING	6" - 12"	30'	OPTIONAL	60
SLASH (CY)	1" - 6"	6'	-	40
LIVE STAKES	1.5" - 3"	10' - 15'	-	50



SECTION A



SECTION B

1 WHS TYPE 2 - MARGIN JAM

1" = 10'

PRELIMINARY NOT FOR CONSTRUCTION

WOLF WATER RESOURCES, INC.
1001 SE WATER AVE, SUITE #180
PORTLAND, OR 97214
503.207.6688

CASCADE FISHERIES
CASCADE FISHERIES
25 N WENATCHEE AVE, SUITE #203
WENATCHEE, WA 98801
509.470.3444

CASCADE FISHERIES
GOODWIN SIDE CHANNEL
CHELAN COUNTY, WA

WOOD HABITAT STRUCTURE DETAILS 2

REVISION NUMBER

No.	Date	Revision

Date 9/26/2024 | Designed By SR, GL
Drawn By BB | Checked By AJ

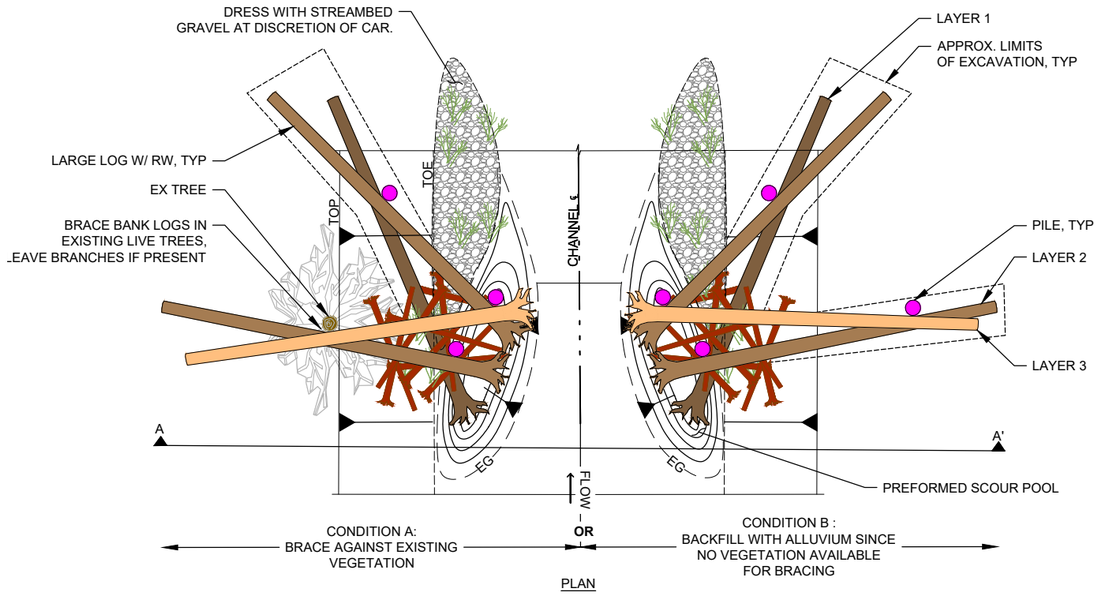
SCALE 0 1"

JOB NO. 20220043

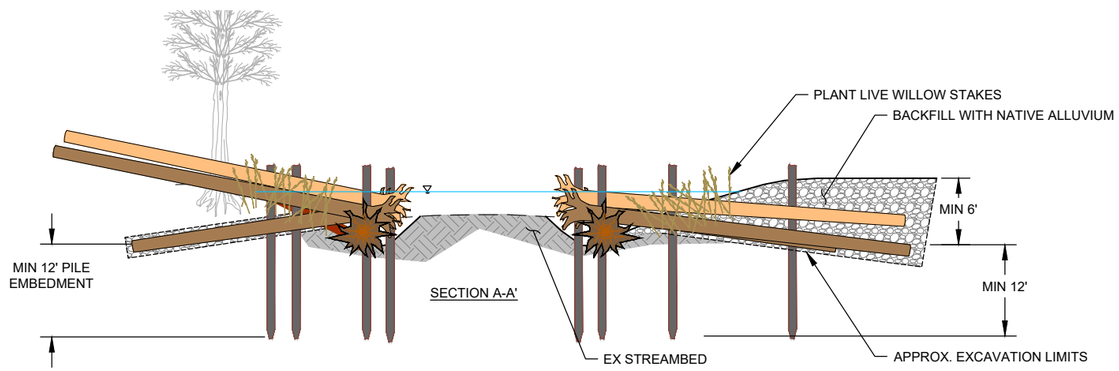
SHEET NO. C4.1

DWG: Z:\Shared\W2r\CAD\20220043-Goodwin Side Channel\DWG\SHEETS\C4.1-4.3.dwg USER: bbennett
DATE: Sep 26, 2024 2:19pm XREFS: GSC-X-TB-W2r-22x34

60% DESIGN
SEPTEMBER 2024



PLAN



1 WHS TYPE 3 - SIDE CHANNEL MARGIN JAM
1" = 5'

WHS TYPE 3

Piece Summary				
LAYER	SIZE (DBH)	MIN LENGTH (FT)	ROOTWAD	QUANTITY
1	18" - 24"	45'	YES	1
2	18" - 24"	45'	YES	2
3	18" - 24"	45'	YES	1
PILES	12" - 15"	25'	NO	4
RACKING	6" - 12"	20'	OPTIONAL	10
SLASH (CY)	1" - 6"	6'	-	20
LIVE STAKES	1.5" - 3"	10' - 15'	-	20

LOG INSTALLATION NOTES:

1. NATIVE STREAMBED BACKFILL SHALL BE PLACED IN 12" LIFTS AND COMPACTED TO FIRM UNYIELDING CONDITION.
2. CONTRACTOR TO COORDINATE LOG PLACEMENT WITH ENGINEER PRIOR TO CONSTRUCTION. PLACEMENT CAN BE FIELD FIT, BUT THE ENGINEER OR CAR SHALL APPROVE FINAL STRUCTURE ORIENTATION AND LOCATION BEFORE COMPLETION. WHERE POSSIBLE, LOGS PROTRUDING FROM BANK SHALL BE PLACED CANTILEVERED BETWEEN EXISTING LIVE TREES. THE SUPPORTING TREE NEAREST TO THE BANK SHALL BE ON THE DOWNSTREAM SIDE OF THE LOGS.
3. EMBEDDED LOGS SHALL BE INSTALLED BY EXCAVATING A TRENCH, PLACING THE LOG, BACKFILLING, AND MACHINE COMPACTING BACKFILL PER SPECIFICATIONS. WHERE EXCAVATION IS NOT POSSIBLE LOG ENDS SHALL BE TIED INTO NATIVE MATERIAL AND BURIED WITH NATIVE MATERIAL PER SPECIFICATIONS.
4. FOR BURIED KEYED LOGS EMBED A MINIMUM OF ⅔ THE TOTAL LENGTH OF THE LOG. MIN 6' COVER AT STEM TIP (MEASURED FROM EG).
5. EMBED ROOTWAD AS NEEDED TO ACHIEVE REQUIRED BURIAL DEPTH AND ALLOW FOR FULL CONTACT BETWEEN THE BOTTOM OF THE LOG AND THE BOTTOM OF THE CHANNEL. BACKFILL AROUND ROOTWAD WITH NATIVE STREAMBED MATERIAL.
6. SEE SPECIFICATIONS FOR TREE SPECIES. KEYED LOG DIAMETER MEASURED AT BREAST HEIGHT (DBH) AND LENGTH AS SHOWN ON PLANS.
7. PRIOR TO PLACING BACKFILL IN STRUCTURES, LAY LIVE WILLOW CUTTINGS IN CREVASSES BETWEEN LOGS OR OPEN TRENCH IN CONTACT WITH UNDERLYING SUBSTRATE AND GROUNDWATER, IF OBSERVED.

PRELIMINARY NOT FOR CONSTRUCTION
STEVEN ROBERT LEWIS STATE OF WASHINGTON PROFESSIONAL ENGINEER

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CASCADE FISHERIES
GOODWIN SIDE CHANNEL
CHELAN COUNTY, WA

WOOD HABITAT STRUCTURE DETAILS 3

REVISION NUMBER

No.	Date	Revision

Date: 9/26/2024
Designed By: SR, GL
Drawn By: BB
Checked By: AJ

SCALE: 0 1"

