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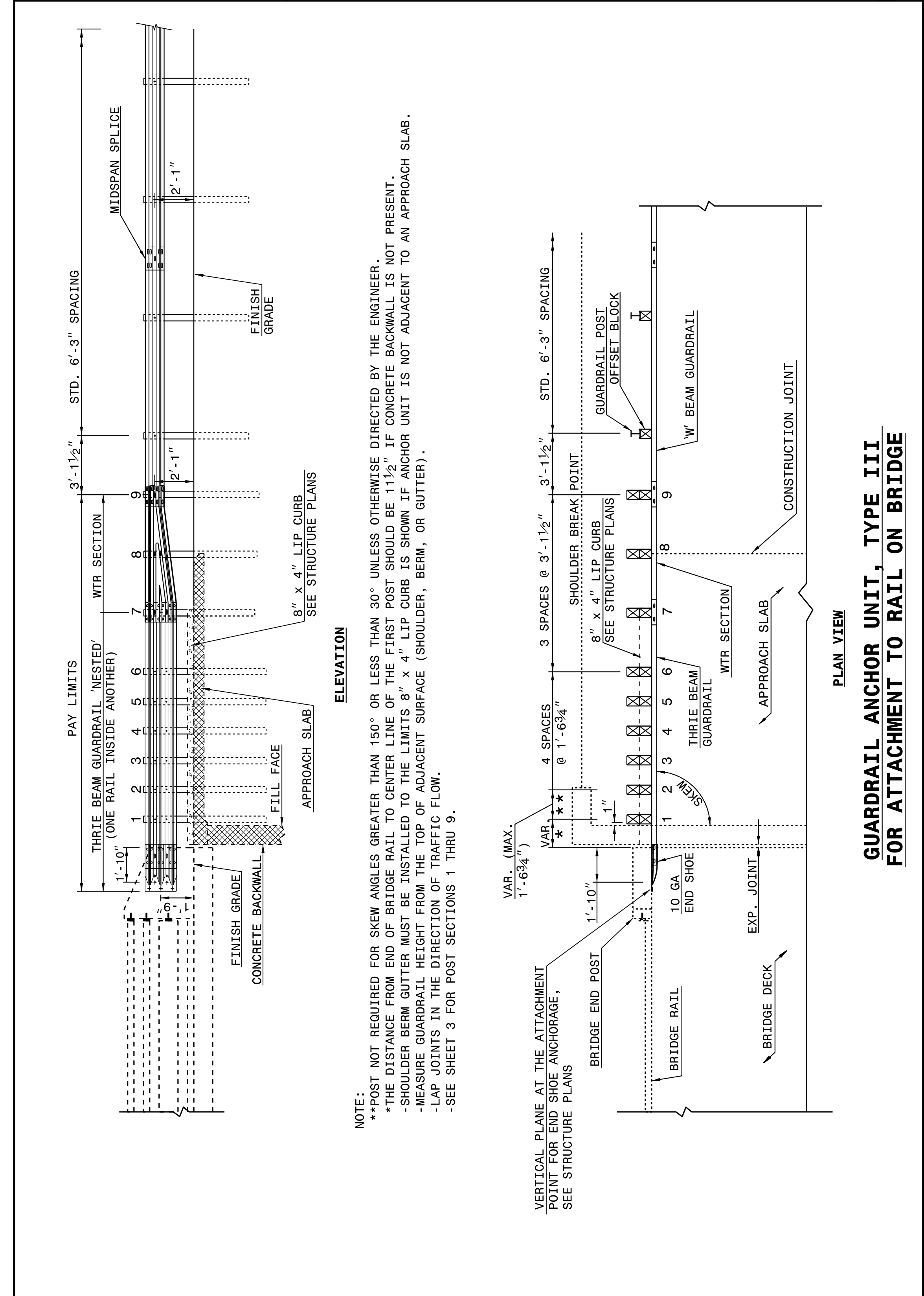
**This file or an individual page
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I4-DEC-2017 10:36
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 Jhowerton AT: USD-292595

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR STRUCTURE ANCHOR UNITS GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE

SHEET 1 OF 7
862D03



STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

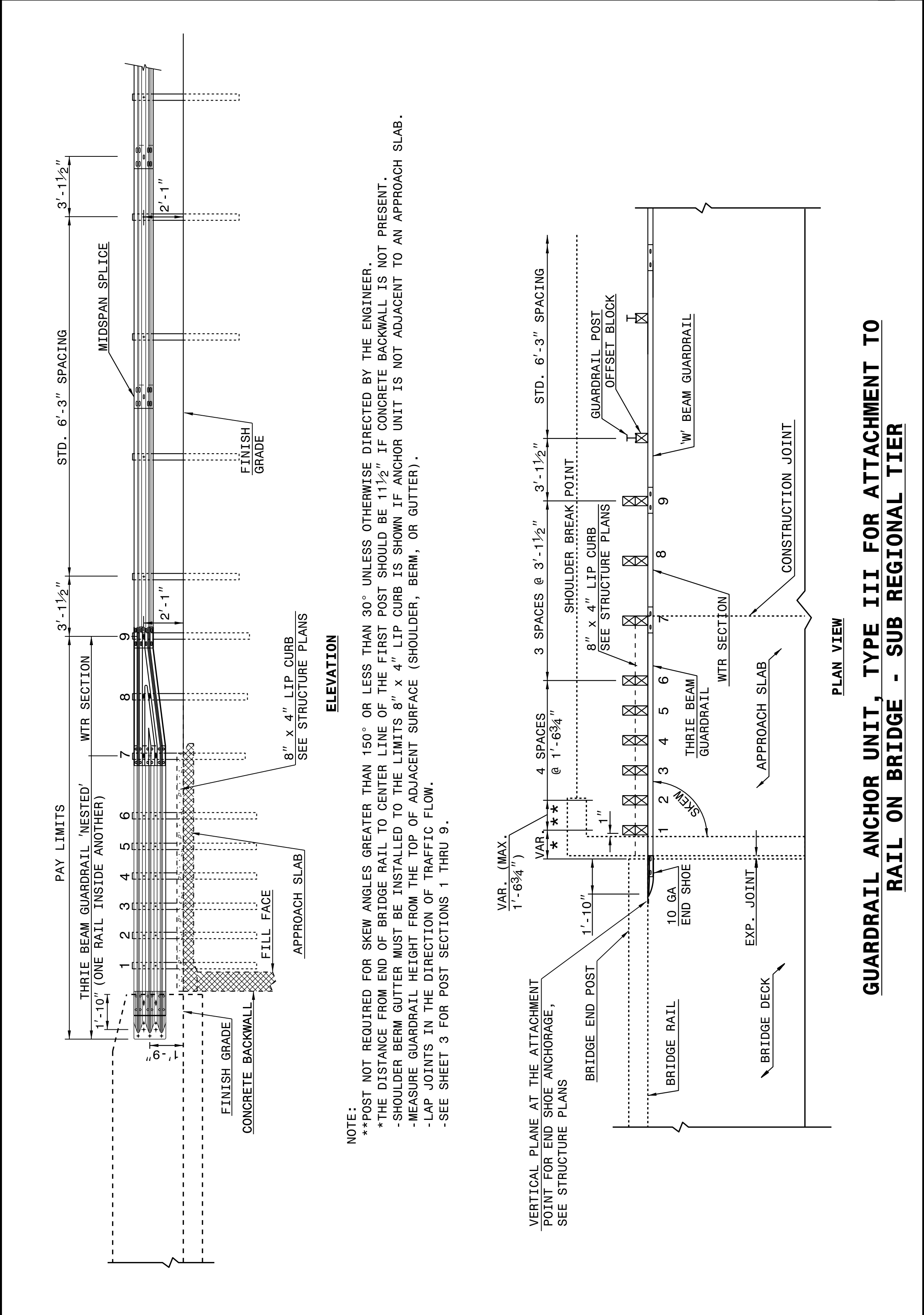
ROADWAY DETAIL DRAWING FOR STRUCTURE ANCHOR UNITS GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE

SHEET 1 OF 7
862D03

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR STRUCTURE ANCHOR UNITS GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER

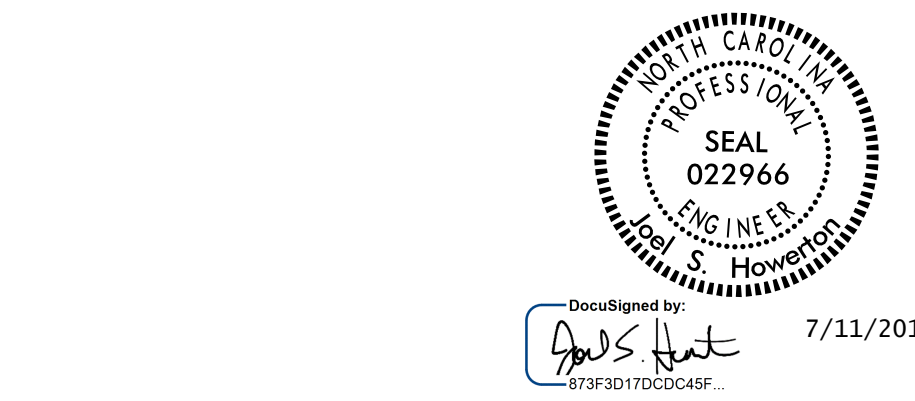
SHEET 2 OF 7
862D03



STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR STRUCTURE ANCHOR UNITS GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER

SHEET 2 OF 7
862D03



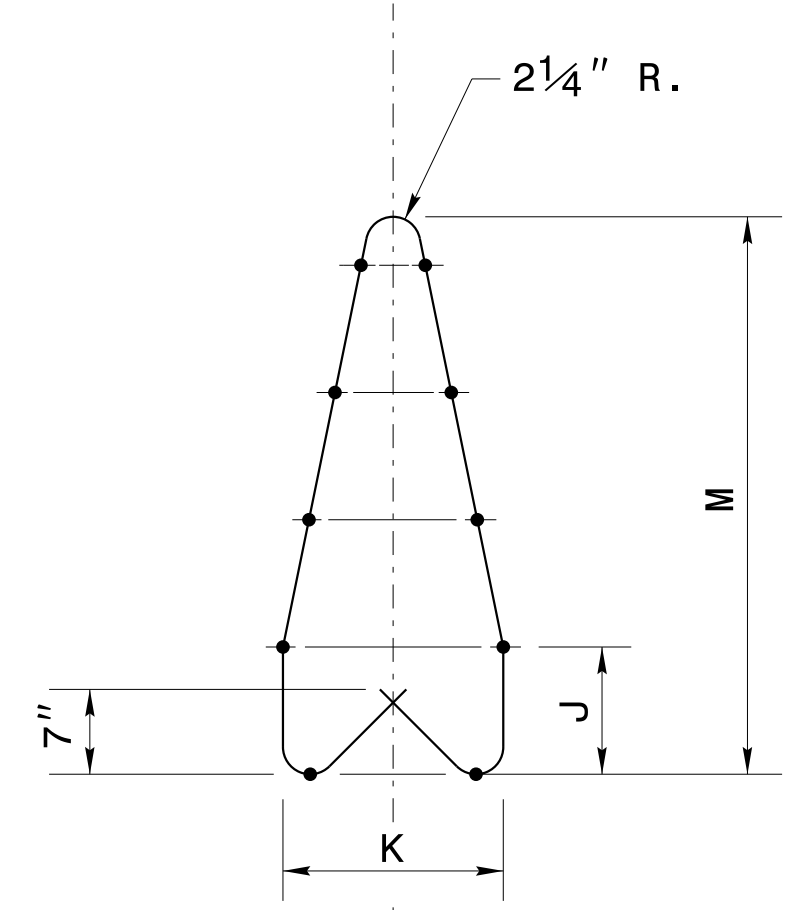
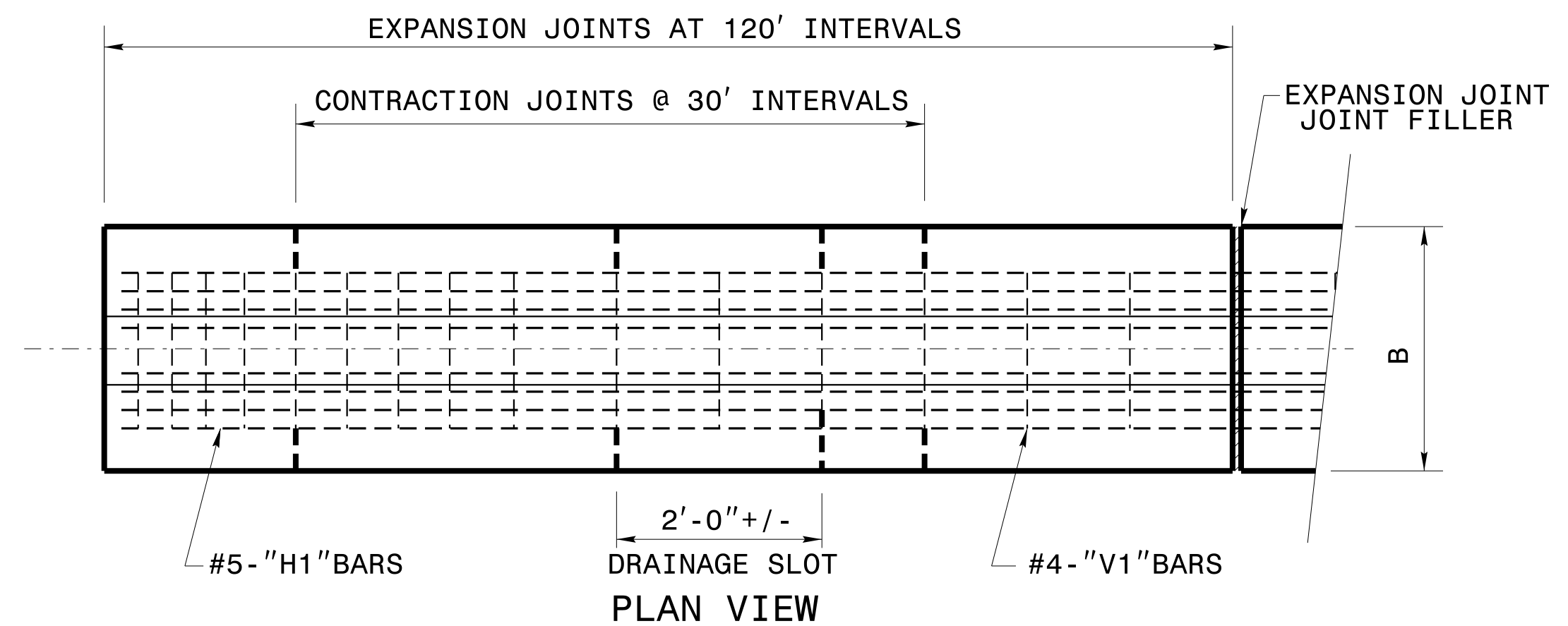
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

SEE TITLE BLOCK

ORIGINAL BY: J. HOWERTON DATE: 06-22-12
 MODIFIED BY: DATE:
 CHECKED BY: DATE:
 FILE SPEC.: DATE:

5/14/99



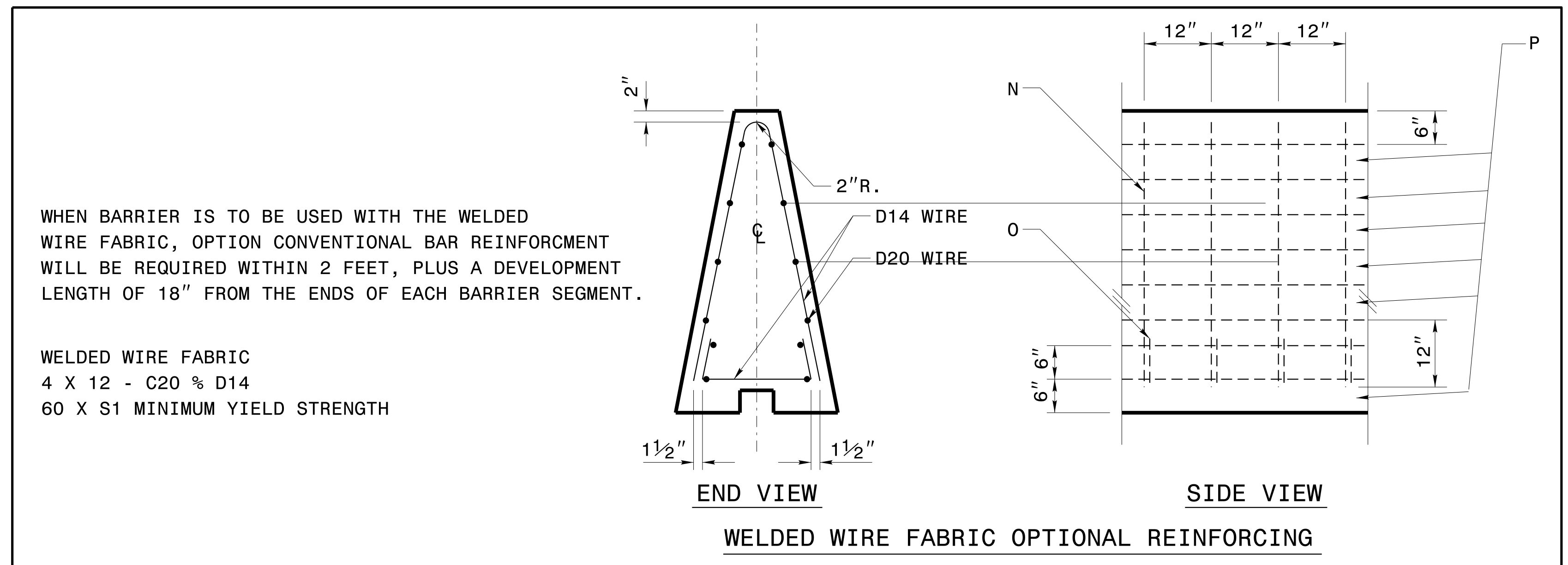
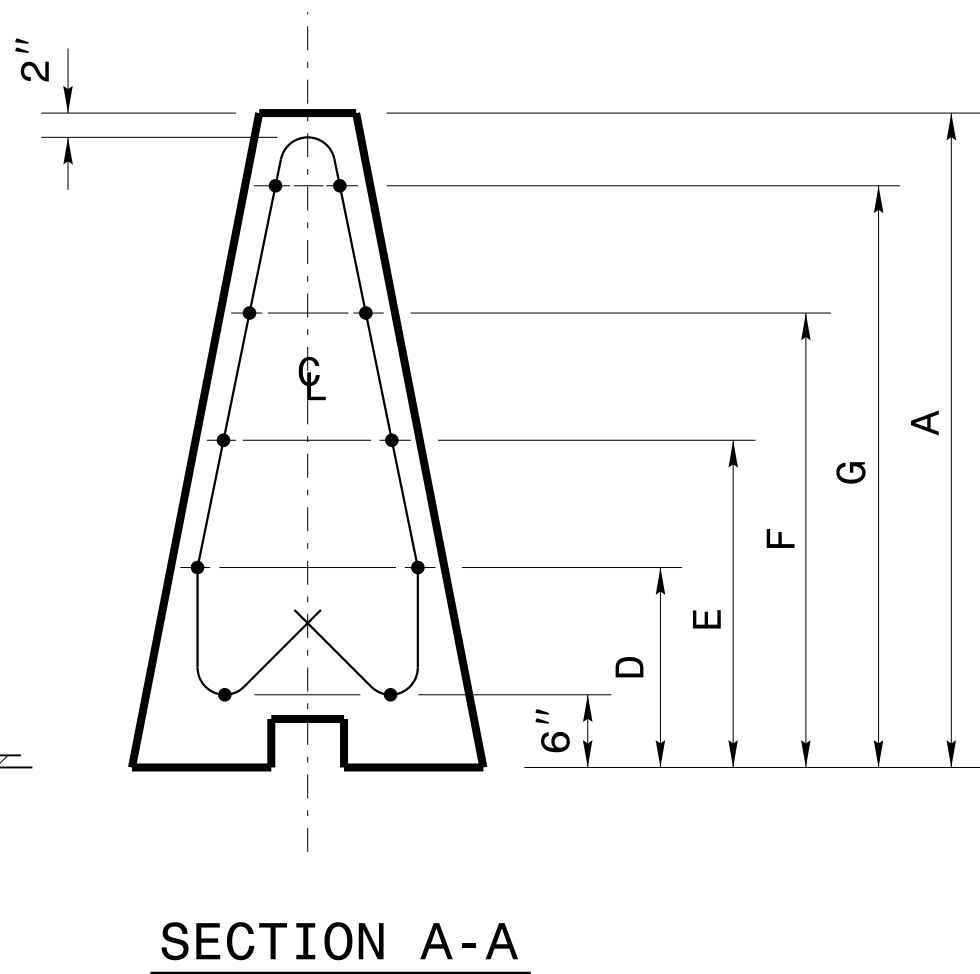
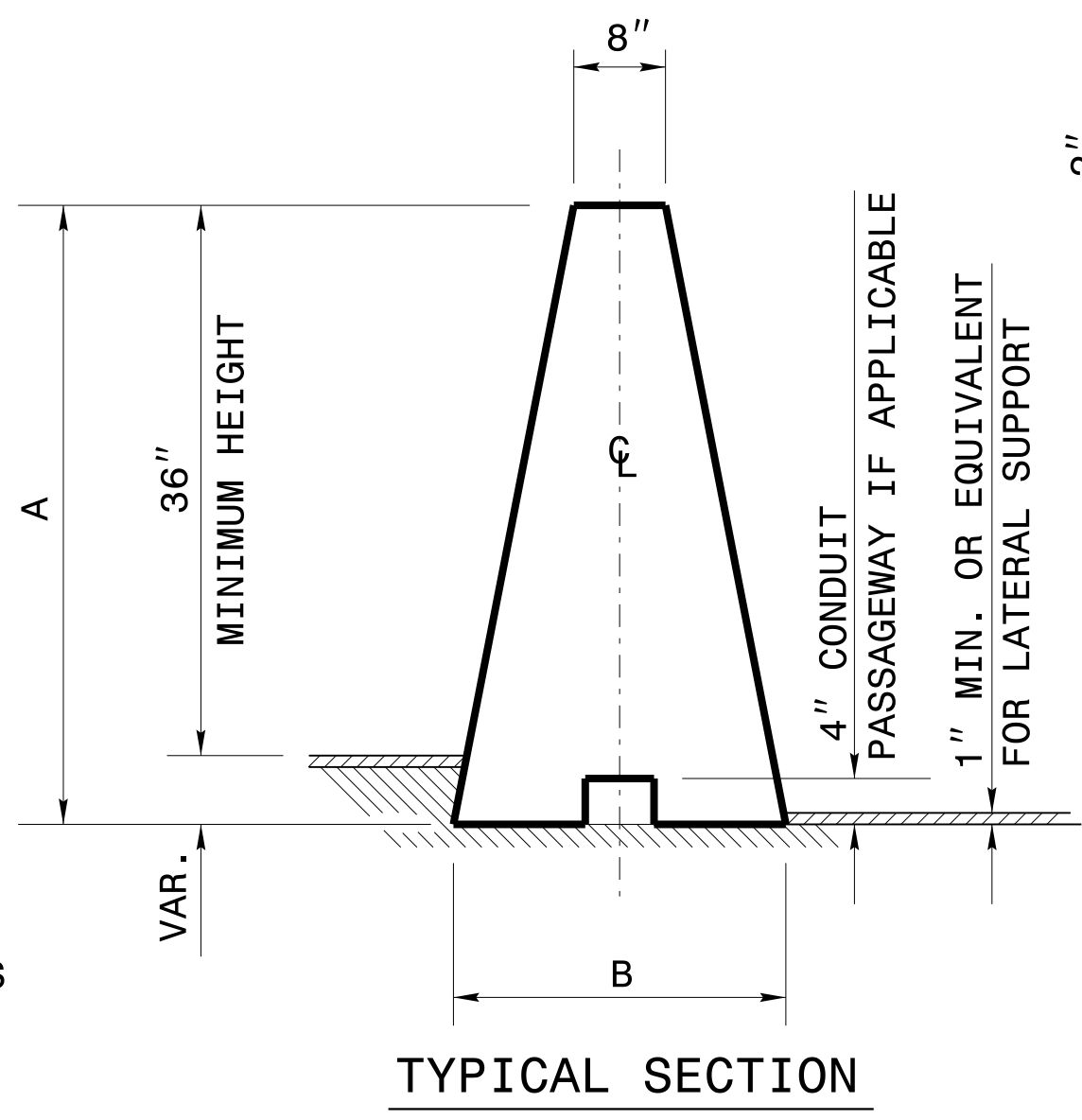
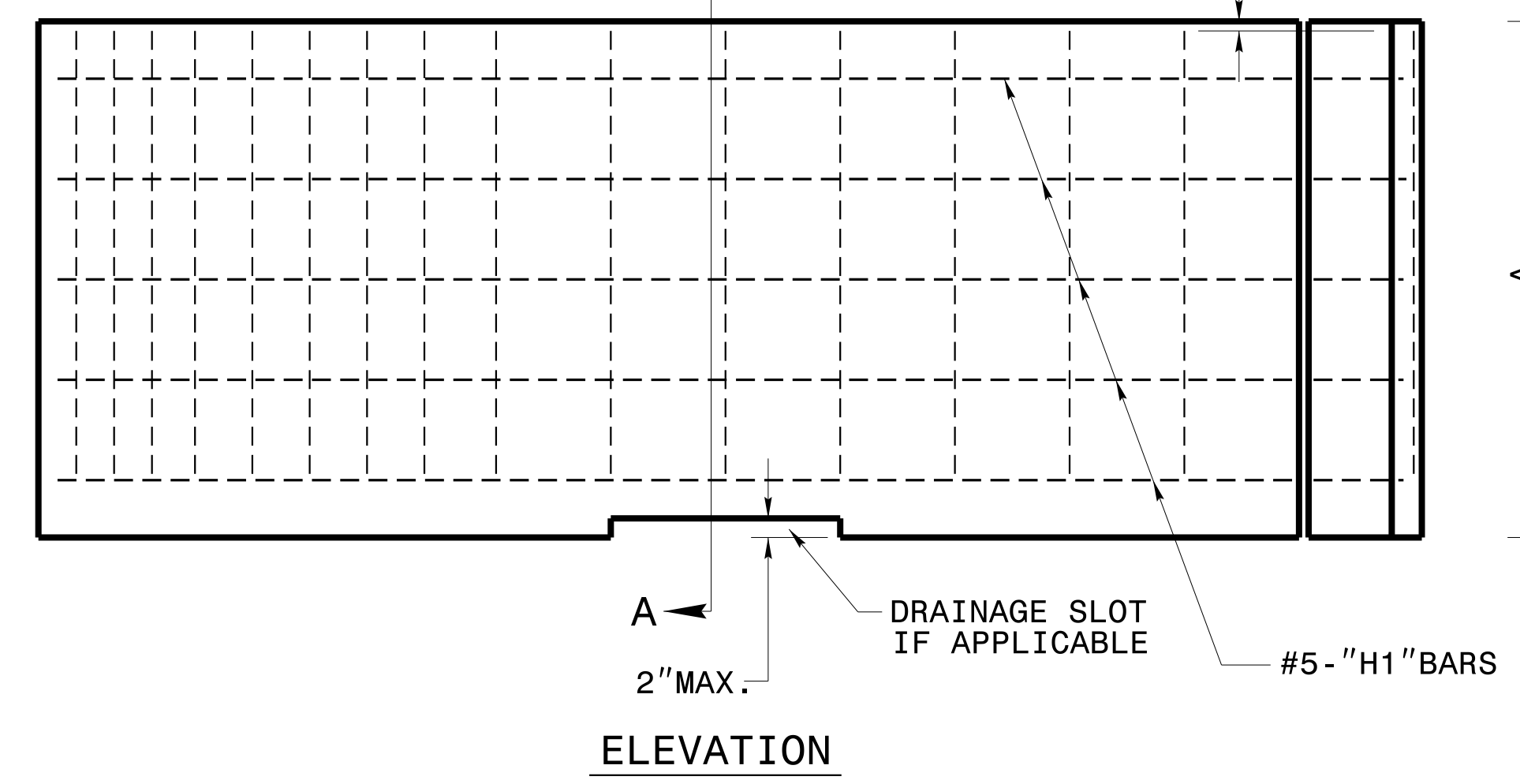
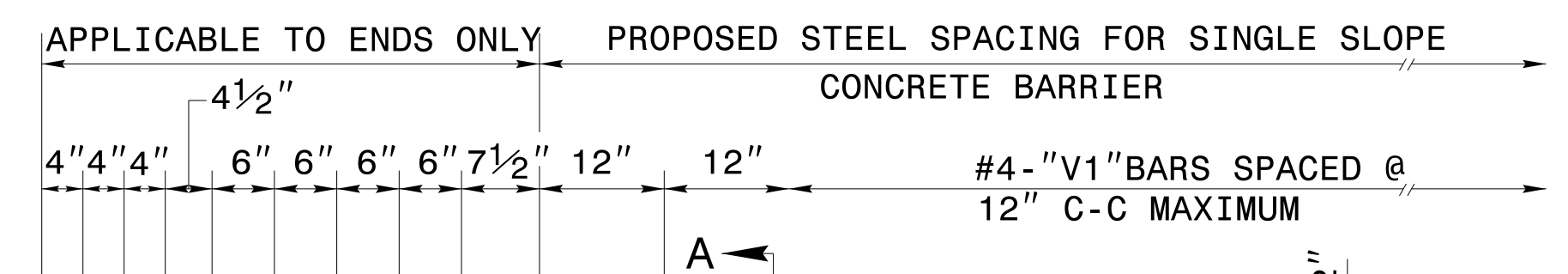
#4-'V1' BAR REINFORCING DETAIL

GENERAL NOTES:

1. USE CLASS "AA" CONCRETE.
2. MAINTAIN 2" OF COVER OVER ALL REBAR. CHAMFER TOP AND ENDS OF BARRIER 1/2 INCH.
3. 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.

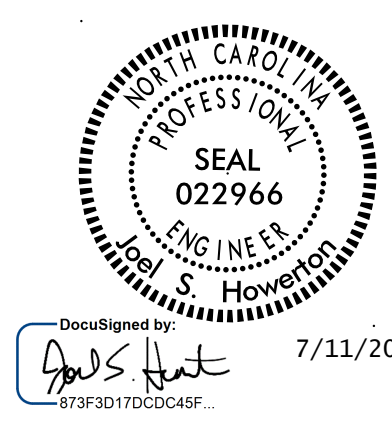
4. REFER TO ROADWAY STANDARD DRAWING NO.854.01 FOR EXPANSION AND CONTRACTION JOINT, FILLER AND OTHER SPECIFICATIONS.



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
42"	42	24	13 1/2	21	28 1/2	36	15	9 1/4	36	72	28	4



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CONTRACTS STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

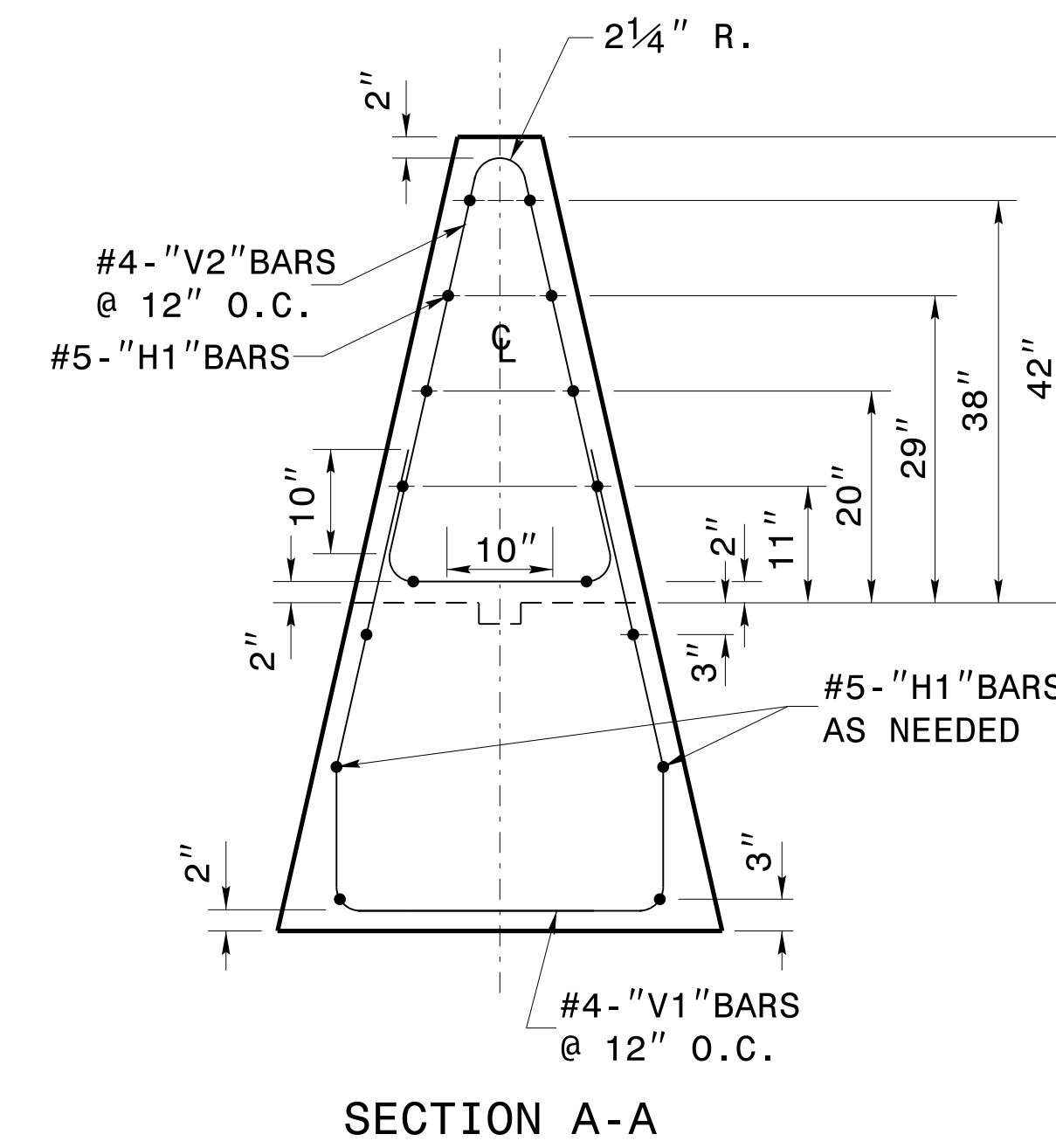
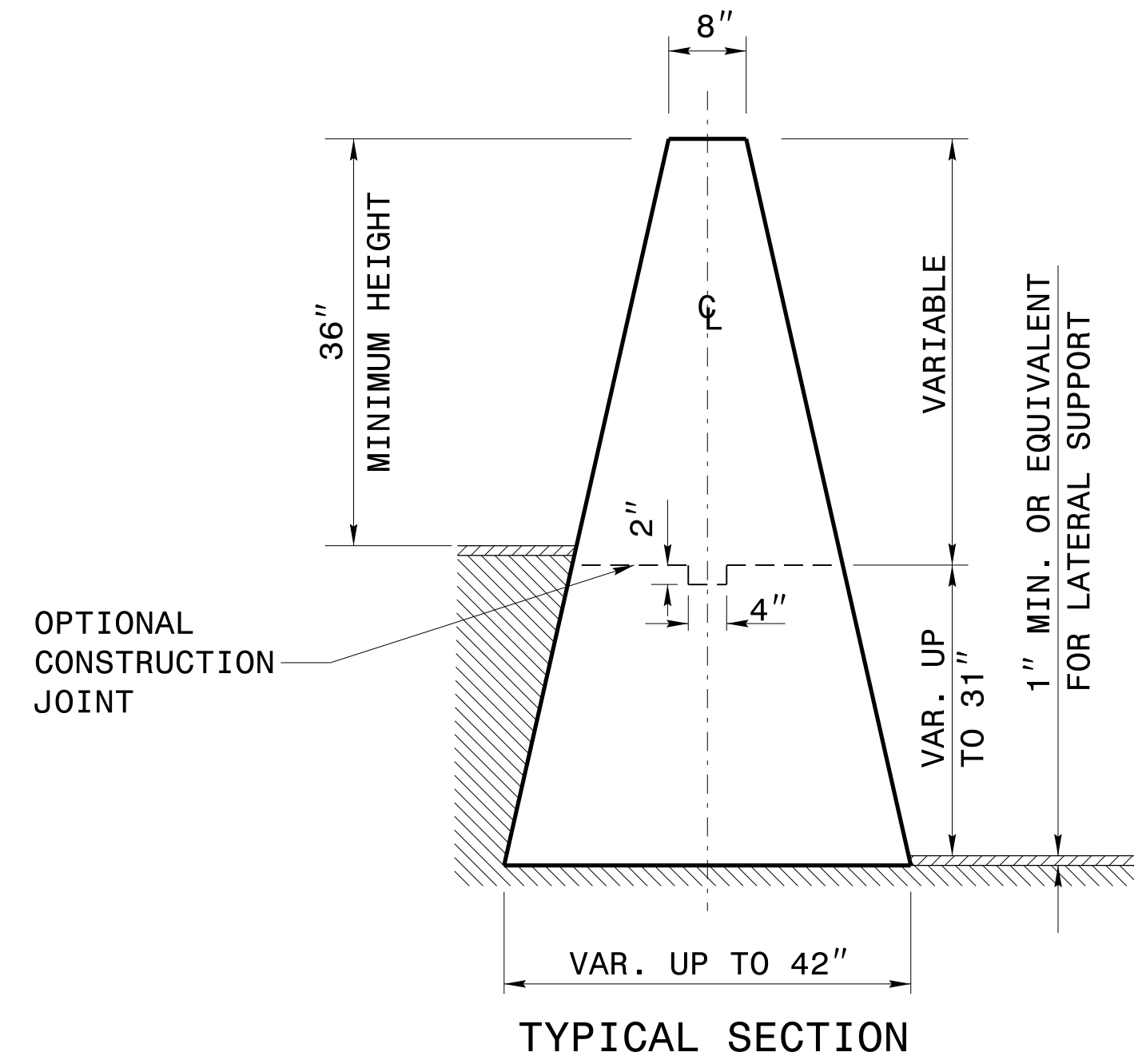
TYPE I SINGLE SLOPE CONCRETE BARRIER

ORIGINAL BY:	DATE:
MODIFIED BY: kkempf	DATE: 05-01-19
CHECKED BY:	DATE:
FILE SPEC.:	details/nbritt/english/gurandrail/single slope concrete barrier.dgn

GENERAL NOTES:

1. USE CLASS "AA" CONCRETE.
2. MAINTAIN 2" OF COVER OVER ALL REBAR. CHAMFER TOP AND ENDS OF BARRIER 1/2 INCH.
3. 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.
4. REFER TO ROADWAY STANDARD DRAWING NO.854.01 FOR EXPANSION AND CONTRACTION JOINT, FILLER AND OTHER SPECIFICATIONS.
5. REFER TO TYPE I SINGLE SLOPE CONCRETE BARRIER SPECIAL DETAIL FOR FURTHER INFORMATION.



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UNLESS ALL SIGNATURES COMPLETED

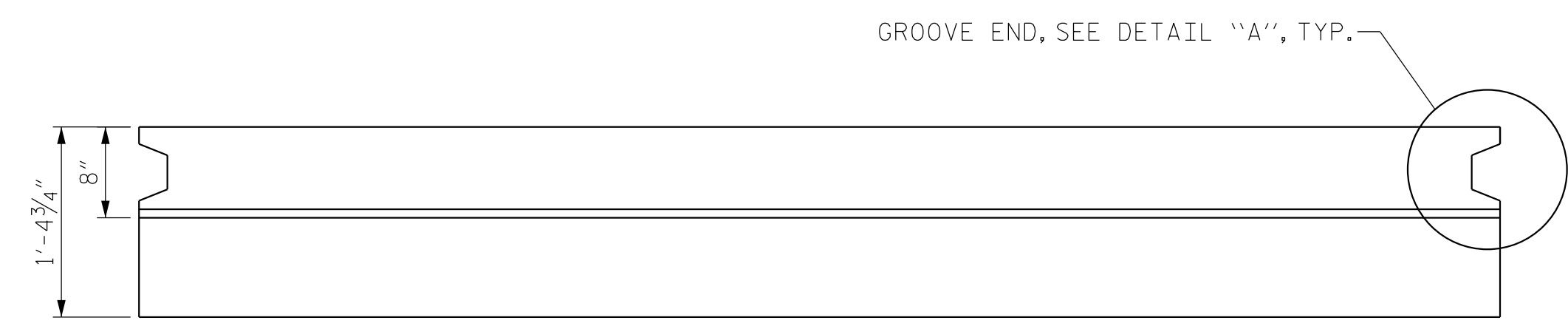
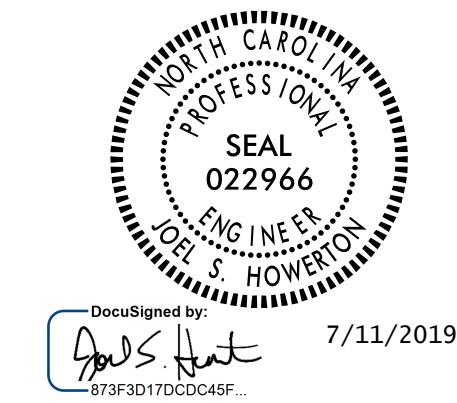
**CONTRACTS STANDARDS
AND DEVELOPMENT UNIT**
Office 919-707-6950 FAX 919-250-4119

**TYPE II SINGLE SLOPE
CONCRETE BARRIER**

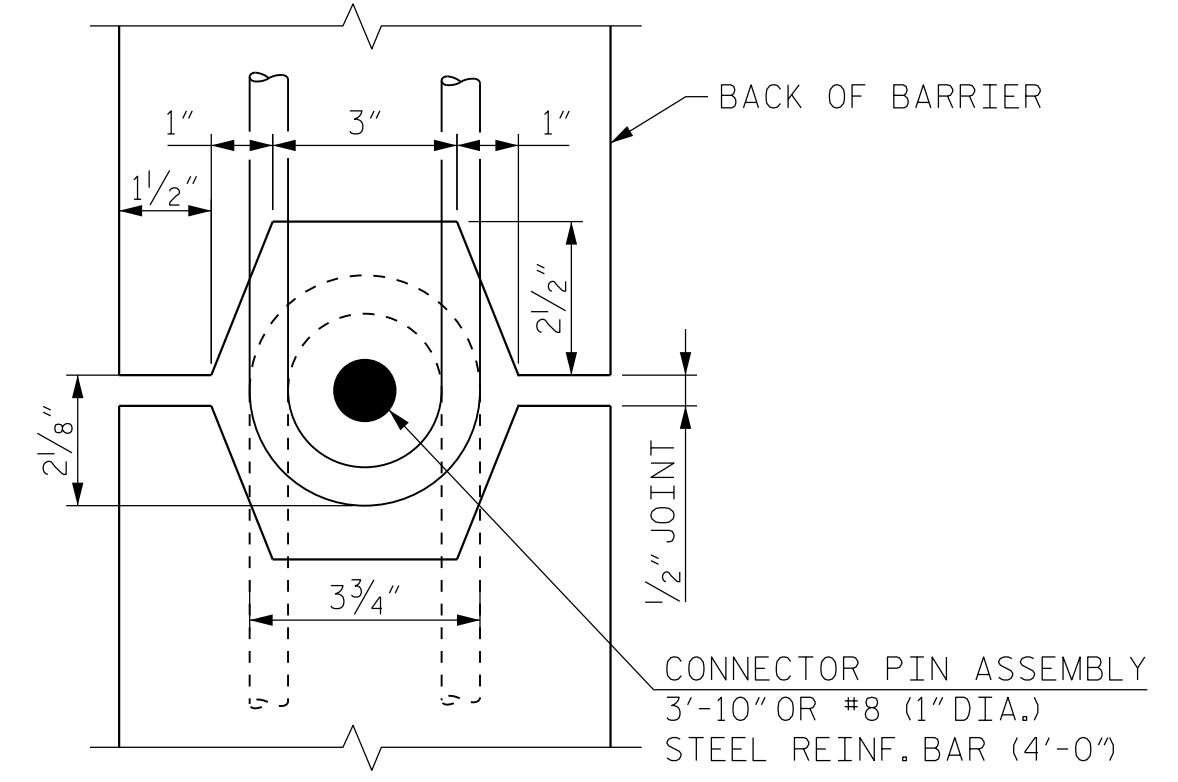
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 CHECKED BY: _____ DATE: _____
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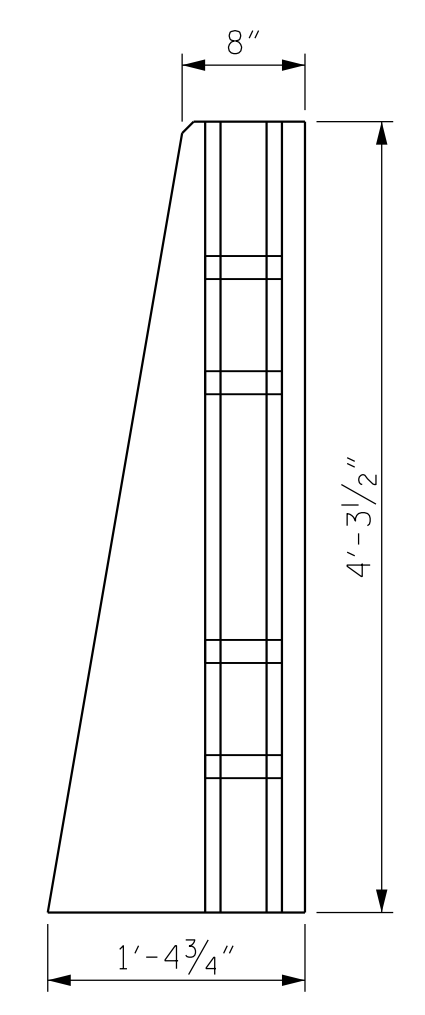
DocuSigned by:
S. Howerton
7/11/2019



