



COLVILLE CONFEDERATED TRIBES
ANTOINE CREEK
ENHANCEMENT PROJECT
OKANOGAN COUNTY, WA

PLAN & PROFILE
STA 16+00 - 47+00

REVISION NUMBER

No.	Date	Revision

Date 3/11/2024	Designed By SR
Drawn By HC	Checked By SR

SCALE
0 1"

JOB NO.
20220046

SHEET NO.
C2.18

26 OF 36



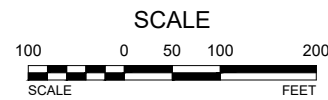
HELICOPTER OR MACHINE PLACED
WOOD, TYP. SEE SHY C4.3

ANTOINE CREEK

SHEET C2.17

PROPOSED SITE PLAN: STA 16+00 - 47+00

SCALE: 1"=100'



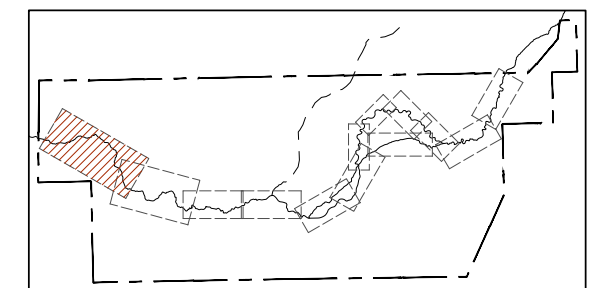
ANTOINE CREEK - DOWNSTREAM CANYON WOOD PLACEMENT				
STA	TREES / CLUSTER	CLUSTER	TOTAL TREES	NOTES
15+50 - 25+00	10	5	50	
25+00 - 35+00	10	9	90	
35+00 - 45+00	10	10	100	
45+00 - 47+00	2	6	12	
TOTAL	32	30	252	

NOTES:

- RESTORATION TREATMENTS PROPOSED FROM STA 10+00 TO STA 76+00 AND DEPICTED ON SHEETS C2.14 AND C2.15 WILL BE IMPLEMENTED AS PART OF A FUTURE PROJECT PHASE

LEGEND

- 2' --- EXISTING 2' CONTOUR LINES
- 10' --- EXISTING 10' CONTOUR LINES
- TAX LOTS
- PROJECT OWNERSHIP BOUNDARY
- ROAD CENTERLINE
- WET WETLANDS
- OHW
- HELICOPTER PLACED LARGE WOOD



LOCATION MAP



WOLF WATER RESOURCES, INC.
1001 SE WATER AVE. SUITE #180
PORTLAND, OR 97214
503.207.6688

COLVILLE CONFEDERATED TRIBES
P.O. BOX 150
NESPELEM, WA 99155
509.634.2277

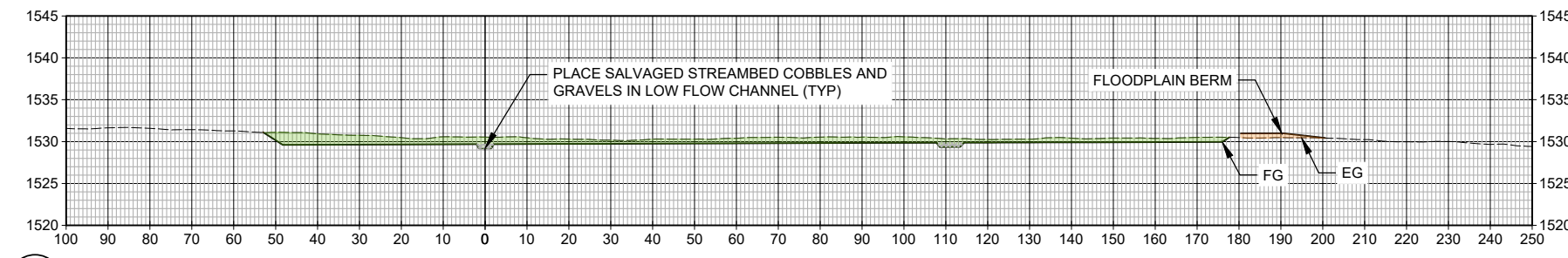
COLVILLE CONFEDERATED TRIBES
**ANTOINE CREEK
ENHANCEMENT PROJECT**
OKANOGAN COUNTY, WA

SECTIONS 2

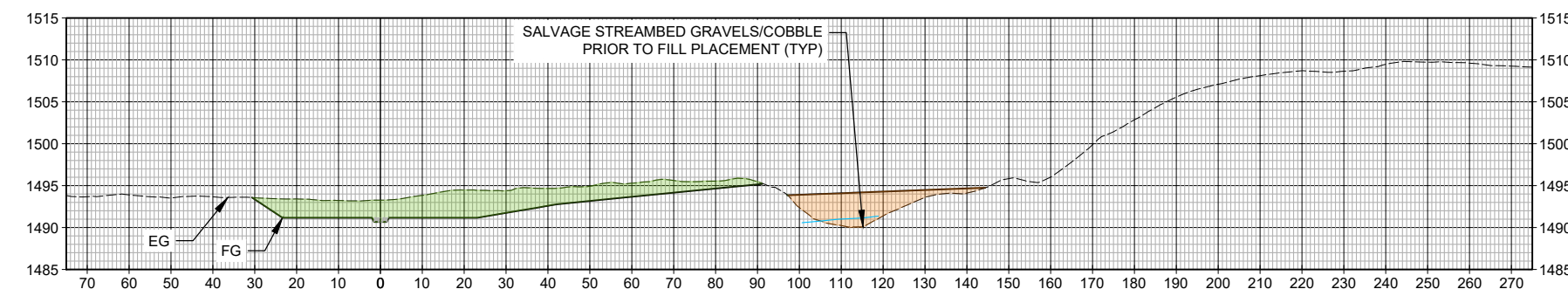
REVISION NUMBER	
No.	Date

Date: 3/11/2024
Designed By: SR, LE
Drawn By: AM, HC
Checked By: SR

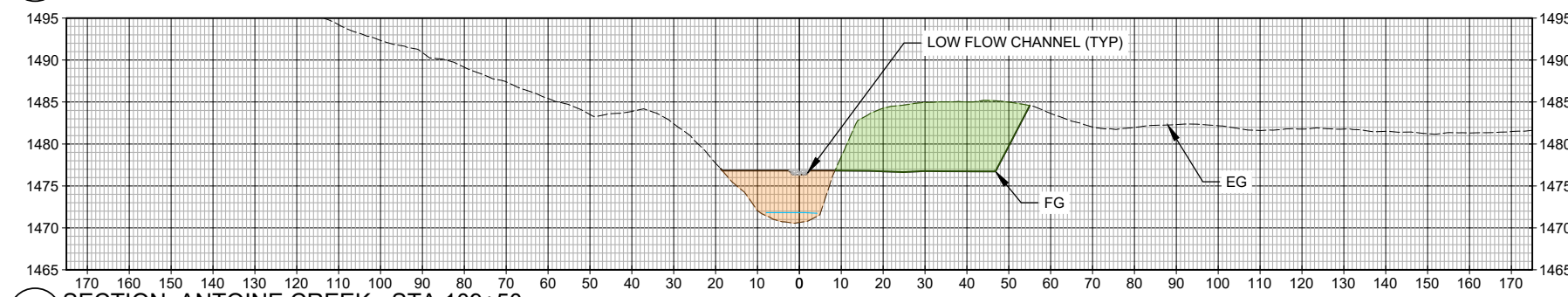
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JOB NO.: 20220046
SHEET NO.: C3.2
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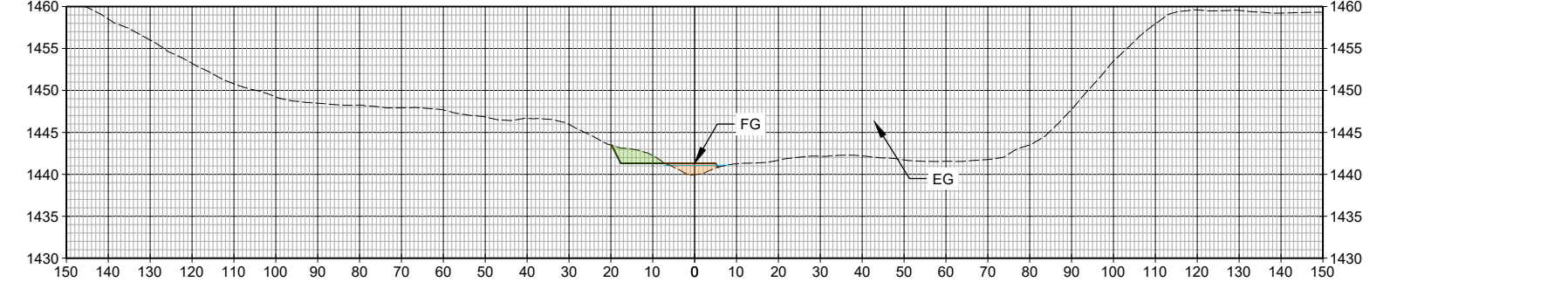
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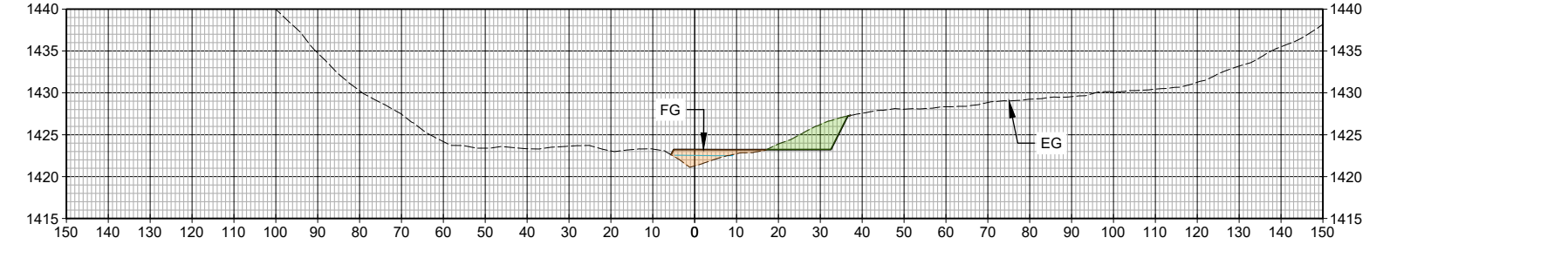
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SCALE: 1" = 20'



H SECTION: ANTOINE CREEK - STA 109+50
SCALE: 1" = 20'



I SECTION: ANTOINE CREEK - STA 91+50
SCALE: 1" = 20'



J SECTION: ANTOINE CREEK - STA 81+00
SCALE: 1" = 20'

LEGEND

- FILL
- CUT

NOTES:

1. SECTIONS ARE LOOKING DOWNSTREAM.
2. ELEVATIONS ARE IN FEET RELATIVE TO NAVD88.

DWG: Z:\Shared\W2\CAD\20220046-Antoine Creek\DWGS\SHEETS\AC - SECTIONS.dwg USER: hcllegg
DATE: Mar 11, 2024 3:41pm XREFS: X-TB-W2-22x34 AC-XR-BASEMAP WBLOCK AC-XR-DESIGN AC-XR-WHS



