

MINNESOTA DEPARTMENT OF TRANSPORTATION

CONSTRUCTION PLAN FOR SPILLWAY CONSTRUCTION, FILLING INPLACE CHANNEL AND PIPE CULVERT REPLACEMENT.
 LOCATED UNDER AND ADJACENT TO T.H. 494 (BR. NO. 9217) IN THE CITY OF MENDOTA HEIGHTS.

FED. PROJ. NO. _____ STATE FUNDS _____

GOVERNING SPECIFICATIONS

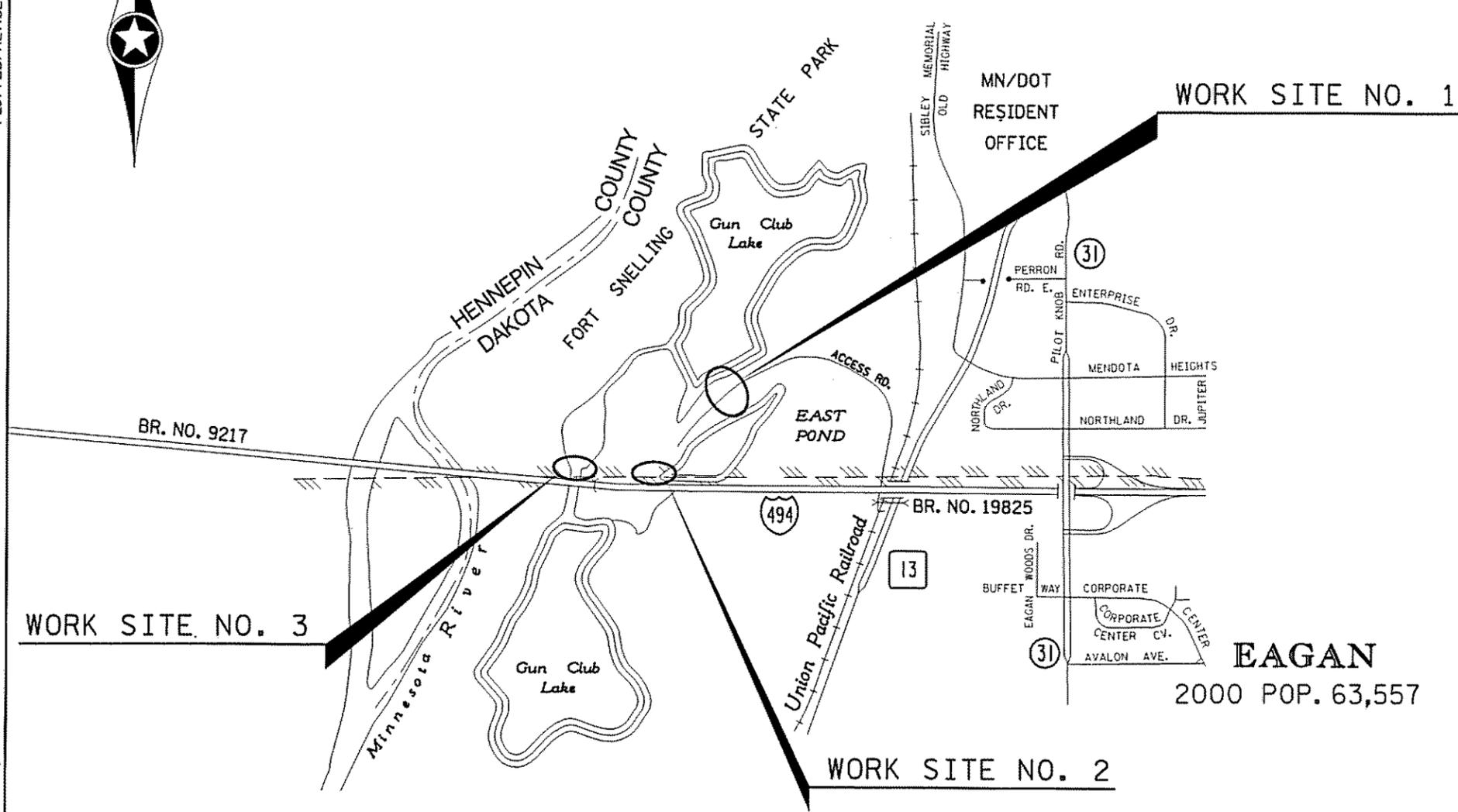
THE 2005 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION
 'STANDARD SPECIFICATIONS FOR CONSTRUCTION', SHALL GOVERN.

INDEX

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	ESTIMATED QUANTITIES, STANDARD PLATES AND SOILS & CONSTRUCTION NOTES
3	EARTHWORK TABULATIONS AND BALANCE
4	TABULATION AND STAGE CONSTRUCTION
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14	INPLACE TOPOGRAPHY AND CONSTRUCTION PLAN, WORK SITE NO. 3
15	SPILLWAY PROFILE
16	WATER RESOURCE NOTES
X1 - X6	CROSS SECTIONS

MENDOTA HEIGHTS

2000 POP. 11,432



THIS PLAN CONTAINS 22 SHEETS

I HEREBY CERTIFY THAT THIS PLAN 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.

PRINT NAME: JOSEPHINE (JOEY) LUNDQUIST LICENSE # 20534

DATE: 4/11/07 SIGNATURE: Josephine Lundquist

DESIGN SQUAD HARVEY SCHEFFERT

RECOMMENDED FOR APPROVAL *By Glen C. Ellis* 4/11/07 DISTRICT TRANSPORTATION ENGINEER

RECOMMENDED FOR APPROVAL *Benjamin J. Simons* 4/11/07 DISTRICT MATERIALS ENGINEER

RECOMMENDED FOR APPROVAL *Scott Carlson* 4/11/07 DISTRICT WATER RESOURCES/HYDRAULICS ENGINEER

RECOMMENDED FOR APPROVAL *Wendy Hill* 5/14/07 STATE PROFESSIONAL ENGINEER

OFFICE OF LAND MANAGEMENT APPROVAL *M. J. Strubberg* 5/14/07 DIRECTOR, LAND MANAGEMENT

APPROVED *M. J. Strubberg* 5/15/07 STATE DESIGN ENGINEER

I HEREBY CERTIFY THAT THE FINAL FIELD REVISIONS, IF ANY, WERE 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.

PRINT NAME: _____ LICENSE # _____

DATE: _____ SIGNATURE: _____

WORK SITE NO. 3

EAGAN

2000 POP. 63,557

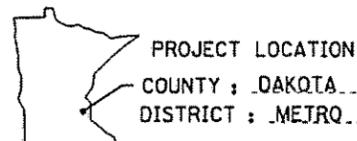
WORK SITE NO. 2

SCALES

PLAN	50'
PLAN	100'
PROFILE	100' HORIZ. 10' VERT.
INDEX MAP	5000'

DESIGN DESIGNATION N/A

Design ESALS	Design Speed	MPH
ADT (Current Year)	Based on	Sight Distance
ADT (Future Year)	Height of eye	Height of object
D (Directional Distr.)	Design Speed not achieved at:	
T (Heavy Commercial)	STA. _____ TO STA. _____	MPH _____
	STA. _____ TO STA. _____	MPH _____



FOR PLANS AND UTILITIES SYMBOLS SEE TECHNICAL MANUAL
 STATE PROJ. NO. 1986-33 CHARGE IDENTIFIER _____

PLOTTED/REVISED: 11-APR-2007 14:16

DISTRICT #: METRO
 PLOT NAME: sr-33_1sh
 PATH & FILENAME: S:\Design\494\1986\033\final\198633_1sh.dgn

106 5-15-07

STATEMENT OF ESTIMATED QUANTITIES

TAB.	SHEET NO.	ITEM NO.	DESCRIPTION	UNITS	TOTAL ESTIMATED QUANTITIES
		2021.501	MOBILIZATION	LUMP SUM	1
		2051.501	MAINT AND RESTORATION OF HAUL ROADS	LUMP SUM	1
B	4	2101.501	CLEARING	ACRE	0.5
B	4	2101.502	CLEARING	TREE	5
B	4	2101.506	GRUBBING	ACRE	0.5
B	4	2101.507	GRUBBING	TREE	35
B	4	2104.501	REMOVE METAL CULVERT	LIN FT	80
B	4	2104.509	REMOVE CONCRETE APRON	EACH	1
B	4	2104.509	REMOVE METAL APRON	EACH	4
A	3	2105.501	COMMON EXCAVATION (8) (P)	CU YD	1398
A	3	2105.525	TOPSOIL BORROW (LV) (12) (P)	CU YD	809
A	3	2105.526	SELECT TOPSOIL BORROW (LV) (9) (P)	CU YD	63
A	3	2105.607	COMMON BORROW SPECIAL (LV) (P)	CU YD	2416
B	4	2105.619	MINOR GRADING (5)	ROAD STA	2
C	4	2501.515	36" RC PIPE APRON	EACH	4
C	4	2501.561	36" RC PIPE CULVERT DESIGN 3006 CLASS V	LIN FT	56
B	4	2501.602	PLUG FILL & ABANDON PIPE CULVERT	EACH	1
B	4	2501.603	CLEAN PIPE CULVERT	LIN FT	160
B	4	2511.501	RANDOM RIPRAP CLASS III	CU YD	82
B	4	2511.515	GEOTEXTILE FILTER TYPE IV	SQ YD	245
B	4	2515.604	ARTICULATED BLOCK MAT CLOSED CELL, TYPE 3 (1) (P)	SQ YD	793
B	4	2515.604	ARTICULATED BLOCK MAT CLOSED CELL, TYPE 4 (1) (P)	SQ YD	618
		2563.601	TRAFFIC CONTROL	LUMP SUM	1
B	4	2573.502	SILT FENCE, TYPE HEAVY DUTY (2)	LIN FT	725
B	4	2573.505	FLOTATION SILT CURTAIN TYPE MOVING WATER (3)	LIN FT	400
B	4	2573.512	TEMPORARY DITCH CHECK TYPE 2 (14)	LIN FT	600
B	4	2575.501	SEEDING (1) (P)	ACRE	1
B	4	2575.502	SEED MIXTURE 350 (4) (P)	POUND	130
		2575.511	MULCH MATERIAL TYPE 3 (13)	TON	1
B	4	2575.523	EROSION CONTROL BLANKETS CATEGORY 3 (6)	SQ YD	4842
B	4	2575.532	FERTILIZER TYPE 4 (7) (P)	POUND	200
		2575.571	RAPID STABILIZATION METHOD 3 (10)	M GALLONS	6

TABULATION INDEX

SHEET NO.	TAB	TABULATION
3	A	EARTHWORK SUMMARY
4	B	MISCELLANEOUS CONSTRUCTION ITEMS
4	C	PIPE CULVERT

NOTE:

THERE IS EXCAVATION ON THIS PROJECT BUT NO UTILITIES WILL BE IMPACTED.

- ① FOR DETAIL, SEE SHEET NO. 6 AND 7. INCLUDES APPROXIMATELY 40 ANCHORS.
- ② FOR DETAIL, SEE SHEET NO. 10. INCLUDES MAINTENANCE.
- ③ FOR DETAIL, SEE SHEET NO. 8. (275' OF 2.0' DEPTH AND 125' OF 4.0' DEPTH).
- ④ APPLIED AT A RATE OF 84.5 LB/ACRE. INCLUDES 45 POUNDS TO BE USED ON PROJECT BY OTHERS.
- ⑤ FOR LOCATION, SEE SHEET NO. 12.
- ⑥ STRAW 2S SPEC. 3885.
- ⑦ ANALYSIS 18-1-8, APPLIED AT A RATE OF 120 LB/ACRE. INCLUDES 80 POUNDS TO BE USED ON PROJECT BY OTHERS.
- ⑧ MATERIAL TO BE HAULED FROM WORK SITE NO. 1 TO WORK SITE NO. 2.
- ⑨ FOR USE IN CABLE CONCRETE BLOCK MATS, PRIOR TO SEEDING.
- ⑩ FOR USE ON PROJECT FOR TEMPORARY EROSION CONTROL AT LOCATIONS AS DIRECTED BY THE ENGINEER.
- ⑪ INCLUDES SEEDING ALL CABLE CONCRETE AREAS.
- ⑫ INCLUDES 300 CU YDS TO BE STOCKPILED ADJACENT TO ACCESS TRAIL FOR PLACEMENT BY OTHERS.
- ⑬ TO BE STOCKPILED ADJACENT TO ACCESS TRAIL FOR PLACEMENT BY OTHERS.
- ⑭ FOR DETAILS, SEE SHEET NO. 9; FOR LOCATION, SEE SHEET NO. 12.

SOILS AND CONSTRUCTION NOTES

1. SUITABLE GRADING MATERIAL ON THIS PROJECT SHALL CONSIST OF ALL SOILS ENCOUNTERED WITH THE EXCEPTION OF TOPSOIL, DEBRIS, ORGANIC MATERIAL AND OTHER UNSTABLE MATERIAL.
2. COMMON BORROW SPECIAL SHALL MEET THE REQUIREMENTS OF SUITABLE GRADING MATERIAL WITH THE ADDITIONAL REQUIREMENT THAT AT LEAST 50% OF THE MATERIAL SHALL PASS THE #200 (75um) SCREEN AND 10% SHALL BE CLAY SIZED PARTICLES.
3. THREE OF THE FOUR BORINGS THROUGH THE EXISTING BERM HIT REFUSAL ON COBBLES OR BOULDERS. THE CONTRACTOR SHOULD EXPECT TO ENCOUNTER THIS MATERIAL WHEN THEY EXCAVATE FOR THE SPILLWAY.
4. IF UNSUITABLE MATERIALS, COBBLES, OR BOULDERS ARE ENCOUNTERED DIRECTLY BENEATH THE CABLE CONCRETE THIS MATERIAL SHALL BE REPLACED WITH AT LEAST 6 INCHES OF COMMON BORROW SPECIAL, AS DIRECTED BY THE ENGINEER.
5. OBTAIN COMPACTION ON THE GRADING PORTION OF CONSTRUCTION IN ACCORDANCE WITH THE "QUALITY COMPACTION METHOD" REQUIREMENTS.

THE FOLLOWING STANDARD PLATES, APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION, SHALL APPLY ON THIS PROJECT

STANDARD PLATES

PLATE NO.	DESCRIPTION
3000L	REINFORCED CONCRETE PIPE (5 SHEETS)
3006G	GASKET JOINT FOR R.C. PIPE (2 SHEETS)
3100G	CONCRETE APRON FOR REINFORCED CONCRETE PIPE
8000I	STANDARD BARRICADES

ESTIMATED QUANTITIES, STANDARD PLATES AND SOILS & CONSTRUCTION NOTES

PLOTTED/REVISED: 11-APR-2007 13:01

EARTHWORK QUANTITIES						
STATION TO STATION	EXCAVATION		EMBANKMENT		TOTAL EXCAVATION CU YD	TOTAL EMBANKMENT CU YD
	COMMON	TOPSOIL	SELECT TOPSOIL			
	CU YD	CU YD	CU YD			
WORK SITE NO. 1						
1+51 TO 1+83	323				323	
1+83 TO 2+16	508				508	
2+16 TO 2+36	245				245	
2+36 TO 2+54	179				179	
2+54 TO 3+02	143				143	
②		67	45			112
TOTALS	1398	67	45		1398	112

EARTHWORK SUMMARY				
LOCATION	EXCAVATION		EMBANKMENT	
	COMMON	SUITABLE GRADING MATERIAL	TOPSOIL	SELECT TOPSOIL ②
	CU YD	CU YD	CU YD	CU YD
ALL WORK SITES				
WORK SITE NO. 1	1398		67	45
WORK SITE NO. 2		2891	296	
①			215	
PROJECT TOTALS	1398 (EV)	2891 (CV)	578 (CV)	45 (CV)

EARTHWORK QUANTITIES			
STATION TO STATION	EMBANKMENT		TOTAL EMBANKMENT CU YD
	SUITABLE GRADING MATERIAL	TOPSOIL	
	CU YD	CU YD	
WORK SITE NO. 2			
5+00 TO 5+25	53	14	67
5+25 TO 5+50	94	18	112
5+50 TO 5+75	144	18	162
5+75 TO 6+00	177	16	193
6+00 TO 6+25	190	17	207
6+25 TO 6+50	240	21	261
6+50 TO 6+75	332	26	358
6+75 TO 7+00	384	30	414
7+00 TO 7+25	391	33	424
7+25 TO 7+50	312	29	341
7+50 TO 7+75	163	16	179
7+75 TO 8+00	83	9	92
8+00 TO 8+25	78	10	88
8+25 TO 8+50	107	14	121
8+50 TO 8+75	90	13	103
8+75 TO 9+00	53	12	65
TOTALS	2891	296	3187

EARTHWORK BALANCE A

EXCAVATION (CU. YDS.)