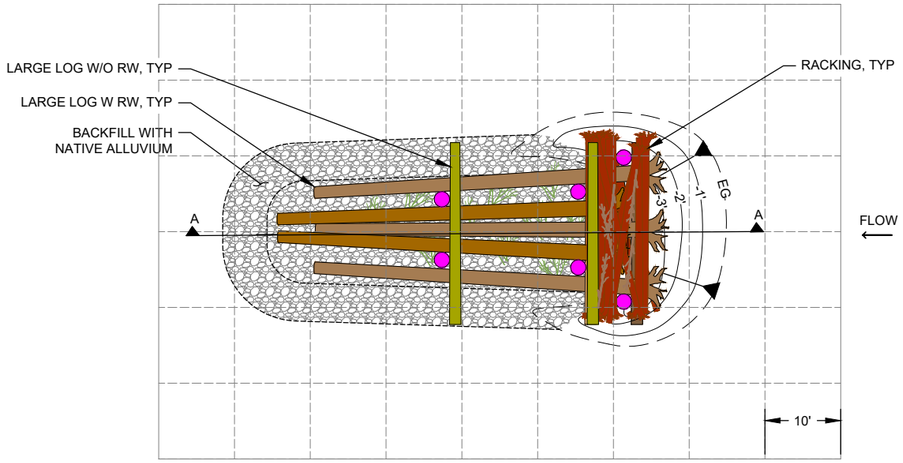
JOB NO. 20220043

SHEET NO. C4.2

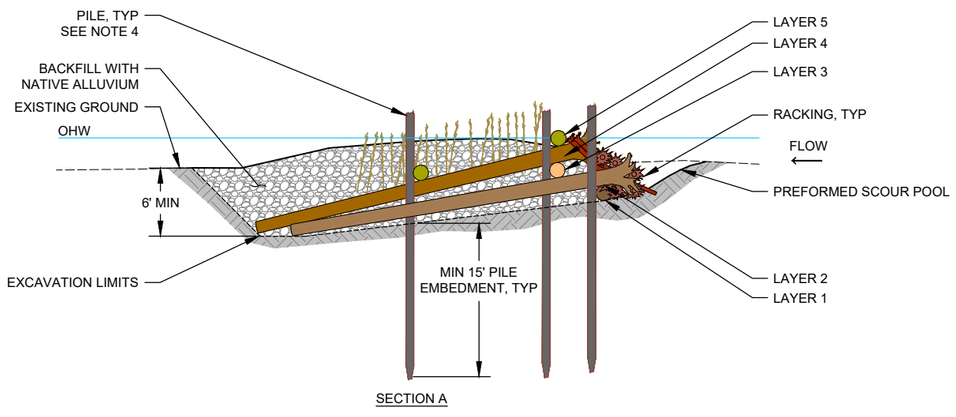
13 OF 21

DWG: Z:\Shared\W2r\CAD\20220043-Goodwin Side Channel\DWG\SHEETS\C4.1-4.3.dwg USER: bbennett
DATE: Sep 26, 2024 2:19pm XREFS:GSC-X-TB-W2r-22x34

60% DESIGN
SEPTEMBER 2024



PLAN



SECTION A

1 WHS TYPE 4 - SIDE CHANNEL APEX JAM

1" = 10'

LOG INSTALLATION NOTES:

1. COORDINATE FINAL STRUCTURE LOCATION IN FIELD WITH ENGINEER AND CAR.
2. CONTRACTOR SHALL EXCAVATE TO THE STRUCTURE BOTTOM ELEVATION AND MAINTAIN A DEWATERED WORK AREA SO LAYERING AND CONNECTIONS CAN BE MADE PER SEQUENCING SHEETS (TO BE ADDED AT FINAL DESIGN).
3. CONTRACTOR SHALL INSTALL PILES AS THE PRIMARY STRUCTURAL ELEMENT OF THE ELJ. LOG MEMBERS SECURED TO ELJ WITH STRUCTURAL CONNECTIONS.
4. PILES TO BE DRIVEN TO MINIMUM DEPTH SHOWN IN PLANS. IF MINIMUM EMBEDMENT CANNOT BE MET BY PILE DRIVING, CONTRACTOR SHALL OVER EXCAVATE AS NEEDED TO ACHIEVE MINIMUM EMBEDMENT. IF OVER EXCAVATION IS REQUIRED TO ACHIEVE MINIMUM EMBEDMENT DEPTH, PILE SHALL CONSIST OF ROOTWAD POST.
5. BOULDERS GREATER THAN 24" DIA ENCOUNTERED DURING STRUCTURE EXCAVATION SHALL BE SALVAGED AND STOCKPILED FOR PLACEMENT AS DIRECTED BY ENGINEER.
6. INSTALL RACKING LOGS AND SLASH WITH EACH LAYER PLACEMENT TO ENSURE SLASH ECTENDS THROUGH STRUCTURE, FILL VOIDS BETWEEN LOGS AND IS PINNED IN PLACE BY SUBSEQUENT LAYERS.
7. BACKFILL STRUCTURE WITH COMPACTED MIX OF COMPACTED NATIVE ALLUVIUM AND SALVAGED BOULDERS.
8. POINT OF REFERENCE FOR LOCATION AND PILE LAYOUT SHALL BE UTILIZED FOR PLACEMENT OF STRUCTURES. POINT FILE SHALL BE PROVIDED TO CONTRACTOR PRIOR TO CONSTRUCTION.
9. REFER TO PLAN SHEETS FOR TOP OF STRUCTURE ELEVATION. FINAL STRUCTURE TOP ELEVATION TO BE ACHIEVED AS SPECIFIED REGARDLESS OF ACTUAL LOG DIAMETERS USED FOR STACKING ARRANGEMENT.

WHS TYPE 4

Piece Summary				
LAYER	SIZE (DBH)	MIN LENGTH (FT)	ROOTWAD	QUANTITY
1	18" - 24"	25	NO	1
2	18" - 24"	45	YES	3
3	18" - 24"	25	NO	1
4	18" - 24"	45	YES	2
5	18" - 24"	25	NO	2
PILES	12" - 15"	25'	NO	6
RACKING	6" - 12"	20'	OPTIONAL	20
SLASH (CY)	1" - 6"	6'	-	20
LIVE WILLOW STAKES	1.5" - 3"	10' - 15'	-	25

PRELIMINARY NOT FOR CONSTRUCTION

WOLF WATER RESOURCES, INC.
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CASCADE FISHERIES
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509.476.3444

CASCADE FISHERIES
GOODWIN SIDE CHANNEL
CHELAN COUNTY, WA

WOOD HABITAT STRUCTURE DETAILS 4

REVISION NUMBER

No.	Date	Revision

Date: 9/26/2024 | Designed By: SR, GL
Drawn By: BB | Checked By: AJ

SCALE 0 1"

JOB NO. 20220043

SHEET NO. C4.3
14 OF 21

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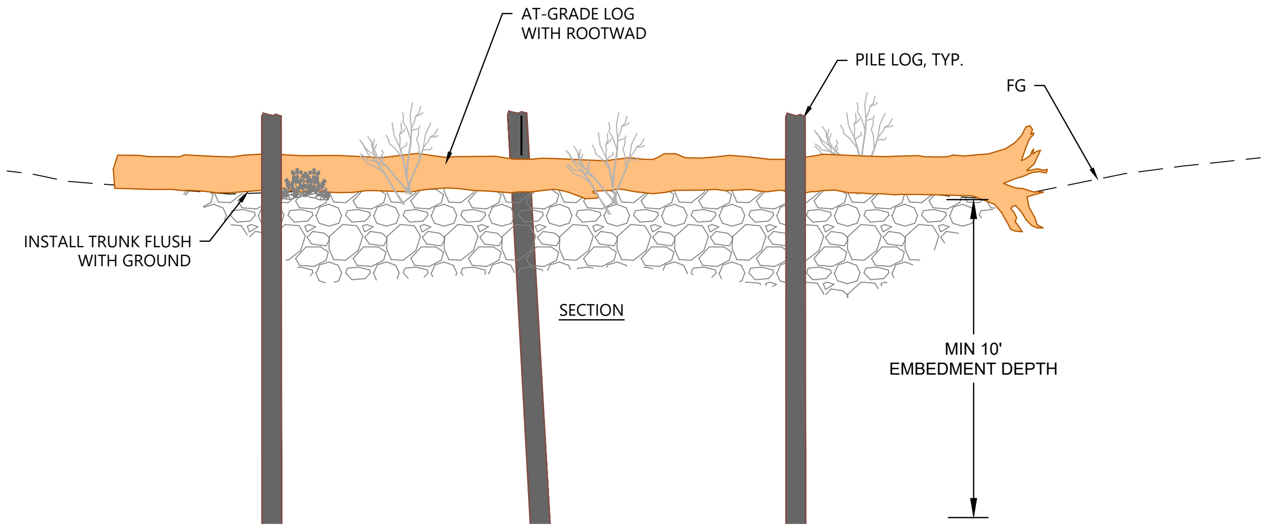
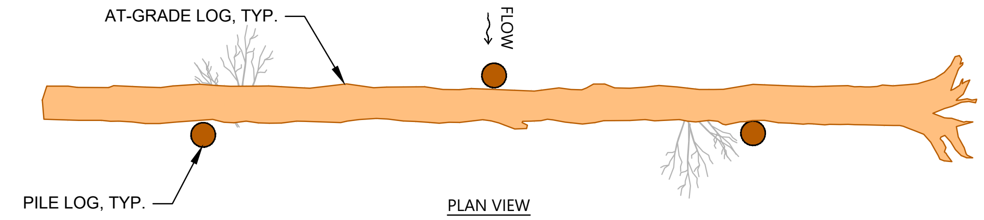
60% DESIGN
SEPTEMBER 2024