COLVILLE CONFEDERATED TRIBES
ANTOINE CREEK
ENHANCEMENT PROJECT
OKANOGAN COUNTY, WA

WHS DETAILS 1

REVISION NUMBER

No.	Date	Revision

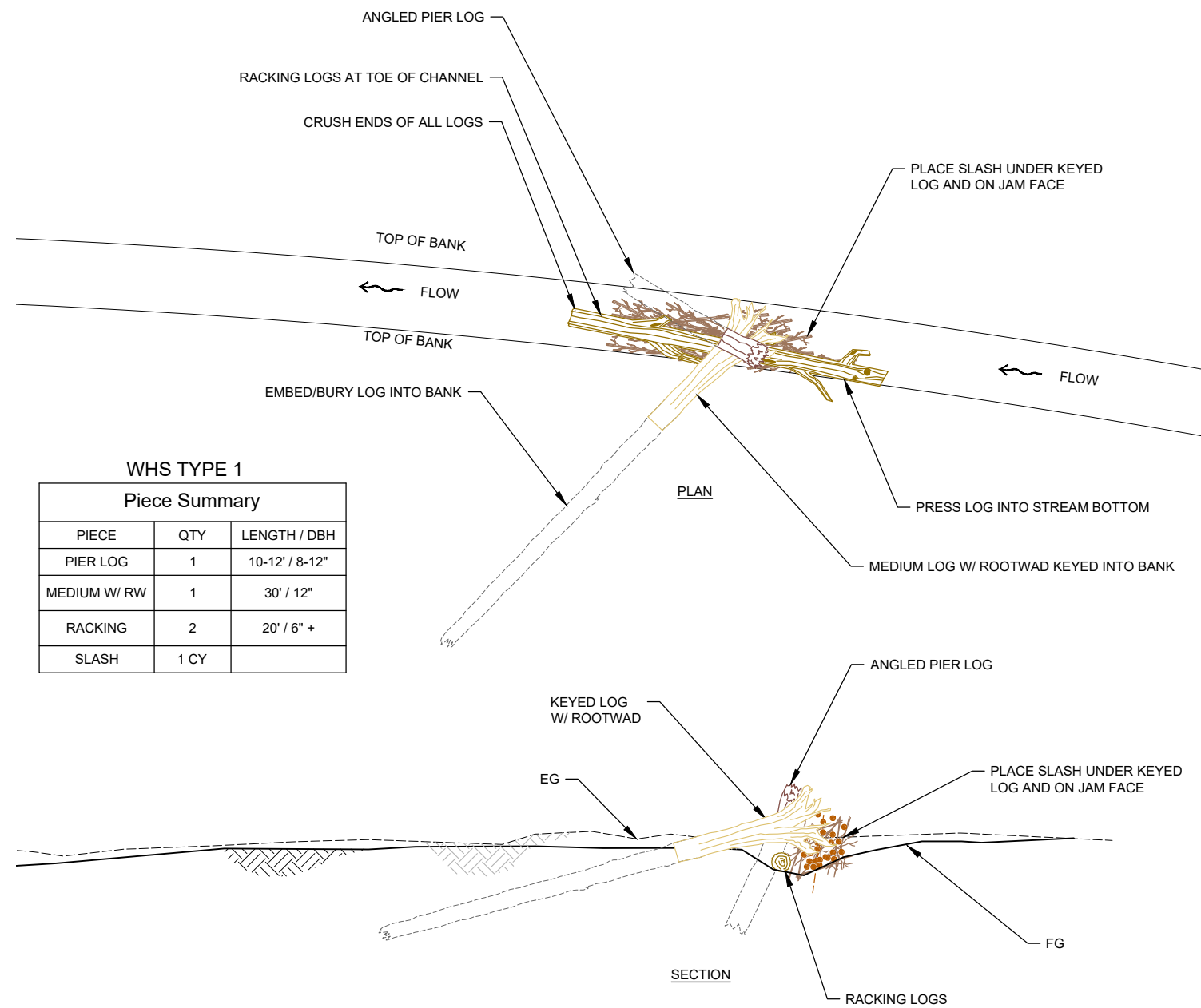
Date: 3/11/2024
Designed By: SR, LE
Drawn By: HC
Checked By: SR

SCALE
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JOB NO. 20220046

SHEET NO. C4.1

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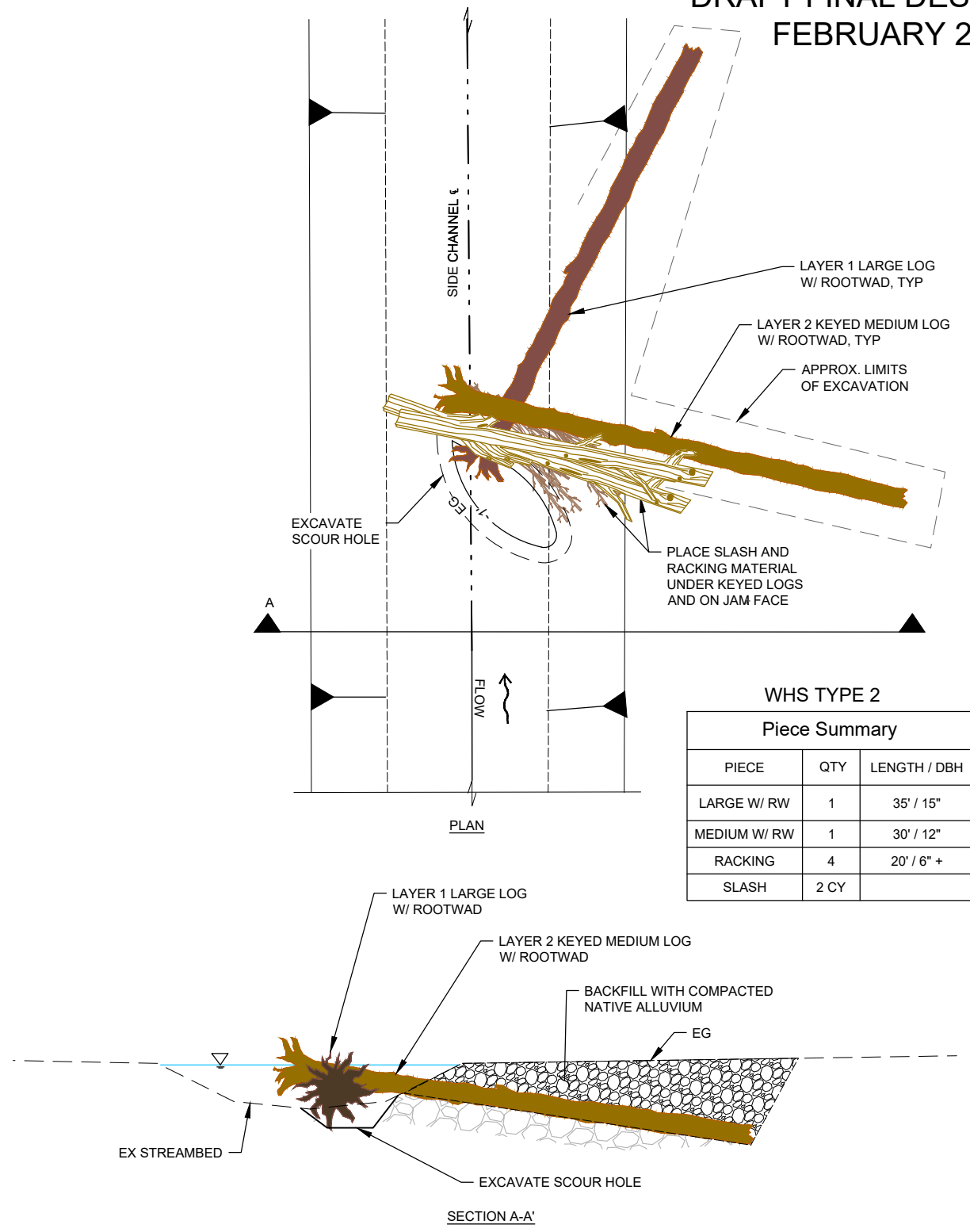


WHS TYPE 1
Piece Summary

PIECE	QTY	LENGTH / DBH
PIER LOG	1	10-12' / 8-12"
MEDIUM W/ RW	1	30' / 12"
RACKING	2	20' / 6" +
SLASH	1 CY	

1 WHS TYPE 1 - SINGLE LOG SC JAM
NOT TO SCALE

- LOG INSTALLATION NOTES:**
- NATIVE STREAMBED BACKFILL SHALL BE PLACED IN 12" LIFTS AND COMPACTED TO FIRM UNYIELDING CONDITION.
 - CONTRACTOR TO COORDINATE LOG PLACEMENT WITH ENGINEER PRIOR TO CONSTRUCTION. ENGINEER SHALL APPROVE PLACEMENT BEFORE COMPLETION.
 - WHERE POSSIBLE, LOGS PROTRUDING FROM BANK SHALL BE PLACED CANTILEVERED BETWEEN EXISTING LIVE TREES. THE SUPPORTING TREE NEAREST TO THE BANK SHALL BE ON THE DOWNSTREAM SIDE OF THE LOGS.
 - EMBEDDED LOGS SHALL BE INSTALLED BY EXCAVATING A TRENCH, PLACING THE LOG, BACKFILLING, AND MACHINE COMPACTING BACKFILL PER SPECIFICATIONS. WHERE EXCAVATION IS NOT POSSIBLE LOG ENDS SHALL BE TIED INTO NATIVE MATERIAL AND BURIED WITH NATIVE MATERIAL PER SPECIFICATIONS.
 - SALVAGE ADJACENT BOULDERS FOR USE IN STRUCTURE.
 - FOR BURIED KEYED LOGS EMBED A MINIMUM OF 2/3 THE TOTAL LENGTH OF THE LOG. MIN 6' COVER AT STEM TIP (MEASURED FROM EG).
 - EMBED ROOTWAD AS NEEDED TO ACHIEVE REQUIRED BURIAL DEPTH AND ALLOW FOR FULL CONTACT BETWEEN THE BOTTOM OF THE LOG AND THE BOTTOM OF THE CHANNEL. BACKFILL AROUND ROOTWAD WITH NATIVE STREAMBED MATERIAL.
 - SEE SPECIFICATIONS FOR TREE SPECIES. KEYED LOG DIAMETER MEASURED AT BREAST HEIGHT (DBH) AND LENGTH AS SHOWN ON PLANS.
 - CRUSH ALL EXPOSED SAW-CUT FACES.

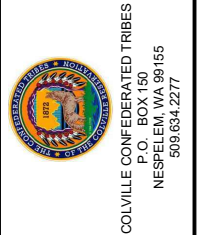


WHS TYPE 2
Piece Summary

PIECE	QTY	LENGTH / DBH
LARGE W/ RW	1	35' / 15"
MEDIUM W/ RW	1	30' / 12"
RACKING	4	20' / 6" +
SLASH	2 CY	

2 WHS TYPE 2 - 2 - LOG SC JAM
NOT TO SCALE

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COLVILLE CONFEDERATED TRIBES
ANTONE CREEK
ENHANCEMENT PROJECT
OKANOGAN COUNTY, WA

