

SOUTH TONGUE POINT RESTORATION PROJECT ASTORIA, OR

ODFW IN-WATER WORK WINDOW COLUMBIA RIVER TONGUE POINT TO BONNEVILLE DAM: NOVEMBER 1 TO FEBRUARY 28 AND PER GENERAL NOTE 9 ON G02

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ADDITIONAL ODOT STD BMP DWGS AND DETS INCLUDED WITH SPECS FOR CONTRACTOR REFERENCE ONLY. SEE SHTS G02 THROUGH G03 FOR INFORMATION ON CONTRACTOR PREPARED ESCP AND BMP RESPONSIBILITIES.

PROJECT OBJECTIVES

- ENHANCE ACCESS BETWEEN THE PROJECT SITE AND THE MAINSTEM COLUMBIA RIVER FOR OUT-MIGRATING JUVENILE SALMONIDS;
- INCREASE NUTRIENT FLOWS THROUGH THE PROJECT AREA, WITH THE SPECIFIC OBJECTIVE OF INCREASING MACRODETRITAL INPUTS ON-SITE AND IN THE MAINSTEM COLUMBIA RIVER;
- INCREASE THE AREA OF OFF-CHANNEL HABITAT BY EXPANDING THE TOTAL AREA OF TIDAL AND SEASONAL INUNDATION WITHIN THE PROJECT SITE, ESPECIALLY BY LOWERING AREAS CURRENTLY DOMINATED BY REED CANARY GRASS;
- CONNECT THE 2012 PROJECT AREA (I.E., AT THE NORTH END OF THE PROJECT AREA) TO TIDAL FLOWS FROM THE COLUMBIA RIVER VIA A FLOW THROUGH CHANNEL TO THE SOUTHERN WETLAND COMPLEX; AND,
- INCREASE THE COVER AND DIVERSITY OF NATIVE PLANT SPECIES IN THE PROJECT AREA BY CONTROLLING INVASIVE PLANTS AND PLANTING/SEEDING NATIVES.

LIMITING FACTORS TARGETED

- THE PROJECT TARGETS LIMITING FACTORS IDENTIFIED BY THE NATIONAL MARINE FISHERIES SERVICE'S (NMFS) ESA RECOVERY PLAN (2013) AND THE COLUMBIA RIVER ESTUARY ESA RECOVERY PLAN MODULE FOR SALMONID AND STEELHEAD (NMFS 2011), INCLUDING:
- REDUCED OFF-CHANNEL HABITAT OPPORTUNITY, AND
 - FOOD WEB-RELATED LIMITING FACTORS.



PROJECT LOCATION



1 LOCATION MAP
SCALE: NOT TO SCALE



2 VICINITY MAP
SCALE: NOT TO SCALE



3 PROJECT AREA
SCALE: 1:500



PROJECT SITE ACCESS

SITE ACCESS IS FROM LIBERTY LANE, NEAR THE ENTRANCE TO CLATSOP COMMUNITY COLLEGE MERTS CAMPUS LOCATED AT 6550 LIBERTY LANE, ASTORIA, OR 97103

CONFORMED DOCUMENT
FEBRUARY 22, 2023

NO.	DATE	DESCRIPTION	BY
1	FEB 22, 2023	ISSUED FOR CONSTRUCTION	RWK

KILGREN WATER RESOURCES
3365 EAST AMAZON DRIVE, SUITE A
EUGENE, OR 97405
PHONE: 971-409-4023



COLUMBIA RIVER ESTUARY STUDY TASKFORCE (CREST)
818 COMMERCIAL STREET, SUITE 203
ASTORIA, OR 97103
PHONE: 503-325-0435



PROJECT NO.
5.2022.0001.1

DESIGNED BY
RWK

DRAWN BY
RWK

SOUTH TONGUE POINT RESTORATION PROJECT

COVER SHEET AND DRAWING INDEX

DRAWING NO.
G01

SHEET NO.
1
OF
30

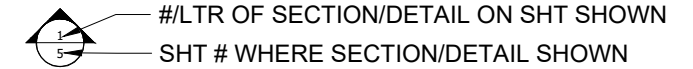
GENERAL NOTES:

- DESIGN INTENT.** THESE DRAWINGS REPRESENT THE GENERAL DESIGN INTENT TO BE IMPLEMENTED AND CONTRACTOR IS RESPONSIBLE FOR ALL ITEMS SHOWN ON THESE PLANS. CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING THE PROJECT MANAGER FOR ANY CLARIFICATIONS OR FURTHER DETAILS NECESSARY TO ACCOMMODATE ACTUAL SITE CONDITIONS. ANY DEVIATION FROM THESE PLANS WITHOUT THE CAR'S PRIOR WRITTEN APPROVAL ARE AT THE CONTRACTOR'S OWN RISK AND EXPENSE. NOTIFY PROJECT MANAGER IMMEDIATELY OF ANY UNEXPECTED AND CHANGED CONDITIONS, UNSAFE WORKING CONDITIONS, AND ENVIRONMENTAL CONCERNS ENCOUNTERED.
- JOB SITE CONDITIONS AND CONTRACTOR RESPONSIBILITY.** CONTRACTOR SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR SITE CONDITIONS DURING THE COURSE OF THE CONSTRUCTION OF THIS PROJECT, INCLUDING THE SAFETY OF ALL PERSONS AND PROPERTY, AND ALL ENVIRONMENTAL PROTECTION ELEMENTS, WHETHER SHOWN ON THESE DRAWINGS OR NOT. CONTRACTOR SHALL FOLLOW ALL APPLICABLE CONSTRUCTION AND SAFETY REGULATIONS. THESE REQUIREMENTS SHALL APPLY CONTINUOUSLY AND WILL NOT BE LIMITED TO NORMAL WORKING HOURS. THE CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD CAR HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPT FROM LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE CAR.
- DAMAGE.** CONTRACTOR SHALL EXERCISE CARE TO AVOID DAMAGE TO EXISTING PUBLIC AND PRIVATE PROPERTY, INCLUDING NATIVE TREES AND SHRUBS, AND OTHER PROPERTY IMPROVEMENTS. IF CONTRACTOR CAUSES DAMAGES TO SUCH ITEMS, CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIR OR REPLACEMENT IN LIKE NUMBER, KIND, CONDITION, AND SIZE. ANY SUCH COST MAY BE DEDUCTED BY OWNER FROM MONIES DUE TO CONTRACTOR UNDER THIS CONTRACT.
- SURVEY CONTROL AND BASEMAPPING.** THE EXISTING GROUND ELEVATION DATA IS FROM USACE 2010 COLUMBIA RIVER DIGITAL TERRAIN MODEL ADJUSTED USING SURVEY PERFORMED BY HLB OTAK IN 2011, STATEWIDE LAND SURVEYING IN 2016, AND CREST AND STILLWATER IN 2020. BASEMAPPING FROM CLATSOP COUNTY, HLB OTAK SURVEY, AND CREST'S 2012 LIBERTY LANE PROJECT DESIGNS BY TETRA TECH. ALL STATIONING REFERS TO CENTERLINE OF CONSTRUCTION, OR AS SHOWN, AND IS THE MEASURED HORIZONTAL DISTANCE.
- PROJECTED COORDINATE SYSTEM.** PROJECT DESIGNS AND COORDINATES ARE REFERENCED TO THE HORIZONTAL DATUM OF NAD83, OREGON STATE PLANE, NORTH ZONE, WITH UNITS OF INTERNATIONAL FEET. ALL ELEVATIONS ARE RELATIVE TO NAVD88 WITH UNITS OF FEET.
- SURFACE WATER DATUM** ARE PROVIDED FOR IDENTIFICATION OF REGULATORY BOUNDARIES, SUCH AS MHW AND HIGHEST MEASURED TIDE, AND FOR CONSTRUCTION CONTRACTOR REFERENCE. SURFACE WATER DATUM ARE FROM THE NOAA ASTORIA TIDE STATION (9439040). WATER LEVELS WITHIN THE PROJECT SITE EXTENT ARE SUBJECT TO TIDAL, RIVER, AND LOCALIZED RUNOFF AND MAY VARY BEYOND THE ELEVATIONS SHOWN HERE.
- UTILITIES.** UTILITY LOCATIONS SHOWN ARE APPROXIMATE AND IN SOME CASES HAVE NOT BEEN SURVEYED. CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING OREGON UTILITY NOTIFICATION CENTER AT 800.332.2344 72 HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION WORK. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING UTILITY LOCATION MARKINGS FOR PROJECT DURATION.
- LIMITS OF WORK, ACCESS, STAGING AND MOBILIZATION AREAS.** THE APPROXIMATE LIMITS OF WORK ARE SHOWN ON THE DRAWINGS. EXACT LIMITS OF WORK, POINTS OF INGRESS-EGRESS, CHANNEL ACCESS, MOBILIZATION, STAGING, AND WORK AREAS WILL SHALL BE IDENTIFIED AND DETAILED IN CONTRACTOR SAFETY PLAN PROVIDED FOR CAR REVIEW PER SPECIFICATIONS. EQUIPMENT MAINTENANCE AND FUELING MUST OCCUR OUTSIDE OF THE WETLAND AND RIPARIAN AREAS AS DESCRIBED IN THE ENVIRONMENTAL PERMITS FOR THE PROJECT. CONTRACTOR PREPARED STAGING AREA AND SAFETY PLAN TO PROVIDE DETAILS OF EQUIPMENT MAINTENANCE AND FUELING ANTICIPATED DURING THE PERFORMANCE OF THE PROJECT WORK.
- WORK IN STREAM CHANNELS AND STREAM DIVERSIONS.** ALL WORK BELOW MHW ON THE COLUMBIA RIVER MUST BE CONDUCTED DURING THE IN-WATER WORK PERIOD, NOVEMBER 1 TO FEBRUARY 28, UNLESS A WRITTEN EXTENSION IS RECEIVED BY THE CAR FROM THE ODFW AND BPA EC LEAD.
- ESTIMATED QUANTITIES.** CONTRACTOR IS RESPONSIBLE FOR TRANSPORT AND PLACEMENT LARGE WOOD, AS SHOWN ON DRAWINGS AND PROVIDED IN CAR STAGING AREA STOCKPILES.
- REQUIRED PROJECT PERMITS.** THE PERMITS REQUIRED FOR THIS PROJECT ARE OUTLINED IN THE SPECIFICATIONS, THE CONTRACTOR SHALL BE GIVEN COPIES OF ALL THE PERMITS, SHALL BECOME FAMILIAR WITH THE PERMIT REQUIREMENTS, AND SHALL BE RESPONSIBLE FOR ADHERENCE TO AND CONFORMANCE WITH ALL PERMIT CONDITIONS.

ABBREVIATIONS AND NOTATIONS:

APN	ASSESSOR'S PARCEL NUMBER	NAVD88	NORTH AMERICAN VERTICAL DATUM OF 1988
APPROX.	APPROXIMATE	NL	NURSE LOG
AHWF	AQUATIC HABITAT WOOD FEATURE	NIC	NOT IN CONTRACT
BMP	BEST MANAGEMENT PRACTICE	NOM	NOMINAL
BPA EC	BONNEVILLE POWER ADMINISTRATION ENVIRONMENTAL COMPLIANCE	NTS	NOT TO SCALE
BT	BRUSH TRENCH	ODFW	OREGON DEPARTMENT OF FISH AND WILDLIFE
CAR	CONTRACTING AGENCY REPRESENTATIVE, COLUMBIA RIVER ESTUARY STUDY TASKFORCE (CREST)	ODOT	OREGON DEPARTMENT OF TRANSPORTATION
CHL, CHNL	CHANNEL	OR	OREGON
CL	CENTERLINE	PL	PROPERTY LINE
CY, CU YD	CUBIC YARD	PP	POWER POLE
CU IN	CUBIC INCHES	QTY	QUANTITY
DBH	DIAMETER BREST HEIGHT	REST.	RESTORATION
DEPT	DEPARTMENT	RR	RAILROAD
DET	DETAIL	ROW	RIGHT OF WAY
DIA	DIAMETER	SHT	SHEET
DWG	DRAWING	SPC	STATE PLACE COORDINATE
DS	DOWNSTREAM	SPEC	SPECIFICATION(S)
E	EASTING	STA	STATION
EG	EXISTING GROUND	STD	STANDARD
EL, ELEV	ELEVATION	SWT	SALVAGED WHOLE TREE
FG	FINISHED GROUND	TBD	TO BE DETERMINED
FOC	FIRST ORDER CHANNEL	TCN	TIDAL CHANNEL NETWORK
FT, '	FEET, FOOT	TEMP	TEMPORARY
H, HORZ	HORIZONTAL	TOB	TOP OF BANK
HIP	HABITAT IMPROVEMENT PROGRAM	TOS	TOE OF SLOPE
HWY	HIGHWAY	TYP	TYPICAL
HT	HEIGHT	US	UPSTREAM
IE	INVERT ELEVATION	V, VERT	VERTICAL
IN, "	INCH, INCHES	W/	WITH
MAX	MAXIMUM	W/O	WITHOUT
MIN	MINIMUM	&	AND
N	NORTHING	°	DEGREE
NAD83	NORTH AMERICAN DATUM OF 1983	#	NUMBER
		%	PERCENT

SYMBOLS:



EXISTING		PROPOSED	
MAJOR CONTOUR	—5—	MAJOR CONTOUR	—5—
MINOR CONTOUR	—1—	MINOR CONTOUR	—1—
2012 PROJECT EXTENT	----	PROJECT SITE EXTENT	----
PROPERTY LINE	----	TEMPORARY TURBIDITY BARRIER	----
RR	+	TEMPORARY SILT FENCE	+
BEAVER DAM	+	TEMPORARY CHECK DAM, TYPE 3	+
RR ROW / PEDESTRIAN EASEMENT	----	TEMPORARY CONSTRUCTION ACCESS / PEDESTRIAN TRAIL	----
NO DISTURBANCE BUFFER	----	BRUSH TRENCH	+
HIGHEST MEASURED TIDE	----	FASCINE	+
SURVEY POINT	11	NURSE LOG	+
		AQUATIC HABITAT WOOD FEATURE	+
		SITE SALVAGED WOOD	+

LEGEND	
HABITAT ZONES (ELEV RANGE FT NAVD88)	SYMBOL
OPEN WATER [UNVEGETATED] (1.38 - 4.72)	[Symbol]
LOW MARSH (4.72 - 6.8)	[Symbol]
MID-MARSH (6.8 - 7.2)	[Symbol]
SCRUB-SHRUB HIGH MARSH (7.2 - 9.5)	[Symbol]
RIPARIAN FOREST (9.5 - UPPER LIMIT OF DISTURBANCE UNLESS SHOWN OTHERWISE)	[Symbol]
UPLAND FILL SLOPES (AS SHOWN)	[Symbol]
UPLAND FILL TOPS (AS SHOWN)	[Symbol]

SURFACE WATER DATUM	
DATUM	ELEV (FT NAVD88)
HIGHEST MEASURED TIDE (JANUARY 27, 1983)	12.58
50% ANNUAL EXCEEDANCE PROBABILITY	11.45
ANNUAL FLOOD	10.59
MEAN HIGHER HIGH WATER	8.82
MEAN HIGH WATER	8.15
MEAN SEA LEVEL	4.72
MEAN LOW WATER	1.38
MEAN LOWER LOW WATER	0.21
LOWEST MEASURED TIDE (JANUARY 28, 1979)	-3.64

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DRAWING NO.
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HIP GENERAL CONSERVATION MEASURES APPLICABLE TO ALL ACTIONS

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

PROJECT DESIGN AND SITE PREPARATION.

1. STATE AND FEDERAL PERMITS.

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

2. TIMING OF IN-WATER WORK.

- A. APPROPRIATE STATE (OREGON DEPARTMENT OF FISH AND WILDLIFE (ODFW), WASHINGTON DEPARTMENT OF FISH AND WILDLIFE (WDFW), IDAHO DEPARTMENT OF FISH AND GAME (IDFG), AND MONTANA FISH WILDLIFE AND PARKS (MFWP)) GUIDELINES FOR TIMING OF IN-WATER WORK WINDOWS (IWW) WILL BE FOLLOWED.
- B. CHANGES TO ESTABLISHED WORK WINDOWS WILL BE APPROVED BY REGIONAL STATE BIOLOGISTS AND BPA'S EC LEAD.

- C. BULL TROUT. FOR AREAS WITH DESIGNATED IN-WATER WORK WINDOWS FOR BULL TROUT OR AREAS KNOWN TO HAVE BULL TROUT, PROJECT PROPONENTS WILL CONTACT THE APPROPRIATE USFWS FIELD OFFICE TO INSURE THAT ALL REASONABLE IMPLEMENTATION MEASURES ARE CONSIDERED AND AN APPROPRIATE IN-WATER WORK WINDOW IS BEING USED TO MINIMIZE PROJECT EFFECTS.

- D. LAMPREY. WORKING IN STREAM OR RIVER CHANNELS THAT CONTAIN PACIFIC LAMPREY WILL BE AVOIDED FROM MARCH 1 TO JULY 1 FOR REACHES <5,000 FEET IN ELEVATION AND FROM MARCH 1 TO AUGUST 1 FOR REACHES >5,000 FEET. IF EITHER TIMEFRAME IS INCOMPATIBLE WITH OTHER OBJECTIVES, THE AREA WILL BE SURVEYED FOR NESTS AND LAMPREY PRESENCE, AND AVOIDED IF POSSIBLE. IF LAMPREYS ARE KNOWN TO EXIST, THE PROJECT SPONSOR WILL UTILIZE DEWATERING AND SALVAGE PROCEDURES (SEE FISH SALVAGE AND ELECTROFISHING SECTIONS) TO MINIMIZE ADVERSE EFFECTS.

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

3. CONTAMINANTS.

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

- B. THE SITE ASSESSMENT WILL SUMMARIZE:

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

4. SITE LAYOUT AND FLAGGING.

- A. CONSTRUCTION AREAS TO BE CLEARLY FLAGGED PRIOR TO CONSTRUCTION.

- B. AREAS TO BE FLAGGED WILL INCLUDE:

- 1. SENSITIVE RESOURCE AREAS, SUCH AS AREAS BELOW ORDINARY HIGH WATER, SPAWNING AREAS, SPRINGS, AND WETLANDS;
- 2. EQUIPMENT ENTRY AND EXIT POINTS;
- 3. ROAD AND STREAM CROSSING ALIGNMENTS;
- 4. STAGING, STORAGE, AND STOCKPILE AREAS; AND
- 5. NO-SPRAY AREAS AND BUFFERS.

5. TEMPORARY ACCESS ROADS AND PATHS.

- A. EXISTING ACCESS ROADS AND PATHS WILL BE PREFERENTIALLY USED WHENEVER REASONABLE, AND THE NUMBER AND LENGTH OF TEMPORARY ACCESS ROADS AND PATHS THROUGH RIPARIAN AREAS AND FLOODPLAINS WILL BE MINIMIZED.
- B. VEHICLE USE AND HUMAN ACTIVITIES, INCLUDING WALKING, IN AREAS OCCUPIED BY TERRESTRIAL ESA-LISTED SPECIES WILL BE MINIMIZED.
- C. TEMPORARY ACCESS ROADS AND PATHS WILL NOT BE BUILT ON SLOPES WHERE GRADE, SOIL, OR OTHER FEATURES SUGGEST A LIKELIHOOD OF EXCESSIVE EROSION OR FAILURE. IF SLOPES ARE STEEPER THAN 30%, THEN THE ROAD WILL BE DESIGNED BY A CIVIL ENGINEER WITH EXPERIENCE IN STEEP ROAD DESIGN.

- D. THE REMOVAL OF RIPARIAN VEGETATION DURING CONSTRUCTION OF TEMPORARY ACCESS ROADS WILL BE MINIMIZED. WHEN TEMPORARY VEGETATION REMOVAL IS REQUIRED, VEGETATION WILL BE CUT AT GROUND LEVEL (NOT GRUBBED).

- E. AT PROJECT COMPLETION, ALL TEMPORARY ACCESS ROADS AND PATHS WILL BE OBLITERATED, AND THE SOIL WILL BE STABILIZED AND REVEGETATED. ROAD AND PATH OBLITERATION REFERS TO THE MOST COMPREHENSIVE DEGREE OF DECOMMISSIONING AND INVOLVES DECOMPACTING THE SURFACE AND DITCH, PULLING THE FILL MATERIAL ONTO THE RUNNING SURFACE, AND RESHAPING TO MATCH THE ORIGINAL CONTOUR.

- F. HELICOPTER FLIGHT PATTERNS WILL BE ESTABLISHED IN ADVANCE AND LOCATED TO AVOID TERRESTRIAL ESA-LISTED SPECIES AND THEIR OCCUPIED HABITAT DURING SENSITIVE LIFE STAGES.

6. TEMPORARY STREAM CROSSINGS.

- A. EXISTING STREAM CROSSINGS OR BEDROCK WILL BE PREFERENTIALLY USED WHENEVER REASONABLE, AND THE NUMBER OF TEMPORARY STREAM CROSSINGS WILL BE MINIMIZED.

- B. TEMPORARY BRIDGES AND CULVERTS WILL BE INSTALLED TO ALLOW FOR EQUIPMENT AND VEHICLE CROSSING OVER PERENNIAL STREAMS DURING CONSTRUCTION. TREATED WOOD SHALL NOT BE USED ON TEMPORARY BRIDGE CROSSINGS OR IN LOCATIONS IN CONTACT WITH OR DIRECTLY OVER WATER.

- C. FOR PROJECTS THAT REQUIRE EQUIPMENT AND VEHICLES TO CROSS IN THE WET:

- 1. THE LOCATION AND NUMBER OF ALL WET CROSSINGS SHALL BE APPROVED BY THE BPA EC LEAD AND DOCUMENTED IN THE CONSTRUCTION PLANS;
- 2. VEHICLES AND MACHINERY SHALL CROSS STREAMS AT RIGHT ANGLES TO THE MAIN CHANNEL WHENEVER POSSIBLE;
- 3. NO STREAM CROSSINGS WILL OCCUR 300 FEET UPSTREAM OR 100 FEET DOWNSTREAM OF AN EXISTING REDD OR SPAWNING FISH; AND
- 4. AFTER PROJECT COMPLETION, TEMPORARY STREAM CROSSINGS WILL BE OBLITERATED AND BANKS RESTORED.

7. STAGING, STORAGE, AND STOCKPILE AREAS.

- A. STAGING AREAS (USED FOR CONSTRUCTION EQUIPMENT STORAGE, VEHICLE STORAGE, FUELING, SERVICING, AND HAZARDOUS MATERIAL STORAGE) WILL BE 150 FEET OR MORE FROM ANY NATURAL WATER BODY OR WETLAND. STAGING AREAS CLOSER THAN 150 FEET WILL BE APPROVED BY THE EC LEAD.

- B. NATURAL MATERIALS USED FOR IMPLEMENTATION OF AQUATIC RESTORATION, SUCH AS LARGE WOOD, GRAVEL, AND BOULDERS, MAY BE STAGED WITHIN 150 FEET IF CLEARLY INDICATED IN THE PLANS THAT AREA IS FOR NATURAL MATERIALS ONLY.

- C. ANY LARGE WOOD, TOPSOIL, AND NATIVE CHANNEL MATERIAL DISPLACED BY CONSTRUCTION WILL BE STOCKPILED FOR USE DURING SITE RESTORATION AT A SPECIFICALLY IDENTIFIED AND FLAGGED AREA.

- D. ANY MATERIAL NOT USED IN RESTORATION, AND NOT NATIVE TO THE FLOODPLAIN, WILL BE DISPOSED OF OUTSIDE THE 100-YEAR FLOODPLAIN.

8. EQUIPMENT.

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

- B. EQUIPMENT WILL BE STORED, FUELED, AND MAINTAINED IN AN CLEARLY IDENTIFIED STAGING AREA THAT MEETS STAGING AREA CONSERVATION MEASURES.

- C. EQUIPMENT WILL BE REFUELED IN A VEHICLE STAGING AREA OR IN AN ISOLATED HARD ZONE, SUCH AS A PAVED PARKING LOT OR ADJACENT, ESTABLISHED ROAD (THIS MEASURE APPLIES ONLY TO GAS-POWERED EQUIPMENT WITH TANKS LARGER THAN 5 GALLONS).

- D. BIODEGRADABLE LUBRICANTS AND FLUIDS WILL BE USED ON EQUIPMENT OPERATING IN AND ADJACENT TO THE STREAM CHANNEL AND LIVE WATER.

- E. EQUIPMENT WILL BE INSPECTED DAILY FOR FLUID LEAKS BEFORE LEAVING THE VEHICLE STAGING AREA FOR OPERATION WITHIN 150 FEET OF ANY NATURAL WATER BODY OR WETLAND.

- F. EQUIPMENT WILL BE THOROUGHLY CLEANED BEFORE OPERATION BELOW ORDINARY HIGH WATER, AND AS OFTEN AS NECESSARY DURING OPERATION, TO REMAIN GREASE FREE.

9. EROSION CONTROL.

- A. TEMPORARY EROSION CONTROL MEASURES INCLUDE:

- 1. TEMPORARY EROSION CONTROLS WILL BE IN PLACE BEFORE ANY SIGNIFICANT ALTERATION OF THE ACTION SITE AND APPROPRIATELY INSTALLED DOWNSLOPE OF PROJECT ACTIVITY WITHIN THE RIPARIAN BUFFER AREA UNTIL SITE REHABILITATION IS COMPLETE;

- 2. IF THERE IS A POTENTIAL FOR ERODED SEDIMENT TO ENTER THE STREAM, SEDIMENT BARRIERS WILL BE INSTALLED AND MAINTAINED FOR THE DURATION OF PROJECT IMPLEMENTATION;

- 3. TEMPORARY EROSION CONTROL MEASURES MAY INCLUDE SEDGE MATS, FIBER WATTLES, SILT FENCES, JUTE MATTING, WOOD FIBER MULCH AND SOIL BINDER, OR GEOTEXTILES AND GEOSYNTHETIC FABRIC;

- 4. SOIL STABILIZATION UTILIZING WOOD FIBER MULCH AND TACKIFIER (HYDRO-APPLIED) MAY BE USED TO REDUCE EROSION OF BARE SOIL IF THE MATERIALS ARE NOXIOUS WEED FREE AND NONTOXIC TO AQUATIC AND TERRESTRIAL ANIMALS, SOIL MICROORGANISMS, AND VEGETATION;

- 5. SEDIMENT WILL BE REMOVED FROM EROSION CONTROLS ONCE IT HAS REACHED 1/3 OF THE EXPOSED HEIGHT OF THE CONTROL; AND

- 6. ONCE THE SITE IS STABILIZED AFTER CONSTRUCTION, TEMPORARY EROSION CONTROL MEASURES WILL BE REMOVED.

- B. EMERGENCY EROSION CONTROLS. THE FOLLOWING MATERIALS FOR EMERGENCY EROSION CONTROL WILL BE AVAILABLE AT THE WORK SITE:

- 1. A SUPPLY OF SEDIMENT CONTROL MATERIALS; AND
- 2. AN OIL-ABSORBING FLOATING BOOM WHENEVER SURFACE WATER IS PRESENT.

