

MILL CREEK CULVERT REPLACEMENT - #1136 (PRIVATE CROSSING)

STREAM DESIGN AND LAYOUT FOR FISH PASSAGE

DESIGNED IN ACCORDANCE WITH PROJECTS (NWR-2013-10221)

100% DESIGN

PROJECT PARTNERS



PROJECT CONTACT INFORMATION

PROJECT ENGINEER

SWCA ENVIRONMENTAL CONSULTANTS
CONTACT: RUSSELL BARTLETT, P.E.
311 SW JEFFERSON AVE
CORVALLIS, OR 97333
PH: (541) 738-2920

OWNER

CONTACT: MIKE CHRISTIE
5775 BRICKYARD ROAD
TILLAMOOK, OR 97141
PH: (503) 812-1029

SPONSOR

TILLAMOOK ESTUARIES PARTNERSHIP
CONTACT: CHRISTER LABRECQUE
613 COMMERCIAL STREET
GARIBALDI, OR 97118
PH: (503) 322-2222

WATER

LONG PRAIRIE WATER DISTRICT
ATT: NONDA ZWALD
9985 S PRAIRIE RD
TILLAMOOK, OR 97141
PH: (503) 842-2158

ONE CALL CENTER

1-800-332-2344
503-232-1897

TELEPHONE

CENTURYLINK
ATT: SCOTT SCHIMINESKY
2714 6TH STREET
TILLAMOOK, OR 97141
PH: (503) 965-9918

POWER

TILLAMOOK PEOPLES UTILITY DISTRICT
ATT: JAMES AMAN
1115 PACIFIC AVE
TILLAMOOK, OR 97141-3925
PH: (503) 842-2535

PROJECT DESCRIPTION

THE TILLAMOOK ESTUARIES PARTNERSHIP (TEP) CONTRACTED WITH RIVER DESIGN GROUP, INC. (RDG) NOW A PART OF SWCA ENVIRONMENTAL CONSULTANTS TO PROVIDE DESIGN AND TECHNICAL ASSISTANCE FOR THE REPLACEMENT OF AN EXISTING STREAM CROSSING ALONG MILL CREEK (TRIB B) NEAR TILLAMOOK, OREGON. THE PROJECT CONSISTS OF REMOVING TWO EXISTING CORRUGATED PLASTIC PIPES LOCATED ALONG A PRIVATE DRIVEWAY ADJACENT TO BRICKYARD ROAD AND REPLACING THEM WITH A NEW CLEAR SPAN BRIDGE TO ENHANCE FISH PASSAGE AND STREAM PROCESSES. THE PROPOSED CROSSING DESIGN IS BASED ON A SIMULATED STREAMBED APPROACH MEETING ODFW AND NOAA/NMFS FISH PASSAGE CRITERIA. BRIDGE DESIGN AND ENGINEERING WILL BE PROVIDED BY THE SELECTED CONTRACTOR.

SPATIAL REFERENCE

SURVEY CONTROL USED FOR THE PROJECT IS PROVIDED ON DRAWING 2.0 AND COORDINATES CORRESPOND TO THE TOP CENTER OF CONTROL MARKERS.

LIDAR, GPS RTK, AND TOTAL STATION:

HORIZONTAL PROJECTION: OREGON STATE PLANE NORTH
HORIZ DATUM: NAD83
VERT DATUM: NAVD88

SURVEY DATE: 3/19/2018 AND 6/11/2024
LIDAR COLLECTED: 2009

STANDARD OF PRACTICE

RDG WORKS EXCLUSIVELY IN THE RIVER ENVIRONMENT AND EMPLOYS THE MOST CURRENT AND ACCEPTED PRACTICES AVAILABLE FOR PLANNING AND DESIGN OF RESTORATION AND CHANNEL ENHANCEMENT PROJECTS. THE DESIGN, ANALYSIS, AND IMPLEMENTATION OF THE NEW BRIDGE CROSSING ADHERE TO NMFS PROJECTS DESIGN CRITERIA AND CURRENT NOAA FISHERS AND ODFW FISH PASSAGE CRITERIA. ALL WORK WAS PERFORMED OR DIRECTED BY A REGISTERED PROFESSIONAL CIVIL ENGINEER WITH PAST EXPERIENCE IN THE DESIGN OF STREAM CROSSINGS.

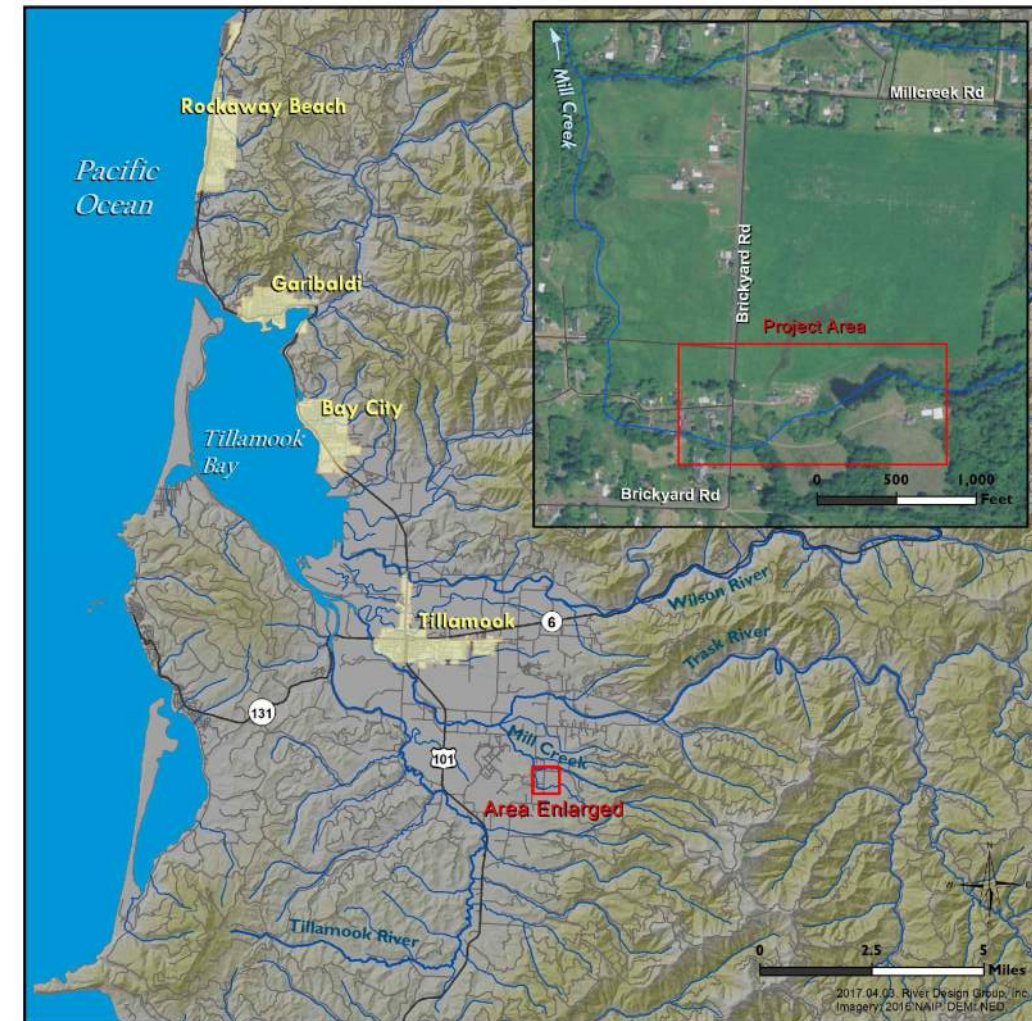
REUSE OF DRAWINGS

THESE DRAWINGS, THE IDEAS AND DESIGNS INCORPORATED HEREIN, AS AN INSTRUMENT OF PROFESSIONAL SERVICE, ARE THE PROPERTY OF SWCA ENVIRONMENTAL CONSULTANTS AND ARE NOT TO BE USED, IN WHOLE OR IN PART, FOR ANY OTHER PROJECT WITHOUT THE WRITTEN AUTHORIZATION OF SWCA. LIKewise, THESE DRAWINGS MAY NOT BE ALTERED OR MODIFIED WITHOUT AUTHORIZATION OF RDG. DRAWING DUPLICATION IS ALLOWED IF THE ORIGINAL CONTENT IS NOT MODIFIED.

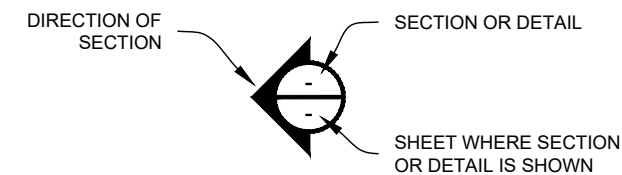
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PROJECT VICINITY MAP



NE 1/4 OF THE SW 1/4 OF SECTION 10, T.02S., R.09W., WILLAMETTE MERIDIAN
TILLAMOOK COUNTY, OREGON
USGS QUADRANGLE: TILLAMOOK, OR



CROSS-SECTION SHEET REFERENCE



RENEWAL 12/31/27

COVER SHEET AND NOTES

MILL CREEK CULVERT REPLACEMENT - #1136

TILLAMOOK, OREGON

NO.	DATE	BY	DESCRIPTION	CHK
*	03/30/26	TF	100% DESIGN	MK

PROJECT NUMBER
RDG-18-023

DRAWING NUMBER

1.0

Drawing 1 of 15



RDG RIVER DESIGN GROUP
311 SW Jefferson Avenue
Corvallis, OR 97333
406.862.4927

Mar 30, 2026 - 5:28pm C:\Users\Russell.Bartlett\OneDrive - SWCA\SWCA-ERED's files - Corvallis\18-023 Mill Creek Fish Passage\CAD\NMFS PROJECTS - Construction Measures.dwg

GENERAL CONSERVATION MEASURES FROM PROGRAMMATIC RESTORATION OPINION FOR JOINT ECOSYSTEM CONSERVATION BY THE SERVICES (PROJECTS)

- 1. SITE ACCESS.** THE ACTION AGENCIES WILL RETAIN THE RIGHT OF REASONABLE ACCESS TO EACH PROJECT SITE TO MONITOR THE USE AND EFFECTIVENESS OF THESE CONDITIONS.
- 2. ON-SITE DOCUMENTATION.** THE FOLLOWING DOCUMENTATION WILL BE POSTED AT THE PROJECT SITE OR ACCESSIBLE IN THE AREA OF WORK IF NOT FEASIBLE TO POST:
 - a. NAME(S), PHONE NUMBER(S), AND ADDRESS(ES) OF THE PERSON(S) RESPONSIBLE FOR OVERSIGHT WILL BE POSTED AT THE WORK SITE.
 - b. A DESCRIPTION OF HAZARDOUS MATERIALS THAT WILL BE USED, INCLUDING INVENTORY, STORAGE, AND HANDLING PROCEDURES WILL BE AVAILABLE ON-SITE.
 - c. PROCEDURES TO CONTAIN AND CONTROL A SPILL OF ANY HAZARDOUS MATERIAL GENERATED, USED OR STORED ON-SITE, INCLUDING NOTIFICATION OF PROPER AUTHORITIES, WILL BE READILY AVAILABLE ON-SITE.
 - d. A STANDING ORDER TO CEASE WORK IN THE EVENT OF HIGH FLOWS (ABOVE THOSE ADDRESSED IN THE DESIGN AND IMPLEMENTATION PLANS) OR EXCEEDANCE OF WATER QUALITY LIMITS WILL BE POSTED ON-SITE.
- 3. PROJECT DESIGN PROCESS.** IN ADDITION TO SPECIFIC CONSERVATION MEASURES BELOW, IT IS EXPECTED THAT PROJECT MANAGERS WILL USE THE BEST AVAILABLE SCIENTIFIC INFORMATION REGARDING THE LIKELY EFFECTS OF CLIMATE CHANGE ON RESOURCES IN THE PROJECT AREA, INCLUDING PROJECTIONS OF LOCAL STREAM FLOW AND WATER TEMPERATURE, AND/OR SEA LEVEL RISE AND SEDIMENT TRANSPORT PROCESSES, TO ENSURE THAT THE PROJECT WILL BE ADAPTABLE TO THOSE CHANGES.

THE FOLLOWING GENERAL DESIGN CONSIDERATIONS WILL BE APPLIED FOR ALL ACTIONS COMPLETED UNDER THE PROJECTS PROGRAM:

 - a. OBTAIN ALL APPLICABLE REGULATORY PERMITS AND OFFICIAL PROJECT AUTHORIZATIONS BEFORE BEGINNING CONSTRUCTION.
 - b. DESIGN THE PROJECT TO MINIMIZE THE EXTENT AND DURATION OF EARTHWORK, E.G., COMPACTING, DREDGING, DRILLING, EXCAVATION, NOISE, AND FILLING, INCLUDING THE FOLLOWING CONCERNS:
 - i. MINIMIZE USE OF HEAVY EQUIPMENT, VEHICLES OR POWER TOOLS BELOW BANKFULL ELEVATION TO THE EXTENT POSSIBLE PROJECT SPECIALISTS DETERMINE SUCH WORK IS NECESSARY, OR WILL RESULT IN LESS RISK OF SEDIMENTATION OR OTHER ECOLOGICAL DAMAGE THAN WORK ABOVE THAT ELEVATION.
 - ii. COMPLETE EARTHWORK IN WETLANDS, RIPARIAN AREAS, AND STREAM CHANNELS AS QUICKLY AS POSSIBLE.
 - iii. SPECIFY THAT THE CONSTRUCTION CONTRACTOR IS TO CEASE PROJECT OPERATIONS WHEN HIGH FLOWS OR HIGH TIDES MAY INUNDATE THE PROJECT AREA, EXCEPT FOR EFFORTS TO AVOID OR MINIMIZE RESOURCE DAMAGE.
 - c. PROJECT DESIGNS FOR A SPECIFIC SPECIES SHOULD INCLUDE REVIEW/INPUT FROM A BIOLOGIST AT THE LOCAL SERVICE OFFICE WITH APPROPRIATE KNOWLEDGE OF THE PARTICULAR SPECIES, SUCH AS THE SERVICE STATE SPECIES LEAD FOR AFFECTED SPECIES. THE BIOLOGIST HAS THE DISCRETION TO ADJUST DISTURBANCE AND DISRUPTION DISTANCES, BASED ON SITE-SPECIFIC CONDITIONS AND KNOWN BIOLOGY OF THE SPECIES.
 - d. HOLLOW PIPES, SUCH AS THOSE USED FOR SIGNS, FENCES AND GATES, WILL BE CAPPED TO PREVENT TRAPPING SMALL BIRDS AND MAMMALS.
- 4. SITE CONTAMINATION ASSESSMENT.** PURSUANT TO SERVICE POLICY, PROJECT MANAGERS WILL CONDUCT A SITE CONTAMINATION ASSESSMENT AS PART OF THE DESIGN PROCESS TO DETERMINE WHETHER THERE IS A LIKELIHOOD OF HAZARDOUS MATERIALS BEING PRESENT AT THE SITE, AND INCLUDE MEASURES IN THE DESIGN TO PREVENT RELEASE OF SUCH MATERIALS AS A RESULT OF THE PROJECT AND TO HANDLE AND DISPOSE OF THEM ACCORDING TO APPLICABLE REGULATIONS.
 - a. THE LEVEL OF DETAIL AND RESOURCES COMMITTED TO

- SUCH AN ASSESSMENT WILL BE COMMENSURATE WITH THE LEVEL AND TYPE OF PAST OR CURRENT DEVELOPMENT AT THE SITE. ASSESSMENTS MAY INCLUDE THE FOLLOWING:
- i. REVIEW AVAILABLE RECORDS, SUCH AS FORMER SITE USE, BUILDING PLANS, AND RECORDS OF ANY PRIOR CONTAMINATION EVENTS.
 - ii. IF THE PROJECT SITE WAS USED FOR INDUSTRIAL PROCESSES (I.E., MINING OR MANUFACTURING WITH CHEMICALS), INSPECT TO DETERMINE THE ENVIRONMENTAL CONDITION OF THE PROPERTY.
 - iii. INTERVIEW PEOPLE WHO ARE KNOWLEDGEABLE ABOUT THE SITE, E.G., SITE OWNERS, OPERATORS, AND OCCUPANTS, NEIGHBORS, OR LOCAL GOVERNMENT OFFICIALS.
- b. RETAIN CONTAMINANT SURVEY INFORMATION IN THE PROJECT FILE. DISCUSS WITH NMFS AND THE SERVICE IF GROUND DISTURBANCE OR OTHER ACTIVITIES TO ACCOMPLISH THE PROPOSED PROJECT HAS SUBSTANTIAL POTENTIAL TO RELEASE CONTAMINANTS INTO HABITATS THAT SUPPORT LISTED FISH AND WILDLIFE SPECIES TO DETERMINE IF ADDITIONAL CONSULTATION IS NEEDED.
- 5. SITE LAYOUT AND FLAGGING**
 - a. BEFORE ANY SIGNIFICANT GROUND DISTURBANCE OR ENTRY OF MECHANIZED EQUIPMENT OR VEHICLES INTO THE CONSTRUCTION AREA, CLEARLY FLAG, MARK WITH SURVEY PAINT, OR OTHER OBVIOUS BOUNDARY MARKER, THE FOLLOWING AREAS AS APPROPRIATE:
 - i. SENSITIVE AREAS, E.G., WETLANDS, WATER BODIES, ORDINARY HIGH WATER, SPAWNING AREAS, APPROPRIATE BUFFER ZONES FOR LISTED PLANT AND ANIMAL SPECIES AND THEIR HABITATS, AS IDENTIFIED IN THE PROPOSED CONSERVATION MEASURES.
 - ii. EQUIPMENT ENTRY AND EXIT POINTS.
 - iii. ROAD AND STREAM CROSSING ALIGNMENTS.
 - iv. STAGING, STORAGE, AND STOCKPILE AREAS.
 - b. BEFORE THE USE OF HERBICIDES, CLEARLY FLAG NO-APPLICATION BUFFER ZONES IF POSSIBLE.
 - 6. STAGING, STORAGE, AND STOCKPILE AREAS**
 - a. DESIGNATE AND USE STAGING AREAS TO STORE HAZARDOUS MATERIALS, OR TO STORE, FUEL, OR SERVICE HEAVY EQUIPMENT, VEHICLES AND OTHER POWER EQUIPMENT WITH TANKS LARGER THAN 18.9 L (5 GALLONS), THAT ARE AT LEAST 45.7 M (150 FEET) FROM ANY NATURAL WATER BODY OR WETLAND, OR ON AN ESTABLISHED PAVED AREA, SUCH THAT SEDIMENT AND OTHER CONTAMINANTS FROM THE STAGING AREA CANNOT BE DEPOSITED IN THE FLOODPLAIN OR STREAM.
 - b. NATURAL MATERIALS THAT ARE DISPLACED BY CONSTRUCTION AND RESERVED FOR RESTORATION, E.G., LW, GRAVEL, AND BOULDERS, MAY BE STOCKPILED WITHIN THE 100-YEAR FLOODPLAIN.
 - c. DISPOSE OF ANY MATERIAL NOT USED IN RESTORATION AND NOT NATIVE TO THE FLOODPLAIN OUTSIDE OF THE FUNCTIONAL FLOODPLAIN.
 - d. AFTER CONSTRUCTION IS COMPLETE, OBLITERATE ALL STAGING, STORAGE, OR STOCKPILE AREAS, STABILIZE THE SOIL, AND REVEGETATE THE AREA.