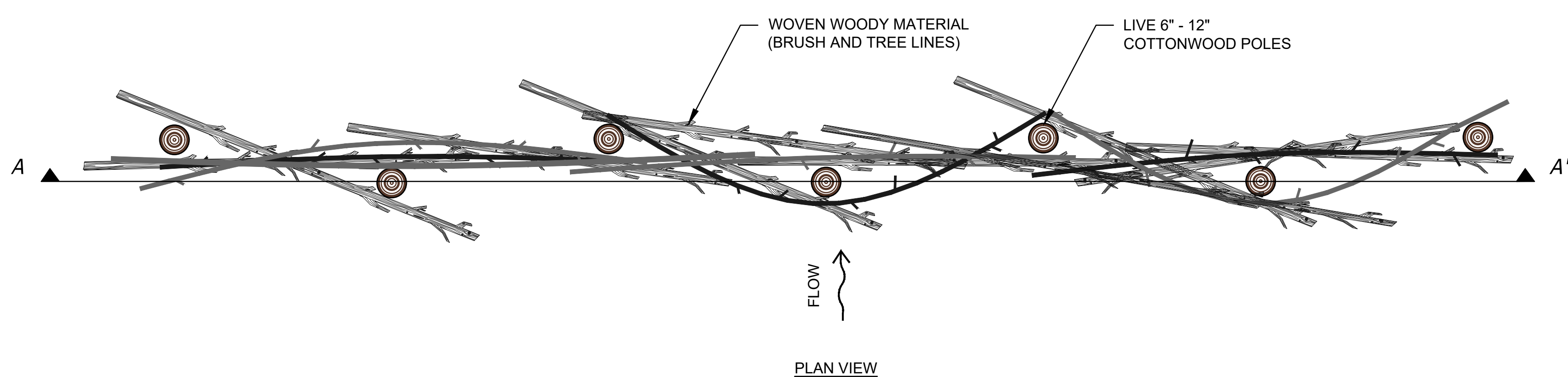


WHS TYPE 5

Piece Summary				
LAYER	SIZE (DBH)	MIN LENGTH (FT)	ROOTWAD	QUANTITY
1	18" - 24"	45'	YES	1
PILES	12" - 15"	15'	NO	3

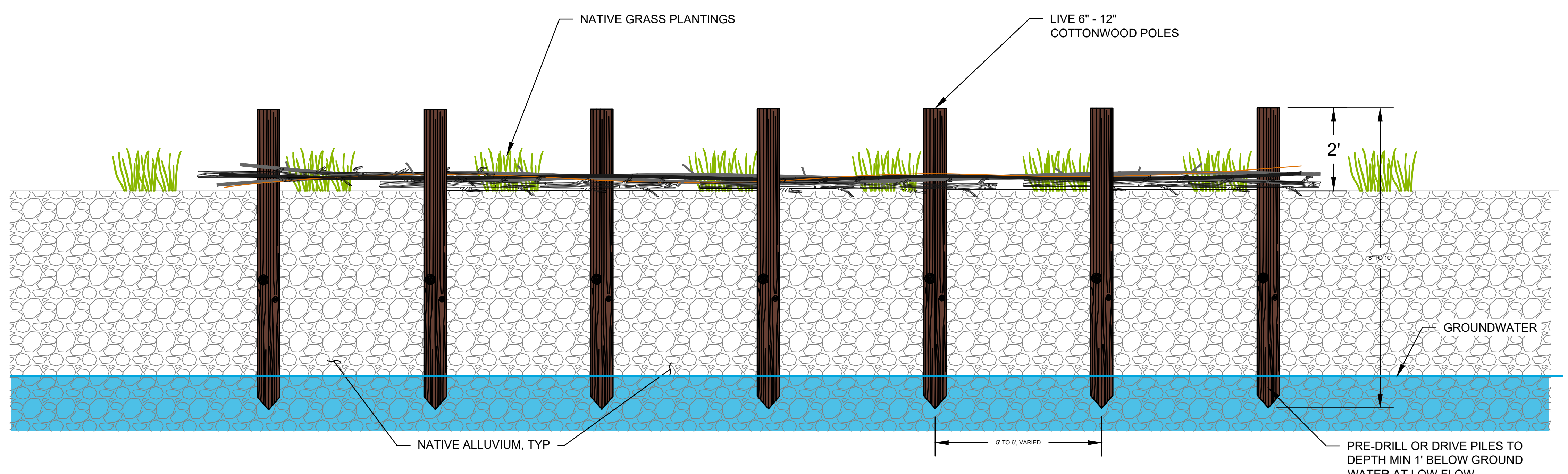
1 WHS TYPE 5 - FLOODPLAIN WOOD

NOT TO SCALE



WHS TYPE 6

Piece Summary				
LOG TYPE	DIAMETER (IN)	MIN LENGTH (FT)	BRANCHES	QUANTITY
POST	6" - 12"	10'	NO	7
WOVEN SLASH	1" - 3"	10 ' - 15'	OPTIONAL	30



2 WHS TYPE 6 - FLOODFENCE

NOT TO SCALE

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CHELAN COUNTY, WA

WOOD HABITAT STRUCTURE DETAILS 5

REVISION NUMBER

No.	Date	Revision

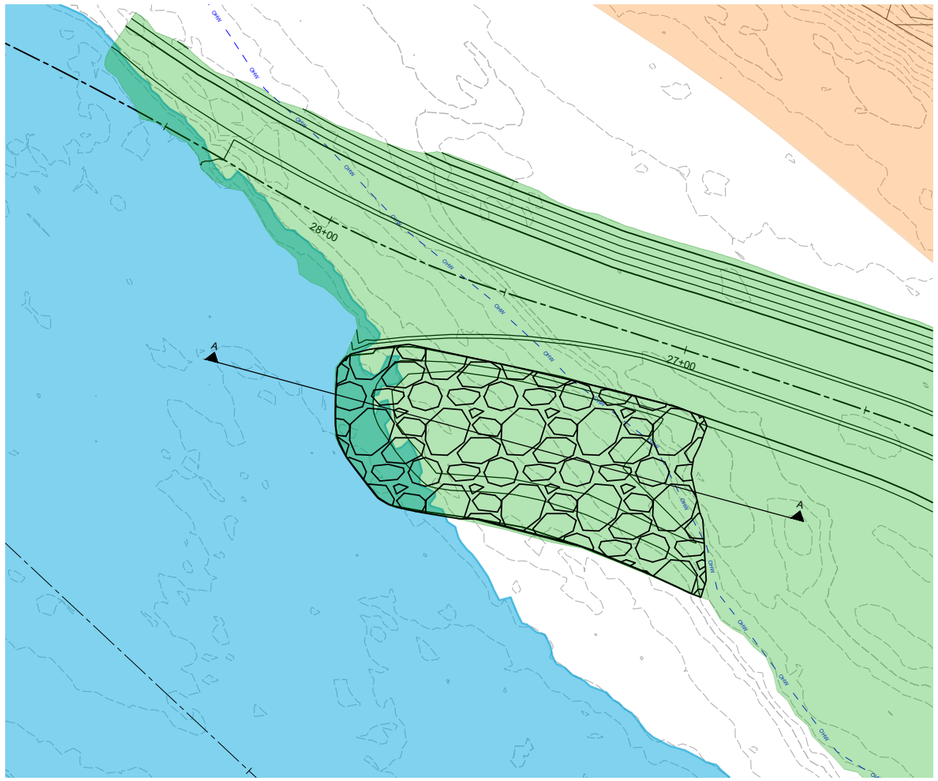
Date 9/26/2024	Designed By SR, GL
Drawn By BB	Checked By AJ

SCALE 0 1"

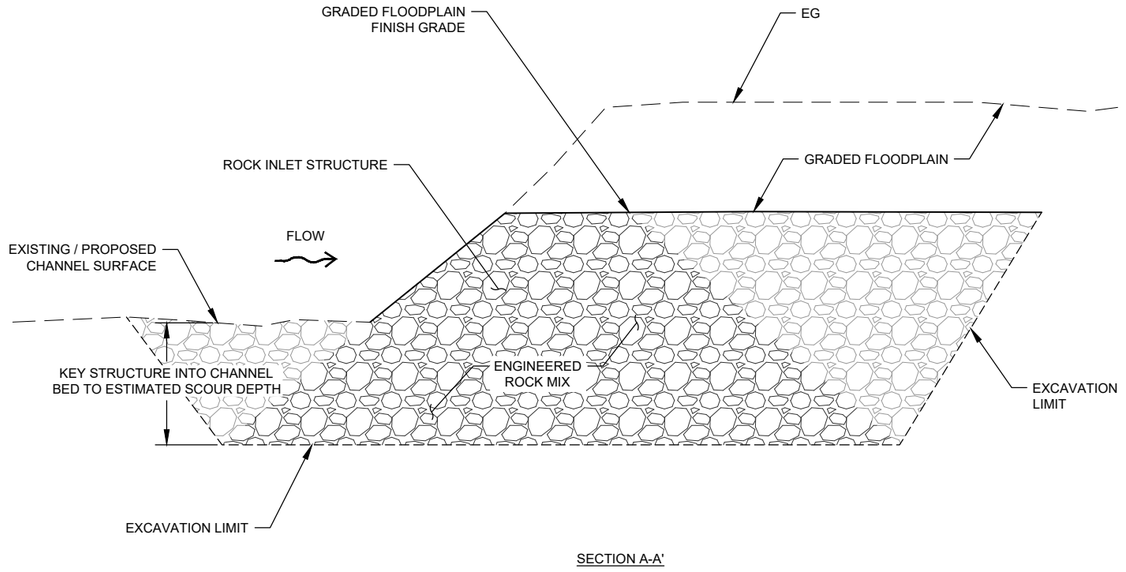
JOB NO. 20220043

SHEET NO. C4.4

60% DESIGN
SEPTEMBER 2024



PLAN VIEW



SECTION A-A'

1 ROCK INLET STRUCTURE DETAIL
NOT TO SCALE

PRELIMINARY NOT FOR CONSTRUCTION
STEVEN ROBERT LEWIS
STATE OF WASHINGTON
PROFESSIONAL ENGINEER

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CHELAN COUNTY, WA

ROCK INLET STRUCTURE DETAIL

REVISION NUMBER

No.	Date	Revision

Date	Designed By
9/26/2024	SR, GL
Drawn By	Checked By
BB	AJ

SCALE 0 1"

