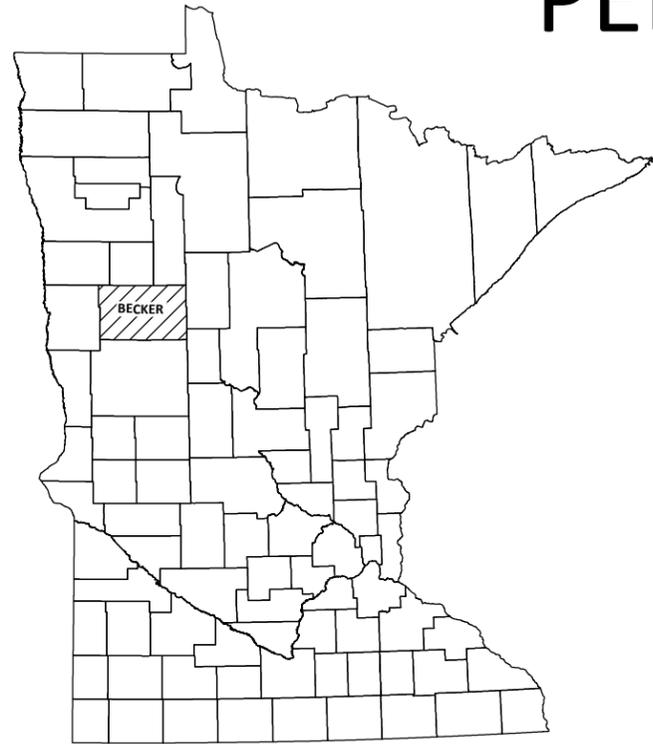


CONSTRUCTION PLANS FOR LITTLE FLOYD LAKE ROCK ARCH RAPIDS PELICAN RIVER WATERSHED DISTRICT

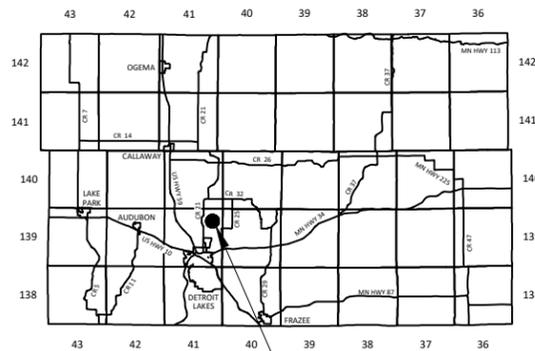
BECKER COUNTY, MINNESOTA
MARCH, 2024



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FARGO, ND 58102
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STATE COUNTY MAP



BECKER COUNTY MAP



LOCATION MAP

SHEET INDEX:

- 1 COVER SHEET
- 2 NOTES AND QUANTITIES
- 3 SITE ACCESS
- 4 ROCK ARCH RAPIDS PLAN & PROFILE
- 5-6 DAM REMOVAL PLAN
- 7 ROCK ARCH RAPIDS LAYOUT
- 8 ROCK ARCH RAPIDS DETAILS
- 9-10 EROSION CONTROL DETAILS

GOVERNING SPECIFICATIONS:

STANDARD SPECIFICATIONS FOR CONSTRUCTION ADOPTED BY THE MINNESOTA DEPARTMENT OF TRANSPORTATION, 2020 EDITION, STANDARD DRAWINGS CURRENTLY IN EFFECT, AND OTHER CONTRACT PREVISIONS SUBMITTED HEREIN.

UTILITY NOTE:

THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION, AS-BUILT MAPS AS PROVIDED BY MUNICIPALITIES OR UTILITY COMPANIES, AND/OR EXISTING DRAWINGS. THERE IS NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN INDICATE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. NOR IS THERE A GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES. THE CONTRACTOR AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MAY RESULT FROM THEIR FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UTILITIES.

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Ted D. Rud
License No. 53711

Date: 3/13/2023



QUANTITIES (BASE PROJECT: LITTLE FLOYD LAKE ROCK ARCH RAPIDS)

No.	Item	Unit	Quantity
1	Mobilization	LS	1
2	Clearing and Grubbing	LS	1
3	Flotation Silt Curtain Type Moving Water	LF	70
4	Modify Existing Dam	LS	1
5	Random Riprap Class II	CY	60
6	Random Riprap Class III	CY	120
7	Rock Weir (36" to 60" Diameter Boulders)	LF	65
8	Rock Boulders (36" to 60" Diameter Boulders)	EA	4
9	Topsoil Import	CY	50
10	Hydroseeding	LS	1
11	Balsam Fir Tree (2" to 3" Diameter)	EA	4
12	Sugar Maple Tree (2" to 3" Diameter)	EA	3
13	Bitternut Hickory Tree (2" to 3" Diameter)	EA	1
14	Canada Plum Tree (2" to 3" Diameter)	EA	1
15	Prairie Crabapple Tree (2" to 3" Diameter)	EA	1

GENERAL NOTES:

- A. ALL MATERIAL NOT UTILIZED ON THIS PROJECT WILL BECOME THE PROPERTY OF THE CONTRACTOR. DISPOSE MATERIAL OUTSIDE THE RIGHT OF WAY ACCORDING TO MNDOT SPEC. 2104, UNLESS OTHERWISE NOTED.
- B. NO WORK SHALL BE COMPLETED WITHIN THE PELICAN RIVER/PRWD DITCH NO. 13 BETWEEN ICE OUT (APPROXIMATELY MARCH 15) THROUGH JUNE 15 TO ALLOW FOR FISH SPAWNING AND MIGRATION.
- C. FLOTATION SILT CURTAIN SHALL BE INSTALLED PRIOR TO COMMENCEMENT OF CONSTRUCTION.
- D. CONTRACTOR SHALL WORK WITH ROAD AUTHORITIES TO MAINTAIN ACCESS FOR RESIDENTS AND EMERGENCY TRAFFIC AT ALL TIMES FOLLOWING MNDOT SPECS.
- E. PRIOR TO CONSTRUCTION OF ROCK ARCH RAPIDS, SUBMIT A TEMPORARY EROSION CONTROL PLAN TO THE ENGINEER FOR REVIEW. PLAN SHALL MEET ALL PERMIT REQUIREMENTS AND BE APPROVED BY THE ENGINEER PRIOR TO STARTING CONSTRUCTION ACTIVITIES.

UTILITY NOTES:

- F. COORDINATE WITH PRIVATE UTILITY OWNERS PER GOPHER STATE ONE CALL REQUIREMENTS.
- G. LOCATE AND COORDINATE EXISTING PRIVATE UTILITY RELOCATIONS AS REQUIRED TO COMPLETE WORK.

SURVEY DATUM:

- H. HORIZONTAL DATUM: NAD83 MN COUNTY COORDINATE SYSTEM, BECKER COUNTY, US FOOT
- I. VERTICAL DATUM: NAVD88

QUANTITIES (ALTERNATIVE 1: LITTLE FLOYD LAKE CULVERT INSTALLATION)

16	18" Corrugated Metal Pipe	LF	20
17	18" Steel Flap Gate	EA	1

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					Checked by TDR	Scale AS SHOWN				

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Scale Feet

NOTES:

1. ACCESS ROAD SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION AND RESTORED TO AS GOOD OR BETTER CONDITIONS THAT EXISTED PRIOR TO CONSTRUCTION. ALL COSTS FOR ACCESS ROAD IMPROVEMENTS, MAINTENANCE, AND RESTORATION SHALL BE INCIDENTAL TO OTHER BID ITEMS.
2. STOCKPILE LOCATION SHALL BE COORDINATED ON-SITE WITH ENGINEER OR ENGINEER'S REPRESENTATIVE AND THE LANDOWNER PRIOR TO CONSTRUCTION ACTIVITIES.