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.
 - 7. EROSION CONTROL**
 - a. USE SITE PLANNING AND SITE EROSION CONTROL MEASURES COMMENSURATE WITH THE SCOPE OF THE PROJECT TO PREVENT EROSION AND SEDIMENT DISCHARGE FROM THE PROJECT SITE.
 - b. BEFORE SIGNIFICANT EARTHWORK BEGINS, INSTALL APPROPRIATE, TEMPORARY EROSION CONTROLS DOWNSLOPE TO PREVENT SEDIMENT DEPOSITION IN THE RIPARIAN AREA, WETLANDS, OR WATER BODY.
 - c. DURING CONSTRUCTION, IF ERODED SEDIMENT APPEARS LIKELY TO BE DEPOSITED IN THE STREAM, INSTALL ADDITIONAL SEDIMENT BARRIERS AS NECESSARY.
 - d. TEMPORARY EROSION CONTROL MEASURES MAY INCLUDE FIBER WATTLES, SILT FENCES, JUTE MATTING, WOOD FIBER MULCH AND SOIL BINDER, OR GEOTEXTILES AND GEOSYNTHETIC FABRIC.
 - e. 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.
- f. REMOVE SEDIMENT FROM EROSION CONTROLS IF IT REACHES 1/3 OF THE EXPOSED HEIGHT OF THE CONTROL.
 - g. WHENEVER SURFACE WATER IS PRESENT, MAINTAIN A SUPPLY OF SEDIMENT CONTROL MATERIALS AND AN OIL-ABSORBING FLOATING BOOM AT THE PROJECT SITE.
 - h. STABILIZE ALL DISTURBED SOILS FOLLOWING ANY BREAK IN WORK UNLESS CONSTRUCTION WILL RESUME WITHIN FOUR DAYS.
 - i. REMOVE TEMPORARY EROSION CONTROLS AFTER CONSTRUCTION IS COMPLETE AND THE SITE IS FULLY STABILIZED.
 - j. FOR PROJECTS INVOLVING NEAR- AND IN-WATER CONSTRUCTION, COMPLETE AND RECORD THE FOLLOWING WATER QUALITY OBSERVATIONS TO ENSURE THAT ANY INCREASES IN SUSPENDED SEDIMENT DO NOT EXCEED BACKGROUND LEVELS:
 - i. TAKE A TURBIDITY SAMPLE USING AN APPROPRIATELY AND REGULARLY CALIBRATED TURBIDIMETER, OR A VISUAL TURBIDITY OBSERVATION, EVERY 4 HOURS WHEN WORK IS BEING COMPLETED, OR MORE OFTEN AS NECESSARY TO ENSURE THAT THE IN-WATER WORK AREA IS NOT CONTRIBUTING VISIBLE SEDIMENT TO WATER, AT A RELATIVELY UNDISTURBED AREA APPROXIMATELY 100 FEET UPSTREAM FROM THE PROJECT AREA, OR 300 FEET FROM THE PROJECT AREA IF IT IS SUBJECT TO TIDAL OR COASTAL SCOUR. RECORD THE OBSERVATION, LOCATION, AND TIME BEFORE MONITORING AT THE DOWNSTREAM POINT.
 - ii. TAKE A SECOND VISUAL OBSERVATION, IMMEDIATELY AFTER EACH UPSTREAM OBSERVATION, APPROXIMATELY 50 FEET DOWNSTREAM FROM THE PROJECT AREA IN STREAMS THAT ARE 30 FEET WIDE OR LESS, 100 FEET FROM THE PROJECT AREA FOR STREAMS BETWEEN 30 AND 100 FEET WIDE, 200 FEET FROM THE DISCHARGE POINT OR NONPOINT SOURCE FOR STREAMS GREATER THAN 100 FEET WIDE, AND 300 FEET FROM THE DISCHARGE POINT OR NONPOINT SOURCE FOR AREAS SUBJECT TO TIDAL OR COASTAL SCOUR. RECORD THE DOWNSTREAM OBSERVATION, LOCATION, AND TIME.
 - iii. COMPARE THE UPSTREAM AND DOWNSTREAM OBSERVATIONS. IF MORE TURBIDITY OR POLLUTANTS IS/ARE OBSERVED DOWNSTREAM THAN UPSTREAM, THE ACTIVITY WILL BE MODIFIED TO REDUCE POLLUTION. CONTINUE TO MONITOR EVERY 4 HOURS.
 - iv. IF THE EXCEEDANCE CONTINUES AFTER THE SECOND MONITORING INTERVAL (AFTER 8 HOURS), THE ACTIVITY WILL STOP UNTIL THE LEVELS RETURNS TO BACKGROUND.
 - v. RESULTS OF TURBIDITY MONITORING AND SAMPLING WILL BE SUMMARIZED AND SUBMITTED TO NMFS IN THE ACTION IMPLEMENTATION FORM WITHIN 60 DAYS OF END OF CONSTRUCTION.

8. HAZARDOUS MATERIAL SPILL PREVENTION AND CONTROL

- a. AT THE PROJECT SITE:
 - i. POST OR HAVE AVAILABLE ON SITE, WRITTEN PROCEDURES FOR NOTIFYING ENVIRONMENTAL RESPONSE AGENCIES, INCLUDING AN INVENTORY AND DESCRIPTION OF ALL HAZARDOUS MATERIALS PRESENT, AND THE STORAGE AND HANDLING PROCEDURES FOR THEIR USE.
 - ii. MAINTAIN A SPILL CONTAINMENT KIT, WITH SUPPLIES AND INSTRUCTIONS FOR CLEANUP AND DISPOSAL, ADEQUATE FOR THE TYPES AND QUANTITY OF HAZARDOUS MATERIALS PRESENT.
 - iii. TRAIN WORKERS IN SPILL CONTAINMENT PROCEDURES, INCLUDING THE LOCATION AND USE OF THE SPILL CONTAINMENT KITS.
- b. TEMPORARILY CONTAIN ANY WASTE LIQUIDS UNDER AN IMPERVIOUS COVER, SUCH AS A TARPULIN, IN THE STAGING AREA UNTIL THE WASTES CAN BE PROPERLY TRANSPORTED TO, AND DISPOSED OF, AT AN APPROVED RECEIVING FACILITY.

9. EQUIPMENT, VEHICLES, AND POWER TOOLS

- a. SELECT, OPERATE AND MAINTAIN ALL HEAVY EQUIPMENT, VEHICLES, AND POWER TOOLS TO MINIMIZE ADVERSE EFFECTS ON THE ENVIRONMENT AND NOISE DISTURBANCE TO LISTED SPECIES, E.G., LOW PRESSURE TIRES, MINIMAL HARD-TURN PATHS FOR TRACK VEHICLES, USE OF TEMPORARY MATS OR PLATES TO PROTECT WET SOILS.
- b. BEFORE ENTERING WETLANDS OR WORKING WITHIN 150 FEET OF A WATERBODY, REPLACE ALL PETROLEUM-BASED HYDRAULIC FLUIDS WITH BIODEGRADABLE PRODUCTS (E.G., MINERAL OIL, POLYGLYCOL, VEGETABLE OIL, SYNTHETIC ESTER; MOBIL® BIODEGRADABLE HYDRAULIC OILS, TOTAL® HYDRAULIC FLUID, TERRESOLVE TECHNOLOGIES LTD.® BIO-BASED BIODEGRADABLE LUBRICANTS, COUGAR LUBRICATION® 2XT BIO ENGINE OIL, SERIES 4300 SYNTHETIC BIO-DEGRADABLE HYDRAULIC OIL, 8060-2 SYNTHETIC BIO-DEGRADABLE GREASE NO. 2, ETC.) THE USE OF TRADE, FIRM, OR CORPORATION NAMES IN THIS OPINION IS FOR THE INFORMATION AND CONVENIENCE OF THE ACTION AGENCY AND APPLICANTS AND DOES NOT CONSTITUTE AN OFFICIAL ENDORSEMENT OR APPROVAL BY THE U.S. DEPARTMENT OF INTERIOR OR USFWS OF ANY PRODUCT OR SERVICE TO THE EXCLUSION OF OTHERS THAT MAY BE SUITABLE.;
- c. TAKE APPROPRIATE MEASURES NECESSARY FOR INVASIVE SPECIES PREVENTION AND CONTROL:
 - i. BEFORE ENTERING AND LEAVING THE PROJECT SITE, POWER WASH ALL HEAVY EQUIPMENT, VEHICLES AND POWER TOOLS, ALLOW THEM TO FULLY DRY, AND INSPECT THEM TO MAKE CERTAIN NO PLANTS, SOIL, OR OTHER ORGANIC MATERIAL IS ADHERING TO THEIR SURFACE.
 - ii. BEFORE ENTERING AND LEAVING THE WATER, INSPECT ANY WATERCRAFT, WADERS, BOOTS, OR OTHER GEAR TO BE USED IN OR NEAR WATER AND REMOVE ANY PLANTS, SOIL, OR OTHER ORGANIC MATERIAL ADHERING TO THE SURFACE.
 - iii. ENSURE ALL VEHICLES, EQUIPMENT, AND TOOLS ARE AS CLEAN AS POSSIBLE AND FREE FROM ANY SEEDS OR VEGETATIVE MATTER.
- d. INSPECT ALL EQUIPMENT, VEHICLES, AND POWER TOOLS FOR FLUID LEAKS BEFORE THEY LEAVE THE STAGING AREA.
- e. BEFORE OPERATION WITHIN 150 FEET OF ANY WATERBODY, AND AS OFTEN AS NECESSARY DURING OPERATION, THOROUGHLY CLEAN ALL EQUIPMENT, VEHICLES, AND POWER TOOLS TO KEEP THEM FREE OF EXTERNAL FLUIDS AND GREASE AND TO PREVENT LEAKS AND SPILLS FROM ENTERING THE WATER.
- f. GENERATORS, CRANES OR OTHER STATIONARY HEAVY EQUIPMENT OPERATED WITHIN 150 FEET OF ANY WATERBODY WILL BE MAINTAINED AND PROTECTED AS NECESSARY TO PREVENT LEAKS AND SPILLS FROM ENTERING THE WATER.

10. TEMPORARY ACCESS ROADS AND PATHS

- a. WHENEVER REASONABLE, PREFERENTIALLY USE EXISTING ACCESS ROADS AND PATHS.
- b. MINIMIZE THE NUMBER AND LENGTH OF TEMPORARY ACCESS ROADS AND PATHS THROUGH RIPARIAN AREAS AND FLOODPLAINS.
- c. MINIMIZE REMOVAL OF RIPARIAN VEGETATION.
- d. WHEN IT IS NECESSARY TO REMOVE VEGETATION, CUT AT GROUND LEVEL (NO GRUBBING).
- e. DO NOT BUILD TEMPORARY ACCESS ROADS OR PATHS WHERE GRADE, SOIL, OR OTHER FEATURES SUGGEST SLOPE INSTABILITY.
- f. ANY ROAD ON A SLOPE STEEPER THAN 30% WILL BE DESIGNED BY A CIVIL ENGINEER WITH EXPERIENCE IN STEEP ROAD DESIGN.
- g. AFTER CONSTRUCTION IS COMPLETE, OBLITERATE ALL TEMPORARY ACCESS ROADS AND PATHS, STABILIZE THE SOIL, AND REVEGETATE THE AREA.
- h. TEMPORARY ROADS AND PATHS IN WET AREAS OR AREAS PRONE TO FLOODING WILL BE OBLITERATED BY THE END OF THE IN-WATER WORK WINDOW. DECOMPACT ROAD SURFACES AND DRAINAGE AREAS, PULL FILL MATERIAL ONTO THE RUNNING SURFACE, AND RESHAPE TO MATCH THE ORIGINAL CONTOURS.



311 SW Jefferson Avenue
Corvallis, OR 97333
406.862.4927

PROJECT CONSERVATION MEASURES
MILL CREEK CULVERT REPLACEMENT
TILLAMOOK, OREGON

NO.	DATE	BY	DESCRIPTION	CHK	
				SW	
*	09/16/24	TF	95% DESIGN		

PROJECT NUMBER
RDG-18-023

DRAWING NUMBER
1.1

GENERAL CONSERVATION MEASURES FROM PROGRAMMATIC RESTORATION OPINION FOR JOINT ECOSYSTEM CONSERVATION BY THE SERVICES (PROJECTS), CONTINUED

11. DUST ABATEMENT

- a. EMPLOY DUST ABATEMENT MEASURES COMMENSURATE WITH SOIL TYPE, EQUIPMENT USE, WIND CONDITIONS, AND THE EFFECTS OF OTHER EROSION CONTROL MEASURES.
- b. SEQUENCE AND SCHEDULE WORK TO REDUCE THE EXPOSURE OF BARE SOIL TO WIND EROSION.
- c. MAINTAIN SPILL CONTAINMENT SUPPLIES ON-SITE WHENEVER DUST ABATEMENT CHEMICALS ARE APPLIED.
- d. DO NOT USE PETROLEUM-BASED PRODUCTS.
- e. DO NOT APPLY DUST-ABATEMENT CHEMICALS, E.G., MAGNESIUM CHLORIDE, CALCIUM CHLORIDE SALTS, LIGNINSULFONATE, WITHIN 25 FEET OF WATER BODY, OR IN OTHER AREAS WHERE THERE MAY BE RUNOFF INTO A WETLAND OR WATER BODY.
- f. DO NOT APPLY LIGNINSULFONATE AT RATES EXCEEDING 2.26 L/M² (0.5 GALLONS PER SQUARE YARD) OF ROAD SURFACE, ASSUMING A 50:50 SOLUTION OF LIGNINSULFONATE TO WATER.

12. TEMPORARY STREAM CROSSINGS

- a. NO STREAM CROSSING MAY OCCUR WHERE LISTED AMPHIBIANS ARE PRESENT.
- b. NO STREAM CROSSING MAY OCCUR AT ACTIVE SPAWNING SITES WHEN HOLDING ADULT LISTED FISH ARE PRESENT, OR WHEN EGGS OR ALVEINS ARE IN THE GRAVEL.
- c. DO NOT PLACE TEMPORARY CROSSINGS IN AREAS THAT MAY INCREASE THE RISK OF CHANNEL RE-ROUTING OR AVULSION, OR IN POTENTIAL SPAWNING HABITAT, E.G., POOLS AND POOL TAILOUTS.
- d. MINIMIZE THE NUMBER OF TEMPORARY STREAM CROSSINGS; USE EXISTING STREAM CROSSINGS WHENEVER REASONABLE.
- e. INSTALL TEMPORARY BRIDGES AND CULVERTS TO ALLOW FOR EQUIPMENT AND VEHICLE CROSSING OVER PERENNIAL STREAMS TO ACCESS CONSTRUCTION AREAS.
- f. WHEREVER POSSIBLE, VEHICLES AND MACHINERY WILL CROSS STREAMS AT RIGHT ANGLES TO THE MAIN CHANNEL.
- g. EQUIPMENT AND VEHICLES MAY CROSS THE STREAM IN THE WET ONLY WHERE THE STREAMBED IS BEDROCK, WHERE THE STREAMBED IS NATURALLY STABLE, OR WHERE MATS OR OFF-SITE LOGS ARE PLACED IN THE STREAM AND USED AS A CROSSING.
- h. OBLITERATE ALL TEMPORARY STREAM CROSSINGS AS SOON AS THEY ARE NO LONGER NEEDED, AND RESTORE ANY DAMAGE TO AFFECTED STREAM BANKS OR CHANNEL.

13. SURFACE WATER WITHDRAWAL AND CONSTRUCTION DISCHARGE WATER

- a. SURFACE WATER MAY BE DIVERTED TO MEET CONSTRUCTION NEEDS, BUT ONLY IF DEVELOPED SOURCES ARE UNAVAILABLE OR INADEQUATE.
- b. DIVERSIONS MAY NOT EXCEED 10% OF THE AVAILABLE FLOW AND WILL HAVE A JUVENILE FISH EXCLUSION DEVICE THAT IS CONSISTENT WITH NMFS'S CRITERIA (NMFS 2011 OR THE MOST RECENT VERSION).
- c. TREAT ALL CONSTRUCTION DISCHARGE WATER USING BMPs TO REMOVE DEBRIS, SEDIMENT, PETROLEUM PRODUCTS, AND ANY OTHER POLLUTANTS LIKELY TO BE PRESENT (E.G., GREEN CONCRETE, CONTAMINATED WATER, SILT, WELDING SLAG, SANDBLASTING ABRASIVE, GROUT CURED LESS THAN 24 HOURS, DRILLING FLUIDS), TO ENSURE THAT NO POLLUTANTS ARE DISCHARGED TO ANY PERENNIAL OR INTERMITTENT WATERBODY.

14. TEMPORARY FISH PASSAGE

- a. PROVIDE FISH PASSAGE FOR ANY ADULT OR JUVENILE LISTED FISH LIKELY TO BE PRESENT IN THE ACTION AREA DURING CONSTRUCTION, UNLESS PASSAGE DID NOT EXIST BEFORE CONSTRUCTION. STREAM ISOLATION AND DEWATERING IS REQUIRED DURING PROJECT IMPLEMENTATION, UNLESS THE STREAM IS NATURALLY IMPASSABLE AT THE TIME OF CONSTRUCTION.
- b. AFTER CONSTRUCTION, PROVIDE FISH PASSAGE THAT

MEETS NMFS'S FISH PASSAGE CRITERIA FOR ANY ADULT OR JUVENILE LISTED FISH (NMFS 2011 OR THE MOST RECENT VERSION), FOR THE LIFE OF THE ACTION.

15. TIMING OF IN-WATER WORK

- a. THE IN-WATER WORK WINDOW WILL LIMIT IN-WATER CONSTRUCTION TO THE TIMES SPECIFIED IN THE PROJECT NOTIFICATION FORM. THE CONSTRUCTION SCHEDULE WILL CONFORM TO THE MOST UP-TO-DATE GUIDELINES ON IN-WATER WORK WINDOWS ESTABLISHED IN OREGON, WASHINGTON, AND IDAHO BY THE OREGON DEPARTMENT OF FISH AND WILDLIFE, WASHINGTON DEPARTMENT OF FISH AND WILDLIFE, AND IDAHO DEPARTMENT OF FISH AND GAME, RESPECTIVELY, AND THE SERVICE FOR BULL TROUT. FOR NEARSHORE PROJECTS IN PUGET SOUND, NO IN-WATER WORK IS ALLOWED IN BULL TROUT FORAGING, MIGRATION AND OVERWINTERING HABITAT FROM FEBRUARY 16 TO JULY 15, AND NEAR THE DUWAMISH RIVER FROM FEBRUARY 16 TO SEPTEMBER 30. ANY EXCEPTIONS TO IN-WATER WORK WINDOWS RECOMMENDED BY ODFW, WDFW, OR IDFG WILL BE APPROVED BY NMFS AND THE SERVICE, AS APPROPRIATE.
- b. HYDRAULIC AND TOPOGRAPHIC MEASUREMENTS AND PLACEMENT OF LW, BOULDERS, OR GRAVEL MAY BE COMPLETED ANYTIME, PROVIDED THERE IS NO EXCAVATION IN AREAS OCCUPIED BY ADULT FISH CONGREGATING FOR SPAWNING, OR IN AREAS WHERE REDDS ARE OCCUPIED BY EGGS OR PRE-EMERGENT ALEVINS.

16. FISHERIES, HYDROLOGY, GEOMORPHOLOGY, WILDLIFE, BOTANY, AND CULTURAL SURVEYS IN SUPPORT OF HABITAT RESTORATION

THIS INCLUDES ASSESSMENTS AND MONITORING PROJECTS THAT ARE ASSOCIATED WITH PLANNING, IMPLEMENTATION, AND MONITORING OF RESTORATION PROJECTS COVERED BY THIS OPINION. SUCH SUPPORT PROJECTS MAY INCLUDE SURVEYS TO DOCUMENT THE FOLLOWING AQUATIC, RIPARIAN, COASTAL AND UPLAND ATTRIBUTES: HABITAT, HYDROLOGY, CHANNEL GEOMORPHOLOGY, WATER QUALITY, FISH SPAWNING, SPECIES PRESENCE (ENUMERATION BY NON-LETHAL TECHNIQUES THAT DO NOT REQUIRE HANDLING, I.E., SNORKELING, OCULAR SURVEYS, ETC.; NOT HOOKING OR ELECTROFISHING FOR FISH SPECIES), MACROINVERTEBRATES, RIPARIAN VEGETATION, WILDLIFE, AND CULTURAL RESOURCES (INCLUDING EXCAVATING TEST PITS LESS THAN 1 M² (~1.2 SQUARE YARD) IN SIZE). THIS ALSO INCLUDES EFFECTIVENESS MONITORING ASSOCIATED WITH PROJECTS IMPLEMENTED UNDER THIS OPINION, PROVIDED THE EFFECTIVENESS MONITORING IS LIMITED TO THE SAME SURVEY TECHNIQUES DESCRIBED IN THIS SECTION.

- a. PROJECT SITES WILL BE SURVEYED FOR PRESENCE OF ANY LISTED PLANT OR ANIMAL SPECIES THAT MAY OCCUR WITHIN THE PROJECT AREA. SURVEYS WILL TAKE PLACE PRIOR TO INITIATION OF THE PROJECT AND DURING THE APPROPRIATE TIME FRAMES. IF NO SURVEYS OCCUR OR ARE AVAILABLE, OCCUPANCY FOR LISTED ANIMAL SPECIES WILL BE ASSUMED IN ALL SUITABLE HABITAT IN PROXIMITY TO KNOWN OCCUPIED HABITAT (DISTANCE IS DEFINED ON A SPECIES BY SPECIES BASIS WITHIN THE CONSERVATION MEASURES), AND LISTED PLANT OCCUPANCY WILL BE ASSUMED IN ALL SUITABLE HABITAT WHERE THE SPECIES IS KNOWN TO OCCUR, UNLESS ABSENCE CAN BE CONFIRMED BY A SERVICE SPECIES LEAD.
- b. TRAIN PERSONNEL IN SURVEY METHODS TO PREVENT OR MINIMIZE DISTURBANCE OF FISH AND WILDLIFE AND PLANTS. CONTRACT SPECIFICATIONS SHOULD INCLUDE THESE METHODS WHERE APPROPRIATE.
- c. AVOID IMPACTS TO FISH REDDS. WHEN POSSIBLE, AVOID SAMPLING DURING SPAWNING PERIODS.
- d. AVOID TRAMPLING AND/OR STEPPING ON LISTED SPECIES, THEIR NESTS AND THEIR FORAGE PLANTS WHEN COMPLETING SURVEYS, ASSESSMENTS, AND MONITORING ACTIVITIES.
- e. DO NOT WALK THROUGH VERNAL POOL HABITATS, ESPECIALLY DURING THE WET SEASON, UNLESS ABSOLUTELY NECESSARY TO COMPLETE REQUIRED SURVEYS, ASSESSMENTS, AND MONITORING ACTIVITIES.
- f. COMPLETE SURVEYS, ASSESSMENTS, AND MONITORING ACTIVITIES DURING NON-CRITICAL LIFE HISTORY PERIODS FOR A LISTED SPECIES (E.G., NOT DURING SPAWNING

AND BREEDING PERIODS), UNLESS THE ACTIVITY OBJECTIVE(S) REQUIRES THIS LEVEL OF TIMING.