10. DUST ABATEMENT.

- A. THE PROJECT SPONSOR WILL DETERMINE THE APPROPRIATE DUST CONTROL MEASURES BY CONSIDERING SOIL TYPE, EQUIPMENT USAGE, PREVAILING WIND DIRECTION, AND THE EFFECTS CAUSED BY OTHER EROSION AND SEDIMENT CONTROL MEASURES.

- B. WORK WILL BE SEQUENCED AND SCHEDULED TO REDUCE EXPOSED BARE SOIL SUBJECT TO WIND EROSION.

- C. DUST-ABATEMENT ADDITIVES AND STABILIZATION CHEMICALS (TYPICALLY MAGNESIUM CHLORIDE, CALCIUM CHLORIDE SALTS, OR LIGNINSULFONATE) WILL NOT BE APPLIED WITHIN 25 FEET OF WATER OR A STREAM CHANNEL AND WILL BE APPLIED SO AS TO MINIMIZE THE LIKELIHOOD THAT THEY WILL ENTER STREAMS. APPLICATIONS OF LIGNINSULFONATE WILL BE LIMITED TO A MAXIMUM RATE OF 0.5 GALLONS PER SQUARE YARD OF ROAD SURFACE, ASSUMING MIXED 50:50 WITH WATER.

- D. APPLICATION OF DUST ABATEMENT CHEMICALS WILL BE AVOIDED DURING OR JUST BEFORE WET WEATHER, AND AT STREAM CROSSINGS OR OTHER AREAS THAT COULD RESULT IN UNFILTERED DELIVERY OF THE DUST ABATEMENT MATERIALS TO A WATERBODY (TYPICALLY THESE WOULD BE AREAS WITHIN 25 FEET OF A WATERBODY OR STREAM CHANNEL; DISTANCES MAY BE GREATER WHERE VEGETATION IS SPARSE OR SLOPES ARE STEEP).

- E. SPILL CONTAINMENT EQUIPMENT WILL BE AVAILABLE DURING APPLICATION OF DUST ABATEMENT CHEMICALS.

- F. PETROLEUM-BASED PRODUCTS WILL NOT BE USED FOR DUST ABATEMENT.

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NO.	DATE	DESCRIPTION	BY	 KILGREN WATER RESOURCES 3365 EAST AMAZON DRIVE, SUITE A EUGENE, OR 97405 PHONE: 971-409-4023	 COLUMBIA RIVER ESTUARY STUDY TASKFORCE (CREST) 818 COMMERCIAL STREET, SUITE 203 ASTORIA, OR 97103 PHONE: 503-325-0435		PROJECT NO.	SOUTH TONGUE POINT RESTORATION PROJECT	DRAWING NO.
	FEB 22, 2023	ISSUED FOR CONSTRUCTION	RWK				5.2022.0001.1		
				DESIGNED BY		SHEET NO.			
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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 TARPULIN, 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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1	FEB 22, 2023	ISSUED FOR CONSTRUCTION	RWK

KILGREN WATER RESOURCES
 3365 EAST AMAZON DRIVE, SUITE A
 EUGENE, OR 97405
 PHONE: 971-409-4023



COLUMBIA RIVER ESTUARY STUDY TASKFORCE (CREST)
 818 COMMERCIAL STREET, SUITE 203
 ASTORIA, OR 97103
 PHONE: 503-325-0435



PROJECT NO.
5.2022.0001.1

DESIGNED BY
RWK

DRAWN BY
RWK

SOUTH TONGUE POINT RESTORATION PROJECT

HIP CONSERVATION & IMPLEMENTATION MEASURES - 2

DRAWING NO.
G04

SHEET NO.
4
OF 30



WORK AREA ISOLATION AND FISH SALVAGE (CONTINUED).

4. DEWATERING.

- A. DEWATERING WILL OCCUR AT A RATE SLOW ENOUGH TO ALLOW SPECIES TO NATURALLY MIGRATE OUT OF THE WORK AREA.
- B. WHERE A GRAVITY FEED DIVERSION IS NOT POSSIBLE, A PUMP MAY BE USED. PUMPS WILL BE INSTALLED TO AVOID REPETITIVE DEWATERING AND REWATERING.
- C. WHEN FISH ARE PRESENT, PUMPS WILL BE SCREENED IN ACCORDANCE WITH NMFS FISH SCREEN CRITERIA. NMFS ENGINEERING REVIEW AND APPROVAL WILL BE OBTAINED FOR PUMPS EXCEEDING 3 CUBIC FEET PER SECOND.
- D. DISSIPATION OF FLOW ENERGY AT THE BYPASS OUTFLOW WILL BE PROVIDED TO PREVENT DAMAGE TO THE STREAM CHANNEL AND RIPARIAN VEGETATION.
- E. SEEPAGE WATER WILL BE PUMPED TO A TEMPORARY STORAGE AND TREATMENT SITE OF INTO UPLAND AREAS TO ALLOW WATER TO PERCOLATE THROUGH SOIL AND VEGETATION PRIOR TO REENTERING THE STREAM CHANNEL.

CONSTRUCTION AND POST CONSTRUCTION CONSERVATION MEASURES.

1. FISH PASSAGE.

- A. FISH PASSAGE WILL BE PROVIDED FOR ADULT AND JUVENILE FISH LIKELY TO BE PRESENT DURING CONSTRUCTION UNLESS PASSAGE DID NOT EXIST BEFORE CONSTRUCTION, THE STREAM IS NATURALLY IMPASSABLE, OR PASSAGE WILL NEGATIVELY IMPACT ESA-LISTED SPECIES OR THEIR HABITAT.
- B. FISH PASSAGE ALTERNATIVES WILL BE APPROVED BY THE BPA EC LEAD UNDER ADVISEMENT BY THE NMFS HABITAT BIOLOGIST.

2. CONSTRUCTION AND DISCHARGE WATER.

- A. SURFACE WATER MAY BE DIVERTED TO MEET CONSTRUCTION NEEDS ONLY IF DEVELOPED SOURCES ARE UNAVAILABLE OR INADEQUATE.
- B. DIVERSIONS WILL NOT EXCEED 10% OF THE AVAILABLE FLOW.
- C. CONSTRUCTION DISCHARGE WATER WILL BE COLLECTED AND TREATED TO REMOVE DEBRIS, NUTRIENTS, SEDIMENT, PETROLEUM HYDROCARBONS, METALS, AND OTHER POLLUTANTS.

3. TIME AND EXTENT OF DISTURBANCE.

- A. EARTHWORK REQUIRING IN-STREAM MECHANIZED EQUIPMENT (INCLUDING DRILLING, EXCAVATION, DREDGING, FILLING, AND COMPACTING) WILL BE COMPLETED AS QUICKLY AS POSSIBLE.
- B. MECHANIZED EQUIPMENT WILL WORK FROM TOP OF BANK UNLESS WORK FROM ANOTHER LOCATION WILL RESULT IN LESS HABITAT DISTURBANCE (TURBIDITY, VEGETATION DISTURBANCE, ETC.).

4. CESSATION OF WORK.

- A. PROJECT OPERATIONS WILL CEASE WHEN HIGH FLOW CONDITIONS MAY RESULT IN INUNDATION OF THE PROJECT AREA (FLOOD EFFORTS TO DECREASE DAMAGES TO NATURAL RESOURCES PERMITTED).
- B. WATER QUALITY LEVELS EXCEEDED. SEE CWA SECTION 401 WATER QUALITY CERTIFICATION AND TURBIDITY MEASURES.

5. SITE RESTORATION.

- A. DISTURBED AREAS, STREAM BANKS, SOILS, AND VEGETATION WILL BE CLEANED UP AND RESTORED TO IMPROVED OR PRE-PROJECT CONDITIONS.
- B. PROJECT-RELATED WASTE WILL BE REMOVED.
- C. TEMPORARY ACCESS ROADS AND STAGING WILL BE DECOMPACTED AND RESTORED. SOILS WILL BE LOOSENEED 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.

- B. 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.
- C. 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.

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DESIGNED BY
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RWK

SOUTH TONGUE POINT RESTORATION PROJECT

HIP CONSERVATION & IMPLEMENTATION MEASURES - 3

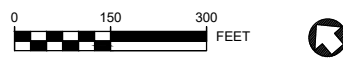
DRAWING NO.
G05

SHEET NO.
5
OF 30



SURVEY CONTROL POINT TABLE				
POINT #	NORTHING	EASTING	ELEV	DESCRIPTION
1	934082.97	7379485.69	14.87	MAG NAIL IN RR TIE
2	934475.96	7379137.85	15.06	MAG NAIL IN RR TIE
3	934277.12	7379291.64	14.85	MAG NAIL IN RR TIE
4	935036.97	7378799.68	14.68	MAG NAIL IN RR TIE
5	935442.38	7378577.02	14.69	MAG NAIL IN RR TIE
6	936972.65	7377058.62	79.85	SET ALUM CAP T.P.
7	936618.19	7379941.15	16.31	SET MAG NAIL WHARF
8	936313.37	7378154.88	17.28	OTAK CNTRL LL
9	936298.12	7378290.88	16.74	CREST CNTRL LL
10	934738.71	7379652.01	17.09	CREST CNTRL M2
11	934798.02	7379601.54	19.19	CREST CNTRL M1
12	934290.48	7379925.92	13.09	CREST CNTRL S2
13	934036.21	7379954.05	8.9	CREST CNTRL S1
14	935571.53	7379388.92	17.79	CREST CNTRL N2
15	935650.93	7379382.61	17.63	CREST CNTRL N1

1 EXISTING CONDITIONS AND SURVEY CONTROL - PLAN
Scale: 1:150



NO.	DATE	DESCRIPTION	BY
1	FEB 22, 2023	ISSUED FOR CONSTRUCTION	RWK

KILGREN WATER RESOURCES
3365 EAST AMAZON DRIVE, SUITE A
EUGENE, OR 97405
PHONE: 971-409-4023



COLUMBIA RIVER ESTUARY STUDY TASKFORCE (CREST)
818 COMMERCIAL STREET, SUITE 203
ASTORIA, OR 97103
PHONE: 503-325-0435



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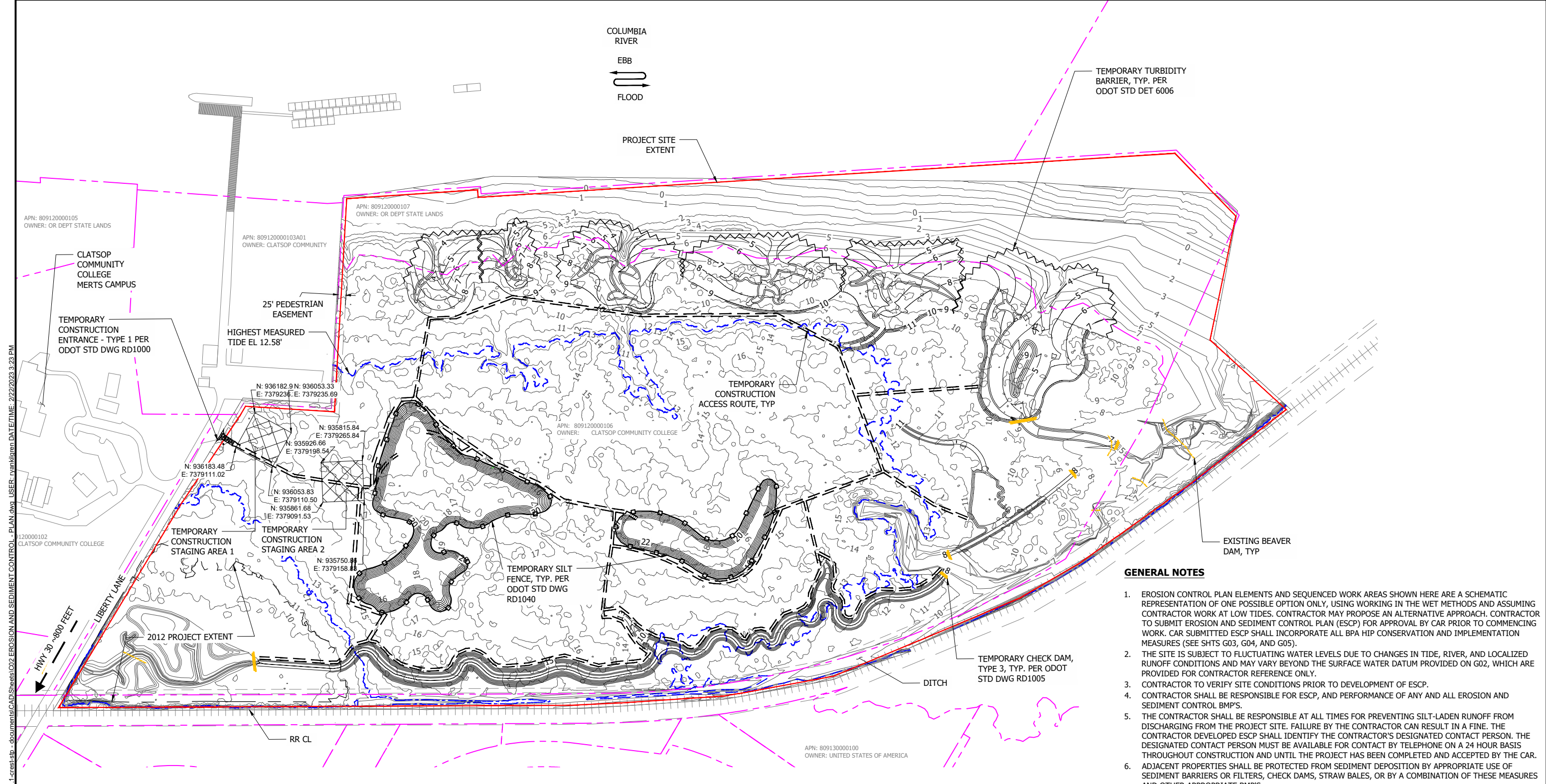
SOUTH TONGUE POINT RESTORATION PROJECT
EXISTING CONDITIONS AND SURVEY CONTROL - PLAN

DRAWING NO.
C01
SHEET NO.
6
OF
30

IF ELECTRONIC SIGNATURE IS BROKEN OR MISSING - THIS IS NOT A LEGAL DRAWING

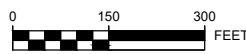
BAR MEASURES 1" FOR 22" X 34" PLOT

FILE: c:\Users\rvantkaren\Documents\CAD\Sheet\C01 - EXISTING CONDITIONS AND SURVEY CONTROL.dwg USER: rvantkaren DATE/TIME: 2/22/2023 3:23 PM



- GENERAL NOTES**
1. EROSION CONTROL PLAN ELEMENTS AND SEQUENCED WORK AREAS SHOWN HERE ARE A SCHEMATIC REPRESENTATION OF ONE POSSIBLE OPTION ONLY, USING WORKING IN THE WET METHODS AND ASSUMING CONTRACTOR WORK AT LOW TIDES. CONTRACTOR MAY PROPOSE AN ALTERNATIVE APPROACH. CONTRACTOR TO SUBMIT EROSION AND SEDIMENT CONTROL PLAN (ESCP) FOR APPROVAL BY CAR PRIOR TO COMMENCING WORK. CAR SUBMITTED ESCP SHALL INCORPORATE ALL BPA HIP CONSERVATION AND IMPLEMENTATION MEASURES (SEE SHTS G03, G04, AND G05).
 2. THE SITE IS SUBJECT TO FLUCTUATING WATER LEVELS DUE TO CHANGES IN TIDE, RIVER, AND LOCALIZED RUNOFF CONDITIONS AND MAY VARY BEYOND THE SURFACE WATER DATUM PROVIDED ON G02, WHICH ARE PROVIDED FOR CONTRACTOR REFERENCE ONLY.
 3. CONTRACTOR TO VERIFY SITE CONDITIONS PRIOR TO DEVELOPMENT OF ESCP.
 4. CONTRACTOR SHALL BE RESPONSIBLE FOR ESCP, AND PERFORMANCE OF ANY AND ALL EROSION AND SEDIMENT CONTROL BMP'S.
 5. THE CONTRACTOR SHALL BE RESPONSIBLE AT ALL TIMES FOR PREVENTING SILT-LADEN RUNOFF FROM DISCHARGING FROM THE PROJECT SITE. FAILURE BY THE CONTRACTOR CAN RESULT IN A FINE. THE CONTRACTOR DEVELOPED ESCP SHALL IDENTIFY THE CONTRACTOR'S DESIGNATED CONTACT PERSON. THE DESIGNATED CONTACT PERSON MUST BE AVAILABLE FOR CONTACT BY TELEPHONE ON A 24 HOUR BASIS THROUGHOUT CONSTRUCTION AND UNTIL THE PROJECT HAS BEEN COMPLETED AND ACCEPTED BY THE CAR.
 6. ADJACENT PROPERTIES SHALL BE PROTECTED FROM SEDIMENT DEPOSITION BY APPROPRIATE USE OF SEDIMENT BARRIERS OR FILTERS, CHECK DAMS, STRAW BALES, OR BY A COMBINATION OF THESE MEASURES AND OTHER APPROPRIATE BMP'S.
 7. TEMPORARY ESCP BMP'S TO REMAIN IN PLACE UNTIL THE SITE IS STABILIZED AFTER CONSTRUCTION.
 8. EMERGENCY EROSION CONTROL MATERIALS SHALL BE AVAILABLE AT THE WORK SITE, INCLUDING A SUPPLY OF SEDIMENT CONTROL MATERIALS AND AN OIL-ABSORBING FLOATING BOOM WHENEVER SURFACE WATER OR WETLAND AREAS ARE WITHIN 150 FEET OF ACTIVE AND IDLE MACHINERY.
 9. CONTRACTOR TO COORDINATE WITH CAR REGARDING PRESENCE OF AQUATIC ORGANISM EXCLUSION WITHIN WATERWAYS ADJACENT TO WORK AREAS AND FISH EXCLUSION REQUIREMENTS.

1 EROSION AND SEDIMENT CONTROL - PLAN
Scale: 1:150



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3365 EAST AMAZON DRIVE, SUITE A
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PHONE: 971-409-4023



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818 COMMERCIAL STREET, SUITE 203
ASTORIA, OR 97103
PHONE: 503-325-0435



PROJECT NO.
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SOUTH TONGUE POINT RESTORATION PROJECT
EROSION AND SEDIMENT CONTROL - PLAN

DRAWING NO.
C02
SHEET NO.
7
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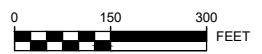
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GENERAL NOTES

- CONSTRUCTION ACCESS IS ASSUMED TO OCCUR FROM HWY 30 VIA LIBERTY LANE AND CONTRACTOR ESTABLISHED TEMPORARY CONSTRUCTION ACCESS ROUTES. ACCESS FROM THE COLUMBIA RIVER IS AT CONTRACTOR OPTION AND RISK. NUMEROUS UNMARKED AND POTENTIALLY SUBMERGED OBSTRUCTIONS MAY BE PRESENT ALONG THE PROJECT SITE SHORELINE AND SHALLOW WATER AREAS. OBSTRUCTIONS MAY INCLUDE DERELICT PILING AND LARGE WOOD.
- STAGING AREAS SHALL BE 150 FEET MIN FROM BODIES OF WATER AND WETLANDS, INCLUDING THE DITCH. STAGING AREAS SHALL BE CONFINED TO THE LIMITS STAKED BY CAR. EXPANSION OF THE STAGING AREAS BEYOND CAR STAKED LIMITS SHALL NOT BE ALLOWED WITHOUT CAR WRITTEN APPROVAL.
- TEMPORARY CONSTRUCTION ACCESS ROUTE WIDTH SHALL BE 10 FEET MAX.
- LOCATE TEMPORARY CONSTRUCTION ACCESS ROUTES WITHIN GRADING SITE LIMITS AND ALONG FLOW-THROUGH CHANNEL ALIGNMENTS TO THE EXTENT PRACTICAL TO LIMIT DISTURBANCE.
- TEMPORARY CONSTRUCTION ACCESS ROUTES AND STAGING AREAS OUTSIDE OF GRADING SITE LIMITS SHALL BE RESTORED PER THE THE PLANTING PLAN ON SHT C22 AND OBLITERATED PER DETAILS ON SHT C25 FOR PEDESTRIAN TRAIL.
- IF CONTRACTOR ELECTS NOT TO USE TEMPORARY CONSTRUCTION ACCESS ROUTE SHOWN ALONG EAST SIDE OF FLOW-THROUGH CHANNEL 1, THEN CONTRACTOR SHALL CLEAR AND MASTICATE VEGETATION FOR THIS LENGTH AT A WIDTH OF 8 FEET MEASURED FROM THE TOP OF SLOPE FOR FLOW-THROUGH CHANNEL 1 AND PER CAR DIRECTION. TRAIL ESTABLISHMENT AND REVEGETATION WITHIN THIS 8-FOOT WIDE AREA SHALL FOLLOW DETAILS AND NOTES ON SHT C25 FOR PEDESTRIAN TRAIL.
- CLEARING FOR STAGING AREAS 1 AND 2, FILL AREAS 1 AND 2, AND TEMPORARY CONSTRUCTION ACCESS ROUTE LENGTH, AND AS APPROXIMATED WITH YELLOW HIGHLIGHTED AREA SHOWN, WAS COMPLETED DURING A PREVIOUS PROJECT CONSTRUCTION PHASE DURING 2022. CONTRACTOR TO VERIFY PREVIOUSLY CLEARED FOOTPRINTS AND AREAS REMAINING TO BE CLEARED. CONTRACTOR SHALL COORDINATE WITH CAR PRIOR TO MOBILIZATION IF ADDITIONAL CLEARING OF PREVIOUS PROJECT CONSTRUCTION PHASE CLEARING IS NEEDED TO ACCOMPLISH THE WORK.

1 CONSTRUCTION ACCESS AND STAGING - PLAN
Scale: 1:150



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3365 EAST AMAZON DRIVE, SUITE A
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PHONE: 971-409-4023



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ASTORIA, OR 97103
PHONE: 503-325-0435



PROJECT NO.
5.2022.0001.1
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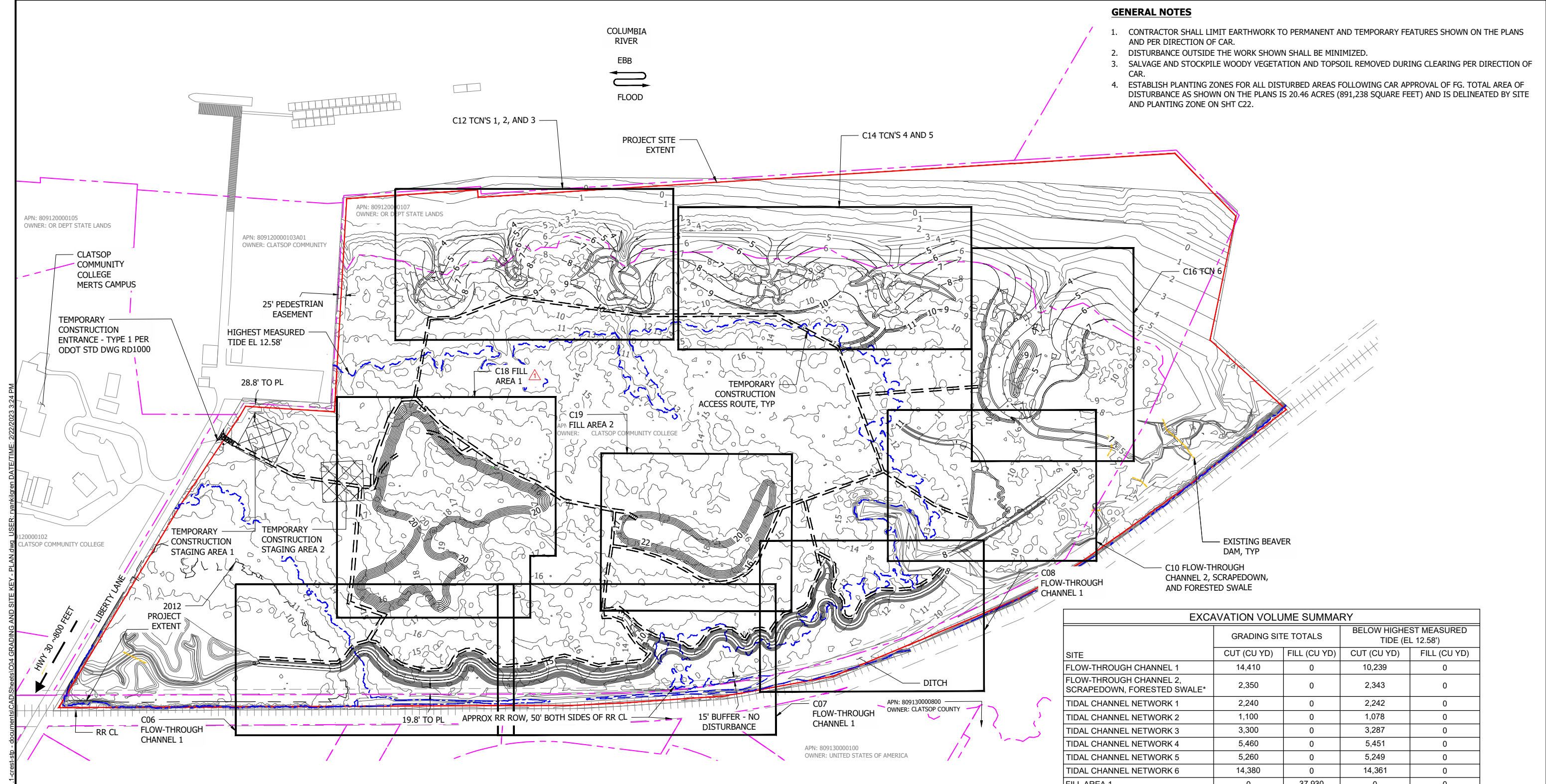
SOUTH TONGUE POINT RESTORATION PROJECT
CONSTRUCTION ACCESS AND STAGING - PLAN

DRAWING NO.
C03
SHEET NO.
8
OF
30

FILE: c:\Users\ryanw@kilgren.com\Documents\CAD\Sheet\C03 CONSTRUCTION ACCESS AND STAGING - PLAN.dwg USER: ryanw@kilgren.com DATE/TIME: 2/22/2023 3:24 PM

GENERAL NOTES

1. CONTRACTOR SHALL LIMIT EARTHWORK TO PERMANENT AND TEMPORARY FEATURES SHOWN ON THE PLANS AND PER DIRECTION OF CAR.
2. DISTURBANCE OUTSIDE THE WORK SHOWN SHALL BE MINIMIZED.
3. SALVAGE AND STOCKPILE WOODY VEGETATION AND TOPSOIL REMOVED DURING CLEARING PER DIRECTION OF CAR.
4. ESTABLISH PLANTING ZONES FOR ALL DISTURBED AREAS FOLLOWING CAR APPROVAL OF FG. TOTAL AREA OF DISTURBANCE AS SHOWN ON THE PLANS IS 20.46 ACRES (891,238 SQUARE FEET) AND IS DELINEATED BY SITE AND PLANTING ZONE ON SHT C22.