WHS DETAILS 2

REVISION NUMBER

No.	Date	Revision

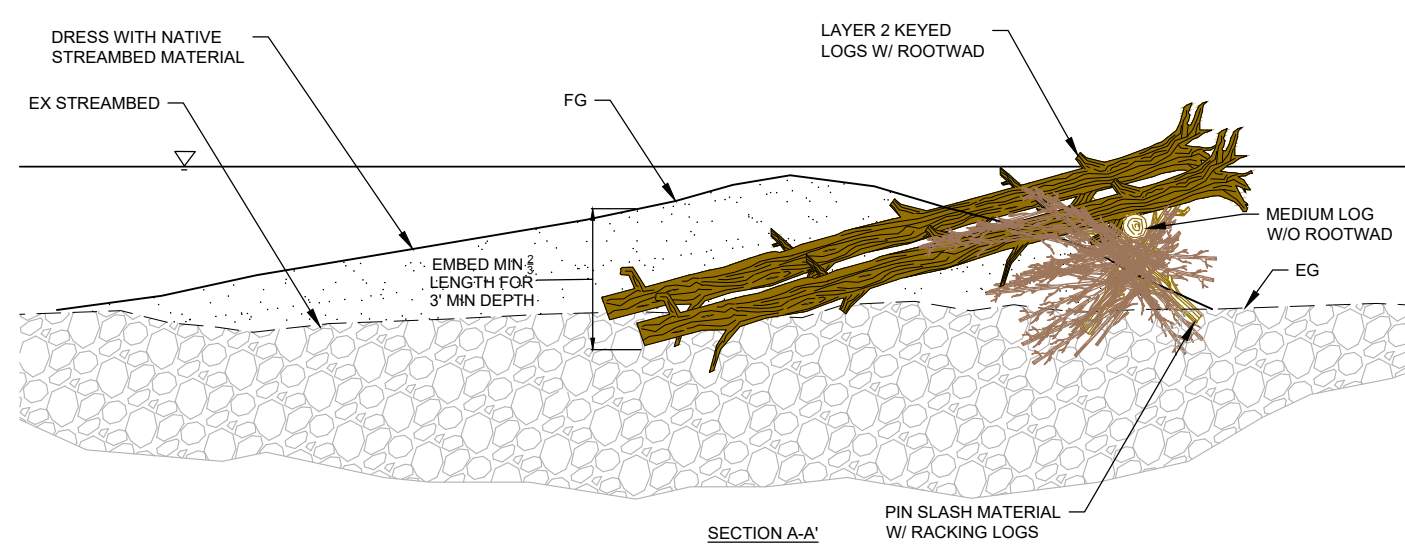
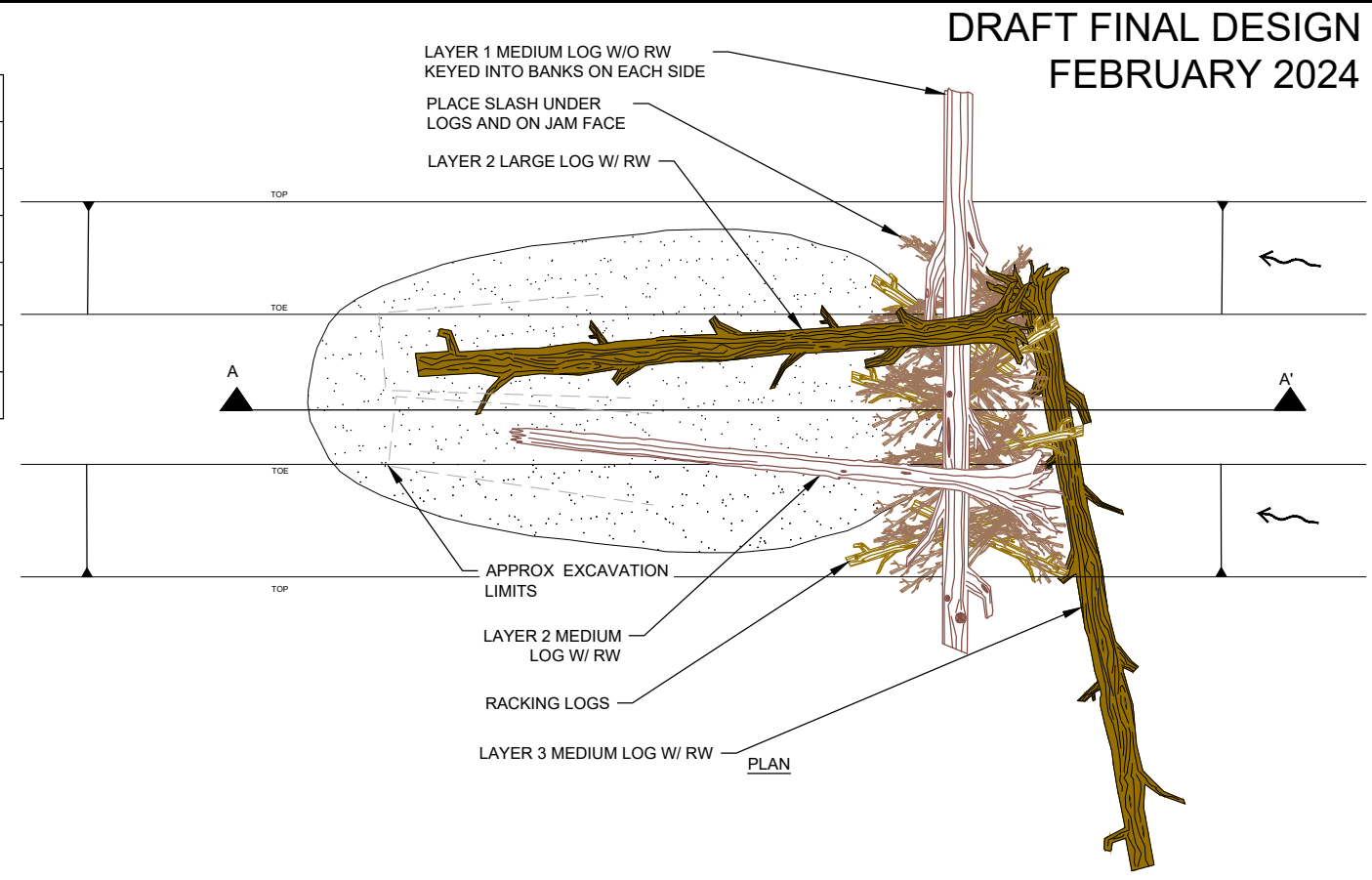
Date: 3/11/2024
Designed By: SR, LE
Drawn By: HC
Checked By: SR



JOB NO. 20220046

SHEET NO. C4.2

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2 WHS TYPE 4 - 4 LOG SC JAM
NOT TO SCALE

LOG INSTALLATION NOTES:

1. NATIVE STREAMBED BACKFILL SHALL BE PLACED IN 12" LIFTS AND COMPACTED TO FIRM UNYIELDING CONDITION.
2. CONTRACTOR TO COORDINATE LOG PLACEMENT WITH ENGINEER PRIOR TO CONSTRUCTION. ENGINEER SHALL APPROVE PLACEMENT BEFORE COMPLETION.
3. WHERE POSSIBLE, LOGS PROTRUDING FROM BANK SHALL BE PLACED CANTILEVERED BETWEEN EXISTING LIVE TREES. THE SUPPORTING TREE NEAREST TO THE BANK SHALL BE ON THE DOWNSTREAM SIDE OF THE LOGS.
4. EMBEDDED LOGS SHALL BE INSTALLED BY EXCAVATING A TRENCH, PLACING THE LOG, BACKFILLING, AND MACHINE COMPACTING BACKFILL PER SPECIFICATIONS. WHERE EXCAVATION IS NOT POSSIBLE LOG ENDS SHALL BE TIED INTO NATIVE MATERIAL AND BURIED WITH NATIVE MATERIAL PER SPECIFICATIONS.
5. SALVAGE ADJACENT BOULDERS FOR USE IN STRUCTURE.
6. FOR BURIED KEYED LOGS EMBED A MINIMUM OF 2/3 THE TOTAL LENGTH OF THE LOG. MIN 6' COVER AT STEM TIP (MEASURED FROM EG).
7. EMBED ROOTWAD AS NEEDED TO ACHIEVE REQUIRED BURIAL DEPTH AND ALLOW FOR FULL CONTACT BETWEEN THE BOTTOM OF THE LOG AND THE BOTTOM OF THE CHANNEL. BACKFILL AROUND ROOTWAD WITH NATIVE STREAMBED MATERIAL.
8. SEE SPECIFICATIONS FOR TREE SPECIES. KEYED LOG DIAMETER MEASURED AT BREAST HEIGHT (DBH) AND LENGTH AS SHOWN ON PLANS.
9. CRUSH ALL EXPOSED SAW-CUT FACES.

WHS TYPE 3

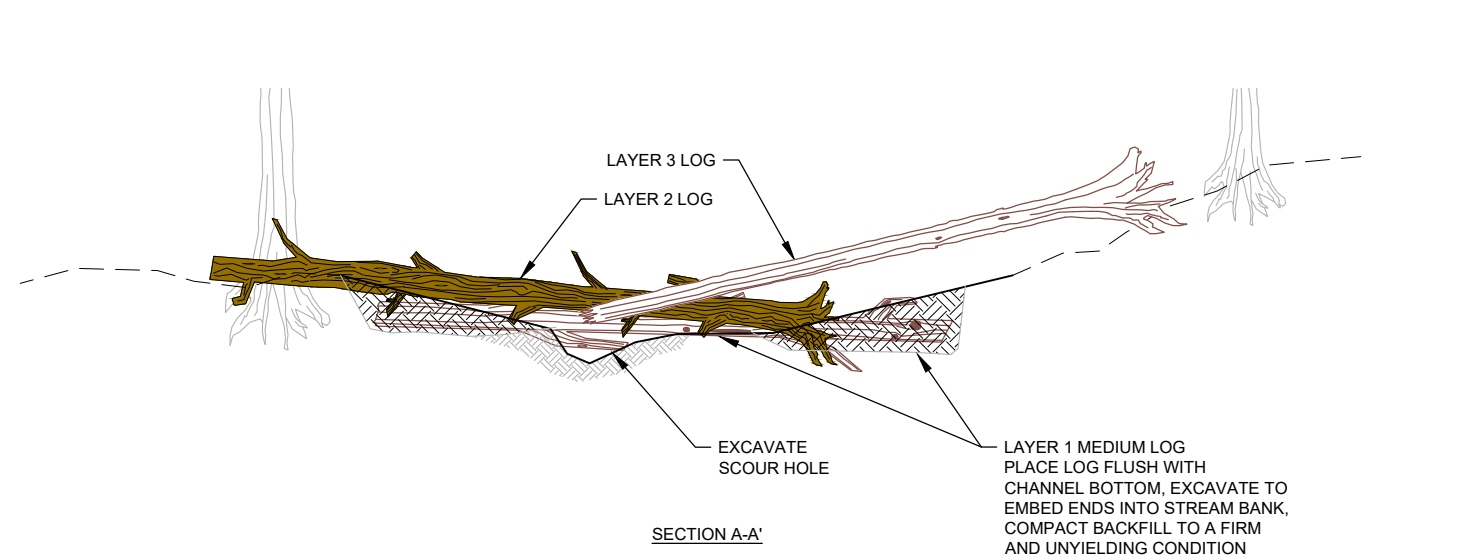
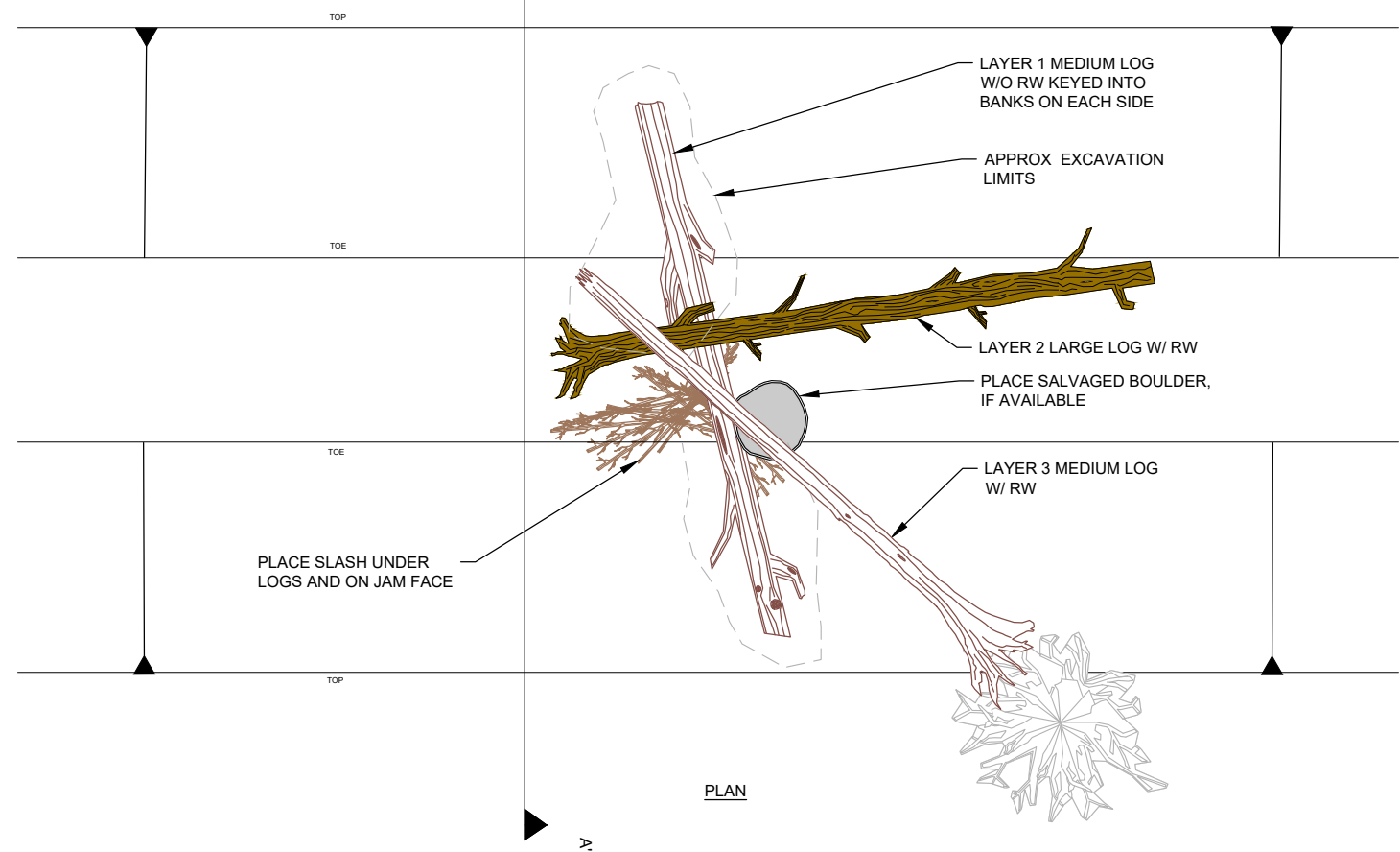
Piece Summary

Piece	QTY	LENGTH / DBH
LARGE W/ RW	1	35' / 15"
MEDIUM W/ RW	1	30' / 12"
MEDIUM W/O RW	1	30' / 12"
RACKING	4	20' / 6" +
SLASH	2 CY	