- g. COORDINATE WITH OTHER LOCAL AGENCIES TO PREVENT REDUNDANT SURVEYS.
- h. LOCATE EXCAVATED MATERIAL FROM CULTURAL RESOURCE TEST PITS AWAY FROM STREAM CHANNELS. REPLACE ALL MATERIAL IN TEST PITS WHEN SURVEY IS COMPLETED AND STABILIZE THE SURFACE.

17. WORK AREA ISOLATION

- a. ISOLATE ANY WORK AREA WITHIN THE WETTED CHANNEL FROM THE ACTIVE STREAM WHENEVER LISTED FISH ARE REASONABLY CERTAIN TO BE PRESENT, OR IF THE WORK AREA IS LESS THAN 91.44 M (300 FEET) UPSTREAM FROM KNOWN SPAWNING HABITATS. HOWEVER, WORK AREA ISOLATION MAY NOT ALWAYS BE NECESSARY OR PRACTICAL IN CERTAIN SETTINGS; E.G., DRY STREAMBEDS AND TIDAL ZONES, RESPECTIVELY.
- b. ENGINEERING DESIGN PLANS FOR WORK AREA ISOLATION WILL INCLUDE ALL ISOLATION ELEMENTS. FINAL SITE SPECIFIC PLANS BY CONTRACTORS WILL BE APPROVED BY PROJECT SPONSOR AND BIOLOGIST.
- c. DEWATER THE SHORTEST LINEAR EXTENT OF WORK AREA PRACTICABLE, UNLESS WETTED IN-STREAM WORK IS DEEMED TO BE MINIMALLY HARMFUL TO FISH, AND IS BENEFICIAL TO OTHER AQUATIC SPECIES. FOR INSTRUCTIONS ON HOW TO DEWATER AREAS OCCUPIED BY LAMPREY, SEE BEST MANAGEMENT PRACTICES TO MINIMIZE ADVERSE EFFECTS TO PACIFIC LAMPREY (ENTOSPHENUS TRIDENTATUS) (USFWS 2010).
 - i. USE A COFFER DAM AND A BY-PASS CULVERT OR PIPE, OR A LINED, NON-ERODIBLE DIVERSION DITCH TO DIVERT FLOW AROUND THE DEWATERED AREA. DISSIPATE FLOW ENERGY TO PREVENT DAMAGE TO RIPARIAN VEGETATION OR STREAM CHANNEL AND PROVIDE SAFE DOWNSTREAM RE-ENTRY FOR FISH, PREFERABLY INTO POOL HABITAT WITH COVER.
 - ii. WHERE GRAVITY FEED IS NOT POSSIBLE, PUMP WATER FROM THE WORK SITE TO AVOID RE-WATERING. MAINTAIN A FISH SCREEN ON THE PUMP INTAKE TO AVOID JUVENILE FISH ENTRAINMENT (NMFS 2011 OR THE MOST RECENT VERSION).
 - iii. PUMP SEEPAGE WATER TO A TEMPORARY STORAGE AND TREATMENT SITE, OR INTO UPLAND AREAS, TO ALLOW WATER TO PERCOLATE THROUGH SOIL OR TO FILTER THROUGH VEGETATION BEFORE REENTERING THE STREAM CHANNEL. THE WATER TREATMENT SITE SHOULD HAVE A TREATMENT SYSTEM COMPRISED OF EITHER A HAY BALE BASIN OR OTHER SEDIMENT CONTROL DEVICE.
 - iv. MONITOR WATER LEVELS BELOW THE CONSTRUCTION SITE TO PREVENT STRANDING OF AQUATIC ORGANISMS.
 - v. WHEN CONSTRUCTION IS COMPLETE, RE-WATER THE CONSTRUCTION SITE SLOWLY TO PREVENT LOSS OF SURFACE FLOW DOWNSTREAM, AND TO PREVENT A RELEASE OF SUSPENDED SEDIMENT.
- d. WHENEVER A PUMP IS USED TO DEWATER THE ISOLATION AREA AND LISTED FISH MAY BE PRESENT, A FISH SCREEN WILL BE USED THAT MEETS NMFS'S FISH SCREEN CRITERIA (NMFS 2011 OR THE MOST RECENT VERSION). NMFS APPROVAL IS REQUIRED FOR PUMPING THAT EXCEEDS 3 CFS.

18. FISH CAPTURE AND RELEASE

- a. IF PRACTICABLE, ALLOW LISTED FISH SPECIES TO MIGRATE OUT OF THE WORK AREA OR REMOVE FISH BEFORE DEWATERING; OTHERWISE REMOVE FISH FROM AN EXCLUSION AREA AS IT IS SLOWLY DEWATERED WITH METHODS SUCH AS HAND OR DIP-NETS, SEINING, AND TRAPPING WITH MINNOW TRAPS (OR GEE-MINNOW TRAPS).
- b. FISH CAPTURE WILL BE SUPERVISED BY A QUALIFIED FISHERIES BIOLOGIST WITH EXPERIENCE IN WORK AREA ISOLATION AND COMPETENCE TO ENSURE THE SAFE HANDLING OF FISH.
- c. CONDUCT FISH CAPTURE ACTIVITIES DURING PERIODS OF THE DAY WITH THE COOLEST AIR AND WATER TEMPERATURES POSSIBLE, NORMALLY EARLY IN THE MORNING TO MINIMIZE STRESS AND INJURY OF SPECIES PRESENT.
- d. MONITOR THE NETS FREQUENTLY ENOUGH TO ENSURE

THEY STAY SECURED TO THE BANKS AND FREE OF ORGANIC ACCUMULATION.

- e. ELECTROFISH DURING THE COOLEST TIME OF DAY, AND ONLY AFTER OTHER MEANS OF FISH CAPTURE ARE DETERMINED TO BE NOT FEASIBLE OR INEFFECTIVE.
 - i. FOLLOW THE MOST RECENT VERSION OF NMFS (2000) ELECTROFISHING GUIDELINES.
 - ii. DO NOT ELECTROFISH WHEN THE WATER APPEARS TURBID, E.G., WHEN OBJECTS ARE NOT VISIBLE AT DEPTH OF 30 CM (12 INCHES).
 - iii. DO NOT INTENTIONALLY CONTACT FISH WITH THE ANODE.
 - iv. USE DIRECT CURRENT OR PULSED DIRECT CURRENT WITHIN THE FOLLOWING RANGES:
 - 1. IF CONDUCTIVITY IS LESS THAN 100 MICROSECOND (MS), USE 900 TO 1100 VOLTS.
 - 2. IF CONDUCTIVITY IS BETWEEN 100 AND 300 MS, USE 500 TO 800 VOLTS.
 - 3. IF CONDUCTIVITY GREATER THAN 300 MS, USE LESS THAN 400 VOLTS.
 - f. BEGIN ELECTROFISHING WITH A MINIMUM PULSE WIDTH AND RECOMMENDED VOLTAGE, THEN GRADUALLY INCREASE TO THE POINT WHERE FISH ARE IMMOBILIZED.
 - g. IMMEDIATELY DISCONTINUE ELECTROFISHING IF FISH ARE KILLED OR INJURED, I.E., DARK BANDS VISIBLE ON THE BODY, SPINAL DEFORMATIONS, SIGNIFICANT DE-SCALING, FISH ARE TORPID OR NOT ABLE TO MAINTAIN UPRIGHT ATTITUDE AFTER SUFFICIENT RECOVERY TIME. RECHECK MACHINE SETTINGS, WATER TEMPERATURE AND CONDUCTIVITY, AND ADJUST OR POSTPONE PROCEDURES AS NECESSARY TO REDUCE INJURIES.
 - h. IF BUCKETS ARE USED TO TRANSPORT FISH:
 - i. MINIMIZE THE TIME FISH ARE IN A TRANSPORT BUCKET.
 - ii. KEEP BUCKETS IN SHADED AREAS OR, IF NO SHADE IS AVAILABLE, COVERED BY A CANOPY.
 - iii. LIMIT THE NUMBER OF FISH WITHIN A BUCKET; FISH WILL BE OF RELATIVELY COMPARABLE SIZE TO MINIMIZE PREDATION.
 - iv. USE AERATORS OR REPLACE THE WATER IN THE BUCKETS AT LEAST EVERY 15 MINUTES WITH COLD CLEAR WATER.
 - v. RELEASE FISH IN AN AREA UPSTREAM WITH ADEQUATE COVER AND FLOW REFUGE; DOWNSTREAM RELEASE IS ACCEPTABLE PROVIDED THE RELEASE SITE IS BELOW THE INFLUENCE OF CONSTRUCTION.
 - vi. BE CAREFUL TO AVOID MORTALITY COUNTING ERRORS.
 - i. MONITOR AND RECORD FISH PRESENCE, HANDLING, AND INJURY DURING ALL PHASES OF FISH CAPTURE AND SUBMIT A FISH SALVAGE REPORT TO NMFS AND THE SERVICE FOR ANY LISTED FISH SPECIES THAT MAY BE PRESENT, WITHIN 60 DAYS OF CAPTURE. THE REPORT MUST, DOCUMENT THE DATE, TIME OF DAY, FISH HANDLING PROCEDURES, AIR AND WATER TEMPERATURES, AND TOTAL NUMBERS OF EACH FISH SPECIES HANDLED, AND NUMBERS OF LISTED FISH INJURED OR KILLED.

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311 SW Jefferson Avenue
Convalis, OR 97333
541.738.2920

236 Wisconsin Avenue
Whitefish, MT 59937
406.862.4927

PROJECT CONSERVATION MEASURES
MILL CREEK CULVERT REPLACEMENT
TILLAMOOK, OREGON

NO.	DATE	BY	DESCRIPTION	CHK	
				SW	SW
*	09/16/24	TF	95% DESIGN		

PROJECT NUMBER
RDG-18-023

DRAWING NUMBER
1.2

Drawing 3 of 15

GENERAL CONSERVATION MEASURES FROM PROGRAMMATIC RESTORATION OPINION FOR JOINT ECOSYSTEM CONSERVATION BY THE SERVICES (PROJECTS), CONTINUED

19. INVASIVE SPECIES AND NON-NATIVE PLANT CONTROL

INVASIVE SPECIES IMPACTS ARE OF CONCERN TO THE SERVICE AND NMFS. INVASIVE SPECIES DEGRADE, CHANGE, OR DISPLACE NATIVE HABITATS AND COMPETE WITH NATIVE WILDLIFE AND ARE THUS HARMFUL TO FISH, WILDLIFE, AND PLANT RESOURCES. PREVENTING THE INTRODUCTION OR SPREAD OF INVASIVE AND NON-TARGET SPECIES IS THE MOST EFFECTIVE STRATEGY TO AVOID IMPACTS TO NATIVE SPECIES AND ECOSYSTEMS. PREVENTIVE MEASURES TYPICALLY OFFER THE MOST COST-EFFECTIVE MEANS TO MINIMIZE OR ELIMINATE ENVIRONMENTAL AND ECONOMIC IMPACTS DUE TO INVASIVE SPECIES.

INVASIVE SPECIES PREVENTION MEASURES

- a. EACH PROJECT MUST CLEARLY IDENTIFY AND IMPLEMENT INVASIVE SPECIES PREVENTION MEASURES, INCLUDING:
 - i. GENERATING A LIST OF INVASIVE SPECIES OF CONCERN FOR IMPORTING OR EXPORTING FROM THE PROJECT SITE.
 - ii. SPECIFYING METHODS TO BE USED TO REDUCE THE RISK OF SPREADING INVASIVE SPECIES.
 - iii. MONITORING THAT WILL OCCUR TO DETECT INVASIVE SPECIES AND;
 - iv. IDENTIFYING ACTIONS THAT WILL BE IMPLEMENTED TO CONTROL INVASIVE SPECIES IF IDENTIFIED AND IT IS DEEMED NECESSARY TO TAKE ACTION.
- b. CONTROL OR REMOVAL OF INVASIVE AND NON-NATIVE VEGETATION MUST BE COMPLETED IN A MANNER THAT MINIMIZES THE ACCIDENTAL DISPERSAL OF SEEDS OR REPRODUCTIVE PLANT PARTS TO OTHER LOCATIONS. PROJECT PERSONNEL SHOULD COMPLETE THE FOLLOWING TASKS.
 - i. SHAKE OUT ALL WORK CLOTHES WORN BEFORE LEAVING A PROJECT SITE.
 - ii. CHANGE WORK CLOTHES (E.G., COVERALLS, GLOVES, AND HATS) AND CLEAN BOOTS IF WORKERS WILL BE GOING TO A NEW LOCATION.
 - iii. LAUNDRY WORK CLOTHES FREQUENTLY.
 - iv. PROPERLY DISPOSE OF ALL INVASIVE AND NON-NATIVE PLANT MATERIALS REMOVED DURING A TREATMENT IN A TIMELY MANNER.
 - v. CLEAN ALL EQUIPMENT, VEHICLES, AND TOOLS USED AT A PROJECT SITE BEFORE GOING TO A NEW LOCATION.

INVASIVE PLANT TREATMENT MEASURES

- a. HERBICIDE METHODS.
 - FOR HERBICIDE USE IN PRAIRIE RESTORATION SITES, SEE PDC 51 FOR ADDITIONAL INFORMATION AND RESTRICTIONS ON PRAIRIE, COASTAL AND OAK HABITAT RESTORATION.
 - HERBICIDE LABEL. HERBICIDE APPLICATORS WILL COMPLY WITH ALL LABEL INSTRUCTIONS.
 - POWER EQUIPMENT. REFUEL GAS-POWERED EQUIPMENT WITH TANKS LARGER THAN 19 LITERS (5 GALLONS) IN A VEHICLE STAGING AREA PLACED 45.72 M (150 FEET) OR MORE FROM ANY NATURAL WATERBODY, OR IN AN ISOLATED HAZARD ZONE SUCH AS A PAVED PARKING LOT.
 - MAXIMUM HERBICIDE TREATMENT AREA. IN RIPARIAN HABITAT: DO NOT TREAT MORE THAN 10% OF THE ACRES OF RIPARIAN HABITAT WITHIN A 6TH FIELD HUC WITH HERBICIDES PER YEAR.
 - HERBICIDE APPLICATOR QUALIFICATIONS. HERBICIDES MAY ONLY BE APPLIED BY AN APPROPRIATELY LICENSED APPLICATOR, OR UNDER THE DIRECT SUPERVISION OF A LICENSED APPLICATOR. ONLY USE AN HERBICIDE SPECIFICALLY TARGETED FOR A PARTICULAR PLANT SPECIES THAT WILL CAUSE THE LEAST IMPACT.
 - HERBICIDE TRANSPORTATION AND SAFETY PLAN. THE APPLICATOR WILL PREPARE AND CARRY OUT AN HERBICIDE SAFETY/SPILL RESPONSE PLAN TO REDUCE THE LIKELIHOOD OF SPILLS OR MISAPPLICATION, TAKE REMEDIAL ACTIONS IN THE

EVENT OF SPILLS, AND FULLY REPORT THE EVENT. THE FOLLOWING MEASURES WILL BE USED TO REDUCE THE RISK OF A SPILL DURING WATER TRANSPORT: A) NO MORE THAN 9.5 L (2.5 GALLONS) OF HERBICIDE CONCENTRATE WILL BE TRANSPORTED PER PERSON OR RAFT, AND TYPICALLY IT WILL BE 3.8 L (1 GALLON) OR LESS; B) GLYPHOSATE WILL BE CARRIED IN 3.8 L (1 GALLON) OR SMALLER PLASTIC CONTAINERS. THE CONTAINERS WILL BE WRAPPED IN PLASTIC BAGS AND THEN SEALED IN A SECONDARY WATERTIGHT CONTAINER. IF TRANSPORTED BY RAFT, THE CONTAINER WILL BE SECURED TO THE WATERCRAFT.

- BEFORE APPLYING HERBICIDE, APPLICATORS MUST THOROUGHLY REVIEW THE SITE TO IDENTIFY AND MARK ANY REQUIRED BUFFER AREAS.

- b. ALL REASONABLE EFFORTS WILL BE MADE TO DETERMINE ADVERSE IMPACTS TO LISTED SPECIES FOLLOWING HERBICIDE APPLICATIONS.
- c. NOTIFY THE SERVICE WITHIN 24 HOURS OF ANY SPILL OR MISAPPLICATION.
- d. PERMITTED HERBICIDES. THE ONLY HERBICIDES ALLOWED FOR USE UNDER THIS OPINION ARE DIVIDED INTO "AQUATIC AND UPLAND" AND "UPLAND USE ONLY". HERBICIDES AND ADJUTANTS IDENTIFIED FOR "UPLAND USE ONLY," MUST NOT BE USED WITHIN 30.5 M (100 FEET) (EXCEPT ORYZALIN WHICH HAS A 297 M (975 FEET) BUFFER) OF AQUATIC HABITATS OR WHERE THERE IS A REASONABLE LIKELIHOOD THAT IT WILL DRIFT OR LEACH INTO AQUATIC HABITATS. ALL BMPS FOR HERBICIDE USE AND SPECIES SPECIFIC CONSERVATION MEASURES MUST BE OBSERVED. THE USE OF DYES IS STRONGLY ENCOURAGED WHEN SPRAYING NEAR THE 30 M (100 FEET) BUFFER. VEGETATION CONTROL CLOSER THAN 30 M (100 FEET) MAY USE "AQUATIC" HERBICIDES WITH ASSOCIATED BUFFERS, OR OTHER CONTROL TECHNIQUES REMOVAL.
- e. PERMITTED HERBICIDES, COMMON TRADE NAMES (THE USE OF TRADE, FIRM, OR CORPORATION NAMES IN THIS OPINION IS FOR THE INFORMATION AND CONVENIENCE OF THE ACTION AGENCY AND APPLICANTS AND DOES NOT CONSTITUTE AN OFFICIAL ENDORSEMENT OR APPROVAL BY THE U.S. DEPARTMENT OF INTERIOR OR USFWS OF ANY PRODUCT OR SERVICE TO THE EXCLUSION OF OTHERS THAT MAY BE SUITABLE), AND ALLOWABLE USES UNDER THIS OPINION ARE AS FOLLOWS:
 - AQUATIC AND UPLAND HERBICIDES
 - AQUATIC IMAZAPYR (E.G., HABITAT) - AQUATIC AND UPLAND, NO T&E PLANTS AND BUTTERFLIES
 - AQUATIC GLYPHOSATE (E.G., AQUAMASTER, AQUAPRO, RODEO) - AQUATIC AND UPLAND
 - AQUATIC TRICLOPYR-TEA (E.G., RENOVATE 3) - AQUATIC AND UPLAND, NO T&E PLANTS AND BUTTERFLIES
 - CHLORSULFURON (E.G., TELAR, GLEAN, CORSAIR) - AQUATIC AND UPLAND
 - CLOPYRALID (E.G., TRANSLINE) - AQUATIC AND UPLAND
 - IMAZAPIC (E.G., PLATEAU) - AQUATIC AND UPLAND
 - IMAZAPYR (E.G., ARSENAL, CHOPPER) - AQUATIC AND UPLAND, NO T&E PLANTS AND BUTTERFLIES
 - METSULFURON-METHYL (E.G., ESCORT) - AQUATIC AND UPLAND
 - PICLORAM (E.G., TORDON) - AQUATIC AND UPLAND
 - SETHOXYDIM (E.G., POAST, VANTAGE) - AQUATIC AND UPLAND
 - SULFOMETURON-METHYL (E.G., OUST, OUST XP) - AQUATIC AND UPLAND
 - GLYPHOSATE (NONAQUATIC FORMULATION) - UPLAND USE ONLY, NO VERNAL POOL USE.
 - TRICLOPYR (E.G., GARLON4ULTRA) - UPLAND USE ONLY, NO VERNAL POOL USE.
 - FLUAZIFOP-P-BUTYL (E.G., FUSILADE) - UPLAND USE ONLY, NO VERNAL POOL USE.
 - CLETHODIM (E.G., ENVOY) - UPLAND USE ONLY, NO VERNAL POOL USE
 - TRICLOPYR +2,4-D ESTER (E.G., CROSSBOW) - UPLAND USE ONLY, NO VERNAL POOL USE.
 - DIQUAT DIBROMIDE (E.G., REWARD) - UPLAND USE ONLY, NO VERNAL POOL USE
 - 2,4-D AMINE, CANNOT USE ON T&E PLANTS AND

- BUTTERFLIES, NO VERNAL POOL USE.
- ORYZALIN, CANNOT USE ON T&E PLANTS AND BUTTERFLIES, NO VERNAL POOL USE.
- AMINOPYRALID - UPLAND USE ONLY, NO VERNAL POOL USE.

f. PERMITTED HERBICIDE ADJUVANTS. WHEN RECOMMENDED BY THE LABEL, AN APPROVED AQUATIC SURFACTANT OR DRIFT RETARDANT CAN BE USED TO IMPROVE HERBICIDAL ACTIVITY OR APPLICATION CHARACTERISTICS. ADJUVANTS THAT CONTAIN ALKY AMINE ETHOLOXYLATES, I.E., POLYETHOXYLATED TALLOW AMINE (POEA), ALKYLPHENOL ETHOXYLATE (INCLUDING ALKYL PHENOL ETHOXYLATE PHOSPHATE ESTERS), OR HERBICIDES THAT CONTAIN THESE COMPOUNDS ARE NOT COVERED BY THIS OPINION. THE FOLLOWING PRODUCT NAMES ARE COVERED BY THIS OPINION:

- AGRI-DEX
- AQUASURF
- BOND
- BRONC MAX
- BRONC PLUS DRY-EDT
- CLASS ACT NG
- COMPETITOR
- CUT RATE
- CYGNET PLUS
- DESTINY HC
- EXCITER FRACTION
- INTERLOCK
- KINETIC
- LEVEL 7
- LIBERATE
- MAGNIFY
- ONE-AP XL
- PRO AMS PLUS
- SPRAY-RITE
- SUPERB HC
- TACTIC
- TRONIC
- ACTIVEATE PLUS - UPLAND USE ONLY
- NUFILM - UPLAND USE ONLY
- OTHER VEGETABLE-BASED SURFACTANTS FOR WHICH THERE IS A DEMONSTRATED TRACK RECORD FOR USE WITH SERVICE ESA-LISTED SPECIES - UPLAND USE ONLY

g. MEASURES FOR HANDLING HERBICIDES ARE AS FOLLOWS.