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Date **3/12/2024**



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VPG	3/13/2024
Checked by	Scale
TDR	AS SHOWN

LITTLE FLOYD LAKE ROCK ARCH RAPIDS
 PELICAN RIVER WATERSHED DISTRICT
 BECKER COUNTY, MINNESOTA

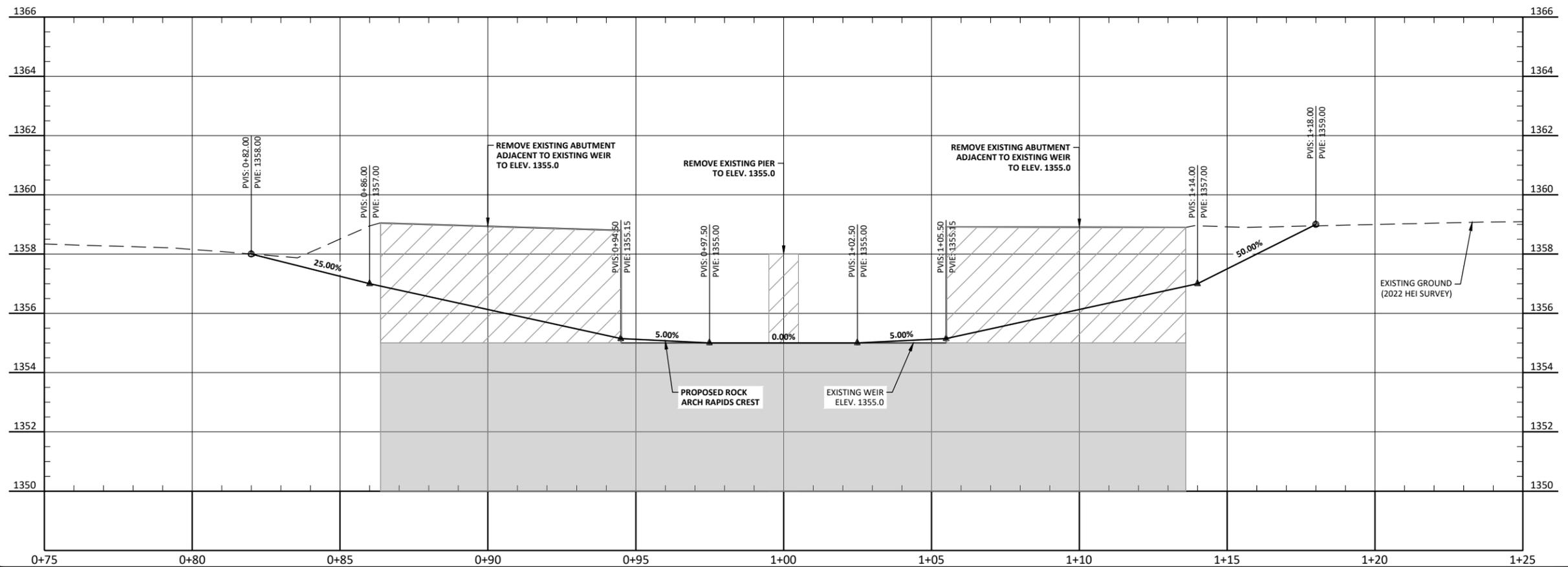
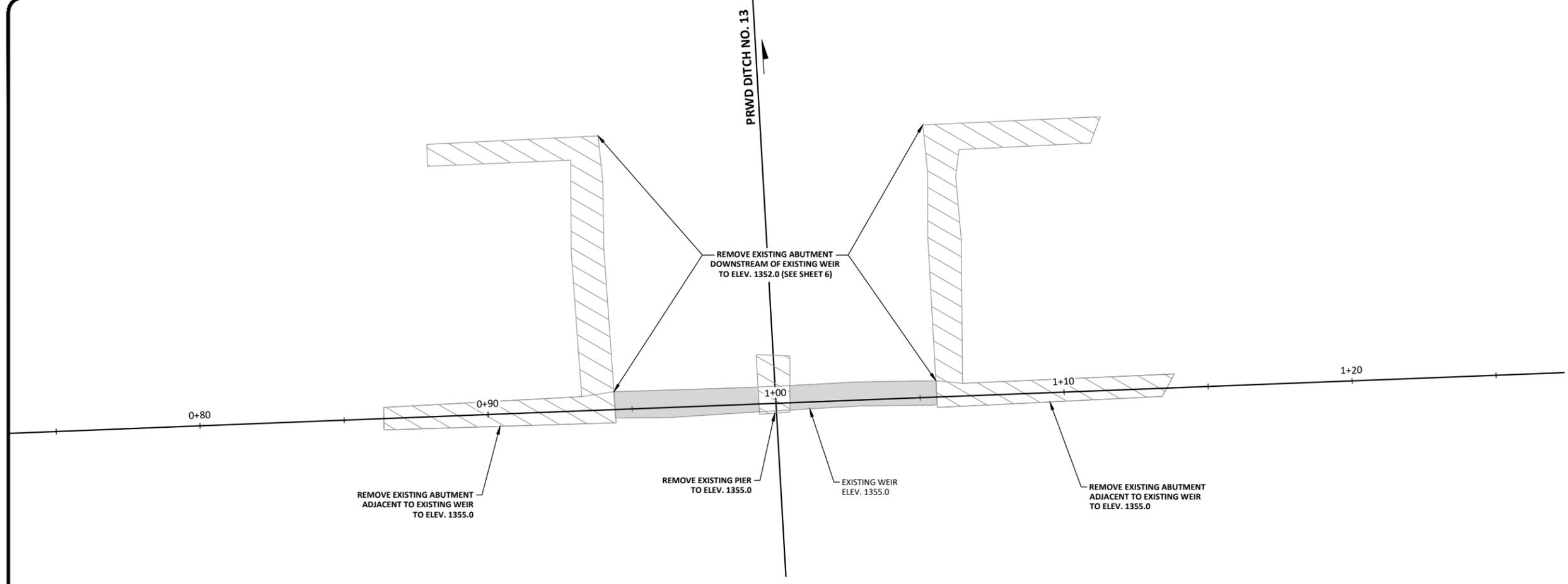
SITE ACCESS
 PROJECT NO. 6498-0003

SHEET
 3



NOTES:

1. DURING REMOVAL OF THE DAM AND THROUGHOUT CONSTRUCTION OF THE ROCK ARCH RAPIDS, THE EXISTING LAKE RUNOUT LEVEL SHALL BE MAINTAINED AT THE EXISTING CREST ELEVATION OF 1355.0.
2. TWO WEEKS PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL, A STAGING PLAN DETAILING EACH PHASE OF REMOVALS AND ROCK WEIR CONSTRUCTION.
3. ALL CONCRETE SHALL BE REMOVED TO THE ELEVATIONS SPECIFIED IN THE PLANS AND IS CONSIDERED INCIDENTAL TO THE BID ITEM MODIFY EXISTING DAM.
4. ALL REMOVED MATERIAL MUST BE DISPOSED OF OFF-SITE BY THE CONTRACTOR (INCIDENTAL TO THE BID ITEM MODIFY EXISTING DAM).
5. ALL PLANT, LABOR, MATERIALS, EQUIPMENT, TOOLS, DISPOSAL, HAULING AND OTHER ITEMS NECESSARY TO COMPLETE THE REMOVALS SHALL NOT BE PAID FOR SEPARATELY BUT INSTEAD BE INCIDENTAL TO BID ITEM MODIFY EXISTING DAM.
6. NO EXPLOSIVES SHALL BE USED TO FACILITATE REMOVAL OF EXISTING DAM.