EMBANKMENT (CU. YDS.)

<p>COMMON 1398 (EV) / 1.2 = 1165 (CV)</p> <p>COMMON BORROW SPECIAL 2416 (LV) / 1.4 = 1726 (CV)</p> <p>SELECT TOPSOIL BORROW 63 (LV) / 1.4 = 45 (CV)</p> <p>TOPSOIL BORROW 809 (LV) / 1.4 = 578 (CV)</p>	<p>3514 (CV)</p>	<p>45 (CV) SELECT TOPSOIL</p> <p>578 (CV) TOPSOIL</p> <p>2891 (CV) SUITABLE GRADING</p>
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① TO BE STOCKPILED ON PROJECT FOR USE BY OTHERS.

② PROVIDED FOR TURF ESTABLISHMENT AREAS WITHIN THE CABLE CONCRETE BLOCK MATS.

DISTRICT #: METRO
PLOT NAME: sr-33_earthwork
PATH & FILENAME: S:\Design\49\986\033\1\ind\198633.tbl.dgn

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MISCELLANEOUS CONSTRUCTION ITEMS

B

LOCATION ①	CLEARING AND GRUBBING				CULVERTS					EARTHWORK ⑫				CABLE CONCRETE AREAS		TURF ESTABLISHMENT			EROSION CONTROL					MINOR GRADING	
	CLEAR	GRUB	CLEAR	GRUB	CLEAN PIPE CULVERT	PLUG FILL & ABANDON PIPE CULVERT ⑩	REMOVE CONCRETE APRON	REMOVE METAL APRON (36")	REMOVE METAL CULVERT (36" CMP)	COMMON EXCAVATION	COMMON BORROW SPECIAL (LV) ②	TOPSOIL BORROW (LV)	SELECT TOPSOIL BORROW (LV)	ARTICULATED BLOCK MAT CLOSED CELL 35 TYPE 3 ③	ARTICULATED BLOCK MAT CLOSED CELL 45 TYPE 4 ③	SEEDING	SEED MIXTURE 350	FERTILIZER TYPE 4	EROSION CONTROL BLANKET CATEGORY 3	FLOTATION SILT CURTAIN TYPE MOVING WATER	SILT FENCE TYPE HEAVY DUTY	RANDOM RIPRAP CLASS III	GEOTEXTILE FILTER TYPE IV		TEMPORARY DITCH CHECK TYPE 2 ⑮
	TREE	TREE	ACRE	ACRE	LIN FT	EACH	EACH	EACH	LIN FT	CU YD	CU YD			SQ YD	SQ YD	⑬	POUND	POUND	SQ YD	LIN FT	LIN FT	CU YD	SQ YD		LIN FT
WORK SITE NO. 1			0.5	0.5	160	1	1		20	1398		94	63	793	618	0.13	11.0	15.6	630	125	200	64	193		
WORK SITE NO. 2	5	35									2416	415				0.49	41.4	58.8	2372	150	275			600	
WORK SITE NO. 3							4	60								0.05	4.2	6.0	242	125	250	18	52		
⑤																0.11	9.3	13.2	533						2
⑪																0.22	18.6	26.4	1065						
PROJECT TOTALS	5	35	0.5	0.5	160	1	1	4	80	1398	2416	509	63	793	618	1.00	84.5	120	4842	400	725	82	245	600	2

PROJECT STAGE CONSTRUCTION

STAGE 1

1. CLEAN INPLACE CULVERT WHERE SPILLWAY WILL BE CONSTRUCTED. (WORK SITE NO. 1)
2. DIVERT WATER THAT FLOWS FROM THE EAST POND TO WETLAND THROUGH OPEN CHANNEL (WORK SITE NO. 2), TO OPENED CULVERT.
3. GRADE 200' OF INPLACE TRAIL. ⑤

STAGE 2

1. HAUL IN BORROW MATERIAL TO BEGIN FILLING OPEN CHANNEL (WORK SITE NO. 2). SEE TYPICAL SECTION ON SHEET NO. 5.

STAGE 3

1. BEGIN EXCAVATING NEW SPILLWAY (WORK SITE NO. 1), USING THE MATERIAL TO COMPLETE THE FILLING OF THE INPLACE CHANNEL AT WORK SITE NO. 2.
2. STOCKPILE ALL INPLACE TOPSOIL FROM ABOVE EXCAVATION, IF AVAILABLE, TO USE AS SLOPE DRESSING WHEN COMPLETING THE CHANNEL FILL.
3. PLACE TURF ESTABLISHMENT AT WORK SITE NO. 2.
4. COMPLETE CONSTRUCTION OF NEW SPILLWAY, (WORK SITE NO. 1).
5. PLACE TURF ESTABLISHMENT AT WORK SITE NO. 1.

STAGE 4

1. PLUG AND ABANDON INPLACE CULVERT THAT WAS USED TO DRAIN EAST POND DURING SPILLWAY CONSTRUCTION. (WORK SITE NO. 1)
2. OPEN SPILLWAY.

STAGE 5

1. CONSTRUCT WORK SITE NO. 3. FOR LOCATION AND DETAILS, SEE SHEET NO. 14.

PIPE CULVERTS

C

LOCATION ①	36" RCP DESIGN 3006 CL. V	36" RCP APRON	REMARKS
	LIN FT	EACH	
WORK SITE NO. 3	56	4	
PROJECT TOTALS	56	4	

- ① FOR WORK SITE LOCATIONS, SEE PLAN SHEETS NO. 12 TO 14.
- ② SEE SOILS AND CONSTRUCTION NOTE NUMBER 2 ON SHEET NO. 2.
- ③ FOR DETAILS, SEE SHEET NO. 6 AND 7.
- ④ APPLIED AT A RATE OF 84.5 LB/ACRE.
- ⑤ MINOR GRADING AREA, FOR LOCATION, SEE SHEET NO. 12.
- ⑥ ANALYSIS 18-1-8, APPLIED AT A RATE OF 120 LB/ACRE.
- ⑦ STRAW 2S SPEC. 3885.
- ⑧ FOR DETAILS, SEE SHEET NO. 8. APPROXIMATE DEPTH OF WATER AT WORK SITES NO. 1 AND 2 IS 2.0' AND WORK SITE NO. 3 IS 4.0'.
- ⑨ FOR DETAIL, SEE SHEET NO. 10.
- ⑩ PLUG INPLACE PIPE CULVERT AT WORK SITE NO. 1 AFTER SPILLWAY HAS BEEN OPENED.
- ⑪ TO BE USED ON PROJECT AS DIRECTED BY THE ENGINEER.
- ⑫ PROVIDED FOR INFORMATIONAL PURPOSES ONLY. SEE EARTHWORK BALANCE ON SHEET NO. 3.
- ⑬ INCLUDES SEEDING OF ALL CABLE CONCRETE AREAS.
- ⑭ INCLUDES APPROXIMATELY 30 TREE STUMPS INPLACE TO BE GRUBBED.
- ⑮ FOR DETAILS, SEE SHEET NO. 9.

MISCELLANEOUS PROJECT ITEMS

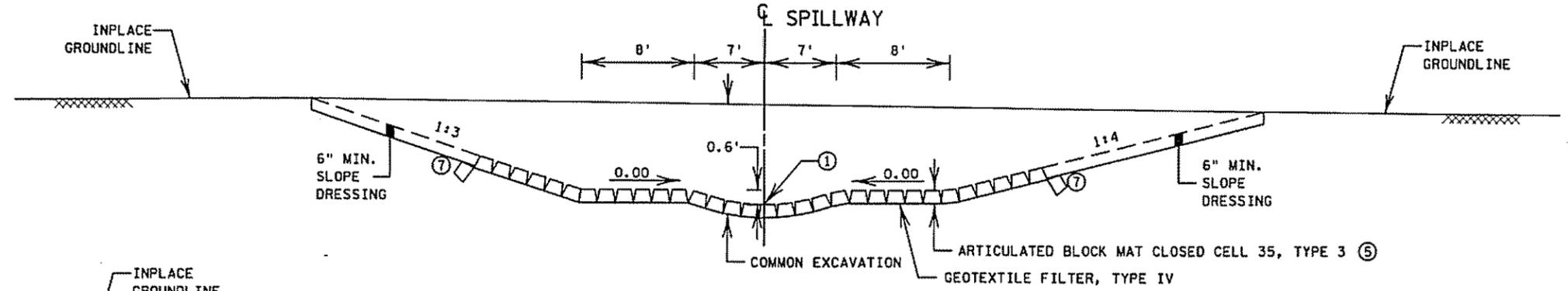
PROJECT STAGE CONSTRUCTION AND TABULATIONS

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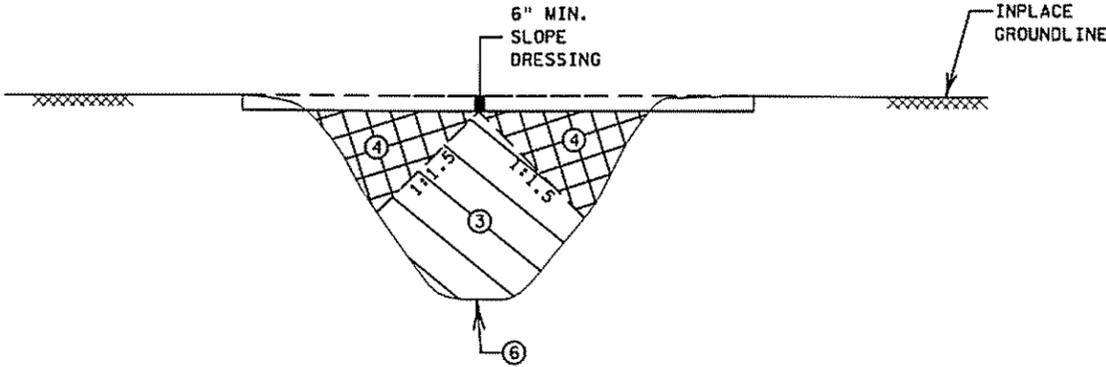
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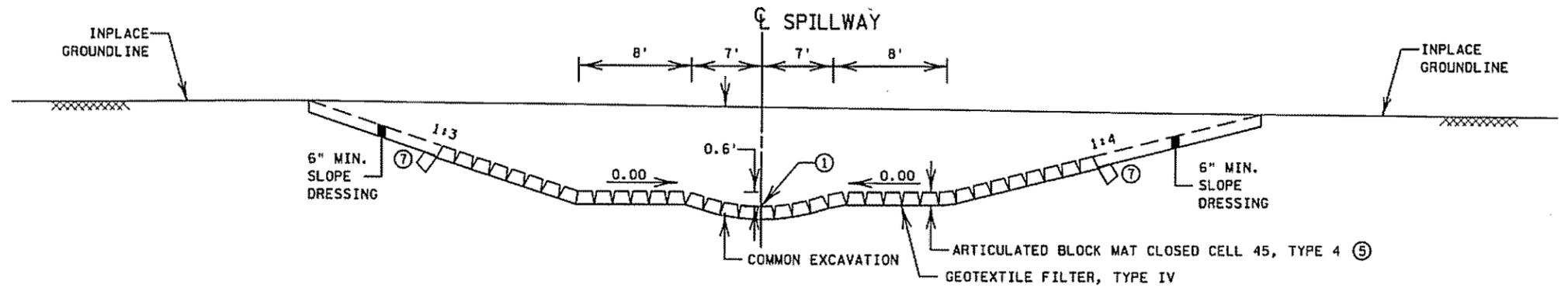
WORK SITE NO. 1 SPILLWAY STA. 1+43 TO 2+06 STA. 2+64 TO 3+02



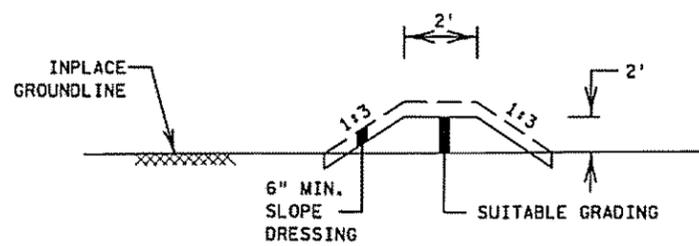
WORK SITE NO. 2 FILL INPLACE CHANNEL



WORK SITE NO. 1 SPILLWAY STA. 2+06 TO 2+64



STA. 2+54 TO 3+10 (2)

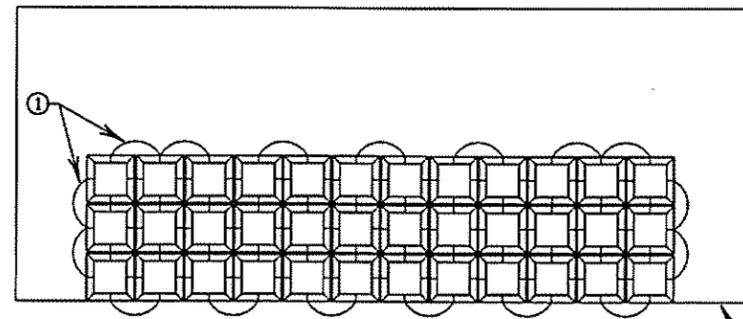
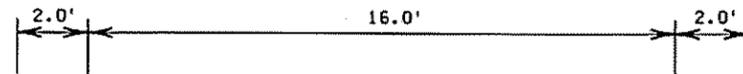


- ① FOR SPILLWAY PROFILE, SEE SHEET NO. 15.
- ② SEE CROSS SECTIONS SHEETS NO. X1 AND X2.
- ③ BACKFILL WITH COMMON BORROW SPECIAL MATERIAL.
- ④ BACKFILL WITH MATERIAL EXCAVATED FROM SPILLWAY CONSTRUCTION.
- ⑤ FOR PLACEMENT WIDTH, SEE SHEET NO. 13.
- ⑥ ALL INPLACE FABRIC AT THE BOTTOM OF CHANNEL SHALL BE REMOVED PRIOR TO PLACING FILL MATERIAL. (INCIDENTAL)
- ⑦ FOR DETAIL, SEE SLOPE APPLICATION ON SHEET NO. 7.