JOB NO. 20220043

SHEET NO. C4.4

16 OF 21

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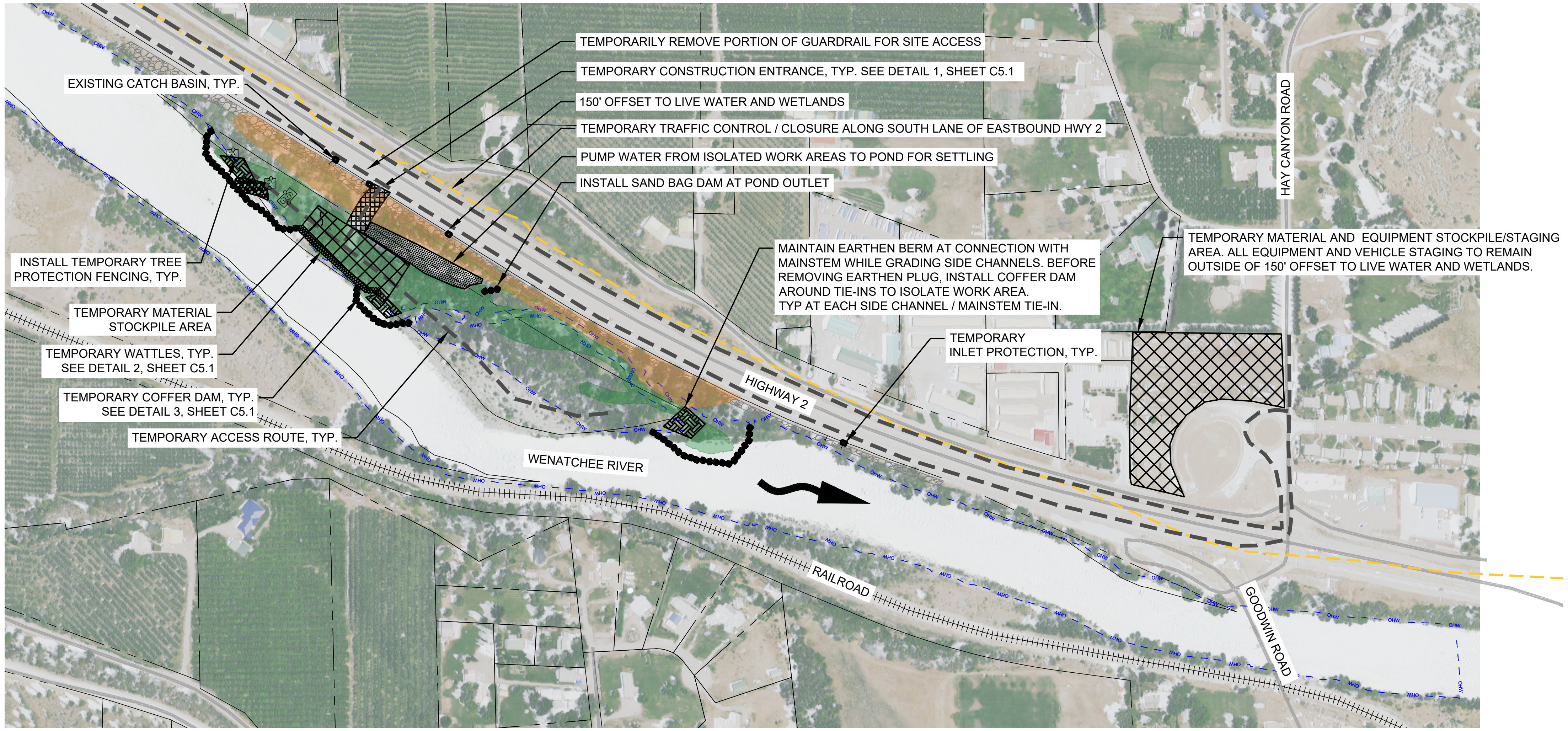

N

SCALE

200 0 100 200 400

SCALE FEET

ACCESS, STAGING, AND TESC PLAN

SCALE: 1"=200"

TEMPORARY EROSION, SEDIMENT, AND POLLUTANT CONTROL (TESC) NOTES:

1. EROSION, SEDIMENT AND POLLUTANT CONTROL IS REQUIRED FOR THIS PROJECT. CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES.
2. PREPARE A TEMPORARY EROSION AND SEDIMENT CONTROL PLAN (TESC) BEFORE BEGINNING WORK. KEEP A COPY OF THE TESC ON SITE AT ALL TIMES DURING THE PROJECT.
3. PREPARE A SPILL PREVENTION CONTROL AND COUNTERMEASURES (SPCC) PLAN PRIOR TO ANY CONSTRUCTION ACTIVITY. KEEP THIS ON SITE AT ALL TIMES.
4. THE TESC FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR THE ANTICIPATED SITE AND SEASONAL CONDITIONS. UPGRADE THESE FACILITIES TO ADDRESS CHANGING WORK OR WEATHER CONDITIONS.
5. INSTALL, MONITOR, REPLACE AND UPGRADE AS NECESSARY ALL FACILITIES AND MEASURES. PERFORM MAINTENANCE TO ENSURE CONTINUED FUNCTIONING FOR ENTIRETY OF CONSTRUCTION.
6. THE TESC PLAN FACILITIES AND MEASURES MUST BE INSPECTED DAILY BY THE CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTION.
7. COMPLETE AN EROSION CONTROL MONITORING FORM AFTER EACH INSPECTION. INCLUDE THE INSPECTION DATE AND TIME. RETAIN THESE COMPLETED FORMS ON SITE AND PROVIDE THEM UPON REQUEST.
8. NO VISIBLE AND MEASURABLE SEDIMENT OR POLLUTANT SHALL EXIT THE SITE, ENTER A PUBLIC RIGHT-OF-WAY OR BE DEPOSITED INTO ANY WATER BODY OR STORM DRAINAGE SYSTEM.
9. FOLLOWING A STORM EVENT, INSPECT AND ADJUST, REPAIR, IMPROVE OR REPLACE ALL DEFICIENT OR FAILING FACILITIES AND MEASURES.
10. PROTECT ALL FUNCTIONING STORM WATER INLETS AND CATCH BASINS FROM RECEIVING UNFILTERED, SEDIMENT-LADEN RUNOFF.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING A VEHICLE/EQUIPMENT STAGING AREA DESIGNATED FOR ALL REFUELING, EQUIPMENT MAINTENANCE, EQUIPMENT STORAGE AND PARKING. THE VEHICLE/EQUIPMENT STAGING AREA SHALL BE LOCATED OUTSIDE THE 150' OFFSET FROM ANY LIVE WATER OR WETLANDS. CONTRACTOR SHALL INSTALL APPROPRIATE TEMPORARY BMPS TO CONTAIN ANY POTENTIAL POLLUTANTS FROM LEAVING THE VEHICLE/EQUIPMENT STAGING AREA THROUGHOUT THE DURATION OF THE PROJECT.

CONSTRUCTION ACCESS & TRAFFIC CONTROL NOTES:

1. CONTRACTOR SHALL SUBMIT AN ACCESS, STAGING , AND STOCKPILE PLAN TO CAR FOR APPROVAL MINIMUM 3 WEEKS PRIOR TO MOBILIZATION.
2. CONSTRUCTION STAGING/STOCKPILE AREAS SHALL BE LIMITED TO EXISTING AREAS OF DISTURBANCE, TO GREATEST EXTENTS POSSIBLE. VEHICLE/EQUIPMENT STAGING SHALL BE LIMITED TO AREAS MINIMUM 150' FROM ANY LIVE WATER OR WETLANDS.
3. ACCESS TO/ALONG ROADWAYS SHALL BE MAINTAINED AT ALL TIMES.
4. CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN TO CAR FOR APPROVAL MINIMUM 3 WEEKS PRIOR TO MOBILIZATION.
5. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR OBTAINING ANY REQUIRED TRAFFIC CONTROL OR ACCESS PERMITS.
6. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR PROVIDING ANY REQUIRED TRAFFIC CONTROL INCLUDING, BUT NOT LIMITED TO, SIGNAGE AND FLAGGERS.
7. ALL EQUIPMENT, MATERIALS, AND PERSONNEL SHALL REMAIN WITHIN THE WORK AREA BOUNDARY.
8. THE CONTRACTOR SHALL KEEP THE WORK AREAS IN NEAT CONDITION, FREE OF DEBRIS AND LITTER FOR THE DURATION OF THE PROJECT.
9. CONTRACTOR SHALL IMPLEMENT MEASURES TO CONTROL AND MINIMIZE WIND BLOWN DUST FROM THE SITE.
10. ACCESS ROUTES OTHER THAN ESTABLISHED ROADS SHALL NOT BE CLEARED OR GRADED.
11. ALL DISTURBED AREAS INCLUDING ROADS, DRIVEWAYS AND ACCESS ROUTES SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER. AREAS SHALL BE DECOMPACTED, ROUGHENED WITH SLASH AT CAR'S DIRECTION, AND REVEGETATED PER PLANS.
12. ALL DISTURBED AREAS OUTSIDE THE LIMITS OF DISTURBANCE SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER AT NO ADDITIONAL COST TO THE OWNER.

WATER MANAGEMENT NOTES:

1. CONTRACTOR SHALL BE RESPONSIBLE FOR WORK AREA ISOLATION FOR THE PURPOSES OF WATER QUALITY PROTECTION, TURBIDITY CONTROL, AND PROTECTION OF AQUATIC LIFE AND HABITAT DURING CONSTRUCTION.
2. MAINTAIN EARTHEN BERM AT SIDE CHANNEL CONNECTIONS TO WENATCHEE RIVER UNTIL AFTER BEGINNING OF IN WATER WORK WINDOW (JULY 15) AND INSTALLATION OF COFFER DAMS AND PUMPS TO ISOLATE WORK AREA IS COMPLETE.
3. MAINTAIN BERMED POND DURING IN WATER WORK FOR DISCHARGE AND SETTLING OF DEWATERING PUMPS.
4. COORDINATE TIMING OF WORK AREA ISOLATION WITH CAR TO ALLOW FOR NECESSARY FISH REMOVAL FROM ISOLATED WORK AREAS PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES WITHIN ISOLATED AREAS.