SITE	GRADING SITE TOTALS		BELOW HIGHEST MEASURED TIDE (EL 12.58')	
	CUT (CU YD)	FILL (CU YD)	CUT (CU YD)	FILL (CU YD)
FLOW-THROUGH CHANNEL 1	14,410	0	10,239	0
FLOW-THROUGH CHANNEL 2, SCRAPEDOWN, FORESTED SWALE*	2,350	0	2,343	0
TIDAL CHANNEL NETWORK 1	2,240	0	2,242	0
TIDAL CHANNEL NETWORK 2	1,100	0	1,078	0
TIDAL CHANNEL NETWORK 3	3,300	0	3,287	0
TIDAL CHANNEL NETWORK 4	5,460	0	5,451	0
TIDAL CHANNEL NETWORK 5	5,260	0	5,249	0
TIDAL CHANNEL NETWORK 6	14,380	0	14,361	0
FILL AREA 1	0	37,930	0	0
FILL AREA 2	0	10,570	0	0
TOTAL	48,500	48,500	44,250	0

* EXCAVATION VOLUME FOR FLOW-THROUGH CHANNEL 2, SCRAPEDOWN, AND FORESTED SWALE SITES COMBINED FOR BREVITY, SEE SHT 14 FOR DETAILS

1 GRADING AND SITE KEY - PLAN
Scale: 1:150



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KILGREN WATER RESOURCES
3365 EAST AMAZON DRIVE, SUITE A
EUGENE, OR 97405
PHONE: 971-409-4023



COLUMBIA RIVER ESTUARY STUDY TASKFORCE (CREST)
818 COMMERCIAL STREET, SUITE 203
ASTORIA, OR 97103
PHONE: 503-325-0435



PROJECT NO.
5.2022.0001.1

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SOUTH TONGUE POINT RESTORATION PROJECT

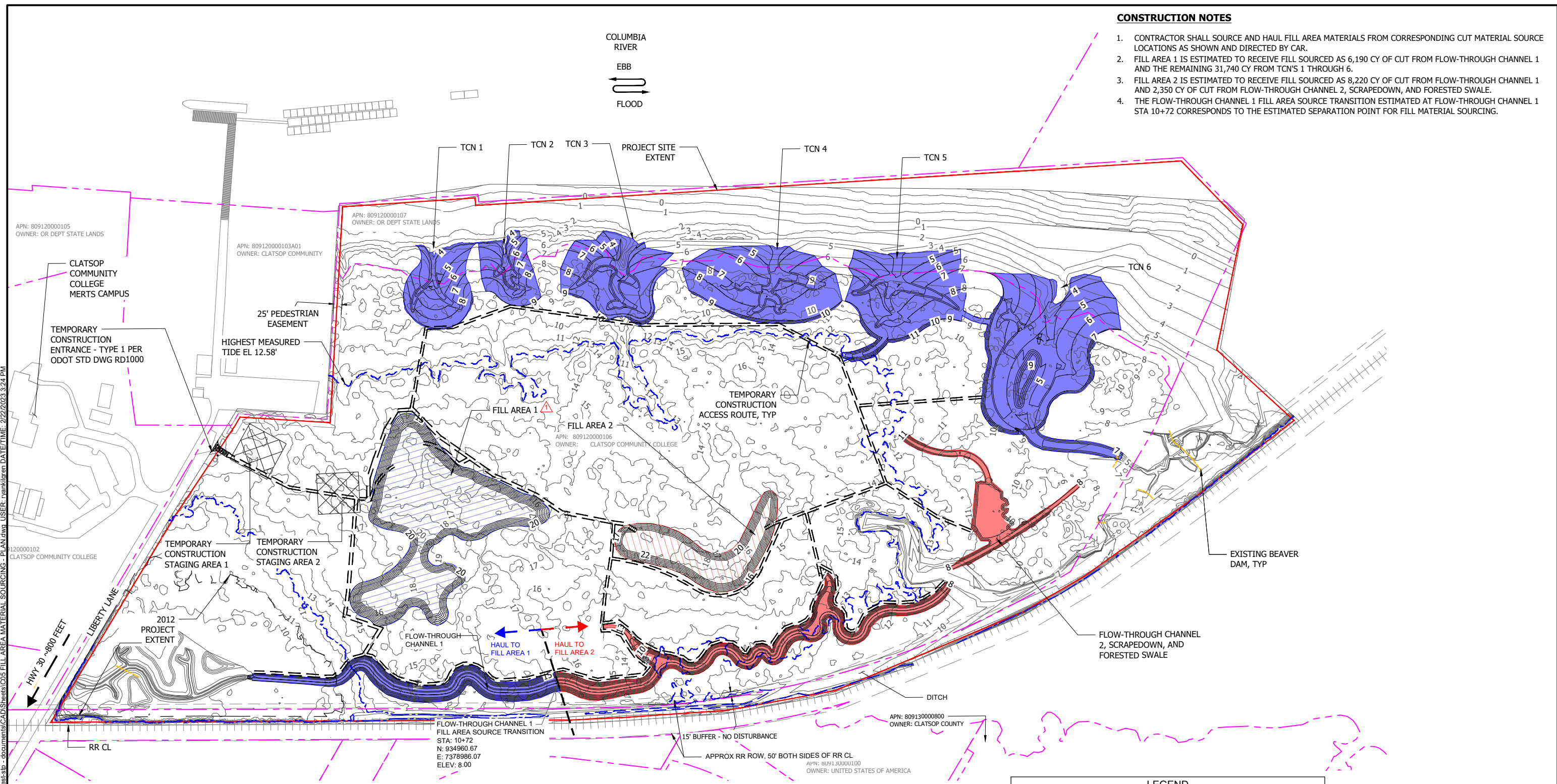
GRADING AND SITE KEY - PLAN

DRAWING NO.
C04

SHEET NO.
9
OF
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CONSTRUCTION NOTES

1. CONTRACTOR SHALL SOURCE AND HAUL FILL AREA MATERIALS FROM CORRESPONDING CUT MATERIAL SOURCE LOCATIONS AS SHOWN AND DIRECTED BY CAR.
2. FILL AREA 1 IS ESTIMATED TO RECEIVE FILL SOURCED AS 6,190 CY OF CUT FROM FLOW-THROUGH CHANNEL 1 AND THE REMAINING 31,740 CY FROM TCN'S 1 THROUGH 6.
3. FILL AREA 2 IS ESTIMATED TO RECEIVE FILL SOURCED AS 8,220 CY OF CUT FROM FLOW-THROUGH CHANNEL 1 AND 2,350 CY OF CUT FROM FLOW-THROUGH CHANNEL 2, SCRAPEDOWN, AND FORESTED SWALE.
4. THE FLOW-THROUGH CHANNEL 1 FILL AREA SOURCE TRANSITION ESTIMATED AT FLOW-THROUGH CHANNEL 1 STA 10+72 CORRESPONDS TO THE ESTIMATED SEPARATION POINT FOR FILL MATERIAL SOURCING.



1 FILL AREA MATERIAL SOURCING - PLAN
Scale: 1:150



LEGEND		
SITE	FILL AREA	CUT MATERIAL SOURCE LOCATIONS FOR FILL AREA
FILL AREA 1	[Red hatched pattern]	[Red solid color]
FILL AREA 2	[Blue hatched pattern]	[Blue solid color]

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FILL AREA MATERIAL SOURCING - PLAN

DRAWING NO.
C05

SHEET NO.
10
OF
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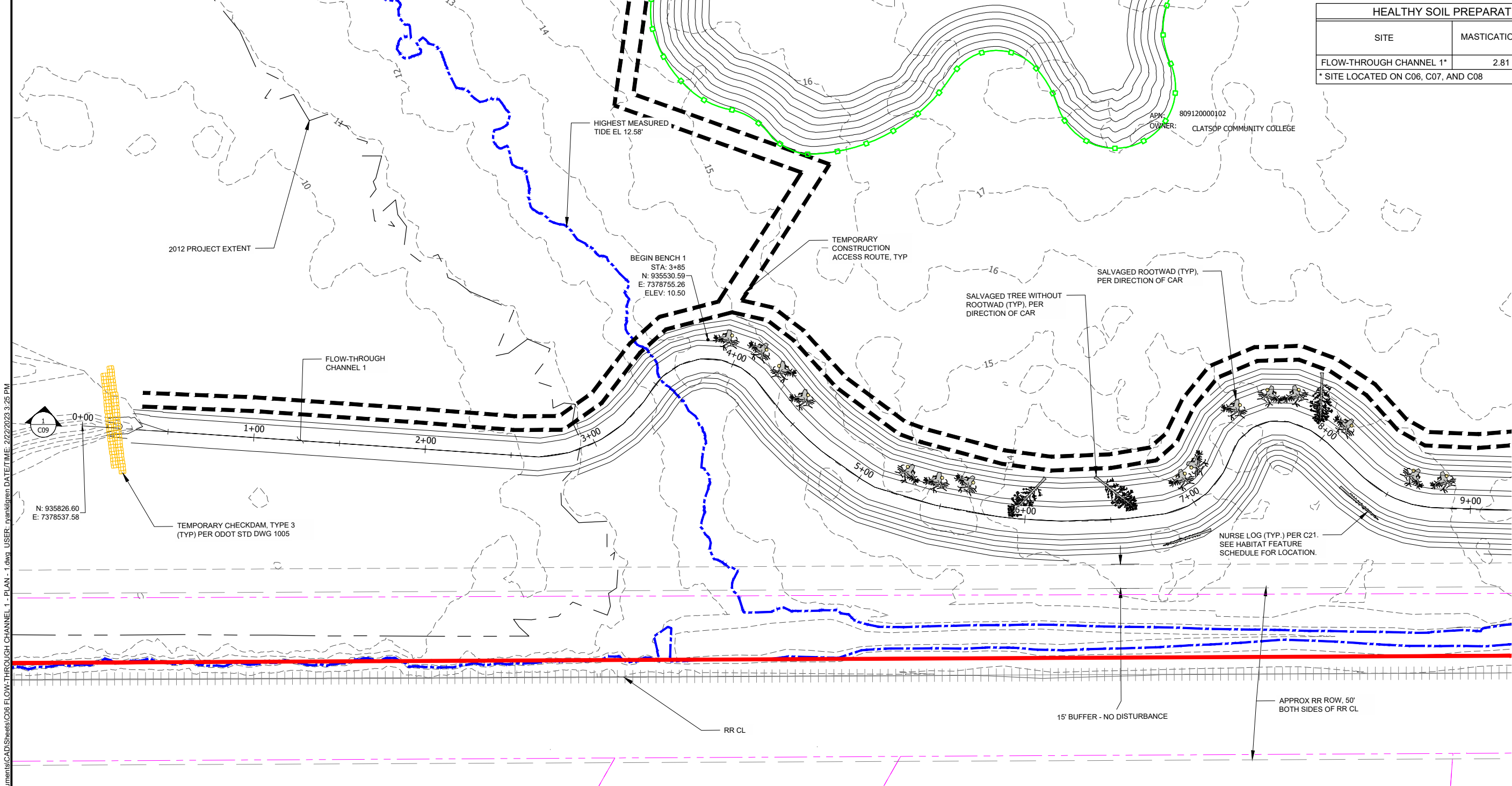
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BAR MEASURES 1" FOR 22" X 34" PLOT

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HEALTHY SOIL PREPARATION SUMMARY		
SITE	MASTICATION (AC)	MASTICATED VEGETATION/SOIL PLACEMENT (AC)
FLOW-THROUGH CHANNEL 1*	2.81	2.10
* SITE LOCATED ON C06, C07, AND C08		



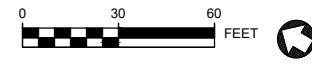
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CUT AND FILL SUMMARY		
SITE	CUT (CU YD)	FILL (CU YD)
FLOW-THROUGH CHANNEL 1*	14,410	0
FILL AREA 1**	0	37,930
FILL AREA 2**	0	10,570
TOTAL	14,410	48,500

* SITE LOCATED ON C06, C07, AND C08
** SITES LOCATED ON C18 AND C19

1 FLOW-THROUGH CHANNEL 1 - PLAN - 1
Scale: 1:30

HABITAT FEATURE SCHEDULE				
SITE	TYPE	NORTHING	EASTING	KEY ELEV
FLOW-THROUGH CHANNEL 1	NL	935154	7378853	10.62
FLOW-THROUGH CHANNEL 1	NL	935230.1	7378789	10.85



GENERAL NOTES

- CONTRACTOR SHALL LIMIT EARTHWORK TO PERMANENT AND TEMPORARY FEATURES SHOWN ON THE PLANS AND PER DIRECTION OF CAR.
- DISTURBANCE OUTSIDE THE WORK SHOWN SHALL BE MINIMIZED.
- SALVAGE AND STOCKPILE WOODY VEGETATION, AND MIXED MASTICATED/MULCHED VEGETATION AND TOPSOIL REMOVED DURING CLEARING PER SPECS AND DIRECTION OF CAR.
- ESTABLISH PLANTING ZONES FOLLOWING APPROVAL OF CAR AND ENGINEER OF FG.
- REUSE SALVAGED WOODY VEGETATION IN HABITAT FEATURES PER C21, SPECS, AND DIRECTION OF CAR.
- REUSE MIXED MASTICATED/MULCHED VEGETATION AND TOPSOIL PER C21 AND C22 TO PROVIDE A SITE GENERATED SOIL AMENDMENT.



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KILGREN WATER RESOURCES
3365 EAST AMAZON DRIVE, SUITE A
EUGENE, OR 97405
PHONE: 971-409-4023



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818 COMMERCIAL STREET, SUITE 203
ASTORIA, OR 97103
PHONE: 503-325-0435

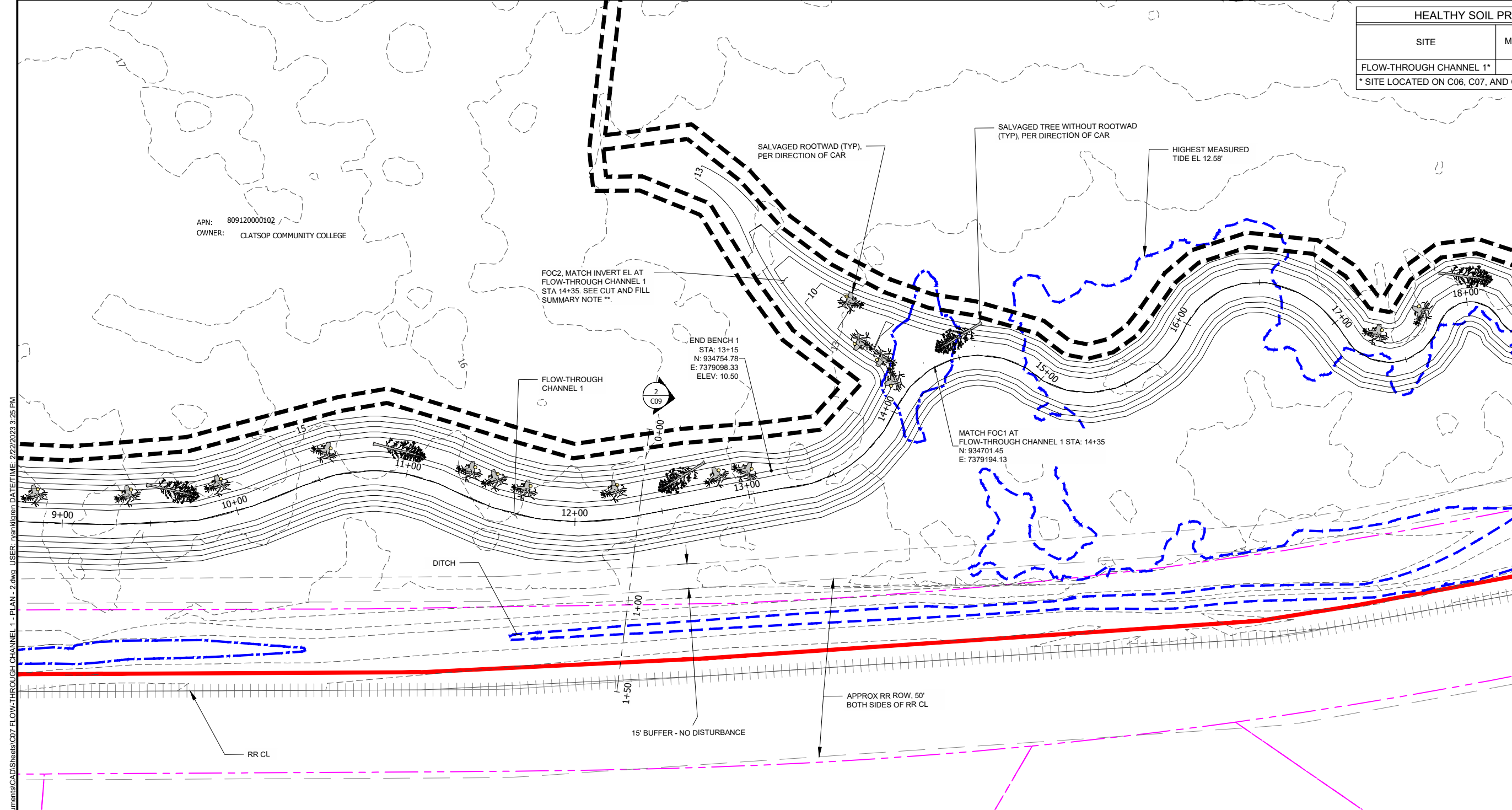


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SOUTH TONGUE POINT RESTORATION PROJECT
FLOW-THROUGH CHANNEL 1 - PLAN - 1

DRAWING NO.
C06
SHEET NO.
11
OF
30

HEALTHY SOIL PREPARATION SUMMARY		
SITE	MASTICATION (AC)	MASTICATED VEGETATION/SOIL PLACEMENT (AC)
FLOW-THROUGH CHANNEL 1*	2.81	2.10
* SITE LOCATED ON C06, C07, AND C08		



APN: 809120000102
OWNER: CLATSOP COMMUNITY COLLEGE

FILE: c:\Users\jvanhille@kilgren.com\Documents\CAD\Sheet\C07 FLOW-THROUGH CHANNEL 1 - PLAN - 2.dwg USER: jvanhille DATE/TIME: 2/22/2023 3:25 PM

CUT AND FILL SUMMARY		
SITE	CUT (CU YD)	FILL (CU YD)
FLOW-THROUGH CHANNEL 1*	14410**	0
FILL AREA 1***	0	37,930
FILL AREA 2***	0	10,570
TOTAL	14,410	48,500

* SITE LOCATED ON C06, C07, AND C08
** FLOW-THROUGH CHANNEL 1 CUT VOLUME INCLUSIVE OF FOC1 AND FOC2. FOR CONTRACTOR EARTH WORK PLANNING, FOC1 CUT IS 445 CU YD AND FOC2 CUT IS 650 CU YD
*** SITES LOCATED ON C18 AND C19

1 FLOW-THROUGH CHANNEL 1 - PLAN - 2
Scale: 1:30




GENERAL NOTES

- CONTRACTOR SHALL LIMIT EARTHWORK TO PERMANENT AND TEMPORARY FEATURES SHOWN ON THE PLANS AND PER DIRECTION OF CAR.
- DISTURBANCE OUTSIDE THE WORK SHOWN SHALL BE MINIMIZED.
- SALVAGE AND STOCKPILE WOODY VEGETATION, AND MIXED MASTICATED/MULCHED VEGETATION AND TOPSOIL REMOVED DURING CLEARING PER SPECS AND DIRECTION OF CAR.
- ESTABLISH PLANTING ZONES FOLLOWING APPROVAL OF CAR AND ENGINEER OF FG.
- REUSE SALVAGED WOODY VEGETATION IN HABITAT FEATURES PER C21, SPECS, AND DIRECTION OF CAR.
- REUSE MIXED MASTICATED/MULCHED VEGETATION AND TOPSOIL PER C21 AND C22 TO PROVIDE A SITE GENERATED SOIL AMENDMENT.



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818 COMMERCIAL STREET, SUITE 203
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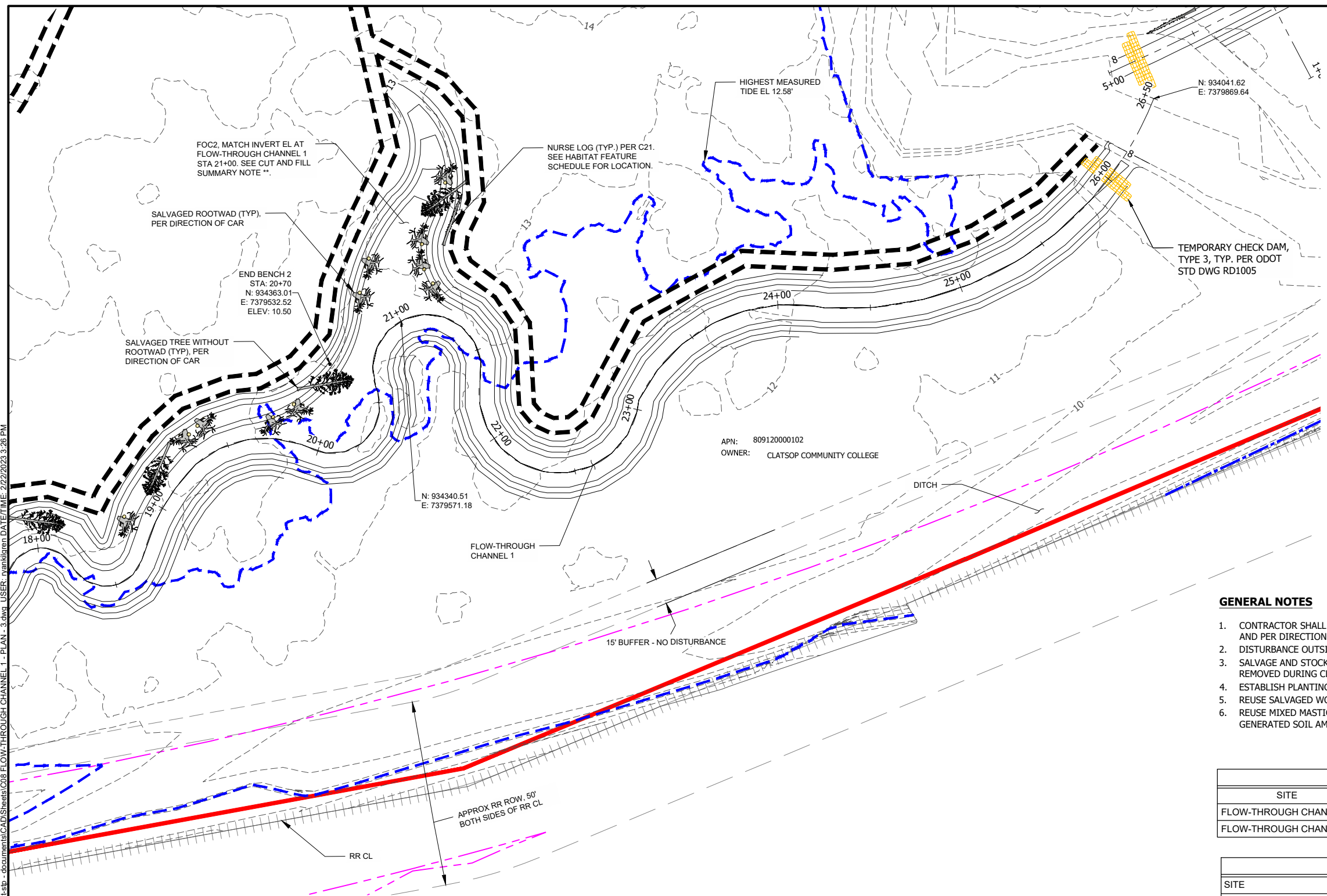
PROJECT NO.
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SOUTH TONGUE POINT RESTORATION PROJECT
FLOW-THROUGH CHANNEL 1 - PLAN - 2

DRAWING NO.
C07
SHEET NO.
12
OF
30

FILE: c:\Users\jvankilgren\Documents\CAD\Sheet\C08 FLOW-THROUGH CHANNEL 1 - PLAN - 3.dwg USER: jvankilgren DATE/TIME: 2/22/2023 3:26 PM

HEALTHY SOIL PREPARATION SUMMARY		
SITE	MASTICATION (AC)	MASTICATED VEGETATION/SOIL PLACEMENT (AC)
FLOW-THROUGH CHANNEL 1*	2.81	2.10
* SITE LOCATED ON C06, C07, AND C08		



1 FLOW-THROUGH CHANNEL 1 - PLAN - 3
Scale: 1:30

GENERAL NOTES

- CONTRACTOR SHALL LIMIT EARTHWORK TO PERMANENT AND TEMPORARY FEATURES SHOWN ON THE PLANS AND PER DIRECTION OF CAR.
- DISTURBANCE OUTSIDE THE WORK SHOWN SHALL BE MINIMIZED.
- SALVAGE AND STOCKPILE WOODY VEGETATION, AND MIXED MASTICATED/MULCHED VEGETATION AND TOPSOIL REMOVED DURING CLEARING PER SPECS AND DIRECTION OF CAR.
- ESTABLISH PLANTING ZONES FOLLOWING APPROVAL OF CAR AND ENGINEER OF FG.
- REUSE SALVAGED WOODY VEGETATION IN HABITAT FEATURES PER C21, SPECS, AND DIRECTION OF CAR.
- REUSE MIXED MASTICATED/MULCHED VEGETATION AND TOPSOIL PER C21 AND C22 TO PROVIDE A SITE GENERATED SOIL AMENDMENT.

