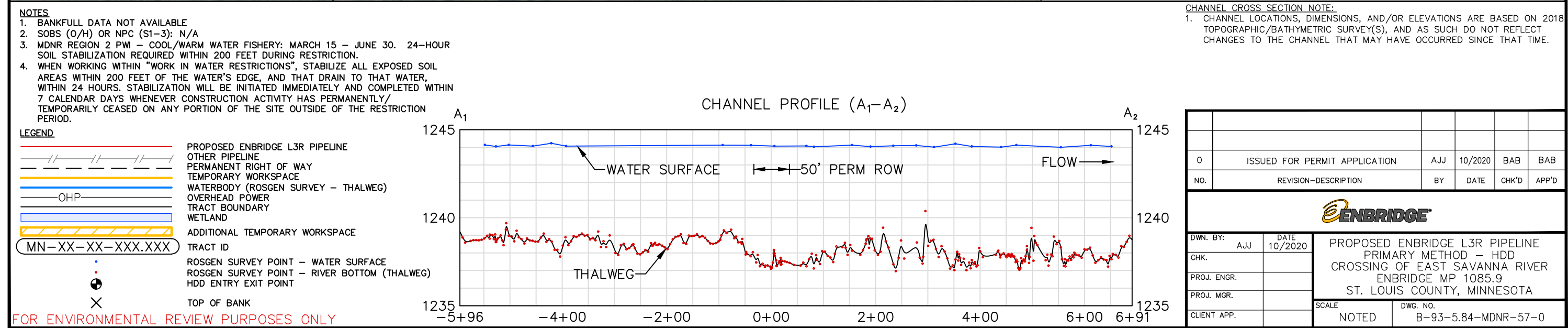
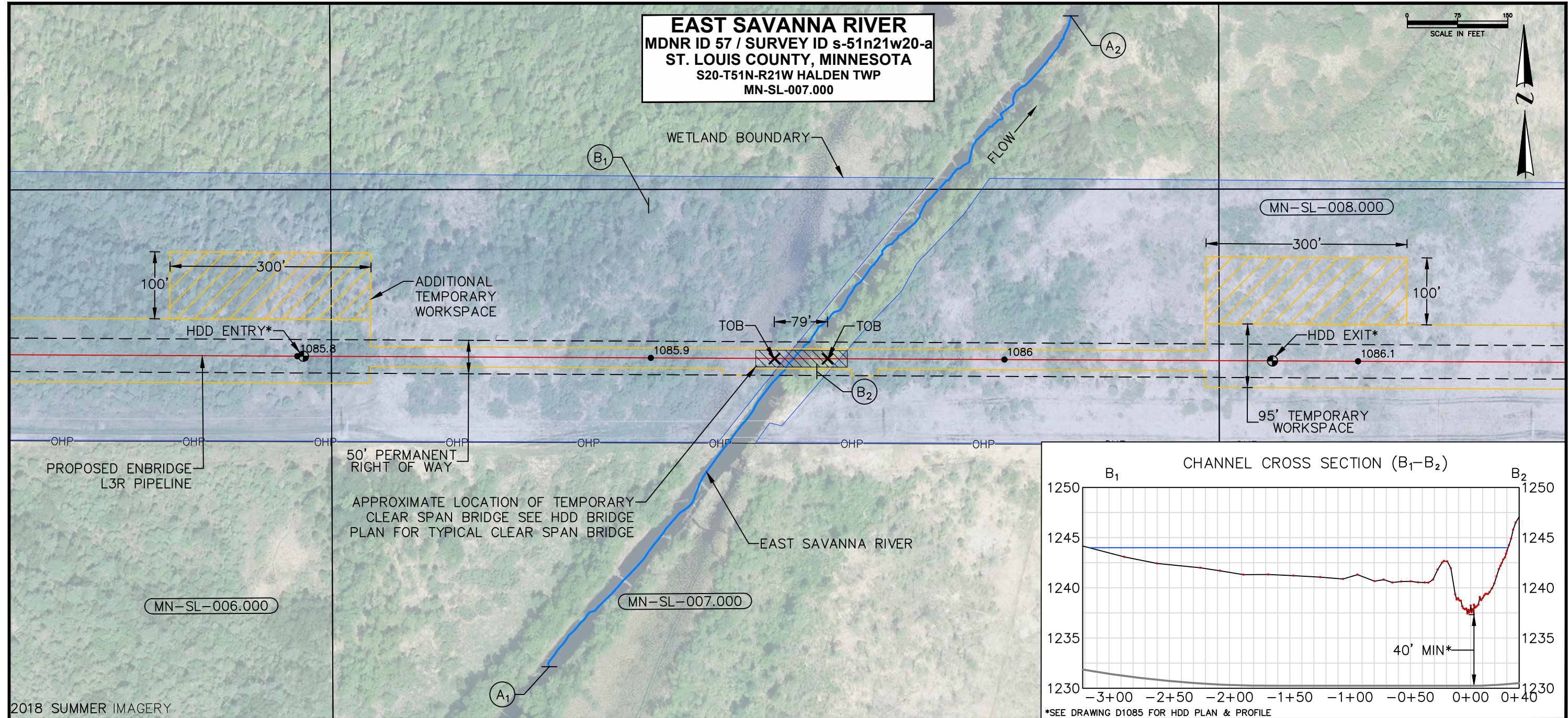
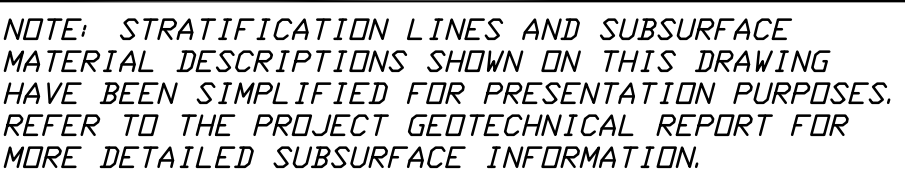


**MDNR ID No. 57: MP 1085.9; East Savanna River (S-002-031)**

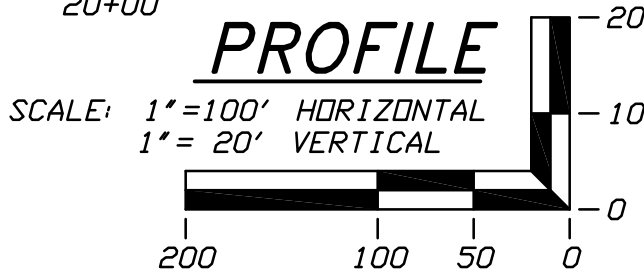








NOTE: PLACEMENT OF HORIZONTAL DRILLING RIG IS NOT FIXED BY DESIGNATION OF ENTRY AND EXIT POINTS. DRILLING RIG PLACEMENT AND/OR THE USE OF DUAL RIGS SHALL BE AT CONTRACTOR'S OPTION.



### PROTECTION OF EXISTING FACILITIES

CONTRACTOR SHALL UNDERTAKE THE FOLLOWING STEPS  
PRIOR TO COMMENCING DRILLING OPERATIONS.

1. CONTACT THE UTILITY LOCATION/NOTIFICATION SERVICE FOR THE CONSTRUCTION AREA.
2. POSITIVELY LOCATE AND STAKE ALL EXISTING UNDERGROUND FACILITIES. ANY FACILITIES LOCATED WITHIN 10 FEET OF THE DESIGNED DRILLED PATH SHALL BE EXPOSED.
3. MODIFY DRILLING PRACTICES AND DOWNHOLE ASSEMBLIES AS NECESSARY TO PREVENT DAMAGE TO EXISTING FACILITIES.

## LINE 3 PIPELINE PROJECT

# PLAN AND PROFILE 36-INCH PIPELINE CROSSING OF THE SAVANNA RIVER BY HORIZONTAL DIRECTIONAL DRILLING

LOCATION: ST. LOUIS COUNTY, MINNESOTA				
DRAWN	DATE	CHECKED	APPROVED	DRAWING LABEL
KWW	08/30/18	ACM	USP	D-03-5.84-23072-B-1356
				REVISION
				B

B	10/27/19	UPDATE WETLAND BOUNDARIES AND WORKSPACE	KWW	JSP	JSP	
A	10/09/19	UPDATE W.S., ADD BRIDGE, ISSUED FOR CONSTRUCTION	DLB	CDS	JSP	
NO.	DATE	REVISION DESCRIPTION	BY	CHK'D	APP.	

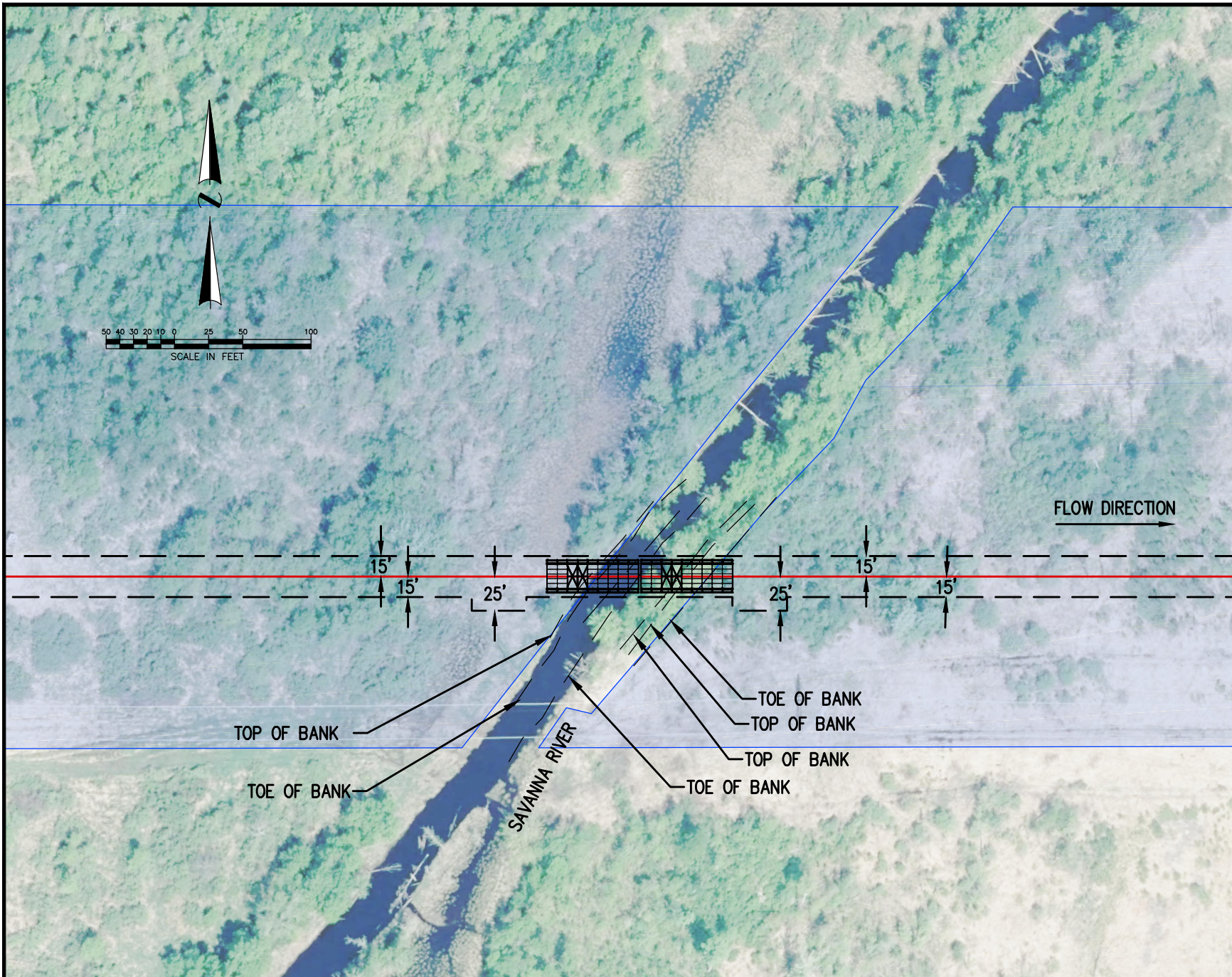
J.D. Hair & Associates, Inc.  
Consulting Engineers

2424 East 21st Street  
Suite 510  
Tulsa, Oklahoma 74111

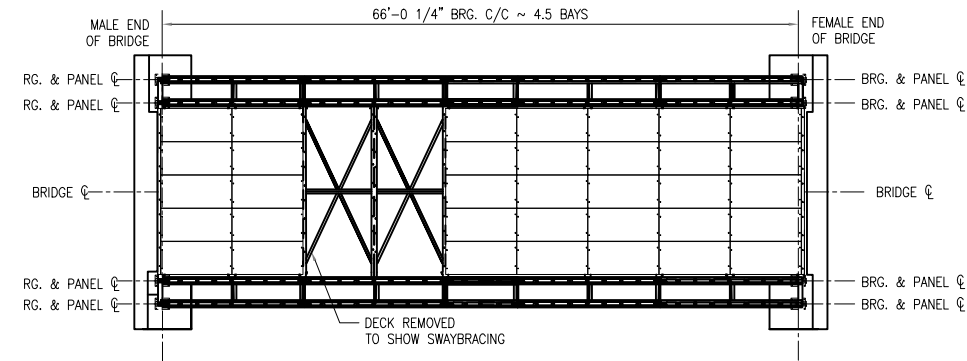
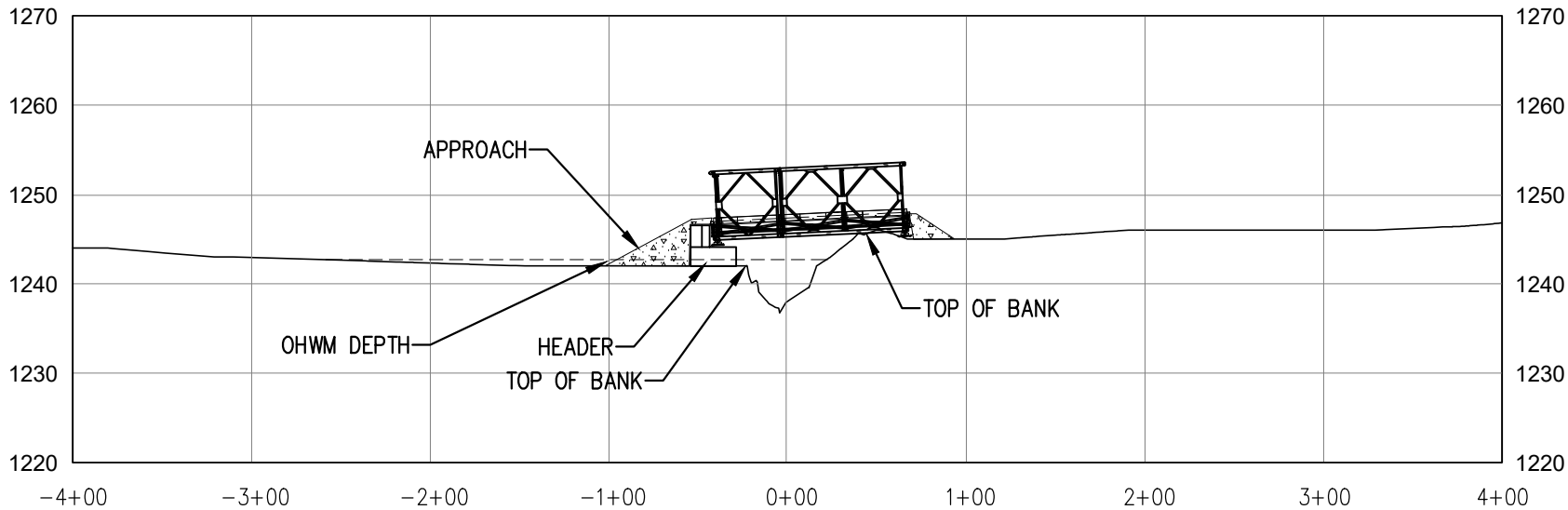
PROJECT NO.  
Enbridge\1404

D1085

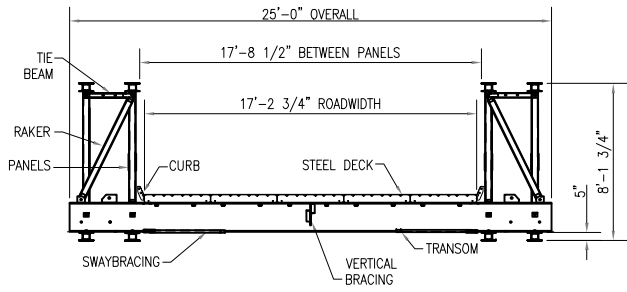




PROFILE



PLAN  
NTS



SECTION  
NTS

STREAM CLASSIFICATION:  
REFER TO ENVIRONMENTAL PROTECTION PLAN (EPP) AND ENVIRONMENTAL ALIGNMENT SHEETS (EAS) FOR ALL STREAM CLASSIFICATION AND RESTRICTED ACTIVITY PERIOD (RAP) DETAILS

CONSTRUCTION NOTES:  
CONTRACTOR WILL BE RESPONSIBLE FOR THE DESIGN OF THE TEMPORARY BRIDGE AS PER CONSTRUCTION NOTES THAT ARE LISTED BELOW AND APPLICABLE PERMIT CONDITIONS:


- TEMPORARY BRIDGES USED FOR CONSTRUCTION SHALL BE DESIGNED AND CONSTRUCTED IN COMPLIANCE WITH MOST RECENT LOCAL GOVERNMENT AND ENVIRONMENTAL PERMITS AND PLANS. THE FOUNDATION AND INSTALLATION OF THE TEMPORARY BRIDGE SHALL PROVIDE FOR THE SAFE PASSAGE OF CONSTRUCTION VEHICLES, EQUIPMENT AND MATERIALS, MINIMIZE SOIL EROSION AND PROVIDE FOR PROPER DRAINAGE AS OUTLINED IN THE ENVIRONMENTAL PROTECTION PLAN (EPP).
- PRIOR TO THE INSTALLATION AND USE OF A STRUCTURE GREATER THAN A SPAN OF 20 FEET, THE CONTRACTOR SHALL ENSURE THAT THE STRUCTURAL DOCUMENTATION SHALL INCLUDE BUT ARE NOT LIMITED TO THE FOLLOWING:
  - DESIGN, PLANS & SPECIFICATION SHEETS STAMPED BY A LICENSED PROFESSIONAL ENGINEER
  - STRUCTURES LOADING CAPACITY
  - INSTALLATION, REMOVAL AND MAINTENANCE INSTRUCTIONS
- SIGNS SHOWING MAXIMUM LOADS AND SPEED LIMITS SHALL BE POSTED ON BOTH SIDES OF ALL BRIDGES. VISIBLE TO APPROACHING VEHICLES AND EQUIPMENT. ENBRIDGE RESERVES THE RIGHT TO EXECUTE INSPECTIONS VERIFYING THE CONTRACTOR IS IN COMPLIANCE WITH THEIR DOCUMENTS.
- TEMPORARY "WARNING-PIPELINE CONSTRUCTION AHEAD" SIGNS MUST BE PLACED 400 FEET UPSTREAM AND DOWNSTREAM OF THE CROSSING ALONG THE WATERWAY AND AT ADDITIONAL LOCATIONS AS SUGGESTED BY THE MINNESOTA DEPARTMENT OF NATURAL RESOURCES. SIGNS MUST BE POSTED DURING FULL DURATION OF CROSSING CONSTRUCTION AND LEGIBLE AT A MINIMUM DISTANCE OF 100 FEET.
- BRIDGE LOCATIONS SUPPORTS MUST BE PLACED BEYOND THE TOP OF BANK. CONTRACTOR MUST RECEIVE ENBRIDGE APPROVAL FOR FINAL BRIDGE LOCATION.
- BRIDGE MUST BE DESIGNED TO HANDLE ALL REQUIRED LOADS DURING CONSTRUCTION.
- THE BRIDGE HEIGHT WILL BE DESIGNED TO ALLOW FOR ADEQUATE CLEARANCE TO ALLOW RECREATIONAL USERS TO PASS SAFELY UNDER THE BRIDGE.
- PER SECTION 2.4.2 OF THE EPP, BRIDGES WILL BE MAINTAINED TO PREVENT SOIL FROM ENTERING THE WATERBODY. SOIL THAT ACCUMULATES ON THE BRIDGE DECKING WILL BE REMOVED DAILY, OR AS DEEMED NECESSARY BY THE EI.
- REFLECTIVE TAPE OR SIGNAGE SHALL BE USED ON THE EDGES OF THE BRIDGE AND THE RAILINGS.

DESIGN AND DRAWING NOTES:  
1. GROUND PROFILE AND PLAN INFORMATION ARE DERIVED FROM SURVEY CONSULTANT DRAWING # 3638S-EAGLEX- 32-18-3-WS-22-R3, DATED SEPTEMBER 14, 2016.  
2. THE SCALES OF THIS DRAWING ARE CONSIDERED RELIABLE ONLY AT ANSI D (22"x34") SIZE.  
3. CHAINAGES ARE BASED ON THE ON HORIZONTAL MEASUREMENTS.  
4. ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE NOTED.  
5. BRIDGE DESIGN BASED ON DRAWINGS SUPPLIED BY RAPID SPAN STRUCTURES LTD. AND IS FOR INFORMATION ONLY.

ISSUED  
FOR  
CONSTRUCTION  
10/13/2020



Know what's below.  
Call before you dig.

B	ISSUED FOR CONSTRUCTION				AM	0/13/2020	NKD	MB
A	ISSUED FOR REVIEW				AM	7/2/2019	NKD	MB
NO.	REVISION-DESCRIPTION				BY	DATE	CHK'D	APP'D
<div></div>								
DWN. BY:		AM	DATE		PROPOSED 36in. LINE 3 REPLACEMENT CROSSING OF SAVANNA RIVER  ENBRIDGE M.P. D1085.9			
CHK.		NKD	7/2/2019					
PROJ. ENGR.								
PROJ. MGR.								
CLIENT APP.								
SCALE				DWG. NO.				
NOTED				B-3-5.84-23065-B-1356				

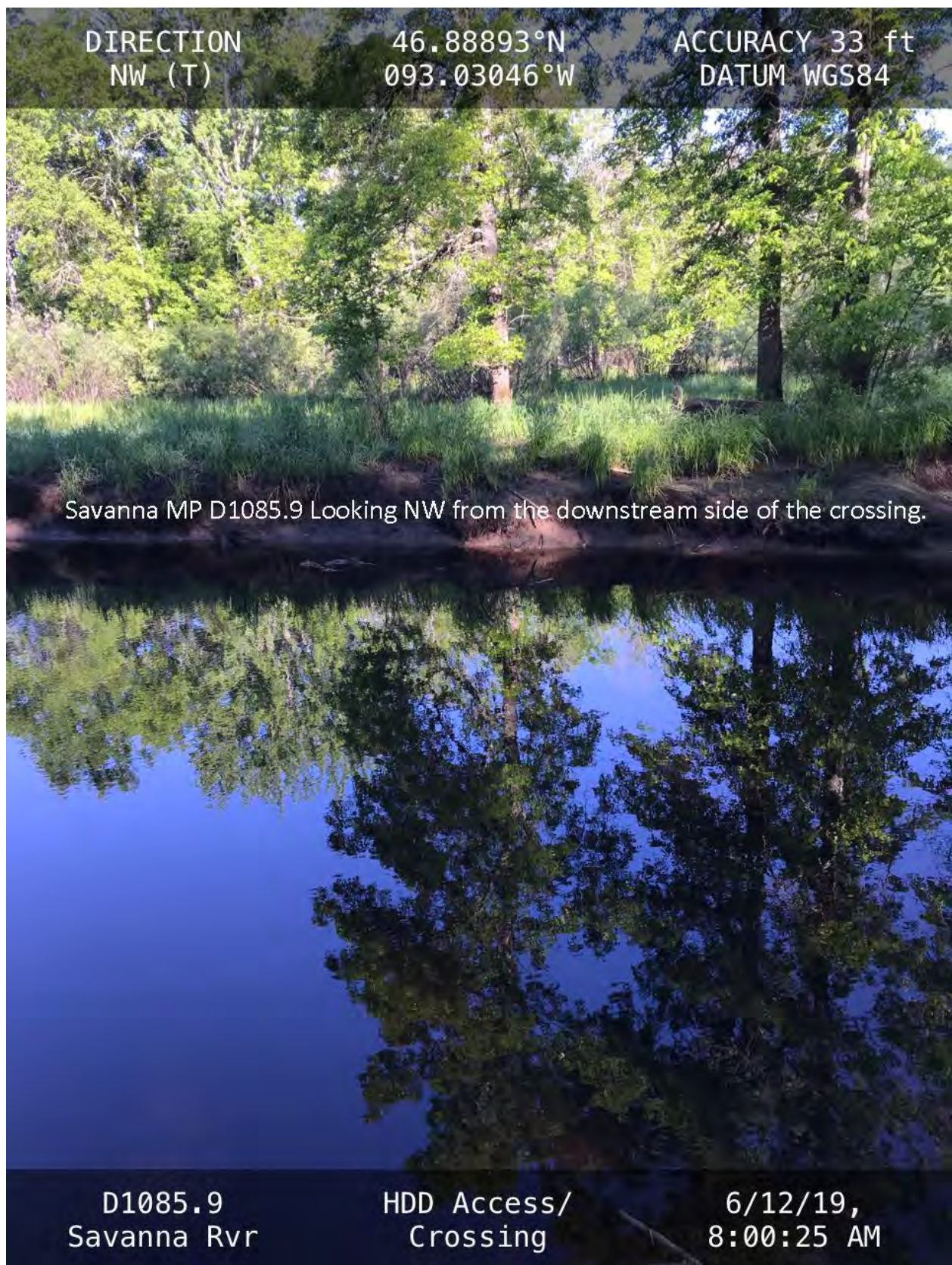


Milepost	MDNR License Application ID Number	Waterbody Name	County	Top-of-Bank Header-to-Header (feet)	Waterbody Width (feet) <sup>b</sup>	OHWL Depth (feet) <sup>c</sup>	Drawing Number
1085.9	60	East Savanna River	St Louis	80.0	45.0	3.5	B-3-5.84-23066-A-1356

**Crossing Location:** The East Savanna River Crossing is in St. Louis County and is situated south and east of Laurie Rd. at Mile Post D1085.9. The bridge would be located on county administered land on either side of the crossing. The topography is relatively flat through the wetland but has defined banks on either side of the waterbody.





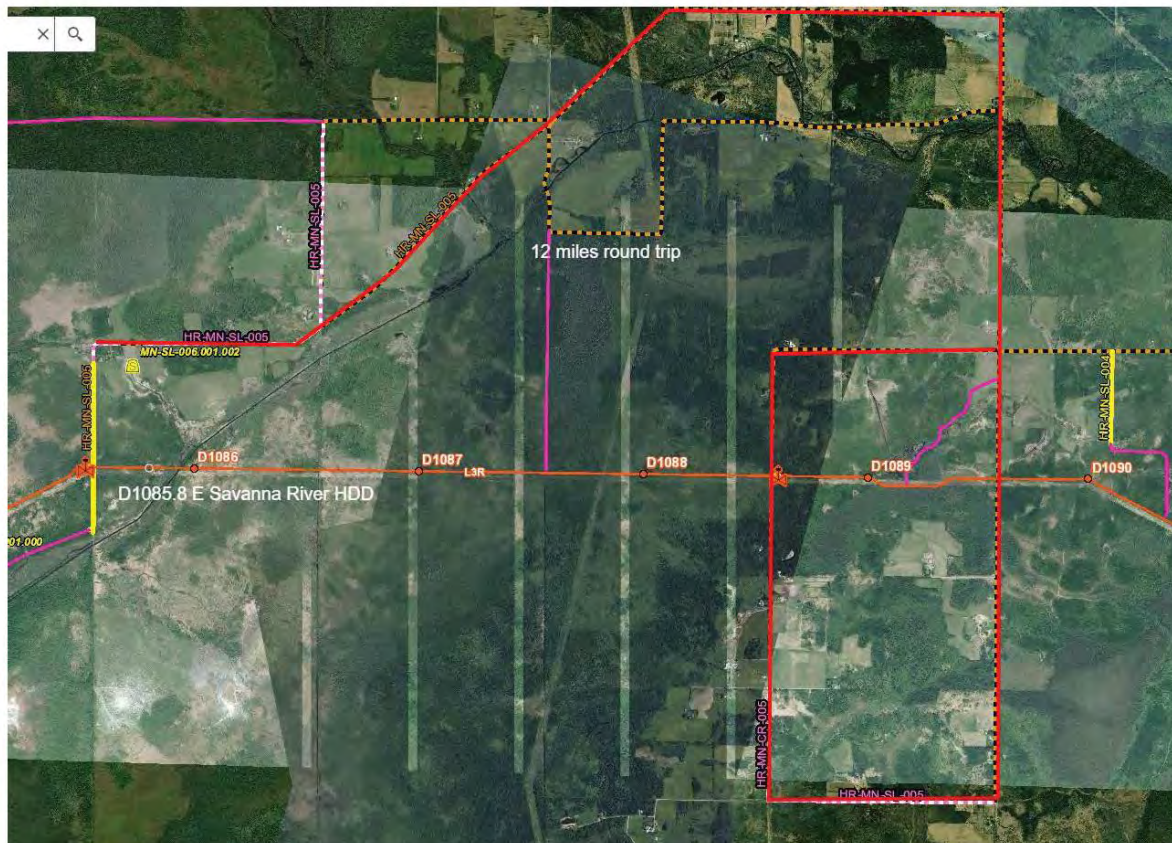


**Bridge Description:** A modular bridge would be built on site from pre-engineered and ready to assemble components. The design would consist of steel bracing, panels and decking. The bridge would have an approximately 18 foot travel lane, with a total width of 25 feet. The length of the bridge at this site would be 80 feet, allowing for a setback of more than 10 feet from the edge of bank on West or upstream side of the crossing and 25 feet on the downstream side.



**Bridge Installation Method:** The bridge would be set from the west side of the crossing due to the close proximity to Laurie Rd. The 30 foot ROW would be matted appropriately to allow safe passage of the Mainline Construction equipment and a 30 by 40 foot work space on the south side of the right-of-way would be used on each side to set the bridge. Clearing of an additional 15 feet by 30 feet for this ATWS would be needed outside of the 30 foot wide ROW, but would be within the original 50' easement. Excavators, cranes and/or side booms would be used to position the bridge over the water body. The bridge and any support headers would be set on top of the existing levees on either side of the crossings and secured by cables attached to temporary anchors on either side of the river. As this bridge will require no in-stream support, all work would occur outside the Ordinary High Water Mark and placement of the bridge would not affect the course, current or cross-section of the waterbody.

**Need of Bridge/Justification:** Enbridge is proposing to install a bridge at this crossing location to avoid the spread move that would result in impacts to local roadways, residents, and communities along the spread move travel path. At this location, the spread move is approximately 12 miles round trip, with an estimated 45-55 truckloads needed to complete the move. Trucks would exit the right-of-way and follow Laurie Rd. north and north east until turning south on Savanna Rd. The trucks would travel 2 miles south until crossing the right-of-way and unloading. The unloaded trucks would then continue south on Savanna Rd. until Tamarack Rd, where they would turn west for a mile until turning north onto Halden Rd. The trucks would continue on Halden Rd for 2 miles and then head east as the road changes into Evergreen Rd. Once the trucks returned back to Savanna Rd. they would head north and follow the same route on Laurie Rd back to the west side of the crossing. A map of this travel path is included, below:

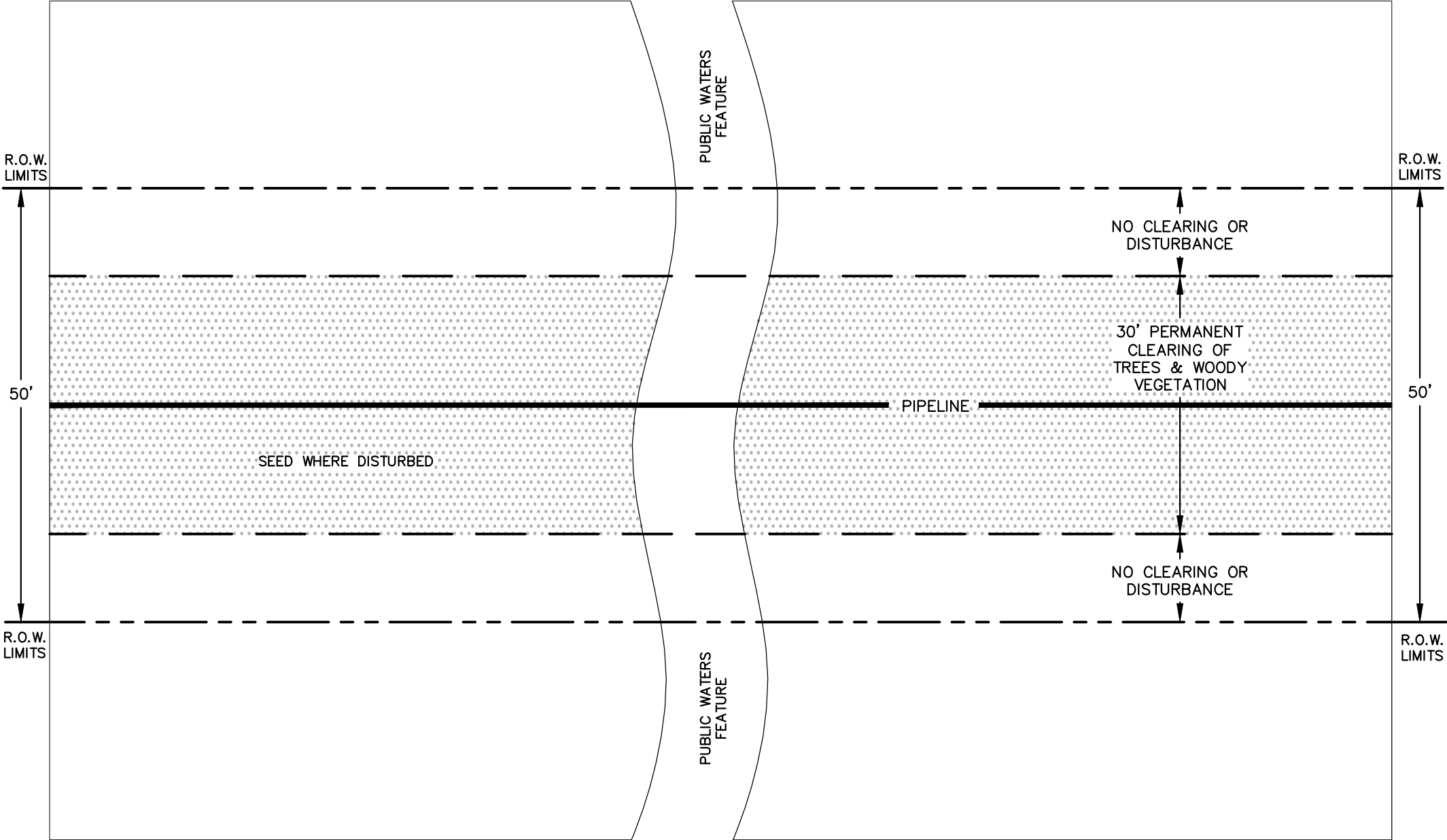
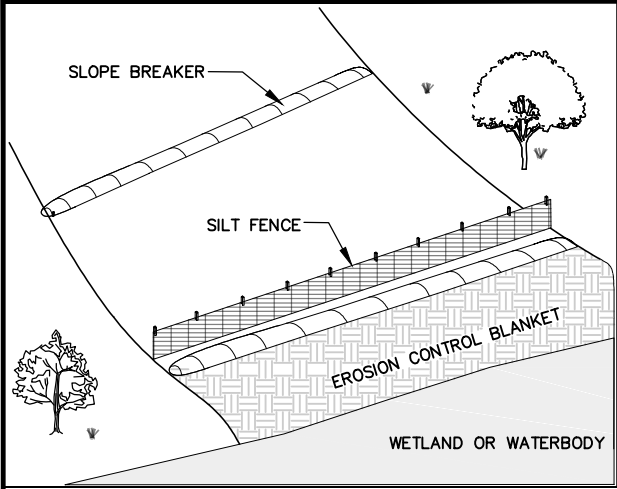


Installation of a bridge will allow all crews except for the clearing crews to remain on the construction right-of way and avoid the need to access public roads. Spread moves also require that Enbridge disassemble heavy equipment and make multiple travel trips around the spread moves to transport and reassemble equipment. Enbridge is also working with the MPCA to plan for inadvertent release of HDD drilling mud at all HDD locations. The construction of a mat road



to the waterbody and a bridge across the feature would also provide for more rapid response to a release, should one occur.





**PUBLIC WATERS FEATURE - HDD CROSSING**

- 1) DISTURBANCE OF THE ROW IS LIMITED TO THE 30--FOOT--WIDE CLEARING OF TREES AND WOODY VEGETATION AND IMPACTS RESULTING FROM TRAVEL LANES AND/OR BRIDGES.
- 2) ANY WETLAND OR WATERBODY BANK THAT IS DISTURBED WILL BE STABILIZED WITH EROSION AND SEDIMENT CONTROL BMP AND RESTORED TO AS NEAR AS PRACTICABLE TO PRE--CONSTRUCTION CONDITIONS.
- 3) PERMANENT REVEGETATION SEEDING OF DISTURBED WATERBODY BANKS WILL UTILIZE THE BWSR RIPARIAN SEED MIXES IN ACCORDANCE WITH THE EPP (SECTION 7.8).
- 4) PERMANENT REVEGETATION SEEDING OF DISTURBED WETLANDS WILL TAKE PLACE IN ACCORDANCE WITH THE EPP (SECTION 7.7).
- 7) IN DISTURBED WETLAND AREAS, THE APPROPRIATE SEED MIX WILL BE DETERMINED USING THE RESULTS OF PRE--CONSTRUCTION WETLAND IN DISTURBED WETLAND AREAS, HYDROLOGICAL CHARACTERISTICS, AND SITE--SPECIFIC CONDITIONS.

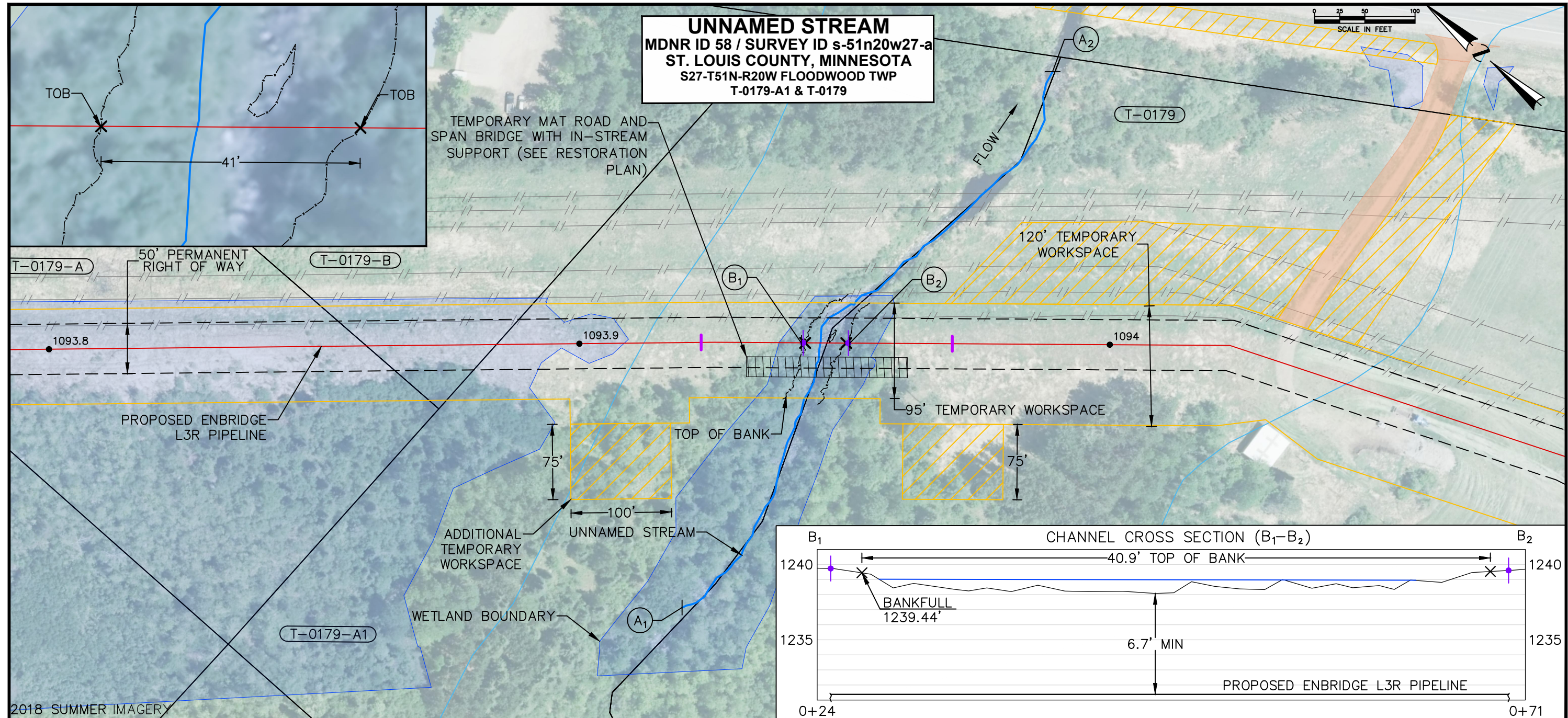
**ISSUED  
FOR PERMIT**  
12/13/19

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**MDNR ID No. 58: MP 1094; Unnamed Stream (S-002-028)**





NOTES

- SOBS (O/H) OR NPC (S1-3): N/A
- MDNR REGION 2 PWI - COOL/WARM WATER FISHERY: MARCH 15 - JUNE 30. 24-HOUR SOIL STABILIZATION REQUIRED WITHIN 200 FEET DURING RESTRICTION.
- WHEN WORKING WITHIN "WORK IN WATER RESTRICTIONS", STABILIZE ALL EXPOSED SOIL AREAS WITHIN 200 FEET OF THE WATER'S EDGE, AND THAT DRAIN TO THAT WATER, WITHIN 24 HOURS. STABILIZATION WILL BE INITIATED IMMEDIATELY AND COMPLETED WITHIN 7 CALENDAR DAYS WHENEVER CONSTRUCTION ACTIVITY HAS PERMANENTLY/ TEMPORARILY CEASED ON ANY PORTION OF THE SITE OUTSIDE OF THE RESTRICTION PERIOD.

LEGEND

- PROPOSED ENBRIDGE L3R PIPELINE
- OTHER PIPELINE
- PERMANENT RIGHT OF WAY
- TEMPORARY WORKSPACE
- WATERBODY (ROSGEN SURVEY - THALWEG)
- TRACT BOUNDARY
- FEMA FLOODPLAIN
- ACCESS ROAD
- TEMPORARY MAT ROAD AND SPAN BRIDGE
- WETLAND
- ADDITIONAL TEMPORARY WORKSPACE
- TRACT ID
- ROSGEN SURVEY POINT - WATER SURFACE
- ROSGEN SURVEY POINT - RIVER BOTTOM (THALWEG)
- PROPOSED INCREASED DEPTH OF COVER EXTENT
- TOP OF BANK
- TRENCH BREAKER (LOCATIONS ARE APPROXIMATE)

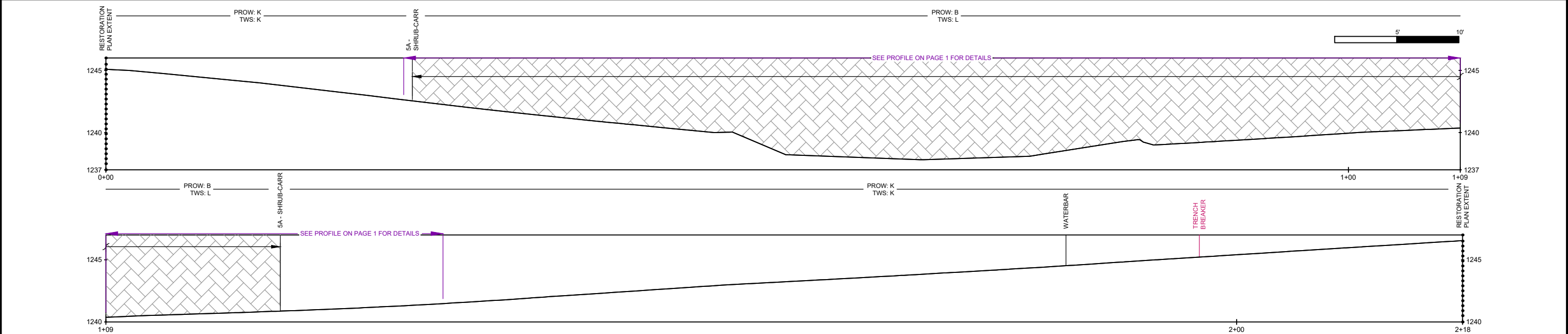
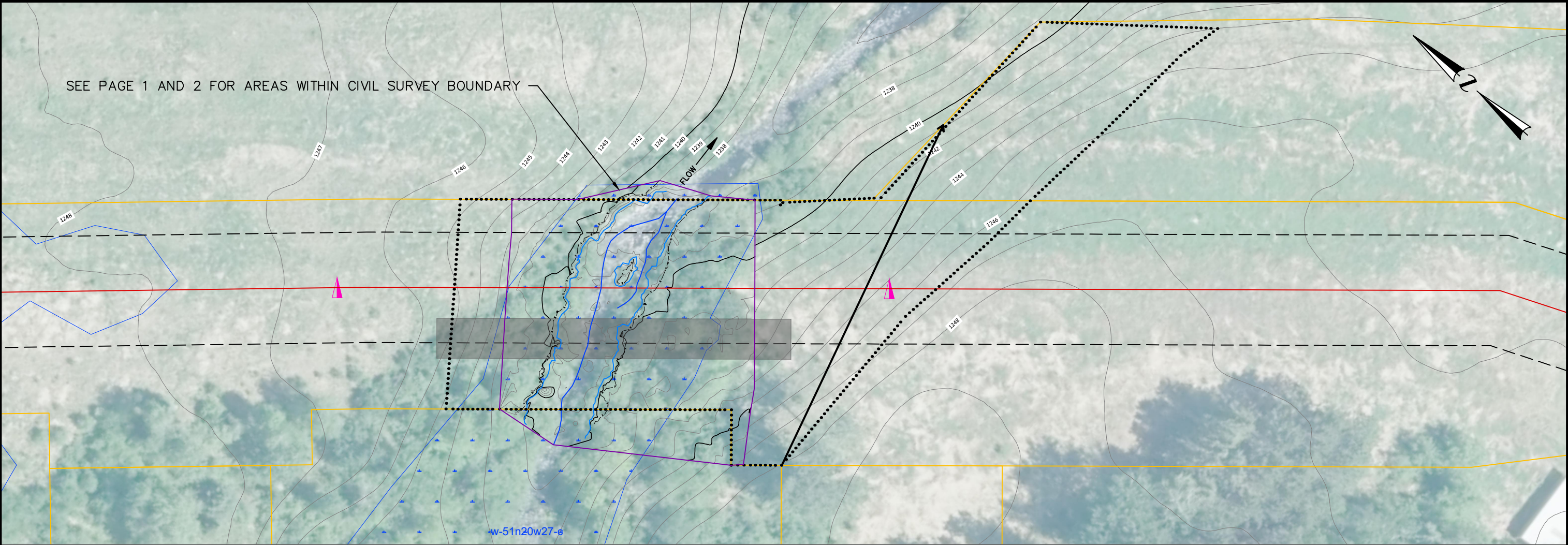
FOR ENVIRONMENTAL REVIEW PURPOSES ONLY

CHANNEL CROSS SECTION NOTE:

- CHANNEL LOCATIONS, DIMENSIONS, AND/OR ELEVATIONS ARE BASED ON 2020 TOPOGRAPHIC/BATHYMETRIC SURVEY(S), AND AS SUCH DO NOT REFLECT CHANGES TO THE CHANNEL THAT MAY HAVE OCCURRED SINCE THAT TIME.
- DEPTH OF COVER AT CENTERLINE WAS DEVELOPED USING THE BOTTOM ELEVATION OF THE DEEPEST UPSTREAM OR DOWNSTREAM POOL WITHIN THE SURVEYED REACH, UNLESS OTHERWISE NOTED IN APPLICATION MATERIALS.
- MEAN MEANDER BELT WIDTH: 76'
- MEANDER WIDTH RATIO: 2.93

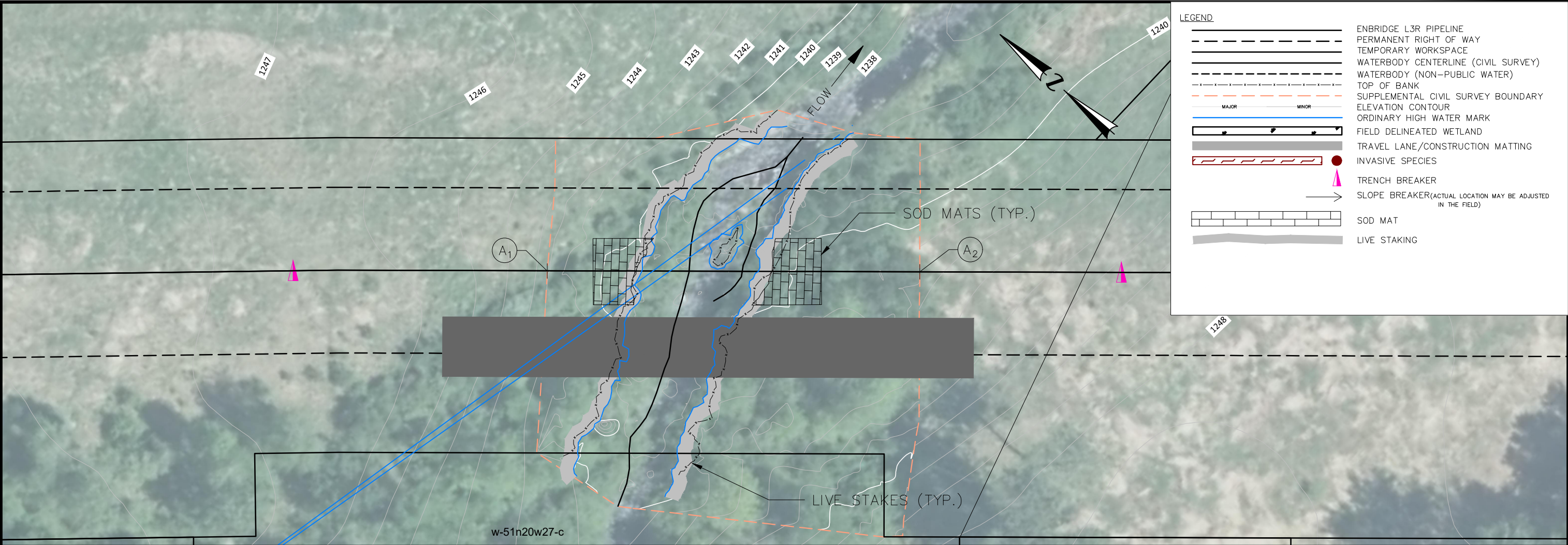
0	ISSUED FOR PERMIT APPLICATION	AJJ	10/2020	BAB	BAB
NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D	APP'D
<b>ENBRIDGE</b>					
DWN. BY:	AJJ	DATE	10/2020	PROPOSED ENBRIDGE L3R PIPELINE PRIMARY METHOD - DRY CROSSING CROSSING OF UNNAMED STREAM ENBRIDGE MP 1094.0 ST. LOUIS COUNTY, MINNESOTA	
CHK.				SCALE	
PROJ. ENGR.				NOTED	
PROJ. MGR.				DWG. NO.	
CLIENT APP.				B-93-5.84-MDNR-58-0	





BWSR SEED MIX		B: RIPARIAN NE (34–361); K: WOODLAND EDGE NE (36–311); L: NATURAL REVEGETATION				
SOBS (O/H) or NPC (S1-3)		N/A				
<div><div><div>1. ELEVATIONS OUTSIDE OF THE AREA WITHIN CIVIL SURVEY BOUNDARY ARE DERIVED FROM LIDAR. ENBRIDGE WILL RESTORE THE AREAS ADJACENT TO THE PUBLIC WATER WITHIN THE MDNR EXPANDED RESTORATION BOUNDARY TO PRE-CONSTRUCTION CONDITIONS.</div><div>2. MDNR REGION 2 PWI – COOL/WARM WATER FISHERY: MARCH 15 – JUNE 30. 24-HOUR SOIL STABILIZATION REQUIRED WITHIN 200 FEET DURING RESTRICTION.</div><div>3. AIR PHOTOS ARE FROM 2018 ENBRIDGE AERIAL PHOTOGRAPHY.</div><div>4. ADDITIONAL ON-THE GROUND PHOTOS MAY BE TAKEN PRIOR TO CONSTRUCTION AT MDNR REQUEST.</div><div>5. PRE-CONSTRUCTION PHOTOS WILL BE USED TO AID IN RESTORATION.</div><div>6. SEE GENERAL NOTES PAGE FOR ADDITIONAL DETAIL.</div><div>7. SEE THE PLANTING PLAN FOR ADDITIONAL DETAIL REGARDING SEEDING PRACTICES AND SEED MIXES AT PUBLIC WATER CROSSINGS.</div><div>8. ON PUBLIC LANDS AND WHEREVER PRACTICABLE AT WATERBODY CROSSINGS, ENBRIDGE WILL USE WILDLIFE-FRIENDLY EROSION AND SEDIMENT CONTROL BMPS THAT CONTAIN BIODEGRADABLE NETTING (CATEGORY 3N OR 4N NATURAL FIBER) AND WILL AVOID THE USE OF PLASTIC MESH (SECTIONS 1.17.1 AND 2.6.1 OF THE EPP).</div><div>9. WHEN WORKING WITHIN "WORK IN WATER RESTRICTIONS", STABILIZE ALL EXPOSED SOIL AREAS WITHIN 200 FEET OF THE WATER'S EDGE, AND THAT DRAIN TO THAT WATER, WITHIN 24 HOURS. STABILIZATION WILL BE INITIATED IMMEDIATELY AND COMPLETED WITHIN 7 CALENDAR DAYS WHENEVER CONSTRUCTION ACTIVITY HAS PERMANENTLY/ TEMPORARILY CEASED ON ANY PORTION OF THE SITE OUTSIDE OF THE RESTRICTION PERIOD.</div></div></div>						
<div><div>LEGEND</div><div><div><div>ENBRIDGE L3R PIPELINE</div><div>PERMANENT RIGHT OF WAY</div><div>TEMPORARY WORKSPACE</div><div>WATERBODY CENTERLINE (CIVIL SURVEY)</div><div>WATERBODY (NON-PUBLIC WATER)</div><div>PUBLIC WATER CIVIL SURVEY BOUNDARY</div><div>MDNR EXPANDED RESTORATION BOUNDARY</div><div>TOP OF BANK</div><div>ELEVATION CONTOUR</div><div>ORDINARY HIGH WATER MARK</div><div>FIELD DELINEATED WETLAND</div><div>TRAVEL LANE/CONSTRUCTION MATTING</div></div></div></div>		<div><div><div>INVASIVE SPECIES</div><div>TRENCH BREAKER</div><div>PERMANENT SLOPE BREAKER (ACTUAL LOCATION MAY BE ADJUSTED IN THE FIELD)</div><div>1 – SHALLOW, OPEN WATER</div><div>2B – SHALLOW MARSH</div><div>3A – SEDGE MEADOW</div><div>3B – FRESH (WET) MEADOW</div><div>5A – SHRUB-CARR</div><div>5B – ALDER THICKET</div><div>6A – HARDWOOD SWAMP</div><div>6B – CONIFEROUS SWAMP</div></div></div>				
B	ISSUED FOR PERMITTING		MJT	10/2020		
A	ISSUED FOR REVIEW		MJT	09/2020		
NO.	REVISION-DESCRIPTION		BY	DATE	CHK'D	APP'D
ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE-SPECIFIC RESTORATION PLAN UNNAMED STREAM – MP 1094.0 – MDNR ID 58 RE-VEGETATION PLAN: EXPANDED EXTENT						
SCALE		DWG. NO.		PAGE NO.		
NOTED		SSRP-1094.0-001A		1A/5		





LEGEND

ENBRIDGE L3R PIPELINE

PERMANENT RIGHT OF WAY

TEMPORARY WORKSPACE

WATERBODY CENTERLINE (CIVIL SURVEY)

WATERBODY (NON-PUBLIC WATER)

TOP OF BANK

SUPPLEMENTAL CIVIL SURVEY BOUNDARY

ELEVATION CONTOUR

ORDINARY HIGH WATER MARK

FIELD DELINEATED WETLAND

TRAVEL LANE/CONSTRUCTION MATTING

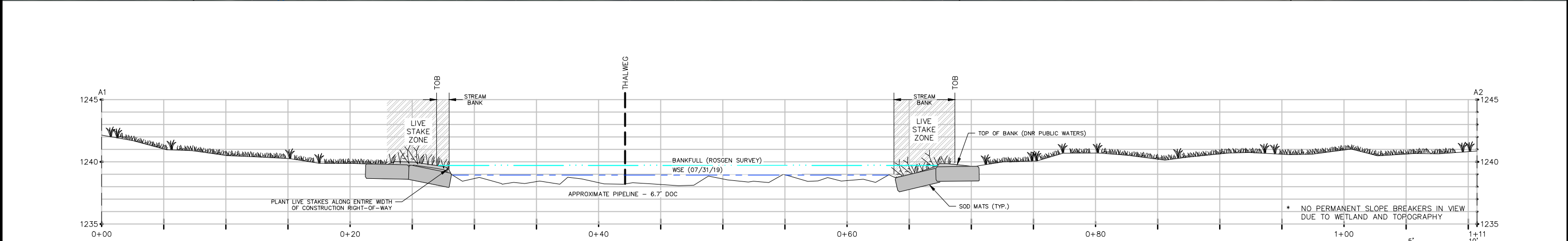
INVASIVE SPECIES

TRENCH BREAKER

SLOPE BREAKER(ACTUAL LOCATION MAY BE ADJUSTED IN THE FIELD)

SOD MAT

LIVE STAKING



PROPOSED RESTORATION ACTIVITIES WILL BE REVIEWED BY DNR AND ENBRIDGE DURING SITE VISIT AND MAY BE CHANGED TO REFLECT SITE CONDITIONS AT THE TIME OF CONSTRUCTION.

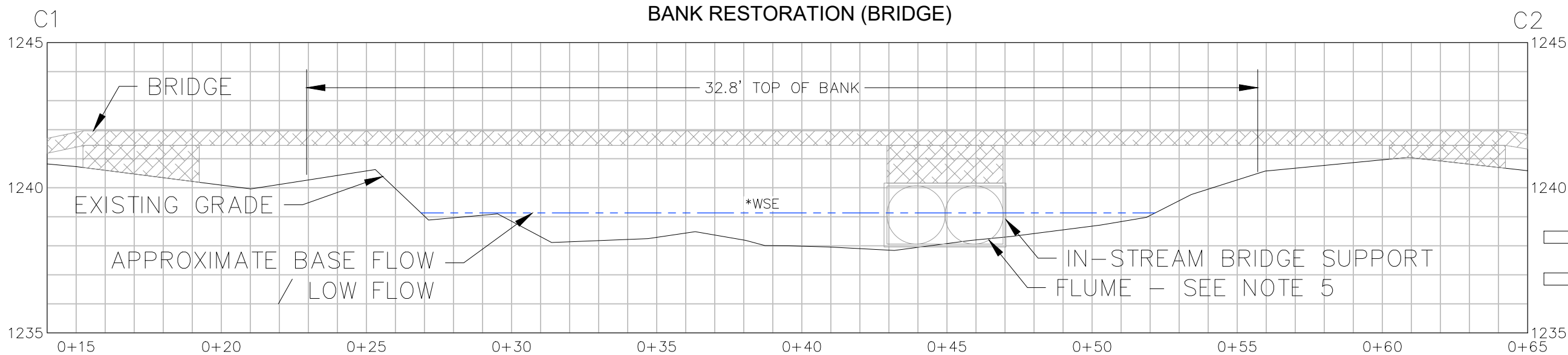
FEATURE ID	s-51n20w27-a; IFC ID: S-294.0
CROSSING TYPE	DRY CROSSING
PROPOSED RESTORATION (SEE DETAILS FOR LIVE STAKING, TRANSPLANTS, AND SHRUB SPECIES IF APPLICABLE)	EC BLANKET - NATURAL FIBER MPCA TYPE 3.B/MNDOT CATEGORY 4N
WITHIN OR ADJACENT WETLAND	SHRUB-CARR
BWSR SEED MIX	RIPARIAN NE (34-361)
DOMINANT WETLAND VEGETATION	1. CALAMAGROSTIS CANADENSIS 3. ALNUS INCANA 2. PHALARIS ARUNDINACEA 4. SALIX PETIOLARIS
SOBS (O/H) or NPC (S1-3)	N/A

- NOTES
- CONSTRUCTION TIMING RESTRICTIONS:
    - WHEN WORK OCCURS WITHIN "WORK IN WATER RESTRICTIONS", ALL EXPOSED SOIL AREAS WITHIN 200 FEET OF THE WATER'S EDGE, AND THAT DRAIN TO THAT WATER, WILL BE STABILIZED WITHIN 24 HOURS DURING THE RESTRICTION PERIOD. STABILIZATION OF ALL EXPOSED SOILS WITHIN 200 FEET OF THE PUBLIC WATER'S EDGE, AND THAT DRAIN TO THAT WATER, WILL BE INITIATED IMMEDIATELY AND COMPLETED WITHIN 7 CALENDAR DAYS WHENEVER CONSTRUCTION ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED ON ANY PORTION OF THE SITE OUTSIDE OF THE RESTRICTION PERIOD.
  - WORK SHALL BE CONDUCTED IN ACCORDANCE WITH APPLICABLE STANDARDS IN ENBRIDGE'S EPP AND VMP FOR PUBLIC LANDS AND WATERS. THE SPECIFICATIONS WITHIN THIS SSRP MAY MODIFY OR REPLACE THESE STANDARDS.
  - SEE GENERAL NOTES PAGE FOR ADDITIONAL DETAIL.
  - INFORMATION REGARDING SEEDING SPECIFICATIONS, SEED BED PREPARATION TECHNIQUES, ETC. ARE DESCRIBED IN THE PLANTING PLAN CONTAINED WITHIN THE VMP.
  - TRENCH BREAKER LOCATION IS APPROXIMATE PENDING FIELD VERIFICATION (EPP SECTION 1.13)



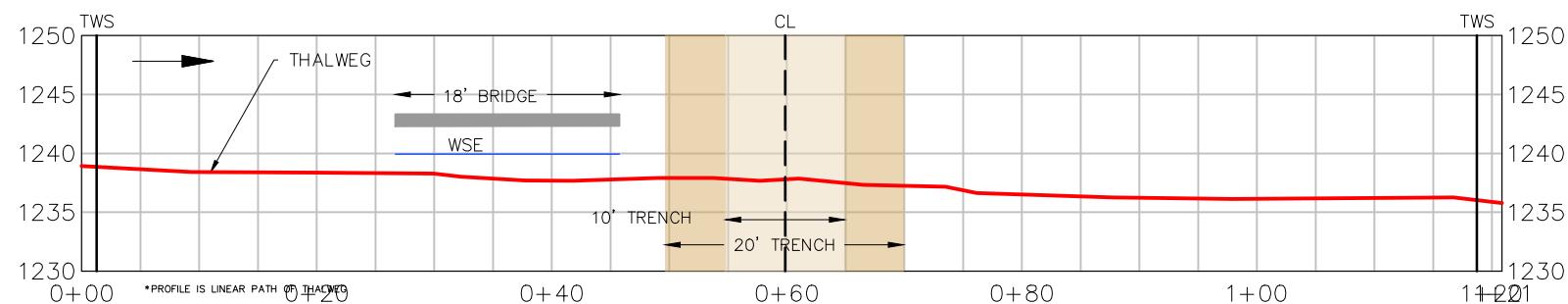
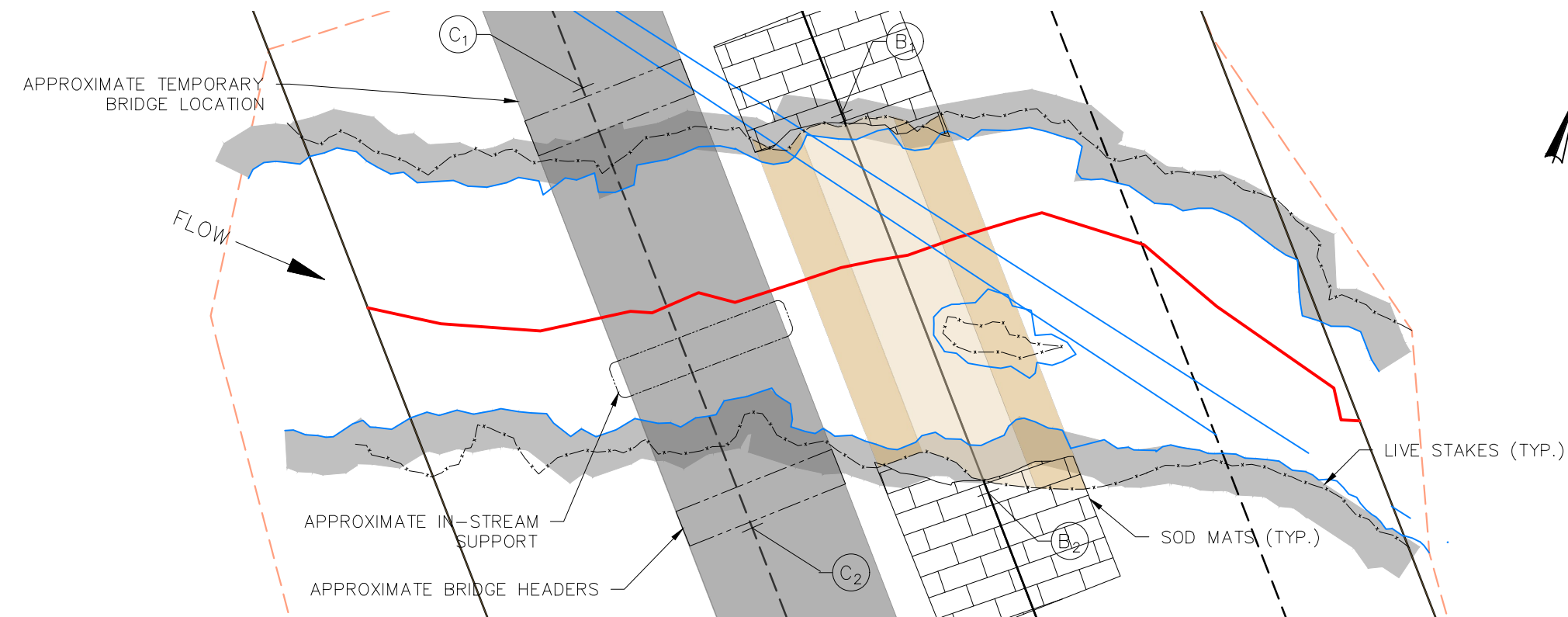
B	ISSUED FOR PERMITTING		10/2020		
A	ISSUED FOR REVIEW	MJT	08/2020		
NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D	APP'D
ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE-SPECIFIC RESTORATION PLAN UNNAMED STREAM - MP 1094.0 - MDNR ID 58 RE-VEGETATION PLAN					
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\* APPROXIMATE WSE IS PROVIDED FOR CONSTRUCTION RELATED ACTIVITIES.

### STREAMBED RESTORATION



#### NOTES

- TRANSITIONS BETWEEN EXISTING CHANNEL FEATURES (BED, BANK, FLOODPLAIN) AND PROPOSED RESTORED TRENCH CROSSING WILL BE SMOOTH AND EVENLY GRADED WITHOUT ABRUPT OR PROTRUDING OBSTRUCTIONS.
- BANK MIGRATION POTENTIAL IS MODERATE. PRIMARY FLOW IS LOCATED IN THE CENTER OF THE CHANNEL.
- PLACE MATS DIRECTLY ON TOP OF EXISTING VEGETATION TO AVOID OR MINIMIZE DISTURBANCE OF VEGETATION ON THE CHANNEL BANKS AND AT THE TOP OF THE STREAM BANK (LIMITED STUMP REMOVAL MAY BE REQUIRED).
- SEE DETAIL SHEET FOR SPECIFIC RESTORATION METHODS AND DETAILS.
- FLUME SIZE MAY VARY BETWEEN 18-48 INCHES BASED ON SITE-SPECIFIC CONDITIONS AT THE TIME OF CONSTRUCTION, BUT MUST ALWAYS EXTEND ABOVE OHWM OR SURFACE WATER AT TIME OF CONSTRUCTION, WHICHEVER IS GREATER.
- MINIMIZE DISTURBANCE OF BED MATERIALS AND FEATURES DURING CONSTRUCTION OF THE TRENCH AND INSTALLATION AND REMOVAL OF IN-STREAM SUPPORT.
- BED AND/OR BANK MATERIALS TEMPORARILY ADJUSTED OR REMOVED DURING CONSTRUCTION SHALL BE PLACED IN THE APPROXIMATE ORIGINAL LOCATION DURING RESTORATION. MATERIALS SHALL BE FIELD ADJUSTED DURING PLACEMENT BASE ON THE OBSERVED FLOW PATH AT THE TIME OF CONSTRUCTION.
- ALIGNMENT OF IN-STREAM SUPPORT SHALL BE FIELD ADJUSTED BASED ON FLOW PATH TO PROTECT CHANNEL BANKS.
- SEE RESTORATION SHEET FOR B1-B2 CROSS SECTION.

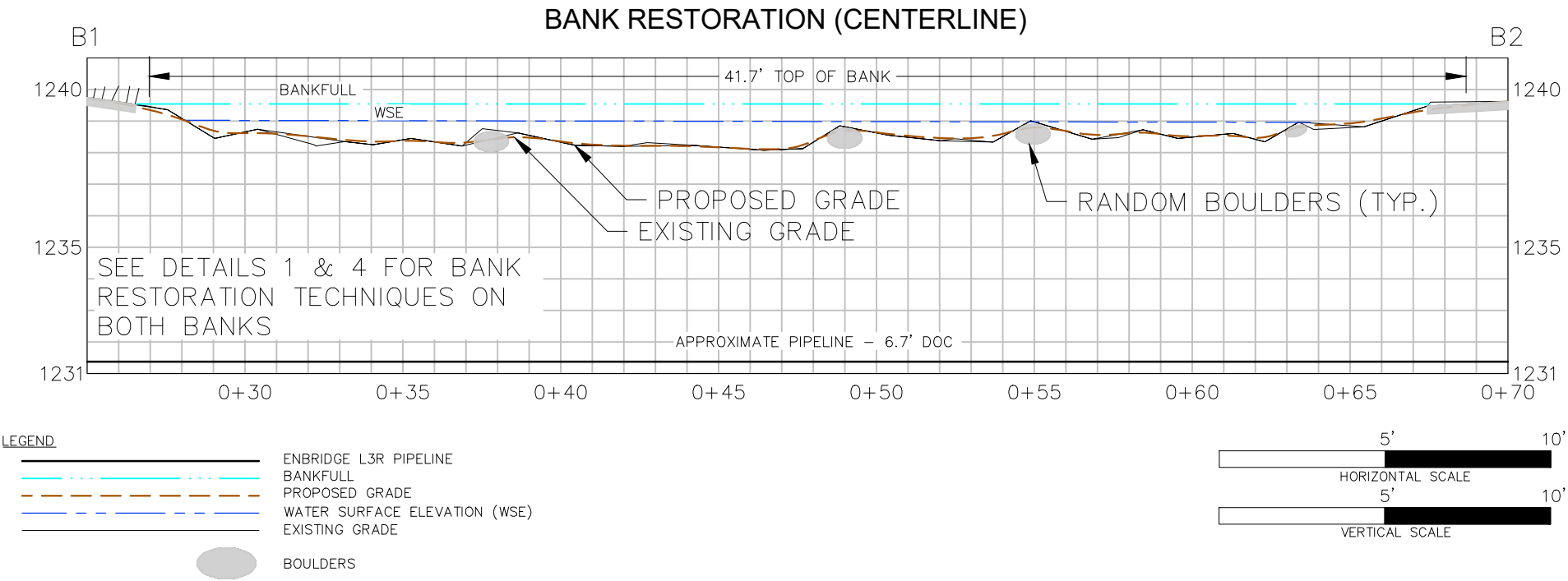
#### LEGEND

	ENBRIDGE L3R PIPELINE
	PERMANENT RIGHT OF WAY
	TEMPORARY WORKSPACE
	WATERBODY - RIFFLE (ROSGEN SURVEY)
	WATERBODY - POOL (ROSGEN SURVEY)
	WATERBODY - RUN (ROSGEN SURVEY)
	WATERBODY - GLIDE (ROSGEN SURVEY)
	MAJOR MINOR
	CONTOUR (1' INTERVAL)
	TOP OF BANK
	ORDINARY HIGH WATER MARK
	FIELD DELINEATED WETLAND
	TRAVEL LANE/CONSTRUCTION MATTING
	TRENCH - 10'
	TRENCH - 20'

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ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE-SPECIFIC RESTORATION PLAN UNNAMED STREAM - MP 1094.0 - MDNR ID 58 STABILIZATION PLAN					
SCALE	DWG. NO.	SSRP-1094.0-002		PAGE NO.	2/7







RESTORATION NOTES:  
GENERAL

- REFER TO RESTORATION DETAIL SHEETS FOR ADDITIONAL INFORMATION RELATED TO PROPOSED RESTORATION MEASURES.
- REFER TO SITE PHOTOS FOR INFORMATION ON PRE-CONSTRUCTION CROSSING CONDITIONS AND TO PROVIDE ADDITIONAL GUIDANCE FOR RESTORATION EFFORTS.
- TRENCH IS LOCATED WITHIN AN EXISTING RIFFLE, AS SUCH, THE BED MATERIAL SHALL BE EXCAVATED AND TEMPORARILY STOCKPILED TO BE REINSTALLED AS PART OF CHANNEL BED AND TOE OF BANK RESTORATION EFFORTS. REFER TO RESTORATION CROSS SECTION AND BED PROFILE SHEET 2 TO MAINTAIN THE EXISTING BED FEATURE GRADE CONTROL.
- RIFFLE MATERIAL IS NATURALLY COMMINGLED WITH A VARIETY OF PARTICLE SIZES TO PROMOTE CHANNEL SURFACE FLOWS. MATERIAL THICKNESS GENERALLY EXTENDS TO A DEPTH OF 1.5 TO 2 TIMES THE LARGEST SURFACE PARTICLE. RESTORED CHANNEL RIFFLE SECTION SHALL INCLUDE RANDOMLY SORTED MATERIALS.