CONSTRUCTION SEQUENCING NOTES:

1. FLAG AREAS FOR CLEARING AND PRESERVATION. INSTALL TEMPORARY BMPS. ESTABLISH ACCESS AND STAGING TO SITE PER NOTES THIS SHEET.
2. PERFORM SITE CLEARING AND DEMO.
3. PERFORM FLOODPLAIN AND CHANNEL GRADING AND INSTALL FLOODPLAIN HABITAT STRUCTURES. PRESERVE BERMED POND FOR USE IN WATER MANAGEMENT DURING IN WATER WORK WINDOW. PRESERVE SEPARATION FROM LIVE WATER.

IN WATER WORK JULY 15TH - SEPTEMBER 30TH:

4. INSTALL COFFER DAMS AT SIDE CHANNEL INLETS AND OUTLET. PERFORM FISH SALVAGE IN ISOLATED WORK AREAS.
5. INSTALL HABITAT STRUCTURES AND PERFORM CHANNEL GRADING AT SIDE CHANNEL INLETS AND OUTLETS.
6. REMOVE COFFER DAM SLOWLY AND RETURN FLOWS TO ISOLATED AREAS.
7. COMPLETE REMAINING FLOODPLAIN AND CHANNEL GRADING, AND HABITAT STRUCTURE INSTALLATIONS. DECOMMISSION ALL ACCESS ROUTES AND STAGING AREAS. PERFORM FINAL SITE RESTORATION ACTIVITIES AND DEMOBILIZE.

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PRELIMINARY
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PROFESSIONAL ENGINEER

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CASCADE FISHERIES
GOODWIN SIDE CHANNEL
CHELAN COUNTY, WA

ACCESS, STAGING, AND TESC PLAN

REVISION NUMBER

No.	Date	Revision

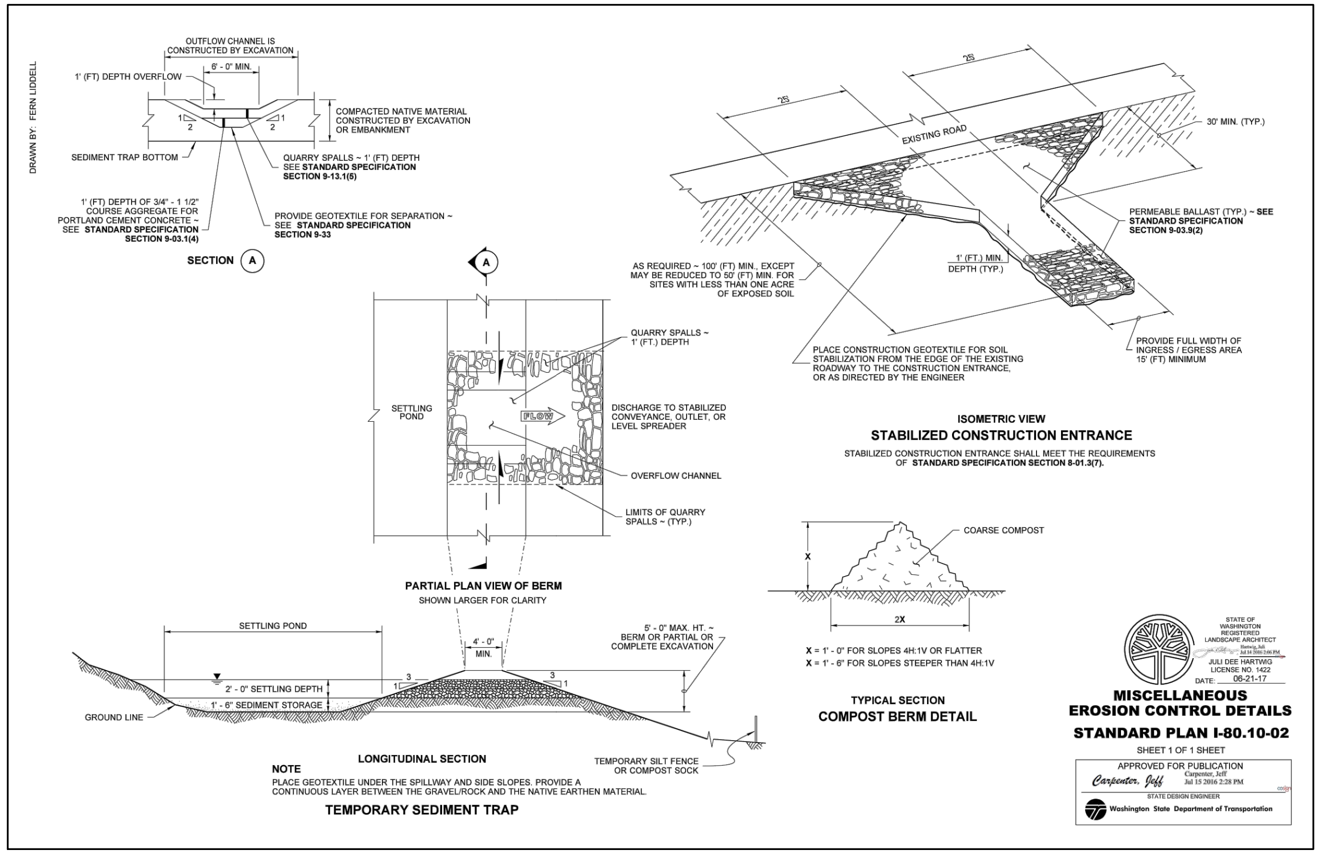
Date 9/26/2024	Designed By SR, GL
Drawn By BB	Checked By AJ

SCALE 0 1"

