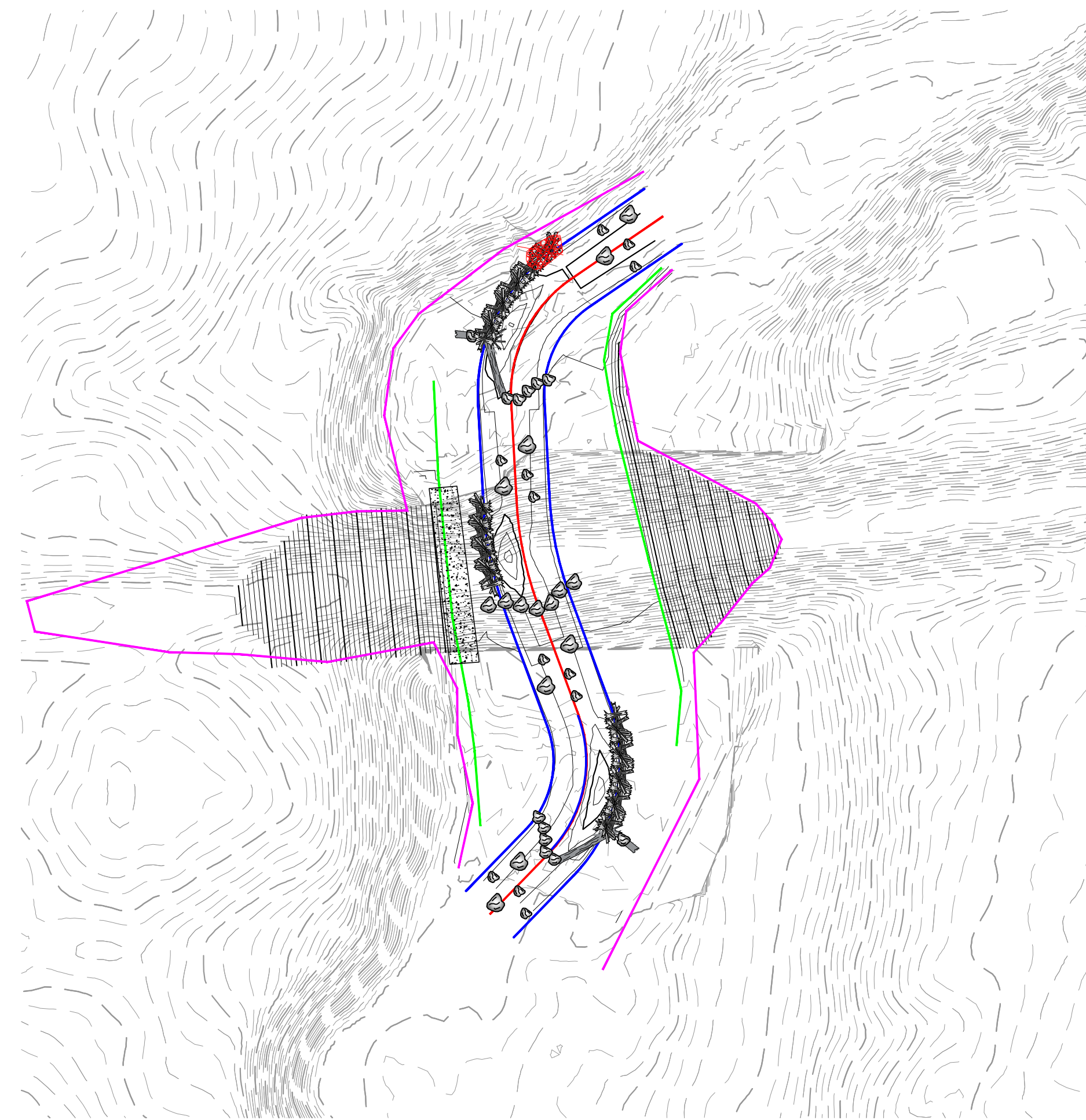
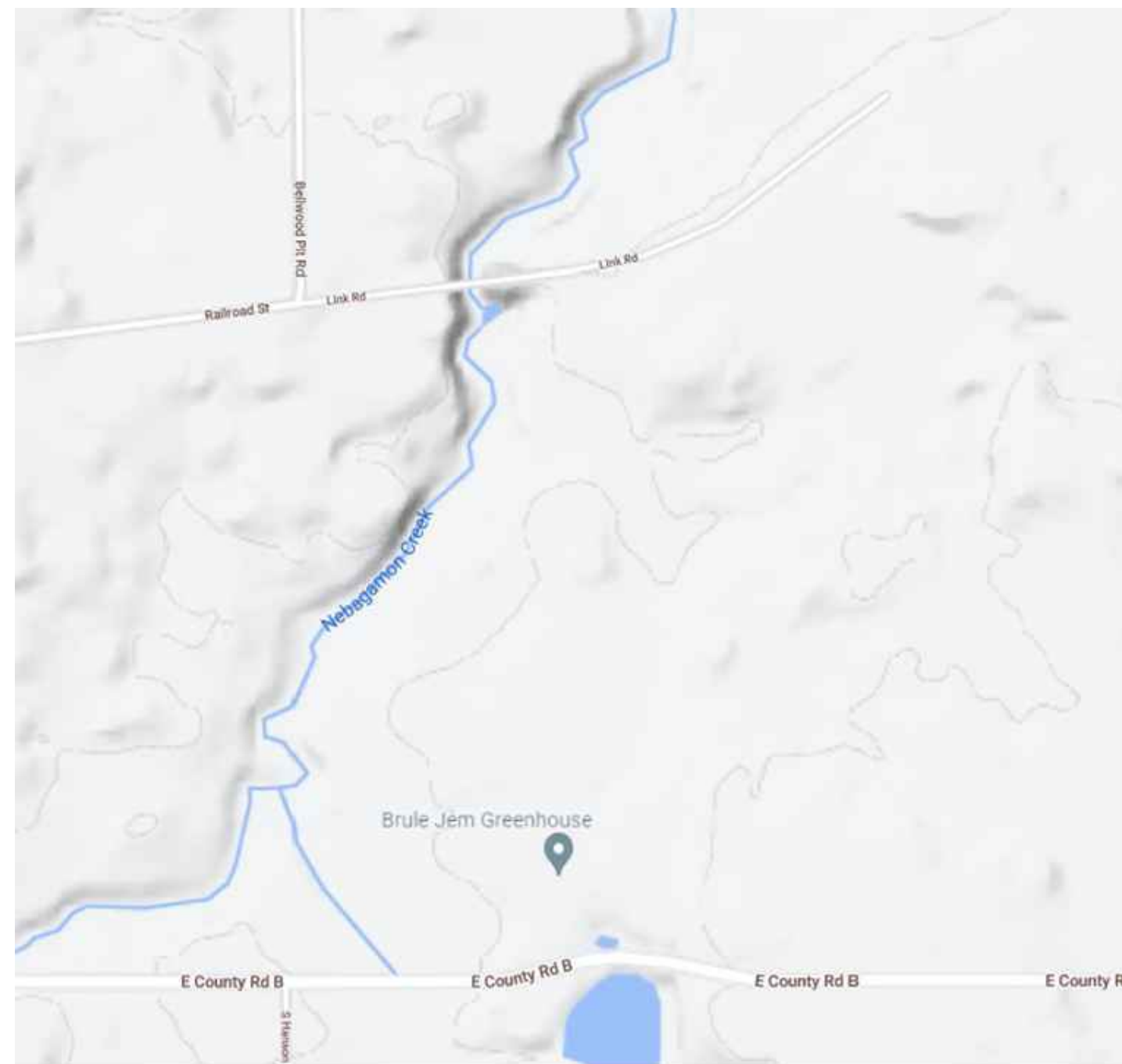
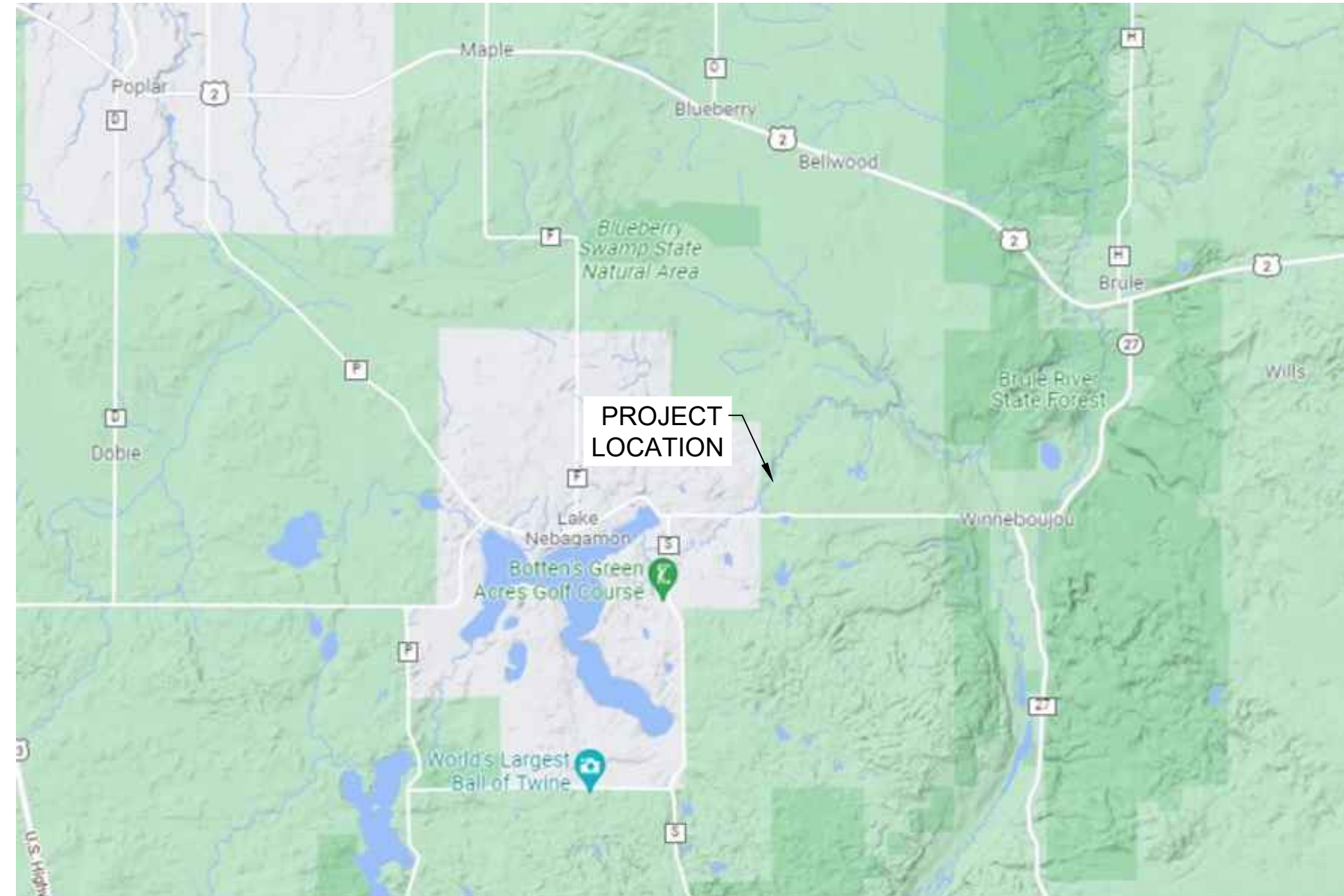


# RECORD DRAWING

## NEBAGAMON CREEK RESTORATION CULVERT REMOVAL AND RIVER IMPROVEMENTS

DOUGLAS COUNTY  
LAKE NEBAGAMON, WI  
11/30/23



Sheet List Table			
SHEET #	SHEET TITLE	DRAWING TITLE	REVISION DATE
1	COVER	Cover_Notes.dwg	Friday, February 25, 2022 2:22:22 PM
2	NOTES	Cover_Notes.dwg	Friday, February 25, 2022 2:22:22 PM
3	SITE ACCESS	Access2.dwg	Friday, February 25, 2022 2:21:42 PM
4	PLAN PROFILE	PLPR.dwg	Thursday, January 20, 2022 12:07:38 PM
5	PLAN VIEW	PlanView.dwg	Friday, February 25, 2022 11:48:26 AM
6	CROSS-SECTION SHEET 1	CrossSections.dwg	Friday, February 25, 2022 1:37:07 PM
7	CROSS-SECTION SHEET 2	CrossSections.dwg	Friday, February 25, 2022 1:37:07 PM
8	EROSION CONTROL PLAN	SESC_VEG.dwg	Friday, February 25, 2022 11:56:14 AM
9	VEGETATION PLAN	SESC_VEG.dwg	Friday, February 25, 2022 11:56:14 AM
10	TOEWOOD	Cover_Notes.dwg	Friday, February 25, 2022 2:22:22 PM
11	JHOOK	Cover_Notes.dwg	Friday, February 25, 2022 2:22:22 PM
12	GRAVEL RIFFLE WITH BOULDERS	Cover_Notes.dwg	Friday, February 25, 2022 2:22:22 PM
13	VEGETATION-FENCE DETAIL	Cover_Notes.dwg	Friday, February 25, 2022 2:22:22 PM
14	EROSION CONTROL BLANKET	Cover_Notes.dwg	Friday, February 25, 2022 2:22:22 PM



WI DNR  
LAKE SUPERIOR TRIBUTARIES  
SUPERIOR, WI



BEAVER  
RIVER  
CONSULTING  
5752 EAGLE VIEW DR  
DULUTH, MN 55803





# RECORD DRAWING

STATEMENT OF ESTIMATED QUANTITIES					
NOTE	NO.	ITEM	SPEC.	QUANTITY	UNIT
	1	MOBILIZATION	619.1000	1	LS
	2	CLEARING AND GRUBBING	201.0115, .0215	2	ACRES
1	3	CUT COMMON CHANNEL EXCAVATION	205.0100	29000	CU YD
1	4	FILL COMMON CHANNEL EXCAVATION	205.0100	1000	CU YD
	5	CAST IN PLACE CONCRETE CULVERT REMOVAL	203.0250	1	EACH
	6	STREAM DIVERSION SYSTEM	PLANS	1	LS
	7	J-HOOK	PLANS	3	EACH
	8	GRAVEL RIFFLE WITH BOULDERS	PLANS	250	FT
2	9	LIGHT RIP RAP	606.0100	81	CY
2	10	EXTRA LIGHT RIP RAP	606.0050	81	CY
2	11	GRAVEL IMPORT FOR RIFFLES, PIT RUN	313.0115	81	CY
3	12	TOE WOOD, COMPLETE	PLANS	286	LIN FT
	13	RIFFLE HABITAT ROCKS	PLANS	40	EACH
	14	MULCH MATERIAL TYPE 1	627.0205	1	TON
	15	SILT FENCE, MACHINE SLICED	628.1504	620	LF
	16	FENCE, 3 STRAND BARBED WIRE WITH SUPPORT POSTS	PLANS	730.0	FT
	17	TREES ZONE 1 AND 2, 1.5' HEIGHT, CONTAINERIZED, COMPLETE WITH DEER PROTECTION WHERE NOTED	PLANS	538	EACH
	18	TREES ZONE 3, 1.5' HEIGHT, CONTAINERIZED, COMPLETE WITH DEER PROTECTION WHERE NOTED	PLANS	270	EACH
	19	DECIDUOUS SHRUB, ZONE 1 AND 2, 1.5' HT CONTAINERIZED	PLANS	538	EACH
4	20	SEED MIXTURE ZONE 1 AND 2, 34-361	MN DOT 2575.502	47	LBS
4	21	SEED MIXTURE ZONE 3 AND ACCESS, 36-311	MN DOT 2575.502	48	LBS
4	22	SEEDING	MN DOT 2575.501	2	ACRES
	23	EROSION CONTROL MATS, CLASS 2, TYPE C	628.2000	6824	SQ YD
5	24	EROSION CONTROL BLANKET- 700 GRAM COCONUT FIBER CLASS 2, TYPE C BACKER MAT	PLANS	544.4	SQ YD

**QUANTITY NOTE:**

- THESE ITEMS DO NOT ACCOUNT FOR DISPLACEMENT DUE TO INSTALLATION OF STREAM RIFFLES OR TOE WOOD.
- THIS ITEM IS INTENDED FOR THE INCORPORATION INTO THE RIFFLE SUBSTRATE.
- THIS ITEM INCLUDES ALL NECESSARY WORK TO COMPLETE THE TOEWOOD INSTALLATION INCLUDING THE COIR WRAPS AND ALL WOOD IMPORT INCLUDING ONSITE WOOD HARVESTING AND PLACEMENT.
- THESE SEED MIXTURES AND SEED SPEC. IS FOUND IN THE MN DEPARTMENT OF TRANSPORTATION SEED SPECIFICATIONS
- THIS ITEM DOES NOT INCLUDE THE COIR BLANKET NEEDED FOR THE COIR WRAPS REQUIRED FOR THE TOEWOOD INSTALLATION AND THE J- HOOKS.

