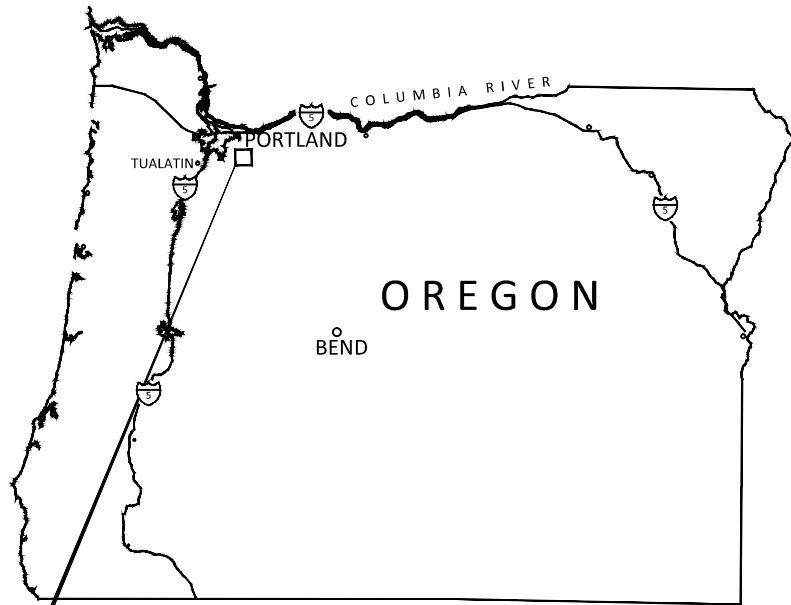


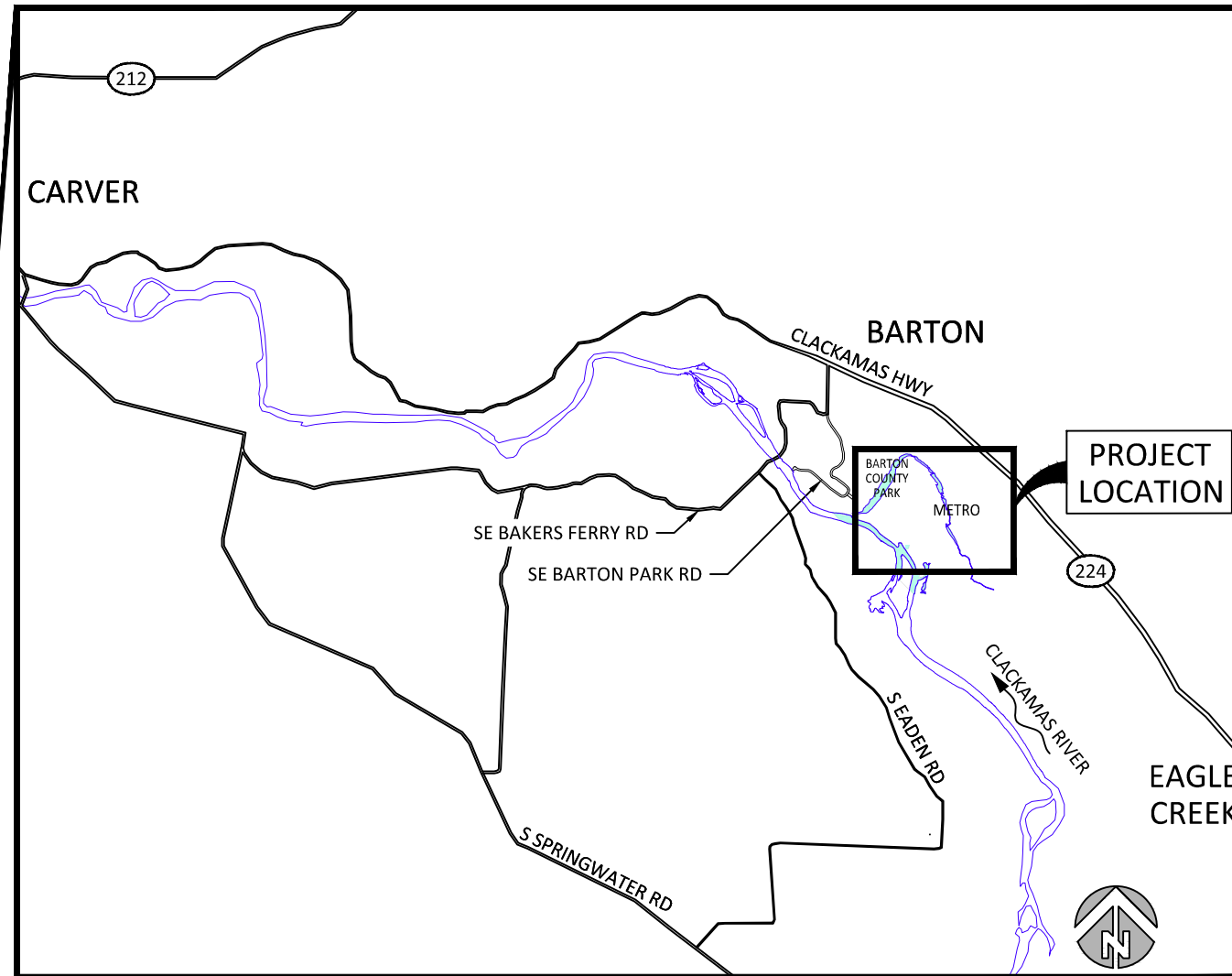
River Island North Preliminary Design

Clackamas River

Clackamas County, Oregon - August, 2015



LOCATION MAP
STATE OF OREGON



SITE MAP
NOT TO SCALE

COORDINATES:
LATITUDE 45°22'34.47" N
LONGITUDE 122°23'59.74" W
WATERBODY: CLACKAMAS RIVER
TRIBUTARY OF: WILLAMETTE RIVER
SECTION 26 TOWNSHIP 2S RANGE 3E WM

SHEET INDEX

GENERAL

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ECOLOGICAL

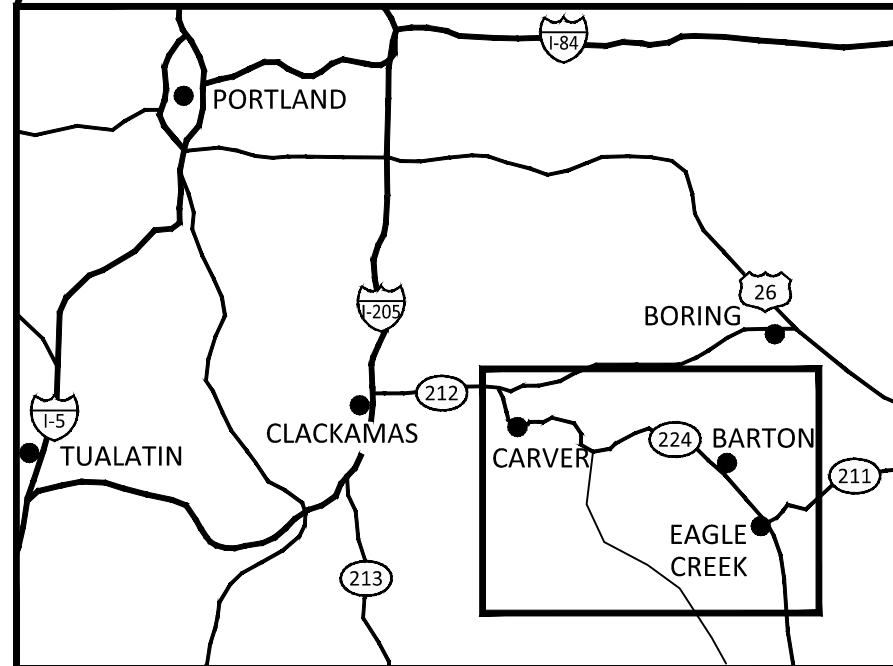
- E1 GOOSE CREEK PLAN AND PROFILE
- E2 GOOSE CREEK SECTIONS 1+00 TO 6+00
- E3 GOOSE CREEK SECTIONS 7+00 TO 15+00
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- E7 GOOSE CREEK CONNECTOR CHANNEL
- E8 RIVER ISLAND NORTH CUT-FILL PLAN
- E9 RIVER ISLAND NORTH PROPOSED ELEVATION BANDING
- E10 RIVER ISLAND NORTH PROFILES A-E
- E11 RIVER ISLAND NORTH - RIGHT BANK PLAN AND SECTIONS
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DETAILS

- D1 TURTLE HABITAT ENHANCEMENT DETAILS
- D2 RIGHT BANK DETAILS 1-2 AND BURIED LOG STRUCTURE DETAILS 3-4
- D3 FLOOD PLAIN LARGE WOOD DETAIL 1
- D4 PILE TESTING DETAIL 1 AND FULLY THREADED ROD DETAIL 2
- D5 LARGE WOOD ENHANCEMENT CONFIGURATION DETAILS 1-3
- D6 GOOSE CREEK FORD PLAN AND PROFILE A

RE-VEGETATION

- V1 REVEGETATION
- V2 REVEGETATION



VICINITY MAP
NOT TO SCALE

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COVER, VICINITY MAP AND
SHEET INDEX

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THE CONTRACTOR SHALL ATTEND A PRE-CONSTRUCTION MEETING WITH OWNER AND OWNER'S REPRESENTATIVE PRIOR TO MOBILIZING TO SITE AND BEGINNING CONSTRUCTION.

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

ODFW IN-WATER WORK PERIODS

WORK SHALL OCCUR DURING THE ODFW PERMITTED IN-WATER WORK PERIOD: JULY 15-AUGUST 31 UNLESS OTHERWISE COORDINATED WITH ODFW AND APPROVED IN WRITING BY DSL.

EXISTING DATA

TOPOGRAPHIC DATA WAS COLLECTED BY INTER-FLUVE USING RTK AND TOTAL STATION IN DECEMBER 2013 AND FEBRUARY 2015. BATHYMETRIC DATA WAS COLLECTED BY INTER-FLUVE USING RTK AND SONAR IN JANUARY AND FEBRUARY OF 2014.

HORIZONTAL DATUM: STATE PLANE NAD83 OREGON NORTH
VERTICAL DATUM: NAVD88

HYDRAULIC MODELING BY INTER-FLUVE USING USACE HEC-RAS (4.1.0). MODEL CALIBRATED USING SURVEYED WATER SURFACE ELEVATIONS AND EXISTING HIGH WATER MARKS.

GIS DATA INCLUDING: AERIAL PHOTOGRAPHY, LIDAR, FISH USE, SURFACE SOILS INFORMATION, LAND OWNERSHIP, AND TRANSPORTATION ROUTES PROVIDED BY METRO.

SOILS

SUBSURFACE SOILS ARE EXPECTED TO BE SAND, GRAVEL, COBBLES, AND BOULDERS. EXCAVATIONS BELOW THE SURFACE MAY ENCOUNTER SANDY RIVER MUDSTONE AT SHALLOW DEPTHS. MUDSTONE SHALL BE KEPT SEPARATE FROM RIVER GRAVELS AND NOT USED FOR BACKFILL OF LARGE WOOD STRUCTURES. VOLUME OF NON-NATIVE MATERIALS (E.G. ASPHALT, RIPRAP) ARE BASED ON SURVEY AND VISUAL ESTIMATES. CONTRACTOR SHALL CONDUCT OWN INVESTIGATIONS IF ADDITIONAL DATA IS REQUIRED AT NO ADDITIONAL COST TO OWNER.

UTILITIES

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

THE CONTRACTOR SHALL CALL (800-322-2344) FOR UTILITY LOCATE PRIOR TO CONSTRUCTION.

THE CONTRACTOR SHALL IMMEDIATELY CONTACT THE AFFECTED UTILITY SERVICE TO REPORT ANY DAMAGED OR DESTROYED UTILITIES.

THE CONTRACTOR SHALL PROVIDE EQUIPMENT AND LABOR TO AID THE EFFECTED UTILITY SERVICE IN REPAIRING DAMAGED OR DESTROYED UTILITIES AT NO ADDITIONAL COST TO OWNER.

CONSTRUCTION STAKING

OWNER'S REPRESENTATIVE WILL PROVIDE STAKING OF PROJECT LIMITS, GRADE STAKES, AND ELEVATION CONTROL POINTS. SOME FIELD ADJUSTMENTS TO THE LINES AND GRADES ARE TO BE EXPECTED.

CONTRACTOR SHALL MEET WITH THE OWNER AND OWNER'S REPRESENTATIVE TO DEFINE AND MARK LIMITS OF DISTURBANCE PRIOR TO MOBILIZATION OF EQUIPMENT OR MATERIALS ONTO THE SITE.

THE CONTRACTOR SHALL REPLACE DAMAGED OR DESTROYED CONSTRUCTION STAKES AT NO ADDITIONAL COST TO THE OWNER.

CONSTRUCTION MATERIALS

CONTRACTOR SHALL ALLOW FOR EXPANSION OF EXCAVATED MATERIAL AND COMPACTION OF PLACED MATERIAL AT NO ADDITIONAL MEASURE OR COST TO THE OWNER. MEASUREMENT AND PAYMENT SHALL NOT BE BASED ON WEIGHT TICKETS OR TRUCK MEASURE WITHOUT PRIOR WRITTEN APPROVAL.

LOCATION, ALIGNMENT, AND ELEVATION OF LOGS AND LOGS WITH ROOTWADS ARE SUBJECT TO ADJUSTMENT BASED ON FIELD CONDITIONS AND MATERIAL SIZE.

THE CONTRACTOR WILL DISPOSE OF NON-NATIVE MATERIAL ENCOUNTERED IN AN APPROVED, LEGAL OFFSITE DISPOSAL FACILITY.

CONSTRUCTION ACCESS/TRAFFIC CONTROL

CONTRACTOR SHALL SUBMIT AN ACCESS, STAGING, AND STOCKPILE PLAN TO OWNER FOR APPROVAL PRIOR TO MOBILIZATION.

PUBLIC ACCESS TO/ALONG ROADWAYS AND THROUGH BARTON PARK SHALL BE MAINTAINED AT ALL TIMES.

THE CONTRACTOR IS SOLELY RESPONSIBLE FOR OBTAINING ANY REQUIRED TRAFFIC CONTROL OR ACCESS PERMITS.

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

THE CONTRACTOR SHALL PLACE SIGNAGE UPSTREAM OF WORK AREA IN A MANNER TO DISCOURAGE RIVER USERS FROM ENTERING THE WORK AREA.

ALL SAPLINGS AND TREES TO BE TRANSPLANTED OR REMOVED SHALL BE CLEARLY MARKED AND APPROVED BY METRO.

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

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

CONTRACTOR SHALL IMPLEMENT MEASURES TO CONTROL AND MINIMIZE WIND BLOWN DUST FROM THE SITE.

ALL DISTURBED AREAS INCLUDING ROADS, DRIVEWAYS AND ACCESS ROUTES SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER AND RE-VEGETATED PER PLANS.

ALL DISTURBED AREAS OUTSIDE THE LIMITS OF DISTURBANCE SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER AT NO ADDITIONAL COST TO THE OWNER.

EROSION CONTROL

CONTRACTOR SHALL BE SOLELY RESPONSIBLE AT OWN EXPENSE FOR PROVIDING AND MAINTAINING ALL NECESSARY EROSION CONTROL FACILITIES TO COMPLY WITH APPLICABLE EROSION CONTROL REGULATIONS AND TO MAINTAIN CLEAN ACCESS ROUTES.

FISH RESCUE

ALL FISH RESCUE EFFORTS SHALL BE SUPERVISED BY THE OWNER'S REPRESENTATIVE AND SHALL BE PERFORMED BY PERSONNEL EXPERIENCED WITH THE COLLECTION AND HANDLING OF SALMONIDS FROM CONSTRUCTION SITES.

ALL FISH TRAPPED IN RESIDUAL POOLS WITHIN THE PROJECT AREA WILL BE CAREFULLY COLLECTED BY SEINE AND/OR DIP NETS AND PLACED IN CLEAN TRANSFER CONTAINERS WITH ADEQUATE VOLUME OF FRESH RIVER WATER.

CAPTURED FISH SHALL BE IMMEDIATELY RELEASED INTO THE RIVER AT AREAS SELECTED BY EXPERIENCED PERSONNEL. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING AN ODFW/NMFS SCIENTIFIC TAKE PERMIT.

WETLANDS AND WATERS OF THE US

THE ORDINARY HIGH WATER (CLACKAMAS OHW) OR APPROXIMATE LOW WATER LINES DISPLAYED IN THIS DESIGN PACKAGE WERE DELINEATED BY INTER-FLUVE STAFF IN 2013 AND 2014. THE WETLAND BOUNDARIES WERE DELINEATED IN 2015. CLACKAMAS OHW AND WETLAND BOUNDARIES ARE BASED UPON ANALYSIS, MODELING, AND BEST PROFESSIONAL JUDGEMENT.

THE CLACKAMAS OHW AND WETLAND LINES DO NOT REPRESENT JURISDICTIONAL BOUNDARIES. WITHIN THE STATE OF OREGON, THE ARMY CORPS OF ENGINEERS AND THE DEPARTMENT OF STATE LANDS HAVE THE FINAL AUTHORITY IN DETERMINING WATERS AND WETLANDS BOUNDARIES AND REGULATIONS.

ABBREVIATIONS

BMPs	BEST MANAGEMENT PRACTICES
CY	CUBIC YARDS
DBH	DIAMETER AT BREAST HEIGHT
DIA	DIAMETER
EA	EACH
FT	FOOT
FTR	FULLY THREADED ROD
HORIZ	HORIZONTAL
NTS	NOT TO SCALE
N	NORTH
LB	POUND
LW	LARGE WOOD
MAX	MAXIMUM
MIN	MINIMUM
ODFW	OREGON DEPARTMENT OF FISH AND WILDLIFE
RD	ROAD
TYP	TYPICAL
VERT	VERTICAL
OHW	ORDINARY HIGH WATER
LF	LINEAR FEET
AC	ACRE



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GENERAL NOTES AND ABBREVIATIONS

TURTLE CROSSING BEST MANAGEMENT PRACTICES

ALL WORK SHALL CONFORM TO THE BELOW LIST OF OREGON DEPARTMENT FISH AND WILDLIFE (ODFW) TURTLE BEST MANAGEMENT PRACTICES TO THE EXTENT PRACTICABLE. THE CONTRACTOR SHALL WORK WITH THE OWNER'S REPRESENTATIVE TO PROTECT TURTLES AND TURTLE HABITAT THROUGHOUT THE CONSTRUCTION PROCESS.

CONTRACTOR SHALL:
MINIMIZE TEMPORARY CHANGES TO THE HYDROLOGY OR SEDIMENTATION RATES OF WATERBODIES SUPPORTING TURTLES FROM GROUND DISTURBANCES WITHIN 500 FT (150 M) OF NATIVE TURTLE HABITAT, OR WITHIN 150 FEET OF WATERWAYS THAT FLOW TO NATIVE TURTLE HABITAT:

- A. PROPERLY INSTALL SILT FENCING AROUND WORK AREAS, WITH REGULAR INSPECTION AND MAINTENANCE;
- B. USE JUTE MATTING, WEED-FREE NATIVE STRAW, MULCH BERMES, OR OTHER NATURAL FIBER EROSION CONTROL PRODUCTS ON DISTURBED AREAS IMMEDIATELY AFTER PROJECT COMPLETION TO MINIMIZE EROSION; DO NOT USE PRODUCTS WITH PLASTIC MESH THAT CAN ENTANGLE WILDLIFE; AND
- C. PROMPTLY RE-VEGETATE AREAS OF TEMPORARY DISTURBANCE WITH NATIVE SPECIES.

MARK CONFIRMED TURTLE NESTS WITH TEMPORARY FLAGGING, SURROUNDING WITH SILT FENCE, ETC. TO PROTECT FROM DISTURBANCE (E.G., CRUSHING BY HEAVY EQUIPMENT). TEMPORARY NEST MARKERS / BARRICADES SHOULD BE REMOVED AS SOON AS POSSIBLE AFTER THE PROJECT IS COMPLETE TO MINIMIZE POSSIBLE ATTRACTION OF PREDATORS.

AVOID INJURING OR DISTURBING NATIVE TURTLES DURING CONSTRUCTION ACTIVITIES IN OR NEAR OCCUPIED HABITAT:

- A. HAVE WORK AREAS INSPECTED BY A QUALIFIED BIOLOGIST EXPERIENCED WITH TURTLES BEFORE AND DURING CONSTRUCTION;
- B. SEASONALLY RESTRICT CERTAIN ACTIVITIES KNOWN TO IMPACT TURTLE HABITAT TO THE EXTENT PRACTICABLE

KEEP ACCESS TO DESIGNATED WORK PATHS TO AND FROM THE STAGING AREA AND WORK SITE(S) TO REDUCE UNNECESSARY HUMAN ACTIVITY AND GROUND DISTURBANCE TO THE TURTLES WITHIN PROJECT SITE. MINIMIZE THE NUMBER OF ACCESS WAYS TO THE EXTENT PRACTICABLE.

LOCATE PROJECT STAGING AREAS AND OTHER CONSTRUCTION RELATED SUPPORT FEATURES (E.G., CONCRETE TRUCK WASHOUT AREA, AND EQUIPMENT FUELING STATIONS) AT LEAST 165 FT (50 M) FROM WATERBODIES AND SUITABLE TURTLE NESTING HABITAT. IF THESE AREAS CANNOT BE LOCATED OUTSIDE THESE BOUNDARIES, INSTALL SILT FENCING IN ROAD CONSTRUCTION AREAS TO PREVENT TURTLES, INCLUDING NESTING TURTLES, FROM ENTERING THE WORK ZONE. CONSIDER TURTLE ACTIVITY CYCLE IN TIMING OF SILT FENCE INSTALLATION. BURY SILT FENCE INTO GROUND AT A 4 IN (10 CM) DEPTH TO PREVENT TURTLES FROM MOVING UNDER FENCE. MONITOR REGULARLY. REMOVE FENCING AS SOON AS PRACTICABLE AFTER WORK IS COMPLETE.

IF SMALL ENGINE EQUIPMENT SUCH AS PUMPS FOR TEMPORARY WATER MANAGEMENT MUST BE USED WITHIN 165 FT (50 M) OF A WATERBODY OF KNOWN OR SUSPECTED TURTLE NEST SITES, PLACE IN A LEAK-PROOF CONTAINER TO CONTAIN SPILLS FROM BROKEN FUEL LINES OR ACCIDENTAL SPILLS DURING REFUELING.

TURTLE EXCLUSION FENCE DESIGNS

TURTLE EXCLUSION FENCING SHOULD BE CONSTRUCTED OF 2" SQUARE WELDED OR WOVEN MESH WIRE 16 - 12.5 GAUGE. FENCE SHALL BE BURIED A MINIMUM OF 6" UNDER THE SOIL, WITH A MINIMUM OF 18" ABOVE GROUND. OWNER SHALL MARK AREAS THAT REQUIRE FENCING.

LIVE TREES

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

KEEP HEAVY EQUIPMENT OUT OF CANOPY DRIP LINE OF EXISTING TREES TO REMAIN.

JURISDICTIONAL AREA IMPACTS:

Wetland/Waterbody Name	Fill Volumes					Duration of impact (days)	Material
	Fill Dimensions ¹						
	Length (ft)	Width (ft)	Depth (ft)	Area (sq. ft.)	Volume (c.y.)		
Clackamas River - Goose Creek Area	1500	115	3.02	172,331	19,251 (19,251 below OHW)	Fill = permanent ²	Native Fill Material and 448 logs
Clackamas River - River Island North Area	1500	403	6.55	604,004	146,560 (128,995 below OHW)	Fill = permanent ²	Native Fill Material, Slash and 1068 logs
Clackamas River - Right Borrow Area	675	154	3.73	104,052	14,374 (799 below OHW)	Fill = permanent ²	Native Fill Material

Notes:

¹ Fill dimensions represent the summation of discontinuous areas.

² Work duration estimate equals 60 days.

Wetland/Waterbody Name	Removal Volumes					Duration of impact (days)	Material
	Removal Dimensions ¹						
	Length (ft)	Width (ft)	Depth (ft)	Area (sq. ft.)	Volume (c.y.)		
Clackamas River - Goose Creek Area	2700	140	4.67	377,665	65,315 (61,383 below OHW)	Removal = permanent ²	Native Fill Material
Clackamas River - River Island North Area	1700	186	3.50	616,656	79,875 (8,262 below OHW)	Removal = permanent ²	Native Fill Material
Clackamas River - Right Borrow Area	900	206	4.82	185,692	33,184 (2 below OHW)	Removal = permanent ²	Native Fill Material

Notes:

¹ Removal dimensions represent the summation of discontinuous areas.

² Work duration estimate equals 60 days.

TREE SALVAGE

ALL TREES AND SLASH REMOVED FOR CONSTRUCTION SHALL BE TEMPORARILY STOCKPILED WITHIN LIMITS OF DISTURBANCE. STOCKPILED TREE/SLASH SHALL BE REINCORPORATED INTO FINISHED PROJECT.

ANY REMOVED VEGETATION GREATER THAN 6 INCHES DIAMETER, AT BASE, AND 15 FEET LONG SHALL BE INCORPORATED INTO LOG STRUCTURES. CONTRACTOR IS RESPONSIBLE FOR REMOVING SMALLER CLEARING AND GRUBBING DEBRIS FROM THE SITE AND DISPOSING AT A LEGAL LOCATION AT THE END OF THE PROJECT UNLESS DIRECTED BY THE OWNER'S REPRESENTATIVE.

ALL TREES REMOVED WITHIN CLEARING LIMITS SHALL BE REMOVED WHOLE WITH ROOT WAD AND UTILIZED IN THE STREAM CONSTRUCTION AS DIRECTED BY OWNER'S REPRESENTATIVE.

ALL NATIVE MATERIAL SLASH SHALL BE STOCKPILED TO BE INCORPORATED INTO THE FINISHED PROJECT.

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GENERAL NOTES

SHEET
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EROSION/SEDIMENTATION CONTROL (ESC) PLAN

THE EROSION AND SEDIMENT CONTROL (ESC) PLAN PROVIDED IS FOR INFORMATIONAL PURPOSES ONLY, THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR PROVIDING EROSION CONTROL MEASURES TO COMPLY WITH APPLICABLE REGULATIONS.

THE RECOMMENDATIONS FOR AN ESC PLAN INCLUDED HEREIN WILL PROVIDE A GUIDELINE FOR THE CONTRACTOR TO DEVELOP AND IMPLEMENT AN ESC PLAN.