PLAN

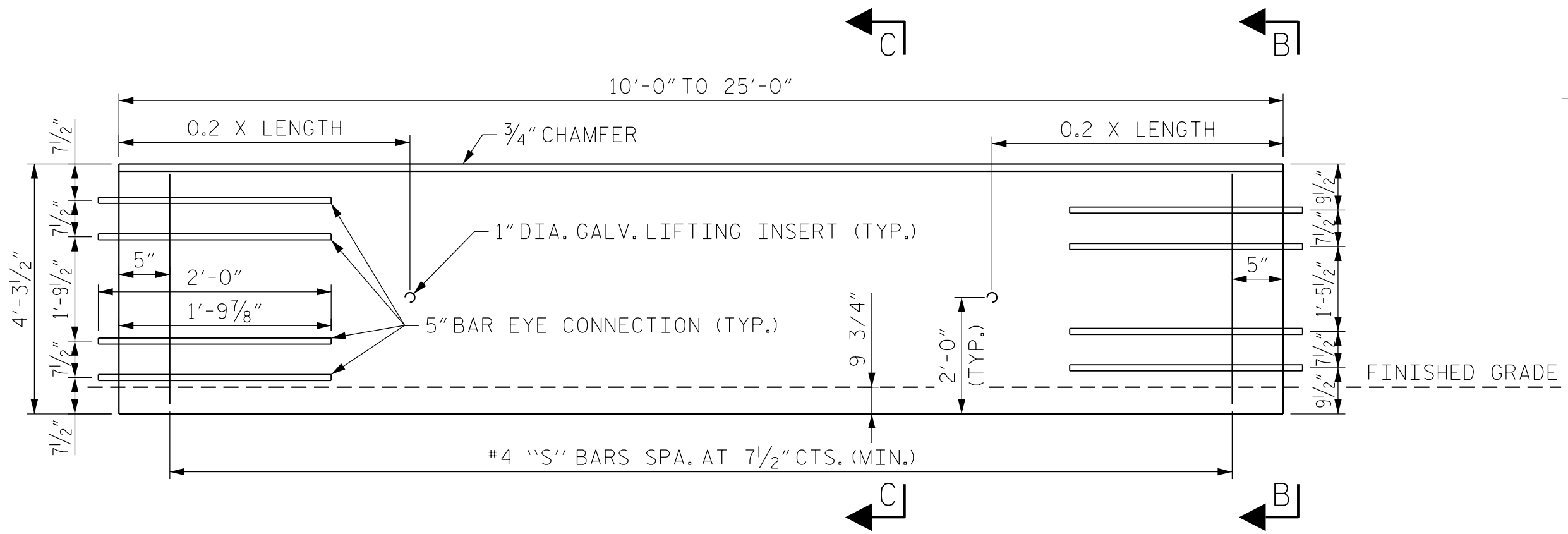


DETAIL "A"

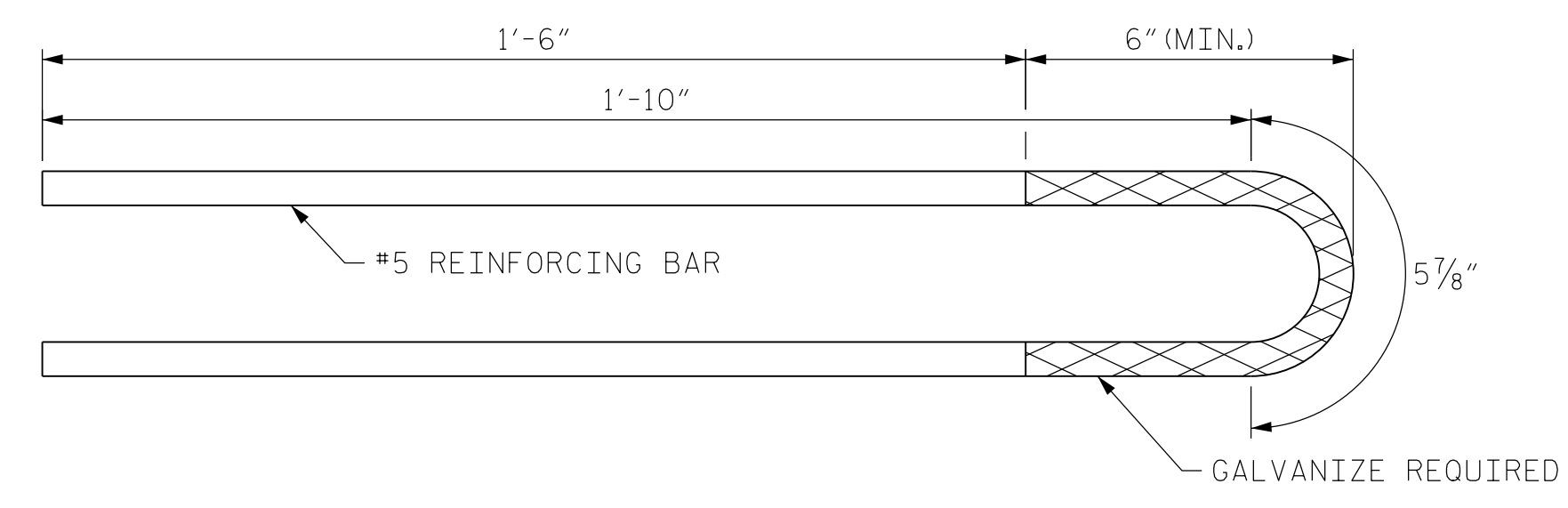


SECTION B-B

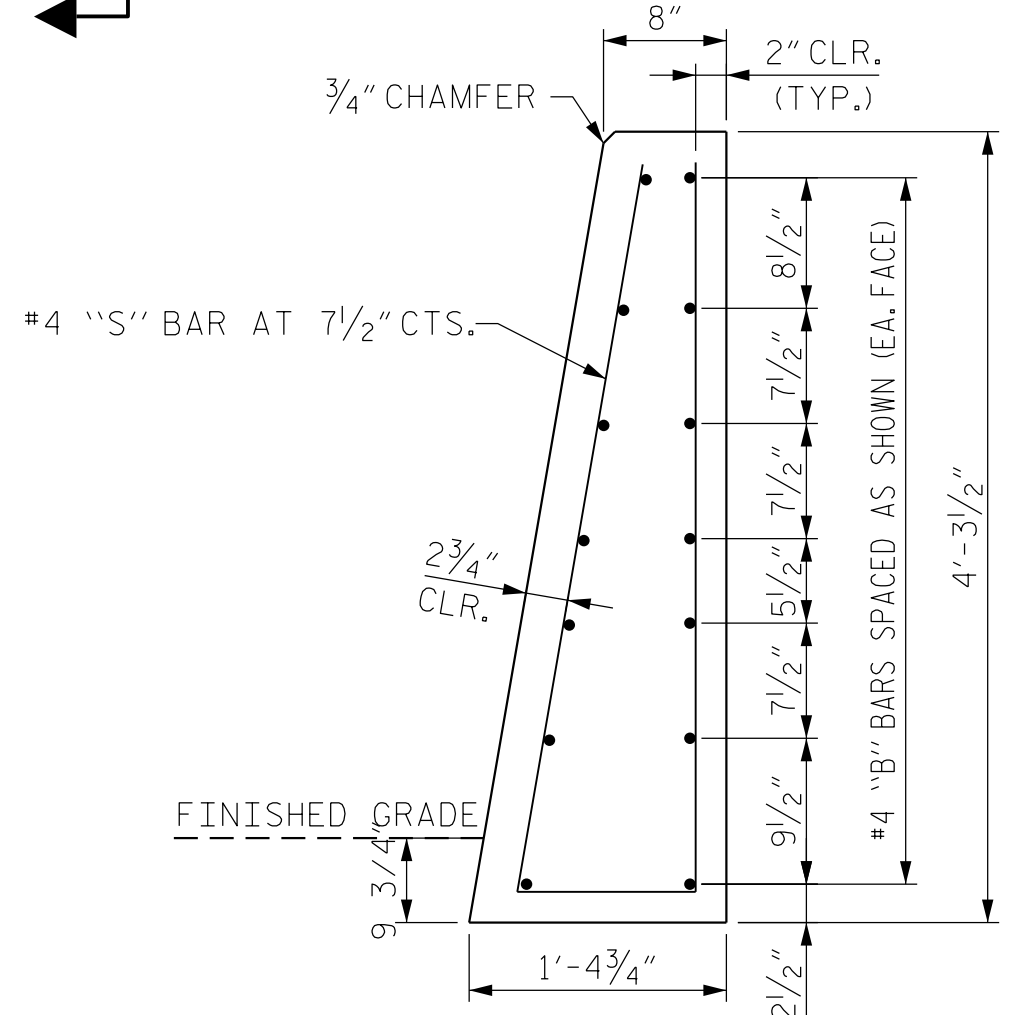
NOTES:
 ALL PARTS OF CONNECTOR PIN ASSEMBLY SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A-153 SPECIFICATIONS.
 ALL CONCRETE IN PRECAST REINFORCED SINGLE FACE SINGLE SLOPE CONCRETE BARRIER RAIL SHALL BE CLASS AA.



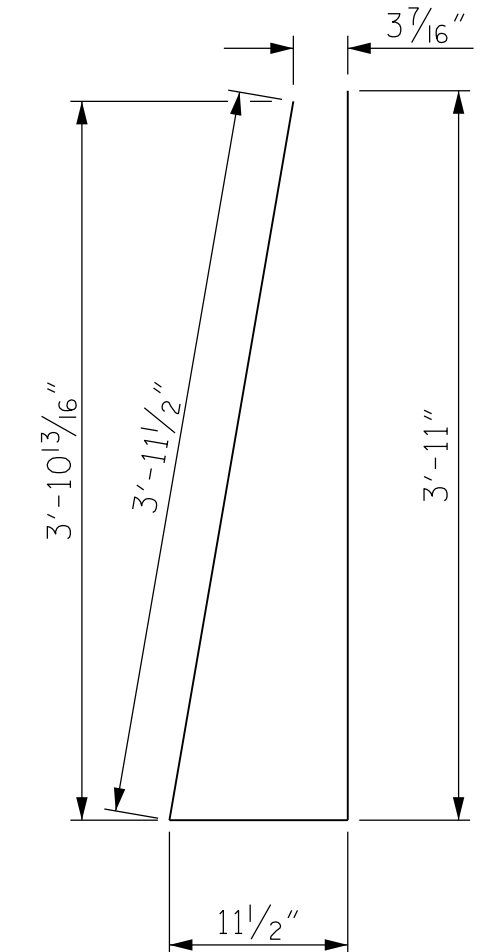
FRONT ELEVATION MIDDLE BARRIER UNIT



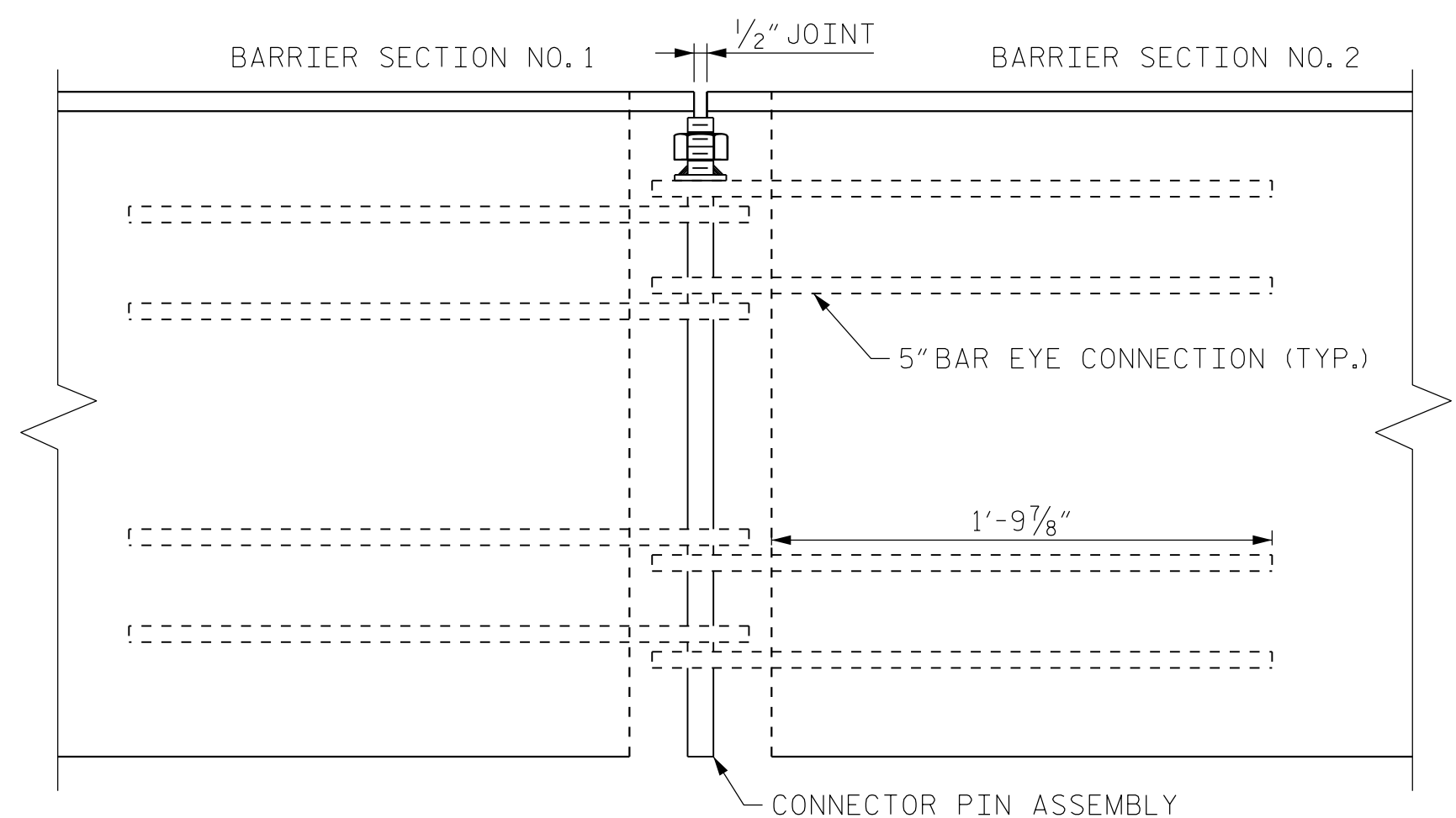
DETAIL OF REINFORCING EYE BAR



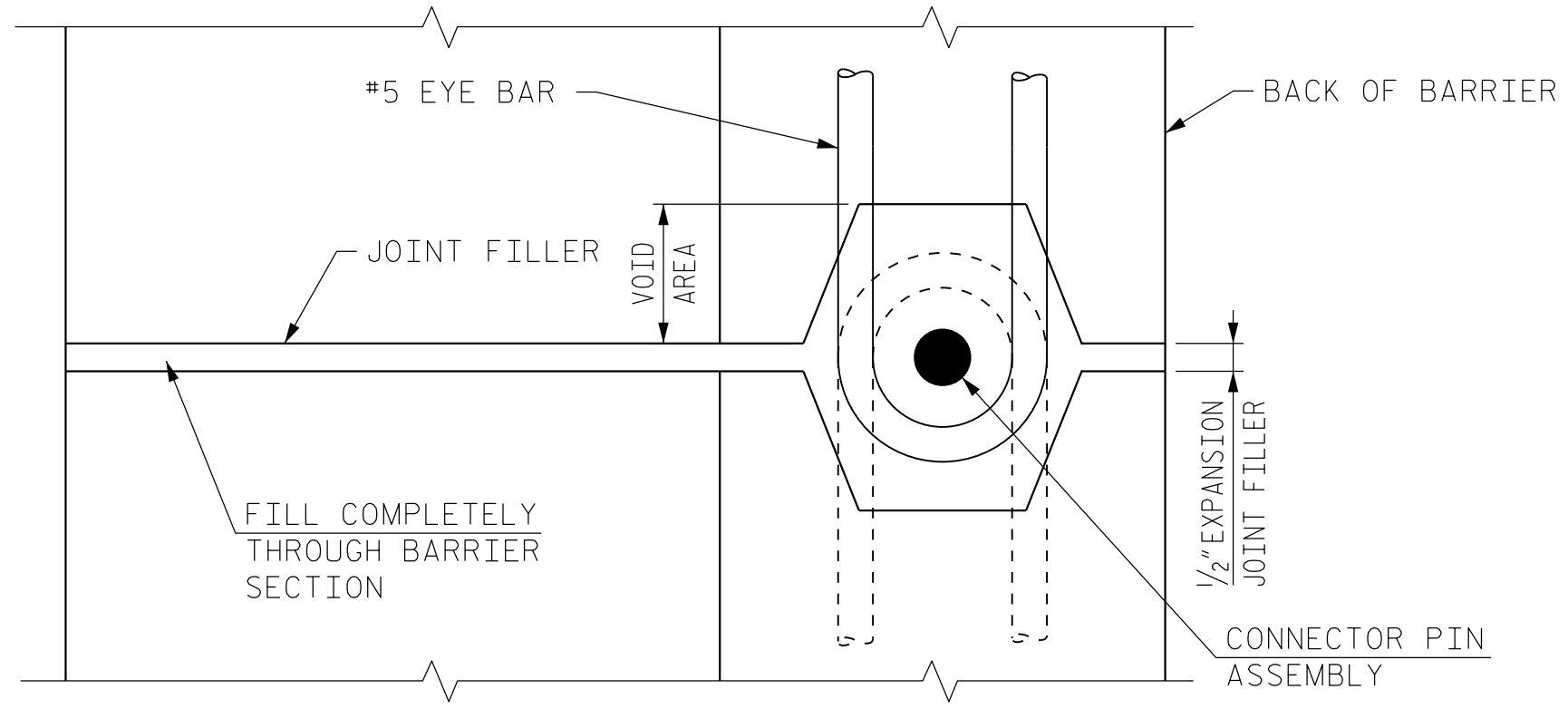
SECTION C-C



"S" BARS

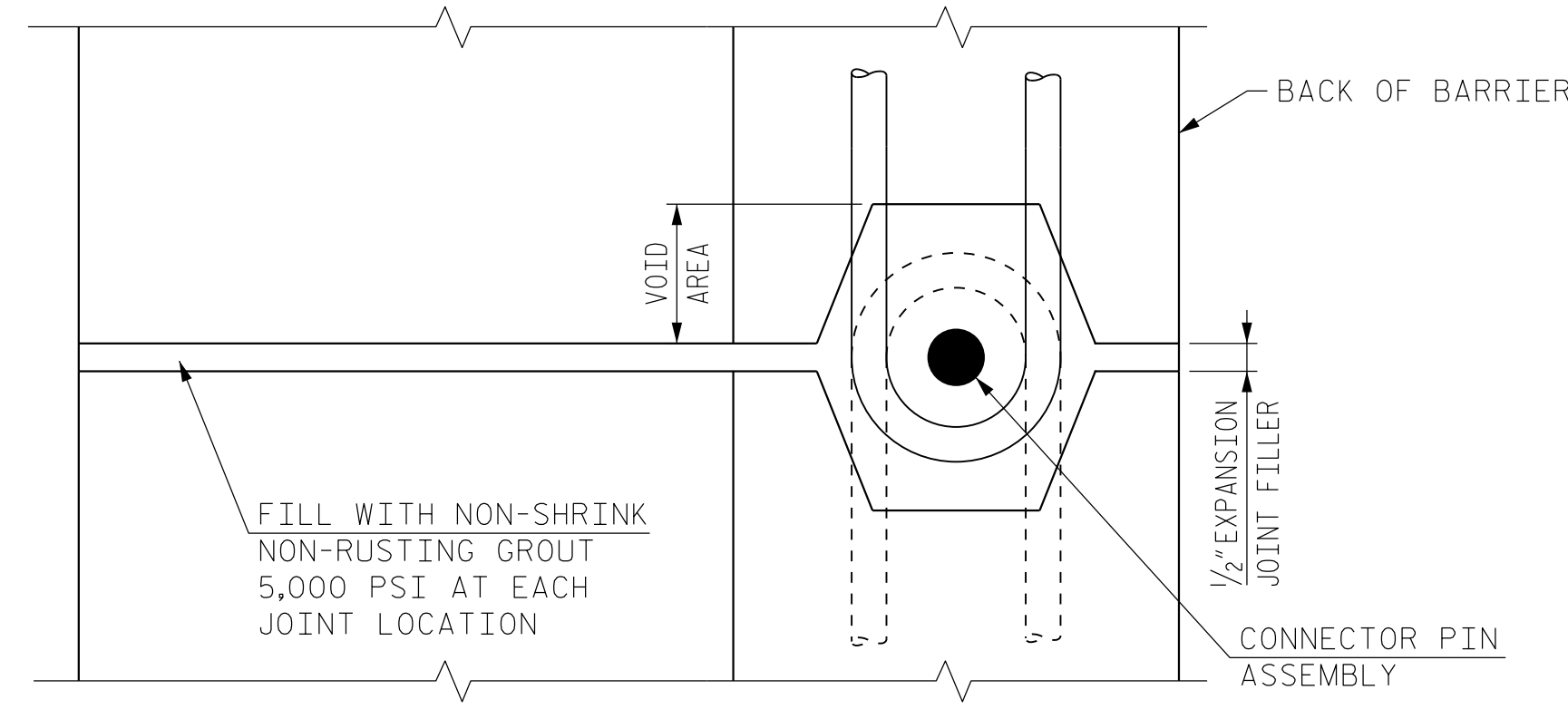


JOINT VIEW ELEVATION

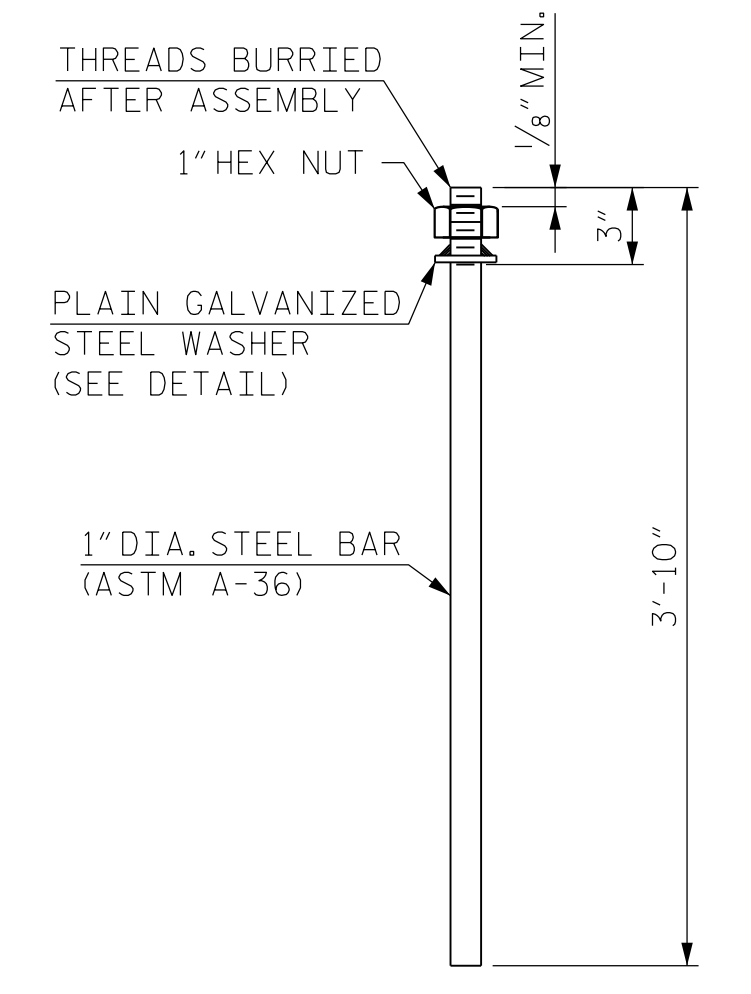


JOINT FILLER DETAIL

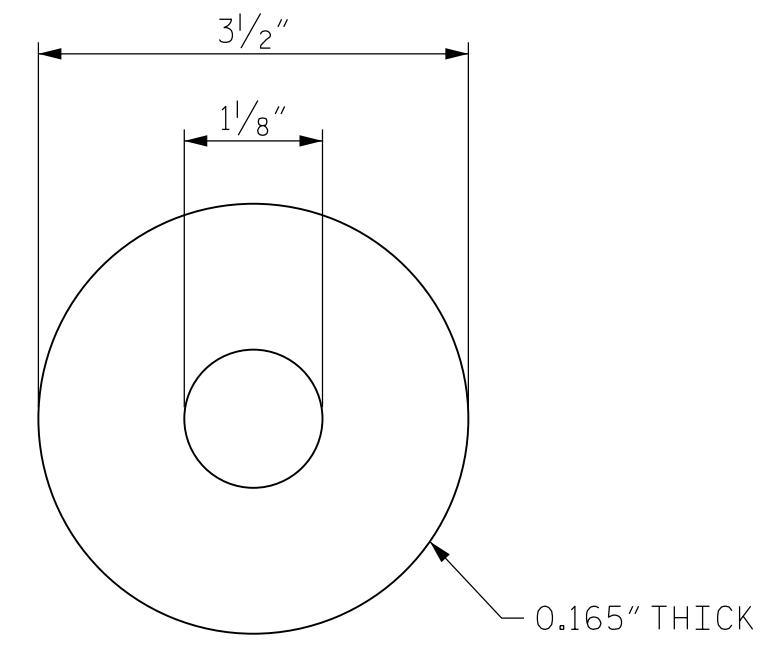
USE JOINT FILLER DETAIL AT 75 FT MAXIMUM SPACINGS



PLAN OF BONDED CONNECTION OF PRECAST UNIT



CONNECTOR PIN ASSEMBLY



PLAIN GALVANIZED STEEL WASHER FOR 1" PIN

CONTRACTS STANDARDS AND DEVELOPMENT UNIT	
Office 919-707-6950	FAX 919-250-4119
PRECAST REINFORCED SINGLE FACE SINGLE SLOPE CONCRETE BARRIER RAIL	
ORIGINAL BY: J. E. KEENE	DATE: APR 2019
MODIFIED BY:	DATE:
CHECKED BY:	DATE:
FILE SPEC.: kkempf/english/single face single slope barrier rail.dgn	

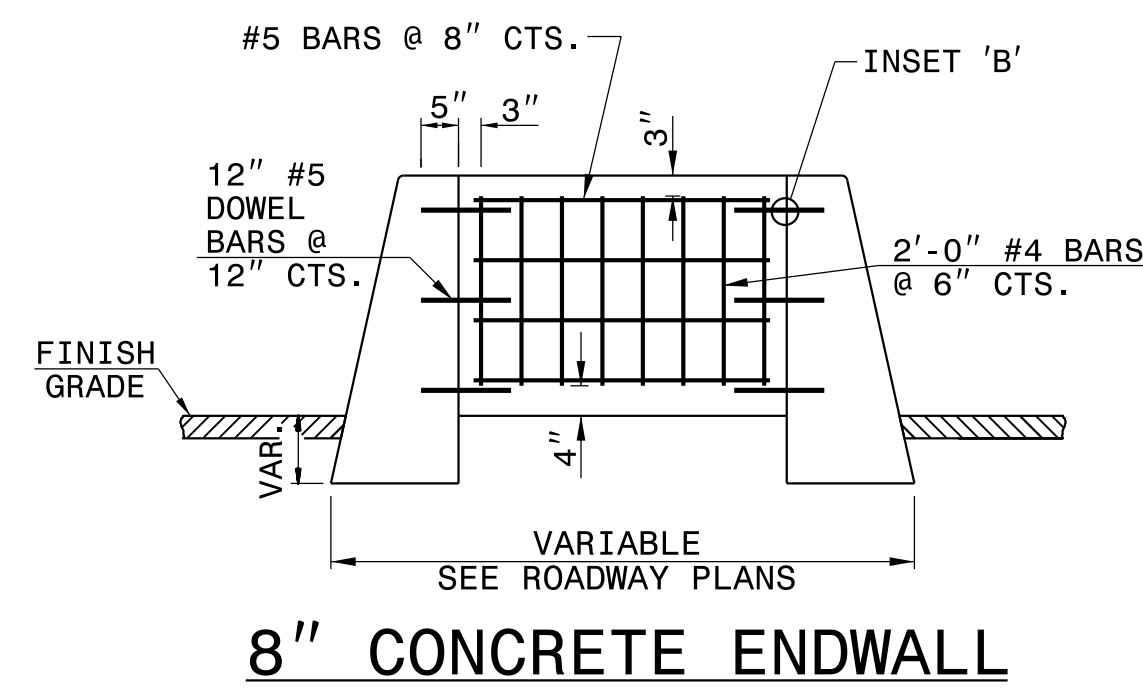
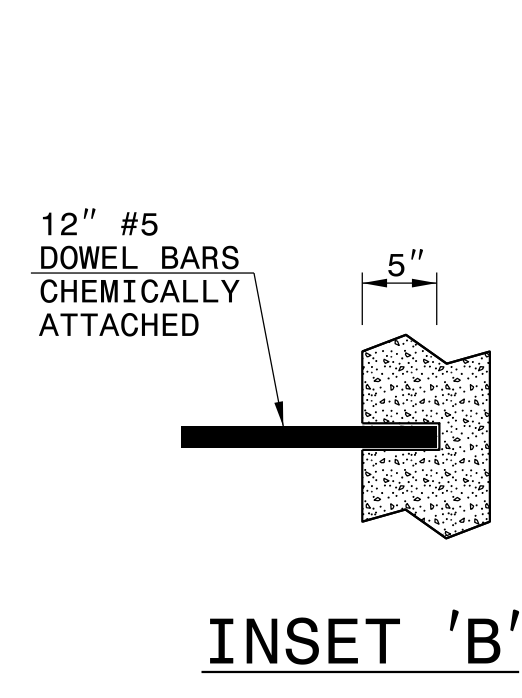
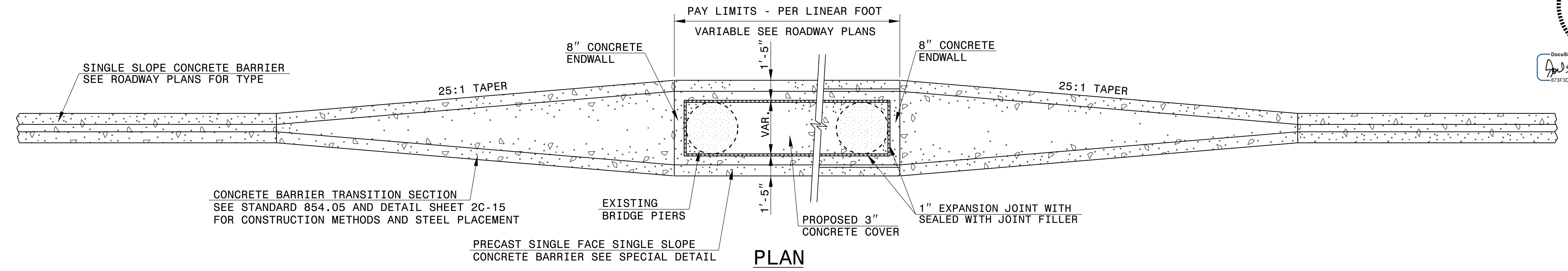
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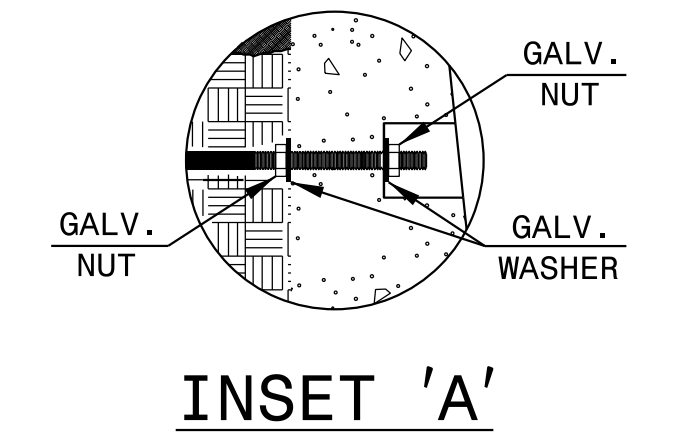
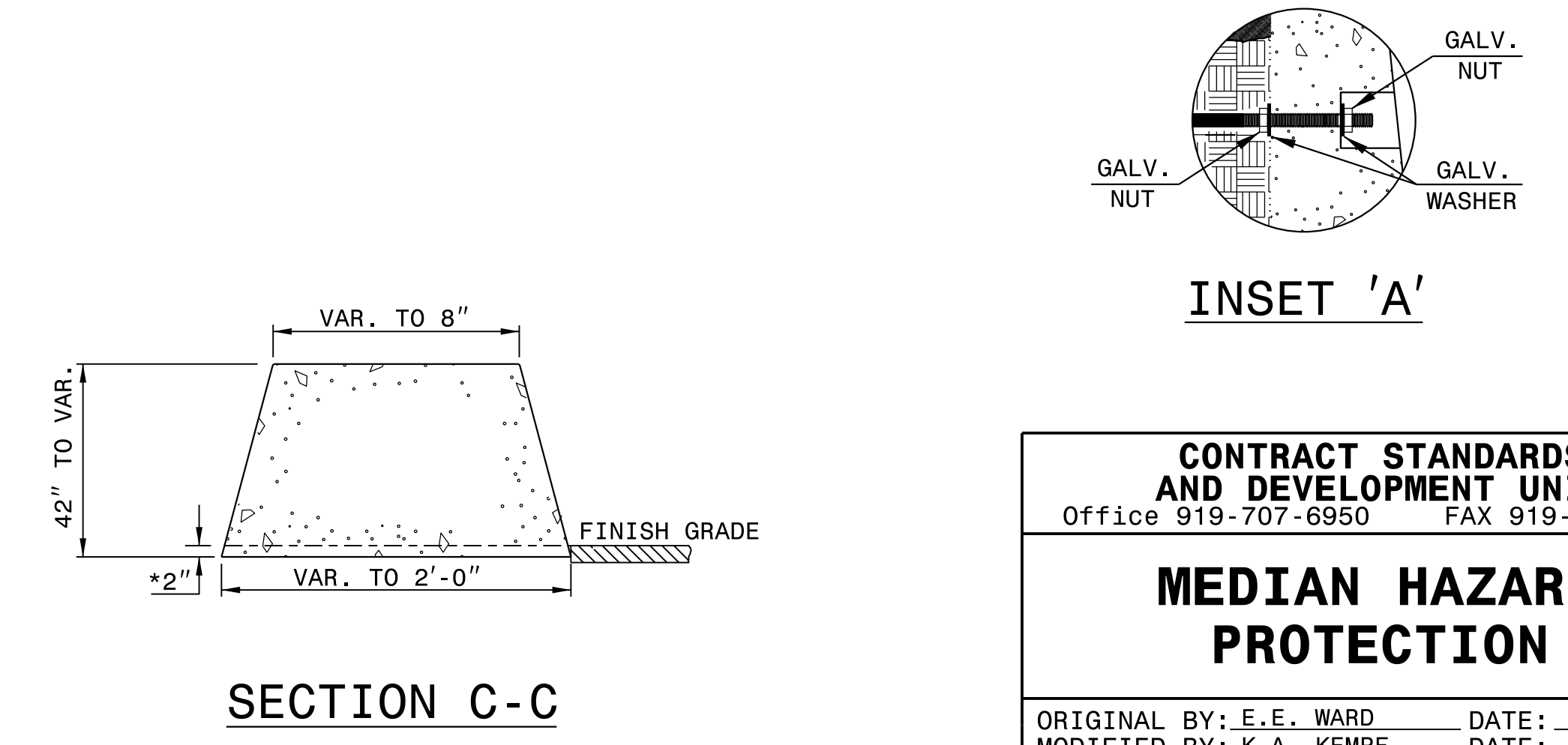
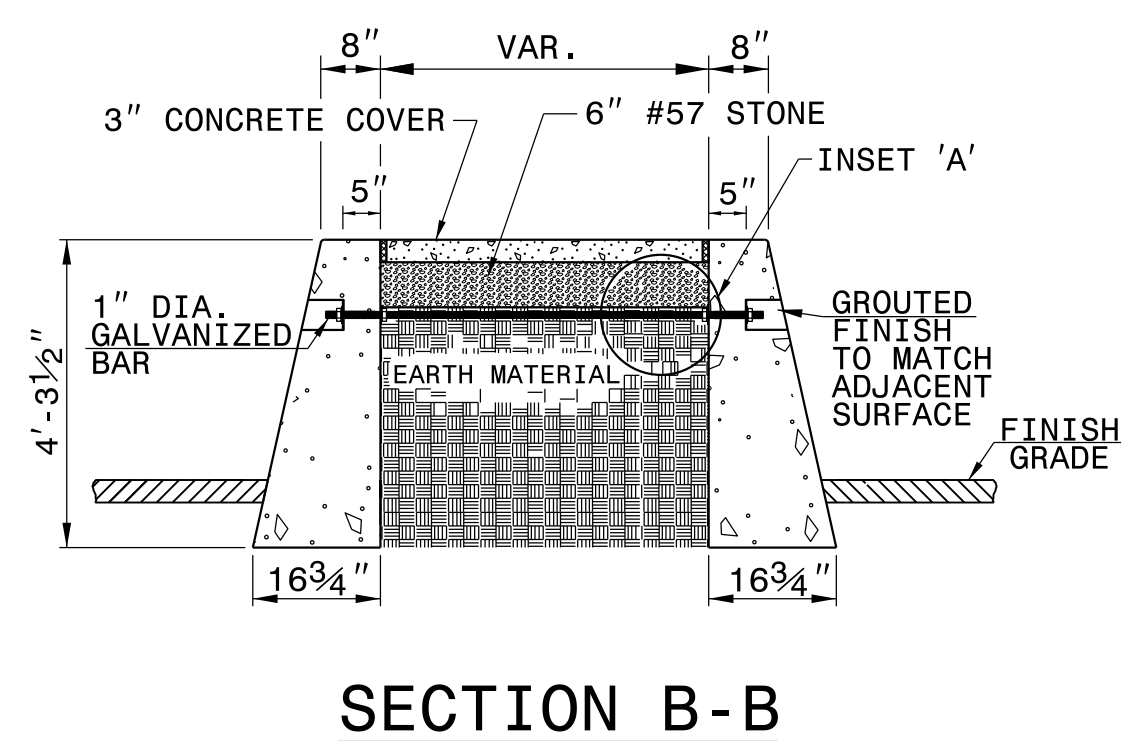
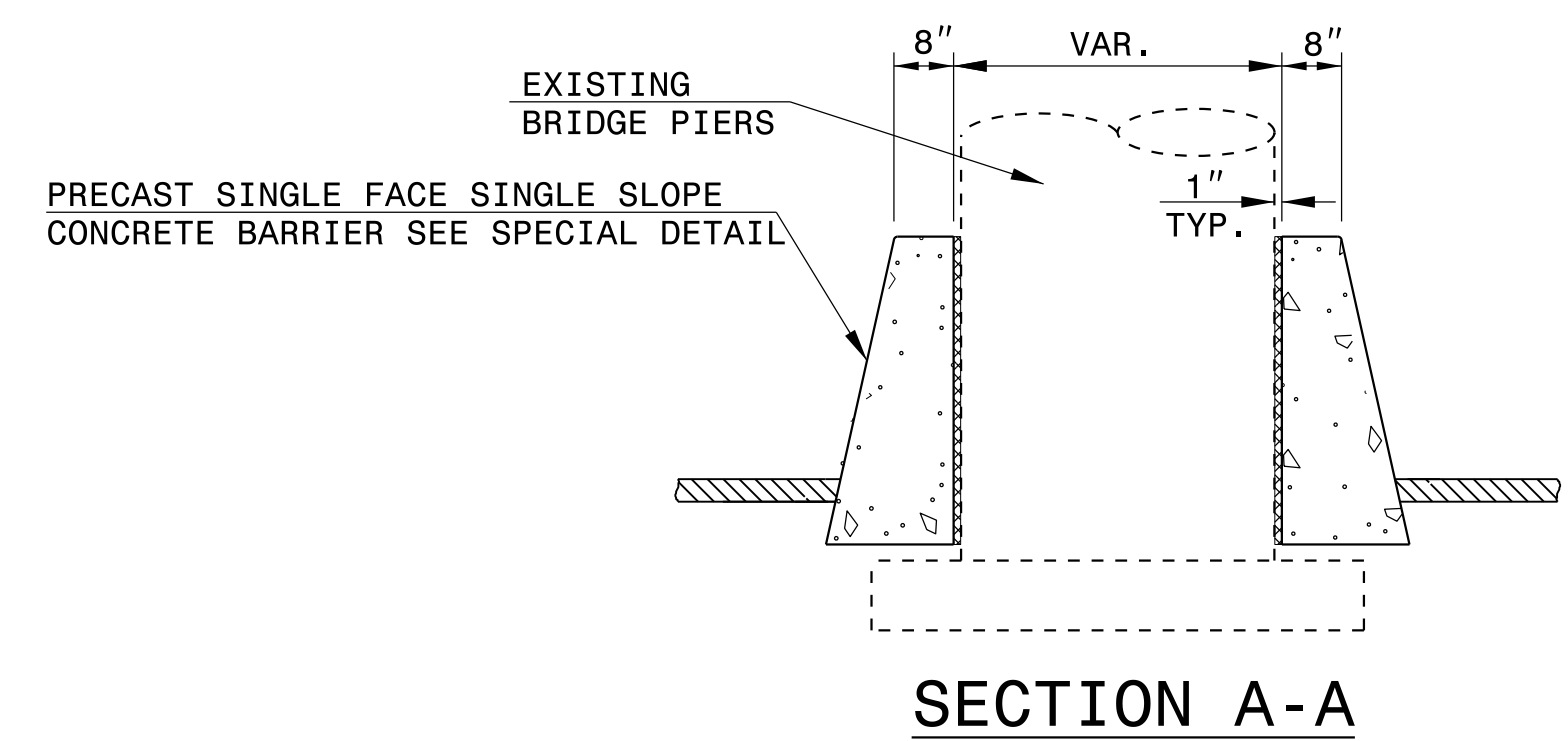
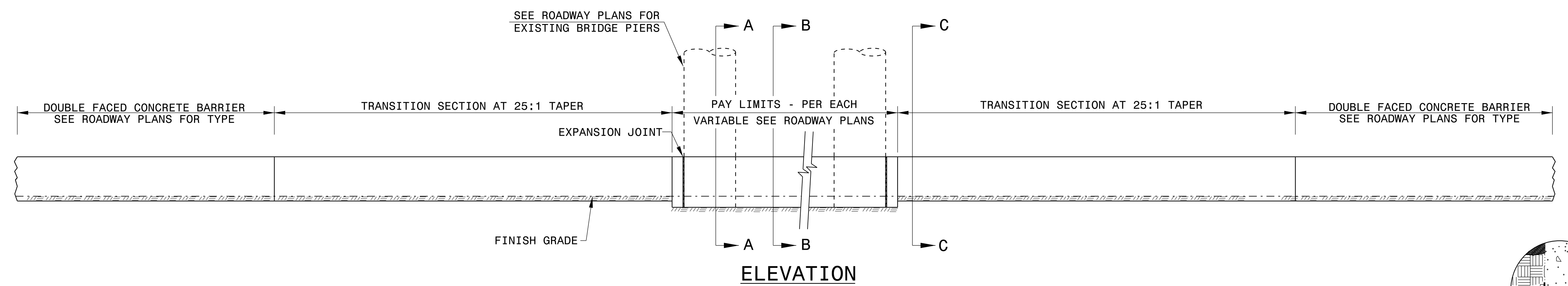
PROJECT REFERENCE NO. 1-4400C	SHEET NO. 2C-08
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



DocuSigned by:
David S. Hest
7/11/2019
673F3D17DCC45F



GENERAL NOTES:
 CONSTRUCT CONCRETE BARRIER WITH CLASS 'AA' CONCRETE. (SEE SPECIFICATIONS SECTION 854).
 CONSTRUCT EXPANSION AND CONTRACTION JOINTS AS SHOWN IN STANDARD DRAWING 854.01.
 SEAL EXPANSION JOINTS WITH JOINT FILLER. (SEE SECTION 1028 OF THE SPECIFICATIONS).
 SEE SPECIAL DETAILS PERTAINING TO SINGLE SLOPE BARRIERS FOR CONSTRUCTION METHODS AND STEEL PLACEMENT.
 SUBMIT ALTERNATIVE METHODS FOR STEEL FABRICATION PLACEMENT FOR REVIEW AND APPROVAL.
 SEE STANDARD DRAWING 854.05 FOR STEEL LAYOUT OF TRANSITION BARRIER.
 *THE 2" DIMENSION FROM FINISH GRADE TO THE BASE IS A MINIMUM DIMENSION.
 INSET FIRST 1" DIA. GALVANIZED BAR 12'-6" AND SPACE THE REMAINING 1' BARS AT 25'-0".
 USE AN APPROVED BONDING SYSTEM IN ACCORDANCE WITH SECTION 1081 OF THE STANDARD SPECIFICATIONS.



