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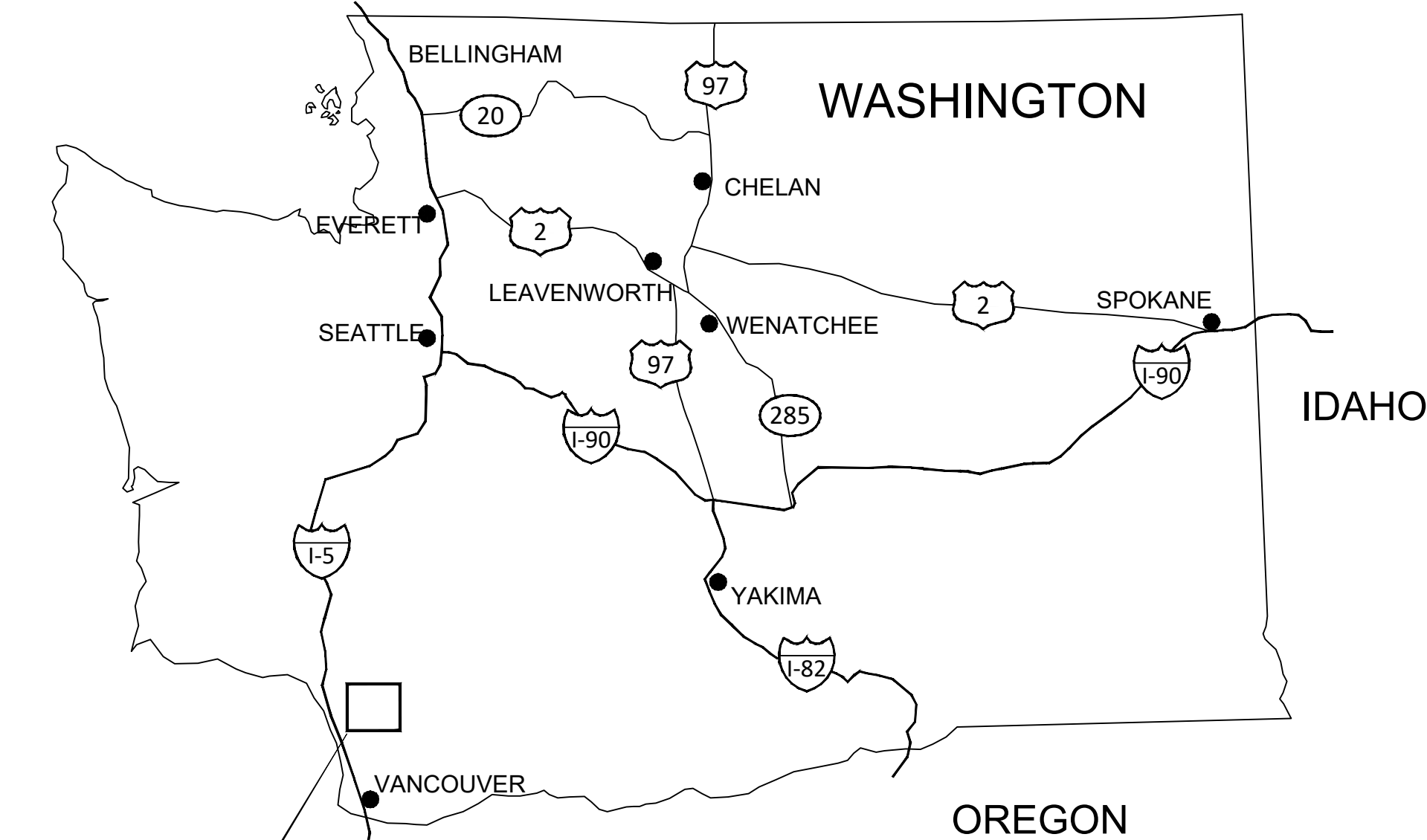
REVEGETATION QUANTITIES

EAST FORK LEWIS RIVER

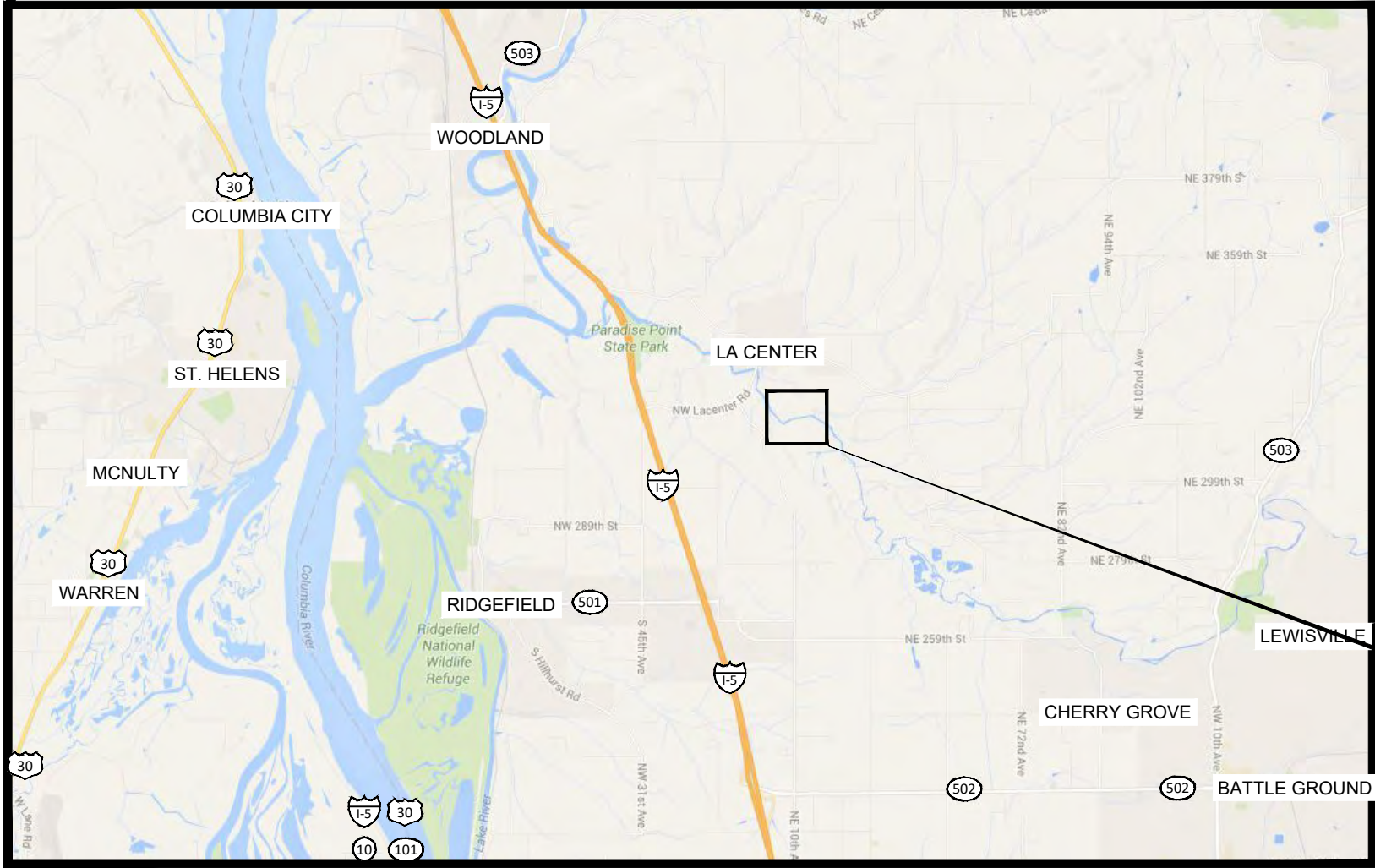
RECONNECTION PROJECT

REVISED 60% DESIGN

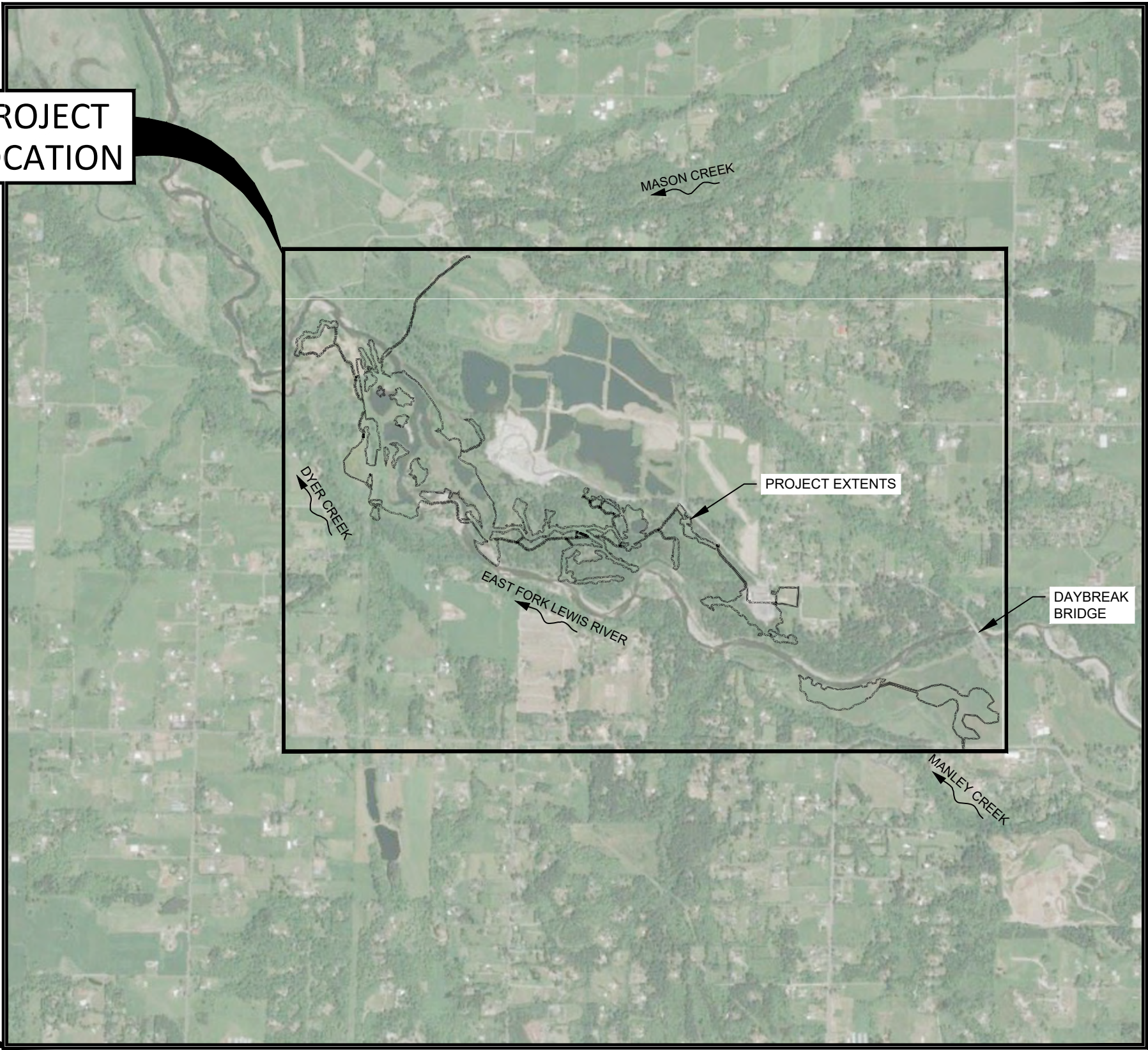
NOVEMBER 2023



LOCATION MAP
STATE OF WASHINGTON
NOT TO SCALE



VICINITY MAP
NOT TO SCALE



SITE MAP
NOT TO SCALE



Preliminary
Not for Construction

NO.	BY	DATE	REVISION DESCRIPTION

CM, JR, NS	MR, GJ	----
DRAWN	DESIGNED	CHECKED
----	11/17/2023	----
APPROVED	DATE	PROJECT

LOWER COLUMBIA ESTUARY PARTNERSHIP
EAST FORK LEWIS RIVER
RECONNECTION PROJECT



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

COVER SHEET

SHEET

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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 WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT), AND LOCAL STANDARDS UNLESS INDICATED OTHERWISE BY THE CONTRACT DOCUMENTS. IN CASE OF A CONFLICT BETWEEN THE REGULATORY STANDARDS OR SPECIFICATIONS, THE MORE STRINGENT WILL PREVAIL.

ALL WORK SHALL BE IN COMPLIANCE WITH REQUIREMENTS STATED IN PERMITS ISSUED FOR THIS PROJECT.

WDFW IN-WATER WORK PERIODS

WORK SHALL OCCUR DURING THE PERMITTED IN-WATER WORK PERIOD OF APRIL 15-OCTOBER 15, UNLESS STATED OTHERWISE IN THE HYDRAULIC PROJECT APPROVAL.

EXISTING DATA

TOPOBATHYMETRIC LIDAR DATA AND HIGH RESOLUTION AERIAL PHOTOS WERE COLLECTED FOR THE ESTUARY PARTNERSHIP BY NV5 GEOSPATIAL IN JUNE 2022. TOPOGRAPHIC DATA WERE SUPPLEMENTED VIA GROUND AND BATHYMETRIC SURVEYS BY INTER-FLUVE AND THE ESTUARY PARTNERSHIP IN OCTOBER 2022.

HORIZONTAL DATUM: STATE PLANE NAD83 WASHINGTON SOUTH
VERTICAL DATUM: NAVD88.

LANDOWNERSHIP DATA OBTAINED FROM CLARK COUNTY IN MAY 2023.

BPA POWERLINE LOCATION DATA OBTAINED FROM BPA AND SPOT-CHECKED DURING SITE SURVEYS.

EXISTING REVEGETATION AREAS (CONDUCTED BY VARIOUS ENTITIES) DETERMINED VIA AERIAL PHOTO ANALYSIS AND SITE OBSERVATIONS.

SOILS

SUBSURFACE MATERIAL INVESTIGATIONS HAVE BEEN CONDUCTED IN SELECT LOCATIONS IN THE PROJECT AREA. THESE DATA ARE AVAILABLE BY REQUEST.

UTILITIES

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

THE CONTRACTOR SHALL CALL (800-424-5555) FOR UTILITY LOCATE PRIOR TO CONSTRUCTION

THE CONTRACTOR SHALL IMMEDIATELY CONTACT THE EFFECTED 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.

CONSTRUCTION STAKING

CONTRACTOR 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.

CONSTRUCTION MATERIALS

ALL MATERIALS QUANTITIES ARE BASED ON IN-PLACE CONDITION DETERMINED BY A PRE-PROJECT CONDITION SURVEY COMPARED AGAINST A PROJECT CONDITION SURVEY

CONTRACTOR SHALL ALLOW FOR EXPANSION OF EXCAVATED MATERIAL AND COMPACTION OF PLACED MATERIAL AT NO ADDITIONAL MEASURE OR COST TO 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 ROOT WADS ARE SUBJECT TO ADJUSTMENT BASED ON FIELD CONDITIONS, AND MATERIAL SIZE.

ANY EXCESS MATERIAL SHALL BE STOCKPILED NEATLY IN AN APPROVED LOCATION IN STOCKPILE AND STAGING AREAS. AT COMPLETION OF WORK, THE MATERIAL SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE FOR LEGAL DISPOSAL.

CONSTRUCTION ACCESS/TRAFFIC CONTROL

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

PUBLIC ACCESS TO/ALONG ROADWAYS 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.

BOUNDARIES OF CLEARING LIMITS ASSOCIATED WITH SITE ACCESS AND CONSTRUCTION WILL BE MARKED TO AVOID OR MINIMIZE DISTURBANCE OF RIPARIAN VEGETATION, WETLANDS AND OTHER SENSITIVE SITES.

EXISTING ROADWAYS OR TRAVEL PATHS WILL BE USED WHENEVER POSSIBLE.

THE NUMBER OF TEMPORARY ACCESS ROADS WILL BE MINIMIZED AND ROADS WILL BE DESIGNED TO AVOID ADVERSE EFFECTS. ACCESS WAYS MAY NOT BE BUILT MID-SLOPE OR ON SLOPES GREATER THAN 30%.

STREAM CROSSINGS WILL PROVIDE FOR FORESEEABLE RISKS SUCH AS FLOODING AND ASSOCIATED BEDLOAD AND DEBRIS TO PREVENT A STREAM DIVERSION IF THE CROSSING FAILS.

HEAVY EQUIPMENT WILL BE LIMITED TO THAT WITH THE LEAST ADVERSE EFFECTS ON THE ENVIRONMENT (E.G., MINIMALLY-SIZED, LOW GROUND PRESSURE EQUIPMENT).

VEHICLES AND MACHINERY WILL CROSS RIPARIAN AREAS AND STREAMS AT RIGHT ANGLES WHENEVER POSSIBLE.

ALL DISTURBED AREAS INCLUDING ROADS, DRIVEWAYS AND ACCESS ROUTES SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER AND RE-VEGETATED PER PLANS. TEMPORARY ROADS IN WET OR FLOODED AREAS WILL BE ABANDONED AND RESTORED BY THE END OF THE IN-WATER WORK PERIOD.

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

WHEN CONSTRUCTION IS FINISHED, ALL STREAMBANKS, SOILS AND VEGETATION WILL BE CLEANED UP AND REHABILITATED AS NECESSARY TO RENEW ECOSYSTEM PROCESSES THAT FORM AND MAINTAIN PRODUCTIVE FISH HABITATS.

ANY FENCES REMOVED FOR ACCESS OR CONSTRUCTION SHALL BE REPLACED BY THE CONTRACTOR AT NO EXPENSE TO THE OWNER.

WOODY VEGETATION CLEARED DURING CONSTRUCTION SHALL BE SALVAGED AND STOCKPILED FOR RE-USE AS SLASH MATERIAL IN THE PROPOSED LARGE WOOD STRUCTURES.

WHENEVER SUBMERGED OR FLOODPLAIN LARGE WOOD MUST BE MOVED TO FACILITATE GRADING, THE WOOD WILL BE STOCKPILED SO IT CAN BE INCORPORATED IN THE PROPOSED LARGE WOOD STRUCTURES.

EROSION AND SEDIMENT CONTROL

THESE BMPS SERVE AS A GUIDELINE FOR THE CONTRACTOR TO DEVELOP A TESC PLAN.

THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR PROVIDING EROSION CONTROL MEASURES TO COMPLY WITH APPLICABLE REGULATIONS.

THE IMPLEMENTATION OF A TESC PLAN AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE TESC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED AND VEGETATION/LANDSCAPING IS ESTABLISHED.

GENERAL TESC PLAN RECOMMENDATIONS:

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 LIMIT SHALL BE PERMITTED. THE FLAGGING SHALL BE MAINTAINED BY THE CONTRACTOR FOR THE DURATION OF CONSTRUCTION.

TESC 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.

THE TESC 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 FOR UNEXPECTED STORM EVENT AND TO ENSURE THAT SEDIMENT AND SEDIMENT-LADEN WATER DO NOT LEAVE THE SITE.

THE TESC FACILITIES SHALL BE INSPECTIONS DAILY BY THE CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING.

THE TESC FACILITIES ON INACTIVE SITES SHALL BE INSPECTED AND MAINTAINED A MINIMUM OF ONCE A WEEK OR WITHIN THE 24 HOURS FOLLOWING A STORM EVENT.

STABILIZED CONSTRUCTION ENTRANCE 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.

INSPECTION AND MAINTENANCE:

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

CONTRACTOR'S TESC RECORD

WEEKLY REPORTS SUMMARIZING THE SCOPE OF INSPECTIONS, THE PERSONNEL CONDUCTING THE INSPECTION, THE DATES 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:

- WHEN MAJOR GRADING ACTIVITIES OCCUR
- DATES OF RAINFALL EVENTS EITHER EXCEEDING TWO HOURS DURATION OR MORE THAN 0.5 INCHES IN 24 HOURS.
- WHEN CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE ON SITE, OR ON A PORTION OF THE SITE.
- WHEN STABILIZATION MEASURES ARE INITIATED FOR PORTIONS OF THE SITE.
- 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 SOIL SHALL BE PROTECTED FROM EROSION BY MULCHING, HYDROSEED COVERING, OR OTHER APPROVED MEASURES WITHIN THREE DAYS OF GRADING. SOILS SHALL BE STABILIZED BEFORE A WORK SHUT DOWN, HOLIDAY, OR WEEKEND, IF NEEDED BASED ON THE WEATHER FORECAST. SOIL STOCKPILINGS MUST BE STABILIZED AND PROTECTED WITH SEDIMENT TRAPPING MEASURES. HYDROSEED ALL DISTURBED AREAS AS SOON AS PRACTICAL IF NOT INDICATED IN THE CONTRACT DOCUMENTS FOR OTHER PERMANENT STABILIZATION 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 OFFSITE 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.

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Preliminary
Not for Construction

NO.	BY	DATE	REVISION DESCRIPTION

CM, JR, NS	MR, GJ	----
DRAWN	DESIGNED	CHECKED
----	11/17/2023	----
APPROVED	DATE	PROJECT

LOWER COLUMBIA ESTUARY PARTNERSHIP
EAST FORK LEWIS RIVER
RECONNECTION PROJECT



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

GENERAL NOTES (1 OF 2)

SHEET

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BMPS FOR GENERAL IMPACT AVOIDANCE AND MINIMIZATION

ALL WORK SHALL BE IN COMPLIANCE WITH REQUIREMENTS STATED IN PERMITS ISSUED FOR THIS PROJECT.

ALL CONSTRUCTION ACTIVITIES WILL COMPLY WITH THE STATE OF WASHINGTON SURFACE WATER QUALITY STANDARDS (WASHINGTON ADMINISTRATIVE CODE [WAC] 173-201A).

IN-WATER WORK SHALL OCCUR DURING THE PERMITTED IN-WATER WORK PERIOD STATED IN THE HYDRAULIC PROJECT APPROVAL.

A TEMPORARY EROSION AND SEDIMENT CONTROL (TESC) PLAN WILL BE DEVELOPED AND IMPLEMENTED FOR ALL PROJECT ELEMENTS THAT ENTAIL CLEARING, VEGETATION REMOVAL, GRADING, DITCHING, FILLING, EMBANKMENT COMPACTION, OR EXCAVATION. EROSION CONTROL ELEMENTS OF THE PLAN WILL ADDRESS MATERIALS STORAGE SITES, ACCESS ROADS, STREAM CROSSINGS, AND INSPECTION AND REPLACEMENT OF EROSION CONTROLS.

A SPILL PREVENTION CONTROL AND COUNTERMEASURES (SPCC) PLAN WILL BE DEVELOPED TO PREVENT AND MINIMIZE SPILLS THAT MAY CONTAMINATE SOIL OR NEARBY WATERS OF THE STATE.

CONTRACTOR SHALL PREPARE A WORK AREA ISOLATION PLAN FOR ALL WORK BELOW THE BANKFULL ELEVATION REQUIRING FLOW DIVERSION OR ISOLATION. INCLUDE THE SEQUENCING AND SCHEDULE OF DEWATERING AND REWATERING ACTIVITIES, PLAN VIEW OF ALL ISOLATION ELEMENTS, AS WELL AS A LIST OF EQUIPMENT AND MATERIALS TO ADEQUATELY PROVIDE APPROPRIATE REDUNDANCY OF ALL KEY PLAN FUNCTIONS (E.G., AN OPERATIONAL, PROPERLY SIZED BACKUP PUMP AND/OR GENERATOR).

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

BOUNDARIES OF CLEARING LIMITS WILL BE CLEARLY FLAGGED TO PREVENT DISTURBANCE OUTSIDE OF THE LIMITS.

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

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

ALL SAPLINGS AND TREES TO BE TRANSPLANTED OR REMOVED SHALL BE CLEARLY MARKED AND APPROVED BY THE OWNER OR OWNER'S REPRESENTATIVE.

ALL TREES NOT MARKED FOR REMOVAL SHALL BE LEFT STANDING UNDISTURBED. ANY TRACKING OR IMPACT TO THE DRIPLINE OF STANDING TREES SHALL BE AVOIDED. CONSTRUCTION ACTIVITY SHALL NOT DEBARK OR DAMAGE LIVE TREES.

ALL NATIVE TREES AND SLASH REMOVED FOR CONSTRUCTION SHALL BE TEMPORARILY STOCKPILED WITHIN THE LIMITS OF DISTURBANCE. STOCKPILED TREES AND SLASH SHALL BE INCORPORATED INTO THE FINISHED PROJECT PER OWNER'S OR OWNER REPRESENTATIVE'S DIRECTION.

STAGING AND STOCKPILE AREAS WILL BE FLAGGED BY THE OWNER. STAGING AREAS USED FOR CONSTRUCTION EQUIPMENT STORAGE, VEHICLE STORAGE, FUELING, SERVICING, AND HAZARDOUS MATERIAL STORAGE SHALL BE 150 FEET OR MORE FROM ANY NATURAL WATER BODY OR WETLAND. NATURAL MATERIALS MAY BE STOCKPILED NEAR INSTALLATION AREAS.

BIODEGRADABLE HYDRAULIC FLUID SHALL BE USED IN EACH EXCAVATOR WORKING WITHIN LIVE WATER. MECHANIZED EQUIPMENT AND VEHICLES SHALL BE INSPECTED DAILY FOR LEAKS, AND CLEANED THOROUGHLY BEFORE OPERATION NEAR WATER.

THE OWNER REQUIRES MECHANIZED EQUIPMENT TO BE CLEANED (PRESSURE WASHED OR BLOWN WITH PRESSURIZED AIR) TO REMOVE NON-NATIVE SEEDS/SOIL BEFORE MOVING INTO THE PROJECT AREA.

CONSTRUCTION DEWATERING

TEMPORARY COFFERDAMS SHALL BE USED TO ISOLATE IN-CHANNEL EXCAVATION AREAS FROM THE RIVER.

COFFERDAM TECHNIQUES AND MATERIALS NEED TO BE APPROVED BY THE OWNER OR OWNER'S REPRESENTATIVE PRIOR TO USE.

DEWATERING OF IN-CHANNEL WORK AREAS SHALL OCCUR CONCURRENT WITH FISH RESCUE. CONTRACTOR SHALL PROVIDE AMPLE TIME TO SCHEDULE FISH RESCUE. IF DIVERSION FAILS DUE TO CONTRACTOR NEGLIGENCE THIS 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.

DEWATERING, WHEN NECESSARY, WILL BE CONDUCTED OVER A SUFFICIENT PERIOD OF TIME TO ALLOW SPECIES TO NATURALLY MIGRATE OUT OF THE WORK AREA AND WILL BE LIMITED TO THE SHORTEST LINEAR EXTENT PRACTICABLE.

PROVIDE PASSAGE FOR ANY ADULT OR JUVENILE SALMONID SPECIES PRESENT IN THE PROJECT AREA DURING CONSTRUCTION. ADEQUATE PRECAUTIONS WILL BE TAKEN TO PREVENT STRANDING OF JUVENILE OR ADULT FISH.

DIVERSION AROUND THE CONSTRUCTION SITE MAY BE ACCOMPLISHED WITH COFFERDAMS AND USE OF BYPASS CHANNELS. WHERE GRAVITY FEED IS NOT POSSIBLE, A PUMP MAY BE USED, BUT MUST BE OPERABLE IN SUCH A WAY AS TO AVOID REPETITIVE DEWATERING AND RE-WATERING OF THE SITE. IMPOUNDMENT BEHIND THE COFFERDAM MUST OCCUR SLOWLY THROUGH THE TRANSITION, WHILE CONSTANT FLOW IS DELIVERED TO THE DOWNSTREAM REACHES.

ALL PUMPS WILL HAVE FISH SCREENS TO AVOID JUVENILE FISH IMPINGEMENT OR ENTRAINMENT, AND WILL BE OPERATED IN ACCORDANCE WITH NMFS'S CURRENT FISH SCREEN CRITERIA (NMFS 2014, OR MOST RECENT VERSION). IF THE PUMPING RATE EXCEEDS 3 CUBIC FEET PER SECOND (CFS), A NMFS HYDRO FISH PASSAGE REVIEW WILL BE NECESSARY.

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

OWNER OR OWNERS REPRESENTATIVE SHALL APPROVE DEWATERING DISCHARGE LOCATION PRIOR TO IMPLEMENTATION.

FISH MANAGEMENT AND RESCUE

ALL FISH RESCUE EFFORTS SHALL BE SUPERVISED BY AN AQUATIC BIOLOGIST EXPERIENCED WITH THE COLLECTION AND HANDLING OF SALMONID FISHES 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 RIVER AT AREAS SELECTED BY THE BIOLOGIST.

WATERS AND WETLANDS OF THE US

THE ORDINARY HIGH WATER LINE WAS DELINEATED BY INTER-FLUVE USING FIELD SURVEYS AND SUPPLEMENTED WITH HYDRAULIC MODELING RESULTS.

THE WETLAND DELINEATION WAS DONE BY THE LOWER COLUMBIA ESTUARY PARTNERSHIP IN 2022 AND 2023.

WITHIN THE STATE OF WASHINGTON, THE U.S. ARMY CORPS OF ENGINEERS AND THE WASHINGTON DEPARTMENT OF ECOLOGY HAVE THE FINAL AUTHORITY IN DETERMINING BOUNDARIES OF WETLANDS AND WATERS.

SUGGESTED CONSTRUCTION SEQUENCE

RIDGEFIELD PITS

- ISOLATE MAIN CHANNEL FROM RIVER-RIGHT FLOODPLAIN USING A TEMPORARY COFFERDAM AT PIT 7 CONNECTION.
- PERFORM FISH RESCUE AND THEM CONSTRUCT RIVER-RIGHT CHANNEL AND FLOODPLAIN GRADING.
- USE TEMPORARY COFFERDAMS IN MAIN CHANNEL TO BYPASS RIVER INTO RIVER-RIGHT CHANNEL, ISOLATING THE MIDDLE AND UPPER MAIN CHANNEL AND RIVER-LEFT FLOODPLAIN.
- PERFORM FISH RESCUE AND THEN CONSTRUCT MIDDLE AND UPPER MAIN CHANNEL, RIVER-LEFT CHANNEL, AND RIVER-LEFT FLOODPLAIN GRADING.
- USE TEMPORARY COFFERDAMS TO SWITCH BYPASS INTO RIVER-LEFT CHANNEL, ISOLATING LOWER MAIN CHANNEL.
- PERFORM FISH RESCUE OF LOWER MAIN CHANNEL THEN CONSTRUCT LOWER MAIN CHANNEL AND FINAL GRADING.
- REMOVE COFFERDAMS AND INTRODUCE FLOW TO FULL SITE.

CONSTRUCTION OF THE WEST FLOODPLAIN SIDE CHANNELS; EAST FLOODPLAIN SIDE-CHANNELS AND LEVEE REMOVALS; DANGER PARK LEVEE REMOVALS; AND COUNTY YARD LEVEE AND FILL REMOVALS CAN OCCUR IN ISOLATION FROM THE MAIN RIVER, WITH USE OF TEMPORARY COFFERDAMS WHERE CHANNELS CONNECT TO THE MAIN CHANNEL, DEPENDING ON FLOW CONDITIONS AT TIME OF CONSTRUCTION.

CONSTRUCTION OF THESE SITES CAN OCCUR BEFORE, OR COMMENSURATE WITH, RIDGEFIELD PITS GRADING AS NEEDED TO PROVIDE MATERIALS FOR RIDGEFIELD PITS GRADING.

CONSTRUCTION OF THE DAYBREAK TRAIL SITE CAN OCCUR INDEPENDENT OF THE OTHER SITES. CONSTRUCTION OF THE CHANNEL MARGIN LARGE WOOD PLACEMENTS WILL REQUIRE TEMPORARY COFFERDAMS ALONG THE MAIN CHANNEL.

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Preliminary
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				CM, JR, NS DRAWN	MR, GJ DESIGNED	--- CHECKED	LOWER COLUMBIA ESTUARY PARTNERSHIP EAST FORK LEWIS RIVER RECONNECTION PROJECT	 501 Portway Avenue, Suite 101 Hood River, OR 97031 541.386.9003 www.interfluve.com	GENERAL NOTES (2 OF 2)	SHEET
				---	11/17/2023	---				3 OF 57
NO.	BY	DATE	REVISION DESCRIPTION	APPROVED	DATE	PROJECT				

EARTHWORK SUMMARY TABLE

	Area Name	Disturbed Area (Ac)	Total Volume (CY)			Coarse Material Volume (CY)		
			Cut	Fill	Net	Available	Required	Net
1	Powerline Bend Side Channel	1.13	6,550	0	6,550	3,275	0	3,275
2	Pits North Berm	1.24	5,930	10	5,920	0	0	0
3	Pits East Berm	0.94	4,370	0	4,370	0	0	0
4	Storedahl Berm	0.41	2,750	0	2,750	2,200	0	2,200
5	BPA North Berm	0.37	1,380	50	1,330	0	0	0
6	BPA South Berm	0.36	2,070	80	1,990	0	0	0
7	Pits West Berm	4.00	28,880	2,420	26,460	1,444	1,915	-471
8	Pits West Channel	3.91	14,660	20,550	-5,890	0	8,581	-8,581
9	Pits North Floodplain	6.06	8,050	56,290	-48,240	0	14,807	-14,807
10	Pits Southwest Floodplain	4.29	3,720	42,140	-38,420	0	11,986	-11,986
11	Pits Main Channel	10.70	740	107,400	-106,660	0	41,719	-41,719
12	Pits Central Floodplain	5.30	29,750	40	29,710	5,950	0	5,950
13	Pits East Channel	6.14	11,930	50,030	-38,100	0	28,006	-28,006
14	Pits 8 and 9	4.61	3,340	39,060	-35,720	0	7,173	-7,173
15	Pits South Central Floodplain	3.25	51,550	10	51,540	10,310	0	10,310
16	East Floodplain West Berm	0.14	5,940	0	5,940	4,752	0	4,752
17	East Floodplain East Berm	0.38	1,200	60	1,140	960	0	960
18	East Floodplain Main Side Channel	3.16	21,050	40	21,010	7,970	0	7,970
19	Old Channel Alcove	1.97	7,510	0	7,510	6,008	0	6,008
20	East Floodplain Connector Channel	0.63	3,640	0	3,640	990	0	990
21	Oxbow Side Channel	4.04	23,890	10	23,880	21,070	0	21,070
22	Oxbow Berm	0.86	5,130	10	5,120	4,104	0	4,104
23	Danger Park Pond Berm	1.91	12,560	10	12,550	2,512	0	2,512
24	Danger Park Pond	1.00	0	8,250	-8,250	0	0	0
25	Danger Park East Berm	0.65	3,840	0	3,840	1,920	0	1,920
26	County Yard	7.70	63,290	130	63,160	38,860	0	38,860
27	Daybreak Trail Floodplain	6.86	36,980	0	36,980	0	0	0
28	Daybreak Trail Spoils Area	8.81	0	36,980	-36,980	0	0	0
Project Total		90.80	360,700	363,570	-2,870	112,325	114,186	-1,861

CONTINGENCY BORROW SUMMARY TABLE

	Area Name	Disturbed Area (Ac)	Total Volume (CY)			Coarse Material Volume (CY)		
			Cut	Fill	Net	Available	Required	Net
C1	Contingency Area - Lower	4.87	20,000	0	20,000	10,000	0	10,000
C2	Contingency Area - Middle	3.88	20,000	0	20,000	10,000	0	10,000
C3	Contingency Area - Upper	3.53	20,000	0	20,000	10,000	0	10,000
Contingency Borrow Total		12.3	60,000	0	60,000	30,000	0	30,000
Project Total with Contingency		103.08	420,700	363,570	57,130	142,325	114,186	28,139

LARGE WOOD STRUCTURE QUANTITIES

ITEM	UNITS	WEST FLOODPLAIN	CORE PITS	EAST FLOODPLAIN	COUNTY YARD	DAYBREAK TRAIL	STRUCTURE TOTAL
Small Bank Buried Structures	EA	4	23	27	4	0	58
Large Bank Buried Structures	EA	2	19	0	0	6	27
Small Whole Tree Structures	EA	2	20	18	3	0	43
Large Whole Tree Structures	EA	1	7	0	0	0	8
Margin Habitat Structures	EA	1	6	0	0	7	14
Apex Structures	EA	0	3	0	0	0	3
Minor Inlet Structures	EA	0	1	2	0	0	3
Major Inlet Structures	EA	1	3	0	0	0	4
Alcove Pool Structures	EA	0	46	7	4	0	57
Pile Fence Structures	EA	0	10	0	0	4	14
Type 1 Floodplain Roughness Structures	EA	0	25	4	10	3	42
Type 2 Floodplain Roughness Structures	EA	0	46	27	8	6	87
PROJECT TOTAL		11	209	85	29	26	360

LARGE WOOD MATERIAL QUANTITIES

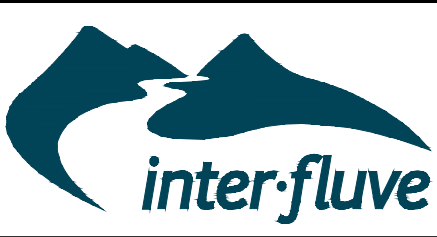
ITEM	UNITS	WEST FLOODPLAIN	CORE PITS	EAST FLOODPLAIN	COUNTY YARD	DAYBREAK TRAIL	STRUCTURE TOTAL
Imported Logs with Roots (18-24" DBH)	EA	81	760	250	64	129	1,284
Imported Logs without Roots (15-18" DBH)	EA	8	519	150	109	59	845
Imported Pile Logs (12-18" DBH)	EA	19	672	62	74	109	936
Small Salvaged Trees (<12" DBH)	EA	21	831	233	101	116	1,302
Medium Salvaged Trees (12-16" DBH)	EA	4	64	18	3	12	101
Large Salvaged Trees (17 to 24" DBH)	EA	2	44	0	0	12	58
PROJECT TOTAL		135	2,890	713	351	437	4,526

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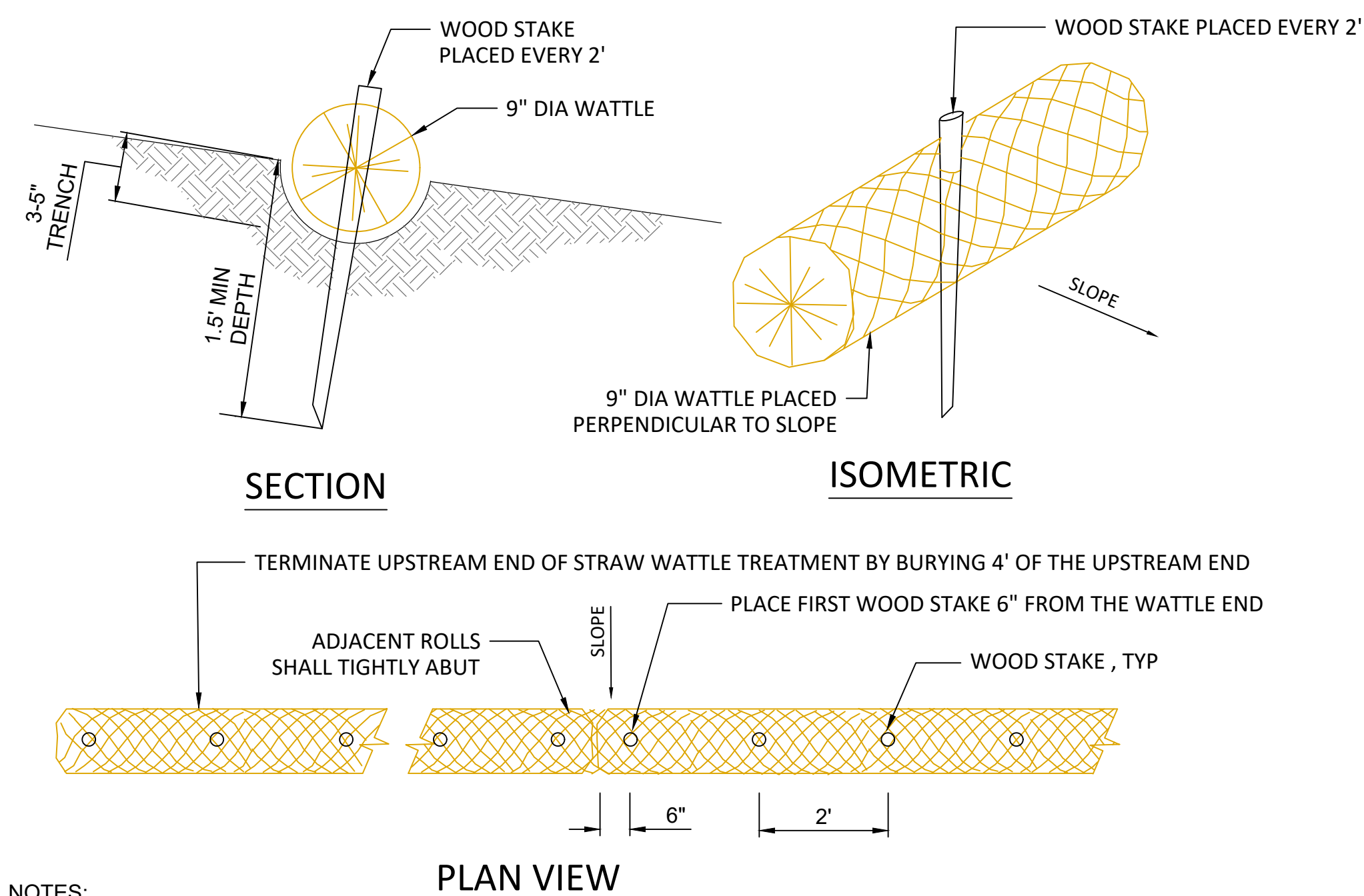
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CONSTRUCTION QUANTITIES

SHEET
4 OF 57

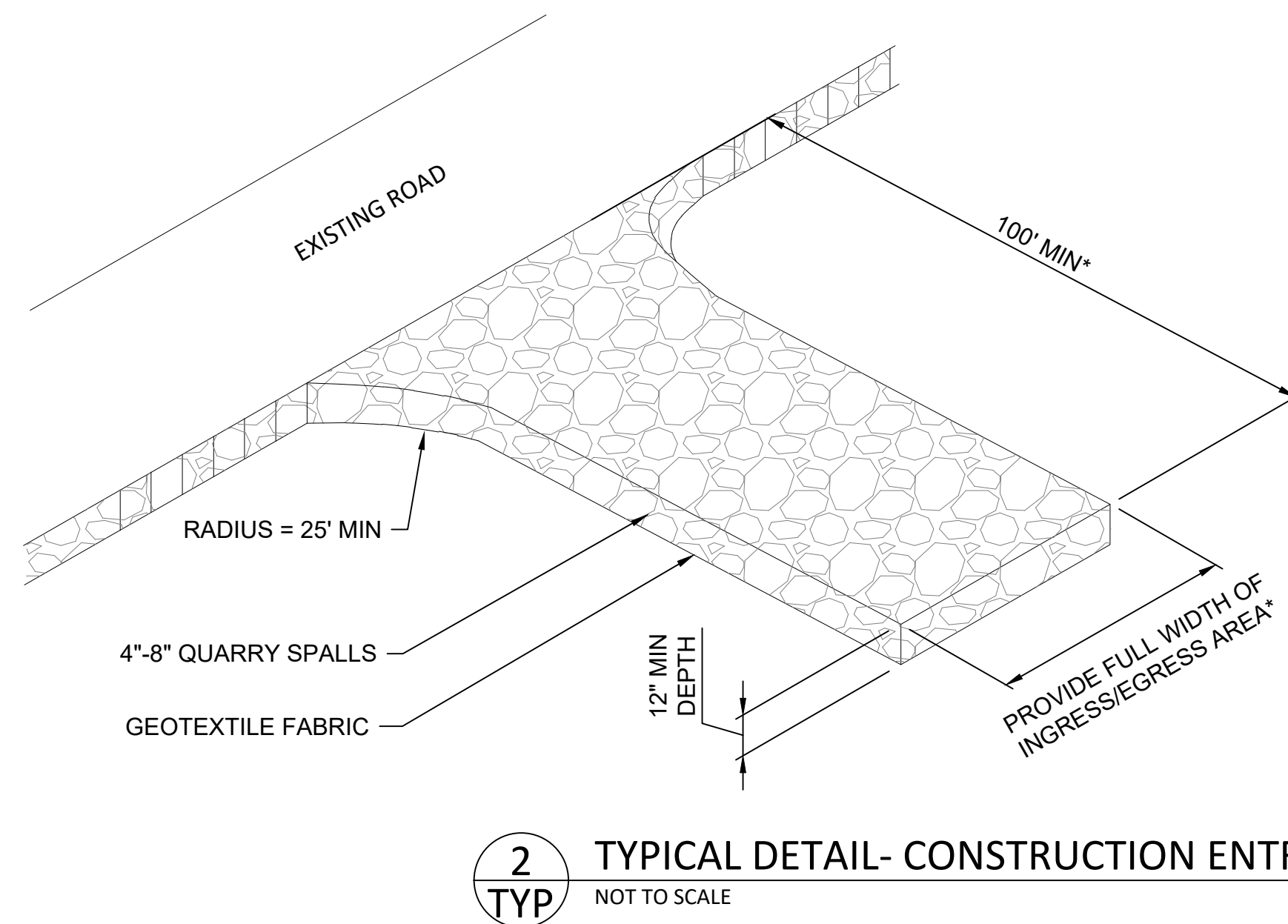


NOTES:

1. INSTALL WATTLES WITHIN TRENCH, SO THAT NO GAPS EXIST BETWEEN THE SOIL AND THE BOTTOM OF THE WATTLE. THE ENDS OF ADJACENT WATTLES SHALL BE TIGHTLY ABUTTED SO THAT NO OPENING EXISTS FOR WATER OR SEDIMENT TO PASS THROUGH.
2. WOOD STAKES SHALL BE USED TO FASTEN THE WATTLES TO THE SOIL. WHEN CONDITIONS WARRANT, A STRAIGHT METAL BAR CAN BE USED TO DRIVE A "PILOT HOLE" THROUGH THE WATTLE AND INTO THE SOIL.
3. WOOD STAKES SHALL BE PLACED 6" FROM THE WATTLE END, ANGLED SUCH THAT THEY ARE PERPENDICULAR TO GRADE. WOOD STAKES SHALL BE SPACED AT 2-FEET CENTERS LEAVING LESS THAN 1-2 INCHES OF STAKE EXPOSED ABOVE THE WATTLE.
4. AT TERMINAL ENDS OF WATTLES, EXCAVATE MIN 2' DEEP KEY TRENCH AND BURY A MIN 4' OF WATTLE END.
5. CARE SHALL BE TAKEN DURING INSTALLATION SO AS TO AVOID DAMAGE OCCURRING TO THE WATTLE AS A RESULT OF THE INSTALLATION PROCESS. SHOULD THE WATTLE BE DAMAGED DURING INSTALLATION, A WOODEN STAKE SHALL BE PLACED EITHER SIDE OF THE DAMAGED AREA TERMINATING THE WATTLE SEGMENT.
6. ANY WATTLE DAMAGED DURING PLACEMENT SHALL BE REPLACED AS DIRECTED BY AGENCY STAFF, AT THE CONTRACTOR'S EXPENSE.
7. INSTALL WATTLES IN FILL LOCATIONS ACCORDING TO THE FOLLOWING GUIDELINES:

STRAW WATTLE: VERTICAL SPACING	
SLOPE	SPACING
2:1	10'
2:1 - 5:1	25'
<5:1	50'

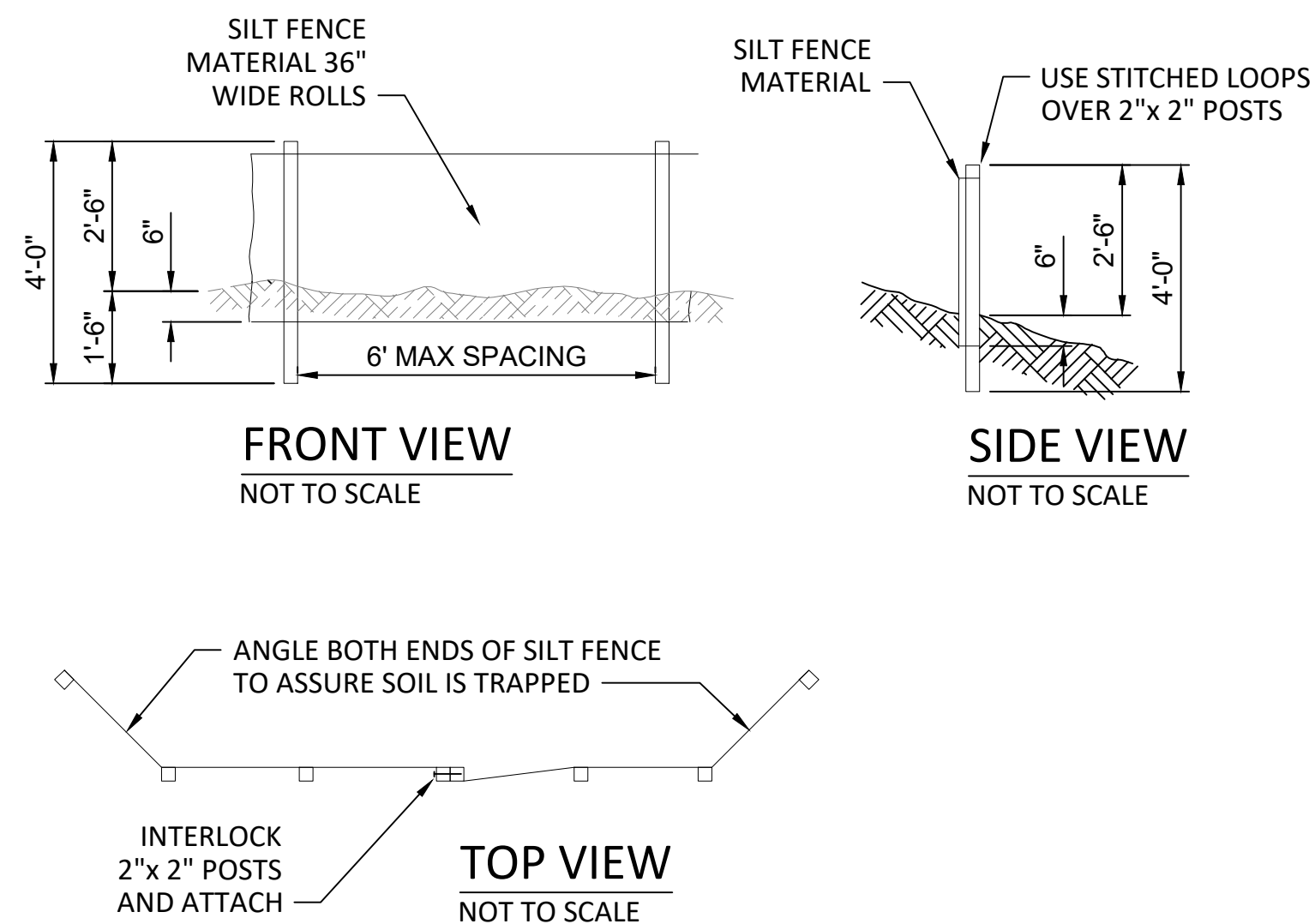
1 TYPICAL DETAIL - STRAW WATTLE
NOT TO SCALE



NOTES:

1. STABILIZED ACCESS MUST BE USED IN ALL AREAS OF THE SITE WITH VEHICLE TRAFFIC AND PARKING.
2. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT.
3. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.
4. SEE SECTION 9-37.2 (TABLE 3) FOR GEOTEXTILE REQUIREMENTS. GEOTEXTILE MODIFICATIONS BASED ON SPECIFIC PROJECT SITE CONDITIONS MAY BE APPROVED BY THE ENGINEER.
5. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.