- A. THE IMPLEMENTATION OF AN ESC PLAN AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE ESC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED AND VEGETATION/LANDSCAPING IS ESTABLISHED.
- B. THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON THIS PLAN SHALL BE CLEARLY FLAGGED IN THE FIELD PRIOR TO CONSTRUCTION. DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE FLAGGED CLEARING LIMITS SHALL BE PERMITTED. THE FLAGGING SHALL BE MAINTAINED BY THE CONTRACTOR FOR THE DURATION OF CONSTRUCTION.
- C. ESC FACILITIES AS APPROXIMATELY SHOWN ON THIS PLAN ARE TO BE CONSTRUCTED PRIOR TO CLEARING AND GRADING ACTIVITIES, AND IN SUCH A MANNER AS TO ENSURE THAT SEDIMENT AND SEDIMENT-LADEN WATER DO NOT ENTER SURFACE WATERS, THE DRAINAGE SYSTEM, OR VIOLATE APPLICABLE WATER STANDARDS.
- D. THE ESC FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE ESC FACILITIES SHALL BE UPGRADED AS NEEDED AT NO ADDITIONAL COST TO OWNER FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT-LADEN WATER DO NOT LEAVE THE SITE.
- E. THE ESC FACILITIES SHALL BE INSPECTED DAILY BY THE CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING.
- F. THE ESC FACILITIES ON INACTIVE SITES SHALL BE INSPECTED AND MAINTAINED A MINIMUM OF ONCE A MONTH OR WITHIN THE 24 HOURS FOLLOWING A STORM EVENT.
- G. STABILIZED CONSTRUCTION ENTRANCES AND ADDITIONAL MEASURES MAY BE REQUIRED AND SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT TO ENSURE ALL ACCESS ROADS ARE KEPT CLEAN AT NO ADDITIONAL COST TO OWNER.

INSPECTION AND MAINTENANCE

ALL ESC FACILITIES SHALL BE INSPECTED, MAINTAINED, AND REPAIRED AS NEEDED TO ASSURE CONTINUED PERFORMANCE OF THEIR INTENDED FUNCTION. ALL ESC FACILITIES SHALL BE INSPECTED WEEKLY AND WITHIN 24 HOURS AFTER ANY STORM EVENT GREATER THAN 0.5 INCHES OF RAIN PER 24 HOUR PERIOD AND AFTER EVENTS EXCEEDING 2 HOURS DURATION.

CONTRACTOR'S ESC RECORD

WEEKLY REPORTS SUMMARIZING THE SCOPE OF INSPECTIONS, THE PERSONNEL CONDUCTING THE INSPECTION, THE DATE(S) OF THE INSPECTION, MAJOR OBSERVATIONS RELATING TO THE IMPLEMENTATION OF THE CONTRACTOR'S EROSION AND SEDIMENT CONTROL PLAN, AND ACTIONS TAKEN AS A RESULT OF THESE INSPECTIONS SHALL BE PREPARED AND RETAINED ON SITE BY THE CONTRACTOR. IN ADDITION, A RECORD OF THE FOLLOWING DATES SHALL BE INCLUDED IN THE REPORTS:

1. WHEN MAJOR GRADING ACTIVITIES OCCUR.
2. DATES OF RAINFALL EVENTS EITHER EXCEEDING 2 HOURS DURATION OR MORE THAN 0.5 INCHES/24 HOURS.

3. WHEN CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE ON SITE, OR ON A PORTION OF THE SITE.
4. WHEN STABILIZATION MEASURES ARE INITIATED FOR PORTIONS OF THE SITE.
5. ESC RECORDS SHALL BE MADE AVAILABLE TO THE OWNER AND OWNER'S REPRESENTATIVE ON REQUEST AND SHALL BE PROVIDED FOR REVIEW AND APPROVAL PRIOR TO APPLICATION FOR PAYMENT.

STABILIZE SOILS AND PROTECT SLOPES

FROM MAY 1 THROUGH SEPTEMBER 30, ALL EXPOSED SOILS SHALL BE PROTECTED FROM EROSION BY MULCHING, HYDROSEED COVERING, OR OTHER APPROVED MEASURES WITHIN THREE DAYS OF GRADING. FROM OCTOBER 1 THROUGH APRIL 30, ALL EXPOSED SOILS MUST BE PROTECTED WITHIN 2 DAYS OF GRADING. SOILS SHALL BE STABILIZED BEFORE A WORK SHUTDOWN, HOLIDAY OR WEEKEND IF NEEDED BASED ON THE WEATHER FORECAST. SOIL STOCKPILES MUST BE STABILIZED AND PROTECTED WITH SEDIMENT TRAPPING MEASURES.

DESIGN, CONSTRUCT, AND PHASE CUT AND FILL SLOPES IN A MANNER THAT WILL MINIMIZE EROSION. REDUCE SLOPE VELOCITIES ON DISTURBED SLOPES BY PROVIDING TEMPORARY BARRIERS. STORMWATER FROM OFF SITE SHOULD BE HANDLED SEPARATELY FROM STORMWATER GENERATED ON SITE.

AFTER FINAL SITE STABILIZATION

ALL TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION IS ACHIEVED OR AFTER THE TEMPORARY BEST MANAGEMENT PRACTICES (BMPs) ARE NO LONGER NEEDED. TRAPPED SEDIMENT SHALL BE REMOVED FROM THE SITE OR INCORPORATED INTO FINISHED GRADING. DISTURBED SOIL AREAS RESULTING FROM REMOVAL SHALL BE PERMANENTLY STABILIZED.

RIVER DIVERSION

DIVERSION MAY BYPASS THE RIVER AROUND SMALLER WORK AREAS AT CONTRACTOR'S DISCRETION.

DEWATERING OF IN-CHANNEL WORK AREA(S) SHALL OCCUR CONCURRENT WITH FISH RESCUE. CONTRACTOR SHALL COORDINATE WITH OWNER FOR FISH RESCUE. CONTRACTOR SHALL PROVIDE OWNER AMPLE TIME TO SCHEDULE FISH RESCUE. IF DIVERSION FAILS DUE TO CONTRACTOR NEGLIGENCE, FISH RESCUE SHALL BE REPEATED BY OWNER'S REPRESENTATIVE AT CONTRACTOR'S EXPENSE.

IF ADDITIONAL PUMPING IS REQUIRED TO DEWATER DURING CONSTRUCTION, PUMPED DISCHARGE SHALL RELEASE SEDIMENT-LADEN WATER AT AN UPLAND DISCHARGE LOCATION IN A MANNER THAT DOES NOT CAUSE EROSION, CONTAMINATION OR INCREASE TURBIDITY OF SURFACE WATERS (SEE CONSTRUCTION DEWATERING).

OWNER'S REPRESENTATIVE SHALL APPROVE DEWATERING DISCHARGE LOCATION PRIOR TO IMPLEMENTATION.

CONSTRUCTION DEWATERING

CONTRACTOR SHALL PERFORM CONSTRUCTION DEWATERING IN SUCH A MANNER AS TO AVOID THE RELEASE OF SEDIMENT-LADEN WATER TO SURFACE WATERS. SEDIMENT LADEN WATER MAY BE PUMPED TO AN UPLAND DISCHARGE LOCATION AND ALLOWED TO SHEET FLOW THROUGH EXISTING VEGETATION BEFORE INFILTRATING INTO THE GROUND. IF THIS METHOD IS NOT SUFFICIENT TO PREVENT RETURN OF TURBID WATER TO THE RIVER, A 'DIRT-BAG' OR SEDIMENT RETENTION STRUCTURE MAY BE REQUIRED AS NECESSARY TO COMPLY WITH LAWS AND PERMIT REQUIREMENTS AT NO ADDITIONAL COST TO THE OWNER.

CONTRACTOR SHALL PROVIDE PLASTIC SHEETING OR GEOTEXTILE LINER OR PLYWOOD OR METAL PLATING AS NECESSARY TO DISSIPATE PUMP DISCHARGE JET TO PREVENT EROSION.

SPILL POLLUTION PREVENTION PLAN

THE CONTRACTOR SHALL PREPARE AND IMPLEMENT A, PROJECT-SPECIFIC, SPILL PREVENTION, CONTROL, AND COUNTERMEASURES PLAN (SPCC PLAN) FOR THE DURATION OF THE PROJECT. THE CONTRACTOR SHALL SUBMIT THE PLAN TO THE PROJECT ENGINEER NO LATER THAN THE DATE OF THE PRECONSTRUCTION CONFERENCE.

ON-SITE CONSTRUCTION ACTIVITIES MAY COMMENCE UNTIL THE CONTRACTING AGENCY ACCEPTS AN SPCC PLAN FOR THE PROJECT.

EROSION CONTROL SEED MIX:

SEED MIX SPECIFICATION

Scientific name	Common name	% of Mix
<i>Deshampsia elongata</i> ¹	Slender hairgrass	60
<i>Agrostis exarata</i> ¹	Spike bentgrass	30
<i>Prunella vulgaris</i> ¹	Self-heal	10

¹NATIVE WILLAMETTE VALLEY SEED STOCK

SEED MIX APPLICATION

APPLY AT 14LB/ACRE. PRIOR TO DISTRIBUTION, MIX SEED WITH 50:50 CRACKED CORN TO FACILITATE EVEN DISTRIBUTION IN LIMITS OF DISTURBANCE ABOVE CLACKAMAS OHW.

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LK,RP,SM	EA,MM	JK
DRAWN	DESIGNED	CHECKED
MM	AUG 2015	130235
APPROVED	DATE	PROJECT

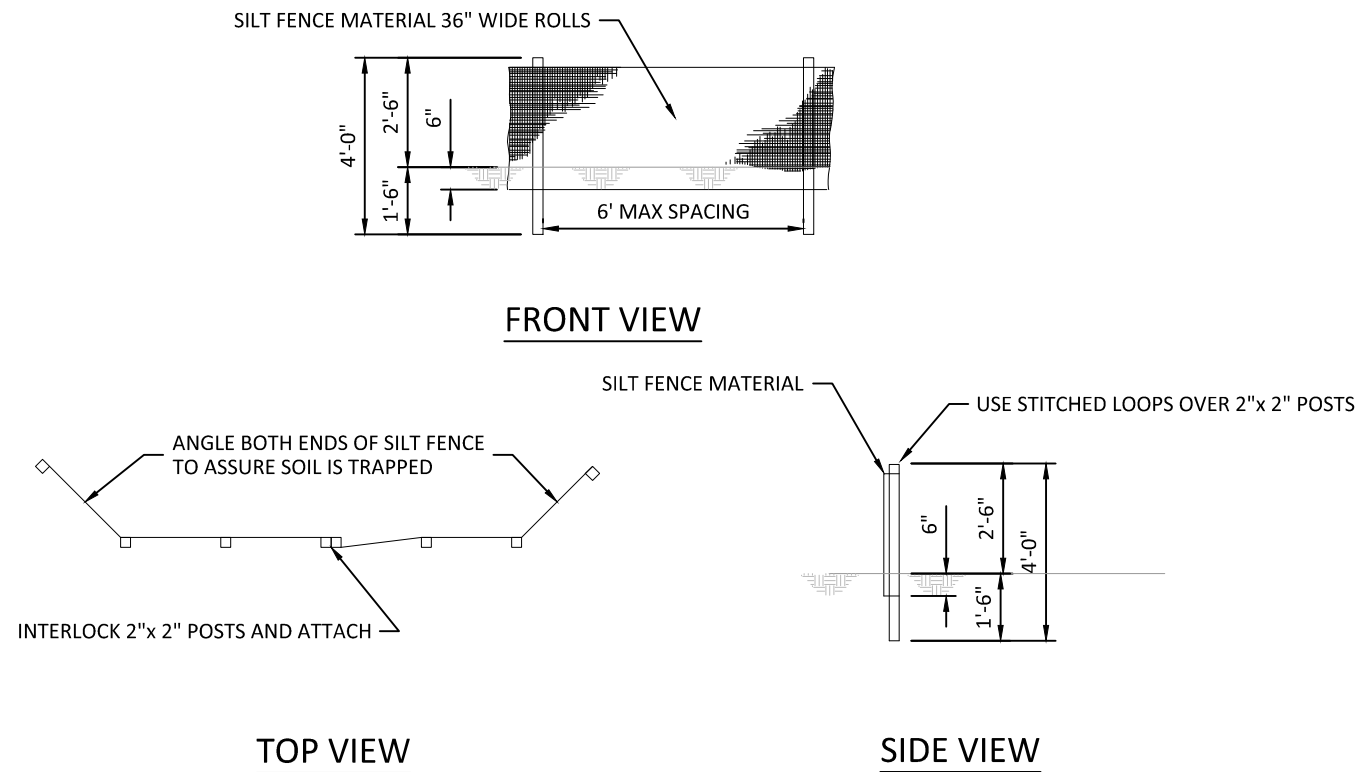
RIVER ISLAND NORTH PRELIMINARY DESIGN
METRO
CLACKAMAS COUNTY, OREGON



EROSION CONTROL GENERAL
NOTES AND DETAILS

SHEET
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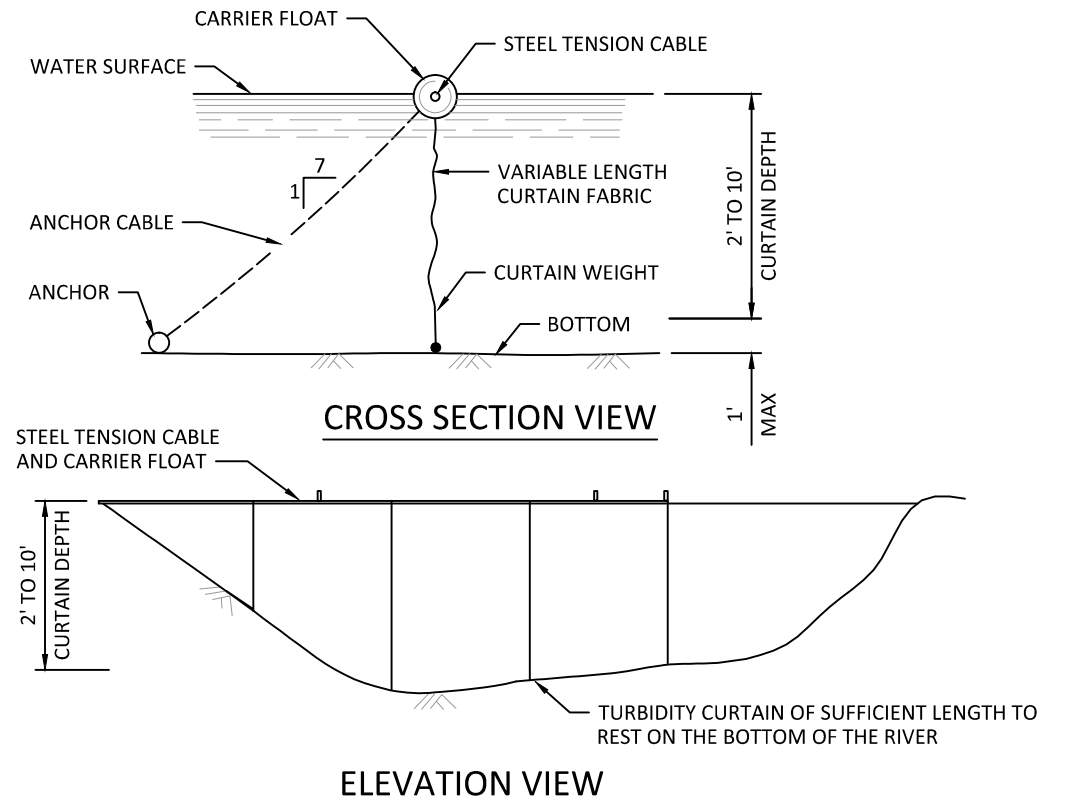


SILT FENCES:

1. THE SILT FENCE SHALL BE PURCHASED IN A CONTINUOUS ROLL CUT TO THE LENGTH OF THE BARRIER TO AVOID USE OF JOINTS. WHEN JOINTS ARE NECESSARY, SILT FENCE SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT POST, WITH A MINIMUM 6 INCH OVERLAP, AND BOTH ENDS SECURELY FASTENED TO THE POST. ALTERNATIVELY, OVERLAP AND INTERLOCK TWO POSTS WITH ATTACHED FABRIC AS REQUIRED TO MEET APPLICABLE REGULATIONS.
2. THE SILT FENCE IS TO BE INSTALLED AT LOCATIONS SHOWN ON THE PLAN ALONG THE DOWNHILL PERIMETER OF CONSTRUCTION AREAS. THE FENCE POSTS SHALL BE SPACED A MAXIMUM OF 6 FEET APART AND DRIVEN SECURELY INTO THE GROUND A MINIMUM OF 24 INCHES.
3. THE SILT FENCE SHALL HAVE A MINIMUM VERTICAL BURIAL OF 6 INCHES. ALL EXCAVATED MATERIAL FROM SILT FENCE INSTALLATION SHALL BE BACK-FILLED AND COMPACTED ALONG THE ENTIRE DISTURBED AREA.
4. STANDARD OR HEAVY DUTY SILT FENCE SHALL HAVE MANUFACTURED STITCHED LOOPS FOR 2 INCHES X 2 INCHES POST INSTALLATION.
5. SILT FENCES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN PERMANENTLY PROTECTED AND STABILIZED, OR AS DIRECTED BY OWNER'S REPRESENTATIVE.

1
G5 TYPICAL SILT FENCE
NOT TO SCALE

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CONSTRUCTION DEWATERING

DIVERSION MAY BYPASS THE RIVER AROUND SMALLER WORK AREAS AT CONTRACTOR'S DISCRETION.

DEWATERING OF IN-CHANNEL WORK AREAS SHALL OCCUR CONCURRENT WITH FISH RESCUE. CONTRACTOR SHALL COORDINATE WITH OWNER FOR FISH RESCUE. IF DIVERSION FAILS DUE TO CONTRACTOR NEGLIGENCE, FISH RESCUE SHALL BE REPEATED AT CONTRACTOR'S EXPENSE.

CONTRACTOR SHALL PERFORM CONSTRUCTION DEWATERING IN SUCH A MANNER AS TO AVOID THE RELEASE OF SEDIMENT-LADEN WATER TO SURFACE WATERS. SEDIMENT LADEN WATER MAY BE PUMPED TO AN UPLAND DISCHARGE LOCATION AND ALLOWED TO SHEET FLOW THROUGH EXISTING VEGETATION BEFORE INFILTRATING INTO THE GROUND. IF THIS METHOD IS NOT SUFFICIENT TO PREVENT RETURN OF TURBID WATER TO THE RIVER, A 'DIRT-BAG' OR SEDIMENT RETENTION STRUCTURE MAY BE REQUIRED AS NECESSARY TO COMPLY WITH LAWS AND PERMIT REQUIREMENTS AT NO ADDITIONAL COST TO THE OWNER.

CONTRACTOR SHALL PROVIDE ANY PUMPS, PIPES, FITTINGS AND ASSOCIATED MATERIALS TO SUFFICIENTLY DEWATER WORK AREAS.

CONTRACTOR SHALL PROVIDE VISQUEEN OR GEOTEXTILE LINER OR PLYWOOD OR METAL PLATING AS NECESSARY TO DISSIPATE PUMP DISCHARGE JET TO PREVENT EROSION.

OWNER'S REPRESENTATIVE SHALL APPROVE DEWATERING DISCHARGE LOCATION PRIOR TO IMPLEMENTATION.

1
G5 DETAIL - TYPICAL TURBIDITY CURTAIN
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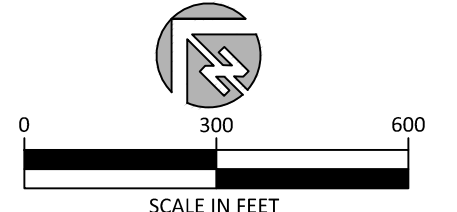
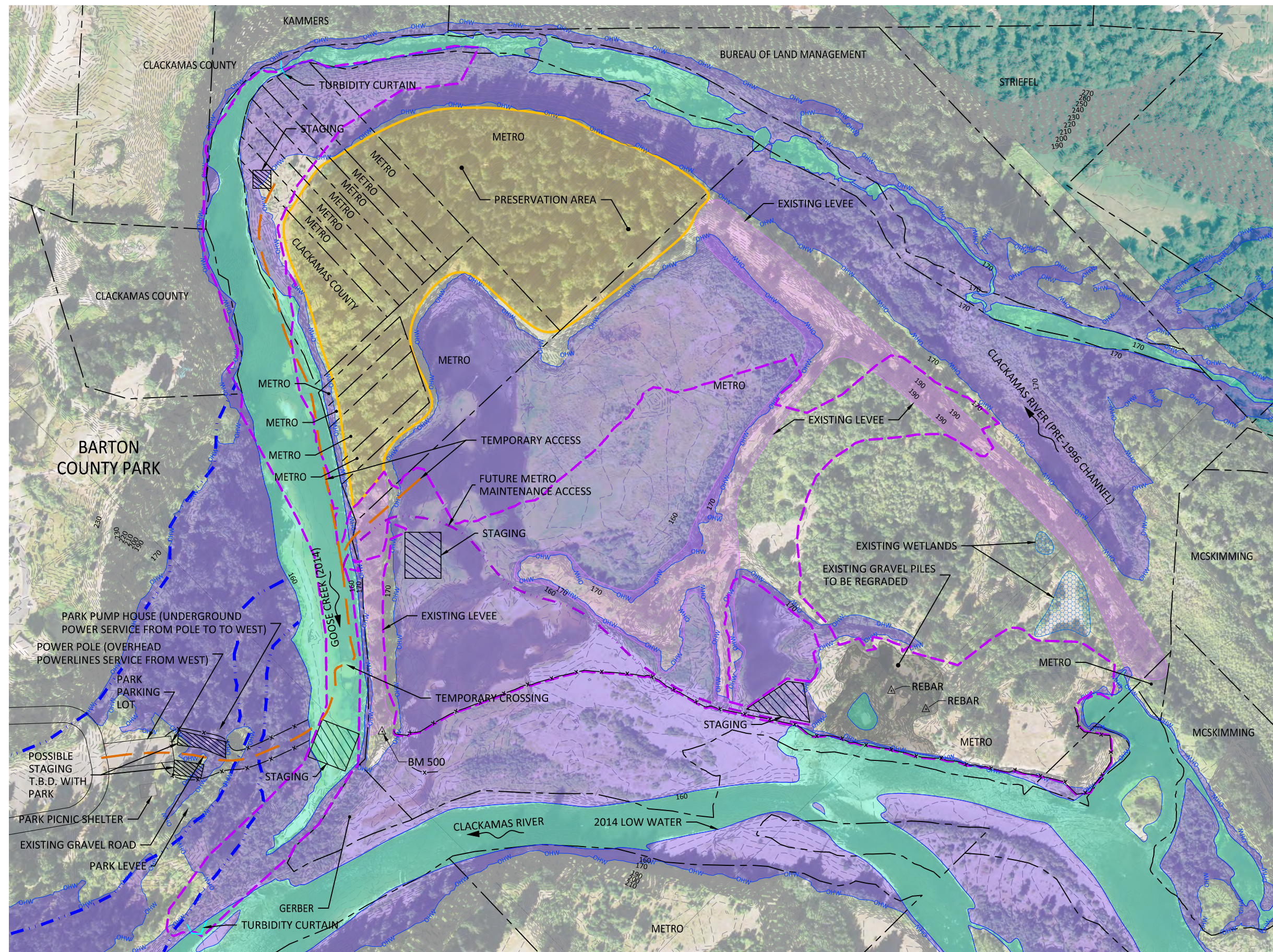
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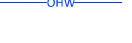
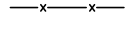



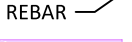

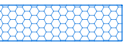
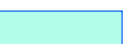




EROSION CONTROL DETAILS

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LEGEND

-  TEMPORARY CONSTRUCTION STAGING
-  EXISTING CONTOURS (1 FT. INTERVALS)
-  PROPERTY LINES
-  ORDINARY HIGH WATER
-  SILT FENCE, SEE $\frac{1}{G5}$
-  EXISTING HIGH FLOW CHANNEL
-  LIMIT OF DISTURBANCE
-  SURVEY BENCHMARK
-  REBAR
-  EXISTING LEVEE TO BE REMOVED
-  EXISTING WETLAND
-  2014 LOW WATER
-  PRESERVATION AREA
-  ORDINARY HIGH WATER (CLACKAMAS OHW)

NOTES:

1. NATURAL COLOR ORTHO-RECTIFIED AERIAL IMAGERY FOR THE PORTLAND METROPOLITAN AREA COLLECTED JULY 30-AUGUST 11, 2014.
2. EXISTING CONTOURS DERIVED FROM LIDAR DATA AND ON SITE SURVEYS CONDUCTED BY INTER-FLUVE, INC. TOPOGRAPHY WITHIN THE AREA OF DISTURBANCE IS BASED ON ON SITE SURVEY DATA. LIDAR DATA COLLECTED FROM JULY 9 TO SEPTEMBER 7 2014 SHOWS TOPOGRAPHY OUTSIDE OF THE AREA OF DISTURBANCE.
3. PROPERTY LINES ARE APPROXIMATE.
4. METRO MAINTENANCE TO BE 2 - SEASON ACCESS FOR 4 - YEAR VEGETATION MAINTENANCE.