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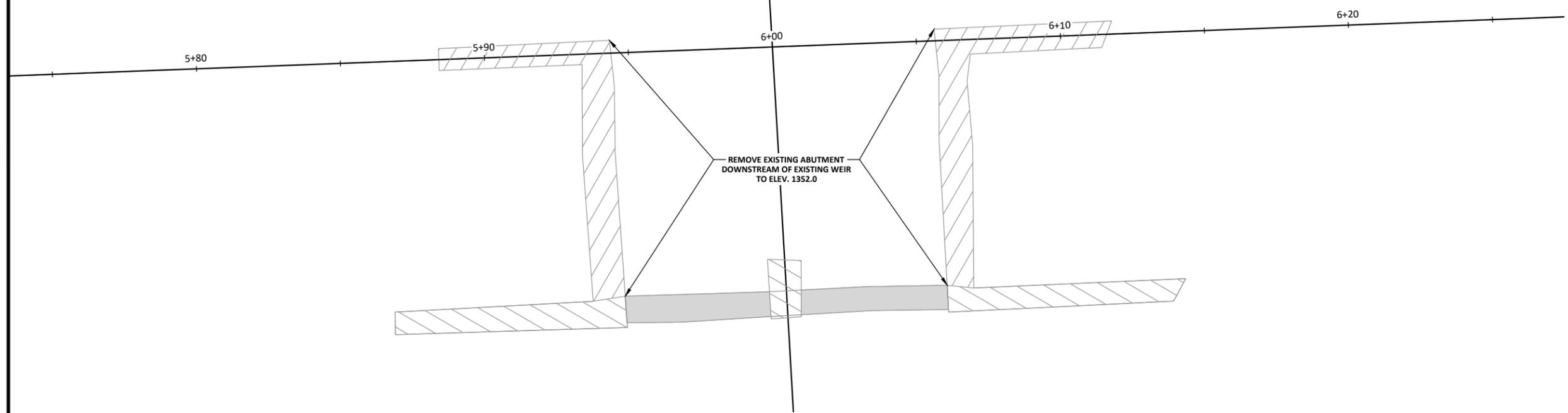
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 Date 3/13/2024
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LITTLE FLOYD LAKE ROCK ARCH RAPIDS
 PELICAN RIVER WATERSHED DISTRICT
 BECKER COUNTY, MINNESOTA

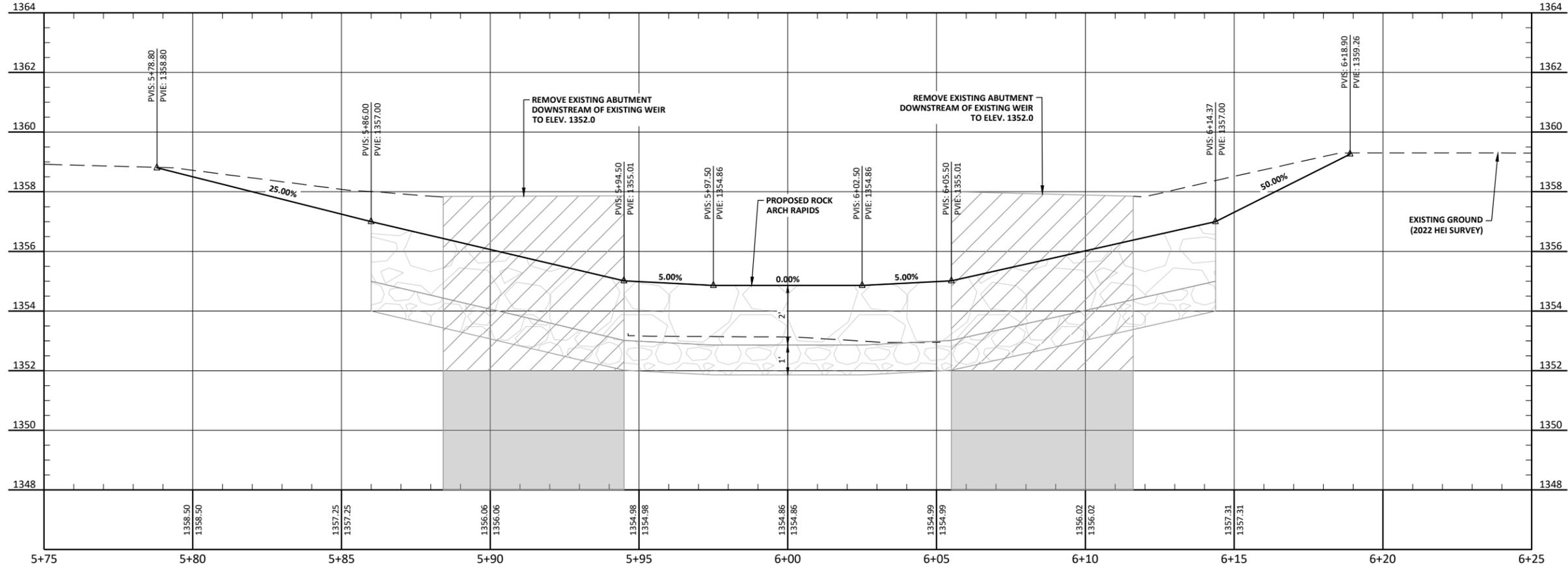
DAM REMOVAL PLAN
 PROJECT NO. 6498-0003

SHEET 5

PRWD DITCH NO. 13



- NOTES:
1. ANY ADDITIONAL CONCRETE LOCATED WITHIN THE RIPRAP FOOTPRINT SHALL BE REMOVED AND IS CONSIDERED INCIDENTAL TO THE BID ITEM MODIFY EXISTING DAM.