SOD MATTING

- REMOVE VEGETATED MATS ON EITHER SIDE OF THE STREAM CROSSING USING ONSITE EQUIPMENT WHICH CAN UNDERCUT THE VEGETATION FOR REMOVAL. SMALL SHRUBS AND/OR TREES WITHIN THE SOD MATS ARE ACCEPTABLE AND SHOULD NOT BE REMOVED.
- DEPENDING ON THE LEVEL OF SATURATION AT THE TIME OF REMOVAL, IT MAY BE DIFFICULT TO OBTAIN INTACT CONSOLIDATED MATS, BUT GENERALLY THE NATIVE VEGETATION WILL BE RETAINED AND CAPTURED FOR PLACEMENT.
- SOD MATS CAN BE TRANSPLANTED DURING ANY SEASON.
- SOD MAT WILL BE PLACED ON CLEAR GROUND OR MATS WITHIN THE WORKSPACE.
- MONITOR MATS TO SUPPORT SURVIVABILITY; WATERING MAY BE NEEDED.
- PRIOR TO PLACEMENT OF SOD MATS FINISH GRADE CHANNEL BANK AND ADJACENT FLOODPLAIN APPLICATION AREA TO PROVIDE A SMOOTH AND EVEN SURFACE. SUBGRADE ELEVATION SHOULD ALLOW FOR THE FINISHED SOD SURFACE TO TRANSITION EVENLY WITH THE CHANNEL BANKS UPSTREAM AND DOWNSTREAM OF THE INSTALLATION AREA. AVOID ABRUPT CHANGES IN GRADE.
- VEGETATED MATS WILL BE RETURNED/SET IN PLACE WITH ONSITE EQUIPMENT.
- SURFACE APPLIED SOD MATTING SHOULD BE PLACED WITH THE LONG SIDE PERPENDICULAR TO THE CHANNEL / FLOW.
- STACKED SOD MATTING SHOULD BE PLACED WITH THE LONG SIDE PARALLEL TO THE CHANNEL / FLOW.
- WHEN PLACING SOD MATS, DO NOT LEAVE LARGE GAPS BETWEEN EACH SOD MAT AS NON-NATIVE VEGETATION WILL QUICKLY ATTEMPT TO COLONIZE THESE VOIDS.
- WATER SOD MATS AFTER REPLACEMENT IF CONDITIONS ARE HOT AND DRY. DAMP AND/OR FROZEN SOD MATS DO NOT REQUIRE WATERING.
- THE TOP MAT AND/OR OTHER MATS CAN BE ANCHORED WITH A LIVE AND/OR DEAD STOUT STAKE TO ENSURE THAT IT DOES NOT MOBILIZE DURING A FLOOD EVENT BEFORE THE ROOTS HAVE ESTABLISHED.
- THE VEGETATED MATS WILL BE REPLACED AS SOON AS PRACTICAL FOLLOWING BACKFILLING OF THE TRENCH AND STABILIZED PER THE TIMING REQUIREMENTS DESCRIBED IN SECTION 1.9.1 OF THE EPP.

LIVE STAKING

- CLEANLY REMOVE ALL SIDE BRANCHES AND THE TOP GROWTH, AND FASHION THE CUTTINGS INTO LIVE STAKES AS DEPICTED IN THE DETAIL DRAWING. AN OPTION DURING PREPARATION IS TO PAINT AND SEAL THE TOP OF THE LIVE STAKE BY DIPPING THE TOP 1-2 INCHES INTO A 50-50 MIX OF LIGHT-COLORED LATEX PAINT AND WATER. SEALING THE TOP OF STAKE WILL REDUCE THE POSSIBILITY OF DESICCATION, ASSURE THE STAKES ARE PLANTED WITH THE TOP UP, AND MAKES THE STAKES MORE VISIBLE FOR SUBSEQUENT PLANTING EVALUATIONS.
- USE A PUNCH BAR OR HAND AUGER TO CREATE A NARROW PILOT HOLE, PERPENDICULAR TO THE SLOPE, THROUGH ANY EROSION CONTROL MATTING, RIP RAP, OR OTHER REVETMENT, FILTER FABRIC, ETC., IF PRESENT, AND DEEP ENOUGH TO INTERCEPT THE WATER TABLE. THE HOLE SHOULD BE ONLY AS LARGE AS NECESSARY TO INSTALL THE LIVE STAKE WITHOUT DAMAGE WHILE ENSURING THE HIGHEST AMOUNT OF STAKE-SOIL CONTACT.
- INSERT THE POINTED END OF THE LIVE STAKE INTO THE PILOT HOLE. TAMP INTO THE GROUND WITH A DEAD BLOW HAMMER TAKING CARE NOT TO SPLIT OR OTHERWISE DAMAGE THE LIVE STAKE. USE WATER, SOIL BACKFILL, TAMPING, ETC. TO ACHIEVE GOOD SOIL-TO-STEM CONTACT AND REMOVE AIR POCKETS.
- USE ONSITE EQUIPMENT TO APPLY WATER FROM THE CHANNEL AFTER INSTALLATION.
- ALL CUTS SHOULD BE CLEAN AND SMOOTH. NO CRACKED OR SPLIT LIVE STAKES SHOULD BE USED. IF THEY SPLIT DURING TAMPING, THEY SHOULD BE CUT BELOW THE CRACK OR REPLACED.
- THE SPECIFIED NUMBER OF LIVE STAKES SHOULD BE INSTALLED INTO THE SOIL AND PROTRUDE ABOVE THE SOIL AND ANY SOD MATTING, MULCHING, EROSION CONTROL MATTING, RIP RAP, OR OTHER REVETMENT.
- LIVE STAKE SHOULD NOT MOVE AFTER INSTALLATION; ENSURING IT IS IN FIRM CONTACT WITH THE SOIL.
- IT IS IMPORTANT TO ENSURE THAT THE UPSTREAM AND DOWNSTREAM ENDS OF THE LIVE STAKING A MERGE SMOOTHLY INTO THE UNDISTURBED BANK BEYOND THE PROJECT AREA. THE RATE OF INSTALLING LIVE STAKES SHOULD TAPER OFF GRADUALLY TO BLEND IN WITH THE EXISTING VEGETATION.

TRANSPLANTS

- SHRUBS AND/OR ALDER REMOVED FROM THE TRENCH AREA MAY BE USED IN LIEU OF SOD MATS IN ACCORDANCE WITH THE TRANSPLANT DETAIL.

	COMMON NAME	SCIENTIFIC NAME
LIVE STAKE SPECIES	ELDERBERRY	SAMBUCUS CANADENSIS
	HIGH BUSH CRANBERRY	VIBURNUM OPOLUS (TRILOBUM)
	RED-OSIER DOGWOOD	CORNUS STOLONIFERA
	SILKY DOGWOOD	CORNUS AMOMUM
TRANSPLANTS	NONE	NONE
SHRUBS	BUTTONBUSH	(CEPHALANTHUS OCCIDENTALIS)
	SILKY DOGWOOD	(CORNUS AMOMUM)
	GRAY DOGWOOD	(CORNUS FOEMINA)
	RED-OSIER DOGWOOD	(CORNUS STOLONIFERA)
	ELDERBERRY	(SAMBUCUS CANADENSIS)
	NANNYBERRY	(VIBURNUM LENTAGO)

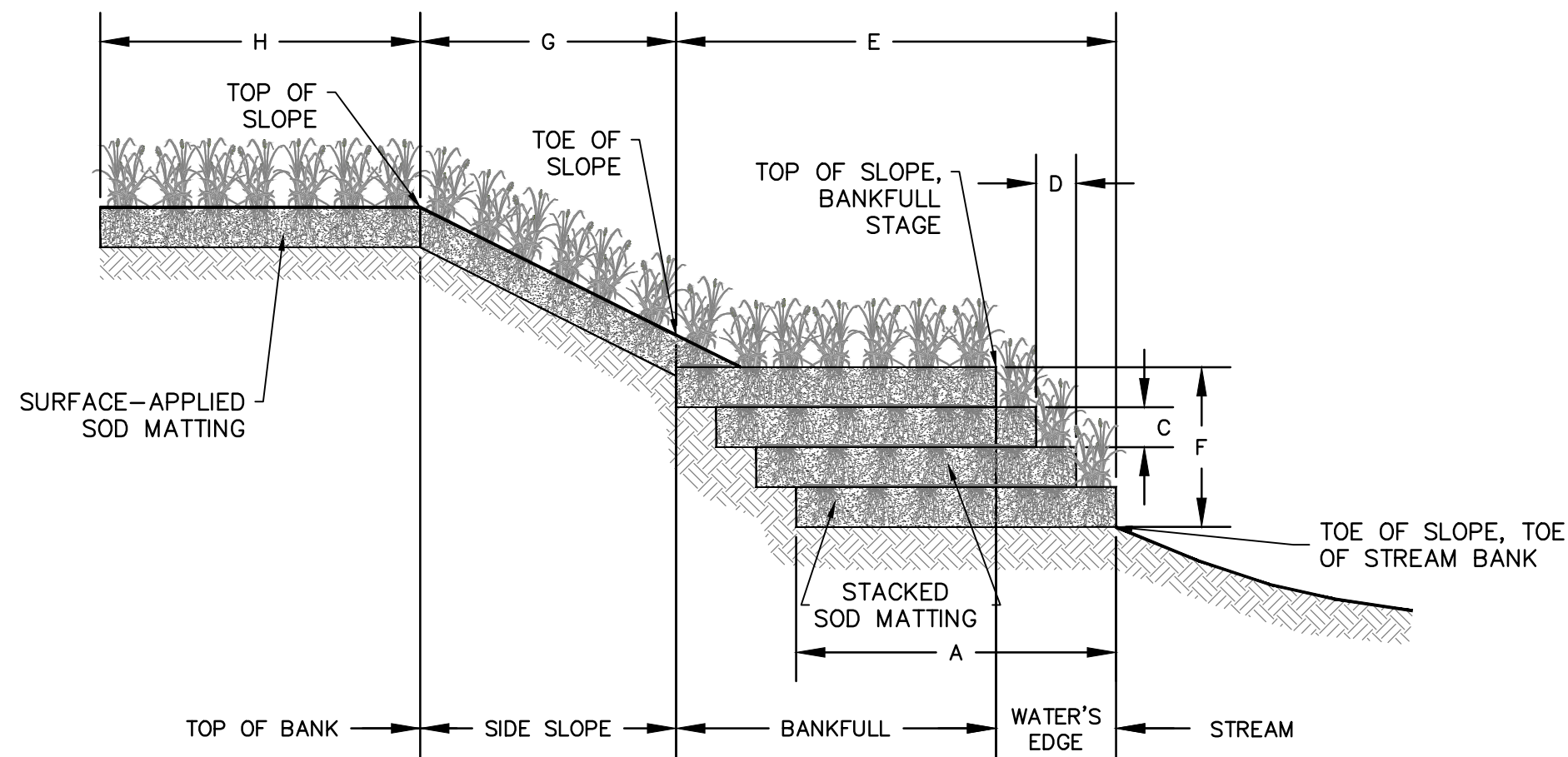
- PRELIMINARY SPECIES. PRIOR TO RESTORATION ACTIVITIES, ALL SPECIES WILL BE REQUIRED TO BE VERIFIED AS NATIVE AND FOUND WITHIN THE COUNTY WHERE PLANTED ON MNTAXA.
- LIVE STAKE SPECIES SELECTION: USE AT LEAST THREE (3) SPECIES WITH NO MORE THAN 60% OF ANY ONE (1) SPECIES; ALTERNATIVE SPECIES MAY BE SELECTED BASED ON SITE CONDITIONS AND AVAILABILITY. ALTERNATIVE SPECIES SHOULD BE REVIEWED AGAINST USDA DATA BASE FOR MN NATIVE SPECIES.
- (WHERE APPLICABLE) TRANSPLANTS AND/OR CONTAINER SHRUBS MAY BE SUBSTITUTED FOR LIVE STAKES BASED ON SITE SPECIFIC CONDITIONS.
  - CONTAINER PLANTED SHRUBS ARE RECOMMENDED TO BE 18" – 24" IN SIZE.
  - CONTAINER PLANTED SHRUBS SPACING: 1 SHRUB PER 3 LINEAR FEET OF BANK, ADDITIONAL ROWS SPACED 3 FEET APART, AND 3–5 SHRUBS OF THE SAME SPECIES.
- (WHERE APPLICABLE) TRANSPLANTS SHOULD BE EXCAVATED WITH A MINIMUM OF 12" SOIL, DIAMETER EQUAL TO PLANT DRIP LINE, AND LOOSE UNBOUND BALL.
- LIVE STAKE SPACING (WHERE APPLICABLE): STAGGER 1 STAKE PER 3 LINEAR FEET OF STREAM BANK IN 2 – 3 ROWS SPACED 1 FOOT APART. PLACE FIRST ROW ALONG TOP OF BANK (BANKFULL) AND THE LOWER ROW(S) BETWEEN THE TOP OF BANK AND OHWM.

1 VEGETATION CHART

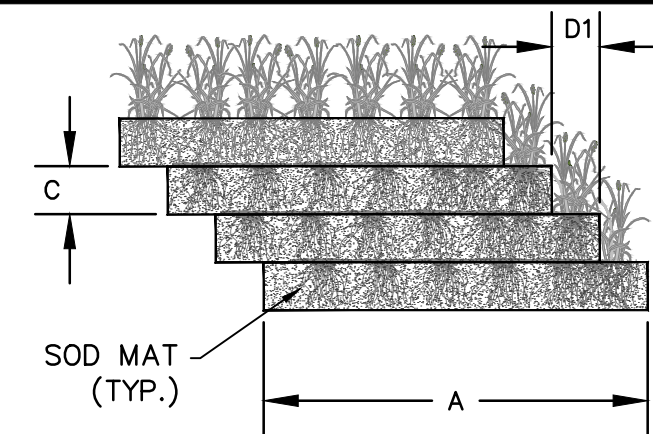
B	ISSUED FOR PERMITTING		10/2020		
A	ISSUED FOR REVIEW	MJT	08/2020		
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ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE-SPECIFIC RESTORATION PLAN UNNAMED STREAM – MP 1094.0 – MDNR ID 58 SITE SPECIFIC DETAILS					
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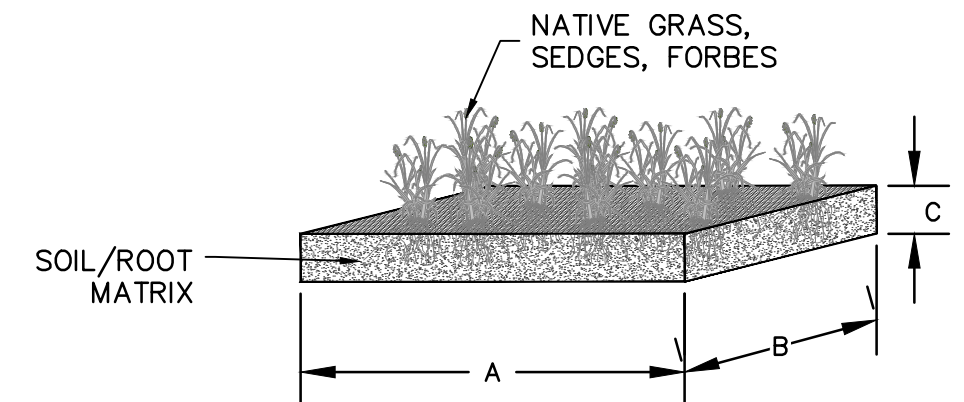




**CROSS SECTION**



**STACKED SOD MATTING DETAIL**



**SOD MAT DETAIL**

DIMENSION <sup>2</sup>	NAME	TYPICAL UNIT	VALUE	DESCRIPTION
A	SOD MAT WIDTH	FEET	3–4	WIDTH OF INDIVIDUAL SOD MAT.
B	SOD MAT LENGTH	FEET	3–6	LENGTH OF INDIVIDUAL SOD MAT.
C	SOD MAT THICKNESS	INCHES	12	THICKNESS OF INDIVIDUAL SOD MAT.
D	STACKED SOD MAT SETBACK	FEET	N/A	THE DISTANCE BETWEEN THE EDGES OF SOD MATS STACKED TO FORM A SLOPE
E	WIDTH OF STACKED SOD MATS	FEET	N/A	WIDTH OF A BANK CREATED BY STACKED SOD MATS
F	HEIGHT OF STACKED SOD MATS	FEET	N/A	HEIGHT OF A SLOPE CREATED BY STACKED SOD MATS
G	WIDTH OF SURFACE- APPLIED SOD MATS	FEET	10–20	WIDTH OF A SLOPE STABILIZED WITH SURFACE-APPLIED SOD MATS
H	TOP OF BANK SOD MATTING DISTANCE	FEET	15	DISTANCE SOD MATTING IS INSTALLED ON THE TOP OF BANK

NOTES:

1. DIMENSION LABELS ARE REFERENCED IN THE DETAIL DRAWINGS.



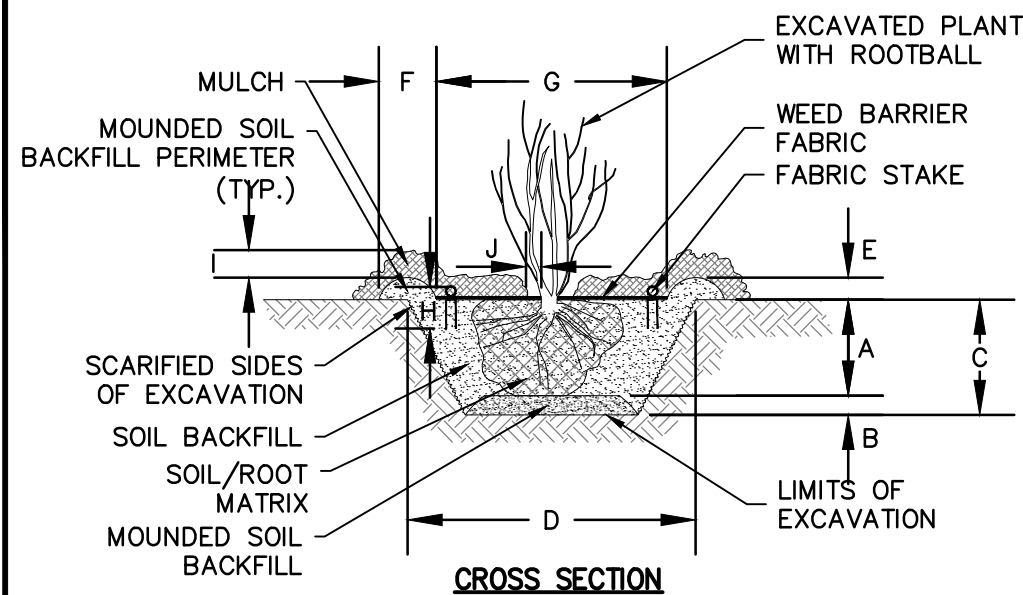
**SOD MAT EXAMPLES**

**SOD MATTING DETAIL**



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DIMENSION <sup>2</sup>	NAME	TYPICAL UNIT	VALUE	DESCRIPTION
A	PLANTING DEPTH	INCHES	12–18	PLANTING DEPTH OF THE TRANSPLANT.
B	HEIGHT OF MOUNDED SOIL BACKFILL	INCHES	N/A	HEIGHT OF MOUNDED LOOSE SOIL PLACED INTO OVER-EXCAVATED PLANTING PIT.
C	DEPTH OF PLANTING PIT	INCHES	12–18	DEPTH OF THE PLANTING PIT; ACCOMMODATES DIMENSION OF SOIL AND EXCAVATED ROOTS AS WELL AS MOUNDED LOOSE SOIL AT BOTTOM OF PIT.
D	WIDTH OF PLANTING PIT	FEET	3–5	OVER-EXCAVATED WIDTH OF THE PLANTING PIT; ACCOMMODATES THE WIDTH OF THE EXCAVATED SOIL AND ROOTS.
E	HEIGHT OF MOUNDED SOIL PERIMETER	INCHES	0–2	HEIGHT OF SOIL BERM CONSTRUCTED ALONG THE PERIMETER OF THE PLANTING PIT; HELPS RETAIN WATER.
F	WIDTH OF MOUNDED SOIL PERIMETER	INCHES	0–6	WIDTH OF SOIL BERM CONSTRUCTED ALONG THE PERIMETER OF THE PLANTING PIT; HELPS RETAIN WATER.
G	WIDTH OF WEED BARRIER FABRIC (OPTIONAL)	INCHES	N/A	WIDTH OF FABRIC PLACED ON SURFACE TO CONTROL WEEDS WITHIN THE MOUNDED SOIL PERIMETER; TRANSPLANTS TYPICALLY HAVE GRASSES, LEAF MATTER, ETC. ATTACHED AND DO NOT REQUIRE WEED BARRIER FABRIC.
H	FABRIC STAKE LENGTH (OPTIONAL)	INCHES	N/A	LENGTH OF STAPLES/SPIKES USED TO SECURE WEED BARRIER FABRIC
I	THICKNESS OF MULCH (OPTIONAL)	INCHES	N/A	THICKNESS OF MULCH, IF NECESSARY. TRANSPLANTS TYPICALLY HAVE GRASSES, LEAF MATTER, ETC. ATTACHED AND DO NOT REQUIRE MULCH.
J	GAP BETWEEN MULCH AND PLANT STEM/TRUNK (OPTIONAL)	INCHES	N/A	ROOM BETWEEN PLANT STEM/TRUNK AND MULCH. TRANSPLANTS TYPICALLY HAVE GRASSES, LEAF MATTER, ETC. ATTACHED

NOTES:

1. DIMENSION LABELS ARE REFERENCED IN THE DETAIL DRAWINGS.



TRANSPLANTS EXAMPLES

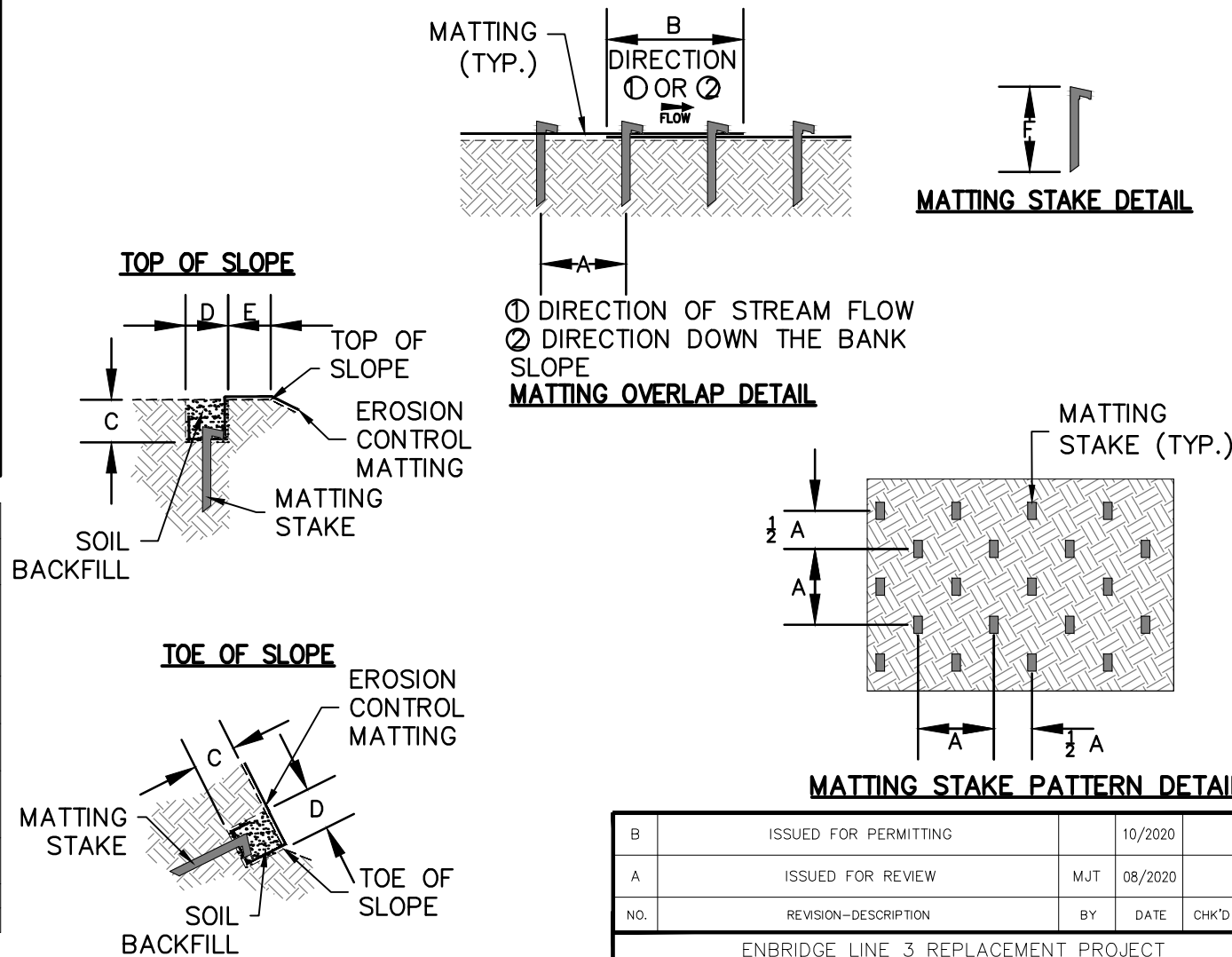
TRANSPLANTING DETAIL

DIMENSION <sup>2</sup>	NAME	TYPICAL UNIT	VALUE	DESCRIPTION
A	MATting STAKE SPACING	FEET, INCHES	N/A	SPACING BETWEEN EROSION CONTROL MATting STAKES USED TO FASTEN THE MATting TO THE SOIL
B	MATting OVERLAP	FEET, INCHES	N/A	AMOUNT OF EROSION CONTROL MATting OVERLAP IF MULTIPLE PIECES AND/OR ROLLS OF MATting ARE USED. OVERLAP VARIES DEPENDING ON THE LOCATION OF THE OVERLAP WITH RESPECT TO POSITION ON THE SLOPE, LOCATION OF THE MATting (EDGE OR END), AND PRODUCT SPECIFICATIONS.
C	MATting ANCHOR TRENCH DEPTH	FEET, INCHES	N/A	DEPTH OF TRENCH INTO WHICH EDGE OF EROSION CONTROL MATting IS ANCHORED AT THE TOP AND/OR TOE OF A SLOPE.
D	MATting ANCHOR TRENCH WIDTH	FEET, INCHES	N/A	WIDTH OF TRENCH INTO WHICH EDGE OF EROSION CONTROL MATting IS ANCHORED AT THE TOP AND/OR TOE OF A SLOPE.
E	TOP OF SLOPE ANCHOR TRENCH SETBACK	FEET, INCHES	N/A	TOP OF SLOPE ANCHOR TRENCH DISTANCE FROM THE TOP OF SLOPE. TOP OF SLOPE REFERS TO TOP OF SIDE SLOPE, BANK SLOPE, TERRACE SLOPE, BANKFULL, ETC.
F	MATting STAKE LENGTH	INCHES	N/A	LENGTH OF EROSION CONTROL MATting STAKES OR STAPLES USED TO FASTEN THE MATting TO THE SOIL

NOTES:

1. DIMENSION LABELS ARE REFERENCED IN THE DETAIL DRAWINGS.

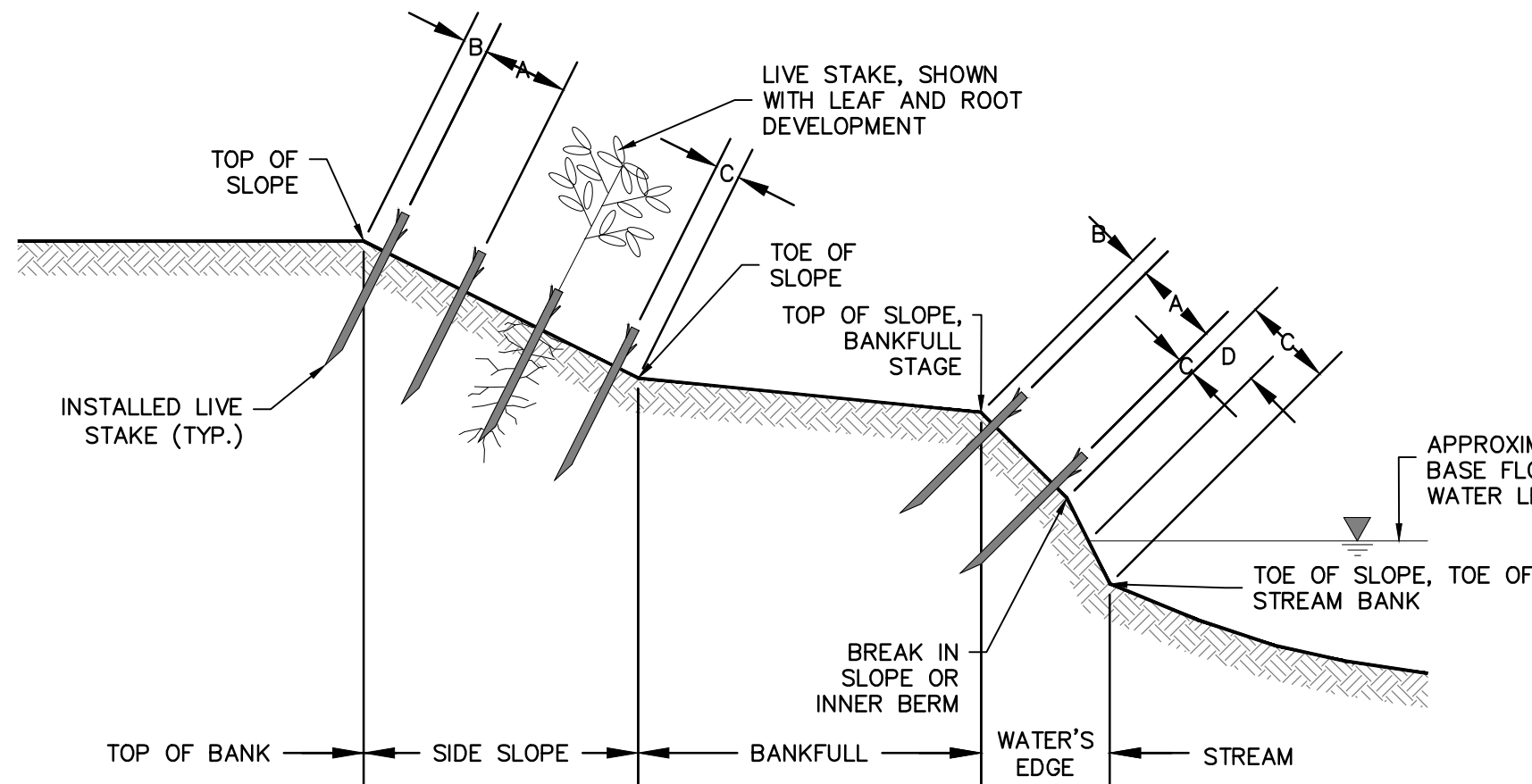
EROSION CONTROL MATting DETAIL



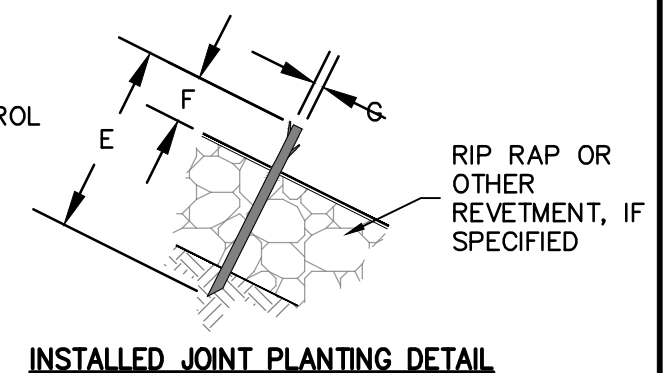
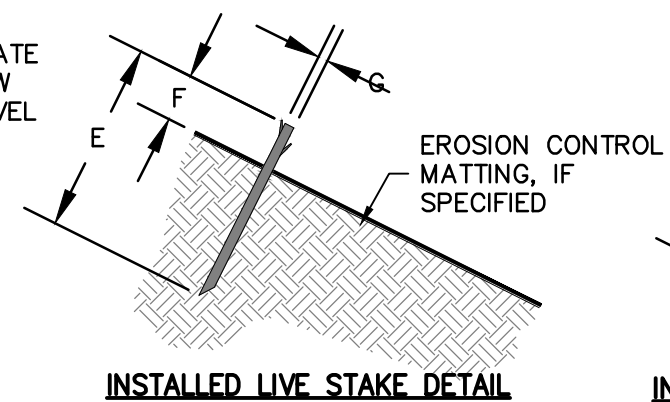
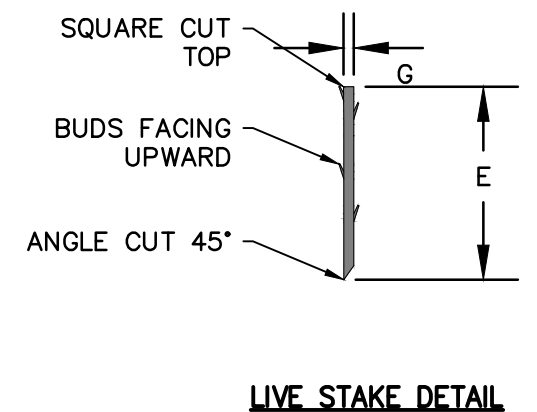
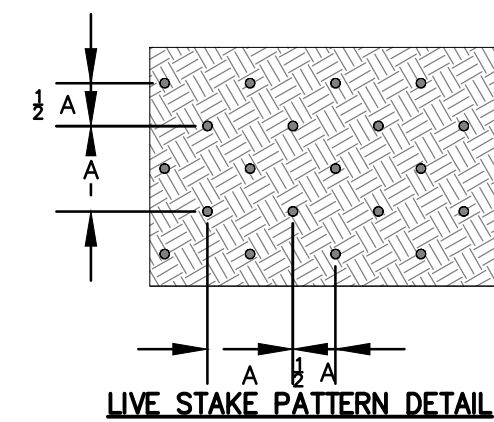
B	ISSUED FOR PERMITTING		10/2020		
A	ISSUED FOR REVIEW	MJT	08/2020		
NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D	APP'D
ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE-SPECIFIC RESTORATION PLAN UNNAMED STREAM – MP 1094.0 – MDNR ID 58 SITE SPECIFIC DETAILS					
SCALE	DWG. NO.	PAGE NO.			
NOTED	SSRP-1094.0-004	5/7			







**CROSS SECTION**



DIMENSION <sup>2</sup>	NAME	TYPICAL UNIT	VALUE	DESCRIPTION
A	LIVE STAKE SPACING	FEET	3 OC	SPACING BETWEEN INDIVIDUALLY INSTALLED LIVE STAKES. STAKES CAN BE PLACED IN A TRIANGULAR GRID (NRCS 2007A) OR RANDOMLY (NRCS 2007A, IOWA DNR 2006). RECOMMEND SPECIES DIVERSITY THROUGHOUT PROJECT AREA.
B	LIVE STAKE – TOP OF SLOPE PLACEMENT	INCHES	0–3	POSITION OF LIVE STAKE RELATIVE TO THE TOP OF A SLOPE
C	LIVE STAKE – TOE OF SLOPE PLACEMENT	INCHES	0–3	POSITION OF LIVE STAKE RELATIVE TO THE TOE OF A SLOPE
D	LIVE STAKE – BASE FLOW RELATIONSHIP	FEET	12-39.0	PLACEMENT OF LOWER ROW OF LIVE STAKES RELATIVE TO THE APPROXIMATE BASE FLOW WATER LEVEL WITH CONSIDERATION GIVEN TO DURATION OF INUNDATION DURING BANKFULL AND OTHER HIGH FLOW EVENTS.
E	LIVE STAKE LENGTH	INCHES	24–36	LENGTH OF PREPARED DORMANT LIVE CUTTING FROM WOODY PLANT TO BE USED AS LIVE STAKE. LENGTH SHOULD BE SUFFICIENT TO REACH LOW-FLOW WATER TABLE ELEVATION.
F	LIVE STAKE PROTRUSION	INCHES	3–4	DISTANCE INSTALLED LIVE STAKE SHOULD PROTRUDE ABOUT 20% FROM THE GROUND. AT LEAST TWO BUDS OR BUD SCARS SHOULD BE PRESENT ABOVE THE GROUND IN THE FINAL INSTALLATION, DEPENDING ON THE SURROUNDING VEGETATION HEIGHT.
G	LIVE STAKE DIAMETER	INCHES	$\frac{1}{2}$ – 1 $\frac{1}{2}$	DIAMETER OF PREPARED DORMANT LIVE CUTTING FROM WOODY PLANT TO BE USED AS LIVE STAKE – TYPICALLY CITE A PERMISSIBLE MINIMUM AND MAXIMUM DIAMETER.

NOTES:  
1. DIMENSION LABELS ARE REFERENCED IN THE DETAIL DRAWINGS.

**LIVE STAKE PLANTINGS DETAIL**

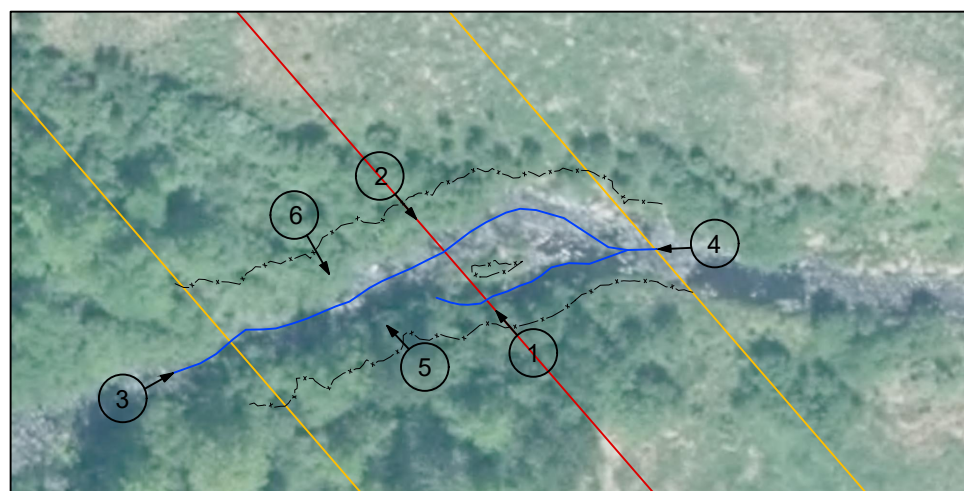


**LIVE STAKE EXAMPLE**

B	ISSUED FOR PERMITTING		10/2020		
A	ISSUED FOR REVIEW	MJT	08/2020		
NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D	APP'D
ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE-SPECIFIC RESTORATION PLAN UNNAMED STREAM – MP 1094.0 – MDNR ID 58 SITE SPECIFIC DETAILS					
SCALE	DWG. NO.	PAGE NO.			
NOTED	SSRP-1094.0-004	6/7			







**NOTES:**

1. AIR PHOTOS ARE FROM 2018 ENBRIDGE AERIAL PHOTOGRAPHY.
2. ADDITIONAL ON-THE GROUND PHOTOS MAY BE TAKEN PRIOR TO CONSTRUCTION AT MDNR REQUEST.
3. PRE-CONSTRUCTION PHOTOS WILL BE USED TO AID IN RESTORATION.



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A	ISSUED FOR REVIEW	MJT	08/2020		
NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D	APP'D
ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE-SPECIFIC RESTORATION PLAN UNNAMED STREAM — MP 1094.0 — MDNR ID 58 PHOTO PAGE					
SCALE		DWG. NO. SSRP-1094.0-005		PAGE NO. 5/5	



GENERAL

1. THE SPECIFICATIONS WITHIN THIS SSRP MAY MODIFY OR REPLACE PROJECT–WIDE STANDARDS PRESENTED IN THE EPP. WHERE MATERIAL WITHIN THESE SSRPS EXCEEDS STANDARD CONSTRUCTION MEASURES IN THE EPP, THESE SSRPS SUPERSEDE THE EPP.
2. CONSTRUCTION AND RESTORATION OF WATERBODY CROSSINGS WILL FOLLOW THESE GENERAL STEPS:

A. SITE CLEARING

B. INSTALLATION OF TEMPORARY EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES (‘BMPS’)

C. BRIDGE INSTALLATION

D. EXCAVATION/BACKFILLING OF THE WATERBODY INCLUDING:

• SOD SAVING TOPSOIL SEGREGATION AT NON–WOODED SITES

• STREAMBED MATERIAL SEGREGATION

• PIPE INSTALLATION

• BACKFILL, INCLUDING IMPLEMENTATION OF CONSTRUCTION–RELATED RESTORATION METHODS (I.E., TOE WOOD)

E. REPLACEMENT OF STREAMBED MATERIAL AND TOPSOIL/SOD LAYER

F. RESTORATION OF STREAM BANKS TO PRE–CONSTRUCTION CONTOURS

G. IF FINAL GRADING NOT POSSIBLE AT THE TIME, TEMPORARY STABILIZATION AND REPLACEMENT/REINFORCEMENT OF TEMPORARY BMPS

H. AFTER FINAL GRADING, PERMANENT SEEDING AND/OR WOODY VEGETATION RESTORATION, STABILIZATION AND REPLACEMENT/REINFORCEMENT OF TEMPORARY BMPS

I. BRIDGE REMOVAL DURING FINAL RESTORATION AFTER STABILIZATION AND PERMANENT SEEDING

J. POST–CONSTRUCTION MONITORING
- CROSSING METHODS
1. ALL WATERBODY AND WETLAND CROSSINGS WILL BE CONDUCTED IN COMPLIANCE WITH SECTION 2.0 AND SECTION 3.0 OF THE ENVIRONMENTAL PROTECTION PLAN (‘EPP’), RESPECTIVELY. SECTION 2.0 AND 3.0 OF THE WINTER CONSTRUCTION PLAN PRESENTS MODIFICATIONS FOR WATERBODY AND WETLAND CONSTRUCTION METHODS, RESPECTIVELY, IN WINTER CONDITIONS.

2. ENBRIDGE’S SUMMARY OF CONSTRUCTION METHODS AND PROCEDURES (THE ‘PROCEDURES,’APPENDIX A OF THE EPP) OUTLINES THE VARIOUS CONSTRUCTION METHODS THAT ENBRIDGE MAY UTILIZE TO CONSTRUCT THROUGH WATERBODIES AND WETLANDS/BASINS AS PRESENTED ON THESE SITE–SPECIFIC RESTORATION PLANS (‘SSRPS’).

A. DRY CROSSING (ISOLATED) METHODS (INCLUDING THE DRY CROSSING AND MODIFIED DRY CROSSING METHOD) ARE DESCRIBED SECTIONS 4.3 OF THE PROCEDURES, AND IN SECTIONS 2.5.2 AND 2.5.3 AND FIGURES 23 AND 24 OF THE EPP.

B. THE BORE METHOD (NON–PRESSURIZED) IS DESCRIBED IN SECTION 3.5 OF THE PROCEDURES, AND SECTION 4.0 OF THE EPP.

C. THE MODIFIED UPLAND CONSTRUCTION (WETLAND) METHOD IS DESCRIBED IN SECTION 3.3 OF THE PROCEDURES, AND SECTION 3.0 AND FIGURES 30 TO 34 OF THE EPP.

D. ALTHOUGH NOT PROPOSED AS A PRIMARY METHOD AT THESE SSRP WATERBODIES, THE OPEN CUT (NON–ISOLATED) WATERBODY CROSSING METHOD IS DESCRIBED IN SECTION 4.1 OF THE PROCEDURES, AND SECTION 2.5.1 AND FIGURE 24 OF THE EPP.

E. ALTHOUGH NOT PROPOSED AS A PRIMARY METHOD AT THESE SSRP WATERBODIES, THE PUSH–PULL METHOD IS DESCRIBED IN SECTION 3.4 OF THE PROCEDURES, AND SECTION 3.7.1 AND FIGURES 35 AND 36 OF THE EPP.

CLEARING/VEGETATION REMOVAL

1. STUMPS WITHIN THE TRENCH LINE WILL BE COMPLETELY REMOVED, GROUND, AND/OR HAULED OFF–SITE TO AN APPROVED LOCATION. TREE STUMPS OUTSIDE THE TRENCH LINE WILL BE GROUND BELOW NORMAL GROUND SURFACE TO FACILITATE A SAFE WORK AREA AND TO ALLOW TOPSOIL REMOVAL, IF NECESSARY. IN SOME CIRCUMSTANCES, TREE STUMPS OUTSIDE THE TRENCH LINE MAY BE COMPLETELY REMOVED TO ALLOW FOR A SAFE WORK AREA AND HAULED OFF–SITE TO AN APPROVED LOCATION AS OUTLINED IN SECTION 1.8.3 OF THE EPP.

2. CLEARING WILL BE CONDUCTED IN WATERBODIES AND WETLANDS AS OUTLINED IN SECTION 2.2 AND 3.2 OF THE EPP, RESPECTIVELY. CHIPS, MULCH, OR MECHANICALLY CUT WOODY DEBRIS SHALL NOT BE STOCKPILED IN A WETLAND. HYDRO–AX DEBRIS, OR SIMILAR CAN BE LEFT IN THE WETLAND IF SPREAD EVENLY IN THE CONSTRUCTION WORKSPACE TO A DEPTH THAT WILL ALLOW FOR NORMAL REVEGETATION, AS DETERMINED BY THE EI. CHIPPING IS NOT ALLOWED ON PUBLIC LANDS. ON PUBLIC LANDS, MULCH AND MECHANICALLY CUT WOODY DEBRIS MUST BE UNIFORMLY BROADCAST TO LESS THAN 2–INCH THICKNESS AND IN A MANNER THAT MAINTAINS VISIBLE GROUND.

3. ENBRIDGE WILL PROPERLY INSTALL AND MAINTAIN REDUNDANT SEDIMENT CONTROL MEASURES IMMEDIATELY AFTER CLEARING AND PRIOR TO INITIAL GROUND DISTURBANCE AT SURFACE WATERS LOCATED WITHIN 50 FEET OF THE PROJECT AND WHERE STORMWATER FLOWS TO THE SURFACE WATER (REFER TO THE ENVIRONMENTAL PLAN SHEETS IN THE SWPPP), AND WITHIN 100 FEET OF SPECIAL AND IMPAIRED WATERS, INCLUDING TROUT STREAMS.

4. ON PUBLIC LANDS AND WHEREVER PRACTICABLE AT WATERBODY CROSSINGS, ENBRIDGE WILL USE WILDLIFE–FRIENDLY EROSION AND SEDIMENT CONTROL BMPS THAT CONTAIN BIODEGRADABLE NETTING (CATEGORY 3N OR 4N NATURAL FIBER) AND WILL AVOID THE USE OF PLASTIC MESH (SECTIONS 1.17.1 AND 2.6.1 OF THE EPP).

TEMPORARY STABILIZATION

1. ON PORTIONS OF THE PROJECT WHERE WORK WILL BE OCCURRING DURING APPLICABLE ‘WORK IN WATER RESTRICTIONS’FOR PUBLIC WATERS (REFER TO SECTION 2.1), ALL EXPOSED SOIL AREAS WITHIN 200 FEET OF THE WATER’S EDGE, AND THAT DRAIN TO THAT WATER, WILL BE STABILIZED WITHIN 24 HOURS DURING THE RESTRICTION PERIOD. STABILIZATION OF ALL EXPOSED SOILS WITHIN 200 FEET OF THE PUBLIC WATER’S EDGE, AND THAT DRAIN TO THAT WATER, WILL BE INITIATED IMMEDIATELY AND COMPLETED WITHIN 7 CALENDAR DAYS WHENEVER CONSTRUCTION ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED ON ANY PORTION OF THE SITE OUTSIDE OF THE RESTRICTION PERIOD. THESE AREAS WILL BE IDENTIFIED ON THE ENVIRONMENTAL PLAN SHEETS ACCOMPANYING THE SWPPP.

2. HYDRO–MULCH AND LIQUID TACKIFIER CAN BE USED IN PLACE OF CERTIFIED WEED–FREE STRAW OR HAY MULCH WITH PRIOR APPROVAL FROM ENBRIDGE. ALL HYDROMULCH AND LIQUID TACKIFIER PRODUCTS USED WILL BE ON THE APPLICABLE STATE DOT PRODUCT LIST. HYDRO–MULCH AND LIQUID TACKIFIER PRODUCTS CONTAINING PLASTIC/POLYPROPYLENE FIBER ADDITIVES AND MALACHITE GREEN (COLORANT) WILL NOT BE UTILIZED ON THIS PROJECT. APPLICATION RATES WILL BE AT THE MANUFACTURER’S RECOMMENDED RATE. ENBRIDGE WILL AVOID THE USE OF HYDROMULCH ON PUBLIC LANDS; HOWEVER, ENBRIDGE MAY USE HYDROMULCH ON STEEP SLOPES TO PREVENT EROSION UNTIL PERMANENT COVER HAS BEEN ESTABLISHED AS OUTLINED IN SECTION 1.8.3 OF THE EPP.

RESTORATION AND STABILIZATION

1. ENBRIDGE WILL RESTORE THE STREAM BANKS AS NEAR AS PRACTICABLE TO PRE–CONSTRUCTION CONDITIONS UNLESS THAT SLOPE IS DETERMINED TO BE UNSTABLE. IF THE SLOPE IS CONSIDERED UNSTABLE, ENBRIDGE WILL RESHAPE THE BANKS TO PREVENT SLUMPING. FOR PUBLIC WATERS, ENBRIDGE WILL RETURN THE BANK TO PRE–CONSTRUCTION CONTOURS, UNLESS OTHERWISE DIRECTED BY THE SITE–SPECIFIC RESTORATION PLAN. IF ENBRIDGE CANNOT RESTORE TO PRE–CONSTRUCTION CONTOURS AT A PUBLIC WATER, ENBRIDGE WILL CONSULT WITH THE MDNR BEFORE PROCEEDING FURTHER AS OUTLINED IN SECTION 2.6 OF THE EPP.

2. UNSTABLE SOILS AND/OR SITE–SPECIFIC FACTORS SUCH AS STREAM VELOCITY AND FLOW DIRECTION MAY REQUIRE ADDITIONAL RESTORATION EFFORTS, SUCH AS INSTALLATION OF WOODY VEGETATION, GEOTEXTILE FABRIC, OR TREE, LOG, ROOTWAD, OR BOULDER REVETMENTS TO STABILIZE DISTURBED STREAM BANKS (SEE FIGURE 29) AS OUTLINED IN SECTION 2.6.2 OF THE EPP. ENBRIDGE WILL WORK WITH THE MDNR TO ENSURE ALL WORK/ADJUSTMENTS ARE APPROVED AND ARE CONDUCTED WITHIN APPLICABLE TIMING RESTRICTIONS.

3. IN UPLAND AND WETLAND AREAS, CLEANUP AND ROUGH GRADING WILL OCCUR AS OUTLINED IN SECTIONS 1.16 AND 3.9 OF THE EPP. ENBRIDGE WILL BACKFILL THE TRENCH TO AN ELEVATION SIMILAR TO THE ADJACENT AREAS OUTSIDE THE TRENCH LINE AND WILL ADD A SLIGHT CROWN OF APPROXIMATELY 3 TO 6 INCHES (DEPENDING ON SOIL TYPE) OVER THE BACKFILLED TRENCH TO ALLOW FOR SUBSIDENCE. GENERALLY, EXCESS SUBSOIL DISPLACED BY THE PIPE INSTALLATION WILL BE SPREAD ACROSS THE PORTION OF THE CONSTRUCTION WORKSPACE WHERE TOPSOIL REMOVAL HAS OCCURRED. ANY REMAINING EXCESS SUBSOIL WILL BE REMOVED AND DISPOSED OF AT AN APPROVED OFF–SITE LOCATION AS NEEDED TO ENSURE CONTOURS ARE RESTORED TO AS NEAR AS PRACTICABLE TO PRE–CONSTRUCTION CONDITIONS.

4. REVEGETATION ACTIVITIES WILL OCCUR AS OUTLINED IN SECTION 7.0 OF THE EPP. SEED MIXES AT PUBLIC WATERS WILL BE SELECTED AND APPLIED AS INDICATED IN THE PLANTING PLAN, WHICH IS APPENDIX A OF THE POST–CONSTRUCTION VEGETATION MANAGEMENT PLAN FOR PUBLIC LANDS AND WATERS (‘VMP’). SEED MIXES RELATIVE TO THESE SSRP CROSSINGS ARE CODED AS FOLLOWS:

A	EMERGENT (34–181)	G	DRY PRAIRIE GENERAL (35–221)
B	RIPARIAN NE (34–361)	H	MESIC PRAIRIE GENERAL (35–241)
C	RIPARIAN S&W (34–261)	I	MESIC PRAIRIE NW (35–441)
D	WET MEADOW NE (34–371)	J	DRY PRAIRIE NORTHWEST (35–421)
E	WET MEADOW S&W (34–271)	K	WOODLAND EDGE NE (36–311)
F	WETLAND REHABILITATION (34–171)	L	NATURAL REVEGETATION

5. ENBRIDGE WILL NOT SEED STANDING WATER OR WOODED (PSS AND PFO) WETLAND COMMUNITIES. NATURAL REVEGETATION WILL TAKE PLACE FROM EXISTING PLANT MATERIAL AND ROOT STOCK IN THESE COMMUNITIES.

6. ALL MATERIALS USED FOR CONSTRUCTION OF THE PROJECT MUST BE REMOVED FROM THE SITE.

7. ENBRIDGE WILL CONDUCT POST–CONSTRUCTION MONITORING IN ACCORDANCE WITH THE POST–CONSTRUCTION MONITORING PLAN FOR WETLANDS AND WATERBODIES, AND IN ACCORDANCE WITH THE VMP FOR THE UPLAND PORTIONS OF THE PROJECT ON PUBLIC LANDS.

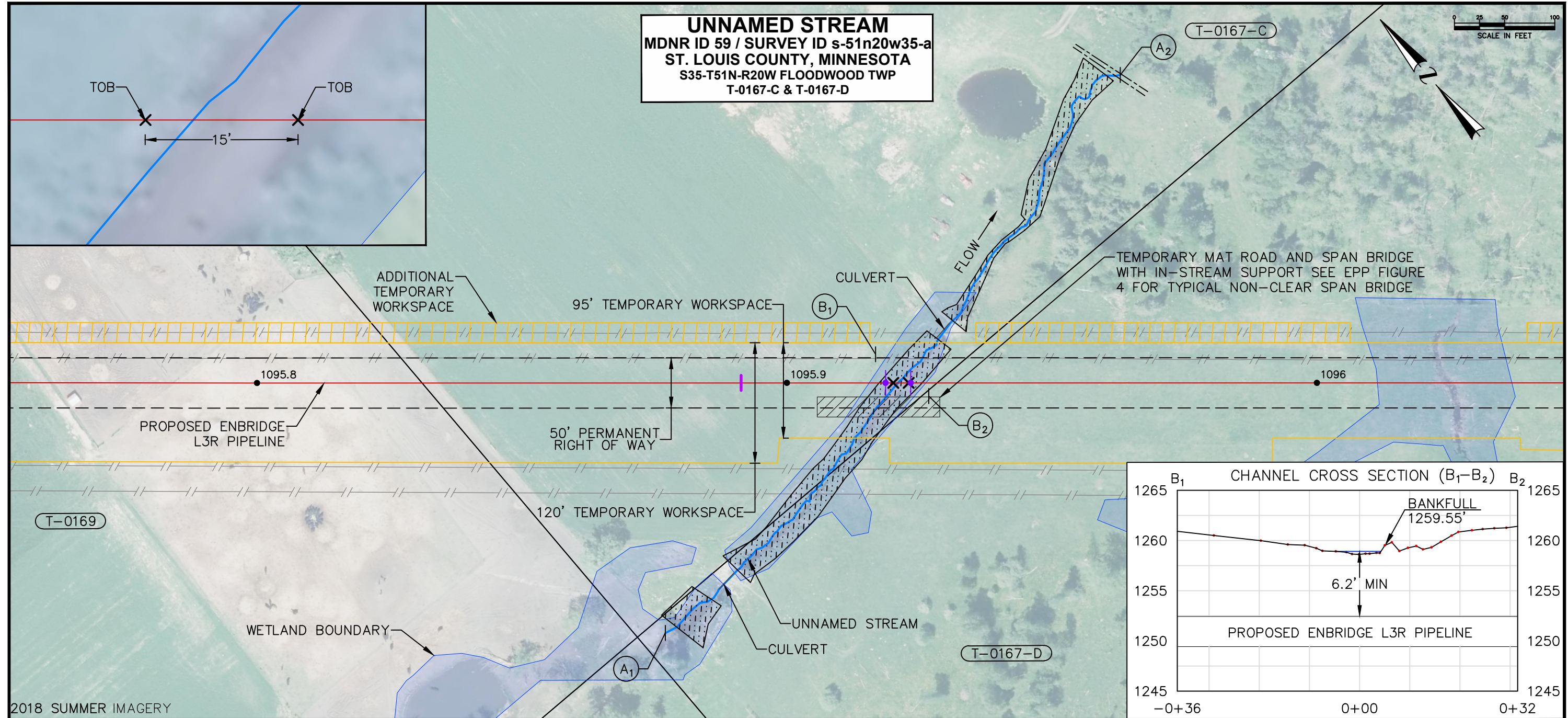
B	ISSUED FOR PERMITTING	MJT	10/2020		
NO.	REVISION–DESCRIPTION	BY	DATE	CHK'D	APP'D
ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE–SPECIFIC RESTORATION PLAN					
CONSTRUCTION NOTES					
SCALE		DWG. NO. SSRP–NOTES		PAGE NO.	

PLOTTED SIZE: ANSI FULL BLEED B (17x11)



**MDNR ID No. 59: MP 1095.9; Unnamed Stream (S-002-027)**





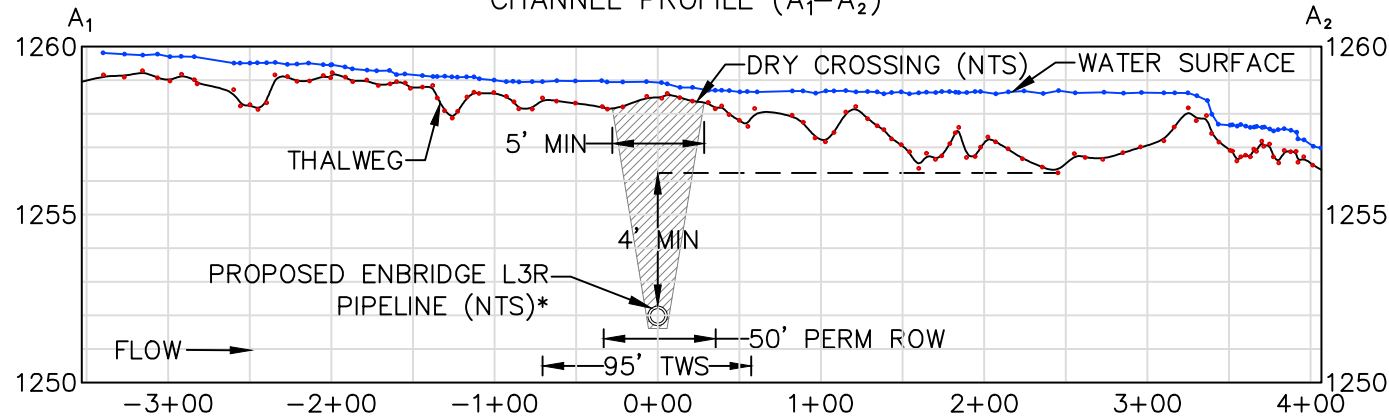
NOTES

- SOBS (O/H) OR NPC (S1-3): N/A
- MDNR REGION 2 PWI - COOL/WARM WATER FISHERY: MARCH 15 - JUNE 30. 24-HOUR SOIL STABILIZATION REQUIRED WITHIN 200 FEET DURING RESTRICTION.
- WHEN WORKING WITHIN "WORK IN WATER RESTRICTIONS", STABILIZE ALL EXPOSED SOIL AREAS WITHIN 200 FEET OF THE WATER'S EDGE, AND THAT DRAIN TO THAT WATER, WITHIN 24 HOURS. STABILIZATION WILL BE INITIATED IMMEDIATELY AND COMPLETED WITHIN 7 CALENDAR DAYS WHENEVER CONSTRUCTION ACTIVITY HAS PERMANENTLY/ TEMPORARILY CEASED ON ANY PORTION OF THE SITE OUTSIDE OF THE RESTRICTION PERIOD.

LEGEND

- PROPOSED ENBRIDGE L3R PIPELINE
- OTHER PIPELINE
- PERMANENT RIGHT OF WAY
- TEMPORARY WORKSPACE
- WATERBODY (ROSGEN SURVEY - THALWEG)
- TRACT BOUNDARY
- FORD
- HOOF SHEER
- TEMPORARY MAT ROAD AND SPAN BRIDGE
- WETLAND
- ADDITIONAL TEMPORARY WORKSPACE
- TRACT ID
- ROSGEN SURVEY POINT - WATER SURFACE
- ROSGEN SURVEY POINT - RIVER BOTTOM (THALWEG)
- PROPOSED INCREASED DEPTH OF COVER EXTENT
- TOP OF BANK
- TRENCH BREAKER (LOCATIONS ARE APPROXIMATE)

CHANNEL PROFILE (A<sub>1</sub>-A<sub>2</sub>)



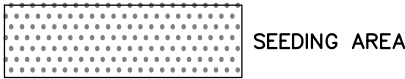
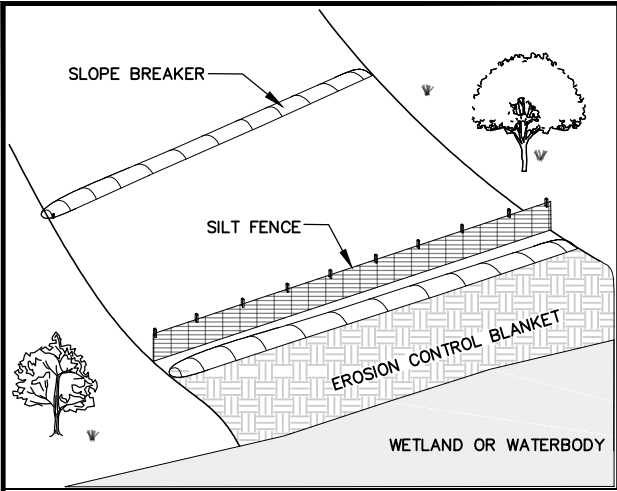
CHANNEL CROSS SECTION NOTE:

- CHANNEL LOCATIONS, DIMENSIONS, AND/OR ELEVATIONS ARE BASED ON 2019 TOPOGRAPHIC/BATHYMETRIC SURVEY(S), AND AS SUCH DO NOT REFLECT CHANGES TO THE CHANNEL THAT MAY HAVE OCCURRED SINCE THAT TIME.
- DEPTH OF COVER AT CENTERLINE WAS DEVELOPED USING THE BOTTOM ELEVATION OF THE DEEPEST UPSTREAM OR DOWNSTREAM POOL WITHIN THE SURVEYED REACH, UNLESS OTHERWISE NOTED IN APPLICATION MATERIALS.
- MEAN MEANDER BELT WIDTH: 25'
- MEANDER WIDTH RATIO: 1.04

0	ISSUED FOR PERMIT APPLICATION	AJJ	10/2020	BAB	BAB
NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D	APP'D
<b>ENBRIDGE</b>					
DWN. BY:	AJJ	DATE	10/2020	PROPOSED ENBRIDGE L3R PIPELINE PRIMARY METHOD - DRY CROSSING CROSSING OF UNNAMED STREAM ENBRIDGE MP 1095.9 ST. LOUIS COUNTY, MINNESOTA	
CHK.				SCALE NOTED DWG. NO. B-93-5.84-MDNR-59-0	
PROJ. ENGR.					
PROJ. MGR.					
CLIENT APP.					

FOR ENVIRONMENTAL REVIEW PURPOSES ONLY





**PUBLIC WATERS WATERCOURSE (SURVEYED AS WATERBODY) CROSSING-RPARIAN AREAS**

- 1) PRIOR TO DISTURBANCE, EROSION AND SEDIMENT CONTROL BMPS (E.G., STRAW BALES, FILTER SOCKS, SILT FENCES) WILL BE INSTALLED AS NECESSARY AND WILL REMAIN IN PLACE UNTIL THE AREA HAS STABILIZED AND ADEQUATE REVEGETATION HAS ESTABLISHED.
- 2) ENBRIDGE WILL RESTORE THE BANKS AS NEAR AS PRACTICABLE TO PRE-CONSTRUCTION CONDITIONS UNLESS THE SLOPE IS DETERMINED BY TO BE UNSTABLE. WHERE THE SLOPE OF THE BANKS IS DETERMINED TO BE UNSTABLE OR HAS THE POTENTIAL TO ERODE OR FAIL, THE BANKS WILL BE RESHAPED TO TRANSITION THE DISTURBED AREAS INTO THE NATURAL STREAM BANK WITH THE INTENT TO STABILIZE THE BANK AND CREATE A BLENDED, NATURAL APPEARANCE.
- 3) SOIL STABILIZATION WILL BE INITIATED WITHIN 24 HOURS AFTER INSTALLATION OF THE CROSSING USING THE OPEN CUT TRENCH METHOD AND PRIOR TO RESTORING FLOW USING THE DAM AND PUMP OR FLUME METHOD, UNLESS SITE AND PERMIT CONDITIONS DELAY PERMANENT INSTALLATION.
- 4) PERMANENT SLOPE BREAKERS WILL BE INSTALLED AT THE BASE OF SLOPED APPROACHES TO PREVENT SEDIMENT FLOW INTO WATERBODIES AS DESCRIBED IN THE EPP (FIGURE 20):
- a. PERMANENT SLOPE BREAKERS WILL BE INSTALLED TO MINIMIZE CONCENTRATED OR SHEET FLOW RUNOFF IN DISTURBED AREAS IN ACCORDANCE WITH THE FOLLOWING MAXIMUM ALLOWABLE SPACING UNLESS OTHERWISE SPECIFIED IN PERMIT CONDITIONS.

	SLOPE (%)	APPROXIMATE SPACING (FT)
1.	<5	250
2.	>5-15	200
3.	15-25	150
4.	>25	<100

- 5) WATERBODY BANKS WILL BE SEEDED WITH AN APPROPRIATE SEED MIX AS SPECIFIED IN THE EPP (SECTION 7.8) AND COVERED WITH AN EROSION CONTROL BLANKET.
- 6) WHERE A WATERBODY IS LOCATED WITHIN A WETLAND, ENBRIDGE WILL RE-SEED THE BANKS WITH THE APPLICABLE WETLAND SEED MIX DESCRIBED IN THE EPP (SECTION 7.7).
- 7) ADDITIONAL VEGETATION REQUIREMENTS MAY ALSO BE CONTAINED WITHIN PROJECT-SPECIFIC PERMITS

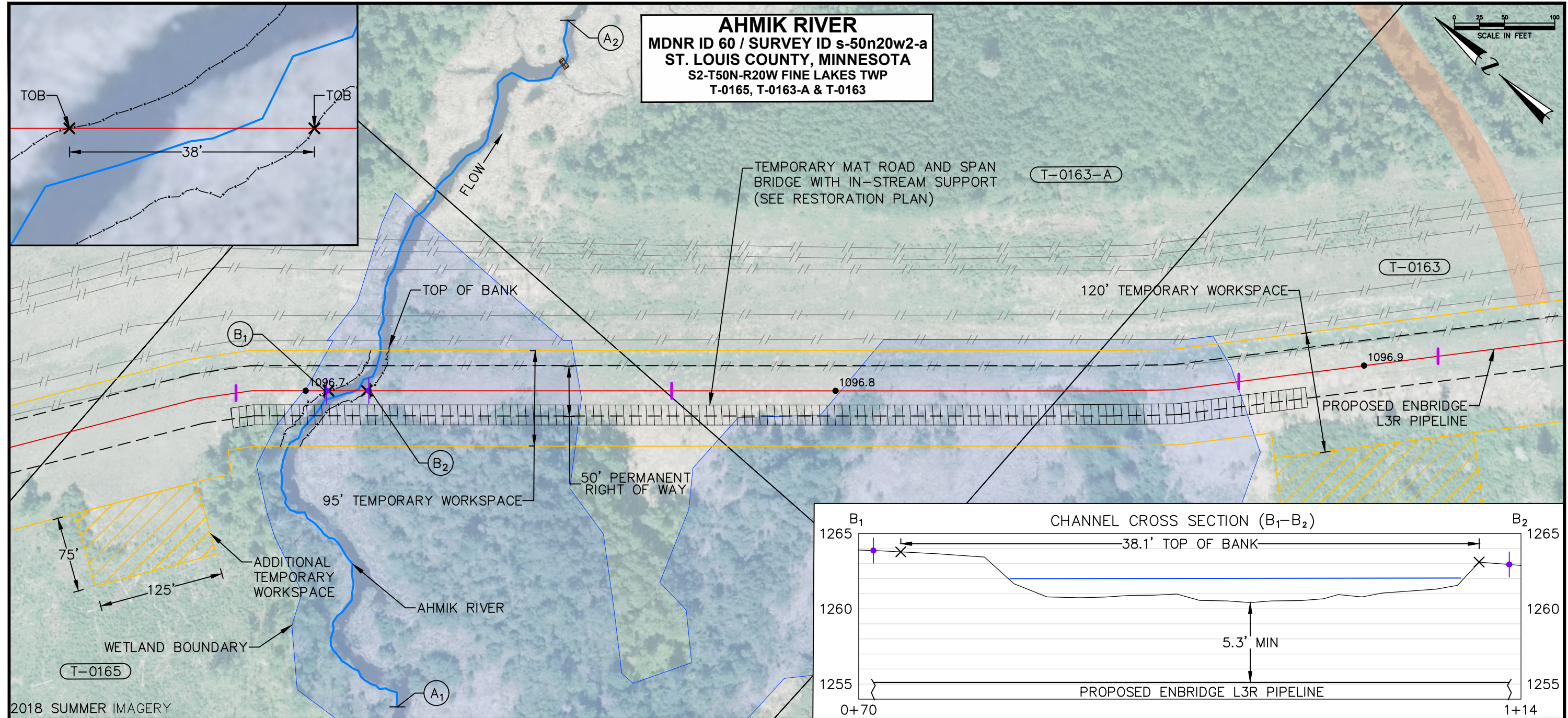
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**MDNR ID No. 60: MP 1096.7; Ahmik River (S-002-026)**





NOTES

1. BANKFULL DATA NOT AVAILABLE
2. SOBS (O/H) OR NPC (S1-3): N/A
3. MDNR REGION 2 PWI - COOL/WARM WATER FISHERY: MARCH 15 - JUNE 30. 24-HOUR SOIL STABILIZATION REQUIRED WITHIN 200 FEET DURING RESTRICTION.

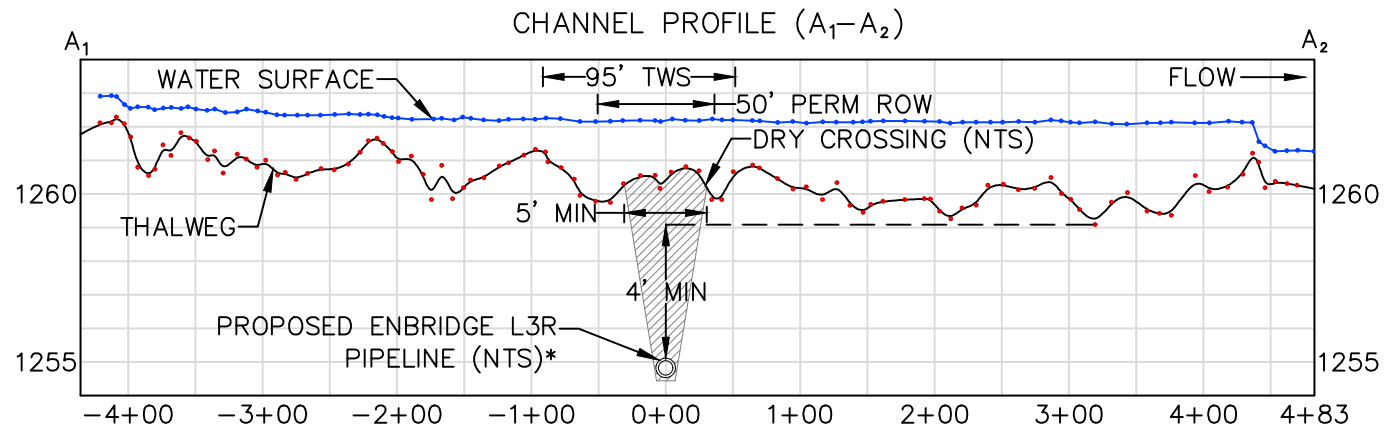
4. WHEN WORKING WITHIN "WORK IN WATER RESTRICTIONS", STABILIZE ALL EXPOSED SOIL AREAS WITHIN 200 FEET OF THE WATER'S EDGE, AND THAT DRAIN TO THAT WATER, WITHIN 24 HOURS. STABILIZATION WILL BE INITIATED IMMEDIATELY AND COMPLETED WITHIN 7 CALENDAR DAYS WHENEVER CONSTRUCTION ACTIVITY HAS PERMANENTLY/TEMPORARILY CEASED ON ANY PORTION OF THE SITE OUTSIDE OF THE RESTRICTION PERIOD.