SELECTED SURVEY BENCHMARKS

Point #	Northing	Easting	Elevation	Description
30000028	628619.094	714299.481	195.435	REBAR
30000051	628507.282	714333.521	192.740	REBAR
30000500	629610.747	713134.826	184.631	BM 500

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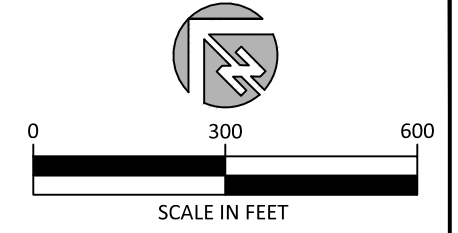
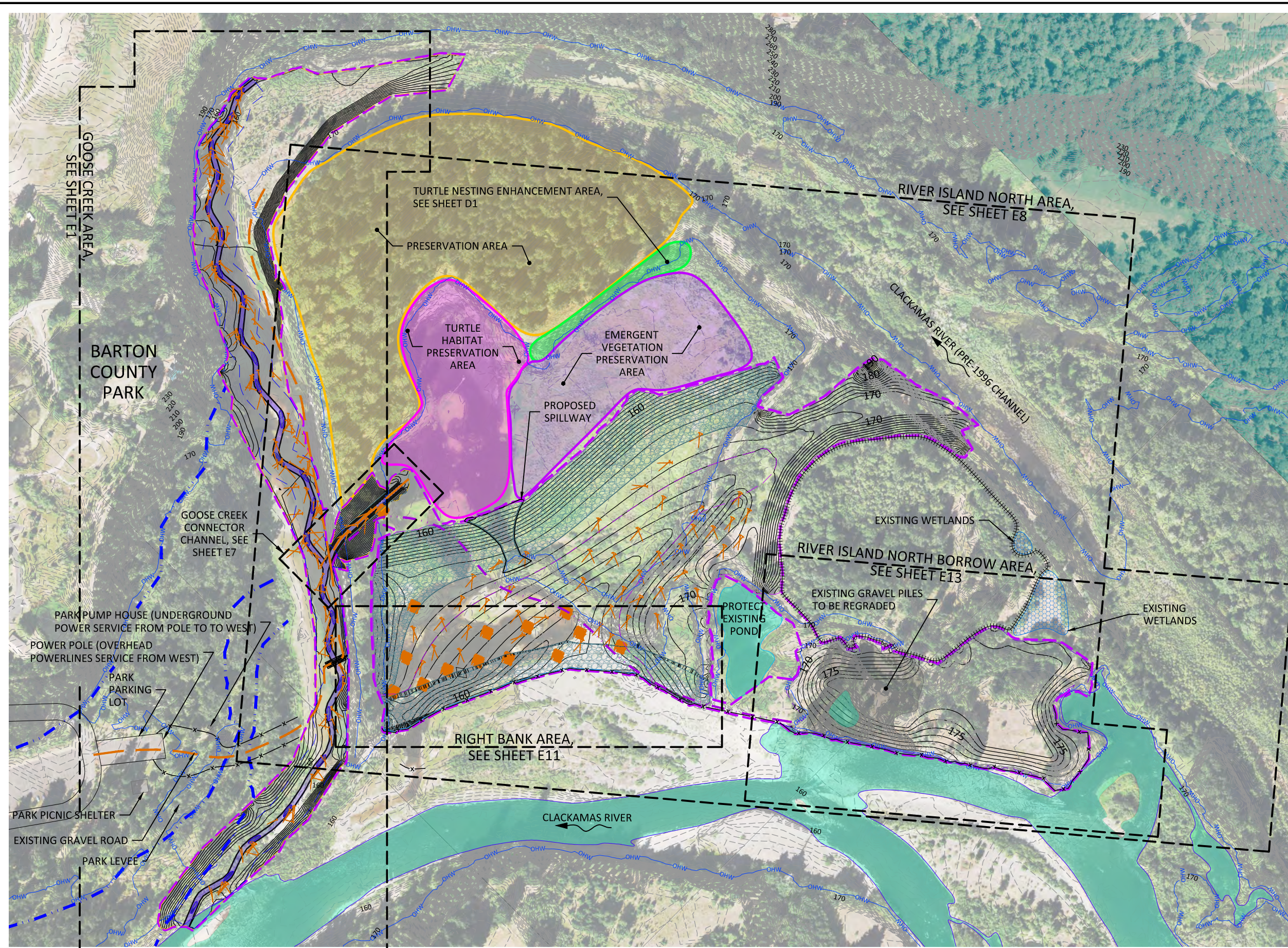
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CLACKAMAS COUNTY, OREGON



EXISTING SITE, ACCESS,
STAGING, ESC AND SURVEY
CONTROL

SHEET
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LEGEND

- TEMPORARY CONSTRUCTION STAGING
- PRESERVATION AREA
- TURTLE HABITAT PRESERVATION AREA
- TURTLE NESTING ENHANCEMENT AREA
- EMERGENT VEGETATION PRESERVATION AREA
- EXISTING CONTOURS (1 FT. INTERVALS)
- PROPOSED CONTOURS (1 FT. INTERVALS)
- TEMPORARY ACCESS
- LIMIT OF DISTURBANCE
- EXISTING HIGH FLOW CHANNEL
- FLOODPLAIN LARGE WOOD $\frac{1}{D3}$
- BURIED LOG JAM $\frac{3}{D2}$

NOTES:

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3. PROPERTY LINES ARE APPROXIMATE.

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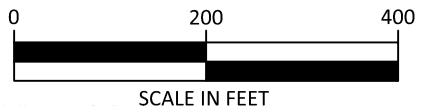
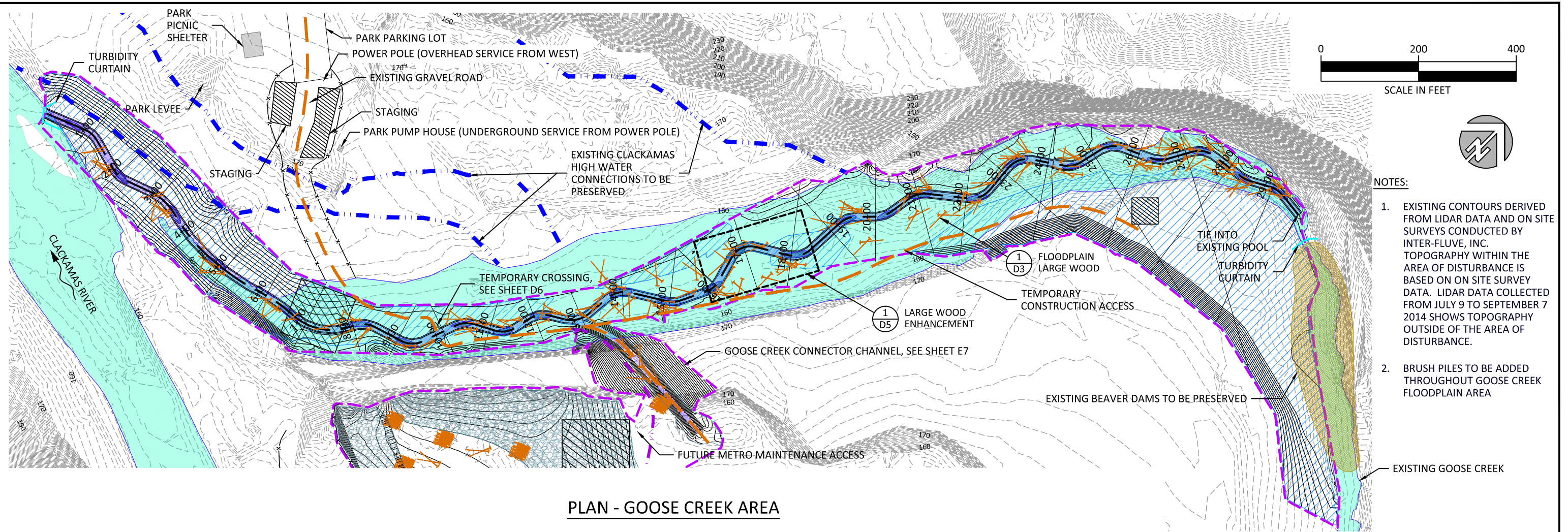
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METRO
CLACKAMAS COUNTY, OREGON



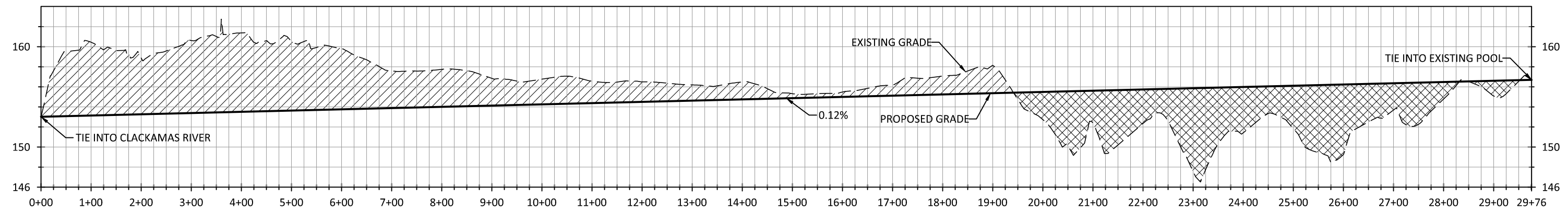
PROPOSED DESIGN AND SHEET
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- NOTES:**
- EXISTING CONTOURS DERIVED FROM LIDAR DATA AND ON SITE SURVEYS CONDUCTED BY INTER-FLUVE, INC. TOPOGRAPHY WITHIN THE AREA OF DISTURBANCE IS BASED ON ON SITE SURVEY DATA. LIDAR DATA COLLECTED FROM JULY 9 TO SEPTEMBER 7 2014 SHOWS TOPOGRAPHY OUTSIDE OF THE AREA OF DISTURBANCE.
 - BRUSH PILES TO BE ADDED THROUGHOUT GOOSE CREEK FLOODPLAIN AREA



- LEGEND**
- EXISTING CONTOURS (1 FT. INTERVALS)
 - PROPOSED CONTOURS (1FT. INTERVALS)
 - - - LIMIT OF DISTURBANCE
 - TEMPORARY ACCESS, TRIPS TO BE MINIMIZED
 - POOL ENHANCEMENT
 - x-x- SILT FENCE
 - ▨ CUT
 - ▩ FILL
 - ▨ AREA OF COARSE MATERIAL CUT (TO BE SORTED AND UTILIZED FOR RIGHT BANK TREATMENT - SEE SHEET E11)
 - ▨ TEMPORARY CONSTRUCTION STAGING

A
E1

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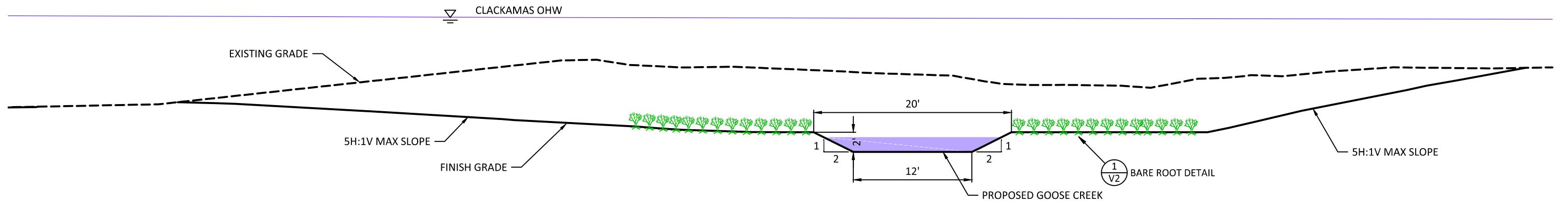
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GOOSE CREEK PLAN AND PROFILE

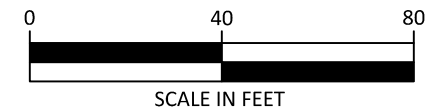
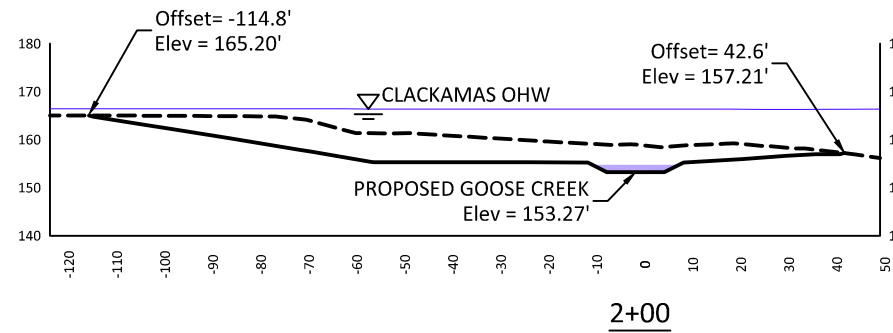
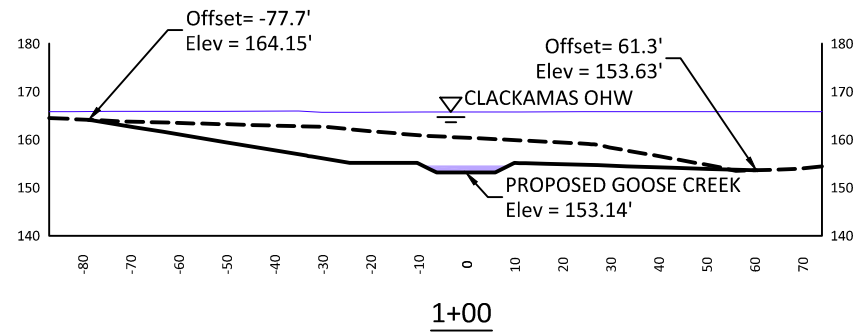
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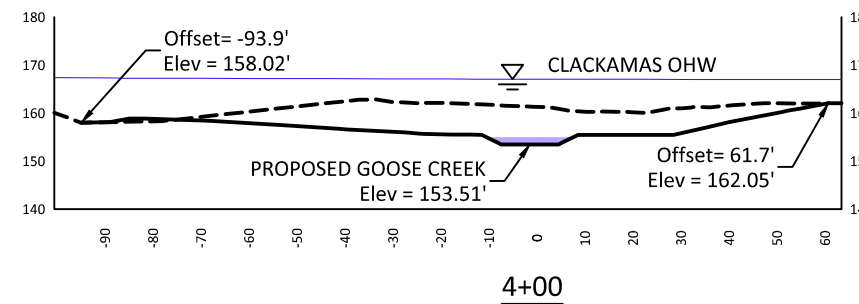
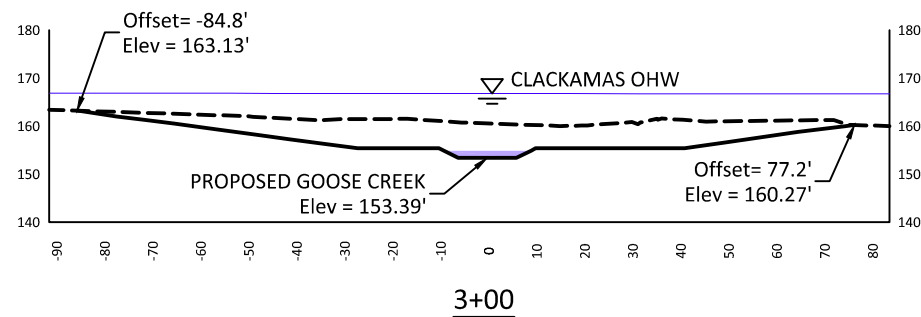
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E2

TYPICAL GOOSE CREEK CHANNEL CROSS-SECTION

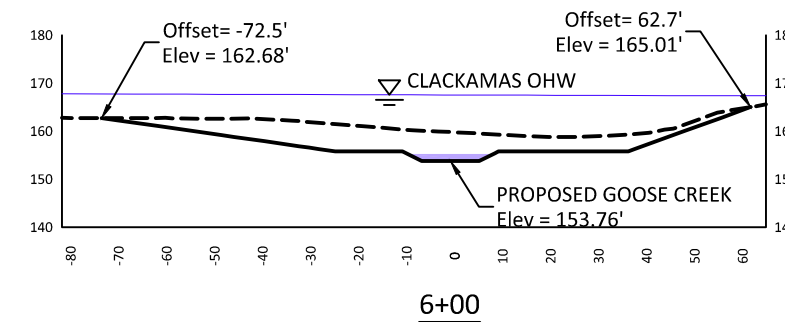
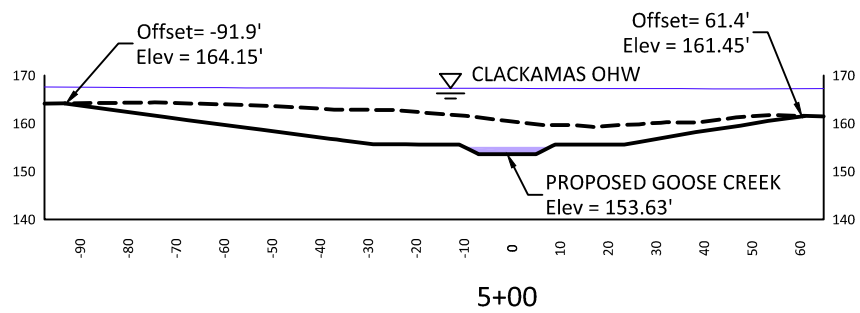


LEGEND

- CLACKAMAS OHW
- EXISTING GRADE
- FINISH GRADE



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GOOSE CREEK SECTIONS 1+00
TO 6+00

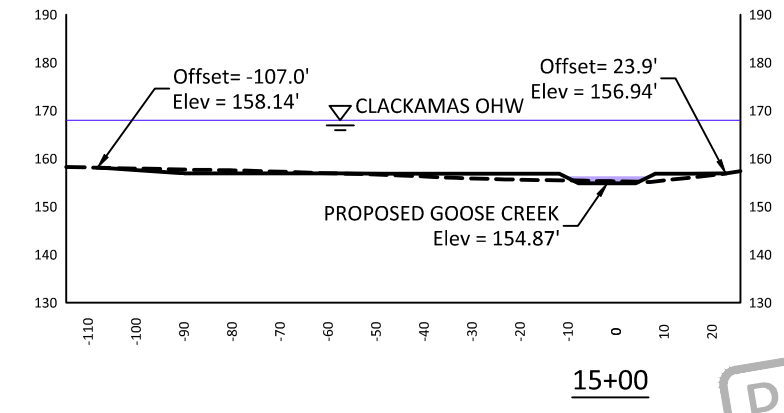
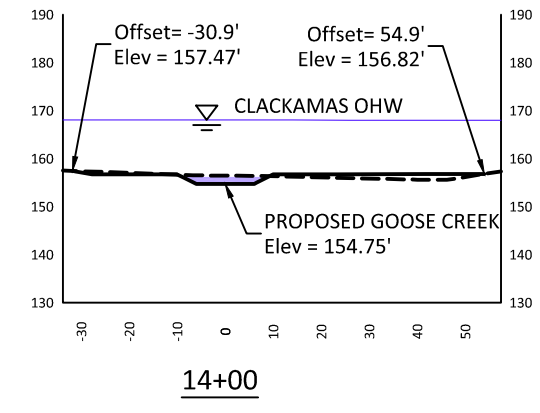
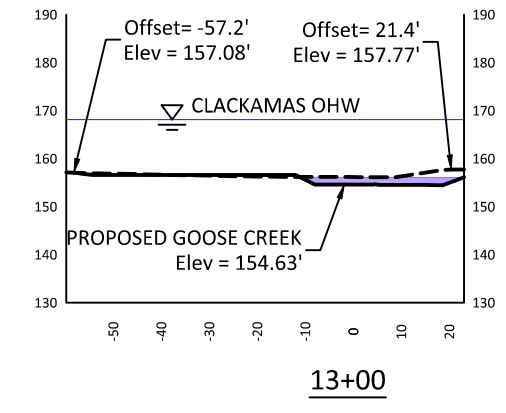
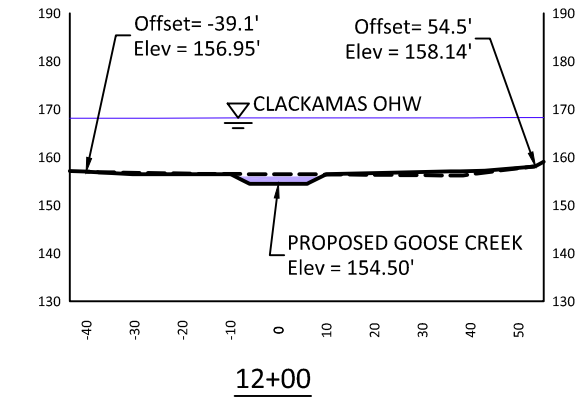
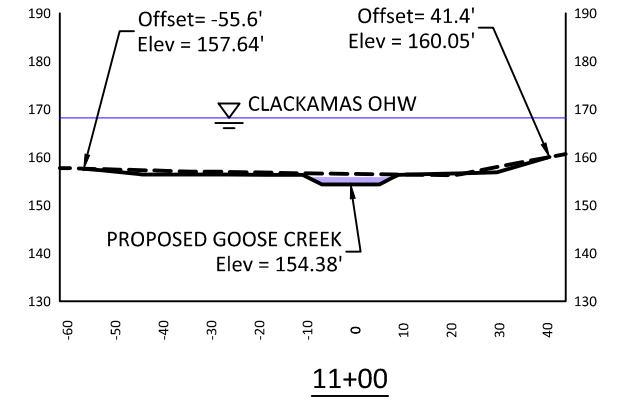
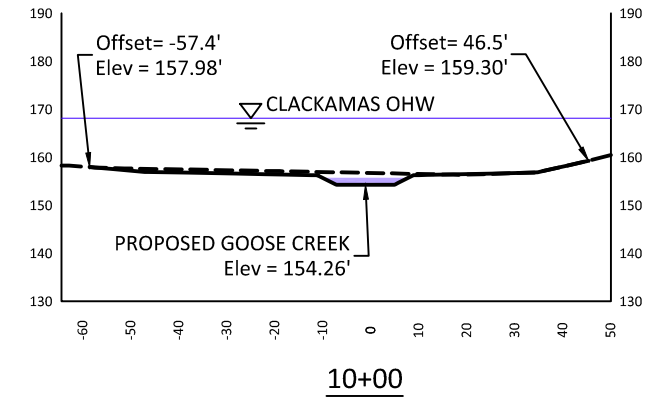
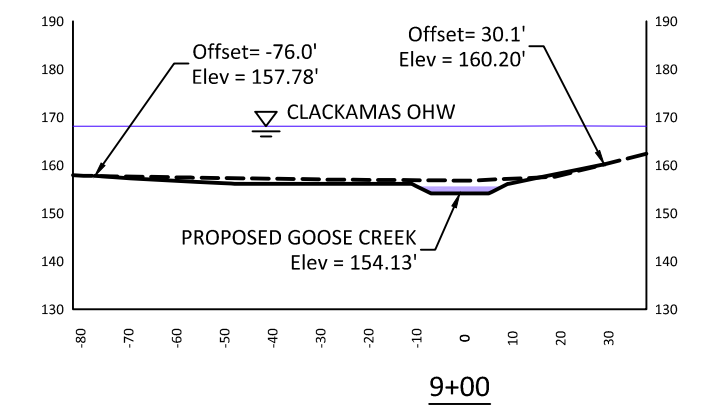
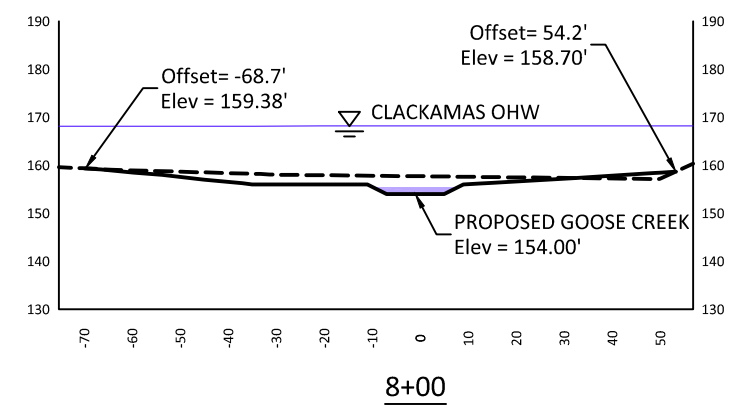
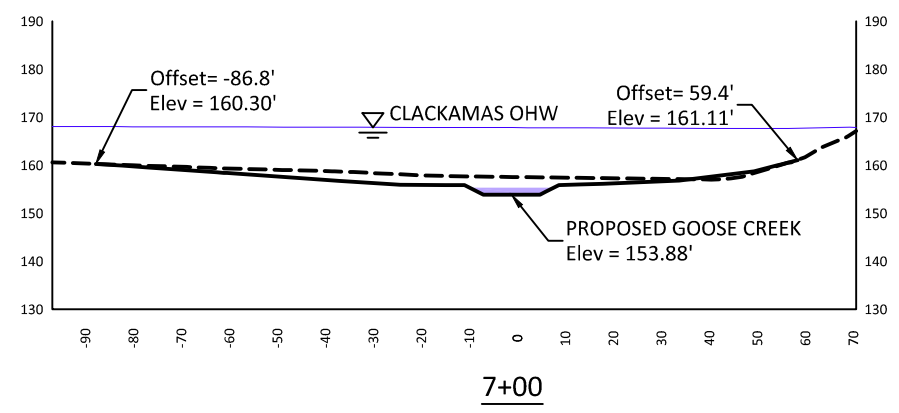
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LEGEND