HABITAT FEATURE SCHEDULE				
SITE	TYPE	NORTHING	EASTING	KEY ELEV
FLOW-THROUGH CHANNEL 1	NL	934341.8	7379629	13
FLOW-THROUGH CHANNEL 1	NL	934400.6	7379364	10.24

CUT AND FILL SUMMARY		
SITE	CUT (CU YD)	FILL (CU YD)
FLOW-THROUGH CHANNEL 1*	14,410**	0
FILL AREA 1***	0	37,930
FILL AREA 2***	0	10,570
TOTAL	14,410	48,500

* SITE LOCATED ON C06, C07, AND C08
 ** FLOW-THROUGH CHANNEL 1 CUT VOLUME INCLUSIVE OF FOC1 AND FOC2. FOR CONTRACTOR EARTH WORK PLANNING, FOC1 CUT IS 445 CU YD AND FOC2 CUT IS 650 CU YD
 *** SITES LOCATED ON C18 AND C19



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 3365 EAST AMAZON DRIVE, SUITE A
 EUGENE, OR 97405
 PHONE: 971-409-4023



COLUMBIA RIVER ESTUARY STUDY TASKFORCE (CREST)
 818 COMMERCIAL STREET, SUITE 203
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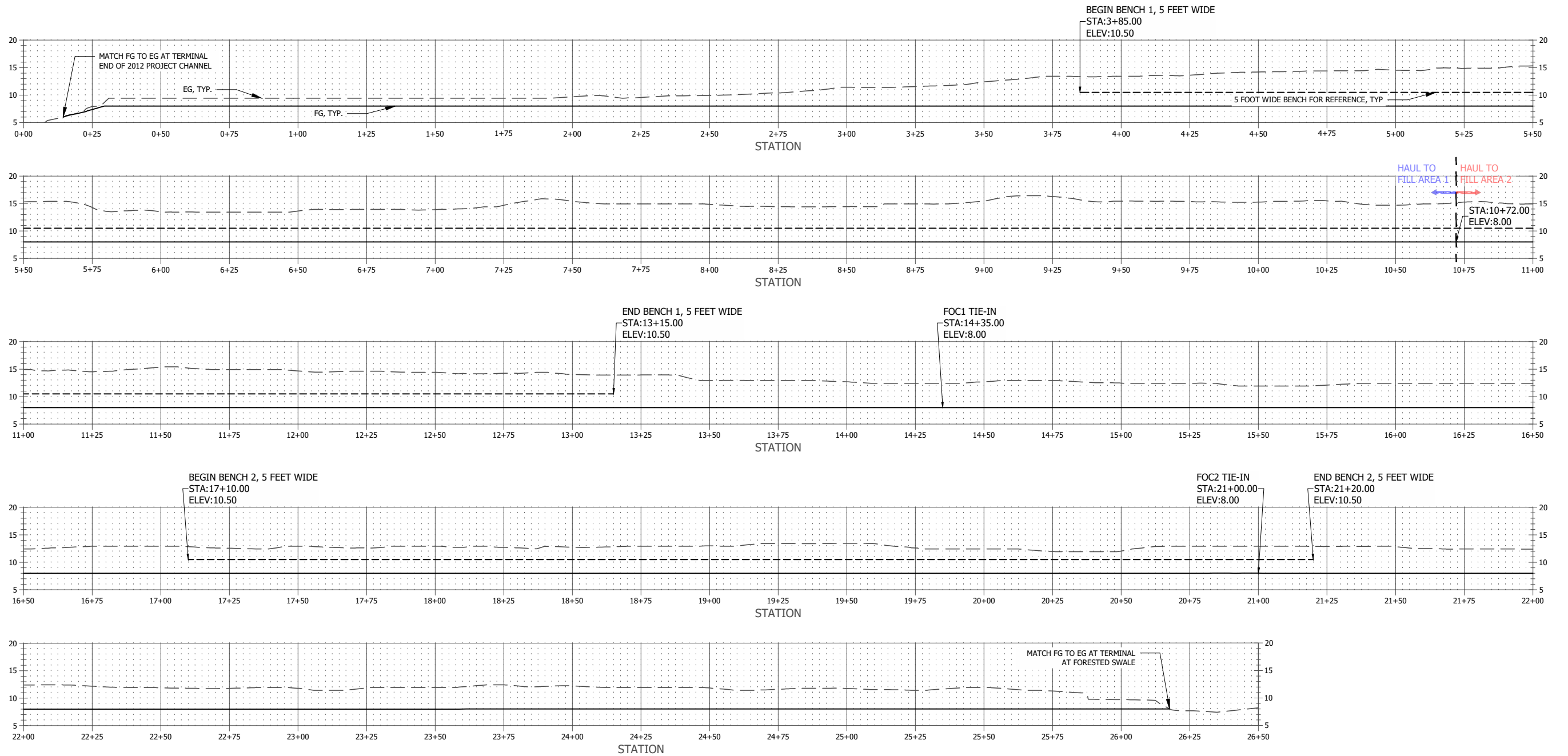


PROJECT NO.
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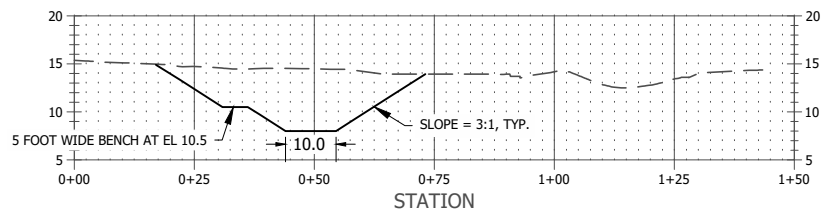
SOUTH TONGUE POINT RESTORATION PROJECT
 FLOW-THROUGH CHANNEL 1 - PLAN - 3

DRAWING NO.
C08
 SHEET NO.
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1 FLOW-THROUGH CHANNEL 1 - PROFILE
Scale: HOZ: 1:20 VERT: 1:10



2 FLOW-THROUGH CHANNEL 1 - SECTION
Scale: HOZ: 1:20 VERT: 1:5

GENERAL NOTES

- SECTIONS SHOW PROPOSED GRADE. SEE PLAN AND DETAIL SHEETS FOR PLANTING AND HABITAT FEATURES TO BE INCORPORATED.

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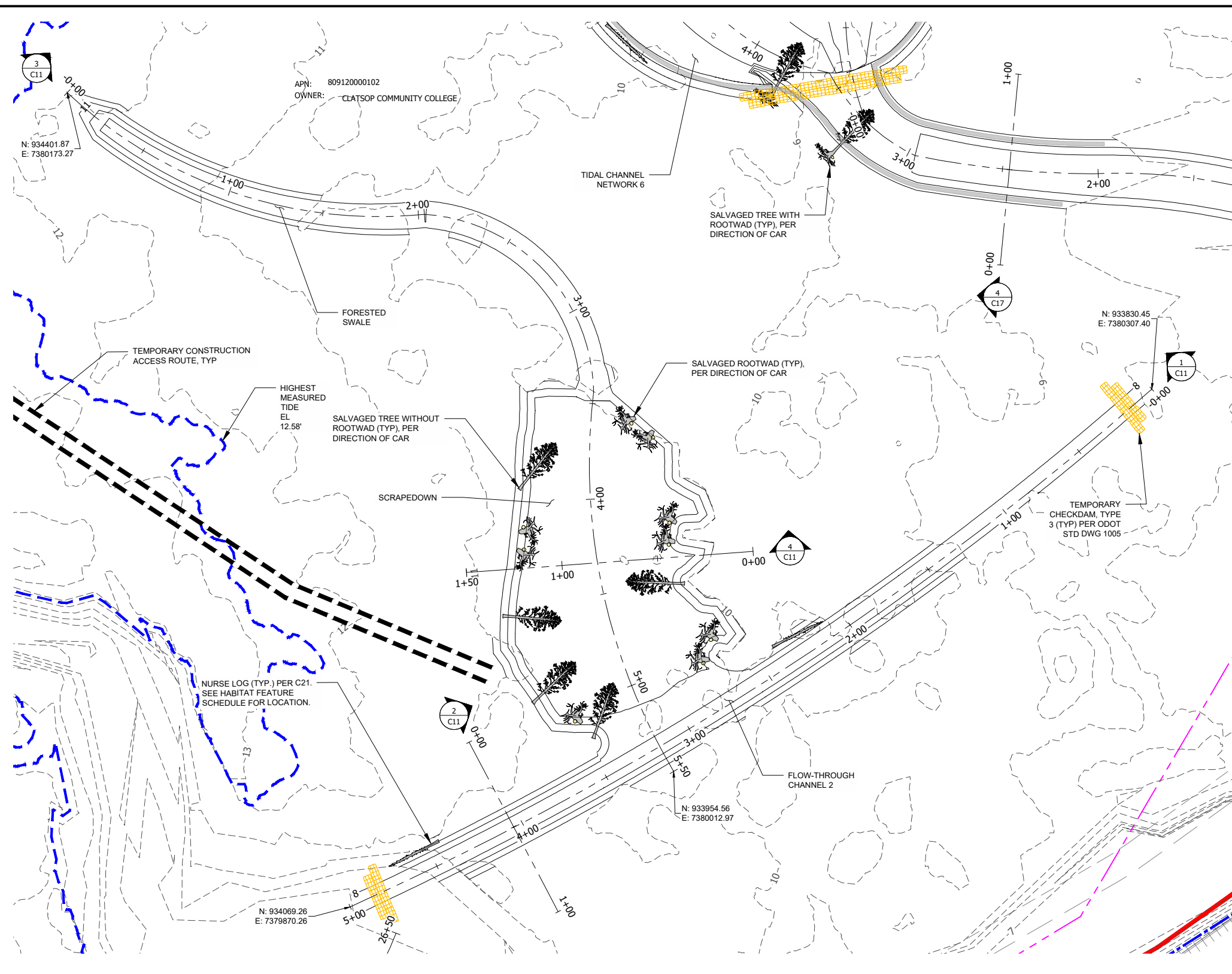
PROJECT NO.
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SOUTH TONGUE POINT RESTORATION PROJECT
FLOW-THROUGH CHANNEL 1 - PROFILES AND SECTION

DRAWING NO.
C09
SHEET NO.
14
OF
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FILE: c:\Users\rvaniloren\Documents\CAD\Sheet\C10 FLOW-THROUGH CHANNEL 2 - PLAN.dwg USER: rvaniloren DATE/TIME: 2/22/2023 3:27 PM



1 FLOW-THROUGH CHANNEL 2 - PLAN
Scale: 1:30



GENERAL NOTES

1. CONTRACTOR SHALL LIMIT EARTHWORK TO PERMANENT AND TEMPORARY FEATURES SHOWN ON THE PLANS AND PER DIRECTION OF CAR.
2. DISTURBANCE OUTSIDE THE WORK SHOWN SHALL BE MINIMIZED.
3. SALVAGE AND STOCKPILE WOODY VEGETATION, AND MIXED MASTICATED/MULCHED VEGETATION AND TOPSOIL REMOVED DURING CLEARING PER SPECS AND DIRECTION OF CAR.
4. ESTABLISH PLANTING ZONES FOLLOWING APPROVAL OF CAR AND ENGINEER OF FG.
5. REUSE SALVAGED WOODY VEGETATION IN HABITAT FEATURES PER C21, SPECS, AND DIRECTION OF CAR.
6. REUSE MIXED MASTICATED/MULCHED VEGETATION AND TOPSOIL PER C21 AND C22 TO PROVIDE A SITE GENERATED SOIL AMENDMENT.

HABITAT FEATURE SUMMARY

SITE	TYPE	NORTHING	EASTING	KEY ELEV
FLOW-THROUGH CHANNEL 2	NL	933933.9	7380105	10
FLOW-THROUGH CHANNEL 2	NL	934050.9	7379914	9.99

CUT AND FILL SUMMARY

SITE	CUT (CU YD)	FILL (CU YD)
FLOW-THROUGH CHANNEL 2	540	0
SCRAPEDOWN	1,440	0
FORESTED SWALE	370	0
FILL AREA 1*	0	37,930
FILL AREA 2*	0	10,570
TOTAL	2,350	48,500

* SITES LOCATED ON C18 AND C19

HEALTHY SOIL PREPARATION SUMMARY

SITE	MASTICATION (AC)	MASTICATED VEGETATION/SOIL PLACEMENT (AC)
FLOW-THROUGH CHANNEL 2, SCRAPEDOWN, AND FORESTED SWALE	0.81	0.34

NO.	DATE	DESCRIPTION	BY
1	FEB 22, 2023	ISSUED FOR CONSTRUCTION	RWK

KILGREN WATER RESOURCES
3365 EAST AMAZON DRIVE, SUITE A
EUGENE, OR 97405
PHONE: 971-409-4023



COLUMBIA RIVER ESTUARY STUDY TASKFORCE (CREST)
818 COMMERCIAL STREET, SUITE 203
ASTORIA, OR 97103
PHONE: 503-325-0435

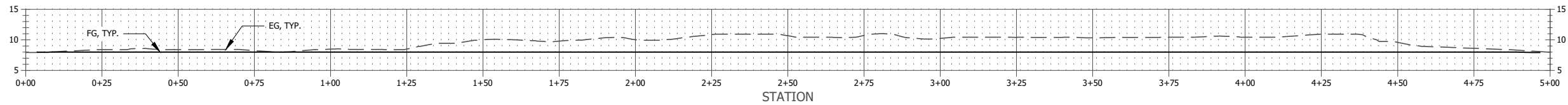


PROJECT NO.
5.2022.0001.1
DESIGNED BY
RWK
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RWK

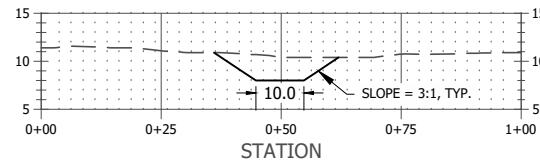
SOUTH TONGUE POINT RESTORATION PROJECT
FLOW-THROUGH CHANNEL 2 - PLAN

DRAWING NO.
C10
SHEET NO.
15
OF
30

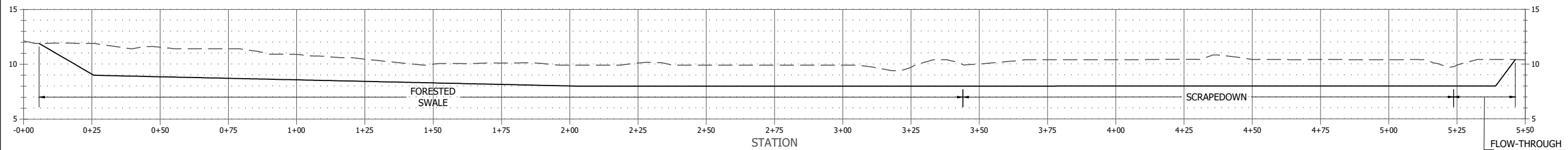




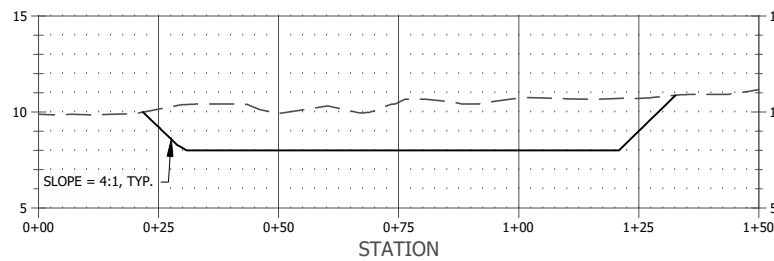
1 FLOW-THROUGH CHANNEL 2 - PROFILE
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2 FLOW-THROUGH CHANNEL 2 - SECTION
Scale: HOZ: 1:20 VERT: 1:5



3 FORESTED SWALE AND SCRAPEDOWN - PROFILE
Scale: HOZ: 1:20 VERT: 1:5



4 SCRAPEDOWN - SECTION
Scale: HOZ: 1:20 VERT: 1:5

GENERAL NOTES

- SECTIONS SHOW PROPOSED GRADE. SEE PLAN AND DETAIL SHEETS FOR PLANTING AND HABITAT FEATURES TO BE INCORPORATED.

NO.	DATE	DESCRIPTION	BY
1	FEB 22, 2023	ISSUED FOR CONSTRUCTION	RWK

KILGREN WATER RESOURCES
3365 EAST AMAZON DRIVE, SUITE A
EUGENE, OR 97405
PHONE: 971-409-4023



COLUMBIA RIVER ESTUARY STUDY TASKFORCE (CREST)
818 COMMERCIAL STREET, SUITE 203
ASTORIA, OR 97103
PHONE: 503-325-0435



PROJECT NO.
5.2022.0001.1
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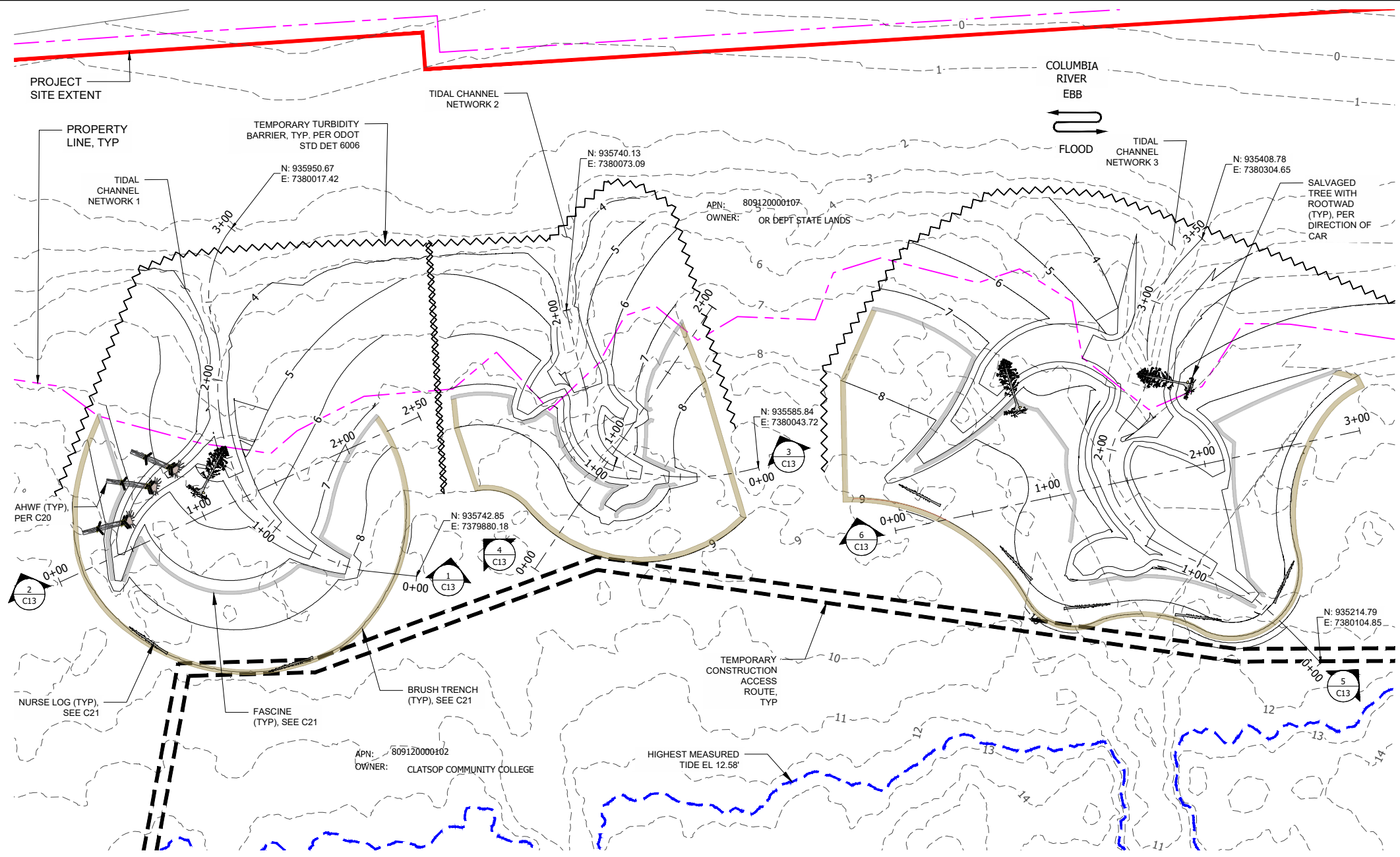
SOUTH TONGUE POINT RESTORATION PROJECT
FLOW-THROUGH CHANNEL 2 - PROFILES AND SECTIONS

DRAWING NO.
C11
SHEET NO.
16
OF
30



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GENERAL NOTES

1. CONTRACTOR SHALL LIMIT EARTHWORK TO PERMANENT AND TEMPORARY FEATURES SHOWN ON THE PLANS AND PER DIRECTION OF CAR.
2. DISTURBANCE OUTSIDE THE WORK SHOWN SHALL BE MINIMIZED.
3. SALVAGE AND STOCKPILE WOODY VEGETATION, AND MIXED MASTICATED/MULCHED VEGETATION AND TOPSOIL REMOVED DURING CLEARING PER SPECS AND DIRECTION OF CAR.
4. ESTABLISH PLANTING ZONES FOLLOWING APPROVAL OF CAR AND ENGINEER OF FG.
5. REUSE SALVAGED WOODY VEGETATION IN HABITAT FEATURES PER C21, SPECS, AND DIRECTION OF CAR.
6. REUSE MIXED MASTICATED/MULCHED VEGETATION AND TOPSOIL PER C21 AND C22 TO PROVIDE A SITE GENERATED SOIL AMENDMENT. NO MIXED MASTICATED/MULCHED VEGETATION AND TOPSOIL TO BE PLACED AT TCN 2 AND TCN 3.

1 TCN 1, 2, AND 3 - PLAN
Scale: 1:40

CUT AND FILL SUMMARY		
SITE	CUT (CU YD)	FILL (CU YD)
TIDAL CHANNEL NETWORK 1	2,240	0
TIDAL CHANNEL NETWORK 2	1,100	0
TIDAL CHANNEL NETWORK 3	3,300	0
FILL AREA 1*	0	37,930
FILL AREA 2*	0	10,570
TOTAL	6,640	48,500

* SITES LOCATED ON C18 AND C19

HEALTHY SOIL PREPARATION SUMMARY		
SITE	MASTICATION (AC)	MASTICATED VEGETATION/SOIL PLACEMENT (AC)
TIDAL CHANNEL NETWORK 1	0.72	0.57
TIDAL CHANNEL NETWORK 2	1.54	0*
TIDAL CHANNEL NETWORK 3	2.10	0*

* NO MASTICATED/MULCHED VEGETATION AND SOIL MIX PLACEMENT, SEE NOTES

HABITAT FEATURE SCHEDULE				
SITE	TYPE	NORTHING	EASTING	KEY ELEV
TIDAL CHANNEL NETWORK 1	AWHF	935923.8	7379820	6
TIDAL CHANNEL NETWORK 1	AWHF	935921.6	7379848	5.03
TIDAL CHANNEL NETWORK 1	AWHF	935915.4	7379866	4.8
TIDAL CHANNEL NETWORK 1	SWT	935887.9	7379871	5.01
TIDAL CHANNEL NETWORK 1	NL	935868.4	7379763	8.81
TIDAL CHANNEL NETWORK 1	NL	935783.2	7379796	8.81
TIDAL CHANNEL NETWORK 3	SWT	935381	7380217	5.27
TIDAL CHANNEL NETWORK 3	SWT	935465.7	7380161	6.92
TIDAL CHANNEL NETWORK 3	NL	935483.5	7380077	8.76
TIDAL CHANNEL NETWORK 3	NL	935410	7380067	8
TIDAL CHANNEL NETWORK 3	NL	935365.8	7380063	8
TIDAL CHANNEL NETWORK 3	NL	935301.1	7380091	8.49
TIDAL CHANNEL NETWORK 3	NL	935259.1	7380134	8

NO.	DATE	DESCRIPTION	BY
1	FEB 22, 2023	ISSUED FOR CONSTRUCTION	RWK

KILGREN WATER RESOURCES
3365 EAST AMAZON DRIVE, SUITE A
EUGENE, OR 97405
PHONE: 971-409-4023



COLUMBIA RIVER ESTUARY STUDY TASKFORCE (CREST)
818 COMMERCIAL STREET, SUITE 203
ASTORIA, OR 97103
PHONE: 503-325-0435



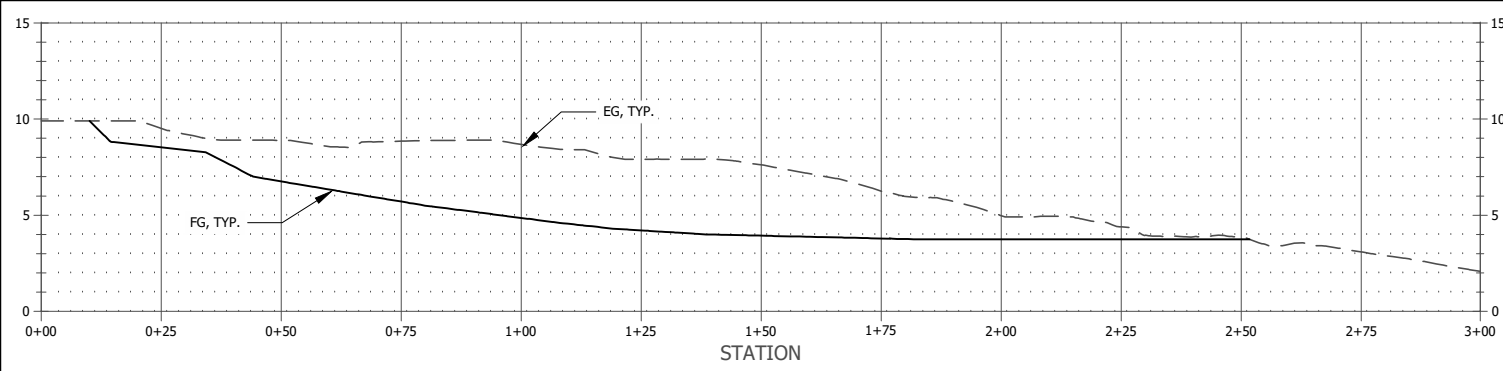
PROJECT NO.
5.2022.0001.1
DESIGNED BY
RWK
DRAWN BY
RWK