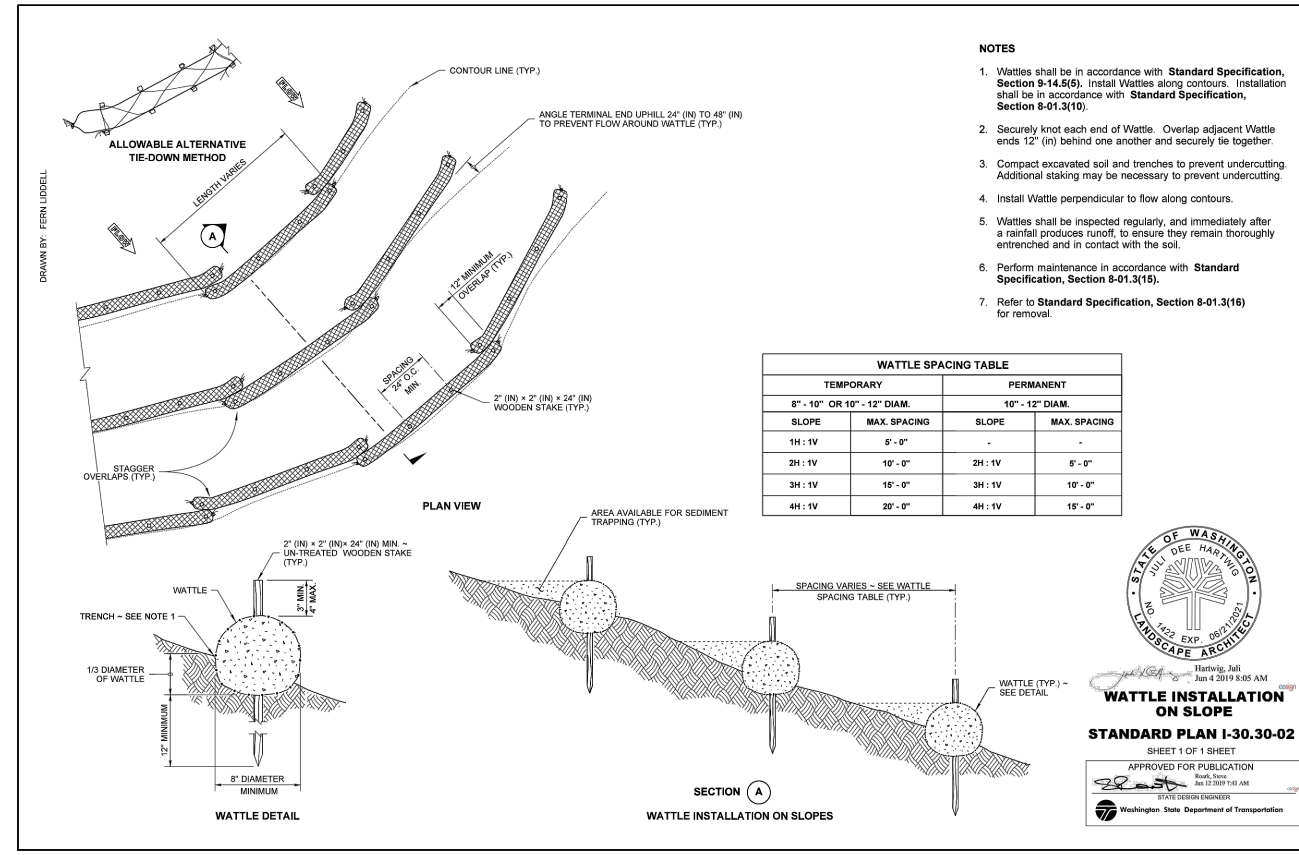
JOB NO. 20220043

SHEET NO. C5.0

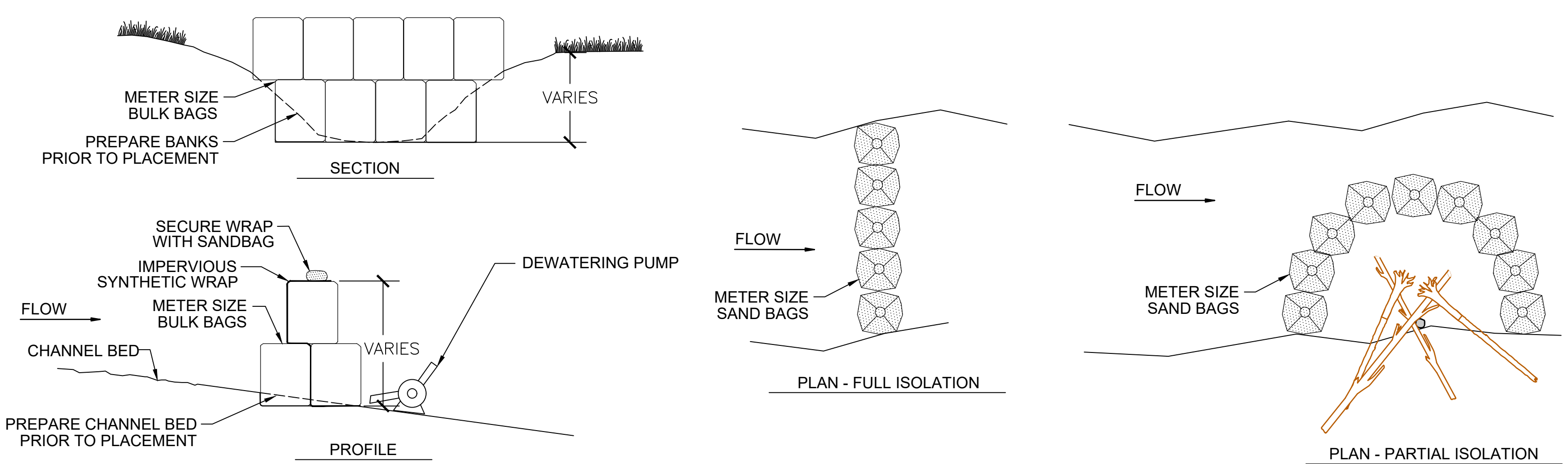
60% DESIGN
SEPTEMBER 2024



1 TEMPORARY CONSTRUCTION ENTRANCE
C5.1 NTS



2 TEMPORARY WATTLES
C5.1 NTS



NOTE:

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

3 TEMPORARY COFFER DAM
C5.1 NTS

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CASCADE FISHERIES
GOODWIN SIDE CHANNEL
CHELAN COUNTY, WA

TESC AND WATER MANAGEMENT DETAILS 1

REVISION NUMBER

No.	Date	Revision

Date 9/26/2024 | Designed By SR, GL
Drawn By BB | Checked By AJ

SCALE 0 1"

JOB NO. 20220043

SHEET NO. C5.1

17 OF 21

DWG: Z:\Shared\W2r\CAD\20220043-Goodwin Side Channel\DWG\SHEETS\C5.1.dwg USER: bbennett
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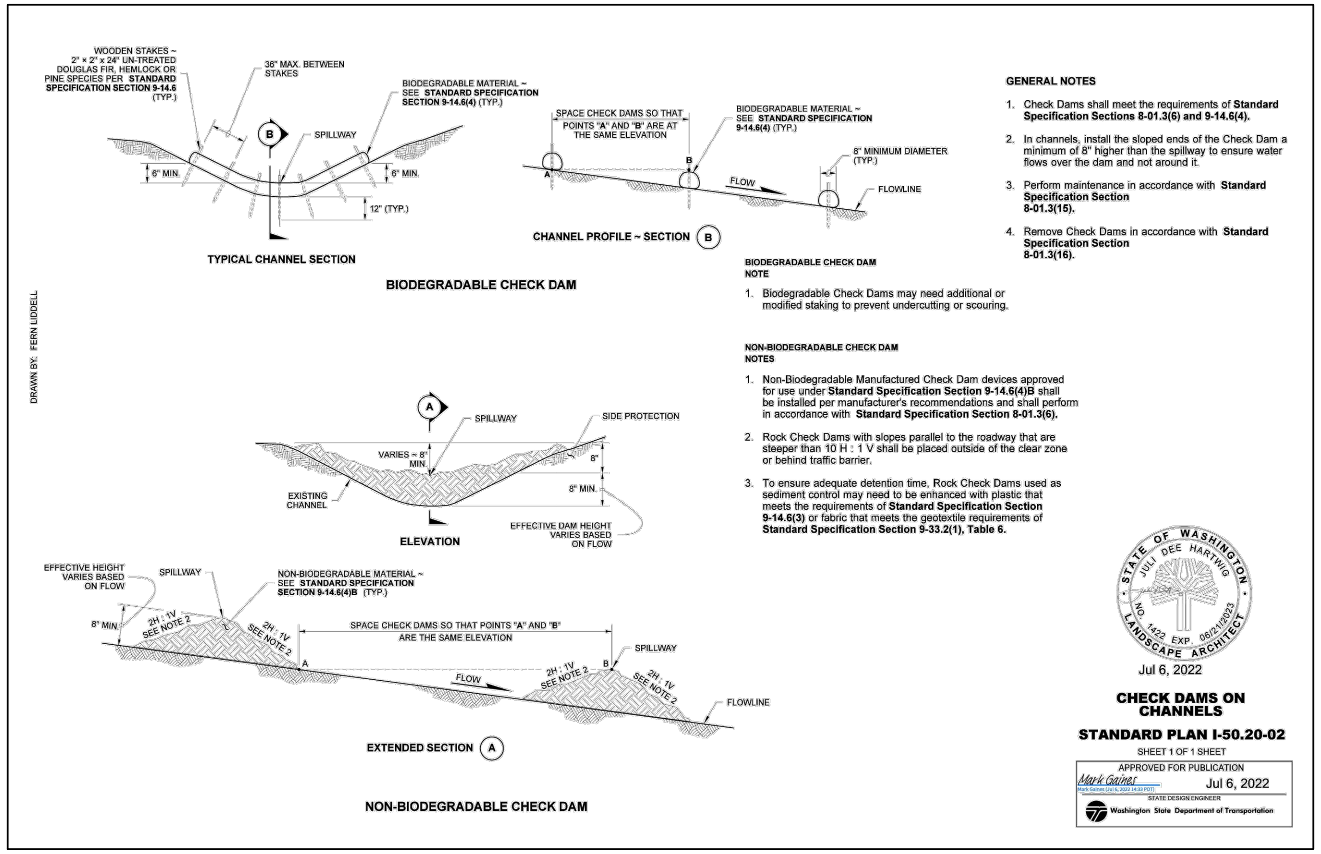
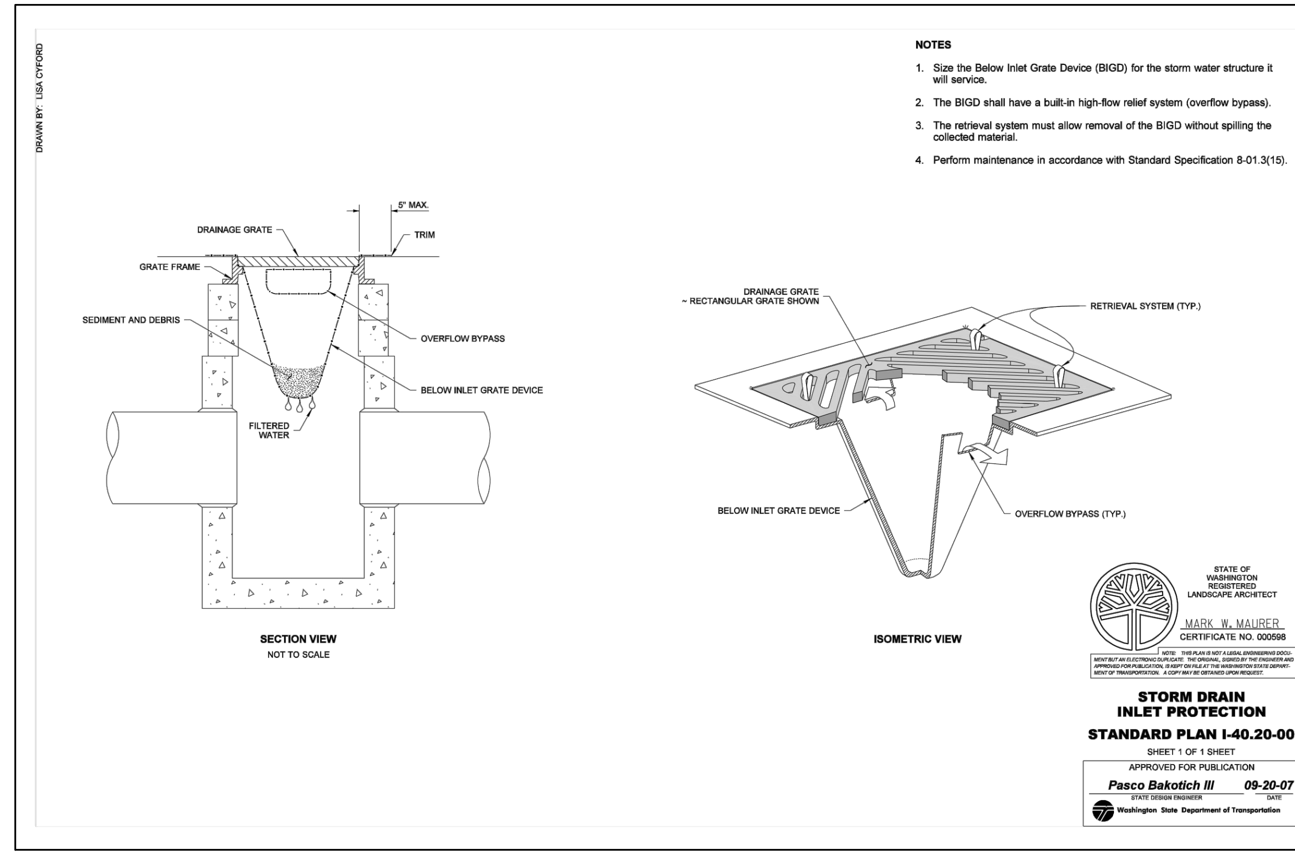
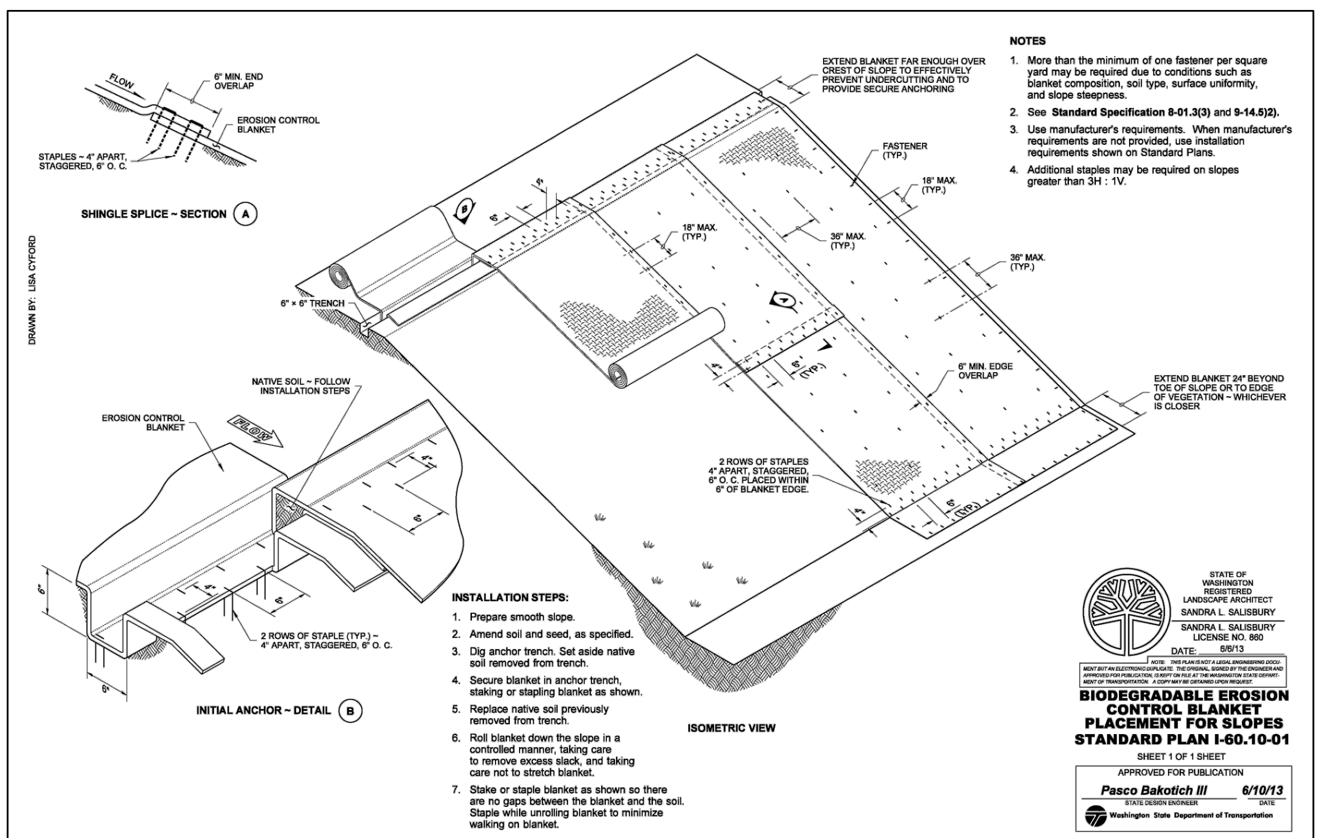
60% DESIGN
SEPTEMBER 2024