WHS TYPE 4

Piece Summary

Piece	QTY	LENGTH / DBH
LARGE W/ RW	1	35' / 15"
MEDIUM W/ RW	2	30' / 12"
MEDIUM W/O RW	1	30' / 12"
RACKING	6	20' / 6" +
SLASH	3 CY	



1 WHS TYPE 3 - 3 - LOG SC JAM
NOT TO SCALE

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WOLF WATER RESOURCES, INC.
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ANTOINE CREEK
ENHANCEMENT PROJECT
OKANOGAN COUNTY, WA

WHS DETAILS 3

REVISION NUMBER

No.	Date	Revision

Date: 3/11/2024
Designed By: SR, LE
Drawn By: HC
Checked By: SR

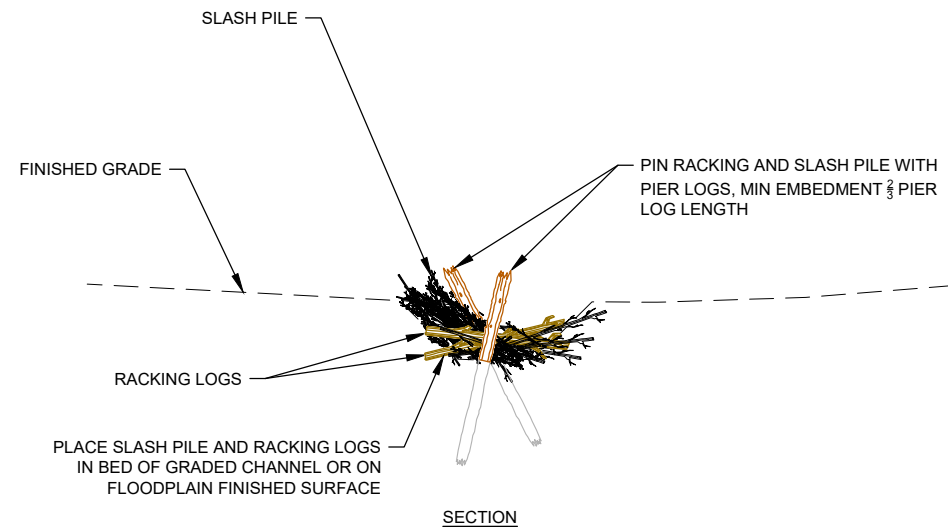
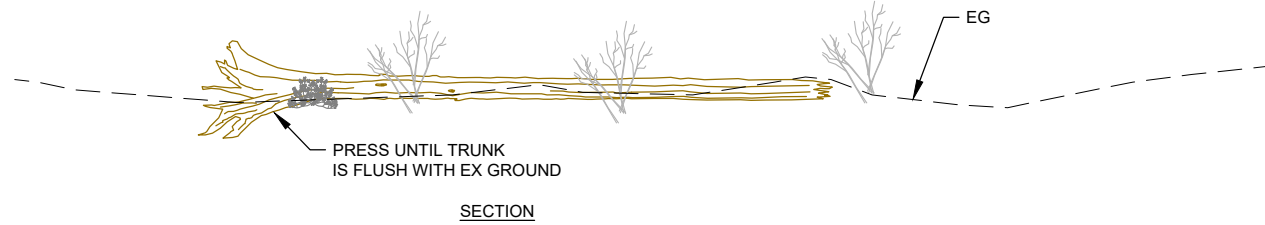
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JOB NO. 20220046
SHEET NO.

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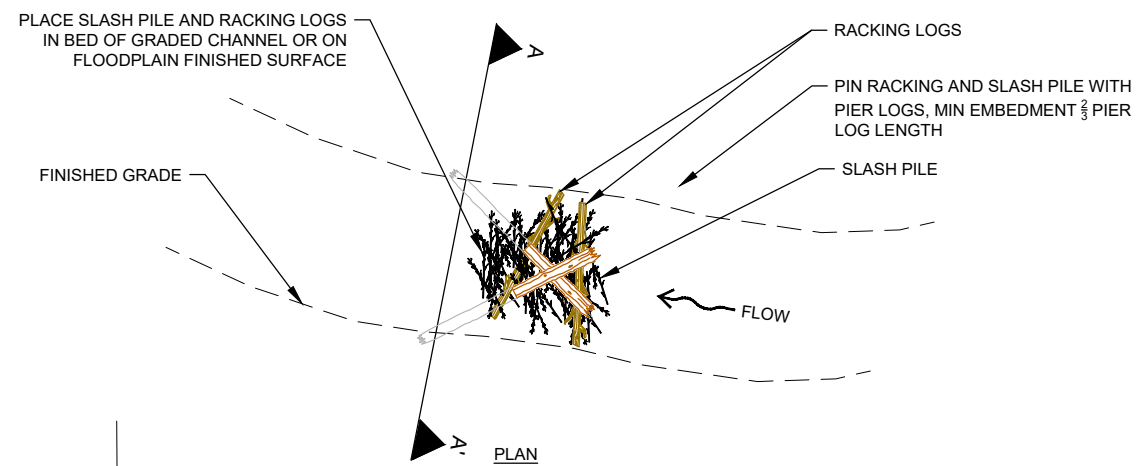
WHS TYPE 5
PIECE SUMMARY

PIECE	QTY	LENGTH / DBH
MEDIUM W/ OR W/O RW	1	30' / 12"



WHS TYPE 7
PIECE SUMMARY

PIECE	QTY	LENGTH / DBH
PIER	2	10' MIN / 8" MIN
RACKING	2	15' - 20' / 6" +
SLASH	2 CY	

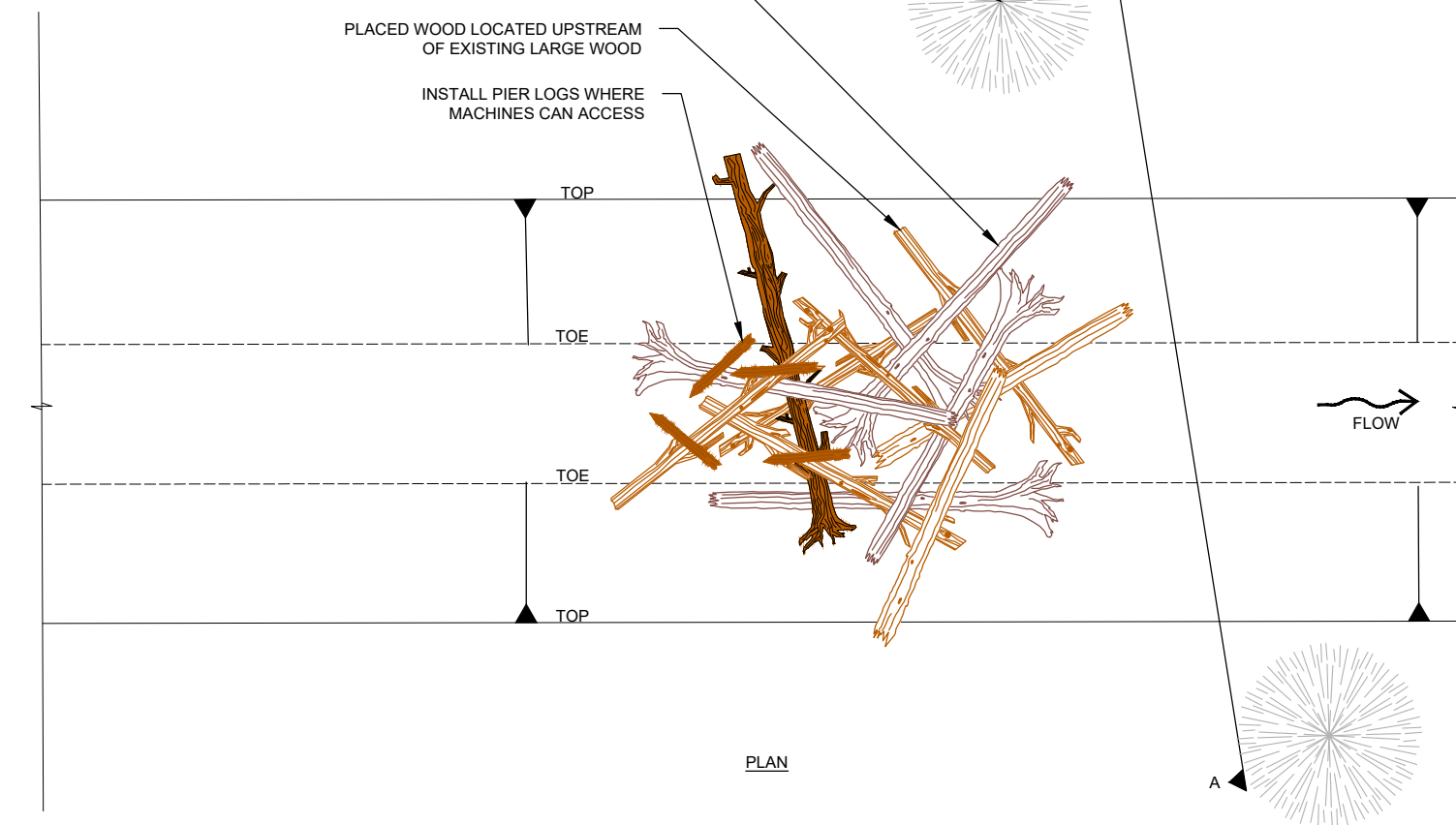


1 WHS TYPE 5 - FLOODPLAIN WOOD

NOT TO SCALE

WHS TYPE 6
Piece Summary

Piece	QTY	LENGTH / DBH
MEDIUM W/ RW	5	30' / 12"
MEDIUM W/O RW	5	30' / 12"
PIER LOG	4	10' - 12' / 8" - 12"



2 WHS TYPE 6 - WOOD CLUSTER

NOT TO SCALE

3 WHS TYPE 7 - SLASH PILE

NOT TO SCALE

WOOD CLUSTER NOTES:

- FOR MACHINE PLACED WOOD CLUSTERS, WOOD LOADING, TO MATCH PIECE SUMMARY TABLE ON THIS SHEET. FOR HELICOPTER PLACED WOOD, QUANTITY AND SIZE OF WOOD LOADING TO MATCH LOADING TABLES ON SHEETS CX.X - CX.X OR AS DIRECTED BY CAR.
- LOOSE WOOD LOADING TO BE LOCATED UPSTREAM OF EXISTING LARGE WOOD, OR INSTALLED WHS, PROVIDING FUTURE WOOD RETENTION.
- LOOSE WOOD TO BE PLACED IN A VARIED MANNER, WITH EFFORTS MADE TO PLACE TREES IN A WAY SO THAT THEY DIRECTLY SUBSIDE INTO THE CHANNEL BOTTOM.
- TREES AND WOOD TO BE PLACED USING HELICOPTER OR MACHINES, AS SITE ACCESS ALLOWS.
- IF PLACING TREES AND WOOD WITH HELICOPTER:
 - CAR TO PROVIDE MULTIPLE CREWS ON THE GROUND AS SPOTTERS ALLOWING HELICOPTER TO WORK IN A SECONDARY LOCATIONS WHILE SPOTTERS FROM THE PREVIOUS DROP SITE MOBILIZE TO THE NEXT DROP SITE.
 - SPOTTERS TO MARK/RELAY LOOSE WOOD PLACEMENT TO PILOT PRIOR TO DROP BY PREVIOUSLY COORDINATED MEANS.
- PERFORM FOLLOW UP WORK WITH HAND CREWS AFTER PLACEMENT OF TREES AND WOOD. FOLLOW UP WORK INCLUDES ASSESSING IF A PLACEMENT HAS:
 - PERCHING OF THE TRUNK ABOVE THE CHANNEL ON THE BANK.
 - SPECIFIC BRANCHES OR LIMBS SUPPORTING THE BULK OF THE TREE AND OTHER LIMBS HIGH ABOVE THE CHANNEL BOTTOM.
 - REMEDY CONDITION "A" BY CUTTING TRUNK (AND SELECT LIMBS AS NEEDED) SO THE TREE CAN SUBSIDE INTO THE CHANNEL BOTTOM, WINCH THE REMAINING PORTION OF THE TREE INTO THE CHANNEL (UPSTREAM IF POSSIBLE), AND WEAVE ANY LOOSE LIMBS OR SLASH FROM THE HELICOPTER WOOD OR CLEARING ACTIVITIES INTO THE BRANCHES OF THE MAIN LOG.
 - REMEDY CONDITION "B" BY SELECTIVE PRUNING OF THE SPECIFIC LIMBS AND WEAVING THEM INTO THE OTHER BRANCHES WHEN THE TREE HAS SUBSIDED INTO THE CHANNEL BOTTOM.