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**MEDIAN HAZARD
PROTECTION**

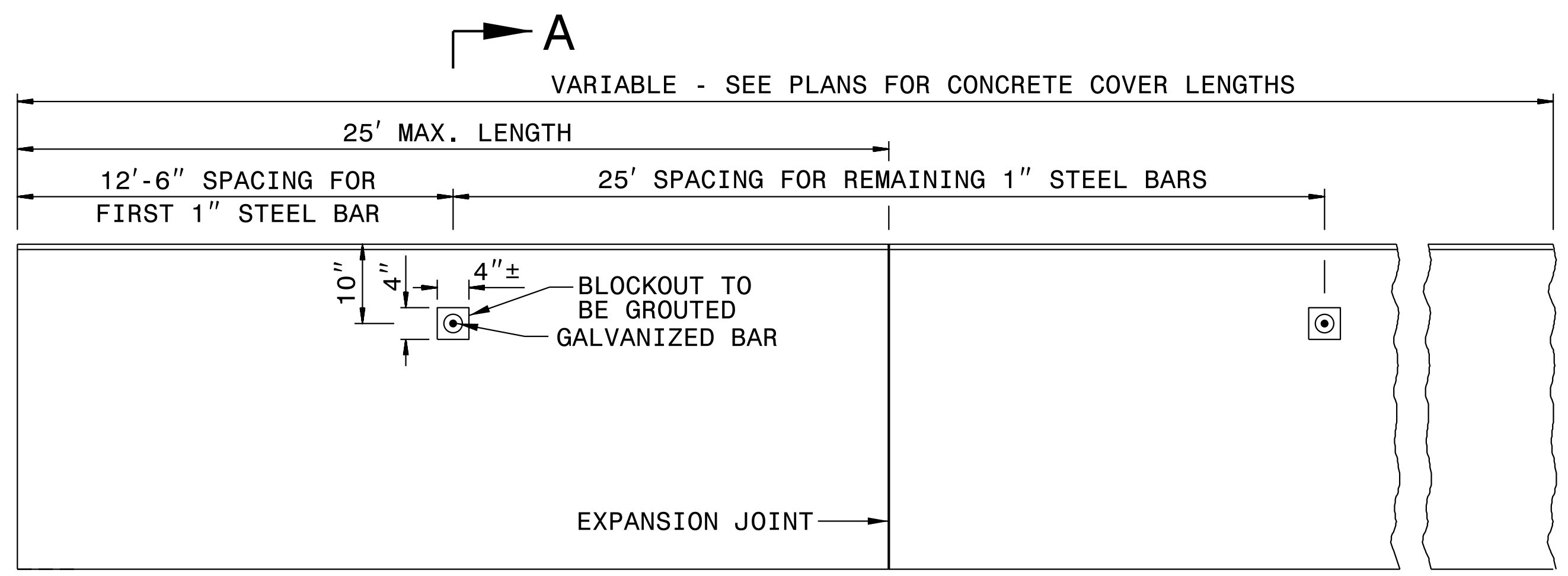
ORIGINAL BY: E.E. WARD	DATE: 7-28-03
MODIFIED BY: K.A. KEMPF	DATE: 5-08-19
CHECKED BY:	DATE:
FILE SPEC.: brittlenenglishguardrailsingle slope concrete barrier.dgn	

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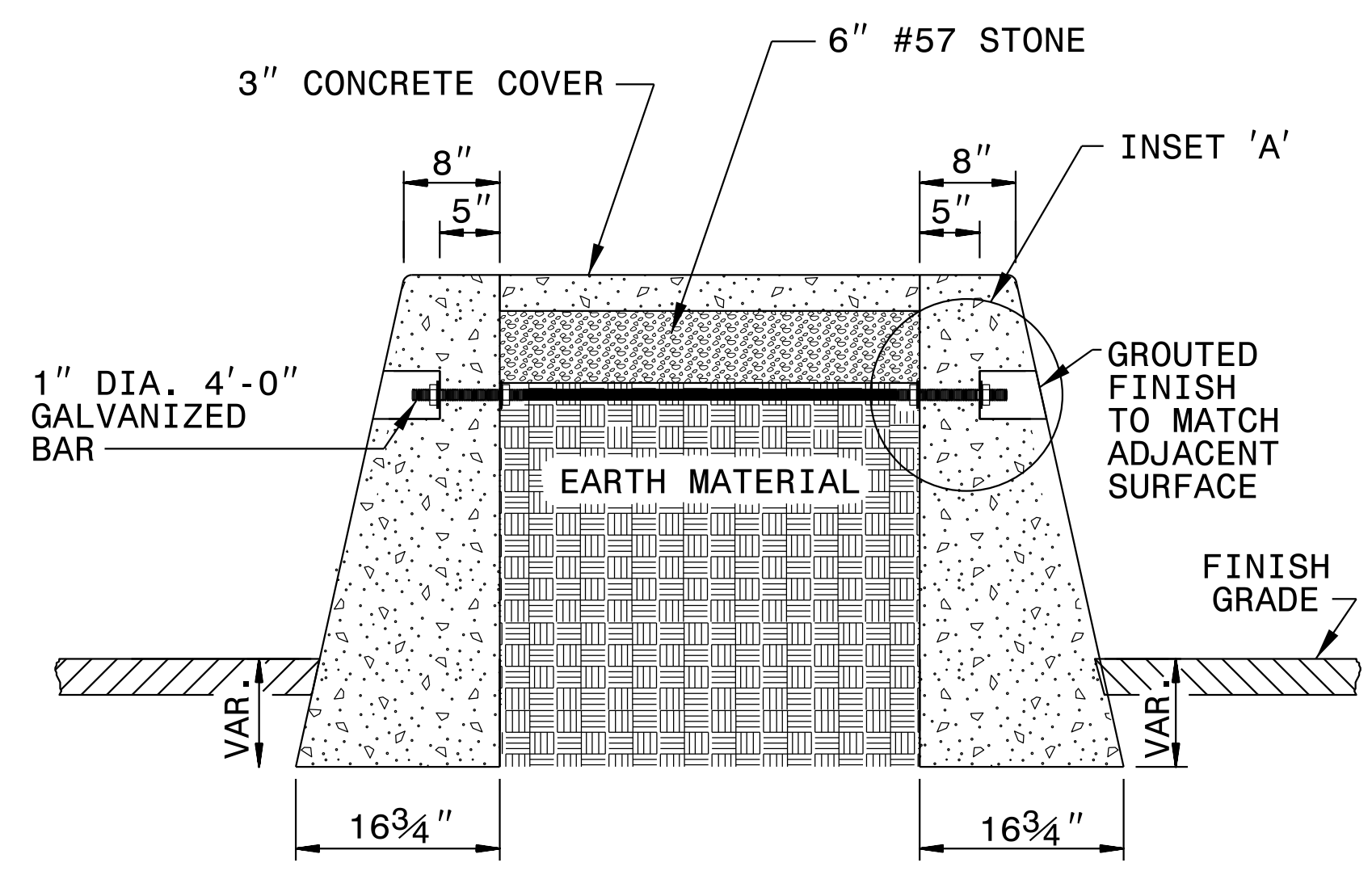
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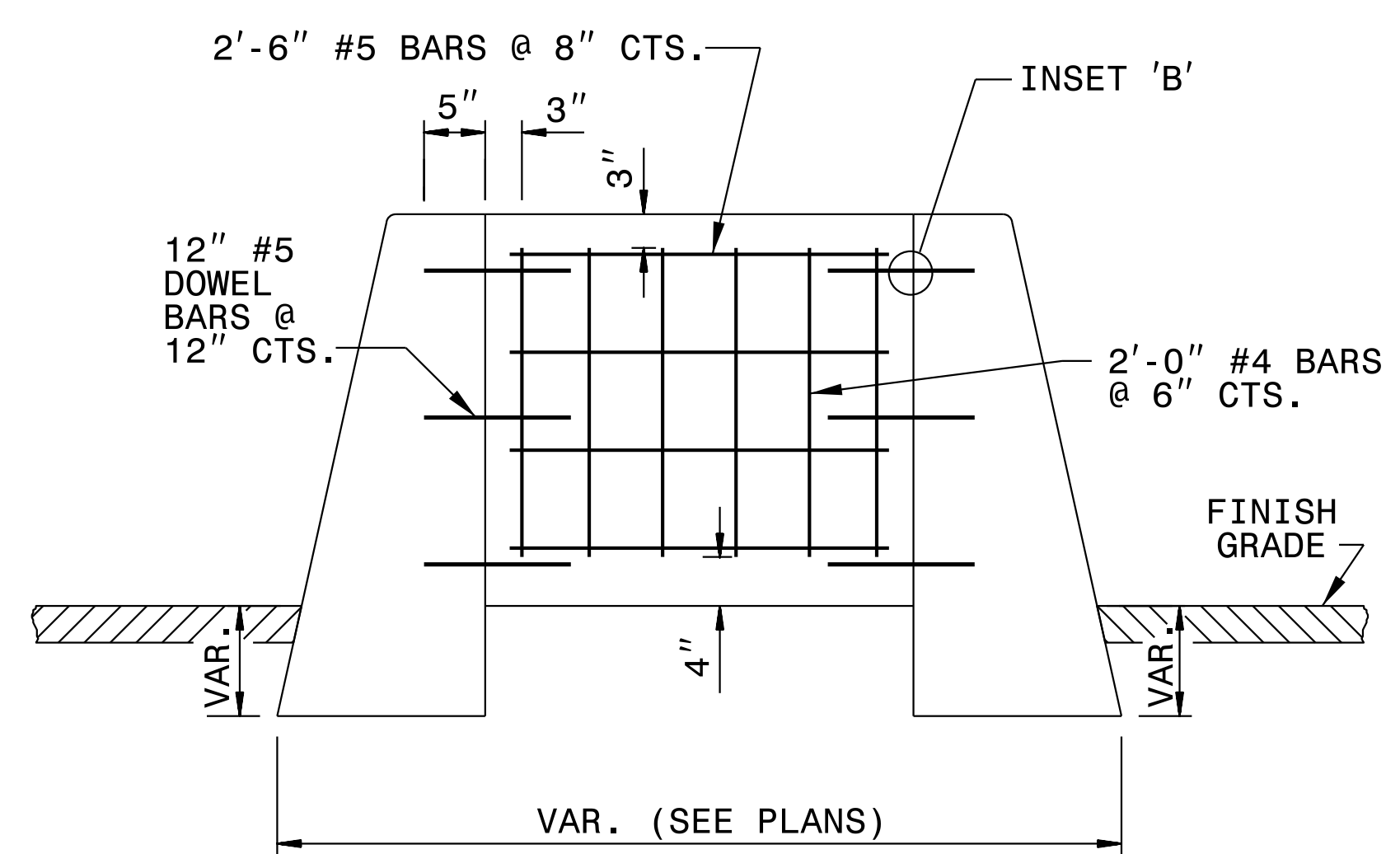
DocuSigned by:
Joe S. Howerton
7/11/2019



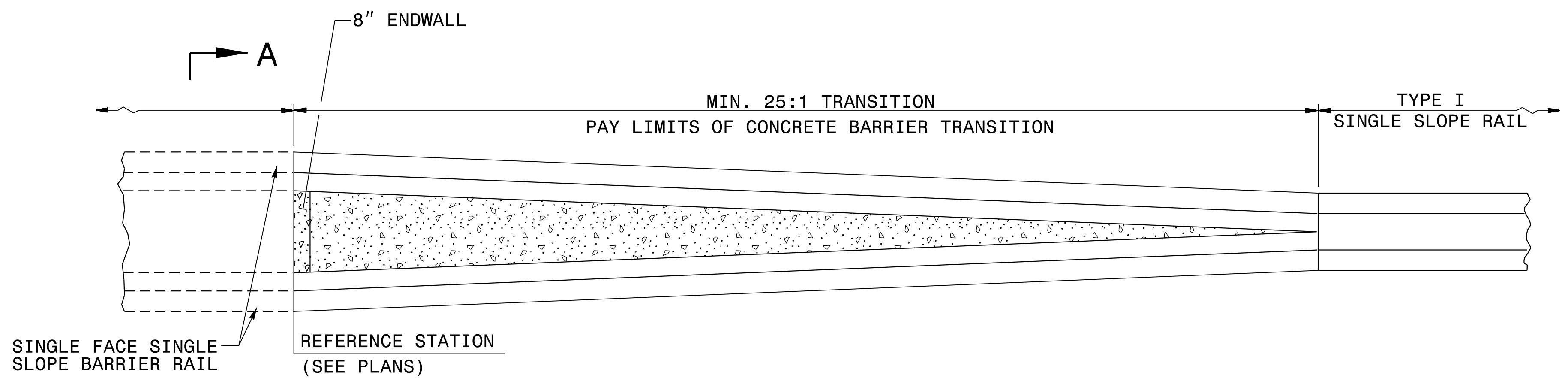
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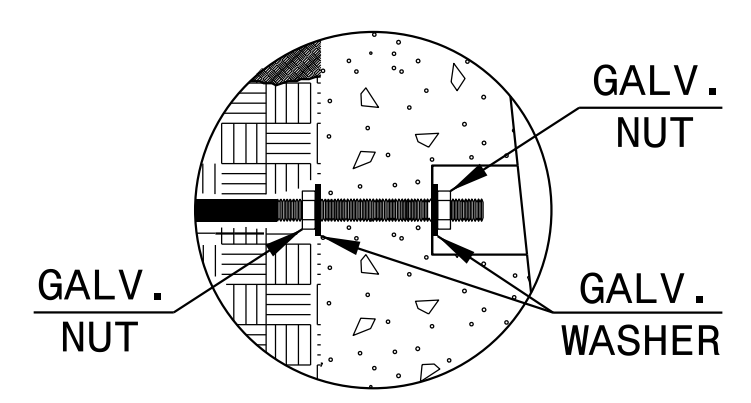
SECTION 'A-A'



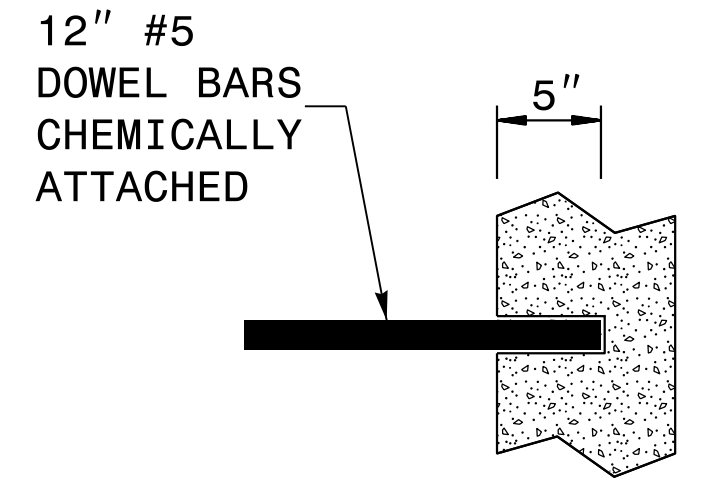
ENDWALL



TRANSITION FROM SINGLE FACE SINGLE SLOPE BARRIER RAIL TO TYPE I SINGLE SLOPE RAIL



INSET 'A'



INSET 'B'

GENERAL NOTES:

USE CLASS 'AA' CONCRETE TO CONSTRUCT CONCRETE BARRIER TRANSITION.

USE CLASS 'B' CONCRETE TO CONSTRUCT CONCRETE COVER.

SEAL ALL EXPANSION JOINTS WITH JOINT FILLER (SEE SECTION 1028 OF THE SPECIFICATIONS).

SEE SPECIAL DETAILS PERTAINING TO SINGLE SLOPE BARRIERS FOR CONSTRUCTION METHODS AND STEEL PLACEMENT.

SUBMIT ALTERNATIVE METHODS FOR STEEL FABRICATION FOR REVIEW.

REFER TO PLANS AND TYPICAL SECTION FOR CONCRETE COVER LOCATIONS.

USE AN APPROVED BONDING SYSTEM IN ACCORDANCE WITH SECTION 1081-1, TYPE 3A OF THE STANDARD SPECIFICATIONS.

DRILL ANCHOR HOLES WITH A PNEUMATIC DRILL UNLESS OTHERWISE APPROVED BY THE ENGINEER.

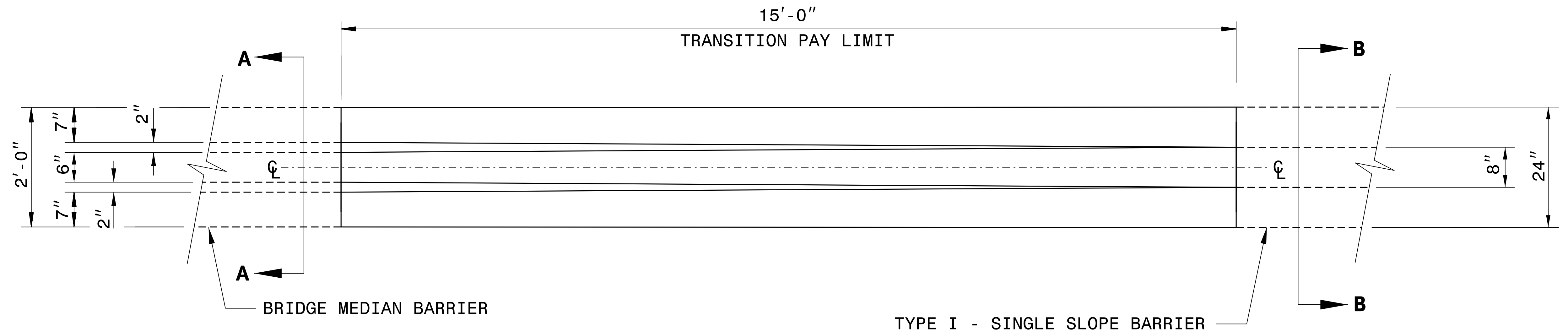
DRILL ANCHOR HOLES IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

REMOVE ALL DEBRIS, CHIPS, DUST, GREASE, OIL AND OTHER FOREIGN MATTER FROM THE ANCHOR HOLES PRIOR TO THE APPLICATION OF THE ADHEIVE BONDING SYSTEM.

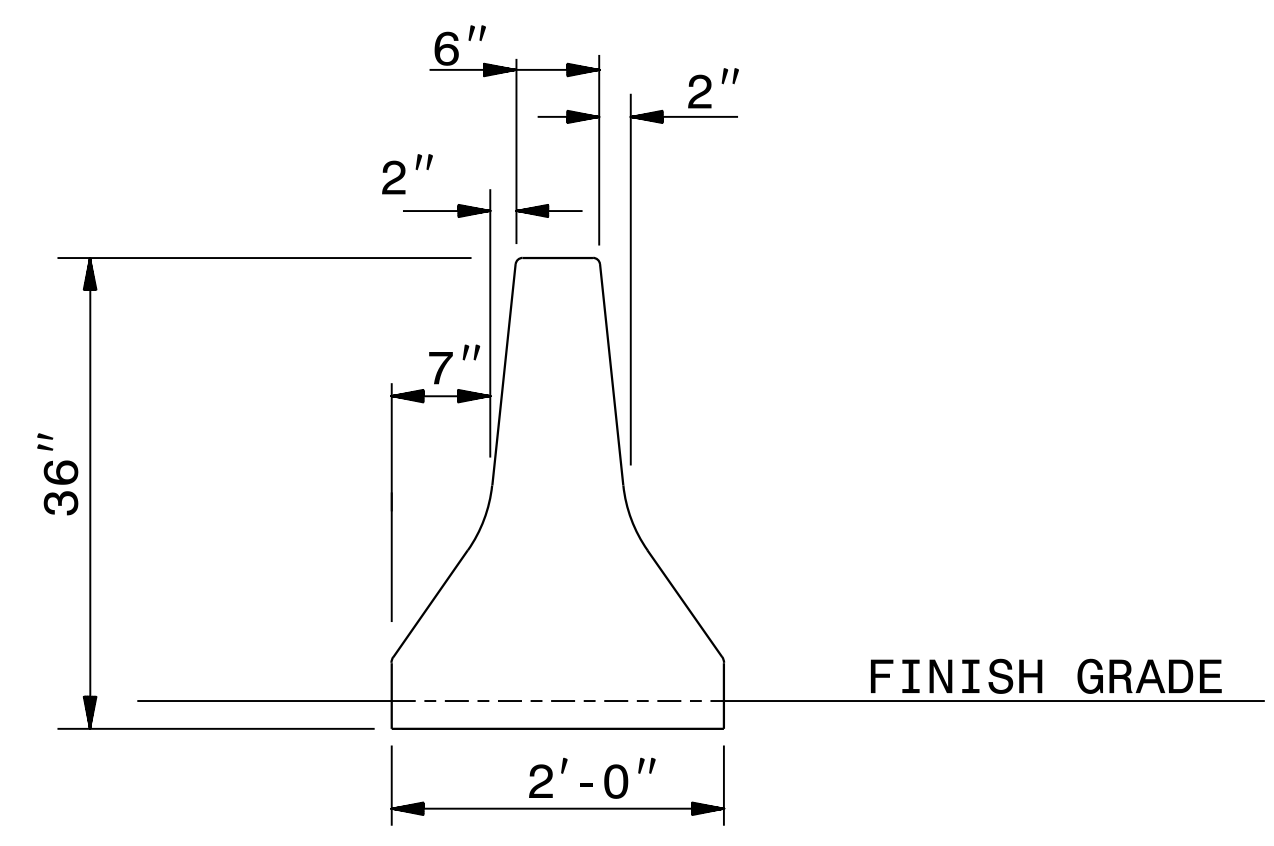
BARRIER TRANSITION LOCATED AS FIELD CONDITIONS DICTATE AND AS DIRECTED BY THE ENGINEER.

J:\MAY-2019\12403 S:\Contracts\Special Details\guardrail\single slope concrete barrier.dgn
 J:\MAY-2019\12403 S:\Contracts\Special Details\guardrail\single slope concrete barrier.dgn
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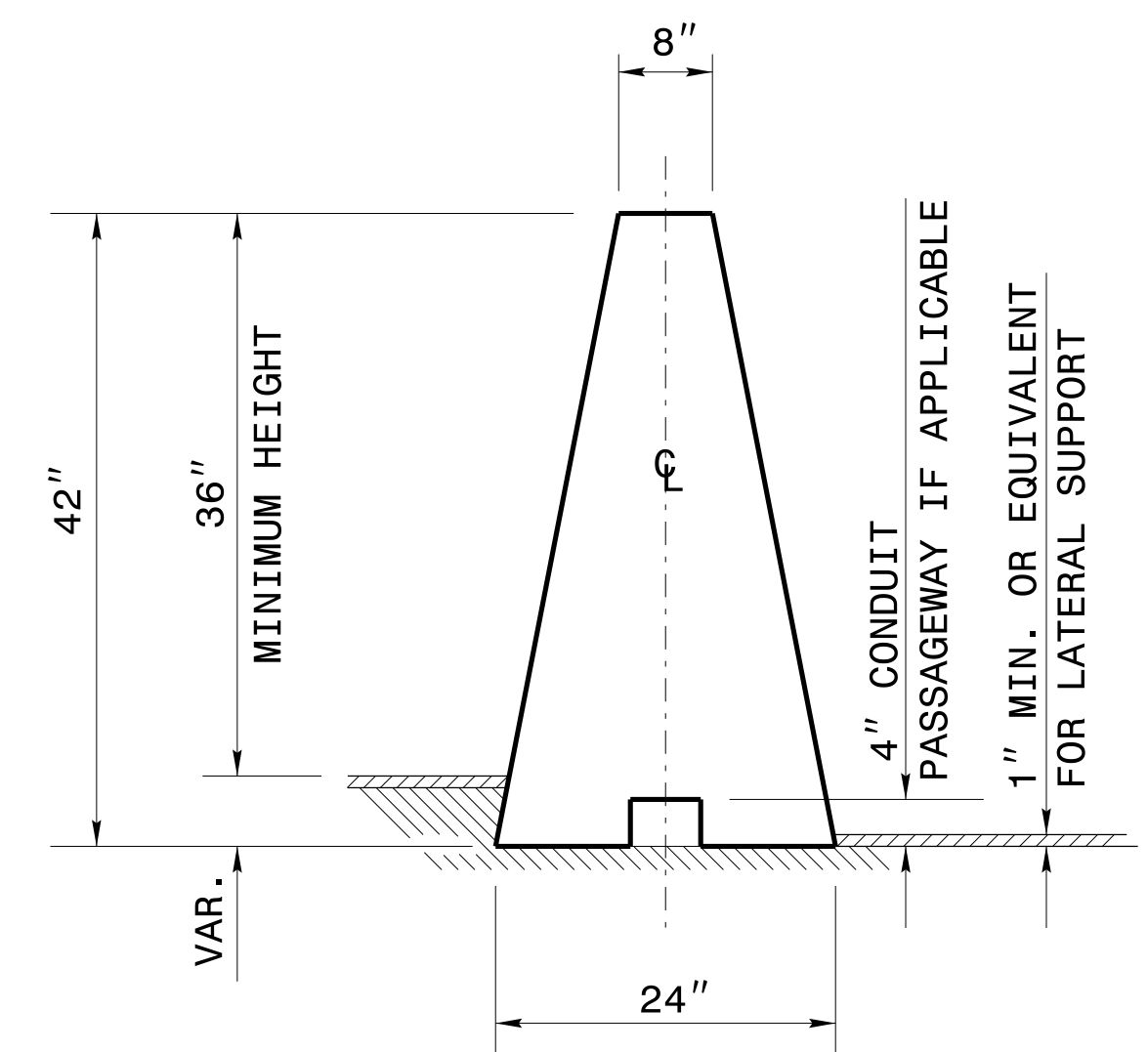
CONTRACT STANDARDS AND DEVELOPMENT UNIT	
Office 919-707-6950 FAX 919-250-4119	
CONCRETE BARRIER TRANSITION	
ORIGINAL BY: T.S.Spell	DATE: 2-14-00
MODIFIED BY: K.A.Kempf	DATE: 5-08-19
CHECKED BY:	DATE:
FILE SPEC.: details/nbritt/english/guardrail/single slope concrete barrier.dgn	



**TRANSITION FROM BRIDGE MEDIAN BARRIER
TO TYPE I SINGLE SLOPE BARRIER**



SECTION A-A
BRIDGE MEDIAN BARRIER



SECTION B-B
TYPE I - SINGLE SLOPE CONCRETE BARRIER

NOTES:
 SEE SPECIAL DETAILS PERTAINING TO SINGLE SLOPE BARRIERS FOR CONSTRUCTION METHODS AND STEEL PLACEMENT.
 SEE STRUCTURE PLANS FOR BRIDGE MEDIAN BARRIER CONSTRUCTION METHODS AND STEEL PLACEMENT.
 DIMENSIONS OF CONCRETE MEDIAN BARRIER ARE APPROXIMATE AND SHOULD BE FIELD VERIFIED.

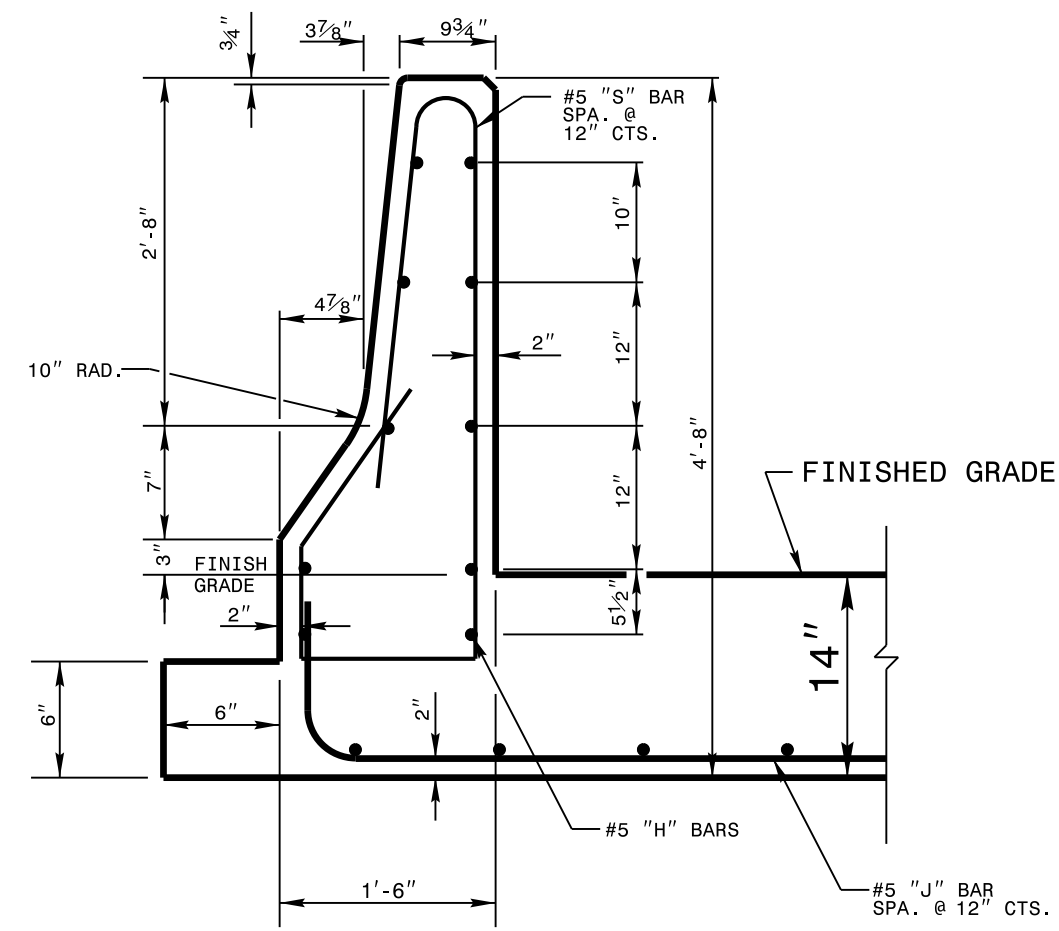


DocuSigned by:
S. Howerton
 8793a1110c0c48...

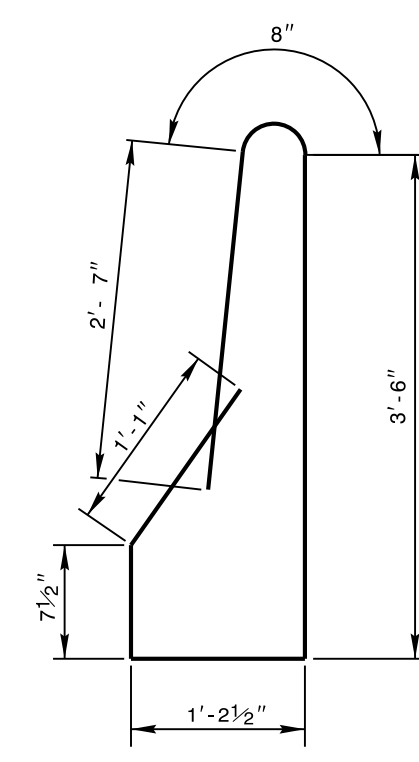
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CONTRACT STANDARDS AND DEVELOPMENT UNIT	
Office 919-707-6950	FAX 919-250-4119
CONCRETE BARRIER TRANSITION	
ORIGINAL BY: T. STEPHENSON	DATE: 1-97
MODIFIED BY: K.A.K.	DATE: 5-19
CHECKED BY:	DATE:
FILE SPEC.: britt/english/guardrail/single slope concrete barrier.dgn	

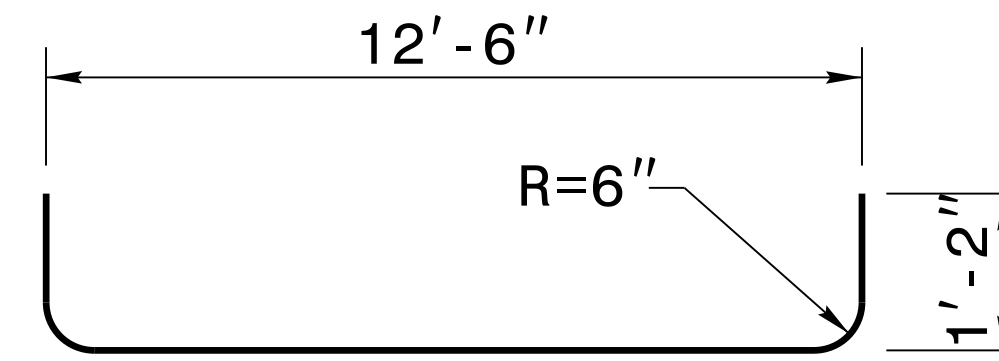
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 J:\overton AT USD-232595



DETAIL X-X
CROSS SECTIONAL VIEW



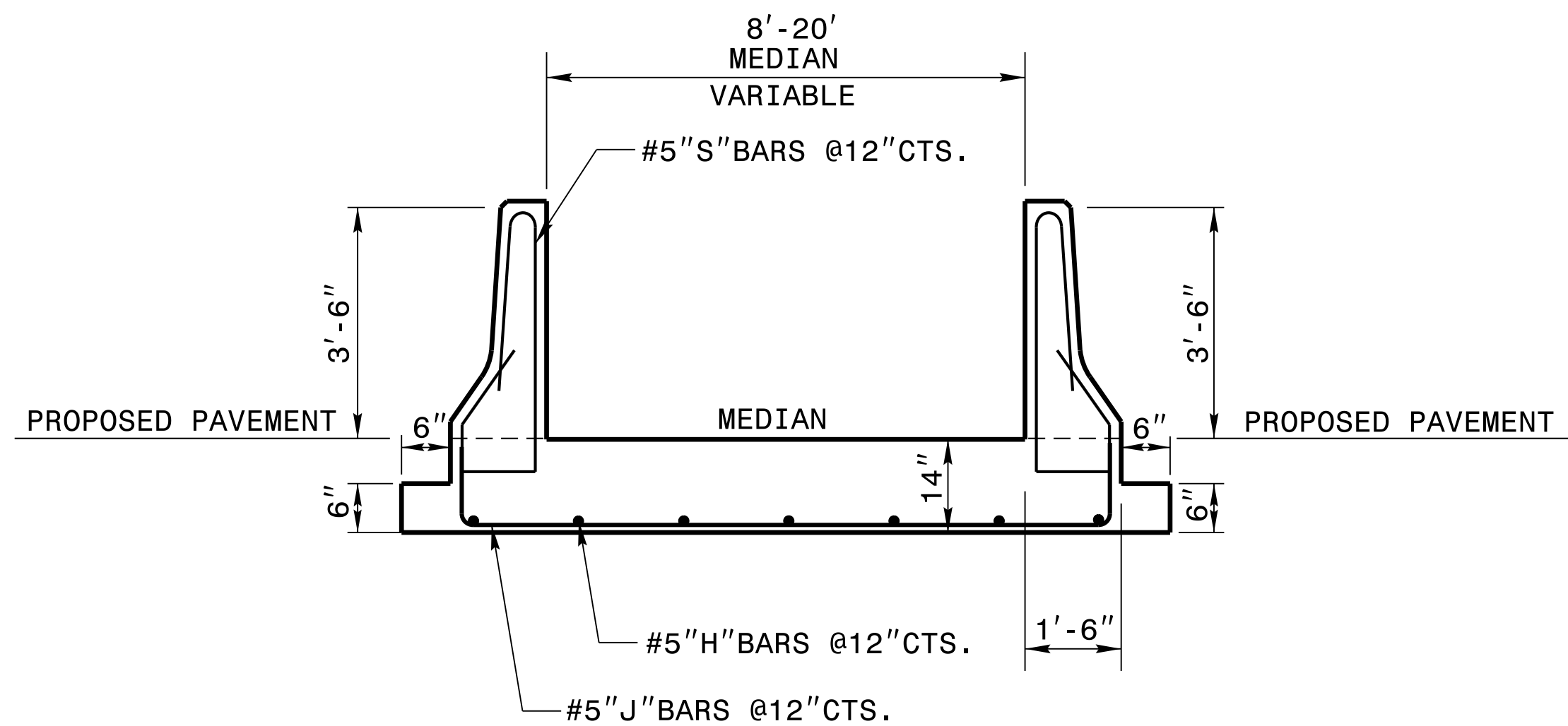
S - BARS
#5 BAR



J - BARS
#5 BAR

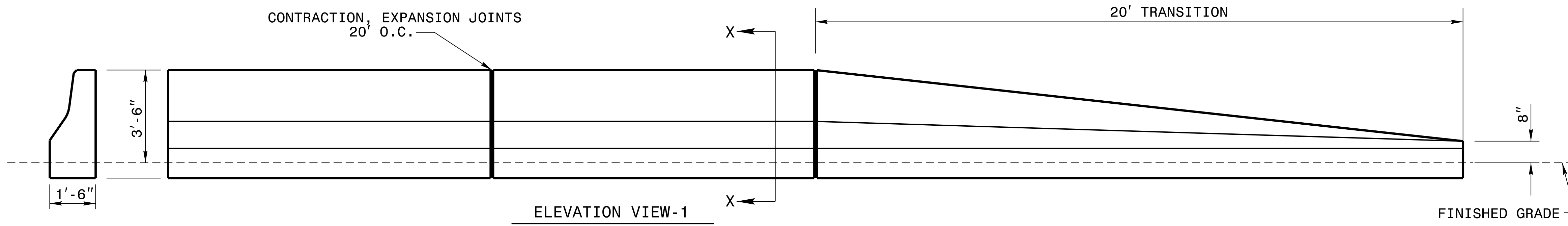
GENERAL NOTES:

- CLASS 'AA' CONCRETE TO BE USED THROUGHOUT.
- REINFORCING STEEL TO BE CUT, BENT OR RELOCATED TO POSITION PIPE AS DIRECTED BY THE ENGINEER.
- ALL EXPOSED CORNERS TO BE CHAMFERED 1".
- MAINTAIN 2" MINIMUM CONCRETE COVERAGE ON ALL STEEL.



CROSS SECTIONAL VIEW

BILL OF MATERIAL					
CODE	BAR#	LENGTH	LBS/FT.	QTY.	LBS
H	5	19'-8"	1.043	968	19,856
J	5	14'-6"	1.043	924	13,974
S	5	9'-8"	1.043	924	9,317
TOTAL WEIGHT STEEL					43,147
MASONRY QUANTITIES					
CLASS "AA" CONCRETE					
SINGLE FACE BARRIER					
AND MEDIAN					700 CU.YDS.
TOTAL CLASS "AA" CONCRETE					700 CU.YDS.



ELEVATION VIEW-1



DocuSigned by:
S. Howerton
7/11/2019

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UNLESS ALL SIGNATURES COMPLETED

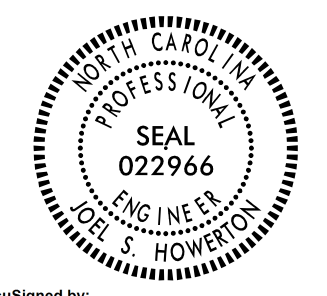
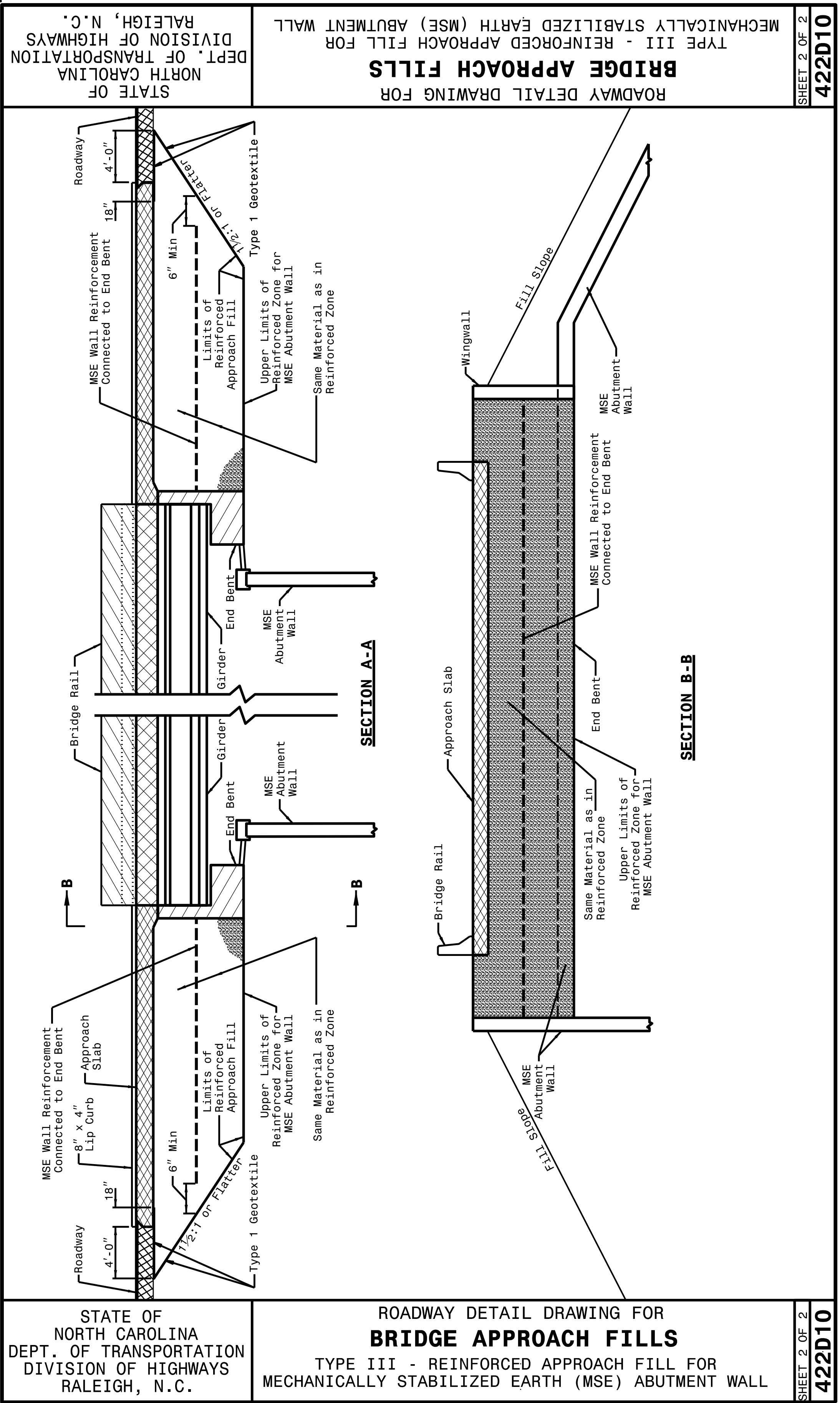
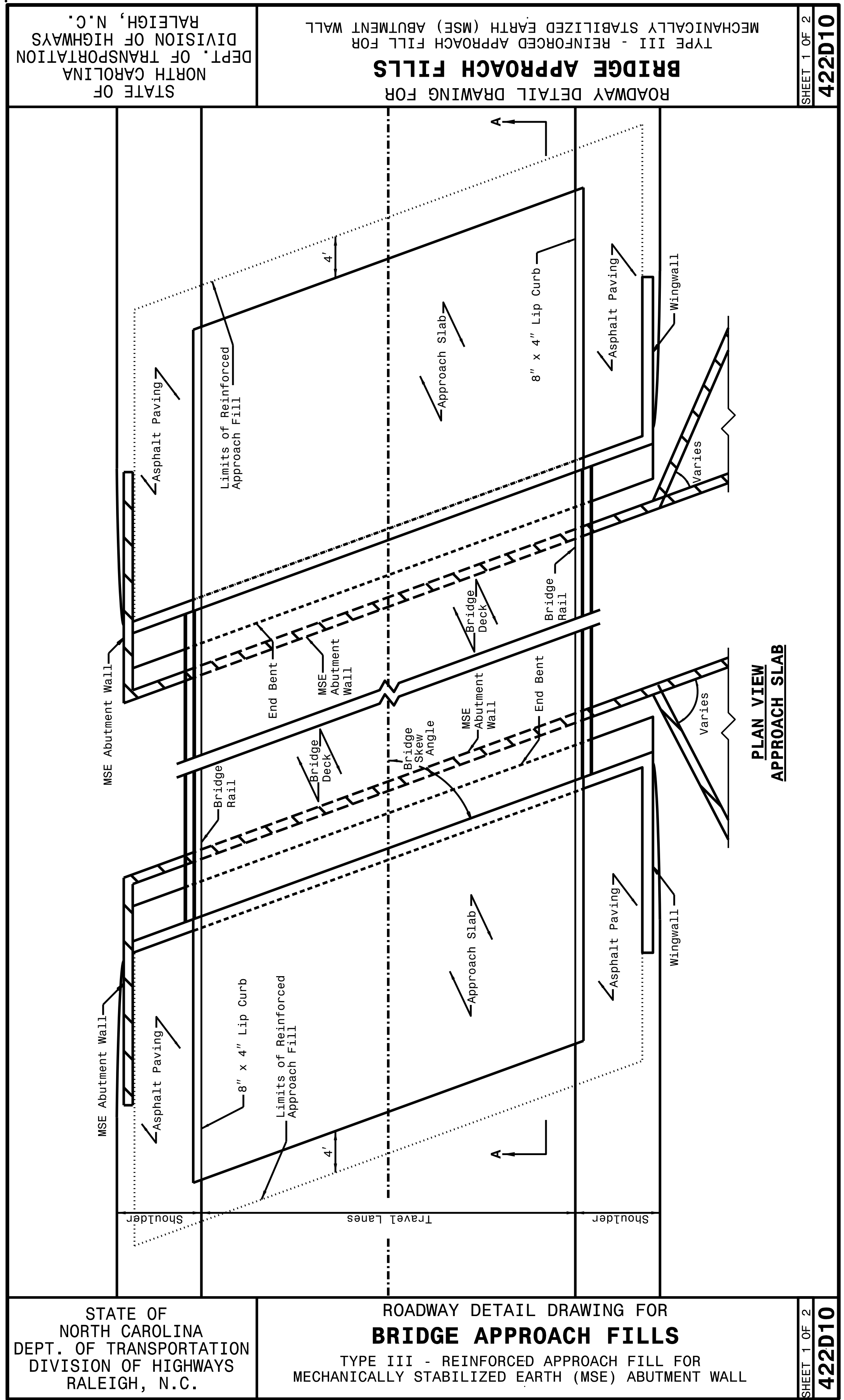
**CONTRACT STANDARDS
STANDARDS AND SPECIAL DESIGN**
Office 919-250-4128 FAX 919-250-4119

DDI BRIDGE BARRIER

ORIGINAL BY: _____ DATE: _____
 MODIFIED BY: nbritt DATE: 4-26-13
 CHECKED BY: _____ DATE: _____
 FILE SPEC.: nbritt\english\interstate\i5501 ddi bridge barrier.dgn