**NOTES:**

**GENERAL CONSTRUCTION NOTES:**

- THE WORK ON THIS PROJECT SHALL ADHERE TO THE FOLLOWING SPECIFICATIONS, STANDARDS AND/OR REGULATIONS: WISCONSIN DOT 2022 STANDARD SPECIFICATIONS, THE FOLLOWING SPECIFICATIONS EITHER MODIFY OR REPLACE APPROPRIATE MN DOT TECHNICAL SPECIFICATIONS.
- IN-STREAM STRUCTURES SHALL BE INSTALLED AS THE CHANNEL IS BEING CONSTRUCTED AND NOT POST CONSTRUCTION.
- WHERE PRACTICABLE, EXISTING TREES AND VEGETATION SHOULD BE LEFT IN PLACE TO FACILITATE NATURAL REGENERATION AND SOIL STABILIZATION.
- DEFINITIONS:
  - BANKFULL ELEVATION IS THE POINT OF INCIPIENT FLOODING IN AN ALLUVIAL CHANNEL. THIS ELEVATION IS THE REFERENCE FOR DEPTHS ON OR ALONG THE CHANNEL PROFILE AND STRUCTURES DESCRIBED IN THESE SHEETS.
  - THE BANKFULL BENCH IS A CONSTRUCTED FLOODPLAIN ADJACENT TO THE CHANNEL. THE BANKFULL BENCH IS CONSTRUCTED AT THE BANKFULL ELEVATION.
  - THE THALWEG IS THE LOWEST PORTION OF THE CHANNEL.
  - THE VANE LENGTH IS THE STRAIGHT LINE DISTANCE BETWEEN THE VANE ARM AND A LINE TANGENT TO THE STREAMBANK AT THE POINT WHERE THE VANE ARM INTERSECTS THE STREAMBANK.
  - THE VANE ANGLE IS THE ANGLE BETWEEN THE VANE ARM AND A LINE TANGENT TO THE STREAMBANK AT THE POINT WHERE THE VANE ARM INTERSECTS THE STREAMBANK.
- THE ENGINEER WILL STAKE OUT THE CENTERLINE OF THE CHANNEL AND BE ON SITE FOR IMPLEMENT CONSTRUCTION OF STRUCTURE AND TO CONFIRM ELEVATIONS. THE CONTRACTOR SHALL HAVE SURVEY LEVEL EQUIPMENT ON SITE TO SET STRUCTURES AND BE RESPONSIBLE FOR ANY AND ALL ELEVATIONS. ANY COST ASSOCIATED WITH CHANGING STRUCTURE LOCATIONS OR ALIGNMENT SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION. STAKING MAY BE OMITTED FOR PORTIONS OF THE STREAM WHEN SURVEY-GRADE GPS IS USED TO CONSTRUCT THE CHANNEL. IF GPS IS USED IN LIEU OF STAKING THE CHANNEL IN THE FIELD, THE CONTRACTOR ASSUMES ALL RESPONSIBILITY FOR THE STREAM BEING CONSTRUCTED AS DESIGNED, INCLUDING ANY ISSUES RELATED TO PROJECTIONS, BASE POINTS OR CONVERSION OF DIGITAL TERRAIN MODELS.
- PRIOR TO CLEARING AND GRUBBING, THE ENGINEER WILL MARK THE LIMITS OF CLEARING NEAR TREES. SOME MINOR ADJUSTMENT OF CHANNEL ALIGNMENT MAY BE REQUIRED TO PRESERVE TREES OR MINIMIZE IMPACT TO TREES.
- ANY HARVESTING OF WILLOWS AND SOD FROM ONSITE MUST BE APPROVED BY THE ENGINEER.
- CONTRACTOR SHALL MINIMIZE, TO THE MAXIMUM EXTENT POSSIBLE, IMPACTS TO THE ADJACENT TREES. CONSTRUCTION EQUIPMENT TRACKS AND PATHWAYS SHALL BE GRADED AND RECONTOURED AFTER CONSTRUCTION TO PREVENT RILL AND GULLY EROSION.
- THE PROPOSED GRADING IS SHOWN ON THESE PLAN SHEETS. THE CONTRACTOR MAY EXTEND THE LIMITS OF DISTURBANCE ONLY WITH THE APPROVAL OF THE ENGINEER.
- CONTRACTOR SHALL USE AN EXCAVATOR WITH A HYDRAULIC THUMB TO INSTALL INSTREAM STRUCTURES.
- CHANNEL RELOCATION WORK SHALL BE COMPLETED AND STABILIZED PRIOR TO ALLOWING FLOW TO ENTER INTO THE NEWLY CONSTRUCTED STREAM CHANNEL. THE CONTRACTOR SHALL NOT OPEN UP MORE THAN 200 FEET OF CHANNEL WITHOUT EROSION CONTROL BLANKET IN PLACE OR BY APPROVAL OF THE ENGINEER.
- IF THE EXISTING GROUND IS LESS THAN 0.2 FEET HIGHER THAN THE PROPOSED BANKFULL ELEVATION, IT IS NOT NECESSARY TO EXCAVATE MATERIAL TO THE PROPOSED ELEVATION SHOWN ON THE PROFILE.
- THE SURFACE OF ALL INSTREAM STRUCTURES SHALL BE FINISHED TO A SMOOTH LINE IN ACCORDANCE WITH THE LINES, GRADES, AND CROSS SECTIONS OR ELEVATIONS SHOWN ON THE DRAWINGS. THE DEGREE OF FINISH FOR THE VANE SLOPES AND INVERT ELEVATIONS SHALL BE WITHIN 0.1 VERTICAL FEET OF THE GRADES AND ELEVATIONS INDICATED. ALL GAPS OR VOIDS BETWEEN THE ROCKS SHALL BE PLUGGED WITH SMALL GRAVEL TO FORM A TIGHT-FITTING SEAL.
- CONSTRUCTION SPECIFICATIONS FOR BANKFULL CHANNEL DIMENSIONS OR CROSS SECTIONS WILL BE HELD TO THE DIMENSIONS SHOWN ON THE TYPICAL CROSS SECTIONS. ELEVATIONS SHALL BE CONSTRUCTED WITHIN 0.1 VERTICAL FEET; WIDTHS AND MEAN DEPTHS MUST FALL WITHIN THE RANGES SHOWN IN THE DRAWINGS.
- THE IN-STRUCTURE BID ITEMS SHALL INCLUDE ALL LABOR AND MATERIALS NECESSARY TO CONSTRUCT THE STRUCTURE. AFTER THE STRUCTURE IS COMPLETE AND FLOW IS RESTORED TO THE CHANNEL, SOME ADJUSTMENT TO THE STRUCTURE OR ADDITIONAL STABILIZATION MEASURES MAY BE NECESSARY TO ACHIEVE DESIRED EFFECT. ANY COSTS ASSOCIATED WITH THESE ADJUSTMENTS SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION.
- EXCESS SPOIL MATERIAL SHALL BE HAULED OFF SITE TO A LOCATION NOTED ON PLANS.
- SPOIL AREAS SHALL BE SEEDED WITHIN 1 DAY WITH TEMPORARY VEGETATION AND COMPLETED WITHIN 7 DAYS FOLLOWING GRADING.
- CONTRACTOR SHALL CALL FOR UTILITY MARKING AT LEAST 48 HOURS PRIOR TO START OF CONSTRUCTION. THE LOCATIONS OF THE UTILITIES SHOWN ON THESE DRAWINGS ARE APPROXIMATE ONLY (UTILITY QUALITY LEVEL D) AND MAY NOT BE ACCURATE. LOCATING UTILITIES IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE ENGINEER AND PROJECT OWNER WILL NOT BE RESPONSIBLE FOR ANY DAMAGES TO UTILITIES.
- CONTRACTOR SHALL UTILIZE NATIVE MATERIAL FROM THE SITE WHERE AVAILABLE AND ALLOWED BY THE ENGINEER. NATIVE MATERIAL THAT CAN BE FOUND ON SITE

- INCLUDE TREES THAT CAN PROVIDE LIVE STAKES AND TREES THAT CAN BE USED FOR LOG STRUCTURES, BOULDERS FOR STRUCTURES, AND WOOD DEBRIS.
- AFTER CONSTRUCTION, THE ACCESS ROADS LEADING TO THE PROJECT SITE SHALL BE RESTORED TO AS GOOD OR BETTER CONDITION THAN BEFORE CONSTRUCTION AT THE ENGINEER'S DISCRETION.
  - FOOTER DEPTH ON ALL STRUCTURES REQUIRING FOOTERS SHALL BE AT LEAST 6 TIMES GREATER THAN THE DROP BETWEEN THE STRUCTURE AND THE FOOTERED STRUCTURE DIRECTLY UPSTREAM OR APPROVED BY THE ONSITE ENGINEER.

**EROSION/SEDIMENTATION CONTROL NOTES:**

- FOR PROJECT SPECIFIC DETAILS REFER TO SHEETS 8 AND 13.
- ALL CONTROL MEASURES SHALL BE CHECKED, AND REPAIRED AS NECESSARY, EVERY 7 DAYS IN DRY PERIODS, AND WITHIN 24 HOURS AFTER ANY RAINFALL AT THE SITE OF .50 INCHES OR GREATER WITHIN A 24 HOUR PERIOD. DAILY CHECKING AND, IF NECESSARY, REPAIRING SHALL BE DONE DURING PROLONGED RAINFALLS. THE PERMITTEE SHALL MAINTAIN WRITTEN RECORDS OF SUCH CHECKS AND REPAIRS ON-SITE AT ALL TIMES, AND RECORDS SHALL BE SUBJECT TO INSPECTION AT ANY REASONABLE TIME.
- THE CONSTRUCTION ACCESS POINTS SHALL BE MAINTAINED AS REQUIRED TO PREVENT SILT/SEDIMENT FROM LEAVING THE SITE. THIS INCLUDES BUT IS NOT LIMITED TO WASH DOWN OF THE CONSTRUCTION ACCESS POINTS, INSTALLING AND UTILIZING A VEHICLE WASH DOWN AREA, INSTALLING ADDITIONAL STONE, ETC.
- TEMPORARY DIVERSION OF RUNOFF/RUNON WATER SHALL BE INSTALLED AS NEEDED TO FACILITATE CONSTRUCTION OR AS DIRECTED ON-SITE BY THE ENGINEER. AT NO TIME SHALL WATER BE SHUT OFF TO THE STREAM FOR GREATER THAN 5 MINUTES.
- ALL DISTURBED AREAS SHALL BE PERMANENTLY STABILIZED IMMEDIATELY AFTER THE COMPLETION OF THE GRADING OPERATION. AREAS REQUIRING COCONUT COIR MATTING SHALL BE SEEDED AND MULCHED FOR STABILIZATION PRIOR TO THE INSTALLATION OF THE MATTING.
- TEMPORARY STABILIZATION OF DISTURBED AREAS MUST BE INITIATED IMMEDIATELY WHENEVER WORK TOWARD PROJECT COMPLETION AND FINAL STABILIZATION OF ANY PORTION OF THE SITE HAS TEMPORARILY CEASED AND WILL NOT RESUME FOR A PERIOD EXCEEDING FOURTEEN (14) CALENDAR DAYS. THOSE AREAS SHALL BE SEEDED AND MULCHED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.
- NECESSARY MEASURES SHALL BE TAKEN TO PRODUCE AND MAINTAIN AN ACCEPTABLE STAND OF GRASS. SAID MEASURES TO INCLUDE (BUT NOT LIMITED TO) WATERING, RE-SEEDING, REGRADING ERODED AREAS, RE-FERTILIZING, ETC.
- CONTRACTOR IS RESPONSIBLE FOR KEEPING MUD AND DEBRIS OFF CITY/STATE STREETS AND ROW. CLEANUP IS REQUIRED DAILY.
- ALL HAZARDOUS SUBSTANCES USED FOR THIS PROJECT (PAINT, OIL, GREASE, AND OTHER PETROLEUM PRODUCTS) SHALL BE STORED IN ACCORDANCE WITH SPCC REGULATIONS. THESE SUBSTANCES SHALL BE STORED AWAY FROM DRAINS AND DITCHES IN WATERTIGHT CONTAINERS. DISPOSAL OF THESE SUBSTANCES SHALL BE IN ACCORDANCE WITH MPCA REGULATIONS. DAILY INSPECTIONS SHALL BE PERFORMED FOR LEAK DETECTION. IF LEAKS OCCUR, APPROPRIATE ACTION SHALL BE TAKEN TO CONTAIN AND REMEDIATE THE SPILL. ADEQUATE TRASH CONTAINERS SHALL BE KEPT ON SITE FOR THE DISPOSAL OF CONSTRUCTION MATERIALS WASTE. NECESSARY MEASURES SHALL BE TAKEN TO PREVENT ANY TRASH OR OTHER POLLUTANTS FROM ENTERING "WATERS OF THE UNITED STATES."
- ALL TEMPORARY MEASURES SHALL BE REMOVED ONCE ACCEPTABLE PERMANENT STABILIZATION IS ACHIEVED. THE ENGINEER SHALL DETERMINE IF THE PERMANENT STABILIZATION IS ACCEPTABLE.

**SPECIAL NOTES:**


THE ELEVATIONS SHOWN HEREIN ARE BASED ON DATA SURVEY THAT ENCOMPASSES THE EXISTING GROUND SURFACE FROM WHICH ALL COMPUTATIONS FOR CUT/FILL ARE BASED. SLIGHT DISCREPANCIES BETWEEN THE EXISTING GROUND DIGITAL SURFACE AND FIELD CONDITIONS CAN RESULT IN SIGNIFICANT VARIATIONS IN TOTAL EXCAVATED QUANTITIES. THUS, THE CONTRACTOR SHALL COMPARE QUANTITIES OF MATERIAL EXCAVATED TO THOSE SHOWN ON THE DRAWINGS TO MANAGE THE MOVEMENT OF MATERIAL ACROSS THE SITE.

**TOPOGRAPHIC INFORMATION:**

EXISTING GROUND SURFACES ARE BASED ON A SURVEY COMPLETED IN MAY 2020 BLENDED WITH STATE OF MN LIDAR. BENCHMARKS WERE SET THROUGHOUT THE SITE AND CAN BE PROVIDED AT ANY TIME. CHANGES IN EXISTING SURFACES SHALL BE INCIDENTAL TO CONSTRUCTION.

**TREE PLANTING**

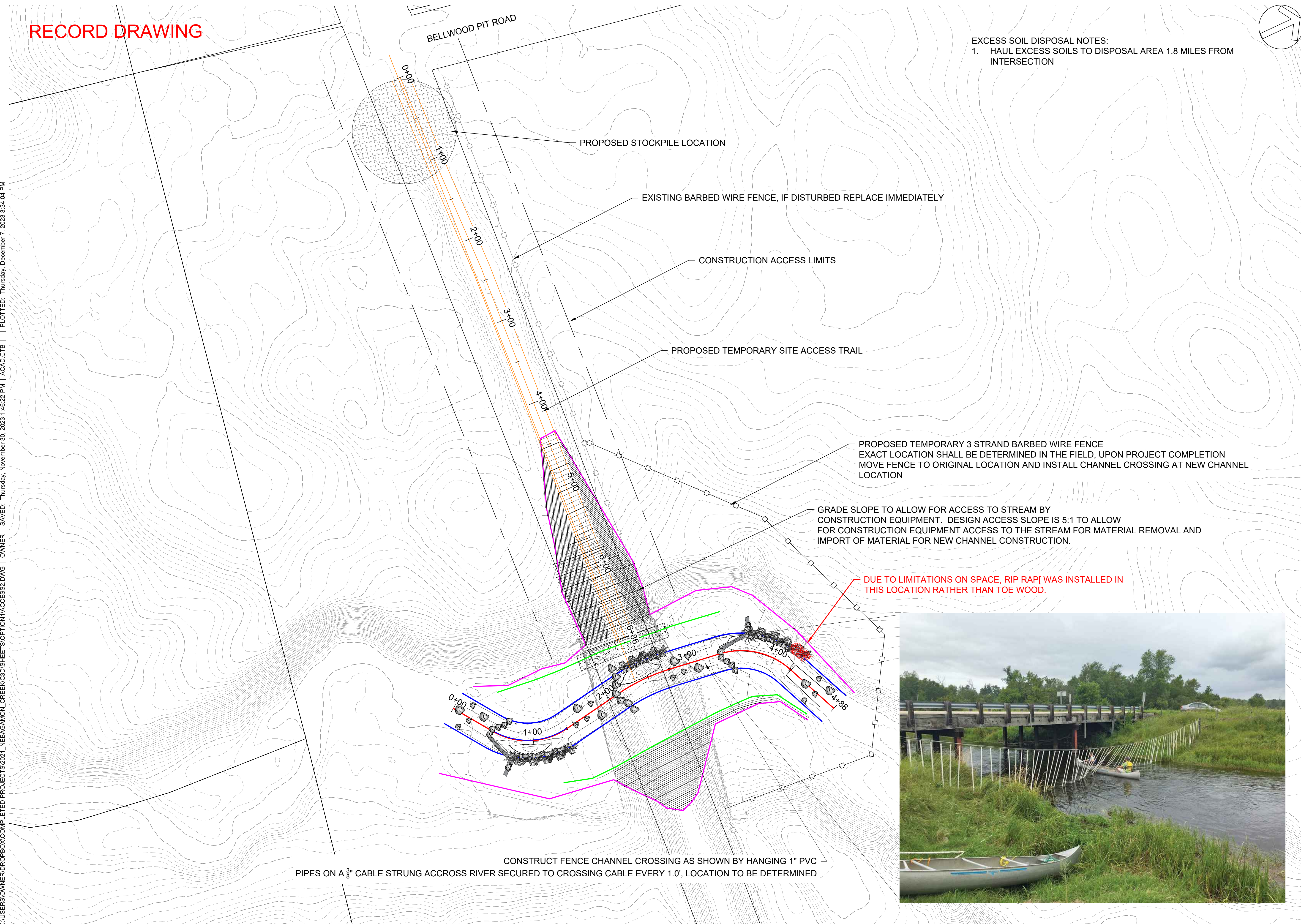
- TREES AND SHRUBS SHALL BE WATERED UPON PLANTING AND DURING DRY PERIODS DURING THE SUMMER AND FALL OF 2022
- PROVIDE WARRANTY FOR SURVIVAL OF 70 PERCENT OF THE TREE STOCK FOR A PERIOD OF ONE YEAR AFTER PLANTING. REPLACE TREES THAT DO NOT SURVIVE IN THE WARRANTY PERIOD IF LESS THAN 70 PERCENT SURVIVE

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CHECKED BY: MUG	DESCRIPTION	AS BUILT SET									
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<b>NEBAGAMON CREEK RESTORATION CULVERT REMOVAL AND RIVER IMPROVEMENTS DOUGLAS COUNTY LAKE NEBAGAMON, WI</b>											
<b>AS BUILT SET</b>											
<b>PROJECT NOTES AND QUANTITIES BID SET</b>											
 WI DNR LAKE SUPERIOR TRIBUTARIES SUPERIOR, WI 715.392.7990											
BEAVER RIVER CONSULTING 5752 EAGLE VIEW DR DULUTH, MN 55803 218.626.7450											
<b>BID SET</b>											
DATE:		11/30/23									
SHEET NUMBER <b>2 OF 13</b>											



**RECORD DRAWING**

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EXCESS SOIL DISPOSAL NOTES:  
1. HAUL EXCESS SOILS TO DISPOSAL AREA 1.8 MILES FROM INTERSECTION

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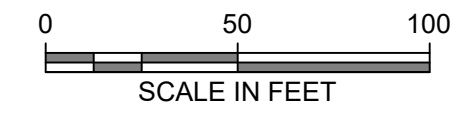
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CULVERT REMOVAL AND RIVER IMPROVEMENTS  
DOUGLAS COUNTY  
LAKE NEBAGAMON, WI

AS BUILT SET  
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5752 EAGLE VIEW DR  
DULUTH, MN 55803  
218.626.7450

