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DIVISION OF HIGHWAYS  
RALEIGH, N.C.

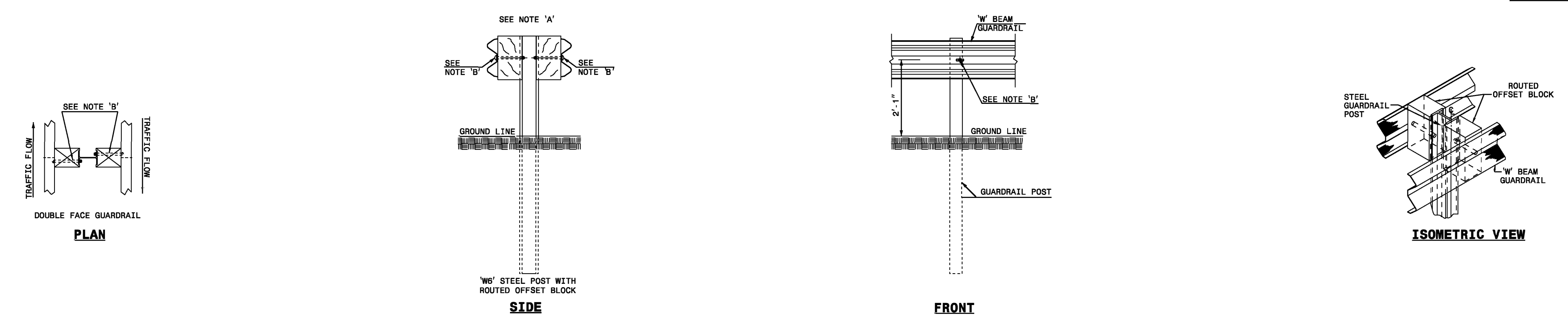
ROADWAY DETAIL DRAWING FOR  
**GUARDRAIL PLACEMENT**  
DOUBLE FACED W-BEAM

SHEET OF  
**862D01**

STATE OF  
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DIVISION OF HIGHWAYS  
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR  
**GUARDRAIL PLACEMENT**  
DOUBLE FACED W-BEAM

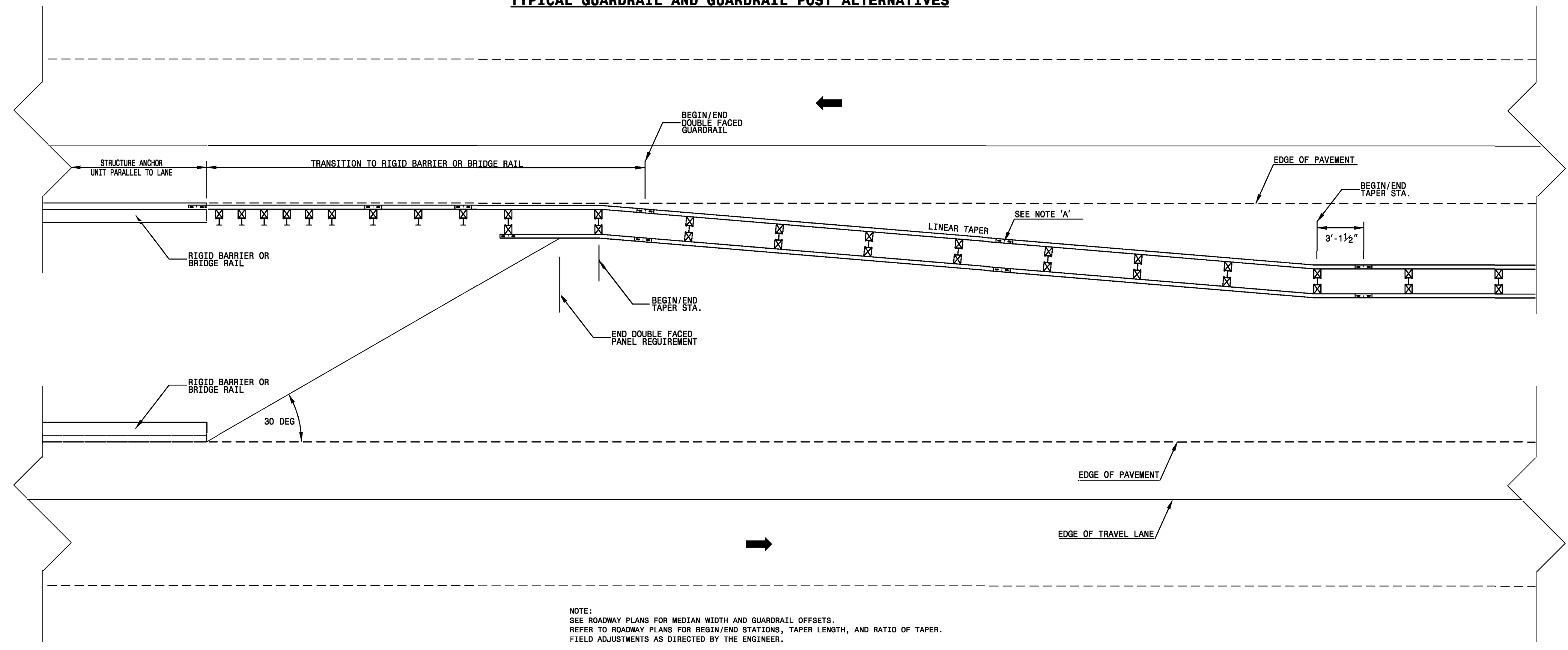
SHEET OF  
**862D01**



DRAWING NOT TO SCALE

NOTES:  
A - 5/8" DIA. BUTTON HEAD SPLICE BOLT 1 1/4" LONG (8 REQ. PER SPLICE JOINT).  
B - 5/8" DIA. BUTTON HEAD BOLT 7 1/2" LONG WITH NUT FOR BOLTING 6" W-BEAM GUARDRAIL TO STEEL POSTS.  
C - FIELD PUNCHING OF HOLES INTO GUARDRAIL AS DIRECTED BY THE ENGINEER.

**TYPICAL GUARDRAIL AND GUARDRAIL POST ALTERNATIVES**



NOTE:  
SEE ROADWAY PLANS FOR MEDIAN WIDTH AND GUARDRAIL OFFSETS.  
REFER TO ROADWAY PLANS FOR BEGIN/END STATIONS, TAPER LENGTH, AND RATIO OF TAPER.  
FIELD ADJUSTMENTS AS DIRECTED BY THE ENGINEER.

**APPROACH TO RIGID BARRIER OR BRIDGE RAIL**



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**GUARDRAIL PLACEMENT DOUBLE FACED W-BEAM**

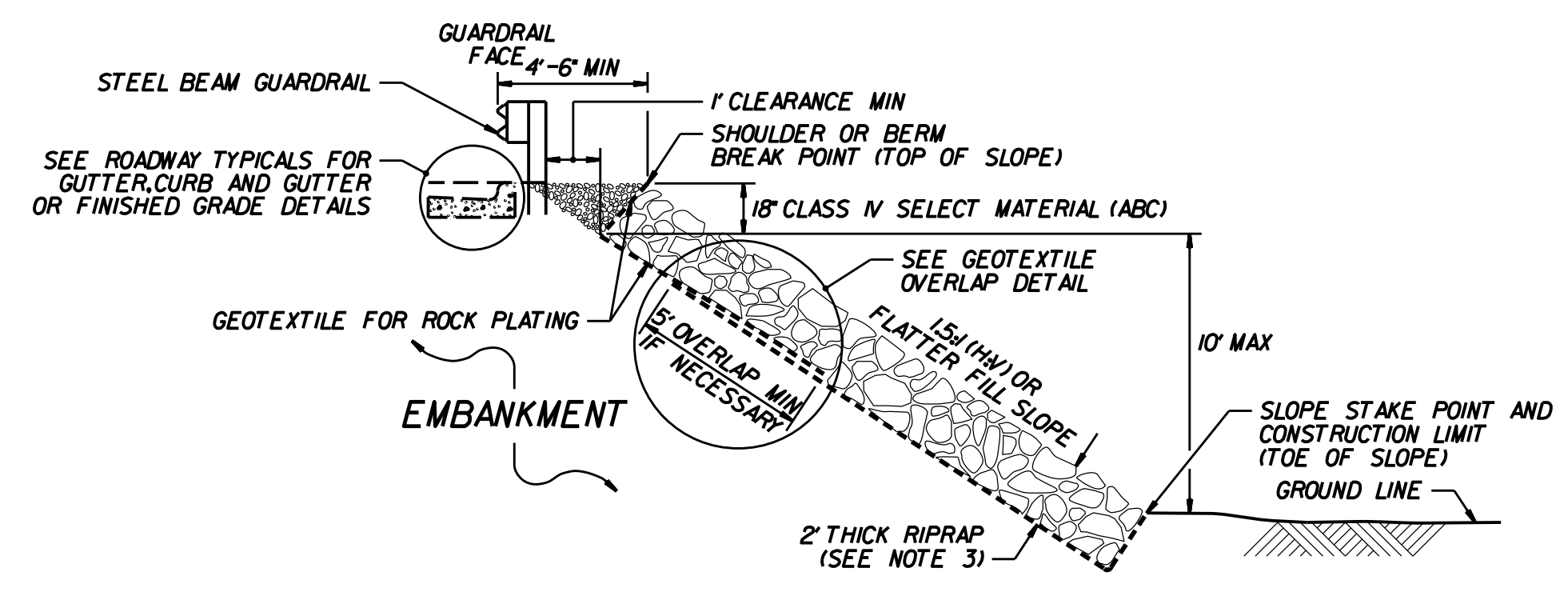
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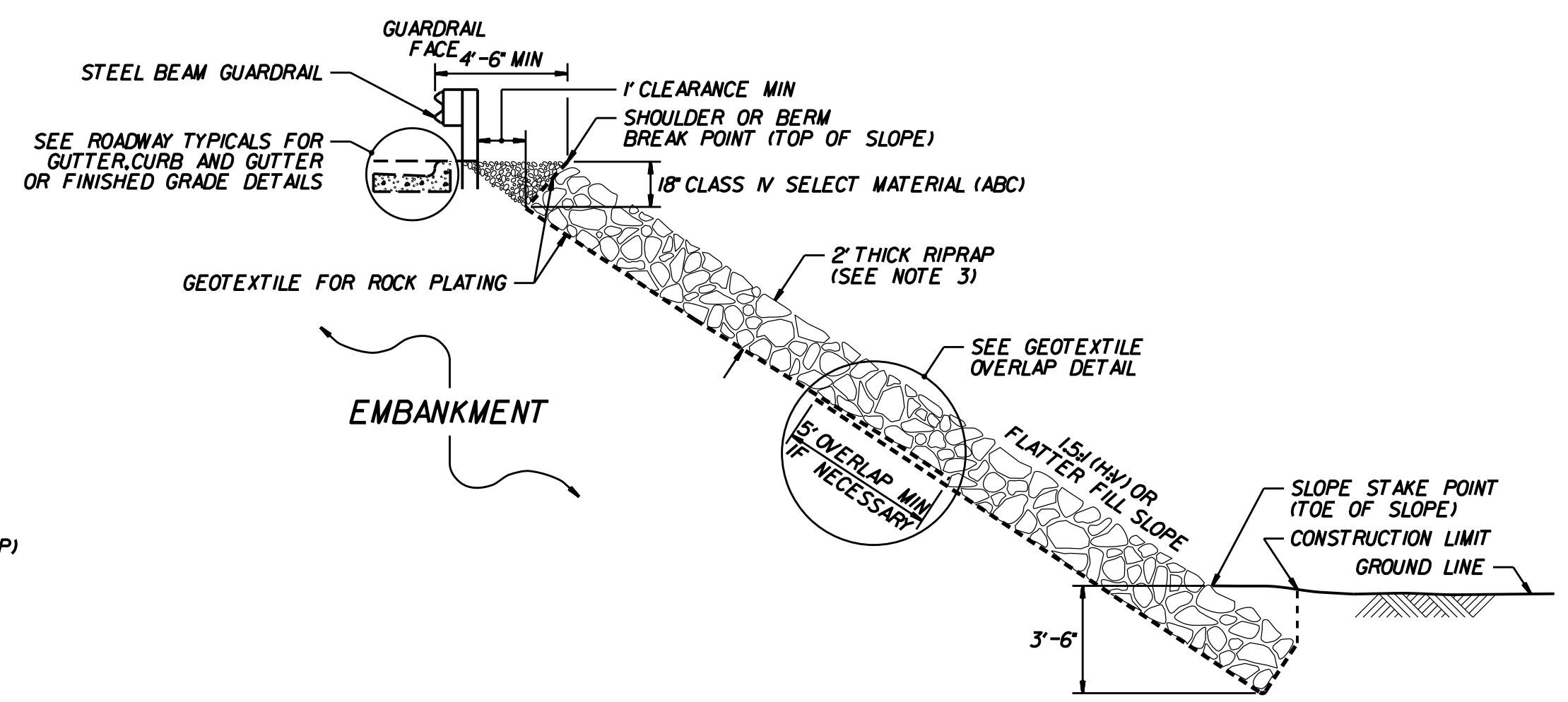
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ROADWAY DETAIL DRAWING FOR  
**ROCK PLATING**

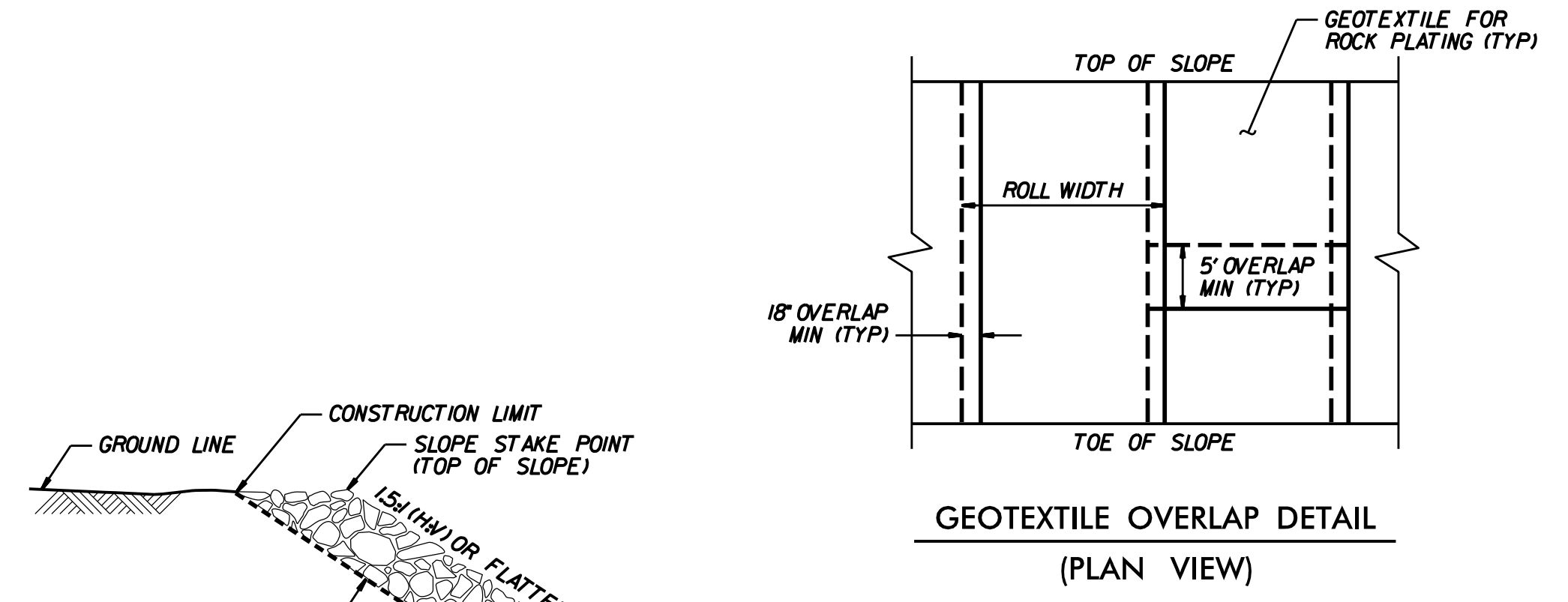
ROADWAY DETAIL DRAWING FOR  
**ROCK PLATING**



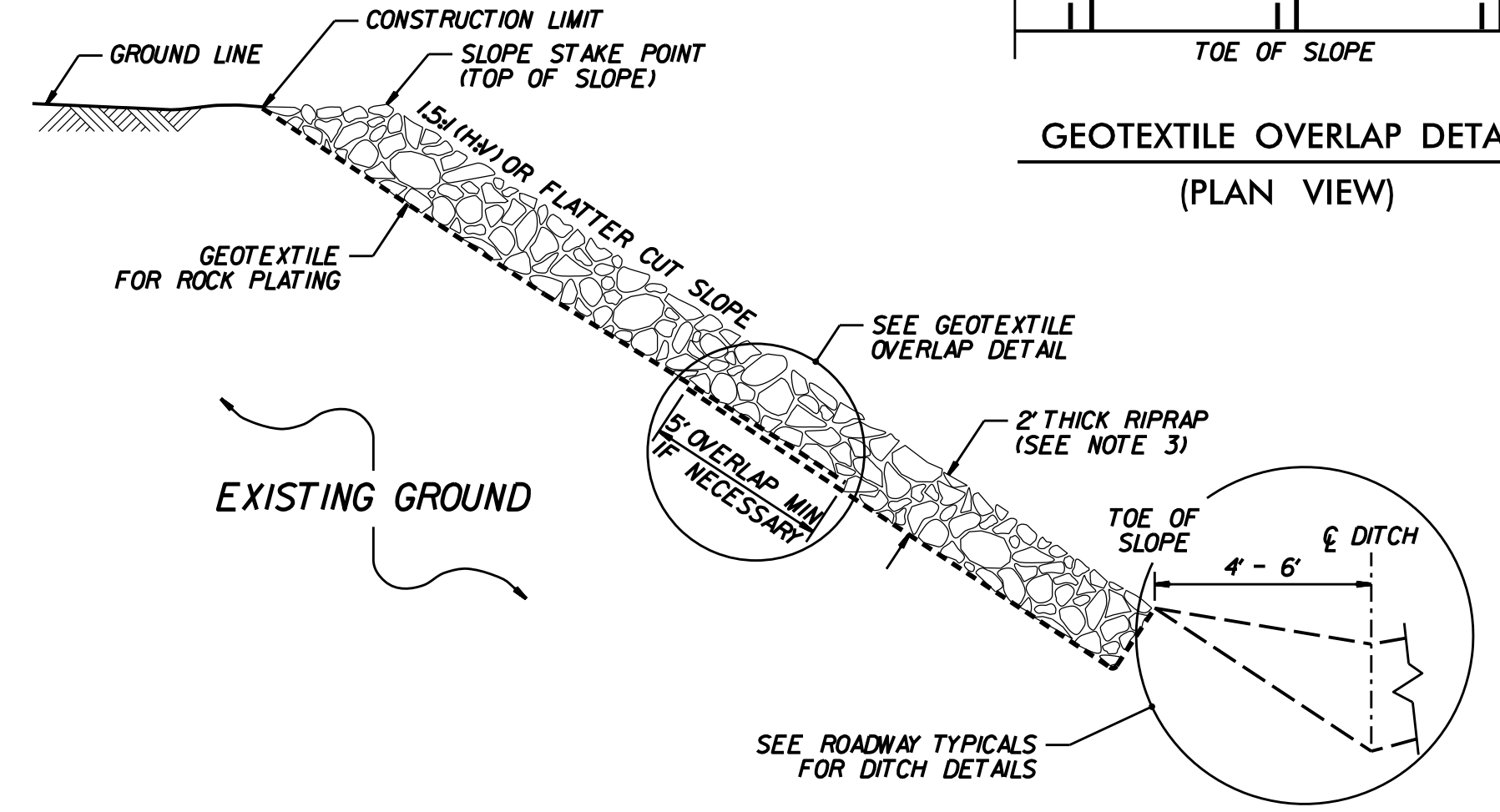
**ROCK PLATING DETAIL NO. 1 - TYPICAL SECTION**



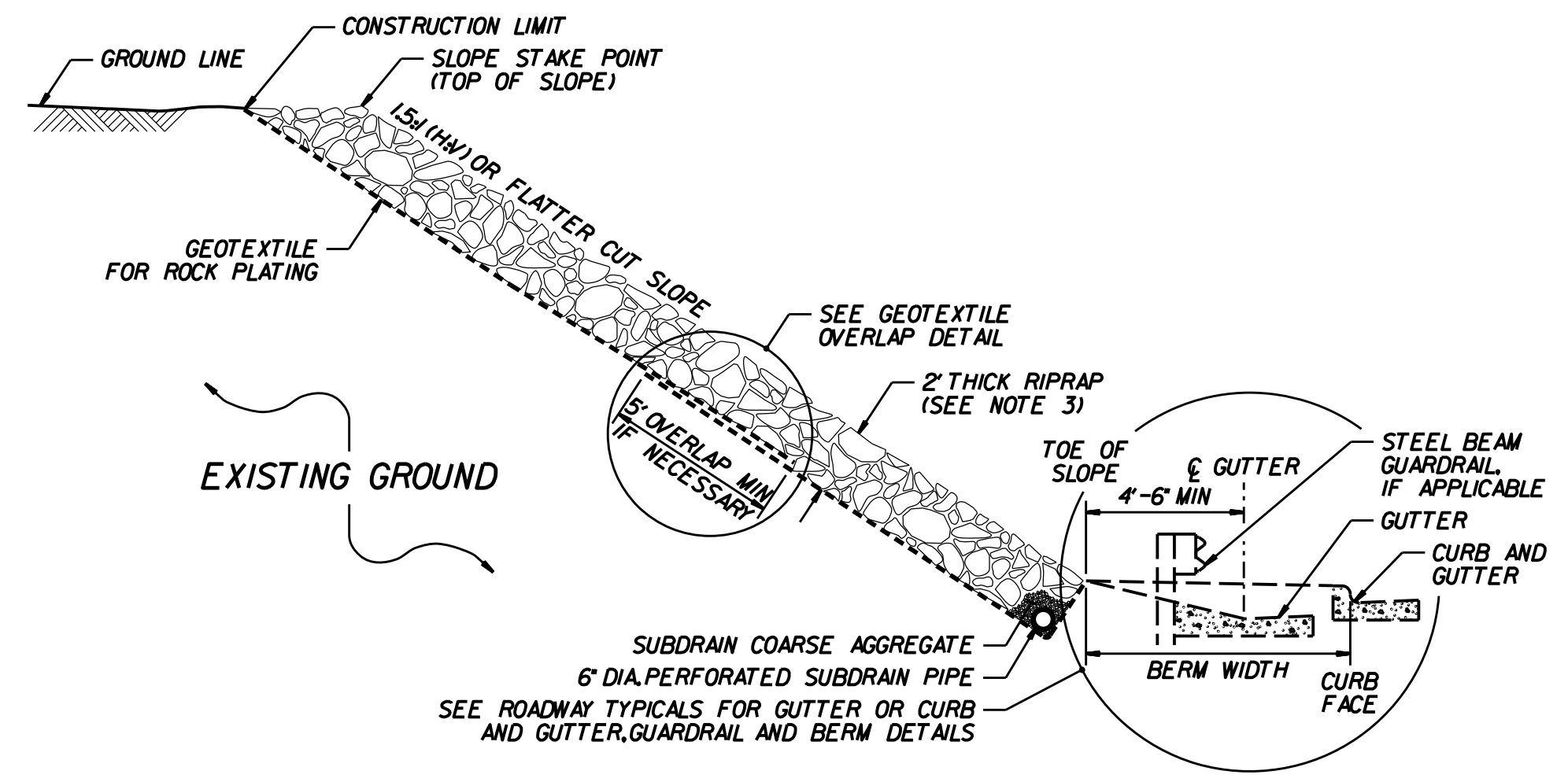
**ROCK PLATING DETAIL NO. 2 - TYPICAL SECTION**



**GEOTEXTILE OVERLAP DETAIL (PLAN VIEW)**



**ROCK PLATING DETAIL NO. 3 - TYPICAL SECTION**



**ROCK PLATING DETAIL NO. 4 - TYPICAL SECTION**

- NOTES:**
1. SEE ROADWAY PLANS AND SUMMARY SHEETS FOR ROCK PLATING LOCATIONS.
  2. FOR ROCK PLATING, SEE SECTION 275 OF THE STANDARD SPECIFICATIONS.
  3. USE CLASS I, 2 OR B RIPRAP UNLESS REQUIRED OTHERWISE IN THE ROADWAY SUMMARY SHEETS.

