Post-Fire Pom Pom: Toppenish Creek Restoration

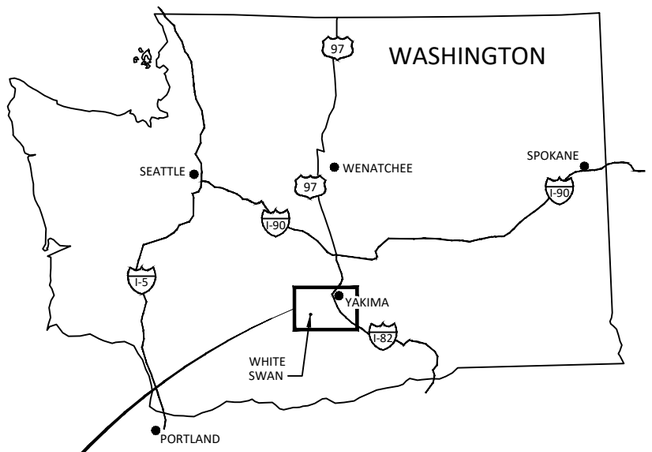
Appendix 7.1

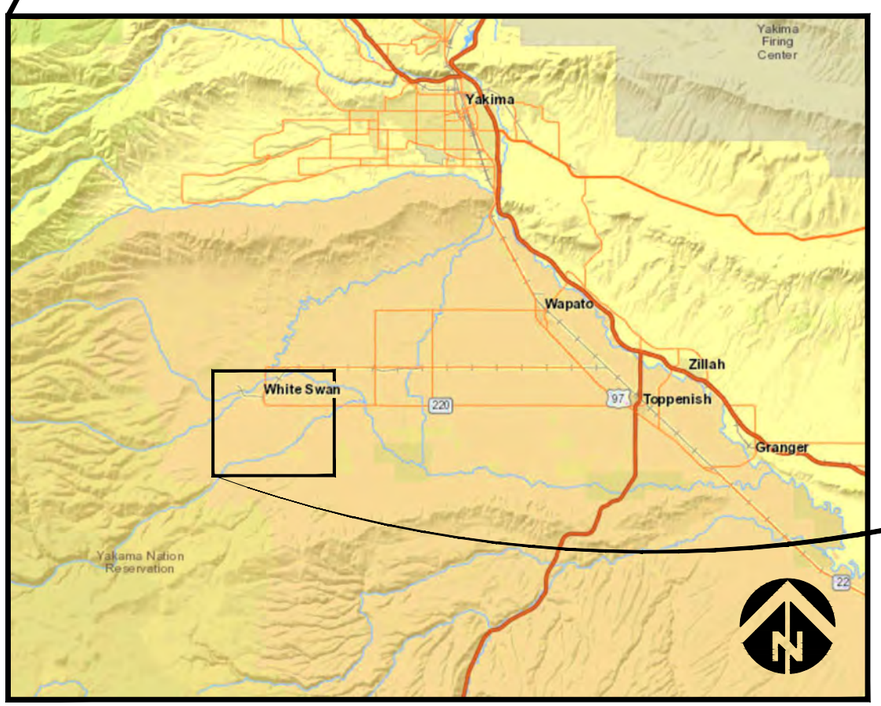
Final - Plan Sheets

May 2025

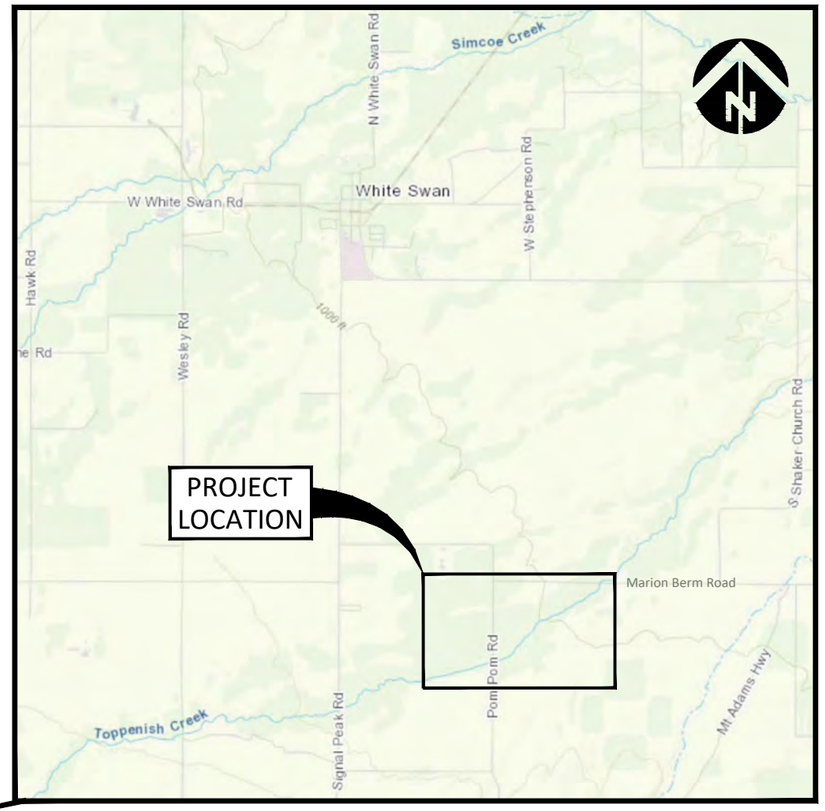
POST-FIRE POM POM, TOPPENISH CREEK RESTORATION
FINAL CHANNEL AND FLOODPLAIN DESIGNS

MARCH 2025





VICINITY MAP
SCALE: 1/8" = 1 mi.



UPSTREAM COORDINATES:
LATITUDE 46° 14' 33.25" N
LONGITUDE 120° 48' 41.78" W

DOWNSTREAM COORDINATES:
LATITUDE 46° 13' 51.82" N
LONGITUDE 120° 48' 09.66" W

SECTION 33, TOWNSHIP 9N, RANGE 16E

WATERBODY: TOPPENISH CREEK
TRIBUTARY OF: YAKIMA RIVER

SITE MAP
SCALE: 1" = 1 mi.

CONSTRUCTION WORK WINDOW IS JULY 1 TO OCTOBER 31

SHEET LIST

MICHAEL R. McALLISTER — STATE OF WASHINGTON — 38180 — REGISTERED PROFESSIONAL ENGINEER — EXPIRES 09-25-2025

NO.	BY	DATE	REVISION DESCRIPTION

DRAWN	DESIGNED	CHECKED
BB, NS, JR	MM, PL, EA, MB	PL, JG
APPROVED	DATE	PROJECT
MM	MAR 2025	200203

YAKAMA NATION FISHERIES
POST-FIRE POM POM, TOPPENISH CREEK RESTORATION
FINAL

501 Portway Avenue, Suite 101
Hood River, OR 97031
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COVER SHEET, LOCATION & SHEET LIST

SHEET 1 OF 32

THE CONTRACTOR SHALL ATTEND A PRE-BID SITE MEETING.

THE CONTRACTOR SHALL ATTEND A PRE-CONSTRUCTION MEETING WITH THE CONTRACTING AGENT (YRWP) AND CONTRACTING AGENT'S REPRESENTATIVE PRIOR TO BEGINNING CONSTRUCTION.

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

IN CASE OF DISCREPANCY, BETWEEN NOTES, LOCAL REGULATIONS, OR OTHER CONTRACT DOCUMENTATION, CONTRACTOR SHALL OBTAIN CLARIFICATION/DIRECTION FROM CONTRACTING AGENT (YRWP).

EXISTING DATA

TOPOGRAPHIC SURVEY COLLECTED BY INTER-FLUVE, INC. USING RTK, GPS, AND TOTAL STATION ON JUNE 24-25 AND NOV 10-12, 2020; AND OCT 20, 2022; AND OCT 18, 2024 AND MARCH 24, 2025. SURVEY DATA IS REFERENCED TO NAD83 WASHINGTON STATE PLANE, SOUTH ZONE, US FEET, NAVD 88.

LIDAR DATA SOLICITED BY WASHINGTON DEPARTMENT OF NATURAL RESOURCES AS PART OF THE YAKIMA BASIN DATA SET. DATA ACQUIRED BY QUANTUM SPATIAL IN NOVEMBER 2017 & MAY 2018.

HYDRAULIC MODELING BY INTER-FLUVE USING USACE HEC-RAS (6.1). MODEL VALIDATED USING SURVEYED WATER SURFACE ELEVATIONS AND FIELD OBSERVATIONS.

WATERS OF THE U.S.

THE LOW FLOW WATER INUNDATION DEPICTED IN THE DESIGNS WERE EXTRACTED FROM THE 2-D HEC-RAS MODEL FOR EXISTING CONDITIONS AT 28 CFS.

SOILS

SOILS ONSITE ARE EXPECTED TO BE COMPOSED OF ONYX SILT LOAM, UMAPINE SILT LOAM, AND WHATUM LOAM, AS MAPPED BY NRCS. NO SUBSURFACE INVESTIGATIONS HAVE BEEN COMPLETED.

UTILITIES

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

CONTRACTOR TO COORDINATE WITH YAKAMA NATION FOR TEMPORARY RELOCATIONS OR REMOVAL OF ANY REMAINING UTILITY LINES, INCLUDING POWER LINES.

THE CONTRACTOR TO COORDINATE WITH YAKAMA NATION FOR TEMPORARY SHUT-OFF OF WATER MAIN UNDER POM POM ROAD.

THE CONTRACTOR SHALL IMMEDIATELY CONTACT THE AFFECTED UTILITY SERVICE TO REPORT ANY DAMAGED OR DESTROYED UTILITIES. THE CONTRACTOR SHALL PROVIDE EQUIPMENT OR LABOR TO AID THE AFFECTED UTILITY SERVICE IN REPAIRING DAMAGED OR DESTROYED UTILITIES AT NO COST TO THE CONTRACTING AGENT (YRWP).

IN-WATER WORK PERIODS

WORK SHALL OCCUR DURING THE PERMITTED IN-WATER WORK PERIOD AS STATED IN THE APPLICABLE PERMITS.

FISH RESCUE

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

ALL FISH TRAPPED IN RESIDUAL POOLS WITHIN THE PROJECT AREA SHALL BE CAREFULLY COLLECTED BY SEINE AND/OR DIP NETS AND PLACED IN CLEAN TRANSFER CONTAINERS WITH ADEQUATE VOLUME OF WATER AND HELD WITHIN NO LONGER THAN 10 MINUTES.

CAPTURED FISHES SHALL BE IMMEDIATELY RELEASED INTO THE RIVER.

CONTRACTOR WILL PROVIDE AGREED UPON ADVANCE NOTICE TO CONTRACTING AGENCY (YRWP) PRIOR TO FISH RESCUE. CONTRACTOR IS RESPONSIBLE FOR ISOLATING THE CONSTRUCTION LOCATION FROM THE STREAM ACCORDING TO REGULATORY AGENCY.

CULTURAL RESOURCES

CULTURAL RESOURCE MONITORING TO BE PROVIDED BY THE CONTRACTING AGENT (YRWP) DURING GROUND DISTURBING ACTIVITIES. THE CONTRACTOR SHALL ACCOMMODATE THE MONITORING PERSONNEL AND COMPLY WITH THEIR DIRECTION RELATIVE TO INTERACTIONS WITH POTENTIAL CULTURAL RESOURCES.

IF YOUR WORK BRINGS YOU INTO CONTACT WITH ANY OF THE FOLLOWING CULTURAL RESOURCES:

- NATIVE AMERICAN CULTURAL ARTIFACTS (EXAMPLE: FLAKES, ARROWHEADS, STONE TOOLS, BONE TOOLS, POTTERY, HEARTH FEATURES, ETC)
- HISTORIC ERA ARTIFACTS (EXAMPLE: BUILDING FOUNDATIONS, HOMESTEADS, MINING CAMPS, ETC)
- HUMAN SKELETAL REMAINS AND BONE FRAGMENTS

YOU MUST IMMEDIATELY DISCONTINUE ALL GROUND-DISTURBING ACTIVITY. DO NOT TOUCH OR MOVE THE OBJECTS AND MAINTAIN THE CONFIDENTIALITY OF THE SITE. FOLLOW THE PROCEDURES LISTED IN THE TRIBES INADVERTENT DISCOVERY PROCEDURE. THEN AWAIT FURTHER DIRECTION FROM THE TRIBES CULTURAL RESOURCES STAFF.

TREE SALVAGE

ALL SAPLING AND TREES TO BE REMOVED SHALL BE APPROVED AND CLEARLY MARKED BY THE CONTRACTING AGENT'S REPRESENTATIVE.

ALL REMOVED NATIVE VEGETATION SHALL BE INCORPORATED INTO LOG STRUCTURES AS DIRECTED BY THE CONTRACTING AGENT'S REPRESENTATIVE. IF EXCESS VEGETATION MATERIAL NEEDS DISPOSAL OUTSIDE OF CHANNEL WORK, IT SHALL BE DISTRIBUTED IN DESIGNATED AREAS ON THE FLOODPLAIN OR ON THE FLOODPLAIN AS DIRECTED BY THE CONTRACTING AGENT'S REPRESENTATIVE.

ALL TREES REMOVED WITHIN CLEARING LIMITS SHALL BE REMOVED WHOLE WITH ROOTS INTACT AND UTILIZED IN CONSTRUCTION AS DIRECTED BY CONTRACTING AGENT'S REPRESENTATIVE.

REMOVE SOIL FROM ROOTS OF SALVAGED TREES BEFORE PLACEMENT IN THE WATERWAY.

LIVE TREES

ALL TREES NOT MARKED FOR REMOVAL SHALL BE PRESERVED AND UNDISTURBED. CONSTRUCTION ACTIVITY SHALL NOT DEBARK OR DAMAGE LIVE TREES.

KEEP OUT OF DRIP LINE OF ALL PRESERVED EXISTING TREES.

PLANTINGS

PLANT INSTALLATION SHALL BE SCHEDULED FOR BEST SURVIVAL RATE. YRWP WILL COORDINATE PLANTING SCHEDULE WITH THE CONTRACTOR.

CONTRACTOR IS RESPONSIBLE FOR PROPER HANDLING, STORAGE, AND WATERING.

CONTRACTOR'S PLANS

CONTRACTOR SHALL PREPARE AND SUBMIT FOR APPROVAL BY THE CONTRACTING AGENT PRIOR TO COMMENCING WORK THE FOLLOWING PLANS:

- ACCESS, TRAFFIC CONTROL AND TEMPORARY STREAM CROSSING PLAN
- CONSTRUCTION SEQUENCING PLAN
- STREAM DIVERSION AND SITE DEWATERING PLAN
- EROSION, SEDIMENT AND DUST CONTROL PLAN
- EARTHWORKS EXCAVATION, PLACEMENT, SALVAGE & REUSE, AND DISPOSAL PLAN

CONSTRUCTION ACCESS

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

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

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

TEMPORARY ACCESS ROUTES IN AREAS PRONE TO INUNDATION DURING THE IN-WATER WORK WINDOW SHALL BE DECOMMISSIONED BEFORE THE END OF THE IN-WATER WORK WINDOW.

CONSTRUCTION STAKING

THE CONTRACTING AGENT (YRWP) OR DESIGNATED REPRESENTATIVE WILL INSTALL FLAGGING TO DELINEATE EQUIPMENT ENTRY AND EXIT POINTS, STAGING AND STOCKPILE AREAS, AND PROJECT LIMITS. THE CONTRACTING AGENT (YRWP) WILL INSTALL ELEVATION CONTROL POINTS. THE CONTRACTOR SHALL BE RESPONSIBLE, AT OWN EXPENSE, FOR STAKING AND REPLACING DAMAGED OR MISSING STAKES.

THE CONTRACTING AGENT (YRWP) AND CONTRACTING AGENT'S REPRESENTATIVE WILL MARK LIMITS OF DISTURBANCE PRIOR TO MOBILIZATION OF EQUIPMENT OR MATERIALS ONTO THE SITE.

LOCATION, ALIGNMENT, AND ELEVATION OF LOGS AND LOGS WITH ROOTWADS ARE SUBJECT TO ADJUSTMENT IN THE FIELD AS DIRECTED BY YRWP REPRESENTATIVE, BASED ON FIELD CONDITIONS, AND MATERIAL SIZE.

ANY PROPERTY MONUMENTS DISTURBED OR DESTROYED SHALL BE REPLACED BY A WASHINGTON STATE PROFESSIONAL LICENSED SURVEYOR AT CONTRACTOR'S EXPENSE.

ABBREVIATIONS

APPROX	APPROXIMATE	HORIZ	HORIZONTAL	RMx	RIVER MILE x
AVE	AVERAGE	IN or "	INCH	STA	STATION
CFS	CUBIC FEET PER SECOND	INV	INVERT	TBD	TO BE DETERMINED
CMs	CONSERVATION MEASURES	LN	LANE	TBM	TEMPORARY BENCHMARK
CY	CUBIC YARDS	MAX	MAXIMUM	TYP	TYPICAL
°	DEGREES	MIN	MINIMUM	U.S.	UNITED STATES
DIA	DIAMETER	NOAA	NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	VERT	VERTICAL
EL or ELEV	ELEVATION			WSDOT	WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
EXIST	EXISTING	OHW	ORDINARY HIGH WATER		
FT or '	FEET	%	PERCENT	WSE	WATER SURFACE ELEVATION
HWY	HIGHWAY	RD	ROAD	YR	YEAR
				YRWP	YAKIMA RESERVATION WATERSHED PROJECT

NO.	BY	DATE	REVISION DESCRIPTION

BB, NS, JR DRAWN | MM, PL, EA, MB DESIGNED | PL, JG CHECKED

MM APPROVED | MAR 2025 DATE | 200203 PROJECT

YAKAMA NATION FISHERIES
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GENERAL NOTES

SHEET 2 OF 32

MICHAEL R. McALLISTER STATE OF WASHINGTON 18139 REGISTERED PROFESSIONAL ENGINEER
EXPIRES 09-26-2025

SUMMARY OF QUANTITIES - GRADING

Description	Cut (CY)	Fill (CY)	Source
SOUTH CANAL PLUG	0	32,000	ONSITE STOCKPILE
CENTER CHANNEL PLUG	0	600	CONNECTOR CHANNEL 3
CONNECTOR CHANNEL 1	1,850	0	
CONNECTOR CHANNEL 2	800	60	ONSITE
CONNECTOR CHANNEL 3	600	0	
CHANNEL CONNECTION	70	70	DISTRIBUTED ON ADJACENT BAR, NO HAUL
SEDIMENT AUGMENTATION - PLACED IN CHANNEL	0	2,430	SOUTH CANAL AT PLUG FOOTPRINT
SEDIMENT AUGMENTATION - CUT FROM UNDER SOUTH PLUG	2,430	0	
CONSTRUCTED RIFFLE - SUBGRADE CUT -DOES NOT INCLUDE RIFFLE CONST.	8,520	0	
CONSTRUCTED RIFFLE - STREAMBED MATERIAL	0	4,400	IMPORTED - SIZE SPECIFICS
FLOODPLAIN BERM	0	9,530	ONSITE
DECOMMISSION 2-TRACK	750	750	BALANCED

NOTE: QUANTITIES ARE ESTIMATES ONLY FOR EVALUATING THE SCALE OF THE WORK. QUANTITIES MAY NOT INCLUDE ALL WORK ITEMS. CONTRACTOR RESPONSIBLE FOR VERIFYING QUANTITIES NEEDED TO COMPLETE THE WORK SHOWN ON THE PLANS.

SUMMARY OF QUANTITIES - MATERIALS

Description	Unit	Quantity	Source
CONSTRUCTED RIFFLE - STREAMBED BOULDERS - TYPE 4	EA	50	IMPORTED
LARGE WOOD WITH ROOTWADS	EA	103	IMPORTED LW
POST ASSISTED ROUGHNESS STRUCTURES (POSTS AND SLASH)	EA	40	POSTS IMPORTED, SLASH SITE GENERATED
FLOODPLAIN ROUGHNESS WEED-FREE STRAW BALES	LF	6,500	IMPORTED
FLOODPLAIN ROUGHNESS WILLOW/ COTTONWOOD TRENCHS	LF	11,500	LIVE STAKES AND SLASH
REVEGETATION SEEDING/ PLANTING	AC	120	RIPARIAN AND UPLAND COMBINED

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ESTIMATED QUANTITIES & JURISDICTIONAL IMPACTS

MICHAEL R. McALLISTER
STATE OF WASHINGTON
38129
REGISTERED
PROFESSIONAL ENGINEER
EXPIRES 09-22-2025

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 IS JULY 1- OCTOBER 30.