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5/14/99



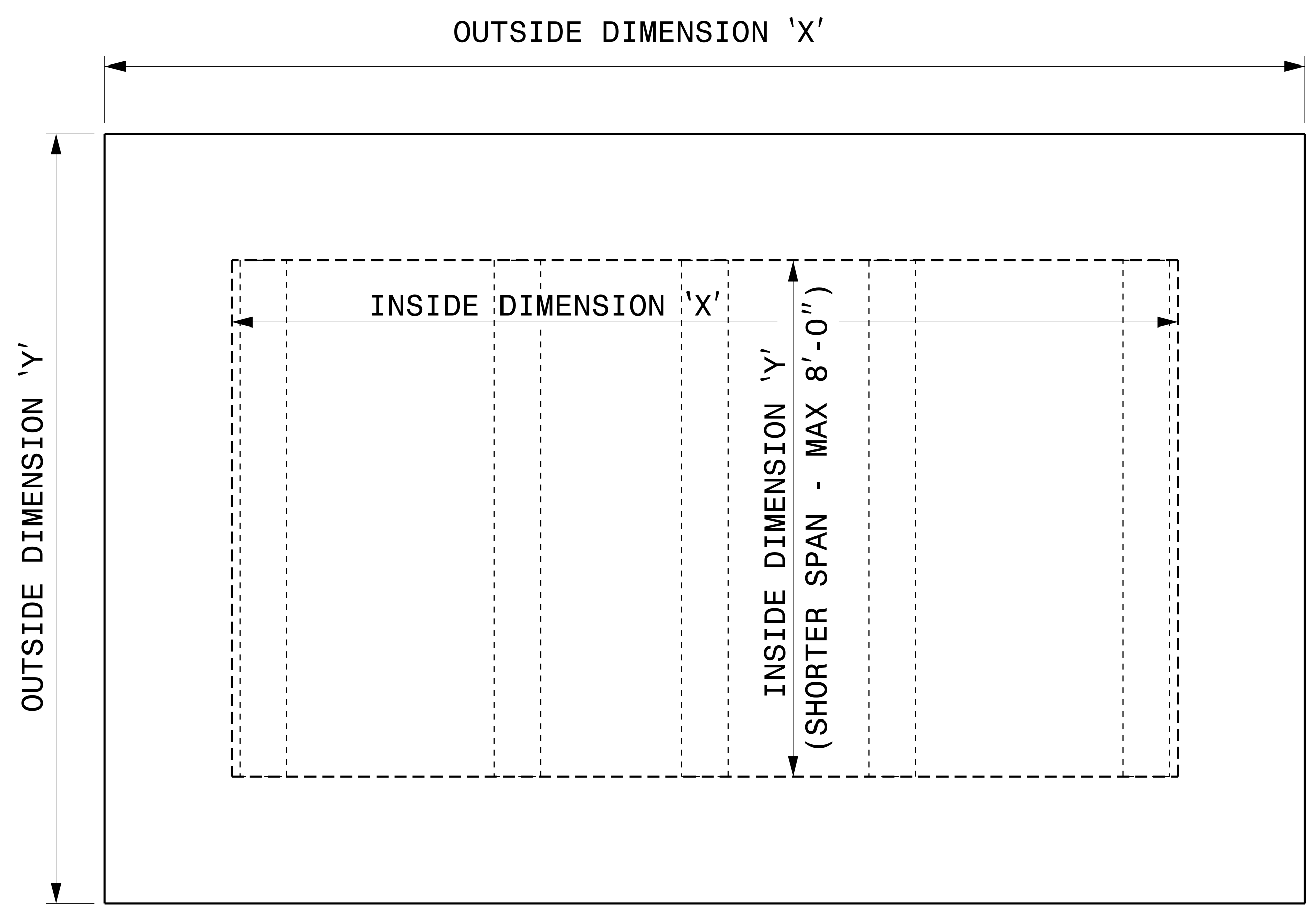
DocuSigned by:
J. S. Howerton
7/11/2019

**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

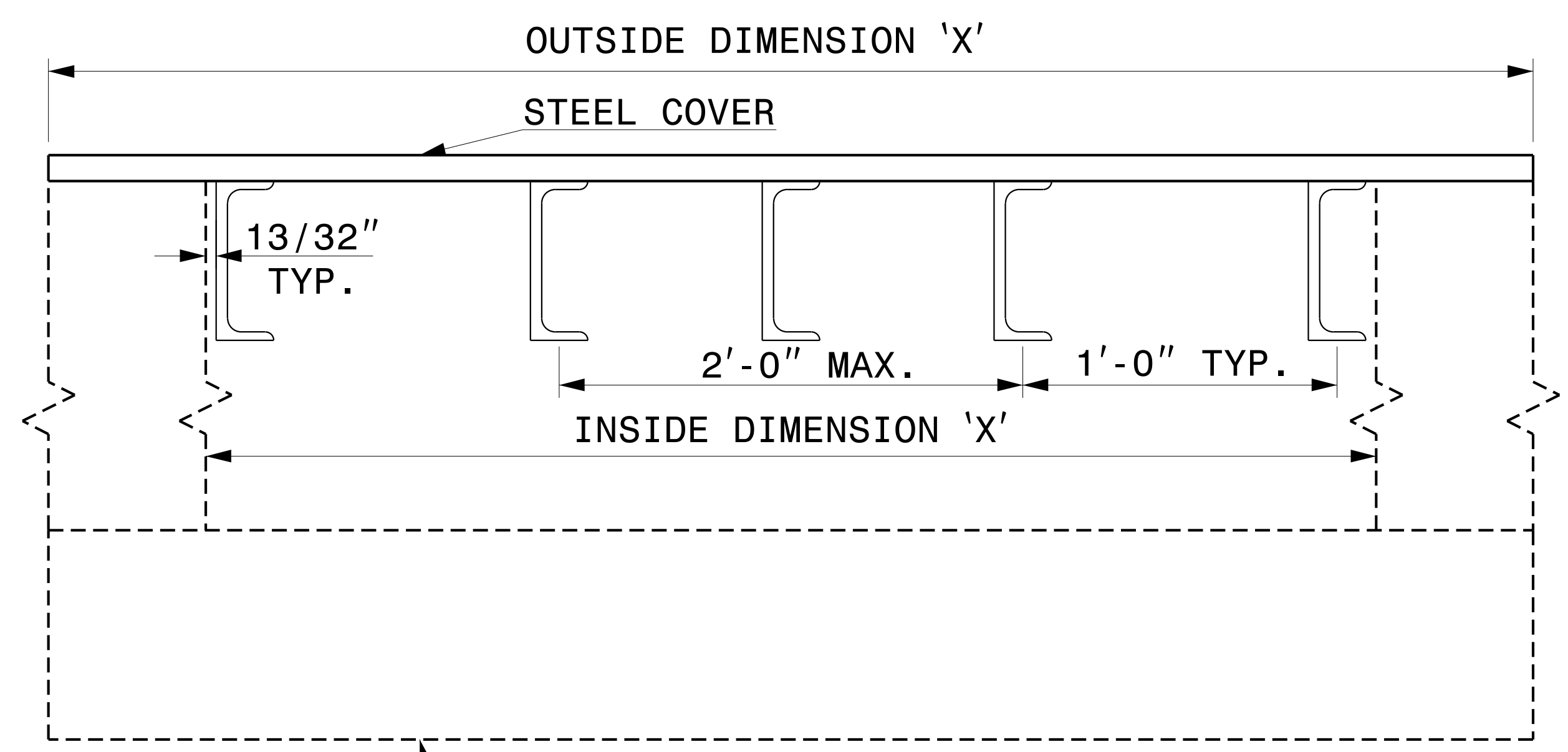
**CONTRACTS STANDARDS
AND DEVELOPMENT UNIT**
Office 919-707-6950 FAX 919-250-4119

**TYPE III
REINFORCED
APPROACH FILLS**

ORIGINAL BY: K. A. KEMPF DATE: JULY 2017
 MODIFIED BY: DATE:
 CHECKED BY: DATE:
 FILE SPEC.: 2018 standard drawings\division 422d10.dgn



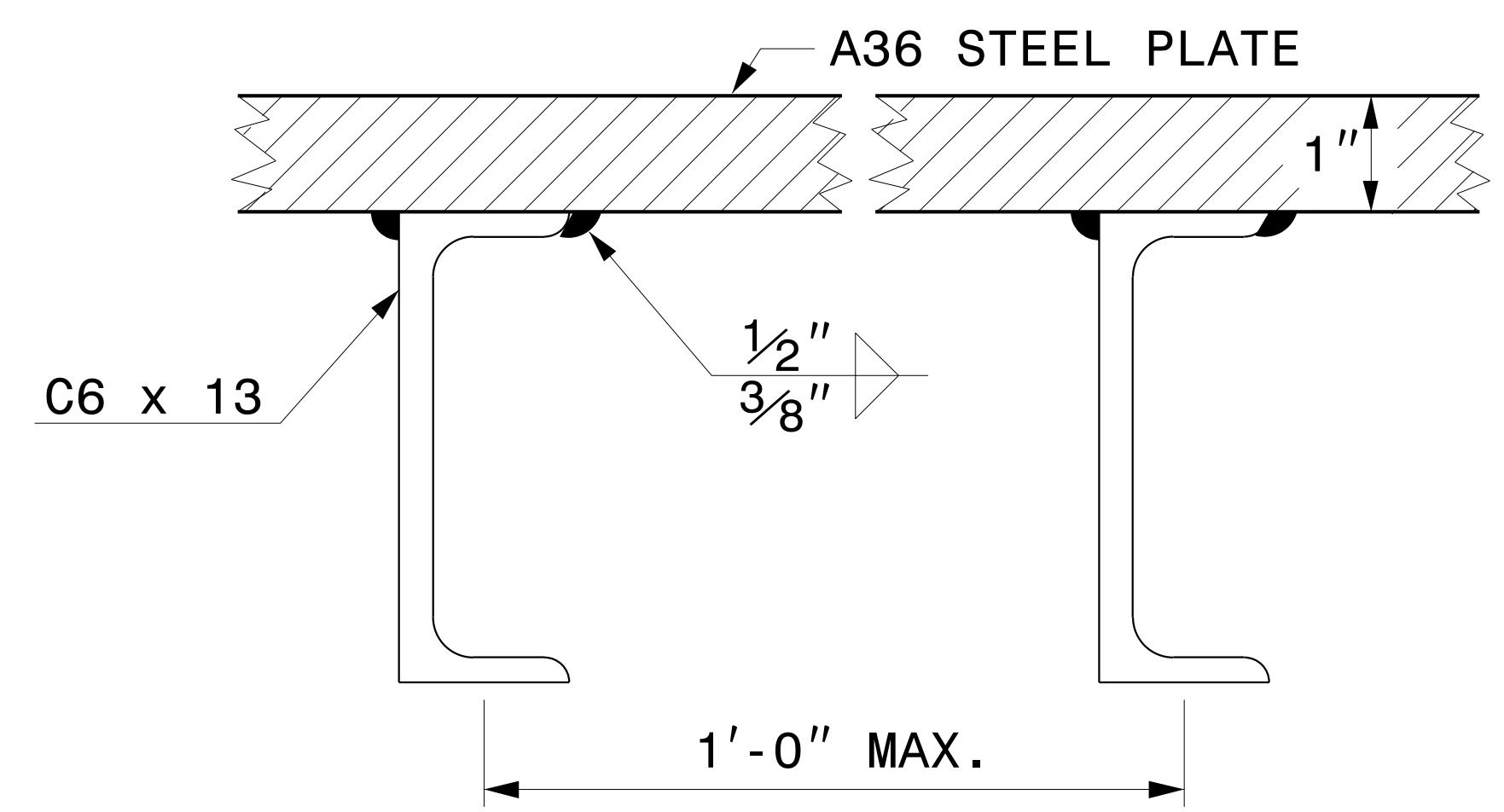
PLAN VIEWS



ELEVATION VIEWS

GENERAL NOTES:

- STEEL COVERS ARE FOR TEMPORARY USE TO SUPPORT TRAFFIC DURING PHASE CONSTRUCTION.
- PLACE PAVEMENT OR FILL 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

WELDS SHALL BE AS SPECIFIED BY AWS



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Michael S. Howerton
 7/11/2019

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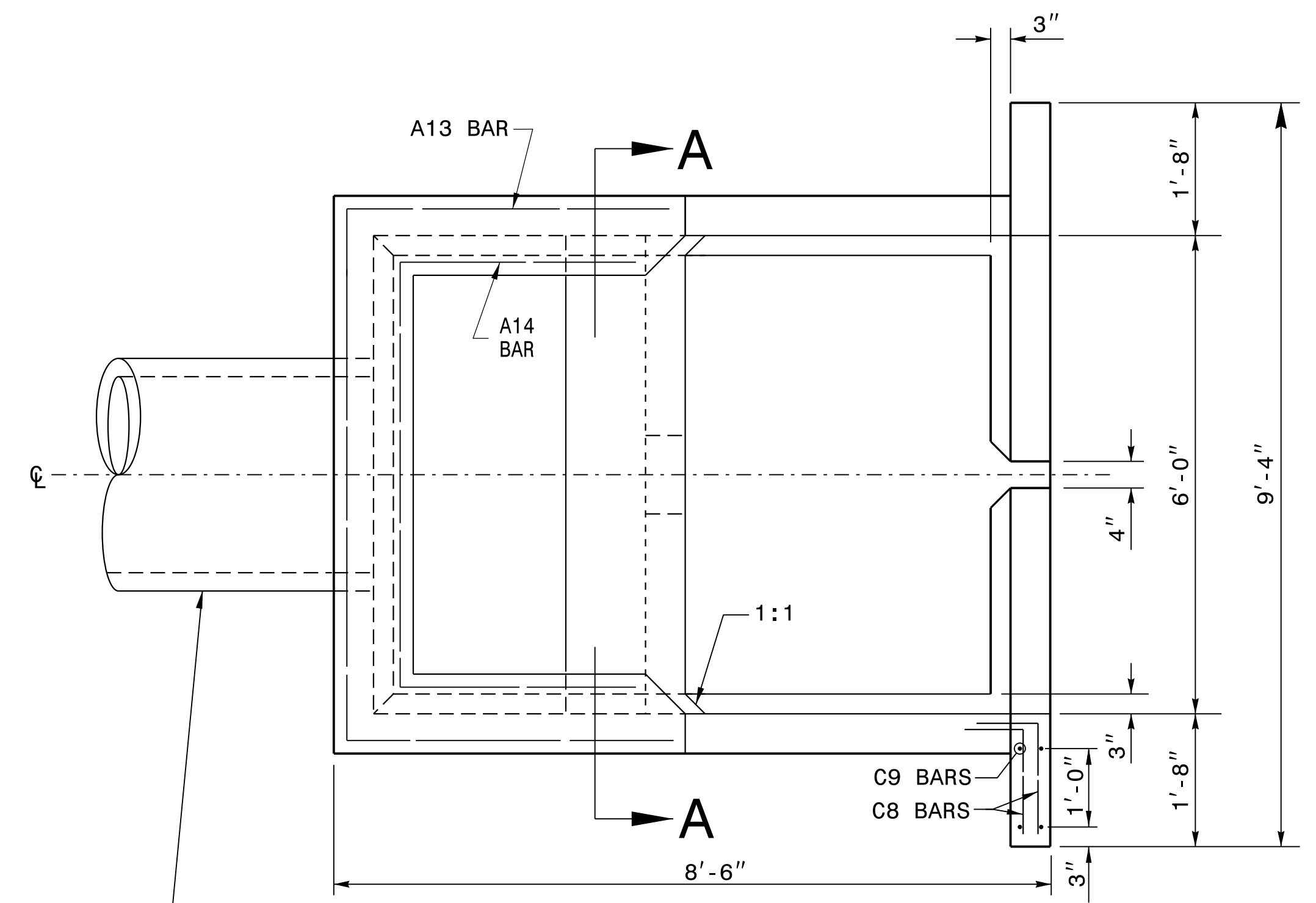
DETAIL OF TRAFFIC BEARING STEEL COVER

ORIGINAL BY: _____ DATE: _____
 MODIFIED BY: rnbritt DATE: 04-29-04
 CHECKED BY: _____ DATE: _____
 FILE SPEC.: details/nbritt/english/misc/steelcover.dgn

03-APR-2018 12:36
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 Ktemp AT CSD-292596

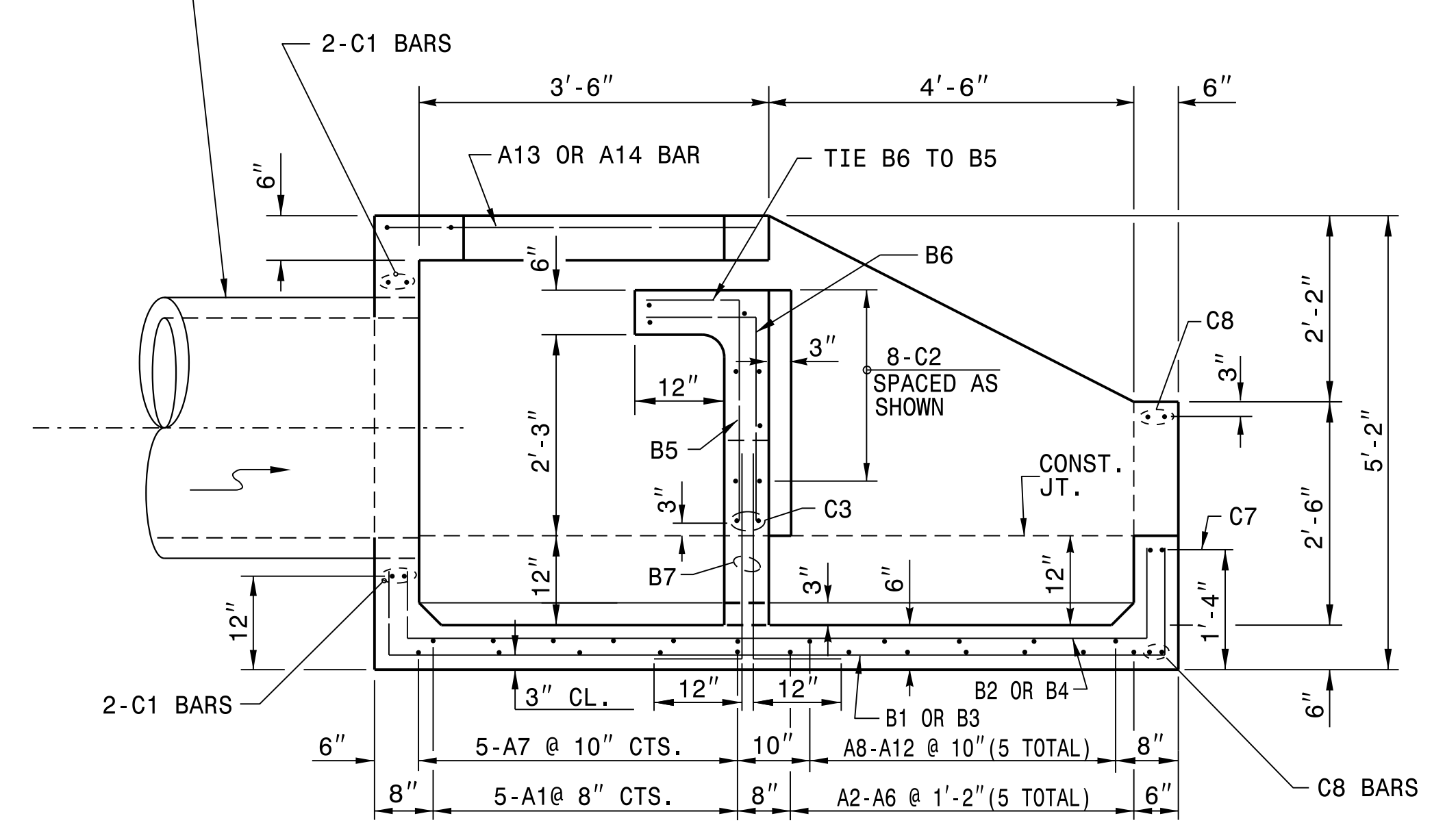
5/14/99

USE THIS STRUCTURE FOR PIPE SIZES 15" THROUGH 36". THE PIPE MAY BE CSP OR RCP.

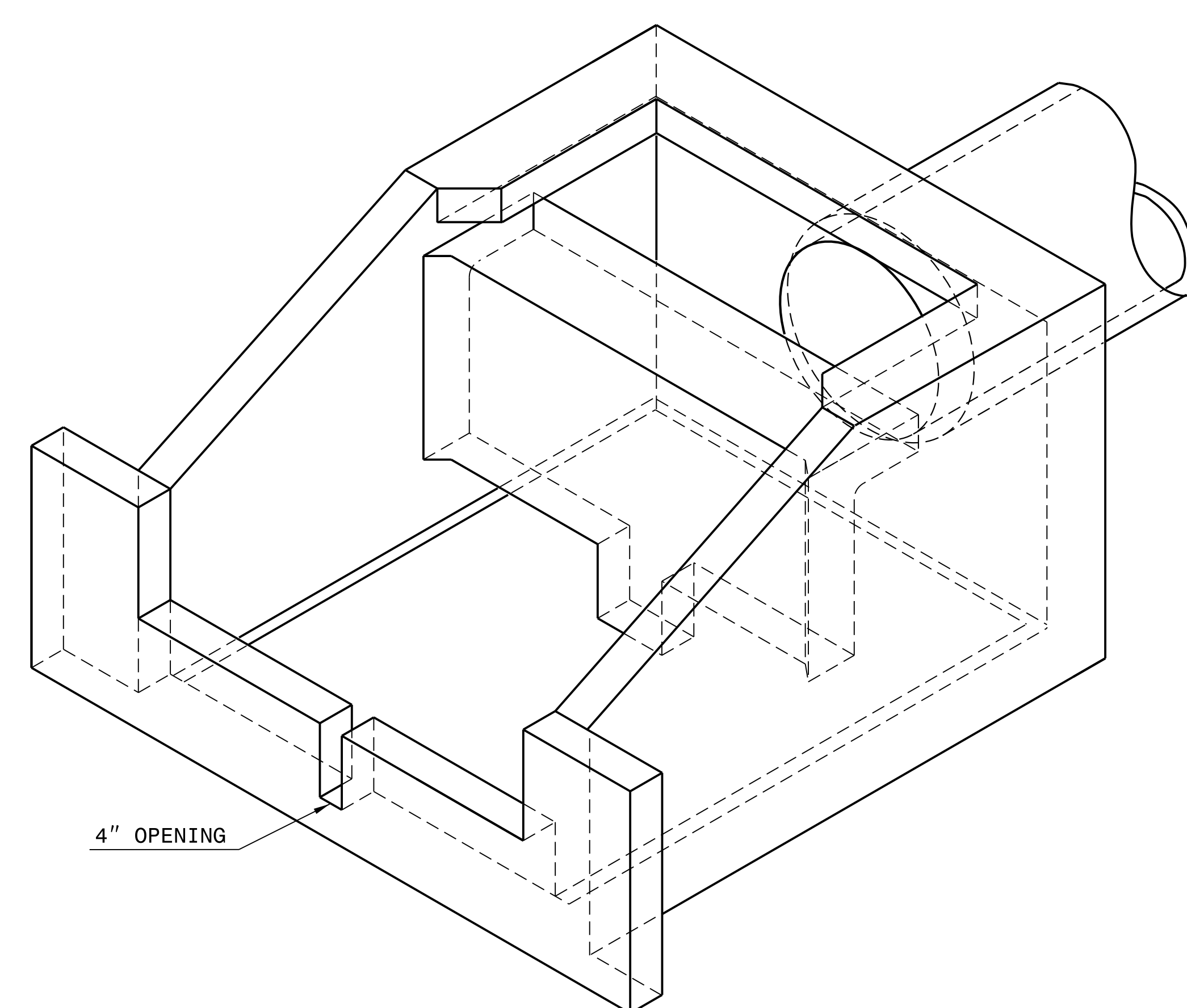


PLAN

SEE PLANS FOR PIPE SIZE



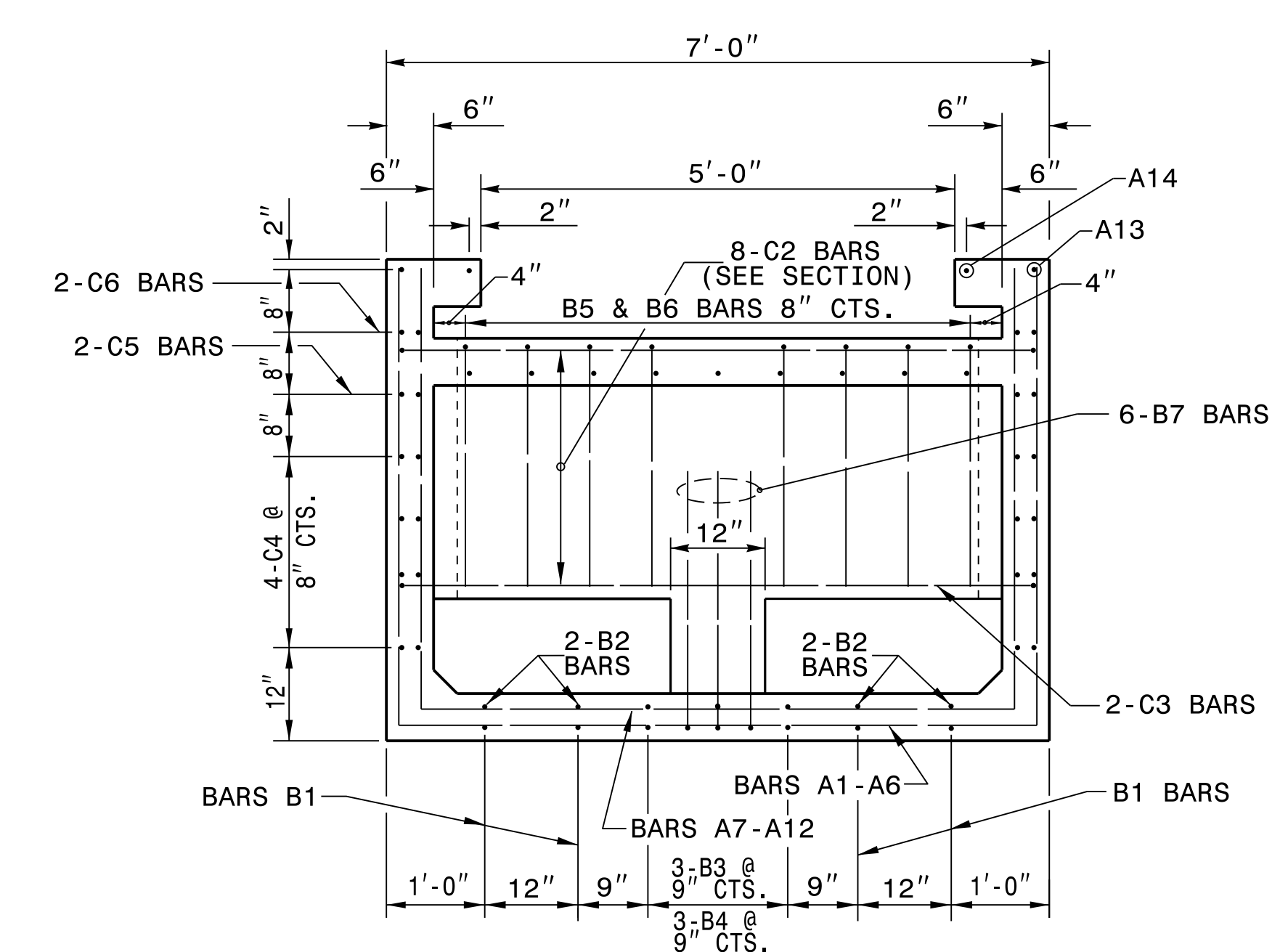
SECTION ON CL



BILL OF MATERIAL

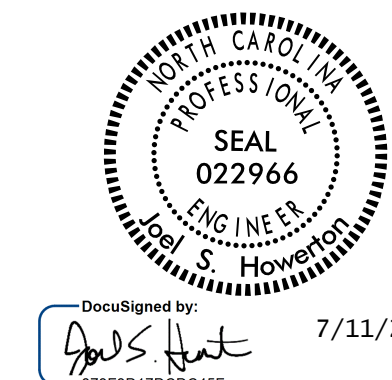
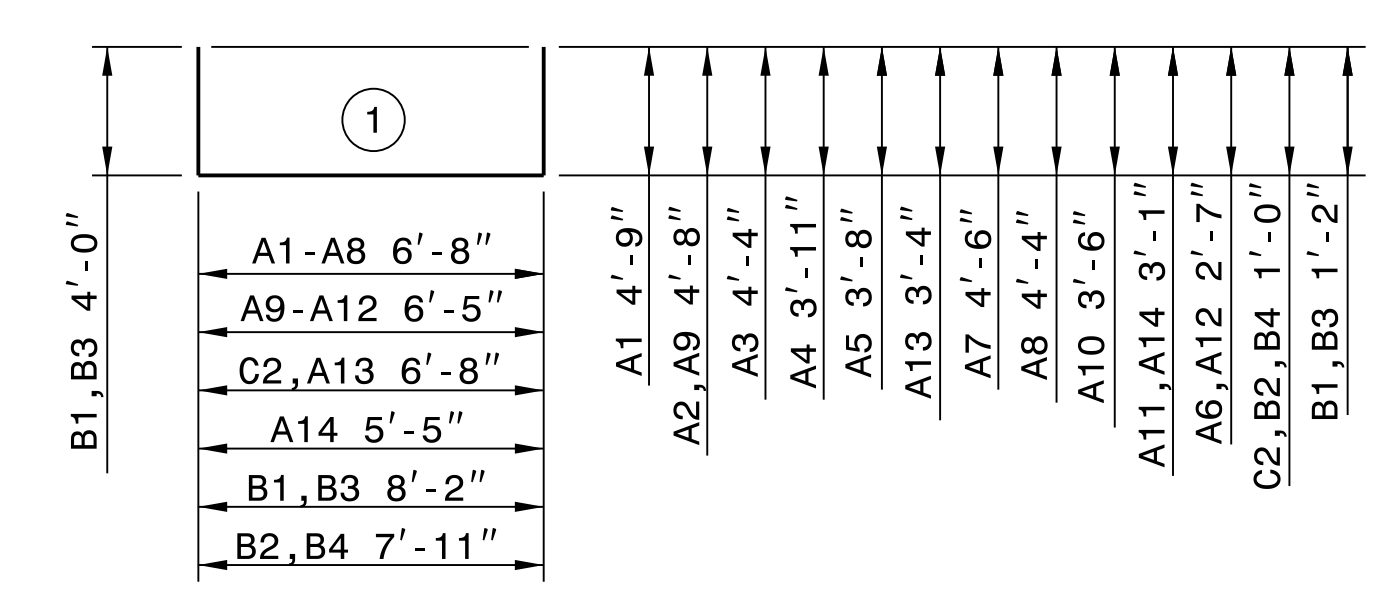
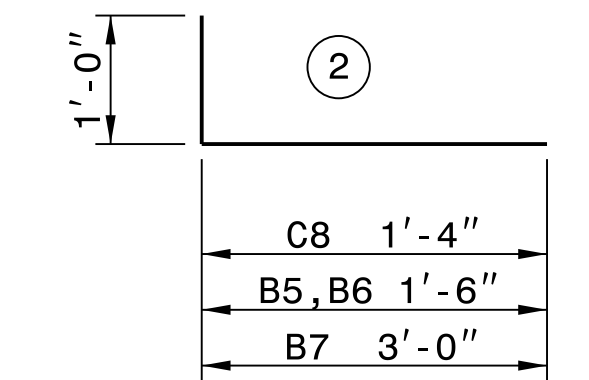
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	5	5	1	16'-2"	84.3
A2	1	5	1	16'-0"	16.7
A3	1	5	1	15'-4"	16.0
A4	1	5	1	14'-6"	15.1
A5	1	5	1	14'-0"	14.6
A6	1	5	1	11'-10"	12.3
A7	5	5	1	15'-8"	81.7
A8	1	5	1	15'-4"	16.0
A9	1	4	1	15'-9"	10.5
A10	1	4	1	13'-4"	8.9
A11	1	4	1	12'-7"	8.4
A12	1	4	1	11'-7"	7.7
A13	1	4	1	13'-5"	8.9
A14	1	4	1	11'-7"	7.7
B1	4	4	1	13'-4"	35.6
B2	4	4	1	9'-11"	26.5
B3	3	4	1	13'-4"	26.7
B4	3	4	1	9'-11"	19.9
B5	9	4	2	2'-6"	15.0
B6	9	4	2	2'-6"	15.0
B7	6	4	2	4'-0"	16.0
C1	4	4	STR	6'-8"	17.8
C2	8	8	1	8'-9"	186.9
C3	2	8	STR	6'-8"	35.6
C4	16	4	STR	8'-2"	87.3
C5	4	4	STR	4'-11"	13.1
C6	4	4	STR	6'-7"	17.6
C7	4	4	STR	2'-8"	7.1
C8	8	4	2	2'-4"	12.5
C9	8	4	STR	2'-8"	14.3
TOTAL REINF. STEEL (LBS.)					
CONCRETE (CU.YDS.)					3.44

* ALL SPLICES SHALL BE 1'-6" MIN.
 * ALL REINFORCING STEEL SHALL BE 2" CL. OF ANY FACE UNLESS SHOWN OTHERWISE.



SECTION A-A

* SHIFT B3 & B4 BARS AS NECESSARY TO CLEAR 4" OPENING



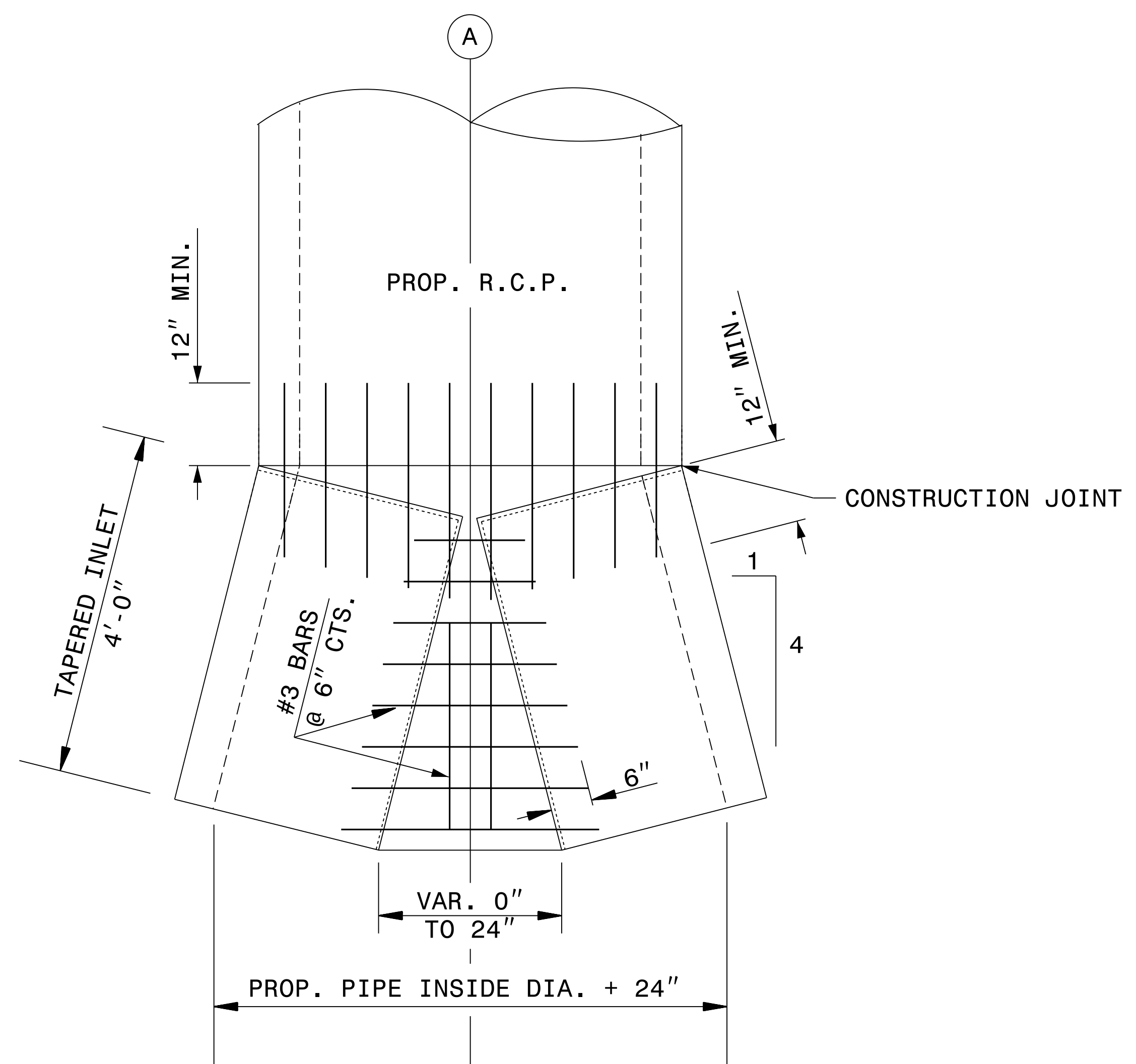
DocuSigned by:
 S. Howerton
 873F3D17DCDC45F... 7/11/2019

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 Office 919-707-6950 FAX 919-250-4119

ENERGY DISSIPATOR

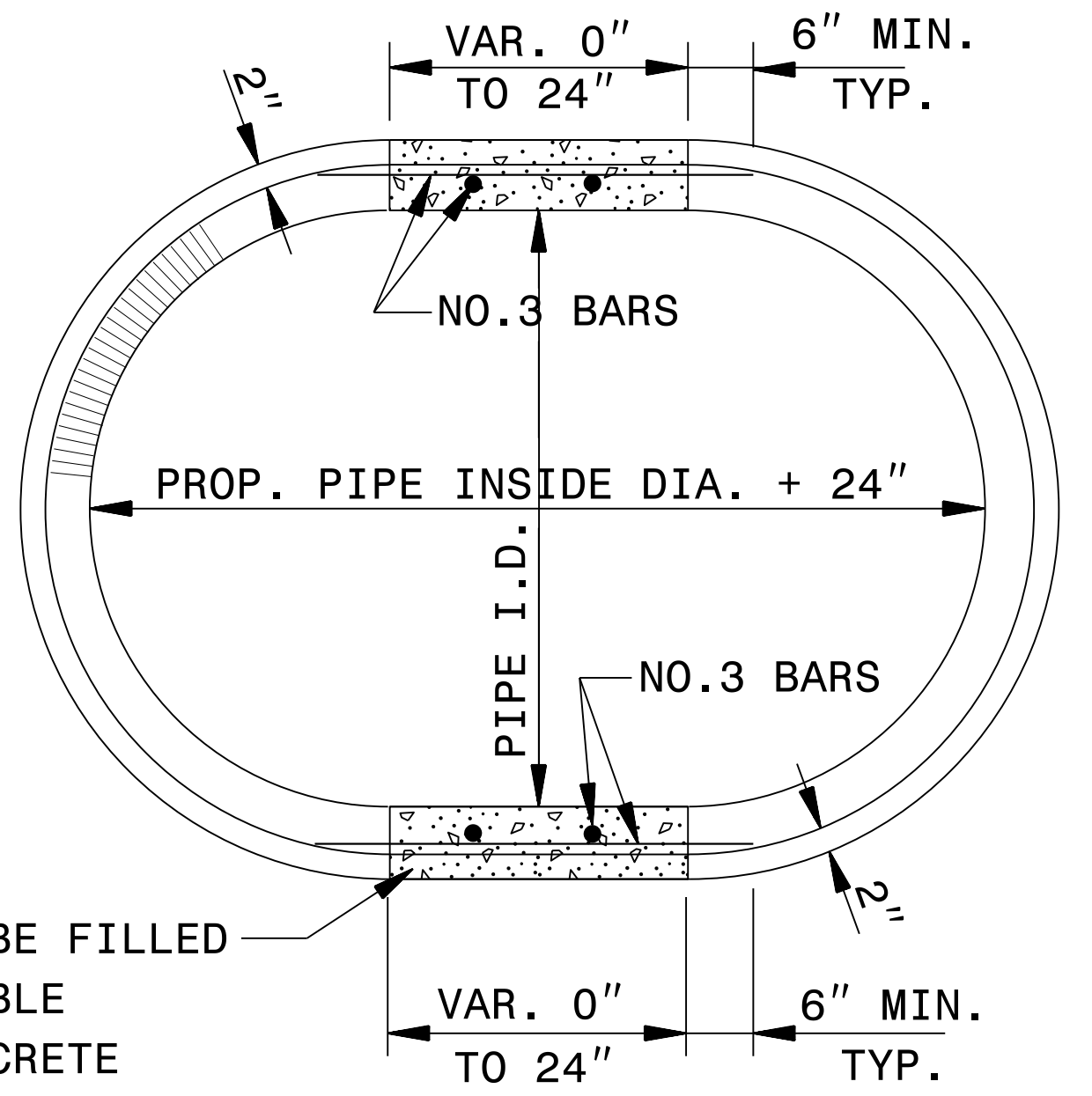
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 MODIFIED BY: T.S.S. DATE: JULY 20, 2011
 CHECKED BY: DATE:
 FILE SPEC.: s:\details\stand\impachasin2enql1sh.dgn

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PLAN

SHOWING PLACEMENT OF REINFORCING STEEL

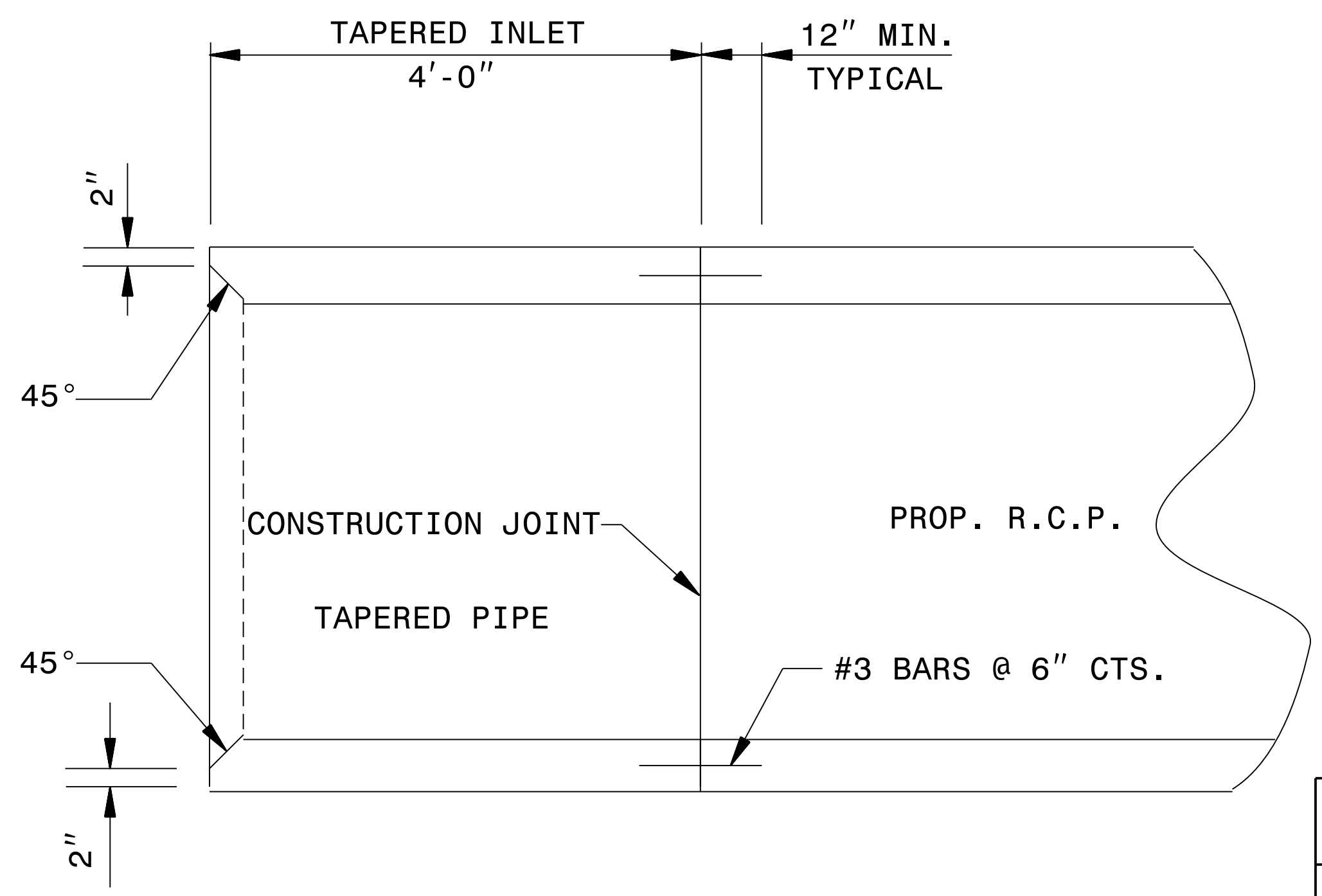


END VIEW

VOIDS SHALL BE FILLED WITH COMPARABLE STRENGTH CONCRETE

GENERAL NOTES:

- * CONSTRUCT SPECIAL REINFORCED CONCRETE TAPERED INLET IN ACCORDANCE WITH DETAIL AND SECTION 310 OF THE STANDARD ROADWAY SPECIFICATIONS.
- * CONSTRUCT THE TAPERED INLET REINFORCED CONCRETE PIPE.
- * EMBED ALL REINFORCING STEEL UNLESS SHOWN OTHERWISE.
- * CONSTRUCT THE TAPERED INLET AS DIRECTED BY THE ENGINEER.