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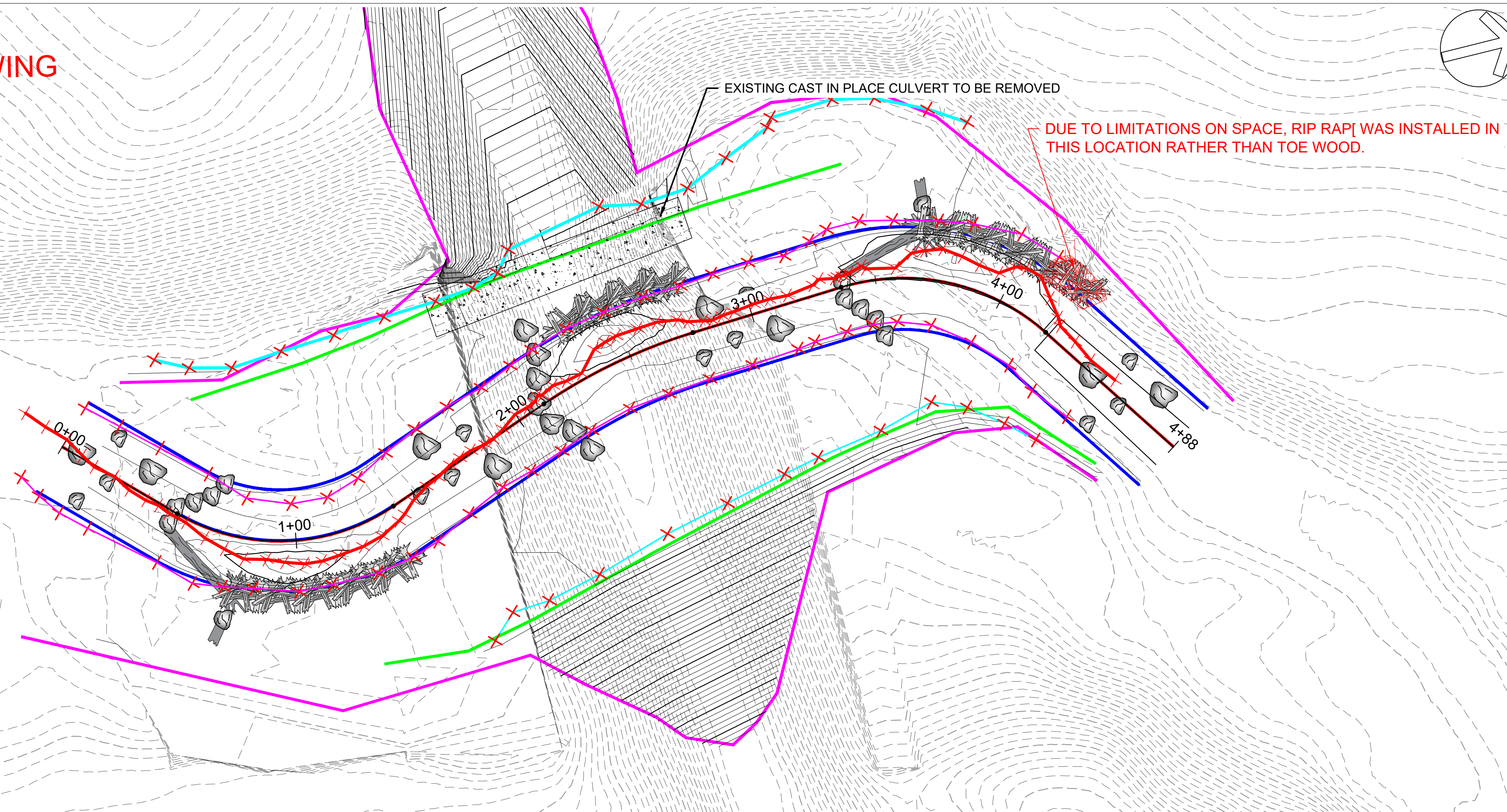
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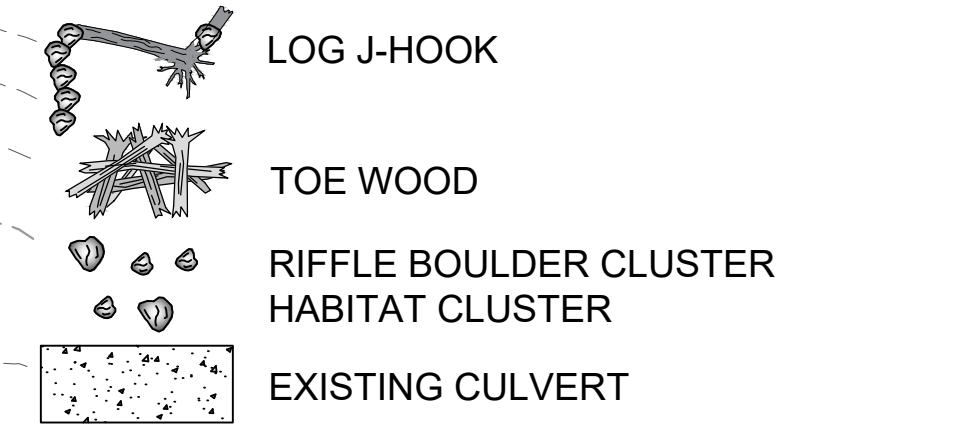
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**RECORD DRAWING**



**PLAN LEGEND**

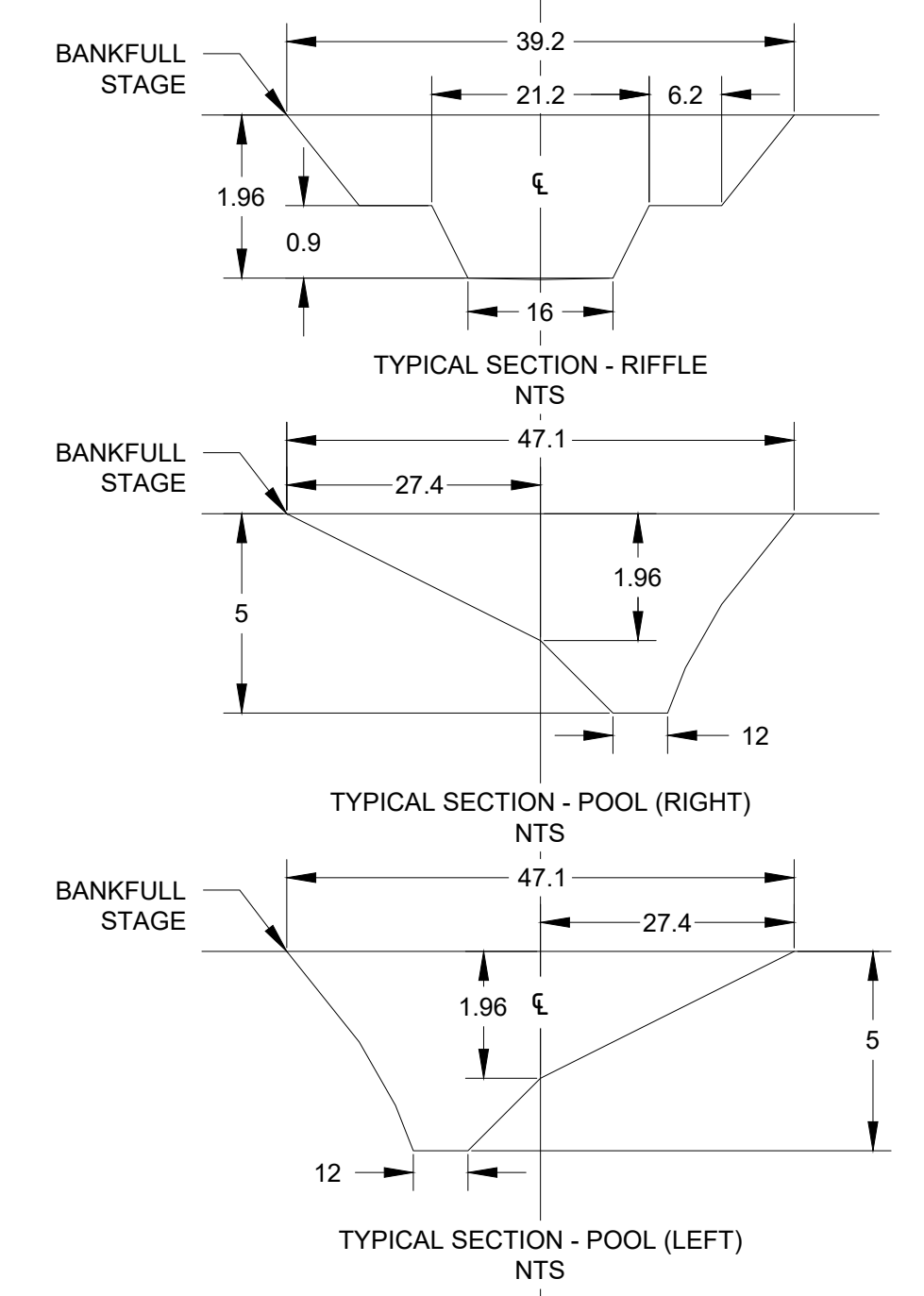
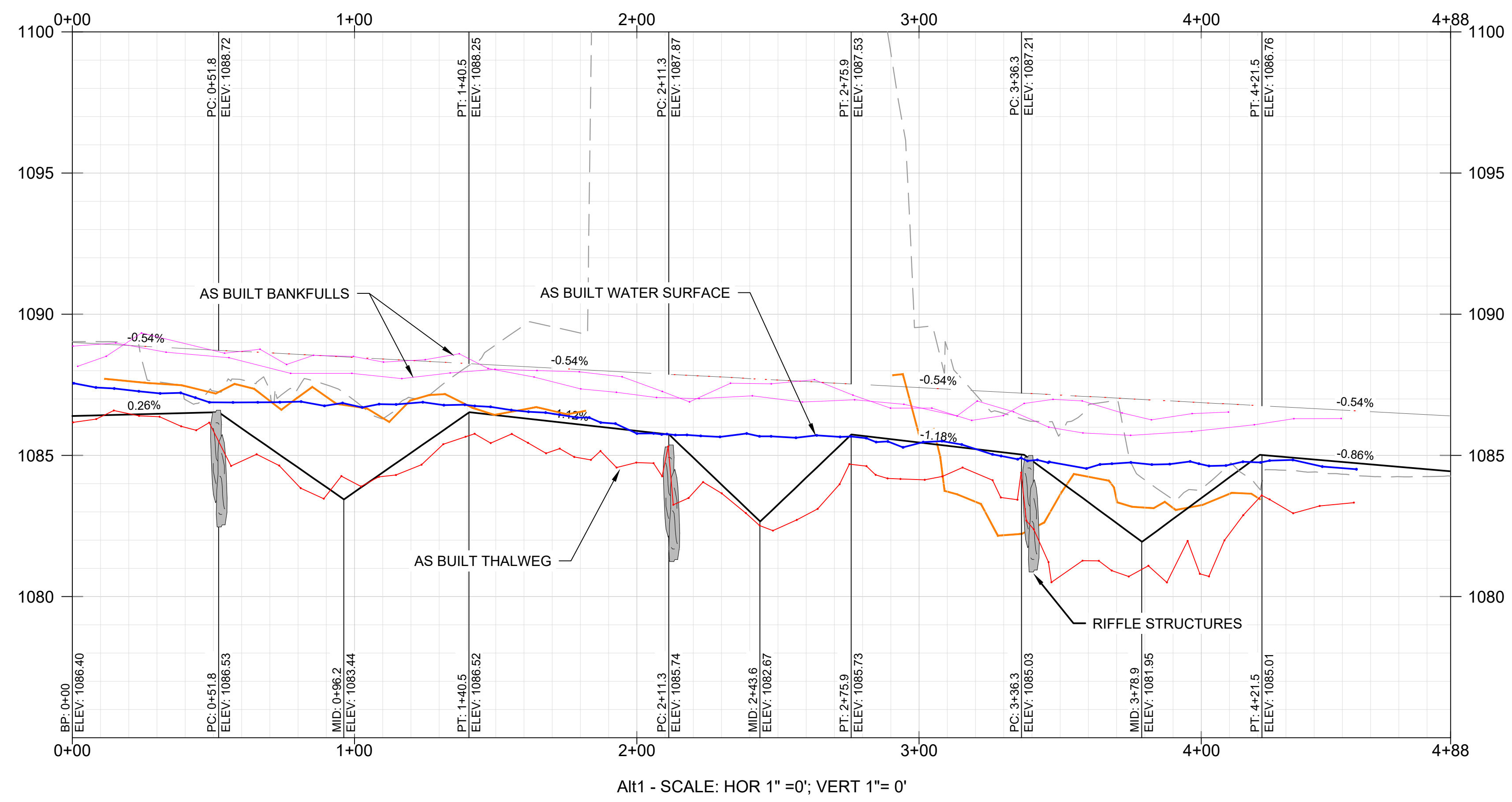
- AS BUILT THALWEG
- AS BUILT WATER SURFACE
- AS BUILT FLOODPLAIN TOE
- AS BUILT BANKFULL
- PROPOSED STREAM CENTER LINE
- PROPOSED BANKFULL
- PROPOSED FLOODPLAIN TOE
- PROPOSED LIMITS OF DISTURBANCE
- (483) PROPOSED MAJOR CONTOUR
- 479 PROPOSED MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR



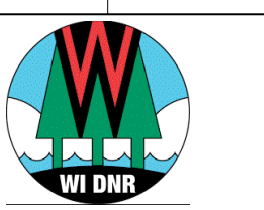
**PROFILE LEGEND**

- PROPOSED STREAM THALWEG
- PROPOSED STREAM BANKFULL
- EXISTING THALWEG
- EXISTING GROUND
- AS BUILT WATER SURFACE
- AS BUILT BANKFULL
- AS BUILT THALWEG

APPROVED BY:	REV	DESCRIPTION	DATE
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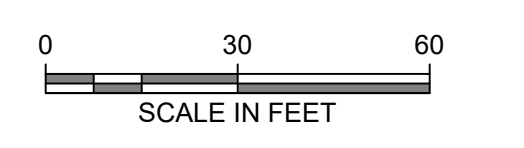
**NEBAGAMON CREEK RESTORATION**  
**CULVERT REMOVAL AND RIVER IMPROVEMENTS**  
 DOUGLAS COUNTY  
 LAKE NEBAGAMON, WI  
 AS BUILT SET  
 PLAN PROFILE SHEET  
 BID SET



WI DNR  
LAKE SUPERIOR TRIBUTARIES  
SUPERIOR, WI  
715.392.7990

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DULUTH, MN 55803  
218.626.7450

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SHEET NUMBER  
4 OF 13



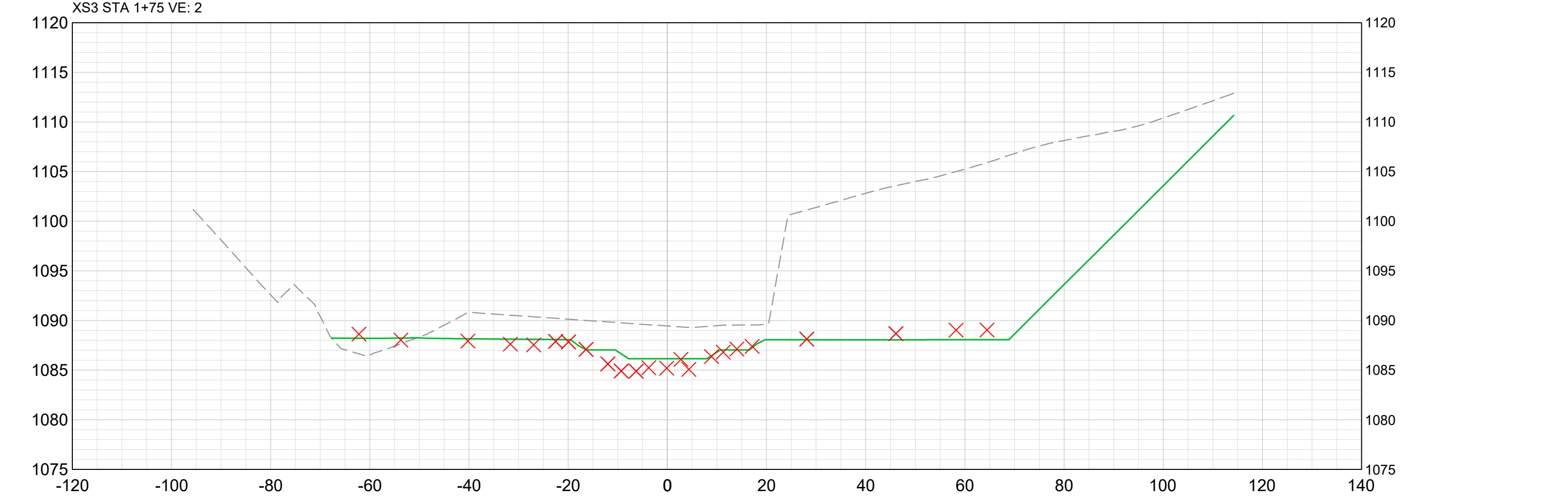
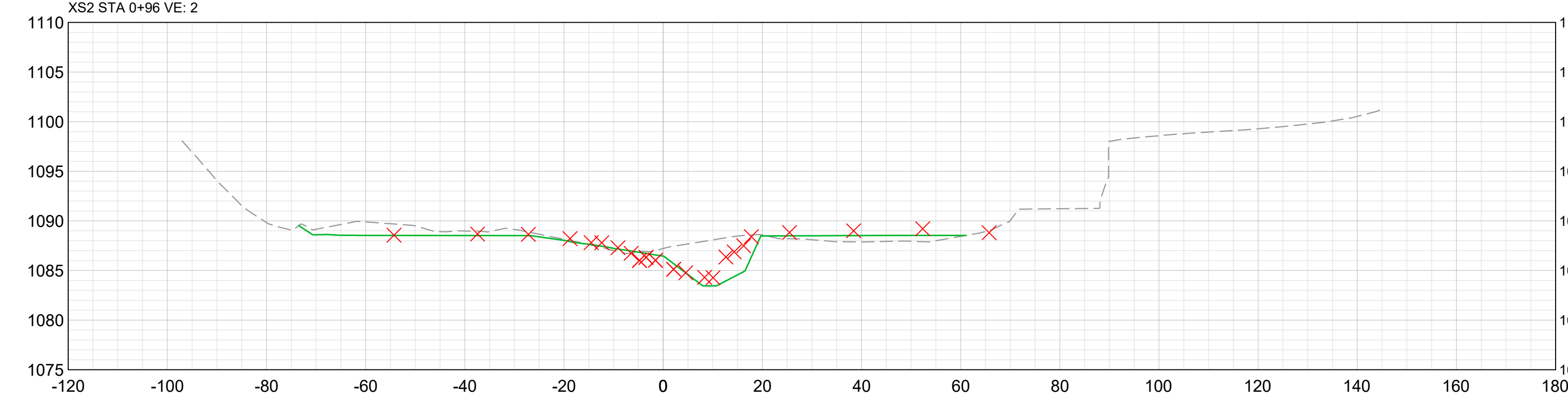
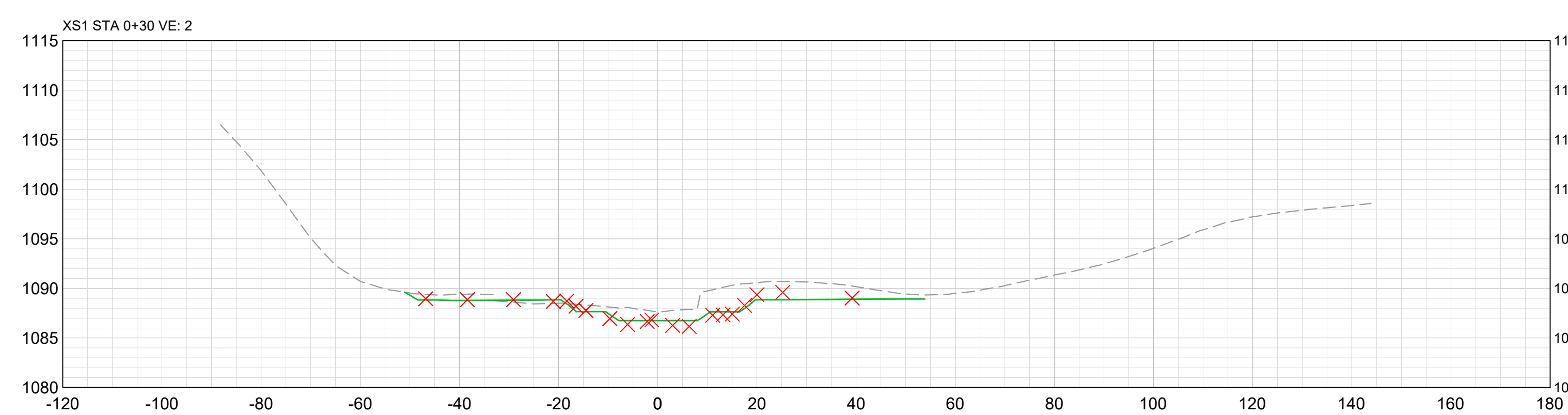