- CLACKAMAS OHW
- EXISTING GRADE
- FINISH GRADE



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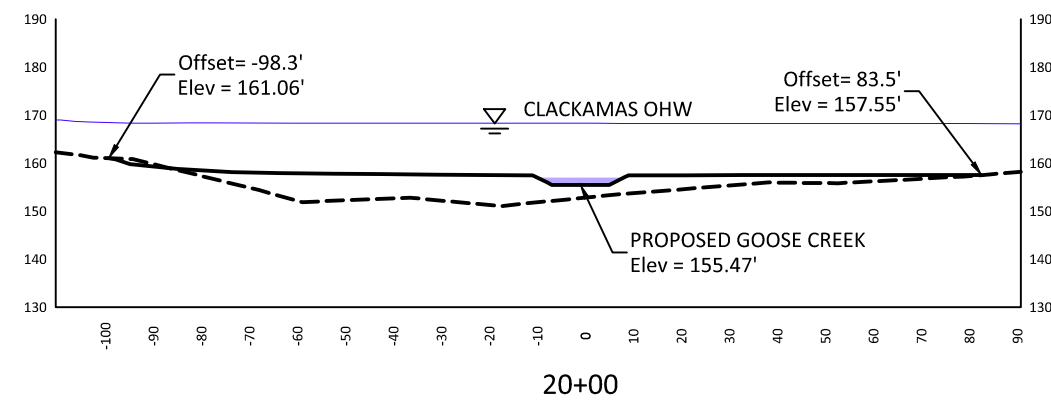
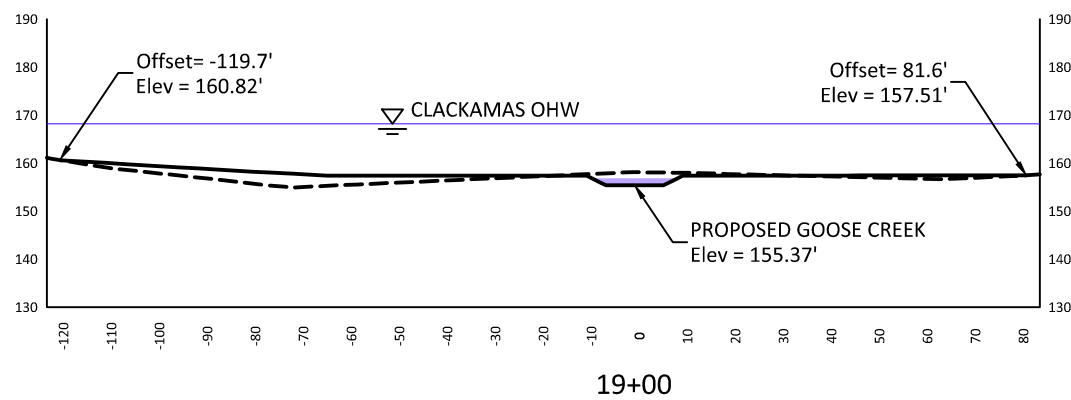
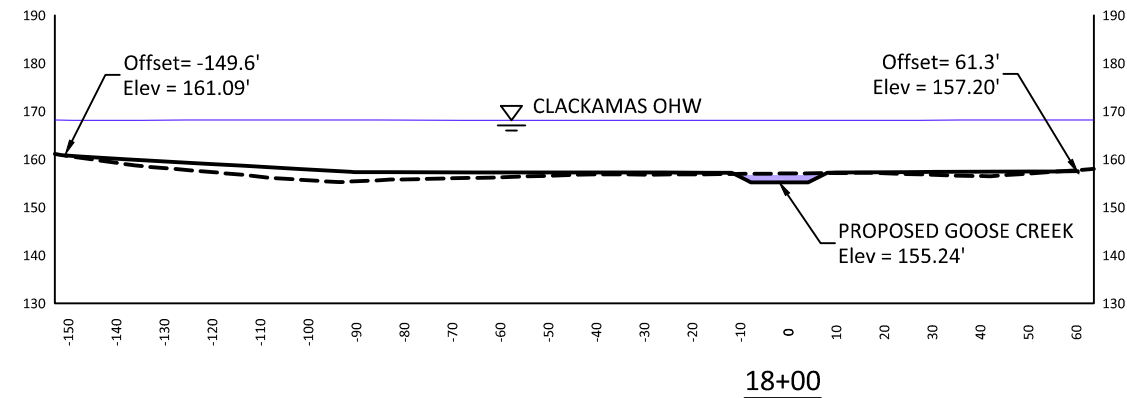
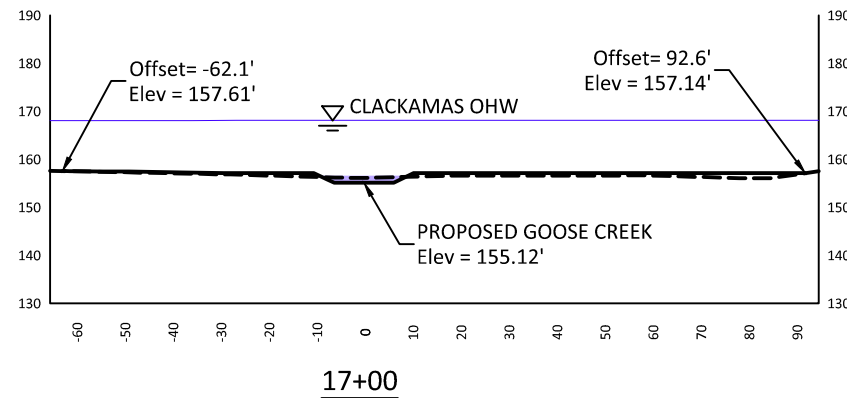
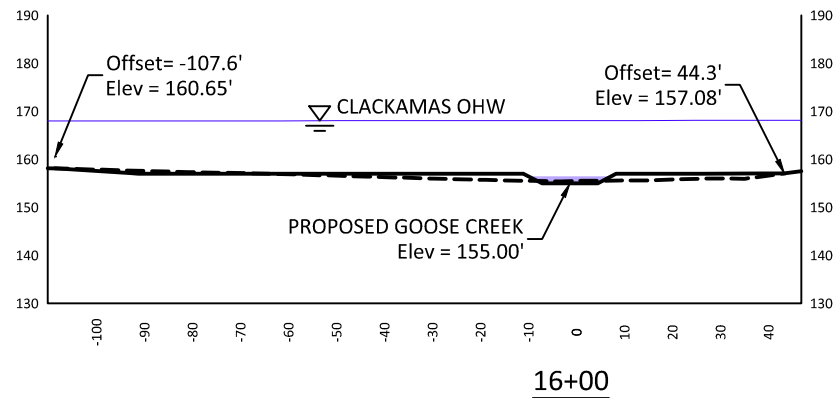
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MM APPROVED	AUG 2015 DATE	130235 PROJECT

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METRO
CLACKAMAS COUNTY, OREGON

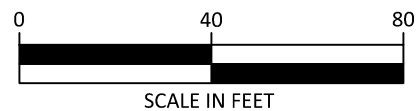
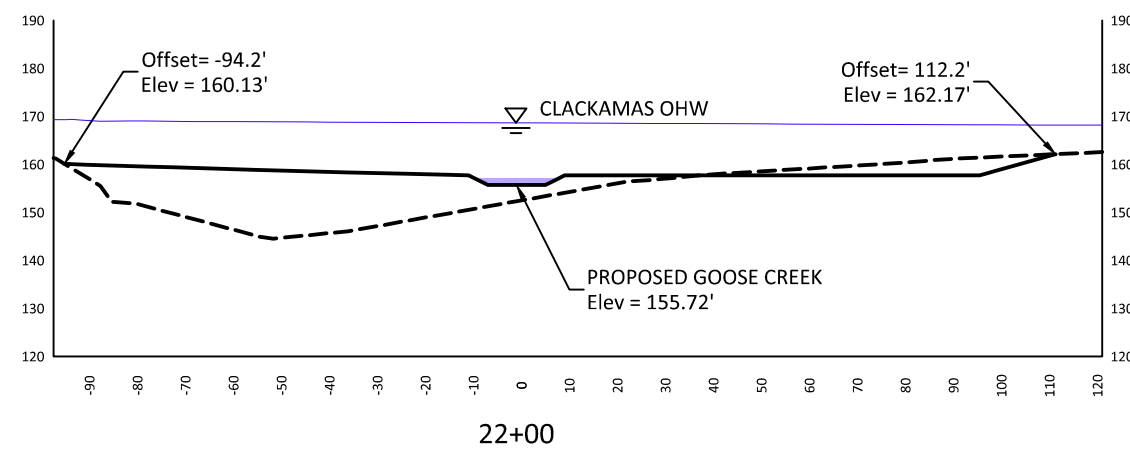
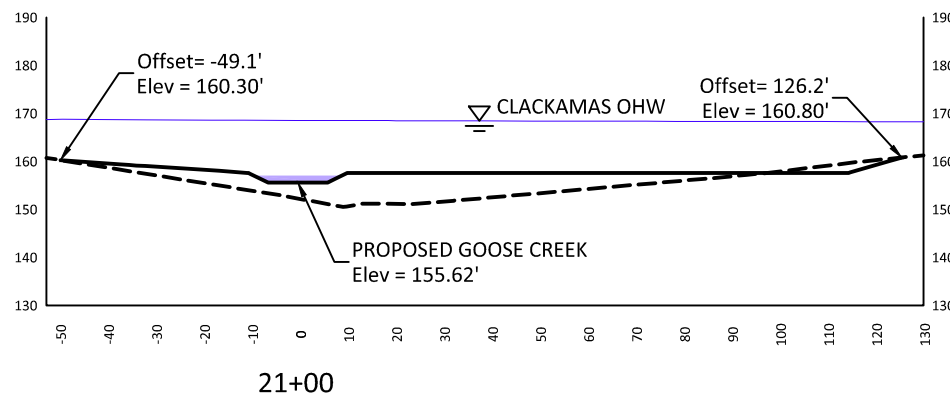


GOOSE CREEK SECTIONS 7+00
TO 15+00

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LEGEND

- CLACKAMAS OHW ———
- EXISTING GRADE - - - - -
- FINISH GRADE ———

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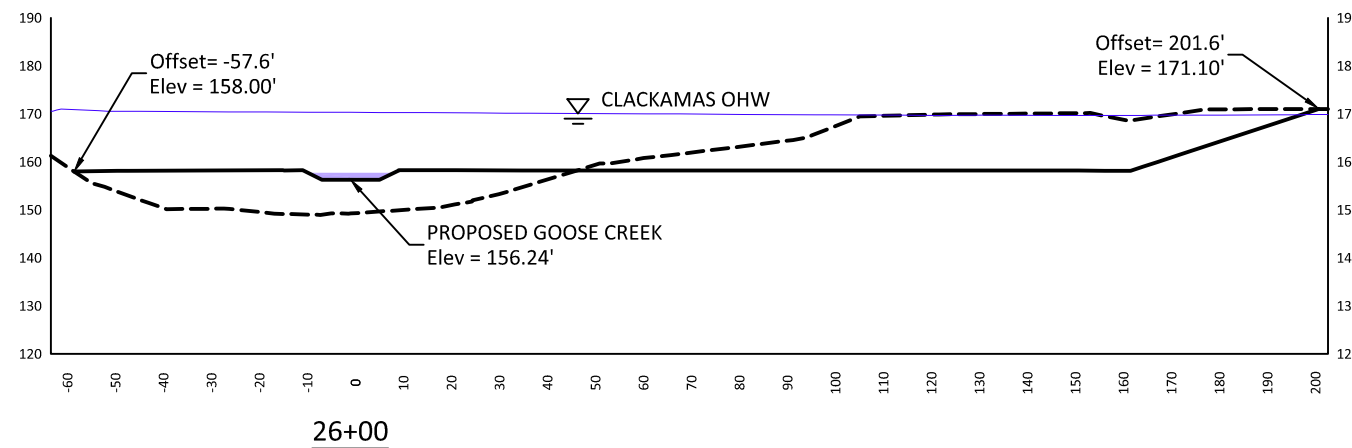
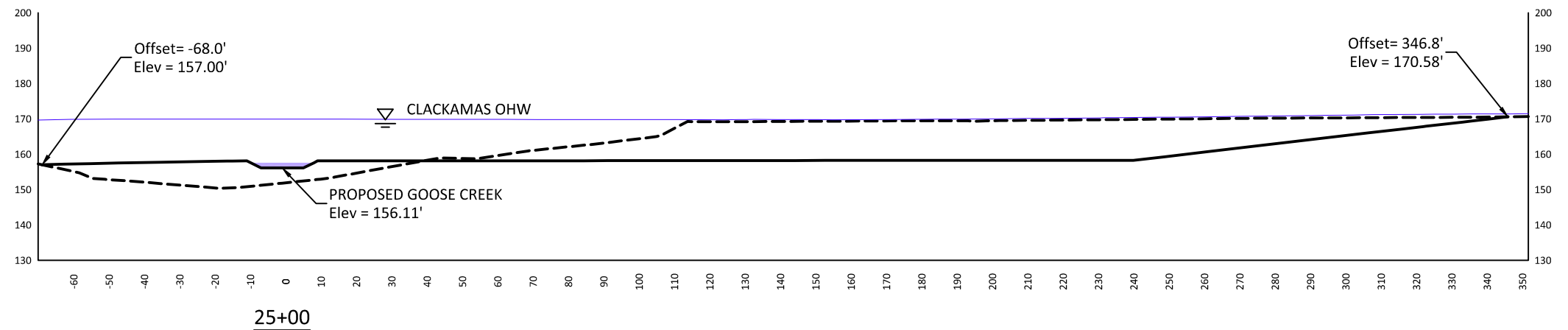
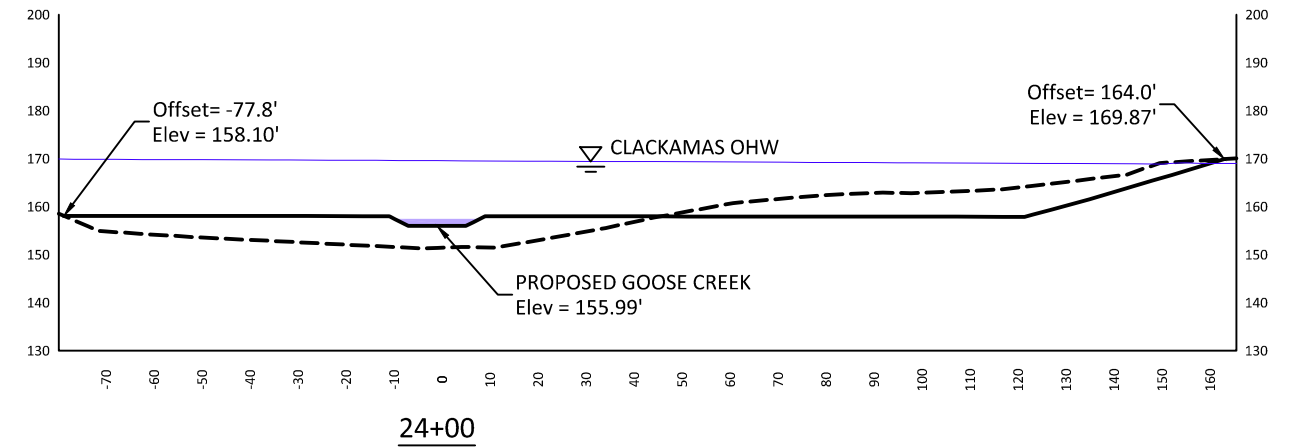
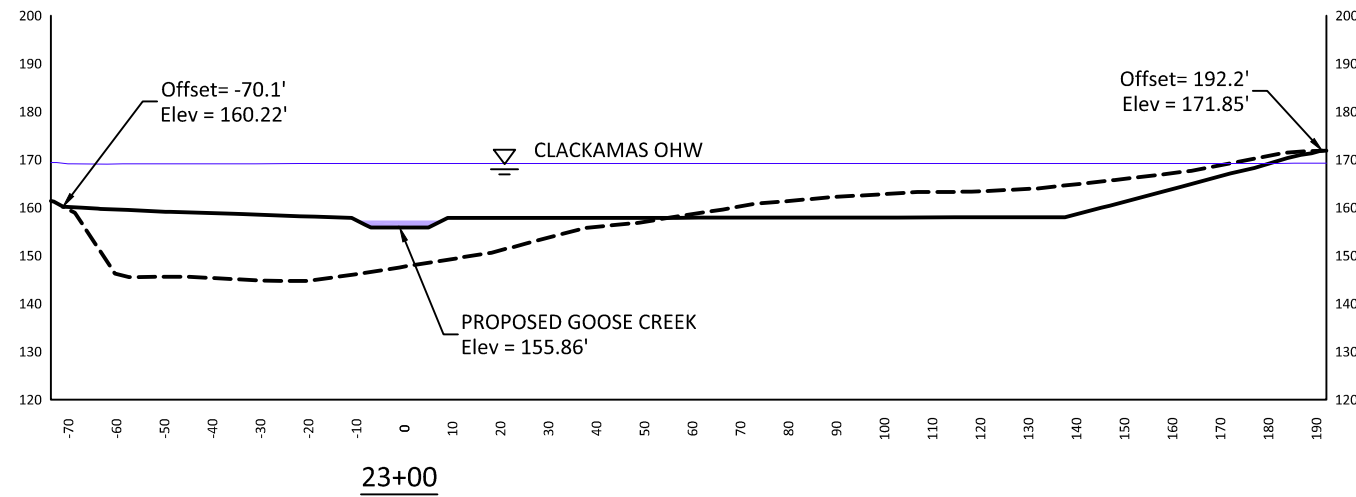
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GOOSE CREEK SECTIONS 16+00
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LEGEND

- CLACKAMAS OHW ———
- EXISTING GRADE - - - - -
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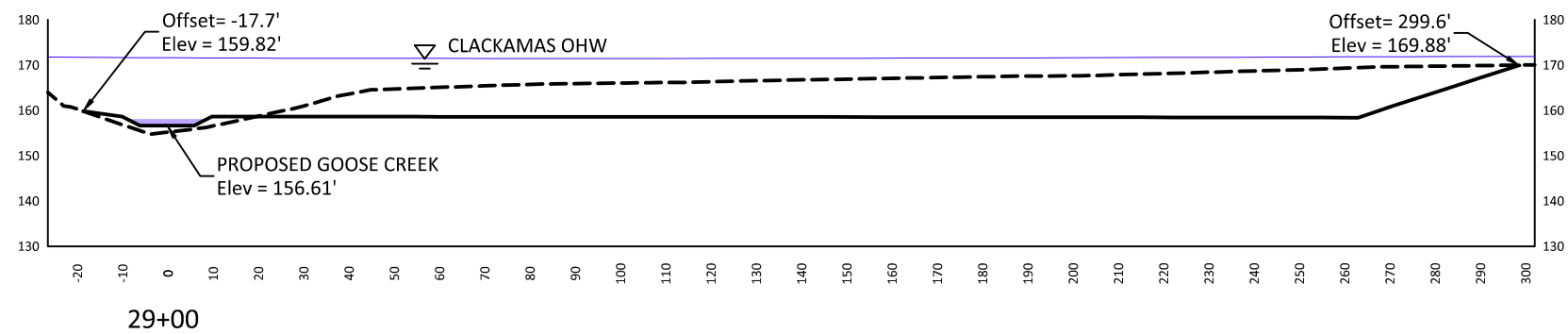
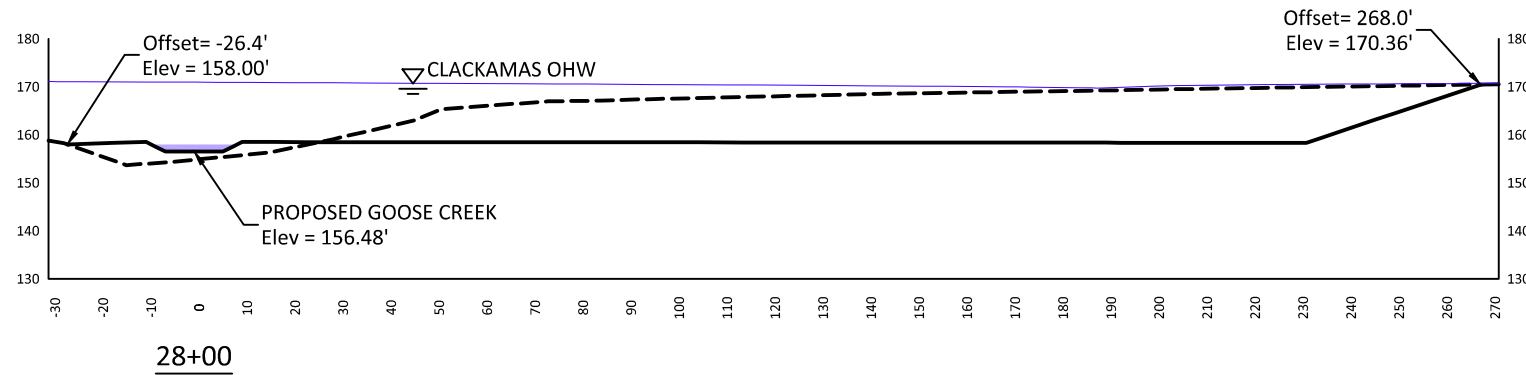
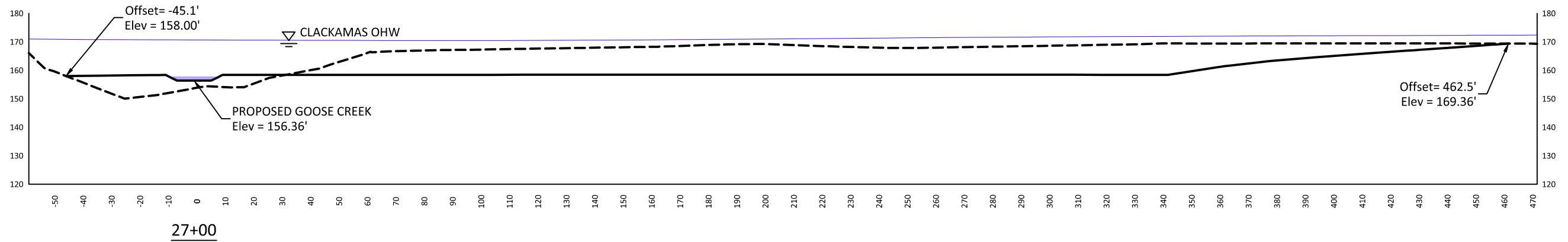
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METRO
CLACKAMAS COUNTY, OREGON



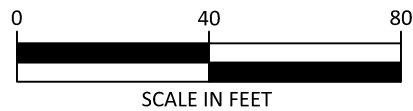
GOOSE CREEK SECTIONS 23+00
TO 26+00

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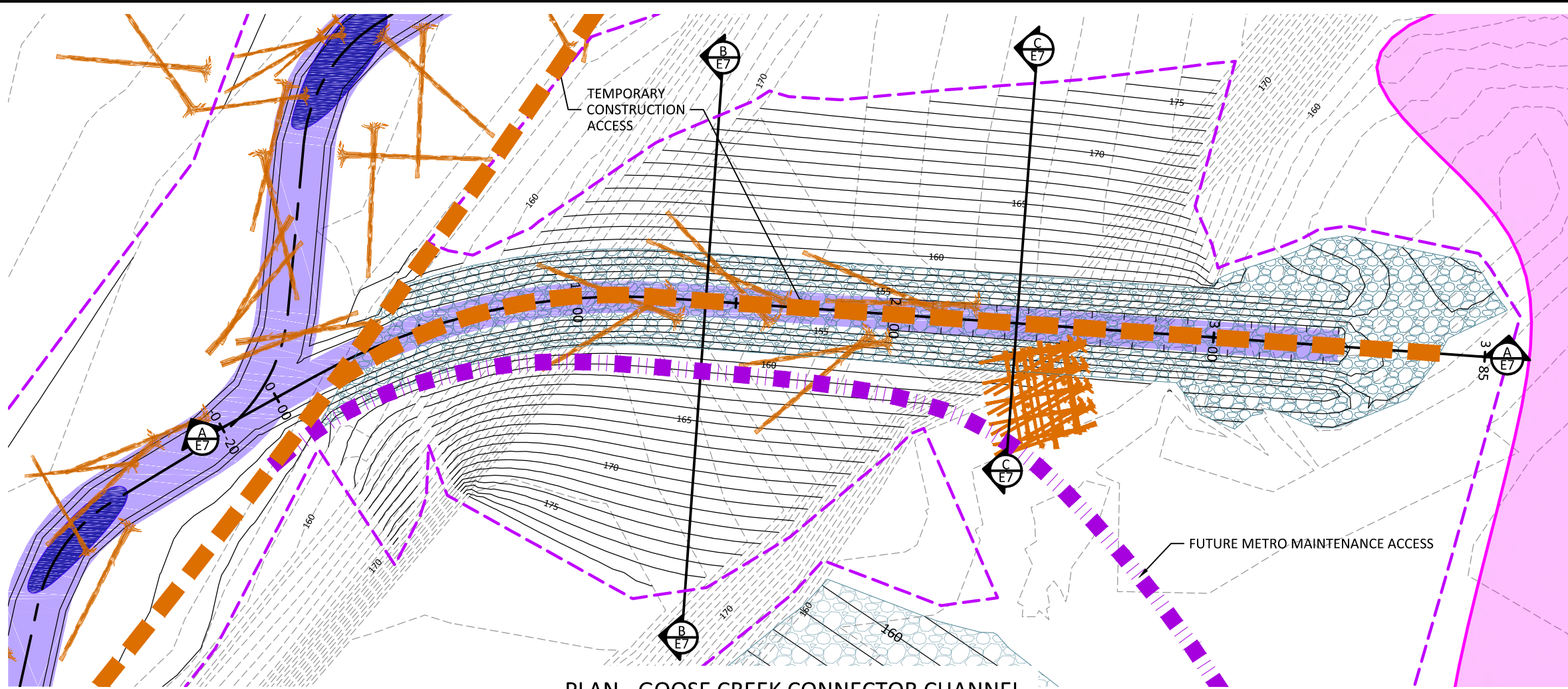


GOOSE CREEK SECTIONS 27+00
TO 29+00

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E6 OF 29

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PLAN - GOOSE CREEK CONNECTOR CHANNEL

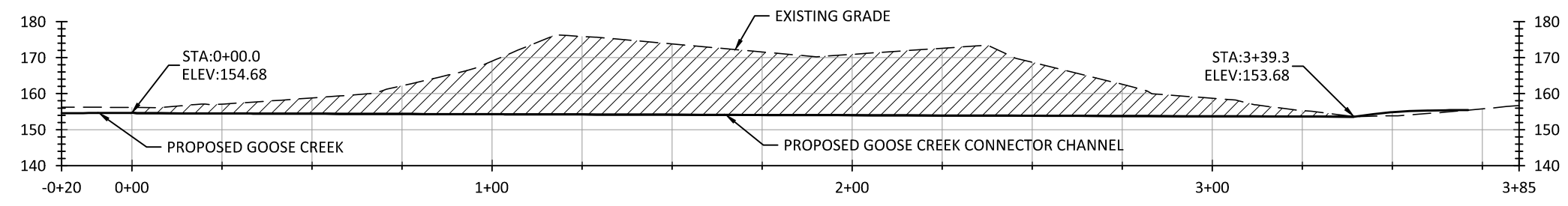


LEGEND

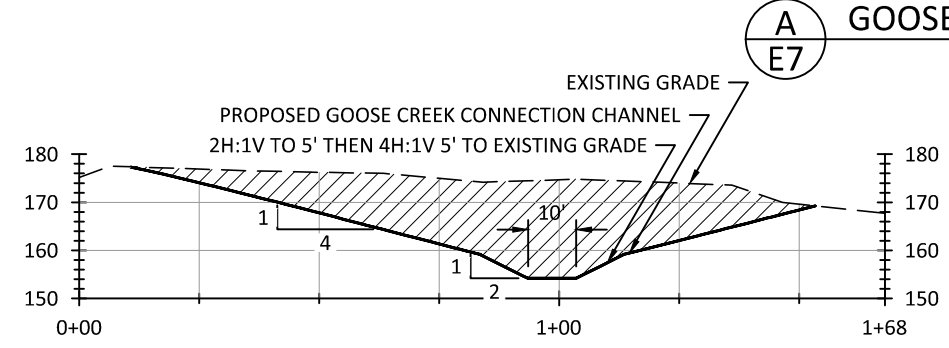
- COARSE FILL (NATIVE GRAVEL/COBBLE)
- CUT
- TURTLE HABITAT PRESERVATION AREA
- EXISTING CONTOURS (1 FT. INTERVALS)
- PROPOSED CONTOURS (1 FT. INTERVALS)
- TEMPORARY ACCESS ROAD
- FUTURE METRO MAINTENANCE ACCESS
- LIMIT OF DISTURBANCE
- FLOODPLAIN LARGE WOOD, SEE $\frac{1}{D3}$
- BURIED LOG STRUCTURE, SEE $\frac{3}{D2}$

NOTES:

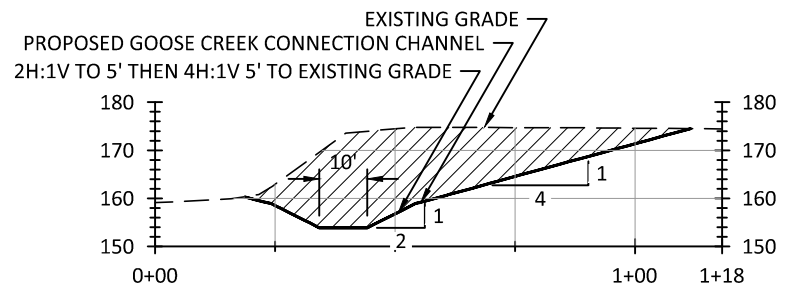
1. EXISTING CONTOURS DERIVED FROM LIDAR DATA AND ON SITE SURVEYS CONDUCTED BY INTER-FLUVE, INC. TOPOGRAPHY WITHIN THE AREA OF DISTURBANCE IS BASED ON ON SITE SURVEY DATA. LIDAR DATA COLLECTED FROM JULY 9 TO SEPTEMBER 7 2014 SHOWS TOPOGRAPHY OUTSIDE OF THE AREA OF DISTURBANCE.
2. METRO MAINTENANCE TO BE 2 - SEASON ACCESS FOR 5 - YEAR VEGETATION MAINTENANCE.