SOUTH TONGUE POINT RESTORATION PROJECT
TCN 1, 2, AND 3 - PLAN

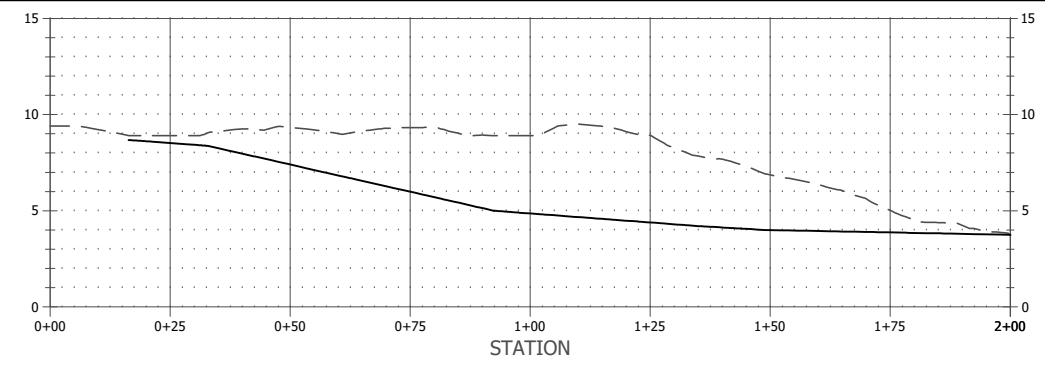
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C12
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OF
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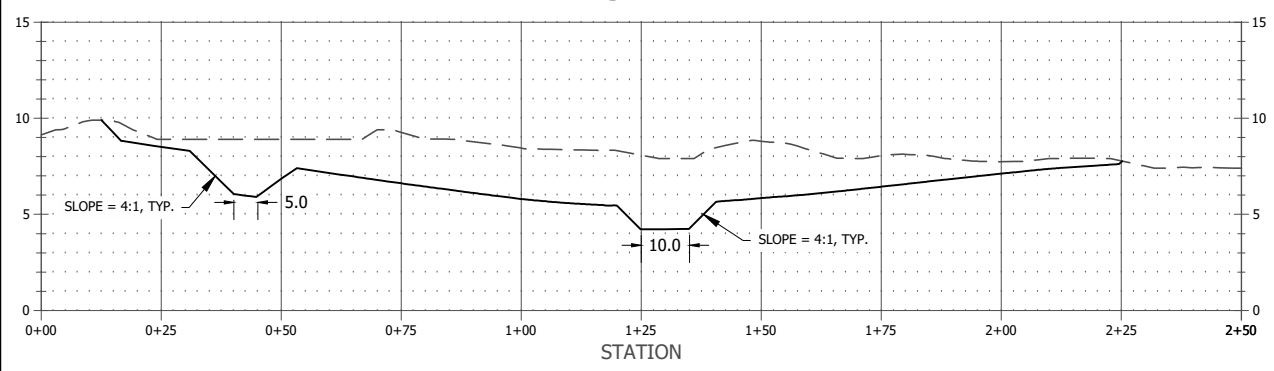
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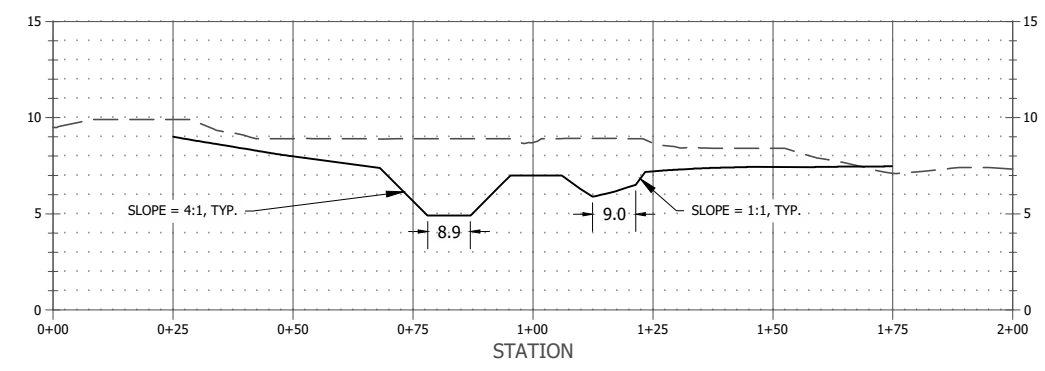
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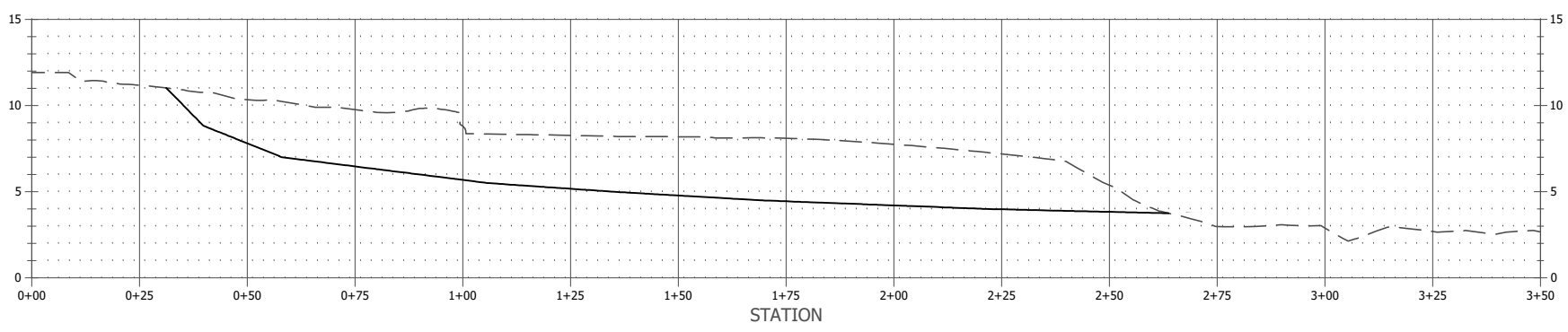
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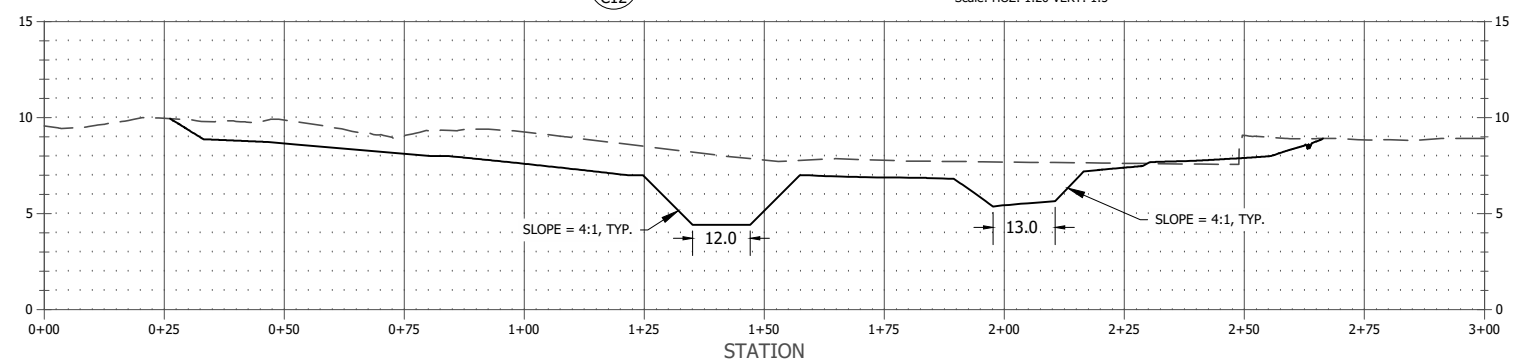
2 TIDAL CHANNEL NETWORK 1 - SECTION
Scale: HOZ: 1:20 VERT: 1:5



4 TIDAL CHANNEL NETWORK 2 - SECTION
Scale: HOZ: 1:20 VERT: 1:5



5 TIDAL CHANNEL NETWORK 3 - PROFILE
Scale: HOZ: 1:20 VERT: 1:5



6 TIDAL CHANNEL NETWORK 3 - SECTION
Scale: HOZ: 1:20 VERT: 1:5

GENERAL NOTES

- SECTIONS SHOW PROPOSED GRADE. SEE PLAN AND DETAIL SHEETS FOR PLANTING AND HABITAT FEATURES TO BE INCORPORATED.

NO.	DATE	DESCRIPTION	BY
1	FEB 22, 2023	ISSUED FOR CONSTRUCTION	RWK

KILGREN WATER RESOURCES
3365 EAST AMAZON DRIVE, SUITE A
EUGENE, OR 97405
PHONE: 971-409-4023



COLUMBIA RIVER ESTUARY STUDY TASKFORCE (CREST)
818 COMMERCIAL STREET, SUITE 203
ASTORIA, OR 97103
PHONE: 503-325-0435

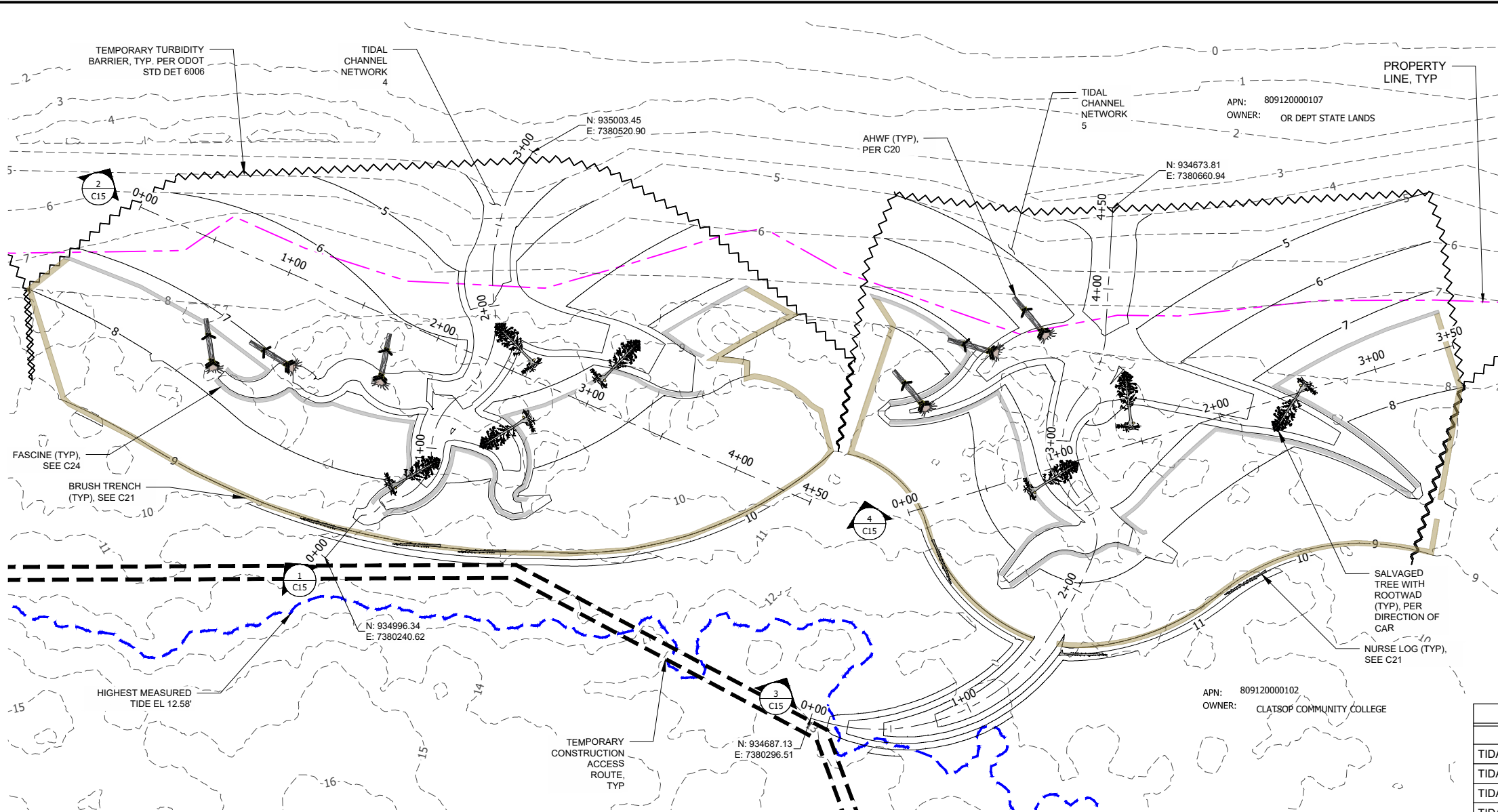


PROJECT NO.
5.2022.0001.1
DESIGNED BY
RWK
DRAWN BY
RWK

SOUTH TONGUE POINT RESTORATION PROJECT
TCN 1 2 AND 3 - PROFILES AND SECTIONS

DRAWING NO.
C13
SHEET NO.
18
OF
30





- GENERAL NOTES**
- CONTRACTOR SHALL LIMIT EARTHWORK TO PERMANENT AND TEMPORARY FEATURES SHOWN ON THE PLANS AND PER DIRECTION OF CAR.
 - DISTURBANCE OUTSIDE THE WORK SHOWN SHALL BE MINIMIZED.
 - SALVAGE AND STOCKPILE WOODY VEGETATION, AND MIXED MASTICATED/MULCHED VEGETATION AND TOPSOIL REMOVED DURING CLEARING PER SPECS AND DIRECTION OF CAR.
 - ESTABLISH PLANTING ZONES FOLLOWING APPROVAL OF CAR AND ENGINEER OF FG.
 - REUSE SALVAGED WOODY VEGETATION IN HABITAT FEATURES PER C21, SPECS, AND DIRECTION OF CAR.
 - REUSE MIXED MASTICATED/MULCHED VEGETATION AND TOPSOIL PER C21 AND C22 TO PROVIDE A SITE GENERATED SOIL AMENDMENT.

1 TCN 4 AND 5 - PLAN
Scale: 1:40



CUT AND FILL SUMMARY		
SITE	CUT (CU YD)	FILL (CU YD)
TIDAL CHANNEL NETWORK 4	5,460	0
TIDAL CHANNEL NETWORK 5	5,260	0
FILL AREA 1*	0	37,930
FILL AREA 2*	0	10570
TOTAL	10,350	47,580

* SITES LOCATED ON C18 AND C19


HEALTHY SOIL PREPARATION SUMMARY		
SITE	MASTICATION (AC)	MASTICATED VEGETATION/SOIL PLACEMENT (AC)
TIDAL CHANNEL NETWORK 4	1.94	1.58
TIDAL CHANNEL NETWORK 5	3.65	1.29

HABITAT FEATURE SCHEDULE				
SITE	TYPE	NORTHING	EASTING	KEY ELEV
TIDAL CHANNEL NETWORK 4	AWHF	935116.8	7380316	7.57
TIDAL CHANNEL NETWORK 4	AWHF	935076.6	7380334	7
TIDAL CHANNEL NETWORK 4	AWHF	935020.5	7380358	6
TIDAL CHANNEL NETWORK 4	SWT	934896.8	7380427	7.08
TIDAL CHANNEL NETWORK 4	SWT	934975.8	7380307	7.01
TIDAL CHANNEL NETWORK 4	SWT	934950.1	7380410	6.31
TIDAL CHANNEL NETWORK 4	SWT	934933.3	7380367	7.05
TIDAL CHANNEL NETWORK 4	NL	935002.6	7380259	9.11
TIDAL CHANNEL NETWORK 4	NL	934946.6	7380277	9
TIDAL CHANNEL NETWORK 4	NL	934909.7	7380293	9
TIDAL CHANNEL NETWORK 5	AWHF	934722	7380500	7
TIDAL CHANNEL NETWORK 5	AWHF	934700.8	7380547	6
TIDAL CHANNEL NETWORK 5	AWHF	934678.8	7380575	5
TIDAL CHANNEL NETWORK 5	SWT	934629.5	7380492	7
TIDAL CHANNEL NETWORK 5	SWT	934605.4	7380557	6.09
TIDAL CHANNEL NETWORK 5	SWT	934519.3	7380612	7.1
TIDAL CHANNEL NETWORK 5	NL	934666.1	7380423	9
TIDAL CHANNEL NETWORK 5	NL	934562.8	7380409	10
TIDAL CHANNEL NETWORK 5	NL	934489.7	7380501	10

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NO.	DATE	DESCRIPTION	BY
1	FEB 22, 2023	ISSUED FOR CONSTRUCTION	RWK

KILGREN WATER RESOURCES
3365 EAST AMAZON DRIVE, SUITE A
EUGENE, OR 97405
PHONE: 971-409-4023


COLUMBIA RIVER ESTUARY STUDY TASKFORCE (CREST)
818 COMMERCIAL STREET, SUITE 203
ASTORIA, OR 97103
PHONE: 503-325-0435


REGISTERED PROFESSIONAL ENGINEER
83634PE
DIGITALLY SIGNED
OREGON
June 2, 2010
RYAN WESLEY KILGREN
RENEWS: 6/30/2023

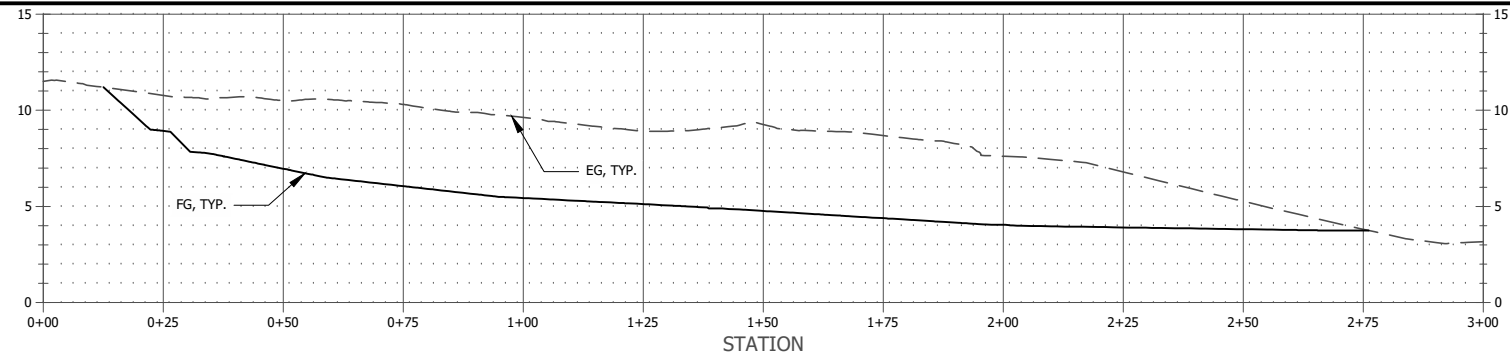
PROJECT NO.
5.2022.0001.1
DESIGNED BY
RWK
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RWK

SOUTH TONGUE POINT RESTORATION PROJECT

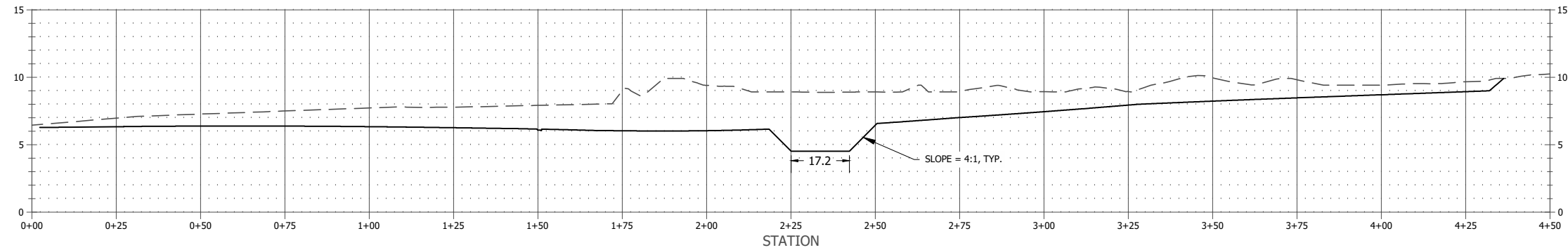
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C14
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OF
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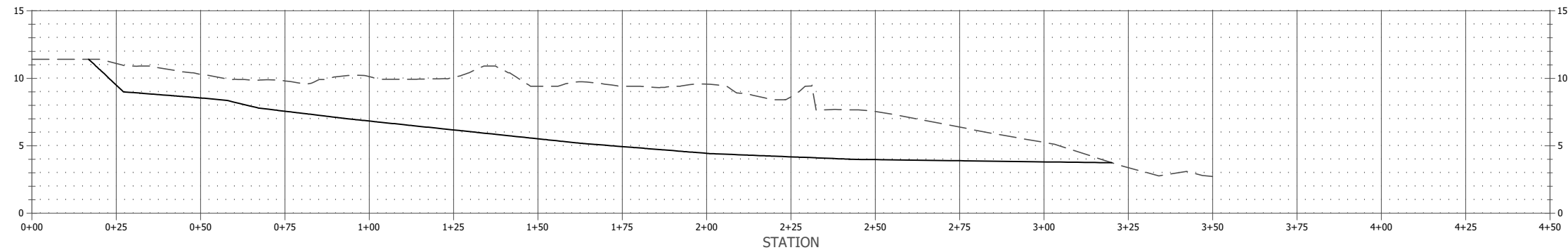
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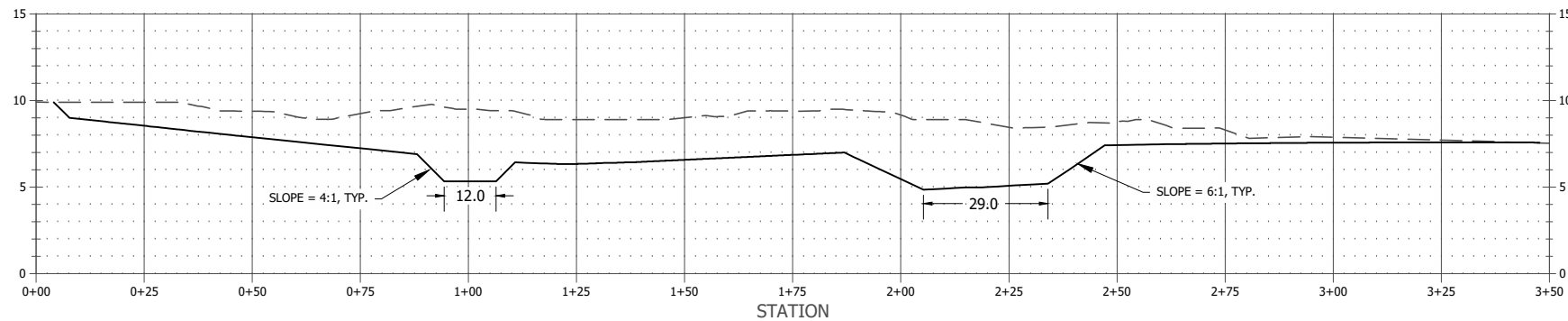
1
C14
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2
C14
TIDAL CHANNEL NETWORK 4 - SECTION
Scale: HOZ: 1:20 VERT: 1:5



3
C14
TIDAL CHANNEL NETWORK 5 - PROFILE
Scale: HOZ: 1:20 VERT: 1:5



4
C14
TIDAL CHANNEL NETWORK 5 - SECTION
Scale: HOZ: 1:20 VERT: 1:5

GENERAL NOTES

- SECTIONS SHOW PROPOSED GRADE. SEE PLAN AND DETAIL SHEETS FOR PLANTING AND HABITAT FEATURES TO BE INCORPORATED.

NO.	DATE	DESCRIPTION	BY
1	FEB 22, 2023	ISSUED FOR CONSTRUCTION	RWK

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3365 EAST AMAZON DRIVE, SUITE A
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PHONE: 971-409-4023



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818 COMMERCIAL STREET, SUITE 203
ASTORIA, OR 97103
PHONE: 503-325-0435



PROJECT NO.
5.2022.0001.1

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SOUTH TONGUE POINT RESTORATION PROJECT

TCN 4 AND 5 - PROFILES AND SECTIONS

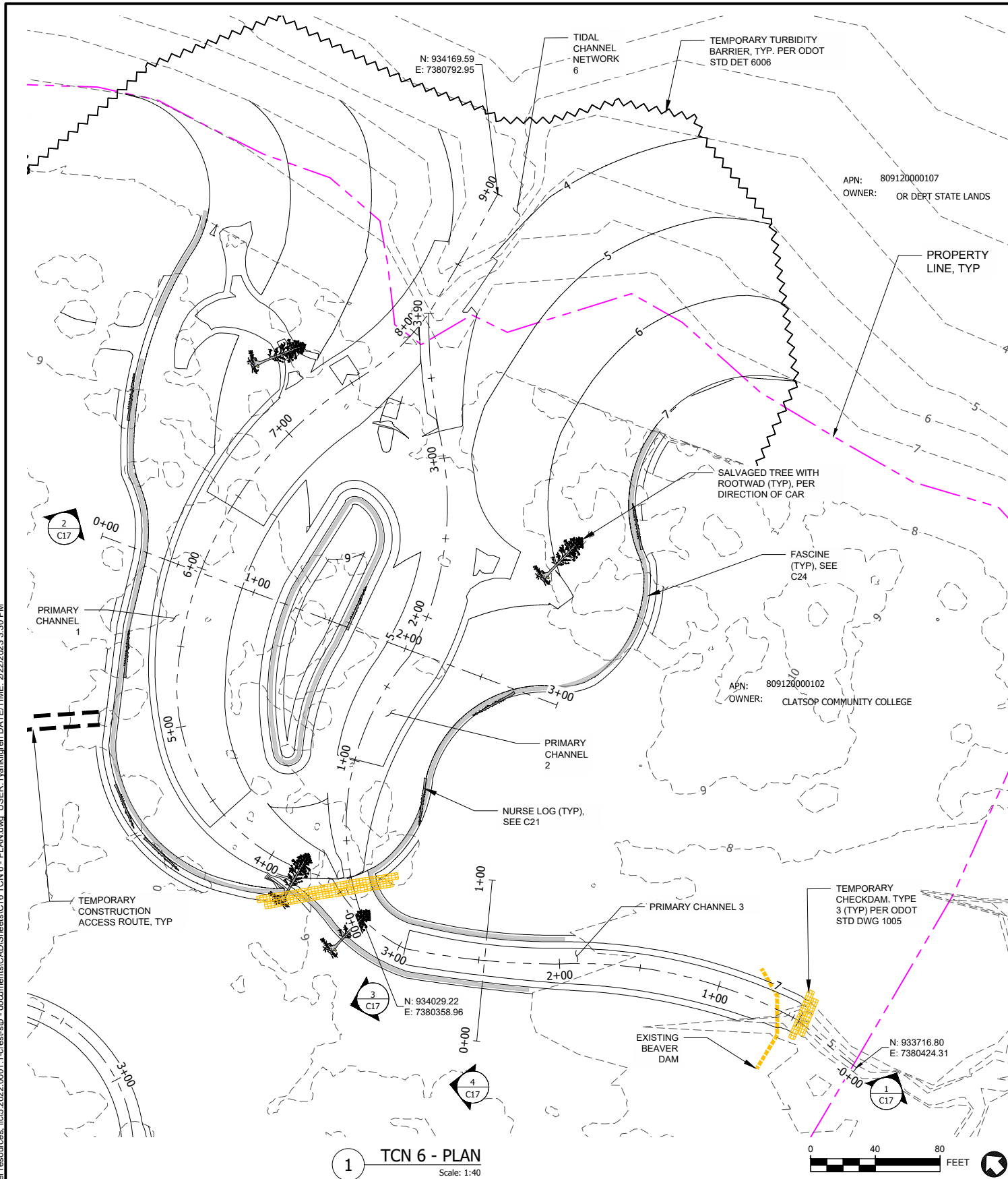
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C15

SHEET NO.
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1 TCN 6 - PLAN
Scale: 1:40



GENERAL NOTES

1. CONTRACTOR SHALL LIMIT EARTHWORK TO PERMANENT AND TEMPORARY FEATURES SHOWN ON THE PLANS AND PER DIRECTION OF CAR.
2. DISTURBANCE OUTSIDE THE WORK SHOWN SHALL BE MINIMIZED.
3. SALVAGE AND STOCKPILE WOODY VEGETATION, AND MIXED MASTICATED/MULCHED VEGETATION AND TOPSOIL REMOVED DURING CLEARING PER SPECS AND DIRECTION OF CAR.
4. ESTABLISH PLANTING ZONES FOLLOWING APPROVAL OF CAR AND ENGINEER OF FG.
5. REUSE SALVAGED WOODY VEGETATION IN HABITAT FEATURES PER C21, SPECS, AND DIRECTION OF CAR.
6. REUSE MIXED MASTICATED/MULCHED VEGETATION AND TOPSOIL PER C21 AND C22 TO PROVIDE A SITE GENERATED SOIL AMENDMENT.