2 TYPICAL DETAIL- CONSTRUCTION ENTRANCE
NOT TO SCALE



SILT FENCE NOTES:

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.

3 TYPICAL DETAIL- SILT FENCE
NOT TO SCALE

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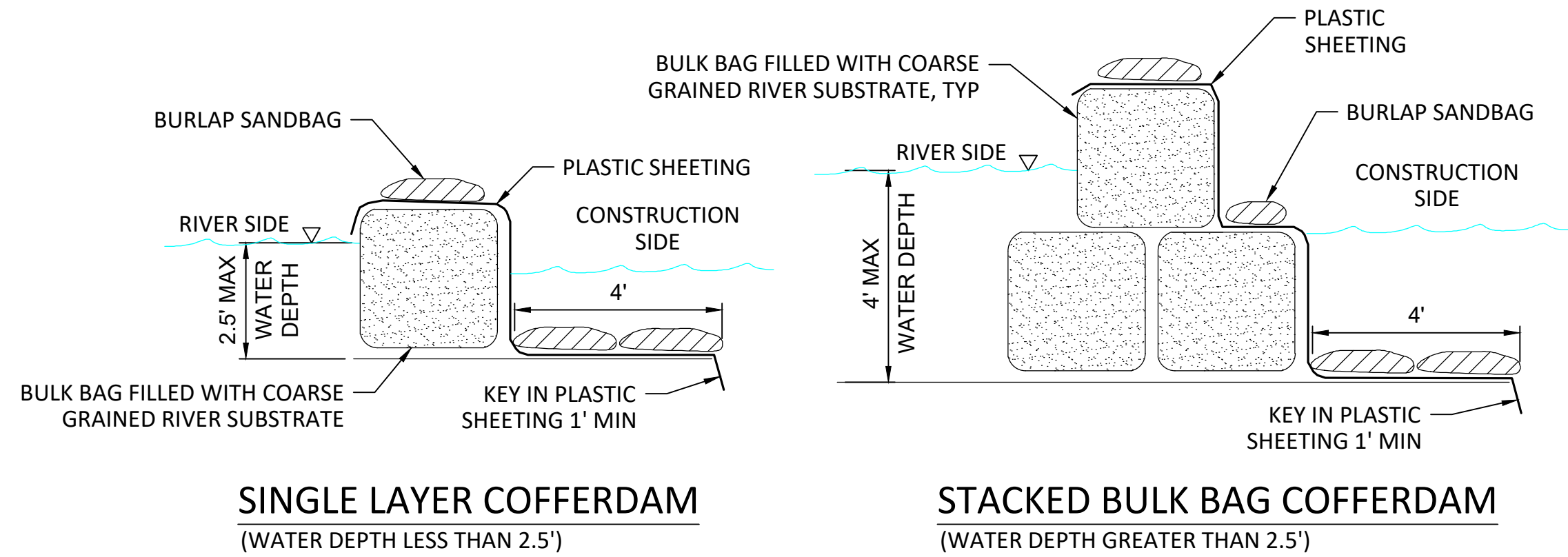
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RECONNECTION PROJECT



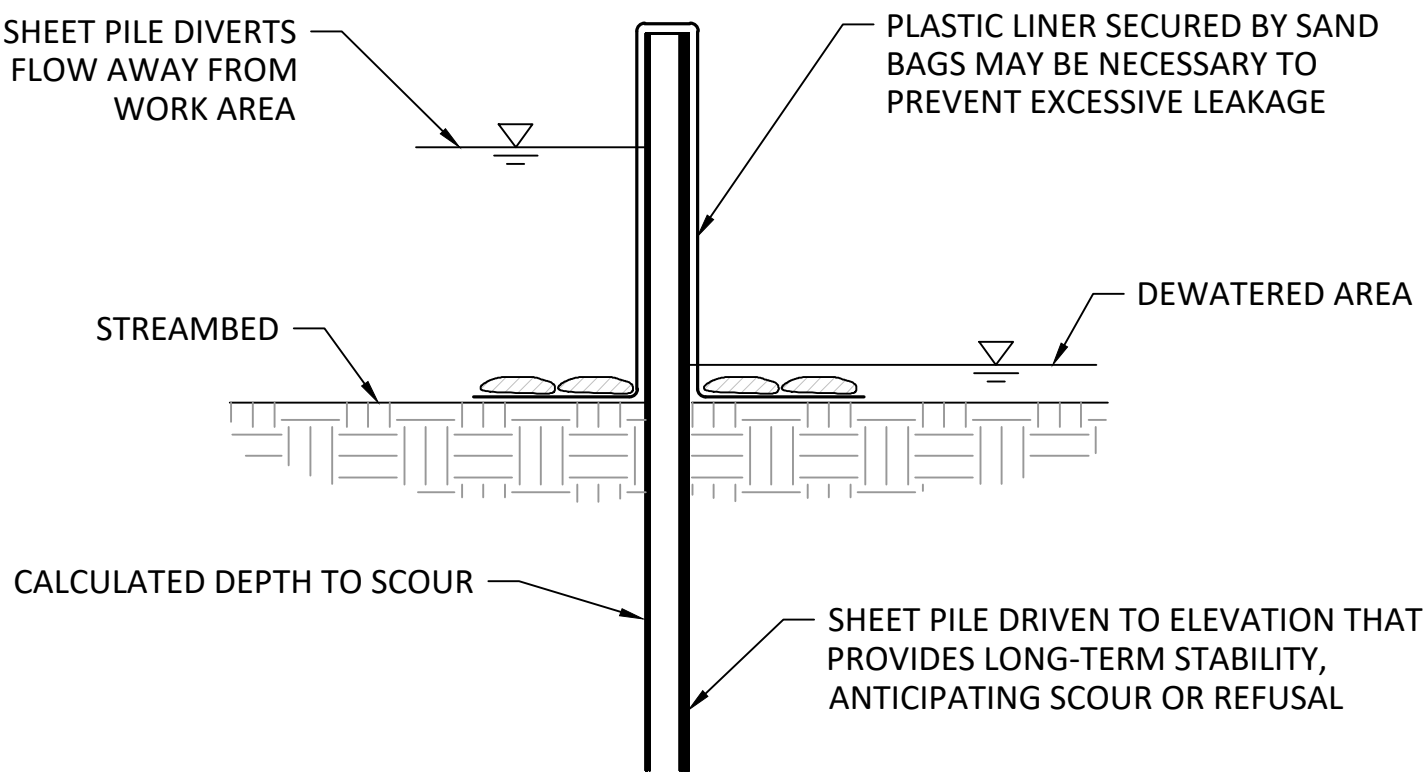
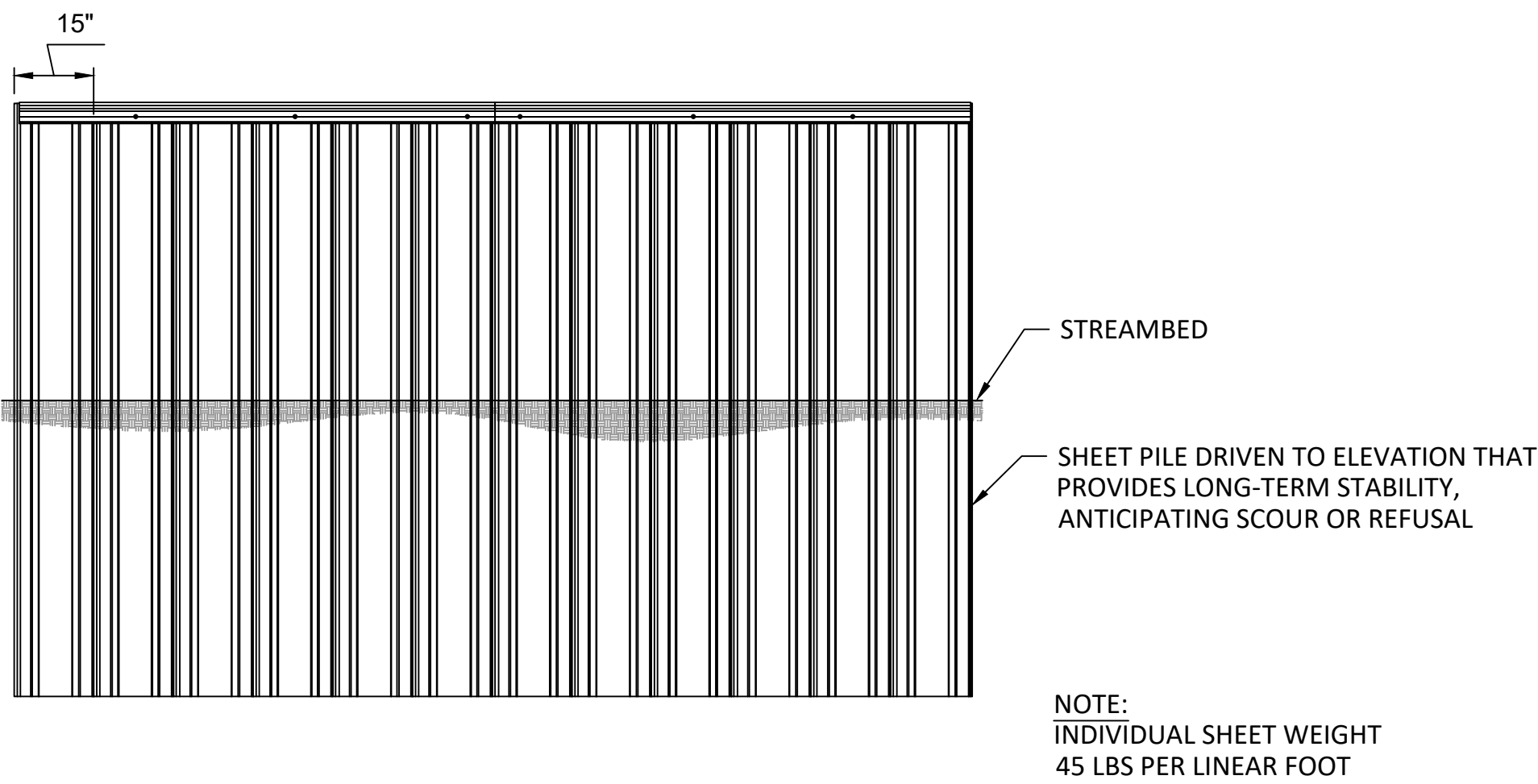
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EROSION CONTROL DETAILS



1 TYP NOT TO SCALE
TYPICAL DETAIL - TEMPORARY BULK BAG COFFERDAM

- BULK BAG NOTES:**
- BULK BAG COFFERDAM SHALL BE CONSTRUCTED OF SEVERAL UNITS OF BULK BAGS FILLED WITH WASHED COBBLE, AND ABUTTED SIDE BY SIDE TO CREATE A ROW THAT ISOLATES THE CONSTRUCTION SITE.
 - IF WATER DEPTH EXCEEDS 85% OF THE BULK BAG HEIGHT, AN ADDITIONAL TOP ROW OF BULK BAGS SHALL BE INSTALLED, SUPPORTED BY TWO BOTTOM ROWS OF BULK BAGS. BULK BAG COFFERDAM SHALL BE SEALED BY COVERING THE COFFERDAM WITH PLASTIC SHEETING HELD IN PLACE BY STANDARD SANDBAGS PLACED IN ROWS ON TOP OF COFFERDAM, AND AT TOE OF COFFERDAM.
 - THE PLASTIC SHEETING SHALL BE DRAPED ALONG THE CHANNEL BOTTOM ON THE RIVER SIDE OF THE COFFERDAM WITH OUTWARD EDGE OF SHEETING MINIMUM 4-Feet FROM TOE OF COFFERDAM. THE DRAPED PORTION OF PLASTIC SHEETING SHALL BE PINNED TO THE CHANNEL BED BY MINIMUM TWO ROWS OF STANDARD SANDBAGS. ALL SANDBAGS SHALL BE FILLED WITH WASHED PEA GRAVEL.
 - THE TERMINAL ENDS OF BULK BAG COFFERDAM, WHERE IT CONNECTS TO CHANNEL BANK OR HIGH GROUND, SHALL BE SEALED WITH PLASTIC SHEETING AND STANDARD SANDBAGS.
 - BULK BAGS SHALL BE CUBE-SHAPED POLYPROPYLENE WOVEN FABRIC BAGS WITH FULLY OPEN TOP, FLAT BOTTOM, FOUR LOOPS, MINIMUM 2-TON WEIGHT CAPACITY, MINIMUM 5:1 SAFETY FACTOR.
 - PLASTIC SHEETING SHALL BE MINIMUM 6-MIL THICKNESS. ROLL LENGTH SHALL BE LONG ENOUGH TO ENSURE THAT ENTIRE LENGTH OF COFFERDAM WILL BE COVERED WITHOUT A SEAM. MINIMUM 12-FT WIDE ROLL SHALL BE USED FOR SINGLE LAYER BULK BAG COFFERDAM. MINIMUM 16-FT WIDE ROLL SHALL BE USED FOR 2-LAYER STACKED BULK BAG COFFERDAM.
 - BULK BAG COFFERDAM SHALL BE COMPLETELY REMOVED AFTER CONSTRUCTION IS COMPLETED AND TURBIDITY HAS BEEN REMOVED. BULK BAG FILL (WASHED COBBLE) AND SANDBAG FILL (WASHED PEA GRAVEL) SHALL BE DISPOSED OF ON SITE. BAGS AND PLASTIC SHEETING SHALL BE REMOVED FROM THE SITE ONCE CONSTRUCTION IS COMPLETED.
 - MEASUREMENT AND PAYMENT FOR BULK BAG COFFERDAM, SAND BAGS, PLASTIC SHEETING, WASHED COBBLE PLACEMENT, AND MAINTENANCE AND REMOVAL OF ALL MATERIALS, SHALL BE INCIDENTAL TO THE LUMP SUM ALL INCLUSIVE COST FOR DIVERSION AND DEWATERING.
 - ALTERNATE COFFERDAM MATERIALS AND CONFIGURATIONS MAY BE ALLOWED BUT SHALL NOT BE IMPLEMENTED WITHOUT REVIEW AND APPROVAL BY THE OWNER'S REPRESENTATIVE. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS AND/OR VENDOR CUT SHEETS FOR SUBSTITUTIONS.
 - IF NECESSARY, GAPS BETWEEN BULK BAGS SHALL BE FILLED WITH WASHED STREAM GRAVEL TO IMPROVE COFFERDAM SEAL.
 - IF FLOW CONDITIONS ENCOUNTERED ON SITE DURING CONSTRUCTION DO NOT ALLOW FOR SUCCESSFUL DEWATERING USING THIS METHOD, SHEETPILE COFFERDAM (HIGH FLOWS) OR SAND BAG COFFERDAM (LOW FLOWS) MAY BE CONSIDERED.



2 TYP NOT TO SCALE
TYPICAL DETAIL - TEMPORARY SHEET PILE COFFERDAM

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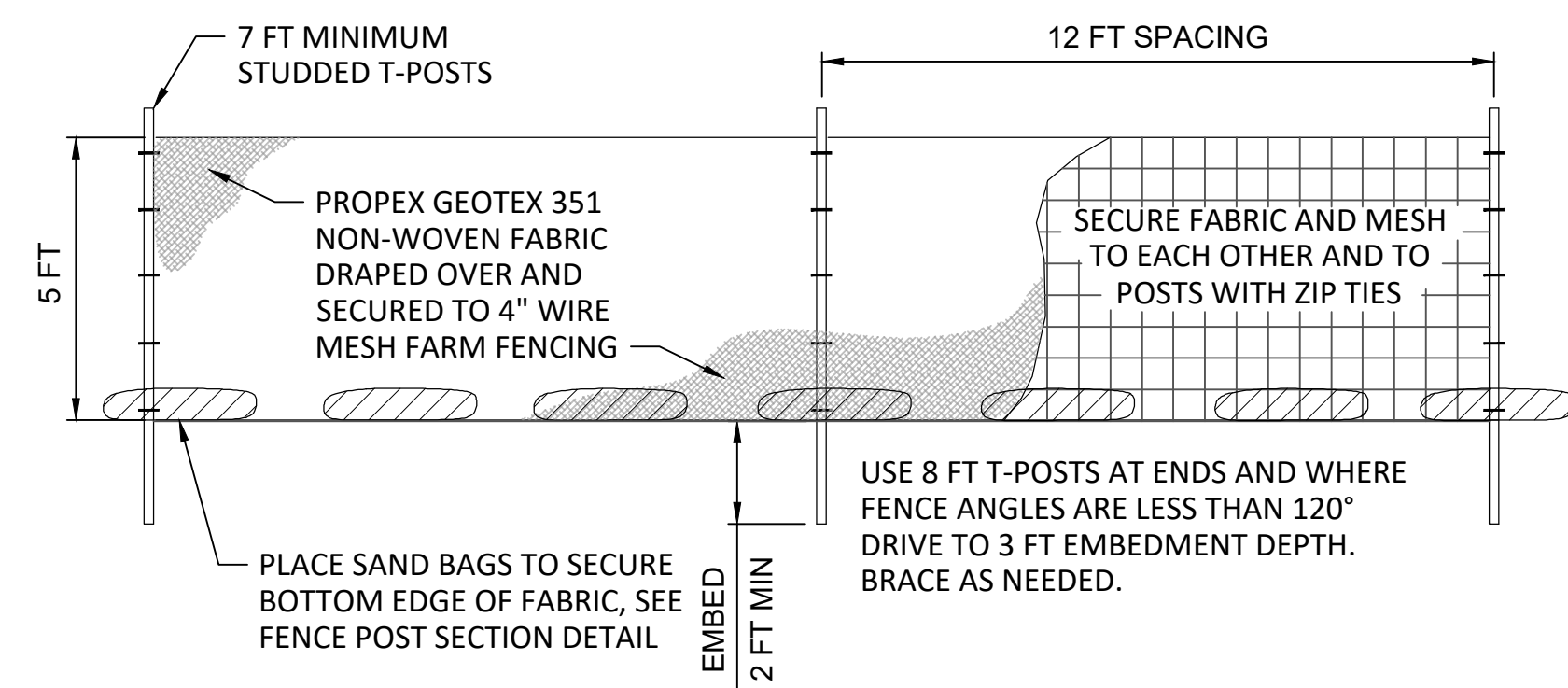
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EAST FORK LEWIS RIVER
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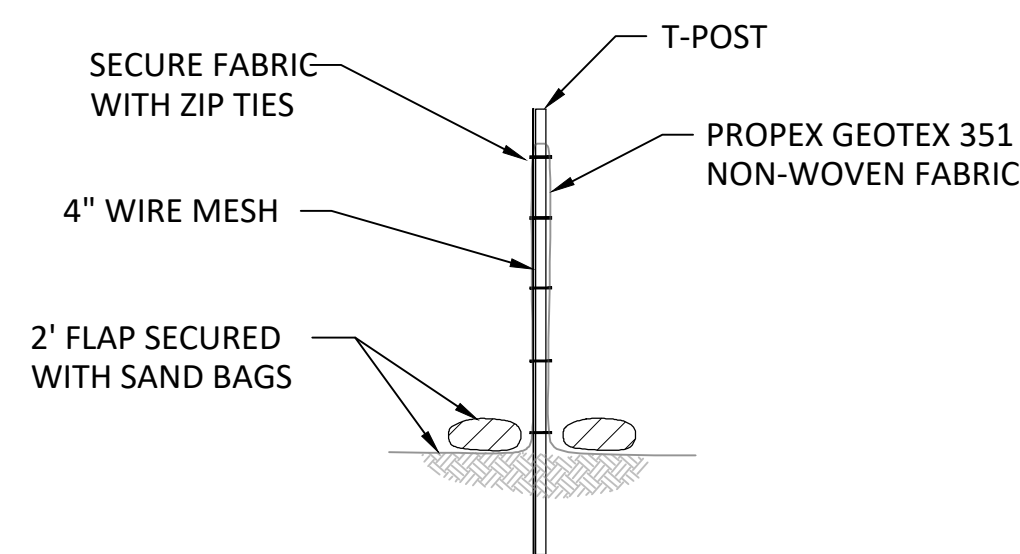


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WORK ISOLATION DETAILS (1 OF 2)

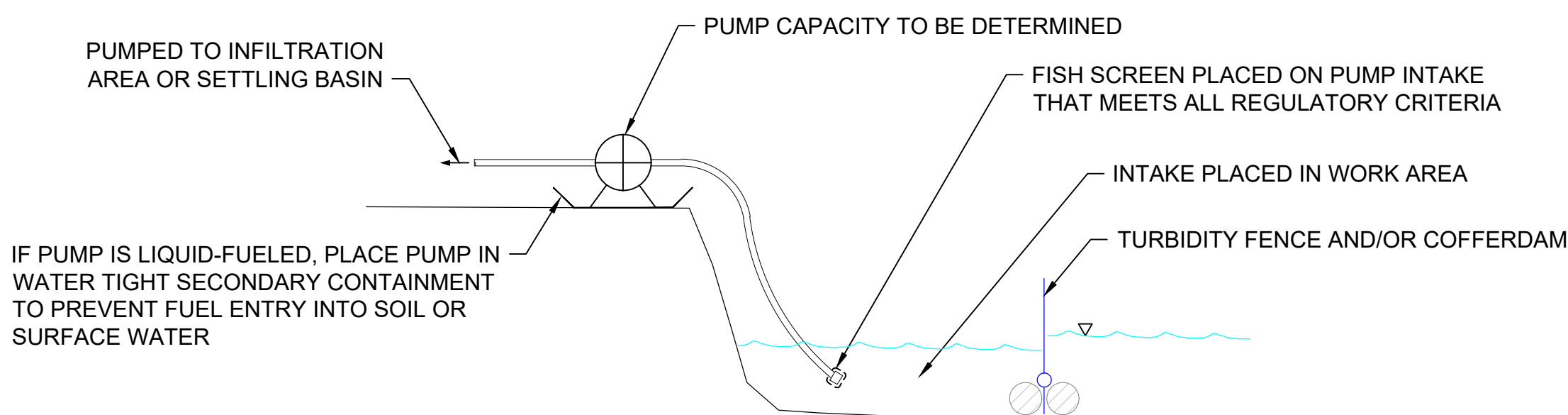


ELEVATION



SECTION

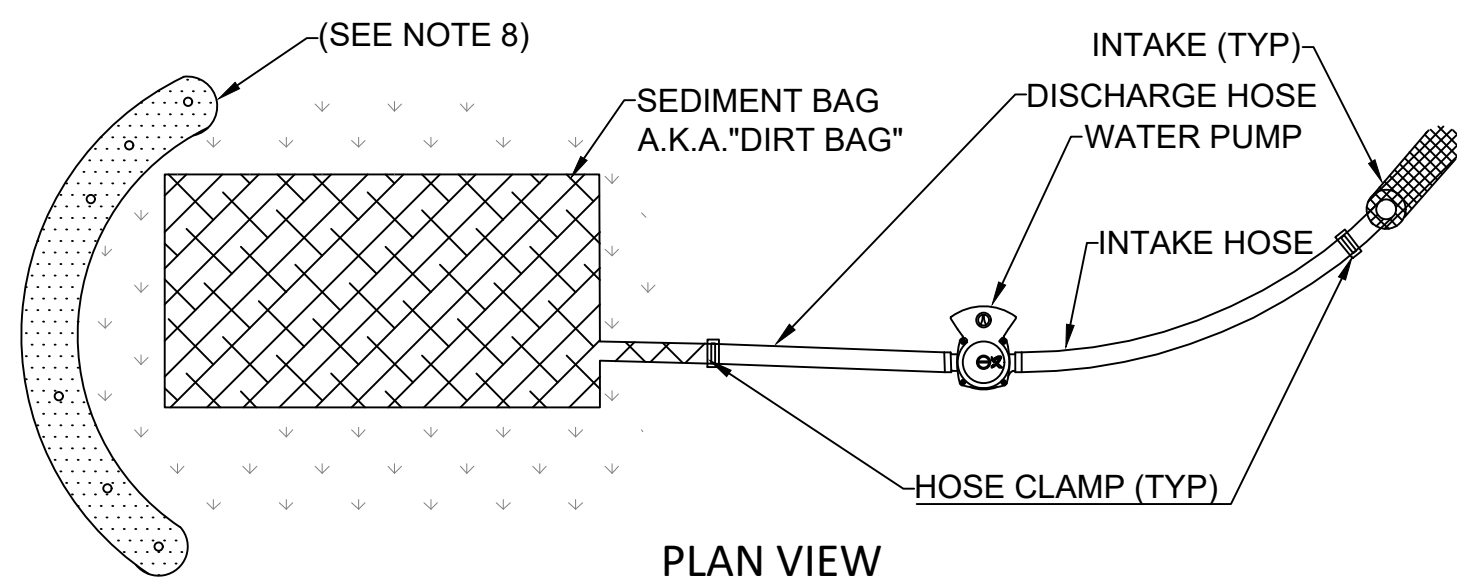
1
TYP
NOT TO SCALE
TYPICAL DETAIL - TURBIDITY CURTAIN



NOTES:

- PREFERENCE IS TO LAND APPLY WITHOUT DIGGING A SETTLING BASIN. IF LAND APPLICATION SITE IS INADEQUATE TO PREVENT ENTRY OF TURBID WATER INTO STREAM, SETTLING BASIN SHALL BE CONSTRUCTED IN A PREVIOUSLY DISTURBED AREA.
- SETTLING BASIN SHALL BE MONITORED FOR SILTATION AND REDUCTION IN INFILTRATION RATES WHILE IN USE.

2
TYP
NOT TO SCALE
TYPICAL DETAIL - PUMP



PLAN VIEW

SEDIMENT BAG NOTES:

- THE SEDIMENT BAG SHALL BE MANUFACTURED USING A POLYPROPYLENE 8 OZ. NON-WOVEN GEOTEXTILE SEWN INTO A BAG WITH A DOUBLE NEEDLE, USING A HIGH STRENGTH THREAD.
- EACH STANDARD SEDIMENT BAG MUST HAVE A FILL SPOUT LARGE ENOUGH TO ACCOMMODATE A 4" DISCHARGE HOSE. STRAPS ARE ATTACHED TO SECURE THE HOSE AND PREVENT PUMPED WATER FROM ESCAPING WITHOUT BEING FILTERED.
- THE SEDIMENT BAG SHALL MEET OR EXCEED OVERALL BAG REMOVAL EFFICIENCY RATE OF 97.55%.
- WATER BEING DISCHARGED FROM THE SEDIMENT BAG MUST BE FREE OF ALL SEDIMENT PRIOR TO LEAVING THE SITE OR ENTERING INTO THE STORM SYSTEM.
- SEDIMENT BAG IS FULL WHEN IT NO LONGER CAN EFFICIENTLY FILTER SEDIMENT OR ALLOW WATER TO PASS AT A RATE LESS THAN 50% OF MANUFACTURER'S DESIGNED FLOW RATE.
- DURING USE, THE SEDIMENT BAG MUST BE MONITORED.
- DISPOSE OF USED SEDIMENT BAG OFF SITE OR AS APPROVED BY CWS.
- FOR BEST RESULTS, PLACE SEDIMENT BAG ON FLAT SURFACE.
- SEDIMENT BAG SHOULD BE PLACED ON EXISTING VEGETATION, ROCK, OR BED OF STRAW. SEDIMENT BAG SHOULD NOT BE PLACED ON BARE GROUND.

3
TYP
NOT TO SCALE
TYPICAL DETAIL - SEDIMENT BAG

Preliminary
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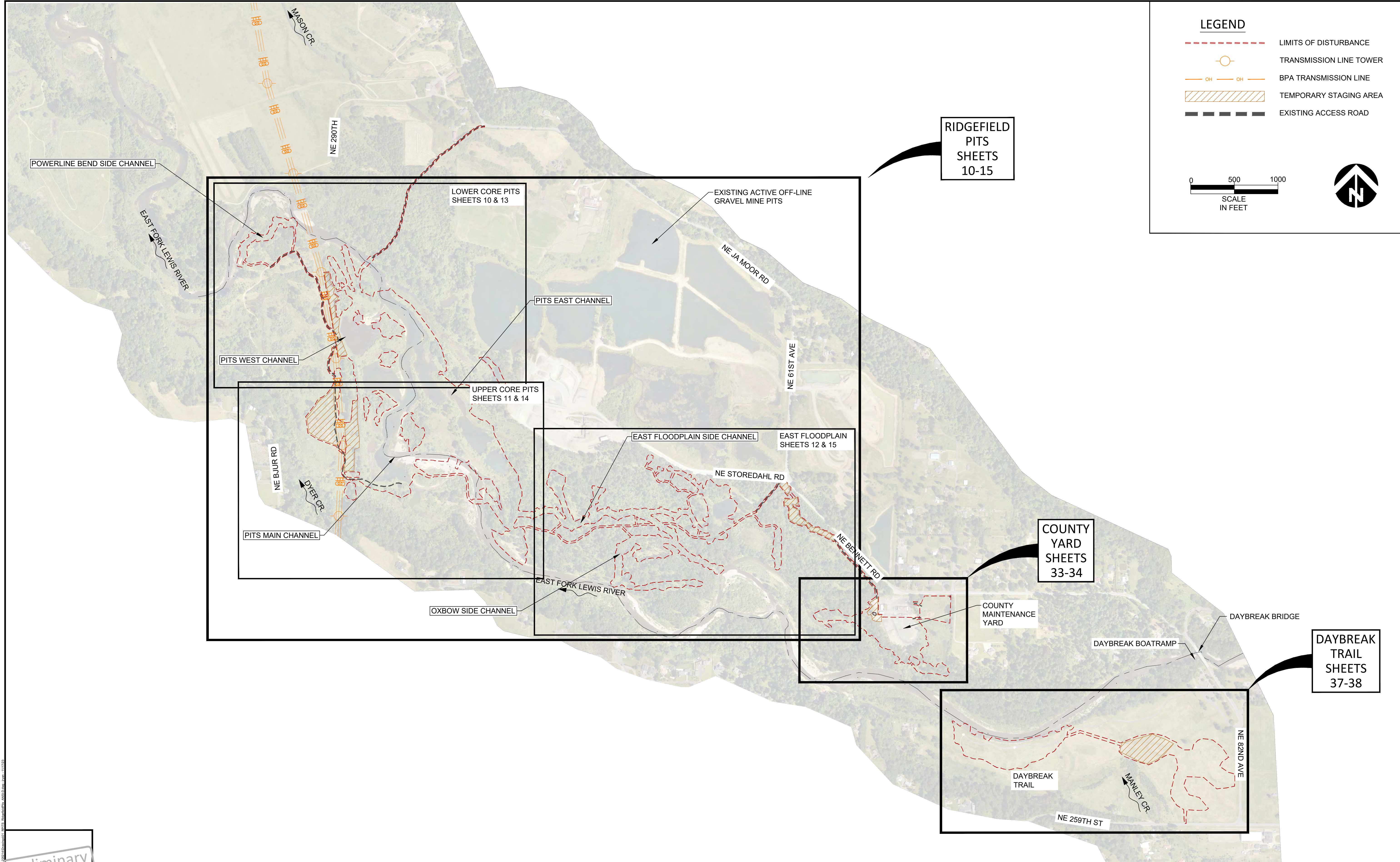


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WORK ISOLATION DETAILS (2 OF 2)

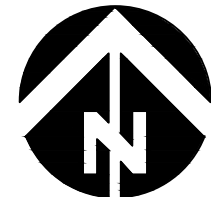
SHEET

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- LEGEND**
- LIMITS OF DISTURBANCE
 - TRANSMISSION LINE TOWER
 - OH OH BPA TRANSMISSION LINE
 - TEMPORARY STAGING AREA
 - EXISTING ACCESS ROAD

0 500 1000
SCALE
IN FEET



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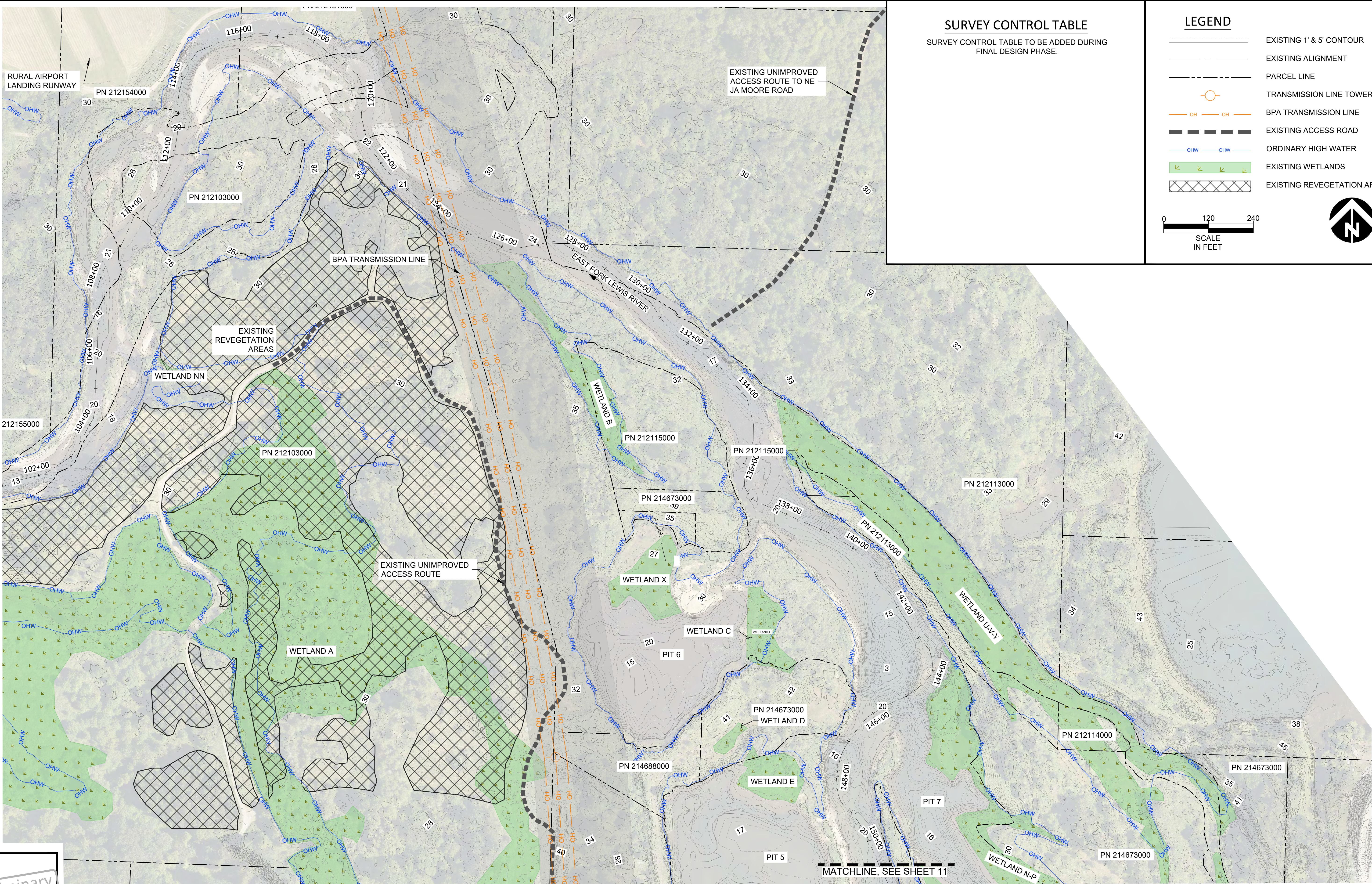
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EXISTING CONDITIONS & TESC
SHEET INDEX

SHEET
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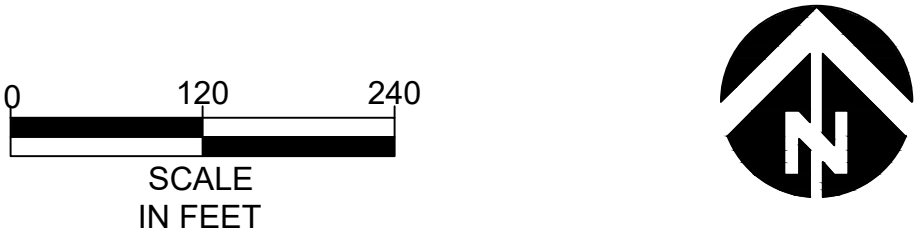


SURVEY CONTROL TABLE

SURVEY CONTROL TABLE TO BE ADDED DURING FINAL DESIGN PHASE.

LEGEND

- EXISTING 1' & 5' CONTOUR
- EXISTING ALIGNMENT
- PARCEL LINE
- TRANSMISSION LINE TOWER
- BPA TRANSMISSION LINE
- EXISTING ACCESS ROAD
- ORDINARY HIGH WATER
- EXISTING WETLANDS
- EXISTING REVEGETATION AREAS



Preliminary
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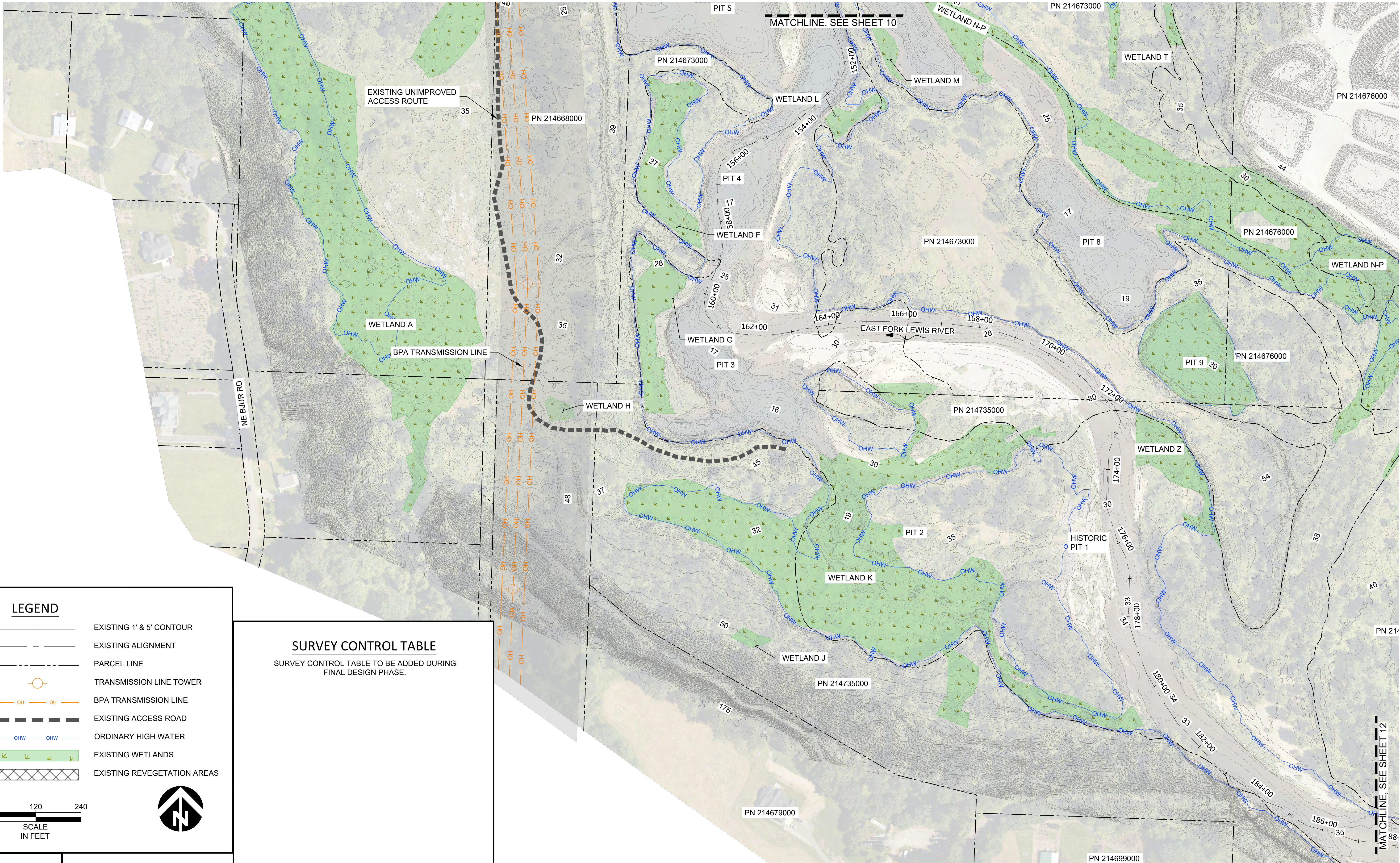
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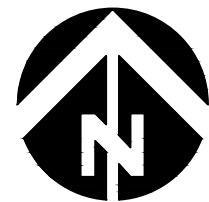
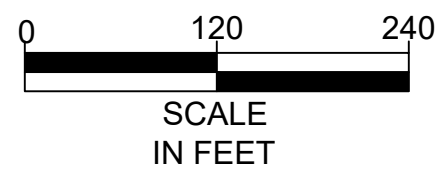
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EXISTING CONDITIONS
LOWER CORE PITS

SHEET
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- LEGEND**
- EXISTING 1' & 5' CONTOUR
 - EXISTING ALIGNMENT
 - PARCEL LINE
 - TRANSMISSION LINE TOWER
 - BPA TRANSMISSION LINE
 - EXISTING ACCESS ROAD
 - ORDINARY HIGH WATER
 - EXISTING WETLANDS
 - EXISTING REVEGETATION AREAS



SURVEY CONTROL TABLE

SURVEY CONTROL TABLE TO BE ADDED DURING FINAL DESIGN PHASE.