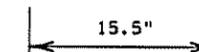
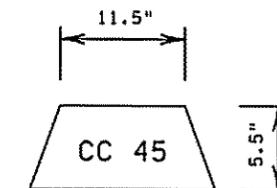
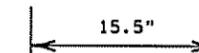
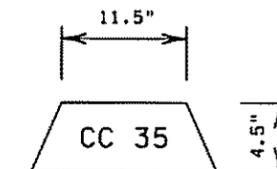
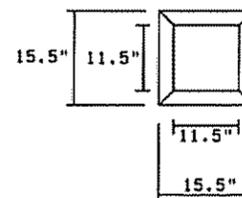
TYPICAL SECTIONS

ARTICULATED BLOCK MAT CLOSED CELL

		CC 35 41 LBS / SQ FT		CC 45 50 LBS / SQ FT	
MAT	AREA	64 SQ FT	128 SQ FT	64 SQ FT	128 SQ FT
	WEIGHT	2620 LBS	5240 LBS	3200 LBS	6400 LBS
	BLOCKS/MAT	36	72	36	72
BLOCKS	SPACING @ BASE	0.5 IN.		0.5 IN.	
	SPACING @ TOP	4.5 IN.		4.5 IN.	
	WEIGHT	73 LBS		89 LBS	
	HEIGHT	4.5"		5.5"	
CABLE	LENGTH		WIDTH		WIDTH
	DIAMETER	5/32 IN.		5/32 IN.	
	CONSTRUCTION	1 X 19		1 X 19	
	BREAKING STRENGTH	3300 LBS		3300 LBS	
OPEN AREA		8.2%			



PLAN



CABLE CONCRETE MAT DESIGN ORIGINAL BLOCK - CLOSED CELL

GENERAL NOTES:

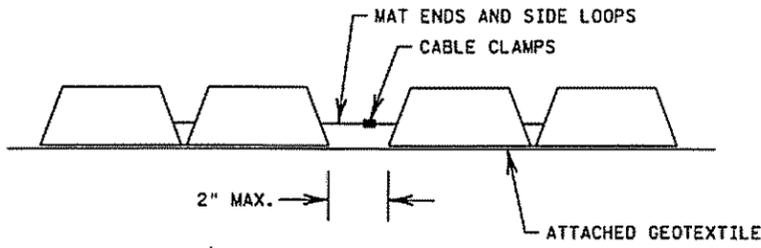
- ① STAINLESS STEEL CABLE IS USED TO CONNECT THE CONCRETE BLOCKS WITHIN THE MAT.
- ② GEOTEXTILE MATERIAL MANUFACTURED ON THE BASE OF THE CONCRETE MAT SYSTEM.
1. CABLE CONCRETE MAT SPECIFICATIONS SHALL BE CC 35 AND CC 45 AS DEFINED ABOVE OR ENGINEER PRE-APPROVED EQUIVALENT.
2. ANCHOR TYPES AND LOCATIONS TO SECURE MATS AS RECOMMENDED BY CABLE CONCRETE SUPPLIER FOR WATER FLOW, SLOPE, AND SOIL CONDITIONS ARE INCIDENTAL.
3. WHEN PLACING MATS, THE GAP BETWEEN THE MATS SHOULD NOT BE LARGER THAN A 2" MAX.
4. AT THE TOP OF THE MATS, THE ANCHOR SHOULD BE PLACED PARALLEL WITH THE TOED-IN BLOCK. WITHIN MATS, THE ANCHOR SHOULD BE PLACED PERPENDICULAR TO THE MAT.
5. THE DIMENSIONS OF THE CONCRETE BLOCKS SHALL BE 15.5" SQUARE AT THE BASE AND 11.5" SQUARE AT TOP FACE (A TRUNCATED PYRAMID SHAPE).
6. CABLES SHALL BE INTEGRAL (POURED INTO) THE CONCRETE BLOCKS AND SHALL PASS THROUGH EACH BLOCK IN LONGITUDINAL AND LATERAL DIRECTIONS IN MAT SYSTEM.

CABLE CONCRETE DETAIL SHEET

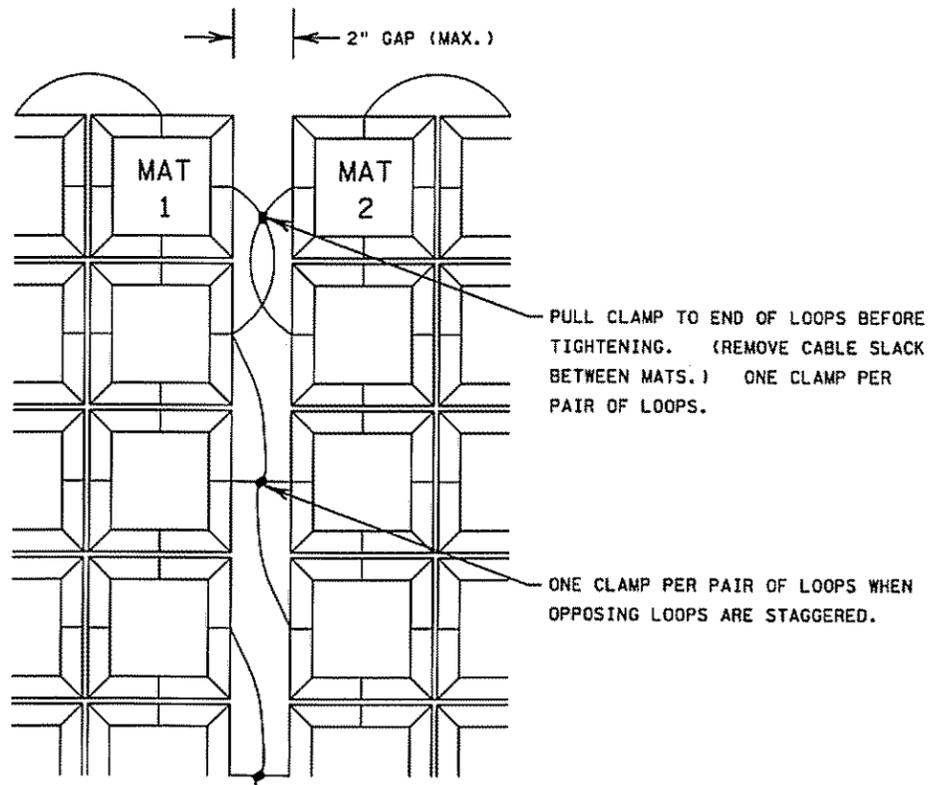
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 PLOT NAME: cf-198633.dd
 PATH & FILENAME: S:\Design\49\1986\03\1\Ina\198633.dd.dgn
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INTERMAT CLAMPING DETAIL

PROFILE VIEW



PROFILE VIEW

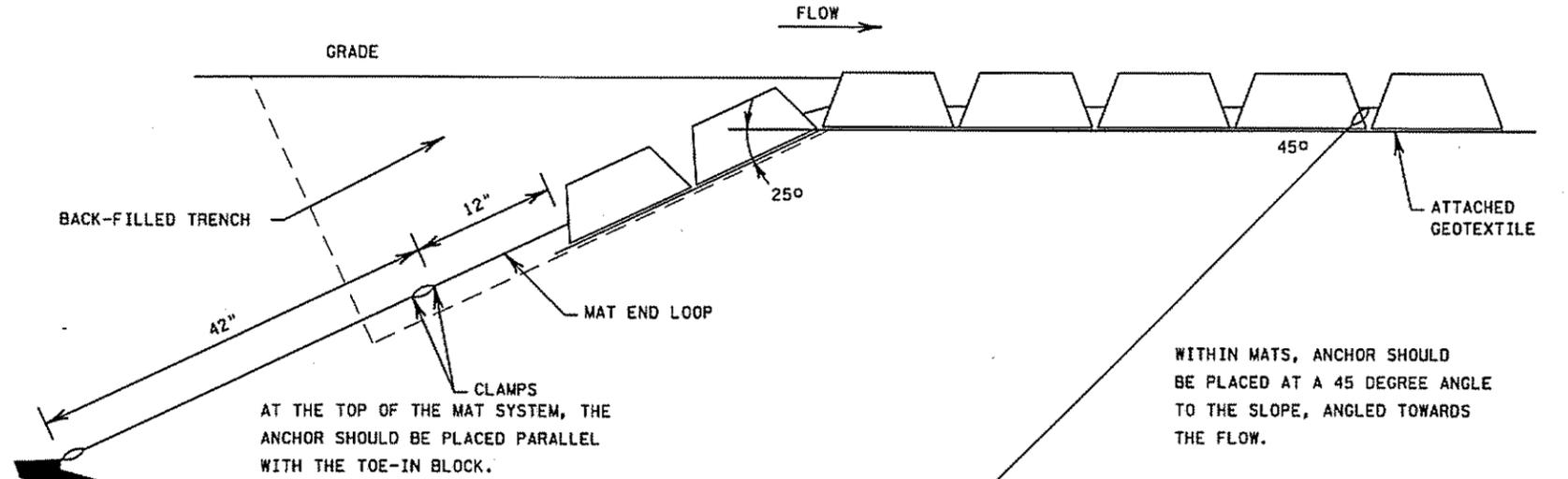


GENERAL NOTES:

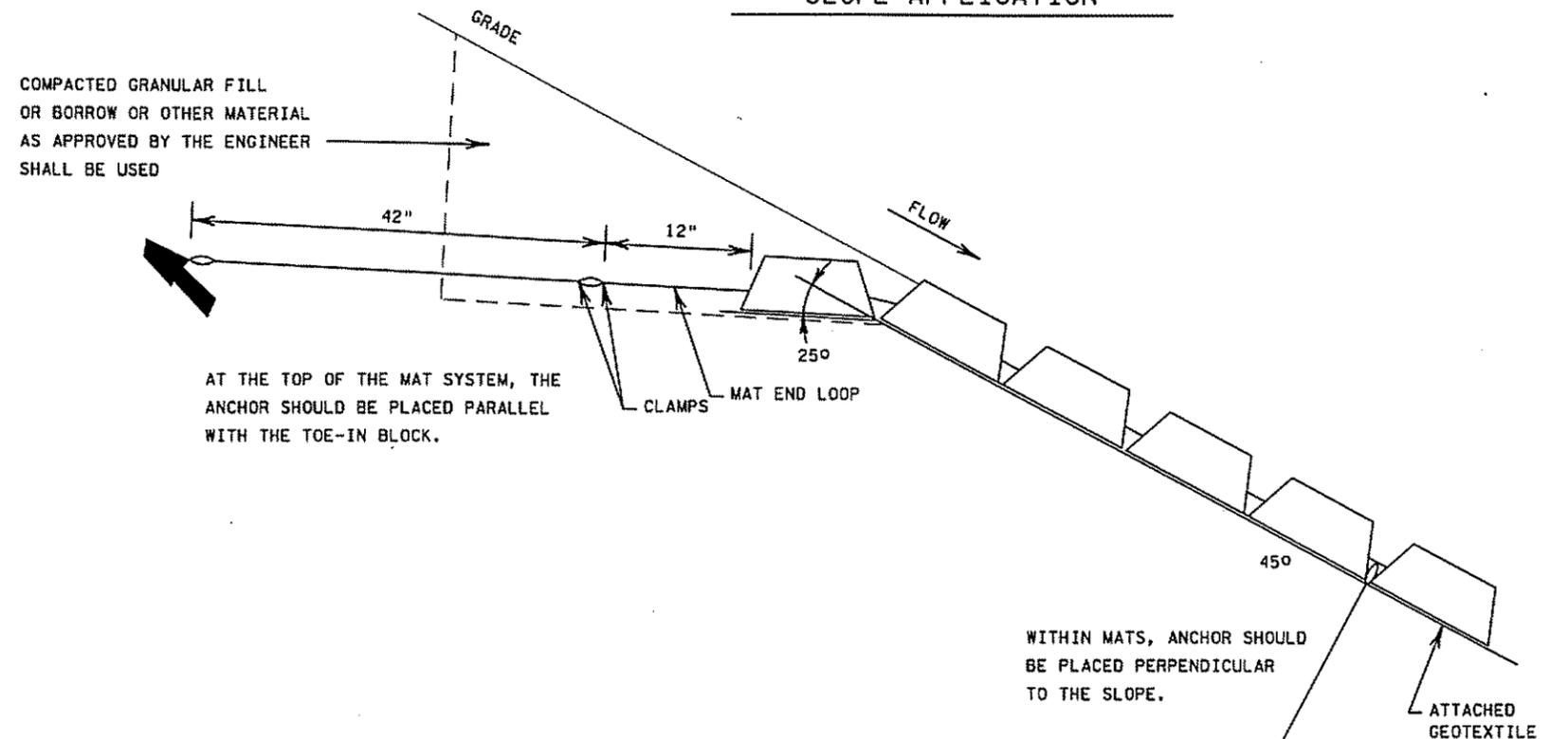
- WHEN PLACING THE MATS, THE GAP BETWEEN THE MATS SHOULD NOT BE ANY LARGER THAN 2". IF THE MATS ARE PLACED WITH A LARGER THAN 2" GAP, IT'S RECOMMENDED TO GROUT THE SEAM BETWEEN THE MATS.
- THE CLAMPS SHALL BE MADE OF STAINLESS STEEL.
- USE A NUT DRIVER, RATCHET, OR PORTABLE DRILL TO TIGHTEN THE NUTS ON THE U-BOLT. TIGHTEN DOWN TO THE COVER OF THE SADDLE. INSPECT TO ASSURE ALL NUTS ARE TIGHTENED.

ANCHOR DETAILS

LEVEL GRADE APPLICATION



SLOPE APPLICATION



GENERAL NOTES:

- ONE BLOCK TOE-IN IS MINIMUM. PROJECT CHARACTERISTICS MAY REQUIRE MULTIPLE BLOCK TOE-INS.
- UPSTREAM SOIL TO BE COMPACTED FLUSH WITH TOP OF BLOCKS.
- ANCHORING TO BE APPROVED BY THE CABLE CONCRETE SUPPLIER.
- APPROXIMATELY 40 ANCHORS REQUIRED FOR PROJECT.