GOOSE CREEK CONNECTOR CHANNEL PROFILE



B
E7
GOOSE CREEK CONNECTOR CHANNEL SECTION



C
E7
GOOSE CREEK CONNECTOR CHANNEL SECTION

Preliminary
Not for Construction

PERMIT SUBMITTAL

NO.	BY	DATE	REVISION DESCRIPTION

LK,RP,SM DRAWN	EA,MM DESIGNED	JK CHECKED
MM APPROVED	AUG 2015 DATE	130235 PROJECT

RIVER ISLAND NORTH PRELIMINARY DESIGN
METRO
CLACKAMAS COUNTY, OREGON

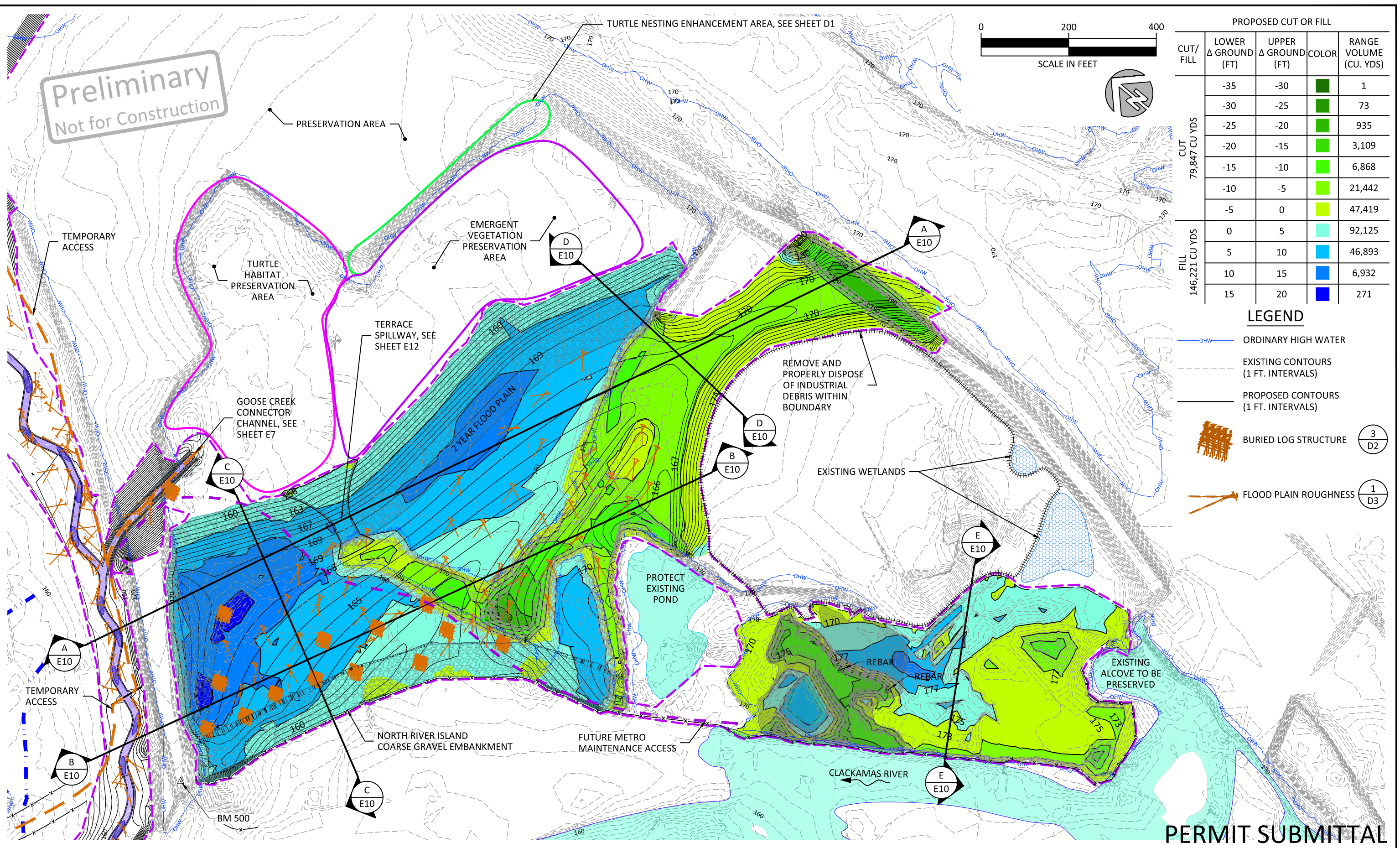


GOOSE CREEK CONNECTOR CHANNEL

SHEET
E7 OF 29

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Not for Construction



PROPOSED CUT OR FILL				
CUT/ FILL	LOWER Δ GROUND (FT)	UPPER Δ GROUND (FT)	COLOR	RANGE VOLUME (CU. YDS)
CUT	-35	-30	Dark Green	1
	-30	-25	Green	73
	-25	-20	Light Green	935
	-20	-15	Yellow-Green	3,109
	-15	-10	Yellow	6,868
	-10	-5	Light Yellow	21,442
	-5	0	Yellow-Orange	47,419
FILL	0	5	Light Cyan	92,125
	5	10	Cyan	46,893
	10	15	Blue	6,932
	15	20	Dark Blue	271

- LEGEND**
- OHW — ORDINARY HIGH WATER
 - EXISTING CONTOURS (1 FT. INTERVALS)
 - PROPOSED CONTOURS (1 FT. INTERVALS)
 - BURIED LOG STRUCTURE (Symbol: 3/D2)
 - FLOOD PLAIN ROUGHNESS (Symbol: 1/D3)

NO.	BY	DATE	REVISION DESCRIPTION

LK,RP,SM DRAWN	EA,MM DESIGNED	JK CHECKED
MM APPROVED	AUG 2015 DATE	130235 PROJECT

RIVER ISLAND NORTH PRELIMINARY DESIGN
METRO
CLACKAMAS COUNTY, OREGON

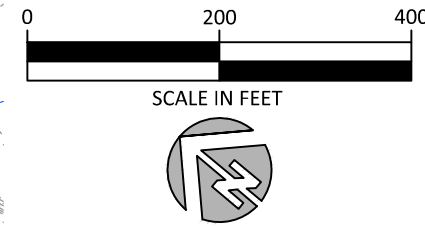


**RIVER ISLAND NORTH CUT-FILL
PLAN**

SHEET
E8 OF 29

PERMIT SUBMITTAL

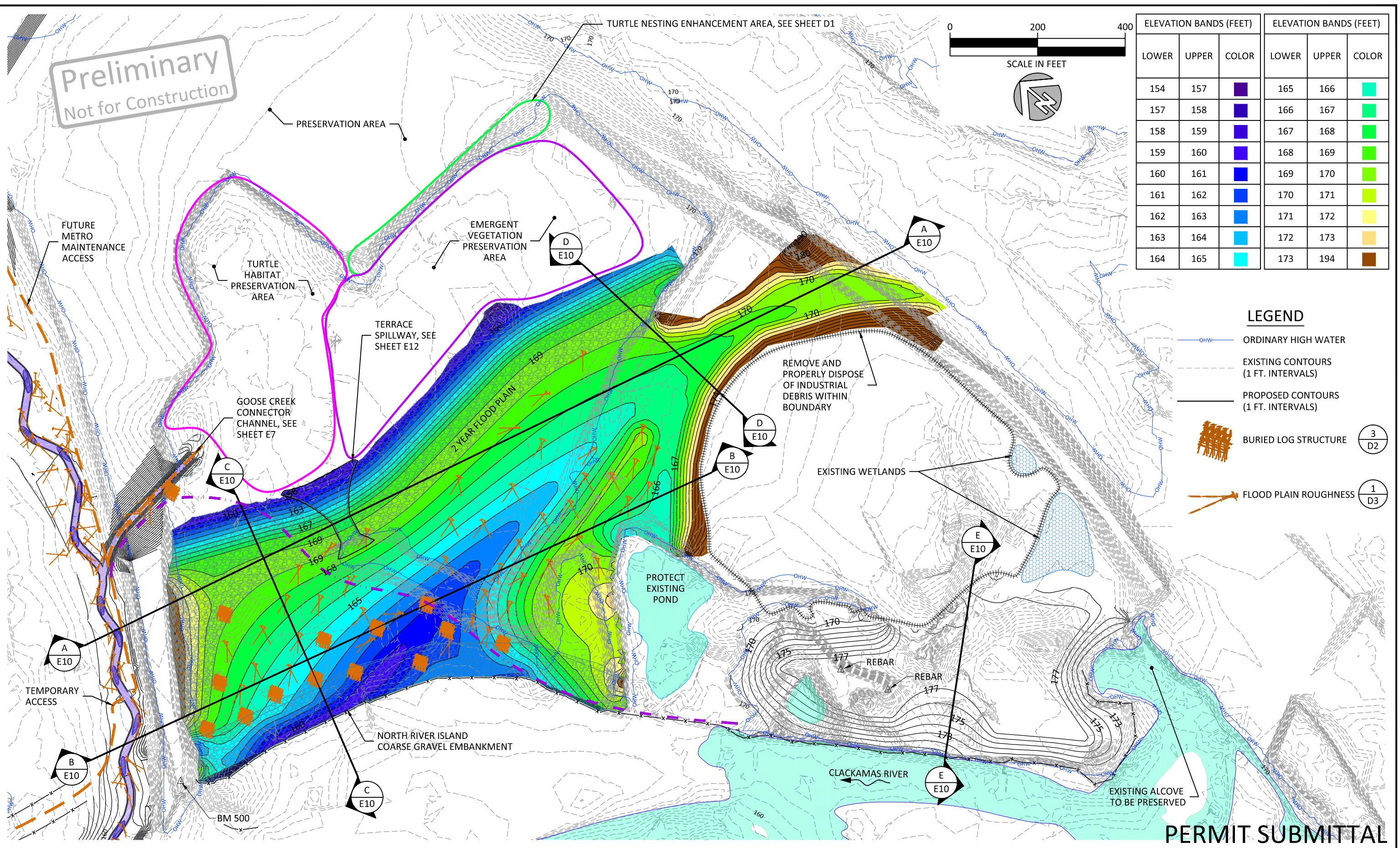
Preliminary
Not for Construction



ELEVATION BANDS (FEET)			ELEVATION BANDS (FEET)		
LOWER	UPPER	COLOR	LOWER	UPPER	COLOR
154	157	Dark Purple	165	166	Light Green
157	158	Medium Purple	166	167	Light Green
158	159	Dark Blue	167	168	Light Green
159	160	Blue	168	169	Light Green
160	161	Light Blue	169	170	Light Green
161	162	Light Blue	170	171	Light Green
162	163	Light Blue	171	172	Light Green
163	164	Light Blue	172	173	Light Green
164	165	Light Blue	173	194	Light Green

LEGEND

- ORDINARY HIGH WATER
- EXISTING CONTOURS (1 FT. INTERVALS)
- PROPOSED CONTOURS (1 FT. INTERVALS)
- BURIED LOG STRUCTURE $\frac{3}{D2}$
- FLOOD PLAIN ROUGHNESS $\frac{1}{D3}$



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NO.	BY	DATE	REVISION DESCRIPTION

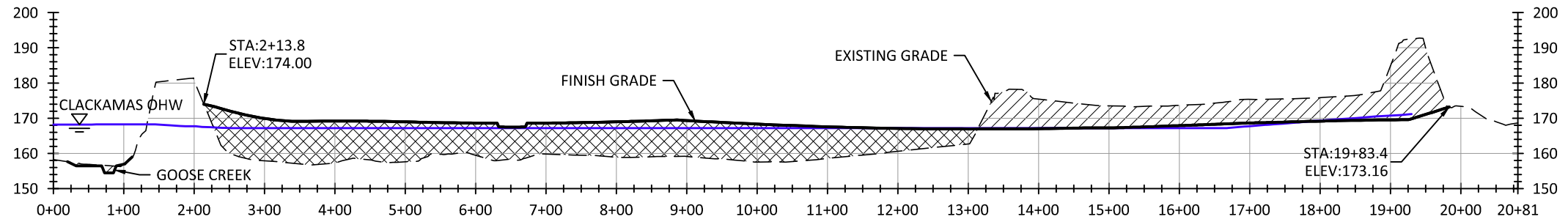
LK,RP,SM	EA,MM	JK
DRAWN	DESIGNED	CHECKED
MM	AUG 2015	130235
APPROVED	DATE	PROJECT

RIVER ISLAND NORTH PRELIMINARY DESIGN
METRO
CLACKAMAS COUNTY, OREGON

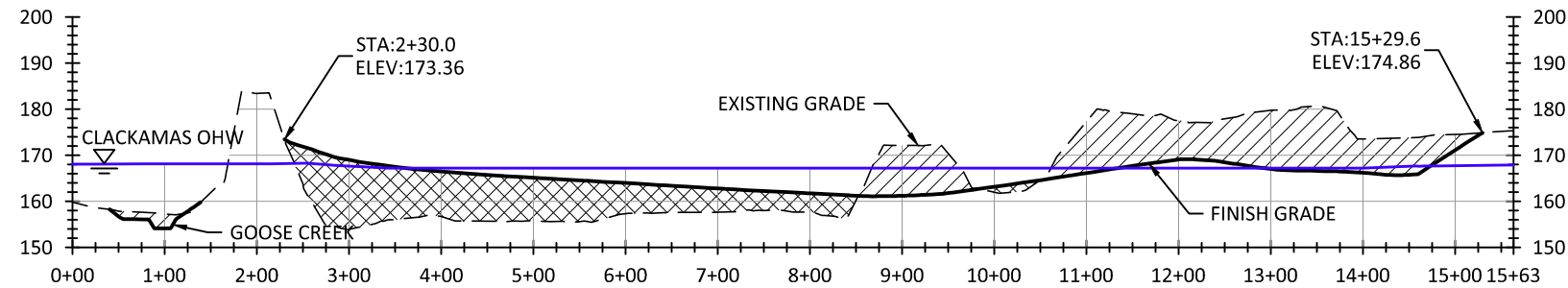


RIVER ISLAND NORTH
PROPOSED ELEVATION
BANDING

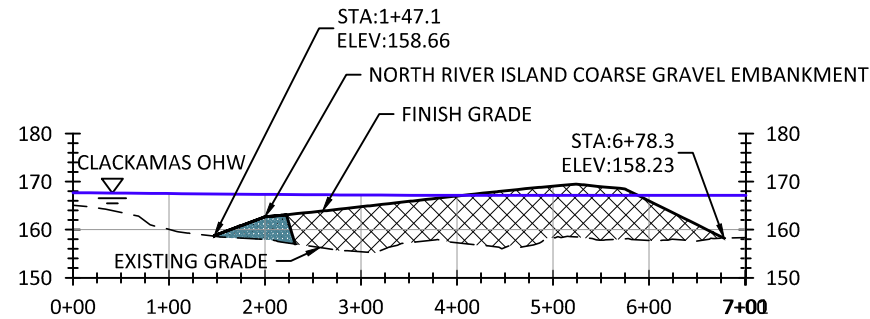
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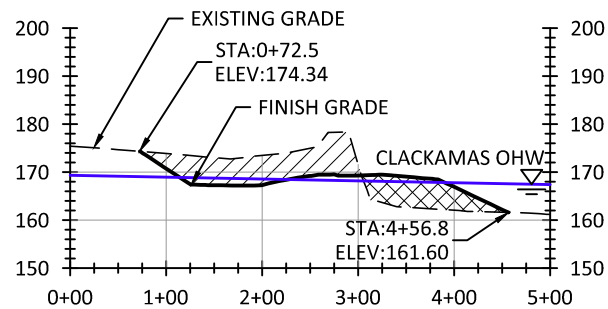
A
E10 RIVER ISLAND NORTH SECTION



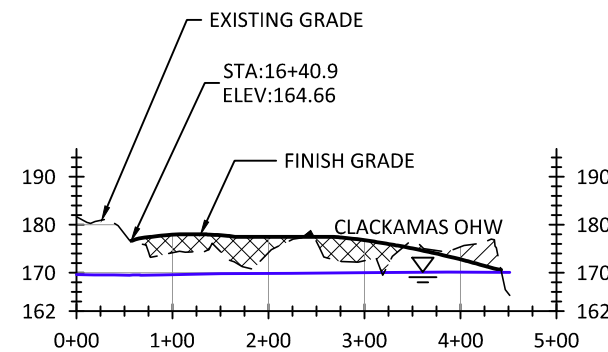
B
E10 RIVER ISLAND NORTH SECTION



C
E10 RIVER ISLAND NORTH SECTION



D
E10 RIVER ISLAND NORTH SECTION

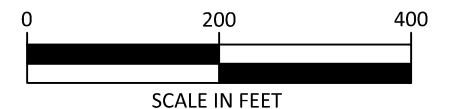


E
E10 RIVER ISLAND NORTH BORROW AREA SECTION

Preliminary
Not for Construction

LEGEND

- EXISTING GRADE
- FINISH GRADE
- ▨ CUT
- ▩ FILL



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NO.	BY	DATE	REVISION DESCRIPTION

LK,RP,SM	EA,MM	JK
DRAWN	DESIGNED	CHECKED
MM	AUG 2015	130235
APPROVED	DATE	PROJECT

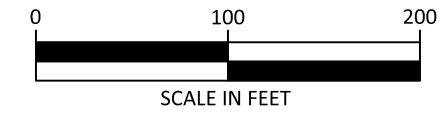
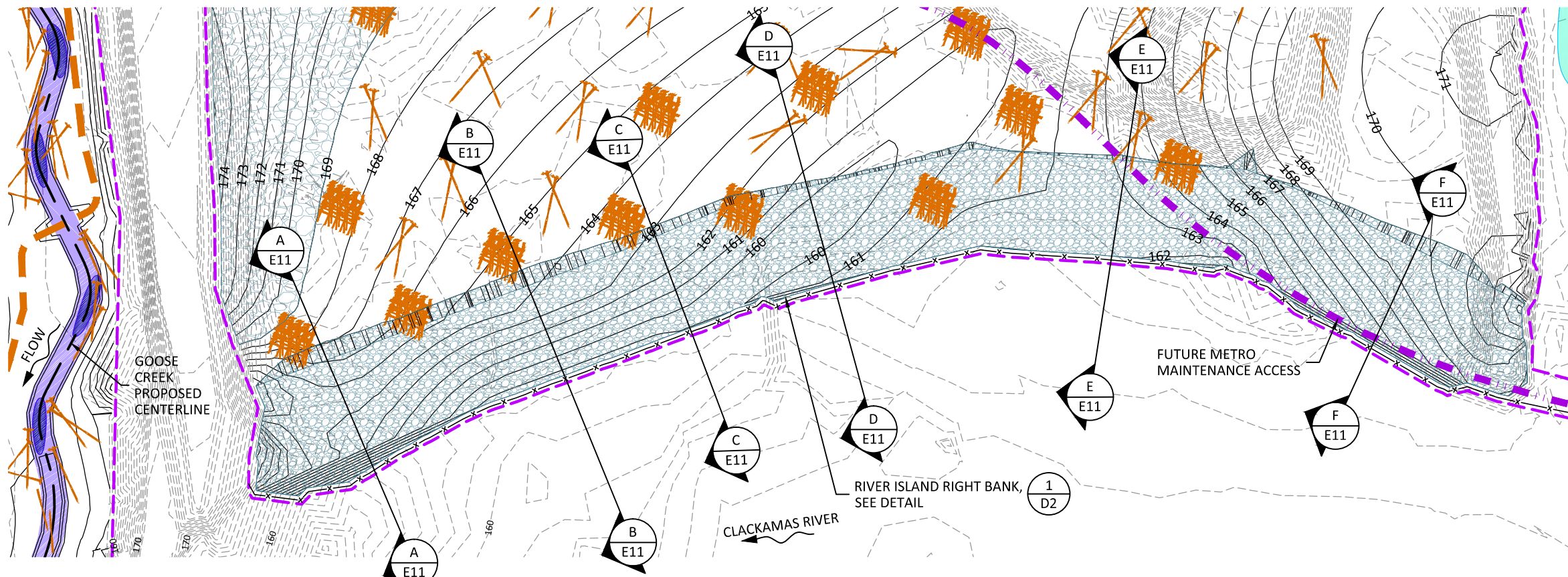
RIVER ISLAND NORTH PRELIMINARY DESIGN
METRO
CLACKAMAS COUNTY, OREGON







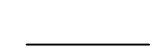





RIVER ISLAND NORTH PROFILES
A-E

SHEET
E10 OF 29

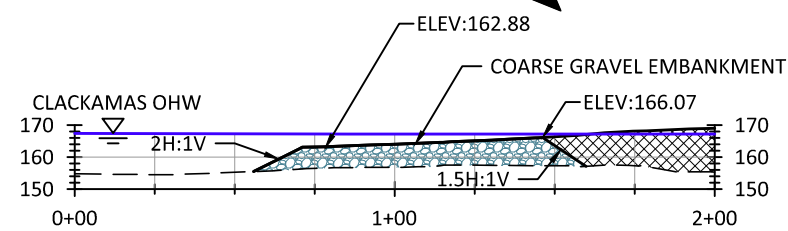
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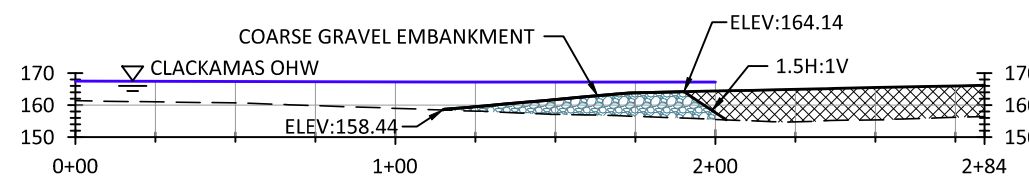
LEGEND

-  CUT
-  TYPE 2 FILL (NATIVE COBBLE, GRAVEL & SILT)
-  COARSE GRAVEL FILL (SMALL BOULDERS, COBBLE, GRAVEL)
-  EXISTING CONTOURS (1 FT. INTERVALS)
-  PROPOSED CONTOURS (1 FT. INTERVALS)
-  LIMIT OF DISTURBANCE
-  SILT FENCE
-  TEMPORARY ACCESS ROAD
-  FLOODPLAIN LARGE WOOD, SEE $\frac{1}{D3}$
-  BURIED LOG STRUCTURE, SEE $\frac{3}{D2}$

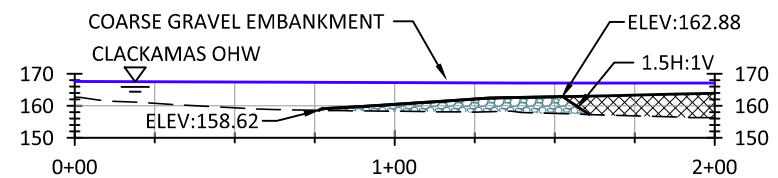
PLAN - RIGHT BANK



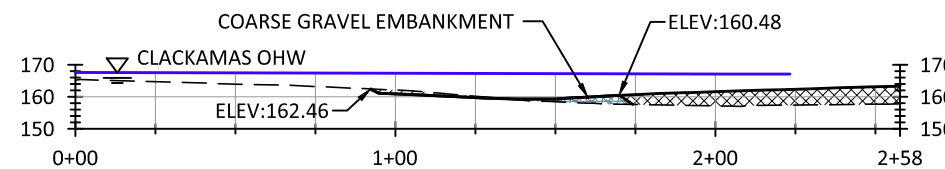
A RIGHT BANK
E11



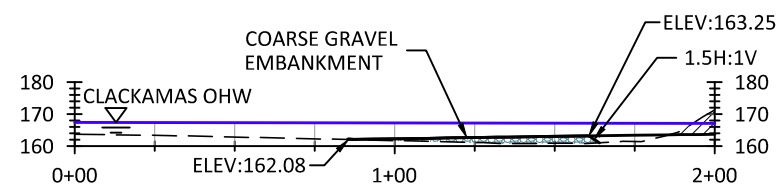
B RIGHT BANK
E11



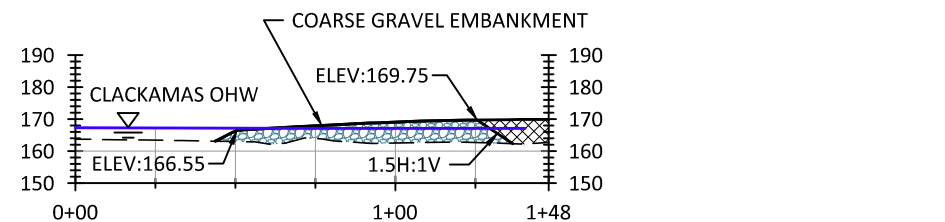
C RIGHT BANK
E11



D RIGHT BANK
E11



E RIGHT BANK
E11



F RIGHT BANK
E11

NOTES:

1. EXISTING CONTOURS DERIVED FROM LIDAR DATA AND ON SITE SURVEYS CONDUCTED BY INTER-FLUVE, INC. TOPOGRAPHY WITHIN THE AREA OF DISTURBANCE IS BASED ON ON SITE SURVEY DATA. LIDAR DATA COLLECTED FROM JULY 9 TO SEPTEMBER 7 2014 SHOWS TOPOGRAPHY OUTSIDE OF THE AREA OF DISTURBANCE.