COLVILLE CONFEDERATED TRIBES
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OKANOGAN COUNTY, WA

WHS DETAILS 5

REVISION NUMBER

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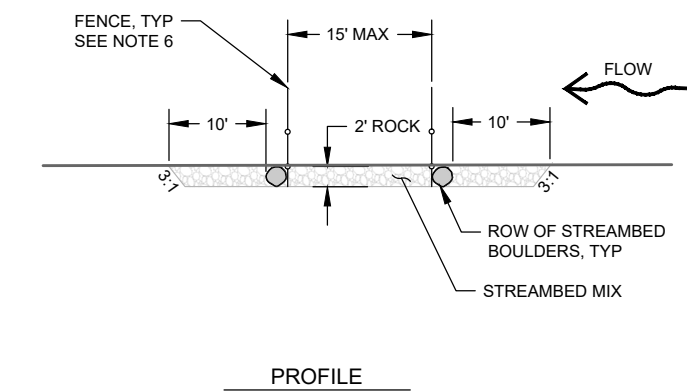
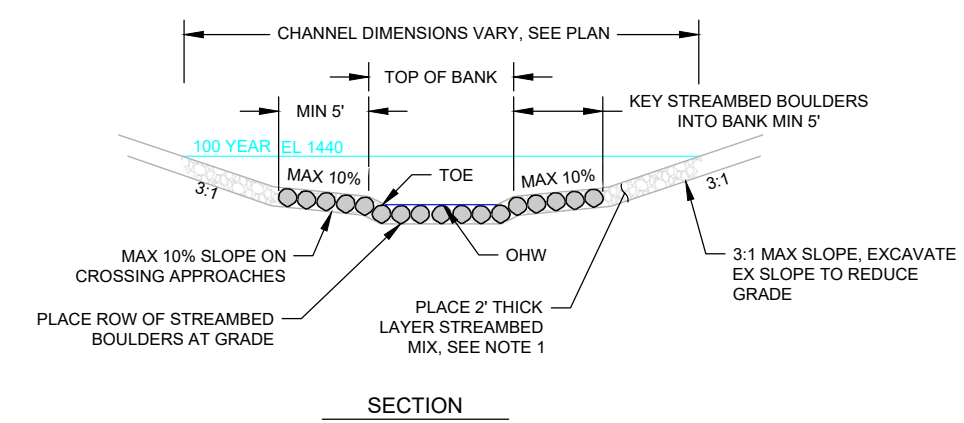
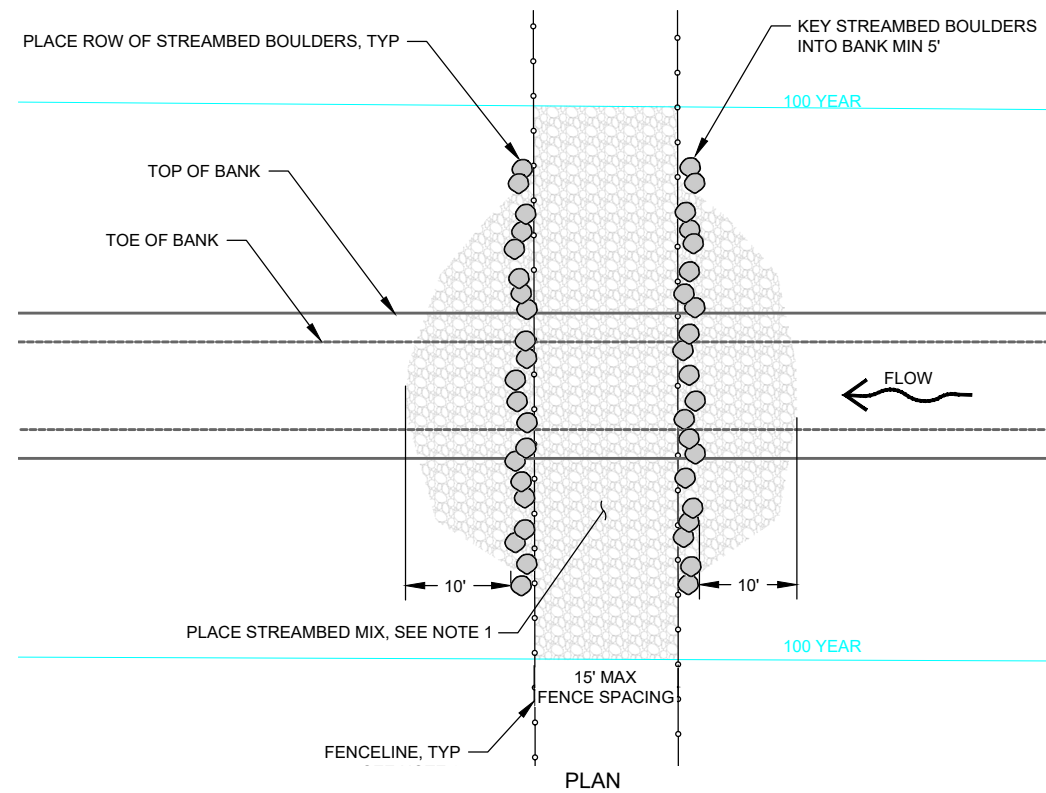
Date: 3/11/2024
Designed By: SR, LE
Drawn By: HC
Checked By: SR

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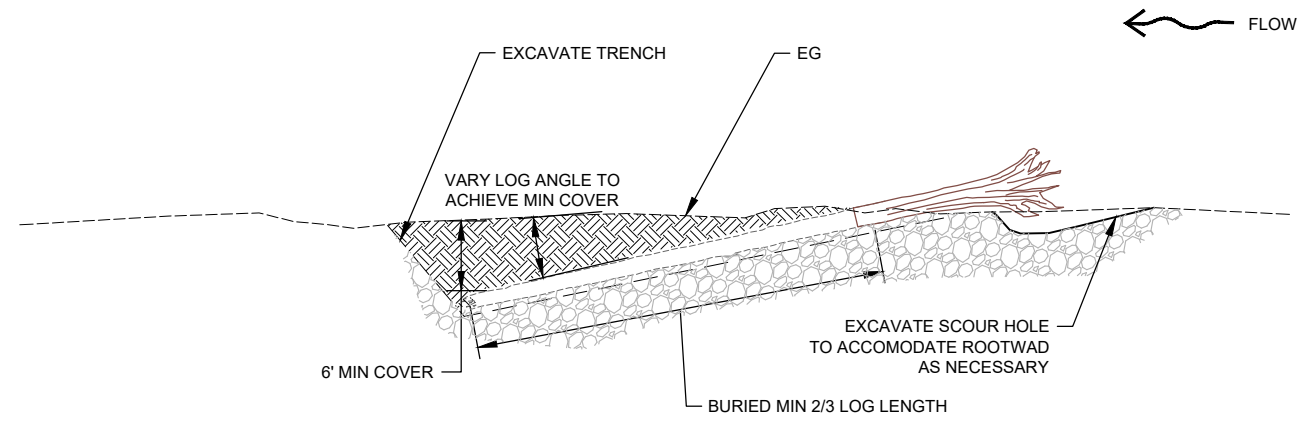
JOB NO. 20220046

SHEET NO. C4.5

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1 AT GRADE CATTLE CROSSING
NTS



1 SINGLE KEYED LOG

NOT TO SCALE

LOG INSTALLATION NOTES:

1. SELECT NATIVE BACKFILL SHALL BE PLACED IN 12" LIFTS AND COMPACTED TO FIRM UNYIELDING CONDITION.
2. CONTRACTOR TO COORDINATE LOG PLACEMENT WITH ENGINEER PRIOR TO CONSTRUCTION. PLACEMENT CAN BE FIELD FIT, BUT THE ENGINEER OR CAR SHALL APPROVE FINAL STRUCTURE ORIENTATION AND LOCATION BEFORE COMPLETION.
3. WHERE POSSIBLE, LOGS PROTRUDING FROM BANK SHALL BE PLACED CANTILEVERED BETWEEN EXISTING LIVE TREES. THE SUPPORTING TREE NEAREST TO THE BANK SHALL BE ON THE DOWNSTREAM SIDE OF THE LOGS.
4. EMBEDDED LOGS SHALL BE INSTALLED BY EXCAVATING A TRENCH, PLACING THE LOG, BACKFILLING, AND MACHINE COMPACTING BACKFILL PER SPECIFICATIONS. WHERE EXCAVATION IS NOT POSSIBLE LOG ENDS SHALL BE TIED INTO NATIVE MATERIAL AND BURIED WITH NATIVE MATERIAL PER SPECIFICATIONS.
5. FOR BURIED KEYED LOGS EMBED A MINIMUM OF 2/3 THE TOTAL LENGTH OF THE LOG.
6. EMBED ROOTWAD AS NEEDED TO ACHIEVE REQUIRED BURIAL DEPTH AND ALLOW FOR FULL CONTACT BETWEEN THE BOTTOM OF THE LOG AND THE BOTTOM OF THE CHANNEL. BACKFILL AROUND ROOTWAD WITH SELECT NATIVE BACKFILL.
7. SEE SPECIFICATIONS FOR TREE SPECIES. KEYED LOG DIAMETER MEASURED AT BREAST HEIGHT (DBH) AND LENGTH AS SHOWN ON PLANS.
8. CRUSH ALL EXPOSED SAW-CUT FACES.

STREAMBED CHANNEL CONSTRUCTION NOTES:

1. THE CONTRACTOR SHALL CREATE AN APPROVED "STREAMBED COBBLE MIX" WHICH SHALL CONSIST OF 1 PART WSDOT STREAMBED FINE SEDIMENT TO 9 PARTS WSDOT 12" STREAMBED COBBLES BY WEIGHT. THE CONTRACTOR MUST EVENLY MIX THE GRADATIONS REQUIRED IN THE STREAMBED COBBLE AND STREAMBED SEDIMENT MIXES.
2. INSTALL BANKLINE ROCK ADJACENT TO CULVERT WALLS, INCLUDING BOULDERS THAT PROTRUDE FROM THE BANK. INDIVIDUALLY PLACE THE LARGER BOULDERS IN THE BANKLINE GRADATION. USE THE SMALLER MATERIAL TO FILL IN THE VOIDS BETWEEN THE LARGER ROCK. TO COMPACT THE BANKLINES, TAMP IN PLACE FOLLOWED BY JETTING OR FLOODING TO WASH THE FINER MATERIAL INTO REMAINING VOIDS.
3. INSTALL STREAMBED MIX IN LIFTS ACROSS THE ACTIVE CHANNEL. THE HEIGHT OF EACH LIFT SHOULD BE 12-INCHES. PLAN AND SPECIFY THE LIFTS AND THE BOULDERS WITHIN EACH LIFT SO THE DESIRED DISTRIBUTION OF EXPOSED ROCK IS EVENTUALLY ACHIEVED AS DESCRIBED BELOW.
 - 3.1. BEGIN EACH LIFT BY INDIVIDUALLY PLACING THE INDIVIDUAL BOULDERS IN THE LIFT THROUGHOUT THE CHANNEL BED IN THE DENSITY SPECIFIED IN THE PLANS. THIS ENSURES BOULDERS ARE POSITIONED VERTICALLY AND Laterally THROUGHOUT THE MATERIAL HORIZON. BOULDERS SHOULD PROTRUDE ABOVE FINISH GRADE TO CREATE HYDRAULIC ROUGHNESS AND DIVERSITY. FOR STABILITY, THE ROCK SHOULD NOT PROTRUDE MORE THAN ONE-THIRD OF ITS HEIGHT ABOVE THE FINISHED GRADE OF THE CHANNEL BED.
 - 3.2. PLACE STREAMBED MIX INTO THE CHANNEL AT A THICKNESS EQUAL TO ONE LIFT. MIX IN-PLACE AS NECESSARY UNTIL THE MIXTURE IS WELL-GRADED.
 - 3.3. COMPACT EACH LIFT BY TAMPING AND TRACK-PACKING, FOLLOWED BY PRESSURE WASHING STREAMBED FINE SEDIMENT INTO THE LIFT. IF WATER CONTINUES TO RAPIDLY INFILTRATE THROUGH THE PLACED STREAMBED MIX, THE BED IS NOT ADEQUATELY SEALED AND ADDITIONAL STREAMBED FINE SEDIMENT MUST BE ADDED. ADD ADDITIONAL FINE MATERIAL TO THE TOP OF THE LIFT AND PRESSURE WASH THE MATERIAL INTO THE BED. REPEAT UNTIL THE BED IS ADEQUATELY SEALED AS APPROVED BY THE CAR BEFORE BEGINNING ON NEXT LIFT. DURING FINAL PRESSURE WASHING OF THE TOP LIFT, AN ADEQUATELY SEALED BED WILL MAINTAIN WATER FLOWING DOWN-SLOPE ACROSS THE SURFACE OF THE CHANNEL.
4. REPEAT STEPS 2 AND 3 AS NECESSARY UNTIL THE FINISH GRADES ARE MET.
5. DRESS THE CONSTRUCTED STREAMBED CHANNEL WITH 2 TO 4 INCHES OF STREAMBED MIX OR NATIVE STREAMBED MATERIAL.