- i. DURING TRANSPORT, THE APPLICATOR MUST SECURE HERBICIDES CONTAINERS TO PREVENT MOVEMENT WITHIN THE VEHICLE OR LOSS FROM THE VEHICLE.
- ii. WHEN SPRAY EQUIPMENT IS NOT BEING USED, THE APPLICATOR MUST ENSURE THAT ALL VALVES AND TANKS COVERS ARE CLOSED DURING MOVEMENT OF THE VEHICLE.
- h. THE APPLICATOR MUST FIRMLY SECURE ANY FILLED PORTABLE TANKS USED FOR HERBICIDE APPLICATIONS TO THE FRAME OF THE VEHICLE.
- i. HERBICIDE CARRIERS. HERBICIDE CARRIERS (SOLVENTS) ARE LIMITED TO WATER OR SPECIFICALLY LABELED VEGETABLE OIL. USE OF DIESEL OIL AS AN HERBICIDE CARRIER IS NOT COVERED BY THIS OPINION.
- j. DYES. THE PRESENCE OF DYE MAKES IT EASIER TO SEE WHERE THE HERBICIDE HAS OR HAS NOT BEEN APPLIED, AS WELL AS ENABLING APPLICATOR TO IMMEDIATELY SEE IF THERE ARE DRIFT ISSUES, SPILLS, LEAKS OR DRIPS (SERA 1997).
 - i. DYES SHOULD BE USED FOR ALL APPLICATIONS TO ENSURE COMPLETE AND UNIFORM TREATMENT OF INVASIVE PLANTS.
 - ii. USE A NON-HAZARDOUS INDICATOR DYE (E.G., HI-LIGHT OR DYNAMARK) WITH HERBICIDES WITHIN 30.5 M (100 FEET) OF WATER.
- k. MEASURES FOR HERBICIDE MIXING.
 - i. MIX HERBICIDES AND ADJUVANTS, CARRIERS, AND/OR DYES MORE THAN 45.7 M (150 FEET) FROM ANY PERENNIAL OR INTERMITTENT WATERBODY TO

MINIMIZE THE RISK OF AN ACCIDENTAL DISCHARGE.

- ii. APPLICATORS MUST PREPARE SPRAY MIXTURES IN ACCORDANCE WITH THE LABEL INSTRUCTIONS AND NOT EXCEED THE AMOUNT OF HERBICIDE PER ACRE AS SPECIFIED IN THE INSTRUCTIONS.
- iii. APPLICATORS MUST MIX AND LOAD HERBICIDES AT LEAST 45.7 M (150 FEET) FROM ANY SURFACE WATERS AND RESIDENTIAL WELLS AND ONLY IN LOCATIONS WHERE ACCIDENTAL SPILLS CANNOT FLOW INTO SURFACE WATERS OR CONTAMINATE GROUNDWATER. REQUIRED BUFFER DISTANCES TO LISTED SPECIES AND SENSITIVE RESOURCES MUST ALSO BE ADHERED TO AS ADDRESSED IN THE SPECIES CONSERVATION MEASURES.

l. TANK MIXTURES. THE POTENTIAL INTERACTIVE RELATIONSHIPS THAT EXIST AMONG MOST ACTIVE INGREDIENT COMBINATIONS HAVE NOT BEEN DEFINED AND ARE UNCERTAIN. THEREFORE, COMBINATIONS OF HERBICIDES IN A TANK MIX ARE NOT COVERED BY THIS OPINION.

m.SPILL CLEANUP KIT. PROVIDE A SPILL CLEANUP KIT WHENEVER HERBICIDES ARE USED, TRANSPORTED, OR STORED. AT A MINIMUM, CLEANUP KITS WILL INCLUDE MATERIAL SAFETY DATA SHEETS, THE HERBICIDE LABEL, EMERGENCY PHONE NUMBERS, AND ABSORBENT MATERIAL SUCH AS CAT LITTER TO CONTAIN SPILLS.

n. HERBICIDE APPLICATION RATES. APPLY HERBICIDES AT THE LOWEST EFFECTIVE LABEL RATES.

o. HERBICIDE APPLICATION METHODS. HERBICIDES WILL ONLY BE APPLIED BY AN APPROPRIATELY LICENSED APPLICATOR OR UNDER THE DIRECT SUPERVISION OF A LICENSED APPLICATOR, AND APPLICATION METHODS MUST COMPLY WITH ALL LABEL INSTRUCTIONS. APPLY LIQUID OR GRANULAR FORMS OF HERBICIDES AS FOLLOWS:

- i. BROADCAST SPRAYING - HAND HELD NOZZLES ATTACHED TO BACK PACK TANKS OR VEHICLES, OR BY USING VEHICLE MOUNTED BOOMS.
- ii. SPOT SPRAYING - HAND HELD NOZZLES ATTACHED TO BACK PACK TANKS OR VEHICLES, HAND-PUMPED SPRAY, OR SQUIRT BOTTLES TO SPRAY HERBICIDE DIRECTLY ONTO SMALL PATCHES OR INDIVIDUAL PLANTS.
- iii. HAND/SELECTIVE - WICKING AND WIPING, BASAL BARK, FILL ("HACK AND SQUIRT"), STEM INJECTION, CUT-STUMP.

n. MEASURES FOR SPOT SPRAYING

- i. KEEP THE SPRAY NOZZLE WITHIN 1.2 M (4 FEET) OF THE GROUND WHEN APPLYING HERBICIDE LESS THAN 4.6 M (15 FEET) FROM HIGH WATER MARK (HWM). IF SPOT OR PATCH SPRAYING TALL VEGETATION MORE THAN 4.6 M (15 FEET) AWAY FROM THE HWM, KEEP THE SPRAY NOZZLE WITHIN 1.8 M (6 FEET) OF THE GROUND.
- ii. APPLY SPRAY IN SWATHS PARALLEL TOWARDS THE PROJECT AREA, AWAY FROM THE CREEK AND DESIRABLE VEGETATION, I.E., THE PERSON APPLYING THE SPRAY WILL GENERALLY HAVE THEIR BACK TO THE CREEK OR OTHER SENSITIVE RESOURCE.

o. MEASURES FOR WICK AND WIPE APPLICATIONS

- i. THE APPROPRIATE TYPE AND SIZE OF EQUIPMENT WILL BE USED TO APPLY HERBICIDES ONTO THE TARGET FOLIAGE AND STEMS.
- ii. HERBICIDE APPLICATIONS WILL BE MADE IN A MANNER THAT PREVENTS HERBICIDE RUNOFF ONTO THE GROUND.

p. MEASURES FOR BASAL BARK APPLICATIONS

- i. APPLICATORS WILL AVOID UNNECESSARY RUN-OFF WHEN APPLYING HERBICIDE TO STEMS OF TARGET VEGETATION. A DRYER IS RECOMMENDED TO ESTABLISH COVERAGE AND PREVENT RUNOFF.
- ii. HERBICIDE APPLICATIONS WILL BE APPLIED USING THE LOWEST NOZZLE PRESSURE THAT WILL ALLOW ADEQUATE COVERAGE.

q. MEASURES FOR SPOT AND PATCH APPLICATIONS

- i. HERBICIDES APPLICATIONS MAY BE USED WITH HAND APPLICATORS OR AN ALL-TERRAIN VEHICLE WITH LOW MOUNTED BOOM SPRAYERS.
- ii. HERBICIDE WILL BE APPLIED IN A MANNER WHERE THE SPRAY IS DIRECTED TOWARDS THE APPLICATION AREA AND AWAY FROM LISTED PLANTS.



PROJECT CONSERVATION MEASURES
MILL CREEK CULVERT REPLACEMENT
TILLAMOOK, OREGON

NO.	DATE	BY	DESCRIPTION	CHK
*	09/16/24	TF	95% DESIGN	SW
PROJECT NUMBER RDG-18-023				
DRAWING NUMBER 1.3				
Drawing 4 of 15				

GENERAL CONSERVATION MEASURES FROM PROGRAMMATIC RESTORATION OPINION FOR JOINT ECOSYSTEM CONSERVATION BY THE SERVICES (PROJECTS), CONTINUED

- r. MEASURES FOR CUT SURFACE AND HACK AND SQUIRT/INJECTION APPLICATIONS
 - i. HERBICIDE APPLICATIONS WILL BE MADE IN A MANNER THAT PREVENTS HERBICIDE RUNOFF ONTO THE GROUND.
- s. MEASURES FOR SPOT APPLICATIONS OF DRY GRANULES, PELLETS, AND DUST
 - i. A 3 M (10 FEET) BUFFER WILL BE MAINTAINED BETWEEN LISTED PLANTS AND APPLICATION AREAS TO PREVENT EXPOSURE TO LISTED PLANTS.
- t. MEASURES FOR TRACTOR-BASED BROADCAST APPLICATIONS
 - i. NOZZLES AND PRESSURES WILL BE ADJUSTED TO MINIMIZE FINE PARTICLE SIZE SO THAT THE SPRAY DOES NOT DRIFT OFF THE APPLICATION AREA, WHILE STILL PROVIDING FOR REASONABLE HERBICIDE COVERAGE.
 - ii. DRIFT CONTROL AGENTS WILL BE USED IF NECESSARY TO PREVENT ANY SPRAY FROM DRIFTING OFF THE APPLICATION AREA.
- u. WASHING SPRAY TANKS. WASH SPRAY TANKS 91.4 M (300 FEET) OR MORE AWAY FROM ANY SURFACE WATER.
- v. AVOID THE USE OF ANY IRRIGATION WATERS THAT ARE CONTAMINATED WITH HERBICIDES. DO NOT USE THESE WATERS IN ANY AREA THAT CONTAINS A LISTED PLANT SPECIES.
- w. MINIMIZATION OF HERBICIDE DRIFT AND AS FOLLOWS:
 - i. DO NOT BROADCAST SPRAY WHEN WIND SPEEDS EXCEED 16.1 KM (10 MILES) PER HOUR, OR ARE LESS THAN 3.2 KM (2 MILES) PER HOUR. DO NOT SPOT SPRAY WHEN WIND SPEEDS EXCEED 16.1 KM (10 MILES) PER HOUR. WINDS LESS THAN 3.2 KM (2 MILES) PER HOUR ARE ACCEPTABLE FOR SPOT SPRAYING.
 - ii. BE AWARE OF WIND DIRECTIONS AND POTENTIAL FOR HERBICIDES TO AFFECT AQUATIC HABITAT AREA DOWNWIND.
 - iii. KEEP BOOM OR SPRAY AS LOW AS POSSIBLE TO REDUCE WIND EFFECTS.
 - iv. USE MINIMUM EFFECTIVE NOZZLE HEIGHT RECOMMENDED BY NOZZLE MANUFACTURER.
 - v. INCREASE SPRAY DROPLET SIZE WHENEVER POSSIBLE BY DECREASING SPRAY PRESSURE TO LOWEST EFFECTIVE NOZZLE PRESSURE RECOMMENDED BY NOZZLE MANUFACTURER, USING HIGH FLOW RATE NOZZLES, USING WATER DILUENTS INSTEAD OF OIL, AND ADDING THICKENING AGENTS.
 - vi. DO NOT APPLY HERBICIDES DURING TEMPERATURE INVERSIONS, OR WHEN AIR TEMPERATURE EXCEEDS 27 °C (81 °F). DO NOT APPLY HERBICIDES WHEN THE SOIL IS SATURATED OR WHEN A PRECIPITATION EVENT LIKELY TO PRODUCE DIRECT RUNOFF TO SALMON/BULL TROUT BEARING WATERS FROM THE TREATED AREA IS FORECASTED BY THE NOAA NATIONAL WEATHER SERVICE OR OTHER SIMILAR FORECASTING SERVICE WITHIN 48 HOURS FOLLOWING APPLICATION. SOIL-ACTIVATED HERBICIDES MAY FOLLOW LABEL INSTRUCTIONS. DO NOT CONDUCT HACK-SQUIRT/INJECTION APPLICATIONS DURING PERIODS OF HEAVY RAINFALL. FOR ALL OTHER CASES: HERBICIDE APPLICATIONS WILL BE DELAYED IF PRECIPITATION IS FORECAST TO OCCUR WITHIN 24 HOURS, EXCEPT FOR PELLET BASED APPLICATIONS. AT UPLAND PRAIRIE SITES, CHEMICAL APPLICATIONS WILL NOT OCCUR WITHIN 24 HOURS OF PREDICTED PRECIPITATION. AT WET PRAIRIE SITES, CHEMICAL APPLICATIONS WILL ONLY BE CONDUCTED IF THE 7-DAY WEATHER FORECAST INDICATES NO SIGNIFICANT RAINFALL.
 - vii. WIND AND OTHER WEATHER DATA WILL BE MONITORED AND REPORTED FOR ALL BROADCAST APPLICATIONS.

A. HERBICIDE BUFFER DISTANCES. TABLE 1 OUTLINES REQUIRED NO-APPLICATION BUFFER-WIDTHS, MEASURED IN FEET, AS MAP DISTANCE PERPENDICULAR TO THE BANKFULL ELEVATION FOR STREAMS, THE UPLAND BOUNDARY FOR WETLANDS, OR THE UPPER BANK FOR ROADSIDE DITCHES. WIDTHS ARE BASED ON HERBICIDE FORMULA, STREAM TYPE, AND APPLICATION METHOD DURING HERBICIDE APPLICATIONS. BEFORE HERBICIDE APPLICATION BEGINS, FLAG OR MARK THE UPLAND BOUNDARY OF EACH APPLICABLE HERBICIDE BUFFER TO ENSURE THAT ALL

BUFFERS ARE IN PLACE AND FUNCTIONAL DURING TREATMENT.

20. PILING INSTALLATION - NOT APPLICABLE TO THIS PROJECT.

21. SITE RESTORATION

- a. RESTORE ANY SIGNIFICANT DISTURBANCE OF RIPARIAN, WETLAND OR UPLAND VEGETATION, SOILS, STREAM BANKS OR STREAM CHANNEL.
- b. REMOVE ALL PROJECT RELATED WASTE; E.G., PICK UP TRASH, SWEEP ROADWAYS IN THE PROJECT AREA TO AVOID RUNOFF-CONTAINING SEDIMENT AND TRASH.
- c. OBLITERATE ALL TEMPORARY ACCESS ROADS, CROSSINGS, AND STAGING AREAS.
- d. LOOSEN SOIL IN COMPACTED AREAS WHEN NECESSARY FOR REVEGETATION OR INFILTRATION.
- e. ALTHOUGH NO SINGLE CRITERION IS SUFFICIENT TO MEASURE RESTORATION SUCCESS, THE INTENT IS THAT THE FOLLOWING FEATURES SHOULD BE PRESENT IN THE UPLAND PARTS OF THE PROJECT AREA, WITHIN REASONABLE LIMITS OF NATURAL AND MANAGEMENT VARIATION:
 - i. HUMAN AND LIVESTOCK DISTURBANCE, IF ANY, ARE CONFINED TO SMALL AREAS NECESSARY FOR ACCESS OR OTHER SPECIAL MANAGEMENT SITUATIONS.
 - ii. AREAS WITH SIGNS OF SIGNIFICANT PAST EROSION ARE COMPLETELY STABILIZED AND HEALED, BARE SOIL SPACES ARE SMALL AND WELL-DISPERSED.
 - iii. SOIL MOVEMENT, SUCH AS ACTIVE RILLS AND SOIL DEPOSITION AROUND PLANTS OR IN SMALL BASINS, IS ABSENT OR SLIGHT AND LOCAL.
 - iv. NATIVE WOODY AND HERBACEOUS VEGETATION, AND GERMINATION MICROSITES, ARE PRESENT AND WELL DISTRIBUTED ACROSS THE SITE; INVASIVE PLANTS ARE MINIMAL OR ABSENT.
 - v. PLANTS HAVE NORMAL, VIGOROUS GROWTH FORM, AND A HIGH PROBABILITY OF REMAINING VIGOROUS, HEALTHY AND DOMINANT OVER UNDESIRED COMPETING VEGETATION.
 - vi. PLANT LITTER IS WELL DISTRIBUTED AND EFFECTIVE IN PROTECTING THE SOIL WITH LITTLE OR NO LITTER ACCUMULATED AGAINST VEGETATION AS A RESULT OF ACTIVE SHEET EROSION ("LITTER DAMS").
 - vii. A CONTINUOUS CORRIDOR OF SHRUBS AND TREES APPROPRIATE TO THE SITE ARE PRESENT TO PROVIDE SHADE AND OTHER HABITAT FUNCTIONS FOR THE ENTIRE STREAMBANK/SHORELINE.

22. REVEGETATION

- a. PLANT AND SEED DISTURBED AREAS BEFORE OR AT THE BEGINNING OF THE FIRST GROWING SEASON AFTER CONSTRUCTION.
- b. NATIVE VEGETATION WILL PLANTED ON DISTURBED PROJECT SITES AND SITES PROTECTED FROM FURTHER DISTURBANCE UNTIL NEW GROWTH IS WELL ESTABLISHED. DO NOT USE NON-NATIVE SPECIES FOR SITE RESTORATION WITH THE EXCEPTION OF STERILE SEED FOR STABILIZATION IF NATIVE SEED IS NOT AVAILABLE.
- c. USE AN ASSEMBLAGE OF VEGETATION SPECIES APPROPRIATE FOR LONG-TERM PRODUCTIVITY OF THE SITE, INCLUDING NATIVE TREES, SHRUBS, AND HERBACEOUS SPECIES. VEGETATION, SUCH AS WILLOW (SALIX SPP.), SEDGE (CAREX SPP.) AND RUSH (JUNCUS SPP.) MATS, MAY BE GATHERED FROM ABANDONED FLOODPLAINS, STREAM CHANNELS, AND WETLANDS.
- d. PLANTING TECHNIQUES MUST NOT CAUSE MAJOR SOIL DISTURBANCE AT PROJECT SITES.
- e. NATIVE VEGETATION SHOULD BE SALVAGED, AS APPROPRIATE, FROM AREAS WHERE SOIL DISTURBANCE WILL BE OCCURRING ON A PROJECT SITE AND REPLANTED LATER AT THE SITE. WHEN FEASIBLE, USE VEGETATION SALVAGED FROM OTHER LOCAL AREAS SCHEDULED FOR CLEARING DUE TO DEVELOPMENT.
- f. USE SPECIES THAT WILL ACHIEVE SHADE AND EROSION CONTROL OBJECTIVES, INCLUDING FORB, GRASS, SHRUB, OR TREE SPECIES THAT ARE APPROPRIATE FOR THE SITE AND NATIVE TO THE PROJECT AREA OR REGION. SHORT-TERM STABILIZATION MEASURES MAY INCLUDE USE OF NON-NATIVE STERILE SEED MIX IF NATIVE SEEDS ARE NOT

AVAILABLE, WEED-FREE CERTIFIED STRAW, JUTE MATTING, AND SIMILAR METHODS.