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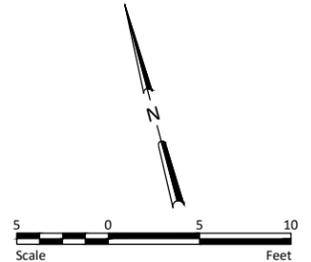
Date 3/13/2024
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LITTLE FLOYD LAKE ROCK ARCH RAPIDS
PELICAN RIVER WATERSHED DISTRICT
BECKER COUNTY, MINNESOTA

DAM REMOVAL PLAN
PROJECT NO. 6498-0003

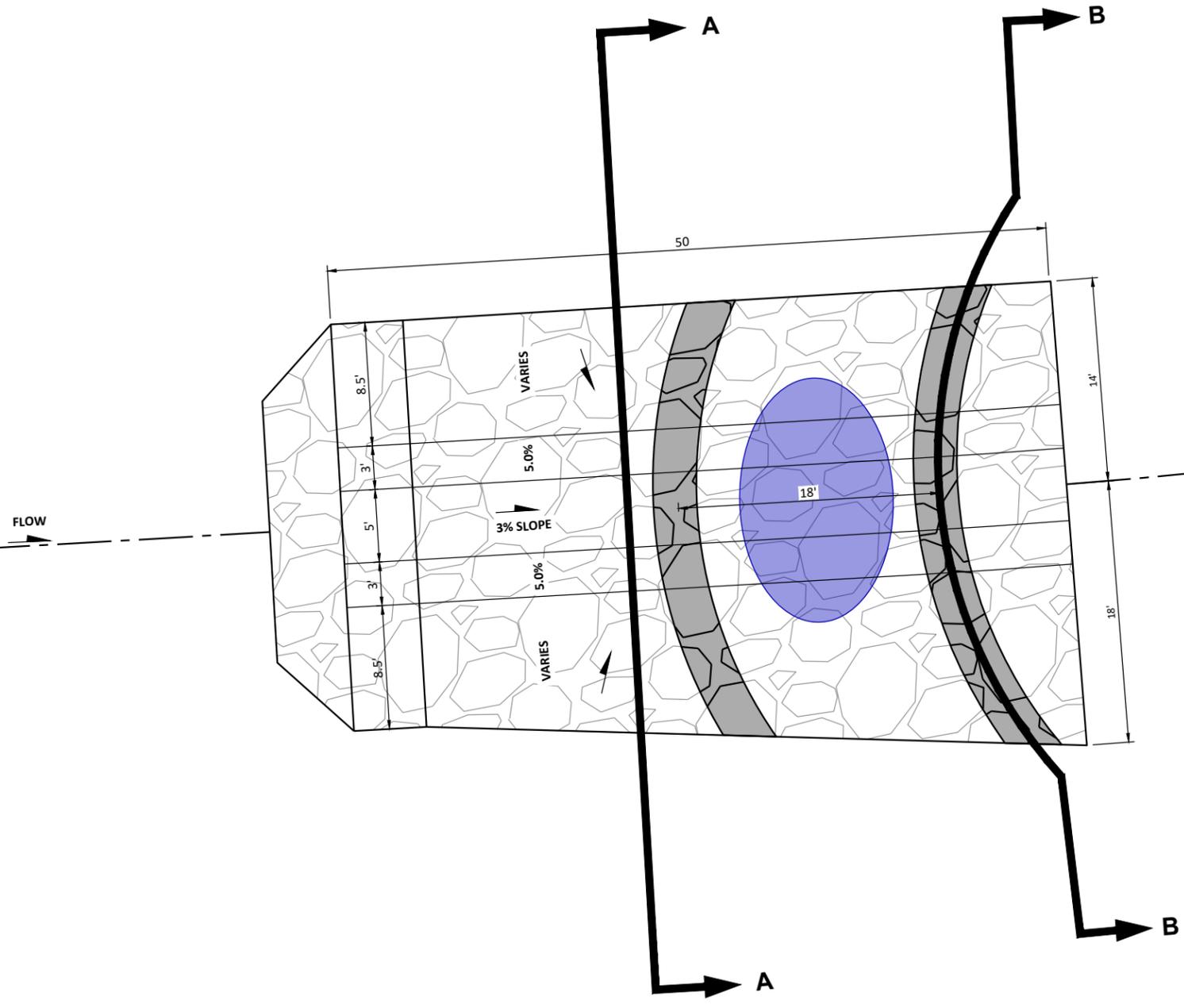
SHEET 6

ROCK WEIR STATION	LOW FLOW BOULDER ELEVATION
10+93	1355.00
11+11	1354.40



-  ROCK WEIR
-  ROCK ARCH RAPIDS
-  POOL

- NOTES:
- EXCAVATE RESTING POOLS 2FT BELOW NEXT DOWNSTREAM WEIR INVERT.
 - POOLS SHALL BE CONSTRUCTED WITH 2H:1V SIDE SLOPES, OR AS DIRECTED BY THE ENGINEER.



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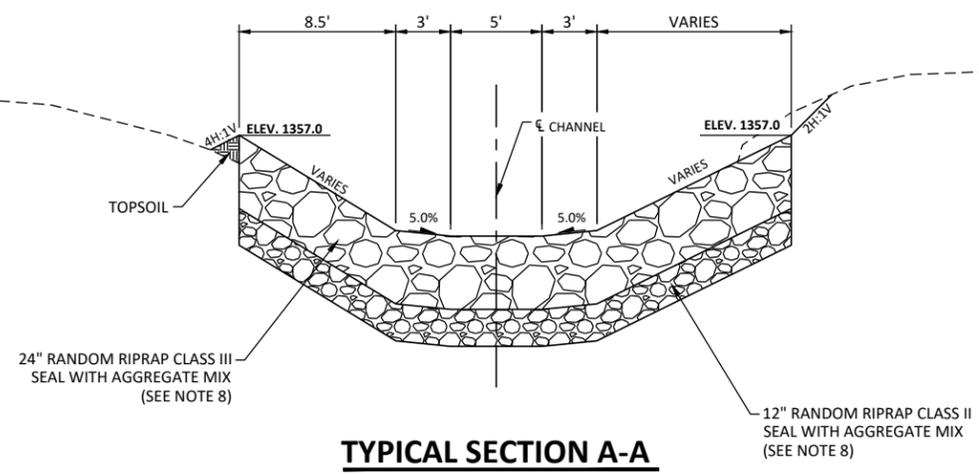
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LITTLE FLOYD LAKE ROCK ARCH RAPIDS
PELICAN RIVER WATERSHED DISTRICT
BECKER COUNTY, MINNESOTA

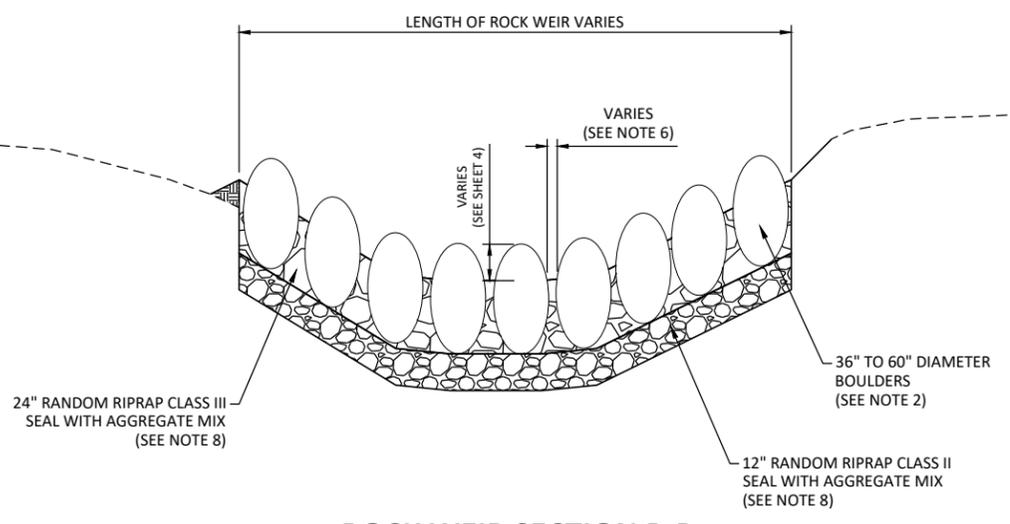
ROCK ARCH RAPIDS
LAYOUT
PROJECT NO. 6498-0003