CHANNEL CROSS SECTION NOTE:

1. CHANNEL LOCATIONS, DIMENSIONS, AND/OR ELEVATIONS ARE BASED ON 2020 TOPOGRAPHIC/BATHYMETRIC SURVEY(S), AND AS SUCH DO NOT REFLECT CHANGES TO THE CHANNEL THAT MAY HAVE OCCURRED SINCE THAT TIME.
2. DEPTH OF COVER AT CENTERLINE WAS DEVELOPED USING THE BOTTOM ELEVATION OF THE DEEPEST UPSTREAM OR DOWNSTREAM POOL WITHIN THE SURVEYED REACH, UNLESS OTHERWISE NOTED IN APPLICATION MATERIALS.
3. MEAN MEANDER BELT WIDTH: N/A
4. MEANDER WIDTH RATIO: N/A

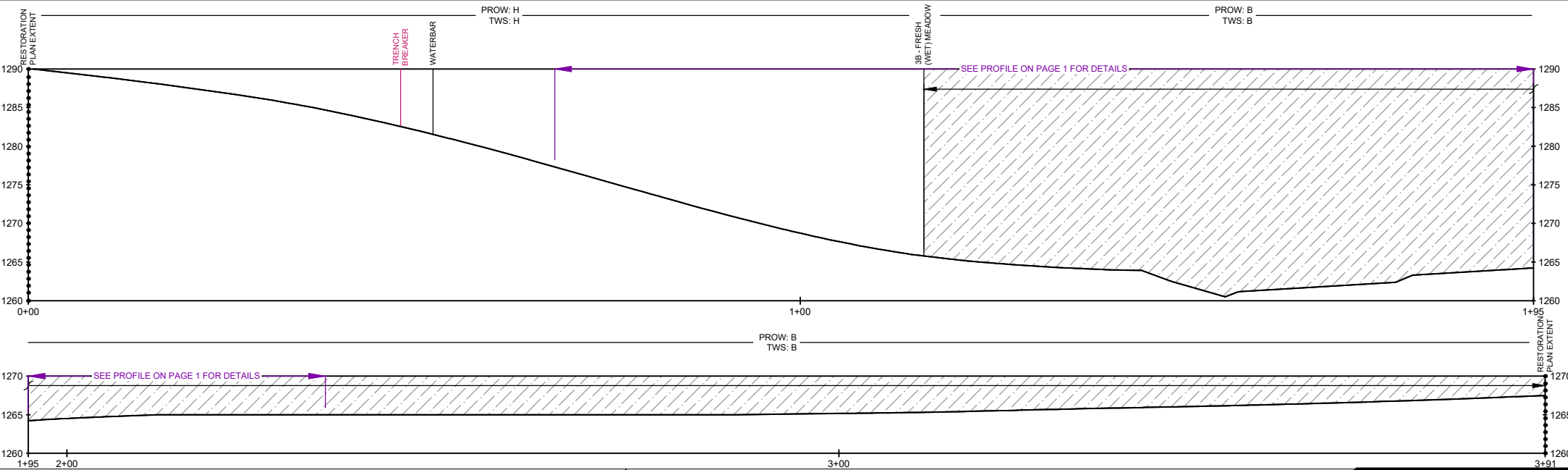
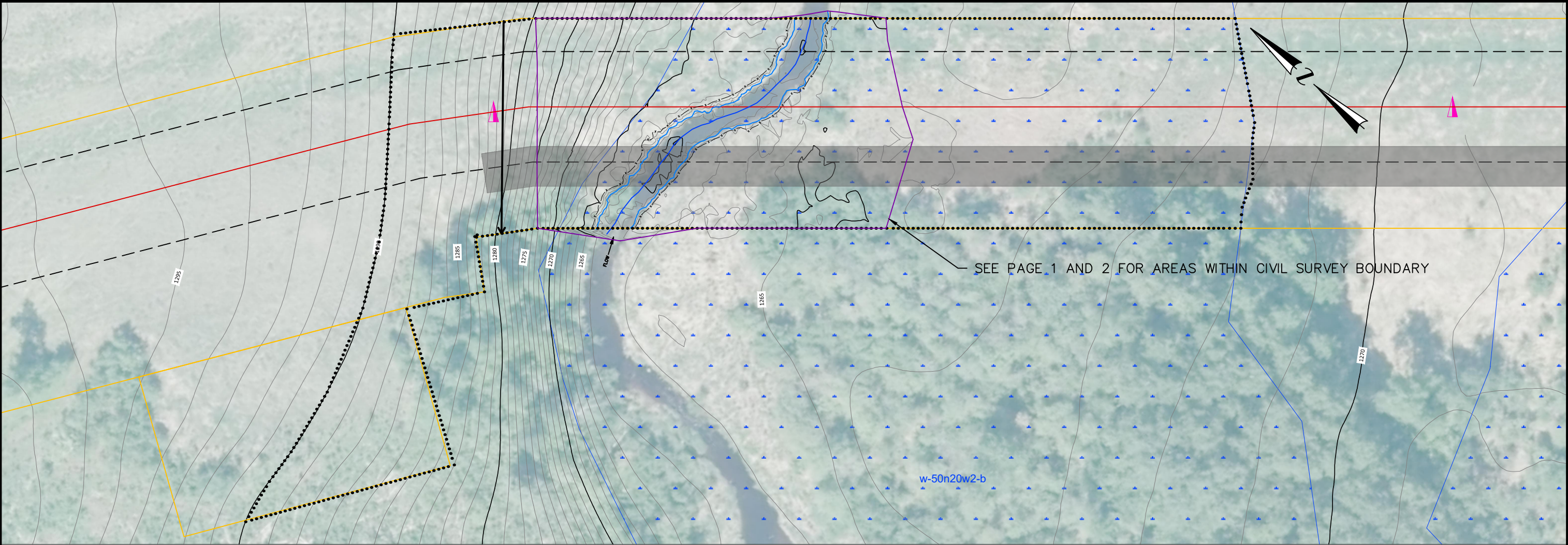
LEGEND

- PROPOSED ENBRIDGE L3R PIPELINE  
OTHER PIPELINE  
PERMANENT RIGHT OF WAY  
TEMPORARY WORKSPACE  
WATERBODY (ROSGEN SURVEY - THALWEG)  
TRACT BOUNDARY  
TEMPORARY MAT ROAD AND SPAN BRIDGE  
ACCESS ROAD  
BEAVER DAM  
WETLAND  
ADDITIONAL TEMPORARY WORKSPACE  
TRACT ID  
ROSGEN SURVEY POINT - WATER SURFACE  
ROSGEN SURVEY POINT - RIVER BOTTOM (THALWEG)  
PROPOSED INCREASED DEPTH OF COVER EXTENT  
TOP OF BANK  
TRENCH BREAKER (LOCATIONS ARE APPROXIMATE)
- MN-XX-XX-XXX.XXX
- FOR ENVIRONMENTAL REVIEW PURPOSES ONLY



0	ISSUED FOR PERMIT APPLICATION	AJJ	10/2020	BAB	BAB
NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D	APP'D
<b>ENBRIDGE</b>					
DWN. BY:	AJJ	DATE	10/2020	PROPOSED ENBRIDGE L3R PIPELINE PRIMARY METHOD - DRY CROSSING CROSSING OF AHMIK RIVER ENBRIDGE MP 1096.7 ST. LOUIS COUNTY, MINNESOTA	
CHK.				SCALE NOTED	
PROJ. ENGR.				DWG. NO. B-93-5.84-MDNR-60-0	
PROJ. MGR.					
CLIENT APP.					





BWSR SEED MIX	B: RIPARIAN NE (34-361); H: MESIC PRAIRIE GENERAL (35-241)
SOBS (O/H) or NPC (S1-3)	N/A

- ELEVATIONS OUTSIDE OF THE AREA WITHIN CIVIL SURVEY BOUNDARY ARE DERIVED FROM LIDAR. ENBRIDGE WILL RESTORE THE AREAS ADJACENT TO THE PUBLIC WATER WITHIN THE MDNR EXPANDED RESTORATION BOUNDARY TO PRE-CONSTRUCTION CONDITIONS.
- MDNR REGION 2 PWI - COOL/WARM WATER FISHERY: MARCH 15 - JUNE 30. 24-HOUR SOIL STABILIZATION REQUIRED WITHIN 200 FEET DURING RESTRICTION.
- AIR PHOTOS ARE FROM 2018 ENBRIDGE AERIAL PHOTOGRAPHY.
- ADDITIONAL ON-THE GROUND PHOTOS MAY BE TAKEN PRIOR TO CONSTRUCTION AT MDNR REQUEST.
- PRE-CONSTRUCTION PHOTOS WILL BE USED TO AID IN RESTORATION.
- SEE GENERAL NOTES PAGE FOR ADDITIONAL DETAIL.
- SEE THE PLANTING PLAN FOR ADDITIONAL DETAIL REGARDING SEEDING PRACTICES AND SEED MIXES AT PUBLIC WATER CROSSINGS.
- ON PUBLIC LANDS AND WHEREVER PRACTICABLE AT WATERBODY CROSSINGS, ENBRIDGE WILL USE WILDLIFE-FRIENDLY EROSION AND SEDIMENT CONTROL BMPs THAT CONTAIN BIODEGRADABLE NETTING (CATEGORY 3N OR 4N NATURAL FIBER) AND WILL AVOID THE USE OF PLASTIC MESH (SECTIONS 1.17.1 AND 2.6.1 OF THE EPP).
- WHEN WORKING WITHIN "WORK IN WATER RESTRICTIONS", STABILIZE ALL EXPOSED SOIL AREAS WITHIN 200 FEET OF THE WATER'S EDGE, AND THAT DRAIN TO THAT WATER, WITHIN 24 HOURS. STABILIZATION WILL BE INITIATED IMMEDIATELY AND COMPLETED WITHIN 7 CALENDAR DAYS WHENEVER CONSTRUCTION ACTIVITY HAS PERMANENTLY/ TEMPORARILY CEASED ON ANY PORTION OF THE SITE OUTSIDE OF THE RESTRICTION PERIOD.

**LEGEND**

- ENBRIDGE L3R PIPELINE
- PERMANENT RIGHT OF WAY
- TEMPORARY WORKSPACE
- WATERBODY CENTERLINE (CIVIL SURVEY)
- WATERBODY (NON-PUBLIC WATER)
- PUBLIC WATER CIVIL SURVEY BOUNDARY
- MDNR EXPANDED RESTORATION BOUNDARY
- TOP OF BANK
- ELEVATION CONTOUR
- ORDINARY HIGH WATER MARK
- FIELD DELINEATED WETLAND
- TRAVEL LANE/CONSTRUCTION MATTING

INVASIVE SPECIES

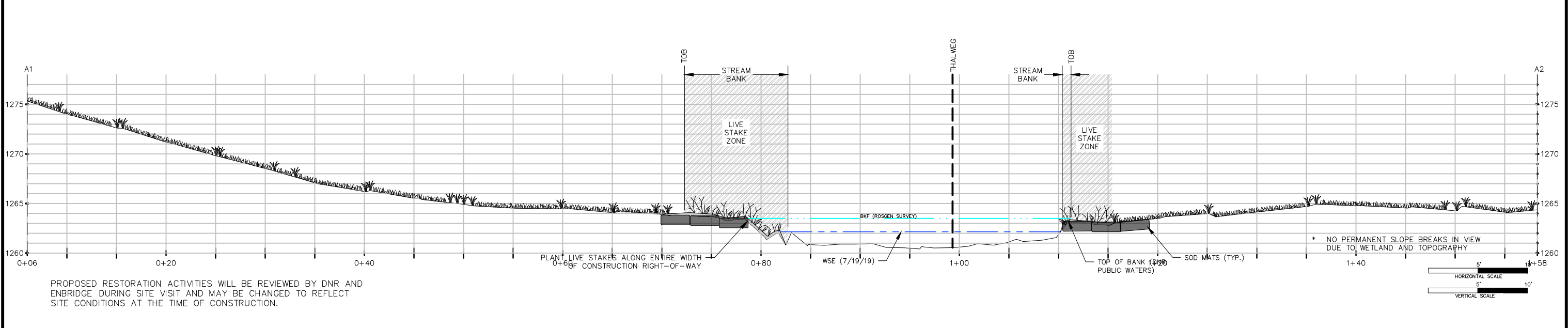
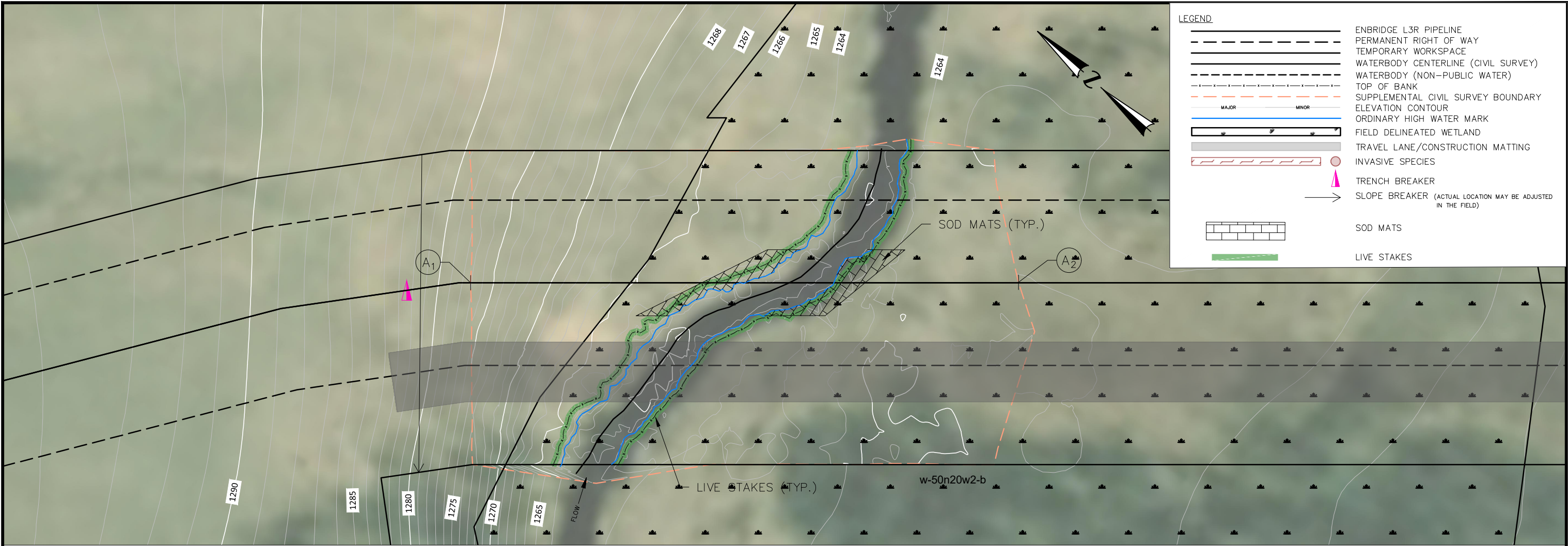
TRENCH BREAKER

PERMANENT SLOPE BREAKER  
(ACTUAL LOCATION MAY BE ADJUSTED IN THE FIELD)

- 1 - SHALLOW, OPEN WATER
- 2B - SHALLOW MARSH
- 3A - SEDGE MEADOW
- 3B - FRESH (WET) MEADOW
- 5A - SHRUB-CARR
- 5B - ALDER THICKET
- 6A - HARDWOOD SWAMP
- 6B - CONIFEROUS SWAMP

B	ISSUED FOR PERMITTING	MJT	10/2020		
A	ISSUED FOR REVIEW	MJT	09/2020		
NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D	APP'D
ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE-SPECIFIC RESTORATION PLAN AHMIK RIVER - MP 1096.7 - MDNR ID 60 RE-VEGETATION PLAN: EXPANDED EXTENT					
SCALE	NOTED	DWG. NO.	SSRP-1096.7-001A	PAGE NO.	1A/5





FEATURE ID	s-50n20w2-a; IFC ID: S-300.0
CROSSING TYPE	DRY CROSSING
PROPOSED RESTORATION (SEE DETAILS FOR LIVE STAKING, TRANSPLANTS, AND SHRUB SPECIES IF APPLICABLE)	EC BLANKET – NATURAL FIBER MPCA TYPE 3.B/MNDOT CATEGORY 4N
WITHIN OR ADJACENT WETLAND	FRESH WET MEADOW
BWSR SEED MIX	RIPARIAN NE (34-361)
DOMINANT WETLAND VEGETATION	1. CALAMAGROSTIS CANADENSIS 3. ALNUS INCANA 2. PHALARIS ARUNDINACEA 4. SPIREA ALBA
SOBS (O/H) or NPC (S1-3)	N/A

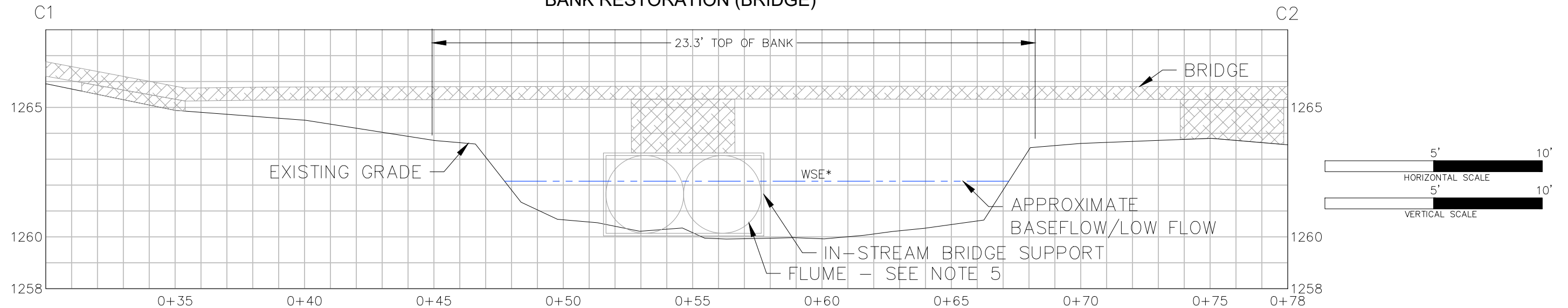
NOTES
1. CONSTRUCTION TIMING RESTRICTIONS 1.1.MDNR REGION 1 PWI – COOL/WARM WATER FISHERY: MARCH 15 – JUNE 30. 1.2. WHEN WORK OCCURS WITHIN 'WORK IN WATER RESTRICTIONS', ALL EXPOSED SOIL AREAS WITHIN 200 FEET OF THE WATER'S EDGE, AND THAT DRAIN TO THAT WATER, WILL BE STABILIZED WITHIN 24 HOURS DURING THE RESTRICTION PERIOD. STABILIZATION OF ALL EXPOSED SOILS WITHIN 200 FEET OF THE PUBLIC WATER'S EDGE, AND THAT DRAIN TO THAT WATER, WILL BE INITIATED IMMEDIATELY AND COMPLETED WITHIN 7 CALENDAR DAYS WHENEVER CONSTRUCTION ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED ON ANY PORTION OF THE SITE OUTSIDE OF THE RESTRICTION PERIOD
2. WORK SHALL BE CONDUCTED IN ACCORDANCE WITH APPLICABLE STANDARDS IN ENBRIDGE'S EPP AND VMP FOR PUBLIC LANDS AND WATERS. THE SPECIFICATIONS WITHIN THIS SSRP MAY MODIFY OR REPLACE THESE STANDARDS.
3. SEE GENERAL NOTES PAGE FOR ADDITIONAL DETAIL.
4. INFORMATION REGARDING SEEDING SPECIFICATIONS, SEED BED PREPARATION TECHNIQUES, ETC. ARE DESCRIBED IN THE PLANTING PLAN CONTAINED WITHIN THE VMP.
5. TRENCH BREAKER LOCATION IS APPROXIMATE PENDING FIELD VERIFICATION (EPP SECTION 1.13)

B	ISSUED FOR PERMITTING		10/2020		
A	ISSUED FOR REVIEW	MJT	08/2020		
NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D	APP'D
ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE-SPECIFIC RESTORATION PLAN AHMIK RIVER – MP 1096.7 – MDNR ID 60 RE-VEGETATION PLAN					
SCALE	NOTED	DWG. NO.	SSRP-1096.7-001	PAGE NO.	1/7

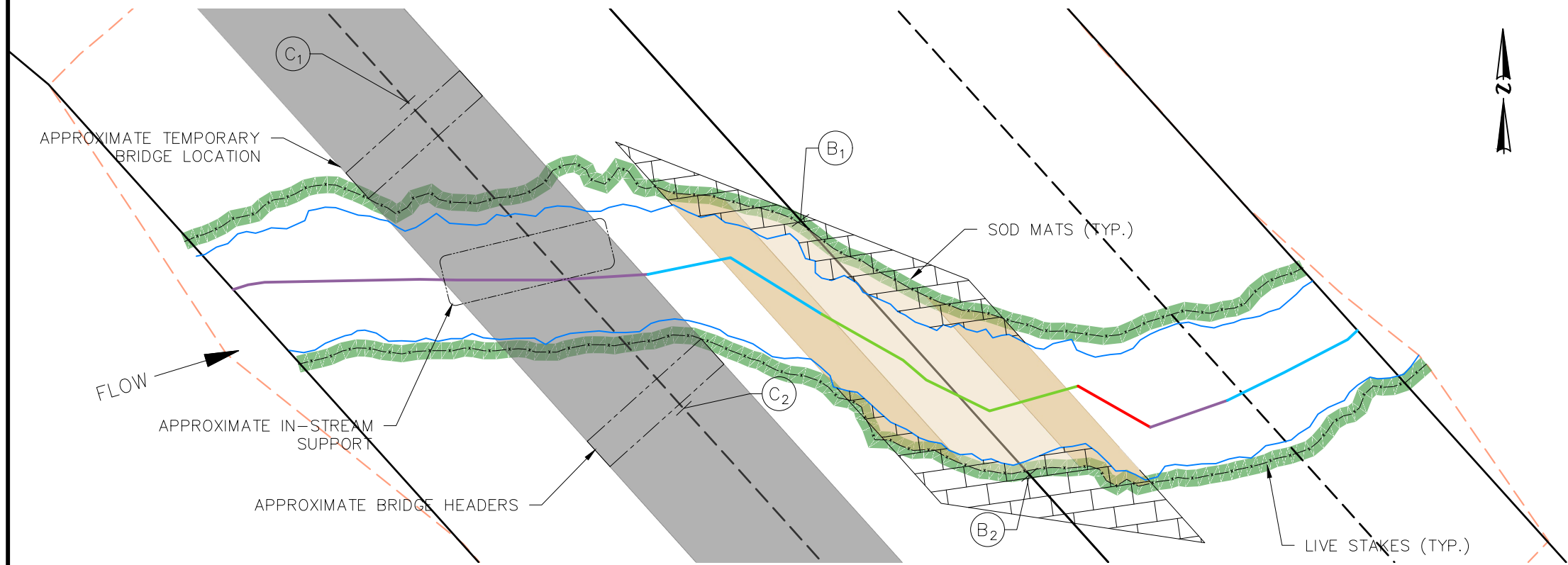




BANK RESTORATION (BRIDGE)



STREAMBED RESTORATION



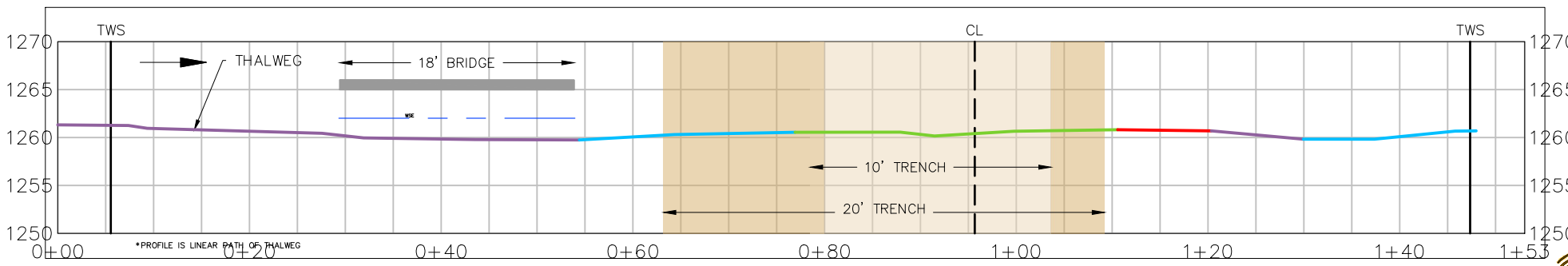
NOTES

1. TRANSITIONS BETWEEN EXISTING CHANNEL FEATURES (BED, BANK, FLOODPLAIN) AND PROPOSED RESTORED TRENCH CROSSING WILL BE SMOOTH AND EVENLY GRADED WITHOUT ABRUPT OR PROTRUDING OBSTRUCTIONS.
2. BANK MIGRATION POTENTIAL IS TO THE SOUTH. PRIMARY FLOW IS LOCATED ON THE DOWNSTREAM SIDE OF THE CHANNEL.
3. PLACE MATS DIRECTLY ON TOP OF EXISTING VEGETATION TO AVOID OR MINIMIZE DISTURBANCE OF VEGETATION ON THE CHANNEL BANKS AND AT THE TOP OF THE STREAM BANK (LIMITED STUMP REMOVAL MAY BE REQUIRED).
4. SEE DETAIL SHEET FOR SPECIFIC RESTORATION METHODS AND DETAILS.
5. FLUME SIZE MAY VARY BETWEEN 18-48 INCHES BASED ON SITE-SPECIFIC CONDITIONS AT THE TIME OF CONSTRUCTION, BUT MUST ALWAYS EXTEND ABOVE OHWM OR SURFACE WATER AT TIME OF CONSTRUCTION, WHICHEVER IS GREATER.
6. MINIMIZE DISTURBANCE OF BED MATERIALS AND FEATURES DURING CONSTRUCTION OF THE TRENCH AND INSTALLATION AND REMOVAL OF IN-STREAM SUPPORT.
7. BED AND/OR BANK MATERIALS TEMPORARILY ADJUSTED OR REMOVED DURING CONSTRUCTION SHALL BE PLACED IN THE APPROXIMATE ORIGINAL LOCATION DURING RESTORATION. MATERIALS SHALL BE FIELD ADJUSTED DURING PLACEMENT BASED ON THE OBSERVED FLOW PATH AT THE TIME OF CONSTRUCTION.
8. ALIGNMENT OF IN-STREAM SUPPORT SHALL BE FIELD ADJUSTED BASED ON FLOW PATH TO PROTECT CHANNEL BANKS.
9. SEE RESTORATION SHEET FOR B1-B2 CROSS SECTION.

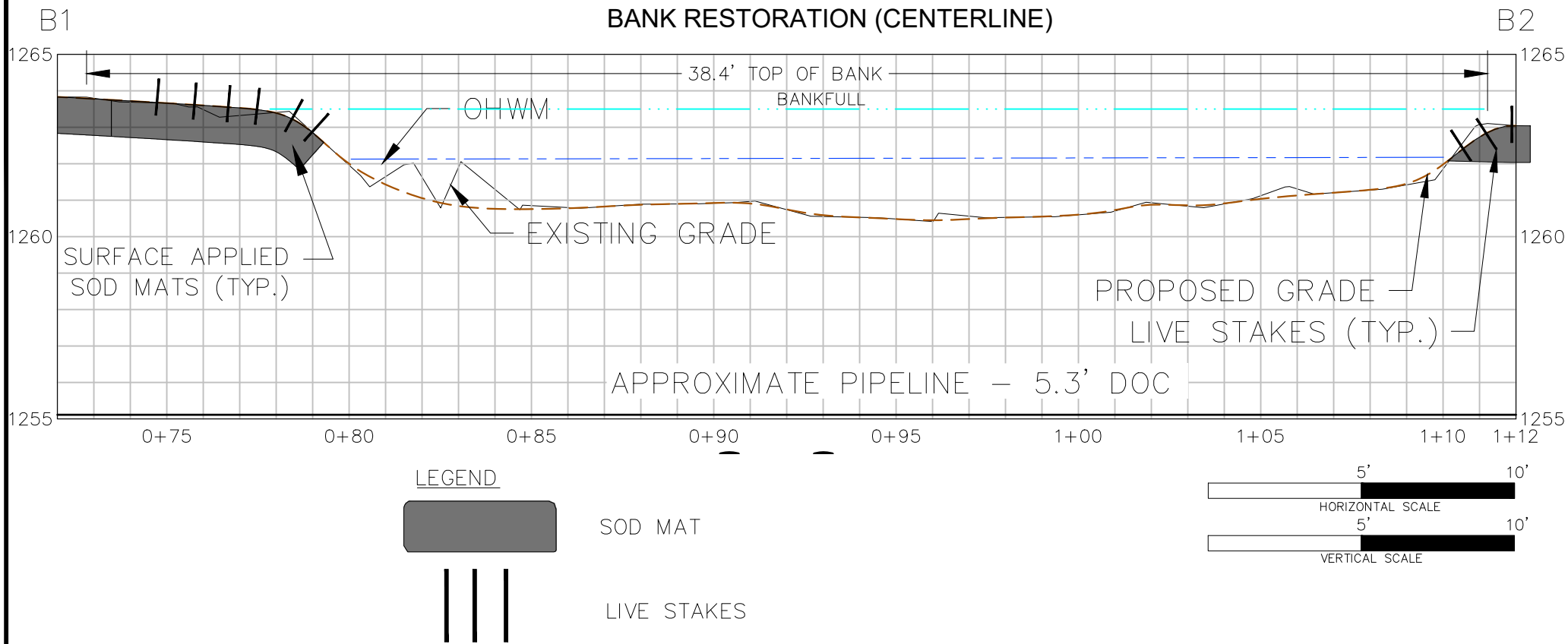
LEGEND

	ENBRIDGE L3R PIPELINE
	PERMANENT RIGHT OF WAY
	TEMPORARY WORKSPACE
	WATERBODY - RIFFLE (ROSGEN SURVEY)
	WATERBODY - POOL (ROSGEN SURVEY)
	WATERBODY - RUN (ROSGEN SURVEY)
	WATERBODY - GLIDE (ROSGEN SURVEY)
	MAJOR
	MINOR
	CONTOUR (1' INTERVAL)
	TOP OF BANK
	ORDINARY HIGH WATER MARK
	FIELD DELINEATED WETLAND
	TRAVEL LANE/CONSTRUCTION MATTING
	TRENCH - 10'
	TRENCH - 20'

B	ISSUED FOR PERMITTING		10/2020		
A	ISSUED FOR REVIEW	MJT	08/2020		
NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D	APP'D
ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE-SPECIFIC RESTORATION PLAN AHMIK RIVER - MP 1096.7 - MDNR ID 60 STABILIZATION PLAN					
SCALE		DWG. NO. SSRP-1096.7-002		PAGE NO. 2/7	







	COMMON NAME	SCIENTIFIC NAME
LIVE STAKE SPECIES	ELDERBERRY	SAMBUCUS CANADENSIS
	HIGH BUSH CRANBERRY	VIBURNUM OPOLUS (TRILOBUM)
	RED-OSIER DOGWOOD	CORNUS STOLONIFERA
	SILKY DOGWOOD	CORNUS AMOMUM
TRANSPLANTS	SPECKELD ALDER	ALNUS INCANA
	WILLOW	SALIX SPP.
	DOGWOOD	CORNUS SPP.
SHRUB	NONE	NONE

- PRELIMINARY SPECIES. PRIOR TO RESTORATION ACTIVITIES, ALL SPECIES WILL BE REQUIRED TO BE VERIFIED AS NATIVE AND FOUND WITHIN THE COUNTY WHERE PLANTED ON MNTAXA.
- LIVE STAKE SPECIES SELECTION: USE AT LEAST THREE (3) SPECIES WITH NO MORE THAN 60% OF ANY ONE (1) SPECIES; ALTERNATIVE SPECIES MAY BE SELECTED BASED ON SITE CONDITIONS AND AVAILABILITY. ALTERNATIVE SPECIES SHOULD BE REVIEWED AGAINST USDA DATA BASE FOR MN NATIVE SPECIES.
- (WHERE APPLICABLE) TRANSPLANTS AND/OR CONTAINER SHRUBS MAY BE SUBSTITUTED FOR LIVE STAKES BASED ON SITE SPECIFIC CONDITIONS.
  - CONTAINER PLANTED SHRUBS ARE RECOMMENDED TO BE 18" – 24" IN SIZE.
  - CONTAINER PLANTED SHRUBS SPACING: 1 SHRUB PER 3 LINEAR FEET OF BANK, ADDITIONAL ROWS SPACED 3 FEET APART, AND 3–5 SHRUBS OF THE SAME SPECIES.
- (WHERE APPLICABLE) TRANSPLANTS SHOULD BE EXCAVATED WITH A MINIMUM OF 12" SOIL, DIAMETER EQUAL TO PLANT DRIP LINE, AND LOOSE UNBOUND BALL.
- LIVE STAKE SPACING (WHERE APPLICABLE): STAGGER 1 STAKE PER 3 LINEAR FEET OF STREAM BANK IN 2 – 3 ROWS SPACED 1 FOOT APART. PLACE FIRST ROW ALONG TOP OF BANK (BANKFULL) AND THE LOWER ROW(S) BETWEEN THE TOP OF BANK AND OHWM

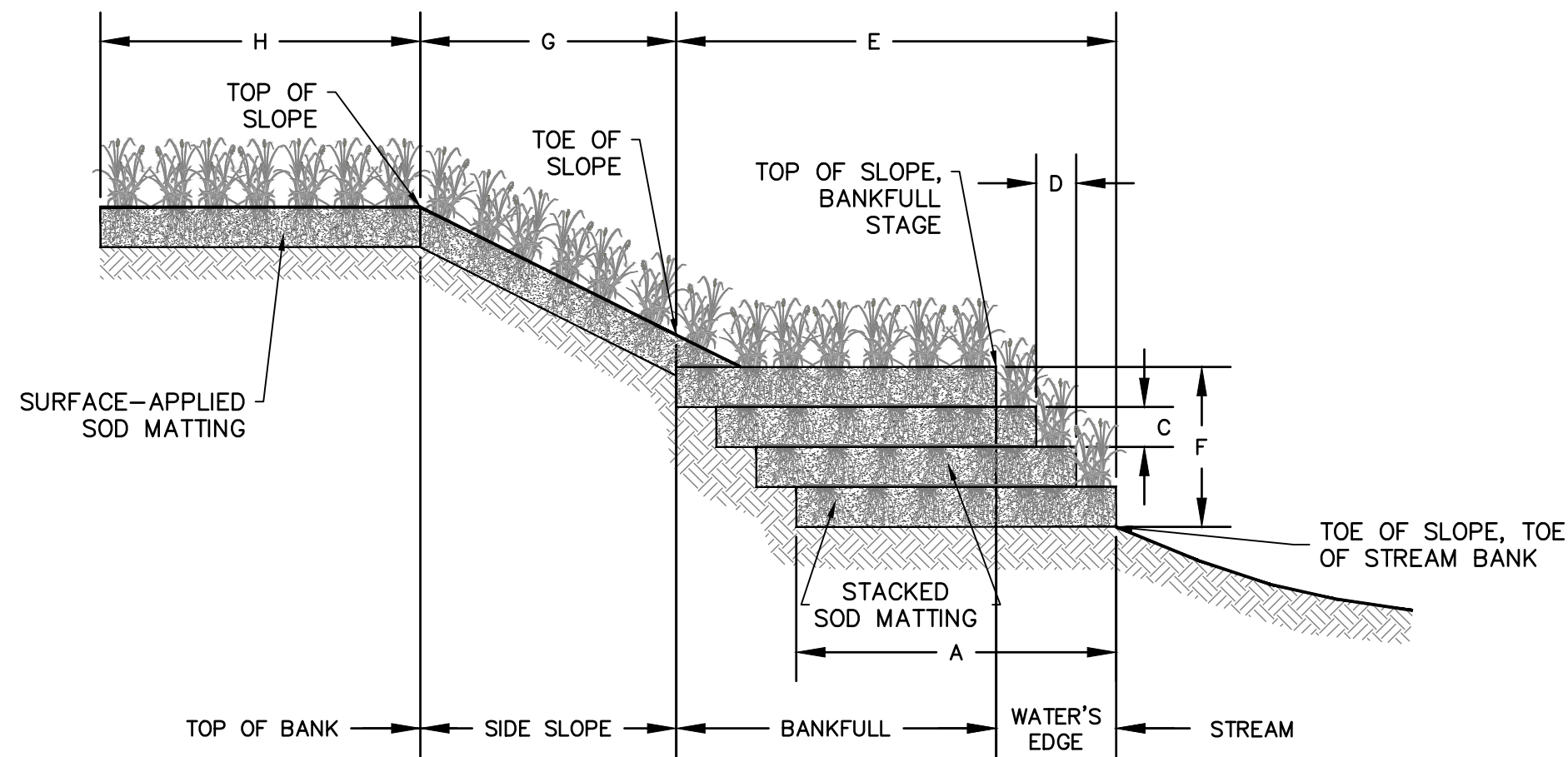
1 VEGETATION CHART

- RESTORATION NOTES:
- GENERAL
- REFER TO RESTORATION DETAIL SHEETS FOR ADDITIONAL INFORMATION RELATED TO PROPOSED RESTORATION MEASURES.
  - REFER TO SITE PHOTOS FOR INFORMATION ON PRE-CONSTRUCTION CROSSING CONDITIONS AND TO PROVIDE ADDITIONAL GUIDANCE FOR RESTORATION EFFORTS.
  - TRENCH IS LOCATED WITHIN AN EXISTING GLIDE, AS SUCH, THE BED MATERIAL SHALL BE EXCAVATED AND TEMPORARILY STOCKPILED TO BE REINSTALLED AS PART OF CHANNEL BED AND TOE OF BANK RESTORATION EFFORTS. REFER TO RESTORATION CROSS SECTION AND BED PROFILE SHEET 2 TO MAINTAIN THE EXISTING BED FEATURE GRADE CONTROL.
  - GLIDE MATERIAL IS NATURALLY COMMINGLED WITH A VARIETY OF PARTICLE SIZES TO PROMOTE CHANNEL SURFACE FLOWS. MATERIAL THICKNESS GENERALLY EXTENDS TO A DEPTH OF 1.5 TO 2 TIMES THE LARGEST SURFACE PARTICLE. RESTORED CHANNEL GLIDE SECTION SHALL INCLUDE RANDOMLY SORTED MATERIALS.
- SOD MATTING
- REMOVE VEGETATED MATS ON EITHER SIDE OF THE STREAM CROSSING USING ONSITE EQUIPMENT WHICH CAN UNDERCUT THE VEGETATION FOR REMOVAL. SMALL SHRUBS AND/OR TREES WITHIN THE SOD MATS ARE ACCEPTABLE AND SHOULD NOT BE REMOVED.
  - DEPENDING ON THE LEVEL OF SATURATION AT THE TIME OF REMOVAL, IT MAY BE DIFFICULT TO OBTAIN INTACT CONSOLIDATED MATS, BUT GENERALLY THE NATIVE VEGETATION WILL BE RETAINED AND CAPTURED FOR PLACEMENT.
  - SOD MATS CAN BE TRANSPLANTED DURING ANY SEASON.
  - 4SOD MAT WILL BE PLACED ON CLEAR GROUND OR MATS WITHIN THE WORKSPACE.
  - MONITOR MATS TO SUPPORT SURVIVABILITY; WATERING MAY BE NEEDED.
  - PRIOR TO PLACEMENT OF SOD MATS FINISH GRADE CHANNEL BANK AND ADJACENT FLOODPLAIN APPLICATION AREA TO PROVIDE A SMOOTH AND EVEN SURFACE. SUBGRADE ELEVATION SHOULD ALLOW FOR THE FINISHED SOD SURFACE TO TRANSITION EVENLY WITH THE CHANNEL BANKS UPSTREAM AND DOWNSTREAM OF THE INSTALLATION AREA. AVOID ABRUPT CHANGES IN GRADE.
  - VEGETATED MATS WILL BE RETURNED/SET IN PLACE WITH ONSITE EQUIPMENT.
    - SURFACE APPLIED SOD MATTING SHOULD BE PLACED WITH THE LONG SIDE PERPENDICULAR TO THE CHANNEL / FLOW.
    - STACKED SOD MATTING SHOULD BE PLACED WITH THE LONG SIDE PARALLEL TO THE CHANNEL / FLOW.
  - WHEN PLACING SOD MATS, DO NOT LEAVE LARGE GAPS BETWEEN EACH SOD MAT AS NON-NATIVE VEGETATION WILL QUICKLY ATTEMPT TO COLONIZE THESE VOIDS.
  - WATER SOD MATS AFTER REPLACEMENT IF CONDITIONS ARE HOT AND DRY. DAMP AND/OR FROZEN SOD MATS DO NOT REQUIRE WATERING.
  - THE TOP MAT AND/OR OTHER MATS CAN BE ANCHORED WITH A LIVE AND/OR DEAD STOUT STAKE TO ENSURE THAT IT DOES NOT MOBILIZE DURING A FLOOD EVENT BEFORE THE ROOTS HAVE ESTABLISHED.
  - THE VEGETATED MATS WILL BE REPLACED AS SOON AS PRACTICAL FOLLOWING BACKFILLING OF THE TRENCH AND STABILIZED PER THE TIMING REQUIREMENTS DESCRIBED IN SECTION 1.9.1 OF THE EPP.
- TRANSPLANTS
- SHRUBS AND/OR ALDER REMOVED FROM THE TRENCH AREA MAY BE USED IN LIEU OF SOD MATS IN ACCORDANCE WITH THE TRANSPLANT DETAIL

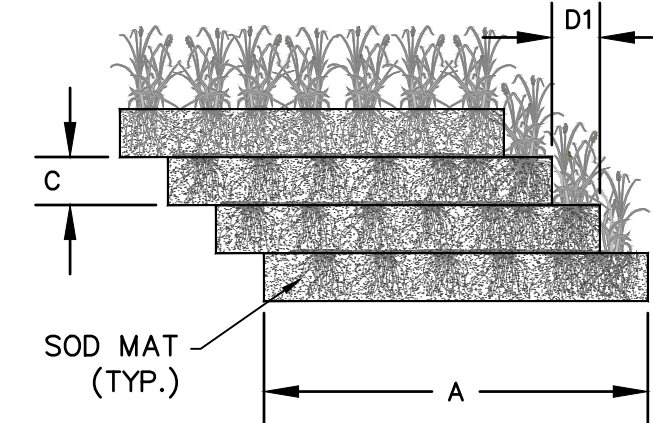
B	ISSUED FOR PERMITTING		10/2020		
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ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE–SPECIFIC RESTORATION PLAN AHMIK RIVER – MP 1096.7 – MDNR ID 60 SITE SPECIFIC DETAILS					
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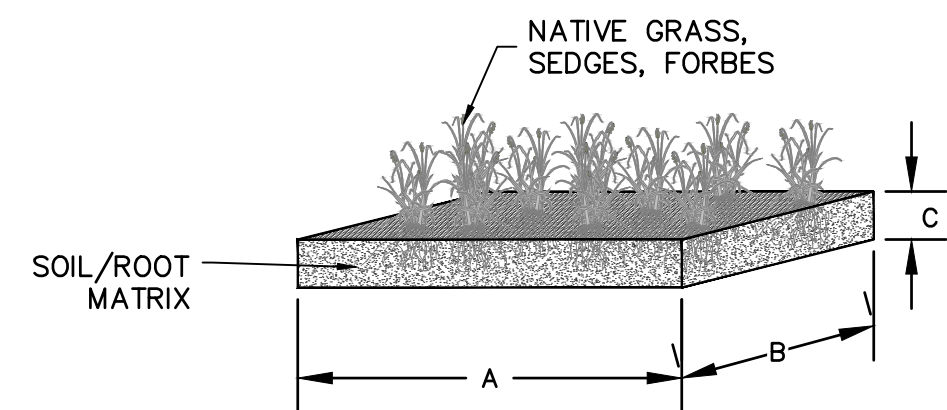




**CROSS SECTION**



**STACKED SOD MATTING DETAIL**



**SOD MAT DETAIL**

DIMENSION <sup>1</sup>	NAME	TYPICAL UNIT	VALUE	DESCRIPTION
A	SOD MAT WIDTH	FEET	3 – 4	WIDTH OF INDIVIDUAL SOD MAT.
B	SOD MAT LENGTH	FEET	3 – 6	LENGTH OF INDIVIDUAL SOD MAT.
C	SOD MAT THICKNESS	INCHES	12	THICKNESS OF INDIVIDUAL SOD MAT.
D	STACKED SOD MAT SETBACK	FEET, INCHES	N/A	THE DISTANCE BETWEEN THE EDGES OF SOD MATS STACKED TO FORM A SLOPE
E	WIDTH OF STACKED SOD MATS	FEET, INCHES	N/A	WIDTH OF A BANK CREATED BY STACKED SOD MATS
F	HEIGHT OF STACKED SOD MATS	FEET, INCHES	N/A	HEIGHT OF A SLOPE CREATED BY STACKED SOD MATS
G	WIDTH OF SURFACE- APPLIED SOD MATS	FEET, INCHES	10 – 20	WIDTH OF A SLOPE STABILIZED WITH SURFACE-APPLIED SOD MATS
H	TOP OF BANK SOD MATTING DISTANCE	FEET	15	DISTANCE SOD MATTING IS INSTALLED ON THE TOP OF BANK

NOTES:

1. DIMENSION LABELS ARE REFERENCED IN THE DETAIL DRAWINGS.



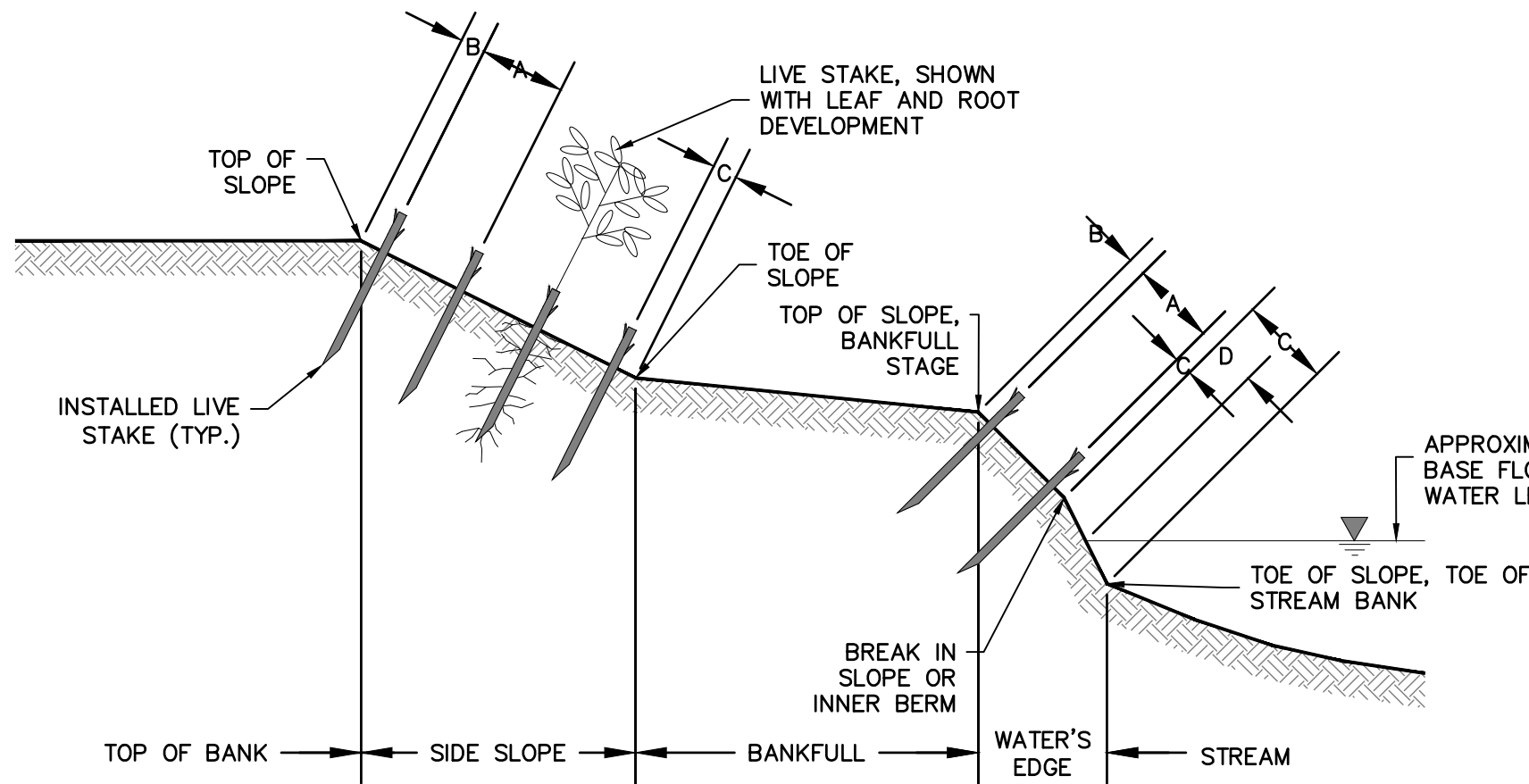
**SOD MAT EXAMPLES**

**1 SOD MATTING DETAIL**

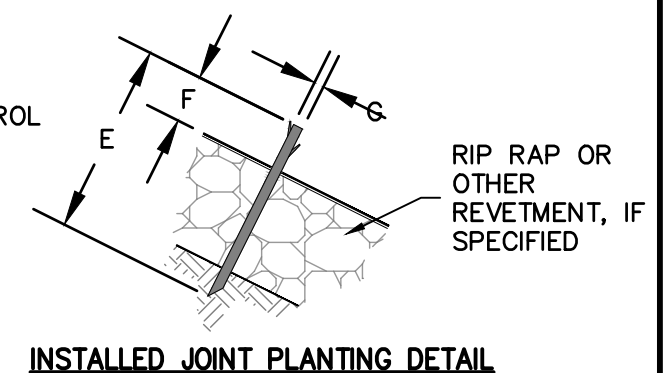
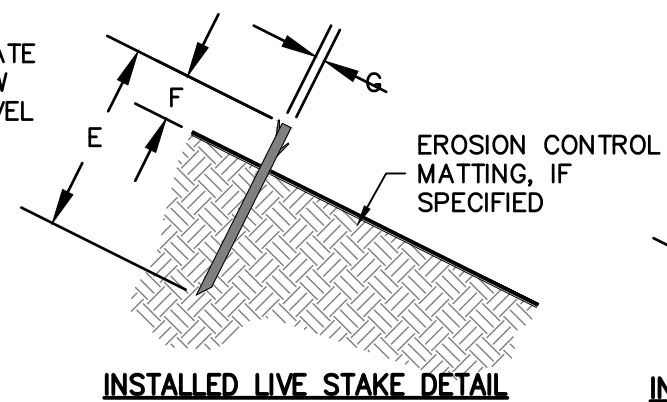
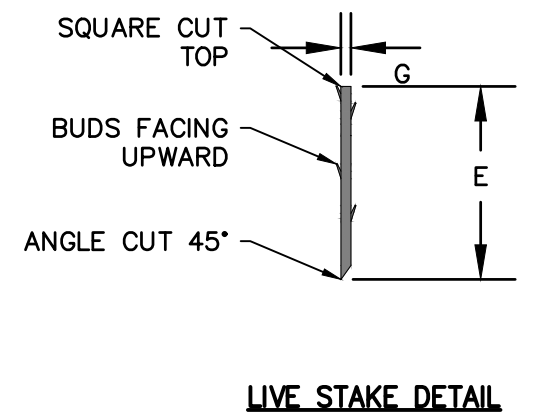
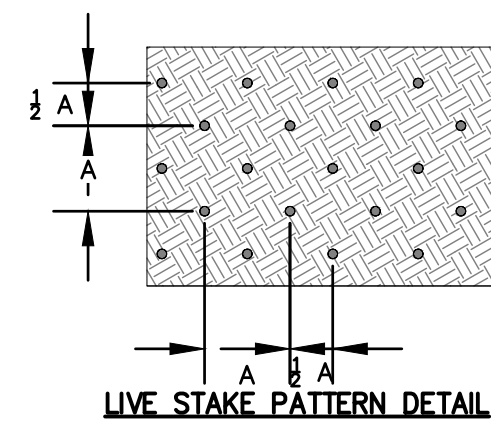


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**CROSS SECTION**



**LIVE STAKE EXAMPLE**

DIMENSION <sup>1</sup>	NAME	TYPICAL UNIT	VALUE	DESCRIPTION
A	LIVE STAKE SPACING	FEET	3 - 0.0	SPACING BETWEEN INDIVIDUALLY INSTALLED LIVE STAKES. STAKES CAN BE PLACED IN A TRIANGULAR GRID (NRCS 2007A) OR RANDOMLY (NRCS 2007A, IOWA DNR 2006). RECOMMEND SPECIES DIVERSITY THROUGHOUT PROJECT AREA.
B	LIVE STAKE - TOP OF SLOPE PLACEMENT	INCHES	0 - 3	POSITION OF LIVE STAKE RELATIVE TO THE TOP OF A SLOPE
C	LIVE STAKE - TOE OF SLOPE PLACEMENT	INCHES	0 - 3	POSITION OF LIVE STAKE RELATIVE TO THE TOE OF A SLOPE
D	LIVE STAKE - BASE FLOW RELATIONSHIP	FEET	1239	PLACEMENT OF LOWER ROW OF LIVE STAKES RELATIVE TO THE APPROXIMATE BASE FLOW WATER LEVEL WITH CONSIDERATION GIVEN TO DURATION OF INUNDATION DURING BANKFULL AND OTHER HIGH FLOW EVENTS.
E	LIVE STAKE LENGTH	INCHES	24 - 36	LENGTH OF PREPARED DORMANT LIVE CUTTING FROM WOODY PLANT TO BE USED AS LIVE STAKE. LENGTH SHOULD BE SUFFICIENT TO REACH LOW-FLOW WATER TABLE ELEVATION.
F	LIVE STAKE PROTRUSION	INCHES	3 - 4	DISTANCE INSTALLED LIVE STAKE SHOULD PROTRUDE ABOUT 20% FROM THE GROUND. AT LEAST TWO BUDS OR BUD SCARS SHOULD BE PRESENT ABOVE THE GROUND IN THE FINAL INSTALLATION, DEPENDING ON THE SURROUNDING VEGETATION HEIGHT.
G	LIVE STAKE DIAMETER	INCHES	1/2 - 1 1/2	DIAMETER OF PREPARED DORMANT LIVE CUTTING FROM WOODY PLANT TO BE USED AS LIVE STAKE - TYPICALLY CITE A PERMISSIBLE MINIMUM AND MAXIMUM DIAMETER.

NOTES:

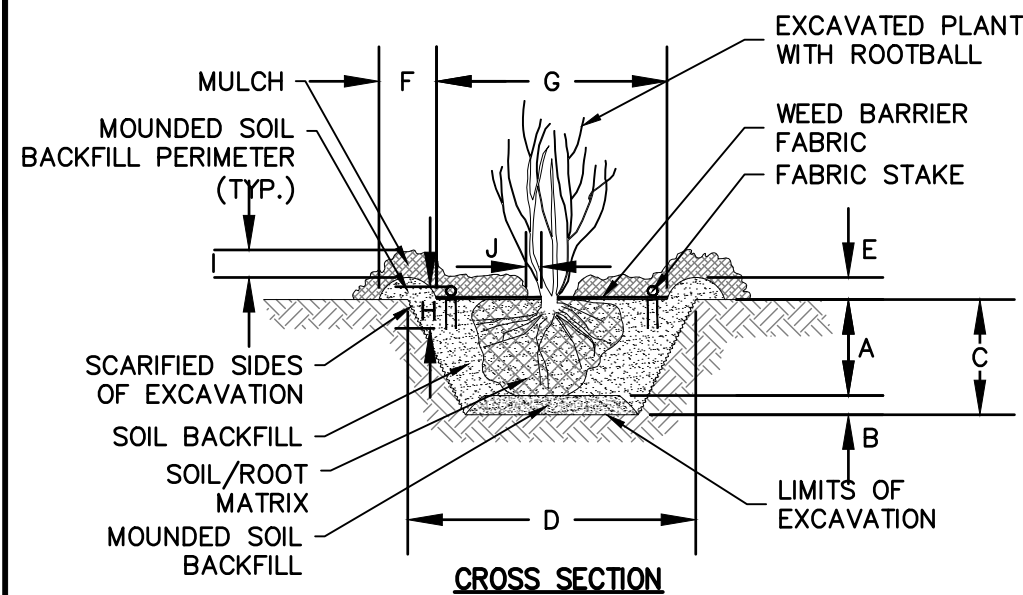
1. DIMENSION LABELS ARE REFERENCED IN THE DETAIL DRAWINGS.

# 1 LIVE STAKE PLANTINGS DETAIL



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DIMENSION <sup>1</sup>	NAME	TYPICAL UNIT	VALUE	DESCRIPTION
A	PLANTING DEPTH	INCHES	12 – 18	PLANTING DEPTH OF THE TRANSPLANT.
B	HEIGHT OF MOUNDED SOIL BACKFILL	INCHES	N/A	HEIGHT OF MOUNDED LOOSE SOIL PLACED INTO OVER-EXCAVATED PLANTING PIT.
C	DEPTH OF PLANTING PIT	INCHES	12 – 18	DEPTH OF THE PLANTING PIT; ACCOMMODATES DIMENSION OF SOIL AND EXCAVATED ROOTS AS WELL AS MOUNDED LOOSE SOIL AT BOTTOM OF PIT.
D	WIDTH OF PLANTING PIT	FEET	3 – 5	OVER-EXCAVATED WIDTH OF THE PLANTING PIT; ACCOMMODATES THE WIDTH OF THE EXCAVATED SOIL AND ROOTS.
E	HEIGHT OF MOUNDED SOIL PERIMETER	INCHES	0 – 2	HEIGHT OF SOIL BERM CONSTRUCTED ALONG THE PERIMETER OF THE PLANTING PIT; HELPS RETAIN WATER.
F	WIDTH OF MOUNDED SOIL PERIMETER	INCHES	0 – 6	WIDTH OF SOIL BERM CONSTRUCTED ALONG THE PERIMETER OF THE PLANTING PIT; HELPS RETAIN WATER.
G	WIDTH OF WEED BARRIER FABRIC (OPTIONAL)	INCHES	N/A	WIDTH OF FABRIC PLACED ON SURFACE TO CONTROL WEEDS WITHIN THE MOUNDED SOIL PERIMETER; TRANSPLANTS TYPICALLY HAVE GRASSES, LEAF MATTER, ETC. ATTACHED AND DO NOT REQUIRE WEED BARRIER FABRIC.
H	FABRIC STAKE LENGTH (OPTIONAL)	INCHES	N/A	LENGTH OF STAPLES/SPIKES USED TO SECURE WEED BARRIER FABRIC
I	THICKNESS OF MULCH (OPTIONAL)	INCHES	N/A	THICKNESS OF MULCH, IF NECESSARY. TRANSPLANTS TYPICALLY HAVE GRASSES, LEAF MATTER, ETC. ATTACHED AND DO NOT REQUIRE MULCH.
J	GAP BETWEEN MULCH AND PLANT STEM/TRUNK (OPTIONAL)	INCHES	N/A	ROOM BETWEEN PLANT STEM/TRUNK AND MULCH. TRANSPLANTS TYPICALLY HAVE GRASSES, LEAF MATTER, ETC. ATTACHED

NOTES:  
1. DIMENSION LABELS ARE REFERENCED IN THE DETAIL DRAWINGS.



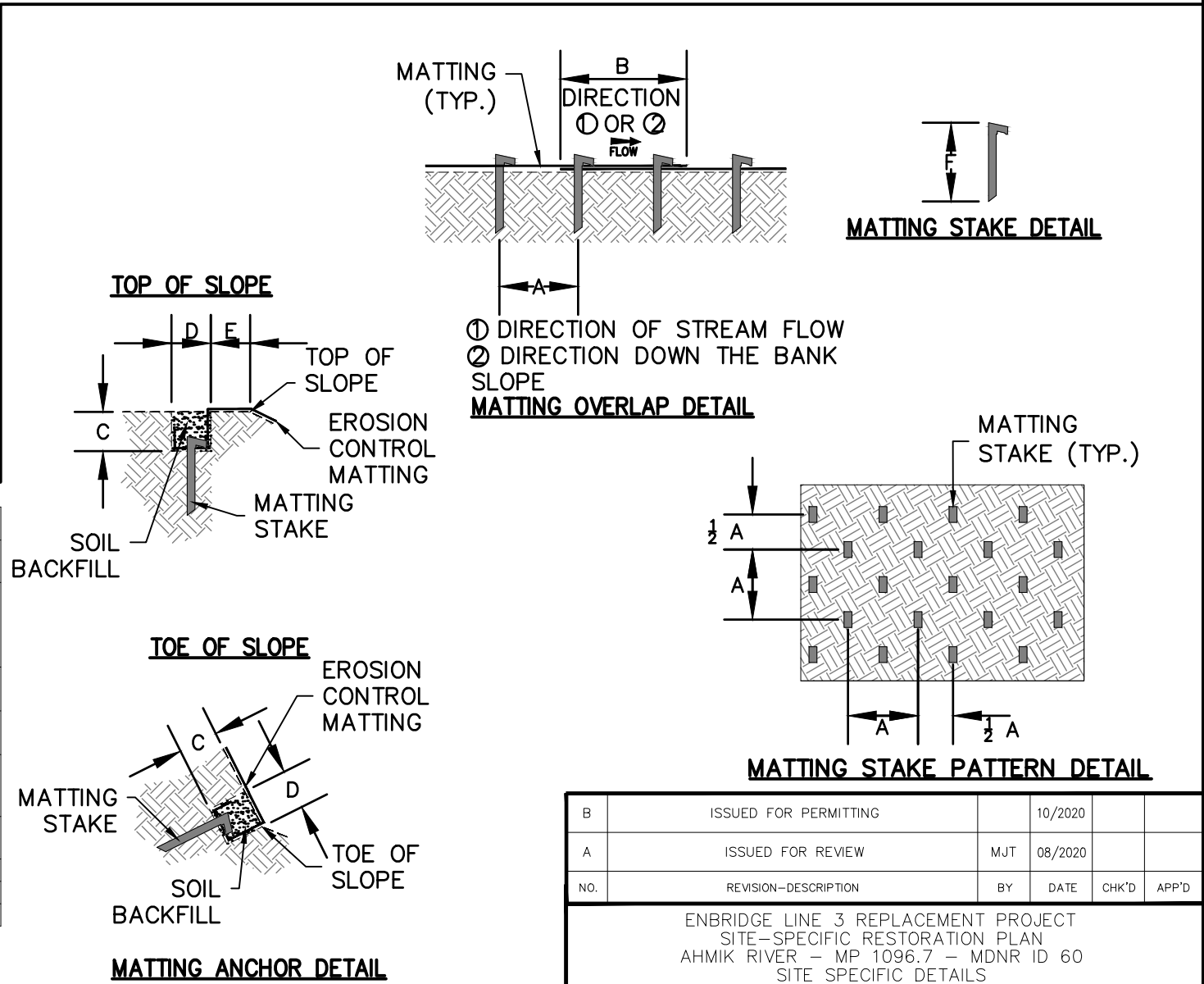
TRANSPLANTS EXAMPLES

1 TRANSPLANTING DETAIL

DIMENSION <sup>2</sup>	NAME	TYPICAL UNIT	VALUE	DESCRIPTION
A	MATting STAKE SPACING	FEET, INCHES	N/A	SPACING BETWEEN EROSION CONTROL MATting STAKES USED TO FASTEN THE MATting TO THE SOIL
B	MATting OVERLAP	FEET, INCHES	N/A	AMOUNT OF EROSION CONTROL MATting OVERLAP IF MULTIPLE PIECES AND/OR ROLLS OF MATting ARE USED. OVERLAP VARIES DEPENDING ON THE LOCATION OF THE OVERLAP WITH RESPECT TO POSITION ON THE SLOPE, LOCATION OF THE MATting (EDGE OR END), AND PRODUCT SPECIFICATIONS.
C	MATting ANCHOR TRENCH DEPTH	FEET, INCHES	N/A	DEPTH OF TRENCH INTO WHICH EDGE OF EROSION CONTROL MATting IS ANCHORED AT THE TOP AND/OR TOE OF A SLOPE.
D	MATting ANCHOR TRENCH WIDTH	FEET, INCHES	N/A	WIDTH OF TRENCH INTO WHICH EDGE OF EROSION CONTROL MATting IS ANCHORED AT THE TOP AND/OR TOE OF A SLOPE.
E	TOP OF SLOPE ANCHOR TRENCH SETBACK	FEET, INCHES	N/A	TOP OF SLOPE ANCHOR TRENCH DISTANCE FROM THE TOP OF SLOPE. TOP OF SLOPE REFERS TO TOP OF SIDE SLOPE, BANK SLOPE, TERRACE SLOPE, BANKFULL, ETC.
F	MATting STAKE LENGTH	INCHES	N/A	LENGTH OF EROSION CONTROL MATting STAKES OR STAPLES USED TO FASTEN THE MATting TO THE SOIL

NOTES:  
1. DATA ARE FOR EROSION CONTROL MATting APPLIED TO STREAM BANK SLOPES.  
2. DIMENSION LABELS ARE REFERENCED IN THE DETAIL DRAWINGS.

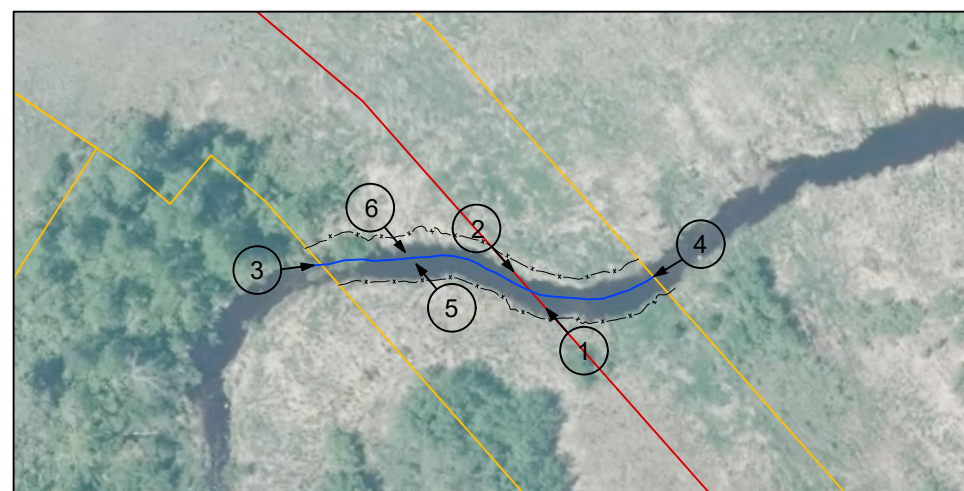
2 EROSION CONTROL MATting DETAIL



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**NOTES:**

1. AIR PHOTOS ARE FROM 2018 ENBRIDGE AERIAL PHOTOGRAPHY.
2. ADDITIONAL ON-THE GROUND PHOTOS MAY BE TAKEN PRIOR TO CONSTRUCTION AT MDNR REQUEST.
3. PRE-CONSTRUCTION PHOTOS WILL BE USED TO AID IN RESTORATION.



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ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE-SPECIFIC RESTORATION PLAN UNNAMED STREAM — MP 1096.7 — MDNR ID 60 PHOTO PAGE					
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GENERAL

1. THE SPECIFICATIONS WITHIN THIS SSRP MAY MODIFY OR REPLACE PROJECT–WIDE STANDARDS PRESENTED IN THE EPP. WHERE MATERIAL WITHIN THESE SSRPS EXCEEDS STANDARD CONSTRUCTION MEASURES IN THE EPP, THESE SSRPS SUPERSEDE THE EPP.
2. CONSTRUCTION AND RESTORATION OF WATERBODY CROSSINGS WILL FOLLOW THESE GENERAL STEPS:

A. SITE CLEARING

B. INSTALLATION OF TEMPORARY EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES (‘BMPS’)

C. BRIDGE INSTALLATION

D. EXCAVATION/BACKFILLING OF THE WATERBODY INCLUDING:

• SOD SAVING TOPSOIL SEGREGATION AT NON–WOODED SITES

• STREAMBED MATERIAL SEGREGATION

• PIPE INSTALLATION

• BACKFILL, INCLUDING IMPLEMENTATION OF CONSTRUCTION–RELATED RESTORATION METHODS (I.E., TOE WOOD)

E. REPLACEMENT OF STREAMBED MATERIAL AND TOPSOIL/SOD LAYER

F. RESTORATION OF STREAM BANKS TO PRE–CONSTRUCTION CONTOURS

G. IF FINAL GRADING NOT POSSIBLE AT THE TIME, TEMPORARY STABILIZATION AND REPLACEMENT/REINFORCEMENT OF TEMPORARY BMPS

H. AFTER FINAL GRADING, PERMANENT SEEDING AND/OR WOODY VEGETATION RESTORATION, STABILIZATION AND REPLACEMENT/REINFORCEMENT OF TEMPORARY BMPS

I. BRIDGE REMOVAL DURING FINAL RESTORATION AFTER STABILIZATION AND PERMANENT SEEDING

J. POST–CONSTRUCTION MONITORING
- CROSSING METHODS
1. ALL WATERBODY AND WETLAND CROSSINGS WILL BE CONDUCTED IN COMPLIANCE WITH SECTION 2.0 AND SECTION 3.0 OF THE ENVIRONMENTAL PROTECTION PLAN (‘EPP’), RESPECTIVELY. SECTION 2.0 AND 3.0 OF THE WINTER CONSTRUCTION PLAN PRESENTS MODIFICATIONS FOR WATERBODY AND WETLAND CONSTRUCTION METHODS, RESPECTIVELY, IN WINTER CONDITIONS.

2. ENBRIDGE’S SUMMARY OF CONSTRUCTION METHODS AND PROCEDURES (THE ‘PROCEDURES,’APPENDIX A OF THE EPP) OUTLINES THE VARIOUS CONSTRUCTION METHODS THAT ENBRIDGE MAY UTILIZE TO CONSTRUCT THROUGH WATERBODIES AND WETLANDS/BASINS AS PRESENTED ON THESE SITE–SPECIFIC RESTORATION PLANS (‘SSRPS’).

A. DRY CROSSING (ISOLATED) METHODS (INCLUDING THE DRY CROSSING AND MODIFIED DRY CROSSING METHOD) ARE DESCRIBED SECTIONS 4.3 OF THE PROCEDURES, AND IN SECTIONS 2.5.2 AND 2.5.3 AND FIGURES 23 AND 24 OF THE EPP.

B. THE BORE METHOD (NON–PRESSURIZED) IS DESCRIBED IN SECTION 3.5 OF THE PROCEDURES, AND SECTION 4.0 OF THE EPP.

C. THE MODIFIED UPLAND CONSTRUCTION (WETLAND) METHOD IS DESCRIBED IN SECTION 3.3 OF THE PROCEDURES, AND SECTION 3.0 AND FIGURES 30 TO 34 OF THE EPP.

D. ALTHOUGH NOT PROPOSED AS A PRIMARY METHOD AT THESE SSRP WATERBODIES, THE OPEN CUT (NON–ISOLATED) WATERBODY CROSSING METHOD IS DESCRIBED IN SECTION 4.1 OF THE PROCEDURES, AND SECTION 2.5.1 AND FIGURE 24 OF THE EPP.

E. ALTHOUGH NOT PROPOSED AS A PRIMARY METHOD AT THESE SSRP WATERBODIES, THE PUSH–PULL METHOD IS DESCRIBED IN SECTION 3.4 OF THE PROCEDURES, AND SECTION 3.7.1 AND FIGURES 35 AND 36 OF THE EPP.

CLEARING/VEGETATION REMOVAL

1. STUMPS WITHIN THE TRENCH LINE WILL BE COMPLETELY REMOVED, GROUND, AND/OR HAULED OFF–SITE TO AN APPROVED LOCATION. TREE STUMPS OUTSIDE THE TRENCH LINE WILL BE GROUND BELOW NORMAL GROUND SURFACE TO FACILITATE A SAFE WORK AREA AND TO ALLOW TOPSOIL REMOVAL, IF NECESSARY. IN SOME CIRCUMSTANCES, TREE STUMPS OUTSIDE THE TRENCH LINE MAY BE COMPLETELY REMOVED TO ALLOW FOR A SAFE WORK AREA AND HAULED OFF–SITE TO AN APPROVED LOCATION AS OUTLINED IN SECTION 1.8.3 OF THE EPP.