SECTION A-A



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 STANDARDS AND SPECIAL DESIGN
 Office 919-707-6950 FAX 919-250-4119

DETAIL OF REINFORCED TAPERD INLET 24" THRU 72" DIAMETER

ORIGINAL BY: ERIC E. WARD DATE: 11-26-97
 MODIFIED BY: DATE: _____
 CHECKED BY: DATE: _____
 FILE SPEC.: ds172:/usr/details/metric/stand/tapin1.dgn

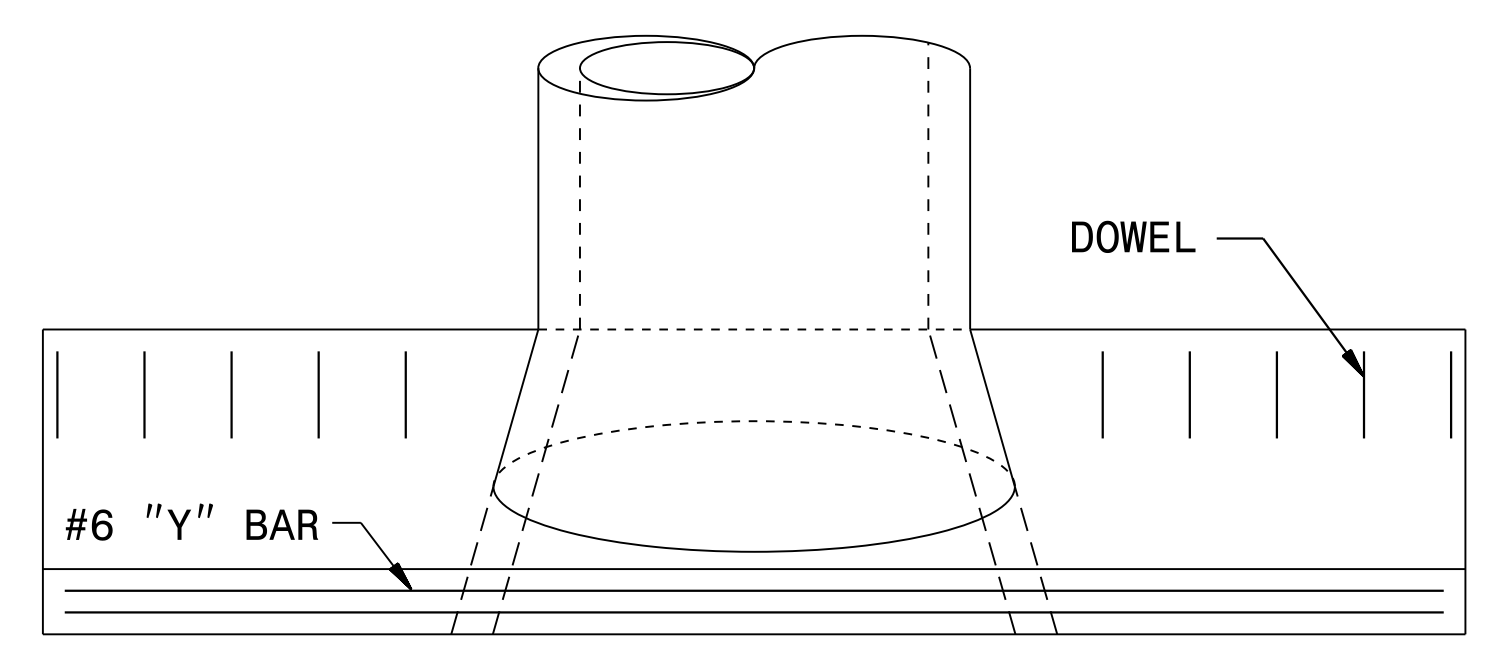
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 .jhowerton AT CSD-292595

5/14/99

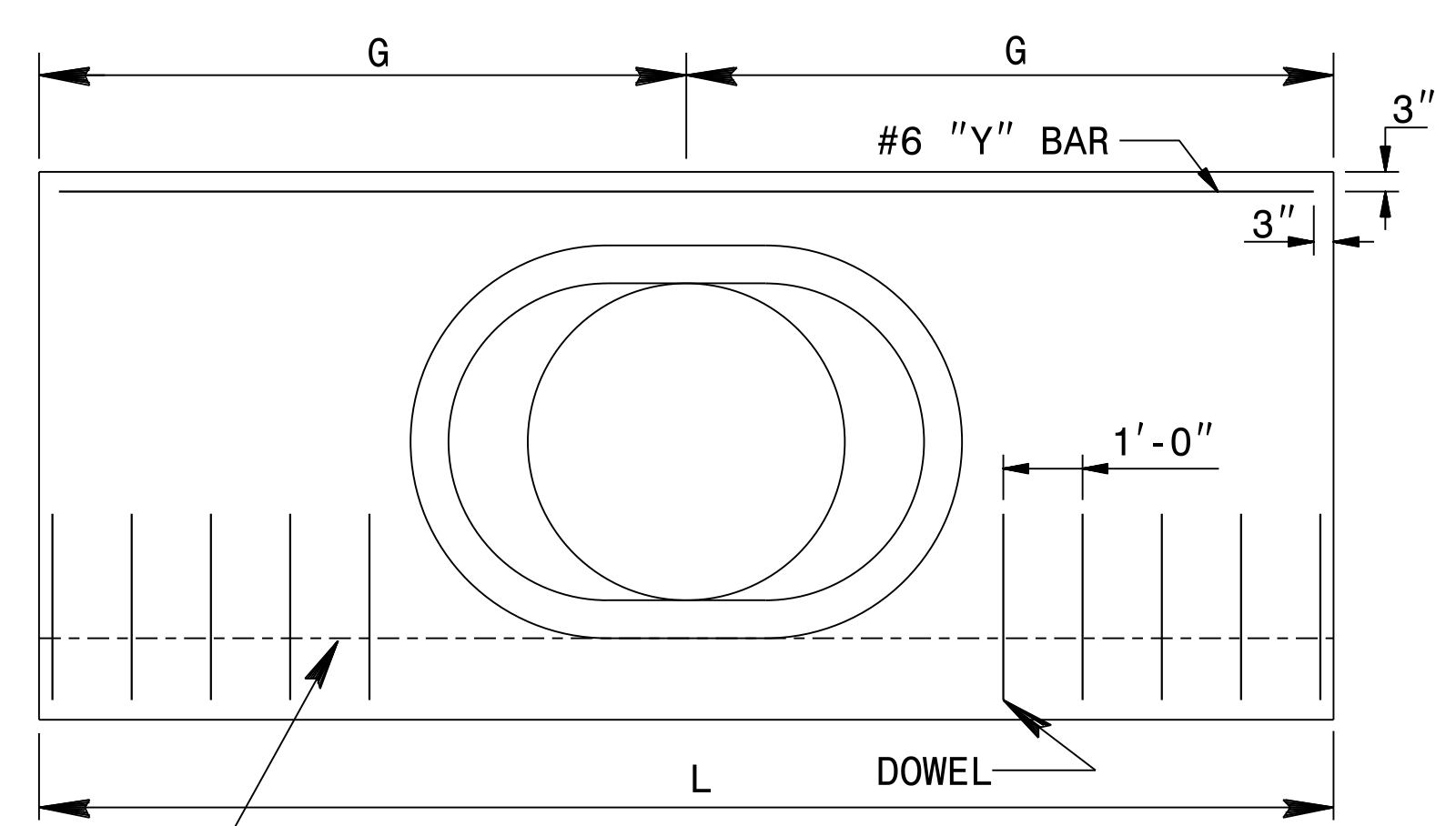
STATE OF NORTH CAROLINA
 DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
CONCRETE ENDWALL FOR TAPERED INLET

SHEET OF
ENDTAP

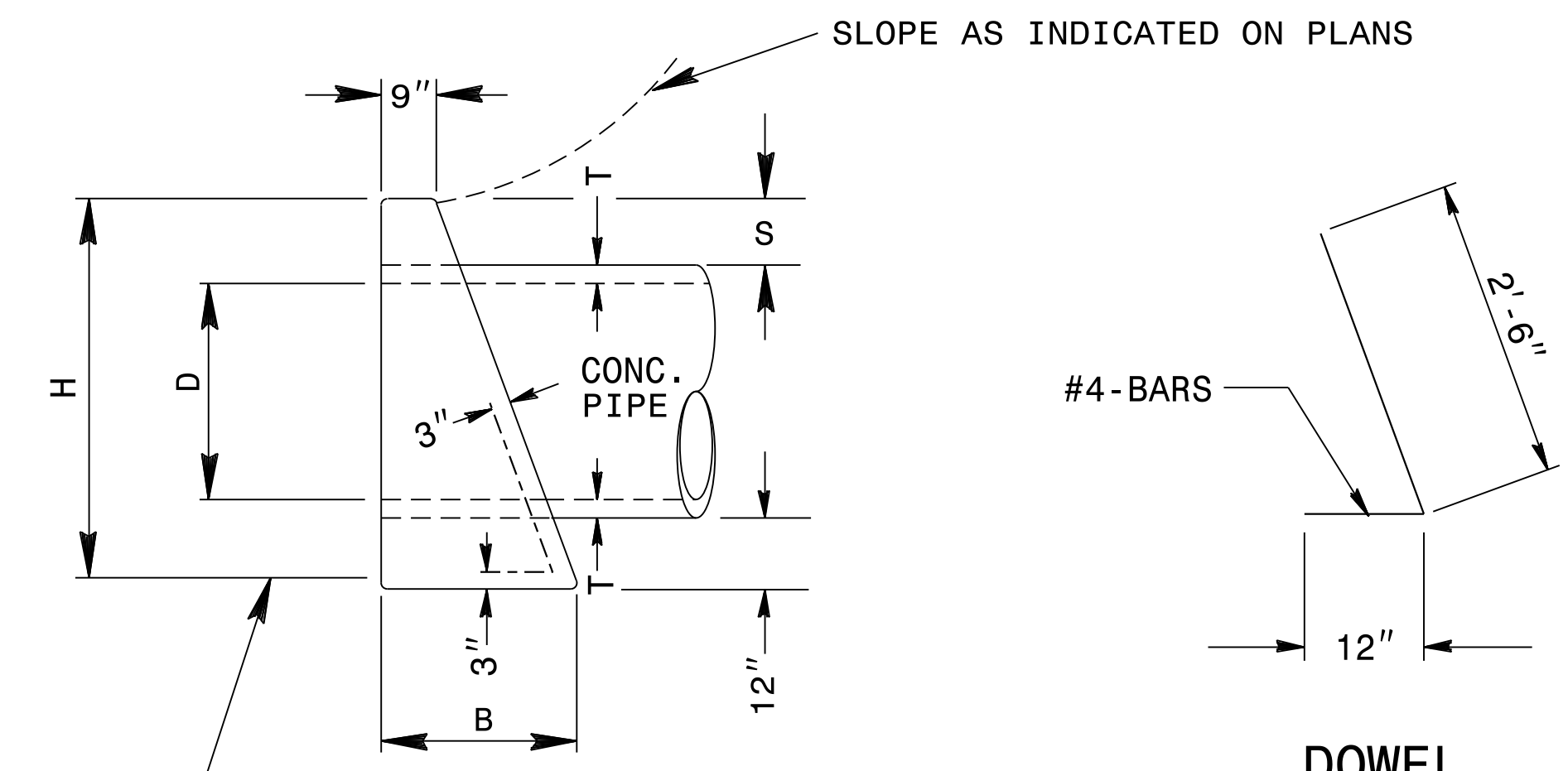


PLAN



ELEVATION

DIMENSIONS AND CONCRETE QUANTITIES							
CONCRETE PIPE	COMMON DIMENSIONS						
D	H	B	L	G	T	S	CU. YDS.
24"x48"	4'-6"	2'-2"	9'-8"	4'-10"	3"	11 1/2"	2.3
30"x54"	5'-1"	2'-6"	11'-4"	5'-8"	3 1/2"	11 1/2"	3.5
36"x60"	5'-8"	2'-10"	13'-0"	6'-6"	4"	11 1/2"	4.9
42"x66"	6'-4"	3'-2"	14'-8"	7'-4"	5 1/4"	11 1/2"	6.7
48"x72"	6'-11"	3'-6"	16'-4"	8'-2"	5 3/4"	11 1/2"	9.2



END ELEVATION

DOWEL BAR - "X"

GENERAL NOTES:

ALL EXTERIOR CORNERS SHALL BE CHAMFERED 1" OR HAVE A RADIUS OF 1".
 THE CONTRACTOR WILL BE REQUIRED TO PLACE 2 #6 "Y" BARS IN THE TOP OF ALL ENDWALL FOR PIPE CULVERTS 42" AND OVER WITH A MINIMUM OF 3" COVER AND A LENGTH OF 6" LESS THAN ENDWALL LENGTH.
 FORMS ARE TO BE USED FOR THE CONSTRUCTION OF THE BOTTOM SLAB.
 WALL THICKNESS (T) SHOWN IS NOT TO BE INTERPRETED TO MEAN THE THICKNESS ACCEPTABLE, BUT IS USED IN COMPUTING ENDWALL QUANTITIES.
 WHEN THE CONTRACTOR ELECTS TO USE A CONSTRUCTION JOINT AT THE BOTTOM OF THE PIPE, BAR X DOWELS SHALL BE PLACED IN THE BASE AS SHOWN ON PLANS. SPACING OF BARS IS TO BE APPROXIMATELY 12" CENTERS UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
 WHEN THE CONTRACTOR ELECTS TO USE A CONSTRUCTION JOINT AT THE BOTTOM OF THE PIPE AND POUR THE BASE SEPARATELY, THE POUR SHALL BE LEFT ROUGH.
 CLASS "B" CONCRETE SHALL BE USED.

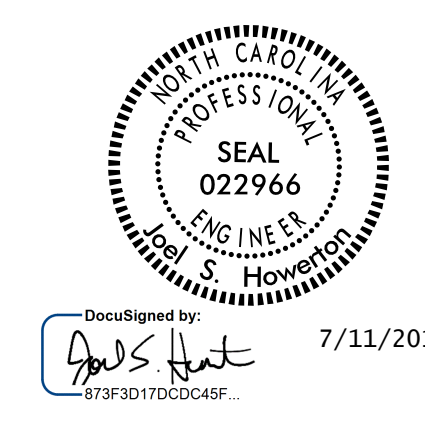
DOWELS IN ENDWALL WITH REINFORCED CONCRETE PIPE											
LOC.	PIPE DIA.	SINGLE PIPE									
		24"x48"		30"x54"		36"x60"		42"x66"		48"x72"	
	BARS	"X"	Y*	"X"	Y*	"X"	Y*	"X"	Y*	"X"	Y*
G	QTY.	3		4		4		5	2	5	2
G	QTY.	3		4		4		5	2	5	2
TOT. LBS.		14		19		19		64		69	

STATE OF NORTH CAROLINA
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 DIVISION OF HIGHWAYS
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ENGLISH DETAIL DRAWING FOR
CONCRETE ENDWALL FOR TAPERED INLET

SHEET OF
ENDTAP

23-APR-2019 10:08 S:\Contracts\Special\Stand\endwalltaper.dgn Jhowerston AT CSD-292595



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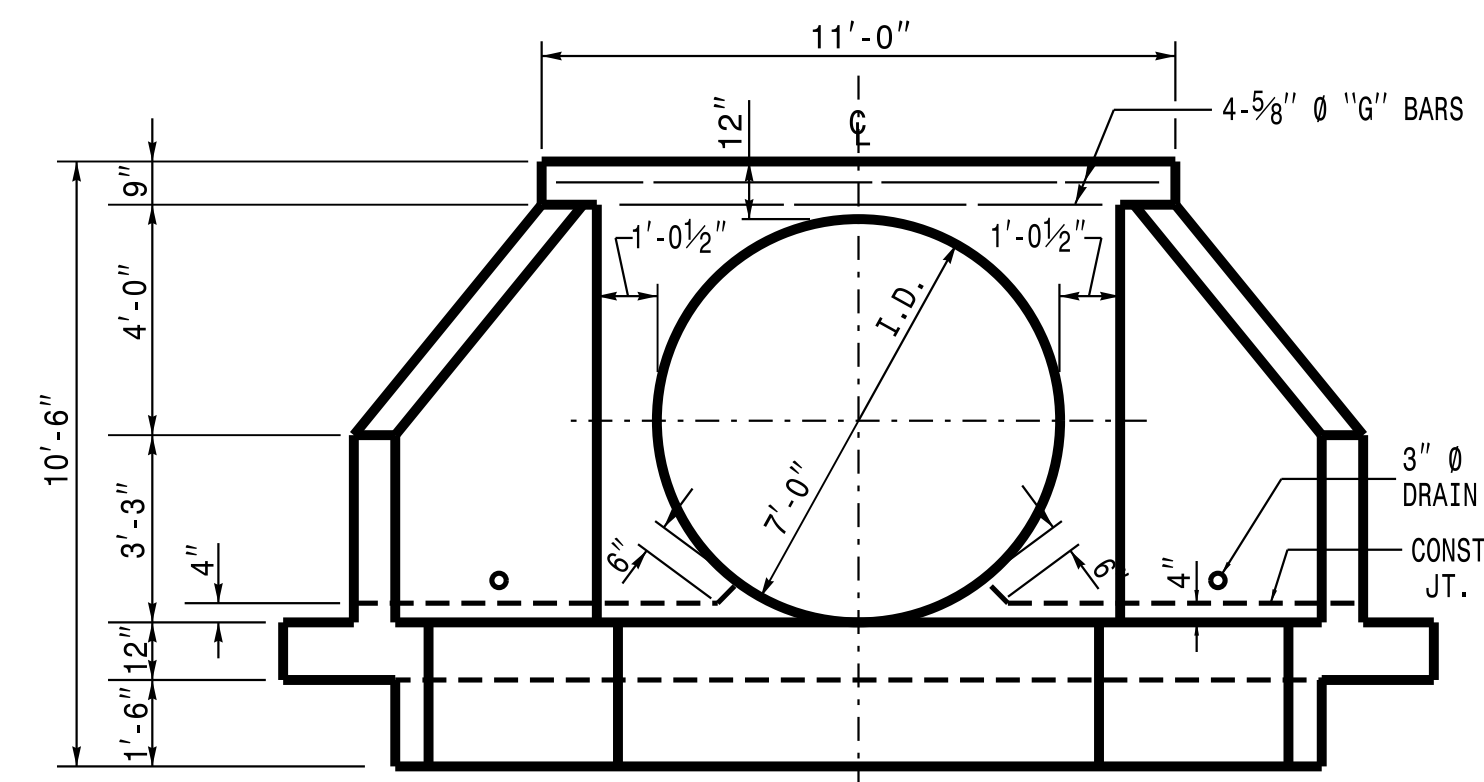
CONTRACT STANDARDS AND DEVELOPMENT UNIT
 Office 919-707-6950 FAX 919-250-4119

SEE PLATE FOR TITLE

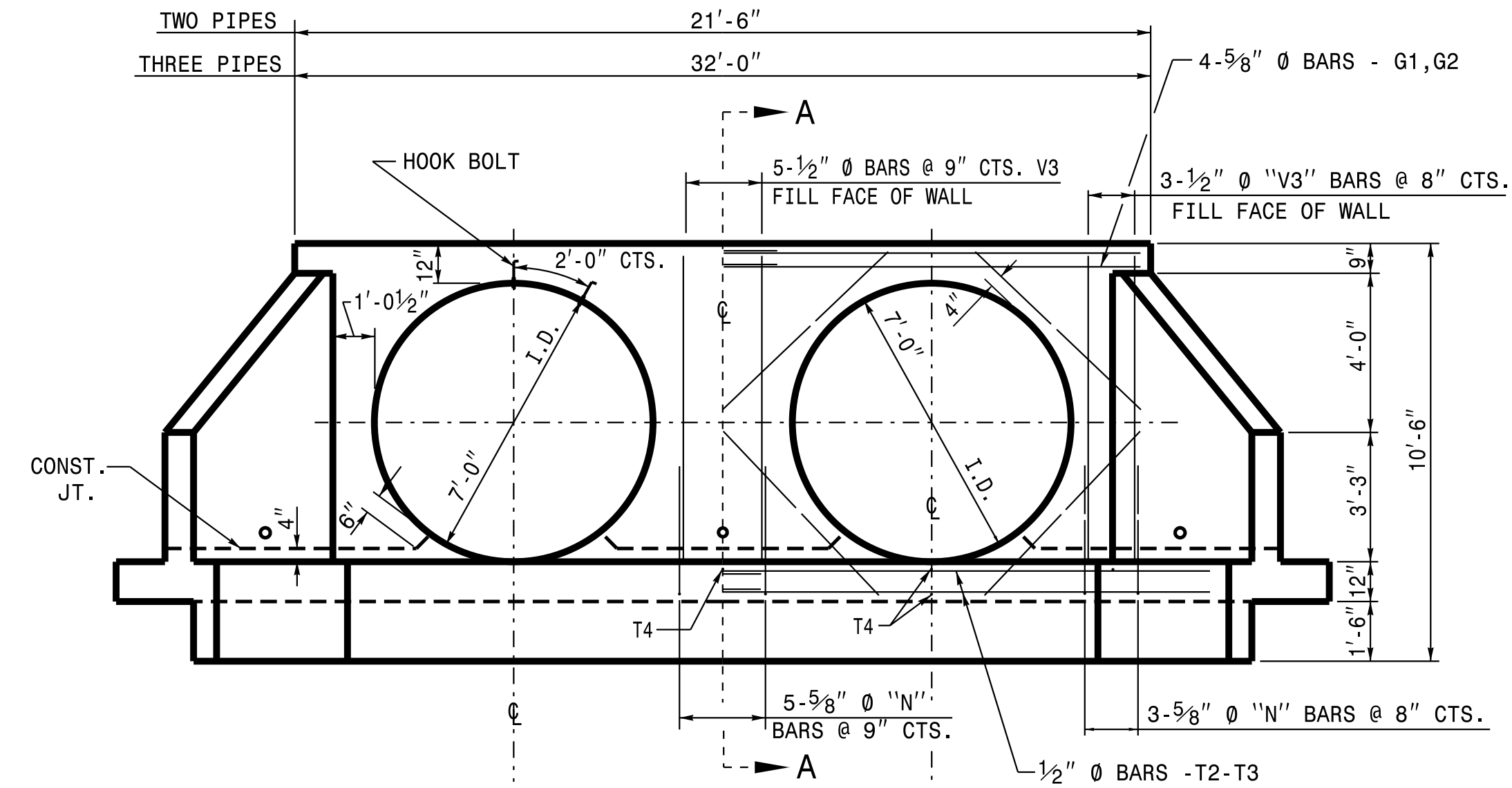
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MODIFIED BY: E.E. WARD	DATE: 10-11-04
CHECKED BY:	DATE:
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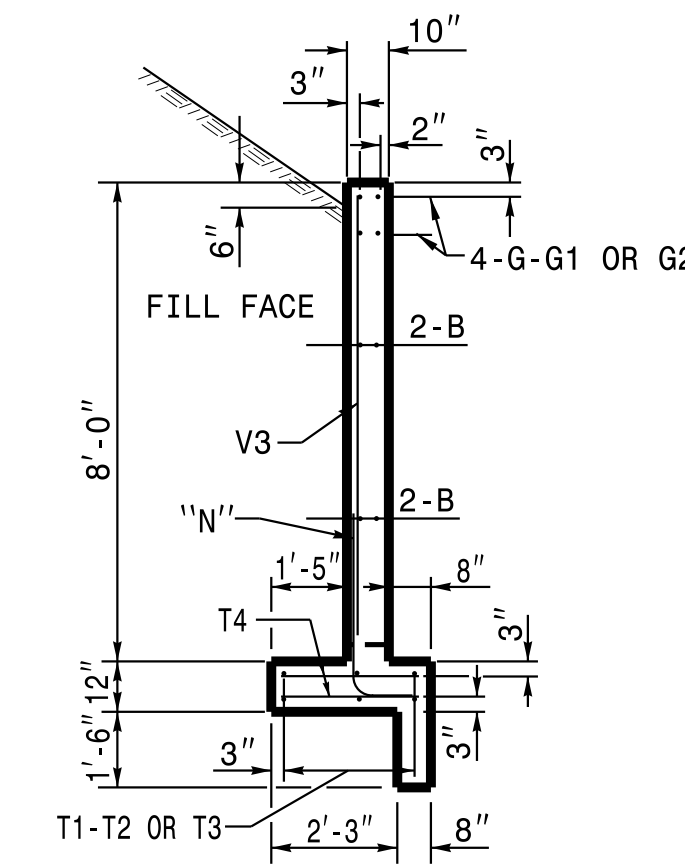
DocuSigned by:
David S. Howerton
7/11/2019



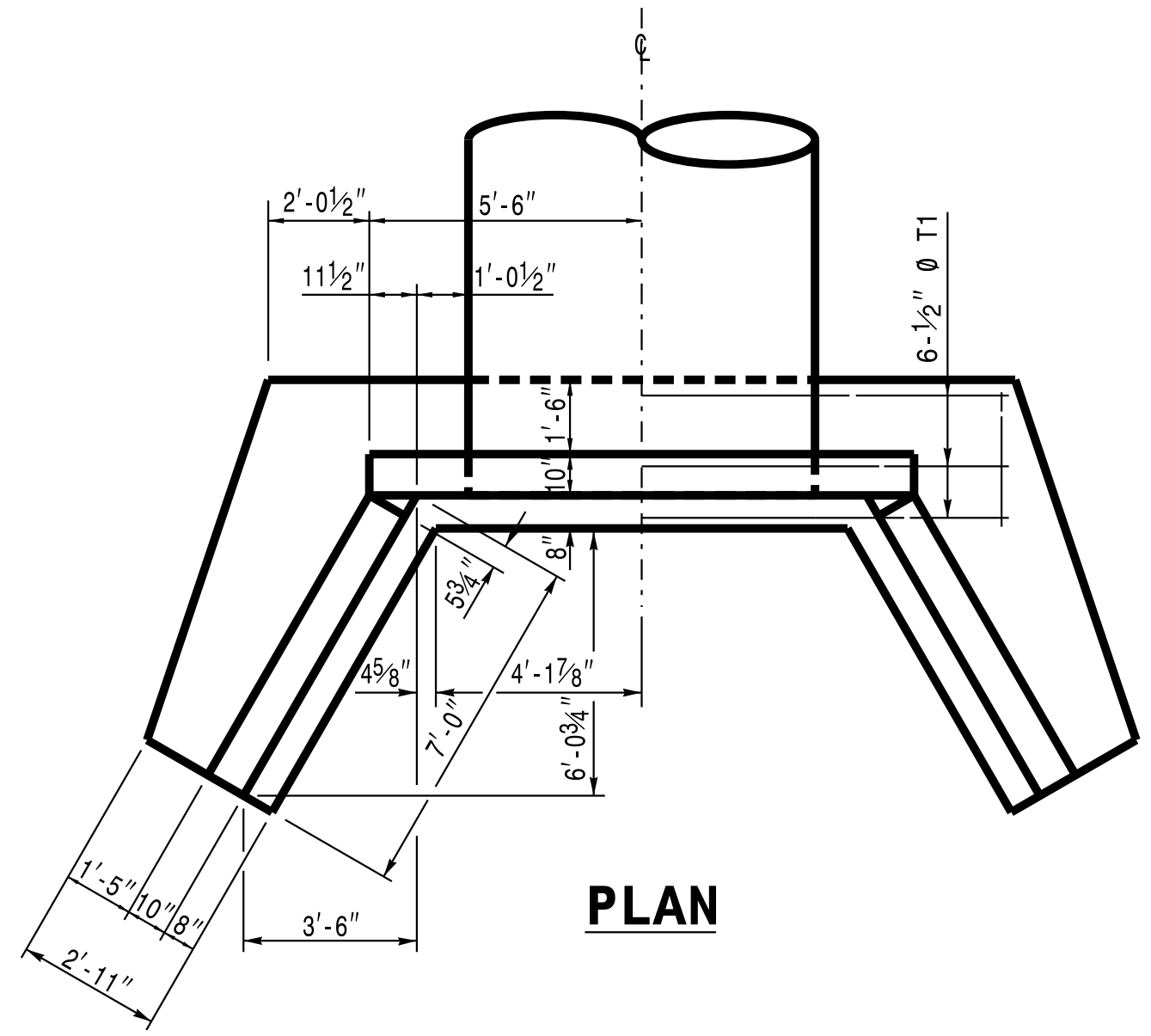
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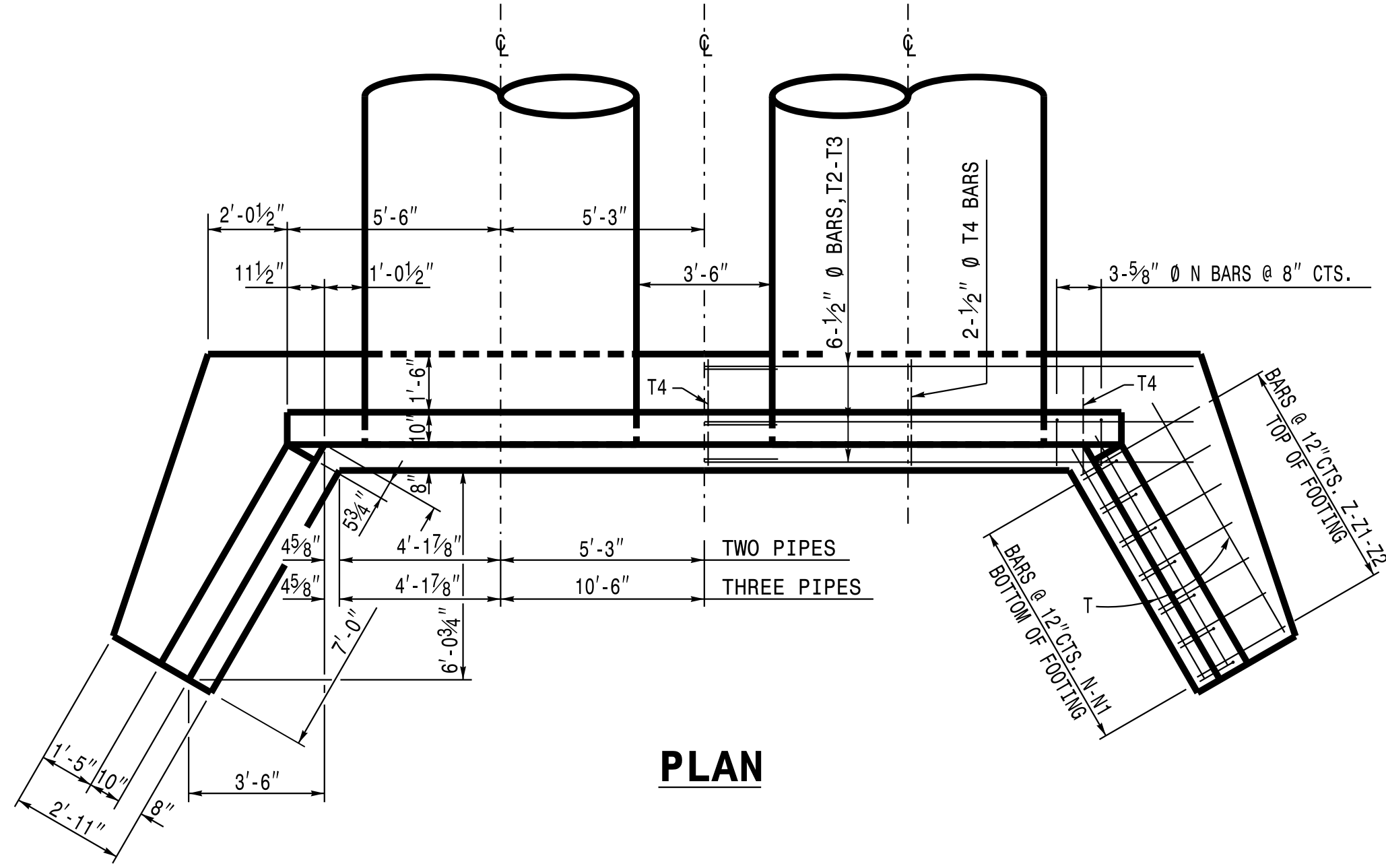
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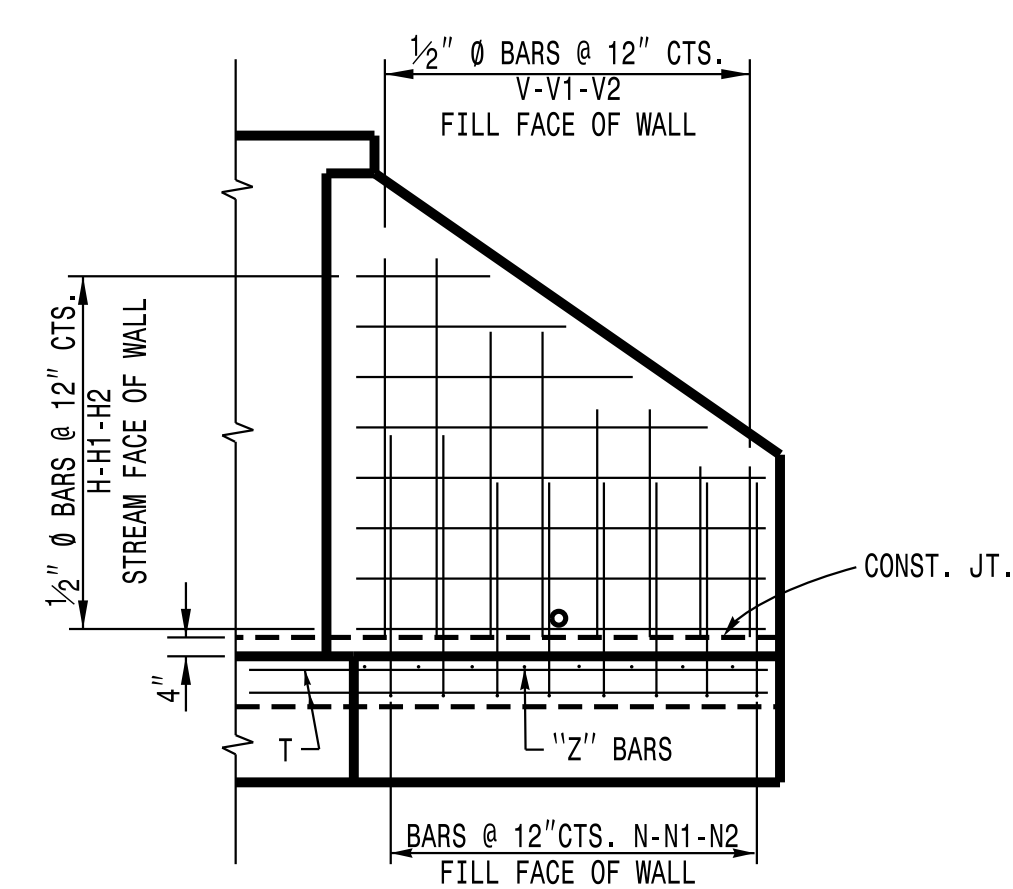
**SECTION A-A
FOR ALL ENDWALLS**



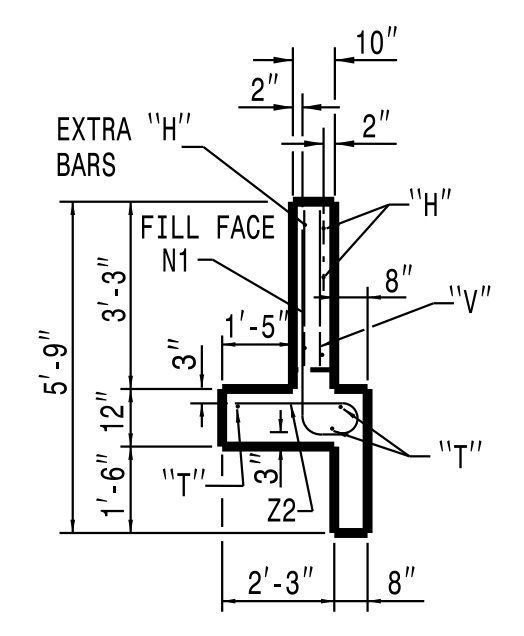
PLAN



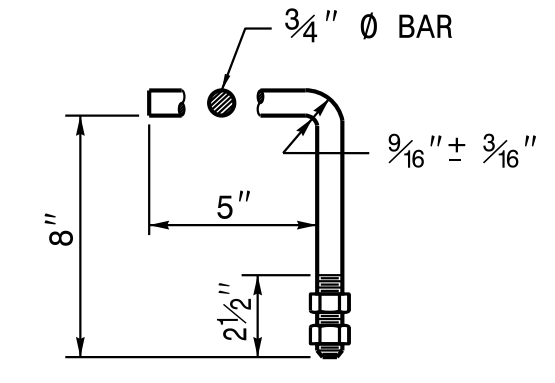
PLAN



**ELEVATION OF WING
SHOWING REINFORCEMENT**

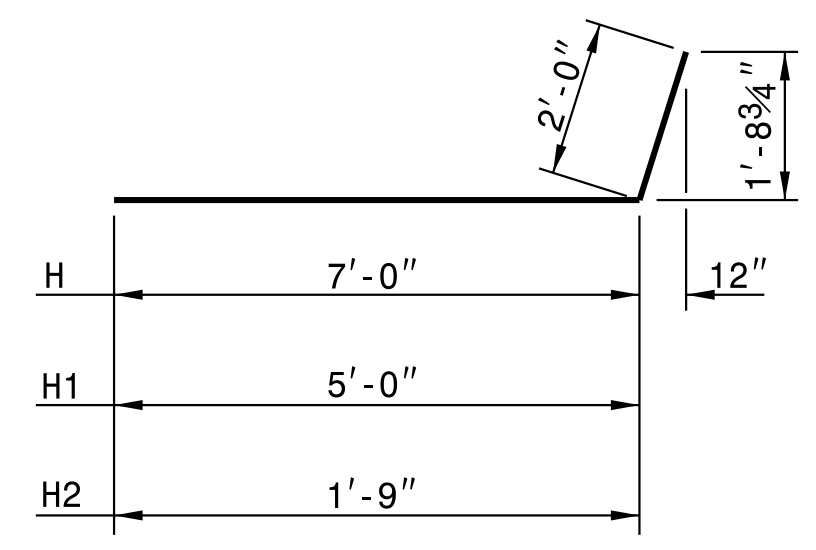


END OF WING

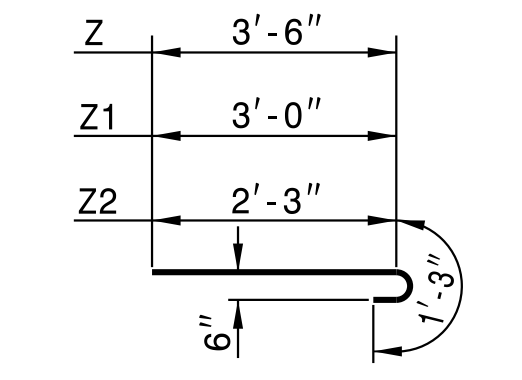


HOOK BOLT

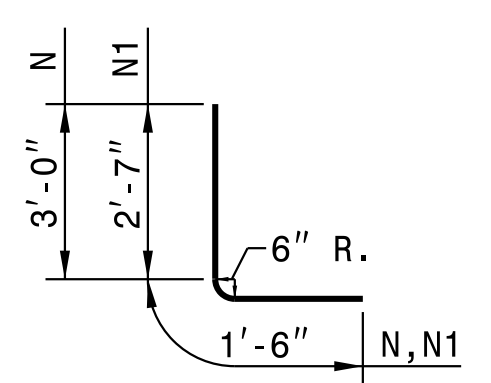
HOOK BOLTS (ANCHORS SHALL BE CONSTRUCTED AT 2'-0" CTS. ALONG THE CIRCUMFERENCE OF THE 7'-0" CSPA. THE HOOK BOLTS SHALL BE EMBEDDED IN THE CONCRETE ENDWALL 8" IN DEPTH. THE GALVANIZED 3/4" DIA. HOOK BOLTS MUST MEET ASTM A-307 OR ASTM A-836. BOTH BOLTS AND NUTS MUST BE IN ACCORDANCE WITH ASTM A-153 FOR GALVANIZING.



BARS H-H1-H2



BARS Z-Z1-Z2



BARS N-N1

NOTES:

- ALL CONCRETE TO BE CLASS "A".
- ALL REINFORCING STEEL SHALL BE ASTM A615-GRADE 60.
- ALL REINFORCING STEEL SHALL BE DEFORMED BARS. WHERE SPLICING OF REINFORCEMENT IS NECESSARY, BARS ARE TO BE LAPPED 45 DIAMETERS. ALL DIMENSIONS RELATIVE TO REINFORCEMENT ARE TO CENTERS OF BARS.
- THE FOOTING, CURTAIN WALL AND 4" OF WALL ARE TO BE POURED IN ONE OPERATION ALLOWING NO TIME FOR INITIAL SET TO TAKE PLACE BETWEEN THEM. THE REMAINING WALL SHALL THEN BE POURED IN ONE OPERATION.
- ALL EXPOSED CORNERS ARE TO BE CHAMFERED 1".
- 3" DIAMETER DRAINS SHALL BE PLACED IN WALL AS SHOWN AND BE 6" ABOVE NORMAL FLOW LINE.
- ALL MATERIAL AND WORKMANSHIP AS PER N.C. DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS.

BILL OF MATERIAL FOR ONE ENDWALL

REINFORCING STEEL		1 PIPE	2 PIPES	3 PIPES				
BAR #	SIZE	LENGTH	NO.	WEIGHT	NO.	WEIGHT	NO.	WEIGHT
B	#4	6'-0"	8	32	16	64	24	96
G	#5	10'-9"	4	45	-	-	-	-
G1	#5	11'-9"	-	-	8	98	-	-
G2	#5	17'-0"	-	-	-	-	8	142
H	#4	9'-0"	10	60	10	60	10	60
H1	#4	7'-0"	6	28	6	28	6	28
H2	#4	3'-9"	4	10	4	10	4	10
N	#5	4'-6"	10	47	15	70	20	94
N1	#4	4'-1"	10	27	10	27	10	27
T	#4	6'-6"	6	26	6	26	6	26
T1	#4	15'-0"	6	60	-	-	-	-
T2	#4	13'-9"	-	-	12	110	-	-
T3	#4	19'-0"	-	-	-	-	12	152
T4	#4	2'-9"	4	7	7	13	10	18
V	#4	5'-9"	6	23	6	23	6	23
V1	#4	4'-6"	6	18	6	18	6	18
V2	#4	2'-9"	8	15	8	15	8	15
V3	#4	7'-6"	6	30	11	55	16	80
Z	#5	4'-9"	4	20	4	20	4	20
Z1	#4	4'-3"	4	11	4	11	4	11
Z2	#4	3'-6"	6	14	6	14	6	14
TOTAL REINF. STEEL (lbs.)				473		662		834
CLASS "A" CONC. (cu. yds.)				7.9		10.8		13.8

**CONTRACT STANDARDS & DEVELOPMENT UNIT
STANDARDS AND SPECIAL DESIGN**
Office 919-250-4128 FAX 919-250-4119

**DETAIL OF REINFORCED
CONCRETE ENDWALL FOR
84" DIAMETER PIPE - 90° SKEW**

ORIGINAL BY: R.S.WICKER DATE: 6-46
MODIFIED BY: R.E.D.&T.S.S. DATE: 6-96 & 5-00
CHECKED BY: DATE:
FILE SPEC.: details/nbritt/english/hydro/84_endwall_90sk.dgn

STATE OF NORTH CAROLINA
 DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 RALEIGH, N.C.

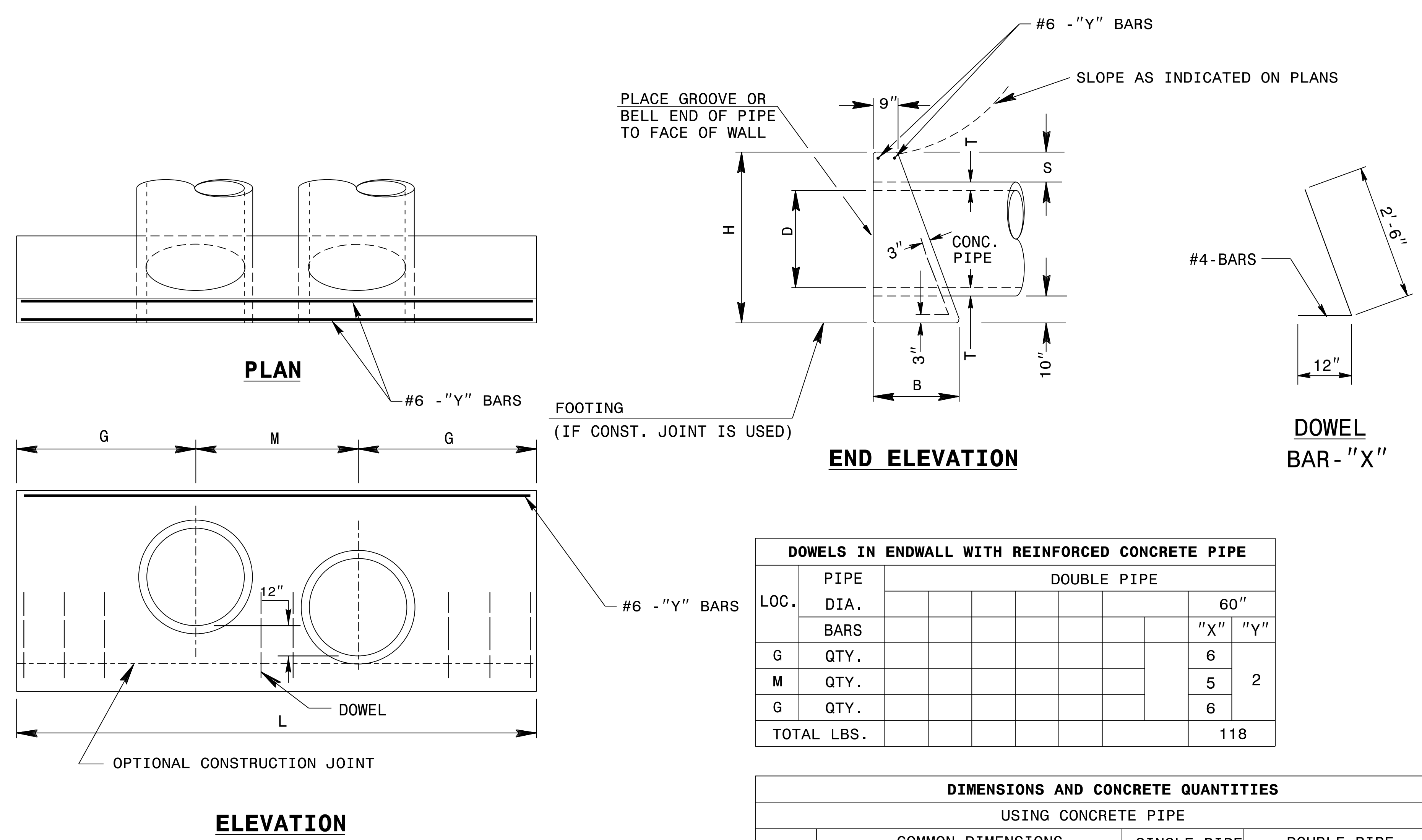
ROADWAY SPECIAL DETAIL FOR
**CONCRETE ENDWALL FOR
 DOUBLE PIPE CULVERTS**
 60" PIPE - 90° SKEW

SHEET OF
838d01

STATE OF NORTH CAROLINA
 DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 RALEIGH, N.C.

ROADWAY SPECIAL DETAIL FOR
**CONCRETE ENDWALL FOR
 DOUBLE PIPE CULVERTS**
 60" PIPE - 90° SKEW

SHEET OF
838d01



- GENERAL NOTES:**
- CHAMFER ALL CORNERS 1".
 - THE CONTRACTOR WILL BE REQUIRED TO PLACE 2 - #6 BARS "Y" IN THE TOP OF ALL ENDWALLS FOR PIPE CULVERTS 42" AND OVER WITH A MINIMUM OF 3" COVER AND A LENGTH OF 6" LESS THAN ENDWALL.
 - USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.
 - WALL THICKNESS SHOWN IS NOT TO BE INTERPRETED TO MEAN THE THICKNESS ACCEPTABLE, BUT ARE USED ONLY IN COMPUTING ENDWALL QUANTITIES.
 - IF CONTRACTOR ELECTS TO USE CONSTRUCTION JOINT AT BOTTOM OF PIPE, BAR X (PLACE DOWELS IN THE BASE AS SHOWN ON PLANS. SPACING OF BARS TO BE APPROXIMATELY 12" CENTER UNLESS ENGINEER DIRECTS OTHERWISE.
 - WHEN CONTRACTOR ELECTS TO USE CONSTRUCTION JOINT AT BOTTOM OF PIPE AND POURS BASE SEPERATELY, THE TOP BASE SHALL BE LEFT ROUGH.
 - USE CLASS "B" CONCRETE.

09-JUL-2019 15:33
 S:\Contracts\Special Details\kempf\english\I4700 extend endwall.dgn
 Jhowerston AT USD-292595

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

**CONTRACT STANDARDS
AND DEVELOPMENT UNIT**
Office 919-707-6950 FAX 919-250-4119

SEE PLATE FOR TITLE

ORIGINAL BY: _____	DATE: _____
MODIFIED BY: KKEMPF	DATE: FEB 2019
CHECKED BY: _____	DATE: _____
FILE SPEC.: details/kkempf/english/I4700 extend endwall	

STATE OF NORTH CAROLINA
 DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 RALEIGH, N.C.