SHEET
7

EXISTING GROUND



TYPICAL SECTION A-A
NOT TO SCALE



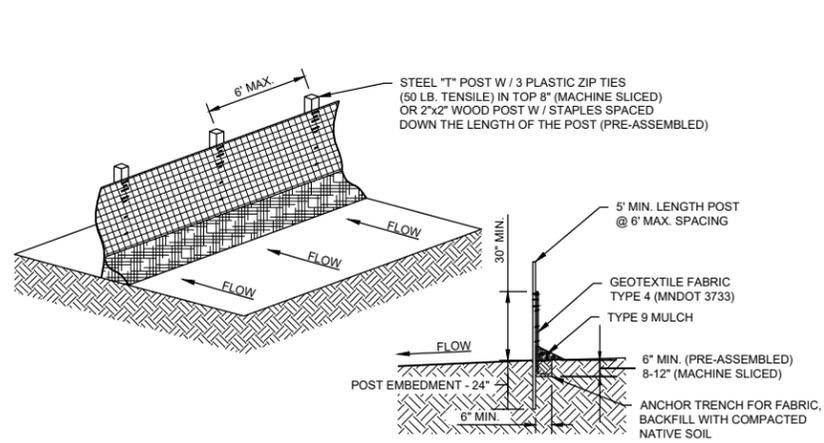
ROCK WEIR SECTION B-B
NOT TO SCALE

NOTES:

1. NUMBER OF BOULDERS FOR EACH ROCK-ARCH IS DEPENDENT ON SIZE AND SPACING OF BOULDERS.
2. ROCK WEIRS SHALL CONSIST OF 36" TO 60" BOULDERS WITH A FLAT TOP. TOP OF BOULDERS SHALL BE SET ABOVE RANDOM RIPRAP CLASS III AS SHOWN ON THE PROFILE TO RESULT IN WEIRS SPACED AT APPROXIMATELY 18' CREST TO CREST.
3. BOULDER WEIRS ARE TO BE FILLED WITH RANDOM RIPRAP CLASS II AND THE AGGREGATE MIX DESCRIBED IN NOTE #8, APPLIED AS A SINGLE, WELL-MIXED MATERIAL TO REDUCE LEAKAGE AND CREATE POOLS.
4. ADDITIONAL BOULDERS WILL BE ADDED RANDOMLY TO ADD TO AESTHETICS AS DIRECTED BY THE ENGINEER OR REPRESENTATIVE IN THE FIELD (ESTIMATED AT 4 TOTAL ADDITIONAL BOULDERS FOR THE LITTLE FLOYD LAKE ROCK ARCH RAPIDS). THE NUMBER OF ADDITIONAL BOULDERS SHALL BE MEASURED AS EACH AND PAID FOR UNDER THE BID ITEM "ROCK BOULDERS (36" TO 60" DIAMETER)".
5. THE WEIRS FUNCTION TO PROVIDE ADDED STABILITY TO THE RAPIDS, RESTING AREA FOR THE MIGRATION OF FISH, DIRECTING FLOW TOWARDS MID-CHANNEL (REDUCING STRESS ON BANKS) AND INCREASING SAFETY BY CREATING LOW VELOCITIES NEAR BANKS.
6. WEIRS ARE TO BE INTEGRATED INTO THE CONSTRUCTED BANKS, THE GAPS BETWEEN BOULDERS SHALL BE COORDINATED WITH ON-SITE DNR PERSONNEL AND THE RESIDENT PROJECT REPRESENTATIVE. THE GAPS TYPICALLY RANGE FROM 0" TO 12".
7. ALL FILL MATERIAL UNDER RIPRAP RAMP TO BE RANDOM RIPRAP CLASS II SEAL WITH AGGREGATE MIX. FILL MATERIAL UNDER RIPRAP RAMP IS ACCOUNTED FOR IN THE PLAN QUANTITY UNDER THE BID ITEM "RANDOM RIPRAP CLASS II". NO ADDITIONAL MEASUREMENT OR PAYMENT WILL BE MADE FOR FILL MATERIAL UNDER RIPRAP RAMP.
8. RIPRAP TO BE MIXED WITH A WELL GRADED MIX OF AGGREGATE VARYING FROM THE NO. 40 SIEVE UP TO 3 INCH STONES AND APPLIED AS A SINGLE, WELL-MIXED BUILDING MATERIAL TO FORM A SOLID, NO-VOID RAMP. THE MIX OF AGGREGATE SHOULD BE SUCH THAT IT IS NOT BLOWN OUT OF THE RIPRAP BY THE RIVERS CURRENT BUT INSTEAD FORCES FLOW OVER THE RIPRAP. EXCESS CHANNEL EXCAVATION CAN BE USED FOR FILLING VOIDS WITH ENGINEERS APPROVAL. SOME CONTRACTORS HAVE ESTIMATED THE QTY TO BE NEAR 1 CY OF WELL GRADED MIX OF AGGREGATE TO 1 CY OF RIPRAP. ENGINEER MAY REQUIRE ADDITIONAL AGGREGATE MIX TO BE INSTALLED. THE WELL GRADED MIX OF AGGREGATE IS CONSIDERED INCIDENTAL TO RIPRAP.

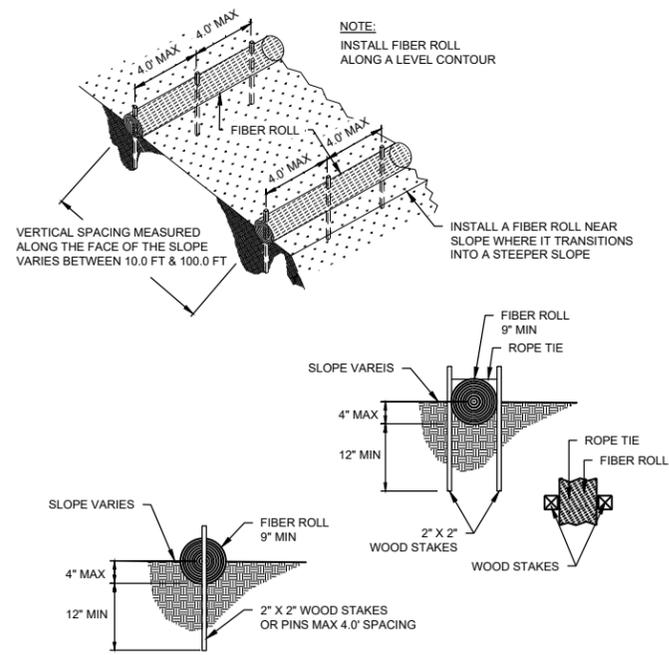
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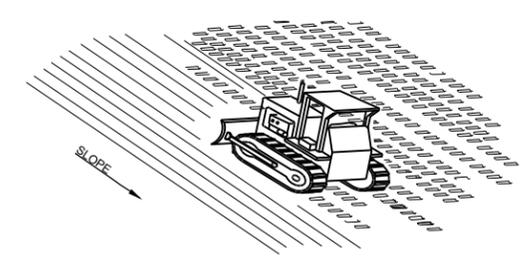


- NOTES:**
1. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN NECESSARY.
 2. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT CONTRIBUTE SEDIMENT OFF-SITE AND CAN BE PERMANENTLY STABILIZED.
 3. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.
 4. INSTALLATION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH MNDOT 3886 FOR THE TYPE OF SILT FENCE INSTALLED (PRE-ASSEMBLED OR MACHINE SLICED).