SHEET 1 OF 1  
**275D01**

SHEET 1 OF 1  
**275D01**



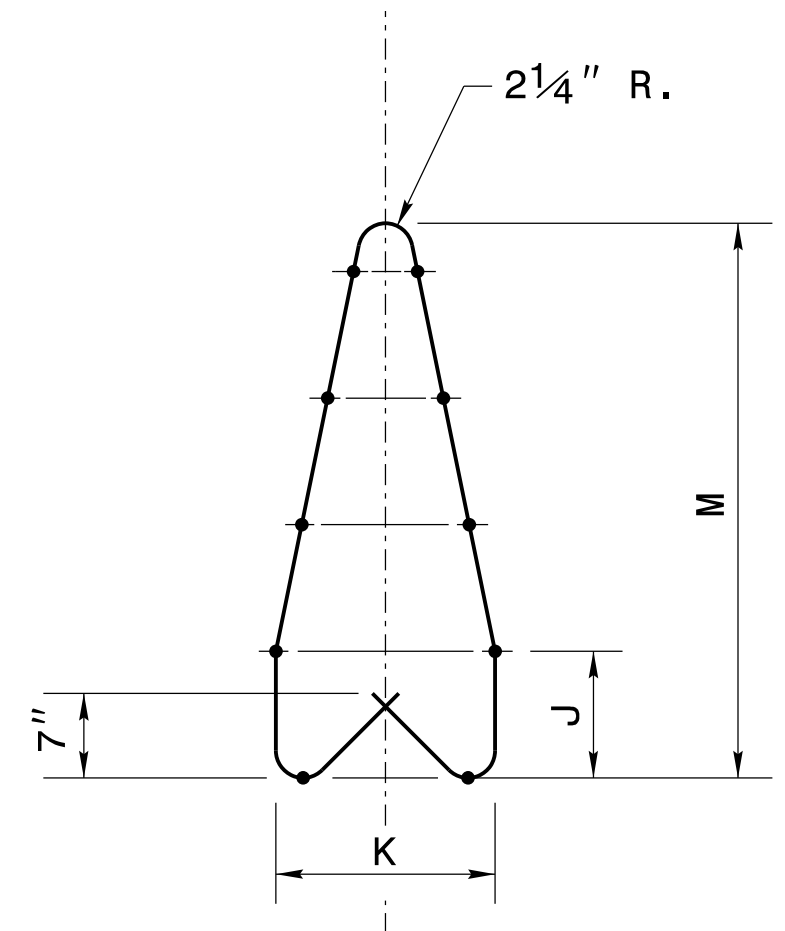
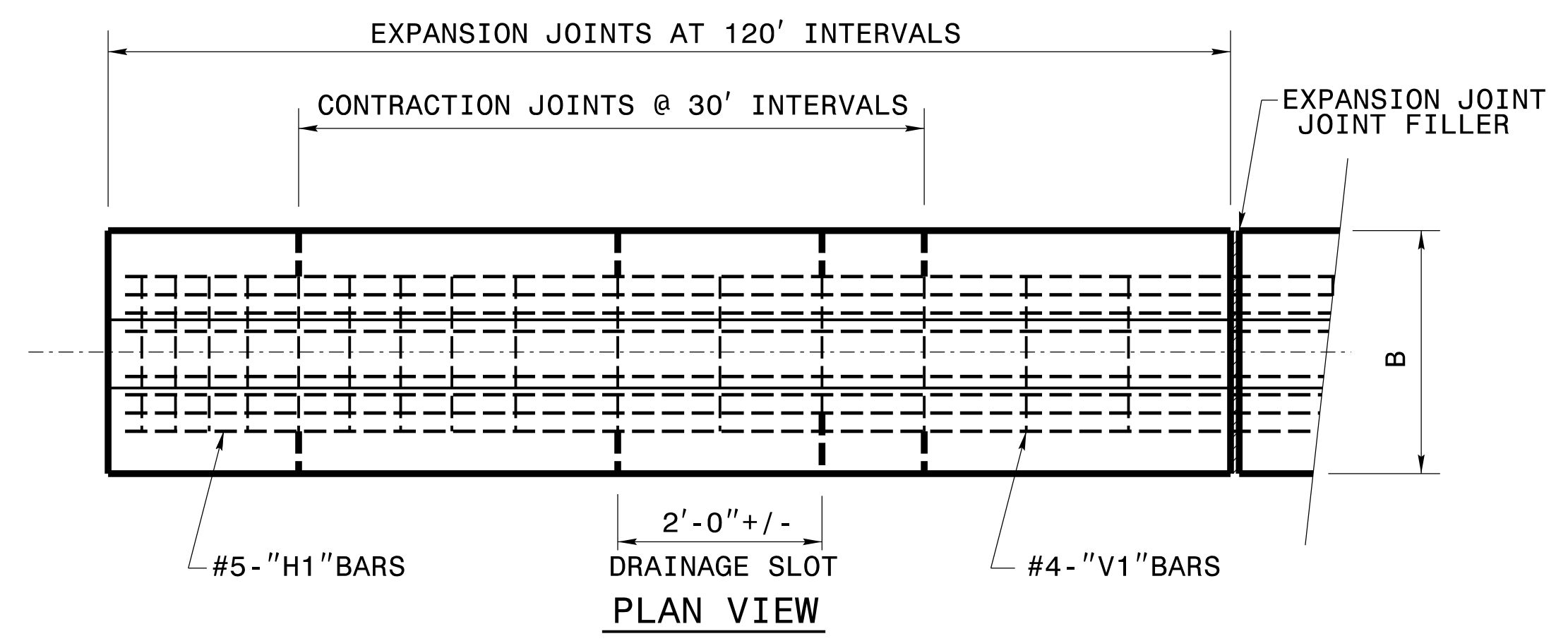
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**SEE TITLE BLOCK**

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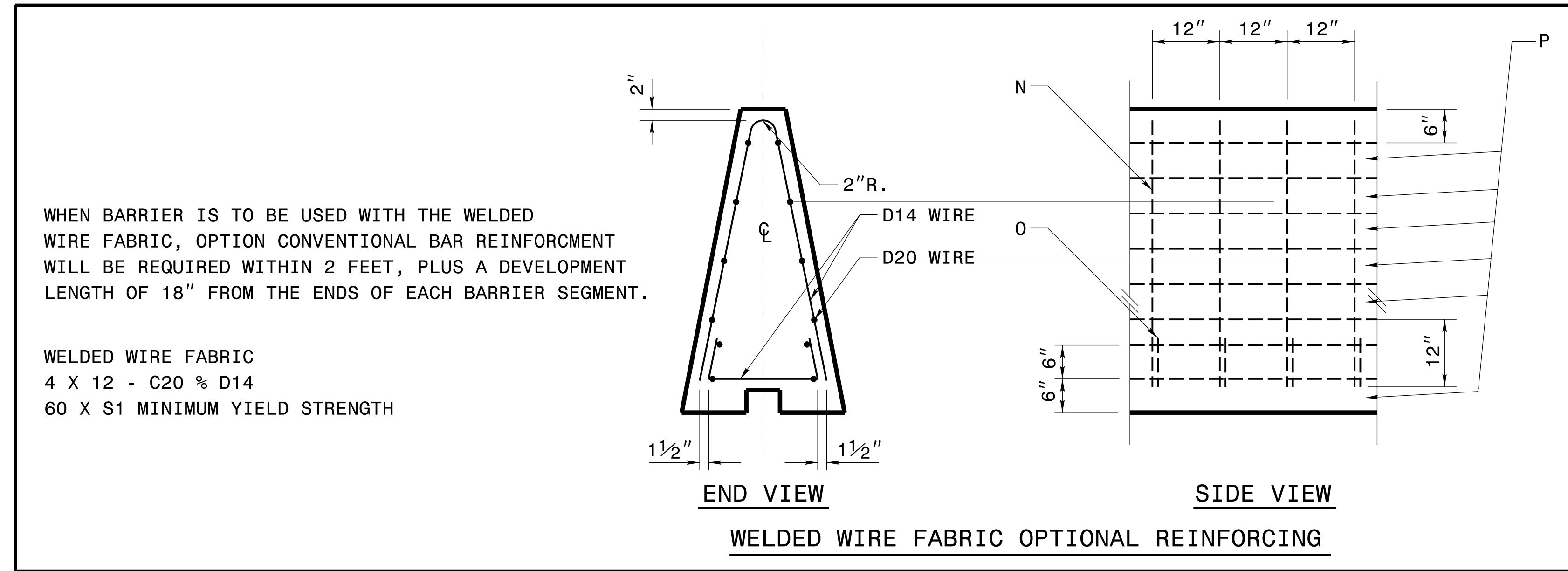
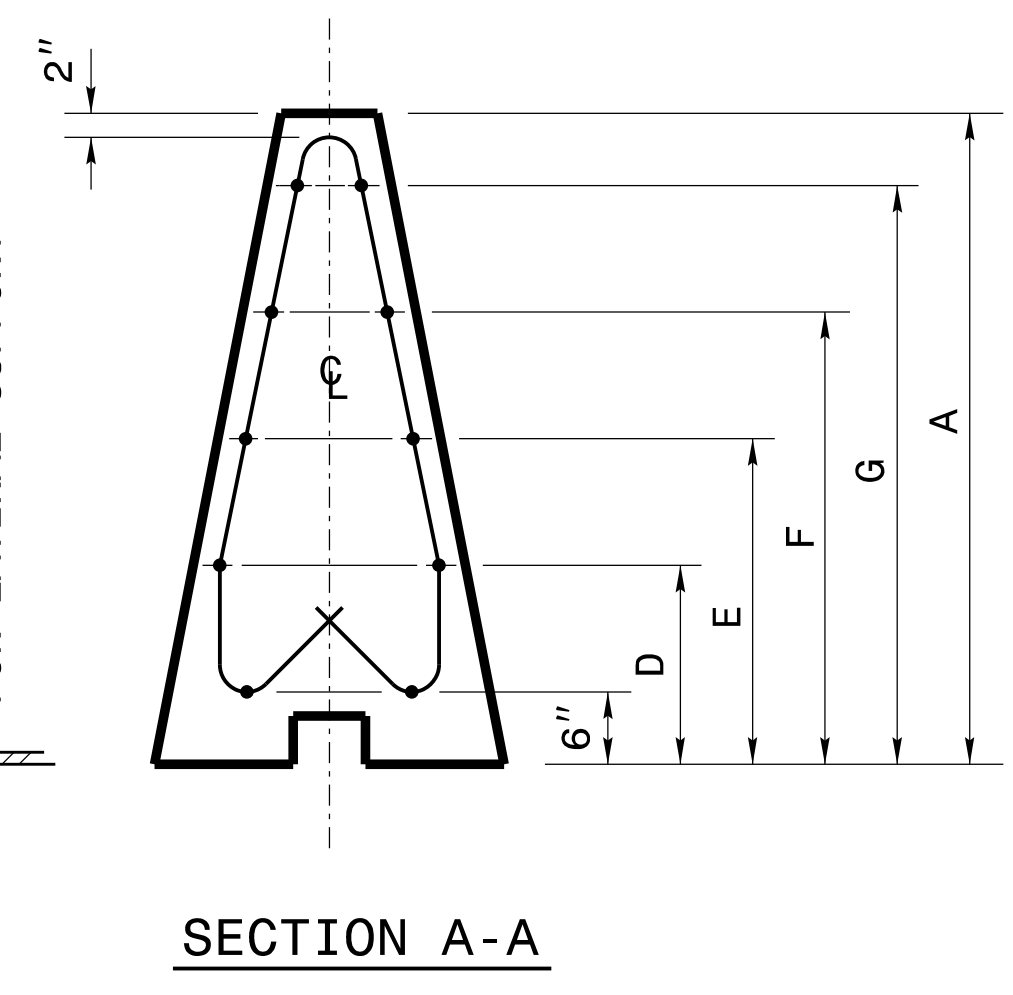
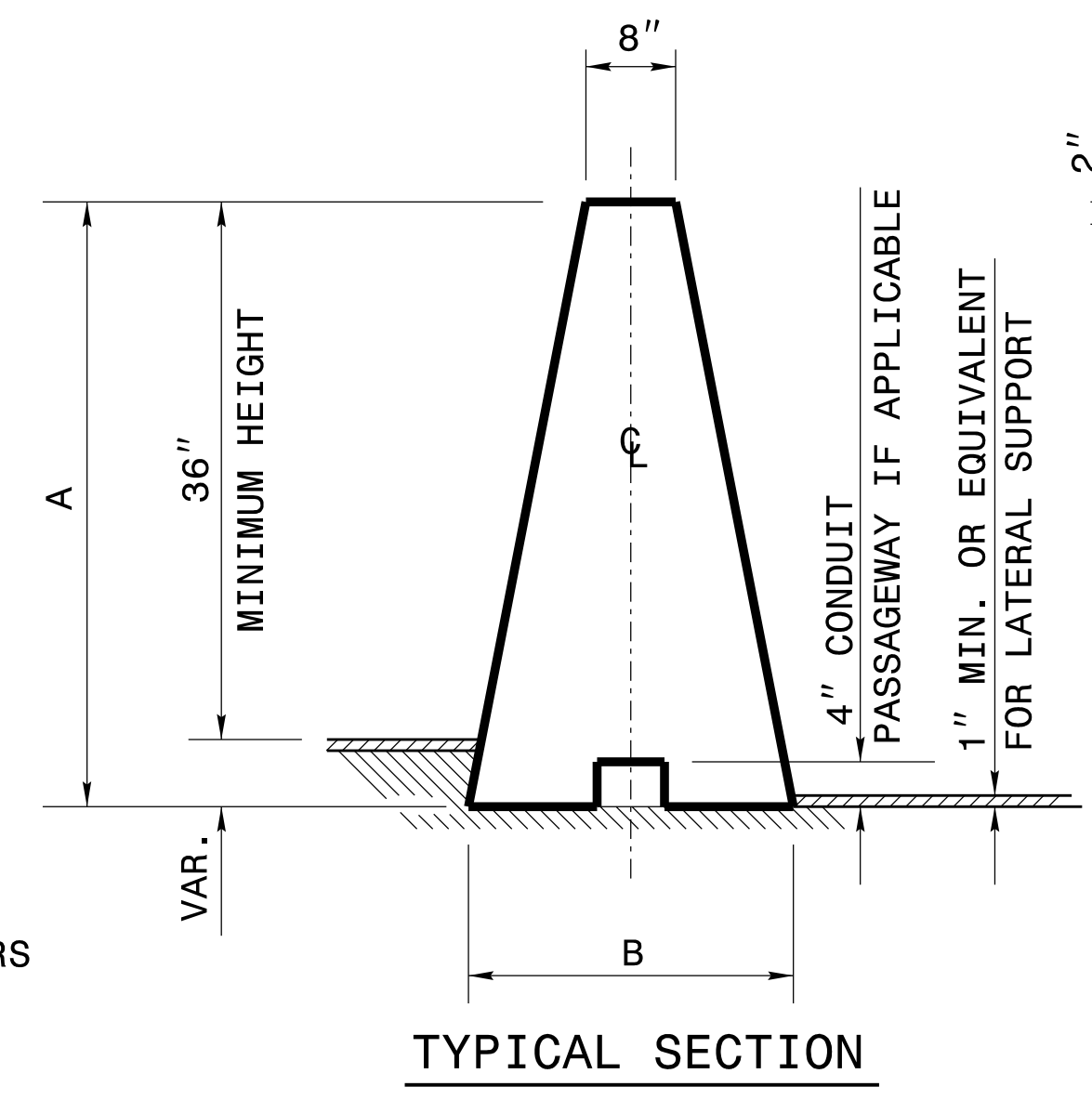
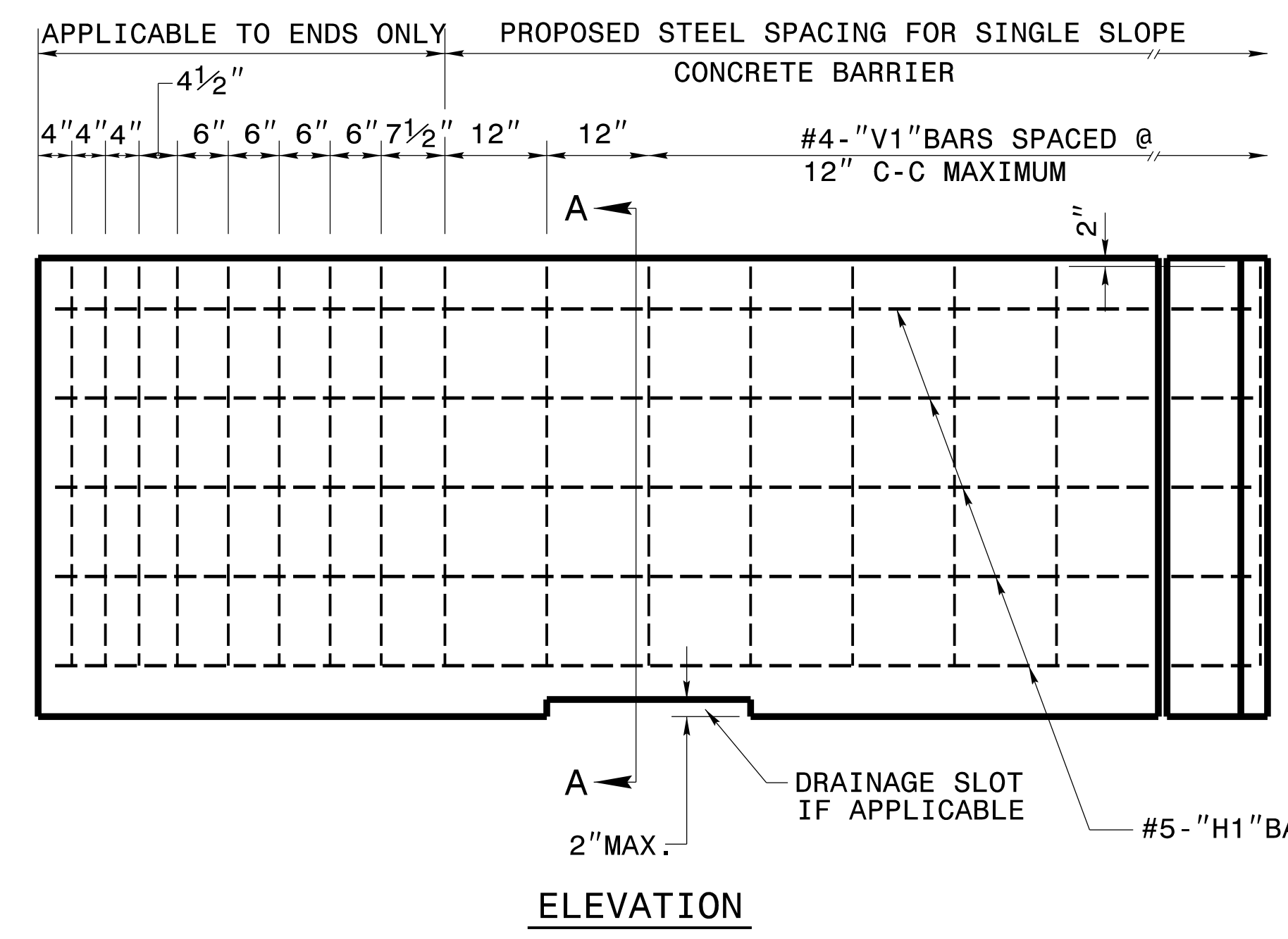
5/14/99



#4-'V1' BAR REINFORCING DETAIL

GENERAL NOTES:

- USE CLASS "AA" CONCRETE.
- MAINTAIN 2" OF COVER OVER ALL REBAR. CHAMFER TOP AND ENDS OF BARRIER 1/2 INCH.
- USE BAR SPLICE LENGTHS A MINIMUM OF 20 TIMES THE NORMAL DIAMETER OF THE BAR. ANY METHOD DEvised BY THE CONTRACTOR AND APPROVED BY THE ENGINEER THAT WILL ASSURE THE LONGITUDINAL ROADWAY STEEL WILL BE POSITIONED +/- 1/2 INCH AS DIMENSIONED WILL BE SATISFACTORY.  
  
WELDED WIRE FABRIC MAY BE USED AS AN OPTION TO CONVENTIONAL REINFORCEMENT FOR CAST-IN-PLACE BARRIER. WELDED WIRE FABRIC SHALL BE MADE IN ACCORDANCE WITH ASTM A497. CONDUIT TO BE PROVIDED ONLY WHEN CALLED FOR ELSEWHERE IN THE PLANS. POSITION OF THE CONDUIT OR CONDUIT PASSAGEWAY MAY BE ADJUSTED TO FACILITATE CONSTRUCTION, SUBJECT TO APPROVAL BY THE ENGINEER.
- REFER TO ROADWAY STANDARD DRAWING NO.854.01 FOR EXPANSION AND CONTRACTION JOINT, FILLER AND OTHER SPECIFICATIONS.



WHEN BARRIER IS TO BE USED WITH THE WELDED WIRE FABRIC, OPTION CONVENTIONAL BAR REINFORCEMENT WILL BE REQUIRED WITHIN 2 FEET, PLUS A DEVELOPMENT LENGTH OF 18" FROM THE ENDS OF EACH BARRIER SEGMENT.

WELDED WIRE FABRIC  
4 X 12 - C20 % D14  
60 X S1 MINIMUM YIELD STRENGTH

BARRIER HEIGHT (IN.)	DIMENSIONS											
	A	B	D	E	F	G	K	L	M	N	O	P
48"	48	26 9/32	15	24	33	42	17 1/2	10 3/4	42	84	31 1/2	5
52"	54	28 9/16	16 1/2	27	37 1/2	48	19 1/2	12 1/4	48	96	34 3/4	6



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**SINGLE SLOPE  
CONCRETE BARRIER**

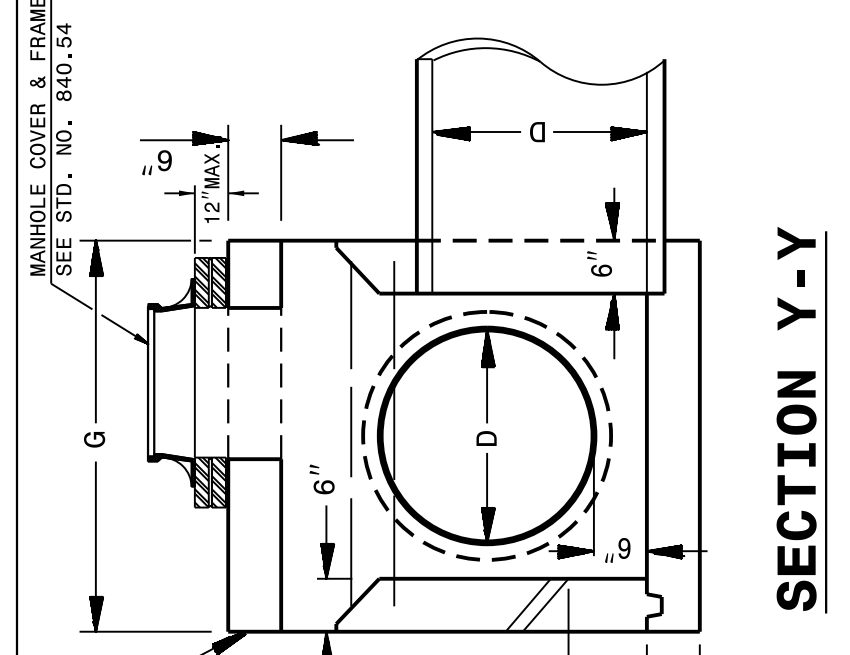
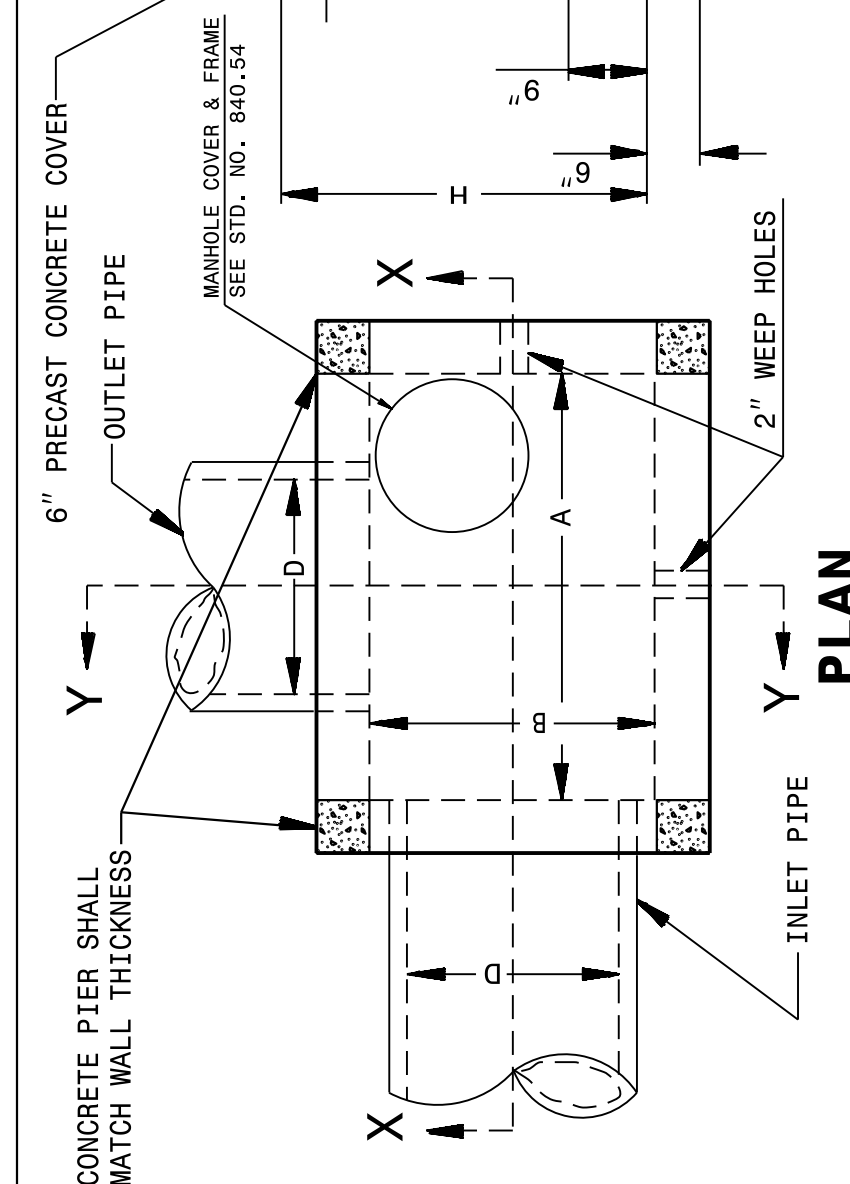
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7/19/2022

24-APR-2019 07:24  
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 jhover-ton AT CSD-292595