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.

NO.	BY	DATE	REVISION DESCRIPTION

BB, NS, JR — DRAWN | MM, PL, EA, MB — DESIGNED | PL, JG — CHECKED
MM — APPROVED | MAR 2025 — DATE | 200203 — PROJECT

YAKAMA NATION FISHERIES
POST-FIRE POM POM, TOPPENISH CREEK RESTORATION
FINAL

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

HIP CONSERVATION MEASURES (1 OF 3)

SHEET
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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 WILL 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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HIP CONSERVATION MEASURES (2 OF 3)

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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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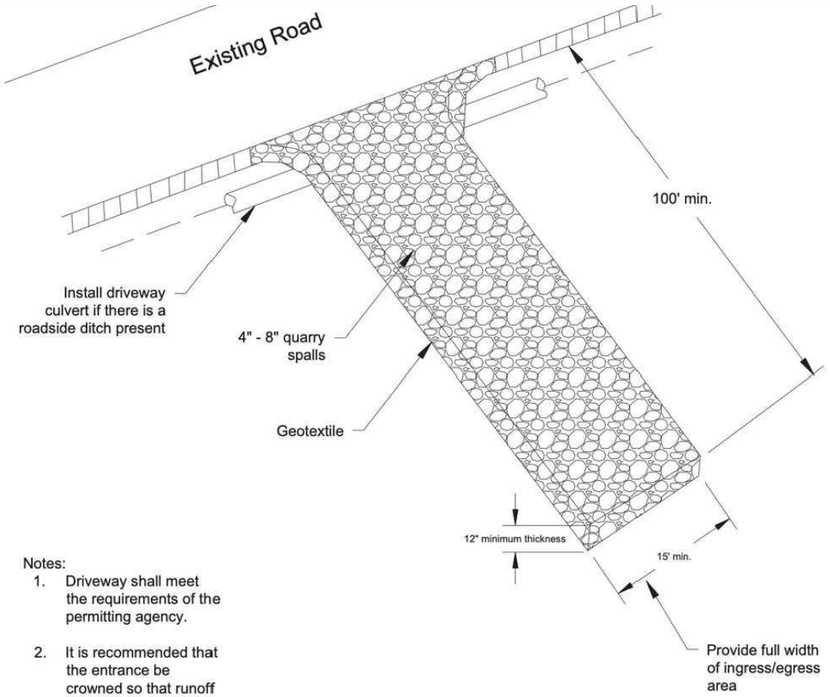
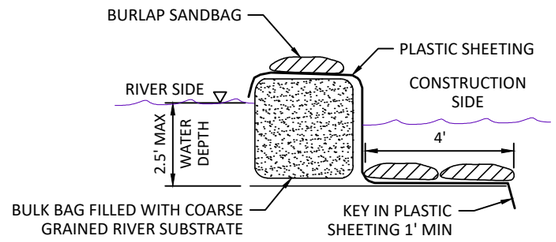
HIP CONSERVATION MEASURES (3 OF 3)

SHEET 6 OF 32



Notes:
1. Driveway shall meet the requirements of the permitting agency.
2. It is recommended that the entrance be crowned so that runoff drains off the pad.

1/7 STABILIZED CONSTRUCTION ENTRANCE DETAIL
NOT TO SCALE



SINGLE LAYER COFFERDAM
(WATER DEPTH LESS THAN 2.5')

2/7 TYPICAL DETAIL - TEMPORARY BULK BAG COFFERDAM
NOT TO SCALE

BULK BAG NOTES:

1. BULK BAG COFFERDAM SHALL BE CONSTRUCTED OF SEVERAL UNITS OF BULK BAGS FILLED WITH WASHED COBBLE, AND ABUTTED SIDE BY SIDE TO CREATE A ROW THAT ISOLATES THE CONSTRUCTION SITE.
2. THE PLASTIC SHEETING SHALL BE DRAPED ALONG THE CHANNEL BOTTOM ON THE RIVER SIDE OF THE COFFERDAM WITH OUTWARD EDGE OF SHEETING MINIMUM 4-FEET FROM TOE OF COFFERDAM. THE DRAPED PORTION OF PLASTIC SHEETING SHALL BE PINNED TO THE CHANNEL BED BY MINIMUM TWO ROWS OF STANDARD SANDBAGS. ALL SANDBAGS SHALL BE FILLED WITH WASHED PEA GRAVEL.
3. THE TERMINAL ENDS OF BULK BAG COFFERDAM, WHERE IT CONNECTS TO CHANNEL BANK OR HIGH GROUND, SHALL BE SEALED WITH PLASTIC SHEETING AND STANDARD SANDBAGS.
4. BULK BAGS SHALL BE CUBE-SHAPED POLYPROPYLENE WOVEN FABRIC BAGS WITH FULLY OPEN TOP, FLAT BOTTOM, FOUR LOOPS, MINIMUM 2-TON WEIGHT CAPACITY, MINIMUM 5:1 SAFETY FACTOR.
5. PLASTIC SHEETING SHALL BE MINIMUM 6-MIL THICKNESS. ROLL LENGTH SHALL BE LONG ENOUGH TO ENSURE THAT ENTIRE LENGTH OF COFFERDAM WILL BE COVERED WITHOUT A SEAM. MINIMUM 12-FT WIDE ROLL SHALL BE USED FOR SINGLE LAYER BULK BAG COFFERDAM.
6. BULK BAG COFFERDAM SHALL BE COMPLETELY REMOVED AFTER CONSTRUCTION IS COMPLETED AND TURBIDITY HAS BEEN REMOVED. BULK BAG FILL (WASHED COBBLE) AND SANDBAG FILL (WASHED PEA GRAVEL) SHALL BE DISPOSED OF ON SITE. BAGS AND PLASTIC SHEETING SHALL BE REMOVED FROM THE SITE ONCE CONSTRUCTION IS COMPLETED.
7. MEASUREMENT AND PAYMENT FOR BULK BAG COFFERDAM, SAND BAGS, PLASTIC SHEETING, WASHED COBBLE PLACEMENT, AND MAINTENANCE AND REMOVAL OF ALL MATERIALS, SHALL BE INCIDENTAL TO THE LUMP SUM ALL INCLUSIVE COST FOR DIVERSION AND DEWATERING.
8. ALTERNATE COFFERDAM MATERIALS AND CONFIGURATIONS MAY BE ALLOWED BUT SHALL NOT BE IMPLEMENTED WITHOUT REVIEW AND APPROVAL BY THE OWNER'S REPRESENTATIVE. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS AND/OR VENDOR CUT SHEETS FOR SUBSTITUTIONS.
9. IF NECESSARY, GAPS BETWEEN BULK BAGS SHALL BE FILLED WITH WASHED STREAM GRAVEL TO IMPROVE COFFERDAM SEAL.
10. IF FLOW CONDITIONS ENCOUNTERED ON SITE DURING CONSTRUCTION DO NOT ALLOW FOR SUCCESSFUL DEWATERING USING THIS METHOD, SHEETPILE COFFERDAM (HIGH FLOWS) OR SAND BAG COFFERDAM (LOW FLOWS) MAY BE CONSIDERED.

TEMPORARY SITE STABILIZATION NOTE:

1. ALL AREAS IMPACTED BY CONSTRUCTION SHALL BE SEEDED WITH QUICK GUARD STERILE TRITICALE (*STERILE TRITICUM x SECALE)* AT A RATE OF 20 LBS/ ACRE WITHIN 3 DAYS OF STIE COMPLETION.
2. SEED MIX TO BE APPLIED WITH 50:50 RICE HULLS (BY VOLUME) TO FACILITATE EVEN DISTRIBUTION.
3. STRAW MULCH TO BE APPLIED AT A RATE OF 2 TONS/ACRE AND LEAVE APPROXIMATELY 25% OF THE GROUND SURFACE VISIBLE OVER ALL DISTURBED AREAS.

NO.	BY	DATE	REVISION DESCRIPTION

BB, NS, JR DRAWN | MM, PL, EA, MB DESIGNED | PL, JG CHECKED
MM APPROVED | MAR 2025 DATE | 200203 PROJECT

YAKAMA NATION FISHERIES
POST-FIRE POM POM, TOPPENISH CREEK RESTORATION
FINAL

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BMP

SHEET 7 OF 32

MICHAEL R. McALLISTER STATE OF WASHINGTON 28120 REGISTERED PROFESSIONAL ENGINEER
EXPIRES 09-26-2025

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0 400 800

SCALE IN FEET

LEGEND

- NN — SURVEY CONTROL POINT
- EXISTING 2-FT CONTOURS
- W W — WATER MAIN
- OVERHEAD POWER LINE TO REMAIN
- EXISTING ACCESS ROAD
- EXISTING LOW FLOW (28 CFS)

NORTH CULVERT

CENTER CHANNEL CULVERT

ACCESS ROAD

SOUTH CULVERT

EXISTING POMPOM BRIDGE

100

101

POM POM RD

FLOOD FLOW SIDE CHANNEL
(HISTORICAL MAIN STEM)

MAINSTEM CHANNEL
(SOUTH CANAL)

TOPPENISH CREEK
EXISTING MAINSTEM
CHANNEL

SURVEY CONTROL POINTS

Pt. No.	Easting	Northing	Elevation	Full Description
100	1586986.25	366596.57	1031.57	Aluminum Disk
101	1586952.69	366480.90	1031.49	Aluminum Disk

MICHAEL R. McALLISTER
STATE OF WASHINGTON
38180
REGISTERED
PROFESSIONAL ENGINEER
EXPIRES 09-25-2025

NO.	BY	DATE	REVISION DESCRIPTION

DRAWN	DESIGNED	CHECKED
BB, NS, JR	MM, PL, EA, MB	PL, JG
APPROVED	DATE	PROJECT
MM	MAR 2025	200203

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EXISTING CONDITIONS AND SURVEY CONTROL

SHEET
8 OF 32

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LEGEND

- PROPOSED FILL AREA
- PROPOSED CHANNEL GRADING
- PROPOSED CHANNEL SEDIMENT AUGMENTATION
- PROPOSED 2-TRACK REGRADING
- CONSTRUCTION BY OTHERS (SEE KPFF PLANS)
- CLEARING LIMIT
- REQUIRED DEAD TREE REMOVAL ZONE
- EXISTING 2-FT CONTOURS
- PROPOSED 1-FT CONTOURS
- LIMIT OF CONSTRUCTION DISTURBANCE
- EXISTING OVERHEAD POWER LINE TO REMAIN
- EXISTING CULVERT
- EXISTING WATERMAIN
- EXISTING LOW FLOW (28 CFS)
- TEMPORARY ACCESS ROUTE
- PROPOSED STAGING / STOCKPILE AREA
- 150' BRIDGE LOCATION, BY OTHERS
- EXCLUSION FENCING (BY YWRP)
- BANK BURIED HABITAT LARGE WOOD, SEE SHEET 26
- POST-ASSISTED ROUGHNESS FEATURE

0 400 800

SCALE IN FEET

SEE SHEET 10 FOR PROPOSED UPSTREAM WORK AREAS

CHANNEL GRADING, SEE SHEET 25

FLOW

STABILIZED CONSTRUCTION ENTRANCE

STABILIZED CONSTRUCTION ENTRANCE

REFUELING AREA-150' SETBACK FROM WATER

STAGING AND STOCKPILE AREA 3

FLOW

REACTIVATED MAINSTEM TOPPENISH CREEK

STOCKPILE AREA 1 (NATURAL MATERIALS ONLY)

STOCKPILE AREA 2 (NATURAL MATERIALS ONLY)

POM POM RD

STOCKPILE AREA 4 (NATURAL MATERIALS ONLY, TOPPENISH 3-WAY SPOILS)

TOPPENISH CREEK EXISTING MAINSTEM CHANNEL

NOTES:

1. EXISTING ROADS SHALL BE IMPROVED AS NEEDED FOR CONSTRUCTION ACCESS. IMPROVEMENTS SHALL BE APPROVED BY YRWP. ROAD CONDITION FOLLOWING CONSTRUCTION SHALL BE AS APPROVED BY YRWP. SEE SHEET 2 - "CONSTRUCTION ACCESS" FOR ADDITIONAL REQUIREMENTS
2. YRWP TO INSTALL EXCLUSION FENCING AFTER PROJECT COMPLETION

MICHAEL R. McALLISTER STATE OF WASHINGTON 18189 REGISTERED PROFESSIONAL ENGINEER

EXPIRES 09-26-2025

NO.	BY	DATE	REVISION DESCRIPTION

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APPROVED	DATE	PROJECT
MM	MAR 2025	200203

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PROPOSED OVERVIEW, STAGING, STOCKPILE & ACCESS

SHEET 9 OF 32

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LEGEND

- PROPOSED FILL AREA
- PROPOSED CHANNEL GRADING
- CHANNEL SEDIMENT AUGMENTATION
- PROPOSED 2-TRACK REGRADING
- FLOODPLAIN ROUGHNESS ZONES, SEE SHEET 32
- EXISTING 2-FT CONTOURS
- PROPOSED 1-FT CONTOURS
- LIMIT OF CONSTRUCTION DISTURBANCE
- EXISTING OVERHEAD POWER LINE TO REMAIN
- EXISTING CULVERT
- EXISTING WATERMAIN
- EXISTING LOW FLOW (28 CFS)
- TEMPORARY ACCESS ROUTE
- PROPOSED STAGING / STOCKPILE AREA
- 150' BRIDGE LOCATION, BY OTHERS
- EXCLUSION FENCING (BY YRWP)
- CONSTRUCTION BY OTHERS (SEE KPFF PLANS)
- BANK-BURIED HABITAT LARGE WOOD, SEE SHEET 26
- POST-ASSISTED ROUGHNESS FEATURE

0 250 500

SCALE IN FEET

SEE SHEET 15

SEE SHEET 20

SEE SHEET 21

SEE SHEET 22

SEE SHEET 18

SEE SHEET 17

SEE SHEET 11

SEE SHEET 13

SEE SHEET 12

CONNECTOR 2

POST-ASSISTED ROUGHNESS

CONNECTOR 3

CENTER CHANNEL PLUG

SEDIMENT AUGMENTATION AND ROUGHNESS

CONSTRUCTED RIFFLE

BRIDGE AND SURROUNDING GRADING BY OTHERS

DITCH FILL, GRADING BY OTHERS

CULVERT 1 BY OTHERS

CULVERT 2 BY OTHERS

CULVERT 3 BY OTHERS

2-TRACK REGRADING

POM POM RD BRIDGE

POM POM RD

REACTIVATED MAINSTEM TOPPENISH CREEK CONNECTOR 1

FLOODPLAIN BERM

SOUTH CANAL PLUG

Floodflow

South Canal

NO.	BY	DATE	REVISION DESCRIPTION

BB, NS, JR	MM, PL, EA, MB	PL, JG
DRAWN	DESIGNED	CHECKED
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APPROVED	DATE	PROJECT

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PROPOSED CONDITIONS OVERVIEW- POM POM ROAD

SHEET 10 OF 32

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EXPIRES 09-12-2025

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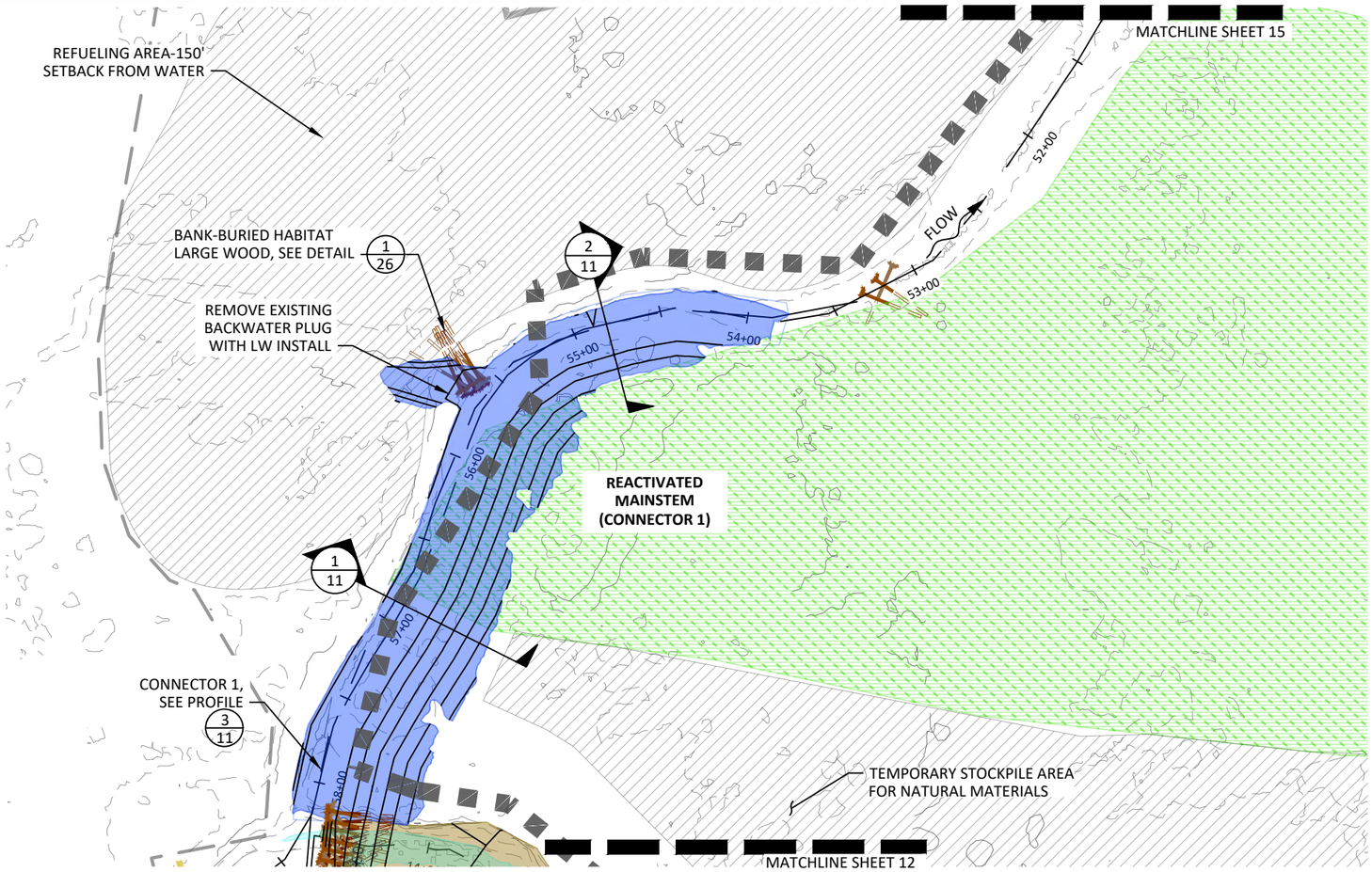
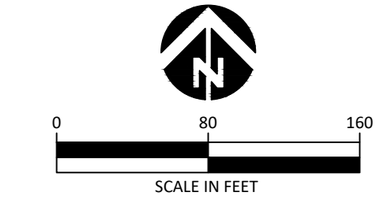
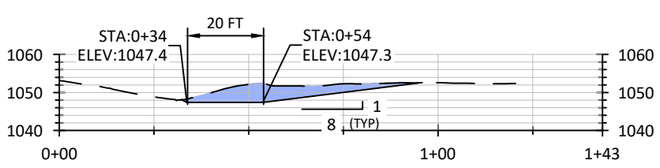