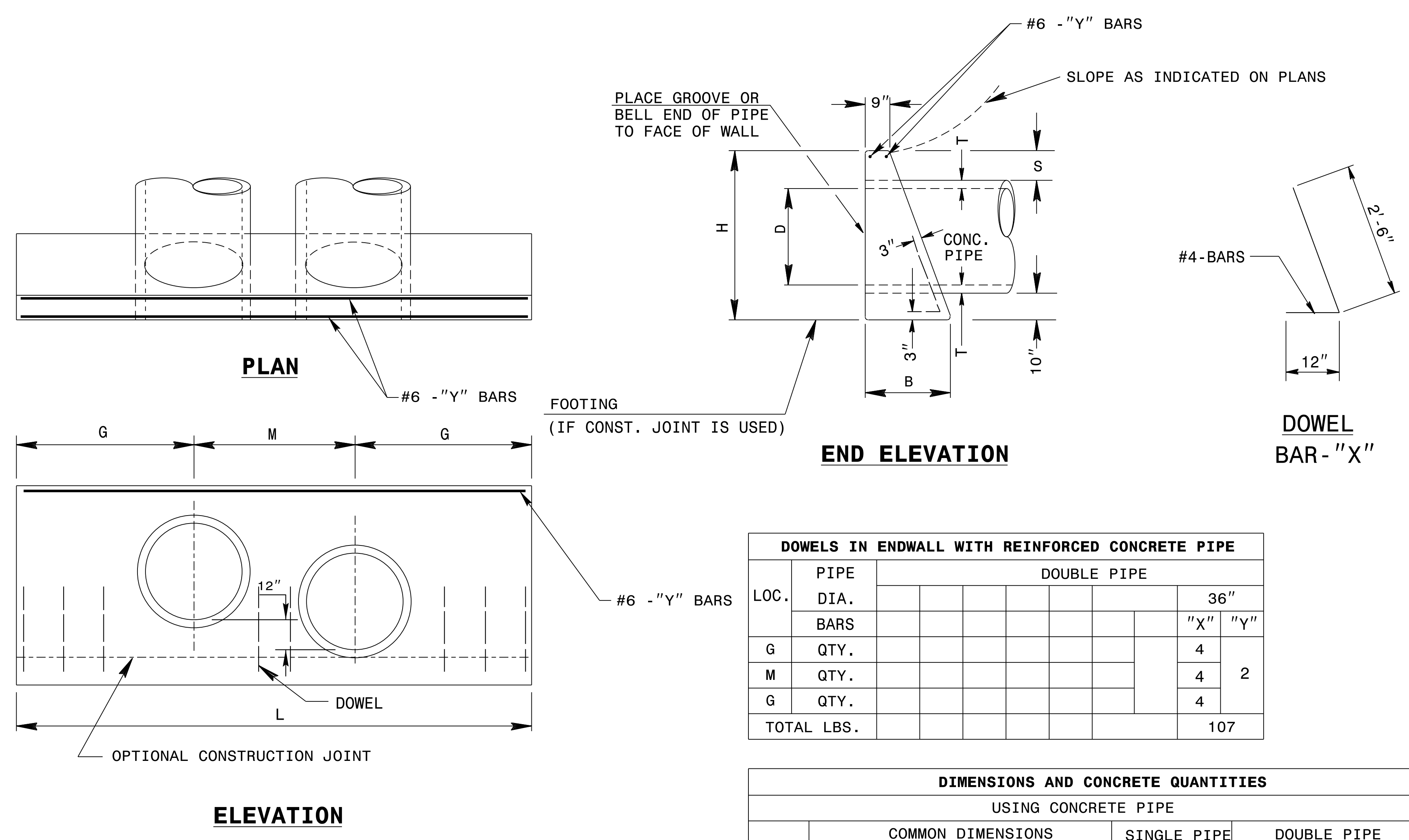
ROADWAY SPECIAL DETAIL FOR
**CONCRETE ENDWALL FOR
 DOUBLE PIPE CULVERTS**
 36" PIPE - 90° SKEW

SHEET OF
838d01

STATE OF NORTH CAROLINA
 DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 RALEIGH, N.C.

ROADWAY SPECIAL DETAIL FOR
**CONCRETE ENDWALL FOR
 DOUBLE PIPE CULVERTS**
 36" PIPE - 90° SKEW

SHEET OF
838d01



GENERAL NOTES:

- CHAMFER ALL CORNERS 1".
- THE CONTRACTOR WILL BE REQUIRED TO PLACE 2 - #6 BARS "Y" IN THE TOP OF ALL ENDWALLS FOR PIPE CULVERTS 42" AND OVER WITH A MINIMUM OF 3" COVER AND A LENGTH OF 6" LESS THAN ENDWALL.
- USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.
- WALL THICKNESS SHOWN IS NOT TO BE INTERPRETED TO MEAN THE THICKNESS ACCEPTABLE, BUT ARE USED ONLY IN COMPUTING ENDWALL QUANTITIES.
- IF CONTRACTOR ELECTS TO USE CONSTRUCTION JOINT AT BOTTOM OF PIPE, BAR X (PLACE DOWELS IN THE BASE AS SHOWN ON PLANS. SPACING OF BARS TO BE APPROXIMATELY 12" CENTER UNLESS ENGINEER DIRECTS OTHERWISE.
- WHEN CONTRACTOR ELECTS TO USE CONSTRUCTION JOINT AT BOTTOM OF PIPE AND POURS BASE SEPERATELY, THE TOP BASE SHALL BE LEFT ROUGH.
- USE CLASS "B" CONCRETE.

09-JUL-2019 15:34
 S:\Contracts\Special Details\kkempf\english\I4700 extend endwall.dgn
 Jhowerston AT USD-292595

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

**CONTRACT STANDARDS
AND DEVELOPMENT UNIT**
Office 919-707-6950 FAX 919-250-4119

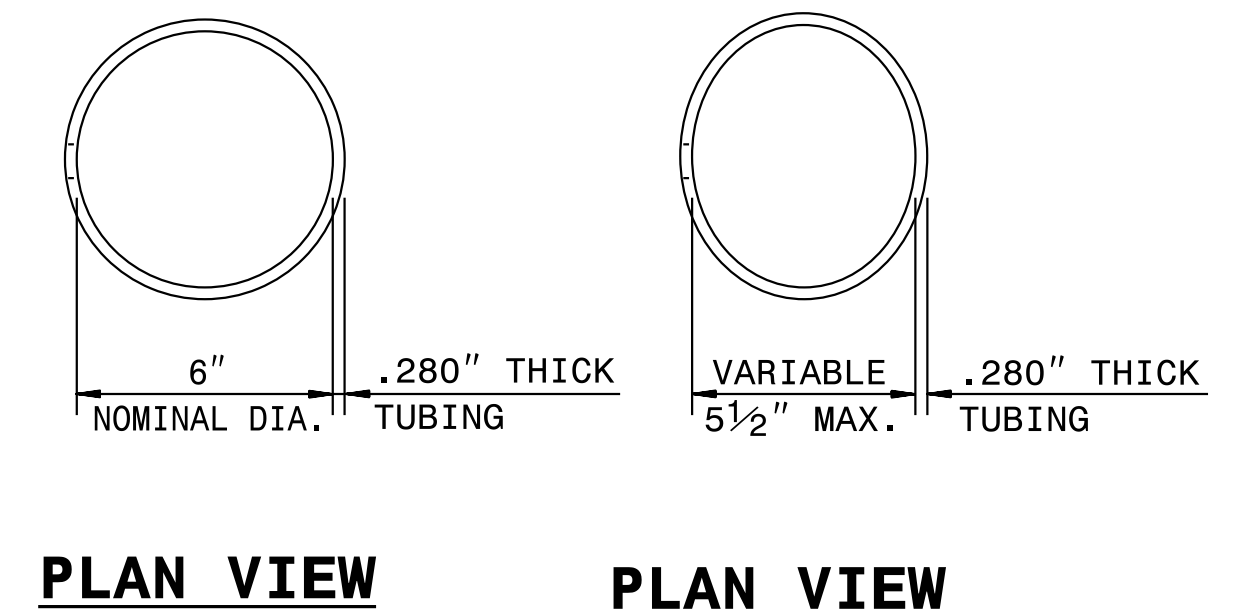
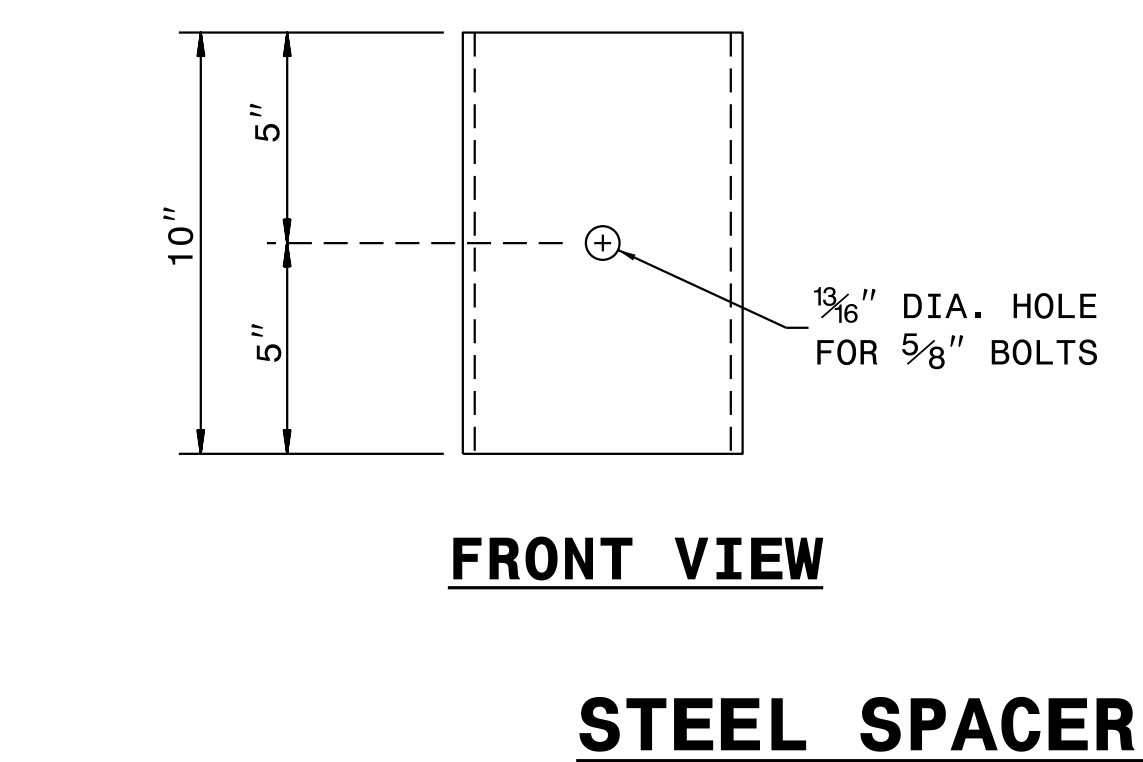
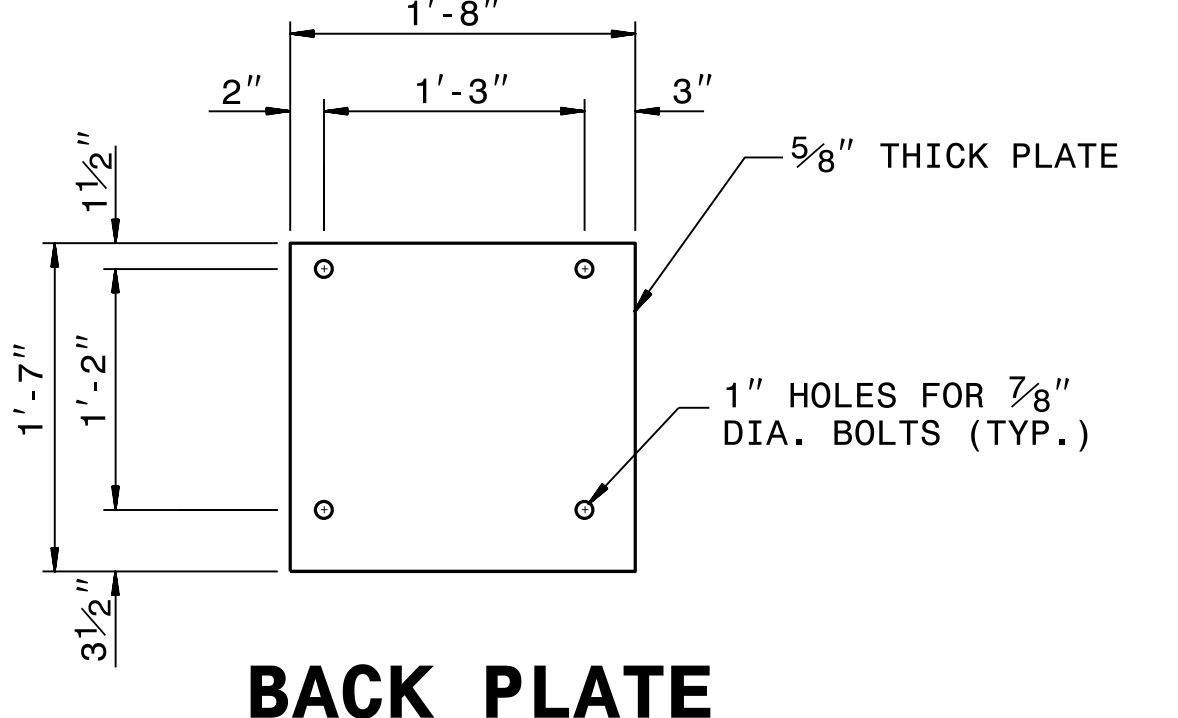
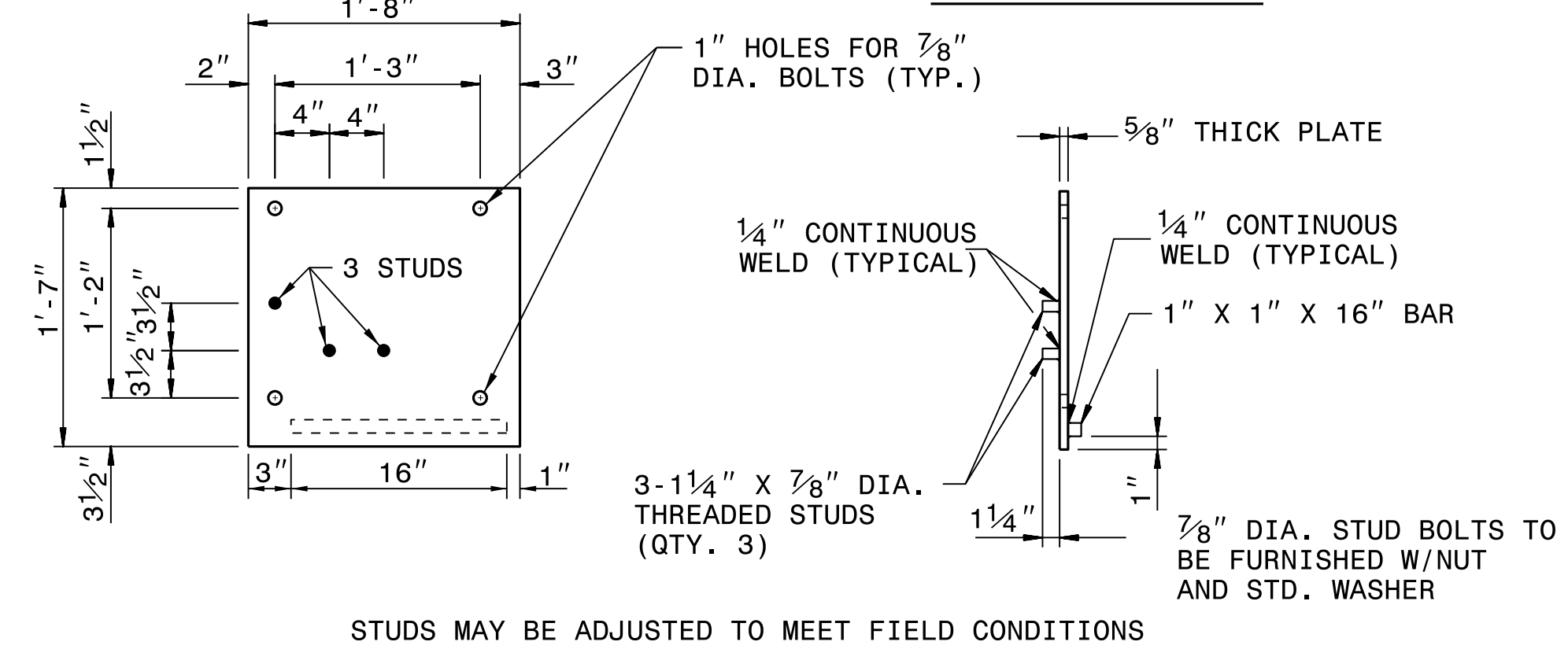
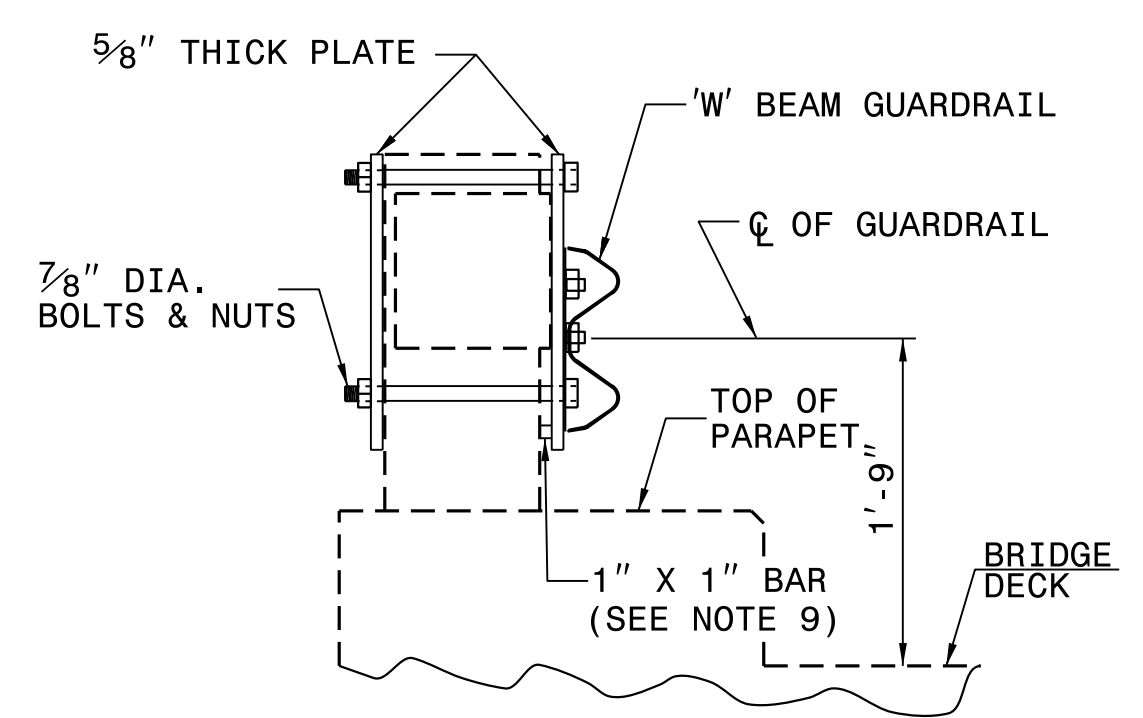
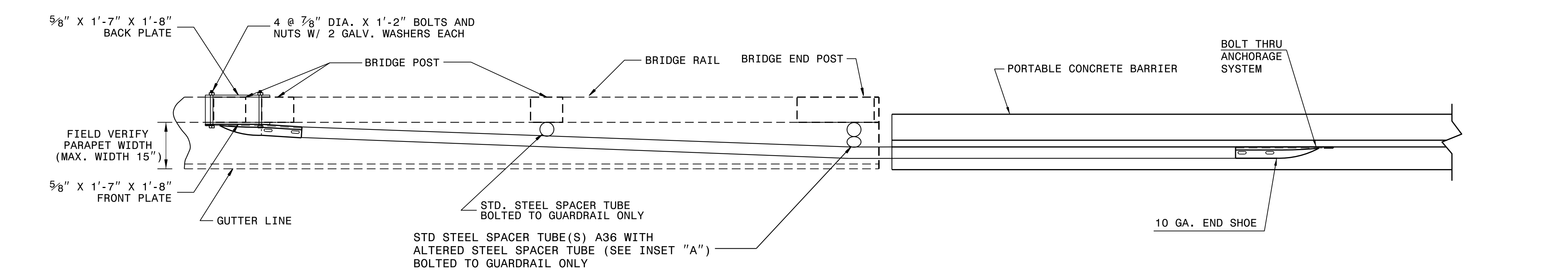
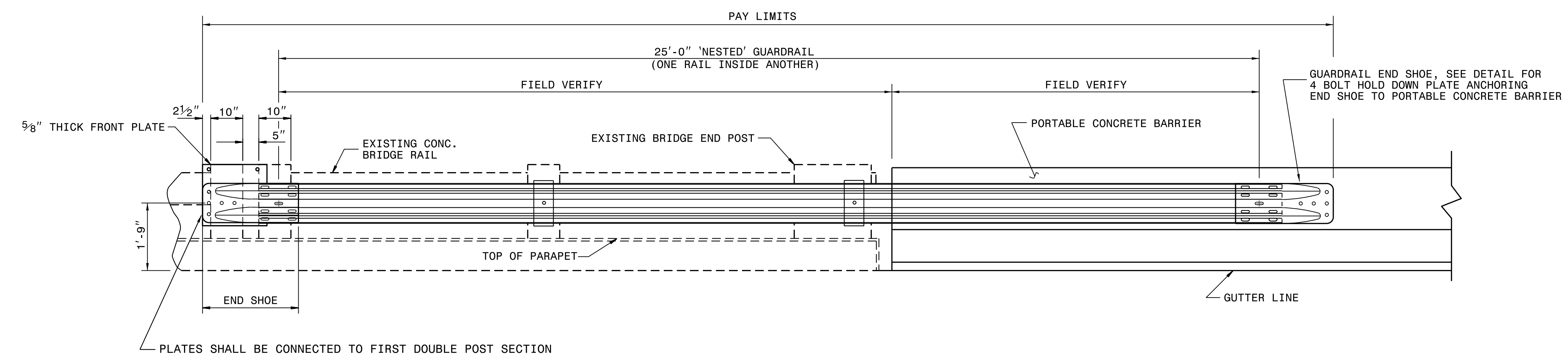
SEE PLATE FOR TITLE

ORIGINAL BY: _____ DATE: _____
 MODIFIED BY: K Kempf DATE: FEB 2019
 CHECKED BY: _____ DATE: _____
 FILE SPEC.: details/kkempf/english/I4700 extend endwall

NORTH CAROLINA
PROFESSIONAL
SEAL
022966
ENGINEER
JOSEPH S. HOWERTON

DocuSigned by:

 7/12/2019



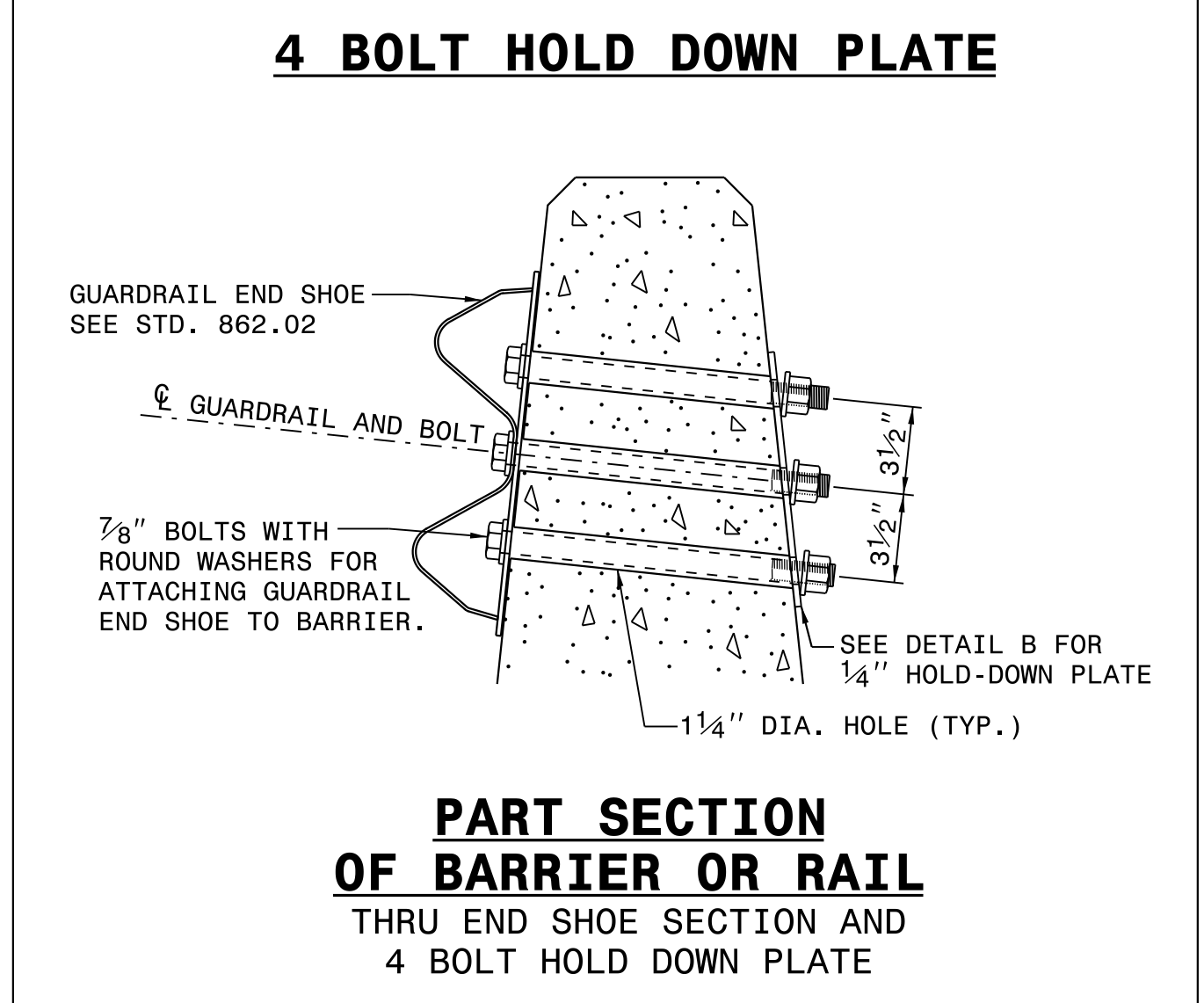
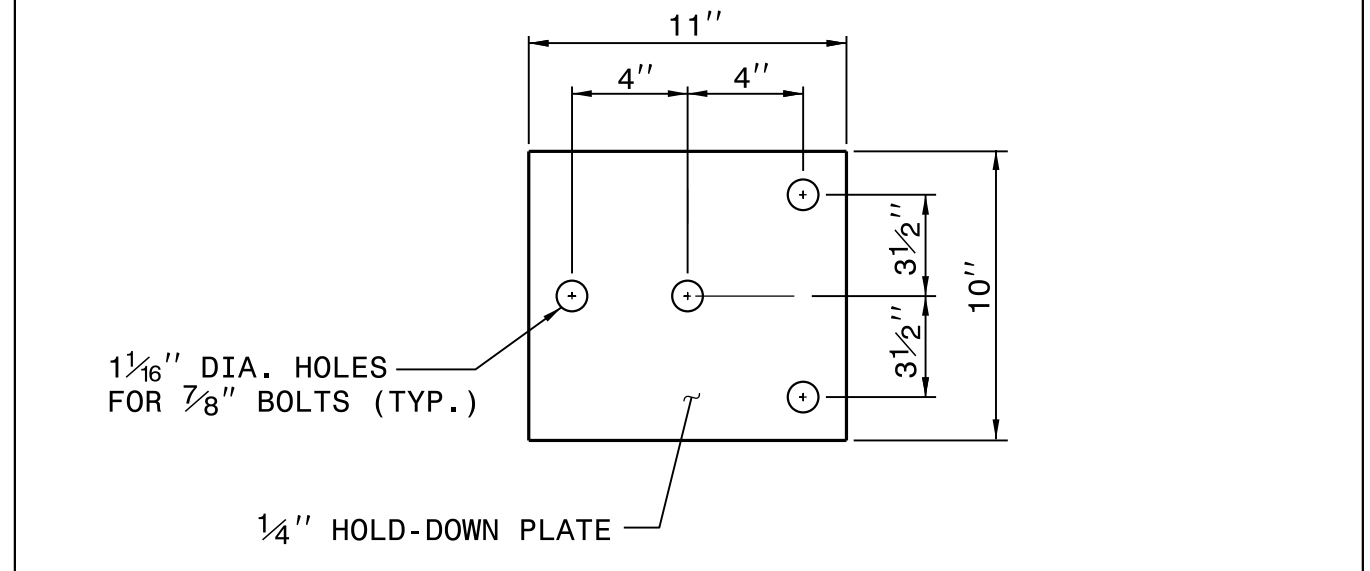
- GENERAL NOTES:**
1. USE NUTS, BOLTS, AND WASHERS CONFORMING TO THE REQUIREMENTS OF A.S.T.M. A-307 AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF STAND. SPECS.
 2. TAP NUTS FOR THE 7/8" DIA. STUDS AND BOLTS AFTER GALVANIZING SEE A.S.T.M. A-563.
 3. USE PLATES AND TUBES CONFORMING TO THE REQUIREMENTS OF A.S.T.M. A-36 AND GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH SECTION 1076 OF STAND. SPECS.
 4. ADDITIONAL FIELD HOLES MAY BE DRILLED IN STEEL RAIL AS DIRECTED BY THE ENGINEER.
 5. INSTALL FACE OF GUARDRAIL AS NEAR AS POSSIBLE TO PLUMB WITH THE PARAPET FACE AT BRIDGE END POST SPACER TUBE LOCATION BY USING STANDARD OR ALTERED SPACER TUBES OR A COMBINATION THEREOF OR AS DIRECTED BY THE ENGINEER. FOR VERY SMALL PARAPET WIDTHS, GUARDRAIL MAY BE INSTALLED AGAINST BRIDGE RAIL WITHOUT SPACER TUBES.
 6. DO NOT DRILL BRIDGE RAIL IN ORDER TO INSTALL GUARDRAIL ANCHOR UNIT.
 7. KEEP TOE OF PORTABLE CONCRETE BARRIER FLUSH WITH FACE OF PARAPET.
 8. ATTACH 1" X 1" BAR AND THREADED STUDS TO PLATE WITH 1/4" WELDS ALL AROUND.
 9. 1" X 1" BAR MAY NOT BE NEEDED ON BRIDGE RAILS WHERE FACE OF RAIL DOES NOT PROJECT BEYOND FACE OF POST.

NOTES FOR 4 BOLT HOLD DOWN PLATE

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 4 - 7/8" DIA. BOLTS WITH NUTS AND WASHERS.

THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.

AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL. THE 1 1/4" DIA. HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



DocuSigned by:
E.E. Ward
7/12/2019

CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

TEMPORARY ANCHOR UNIT TYPE W-BEAM

ORIGINAL BY: E.E. WARD DATE: 4-03
MODIFIED BY: E.E. WARD DATE: 6-04
CHECKED BY: DATE:
FILE SPEC.: :usr\details\stand\862stds\anc.dgn

I:\SEP-2018_07\24 S:\Contracts\Special Details\ward\stand\862stds\anc.dgn J:\over-ton AT_CSD-292595