5/14/99

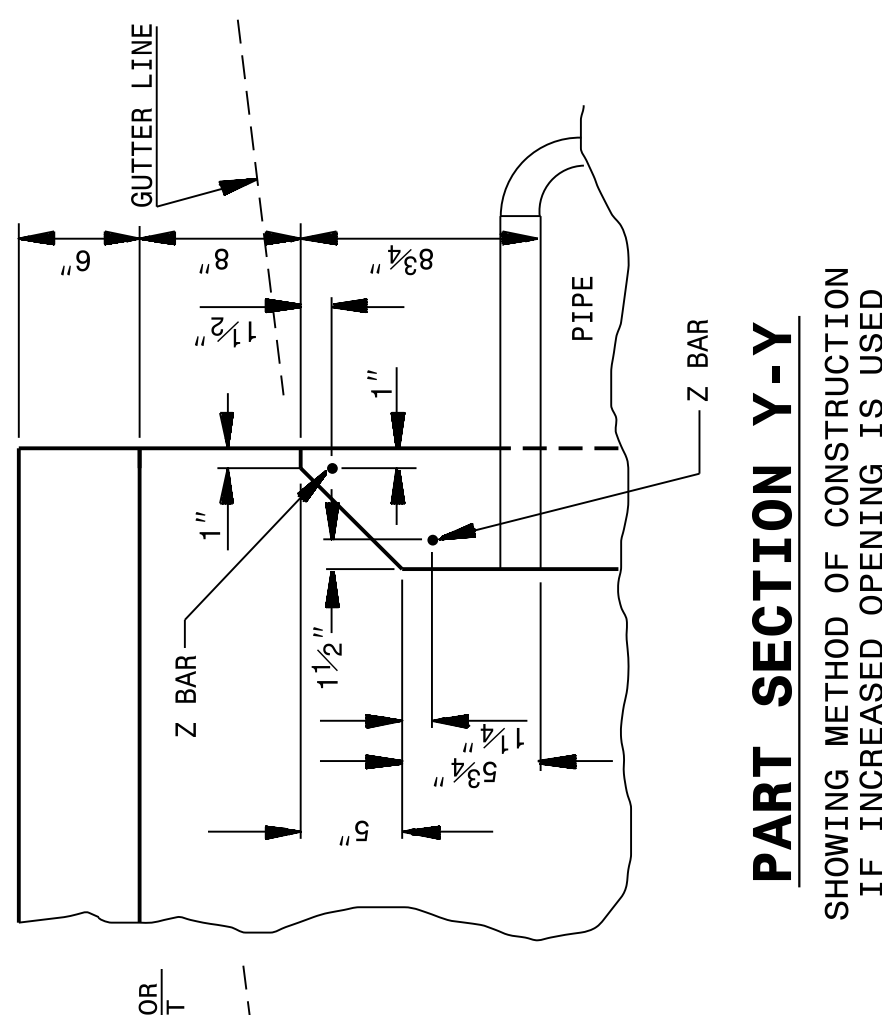
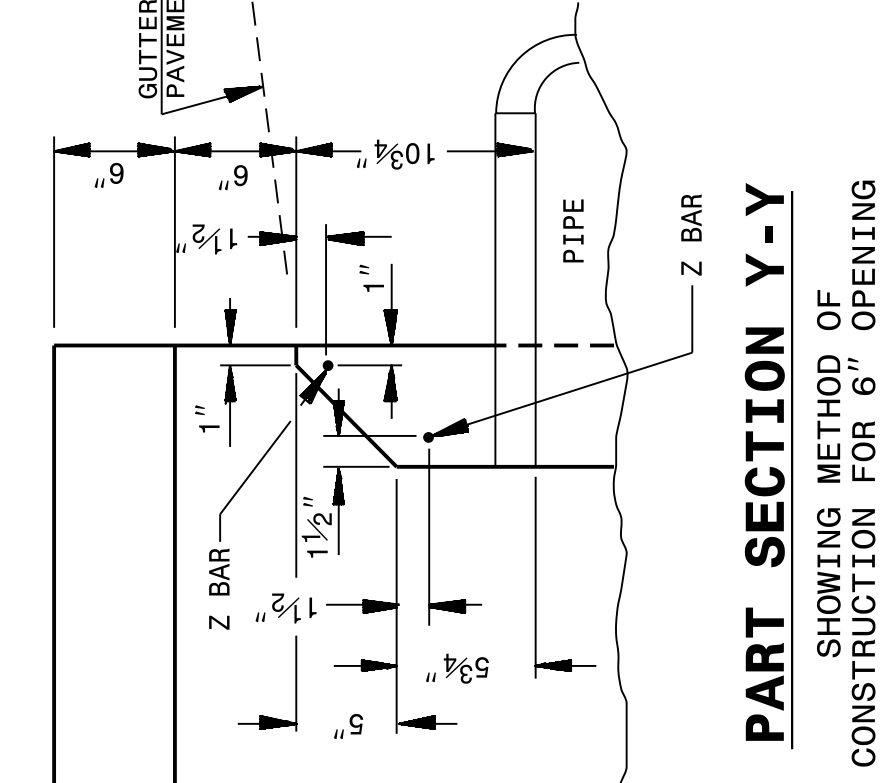
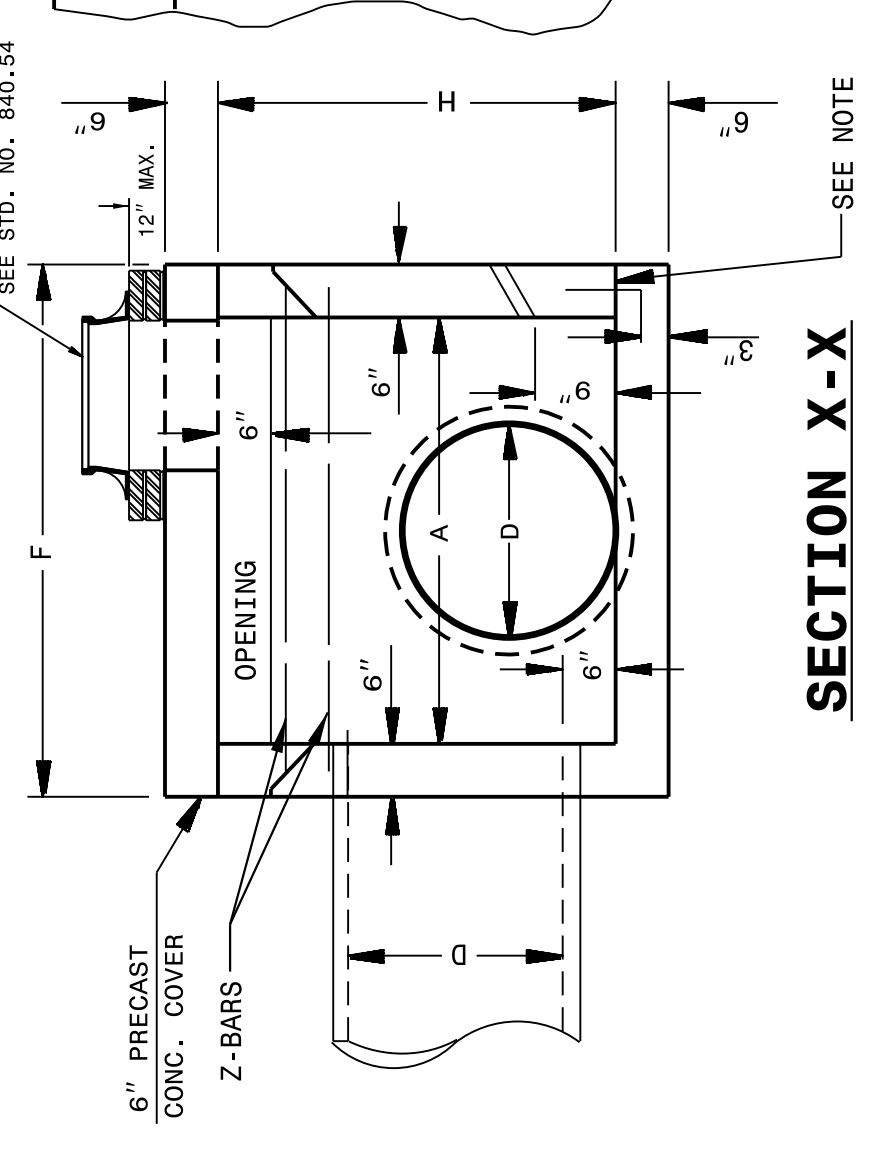
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**GENERAL NOTES:**  
 ALL CATCH BASINS OVER 3'-6" IN DEPTH TO BE PROVIDED WITH STEPS 12" ON CENTERS. STEPS SHALL BE IN ACCORDANCE WITH STD. 840.66.  
 ALL EXPOSED CORNERS TO BE CHAMFERED 1".  
 CLASS "B" CONCRETE TO BE USED THROUGHOUT.  
 2" PIPE WEEPHOLES TO BE PLACED AS DIRECTED BY THE ENGINEER.  
 THE 6" OPENING SHOWN MAY BE INCREASED TO 8" MAXIMUM IF DEEMED TO BE NECESSARY BY THE ENGINEER.  
 OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2" KEYWAY, OR #5 BAR DOWELS FORMS ARE TO BE USED FOR THE CONSTRUCTION OF THE BOTTOM SLAB.  
 IF REINFORCED CONCRETE PIPE IS SET IN BASE SLAB OF BOX, ADD TO BASE AS SHOWN ON STD. DWG. 840.00.  
 A STONE DRAIN CONSISTING OF 1 CUBIC FOOT OF NO. 78M STONE CONTAINED IN A BAG OF POROUS FABRIC SHALL BE PLACED AT EACH WEEP HOLE.  
 FOR 8" IN HEIGHT OR LESS USE 6" WALLS AND BOTTOM SLAB.  
 OVER 8" IN HEIGHT USE 8" WALLS AND BOTTOM SLAB. QUANTITIES TO BE ADJUSTED ACCORDINGLY.  
 DIMENSIONS MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER.

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ENGLISH DETAIL DRAWING FOR  
**CONCRETE CATCH BASIN  
 (3 OR 4 SIDE OPEN THROAT)  
 (MANHOLE OPTIONAL)**



**PART SECTION Y-Y**  
 SHOWING METHOD OF CONSTRUCTION  
 IF INCREASED OPENING IS USED

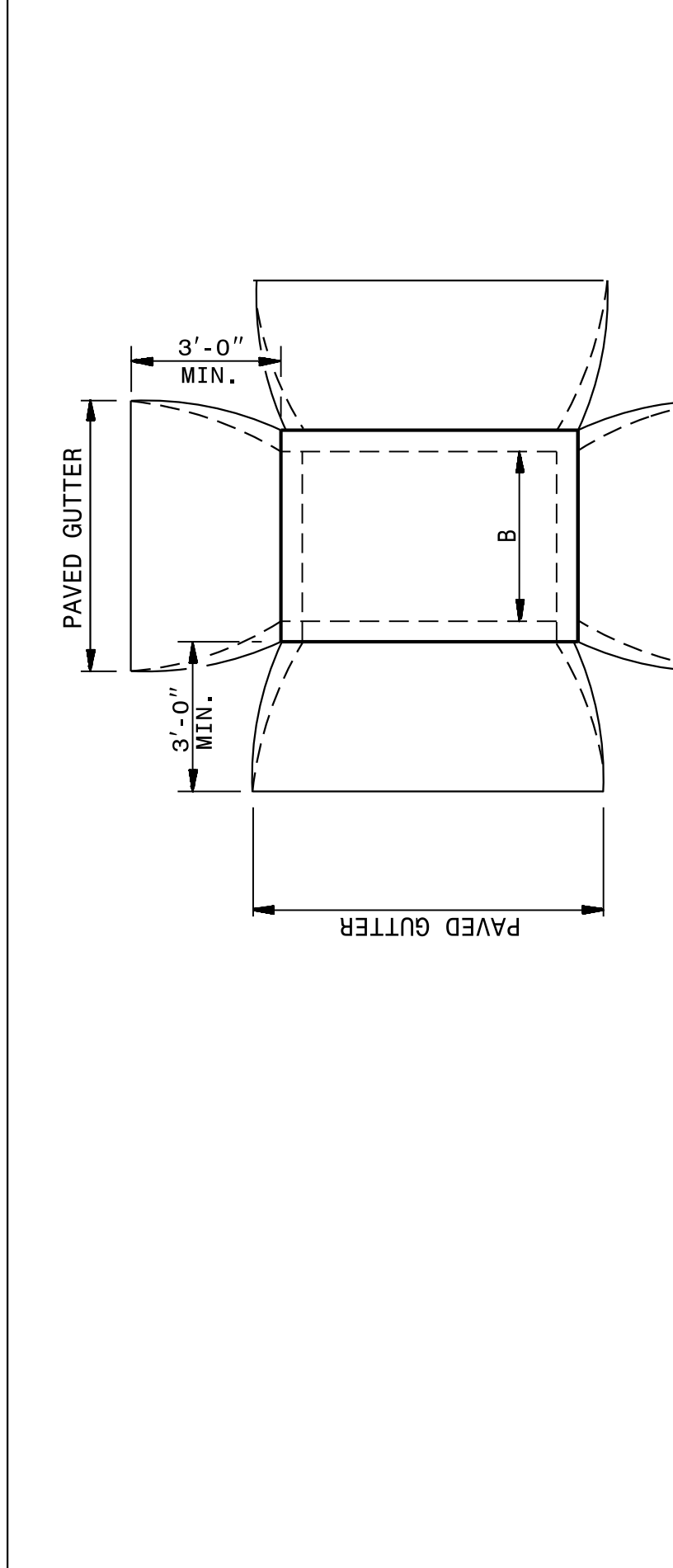
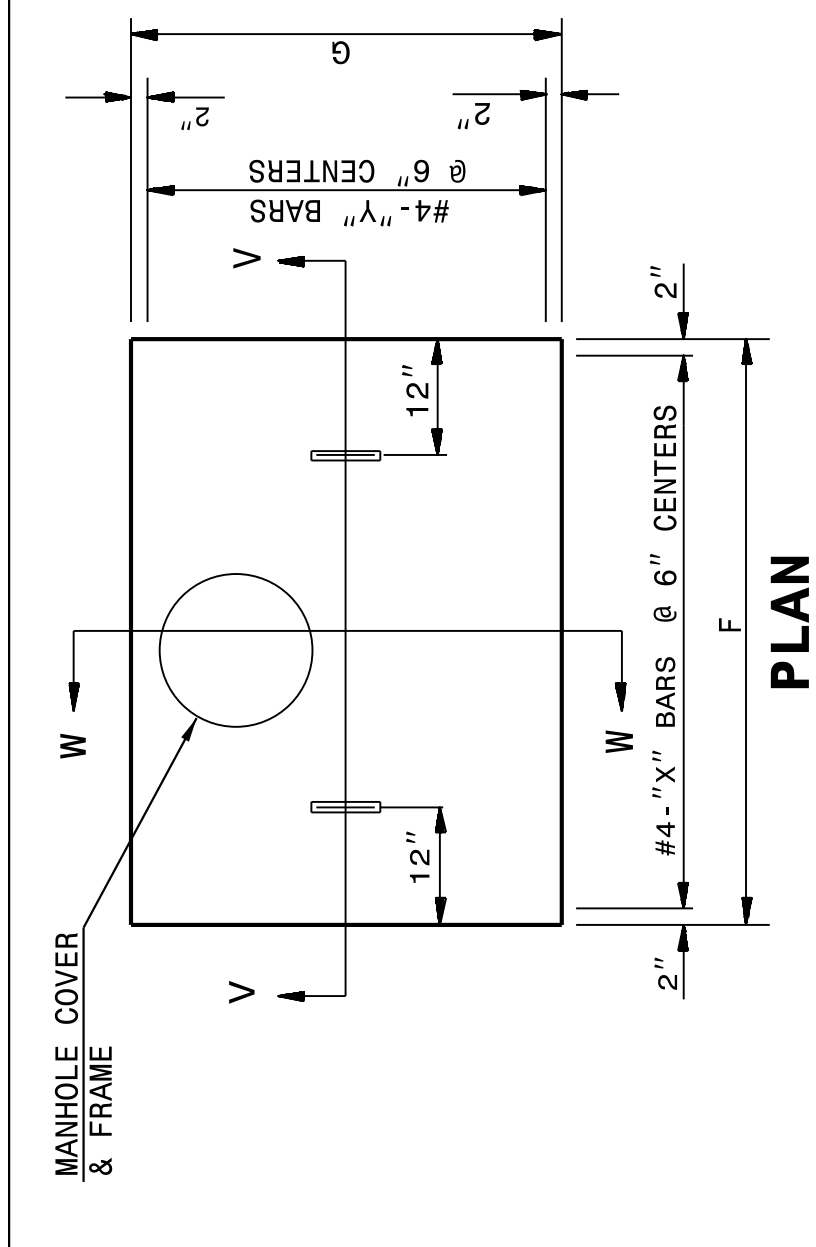
**PART SECTION Y-Y**  
 SHOWING METHOD OF  
 CONSTRUCTION FOR 6" OPENING

PIPE DIM'S OF BOX & PIPE	MIN. DIMENSIONS AND QUANTITIES FOR CONCRETE CATCH BASIN (BASED ON MIN. HEIGHT, H)				TOTAL QUANTITIES		DEDUCTION ONE PIPE THROUGH OPENING												
	SPAN	WIDTH	HEIGHT	REINFORCING	CU. YDS. CONC. IN BOX	BOX & SLABS													
D	A	B	H	BAIRS - X	BAIRS - Y	BAIRS - Z	NO. LENGTH	NO. LENGTH	F	G	TOP SLAB (BOT. SLAB)	REINFT. (LBS. REINFT. (Y <sup>3</sup> (MIN. H)	C. S.	R. C.	YD <sup>3</sup>				
12"	3'-6"	2'-3"	1'-10"	4	3'-0"	6	4'-3"	2	4'-3"	4	4'-6"	0.181	0.271	0.250	27	1.046	0.015	0.032	0.046
15"	3'-6"	2'-3"	2'-1"	4	3'-0"	6	4'-3"	2	4'-3"	4	4'-6"	0.181	0.271	0.250	27	1.108	0.023	0.036	0.046
18"	4'-0"	2'-8"	2'-4"	5	3'-5"	7	4'-9"	2	4'-9"	5	5'-0"	0.226	0.340	0.284	35	1.379	0.033	0.049	0.053
24"	4'-0"	2'-8"	2'-10"	5	3'-5"	7	4'-9"	2	4'-9"	5	5'-0"	0.226	0.340	0.284	35	1.521	0.059	0.085	0.083
30"	4'-0"	3'-6"	3'-4"	5	4'-3"	9	4'-9"	2	4'-9"	5	5'-0"	0.278	0.417	0.315	43	1.916	0.092	0.127	0.053
36"	4'-0"	4'-6"	4'-4"	5	4'-3"	12	5'-3"	2	5'-3"	5	5'-6"	0.340	0.510	0.352	51	2.390	0.132	0.178	0.069
42"	5'-0"	4'-6"	4'-4"	5	5'-3"	12	5'-9"	2	5'-9"	5	6'-0"	0.407	0.611	0.389	64	2.914	0.180	0.243	0.066
48"	5'-0"	5'-0"	4'-10"	5	5'-9"	13	5'-9"	2	5'-9"	5	6'-0"	0.444	0.666	0.407	68	3.298	0.235	0.317	0.066

SHEET 1 OF 2  
**840D04**

SHEET 1 OF 2  
**840D04**

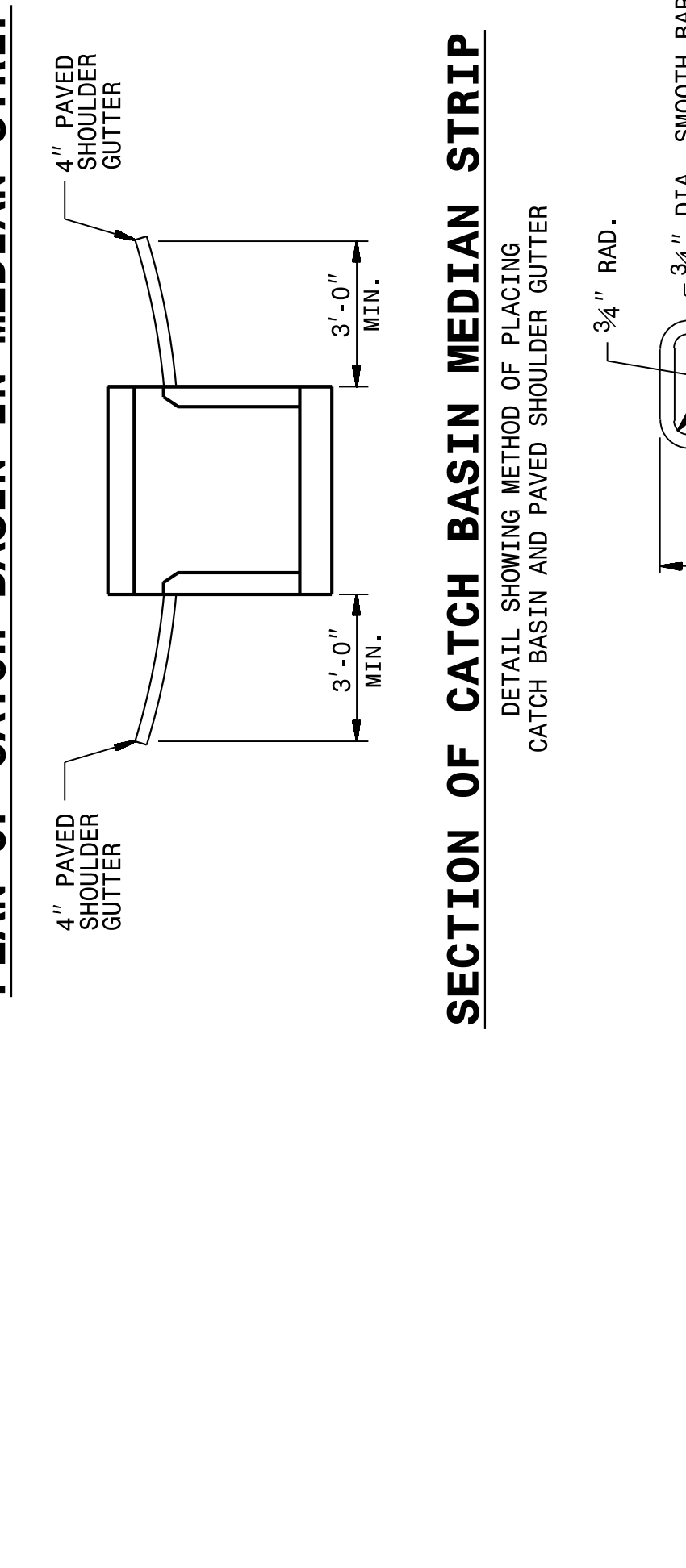
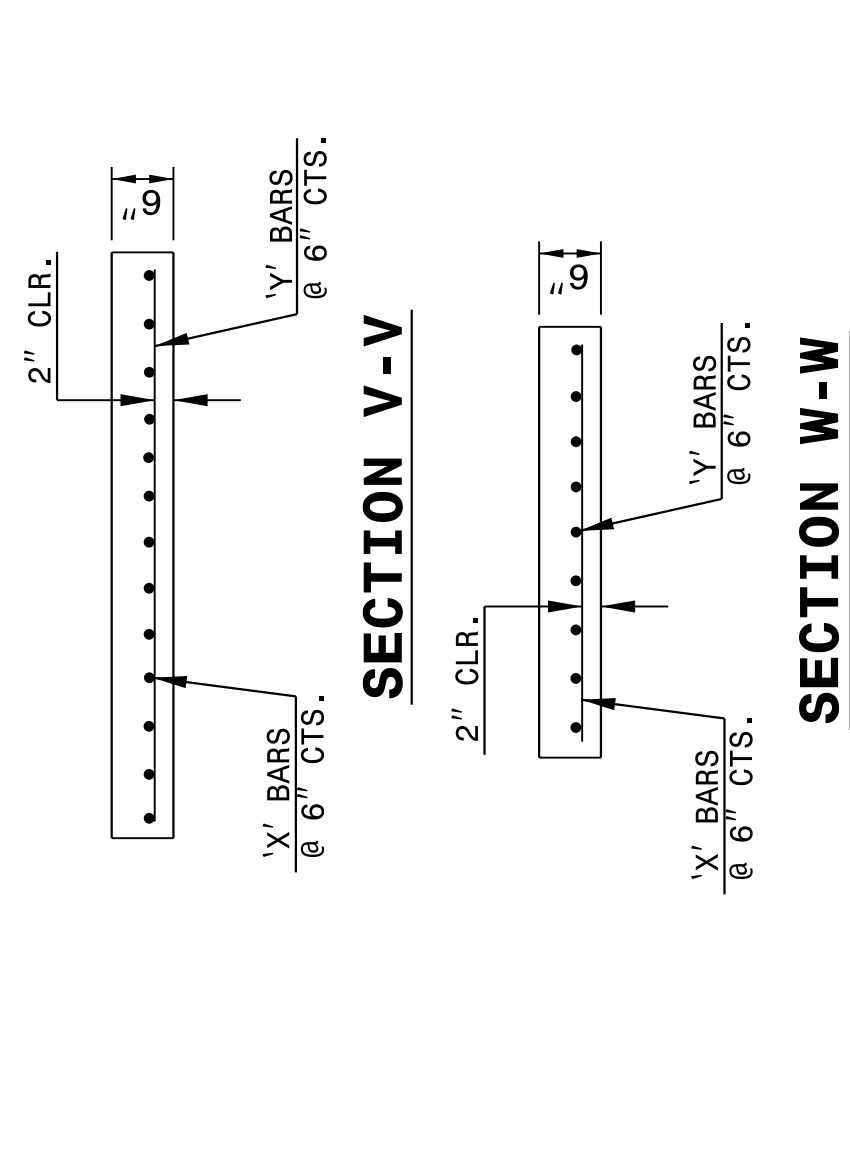
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**PLAN**  
 PLAN OF PRECAST COVER

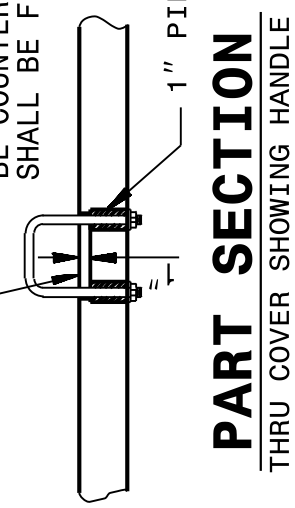
**PLAN OF CATCH BASIN IN MEDIAN STRIP**

ENGLISH DETAIL DRAWING FOR  
**CONCRETE CATCH BASIN  
 (3 OR 4 SIDE OPEN THROAT)  
 (MANHOLE OPTIONAL)**



**SECTION OF CATCH BASIN MEDIAN STRIP**  
 DETAIL SHOWING METHOD OF PLACING  
 CATCH BASIN AND PAVED SHOULDER GUTTER

**SECTION W-W**  
 PART WHERE HANDLE IS LOCATED SHALL  
 BE COUNTERSUNK 1" AND HANDLE  
 SHALL BE FREE TO MOVE UP AND DOWN.