GENERAL FINISH GRADE TOLERANCES IN THE ROUGHED CHANNEL AND BANKS SHALL GENERALLY ALLOW FOR LARGER ROCK TO PROTRUDE ABOVE THE STATED FINISH GRADE.

6. EXISTING FENCE AT CROSSING SHALL BE PROTECTED. DIMENSIONS OF CROSSING SHALL BE FIELD FIT AT DIRECTION OF ENGINEER TO ACCOMMODATE EXISTING FENCING.

DWG: Z:\Shared\W21\CAD\2022\0046-Antoine Creek\DWGS\SHSHEETS\SAC - WHS DETAILS.dwg USER: hdegg DATE: Mar 11, 2024 3:48pm XREFS: X-TB-W21-2234 AC - TEMPORARY ACCESS AND STAGING PLAN AC-XR-ACCESS-STAGING-WATER-MANAGEMENT



COLVILLE CONFEDERATED TRIBES
ANTOINE CREEK
ENHANCEMENT PROJECT
OKANOGAN COUNTY, WA

TEMP ACCESS
AND STAGING
PLAN

REVISION NUMBER

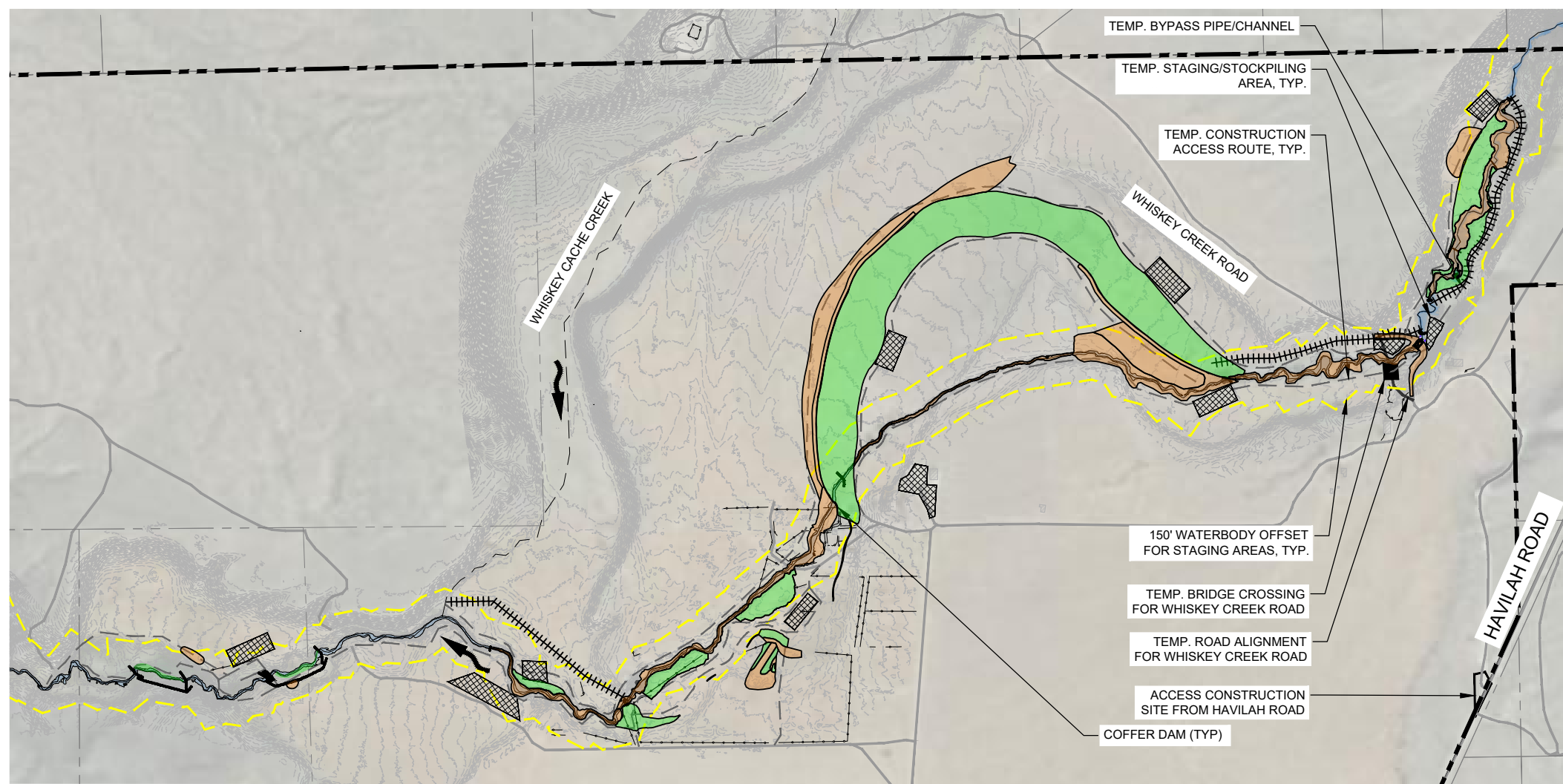
No.	Date	Revision

Date 3/11/2024	Designed By SR
Drawn By HC	Checked By SR

JOB NO.
20220046

SHEET NO.
C5.1

34 OF 36



LEGEND

EXISTING FEATURES

- PROJECT OWNERSHIP BOUNDARY
- EXISTING ROADWAY
- WET WETLANDS
- OHW ORDINARY HIGH WATER BOUNDARY

PROPOSED FEATURES

- CUT AREA
- FILL AREA
- TEMPORARY CONSTRUCTION ENTRANCE
- STAGING AREA
- TEMPORARY SITE ACCESS ROUTE
- BYPASS PIPE/CHANNEL
- 150 FT OFFSET
- COFFER DAM

ACCESS, STAGING, AND TESC OVERVIEW PLAN
SCALE: 1"=400'
SCALE 0 200 400 800 FEET

TEMPORARY EROSION, SEDIMENT, AND POLLUTANT CONTROL (TESC) NOTES:

1. EROSION, SEDIMENT AND POLLUTANT CONTROL IS REQUIRED FOR THIS PROJECT. CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES.
2. PREPARE A TEMPORARY EROSION AND SEDIMENT CONTROL PLAN (TESC) BEFORE BEGINNING WORK. KEEP A COPY OF THE TESC ON SITE AT ALL TIMES DURING THE PROJECT.
3. PREPARE A SPILL PREVENTION CONTROL AND COUNTERMEASURES (SPCC) PLAN PRIOR TO ANY CONSTRUCTION ACTIVITY. KEEP THIS ON SITE AT ALL TIMES.
4. THE TESC FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR THE ANTICIPATED SITE AND SEASONAL CONDITIONS. UPGRADE THESE FACILITIES TO ADDRESS CHANGING WORK OR WEATHER CONDITIONS.
5. INSTALL, MONITOR, REPLACE AND UPGRADE AS NECESSARY ALL FACILITIES AND MEASURES. PERFORM MAINTENANCE TO ENSURE CONTINUED FUNCTIONING FOR ENTIRETY OF CONSTRUCTION.
6. THE TESC PLAN FACILITIES AND MEASURES MUST BE INSPECTED DAILY BY THE CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTION.
7. COMPLETE AN EROSION CONTROL MONITORING FORM AFTER EACH INSPECTION. INCLUDE THE INSPECTION DATE AND TIME. RETAIN THESE COMPLETED FORMS ON SITE AND PROVIDE THEM UPON REQUEST.
8. NO VISIBLE AND MEASURABLE SEDIMENT OR POLLUTANT SHALL EXIT THE SITE, ENTER A PUBLIC RIGHT-OF-WAY OR BE DEPOSITED INTO ANY WATER BODY OR STORM DRAINAGE SYSTEM.
9. FOLLOWING A STORM EVENT, INSPECT AND ADJUST, REPAIR, IMPROVE OR REPLACE ALL DEFICIENT OR FAILING FACILITIES AND MEASURES.
10. PROTECT ALL FUNCTIONING STORM WATER INLETS AND CATCH BASINS FROM RECEIVING UNFILTERED, SEDIMENT-LADEN RUNOFF.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING A VEHICLE/EQUIPMENT STAGING AREA DESIGNATED FOR ALL REFUELING, EQUIPMENT MAINTENANCE, EQUIPMENT STORAGE AND PARKING. THE VEHICLE/EQUIPMENT STAGING AREA SHALL BE LOCATED OUTSIDE THE 150' OFFSET FROM ANY LIVE WATER OR WETLANDS. CONTRACTOR SHALL INSTALL APPROPRIATE TEMPORARY BMPs TO CONTAIN ANY POTENTIAL POLLUTANTS FROM LEAVING THE VEHICLE/EQUIPMENT STAGING AREA THROUGHOUT THE DURATION OF THE PROJECT.

CONSTRUCTION ACCESS & TRAFFIC CONTROL NOTES:

1. DRIVING DIRECTIONS: HEADING SOUTH ON OR-99E, USE THE RIGHT TWO LANES TO MERGE ONTO OR-224E TO CLACKAMAS/ESTACADA. TURN LEFT ONTO OR-212E/OR-224E. TURN RIGHT ONTO OR-224E. CONTINUE ONTO NF-46 (CLACKAMAS RIVER ROAD) FOR APPROXIMATELY 6 MILES.
2. CONTRACTOR SHALL SUBMIT AN ACCESS, STAGING, AND STOCKPILE PLAN TO CAR FOR APPROVAL MINIMUM 3 WEEKS PRIOR TO MOBILIZATION.
3. CONSTRUCTION STAGING/STOCKPILE AREAS SHALL BE LIMITED TO EXISTING AREAS OF DISTURBANCE, TO GREATEST EXTENTS POSSIBLE. VEHICLE/EQUIPMENT STAGING SHALL BE LIMITED TO AREAS MINIMUM 150' FROM ANY LIVE WATER OR WETLANDS.
4. ACCESS TO/ALONG ROADWAYS SHALL BE MAINTAINED AT ALL TIMES.
5. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR OBTAINING ANY REQUIRED TRAFFIC CONTROL OR ACCESS PERMITS.
6. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR PROVIDING ANY REQUIRED TRAFFIC CONTROL INCLUDING, BUT NOT LIMITED TO, SIGNAGE AND FLAGGERS.
7. ALL EQUIPMENT, MATERIALS, AND PERSONNEL SHALL REMAIN WITHIN THE WORK AREA BOUNDARY.
8. THE CONTRACTOR SHALL KEEP THE WORK AREAS IN NEAT CONDITION, FREE OF DEBRIS AND LITTER FOR THE DURATION OF THE PROJECT.
9. CONTRACTOR SHALL IMPLEMENT MEASURES TO CONTROL AND MINIMIZE WIND BLOWN DUST FROM THE SITE.
10. ACCESS ROUTES OTHER THAN ESTABLISHED ROADS SHALL NOT BE CLEARED OR GRADED.
11. ALL DISTURBED AREAS INCLUDING ROADS, DRIVEWAYS AND ACCESS ROUTES SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER. AREAS SHALL BE DECOMPACTED, ROUGHENED WITH SLASH AT CAR'S DIRECTION, AND REVEGETATED PER PLANS.
12. ALL DISTURBED AREAS OUTSIDE THE LIMITS OF DISTURBANCE SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER AT NO ADDITIONAL COST TO THE OWNER.