- g. DO NOT APPLY SURFACE FERTILIZER WITHIN 15.4 M (50 FEET) OF ANY WETLAND OR WATER BODY.
- h. INSTALL FENCING AS NECESSARY TO PREVENT ACCESS TO REVEGETATED SITES BY LIVESTOCK OR UNAUTHORIZED PERSONS.
- i. CONDUCT POST-CONSTRUCTION MONITORING AND TREATMENT TO REMOVE OR CONTROL INVASIVE PLANTS UNTIL NATIVE PLANT SPECIES ARE WELL ESTABLISHED.

TABLE 1. HERBICIDE BUFFER DISTANCES BY HERBICIDE FORMULA, STREAM TYPE, AND APPLICATION METHOD FOR AQUATIC HABITAT RESTORATION PROJECTS. UPLAND USE ONLY HERBICIDES MUST BE USED AT LEAST 30.5 M (100 FEET) FROM ANY AQUATIC HABITAT, EXCEPT FOR ORYZALIN, WHICH REQUIRES A 297 M (975 FEET) BUFFER FROM AQUATIC HABITATS. CHECK SPECIES-SPECIFIC CONSERVATION MEASURES FOR ADDITIONAL RESTRICTIONS FOR EACH LISTED SPECIES AT EACH PROJECT SITE.

Herbicide	No Application Buffer Width (feet)					
	Streams and Roadside Ditches with flowing or standing water present and Wetlands			Dry Streams, Roadside Ditches, and Wetlands (no standing water present)		
	Broadcast Spraying	Spot Spraying	Hand Selective	Broadcast Spraying	Spot Spraying	Hand Selective
Labeled for Aquatic Use						
Aquatic Glyphosate	100	waterline	Waterline	50	None	None
Aquatic Imazapyr	100	15	Waterline	50	None	None
Aquatic Triclopyr-TEA	Not Allowed	15	Waterline	Not Allowed	None	None
Low Risk to Aquatic Organisms						
Imazapic	100	15	bankfull elevation	50	None	None
Clopyralid	100	15	bankfull elevation	50	None	None
Metsulfuron-methyl	100	15	bankfull elevation	50	None	None
Moderate Risk to Aquatic Organisms						
Imazapyr	100	50	bankfull elevation	50	15	bankfull elevation
Sulfometuron-methyl	100	50	50	50	15	bankfull elevation
Chlorsulfuron	100	50	bankfull elevation	50	15	bankfull elevation
High Risk to Aquatic Organisms						
Picloram	100	50	50	100	50	50
Sethoxydim	100	50	50	100	50	50
Upland Use Only Herbicides						
Triclopyr - BEE	100	100	100	100	100	100
Glyphosate	100	100	100	100	100	100
2, 4-D amine	100	100	100	100	100	100
Clethodim	100	100	100	100	100	100
Fluazifop-P-butyl	100	100	100	100	100	100
Oryzalin	Not Allowed	975	975	Not Allowed	975	975
Aminopyralid	100	100	100	100	100	100
diquat dibromide (e.g., Reward)	100	100	100	100	100	100
triclopyr +2,4-D ester (e.g., Crossbow)	100	100	100	100	100	100



PROJECT CONSERVATION MEASURES

MILL CREEK CULVERT REPLACEMENT
TILLAMOOK, OREGON

NO.	DATE	BY	DESCRIPTION	CHK
*	09/16/24	TF	95% DESIGN	SW

PROJECT NUMBER
RDG-18-023

DRAWING NUMBER
1.4

STREAM REACH CHARACTERISTICS

DRAINAGE AREA	1.6 SQ. MILES
AVERAGE REACH SLOPE (2018)	0.0047 FT/FT
ACTIVE CHANNEL WIDTH	AVG. 14 FT
2-YEAR FLOW	100 CFS
10-YEAR FLOW	170 CFS
50-YEAR FLOW	230 CFS
100-YEAR FLOW	260 CFS
100 ⁺ -YEAR FLOW	335 CFS
IN WATER WORK PERIOD	JULY 1 - SEPTEMBER 15

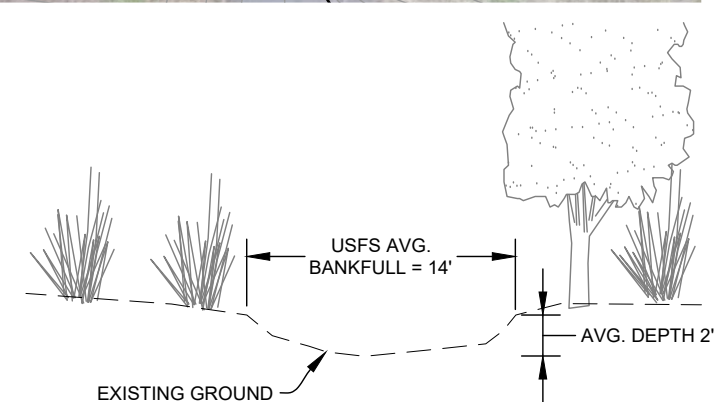
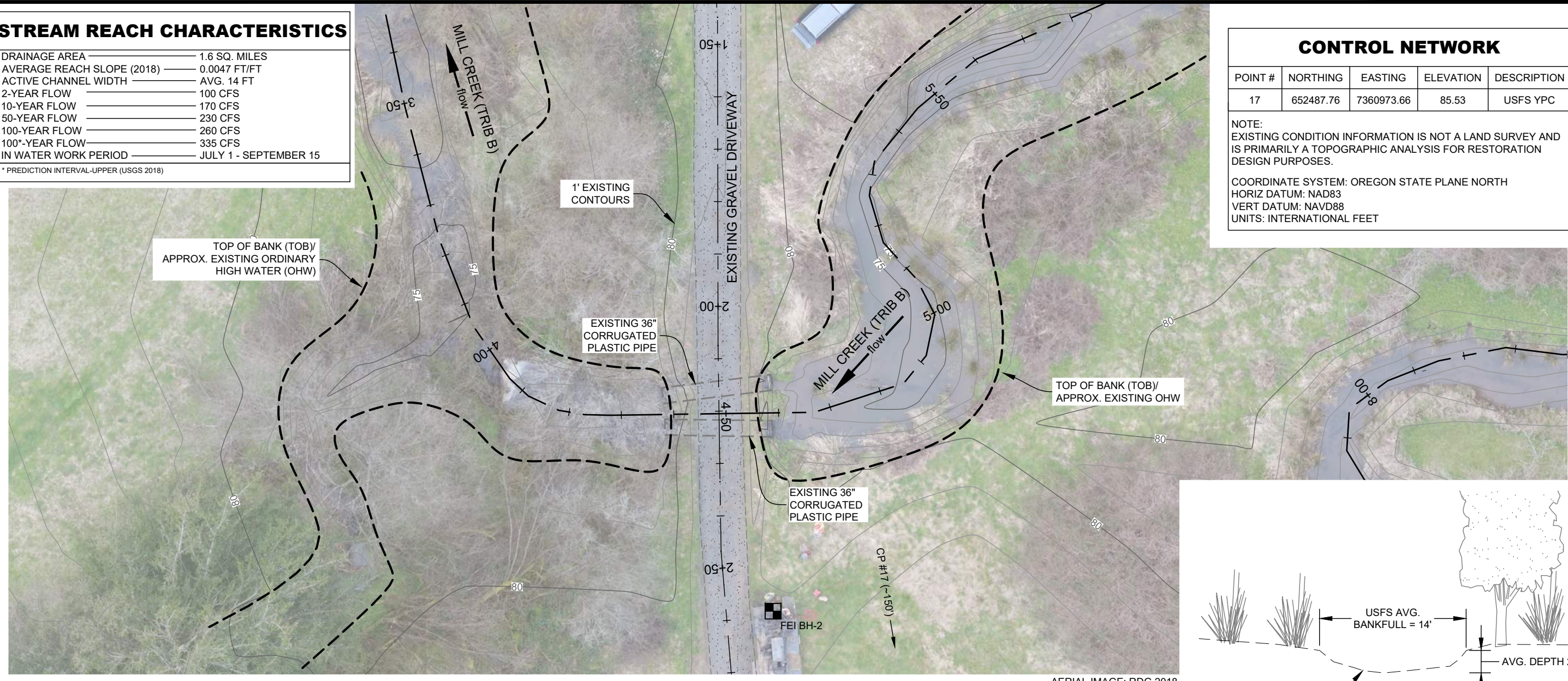
* PREDICTION INTERVAL-UPPER (USGS 2018)

CONTROL NETWORK

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
17	652487.76	7360973.66	85.53	USFS YPC

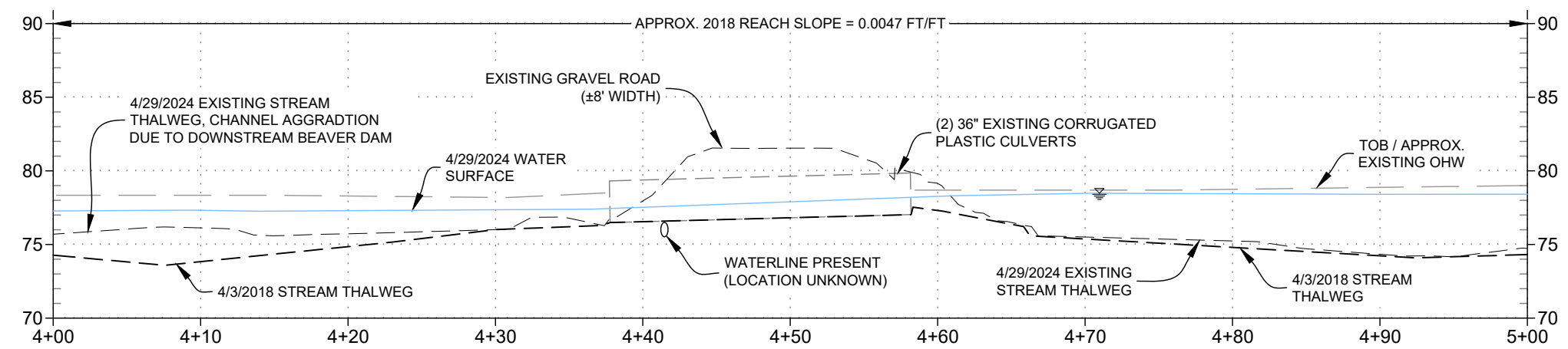
NOTE:
EXISTING CONDITION INFORMATION IS NOT A LAND SURVEY AND IS PRIMARILY A TOPOGRAPHIC ANALYSIS FOR RESTORATION DESIGN PURPOSES.

COORDINATE SYSTEM: OREGON STATE PLANE NORTH
HORIZ DATUM: NAD83
VERT DATUM: NAVD88
UNITS: INTERNATIONAL FEET



1 EXISTING CONDITIONS PLAN VIEW
1" = 20'

3 TYPICAL EXISTING SECTION
HORIZ 1" = 10'
VERT 1" = 10'



2 EXISTING PROFILE
HORIZ 1" = 10'
VERT 1" = 10'

NOW PART OF
SWCA
 SOUTHWESTERN CONSULTANTS
RIVER DESIGN GROUP
 311 SW Jefferson Avenue
 Corvallis, OR 97333
 541.738.2920
 236 Wisconsin Avenue
 Whitefish, MT 59937
 406.862.4927

EXISTING SITE LAYOUT

MILL CREEK CULVERT REPLACEMENT - #1136

TILLAMOOK, OREGON

NO.	DATE	BY	DESCRIPTION	CHK	MK
*	03/30/26	TF	100% DESIGN		

PROJECT NUMBER
RDG-18-023

DRAWING NUMBER

2.0

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STREAMBED QUANTITIES

CUT/FILL	EST. VOLUME
STREAMBED EXCAVATION	185 CUBIC YARDS
ABUTMENT SCOUR PROTECTION (<i>ODOT CLASS 200</i>)	20 CUBIC YARDS
STREAMBED FILL (COBBLES, GRAVELS, FINES)	50 CUBIC YARDS
HABITAT BOULDERS	30 CUBIC YARDS

*NOTE: ESTIMATED VOLUMES ARE "NEAT LINE" ESTIMATES

ROAD CONSTRUCTION QUANTITIES

CUT/FILL	EST. VOLUME
ABUTMENT/ ROAD EXCAVATION	75 CUBIC YARDS
SELECT STRUCTURAL BACKFILL	25 CUBIC YARDS
ROAD FILL SUPPORT BOULDERS	15 CUBIC YARDS
ROAD SURFACE FILL	20 CUBIC YARDS
ROAD SURFACE PROTECTION (<i>ODOT CLASS 100</i>)	20 CUBIC YARDS

*NOTE: ESTIMATED VOLUMES ARE "NEAT LINE" ESTIMATES

ANGULAR ROCK DESIGNATION

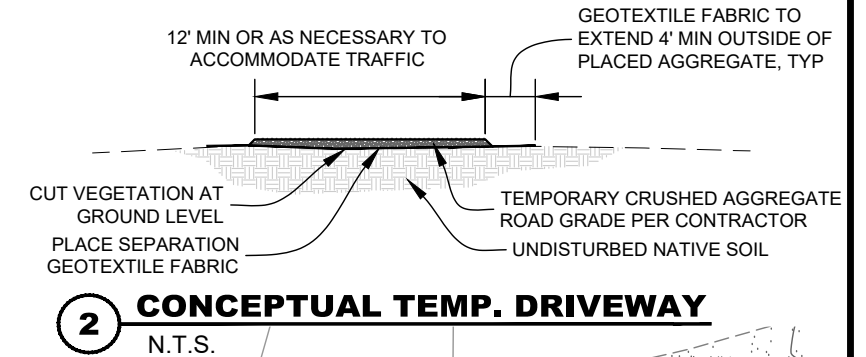
ODOT CLASS 100	$D_{50} = 0.66 \text{ FT}; D_{100} = 1.05 \text{ FT}$
ODOT CLASS 200	$D_{50} = 0.93 \text{ FT}; D_{100} = 1.32 \text{ FT}$

*NOTE: PLACED AT STANDARD THICKNESS.

GENERAL NOTES

CONTRACTOR SHALL SUBMIT A DEWATERING AND ISOLATION (STREAM BYPASS) PLAN FOR APPROVAL PRIOR TO BEGINNING CONSTRUCTION. AT A MINIMUM, CONTRACTOR MUST FOLLOW DRAWING 7.0 - 8.1 FOR WORK AREA ISOLATION AND EROSION CONTROL DURING CONSTRUCTION.

THE CONTRACTOR SHALL PROVIDE A TEMPORARY DRIVEWAY CROSSING DURING CONSTRUCTION IN CONFORMANCE WITH PROJECTS CONSERVATION MEASURE 12: TEMPORARY STREAM CROSSINGS. STRUCTURE LOCATION, LOADING, AND GEOMETRY TO BE COORDINATED BETWEEN THE CONTRACTOR, THE PROJECT SPONSOR, AND THE LANDOWNER. TEMPORARY CROSSING PLAN AND DESIGN CALCULATIONS (AS APPLICABLE) SHALL BE SUBMITTED FOR APPROVAL PRIOR TO COMMENCING WORK. CROSSING MAY BE INCORPORATED INTO OTHER TEMPORARY WORK AREA ISOLATION MEASURES. INSTALLATION AND REMOVAL OF THE CROSSING SHALL MINIMIZE ANY DISRUPTION TO EXISTING NATIVE SOILS AND VEGETATION TO THE MAXIMUM EXTENT PRACTICABLE, SEE CONCEPTUAL TEMPORARY DRIVEWAY SECTION THIS SHEET.

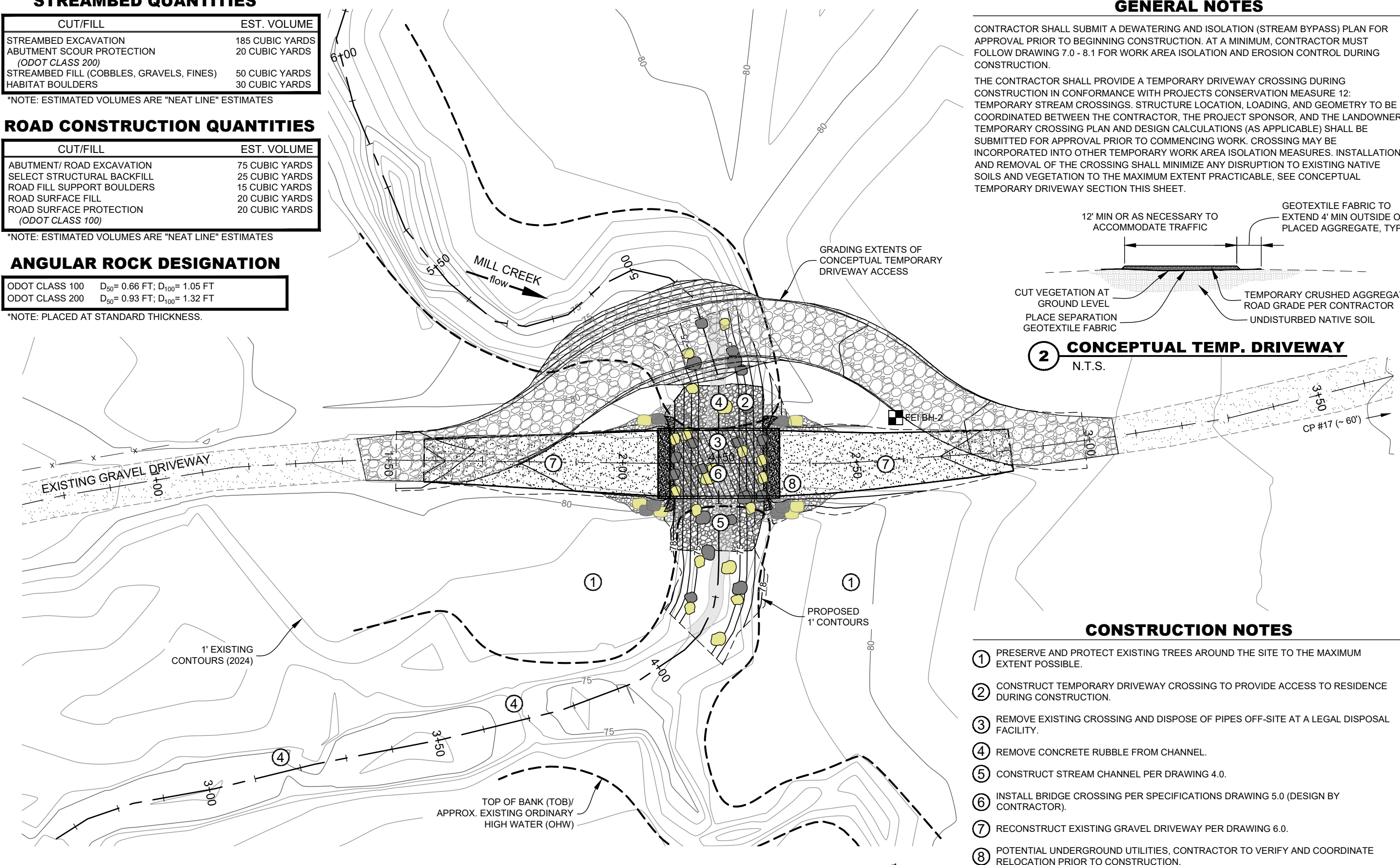


CONSTRUCTION NOTES

- ① PRESERVE AND PROTECT EXISTING TREES AROUND THE SITE TO THE MAXIMUM EXTENT POSSIBLE.
- ② CONSTRUCT TEMPORARY DRIVEWAY CROSSING TO PROVIDE ACCESS TO RESIDENCE DURING CONSTRUCTION.
- ③ REMOVE EXISTING CROSSING AND DISPOSE OF PIPES OFF-SITE AT A LEGAL DISPOSAL FACILITY.
- ④ REMOVE CONCRETE RUBBLE FROM CHANNEL.
- ⑤ CONSTRUCT STREAM CHANNEL PER DRAWING 4.0.
- ⑥ INSTALL BRIDGE CROSSING PER SPECIFICATIONS DRAWING 5.0 (DESIGN BY CONTRACTOR).
- ⑦ RECONSTRUCT EXISTING GRAVEL DRIVEWAY PER DRAWING 6.0.
- ⑧ POTENTIAL UNDERGROUND UTILITIES, CONTRACTOR TO VERIFY AND COORDINATE RELOCATION PRIOR TO CONSTRUCTION.