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# RECORD DRAWING

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 - - - - - EXISTING GROUND  
 X AS BUILT ELEVATION



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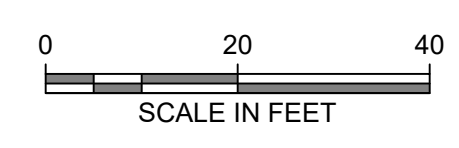
NEBAGAMON CREEK RESTORATION  
 CULVERT REMOVAL AND RIVER IMPROVEMENTS  
 DOUGLAS COUNTY  
 LAKE NEBAGAMON, WI  
 AS BUILT SET  
 CROSS-SECTION SHEET 1  
 BID SET



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 DULUTH, MN 55803  
 218.626.7450

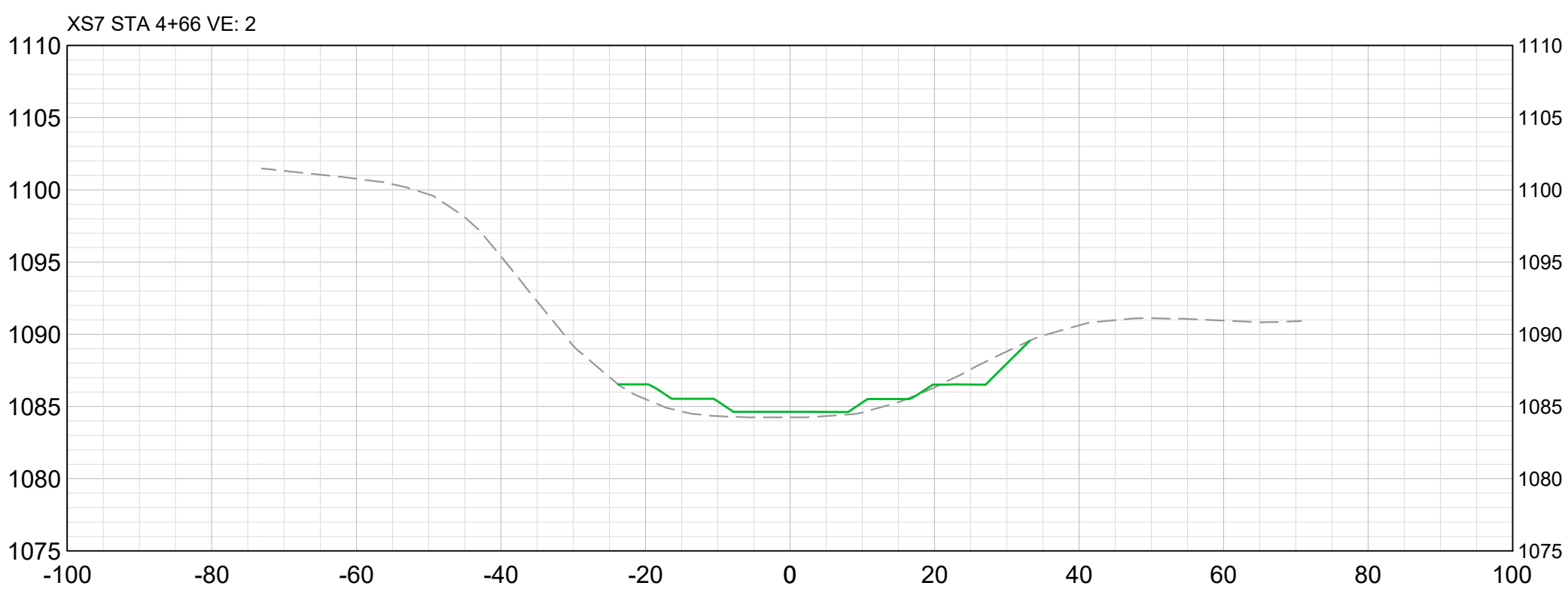
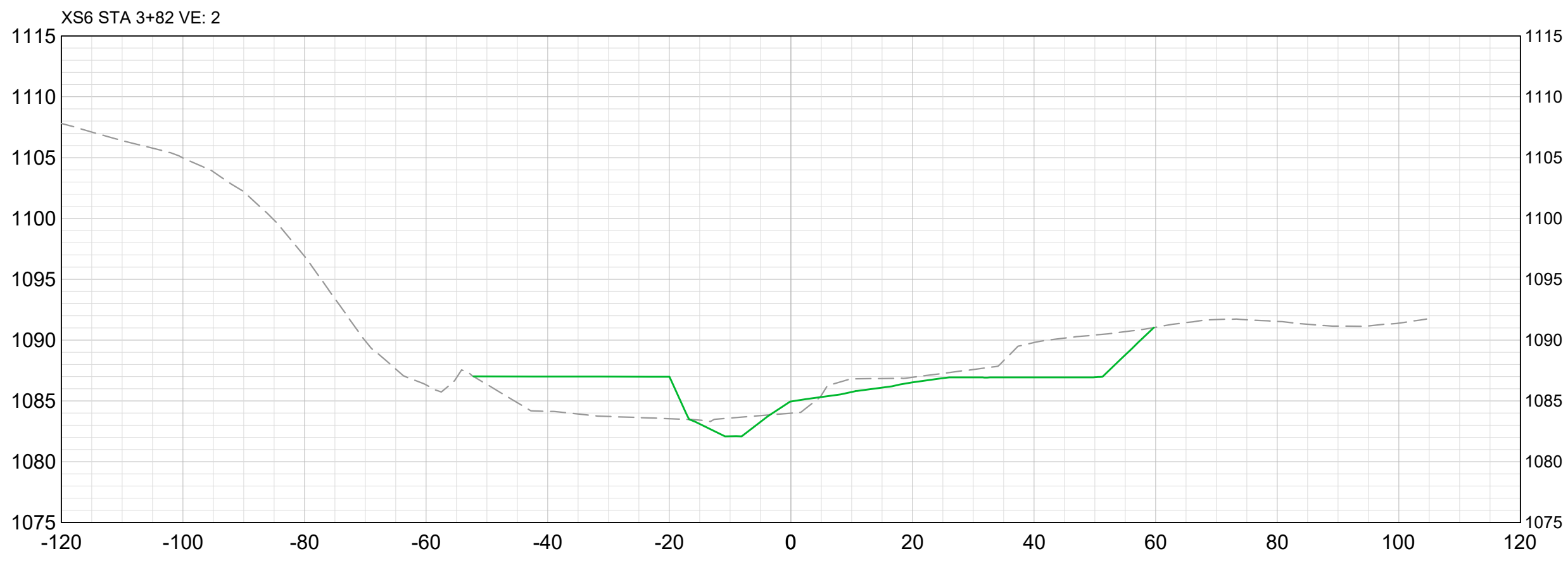
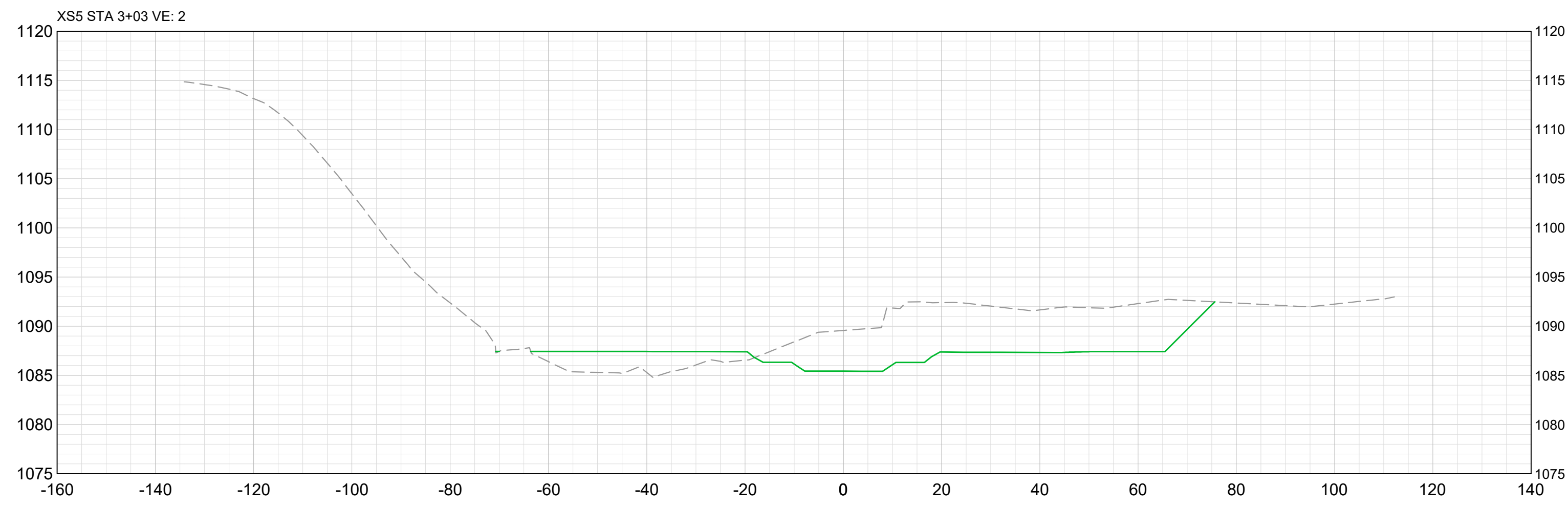
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 SCALE (17"X11"): 1" = 40'



SHEET NUMBER  
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 - - - - - EXISTING GROUND  
 x AS BUILT ELEVATION

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**NEBAGAMON CREEK RESTORATION  
 CULVERT REMOVAL AND RIVER IMPROVEMENTS  
 DOUGLAS COUNTY  
 LAKE NEBAGAMON, WI**

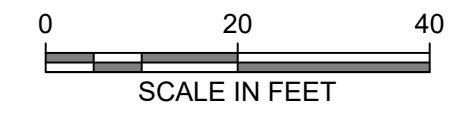
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BEAVER RIVER CONSULTING  
 5752 EAGLE VIEW DR  
 DULUTH, MN 55803  
 218.626.7450

AS BUILT SET

DATE: 11/30/23  
 SCALE (34"X22"): 1" = 20'  
 SCALE (17"X11"): 1" = 40'



SHEET NUMBER  
 7 OF 13



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NEBAGAMON CREEK RESTORATION  
 CULVERT REMOVAL AND RIVER IMPROVEMENTS  
 DOUGLAS COUNTY  
 LAKE NEBAGAMON, WI  
 AS BUILT SET  
 SOIL AND EROSION PLAN VIEW  
 BID SET

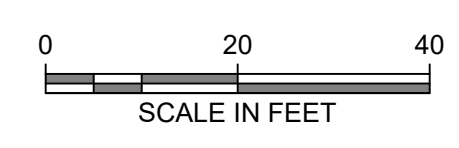


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SHEET NUMBER  
 8 OF 13

INSTALL SILT FENCE DOWNGRADIENT OF EMBANKMENT REMOVAL AREA

CONSTRUCT 2 FOOT HIGH BERM TO DIRECT FLOW INTO BYPASS CHANNEL

PROPOSED BYPASS CHANNEL

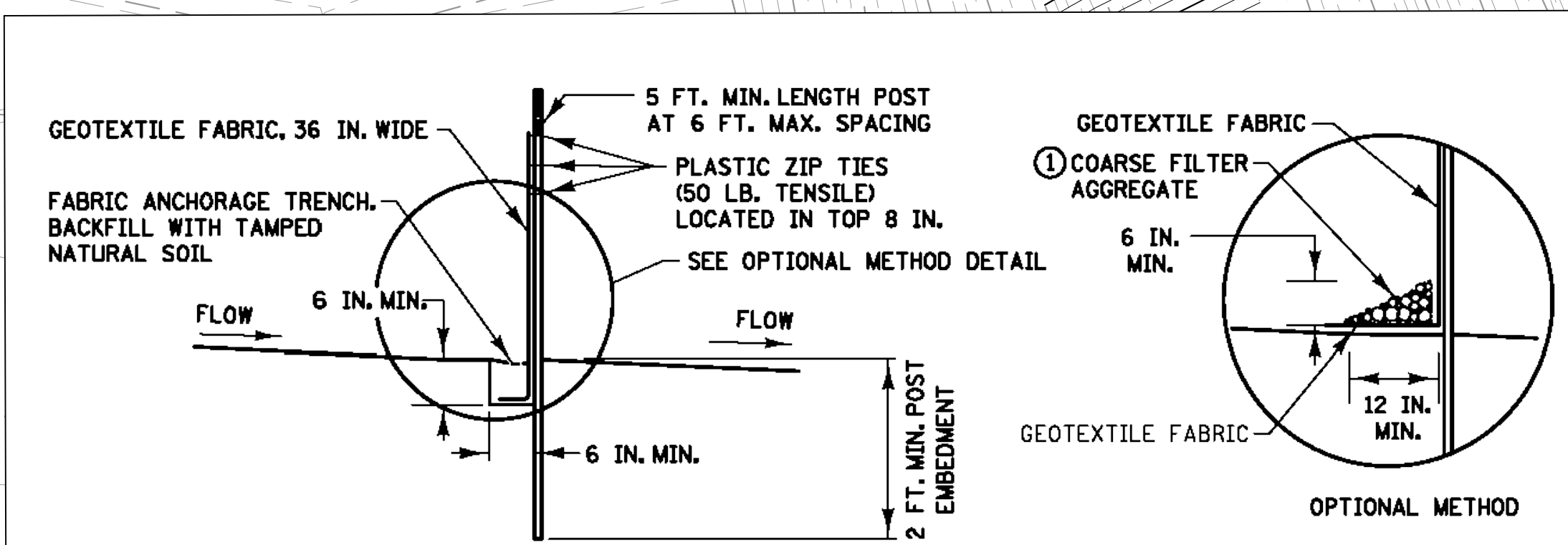
EXISTING CULVERT

INSTALL SILT FENCE DOWNGRADIENT OF EMBANKMENT REMOVAL AREA

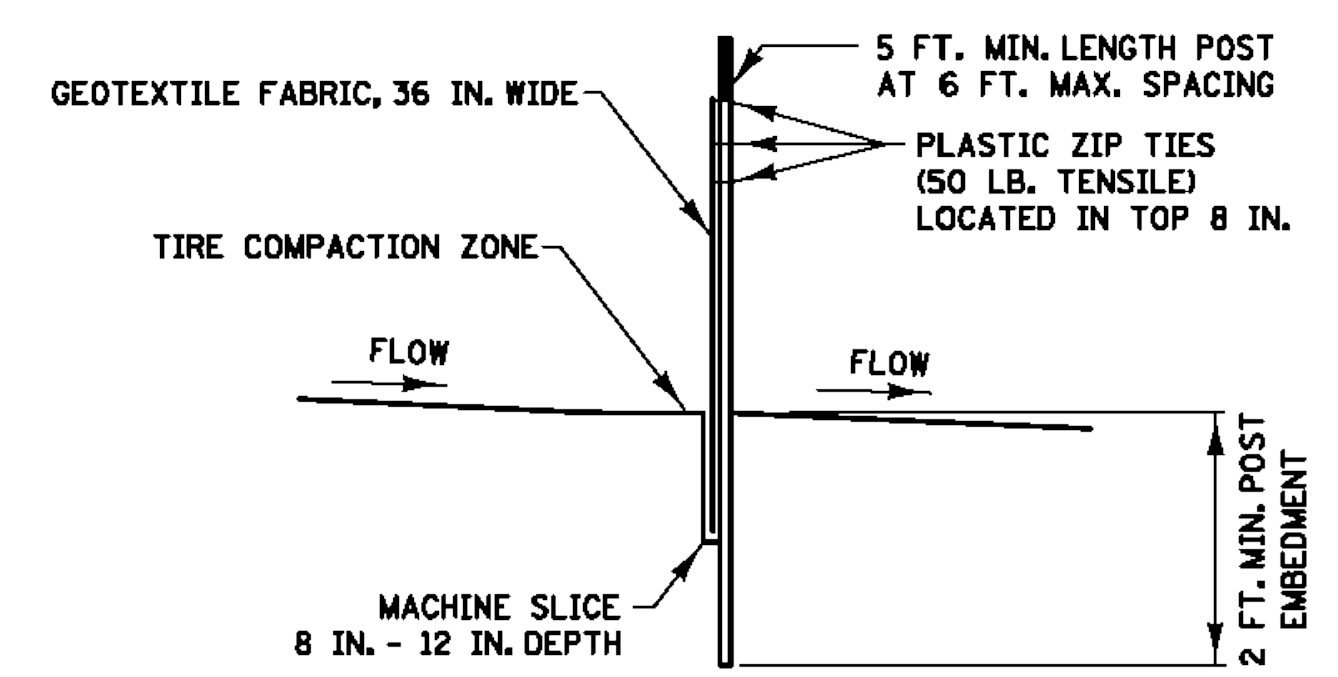
ONCE EMBANKMENT IS REMOVED, INSTALL SILT FENCE PRIOR TO REMOVING CULVERT

INSTALL SILT FENCE DURING REMOVAL OF EMBANKMENT

- CONSTRUCTION SEQUENCE AND EROSION CONTROL NOTES
- CLEAR AND GRUB EMBANKMENT FOR PURPOSES OF EXCAVATING MATERIAL
  - INSTALL DOWNGRADIENT SEDIMENT CONTROL
  - REMOVE EMBANKMENT MATERIAL AND HAUL OFF EXCESS TO DISPOSAL SITE
  - INSTALL DIVERSION SYSTEM BY DIVERTING FLOW THROUGH THE USE OF A DIVERSION BERM FROM EXISTING CHANNEL TO DIVERSION CHANNEL SHOWN ON PLANS, REMOVE DEBRIS ON DOWNSTREAM END OF CULVERT TO ALLOW FOR ADDITIONAL WATER TO FLOW AND LOWER UPSTREAM WATER SURFACE ELEVATIONS. IF NEEDED REMOVE PORTIONS OF CULVERT DOWNSTREAM TO ALLOW FOR THE WATER ELEVATION TO DROP UPSTREAM
  - EXCAVATE NEW CHANNEL AND FILL FLOODPLAIN TO DESIGN ELEVATIONS
  - INSTALL STREAM RIFFLES, TOE WOOD, J-HOOKS AND OTHER STREAM RELATED STRUCTURES
  - SEED AND APPLY EROSION CONTROL BLANKET IN STREAM AND FLOODPLAIN AREAS AS SHOWN IN THE PLANTING AND SEEDING PLAN
  - REMOVE DIVERSION BERM AND ALLOW FLOW TO ENTER NEW CHANNEL
  - REMOVE THE REMAINING CAST IN PLACE CULVERT
  - COMPLETE FINAL CONSTRUCTION OF THE LOWEST END OF THE STREAM PROJECT AND TIE INTO THE EXISTING STREAM BED
  - FILL THE ACCESS ROAD, SEED, AND INSTALL EROSION CONTROL BLANKET
  - PLANT TREES AND REMOVE SILT FENCE
  - PERFORM FINAL CLEAN UP AND SEEDING AND MULCHING OF ACCESS ROAD AND STAGING AREAS