2. CLEARING WILL BE CONDUCTED IN WATERBODIES AND WETLANDS AS OUTLINED IN SECTION 2.2 AND 3.2 OF THE EPP, RESPECTIVELY. CHIPS, MULCH, OR MECHANICALLY CUT WOODY DEBRIS SHALL NOT BE STOCKPILED IN A WETLAND. HYDRO–AX DEBRIS, OR SIMILAR CAN BE LEFT IN THE WETLAND IF SPREAD EVENLY IN THE CONSTRUCTION WORKSPACE TO A DEPTH THAT WILL ALLOW FOR NORMAL REVEGETATION, AS DETERMINED BY THE EI. CHIPPING IS NOT ALLOWED ON PUBLIC LANDS. ON PUBLIC LANDS, MULCH AND MECHANICALLY CUT WOODY DEBRIS MUST BE UNIFORMLY BROADCAST TO LESS THAN 2–INCH THICKNESS AND IN A MANNER THAT MAINTAINS VISIBLE GROUND.

3. ENBRIDGE WILL PROPERLY INSTALL AND MAINTAIN REDUNDANT SEDIMENT CONTROL MEASURES IMMEDIATELY AFTER CLEARING AND PRIOR TO INITIAL GROUND DISTURBANCE AT SURFACE WATERS LOCATED WITHIN 50 FEET OF THE PROJECT AND WHERE STORMWATER FLOWS TO THE SURFACE WATER (REFER TO THE ENVIRONMENTAL PLAN SHEETS IN THE SWPPP), AND WITHIN 100 FEET OF SPECIAL AND IMPAIRED WATERS, INCLUDING TROUT STREAMS.

4. ON PUBLIC LANDS AND WHEREVER PRACTICABLE AT WATERBODY CROSSINGS, ENBRIDGE WILL USE WILDLIFE–FRIENDLY EROSION AND SEDIMENT CONTROL BMPS THAT CONTAIN BIODEGRADABLE NETTING (CATEGORY 3N OR 4N NATURAL FIBER) AND WILL AVOID THE USE OF PLASTIC MESH (SECTIONS 1.17.1 AND 2.6.1 OF THE EPP).

TEMPORARY STABILIZATION

1. ON PORTIONS OF THE PROJECT WHERE WORK WILL BE OCCURRING DURING APPLICABLE ‘WORK IN WATER RESTRICTIONS’FOR PUBLIC WATERS (REFER TO SECTION 2.1), ALL EXPOSED SOIL AREAS WITHIN 200 FEET OF THE WATER’S EDGE, AND THAT DRAIN TO THAT WATER, WILL BE STABILIZED WITHIN 24 HOURS DURING THE RESTRICTION PERIOD. STABILIZATION OF ALL EXPOSED SOILS WITHIN 200 FEET OF THE PUBLIC WATER’S EDGE, AND THAT DRAIN TO THAT WATER, WILL BE INITIATED IMMEDIATELY AND COMPLETED WITHIN 7 CALENDAR DAYS WHENEVER CONSTRUCTION ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED ON ANY PORTION OF THE SITE OUTSIDE OF THE RESTRICTION PERIOD. THESE AREAS WILL BE IDENTIFIED ON THE ENVIRONMENTAL PLAN SHEETS ACCOMPANYING THE SWPPP.

2. HYDRO–MULCH AND LIQUID TACKIFIER CAN BE USED IN PLACE OF CERTIFIED WEED–FREE STRAW OR HAY MULCH WITH PRIOR APPROVAL FROM ENBRIDGE. ALL HYDROMULCH AND LIQUID TACKIFIER PRODUCTS USED WILL BE ON THE APPLICABLE STATE DOT PRODUCT LIST. HYDRO–MULCH AND LIQUID TACKIFIER PRODUCTS CONTAINING PLASTIC/POLYPROPYLENE FIBER ADDITIVES AND MALACHITE GREEN (COLORANT) WILL NOT BE UTILIZED ON THIS PROJECT. APPLICATION RATES WILL BE AT THE MANUFACTURER’S RECOMMENDED RATE. ENBRIDGE WILL AVOID THE USE OF HYDROMULCH ON PUBLIC LANDS; HOWEVER, ENBRIDGE MAY USE HYDROMULCH ON STEEP SLOPES TO PREVENT EROSION UNTIL PERMANENT COVER HAS BEEN ESTABLISHED AS OUTLINED IN SECTION 1.8.3 OF THE EPP.

RESTORATION AND STABILIZATION

1. ENBRIDGE WILL RESTORE THE STREAM BANKS AS NEAR AS PRACTICABLE TO PRE–CONSTRUCTION CONDITIONS UNLESS THAT SLOPE IS DETERMINED TO BE UNSTABLE. IF THE SLOPE IS CONSIDERED UNSTABLE, ENBRIDGE WILL RESHAPE THE BANKS TO PREVENT SLUMPING. FOR PUBLIC WATERS, ENBRIDGE WILL RETURN THE BANK TO PRE–CONSTRUCTION CONTOURS, UNLESS OTHERWISE DIRECTED BY THE SITE–SPECIFIC RESTORATION PLAN. IF ENBRIDGE CANNOT RESTORE TO PRE–CONSTRUCTION CONTOURS AT A PUBLIC WATER, ENBRIDGE WILL CONSULT WITH THE MDNR BEFORE PROCEEDING FURTHER AS OUTLINED IN SECTION 2.6 OF THE EPP.

2. UNSTABLE SOILS AND/OR SITE–SPECIFIC FACTORS SUCH AS STREAM VELOCITY AND FLOW DIRECTION MAY REQUIRE ADDITIONAL RESTORATION EFFORTS, SUCH AS INSTALLATION OF WOODY VEGETATION, GEOTEXTILE FABRIC, OR TREE, LOG, ROOTWAD, OR BOULDER REVETMENTS TO STABILIZE DISTURBED STREAM BANKS (SEE FIGURE 29) AS OUTLINED IN SECTION 2.6.2 OF THE EPP. ENBRIDGE WILL WORK WITH THE MDNR TO ENSURE ALL WORK/ADJUSTMENTS ARE APPROVED AND ARE CONDUCTED WITHIN APPLICABLE TIMING RESTRICTIONS.

3. IN UPLAND AND WETLAND AREAS, CLEANUP AND ROUGH GRADING WILL OCCUR AS OUTLINED IN SECTIONS 1.16 AND 3.9 OF THE EPP. ENBRIDGE WILL BACKFILL THE TRENCH TO AN ELEVATION SIMILAR TO THE ADJACENT AREAS OUTSIDE THE TRENCH LINE AND WILL ADD A SLIGHT CROWN OF APPROXIMATELY 3 TO 6 INCHES (DEPENDING ON SOIL TYPE) OVER THE BACKFILLED TRENCH TO ALLOW FOR SUBSIDENCE. GENERALLY, EXCESS SUBSOIL DISPLACED BY THE PIPE INSTALLATION WILL BE SPREAD ACROSS THE PORTION OF THE CONSTRUCTION WORKSPACE WHERE TOPSOIL REMOVAL HAS OCCURRED. ANY REMAINING EXCESS SUBSOIL WILL BE REMOVED AND DISPOSED OF AT AN APPROVED OFF–SITE LOCATION AS NEEDED TO ENSURE CONTOURS ARE RESTORED TO AS NEAR AS PRACTICABLE TO PRE–CONSTRUCTION CONDITIONS.

4. REVEGETATION ACTIVITIES WILL OCCUR AS OUTLINED IN SECTION 7.0 OF THE EPP. SEED MIXES AT PUBLIC WATERS WILL BE SELECTED AND APPLIED AS INDICATED IN THE PLANTING PLAN, WHICH IS APPENDIX A OF THE POST–CONSTRUCTION VEGETATION MANAGEMENT PLAN FOR PUBLIC LANDS AND WATERS (‘VMP’). SEED MIXES RELATIVE TO THESE SSRP CROSSINGS ARE CODED AS FOLLOWS:

A	EMERGENT (34–181)	G	DRY PRAIRIE GENERAL (35–221)
B	RIPARIAN NE (34–361)	H	MESIC PRAIRIE GENERAL (35–241)
C	RIPARIAN S&W (34–261)	I	MESIC PRAIRIE NW (35–441)
D	WET MEADOW NE (34–371)	J	DRY PRAIRIE NORTHWEST (35–421)
E	WET MEADOW S&W (34–271)	K	WOODLAND EDGE NE (36–311)
F	WETLAND REHABILITATION (34–171)	L	NATURAL REVEGETATION

5. ENBRIDGE WILL NOT SEED STANDING WATER OR WOODED (PSS AND PFO) WETLAND COMMUNITIES. NATURAL REVEGETATION WILL TAKE PLACE FROM EXISTING PLANT MATERIAL AND ROOT STOCK IN THESE COMMUNITIES.

6. ALL MATERIALS USED FOR CONSTRUCTION OF THE PROJECT MUST BE REMOVED FROM THE SITE.

7. ENBRIDGE WILL CONDUCT POST–CONSTRUCTION MONITORING IN ACCORDANCE WITH THE POST–CONSTRUCTION MONITORING PLAN FOR WETLANDS AND WATERBODIES, AND IN ACCORDANCE WITH THE VMP FOR THE UPLAND PORTIONS OF THE PROJECT ON PUBLIC LANDS.

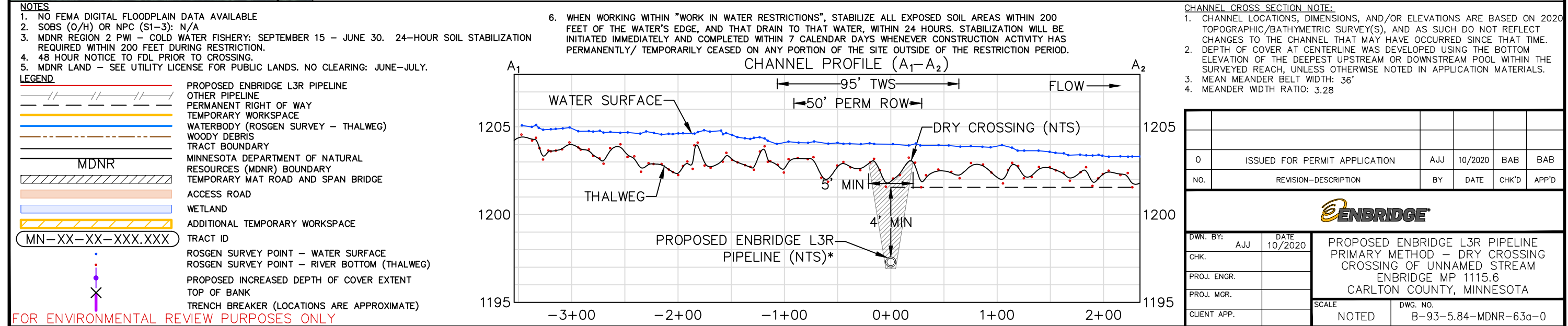
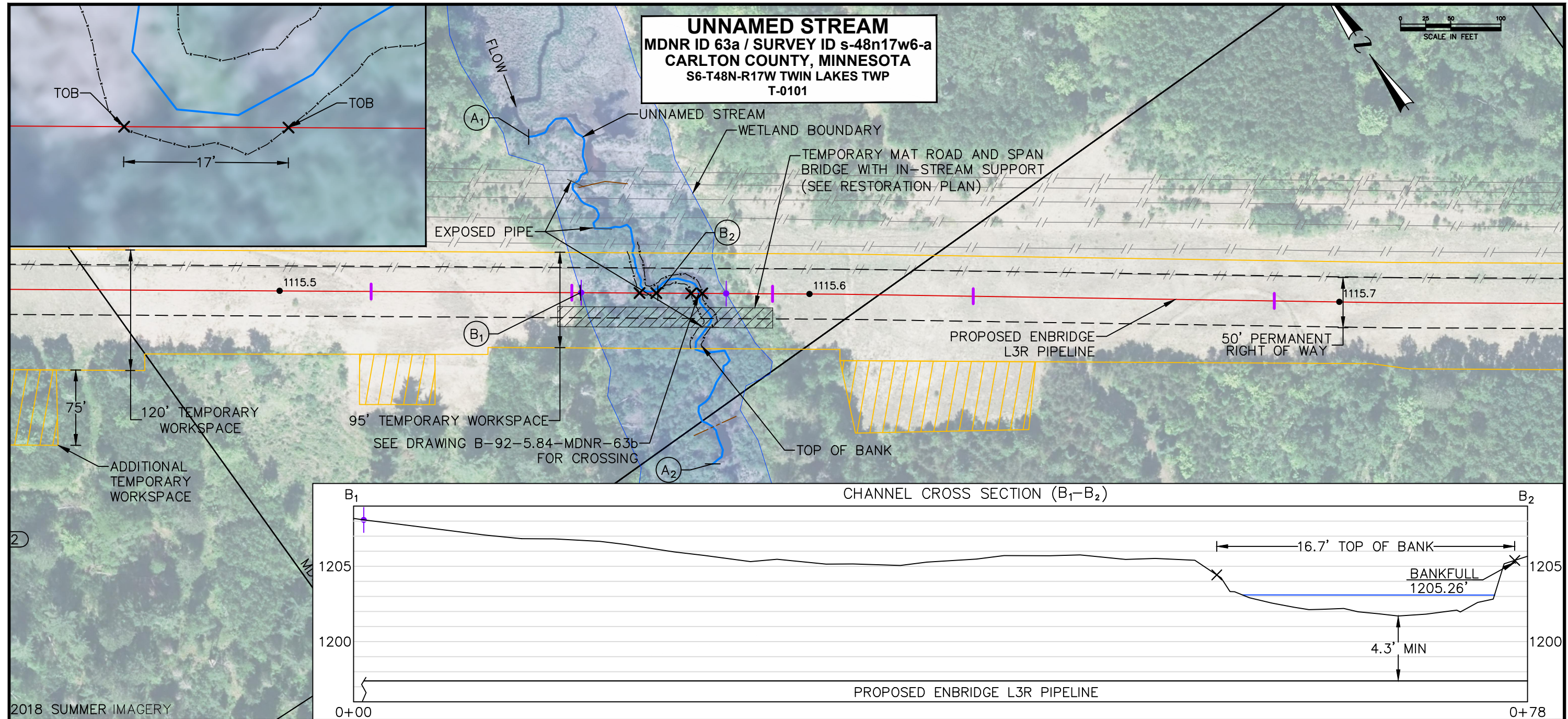
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ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE–SPECIFIC RESTORATION PLAN					
CONSTRUCTION NOTES					
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PLOTTED SIZE: ANSI FULL BLEED B (17x11)

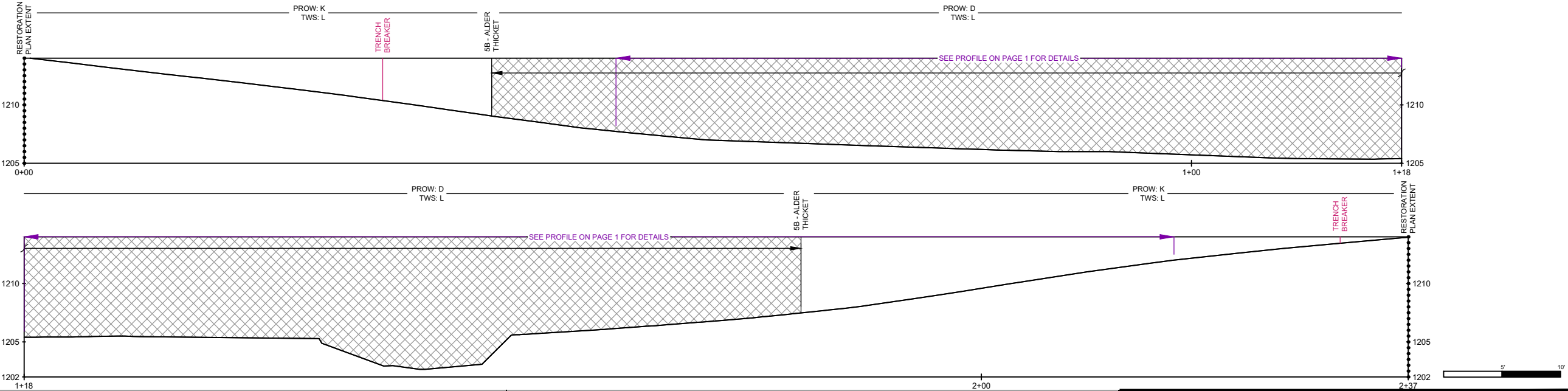
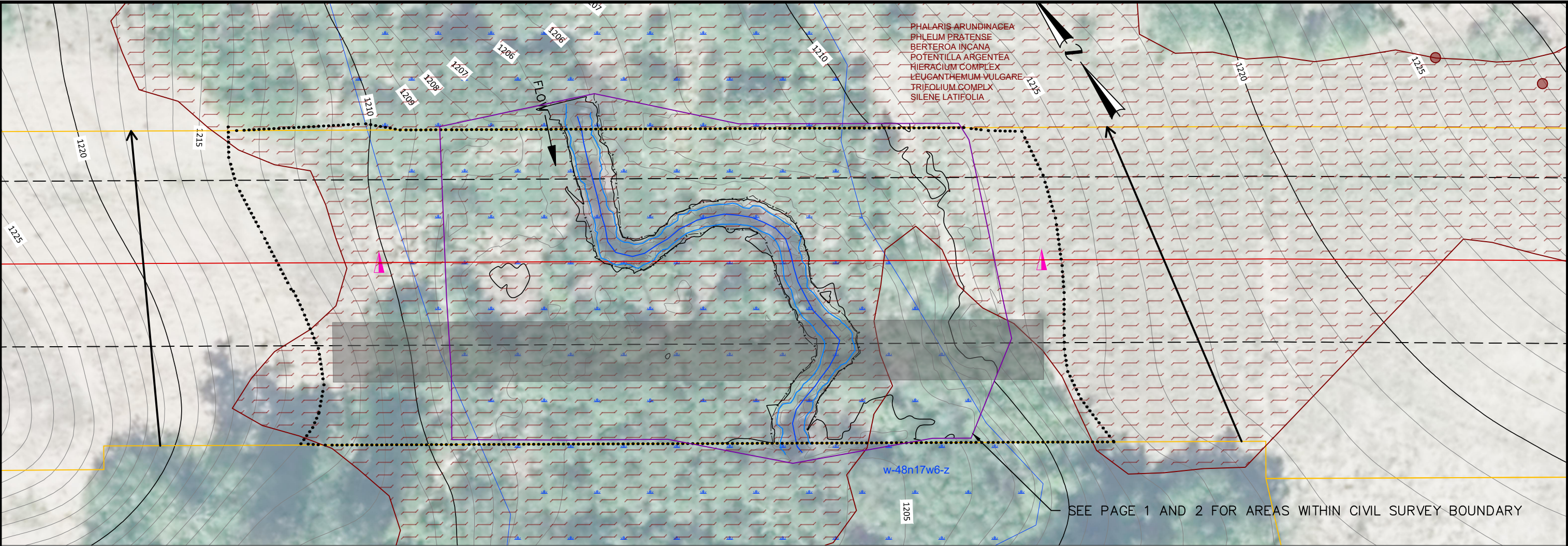


**MDNR ID No. 63a: MP 1115.6; Unnamed Stream (S-002-009-001-002)**









BWSR SEED MIX	D: WET MEADOW NE (34-371); K: WOODLAND EDGE NE (36-311); L: NATURAL REVEGETATION
SOBS (O/H) or NPC (S1-3)	NO (MODERATE); N/A

- ELEVATIONS OUTSIDE OF THE AREA WITHIN CIVIL SURVEY BOUNDARY ARE DERIVED FROM LIDAR. ENBRIDGE WILL RESTORE THE AREAS ADJACENT TO THE PUBLIC WATER WITHIN THE MDNR EXPANDED RESTORATION BOUNDARY TO PRE-CONSTRUCTION CONDITIONS.
- VOLUNTARY TROUT STREAM RESTRICTION: SEPTEMBER 15 - JUNE 30. 24-HOUR SOIL STABILIZATION REQUIRED WITHIN 200 FEET DURING RESTRICTION.
- AIR PHOTOS ARE FROM 2018 ENBRIDGE AERIAL PHOTOGRAPHY.
- ADDITIONAL ON-THE GROUND PHOTOS MAY BE TAKEN PRIOR TO CONSTRUCTION AT MDNR REQUEST.
- PRE-CONSTRUCTION PHOTOS WILL BE USED TO AID IN RESTORATION.
- SEE GENERAL NOTES PAGE FOR ADDITIONAL DETAIL.
- SEE THE PLANTING PLAN FOR ADDITIONAL DETAIL REGARDING SEEDING PRACTICES AND SEED MIXES AT PUBLIC WATER CROSSINGS.
- ON PUBLIC LANDS AND WHEREVER PRACTICABLE AT WATERBODY CROSSINGS, ENBRIDGE WILL USE WILDLIFE-FRIENDLY EROSION AND SEDIMENT CONTROL BMPs THAT CONTAIN BIODEGRADABLE NETTING (CATEGORY 3N OR 4N NATURAL FIBER) AND WILL AVOID THE USE OF PLASTIC MESH (SECTIONS 1.17.1 AND 2.6.1 OF THE EPP).
- WHEN WORKING WITHIN "WORK IN WATER RESTRICTIONS", STABILIZE ALL EXPOSED SOIL AREAS WITHIN 200 FEET OF THE WATER'S EDGE, AND THAT DRAIN TO THAT WATER, WITHIN 24 HOURS. STABILIZATION WILL BE INITIATED IMMEDIATELY AND COMPLETED WITHIN 7 CALENDAR DAYS WHENEVER CONSTRUCTION ACTIVITY HAS PERMANENTLY/ TEMPORARILY CEASED ON ANY PORTION OF THE SITE OUTSIDE OF THE RESTRICTION PERIOD.

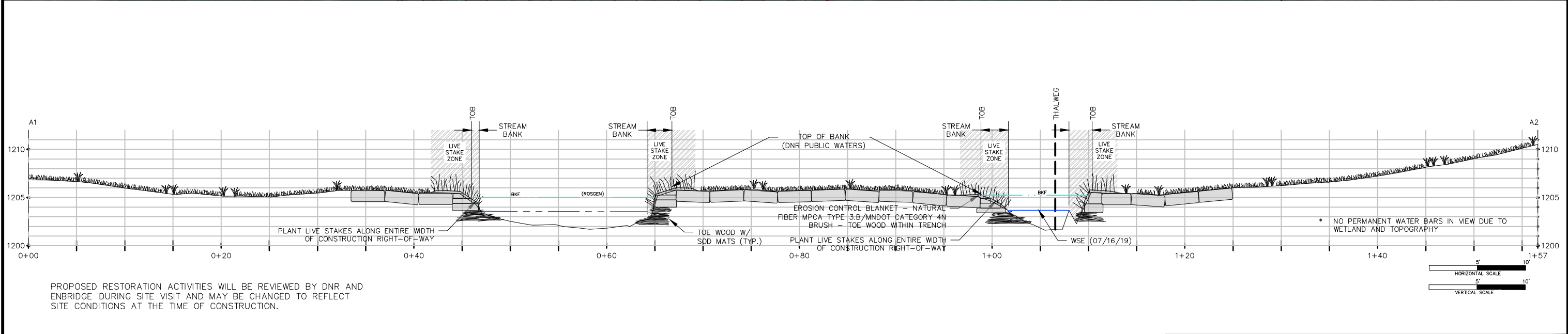
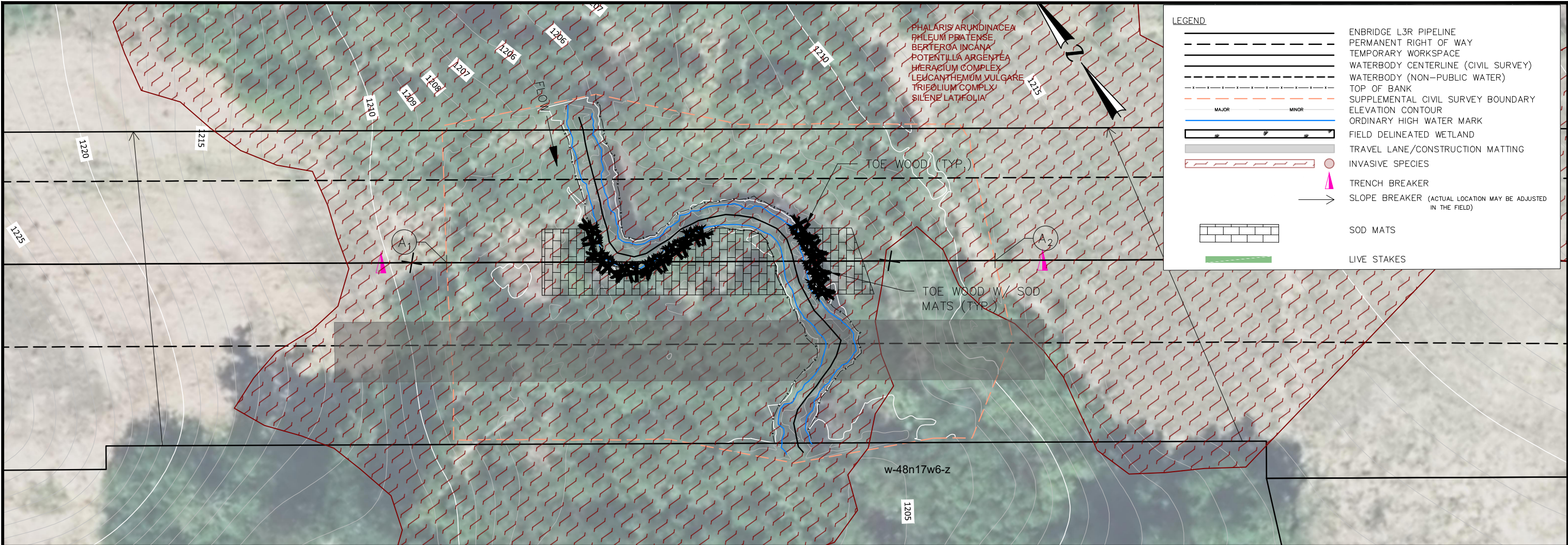
**LEGEND**


- ENBRIDGE L3R PIPELINE
- PERMANENT RIGHT OF WAY
- TEMPORARY WORKSPACE
- WATERBODY CENTERLINE (CIVIL SURVEY)
- WATERBODY (NON-PUBLIC WATER)
- PUBLIC WATER CIVIL SURVEY BOUNDARY
- MDNR EXPANDED RESTORATION BOUNDARY
- TOP OF BANK
- ELEVATION CONTOUR
- ORDINARY HIGH WATER MARK
- FIELD DELINEATED WETLAND
- TRAVEL LANE/CONSTRUCTION MATTING

- INVASIVE SPECIES
- TRENCH BREAKER
- PERMANENT SLOPE BREAKER (ACTUAL LOCATION MAY BE ADJUSTED IN THE FIELD)
- 1 - SHALLOW, OPEN WATER
- 2B - SHALLOW MARSH
- 3A - SEDGE MEADOW
- 3B - FRESH (WET) MEADOW
- 5A - SHRUB-CARR
- 5B - ALDER THICKET
- 6A - HARDWOOD SWAMP
- 6B - CONIFEROUS SWAMP

B	ISSUED FOR PERMITTING	MJT	10/2020		
A	ISSUED FOR REVIEW	MJT	09/2020		
NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D	APP'D
ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE-SPECIFIC RESTORATION PLAN UNNAMED STREAM - MP 1115.6 - MDNR ID 63A/63B RE-VEGETATION PLAN: EXPANDED EXTENT					
SCALE	NOTED	DWG. NO.	SSRP-1115.6-001A	PAGE NO.	1A/5



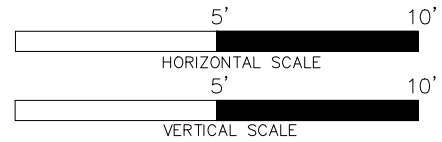


FEATURE ID	s-48n17w6-a; IFC ID: S-308.0	<div>NOTES</div> <div>1. CONSTRUCTION TIMING RESTRICTIONS</div> <div>1.1. VOLUNTARY TROUT STREAM RESTRICTION: SEPTEMBER 15 – JUNE 30.</div> <div>1.2. WHEN WORK OCCURS WITHIN 'WORK IN WATER RESTRICTIONS', ALL EXPOSED SOIL AREAS WITHIN 200 FEET OF THE WATER'S EDGE, AND THAT DRAIN TO THAT WATER, WILL BE STABILIZED WITHIN 24 HOURS DURING THE RESTRICTION PERIOD. STABILIZATION OF ALL EXPOSED SOILS WITHIN 200 FEET OF THE PUBLIC WATER'S EDGE, AND THAT DRAIN TO THAT WATER, WILL BE INITIATED IMMEDIATELY AND COMPLETED WITHIN 7 CALENDAR DAYS WHENEVER CONSTRUCTION ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED ON ANY PORTION OF THE SITE OUTSIDE OF THE RESTRICTION PERIOD</div> <div>2. WORK SHALL BE CONDUCTED IN ACCORDANCE WITH APPLICABLE STANDARDS IN ENBRIDGE'S EPP AND VMP FOR PUBLIC LANDS AND WATERS. THE SPECIFICATIONS WITHIN THIS SSRP MAY MODIFY OR REPLACE THESE STANDARDS.</div> <div>3. SEE GENERAL NOTES PAGE FOR ADDITIONAL DETAIL.</div> <div>4. INFORMATION REGARDING SEEDING SPECIFICATIONS, SEED BED PREPARATION TECHNIQUES, ETC. ARE DESCRIBED IN THE PLANTING PLAN CONTAINED WITHIN THE VMP.</div> <div>5. TRENCH BREAKER LOCATION IS APPROXIMATE PENDING FIELD VERIFICATION (EPP SECTION 1.13)</div> <div>6. SITE WITHIN PEAT BASIN – SOURCE: SSURGO</div> <div></div>	B	ISSUED FOR PERMITTING		10/2020		
CROSSING TYPE	DRY CROSSING		A	ISSUED FOR REVIEW	MJT	08/2020		
PROPOSED RESTORATION <small>(SEE DETAILS FOR LIVE STAKING, TRANSPLANTS, AND SHRUB SPECIES IF APPLICABLE)</small>	EC BLANKET – NATURAL FIBER MPCA TYPE 3.B/MNDOT CATEGORY 4N; BRUSH – TOE WOOD		NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D	APP'D
WITHIN OR ADJACENT WETLAND	ALDER THICKET		ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE-SPECIFIC RESTORATION PLAN UNNAMED STREAM – MP 1115.6 – MDNR ID 63A/63B RE-VEGETATION PLAN					
BWSR SEED MIX	WET MEADOW NE (34–371)							
DOMINANT WETLAND VEGETATION	1. CALAMAGROSTIS CANADENSIS 3. ALNUS INCANA 2. PHALARIS ARUNDINACEA 4. SALIX PETIOLARIS							
SOBS (O/H) or NPC (S1-3)	NO (MODERATE); N/A							
		SCALE NOTED	DWG. NO. SSRP-1115.6-001			PAGE NO. 1/ 7		



BANK RESTORATION (BRIDGE)

\*APPROXIMATE WSE PROVIDED FOR CONSTRUCTION RELATED ACTIVITIES.



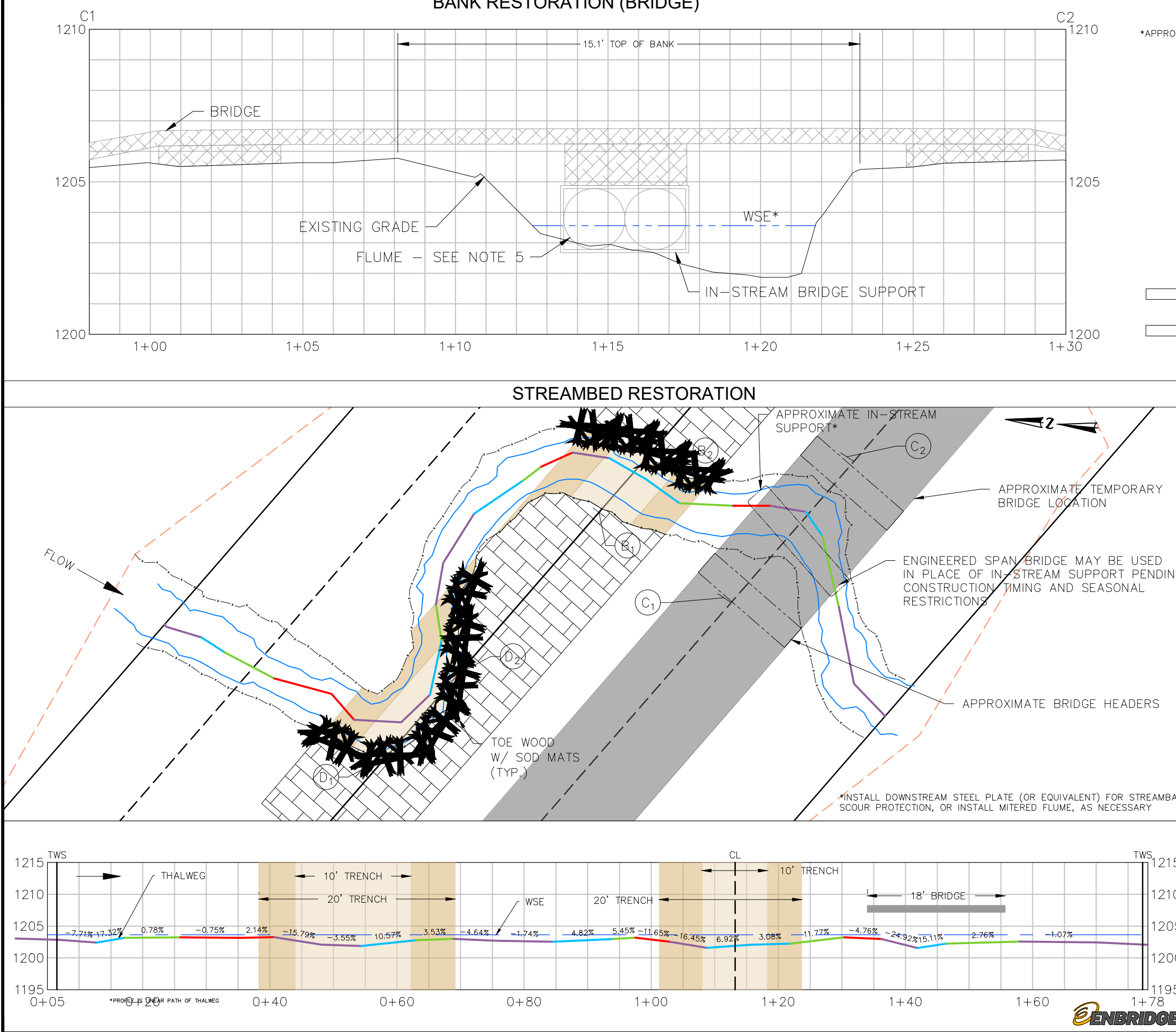
STREAMBED RESTORATION

- NOTES
1. TRANSITIONS BETWEEN EXISTING CHANNEL FEATURES (BED, BANK, FLOODPLAIN) AND PROPOSED RESTORED TRENCH CROSSING WILL BE SMOOTH AND EVENLY GRADED WITHOUT ABRUPT OR PROTRUDING OBSTRUCTIONS.
  2. MINIMIZE DISTURBANCE OF BED MATERIALS AND FEATURES DURING CONSTRUCTION OF THE TRENCH AND INSTALLATION AND REMOVAL OF IN-STREAM SUPPORT.
  3. BED AND/OR BANK MATERIALS TEMPORARILY ADJUSTED OR REMOVED DURING CONSTRUCTION SHALL BE PLACED IN THE APPROXIMATE ORIGINAL LOCATION DURING RESTORATION. MATERIALS SHALL BE FIELD ADJUSTED DURING PLACEMENT BASE ON THE OBSERVED FLOW PATH AT THE TIME OF CONSTRUCTION.
  4. ALIGNMENT OF IN-STREAM SUPPORT SHALL BE FIELD ADJUSTED BASED ON FLOW PATH TO PROTECT CHANNEL BANKS.
  5. SEE RESTORATION SHEET FOR B1-B2 CROSS SECTION.

LEGEND

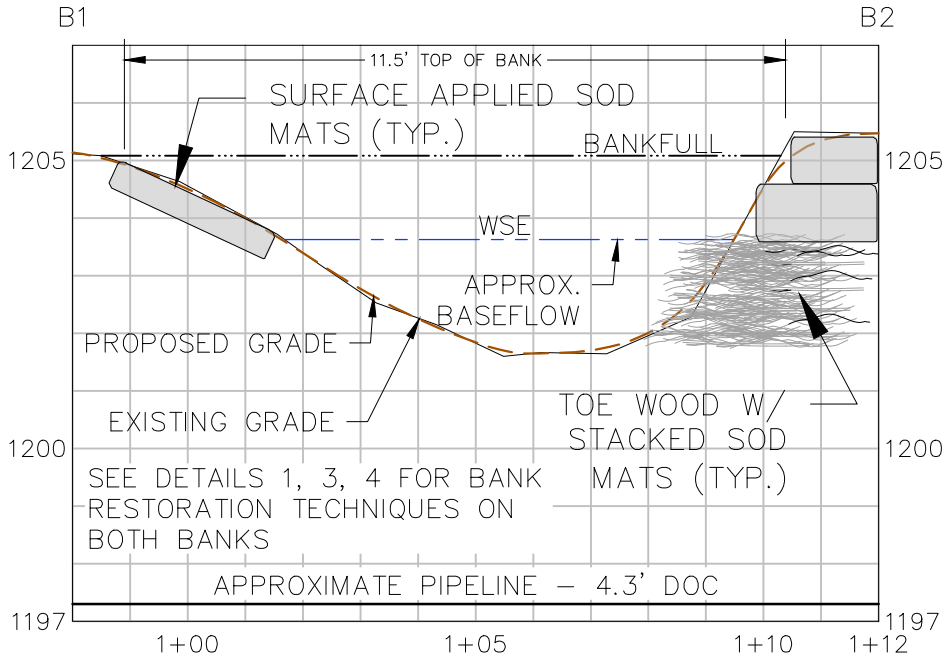
ENBRIDGE L3R PIPELINE
PERMANENT RIGHT OF WAY
TEMPORARY WORKSPACE
WATERBODY - RIFFLE (ROSGEN SURVEY)
WATERBODY - POOL (ROSGEN SURVEY)
WATERBODY - RUN (ROSGEN SURVEY)
WATERBODY - GLIDE (ROSGEN SURVEY)
CONTOUR (1' INTERVAL)
TOP OF BANK
ORDINARY HIGH WATER MARK
FIELD DELINEATED WETLAND
TRAVEL LANE/CONSTRUCTION MATTING
TRENCH - 10'
TRENCH - 20'

B	ISSUED FOR PERMITTING	10/2020		
A	ISSUED FOR REVIEW	MJT	08/2020	
NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D APP'D
ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE-SPECIFIC RESTORATION PLAN UNNAMED STREAM - MP 1115.6 - MDNR ID 63 STABILIZATION PLAN				
SCALE	DWG. NO. SSRP-1115.6-002	PAGE NO. 2/7		

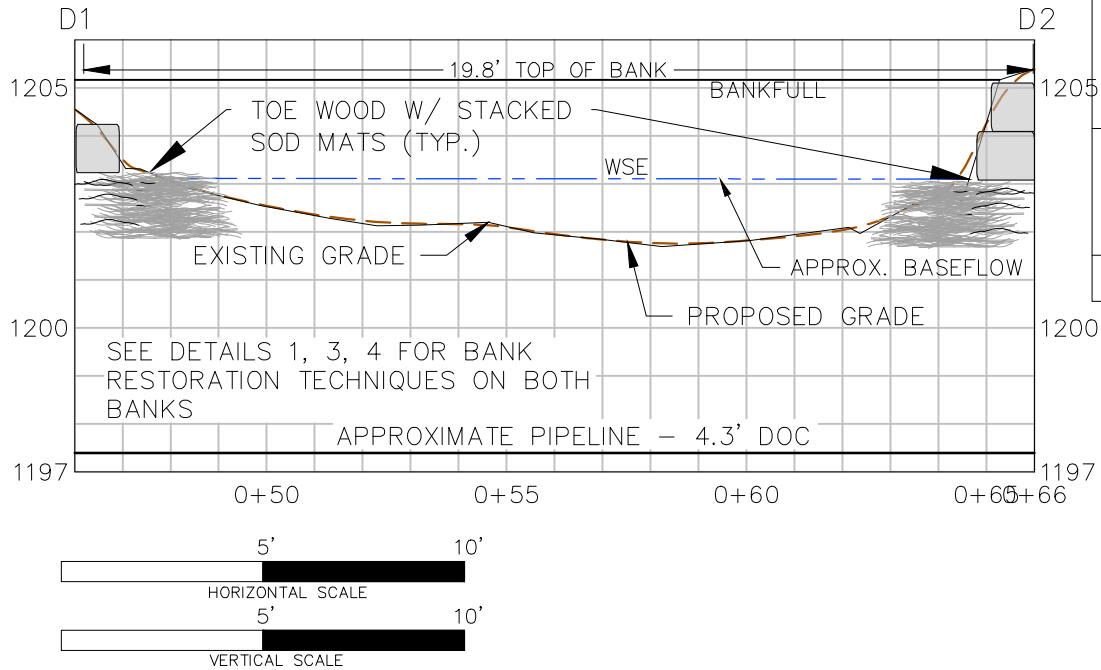




BANK RESTORATION (CENTERLINE)



BANK RESTORATION (CENTERLINE - SECOND CROSSING)



	COMMON NAME	SCIENTIFIC NAME
LIVE STAKE SPECIES	ELDERBERRY	SAMBUCUS CANADENSIS
	HIGH BUSH CRANBERRY	VIBURNUM OPOLUS (TRILOBUM)
	RED-OSIER DOGWOOD	CORNUS STOLONIFERA
	SILKY DOGWOOD	CORNUS AMOMUM
TRANSPLANTS	SPECKELD ALDER	ALNUS INCANA
	WILLOW	SALIX SPP.
	DOGWOOD	CORNUS SPP.
SHRUB	NONE	NONE

ACTIVITIES, ALL SPECIES WILL BE UND WITHIN THE COUNTY WHERE

ST THREE (3) SPECIES WITH NO MORE ATIVE SPECIES MAY BE SELECTED . ALTERNATIVE SPECIES SHOULD BE NATIVE SPECIES. CONTAINER SHRUBS MAY BE E SPECIFIC CONDITIONS. DED TO BE 18" – 24" IN SIZE. RUB PER 3 LINEAR FEET OF BANK, ND 3–5 SHRUBS OF THE SAME SPECIES. BE EXCAVATED WITH A MINIMUM OF NE, AND LOOSE UNBOUND BALL. TAGGER 1 STAKE PER 3 LINEAR FEET FOOT APART. PLACE FIRST ROW OWER ROW(S) BETWEEN THE TOP OF

RESTORATION NOTES:  
GENERAL

- REFER TO RESTORATION DETAIL SHEETS FOR ADDITIONAL INFORMATION RELATED TO PROPOSED RESTORATION MEASURES.
- REFER TO SITE PHOTOS FOR INFORMATION ON PRE-CONSTRUCTION CROSSING CONDITIONS AND TO PROVIDE ADDITIONAL GUIDANCE FOR RESTORATION EFFORTS.

TOE WOOD

- ROUGH GRADE CHANNEL BED FEATURES INCLUDING PLACEMENT OF SUBSTRATE.
- INSTALL FOOTER LOG(S) ALONG PROPOSED TOE OF SLOPE. FOOTER LOGS SHOULD BE ANGLED TO ALLOW FOR TOE ALIGNMENT TO GENERALLY MATCH THE EXISTING CURVE AND EVENLY TRANSITION FROM UPSTREAM TO DOWNSTREAM.
- PUSH FOOTER LOG INTO SOIL APPLY A SMALL AMOUNT OF GRAVEL OR STONE AS NEEDED TO PREVENT FLOATATION OF FOOTER LOG PRIOR TO PLACING WOODY DEBRIS.
- PLACE A LAYER WOODY DEBRIS IN 6" TO 8" LIFTS, APPLY 3"-4" GRAVEL AND/OR SOIL FILL AND COMPACT WITH EXCAVATOR BUCKET. WASH FILL MATERIAL INTO WOODY DEBRIS MATRIX WITH WATER FROM CHANNEL. APPLY ADDITIONAL LAYERS "AS NEEDED" TO REACH THE SPECIFIED TOE WOOD HEIGHT.
- PLACE STACKED SOD MATS ABOVE TOE WOOD. THE USE OF TRANSPLANTS OR FABRIC LIFTS MAY BE FIELD APPROVED BY ENBRIDGE IN CONSULTATION WITH MN DNR.

SOD MATTING

- REMOVE VEGETATED MATS ON EITHER SIDE OF THE STREAM CROSSING USING ONSITE EQUIPMENT WHICH CAN UNDERCUT THE VEGETATION FOR REMOVAL. SMALL SHRUBS AND/OR TREES WITHIN THE SOD MATS ARE ACCEPTABLE AND SHOULD NOT BE REMOVED.
- DEPENDING ON THE LEVEL OF SATURATION AT THE TIME OF REMOVAL, IT MAY BE DIFFICULT TO OBTAIN INTACT CONSOLIDATED MATS, BUT GENERALLY THE NATIVE VEGETATION WILL BE RETAINED AND CAPTURED FOR PLACEMENT.
- SOD MATS CAN BE TRANSPLANTED DURING ANY SEASON.
- SOD MAT WILL BE PLACED ON CLEAR GROUND OR MATS WITHIN THE WORKSPACE.
- MONITOR MATS TO SUPPORT SURVIVABILITY; WATERING MAY BE NEEDED.
- PRIOR TO PLACEMENT OF SOD MATS FINISH GRADE CHANNEL BANK AND ADJACENT FLOODPLAIN APPLICATION AREA TO PROVIDE A SMOOTH AND EVEN SURFACE. SUBGRADE ELEVATION SHOULD ALLOW FOR THE FINISHED SOD SURFACE TO TRANSITION EVENLY WITH THE CHANNEL BANKS UPSTREAM AND DOWNSTREAM OF THE INSTALLATION AREA. AVOID ABRUPT CHANGES IN GRADE.
- VEGETATED MATS WILL BE RETURNED/SET IN PLACE WITH ONSITE EQUIPMENT.
  - SURFACE APPLIED SOD MATTING SHOULD BE PLACED WITH THE LONG SIDE PERPENDICULAR TO THE CHANNEL / FLOW.
  - STACKED SOD MATTING SHOULD BE PLACED WITH THE LONG SIDE PARALLEL TO THE CHANNEL / FLOW.
- IF SUFFICIENT SOD IS NOT AVAILABLE FROM THE STREAM BANKS ADDITIONAL SOD MAY BE TAKEN FROM THE ADJACENT CONSTRUCTION WORKSPACE.
- WHEN PLACING SOD MATS, DO NOT LEAVE LARGE GAPS BETWEEN EACH SOD MAT AS NON-NATIVE VEGETATION WILL QUICKLY ATTEMPT TO COLONIZE THESE VOIDS.
- WATER SOD MATS AFTER REPLACEMENT IF CONDITIONS ARE HOT AND DRY. DAMP AND/OR FROZEN SOD MATS DO NOT REQUIRE WATERING.
- THE TOP MAT AND/OR OTHER MATS CAN BE ANCHORED WITH A LIVE AND/OR DEAD STOUT STAKE TO ENSURE THAT IT DOES NOT MOBILIZE DURING A FLOOD EVENT BEFORE THE ROOTS HAVE ESTABLISHED.
- THE VEGETATED MATS WILL BE REPLACED AS SOON AS PRACTICAL FOLLOWING BACKFILLING OF THE TRENCH AND STABILIZED PER THE TIMING REQUIREMENTS DESCRIBED IN SECTION 1.9.1 OF THE EPP.

LIVE STAKING

- CLEANLY REMOVE ALL SIDE BRANCHES AND THE TOP GROWTH, AND FASHION THE CUTTINGS INTO LIVE STAKES AS DEPICTED IN THE DETAIL DRAWING. AN OPTION DURING PREPARATION IS TO PAINT AND SEAL THE TOP OF THE LIVE STAKE BY DIPPING THE TOP 1-2 INCHES INTO A 50-50 MIX OF LIGHT-COLORED LATEX PAINT AND WATER. SEALING THE TOP OF STAKE WILL REDUCE THE POSSIBILITY OF DESICCATION, ASSURE THE STAKES ARE PLANTED WITH THE TOP UP, AND MAKES THE STAKES MORE VISIBLE FOR SUBSEQUENT PLANTING EVALUATIONS.
- USE A PUNCH BAR OR HAND AUGER TO CREATE A NARROW PILOT HOLE, PERPENDICULAR TO THE SLOPE, THROUGH ANY EROSION CONTROL MATTING, RIP RAP, OR OTHER REVETMENT, FILTER FABRIC, ETC., IF PRESENT, AND DEEP ENOUGH TO INTERCEPT THE WATER TABLE. THE HOLE SHOULD BE ONLY AS LARGE AS NECESSARY TO INSTALL THE LIVE STAKE WITHOUT DAMAGE WHILE ENSURING THE HIGHEST AMOUNT OF STAKE-SOIL CONTACT.
- INSERT THE POINTED END OF THE LIVE STAKE INTO THE PILOT HOLE. TAMP INTO THE GROUND WITH A DEAD BLOW HAMMER TAKING CARE NOT TO SPLIT OR OTHERWISE DAMAGE THE LIVE STAKE. USE WATER, SOIL BACKFILL, TAMPING, ETC. TO ACHIEVE GOOD SOIL-TO-STEM CONTACT AND REMOVE AIR POCKETS.
- USE ONSITE EQUIPMENT TO APPLY WATER FROM THE CHANNEL AFTER INSTALLATION.
- ALL CUTS SHOULD BE CLEAN AND SMOOTH. NO CRACKED OR SPLIT LIVE STAKES SHOULD BE USED. IF THEY SPLIT DURING TAMPING, THEY SHOULD BE CUT BELOW THE CRACK OR REPLACED.
- THE SPECIFIED NUMBER OF LIVE STAKES SHOULD BE INSTALLED INTO THE SOIL AND PROTRUDE ABOVE THE SOIL AND ANY SOD MATTING, MULCHING, EROSION CONTROL MATTING, RIP RAP, OR OTHER REVETMENT.
- LIVE STAKE SHOULD NOT MOVE AFTER INSTALLATION; ENSURING IT IS IN FIRM CONTACT WITH THE SOIL.
- IT IS IMPORTANT TO ENSURE THAT THE UPSTREAM AND DOWNSTREAM ENDS OF THE LIVE STAKING A MERGE SMOOTHLY INTO THE UNDISTURBED BANK BEYOND THE PROJECT AREA. THE RATE OF INSTALLING LIVE STAKES SHOULD TAPER OFF GRADUALLY TO BLEND IN WITH THE EXISTING VEGETATION.

TRANSPLANTS

- SHRUBS AND/OR ALDER REMOVED FROM THE TRENCH AREA MAY BE USED IN LIEU OF SOD MATS IN ACCORDANCE WITH THE TRANSPLANT DETAIL.

HART

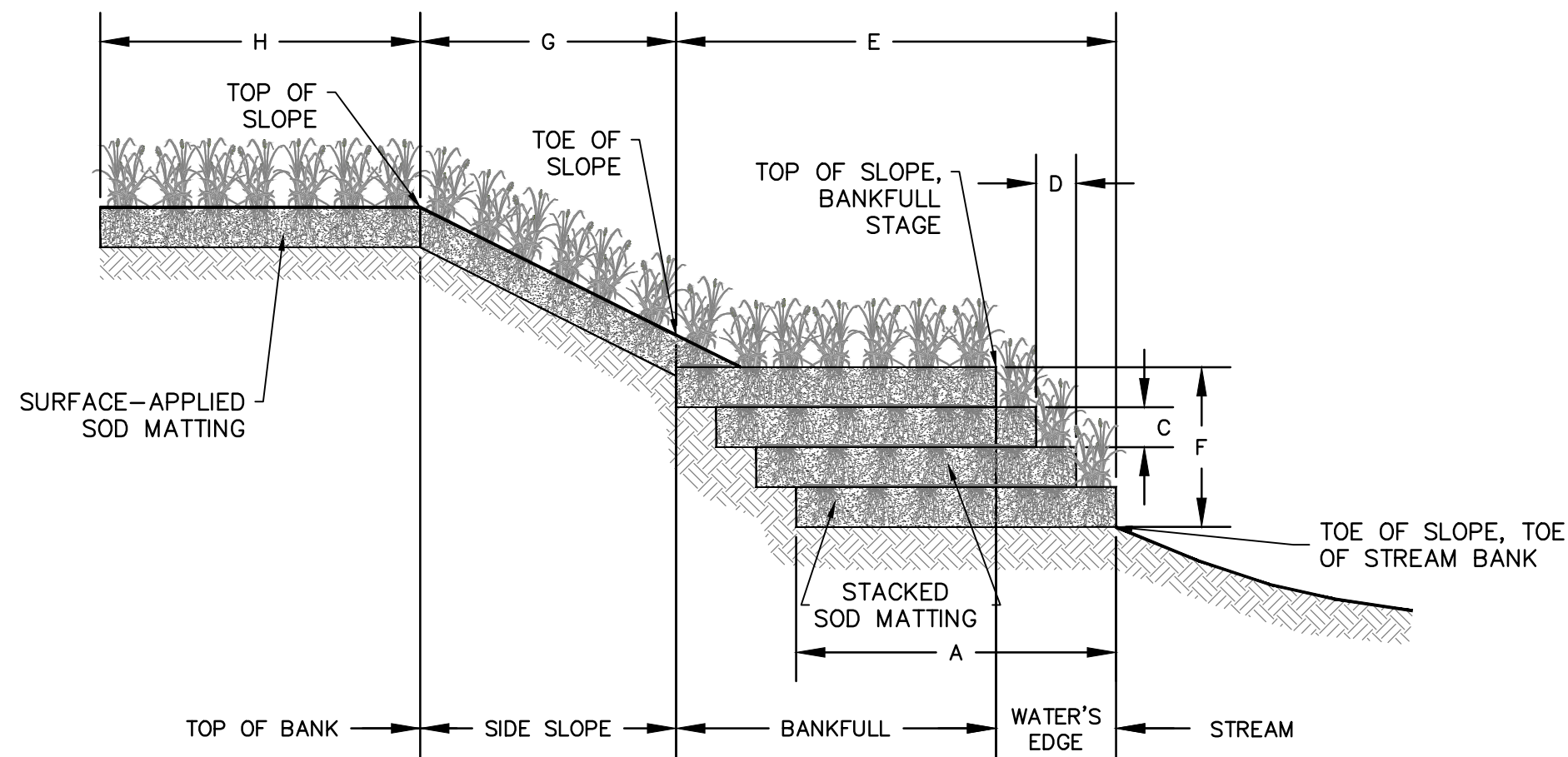
L3R PIPELINE  
T RIGHT OF WAY  
Y WORKSPACE  
Y CENTERLINE (CIVIL SURVEY)  
Y (NON-PUBLIC WATER)  
ANK  
NTAL CIVIL SURVEY BOUNDARY  
CONTOUR  
HIGH WATER MARK  
NEATED WETLAND  
ANE/CONSTRUCTION MATTING  
SPECIES  
  
REAKER  
CAKER (ACTUAL LOCATION MAY BE ADJUSTED IN THE FIELD)

CS

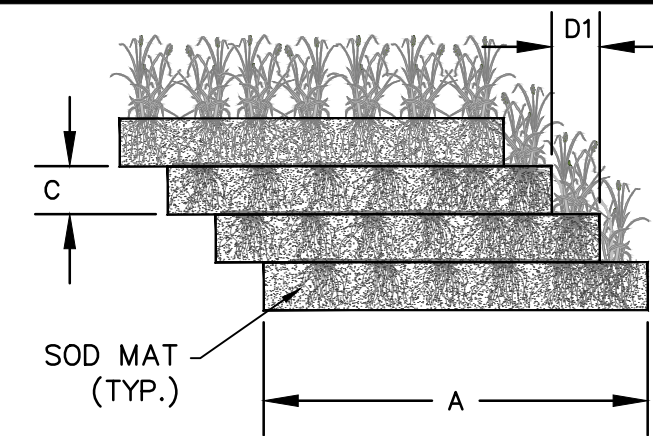
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NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D	APP'D
ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE-SPECIFIC RESTORATION PLAN UNNAMED STREAM – MP 1115.6 – MDNR ID 63 SITE SPECIFIC DETAILS					
SCALE	DWG. NO.	PAGE NO.			
NOTED	SSRP-1115.6-004	3/7			



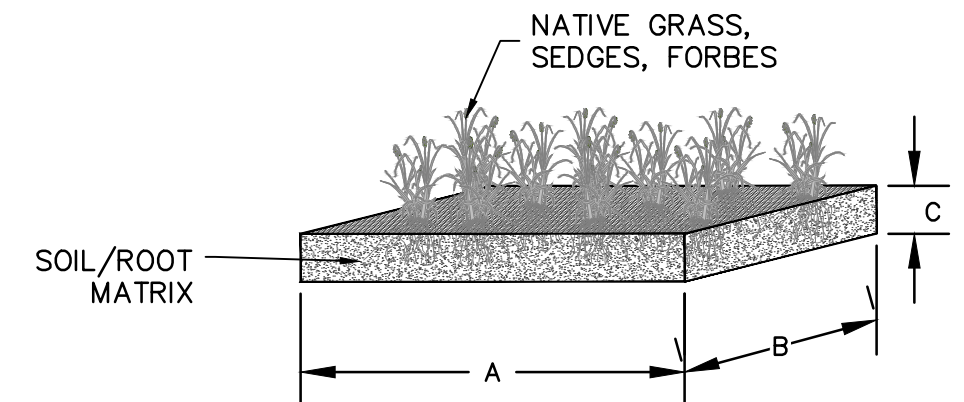




**CROSS SECTION**



**STACKED SOD MATTING DETAIL**



**SOD MAT DETAIL**

DIMENSION <sup>1</sup>	NAME	TYPICAL UNIT	VALUE	DESCRIPTION
A	SOD MAT WIDTH	FEET	3–4	WIDTH OF INDIVIDUAL SOD MAT.
B	SOD MAT LENGTH	FEET	3–6	LENGTH OF INDIVIDUAL SOD MAT.
C	SOD MAT THICKNESS	INCHES	12	THICKNESS OF INDIVIDUAL SOD MAT.
D	STACKED SOD MAT SETBACK	FEET	VARIES	THE DISTANCE BETWEEN THE EDGES OF SOD MATS STACKED TO FORM A SLOPE
E	WIDTH OF STACKED SOD MATS	FEET	10 - 20	WIDTH OF A BANK CREATED BY STACKED SOD MATS
F	HEIGHT OF STACKED SOD MATS	FEET	2	HEIGHT OF A SLOPE CREATED BY STACKED SOD MATS
G	WIDTH OF SURFACE- APPLIED SOD MATS	FEET	10–20	WIDTH OF A SLOPE STABILIZED WITH SURFACE-APPLIED SOD MATS
H	TOP OF BANK SOD MATTING DISTANCE	FEET	15	DISTANCE SOD MATTING IS INSTALLED ON THE TOP OF BANK

NOTES:

1. DIMENSION LABELS ARE REFERENCED IN THE DETAIL DRAWINGS.



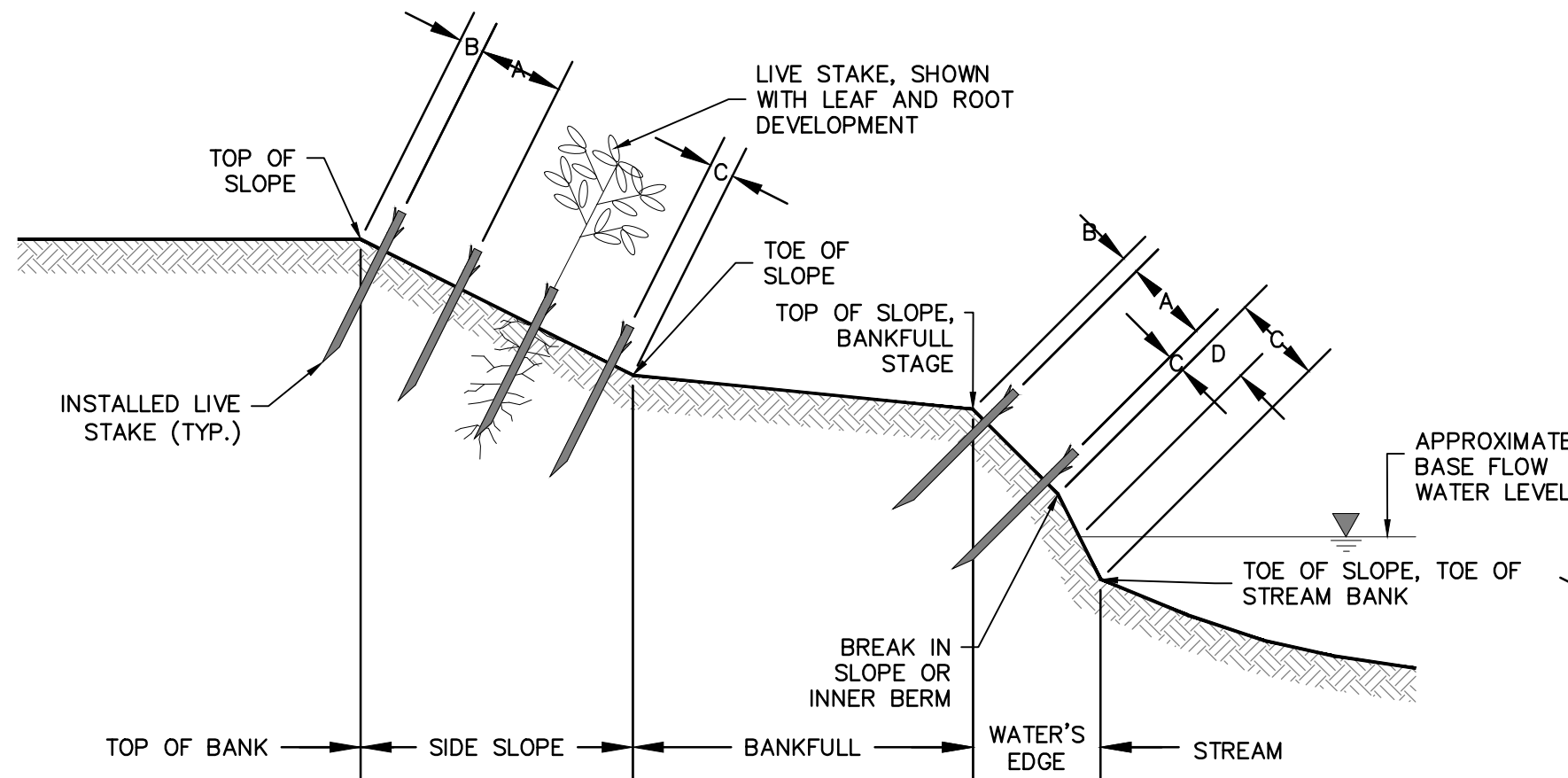
**SOD MAT EXAMPLES**

**SOD MATTING DETAIL**

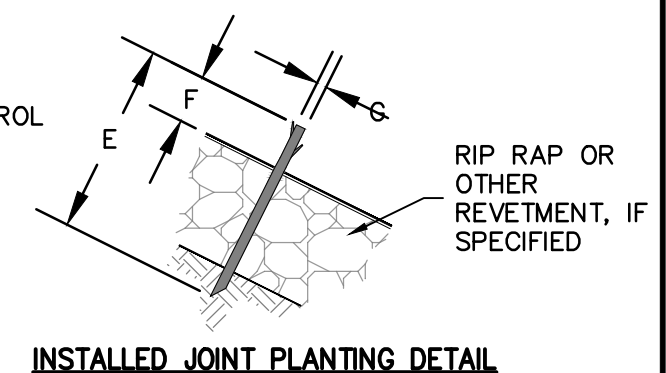
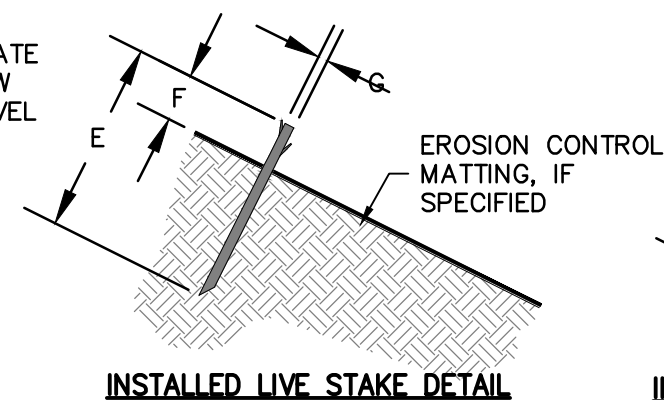
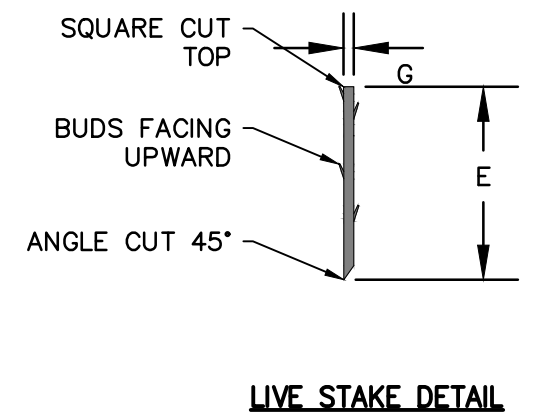
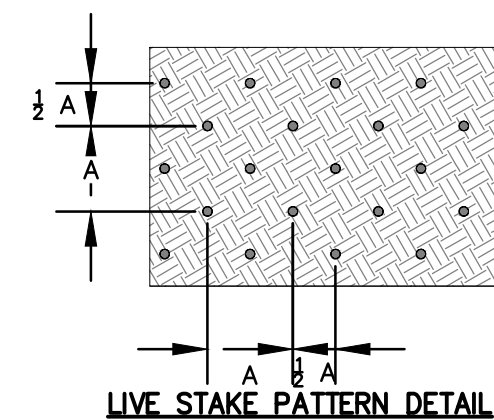


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ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE-SPECIFIC RESTORATION PLAN UNNAMED STREAM – MP 1115.6 – MDNR ID 63A 63B SITE SPECIFIC DETAILS					
SCALE	DWG. NO.	PAGE NO.			
NOTED	SSRP-1115.6-004	4 / 7			





**CROSS SECTION**



DIMENSION <sup>1</sup>	NAME	TYPICAL UNIT	VALUE	DESCRIPTION
A	LIVE STAKE SPACING	FEET	3 OC	SPACING BETWEEN INDIVIDUALLY INSTALLED LIVE STAKES. STAKES CAN BE PLACED IN A TRIANGULAR GRID (NRCS 2007A) OR RANDOMLY (NRCS 2007A, IOWA DNR 2006). RECOMMEND SPECIES DIVERSITY THROUGHOUT PROJECT AREA.
B	LIVE STAKE – TOP OF SLOPE PLACEMENT	INCHES	0–3	POSITION OF LIVE STAKE RELATIVE TO THE TOP OF A SLOPE
C	LIVE STAKE – TOE OF SLOPE PLACEMENT	INCHES	0–3	POSITION OF LIVE STAKE RELATIVE TO THE TOE OF A SLOPE
D	LIVE STAKE – BASE FLOW RELATIONSHIP	FEET	1239.0	PLACEMENT OF LOWER ROW OF LIVE STAKES RELATIVE TO THE APPROXIMATE BASE FLOW WATER LEVEL WITH CONSIDERATION GIVEN TO DURATION OF INUNDATION DURING BANKFULL AND OTHER HIGH FLOW EVENTS.
E	LIVE STAKE LENGTH	INCHES	24–36	LENGTH OF PREPARED DORMANT LIVE CUTTING FROM WOODY PLANT TO BE USED AS LIVE STAKE. LENGTH SHOULD BE SUFFICIENT TO REACH LOW-FLOW WATER TABLE ELEVATION.
F	LIVE STAKE PROTRUSION	INCHES	3–4	DISTANCE INSTALLED LIVE STAKE SHOULD PROTRUDE ABOUT 20% FROM THE GROUND. AT LEAST TWO BUDS OR BUD SCARS SHOULD BE PRESENT ABOVE THE GROUND IN THE FINAL INSTALLATION, DEPENDING ON THE SURROUNDING VEGETATION HEIGHT.
G	LIVE STAKE DIAMETER	INCHES	$\frac{1}{2}$ – $1\frac{1}{2}$	DIAMETER OF PREPARED DORMANT LIVE CUTTING FROM WOODY PLANT TO BE USED AS LIVE STAKE – TYPICALLY CITE A PERMISSIBLE MINIMUM AND MAXIMUM DIAMETER.

NOTES:  
1. DIMENSION LABELS ARE REFERENCED IN THE DETAIL DRAWINGS.



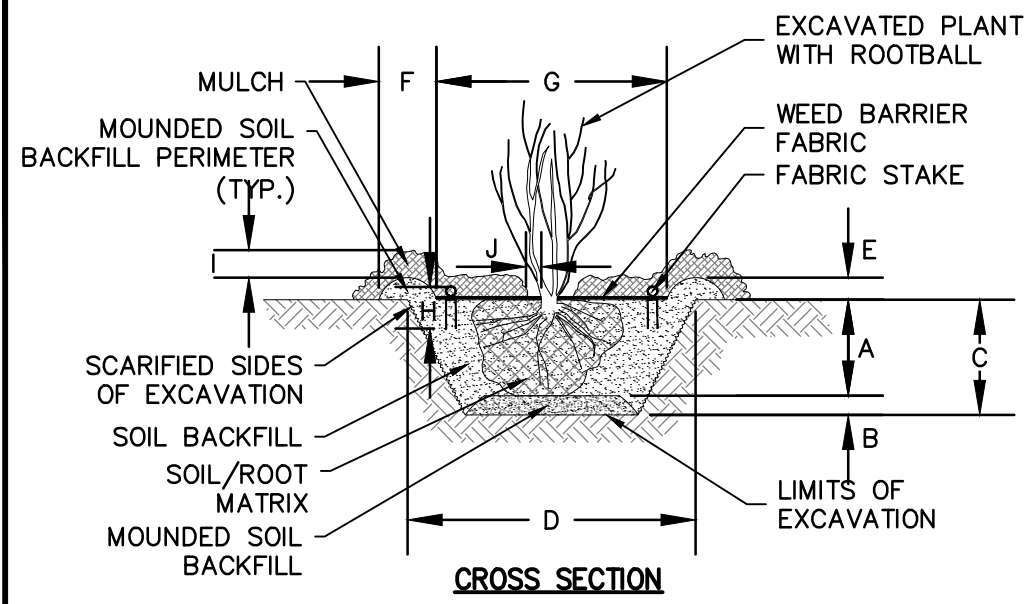
**LIVE STAKE EXAMPLE**

**LIVE STAKE PLANTINGS DETAIL**



B	ISSUED FOR PERMITTING		10/2020		
A	ISSUED FOR REVIEW	MJT	08/2020		
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SCALE	DWG. NO.	PAGE NO.			
NOTED	SSRP-1115.6-004	6/7			





DIMENSION <sup>1</sup>	NAME	TYPICAL UNIT	VALUE	DESCRIPTION
A	PLANTING DEPTH	INCHES	12-18	PLANTING DEPTH OF THE TRANSPLANT.
B	HEIGHT OF MOUNDED SOIL BACKFILL	INCHES	N/A	HEIGHT OF MOUNDED LOOSE SOIL PLACED INTO OVER-EXCAVATED PLANTING PIT.
C	DEPTH OF PLANTING PIT	INCHES	12-18	DEPTH OF THE PLANTING PIT; ACCOMMODATES DIMENSION OF SOIL AND EXCAVATED ROOTS AS WELL AS MOUNDED LOOSE SOIL AT BOTTOM OF PIT.
D	WIDTH OF PLANTING PIT	FEET	3-5	OVER-EXCAVATED WIDTH OF THE PLANTING PIT; ACCOMMODATES THE WIDTH OF THE EXCAVATED SOIL AND ROOTS.
E	HEIGHT OF MOUNDED SOIL PERIMETER	INCHES	0-2	HEIGHT OF SOIL BERM CONSTRUCTED ALONG THE PERIMETER OF THE PLANTING PIT; HELPS RETAIN WATER.
F	WIDTH OF MOUNDED SOIL PERIMETER	INCHES	0-6	WIDTH OF SOIL BERM CONSTRUCTED ALONG THE PERIMETER OF THE PLANTING PIT; HELPS RETAIN WATER.
G	WIDTH OF WEED BARRIER FABRIC (OPTIONAL)	INCHES	N/A	WIDTH OF FABRIC PLACED ON SURFACE TO CONTROL WEEDS WITHIN THE MOUNDED SOIL PERIMETER; TRANSPLANTS TYPICALLY HAVE GRASSES, LEAF MATTER, ETC. ATTACHED AND DO NOT REQUIRE WEED BARRIER FABRIC.
H	FABRIC STAKE LENGTH (OPTIONAL)	INCHES	N/A	LENGTH OF STAPLES/SPIKES USED TO SECURE WEED BARRIER FABRIC
I	THICKNESS OF MULCH (OPTIONAL)	INCHES	N/A	THICKNESS OF MULCH, IF NECESSARY. TRANSPLANTS TYPICALLY HAVE GRASSES, LEAF MATTER, ETC. ATTACHED AND DO NOT REQUIRE MULCH.
J	GAP BETWEEN MULCH AND PLANT STEM/TRUNK (OPTIONAL)	INCHES	N/A	ROOM BETWEEN PLANT STEM/TRUNK AND MULCH. TRANSPLANTS TYPICALLY HAVE GRASSES, LEAF MATTER, ETC. ATTACHED

NOTES:  
1. DIMENSION LABELS ARE REFERENCED IN THE DETAIL DRAWINGS.