1 PROPOSED PROJECT LAYOUT

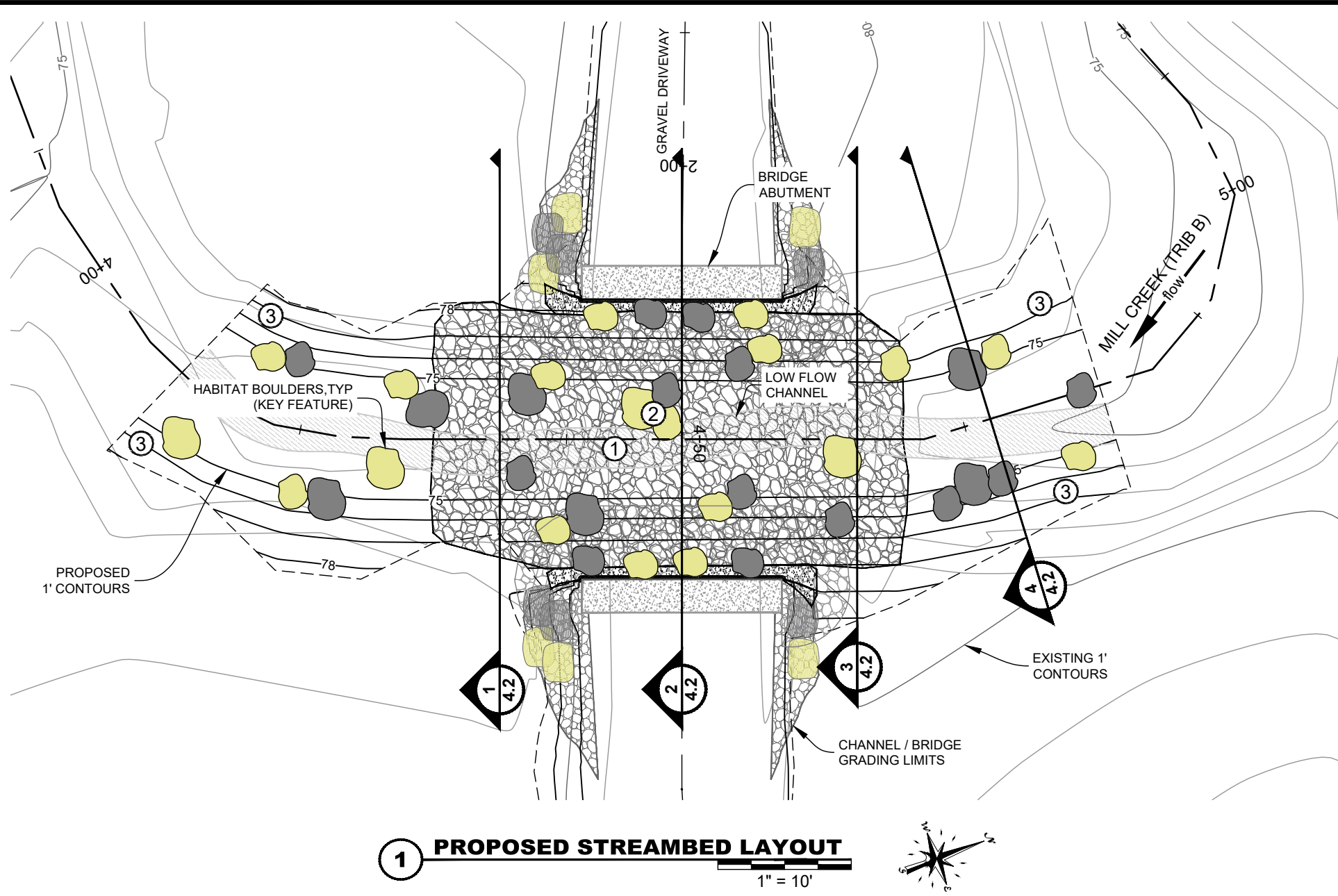
1" = 20'



NO.	DATE	BY	DESCRIPTION	CHK	MK
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PROJECT NUMBER
 RDG-18-023
 DRAWING NUMBER
3.0
 Drawing 7 of 15

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STREAMBED GENERAL NOTES

THE DESIGN INTENT IS TO MIMIC A NATURAL STREAMBED BY SIMULATING IT THROUGH THE CROSSING. THIS IS ACCOMPLISHED BY PLACING THE SPECIFIED ROCK AND SEDIMENT INSIDE THE BRIDGE AND SHAPING THE STREAMBED IN ACCORDANCE WITH CRITERIA PRESENTED IN SECTION 6.2 OF STREAM SIMULATION: AN ECOLOGICAL APPROACH TO PROVIDING PASSAGE FOR AQUATIC ORGANISMS AT ROAD-STREAM CROSSINGS (USDA-FOREST SERVICE 2008).

- 1) STREAMBED MATRIX SHALL CONFORM TO THE ROUND ROCK DESIGNATION SPECIFIED. ROCK MUST BE CLEAN, FREE OF FINES. PLACE PER CONSTRUCTION NOTE 2 THIS SHEET.
- 2) NATURAL GRAVELS WITH FINES (3'-MINUS) SHALL BE DEVELOPED FROM ON-SITE EXCAVATIONS OR IMPORTED TO SIDE AND GRADED INTO PLACED STREAMBED MATRIX TO FILL VOIDS.
- 3) AFTER MATRIX IS IN PLACE, NATURAL FINE SEDIMENT (RIVER SAND) SHALL BE ADDED TO THE STREAMBED SEPARATELY IN ORDER TO SEAL THE STREAMBED. SAND IS DISTRIBUTED OVER THE SURFACE OF THE STREAMBED, AND THEN WASHED INTO THE STREAMBED WITH PRESSURIZED WATER TO ALLOW THE FINES TO WORK INTO OPEN SPACES AND SEAL THE SUBSTRATE. SAND SHALL BE ADDED UNTIL THE STREAMBED IS "SEALED" AND WASH WATER FLOWS ON TOP OF THE STREAMBED.

CONSTRUCTION NOTES

- 1) CONSTRUCT STREAMBED PER PLAN AND PROFILE THIS SHEET AND DETAILS DRAWING 4.1 WITH STREAMBED MATRIX TO THE FULL COARSE THICKNESS IN ONE OPERATION. MATRIX ROCK TO BE PLACED IN MAXIMUM 15" LAYERS PRIOR TO COMPACTION AND IN A MANNER THAT PREVENTS DISPLACEMENT OF THE UNDERLYING MATERIALS. MATRIX ROCK SHALL BE PLACED IN A MANNER THAT WILL ENSURE THE ROCK IS REASONABLY HOMOGENEOUS WITH LARGER ROCKS UNIFORMLY DISTRIBUTED AND FIRMLY IN CONTACT WITH ONE ANOTHER WITH GAPS LESS THAN TWO INCHES.
- 2) PLACE MINIMUM OF 30 HABITAT BOULDERS, MINIMUM 50% BURIAL, NEAR THE SURFACE OF THE STREAMBED ALONG THE LOW FLOW CHANNEL AND ALONG THE TOE OF THE BANKFULL CHANNEL TO PROVIDE HYDRAULIC SHADOW AND CHANNEL STABILITY.
- 3) TRANSITION CONSTRUCTED STREAMBED TO EXISTING STREAMBED PER PROFILE THIS SHEET AND ALONG NATURAL TRANSITION LINES.

HABITAT BOULDERS ROUND

DIAMETER (FT)	MINIMUM COUNT (#)
2.0'	15
3.0'	15
MIN. EST. BOULDERS - 30	

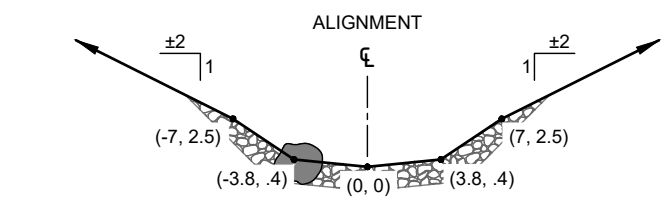
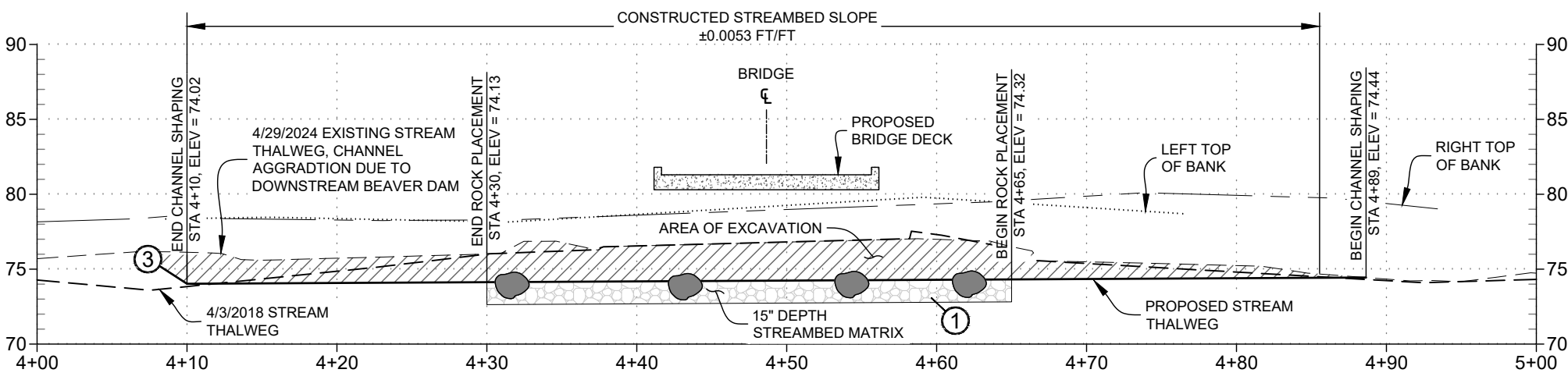
ESTIMATED TOTAL SITE QUANTITIES

STREAMBED MATRIX ROUND ROCK GRADATION

PERCENT PASSING BY WEIGHT	AVERAGE PARTICLE SIZE (INCHES)
100	12
85	10
50	6
15	2

MIN. MATRIX THICKNESS = 15 INCHES
APPROX. VOLUME = 50 CY

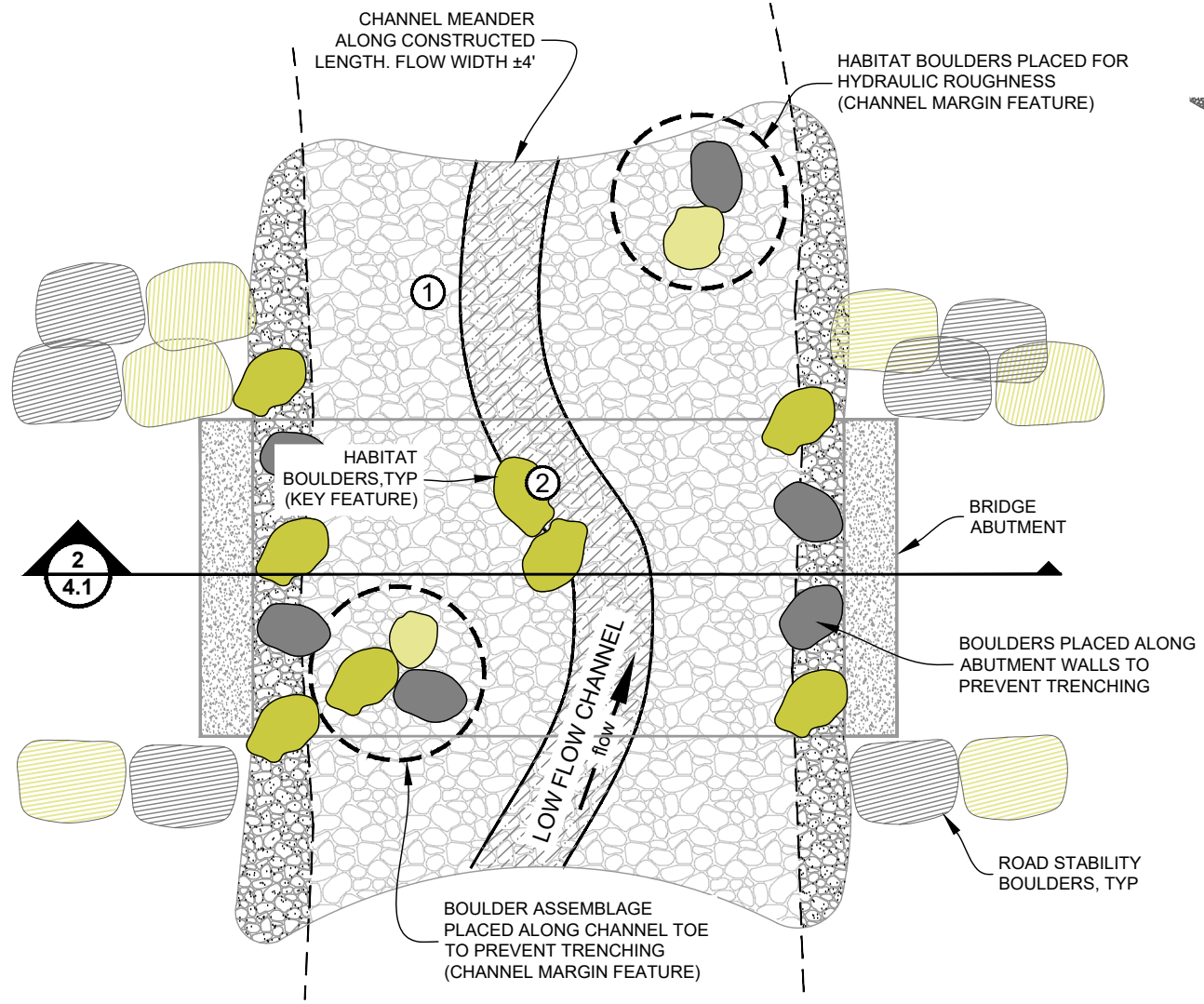
TOTAL SITE NEAT LINE VOLUME



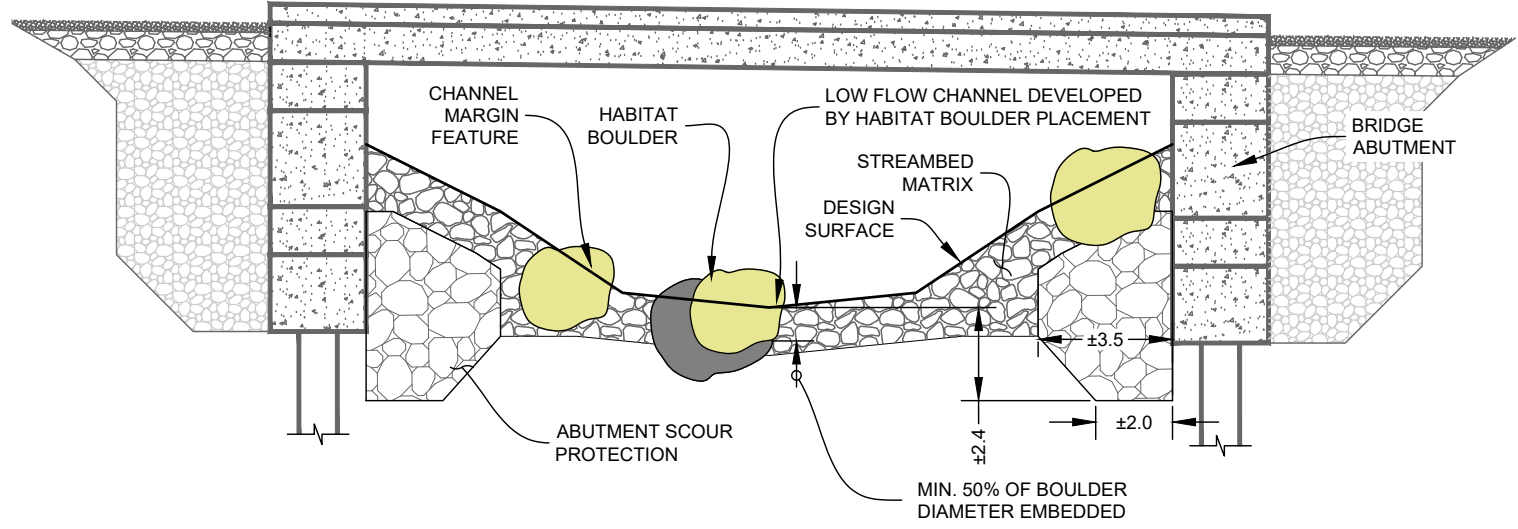
NO.	DATE	BY	DESCRIPTION	CHK	MK
*	03/30/26	TF	100% DESIGN		

PROJECT NUMBER: RDG-18-023
DRAWING NUMBER: **4.0**
Drawing 8 of 15

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1 **TYPICAL STREAM CHANNEL PLAN VIEW**
NOT TO SCALE

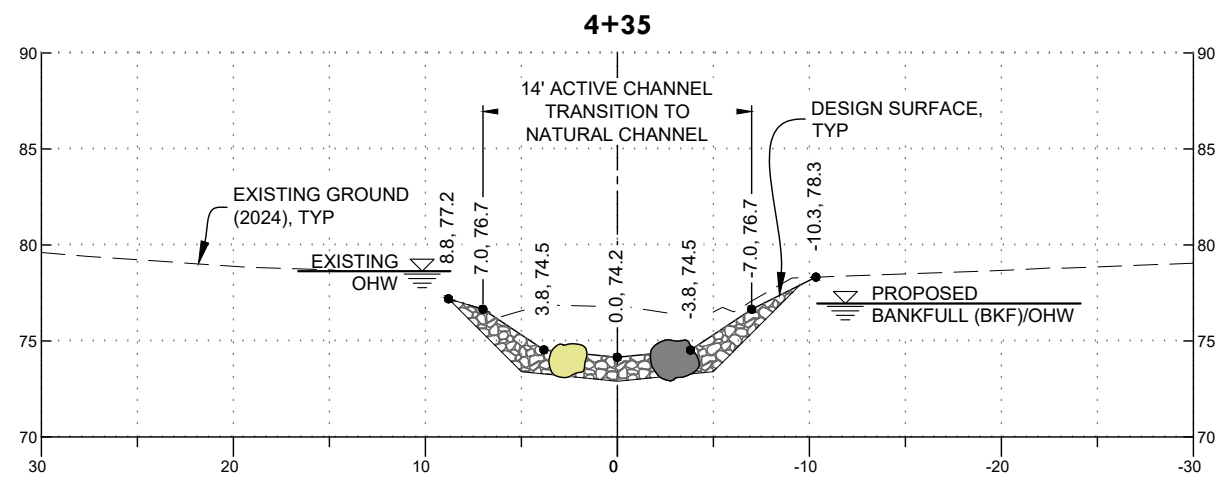


2 **TYPICAL STREAMBED SECTION**
HORIZ 1" = 5'
VERT 1" = 5'

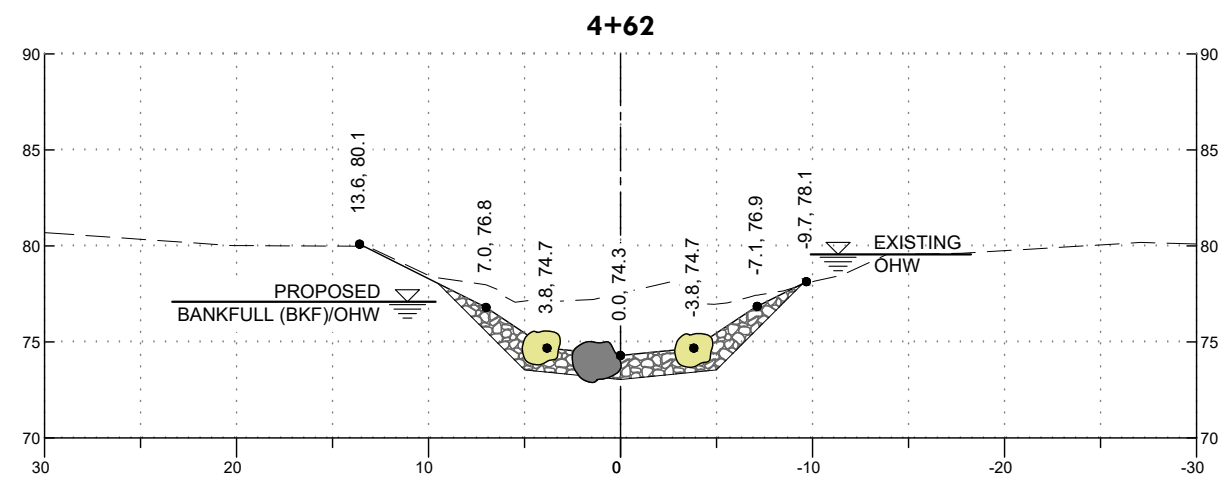
STREAMBED SUMULATION DETAILS
 MILL CREEK CULVERT REPLACEMENT - #1136
 TILLAMOOK, OREGON