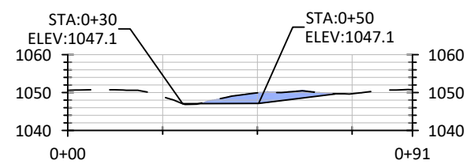


LEGEND

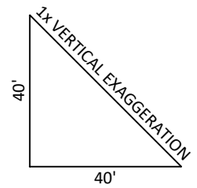
- EXISTING 2-FT CONTOURS
- PROPOSED 1-FT CONTOURS
- LIMIT OF CONSTRUCTION DISTURBANCE
- PROPOSED STAGING / STOCKPILE AREA
- PROPOSED FILL AREA
- PROPOSED CHANNEL GRADING
- FLOODPLAIN ROUGHNESS ZONES, SEE SHEET 32
- EXISTING LOW FLOW (28 CFS)
- BANK-BURIED HABITAT LARGE WOOD, SEE SHEET 26
- TEMPORARY ACCESS ROUTE



1/11 SECTION - PROPOSED MAINSTEM
REACTIVATED MAINSTEM CHANNNEL STA 56+88

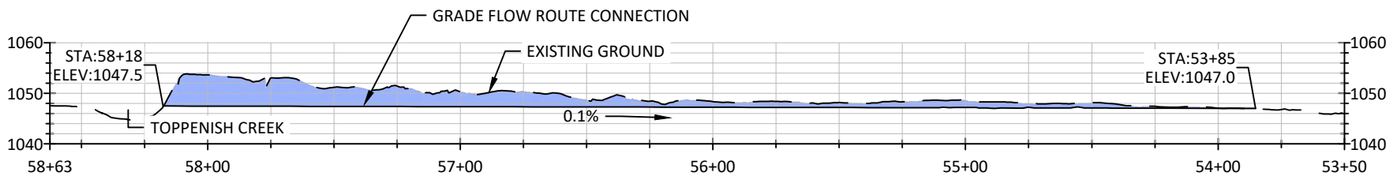


2/11 SECTION - PROPOSED MAINSTEM
REACTIVATED MAINSTEM CHANNEL STA 54+81

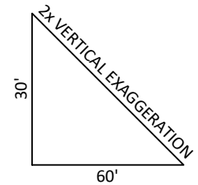


LEGEND

- PROPOSED GRADE
- EXISTING GRADE
- PROPOSED CHANNEL GRADING



3/11 CONNECTOR 1 PROFILE
REACTIVATED MAINSTEM CHANNEL STA. 53+50 - 58+63



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APPROVED	**DATE**	**PROJECT**
MM	MAR 2025	200203

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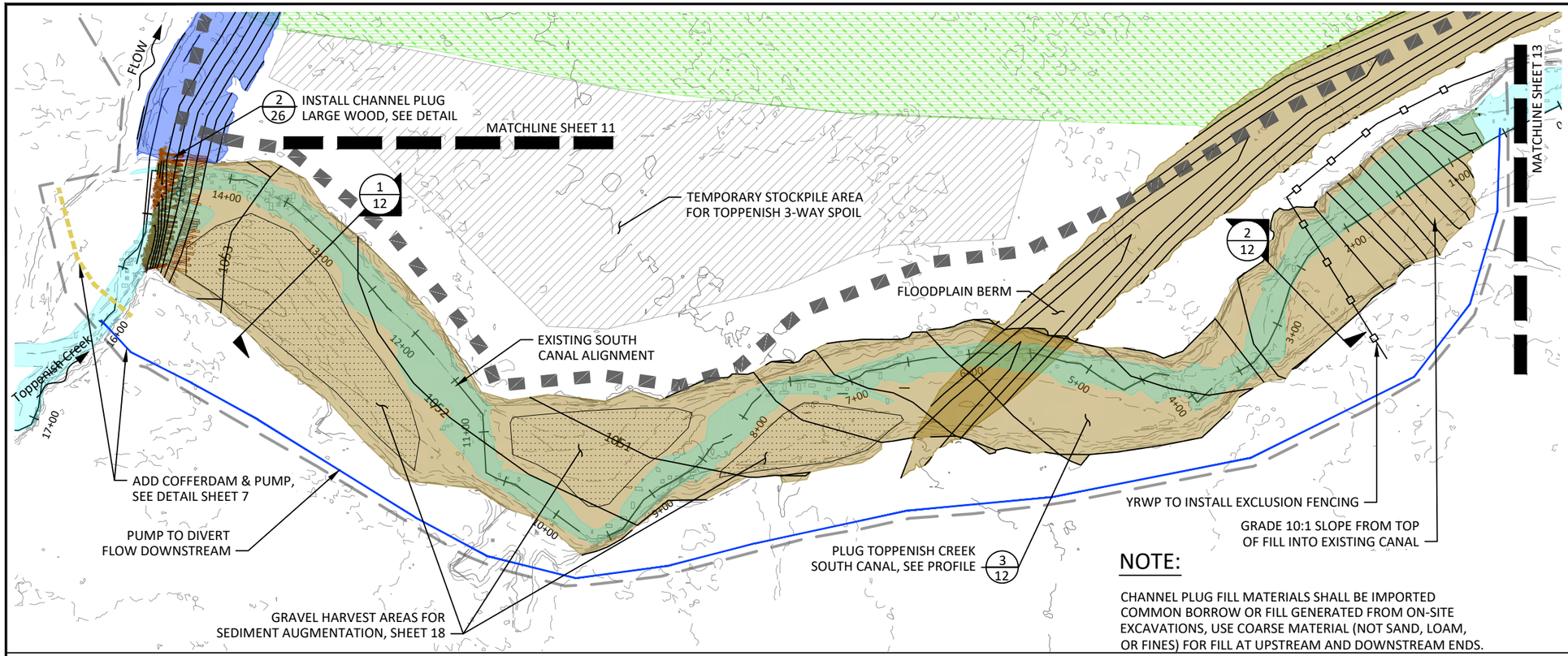
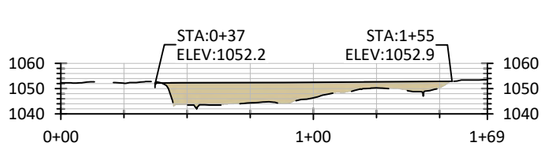
PROPOSED REACTIVATED MAIN STEM PLAN, SECTIONS, & PROFILE

SHEET
11 OF 32



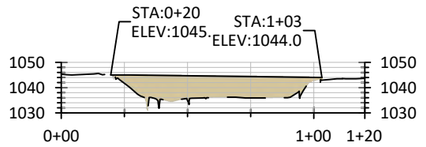
NOTE:

CHANNEL PLUG FILL MATERIALS SHALL BE IMPORTED COMMON BORROW OR FILL GENERATED FROM ON-SITE EXCAVATIONS, USE COARSE MATERIAL (NOT SAND, LOAM, OR FINES) FOR FILL AT UPSTREAM AND DOWNSTREAM ENDS.

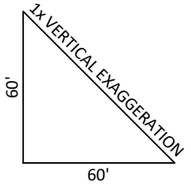


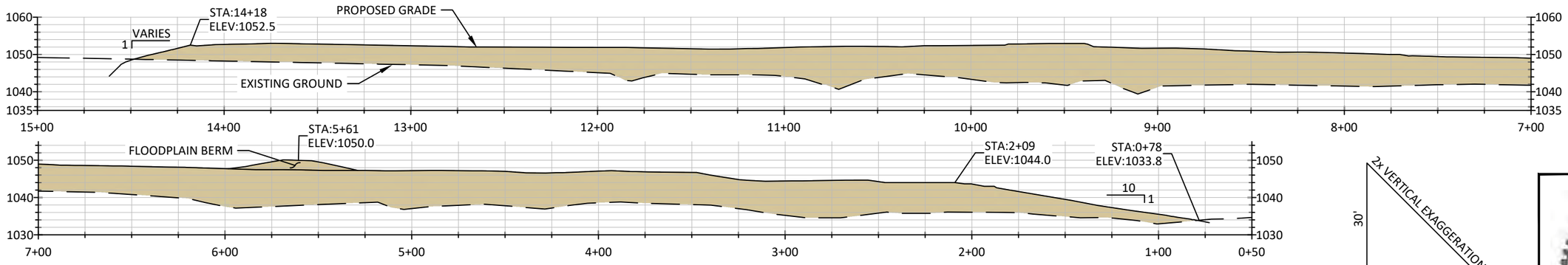
1/12 SECTION - SOUTH CANAL PLUG
SOUTH CANAL STA 7+32

LEGEND
PROPOSED GRADE
EXISTING GRADE
PROPOSED FILL AREA

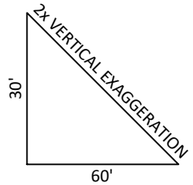


2/12 SECTION - SOUTH CANAL PLUG
SOUTH CANAL STA 5+31





3/12 SOUTH CANAL PLUG PROFILE
SOUTH CANAL STA 0+50 - STA 15+00



NO.	BY	DATE	REVISION DESCRIPTION

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BB, NS, JR	MM, PL, EA, MB	PL, JG
APPROVED	DATE	PROJECT
MM	MAR 2025	200203

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PROPOSED SOUTH CANAL PLUG PLAN, SECTIONS, & PROFILE

SHEET 12 OF 32

MICHAEL R. McALLISTER
STATE OF WASHINGTON
38189
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PROFESSIONAL ENGINEER
EXPIRES 09-22-2025

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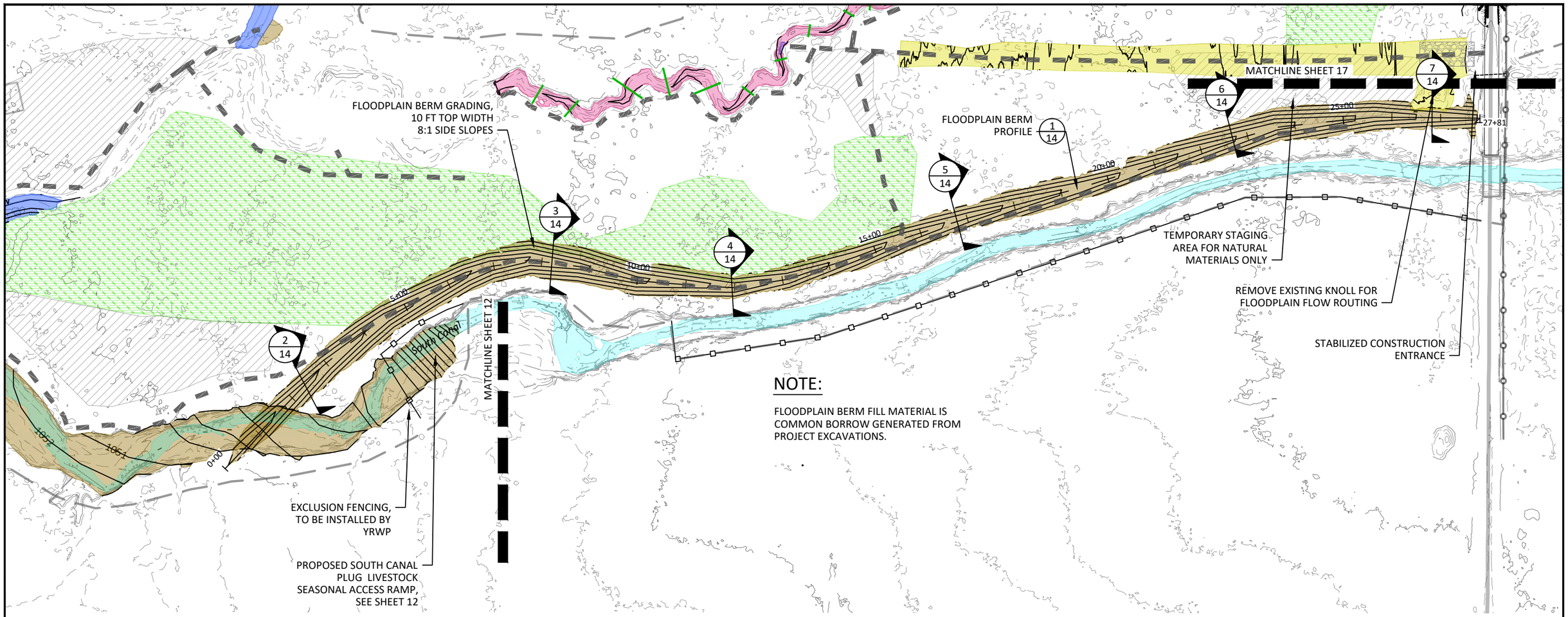

NOTE:

FLOODPLAIN BERM FILL MATERIAL IS COMMON BORROW GENERATED FROM PROJECT EXCAVATIONS.

LEGEND

- EXISTING 2-FT CONTOURS
- PROPOSED 1-FT CONTOURS
- LIMIT OF CONSTRUCTION DISTURBANCE
- PROPOSED FILL AREA
- PROPOSED 2-TRACK REGRADING
- PROPOSED CHANNEL GRADING
- PROPOSED CHANNEL SEDIMENT AUGMENTATION
- PROPOSED STAGING / STOCKPILE AREA
- FLOODPLAIN ROUGHNESS ZONES, SEE SHEET 32
- EXISTING LOW FLOW (28 CFS)
- EXCLUSION FENCING (BY YWRP)
- EXISTING OVERHEAD POWER LINE TO REMAIN
- TEMPORARY ACCESS ROUTE

N

0 200 400

SCALE IN FEET

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NO.	BY	DATE	REVISION DESCRIPTION

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APPROVED	DATE	PROJECT
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PROPOSED FLOODPLAIN BERM

SHEET 13 OF 32

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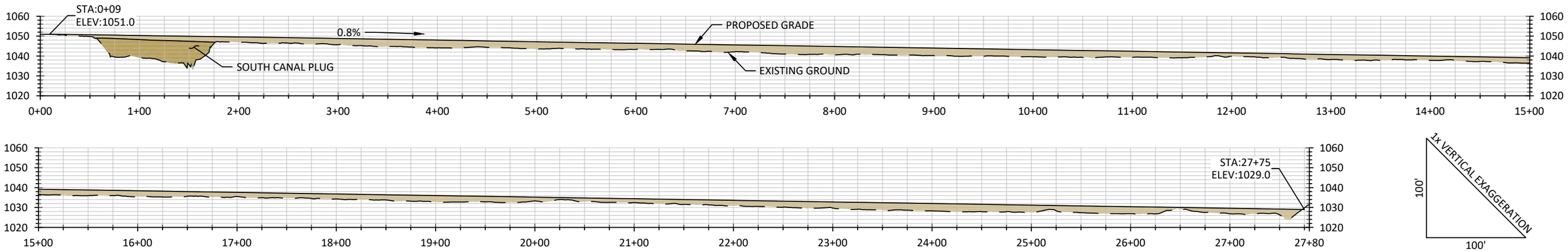
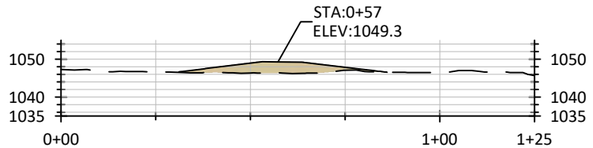
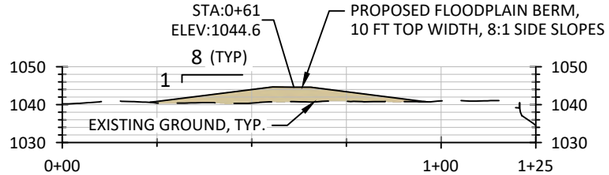


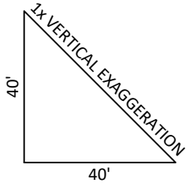
1/14 PROPOSED FLOODPLAIN BERM PROFILE
FLOODPLAIN BERM ALIGNMENT

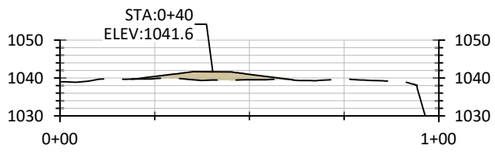


2/14 SECTION - PROPOSED FLOODPLAIN BERM
BERM STA 5+14

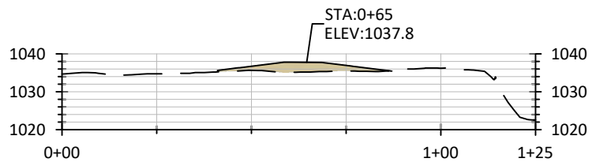


3/14 SECTION - PROPOSED FLOODPLAIN BERM
BERM STA 10+90





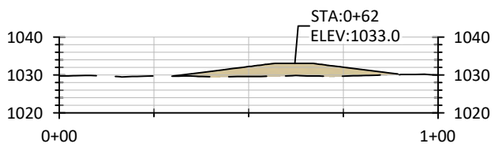
4/14 SECTION - PROPOSED FLOODPLAIN BERM
BERM STA 14+65



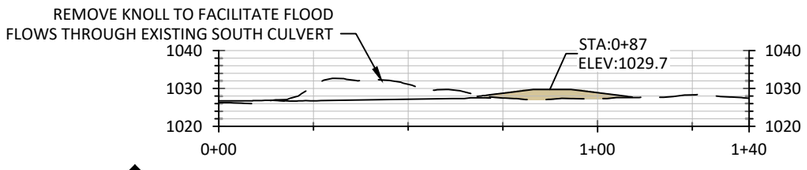
5/14 SECTION - PROPOSED FLOODPLAIN BERM
BERM STA 19+48

LEGEND

- PROPOSED GRADE
- EXISTING GRADE
- PROPOSED FILL AREA



6/14 SECTION - PROPOSED FLOODPLAIN BERM
BERM STA 25+37



7/14 SECTION - PROPOSED FLOODPLAIN BERM
BERM STA 29+53

NO.	BY	DATE	REVISION DESCRIPTION

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PROPOSED FLOODPLAIN BERM SECTIONS & PROFILE

SHEET 14 OF 32

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LEGEND

- EXISTING 2-FT CONTOURS
- PROPOSED 1-FT CONTOURS
- LIMIT OF CONSTRUCTION DISTURBANCE
- TEMPORARY ACCESS ROUTE
- PROPOSED STAGING / STOCKPILE AREA
- PROPOSED CHANNEL GRADING
- PROPOSED FILL AREA
- FLOODPLAIN ROUGHNESS ZONES, SEE SHEET 32
- BANK-BURIED HABITAT LARGE WOOD, SEE SHEET 26

0 70 140

SCALE IN FEET

FLOW

CONNECTOR 2

CONNECTOR 2, 15 FT BOTTOM WIDTH WITH 2:1 SIDE SLOPES TO EXISTING, SEE PROFILE

5/16

2/16

1/16

3/16

4/16

FILL LOW AREA

STAGING AREA

0+00 1+00 2+00 3+00 4+00 4+56 48+00 49+00 50+00 51+00 52+00 53+00 44+00 43+00 45+00 47+00 46+00 42+00 41+00 40+00 39+00

MATCHLINE SHEET 11

MATCHLINE SHEET 18

NO.	BY	DATE	REVISION DESCRIPTION

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PROPOSED HABITAT ENHANCEMENTS & CONNECTOR 2

SHEET 15 OF 32

MICHAEL R. McALLISTER
STATE OF WASHINGTON
38180
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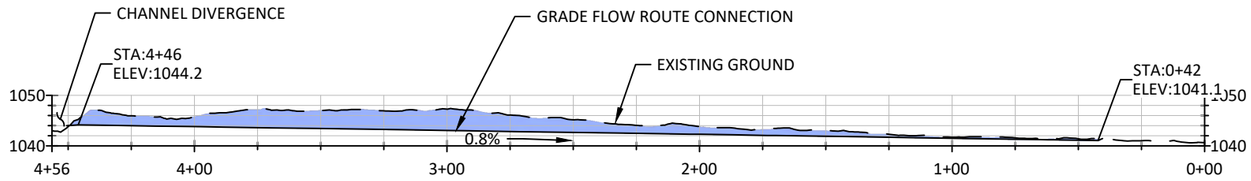
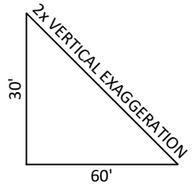
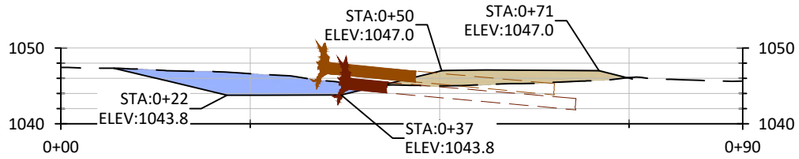