WATER MANAGEMENT NOTES:

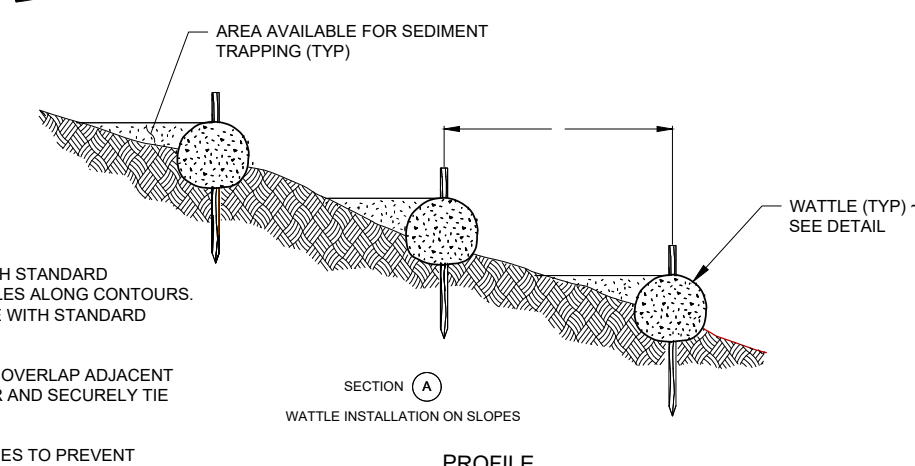
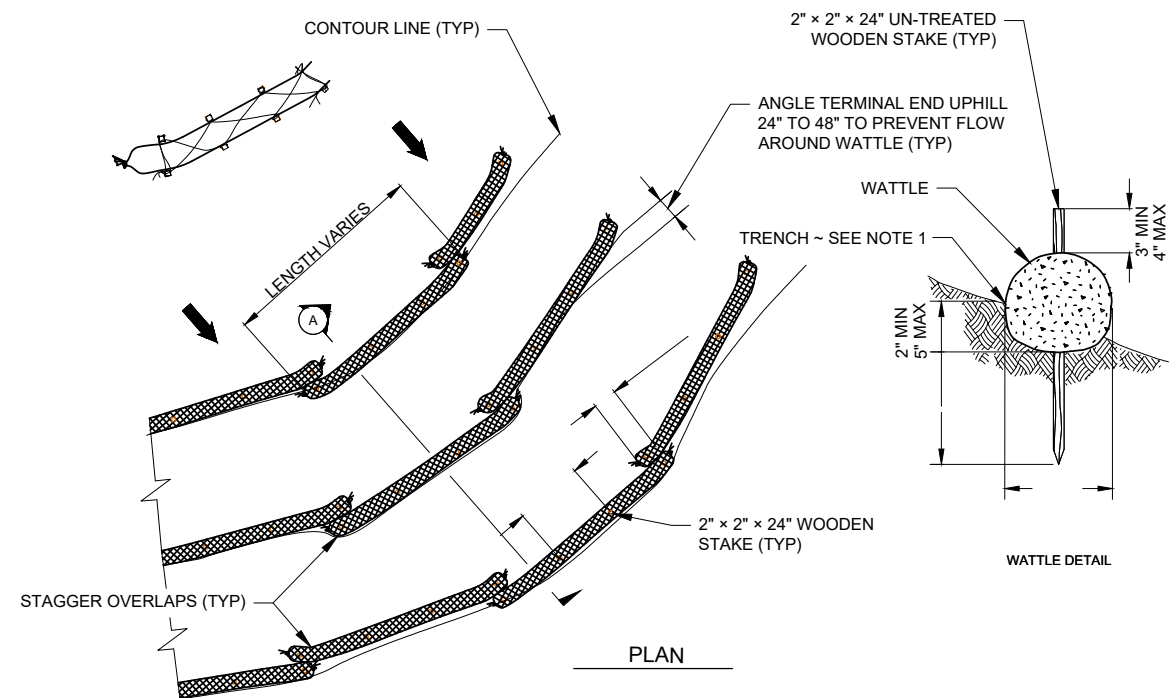
CONTRACTOR SHALL BE RESPONSIBLE FOR WORK AREA ISOLATION AND/OR STREAM DIVERSION FOR THE PURPOSES OF WATER QUALITY PROTECTION, TURBIDITY CONTROL AND PROTECTION OF AQUATIC LIFE AND HABITAT DURING CONSTRUCTION.

PLAN AND PROFILE SHEETS SHOW CONCEPTUAL STREAM DIVERSION ALIGNMENTS THAT COULD BE USED TO MANAGE ANTOINE CREEK DURING CHANNEL FILL ACTIVITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUBMITTING AN UPDATED WATER MANAGEMENT PLAN PRIOR TO DIVERTING ANY FLOW FROM ANTOINE CREEK.

CONSTRUCTION SEQUENCING NOTES:

1. ESTABLISH ACCESS AND STAGING TO SITE. FLAG AREA TO BE CLEARED.
 2. PERFORM SITE CLEARING AND DEMO.
 3. EXCAVATE FLOODPLAIN GRADING AREAS AND STOCKPILE MATERIAL FOR FILL WITHIN CHANNEL.
 4. CONSTRUCT HABITAT FEATURES IN FLOODPLAIN GRADING AREAS.
- IN WATER WORK BEGINS:
5. INSTALL FISH EXCLUSION NETTING AT DOWNSTREAM EXTENTS OF ACTIVE CHANNEL WORK AREAS AND COFFER DAMS AT UPSTREAM EXTENTS. DIVERT FLOW INTO TEMPORARY BYPASS PIPE/CHANNEL, OR INTO NEWLY CONSTRUCTED CHANNEL IF PRESENT. PERFORM FISH SALVAGE THROUGH CHANNEL WORK AREAS.
 6. PERFORM IN CHANNEL WORK (FILL/GRADE) AND CONSTRUCTION OF HABITAT FEATURES.
 7. REMOVE COFFER DAM SLOWLY AND RETURN FLOWS TO ISOLATED CHANNELS.
 8. RESTORE ACCESS ROUTES AND STAGING AREA NO LONGER NECESSARY FOR FUTURE PHASES OF WORK.

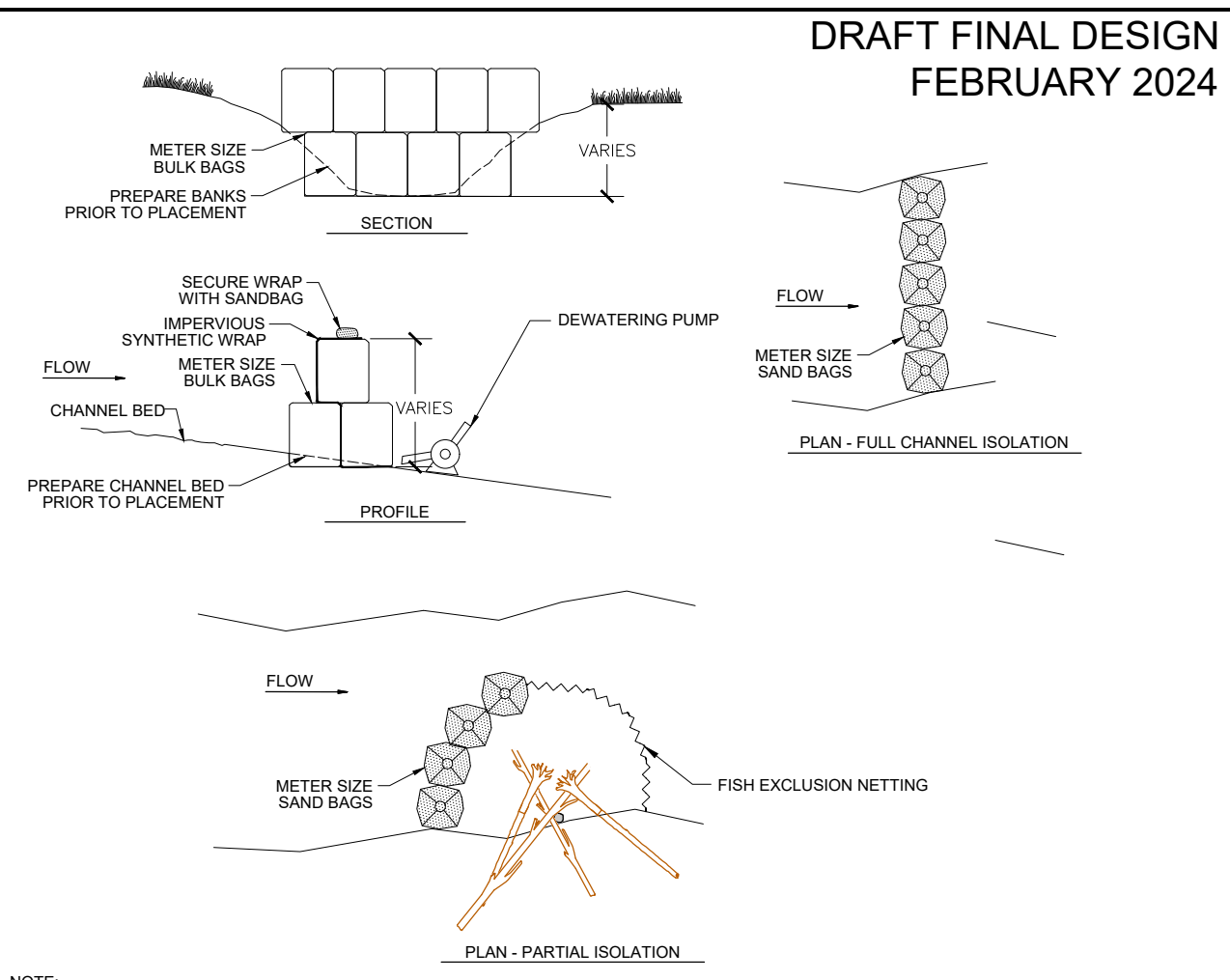
DWG: Z:\Shared\W21\CAD\20220046-Antoine Creek\DWG\SHEETS\SAC - TEMPORARY ACCESS AND STAGING PLAN.dwg USER: hde99g DATE: Mar 11, 2024 3:49pm XREFS: X-TB-W21-22034 AC-XR-BASEMAP.WBLOCK AC-XR-ACCESS-STAGING-WATER-MANAGEMENT AC-XR-DESIGN



- WATTLES NOTES:**
1. WATTLES SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATION 9-14.5(5). INSTALL WATTLES ALONG CONTOURS. INSTALLATION SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATION 8-01.3(10).
 2. SECURELY KNOT EACH END OF WATTLE. OVERLAP ADJACENT WATTLE ENDS 12" BEHIND ONE ANOTHER AND SECURELY TIE TOGETHER.
 3. COMPACT EXCAVATED SOIL AND TRENCHES TO PREVENT UNDERCUTTING. ADDITIONAL STAKING MAY BE NECESSARY TO PREVENT UNDERCUTTING.
 4. INSTALL WATTLE PERPENDICULAR TO FLOW ALONG CONTOURS.
 5. WATTLES SHALL BE INSPECTED REGULARLY, AND IMMEDIATELY AFTER A RAINFALL PRODUCES RUNOFF, TO ENSURE THEY REMAIN THOROUGHLY ENTRENCHED AND IN CONTACT WITH THE SOIL.
 6. PERFORM MAINTENANCE IN ACCORDANCE WITH STANDARD SPECIFICATION 8-01.3(15).
 7. REFER TO STANDARD SPECIFICATION 8-01.3(16) FOR REMOVAL.

1 WATTLE
NTS

- PLANTING NOTES**
1. REFER TO SHEET C6.1 FOR THE PLANTING PLAN.
 2. THE UPLAND SEEDING AND PLANTING LIST SHOWN HERE SHALL BE APPLIED ON ALL UPLAND ZONES SHOWN ON THE PLANTING PLAN AND AS EROSION CONTROL SEED IN ALL DISTURBED ACCESS ROUTES AND STAGING AREAS DURING DEMOBILIZATION.

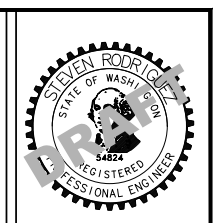


- NOTE:**
1. CONSTRUCTION CREWS SHALL INSTALL BULK BAG COFFER DAMS AS SHOWN ON PLANS OR AS NECESSARY TO ISOLATE THE EXCAVATION AREAS.
 2. IN ADDITION TO BULK BAGS, USE AN IMPERVIOUS SYNTHETIC LINER TO REDUCE PERMEABILITY OF BULK BAG COFFER DAM.
 3. HEIGHT OF THE BULK BAG COFFER DAMS SHALL BE HIGH ENOUGH TO PREVENT BYPASS FLOWS FROM ENTERING THE ISOLATED WORK AREA. DAM HEIGHTS AND MATERIALS SHALL BE INCLUDED IN THE CONTRACTOR'S WORK CONTAINMENT AND DEWATERING PLAN.