**PART SECTION**  
 THRU COVER SHOWING HANDLE

SHEET 2 OF 2  
**840D04**

SHEET 2 OF 2  
**840D04**

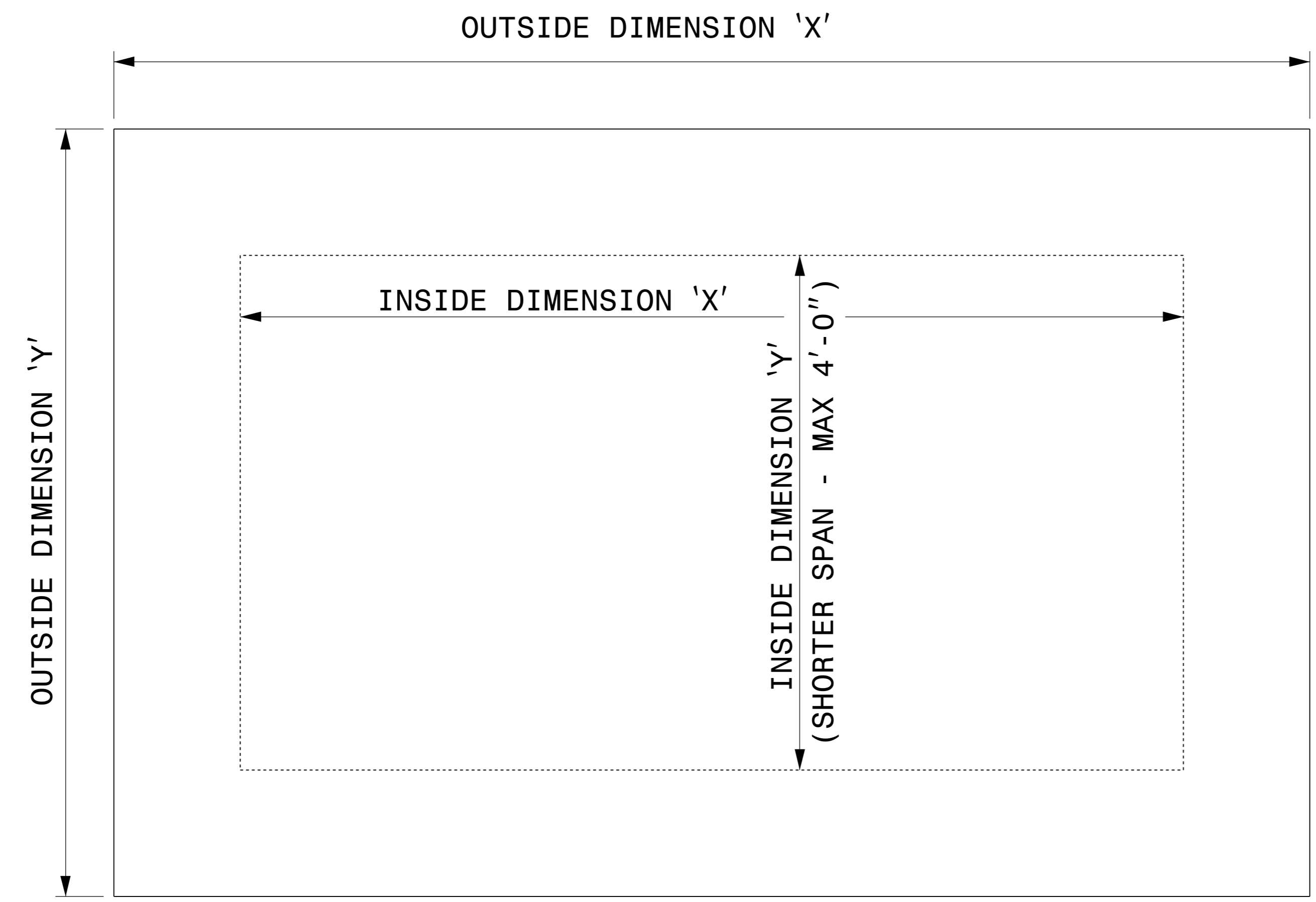
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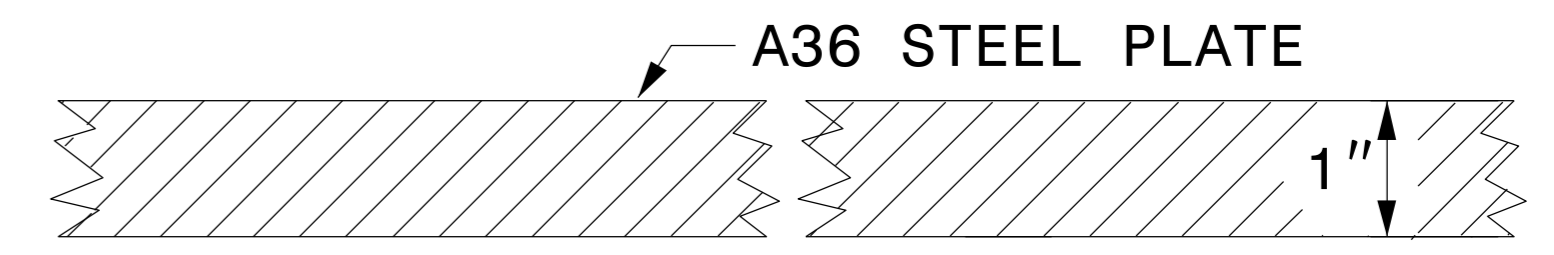
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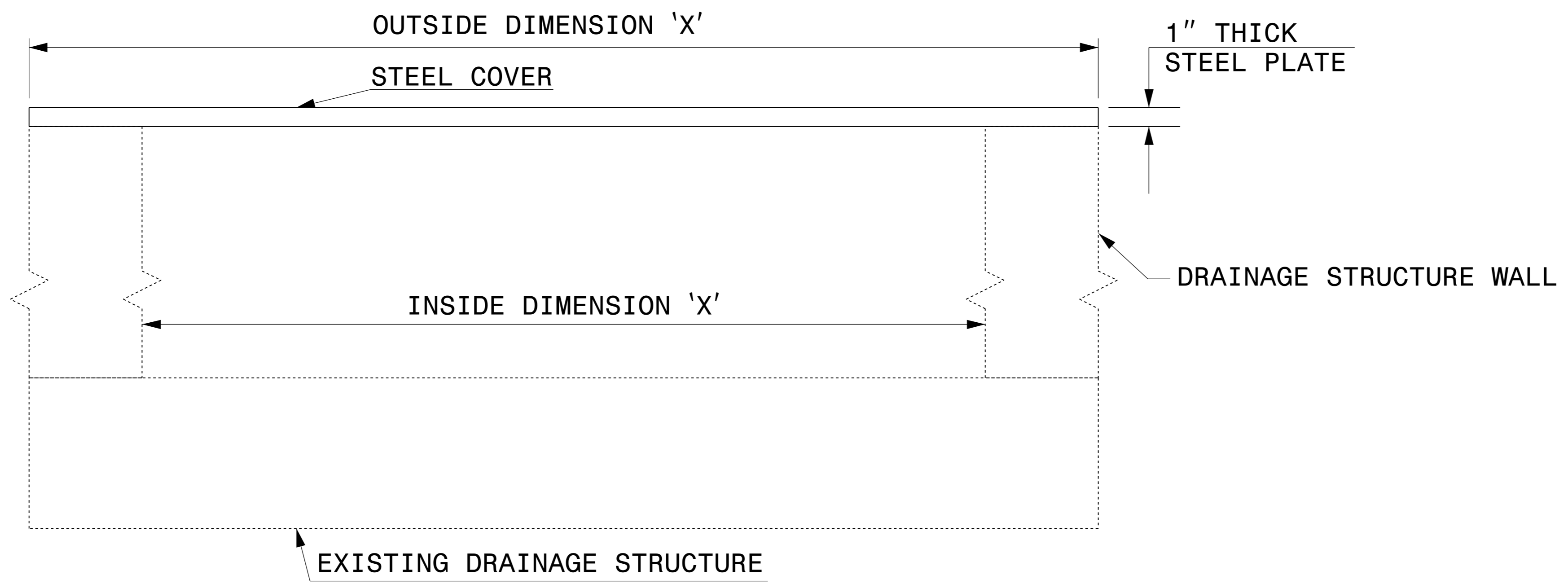
GENERAL NOTES:

- USE GRADE A36 STEEL
- STEEL COVERS ARE FOR TEMPORARY USE DURING PHASE CONSTRUCTION.
- FILL SHALL BE PLACED DIRECTLY OVER THE STEEL PLATES.
- SEE ROADWAY PLANS AND PROVISIONS FOR LOCATIONS
- QUANTITIES TO BE PAID FOR AT THE UNIT PRICE BID PER EACH.



SECTION VIEW OF STEEL TOP PLATE

PLAN VIEWS



ELEVATION VIEWS



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**DETAIL OF TEMPORARY 1" STEEL COVER OVER DRAINAGE STRUCTURE**

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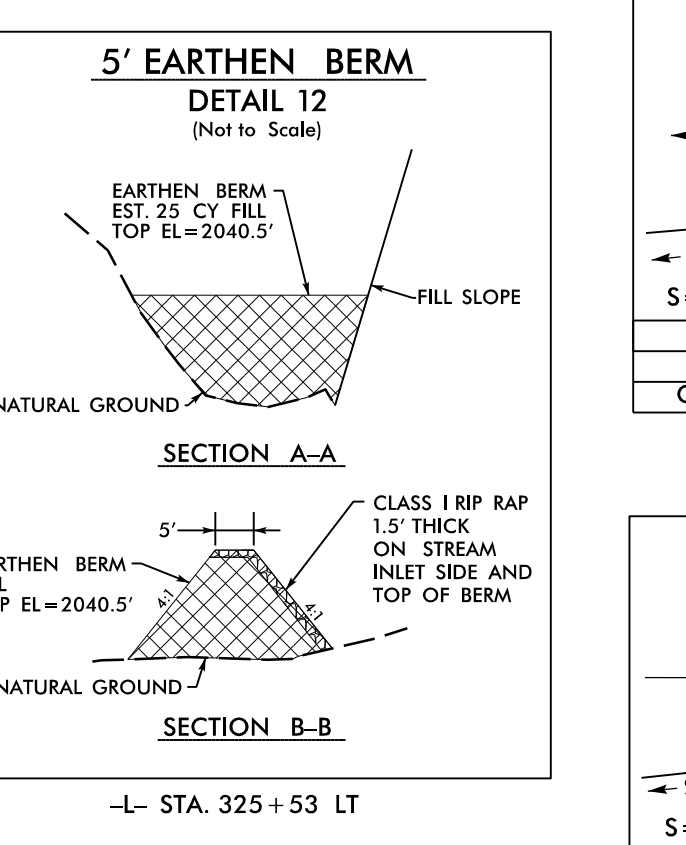
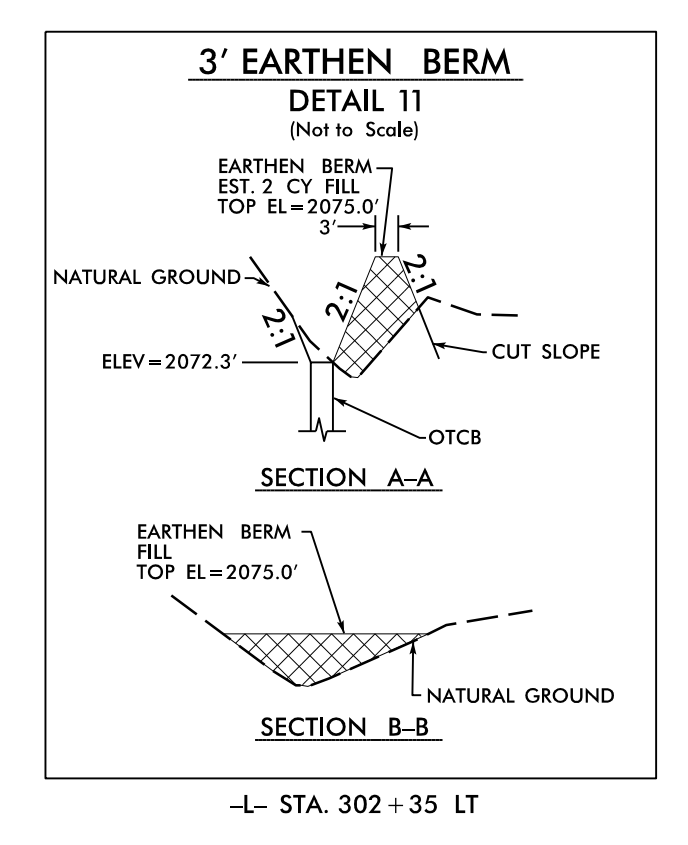
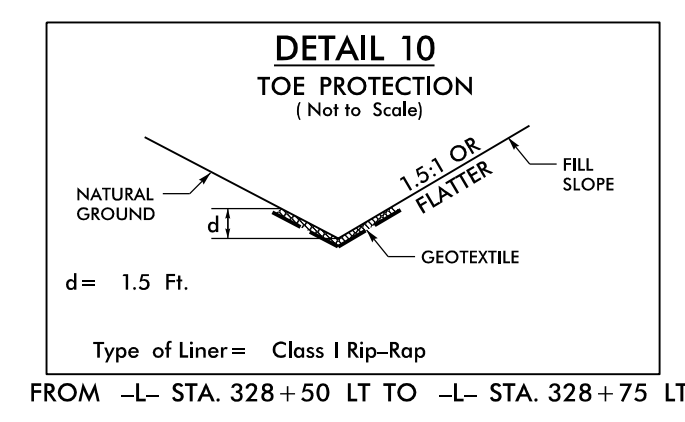
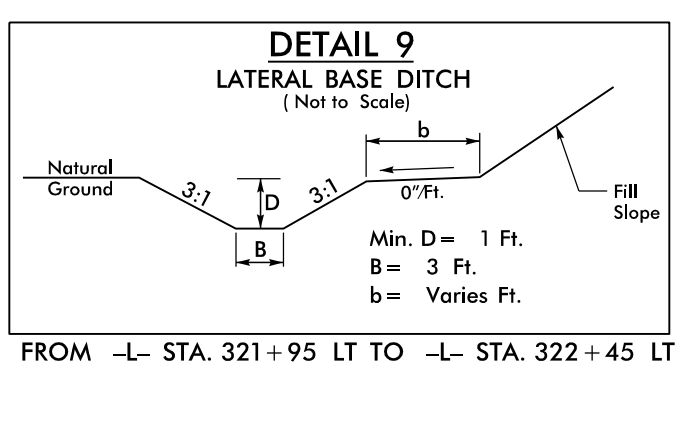
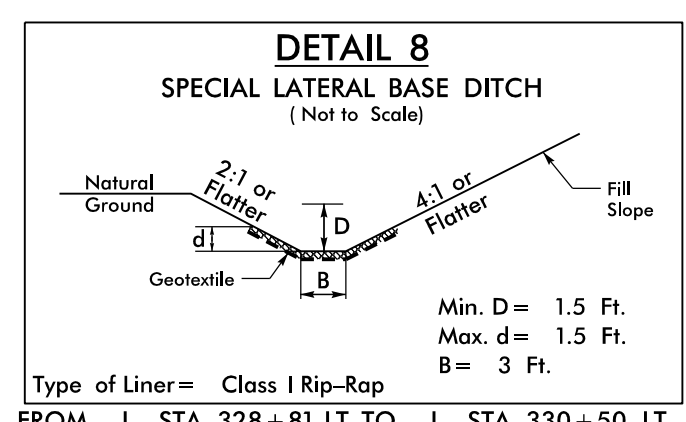
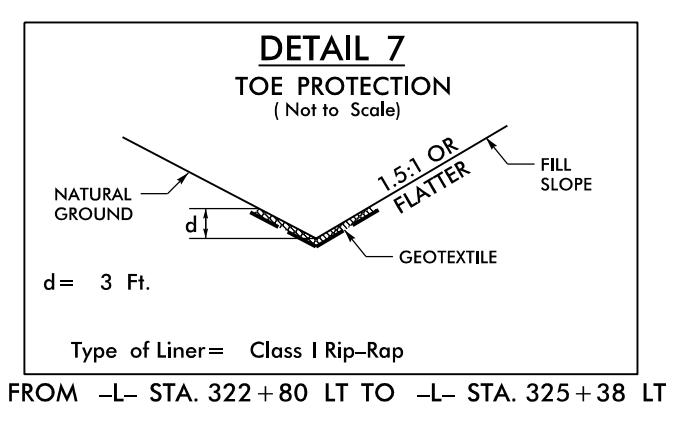
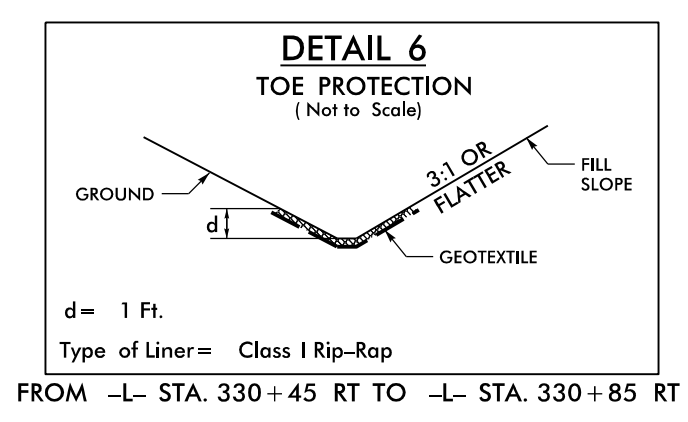
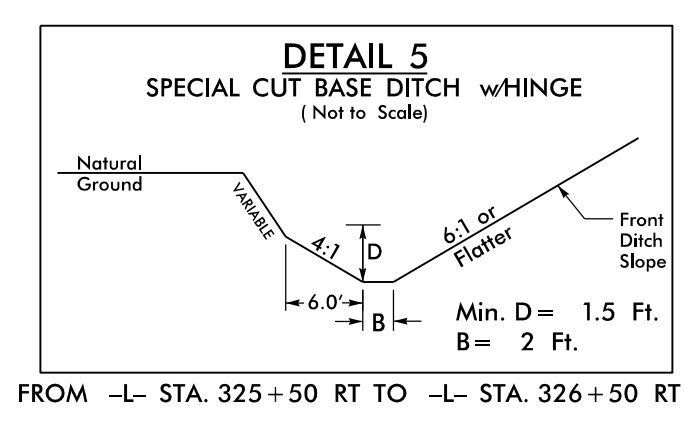
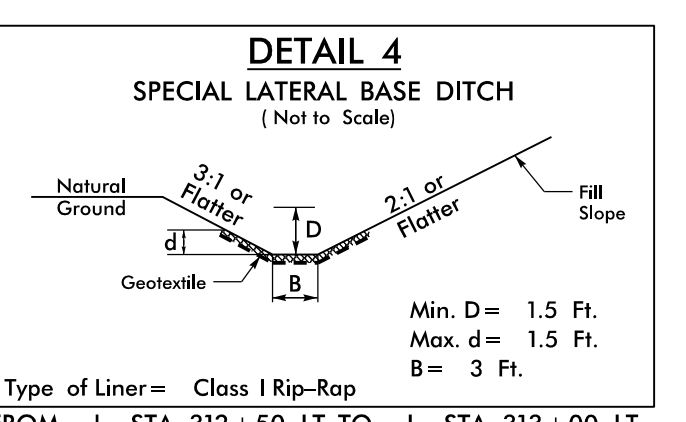
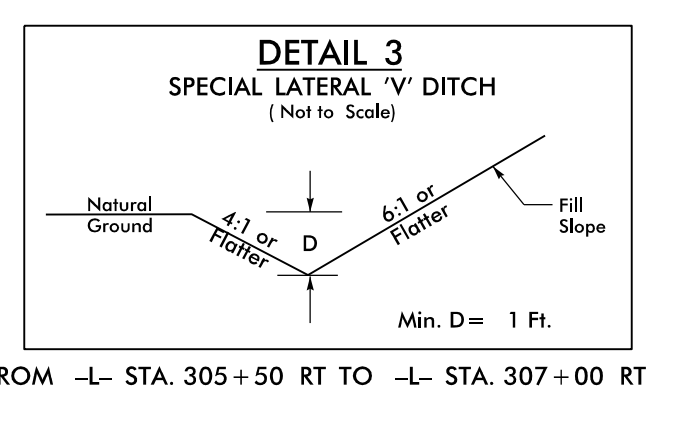
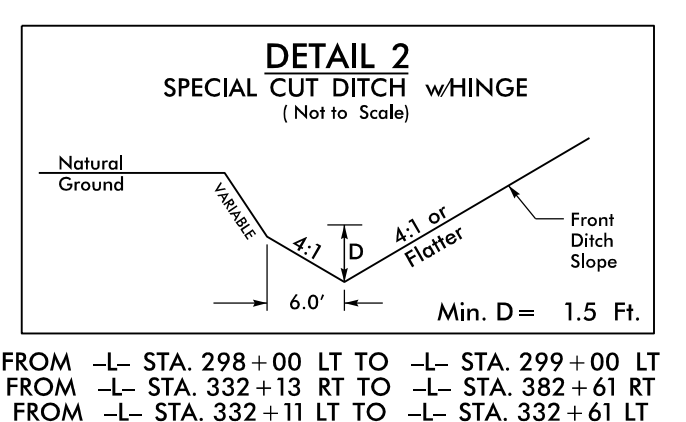
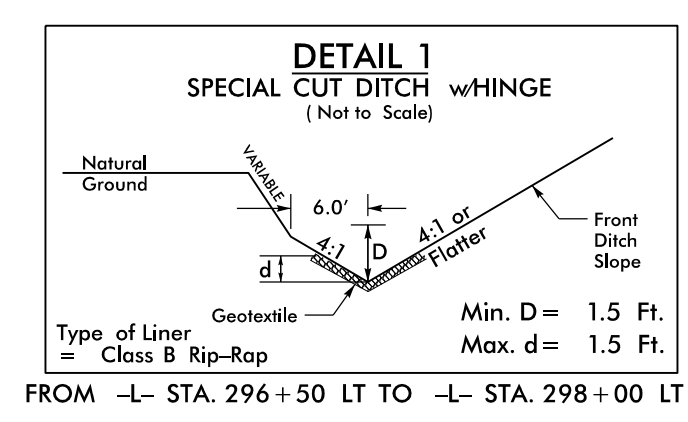
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PROJECT REFERENCE NO. <b>B-4442</b>	SHEET NO. <b>2D-1</b>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

Prepared in the Office of: **AECOM**  
 NC FIRM LICENSE No. F-0342  
 5438 Wade Street, Boulevard 2014 200  
 Raleigh, NC 27607  
 (919) 854-6200 / (919) 854-6259 (FAX)

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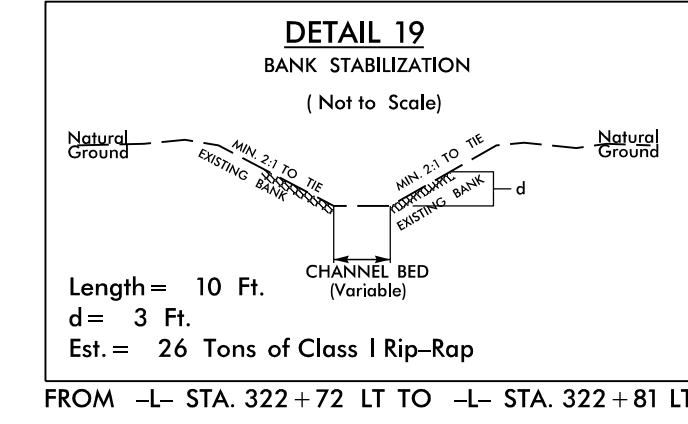
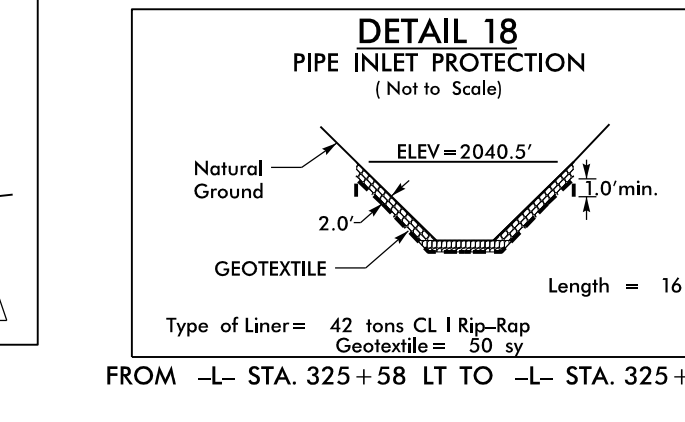
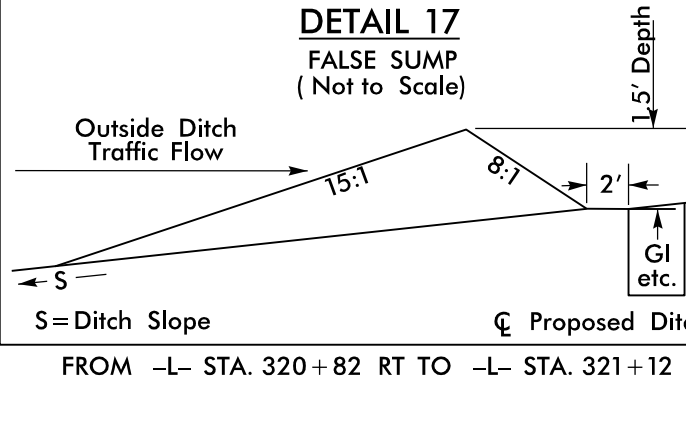
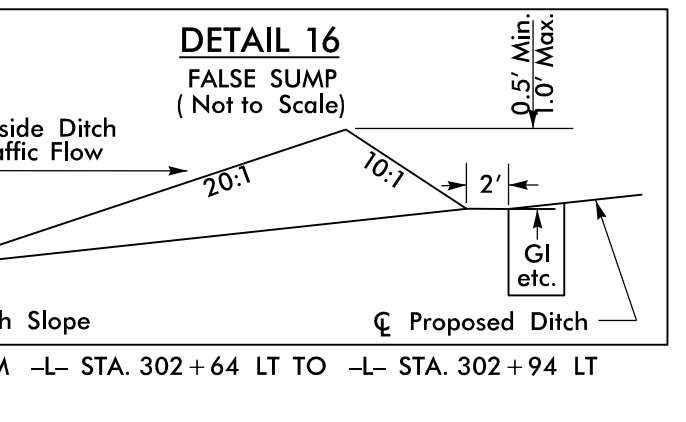
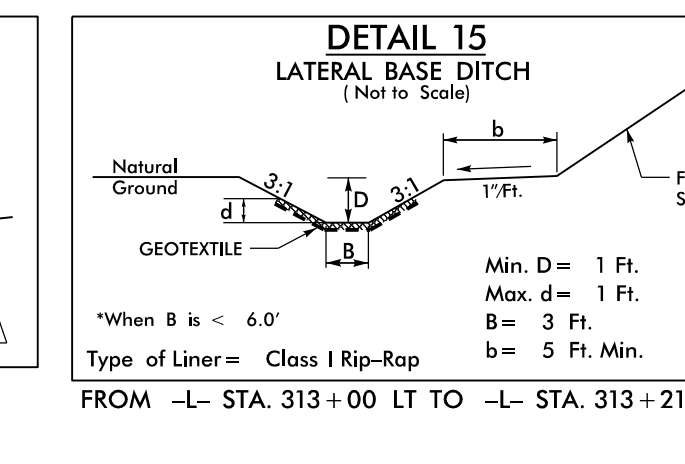
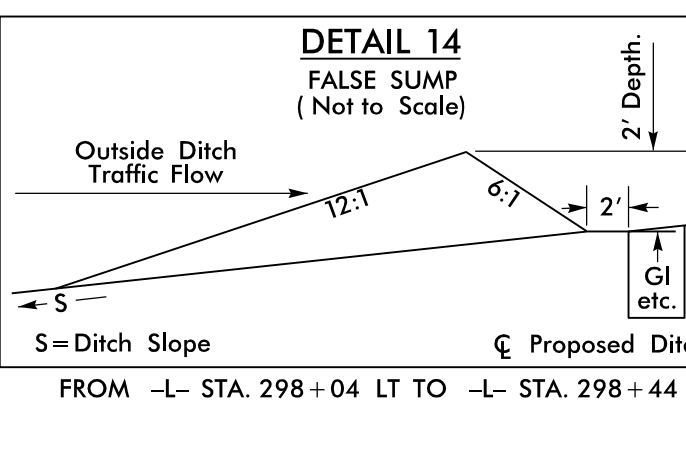
# DRAINAGE DETAILS



**DETAIL 13**  
FALSE SUMP  
(Not to Scale)


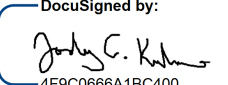
Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