5/16 PROPOSED CONNECTOR 2 PROFILE

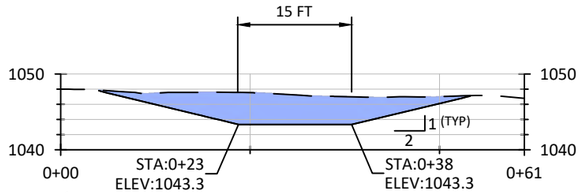
SECONDARY CHANNEL STA 0+00 - STA 4+56





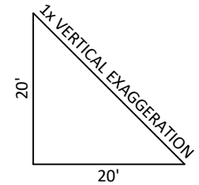
1/16 SECTION - CONNECTOR 2 CHANNEL

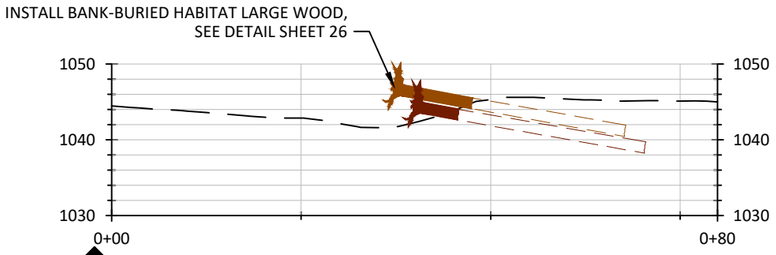
SECONDARY CHANNEL STA 3+94



2/16 SECTION - CONNECTOR 2 CHANNEL

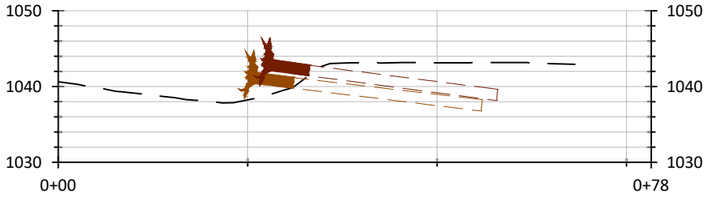
SECONDARY CHANNEL STA 3+35





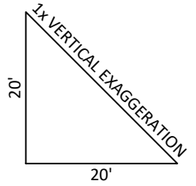
3/16 SECTION - LARGE WOOD HABITAT STRUCTURE 1

REACTIVATED MAINSTEM CHANNEL



4/16 SECTION - LARGE WOOD HABITAT STRUCTURE 3

REACTIVATED MAINSTEM CHANNEL



LEGEND

- PROPOSED GRADE
- EXISTING GRADE
- PROPOSED CHANNEL GRADING
- PROPOSED FILL AREA

NO.	BY	DATE	REVISION DESCRIPTION

BB, NS, JR DRAWN | MM, PL, EA, MB DESIGNED | PL, JG CHECKED

MM APPROVED | MAR 2025 DATE | 200203 PROJECT

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PROPOSED HABITAT ENHANCEMENTS AND CONNECTOR 2 PROFILES

SHEET 16 OF 32

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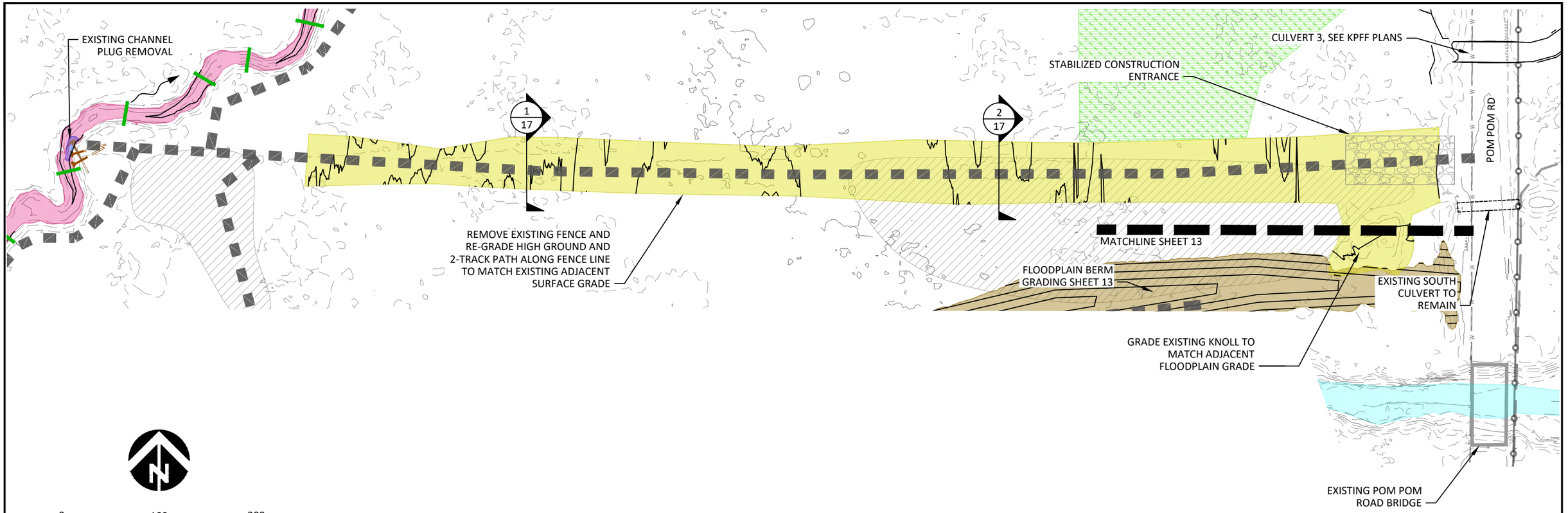
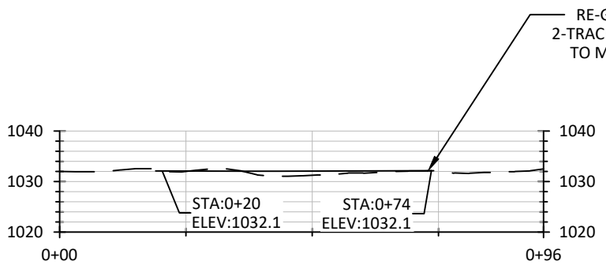
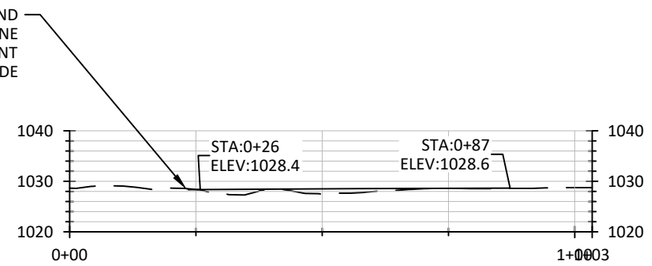


LEGEND

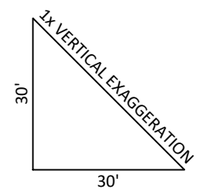
- EXISTING 2-FT CONTOURS
- PROPOSED 1-FT CONTOURS
- EXISTING OVERHEAD POWER LINE
- EXISTING WATERMAIN
- LIMIT OF CONSTRUCTION DISTURBANCE
- TEMPORARY ACCESS ROUTE
- EXISTING LOW FLOW (28 CFS)
- PROPOSED STAGING / STOCKPILE AREA
- PROPOSED EXISTING 2-TRACK REGRADING
- PROPOSED CHANNEL SEDIMENT AUGMENTATION
- PROPOSED FILL AREA
- FLOODPLAIN ROUGHNESS ZONES, SEE SHEET 32



1/17 SECTION - 2-TRACK REGRADE



2/17 SECTION - 2-TRACK REGRADE



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MM	MAR 2025	200203

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DECOMMISSION EXISTING 2-TRACK

SHEET
17 OF 32

MICHAEL R. McALLISTER
STATE OF WASHINGTON
38180
REGISTERED
PROFESSIONAL ENGINEER
EXPIRES 09-25-2025

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LEGEND

- EXISTING 2-FT CONTOURS
- PROPOSED 1-FT CONTOURS
- LIMIT OF CONSTRUCTION DISTURBANCE
- TEMPORARY ACCESS ROUTE
- PROPOSED STAGING / STOCKPILE AREA
- FLOODPLAIN ROUGHNESS ZONES, SEE SHEET 31
- PROPOSED FILL AREA
- CHANNEL SEDIMENT AUGMENTATION
- PROPOSED CHANNEL GRADING
- PROPOSED EXISTING 2-TRACK REGRADING
- BANK-BURIED HABITAT LARGE WOOD, SEE SHEET 26
- POST-ASSISTED ROUGHNESS FEATURE, SEE SHEET 19

NOTE:
1. CUT DOWN BURNED TREES AND INCORPORATE THEM INTO THE CHANNEL AND SEDIMENT AUGMENTATION CHANNEL FILL, SEE SHEET 27
2. SEDIMENT AUGMENTATION GRAVEL TO BE HARVESTED FROM SOUTH CANAL PLUG AREA, SEE SHEET 12

0 80 160

SCALE IN FEET

MATCHLINE SHEET 15

MATCHLINE SHEET 21

UPSTREAM END SEDIMENT AUGMENTATION AND ROUGHNESS

SEDIMENT AUGMENTATION AND ROUGHNESS, SEE PROFILE 1/19

2/19

3/19

39+00 38+00 37+00 36+00 35+00 34+00 33+00 32+00 31+00 30+00 29+00 28+00 27+00 26+00 25+00

REACTIVATED MAINSTEM CHANNEL

STAGING AREA (NATURAL MATERIALS ONLY)

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PROPOSED SEDIMENT AUGMENTATION AND ROUGHNESS

SHEET 18 OF 32

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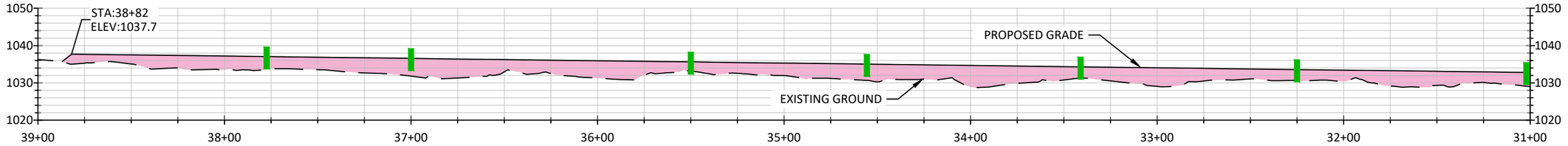
STATE OF WASHINGTON
23180
REGISTERED
PROFESSIONAL ENGINEER
EXPIRES 09-12-2025

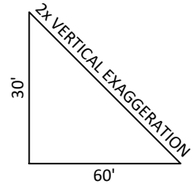


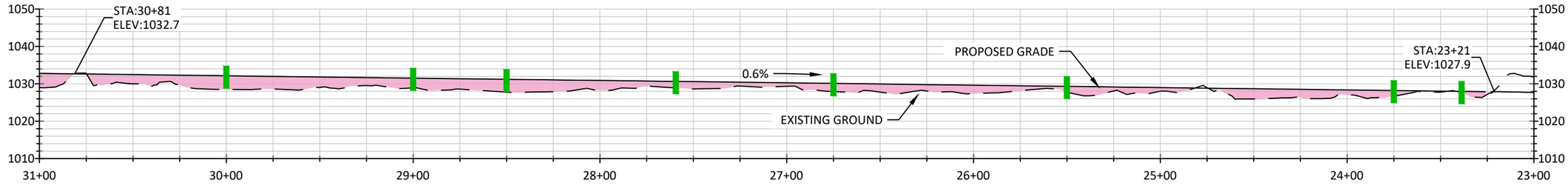
1/19 PROFILE-SEDIMENT AUGMENTATION
REACTIVATED MAINSTEM CHANNEL STA 39+00 - 31+00

LEGEND

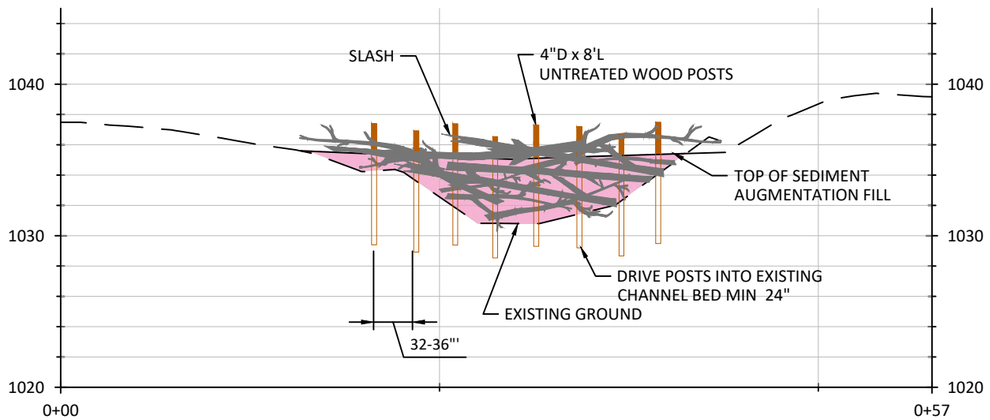
- PROPOSED GRADE
- EXISTING GRADE
- CHANNEL SEDIMENT AUGMENTATION
- POST-ASSISTED ROUGHNESS FEATURE

NOTE:
FILL CHANNEL TO DESIGN GRADE WITH SEDIMENT SOURCED FROM THE HARVEST AREA (SOUTH CANAL WITHIN PLUG FOOTPRINT). FILL TO BE MIXED WITH SLASH. POST ASSISTED ROUGHNESS FEATURES ALSO INSTALLED AT DESIGNATED LOCATIONS.

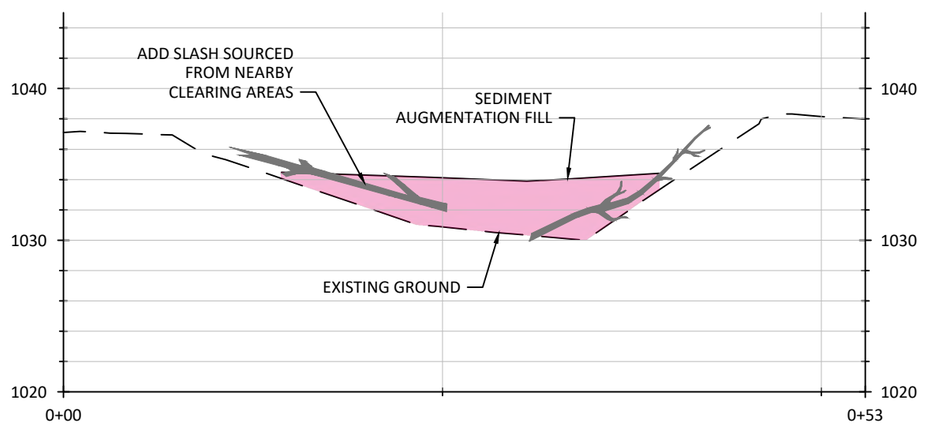




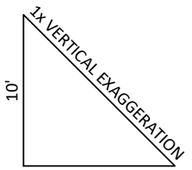
1/19 PROFILE-SEDIMENT AUGMENTATION
REACTIVATED MAINSTEM CHANNEL STA 31+00 - 23+00



2/19 SECTION - SEDIMENT AUGMENTATION & POST-ASSISTED ROUGHNESS FEATURE
REACTIVATED MAINSTEM CHANNEL STA 34+60



3/19 SECTION - SEDIMENT AUGMENTATION
REACTIVATED MAINSTEM CHANNEL STA 22+75



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PROPOSED SEDIMENT AUGMENTATION PROFILE & SECTIONS

SHEET 19 OF 32

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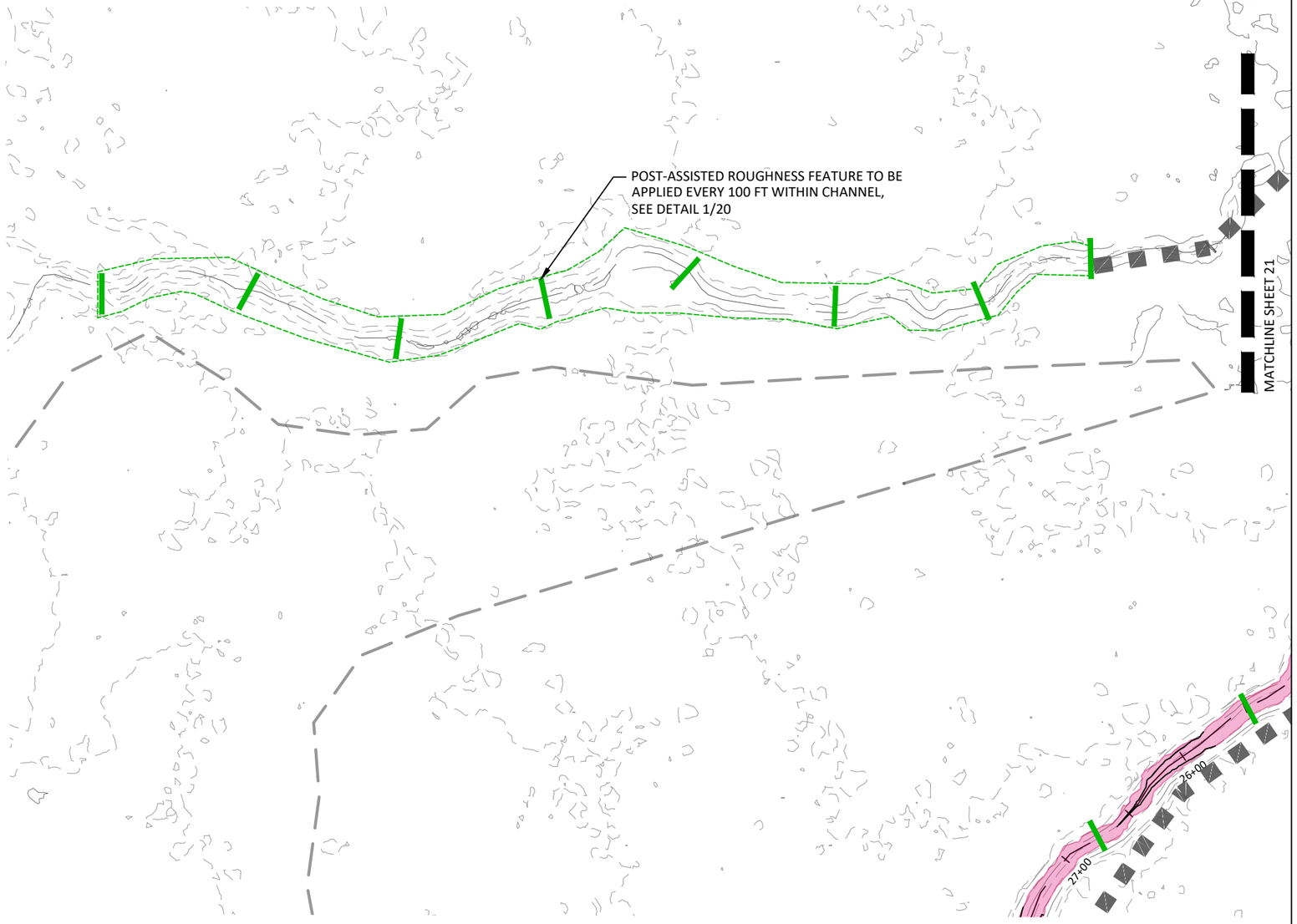
LEGEND