Preliminary
Not for Construction

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LK,RP,SM	EA,MM	JK
DRAWN	DESIGNED	CHECKED
MM	AUG 2015	130235
APPROVED	DATE	PROJECT

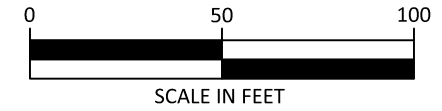
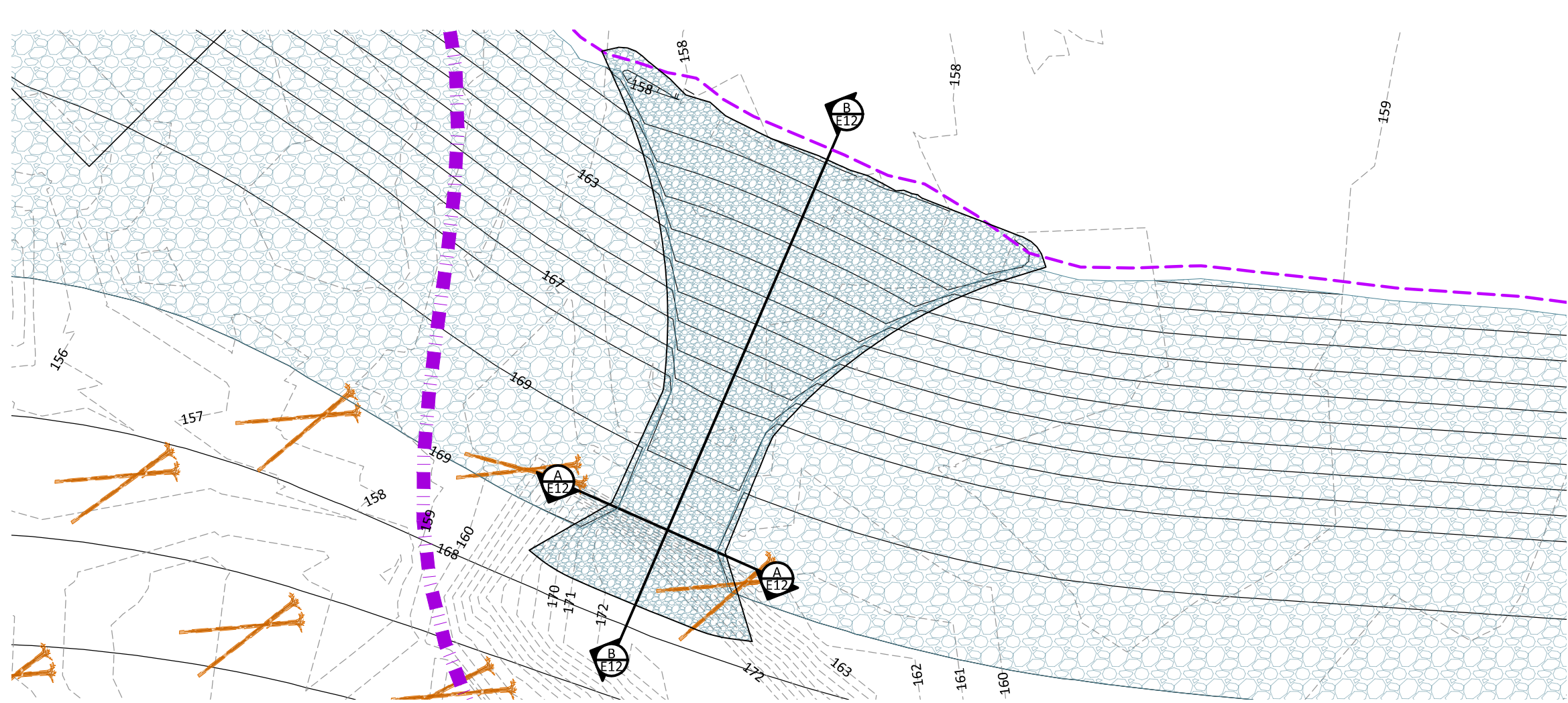
RIVER ISLAND NORTH PRELIMINARY DESIGN
METRO
CLACKAMAS COUNTY, OREGON



RIVER ISLAND NORTH - RIGHT BANK PLAN AND SECTIONS

SHEET
E11 OF 29

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LEGEND

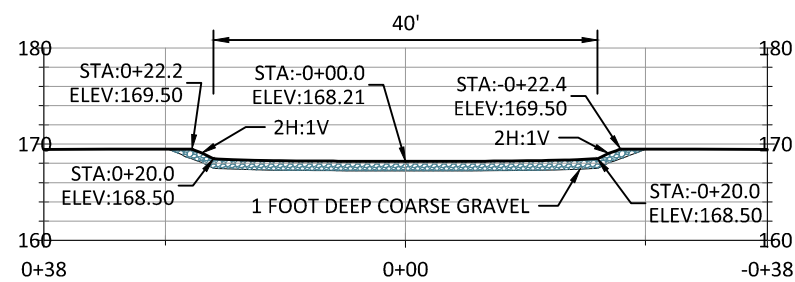
- CUT
- COARSE GRAVEL FILL (SMALL BOULDERS, COBBLE, GRAVEL) IN SPILLWAY
- COARSE GRAVEL FILL CAP (PLACED ALONG TOP OF TERRACE)
- EXISTING CONTOURS (1 FT. INTERVALS)
- PROPOSED CONTOURS (1 FT. INTERVALS)
- TEMPORARY ACCESS ROAD
- FLOODPLAIN LARGE WOOD, SEE 1/D3

NOTES:

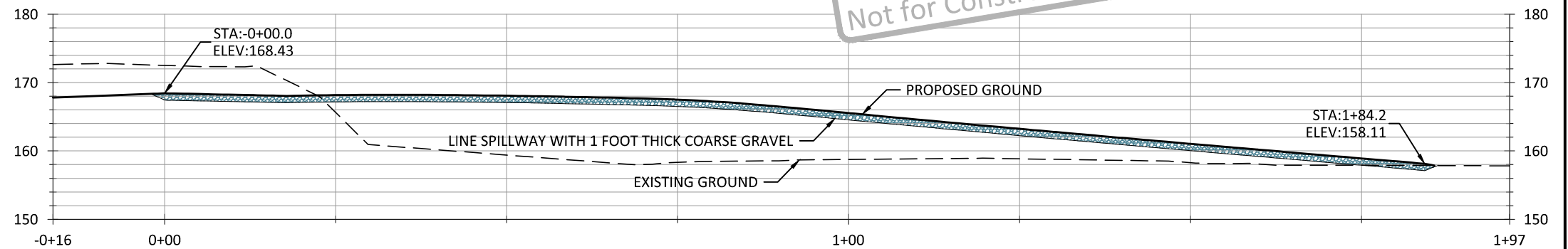
1. EXISTING CONTOURS DERIVED FROM LIDAR DATA AND ON SITE SURVEYS CONDUCTED BY INTER-FLUVE, INC. TOPOGRAPHY WITHIN THE AREA OF DISTURBANCE IS BASED ON ON SITE SURVEY DATA. LIDAR DATA COLLECTED FROM JULY 9 TO SEPTEMBER 7 2014 SHOWS TOPOGRAPHY OUTSIDE OF THE AREA OF DISTURBANCE.

PLAN - RIVER ISLAND TERRACE SPILLWAY

Preliminary
Not for Construction



A
E12 PROPOSED TERRACE SPILLWAY SECTION



B
E12 PROPOSED TERRACE SPILLWAY PROFILE

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MM	AUG 2015	130235
APPROVED	DATE	PROJECT

RIVER ISLAND NORTH PRELIMINARY DESIGN
METRO
CLACKAMAS COUNTY, OREGON

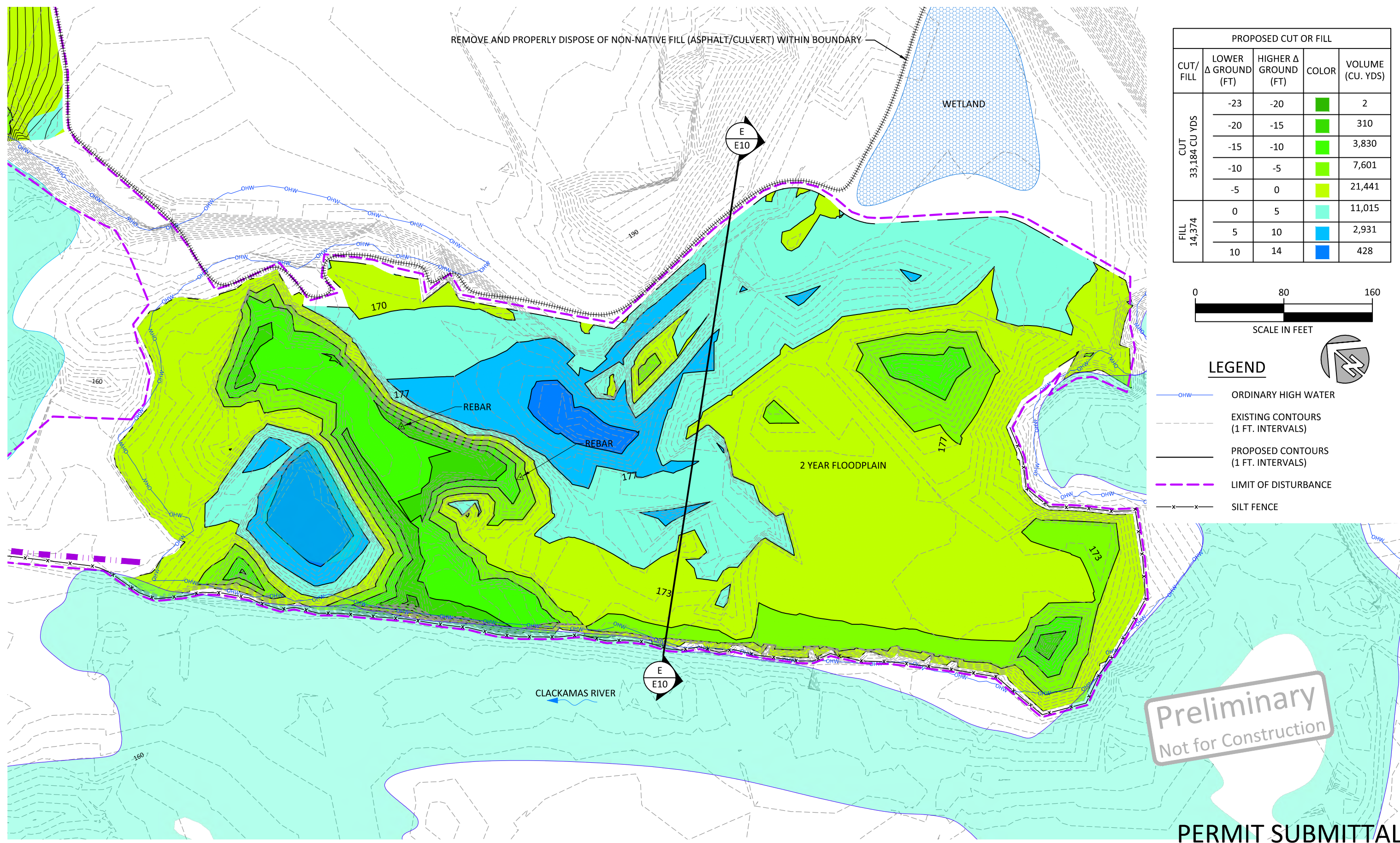


PROPOSED RIVER ISLAND
TERRACE SPILLWAY

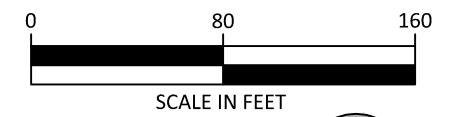
SHEET
E12 OF 29

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REMOVE AND PROPERLY DISPOSE OF NON-NATIVE FILL (ASPHALT/CULVERT) WITHIN BOUNDARY



PROPOSED CUT OR FILL				
CUT/FILL	LOWER Δ GROUND (FT)	HIGHER Δ GROUND (FT)	COLOR	VOLUME (CU. YDS)
CUT 33,184 CU YDS	-23	-20	Dark Green	2
	-20	-15	Light Green	310
	-15	-10	Yellow-Green	3,830
	-10	-5	Yellow	7,601
	-5	0	Light Yellow	21,441
FILL 14,374	0	5	Light Cyan	11,015
	5	10	Blue	2,931
	10	14	Dark Blue	428



LEGEND

- ORDINARY HIGH WATER
- EXISTING CONTOURS (1 FT. INTERVALS)
- PROPOSED CONTOURS (1 FT. INTERVALS)
- LIMIT OF DISTURBANCE
- SILT FENCE

Preliminary
Not for Construction

PERMIT SUBMITTAL

NO.	BY	DATE	REVISION DESCRIPTION

LK,RP,SM	EA,MM	JK
DRAWN	DESIGNED	CHECKED
MM	AUG 2015	130235
APPROVED	DATE	PROJECT

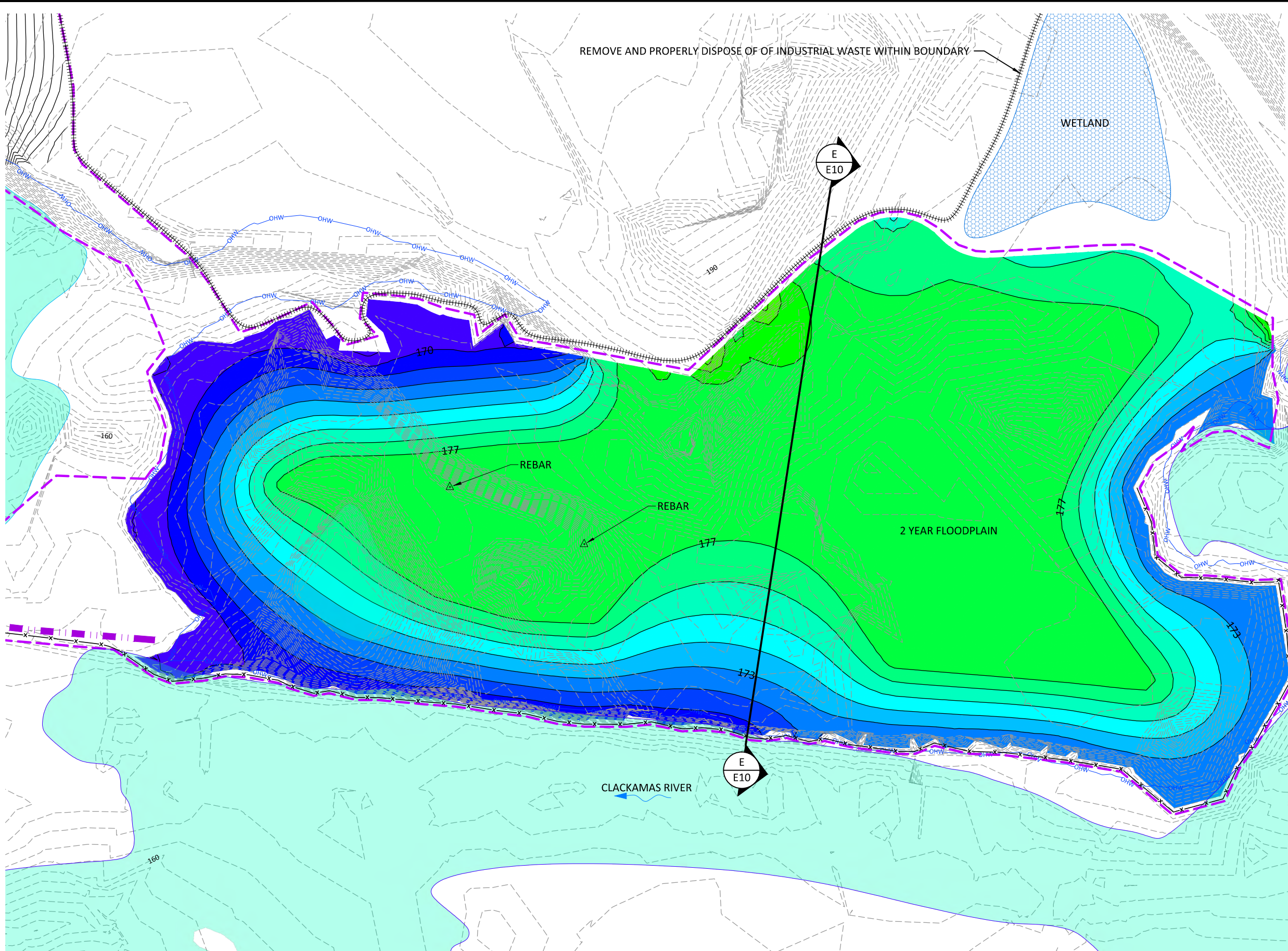
RIVER ISLAND NORTH PRELIMINARY DESIGN
METRO
CLACKAMAS COUNTY, OREGON



RIVER ISLAND NORTH
BORROW AREA

SHEET
E13 OF 29

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REMOVE AND PROPERLY DISPOSE OF OF INDUSTRIAL WASTE WITHIN BOUNDARY

WETLAND

E
E10

E
E10

CLACKAMAS RIVER

177

REBAR

REBAR

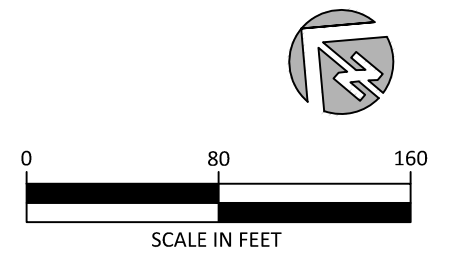
177

2 YEAR FLOODPLAIN

177

173

ELEVATION BANDS (FEET)			ELEVATION BANDS (FEET)		
LOWER	UPPER	COLOR	LOWER	UPPER	COLOR
169	170	Dark Blue	175	176	Light Green
170	171	Blue	176	177	Light Green
171	172	Blue	177	178	Light Green
172	173	Blue	178	179	Light Green
173	174	Blue	179	180	Light Green
174	175	Light Blue			



LEGEND

- ORDINARY HIGH WATER
- - - EXISTING CONTOURS (1 FT. INTERVALS)
- PROPOSED CONTOURS (1 FT. INTERVALS)
- - - LIMIT OF DISTURBANCE
- x-x-x SILT FENCE

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LK,RP,SM	EA,MM	JK
DRAWN	DESIGNED	CHECKED
MM	AUG 2015	130235
APPROVED	DATE	PROJECT

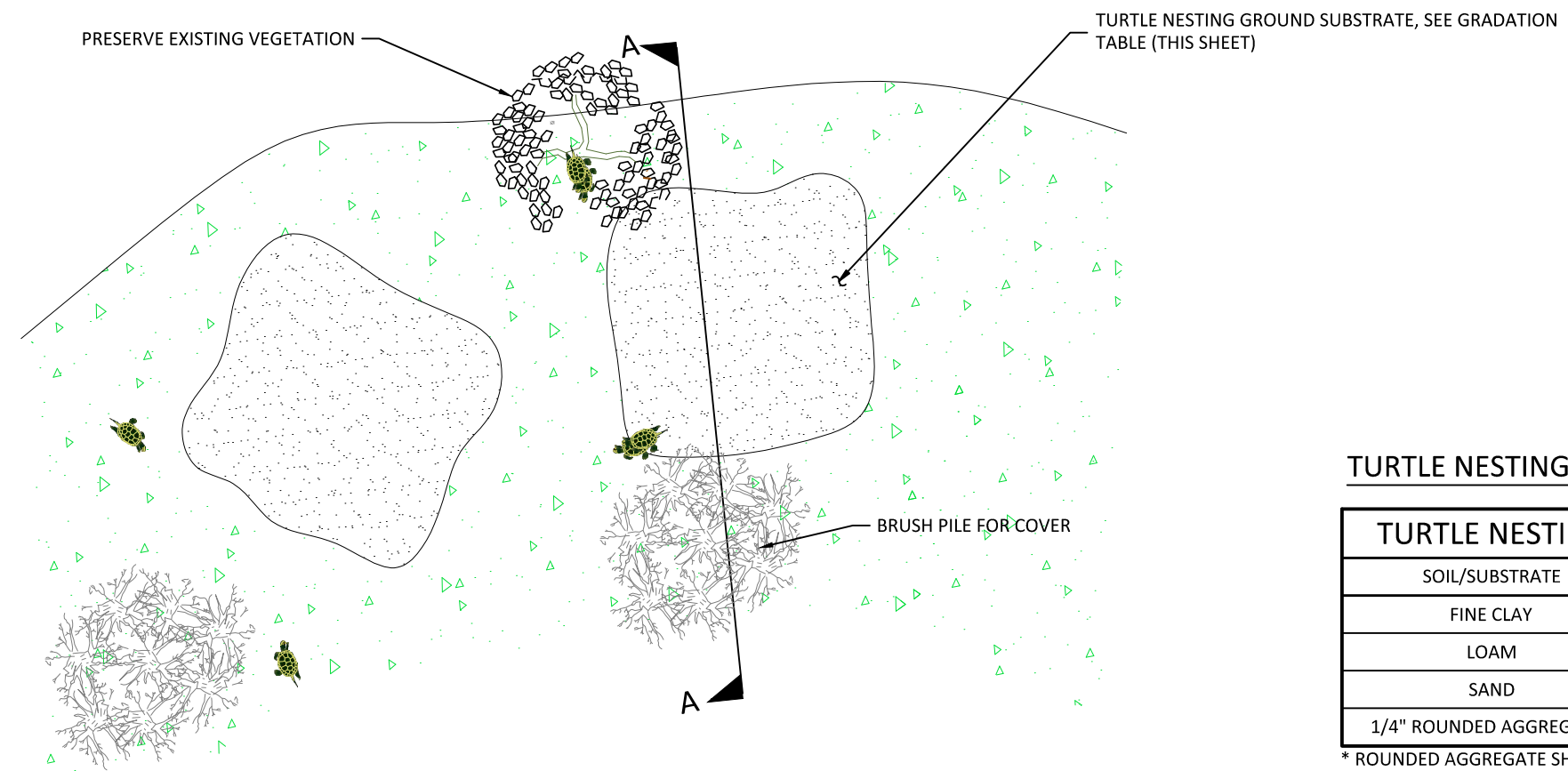
RIVER ISLAND NORTH PRELIMINARY DESIGN
METRO
CLACKAMAS COUNTY, OREGON



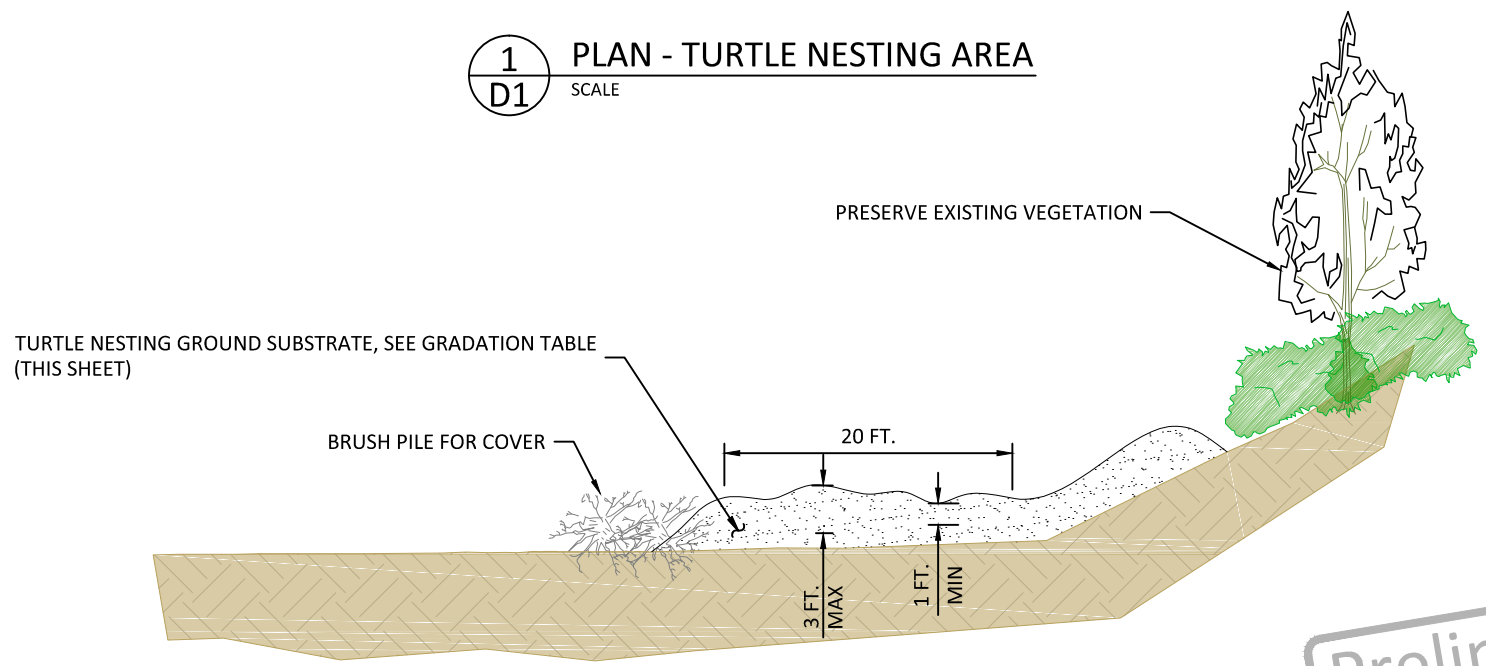
RIVER ISLAND NORTH
BORROW AREA WITH
ELEVATION BANDING

SHEET
E14 OF 29

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1
D1 SCALE
PLAN - TURTLE NESTING AREA



A
D1 SCALE
SECTION - TURTLE NESTING AREA

TURTLE NESTING GRADATION TABLE

TURTLE NESTING GROUND SUBSTRATE	
SOIL/SUBSTRATE	% OF TOTAL MIX
FINE CLAY	25 OR LESS
LOAM	25
SAND	25-50
1/4" ROUNDED AGGREGATE*	25 OR LESS

* ROUNDED AGGREGATE SHALL NOT INCLUDE FINES

NOTES:

1. TURTLE NESTING AREAS TO BE CONSTRUCTED USING TURTLE NESTING GROUND SUBSTRATE MIX 30 CUBIC YARDS PER NESTING AREA.
2. DEPOSIT GROUND SUBSTRATE IN MOUNDS MEASURING AT LEAST 20 FT X 20 FT AND RANGING FROM 12 INCHES TO 36 INCHES DEEP.
3. TURTLE AREA BRUSH PILES TO BE COMPOSED OF NATIVE SLASH SMALLER THAN 12" DBH. BRUSH PILES TO BE A MINIMUM OF 10 FEET LONG X 10 FEET WIDE, AND 2 FEET HIGH.