2 TEMPORARY BULK BAG COFFER DAM
NOT TO SCALE

ZONE 3 - UPLAND SEEDING AND PLANTING (12 ACRES)							
GROWTH/STOCK TYPE	SCIENTIFIC NAME	COMMON NAME	LBS PLS/ACRE OR DENSITY	PROPAGATION METHOD	PLANTING AREA	NOTES	
SEED	<i>Elymus cinereus</i>	Giant wild rye	2.00	Seed	All		
	<i>Achillea millefolium</i>	Common yarrow	0.25	Seed	All		
	<i>Pseudoregneria spicatum</i>	Bluebunch wheatgrass	5.00	Seed	All		
	<i>Danthonia unispicata</i>	One-spike oat grass	5.00	Seed	All		
	<i>Eriogonum ovalifolium</i>	Cushion buckwheat	0.25	Seed	All		
	<i>Festuca idahoensis</i>	Idaho Fescue	8.00	Seed	All		
TOTAL SEED POUNDS PLS PER ACRE			20.50				
SHRUB	<i>Artemisia tridentata</i>	Big sagebrush	500/ac	6" (1/2 gal) pot	All		
	<i>Gutierrezia sarothrae</i>	Snakebrush	500/ac	6" (1/2 gal) pot	All		
	<i>Ericameria nauseosa</i>	Rabbitbrush	500/ac	6" (1/2 gal) pot	All		
	<i>Purshia tridentata</i>	Bitterbrush	500/ac	6" (1/2 gal) pot	All		
TOTAL SHRUB STEM DENSITY			2000/ac				
TREE	<i>Pinus ponderosa</i>	Ponderosa Pine	500/ac	1-2 gal pot	All		

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WOLF WATER RESOURCES, INC.
1001 SE WATER AVE. SUITE #180
PORTLAND, OR 97214
503.207.6688

COLVILLE CONFEDERATED TRIBES
P.O. BOX 150
NESPELEM, WA 99155
509.634.2277

COLVILLE CONFEDERATED TRIBES
ANTOINE CREEK
ENHANCEMENT PROJECT
OKANOGAN COUNTY, WA

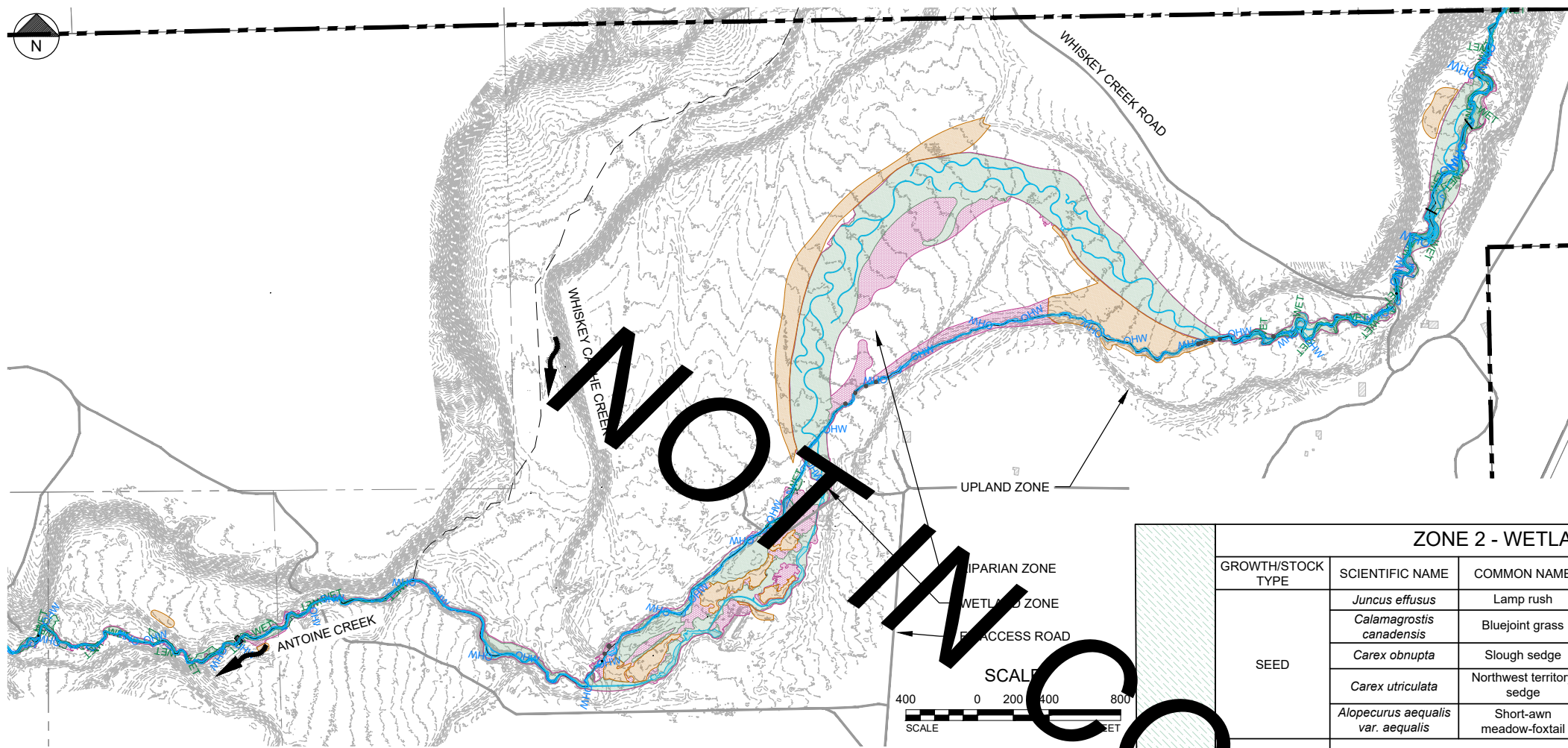
TESC DETAILS 1

REVISION NUMBER		
No.	Date	Revision

Date: 3/11/2024
Designed By: SR
Drawn By: HC
Checked By: SR

SCALE: 0 1'

JOB NO. 20220046
SHEET NO. C5.1
35 OF 36



LEGEND

EXISTING FEATURES

- PROJECT OWNERSHIP BOUNDARY
- EXISTING ROADWAY
- WET WETLANDS
- OHW ORDINARY HIGH WATER BOUNDARY

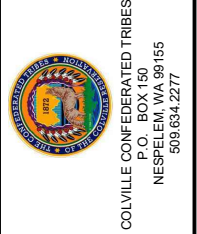
PROPOSED FEATURES

- OPEN WATER
- RIPARIAN ZONE
- UPLAND ZONE
- WETLAND ZONE

DRAFT FINAL DESIGN
FEBRUARY 2024



WOLF WATER RESOURCES, INC.
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COLVILLE CONFEDERATED TRIBES
ANTOINE CREEK
ENHANCEMENT PROJECT
OKANOGAN COUNTY, WA

SITE RESTORATION AND PLANTING PLAN
SCALE: 1"=400"

ZONE 1 - RIPARIAN SEEDING AND PLANTING (12 ACRES)							
GROWTH/STOCK TYPE	SCIENTIFIC NAME	COMMON NAME	LBS PLS/ACRE OR DENSITY	PROPAGATION METHOD	PLANTING AREA	NOTES	
SEED	<i>Achillea millefolium</i>	Common yarrow	0.50	Seed	All		
	<i>Deschampsia cespitosa</i>	Tufted hairgrass	5.00	Seed	All		
	<i>Koeleria macrantha</i>	June grass	10.00	Seed	All		
	<i>Lupinus latifolius</i>	Broadleaf lupine	15.00	Seed	All		
	TOTAL LBS PLS PER ACRE			30.50			
	SHRUB	<i>Rosa woodsii</i>	Woods' rose	200/ac	6" (1/2 gal) pot	Upper end of overbank and transitional area	
<i>Cornus sericea</i>		Red-osier dogwood	400/ac	6" (1/2 gal) pot	Bank or overbank	Grows in thickets, not clumps	
<i>Sambucus mexicana ssp. cerulea</i>		Elderberry	200/ac	6" (1/2 gal) pot	Bank or overbank		
<i>Amelanchier alnifolia</i>		Service berry	200/ac	6" (1/2 gal) pot	Upper end of overbank and into transitional zone	Shrub or tree	
<i>Symphoricarpos albus</i>		Common Snowberry	200	6" (1/2 gal) pot	Upper end of overbank and transitional area		
<i>Alnus incana</i>		Speckled alder	500/ac	1 gal pot	Bank and transitional area	Shrub or tree	
<i>Salix exigua</i>		Narrow-leaf willow	500/ac	live stakes	Bank	Grows in thickets, not clumps	
<i>Prunus virginiana</i>		Black Hawthorne	200/ac	6" (1/2 gal) pot	Bank or overbank		
<i>Crataegus douglasii</i>		Chokecherry	400/ac	6" (1/2 gal) pot	Bank or overbank		
TOTAL SHRUB STEM DENSITY			2800/ac				
TREE		<i>Populus trichocarpa</i>	Black Cottonwood	500/ac	live stakes	Some riparian areas should be reserved primarily for cottonwood galleries. Bank and overbank.	
		<i>Salix lucida</i>	Pacific willow	300/ac	live stakes	Bank	Tree-like
	<i>Pinus ponderosa</i>	Ponderosa pine	200/ac	1-2 gal pot	Top of bank and transitional area into upland		
	<i>Betula occidentalis</i>	Water Birch	500/ac	live stakes	Bank		
	<i>Populus Tremuloides</i>	Quaking Aspen	300/ac	1-2 gal pot	Bank		
TOTAL TREE STEM DENSITY			1800/ac				

ZONE 2 - WETLAND SEEDING AND PLANTING (30 ACRES)						
GROWTH/STOCK TYPE	SCIENTIFIC NAME	COMMON NAME	LBS PLS/ACRE OR DENSITY	PROPAGATION METHOD	PLANTING AREA	NOTES
SEED	<i>Juncus effusus</i>	Lamp rush	3.00	Seed	All	
	<i>Calamagrostis canadensis</i>	Bluejoint grass	15.00	Seed	All	
	<i>Carex obnupta</i>	Slough sedge	3.00	Seed	All	
	<i>Carex utriculata</i>	Northwest territory sedge	3.00	Seed	All	
	<i>Alopecurus aequalis var. aequalis</i>	Short-awn meadow-foxtail	15.00	Seed	All	
TOTAL LBS PLS PER ACRE			39.00			
SHRUB	<i>Cornus sericea</i>	Red-osier dogwood	600/ac	6" (1/2 gal) pot	Near margins	Grows in thickets, not clumps
	<i>Salix exigua</i>	Narrow-leaf willow	600/ac	live stakes	Near margins	Grows in thickets, not clumps
	<i>Alnus incana</i>	Speckled alder	600/ac	1 gal pot	Margins and transitional area	Shrub or tree
	<i>Prunus virginiana</i>	Chokecherry	300/ac	6" (1/2 gal) pot	All	
	<i>Rosa woodsii</i>	Woods' rose	200/ac	6" (1/2 gal) pot	All	
	<i>Alnus incana ssp. sinuata</i>	Speckled alder	400/ac	1 gal pot	All	
TOTAL SHRUB STEM DENSITY			2700/ac			
TREE	<i>Salix lucida</i>	Pacific willow	500/ac	live stakes	Near margins	Tree-like
	<i>Betula occidentalis</i>	Water Birch	500/ac	live stakes	Bank	
	<i>Populus trichocarpa</i>	Black cottonwood	600/ac	live stakes	Some wetland areas should be reserved primarily for cottonwood galleries. Higher elevation areas.	
TOTAL TREE STEM DENSITY			1600/ac			

PLANTING NOTES

- REFER TO SHEET C6.1 FOR THE THE UPLAND SEEDING AND PLANTING LIST.
- PLANTING AND REVEGETATION SHALL BE COMPLETED IN A SEPARATE CONTRACT DURING THE PLANT DORMANCY PERIOD (WINTER 2024 TO SPRING 2025).
- PLANT MATERIALS SHALL BE SOURCED FROM A NATIVE PLANT NURSERY IN THE SAME ECOREGION WITH PLANT CULTIVARS FROM THE SAME CLIMATE AND ELEVATION AS THE PROJECT AREA.

SITE RESTORATION AND PLANTING PLAN

REVISION NUMBER

No.	Date	Revision

Date: 3/11/2024
Designed By: SR
Drawn By: HC
Checked By: SR

SCALE: 1"=400'

JOB NO. 20220046
SHEET NO. C6.1
36 OF 36

DWG: Z:\Shared\W2\CAD\2022\046-Antoine Creek\DWGS\SHEETS\AC - PLANTING PLAN.dwg USER: hdegg DATE: Mar 11, 2024 3:50pm XREFS: X-TB-W2-r-2234 AC-XR-DESIGN AC-XR-AERIAL AC-XR-HAWS AC-XR-PLANTING AC-XR-BASEMAP WBLOCK