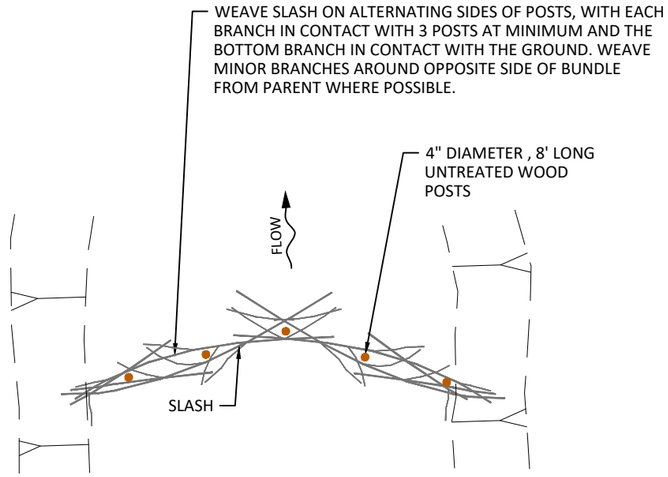
- EXISTING 2-FT CONTOURS
- LIMIT OF CONSTRUCTION DISTURBANCE
- TEMPORARY ACCESS ROUTE
- PROPOSED STAGING / STOCKPILE AREA
- POST-ASSISTED ROUGHNESS FEATURE

0 80 160

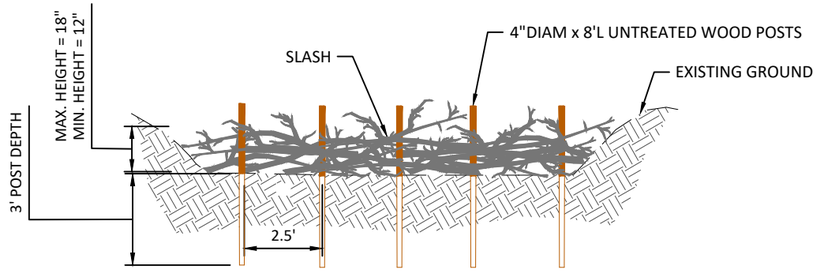
SCALE IN FEET

NOTE:
CUT DOWN BURNED TREES AND INCORPORATE THEM INTO THE CHANNEL , SEE SHEET 27





PLAN



SECTION

1/20 POST-ASSISTED ROUGHNESS FEATURE
NOT TO SCALE

MICHAEL R. McALLISTER
STATE OF WASHINGTON
21819
REGISTERED
PROFESSIONAL ENGINEER
EXPIRES 09-25-2025

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POST-ASSISTED ROUGHNESS PLAN & DETAIL

SHEET 20 OF 32

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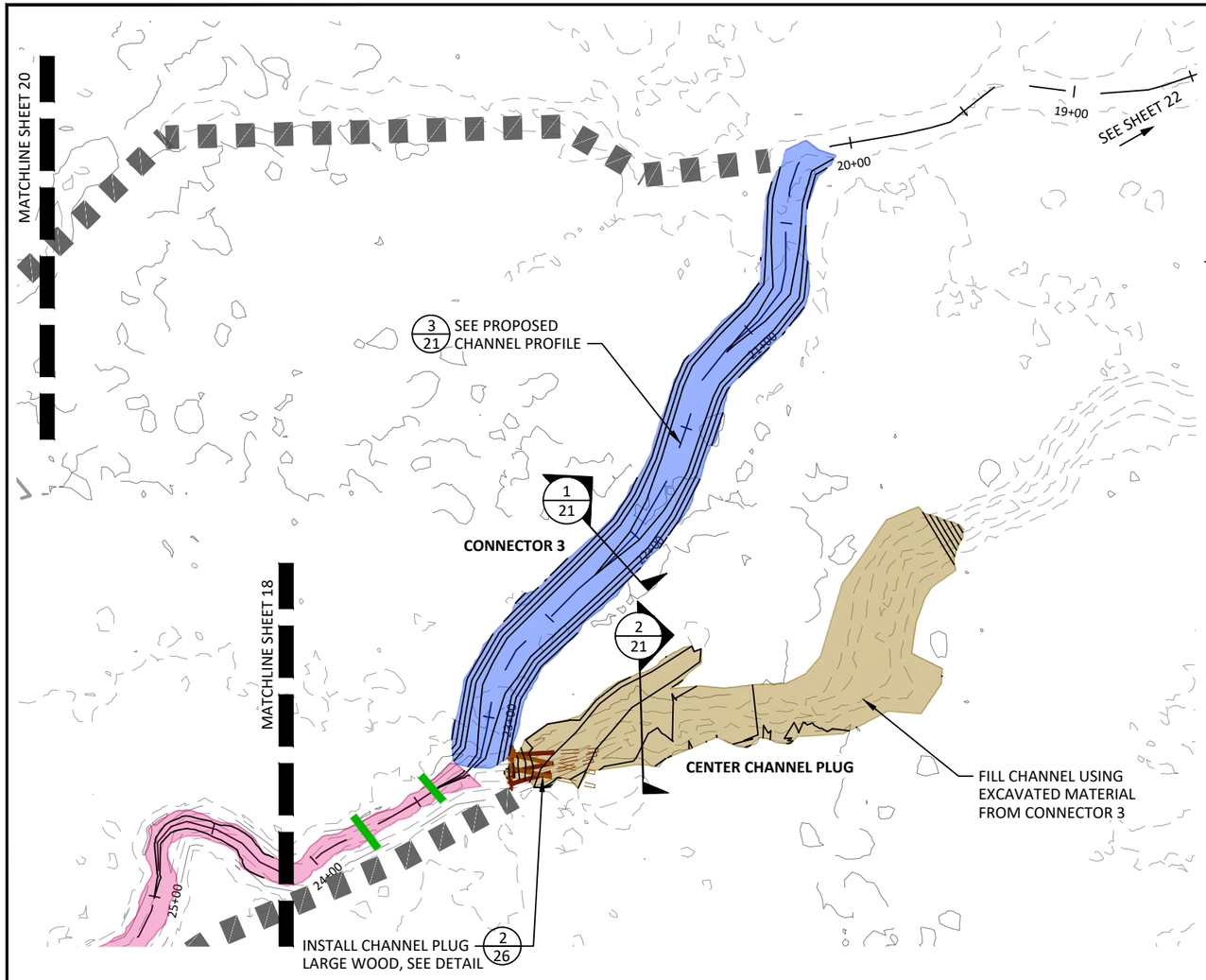
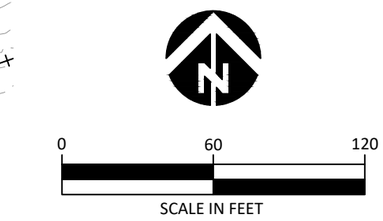
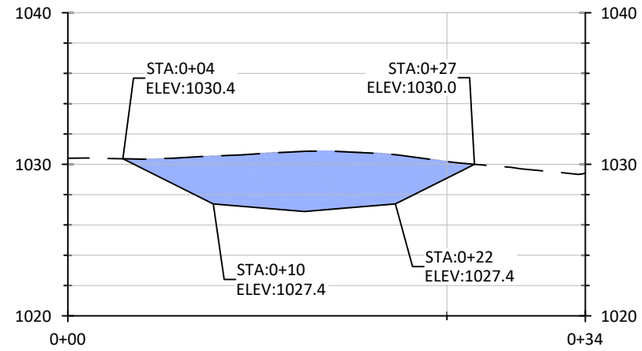


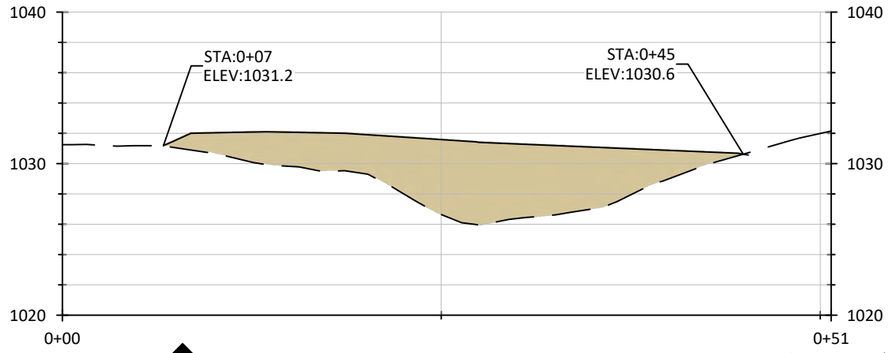


LEGEND

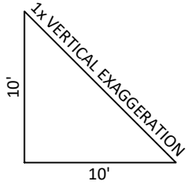
- EXISTING 2-FT CONTOURS
- PROPOSED 1-FT CONTOURS
- TEMPORARY ACCESS ROUTE
- PROPOSED FILL AREA
- CHANNEL SEDIMENT AUGMENTATION
- PROPOSED CHANNEL GRADING
- POST-ASSISTED ROUGHNESS FEATURE

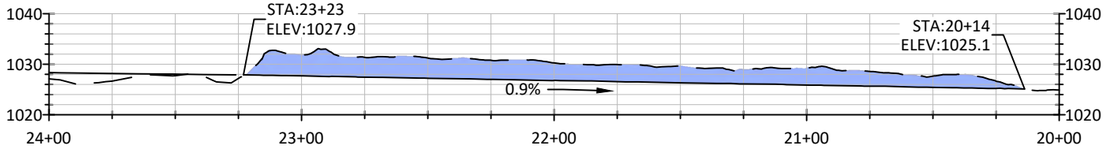


1/21 SECTION - CONNECTOR CHANNEL 3
REACTIVATED MAINSTEM CHANNEL STA 27+50

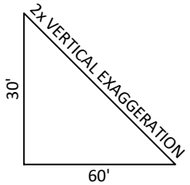


2/21 SECTION - PROPOSED CENTER CHANNEL PLUG





3/21 PROFILE-PROPOSED CONNECTOR CHANNEL 3
REACTIVATED MAINSTEM CHANNEL STA 20+15 - 23+25



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PROPOSED CONNECTOR 3
PLAN, SECTIONS, & PROFILE

SHEET
21 OF 32

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0 60 120

SCALE IN FEET

LEGEND

- EXISTING 2-FT CONTOURS
- PROPOSED 1-FT CONTOURS
- EXISTING OVERHEAD POWER LINE
- W EXISTING WATERMAIN
- LIMIT OF CONSTRUCTION DISTURBANCE
- CONSTRUCTED RIFFLE
- CONSTRUCTION BY OTHERS (SEE KPFF PLANS)
- PROPOSED CHANNEL GRADING
- TEMPORARY ACCESS ROUTE
- COFFER DAM

EXISTING NORTH CULVERT TO REMAIN

150 FT BRIDGE WITH CONSTRUCTED RIFFLE. REFER TO KPFF PLANS

WATER MAIN AND UTILITIES MANAGEMENT INCLUDED IN KPFF BRIDGE DESIGN PLANS

CONSTRUCTED RIFFLE

COFFERDAM, SEE DETAIL SHEET 7

FLOW

4+00

5+00

6+00

7+00

8+00

9+00

10+00

11+00

12+00

13+00

14+00

15+00

3 / 23

4 / 23

2 / 23

5 / 23

1 / 23

CONSTRUCTED RIFFLE

POM POM RD

PROPOSED MAINSTEM CONNECTOR 4, SEE PROFILE

RIFFLE CREST KEY

TEMPORARY STABILIZED CONSTRUCTION ENTRANCE

REMOVE EXISTING CULVERT. SEE KPFF PLANS.

DITCH FILL

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PROPOSED CONSTRUCTED RIFFLE

SHEET 22 OF 32

MICHAEL R. McALLISTER
STATE OF WASHINGTON
38189
REGISTERED
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EXPIRES 09-26-2025

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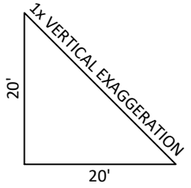
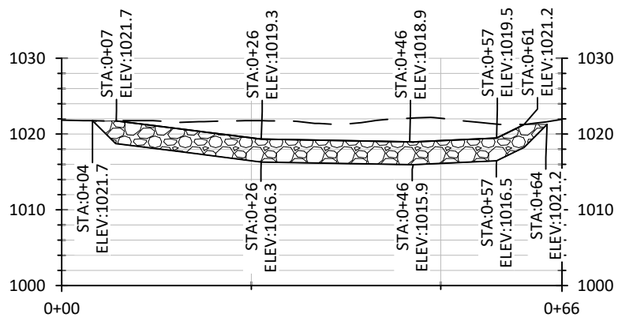
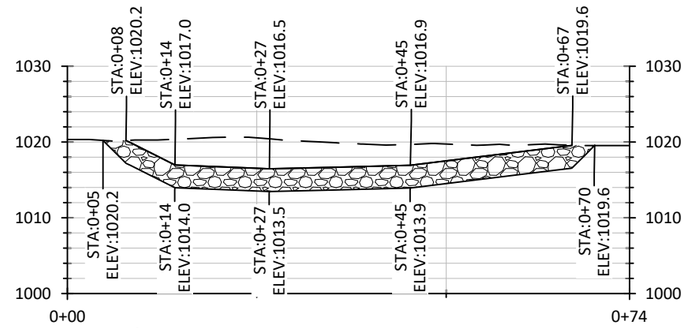
NOTE: SEE KPFF PLANS FOR BRIDGE AND EXISTING WATERLINE RELOCATION DESIGN

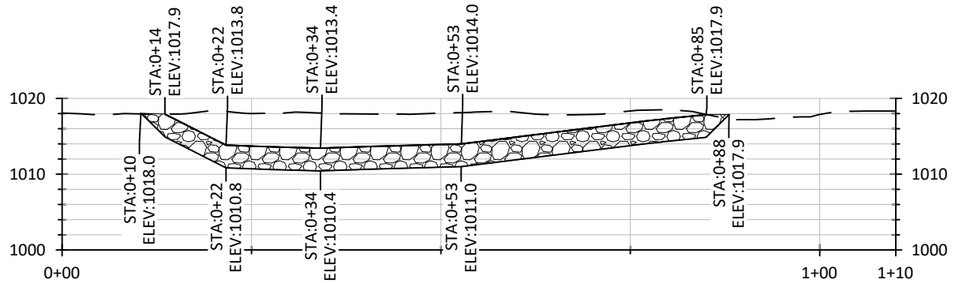




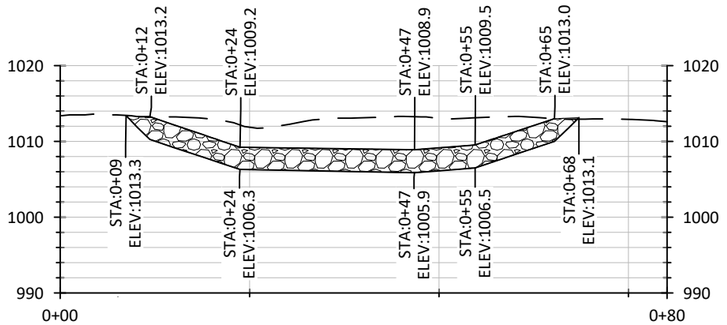
1 / 23 SECTION - CONSTRUCTED RIFFLE
REACTIVATED MAINSTEM CHANNEL STA 13+73



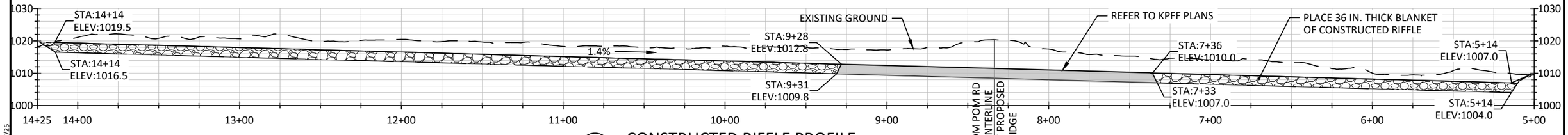
2 / 23 SECTION - CONSTRUCTED RIFFLE
REACTIVATED MAINSTEM CHANNEL STA 11+96



3 / 23 SECTION - CONSTRUCTED RIFFLE
REACTIVATED MAINSTEM CHANNEL STA 9+78



4 / 23 SECTION - CONSTRUCTED RIFFLE
REACTIVATED MAINSTEM CHANNEL STA 6+51



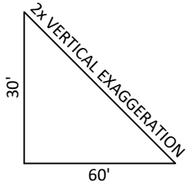
5 / 23 CONSTRUCTED RIFFLE PROFILE
REACTIVATED MAINSTEM CHANNEL

LEGEND

PROPOSED GRADE

EXISTING GRADE

CONSTRUCTED RIFFLE



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PROPOSED CONSTRUCTED RIFFLE SECTIONS & PROFILES

SHEET 23 OF 32

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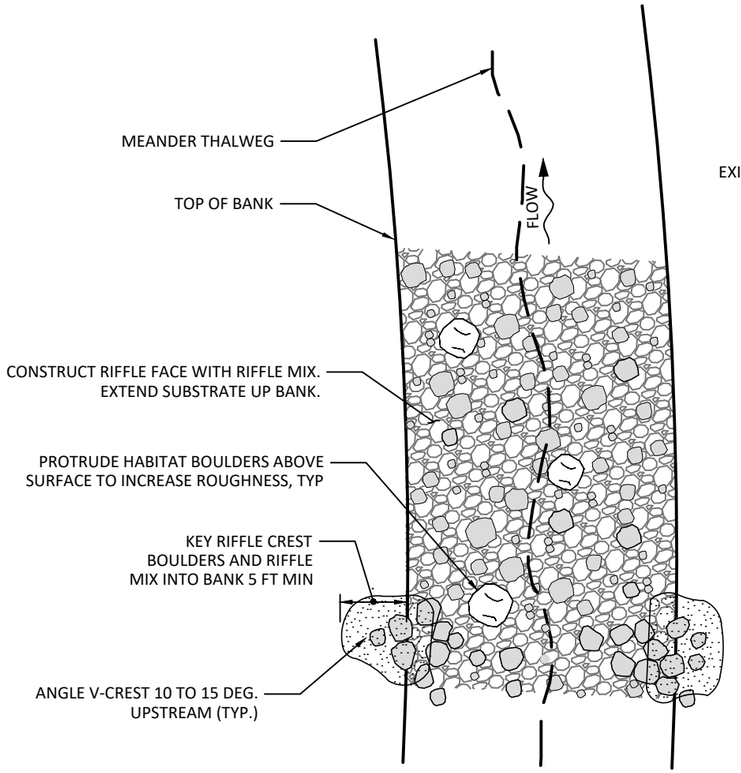
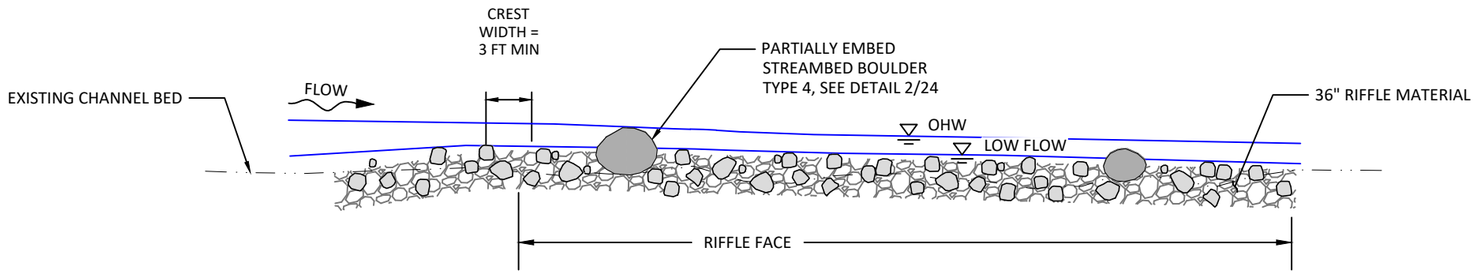


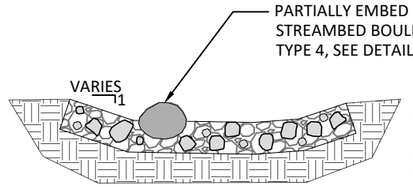
PLAN



PROFILE

NOTES:

1. LIMITS OF RIFFLE SHOWN ON THE PLAN AND PROFILE SHEETS.
2. WITHIN THE LIMITS OF THE RIFFLE STRUCTURES, EXTEND RIFFLE MIX TO THE TOP OF BANKFULL CHANNEL.
3. SHAPE RIFFLE BED TO CREATE A 1 FT DEEP LOW FLOW PATH.
4. WASH FINES TO SEAL BED PROPERLY AND PREVENT FLOWS FROM GOING SUBSURFACE.