CUT AND FILL SUMMARY		
SITE	CUT (CU YD)	FILL (CU YD)
TIDAL CHANNEL NETWORK 6	14,380	0
FILL AREA 1*	0	37,930
FILL AREA 2*	0	10570
TOTAL	14,380	48,500

* SITES LOCATED ON C18 AND C19

HEALTHY SOIL PREPARATION SUMMARY		
SITE	MASTICATION (AC)	MASTICATED VEGETATION/SOIL PLACEMENT (AC)
TIDAL CHANNEL NETWORK 6	0.99	1.44

HABITAT FEATURES SCHEDULE				
SITE	TYPE	NORTHING	EASTING	KEY ELEV
TIDAL CHANNEL NETWORK 6	SWT	934244.9	7380636	5.54
TIDAL CHANNEL NETWORK 6	SWT	934077.9	7380355	8.25
TIDAL CHANNEL NETWORK 6	SWT	934034	7380343	7.74
TIDAL CHANNEL NETWORK 6	SWT	934028.4	7380608	6
TIDAL CHANNEL NETWORK 6	NL	934307.2	7380570	8
TIDAL CHANNEL NETWORK 6	NL	934233.7	7380429	7
TIDAL CHANNEL NETWORK 6	NL	934195.4	7380353	8
TIDAL CHANNEL NETWORK 6	NL	934160.7	7380336	8
TIDAL CHANNEL NETWORK 6	NL	934124.3	7380524	7
TIDAL CHANNEL NETWORK 6	NL	934032.5	7380445	7
TIDAL CHANNEL NETWORK 6	NL	934019	7380518	8
TIDAL CHANNEL NETWORK 6	NL	933993.5	7380651	8

NO.	DATE	DESCRIPTION	BY
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KILGREN WATER RESOURCES
3365 EAST AMAZON DRIVE, SUITE A
EUGENE, OR 97405
PHONE: 971-409-4023



COLUMBIA RIVER ESTUARY STUDY TASKFORCE (CREST)
818 COMMERCIAL STREET, SUITE 203
ASTORIA, OR 97103
PHONE: 503-325-0435



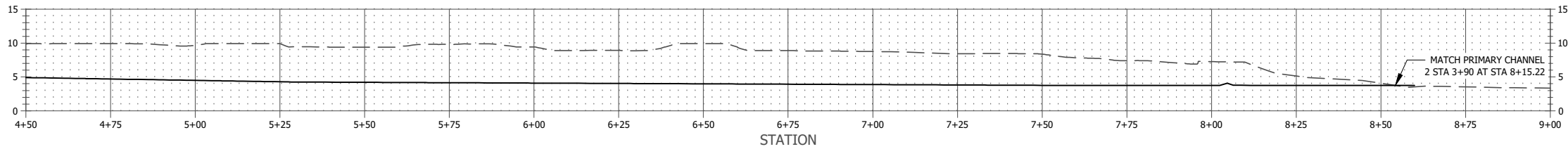
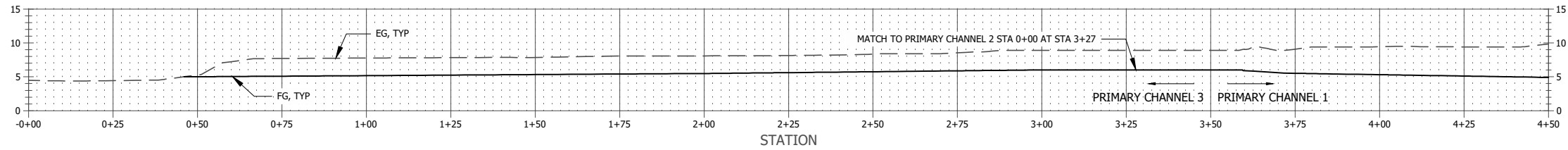
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RWK
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SOUTH TONGUE POINT RESTORATION PROJECT
TCN 6 - PLAN

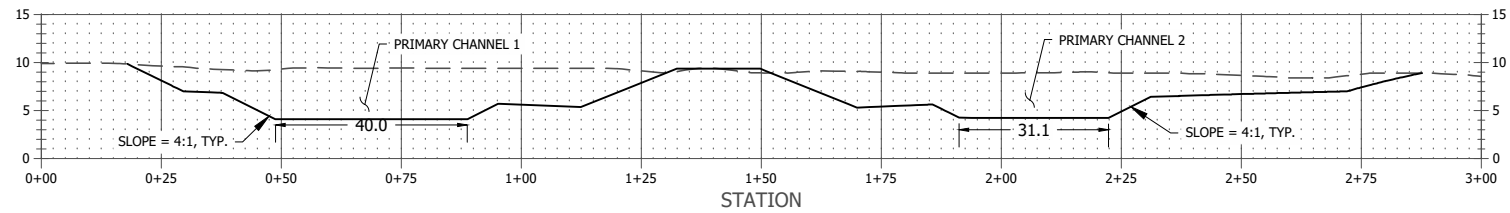
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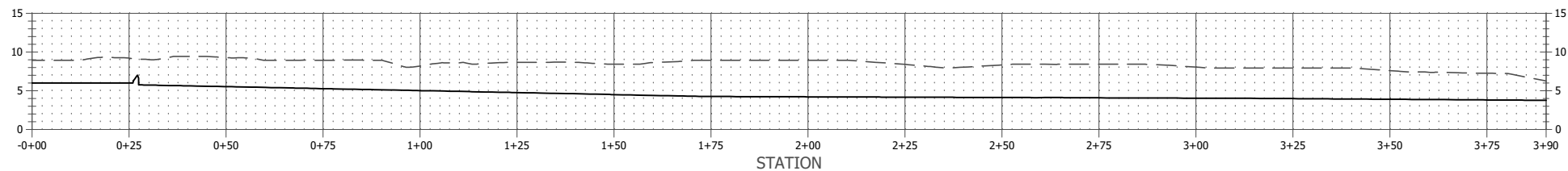
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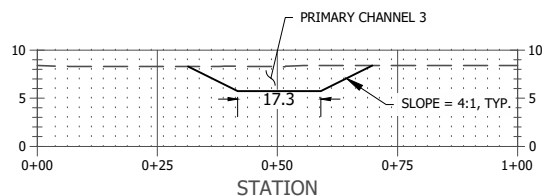
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2 TIDAL CHANNEL NETWORK 6 - PRIMARY CHANNELS 1 AND 2 - SECTION
Scale: HOZ: 1:20 VERT: 1:5



3 TIDAL CHANNEL NETWORK 6 - PRIMARY CHANNEL 2 - PROFILE
Scale: HOZ: 1:20 VERT: 1:5



4 TIDAL CHANNEL NETWORK 6 - PRIMARY CHANNEL 3 - SECTION
Scale: HOZ: 1:20 VERT: 1:5

GENERAL NOTES

- SECTIONS SHOW PROPOSED GRADE. SEE PLAN AND DETAIL SHEETS FOR PLANTING AND HABITAT FEATURES TO BE INCORPORATED.

NO.	DATE	DESCRIPTION	BY
1	FEB 22, 2023	ISSUED FOR CONSTRUCTION	RWK

KILGREN WATER RESOURCES
3365 EAST AMAZON DRIVE, SUITE A
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PHONE: 971-409-4023



COLUMBIA RIVER ESTUARY STUDY TASKFORCE (CREST)
818 COMMERCIAL STREET, SUITE 203
ASTORIA, OR 97103
PHONE: 503-325-0435



PROJECT NO.
5.2022.0001.1

DESIGNED BY
RWK

DRAWN BY
RWK

SOUTH TONGUE POINT RESTORATION PROJECT

TCN 6 - PROFILES AND SECTIONS

DRAWING NO.

C17

SHEET NO.

22

OF

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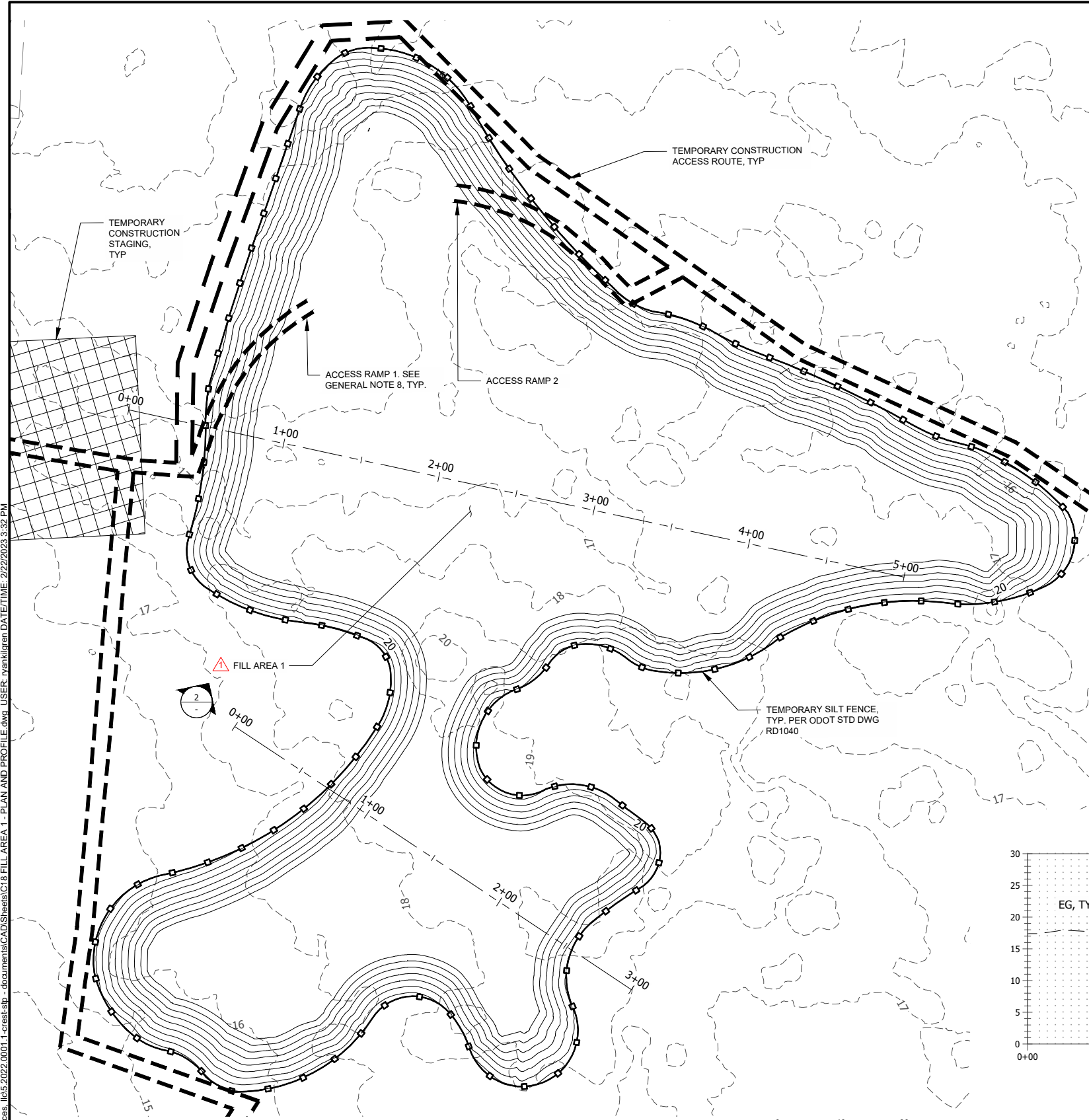


GENERAL NOTES

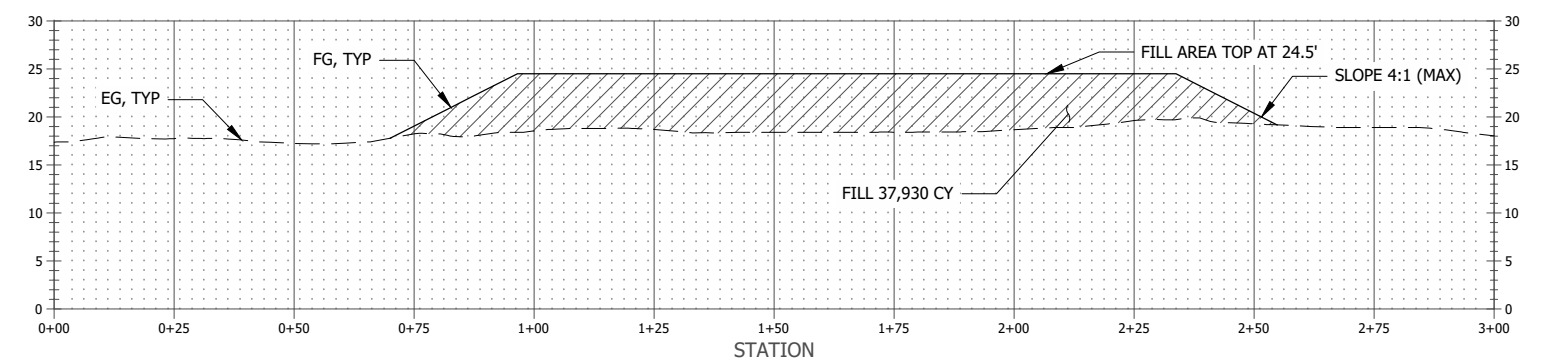
1. SOURCE AND HAUL FILL AREA MATERIALS FROM CORRESPONDING CUT MATERIAL SOURCE LOCATIONS PER C05 AND AS DIRECTED BY CAR.
2. CONTRACTOR SHALL LIMIT EARTHWORK TO PERMANENT AND TEMPORARY FEATURES SHOWN ON THE PLANS AND PER DIRECTION OF CAR.
3. DISTURBANCE OUTSIDE THE WORK SHOWN SHALL BE MINIMIZED.
4. VEGETATION AT FILL AREA 1 HAS BEEN CLEARED DURING A PREVIOUS PROJECT CONSTRUCTION PHASE DURING 2022. CONTRACTOR TO VERIFY FILL AREA SITE DIMENSIONS AND COORDINATE WITH CAR PRIOR TO PLACEMENT OF FILL ON CAR IDENTIFIED TREES FOR PROTECTION WITHIN THE CLEARED FOOTPRINT AND THE ABILITY TO PLACE THE AMOUNT OF FILL AS IDENTIFIED HEREON.
5. ESTABLISH PLANTING ZONES FOLLOWING APPROVAL OF CAR AND ENGINEER OF FG.
6. NO MIXED MASTICATED/MULCHED VEGETATION AND TOPSOIL TO BE PLACED AT FILL AREA 1.
7. FILL AREA 1 ACCESS RAMPS 1 AND 2 SHALL HAVE TREAD WIDTHS OF 8' MIN, TRAVEL DIRECTION SLOPES OF 12:1 MAX, AND OUTSLOPES AT 4:1 MAX TO MATCH FILL AREA SLOPES.

CUT AND FILL SUMMARY		
SITE	CUT (CU YD)	FILL (CU YD)
FILL AREA 1	0	37,930
FILL AREA 2*	0	10,570
TOTAL	0	48,500

* SITE LOCATED ON C19



1 FILL AREA 1 - PLAN
Scale: 1:40



2 FILL AREA 1 - PROFILE
SCALE: HOZ: 1" = 20' VERT: 1" = 10'

FILE: c:\Users\rvaniloren\Documents\CAD\Sheet\C18 FILL AREA 1 - PLAN AND PROFILE.dwg USER: rvaniloren DATE/TIME: 2/22/2023 3:32 PM

NO.	DATE	DESCRIPTION	BY
1	FEB 22, 2023	ISSUED FOR CONSTRUCTION	RWK

KILGREN WATER RESOURCES
3365 EAST AMAZON DRIVE, SUITE A
EUGENE, OR 97405
PHONE: 971-409-4023



COLUMBIA RIVER ESTUARY STUDY TASKFORCE (CREST)
818 COMMERCIAL STREET, SUITE 203
ASTORIA, OR 97103
PHONE: 503-325-0435



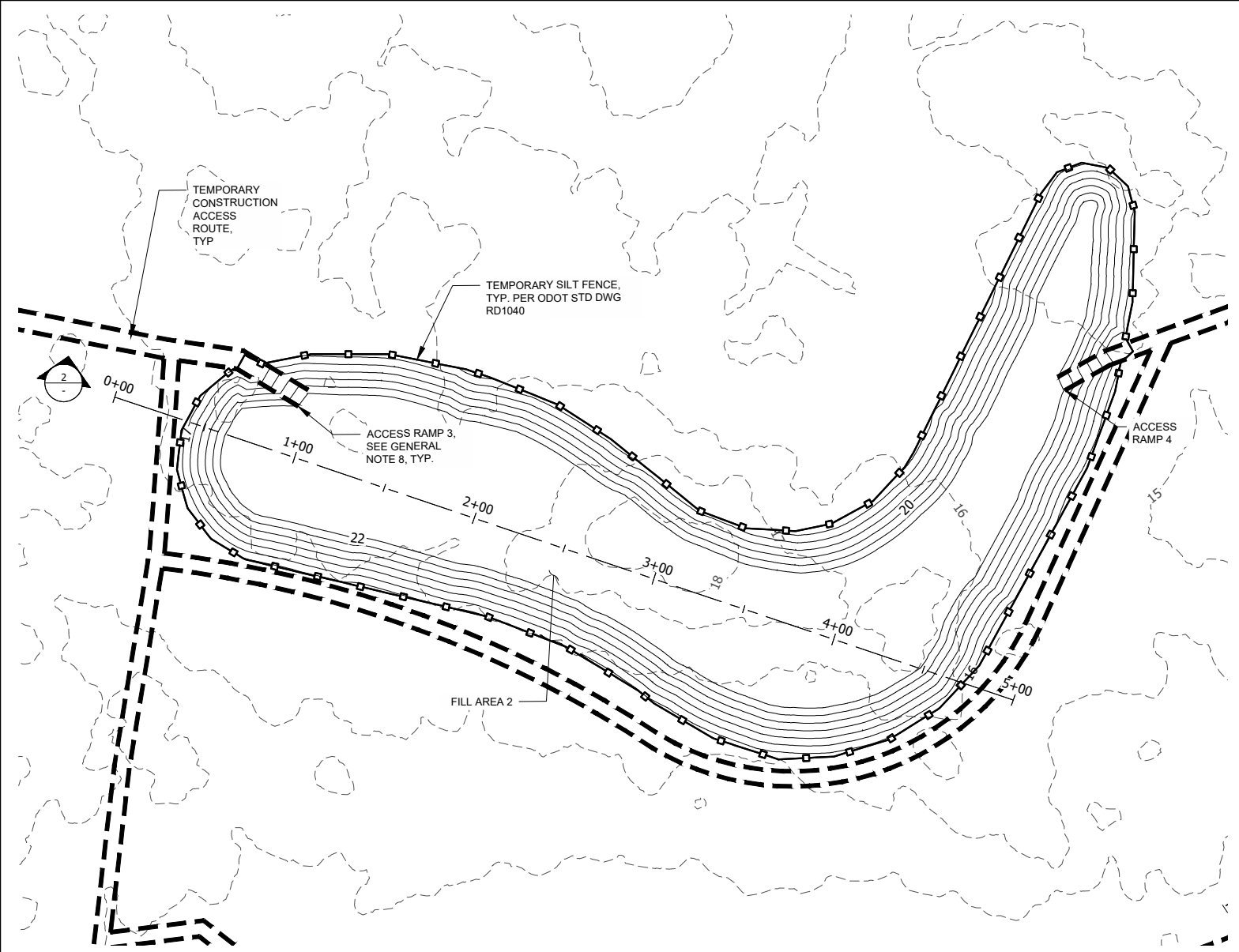
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DESIGNED BY
RWK
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RWK

SOUTH TONGUE POINT RESTORATION PROJECT
FILL AREA 1 - PLAN AND PROFILE

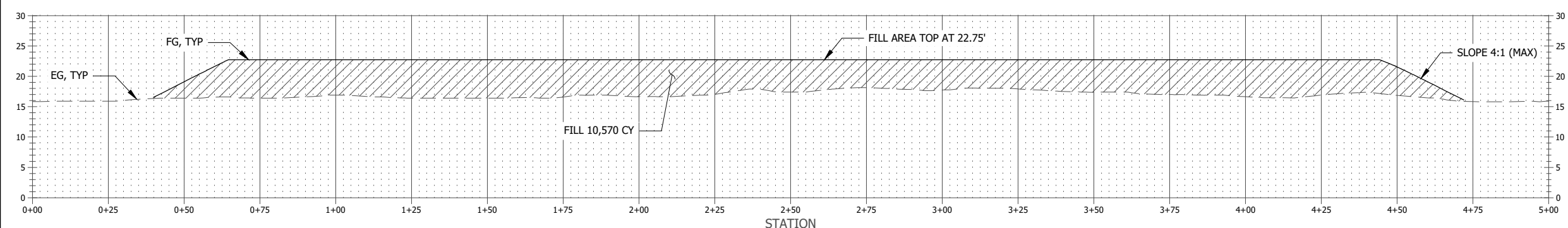
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C18
SHEET NO.
23
OF
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FILE: c:\Users\rvankilgren\Documents\CAD\Sheet\C19\FILL AREA 2 - PLAN AND PROFILE.dwg USER: rvankilgren DATE/TIME: 2/22/2023 3:32 PM



1 FILL AREA 2 - PLAN
Scale: 1:40



2 FILL AREA 2 - PROFILE
SCALE: HORIZ: 1" = 20' VERT: 1" = 10'

- GENERAL NOTES**
1. SOURCE AND HAUL FILL AREA MATERIALS FROM CORRESPONDING CUT MATERIAL SOURCE LOCATIONS PER C05 AND AS DIRECTED BY CAR.
 2. CONTRACTOR SHALL LIMIT EARTHWORK TO PERMANENT AND TEMPORARY FEATURES SHOWN ON THE PLANS AND PER DIRECTION OF CAR.
 3. DISTURBANCE OUTSIDE THE WORK SHOWN SHALL BE MINIMIZED.
 4. VEGETATION AT FILL AREA 2 HAS BEEN CLEARED DURING A PREVIOUS PROJECT CONSTRUCTION PHASE DURING 2022. CONTRACTOR TO VERIFY FILL AREA SITE DIMENSIONS AND COORDINATE WITH CAR PRIOR TO PLACEMENT OF FILL ON CAR IDENTIFIED TREES FOR PROTECTION WITHIN THE CLEARED FOOTPRINT AND THE ABILITY TO PLACE THE AMOUNT OF FILL AS IDENTIFIED HEREON.
 5. ESTABLISH PLANTING ZONES FOLLOWING APPROVAL OF CAR AND ENGINEER OF FG.
 6. NO MIXED MASTICATED/MULCHED VEGETATION AND TOPSOIL TO BE PLACED AT FILL AREA 2.
 7. FILL AREA 1 ACCESS RAMPS 1 AND 2 SHALL HAVE TREAD WIDTHS OF 8' MIN, TRAVEL DIRECTION SLOPES OF 12:1 MAX, AND OUTSLOPES AT 4:1 MAX TO MATCH FILL AREA SLOPES.

CUT AND FILL SUMMARY		
SITE	CUT (CU YD)	FILL (CU YD)
FILL AREA 1*	0	37,930
FILL AREA 2	0	10,570
TOTAL	0	48,500

* SITE LOCATED ON C18

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3365 EAST AMAZON DRIVE, SUITE A
EUGENE, OR 97405
PHONE: 971-409-4023

crest
COLUMBIA RIVER ESTUARY STUDY TASKFORCE
818 COMMERCIAL STREET, SUITE 203
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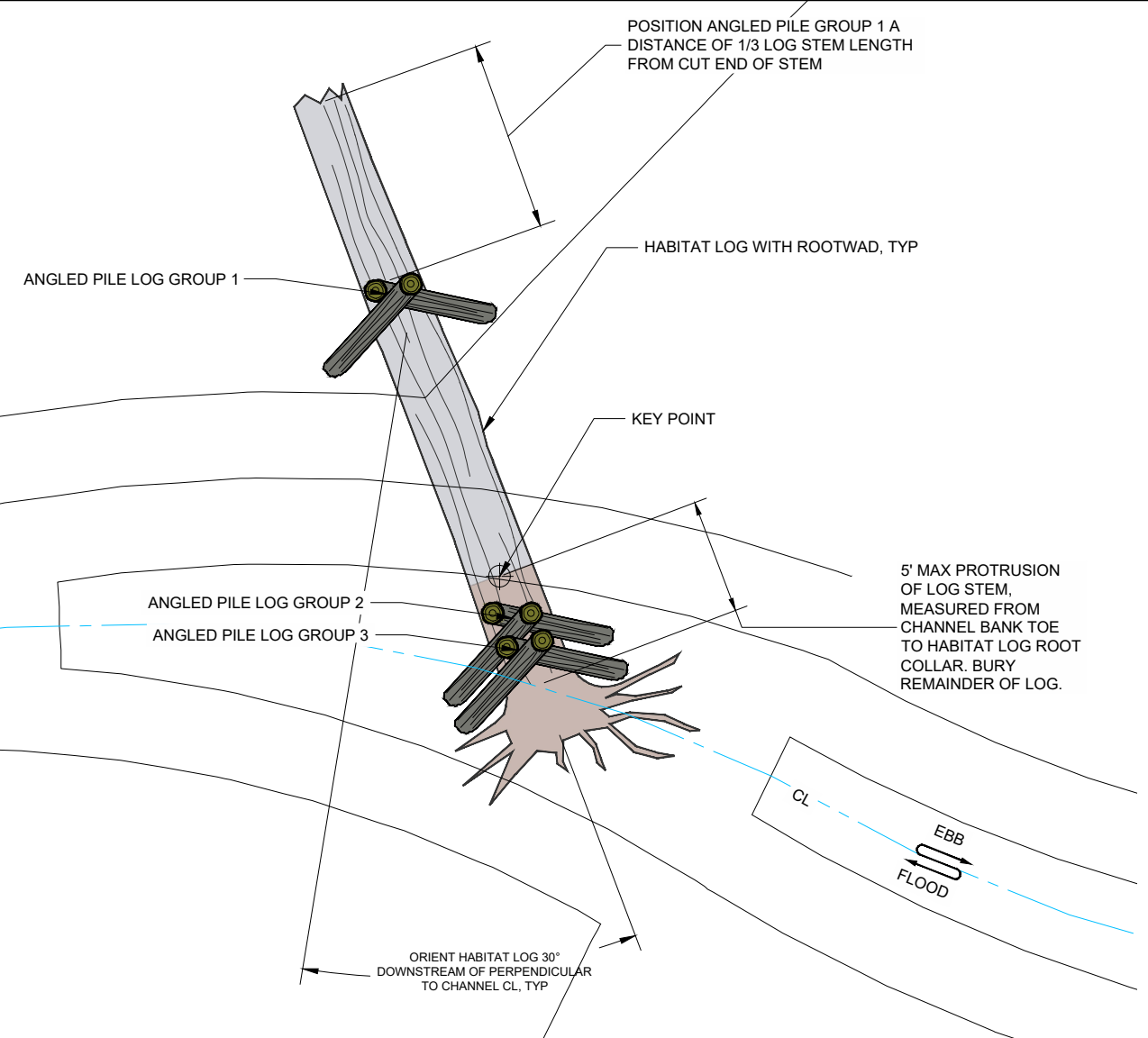
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SOUTH TONGUE POINT RESTORATION PROJECT
FILL AREA 2 - PLAN AND PROFILE