1 C5.2 TEMPORARY CHECK DAMS
NTS



2 C5.2 TEMPORARY STORM DRAIN INLET PROTECTION
NTS



3 C5.2 BIODEGRADABLE EROSION CONTROL BLANKET
NTS

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TESC AND WATER MANAGEMENT DETAILS 2

REVISION NUMBER

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Drawn By BB	Checked By AJ

SCALE 0 1"

JOB NO. 20220043

SHEET NO. C5.2

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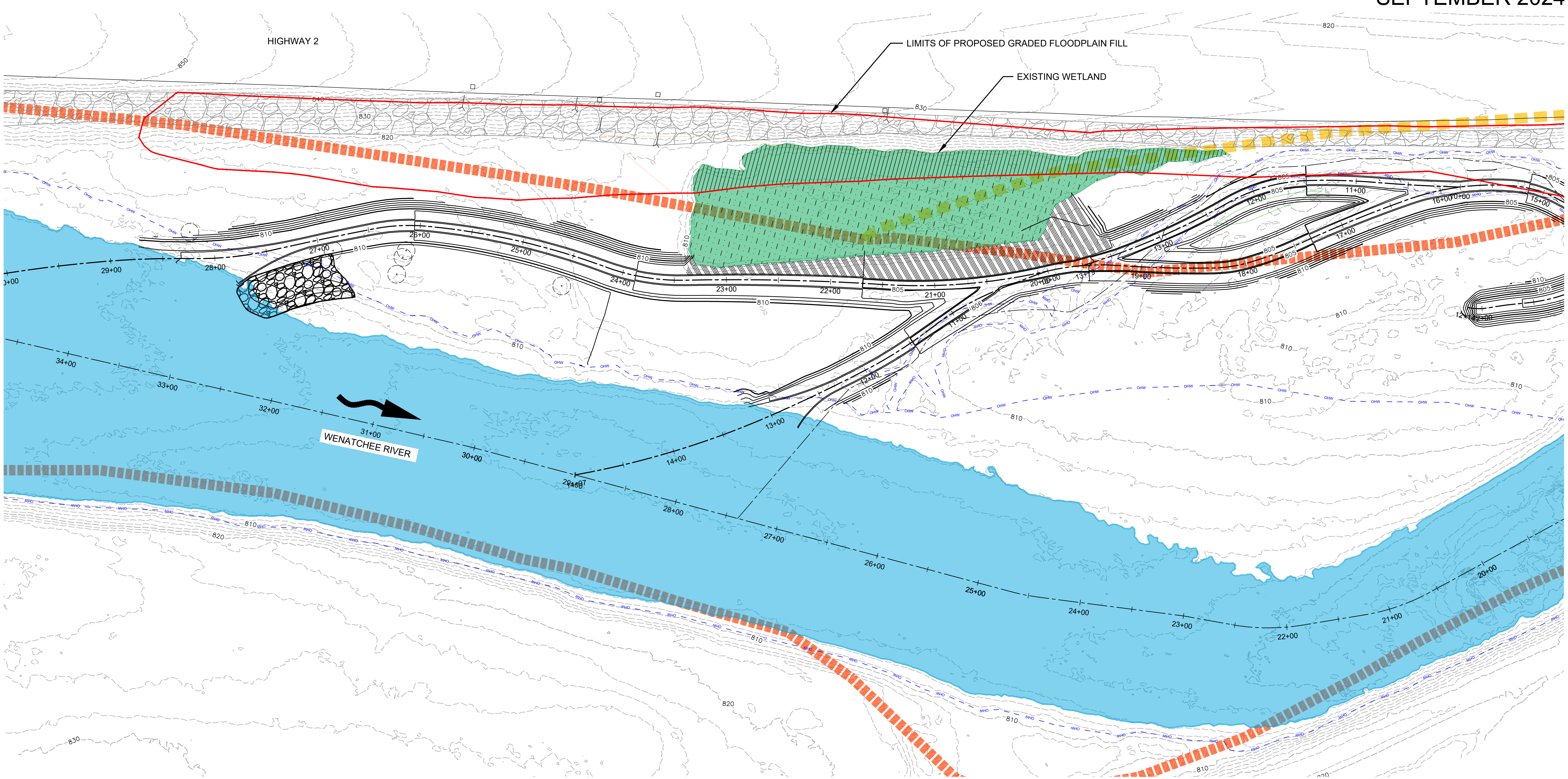
DATE: Sep 26, 2024 2:22pm XREFS: GSC-X-TB-W2r-22x34 GSC-X-PLANIMETRICS GSC-X-LEGEND GSC-X-OHW GSC-X-DESIGN

60% DESIGN
SEPTEMBER 2024



PROPOSED WETLAND IMPACTS PLAN

SCALE: 1"=50"

PROPOSED WETLAND IMPACTS			
		AREA (S.F.)	AREA (AC.)
EXISTING WETLAND		37,500	0.86
PROPOSED WETLAND FILL		12,200	0.28
PROPOSED WETLAND ENHANCEMENT		25,200	0.58
PROPOSED WETLAND CREATION **		9,500	0.22

** PROPOSED WETLAND CREATION AREA SUBJECT TO CHANGE AS DESIGN IS REFINED.

SCALE
50 0 25 50 100
SCALE FEET

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PROPOSED WETLAND IMPACTS OVERVIEW