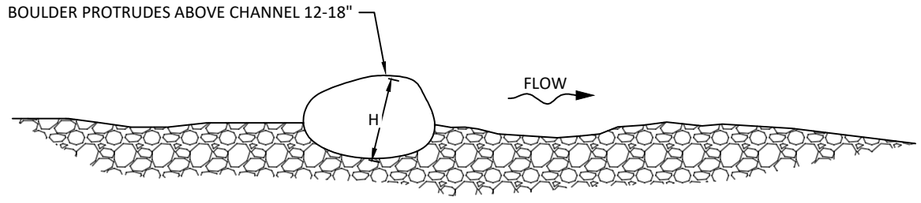


SECTION

NOTE:

KEY RIFFLE INTO IN-SITU GRAVEL/ COBBLE MATERIAL. IF APPROPRIATE IN-SITU GRAVEL/COBBLE MATERIAL IS NOT ENCOUNTERED, WIDTH OF RIFFLE KEYED INTO BANK SHALL BE INCREASED.

1/24 TYPICAL DETAIL - CONSTRUCTED RIFFLE
NOT TO SCALE



2/24 TYPICAL DETAIL - STREAMBED BOULDER TYPE 4
NOT TO SCALE

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APPROVED	DATE	PROJECT

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TYPICAL DETAILS
CONSTRUCTED RIFFLE

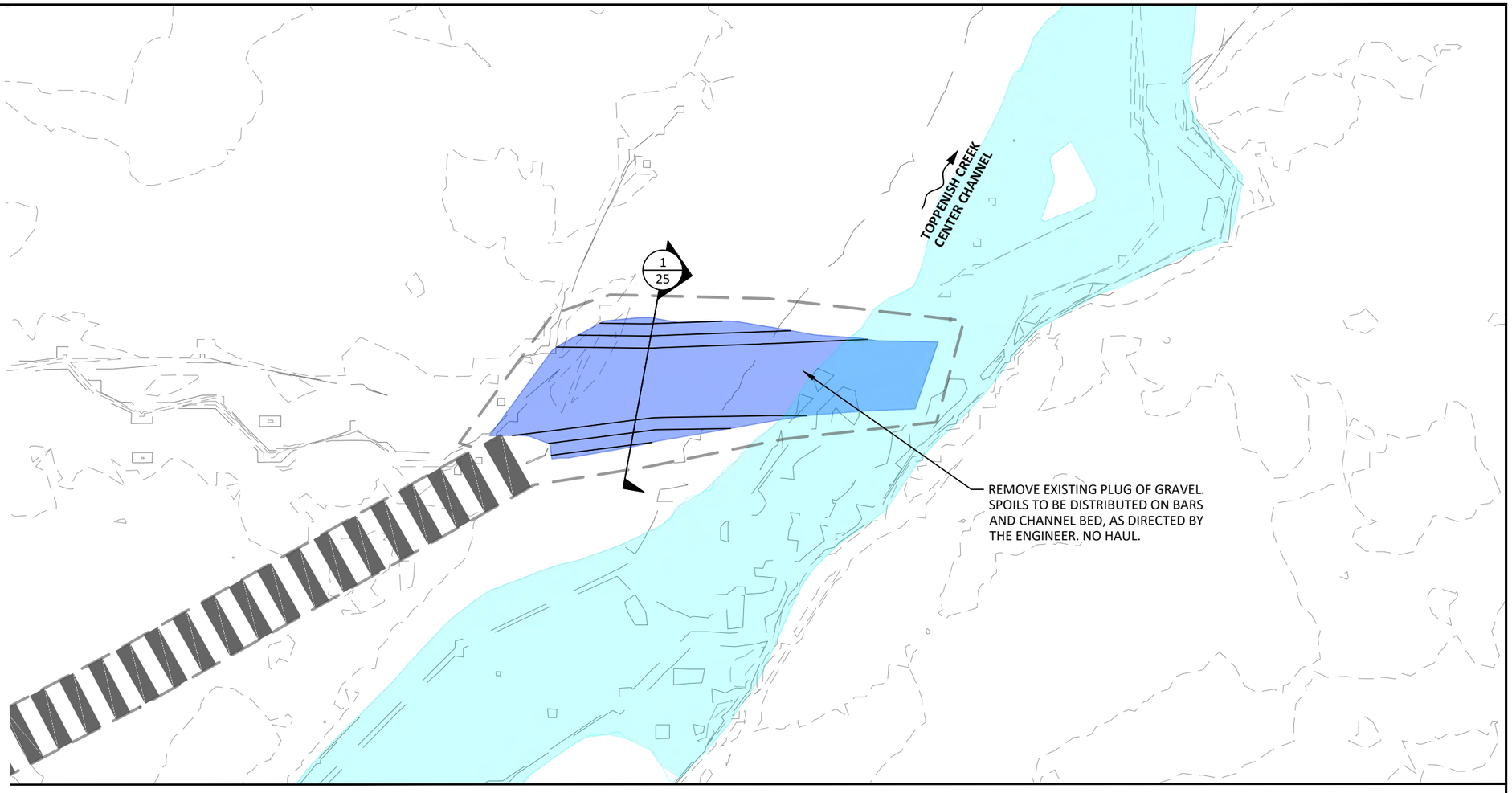
SHEET
24 OF 32

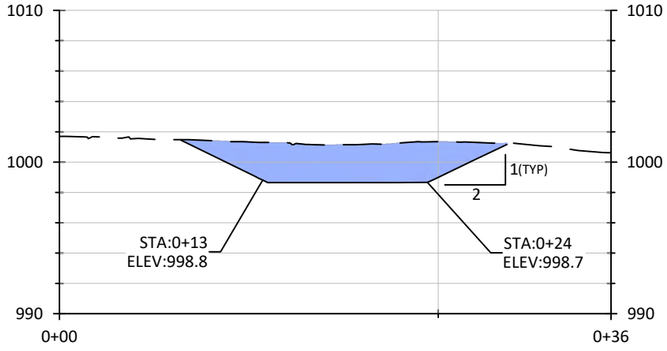
0 20 40

SCALE IN FEET

LEGEND

- EXISTING 2-FT CONTOURS
- PROPOSED 1-FT CONTOURS
- PROPOSED CHANNEL GRADING
- EXISTING LOW FLOW (28 CFS)
- LIMIT OF CONSTRUCTION DISTURBANCE
- TEMPORARY ACCESS ROUTE





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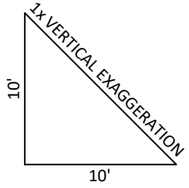
25
SECTION - CHANNEL CONNECTION



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MAR 2025 — DATE
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CHANNEL CONNECTION GRADING & SECTION

SHEET
25 OF 32

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STATE OF WASHINGTON
38189
REGISTERED
PROFESSIONAL ENGINEER
EXPIRES 09-22-2025

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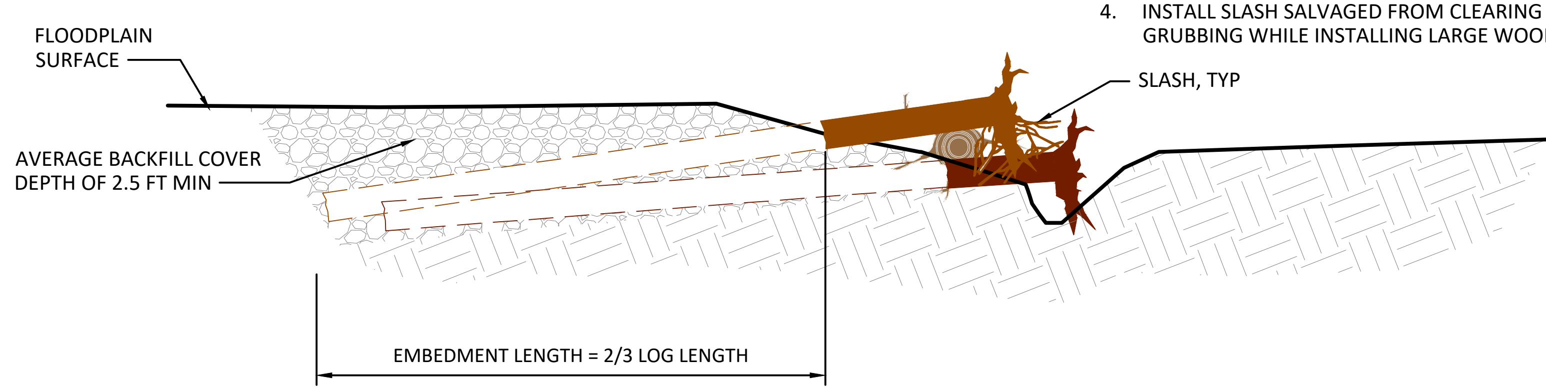
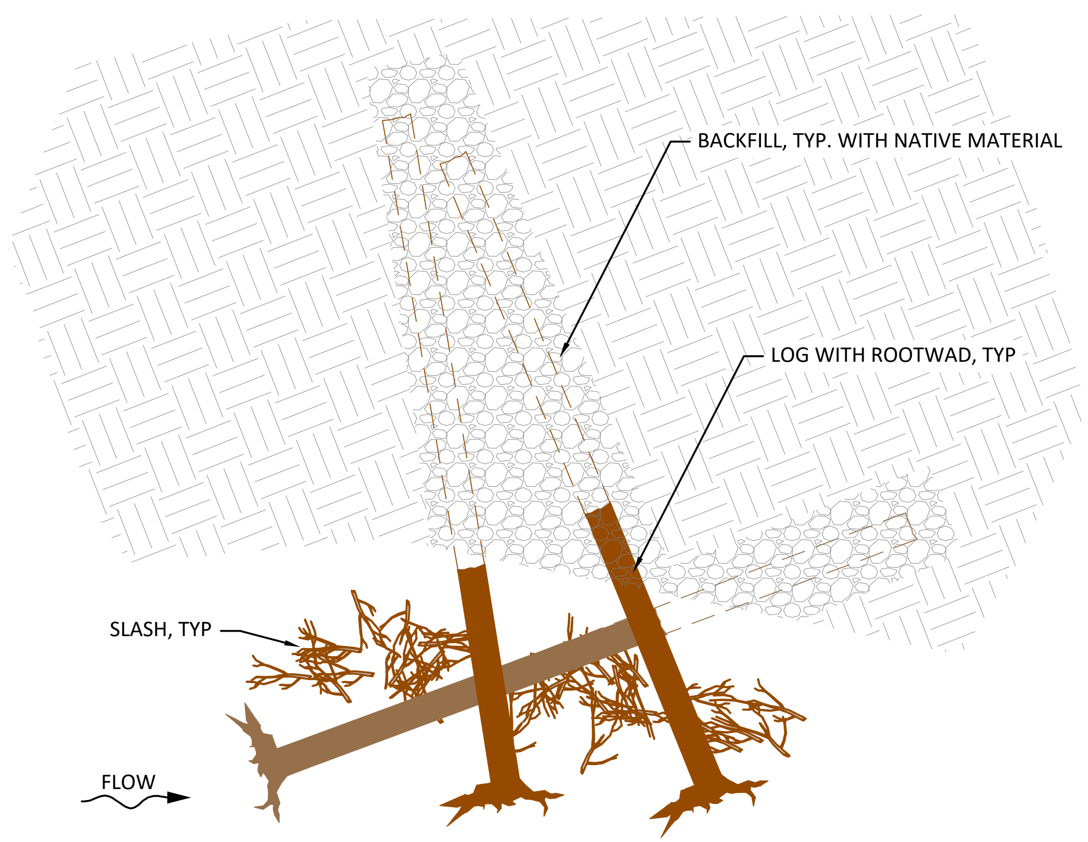
NOTES:

1. LARGE WOOD SHALL BE LOGS WITH ROOTS HAVING APPROXIMATE DIMENSIONS OF 40 FEET LONG AND 18 INCHES MINIMUM DIAMETER AT BREAST HEIGHT (DBH).
2. LARGE WOOD SIZES, LOCATIONS, AND ORIENTATIONS SHOWN IN THE PLANS ARE SUBJECT TO CHANGE IN THE FIELD.
3. INSTALLATION SHALL BE FIT-IN-THE FIELD GUIDED BY ENGINEER.
4. INSTALL SLASH SALVAGED FROM CLEARING AND GRUBBING WHILE INSTALLING LARGE WOOD.



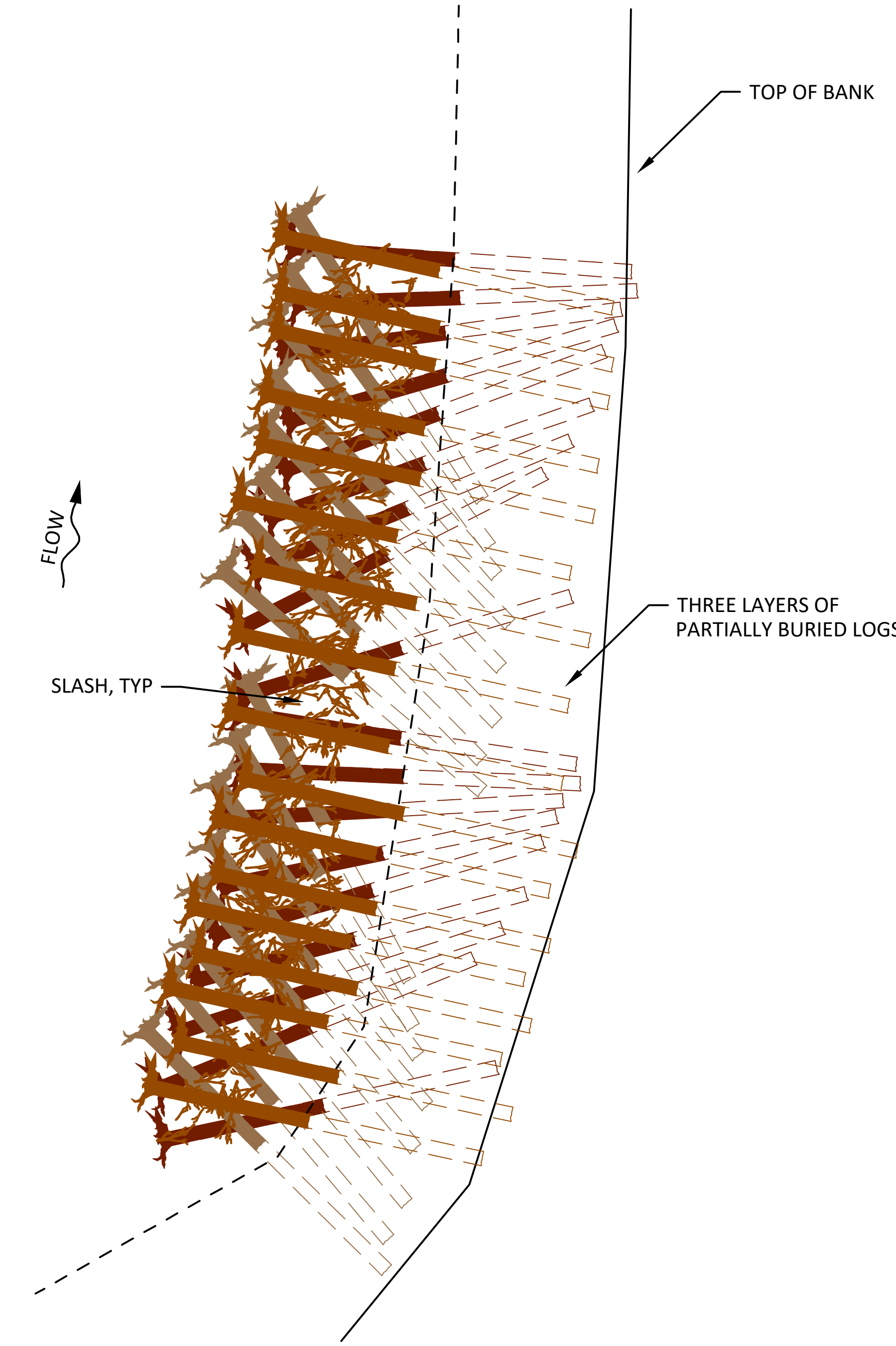
SECTION



PLAN

1/26 BANK-BURIED HABITAT LARGE WOOD

NOT TO SCALE



2/26 CHANNEL PLUG LARGE WOOD

NOT TO SCALE

NO.	BY	DATE	REVISION DESCRIPTION

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TYPICAL DETAILS LARGE WOOD HABITAT STRUCTURE

SHEET 26 OF 32

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0 250 500

SCALE IN FEET

LEGEND

- CLEARING LIMITS
- CLEARING-RESTRICTED IMPACTS
- REQUIRED DEAD TREE REMOVAL ZONE
- EXISTING LOW FLOW (28 CFS)
- EXISTING 2-FT CONTOURS
- PROPOSED 1-FT CONTOURS
- LIMIT OF CONSTRUCTION DISTURBANCE

CLEARING NOTES:

1. REMOVE DEAD PORTIONS OF BURNED TREES IN DESIGNATED AREAS.
2. REUSE GENERATED MATERIAL ON SITE AS SLASH OR AS OTHERWISE DIRECTED BY CONTRACT REPRESENTATIVE.
3. CUT BURNED TREES NEAR THE BASE BUT ABOVE ALL LIVING BRANCHES AND SPROUTS.
4. REMOVE ALL BURNED TREES IN THE ZONE OF REQUIRED CLEARING.
5. CLEARING AREAS OUTSIDE OF THE REQUIRED REMOVAL ZONE SHALL BE CLEARED AS NEEDED TO GENERATE NEEDED MATERIAL - PRIORITIZING AREAS ALONG FLOW PATHS.

CLEARING-RESTRICTED IMPACTS NOTES:

1. THESE ARE ASPEN REGENERATION AREAS WHERE NO HEAVY EQUIPMENT SHALL BE ALLOWED.
2. BURNED TREE REMOVAL SHALL BE DONE BY HAND LABOR AND SMALL VEHICLES ONLY
3. REUSE GENERATED MATERIAL ON SITE AS SLASH OR AS OTHERWISE DIRECTED BY CONTRACT REPRESENTATIVE.
4. CUT BURNED TREES NEAR THE BASE BUT ABOVE ALL LIVING BRANCHES AND SPROUTS.

POM POM RD

SOUTH CANAL

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DEAD TREE REMOVAL & SLASH SOURCE PLAN

SHEET
27 OF 32

MICHAEL R. McALLISTER
STATE OF WASHINGTON
18189
REGISTERED
PROFESSIONAL ENGINEER
EXPIRES 09-26-2025

0 400 800

SCALE IN FEET

LEGEND

- TRANSITIONAL SEEDING ZONE, SEE SHEET 29
- RIPARIAN SEEDING AND PLANTING ZONE, SEE SHEET 29
- EXISTING LOW FLOW (28 CFS)
- EXISTING 2-FT CONTOURS
- PROPOSED 1-FT CONTOURS
- LIMIT OF CONSTRUCTION DISTURBANCE

MARION DRAIN RD

SOUTH CANAL

POM POM RD

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SEEDING & PLANTING PLAN

SHEET

28 OF 32

MICHAEL R. McALLISTER
STATE OF WASHINGTON
38189
REGISTERED
PROFESSIONAL ENGINEER

EXPIRES 09-26-2025

SEED MIX

TRANSITIONAL SEEDING AREA (56.7 ACRES)		
Seeding rate: 40 lbs/acre (2268 lbs)		
COMMON NAME	**SCIENTIFIC NAME**	**PERCENT OF WHOLE MIX**
Blue wildrye	*Elymus glaucus*	31%
Bluebunch wheatgrass	*Pseudoroegneria spicata* var. *anatone*	25%
Indian ricegrass	*Achnatherum hymenoides*	20%
Sandbergs bluegrass	*Poa secunda*	5%
Western Yarrow	*Achillea millefolium occidentalis*	1%
Idaho fescue	*Festuca idahoensis*	8%
California oatgrass	*Danthonia californica*	10%

TRANSITIONAL SEEDING NOTES:

1. ALL AREAS IMPACTED BY CONSTRUCTION SHALL BE SEEDED WITHIN 3 DAYS OF WORK AREA COMPLETION.
2. SEED MIX TO BE APPLIED WITH 50:50 RICE HULLS (BY VOLUME) TO FACILITATE EVEN DISTRIBUTION.
3. STRAW MULCH TO BE APPLIED AT A RATE OF 2 TONS/ACRE AND LEAVE APPROXIMATELY 25% OF THE GROUND SURFACE VISIBLE OVER ALL DISTURBED AREAS.
4. STRAW MULCH IS CONSIDERED INCIDENTAL TO SEEDING.