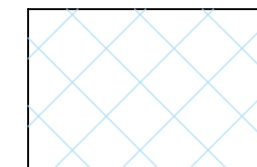
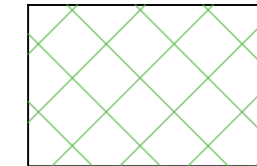
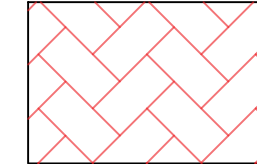
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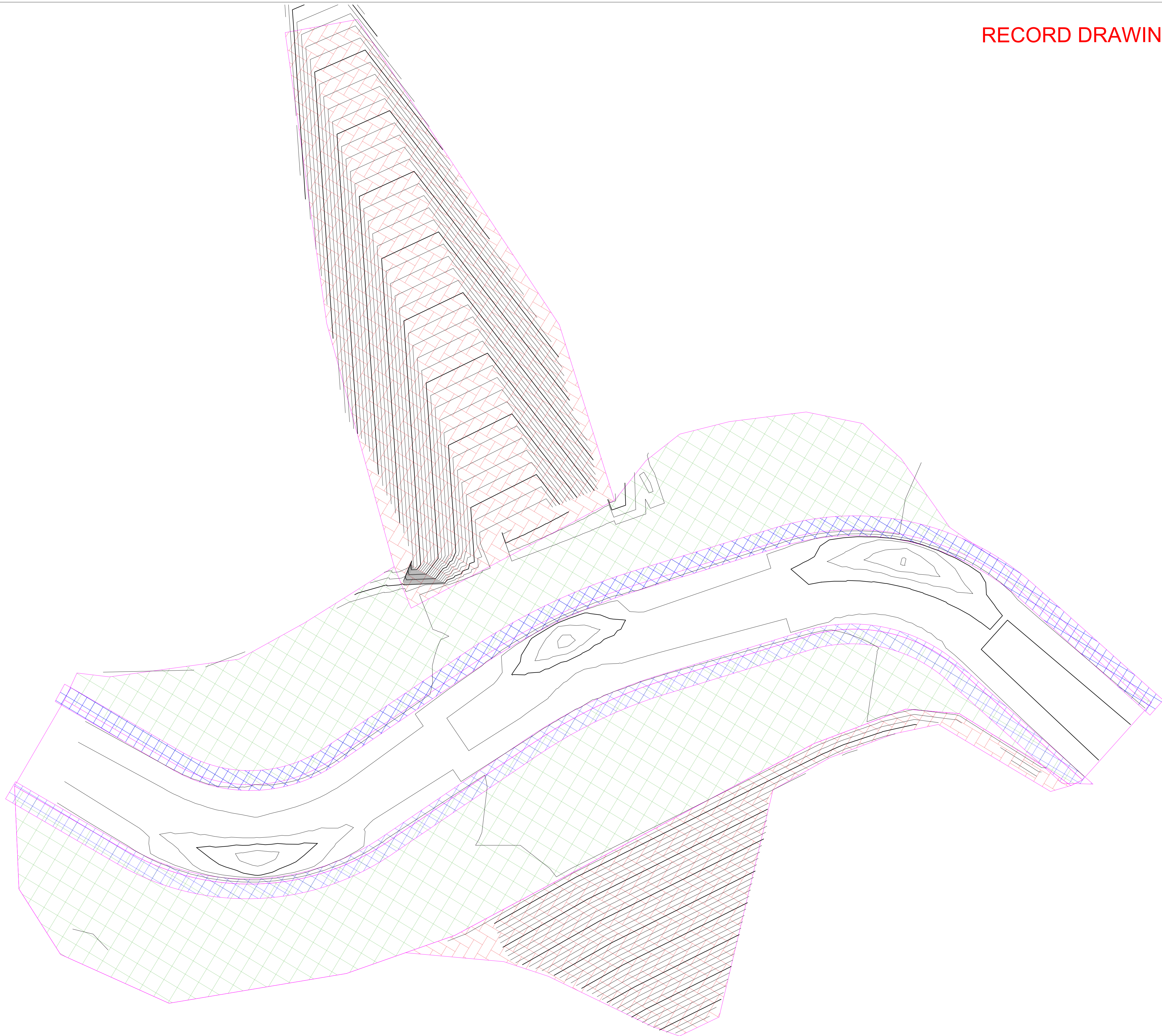


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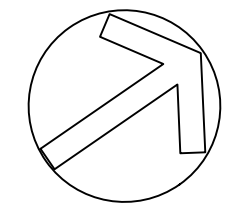


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-  VEGETATION ZONE 1
-  VEGETATION ZONE 2
-  VEGETATION ZONE 3

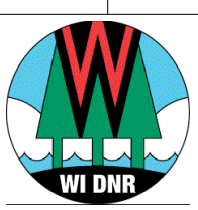


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**NEBAGAMON CREEK RESTORATION**  
**CULVERT REMOVAL AND RIVER IMPROVEMENTS**  
 DOUGLAS COUNTY  
 LAKE NEBAGAMON, WI  
 AS BUILT SET  
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 VEGETATION PLAN VIEW  
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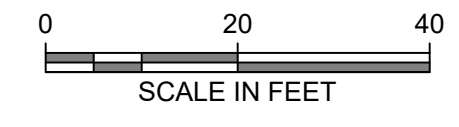


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SHEET NUMBER  
**9 OF 13**

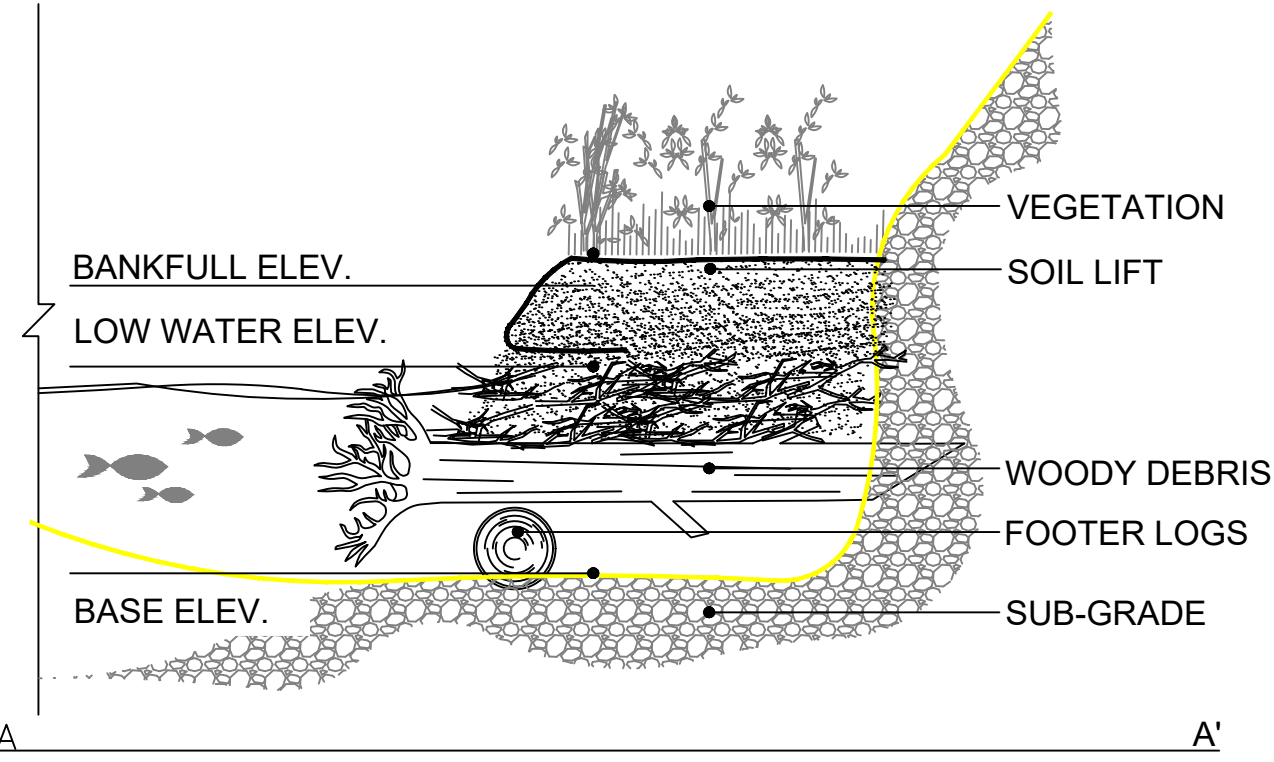


### 1. INSTALLATION SUMMARY

TOEWOOD BENCH CONSTRUCTION WILL BE DONE IN DRY WEATHER CONDITIONS AFTER STREAM HAS BEEN DIVERTED AND SITE DEWATERED.

ENGINEER OR SWCD REPRESENTATIVE MUST BE PRESENT FOR INSTALLATION OF TOEWOOD BENCH.

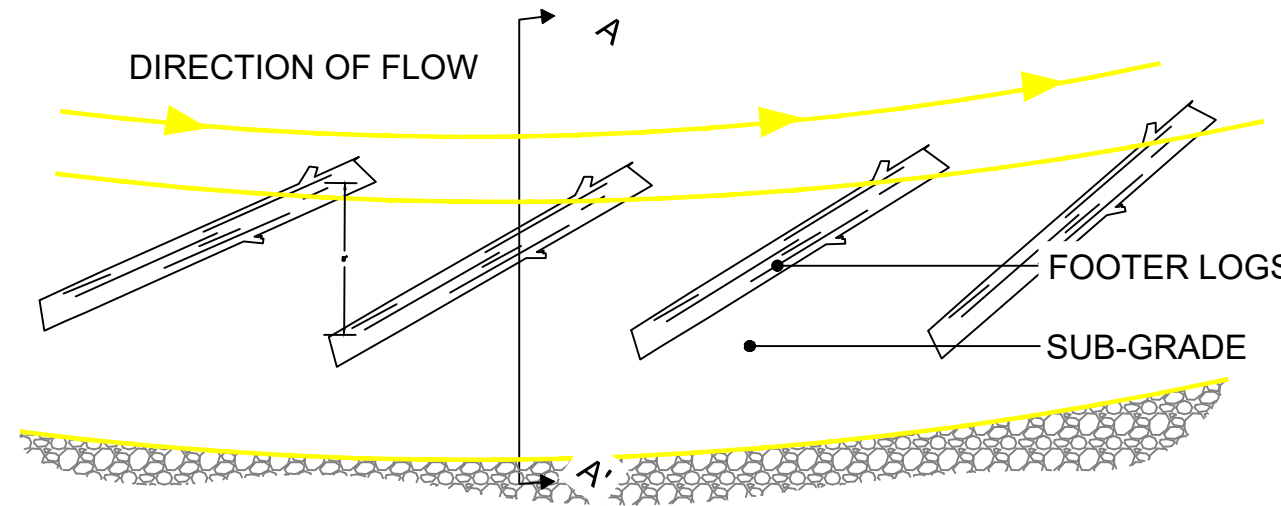
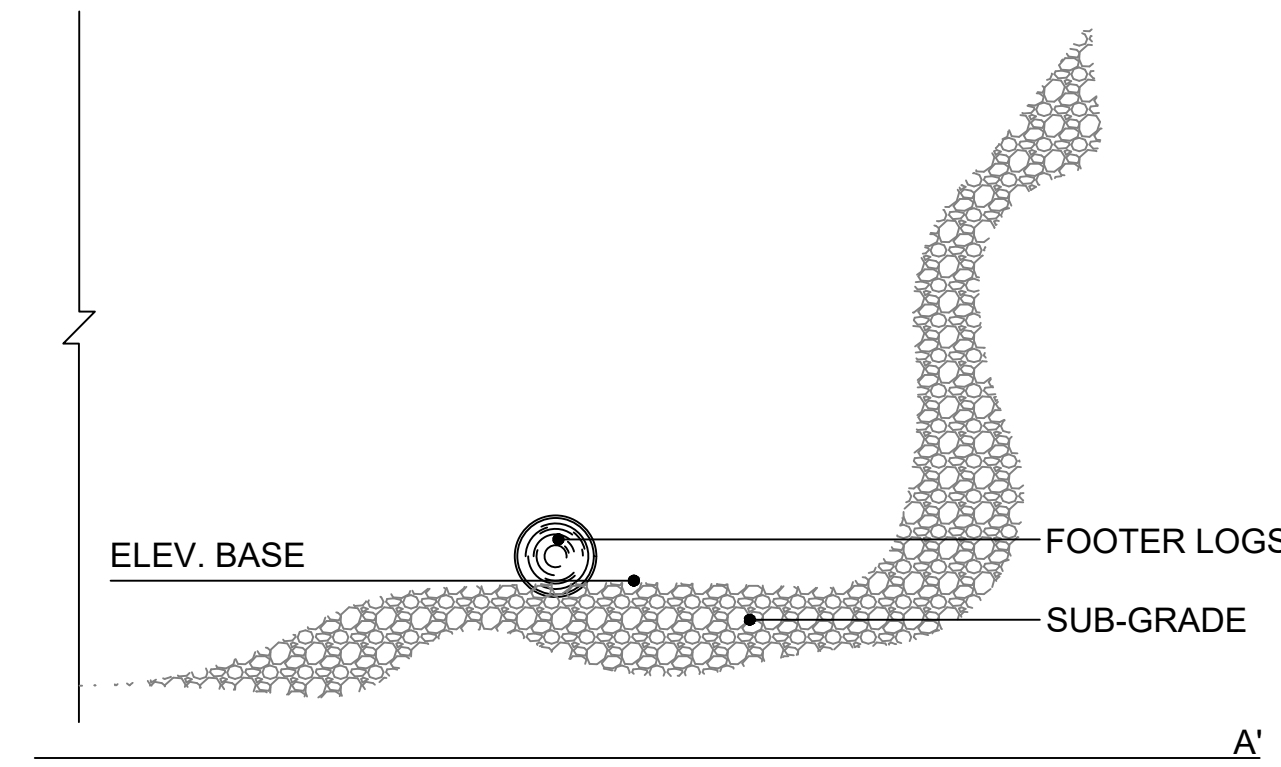
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### 2. SUBGRADE AND FOOTER LOGS

**SPECIFICATION:**  
 -10" MIN. DIAMETER  
 -LIMBS REMOVED  
 -10' MIN. LENGTH

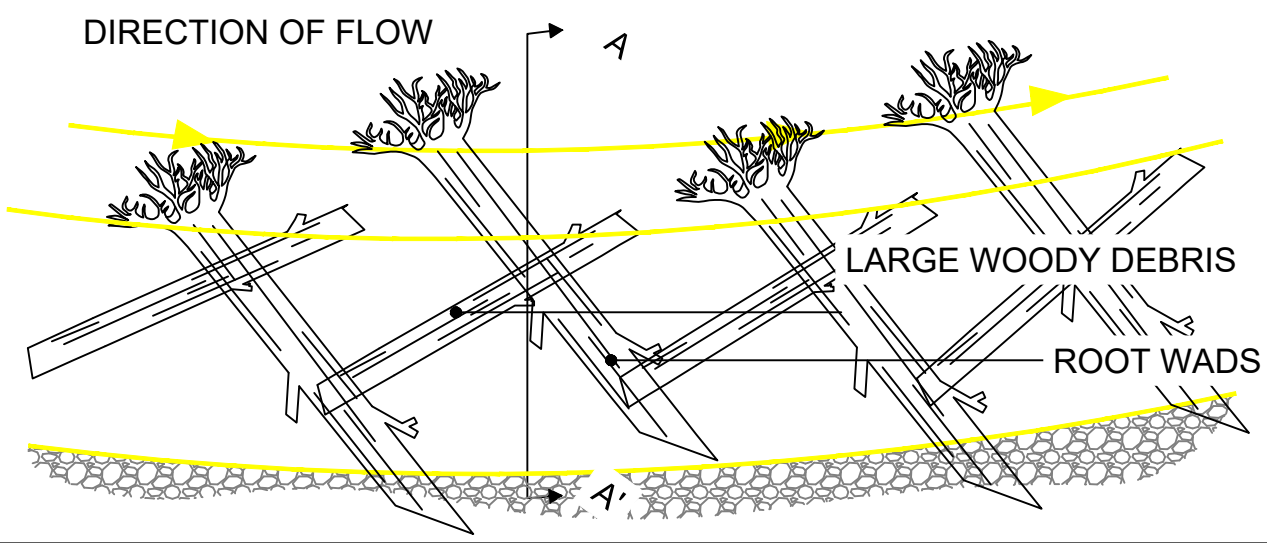
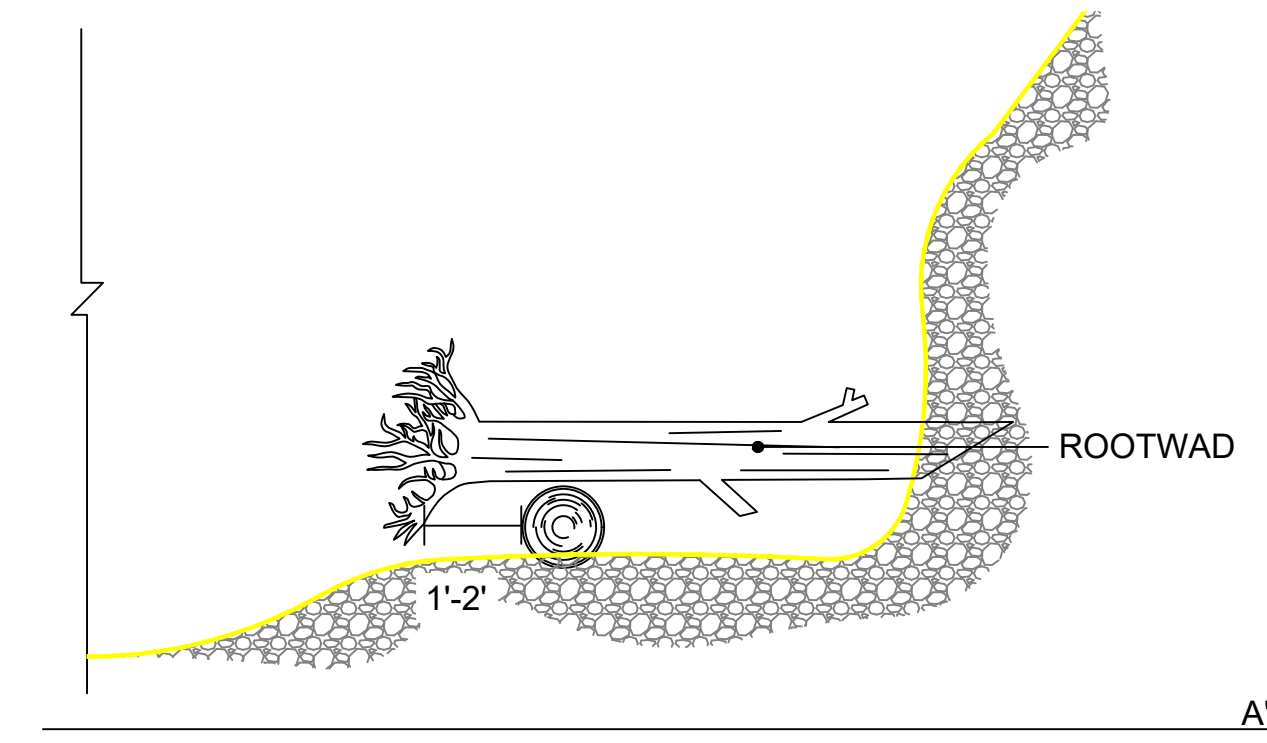
**PLACEMENT:**  
 -EXCAVATE TO BASE ELEVATION  
 -CONTRACTOR SHALL MAKE EFFORT TO SEPARATE GRANULAR AND FINE FILL NATIVE MATERIAL FOR USE IN STEPS 4 AND 5.  
 -SPACE FOOTER LOGS ENDS 8' APART, PERPENDICULAR TO STREAM  
 -KEY FOOTER LOGS 8' INTO BANK, 2' PROTRUDING INTO STREAM.