Preliminary
Not for Construction

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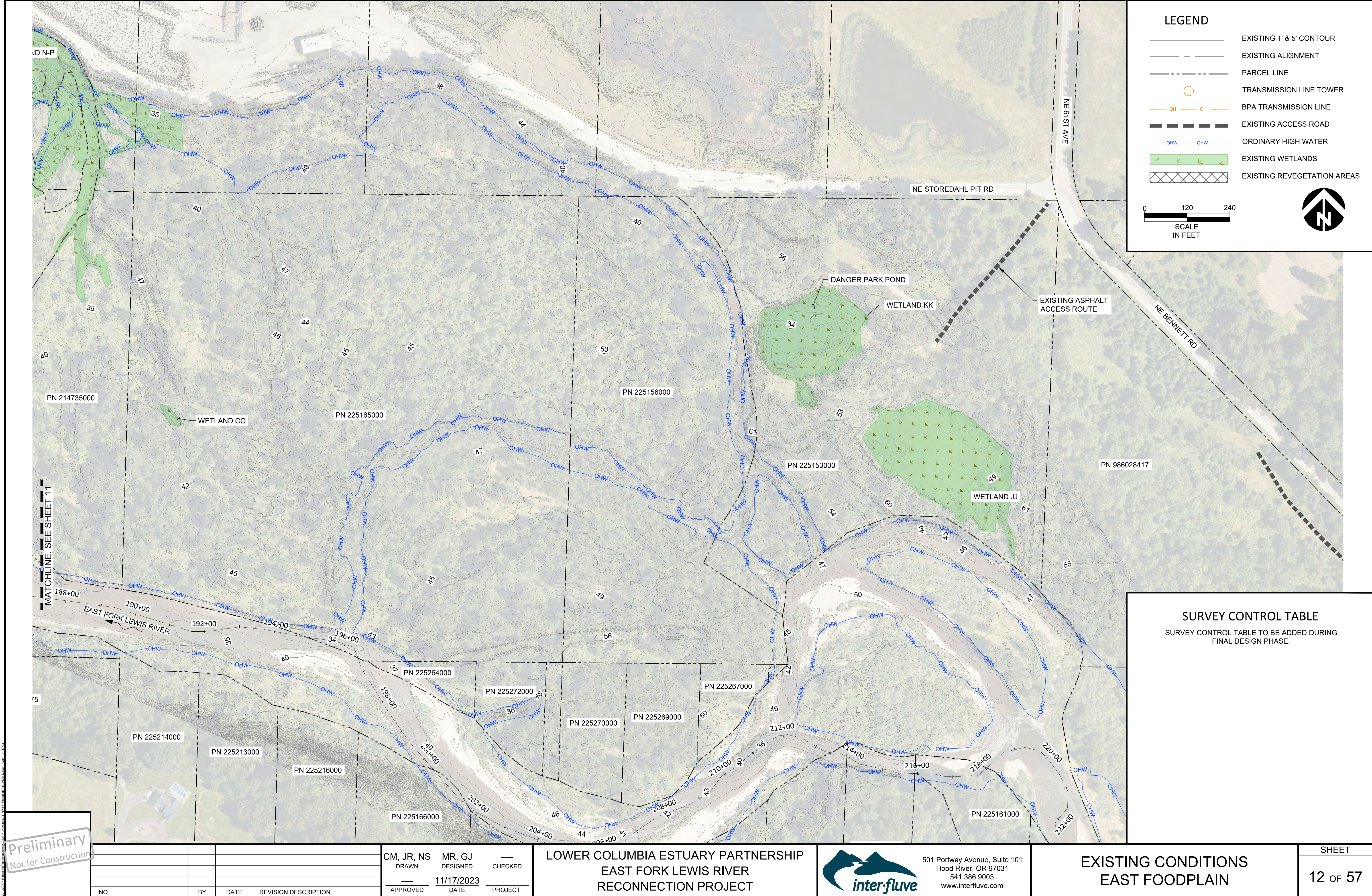
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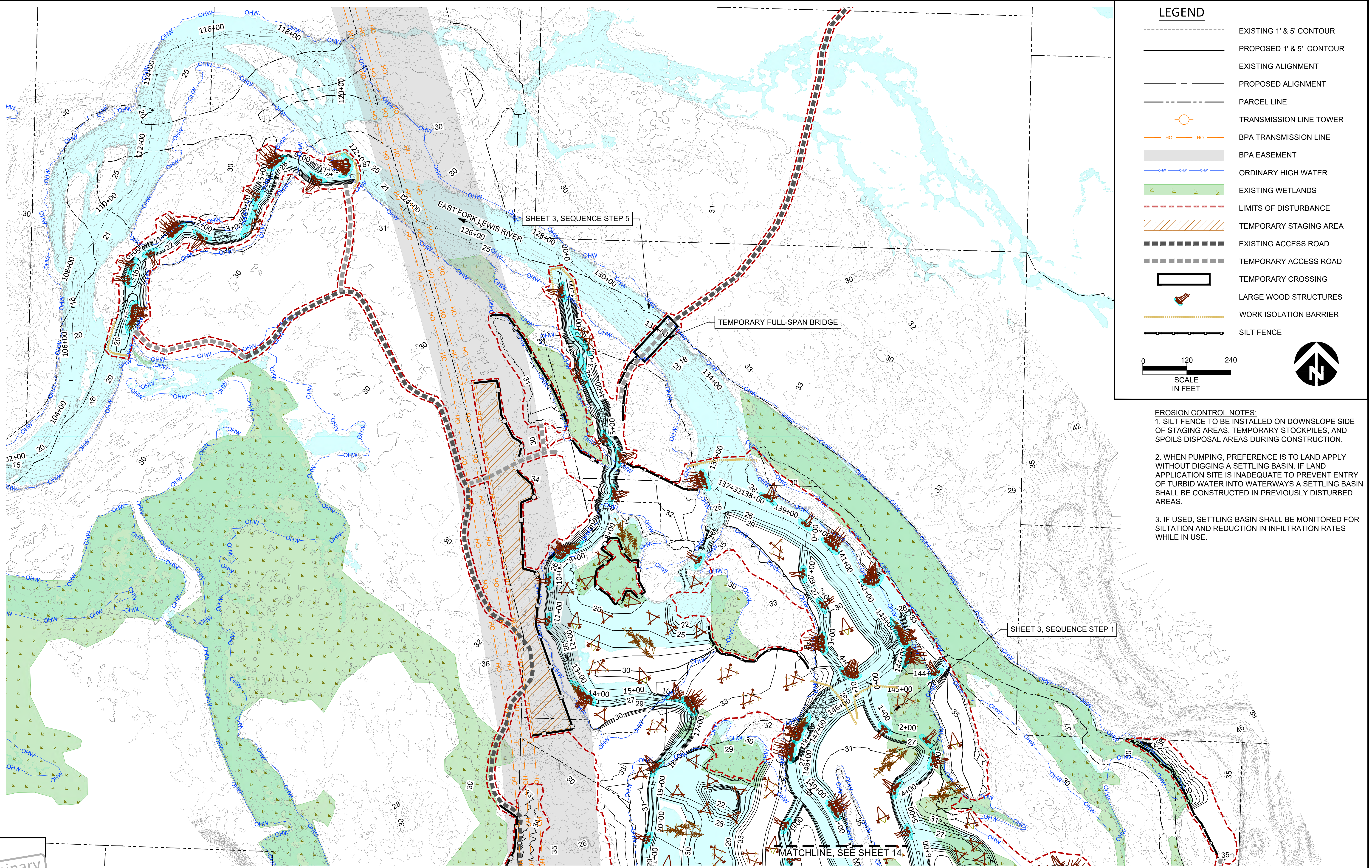


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EXISTING CONDITIONS
UPPER CORE PITS

SHEET
11 OF 57





LEGEND

EXISTING 1' & 5' CONTOUR

PROPOSED 1' & 5' CONTOUR

EXISTING ALIGNMENT

PROPOSED ALIGNMENT

PARCEL LINE

TRANSMISSION LINE TOWER

BPA TRANSMISSION LINE

BPA EASEMENT

ORDINARY HIGH WATER

EXISTING WETLANDS

LIMITS OF DISTURBANCE

TEMPORARY STAGING AREA

EXISTING ACCESS ROAD

TEMPORARY ACCESS ROAD

TEMPORARY CROSSING

LARGE WOOD STRUCTURES

WORK ISOLATION BARRIER

SILT FENCE

0

120

240

SCALE
IN FEET

EROSION CONTROL NOTES:

1. SILT FENCE TO BE INSTALLED ON DOWNSLOPE SIDE OF STAGING AREAS, TEMPORARY STOCKPILES, AND SPOILS DISPOSAL AREAS DURING CONSTRUCTION.

2. WHEN PUMPING, PREFERENCE IS TO LAND APPLY WITHOUT DIGGING A SETTLING BASIN. IF LAND APPLICATION SITE IS INADEQUATE TO PREVENT ENTRY OF TURBID WATER INTO WATERWAYS A SETTLING BASIN SHALL BE CONSTRUCTED IN PREVIOUSLY DISTURBED AREAS.

3. IF USED, SETTLING BASIN SHALL BE MONITORED FOR SILTATION AND REDUCTION IN INFILTRATION RATES WHILE IN USE.

Preliminary
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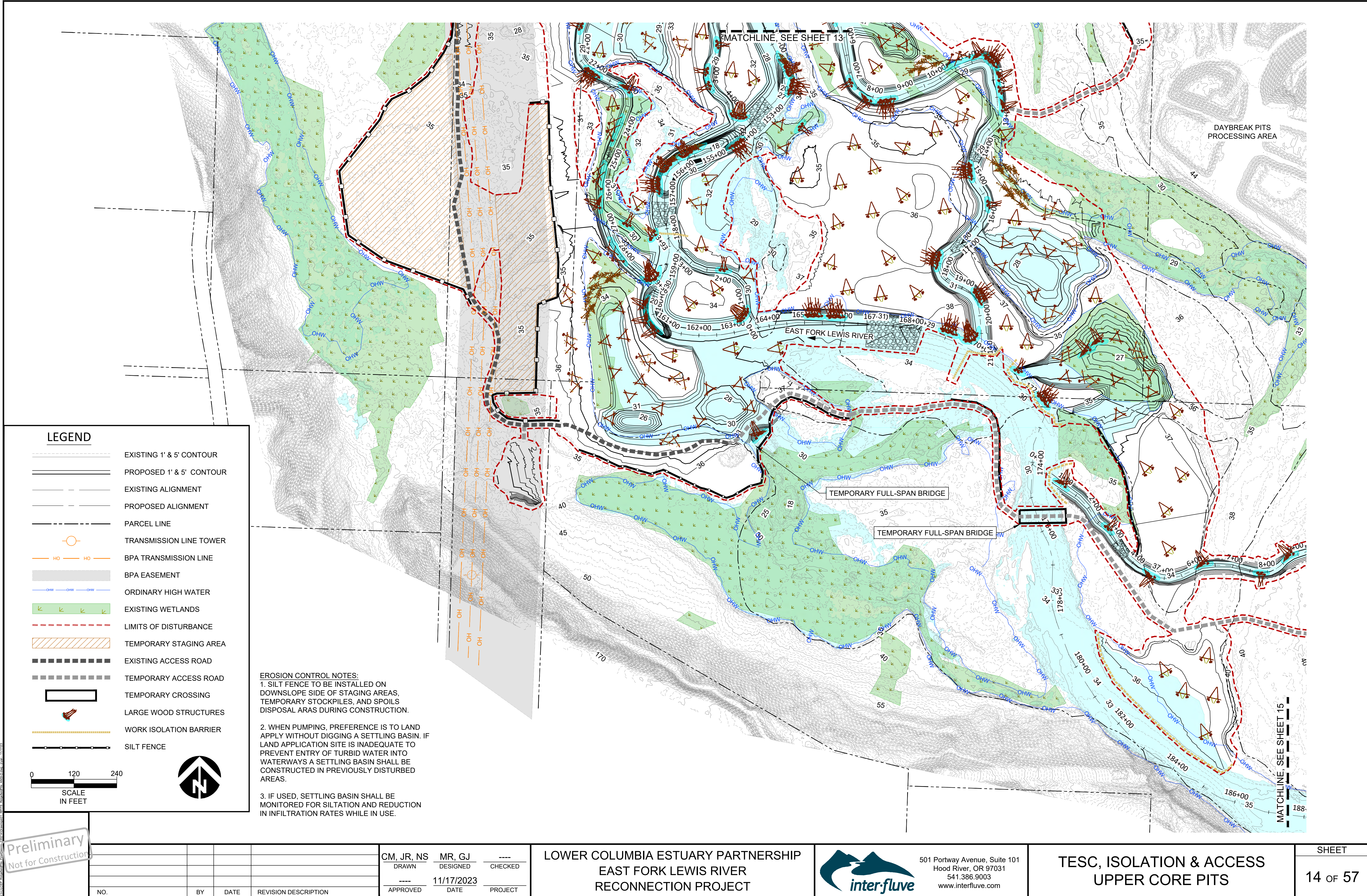
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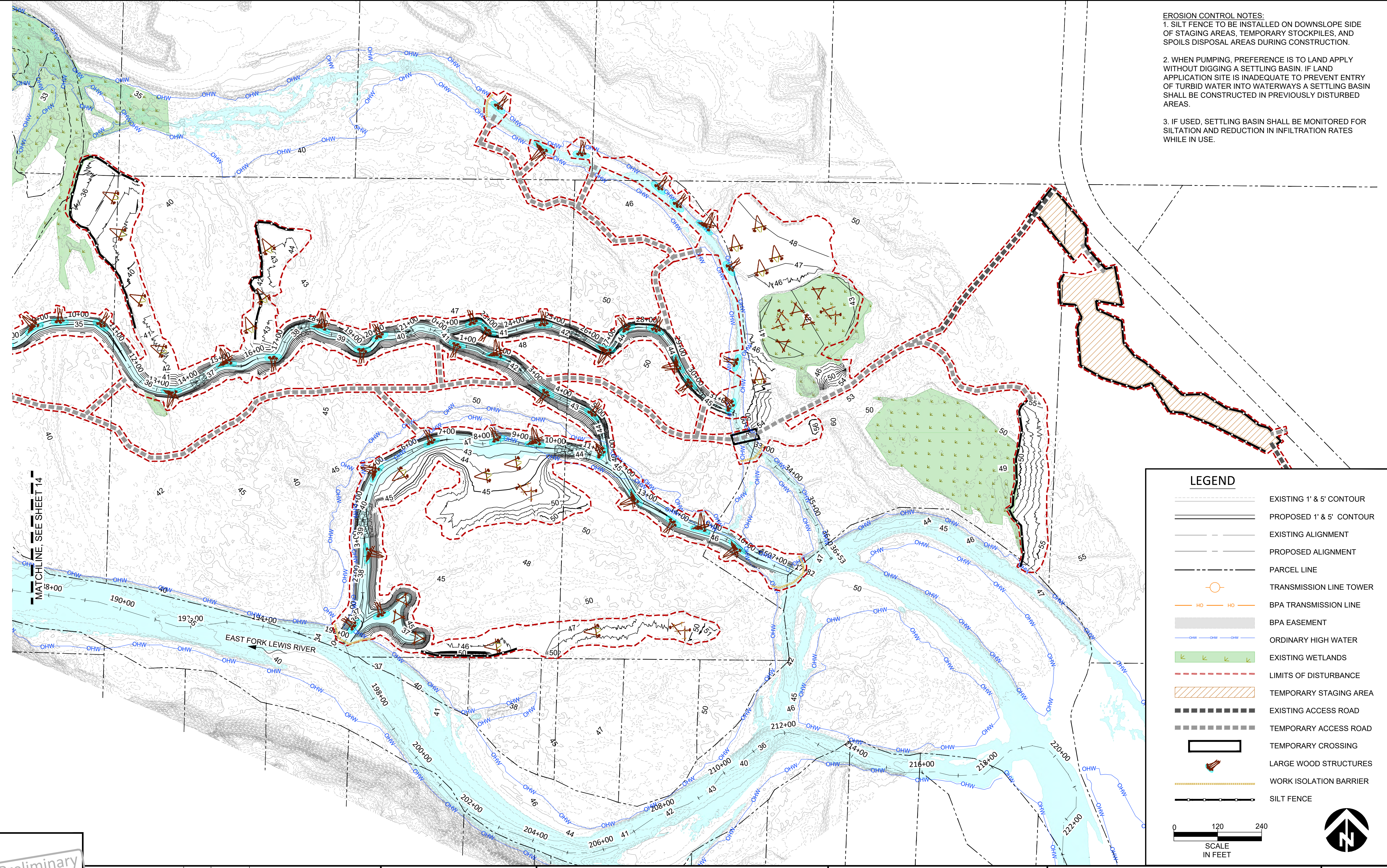
LOWER COLUMBIA ESTUARY PARTNERSHIP
EAST FORK LEWIS RIVER
RECONNECTION PROJECT

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TESC, ISOLATION & ACCESS
LOWER CORE PITS



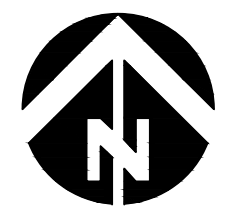
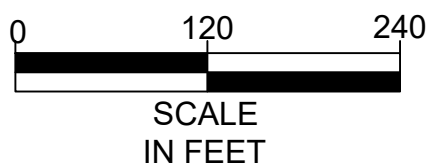
EROSION CONTROL NOTES:
1. SILT FENCE TO BE INSTALLED ON DOWNSLOPE SIDE OF STAGING AREAS, TEMPORARY STOCKPILES, AND SPOILS DISPOSAL AREAS DURING CONSTRUCTION.
2. WHEN PUMPING, PREFERENCE IS TO LAND APPLY WITHOUT DIGGING A SETTLING BASIN. IF LAND APPLICATION SITE IS INADEQUATE TO PREVENT ENTRY OF TURBID WATER INTO WATERWAYS A SETTLING BASIN SHALL BE CONSTRUCTED IN PREVIOUSLY DISTURBED AREAS.
3. IF USED, SETTLING BASIN SHALL BE MONITORED FOR SILTATION AND REDUCTION IN INFILTRATION RATES WHILE IN USE.



MATCHLINE, SEE SHEET 14

LEGEND

- EXISTING 1' & 5' CONTOUR
- PROPOSED 1' & 5' CONTOUR
- EXISTING ALIGNMENT
- PROPOSED ALIGNMENT
- PARCEL LINE
- TRANSMISSION LINE TOWER
- BPA TRANSMISSION LINE
- BPA EASEMENT
- ORDINARY HIGH WATER
- EXISTING WETLANDS
- LIMITS OF DISTURBANCE
- TEMPORARY STAGING AREA
- EXISTING ACCESS ROAD
- TEMPORARY ACCESS ROAD
- TEMPORARY CROSSING
- LARGE WOOD STRUCTURES
- WORK ISOLATION BARRIER
- SILT FENCE



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	DATE	

LOWER COLUMBIA ESTUARY PARTNERSHIP
EAST FORK LEWIS RIVER
RECONNECTION PROJECT



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TESC, ISOLATION & ACCESS
EAST FLOODPLAIN

LEGEND

EXISTING 1' & 5' CONTOUR

PROPOSED 1' & 5' CONTOUR

CUT

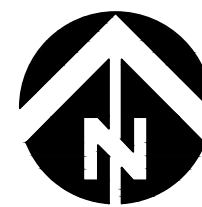
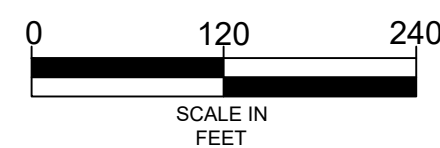
FILL: RIFFLE

FILL: GRAVEL BAR

FILL: CHANNEL

FILL: NO TREATMENT

CONTINGENCY BORROW AREA



MATCHLINE, SEE SHEET 16

BPA NORTH BERM

PITS NORTH FLOODPLAIN

PITS WEST CHANNEL

PITS WEST BERM

PITS CENTRAL

PITS EAST CHANNEL

PITS 8 AND 9

PITS MAIN CHANNEL

PITS SOUTHWEST FLOODPLAIN

BPA SOUTH BERM

PITS SOUTH CENTRAL
FLOODPLAIN

EAST FLOODPLAIN
MAIN SIDE CHANNEL

OLD CHANNEL ALCOVE -

LOWER CONTINGENCY
BORROW AREA

MATCHLINE, SEE SHEET 18

				CM, JR, NS	MR, GJ	----
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				----	11/17/2023	
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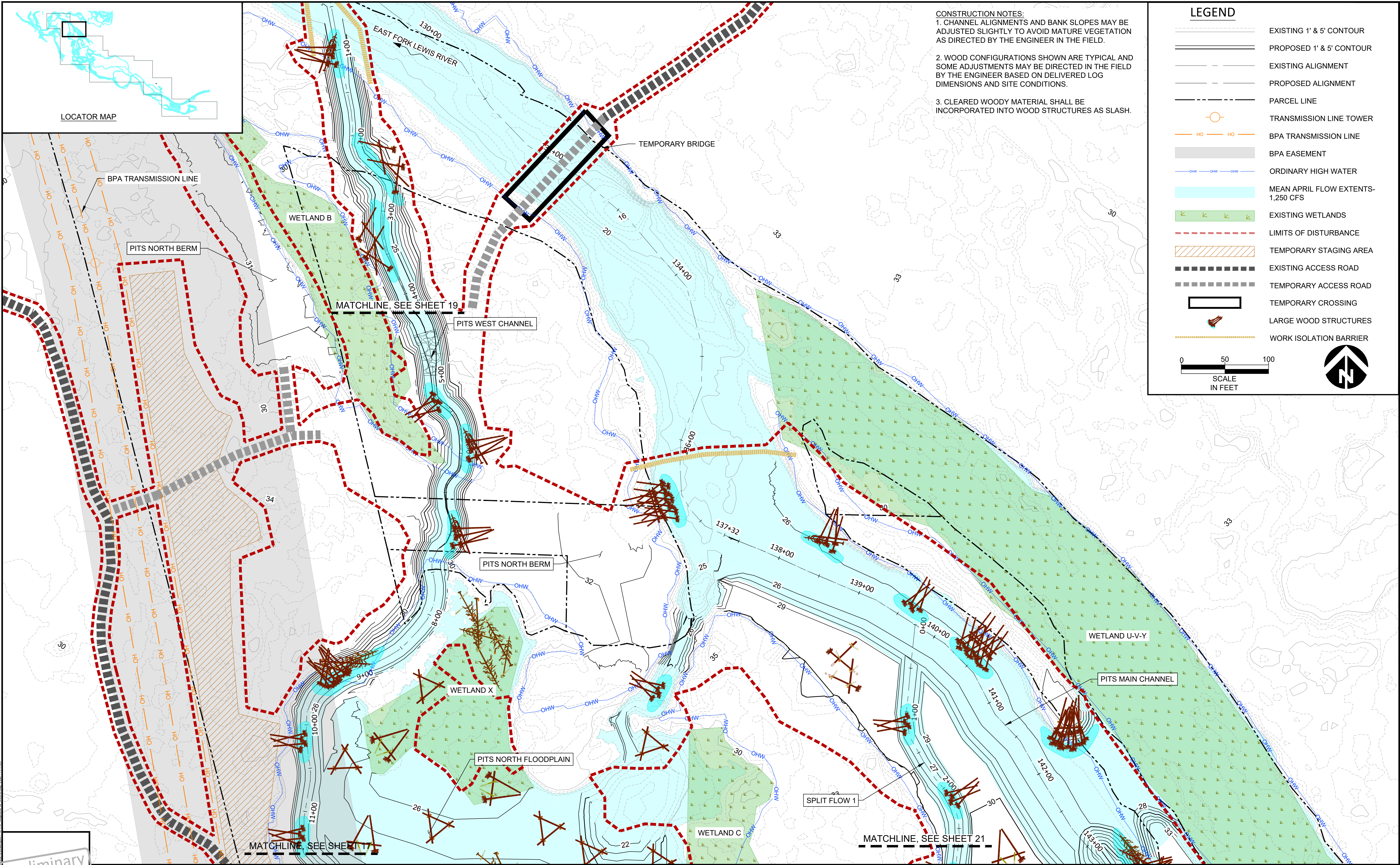


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EARTHWORK & SEQUENCING UPPER CORE PITS

SHEET

17 OF 57



CONSTRUCTION NOTES:
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3. CLEARED WOODY MATERIAL SHALL BE INCORPORATED INTO WOOD STRUCTURES AS SLASH.

LEGEND

- EXISTING 1' & 5' CONTOUR
- PROPOSED 1' & 5' CONTOUR
- EXISTING ALIGNMENT
- PROPOSED ALIGNMENT
- PARCEL LINE
- TRANSMISSION LINE TOWER
- BPA TRANSMISSION LINE
- BPA EASEMENT
- ORDINARY HIGH WATER
- MEAN APRIL FLOW EXTENTS-1,250 CFS
- EXISTING WETLANDS
- LIMITS OF DISTURBANCE
- TEMPORARY STAGING AREA
- EXISTING ACCESS ROAD
- TEMPORARY ACCESS ROAD
- TEMPORARY CROSSING
- LARGE WOOD STRUCTURES
- WORK ISOLATION BARRIER

0 50 100
SCALE
IN FEET

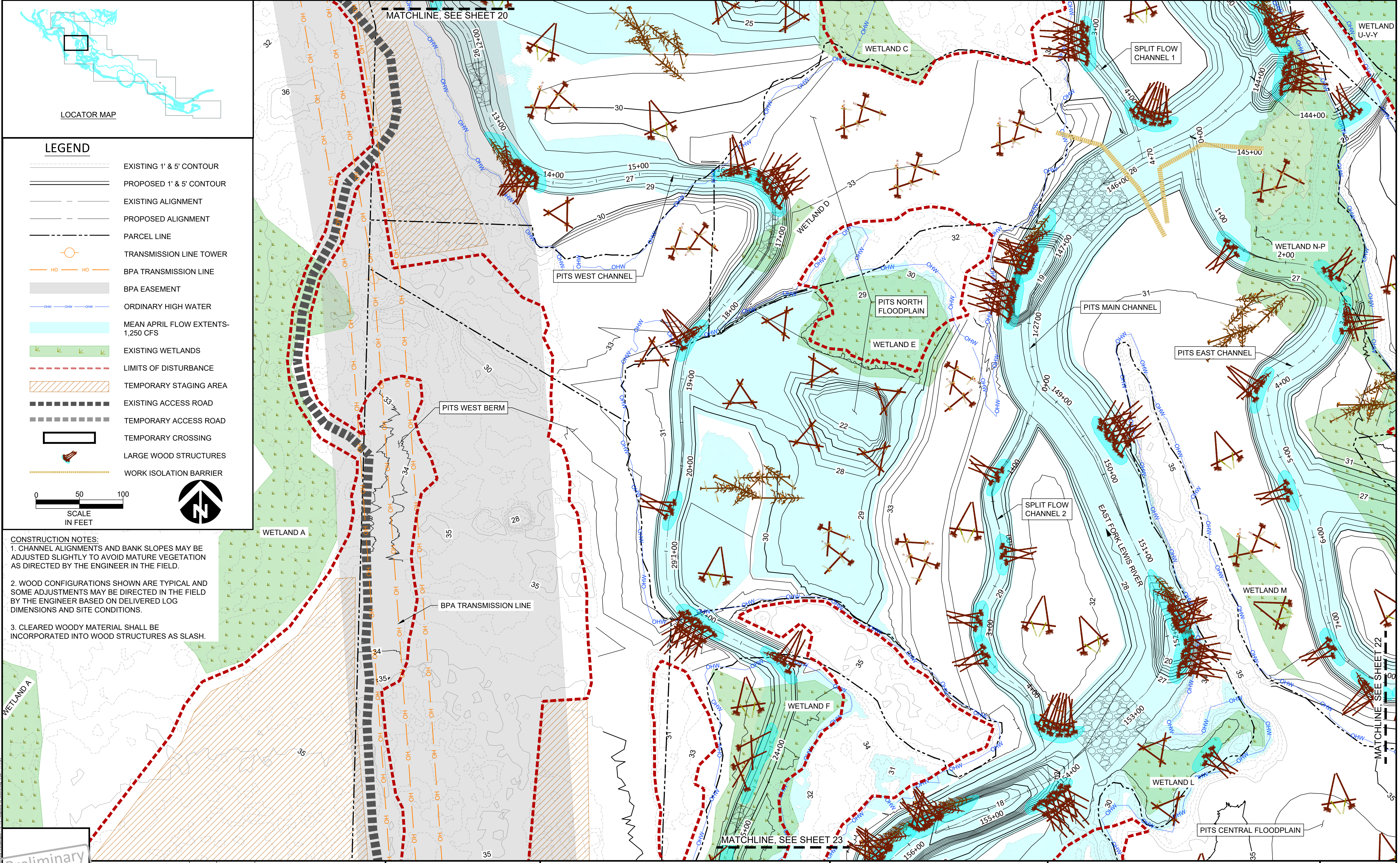
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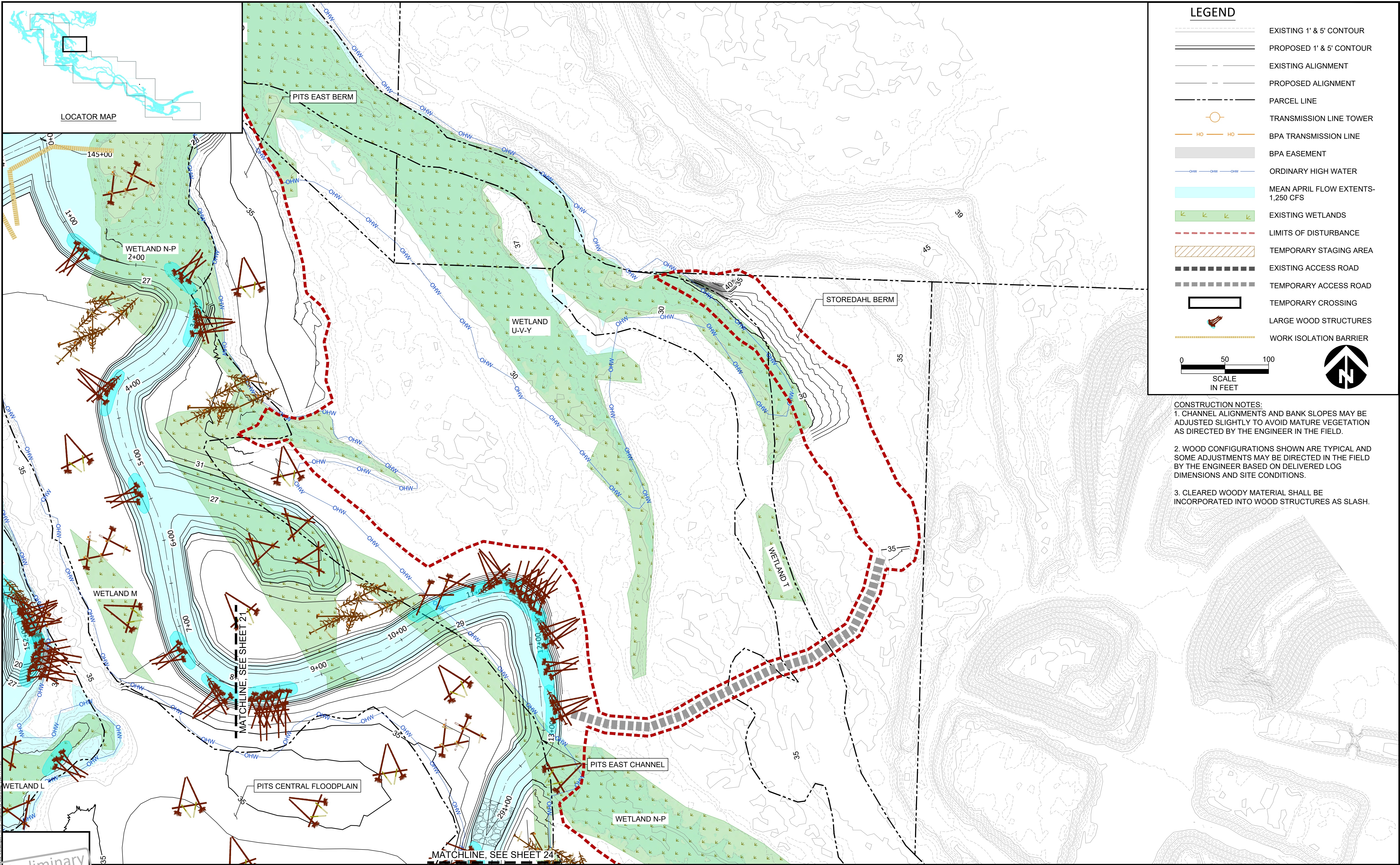
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APPROVED	DATE	PROJECT

LOWER COLUMBIA ESTUARY PARTNERSHIP
EAST FORK LEWIS RIVER
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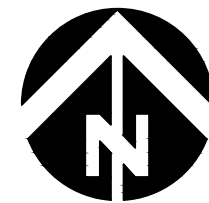
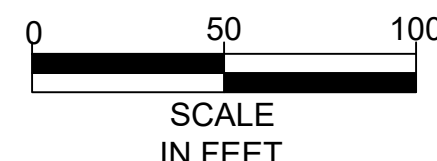
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PROPOSED CONDITIONS
CORE PITS 2



LEGEND

- EXISTING 1' & 5' CONTOUR
- PROPOSED 1' & 5' CONTOUR
- EXISTING ALIGNMENT
- PROPOSED ALIGNMENT
- PARCEL LINE
- TRANSMISSION LINE TOWER
- BPA TRANSMISSION LINE
- BPA EASEMENT
- ORDINARY HIGH WATER
- MEAN APRIL FLOW EXTENTS-1,250 CFS
- EXISTING WETLANDS
- LIMITS OF DISTURBANCE
- TEMPORARY STAGING AREA
- EXISTING ACCESS ROAD
- TEMPORARY ACCESS ROAD
- TEMPORARY CROSSING
- LARGE WOOD STRUCTURES
- WORK ISOLATION BARRIER



- CONSTRUCTION NOTES:
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APPROVED	DATE	PROJECT

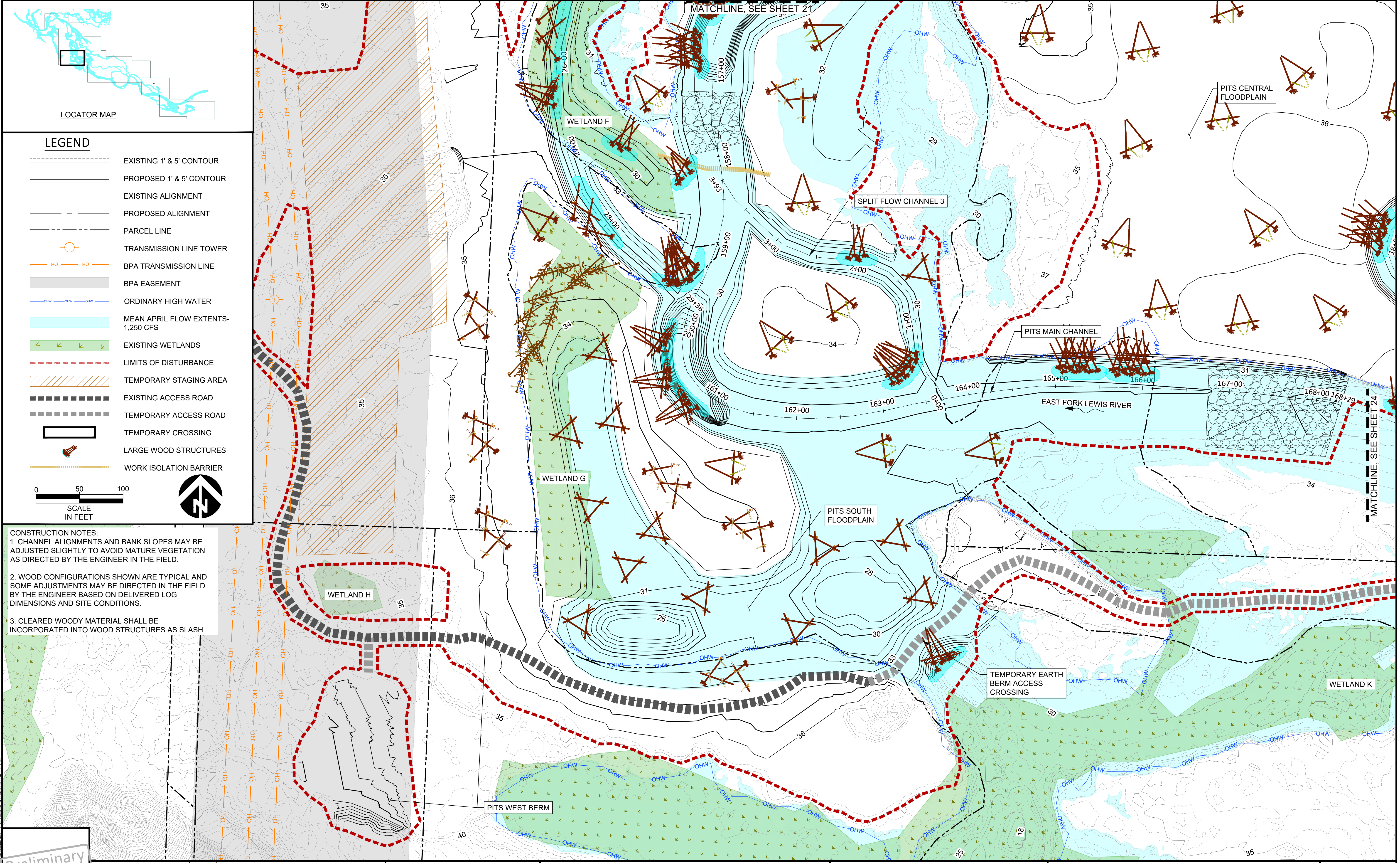
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RECONNECTION PROJECT



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PROPOSED CONDITIONS
CORE PITS 3

SHEET
22 OF 57



LEGEND

EXISTING 1' & 5' CONTOUR

PROPOSED 1' & 5' CONTOUR

EXISTING ALIGNMENT

PROPOSED ALIGNMENT

PARCEL LINE

TRANSMISSION LINE TOWER

BPA TRANSMISSION LINE

BPA EASEMENT

ORDINARY HIGH WATER

MEAN APRIL FLOW EXTENTS- 1,250 CFS

EXISTING WETLANDS

LIMITS OF DISTURBANCE

TEMPORARY STAGING AREA

EXISTING ACCESS ROAD

TEMPORARY ACCESS ROAD

TEMPORARY CROSSING

LARGE WOOD STRUCTURES

WORK ISOLATION BARRIER

050100

SCALE
IN FEET

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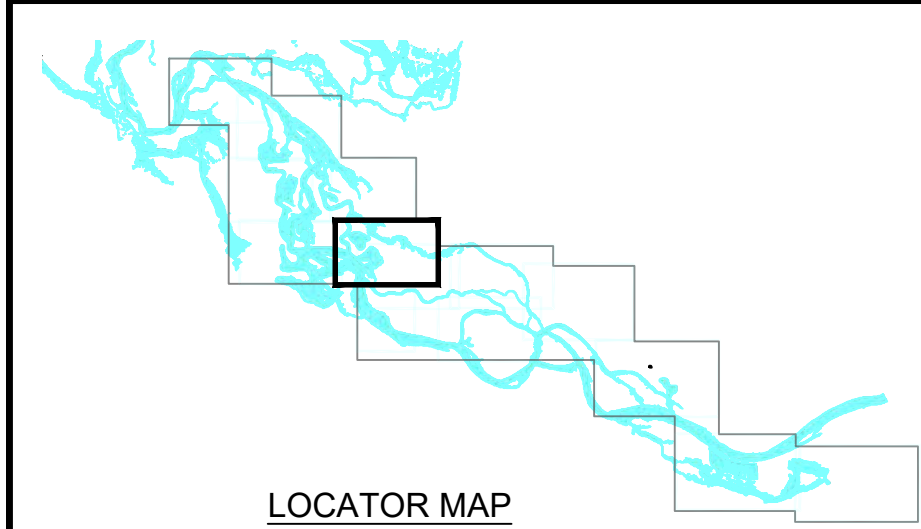
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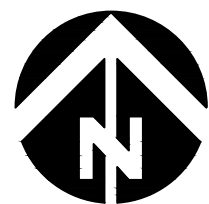
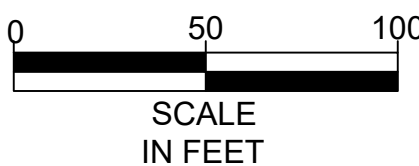
PROPOSED CONDITIONS
CORE PITS 4



LOCATOR MAP

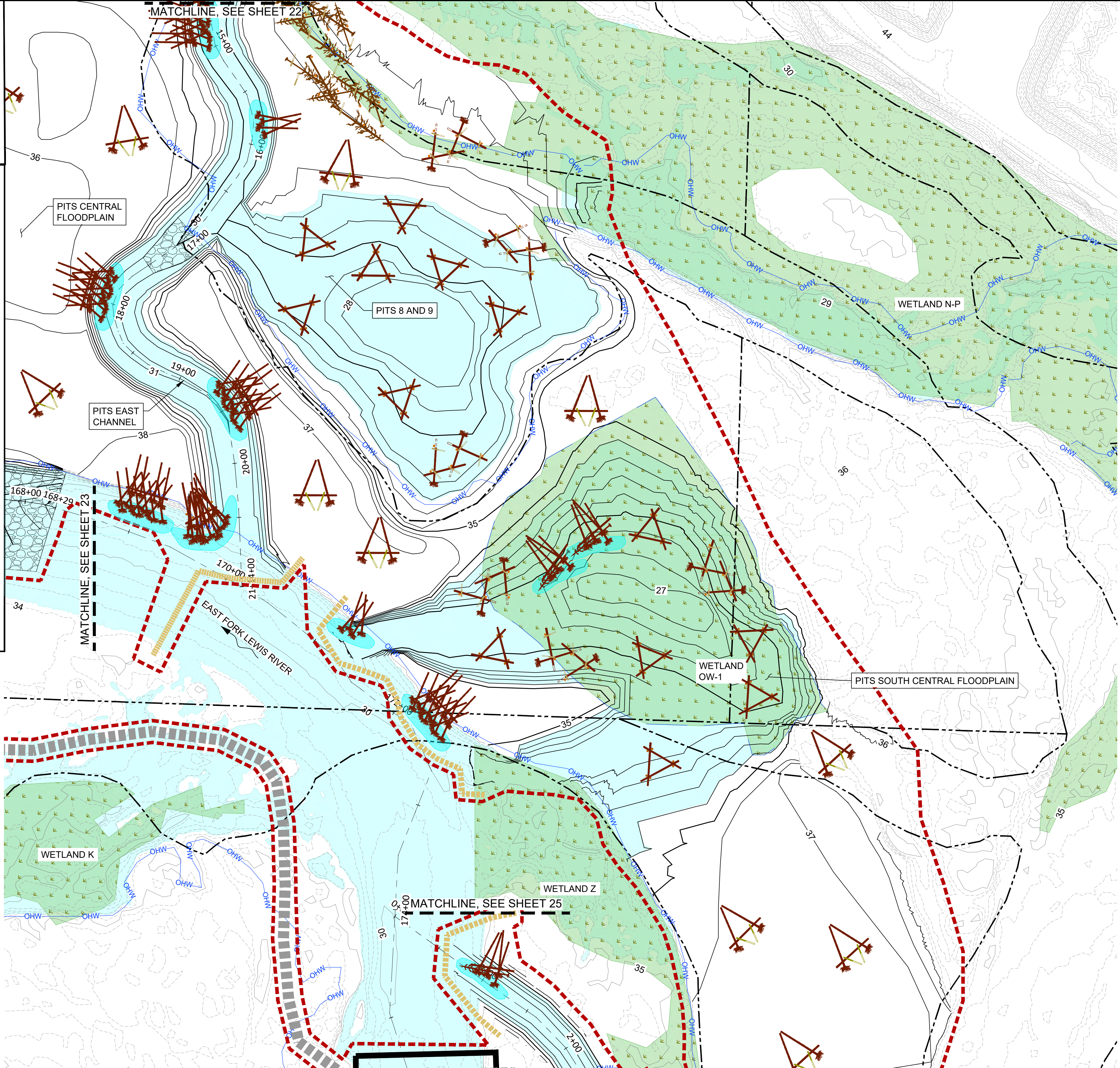
LEGEND

- EXISTING 1' & 5' CONTOUR
- PROPOSED 1' & 5' CONTOUR
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- PROPOSED ALIGNMENT
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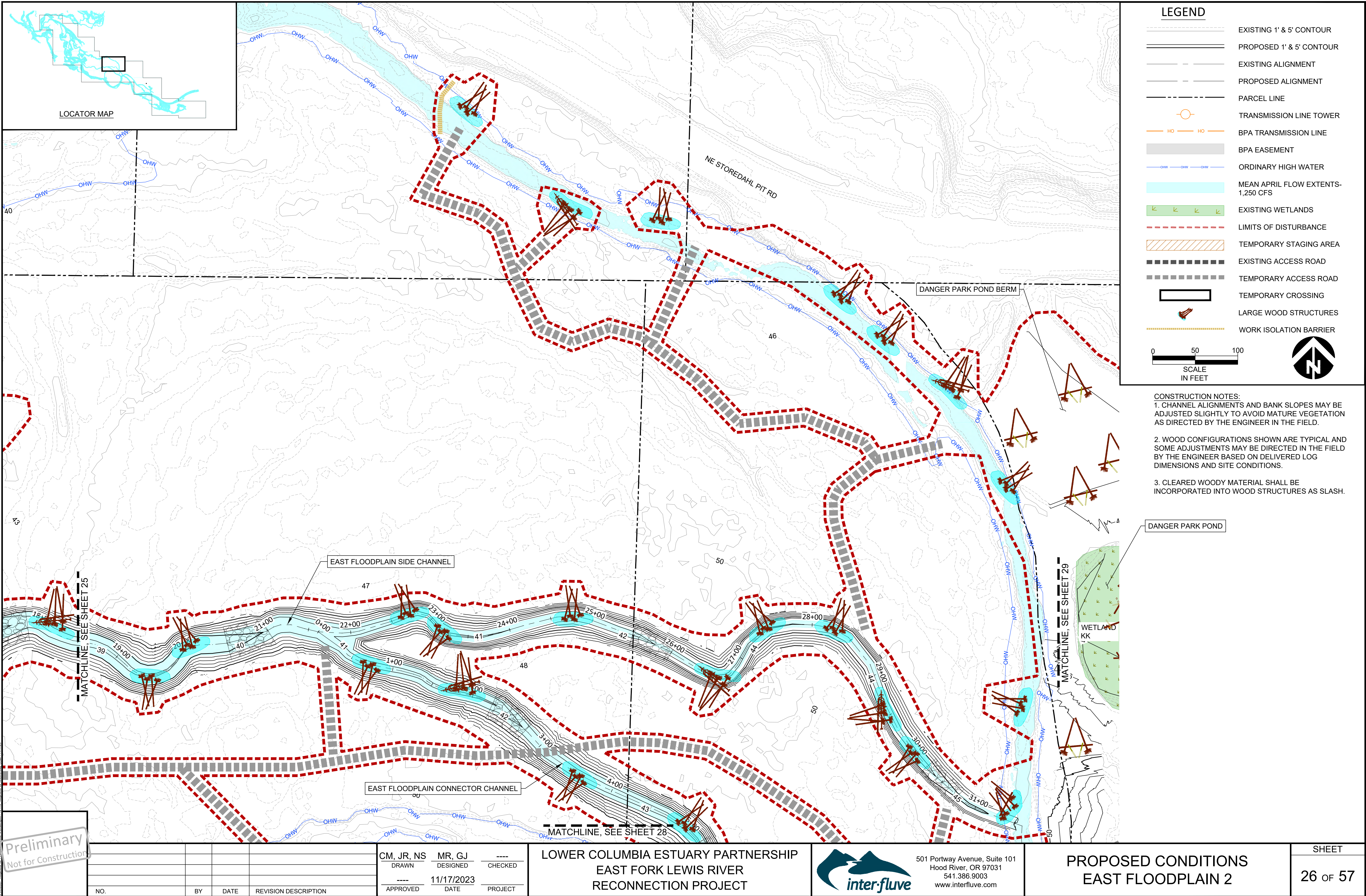
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EAST FORK LEWIS RIVER
RECONNECTION PROJECT