FROM -L- STA. 298+04 M TO -L- STA. 298+54 M  
 FROM -L- STA. 330+40 M TO -L- STA. 330+90 M

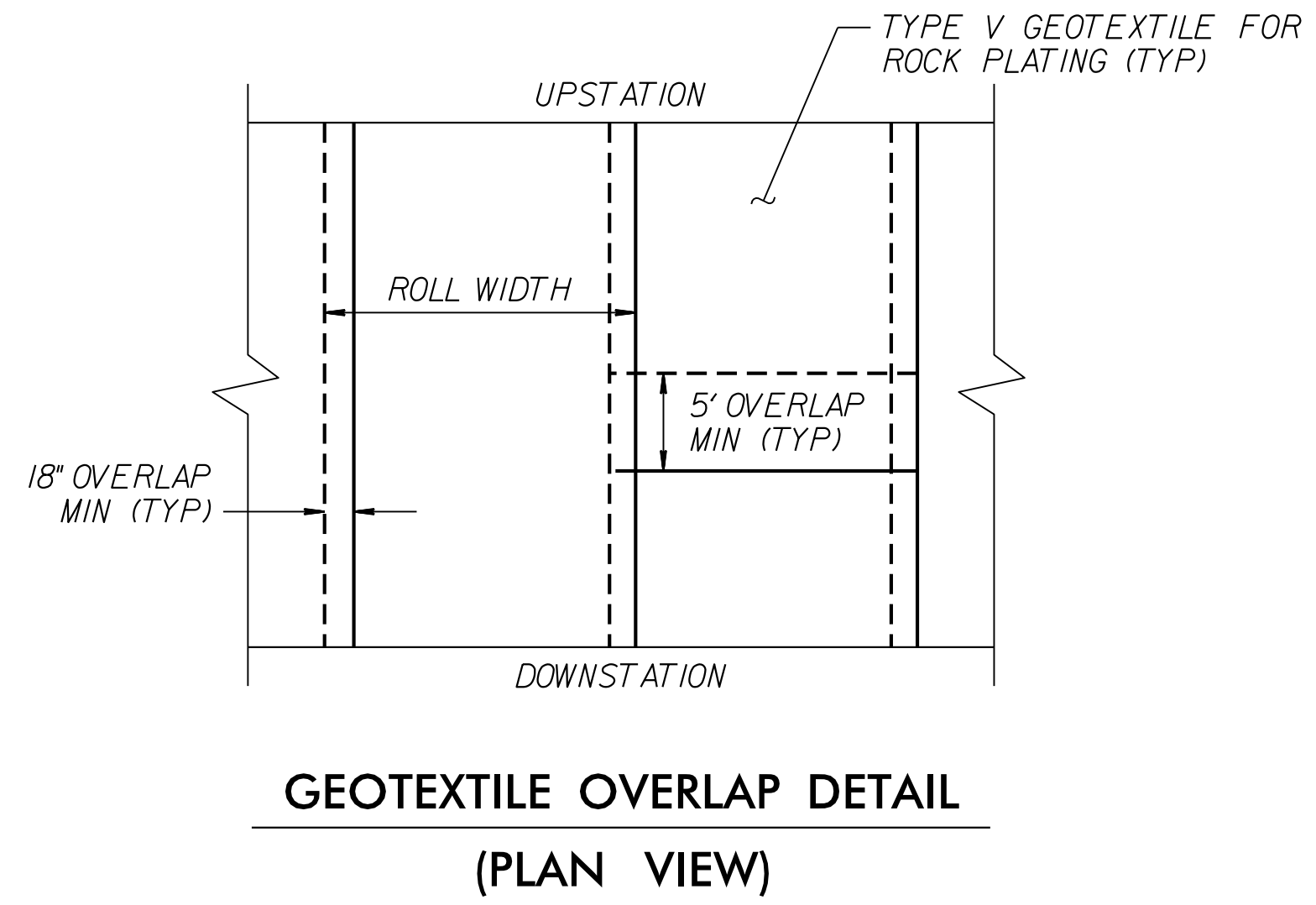
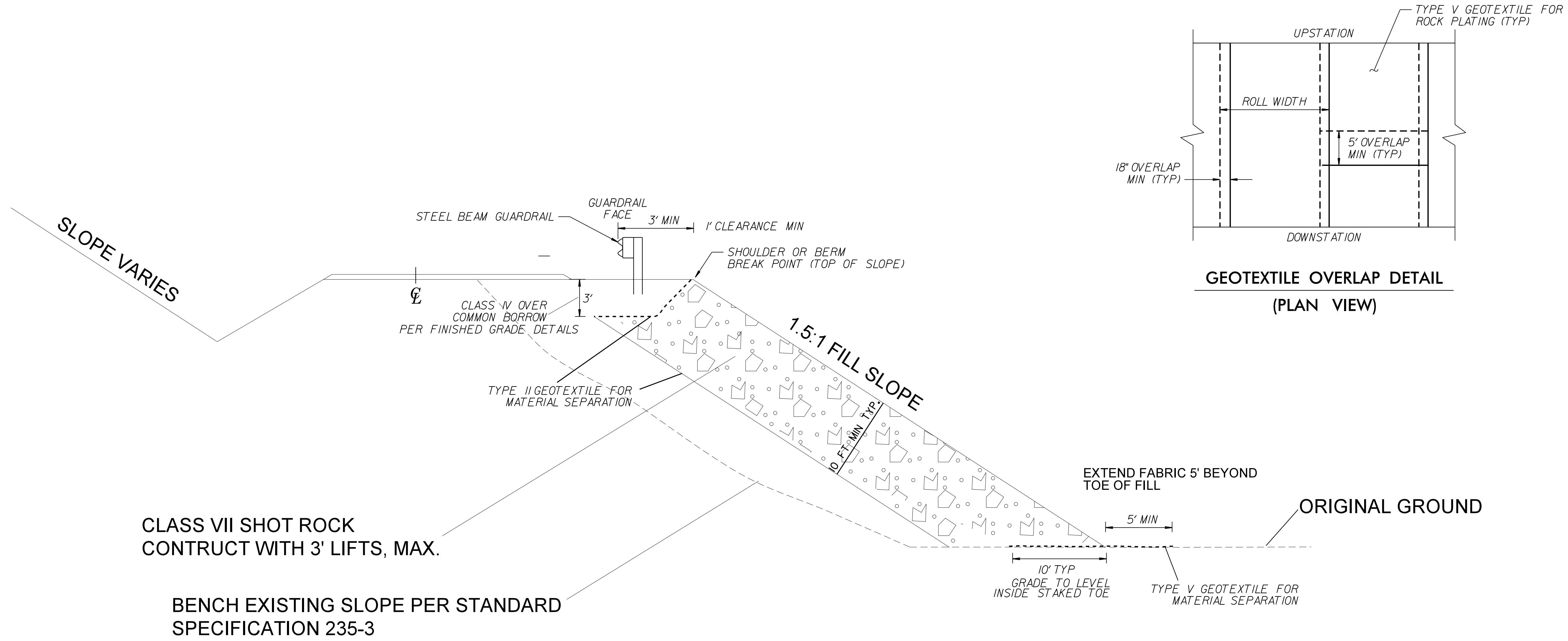


REVISIONS

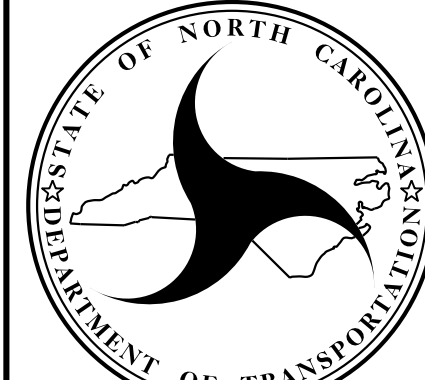
6/28/2022  
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 Mohammed Fallouh

<b>PROJECT REFERENCE NO.</b> B-4442 38368		<b>SHEET NO.</b> 2G-1
GEOTECHNICAL ENGINEER  DocuSigned by:  02/15/2022 SIGNATURE DATE		ENGINEER
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>		

<b>QUANTITY SUMMARY</b>				
	STATION FROM	STATION TO	LINE	TOTAL
CLASS VII ROCK	316+50	328+50	LT -L-	15,400 CY (30,800 TONS)
TYPE V GEOTEXTILE	316+50	328+50	LT -L-	2,000 SY
TYPE II GEOTEXTILE	316+50	328+50	LT -L-	3,800 SY



- NOTES:**
- 1) USE CLASS VII SHOT ROCK TO CONSTRUCT EXPANDED FILLS WHICH ARE 1.5:1 (H:V) AS SHOWN ON PLANS
  - 2) TYPE V GEOTEXTILE AT TOE WITH NO UNDERCUT BENCHING
  - 3) CONSTRUCT WITH 3' LIFTS, MAX

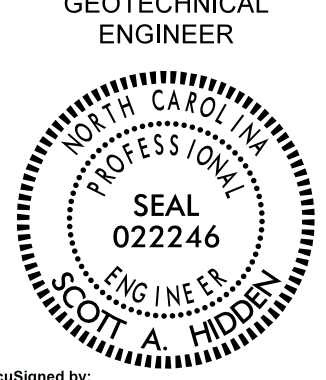


**NORTH CAROLINA**  
**DEPARTMENT OF TRANSPORTATION**  
**DIVISION OF HIGHWAYS**  
  
**GEOTECHNICAL**  
**ENGINEERING UNIT**

DATE: 01-2022

<b>ROCK EMBANKMENT</b>
TYPICAL FOR FILL SLOPES 1.5:1 (H:V) STA 316+50 TO 329+00 LT



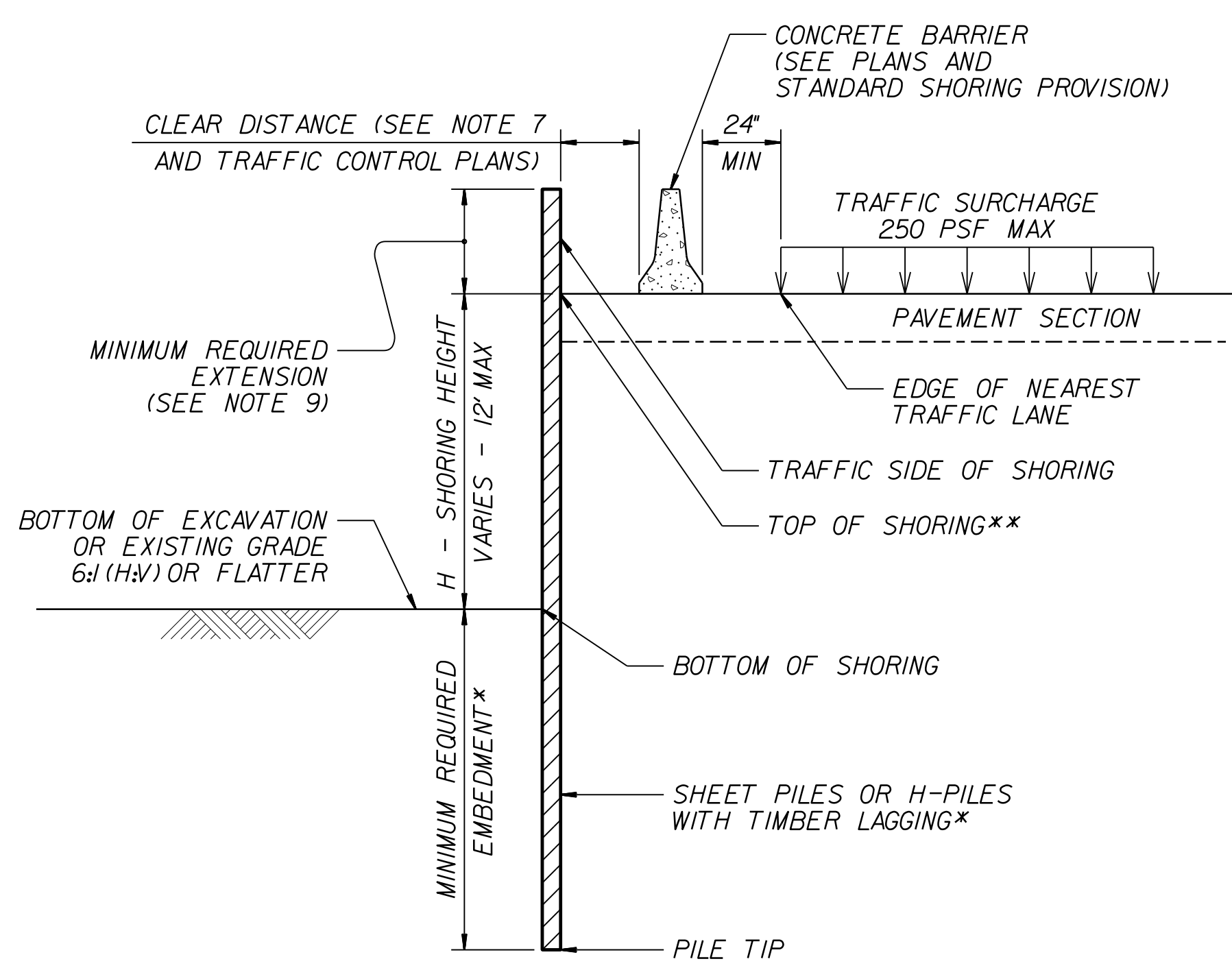
<b>PROJECT REFERENCE NO.</b> B-4442		<b>SHEET NO.</b> 2G-2
GEOTECHNICAL ENGINEER  SEAL 022246 SCOTT A. HADDEN ENGINEER		ENGINEER
DocuSigned by: Scott A. Hadden 06/17/2022 1760CAE896FC03		SIGNATURE DATE SIGNATURE DATE
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>		

GROUNDWATER CONDITION (SEE NOTE 6)	H SHORING HEIGHT (FT)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT						SURCHARGE CASE WITH TRAFFIC IMPACT						
		SHEET PILES		H-PILES WITH TIMBER LAGGING				SHEET PILES		H-PILES WITH TIMBER LAGGING				
		MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (IN <sup>3</sup> /FT)	MINIMUM REQUIRED EMBEDMENT* (FT) (SEE NOTE 10)		MINIMUM REQUIRED EMBEDMENT* (FT) (SEE NOTE 10)		MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (IN <sup>3</sup> /FT)	MINIMUM REQUIRED EMBEDMENT* (FT) (SEE NOTE 10)		MINIMUM REQUIRED EMBEDMENT* (FT) (SEE NOTE 10)		
		HP 10x42	HP 12x53	HP 14x73	HP 10x42	HP 12x53	HP 14x73	HP 10x42	HP 12x53	HP 14x73	HP 10x42	HP 12x53	HP 14x73	
GROUNDWATER ELEVATION BETWEEN BOTTOM OF SHORING AND PILE TIP	< 6	11.5	4.5	11.5	11.5	11.5	16.0	12.0	13.0	13.0	13.0			
	7	13.0	7.0	13.0	13.0	13.0	17.0	14.5	14.5	14.5				
	8	15.0	10.0	--	15.0	15.0	18.0	17.0	--	15.5	15.5			
	9	17.0	14.0	--	17.0	17.0	19.0	20.0	--	17.0	17.0			
	10	18.5	19.5	--	--	18.5	20.0	23.5	--	--	18.5			
	11	20.5	26.0	--	--	--	21.0	28.0	--	--	20.0			
GROUNDWATER ELEVATION BELOW PILE TIP	< 6	7.5	3.0	8.0	8.0	8.0	11.0	10.0	9.5	9.5	9.5			
	7	8.5	4.5	9.5	9.5	9.5	12.0	12.0	10.5	10.5	10.5			
	8	10.0	6.5	10.5	10.5	10.5	12.5	14.0	11.5	11.5	11.5			
	9	11.0	9.5	--	12.0	12.0	13.5	16.5	--	12.5	12.5			
	10	12.5	13.0	--	--	13.5	14.0	19.5	--	13.5	13.5			
	11	13.5	17.0	--	--	14.5	15.0	22.5	--	--	14.5			
12	15.0	21.5	--	--	16.0	16.0	25.5	--	--	15.5				

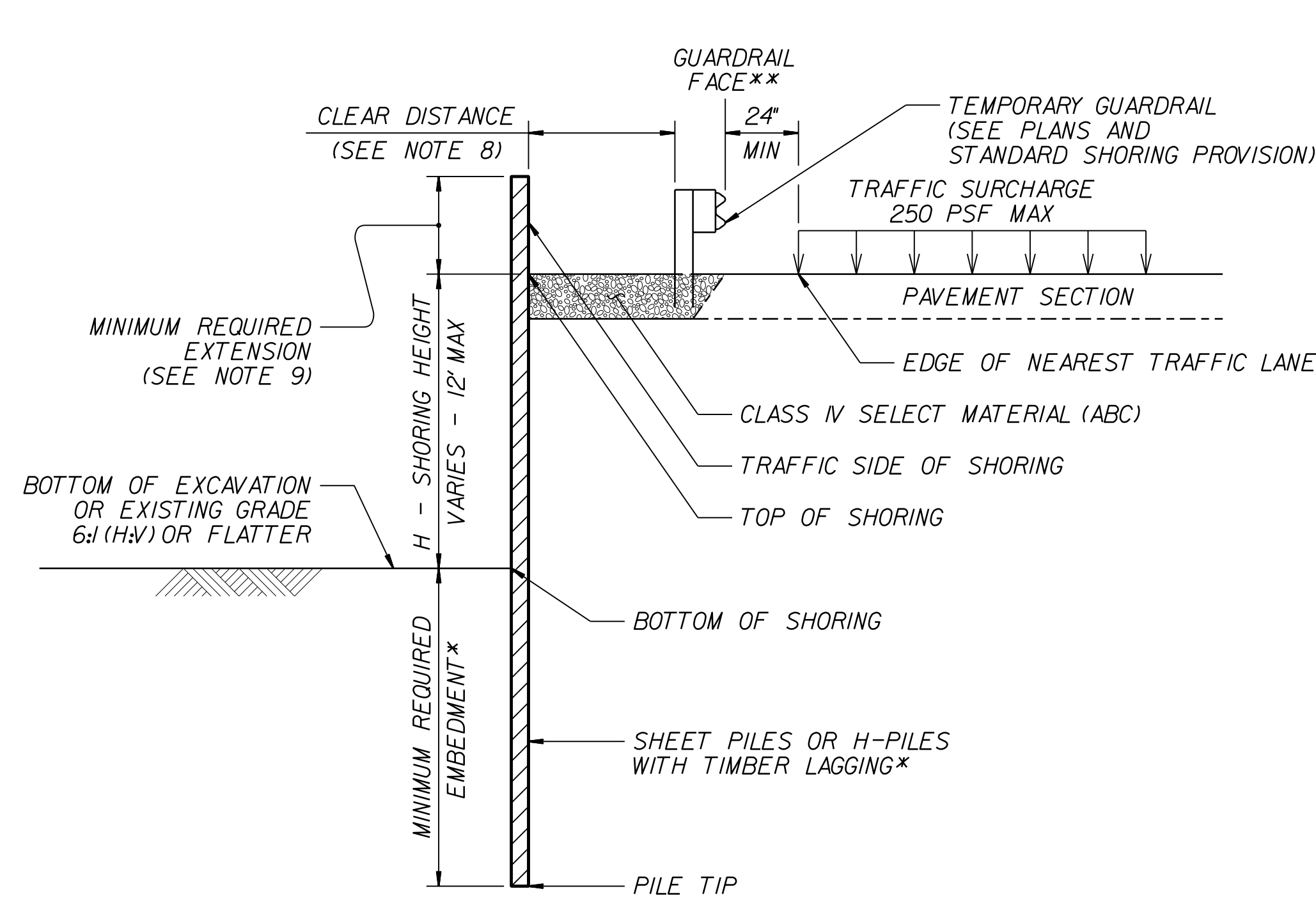
- NOTES:**
- AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY SHORING AS NOTED IN THE PLANS.
  - FOR STANDARD TEMPORARY SHORING, SEE STANDARD SHORING PROVISION.
  - STANDARD TEMPORARY SHORING IS BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:  
UNIT WEIGHT,  $\gamma = 120$  PCF  
FRICTION ANGLE,  $\phi = 30$  DEGREES  
COHESION,  $c = 0$  PSF
  - DO NOT USE STANDARD TEMPORARY SHORING IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
  - DO NOT USE STANDARD TEMPORARY SHORING WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS WITHIN THE EMBEDMENT DEPTH.
  - USE GROUNDWATER ELEVATION NOTED IN THE PLANS. IF NO GROUNDWATER ELEVATION IS SHOWN IN THE PLANS, USE "GROUNDWATER ELEVATION BETWEEN BOTTOM OF SHORING AND PILE TIP" FOR GROUNDWATER CONDITION. DO NOT USE STANDARD TEMPORARY SHORING IF GROUNDWATER IS ABOVE BOTTOM OF SHORING.
  - AT THE CONTRACTOR'S OPTION OR IF AVAILABLE CLEAR DISTANCE IS LESS THAN THE MINIMUM REQUIRED FOR CONCRETE BARRIER, SET BARRIER NEXT TO AND UP AGAINST TRAFFIC SIDE OF PILES AND USE "SURCHARGE CASE WITH TRAFFIC IMPACT".
  - AT THE CONTRACTOR'S OPTION OR IF AVAILABLE CLEAR DISTANCE IS LESS THAN 4' FOR TEMPORARY GUARDRAIL, ATTACH GUARDRAIL TO TRAFFIC SIDE OF PILES AS SHOWN IN THE PLANS AND USE "SURCHARGE CASE WITH TRAFFIC IMPACT".
  - MINIMUM REQUIRED EXTENSION IS 6' FOR "SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT" AND 32' FOR "SURCHARGE CASE WITH TRAFFIC IMPACT".
  - MINIMUM REQUIRED EMBEDMENT FOR H-PILES WITH TIMBER LAGGING IS BASED ON DRIVEN H-PILES AT MAXIMUM 6' SPACING. AT THE CONTRACTOR'S OPTION, EMBEDMENT DEPTHS MAY BE REDUCED BY 25% FOR DRILLED-IN H-PILES.
  - SUBMIT A "STANDARD TEMPORARY SHORING SELECTION FORM" AT LEAST 7 DAYS BEFORE STARTING TEMPORARY SHORING CONSTRUCTION. UP TO 3 SHORING LOCATIONS MAY BE INCLUDED ON EACH FORM. STANDARD SHORING SELECTION FORMS ARE AVAILABLE FROM:  
[connect.ncdot.gov/resources/Geological/Pages/Geotech\\_Forms\\_Details.aspx](http://connect.ncdot.gov/resources/Geological/Pages/Geotech_Forms_Details.aspx)
  - CONTACT THE ENGINEER IF PILES DO NOT ATTAIN THE MINIMUM REQUIRED EMBEDMENT.

**MINIMUM REQUIRED EMBEDMENT AND SECTION MODULUS**

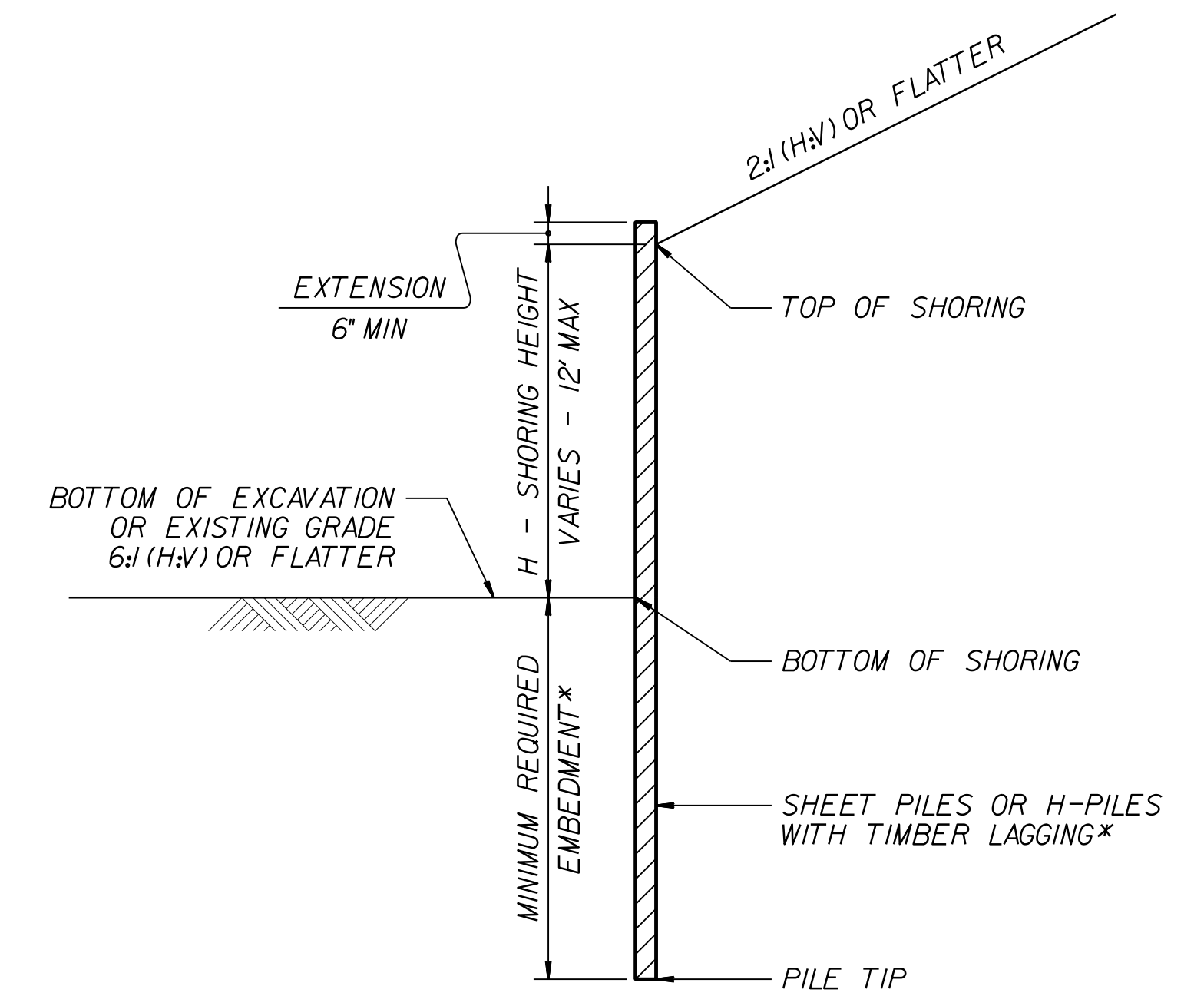
**\*DO NOT USE H-PILES WITH TIMBER LAGGING FOR GROUNDWATER CONDITION, SHORING HEIGHT AND H-PILE SIZE SHOWN IF MINIMUM REQUIRED EMBEDMENT IS "--".**



**CONCRETE BARRIER**  
\*\*TOP OF SHORING = EDGE OF PAVEMENT

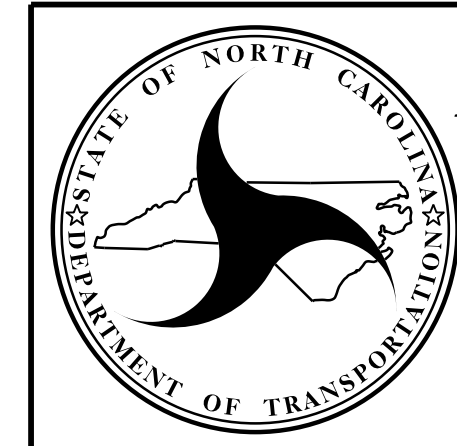


**TEMPORARY GUARDRAIL**  
\*\*GUARDRAIL FACE = EDGE OF PAVEMENT



**STANDARD TEMPORARY SHORING (SLOPE CASE)**  
\*SEE TABLE ABOVE.

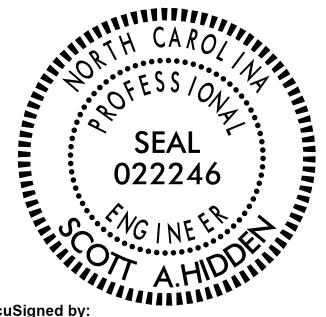
**STANDARD TEMPORARY SHORING (SURCHARGE CASE)**  
\*SEE TABLE ABOVE.