TRANSPLANTS EXAMPLES

TRANSPLANTING DETAIL

DIMENSION <sup>2</sup>	NAME	TYPICAL UNIT	VALUE	DESCRIPTION
A	MATting STAKE SPACING	FEET, INCHES	N/A	SPACING BETWEEN EROSION CONTROL MATting STAKES USED TO FASTEN THE MATting TO THE SOIL
B	MATting OVERLAP	FEET, INCHES	N/A	AMOUNT OF EROSION CONTROL MATting OVERLAP IF MULTIPLE PIECES AND/OR ROLLS OF MATting ARE USED. OVERLAP VARIES DEPENDING ON THE LOCATION OF THE OVERLAP WITH RESPECT TO POSITION ON THE SLOPE, LOCATION OF THE MATting (EDGE OR END), AND PRODUCT SPECIFICATIONS.
C	MATting ANCHOR TRENCH DEPTH	FEET, INCHES	N/A	DEPTH OF TRENCH INTO WHICH EDGE OF EROSION CONTROL MATting IS ANCHORED AT THE TOP AND/OR TOE OF A SLOPE.
D	MATting ANCHOR TRENCH WIDTH	FEET, INCHES	N/A	WIDTH OF TRENCH INTO WHICH EDGE OF EROSION CONTROL MATting IS ANCHORED AT THE TOP AND/OR TOE OF A SLOPE.
E	TOP OF SLOPE ANCHOR TRENCH SETBACK	FEET, INCHES	N/A	TOP OF SLOPE ANCHOR TRENCH DISTANCE FROM THE TOP OF SLOPE. TOP OF SLOPE REFERS TO TOP OF SIDE SLOPE, BANK SLOPE, TERRACE SLOPE, BANKFULL, ETC.
F	MATting STAKE LENGTH	INCHES	N/A	LENGTH OF EROSION CONTROL MATting STAKES OR STAPLES USED TO FASTEN THE MATting TO THE SOIL

NOTES:  
1. DATA ARE FOR EROSION CONTROL MATting APPLIED TO STREAM BANK SLOPES.  
2. DIMENSION LABELS ARE REFERENCED IN THE DETAIL DRAWINGS.

EROSION CONTROL MATting DETAIL

① DIRECTION OF STREAM FLOW  
② DIRECTION DOWN THE BANK SLOPE

**MATting OVERLAP DETAIL**

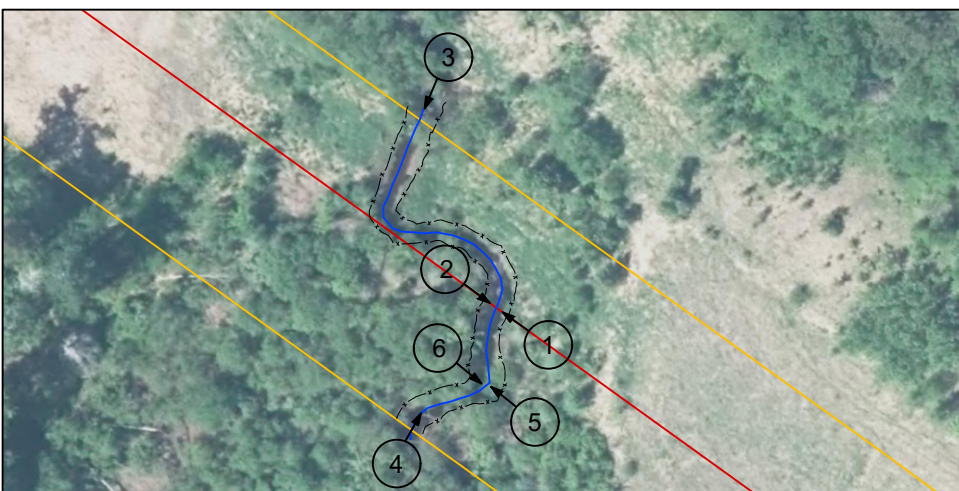
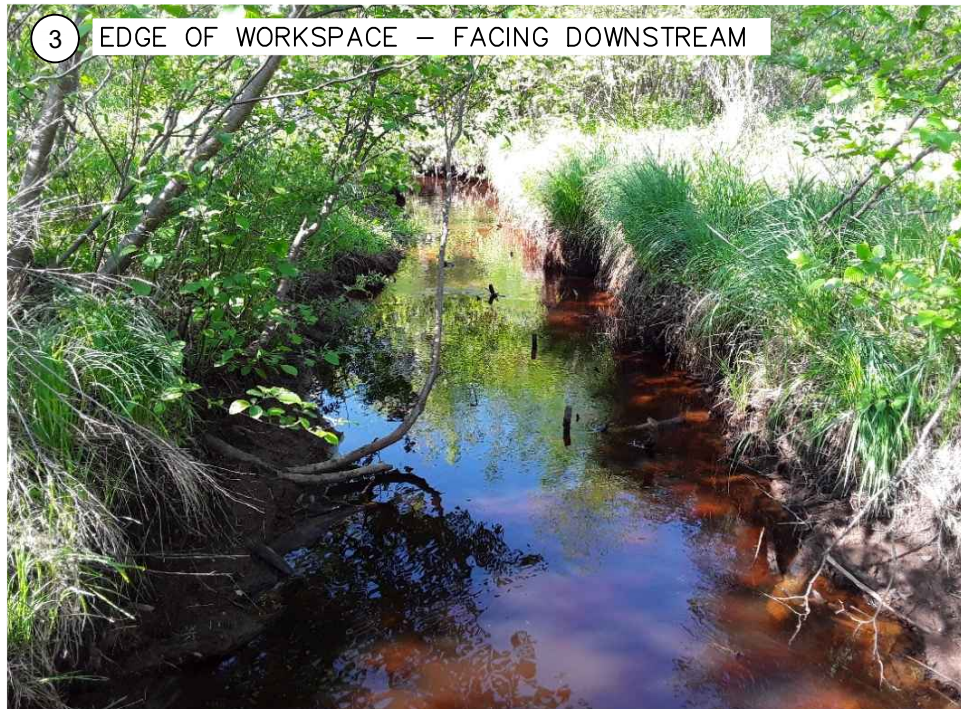
**MATting STAKE PATTERN DETAIL**

**MATting ANCHOR DETAIL**

B	ISSUED FOR PERMITTING		10/2020		
A	ISSUED FOR REVIEW	MJT	08/2020		
NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D	APP'D
ENBRIDGE LINE 3 REPLACEMENT PROJECT SITF-SPFCIFIC RFSTORATION PLAN UNNAMED STREAM - MP 1115.6 - MDNR ID 63A 63B SITE SPECIFIC DETAILS					
SCALE	DWG. NO.	PAGE NO.			
NOTED	SSRP-1115.6-004	7/7			







- NOTES:**
1. AIR PHOTOS ARE FROM 2018 ENBRIDGE AERIAL PHOTOGRAPHY.
  2. ADDITIONAL ON-THE GROUND PHOTOS MAY BE TAKEN PRIOR TO CONSTRUCTION AT MDNR REQUEST.
  3. PRE-CONSTRUCTION PHOTOS WILL BE USED TO AID IN RESTORATION.



B	ISSUED FOR PERMITTING	MJT	10/2020		
A	ISSUED FOR REVIEW	MJT	08/2020		
NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D	APP'D
ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE-SPECIFIC RESTORATION PLAN UNNAMED STREAM — MP 1115.6 — MDNR ID 63 PHOTO PAGE					
SCALE		DWG. NO. SSRP-1115.6-005		PAGE NO. 5/5	



GENERAL

1. THE SPECIFICATIONS WITHIN THIS SSRP MAY MODIFY OR REPLACE PROJECT–WIDE STANDARDS PRESENTED IN THE EPP. WHERE MATERIAL WITHIN THESE SSRPS EXCEEDS STANDARD CONSTRUCTION MEASURES IN THE EPP, THESE SSRPS SUPERSEDE THE EPP.
2. CONSTRUCTION AND RESTORATION OF WATERBODY CROSSINGS WILL FOLLOW THESE GENERAL STEPS:

A. SITE CLEARING

B. INSTALLATION OF TEMPORARY EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES (‘BMPS’)

C. BRIDGE INSTALLATION

D. EXCAVATION/BACKFILLING OF THE WATERBODY INCLUDING:

• SOD SAVING TOPSOIL SEGREGATION AT NON–WOODED SITES

• STREAMBED MATERIAL SEGREGATION

• PIPE INSTALLATION

• BACKFILL, INCLUDING IMPLEMENTATION OF CONSTRUCTION–RELATED RESTORATION METHODS (I.E., TOE WOOD)

E. REPLACEMENT OF STREAMBED MATERIAL AND TOPSOIL/SOD LAYER

F. RESTORATION OF STREAM BANKS TO PRE–CONSTRUCTION CONTOURS

G. IF FINAL GRADING NOT POSSIBLE AT THE TIME, TEMPORARY STABILIZATION AND REPLACEMENT/REINFORCEMENT OF TEMPORARY BMPS

H. AFTER FINAL GRADING, PERMANENT SEEDING AND/OR WOODY VEGETATION RESTORATION, STABILIZATION AND REPLACEMENT/REINFORCEMENT OF TEMPORARY BMPS

I. BRIDGE REMOVAL DURING FINAL RESTORATION AFTER STABILIZATION AND PERMANENT SEEDING

J. POST–CONSTRUCTION MONITORING
- CROSSING METHODS
1. ALL WATERBODY AND WETLAND CROSSINGS WILL BE CONDUCTED IN COMPLIANCE WITH SECTION 2.0 AND SECTION 3.0 OF THE ENVIRONMENTAL PROTECTION PLAN (‘EPP’), RESPECTIVELY. SECTION 2.0 AND 3.0 OF THE WINTER CONSTRUCTION PLAN PRESENTS MODIFICATIONS FOR WATERBODY AND WETLAND CONSTRUCTION METHODS, RESPECTIVELY, IN WINTER CONDITIONS.

2. ENBRIDGE’S SUMMARY OF CONSTRUCTION METHODS AND PROCEDURES (THE ‘PROCEDURES,’APPENDIX A OF THE EPP) OUTLINES THE VARIOUS CONSTRUCTION METHODS THAT ENBRIDGE MAY UTILIZE TO CONSTRUCT THROUGH WATERBODIES AND WETLANDS/BASINS AS PRESENTED ON THESE SITE–SPECIFIC RESTORATION PLANS (‘SSRPS’).

A. DRY CROSSING (ISOLATED) METHODS (INCLUDING THE DRY CROSSING AND MODIFIED DRY CROSSING METHOD) ARE DESCRIBED SECTIONS 4.3 OF THE PROCEDURES, AND IN SECTIONS 2.5.2 AND 2.5.3 AND FIGURES 23 AND 24 OF THE EPP.

B. THE BORE METHOD (NON–PRESSURIZED) IS DESCRIBED IN SECTION 3.5 OF THE PROCEDURES, AND SECTION 4.0 OF THE EPP.

C. THE MODIFIED UPLAND CONSTRUCTION (WETLAND) METHOD IS DESCRIBED IN SECTION 3.3 OF THE PROCEDURES, AND SECTION 3.0 AND FIGURES 30 TO 34 OF THE EPP.

D. ALTHOUGH NOT PROPOSED AS A PRIMARY METHOD AT THESE SSRP WATERBODIES, THE OPEN CUT (NON–ISOLATED) WATERBODY CROSSING METHOD IS DESCRIBED IN SECTION 4.1 OF THE PROCEDURES, AND SECTION 2.5.1 AND FIGURE 24 OF THE EPP.

E. ALTHOUGH NOT PROPOSED AS A PRIMARY METHOD AT THESE SSRP WATERBODIES, THE PUSH–PULL METHOD IS DESCRIBED IN SECTION 3.4 OF THE PROCEDURES, AND SECTION 3.7.1 AND FIGURES 35 AND 36 OF THE EPP.

CLEARING/VEGETATION REMOVAL

1. STUMPS WITHIN THE TRENCH LINE WILL BE COMPLETELY REMOVED, GROUND, AND/OR HAULED OFF–SITE TO AN APPROVED LOCATION. TREE STUMPS OUTSIDE THE TRENCH LINE WILL BE GROUND BELOW NORMAL GROUND SURFACE TO FACILITATE A SAFE WORK AREA AND TO ALLOW TOPSOIL REMOVAL, IF NECESSARY. IN SOME CIRCUMSTANCES, TREE STUMPS OUTSIDE THE TRENCH LINE MAY BE COMPLETELY REMOVED TO ALLOW FOR A SAFE WORK AREA AND HAULED OFF–SITE TO AN APPROVED LOCATION AS OUTLINED IN SECTION 1.8.3 OF THE EPP.

2. CLEARING WILL BE CONDUCTED IN WATERBODIES AND WETLANDS AS OUTLINED IN SECTION 2.2 AND 3.2 OF THE EPP, RESPECTIVELY. CHIPS, MULCH, OR MECHANICALLY CUT WOODY DEBRIS SHALL NOT BE STOCKPILED IN A WETLAND. HYDRO–AX DEBRIS, OR SIMILAR CAN BE LEFT IN THE WETLAND IF SPREAD EVENLY IN THE CONSTRUCTION WORKSPACE TO A DEPTH THAT WILL ALLOW FOR NORMAL REVEGETATION, AS DETERMINED BY THE EI. CHIPPING IS NOT ALLOWED ON PUBLIC LANDS. ON PUBLIC LANDS, MULCH AND MECHANICALLY CUT WOODY DEBRIS MUST BE UNIFORMLY BROADCAST TO LESS THAN 2–INCH THICKNESS AND IN A MANNER THAT MAINTAINS VISIBLE GROUND.

3. ENBRIDGE WILL PROPERLY INSTALL AND MAINTAIN REDUNDANT SEDIMENT CONTROL MEASURES IMMEDIATELY AFTER CLEARING AND PRIOR TO INITIAL GROUND DISTURBANCE AT SURFACE WATERS LOCATED WITHIN 50 FEET OF THE PROJECT AND WHERE STORMWATER FLOWS TO THE SURFACE WATER (REFER TO THE ENVIRONMENTAL PLAN SHEETS IN THE SWPPP), AND WITHIN 100 FEET OF SPECIAL AND IMPAIRED WATERS, INCLUDING TROUT STREAMS.

4. ON PUBLIC LANDS AND WHEREVER PRACTICABLE AT WATERBODY CROSSINGS, ENBRIDGE WILL USE WILDLIFE–FRIENDLY EROSION AND SEDIMENT CONTROL BMPS THAT CONTAIN BIODEGRADABLE NETTING (CATEGORY 3N OR 4N NATURAL FIBER) AND WILL AVOID THE USE OF PLASTIC MESH (SECTIONS 1.17.1 AND 2.6.1 OF THE EPP).

TEMPORARY STABILIZATION

1. ON PORTIONS OF THE PROJECT WHERE WORK WILL BE OCCURRING DURING APPLICABLE ‘WORK IN WATER RESTRICTIONS’FOR PUBLIC WATERS (REFER TO SECTION 2.1), ALL EXPOSED SOIL AREAS WITHIN 200 FEET OF THE WATER’S EDGE, AND THAT DRAIN TO THAT WATER, WILL BE STABILIZED WITHIN 24 HOURS DURING THE RESTRICTION PERIOD. STABILIZATION OF ALL EXPOSED SOILS WITHIN 200 FEET OF THE PUBLIC WATER’S EDGE, AND THAT DRAIN TO THAT WATER, WILL BE INITIATED IMMEDIATELY AND COMPLETED WITHIN 7 CALENDAR DAYS WHENEVER CONSTRUCTION ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED ON ANY PORTION OF THE SITE OUTSIDE OF THE RESTRICTION PERIOD. THESE AREAS WILL BE IDENTIFIED ON THE ENVIRONMENTAL PLAN SHEETS ACCOMPANYING THE SWPPP.

2. HYDRO–MULCH AND LIQUID TACKIFIER CAN BE USED IN PLACE OF CERTIFIED WEED–FREE STRAW OR HAY MULCH WITH PRIOR APPROVAL FROM ENBRIDGE. ALL HYDROMULCH AND LIQUID TACKIFIER PRODUCTS USED WILL BE ON THE APPLICABLE STATE DOT PRODUCT LIST. HYDRO–MULCH AND LIQUID TACKIFIER PRODUCTS CONTAINING PLASTIC/POLYPROPYLENE FIBER ADDITIVES AND MALACHITE GREEN (COLORANT) WILL NOT BE UTILIZED ON THIS PROJECT. APPLICATION RATES WILL BE AT THE MANUFACTURER’S RECOMMENDED RATE. ENBRIDGE WILL AVOID THE USE OF HYDROMULCH ON PUBLIC LANDS; HOWEVER, ENBRIDGE MAY USE HYDROMULCH ON STEEP SLOPES TO PREVENT EROSION UNTIL PERMANENT COVER HAS BEEN ESTABLISHED AS OUTLINED IN SECTION 1.8.3 OF THE EPP.

RESTORATION AND STABILIZATION

1. ENBRIDGE WILL RESTORE THE STREAM BANKS AS NEAR AS PRACTICABLE TO PRE–CONSTRUCTION CONDITIONS UNLESS THAT SLOPE IS DETERMINED TO BE UNSTABLE. IF THE SLOPE IS CONSIDERED UNSTABLE, ENBRIDGE WILL RESHAPE THE BANKS TO PREVENT SLUMPING. FOR PUBLIC WATERS, ENBRIDGE WILL RETURN THE BANK TO PRE–CONSTRUCTION CONTOURS, UNLESS OTHERWISE DIRECTED BY THE SITE–SPECIFIC RESTORATION PLAN. IF ENBRIDGE CANNOT RESTORE TO PRE–CONSTRUCTION CONTOURS AT A PUBLIC WATER, ENBRIDGE WILL CONSULT WITH THE MDNR BEFORE PROCEEDING FURTHER AS OUTLINED IN SECTION 2.6 OF THE EPP.

2. UNSTABLE SOILS AND/OR SITE–SPECIFIC FACTORS SUCH AS STREAM VELOCITY AND FLOW DIRECTION MAY REQUIRE ADDITIONAL RESTORATION EFFORTS, SUCH AS INSTALLATION OF WOODY VEGETATION, GEOTEXTILE FABRIC, OR TREE, LOG, ROOTWAD, OR BOULDER REVETMENTS TO STABILIZE DISTURBED STREAM BANKS (SEE FIGURE 29) AS OUTLINED IN SECTION 2.6.2 OF THE EPP. ENBRIDGE WILL WORK WITH THE MDNR TO ENSURE ALL WORK/ADJUSTMENTS ARE APPROVED AND ARE CONDUCTED WITHIN APPLICABLE TIMING RESTRICTIONS.

3. IN UPLAND AND WETLAND AREAS, CLEANUP AND ROUGH GRADING WILL OCCUR AS OUTLINED IN SECTIONS 1.16 AND 3.9 OF THE EPP. ENBRIDGE WILL BACKFILL THE TRENCH TO AN ELEVATION SIMILAR TO THE ADJACENT AREAS OUTSIDE THE TRENCH LINE AND WILL ADD A SLIGHT CROWN OF APPROXIMATELY 3 TO 6 INCHES (DEPENDING ON SOIL TYPE) OVER THE BACKFILLED TRENCH TO ALLOW FOR SUBSIDENCE. GENERALLY, EXCESS SUBSOIL DISPLACED BY THE PIPE INSTALLATION WILL BE SPREAD ACROSS THE PORTION OF THE CONSTRUCTION WORKSPACE WHERE TOPSOIL REMOVAL HAS OCCURRED. ANY REMAINING EXCESS SUBSOIL WILL BE REMOVED AND DISPOSED OF AT AN APPROVED OFF–SITE LOCATION AS NEEDED TO ENSURE CONTOURS ARE RESTORED TO AS NEAR AS PRACTICABLE TO PRE–CONSTRUCTION CONDITIONS.

4. REVEGETATION ACTIVITIES WILL OCCUR AS OUTLINED IN SECTION 7.0 OF THE EPP. SEED MIXES AT PUBLIC WATERS WILL BE SELECTED AND APPLIED AS INDICATED IN THE PLANTING PLAN, WHICH IS APPENDIX A OF THE POST–CONSTRUCTION VEGETATION MANAGEMENT PLAN FOR PUBLIC LANDS AND WATERS (‘VMP’). SEED MIXES RELATIVE TO THESE SSRP CROSSINGS ARE CODED AS FOLLOWS:

A	EMERGENT (34–181)	G	DRY PRAIRIE GENERAL (35–221)
B	RIPARIAN NE (34–361)	H	MESIC PRAIRIE GENERAL (35–241)
C	RIPARIAN S&W (34–261)	I	MESIC PRAIRIE NW (35–441)
D	WET MEADOW NE (34–371)	J	DRY PRAIRIE NORTHWEST (35–421)
E	WET MEADOW S&W (34–271)	K	WOODLAND EDGE NE (36–311)
F	WETLAND REHABILITATION (34–171)	L	NATURAL REVEGETATION

5. ENBRIDGE WILL NOT SEED STANDING WATER OR WOODED (PSS AND PFO) WETLAND COMMUNITIES. NATURAL REVEGETATION WILL TAKE PLACE FROM EXISTING PLANT MATERIAL AND ROOT STOCK IN THESE COMMUNITIES.

6. ALL MATERIALS USED FOR CONSTRUCTION OF THE PROJECT MUST BE REMOVED FROM THE SITE.

7. ENBRIDGE WILL CONDUCT POST–CONSTRUCTION MONITORING IN ACCORDANCE WITH THE POST–CONSTRUCTION MONITORING PLAN FOR WETLANDS AND WATERBODIES, AND IN ACCORDANCE WITH THE VMP FOR THE UPLAND PORTIONS OF THE PROJECT ON PUBLIC LANDS.

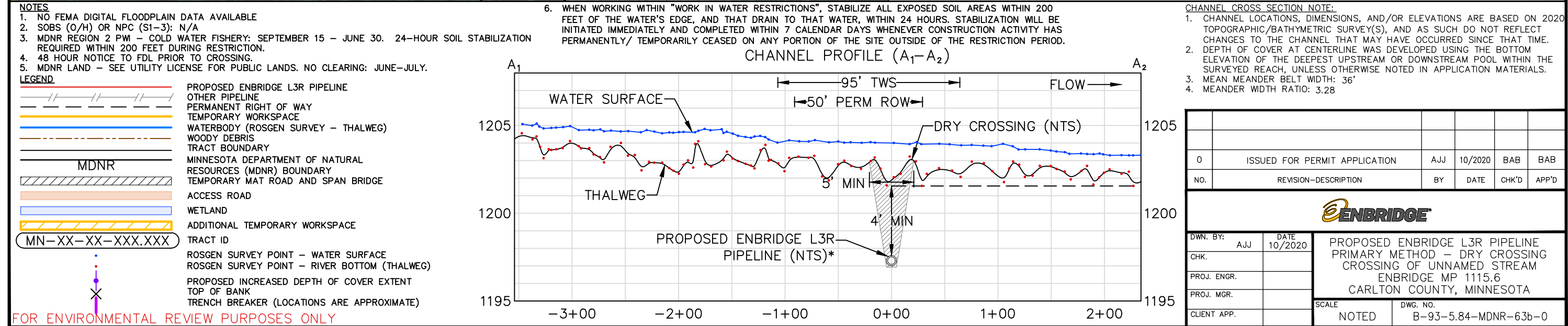
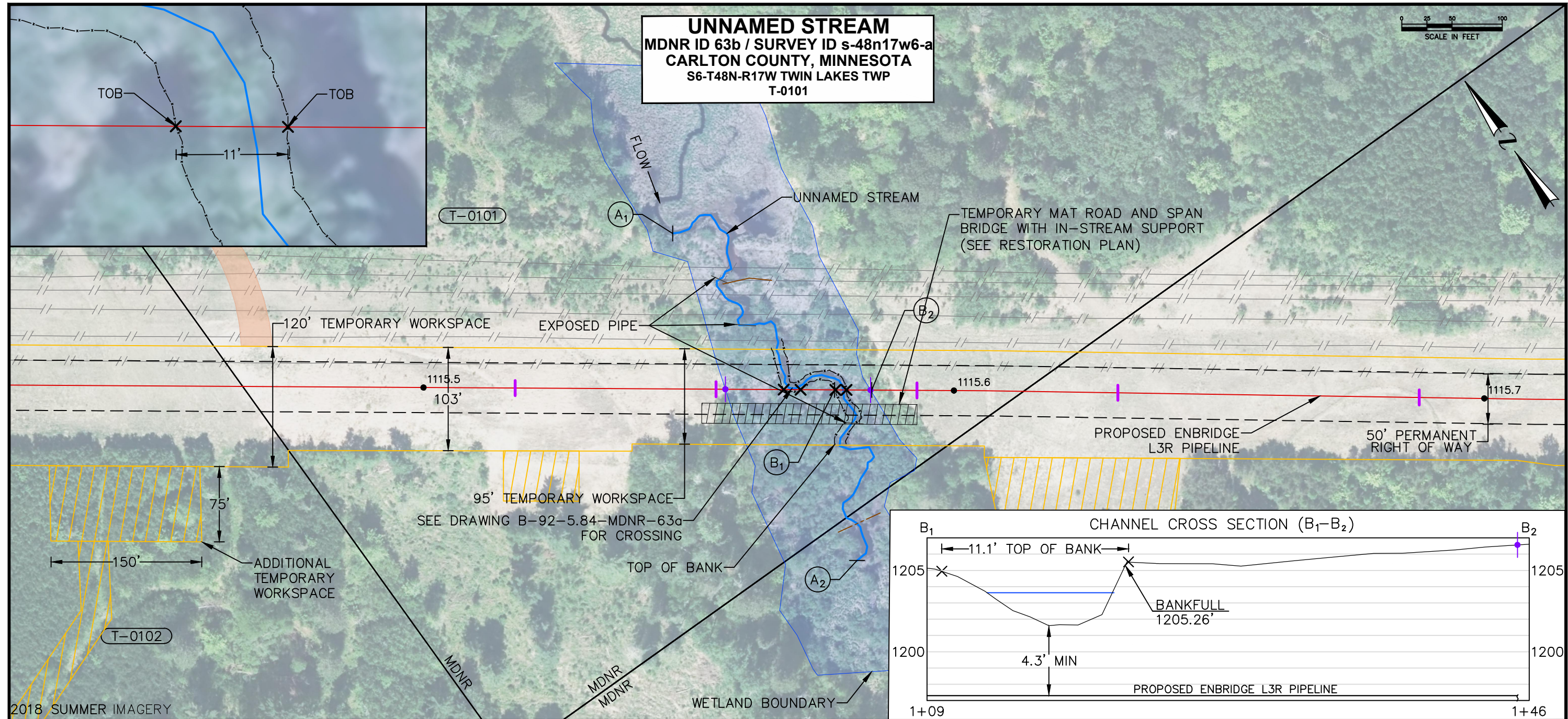
B	ISSUED FOR PERMITTING	MJT	10/2020		
NO.	REVISION–DESCRIPTION	BY	DATE	CHK'D	APP'D
ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE–SPECIFIC RESTORATION PLAN					
CONSTRUCTION NOTES					
SCALE		DWG. NO. SSRP–NOTES		PAGE NO.	

PLOTTED SIZE: ANSI FULL BLEED B (17x11)

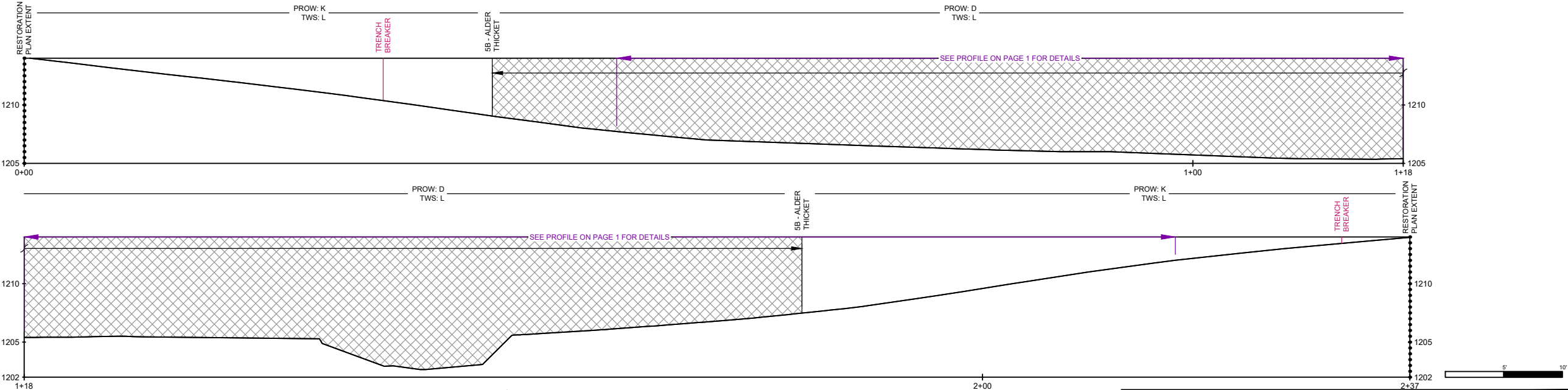
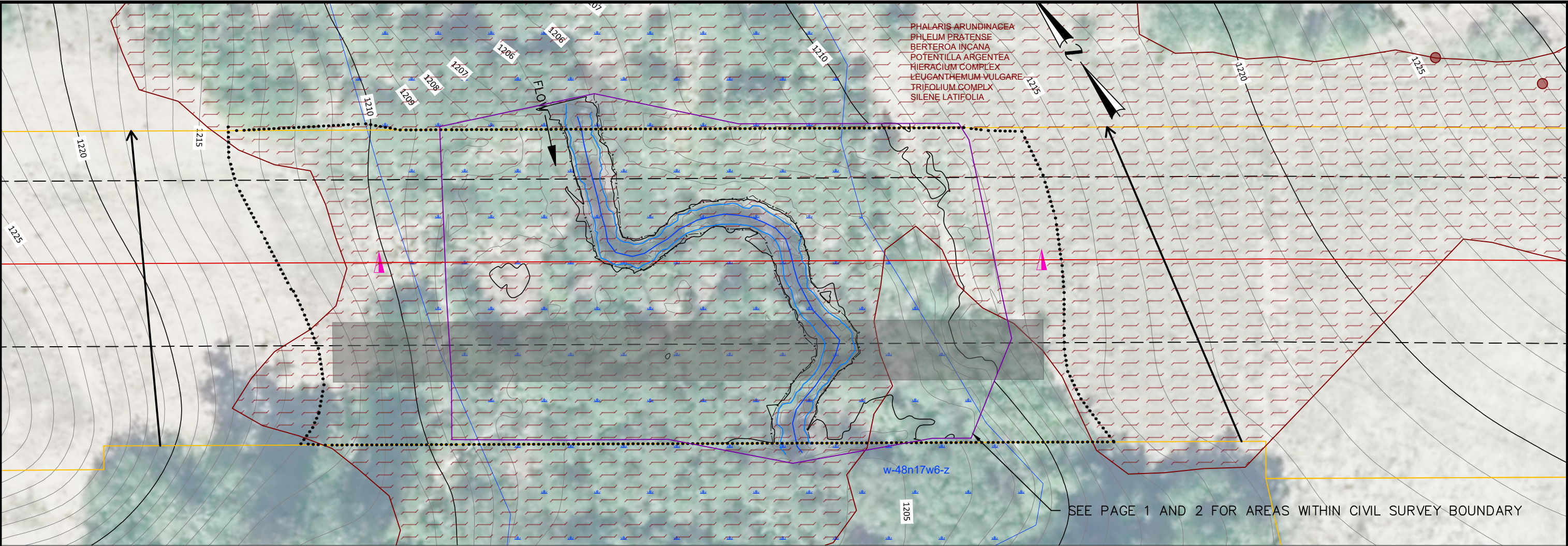


**MDNR ID No. 63b: MP 1115.6; Unnamed Stream (S-002-009-001-002)**









BWSR SEED MIX | D: WET MEADOW NE (34-371); K: WOODLAND EDGE NE (36-311); L: NATURAL REVEGETATION

SOBS (O/H) or NPC (S1-3) | NO (MODERATE); N/A

- ELEVATIONS OUTSIDE OF THE AREA WITHIN CIVIL SURVEY BOUNDARY ARE DERIVED FROM LIDAR. ENBRIDGE WILL RESTORE THE AREAS ADJACENT TO THE PUBLIC WATER WITHIN THE MDNR EXPANDED RESTORATION BOUNDARY TO PRE-CONSTRUCTION CONDITIONS.
- VOLUNTARY TROUT STREAM RESTRICTION: SEPTEMBER 15 - JUNE 30. 24-HOUR SOIL STABILIZATION REQUIRED WITHIN 200 FEET DURING RESTRICTION.
- AIR PHOTOS ARE FROM 2018 ENBRIDGE AERIAL PHOTOGRAPHY.
- ADDITIONAL ON-THE GROUND PHOTOS MAY BE TAKEN PRIOR TO CONSTRUCTION AT MDNR REQUEST.
- PRE-CONSTRUCTION PHOTOS WILL BE USED TO AID IN RESTORATION.
- SEE GENERAL NOTES PAGE FOR ADDITIONAL DETAIL.
- SEE THE PLANTING PLAN FOR ADDITIONAL DETAIL REGARDING SEEDING PRACTICES AND SEED MIXES AT PUBLIC WATER CROSSINGS.
- ON PUBLIC LANDS AND WHEREVER PRACTICABLE AT WATERBODY CROSSINGS, ENBRIDGE WILL USE WILDLIFE-FRIENDLY EROSION AND SEDIMENT CONTROL BMPS THAT CONTAIN BIODEGRADABLE NETTING (CATEGORY 3N OR 4N NATURAL FIBER) AND WILL AVOID THE USE OF PLASTIC MESH (SECTIONS 1.17.1 AND 2.6.1 OF THE EPP).
- WHEN WORKING WITHIN "WORK IN WATER RESTRICTIONS", STABILIZE ALL EXPOSED SOIL AREAS WITHIN 200 FEET OF THE WATER'S EDGE, AND THAT DRAIN TO THAT WATER, WITHIN 24 HOURS. STABILIZATION WILL BE INITIATED IMMEDIATELY AND COMPLETED WITHIN 7 CALENDAR DAYS WHENEVER CONSTRUCTION ACTIVITY HAS PERMANENTLY/ TEMPORARILY CEASED ON ANY PORTION OF THE SITE OUTSIDE OF THE RESTRICTION PERIOD.

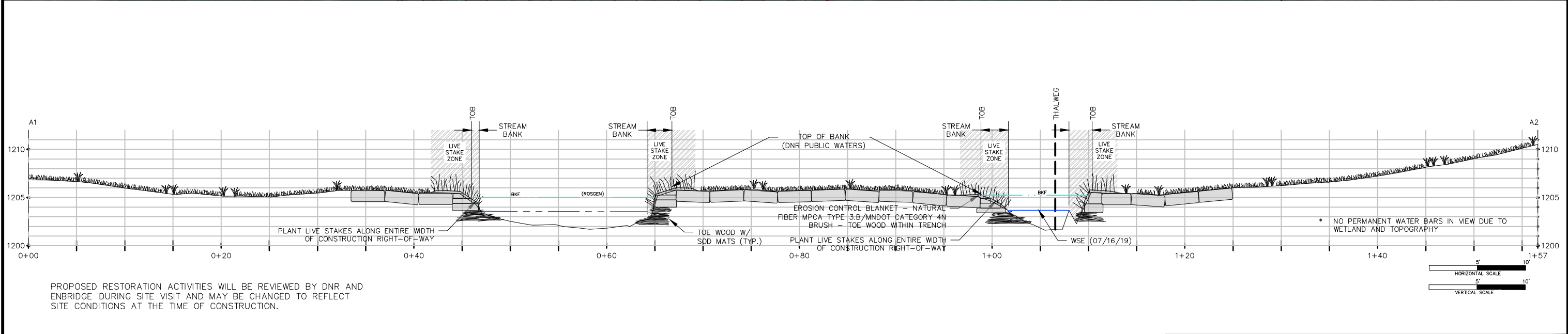
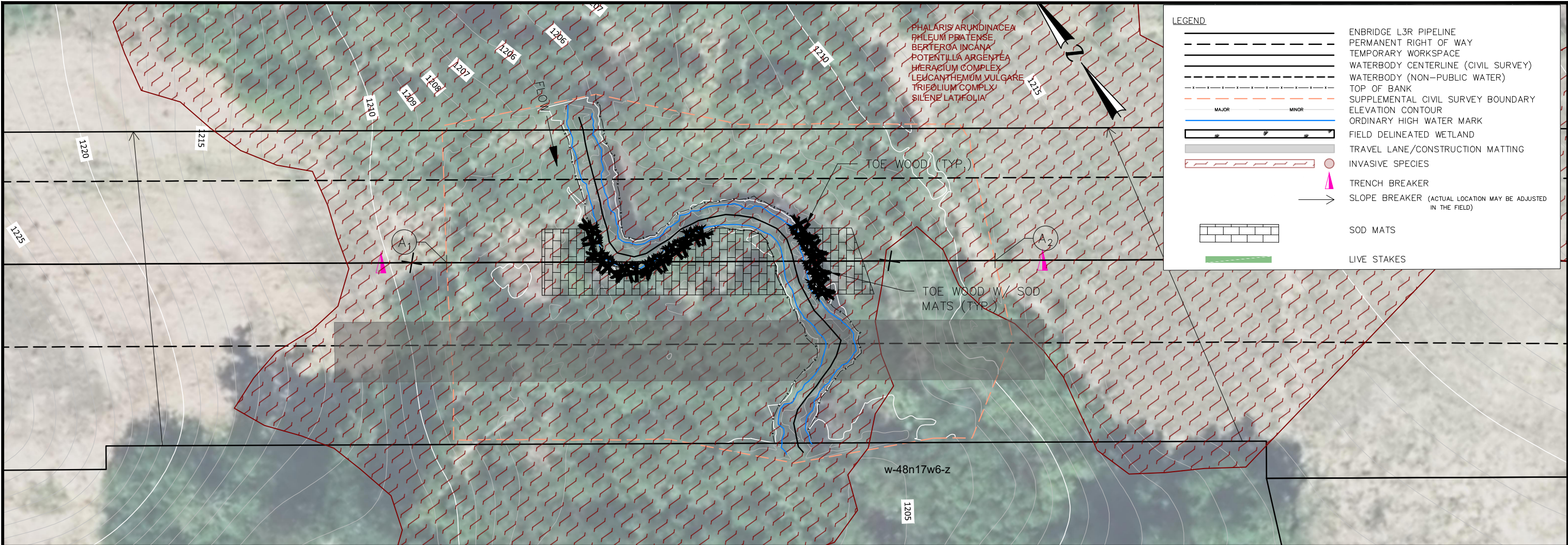
**LEGEND**

- ENBRIDGE L3R PIPELINE
- PERMANENT RIGHT OF WAY
- TEMPORARY WORKSPACE
- WATERBODY CENTERLINE (CIVIL SURVEY)
- WATERBODY (NON-PUBLIC WATER)
- PUBLIC WATER CIVIL SURVEY BOUNDARY
- MDNR EXPANDED RESTORATION BOUNDARY
- TOP OF BANK
- ELEVATION CONTOUR
- ORDINARY HIGH WATER MARK
- FIELD DELINEATED WETLAND
- TRAVEL LANE/CONSTRUCTION MATTING

- INVASIVE SPECIES
- TRENCH BREAKER
- PERMANENT SLOPE BREAKER (ACTUAL LOCATION MAY BE ADJUSTED IN THE FIELD)
- 1 - SHALLOW, OPEN WATER
- 2B - SHALLOW MARSH
- 3A - SEDGE MEADOW
- 3B - FRESH (WET) MEADOW
- 5A - SHRUB-CARR
- 5B - ALDER THICKET
- 6A - HARDWOOD SWAMP
- 6B - CONIFEROUS SWAMP

B	ISSUED FOR PERMITTING	MJT	10/2020		
A	ISSUED FOR REVIEW	MJT	09/2020		
NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D	APP'D
ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE-SPECIFIC RESTORATION PLAN UNNAMED STREAM - MP 1115.6 - MDNR ID 63A/63B RE-VEGETATION PLAN: EXPANDED EXTENT					
SCALE	DWG. NO.	PAGE NO.			
NOTED	SSRP-1115.6-001A	1A/5			





FEATURE ID	s-48n17w6-a; IFC ID: S-308.0
CROSSING TYPE	DRY CROSSING
PROPOSED RESTORATION (SEE DETAILS FOR LIVE STAKING, TRANSPLANTS, AND SHRUB SPECIES IF APPLICABLE)	EC BLANKET - NATURAL FIBER MPCA TYPE 3.B/MNDOT CATEGORY 4N; BRUSH - TOE WOOD
WITHIN OR ADJACENT WETLAND	ALDER THICKET
BWSR SEED MIX	WET MEADOW NE (34-371)
DOMINANT WETLAND VEGETATION	1. CALAMAGROSTIS CANADENSIS 3. ALNUS INCANA 2. PHALARIS ARUNDINACEA 4. SALIX PETIOLARIS
SOBS (O/H) or NPC (S1-3)	NO (MODERATE); N/A

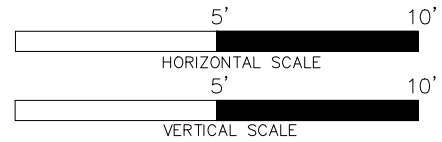
<strong>NOTES</strong>	
1. CONSTRUCTION TIMING RESTRICTIONS	
1.1. VOLUNTARY TROUT STREAM RESTRICTION: SEPTEMBER 15 - JUNE 30.	
1.2. WHEN WORK OCCURS WITHIN 'WORK IN WATER RESTRICTIONS', ALL EXPOSED SOIL AREAS WITHIN 200 FEET OF THE WATER'S EDGE, AND THAT DRAIN TO THAT WATER, WILL BE STABILIZED WITHIN 24 HOURS DURING THE RESTRICTION PERIOD. STABILIZATION OF ALL EXPOSED SOILS WITHIN 200 FEET OF THE PUBLIC WATER'S EDGE, AND THAT DRAIN TO THAT WATER, WILL BE INITIATED IMMEDIATELY AND COMPLETED WITHIN 7 CALENDAR DAYS WHENEVER CONSTRUCTION ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED ON ANY PORTION OF THE SITE OUTSIDE OF THE RESTRICTION PERIOD	
2. WORK SHALL BE CONDUCTED IN ACCORDANCE WITH APPLICABLE STANDARDS IN ENBRIDGE'S EPP AND VMP FOR PUBLIC LANDS AND WATERS. THE SPECIFICATIONS WITHIN THIS SSRP MAY MODIFY OR REPLACE THESE STANDARDS.	
3. SEE GENERAL NOTES PAGE FOR ADDITIONAL DETAIL.	
4. INFORMATION REGARDING SEEDING SPECIFICATIONS, SEED BED PREPARATION TECHNIQUES, ETC. ARE DESCRIBED IN THE PLANTING PLAN CONTAINED WITHIN THE VMP.	
5. TRENCH BREAKER LOCATION IS APPROXIMATE PENDING FIELD VERIFICATION (EPP SECTION 1.13)	
6. SITE WITHIN PEAT BASIN - SOURCE: SSURGO	

B	ISSUED FOR PERMITTING		10/2020		
A	ISSUED FOR REVIEW	MJT	08/2020		
NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D	APP'D
ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE-SPECIFIC RESTORATION PLAN UNNAMED STREAM - MP 1115.6 - MDNR ID 63A/63B RE-VEGETATION PLAN					
SCALE NOTED		DWG. NO. SSRP-1115.6-001		PAGE NO. 1/ 7	



BANK RESTORATION (BRIDGE)

\*APPROXIMATE WSE PROVIDED FOR CONSTRUCTION RELATED ACTIVITIES.

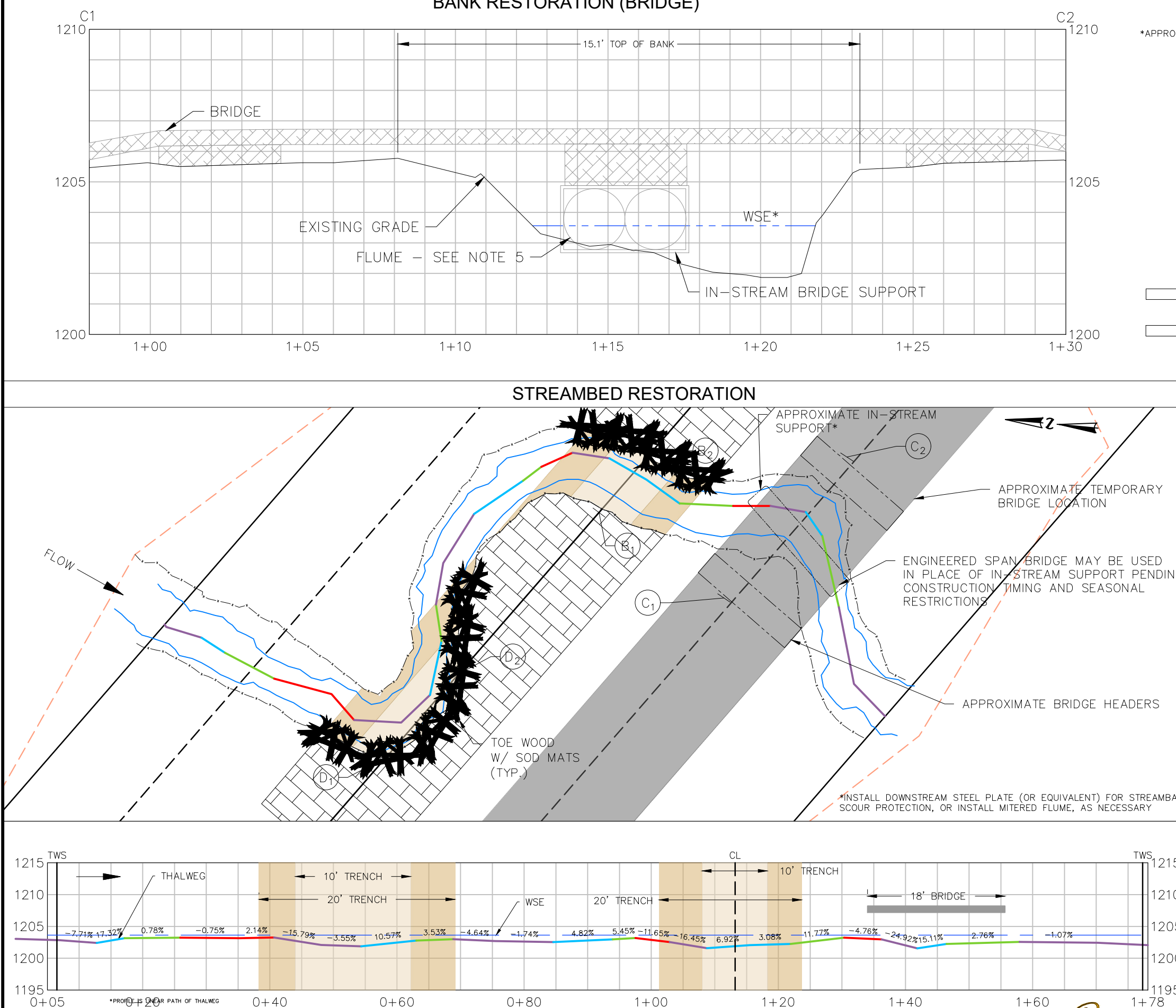


STREAMBED RESTORATION

- NOTES
1. TRANSITIONS BETWEEN EXISTING CHANNEL FEATURES (BED, BANK, FLOODPLAIN) AND PROPOSED RESTORED TRENCH CROSSING WILL BE SMOOTH AND EVENLY GRADED WITHOUT ABRUPT OR PROTRUDING OBSTRUCTIONS.
  2. MINIMIZE DISTURBANCE OF BED MATERIALS AND FEATURES DURING CONSTRUCTION OF THE TRENCH AND INSTALLATION AND REMOVAL OF IN-STREAM SUPPORT.
  3. BED AND/OR BANK MATERIALS TEMPORARILY ADJUSTED OR REMOVED DURING CONSTRUCTION SHALL BE PLACED IN THE APPROXIMATE ORIGINAL LOCATION DURING RESTORATION. MATERIALS SHALL BE FIELD ADJUSTED DURING PLACEMENT BASE ON THE OBSERVED FLOW PATH AT THE TIME OF CONSTRUCTION.
  4. ALIGNMENT OF IN-STREAM SUPPORT SHALL BE FIELD ADJUSTED BASED ON FLOW PATH TO PROTECT CHANNEL BANKS.
  5. SEE RESTORATION SHEET FOR B1-B2 CROSS SECTION.

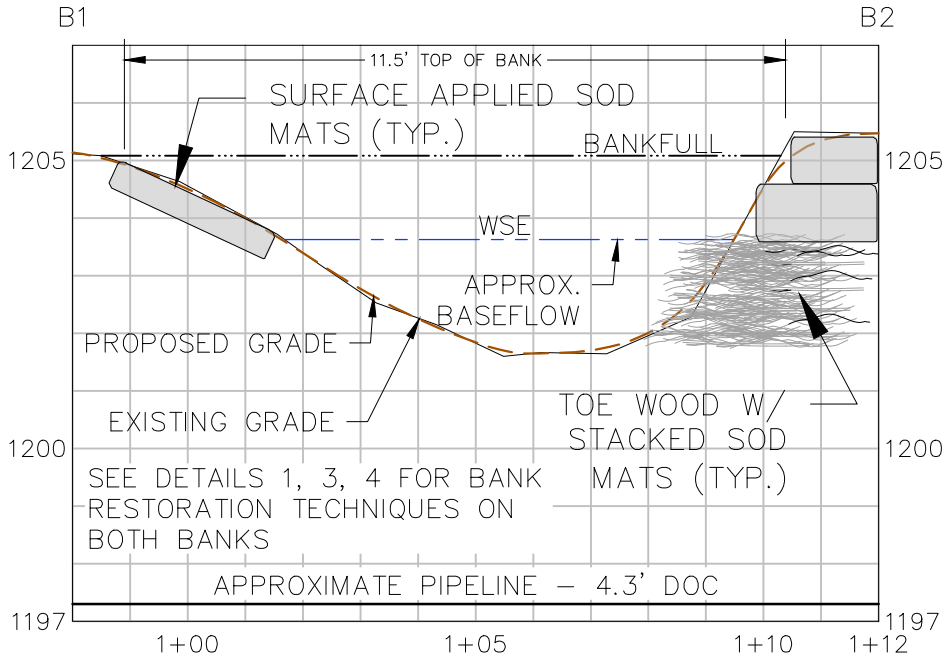
- LEGEND
- ENBRIDGE L3R PIPELINE
  - PERMANENT RIGHT OF WAY
  - TEMPORARY WORKSPACE
  - WATERBODY - RIFFLE (ROSGEN SURVEY)
  - WATERBODY - POOL (ROSGEN SURVEY)
  - WATERBODY - RUN (ROSGEN SURVEY)
  - WATERBODY - GLIDE (ROSGEN SURVEY)
  - CONTOUR (1' INTERVAL)
  - TOP OF BANK
  - ORDINARY HIGH WATER MARK
  - FIELD DELINEATED WETLAND
  - TRAVEL LANE/CONSTRUCTION MATTING
  - TRENCH - 10'
  - TRENCH - 20'

B	ISSUED FOR PERMITTING		10/2020		
A	ISSUED FOR REVIEW	MJT	08/2020		
NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D	APP'D
ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE-SPECIFIC RESTORATION PLAN UNNAMED STREAM - MP 1115.6 - MDNR ID 63 STABILIZATION PLAN					
SCALE	DWG. NO.	SSRP-1115.6-002		PAGE NO. 2/7	

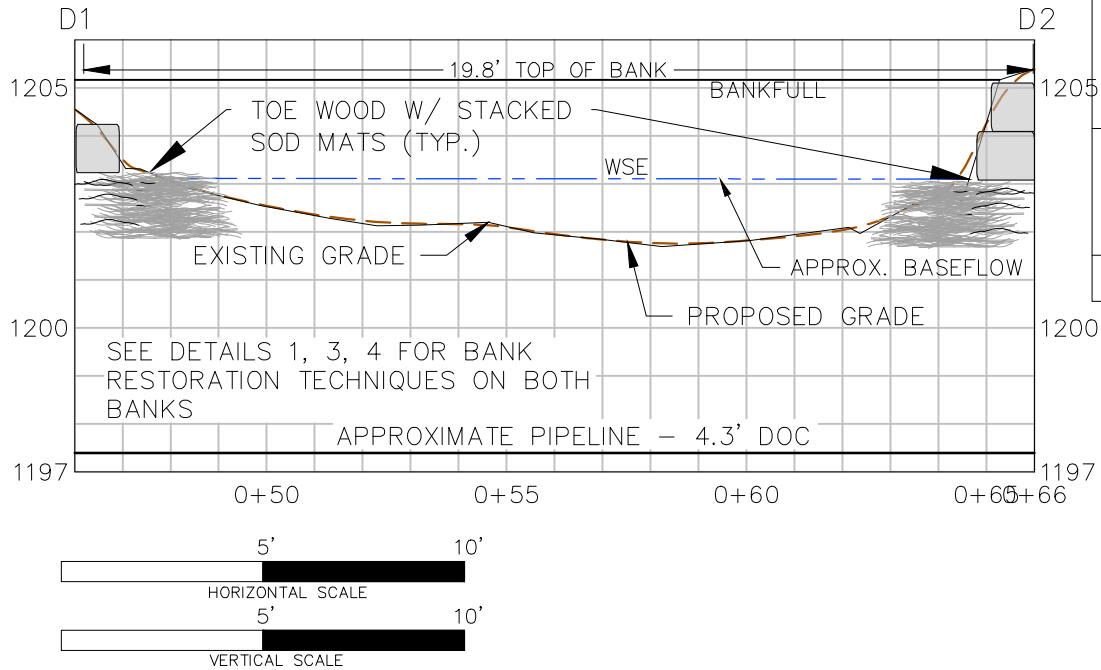




BANK RESTORATION (CENTERLINE)



BANK RESTORATION (CENTERLINE - SECOND CROSSING)



	COMMON NAME	SCIENTIFIC NAME
LIVE STAKE SPECIES	ELDERBERRY	SAMBUCUS CANADENSIS
	HIGH BUSH CRANBERRY	VIBURNUM OPOLUS (TRILOBUM)
	RED-OSIER DOGWOOD	CORNUS STOLONIFERA
	SILKY DOGWOOD	CORNUS AMOMUM
TRANSPLANTS	SPECKELD ALDER	ALNUS INCANA
	WILLOW	SALIX SPP.
	DOGWOOD	CORNUS SPP.
SHRUB	NONE	NONE

- PRELIMINARY SPECIES. PRIOR TO RESTORATION ACTIVITIES, ALL SPECIES WILL BE REQUIRED TO BE VERIFIED AS NATIVE AND FOUND WITHIN THE COUNTY WHERE PLANTED ON MNTAXA.
- LIVE STAKE SPECIES SELECTION: USE AT LEAST THREE (3) SPECIES WITH NO MORE THAN 60% OF ANY ONE (1) SPECIES; ALTERNATIVE SPECIES MAY BE SELECTED BASED ON SITE CONDITIONS AND AVAILABILITY. ALTERNATIVE SPECIES SHOULD BE REVIEWED AGAINST USDA DATA BASE FOR MN NATIVE SPECIES.
- (WHERE APPLICABLE) TRANSPLANTS AND/OR CONTAINER SHRUBS MAY BE SUBSTITUTED FOR LIVE STAKES BASED ON SITE SPECIFIC CONDITIONS.
  - CONTAINER PLANTED SHRUBS ARE RECOMMENDED TO BE 18" – 24" IN SIZE.
  - CONTAINER PLANTED SHRUBS SPACING: 1 SHRUB PER 3 LINEAR FEET OF BANK, ADDITIONAL ROWS SPACED 3 FEET APART, AND 3–5 SHRUBS OF THE SAME SPECIES.
- (WHERE APPLICABLE) TRANSPLANTS SHOULD BE EXCAVATED WITH A MINIMUM OF 12" SOIL, DIAMETER EQUAL TO PLANT DRIP LINE, AND LOOSE UNBOUND BALL.
- LIVE STAKE SPACING (WHERE APPLICABLE): STAGGER 1 STAKE PER 3 LINEAR FEET OF STREAM BANK IN 2 – 3 ROWS SPACED 1 FOOT APART. PLACE FIRST ROW ALONG TOP OF BANK (BANKFULL) AND THE LOWER ROW(S) BETWEEN THE TOP OF BANK AND OHWM

VEGETATION CHART

RESTORATION NOTES:  
GENERAL

- REFER TO RESTORATION DETAIL SHEETS FOR ADDITIONAL INFORMATION RELATED TO PROPOSED RESTORATION MEASURES.
- REFER TO SITE PHOTOS FOR INFORMATION ON PRE-CONSTRUCTION CROSSING CONDITIONS AND TO PROVIDE ADDITIONAL GUIDANCE FOR RESTORATION EFFORTS.

TOE WOOD

- ROUGH GRADE CHANNEL BED FEATURES INCLUDING PLACEMENT OF SUBSTRATE.
- INSTALL FOOTER LOG(S) ALONG PROPOSED TOE OF SLOPE. FOOTER LOGS SHOULD BE ANGLED TO ALLOW FOR TOE ALIGNMENT TO GENERALLY MATCH THE EXISTING CURVE AND EVENLY TRANSITION FROM UPSTREAM TO DOWNSTREAM.
- PUSH FOOTER LOG INTO SOIL APPLY A SMALL AMOUNT OF GRAVEL OR STONE AS NEEDED TO PREVENT FLOATATION OF FOOTER LOG PRIOR TO PLACING WOODY DEBRIS.
- PLACE A LAYER WOODY DEBRIS IN 6" TO 8" LIFTS, APPLY 3"-4" GRAVEL AND/OR SOIL FILL AND COMPACT WITH EXCAVATOR BUCKET. WASH FILL MATERIAL INTO WOODY DEBRIS MATRIX WITH WATER FROM CHANNEL. APPLY ADDITIONAL LAYERS "AS NEEDED" TO REACH THE SPECIFIED TOE WOOD HEIGHT.
- PLACE STACKED SOD MATS ABOVE TOE WOOD. THE USE OF TRANSPLANTS OR FABRIC LIFTS MAY BE FIELD APPROVED BY ENBRIDGE IN CONSULTATION WITH MN DNR.

SOD MATTING

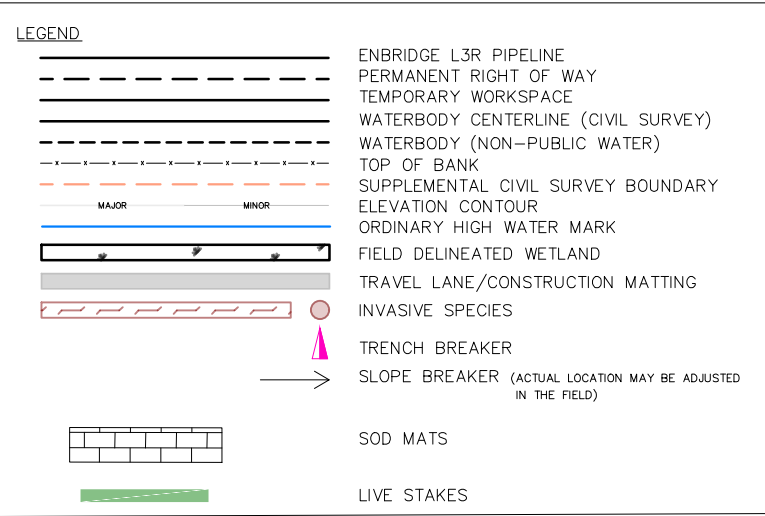
- REMOVE VEGETATED MATS ON EITHER SIDE OF THE STREAM CROSSING USING ONSITE EQUIPMENT WHICH CAN UNDERCUT THE VEGETATION FOR REMOVAL. SMALL SHRUBS AND/OR TREES WITHIN THE SOD MATS ARE ACCEPTABLE AND SHOULD NOT BE REMOVED.
- DEPENDING ON THE LEVEL OF SATURATION AT THE TIME OF REMOVAL, IT MAY BE DIFFICULT TO OBTAIN INTACT CONSOLIDATED MATS, BUT GENERALLY THE NATIVE VEGETATION WILL BE RETAINED AND CAPTURED FOR PLACEMENT.
- SOD MATS CAN BE TRANSPLANTED DURING ANY SEASON.
- SOD MAT WILL BE PLACED ON CLEAR GROUND OR MATS WITHIN THE WORKSPACE.
- MONITOR MATS TO SUPPORT SURVIVABILITY; WATERING MAY BE NEEDED.
- PRIOR TO PLACEMENT OF SOD MATS FINISH GRADE CHANNEL BANK AND ADJACENT FLOODPLAIN APPLICATION AREA TO PROVIDE A SMOOTH AND EVEN SURFACE. SUBGRADE ELEVATION SHOULD ALLOW FOR THE FINISHED SOD SURFACE TO TRANSITION EVENLY WITH THE CHANNEL BANKS UPSTREAM AND DOWNSTREAM OF THE INSTALLATION AREA. AVOID ABRUPT CHANGES IN GRADE.
- VEGETATED MATS WILL BE RETURNED/SET IN PLACE WITH ONSITE EQUIPMENT.
  - SURFACE APPLIED SOD MATTING SHOULD BE PLACED WITH THE LONG SIDE PERPENDICULAR TO THE CHANNEL / FLOW.
  - STACKED SOD MATTING SHOULD BE PLACED WITH THE LONG SIDE PARALLEL TO THE CHANNEL / FLOW.
- IF SUFFICIENT SOD IS NOT AVAILABLE FROM THE STREAM BANKS ADDITIONAL SOD MAY BE TAKEN FROM THE ADJACENT CONSTRUCTION WORKSPACE.
- WHEN PLACING SOD MATS, DO NOT LEAVE LARGE GAPS BETWEEN EACH SOD MAT AS NON-NATIVE VEGETATION WILL QUICKLY ATTEMPT TO COLONIZE THESE VOIDS.
- WATER SOD MATS AFTER REPLACEMENT IF CONDITIONS ARE HOT AND DRY. DAMP AND/OR FROZEN SOD MATS DO NOT REQUIRE WATERING.
- THE TOP MAT AND/OR OTHER MATS CAN BE ANCHORED WITH A LIVE AND/OR DEAD STOUT STAKE TO ENSURE THAT IT DOES NOT MOBILIZE DURING A FLOOD EVENT BEFORE THE ROOTS HAVE ESTABLISHED.
- THE VEGETATED MATS WILL BE REPLACED AS SOON AS PRACTICAL FOLLOWING BACKFILLING OF THE TRENCH AND STABILIZED PER THE TIMING REQUIREMENTS DESCRIBED IN SECTION 1.9.1 OF THE EPP.

LIVE STAKING

- CLEANLY REMOVE ALL SIDE BRANCHES AND THE TOP GROWTH, AND FASHION THE CUTTINGS INTO LIVE STAKES AS DEPICTED IN THE DETAIL DRAWING. AN OPTION DURING PREPARATION IS TO PAINT AND SEAL THE TOP OF THE LIVE STAKE BY DIPPING THE TOP 1-2 INCHES INTO A 50-50 MIX OF LIGHT-COLORED LATEX PAINT AND WATER. SEALING THE TOP OF STAKE WILL REDUCE THE POSSIBILITY OF DESICCATION, ASSURE THE STAKES ARE PLANTED WITH THE TOP UP, AND MAKES THE STAKES MORE VISIBLE FOR SUBSEQUENT PLANTING EVALUATIONS.
- USE A PUNCH BAR OR HAND AUGER TO CREATE A NARROW PILOT HOLE, PERPENDICULAR TO THE SLOPE, THROUGH ANY EROSION CONTROL MATTING, RIP RAP, OR OTHER REVETMENT, FILTER FABRIC, ETC., IF PRESENT, AND DEEP ENOUGH TO INTERCEPT THE WATER TABLE. THE HOLE SHOULD BE ONLY AS LARGE AS NECESSARY TO INSTALL THE LIVE STAKE WITHOUT DAMAGE WHILE ENSURING THE HIGHEST AMOUNT OF STAKE-SOIL CONTACT.
- INSERT THE POINTED END OF THE LIVE STAKE INTO THE PILOT HOLE. TAMP INTO THE GROUND WITH A DEAD BLOW HAMMER TAKING CARE NOT TO SPLIT OR OTHERWISE DAMAGE THE LIVE STAKE. USE WATER, SOIL BACKFILL, TAMPING, ETC. TO ACHIEVE GOOD SOIL-TO-STEM CONTACT AND REMOVE AIR POCKETS.
- USE ONSITE EQUIPMENT TO APPLY WATER FROM THE CHANNEL AFTER INSTALLATION.
- ALL CUTS SHOULD BE CLEAN AND SMOOTH. NO CRACKED OR SPLIT LIVE STAKES SHOULD BE USED. IF THEY SPLIT DURING TAMPING, THEY SHOULD BE CUT BELOW THE CRACK OR REPLACED.
- THE SPECIFIED NUMBER OF LIVE STAKES SHOULD BE INSTALLED INTO THE SOIL AND PROTRUDE ABOVE THE SOIL AND ANY SOD MATTING, MULCHING, EROSION CONTROL MATTING, RIP RAP, OR OTHER REVETMENT.
- LIVE STAKE SHOULD NOT MOVE AFTER INSTALLATION; ENSURING IT IS IN FIRM CONTACT WITH THE SOIL.
- IT IS IMPORTANT TO ENSURE THAT THE UPSTREAM AND DOWNSTREAM ENDS OF THE LIVE STAKING A MERGE SMOOTHLY INTO THE UNDISTURBED BANK BEYOND THE PROJECT AREA. THE RATE OF INSTALLING LIVE STAKES SHOULD TAPER OFF GRADUALLY TO BLEND IN WITH THE EXISTING VEGETATION.

TRANSPLANTS

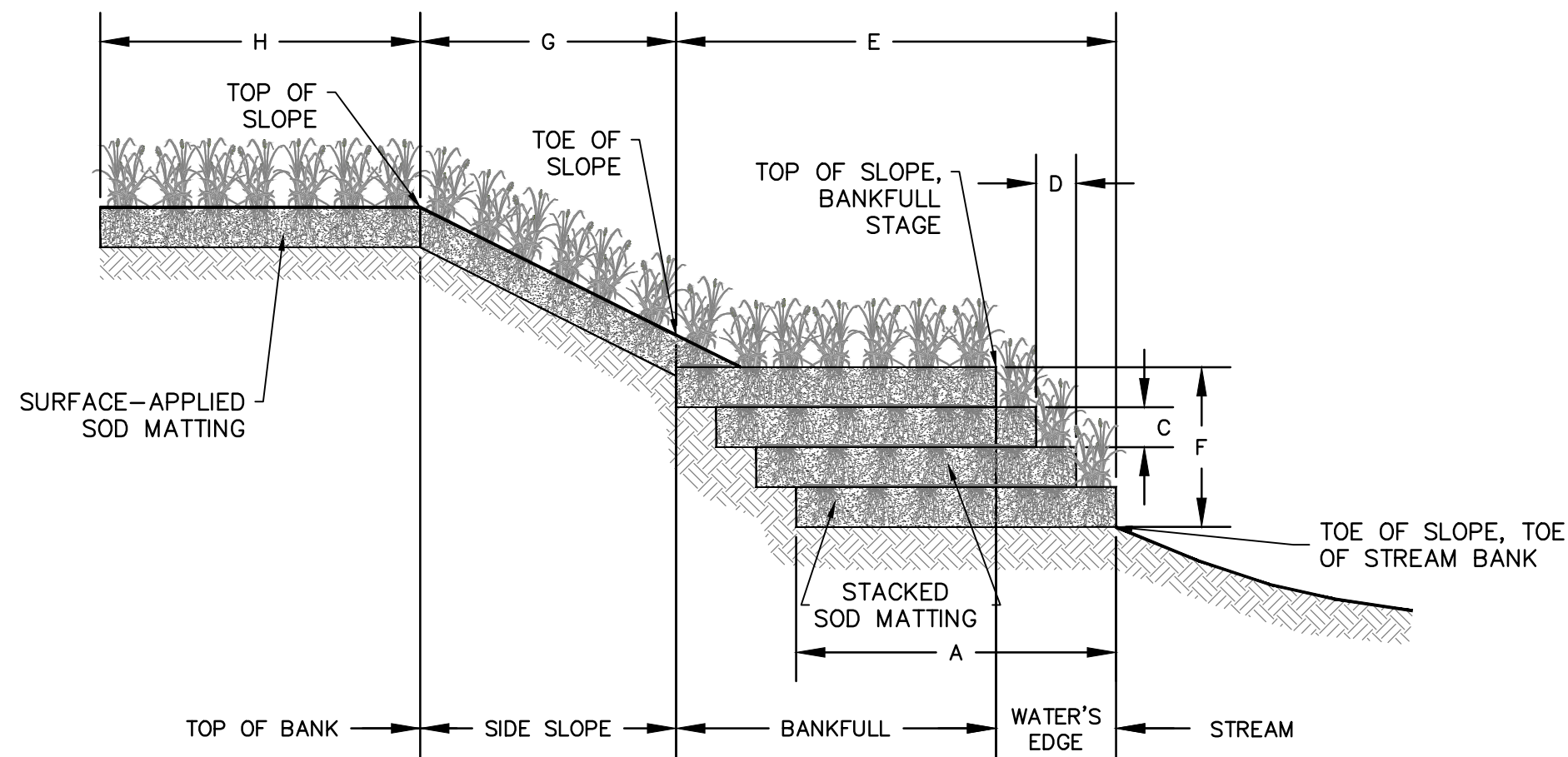
- SHRUBS AND/OR ALDER REMOVED FROM THE TRENCH AREA MAY BE USED IN LIEU OF SOD MATS IN ACCORDANCE WITH THE TRANSPLANT DETAIL.



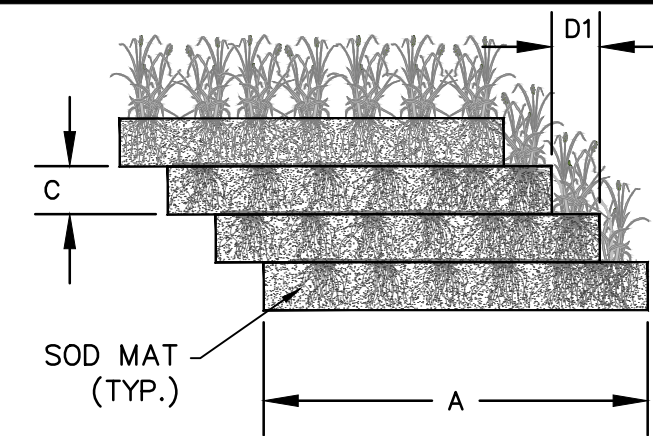
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ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE-SPECIFIC RESTORATION PLAN UNNAMED STREAM – MP 1115.6 – MDNR ID 63 SITE SPECIFIC DETAILS					
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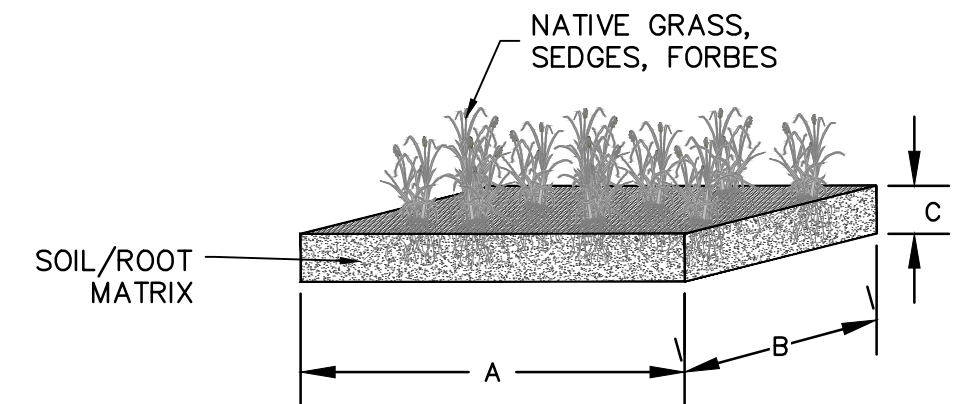




**CROSS SECTION**



**STACKED SOD MATTING DETAIL**



**SOD MAT DETAIL**

DIMENSION <sup>1</sup>	NAME	TYPICAL UNIT	VALUE	DESCRIPTION
A	SOD MAT WIDTH	FEET	3–4	WIDTH OF INDIVIDUAL SOD MAT.
B	SOD MAT LENGTH	FEET	3–6	LENGTH OF INDIVIDUAL SOD MAT.
C	SOD MAT THICKNESS	INCHES	12	THICKNESS OF INDIVIDUAL SOD MAT.
D	STACKED SOD MAT SETBACK	FEET	VARIES	THE DISTANCE BETWEEN THE EDGES OF SOD MATS STACKED TO FORM A SLOPE
E	WIDTH OF STACKED SOD MATS	FEET	10 - 20	WIDTH OF A BANK CREATED BY STACKED SOD MATS
F	HEIGHT OF STACKED SOD MATS	FEET	2	HEIGHT OF A SLOPE CREATED BY STACKED SOD MATS
G	WIDTH OF SURFACE- APPLIED SOD MATS	FEET	10–20	WIDTH OF A SLOPE STABILIZED WITH SURFACE-APPLIED SOD MATS
H	TOP OF BANK SOD MATTING DISTANCE	FEET	15	DISTANCE SOD MATTING IS INSTALLED ON THE TOP OF BANK

NOTES:

1. DIMENSION LABELS ARE REFERENCED IN THE DETAIL DRAWINGS.



**SOD MAT EXAMPLES**

**SOD MATTING DETAIL**



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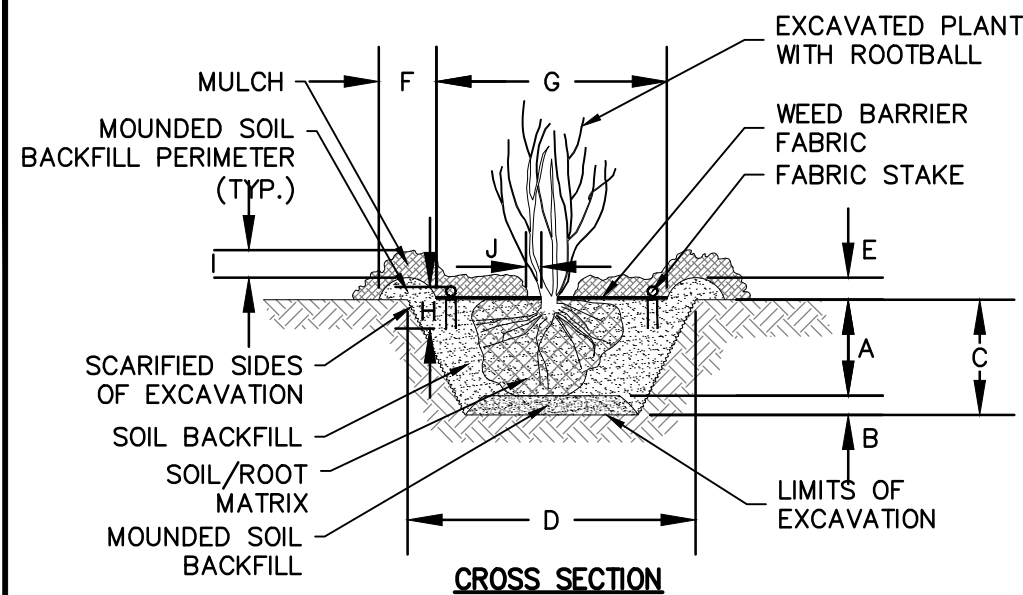


NOTES:
1. DIMENSION LABELS ARE REFERENCED IN THE DETAIL DRAWINGS.