CABLE CONCRETE DETAIL SHEET

DRAWN BY: SR

CHECKED BY: HS

CERTIFIED BY

Josephine Lundquist
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 20534 DATE 5/10/2007

STATE PROJ. NO. 1986-33 (T.H. 494)

SHEET NO. 7 OF 16 SHEETS

PLOTTED/REVISED: 10-MAY-2007 07:54

DISTRICT #: METRO
PLOT NAME: sr-33_dtd
PATH & FILENAME: S:\Design\49-4\986\0351\mat\198633_dtd.dgn

DISTRICT #: METRO

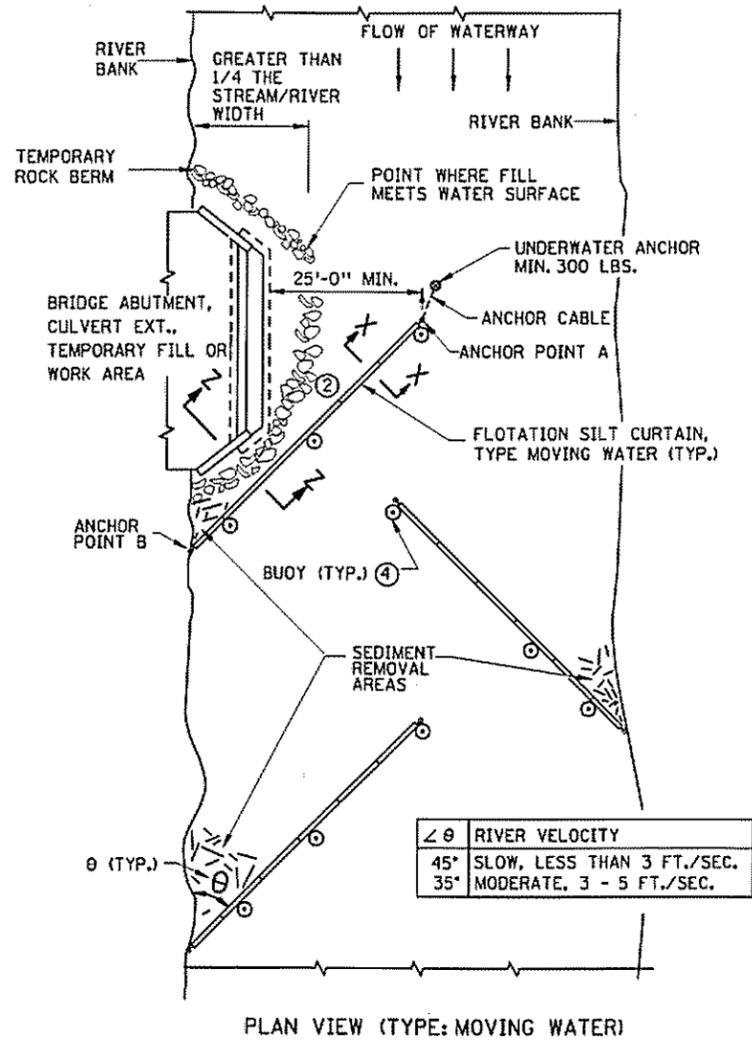
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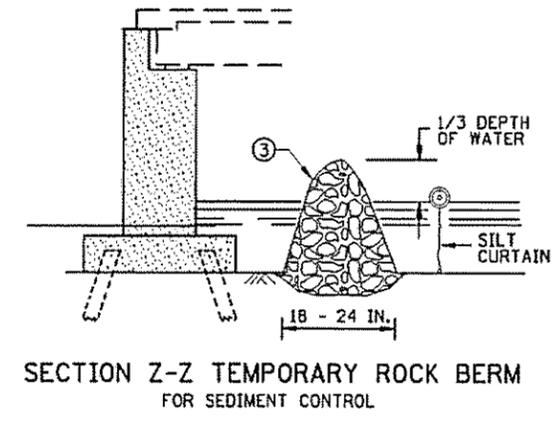
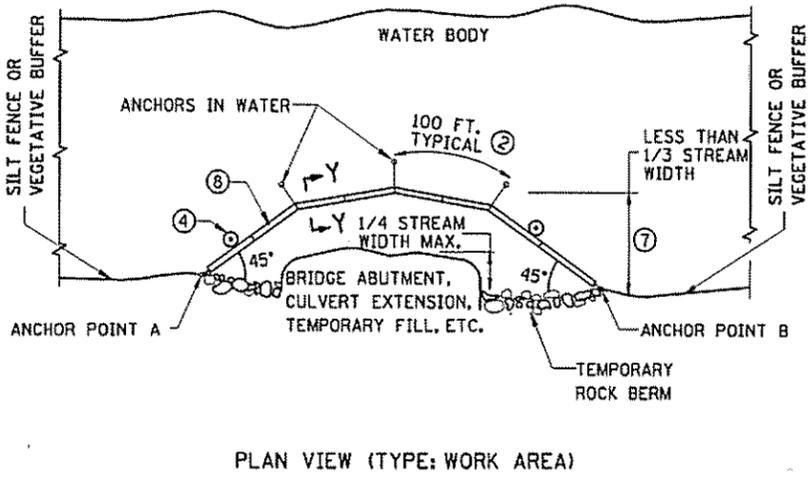
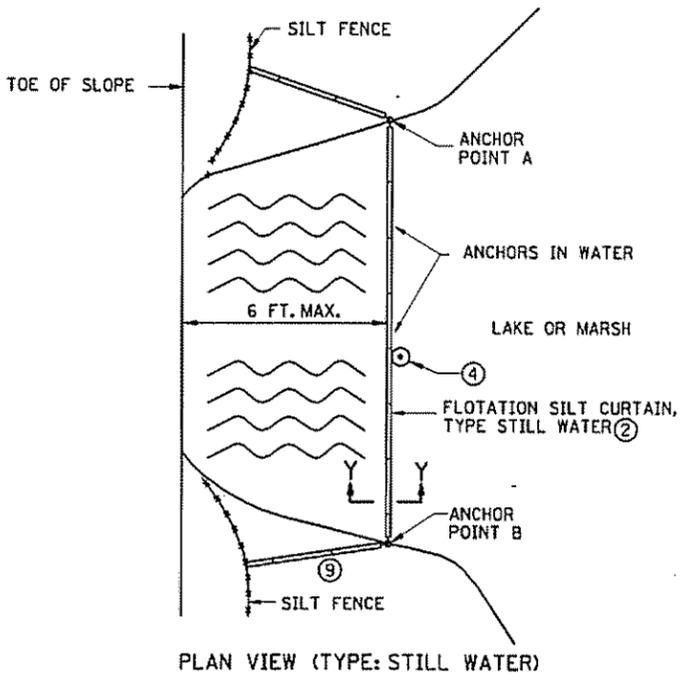
PLOTTED/REVISED: 11-APR-2007 13:01

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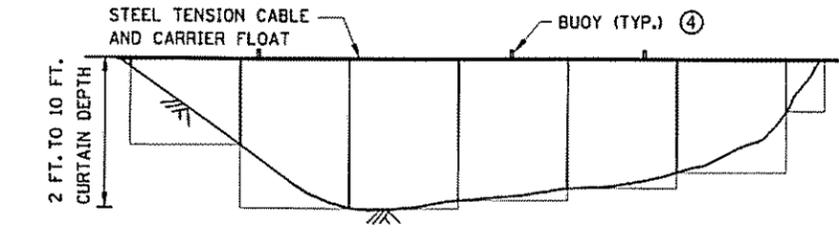
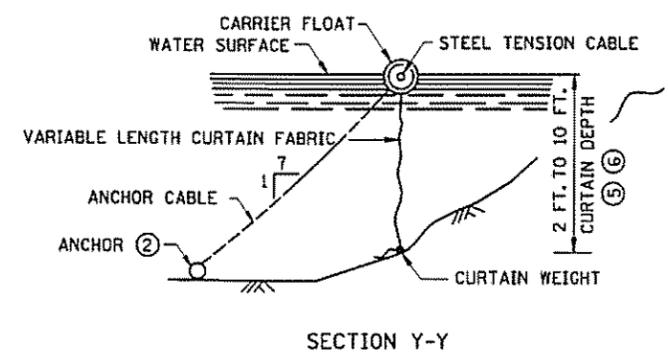
∠ θ	RIVER VELOCITY
45°	SLOW, LESS THAN 3 FT./SEC.
35°	MODERATE, 3 - 5 FT./SEC.



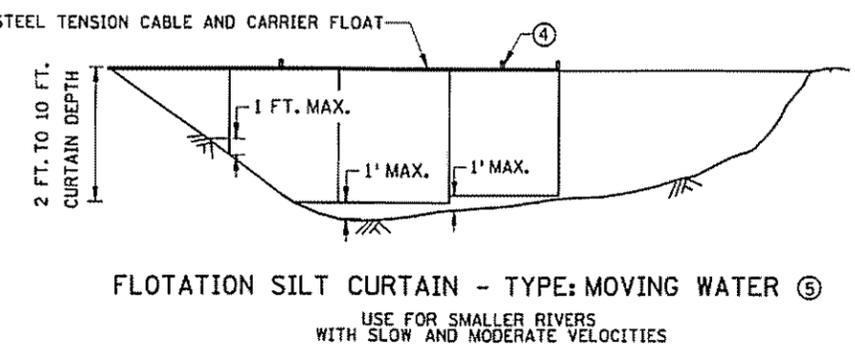
DESIGN GUIDELINES: MOVING WATER
 WHEN TEMPORARY FILL ENCROACHES MORE THAN 1/4 BUT LESS THAN 1/3 WIDTH OF THE STREAM.
 MINIMUM WATER DEPTH: 3 FT.
 MAXIMUM WATER DEPTH: 11 FT.
 MAXIMUM WATER VELOCITY: 5 FT./SEC. ① ⑥

DESIGN GUIDELINES: WORK AREA
 WHEN TEMPORARY FILL ENCROACHES LESS THAN 1/4 OF THE WIDTH OF THE STREAM.
 MAXIMUM WATER DEPTH: 10 FT.
 MAXIMUM WATER VELOCITY: 5 FT./SEC.

DESIGN GUIDELINES: STILL WATER ⑥
 MINIMUM WATER DEPTH: 0 FT.
 MAXIMUM WATER DEPTH: 10 FT.



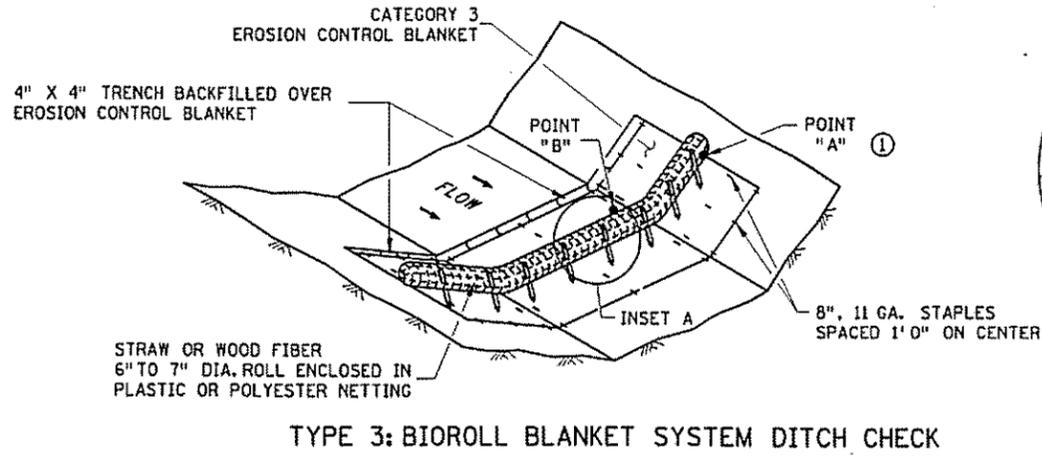
FLOTATION SILT CURTAIN - TYPE: WORK AREA AND STILL WATER ⑤
 FOR CONTAINING OVERFLOWS FROM WEIRS, STANDPIPES, SETTLING PONDS



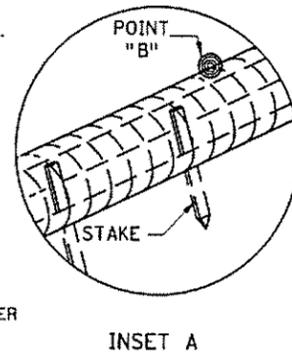
NOTES:

- SEE SPECS. 2573 & 3887.
- ① CURTAIN EXTENDS TO 1 FT. MAXIMUM FROM BOTTOM OF WATER BODY.
- ② FOR ANCHOR AND WEIGHT REQUIREMENTS, SEE SPEC. 2573.
- ③ IN AREAS WHERE THE PLAN CALLS FOR RIPRAP AT THE BRIDGE, A TEMPORARY ROCK BERM WILL BE USED TO PROVIDE ADDITIONAL PROTECTION. THE TEMPORARY ROCK BERM IS INCIDENTAL FOR WHICH NO DIRECT PAYMENT WILL BE MADE.
- ④ 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.
- ⑤ WATER DEPTH CAN BE 0 TO 10 FEET, 0 TO 11 FEET FOR TYPE MOVING WATER.
- ⑥ SILT CURTAIN HEIGHT INCLUDES MAXIMUM WAVE HEIGHT FOR WATER BODY.
- ⑦ KEEP AS CLOSE TO WORK AREA AS POSSIBLE.
- ⑧ SILT CURTAIN, ROCK BERM OR SHEET PILE AS REQUIRED TO CONTROL THE INFILTRATION OF SILT.
- ⑨ IF 6 INCHES OR LESS OF WATER, USE BALE BARRIERS, SEE SHEET 2.

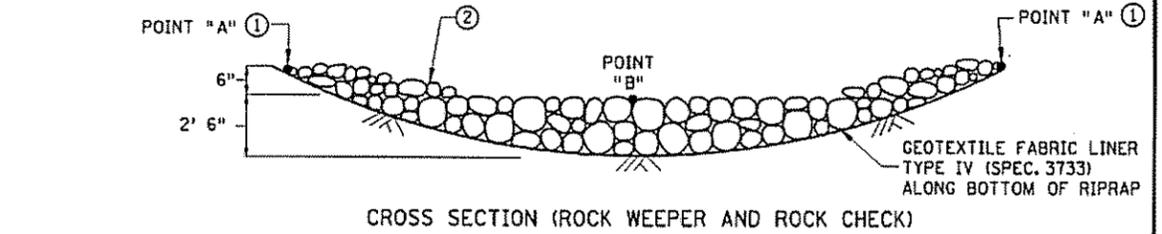
STANDARD SHEET NO. 5-297.405 (1 OF 4)	TITLE: TEMPORARY SEDIMENT CONTROL SILT CURTAIN
STANDARD APPROVED: SEPTEMBER 27, 2006	
STATE PROJ. NO. 1986-33 (T.H. 494) SHEET NO. 8 OF 16 SHEETS	



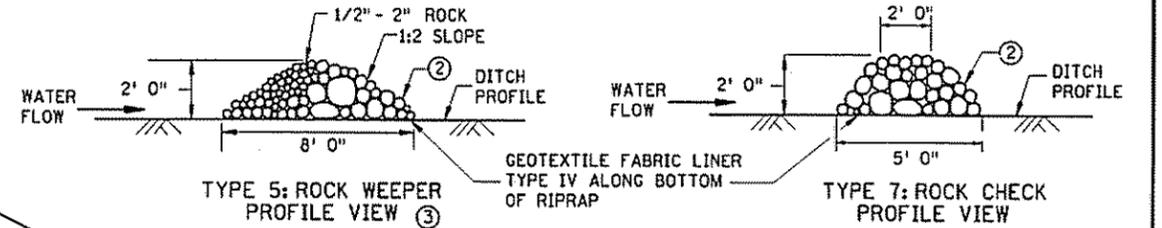
TYPE 3: BIOROLL BLANKET SYSTEM DITCH CHECK



INSET A

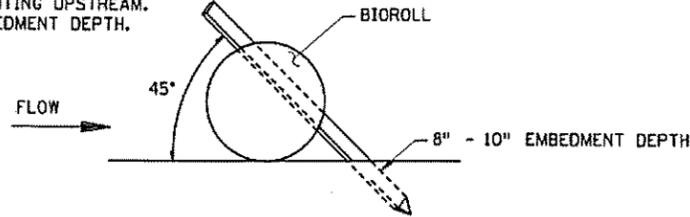


CROSS SECTION (ROCK WEEPER AND ROCK CHECK)

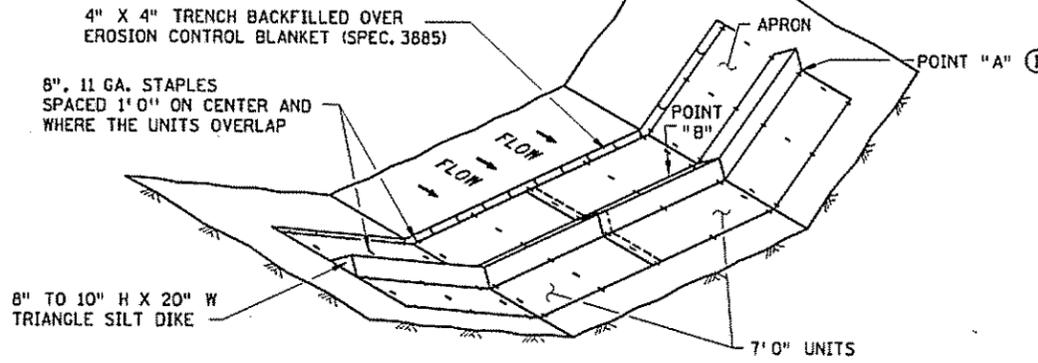


TYPE 5: ROCK WEEPER AND TYPE 7: ROCK CHECK DITCH CHECKS ④
USE ON ROUGH GRADED AREAS

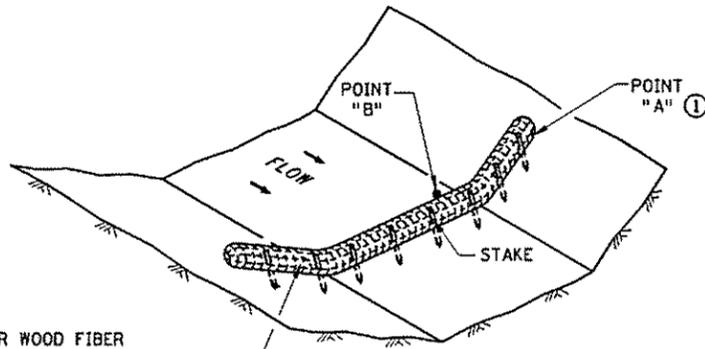
1" X 2" X 18" LONG WOODEN STAKES AT 1'0" SPACING MAXIMUM. STAKES SHALL BE DRIVEN THROUGH THE BACK HALF OF THE BIOROLL AT AN ANGLE OF 45 DEGREES WITH THE TOP OF THE STAKE POINTING UPSTREAM. PROVIDE 8" TO 10" OF EMBEDMENT DEPTH.