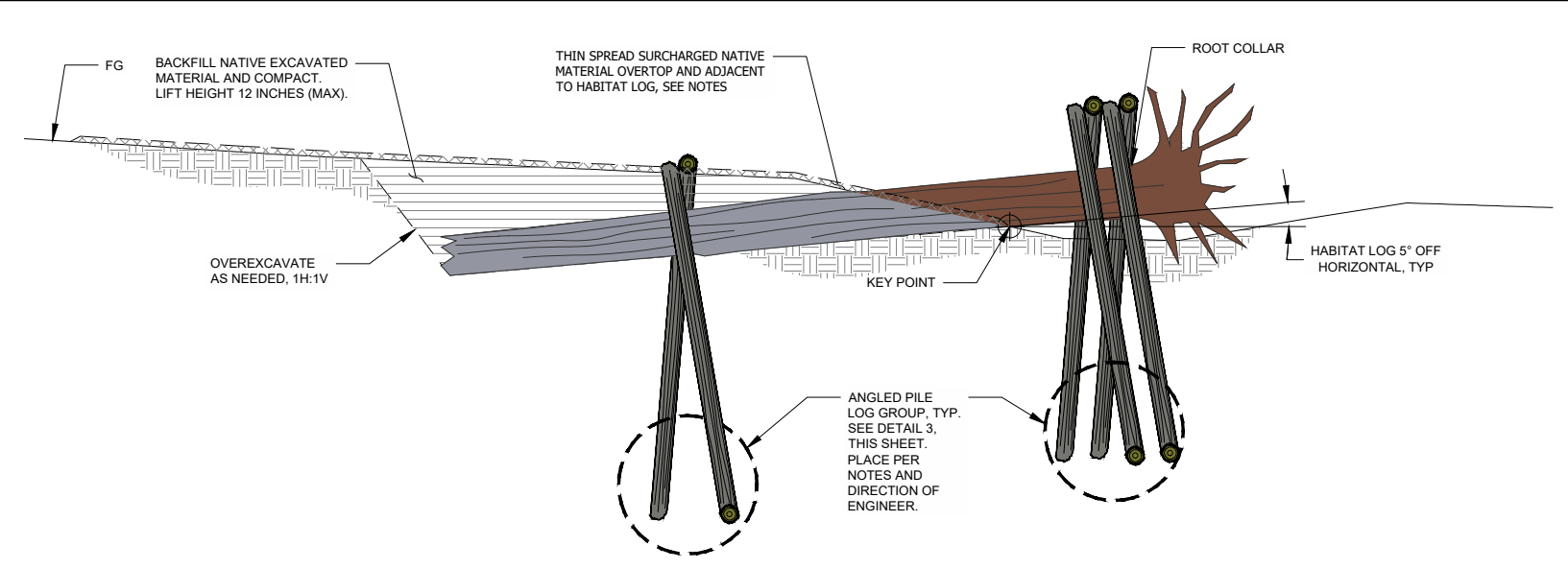
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C19
SHEET NO.
24
OF
30



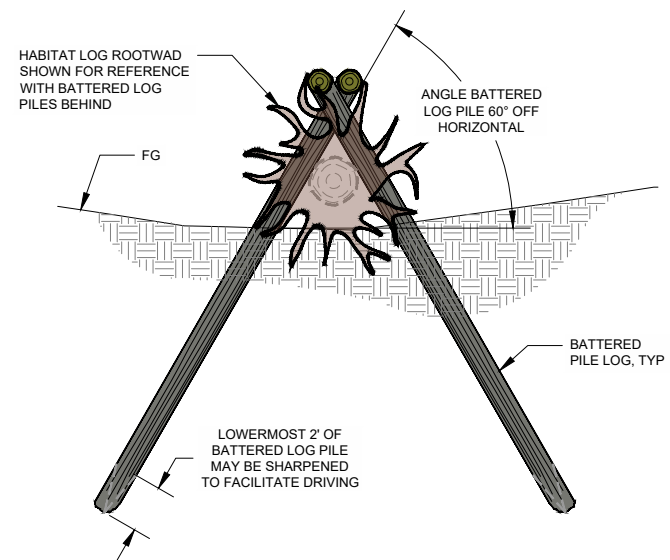
FILE: c:\Users\rvanlinden\Documents\water resources\1105 2022\001 1-crest.sbp - documents\CAD\Sheet\C20 AQUATIC HABITAT FEATURE - TYPE 1 - DETAILS.dwg USER: rvanlinden DATE/TIME: 2/22/2023 3:33 PM



1 AHWF - PLAN VIEW Scale: 1:4



2 AHWF - SECTION VIEW Scale: 1:4



3 AHWF - ANGLED PILE LOG GROUP DETAIL Scale: 1:4

AQUATIC HABITAT WOOD FEATURE (AHWF) CONSTRUCTION NOTES

- HABITAT LOGS SHALL BE SOURCED FROM IMPORTED SITKA SPRUCE.
- THE AHWF SHALL INCLUDE A SINGLE HABITAT LOG WITH ROOTWAD. HABITAT LOGS SHALL MEET THE DIMENSIONS AS SHOWN ON THESE PLANS.
- LOGS WILL BE PLACED AND BACKFILLED WITH NATIVE MATERIAL. LOGS MAY BE PUSHED OR DRIVEN IN PLACE INSTEAD OF BY OVER EXCAVATION AT CONTRACTOR ELECTION. OVER EXCAVATION AND NATIVE BACKFILL QUANTITY ESTIMATE PROVIDED FOR CONTRACTOR INFORMATION, AND IS CONSIDERED INCIDENTAL TO CONSTRUCTION OF AHWF. ADDITIONAL OVER EXCAVATION MUST BE APPROVED BY THE CAR AND WILL ONLY BE USED IN ORDER TO MEET THE DIMENSIONS AND REQUIREMENTS AS SHOWN ON THESE PLANS.
- LOGS WILL BE ORIENTED AND KEYED INTO THE BANK AT THE INDICATED ANGLE AND DEPTH. ROOTWAD ORIENTATION WILL GENERALLY BE AS SHOWN ON THE PLANS AND PER THE DIRECTION OF THE CAR.
- IF CONTRACTOR ELECTS TO OVER EXCAVATE FOR AHWF, THEN NATIVE BACKFILL SHALL BE PLACED AND COMPACTED TO MEET ADJACENT FG AND EG, AS INDICATED ON THE PLANS AND TO REMOVE AIR FILLED VOIDS WITHIN BACKFILL. NO HAUL ASSUMED FOR EXCESS NATIVE BACKFILL. EXCESS NATIVE BACKFILL MAY BE THIN SPREAD (COVER DEPTH NOT TO EXCEED 3 INCHES ABOVE FG OR EG) LATERALLY TO CREATE A SEAMLESS SMOOTH TRANSITION IN GRADE WITH ADJACENT GRADE PER CAR APPROVAL.
- ANGLED PILE LOG GROUPS ARE COMPRISED OF TWO (2) INDIVIDUAL BATTERED LOG PILES WITH OPPOSING ANGLES (I.E., A NEGATIVE BATTERED PILE AND A POSITIVE BATTERED PILE) TO FORM A VEE. THE ANGLED PILE LOG GROUPS SHALL BE INSTALLED SUCH THAT THE APEX VEE FORMED BY THE OPPOSING BATTERED LOG PILES IS PLACED ABOVE AND IN CONTACT WITH THE HABITAT LOG. BATTERED LOG PILES SHALL BE SOURCED FROM SITE SALVAGED AND CAR STOCKPILED RED ALDER LOGS MEETING THE DIMENSIONS SHOWN. BATTER LOG PILES SHALL BE DRIVEN TO REFUSAL AT APPROXIMATELY 60° OFF HORIZONTAL WITH THE TOP ANGLED OVERTOP OF THE HABITAT LOG TO RESIST FLOTATION OF THE HABITAT LOG. ENSURE LOG-TO-LOG CONTACT BETWEEN BATTERED PILE LOGS WITHIN ANGLED PILE LOG GROUPS AND BETWEEN ADJACENT ANGLED PILE LOG GROUPS, AS SHOWN FOR ANGLED PILE GROUPS 2 AND 3. A LENGTH OF 2 FEET MAX FROM THE ENDS OF THE BATTERED PILE LOGS MAY BE SHARPENED OR MITER CUT PRIOR TO DRIVING INTO THE SUBGRADE.
- ANGLED PILE LOG GROUP 1 SHALL BE PLACED AS SHOWN AND PER DIRECTION OF ENGINEER.
- ANGLED PILE LOG GROUPS 1 AND 2 SHALL BE PLACED AS CLOSE AS PRACTICAL TO THE HABITAT LOG ROOT COLLAR AS SHOWN.
- ADDITIONAL SMALLER WOODY MATERIAL SALVAGED DURING SITE PREPARATION OR RECEIVED WITH IMPORTED HABITAT LOGS MAY BE PLACED AS DIRECTED BY CAR TO EMULATE THE NATURAL ACCUMULATIONS OF WOODY MATERIAL ON LARGER BANK ATTACHED WOOD, AS WELL AS INCREASE HYDRAULIC DIVERSITY, REFUGIA OPPORTUNITIES, AND MACRO-DETRITAL SUPPLY.
- INSPECTION AND APPROVAL BY THE ENGINEER OR CAR SHALL BE REQUIRED BEFORE FINAL AHWF PLACEMENT.
- SCARIFY SURFACE OF BACKFILLED AND GRADED AREAS ADJACENT TO FINISHED AHWF'S TO FACILITATE REVEGETATION.

AHWF MATERIAL SCHEDULE

MATERIAL	QUANTITY PER FEATURE	DIA (IN)	LENGTH (FT)	TOTAL QUANTITY PER PLANS
HABITAT LOG WITH ROOTWAD	1	18 (MIN) - 24 (MAX)	25 (MIN) - 30 (MAX)	9
ANGLED PILE LOG GROUP (PER NOTES)	3	9 (MIN)	15 (MIN)	27
NATIVE BACKFILL (PER NOTES)	12 CY	-	-	108

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PHONE: 971-409-4023



COLUMBIA RIVER ESTUARY STUDY TASKFORCE (CREST)
818 COMMERCIAL STREET, SUITE 203
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PHONE: 503-325-0435



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SOUTH TONGUE POINT RESTORATION PROJECT

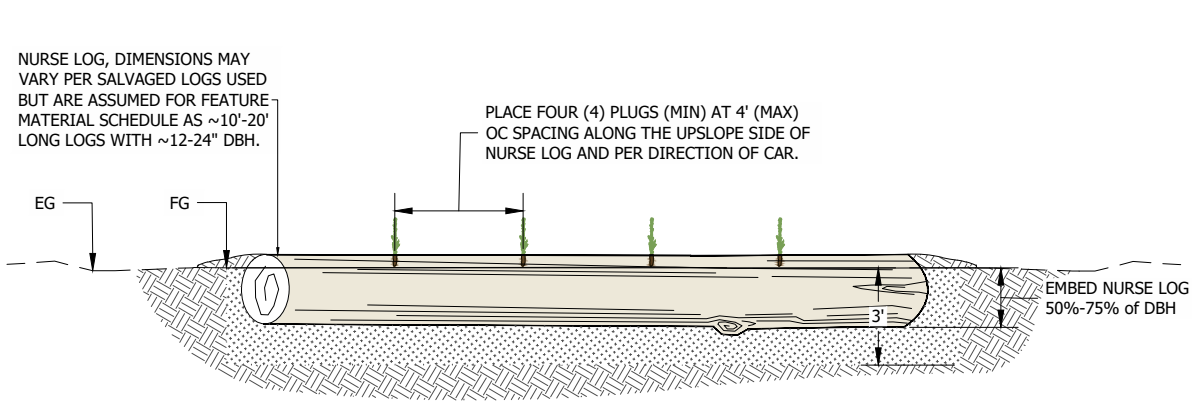
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C20

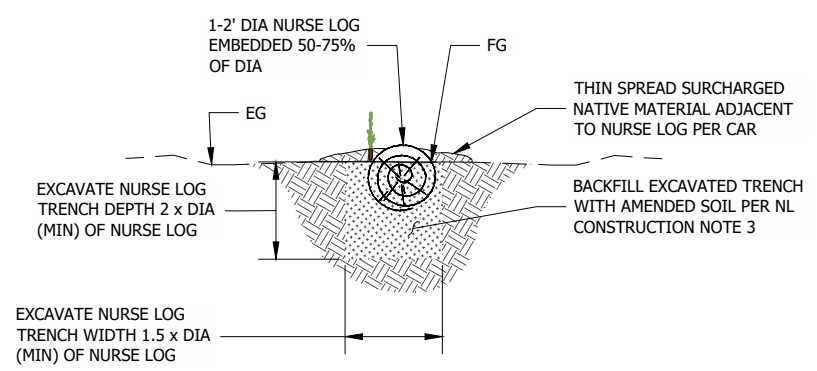
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OF
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FILE: c:\Users\jvanhulst\Documents\Kilgren Water Resources\IIS 2022\001 1-crest-stp - documents\CAD\Sheet\C20 NURSE LOG AND BRUSH TRENCH - DETAILS.dwg USER: jvanhulst DATE/TIME: 2/22/2023 3:33 PM



1 NL - ELEVATION VIEW
Scale: 1:3



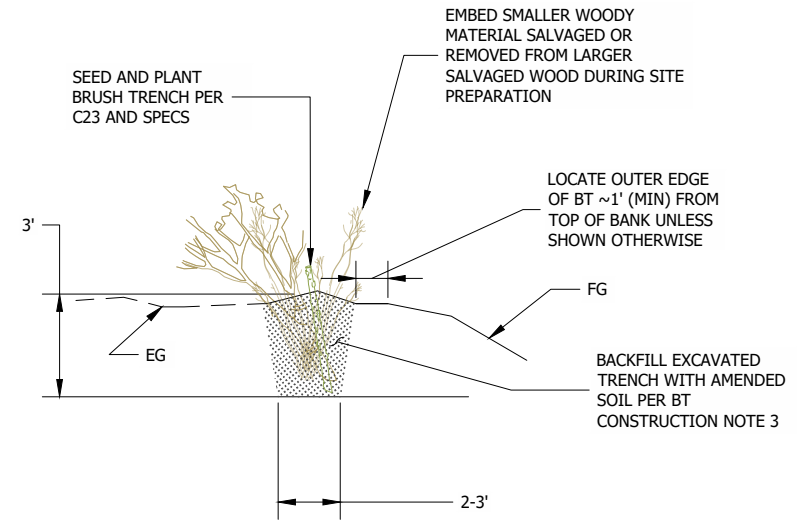
2 NL - SECTION VIEW
Scale: 1:3

NURSE LOG (NL) NOTES:

- DESCRIPTION:**
- THE NL EMULATES FALLEN TREES AND ACCUMULATION OF COARSE WOODY MATERIAL (E.G., BRANCHES) THAT NATURALLY OCCURS IN ESTABLISHED RIPARIAN AND UPLAND FORESTED HABITATS.
 - NL'S INVIGORATE HEALTHY SOIL DEVELOPMENT PROCESSES BY IMPROVING SOIL MOISTURE CAPACITY, ENHANCING NUTRIENT CYCLING, AND FACILITATING MYCORRHIZAL SYMBIOSIS WITH NATIVE PLANTINGS INSTALLED NEAR THE NL LOG.
 - NL'S PROVIDE HABITAT FOR A VARIETY OF TERRESTRIAL AND AVIAN SPECIES, INCLUDING MACROINVERTEBRATES THAT CONTRIBUTE TO MACRO-DETRITUS SUPPLY TO ADJACENT HABITATS.
 - NL'S CAN UTILIZE IMPORTED OR SALVAGED WHOLE TREES, AS WELL AS BROKEN OR SAWN LOGS AND COARSE WOODY MATERIALS.
 - NL'S WOOD PLACEMENT CAN VARY FROM FULLY EMBEDDED TO PARTIALLY EMBEDDED, OR LOOSELY PLACED ON THE FINISHED GROUND SURFACE PER APPROVAL OF ENGINEER.

- GENERAL NOTES:**
- CAR SHALL INSPECT AND APPROVE ALL CONTRACTOR PROPOSED NL PRIOR TO PLACEMENT.
 - CONTRACTOR SHALL NOTIFY CAR OF ANY PROPOSED CHANGES PRIOR TO CONSTRUCTING THE NL.
 - THE CAR SHALL INSPECT THE EXCAVATION EXTENTS, MATERIALS, AND FINISH TREATMENT OF THE NL.

- CONSTRUCTION NOTES**
1. OVER EXCAVATE THE NL FOOTPRINT TO THE SPECIFIED DIMENSIONS SHOWN ON THESE PLANS.
 2. LOOSEN NL TRENCH SUBGRADE SOILS BY RIPPING WITH EXCAVATOR BUCKET TINES OR EQUIVALENT.
 3. MIX SALVAGED MASTICATED VEGETATION WITH NATIVE SOIL THOROUGHLY BEFORE USE AS AMENDED SOIL BACKFILL.
 4. BACKFILL NL TRENCH WITH AMENDED SOIL TO ESTABLISH A LEVEL NL LOG BEDDING SURFACE THAT ALLOWS THE LOG TO PROTRUDE 25-50% OF LOG DIA ABOVE ADJACENT FINISHED AND EXISTING GRADES. DO NOT COMPACT AMENDED SOIL BACKFILL.
 5. PLACE NL LOG ON AMENDED SOIL BEDDING.
 6. BACKFILL THE NL TRENCH TO MATCH THE ADJACENT FINISHED AND EXISTING GRADES.
 7. INSTALL PLUGS PER SPACING SHOWN HEREIN AND SPECIES SHOWN ON C23. SEED PER C23.



3 BT - SECTION VIEW
Scale: 1:3

BRUSH TRENCH (BT) NOTES:

- DESCRIPTION:**
- THE BT IS A BIOENGINEERING TECHNIQUE THAT EMULATES THE ACCUMULATION OF COARSE WOODY MATERIAL (E.G., BRANCHES) THAT NATURALLY OCCURS IN ESTABLISHED RIPARIAN AND UPLAND FORESTED HABITATS AND AT DEPOSITIONAL LOCATIONS BETWEEN CHANGES IN GRADE AND OVERBANK FLOW CONDITIONS.
 - BT'S INVIGORATE HEALTHY SOIL DEVELOPMENT PROCESSES BY IMPROVING SOIL MOISTURE CAPACITY, ENHANCING NUTRIENT CYCLING, AND FACILITATING MYCORRHIZAL SYMBIOSIS WITH NATIVE PLANTINGS ESTABLISHED THROUGH SEEDING OF THE FINISHED BT.
 - BT CUTTINGS PROVIDE SURFACE ROUGHNESS AND A FILTERING FENCE THAT REDUCED THE LIKELIHOOD OF RILLING ALONG DOWNSLOPE BANK SURFACES AND SUPPORTS RECRUITMENT OF FLUVIAL AND AEOLIAN TRANSPORTED MACRODETRITUS.
 - THE SUBSURFACE AMENDED SOIL BACKFILL OF THE BT HELPS TO STORE AND SLOW THE RELEASE OF INFILTRATED PRECIPITATION AND SURFACE RUNOFF.
 - THE BT WORKS IN CONCERT WITH OTHER RESTORATION ELEMENTS INCLUDED IN THESE PLANS TO ENHANCE HABITAT VALUES FOR THE PROJECT TARGETED SPECIES.
 - BT'S PROVIDE HABITAT FOR A VARIETY OF TERRESTRIAL AND AVIAN SPECIES, INCLUDING MACROINVERTEBRATES THAT CONTRIBUTE TO MACRO-DETRITUS SUPPLY FROM BOTH BT CUTTINGS AND RECRUITED WOODY MATERIALS TO ADJACENT HABITATS.
 - BT'S CAN UTILIZE IMPORTED OR SALVAGED COARSE WOODY MATERIALS.

- GENERAL NOTES:**
- CONTRACTOR SHALL NOTIFY CAR OF ANY PROPOSED CHANGES PRIOR TO CONSTRUCTING THE BT.
 - THE CAR SHALL INSPECT THE EXCAVATION EXTENTS, MATERIALS, AND FINISH TREATMENT OF THE BT.

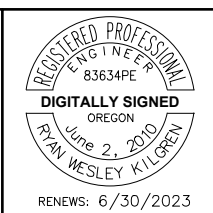
- CONSTRUCTION NOTES**
1. OVER EXCAVATE THE BT FOOTPRINT TO THE SPECIFIED DIMENSIONS SHOWN ON THESE PLANS.
 2. LOOSEN BT SUBGRADE SOILS BY RIPPING WITH EXCAVATOR BUCKET TINES OR EQUIVALENT.
 3. MIX SALVAGED MASTICATED VEGETATION WITH NATIVE SOIL THOROUGHLY BEFORE USE AS AMENDED SOIL BACKFILL.
 4. BACKFILL THE BT USING ALTERNATING PLACEMENT OF SALVAGED SMALLER WOODY MATERIAL AND AMENDED SOIL TO MATCH THE ADJACENT FINISHED AND EXISTING GRADES.
 5. SMALLER WOODY MATERIAL MAY PROTRUDE UP TO 4'.
 6. SEED AND PLANT PER SPECS AND C23.

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KILGREN WATER RESOURCES
3365 EAST AMAZON DRIVE, SUITE A
EUGENE, OR 97405
PHONE: 971-409-4023



COLUMBIA RIVER ESTUARY STUDY TASKFORCE (CREST)
818 COMMERCIAL STREET, SUITE 203
ASTORIA, OR 97103
PHONE: 503-325-0435



PROJECT NO.
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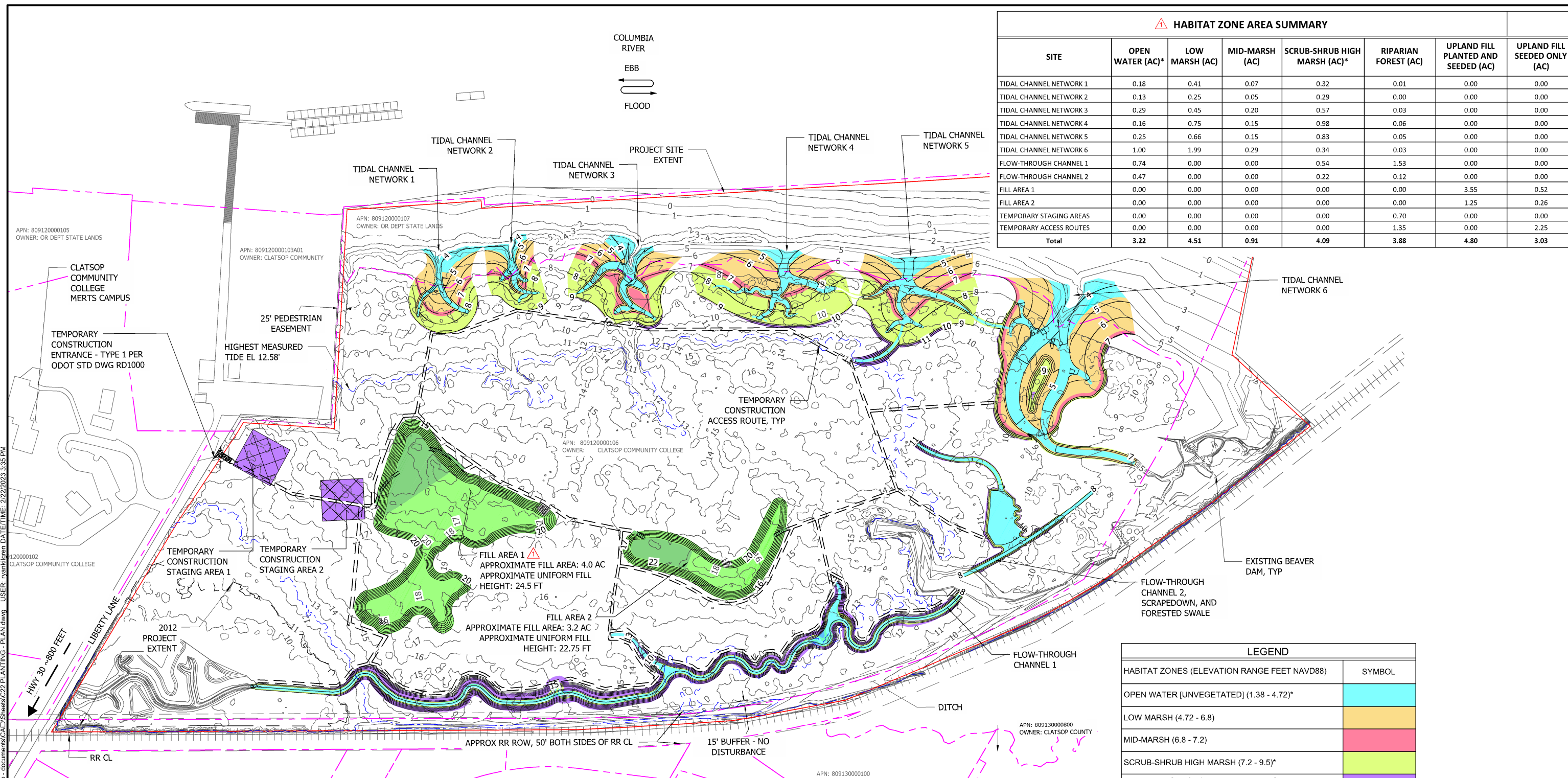
SOUTH TONGUE POINT RESTORATION PROJECT

NURSE LOG AND BRUSH TRENCH - DETAILS

DRAWING NO.
C21

SHEET NO.
26
OF
30





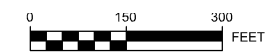
HABITAT ZONE AREA SUMMARY							
SITE	OPEN WATER (AC)*	LOW MARSH (AC)	MID-MARSH (AC)	SCRUB-SHRUB HIGH MARSH (AC)*	RIPARIAN FOREST (AC)	UPLAND FILL PLANTED AND SEEDED (AC)	UPLAND FILL SEEDED ONLY (AC)
TIDAL CHANNEL NETWORK 1	0.18	0.41	0.07	0.32	0.01	0.00	0.00
TIDAL CHANNEL NETWORK 2	0.13	0.25	0.05	0.29	0.00	0.00	0.00
TIDAL CHANNEL NETWORK 3	0.29	0.45	0.20	0.57	0.03	0.00	0.00
TIDAL CHANNEL NETWORK 4	0.16	0.75	0.15	0.98	0.06	0.00	0.00
TIDAL CHANNEL NETWORK 5	0.25	0.66	0.15	0.83	0.05	0.00	0.00
TIDAL CHANNEL NETWORK 6	1.00	1.99	0.29	0.34	0.03	0.00	0.00
FLOW-THROUGH CHANNEL 1	0.74	0.00	0.00	0.54	1.53	0.00	0.00
FLOW-THROUGH CHANNEL 2	0.47	0.00	0.00	0.22	0.12	0.00	0.00
FILL AREA 1	0.00	0.00	0.00	0.00	0.00	3.55	0.52
FILL AREA 2	0.00	0.00	0.00	0.00	0.00	1.25	0.26
TEMPORARY STAGING AREAS	0.00	0.00	0.00	0.00	0.70	0.00	0.00
TEMPORARY ACCESS ROUTES	0.00	0.00	0.00	0.00	1.35	0.00	2.25
Total	3.22	4.51	0.91	4.09	3.88	4.80	3.03

LEGEND	
HABITAT ZONES (ELEVATION RANGE FEET NAVD88)	SYMBOL
OPEN WATER [UNVEGETATED] (1.38 - 4.72)'	[Light Blue Box]
LOW MARSH (4.72 - 6.8)	[Yellow Box]
MID-MARSH (6.8 - 7.2)	[Pink Box]
SCRUB-SHRUB HIGH MARSH (7.2 - 9.5)'	[Light Green Box]
RIPARIAN FOREST (9.5 - UPPER LIMIT OF DISTURBANCE UNLESS SHOWN OTHERWISE)	[Purple Box]
UPLAND FILL PLANTED AND SEEDED (AS SHOWN)	[Light Green Box]
UPLAND FILL SEEDED ONLY (AS SHOWN)	[Dark Green Box]

* TRANSITION BETWEEN OPEN WATER AND SCRUB-SHRUB HIGH MARSH FOR FLOW-THROUGH CHANNEL 1 AND 2 AT ELEV 8 FEET AND AT TOE OF SLOPES. BOTTOM OF CHANNELS TO REMAIN UNVEGETATED.