NO.	DATE	BY	DESCRIPTION	CHK
*	03/30/26	TF	100% DESIGN	MK

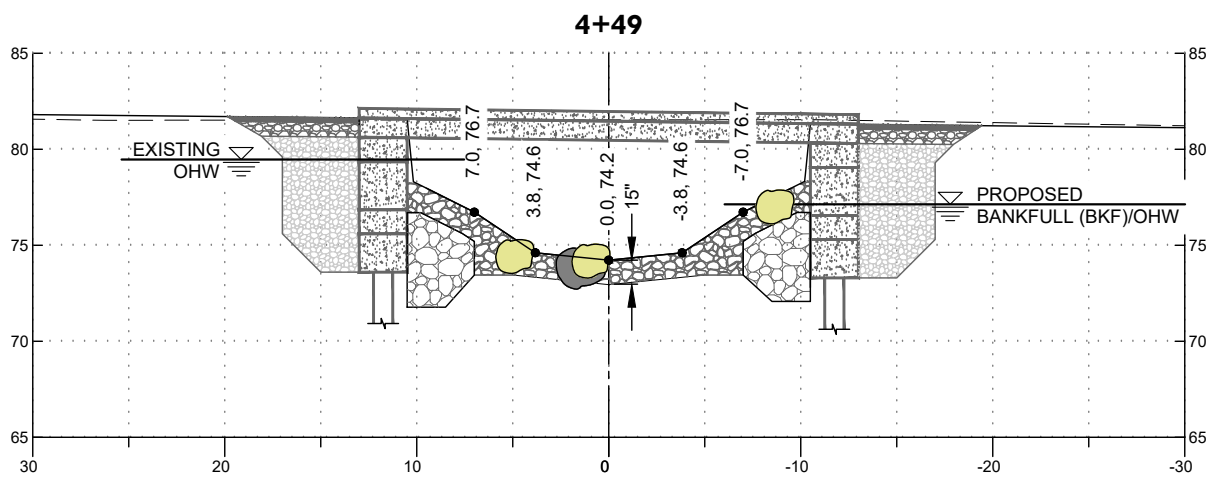
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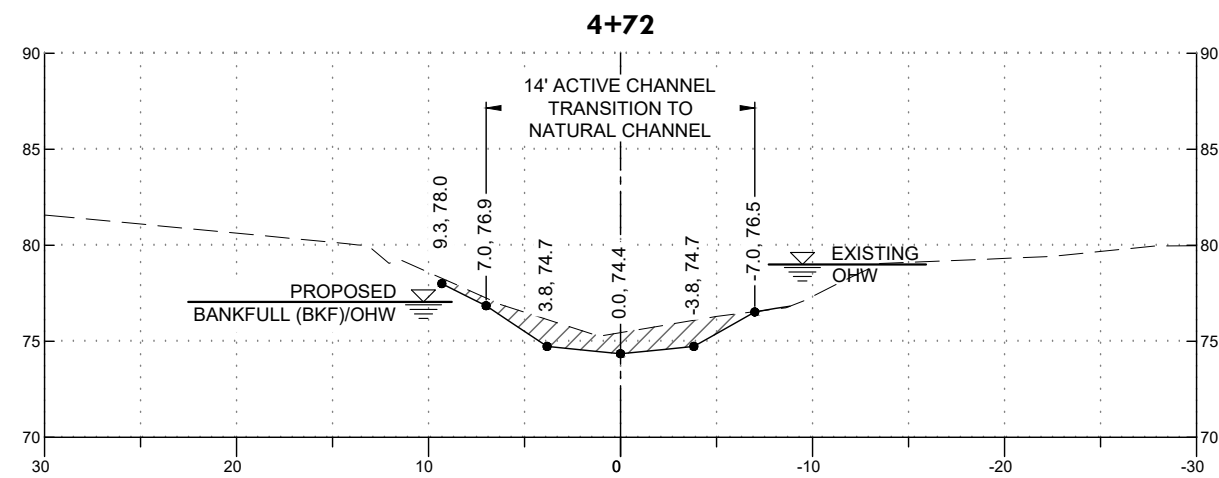
1 STA 4+35 SECTION - STREAMBED
 HORIZ 1" = 10'
 VERT 1" = 10'



3 STA 4+62 SECTION - STREAMBED
 HORIZ 1" = 10'
 VERT 1" = 10'



2 STA 4+49 SECTION - BRIDGE
 HORIZ 1" = 10'
 VERT 1" = 10'



4 STA 4+72 SECTION - CHANNEL TRANSITION
 HORIZ 1" = 10'
 VERT 1" = 10'

NOTE:
 ALL SECTIONS ARE LOOKING IN THE
 DOWNSTREAM DIRECTION.

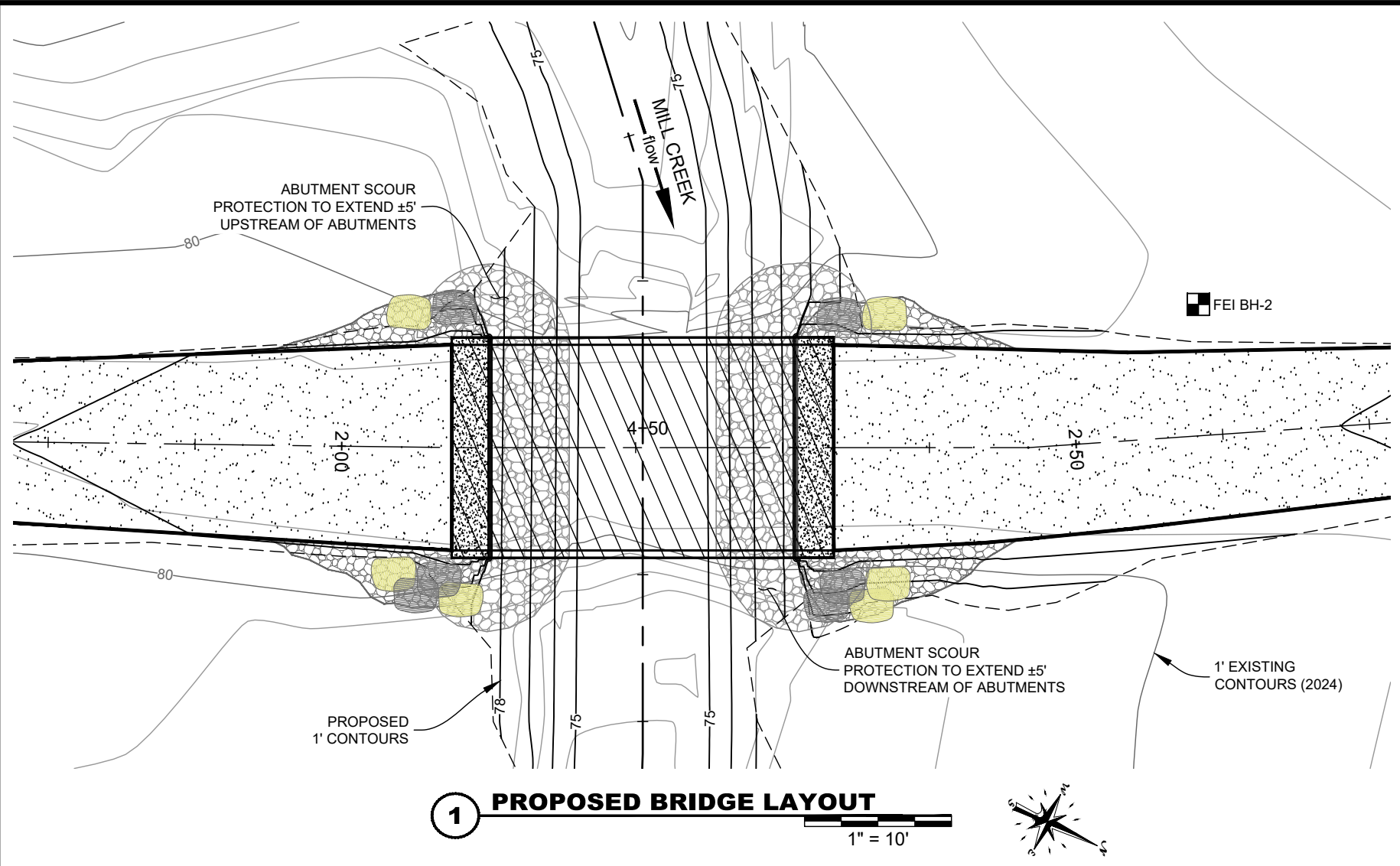
STREAM DESIGN SECTIONS
 MILL CREEK CULVERT REPLACEMENT - #1136
 TILLAMOOK, OREGON

NO.	DATE	BY	DESCRIPTION	CHK	MK
*	03/30/26	TF	100% DESIGN		

PROJECT NUMBER
 RDG-18-023

DRAWING NUMBER
4.2

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1 PROPOSED BRIDGE LAYOUT
1" = 10'

BRIDGE SPECIFICATIONS

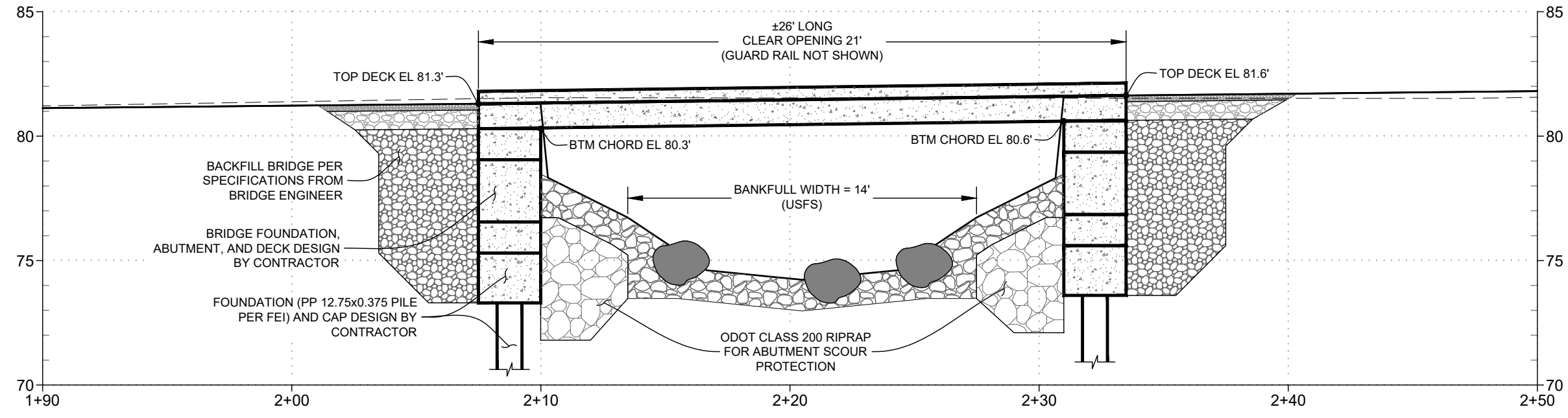
BRIDGE FOUNDATION, ABUTMENTS, DECK, AND ALL CONNECTIONS/FASTENERS SHALL BE PROVIDED BY THE CONTRACTOR AND INSTALLED AND MAINTAINED IN ACCORDANCE WITH OFC (OREGON FIRE CODE, 2019) SECTION 503.2.6 AND CURRENT AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES. DESIGN REPORT AND DRAWINGS SHALL BE PROVIDED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE AND SEALED/SIGNED BY A LICENSED ENGINEER IN THE STATE OF OREGON. THE FOLLOWING CRITERIA MUST BE INCORPORATED INTO THE DESIGN FOR THE BRIDGE FOUNDATION, ABUTMENTS, DECK, AND CONNECTIONS/FASTENERS:

DESIGN LOAD	HL-93 & 75,000 GVW IMPOSED LOAD ¹
MINIMUM CLEAR SPAN OVER STREAM	21 FT
MINIMUM CLEAR WIDTH OF BRIDGE DECK W/ CURB AND GUARD RAIL	
DRIVING SURFACE WIDTH BETWEEN CURB FACE ²	14 FT
RAILING DESIGN	STANDARD CRASH TESTED GUARD RAIL
MINIMUM ABUTMENT HEIGHT (INCLUDING PILE CAP)	7 FT
FOUNDATION TYPE	PIPE PILE PER FEI MEMO

¹SEE SECTION 3.12 BRIDGES AND CULVERTS OF TILLAMOOK COUNTY FIRE DEFENSE BOARD: SINGLE, MULTI-FAMILY AND RESIDENTIAL DEVELOPMENT ROAD ACCESS GUIDES, UPDATED 2021
²STANDARD CURB PER PROPOSED STRUCTURE TYPE. THE MINIMUM CLEAR WIDTH BETWEEN DECK RAILS SHALL ALSO BE 14 FT.

GEOTECHNICAL INVESTIGATION

FOUNDATION ENGINEERING, INC (FEI) CONDUCTED A FIELD EXPLORATION AT THE BRICKYARD ROAD CROSSING ON MARCH 21, 2018. THE LOCATION OF THE EXPLORATORY BOREHOLE (BH-2) IS INCLUDED ON THIS DRAWING. THE INVESTIGATION REPORT COMPLETED BY FEI WILL BE INCLUDED AS PART OF THE BIDDING DOCUMENTS.



2 PROPOSED BRIDGE SECTION
HORIZ 1" = 5'
VERT 1" = 5'


 NOW PART OF

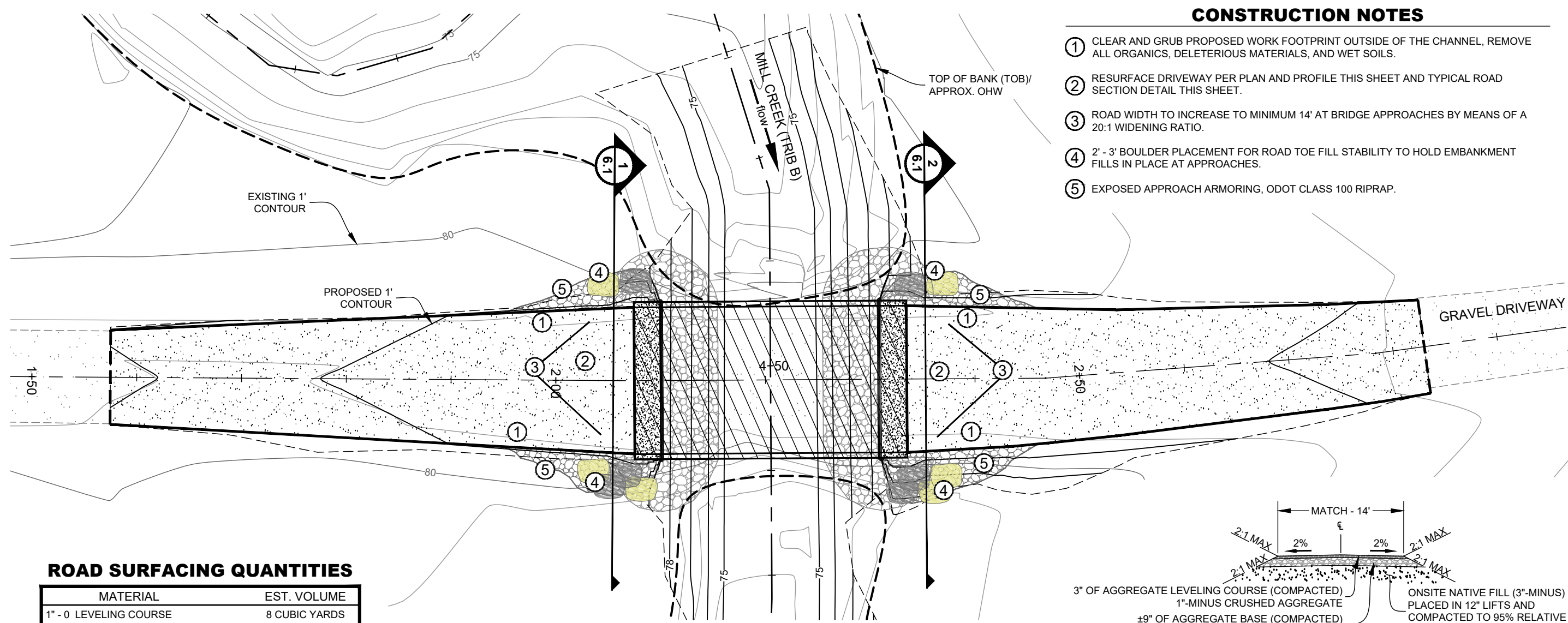
 236 Wisconsin Avenue
 Whitefish, MT 59937
 406.862.4927
 311 SW Jefferson Avenue
 Corvallis, OR 97333
 541.738.2920

PROPOSED BRIDGE LAYOUT
 MILL CREEK CULVERT REPLACEMENT - #1136
 TILLAMOOK, OREGON

NO.	DATE	BY	DESCRIPTION	CHK	MK
*	03/30/26	TF	100% DESIGN		

PROJECT NUMBER
 RDG-18-023
 DRAWING NUMBER
5.0
 Drawing 11 of 15

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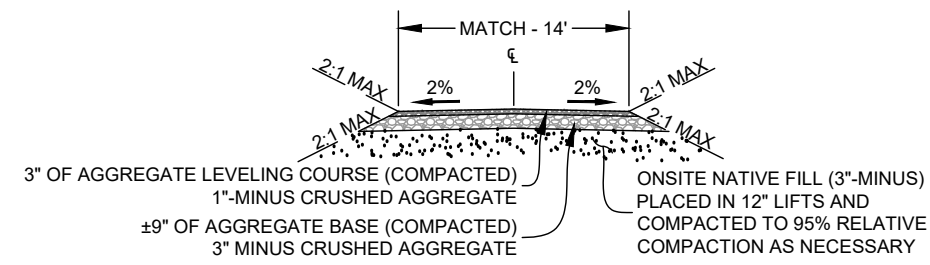
ROAD SURFACING QUANTITIES

MATERIAL	EST. VOLUME
1" - 0 LEVELING COURSE	8 CUBIC YARDS
3" - 0 BASE	12 CUBIC YARDS

*ESTIMATED NEAT LINE VOLUMES

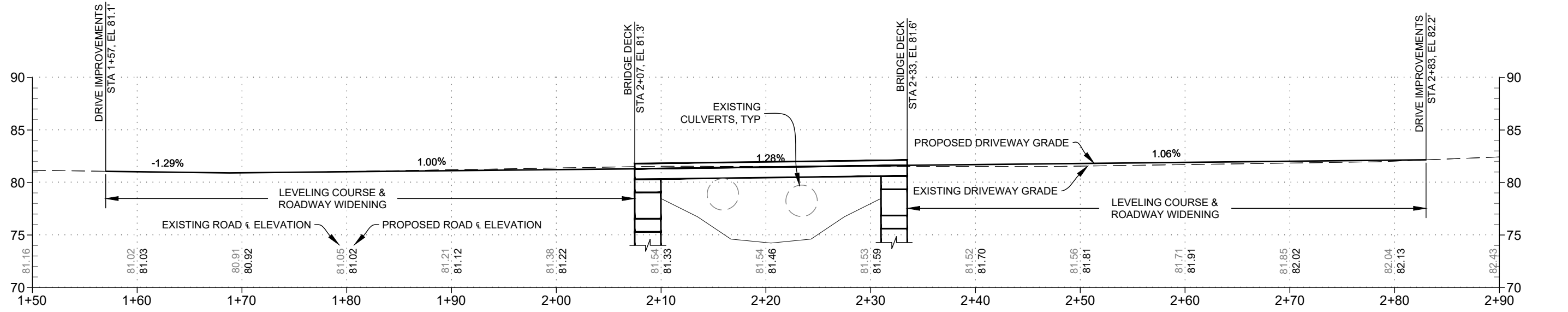
1 DRIVEWAY SURFACING LAYOUT

1" = 10'



3 TYPICAL DRIVEWAY SECTION

HORIZ 1" = 10'
VERT 1" = 10'



2 PROPOSED DRIVEWAY PROFILE

HORIZ 1" = 10'
VERT 1" = 10'