BIOROLL STAKING DETAIL



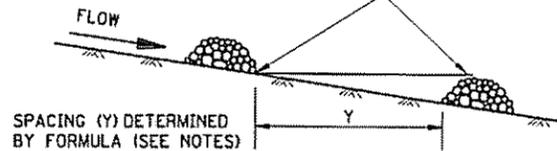
TYPE 6: GEOTEXTILE TRIANGULAR DIKE DITCH CHECK



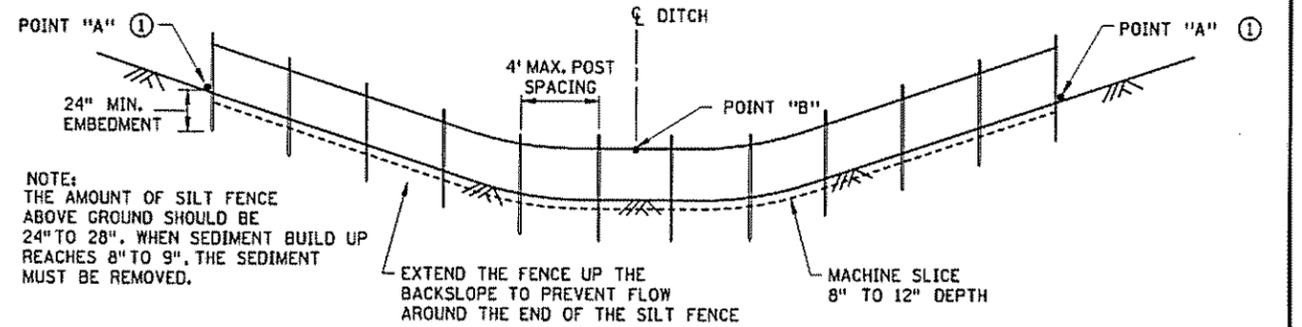
STRAW OR WOOD FIBER 6" TO 7" DIA. ROLL ENCLOSED IN PLASTIC OR POLYESTER NETTING

TYPE 2: BIOROLL DITCH CHECK
USE ON ROUGH GRADED AREAS

BOTTOM OF UPPER CHECK SHOULD BE SAME ELEVATION AS THE TOP OF THE LOWER CHECK TO PROVIDE FOR POOLING.



DITCH CHECK SPACING ④



NOTE: THE AMOUNT OF SILT FENCE ABOVE GROUND SHOULD BE 24" TO 28". WHEN SEDIMENT BUILD UP REACHES 8" TO 9", THE SEDIMENT MUST BE REMOVED.

EXTEND THE FENCE UP THE BACKSLOPE TO PREVENT FLOW AROUND THE END OF THE SILT FENCE
MACHINE SLICE 8" TO 12" DEPTH

TYPE 1: SLICED IN SILT FENCE DITCH CHECK

NOTES:

- SEE SPECS. 2573, 3601, 3733, 3885, 3886 & 3889.
- APPROXIMATE SPACING BETWEEN EACH DITCH CHECK SHOULD BE DETERMINED FROM THE FOLLOWING SPACING FORMULA:

$$\text{APPROXIMATE SPACING OF DITCH CHECKS (FT.)} = Y = \frac{\text{DITCH CHECK HEIGHT (FT)}}{\% \text{ CHANNEL SLOPE}} \times 100$$
- ① POINT "A" MUST BE A MINIMUM OF 6 INCHES HIGHER THAN POINT "B" TO ENSURE THAT WATER FLOWS OVER THE DIKE AND NOT AROUND THE ENDS.
- ② CLASS I - IV RIPRAP (SPEC. 3601) WITH GEOTEXTILE FABRIC LINER, TYPE IV (SPEC. 3733).
- ③ THE ROCK WEEPER FILTERS SEDIMENT OUT OF THE WATER BETTER THAN THE OTHER DITCH CHECKS. THE ROCK WEEPER COULD BE USED AS A PERMANENT WATER FILTERING FEATURE.
- ④ PERMANENT ROCK DITCH CHECKS PLACED WITHIN THE CLEAR ZONE WILL NEED TO BE 18" OR LESS IN HEIGHT. A 1:6 APPROACH AND DEPARTURE SLOPE SHALL BE PROVIDED.

GENERAL DESIGN GUIDELINES						
DITCH CHECK TYPE	SILT FENCE	BIOROLL	BIOROLL BLANKET	TRIANGULAR DIKE	ROCK WEEPER	ROCK CHECK
STORM FREQUENCY:	2 YR. - 24 HR.	2 YR. - 24 HR.	2 YR. - 24 HR.	2 YR. - 24 HR.	5 YR. - 24 HR.	5 YR. - 24 HR.
MAX. FLOW VELOCITY:	< 1 FT./SECOND	1.5 FT./SECOND	4.5 FT./SECOND	1.5 FT./SECOND	12 FT./SECOND	12 FT./SECOND
MAX. DITCH GRADE:	0% - 0.5%	1.5% - 3%	1.5% - 3%	1.5% - 2.0%	3% - 5%	3% - 5%
MAX. DRAINAGE AREA:	1 ACRE	2 ACRE	2 ACRE	4 ACRE	4+ ACRE	4+ ACRE

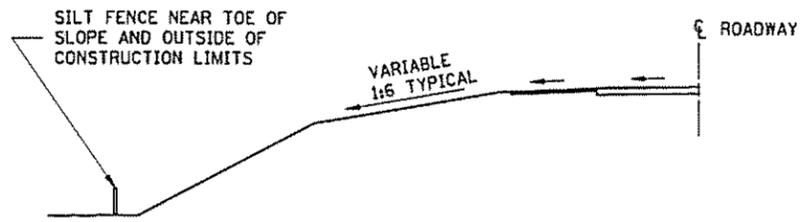
STANDARD SHEET NO. 5-297.405 (3 OF 4)	TEMPORARY SEDIMENT CONTROL DITCH CHECK/BARRIER
STANDARD APPROVED: SEPTEMBER 27, 2006	
STATE PROJ. NO. 1986-33 (T.H. 494) SHEET NO. 9 OF 16 SHEETS	

PLOTTED/REVISED: 11-APR-2007 13:01

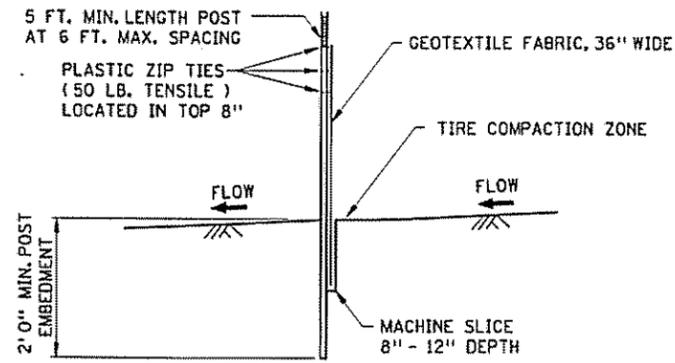
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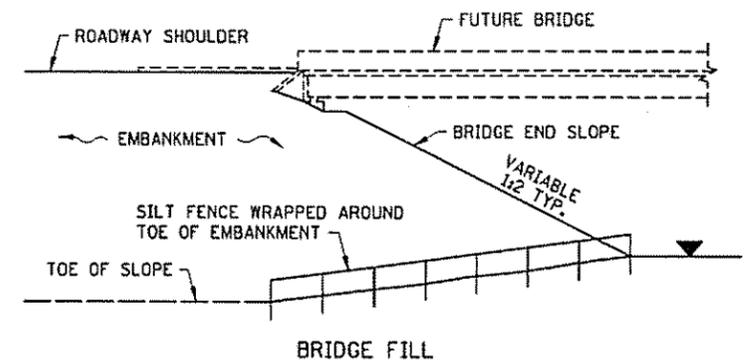
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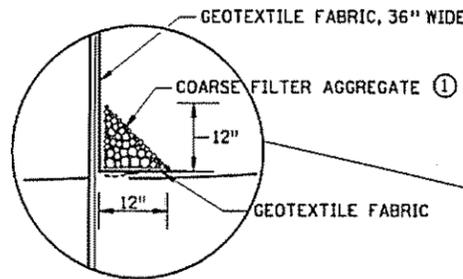
LOCATION OF SILT FENCE AT TOE OF ROADWAY EMBANKMENT



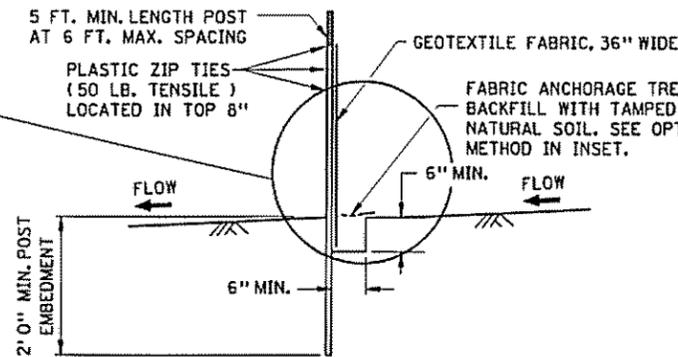
SILT FENCE, MACHINE SLICED
DESIGN GUIDELINES:
TO PROTECT AREAS FROM SHEET FLOW.
MAXIMUM CONTRIBUTING AREA: 1 ACRE.



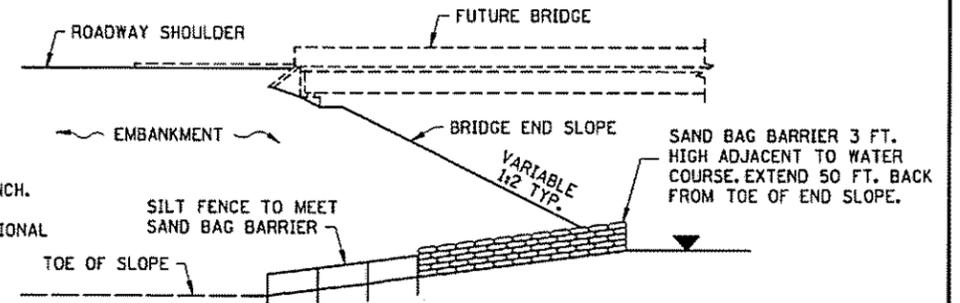
DESIGN GUIDELINES:
WATER COURSE FLOW VELOCITY: STAGNANT
CONTRIBUTING SLOPE AREA: 1/2 ACRE



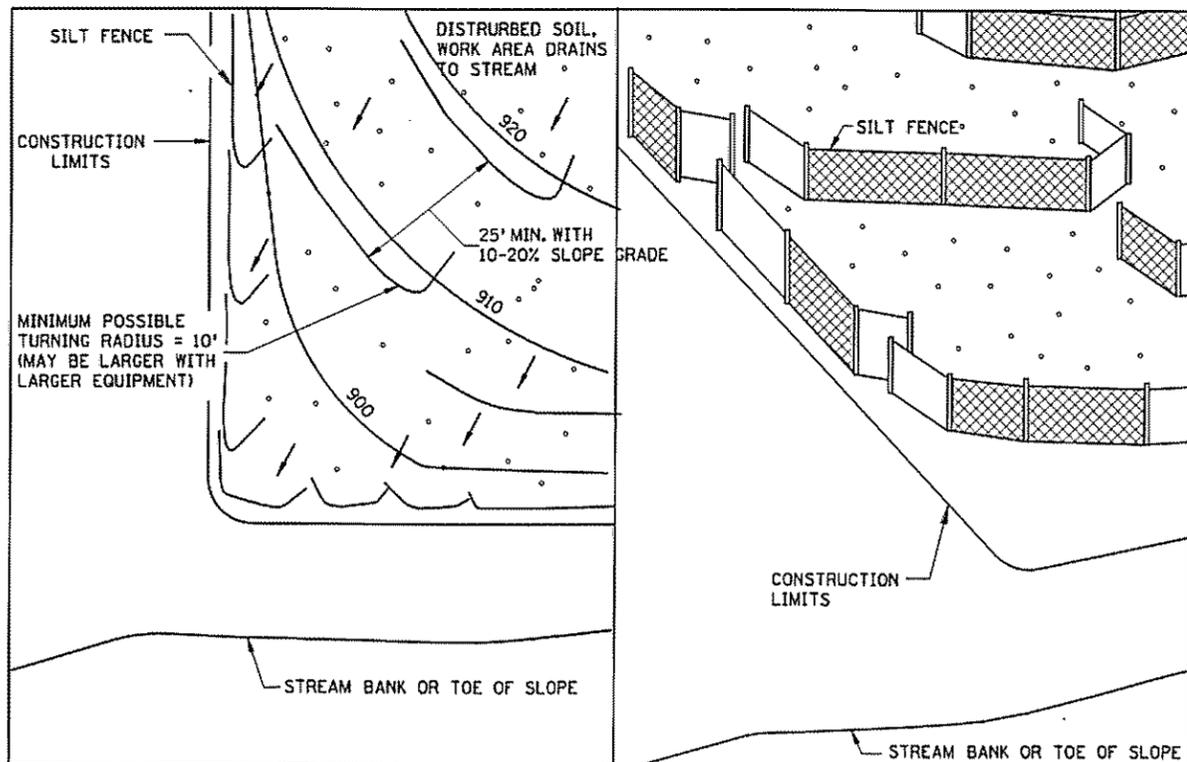
OPTIONAL METHOD FOR SILT FENCE, HEAVY DUTY



SILT FENCE, HEAVY DUTY (HAND INSTALLED)
DESIGN GUIDELINES:
TO PROTECT AREAS FROM SHEET FLOW.
MAXIMUM CONTRIBUTING AREA: 1 ACRE.