### 3. ROOTWAD PLACEMENT

**ROOTWAD SPECIFICATION:**  
 -10" MIN DIAMETER  
 -LOG LENGTH OF 10' MIN.  
 -LIMBS SHALL BE REMOVED  
 -ROOT WADS SHALL BE LEFT INTACT

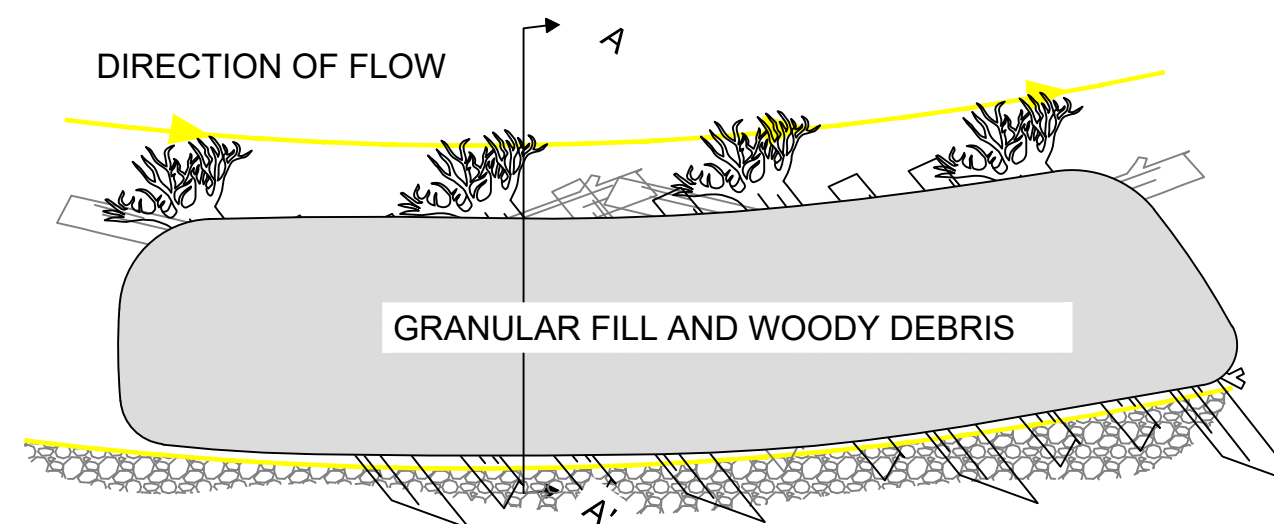
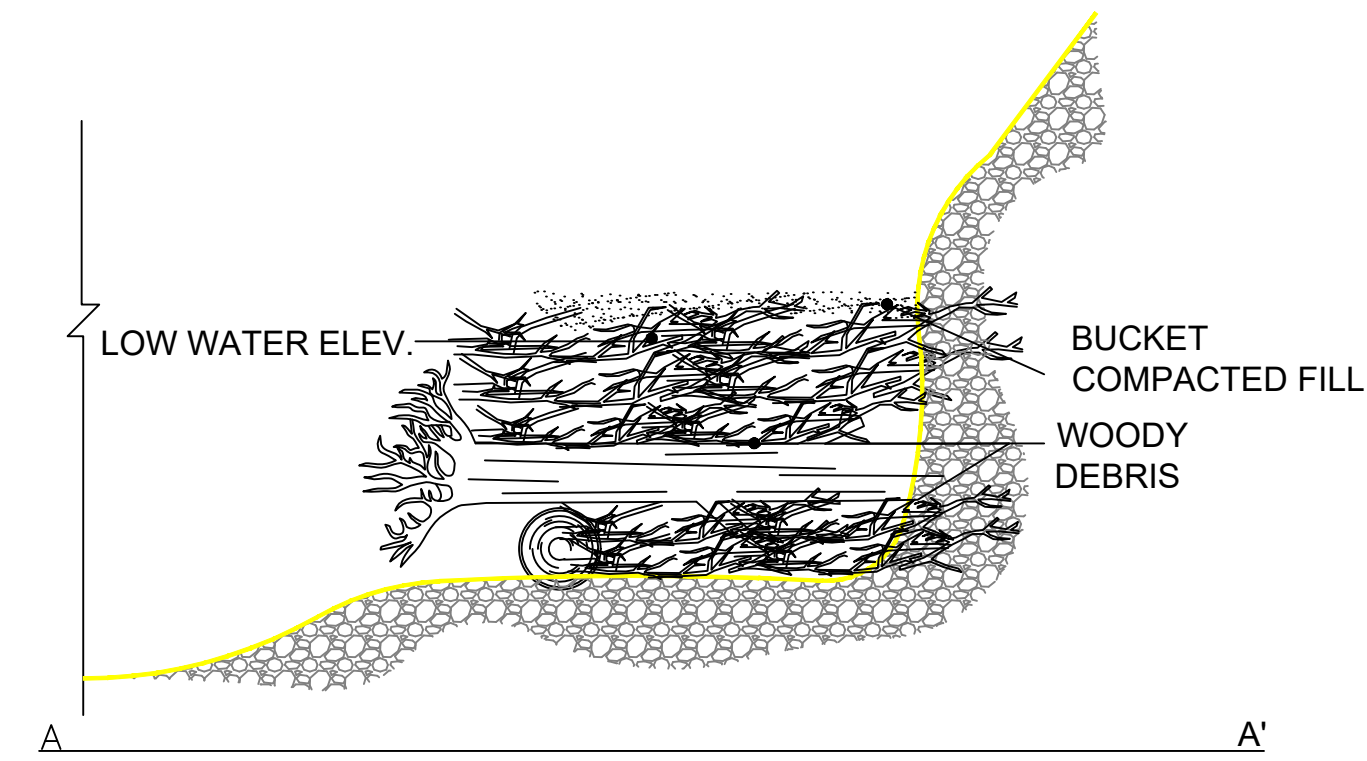
**PLACEMENT:**  
 -PLACE ROOTWADS ON TOP OF FOOTER LOGS AS SHOWN, OVERHANG ROOT WAD LOGS 1'-2'. VARY AND SHOWN SUCH THAT EVERY OTHER ROOT WAD IS PROTRUDING INTO STREAM 2 FEET  
 -ANGLE ROOTWADS UPSTREAM AS DIRECTED IN FIELD  
 -PLACE 1 ROOT WAD PER FOOTER LOG



### 4. WOODY DEBRIS PLACEMENT

**WOODY MATERIAL SPECIFICATION:**  
 -WOODY MATERIAL (COMPOSED OF 75% SMALL LIMBS AND BRANCHES, 25% MEDIUM SIZED MATERIAL (3-6" LIMBS), AND LOGS UP TO 10" IN DIAMETER (ONE PER FIVE FEET),  
 -ALL MATERIAL SHALL BE FRESHLY CUT (NO ROTTEN LOGS OR LIMBS)

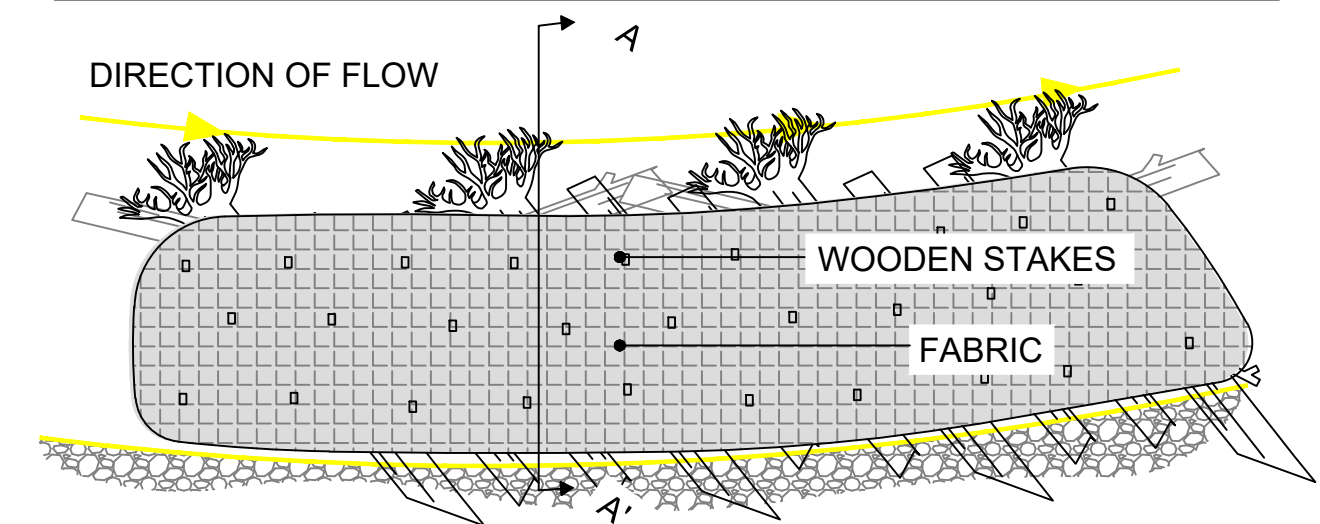
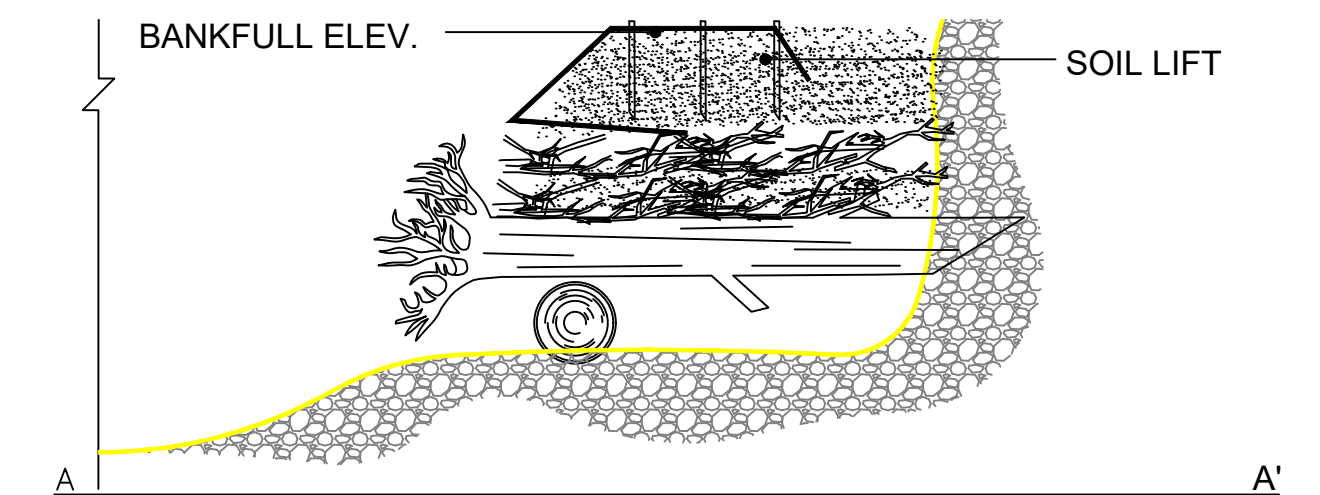
**PLACEMENT:**  
 -FILL BETWEEN FOOTER LOGS AND ROOTWADS WITH WOODY MATERIAL  
 -PLACE WOODY MATERIAL TO 0.5' ABOVE LOW WATER ELEVATION  
 -LAYER GRANULAR FILL ON TOP OF WOODY DEBRIS  
 -COMPACTED FILL SHALL BE PLACED SUCH THAT THE TOP IS 0.8' ABOVE LOW WATER ELEVATION



### 5. SOIL LIFT

**MATERIAL SPECIFICATION:**  
 -BLANKET SHALL BE: MIN 9.8' WIDE ROLANKA BIOD-MAT 70, GEOCOIR 700, OR EQUAL BACKED WITH MNDOT CAT 3N EROSION CONTROL BLANKET WITH NATURAL NETTING  
 -WOODEN STAKES: 18" WOODEN STAKES (2X4 CUT AT ANGLE OR EQUAL), PLACED AT MANUFACTURERS RECOMMENDED SPACING (3' MIN. TYP.) ALONG BLANKET.

**PLACEMENT:**  
 -LAY BLANKET ON TOP OF SOIL A MINIMUM OF 3 FEET BACK FROM FACE OF WOOD, ON TOP OF BENCH ENSURE THAT COIR BLANKET IS A MINIMUM OF 3 FEET BACK FROM TOP OF BENCH  
 -PLACE FILL ON TOP OF BLANKET SLOPE AT 2:1 (H:V).  
 -BEFORE WRAPPING UP BLANKET, SEED ALL AREAS ABOVE LOW FLOW ELEVATION WITH MNDOT SEED MIX 34-361 RIPARIAN NORTHEAST @ 60 LBS/ACRE.  
 -BUCKET COMPACT UNTIL BANKFULL ELEVATION IS MET, GRADE TOP OF BENCH 2% TO EXISTING GROUND.  
 -TRENCH COCONUT BLANKET INTO GROUND 1.0' ALONG OUTSIDE OF BEND.