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PERMIT SUBMITTAL

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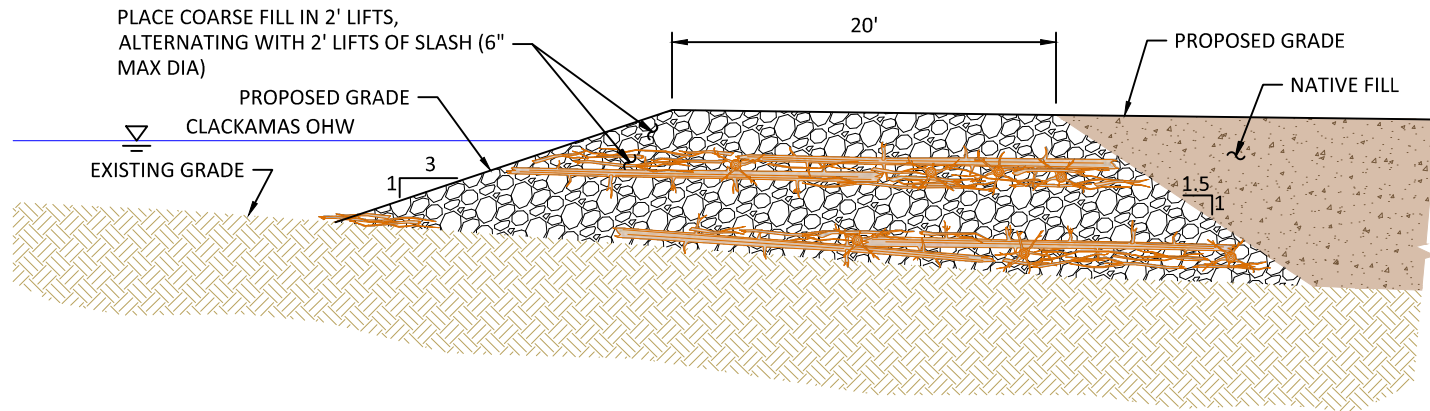
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DRAWN	DESIGNED	CHECKED
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RIVER ISLAND NORTH PRELIMINARY DESIGN
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CLACKAMAS COUNTY, OREGON



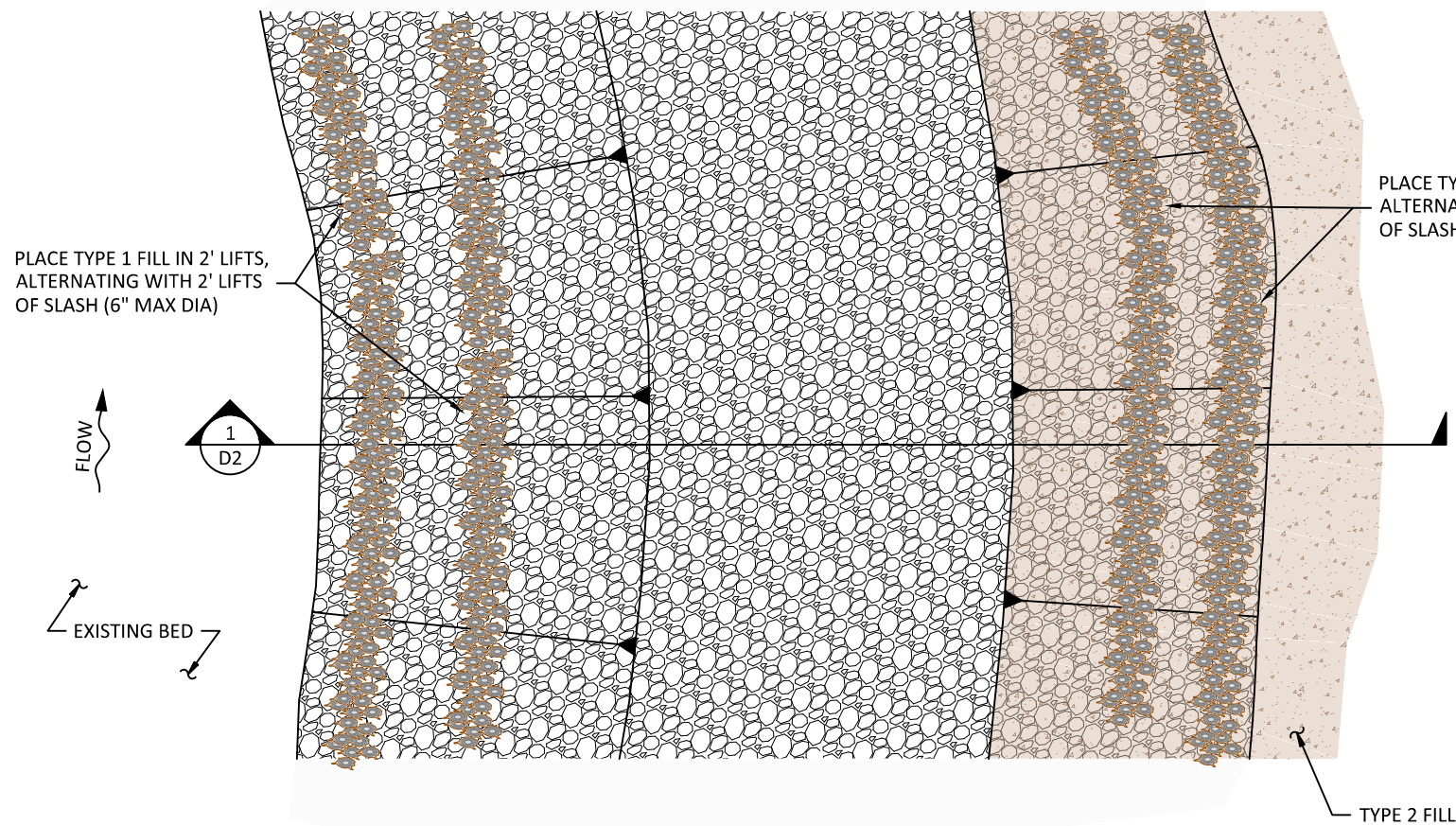
TURTLE HABITAT ENHANCEMENT DETAILS

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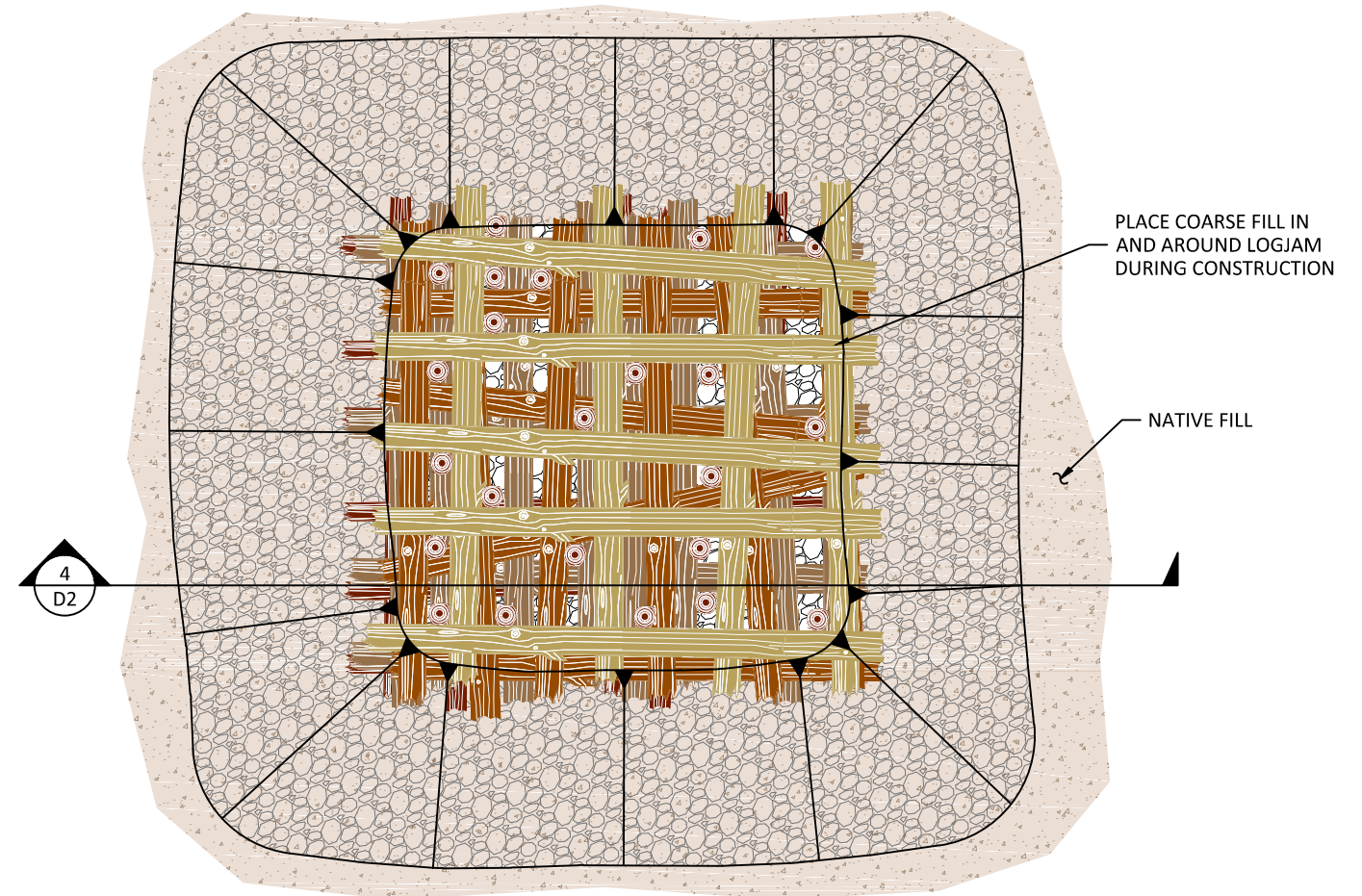


1
D2
TYPICAL SECTION - CONSTRUCTED RIGHT BANK TREATMENT
NOT TO SCALE

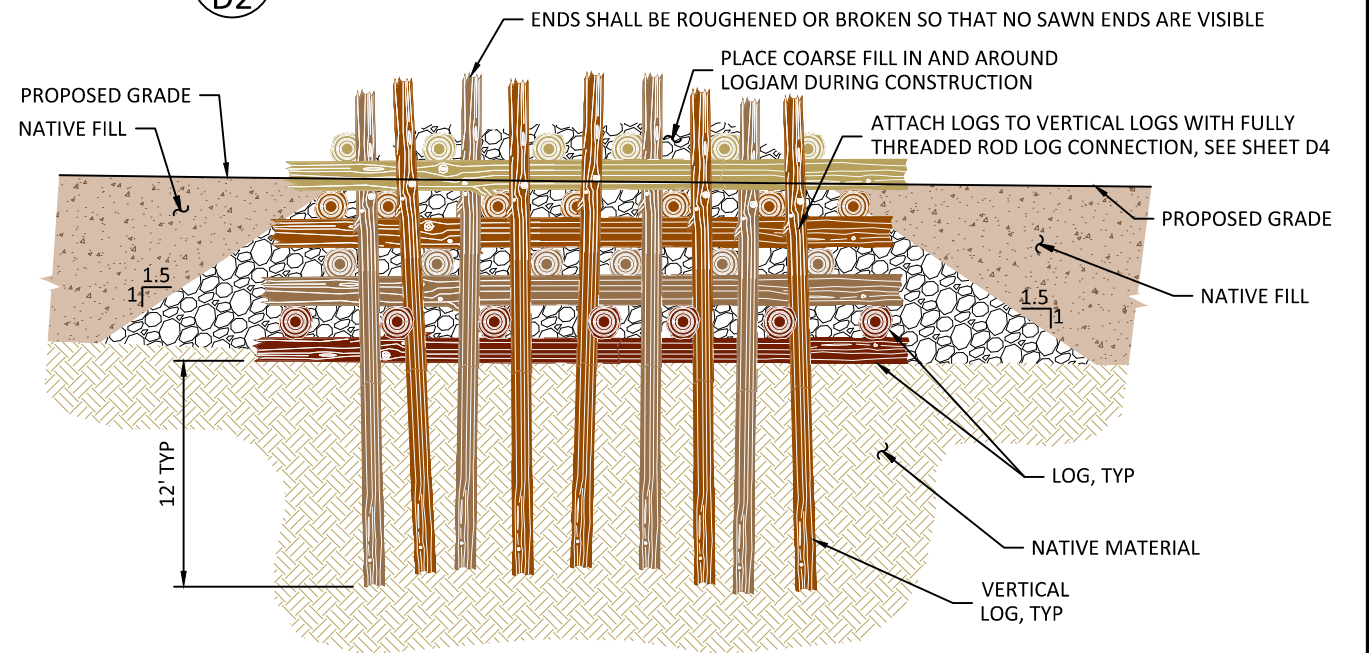
Preliminary
Not for Construction



2
D2
TYPICAL SECTION - CONSTRUCTED RIGHT BANK TREATMENT
NOT TO SCALE



3
D2
TYPICAL PLAN - BURIED LOG JAM
NOT TO SCALE



4
D2
TYPICAL SECTION - BURIED LOG JAM
NOT TO SCALE

PERMIT SUBMITTAL

NO.	BY	DATE	REVISION DESCRIPTION

LK,RP,SM	EA,MM	JK
DRAWN	DESIGNED	CHECKED
MM	AUG 2015	130235
APPROVED	DATE	PROJECT

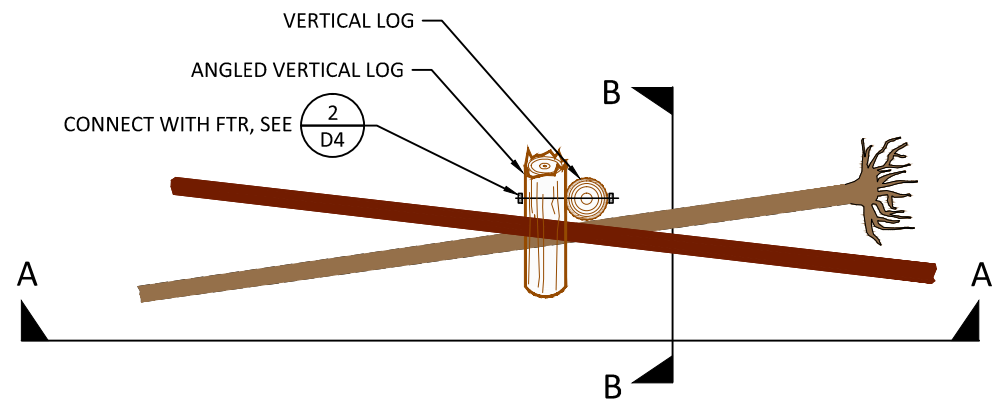
RIVER ISLAND NORTH PRELIMINARY DESIGN
METRO
CLACKAMAS COUNTY, OREGON



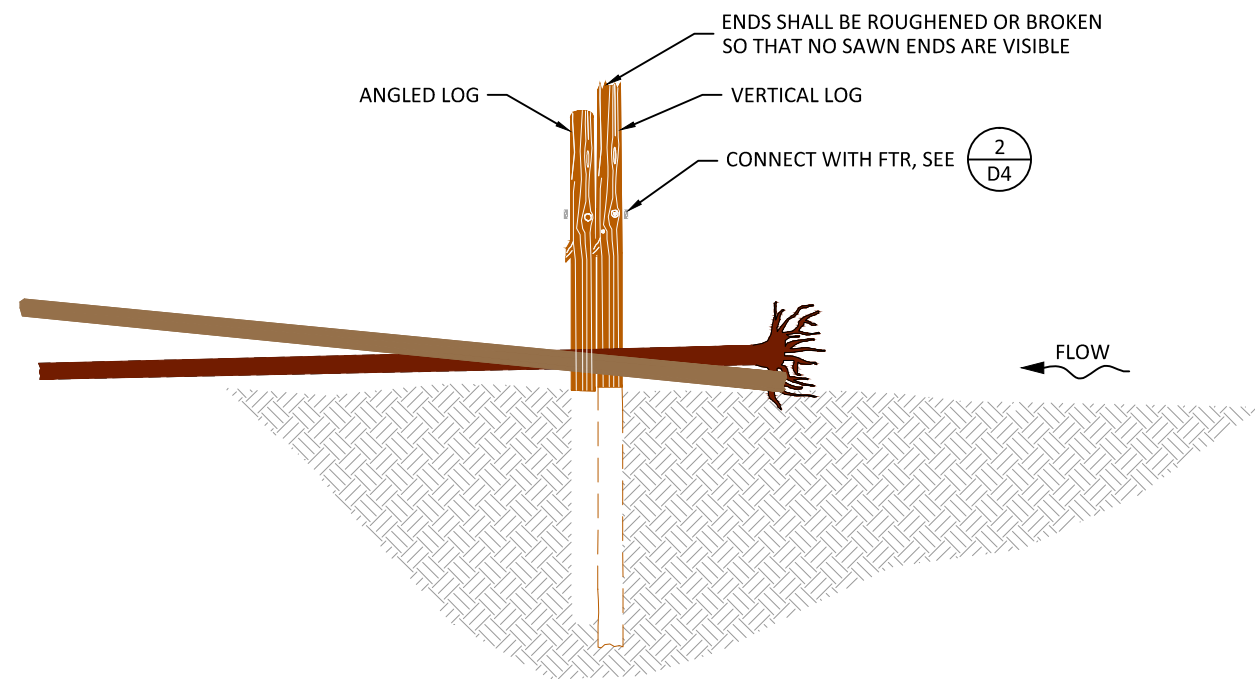
RIGHT BANK DETAILS 1-2 AND
BURIED LOG STRUCTURE
DETAILS 3-4

SHEET
D2 OF 29

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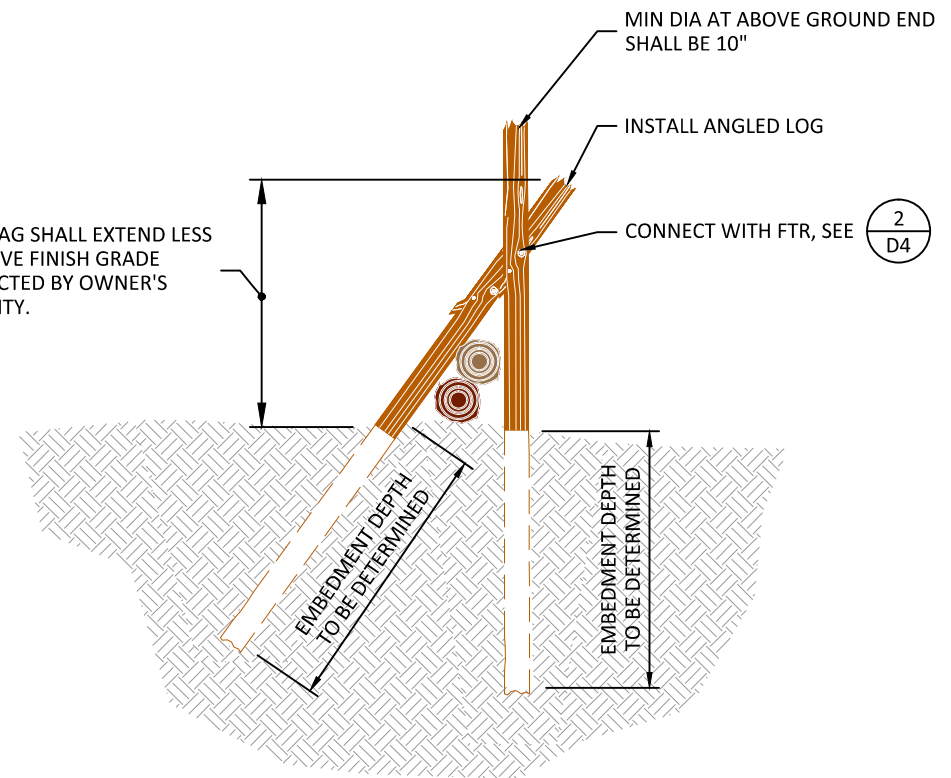


PLAN



SECTION A-A

VERTICAL SNAG SHALL EXTEND LESS THAN 8' ABOVE FINISH GRADE UNLESS DIRECTED BY OWNER'S RESPONSIBILITY.



SECTION B-B

Preliminary
 Not for Construction

(1/D3) TYPICAL DETAIL - FLOODPLAIN LARGE WOOD
 NTS

PERMIT SUBMITTAL

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DRAWN	DESIGNED	CHECKED
MM	AUG 2015	130235
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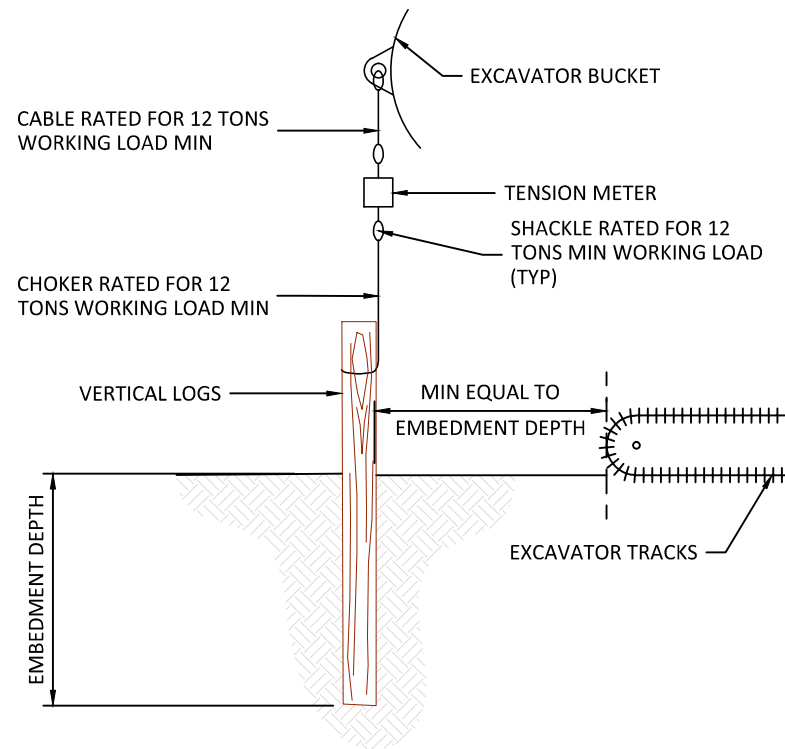
RIVER ISLAND NORTH PRELIMINARY DESIGN
 METRO
 CLACKAMAS COUNTY, OREGON



FLOOD PLAIN LARGE WOOD
 DETAIL 1

SHEET
 D3 OF 29

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VERTICAL LOGS

ALL VERTICAL LOGS SHALL BE INSTALLED USING VIBRASONIC PILE DRIVING EQUIPMENT. INSTALLATION BY EXCAVATION OR HAMMERING WILL NOT BE ALLOWED.

RIGGING

RIGGING FOR VERTICAL LOG TESTING SHALL CONFORM TO THE TENSION SCALE MANUFACTURER'S RECOMMENDATIONS.

CHOKERS, CABLES AND SHACKLES SHALL HAVE MINIMUM WORKING LOAD RATING OF 12 TONS. FITTINGS SHALL BE SIZED ACCORDINGLY

TESTING

TESTING OF VERTICAL LOGS SHALL BE PERFORMED IN THE PRESENCE OF THE ENGINEER OR OTHER QUALIFIED PERSONNEL.

EACH VERTICAL LOG TEST SHALL HAVE UPWARD LOAD GRADUALLY INCREASED AND AS CLOSELY ALIGNED TO AXIS OF VERTICAL LOG AS POSSIBLE. RECORD THE VERTICAL LOG DIAMETER, EMBEDMENT DEPTH AND MAXIMUM FORCE REQUIRED TO MOVE THE VERTICAL LOG. UP TO A TOTAL OF THREE LOADINGS MAY BE REQUIRED AT EACH EMBEDMENT DEPTH.

PROOF TESTS SHALL BE MADE AT UP TO FOUR EMBEDMENT DEPTHS TO BE DETERMINED IN THE FIELD. AS A GUIDELINE TEST EMBEDMENT DEPTHS MAY INCLUDE 6', 8', 10', AND 12'.

EXCAVATOR CONDUCTING PULL OUT LOADING SHALL BE POSITIONED NO CLOSER THAN EMBEDMENT DEPTH OF VERTICAL LOG IF POSSIBLE. IF A CLOSER POSITIONING IS REQUIRED, EXCAVATOR SHALL BE NO CLOSER THAN THAT REQUIRED TO GENERATE DESIRED LOADING WITH DISTANCE FROM VERTICAL LOG NOTED IN THE TEST RECORD. LOAD MAY BE SPREAD IN THIS SITUATION BY POSITIONING THE EXCAVATOR ACROSS HORIZONTAL LOGS, WITH DISTANCE FROM VERTICAL LOG, LOG NUMBERS AND LENGTH NOTED IN THE TEST RECORD.