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DIMENSION <sup>1</sup>	NAME	TYPICAL UNIT	VALUE	DESCRIPTION
A	PLANTING DEPTH	INCHES	12-18	PLANTING DEPTH OF THE TRANSPLANT.
B	HEIGHT OF MOUNDED SOIL BACKFILL	INCHES	N/A	HEIGHT OF MOUNDED LOOSE SOIL PLACED INTO OVER-EXCAVATED PLANTING PIT.
C	DEPTH OF PLANTING PIT	INCHES	12-18	DEPTH OF THE PLANTING PIT; ACCOMMODATES DIMENSION OF SOIL AND EXCAVATED ROOTS AS WELL AS MOUNDED LOOSE SOIL AT BOTTOM OF PIT.
D	WIDTH OF PLANTING PIT	FEET	3-5	OVER-EXCAVATED WIDTH OF THE PLANTING PIT; ACCOMMODATES THE WIDTH OF THE EXCAVATED SOIL AND ROOTS.
E	HEIGHT OF MOUNDED SOIL PERIMETER	INCHES	0-2	HEIGHT OF SOIL BERM CONSTRUCTED ALONG THE PERIMETER OF THE PLANTING PIT; HELPS RETAIN WATER.
F	WIDTH OF MOUNDED SOIL PERIMETER	INCHES	0-6	WIDTH OF SOIL BERM CONSTRUCTED ALONG THE PERIMETER OF THE PLANTING PIT; HELPS RETAIN WATER.
G	WIDTH OF WEED BARRIER FABRIC (OPTIONAL)	INCHES	N/A	WIDTH OF FABRIC PLACED ON SURFACE TO CONTROL WEEDS WITHIN THE MOUNDED SOIL PERIMETER; TRANSPLANTS TYPICALLY HAVE GRASSES, LEAF MATTER, ETC. ATTACHED AND DO NOT REQUIRE WEED BARRIER FABRIC.
H	FABRIC STAKE LENGTH (OPTIONAL)	INCHES	N/A	LENGTH OF STAPLES/SPIKES USED TO SECURE WEED BARRIER FABRIC
I	THICKNESS OF MULCH (OPTIONAL)	INCHES	N/A	THICKNESS OF MULCH, IF NECESSARY. TRANSPLANTS TYPICALLY HAVE GRASSES, LEAF MATTER, ETC. ATTACHED AND DO NOT REQUIRE MULCH.
J	GAP BETWEEN MULCH AND PLANT STEM/TRUNK (OPTIONAL)	INCHES	N/A	ROOM BETWEEN PLANT STEM/TRUNK AND MULCH. TRANSPLANTS TYPICALLY HAVE GRASSES, LEAF MATTER, ETC. ATTACHED

NOTES:

1. DIMENSION LABELS ARE REFERENCED IN THE DETAIL DRAWINGS.



TRANSPLANTS EXAMPLES

TRANSPLANTING DETAIL

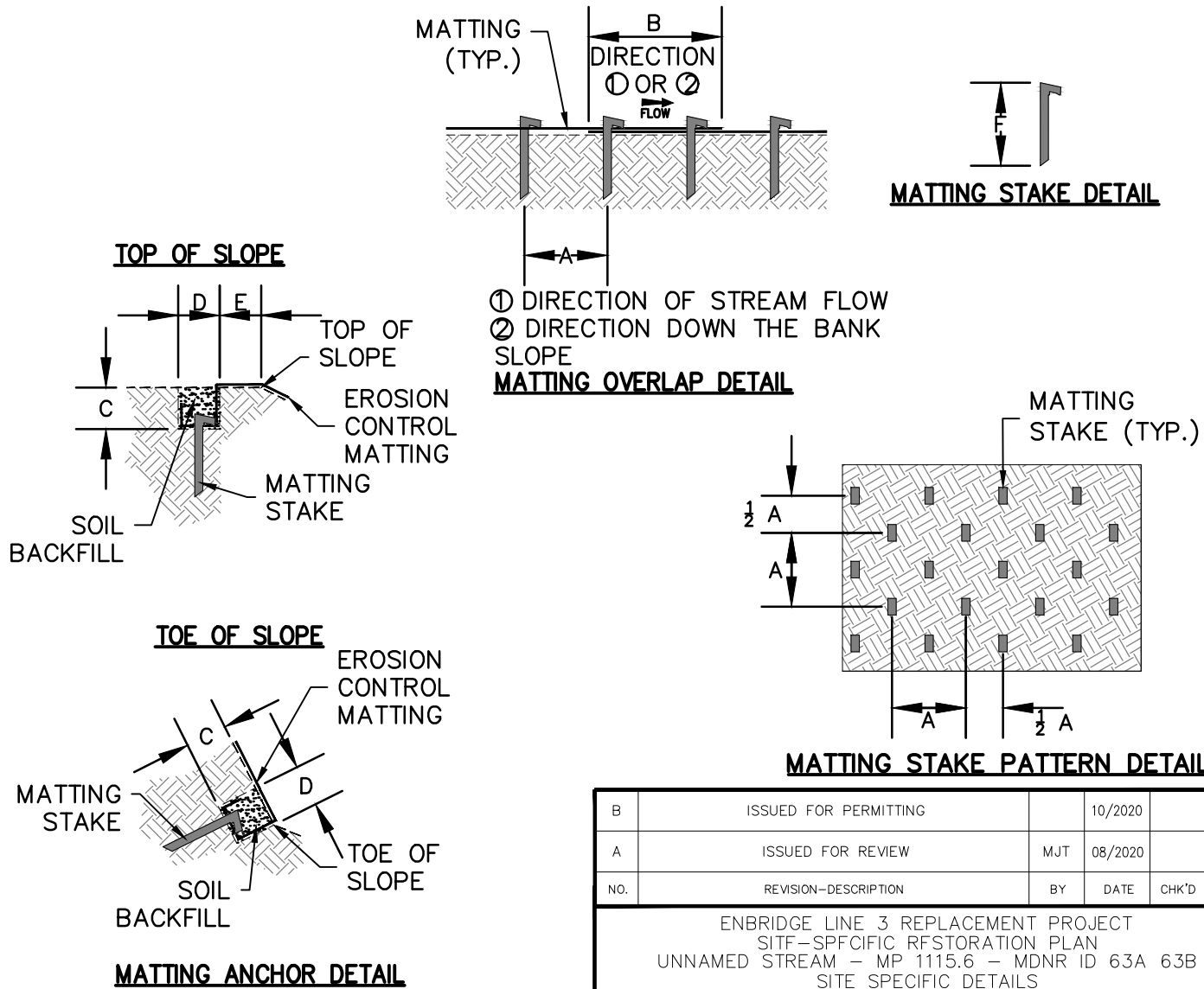
DIMENSION <sup>2</sup>	NAME	TYPICAL UNIT	VALUE	DESCRIPTION
A	MATting STAKE SPACING	FEET, INCHES	N/A	SPACING BETWEEN EROSION CONTROL MATting STAKES USED TO FASTEN THE MATting TO THE SOIL
B	MATting OVERLAP	FEET, INCHES	N/A	AMOUNT OF EROSION CONTROL MATting OVERLAP IF MULTIPLE PIECES AND/OR ROLLS OF MATting ARE USED. OVERLAP VARIES DEPENDING ON THE LOCATION OF THE OVERLAP WITH RESPECT TO POSITION ON THE SLOPE, LOCATION OF THE MATting (EDGE OR END), AND PRODUCT SPECIFICATIONS.
C	MATting ANCHOR TRENCH DEPTH	FEET, INCHES	N/A	DEPTH OF TRENCH INTO WHICH EDGE OF EROSION CONTROL MATting IS ANCHORED AT THE TOP AND/OR TOE OF A SLOPE.
D	MATting ANCHOR TRENCH WIDTH	FEET, INCHES	N/A	WIDTH OF TRENCH INTO WHICH EDGE OF EROSION CONTROL MATting IS ANCHORED AT THE TOP AND/OR TOE OF A SLOPE.
E	TOP OF SLOPE ANCHOR TRENCH SETBACK	FEET, INCHES	N/A	TOP OF SLOPE ANCHOR TRENCH DISTANCE FROM THE TOP OF SLOPE. TOP OF SLOPE REFERS TO TOP OF SIDE SLOPE, BANK SLOPE, TERRACE SLOPE, BANKFULL, ETC.
F	MATting STAKE LENGTH	INCHES	N/A	LENGTH OF EROSION CONTROL MATting STAKES OR STAPLES USED TO FASTEN THE MATting TO THE SOIL

NOTES:

1. DATA ARE FOR EROSION CONTROL MATting APPLIED TO STREAM BANK SLOPES.

2. DIMENSION LABELS ARE REFERENCED IN THE DETAIL DRAWINGS.

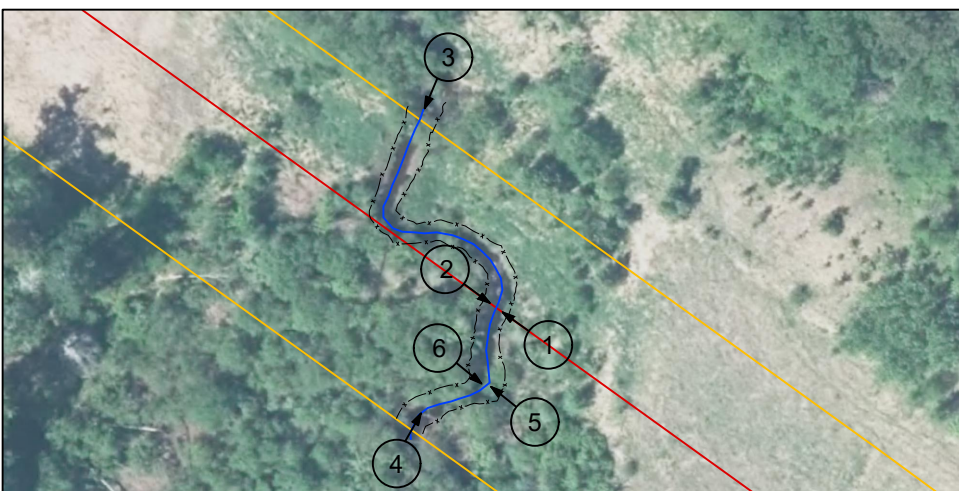
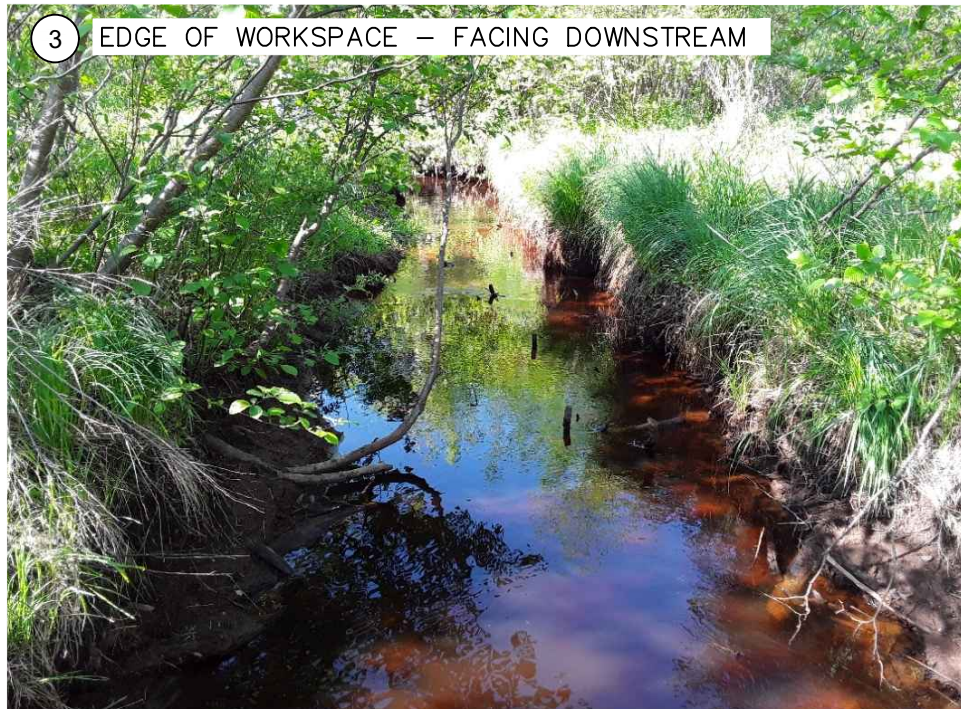
EROSION CONTROL MATting DETAIL



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- NOTES:**
1. AIR PHOTOS ARE FROM 2018 ENBRIDGE AERIAL PHOTOGRAPHY.
  2. ADDITIONAL ON-THE GROUND PHOTOS MAY BE TAKEN PRIOR TO CONSTRUCTION AT MDNR REQUEST.
  3. PRE-CONSTRUCTION PHOTOS WILL BE USED TO AID IN RESTORATION.



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ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE-SPECIFIC RESTORATION PLAN UNNAMED STREAM — MP 1115.6 — MDNR ID 63 PHOTO PAGE					
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GENERAL

1. THE SPECIFICATIONS WITHIN THIS SSRP MAY MODIFY OR REPLACE PROJECT–WIDE STANDARDS PRESENTED IN THE EPP. WHERE MATERIAL WITHIN THESE SSRPS EXCEEDS STANDARD CONSTRUCTION MEASURES IN THE EPP, THESE SSRPS SUPERSEDE THE EPP.
2. CONSTRUCTION AND RESTORATION OF WATERBODY CROSSINGS WILL FOLLOW THESE GENERAL STEPS:

A. SITE CLEARING

B. INSTALLATION OF TEMPORARY EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES (‘BMPS’)

C. BRIDGE INSTALLATION

D. EXCAVATION/BACKFILLING OF THE WATERBODY INCLUDING:

• SOD SAVING TOPSOIL SEGREGATION AT NON–WOODED SITES

• STREAMBED MATERIAL SEGREGATION

• PIPE INSTALLATION

• BACKFILL, INCLUDING IMPLEMENTATION OF CONSTRUCTION–RELATED RESTORATION METHODS (I.E., TOE WOOD)

E. REPLACEMENT OF STREAMBED MATERIAL AND TOPSOIL/SOD LAYER

F. RESTORATION OF STREAM BANKS TO PRE–CONSTRUCTION CONTOURS

G. IF FINAL GRADING NOT POSSIBLE AT THE TIME, TEMPORARY STABILIZATION AND REPLACEMENT/REINFORCEMENT OF TEMPORARY BMPS

H. AFTER FINAL GRADING, PERMANENT SEEDING AND/OR WOODY VEGETATION RESTORATION, STABILIZATION AND REPLACEMENT/REINFORCEMENT OF TEMPORARY BMPS

I. BRIDGE REMOVAL DURING FINAL RESTORATION AFTER STABILIZATION AND PERMANENT SEEDING

J. POST–CONSTRUCTION MONITORING
- CROSSING METHODS
1. ALL WATERBODY AND WETLAND CROSSINGS WILL BE CONDUCTED IN COMPLIANCE WITH SECTION 2.0 AND SECTION 3.0 OF THE ENVIRONMENTAL PROTECTION PLAN (‘EPP’), RESPECTIVELY. SECTION 2.0 AND 3.0 OF THE WINTER CONSTRUCTION PLAN PRESENTS MODIFICATIONS FOR WATERBODY AND WETLAND CONSTRUCTION METHODS, RESPECTIVELY, IN WINTER CONDITIONS.

2. ENBRIDGE’S SUMMARY OF CONSTRUCTION METHODS AND PROCEDURES (THE ‘PROCEDURES,’APPENDIX A OF THE EPP) OUTLINES THE VARIOUS CONSTRUCTION METHODS THAT ENBRIDGE MAY UTILIZE TO CONSTRUCT THROUGH WATERBODIES AND WETLANDS/BASINS AS PRESENTED ON THESE SITE–SPECIFIC RESTORATION PLANS (‘SSRPS’).

A. DRY CROSSING (ISOLATED) METHODS (INCLUDING THE DRY CROSSING AND MODIFIED DRY CROSSING METHOD) ARE DESCRIBED SECTIONS 4.3 OF THE PROCEDURES, AND IN SECTIONS 2.5.2 AND 2.5.3 AND FIGURES 23 AND 24 OF THE EPP.

B. THE BORE METHOD (NON–PRESSURIZED) IS DESCRIBED IN SECTION 3.5 OF THE PROCEDURES, AND SECTION 4.0 OF THE EPP.

C. THE MODIFIED UPLAND CONSTRUCTION (WETLAND) METHOD IS DESCRIBED IN SECTION 3.3 OF THE PROCEDURES, AND SECTION 3.0 AND FIGURES 30 TO 34 OF THE EPP.

D. ALTHOUGH NOT PROPOSED AS A PRIMARY METHOD AT THESE SSRP WATERBODIES, THE OPEN CUT (NON–ISOLATED) WATERBODY CROSSING METHOD IS DESCRIBED IN SECTION 4.1 OF THE PROCEDURES, AND SECTION 2.5.1 AND FIGURE 24 OF THE EPP.

E. ALTHOUGH NOT PROPOSED AS A PRIMARY METHOD AT THESE SSRP WATERBODIES, THE PUSH–PULL METHOD IS DESCRIBED IN SECTION 3.4 OF THE PROCEDURES, AND SECTION 3.7.1 AND FIGURES 35 AND 36 OF THE EPP.

CLEARING/VEGETATION REMOVAL

1. STUMPS WITHIN THE TRENCH LINE WILL BE COMPLETELY REMOVED, GROUND, AND/OR HAULED OFF–SITE TO AN APPROVED LOCATION. TREE STUMPS OUTSIDE THE TRENCH LINE WILL BE GROUND BELOW NORMAL GROUND SURFACE TO FACILITATE A SAFE WORK AREA AND TO ALLOW TOPSOIL REMOVAL, IF NECESSARY. IN SOME CIRCUMSTANCES, TREE STUMPS OUTSIDE THE TRENCH LINE MAY BE COMPLETELY REMOVED TO ALLOW FOR A SAFE WORK AREA AND HAULED OFF–SITE TO AN APPROVED LOCATION AS OUTLINED IN SECTION 1.8.3 OF THE EPP.

2. CLEARING WILL BE CONDUCTED IN WATERBODIES AND WETLANDS AS OUTLINED IN SECTION 2.2 AND 3.2 OF THE EPP, RESPECTIVELY. CHIPS, MULCH, OR MECHANICALLY CUT WOODY DEBRIS SHALL NOT BE STOCKPILED IN A WETLAND. HYDRO–AX DEBRIS, OR SIMILAR CAN BE LEFT IN THE WETLAND IF SPREAD EVENLY IN THE CONSTRUCTION WORKSPACE TO A DEPTH THAT WILL ALLOW FOR NORMAL REVEGETATION, AS DETERMINED BY THE EI. CHIPPING IS NOT ALLOWED ON PUBLIC LANDS. ON PUBLIC LANDS, MULCH AND MECHANICALLY CUT WOODY DEBRIS MUST BE UNIFORMLY BROADCAST TO LESS THAN 2–INCH THICKNESS AND IN A MANNER THAT MAINTAINS VISIBLE GROUND.

3. ENBRIDGE WILL PROPERLY INSTALL AND MAINTAIN REDUNDANT SEDIMENT CONTROL MEASURES IMMEDIATELY AFTER CLEARING AND PRIOR TO INITIAL GROUND DISTURBANCE AT SURFACE WATERS LOCATED WITHIN 50 FEET OF THE PROJECT AND WHERE STORMWATER FLOWS TO THE SURFACE WATER (REFER TO THE ENVIRONMENTAL PLAN SHEETS IN THE SWPPP), AND WITHIN 100 FEET OF SPECIAL AND IMPAIRED WATERS, INCLUDING TROUT STREAMS.

4. ON PUBLIC LANDS AND WHEREVER PRACTICABLE AT WATERBODY CROSSINGS, ENBRIDGE WILL USE WILDLIFE–FRIENDLY EROSION AND SEDIMENT CONTROL BMPS THAT CONTAIN BIODEGRADABLE NETTING (CATEGORY 3N OR 4N NATURAL FIBER) AND WILL AVOID THE USE OF PLASTIC MESH (SECTIONS 1.17.1 AND 2.6.1 OF THE EPP).

TEMPORARY STABILIZATION

1. ON PORTIONS OF THE PROJECT WHERE WORK WILL BE OCCURRING DURING APPLICABLE ‘WORK IN WATER RESTRICTIONS’FOR PUBLIC WATERS (REFER TO SECTION 2.1), ALL EXPOSED SOIL AREAS WITHIN 200 FEET OF THE WATER’S EDGE, AND THAT DRAIN TO THAT WATER, WILL BE STABILIZED WITHIN 24 HOURS DURING THE RESTRICTION PERIOD. STABILIZATION OF ALL EXPOSED SOILS WITHIN 200 FEET OF THE PUBLIC WATER’S EDGE, AND THAT DRAIN TO THAT WATER, WILL BE INITIATED IMMEDIATELY AND COMPLETED WITHIN 7 CALENDAR DAYS WHENEVER CONSTRUCTION ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED ON ANY PORTION OF THE SITE OUTSIDE OF THE RESTRICTION PERIOD. THESE AREAS WILL BE IDENTIFIED ON THE ENVIRONMENTAL PLAN SHEETS ACCOMPANYING THE SWPPP.

2. HYDRO–MULCH AND LIQUID TACKIFIER CAN BE USED IN PLACE OF CERTIFIED WEED–FREE STRAW OR HAY MULCH WITH PRIOR APPROVAL FROM ENBRIDGE. ALL HYDROMULCH AND LIQUID TACKIFIER PRODUCTS USED WILL BE ON THE APPLICABLE STATE DOT PRODUCT LIST. HYDRO–MULCH AND LIQUID TACKIFIER PRODUCTS CONTAINING PLASTIC/POLYPROPYLENE FIBER ADDITIVES AND MALACHITE GREEN (COLORANT) WILL NOT BE UTILIZED ON THIS PROJECT. APPLICATION RATES WILL BE AT THE MANUFACTURER’S RECOMMENDED RATE. ENBRIDGE WILL AVOID THE USE OF HYDROMULCH ON PUBLIC LANDS; HOWEVER, ENBRIDGE MAY USE HYDROMULCH ON STEEP SLOPES TO PREVENT EROSION UNTIL PERMANENT COVER HAS BEEN ESTABLISHED AS OUTLINED IN SECTION 1.8.3 OF THE EPP.

RESTORATION AND STABILIZATION

1. ENBRIDGE WILL RESTORE THE STREAM BANKS AS NEAR AS PRACTICABLE TO PRE–CONSTRUCTION CONDITIONS UNLESS THAT SLOPE IS DETERMINED TO BE UNSTABLE. IF THE SLOPE IS CONSIDERED UNSTABLE, ENBRIDGE WILL RESHAPE THE BANKS TO PREVENT SLUMPING. FOR PUBLIC WATERS, ENBRIDGE WILL RETURN THE BANK TO PRE–CONSTRUCTION CONTOURS, UNLESS OTHERWISE DIRECTED BY THE SITE–SPECIFIC RESTORATION PLAN. IF ENBRIDGE CANNOT RESTORE TO PRE–CONSTRUCTION CONTOURS AT A PUBLIC WATER, ENBRIDGE WILL CONSULT WITH THE MDNR BEFORE PROCEEDING FURTHER AS OUTLINED IN SECTION 2.6 OF THE EPP.

2. UNSTABLE SOILS AND/OR SITE–SPECIFIC FACTORS SUCH AS STREAM VELOCITY AND FLOW DIRECTION MAY REQUIRE ADDITIONAL RESTORATION EFFORTS, SUCH AS INSTALLATION OF WOODY VEGETATION, GEOTEXTILE FABRIC, OR TREE, LOG, ROOTWAD, OR BOULDER REVETMENTS TO STABILIZE DISTURBED STREAM BANKS (SEE FIGURE 29) AS OUTLINED IN SECTION 2.6.2 OF THE EPP. ENBRIDGE WILL WORK WITH THE MDNR TO ENSURE ALL WORK/ADJUSTMENTS ARE APPROVED AND ARE CONDUCTED WITHIN APPLICABLE TIMING RESTRICTIONS.

3. IN UPLAND AND WETLAND AREAS, CLEANUP AND ROUGH GRADING WILL OCCUR AS OUTLINED IN SECTIONS 1.16 AND 3.9 OF THE EPP. ENBRIDGE WILL BACKFILL THE TRENCH TO AN ELEVATION SIMILAR TO THE ADJACENT AREAS OUTSIDE THE TRENCH LINE AND WILL ADD A SLIGHT CROWN OF APPROXIMATELY 3 TO 6 INCHES (DEPENDING ON SOIL TYPE) OVER THE BACKFILLED TRENCH TO ALLOW FOR SUBSIDENCE. GENERALLY, EXCESS SUBSOIL DISPLACED BY THE PIPE INSTALLATION WILL BE SPREAD ACROSS THE PORTION OF THE CONSTRUCTION WORKSPACE WHERE TOPSOIL REMOVAL HAS OCCURRED. ANY REMAINING EXCESS SUBSOIL WILL BE REMOVED AND DISPOSED OF AT AN APPROVED OFF–SITE LOCATION AS NEEDED TO ENSURE CONTOURS ARE RESTORED TO AS NEAR AS PRACTICABLE TO PRE–CONSTRUCTION CONDITIONS.

4. REVEGETATION ACTIVITIES WILL OCCUR AS OUTLINED IN SECTION 7.0 OF THE EPP. SEED MIXES AT PUBLIC WATERS WILL BE SELECTED AND APPLIED AS INDICATED IN THE PLANTING PLAN, WHICH IS APPENDIX A OF THE POST–CONSTRUCTION VEGETATION MANAGEMENT PLAN FOR PUBLIC LANDS AND WATERS (‘VMP’). SEED MIXES RELATIVE TO THESE SSRP CROSSINGS ARE CODED AS FOLLOWS:

A	EMERGENT (34–181)	G	DRY PRAIRIE GENERAL (35–221)
B	RIPARIAN NE (34–361)	H	MESIC PRAIRIE GENERAL (35–241)
C	RIPARIAN S&W (34–261)	I	MESIC PRAIRIE NW (35–441)
D	WET MEADOW NE (34–371)	J	DRY PRAIRIE NORTHWEST (35–421)
E	WET MEADOW S&W (34–271)	K	WOODLAND EDGE NE (36–311)
F	WETLAND REHABILITATION (34–171)	L	NATURAL REVEGETATION

5. ENBRIDGE WILL NOT SEED STANDING WATER OR WOODED (PSS AND PFO) WETLAND COMMUNITIES. NATURAL REVEGETATION WILL TAKE PLACE FROM EXISTING PLANT MATERIAL AND ROOT STOCK IN THESE COMMUNITIES.

6. ALL MATERIALS USED FOR CONSTRUCTION OF THE PROJECT MUST BE REMOVED FROM THE SITE.

7. ENBRIDGE WILL CONDUCT POST–CONSTRUCTION MONITORING IN ACCORDANCE WITH THE POST–CONSTRUCTION MONITORING PLAN FOR WETLANDS AND WATERBODIES, AND IN ACCORDANCE WITH THE VMP FOR THE UPLAND PORTIONS OF THE PROJECT ON PUBLIC LANDS.

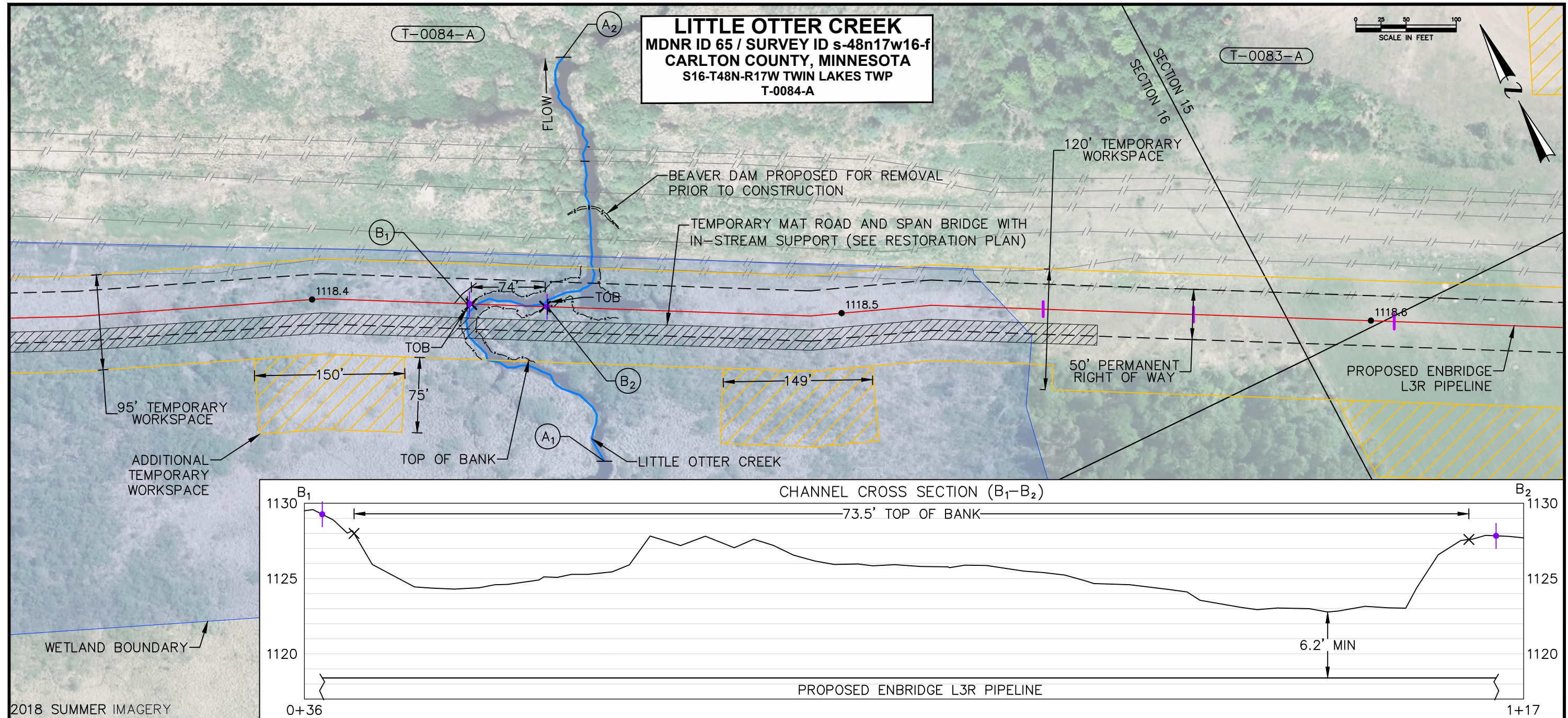
B	ISSUED FOR PERMITTING	MJT	10/2020		
NO.	REVISION–DESCRIPTION	BY	DATE	CHK'D	APP'D
ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE–SPECIFIC RESTORATION PLAN					
CONSTRUCTION NOTES					
SCALE		DWG. NO. SSRP–NOTES		PAGE NO.	

PLOTTED SIZE: ANSI FULL BLEED B (17x11)

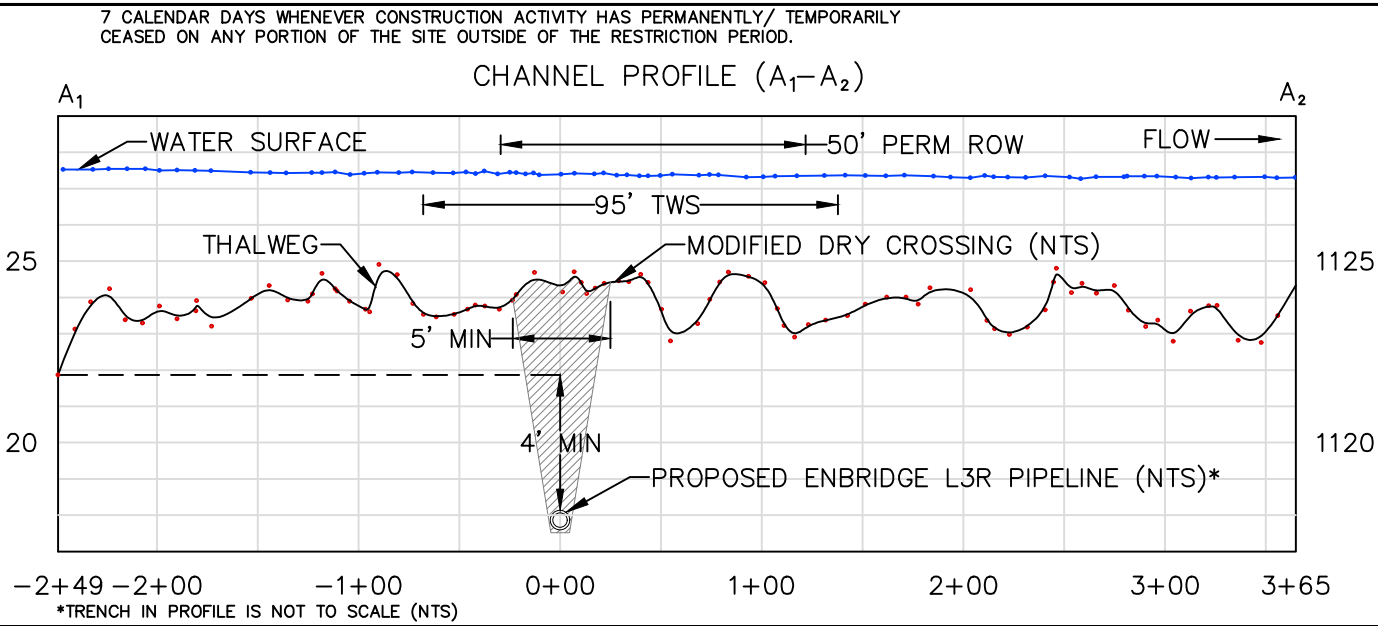


**MDNR ID No. 65: MP 1118.4; Little Otter Creek (S-002-009-001)**





- NOTES**
1. NO FEMA DIGITAL FLOODPLAIN DATA AVAILABLE
  2. BANKFULL DATA NOT AVAILABLE
  3. SOBS (O/H) OR NPC (S1-3): N/A
  4. MDNR REGION 2 PWI - COLD WATER FISHERY: SEPTEMBER 15 - JUNE 30. 24-HOUR SOIL STABILIZATION REQUIRED WITHIN 200 FEET DURING RESTRICTION.
  5. SEE BLASTING PLAN.
  6. WHEN WORKING WITHIN "WORK IN WATER RESTRICTIONS", STABILIZE ALL EXPOSED SOIL AREAS WITHIN 200 FEET OF THE WATER'S EDGE, AND THAT DRAIN TO THAT WATER, WITHIN 24 HOURS. STABILIZATION WILL BE INITIATED IMMEDIATELY AND COMPLETED WITHIN 7 CALENDAR DAYS WHENEVER CONSTRUCTION ACTIVITY HAS PERMANENTLY/ TEMPORARILY CEASED ON ANY PORTION OF THE SITE OUTSIDE OF THE RESTRICTION PERIOD.
- LEGEND**
- PROPOSED ENBRIDGE L3R PIPELINE
  - OTHER PIPELINE
  - PERMANENT RIGHT OF WAY
  - TEMPORARY WORKSPACE
  - WATERBODY (ROSGEN SURVEY - THALWEG)
  - TRACT BOUNDARY
  - TEMPORARY MAT ROAD AND SPAN BRIDGE
  - WETLAND
  - ADDITIONAL TEMPORARY WORKSPACE
  - TRACT ID
  - ROSGEN SURVEY POINT - WATER SURFACE
  - ROSGEN SURVEY POINT - RIVER BOTTOM (THALWEG)
  - PROPOSED INCREASED DEPTH OF COVER EXTENT
  - TOP OF BANK
  - TRENCH BREAKER (LOCATIONS ARE APPROXIMATE)
- FOR ENVIRONMENTAL REVIEW PURPOSES ONLY**



**CHANNEL CROSS SECTION NOTE:**

1. CHANNEL LOCATIONS, DIMENSIONS, AND/OR ELEVATIONS ARE BASED ON 2020 TOPOGRAPHIC/BATHYMETRIC SURVEY(S), AND AS SUCH DO NOT REFLECT CHANGES TO THE CHANNEL THAT MAY HAVE OCCURRED SINCE THAT TIME.
2. DEPTH OF COVER AT CENTERLINE WAS DEVELOPED USING THE BOTTOM ELEVATION OF THE DEEPEST UPSTREAM OR DOWNSTREAM POOL WITHIN THE SURVEYED REACH, UNLESS OTHERWISE NOTED IN APPLICATION MATERIALS.
3. MEAN MEANDER BELT WIDTH: 87'
4. MEANDER WIDTH RATIO: 5.38

0	ISSUED FOR PERMIT APPLICATION	AJJ	10/2020	BAB	BAB
NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D	APP'D

**ENBRIDGE**

DWN. BY:	AJJ	DATE	10/2020
CHK.			
PROJ. ENGR.			
PROJ. MGR.			
CLIENT APP.			

PROPOSED ENBRIDGE L3R PIPELINE  
PRIMARY METHOD - MODIFIED DRY CROSSING  
CROSSING OF LITTLE OTTER CREEK  
ENBRIDGE MP 1118.4  
CARLTON COUNTY, MINNESOTA

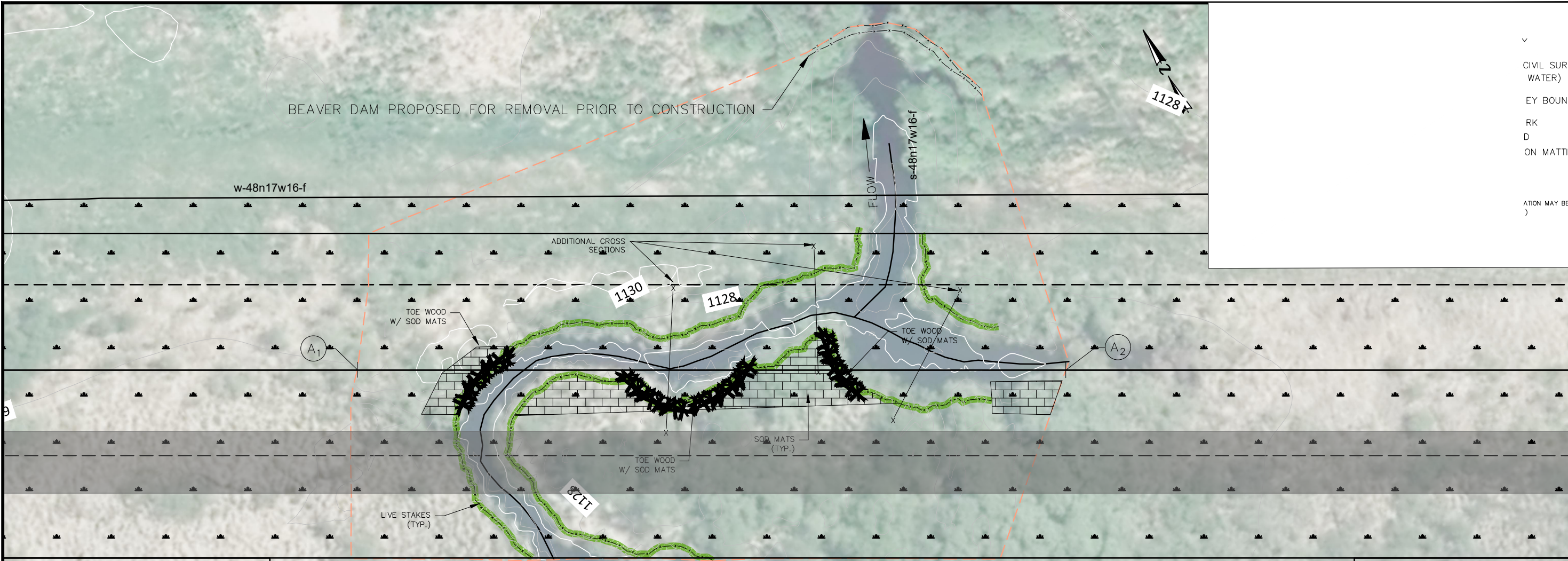
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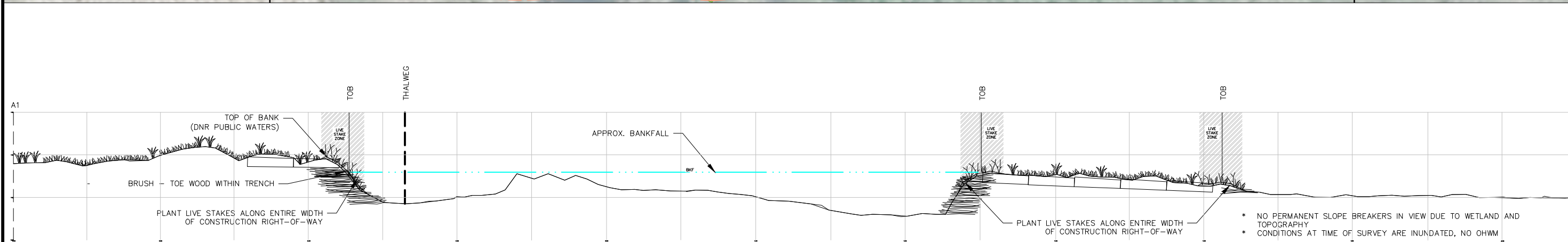




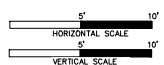




CIVIL SURVEY)  
WATER)  
EY BOUNDARY  
RK  
D  
ON MATTING  
ATION MAY BE ADJUSTED  
)



\* NO PERMANENT SLOPE BREAKERS IN VIEW DUE TO WETLAND AND TOPOGRAPHY  
\* CONDITIONS AT TIME OF SURVEY ARE INUNDATED, NO OHWM



PROPOSED RESTORATION ACTIVITIES WILL BE REVIEWED BY DNR AND ENBRIDGE DURING SITE VISIT AND MAY BE CHANGED TO REFLECT SITE CONDITIONS AT THE TIME OF CONSTRUCTION.

FEATURE ID	s-48n17w16-f; IFC ID: S-310.0	<b>NOTES</b> 1. CONSTRUCTION TIMING RESTRICTIONS 1.1. MDNR REGION 2 PWI - COLD WATER FISHERY: SEPTEMBER 15 - JUNE 30. 1.2. WHEN WORK OCCURS WITHIN "WORK IN WATER RESTRICTIONS", ALL EXPOSED SOIL AREAS WITHIN 200 FEET OF THE WATER'S EDGE, AND THAT DRAIN TO THAT WATER, WILL BE STABILIZED WITHIN 24 HOURS DURING THE RESTRICTION PERIOD. STABILIZATION OF ALL EXPOSED SOILS WITHIN 200 FEET OF THE PUBLIC WATER'S EDGE, AND THAT DRAIN TO THAT WATER, WILL BE INITIATED IMMEDIATELY AND COMPLETED WITHIN 7 CALENDAR DAYS WHENEVER CONSTRUCTION ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED ON ANY PORTION OF THE SITE OUTSIDE OF THE RESTRICTION PERIOD 1.3. WILD RICE: APRIL 1 - JULY 15 2. WORK SHALL BE CONDUCTED IN ACCORDANCE WITH APPLICABLE STANDARDS IN ENBRIDGE'S EPP AND VMP FOR PUBLIC LANDS AND WATERS. THE SPECIFICATIONS WITHIN THIS SSRP MAY MODIFY OR REPLACE THESE STANDARDS. 3. SEE GENERAL NOTES PAGE FOR ADDITIONAL DETAIL. 4. INFORMATION REGARDING SEEDING SPECIFICATIONS, SEED BED PREPARATION TECHNIQUES, ETC. ARE DESCRIBED IN THE PLANTING PLAN CONTAINED WITHIN THE VMP. 5. TRENCH BREAKER LOCATION IS APPROXIMATE PENDING FIELD VERIFICATION (EPP SECTION 1.13) 6. ADDITIONAL CROSS-SECTIONS ARE TO BE SURVEYED PRIOR TO CONSTRUCTION. THE EXACT LOCATION OF THE CROSS-SECTIONS WILL BE FIELD DETERMINED.
CROSSING TYPE	MODIFIED DRY CROSSING	
PROPOSED RESTORATION (SEE DETAILS FOR LIVE STAKING, TRANSPLANTS, AND SHRUB SPECIES IF APPLICABLE)	EC BLANKET - NATURAL FIBER MPCA TYPE 3.B/MNDOT CATEGORY 4N; BRUSH-TOE WOOD; SOD MATS & LIVE STAKES	
WITHIN OR ADJACENT WETLAND	ALDER THICKET	
BWSR SEED MIX	RIPARIAN NE (34-361)	
DOMINANT WETLAND VEGETATION	1. CALAMAGROSTIS CANADENSIS 3. SALIX PETIOLARIS 2. PHALARIS ARUNDINACEA 4. ALNUS INCANA	
SOBS (O/H) or NPC (S1-3)	NO (MODERATE); N/A	



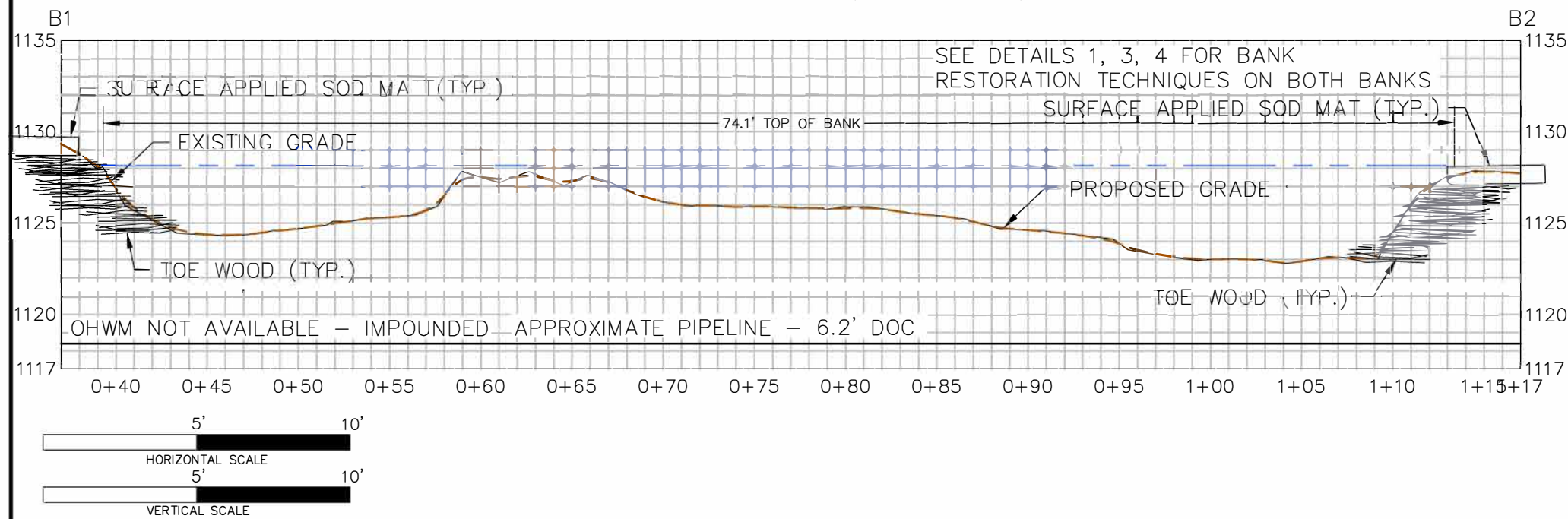
B	ISSUED FOR PERMITTING		10/2020		
A	ISSUED FOR REVIEW	MJT	08/2020		
NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D	APP'D
ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE-SPECIFIC RESTORATION PLAN LITTLE OTTER CREEK - MP 1118.4 - MDNR ID 65 RE-VEGETATION PLAN					
SCALE NOTED	DWG. NO. SSRP-1118.4-001	PAGE NO. 1/8			







### BANK RESTORATION (CENTERLINE)



## RESTORATION NOTES:

## GENERAL

1. COORDINATE WITH MDNR FISHERIES TO REVIEW WOODY REVEGETATION REPLANTING PRIOR TO START OF RESTORATION ACTIVITIES.
2. REFER TO RESTORATION DETAIL SHEETS FOR ADDITIONAL INFORMATION RELATED TO PROPOSED RESTORATION MEASURES.
3. REFER TO SITE PHOTOS FOR INFORMATION ON PRE-CONSTRUCTION CROSSING CONDITIONS AND TO PROVIDE ADDITIONAL GUIDANCE FOR RESTORATION EFFORTS.

TOE WOOD

1. ROUGH GRADE CHANNEL BED FEATURES INCLUDING PLACEMENT OF SUBSTRATE.
2. INSTALL FOOTER LOG(S) ALONG PROPOSED TOE OF SLOPE. FOOTER LOGS SHOULD BE ANGLED TO ALLOW FOR TOE ALIGNMENT TO GENERALLY MATCH THE EXISTING CURVE AND EVENLY TRANSITION FROM UPSTREAM TO DOWNSTREAM.
3. PUSH FOOTER LOG INTO SOIL APPLY A SMALL AMOUNT OF GRAVEL OR STONE AS NEEDED TO PREVENT FLOATATION OF FOOTER LOG PRIOR TO PLACING WOODY DEBRIS.
4. PLACE A LAYER WOODY DEBRIS IN 6" TO 8" LIFTS, APPLY 3"-4" GRAVEL AND/OR SOIL FILL AND COMPACT WITH EXCAVATOR BUCKET. WASH FILL MATERIAL INTO WOODY DEBRIS MATRIX WITH WATER FROM CHANNEL. APPLY ADDITIONAL LAYERS "AS NEEDED" TO REACH THE SPECIFIED TOE WOOD HEIGHT.
5. PLACE STACKED SOD MATS ABOVE TOE WOOD. THE USE OF TRANSPLANTS OR FABRIC LIFTS MAY BE FIELD APPROVED BY ENBRIDGE IN CONSULTATION WITH MN DNR.

### SOD MATTING

1. REMOVE VEGETATED MATS ON EITHER SIDE OF THE STREAM CROSSING USING ONSITE EQUIPMENT WHICH CAN UNDERCUT THE VEGETATION FOR REMOVAL. SMALL SHRUBS AND/OR TREES WITHIN THE SOD MATS ARE ACCEPTABLE AND SHOULD NOT BE REMOVED.
2. DEPENDING ON THE LEVEL OF SATURATION AT THE TIME OF REMOVAL, IT MAY BE DIFFICULT TO OBTAIN INTACT CONSOLIDATED MATS, BUT GENERALLY THE NATIVE VEGETATION WILL BE RETAINED AND CAPTURED FOR PLACEMENT.
3. SOD MATS CAN BE TRANSPLANTED DURING ANY SEASON.
4. SOD MAT WILL BE PLACED ON CLEAR GROUND OR MATS WITHIN THE WORKSPACE.
5. MONITOR MATS TO SUPPORT SURVIVABILITY; WATERING MAY BE NEEDED.
6. PRIOR TO PLACEMENT OF SOD MATS FINISH GRADE CHANNEL BANK AND ADJACENT FLOODPLAIN APPLICATION AREA TO PROVIDE A SMOOTH AND EVEN SURFACE. SUBGRADE ELEVATION SHOULD ALLOW FOR THE FINISHED SOD SURFACE TO TRANSITION EVENLY WITH THE CHANNEL BANKS UPSTREAM AND DOWNSTREAM OF THE INSTALLATION AREA. AVOID ABRUPT CHANGES IN GRADE.
7. RETURN THE VEGETATED MATS USING ONSITE EQUIPMENT.
8. SURFACE APPLIED SOD MATTING SHOULD BE PLACED WITH THE LONG SIDE PERPENDICULAR TO THE CHANNEL / FLOW.
9. STACKED SOD MATTING SHOULD BE PLACED WITH THE LONG SIDE PARALLEL TO THE CHANNEL / FLOW.
10. WHEN PLACING SOD MATS, DO NOT LEAVE LARGE GAPS BETWEEN EACH SOD MAT AS NON-NATIVE VEGETATION WILL QUICKLY ATTEMPT TO COLONIZE THESE VOIDS.
11. WATER SOD MATS AFTER REPLACEMENT IF CONDITIONS ARE HOT AND DRY. DAMP AND/OR FROZEN SOD MATS DO NOT REQUIRE WATERING.
12. THE TOP MAT AND/OR OTHER MATS CAN BE ANCHORED WITH A LIVE AND/OR DEAD STOUT STAKE TO ENSURE THAT IT DOES NOT MOBILIZE DURING A FLOOD EVENT BEFORE THE ROOTS HAVE ESTABLISHED.
13. THE VEGETATED MATS WILL BE REPLACED AS SOON AS PRACTICAL FOLLOWING BACKFILLING OF THE TRENCH AND STABILIZED PER THE TIMING REQUIREMENTS DESCRIBED IN SECTION 1.9.1 OF THE EPP.

## LIVE STAKING

1. CLEARLY REMOVE ALL SIDE BRANCHES AND THE TOP GROWTH, AND FASHION THE CUTTINGS INTO LIVE STAKES AS DEPICTED IN THE DETAIL DRAWING. AN OPTION DURING PREPARATION IS TO PAINT AND SEAL THE TOP OF THE LIVE STAKE BY DIPPING THE TOP 1-2 INCHES INTO A 50-50 MIX OF LIGHT-COLORED LATEX PAINT AND WATER. SEALING THE TOP OF STAKE WILL REDUCE THE POSSIBILITY OF DESICCATION, ASSURE THE STAKES ARE PLANTED WITH THE TOP UP, AND MAKES THE STAKES MORE VISIBLE FOR SUBSEQUENT PLANTING EVALUATIONS.
2. USE A PUNCH BAR OR HAND AUGER TO CREATE A NARROW PILOT HOLE, PERPENDICULAR TO THE SLOPE, THROUGH ANY EROSION CONTROL MATTING, RIP RAP, OR OTHER REVETMENT, FILTER FABRIC, ETC., IF PRESENT, AND DEEP ENOUGH TO INTERCEPT THE WATER TABLE. THE HOLE SHOULD BE ONLY AS LARGE AS NECESSARY TO INSTALL THE LIVE STAKE WITHOUT DAMAGE WHILE ENSURING THE HIGHEST AMOUNT OF STAKE-SOIL CONTACT.
3. INSERT THE POINTED END OF THE LIVE STAKE INTO THE PILOT HOLE. TAMP INTO THE GROUND WITH A DEAD BLOW HAMMER TAKING CARE NOT TO SPLIT OR OTHERWISE DAMAGE THE LIVE STAKE. USE WATER, SOIL BACKFILL, TAMPING, ETC. TO ACHIEVE GOOD SOIL-TO-STEM CONTACT AND REMOVE AIR POCKETS.
4. USE ONSITE EQUIPMENT TO APPLY WATER FROM THE CHANNEL AFTER INSTALLATION.
5. ALL CUTS SHOULD BE CLEAN AND SMOOTH. NO CRACKED OR SPLIT LIVE STAKES SHOULD BE USED. IF THEY SPLIT DURING TAMPING, THEY SHOULD BE CUT BELOW THE CRACK OR REPLACED.
6. THE SPECIFIED NUMBER OF LIVE STAKES SHOULD BE INSTALLED INTO THE SOIL AND PROTRUDE ABOVE THE SOIL AND ANY SOD MATTING, MULCHING, EROSION CONTROL MATTING, RIP RAP, OR OTHER REVETMENT.
7. LIVE STAKE SHOULD NOT MOVE AFTER INSTALLATION; ENSURING IT IS IN FIRM CONTACT WITH THE SOIL.
8. IT IS IMPORTANT TO ENSURE THAT THE UPSTREAM AND DOWNSTREAM ENDS OF THE LIVE STAKING A MERGE SMOOTHLY INTO THE UNDISTURBED BANK BEYOND THE PROJECT AREA. THE RATE OF INSTALLING LIVE STAKES SHOULD TAPER OFF GRADUALLY TO BLEND IN WITH THE EXISTING VEGETATION.

## TRANSPLANTS

1. SHRUBS AND/OR ALDER REMOVED FROM THE TRENCH AREA MAY BE USED IN LIEU OF SOD MATS IN ACCORDANCE WITH THE TRANSPLANT DETAIL.

	<u>COMMON NAME</u>	<u>SCIENTIFIC NAME</u>
<u>LIVE STAKE SPECIES</u>	ELDERBERRY	SAMBUCUS CANADENSIS
	RED-OSIER DOGWOOD	CORNUS STOLONIFERA
	SILKY DOGWOOD	CORNUS AMOMUM
<u>TRANSPLANTS</u>	SPECKELD ALDER	ALNUS INCANA
	DOGWOOD	CORNUS SPP.
<u>SHRUB</u>	BUSH HONEYSUCKLE	LONICERA TATARICA

1. PRELIMINARY SPECIES SELECTION. PRIOR TO RESTORATION ACTIVITIES, ALL SPECIES WILL BE REQUIRED TO BE VERIFIED AS NATIVE AND FOUND WITHIN THE COUNTY WHERE PLANTED ON MNTAXA.
2. LIVE STAKE SPECIES SELECTION: USE AT LEAST THREE (3) SPECIES WITH NO MORE THAN 60% OF ANY ONE (1) SPECIES; ALTERNATIVE SPECIES MAY BE SELECTED BASED ON SITE CONDITIONS AND AVAILABILITY. ALTERNATIVE SPECIES SHOULD BE REVIEWED AGAINST USDA DATA BASE FOR MN NATIVE SPECIES.
3. NO WILLOW PLANTING AT TROUT STREAMS. 50% ELDERBERRY, 25% BUSH HONEYSUCKLE, 25% DOGWOOD-ALDER COMBINED.
4. (WHERE APPLICABLE) TRANSPLANTS AND/OR CONTAINER SHRUBS MAY BE SUBSTITUTED FOR LIVE STAKES BASED ON SITE SPECIFIC CONDITIONS.
  - 4.1. CONTAINER PLANTED SHRUBS ARE RECOMMENDED TO BE 18"- 24" IN SIZE.
  - 4.2. CONTAINER PLANTED SHRUBS SPACING: 1 SHRUB PER 3 LINEAR FEET OF BANK, ADDITIONAL ROWS SPACED 3 FEET APART, AND 3-5 SHRUBS OF THE SAME SPECIES.
5. (WHERE APPLICABLE) TRANSPLANTS SHOULD BE EXCAVATED WITH A MINIMUM OF 12" SOIL, DIAMETER EQUAL TO PLANT DRIP LINE, AND LOOSE UNBOUND BALL.
6. LIVE STAKE SPACING (WHERE APPLICABLE): STAGGER 1 STAKE PER 3 LINEAR FEET OF STREAM BANK IN 2 - 3 ROWS SPACED 1 FOOT APART. PLACE FIRST ROW ALONG TOP OF BANK (BANKFULL) AND THE LOWER ROW(S) BETWEEN THE TOP OF BANK AND OHWM.

## 4 VEGETATION CHART

B	ISSUED FOR PERMITTING		10/2020		
A	ISSUED FOR REVIEW	MJT	08/2020		
NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D	APP'D
ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE-SPECIFIC RESTORATION PLAN LITTLE OTTER CREEK - MP 1118.4 - MDNR ID 65 SITE SPECIFIC DETAILS					
SCALE NOTED		DWG. NO. SSRP-1118.4-003		PAGE NO. 3/8	

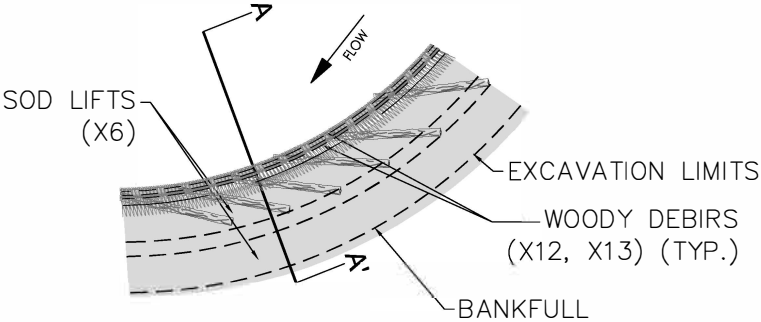
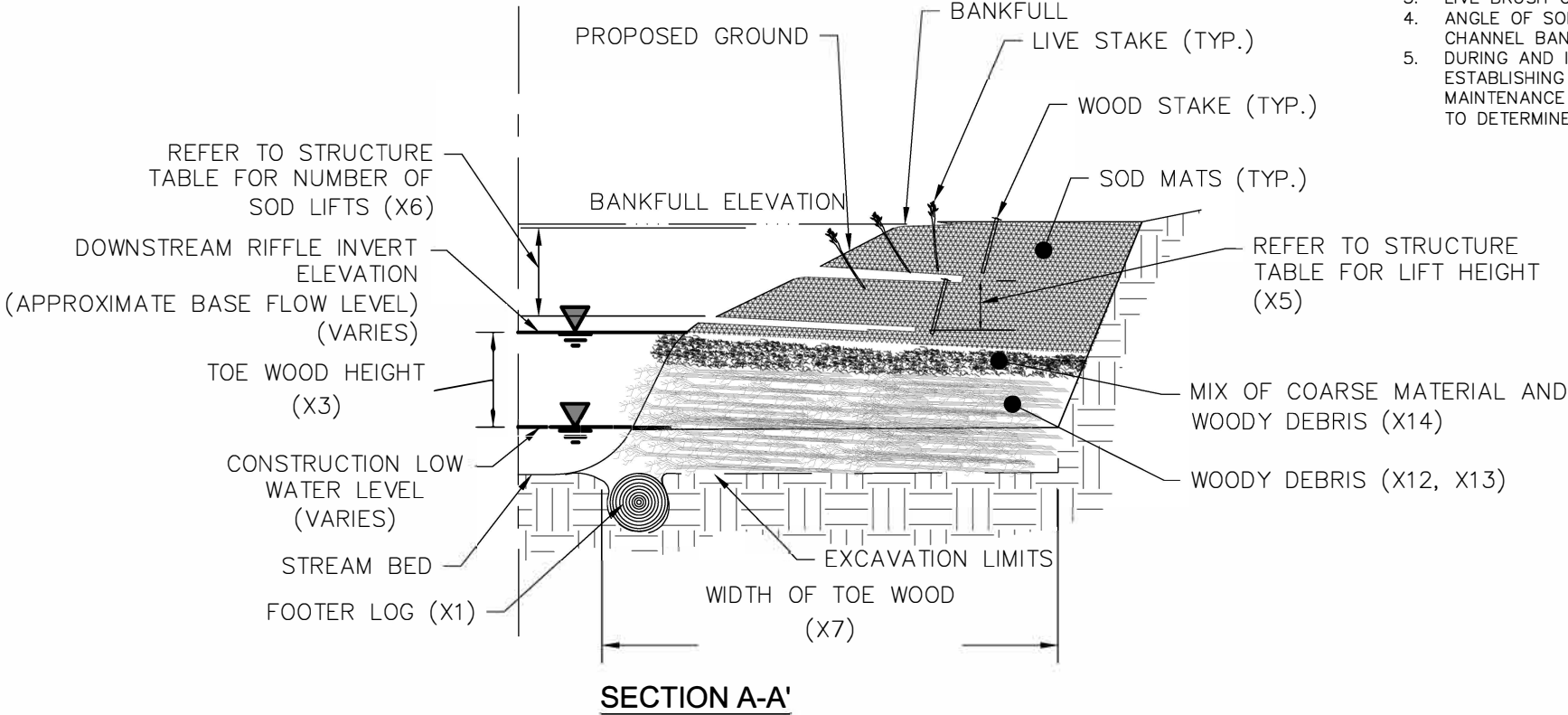


TOE WOOD DIMENSIONS			
VARIABLE	VALUE	TYPICAL UNIT	DESCRIPTION
X1	6.0 - 10.0	IN.	FOOTER LOG DIAMETER
X2	8.0 - 12.0	FT.	FOOTER LOG LENGTH
X3	18.0	IN.	TOE WOOD HEIGHT
X4	SEE SHEET 3	N/A	MATCH TYPICAL SECTION
X5	SEE SHEET 5	FT.	SOD LIFT HEIGHT
X6	3.0	#	SOD LIFTS
X7	8.0 - 10.0	FT.	TOE WOOD WIDTH
X8	3.0 - 6.0	FT.	SOD LIFT WIDTH
X9	24.0	IN.	WOOD STAKE LENGTH
X10	4.0	IN.	WOOD STAKE WIDTH (TOP)
X11	0.5	IN.	WOOD STAKE WIDTH (BOTTOM)
X12	1/2 - 3.0	IN.	WOODY DEBRIS DIAMETER
X13	8.0 - 12.0	FT.	WOODY DEBRIS LENGTH
X14	3" MINING GRAVEL WITH FINES	%	SELECT COARSE MATERIAL BACKFILL (BY VOLUME)



TOE WOOD EXAMPLE

- NOTES:
- WOODY MATERIAL OF APPROPRIATE SIZE CONSISTING OF LOGS, TRUNKS, LIMBS, BRANCHES, AND SMALLER WOODY DEBRIS INCLUDING TOPS OR SLASH. ON-SITE WOODY MATERIAL IS PREFERRED.
  - WOODY DEBRIS SHOULD BE GREEN OR RELATIVELY GREEN AND MAY CONSIST OF HARDWOODS, CONIFERS, OR A COMBINATION OF BOTH.
  - LIVE BRUSH OR OTHER BANK VEGETATION MAY BE INCORPORATED.
  - ANGLE OF SOD MAT SURFACE SHALL MATCH THE PROPOSED CHANNEL CROSS SECTION AND PROVIDE A SMOOTH AND EVEN CHANNEL BANK SURFACE BETWEEN UPSTREAM AND DOWNSTREAM BANKS.
  - DURING AND IMMEDIATELY AFTER CONSTRUCTION, BANK SLOPES ABOVE THE WOOD TOE ARE VULNERABLE TO EROSION. ESTABLISHING VEGETATION OR OTHER COVER MATERIAL AS SOON AS POSSIBLE WILL HELP REDUCE EROSION. ADDITIONAL MAINTENANCE IS NOT EXPECTED ONCE VEGETATION ESTABLISHES. INSPECTION AFTER LARGE FLOW EVENTS MAY BE ADVISABLE TO DETERMINE IF ANY MATERIAL MOVEMENT OR UNEXPECTED SCOUR HAS OCCURRED.