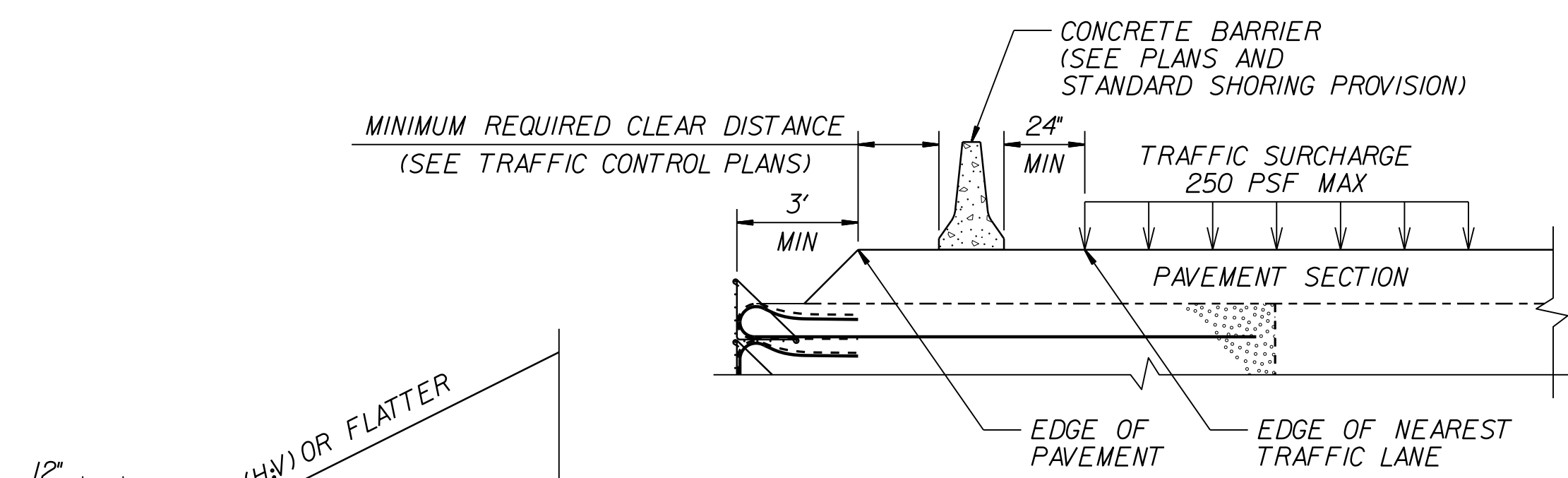


**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**  
  
**GEOTECHNICAL ENGINEERING UNIT**

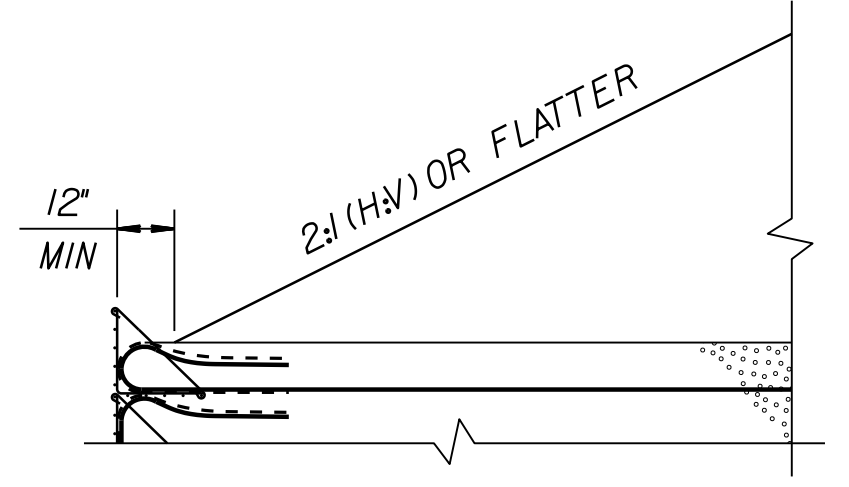
STANDARD DETAIL NO. 1801.01

STANDARD TEMPORARY SHORING

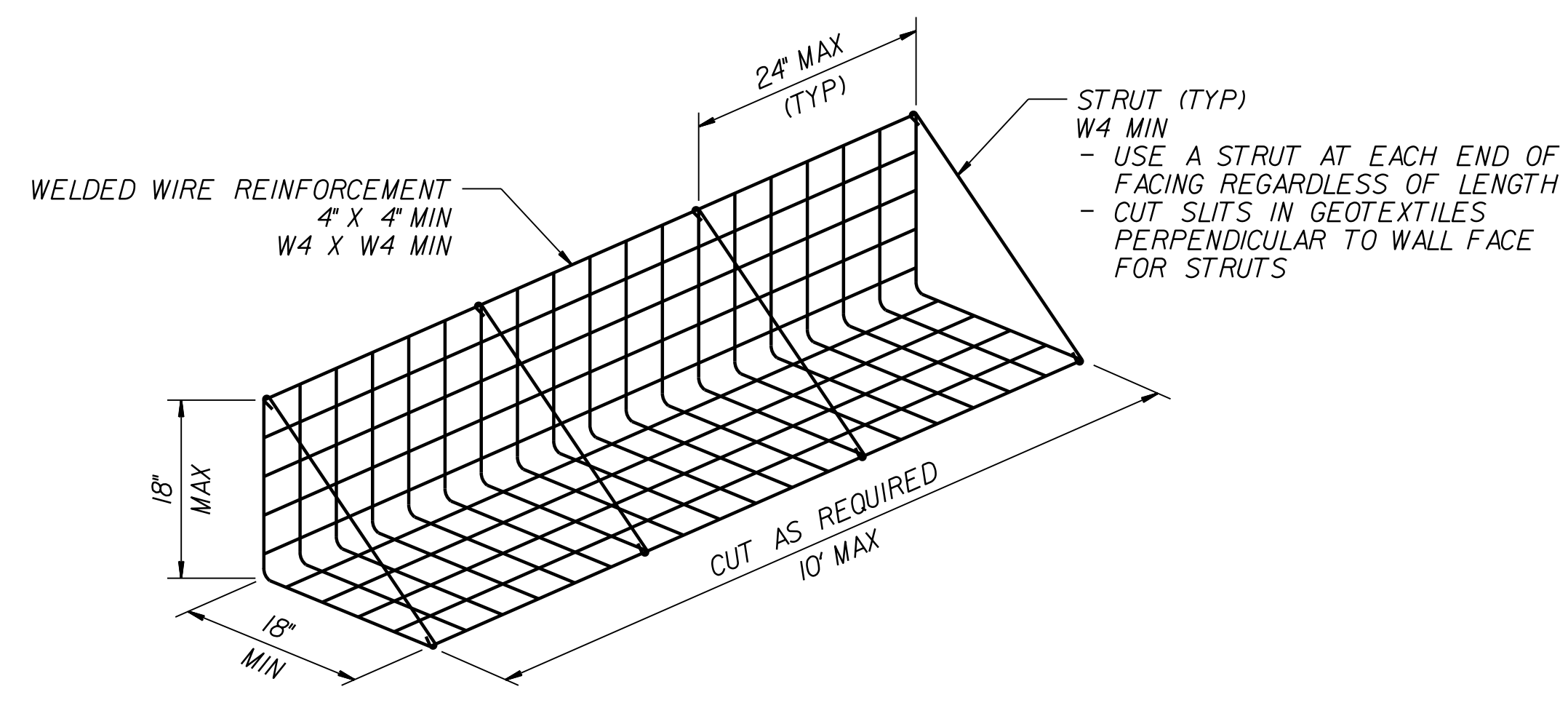
<b>PROJECT REFERENCE NO.</b> B-4442		<b>SHEET NO.</b> 2G-3	
GEOTECHNICAL ENGINEER  DocuSigned by: Scott A. Hidden 06/17/2022 F790CAE899FC4D3		ENGINEER SIGNATURE _____ DATE _____	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>			



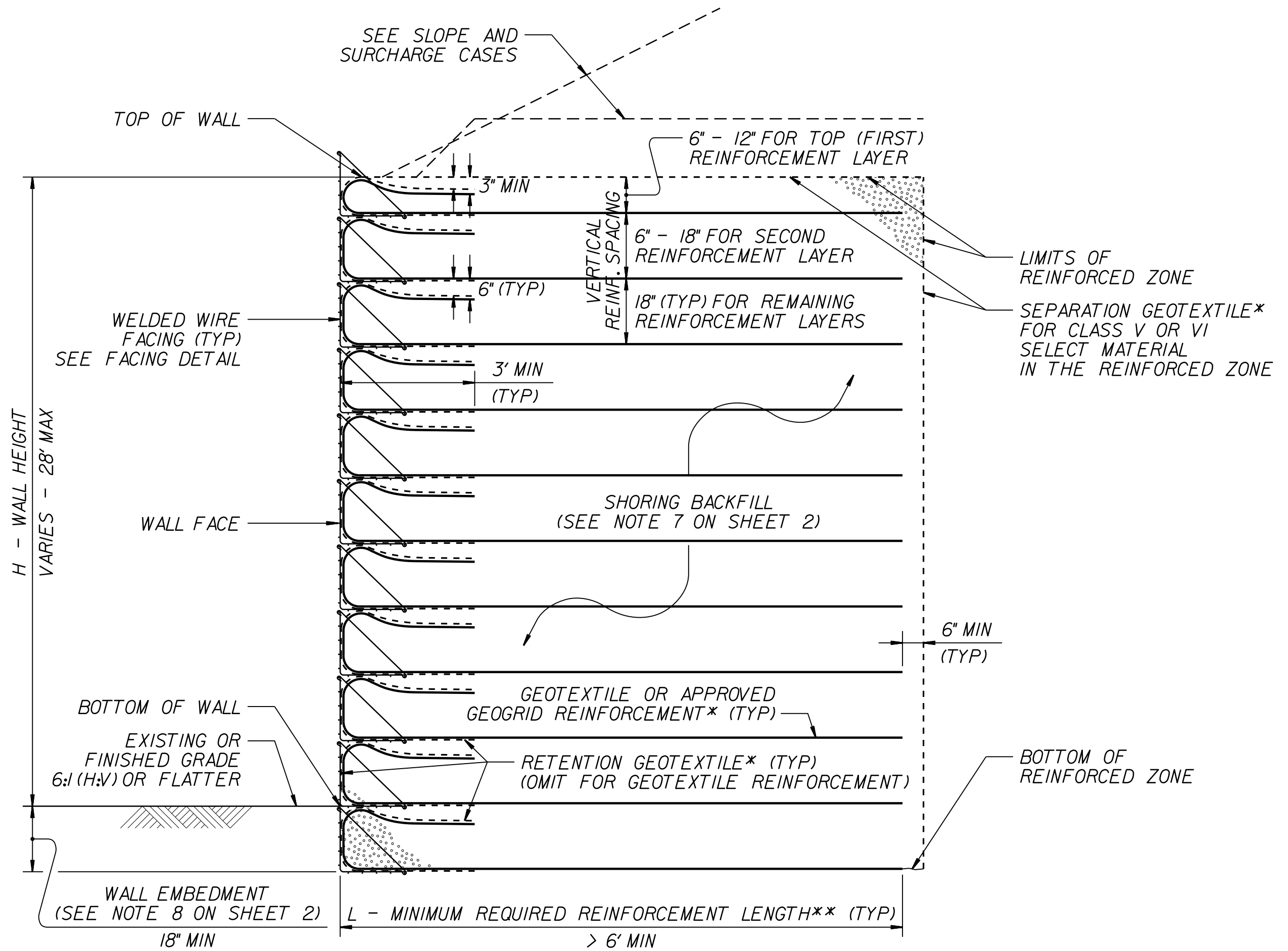
**SURCHARGE CASE**



**SLOPE CASE**

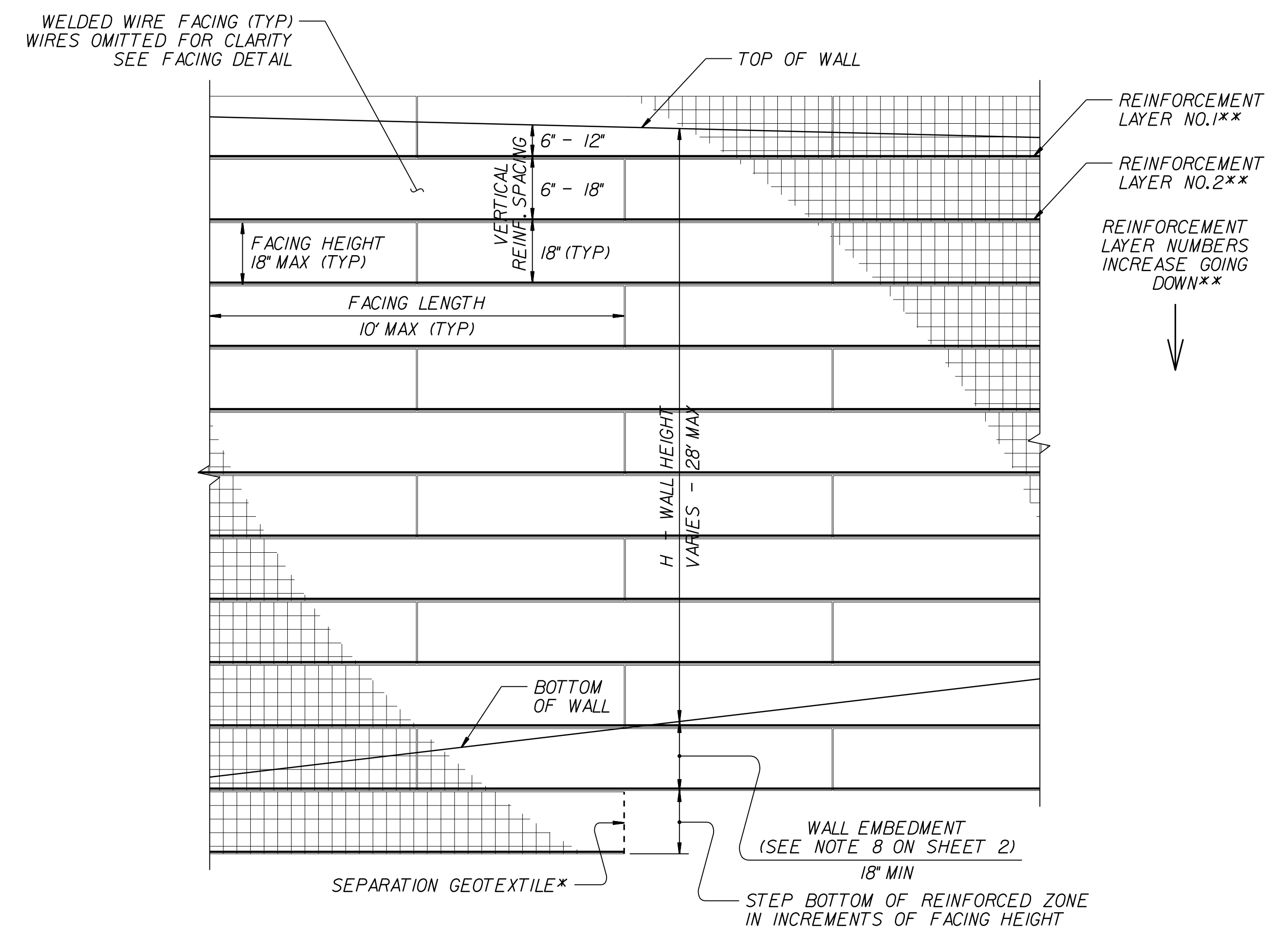


**FACING DETAIL**



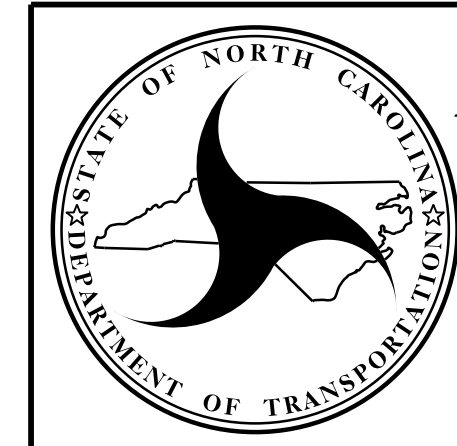
**STANDARD TEMPORARY WALL**

(FOR STANDARD TEMPORARY WALLS ON STRUCTURES, SEE TEMPORARY WALL ON STRUCTURE DETAIL ON SHEET 2.)  
 \*SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.  
 \*\*SEE REINFORCEMENT TABLES ON SHEET 3.



**STANDARD TEMPORARY WALL - PARTIAL ELEVATION**


\*SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.  
 \*\*SEE REINFORCEMENT TABLES ON SHEET 3.

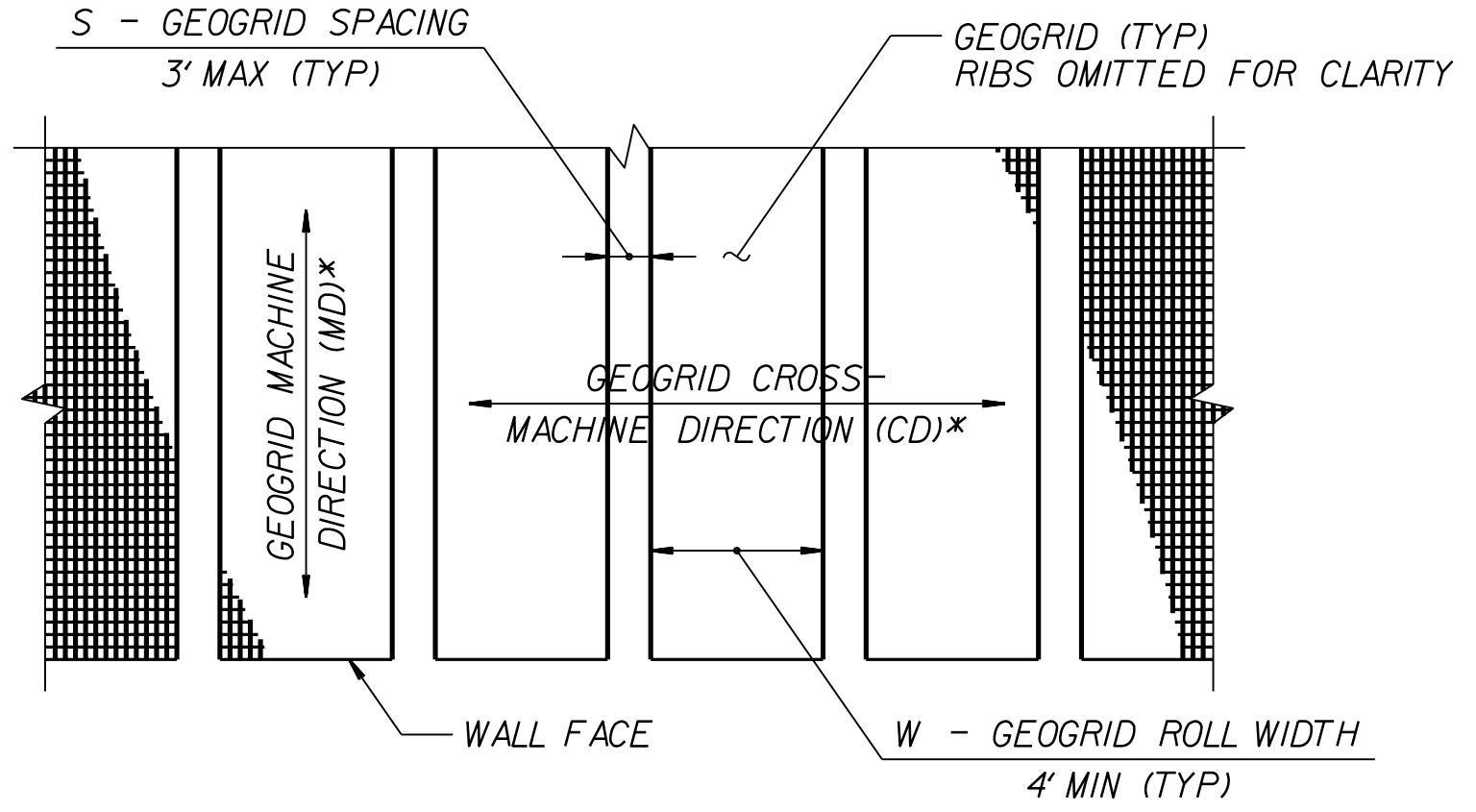
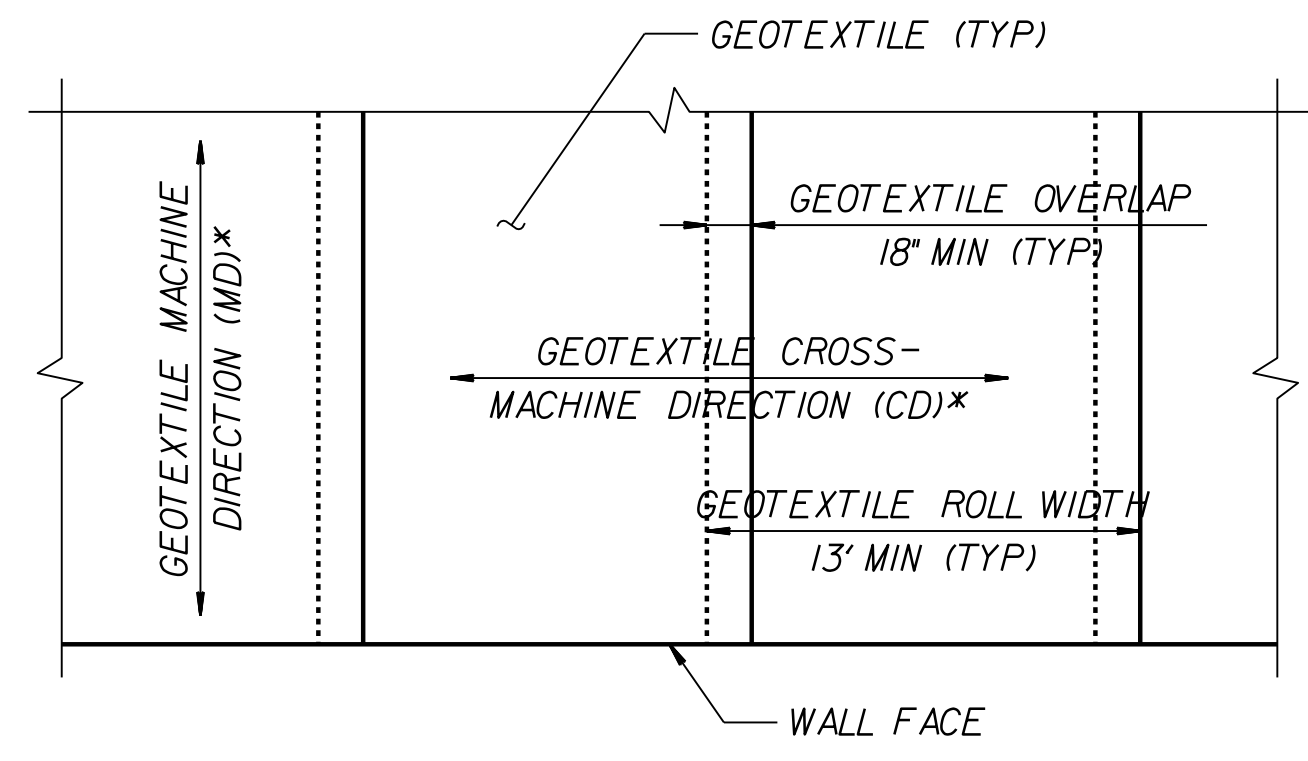


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**GEOTECHNICAL  
 ENGINEERING UNIT**

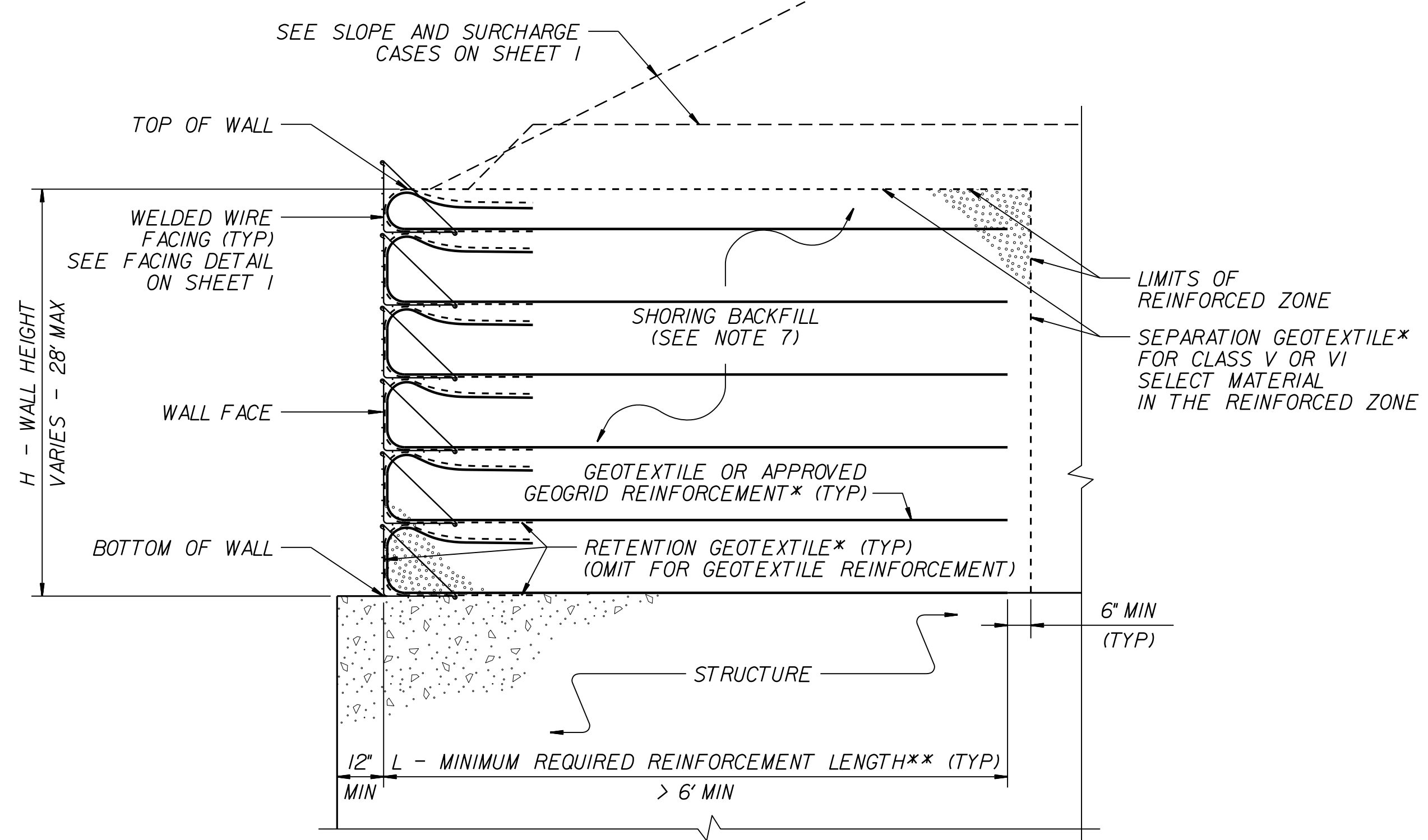
STANDARD DETAIL NO. 1801.02

STANDARD  
 TEMPORARY WALL  
 SHEET 1 OF 3

<b>PROJECT REFERENCE NO.</b> B-4442	<b>SHEET NO.</b> 2G-4
GEOTECHNICAL ENGINEER  DocuSigned by: Scott A. Hadden 06/17/2022	ENGINEER _____ SIGNATURE _____ DATE
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	