## RECORD DRAWING

NEBAGAMON CREEK RESTORATION  
 CULVERT REMOVAL AND RIVER IMPROVEMENTS  
 DOUGLAS COUNTY  
 LAKE NEBAGAMON, WI

AS BUILT SET  
 TOE WOOD STREAM DETAIL  
 BID SET



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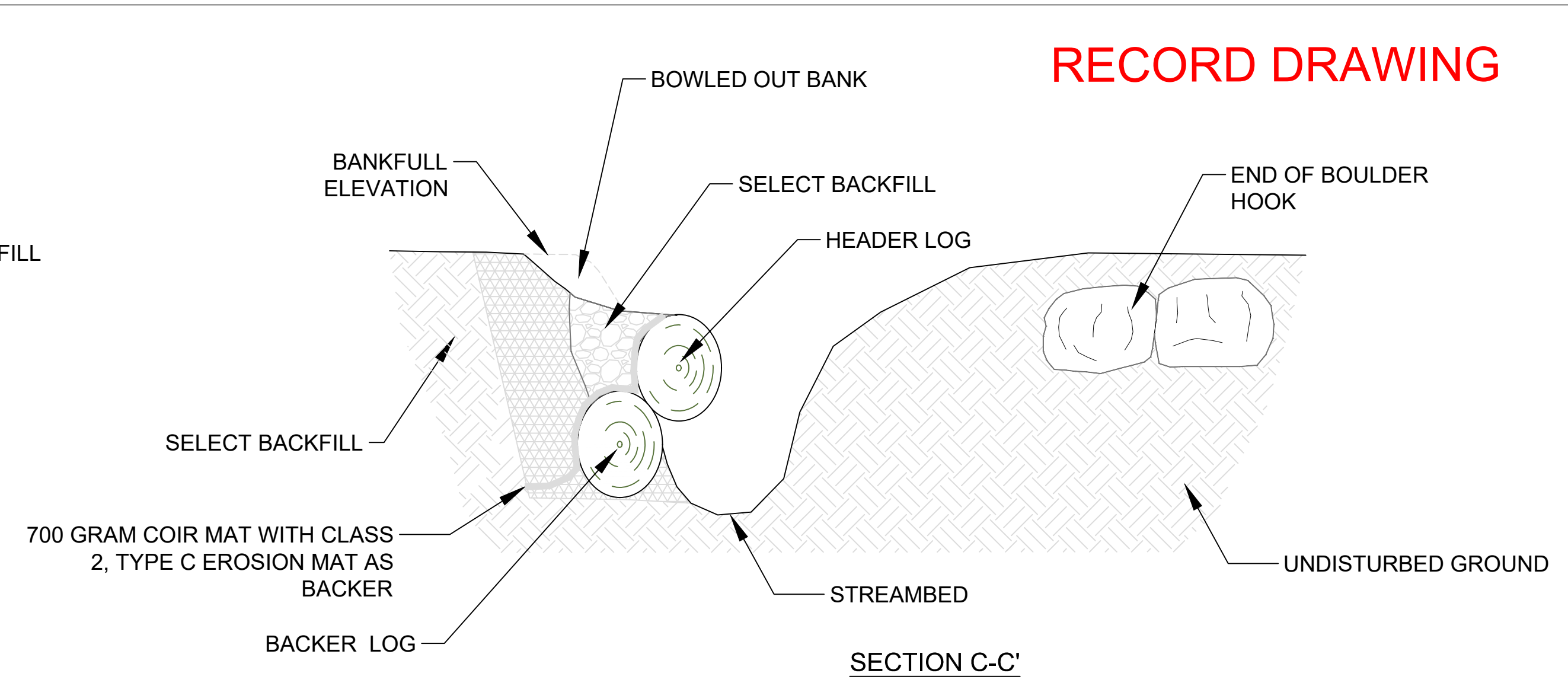
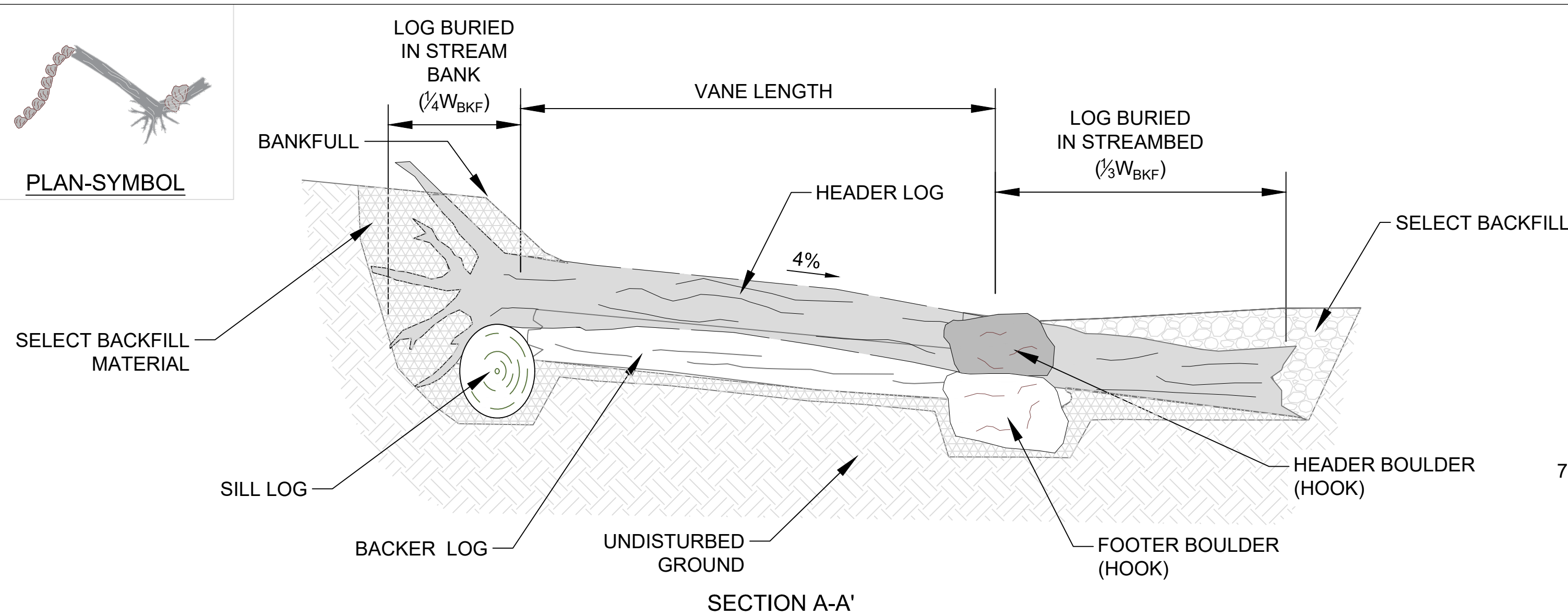
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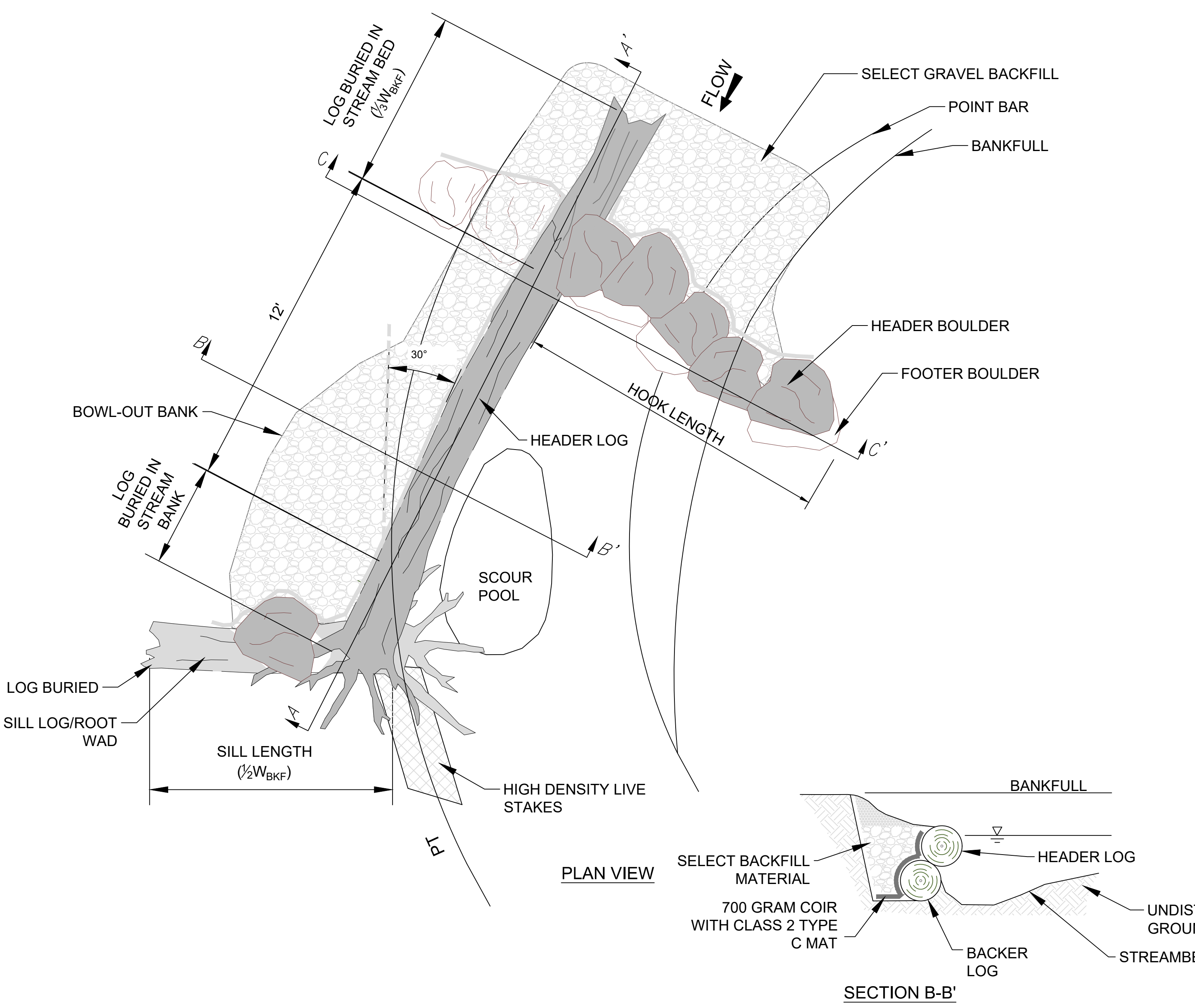
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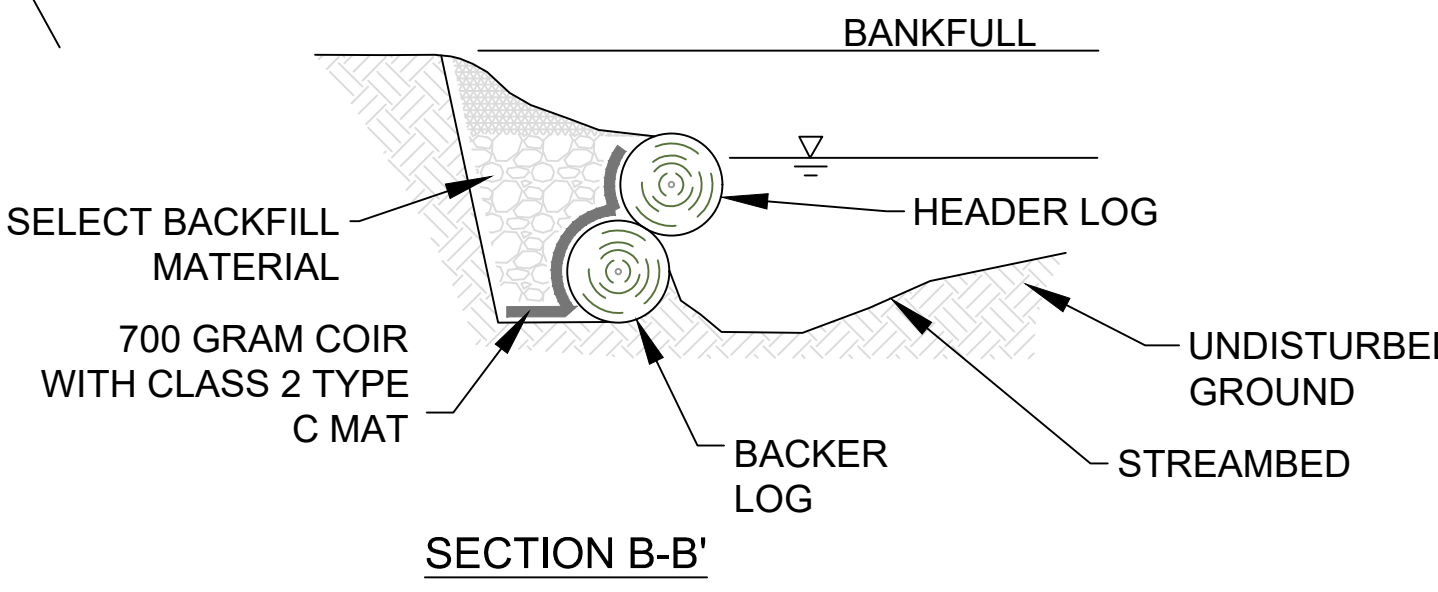
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**RECORD DRAWING**



**PLAN VIEW**



**SECTION B-B'**

**DETAIL - LOG J-HOOK WITH ROOTWAD  
NOT TO SCALE**

**NOTES:**

1. THE LOG J-HOOK WITH ROOT WAD IS USED TO STABILIZE THE OUTSIDE BANK OF A STREAM CHANNEL IN A BEND BY PHYSICALLY PROTECTING THE BANK AND HELPING TURN THE WATER TOWARD THE CENTER OF THE CHANNEL. THE LOG J-HOOK WITH ROOT WAD CAN BE USED TO HELP STABILIZE AN EXISTING CHANNEL OR TO PROTECT THE BANK OF A NEWLY CONSTRUCTED CHANNEL.
2. THE STRUCTURE IS COMPRISED OF BOTH LOGS AND BOULDERS. LOGS SHALL HAVE A MINIMUM DIAMETER OF 18". THE LENGTH OF THE LOGS EXPOSED PORTION SHALL BE 12'. ALL LOGS SHALL BE RELATIVELY STRAIGHT AND LIMBS SHALL BE TRIMMED FLUSH. THE SIZE OF THE BOULDERS VARIES WITH THE SIZE OF THE CHANNEL.
3. HEADER LOGS/BOULDERS SHALL BE UNDERLAIN BY FOOTER LOGS/BOULDERS UNLESS OTHERWISE DIRECTED BY THE ENGINEER. FOOTER LOGS PROVIDE SCOUR PROTECTION FOR HEADER LOGS. FOOTER BOULDERS PROVIDE SCOUR PROTECTION AND A FOUNDATION FOR THE HEADER BOULDERS.
4. THE SILL LOG WITH ROOT WAD IS GENERALLY INSTALLED FIRST. THE CONTRACTOR SHALL DIG A TRENCH PERPENDICULAR TO THE BANKFULL FLOW DIRECTION AND INSTALL THE SILL LOG. IT MAY BE NECESSARY TO CUT THE SILL LOG ROOTWAD TO PREVENT THE ROOTWAD FROM PROTRUDING ABOVE THE BANKFULL ELEVATION. A BOULDER OR HEADER SILL LOG SHALL BE PLACED ON THE SILL LOG TO EFFECTIVELY EXTEND THE SILL FURTHER INTO THE BANK.
5. THE HEADER LOG OF THE VANE ARM IS GENERALLY INSTALLED NEXT. THE CONTRACTOR SHALL DIG A TRENCH TO FACILITATE THE INSTALLATION OF THE VANE ARM. THE HEADER LOG SHALL TIE INTO THE STREAM BANK AT A MINIMUM ELEVATION OF 1/4 DMAX (MEASURED AT THE NEXT DOWNSTREAM RIFFLE) BELOW BANKFULL ELEVATION AND A MINIMUM ELEVATION OF 1/2 DMAX (MEASURED AT THE NEXT DOWNSTREAM RIFFLE) BELOW BANKFULL ELEVATION UNLESS OTHERWISE DIRECTED BY THE ENGINEER. THE HEADER LOG SHALL EXTEND FROM THE SILL LOG TO BEYOND THE HOOK PORTION OF THE STRUCTURE, GENERALLY AT A SLOPE OF 2-4%. THE VANE ARM FOOTER LOG SHALL BE CUT TO FIT BETWEEN SILL LOG AND THE BOULDER HOOK PORTION OF THE STRUCTURE. THE FOOTER LOG OF THE VANE ARM SHALL BE INSTALLED FROM UPSTREAM SIDE AND INSTALLED AGAINST THE LOWER HALF OF THE HEADER LOG RESULTING IN A STAGGER WITH THE HEADER LOG BEING SLIGHTLY MORE DOWNSTREAM THAN THE FOOTER LOG. ANY GAPS BETWEEN THE HEADER AND FOOTER LOGS WIDER THAN 1" SHALL BE CHINKED WITH BRANCHES AND/OR BRUSH FROM THE UPSTREAM SIDE. WHEN COMPLETE THE FOOTER LOG WILL NOT BE VISIBLE BUT THE HEADER LOG WILL BE VISIBLE DURING LOW FLOWS.
6. THE HOOK PORTION OF THE STRUCTURE CONSISTS OF BOULDERS. THE CONTRACTOR SHALL EXCAVATE A TRENCH TO FACILITATE THE INSTALLATION OF A ROW OF FOOTER

7. BOULDERS (24" MINIMUM DIAMETER) THAT EXTEND FROM THE END OF THE FOOTER LOG OF THE VANE ARM ACROSS THE CHANNEL TO BEYOND BANKFULL ON THE OTHER SIDE OF THE CHANNEL CREATING A BURIED SILL. THE CONTRACTOR SHALL INSTALL HEADER BOULDERS ON TOP OF THE FOOTER BOULDERS. ALL BOULDERS SHALL BE FIT TIGHTLY TOGETHER AND ANY GAPS WIDER THAN 1" SHALL BE CHINKED WITH GRAVEL AND COBBLE FROM THE UPSTREAM SIDE WITH ROCKS. WHEN COMPLETE THE FOOTER BOULDERS WILL NOT BE VISIBLE BUT THE HEADER BOULDERS WILL BE VISIBLE DURING LOW FLOWS.
  8. THE LOCATION AND ELEVATION OF THE SILL, VANE ARM AND BOULDER HOOK STRUCTURE MAY NOT VARY FROM THOSE SPECIFIED IN THE PLANSHEETS UNLESS DIRECTED OTHERWISE BY THE ENGINEER. THE FOOTER DEPTH ON ALL STRUCTURES REQUIRING FOOTERS SHALL BE 6 TIMES GREATER THAN THE DROP BETWEEN THE STRUCTURE AND THE FOOTERED STRUCTURE DIRECTLY DOWNSTREAM.
- THE EXCAVATED AREAS UPSTREAM OF THE SILL, VANE ARM AND BOULDER HOOK SHOULD BE FILLED WITH SELECT BACKFILL MATERIAL AS SPECIFIED AND APPROVED BY THE ENGINEER. THE SELECT BACKFILL AND SOIL BACKFILL MATERIAL SHALL BE OVER COMPACTED USING EQUIPMENT SO THAT FUTURE SETTLEMENT IS KEPT TO A MINIMUM. THE STEAMBANK SHOULD BE BOWLED OUT BEHIND THE VANE ARM AT THE DOWNSTREAM END OF THE VANE ARM.
- THE SURFACE OF THIS STRUCTURE SHALL BE FINISHED TO A SMOOTH AND COMPACT SURFACE IN ACCORDANCE WITH THE LINES, GRADES, AND CROSS-SECTIONS OR ELEVATIONS SHOWN ON THE DRAWINGS. THE DEGREE OF FINISH FOR ELEVATIONS SHALL BE WITHIN 0.1' OF THE GRADES AND ELEVATIONS INDICATED. DRESSING OF THE CHANNEL, BANKFULL BENCH AND FLOODPLAIN WILL LIKELY BE REQUIRED FOLLOWING INSTALLATION OF THIS STRUCTURE AND SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION.

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**NEBAGAMON CREEK RESTORATION  
CULVERT REMOVAL AND RIVER IMPROVEMENTS  
DOUGLAS COUNTY  
LAKE NEBAGAMON, WI**

**AS BUILT SET**

**LOG J-HOOK STREAM DETAIL  
BID SET**



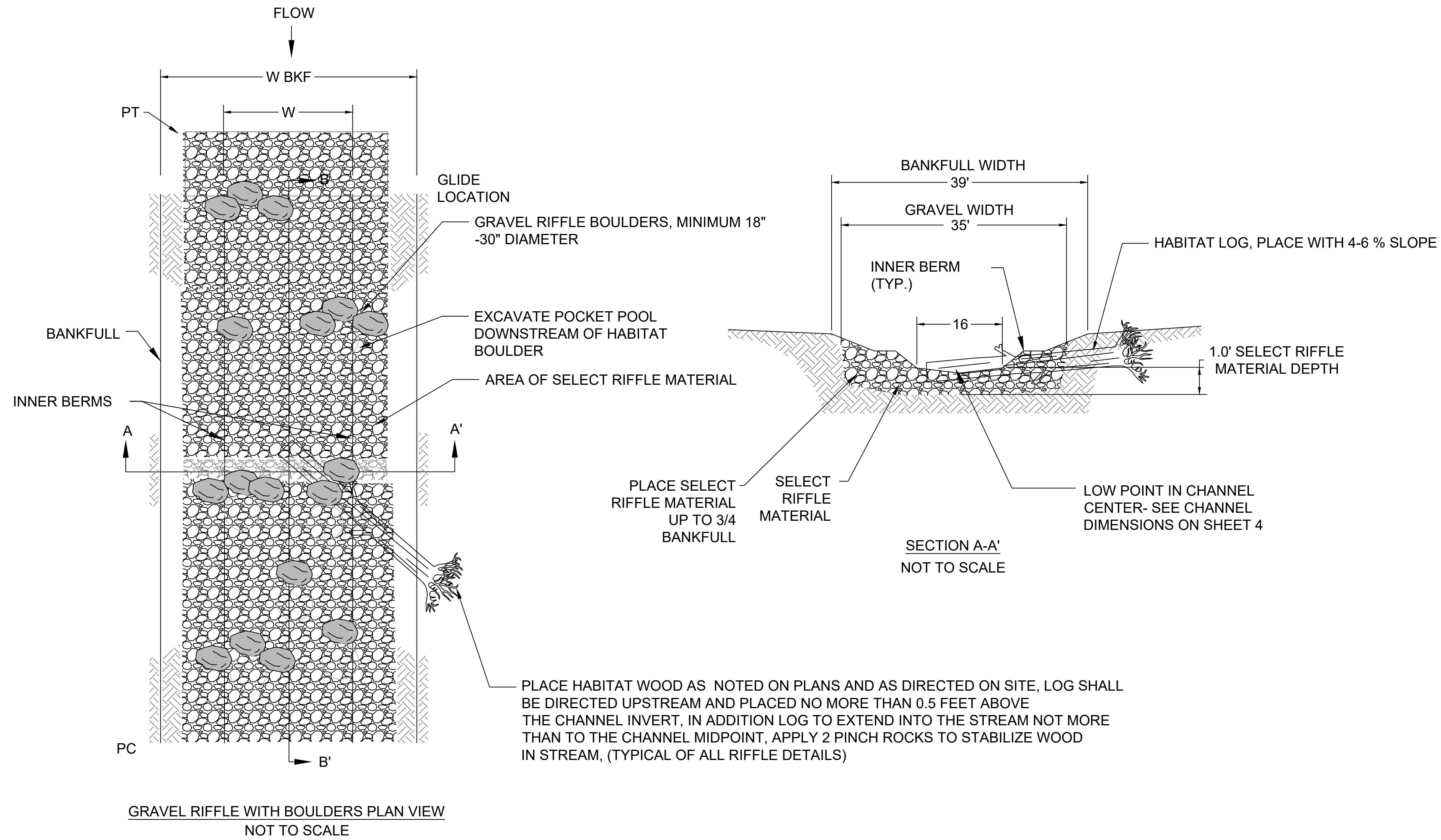
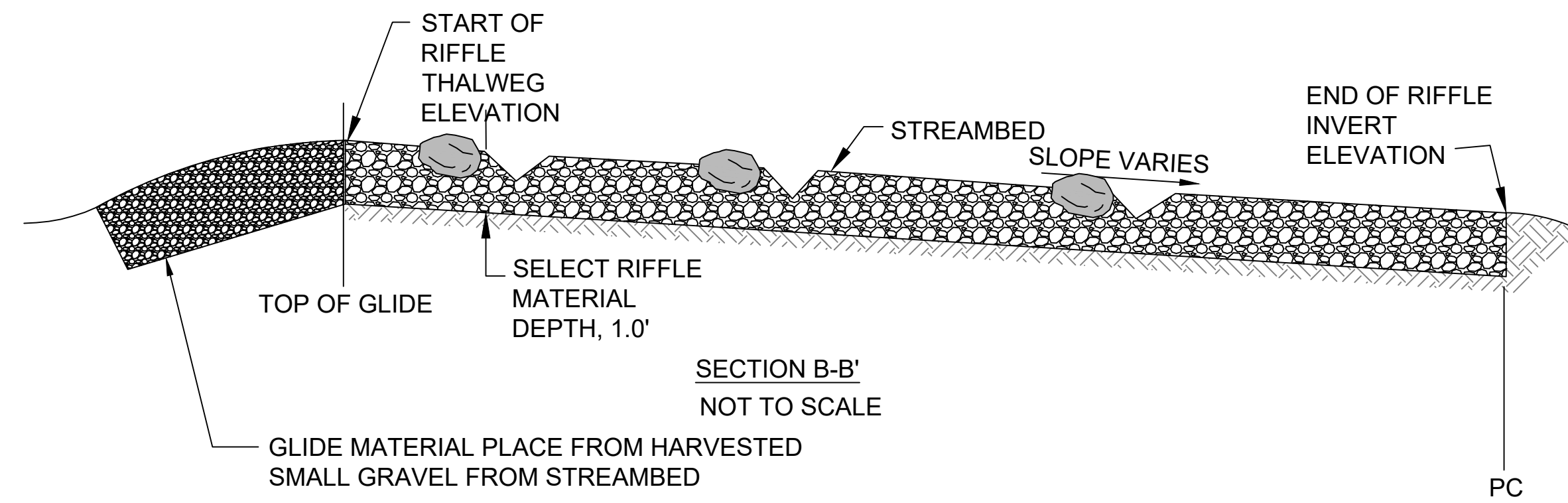
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PLAN-SYMBOL  
NOT TO SCALE