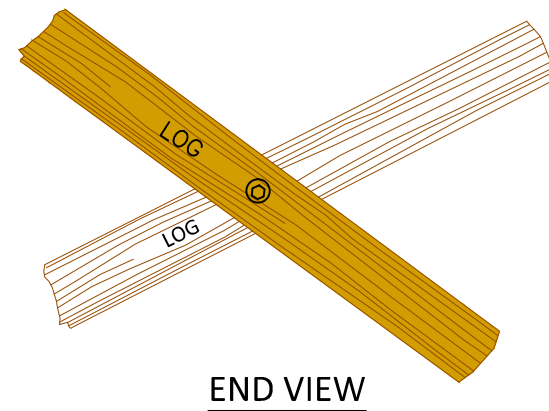
PULL OUT RESISTANCE READING SHALL BE COMPARED AGAINST EXCAVATOR MAX LIFT OFFSET TABLE.

10% OF PRODUCTION PILINGS SHALL BE PROOF TESTED. IF RESULTS VARY MORE THAN 50% THEN IT SHOULD BE ANTICIPATED THAT UP TO 25% OF THE PRODUCTION PILINGS SHALL BE PROOF TESTED. IF THE VERTICAL LOG EMBEDMENT DEPTH DOES NOT MEET MINIMUM, OWNER'S REPRESENTATIVE MAY REQUEST ADDITIONAL PULLOUT TESTING.

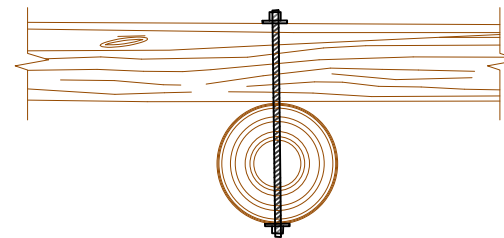
CONSTRUCTED DRIVEN VERTICAL LOG EMBEDMENT DEPTH SPECIFIED IN THE DRAWINGS MAY BE REDUCED OR INCREASED, PENDING PULL OUT TEST RESULTS, AT THE CONTRACTOR'S EXPENSE.

1 VERTICAL LOG TESTING

D4 NTS



END VIEW



SIDE VIEW

1. PIN LOGS TO LW OR VERTICAL LOG
2. DRILL 1-3/8" HOLE THROUGH LW OR VERTICAL LOG
3. INSERT 1-1/4" DIA FTR
4. INSTALL WASHER AND NUT
5. FILE OR GRIND OFF SHARP EDGES

2 FULLY THREADED ROD

D4 NTS

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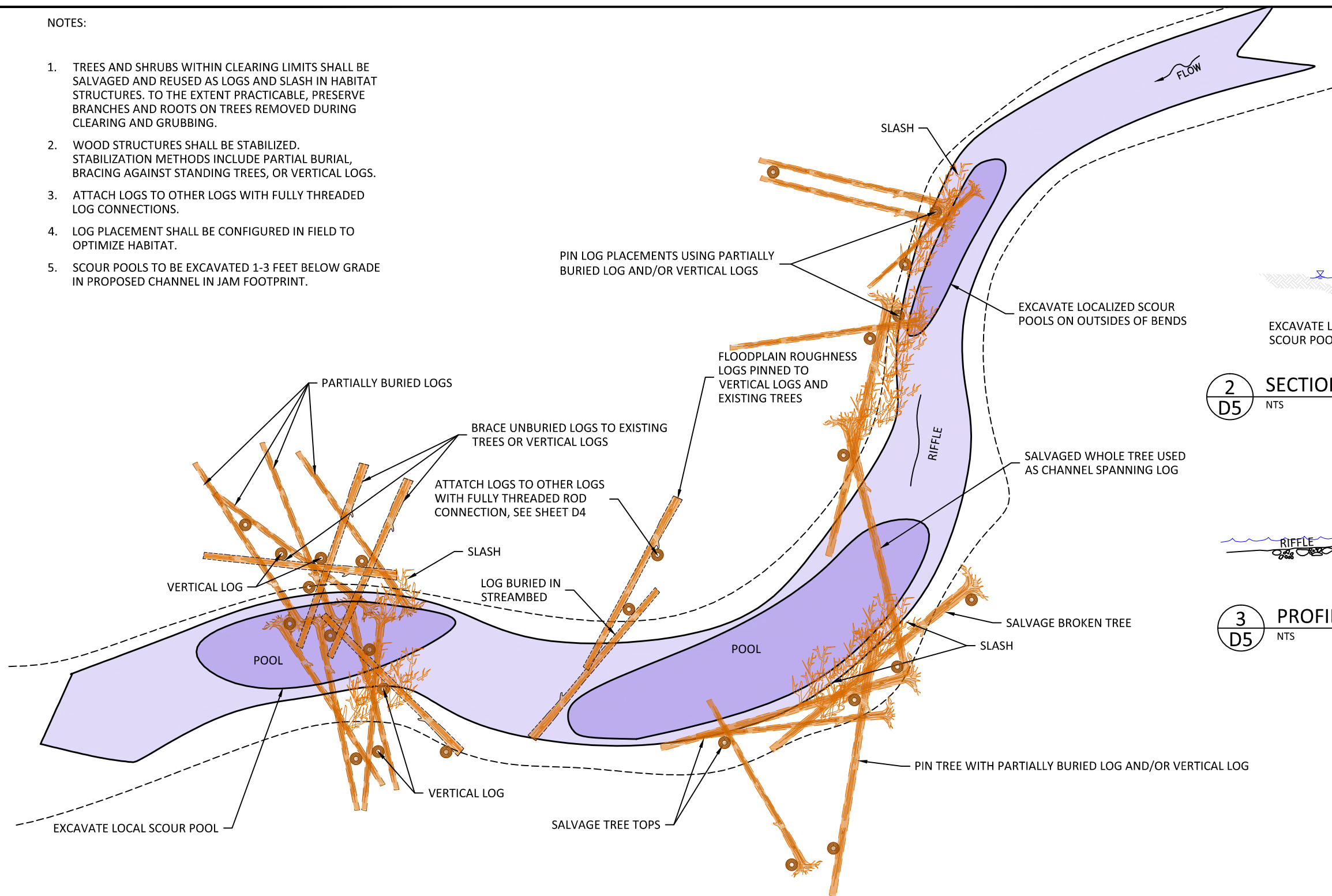
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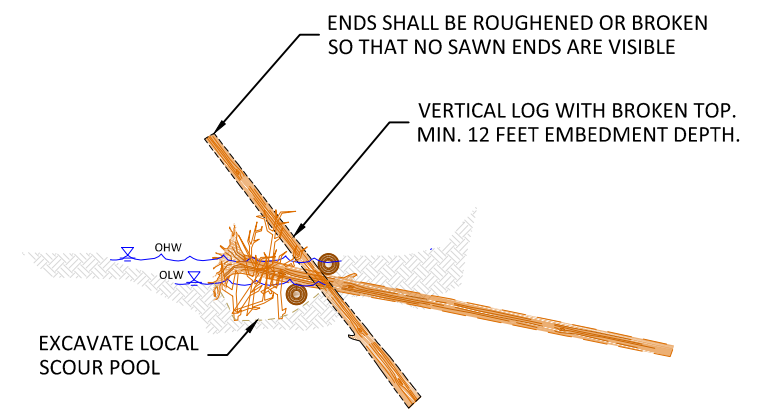
PILE TESTING DETAIL 1 AND
FULLY THREADED ROD
DETAIL 2

NOTES:

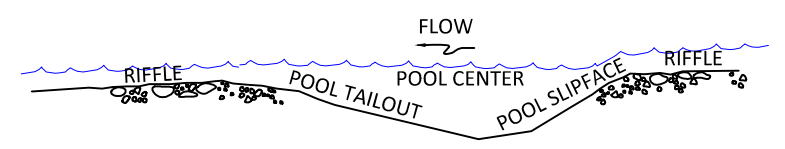
1. TREES AND SHRUBS WITHIN CLEARING LIMITS SHALL BE SALVAGED AND REUSED AS LOGS AND SLASH IN HABITAT STRUCTURES. TO THE EXTENT PRACTICABLE, PRESERVE BRANCHES AND ROOTS ON TREES REMOVED DURING CLEARING AND GRUBBING.
2. WOOD STRUCTURES SHALL BE STABILIZED. STABILIZATION METHODS INCLUDE PARTIAL BURIAL, BRACING AGAINST STANDING TREES, OR VERTICAL LOGS.
3. ATTACH LOGS TO OTHER LOGS WITH FULLY THREADED LOG CONNECTIONS.
4. LOG PLACEMENT SHALL BE CONFIGURED IN FIELD TO OPTIMIZE HABITAT.
5. SCOUR POOLS TO BE EXCAVATED 1-3 FEET BELOW GRADE IN PROPOSED CHANNEL IN JAM FOOTPRINT.



1
D5 NTS
PLAN VIEW: TYPICAL LARGE WOOD ENHANCEMENT CONFIGURATIONS



2
D5 NTS
SECTION VIEW: TYPICAL LW CONFIGURATIONS



3
D5 NTS
PROFILE VIEW: TYPICAL POOL AND RIFFLE

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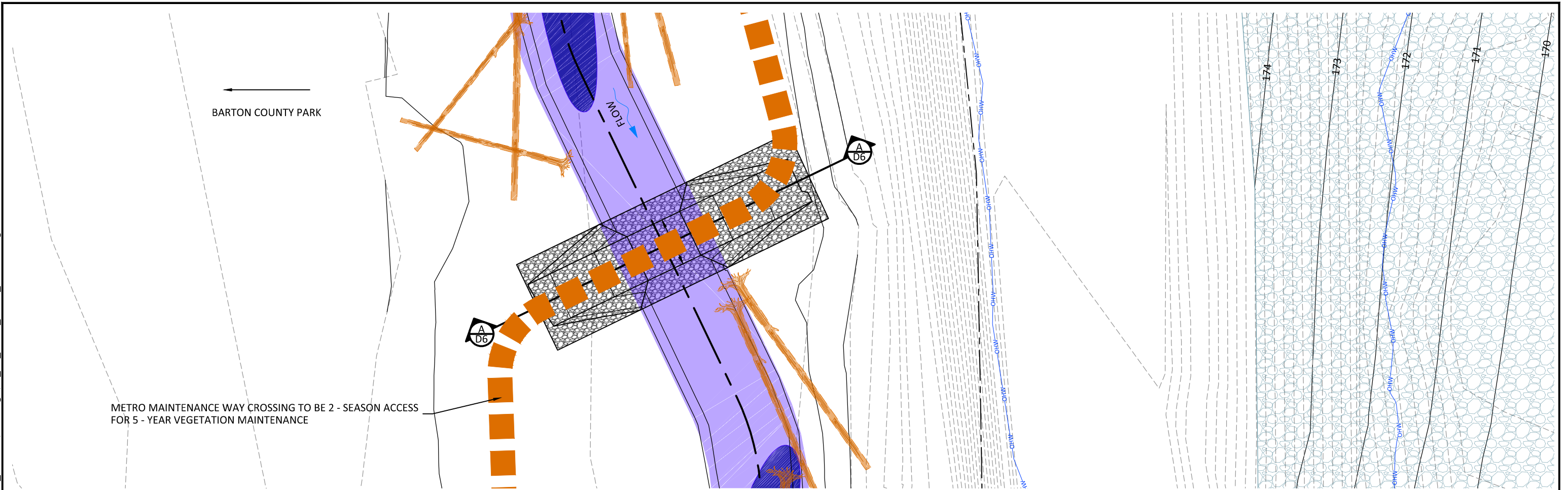
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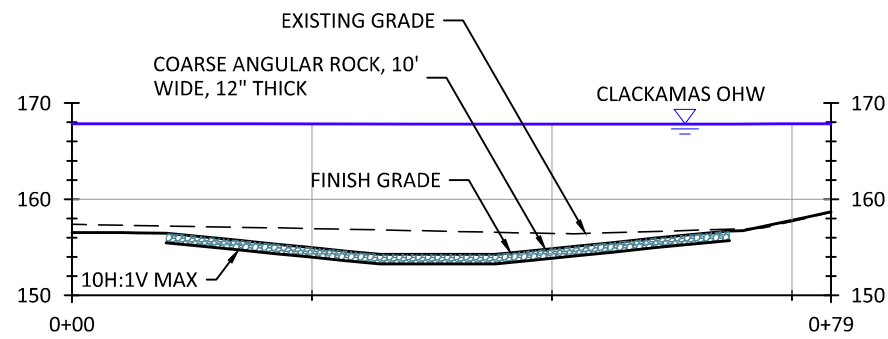
TYPICAL GOOSE CREEK LARGE WOOD ENHANCEMENT CONFIGURATION DETAILS 1-3

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PLAN - GOOSE CREEK TEMPORARY CROSSING

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A
D6
GOOSE CREEK TEMPORARY CROSSING
1" = 20'

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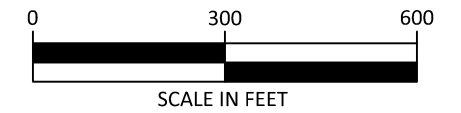
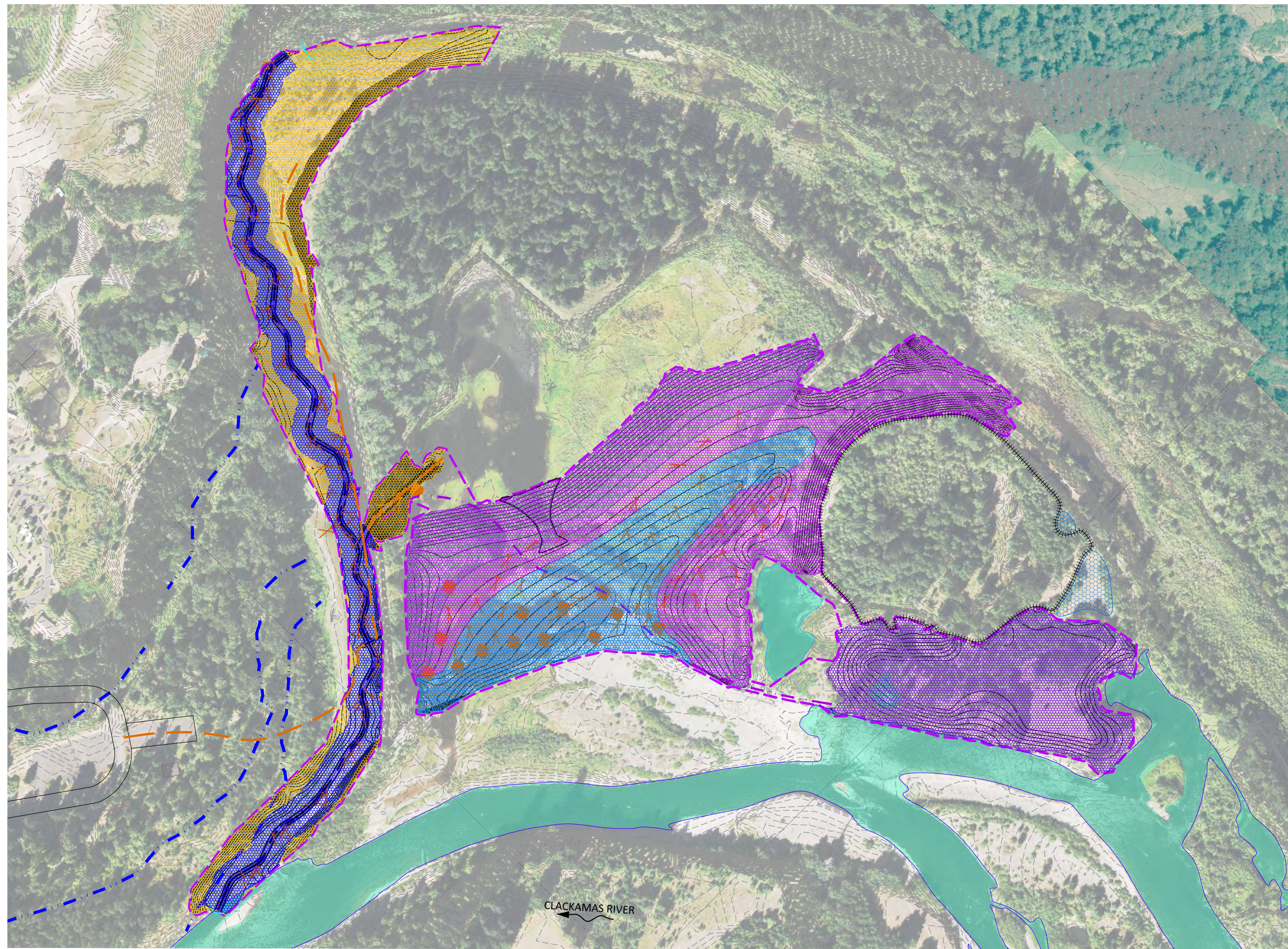
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GOOSE CREEK FORD PLAN AND PROFILE A

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LEGEND

- VEGETATIVE UNIT #1 (6.38 ACRES)
- VEGETATIVE UNIT #2 (6.25 ACRES)
- VEGETATIVE UNIT #3 (14.56 ACRES)
- VEGETATIVE UNIT #4 (6.58 ACRES)
- VEGETATIVE UNIT #5 (6.65 ACRES)

NOTE:

1. SPECIES MIX TO VARY BY PLANTING UNIT. PLANTING WILL BE BY BARE ROOT AND CUTTINGS, 12-18" NATIVE STOCK, NATIVE WILLAMETTE VALLEY SEED STOCK TO BE PLANTED BY PROFESSIONAL REFORESTATION CONTRACTOR.
2. REVEGETATION AREAS AND SPECIFICATIONS DEVELOPED BY METRO STAFF.
3. REVEGETATION TO OCCUR ONLY ABOVE CLACKAMAS OHW.
4. SEE SHEET V2 FOR REVEGETATION SPECIES COMPOSITION.

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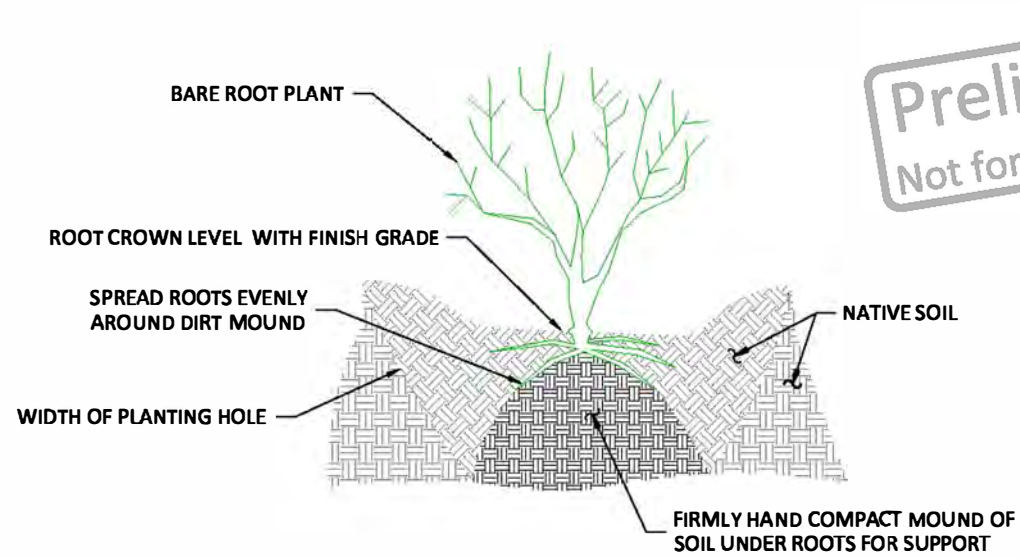


REVEGETATION UNITS

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V1 OF 29

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1
V2 BARE ROOT
NTS

PLANTING - INSTALL SMALL BARE ROOT PLANTS

CONTRACTOR SHALL PLANT ONE AND TWO YEAR OLD BARE ROOT PLANTS (TYPICALLY LESS THAN TWENTY FOUR (24) INCHES TALL ABOVE THE ROOT CROWN) PROVIDED BY METRO IN ROW OR RANDOM ARRANGEMENTS OR AS DIRECTED BY METRO'S PROJECT MANAGER.

HANDLING OF PLANT MATERIALS DURING PLANTING. CONTRACTOR SHALL ENSURE THAT PLANT ROOT SYSTEMS ARE IN A DRIPPING WET STATE PRIOR TO INSTALLATION. IF NECESSARY, CONTRACTOR SHALL DIP THE ENTIRE ROOT SYSTEM OF ALL PLANTS IN WATER UPON REMOVING THE PLANTS FROM THE NURSERY BAG, AND SHALL THEN PLACE PLANTS DIRECTLY INTO A PLANTING BAG. PLANT MATERIAL SHALL BE CARRIED INTO PLANTING AREAS ONLY IN METRO APPROVED PLANTING BAGS. THE QUANTITY OF SEEDLINGS PLACED IN A PLANTING BAG SHALL BE LIMITED TO THAT WHICH ALLOWS THE REMOVAL OF INDIVIDUAL SEEDLINGS WITHOUT DAMAGE TO TOPS OR ROOTS. CONTRACTOR SHALL REMOVE ONLY ONE SEEDLING AT A TIME FROM A PLANTING BAG ONLY AFTER THE PLANTING HOLE HAS BEEN PREPARED. CONTRACTOR SHALL NOT CULL PLANT MATERIAL OR PRUNE ROOTS OR STEMS UNLESS DIRECTED BY METRO.

PLANT PLACEMENT. CONTRACTOR SHALL PLANT BARE ROOT PLANT MATERIAL AT VARIOUS PLANTING DENSITIES AS DIRECTED BY METRO. METRO MAY ALSO SPECIFY WHERE CERTAIN PLANT SPECIES OR ASSOCIATIONS OF PLANT SPECIES ARE TO BE PLANTED WITHIN EACH PROJECT AREA. PLANT MATERIAL PLANTED IN INAPPROPRIATE PLACES WILL BE SUBJECT TO REJECTION BY METRO DURING INSPECTIONS. INAPPROPRIATE PLACES ARE PLACES WHERE LOGS, COMPACTED SLASH GREATER THAN 18 INCHES IN DEPTH, ROCK OUTCROPS, COBBLE, GRAVEL, STANDING WATER OR OTHER MEDIA PREVENT PLANTING TOOLS FROM MAKING AN ACCEPTABLE PLANTING HOLE. WHEN AN INAPPROPRIATE PLACE IS ENCOUNTERED, CONTRACTOR SHALL PLANT THE PLANT MATERIAL IN THE NEAREST APPROPRIATE LOCATION.

PLANTING TECHNIQUE. CONTRACTOR SHALL PREPARE A PLANTING HOLE THAT IS WIDE AND DEEP ENOUGH TO FULLY SUSPEND THE ROOTS OF THE PLANT MATERIAL. CONTRACTOR SHALL SUSPEND THE ROOT SYSTEM NEAR THE CENTER OF THE PLANTING HOLE, WITH ROOTS IN A NEAR-NATURAL ARRANGEMENT, AT A DEPTH AT WHICH THE ROOT COLLAR IS EXPOSED AND THE ENTIRE ROOT SYSTEM IS COVERED BY SOIL AFTER FILLING, PACKING AND LEVELING. A "NEAR-NATURAL ARRANGEMENT" MEANS THAT ROOTS APPROXIMATE THE POSITION THEY WOULD HAVE WHEN GROWING IN NATURE, AND ARE NOT TWISTED, TANGLED, COMPACTED, CURLED, OR BENT RELATIVE TO A POSITION THAT IS PERPENDICULAR TO THE GROUND SURFACE. EACH PLANT SHALL BE SET FIRMLY IN THE GROUND, WITH MOIST SOIL FILLED IN AND PLACED FIRMLY AROUND THE ROOTS. THERE SHALL BE NO AIR POCKETS ADJACENT TO OR NEAR THE ROOTS. CONTRACTOR SHALL LEVEL THE SOIL NEAR THE PLANT AFTER PLANTING AND FIRING SO THAT THERE ARE NO DEPRESSIONS OR MOUNDS NEAR THE STEM.

REVEGETATION UNITS SPECIES COMPOSITION

Scientific name	Common name	Total	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5
<i>Abies grandis</i>	Grand Fir	2,550	500	200	1500		350
<i>Alnus rubra</i>	Red Alder	7,200	800	200	3500	1200	1,500
<i>Crataegus douglasii</i>	Black Hawthorn	2,000	1000	500		500	
<i>Fraxinus latifolia</i>	Oregon Ash	9,600	4500	2500	1000	1600	
<i>Populus trichocarpa</i>	Black Cottonwood	7,600	3,000	2,000	500	1,600	500
<i>Psuedotsuga menziesii</i>	Douglas Fir	6,500			4,000		2,500
<i>Rhamnus purshiana</i>	Cascara	3,150			2,000		1,150
<i>Thuja plicata</i>	Western Red Cedar	2,700	500	200	1,200	200	600
<i>Tsuga heterophylla</i>	Western Hemlock	650			500		150
	Total Trees	41,950	10,300	5,600	14,200	5,100	6,750
<i>Cornus sericea</i>	Red Osier Dogwood	8,150	3,500	2,000	500	2,000	150
<i>Holodiscus discolor</i>	Oceanspray	2,250			1500		750
<i>Mahonia aquifolium</i>	Tall Oregon Grape	8,750	500	250	4500	1,000	2,500
<i>Oemleria cerasiformis</i>	Indian Plum	1,500			1000		500
<i>Physocarpus capitatus</i>	Ninebark	6,250	2,000	1,000	1500	1,000	750
<i>Ribes sanguineum</i>	Red flowering currant	1,000			1000		
<i>Rosa nutkana</i>	Nutka Rose	1,700			1200		500
<i>Rosa pisocarpa</i>	Swamp Rose	4,200	1,500	750	1000	750	200
<i>Rubus parviflorus</i>	Thimbleberry	2,200			1800		400
<i>Salix lasiandra</i>	Pacific Willow	3,750	1,500	750		1,500	
<i>Salix scouleriana</i>	Scouler Willow	1,700			1500		200
<i>Salix sitchensis</i>	Sitka Willow	2,500	1,000	500		1,000	
<i>Sambucus cerulea</i>	Blue Elderberry	2,250			1500		750
<i>Sambucus racemosa</i>	Red Elderberry	2,650	500	250	500	1,200	200
<i>Spiraea douglasii</i>	Spiraea	5,200	3,000	2,200			
<i>Symphoricarpos albus</i>	Snowberry	8,800	1,000	1,100	4000	1,100	1,600
	SHRUB TOTAL	62,850	14,500	8,800	21,500	9,550	8,500
	PLANT TOTAL	104,800	24,800	14,400	35,700	14,650	15,250

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REVEGETATION SPECIFICATIONS