- GENERAL NOTES**
1. PLANTING PLAN COLORED SHADED AREA IS OMITTED FOR TEMPORARY CONSTRUCTION ACCESS ROUTES DUE TO SCALE OF ROUTE WIDTH. TEMPORARY CONSTRUCTION ACCESS ROUTES AND STAGING AREAS SHALL BE RESTORED PER THE THE PLANTING PLAN HEREON AND OBLITERATED PER DETAILS ON C25 FOR PEDESTRIAN TRAIL. PLANTING SHALL USE THE RIPARIAN FOREST PALETTE AND SEEDING SHALL USE THE UPLAND SEED MIX D.
 2. NO MIXED MASTICATED/MULCHED VEGETATION AND TOPSOIL TO BE PLACED AT TCN 2, TCN 3, FILL AREA 1, AND FILL AREA 2.
 3. FILL AREA TOPS INCLUDE BOTH PLANTED AND SEEDED, AND SEEDED ONLY AREAS AS SHOWN AND PER DIRECTION OF CAR.

1 PLANTING - PLAN
Scale: 1:150



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3385 EAST AMAZON DRIVE, SUITE A
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SOUTH TONGUE POINT RESTORATION PROJECT
PLANTING - PLAN

DRAWING NO.
C22
SHEET NO.
27
OF
30

FILE: c:\Users\kylgren\Documents\CAD\Sheets\C23 PLANTING - PALETTE.dwg USER: kylgren DATE/TIME: 2/22/2023 3:38 PM

PLANTING ZONE PALETTE

ZONE ID	ZONE CLASSIFICATION	MIN EL	MAX EL	STEMS PER ACRE	ACREAGE	% of Zone Coverage	COMMON NAME	SCIENTIFIC NAME	SIZE	CONDITION	SPACING (Feet On Center)	Spacing between rows (ft)	Area per plant (ft2)	QUANTITY	
1	Open Water (Unvegetated)	Lower Limit of Disturbance	4.72	N/A	3.22	100%	TO REMAIN UNVEGETATED WITH FINISHED GRADE AS SHOWN AND PER PROJECT SPECIFICATIONS								
2	Low Marsh	4.72	6.80	N/A	4.51	No seeding specified, but plan tiwth the following:									
						20%	Giant bur-reed	<i>Sparganium eurycarpum</i>	6" HT Max	Plug	6	5.2	31	1260	
						20%	Softstem bulrush	<i>Schoenoplectus tabernaemontani</i>	6" HT Max	Plug	6	5.2	31	1260	
						20%	Creeping spikerush	<i>Eleocharis palustris</i>	6" HT Max	Plug	6	5.2	31	1260	
						20%	Lyngbye's sedge	<i>Carex lyngbyei</i>	6" HT Max	Plug	6	5.2	31	1260	
						10%	Northern Water plantain	<i>Alisma triviale</i>	6" HT Max	Plug	6	5.2	31	630	
3	Mid Marsh	6.80	7.20	N/A	0.91	No seeding specified, but plan tiwth the following:									
						20%	Small-fruited bulrush	<i>Scirpus microcarpus</i>	6" HT Max	Plug	6	5.2	31	254	
						20%	Pacific silverweed	<i>Potentilla pacifica/Potentilla anserina ssp. pacifica</i>	6" HT Max	Plug	6	5.2	31	254	
						20%	Lyngbye's sedge	<i>Carex lyngbyei</i>	6" HT Max	Plug	6	5.2	31	254	
						20%	Broadleaf Cattail	<i>Typha latifolia</i>	6" HT Max	Plug	6	5.2	31	254	
4	Fascine Bundles	7.20	7.20	N/A	N/A										
5	Scrub-Shrub High Marsh	7.20	9.50	1873.10	4.09	To be seeded with Seed Mix A and planted with the following:									
						5%	Northern Water plantain	<i>Alisma triviale</i>	6" HT Max	Plug	4	3.5	14	643	
						15%	Pacific willow	<i>Salix lucida ssp. lasiandra</i>	4', 1" Dia	Live stake	4	3.5	14	1929	
						15%	Hooker willow	<i>Salix hookeriana</i>	4', 1" Dia	Live stake	4	3.5	14	1929	
						15%	Sitka willow	<i>Salix sitchensis</i>	4', 1" Dia	Live stake	4	3.5	14	1929	
						15%	Black twinberry	<i>Lonicera involucrata</i>	4', 1" Dia	Live stake	6	5.2	31	857	
						15%	Red osier dogwood	<i>Cornus sericea</i>	4', 1" Dia	Live stake	6	5.2	31	857	
						5%	Common sneezeweed	<i>Helenium autumnale</i>	6" HT Max	Plug	4	3.5	14	643	
						5%	Slenderbeak sedge	<i>Carex athrostachya</i>	6" HT Max	Plug	4	3.5	14	643	
						5%	Spirea	<i>Spiraea douglasii</i>	18 - 24" HT	Bare root	8	6.9	55	161	
6	Brush Trench	7.20	9.50	1484.51	0.20	To be seeded with Seed Mix B planted with the following:									
						25%	Spirea	<i>Spiraea douglasii</i>	18 - 24" HT	Bare root	4	3.5	14	160	
						25%	Hooker willow	<i>Salix hookeriana</i>	4', 1" Dia	Live stake	6	5.2	31	71	
						25%	Red osier dogwood	<i>Cornus sericea</i>	18 - 24" HT	Bare root or cuttings	6	5.2	31	71	
7	Riparian Forest	9.50	Upper limit of disturbance, Unless shown otherwise	1004	3.88	To be seeded with Seed Mix C and planted with the following:									
						10%	Snowberry	<i>Symphoricarpos albus</i>	6-12" HT	Bare root	4	3.5	14	1220	
						10%	Nootka rose	<i>Rosa nutkana</i>	18 - 24" HT	Bare root or cuttings	6	5.2	31	542	
						5%	Pacific crabapple	<i>Malus fusca</i>	18 - 24" HT	Bare root	6	5.2	31	271	
						10%	Thimbleberry	<i>Rubus parviflorus</i>	18 - 24" HT	Bare root	8	6.9	55	305	
						5%	Red elderberry	<i>Sambucus racemosa</i>	18 - 24" HT	Bare root	6	5.2	31.2	271	
						5%	Red alder	<i>Alnus rubra</i>	18 - 24" HT	Bare root	20	17.3	346	24	
						10%	Scouler willow	<i>Salix scouleriana</i>	4', 1" Dia	Live stake	6	5.2	31	542	
						5%	Sitka spruce	<i>Picea sitchensis</i>	9 CU IN MIN	Plug	12	10.4	125	68	
						5%	Pacific ninebark	<i>Physocarpus capitatus</i>	18 - 24" HT	Bare root	6	5.2	31	271	
						5%	Red osier dogwood	<i>Cornus sericea</i>	18 - 24" HT	Bare root or cuttings	20	17.3	346	24	
						10%	Black twinberry	<i>Lonicera involucrata</i>	18 - 24" HT	Bare root	12	10.4	125	136	
						5%	Cottonwood	<i>Populus trichocarpa</i>	4', 1" Dia	Live stake	15	13.0	195	43	
						5%	Western red cedar	<i>Thuja plicata</i>	9 CU IN MIN	Plug	15	13.0	195	43	
						5%	Osoberry	<i>Oemleria cerasiformis</i>	12 - 24" HT	Bare root	12	10.4	125	68	
5%	Cascara	<i>Rhamnus purshiana</i>	12 - 24" HT	Bare root	12	10.4	125	68							
8	Upland Fill Slopes	As Shown	As Shown	1844	4.80	To be seeded with Seed Mix D and planted with the following:									
						4%	Snowberry	<i>Symphoricarpos albus</i>	6-12" HT	Bare root	4	3.5	14	604	
						4%	Thimbleberry	<i>Rubus parviflorus</i>	18 - 24" HT	Bare root	8	6.9	55	151	
						4%	Red alder	<i>Alnus rubra</i>	18 - 24" HT	Bare root	20	17.3	346	24	
						4%	Sitka spruce	<i>Picea sitchensis</i>	9 CU IN MIN	Plug	12	10.4	125	67	
						4%	Osoberry	<i>Oemleria cerasiformis</i>	12 - 24" HT	Bare root	10	8.7	87	97	
						4%	Cascara	<i>Rhamnus purshiana</i>	12 - 24" HT	Bare root	10	8.7	87	97	
						4%	Coyote bush	<i>Baccharis pilularis ssp. consanguinea</i>	6-24" HT	Bare root	12	10.4	125	67	
						4%	Red flowering currant	<i>Ribes sanguineum</i>	18 - 24" HT	Bare root	12	10.4	125	67	
						4%	Red elderberry	<i>Sambucus racemosa</i>	18 - 24" HT	Bare root	12	10.4	125	67	
						4%	Salal	<i>Gaultheria shallon</i>	6-12" HT	Bare root	4	3.5	14	604	
9	Upland Fill Tops	As Shown	As Shown	N/A	3.03	To be seeded with Seed Mix D only									



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1	FEB 22, 2023	ISSUED FOR CONSTRUCTION	RWK

KILGREN WATER RESOURCES
 3365 EAST AMAZON DRIVE, SUITE A
 EUGENE, OR 97405
 PHONE: 971-409-4023



COLUMBIA RIVER ESTUARY STUDY TASKFORCE (CREST)
 818 COMMERCIAL STREET, SUITE 203
 ASTORIA, OR 97103
 PHONE: 503-325-0435



PROJECT NO.
5.2022.0001.1

DESIGNED BY
RWK

DRAWN BY
RWK

SOUTH TONGUE POINT RESTORATION PROJECT

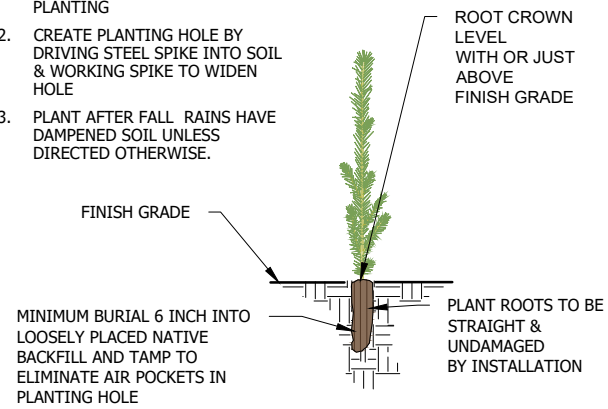
PLANTING - PALETTE

DRAWING NO.
C23

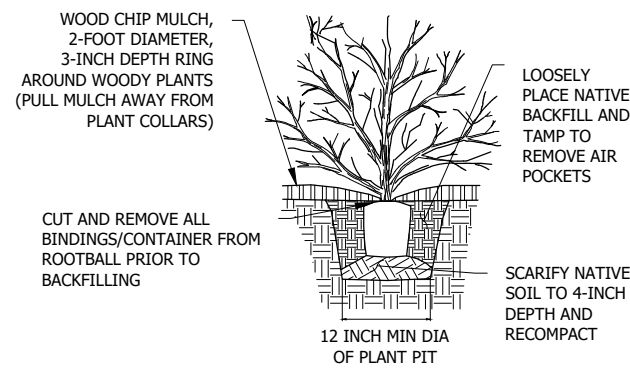
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OF
30

PLUG PLANTING NOTES:

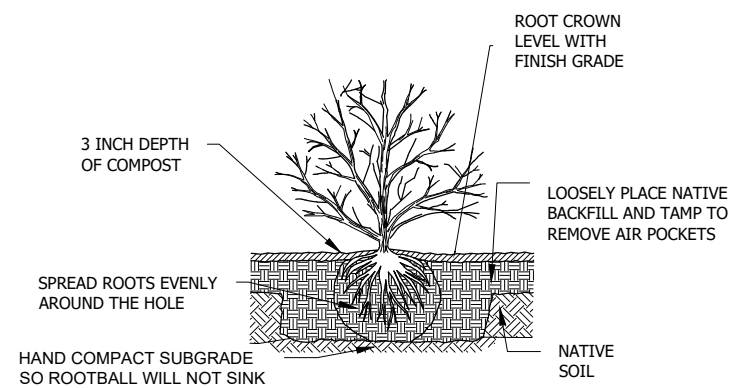
1. LEAVES & ROOT CROWN TO REMAIN UNDAMAGED DURING PLANTING
2. CREATE PLANTING HOLE BY DRIVING STEEL SPIKE INTO SOIL & WORKING SPIKE TO WIDEN HOLE
3. PLANT AFTER FALL RAINS HAVE DAMPENED SOIL UNLESS DIRECTED OTHERWISE.



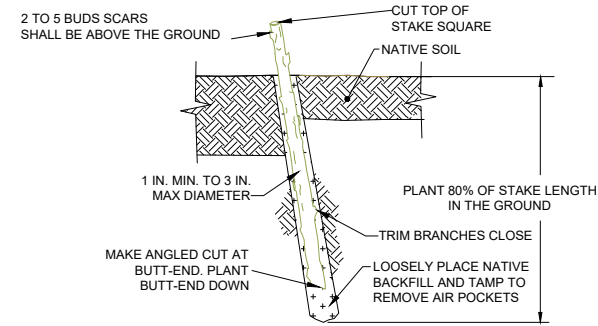
1 PLUG PLANTING - SECTION VIEW
Scale: NTS



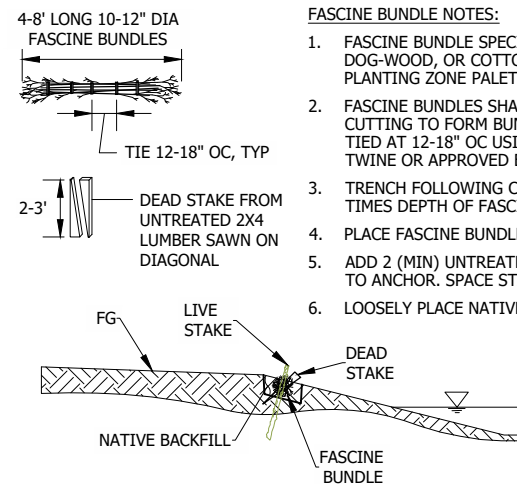
1 CONTAINER PLANTING - SECTION VIEW
Scale: NTS



1 BARE ROOT PLANTING - SECTION VIEW
Scale: NTS



1 LIVE STAKE PLANTING - SECTION VIEW
Scale: NTS



1 FASCINE BUNDLE - SECTION VIEW
Scale: NTS

FASCINE BUNDLE NOTES:

1. FASCINE BUNDLE SPECIES SHALL BE 1/4-1" DIA LIVE CUTTINGS OF SUITABLE WILLOW, DOG-WOOD, OR COTTONWOOD SPECIES IDENTIFIED FOR ADJACENT PLANTING ZONES BY THE PLANTING ZONE PALETTE.
2. FASCINE BUNDLES SHALL ASSEMBLED BY ALTERNATING THE BASAL/BUTT-ENDS OF EACH CUTTING TO FORM BUNDLES APPROXIMATELY 10-12" IN DIA. BUNDLES SHALL BE SECURELY TIED AT 12-18" OC USING NATURAL, BIODEGRADABLE, UNTREATED, AND UNDYED BAILING TWINE OR APPROVED EQUIVALENT.
3. TRENCH FOLLOWING CONTOUR AND AS DIRECTED BY CAR UP TO TWO TIMES WIDTH AND ONE TIMES DEPTH OF FASCINE BUNDLE.
4. PLACE FASCINE BUNDLE IN TRENCH WITH 80% OF BUNDLE DIA BELOW FINISHED GRADE.
5. ADD 2 (MIN) UNTREATED DEAD STAKES AND 2 (MIN) LIVE STAKES THROUGH FASCINE BUNDLES TO ANCHOR. SPACE STAKES EQUALLY ALONG LENGTH OF FASCINE BUNDLE.
6. LOOSELY PLACE NATIVE BACKFILL AND TAMP TO REMOVE AIR POCKETS.

CONSTRUCTION NOTES

1. MUST ACHIEVE 80% SURVIVAL OF INSTALLED PLANTS AFTER 1ST YEAR. SURVIVAL RATE LOWER THAN THIS WILL REQUIRE INSTALLATION OF ADDITIONAL SPECIMENS TO ACHIEVE DESIRED SURVIVAL.
2. HAND COMPACT SOILS BENEATH BARE ROOT SHRUBS TO PROVIDE SUPPORT.
3. FINISH BARE ROOT PLANTINGS WITH 2-3 INCHES OF CERTIFIED WEED-FREE COMPOST TO TOP OF ROOT CROWN.
4. USE SOIL AMENDMENT PER PLANTING MATERIALS NOTE 5 FOR UPLAND FILL SLOPE PLANTINGS, ONLY, PER C22 AND DIRECTION OF CAR.
5. STOCKPILE SALVAGED PLANTS IN SHADY SPOT IF POSSIBLE. WATER AS NEEDED TO ENSURE ROOTS STAY MOIST.
6. RESTORE ALL AREAS DISTURBED FOR TEMPORARY CONSTRUCTION ACCESS FOLLOWING THE PLANTING PALETTE OR PER DIRECTION OF OWNER'S REPRESENTATIVE.

PLANTING NOTES

1. SEE PLANTING DETAILS THIS SHEET FOR LIVE STAKE, BARE ROOT, CONTAINER, PLUG PLANTS, AND PLANTING ZONE DIRECTIONS.
2. REMOVE ALL ESC MEASURES FOLLOWING ACCEPTANCE OF FINAL PLANTING.

PLANT MATERIALS

1. PLANT MATERIALS WILL CONFORM TO ODOT PLANT MATERIALS STANDARDS.
2. LIVE STAKES WILL BE HARVESTED WITHIN 7 DAYS (MAX) OF PLANTING.
3. BARE ROOT STOCK WILL BE PRODUCED FROM SEED AND CUTTINGS COLLECTED DURING THE DURING THE SUMMER IMMEDIATELY PRECEDING INSTALLATION.
4. PLANTING DENSITY WILL BE AS SHOWN IN THE PLANTING PALETTE AND DETAILS.
5. REUSE SITE-SALVAGED MIXED MASTICATED/MULCHED VEGETATION AND TOPSOIL FOR SOIL AMENDMENT APPLIED IN PLACE OF NATIVE BACKFILL FOR PLANTINGS ON UPLAND FILL SLOPES.

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3365 EAST AMAZON DRIVE, SUITE A
EUGENE, OR 97405
PHONE: 971-409-4023



COLUMBIA RIVER ESTUARY STUDY TASKFORCE (CREST)
818 COMMERCIAL STREET, SUITE 203
ASTORIA, OR 97103
PHONE: 503-325-0435



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SOUTH TONGUE POINT RESTORATION PROJECT

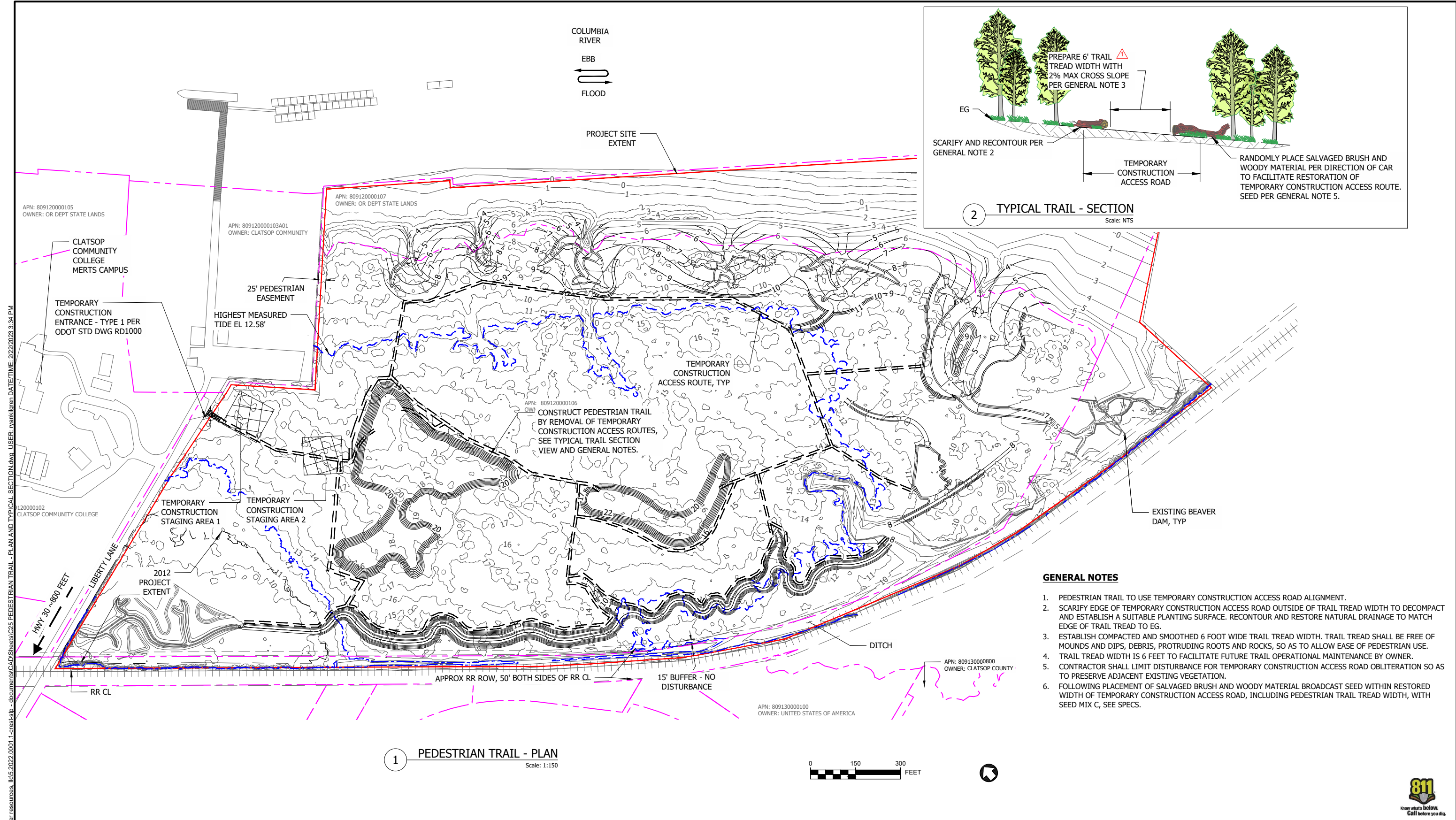
PLANTING - DETAILS AND NOTES

DRAWING NO.
C24

SHEET NO.
29
OF
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FILE: c:\Users\rvanilg@kilgren.com\Documents\CAD\Sheets\C24 PLANTING - DETAILS AND NOTES.dwg USER: rvanilg@kilgren.com DATE/TIME: 2/22/2023 3:34 PM





1 PEDESTRIAN TRAIL - PLAN
Scale: 1:150

2 TYPICAL TRAIL - SECTION
Scale: NTS


GENERAL NOTES

1. PEDESTRIAN TRAIL TO USE TEMPORARY CONSTRUCTION ACCESS ROAD ALIGNMENT.
2. SCARIFY EDGE OF TEMPORARY CONSTRUCTION ACCESS ROAD OUTSIDE OF TRAIL TREAD WIDTH TO DECOMPACT AND ESTABLISH A SUITABLE PLANTING SURFACE. RECONTOUR AND RESTORE NATURAL DRAINAGE TO MATCH EDGE OF TRAIL TREAD TO EG.
3. ESTABLISH COMPACTED AND SMOOTHED 6 FOOT WIDE TRAIL TREAD WIDTH. TRAIL TREAD SHALL BE FREE OF MOUNDS AND DIPS, DEBRIS, PROTRUDING ROOTS AND ROCKS, SO AS TO ALLOW EASE OF PEDESTRIAN USE.
4. TRAIL TREAD WIDTH IS 6 FEET TO FACILITATE FUTURE TRAIL OPERATIONAL MAINTENANCE BY OWNER.
5. CONTRACTOR SHALL LIMIT DISTURBANCE FOR TEMPORARY CONSTRUCTION ACCESS ROAD OBLITERATION SO AS TO PRESERVE ADJACENT EXISTING VEGETATION.
6. FOLLOWING PLACEMENT OF SALVAGED BRUSH AND WOODY MATERIAL BROADCAST SEED WITHIN RESTORED WIDTH OF TEMPORARY CONSTRUCTION ACCESS ROAD, INCLUDING PEDESTRIAN TRAIL TREAD WIDTH, WITH SEED MIX C, SEE SPECS.

FILE: c:\Users\ryanw\Documents\CAD\Sheet\C25 PEDESTRIAN TRAIL - PLAN AND TYPICAL SECTION.dwg USER: ryanw DATE/TIME: 2/22/2023 3:34 PM
 120000102 CLATSOP COMMUNITY COLLEGE
 809120000105 OR DEPT STATE LANDS
 809120000103A01 CLATSOP COMMUNITY
 809120000107 OR DEPT STATE LANDS
 809120000106 OWR
 809130000800 CLATSOP COUNTY
 809130000100 UNITED STATES OF AMERICA

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 COLUMBIA RIVER ESTUARY STUDY TASKFORCE (CREST)
 818 COMMERCIAL STREET, SUITE 203
 ASTORIA, OR 97103
 PHONE: 503-325-0435

REGISTERED PROFESSIONAL ENGINEER
 83634PE
 DIGITALLY SIGNED
 OREGON
 June 2, 2010
 RYAN WESLEY KILGREN
 RENEWS: 6/30/2023

PROJECT NO.
 5.2022.0001.1
 DESIGNED BY
 RWK
 DRAWN BY
 RWK

SOUTH TONGUE POINT RESTORATION PROJECT
 PEDESTRIAN TRAIL - PLAN AND TYPICAL SECTION

DRAWING NO.
 C25
 SHEET NO.
 30
 OF
 30