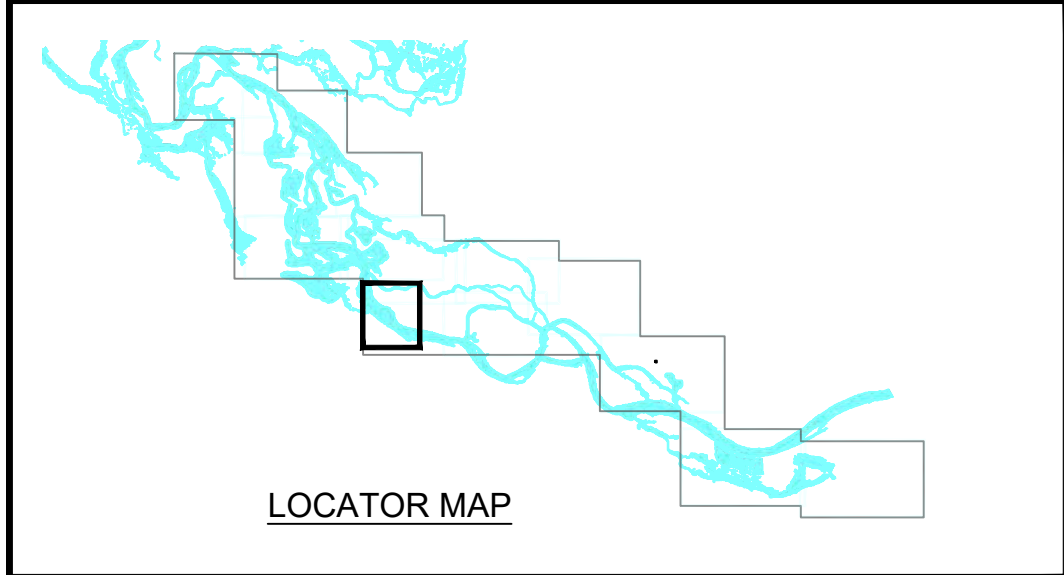


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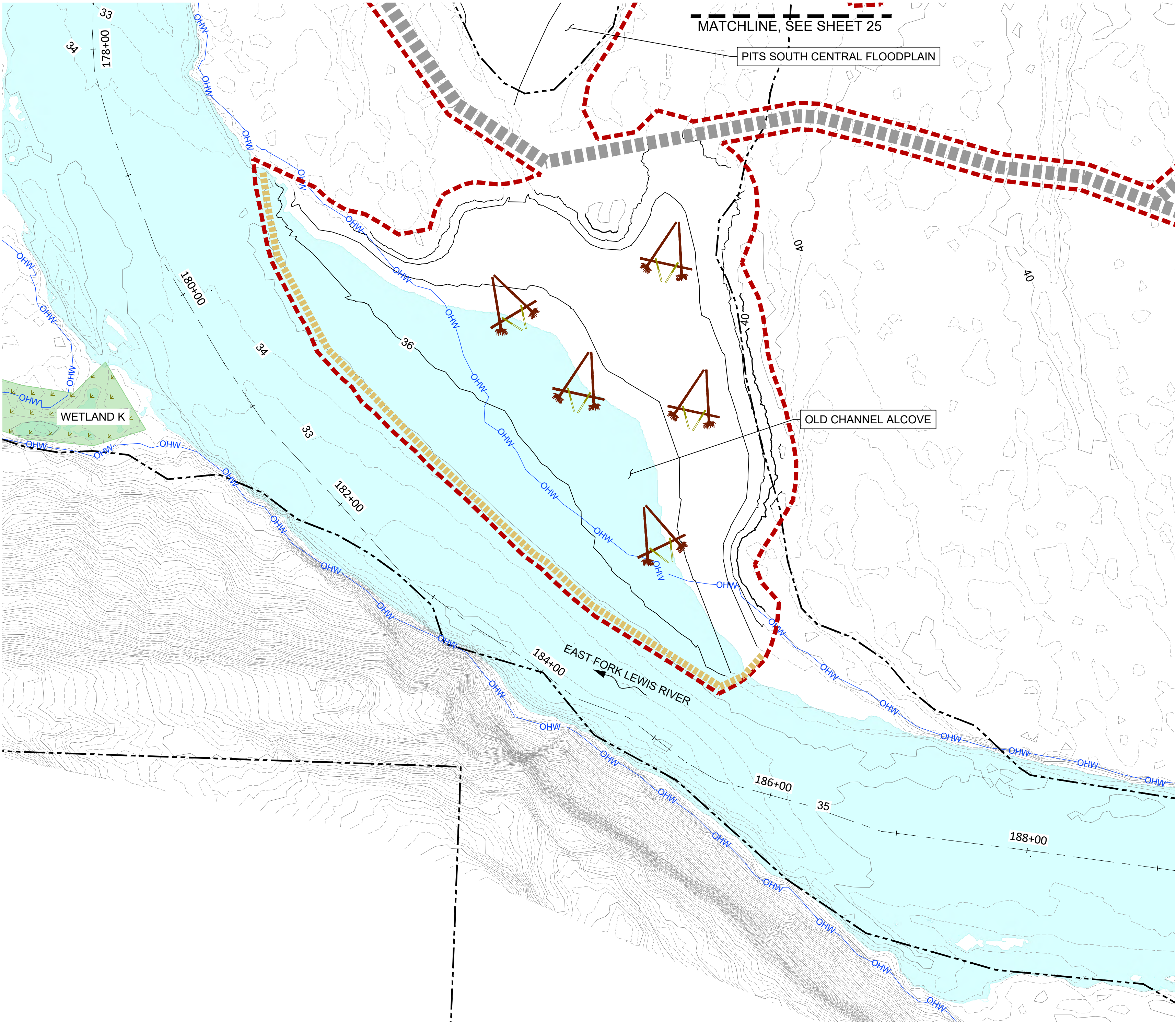
PROPOSED CONDITIONS
CORE PITS 5

SHEET
24 OF 57





LOCATOR MAP



LEGEND

EXISTING 1' & 5' CONTOUR

PROPOSED 1' & 5' CONTOUR

EXISTING ALIGNMENT

PROPOSED ALIGNMENT

PARCEL LINE

TRANSMISSION LINE TOWER

BPA TRANSMISSION LINE

BPA EASEMENT

ORDINARY HIGH WATER

MEAN APRIL FLOW EXTENTS-1,250 CFS

EXISTING WETLANDS

LIMITS OF DISTURBANCE

TEMPORARY STAGING AREA

EXISTING ACCESS ROAD

TEMPORARY ACCESS ROAD

TEMPORARY CROSSING

LARGE WOOD STRUCTURES

WORK ISOLATION BARRIER

050100

SCALE
IN FEET

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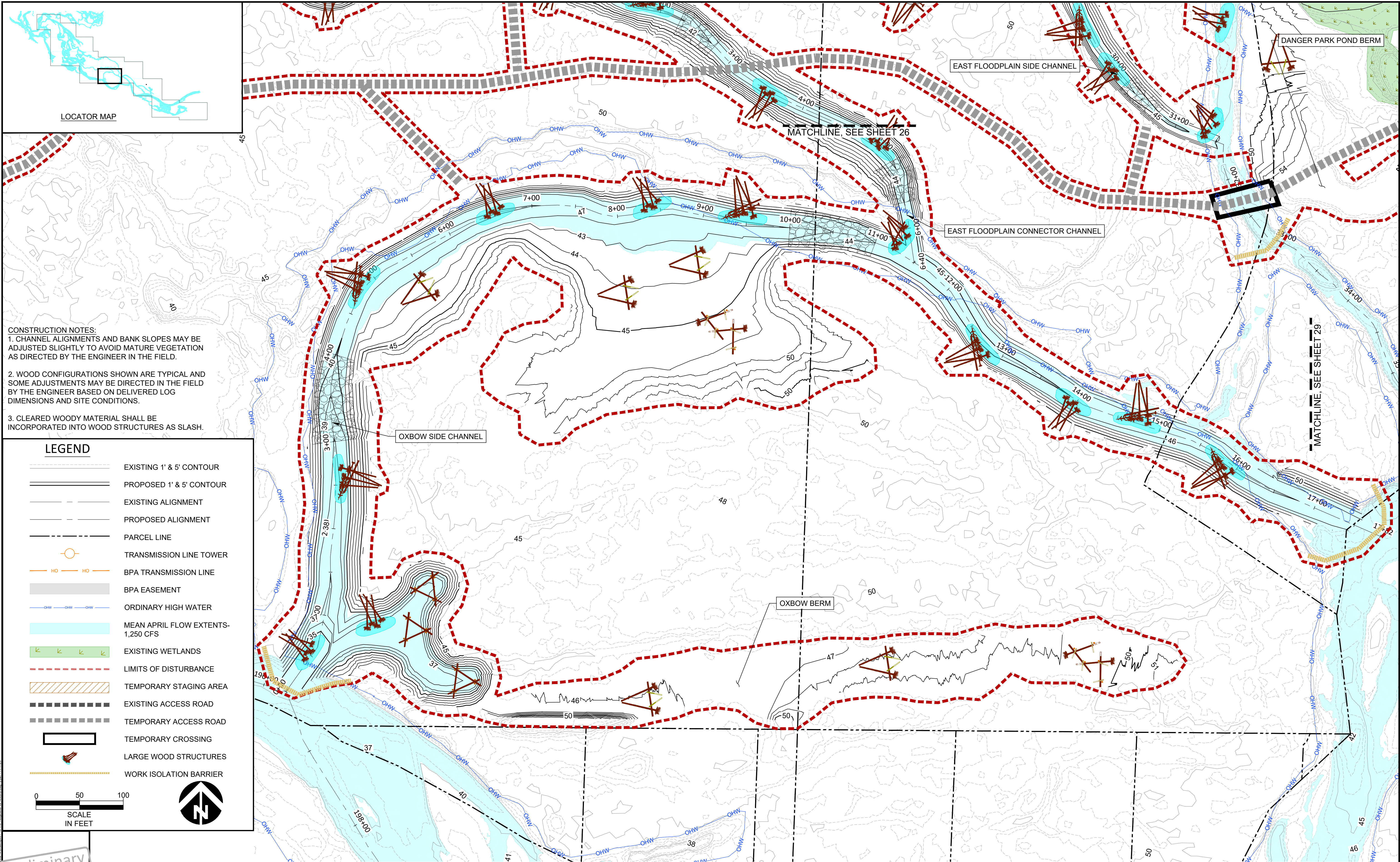
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- PROPOSED ALIGNMENT
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- TRANSMISSION LINE TOWER
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- TEMPORARY STAGING AREA
- EXISTING ACCESS ROAD
- TEMPORARY ACCESS ROAD
- TEMPORARY CROSSING
- LARGE WOOD STRUCTURES
- WORK ISOLATION BARRIER

0 50 100
SCALE
IN FEET

Preliminary
Not for Construction

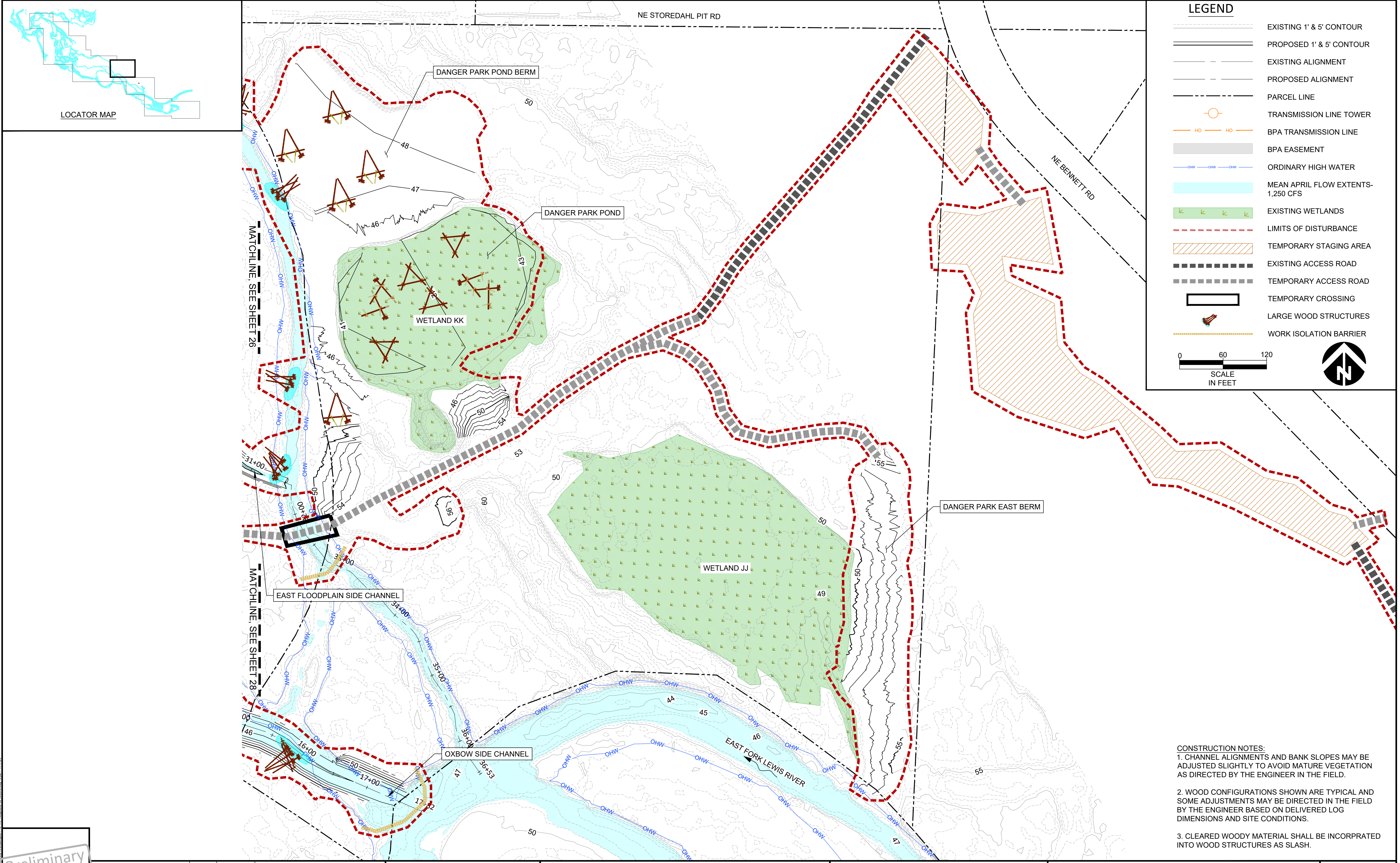
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PROPOSED CONDITIONS
EAST FLOODPLAIN 4



LEGEND

EXISTING 1' & 5' CONTOUR

PROPOSED 1' & 5' CONTOUR

EXISTING ALIGNMENT

PROPOSED ALIGNMENT

PARCEL LINE

TRANSMISSION LINE TOWER

BPA TRANSMISSION LINE

BPA EASEMENT

ORDINARY HIGH WATER

MEAN APRIL FLOW EXTENTS-1,250 CFS

EXISTING WETLANDS

LIMITS OF DISTURBANCE

TEMPORARY STAGING AREA

EXISTING ACCESS ROAD

TEMPORARY ACCESS ROAD

TEMPORARY CROSSING

LARGE WOOD STRUCTURES

WORK ISOLATION BARRIER

0

60

120

SCALE
IN FEET

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LOWER COLUMBIA ESTUARY PARTNERSHIP
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RECONNECTION PROJECT



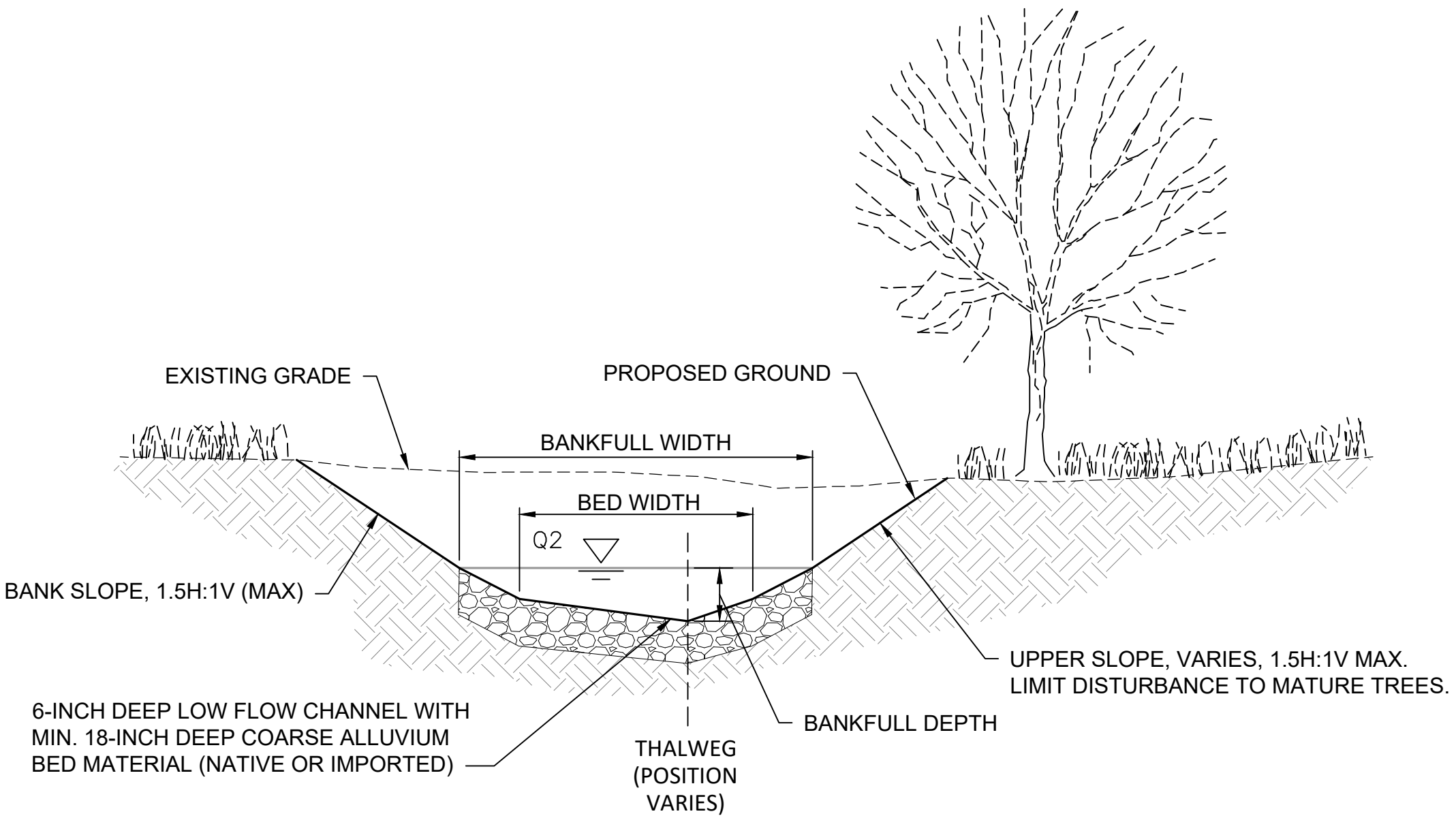
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PROPOSED CONDITIONS
EAST FLOODPLAIN 5

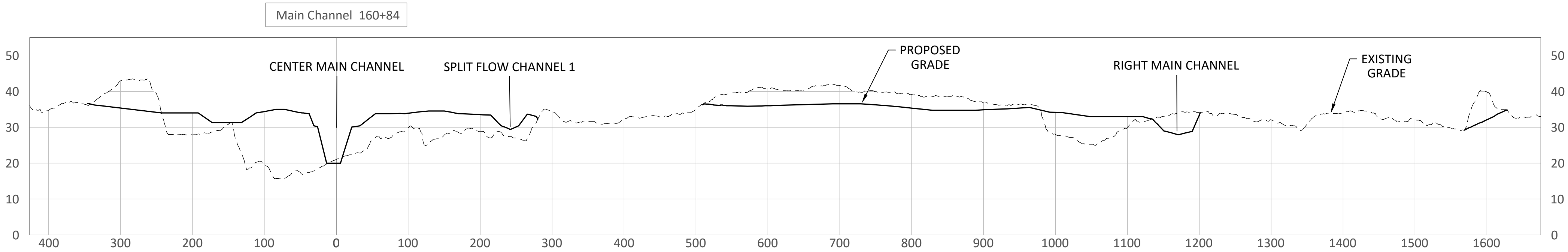
CHANNEL GEOMETRY SUMMARY TABLE										
ALIGNMENT		STATION (FT)		TYPICAL WIDTH (FT)		TYPICAL DEPTH (FT)		SIDE SLOPES (XH:1V) (FT)		
ZONE	NAME	START	END	BED	BANKFULL	LOW FLOW	BANKFULL	MIN	TYP	MAX
EAST FORK LEWIS RIVER CORE PITS	CENTER MAIN CHANNEL	137+38	168+29	62	94	1	5	2	4	6
	LEFT MAIN CHANNEL	0+00	29+36	20	44	1	5	2	3	4
	RIGHT MAIN CHANNEL	0+00	21+14	34	58	1	5	2	3	4
	SPLIT FLOW CHANNEL 1	0+00	3+93	20	32	1	3	2	3	4
	SPLIT FLOW CHANNEL 2	0+00	5+02	20	32	1	3	2	3	4
WEST FLOODPLAIN	SPLIT FLOW CHANNEL 3	0+00	4+70	20	32	1	3	2	3	4
	LOWER SIDE CHANNEL	0+00	6+88	24	48	1	5	2	3	4
	UPPER SIDE CHANNEL	6+88	35+61	8	32	1	5	2	3	4
	CONNECTOR CHANNEL	0+00	14+41	8	32	1	5	2	3	4
EAST FLOODPLAIN	OXBOW SIDE CHANNEL	0+00	17+82	26	50	1	5	2	3	4
	LOWER SIDE CHANNEL	0+00	21+62	22	40	1	4	2	3	4
	UPPER SIDE CHANNEL	21+62	36+53	14	27.5	1	4	1.5	2.25	3
	CONNECTOR CHANNEL	0+00	6+40	14	38	1	5	2	3	4

NOTE: BANKFULL WIDTHS AND DEPTHS WILL VARY ALONG EACH ALIGNMENT BASED ON THE LOCAL FLOODPLAIN ELEVATIONS. THESE DIMENSIONS ARE NOT DIRECTLY TIED TO INUNDATION FREQUENCIES.

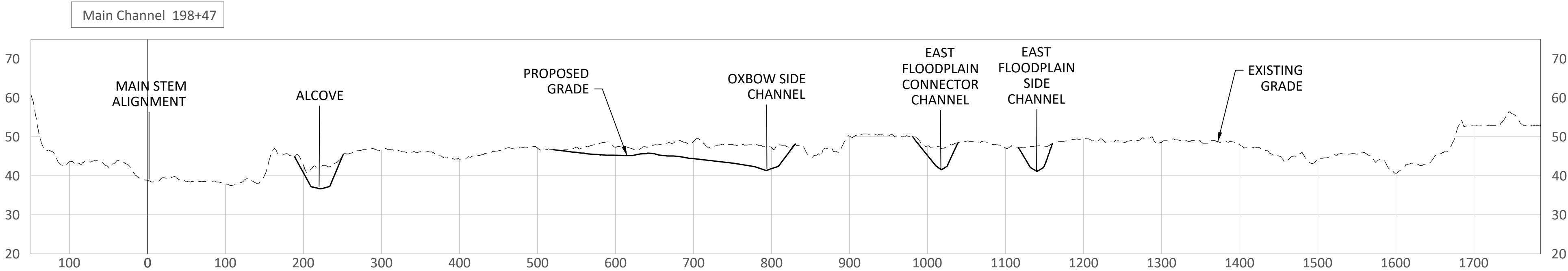
TYPICAL SIDE SLOPES ARE APPLIED TO RELATIVELY STRAIGHT CHANNEL SEGMENTS. MAXIMUM AND MINIMUM SIDE SLOPES ARE APPLIED TO INNER AND OUTER CHANNEL MEANDERS, RESPECTIVELY. SOME VARIATION MAY BE REQUIRED BASED ON CONDITIONS ENCOUNTERED IN THE FIELD, AS DIRECTED BY THE ENGINEER.



1 SIDE CHANNEL GEOMETRY - CROSS SECTION VIEW
TYP NOT TO SCALE

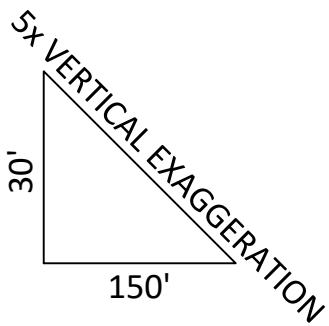


A MAIN CHANNEL FLOODPLAIN REPRESENTATIVE CROSS SECTION
21 NOT TO SCALE



NOTE:
ADDITIONAL CROSS-SECTION DETAILS, INCLUDING POOLS, RIFFLES, AND CHANNEL BED COMPLEXITY WILL BE DEVELOPED IN FINAL DESIGN STAGE.

B EAST FLOODPLAIN REPRESENTATIVE CROSS SECTION
21 NOT TO SCALE



LEGEND

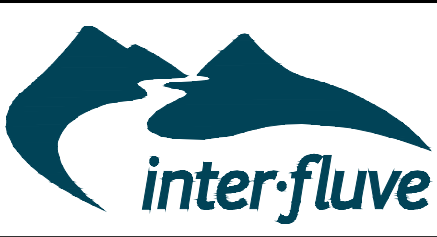
----- EXISTING GRADE
————— PROPOSED GRADE

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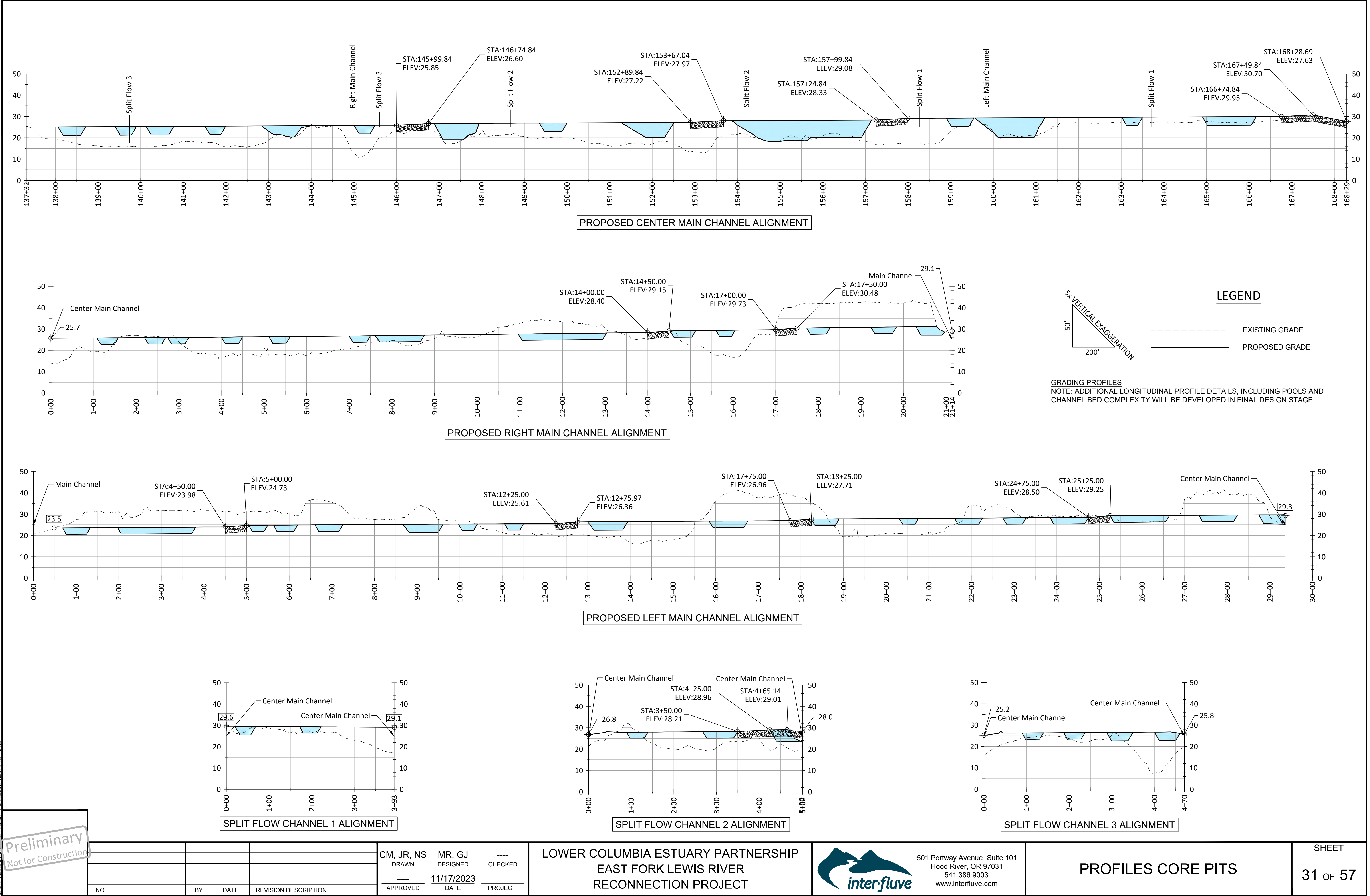
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CROSS-SECTIONS

SHEET
30 OF 57



Preliminary
Not for Construction

NO.	BY	DATE	REVISION DESCRIPTION

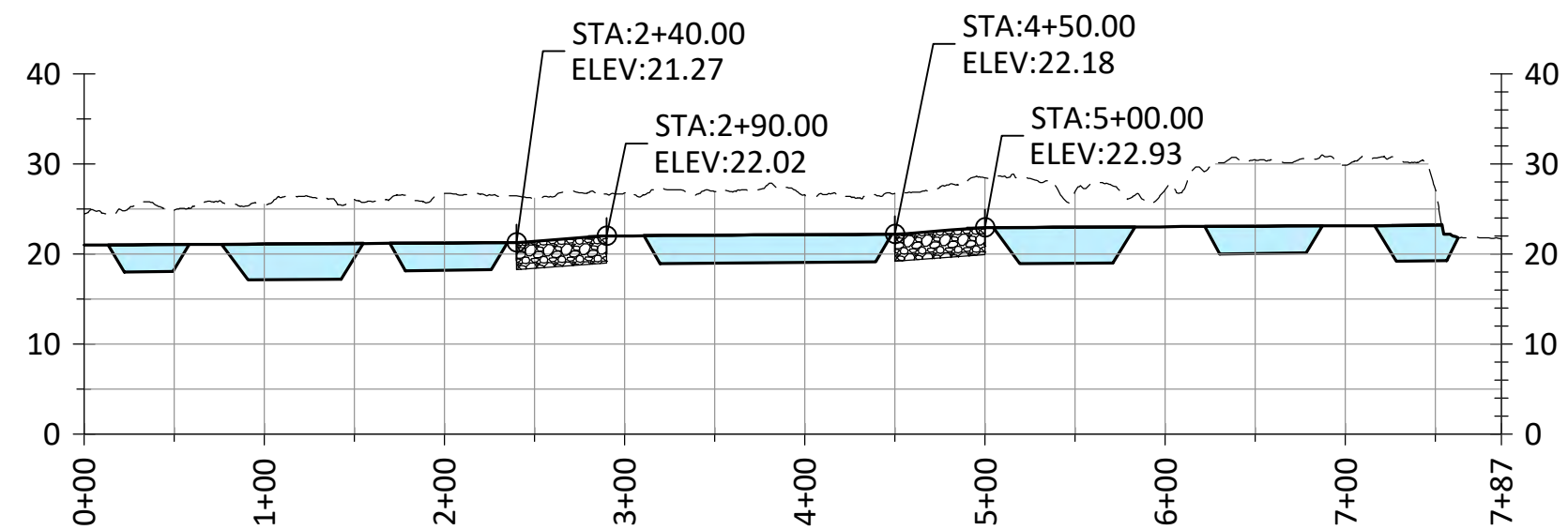
CM, JR, NS	MR, GJ	---
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EAST FORK LEWIS RIVER
RECONNECTION PROJECT

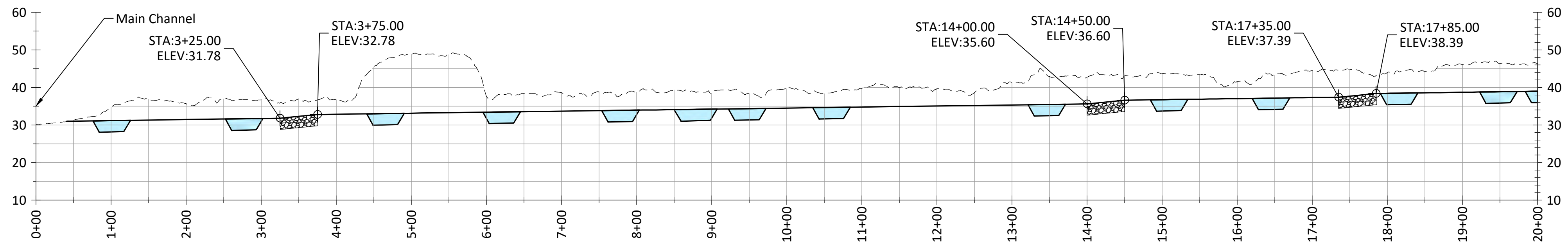


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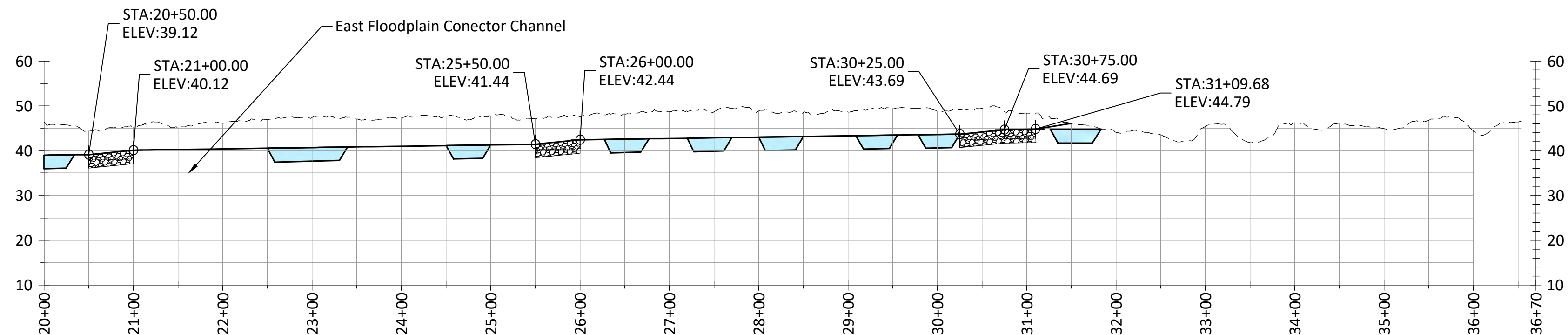
PROFILES CORE PITS



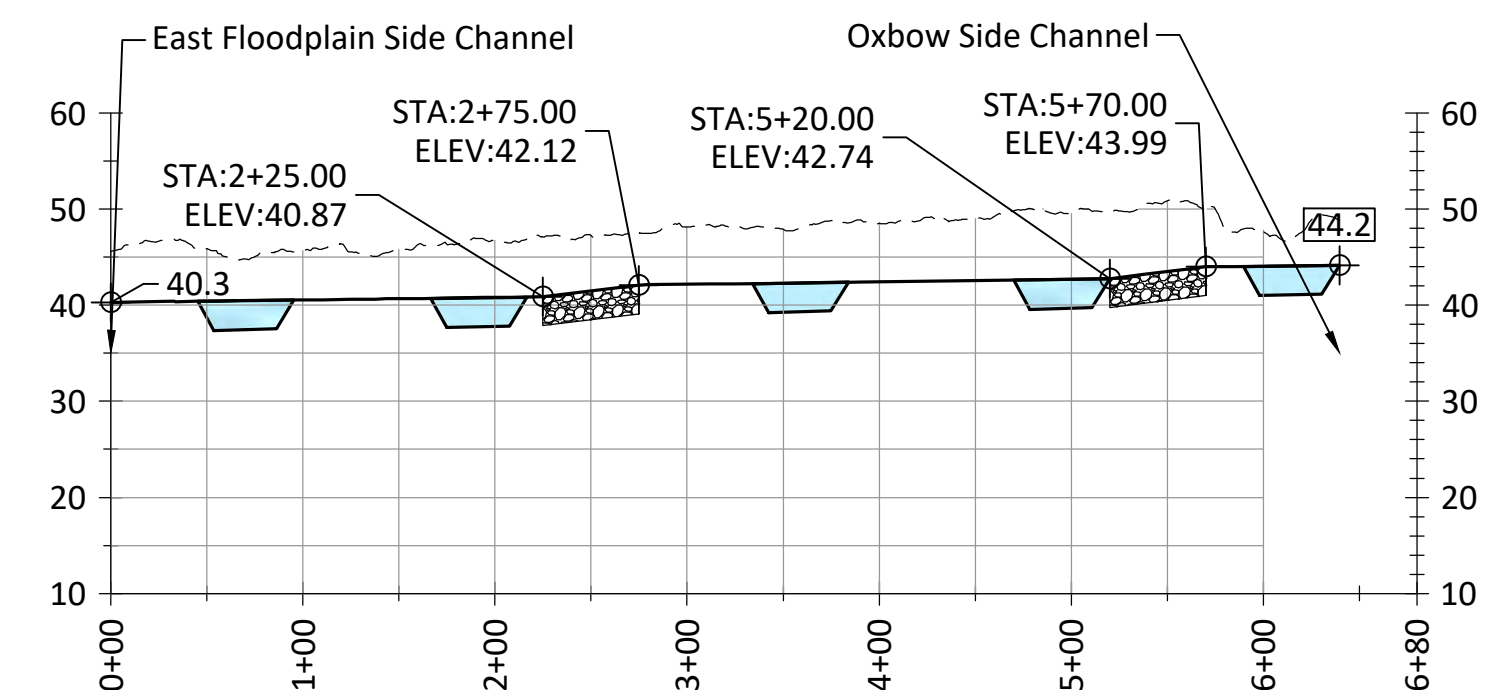
PROPOSED POWERLINE BEND SIDE CHANNEL ALIGNMENT



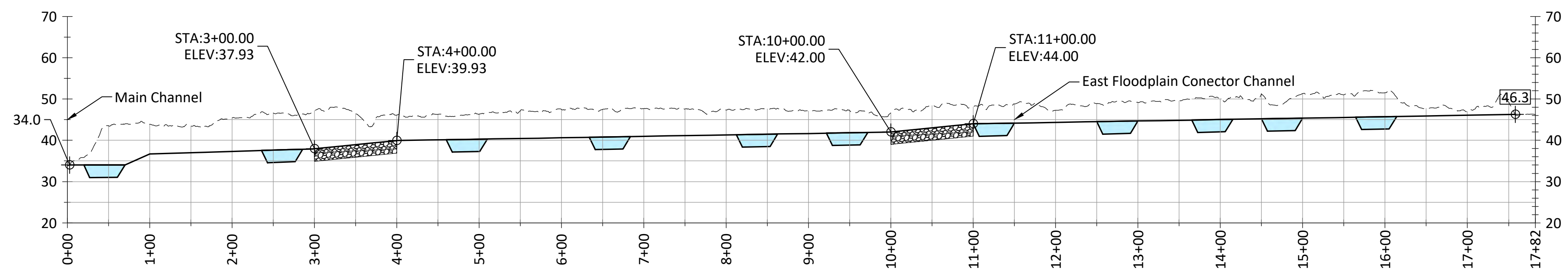
PROPOSED EAST FLOODPLAIN SIDE CHANNEL ALIGNMENT - STA: 0+00 TO STA: 25+00



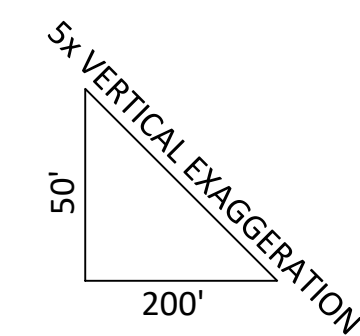
PROPOSED EAST FLOODPLAIN SIDE CHANNEL ALIGNMENT - STA: 25+00 TO STA: 36+53



PROPOSED EAST FLOODPLAIN CONNECTOR CHANNEL ALIGNMENT



PROPOSED OXBOW SIDE CHANNEL ALIGNMENT



LEGEND

- EXISTING GRADE
- PROPOSED GRADE

GRADING PROFILES

NOTE: ADDITIONAL LONGITUDINAL PROFILE DETAILS, INCLUDING POOLS AND CHANNEL BED COMPLEXITY WILL BE DEVELOPED IN FINAL DESIGN STAGE.

Preliminary
Not for Construction

NO.	BY	DATE	REVISION DESCRIPTION

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DRAWN	DESIGNED	CHECKED
---	11/17/2023	---
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LOWER COLUMBIA ESTUARY PARTNERSHIP
EAST FORK LEWIS RIVER
RECONNECTION PROJECT

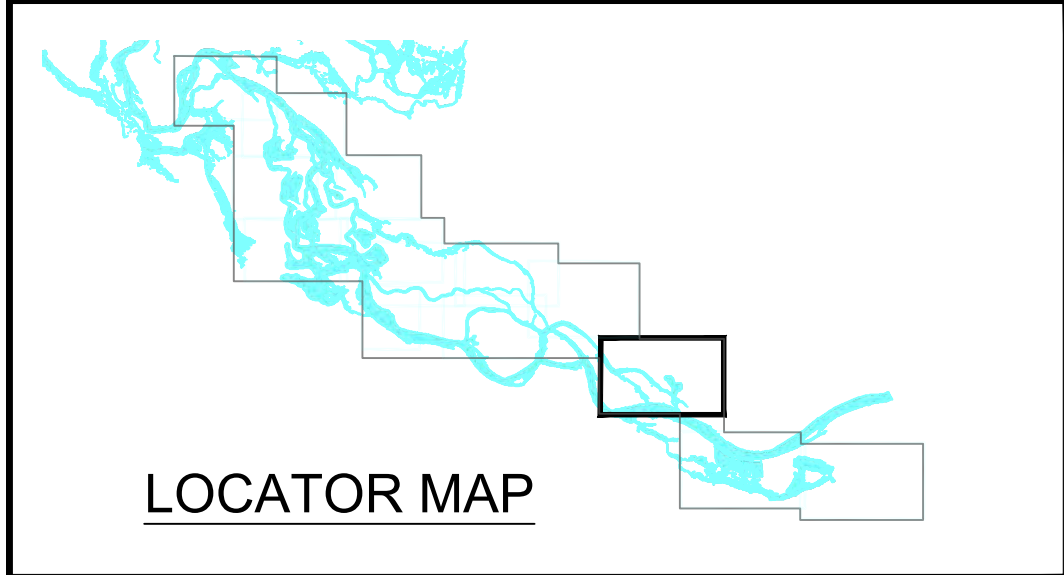
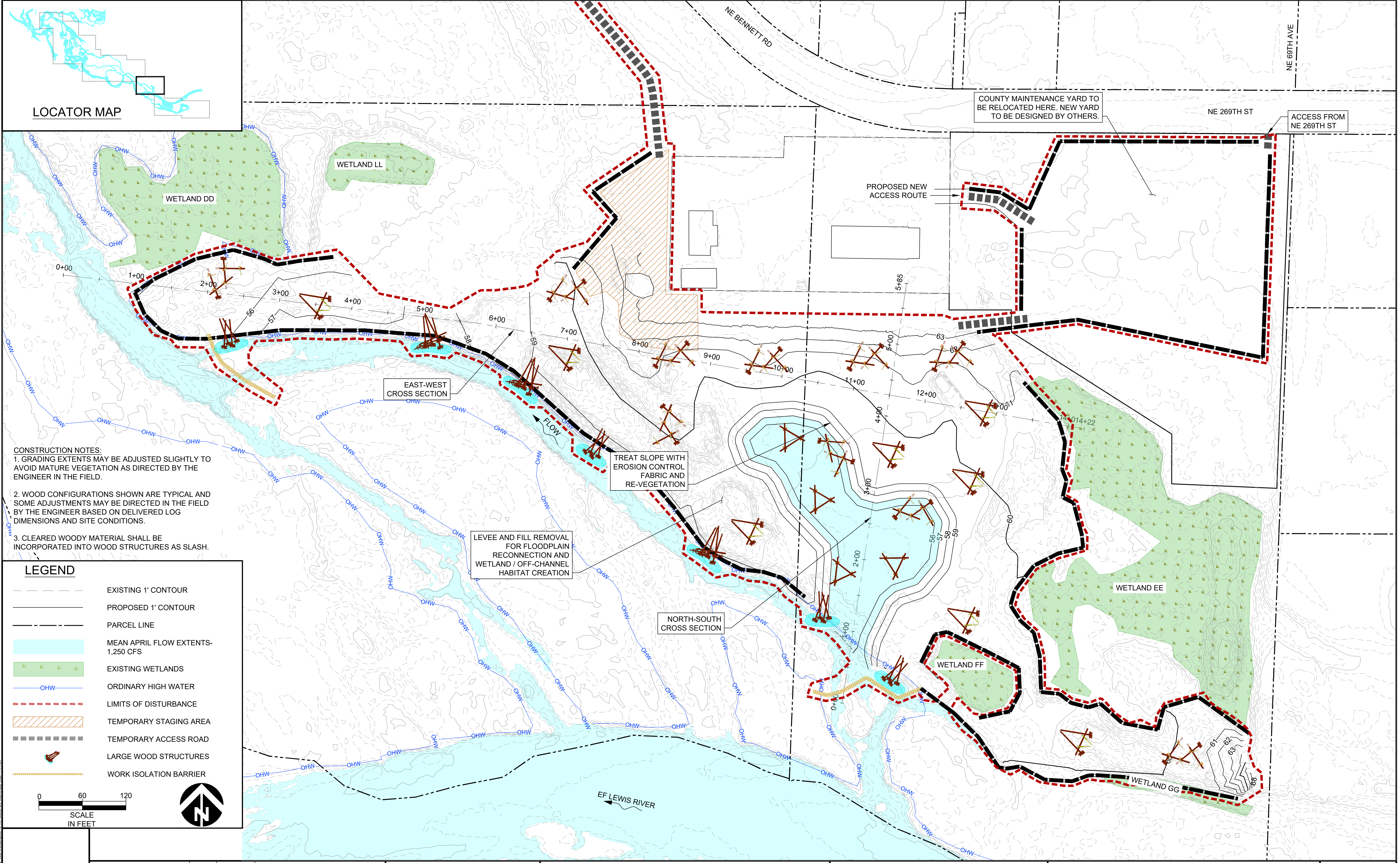


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PROFILES WEST & EAST
FLOODPLAINS

SHEET

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LOCATOR MAP

CONSTRUCTION NOTES:

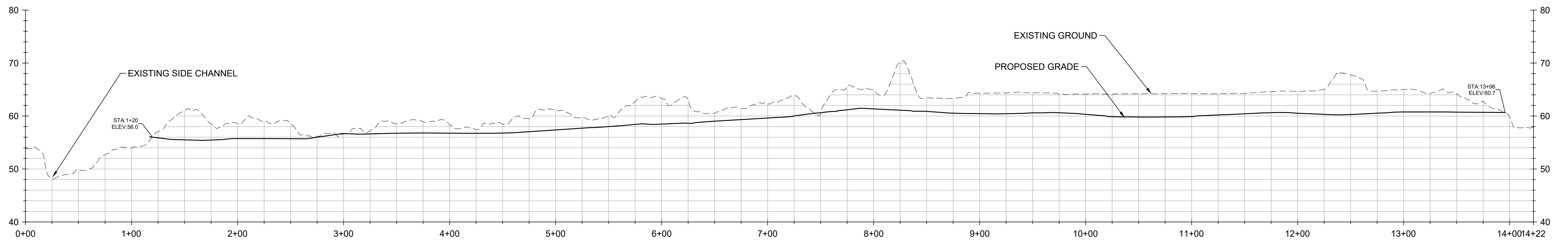
1. GRADING EXTENTS MAY BE ADJUSTED SLIGHTLY TO AVOID MATURE VEGETATION AS DIRECTED BY THE ENGINEER IN THE FIELD.
2. WOOD CONFIGURATIONS SHOWN ARE TYPICAL AND SOME ADJUSTMENTS MAY BE DIRECTED IN THE FIELD BY THE ENGINEER BASED ON DELIVERED LOG DIMENSIONS AND SITE CONDITIONS.
3. CLEARED WOODY MATERIAL SHALL BE INCORPORATED INTO WOOD STRUCTURES AS SLASH.