REVISION NUMBER

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JOB NO. 20220043

SHEET NO. C6.0

20 OF 21

DWG: Z:\Shared\W2r\CAD\20220043-Goodwin Side Channel\DWG\FIGURES\GSC-PROPOSED-WETLAND-BERM.dwg USER: bbennett
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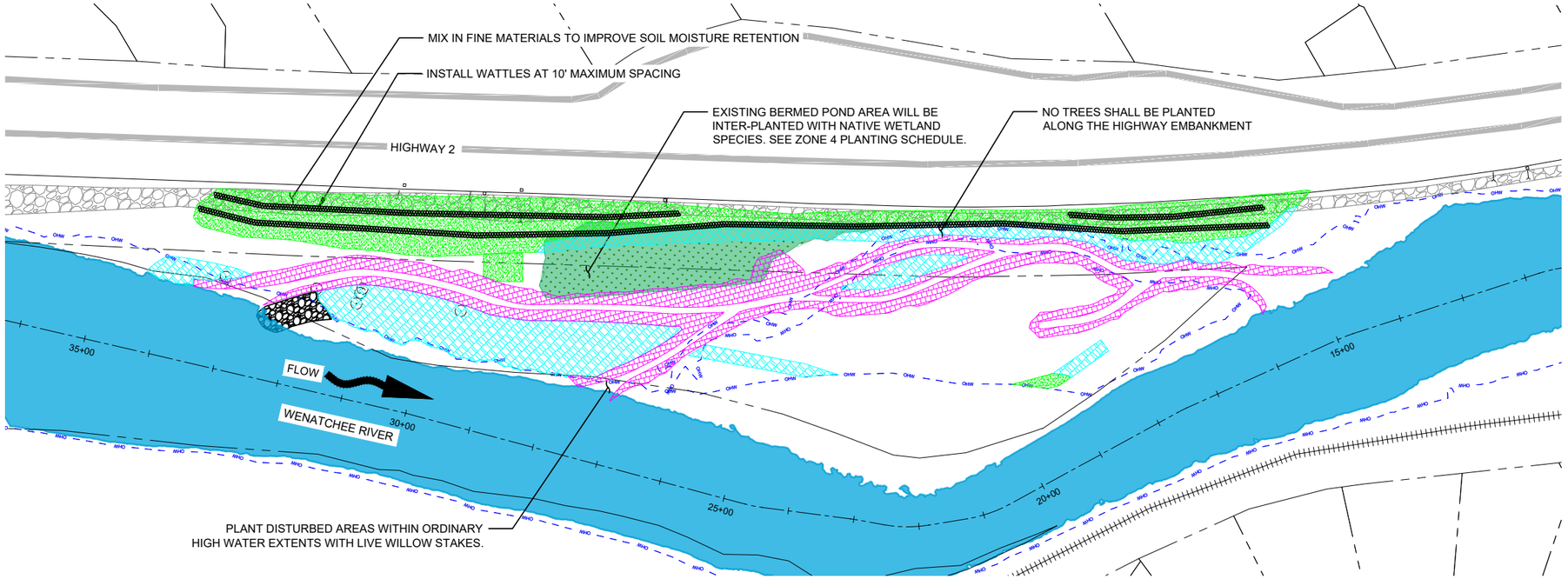

60% DESIGN
SEPTEMBER 2024

NOTES:

1. EXISTING TOPOGRAPHY DERIVED FROM 2022 TOPOBATHY LIDAR DEVELOPED BY USBR.
2. FLOODWAY AND FLOODPLAIN LINEWORK DOWNLOADED FROM FEMA FLOOD MAP SERVICE CENTER.
3. RAILROAD, ROADWAY, AND TAXLOT LINEWORK DOWNLOADED FROM CHELAN COUNTY GIS.
4. EXISTING WETLAND EXTENTS APPROXIMATELY DELINEATED BY W2R IN 2023.
5. WATER EXTENTS SHOWN ARE FROM THE EXISTING CONDITIONS HYDRAULIC MODEL FOR THE 50% DURATION EXCEEDENCE FLOW (1,810 CFS).
6. ORDINARY HIGH WATER EXTENTS SHOWN ARE DERIVED FROM FIELD SURVEY DATA AND DESKTOP DELINEATION ANALYSIS PERFORMED BY W2R IN 2023.

LEGEND:

- ORDINARY HIGH WATER EXTENT
- MODELED WATER EXTENT (1,810 CFS)
- TAXLOTS
- EXISTING WETLANDS
- EXISTING RAILROAD
- EXISTING ROADWAY
- EXISTING RIP RAP
- EXISTING PONDEROSA PINE
- EXISTING CATCH BASIN

SCALE
100 0 50 100 200
SCALE FEET

SITE RESTORATION AND PLANTING PLAN

SCALE: 1"=100'

ZONE 1 - CHANNEL BANK PLANT SCHEDULE (1.7 AC)

STOCK TYPE	SCIENTIFIC NAME	COMMON NAME	PERCENT COMPOSITION	QUANTITY	NOTES
TREE	*SALIX ANYGDALOIDES*	PEACHLEAF WILLOW	10%	116	8' TYP. SPACING
	POPULUS TRICHOCARPA	BLACK COTTONWOOD	20%	231	8' TYP. SPACING
SHRUB	*SALIX EXIGUA*	COYOTE WILLOW	25%	741	5' TYP. SPACING
	SALIX LASIANDRA	PACIFIC WILOW	25%	741	5' TYP. SPACING
	SALIX PROLIXA	MACKENZIE WILLOW	20%	592	5' TYP. SPACING
WETLAND SOD	*CAREX NEBRASCENSIS*	NEBRASKA SEDGE	WETLAND SOD COMPOSITION SEPARATE FROM TREE AND SHRUB PLANTING COMPOSITION. WETLAND SOD COMPOSITION TO BE FINALIZED AT FUTURE DESIGN PHASE.		
	JUNCUS ARCTICUS	ARCTIC RUSH			
	CAREX UTRICULATA	BEAKED SEDGE			

ZONE 2 - RIPARIAN PLANT SCHEDULE (1.8 AC)

STOCK TYPE	SCIENTIFIC NAME	COMMON NAME	PERCENT COMPOSITION	QUANTITY	NOTES
TREE	*POPULUS TRICHOCARPA*	BLACK COTTONWOOD	15%	111	10' TYP. SPACING
	SALIX ANYGDALOIDES	PEACHLEAF WILLOW	5%	37	10' TYP. SPACING
SHRUB	*ROSA WOODSII*	WOOD'S ROSE	15%	227	7' TYP. SPACING
	PHILADELPHUS LEWISII	MOCKORANGE	15%	227	7' TYP. SPACING
	SALIX PROLIXA	MACKENZIE WILLOW	10%	151	7' TYP. SPACING
	ROSA NUTKANA	NOOTKA ROSE	10%	151	7' TYP. SPACING
	PRUNUS VIRGINIANA	CHOKECHERRY	15%	227	7' TYP. SPACING
	CORNUS SOLONIFERA	REDOSIER DOGWOOD	15%	227	7' TYP. SPACING
SEED	*BROMUS SITCHENSIS VAR. MARGINATUS*	MOUNTAIN BROME	15%	SEED MIX COMPOSITION SEPARATE FROM TREE AND SHRUB PLANTING COMPOSITION.	
	DESCHAMPSIA ELONGATA	SLENDER HAIRGRASS	25%		
	ELYMUS CANADENSIS	CANADA WILDRYE	20%		
	ELYMUS GLAUCUS	BLUE WILDRYE	25%		
	BLYCERIA STRIATA	FOWL MANAGRASS	15%		

ZONE 3 - UPLAND PLANT SCHEDULE (2.0 AC)

STOCK TYPE	SCIENTIFIC NAME	COMMON NAME	PERCENT COMPOSITION	QUANTITY	NOTES
TREE	*PINUS PONDEROSA*	PONDEROSA PINE	5%	19	15' TYP. SPACING
SHRUB	*MAHONIA AQUIFOLIUM*	TALL OREGON GRAPE	15%	523	5' TYP. SPACING
	PURSHIA TRIDENTATA	BITTERBRUSH	5%	174	5' TYP. SPACING
	ROSA WOODSII	WOODS ROSE	15%	363	6' TYP. SPACING
	PHILADELPHUS LEWISII	MOCKORANGE	20%	272	8' TYP. SPACING
	RIBES CEREUM	WAX CURRANT	10%	136	8' TYP. SPACING
	RHUS GLABRA	SMOOTH SUMAC	20%	272	8' TYP. SPACING
	ERICAMERIA NAUSEOSA	GRAY RABBITBRUSH	10%	348	5' TYP. SPACING
SEED	*BROMUS SITCHENSIS VAR. MARGINATUS*	MOUNTAIN BROME	2%	SEED MIX COMPOSITION SEPARATE FROM TREE AND SHRUB PLANTING COMPOSITION.	
	PSUEDOROEGNERIA SPICATA	BLUEBUNCH WHEATGRASS	20%		
	FESTUCA IDAHOENSIS	IDAHO FESCUE	20%		
	KOELERIA MACRANTHA	PRAIRIE JUNEGRASS	10%		
	POA SECUNDA	SANDBERG BLUEGRASS	10%		
	ELYMUS GLAUCUS	BLUE WILDRYE	20%		

ZONE 4 - BERMED POND INFILL PLANT SCHEDULE (0.4 AC)

STOCK TYPE	SCIENTIFIC NAME	COMMON NAME	PERCENT COMPOSITION	QUANTITY	NOTES
TREE	*SALIX ANYGDALOIDES*	PEACHLEAF WILLOW	10%	14	15' TYP. SPACING
	POPULUS TRICHOCARPA	BLACK COTTONWOOD	30%	41	15' TYP. SPACING
SHRUB	*CORNUS SOLONIFERA*	REDOSIER DOGWOOD	25%	76	10' TYP. SPACING
	SALIX PROLIXA	MACKENZIE WILLOW	20%	61	10' TYP. SPACING
	SALIX BEBBIANA	BEBB'S WILLOW	25%	76	10' TYP. SPACING

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CASCADE FISHERIES
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CASCADE FISHERIES
GOODWIN SIDE CHANNEL
CHELAN COUNTY, WA

SITE RESTORATION AND PLANTING PLAN

REVISION NUMBER

No.	Date	Revision

Date: 9/26/2024 | Designed By: SR, GL
Drawn By: BB | Checked By: AJ

SCALE 0 1"

JOB NO. 20220043

SHEET NO. C6.1

21 OF 21

DWG: Z:\Shared\W2r\CAD\20220043-Goodwin Side Channel\DWG\SHEETS\C6.0.dwg USER: bbennett
DATE: Sep 26, 2024 2:23pm XREFS:GSC-X-TB-W2r-22x34 GSC-X-PLANIMETRICS GSC-X-LEGEND GSC-X-OHW GSC-X-DESIGN