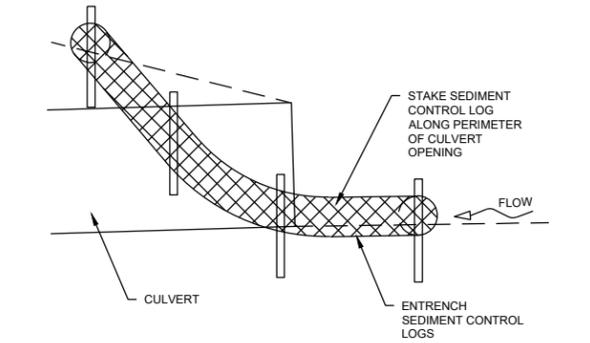
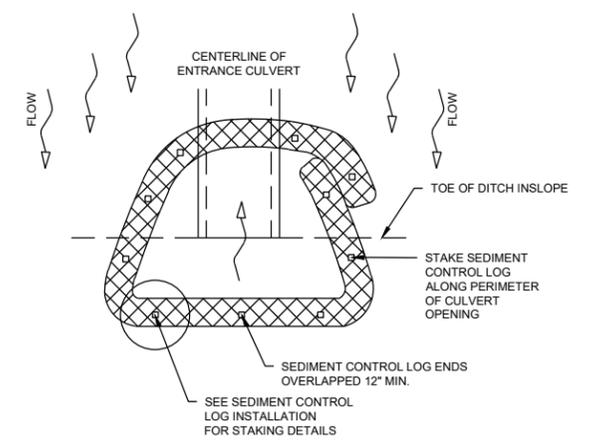
SILT FENCE, TYPE MS
NOT TO SCALE



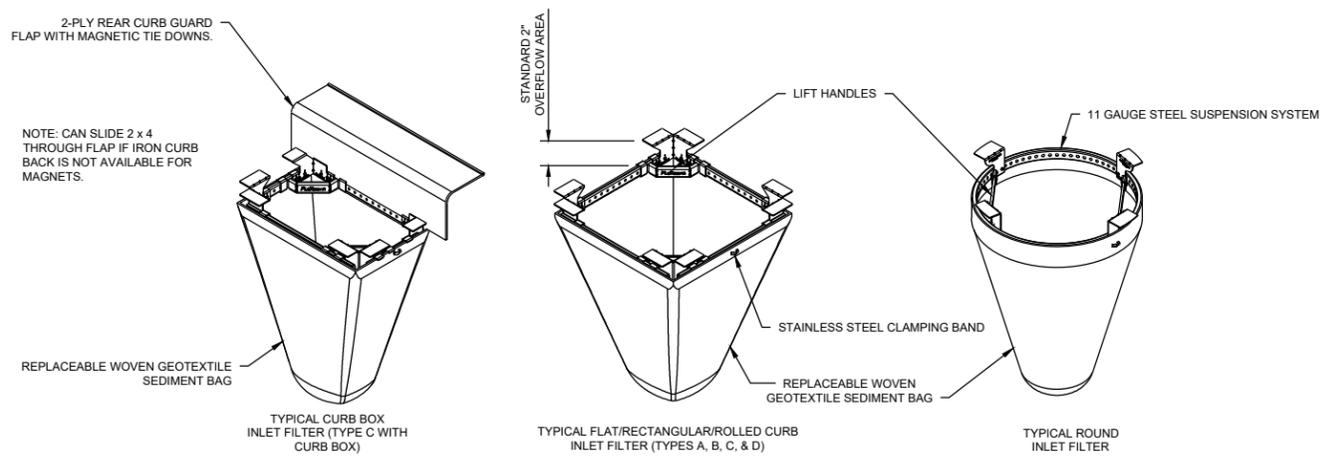
SEDIMENT CONTROL LOG INSTALLATION
NOT TO SCALE



SURFACE ROUGHENING
NOT TO SCALE



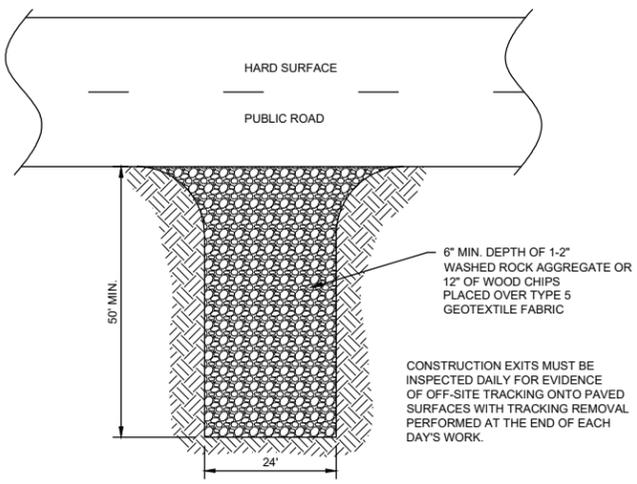
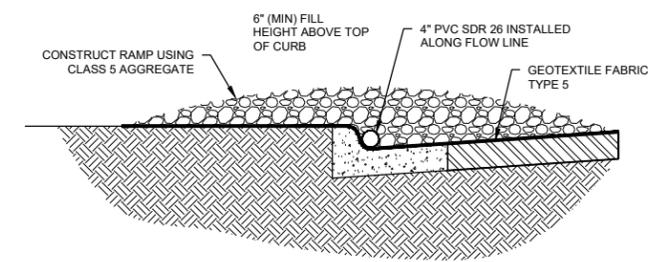
CULVERT END CONTROLS
NOT TO SCALE



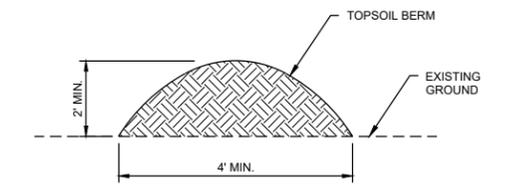
- MATERIALS:**
1. FRAMING - 11 GAUGE STEEL; CORROSION RESISTANT
 2. SEDIMENT BAG - WOVEN GEOTEXTILE (TYPE FF OR APPROVED EQUAL); 2 C.F. TYPICAL VOLUME; STAINLESS STEEL LOCKING BAND SECURING BAG TO FRAME

- INSTALLATION**
1. REMOVE GRATE FROM DRAINAGE STRUCTURE.
 2. CLEAN SOIL AND DEBRIS FROM LEDGE (LIP) OF DRAINAGE STRUCTURE.
 3. DROP FLEXSTORM INLET FILTER ONTO LOAD BEARING LIP OF CASTING OR CONCRETE STRUCTURE.
 4. REPLACE GRATE AND CONFIRM IT IS NOT ELEVATED MORE THAN 1/8", THE THICKNESS OF THE STEEL HANGARS.