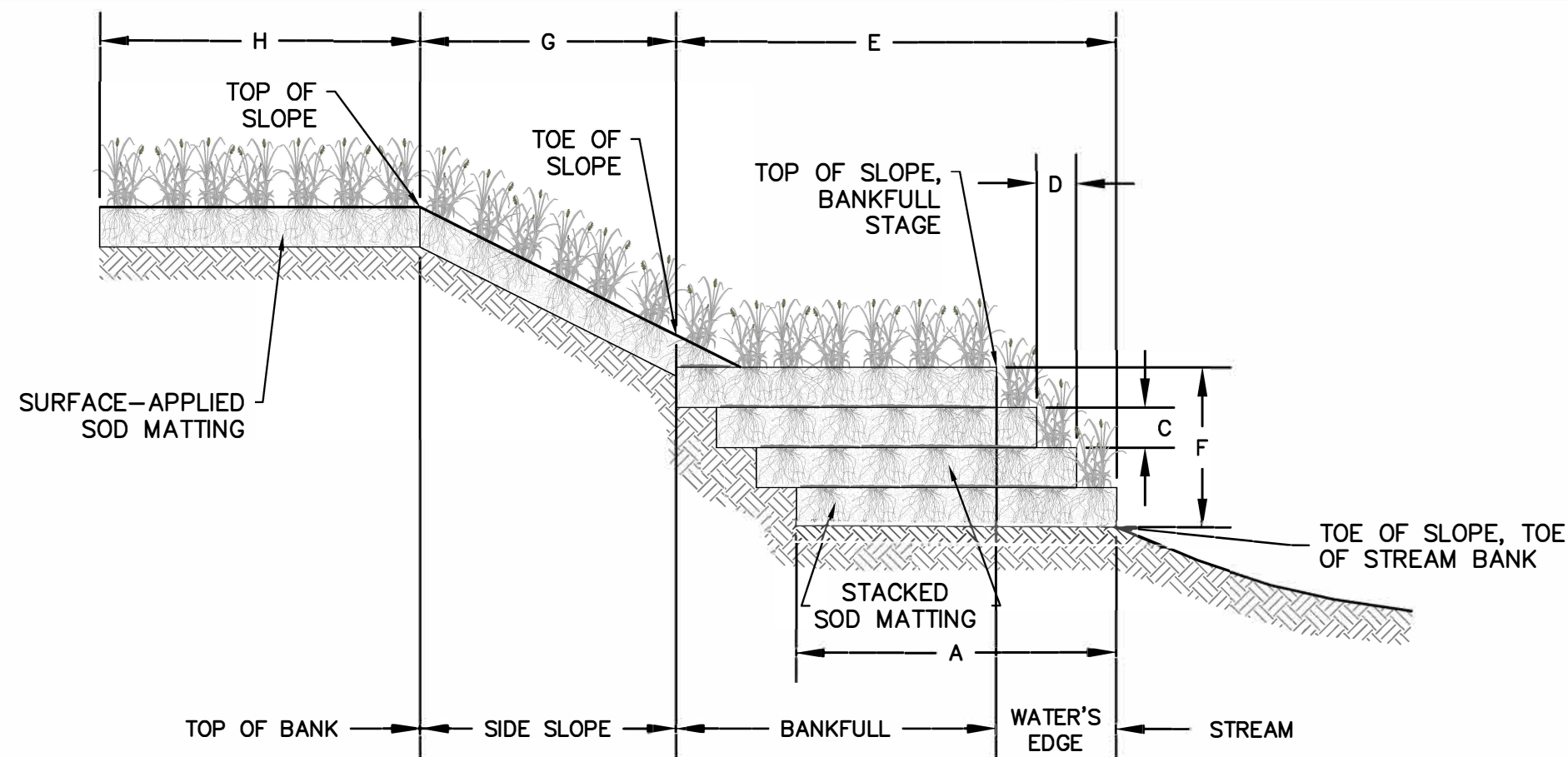
PLAN VIEW AT BANKFULL ELEVATION

1 TOE WOOD DETAIL

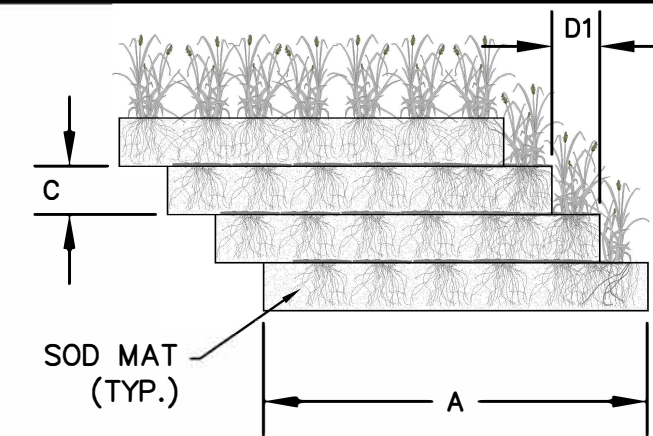


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A	ISSUED FOR REVIEW	MJT	08/2020		
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ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE-SPECIFIC RESTORATION PLAN LITTLE OTTER CREEK - MP 1118.4 - MDNR ID 65 SITE SPECIFIC DETAILS					
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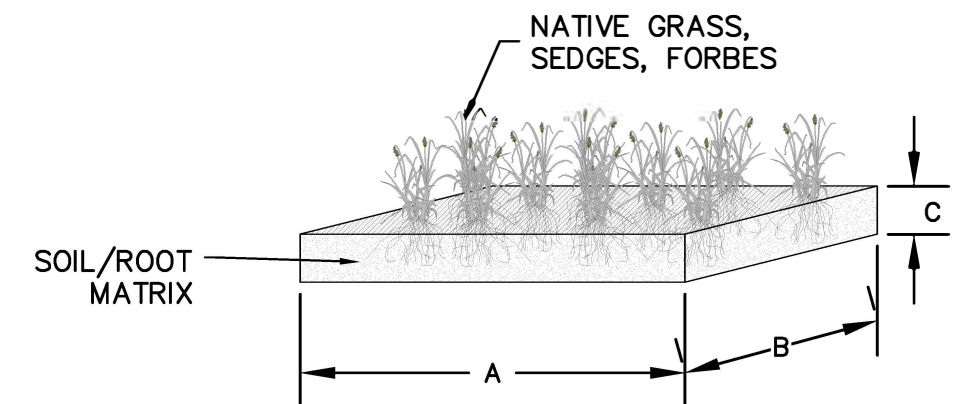




**CROSS SECTION**



**STACKED SOD MATTING DETAIL**



**SOD MAT DETAIL**

DIMENSION <sup>1</sup>	NAME	TYPICAL UNIT	VALUE	DESCRIPTION
A	SOD MAT WIDTH	FEET	3-4	WIDTH OF INDIVIDUAL SOD MAT.
B	SOD MAT LENGTH	FEET	3-6	LENGTH OF INDIVIDUAL SOD MAT.
C	SOD MAT THICKNESS	INCHES	12	THICKNESS OF INDIVIDUAL SOD MAT.
D	STACKED SOD MAT SETBACK	FEET	N/A	THE DISTANCE BETWEEN THE EDGES OF SOD MATS STACKED TO FORM A SLOPE
E	WIDTH OF STACKED SOD MATS	FEET	N/A	WIDTH OF A BANK CREATED BY STACKED SOD MATS
F	HEIGHT OF STACKED SOD MATS	FEET	N/A	HEIGHT OF A SLOPE CREATED BY STACKED SOD MATS
G	WIDTH OF SURFACE-APPLIED SOD MATS	FEET	10-20	WIDTH OF A SLOPE STABILIZED WITH SURFACE-APPLIED SOD MATS
H	TOP OF BANK SOD MATTING DISTANCE	FEET	15	DISTANCE SOD MATTING IS INSTALLED ON THE TOP OF BANK

NOTES:

1. DIMENSION LABELS ARE REFERENCED IN THE DETAIL DRAWINGS.



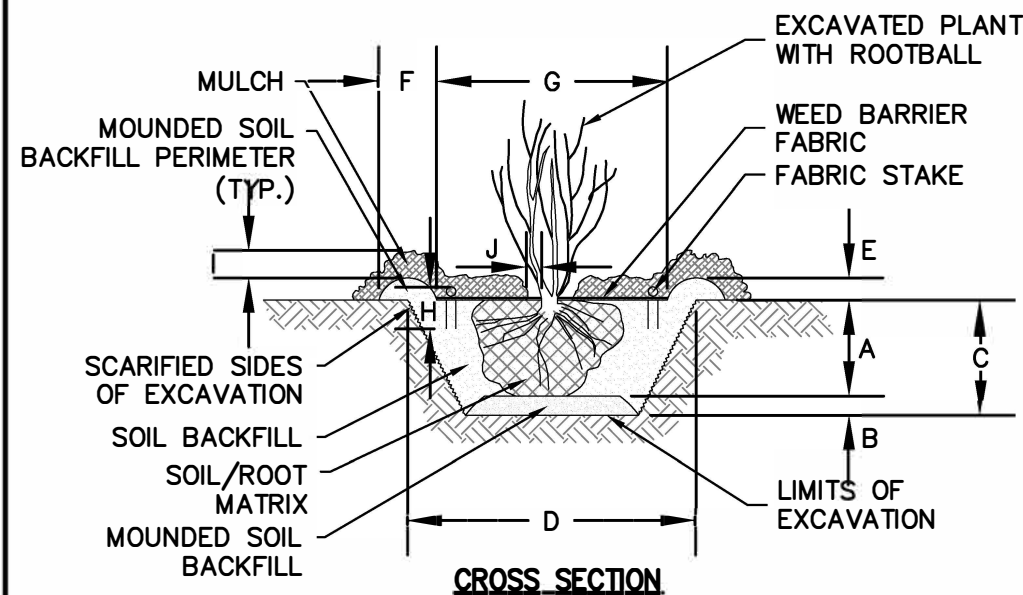
**SOD MAT EXAMPLES**

**SOD MATTING DETAIL**



B	ISSUED FOR PERMITTING		10/2020		
A	ISSUED FOR REVIEW	MJT	08/2020		
NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D	APP'D
ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE-SPECIFIC RESTORATION PLAN LITTLE OTTER CREEK - MP 1118.4 - MDNR ID 65 SITE-SPECIFIC DETAILS					
SCALE	NOTED	DWG. NO.	SSRP-- 1118.4--005	PAGE NO.	5/8





DIMENSION <sup>1</sup>	NAME	TYPICAL UNIT	VALUE	DESCRIPTION
A	PLANTING DEPTH	INCHES	12-18	PLANTING DEPTH OF THE TRANSPLANT.
B	HEIGHT OF MOUNDED SOIL BACKFILL	INCHES	N/A	HEIGHT OF MOUNDED LOOSE SOIL PLACED INTO OVER-EXCAVATED PLANTING PIT.
C	DEPTH OF PLANTING PIT	INCHES	12-18	DEPTH OF THE PLANTING PIT; ACCOMMODATES DIMENSION OF SOIL AND EXCAVATED ROOTS AS WELL AS MOUNDED LOOSE SOIL AT BOTTOM OF PIT.
D	WIDTH OF PLANTING PIT	FEET	3-5	OVER-EXCAVATED WIDTH OF THE PLANTING PIT; ACCOMMODATES THE WIDTH OF THE EXCAVATED SOIL AND ROOTS.
E	HEIGHT OF MOUNDED SOIL PERIMETER	INCHES	0-2	HEIGHT OF SOIL BERM CONSTRUCTED ALONG THE PERIMETER OF THE PLANTING PIT; HELPS RETAIN WATER.
F	WIDTH OF MOUNDED SOIL PERIMETER	INCHES	0-6	WIDTH OF SOIL BERM CONSTRUCTED ALONG THE PERIMETER OF THE PLANTING PIT; HELPS RETAIN WATER.
G	WIDTH OF WEED BARRIER FABRIC (OPTIONAL)	INCHES	N/A	WIDTH OF FABRIC PLACED ON SURFACE TO CONTROL WEEDS WITHIN THE MOUNDED SOIL PERIMETER; TRANSPLANTS TYPICALLY HAVE GRASSES, LEAF MATTER, ETC. ATTACHED AND DO NOT REQUIRE WEED BARRIER FABRIC.
H	FABRIC STAKE LENGTH (OPTIONAL)	INCHES	N/A	LENGTH OF STAPLES/SPIKES USED TO SECURE WEED BARRIER FABRIC
I	THICKNESS OF MULCH (OPTIONAL)	INCHES	N/A	THICKNESS OF MULCH, IF NECESSARY. TRANSPLANTS TYPICALLY HAVE GRASSES, LEAF MATTER, ETC. ATTACHED AND DO NOT REQUIRE MULCH.
J	GAP BETWEEN MULCH AND PLANT STEM/TRUNK (OPTIONAL)	INCHES	N/A	ROOM BETWEEN PLANT STEM/TRUNK AND MULCH. TRANSPLANTS TYPICALLY HAVE GRASSES, LEAF MATTER, ETC. ATTACHED

NOTES:  
1. DIMENSION LABELS ARE REFERENCED IN THE DETAIL DRAWINGS.



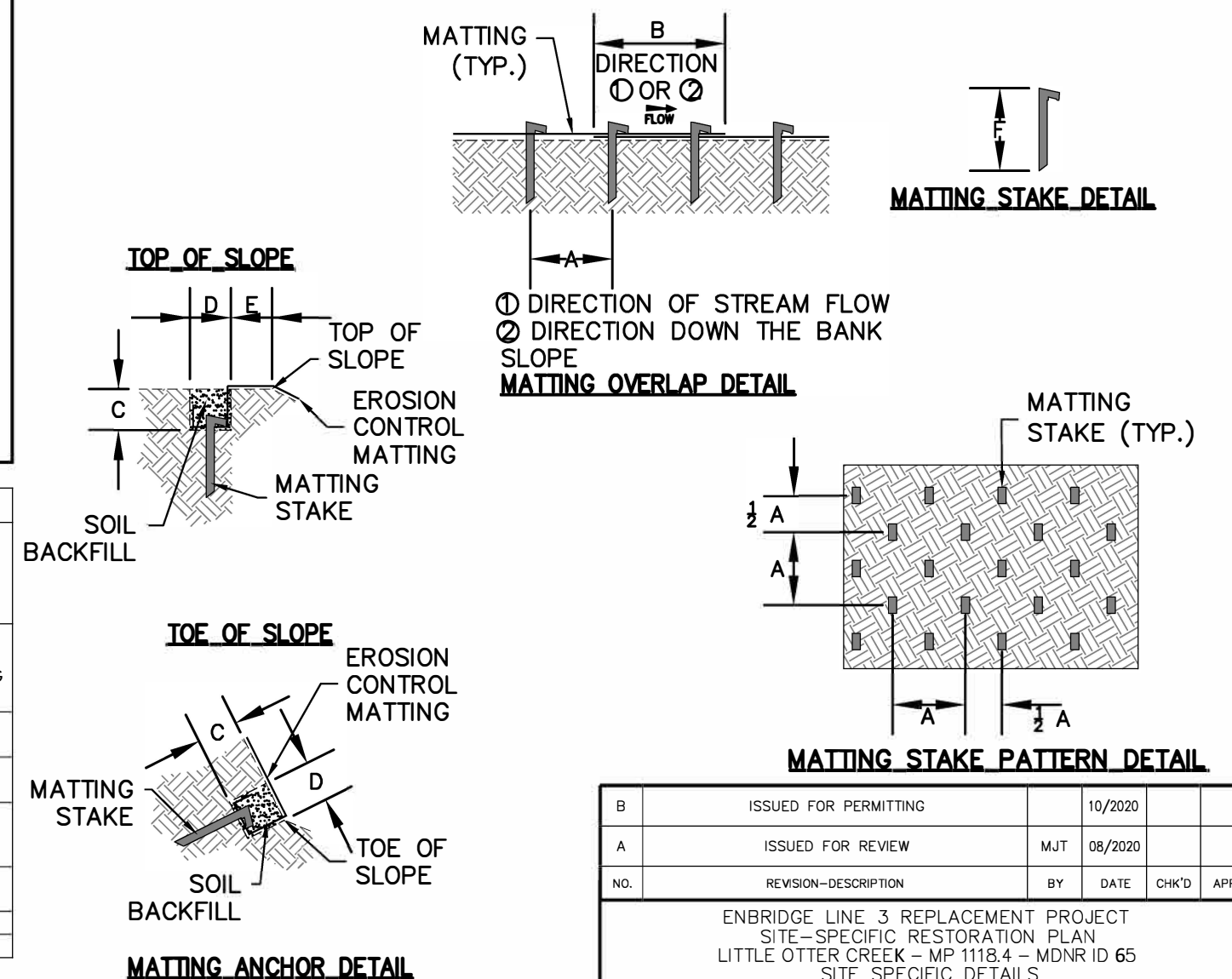
**TRANSPLANTS EXAMPLES**

## TRANSPLANTING DETAIL

DIMENSION <sup>1</sup>	NAME	TYPICAL UNIT	VALUE	DESCRIPTION
A	MATting STAKE SPACING	FEET, INCHES	N/A	SPACING BETWEEN EROSION CONTROL MATting STAKES USED TO FASTEN THE MATting TO THE SOIL
B	MATting OVERLAP	FEET, INCHES	N/A	AMOUNT OF EROSION CONTROL MATting OVERLAP IF MULTIPLE PIECES AND/OR ROLLS OF MATting ARE USED. OVERLAP VARIES DEPENDING ON THE LOCATION OF THE OVERLAP WITH RESPECT TO POSITION ON THE SLOPE, LOCATION OF THE MATting (EDGE OR END), AND PRODUCT SPECIFICATIONS.
C	MATting ANCHOR TRENCH DEPTH	FEET, INCHES	N/A	DEPTH OF TRENCH INTO WHICH EDGE OF EROSION CONTROL MATting IS ANCHORED AT THE TOP AND/OR TOE OF A SLOPE.
D	MATting ANCHOR TRENCH WIDTH	FEET, INCHES	N/A	WIDTH OF TRENCH INTO WHICH EDGE OF EROSION CONTROL MATting IS ANCHORED AT THE TOP AND/OR TOE OF A SLOPE.
E	TOP OF SLOPE ANCHOR TRENCH SETBACK	FEET, INCHES	N/A	TOP OF SLOPE ANCHOR TRENCH DISTANCE FROM THE TOP OF SLOPE. TOP OF SLOPE REFERS TO TOP OF SIDE SLOPE, BANK SLOPE, TERRACE SLOPE, BANKFULL, ETC.
F	MATting STAKE LENGTH	INCHES	N/A	LENGTH OF EROSION CONTROL MATting STAKES OR STAPLES USED TO FASTEN THE MATting TO THE SOIL

NOTES:  
1. DIMENSION LABELS ARE REFERENCED IN THE DETAIL DRAWINGS.

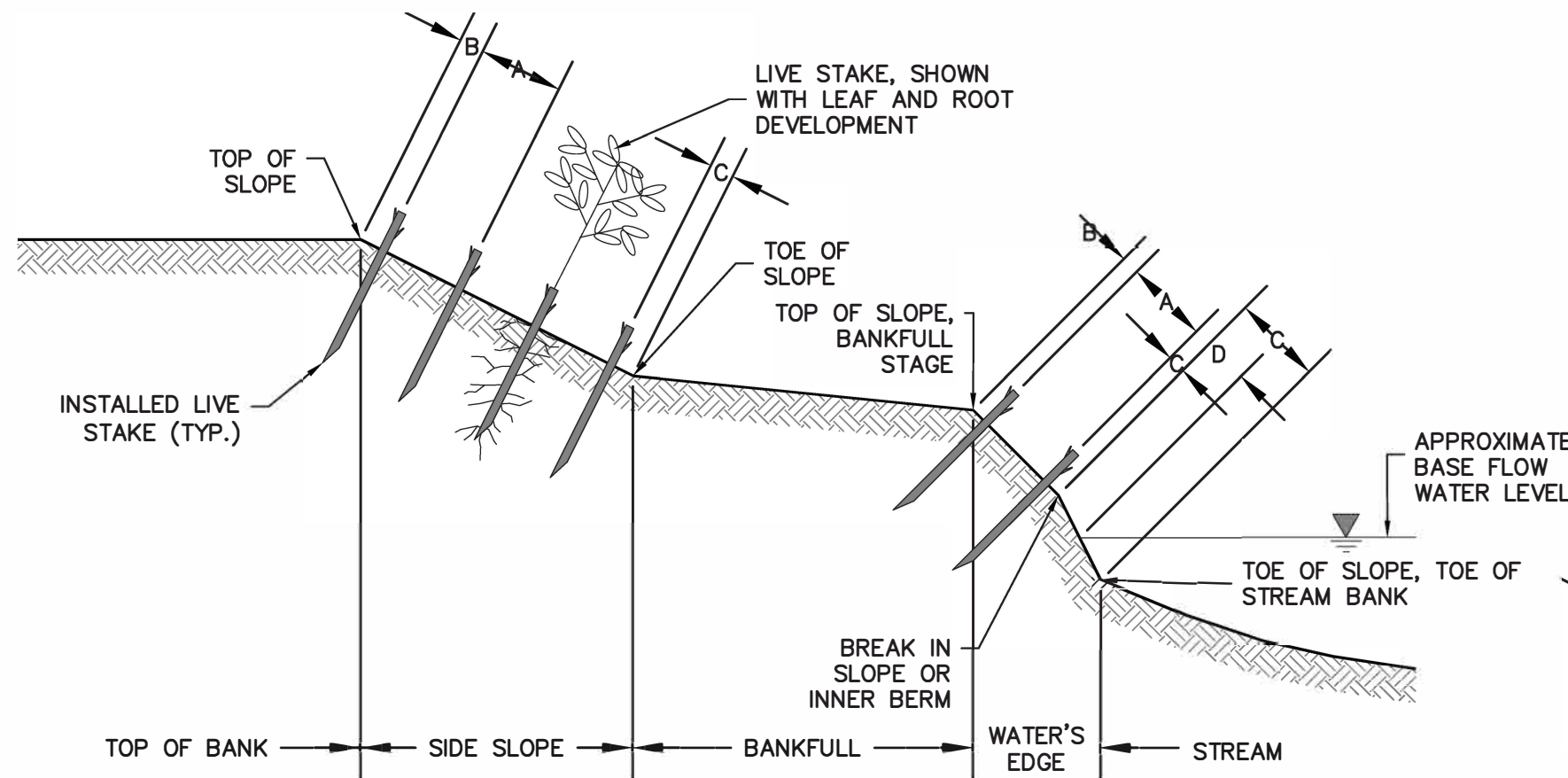
## EROSION CONTROL MATTING DETAIL



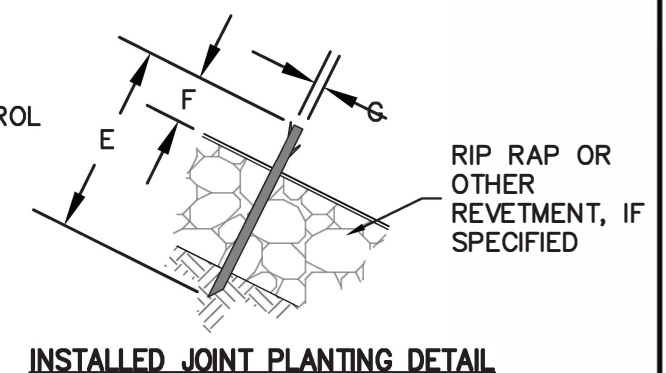
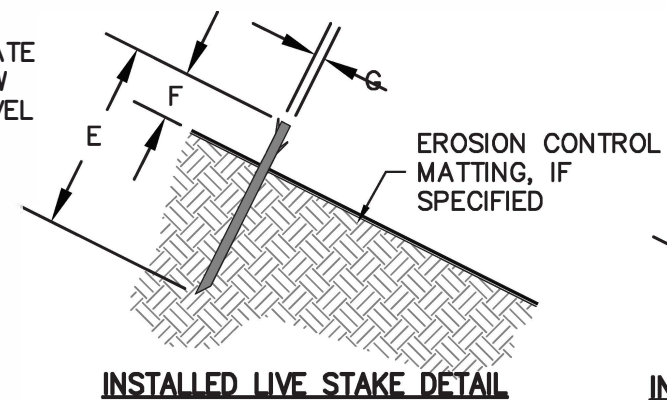
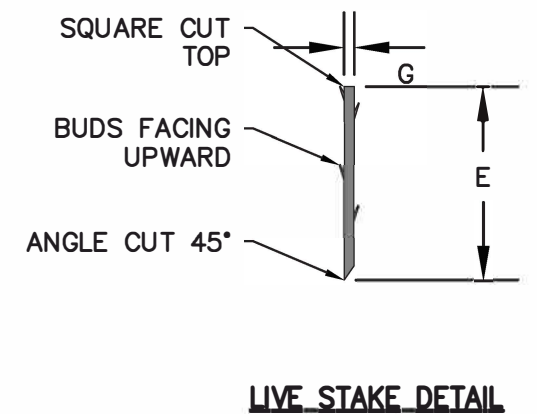
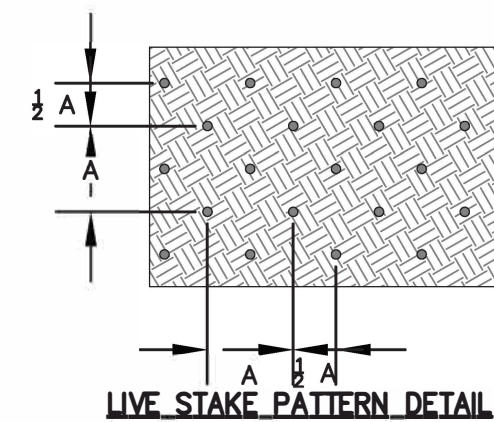
B	ISSUED FOR PERMITTING		10/2020		
A	ISSUED FOR REVIEW	MJT	08/2020		
NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D	APP'D
ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE-SPECIFIC RESTORATION PLAN LITTLE OTTER CREEK - MP 1118.4 - MDNR ID 65 SITE SPECIFIC DETAILS					
SCALE	NOTED	DWG. NO.	SSRP-1094.0-004	PAGE NO.	6/8







**CROSS SECTION**



**LIVE STAKE EXAMPLE**

DIMENSION <sup>1</sup>	NAME	TYPICAL UNIT	VALUE	DESCRIPTION
A	LIVE STAKE SPACING	FEET	300	SPACING BETWEEN INDIVIDUALLY INSTALLED LIVE STAKES. STAKES CAN BE PLACED IN A TRIANGULAR GRID (NRCS 2007A) OR RANDOMLY (NRCS 2007A, IOWA DNR 2006). RECOMMEND SPECIES DIVERSITY THROUGHOUT PROJECT AREA.
B	LIVE STAKE – TOP OF SLOPE PLACEMENT	INCHES	0-3	POSITION OF LIVE STAKE RELATIVE TO THE TOP OF A SLOPE
C	LIVE STAKE – TOE OF SLOPE PLACEMENT	INCHES	0-3	POSITION OF LIVE STAKE RELATIVE TO THE TOE OF A SLOPE
D	LIVE STAKE – BASE FLOW RELATIONSHIP	FEET	1239.0	PLACEMENT OF LOWER ROW OF LIVE STAKES RELATIVE TO THE APPROXIMATE BASE FLOW WATER LEVEL WITH CONSIDERATION GIVEN TO DURATION OF INUNDATION DURING BANKFULL AND OTHER HIGH FLOW EVENTS.
E	LIVE STAKE LENGTH	INCHES	24-36	LENGTH OF PREPARED DORMANT LIVE CUTTING FROM WOODY PLANT TO BE USED AS LIVE STAKE. LENGTH SHOULD BE SUFFICIENT TO REACH LOW-FLOW WATER TABLE ELEVATION.
F	LIVE STAKE PROTRUSION	INCHES	3-4	DISTANCE INSTALLED LIVE STAKE SHOULD PROTRUDE ABOUT 20% FROM THE GROUND. AT LEAST TWO BUDS OR BUD SCARS SHOULD BE PRESENT ABOVE THE GROUND IN THE FINAL INSTALLATION, DEPENDING ON THE SURROUNDING VEGETATION HEIGHT.
G	LIVE STAKE DIAMETER	INCHES	1/2 - 1 1/2	DIAMETER OF PREPARED DORMANT LIVE CUTTING FROM WOODY PLANT TO BE USED AS LIVE STAKE – TYPICALLY CITE A PERMISSIBLE MINIMUM AND MAXIMUM DIAMETER.

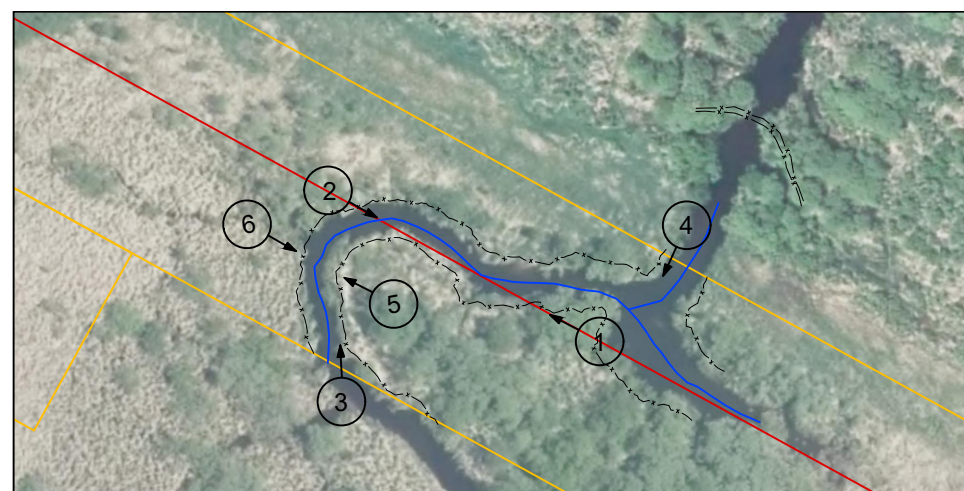
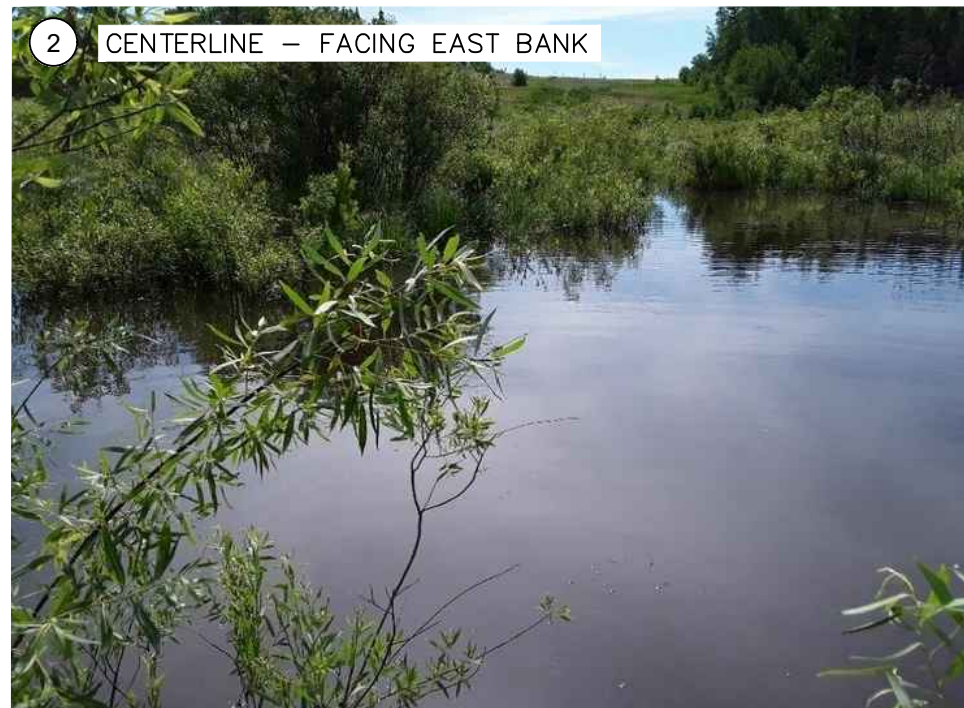
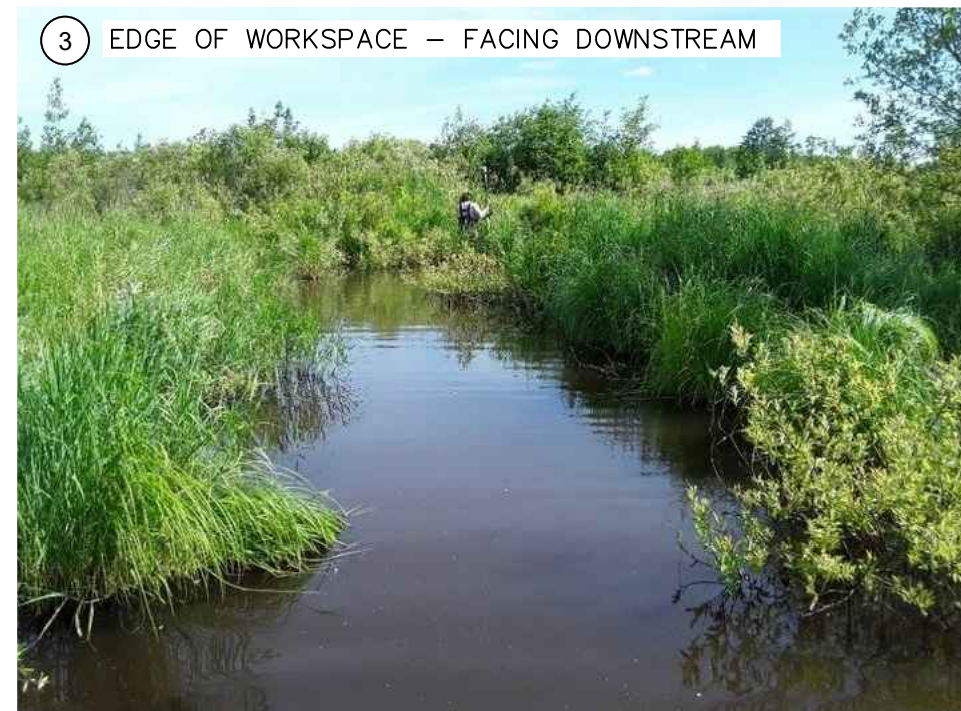
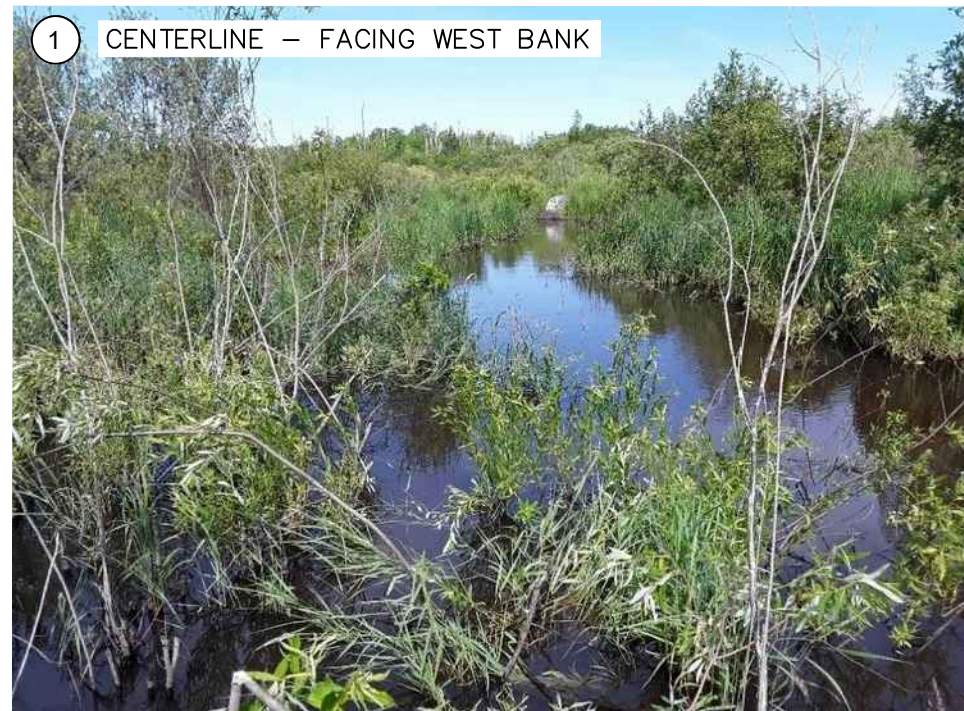
NOTES:  
1. DIMENSION LABELS ARE REFERENCED IN THE DETAIL DRAWINGS.

**LIVE STAKE PLANTINGS DETAIL**

B	ISSUED FOR PERMITTING		10/2020		
A	ISSUED FOR REVIEW	MJT	08/2020		
NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D	APP'D
ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE-SPECIFIC RESTORATION PLAN LITTLE OTTER CREEK - MP 1118.4 - MDNR ID 65 SITE SPECIFIC DETAILS					
SCALE	NOTED	DWG. NO.	SSRP- 1118.4-004	PAGE NO.	7/8







- NOTES:**
1. AIR PHOTOS ARE FROM 2018 ENBRIDGE AERIAL PHOTOGRAPHY.
  2. ADDITIONAL ON-THE GROUND PHOTOS MAY BE TAKEN PRIOR TO CONSTRUCTION AT MDNR REQUEST.
  3. PRE-CONSTRUCTION PHOTOS WILL BE USED TO AID IN RESTORATION.



B	ISSUED FOR PERMITTING	MJT	10/2020		
A	ISSUED FOR REVIEW	MJT	08/2020		
NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D	APP'D
ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE-SPECIFIC RESTORATION PLAN LITTLE OTTER CREEK — MP 1118.4 — MDNR ID 65 PHOTO PAGE					
SCALE		DWG. NO. SSRP-1118.4-005		PAGE NO. 5/5	



GENERAL

1. THE SPECIFICATIONS WITHIN THIS SSRP MAY MODIFY OR REPLACE PROJECT–WIDE STANDARDS PRESENTED IN THE EPP. WHERE MATERIAL WITHIN THESE SSRPS EXCEEDS STANDARD CONSTRUCTION MEASURES IN THE EPP, THESE SSRPS SUPERSEDE THE EPP.
2. CONSTRUCTION AND RESTORATION OF WATERBODY CROSSINGS WILL FOLLOW THESE GENERAL STEPS:

A. SITE CLEARING

B. INSTALLATION OF TEMPORARY EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES (‘BMPS’)

C. BRIDGE INSTALLATION

D. EXCAVATION/BACKFILLING OF THE WATERBODY INCLUDING:

• SOD SAVING TOPSOIL SEGREGATION AT NON–WOODED SITES

• STREAMBED MATERIAL SEGREGATION

• PIPE INSTALLATION

• BACKFILL, INCLUDING IMPLEMENTATION OF CONSTRUCTION–RELATED RESTORATION METHODS (I.E., TOE WOOD)

E. REPLACEMENT OF STREAMBED MATERIAL AND TOPSOIL/SOD LAYER

F. RESTORATION OF STREAM BANKS TO PRE–CONSTRUCTION CONTOURS

G. IF FINAL GRADING NOT POSSIBLE AT THE TIME, TEMPORARY STABILIZATION AND REPLACEMENT/REINFORCEMENT OF TEMPORARY BMPS

H. AFTER FINAL GRADING, PERMANENT SEEDING AND/OR WOODY VEGETATION RESTORATION, STABILIZATION AND REPLACEMENT/REINFORCEMENT OF TEMPORARY BMPS

I. BRIDGE REMOVAL DURING FINAL RESTORATION AFTER STABILIZATION AND PERMANENT SEEDING

J. POST–CONSTRUCTION MONITORING
- CROSSING METHODS
1. ALL WATERBODY AND WETLAND CROSSINGS WILL BE CONDUCTED IN COMPLIANCE WITH SECTION 2.0 AND SECTION 3.0 OF THE ENVIRONMENTAL PROTECTION PLAN (‘EPP’), RESPECTIVELY. SECTION 2.0 AND 3.0 OF THE WINTER CONSTRUCTION PLAN PRESENTS MODIFICATIONS FOR WATERBODY AND WETLAND CONSTRUCTION METHODS, RESPECTIVELY, IN WINTER CONDITIONS.

2. ENBRIDGE’S SUMMARY OF CONSTRUCTION METHODS AND PROCEDURES (THE ‘PROCEDURES,’APPENDIX A OF THE EPP) OUTLINES THE VARIOUS CONSTRUCTION METHODS THAT ENBRIDGE MAY UTILIZE TO CONSTRUCT THROUGH WATERBODIES AND WETLANDS/BASINS AS PRESENTED ON THESE SITE–SPECIFIC RESTORATION PLANS (‘SSRPS’).

A. DRY CROSSING (ISOLATED) METHODS (INCLUDING THE DRY CROSSING AND MODIFIED DRY CROSSING METHOD) ARE DESCRIBED SECTIONS 4.3 OF THE PROCEDURES, AND IN SECTIONS 2.5.2 AND 2.5.3 AND FIGURES 23 AND 24 OF THE EPP.

B. THE BORE METHOD (NON–PRESSURIZED) IS DESCRIBED IN SECTION 3.5 OF THE PROCEDURES, AND SECTION 4.0 OF THE EPP.

C. THE MODIFIED UPLAND CONSTRUCTION (WETLAND) METHOD IS DESCRIBED IN SECTION 3.3 OF THE PROCEDURES, AND SECTION 3.0 AND FIGURES 30 TO 34 OF THE EPP.

D. ALTHOUGH NOT PROPOSED AS A PRIMARY METHOD AT THESE SSRP WATERBODIES, THE OPEN CUT (NON–ISOLATED) WATERBODY CROSSING METHOD IS DESCRIBED IN SECTION 4.1 OF THE PROCEDURES, AND SECTION 2.5.1 AND FIGURE 24 OF THE EPP.

E. ALTHOUGH NOT PROPOSED AS A PRIMARY METHOD AT THESE SSRP WATERBODIES, THE PUSH–PULL METHOD IS DESCRIBED IN SECTION 3.4 OF THE PROCEDURES, AND SECTION 3.7.1 AND FIGURES 35 AND 36 OF THE EPP.

CLEARING/VEGETATION REMOVAL

1. STUMPS WITHIN THE TRENCH LINE WILL BE COMPLETELY REMOVED, GROUND, AND/OR HAULED OFF–SITE TO AN APPROVED LOCATION. TREE STUMPS OUTSIDE THE TRENCH LINE WILL BE GROUND BELOW NORMAL GROUND SURFACE TO FACILITATE A SAFE WORK AREA AND TO ALLOW TOPSOIL REMOVAL, IF NECESSARY. IN SOME CIRCUMSTANCES, TREE STUMPS OUTSIDE THE TRENCH LINE MAY BE COMPLETELY REMOVED TO ALLOW FOR A SAFE WORK AREA AND HAULED OFF–SITE TO AN APPROVED LOCATION AS OUTLINED IN SECTION 1.8.3 OF THE EPP.

2. CLEARING WILL BE CONDUCTED IN WATERBODIES AND WETLANDS AS OUTLINED IN SECTION 2.2 AND 3.2 OF THE EPP, RESPECTIVELY. CHIPS, MULCH, OR MECHANICALLY CUT WOODY DEBRIS SHALL NOT BE STOCKPILED IN A WETLAND. HYDRO–AX DEBRIS, OR SIMILAR CAN BE LEFT IN THE WETLAND IF SPREAD EVENLY IN THE CONSTRUCTION WORKSPACE TO A DEPTH THAT WILL ALLOW FOR NORMAL REVEGETATION, AS DETERMINED BY THE EI. CHIPPING IS NOT ALLOWED ON PUBLIC LANDS. ON PUBLIC LANDS, MULCH AND MECHANICALLY CUT WOODY DEBRIS MUST BE UNIFORMLY BROADCAST TO LESS THAN 2–INCH THICKNESS AND IN A MANNER THAT MAINTAINS VISIBLE GROUND.

3. ENBRIDGE WILL PROPERLY INSTALL AND MAINTAIN REDUNDANT SEDIMENT CONTROL MEASURES IMMEDIATELY AFTER CLEARING AND PRIOR TO INITIAL GROUND DISTURBANCE AT SURFACE WATERS LOCATED WITHIN 50 FEET OF THE PROJECT AND WHERE STORMWATER FLOWS TO THE SURFACE WATER (REFER TO THE ENVIRONMENTAL PLAN SHEETS IN THE SWPPP), AND WITHIN 100 FEET OF SPECIAL AND IMPAIRED WATERS, INCLUDING TROUT STREAMS.

4. ON PUBLIC LANDS AND WHEREVER PRACTICABLE AT WATERBODY CROSSINGS, ENBRIDGE WILL USE WILDLIFE–FRIENDLY EROSION AND SEDIMENT CONTROL BMPS THAT CONTAIN BIODEGRADABLE NETTING (CATEGORY 3N OR 4N NATURAL FIBER) AND WILL AVOID THE USE OF PLASTIC MESH (SECTIONS 1.17.1 AND 2.6.1 OF THE EPP).

TEMPORARY STABILIZATION

1. ON PORTIONS OF THE PROJECT WHERE WORK WILL BE OCCURRING DURING APPLICABLE ‘WORK IN WATER RESTRICTIONS’FOR PUBLIC WATERS (REFER TO SECTION 2.1), ALL EXPOSED SOIL AREAS WITHIN 200 FEET OF THE WATER’S EDGE, AND THAT DRAIN TO THAT WATER, WILL BE STABILIZED WITHIN 24 HOURS DURING THE RESTRICTION PERIOD. STABILIZATION OF ALL EXPOSED SOILS WITHIN 200 FEET OF THE PUBLIC WATER’S EDGE, AND THAT DRAIN TO THAT WATER, WILL BE INITIATED IMMEDIATELY AND COMPLETED WITHIN 7 CALENDAR DAYS WHENEVER CONSTRUCTION ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED ON ANY PORTION OF THE SITE OUTSIDE OF THE RESTRICTION PERIOD. THESE AREAS WILL BE IDENTIFIED ON THE ENVIRONMENTAL PLAN SHEETS ACCOMPANYING THE SWPPP.

2. HYDRO–MULCH AND LIQUID TACKIFIER CAN BE USED IN PLACE OF CERTIFIED WEED–FREE STRAW OR HAY MULCH WITH PRIOR APPROVAL FROM ENBRIDGE. ALL HYDROMULCH AND LIQUID TACKIFIER PRODUCTS USED WILL BE ON THE APPLICABLE STATE DOT PRODUCT LIST. HYDRO–MULCH AND LIQUID TACKIFIER PRODUCTS CONTAINING PLASTIC/POLYPROPYLENE FIBER ADDITIVES AND MALACHITE GREEN (COLORANT) WILL NOT BE UTILIZED ON THIS PROJECT. APPLICATION RATES WILL BE AT THE MANUFACTURER’S RECOMMENDED RATE. ENBRIDGE WILL AVOID THE USE OF HYDROMULCH ON PUBLIC LANDS; HOWEVER, ENBRIDGE MAY USE HYDROMULCH ON STEEP SLOPES TO PREVENT EROSION UNTIL PERMANENT COVER HAS BEEN ESTABLISHED AS OUTLINED IN SECTION 1.8.3 OF THE EPP.

RESTORATION AND STABILIZATION

1. ENBRIDGE WILL RESTORE THE STREAM BANKS AS NEAR AS PRACTICABLE TO PRE–CONSTRUCTION CONDITIONS UNLESS THAT SLOPE IS DETERMINED TO BE UNSTABLE. IF THE SLOPE IS CONSIDERED UNSTABLE, ENBRIDGE WILL RESHAPE THE BANKS TO PREVENT SLUMPING. FOR PUBLIC WATERS, ENBRIDGE WILL RETURN THE BANK TO PRE–CONSTRUCTION CONTOURS, UNLESS OTHERWISE DIRECTED BY THE SITE–SPECIFIC RESTORATION PLAN. IF ENBRIDGE CANNOT RESTORE TO PRE–CONSTRUCTION CONTOURS AT A PUBLIC WATER, ENBRIDGE WILL CONSULT WITH THE MDNR BEFORE PROCEEDING FURTHER AS OUTLINED IN SECTION 2.6 OF THE EPP.

2. UNSTABLE SOILS AND/OR SITE–SPECIFIC FACTORS SUCH AS STREAM VELOCITY AND FLOW DIRECTION MAY REQUIRE ADDITIONAL RESTORATION EFFORTS, SUCH AS INSTALLATION OF WOODY VEGETATION, GEOTEXTILE FABRIC, OR TREE, LOG, ROOTWAD, OR BOULDER REVETMENTS TO STABILIZE DISTURBED STREAM BANKS (SEE FIGURE 29) AS OUTLINED IN SECTION 2.6.2 OF THE EPP. ENBRIDGE WILL WORK WITH THE MDNR TO ENSURE ALL WORK/ADJUSTMENTS ARE APPROVED AND ARE CONDUCTED WITHIN APPLICABLE TIMING RESTRICTIONS.

3. IN UPLAND AND WETLAND AREAS, CLEANUP AND ROUGH GRADING WILL OCCUR AS OUTLINED IN SECTIONS 1.16 AND 3.9 OF THE EPP. ENBRIDGE WILL BACKFILL THE TRENCH TO AN ELEVATION SIMILAR TO THE ADJACENT AREAS OUTSIDE THE TRENCH LINE AND WILL ADD A SLIGHT CROWN OF APPROXIMATELY 3 TO 6 INCHES (DEPENDING ON SOIL TYPE) OVER THE BACKFILLED TRENCH TO ALLOW FOR SUBSIDENCE. GENERALLY, EXCESS SUBSOIL DISPLACED BY THE PIPE INSTALLATION WILL BE SPREAD ACROSS THE PORTION OF THE CONSTRUCTION WORKSPACE WHERE TOPSOIL REMOVAL HAS OCCURRED. ANY REMAINING EXCESS SUBSOIL WILL BE REMOVED AND DISPOSED OF AT AN APPROVED OFF–SITE LOCATION AS NEEDED TO ENSURE CONTOURS ARE RESTORED TO AS NEAR AS PRACTICABLE TO PRE–CONSTRUCTION CONDITIONS.

4. REVEGETATION ACTIVITIES WILL OCCUR AS OUTLINED IN SECTION 7.0 OF THE EPP. SEED MIXES AT PUBLIC WATERS WILL BE SELECTED AND APPLIED AS INDICATED IN THE PLANTING PLAN, WHICH IS APPENDIX A OF THE POST–CONSTRUCTION VEGETATION MANAGEMENT PLAN FOR PUBLIC LANDS AND WATERS (‘VMP’). SEED MIXES RELATIVE TO THESE SSRP CROSSINGS ARE CODED AS FOLLOWS:

A	EMERGENT (34–181)	G	DRY PRAIRIE GENERAL (35–221)
B	RIPARIAN NE (34–361)	H	MESIC PRAIRIE GENERAL (35–241)
C	RIPARIAN S&W (34–261)	I	MESIC PRAIRIE NW (35–441)
D	WET MEADOW NE (34–371)	J	DRY PRAIRIE NORTHWEST (35–421)
E	WET MEADOW S&W (34–271)	K	WOODLAND EDGE NE (36–311)
F	WETLAND REHABILITATION (34–171)	L	NATURAL REVEGETATION

5. ENBRIDGE WILL NOT SEED STANDING WATER OR WOODED (PSS AND PFO) WETLAND COMMUNITIES. NATURAL REVEGETATION WILL TAKE PLACE FROM EXISTING PLANT MATERIAL AND ROOT STOCK IN THESE COMMUNITIES.

6. ALL MATERIALS USED FOR CONSTRUCTION OF THE PROJECT MUST BE REMOVED FROM THE SITE.

7. ENBRIDGE WILL CONDUCT POST–CONSTRUCTION MONITORING IN ACCORDANCE WITH THE POST–CONSTRUCTION MONITORING PLAN FOR WETLANDS AND WATERBODIES, AND IN ACCORDANCE WITH THE VMP FOR THE UPLAND PORTIONS OF THE PROJECT ON PUBLIC LANDS.

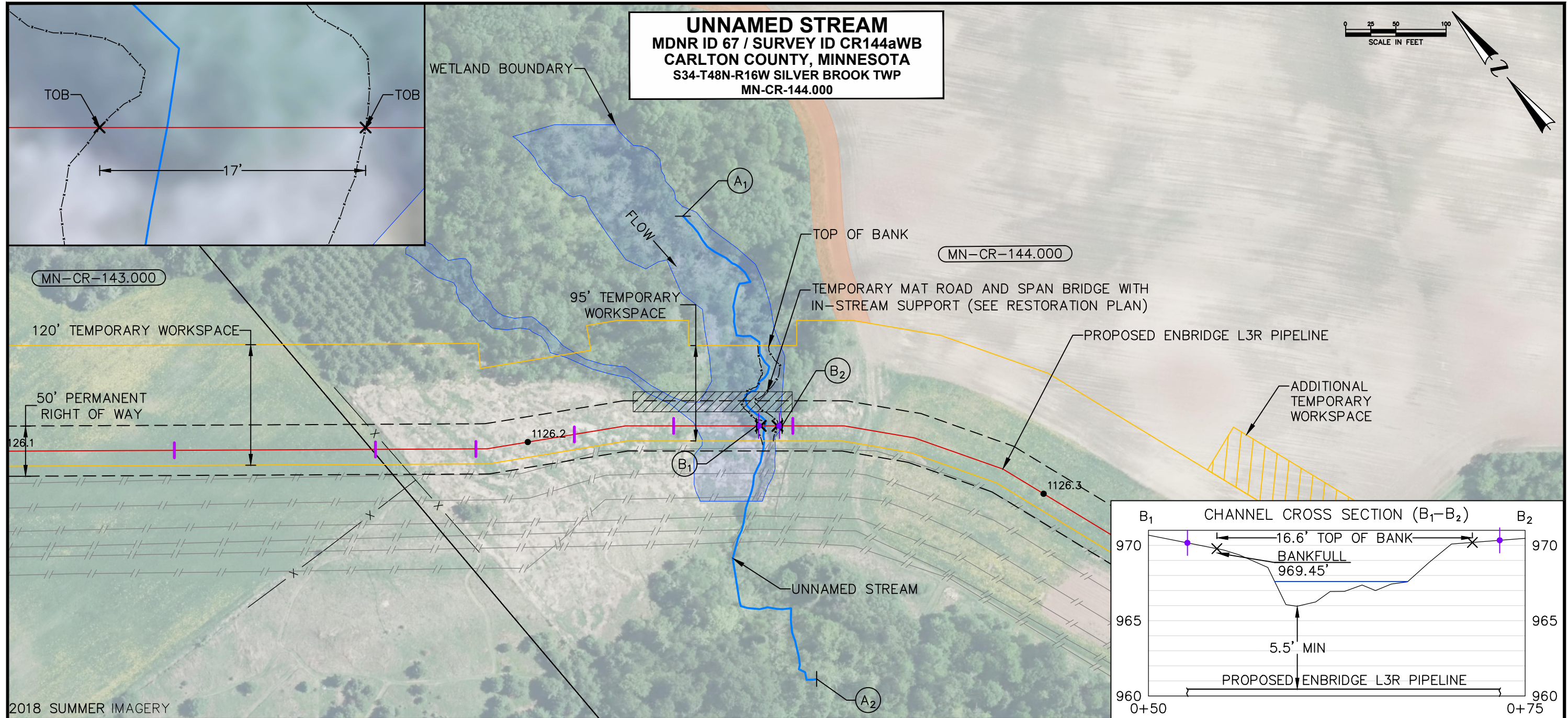
B	ISSUED FOR PERMITTING	MJT	10/2020		
NO.	REVISION–DESCRIPTION	BY	DATE	CHK'D	APP'D
ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE–SPECIFIC RESTORATION PLAN					
CONSTRUCTION NOTES					
SCALE		DWG. NO. SSRP–NOTES		PAGE NO.	

PLOTTED SIZE: ANSI FULL BLEED B (17x11)



**MDNR ID No. 67: MP 1126.2; Unnamed Stream (S-001.5-007)**





**NOTES**

- NO FEMA DIGITAL FLOODPLAIN DATA AVAILABLE
- SOBS (O/H) OR NPC (S1-3): N/A
- MDNR REGION 2 PW - COLD WATER FISHERY: SEPTEMBER 15 - JUNE 30. 24-HOUR SOIL STABILIZATION REQUIRED WITHIN 200 FEET DURING RESTRICTION.
- WHEN WORKING WITHIN "WORK IN WATER RESTRICTIONS", STABILIZE ALL EXPOSED SOIL AREAS WITHIN 200 FEET OF THE WATER'S EDGE, AND THAT DRAIN TO THAT WATER, WITHIN 24 HOURS. STABILIZATION WILL BE INITIATED IMMEDIATELY AND COMPLETED WITHIN 7 CALENDAR DAYS WHENEVER CONSTRUCTION ACTIVITY HAS PERMANENTLY/TEMPORARILY CEASED ON ANY PORTION OF THE SITE OUTSIDE OF THE RESTRICTION PERIOD.

**LEGEND**

- PROPOSED ENBRIDGE L3R PIPELINE
- OTHER PIPELINE
- PERMANENT RIGHT OF WAY
- TEMPORARY WORKSPACE
- WATERBODY (ROSGEN SURVEY - THALWEG)
- FENCE
- TRACT BOUNDARY
- TEMPORARY MAT ROAD AND SPAN BRIDGE
- ACCESS ROAD
- WETLAND
- ADDITIONAL TEMPORARY WORKSPACE
- TRACT ID
- ROSGEN SURVEY POINT - WATER SURFACE
- ROSGEN SURVEY POINT - RIVER BOTTOM (THALWEG)
- PROPOSED INCREASED DEPTH OF COVER EXTENT
- TOP OF BANK
- TRENCH BREAKER (LOCATIONS ARE APPROXIMATE)

**CHANNEL CROSS SECTION (B<sub>1</sub>-B<sub>2</sub>)**

16.6' TOP OF BANK

BANKFULL 969.45'

5.5' MIN

PROPOSED ENBRIDGE L3R PIPELINE

**CHANNEL PROFILE (A<sub>1</sub>-A<sub>2</sub>)**

95' TWS

50' PERM ROW

WATER SURFACE

THALWEG

5' MIN

4' MIN

PROPOSED ENBRIDGE L3R PIPELINE (NTS)\*

DRY CROSSING (NTS)

**CHANNEL CROSS SECTION NOTE:**

- CHANNEL LOCATIONS, DIMENSIONS, AND/OR ELEVATIONS ARE BASED ON 2020 TOPOGRAPHIC/BATHYMETRIC SURVEY(S), AND AS SUCH DO NOT REFLECT CHANGES TO THE CHANNEL THAT MAY HAVE OCCURRED SINCE THAT TIME.
- DEPTH OF COVER AT CENTERLINE WAS DEVELOPED USING THE BOTTOM ELEVATION OF THE DEEPEST UPSTREAM OR DOWNSTREAM POOL WITHIN THE SURVEYED REACH, UNLESS OTHERWISE NOTED IN APPLICATION MATERIALS.
- MEAN MEANDER BELT WIDTH: 45'
- MEANDER WIDTH RATIO: 6.99

NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D	APP'D
0	ISSUED FOR PERMIT APPLICATION	AJJ	10/2020	BAB	BAB

**ENBRIDGE**

DWN. BY: AJJ DATE: 10/2020

CHK.:

PROJ. ENGR.:

PROJ. MGR.:

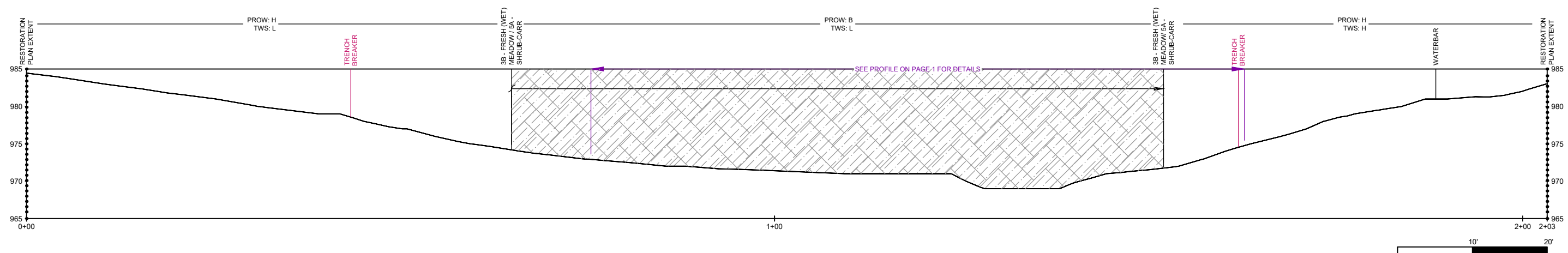
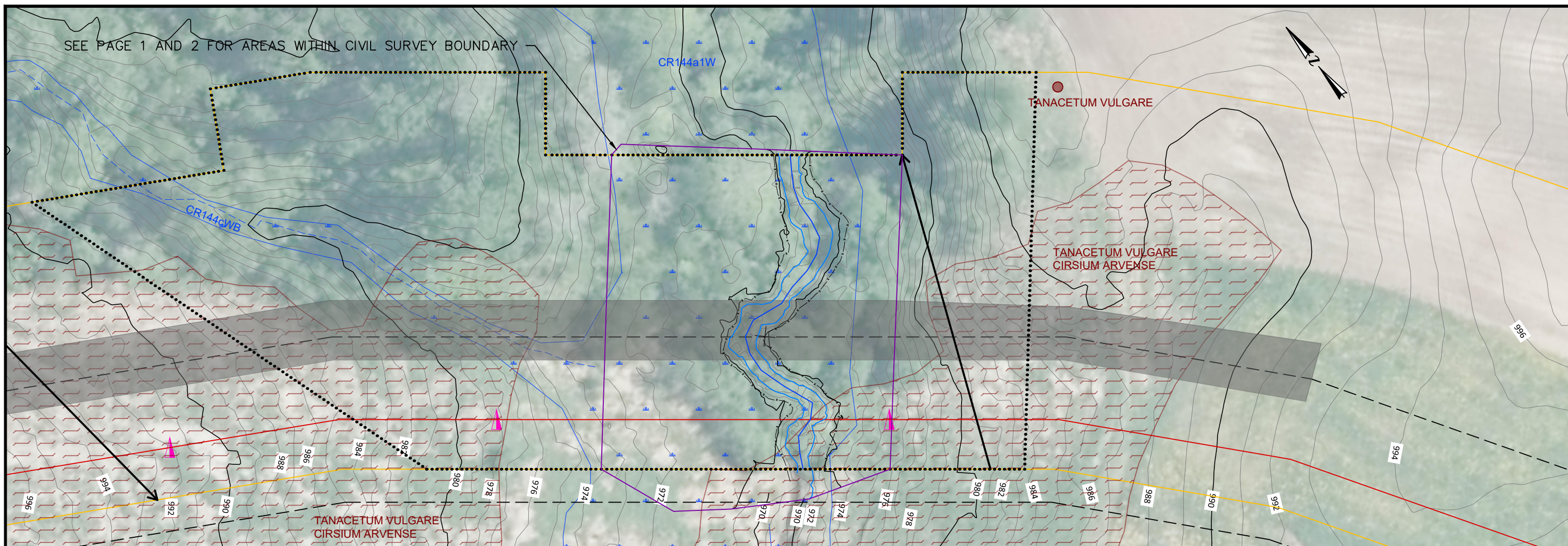
CLIENT APP.:

PROPOSED ENBRIDGE L3R PIPELINE  
PRIMARY METHOD - DRY CROSSING  
CROSSING OF UNNAMED STREAM  
ENBRIDGE MP 1126.2  
CARLTON COUNTY, MINNESOTA

SCALE: NOTED DWG. NO. B-93-5.84-MDNR-67-0

**FOR ENVIRONMENTAL REVIEW PURPOSES ONLY**





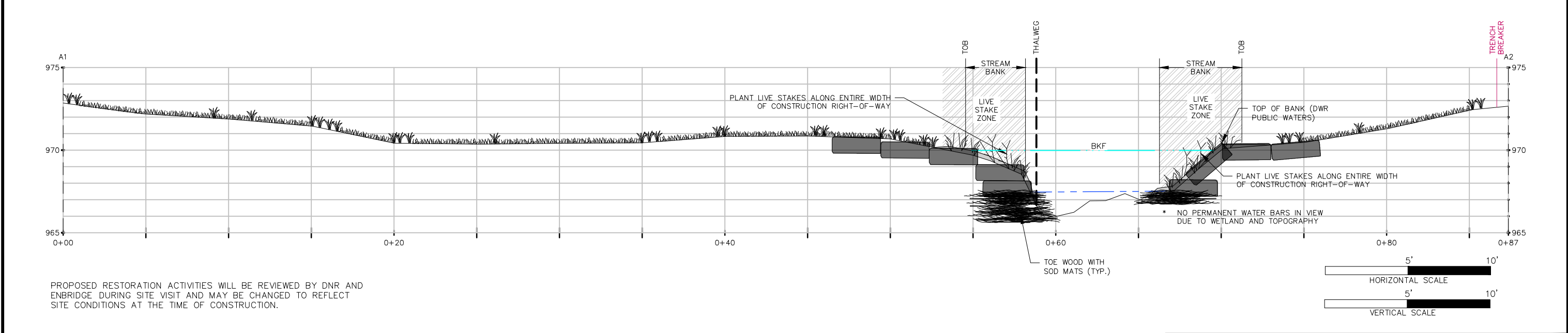
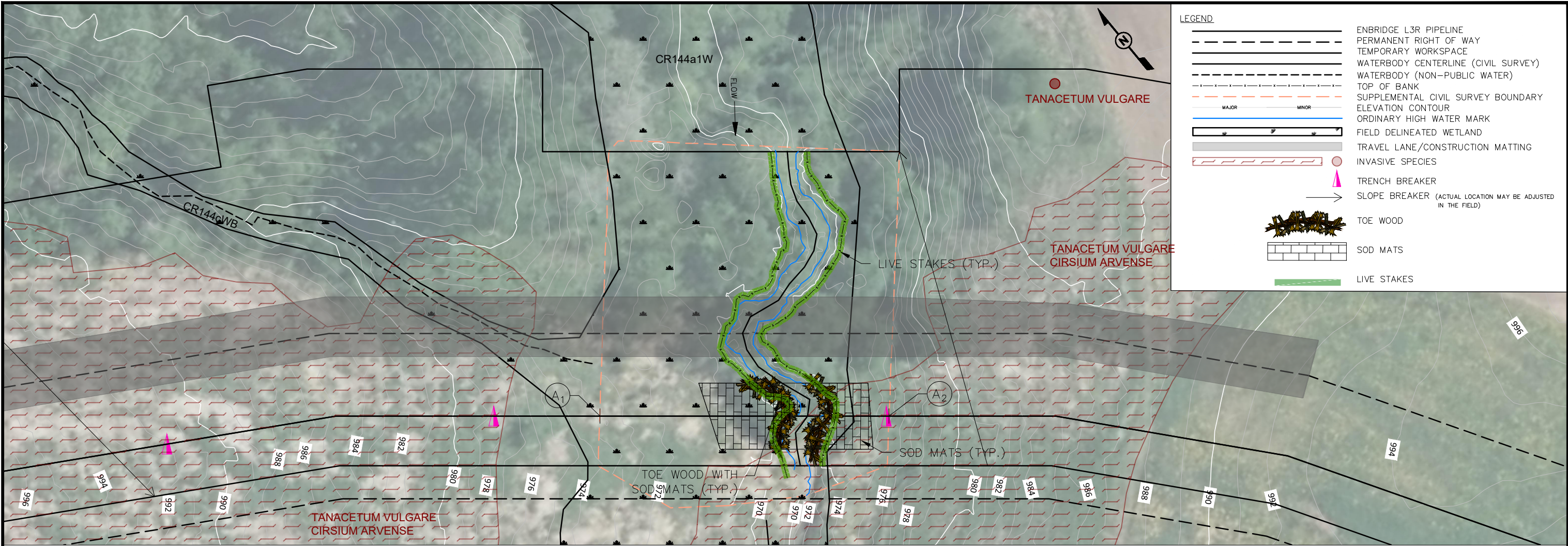
BWSR SEED MIX	B: RIPARIAN NE (34–361); H: MESIC PRAIRIE GENERAL (35–241); L: NATURAL REVEGETATION
SOBS (O/H) or NPC (S1-3)	N/A


1. ELEVATIONS OUTSIDE OF THE AREA WITHIN CIVIL SURVEY BOUNDARY ARE DERIVED FROM LIDAR. ENBRIDGE WILL RESTORE THE AREAS ADJACENT TO THE PUBLIC WATER WITHIN THE MDNR EXPANDED RESTORATION BOUNDARY TO PRE-CONSTRUCTION CONDITIONS.
2. VOLUNTARY WATER TROUBLE RESTRICTION: SEPTEMBER 15 - JUNE 30. 24-HOUR SOIL STABILIZATION REQUIRED WITHIN 200 FEET DURING RESTRICTION.
3. AIR PHOTOS ARE FROM 2018 ENBRIDGE AERIAL PHOTOGRAPHY.
4. ADDITIONAL ON-THE GROUND PHOTOS MAY BE TAKEN PRIOR TO CONSTRUCTION AT MDNR REQUEST.
5. PRE-CONSTRUCTION PHOTOS WILL BE USED TO AID IN RESTORATION.
6. SEE GENERAL NOTES PAGE FOR ADDITIONAL DETAIL.
7. SEE THE PLANTING PLAN FOR ADDITIONAL DETAIL REGARDING SEEDING PRACTICES AND SEED MIXES AT PUBLIC WATER CROSSINGS.
8. ON PUBLIC LANDS AND WHEREVER PRACTICABLE AT WATERBODY CROSSINGS, ENBRIDGE WILL USE WILDLIFE-FRIENDLY EROSION AND SEDIMENT CONTROL BMPs THAT CONTAIN BIODEGRADABLE NETTING (CATEGORY 3N OR 4N NATURAL FIBER) AND WILL AVOID THE USE OF PLASTIC MESH (SECTIONS 1.17.1 AND 2.6.1 OF THE EPP).
9. WHEN WORKING WITHIN "WORK IN WATER RESTRICTIONS", STABILIZE ALL EXPOSED SOIL AREAS WITHIN 200 FEET OF THE WATER'S EDGE, AND THAT DRAIN TO THAT WATER, WITHIN 24 HOURS. STABILIZATION WILL BE INITIATED IMMEDIATELY AND COMPLETED WITHIN 7 CALENDAR DAYS WHENEVER CONSTRUCTION ACTIVITY HAS PERMANENTLY/ TEMPORARILY CEASED ON ANY PORTION OF THE SITE OUTSIDE OF THE RESTRICTION PERIOD.

LEGEND				
	ENBRIDGE L3R PIPELINE			INVASIVE SPECIES
	PERMANENT RIGHT OF WAY			
	TEMPORARY WORKSPACE			TRENCH BREAKER
	WATERBODY CENTERLINE (CIVIL SURVEY)			PERMANENT SLOPE BREAKER
	WATERBODY (NON-PUBLIC WATER)			(ACTUAL LOCATION MAY BE ADJUSTED IN THE FIELD)
	PUBLIC WATER CIVIL SURVEY BOUNDARY		1	- SHALLOW, OPEN WATER
	MDNR EXPANDED RESTORATION BOUNDARY		2B	- SHALLOW MARSH
	TOP OF BANK		3A	- SEDGE MEADOW
	ELEVATION CONTOUR		3B	- FRESH (WET) MEADOW
	ORDINARY HIGH WATER MARK		5A	- SHRUB-CARR
	FIELD DELINEATED WETLAND		5B	- ALDER THICKET
	TRAVEL LANE/CONSTRUCTION MATTING		6A	- HARDWOOD SWAMP
			6B	- CONIFEROUS SWAMP

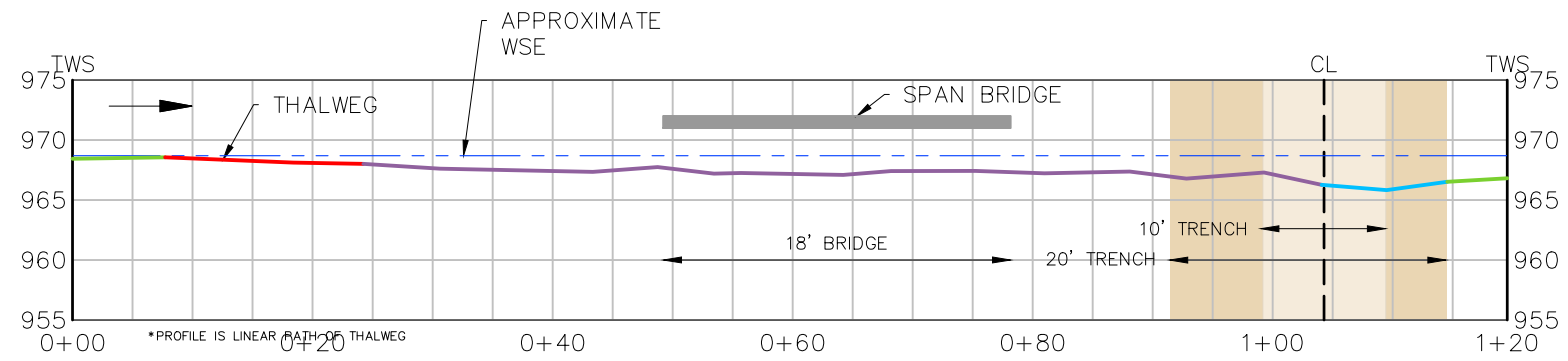
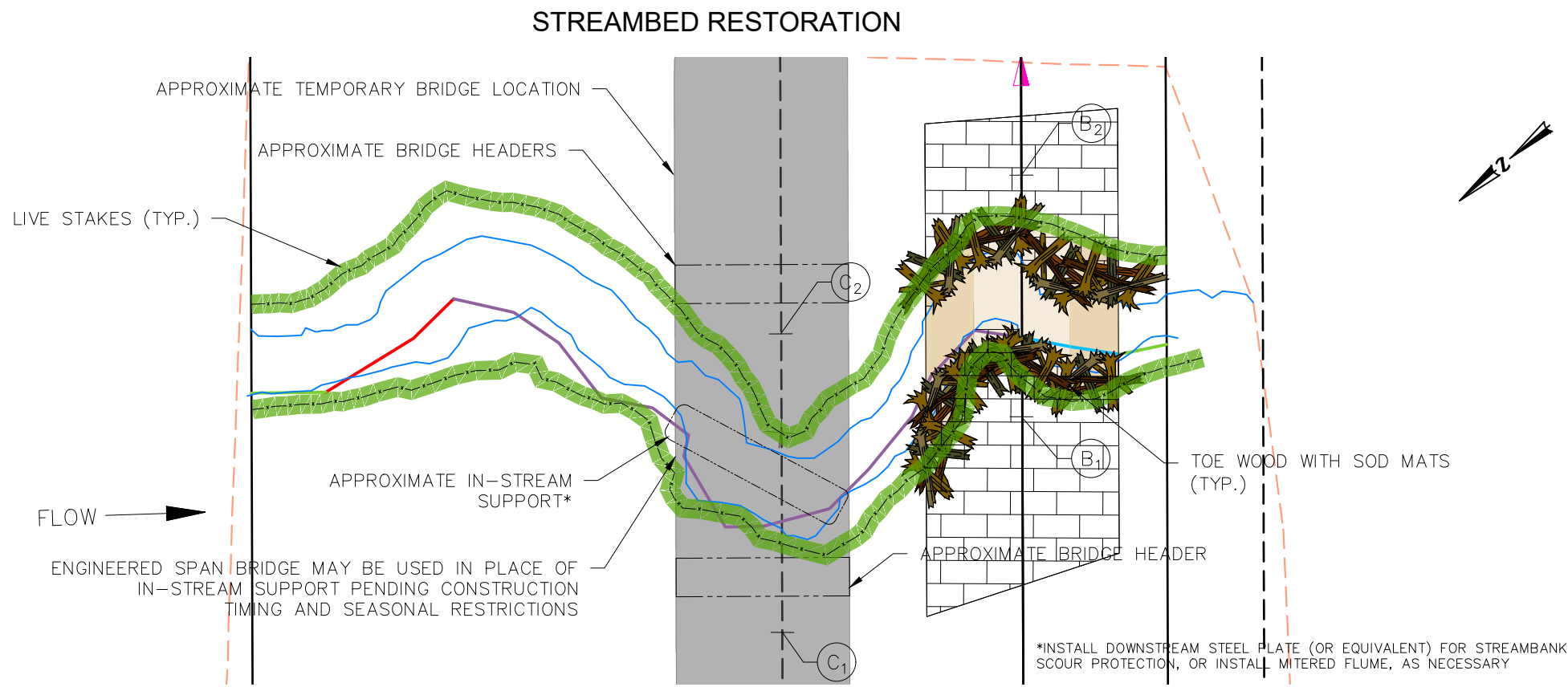
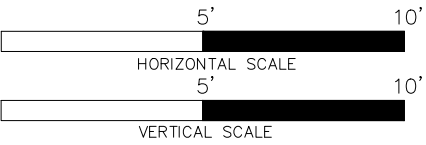
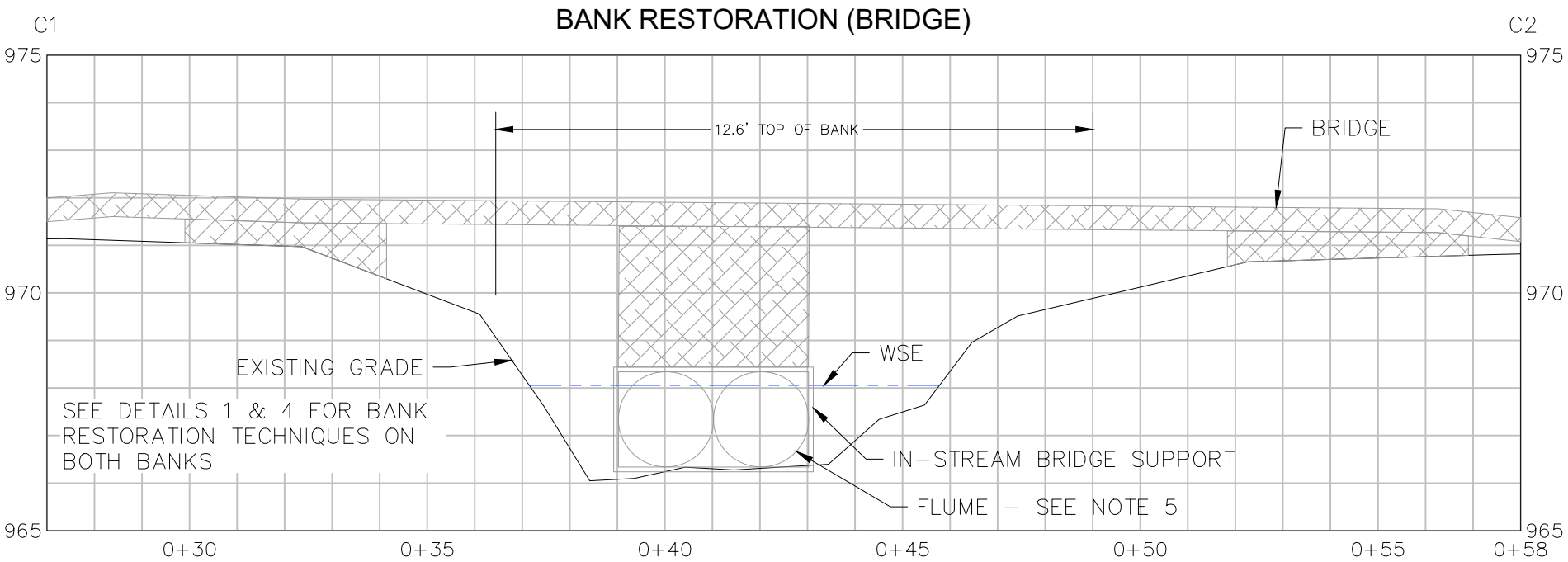
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A	ISSUED FOR REVIEW	MJT	09/2020		
NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D	APP'D
<p>ENBRIDGE LINE 3 REPLACEMENT PROJECT          SITE-SPECIFIC RESTORATION PLAN          UNNAMED STREAM – MP 1126.2 – MDNR ID 67          RE-VEGETATION PLAN: EXPANDED EXTENT</p>					
SCALE NOTED		DWG. NO. SSRP-1126.2-001A		PAGE NO. 1A/5	





FEATURE ID	CR144aWB; IFC ID: S-315.0	<div>NOTES</div> <div>1. CONSTRUCTION TIMING RESTRICTIONS 1.1.VOLUNTARY TROUT STREAM RESTRICTION: SEPTEMBER 15 – JUNE 30. 1.2. WHEN WORK OCCURS WITHIN "WORK IN WATER RESTRICTIONS", ALL EXPOSED SOIL AREAS WITHIN 200 FEET OF THE WATER'S EDGE, AND THAT DRAIN TO THAT WATER, WILL BE STABILIZED WITHIN 24 HOURS DURING THE RESTRICTION PERIOD. STABILIZATION OF ALL EXPOSED SOILS WITHIN 200 FEET OF THE PUBLIC WATER'S EDGE, AND THAT DRAIN TO THAT WATER, WILL BE INITIATED IMMEDIATELY AND COMPLETED WITHIN 7 CALENDAR DAYS WHENEVER CONSTRUCTION ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED ON ANY PORTION OF THE SITE OUTSIDE OF THE RESTRICTION PERIOD 2. WORK SHALL BE CONDUCTED IN ACCORDANCE WITH APPLICABLE STANDARDS IN ENBRIDGE'S EPP AND VMP FOR PUBLIC LANDS AND WATERS. THE SPECIFICATIONS WITHIN THIS SSRP MAY MODIFY OR REPLACE THESE STANDARDS. 3. SEE GENERAL NOTES PAGE FOR ADDITIONAL DETAIL. 4. INFORMATION REGARDING SEEDING SPECIFICATIONS, SEED BED PREPARATION TECHNIQUES, ETC. ARE DESCRIBED IN THE PLANTING PLAN CONTAINED WITHIN THE VMP. 5. TRENCH BREAKER LOCATION IS APPROXIMATE PENDING FIELD VERIFICATION (EPP SECTION 1.13)</div> <div></div>	<div><div>B</div><div>ISSUED FOR PERMITTING</div><div>10/2020</div></div>					
CROSSING TYPE	DRY CROSSING		<div><div>A</div><div>ISSUED FOR REVIEW</div><div>MJT 08/2020</div></div>					
PROPOSED RESTORATION <small>(SEE DETAILS FOR LIVE STAKING, TRANSPLANTS, AND SHRUB SPECIES IF APPLICABLE)</small>	EC BLANKET – NATURAL FIBER MPCA TYPE 3.B/MNDOT CATEGORY 4N; BRUSH – TOE WOOD		<div><div>NO.</div><div>REVISION-DESCRIPTION</div><div>BY</div><div>DATE</div><div>CHK'D</div><div>APP'D</div></div>					
WITHIN OR ADJACENT WETLAND	FRESH WET MEADOW		<div>ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE-SPECIFIC RESTORATION PLAN UNNAMED STREAM – MP 1126.2 – MDNR ID 67 RE-VEGETATION PLAN</div>					
BWSR SEED MIX	RIPARIAN NE (34-361)							
DOMINANT WETLAND VEGETATION	1. ALNUS INCANA 2. EUISETUM ARVENSE 3. HERACLEUM MAXIMUM 4. LAPORTEA CANADENSIS							
SOBS (O/H) or NPC (S1-3)	N/A							
			SCALE		DWG. NO.		PAGE NO.	
			NOTED		SSRP-1126.2-001		1/8	





- NOTES**
1. TRANSITIONS BETWEEN EXISTING CHANNEL FEATURES (BED, BANK, FLOODPLAIN) AND PROPOSED RESTORED TRENCH CROSSING WILL BE SMOOTH AND EVENLY GRADED WITHOUT ABRUPT OR PROTRUDING OBSTRUCTIONS.
  2. BANK MIGRATION POTENTIAL IS LOW. PRIMARY FLOW IS LOCATED IN THE CENTER OF THE CHANNEL.
  3. PLACE MATS DIRECTLY ON TOP OF EXISTING VEGETATION TO AVOID OR MINIMIZE DISTURBANCE OF VEGETATION ON THE CHANNEL BANKS AND AT THE TOP OF THE STREAM BANK (LIMITED STUMP REMOVAL MAY BE REQUIRED).
  4. SEE DETAIL SHEET FOR SPECIFIC RESTORATION METHODS AND DETAILS.
  5. FLUME SIZE MAY VARY BETWEEN 18-48 INCHES BASED ON SITE-SPECIFIC CONDITIONS AT THE TIME OF CONSTRUCTION, BUT MUST ALWAYS EXTEND ABOVE OHWM OR SURFACE WATER AT TIME OF CONSTRUCTION, WHICHEVER IS GREATER.
  6. MINIMIZE DISTURBANCE OF BED MATERIALS AND FEATURES DURING CONSTRUCTION OF THE TRENCH AND INSTALLATION AND REMOVAL OF IN-STREAM SUPPORT
  7. BED AND/OR BANK MATERIALS TEMPORARILY ADJUSTED OR REMOVED DURING CONSTRUCTION SHALL BE PLACED IN THE APPROXIMATE ORIGINAL LOCATION DURING RESTORATION. MATERIALS SHALL BE FIELD ADJUSTED DURING PLACEMENT BASE ON THE OBSERVED FLOW PATH AT THE TIME OF CONSTRUCTION.
  8. ALIGNMENT OF IN-STREAM SUPPORT SHALL BE FIELD ADJUSTED BASED ON FLOW PATH TO PROTECT CHANNEL BANKS.
  9. SEE RESTORATION SHEET FOR B1-B2 CROSS SECTION.