DITCH DETAILS

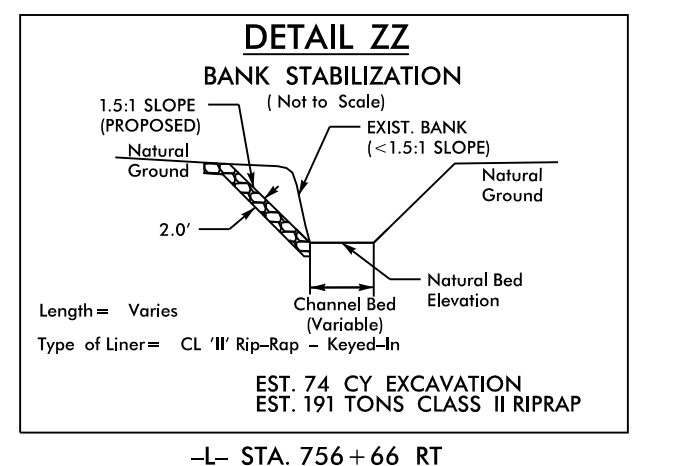
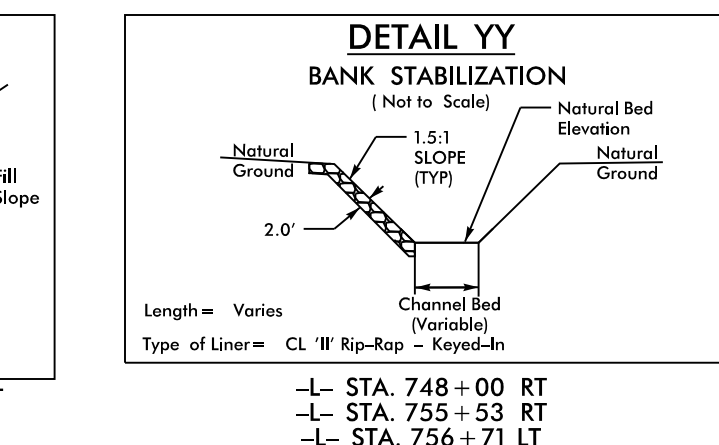
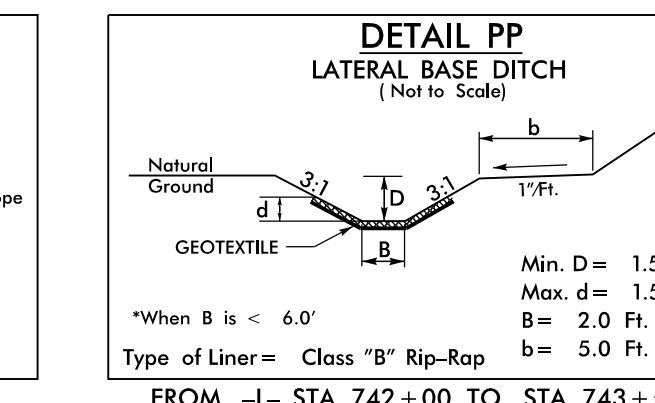
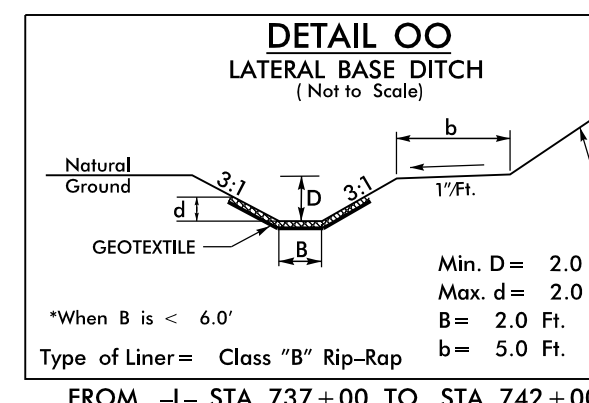
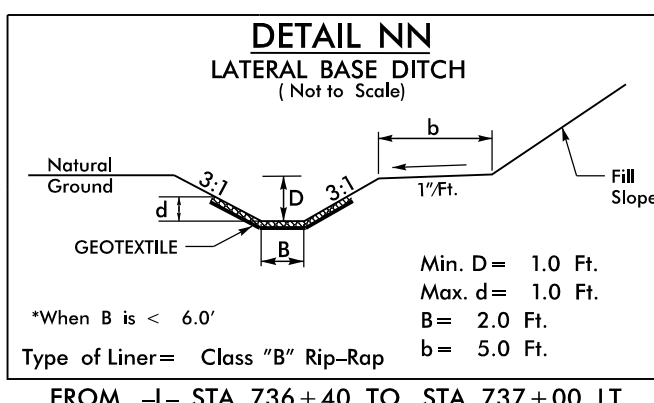
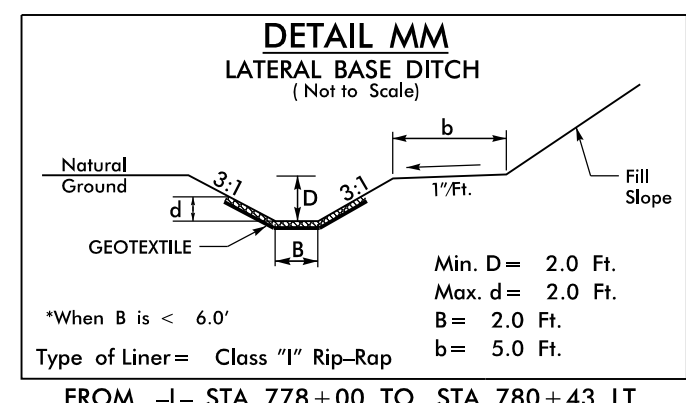
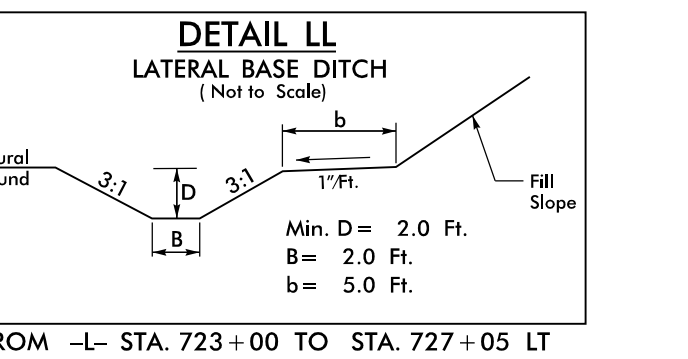
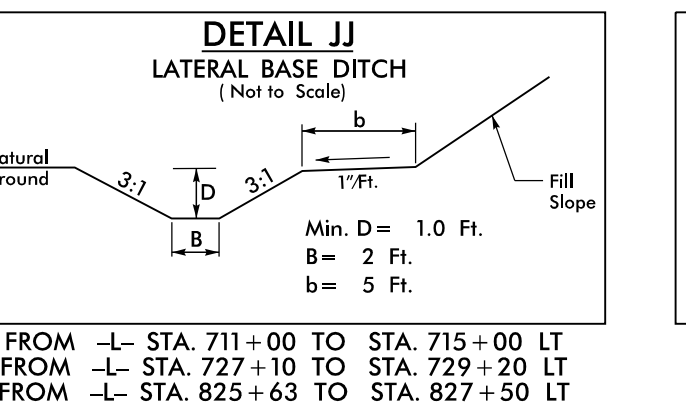
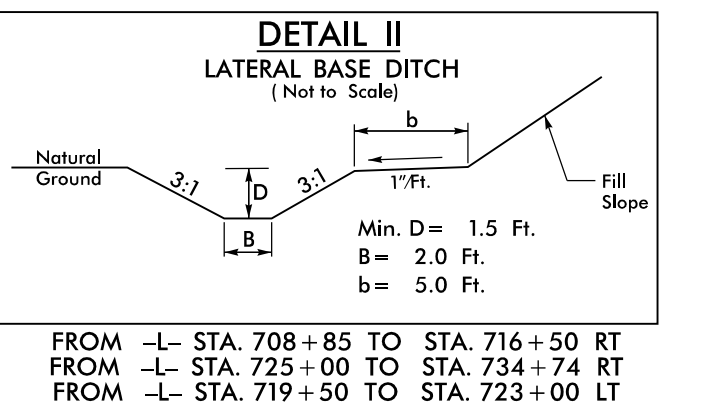
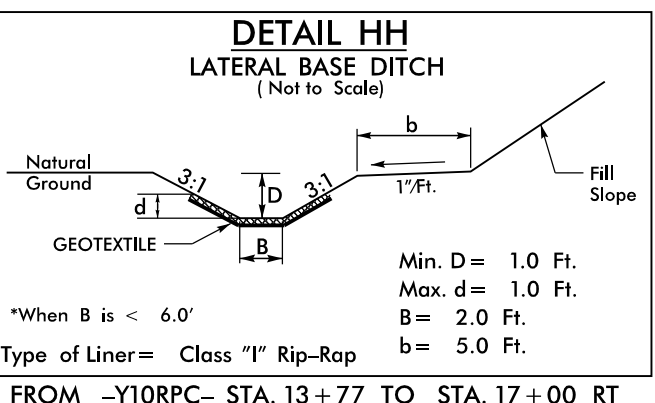
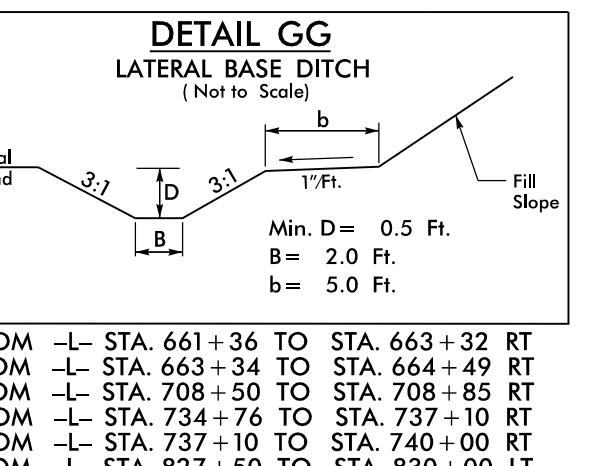
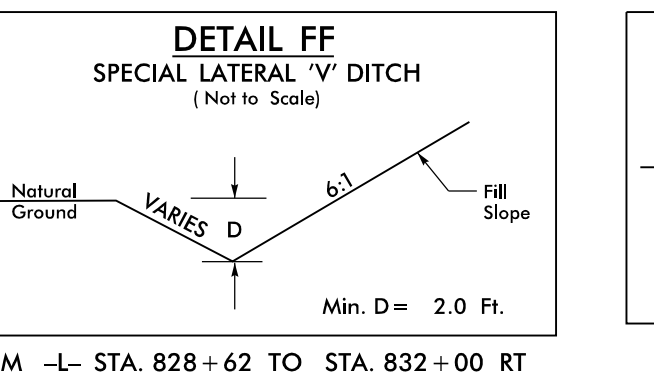
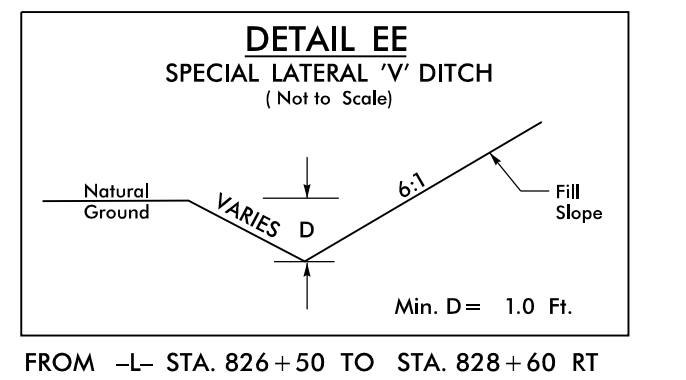
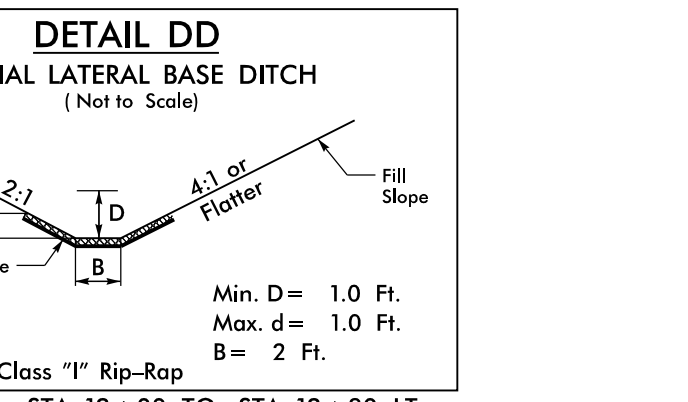
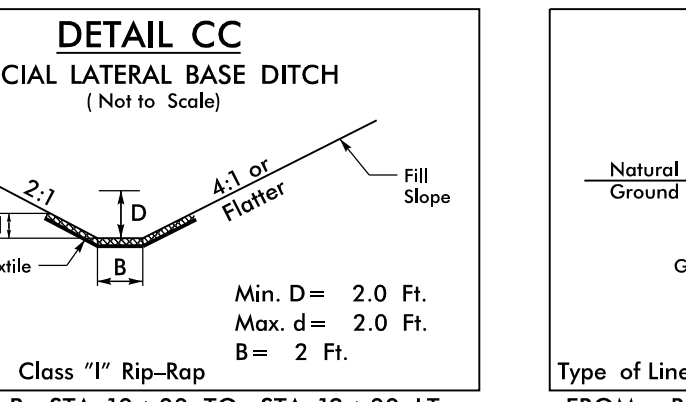
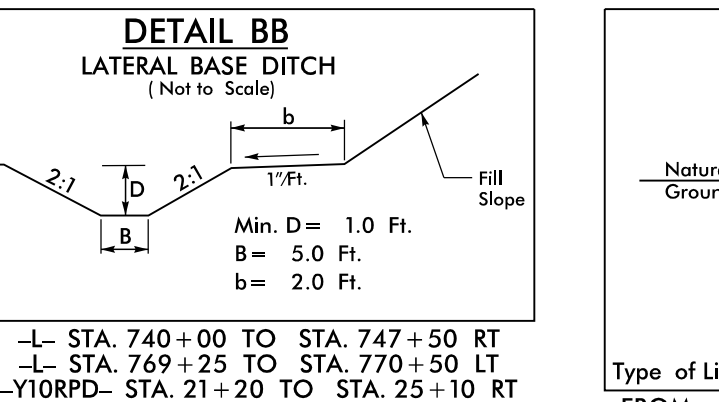
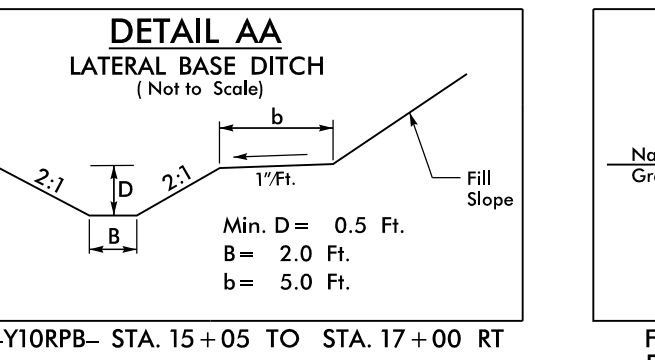
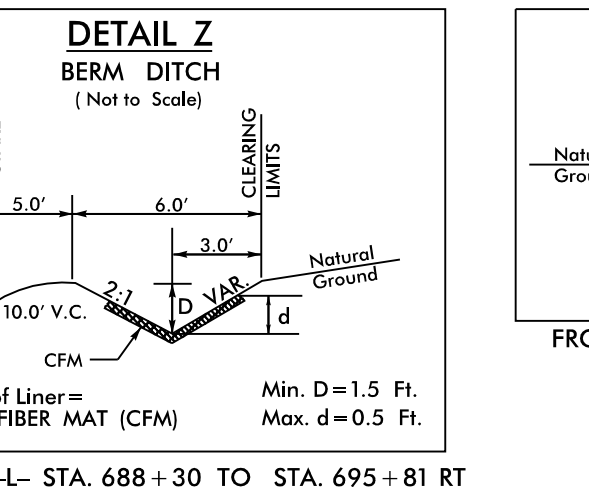
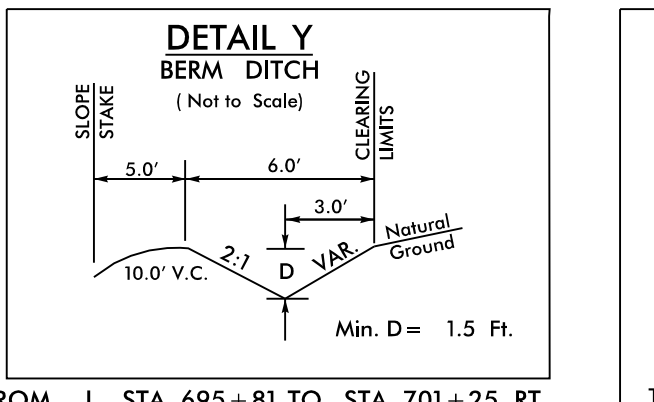
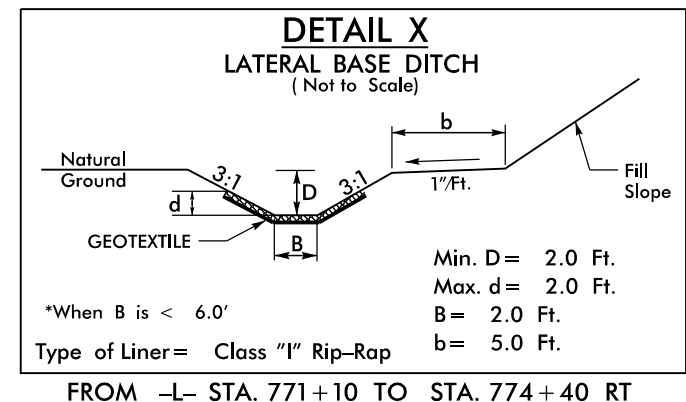
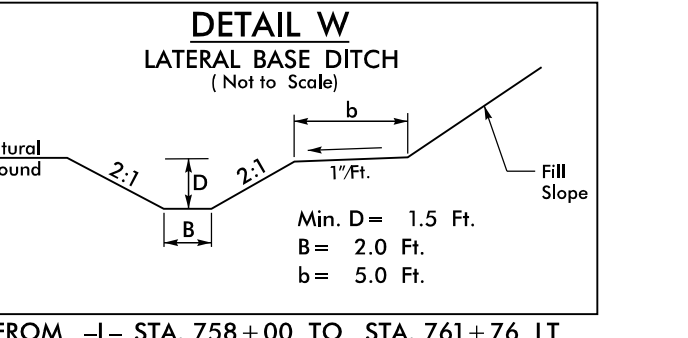
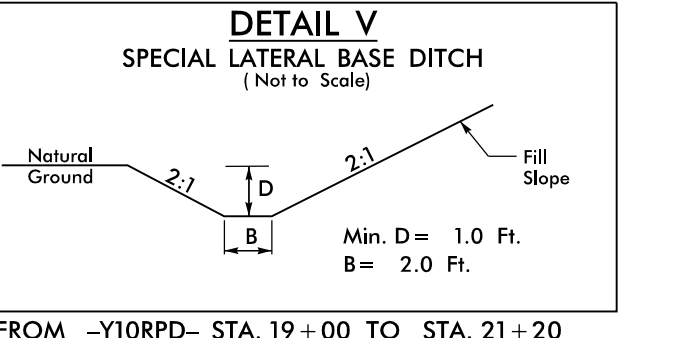
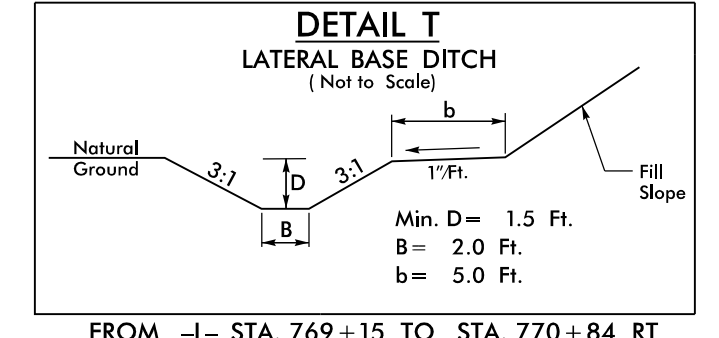
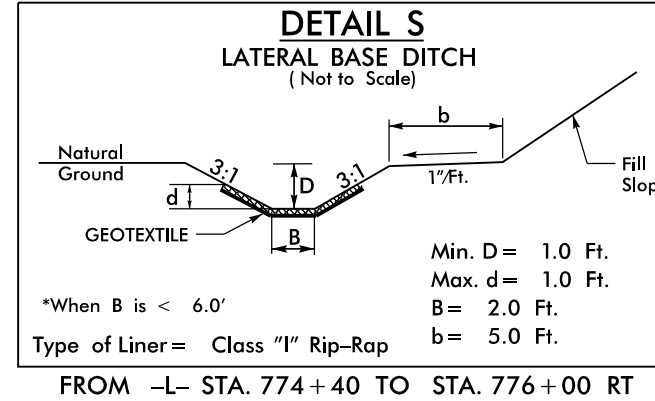
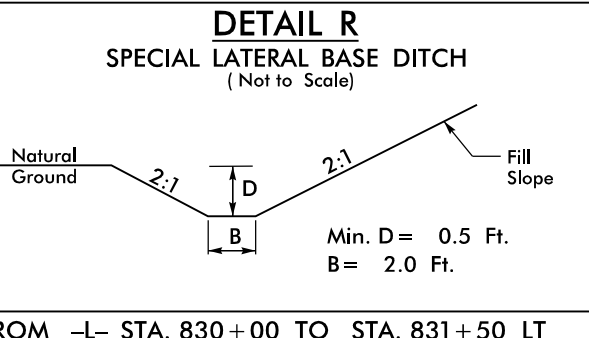
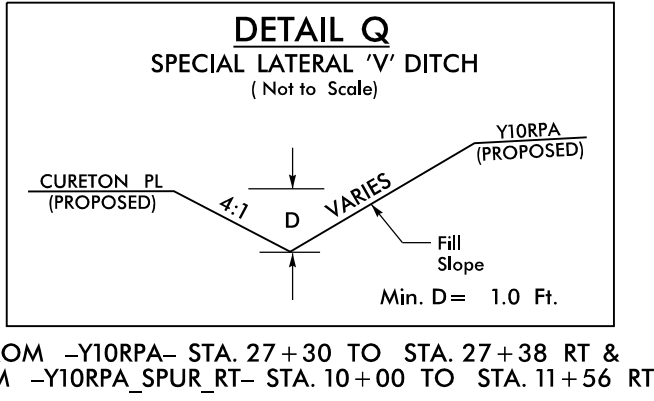
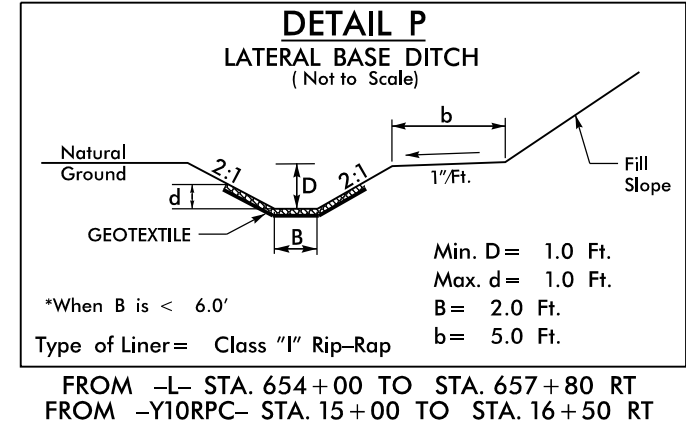
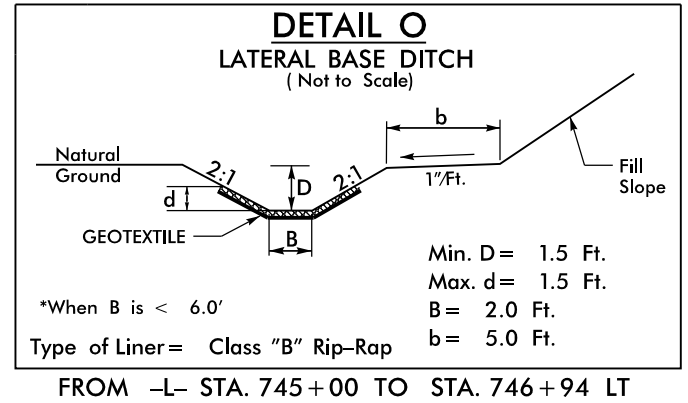
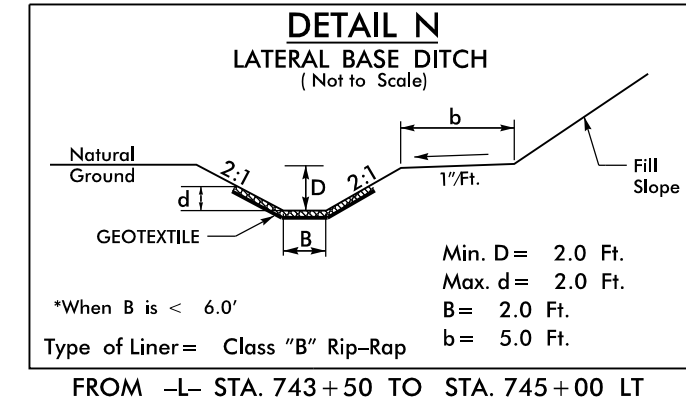
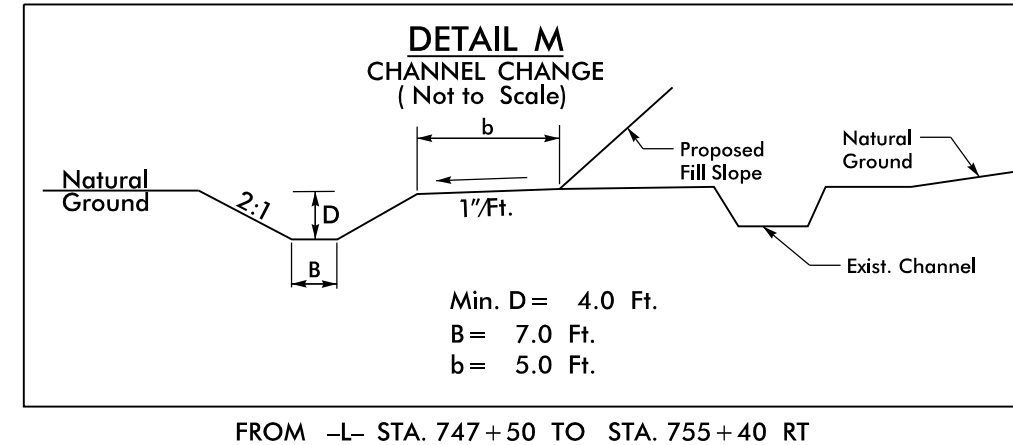
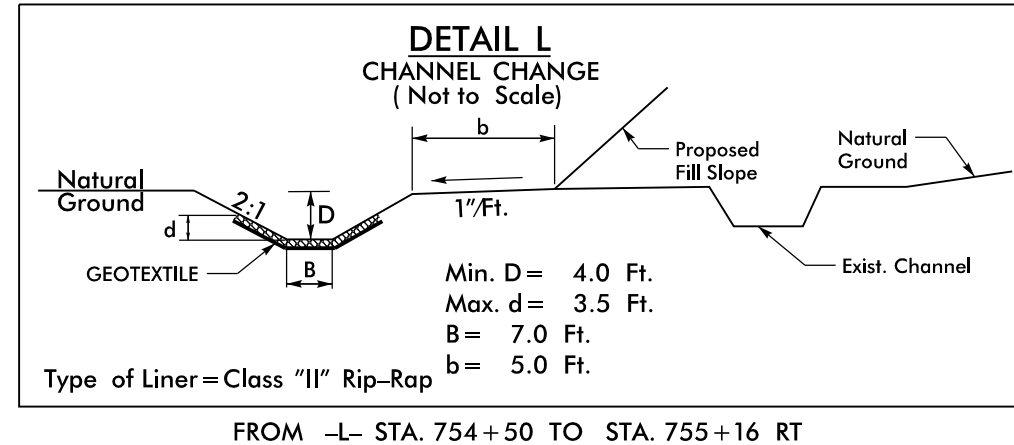
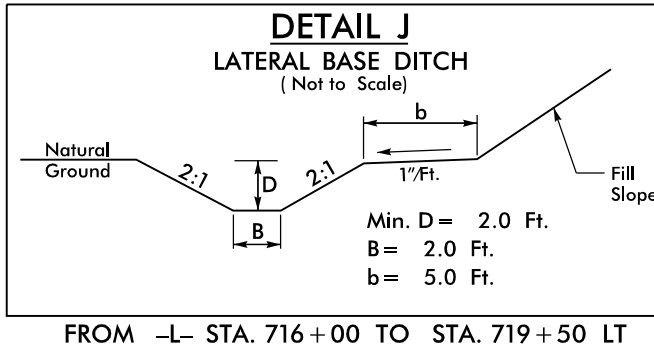
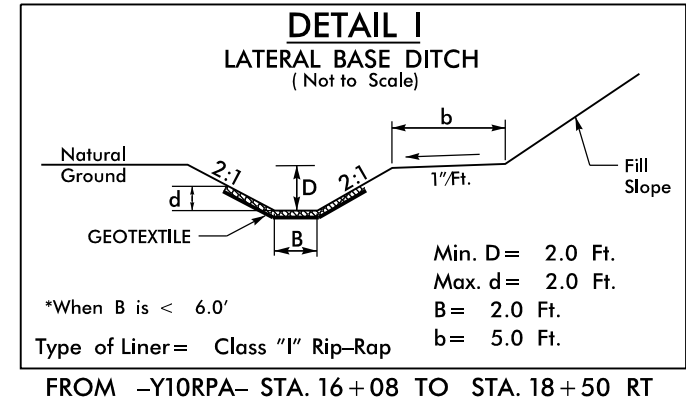
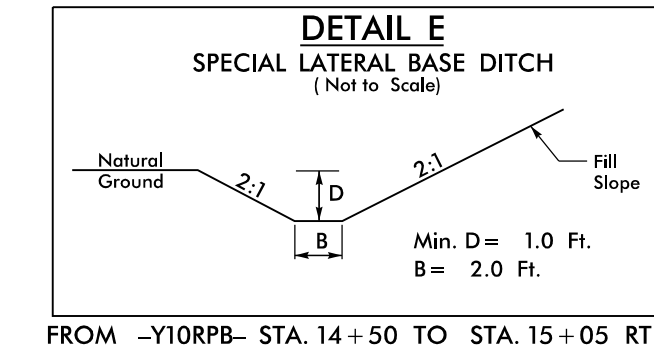
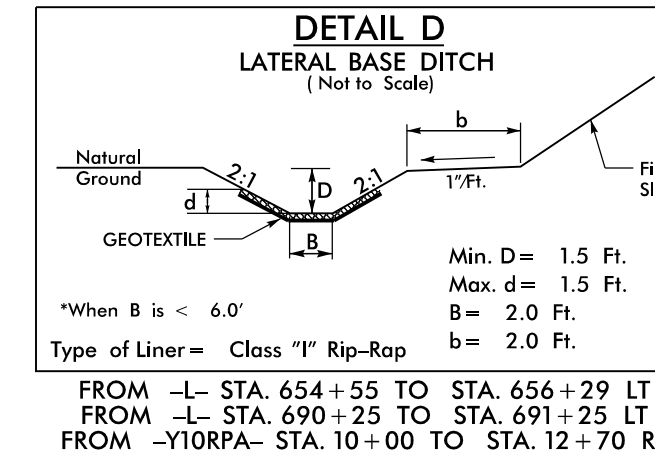
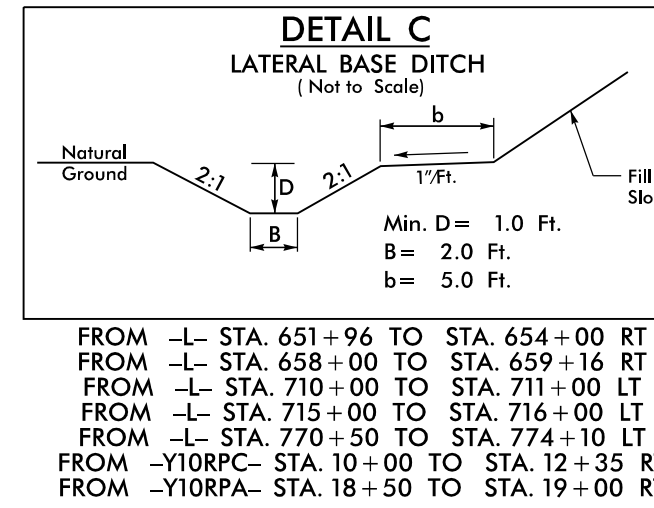
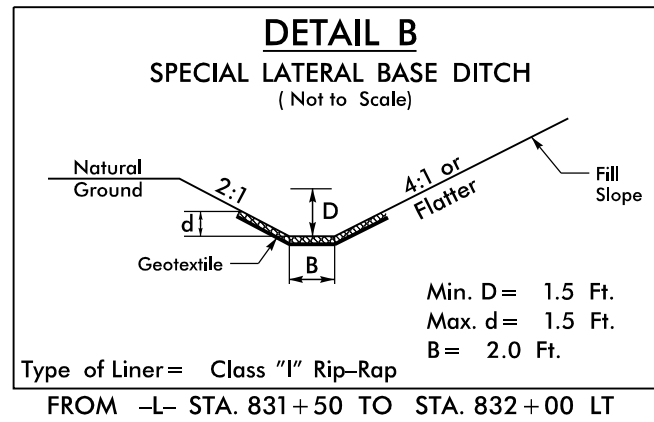
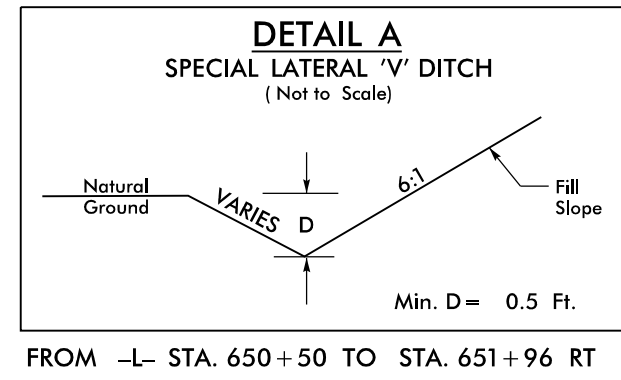
RW SHEET NO.

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL 047948
JOHN M. BLANCETT

DocuSigned by: *John M. Blancett* 7/12/2019

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REVISIONS

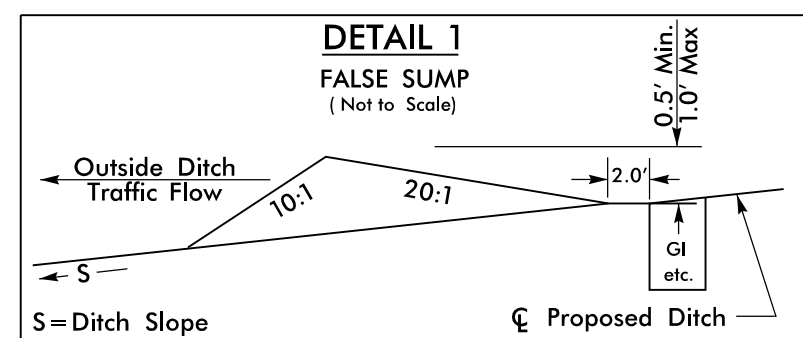
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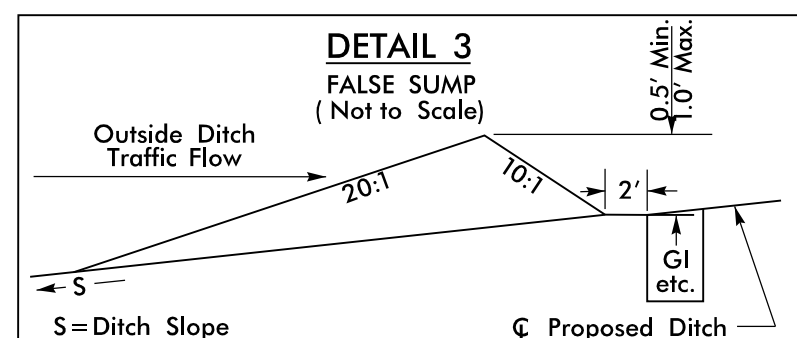


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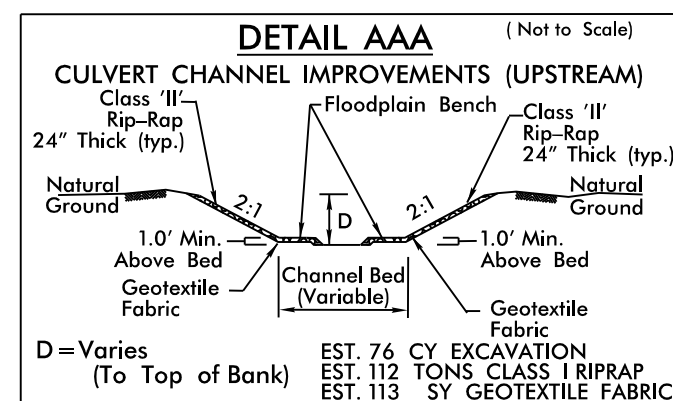
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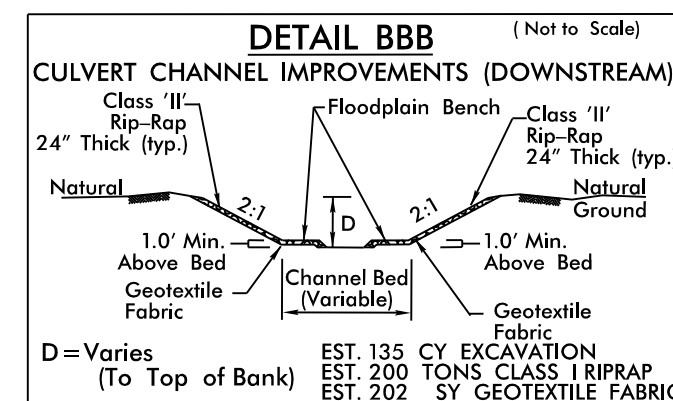
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- L- 724 + 98 RT
- L- 789 + 61 LT
- L- 793 + 11 LT
- RESTA- 10 + 65 RT
- L- 810 + 57 LT



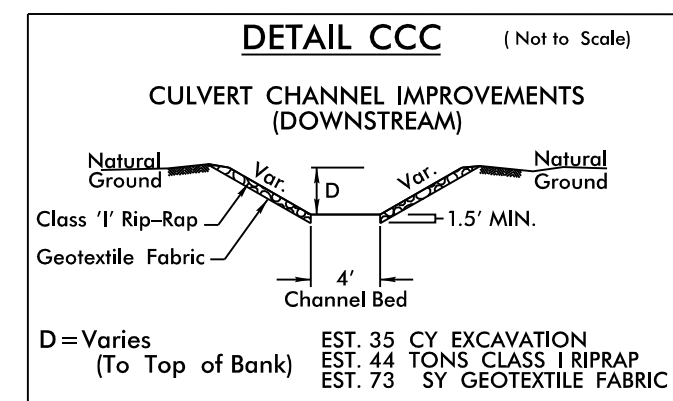
- L- STA. 669 + 65 LT
- L- STA. 673 + 90 LT
- L- STA. 678 + 60 LT
- L- STA. 689 + 83 RT
- L- STA. 699 + 85 RT
- L- STA. 704 + 19 RT
- L- STA. 783 + 63 RT
- L- STA. 789 + 60 RT
- L- STA. 793 + 11 RT
- L- STA. 799 + 09 RT
- L- STA. 800 + 84 RT
- Y10RPPD- STA. 14 + 69 LT
- Y10RPPD- STA. 11 + 13 LT



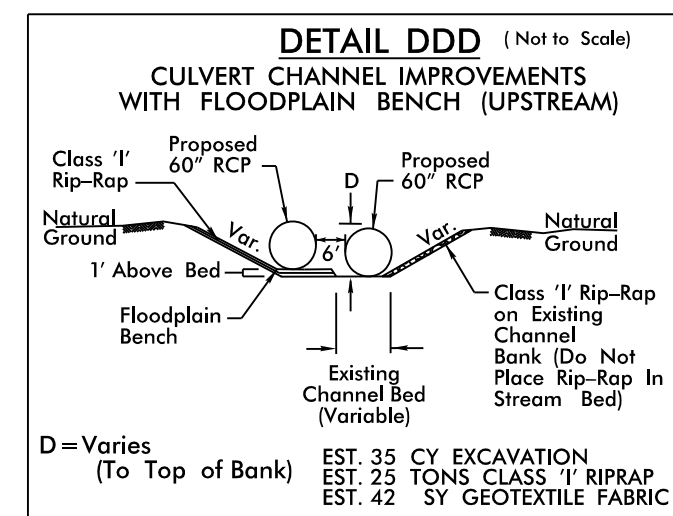
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- EST. 112 TONS CLASS II RIPRAP
- EST. 113 SY GEOTEXTILE FABRIC



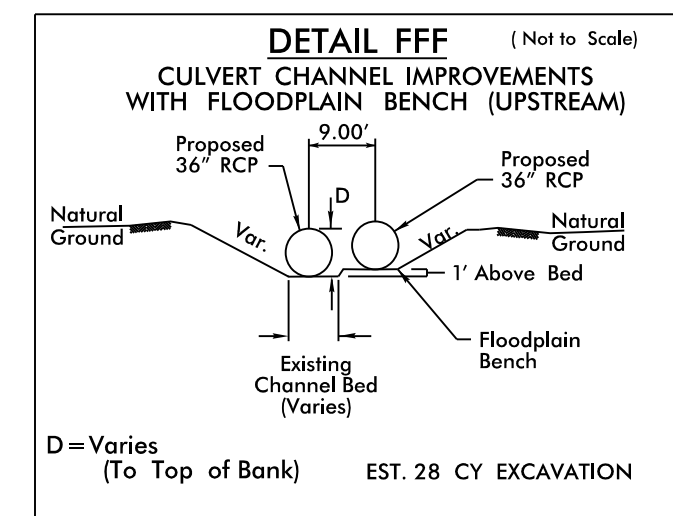
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- EST. 200 TONS CLASS I RIPRAP
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- EST. 35 CY EXCAVATION
- EST. 44 TONS CLASS I RIPRAP
- EST. 73 SY GEOTEXTILE FABRIC

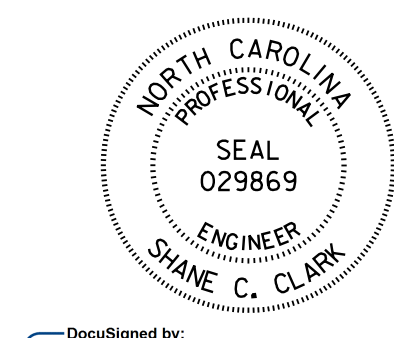


- EST. 35 CY EXCAVATION
- EST. 25 TONS CLASS I RIPRAP
- EST. 42 SY GEOTEXTILE FABRIC



- EST. 28 CY EXCAVATION

REVISIONS

PROJECT REFERENCE NO. I-4400C	SHEET NO. 2G-1
GEOTECHNICAL ENGINEER  Documented by: <u>Shane C. Clark</u> 7/9/2019 DATE	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

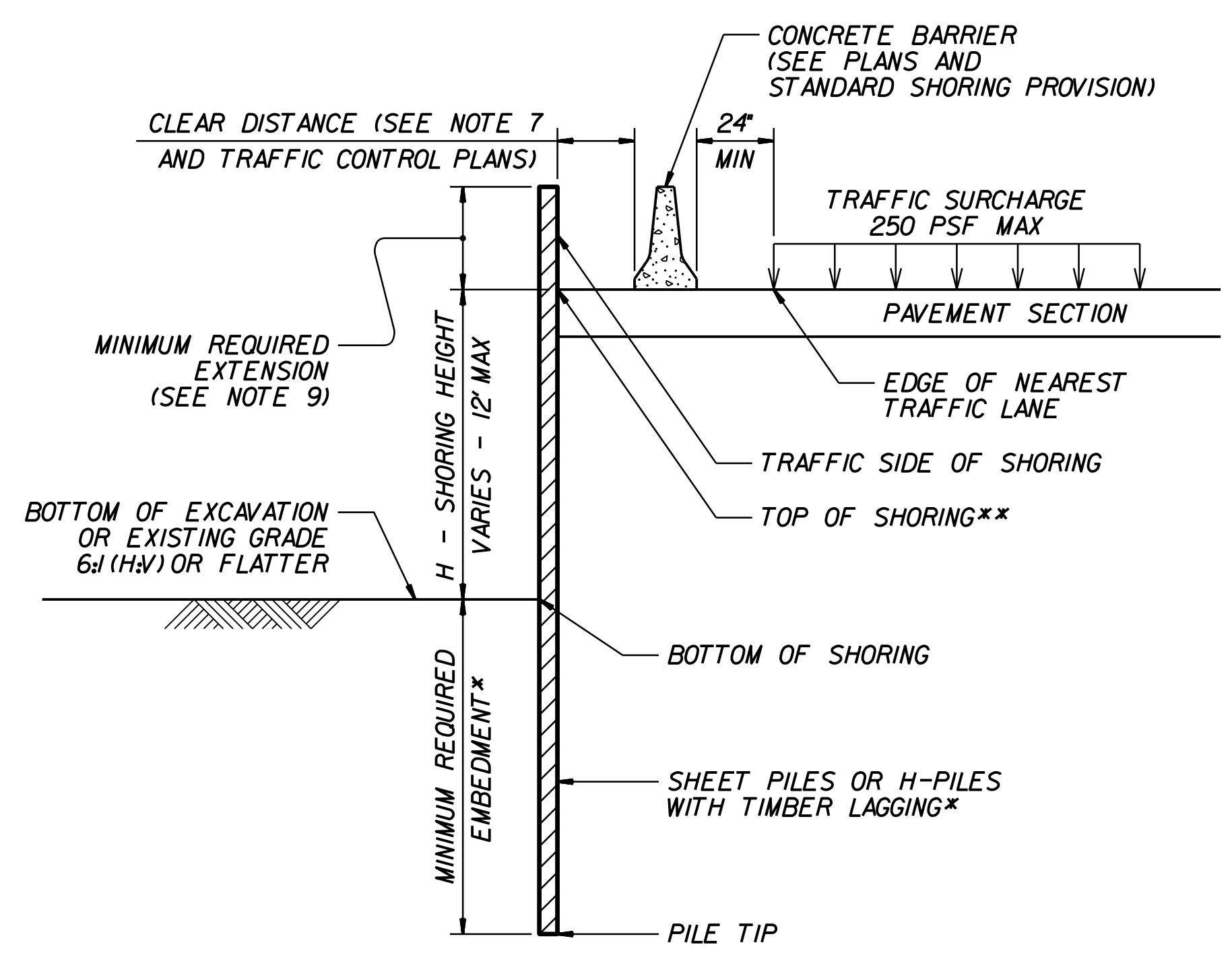
GROUNDWATER CONDITION (SEE NOTE 6)	H SHORING HEIGHT (FT)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT						SURCHARGE CASE WITH TRAFFIC IMPACT					
		SHEET PILES		H-PILES WITH TIMBER LAGGING				SHEET PILES		H-PILES WITH TIMBER LAGGING			
		MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (IN ³ /FT)	MINIMUM REQUIRED EMBEDMENT* (FT) (SEE NOTE 10)			MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (IN ³ /FT)	MINIMUM REQUIRED EMBEDMENT* (FT) (SEE NOTE 10)				
				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	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		
	12	22.5	33.0	--	--	--	22.0	33.0	--	--	21.5		
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:

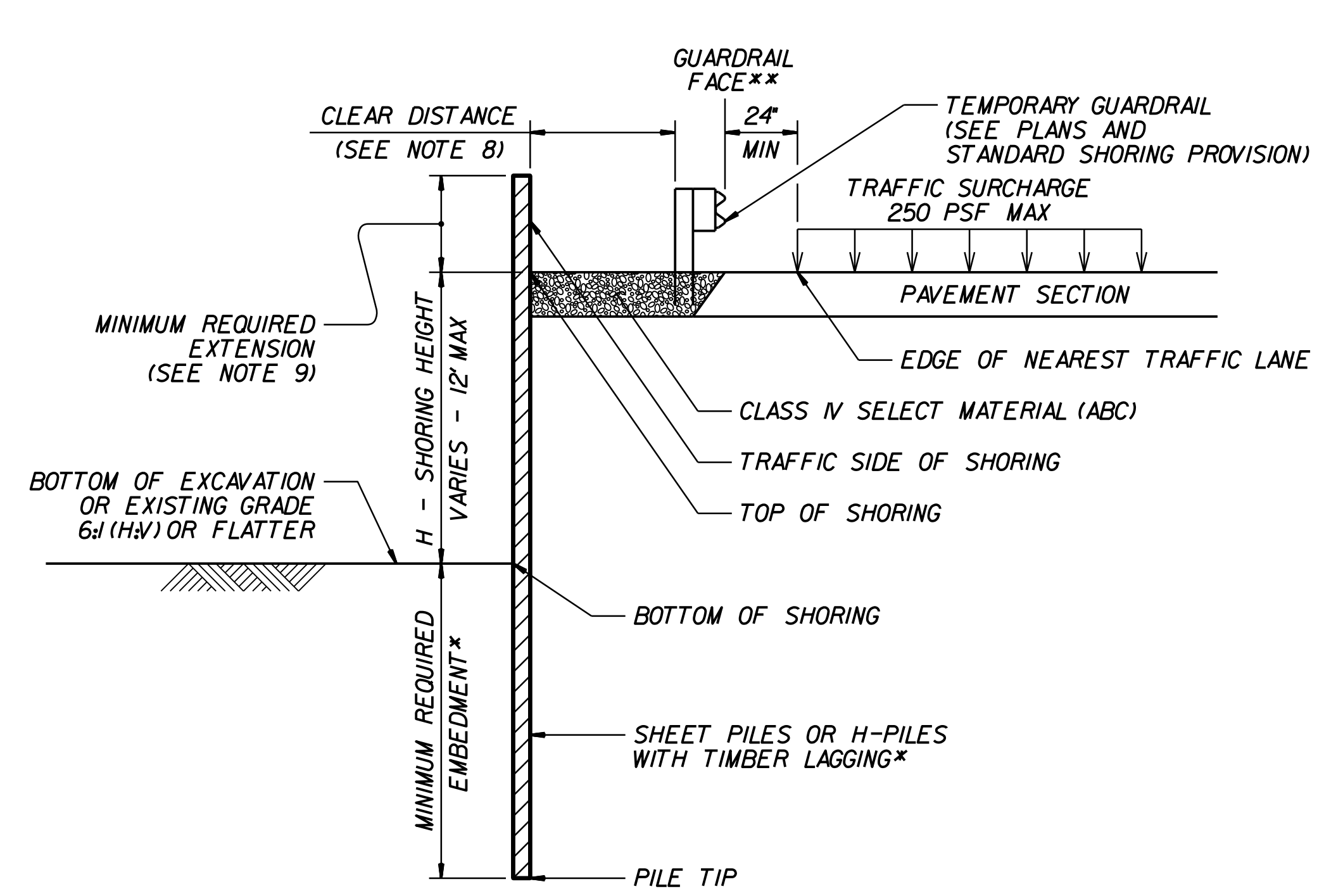
- AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY SHORING AS NOTED IN THE PLANS.
- FOR STANDARD TEMPORARY SHORING, SEE STANDARD SHORING PROVISION.
- STANDARD TEMPORARY SHORING IS BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
UNIT WEIGHT, $\gamma = 120$ PCF
FRICTION ANGLE, $\phi = 30$ DEGREES
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
- CONTACT THE ENGINEER IF PILES DO NOT ATTAIN THE MINIMUM REQUIRED EMBEDMENT.

MINIMUM REQUIRED EMBEDMENT AND SECTION MODULUS

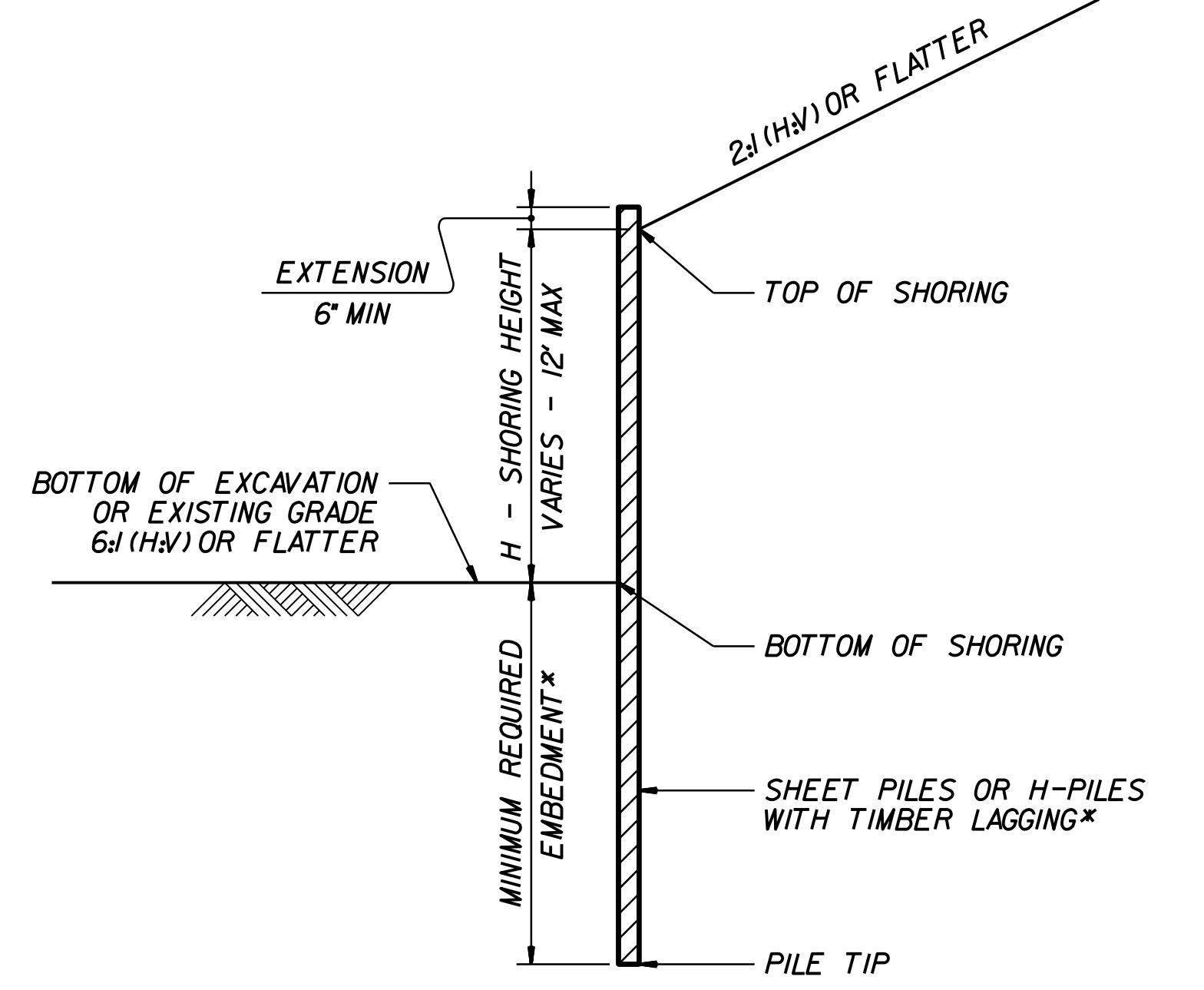
*DO NOT USE H-PILES WITH TIMBER LAGGING FOR GROUNDWATER CONDITION, SHORING HEIGHT AND H-PILE SIZE SHOWN IF MINIMUM REQUIRED EMBEDMENT IS "--".



CONCRETE BARRIER
**TOP OF SHORING = EDGE OF PAVEMENT

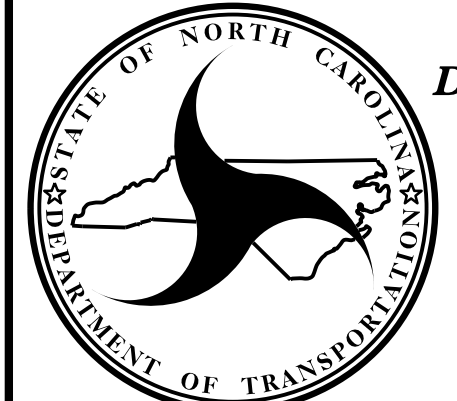


TEMPORARY GUARDRAIL
**GUARDRAIL FACE = EDGE OF PAVEMENT

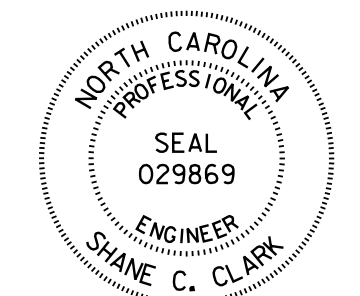


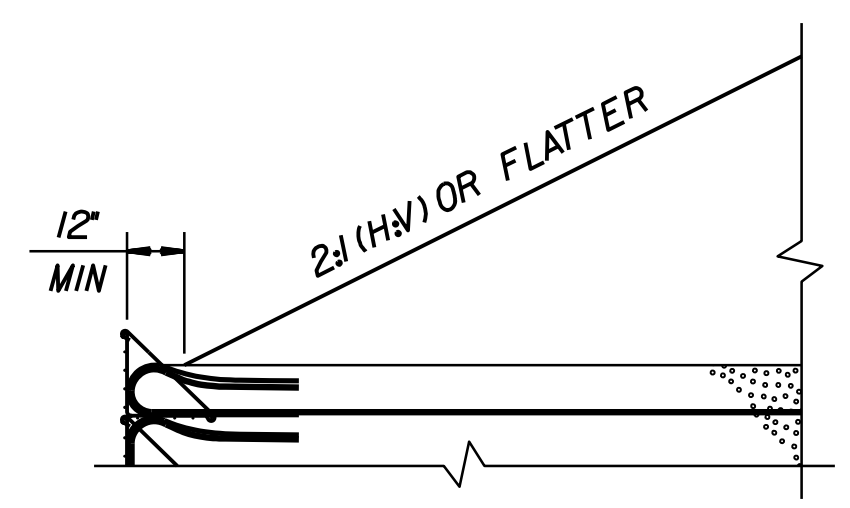
STANDARD TEMPORARY SHORING (SLOPE CASE)
*SEE TABLE ABOVE.