STORM DRAIN INLET PROTECTION
NOT TO SCALE



STABILIZED CONSTRUCTION EXIT
NOT TO SCALE



- NOTES:**
1. CONSTRUCT TOPSOIL BERM FROM TOPSOIL SALVAGED FROM THE PROJECT.
 2. IMMEDIATELY FOLLOWING FORMATION, STABILIZE BERM WITH SEED AND MULCH OR AN EQUIVALENT APPROVED BY THE ENGINEER.
 3. MAINTAIN THE BERMS BY INSPECTING AFTER EACH RAINFALL AND/OR ONCE WEEKLY AND REPAIR AS NEEDED.

TYPE 4 (TOPSOIL) FILTER BERM
NOT TO SCALE

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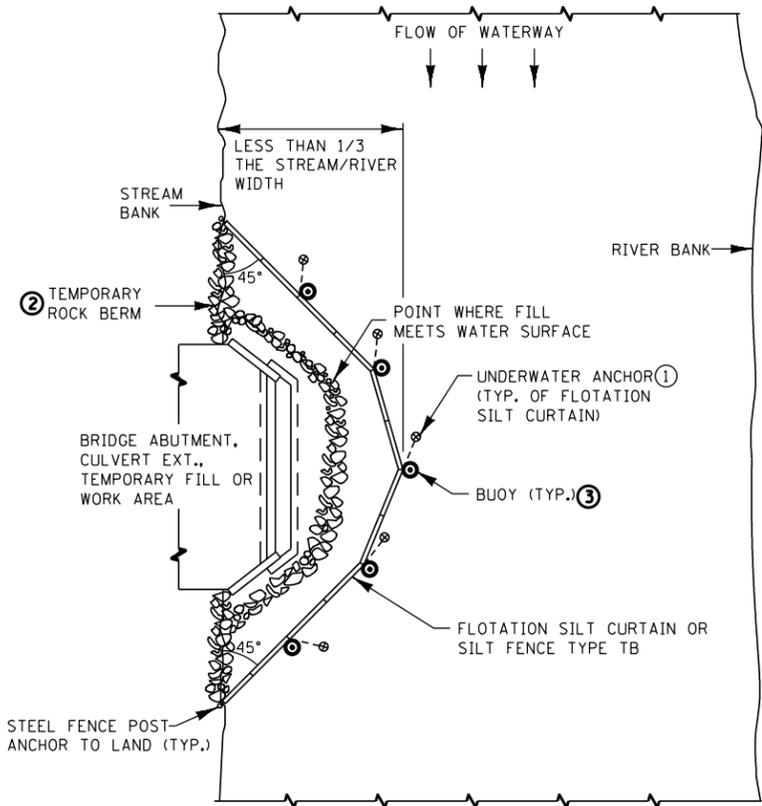


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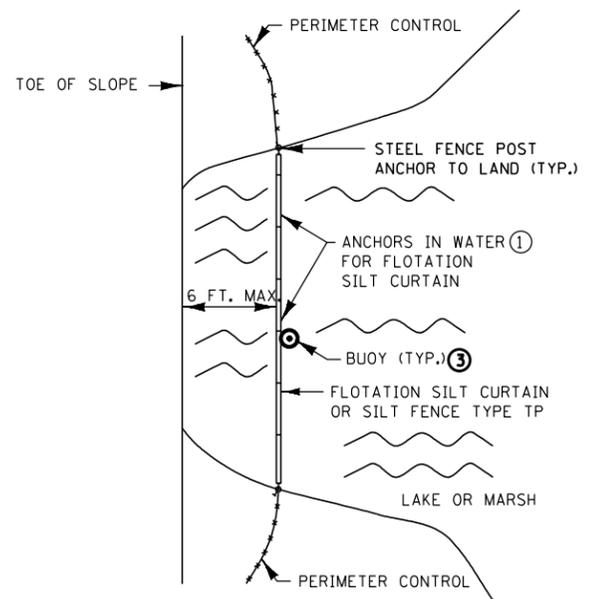
LITTLE FLOYD LAKE ROCK ARCH RAPIDS
PELICAN RIVER WATERSHED DISTRICT
BECKER COUNTY, MINNESOTA

EROSION CONTROL
DETAILS
PROJECT NO. 6498-0003

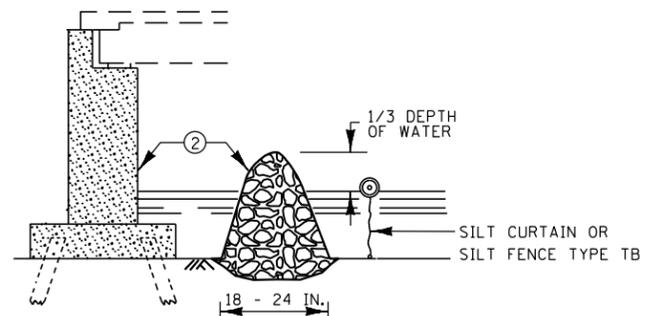
SHEET
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PLAN VIEW FOR STREAM ⑤



PLAN VIEW FOR LAKE OR MARSH ⑤

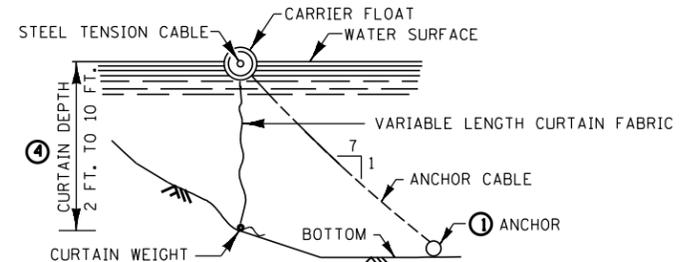


TEMPORARY ROCK BERM FOR SEDIMENT CONTROL

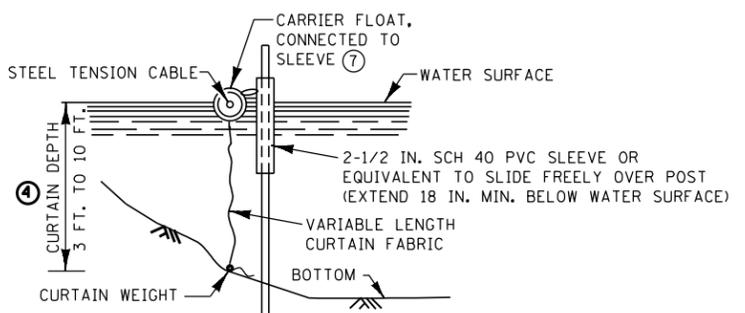
INSTALLATION GUIDELINES
SILT FENCE TYPE TB
MINIMUM WATER DEPTH: 1 FT.
MAXIMUM WATER DEPTH: 3 FT.
MAXIMUM WATER VELOCITY: 5 FT./SEC.