**NOTES:**

1. SORTING AND SIEVING OF THE HARVESTED RIFFLE SUBSTRATE IS INCIDENTAL TO THE CONSTRUCTION OF THIS STRUCTURE
2. SELECT RIFFLE MATERIAL SHALL HAVE A GRADATION OF 25 % BY VOLUME OF LIGHT RIP RAP, 25 PERCENT BY VOLUME EXTRA LIGHT RIP RAP, 25 % IMPORTED PIT RUN AND 25 % BY VOLUME HARVESTED IN PLACE STREAM BED MATERIAL
3. SELECT RIFFLE MATERIAL WILL BE PLACED AT A MINIMUM THICKNESS OF 1.0'.
4. THE SELECT RIFFLE MATERIAL WILL BE PLACED SUCH THAT, IN CROSS-SECTION, ITS LOWEST ELEVATION OCCURS IN THE CENTER OF THE CHANNEL AS PER THE DETAIL.
5. HABITAT BOULDERS SHALL BE PLACED IN THE RIFFLE SUCH THAT NOT MORE THAN 3/4 OF THE DIAMETER OF THE BOULDER PROTRUDES ABOVE THE STREAM BED. AS SHOWN SOME OF THE BOULDERS SHALL BE PLACED IN GROUPINGS OF 3 IN ORDER TO CREATE DOWNSTREAM SCOUR, THE BOULDERS SHALL BE 18-30" IN DIAMETER.
6. SELECT RIFFLE MATERIAL SHALL BE COMPACTED USING TRACK EQUIPMENT SUCH THAT FUTURE SETTLEMENT OF THE MATERIAL IS KEPT TO A MINIMUM.
7. RE-DRESSING OF CHANNEL AND BANKFULL BENCH/FLOODPLAIN WILL LIKELY BE REQUIRED FOLLOWING INSTALLATION OF IN-STREAM STRUCTURES AND SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION.

**RECORD DRAWING**

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NEBAGAMON CREEK RESTORATION  
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GRAVEL RIFFLE WITH BOULDERS DETAIL  
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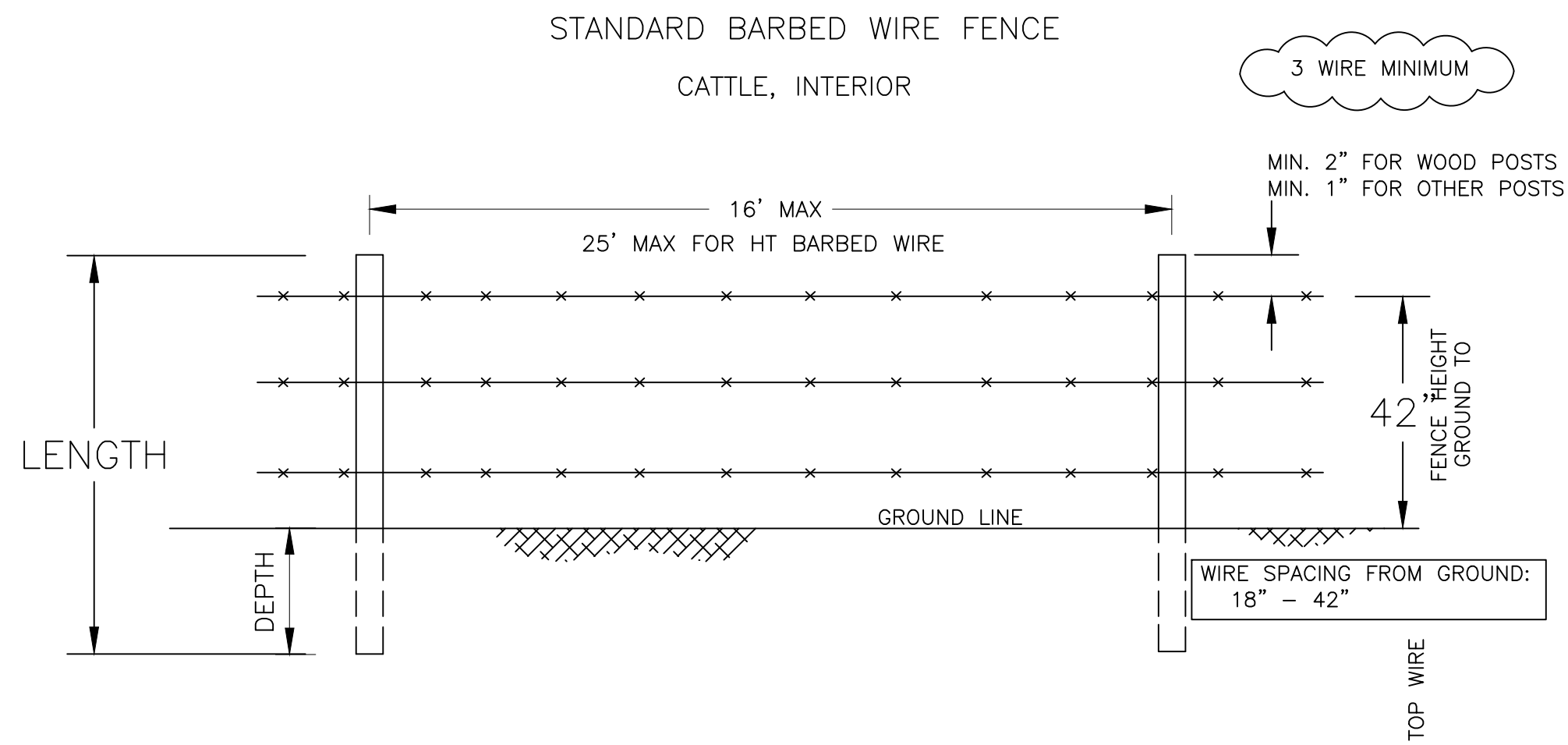
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12 OF 13



# RECORD DRAWING



### LINE POSTS

#### WOOD:

DIA. = 4" MIN  
 DEPTH = 2" MIN  
 MIN. LENGTH = FENCE HEIGHT + POST DEPTH + 2"

ALL WOOD SPECIES EXCEPT RED CEDAR, WHITE CEDAR, TAMARACK, OSAGE ORANGE, BLACK LOCUST, AND WHITE OAK SHALL BE TREATED BY A METHOD LISTED IN WI CONSTRUCTION SPEC. #10-FENCES.

#### STEEL:

STANDARD "T" POST MIN 1.25 LBS/FT, 1-3/8" X 1-3/8" X 1/8"  
 DEPTH = 1.5' MIN  
 MIN. LENGTH = FENCE HEIGHT + POST DEPTH + 1"

ALL STEEL POSTS WILL HAVE AN ANCHOR PLATE AND BE STUDDED

ALL STEEL POSTS WILL BE PAINTED WITH A WEATHER RESISTANT PAINT FOR STEEL, ENAMELED AND BAKED, OR HOT DIP GALVANIZED

ALL STEEL POSTS WILL BE ROLLED FROM HIGH CARBON STEEL

#### NOTES

BARBED WIRE SHALL NOT BE ELECTRIFIED OR INSULATED FOR ELECTRIFICATION

BRACES ARE REQUIRED AT ALL CORNERS, GATES, PULL AND END ASSEMBLIES. SEE BRACE DETAILS.

H-BRACING IS REQUIRED AT ALL PULL ASSEMBLIES AND MUST BE INSTALLED EVERY 660' MAX. SEE BRACE DETAILS

#### WIRE

2 TWISTED STRANDS OF 12.5-GAUGE OR HEAVIER GALVANIZED STEEL WIRE OR 15.5-GAUGE OR HEAVIER HIGH TENSILE GALVANIZED WIRE WITH A 20 YEAR SUPPLIER'S WARRANTY OR SUPPLIER DOCUMENTATION THAT THE WIRE WILL REMAIN DURABLE FOR THE PRACTICE LIFESPAN. ALL WIRE SHALL MEET ASTM A121 WITH GALVANIZING MEETING ASTM 641

BARBS MIN 2 POINT ON 5" CENTER

1" MIN. FOR HARDWOODS

#### FASTENERS

ALL WIRES SHALL BE ATTACHED TO EACH LINE POST

STAPLES SHALL BE 9-GAUGE, GALVANIZED STEEL OR HEAVIER.

RECOMMENDED LENGTH: 1.75" MIN. FOR SOFTWOODS

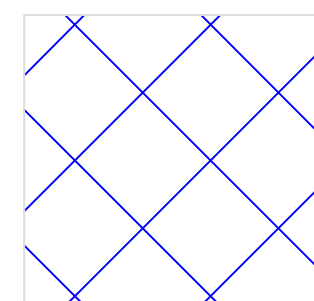
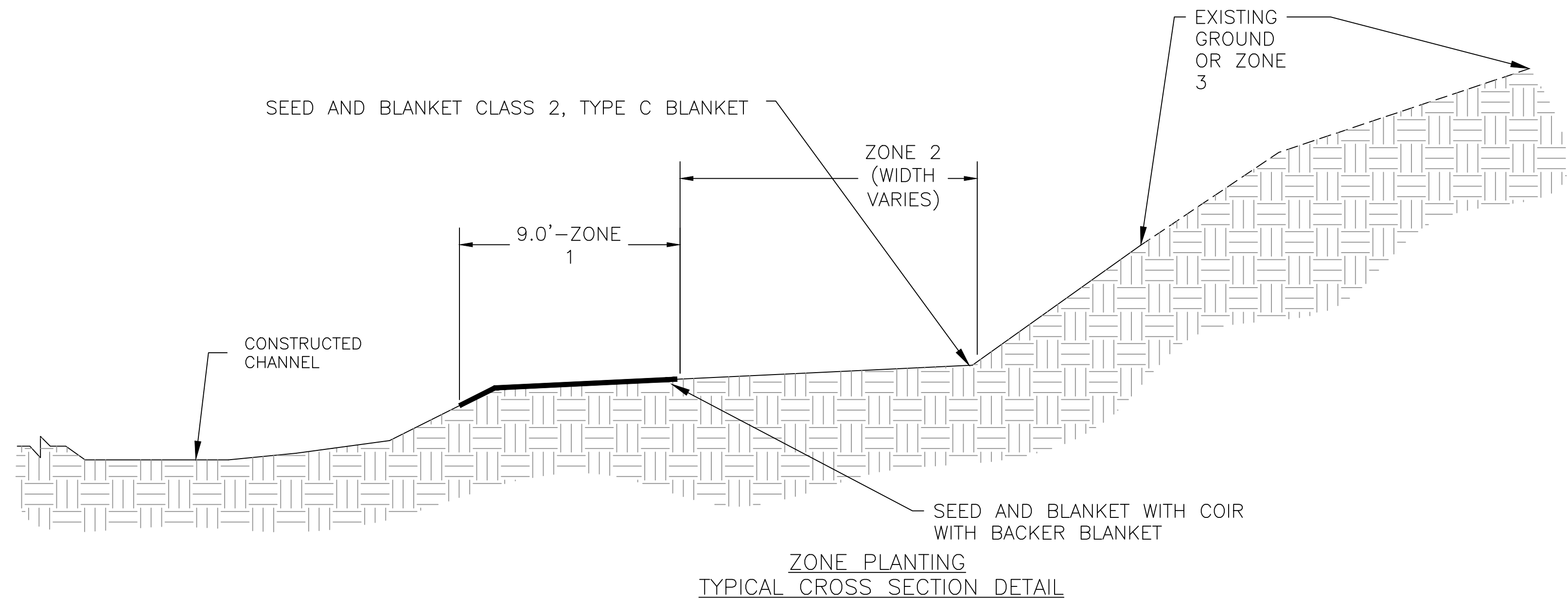
MANUFACTURER'S CLIPS OR 14-GAUGE WIRE MAY BE USED TO FASTEN WIRES TO NON-WOOD POSTS

USE BARBED STAPLES FOR WOOD POSTS

#### GROUNDING

IT IS RECOMMENDED THAT FENCES WITHOUT STEEL POSTS BE GROUNDED FOR LIGHTNING PROTECTION AT LEAST EVERY QUARTER MILE. ALL LINE WIRES MUST BE GROUNDED. USE 12.5 GAUGE WIRE FOR LEAD-OUT WIRE.

-GROUND RODS  
 MIN. 4 INTO GROUND  
 0.5" MIN DIAMETER, GALVANIZED STEEL



### ZONE 1

#### PLANTING AREA-

9' WIDE AREA EXTENDING 2 FEET IN CHANNEL CANOPY-

PLANT THE SPECIES MIX AS IDENTIFIED IN ZONE 2 AT 8 FOOT SPACING

#### SEED AND COIR AND BACKER BLANKET

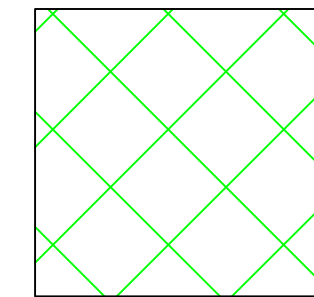
- BLANKET MAIN CHANNEL WITH 9.8' WIDE 700 GRAM COIR BLANKET BACKED WITH CLASS 2, TYPE C EROSION CONTROL MAT. INSTALL 2' LONG, 2"X2" WOOD STAKES WITH A ROOFING NAIL AT THE TOP TO SECURE THE BLANKET, INSTALL STAKES EVERY 5' ALONG BLANKET EDGES AND EVERY 5' ON THE CENTERLINE OF THE BLANKET. SEED WITH MIX MN DOT34-361 SEED MIX, AT 60 LBS PER ACRE. BLANKET SHALL EXTEND OVER THE EDGE OF THE BANKFULL SURFACE TO THE INSTALLED RIFFLE GRAVELS.

#### TREE PROTECTION:

\* SPECIES THAT REQUIRE 6' HIGH X 3.0' DIAMETER FENCING WITH 2 PIECES OF 5 3/8" DIAMETER REBAR DRIVEN INTO THE GROUND AND WOVEN INTO THE FENCE

### ACCESS AND OTHER DISTURBED AREAS

SEED AND MULCH  
 SEED EXPOSED SOILS WITH SEED MIX MN DOT 36-311 AT 60 LBS PER ACRE, MULCH WITH WEED FREE STRAW



### ZONE 2

#### PLANTING AREA-

FLOODPLAIN AREA NOTED ON PLANTING PLAN SHEET

#### CANOPY

THE FOLLOWING CANOPY PLANTS SHALL BE 1.5' MINIMUM HEIGHT CONTAINERIZED STOCK. PLANT AT 8 FOOT SPACING:

- WHITE SPRUCE (PICEA GLAUCA) -30%
- YELLOW BIRCH (BETULA ALLEGHANIENSIS)-10%
- RED OAK (QUERCUS RUBRA) -10%
- \*WHITE PINE (PINUS STROBUS) -20%
- PAPER BIRCH (BETULA Papyrifera) -20%
- SUGAR MAPLE (ACER SACCHARUM)-10%

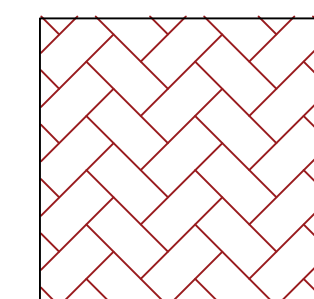
#### SUB-CANOPY

THE FOLLOWING SUB-CANOPY PLANTS SHALL BE 1.5' HEIGHT CONTAINERIZED STOCK. PLANT THE FOLLOWING AT 8 FOOT SPACING,

- CHOKE CHERRY (PRUNIS VIRGINIANA)-20%
- JUNE BERRIES (AMELANCHIER SPP.)-30%
- BUSH HONEYSUCKLE (DIERVILLA LONICERA)-50%

#### SEED AND MULCH

- APPLY CATEATORY CLASS 2 TYPE C EROSION CONTROL MAT
- SEED WITH MN DOT 34-361 SEED MIX AT 60 LBS/ACRE.
- SCARIFY SOIL PRIOR TO SEEDING



### ZONE 3

#### PLANTING AREA AND SITE PREP-

AREAS AS NOTED ON THE PLANS, SLOPES REMAINING AFTER REMOVAL OF OLD RAILROAD EMBANKMENT

#### CANOPY

THE FOLLOWING CANOPY PLANTS SHALL BE 2.0' HEIGHT 1 GALLON POT CONTAINERIZED STOCK. PLANT AT 10 FOOT SPACING:

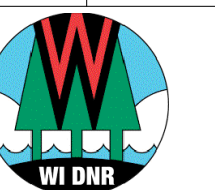
- WHITE SPRUCE (PICEA GLAUCA) -10%
- YELLOW BIRCH (BETULA ALLEGHANIENSIS)-10%
- \*WHITE PINE (PINUS STROBUS) -20%
- RED OAK (QUERCUS RUBRA) -30%
- RED PINE (PINUS RESINOSA)-30%

#### SEED AND EROSION CONTROL BLANKET

- APPLY CATEATORY CLASS 2 TYPE C EROSION CONTROL MAT
- SEED WITH MN DOT 36-311 SEED MIX AT 60 LBS/ACRE.
- SCARIFY SOIL PRIOR TO SEEDING

APPROVED BY: KA	CHECKED BY: MUG	DRAWN BY: MUG
REV	DESCRIPTION	AS BUILT SET
1	XX	XX
	XX	XX
	XX	XX
	XX	XX
	XX	XX
	XX	XX
	XX	XX
	XX	XX

NEBAGAMON CREEK RESTORATION  
 CULVERT REMOVAL AND RIVER IMPROVEMENTS  
 DOUGLAS COUNTY  
 LAKE NEBAGAMON, WI  
 AS BUILT SET  
 VEGETATION PLANTING AND FENCE DETAIL  
 BID SET



WI DNR  
 LAKE SUPERIOR TRIBUTARIES  
 SUPERIOR, WI  
 715.392.7990

U.S. Name: Lake Superior State Park

BEAVER RIVER CONSULTING  
 5752 EAGLE VIEW DR  
 DULUTH, MN 55803  
 218.626.7450

BID SET

DATE: 11/30/23

NTS

SHEET NUMBER  
 13 OF 13