DRIVEWAY PLAN AND PROFILE

MILL CREEK CULVERT REPLACEMENT - #1136

TILLAMOOK, OREGON

NO.	DATE	BY	DESCRIPTION	CHK	MK
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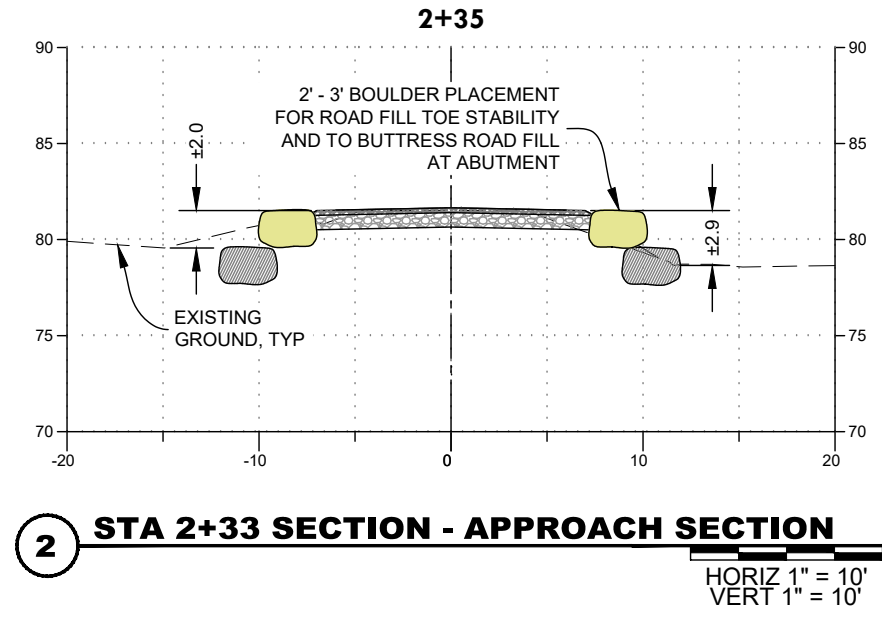
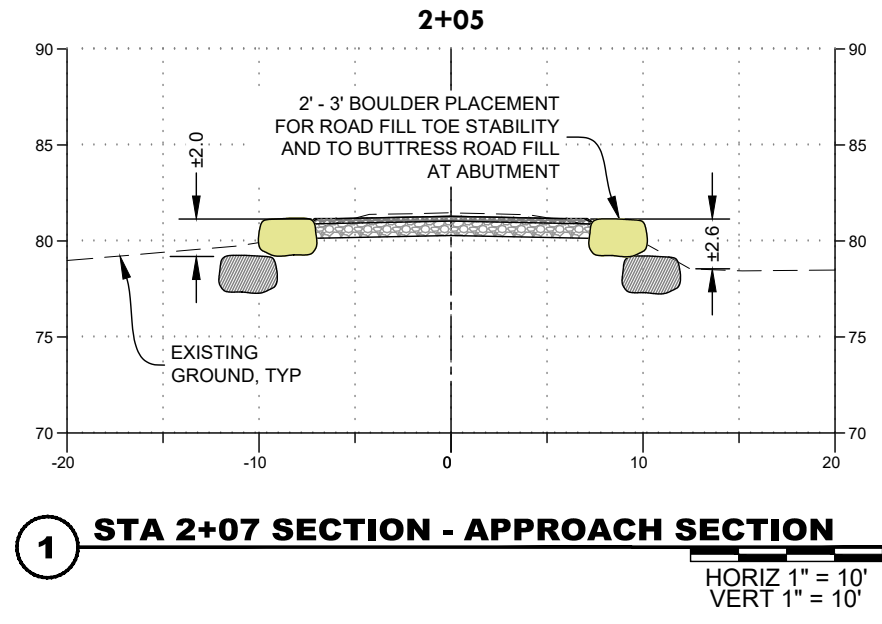
PROJECT NUMBER
RDG-18-023

DRAWING NUMBER

6.0

Drawing 12 of 15

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DRIVEWAY DESIGN SECTIONS

MILL CREEK CULVERT REPLACEMENT - #1136

TILLAMOOK, OREGON

NO.	DATE	BY	DESCRIPTION	CHK
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GENERAL NOTES

1. STAGING, STORAGE, AND STOCKPILING AREAS: PER PROJECTS CONSERVATION MEASURE 6. STAGING, STORAGE, AND STOCKPILING AREA, CONTRACTOR SHALL UTILIZE THE IMMEDIATE VICINITY TO THE MAXIMUM EXTENT POSSIBLE FOR MATERIAL STOCKPILING AND STAGING AS DESIGNATED ON THE PROJECT DRAWINGS.

ANY AREAS OFF OF ROADWAY THAT AREA DISTURBED DUE TO STOCKPILING AND STAGING MUST BE RESTORED TO PRE- PROJECT CONDITION, SEE GENERAL CONSTRUCTION MEASURE NOTES.

2. EROSION CONTROL: PER PROJECTS CONSERVATION MEASURE 7. EROSION CONTROL, CONTRACTOR SHALL DEVELOP, SUBMIT TO CONTRACTING AGENT FOR APPROVAL, AND IMPLEMENT AN EROSION CONTROL PLAN THAT OUTLINES APPROPRIATE EROSION CONTROL MEASURES IN CONFORMANCE WITH THOSE PRESCRIBED IN THE PROJECT DRAWINGS. EROSION CONTROL MEASURES SHALL BE INSPECTED WEEKLY BY CONTRACTOR AND BASED ON INSPECTIONS, WORK CREWS SHALL MOBILIZE IMMEDIATELY TO MAKE REPAIRS OR INSTALL ADDITIONAL MEASURES, IF NECESSARY.

VEGETATION WITHIN THE CONSTRUCTION SITE SHALL BE PRESERVED AND PROTECTED TO THE FULLEST EXTENT PRACTICAL. VEGETATION TO BE REMOVED WILL BE CLEARLY MARKED WITH RIBBON OR FLAGGING.

CONTRACTOR SHALL PREPARE AND HAVE ON-SITE A SPILL CONTAINMENT AND CONTROL PLAN WITH NOTIFICATION PROCEDURES, SPECIFIC CLEANUP AND DISPOSAL INSTRUCTIONS FOR ALL PRODUCTS USED ON-SITE. THE PLAN MUST INCLUDE 24-HOUR EMERGENCY CONTACT NUMBERS FOR THE CONTRACTOR.

CONTRACTOR SHALL HAVE AN EMERGENCY SUPPLY OF SEDIMENT CONTROL MATERIALS ON HAND (SILT FENCE, STRAW BALES, WATTLES, ETC.), AN OIL ABSORBING FLOATING BOOM, AND A SPILL KIT.

EXCAVATED AREAS SHALL BE PROTECTED FROM EROSION BY PLACING A PROTECTIVE COVER OVER THE MATERIAL (SUCH AS PLASTIC) AND PROVIDING STRAW MULCH OVER EXCAVATED SLOPES AND DISTURBED AREAS. HAY BALES SHALL BE PLACED DOWNSTREAM OF WORK AREA IN THE STREAM TO REDUCE TURBIDITY.

CONTRACTOR SHALL PROVIDE MEASURES TO PREVENT CONSTRUCTION VEHICLES FROM TRACKING SEDIMENT OFFSITE OR ONTO ROADWAYS WHERE IT IS SUBJECT TO WASHING INTO STORM DRAINS, WATERWAYS, OR WETLANDS; INCLUDING GRAVEL ACCESS PADS, WHEEL WASH STATIONS, OR OTHER EQUALLY EFFECTIVE METHODS.

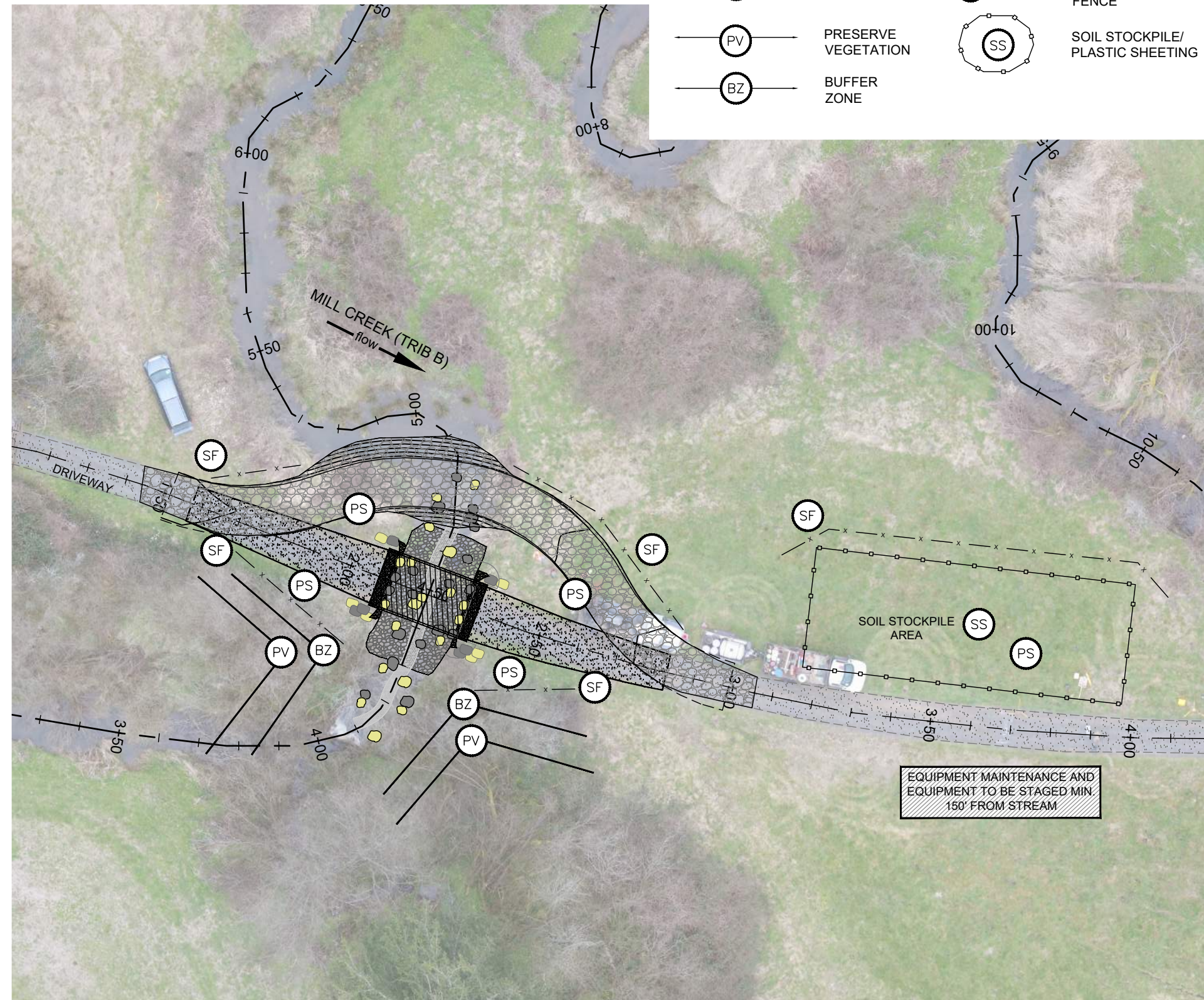
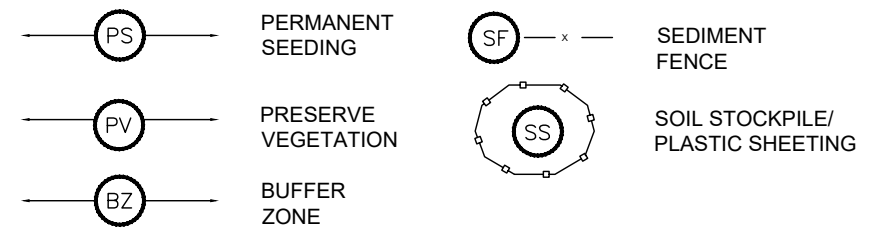
DUST CONTROL (SEE PROJECTS CONSERVATION MEASURE 11. DUST ABATEMENT): ALL HEAVY USE AREAS ARE TO BE MAINTAINED IN A CONDITION THAT MINIMIZES DUST ON THE PROJECT SITE.

ALL EQUIPMENT TO REMAIN WITHIN THE BOUNDS OF THE CONSTRUCTION AREA.

3. SITE RESTORATION: PER PROJECTS CONSERVATION MEASURE 21. SITE RESTORATION, SHORT-TERM STABILIZATION MEASURES WILL BE IMPLEMENTED UNTIL PERMANENT EROSION CONTROL MEASURES (PLANT RESTORATION) ARE EFFECTIVE.

4. REVEGETATION: PER PROJECTS CONSERVATION MEASURE 22. REVEGETATION, CONTRACTOR SHALL DECOMPACT, SCARIFY, SEED WITH NATIVE SEED MIX AND MULCH WITH WEED-FREE STRAW (APPROXIMATE 2-INCH THICKNESS) ALL EXPOSED SURFACES RESULTANT OF PROJECT ACTIVITIES. CONTRACTOR TO PROVIDE CONSTITUENTS OF EROSION CONTROL SEED MIX (NON-INVASIVE ANNUAL GRASS) FOR REVIEW AND APPROVAL BY CONTRACTING AGENT.

EROSION CONTROL LEGEND



1 EROSION CONTROL LAYOUT
1" = 30'

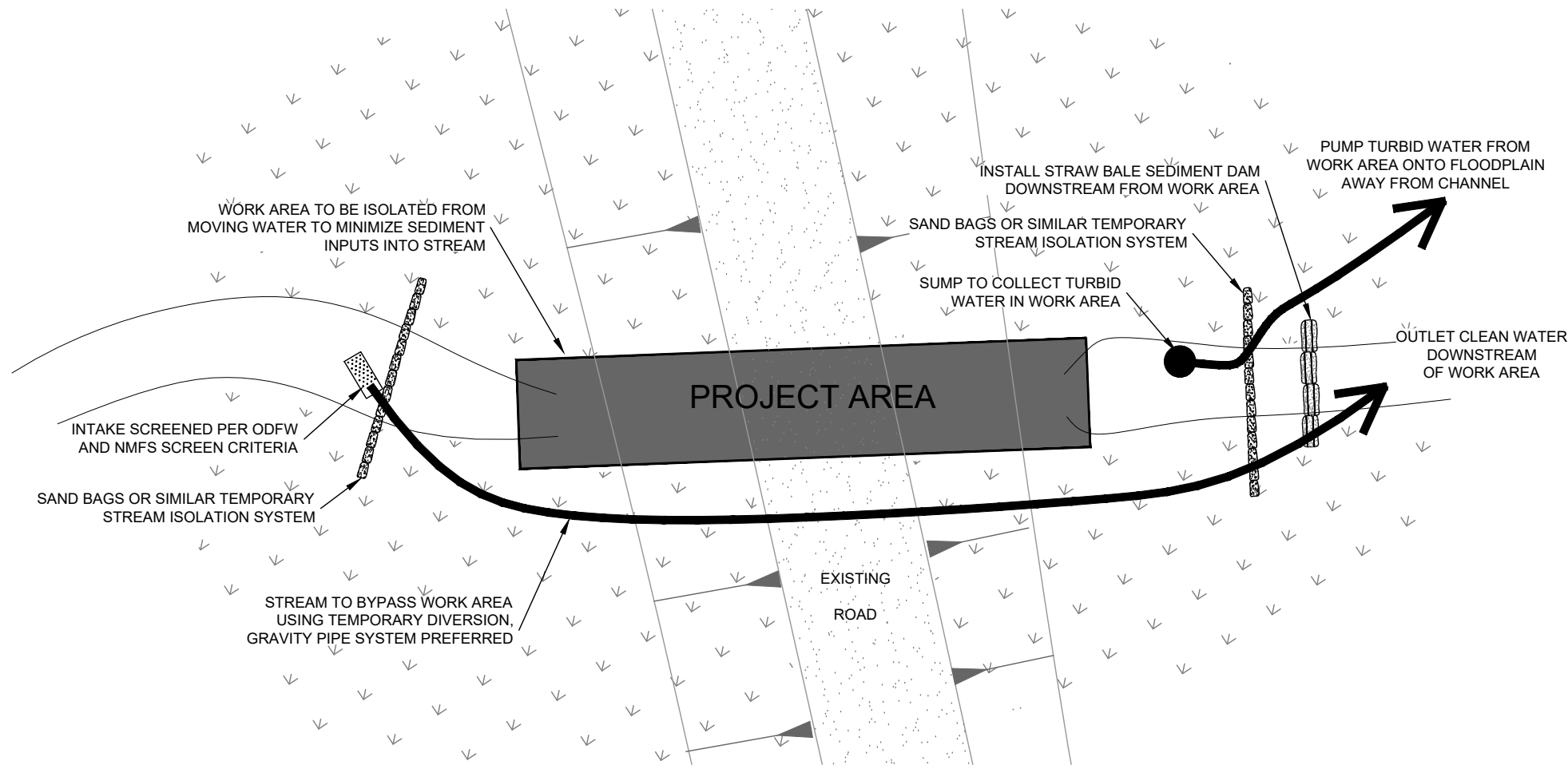
EROSION CONTROL PLAN AND RESTORATION

MILL CREEK CULVERT REPLACEMENT - #1136
TILLAMOOK, OREGON

NO.	DATE	BY	DESCRIPTION	CHK
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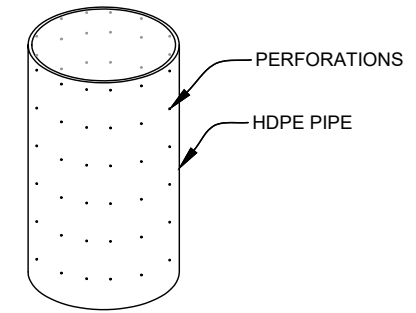
Mar 30, 2026 - 5:28pm C:\Users\Russell.Bartlett\OneDrive - SWCA\SWCA-ERED's files - Corvallis\18-023 Mill Creek Fish Passage\CAD\RDG-18-023 Mill Creek PrivateCrossing_Production.dwg



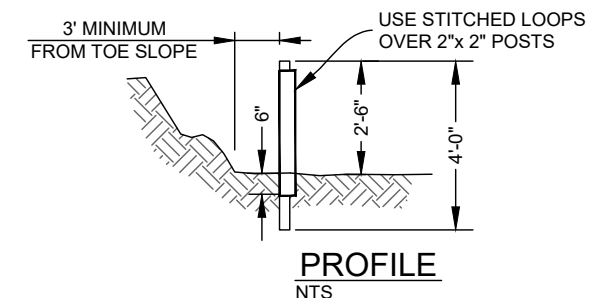
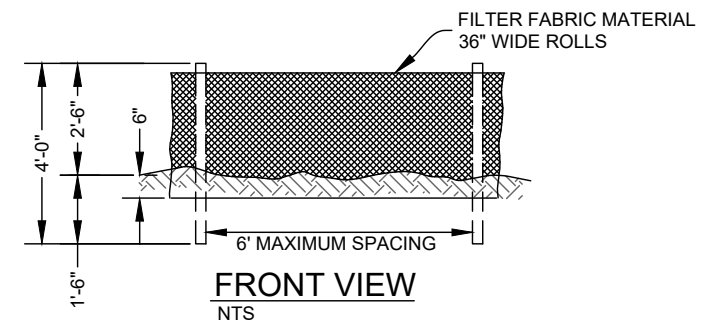
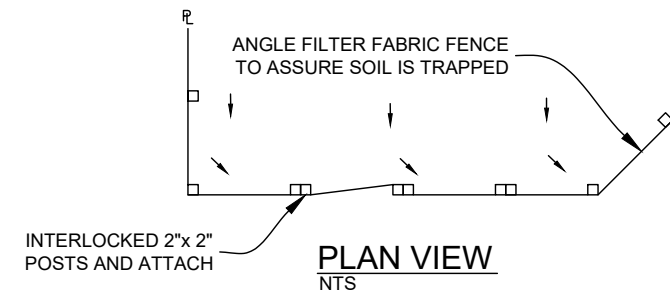
1 TYPICAL WORK AREA ISOLATION / STREAM BYPASS
NOT TO SCALE

GENERAL NOTES

- TIMING OF IN-WATER WORK:** PER PROJECTS CONSERVATION MEASURE 15. TIMING OF IN-WATER WORK, CONTRACTOR SHALL SUBMIT A DEWATERING AND WORK AREA ISOLATION (STREAM BYPASS) PLAN PER PROJECTS WORK AREA ISOLATION NOTES (CONSERVATION MEASURE 17) THAT LIMITS DEWATERED STREAM LENGTH TO CONTRACTING AGENT FOR APPROVAL PRIOR TO BEGINNING CONSTRUCTION.
- WORK AREA ISOLATION:** PER PROJECTS CONSERVATION MEASURE 17. WORK AREA ISOLATION.
- FISH CAPTURE AND RELEASE:** PER PROJECTS CONSTRUCTION MEASURE 18. FISH CAPTURE AND RELEASE.
- CONSTRUCTION DISCHARGE WATER:** PER PROJECTS CONSERVATION MEASURE 13. SURFACE WATER WITHDRAWAL AND CONSTRUCTION DISCHARGE WATER.



2 SUMP - TYPICAL



- NOTES:
- BURY BOTTOM OF FILTER FABRIC 6" VERTICALLY BELOW FINISHED GRADE.
 - 2"x 2" FIR, PINE OR STEEL FENCE POSTS.
 - POSTS TO BE INSTALLED ON UPHILL SIDE OF SLOPE.
 - COMPACT BOTH SIDES OF FILTER FABRIC TRENCH.
 - PANELS MUST BE PLACED ACCORDING TO SPACING ON DETAIL NO.940

3 TYPICAL SILT FENCE INSTALLATION

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PROJECT NUMBER
RDG-18-023

DRAWING NUMBER
8.0