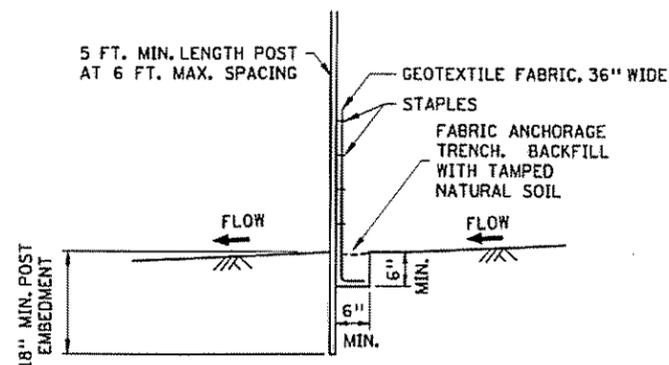
DESIGN GUIDELINES:
WATER COURSE FLOW VELOCITY: 1 TO 7 FT./SEC.
CONTRIBUTING SLOPE AREA: 1 ACRE



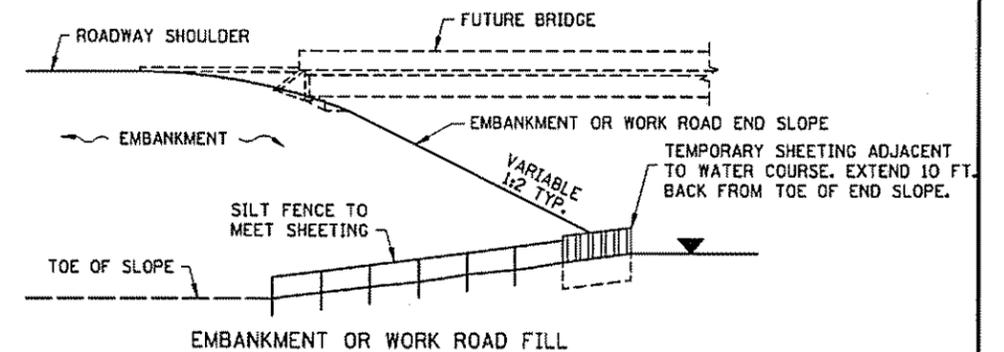
PLAN VIEW

SIDE VIEW

SILT FENCE, J-HOOK INSTALLATION



SILT FENCE, PREASSEMBLED
DESIGN GUIDELINES:
TO PROTECT AREAS FROM SHEET FLOW.
MAXIMUM CONTRIBUTING AREA: 1 ACRE.



DESIGN GUIDELINES:
WATER COURSE FLOW VELOCITY: 8 TO 15 FT./SEC.
CONTRIBUTING SLOPE AREA: 3 ACRES
SILT FENCE AT BRIDGE EMBANKMENT ADJACENT TO WATER

NOTES:

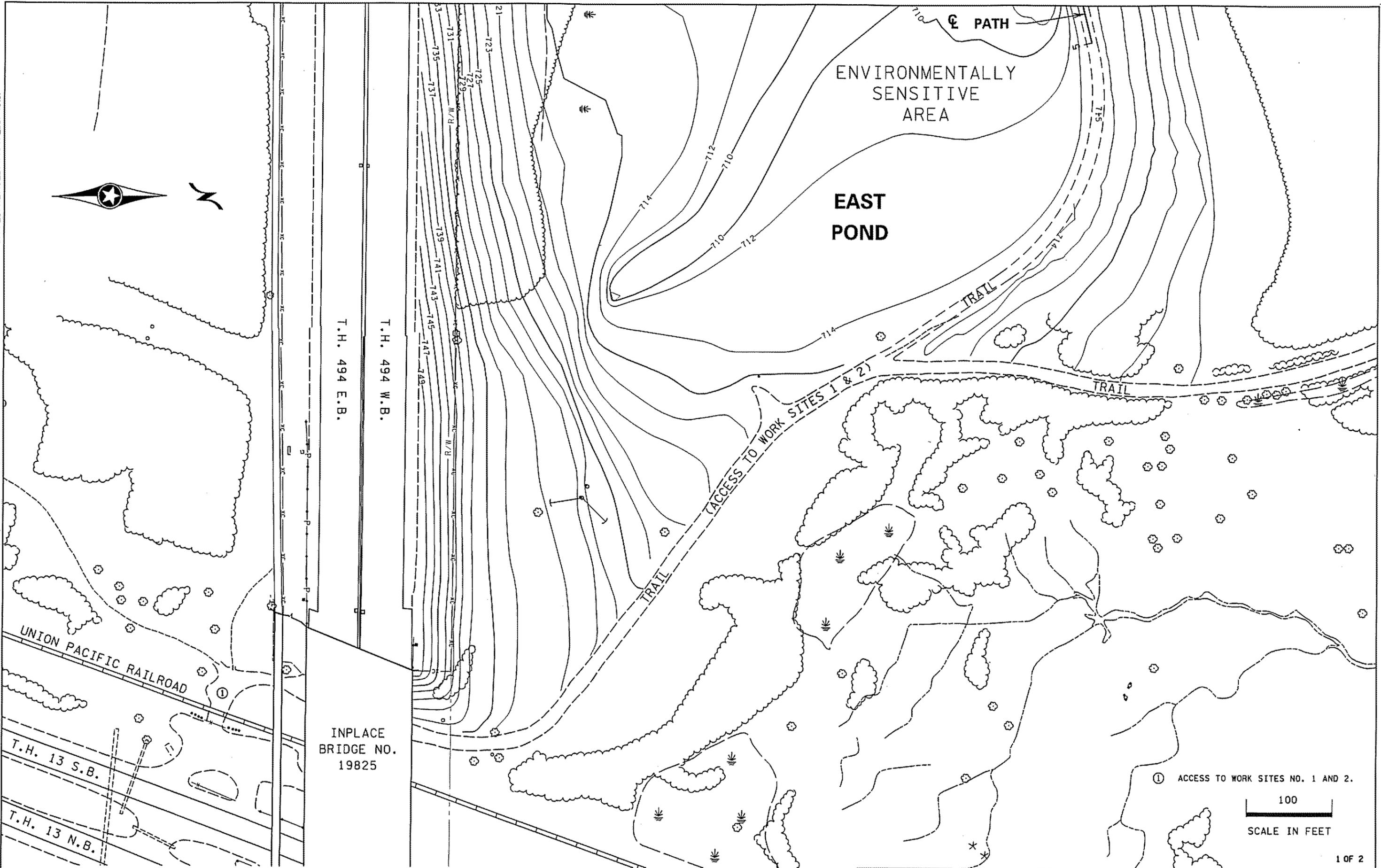
SEE SPECS. 2573, 3149 & 3886.

① COARSE FILTER AGGREGATE (SPEC. 3149) SHALL BE INCIDENTAL.

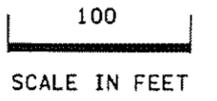
STANDARD SHEET NO. 5-297.408 (1 OF 2)	TITLE: TEMPORARY SEDIMENT CONTROL SILT FENCE
STANDARD APPROVED: SEPTEMBER 27, 2006	
STATE PROJ. NO. 1986-33 (T.H. 494) SHEET NO. 10 OF 16 SHEETS	

PLOTTED/REVISED: 11-APR-2007 13:01

DISTRICT #: METRO
PLOT NAME: sr-33-jpi
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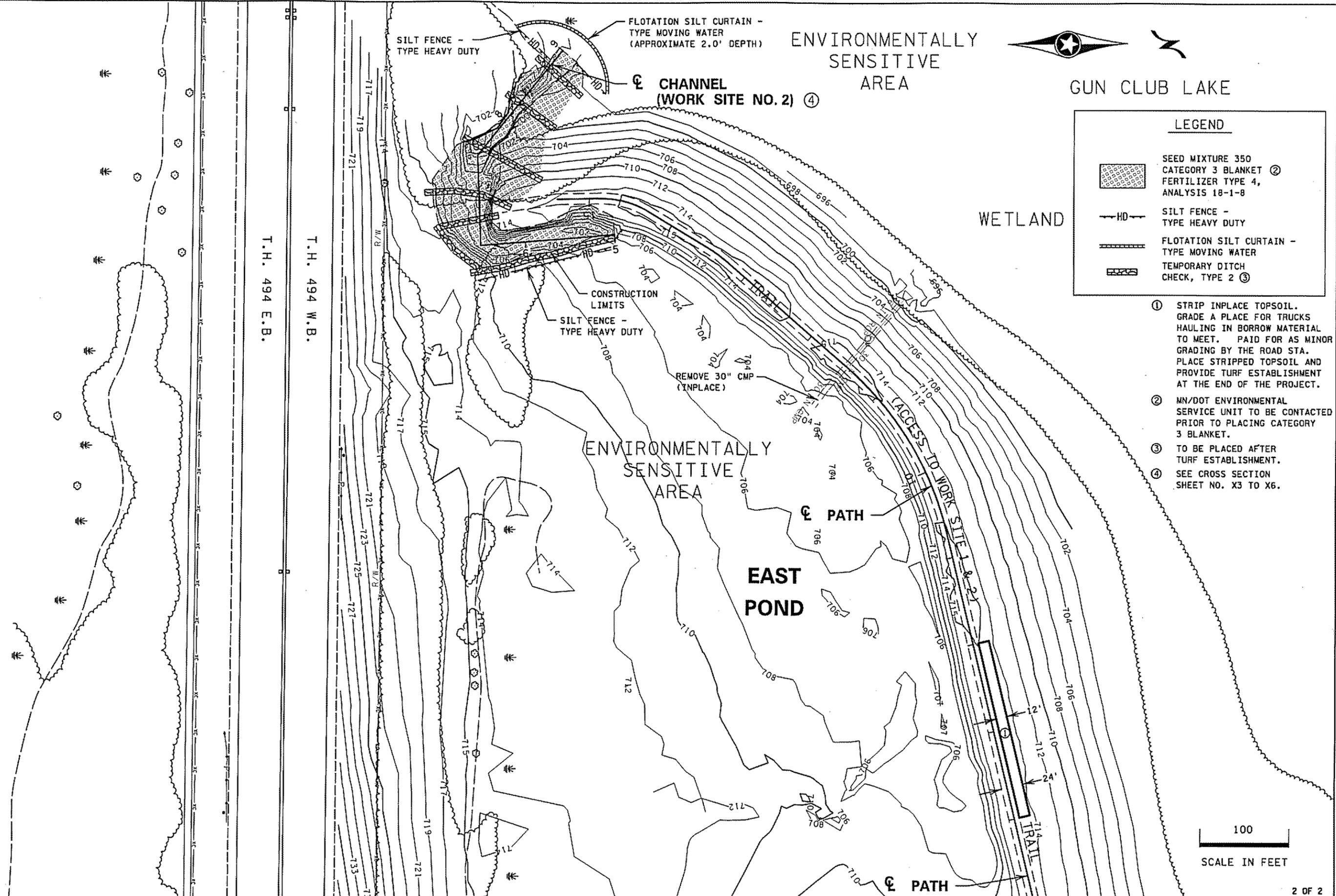
① ACCESS TO WORK SITES NO. 1 AND 2.



INPLACE CONTOURS AND TOPOGRAPHY PLAN

PLOTTED/REVISED: 11-APR-2007 13:01

DISTRICT #: METRO
PLOT NAME: sr-33.rpl
PATH & FILENAME: S:\Design\494\986\033\Inplace\sheet15.rpl.dgn



LEGEND	
	SEED MIXTURE 350 CATEGORY 3 BLANKET ② FERTILIZER TYPE 4, ANALYSIS 18-1-8
	SILT FENCE - TYPE HEAVY DUTY
	FLOTATION SILT CURTAIN - TYPE MOVING WATER
	TEMPORARY DITCH CHECK, TYPE 2 ③

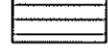
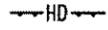
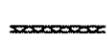
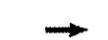
- ① STRIP INPLACE TOPSOIL. GRADE A PLACE FOR TRUCKS HAULING IN BORROW MATERIAL TO MEET. PAID FOR AS MINOR GRADING BY THE ROAD STA. PLACE STRIPPED TOPSOIL AND PROVIDE TURF ESTABLISHMENT AT THE END OF THE PROJECT.
- ② MN/DOT ENVIRONMENTAL SERVICE UNIT TO BE CONTACTED PRIOR TO PLACING CATEGORY 3 BLANKET.
- ③ TO BE PLACED AFTER TURF ESTABLISHMENT.
- ④ SEE CROSS SECTION SHEET NO. X3 TO X6.

INPLACE CONTOURS AND TOPOGRAPHY PLAN

PLOTTED/REVISED: 11-APR-2007 13:01

DISTRICT #: METRO
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LEGEND

	CABLE CONCRETE ② CLOSED CELL 35, TYPE 3
	CABLE CONCRETE ② CLOSED CELL 45, TYPE 4
	SEED MIXTURE 350 CATEGORY 3 BLANKET FERTILIZER TYPE 4, ANALYSIS 18-1-8
	RANDOM RIPRAP, CLASS III
	SILT FENCE - TYPE HEAVY DUTY
	FLOTATION SILT CURTAIN - TYPE MOVING WATER
	SURFACE FLOW

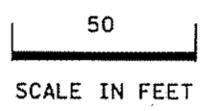
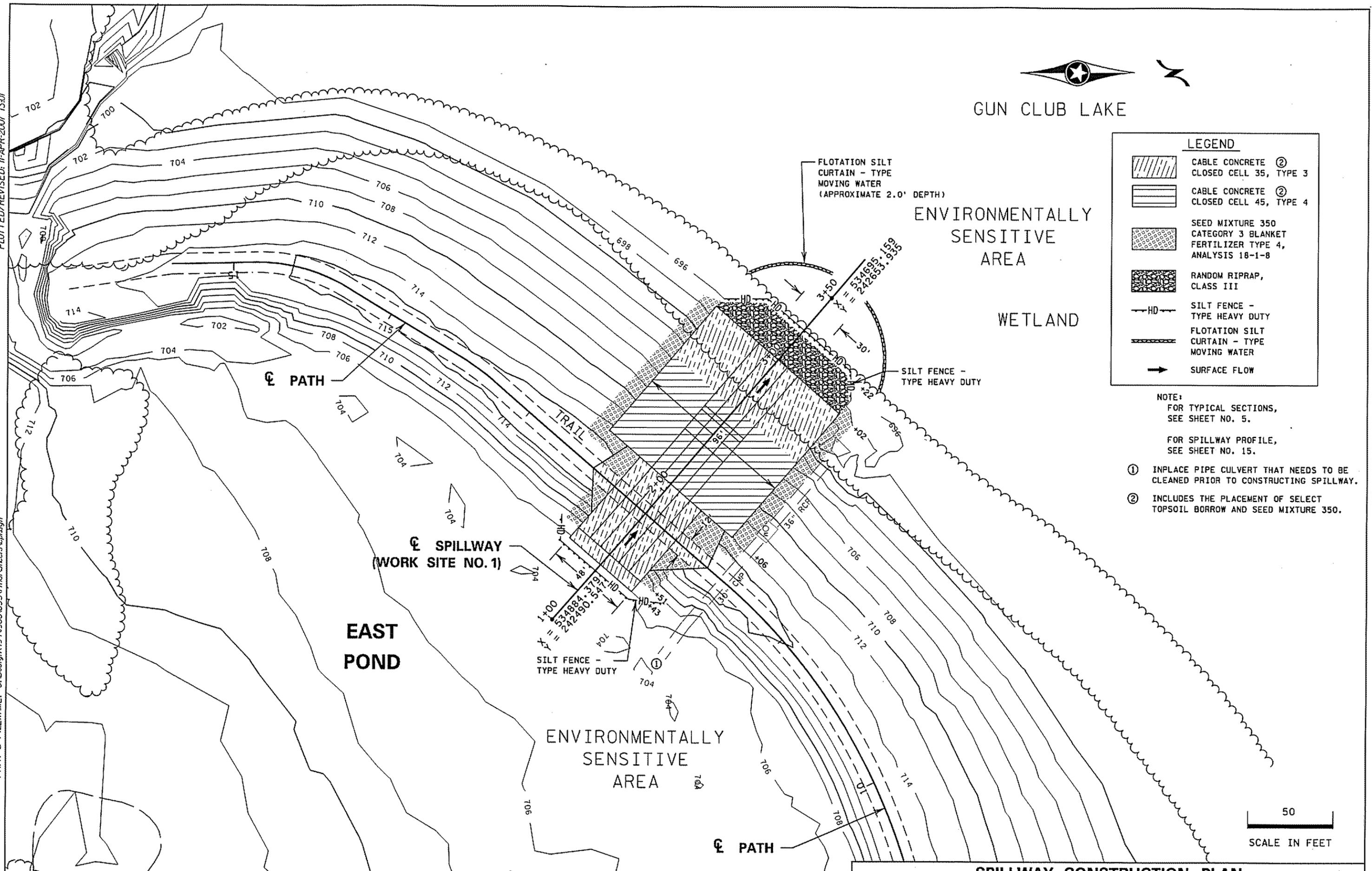
NOTE:

FOR TYPICAL SECTIONS,
SEE SHEET NO. 5.