LEGEND

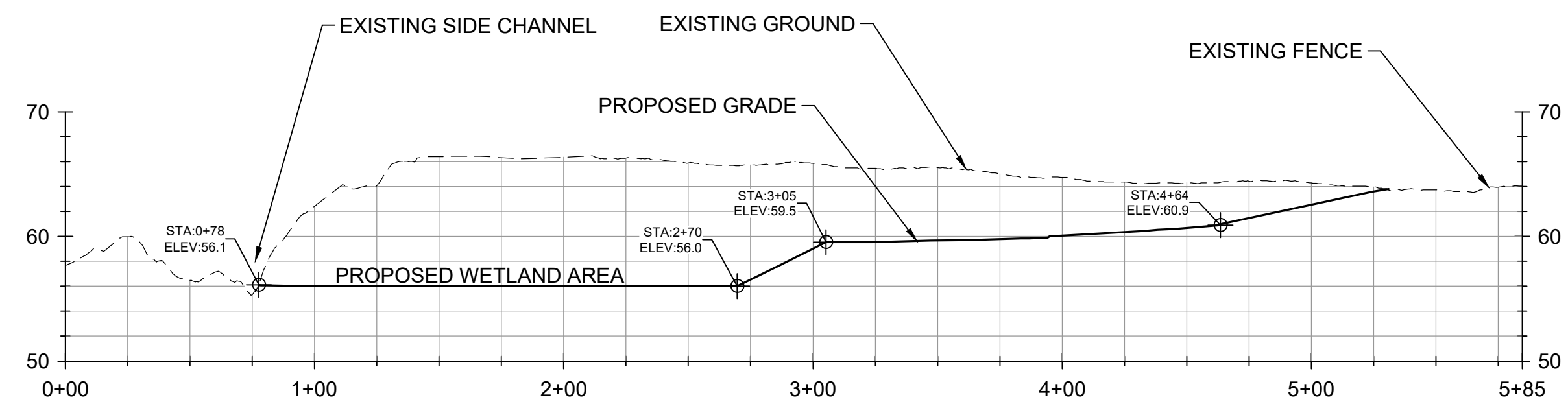
- EXISTING 1' CONTOUR
- PROPOSED 1' CONTOUR
- PARCEL LINE
- MEAN APRIL FLOW EXTENTS- 1,250 CFS
- EXISTING WETLANDS
- ORDINARY HIGH WATER
- LIMITS OF DISTURBANCE
- TEMPORARY STAGING AREA
- TEMPORARY ACCESS ROAD
- LARGE WOOD STRUCTURES
- WORK ISOLATION BARRIER

0 60 120
SCALE
IN FEET

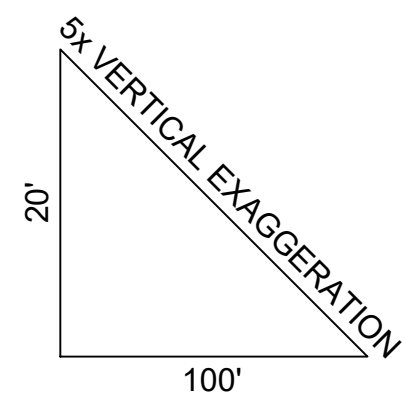
EF LEWIS RIVER



PROFILE - EAST-WEST CROSS SECTION



PROFILE - NORTH-SOUTH CROSS SECTION



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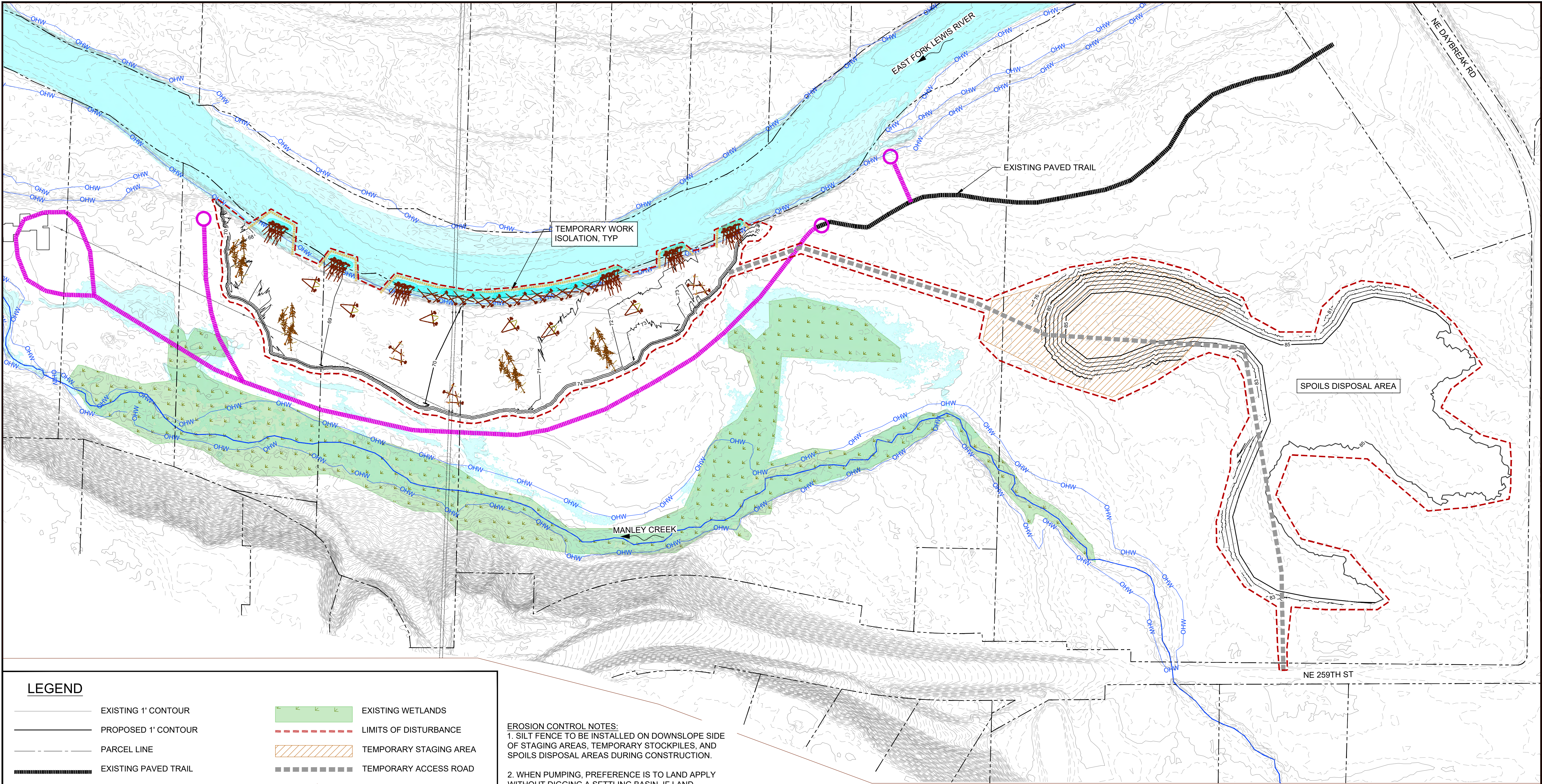
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LOWER COLUMBIA ESTUARY PARTNERSHIP
EAST FORK LEWIS RIVER
RECONNECTION PROJECT



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PROFILES & CROSS-SECTIONS
COUNTY YARD



LEGEND

EXISTING 1' CONTOUR

PROPOSED 1' CONTOUR

PARCEL LINE

EXISTING PAVED TRAIL

SECONDARY GRAVEL TRAIL

PROPOSED RELOCATED TRAIL

OVERLOOK AND RESTING AREAS

PROPOSED OVERLOOK AREA

ELECTRICAL TRANSMISSION LINE

MEAN APRIL FLOW EXTENTS-
1,250 CFS

EXISTING WETLANDS

LIMITS OF DISTURBANCE

TEMPORARY STAGING AREA

TEMPORARY ACCESS ROAD

LARGE WOOD STRUCTURES

WORK ISOLATION BARRIER

ORDINARY HIGH WATER

0

120

240

SCALE
IN FEET

EROSION CONTROL NOTES:

1. SILT FENCE TO BE INSTALLED ON DOWNSLOPE SIDE OF STAGING AREAS, TEMPORARY STOCKPILES, AND SPOILS DISPOSAL AREAS DURING CONSTRUCTION.

2. WHEN PUMPING, PREFERENCE IS TO LAND APPLY WITHOUT DIGGING A SETTLING BASIN. IF LAND APPLICATION SITE IS INADEQUATE TO PREVENT ENTRY OF TURBID WATER INTO WATERWAYS A SETTLING BASIN SHALL BE CONSTRUCTED IN PREVIOUSLY DISTURBED AREAS.

3. IF USED, SETTLING BASIN SHALL BE MONITORED FOR SILTATION AND REDUCTION IN INFILTRATION RATES WHILE IN USE.

4. BIODEGRADABLE STRAW WATTLES SHALL BE INSTALLED WITHIN AND AROUND SPOIL DISPOSAL AREAS AND LEFT IN PLACE FOLLOWING CONSTRUCTION.

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				APPROVED	PROJECT	
NO.	BY	DATE	REVISION DESCRIPTION			

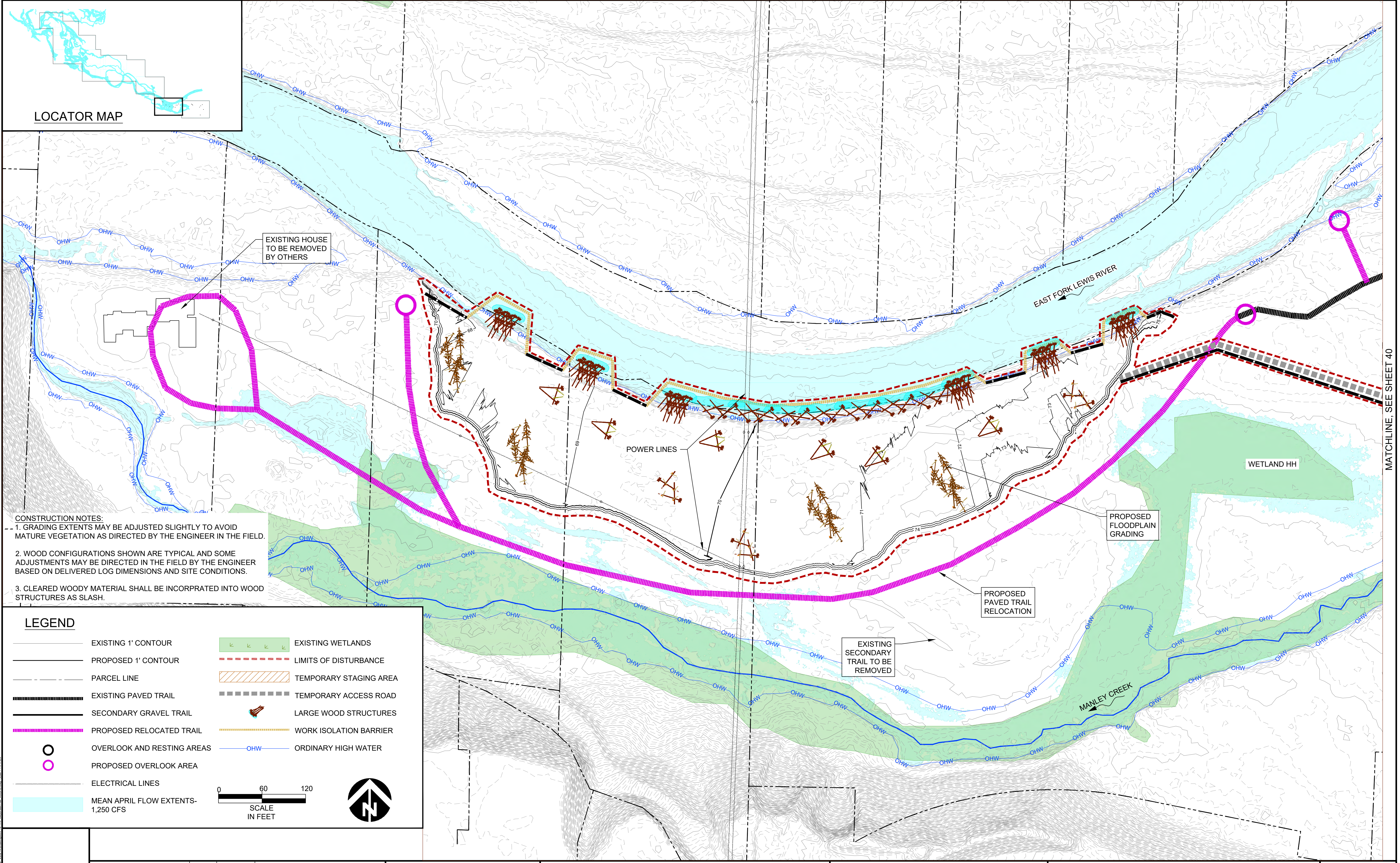
LOWER COLUMBIA ESTUARY PARTNERSHIP
EAST FORK LEWIS RIVER
RECONNECTION PROJECT

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DAYBREAK TRAIL TESC & WORK
ISOLATION

SHEET
38 OF 57



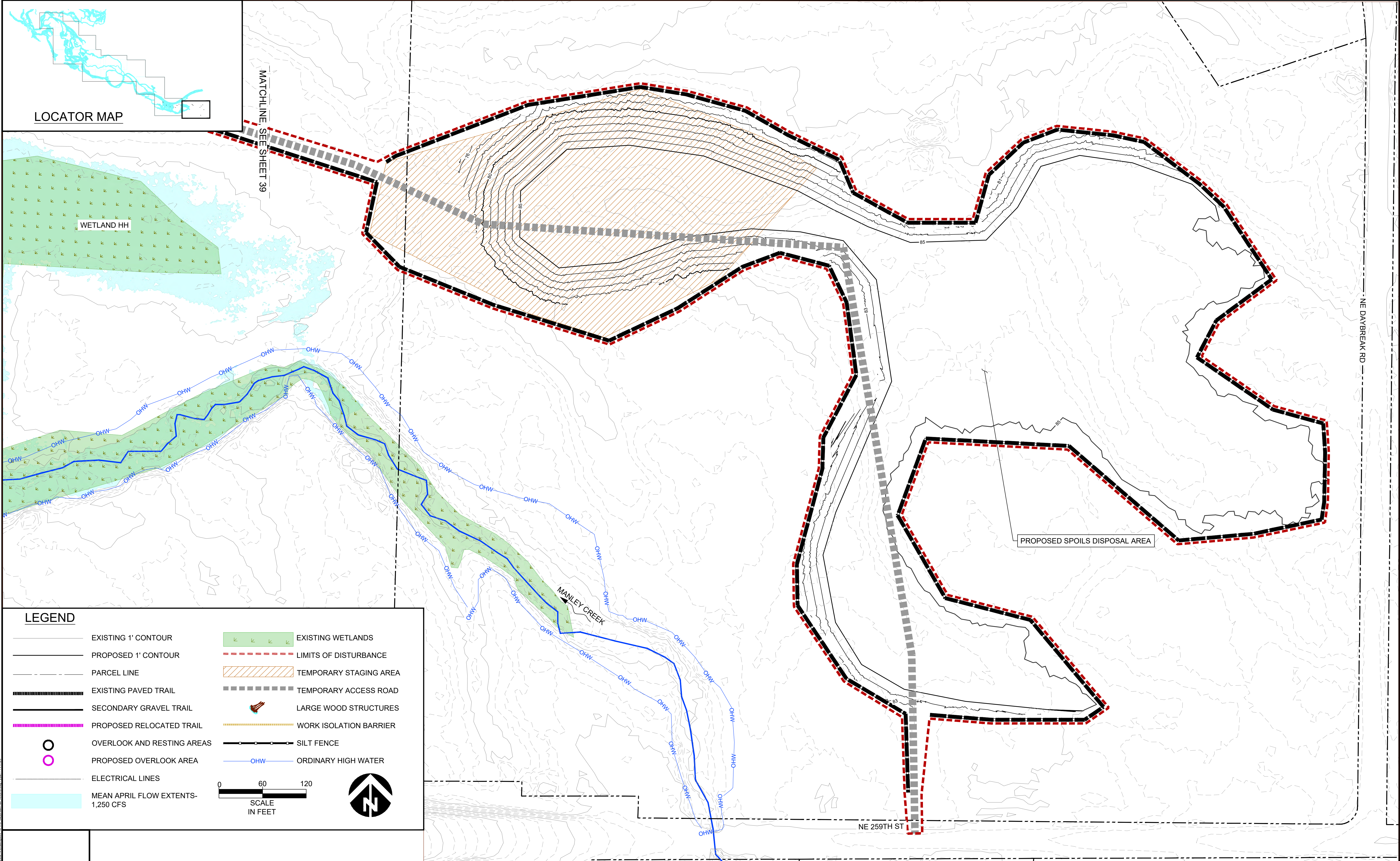
CONSTRUCTION NOTES:

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2. WOOD CONFIGURATIONS SHOWN ARE TYPICAL AND SOME ADJUSTMENTS MAY BE DIRECTED IN THE FIELD BY THE ENGINEER BASED ON DELIVERED LOG DIMENSIONS AND SITE CONDITIONS.
3. CLEARED WOODY MATERIAL SHALL BE INCORPORATED INTO WOOD STRUCTURES AS SLASH.

LEGEND

	EXISTING 1' CONTOUR		EXISTING WETLANDS
	PROPOSED 1' CONTOUR		LIMITS OF DISTURBANCE
	PARCEL LINE		TEMPORARY STAGING AREA
	EXISTING PAVED TRAIL		TEMPORARY ACCESS ROAD
	SECONDARY GRAVEL TRAIL		LARGE WOOD STRUCTURES
	PROPOSED RELOCATED TRAIL		WORK ISOLATION BARRIER
	OVERLOOK AND RESTING AREAS		ORDINARY HIGH WATER
	PROPOSED OVERLOOK AREA		
	ELECTRICAL LINES		
	MEAN APRIL FLOW EXTENTS- 1,250 CFS		

SCALE IN FEET



LEGEND

EXISTING 1' CONTOUR

PROPOSED 1' CONTOUR

PARCEL LINE

EXISTING PAVED TRAIL

SECONDARY GRAVEL TRAIL

PROPOSED RELOCATED TRAIL

OVERLOOK AND RESTING AREAS

PROPOSED OVERLOOK AREA

ELECTRICAL LINES

MEAN APRIL FLOW EXTENTS-1,250 CFS

EXISTING WETLANDS

LIMITS OF DISTURBANCE

TEMPORARY STAGING AREA

TEMPORARY ACCESS ROAD

LARGE WOOD STRUCTURES

WORK ISOLATION BARRIER

SILT FENCE

ORDINARY HIGH WATER

SCALE
IN FEET

060120

2

NO.	BY	DATE	REVISION DESCRIPTION

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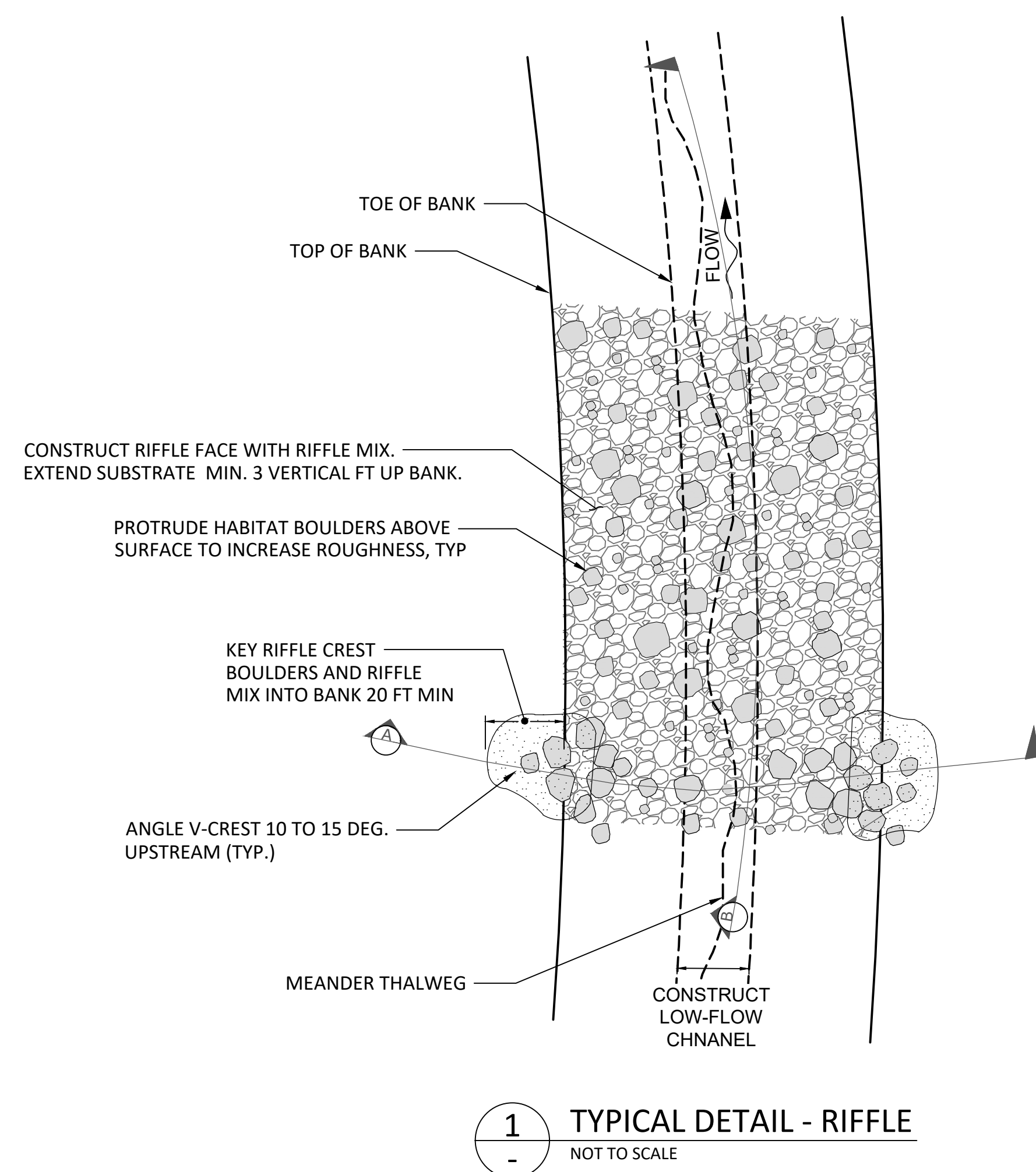
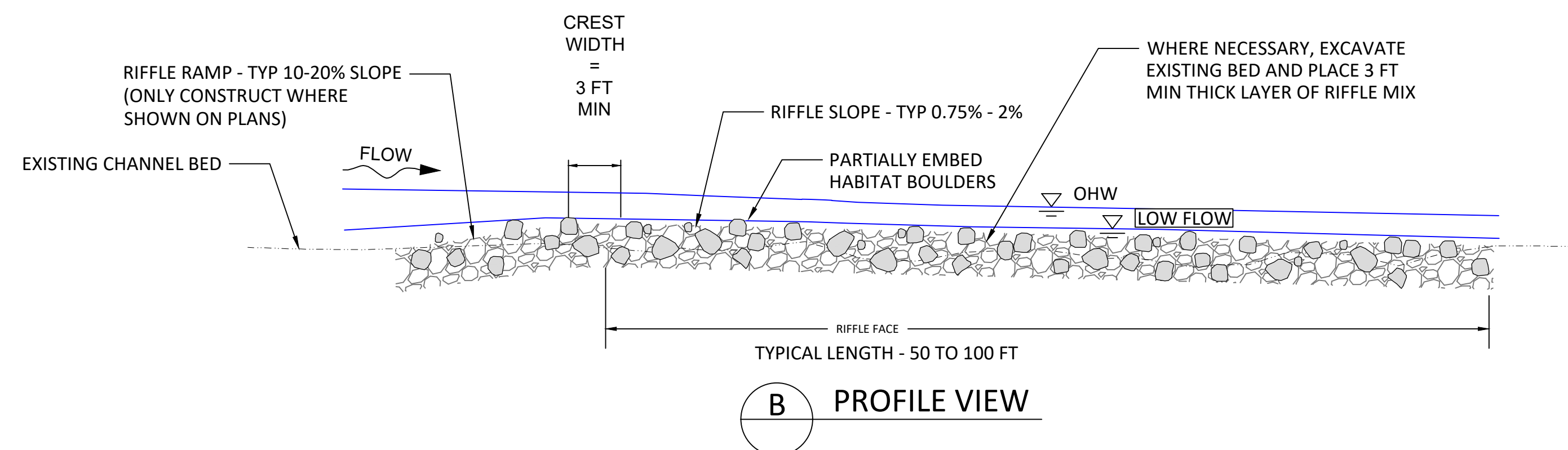
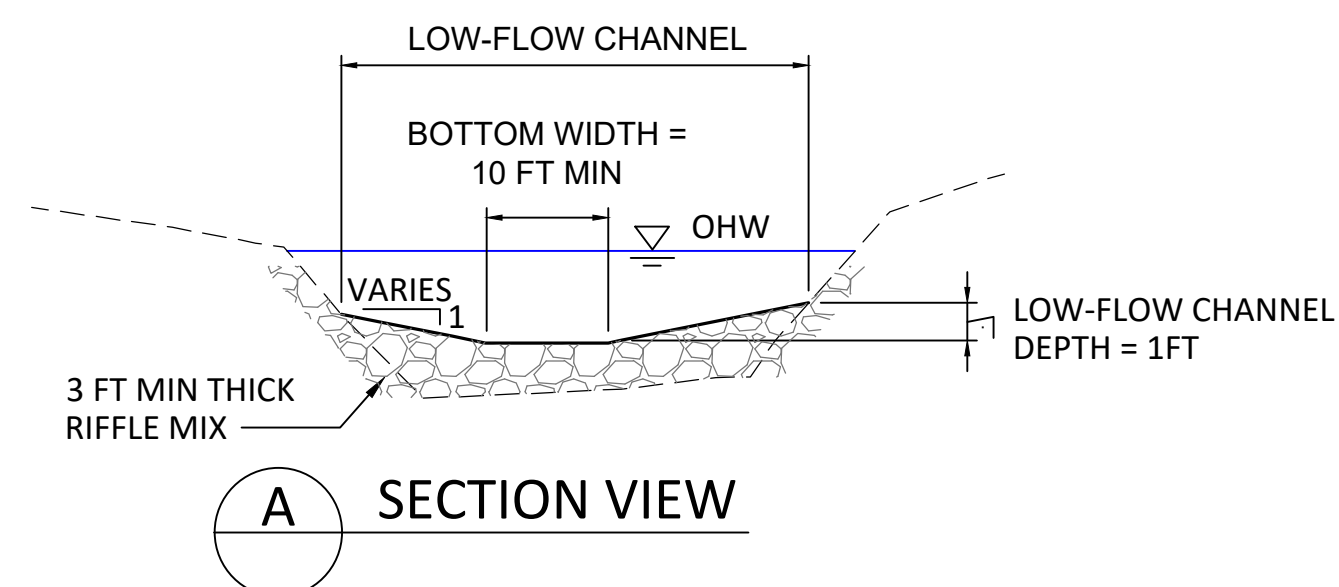
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DAYBREAK TRAIL PROPOSED
CONDITIONS - FILL AREA

SHEET
40 OF 57



NOTE:

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

NOTES:

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

RIFFLE MIX

TABLE TO BE PROVIDED
DURING FUTURE DESIGN PHASE

RIFFLE CREST GEOMETRY TABLE

LISTED UPSTREAM TO DOWNSTREAM

TABLE TO BE PROVIDED
DURING FUTURE DESIGN PHASE

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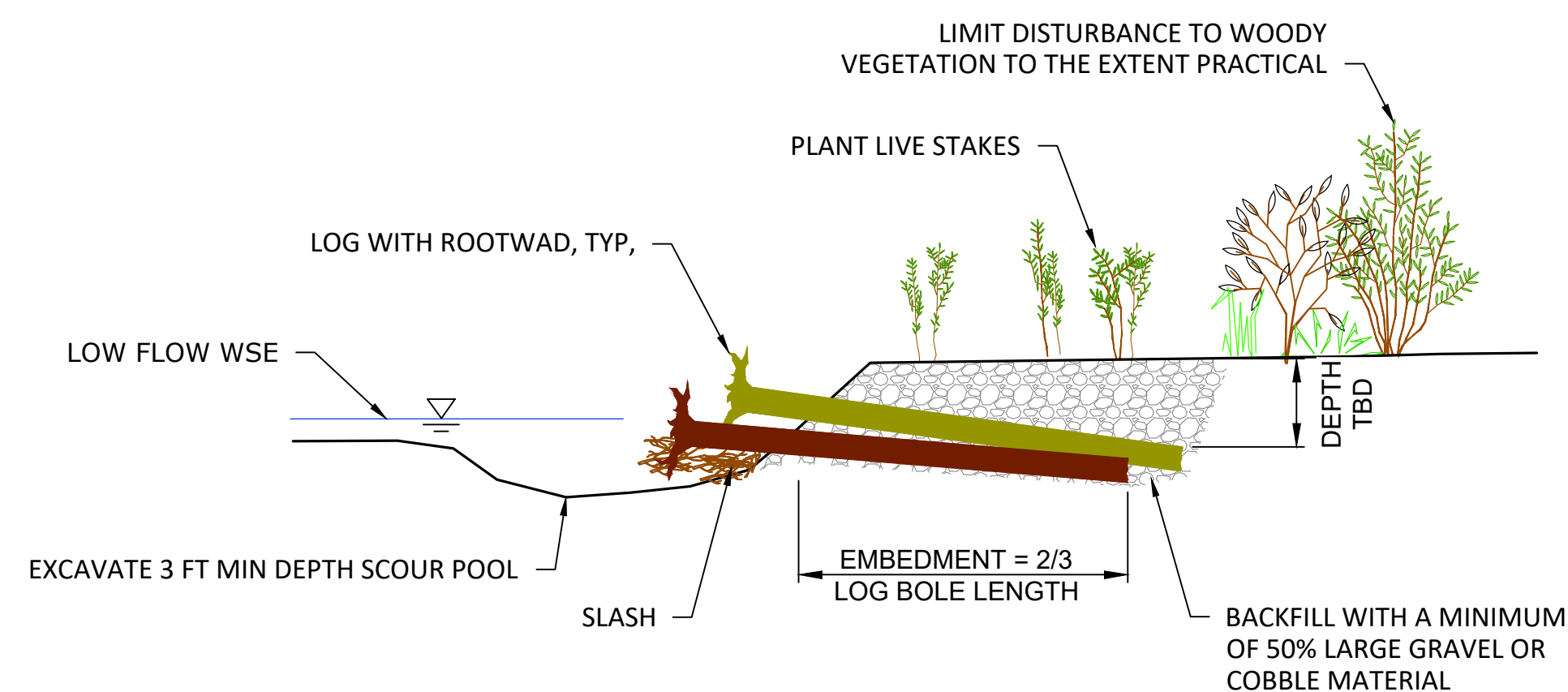
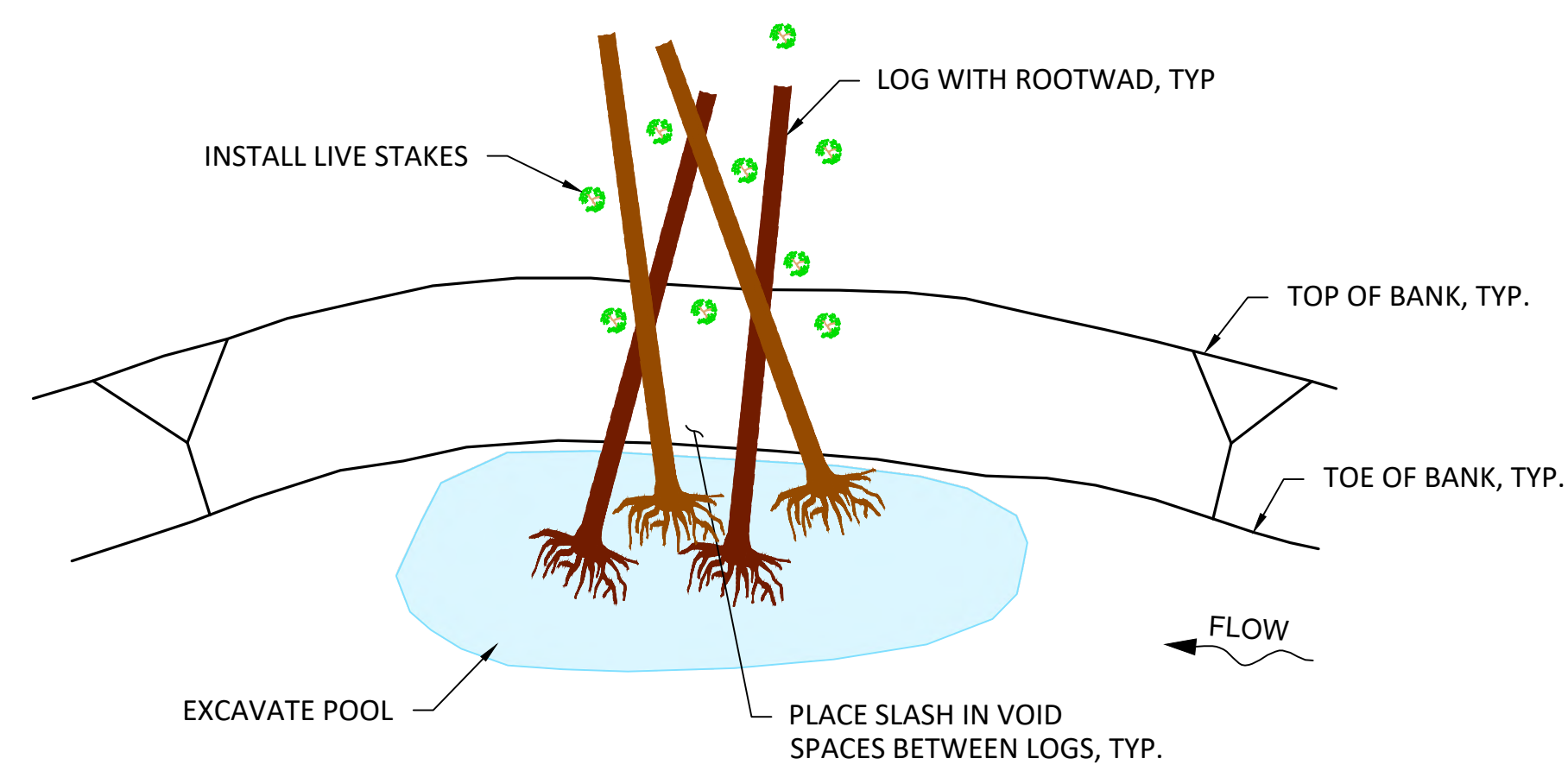


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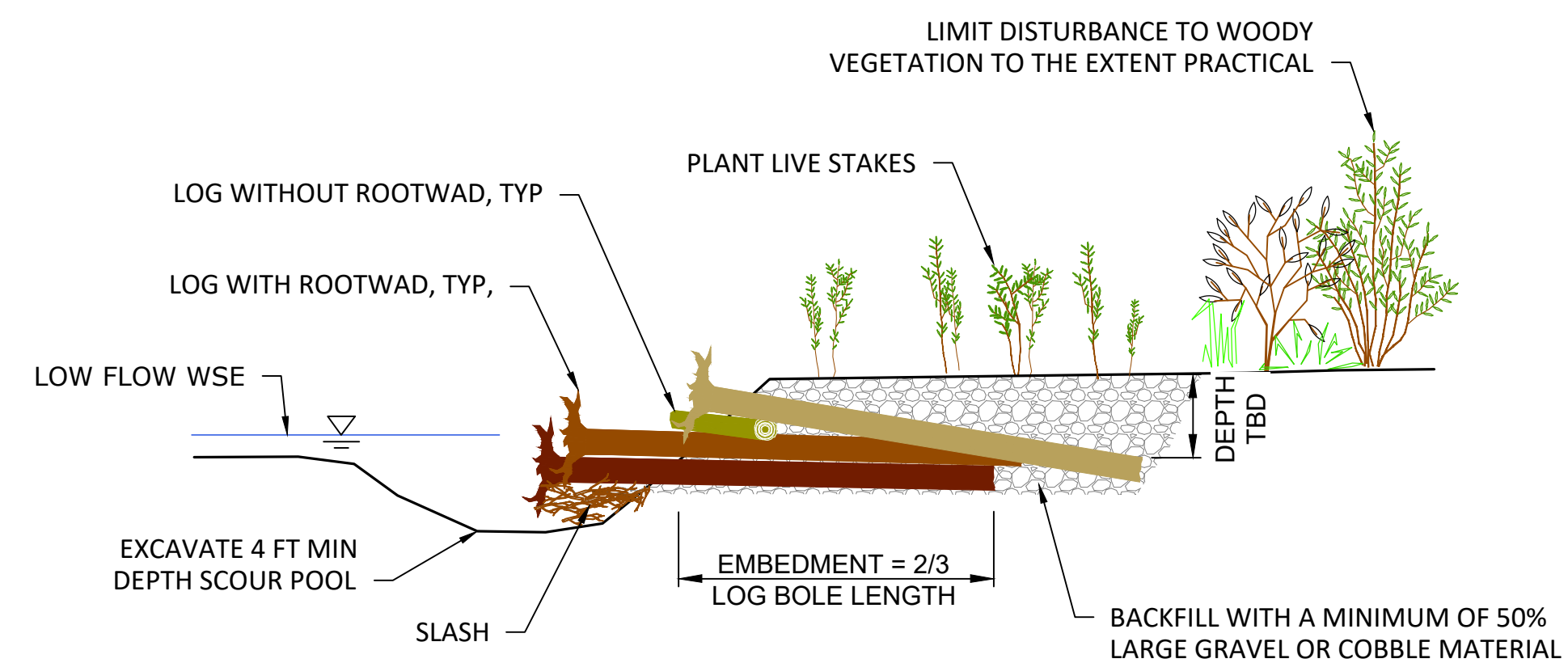
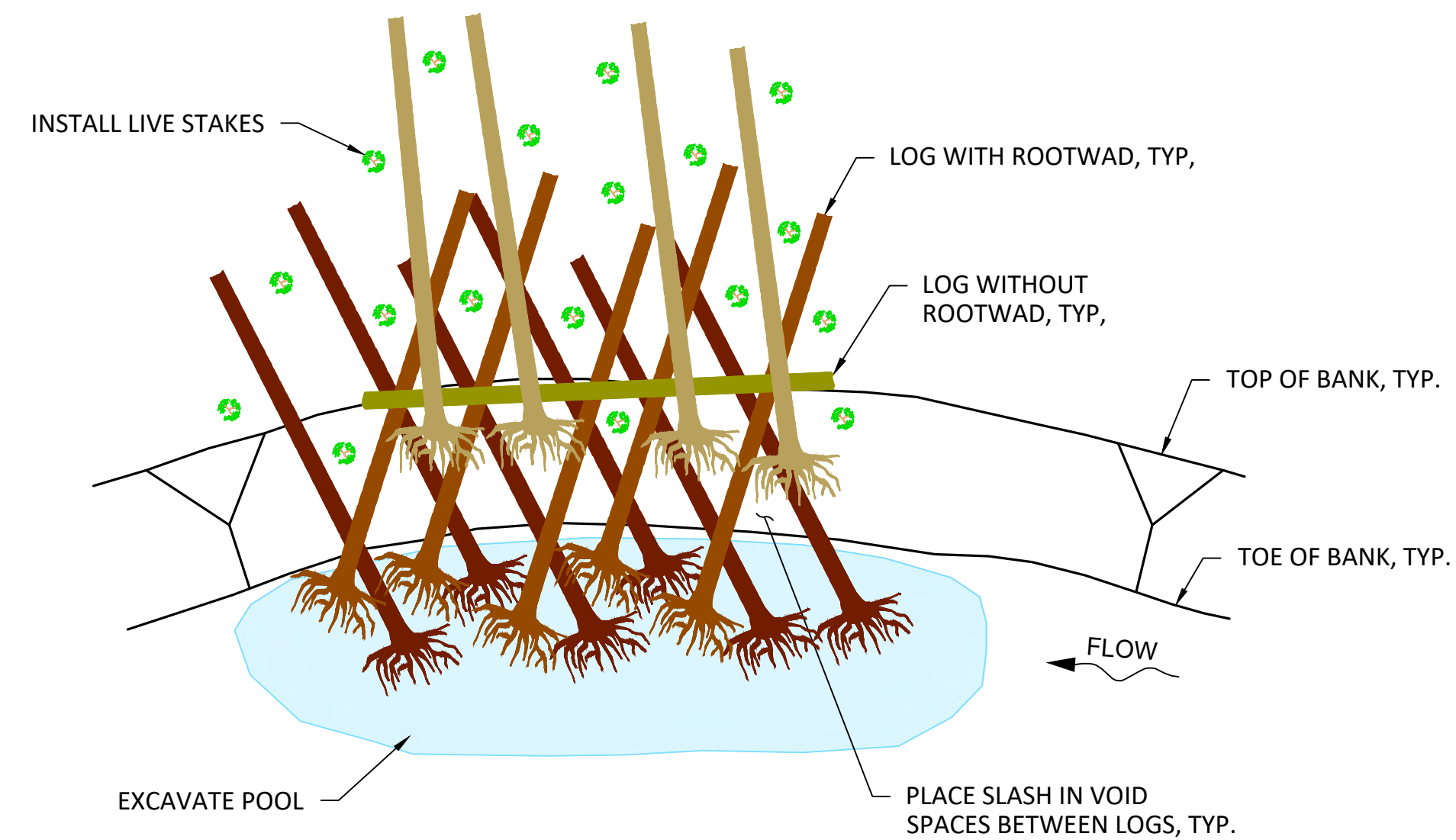
RIFFLE DETAILS

SHEET

41 OF 57



1
30 SMALL BANK BURIED WOOD STRUCTURE
NOT TO SCALE



2 LARGE BANK BURIED WOOD STRUCTURE
30 NOT TO SCALE

LARGE WOOD STRUCTURE NOTES:

1. SPECIFIC ORIENTATION OF LOGS MAY VARY FROM TYPICAL DRAWINGS DEPENDING ON SITE CONDITIONS AND SIZE AND SHAPE OF LARGE WOOD MATERIAL.
2. EACH VERTICAL LOG SHOULD ONLY BE MECHANICALLY CONNECTED TO THE TOP LOG LAYER (WITH A MINIMUM DIAMETER OF 12 INCHES) UNLESS OTHERWISE DIRECTED BY THE ENGINEER IN THE FIELD. REFER TO TIMBER PILE DETAIL FOR MORE INFORMATION ON BALLAST REQUIREMENTS.
3. INSTALL LIVE STAKES AND/OR DEEP-ROOTED LIVE POLES IN AND AROUND EACH STRUCTURE. REFER TO PLANTING PLANS FOR MORE INFORMATION AND DETAILS ABOUT REVEGETATION.