INSTALLATION GUIDELINES ④
FLOTATION SILT CURTAIN TYPE: STILL WATER
MINIMUM WATER DEPTH: 3 FT.
MAXIMUM WATER DEPTH: 10 FT.
MAXIMUM WATER VELOCITY: 2 FT./SEC.
MAXIMUM WAVE HEIGHT: 1 FT

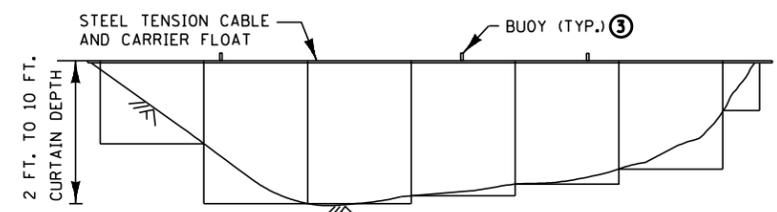
INSTALLATION GUIDELINES ④
FLOTATION SILT CURTAIN TYPE: MOVING WATER
MINIMUM WATER DEPTH: 3 FT.
MAXIMUM WATER DEPTH: 10 FT.
MAXIMUM WATER VELOCITY: 5 FT./SEC.
MAXIMUM WAVE HEIGHT: 2 FT.



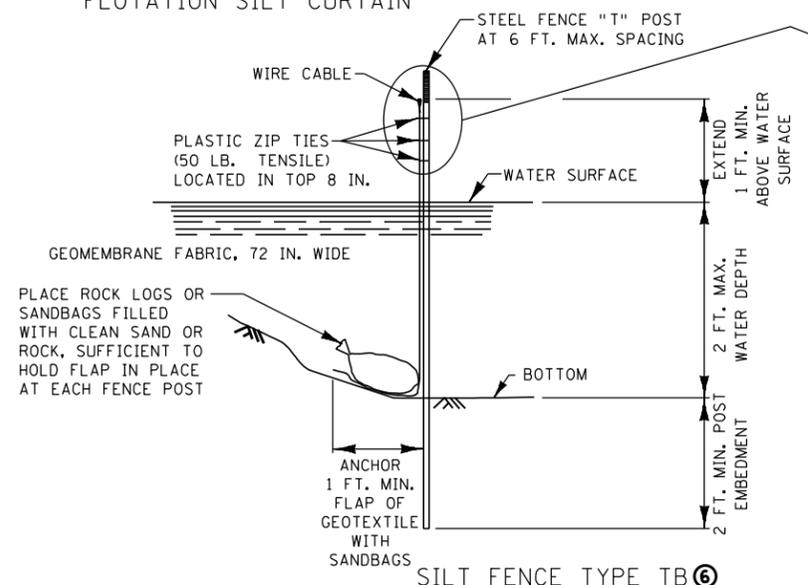
FLOTATION SILT CURTAIN



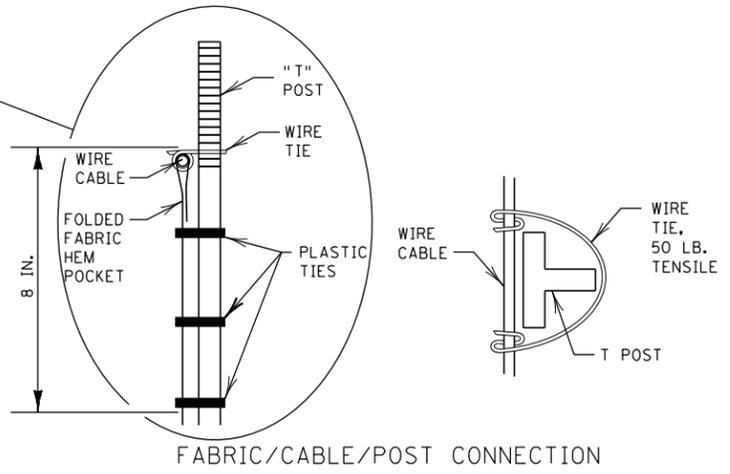
ALTERNATE FLOTATION SILT CURTAIN



FRONT VIEW FOR FLOTATION SILT CURTAIN



SILT FENCE TYPE TB ⑥



FABRIC/CABLE/POST CONNECTION

NOTES:

- SEE SPECS. 2573, 3886, 3887 & 3893.
- ① FOR ANCHOR SPACING AND WEIGHT REQUIREMENTS, SEE SPEC. 2573.
- ② IN AREAS WHERE THE PLAN CALLS FOR RIPRAP AT A BRIDGE, CULVERT, OR SLOPE, A TEMPORARY ROCK BERM CONSTRUCTED FROM THE RIPRAP CAN BE USED TO PROVIDE ADDITIONAL PROTECTION. WHEN THE WORK IS COMPLETE THE RIPRAP CAN THEN BE MOVED TO THE PERMANENT LOCATION INDICATED IN THE PLANS. THE TEMPORARY ROCK BERM IS INCIDENTAL.
- ③ ON U.S. COAST GUARD OR OTHER MOTORIZED WATERWAYS, BUOYS ARE REQUIRED TO MARK THE ENDS AND SPECIAL AREAS FOR VISIBILITY. PLACE BUOYS AS REQUIRED FOR NAVIGATIONAL PURPOSES.
- ④ MINIMUM WATER DEPTH APPLIES TO THE DEEPEST POINT ALONG THE FLOTATION SILT CURTAIN OR SILT FENCE TYPE TB FOR DETERMINING APPLICABILITY OF FLOTATION SILT CURTAIN OR SILT FENCE TYPE TB.
- ⑤ SILT CURTAIN SHOULD BE REMOVED WHEN THE AREA CONTRIBUTING DIRECT RUNOFF HAS BEEN TEMPORARILY OR PERMANENTLY STABILIZED. SILT CURTAIN SHOULD ALSO BE REMOVED BEFORE WINTER IF ICE UP OR ICE FLOW IS ANTICIPATED.
- ⑥ EMBED POST INTO BOTTOM A MINIMUM OF 40% OF THE WATER DEPTH (INCLUDING WAVE HEIGHT), BUT IN NO CASE SHALL EMBEDMENT BE LESS THAN 2 FEET.
- ⑦ ANCHOR FLOAT MUST BE CONNECTED SECURELY TO SLEEVE WITH A MINIMUM TENSILE STRENGTH OF 100 LBS. CONNECTION METHOD MUST ALLOW FOR SLEEVE TO MOVE FREELY ON POST.
- ⑧ PROVIDE SUFFICIENT NUMBER OF POST ANCHORS TO MAINTAIN SILT CURTAIN POSITION.

	STANDARD PLAN 5-297.405	1 OF 8	TEMPORARY SEDIMENT CONTROL SILT CURTAIN OR SILT FENCE TYPE TB
		APPROVED: 2-28-2017 REVISED:	
DEPARTMENT OF TRANSPORTATION	STATE DESIGN ENGINEER		

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No.	Revision	Date	By	I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision, and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota. Ted D. Rud License No. 53711	Date 3/12/2024
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Drawn by	Date
VPG	3/13/2024
Checked by	Scale
TDR	AS SHOWN

LITTLE FLOYD LAKE ROCK ARCH RAPIDS
PELICAN RIVER WATERSHED DISTRICT
BECKER COUNTY, MINNESOTA

EROSION CONTROL
DETAILS
PROJECT NO. 6498-0003

SHEET
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