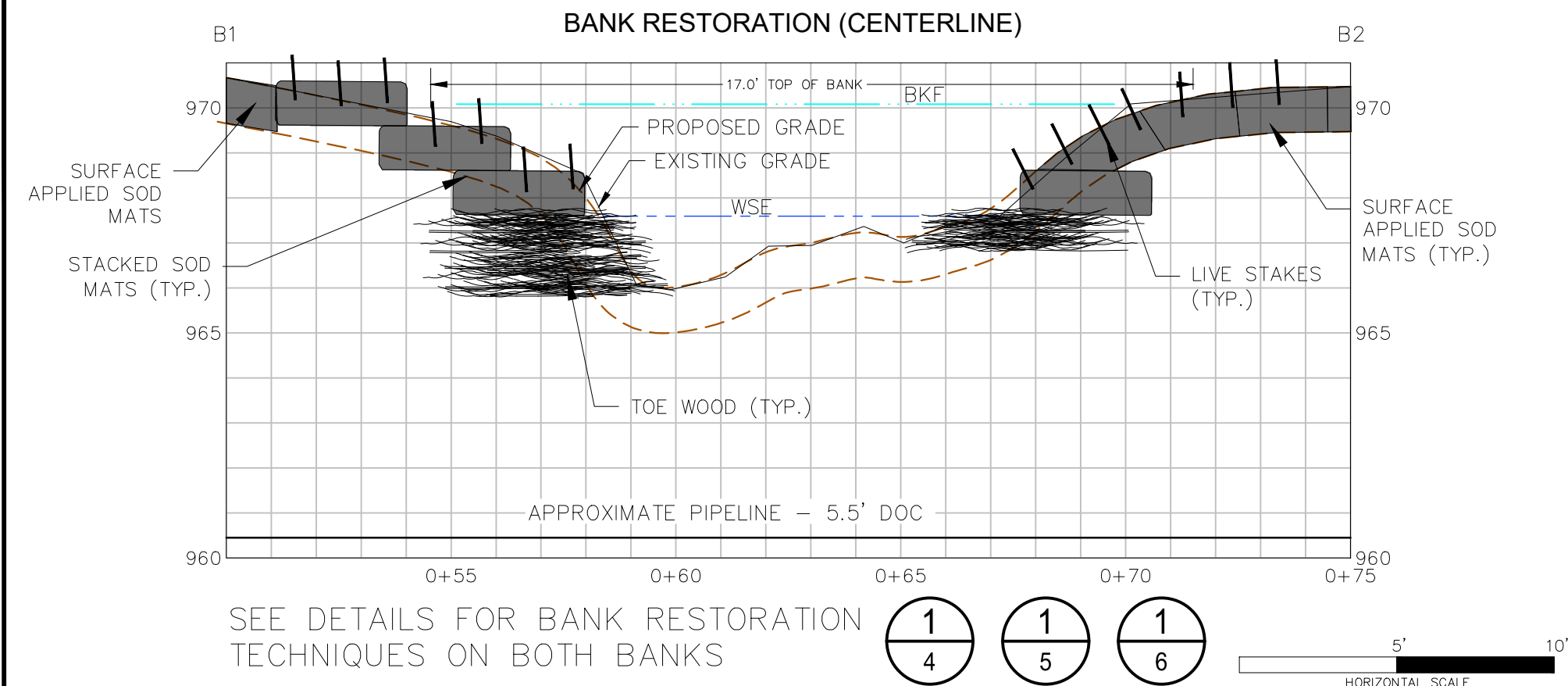
**LEGEND**

ENBRIDGE L3R PIPELINE
PERMANENT RIGHT OF WAY
TEMPORARY WORKSPACE
WATERBODY - RIFFLE (ROSGEN SURVEY)
WATERBODY - POOL (ROSGEN SURVEY)
WATERBODY - RUN (ROSGEN SURVEY)
WATERBODY - GLIDE (ROSGEN SURVEY)
CONTOUR (1' INTERVAL)
TOP OF BANK
ORDINARY HIGH WATER MARK
FIELD DELINEATED WETLAND
TRAVEL LANE/CONSTRUCTION MATTING
TRENCH - 10'
TRENCH - 20'

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ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE-SPECIFIC RESTORATION PLAN UNNAMED STREAM - MP 1126.2 - MDNR ID 67 STABILIZATION PLAN				
SCALE	DWG. NO.	PAGE NO.		
	SSRP-1126.2-002	2/8		

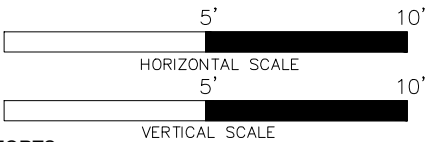
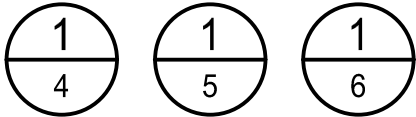






	COMMON NAME	SCIENTIFIC NAME
LIVE STAKE SPECIES	ELDERBERRY	SAMBUCUS CANADENSIS
	RED-OSIER DOGWOOD	CORNUS STOLONIFERA
	SILKY DOGWOOD	CORNUS AMOMUM
TRANSPLANTS	SPECKELD ALDER	ALNUS INCANA
	DOGWOOD	CORNUS SPP.
SHRUB	BUSH HONEYSUCKLE	LONICERA TATARICA

SEE DETAILS FOR BANK RESTORATION TECHNIQUES ON BOTH BANKS



RESTORATION NOTES:  
GENERAL

- REFER TO RESTORATION DETAIL SHEETS FOR ADDITIONAL INFORMATION RELATED TO PROPOSED RESTORATION MEASURES.
- REFER TO SITE PHOTOS FOR INFORMATION ON PRE-CONSTRUCTION CROSSING CONDITIONS AND TO PROVIDE ADDITIONAL GUIDANCE FOR RESTORATION EFFORTS.

TOE WOOD

- ROUGH GRADE CHANNEL BED FEATURES INCLUDING PLACEMENT OF SUBSTRATE.
- INSTALL FOOTER LOG(S) ALONG PROPOSED TOE OF SLOPE. FOOTER LOGS SHOULD BE ANGLED TO ALLOW FOR TOE ALIGNMENT TO GENERALLY MATCH THE EXISTING CURVE AND EVENLY TRANSITION FROM UPSTREAM TO DOWNSTREAM.
- PUSH FOOTER LOG INTO SOIL APPLY A SMALL AMOUNT OF GRAVEL OR STONE AS NEEDED TO PREVENT FLOATATION OF FOOTER LOG PRIOR TO PLACING WOODY DEBRIS.
- PLACE A LAYER WOODY DEBRIS IN 6" TO 8" LIFTS, APPLY 3"-4" GRAVEL AND/OR SOIL FILL AND COMPACT WITH EXCAVATOR BUCKET. WASH FILL MATERIAL INTO WOODY DEBRIS MATRIX WITH WATER FROM CHANNEL. APPLY ADDITIONAL LAYERS "AS NEEDED" TO REACH THE SPECIFIED TOE WOOD HEIGHT.
- PLACE STACKED SOD MATS ABOVE TOE WOOD. THE USE OF TRANSPLANTS OR FABRIC LIFTS MAY BE FIELD APPROVED BY ENBRIDGE IN CONSULTATION WITH MN DNR.

SOD MATTING

- REMOVE 15 LINEAR FEET OF VEGETATED MATS ON EITHER SIDE OF THE STREAM CROSSING USING ONSITE EQUIPMENT WHICH CAN UNDERCUT THE VEGETATION FOR REMOVAL. SMALL SHRUBS AND/OR TREES WITHIN THE SOD MATS ARE ACCEPTABLE AND SHOULD NOT BE REMOVED.
- DEPENDING ON THE LEVEL OF SATURATION AT THE TIME OF REMOVAL, IT MAY BE DIFFICULT TO OBTAIN INTACT CONSOLIDATED MATS, BUT GENERALLY THE NATIVE VEGETATION WILL BE RETAINED AND CAPTURED FOR PLACEMENT.
- SOD MATS CAN BE TRANSPLANTED DURING ANY SEASON.
- SOD MAT WILL BE PLACED ON CLEAR GROUND OR MATS WITHIN THE WORKSPACE.
- MONITOR MATS TO SUPPORT SURVIVABILITY; WATERING MAY BE NEEDED.
- PRIOR TO PLACEMENT OF SOD MATS FINISH GRADE CHANNEL BANK AND ADJACENT FLOODPLAIN APPLICATION AREA TO PROVIDE A SMOOTH AND EVEN SURFACE. SUBGRADE ELEVATION SHOULD ALLOW FOR THE FINISHED SOD SURFACE TO TRANSITION EVENLY WITH THE CHANNEL BANKS UPSTREAM AND DOWNSTREAM OF THE INSTALLATION AREA. AVOID ABRUPT CHANGES IN GRADE.
- VEGETATED MATS WILL BE RETURNED/SET IN PLACE WITH ONSITE EQUIPMENT.
  - SURFACE APPLIED SOD MATTING SHOULD BE PLACED WITH THE LONG SIDE PERPENDICULAR TO THE CHANNEL / FLOW.
  - STACKED SOD MATTING SHOULD BE PLACED WITH THE LONG SIDE PARALLEL TO THE CHANNEL / FLOW.
- IF SUFFICIENT SOD IS NOT AVAILABLE FROM THE STREAM BANKS ADDITIONAL SOD MAY BE TAKEN FROM THE ADJACENT CONSTRUCTION WORKSPACE.
- WHEN PLACING SOD MATS, DO NOT LEAVE LARGE GAPS BETWEEN EACH SOD MAT AS NON-NATIVE VEGETATION WILL QUICKLY ATTEMPT TO COLONIZE THESE VOIDS.
- WATER SOD MATS AFTER REPLACEMENT IF CONDITIONS ARE HOT AND DRY. DAMP AND/OR FROZEN SOD MATS DO NOT REQUIRE WATERING.
- THE TOP MAT AND/OR OTHER MATS CAN BE ANCHORED WITH A LIVE AND/OR DEAD STOUT STAKE TO ENSURE THAT IT DOES NOT MOBILIZE DURING A FLOOD EVENT BEFORE THE ROOTS HAVE ESTABLISHED.
- THE VEGETATED MATS WILL BE REPLACED AS SOON AS PRACTICAL FOLLOWING BACKFILLING OF THE TRENCH AND STABILIZED PER THE TIMING REQUIREMENTS DESCRIBED IN SECTION 1.9.1 OF THE EPP.

LIVE STAKING

- CLEANLY REMOVE ALL SIDE BRANCHES AND THE TOP GROWTH, AND FASHION THE CUTTINGS INTO LIVE STAKES AS DEPICTED IN THE DETAIL DRAWING. AN OPTION DURING PREPARATION IS TO PAINT AND SEAL THE TOP OF THE LIVE STAKE BY DIPPING THE TOP 1-2 INCHES INTO A 50-50 MIX OF LIGHT-COLORED LATEX PAINT AND WATER. SEALING THE TOP OF STAKE WILL REDUCE THE POSSIBILITY OF DESICCATION, ASSURE THE STAKES ARE PLANTED WITH THE TOP UP, AND MAKES THE STAKES MORE VISIBLE FOR SUBSEQUENT PLANTING EVALUATIONS.
- USE A PUNCH BAR OR HAND AUGER TO CREATE A NARROW PILOT HOLE, PERPENDICULAR TO THE SLOPE, THROUGH ANY EROSION CONTROL MATTING, RIP RAP, OR OTHER REVETMENT, FILTER FABRIC, ETC., IF PRESENT, AND DEEP ENOUGH TO INTERCEPT THE WATER TABLE. THE HOLE SHOULD BE ONLY AS LARGE AS NECESSARY TO INSTALL THE LIVE STAKE WITHOUT DAMAGE WHILE ENSURING THE HIGHEST AMOUNT OF STAKE-SOIL CONTACT.
- INSERT THE POINTED END OF THE LIVE STAKE INTO THE PILOT HOLE. TAMP INTO THE GROUND WITH A DEAD BLOW HAMMER TAKING CARE NOT TO SPLIT OR OTHERWISE DAMAGE THE LIVE STAKE. USE WATER, SOIL BACKFILL, TAMPING, ETC. TO ACHIEVE GOOD SOIL-TO-STEM CONTACT AND REMOVE AIR POCKETS.
- USE ONSITE EQUIPMENT TO APPLY WATER FROM THE CHANNEL AFTER INSTALLATION.
- ALL CUTS SHOULD BE CLEAN AND SMOOTH. NO CRACKED OR SPLIT LIVE STAKES SHOULD BE USED. IF THEY SPLIT DURING TAMPING, THEY SHOULD BE CUT BELOW THE CRACK OR REPLACED.
- THE SPECIFIED NUMBER OF LIVE STAKES SHOULD BE INSTALLED INTO THE SOIL AND PROTRUDE ABOVE THE SOIL AND ANY SOD MATTING, MULCHING, EROSION CONTROL MATTING, RIP RAP, OR OTHER REVETMENT.
- LIVE STAKE SHOULD NOT MOVE AFTER INSTALLATION; ENSURING IT IS IN FIRM CONTACT WITH THE SOIL.
- IT IS IMPORTANT TO ENSURE THAT THE UPSTREAM AND DOWNSTREAM ENDS OF THE LIVE STAKING A MERGE SMOOTHLY INTO THE UNDISTURBED BANK BEYOND THE PROJECT AREA. THE RATE OF INSTALLING LIVE STAKES SHOULD TAPER OFF GRADUALLY TO BLEND IN WITH THE EXISTING VEGETATION.

TRANSPLANTS

- SHRUBS AND/OR ALDER REMOVED FROM THE TRENCH AREA MAY BE USED IN LIEU OF SOD MATS IN ACCORDANCE WITH THE TRANSPLANT DETAIL.

1 VEGETATION CHART



B	ISSUED FOR PERMITTING		10/2020		
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ENBRIDGE LINE 3 REPLACEMENT PROJECT SITF-SPFCIFIC RFSTORATION PLAN UNNAMED STREAM - MP 1126.2 - MDNR ID 67 SITE SPECIFIC DETAILS					
SCALE	DWG. NO.	PAGE NO.			
NOTED	SSRP-1126.2-004	3/8			



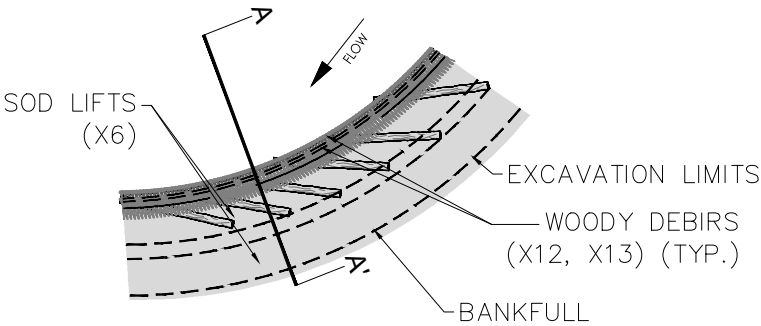
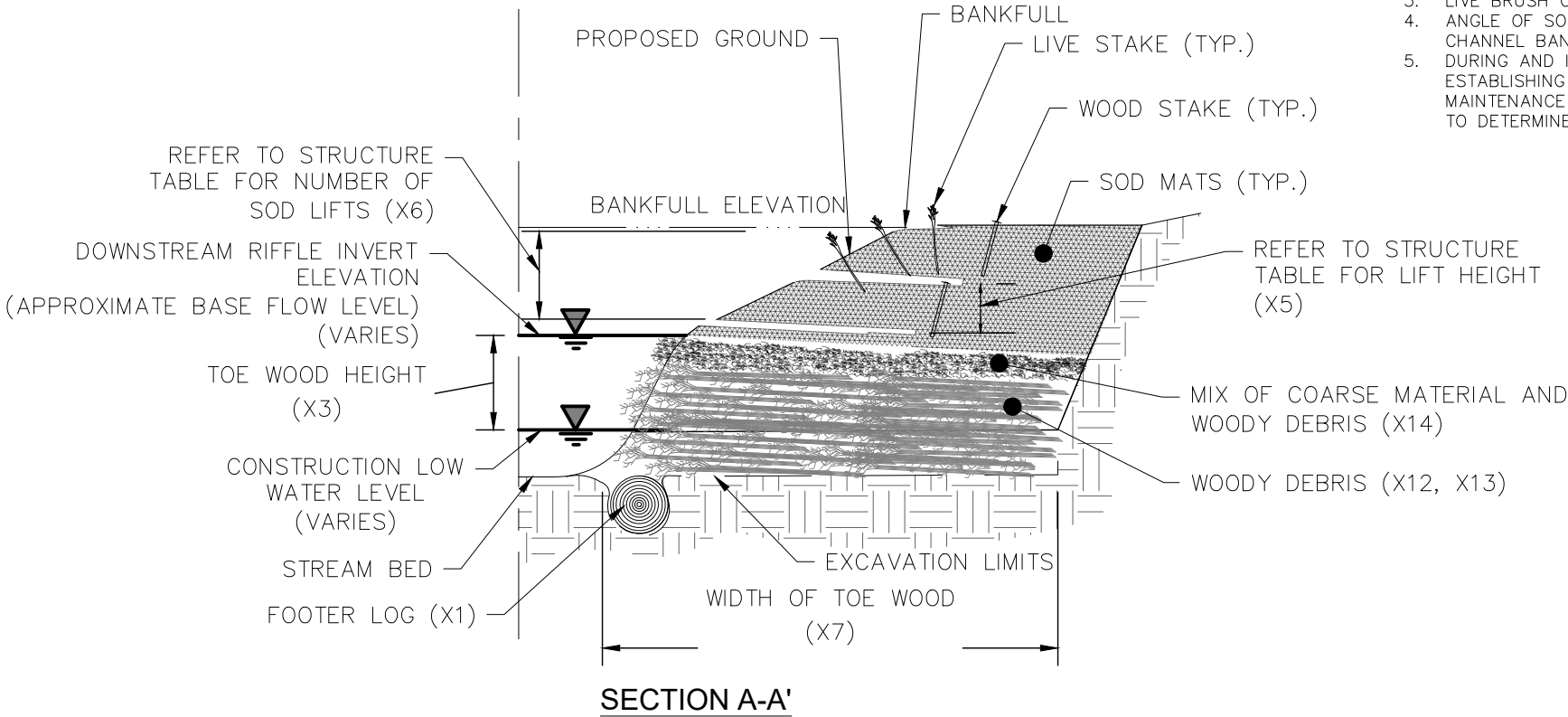


TOE WOOD DIMENSIONS			
VARIABLE	VALUE	TYPICAL UNIT	DESCRIPTION
X1	6.0 - 10.0	IN.	FOOTER LOG DIAMETER
X2	8.0 - 12.0	FT.	FOOTER LOG LENGTH
X3	18.0	IN.	TOE WOOD HEIGHT
X4	SEE SHEET 3	N/A	MATCH TYPICAL SECTION
X5	SEE SHEET 5	FT.	SOD LIFT HEIGHT
X6	1 - 4	#	SOD LIFTS
X7	8.0 - 10.0	FT.	TOE WOOD WIDTH
X8	3.0 - 6.0	FT.	SOD LIFT WIDTH
X9	24.0	IN.	WOOD STAKE LENGTH
X10	4.0	IN.	WOOD STAKE WIDTH (TOP)
X11	0.5	IN.	WOOD STAKE WIDTH (BOTTOM)
X12	1/2 - 3.0	IN.	WOODY DEBRIS DIAMETER
X13	8.0 - 12.0	FT.	WOODY DEBRIS LENGTH
X14	3" MINING GRAVEL WITH FINES	%	SELECT COARSE MATERIAL BACKFILL (BY VOLUME)



TOE WOOD EXAMPLE

- NOTES:
- WOODY MATERIAL OF APPROPRIATE SIZE CONSISTING OF LOGS, TRUNKS, LIMBS, BRANCHES, AND SMALLER WOODY DEBRIS INCLUDING TOPS OR SLASH. ON-SITE WOODY MATERIAL IS PREFERRED.
  - WOODY DEBRIS SHOULD BE GREEN OR RELATIVELY GREEN AND MAY CONSIST OF HARDWOODS, CONIFERS, OR A COMBINATION OF BOTH.
  - LIVE BRUSH OR OTHER BANK VEGETATION MAY BE INCORPORATED.
  - ANGLE OF SOD MAT SURFACE SHALL MATCH THE PROPOSED CHANNEL CROSS SECTION AND PROVIDE A SMOOTH AND EVEN CHANNEL BANK SURFACE BETWEEN UPSTREAM AND DOWNSTREAM BANKS.
  - DURING AND IMMEDIATELY AFTER CONSTRUCTION, BANK SLOPES ABOVE THE WOOD TOE ARE VULNERABLE TO EROSION. ESTABLISHING VEGETATION OR OTHER COVER MATERIAL AS SOON AS POSSIBLE WILL HELP REDUCE EROSION. ADDITIONAL MAINTENANCE IS NOT EXPECTED ONCE VEGETATION ESTABLISHES. INSPECTION AFTER LARGE FLOW EVENTS MAY BE ADVISABLE TO DETERMINE IF ANY MATERIAL MOVEMENT OR UNEXPECTED SCOUR HAS OCCURRED.



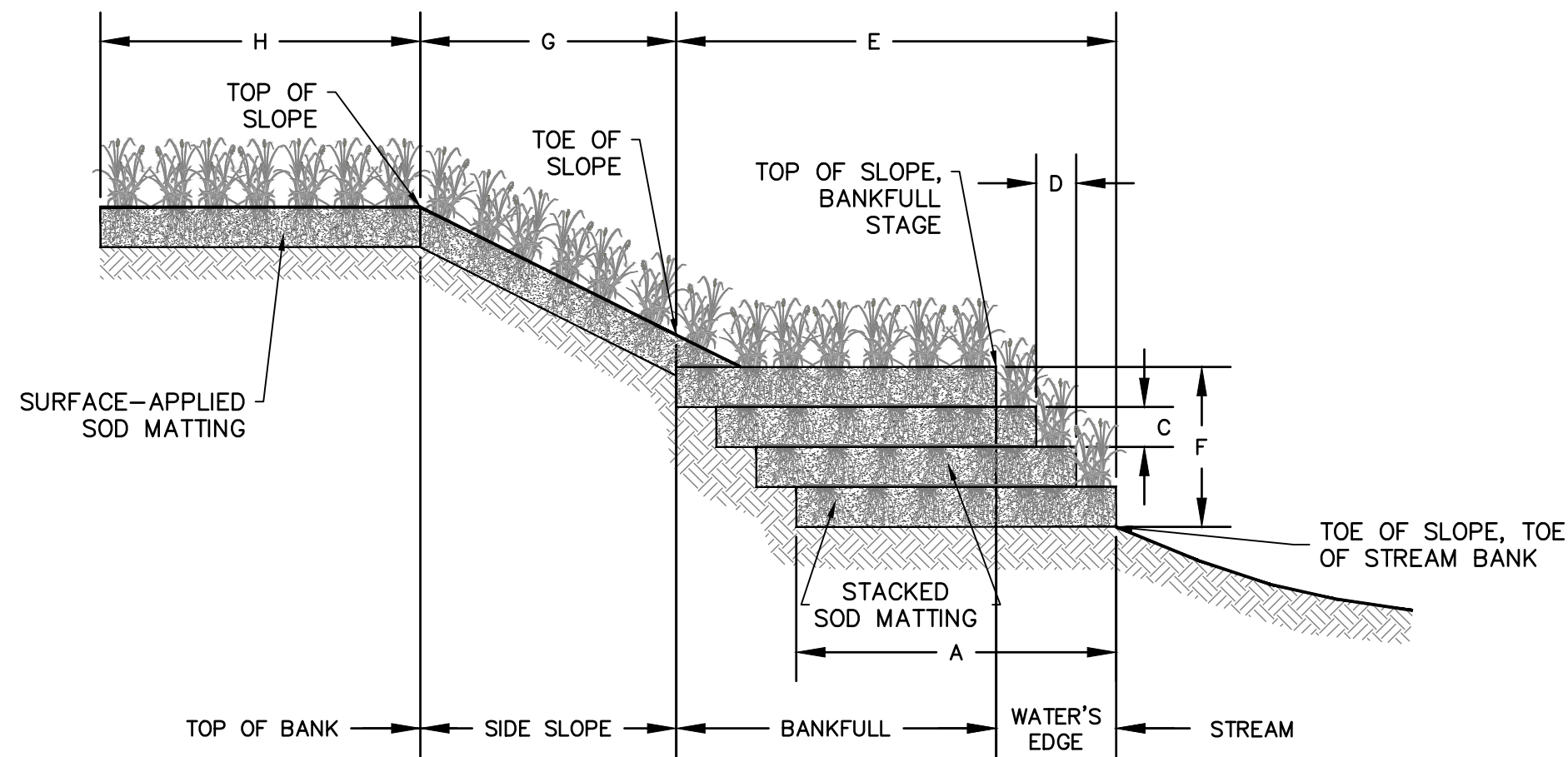
PLAN VIEW AT BANKFULL ELEVATION

1 TOE WOOD DETAIL

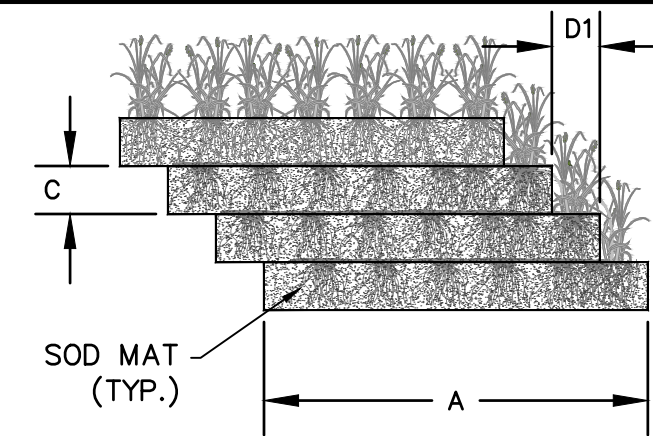


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NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D	APP'D
ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE-SPECIFIC RESTORATION PLAN UNNAMED STREAM - MP 1094.0 - MDNR ID 58 SITE SPECIFIC DETAILS					
SCALE	DWG. NO.	PAGE NO.			
NOTED	SSRP-1094.0-004	4/8			

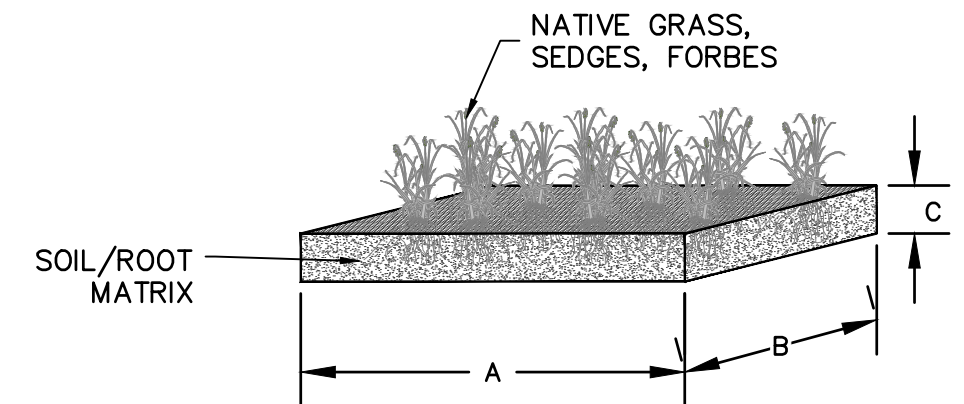




**CROSS SECTION**



**STACKED SOD MATTING DETAIL**



**SOD MAT DETAIL**

DIMENSION <sup>1</sup>	NAME	TYPICAL UNIT	VALUE	DESCRIPTION
A	SOD MAT WIDTH	FEET	3 – 4	WIDTH OF INDIVIDUAL SOD MAT.
B	SOD MAT LENGTH	FEET	3 – 6	LENGTH OF INDIVIDUAL SOD MAT.
C	SOD MAT THICKNESS	INCHES	12	THICKNESS OF INDIVIDUAL SOD MAT.
D	STACKED SOD MAT SETBACK	FEET	VARIES	THE DISTANCE BETWEEN THE EDGES OF SOD MATS STACKED TO FORM A SLOPE
E	WIDTH OF STACKED SOD MATS	FEET	10 – 20	WIDTH OF A BANK CREATED BY STACKED SOD MATS
F	HEIGHT OF STACKED SOD MATS	FEET	3 – 4	HEIGHT OF A SLOPE CREATED BY STACKED SOD MATS
G	WIDTH OF SURFACE- APPLIED SOD MATS	FEET	10 – 20	WIDTH OF A SLOPE STABILIZED WITH SURFACE-APPLIED SOD MATS
H	TOP OF BANK SOD MATTING DISTANCE	FEET	20	DISTANCE SOD MATTING IS INSTALLED ON THE TOP OF BANK

NOTES:

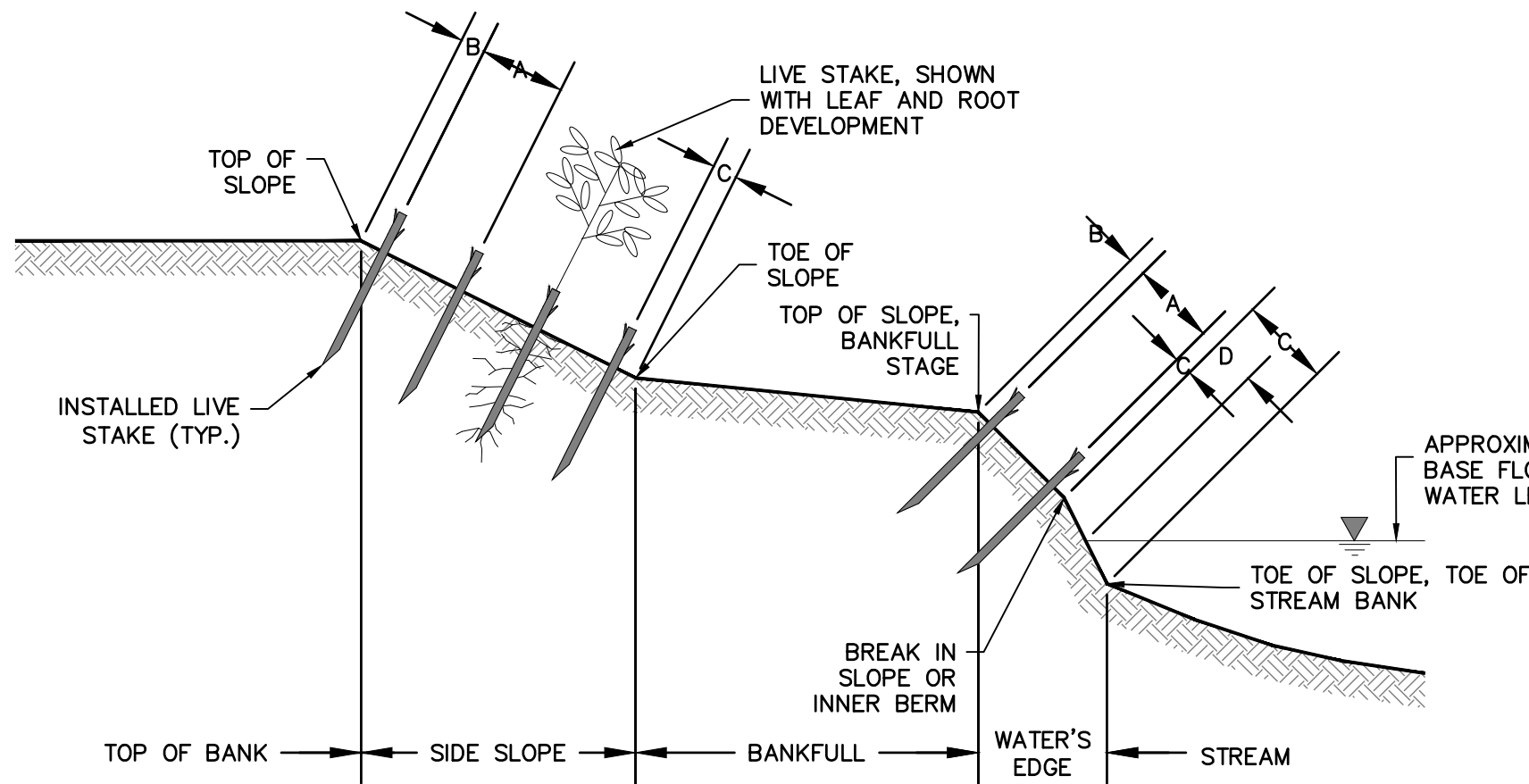
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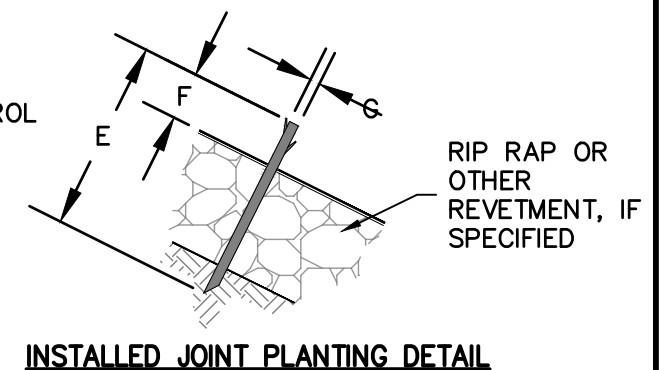
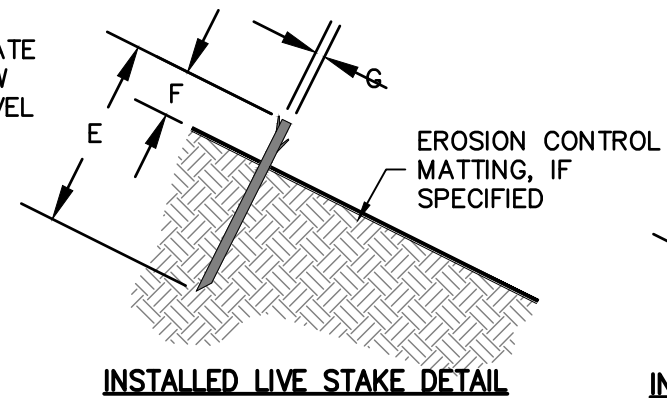
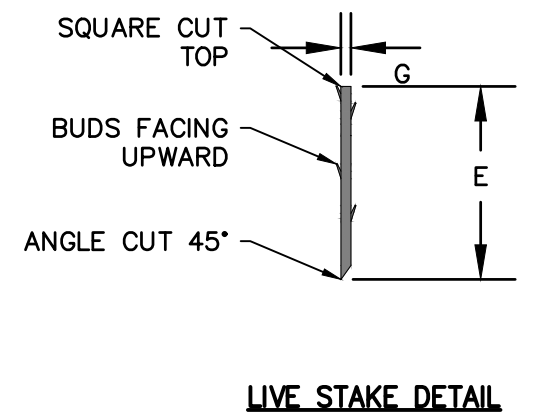
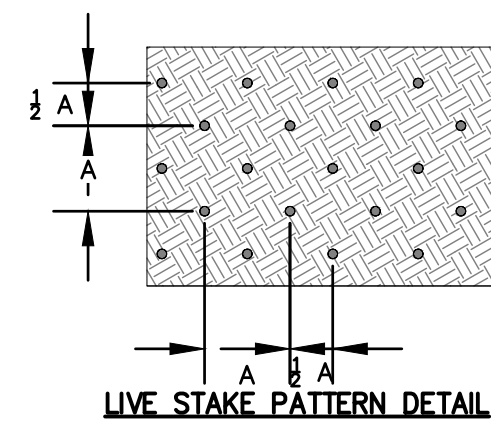
**SOD MAT EXAMPLES**

B	ISSUED FOR PERMITTING		10/2020		
A	ISSUED FOR REVIEW	MJT	08/2020		
NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D	APP'D
ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE-SPECIFIC RESTORATION PLAN UNNAMED STREAM – MP 1126.2 – MDNR ID 67 SITE SPECIFIC DETAILS					
SCALE	DWG. NO.	PAGE NO.			
NOTED	SSRP-1126.2-004	5/8			





**CROSS SECTION**



**LIVE STAKE EXAMPLE**

DIMENSION <sup>2</sup>	NAME	TYPICAL UNIT	VALUE	DESCRIPTION
A	LIVE STAKE SPACING	FEET	3 - 0.0	SPACING BETWEEN INDIVIDUALLY INSTALLED LIVE STAKES. STAKES CAN BE PLACED IN A TRIANGULAR GRID (NRCS 2007A) OR RANDOMLY (NRCS 2007A, IOWA DNR 2006). RECOMMEND SPECIES DIVERSITY THROUGHOUT PROJECT AREA.
B	LIVE STAKE - TOP OF SLOPE PLACEMENT	INCHES	0 - 3	POSITION OF LIVE STAKE RELATIVE TO THE TOP OF A SLOPE
C	LIVE STAKE - TOE OF SLOPE PLACEMENT	INCHES	0 - 3	POSITION OF LIVE STAKE RELATIVE TO THE TOE OF A SLOPE
D	LIVE STAKE - BASE FLOW RELATIONSHIP	FEET	1239	PLACEMENT OF LOWER ROW OF LIVE STAKES RELATIVE TO THE APPROXIMATE BASE FLOW WATER LEVEL WITH CONSIDERATION GIVEN TO DURATION OF INUNDATION DURING BANKFULL AND OTHER HIGH FLOW EVENTS.
E	LIVE STAKE LENGTH	INCHES	24 - 36	LENGTH OF PREPARED DORMANT LIVE CUTTING FROM WOODY PLANT TO BE USED AS LIVE STAKE. LENGTH SHOULD BE SUFFICIENT TO REACH LOW-FLOW WATER TABLE ELEVATION.
F	LIVE STAKE PROTRUSION	INCHES	3 - 4	DISTANCE INSTALLED LIVE STAKE SHOULD PROTRUDE ABOUT 20% FROM THE GROUND. AT LEAST TWO BUDS OR BUD SCARS SHOULD BE PRESENT ABOVE THE GROUND IN THE FINAL INSTALLATION, DEPENDING ON THE SURROUNDING VEGETATION HEIGHT.
G	LIVE STAKE DIAMETER	INCHES	1/2 - 1 1/2	DIAMETER OF PREPARED DORMANT LIVE CUTTING FROM WOODY PLANT TO BE USED AS LIVE STAKE - TYPICALLY CITE A PERMISSIBLE MINIMUM AND MAXIMUM DIAMETER.

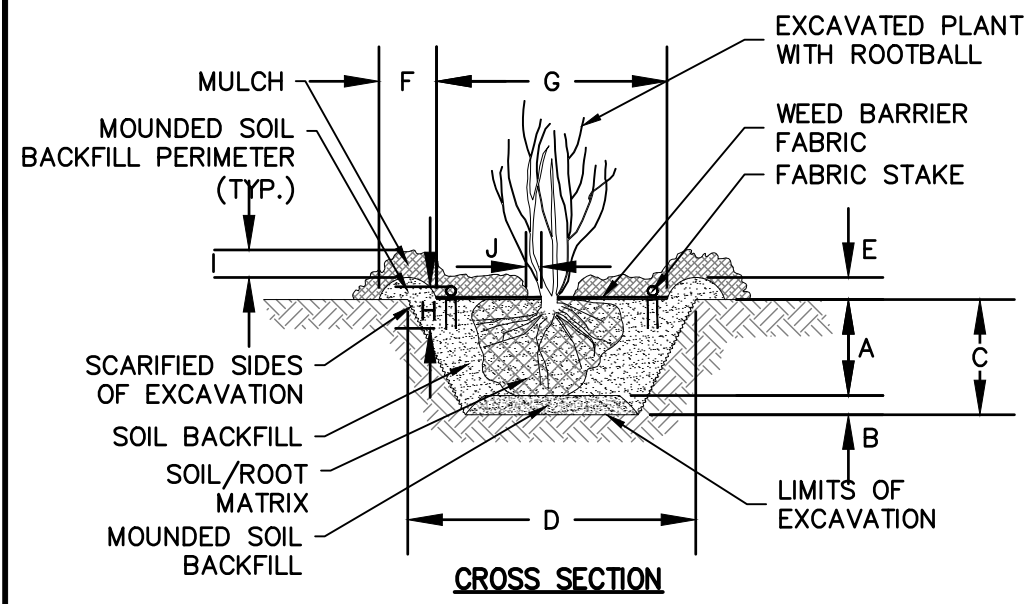
NOTES:  
1. DIMENSION LABELS ARE REFERENCED IN THE DETAIL DRAWINGS.

**1 LIVE STAKE PLANTINGS DETAIL**



B	ISSUED FOR PERMITTING		10/2020		
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ENBRIDGE LINE 3 REPLACEMENT PROJECT SITF-SPFCIFIC RFSTORATION PLAN UNNAMED STREAM - MP 1126.2 - MDNR ID 67 SITE SPECIFIC DETAILS					
SCALE	DWG. NO.	PAGE NO.			
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DIMENSION <sup>1</sup>	NAME	TYPICAL UNIT	VALUE	DESCRIPTION
A	PLANTING DEPTH	VARIES	12 – 18	PLANTING DEPTH OF THE TRANSPLANT.
B	HEIGHT OF MOUNDED SOIL BACKFILL	INCHES	N/A	HEIGHT OF MOUNDED LOOSE SOIL PLACED INTO OVER-EXCAVATED PLANTING PIT.
C	DEPTH OF PLANTING PIT	VARIES	12 – 18	DEPTH OF THE PLANTING PIT; ACCOMMODATES DIMENSION OF SOIL AND EXCAVATED ROOTS AS WELL AS MOUNDED LOOSE SOIL AT BOTTOM OF PIT.
D	WIDTH OF PLANTING PIT	VARIES	3 – 5	OVER-EXCAVATED WIDTH OF THE PLANTING PIT; ACCOMMODATES THE WIDTH OF THE EXCAVATED SOIL AND ROOTS.
E	HEIGHT OF MOUNDED SOIL PERIMETER	INCHES	0 – 2	HEIGHT OF SOIL BERM CONSTRUCTED ALONG THE PERIMETER OF THE PLANTING PIT; HELPS RETAIN WATER.
F	WIDTH OF MOUNDED SOIL PERIMETER	INCHES	0 – 6	WIDTH OF SOIL BERM CONSTRUCTED ALONG THE PERIMETER OF THE PLANTING PIT; HELPS RETAIN WATER.
G	WIDTH OF WEED BARRIER FABRIC (OPTIONAL)	INCHES	N/A	WIDTH OF FABRIC PLACED ON SURFACE TO CONTROL WEEDS WITHIN THE MOUNDED SOIL PERIMETER; TRANSPLANTS TYPICALLY HAVE GRASSES, LEAF MATTER, ETC. ATTACHED AND DO NOT REQUIRE WEED BARRIER FABRIC.
H	FABRIC STAKE LENGTH (OPTIONAL)	INCHES	N/A	LENGTH OF STAPLES/SPIKES USED TO SECURE WEED BARRIER FABRIC
I	THICKNESS OF MULCH (OPTIONAL)	INCHES	N/A	THICKNESS OF MULCH, IF NECESSARY. TRANSPLANTS TYPICALLY HAVE GRASSES, LEAF MATTER, ETC. ATTACHED AND DO NOT REQUIRE MULCH.
J	GAP BETWEEN MULCH AND PLANT STEM/TRUNK (OPTIONAL)	INCHES	N/A	ROOM BETWEEN PLANT STEM/TRUNK AND MULCH. TRANSPLANTS TYPICALLY HAVE GRASSES, LEAF MATTER, ETC. ATTACHED

NOTES:  
1. DIMENSION LABELS ARE REFERENCED IN THE DETAIL DRAWINGS.



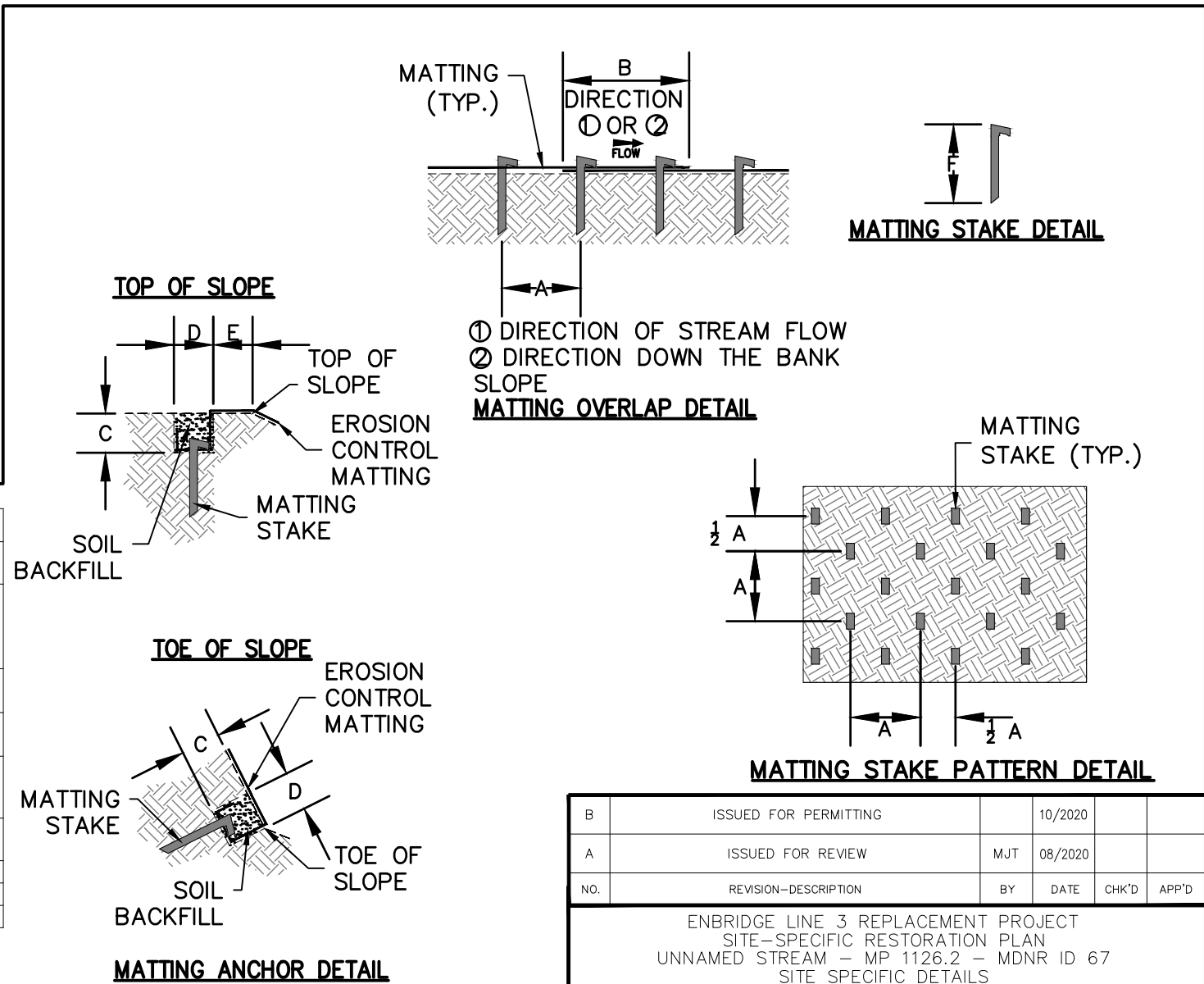
TRANSPLANTS EXAMPLES

1 TRANSPLANTING DETAIL

DIMENSION <sup>2</sup>	NAME	TYPICAL UNIT	VALUE	DESCRIPTION
A	MATting STAKE SPACING	FEET, INCHES	N/A	SPACING BETWEEN EROSION CONTROL MATting STAKES USED TO FASTEN THE MATting TO THE SOIL
B	MATting OVERLAP	FEET, INCHES	N/A	AMOUNT OF EROSION CONTROL MATting OVERLAP IF MULTIPLE PIECES AND/OR ROLLS OF MATting ARE USED. OVERLAP VARIES DEPENDING ON THE LOCATION OF THE OVERLAP WITH RESPECT TO POSITION ON THE SLOPE, LOCATION OF THE MATting (EDGE OR END), AND PRODUCT SPECIFICATIONS.
C	MATting ANCHOR TRENCH DEPTH	FEET, INCHES	N/A	DEPTH OF TRENCH INTO WHICH EDGE OF EROSION CONTROL MATting IS ANCHORED AT THE TOP AND/OR TOE OF A SLOPE.
D	MATting ANCHOR TRENCH WIDTH	FEET, INCHES	N/A	WIDTH OF TRENCH INTO WHICH EDGE OF EROSION CONTROL MATting IS ANCHORED AT THE TOP AND/OR TOE OF A SLOPE.
E	TOP OF SLOPE ANCHOR TRENCH SETBACK	FEET, INCHES	N/A	TOP OF SLOPE ANCHOR TRENCH DISTANCE FROM THE TOP OF SLOPE. TOP OF SLOPE REFERS TO TOP OF SIDE SLOPE, BANK SLOPE, TERRACE SLOPE, BANKFULL, ETC.
F	MATting STAKE LENGTH	INCHES	N/A	LENGTH OF EROSION CONTROL MATting STAKES OR STAPLES USED TO FASTEN THE MATting TO THE SOIL

NOTES:  
1. DATA ARE FOR EROSION CONTROL MATting APPLIED TO STREAM BANK SLOPES.  
2. DIMENSION LABELS ARE REFERENCED IN THE DETAIL DRAWINGS.

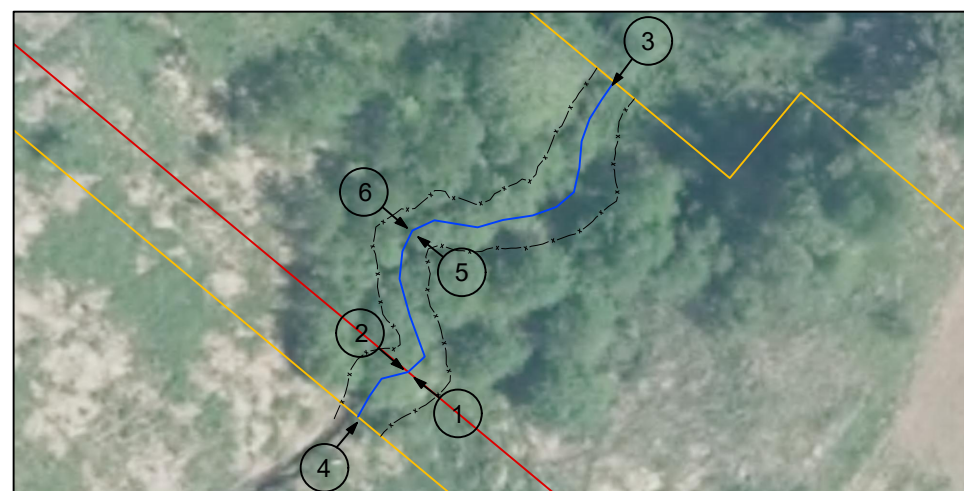
2 EROSION CONTROL MATting DETAIL



B	ISSUED FOR PERMITTING		10/2020		
A	ISSUED FOR REVIEW	MJT	08/2020		
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**NOTES:**

1. AIR PHOTOS ARE FROM 2018 ENBRIDGE AERIAL PHOTOGRAPHY.
2. ADDITIONAL ON-THE GROUND PHOTOS MAY BE TAKEN PRIOR TO CONSTRUCTION AT MDNR REQUEST.
3. PRE-CONSTRUCTION PHOTOS WILL BE USED TO AID IN RESTORATION.



B	ISSUED FOR PERMITTING	MJT	10/2020		
A	ISSUED FOR REVIEW	MJT	08/2020		
NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D	APP'D
ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE-SPECIFIC RESTORATION PLAN UNNAMED STREAM — MP 1126.2 — MDNR ID 67 PHOTO PAGE					
SCALE	DWG. NO. SSRP-1126.2-005	PAGE NO. 5/5			



GENERAL

1. THE SPECIFICATIONS WITHIN THIS SSRP MAY MODIFY OR REPLACE PROJECT–WIDE STANDARDS PRESENTED IN THE EPP. WHERE MATERIAL WITHIN THESE SSRPS EXCEEDS STANDARD CONSTRUCTION MEASURES IN THE EPP, THESE SSRPS SUPERSEDE THE EPP.
2. CONSTRUCTION AND RESTORATION OF WATERBODY CROSSINGS WILL FOLLOW THESE GENERAL STEPS:

A. SITE CLEARING

B. INSTALLATION OF TEMPORARY EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES (‘BMPS’)

C. BRIDGE INSTALLATION

D. EXCAVATION/BACKFILLING OF THE WATERBODY INCLUDING:

• SOD SAVING TOPSOIL SEGREGATION AT NON–WOODED SITES

• STREAMBED MATERIAL SEGREGATION

• PIPE INSTALLATION

• BACKFILL, INCLUDING IMPLEMENTATION OF CONSTRUCTION–RELATED RESTORATION METHODS (I.E., TOE WOOD)

E. REPLACEMENT OF STREAMBED MATERIAL AND TOPSOIL/SOD LAYER

F. RESTORATION OF STREAM BANKS TO PRE–CONSTRUCTION CONTOURS

G. IF FINAL GRADING NOT POSSIBLE AT THE TIME, TEMPORARY STABILIZATION AND REPLACEMENT/REINFORCEMENT OF TEMPORARY BMPS

H. AFTER FINAL GRADING, PERMANENT SEEDING AND/OR WOODY VEGETATION RESTORATION, STABILIZATION AND REPLACEMENT/REINFORCEMENT OF TEMPORARY BMPS

I. BRIDGE REMOVAL DURING FINAL RESTORATION AFTER STABILIZATION AND PERMANENT SEEDING

J. POST–CONSTRUCTION MONITORING
- CROSSING METHODS
1. ALL WATERBODY AND WETLAND CROSSINGS WILL BE CONDUCTED IN COMPLIANCE WITH SECTION 2.0 AND SECTION 3.0 OF THE ENVIRONMENTAL PROTECTION PLAN (‘EPP’), RESPECTIVELY. SECTION 2.0 AND 3.0 OF THE WINTER CONSTRUCTION PLAN PRESENTS MODIFICATIONS FOR WATERBODY AND WETLAND CONSTRUCTION METHODS, RESPECTIVELY, IN WINTER CONDITIONS.

2. ENBRIDGE’S SUMMARY OF CONSTRUCTION METHODS AND PROCEDURES (THE ‘PROCEDURES,’APPENDIX A OF THE EPP) OUTLINES THE VARIOUS CONSTRUCTION METHODS THAT ENBRIDGE MAY UTILIZE TO CONSTRUCT THROUGH WATERBODIES AND WETLANDS/BASINS AS PRESENTED ON THESE SITE–SPECIFIC RESTORATION PLANS (‘SSRPS’).

A. DRY CROSSING (ISOLATED) METHODS (INCLUDING THE DRY CROSSING AND MODIFIED DRY CROSSING METHOD) ARE DESCRIBED SECTIONS 4.3 OF THE PROCEDURES, AND IN SECTIONS 2.5.2 AND 2.5.3 AND FIGURES 23 AND 24 OF THE EPP.

B. THE BORE METHOD (NON–PRESSURIZED) IS DESCRIBED IN SECTION 3.5 OF THE PROCEDURES, AND SECTION 4.0 OF THE EPP.

C. THE MODIFIED UPLAND CONSTRUCTION (WETLAND) METHOD IS DESCRIBED IN SECTION 3.3 OF THE PROCEDURES, AND SECTION 3.0 AND FIGURES 30 TO 34 OF THE EPP.

D. ALTHOUGH NOT PROPOSED AS A PRIMARY METHOD AT THESE SSRP WATERBODIES, THE OPEN CUT (NON–ISOLATED) WATERBODY CROSSING METHOD IS DESCRIBED IN SECTION 4.1 OF THE PROCEDURES, AND SECTION 2.5.1 AND FIGURE 24 OF THE EPP.

E. ALTHOUGH NOT PROPOSED AS A PRIMARY METHOD AT THESE SSRP WATERBODIES, THE PUSH–PULL METHOD IS DESCRIBED IN SECTION 3.4 OF THE PROCEDURES, AND SECTION 3.7.1 AND FIGURES 35 AND 36 OF THE EPP.

CLEARING/VEGETATION REMOVAL

1. STUMPS WITHIN THE TRENCH LINE WILL BE COMPLETELY REMOVED, GROUND, AND/OR HAULED OFF–SITE TO AN APPROVED LOCATION. TREE STUMPS OUTSIDE THE TRENCH LINE WILL BE GROUND BELOW NORMAL GROUND SURFACE TO FACILITATE A SAFE WORK AREA AND TO ALLOW TOPSOIL REMOVAL, IF NECESSARY. IN SOME CIRCUMSTANCES, TREE STUMPS OUTSIDE THE TRENCH LINE MAY BE COMPLETELY REMOVED TO ALLOW FOR A SAFE WORK AREA AND HAULED OFF–SITE TO AN APPROVED LOCATION AS OUTLINED IN SECTION 1.8.3 OF THE EPP.

2. CLEARING WILL BE CONDUCTED IN WATERBODIES AND WETLANDS AS OUTLINED IN SECTION 2.2 AND 3.2 OF THE EPP, RESPECTIVELY. CHIPS, MULCH, OR MECHANICALLY CUT WOODY DEBRIS SHALL NOT BE STOCKPILED IN A WETLAND. HYDRO–AX DEBRIS, OR SIMILAR CAN BE LEFT IN THE WETLAND IF SPREAD EVENLY IN THE CONSTRUCTION WORKSPACE TO A DEPTH THAT WILL ALLOW FOR NORMAL REVEGETATION, AS DETERMINED BY THE EI. CHIPPING IS NOT ALLOWED ON PUBLIC LANDS. ON PUBLIC LANDS, MULCH AND MECHANICALLY CUT WOODY DEBRIS MUST BE UNIFORMLY BROADCAST TO LESS THAN 2–INCH THICKNESS AND IN A MANNER THAT MAINTAINS VISIBLE GROUND.

3. ENBRIDGE WILL PROPERLY INSTALL AND MAINTAIN REDUNDANT SEDIMENT CONTROL MEASURES IMMEDIATELY AFTER CLEARING AND PRIOR TO INITIAL GROUND DISTURBANCE AT SURFACE WATERS LOCATED WITHIN 50 FEET OF THE PROJECT AND WHERE STORMWATER FLOWS TO THE SURFACE WATER (REFER TO THE ENVIRONMENTAL PLAN SHEETS IN THE SWPPP), AND WITHIN 100 FEET OF SPECIAL AND IMPAIRED WATERS, INCLUDING TROUT STREAMS.

4. ON PUBLIC LANDS AND WHEREVER PRACTICABLE AT WATERBODY CROSSINGS, ENBRIDGE WILL USE WILDLIFE–FRIENDLY EROSION AND SEDIMENT CONTROL BMPS THAT CONTAIN BIODEGRADABLE NETTING (CATEGORY 3N OR 4N NATURAL FIBER) AND WILL AVOID THE USE OF PLASTIC MESH (SECTIONS 1.17.1 AND 2.6.1 OF THE EPP).

TEMPORARY STABILIZATION

1. ON PORTIONS OF THE PROJECT WHERE WORK WILL BE OCCURRING DURING APPLICABLE ‘WORK IN WATER RESTRICTIONS’FOR PUBLIC WATERS (REFER TO SECTION 2.1), ALL EXPOSED SOIL AREAS WITHIN 200 FEET OF THE WATER’S EDGE, AND THAT DRAIN TO THAT WATER, WILL BE STABILIZED WITHIN 24 HOURS DURING THE RESTRICTION PERIOD. STABILIZATION OF ALL EXPOSED SOILS WITHIN 200 FEET OF THE PUBLIC WATER’S EDGE, AND THAT DRAIN TO THAT WATER, WILL BE INITIATED IMMEDIATELY AND COMPLETED WITHIN 7 CALENDAR DAYS WHENEVER CONSTRUCTION ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED ON ANY PORTION OF THE SITE OUTSIDE OF THE RESTRICTION PERIOD. THESE AREAS WILL BE IDENTIFIED ON THE ENVIRONMENTAL PLAN SHEETS ACCOMPANYING THE SWPPP.

2. HYDRO–MULCH AND LIQUID TACKIFIER CAN BE USED IN PLACE OF CERTIFIED WEED–FREE STRAW OR HAY MULCH WITH PRIOR APPROVAL FROM ENBRIDGE. ALL HYDROMULCH AND LIQUID TACKIFIER PRODUCTS USED WILL BE ON THE APPLICABLE STATE DOT PRODUCT LIST. HYDRO–MULCH AND LIQUID TACKIFIER PRODUCTS CONTAINING PLASTIC/POLYPROPYLENE FIBER ADDITIVES AND MALACHITE GREEN (COLORANT) WILL NOT BE UTILIZED ON THIS PROJECT. APPLICATION RATES WILL BE AT THE MANUFACTURER’S RECOMMENDED RATE. ENBRIDGE WILL AVOID THE USE OF HYDROMULCH ON PUBLIC LANDS; HOWEVER, ENBRIDGE MAY USE HYDROMULCH ON STEEP SLOPES TO PREVENT EROSION UNTIL PERMANENT COVER HAS BEEN ESTABLISHED AS OUTLINED IN SECTION 1.8.3 OF THE EPP.

RESTORATION AND STABILIZATION

1. ENBRIDGE WILL RESTORE THE STREAM BANKS AS NEAR AS PRACTICABLE TO PRE–CONSTRUCTION CONDITIONS UNLESS THAT SLOPE IS DETERMINED TO BE UNSTABLE. IF THE SLOPE IS CONSIDERED UNSTABLE, ENBRIDGE WILL RESHAPE THE BANKS TO PREVENT SLUMPING. FOR PUBLIC WATERS, ENBRIDGE WILL RETURN THE BANK TO PRE–CONSTRUCTION CONTOURS, UNLESS OTHERWISE DIRECTED BY THE SITE–SPECIFIC RESTORATION PLAN. IF ENBRIDGE CANNOT RESTORE TO PRE–CONSTRUCTION CONTOURS AT A PUBLIC WATER, ENBRIDGE WILL CONSULT WITH THE MDNR BEFORE PROCEEDING FURTHER AS OUTLINED IN SECTION 2.6 OF THE EPP.

2. UNSTABLE SOILS AND/OR SITE–SPECIFIC FACTORS SUCH AS STREAM VELOCITY AND FLOW DIRECTION MAY REQUIRE ADDITIONAL RESTORATION EFFORTS, SUCH AS INSTALLATION OF WOODY VEGETATION, GEOTEXTILE FABRIC, OR TREE, LOG, ROOTWAD, OR BOULDER REVETMENTS TO STABILIZE DISTURBED STREAM BANKS (SEE FIGURE 29) AS OUTLINED IN SECTION 2.6.2 OF THE EPP. ENBRIDGE WILL WORK WITH THE MDNR TO ENSURE ALL WORK/ADJUSTMENTS ARE APPROVED AND ARE CONDUCTED WITHIN APPLICABLE TIMING RESTRICTIONS.

3. IN UPLAND AND WETLAND AREAS, CLEANUP AND ROUGH GRADING WILL OCCUR AS OUTLINED IN SECTIONS 1.16 AND 3.9 OF THE EPP. ENBRIDGE WILL BACKFILL THE TRENCH TO AN ELEVATION SIMILAR TO THE ADJACENT AREAS OUTSIDE THE TRENCH LINE AND WILL ADD A SLIGHT CROWN OF APPROXIMATELY 3 TO 6 INCHES (DEPENDING ON SOIL TYPE) OVER THE BACKFILLED TRENCH TO ALLOW FOR SUBSIDENCE. GENERALLY, EXCESS SUBSOIL DISPLACED BY THE PIPE INSTALLATION WILL BE SPREAD ACROSS THE PORTION OF THE CONSTRUCTION WORKSPACE WHERE TOPSOIL REMOVAL HAS OCCURRED. ANY REMAINING EXCESS SUBSOIL WILL BE REMOVED AND DISPOSED OF AT AN APPROVED OFF–SITE LOCATION AS NEEDED TO ENSURE CONTOURS ARE RESTORED TO AS NEAR AS PRACTICABLE TO PRE–CONSTRUCTION CONDITIONS.

4. REVEGETATION ACTIVITIES WILL OCCUR AS OUTLINED IN SECTION 7.0 OF THE EPP. SEED MIXES AT PUBLIC WATERS WILL BE SELECTED AND APPLIED AS INDICATED IN THE PLANTING PLAN, WHICH IS APPENDIX A OF THE POST–CONSTRUCTION VEGETATION MANAGEMENT PLAN FOR PUBLIC LANDS AND WATERS (‘VMP’). SEED MIXES RELATIVE TO THESE SSRP CROSSINGS ARE CODED AS FOLLOWS:

A	EMERGENT (34–181)	G	DRY PRAIRIE GENERAL (35–221)
B	RIPARIAN NE (34–361)	H	MESIC PRAIRIE GENERAL (35–241)
C	RIPARIAN S&W (34–261)	I	MESIC PRAIRIE NW (35–441)
D	WET MEADOW NE (34–371)	J	DRY PRAIRIE NORTHWEST (35–421)
E	WET MEADOW S&W (34–271)	K	WOODLAND EDGE NE (36–311)
F	WETLAND REHABILITATION (34–171)	L	NATURAL REVEGETATION

5. ENBRIDGE WILL NOT SEED STANDING WATER OR WOODED (PSS AND PFO) WETLAND COMMUNITIES. NATURAL REVEGETATION WILL TAKE PLACE FROM EXISTING PLANT MATERIAL AND ROOT STOCK IN THESE COMMUNITIES.

6. ALL MATERIALS USED FOR CONSTRUCTION OF THE PROJECT MUST BE REMOVED FROM THE SITE.

7. ENBRIDGE WILL CONDUCT POST–CONSTRUCTION MONITORING IN ACCORDANCE WITH THE POST–CONSTRUCTION MONITORING PLAN FOR WETLANDS AND WATERBODIES, AND IN ACCORDANCE WITH THE VMP FOR THE UPLAND PORTIONS OF THE PROJECT ON PUBLIC LANDS.

B	ISSUED FOR PERMITTING	MJT	10/2020		
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ENBRIDGE LINE 3 REPLACEMENT PROJECT SITE–SPECIFIC RESTORATION PLAN					
CONSTRUCTION NOTES					
SCALE		DWG. NO. SSRP–NOTES		PAGE NO.	

PLOTTED SIZE: ANSI FULL BLEED B (17x11)