FOR SPILLWAY PROFILE,
SEE SHEET NO. 15.

① INPLACE PIPE CULVERT THAT NEEDS TO BE
CLEANED PRIOR TO CONSTRUCTING SPILLWAY.

② INCLUDES THE PLACEMENT OF SELECT
TOPSOIL BORROW AND SEED MIXTURE 350.





MINNESOTA RIVER

ENVIRONMENTALLY SENSITIVE AREA

FLOTATION SILT CURTAIN - TYPE MOVING WATER (APPROXIMATE 4.0' DEPTH)

SILT FENCE - TYPE HEAVY DUTY

2 - 36" X 30' CMP + 4 APRONS INP. (REMOVE)

F & I 2 - 36" X 27' RCP + 4 APRONS

(WORK SITE NO. 3)

SILT FENCE - TYPE HEAVY DUTY

OPEN CHANNEL

BRIDGE NO. 9217

BRIDGE NO. 9217

GATED ACCESS TO WORK SITE NO. 3

T.H. 494 W.B.

T.H. 494 E.B.

ENVIRONMENTALLY SENSITIVE AREA

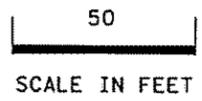
MINNESOTA RIVER

PROPOSED STAGING

1. BLOCK WEST CULVERT AND DIVERT ALL FLOWING WATER THROUGH EAST CULVERT. (INCIDENTAL)
2. EXCAVATE WESTERLY PORTION, REMOVE CULVERT AND F & I NEW 36" RCP + 2 APRONS. (INL. AND OUT. EL. 694.84)
3. DIVERT WATER THROUGH CULVERT PLACED ABOVE. (INCIDENTAL)
4. REMOVE CULVERT AND F & I NEW 36" RCP + 2 APRONS. (INL. AND OUT. EL. 694.66)
5. PLACE TURF ESTABLISHMENT.
6. USE RANDOM RIPRAP TO ASSIST IN DIVERTING WATER STATED ABOVE.
7. NEW 36" RCP SHALL BE PLACED FLAT AT EXISTING FLOWLINE ELEVATIONS.

LEGEND

-  SEED MIXTURE 350 CATEGORY 3 BLANKET FERTILIZER TYPE 4, ANALYSIS 18-1-8
-  RANDOM RIPRAP, CLASS III
-  SILT FENCE - TYPE HEAVY DUTY
-  FLOTATION SILT CURTAIN - TYPE MOVING WATER
-  RC PIPE CULVERT
-  RC PIPE APRON



INPLACE TOPOGRAPHY & CONST. PLAN - WORK SITE NO. 3

DRAWN BY: SR

CHECKED BY: HS

CERTIFIED BY *Josephine Lundquist*

LIC. NO. 20534 DATE 4/12/2007

STATE PROJ. NO. 1986-33 (T.H. 494)

SHEET NO. 14 OF 16 SHEETS

PLOTTED/REVISED: 11-APR-2007 13:01

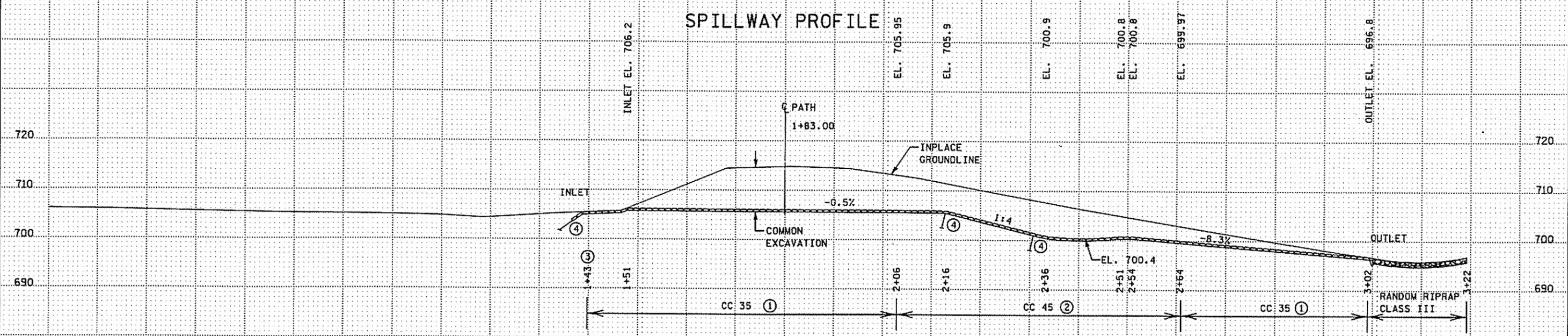
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PLOTTED/REVISED: 11-APR-2007 13:01

DISTRICT: METRO
PLOT NAME: sr-33_Spillway_xp2
PATH & FILENAME: S:\Design\99\9866\03\1\Inlets\Spillway_xp2.dgn

WORK SITE NO. 1

SPILLWAY PROFILE



- ① ARTICULATED BLOCK MAT CLOSED CELL 35, TYPE 3. FOR DETAILS, SEE SHEET NO. 6 AND 7.
- ② ARTICULATED BLOCK MAT CLOSED CELL 45, TYPE 4. FOR DETAILS, SEE SHEET NO. 6 AND 7.
- ③ PROVIDE 8 LIN FT OF CABLE CONCRETE PRIOR TO SPILLWAY INLET.
- ④ ANCHORS WITHIN MAT SYSTEM SHALL HAVE HOLES FILLED WITH BENTONITE.

SPILLWAY PROFILE - WORK SITE NO. 1

DRAWN BY: SR

CHECKED BY: HS

CERTIFIED BY *Josephine Lundquist*
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 20534 DATE 4/12/2007

STATE PROJ. NO. 1986-33 (T.H. 494)

SHEET NO. 15 OF 16 SHEETS

PLOTTED/REVISED: 10-MAY-2007 07:54

DISTRICT : METRO
PLOT NAME: sr-33_lwr
PATH & FILENAME: S:\Design\49-1986\035\Ina\198633_lwr.dgn

WATER RESOURCE NOTES

ANY DESIGN MODIFICATIONS THAT ARE CONSIDERED NECESSARY IN THE COURSE OF CONSTRUCTING THIS PROJECT SHOULD BE REVIEWED BY SCOTT CARLSTROM, THE WATER RESOURCES ENGINEER FOR THIS PROJECT, AND BY HARVEY SCHEFFERT, THE PROJECT DESIGN ENGINEER.

- SCOTT CARLSTROM (651) 234-7525
- HARVEY SCHEFFERT (651) 234-7661

1. THE FOLLOWING CONSTRUCTION PERMITS APPLIES:
 - SECTION 404 GENERAL MAINTENANCE PERMIT, ARMY CORPS OF ENGINEERS
THE CONTRACTOR SHALL READ THE SECTION 404 PERMIT FOR STIPULATIONS AND SPECIAL PERMIT REQUIREMENTS.
 - DNR GENERAL WATERS.

2. ENVIRONMENTALLY SENSITIVE AREAS ARE IDENTIFIED IN THE PLAN SET AND INCLUDES:
 - WETLANDS
 - MINNESOTA RIVER
 - GUN CLUB LAKE NORTH WETLAND
 - FORT SNELLING STATE PARK

3. IF SEDIMENT DEPOSITS IN A WATER OF THE STATE THE MATERIAL MUST BE REMOVED WITHIN 24 HOURS.

4. ALL EXPOSED SOIL AREAS MUST HAVE TEMPORARY EROSION OR PERMANENT EROSION COVER WITHIN 3 DAYS AFTER THE AREA IS NO LONGER BEING ACTIVELY WORKED.

5. ALL EROSION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO ANY REMOVAL WORK AND/OR DISTURBING ACTIVITIES AND SHALL BE MAINTAINED UNTIL THE POTENTIAL FOR EROSION HAS BEEN ELIMINATED.

6. ALL EROSION PREVENTION AND SEDIMENT CONTROL BMPs MUST BE INSPECTED TO ENSURE INTEGRITY AND EFFECTIVENESS. ALL NONFUNCTIONAL BMPs MUST BE REPAIRED, REPLACED, OR SUPPLEMENTED WITH FUNCTIONAL BMPs.

7. DEWATERING AND BASIN DRAINING:
 - DEWATERING OR BASIN DRAINING (E.G. PUMPED DISCHARGES, TRENCH/DITCH CUTS FOR DRAINAGE) RELATED TO THE CONSTRUCTION ACTIVITY THAT MIGHT HAVE TURBID OR SEDIMENT-LADEN DISCHARGE MUST BE DISCHARGED TO A TEMPORARY OR PERMANENT SEDIMENTATION BASIN ON THE PROJECT SITE. IF DEWATERING IS NEEDED, THE CONTRACTOR IS REQUIRED TO SUBMIT SITE PLANS TO THE MN/DOT RESIDENT CONSTRUCTION ENGINEER FOR APPROVAL PRIOR TO COMMENCING WORK.

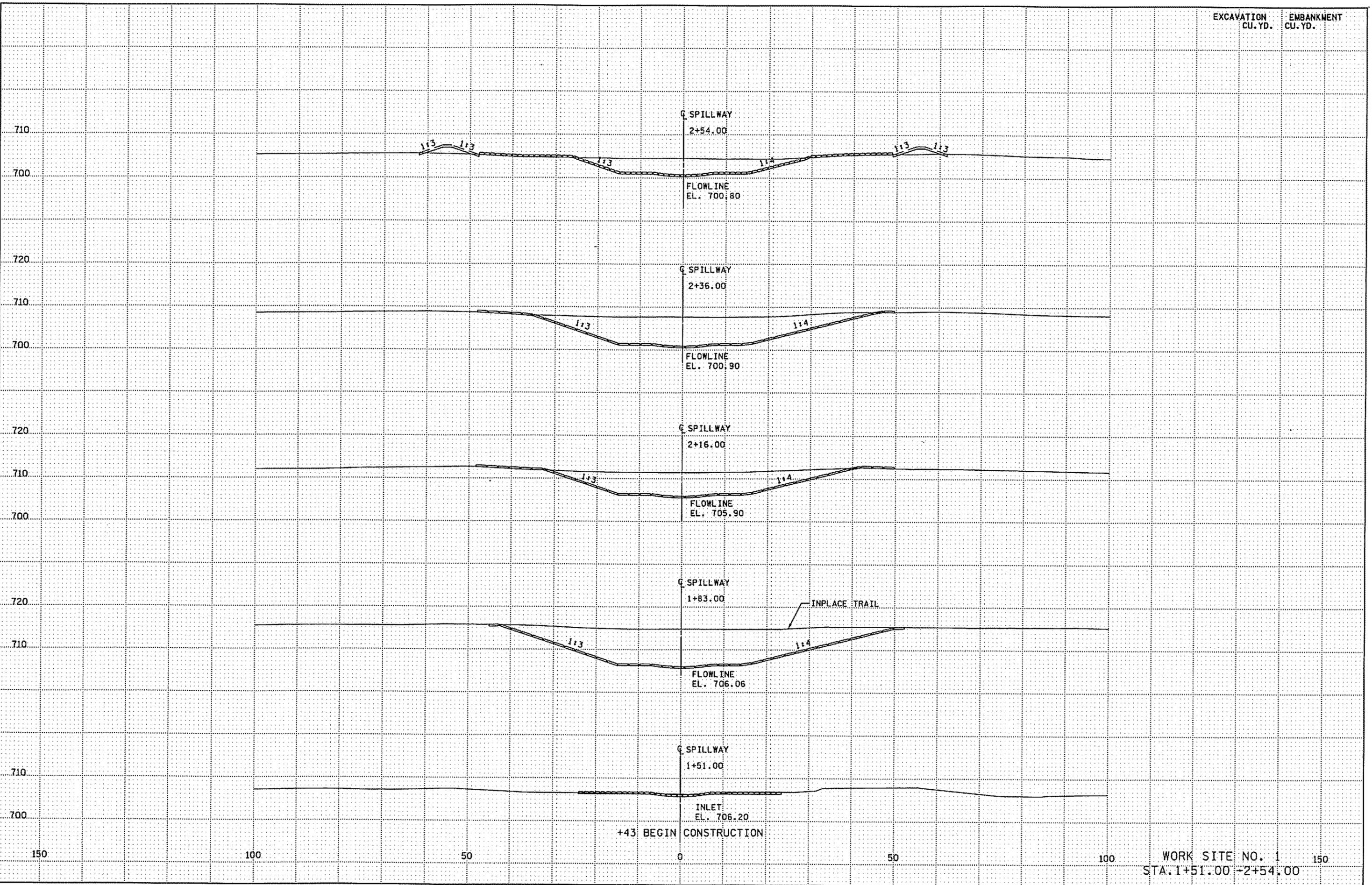
WATER RESOURCE NOTES

EXCAVATION
CU. YD.

EMBANKMENT
CU. YD.