SEED MIX

RIPARIAN SEEDING AREA (63.7 ACRES)		
Seeding rate: 40 lbs/acre (2548 lbs)		
COMMON NAME	**SCIENTIFIC NAME**	**PERCENT OF WHOLE MIX**
Blue wildrye	*Elymus glaucus*	50%
Thickspike wheatgrass	*Elymus lanceolatus* var. *critana*	44%
Bluejoint reedgrass	*Calamagrostis canadensis*	1%
Analogue sedge	*Carex simulata*	5%

RIPARIAN SEEDING NOTES:

1. ALL AREAS IMPACTED BY CONSTRUCTION SHALL BE SEEDED WITHIN 3 DAYS OF WORK AREA COMPLETION.
2. ALL RIPARIAN SEED WILL BE APPLIED BY HAND CREWS USING A SEED DRILL OR BROADCAST SPREADER.
3. SEED MIX TO BE APPLIED WITH 50:50 CRACKED CORN (BY VOLUME) TO FACILITATE EVEN DISTRIBUTION.
4. STRAW MULCH TO BE APPLIED OVER ALL DISTURBED AREAS.
5. STRAW MULCH IS CONSIDERED INCIDENTAL TO SEEDING.

PLANTING TABLES

RIPARIAN PLANTING AREA (63.7 ACRES)							
COMMON NAME	**SCIENTIFIC NAME**	**STRATA**	**TYPE**	**SIZE**	**DENSITY**	**PERCENT OF MIX**	**QUANTITY (EA)**
Black cottonwood	*Populus balsamifera* ssp. *trichocarpa*	Overstory	Plug	40 cubic inch	20 feet on center	50%	3470
Coyote willow	*Salix exigua*	Overstory	Plug	40 cubic inch	20 feet on center	50%	3470
Black hawthorn	*Crataegus douglasii*	Understory	Plug	40 cubic inch	10 feet on center	20%	4160
Mock orange	*Philadelphus lewisii*	Understory	Plug	40 cubic inch	10 feet on center	15%	3120
Red osier dogwood	*Cornus sericea*	Understory	Plug	40 cubic inch	10 feet on center	20%	4160
Pacific willow	*Salix lucida* spp. *lasiandra*	Understory	Plug	40 cubic inch	10 feet on center	15%	3120
Woods' rose	*Rosa woodsii*	Understory	Plug	40 cubic inch	10 feet on center	15%	3120
Western serviceberry	*Amelanchier alnifolia*	Understory	Plug	40 cubic inch	10 feet on center	15%	3120

LIVE CUTTING TRENCHES (11460 LF)						
COMMON NAME	**SCIENTIFIC NAME**	**TYPE**	**SIZE**	**DENSITY**	**PERCENT OF MIX**	**QUANTITY (EA)**
Black cottonwood	*Populus balsamifera* ssp. *trichocarpa*	Live stake	3/4" to 1-1/2" diameter, 5-6 ft long	10 feet on center	100%	1200
Coyote willow	*Salix exigua*	Live stake	3/4" to 1-1/2" diameter, 5-6 ft long	2 feet on center	50%	2290
Pacific willow	*Salix lucida* spp. *lasiandra*	Live stake	3/4" to 1-1/2" diameter, 5-6 ft long	2 feet on center	50%	2290

LIVE PLANTING AND LIVE CUTTING TRENCH NOTES:

1. QUANTITY REFERS TO NUMBER OF INDIVIDUAL LIVE CUTTINGS.
2. LOCALIZED ADJUSTMENTS TO THE NEAREST APPROPRIATE LOCATION MAY BE MADE TO OPTIMIZE PLANTING CONDITIONS (WITHIN 5 FEET LATERALLY OF THE DESIGNATED SPACE) SUCH AS AVOIDING PLANTING ON LOGS, OTHER PLANTS, COMPACTED SLASH, ROCK OUTCROPS, COBBLE, GRAVEL, OR STANDING WATER MAY BE MADE.
3. SPECIES COMPOSITION SHALL BE EVENLY MIXED THROUGHOUT THE FULL SPATIAL EXTENT OF THE RIPARIAN PLANTING AREA AND BE CHOSEN IN ACCORDANCE WITH THE RIPARIAN REVEGETATION AREA SPECIES.

NO.	BY	DATE	REVISION DESCRIPTION

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SEED MIX AND PLANTING TABLES

SHEET 29 OF 32

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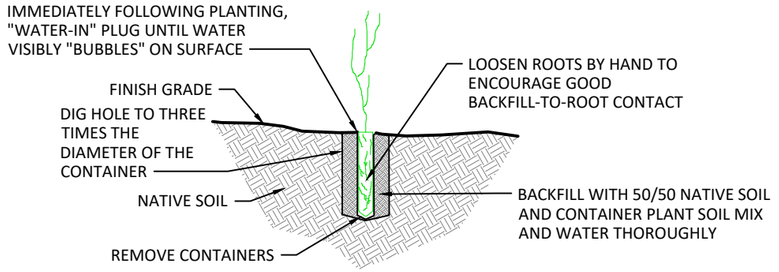
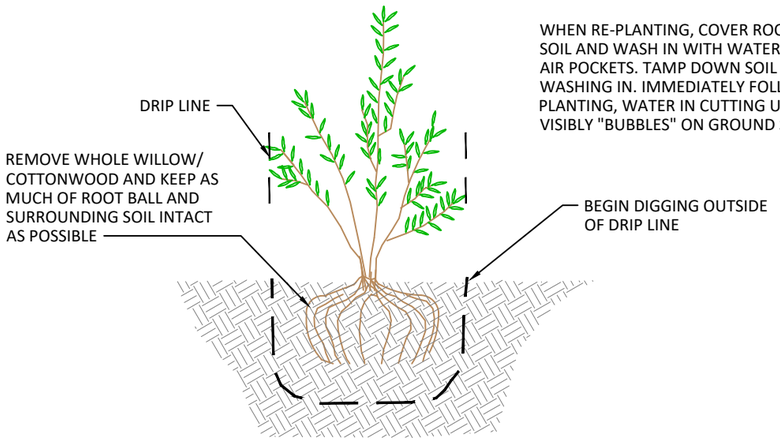


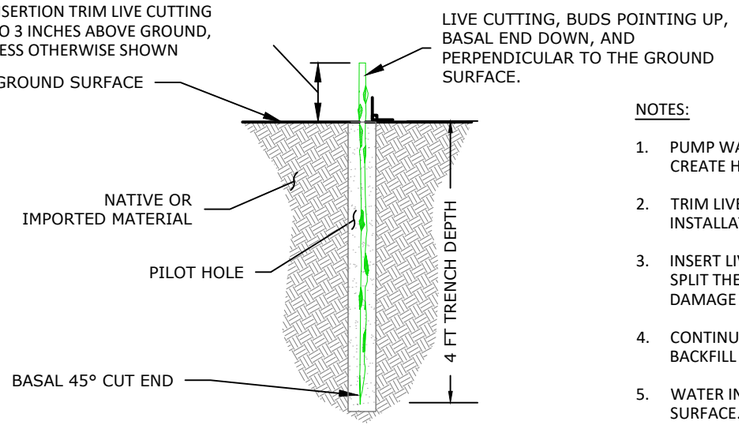
1/30 TYPICAL DETAIL - PLUG PLANTING

NOT TO SCALE



2/30 TYPICAL DETAIL - WILLOW/ COTTONWOOD SALVAGE

NOT TO SCALE

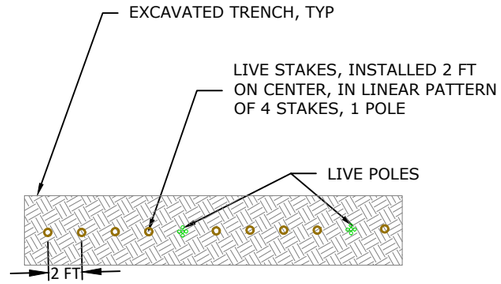


3/30 TYPICAL DETAIL - LIVE CUTTING

NOT TO SCALE

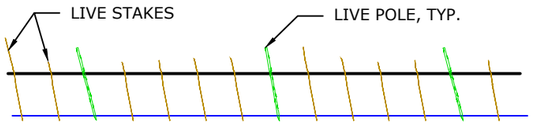
NOTES:

1. PUMP WATER INTO HOLE. LIVE CUTTINGS SHALL NOT BE USED TO CREATE HOLE.
2. TRIM LIVE CUTTING BASAL END AT 45 DEGREES JUST PRIOR TO INSTALLATION. NEW CUT SHALL BE 1 TO 2 INCHES FROM OLD CUT.
3. INSERT LIVE CUTTING INTO PILOT HOLE. INSERTION SHALL NOT SPLIT THE CUTTING, BRUISE OR STRIP BARK, OR OTHERWISE DAMAGE THE LIVE CUTTING.
4. CONTINUE TO PUMP WATER INTO HOLE AND COMPACT SOIL BACKFILL IN LIFTS TO IMPROVE CUTTING TO SOIL CONTACT.
5. WATER IN FINISHED CUTTING UNTIL WATER VISIBLY "BUBBLES" ON SURFACE.
6. TAMP IN MATERIAL AT GROUND SURFACE AROUND LIVE CUTTING.



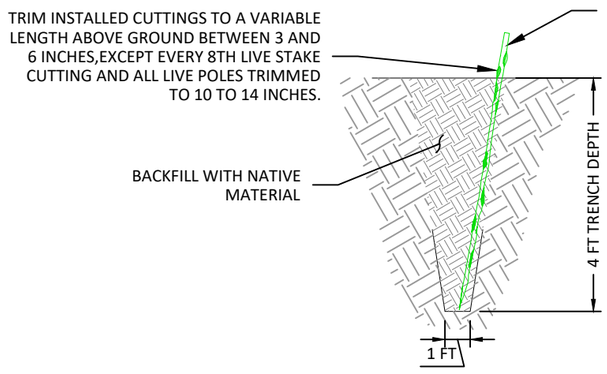
PLAN

NOT TO SCALE



ELEVATION VIEW

NOT TO SCALE



SECTION

NOT TO SCALE

NOTES:

1. ALL LIVE CUTTINGS TO BE CUT AT A 45 DEGREE ANGLE TO A POINT IMMEDIATELY PRIOR TO INSTALLATION.
2. PUMP WATER INTO TRENCH. INSTALL LIVE CUTTINGS WITH CUT ENDS IN TOE OF TRENCH.
3. IF INSTALLED BY TRENCHING, COMPACT BACKFILL IN 12 INCH LIFTS TO IMPROVE CUTTING TO SOIL CONTACT
4. PUMP WATER INTO THE TRENCH WHILE BACKFILLING EACH LIFT UNTIL WATER VISIBLY "BUBBLES" ON SURFACE
5. TAMP IN MATERIAL AT GROUND SURFACE AROUND LIVE CUTTING

4/30 TYPICAL DETAIL - LIVE CUTTING TRENCH

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YAKAMA NATION FISHERIES

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TYPICAL PLANTING DETAILS

SHEET

30 OF 32

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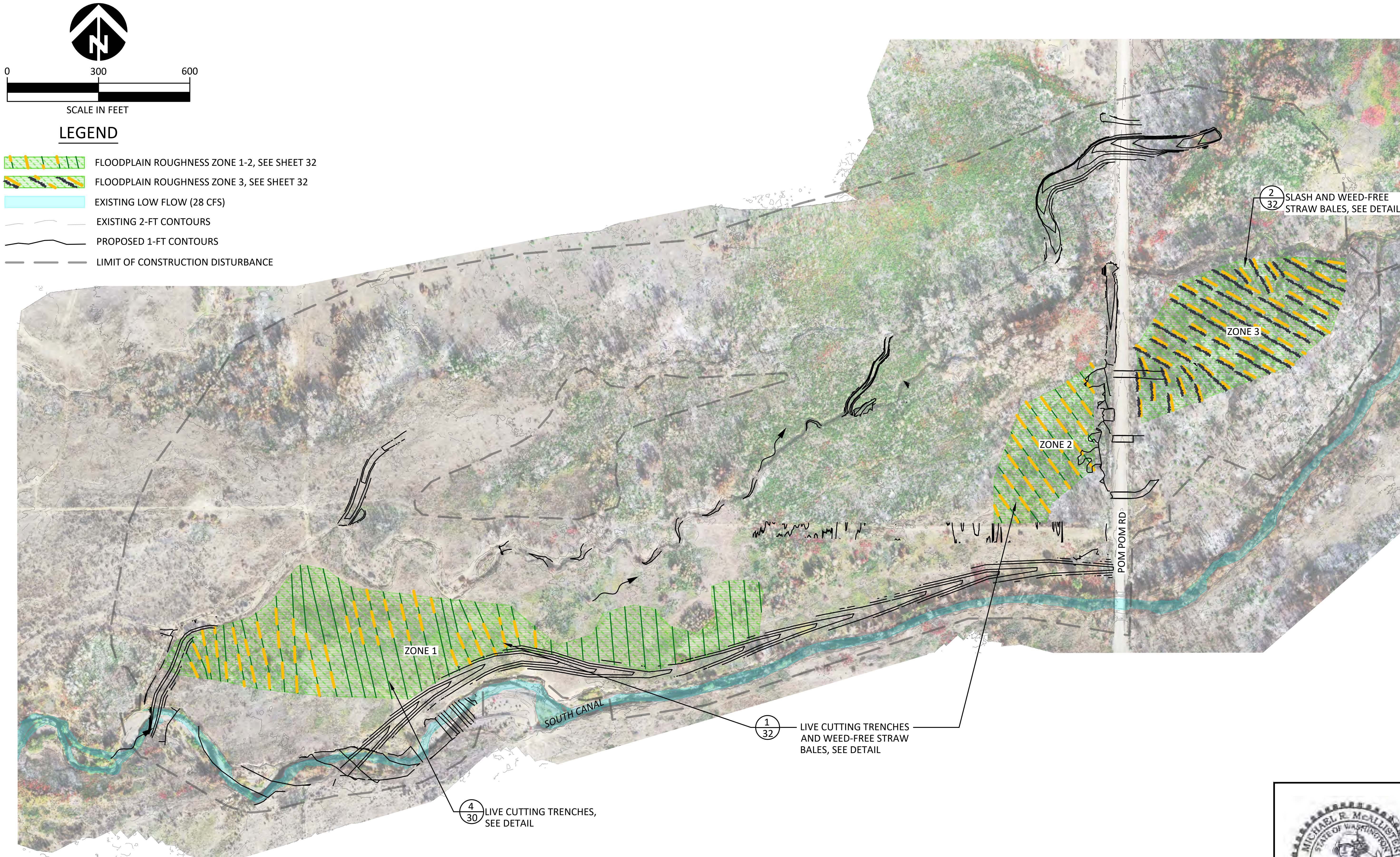

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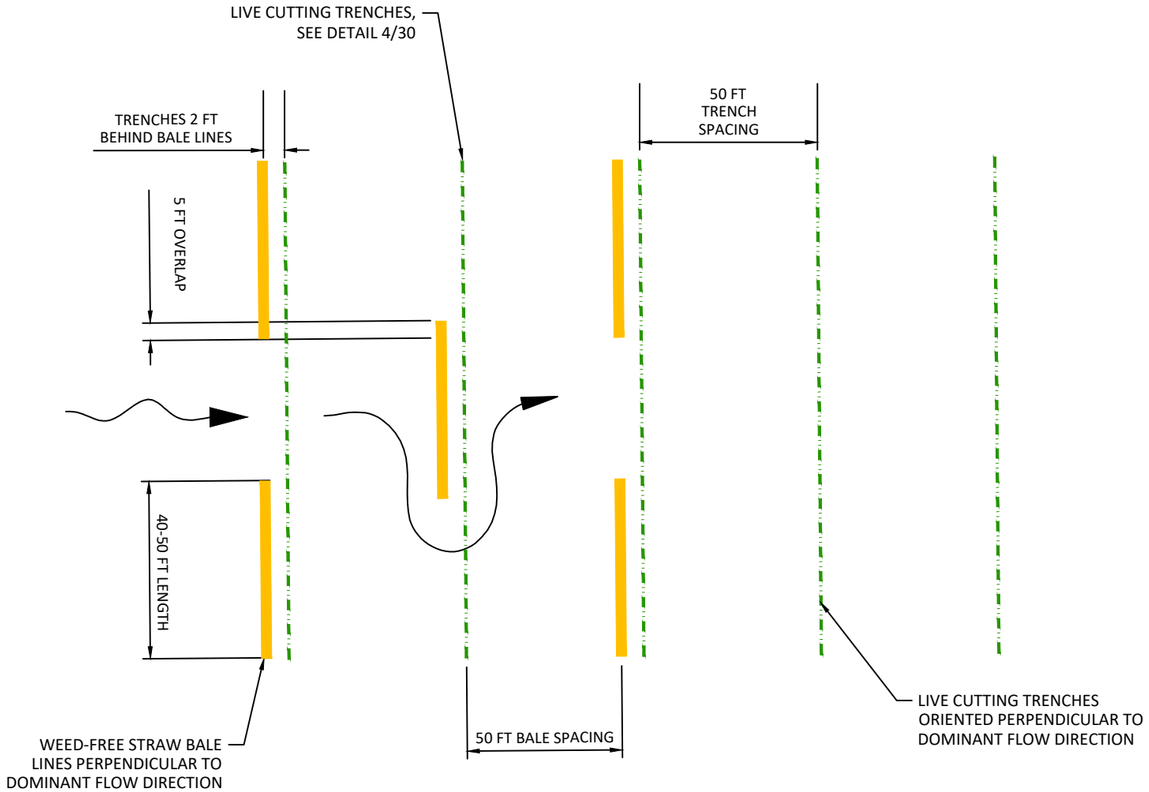
FLOODPLAIN ROUGHNESS PLAN

SHEET
31 OF 32

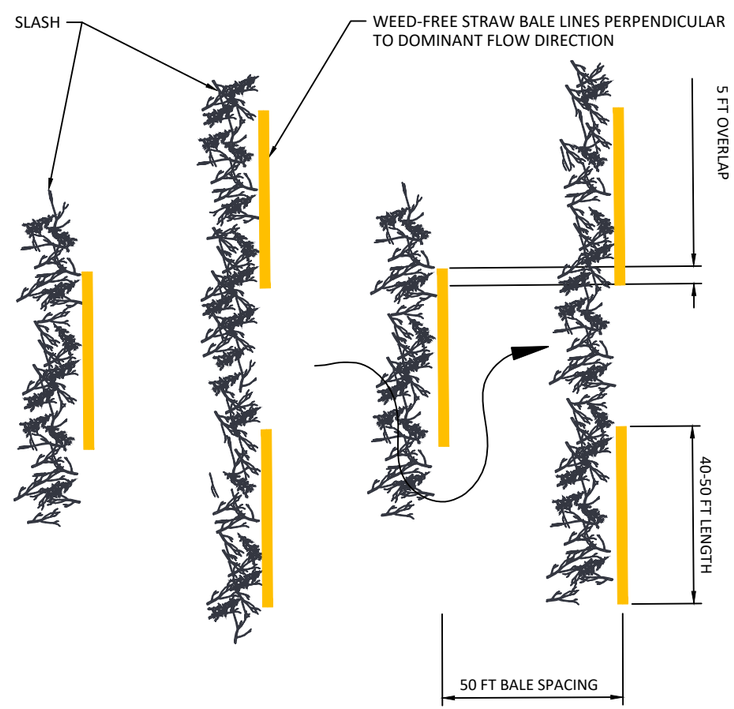
MICHAEL R. McALLISTER
STATE OF WASHINGTON
38189
REGISTERED
PROFESSIONAL ENGINEER
EXPIRES 08-25-2026

NOTES:

1. WILLOW TRENCH PLACEMENT WILL BE ADJUSTED DURING CONSTRUCTION AT THE DIRECTION OF THE ENGINEER TO AVOID DAMAGE TO EXISTING STRAW WATTLES.
2. EXISTING STRAW WATTLES MAY ALSO BE MOVED AT THE DIRECTION OF THE ENGINEER.
3. TWO 3' WOODEN STAKES THROUGH EACH BALE AT 18" INTO UNDERLYING SOIL.