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EAST FORK LEWIS RIVER
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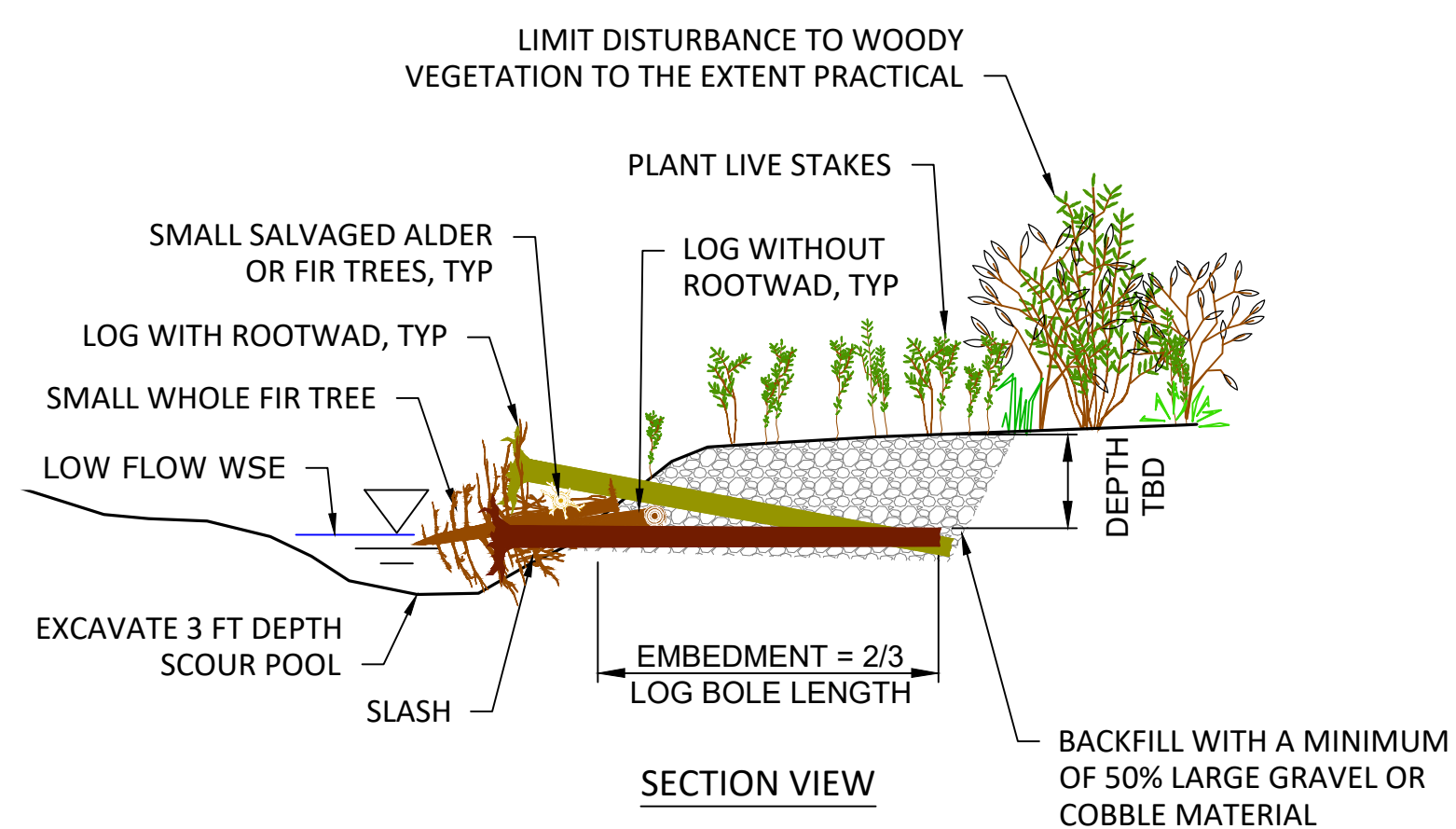
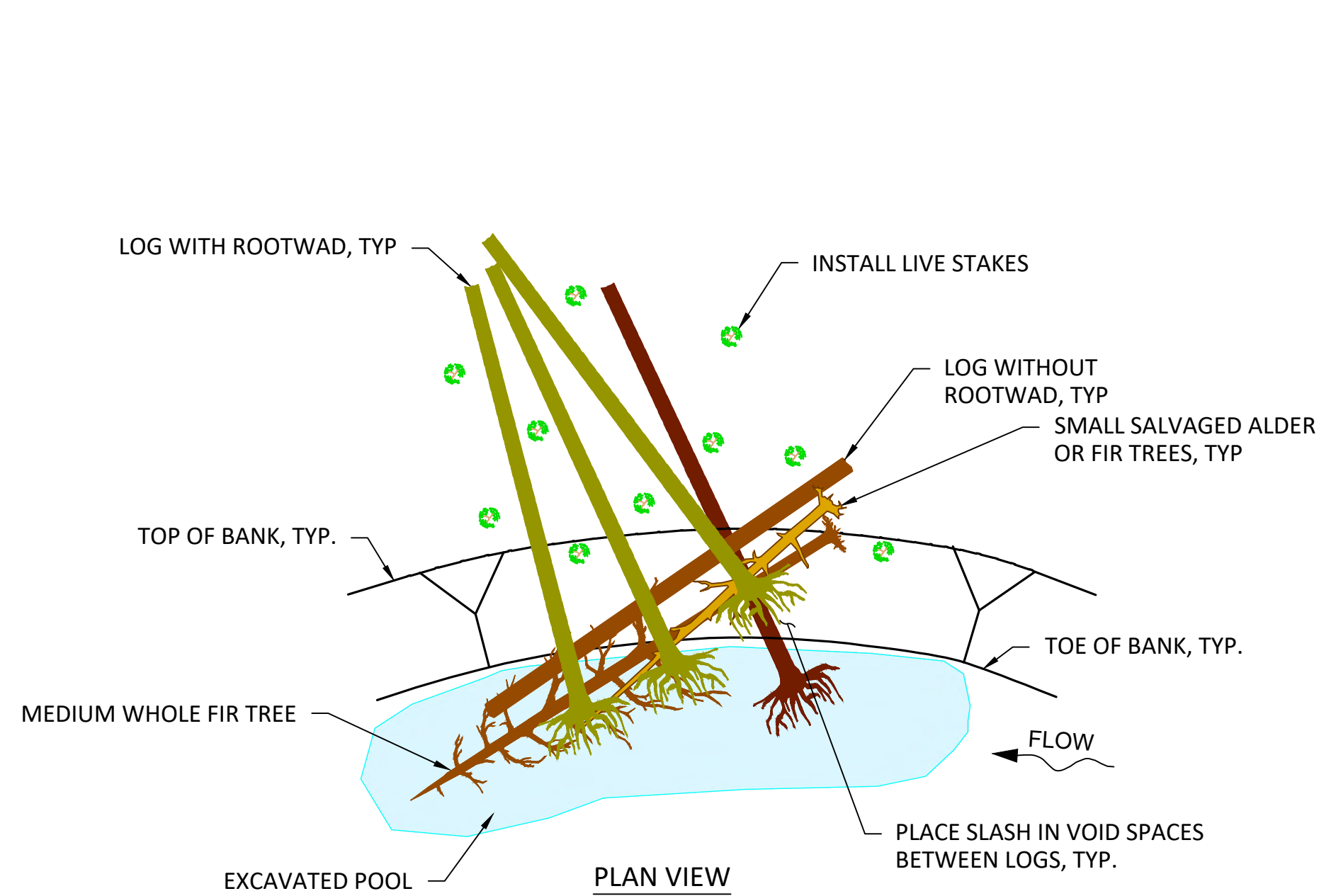


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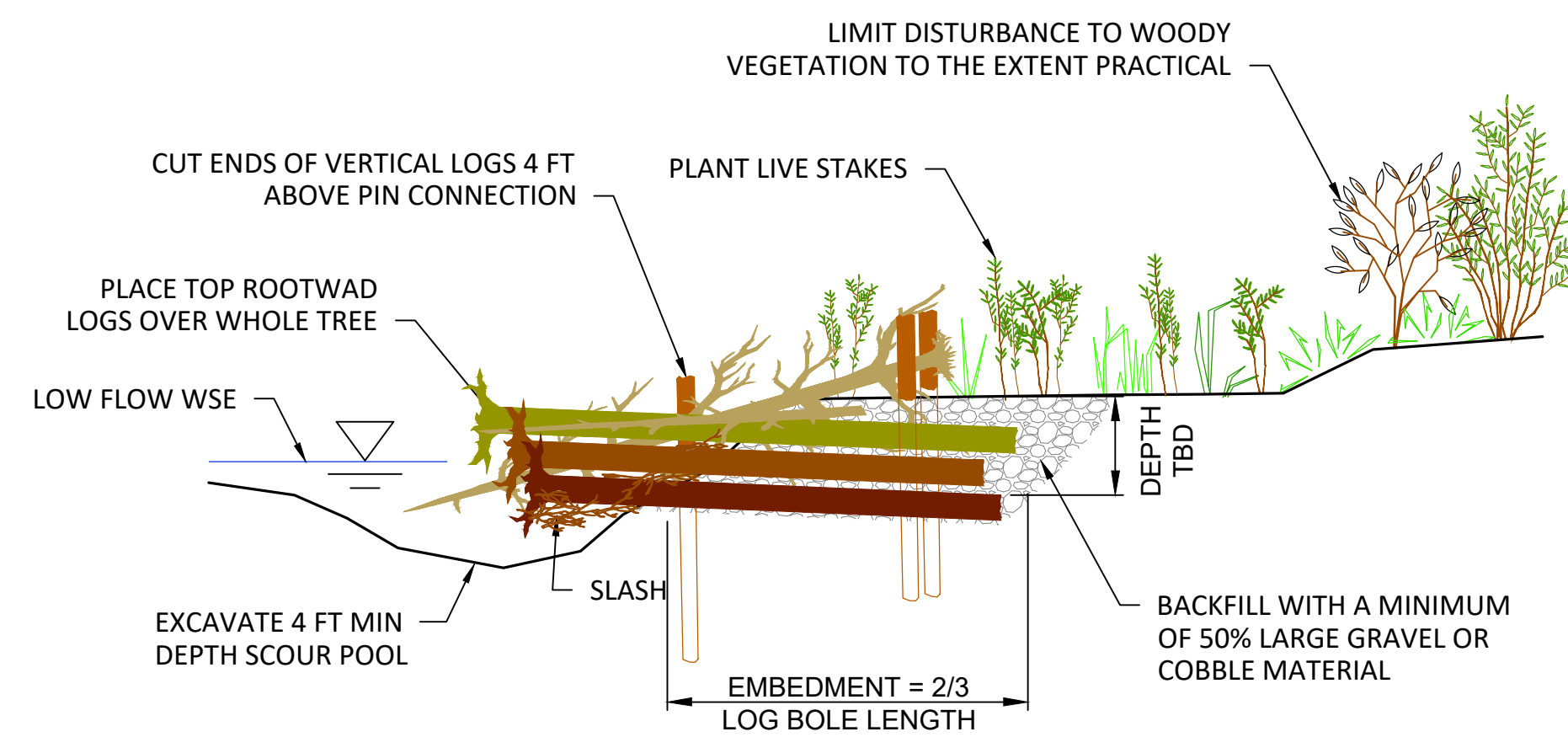
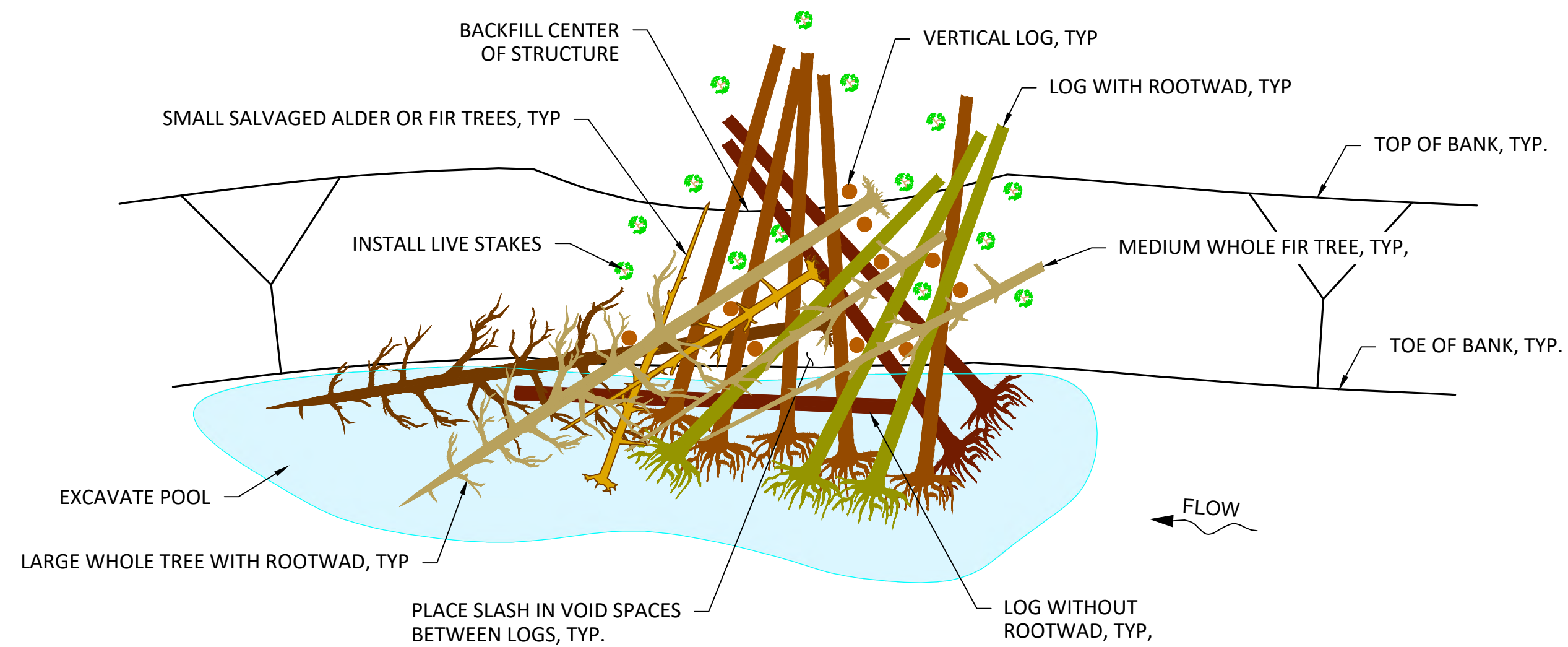
LARGE WOOD STRUCTURE DETAILS (1 OF 6)

SHEET

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1 **SMALL WHOLE TREE WOOD STRUCTURE**
31 NOT TO SCALE



2 **LARGE WHOLE TREE WOOD STRUCTURE**
31 NOT TO SCALE

LARGE WOOD STRUCTURE NOTES:

1. SPECIFIC ORIENTATION OF LOGS MAY VARY FROM TYPICAL DRAWINGS DEPENDING ON SITE CONDITIONS AND SIZE AND SHAPE OF LARGE WOOD MATERIAL.
2. EACH VERTICAL LOG SHOULD ONLY BE MECHANICALLY CONNECTED TO THE TOP LOG LAYER (WITH A MINIMUM DIAMETER OF 12 INCHES) UNLESS OTHERWISE DIRECTED BY THE ENGINEER IN THE FIELD. REFER TO TIMBER PILE DETAIL FOR MORE INFORMATION ON BALLAST REQUIREMENTS.
3. INSTALL LIVE STAKES AND/OR DEEP-ROOTED LIVE POLES IN AND AROUND EACH STRUCTURE. REFER TO PLANTING PLANS FOR MORE INFORMATION AND DETAILS ABOUT REVEGETATION.

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LOWER COLUMBIA ESTUARY PARTNERSHIP
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RECONNECTION PROJECT

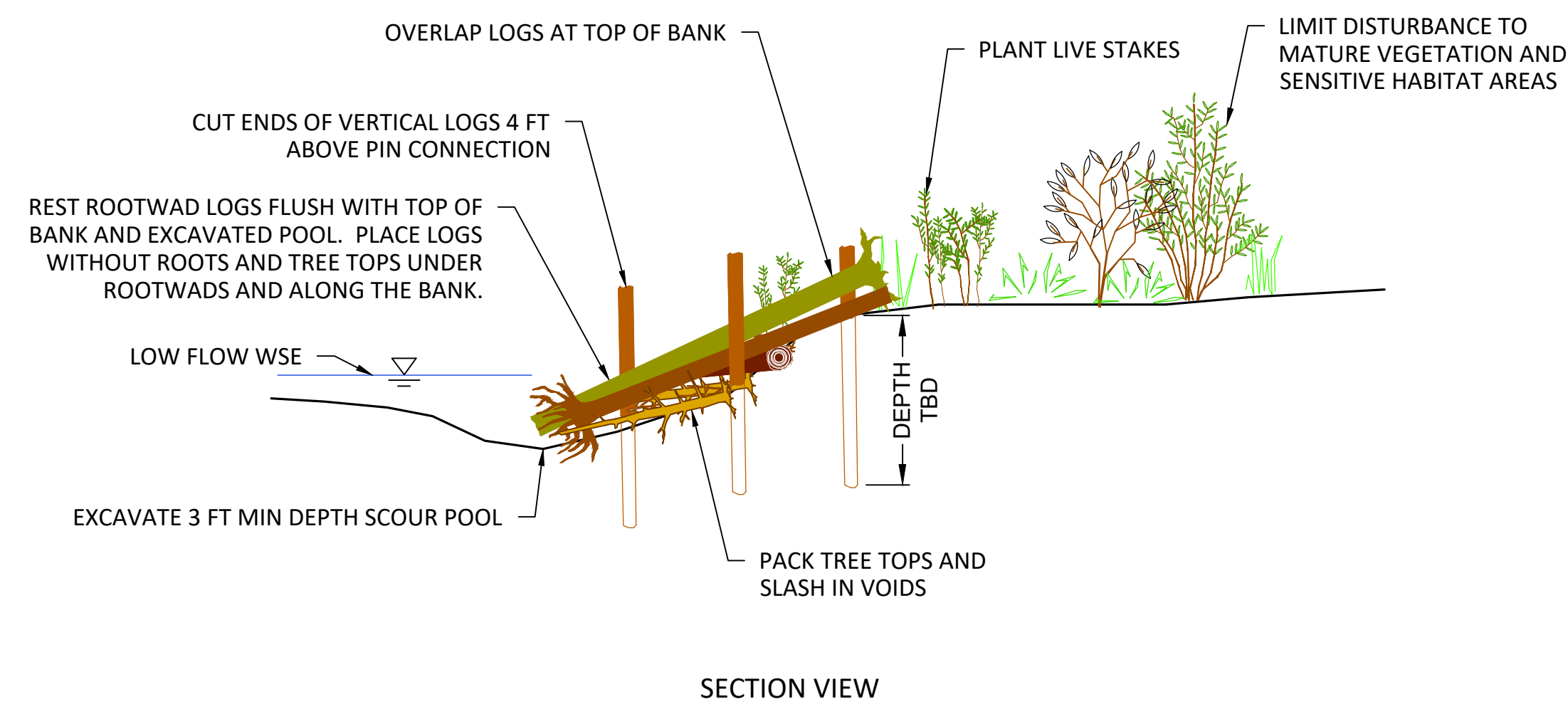
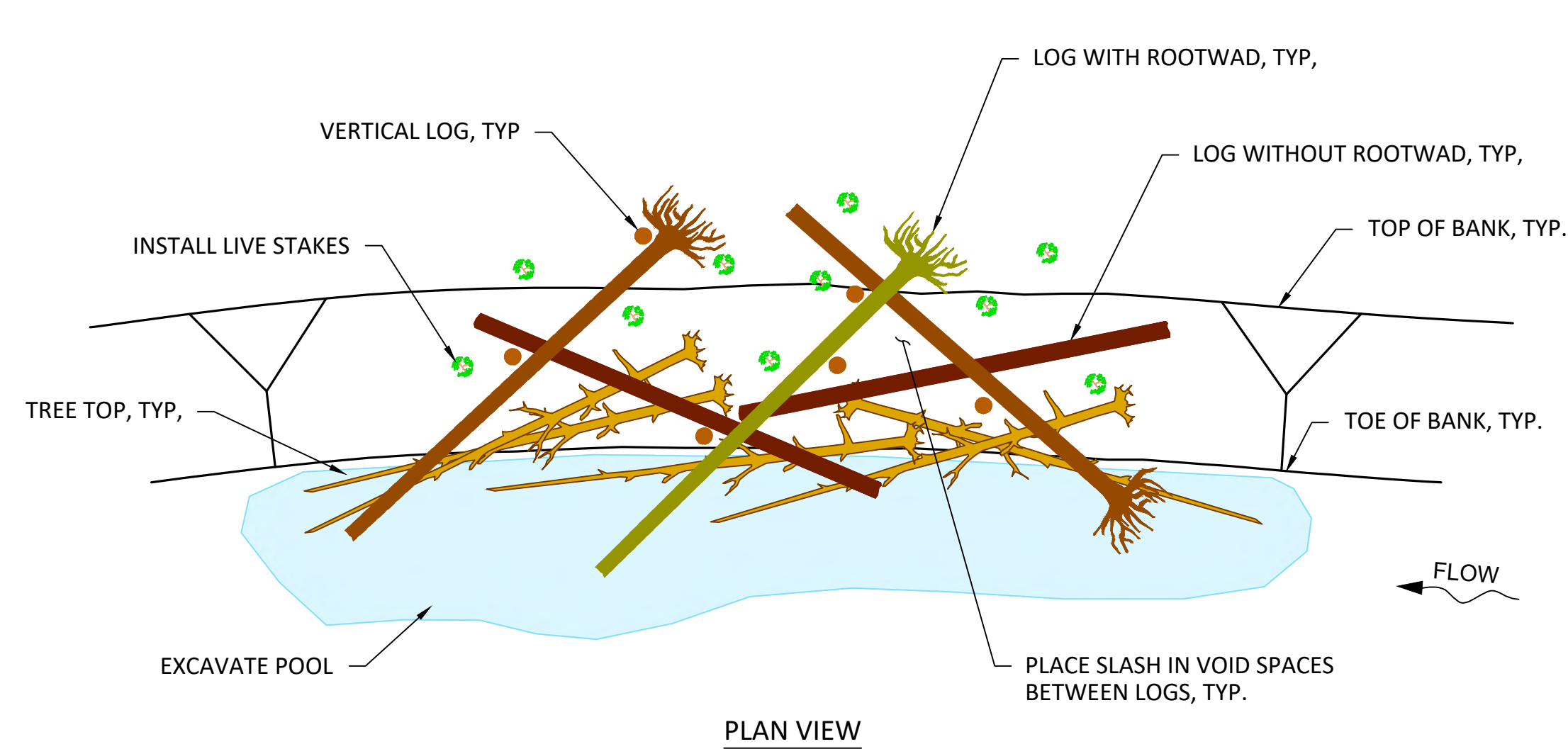


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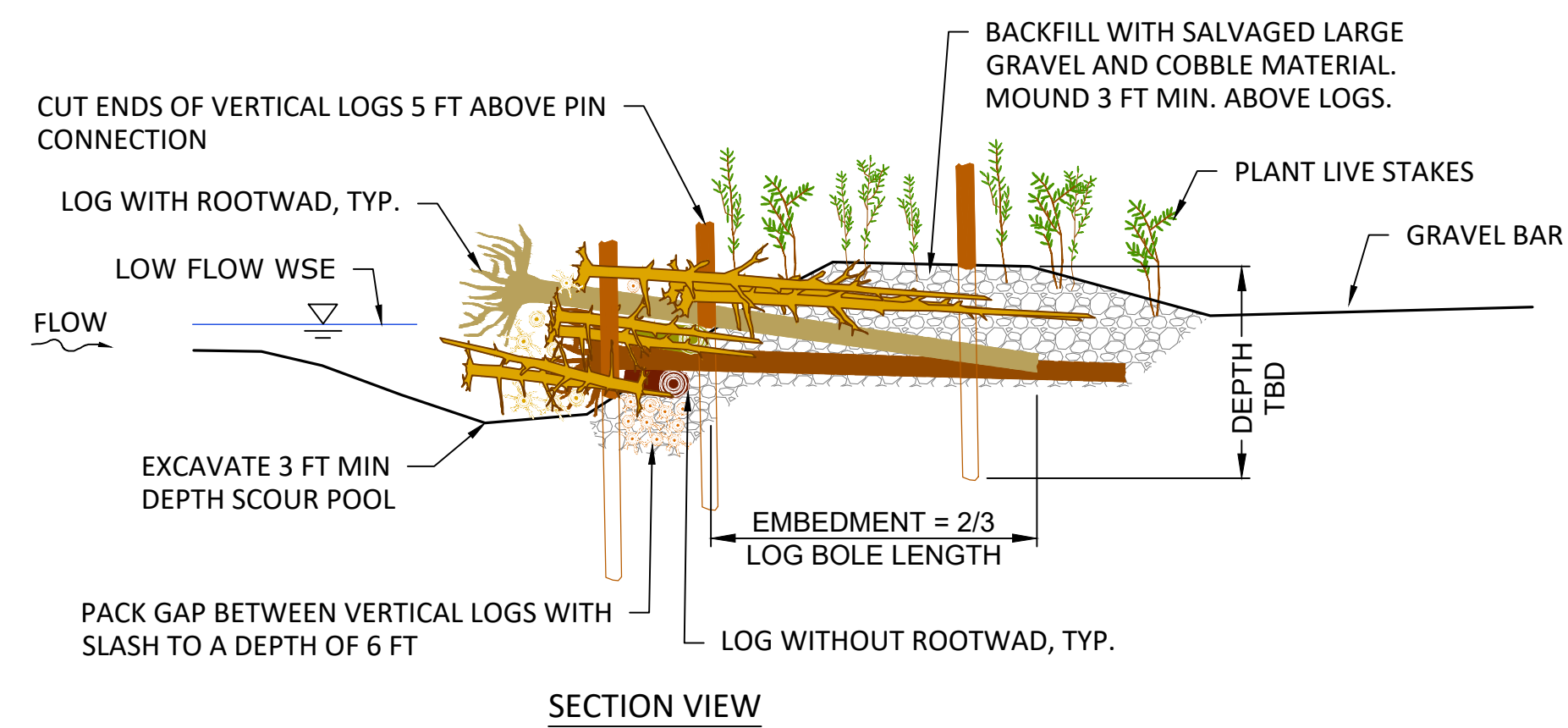
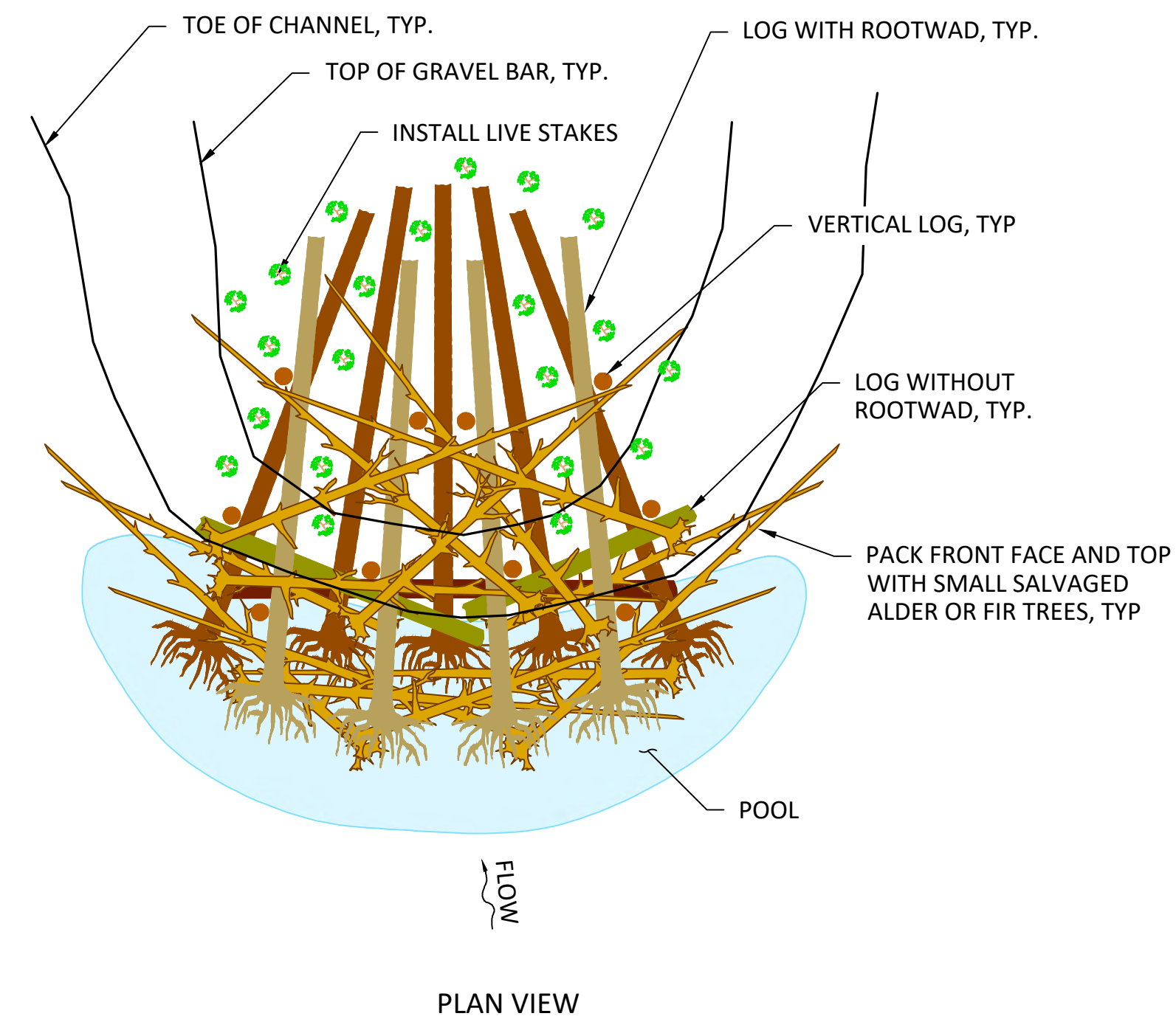
LARGE WOOD STRUCTURE
DETAILS (2 OF 6)

SHEET

43 OF 57



1
32 MARGIN HABITAT WOOD STRUCTURE
NOT TO SCALE



2
32 APEX WOOD STRUCTURE
NOT TO SCALE

LARGE WOOD STRUCTURE NOTES:

1. SPECIFIC ORIENTATION OF LOGS MAY VARY FROM TYPICAL DRAWINGS DEPENDING ON SITE CONDITIONS AND SIZE AND SHAPE OF LARGE WOOD MATERIAL.
2. EACH VERTICAL LOG SHOULD ONLY BE MECHANICALLY CONNECTED TO THE TOP LOG LAYER (WITH A MINIMUM DIAMETER OF 12 INCHES) UNLESS OTHERWISE DIRECTED BY THE ENGINEER IN THE FIELD. REFER TO TIMBER PILE DETAIL FOR MORE INFORMATION ON BALLAST REQUIREMENTS.
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LOWER COLUMBIA ESTUARY PARTNERSHIP
EAST FORK LEWIS RIVER
RECONNECTION PROJECT

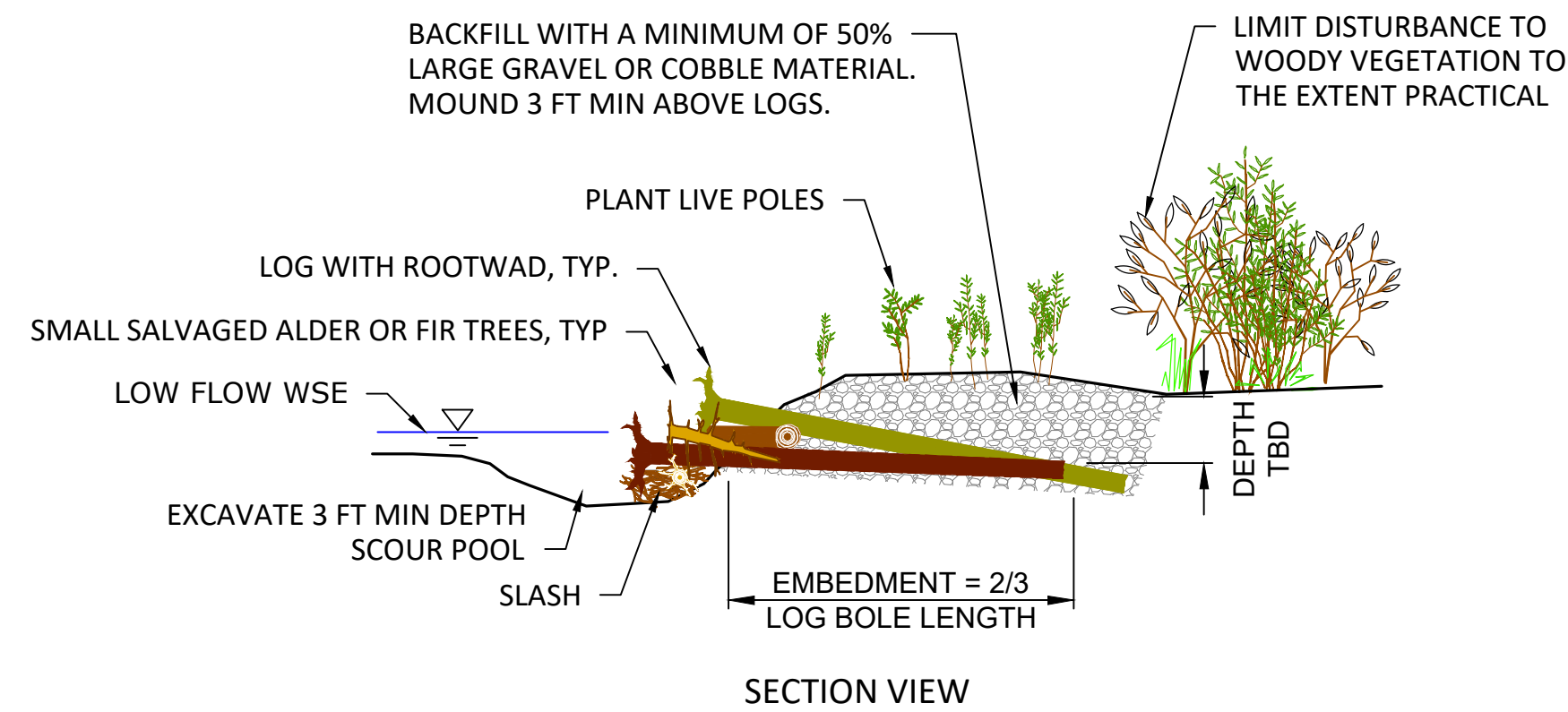
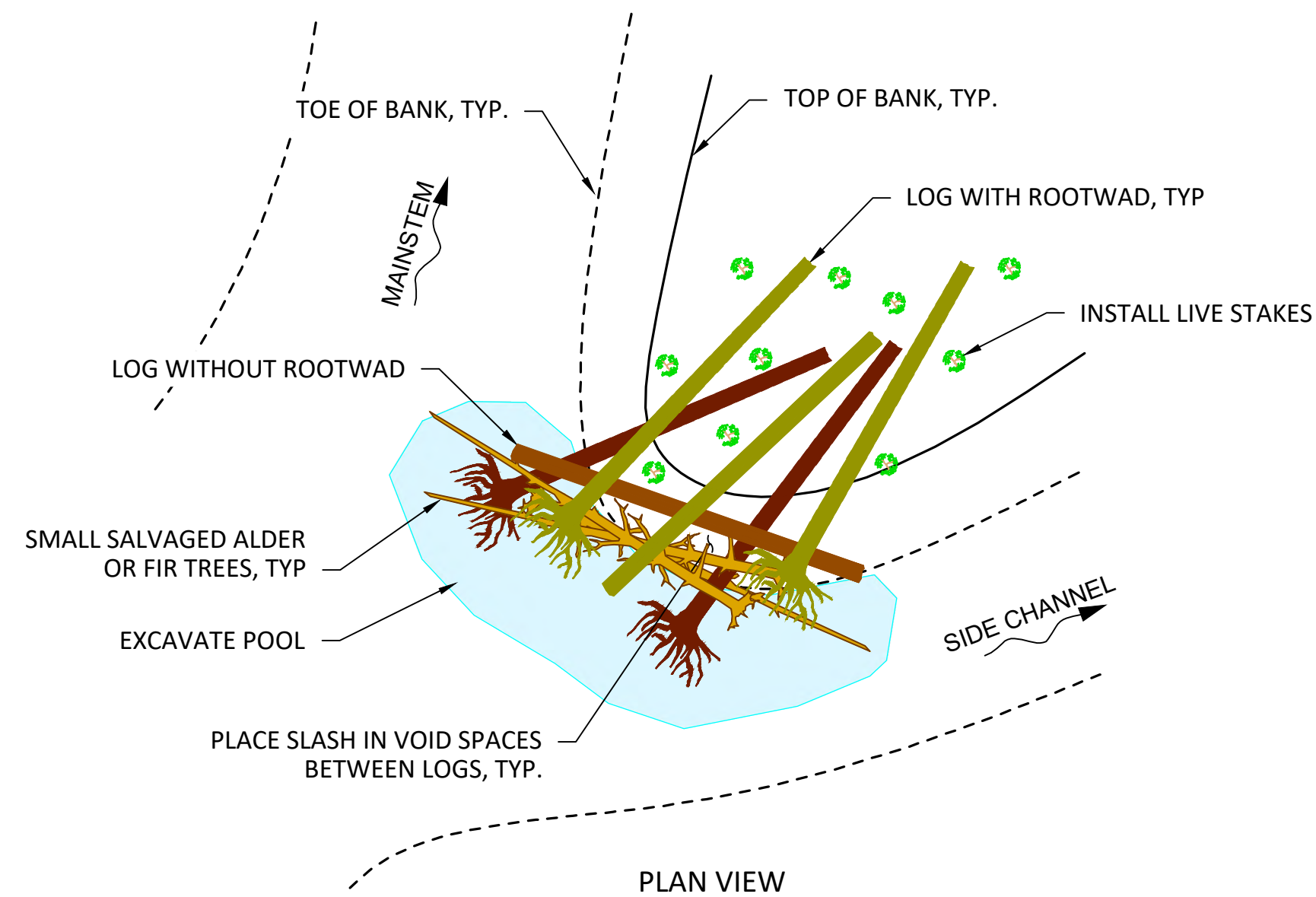


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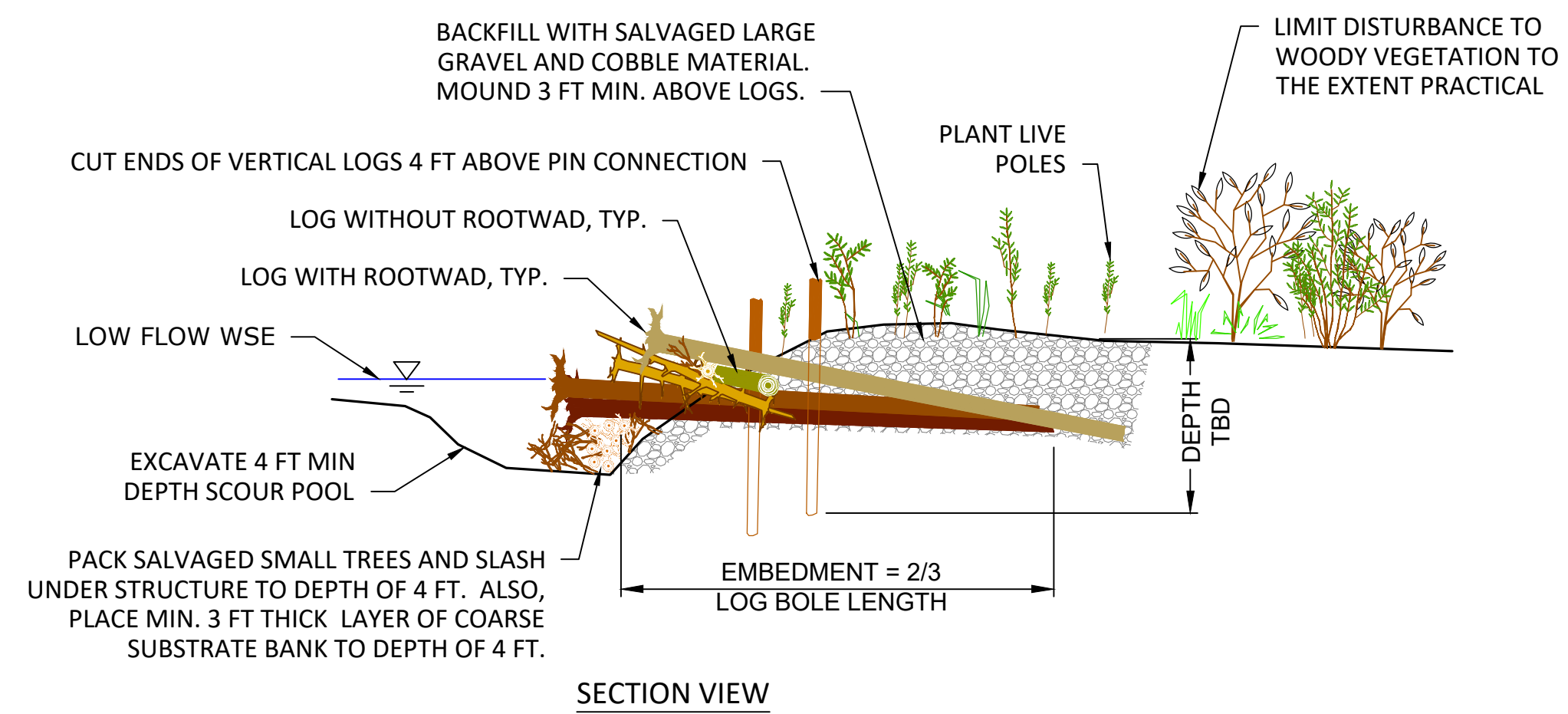
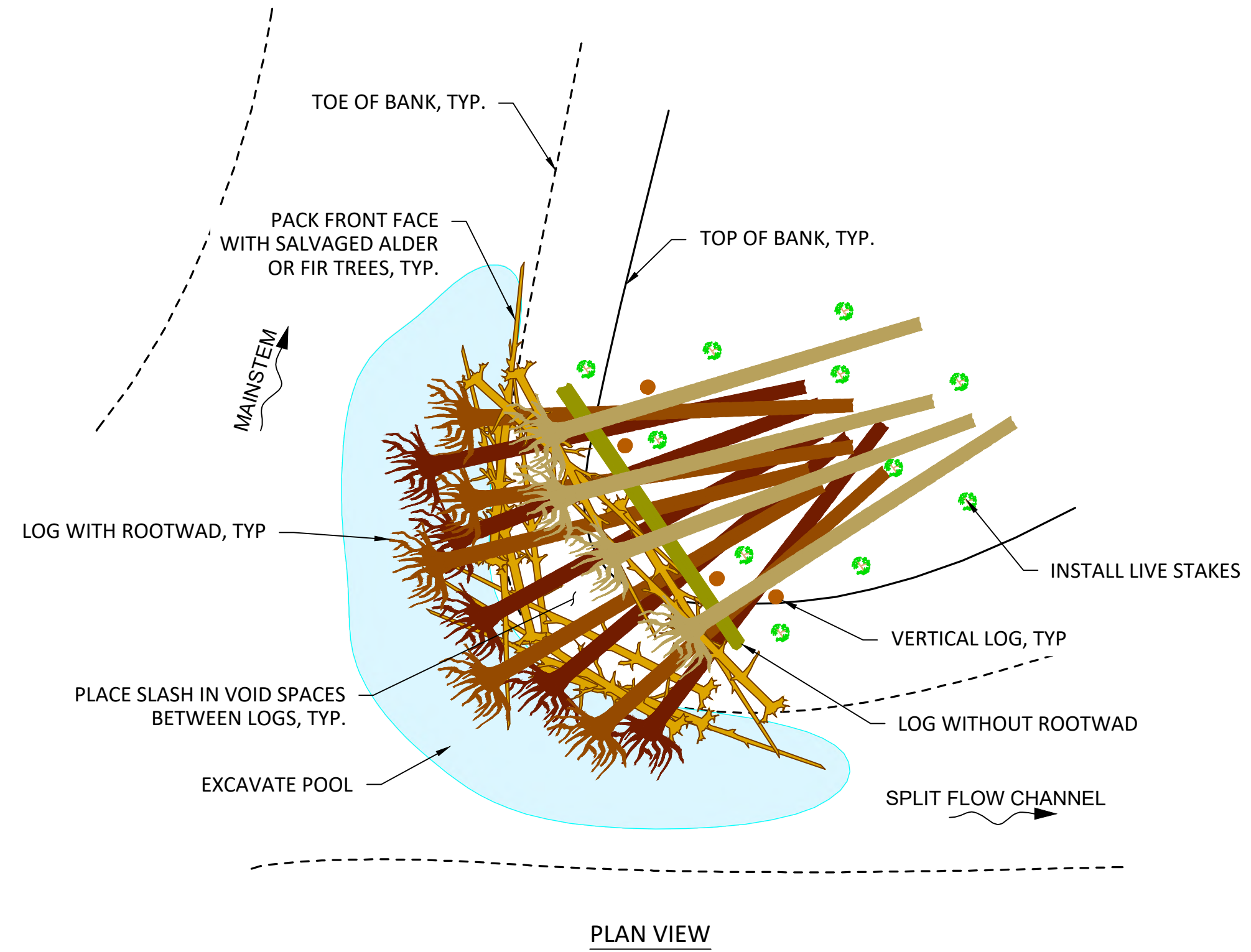
LARGE WOOD STRUCTURE
DETAILS (3 OF 6)

SHEET

44 OF 57



1 **MINOR INLET WOOD STRUCTURE**
33 NOT TO SCALE

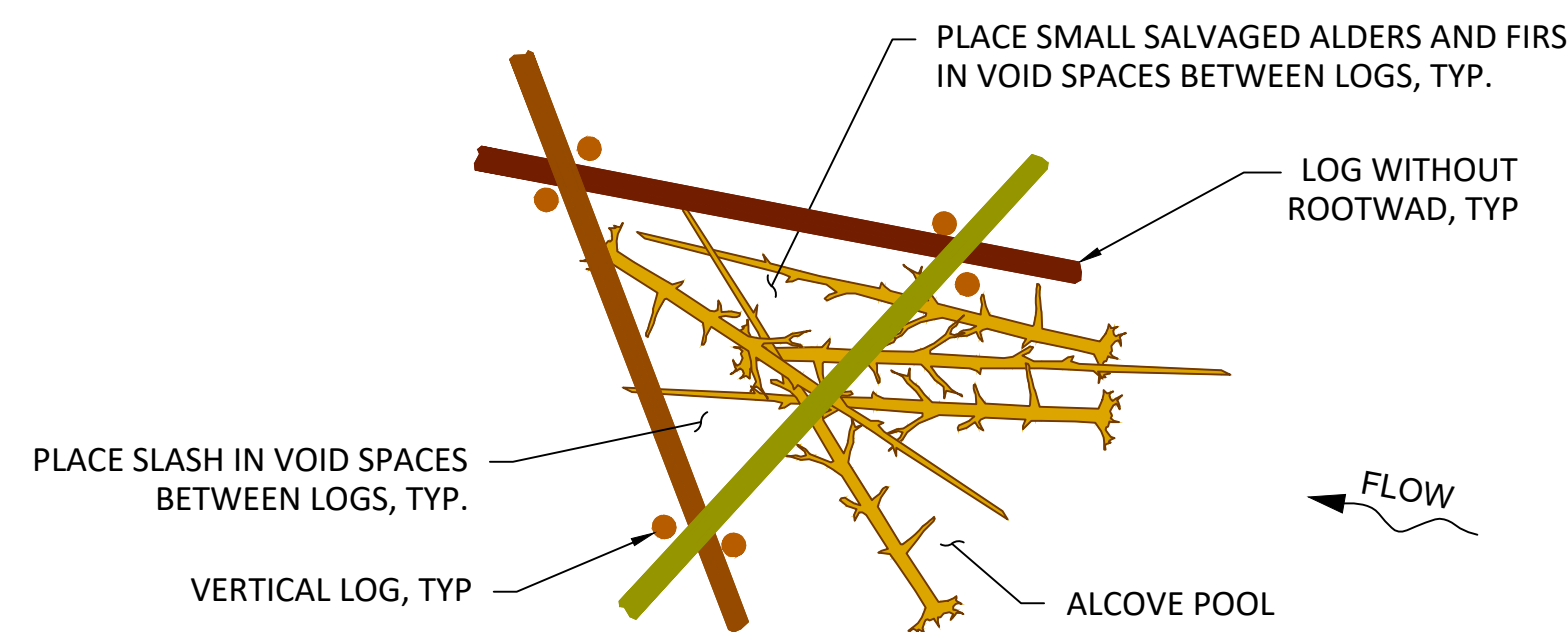


2 **MAJOR INLET WOOD STRUCTURE**
33 NOT TO SCALE

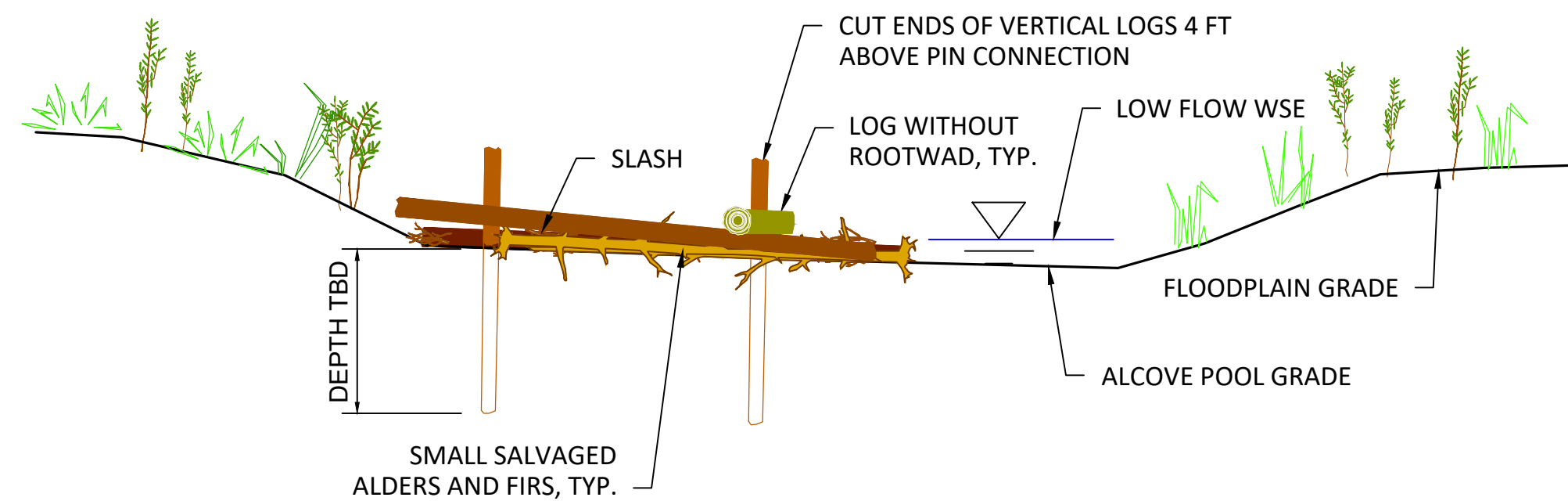
LARGE WOOD STRUCTURE NOTES:

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3. INSTALL LIVE STAKES AND/OR DEEP-ROOTED LIVE POLES IN AND AROUND EACH STRUCTURE. REFER TO PLANTING PLANS FOR MORE INFORMATION AND DETAILS ABOUT REVEGETATION.