PLOTTED/REVISED: 11-APR-2007 13:01

DISTRICT : METRO
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+43 BEGIN CONSTRUCTION

WORK SITE NO. 1
STA. 1+51.00 - 2+54.00

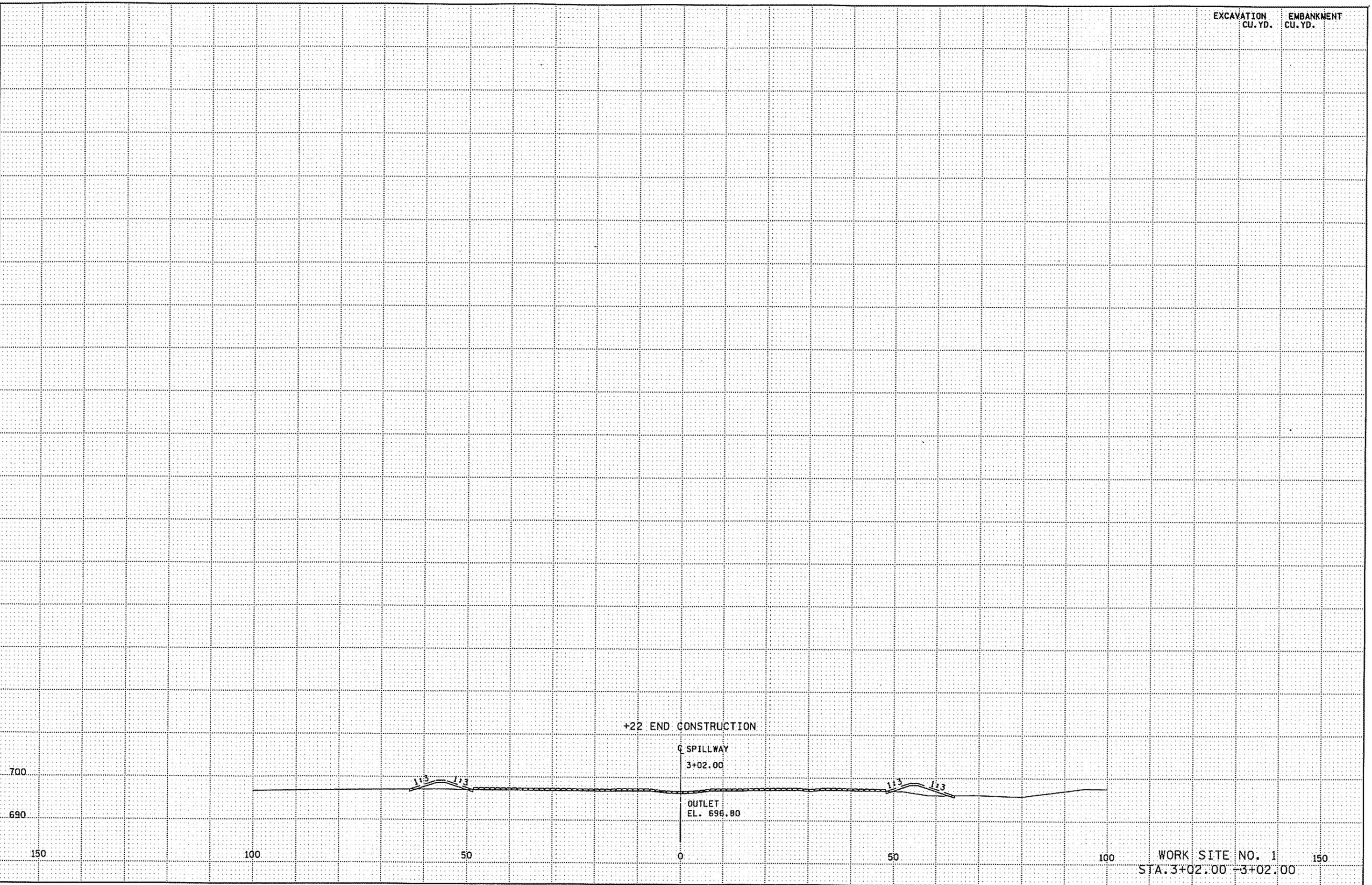
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CU. YD.

EMBANKMENT
CU. YD.

PLOTTED/REVISED: 11-APR-2007 13:01

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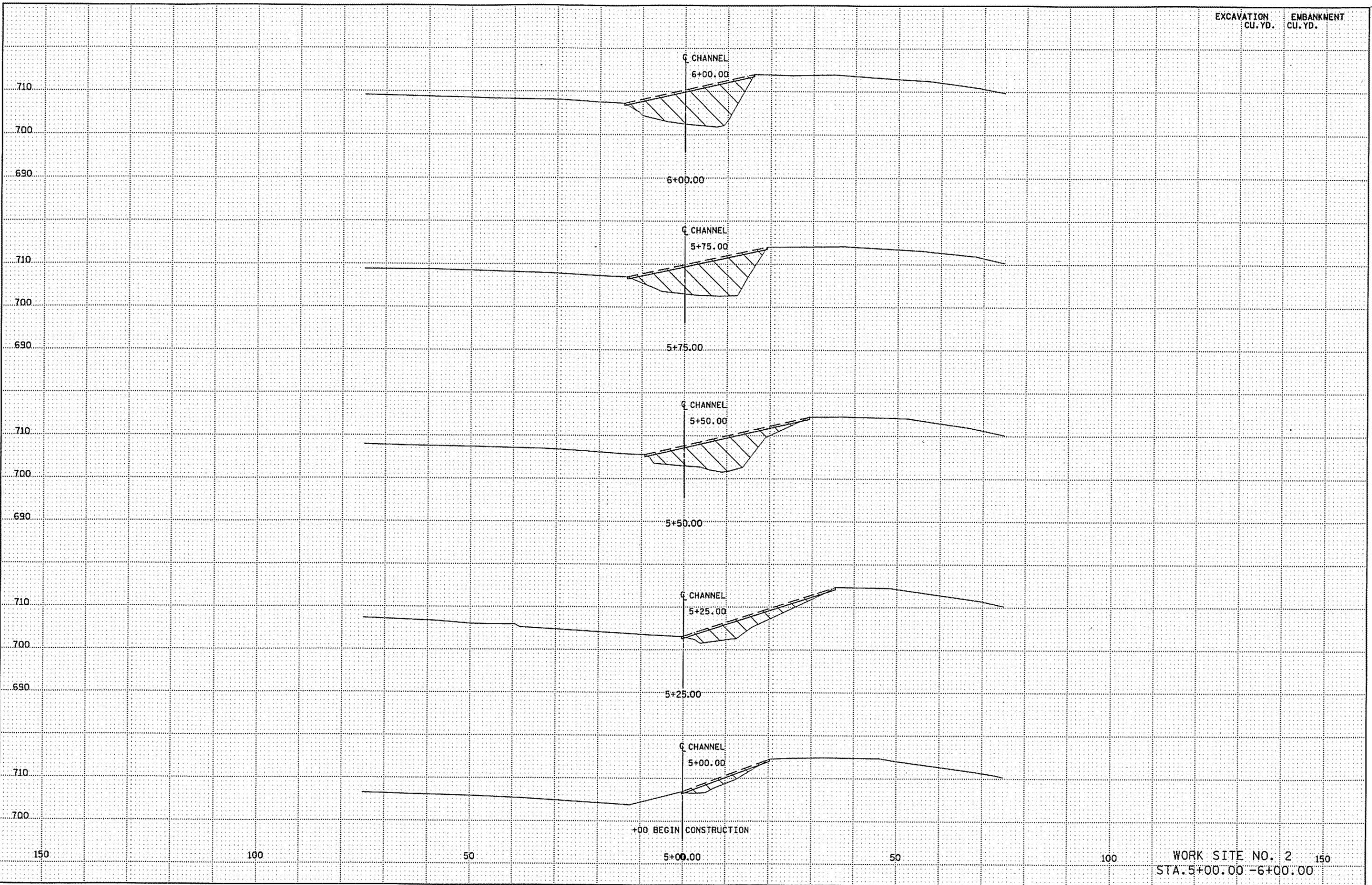


WORK SITE NO. 1
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EXCAVATION
CU. YD. EMBANKMENT
CU. YD.

PLOTTED/REVISED: 11-APR-2007 13:01

DISTRICT : METRO
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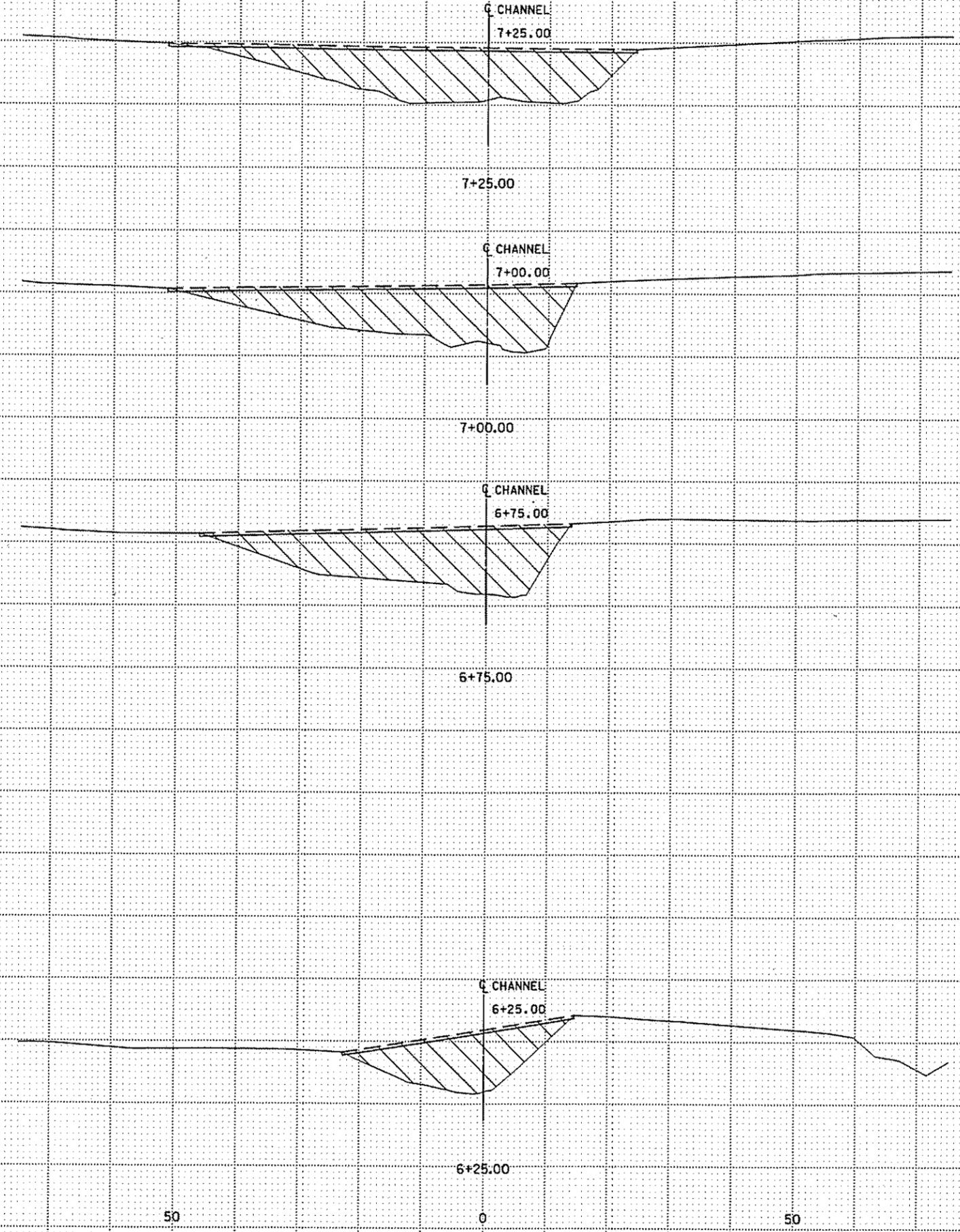
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WORK SITE NO. 2
STA. 5+00.00 - 6+00.00

EXCAVATION
CU. YD.

EMBANKMENT
CU. YD.

710
700
690
710
700
690
710
700
690
710
700
690



150 100 50 0 50 100 150

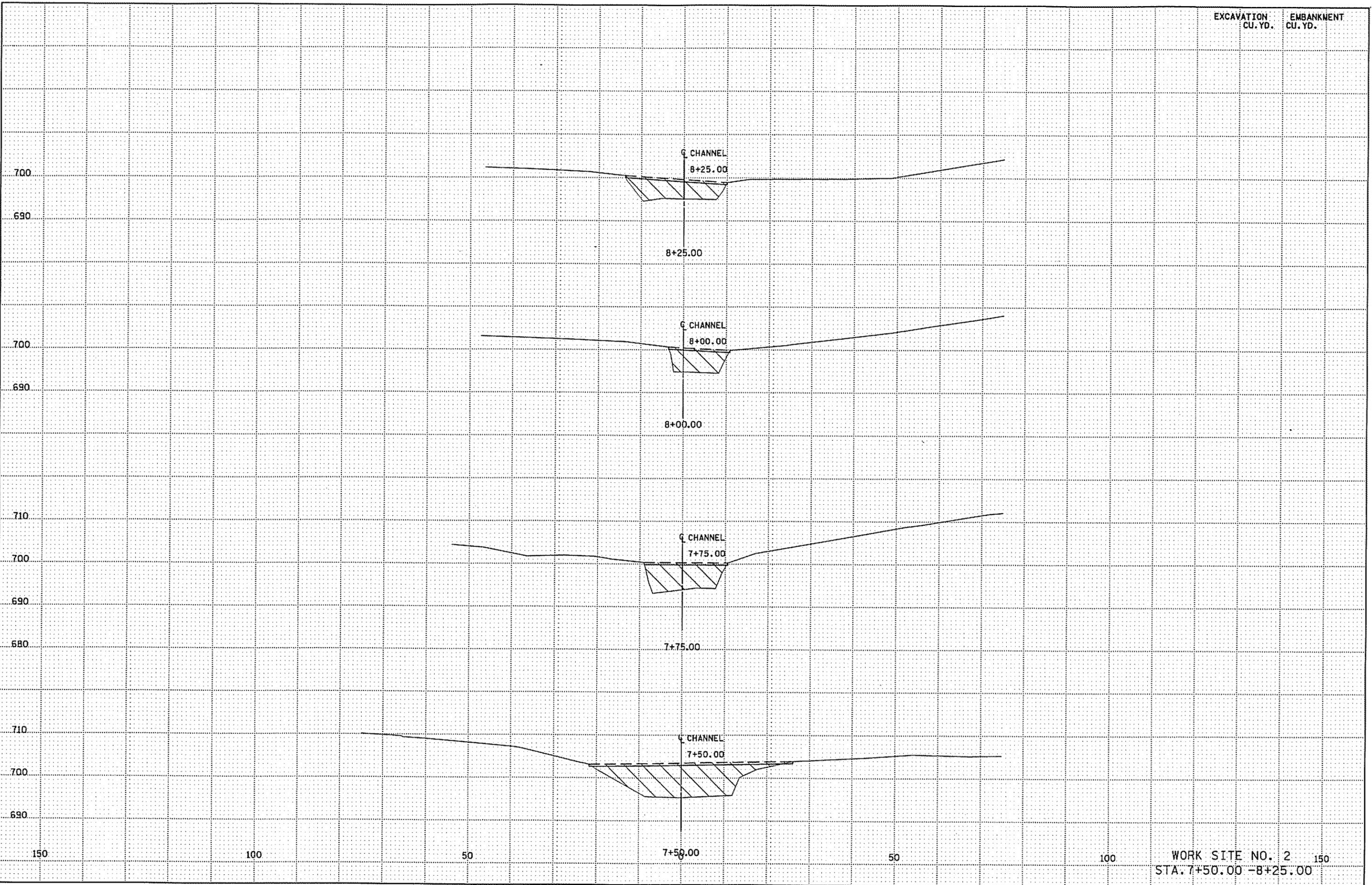
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DISTRICT : METRO
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PLOTTED/REVISED: 11-APR-2007 13:01

EXCAVATION
CU. YD. EMBANKMENT
CU. YD.

PLOTTED/REVISED: 11-APR-2007 13:02

DISTRICT : METRO
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WORK SITE NO. 2
STA. 7+50.00 - 8+25.00