1/32 LIVE CUTTING TRENCHES AND STRAW BALES FOR FLOODPLAIN ROUGHNESS ZONES 1 & 2
NOT TO SCALE



2/32 SLASH AND STRAW BALES FOR FLOODPLAIN ROUGHNESS ZONE 3
NOT TO SCALE

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MM, PL, EA, MB — DESIGNED
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MM — APPROVED
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FLOODPLAIN ROUGHNESS DETAILS

SHEET 32 OF 32

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The following Amendments to the Division 8 and Division 9 Standard Specifications are made a part of this contract and supersede any conflicting provisions of the 2024 Standards Specifications for Road, Bridge and Municipal Construction and the foregoing Amendments to the Standard Specifications, as issued by the Washington State Department of Transportation (WSDOT) and the American Public Works Association (APWA), Washington State Chapter (hereafter "Standard Specifications"). Each Amendment contains all current revisions to the applicable section of the Standard Specifications and may include references which do not apply to this particular project. The following Amendments and Special Provisions shall be used in conjunction with the applicable provisions of Washington Department of Transportation Standard Specifications for Road, Bridge and Municipal Construction 2024 M 41-10, or as amended hereafter.

SPECIFICATION
POM POM: TOPPENISH CREEK REVEGETATION

DIVISION 8
MISCELLANEOUS CONSTRUCTION

8-02 Roadside Restoration

8-02.3 Construction Requirements

8-02.3(2) Work Plans

Section 8-02.3(2) is revised to read:

(******)

Three Work Plan submittals under this section:

1. Restoration Work Plan: This plan is required when trees or native vegetation will be removed. The Contractor shall submit a Type 3 Working Drawing within 15 calendar days prior to any earth disturbing activities.
2. Weed Control Plan: The Contractor shall submit for approval the Weed Control Plan as a Type 3 Working Drawing. The plan shall be submitted at the same time as the Revegetation Work Plan. The plan will require approval prior to beginning the following additional activities: selective clearing, surface preparation, application of chemical herbicides, or any weed control activities.
3. Plant Establishment Plan: This plan is required prior to completion of Initial Planting. See 8-02.3(2)C Plant Establishment Plan.

8-02.3(2)A Roadside Work Plan

Section 8-02.3(2)A is revised to read:

(******)

8-02.3(2)A Revegetation Work Plan

The Revegetation Work Plan shall define the expected impacts to the project area and restoration resulting from Work necessary to meet all Contract requirements. The Contractor shall define how the restoration Work included in the Contract will be phased and coordinated with project Work such as earthwork, staging, access, erosion and water pollution control, irrigation, etc. The Revegetation Work Plan shall include the following:

1. Means and methods for vegetation protection (in accordance with Section 1-07.16(2)).
2. Plan for propagation and procurement of plants, ground preparation for planting, and installation of plants.
3. Plan and timing to incorporate or remove erosion control items.

8-02.3(2)B Weed and Pest Control Plan

Section 8-02.3(2)B is revised to read:

(******)

8-02.3(2)B Weed Control Plan

The Weed Control Plan shall describe all weed control needs for the project.

The plan for control of weeds on the Contract in accordance with Section 8-02.3(3) shall include the following:

1. Names of plan preparer and herbicide operators, including contact information. The Contractor shall provide the Owner evidence that all operators are licensed with appropriate endorsements, and that any herbicide used is registered for use by the Washington State Department of Agriculture.
2. Means and methods of weed control approved by Owner, including mechanical and/or chemical. The Contractor shall provide a site plan indicating where the noted methods of weed control will be implemented.
3. Schedule and timing for weed control including re-entry times for herbicide application by herbicide type, if any.
4. Proposed herbicide use, if approved by Owner, in accordance with Section 8-02.3(3)A: name, application rate, and Safety Data Sheets of all proposed herbicides. The Contractor shall provide a copy of the current product label for each herbicide to be used.
5. Plan to ensure worker safety until herbicide re-entry periods are met.
6. Site management and control protocol for all anticipated pests including herbivory (browse and girdling), fungal and insect infestations, and all applicable aquatic invasive species per RCW 77.135.010. Document equipment cleaning and/or sterilization protocols in accordance with Section 1-05.9, including provisions to prevent the spread of listed species.

8-02.3(3) Weed Control

The Contractor shall control Class A and B Noxious weed species within the project area prior to construction in the spring of 2026 and as necessary during planting in the fall of 2026 using integrated management principles consisting of mechanical, biological, and/or chemical controls that are outlined in the Weed Control Plan or as designated by the Owner. Weeds shall be defined as plant species listed as Class A and B Weeds by the Washington State Noxious Weed Control Board (WSNWCB. Controlling weeds consists of killing and removing weeds by methods approved by Owner

8-02.3(3)B Restoration Area Weed Control

Seeding and planting area weed control consists of controlling weeds in seeded and planted areas shown on the Plans. This Work is included in the bid items for weed control areas.

All seeding and planting areas shall be prepared so that they are weed and unnatural debris free at the time of planting and until completion of the project. The planting areas shall include the entire ground surface, regardless of cover, areas around plants, and those areas shown on the Plans.

Within seeding and planting areas, all noxious weed species are unwanted and shall be controlled unless specifically allowed by the Owner to remain.

All applications of post-emergent herbicides shall be made while green and growing tissue is present. Residual herbicides shall not be used where rhizomatous species or perennial species are indicated.

Should unwanted vegetation reach the flowering and seed stage in violation of these Specifications, the Contractor shall physically remove and bag the seed heads prior to seed dispersion. All physically removed vegetation and seed heads shall be disposed of off-site at no cost to the Owner.

8-02.3(5) Restoration Seeding and Planting Area Preparation

8-02.3(5)A Seeding Area Preparation

Section 8-02.3(5)A. is revised to read:
(******)

The Contractor shall prepare restoration seeding areas as follows:

1. Remove all unnatural debris from areas to be seeded. Dispose of removed materials offsite.
2. Prepare restoration seeding area to a weed free and bare condition.

8-02.3(6) Mulch and Amendments

Sections 8-02.3(6)A and B are omitted.

Section 8-02.3(6) is supplemented with the following:

For riparian plantings, mulch will be placed in an 8.5” diameter around each plant to a depth of 3”. For the live cutting trenches, mulch will be placed at the width of the trenching bucket, approximately 18”, and 3” deep.

8-02.3(7) Layout of Planting and Seeding Areas

The Contractor shall lay out and prepare planting and lawn areas and receive the Owner’s acceptance of layout and preparation prior to any installation activities. See details and notes on the Plans for planting layout schematic.

8-02.3(8) Planting

8-02.3(8)A Dates and Conditions for Planting

Section 8-02.3(8)A paragraph 7 is revised to read:
(******)

After delivery and prior to installation, plugs shall be closely monitored for sufficient root moisture and shall be protected from sun, wind and extreme temperatures. Stored plugs

shall be watered and misted several times a day when necessary to maintain proper root moisture and to reduce transpiration in sunny and windy locations.

The Contractor shall minimize foot traffic and soil disturbance during installation of the plugs.

Install the plug so the stem base is at or slightly above finish grade. Plant plugs fully into planting soil, not into mulch. Install plugs to their full depth without bending the plug. Plugs demonstrating "J-roots" shall not be acceptable. Backfill planting holes and tamp the soil around each plug in-place so that it is firmly seated in the soil, with no air pockets. Following backfilling, plugs shall be watered thoroughly until bubbles are observed at the ground surface.

Section 8-02.3(8)A. is supplemented with the following:
(******)

Live stakes and poles for use on the floodplain and as live cuttings shall be harvested during dormancy, which shall tentatively range from October 1 through November 15 unless otherwise approved by Owner's representative.

At the time of live stake or pole harvest, no leaf buds shall have initiated growth beyond one-quarter inch and the cambium layer shall be moist, green, and healthy. Materials shall be maintained in a continuously cool, covered, and moist state prior to use and be in good condition when installed.

Live cuttings shall be delivered to the site no earlier than October 1 unless approved by the Owner.

8-02.3(8)B Plant Installation

Section 8-02.3(8)B is revised as follows:
(******)
The Contractor must coordinate live cutting delivery and storage with the Owner and Restoration Construction Contractor to ensure that cuttings do not desiccate (dry out) before planting. No more cuttings than can be planted within 72 hours after removal from storage shall be delivered to an installation location. Live cuttings that are not used within 24 hours shall be wrapped in wet burlap sacks and stored in a location with an air temperature between 37 ºF and 65 ºF until the next planting day or returned to storage.

The Contractor shall deliver live stakes and poles to the project site in tagged bundles of 5 to 25 cuttings. Live cuttings shall be bundled into groups, each with a mixture of diameter ranges and an equal number of male and female cuttings. Label individual bundles with an aluminum tag. Tags on each bundle will clearly indicate the species, date and location of collection, the date soaking began.

Cuttings shall be properly stored. If cold storage is necessary, the collected and soaked cuttings shall be stored for no more than an additional 10 days at 37 ºF to 41 ºF until planting. After the cuttings have been removed from cold storage, they shall be soaked for

no more than another 5 days to complete soaking and ensure hydration before and after storage.

The Contractor shall maintain a list of species, and quantities of collected live cuttings at the end of each collection day. The Contractor shall provide the Owner with an on-site plant material inventory within 24 hours of a request. The Owner may also request an inspection of the collection, storage, and live cutting inventory 24 hours in advance of the inspection. The request shall include the quantities of plant species and date of scheduled installation.

The last paragraph of 8-02.3(8)B is revised to read:
(******)

When installing plants, the Contractor shall dig planting holes three times the diameter of the container or root ball size as described in the Plans. Any glazed surface of the planting hole shall be roughened prior to planting.

8-02.3(9) Seeding, Fertilizing, and Mulching

8-02.3(9)A Dates for Application of Seed

Section 8-02.3(9)A is revised as follows:
(******)

Unless otherwise allowed by the Owner, the Contractor shall apply seed for restoration between October 1 and November 15.

All disturbed or finished graded ground surfaces shall be prepared and seeded during the first available seeding window. When environmental conditions are not conducive to satisfactory results, the Owner may suspend the seeding Work until such time that the desired results are likely to be obtained. If seeding is suspended, temporary erosion control methods according to Section 8-01 shall be used to protect the bare soil until seeding conditions improve.

8-02.3(9)B Seeding and Fertilizing

Section 8-02.3(9)B is revised as follows:
(******)

The Contractor shall prepare the seeding area in accordance with Section 8-02.3(5)A and apply seed at the rate and mix specified on the Plans. The Contractor shall notify the Owner within 5 days in advance of any seeding operation and shall not begin the Work until areas prepared or designated for seeding have been accepted. Following the Owner's acceptance, seeding of the accepted ground surfaces shall begin immediately.

Seeding shall not be done during windy weather or when the ground is frozen, or excessively wet.

Seed shall be applied using a hand-held seed spreader at a rate of 40 pounds per acre as described in the Plans.

8-02.3(9)D Inspection

Section 8-02.3(9)D is revised as follows:
(******)

Seeded areas will be observed by the Owner upon completion of seeding. The Work in any area will not be measured for payment until a uniform distribution of the materials is accomplished at the specified rate. Areas that have not received a uniform application of seed at the specified rate, as determined by the Owner, shall be re-seeded prior to payment for seeding within a designated area.

8-02.3(11) Mulch
Section 8-02.3(11) is revised as follows:
(******)

Sections 8-02.3(11)A and C shall be omitted.

8-02.3(12) Inspection and Completion of Initial Planting

Omit the following from 8-02.3(12)3.:
(******)

…including but not limited to, full operation of the irrigation system.

8-02.4 Measurement
Section 8-02.4 is revised as follows:
(******)

“Weed Control Areas” will be measured by the acre using plan area measurement or through the use of design data.

“Riparian Seeding Areas” will be measured by the acre using plan area measurement or through the use of design data.

“Transitional Seeding Areas” will be measured by the acre using plan area measurement or through the use of design data.

“Riparian Planting Areas” will be measured by the acre using plan area measurement or through the use of design data.

“Hog Fuel Mulch” will be measured by the cubic yard when the hog fuel is delivered to and staged at the project site. Dispersal of the hog fuel mulch over the plants is considered incidental to planting.

"Weed-Free Straw Mulch" will be measured by the ton when the straw is delivered to and staged on the staging areas at the project site (see Plans). Dispersal of the straw mulch over seeded areas is considered incidental to seeding.

8-02.5 Payment

Section 8-02.5 is supplemented with the following:
(******)

(A) Payment will be made for "Weed Control Areas" per acre.

(B) Payment will be made for "Riparian Seeding Areas" per acre.

(C) Payment will be made for "Transitional Seeding Areas" per acre.

(D) Payment will be made for "Riparian Planting Areas" per acre.

(E) Payment will be made for "Hog Fuel Mulch" per cubic yard. Dispersal of hog fuel will be incidental to "Riparian Planting Areas" as shown on the Plans.

(F) Payment will be made for "Weed-Free Straw Mulch" per ton. Dispersal of straw will be incidental to "Riparian Seeding Areas," and "Transitional Seeding Areas" as shown on the Plans.

The Bid Item price shall be full compensation for all costs incurred to complete the Work as shown on the Plans and described in the Specifications.

No payment shall be made for items specified under 8-02.5 which are not included on the Bid Form.

8-32 FLOODPLAIN ROUGHNESS ZONES

8-32.1 Description

This item includes all work necessary to deliver materials for the Floodplain Roughness Zones in accordance with the Plans. Three types of floodplain roughness are shown in the Plans:

1. Straw Bales
2. Live Cutting Stakes and Poles

8-32.2 Materials

Straw bales shall be weed-free, between 3 and 4 feet in length, and shall be secured with plastic-free baling twine.

Live Cuttings shall Live Stakes and Live Poles in accordance with Sections 9-14.7 and 8-02.3(8)B.

8-32.4 Measurement

"Floodplain Roughness Weed-Free Straw Bales" shall be measured per linear foot.

"Black Cottonwood (Live Cuttings)" shall be measured per pole when each cutting has exchanged custody with the construction contractor.

"Coyote Willow (Live Cuttings)" shall be measured per stake when each cutting has exchanged custody with the construction contractor.

"Pacific Willow (Live Cuttings)" shall be measured per stake when each cutting has exchanged custody with the construction contractor.

8-32.5 Payment

"Floodplain Roughness Weed-Free Straw Bales", linear foot.

"Black Cottonwood (Live Cuttings)", per pole

"Coyote Willow (Live Cuttings)", per stake

"Pacific Willow (Live Cuttings)", per stake

The unit contract prices for "Floodplain Roughness Weed Free Straw Bales" and all "Live Cuttings" shall be full compensation for all costs incurred for equipment, materials, delivery to the onsite staging areas (see Plans), and on-site storage with section 8-02.3(8)B

DIVISION 9
MATERIALS

9-14 Erosion Control and Roadside Planting

9-14.3 Seed

Section 9-14.3 is revised to read:
(******)

Seed mixes and seeding zones for the seed mixes are delineated on plans.

1. Contractor shall purchase seed in the quantity and at the percentages provided in the seed mix tables.
2. Contractor shall source the seed from within the appropriate genetic zones of the Columbia Plateau and Pleistocene Lake Basins ecoregions as defined by the US Environmental Protection Agency (EPA). The seed certification class shall be Certified (blue tag) in accordance with WAC 16-302 and meet the following requirements:

   Prohibited Weed 0 percent max.

Noxious Weed	0 percent max.
Other Weed	0.2 percent max.
Other Crop	0.4 percent max.

3. Prior to seed purchase, the Contractor shall submit a list of suppliers and their seed sources (Submittal) and identify any difficulties in obtaining species or quantities.
4. Owner's Representative shall review submittal and approve or provide comments in order to assist the Contractor with securing appropriate seed.
5. Contractor shall provide the seed labels that include the germination rate and purity. Based on the certified testing results required by 9-14.2 of the Standard Specifications, the actual pounds of each grass species applied shall be adjusted so as to provide the specified pounds of PLS per species per acre. Seeds shall be certified "Weed Free," indicating there are no noxious or nuisance weeds in the seed.
6. Contractor shall not make any substitutions without the approval of the Owner's Representative.
7. If substitutions are required, and substituted species have substantially lower cost than the originally contract specified species; the cost for the seed shall be reduced accordingly.
8. Contractor shall be responsible for ordering, storing and delivering seed to the project site and storing site in a cool, dry location, out of direct sunlight on an as needed basis.
9. Any seed that is damaged due to herbivory or moisture prior to being spread will be rejected and will be the responsibility of the Contractor to procure replacement seed at no additional cost to the Owner.

9-14.7 Plant Materials

9-14.7(1) Description

Section 9-14.7(1) paragraph 4 is revised to read:
(******)

Cuttings are live plant material without a previously developed root system. Source plants for cuttings shall be healthy and either dormant or in vigorous seasonal growth when cuttings are taken. All cuts shall be made with a sharp instrument producing a clean cut and no adjacent bark damage. Cuttings may be collected. If cuttings are collected, the requirement to be nursery grown or held in nursery conditions does not apply. Written permission shall be obtained from property owners and provided to the Owner before cuttings are collected. The Contractor shall collect cuttings in accordance with applicable sensitive area ordinances. Collection sites shall be located within the Toppenish Creek Watershed and within +/- 500 foot elevation band from the project site unless otherwise approved by Owner.

Cuttings shall meet the following requirements:

Section 9-14.7(1)2. and 3. are revised to read:
(******)

2. Live Stake cuttings shall have a basal end diameter between ¾ inch and 1½ inches. The top end shall have straight top cut immediately above a bud. The basal rooting end shall be cut at an approximate 45-degree angle at time of harvest. Live stakes are cut from one- to two-year-old wood. Live stake cuttings shall be cut and installed with the bark intact with no branches, stems, or leaves attached.

3. Live Pole cuttings shall have a diameter between 1½ inch and 3 inches. The top end(s) shall have straight top cut immediately above a bud. The basal rooting end shall be cut at an approximate 45-degree angle at time of harvest. Live Poles shall have no more than three branches that must be located at the top end of the pole and those branches shall be pruned back to the first bud from the main pole. Live Pole cuttings shall be cut and installed with the bark intact with no stems or leaves attached.

Section 9-14.7(1) is supplemented with the following:
(******)

1. Live cuttings sourced from plants during the growing season shall be harvested no less than 7 days and no more than 14 days prior to installation. Live cuttings shall be continuously and completely submerged 6 inches under fresh water from within 1 hour of harvest to within 1 hour of installation.
2. Live cuttings sourced from plants during the dormant season shall be harvested no more than 300 days prior to installation. See *8-02.3(8)A* for additional requirements for the storage of dormant season harvested live cuttings.
3. Live cuttings shall have the lower basal rooting end recut cut to an approximate 45-degree angle no more than 1 hour prior to installation. The fresh cut prior to installation shall be 1 to 2 inches up from the original 45-degree cut made at time of harvest.

9-14.7(2) Quality

Section 9-14.7(2) paragraph 3 is revised to read:
(******)

All plant material, except live cuttings, shall be purchased from a nursery licensed to sell plants in their state or province.

Section 9-14.7(2) is supplemented with the following:
(******)

No less than 15 days prior to the first delivery of Live Cuttings to the project site, the Contractor shall submit source, type, size, count, and species information for all Plants and Live Cuttings required for the project for approval by the Owner.

Live cutting plant material shall be inspected upon delivery to the project site by the Owner.

The Contractor may request that the Owner inspect plant materials at least three business days in advance of delivery.