**GEOSYNTHETIC PLACEMENT DETAILS**  
(PLAN VIEW)  
\*SEE NOTE 12.

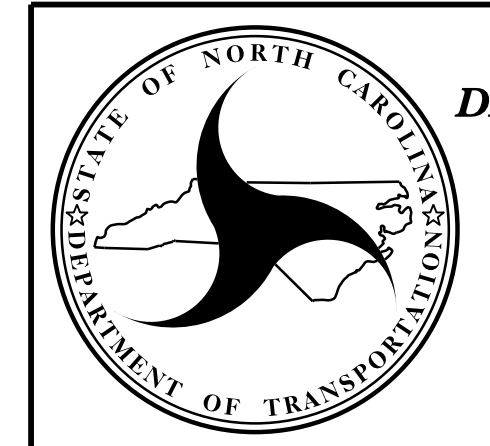


**NOTES:**

1. AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY WALLS AS NOTED IN THE PLANS.
2. FOR STANDARD TEMPORARY WALLS, SEE STANDARD SHORING PROVISION.
3. STANDARD TEMPORARY WALLS ARE BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:  
 UNIT WEIGHT,  $\gamma = 120$  PCF  
 FRICTION ANGLE,  $\phi = 30$  DEGREES  
 COHESION,  $c = 0$  PSF
4. DO NOT USE STANDARD TEMPORARY WALLS IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
5. DO NOT USE STANDARD TEMPORARY WALLS WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS BELOW TEMPORARY WALLS.
6. USE GROUNDWATER ELEVATION NOTED IN THE PLANS. IF NO GROUNDWATER ELEVATION IS SHOWN IN THE PLANS, ASSUME GROUNDWATER DEPTH IS LESS THAN 7' BELOW BOTTOM OF REINFORCED ZONE. DO NOT USE STANDARD TEMPORARY WALLS IF GROUNDWATER OR FLOOD ELEVATION IS ABOVE BOTTOM OF REINFORCED ZONE.
7. DO NOT USE A-2-4 SOIL FOR STANDARD TEMPORARY WALLS AROUND CULVERTS OR IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS FOR SLOPE CASES. DO NOT USE CLASS VI SELECT MATERIAL IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS WITH GEOTEXTILE REINFORCEMENT.
8. WALL EMBEDMENT IS NOT REQUIRED FOR STANDARD TEMPORARY WALLS ON STRUCTURES OR ROCK AS DETERMINED BY THE ENGINEER.
9. DO NOT USE MORE THAN 4 DIFFERENT REINFORCEMENT STRENGTHS FOR EACH STANDARD TEMPORARY WALL.
10. GEOGRIDS FOR GEOGRID REINFORCEMENT ARE APPROVED FOR SHORT TERM DESIGN STRENGTHS (3-YEAR DESIGN LIFE) IN THE MD AND CD BASED ON MATERIAL TYPE. THE LIST OF APPROVED GEOGRIDS WITH DESIGN STRENGTHS IS AVAILABLE FROM: [connect.ncdot.gov/resources/Geological/Pages/Products.aspx](http://connect.ncdot.gov/resources/Geological/Pages/Products.aspx)  
 DEFINE MATERIAL TYPE FROM THE WEBSITE ABOVE FOR SHORING BACKFILL AS FOLLOWS:

MATERIAL TYPE	SHORING BACKFILL
BORROW	A-2-4 SOIL
FINE AGGREGATE	CLASS II, TYPE I OR CLASS III SELECT MATERIAL
COARSE AGGREGATE	CLASS V OR VI SELECT MATERIAL

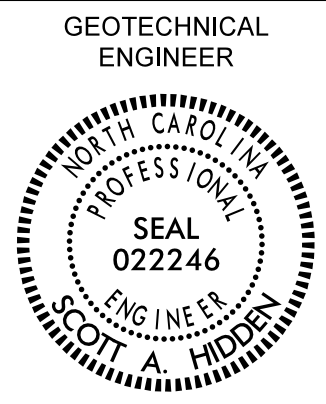
11. FOR GEOGRID REINFORCEMENT WITH LESS THAN 100% COVERAGE, STAGGER REINFORCEMENT SO GEOGRIDS ARE CENTERED OVER GAPS IN THE REINFORCEMENT LAYER BELOW.
12. AT THE CONTRACTOR'S OPTION, REINFORCEMENT MAY BE INSTALLED WITH THE MD PARALLEL TO THE WALL FACE IF BOTH OF THE FOLLOWING CONDITIONS OCCUR:  
 - W (REINFORCEMENT ROLL WIDTH)  $\geq$  (MINIMUM REQUIRED REINFORCEMENT LENGTH) + 4.5' AND  
 - REINFORCEMENT STRENGTH IN CD  $\geq$  MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD.
13. SUBMIT A "STANDARD TEMPORARY WALL SELECTION FORM" AT LEAST 7 DAYS BEFORE STARTING TEMPORARY WALL CONSTRUCTION. STANDARD SHORING SELECTION FORMS ARE AVAILABLE FROM: [connect.ncdot.gov/resources/Geological/Pages/Geotech\\_Forms\\_Details.aspx](http://connect.ncdot.gov/resources/Geological/Pages/Geotech_Forms_Details.aspx)
14. DO NOT PLACE SHORING BACKFILL OR REINFORCEMENT UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.
15. FOR STANDARD TEMPORARY WALLS WITH PILE FOUNDATIONS IN THE REINFORCED ZONE, DRIVE PILES THROUGH REINFORCEMENT AFTER CONSTRUCTING TEMPORARY WALLS.
16. DO NOT SPLICE OR OVERLAP REINFORCEMENT SO SEAMS ARE PARALLEL TO THE WALL FACE.
17. CONTACT THE ENGINEER WHEN EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH REINFORCEMENT.
18. FOR STANDARD TEMPORARY WALLS WITH INTERIOR ANGLES LESS THAN 90 DEGREES, WRAP GEOSYNTHETICS AT ACUTE CORNERS AS DIRECTED BY THE ENGINEER.
19. FOR STANDARD TEMPORARY WALLS WITH TOP OF WALL WITHIN 5' OF FINISHED GRADE, REMOVE TOP FACING AND INCORPORATE TOP REINFORCEMENT LAYER INTO FILL WHEN PLACING FILL IN FRONT OF WALL.



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**STANDARD DETAIL NO. 1801.02**

**STANDARD**  
**TEMPORARY WALL**  
**SHEET 2 OF 3**

<b>PROJECT REFERENCE NO.</b> B-4442	<b>SHEET NO.</b> 2G-5
 GEOTECHNICAL ENGINEER SEAL 022246 SCOTT A. HOLDEN	ENGINEER
DocuSigned by: <i>Scott A. Holden</i> 06/17/2022	DATE
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

SLOPE OR SURCHARGE CASE	GROUNDWATER DEPTH BELOW BOTTOM OF REINFORCED ZONE (SEE NOTE 6 ON SHEET 2) (FT)	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)	H - WALL HEIGHT (FT)																									
			< 4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
SLOPE CASE	> 0	CLASS II, TYPE I, CLASS III, CLASS V OR CLASS VI SELECT MATERIAL	6	6	7	8	9	11	12	13	13	14	15	16	17	18	19	20	21	22	23	24	24	25	26	27	27	
SURCHARGE CASE	> 0 TO 7 FOR H < 20' > 0 TO 10 FOR H ≥ 20'	ALL SHORING BACKFILL TYPES	6	7	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	17	17	18	19	19	20	21	22	
		A-2-4 SOIL	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	16	17	18	18	19	20	20	21	
		CLASS II, TYPE I OR CLASS III SELECT MATERIAL	6	6	7	7	8	8	9	10	10	11	11	12	12	13	14	15	15	16	16	17	17	18	18	19	20	
	> 7 FOR H < 20' > 10 FOR H ≥ 20'	CLASS V OR CLASS VI SELECT MATERIAL	6	6	7	7	8	8	9	9	10	10	11	12	13	13	14	14	15	15	16	17	17	18	19	19		

**L - MINIMUM REQUIRED REINFORCEMENT LENGTH (FT)**  
(FOR ALL REINFORCEMENT TYPES)

WALL HEIGHT (H) + WALL EMBEDMENT (FT)	NUMBER OF REINFORCEMENT LAYERS*
2.5 - 4	3
4 - 5.5	4
5.5 - 7	5
7 - 8.5	6
8.5 - 10	7
10 - 11.5	8
11.5 - 13	9
13 - 14.5	10
14.5 - 16	11
16 - 17.5	12
17.5 - 19	13
19 - 20.5	14
20.5 - 22	15
22 - 23.5	16
23.5 - 25	17
25 - 26.5	18
26.5 - 28	19
28 - 29.5	20

\*BASED ON VERTICAL REINFORCEMENT SPACING SHOWN ON SHEET 1.

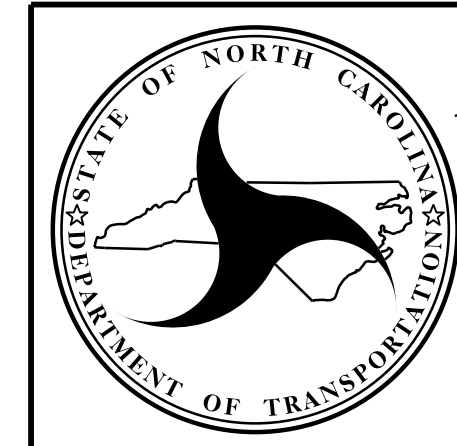
REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II, TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL	A-2-4 SOIL	CLASS II, TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL
1	2400	2400	2400	2400	2400
2	2400	2400	2400	2400	2400
3	2400	2400	2400	2400	2400
4	2400	2400	2500	2400	2400
5	2500	2400	3000	2400	2400
6	3000	2400	3500	2800	2400
7	3500	2700	4000	3200	2600
8	4000	3100	4500	3600	2900
9	4500	3500	5000	4000	3200
10	5000	3900	5500	4400	3500
11	5500	4300	6000	4800	3800
12	6000	4700	6500	5200	4100
13	6500	5100	7000	5600	4400
14	7000	5400	7500	6000	4700
15	7500	5800	8000	6400	5000
16	8000	6200	8500	6800	5300
17	8500	6600	9000	7200	5600
18	9000	7000	9500	7600	5900
19	9500	7400	10000	8000	6200
20	10000	7800	10500	8400	6500

**GEOTEXTILE REINFORCEMENT**  
ULTIMATE TENSILE STRENGTH (LB/FT)

REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II, TYPE I OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL	A-2-4 SOIL	CLASS II, TYPE I OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL
1	240	200	340	290	240
2	380	310	520	430	350
3	530	420	700	570	460
4	690	550	870	720	570
5	860	690	1050	860	680
6	1030	830	1220	1000	790
7	1200	970	1400	1150	900
8	1370	1110	1580	1290	1010
9	1550	1240	1750	1430	1120
10	1720	1380	1930	1580	1230
11	1890	1520	2100	1720	1340
12	2060	1660	2280	1860	1450
13	2240	1800	2450	2010	1560
14	2410	1940	2630	2150	1670
15	2580	2080	2800	2290	1780
16	2750	2220	2980	2440	1890
17	2930	2360	3160	2580	2000
18	3100	2500	3330	2720	2110
19	3270	2640	3510	2860	2220
20	3440	2780	3690	3000	2330

**GEOGRID REINFORCEMENT**  
SHORT-TERM DESIGN STRENGTH (LB/FT)  
(SEE NOTE 10 ON SHEET 2.)

**MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD**  
(SEE NOTE 9 ON SHEET 2.)  
\*SEE PARTIAL ELEVATION ON SHEET 1 FOR REINFORCEMENT LAYER NUMBERING.



NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
  
**GEOTECHNICAL  
ENGINEERING UNIT**

STANDARD DETAIL NO. 1801.02
STANDARD TEMPORARY WALL SHEET 3 OF 3
DATE: 11-19-13

### SUMMARY OF EARTHWORK IN CUBIC YARDS

STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT	BORROW	WASTE
PHASE I					
-L- 297+00.00 TO -L- 313+82.00 (BEGIN BRIDGE)	44,327		5,399		38,928
-L- 316+70.00 (END BRIDGE) TO -L- 332+11.46	2,282		35,185	32,903	
<b>SUBTOTAL</b>	<b>46,609</b>		<b>40,584</b>	<b>32,903</b>	<b>38,928</b>
PHASE II					
-L- 297+00.00 TO -L- 313+82.00 (BEGIN BRIDGE)	332		8,058	7,726	
-L- 316+70.00 (END BRIDGE) TO -L- 332+11.46	182		9,750	9,568	
<b>SUBTOTAL</b>	<b>514</b>		<b>17,807</b>	<b>17,293</b>	
PHASE III					
-L- 297+00.00 TO -L- 313+82.00 (BEGIN BRIDGE)	1,115		8,218	7,103	
-L- 316+70.00 (END BRIDGE) TO -L- 332+11.46	5,835		10,560	4,725	
<b>SUBTOTAL</b>	<b>6,950</b>		<b>18,778</b>	<b>11,828</b>	
<b>PROJECT TOTALS:</b>	<b>54,073</b>		<b>77,169</b>	<b>62,024</b>	<b>38,928</b>
MATERIAL FOR SHOULDER CONSTRUCTION			3,021	3,021	
LOSS DUE TO CLEARING & GRUBBING	-1,600			1,600	
USE WASTE IN LIEU OF BORROW				-38,928	
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT				1,386	
<b>GRAND TOTAL:</b>	<b>52,473</b>		<b>80,190</b>	<b>29,103</b>	
<b>SAY</b>	<b>52,480</b>		<b>29,110</b>		

CONTINGENCY ITEMS PER NCDOT GEOTECHNICAL REPORT - DESIGN AND CONSTRUCTION RECOMMENDATIONS, DATED FEBRUARY 14, 2022:  
 UNDERCUT EXCAVATION = 900 CY  
 SELECT GRANULAR MATERIAL = 600 CY  
 SHALLOW UNDERCUT = 400 CY

**NOTE:** Earthwork quantities are calculated by the Roadway Design Unit. These quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

### SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LENGTH
-L- RT	297+50.00	301+03.00	355'
-L- RT	307+47.00	313+73.00	626'
-L- LT	312+58.00	313+41.00	83'
-L- LT	316+80.00	328+78.00	1,200'
-L- RT	317+12.00	321+23.00	411'
-L- RT	324+00.00	325+00.00	100'
		<b>TOTAL:</b>	<b>2,775</b>
		<b>SAY:</b>	<b>2,780</b>

### WOVEN WIRE FENCE SUMMARY

SURVEY LINE	STATION	STATION	47" FABRIC LF	4" POSTS	5" POSTS
-L- LT	307+20.00	308+37.58	120'	5	7
-L- LT	310+70.00	313+35.00	291'	12	16
-L- LT	316+71.30	325+74.51	911'	45	37
-L- LT	329+12.00	329+80.00	78'	0	10
-L- RT	316+87.97	316+89.47	28'	0	4
		<b>TOTAL:</b>	<b>1,428</b>	<b>62</b>	<b>74</b>
		<b>SAY:</b>	<b>1,430</b>	<b>70</b>	<b>80</b>

### ASPHALT PAVEMENT BREAKING SUMMARY

SURVEY LINE	STATION	STATION	AREA (SY)
-L- LT	306+50	313+60	3,081
-L- RT	306+50	313+60	3,061
-L- LT	316+85	327+00	4,264
-L- RT	316+85	327+00	4,256
		<b>TOTAL:</b>	<b>14,662</b>
		<b>SAY:</b>	<b>14,670</b>

### SUMMARY OF ASPHALT PAVEMENT REMOVAL

SURVEY LINE	STATION	STATION	AREA (SY)
-L- LT	303+00	306+50	1,483
-L- RT	303+00	306+50	1,495
-L- LT	327+00	327+50	211
-L- RT	327+00	327+50	213
TEMPORARY CROSSEOVERS:			
-L- LT/RT	297+05	308+95	2,500
-L- LT/RT	321+52	333+05	2,381
		<b>TOTAL:</b>	<b>8,283</b>
		<b>SAY:</b>	<b>8,290</b>

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL.  
 TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.  
 FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.  
 W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.  
 G = GATING IMPACT ATTENUATOR TYPE 350  
 NG = NON-GATING IMPACT ATTENUATOR TYPE 350

### GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS				IMPACT ATTENUATOR TYPE 350			SINGLE SLOPE CONCRETE BARRIER	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS				
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	GREU, TL-3	CAT-1	B-77	TEMP B-77	EA	G	NG								
-L-	297+00.00	298+82.12	LT	187.5'					VAR																				
-L-	297+00.00	298+82.12	RT	187.5'					VAR																				
-L-	297+00.00	301+09.66	RT	411.25'			298+00.00	301+00.00	VAR																				
-L-	306+96.73	313+97.59	RT	706.25'			307+00.00	313+97.59	VAR						1		1												
-L-	312+52.07	313+64.91	LT	112.5'			313+64.91	313+00.00	VAR							1	1												
-L-	316+54.91	329+28.30	LT	1275'				316+54.91	VAR						1		1												
-L-	316+87.59	325+06.25	RT	816.625'			316+87.59		VAR							1	1												
-L-	330+28.32	332+11.46	LT	187.5'					VAR																				
-L-	330+28.32	332+11.46	RT	187.5'					VAR																				
-L-	298+82.12	299+10.00	LT/RT																										
-L-	330+01.46	330+28.32	LT/RT																										
-L-	299+10.00	330+01.46																							3,092				
-L-	297+00.00		LT												1														
-L-	313+85.00		LT																										
-L-	316+50.00		LT																										
			<b>SUBTOTAL</b>	<b>4071.625'</b>		<b>55'</b>									<b>3</b>	<b>3</b>	<b>4</b>								<b>3,092</b>	<b>9,597</b>			
			<b>ANCHOR UNIT DEDUCTIONS</b>																										
			GREU, TL-3	2 @ 50' EA		100'																							
			CAT-1	3 @ 6.25' EA		18.75'																							
			B-77	4 @ 22.875' EA		91.5'																							
			<b>TOTAL</b>			<b>3,861.375'</b>									<b>3</b>	<b>3</b>	<b>4</b>									<b>3,092</b>	<b>9,597</b>		
			<b>SAY</b>			<b>3,875'</b>									<b>3</b>	<b>3</b>	<b>4</b>	<b>2</b>							<b>3,092</b>	<b>9,600</b>			

ADDITIONAL GUARDRAIL POSTS = 10 EACH

5/9/06  
 8/10/2022  
 B:\V\_Soc\m-n-r-bentley.com\AECOM\_DS21\_NA\_2020\Documents\M100480-B-4442 1-26 over Reems C-reek\900-CAD GIS\910\_CAD\70\_NCDOT\_TIP\_Roadway\_Design\B4442\_rdy.psh\_03B-1.dgn



USA313177006

COMPUTED BY: NKS DATE: 01/21/2022  
CHECKED BY: MDB DATE: 06/24/2022

PROJECT NO. B-4442 SHEET NO. 3D-2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.  
See "Standard Specifications For Roads and Structures, Section 300-5".

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & UNDER)

Table with columns for Line & Station, Offset, Structure Number, Top Elevation, Invert Elevation, Minimum Required Slope, C.S. Pipe (15-48 inch), R.C. Pipe Class IV (15-48 inch), Endwalls, Reinforced Endwalls, Drainage Structure, Quantities for Drainage Structures, Frame, Grates, and Hood, Concrete Transitional Section, and Abbreviations. Includes SHEET TOTALS and PROJECT TOTALS rows.

COMPUTED BY: JCK DATE: JAN, 2022  
 CHECKED BY: SCC DATE: JAN, 2022

(12-17-19)

PROJECT NO.  
B-4442

SHEET NO.  
3G-1

STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS

SUMMARY OF SUBSURFACE DRAINAGE

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
CONTINGENCY				SD	500
				TOTAL LF:	500

\*UD = Underdrain  
 \*BD = Blind Drain  
 \*SD = Subsurface Drain

SUMMARY OF GEOTEXTILE  
 FOR PAVEMENT STABILIZATION

LINE	Station	Station	Geotextile for Pavement Stabilization SY	Class IV Subgrade Stabilization TONS	Offset
-L-	313+50	314+00	694	ABC	CL
-L-	317+00	328+00	15278	ABC	CL
-L-	328+00	330+00	533	ABC	LT
CONTINGENCY					
			TOTAL SY/TONS:	N/A	

\*Total tons of "Class IV Subgrade Stabilization" is only the estimated quantity for pavement stabilization and may only represent a portion of the subgrade stabilization quantity shown in the Item Sheets of the Proposal.

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

LINE	Station	Station	Aggregate Type* ASU(1/2)/ AST	Aggregate Thickness INCHES [8" for ASU(2)]	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Soil Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY			AST	3				50	
CONTINGENCY			ASU(1)	12	400	800	2400		
			TOTAL CY/TONS/SY:		400	800**	2400**	50	0

\*ASU(1/2) = Aggregate Subgrade (Type 1 or 2)  
 \*AST = Aggregate Stabilization  
 \*\*Total tons of "Class IV Subgrade Stabilization" and total square yards of "Geotextile for Soil Stabilization" are only the estimated quantities for ASU(1/2)/AST and may only represent a portion of the subgrade stabilization and geotextile quantities shown in the Item Sheets of the Proposal.

SUMMARY OF ROCK PLATING

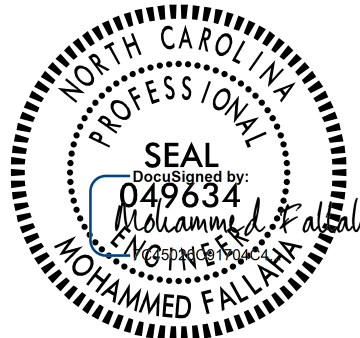
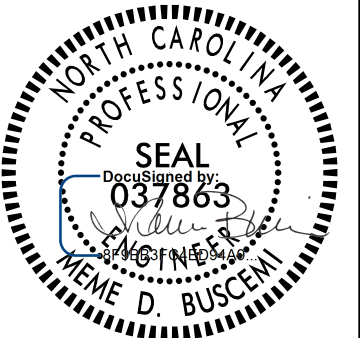
LINE	Beginning Slope (H:V)	Approx. Station	Ending Slope (H:V)	Approx. Station	Location LT/RT	Rock Plating Detail No. 1/2/3/4	Riprap Class* 1/2/B	Rock Plating SY
L	1.5:1.0	298+50	1.5:1.0	300+75	RT	1	1	450
							TOTAL SY:	450

\*Use Class 1, 2 or B riprap if riprap class is not shown for rock plating location.