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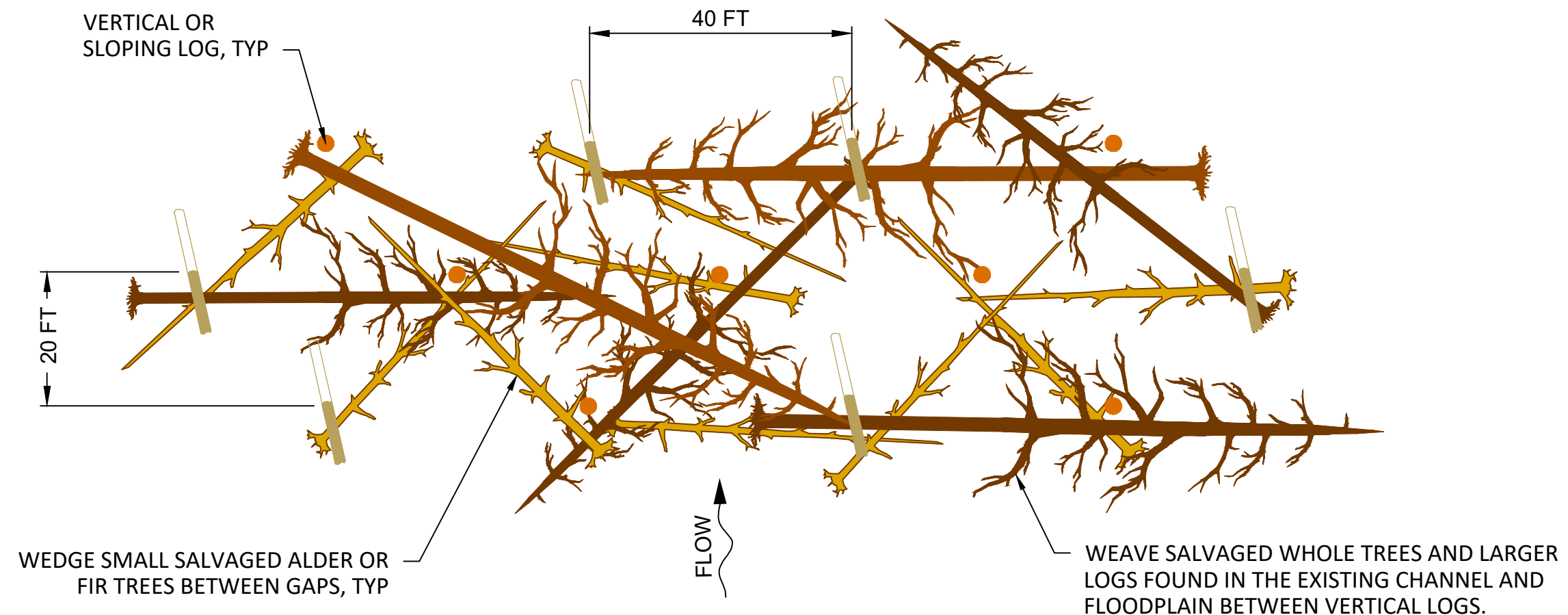


PLAN VIEW

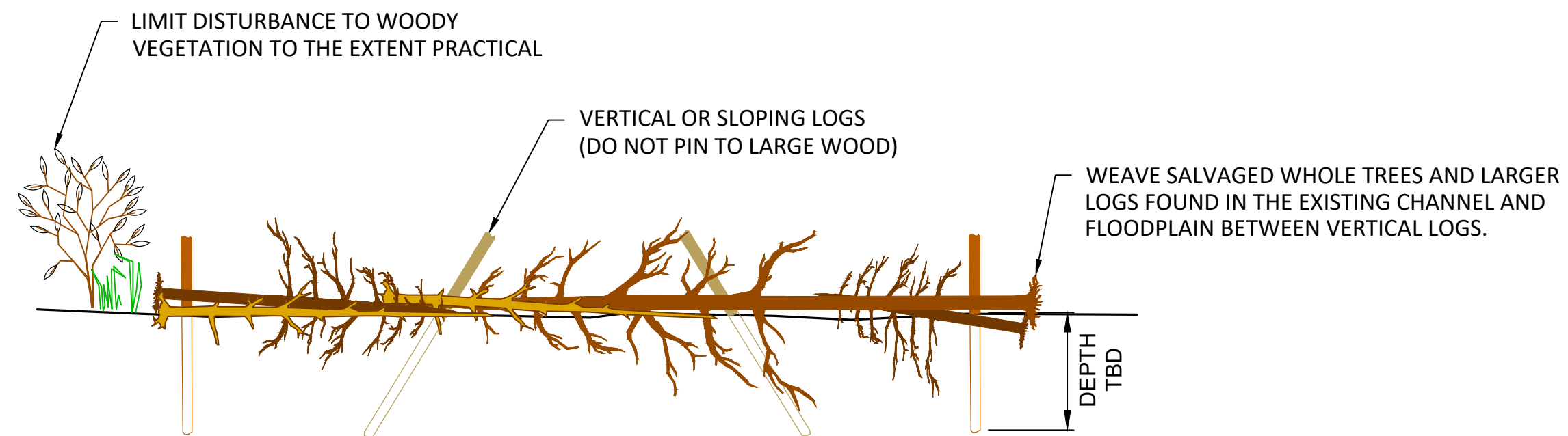


SECTION VIEW

1
34 ALCOVE POOL WOOD STRUCTURE
NOT TO SCALE



PLAN VIEW



SECTION VIEW

2
34 PILE FENCE WOOD STRUCTURE
NOT TO SCALE

LARGE WOOD STRUCTURE NOTES:

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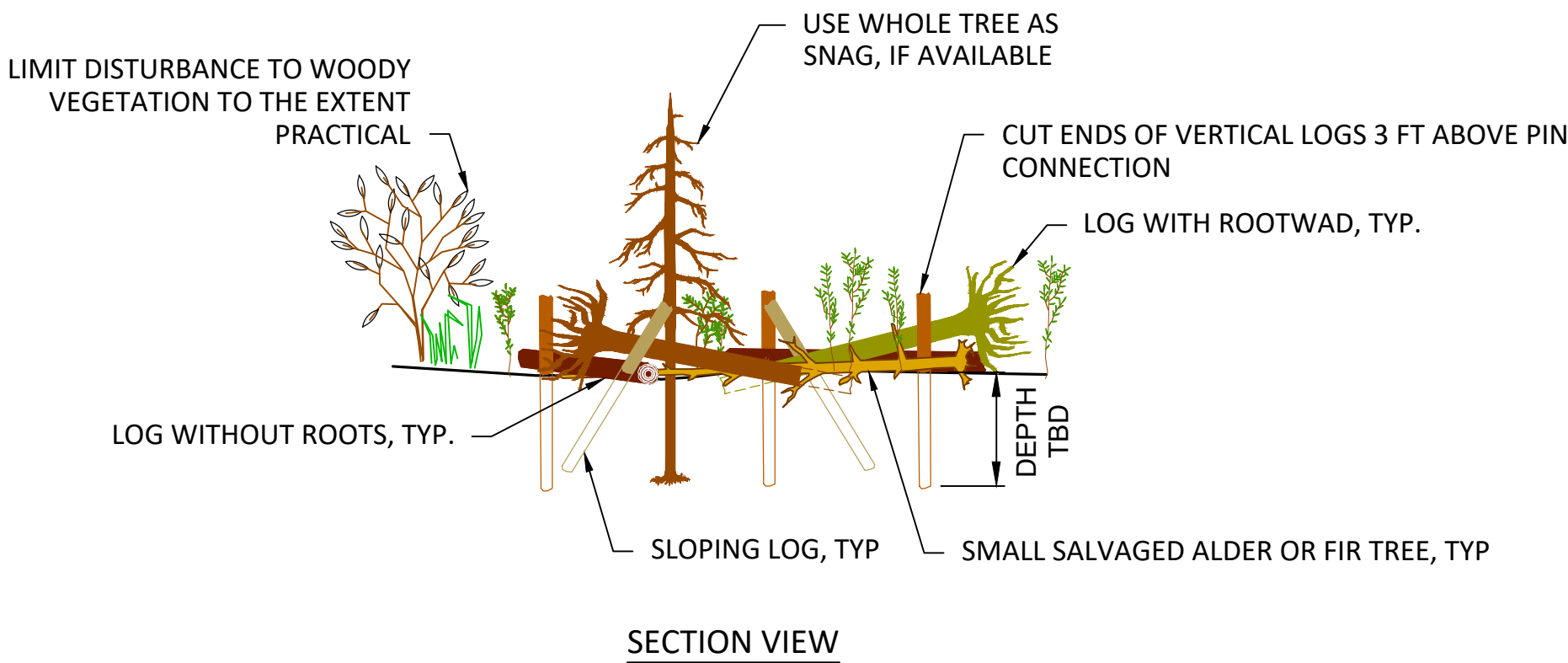
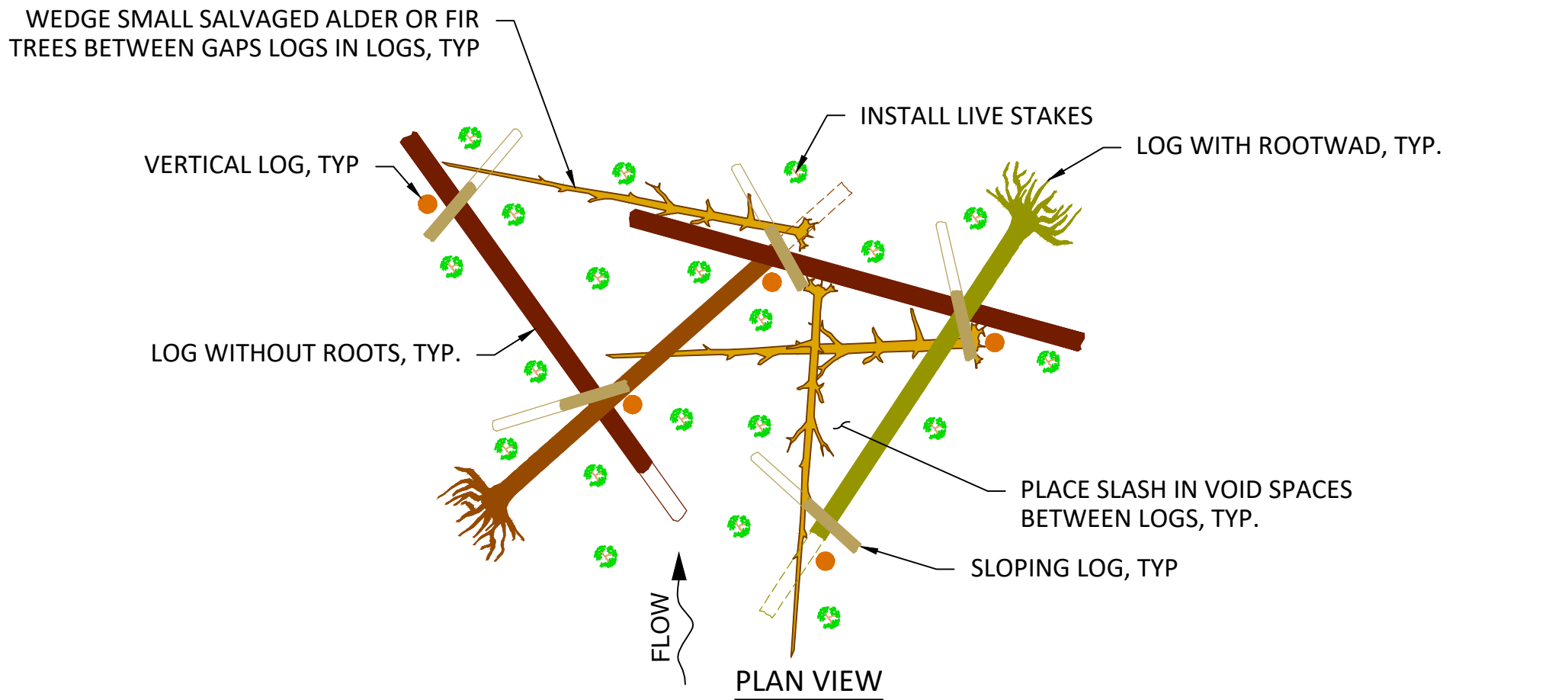
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EAST FORK LEWIS RIVER
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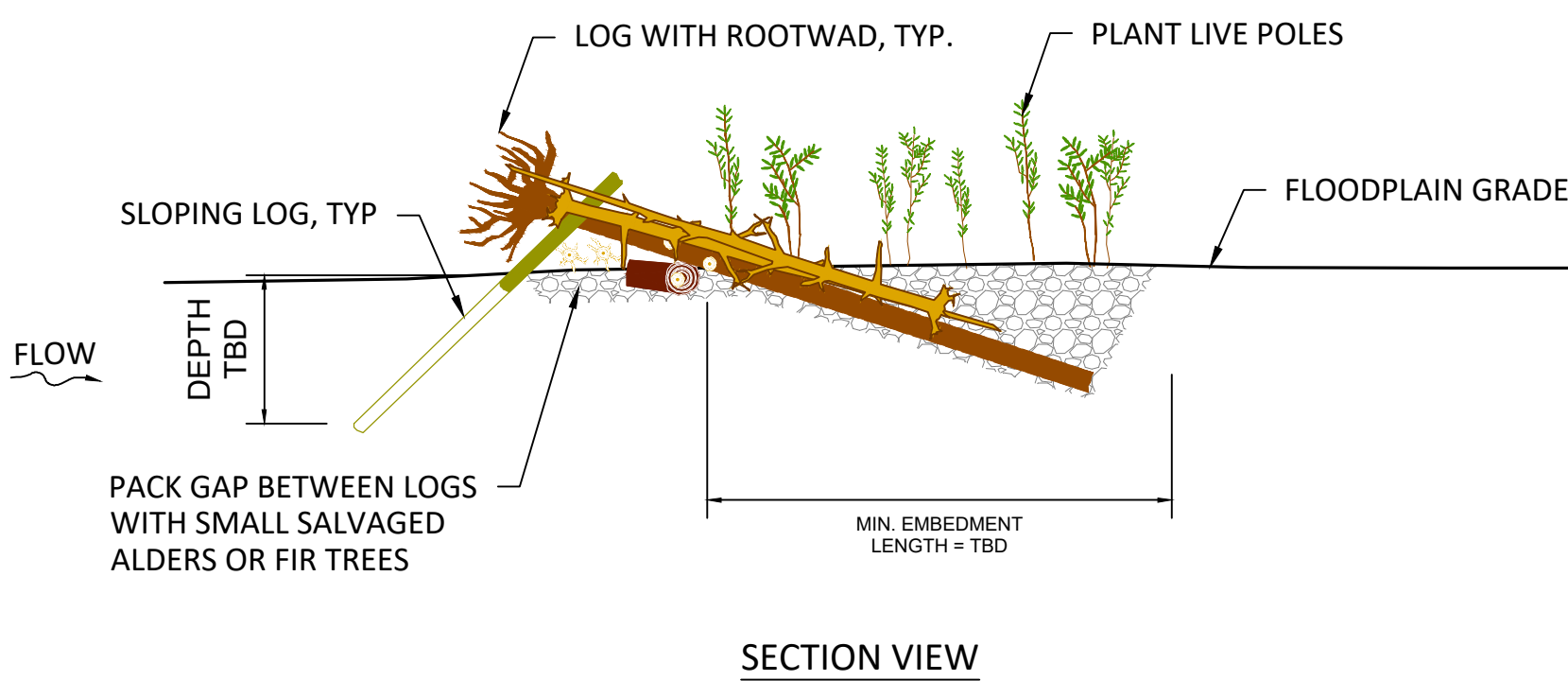
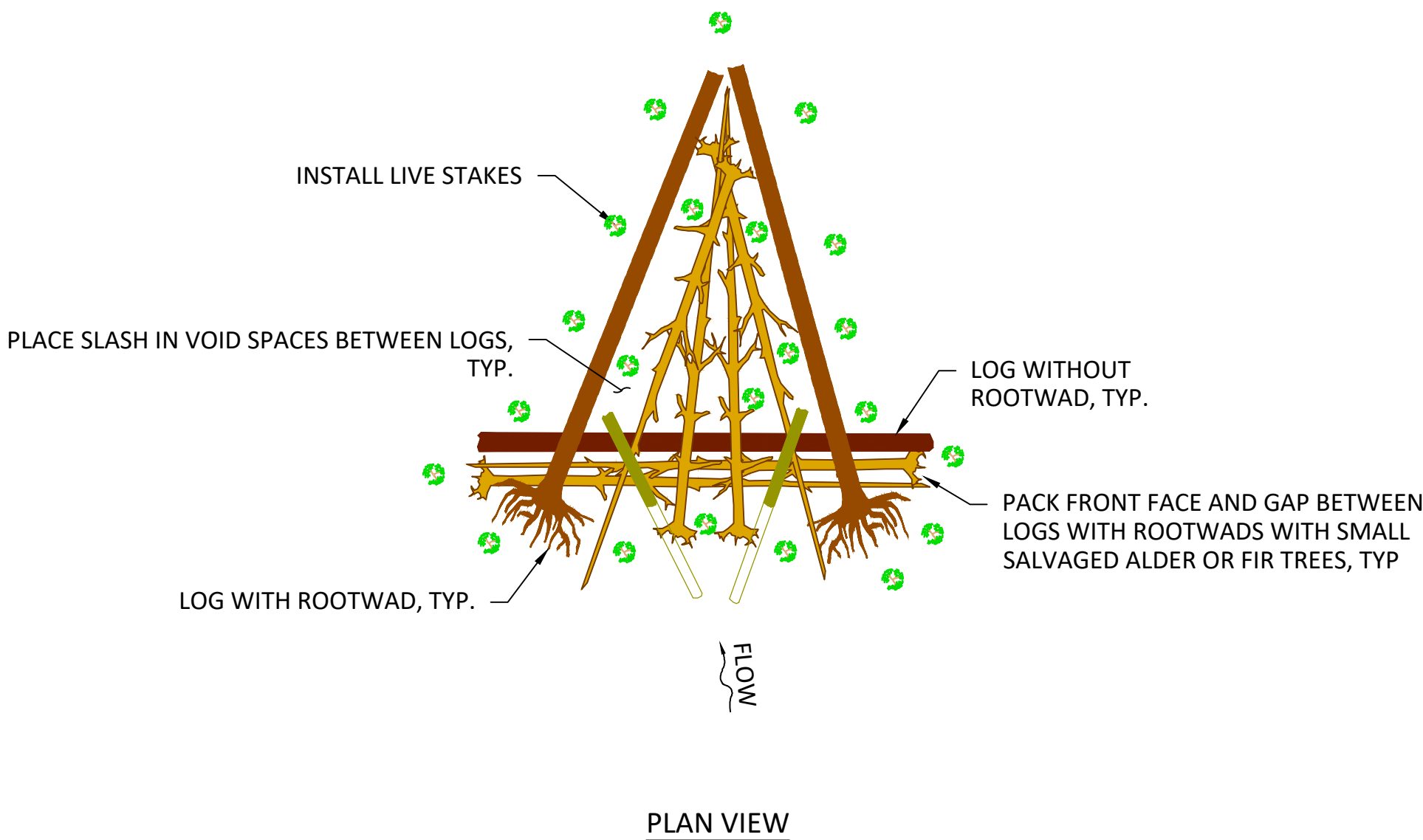


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LARGE WOOD STRUCTURE
DETAILS (5 OF 6)



1
35 FLOODPLAIN ROUGHNESS WOOD STRUCTURE - TYPE 1
NOT TO SCALE



2
35 FLOODPLAIN ROUGHNESS WOOD STRUCTURE - TYPE 2
NOT TO SCALE

- LARGE WOOD STRUCTURE NOTES:**
- 1. SPECIFIC ORIENTATION OF LOGS MAY VARY FROM TYPICAL DRAWINGS DEPENDING ON SITE CONDITIONS AND SIZE AND SHAPE OF LARGE WOOD MATERIAL.
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 - 3. INSTALL LIVE STAKES AND/OR DEEP-ROOTED LIVE POLES IN AND AROUND EACH STRUCTURE. REFER TO PLANTING PLANS FOR MORE INFORMATION AND DETAILS ABOUT REVEGETATION.

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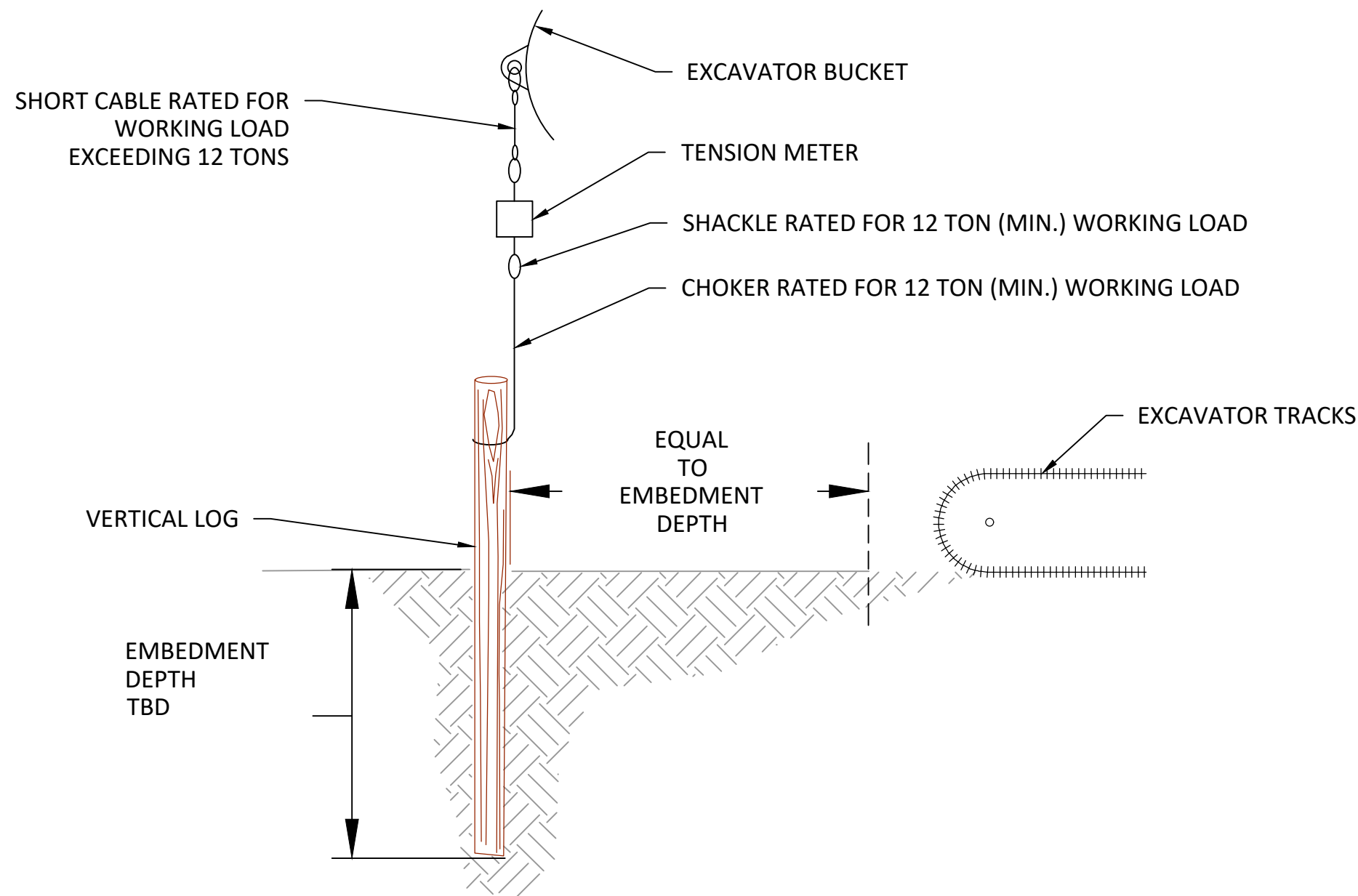
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LOWER COLUMBIA ESTUARY PARTNERSHIP
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LARGE WOOD STRUCTURE
DETAILS (6 OF 6)



VERTICAL LOG INSTALLATION

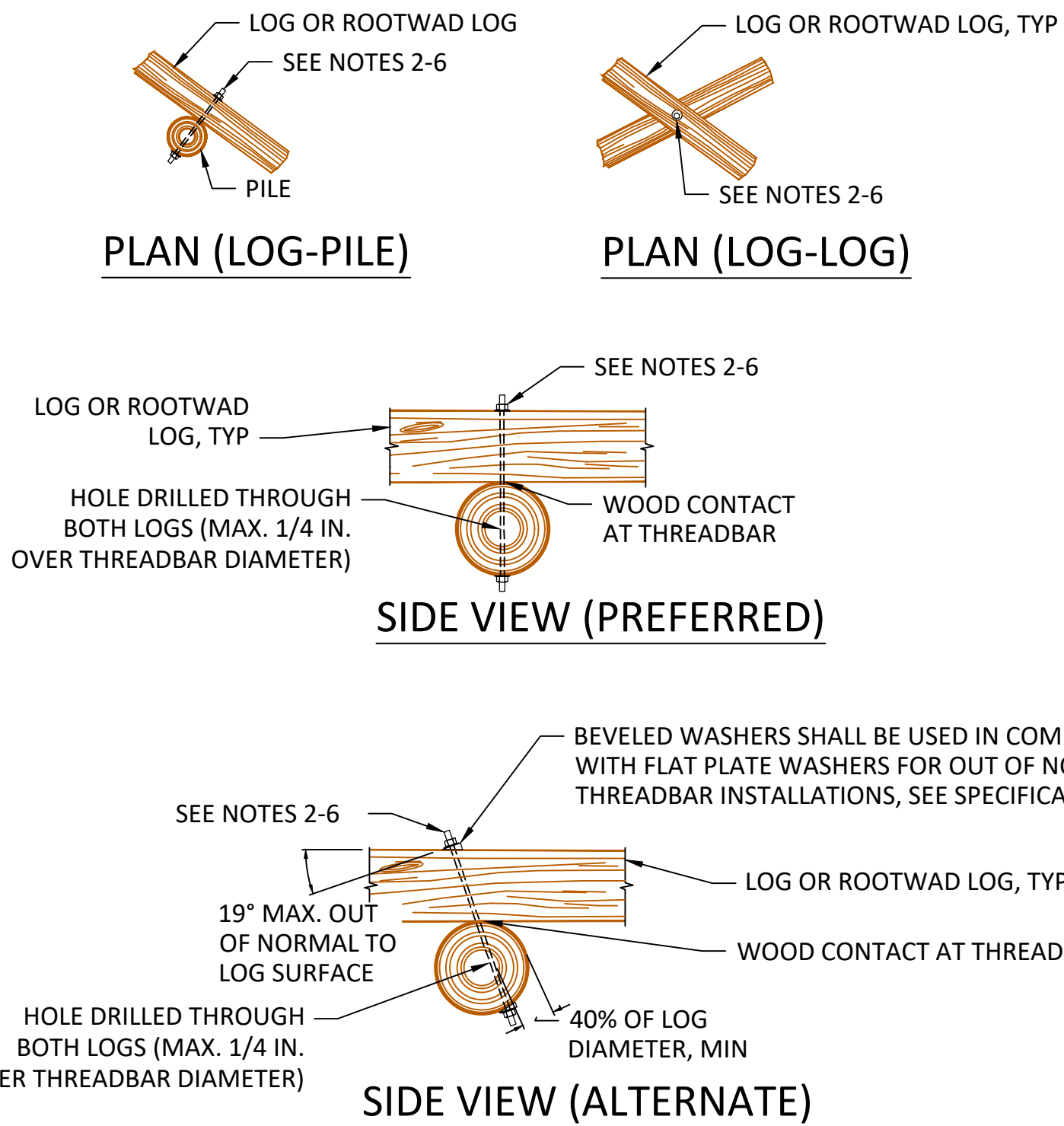
GENERAL NOTES:
RIGGING

- RIGGING FOR VERTICAL LOG TESTING SHALL CONFORM TO THE TENSION SCALE MANUFACTURER'S RECOMMENDATIONS.
- CHOKERS, CABLES AND AND SHACKLES SHALL HAVE MINIMUM WORKING LOAD RATING OF 12 TONS. FITTINGS SHALL BE SIZED ACCORDINGLY.

TESTING

- TESTING OF VERTICAL LOG SHALL BE PERFORMED IN THE PRESENCE OF THE ENGINEER. UP TO FOUR LOAD TESTS SHALL BE APPLIED TO EACH TESTED VERTICAL LOG. EACH OF THE FOUR LOAD TESTS SHALL BE APPLIED TO THE VERTICAL LOG WITH A DIFFERENT INSTALLED DEPTH.
- EACH VERTICAL LOG TEST SHALL HAVE UPWARD LOAD GRADUALLY INCREASED AND AS CLOSELY ALIGNED TO AXIS OF PILE AS POSSIBLE. RECORD THE VERTICAL LOG DIAMETER, EMBEDMENT DEPTH AND MAXIMUM FORCE REQUIRED TO MOVE THE PILE VERTICALLY APPROXIMATELY 1 INCH. THEN DRIVE THE VERTICAL LOG TO A NEW DEPTH IN CONSULTATION WITH THE ENGINEER. APPLY NEW LOAD AND RECORD MAX FORCE THAT CAUSES THE VERTICAL LOG TO MOVE VERTICALLY 1 INCH. REPEAT FOR THIRD AND FOURTH TEST.
- PROOF TESTS SHALL BE MADE AT UP TO FOUR EMBEDMENT DEPTHS FOR EACH VERTICAL LOG. DEPTHS SHALL BE DETERMINED IN THE FIELD. AS A GUIDELINE, TEST EMBEDMENT DEPTHS MAY INCLUDE 8 FT, 10 FT, 12 FT, AND 14 FT. TESTS AT 12 FT AND 14 FT WILL ONLY BE REQUIRED IF PILES MUST BE DRIVEN DEEPER THAN 10 FT TO ACHIEVE TARGET PULLOUT RESISTANCE. SEE NOTE BELOW.
- 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. LIMIT COMPRESSIVE LOADING OF THE TRACKS ON THE GROUND BY DRIVING THE EXCAVATOR ONTO LOGS LAID ON THE GROUND TO DISTRIBUTE THE WEIGHT OVER A LARGER AREA.
- PULL OUT RESISTANCE READING SHALL BE COMPARED AGAINST EXCAVATOR MAX LIFT OFFSET TABLE.
- UP TO 10% OF PRODUCTION VERTICAL LOGS SHALL BE PROOF TESTED. IF RESULTS VARY MORE THAN 50% THEN IT SHOULD BE ANTICIPATED THAT UP TO 25% OF THE PRODUCTION VERTICAL LOGS SHALL BE PROOF TESTED.
- VERTICAL LOG EMBEDMENT DEPTH SPECIFIED IN THESE DRAWINGS MAY BE INCREASED, AT NO ADDITIONAL COST, PENDING COMPARISON OF PULL OUT TEST RESULTS TO AN ASSUMED RAW PULLOUT RESISTANCE OF 15,000 POUNDS. IF TESTING REVEALS FIELD PULLOUT RESISTANCE VALUES THAT ARE LESS THAN THE ASSUMED VALUES, VERTICAL LOGS MAY BE REQUIRED TO BE DRIVEN UP TO 5 FT DEEPER THAN INDICATED. ENGINEER WILL DETERMINE WHETHER THE NUMBER OF VERTICAL LOGS MAY BE REDUCED IF TESTING YIELDS VALUES THAT EXCEED ASSUMED VALUES, BASED ON EVALUATION OF VERTICAL PULLOUT AND LATERAL BRACING OBJECTIVES AT EACH LOCATION. (THE RESISTANCE VALUE MAY BE ADJUSTED DURING A FUTURE PHASE OF DESIGN.)
- TO INSTALL A SNAG INSTEAD OF A VERTICAL LOG, EXCAVATE TO A DEPTH OF AT LEAST 6 FEET, AND PLACE THE SNAG WITH THE ROOTWAD (IF ATTACHED) BURIED IN THE GROUND.
- VERTICAL PILES ARE PREFERRED INSTEAD OF SNAGS IF MECHANICAL CONNECTIONS (THREADED ROD) ARE REQUIRED. SNAGS MAY BE USED AS BRACE POINTS FOR SURFACE LOGS, AS APPROVED BY THE ENGINEER.

1
36 TYPICAL DETAIL - VERTICAL LOG TESTING
NOT TO SCALE



NOTES:

- REQUIREMENTS FOR LOG TO LOG AND LOG TO PILE CONNECTIONS AT LOCATIONS SHOWN ON THE LARGE WOOD TYPICAL DETAIL OR AS OTHERWISE REQUIRED BY THE ENGINEER. THREADBAR SHALL BE #8 FULLY THREADED REBAR WITH A MIN. TENSILE YIELD RATING OF 75,000 POUNDS PER SQUARE INCH (75KSI). WASHERS SHALL BE 3" SQUARE AND 3/16" THICK. NUTS SHALL MATCH THREADBAR AND BE CAPABLE OF DEVELOPING 100% OF THE THREADBAR CAPACITY IN TENSION.
- INSERT THREADBAR THROUGH HOLE DRILLED IN BOTH LOGS.
- PLACE WASHER(S) OVER EACH END OF THREADBAR. THREAD A NUT ONTO EACH END OF THREADBAR AND TIGHTEN UNTIL WOOD SURFACE CRUSHES UNDER THE WASHER.
- IF END OF THREADBAR EXTENDS MORE THAN 2 IN. BEYOND NUT. CUT OFF EXCESS TO NO CLOSER THAN 1 IN. FROM THE NUT.
- PEEN END OF THREADBAR OR CHISEL THREADS SO NUT CANNOT BE BACKED OFF.
- FILE OR GRIND OFF SHARP EDGES.

2
36 TYPICAL DETAIL - THREAD BAR CONNECTION
NOT TO SCALE

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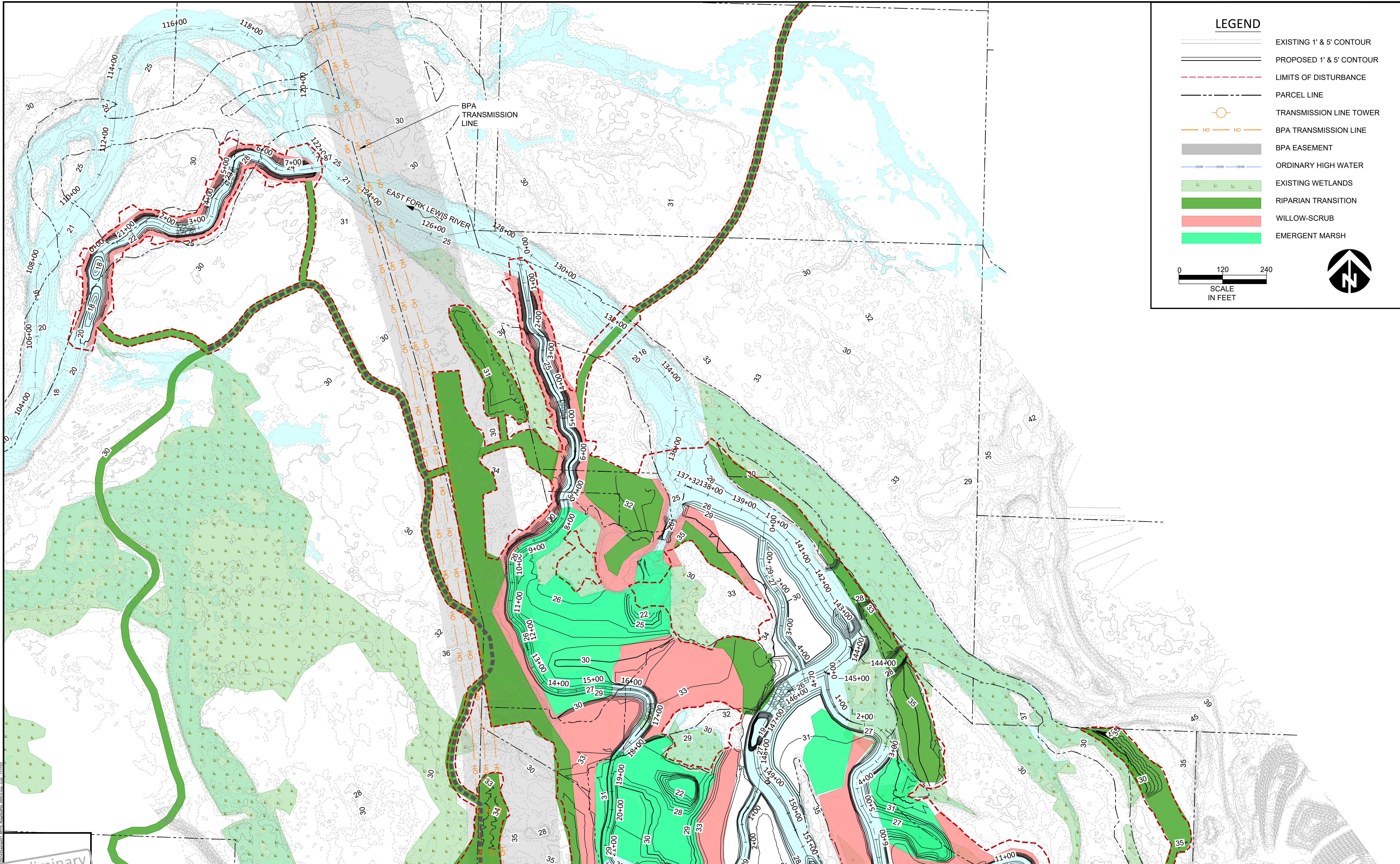
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LARGE WOOD BALLASTING
DETAILS

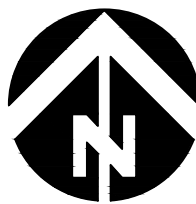
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LEGEND

- EXISTING 1' & 5' CONTOUR
- PROPOSED 1' & 5' CONTOUR
- LIMITS OF DISTURBANCE
- PARCEL LINE
- TRANSMISSION LINE TOWER
- BPA TRANSMISSION LINE
- BPA EASEMENT
- ORDINARY HIGH WATER
- EXISTING WETLANDS
- RIPARIAN TRANSITION
- WILLOW-SCRUB
- EMERGENT MARSH

0 120 240
SCALE
IN FEET

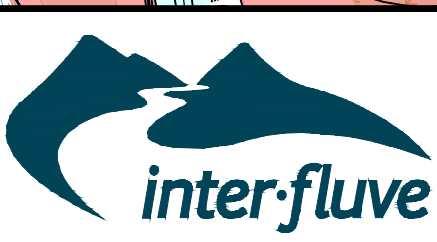


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Not for Construction

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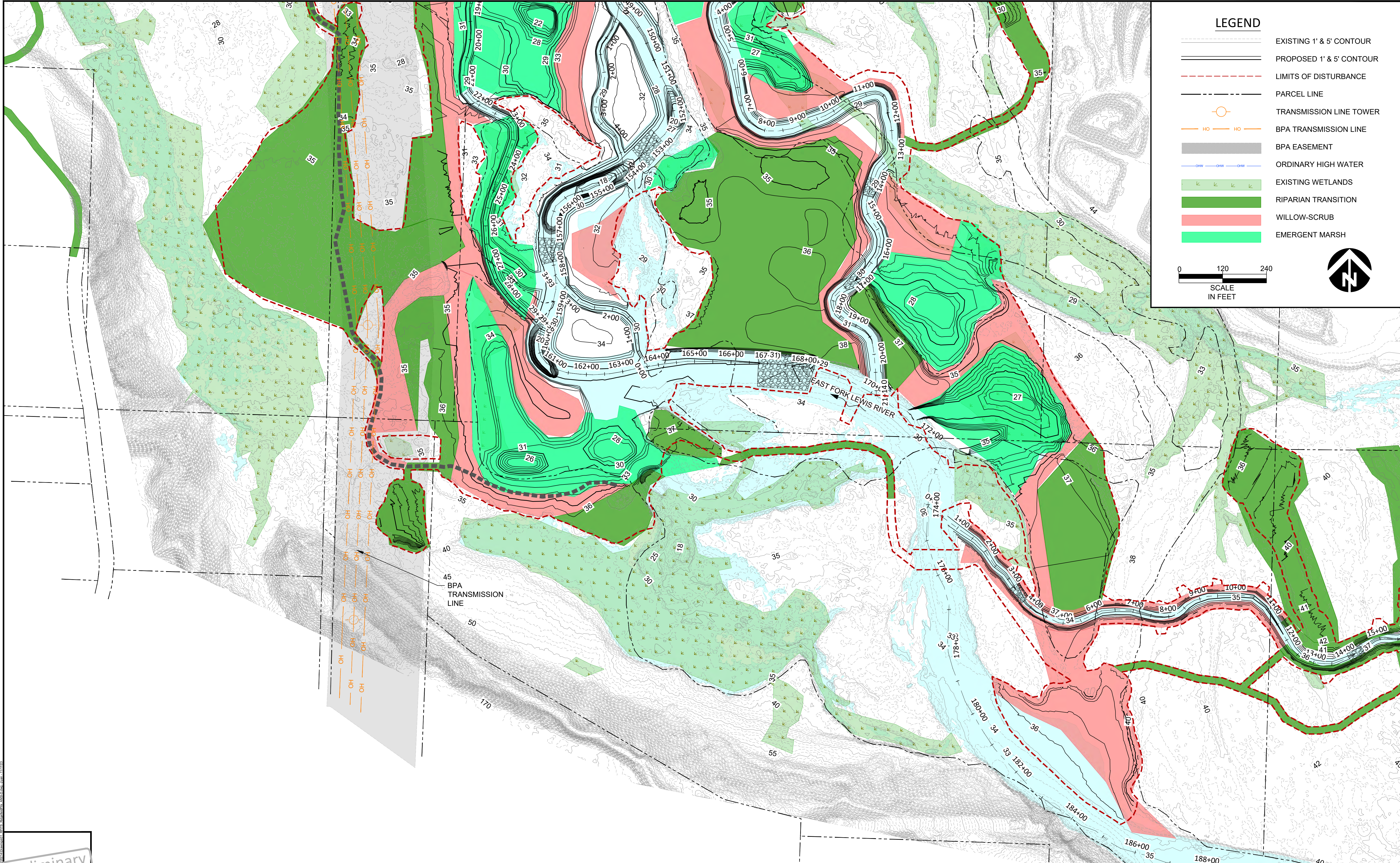
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REVEGETATION PLAN LOWER
CORE PITS

SHEET
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LEGEND

EXISTING 1' & 5' CONTOUR

PROPOSED 1' & 5' CONTOUR

LIMITS OF DISTURBANCE

PARCEL LINE

TRANSMISSION LINE TOWER

BPA TRANSMISSION LINE

BPA EASEMENT

ORDINARY HIGH WATER

EXISTING WETLANDS

RIPARIAN TRANSITION

WILLOW-SCRUB

EMERGENT MARSH

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SCALE
IN FEET

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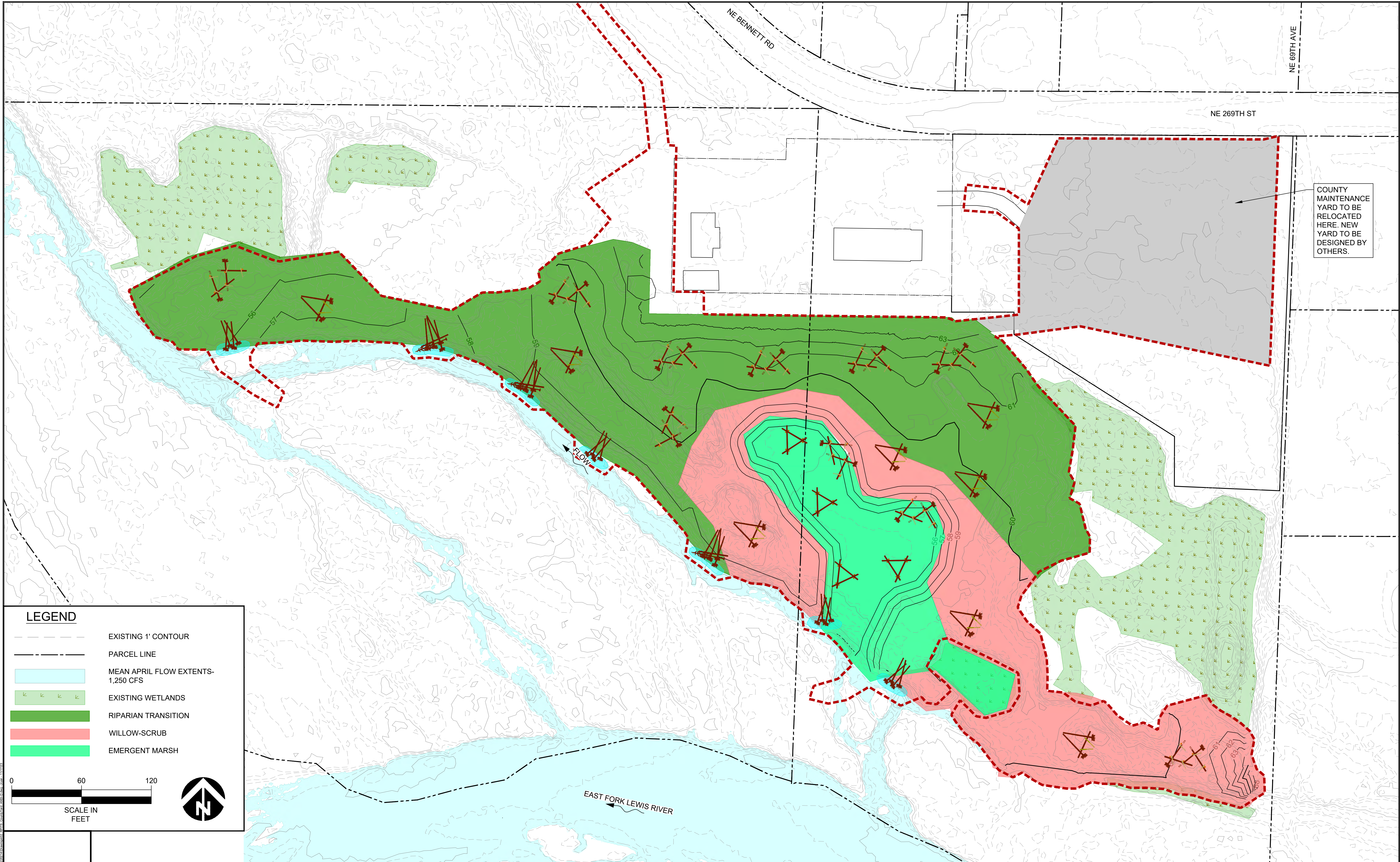
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REVEGETATION PLAN UPPER
CORE PITS

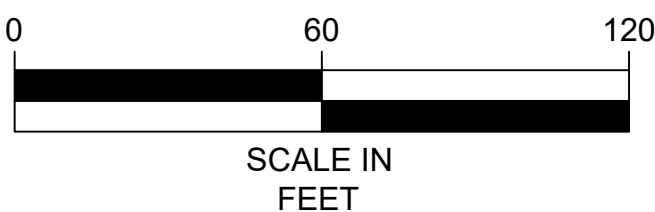
SHEET
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COUNTY
MAINTENANCE
YARD TO BE
RELOCATED
HERE. NEW
YARD TO BE
DESIGNED BY
OTHERS.