8/17/19

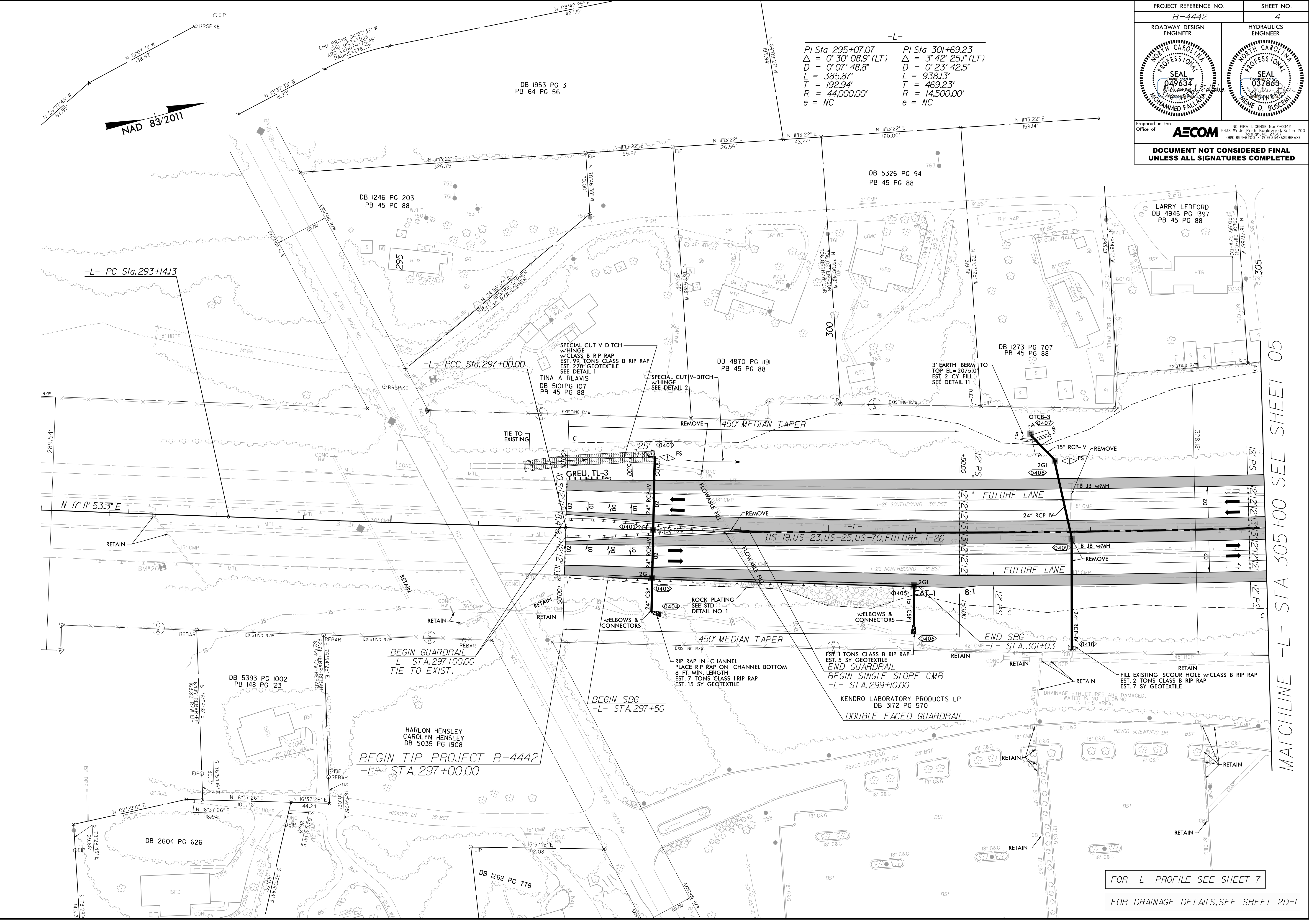
PROJECT REFERENCE NO. <b>B-4442</b>		SHEET NO. <b>4</b>	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
			
Prepared in the Office of: <b>AECOM</b>			
NC FIRM LICENSE No. F-0342 5438 Wade Park Boulevard, Suite 200 Raleigh, NC 27617 (919) 854-6200 • (919) 854-6259 (FAX)			
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>			

-L-

PI Sta 295+07.07	PI Sta 301+69.23
$\Delta = 0' 30' 08.9''$ (LT)	$\Delta = 3' 42' 25.1''$ (LT)
$D = 0' 07' 48.8''$	$D = 0' 23' 42.5''$
$L = 385.87'$	$L = 938.13'$
$T = 192.94'$	$T = 469.23'$
$R = 44,000.00'$	$R = 14,500.00'$
$e = NC$	$e = NC$

REVISIONS

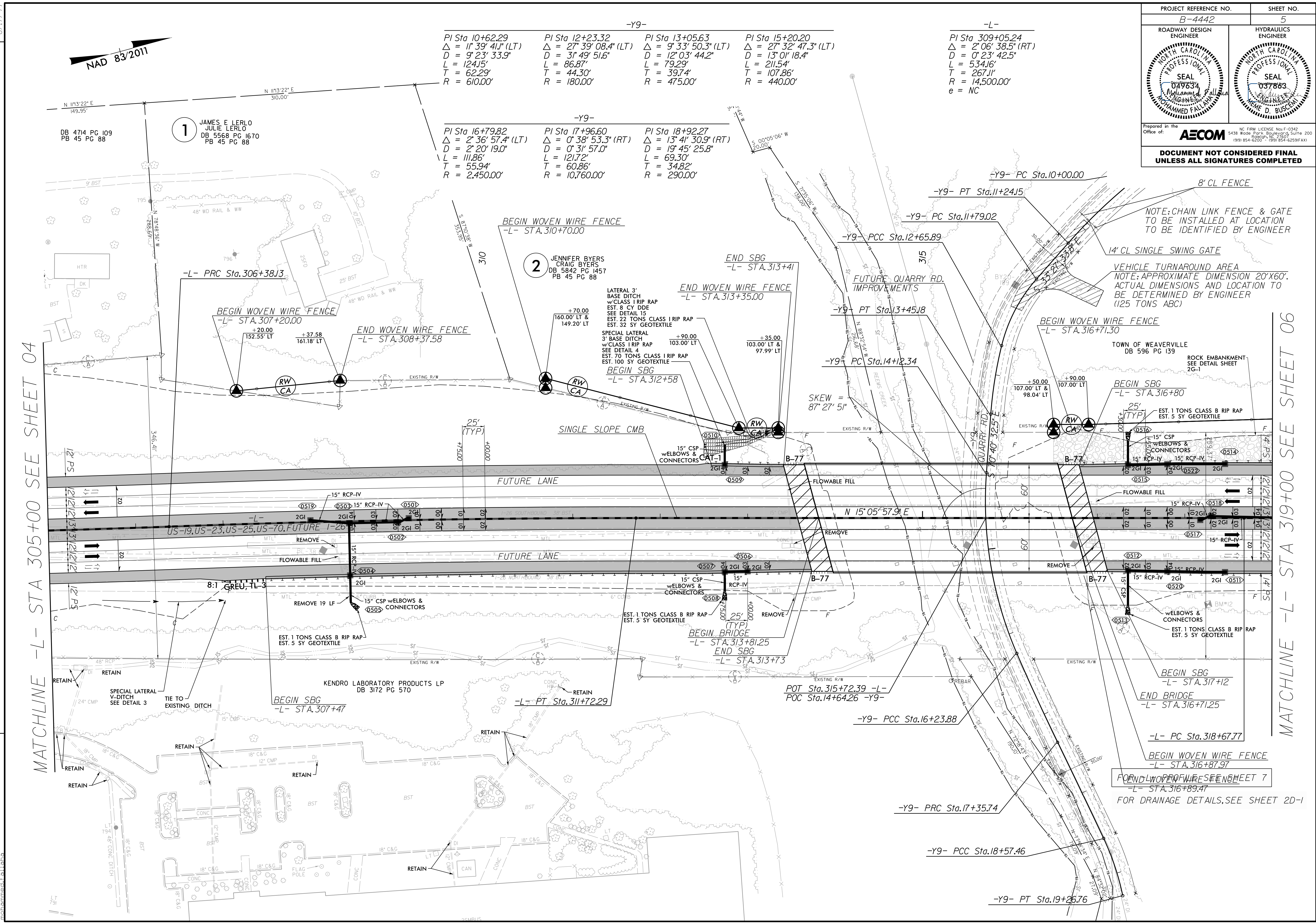
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FOR -L- PROFILE SEE SHEET 7

FOR DRAINAGE DETAILS, SEE SHEET 2D-1

PROJECT REFERENCE NO. B-4442	SHEET NO. 5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
Prepared in the Office of: <b>AECOM</b> NC FIRM LICENSE NO. F-0342 5438 Wade Street, Raleigh, NC 27607 (919) 854-6200 • (919) 854-6259 (FAX)	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	



NAD 83/2011

-Y9- PI Sta 10+62.29 $\Delta = 11' 39'' 41.1''$ (LT) $D = 9' 23'' 33.9''$ $L = 124.15'$ $T = 62.29'$ $R = 610.00'$	-Y9- PI Sta 12+23.32 $\Delta = 27' 39'' 08.4''$ (LT) $D = 31' 49'' 51.6''$ $L = 86.87'$ $T = 44.30'$ $R = 180.00'$	-Y9- PI Sta 13+05.63 $\Delta = 9' 33'' 50.3''$ (LT) $D = 12' 03'' 44.2''$ $L = 79.29'$ $T = 39.74'$ $R = 475.00'$	-L- PI Sta 15+20.20 $\Delta = 27' 32'' 47.3''$ (LT) $D = 13' 01'' 18.4''$ $L = 211.54'$ $T = 107.86'$ $R = 440.00'$
--------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------

-Y9- PI Sta 16+79.82 $\Delta = 2' 36'' 57.4''$ (LT) $D = 2' 20'' 19.0''$ $L = 111.86'$ $T = 55.94'$ $R = 2,450.00'$	-Y9- PI Sta 17+96.60 $\Delta = 0' 38'' 53.3''$ (RT) $D = 0' 31'' 57.0''$ $L = 121.72'$ $T = 60.86'$ $R = 10,760.00'$	-Y9- PI Sta 18+92.27 $\Delta = 13' 41'' 30.9''$ (RT) $D = 19' 45'' 25.8''$ $L = 69.30'$ $T = 34.82'$ $R = 290.00'$
---------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------

-L- PI Sta 309+05.24 $\Delta = 2' 06'' 38.5''$ (RT) $D = 0' 23'' 42.5''$ $L = 534.16'$ $T = 267.11'$ $R = 14,500.00'$ $e = NC$
-----------------------------------------------------------------------------------------------------------------------------------------------------

MATCHLINE -L- STA 305+00 SEE SHEET 04

MATCHLINE -L- STA 319+00 SEE SHEET 06

NOTE: CHAIN LINK FENCE & GATE TO BE INSTALLED AT LOCATION TO BE IDENTIFIED BY ENGINEER

VEHICLE TURNAROUND AREA  
NOTE: APPROXIMATE DIMENSION 20'X60'.  
ACTUAL DIMENSIONS AND LOCATION TO BE DETERMINED BY ENGINEER (125 TONS ABC)

TOWN OF WEAVERVILLE  
DB 596 PG 139

EST. 1 TONS CLASS B RIP RAP  
EST. 5 SY GEOTEXTILE

EST. 1 TONS CLASS B RIP RAP  
EST. 5 SY GEOTEXTILE

EST. 1 TONS CLASS B RIP RAP  
EST. 5 SY GEOTEXTILE

EST. 1 TONS CLASS B RIP RAP  
EST. 5 SY GEOTEXTILE

EST. 1 TONS CLASS B RIP RAP  
EST. 5 SY GEOTEXTILE


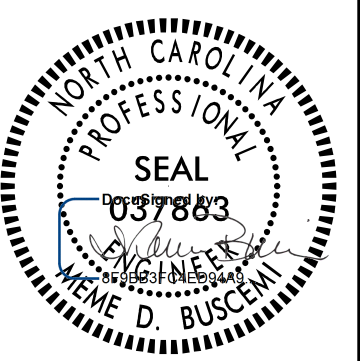
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EST. 5 SY GEOTEXTILE

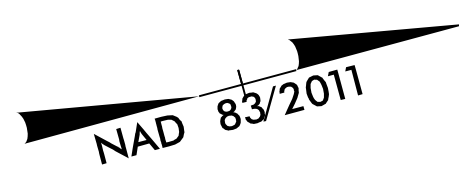
EST. 1 TONS CLASS B RIP RAP  
EST. 5 SY GEOTEXTILE

FOR DRAINAGE DETAILS, SEE SHEET 2D-1

REVISIONS

7/21/2022  
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 Mohammed Fallouh

PROJECT REFERENCE NO. <b>B-4442</b>	SHEET NO. <b>6</b>
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER 
Prepared in the Office of: <b>AECOM</b>	
<small>NC FIRM LICENSE No. F-0342 5438 Wade Street, Raleigh, NC 27607 (919) 854-6200 • (919) 854-6259 (FAX)</small>	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

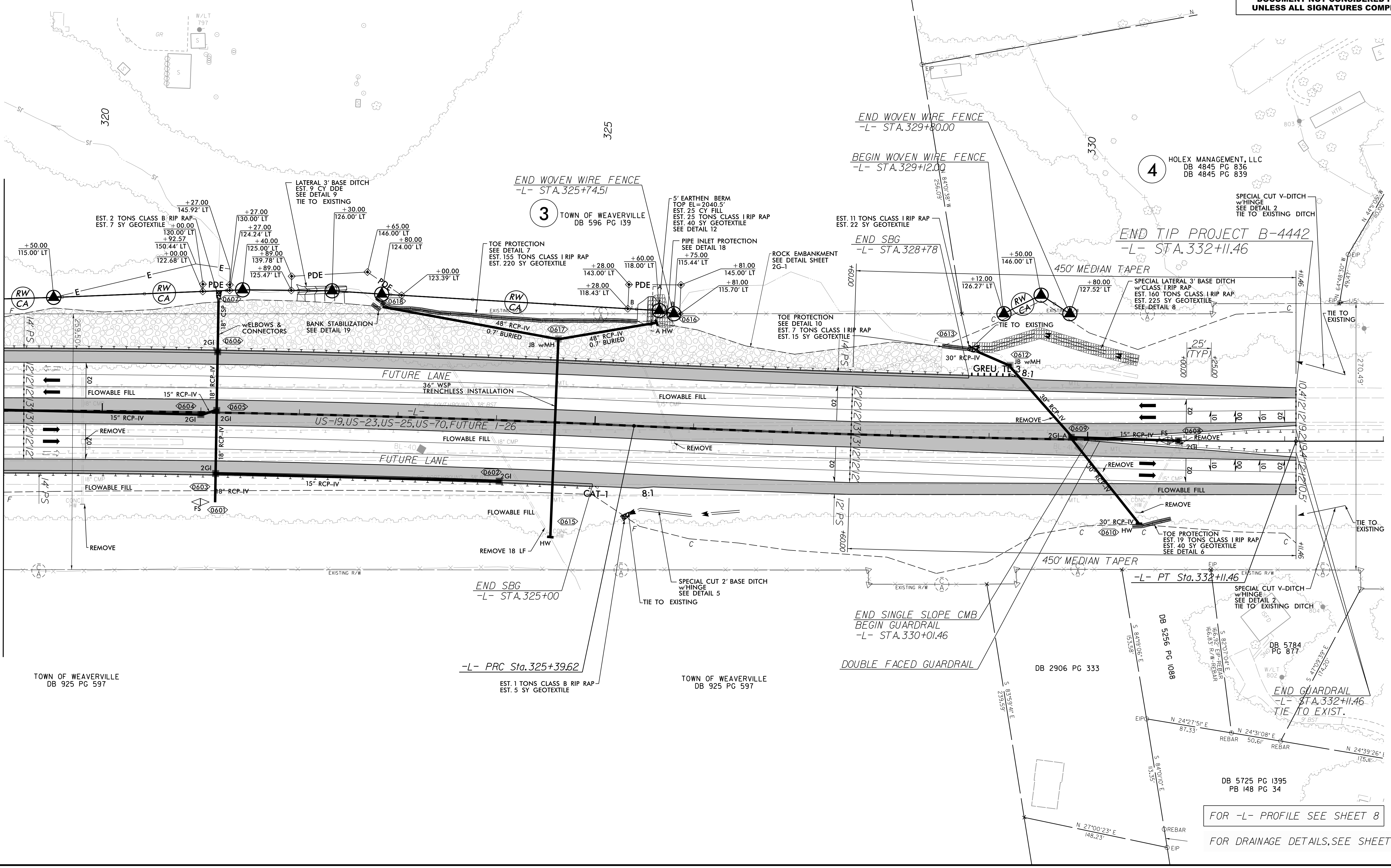


-L-

PI Sta 322+03.75 Δ = 2° 39' 17.1" (RT) D = 0° 23' 42.5" L = 671.84' T = 335.98' R = 14,500.00' e = NC	PI Sta 328+75.60 Δ = 2° 39' 17.1" (LT) D = 0° 23' 42.5" L = 671.84' T = 335.98' R = 14,500.00' e = NC
-------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------

DB 4786 PG 1703

MATCHLINE -L- STA 319+00 SEE SHEET 05



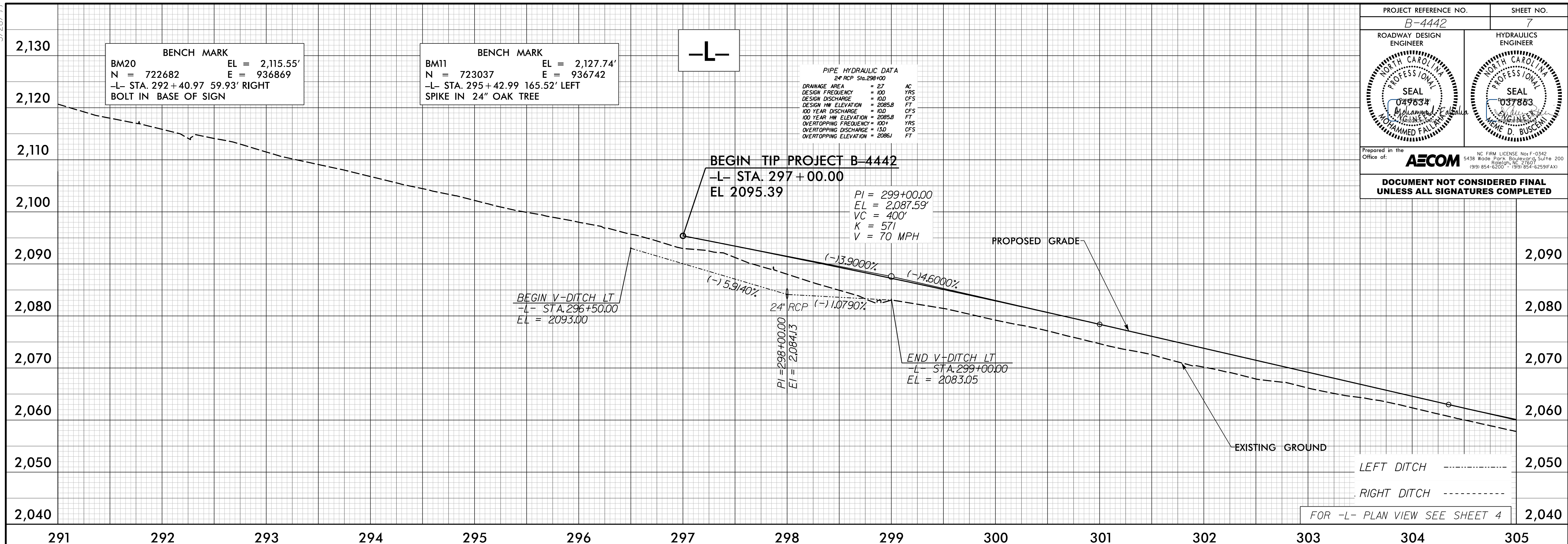
FOR -L- PROFILE SEE SHEET 8  
FOR DRAINAGE DETAILS, SEE SHEET 2D-1

REVISIONS

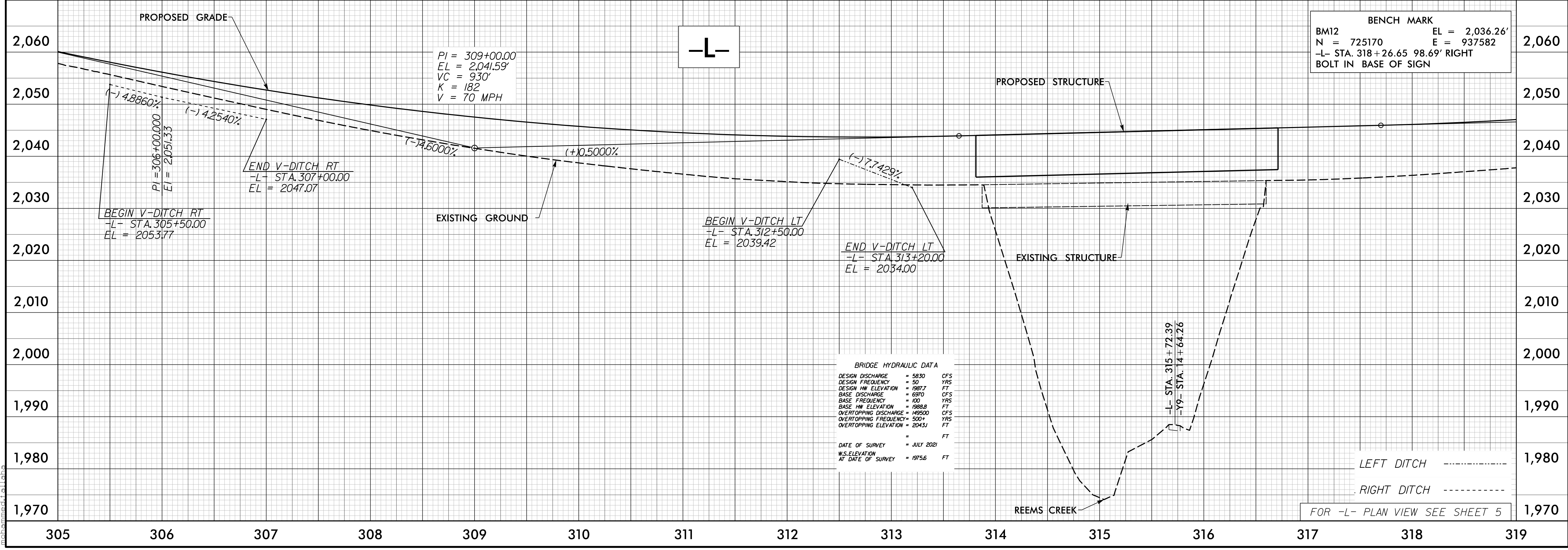
6/28/2022  
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Mohammed Fallouh

5/28/2022

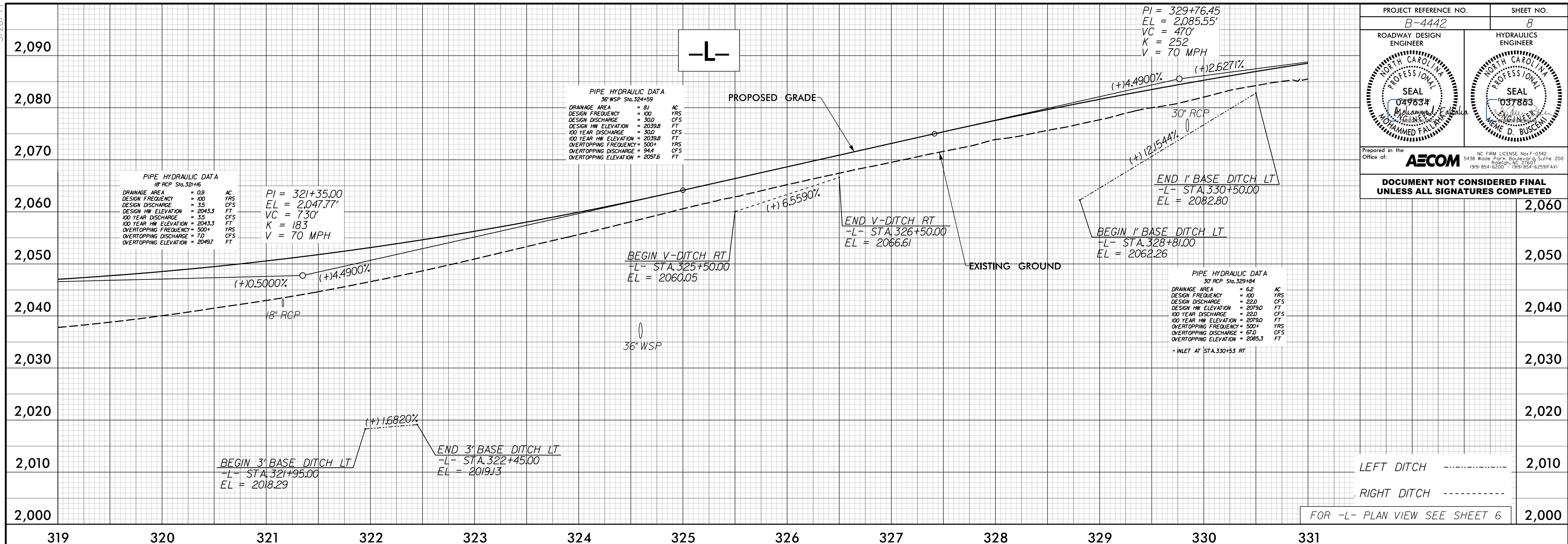
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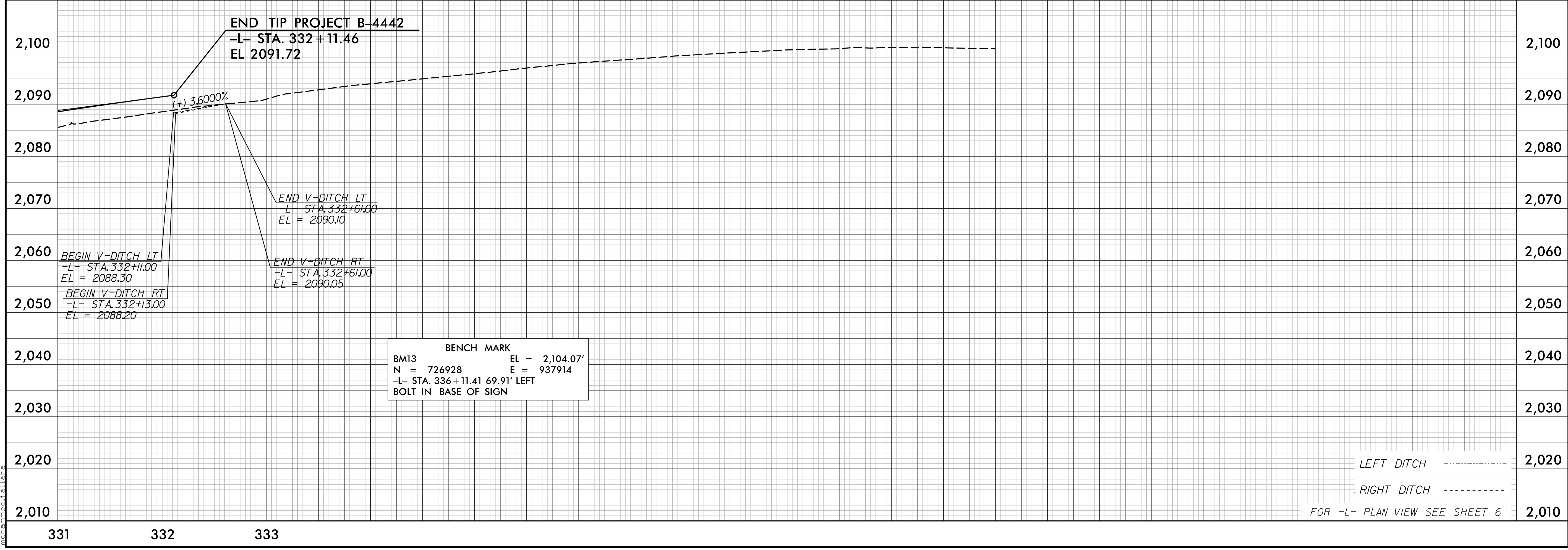
PROJECT REFERENCE NO. B-4442	SHEET NO. 7
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
Prepared in the Office of: <b>AECOM</b>	
<small>NC FIRM LICENSE No. F-0342        5438 Wade Street, Boulevard, Suite 200        Raleigh, NC 27607        (919) 854-6000 • (919) 854-6258 FAX1</small>	
<b>DOCUMENT NOT CONSIDERED FINAL        UNLESS ALL SIGNATURES COMPLETED</b>	





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PROJECT REFERENCE NO. B-4442	SHEET NO. 8
ROADWAY DESIGN ENGINEER MOHAMMED FALLAH	HYDRAULICS ENGINEER MOHAMMED FALLAH
SEAL 049634 MOHAMMED FALLAH NORTH CAROLINA PROFESSIONAL ENGINEER	SEAL 037883 MOHAMMED FALLAH NORTH CAROLINA PROFESSIONAL ENGINEER
Prepared in the Office of: <b>AECOM</b>	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



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PROJECT REFERENCE NO. B-4442	SHEET NO. 9
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
	
Prepared in the Office of: <b>AECOM</b>	
NC FIRM LICENSE No. F-0342 5438 Wade Park Boulevard, Suite 200 Raleigh, NC 27607 (919) 854-6000 • (919) 854-6259 FAX	
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