LEGEND

- EXISTING 1' CONTOUR
- - - - - PARCEL LINE
- MEAN APRIL FLOW EXTENTS-
1,250 CFS
- EXISTING WETLANDS
- RIPARIAN TRANSITION
- WILLOW-SCRUB
- EMERGENT MARSH



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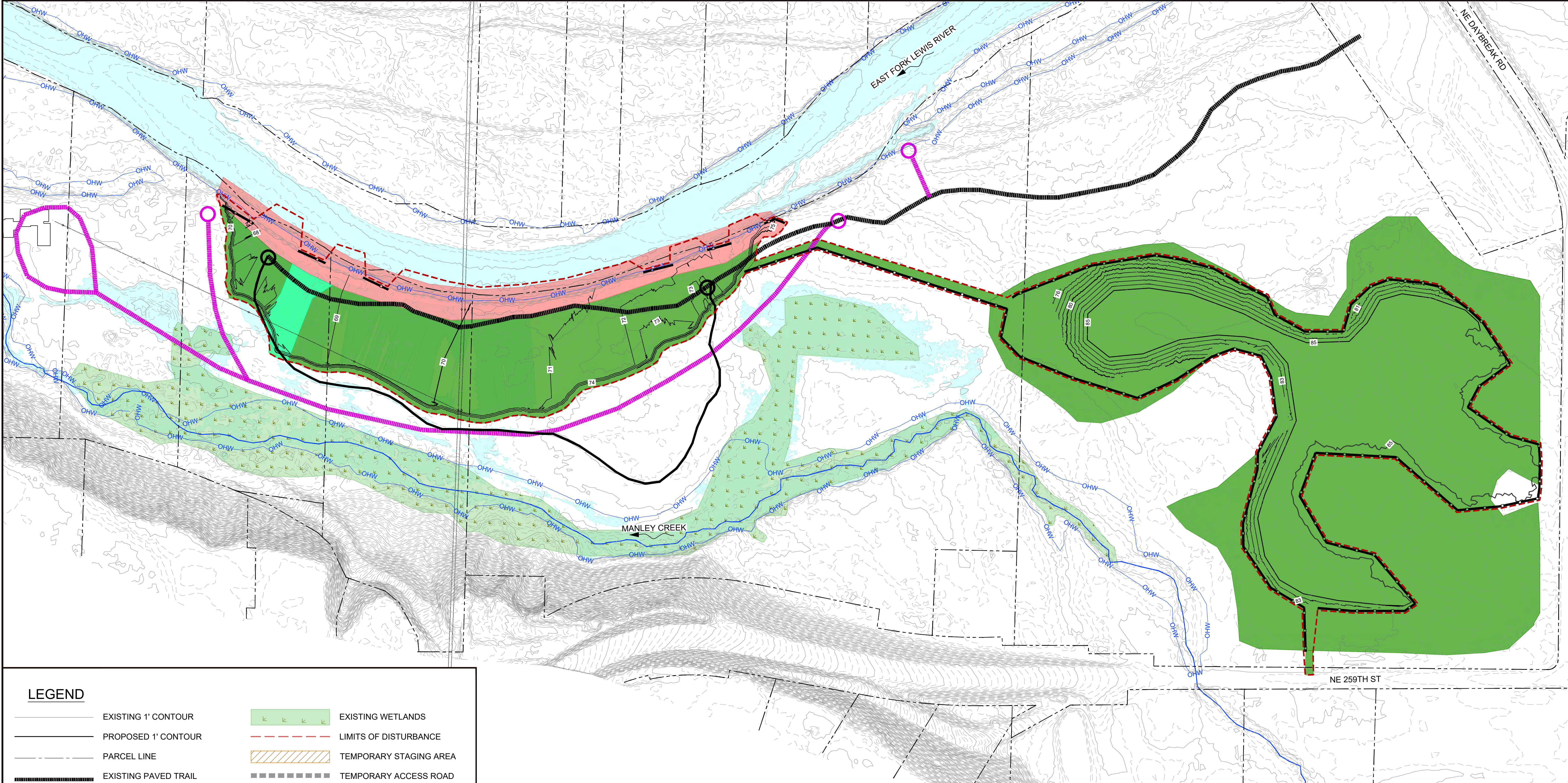
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REVEGETATION PLAN COUNTY
YARD

SHEET
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LEGEND

EXISTING 1' CONTOUR

PROPOSED 1' CONTOUR

PARCEL LINE

EXISTING PAVED TRAIL

SECONDARY GRAVEL TRAIL

TRAIL TO BE REMOVED

PROPOSED RELOCATED TRAIL

OVERLOOK AND RESTING AREAS

PROPOSED OVERLOOK AREA

ELECTRICAL LINES

EXISTING WETLANDS

LIMITS OF DISTURBANCE

TEMPORARY STAGING AREA

TEMPORARY ACCESS ROAD

RIPARIAN TRANSITION

WILLOW-SCRUB

EMERGENT MARSH

0

120

240

SCALE
IN FEET

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GENERAL PLANTING NOTES

1. PLANTING KEY AND GENERAL PLANTING NOTES APPLY TO ALL REVEGETATION SHEETS.
2. REFER TO PLANTING SCHEDULES ON SHEET X FOR PLANT MATERIAL SPECIES, SIZES, CONDITIONS, AND TYPICAL SPACING FOR EACH PLANTING ZONE.
3. IT IS ANTICIPATED THAT THE MAJORITY OF THE PLANTING WORK WILL BE IMPLEMENTED BY PROFESSIONAL REVEGETATION CONTRACTORS THOUGH COMMUNITY VOLUNTEERS AND STUDENT GROUPS WILL ALSO PLAY A ROLE. AT LEAST ONE EXPERIENCED PERSON FAMILIAR WITH THE MATERIALS AND BEST PLANTING PRACTICES WILL BE ON SITE AT ALL TIMES TO DIRECT THE SPECIFIC REVEGETATION WORK.

PLANT MATERIALS

ACQUISITION AND STORAGE OF PLANT MATERIALS INCLUDING BARE ROOT STOCK, CUTTINGS, WETLAND SEEDS AND PLUGS WILL BE DETERMINED BY THE ESTUARY PARTNERSHIP. PLANT MATERIAL SOURCES WILL LIKELY INCLUDE A COMBINATION OF NATIVE NURSERY PROCUREMENT CONTRACTS, PROJECT PARTNER COLLECTION AND/OR DONATIONS, AND REVEGETATION CONTRACTOR HARVESTED MATERIALS. BAREROOT STOCK, WETLAND SEED AND PLUGS SHALL BE GROWN FROM SEED COLLECTED FROM NATURALLY OCCURRING POPULATIONS AT ELEVATIONS BELOW 1,000 FEET WITHIN WILLAMETTE VALLEY ECOREGION UNLESS OTHERWISE SPECIFIED. LIVE CUTTING WILL BE SOURCED WITHIN NATURALLY OCCURRING POPULATIONS WITHIN 50 MILES OF THE PROJECT SITE.

STORAGE AND DELIVERY OF PLANT MATERIALS TO THE PROJECT SITE WILL BE NEGOTIATED IN CONTACTS WITH SOURCE SUPPLIERS AND REVEGETATION CONTRACTOR. A REEFER COOLER MAY BE UTILIZED TO STORE BAREROOT PLANTS ONSITE.

PLANT HANDLING

1. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL LOSS, DESTRUCTION OR DAMAGE TO PLANT MATERIAL THAT OCCURS FROM THE TIME CONTRACTOR TAKES POSSESSION OF THE PLANT MATERIAL UNTIL MATERIAL IS PLANTED.
2. CONTRACTOR SHALL PROTECT ALL PLANT MATERIAL FROM LOSS, DESTRUCTION OR DAMAGE OF ANY KIND, INCLUDING PHYSICAL INJURY, FREEZING, HEATING, DRYING OR RODENTS.
3. WETLAND SEED SHALL BE KEPT IN COOL, DRY LOCATION PRIOR TO SOWING.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR TRANSPORTING ALL PLANT MATERIALS WITHIN THE PROJECT SITE AND PLANTING ACCORDING TO SPECIFICATIONS.
5. CONTRACTOR SHALL KEEP WETLAND PLUGS WETTED DURING ONSITE STORAGE.
6. CONTRACTOR SHALL PROPERLY PROTECT ALL POLE CUTTINGS AND WILLOW CUTTINGS DURING STORAGE:
 - A. DURING ON-SITE STORAGE POLE/WILLOW CUTTINGS SHALL BE WETTED AND COVERED WITH A REFLECTIVE TARP TO MAINTAIN HIGH HUMIDITY WITHIN AND REFLECT SOLAR RADIATION. TARPS MUST BE WEIGHTED WITH SANDBAGS OR EQUIVALENT MEANS.
 - B. ANY POLES/WILLOWS THAT WILL NOT BE PLANTED WITHIN 72 HRS OF HARVEST SHALL BE SOAKED IN WATER FOR A MINIMUM OF 48 HOURS PRIOR TO PLANTING PREVENTING DRYING OF LIVE CUTTINGS IS PARAMOUNT TO PLANTING SUCCESS.
 - C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING APPROPRIATE MEANS FOR SOAKING LIVE CUTTINGS AS REQUIRED.
 - D. SOAKED CUTTINGS SHALL BE WEIGHTED WITH SANDBAGS TO MAINTAIN A SUBMERGED STATE.

GENERAL PLANT PLACEMENT

1. CONTRACTOR SHALL PLANT CUTTINGS OR BARE ROOT PLANTS AT VARIOUS PLANTING DENSITIES PER PLANS UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

2. PLANTS MAY BE PLANTED IN ROWS OR CLUSTER ARRANGEMENTS AS DIRECTED BY THE ENGINEER. WHEN PLANTING IN ROWS, GROUPINGS OF THE SAME SPECIES SHOULD BE PLANTED IN CONSECUTIVE ROWS TO RESEMBLE NATURAL PLANT DISTRIBUTIONS.
3. WHERE DISTURBED AREAS HAVE BEEN "RIPPED," CONTRACTOR SHALL PLANT ALL POLES/CUTTINGS OR BARE ROOT PLANTS WITHIN THE BASE OF THE RIPPED TRENCH.
4. THE PROJECT SITE WILL INCLUDE A VARIETY OF PLANTING ZONES BASED ON ELEVATION. THE ENGINEER SHALL SPECIFY WHERE CERTAIN PLANT SPECIES OR ASSOCIATIONS OF PLANT SPECIES ARE TO BE PLANTED WITHIN EACH PLANTING ZONE.
5. PLANT MATERIAL PLANTED IN INAPPROPRIATE PLACES SHALL BE SUBJECT TO REJECTION BY THE ENGINEER.
6. DUE TO VARIABLE SITE CONDITIONS, INAPPROPRIATE PLANTING LOCATIONS MAY BE ENCOUNTERED. INAPPROPRIATE PLANTING LOCATIONS MAY INCLUDE INSUFFICIENT SOIL DEPTH, BURIED LOGS, WOODCHIPS, 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.
7. CONTRACTOR SHALL PLANT THE PLANT MATERIAL IN THE NEAREST APPROPRIATE LOCATION.

PLANTING TASK SPECIFICATIONS

BAREROOT PLANTINGS

1. REFER TO PLANTING DETAILS ON SHEET X FOR SPECIFICATIONS.

WILLOW CUTTINGS

1. REFER TO PLANTING DETAILS ON SHEET X FOR SPECIFICATIONS.

LARGE COTTONWOOD POLES

1. REFER TO "LIVE STAKE" SCHEMATIC DETAIL GENERAL PLANTING ORIENTATION ON SHEET X.
2. POLE CUTTINGS SHALL BE A MINIMUM OF 7 FT IN LENGTH AND 1½ - 3 INCHES DIAMETER AT THE SMALL END.
3. PILOT HOLES SHALL BE AUGURED OR OTHERWISE HAND DUG PRIOR TO PLANTING.
4. CONTRACTOR SHALL INSERT POLE CUTTINGS INTO THE GROUND TO A MINIMUM DEPTH OF 24 INCHES.
5. POLE CUTTINGS SHALL BE PLANTED BOTTOM END DOWN.
6. CONTRACTOR SHALL TAMP THE SOIL OR BACKFILL IF NEEDED AROUND THE BASE OF EACH POLE AFTER PLANTING.
7. CONTRACTOR SHALL REMOVE AND REPLACE ANY CUTTINGS THAT ARE BROKEN, SKINNED DURING PLANTING, INSTALLED UPSIDE DOWN, AND/OR NOT INSTALLED TO THE PROPER DEPTH.

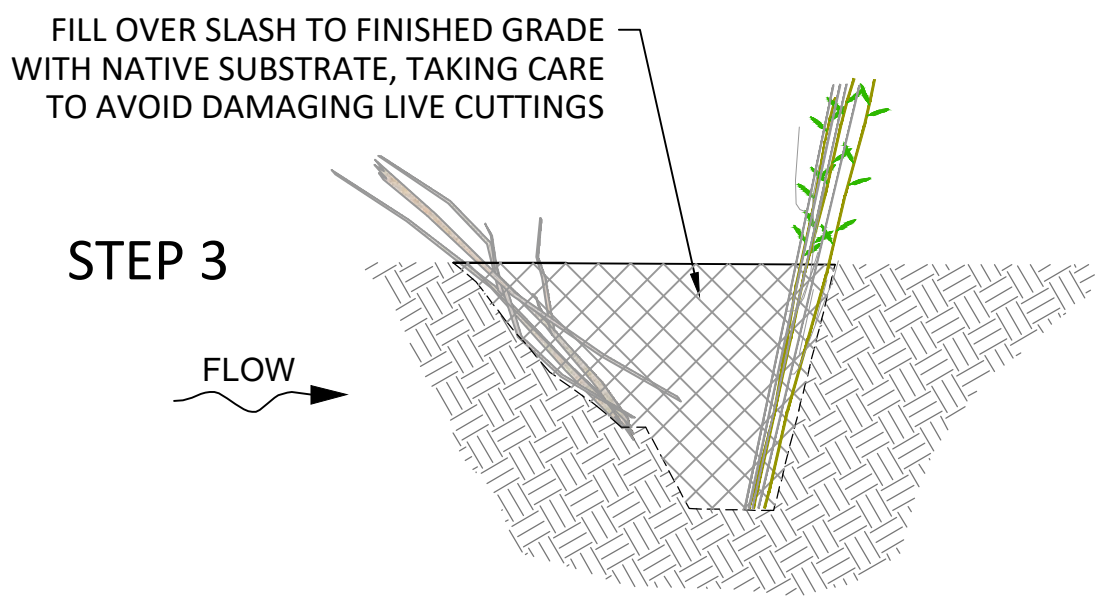
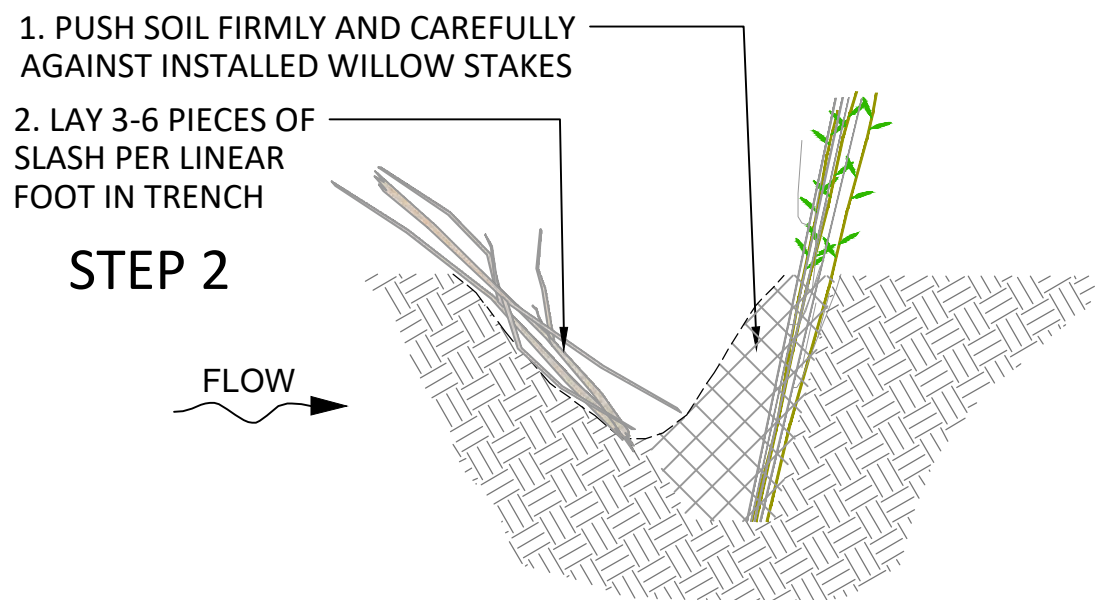
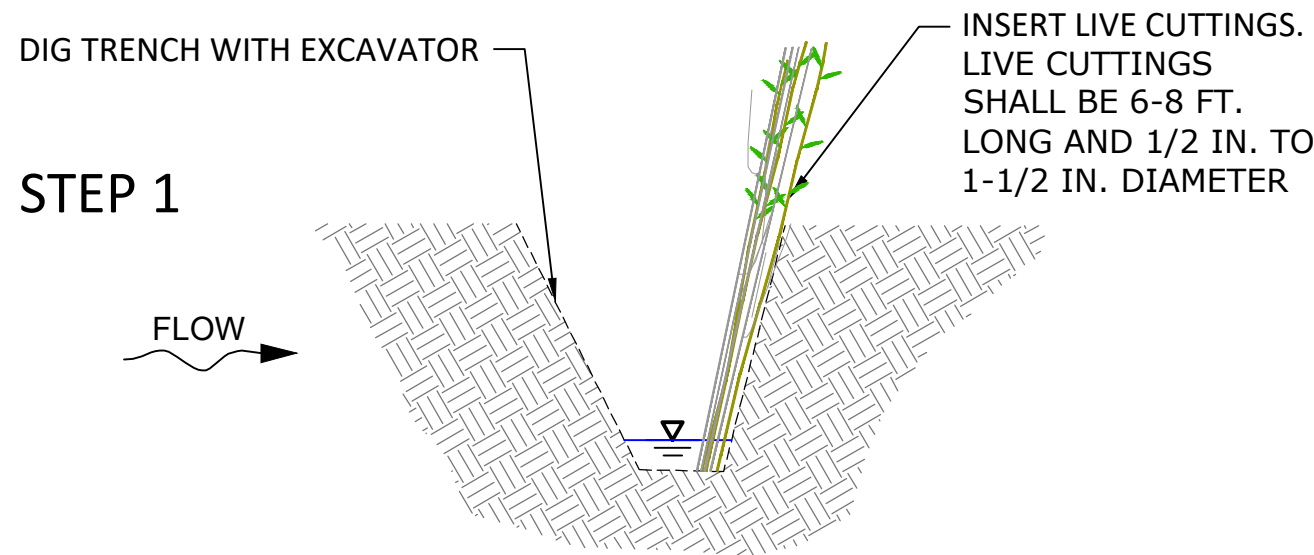
WETLAND PLUGS

1. REFER TO PLANTING DETAILS ON SHEET X FOR SPECIFICATIONS.
2. A SEPARATE MAP OF THE WETLANDS DESIGNATED FOR PLUG PLANTING WILL BE PROVIDED TO THE CONTRACTOR.
3. PREPARE INDIVIDUAL PLANTING SPOTS BY SCRAPING AWAY ALL LIVE AND DEAD VEGETATION, NON-NATIVE MATERIAL.
4. CONTRACTOR SHALL PLANT 25 PLUGS PER PLOT OF SAME SPECIES AT 18" OC.
5. PLOTS SHALL BE DISTRIBUTED EVENLY ACROSS THE WETLAND AT VARYING ELEVATIONS AND COVER APPROXIMATELY 10% OF THE GIVEN WETLAND SURFACE.

WETLAND SEEDING

1. A SEPARATE MAP OF THE WETLANDS DESIGNATED FOR SPECIALTY WETLAND SEEDING WILL BE PROVIDED TO THE CONTRACTOR.
2. SEED WILL BE MIXED AND DIVIDED UP FOR DISTRIBUTION INTO THE SELECTED WETLANDS AS DIRECTED BY ENGINEER.
3. CONTRACTOR WILL COMBINE APPROPRIATE AMOUNTS OF SEED MIX WITH NATIVE WETLAND CLAY SOIL IN BUCKETS OR AS DIRECTED BY ENGINEER TO A CONSISTENCY TO FORM "MUDBALLS".
4. CONTRACTOR WILL DISTRIBUTE SEED MUDBALLS (APPROX. SIZE OF GOLF BALL) BY EVENLY GRIDING THROUGH WETLAND AREAS AND SQUISHING SEED MUDBALLS INTO WETLAND BOTTOMS OR OTHER DIRECTED METHODS.

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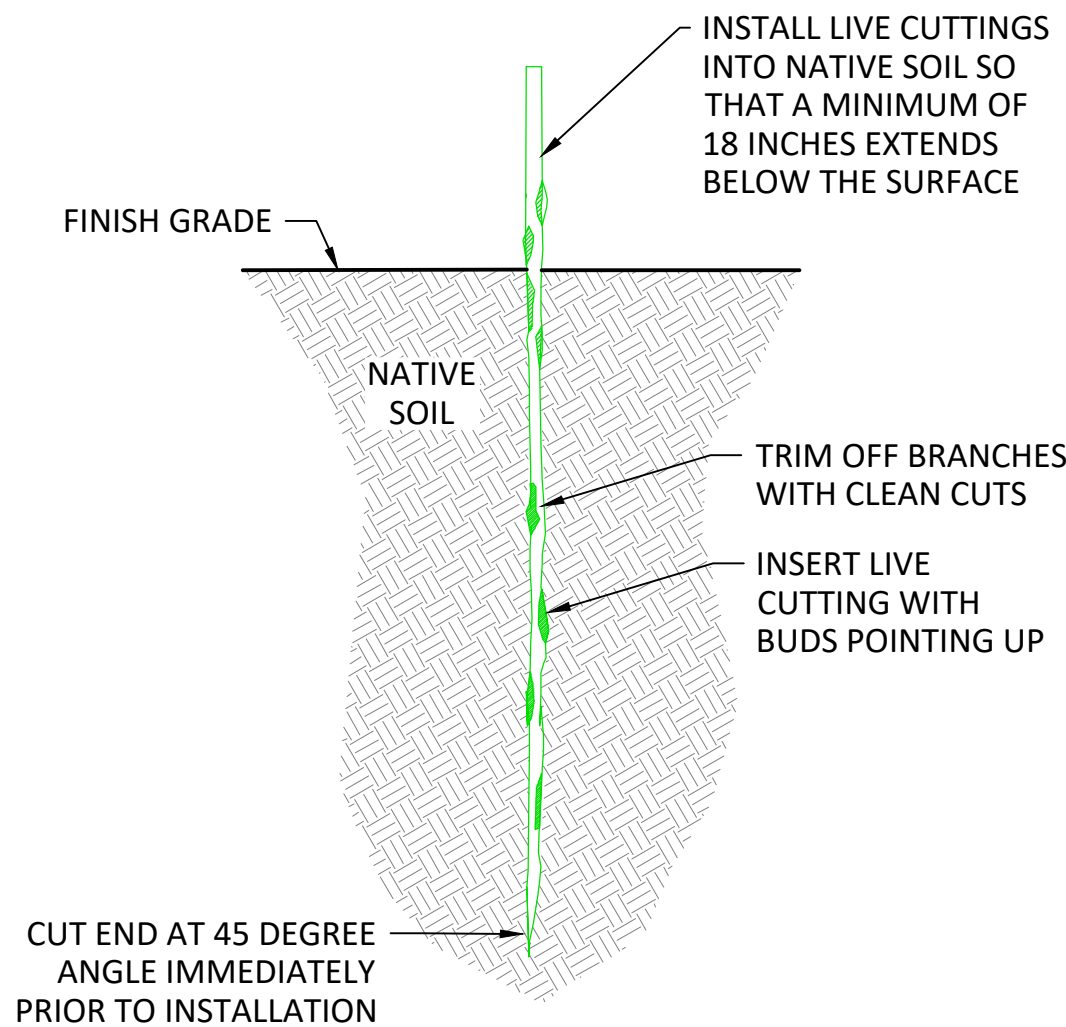


PURPOSE:

- PROVIDE ROUGHNESS ON THE FLOODPLAIN AND DISSIPATE ENERGY FROM OVERLAND FLOW
- SLASH PROVIDES FLOODPLAIN ROUGHNESS IN THE SHORT TERM AS LIVE CUTTINGS ESTABLISH

NOTES:

1. LIVE CUTTINGS SHALL BE HARVESTED FROM HEALTHY, VIGOROUS ONSITE WILLOW PLANTS, LIKELY SITKA OR PACIFIC WILLOW.
2. INSTALL LIVE CUTTINGS WITH CUT ENDS IN TOE OF TRENCH.
3. INSTALL 3 LIVE CUTTINGS AND 3-6 PIECES OF SLASH PER LINEAR FOOT OF TRENCH.



LIVE STAKE NOTES:

1. TYPICAL SPECIES TO BE SPECIFIED WILL BE PACIFIC WILLOW (SALIX LASIANDRA), SITKA WILLOW (S. SITCHENSIS) AND PIPERS WILLOW (S. PIPERI)
2. WILLOW CUTTINGS SHALL BE A MINIMUM OF 36 INCHES IN LENGTH AND A MINIMUM OF 1/2 INCH DIAMETER AT THE SMALL END
3. CONTRACTOR SHALL USE A DIBBLE BAR OR PREFERRED TOOL TO MAKE A PILOT HOLE PRIOR TO INSTALLATION
4. WILLOW CUTTINGS SHALL BE PLANTED BOTTOM (ANGLED CUT) END DOWN.
5. CONTRACTOR SHALL INSERT WILLOW CUTTINGS INTO THE PILOT HOLE TO A MINIMUM DEPTH OF 18 INCHES.
6. CONTRACTOR SHALL USE BEST PRACTICES TO INSTALL CUTTINGS WHILE MINIMIZING DAMAGE TO WOODY TISSUE. ANY BROKEN OR SHATTERED TOPS SHALL BE CLEANLY PRUNED OFF
7. CONTRACTOR SHALL TAMP THE SOIL AROUND THE BASE OF EACH WILLOW CUTTING FOLLOWING PLANTING TO REMOVE ANY AIR POCKETS.
8. CONTRACTOR SHALL REMOVE AND REPLACE ANY CUTTINGS THAT ARE BROKEN, SKINNED DURING PLANTING, INSTALLED UPSIDE DOWN, AND/OR NOT INSTALLED TO THE PROPER DEPTH

1
55 TYPICAL DETAIL - WILLOW TRENCH
NOT TO SCALE

NOTES:

1. WILLOW TRENCHES WILL BE INSTALLED WITHIN FLOODPLAINS THROUGHOUT THE PROJECT SITE AS SEEN ON THE PLANS SHEETS AND/OR DIRECTED BY ENGINEER.
2. WILLOW TRENCHES WILL PROVIDE FLOODPLAIN SURFACE ROUGHNESS AND DISSIPATE ENERGY IN LIEU OF PLACING LARGE WOOD.
3. WILLOW TRENCHES SHALL INCLUDE BOTH SLASH AND LIVE WILLOW STAKES.
4. IT IS ANTICIPATED THAT WILLOW CUTTINGS AND SLASH WILL BE AVAILABLE FROM ONSITE SOURCES AND WILL NOT NEED TO BE PURCHASED OR OBTAINED FROM OFFSITE.
5. WILLOW WILL BE HARVESTED AND STAGED AS DESCRIBED ON SHEET 43 (SEE "HARVEST WILLOW CUTTINGS FOR WILLOW TRENCHES").
6. WILLOW TRENCHES SHALL BE CONSTRUCTED AS FOLLOWS:
 - 6.1. DIG TRENCH APPROXIMATELY 2 FT DEPTH* X 2 FT WIDTH X 20 FT LENGTH - THE INTENT IS TO DIG TRENCHES TO A DEPTH AS REQUIRED TO EXPOSE SHALLOW GROUNDWATER.
 - 6.2. TRENCHES SHALL BE A MINIMUM OF 2 FT DEEP AND A MAXIMUM OF 4 FT IN DEPTH.
 - 6.3. STOCKPILE SOILS ON THE UPSTREAM SIDE OF THE TRENCH AS DIGGING PROCEEDS.
 - 6.4. PLACE A ROW OF WILLOW CUTTINGS ALONG THE "DOWNSTREAM" SIDE OF THE TRENCH, ANGLED SLIGHTLY DOWNSTREAM, WITH THE CUT BOTTOM END AT THE TOE OF THE TRENCH. INSTALL A MINIMUM OF THREE (3) CUTTINGS PER LINEAR FOOT (60 PER TRENCH).
 - 6.5. PLACE A SMALL AMOUNT OF FILL TO STABILIZE THE INSTALLED WILLOW CUTTINGS.
 - 6.6. INSTALL "SLASH" ALONG THE "UPSTREAM" SIDE OF THE TRENCH, ANGLED UPSTREAM, WITH BASE OF SLASH AT TOE OF TRENCH.
7. SLASH MAY BE AS FOLLOWS:
 - 7.1. ANY WOODY MATERIAL THAT IS DEAD OR ALIVE.
 - 7.2. A MINIMUM DIAMETER OF 2" AT THE SMALL END AND AT LEAST 6 FEET IN LENGTH.
 - 7.3. SLASH IS INTENDED TO CAPTURE DEBRIS DURING HIGH FLOWS AND PROTECT LIVE WILLOW CUTTINGS.
 - 7.4. PLACE MINIMUM OF 50 PIECES OF SLASH PER 20 FOOT LENGTH OF WILLOW TRENCH.
 - 7.5. BACKFILL THE WILLOW TRENCH TAKING CARE NOT TO DAMAGE LIVE WILLOW CUTTING, TAMP BACKFILL LIGHTLY TO ELIMINATE AIR POCKETS AND SET THE SLASH IN PLACE.

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52 TYPICAL DETAIL - LIVE STAKE
NOT TO SCALE

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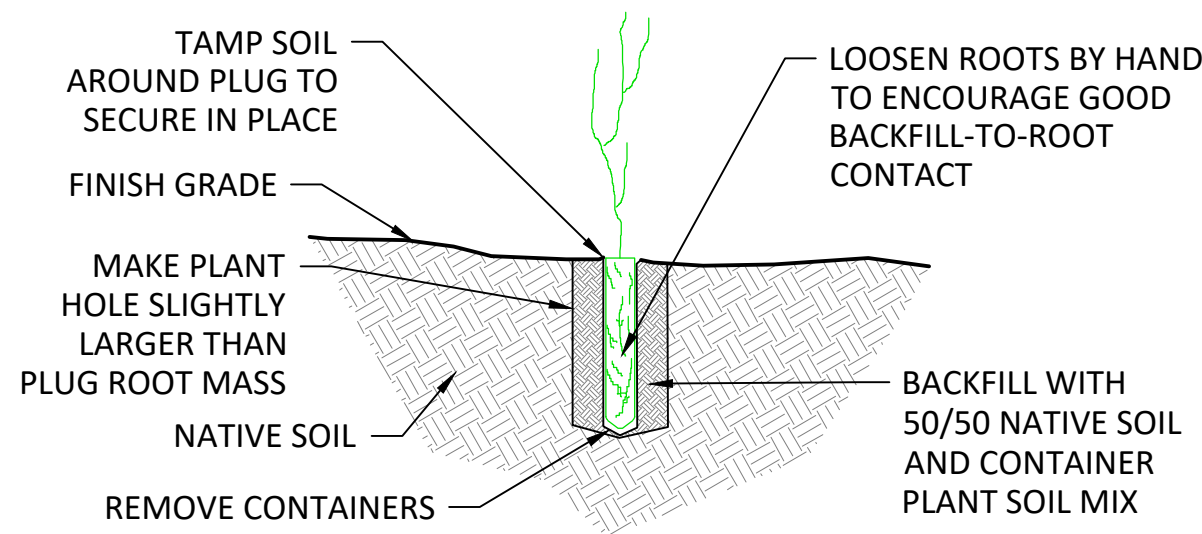
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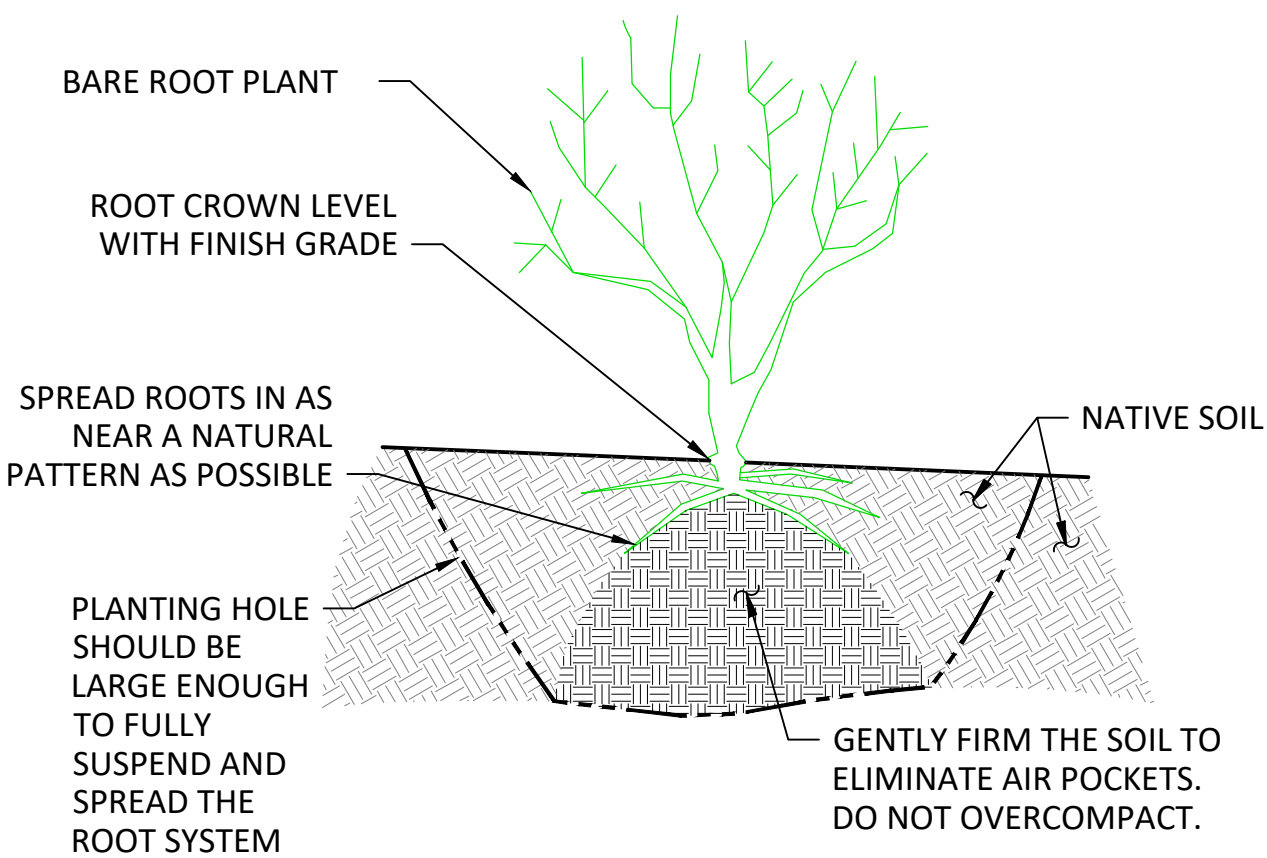
REVEGETATION DETAILS (1 OF 2)

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1
53 TYPICAL DETAIL - PLUG/ TUBELING
NOT TO SCALE

- PLUG/TUBELING NOTES:**
1. CONTRACTOR SHALL KEEP WETLAND HERBACEOUS PLUGS MOIST AND IN THEIR CONTAINERS UNTIL INSTALLATION
 2. WHEN INSTALLING WETLAND HERBACEOUS PLUGS OVER LARGE AREAS, BEGIN WORK AT LOWER ELEVATIONS AND WORK OUT TO HIGHER ELEVATIONS. TAKE CARE NOT TO OVER-COMPACT SOILS
 3. MAKE PLUG PLANTING HOLE WITH DIBBLE BAR, BARE-ROOT SHOVEL OR PICK OF DIAMETER SLIGHTLY LARGER THAN PLUG ROOT MASS
 4. INSTALL WETLAND HERBACEOUS PLUG INTO SOIL AND FOLLOW SPECIFIED PLANTING PLOT QUANTITIES AND SPACING
 5. TAMP SOIL LIGHTLY AROUND PLUG TO ENSURE IT WILL REMAIN SECURE IN SOIL
 6. CONTRACTOR MAY BE REQUIRED TO STAPLE OR ANCHOR BIO-MATTING MATERIAL OVER PLUGS PLOTS TO ENSURE PLUGS REMAIN SECURE IN SOIL



2
53 TYPICAL DETAIL - BARE ROOT PLANT
NOT TO SCALE

- BARE ROOT NOTES:**
1. CONTRACTOR SHALL BE REQUIRED TO PLANT ONE-YEAR OLD AND/OR TWO-YEAR OLD BARE ROOT PLANTS
 2. THESE PLANTS WILL RANGE IN SIZE FROM TWELVE (12) INCHES TO TWENTY-FOUR (24) INCHES HEIGHT ABOVE THE ROOT CROWN
 3. CONTRACTOR SHALL NOT CULL PLANT MATERIAL OR PRUNE ROOTS OR STEMS UNLESS DIRECTED BY THE ENGINEER
 4. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING PLANT ROOTS SYSTEMS IN A WET STATE ONCE THEY HAVE POSSESSION OF THE PLANTS AND SHALL DIP THE ENTIRE ROOT SYSTEM OF ALL PLANTS IN WATER UPON REMOVING FROM THE NURSERY BAG PRIOR TO INSTALLATION
 5. CONTRACTOR SHALL PREPARE A PLANTING HOLE THAT IS WIDE AND DEEP ENOUGH TO FULLY SUSPEND THE ROOTS OF THE PLANT MATERIAL SUCH THAT THEY ARE IN A "NEAR NATURAL" ARRANGEMENT
 6. PLANTS SHALL BE INSTALLED SO THAT THE ROOT COLLAR IS AT THE SAME DEPTH THAT IT WAS IN THE NURSERY
 7. THE PLANTING HOLE SHALL BE GENTLY BACKFILLED TO ELIMINATE ANY AIR POCKETS AND SOIL SURROUNDING EACH PLANT SHALL BE LEVELED
 8. PLANTING WORK MAY BE SUSPENDED IF ENGINEER DETERMINES THAT WEATHER CONDITIONS COULD DAMAGE PLANT MATERIAL OR IF CONTRACTOR IS NOT HANDLING PLANTS IN ACCORDANCE WITH PLANTING PLANS

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CM, JR, NS	MR, GJ	----
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----	11/17/2023	----
APPROVED	DATE	PROJECT

LOWER COLUMBIA ESTUARY PARTNERSHIP
EAST FORK LEWIS RIVER
RECONNECTION PROJECT



501 Portway Avenue, Suite 101
Hood River, OR 97031
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REVEGETATION DETAILS (2 OF 2)

SHEET
56 OF 57

PLANT MIXES

Zone 1: Emergent Marsh (17 Acres)								
latin	common	Indicator Status	Form	Stock	Size	Spacing (ft oc)	total plugs/ acre	Total plants
<i>Carex obnupta</i>	slough sedge	OBL	herb	plug	10 in ³ plug	Plots of 25 at 1.5ft OC.	300	5100
<i>Carex stipata</i>	Awl fruited sedge	OBL	herb	plug	10 in ³ plug	Plots distributed across wetlands @	250	4250
<i>Eleocharis palustris</i>	Common Spike-Rush	OBL	herb	plug	10 in ³ plug		250	4250
<i>Sagittaria latifolia</i>	Wapato	OBL	herb	tuber	tuber		200	3400
<i>Schoenoplectus acutus</i>	hardstem bulrush	OBL	herb	plug	10 in ³ plug		250	4250
<i>Schoenoplectus tabernaemon</i>	Soft stem Bulrush	OBL	herb	plug	10 in ³ plug	2000 plug per acre	250	4250
<i>Scirpus microcarpus</i>	small-fruited bullrush	OBL	herb	plug	10 in ³ plug		300	5100
<i>Sparganium emersum</i>	Narrow leaved burreed	OBL	herb	plug	10 in ³ plug		200	3400
							2000	34000

Zone 2: Willow-Scrub (30 Acres)								
latin	common	Indicator Status	Form	Stock	Size	Spacing (ft oc)	Qty/ac	Total plants
<i>Comus sericea</i>	Redosier dogwood	FACW	Shrub	bare root	12" - 18"	4	500	15000
<i>Fraxinus latifolia</i>	Oregon ash	FACW	Tree	bare root	12" - 18"	12	50	1500
<i>Physocarpus capitatus</i>	Pacific ninebark	FAC	Shrub	bare root	12" - 18"	4	75	2250
<i>Populus trichocarpa</i>	Black cottonwood	FAC	Tree	pole	7'-10'	12	250	7500
<i>Rosa pisocarpa</i>	Swamp rose	FAC	Shrub	bare root	12" - 18"	4	375	11250
<i>Salix lasiandra</i>	Pacific willow	FACW+	Shrub	cutting	0.5" min dia, 3 ft long	4	250	7500
<i>Salix piperi</i>	Inland hooker's willow	FACW	Shrub	cutting	0.5" min dia, 3 ft long	4	250	7500
<i>Salix sitchensis</i>	Sitka willow	FACW	Shrub	cutting	0.5" min dia, 3 ft long	4	250	7500
<i>Spiraea douglasii</i>	Spiraea	FACW	Shrub	bare root	12" - 18"	4	500	15000
							2500	75000

Zone 3: Riparian Transition (53 Acres)								
latin	common	Indicator Status	Form	Stock	Size	Spacing (ft oc)	Qty/ac	Total plants
<i>Acer macrophyllum</i>	Bigleaf maple	FACU	Tree	bare root	12" - 18"	9	50	2650
<i>Alnus rubra</i>	Red alder	FAC	Tree	bare root	12" - 18"	9	125	6625
<i>Calocedrus decurrens</i>	Incense cedar	FACU	Tree	bare root	12" - 18"	9	50	2650
<i>Comus sericea</i>	Redosier dogwood	FACW	Shrub	bare root	12" - 18"	5	125	6625
<i>Lonicera involucrata</i>	Black twinberry	FACW-	Shrub	bare root	12" - 18"	5	75	3975
<i>Mahonia aquifolium</i>	Tall oregon grape	FACU	Shrub	bare root	12" - 18"	5	125	6625
<i>Oemleria cerasiformis</i>	Indian plum	FACU	Shrub	bare root	12" - 18"	5	75	3975
<i>Philadelphus lewisii</i>	Mock orange	UPL	Shrub	bare root	12" - 18"	5	50	2650
<i>Physocarpus capitatus</i>	Pacific ninebark	FAC	Shrub	bare root	12" - 18"	5	275	14575
<i>Pinus ponderosa</i>	Willamette ponderosa pine	FACU-	Tree	bare root	12" - 18"	9	75	3975
<i>Populus trichocarpa</i>	Black cottonwood	FAC	Tree	bare root	12" - 18"	9	100	5300
<i>Populus trichocarpa</i>	Black cottonwood	FAC	Tree	pole	7' - 10'	9	100	5300
<i>Pseudotsuga menziesii</i>	Douglas fir	FACU	Tree	bare root	12" - 18"	9	75	3975
<i>Rosa nutkana</i>	Nootka rose	FAC	Shrub	bare root	12" - 18"	5	150	7950
<i>Rubus spectabilis</i>	Salmonberry	FAC+	Shrub	bare root	12" - 18"	5	75	3975
<i>Salix scouleriana</i>	Scoulers willow	FAC	Shrub	cutting	0.5" min dia, 3 ft long	5	125	6625
<i>Salix sitchensis</i>	Sitka willow	FACW	Shrub	cutting	0.5" min dia, 3 ft long	5	250	13250
<i>Sambucus racemosa</i>	Red elderberry	FACU	Shrub	bare root	12" - 18"	5	75	3975
<i>Spiraea douglasii</i>	Spiraea	FACW	Shrub	bare root	12" - 18"	5	250	13250
<i>Symphoricarpos alba</i>	Snowberry	FACU	Shrub	bare root	12" - 18"	5	250	13250
<i>Thuja plicata</i>	Western red cedar	FAC	Tree	bare root	12" - 18"	9	25	1325
							2500	132500

HYDROSEED MIXES

Zone 1: Emergent Marsh (17 acres)						
latin	common	Indicator Status	Form	Stock	Pounds Pure Live Seed (PLS)/ac	Total Pounds
<i>Schoenoplectus tabernaemon</i>	Soft stem Bulrush	OBL	herb	seed	0.5	8.5
<i>Schoenoplectus acutus</i>	hardstem bulrush	OBL	herb	seed	0.5	8.5
<i>Sparganium emersum</i>	Narrow leaved burreed	OBL	herb	seed	0.5	8.5
<i>Sparganium eurycarpum</i>	Giant burreed	OBL	herb	seed	0.5	8.5
<i>Carex stipata</i>	Awl fruited sedge	OBL	herb	seed	0.25	4.25
<i>Sagittaria latifolia</i>	Wapato	OBL	herb	seed	1	17
<i>Eleocharis palustris</i>	Common Spike-Rush	OBL	herb	seed	0.5	8.5
<i>Scirpus microcarpus</i>	small-fruited bulrush	OBL	herb	seed	0.25	4.25
				total	4	68

Zone 2: Willow Scrub (30 acres)						
latin	common	Indicator Status	Form	Stock	Pounds Pure Live Seed (PLS)/ac	Total Pounds
<i>Agrostis exarata</i>	spike bentgrass	FACW	grass	seed	5	150
<i>Alopecurus aequalis</i>	shortawn foxtail	FACW	grass	seed	4	120
<i>Beckmannia syzigachne</i>	American sloughgrass	OBL	grass	seed	3	90
<i>Carex obnupta</i>	slough sedge	OBL	herb	seed	1	30
<i>Deschampsia cespitosa</i>	tufted hairgrass	FACW	grass	seed	5	150
<i>Glyceria occidentalis</i>	Western mannagrass	OBL	grass	seed	2	60
<i>Hordeum brachyantherum</i>	meadow barley	FACW	grass	seed	10	300
<i>Triticum aestivum</i> x <i>Elymus trachycaulus</i>	Regreen Hybrid Wheatgrass	FAC	grass	seed	30	900
					60	1800

Zone 3: Riparian Transition (59 acres)						
latin	common	Indicator Status	Form	Stock	Pounds Pure Live Seed (PLS)/ac	Total Pounds
<i>Achillea millefolium</i>	yarrow	FACU	herb	seed	1	177
<i>Agrostis exarata</i>	spike bentgrass	FACW	grass	seed	3	413
<i>Bromus carinatus</i>	California brome	FACU	grass	seed	7	177
<i>Deschampsia cespitosa</i>	tufted hairgrass	FACW	grass	seed	3	177
<i>Deschampsia elongata</i>	slender hairgrass	FACW	grass	seed	3	413
<i>Elymus glaucus</i>	blue wild rye	FACU	grass	seed	7	295
<i>Hordeum brachyantherum</i>	meadow barley	FACW	grass	seed	5	59
<i>Lupinus rivularis</i>	streamside lupine	FAC	herb	seed	1	1770
<i>Triticum aestivum</i> x <i>Elymus trachycaulus</i>	Regreen Hybrid Wheatgrass	FAC	grass	seed	30	3540
					60	7021

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