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

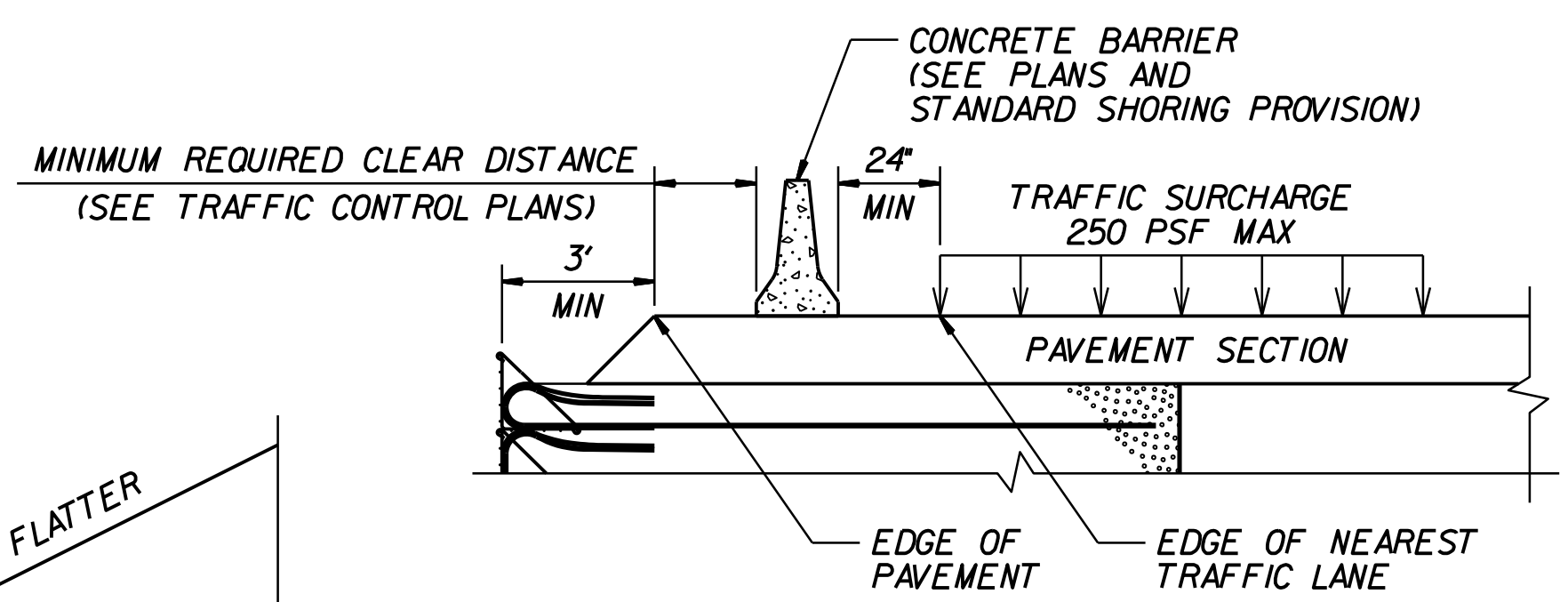

 NORTH CAROLINA
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GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.01
STANDARD TEMPORARY SHORING
 DATE: 11-19-13

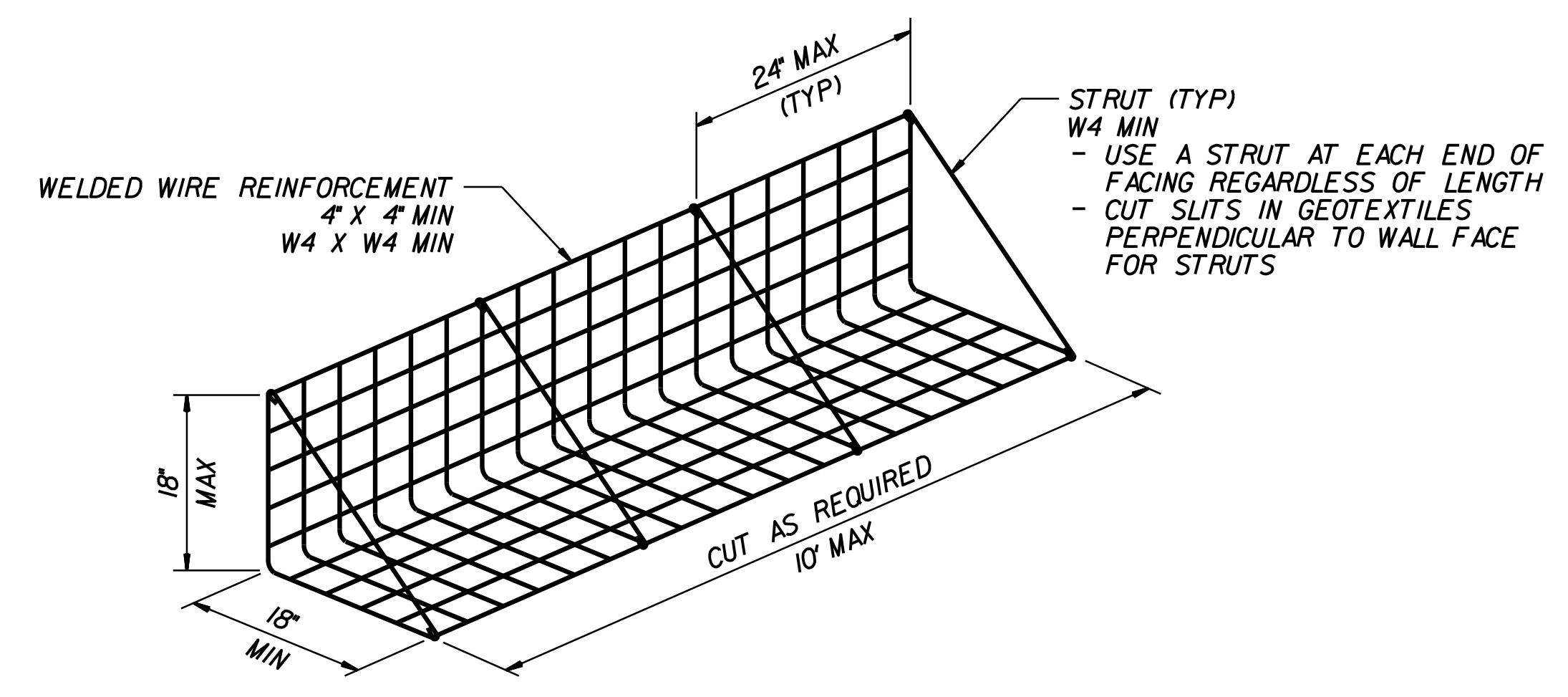
PROJECT REFERENCE NO. I-4400C	SHEET NO. 2G-2
GEOTECHNICAL ENGINEER  Signed by: <u>Shane C. Clark</u> 7/9/2019 DATE	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



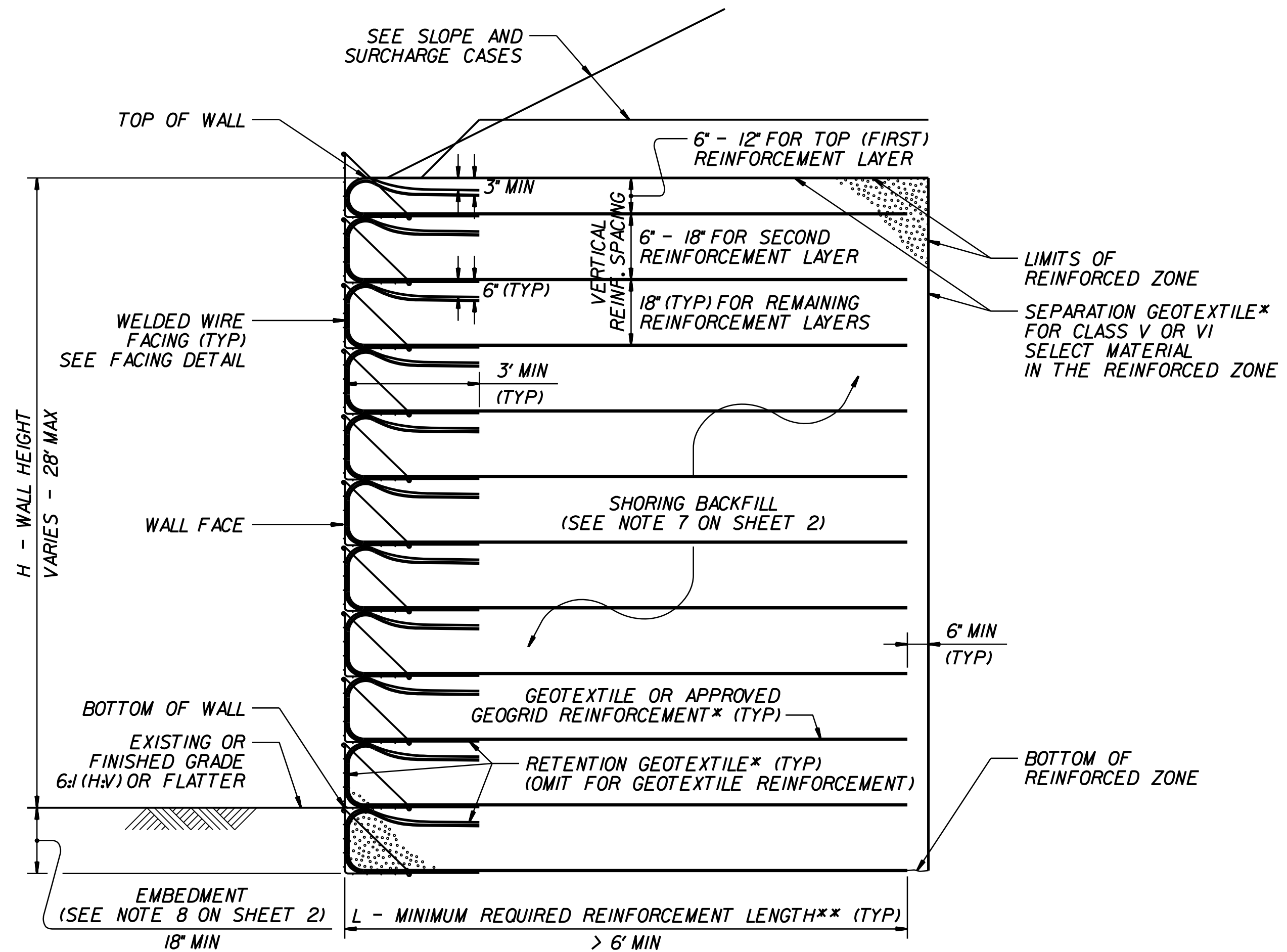
SLOPE CASE



SURCHARGE CASE

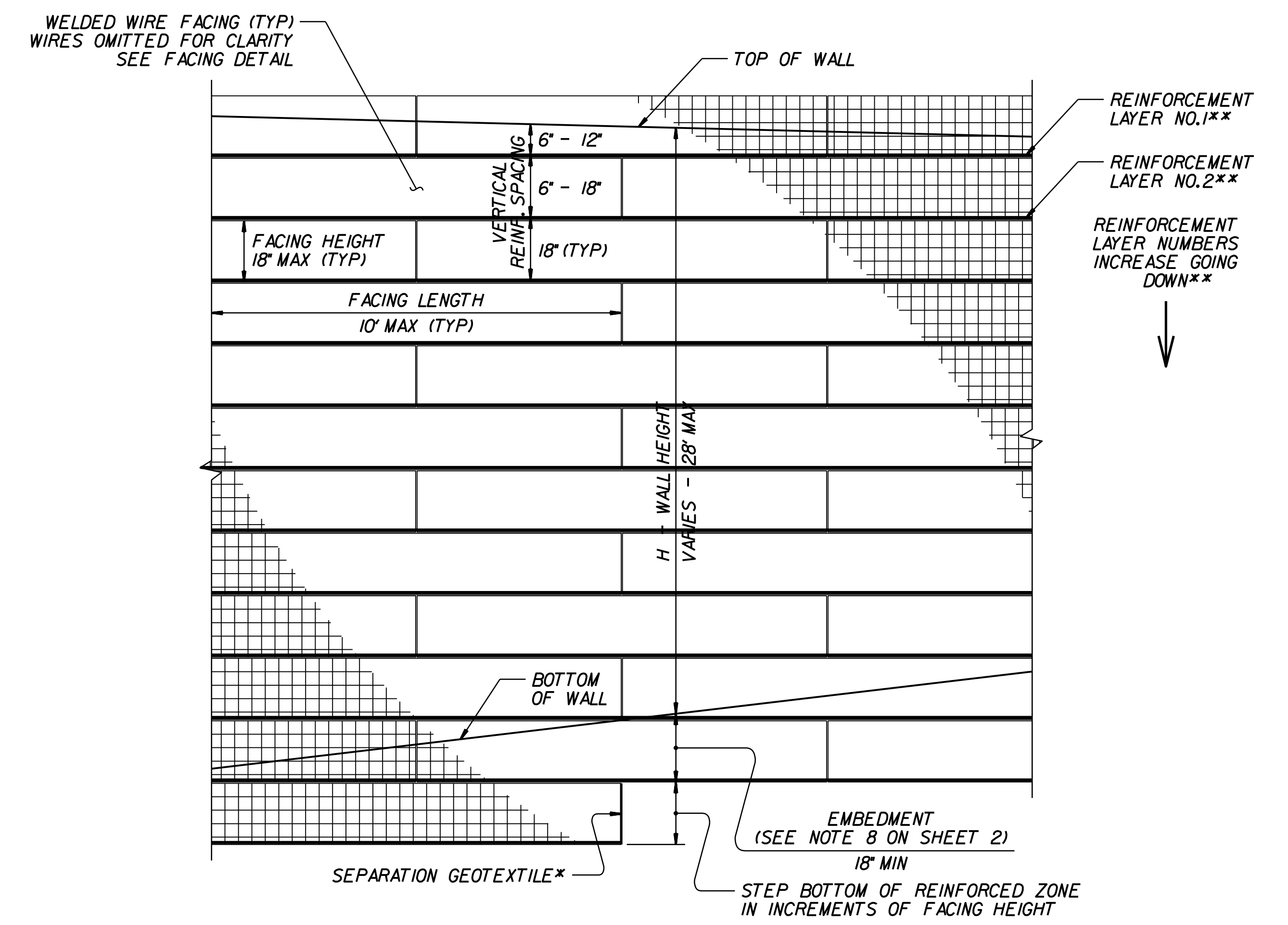


FACING DETAIL



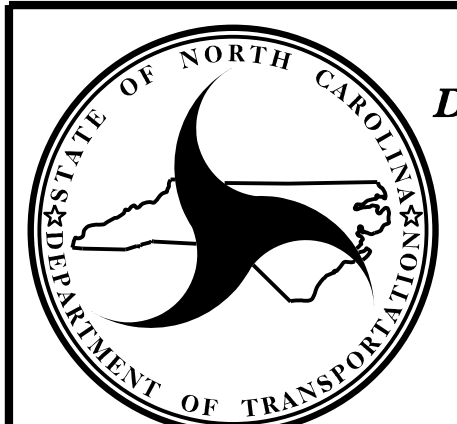
STANDARD TEMPORARY WALL

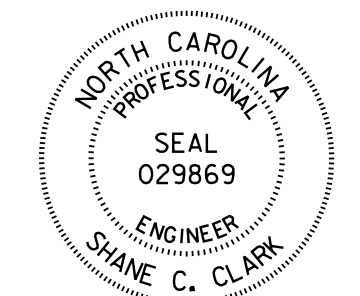
(FOR STANDARD TEMPORARY WALLS ON STRUCTURES, SEE TEMPORARY WALL ON STRUCTURE DETAIL ON SHEET 2.)
 *SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.
 **SEE REINFORCEMENT TABLES ON SHEET 3.

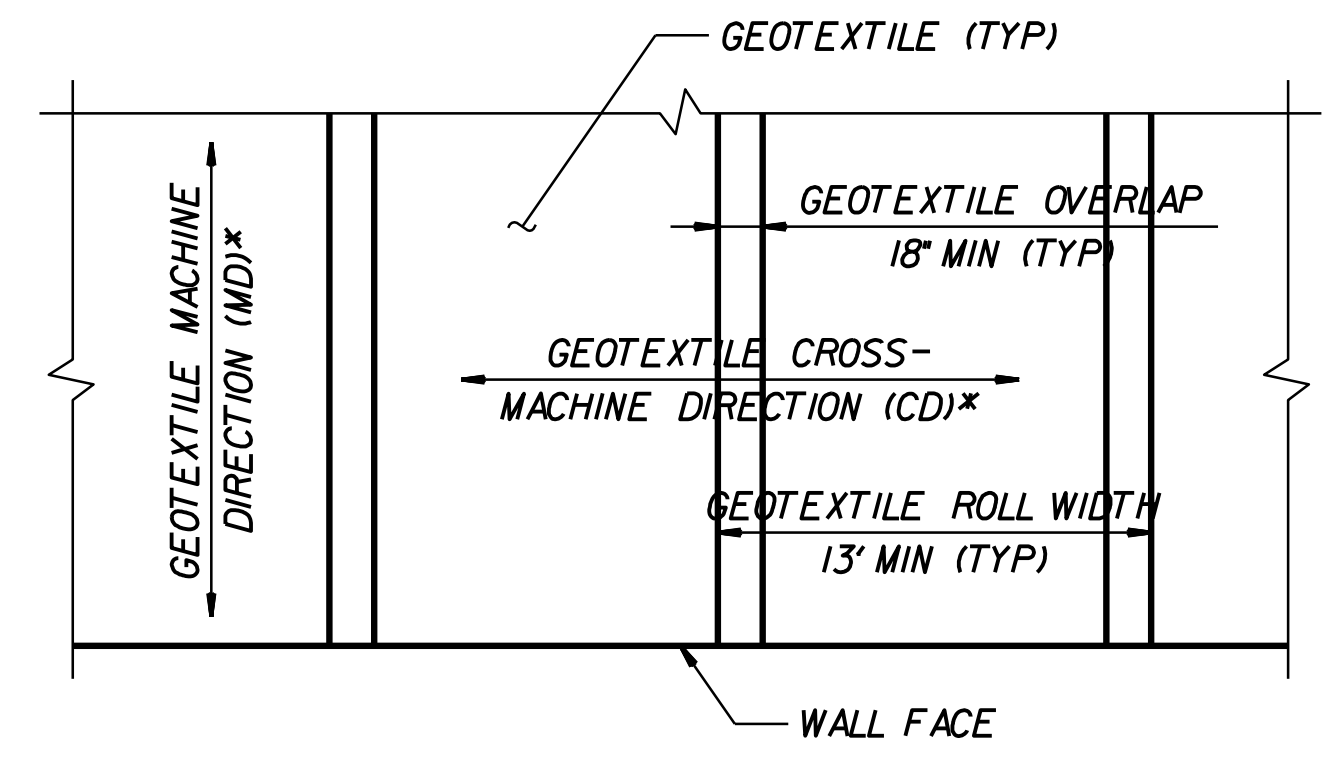


STANDARD TEMPORARY WALL - PARTIAL ELEVATION

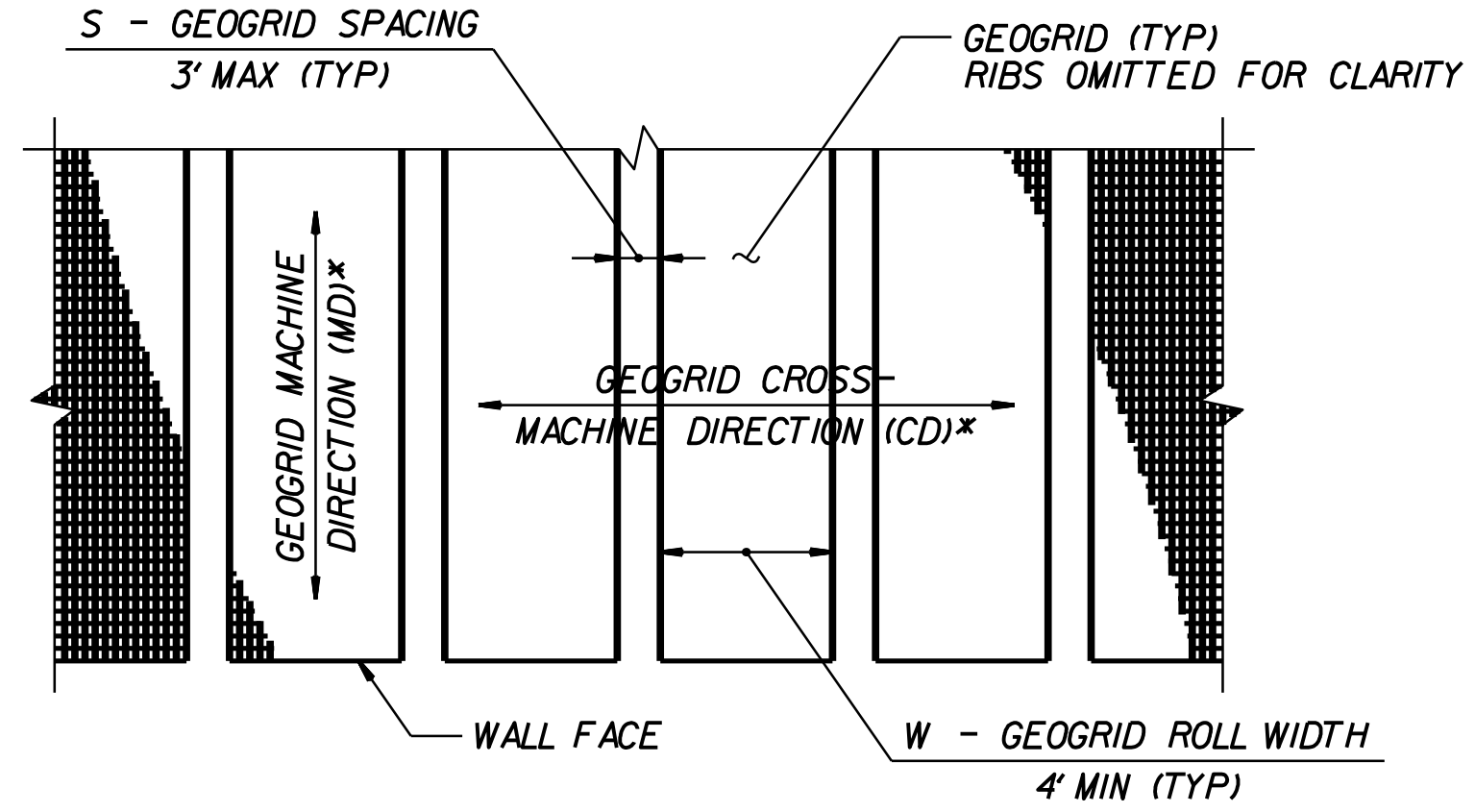
*SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.
 **SEE REINFORCEMENT TABLES ON SHEET 3.

 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT	STANDARD DETAIL NO. 1801.02
	STANDARD TEMPORARY WALL SHEET 1 OF 3

PROJECT REFERENCE NO. I-4400C	SHEET NO. 2G-3
GEOTECHNICAL ENGINEER  DocuSigned by: Shane C. Clark 7/9/2019 <small>DATE</small>	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

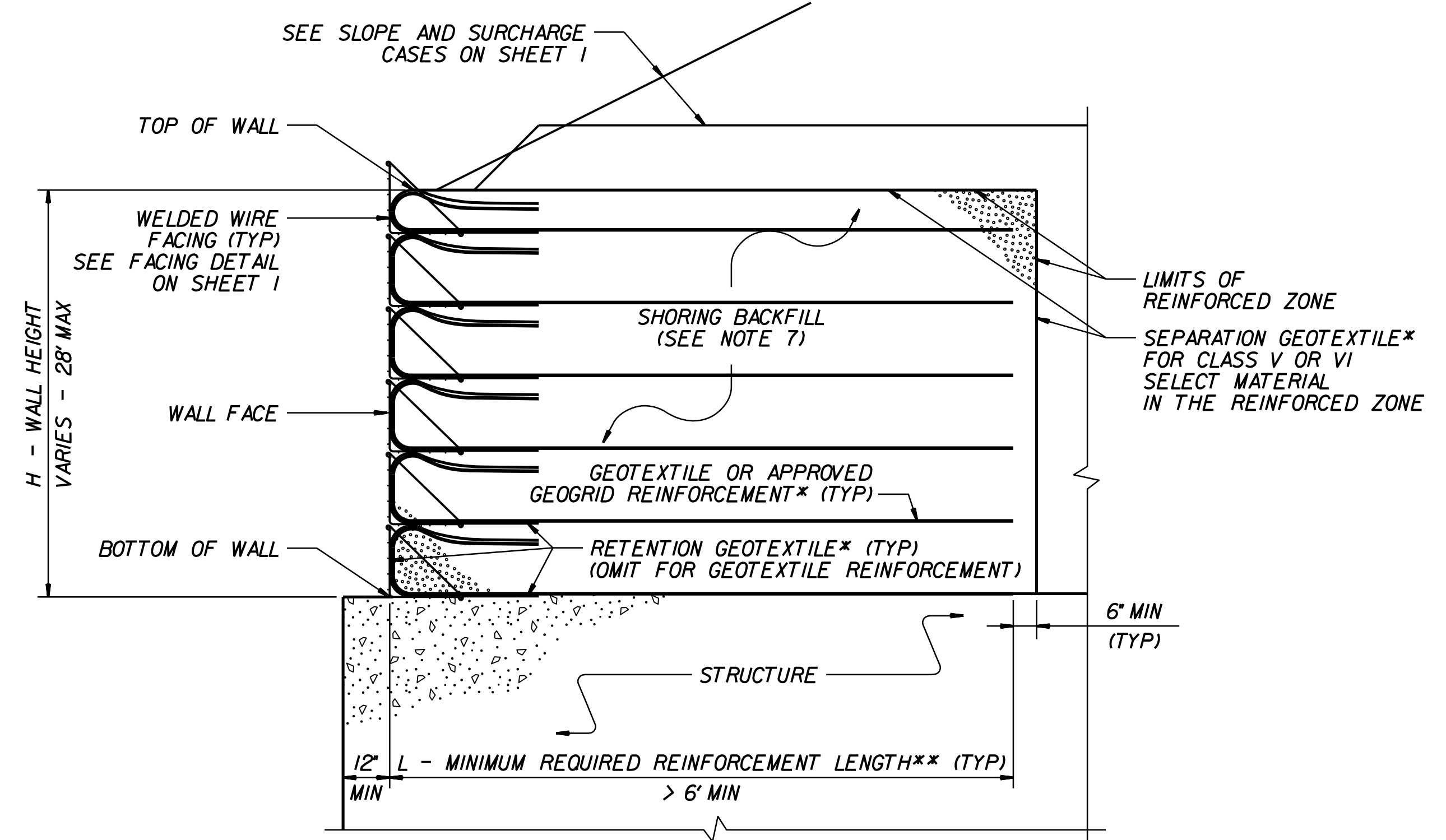


GEOTEXTILE PLACEMENT
(100% COVERAGE MIN FOR GEOTEXTILE REINFORCEMENT)



GEOGRID PLACEMENT
(80% COVERAGE MIN FOR GEOGRID REINFORCEMENT - $\frac{W}{W+S} \times 100 \geq 80\%$, SEE NOTE 11)

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



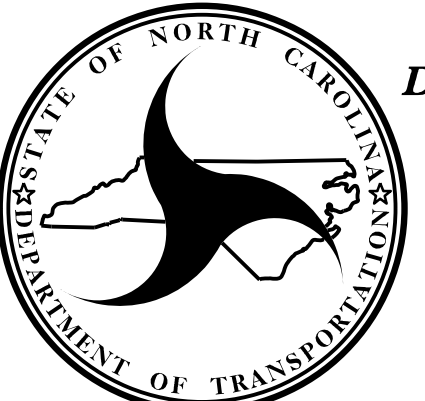
TEMPORARY WALL ON STRUCTURE DETAIL
*SEE GEOSYNTHETIC PLACEMENT DETAILS.
**SEE REINFORCEMENT TABLES ON SHEET 3.

NOTES:

- AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY WALLS AS NOTED IN THE PLANS.
- FOR STANDARD TEMPORARY WALLS, SEE STANDARD SHORING PROVISION.
- 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
- DO NOT USE STANDARD TEMPORARY WALLS IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
- DO NOT USE STANDARD TEMPORARY WALLS WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS BELOW TEMPORARY WALLS.
- 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 IS ABOVE BOTTOM OF REINFORCED ZONE.
- 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.
- EMBEDMENT IS NOT REQUIRED FOR STANDARD TEMPORARY WALLS ON STRUCTURES OR ROCK AS DETERMINED BY THE ENGINEER.
- DO NOT USE MORE THAN 4 DIFFERENT REINFORCEMENT STRENGTHS FOR EACH STANDARD TEMPORARY WALL.
- GEOGRIDS ARE TYPICALLY APPROVED FOR ULTIMATE TENSILE STRENGTHS IN THE MACHINE DIRECTION (MD) AND CROSS-MACHINE DIRECTION (CD) OR SHORT-TERM DESIGN STRENGTHS FOR A 3-YEAR DESIGN LIFE IN THE MD BASED ON MATERIAL TYPE. THE LIST OF APPROVED GEOGRIDS WITH DESIGN STRENGTHS IS AVAILABLE FROM:
connect.ncdot.gov/resources/Materials/Pages/Materials-Manual-by-Manual.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

- IF THE WEBSITE DOES NOT LIST A SHORT-TERM DESIGN STRENGTH FOR AN APPROVED GEOGRID, USE A SHORT-TERM DESIGN STRENGTH EQUAL TO THE ULTIMATE TENSILE STRENGTH DIVIDED BY 3.5 FOR THE GEOGRID REINFORCEMENT.
- FOR GEOGRID REINFORCEMENT WITH LESS THAN 100% COVERAGE, STAGGER REINFORCEMENT SO GEOGRIDS ARE CENTERED OVER GAPS IN THE REINFORCEMENT LAYER BELOW.
 - 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) + 45' AND
 - REINFORCEMENT STRENGTH IN CD \geq MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD.
 - 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
 - DO NOT PLACE SHORING BACKFILL OR REINFORCEMENT UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.
 - FOR STANDARD TEMPORARY WALLS WITH PILE FOUNDATIONS IN THE REINFORCED ZONE, DRIVE PILES THROUGH REINFORCEMENT AFTER CONSTRUCTING TEMPORARY WALLS.
 - DO NOT SPLICE OR OVERLAP REINFORCEMENT SO SEAMS ARE PARALLEL TO THE WALL FACE.
 - CONTACT THE ENGINEER WHEN EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH REINFORCEMENT.
 - FOR STANDARD TEMPORARY WALLS WITH INTERIOR ANGLES LESS THAN 90 DEGREES, WRAP GEOSYNTHETICS AT ACUTE CORNERS AS DIRECTED BY THE ENGINEER.
 - 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.

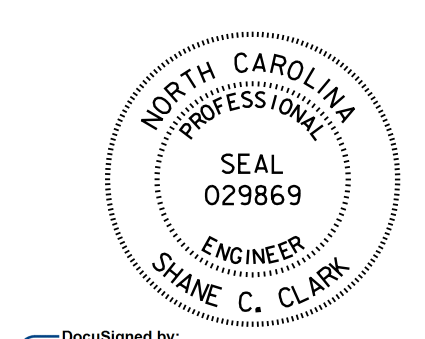

**NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS**

**GEOTECHNICAL
ENGINEERING UNIT**

STANDARD DETAIL NO. 1801.02

**STANDARD
TEMPORARY WALL
SHEET 2 OF 3**

 DATE: 11-19-13

PROJECT REFERENCE NO. I-4400C	SHEET NO. 2G-4
 GEOTECHNICAL ENGINEER SEAL 029869 SHANE C. CLARK	
Documented by: <u>Shane C. Clark</u> 7/9/2019 <small>DATE</small>	
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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) + 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.

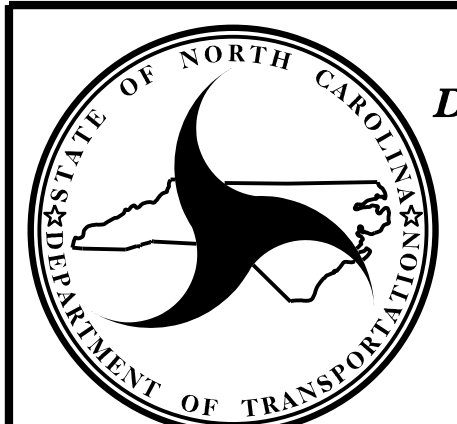
REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II, TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL	A-2-4 SOIL	CLASS II, TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL
1	2400	2400	2400	2400	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.

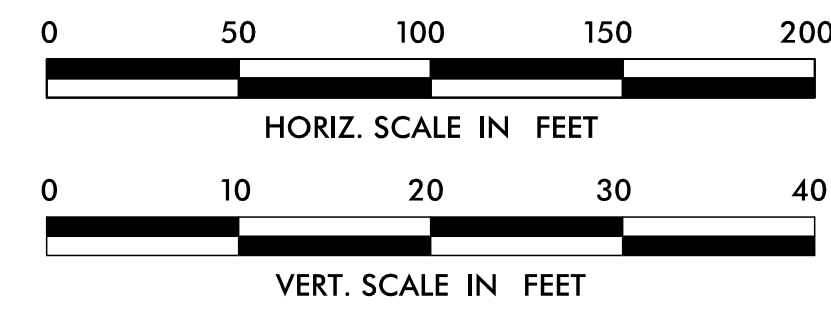


**NORTH CAROLINA
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DIVISION OF HIGHWAYS**

**GEOTECHNICAL
ENGINEERING UNIT**

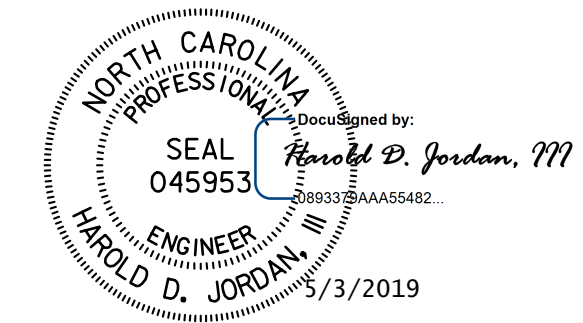
<i>STANDARD DETAIL NO. 1801.02</i>
STANDARD TEMPORARY WALL SHEET 3 OF 3
DATE: 11-19-13

PLAN AND PROFILE OF NOISE WALL 4.6

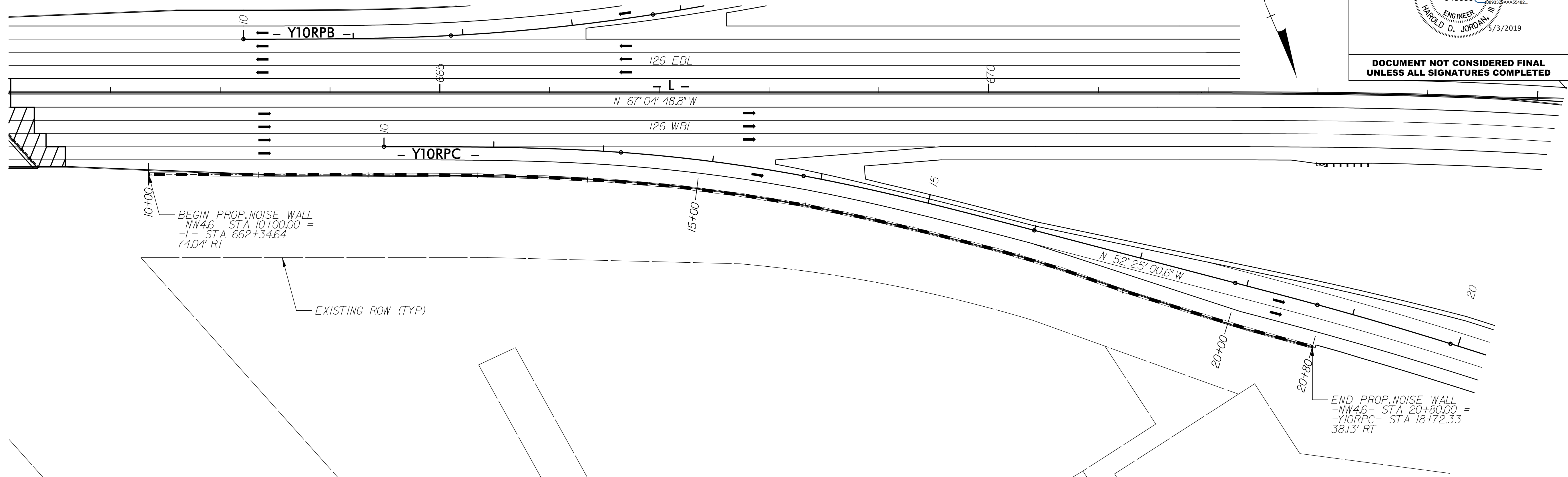


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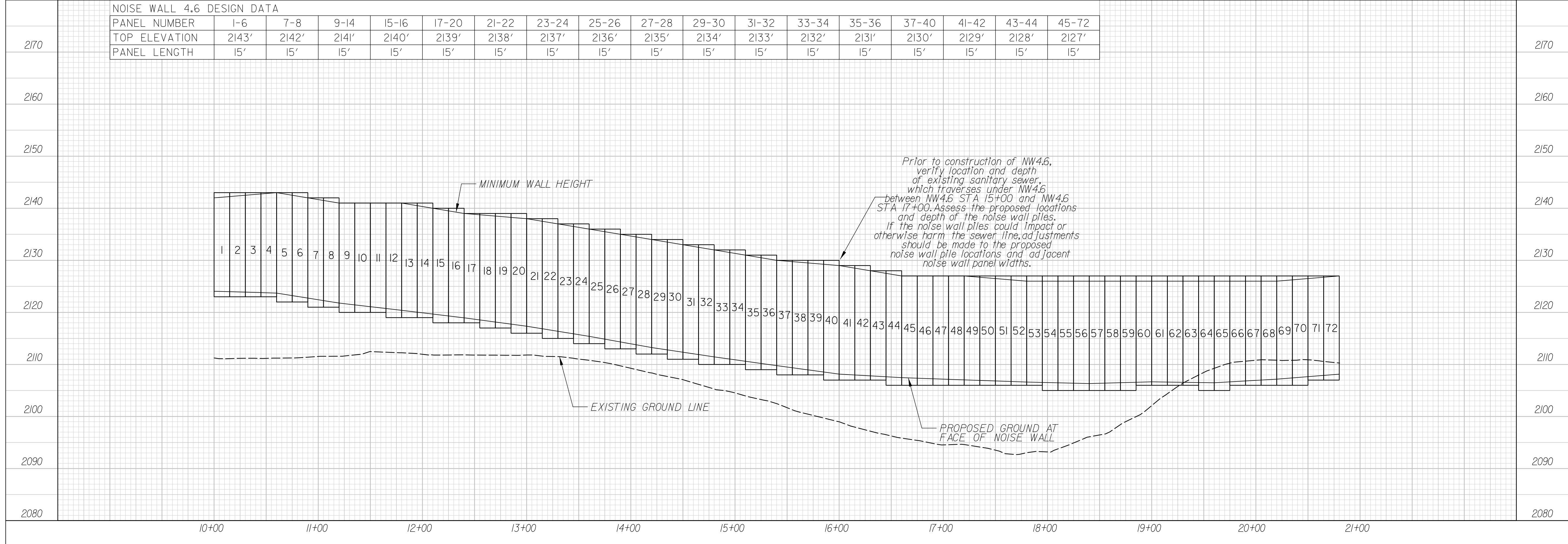
PROJECT REFERENCE NO. 1-4400C
SHEET NO. 2N-1

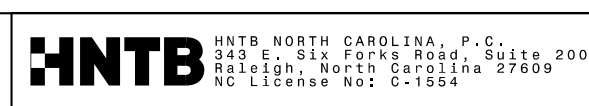
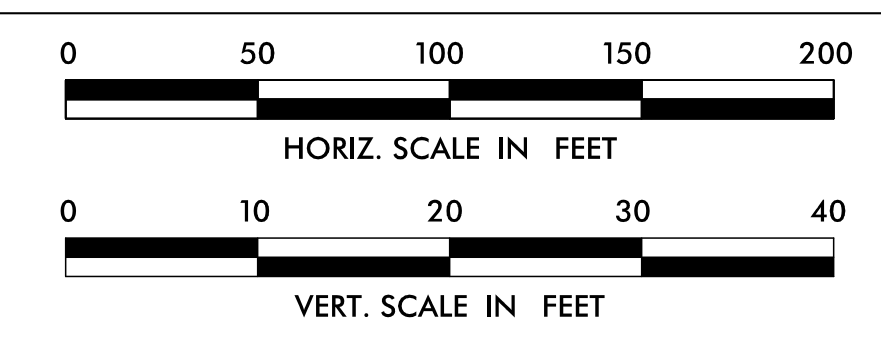


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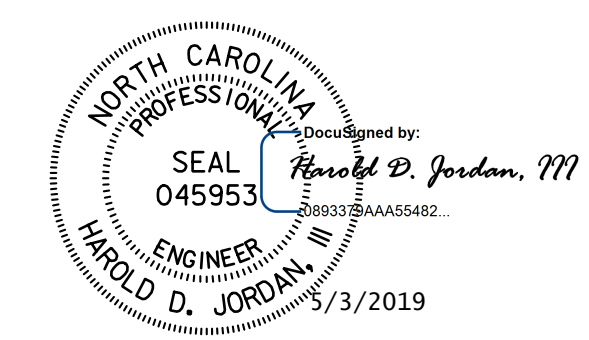


NOISE WALL 4.6 DESIGN DATA																	
PANEL NUMBER	1-6	7-8	9-14	15-16	17-20	21-22	23-24	25-26	27-28	29-30	31-32	33-34	35-36	37-40	41-42	43-44	45-72
TOP ELEVATION	2143'	2142'	2141'	2140'	2139'	2138'	2137'	2136'	2135'	2134'	2133'	2132'	2131'	2130'	2129'	2128'	2127'
PANEL LENGTH	15'	15'	15'	15'	15'	15'	15'	15'	15'	15'	15'	15'	15'	15'	15'	15'	15'



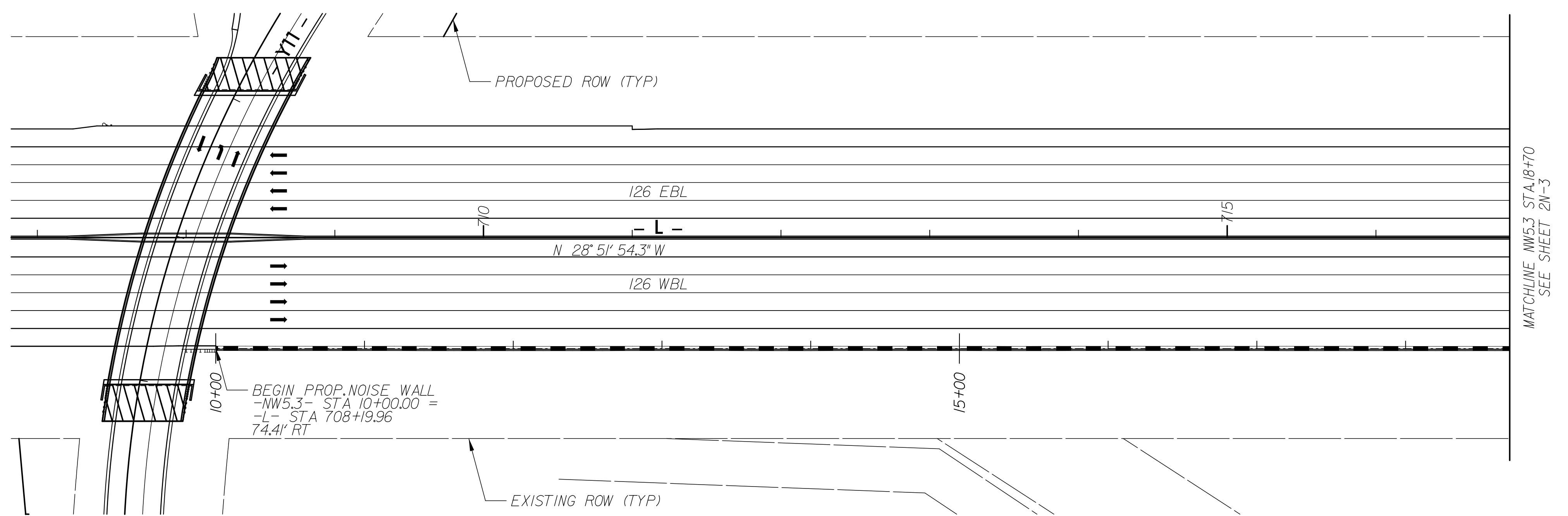


PROJECT REFERENCE NO. 1-4400C
SHEET NO. 2N-2

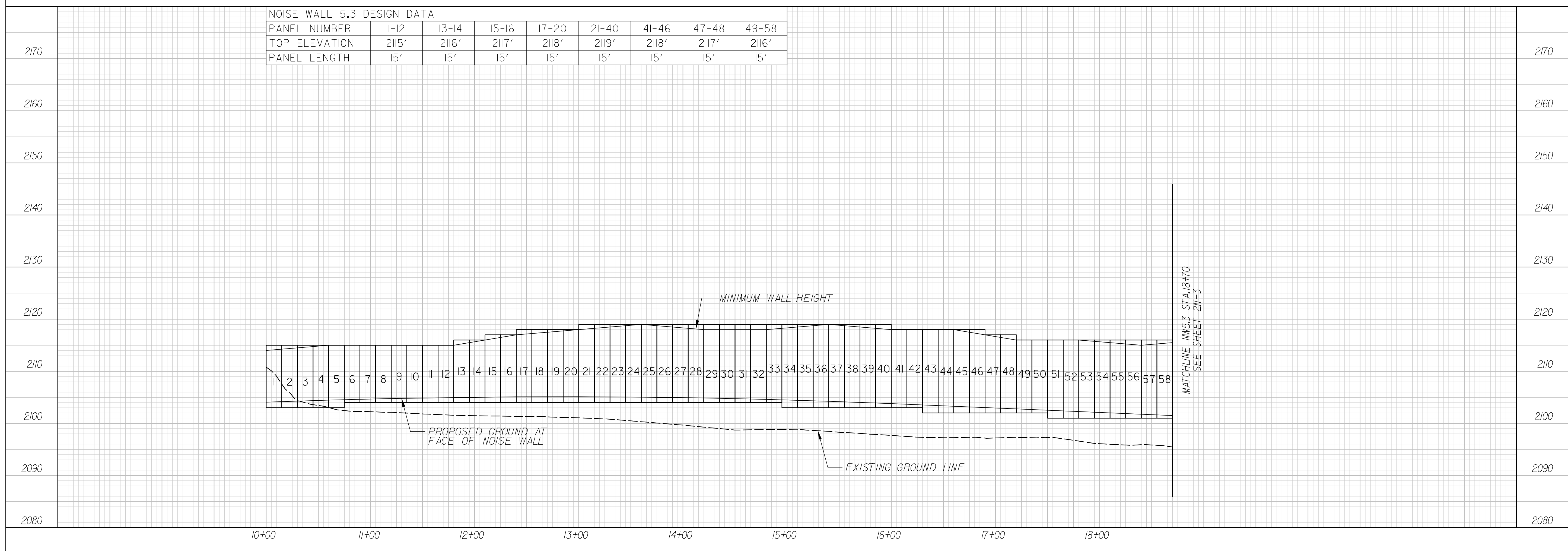


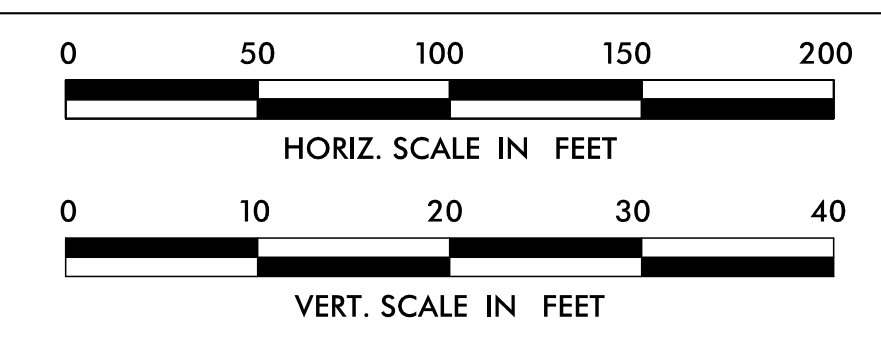
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PLAN AND PROFILE OF NOISE WALL 5.3



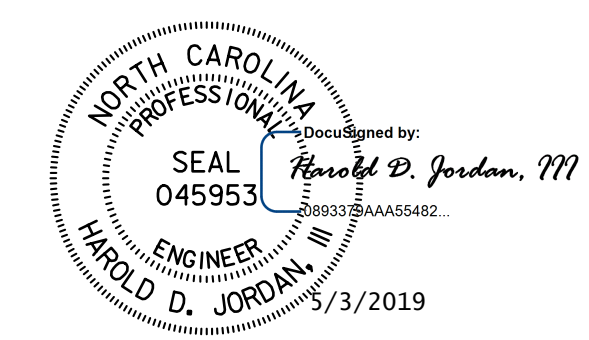
PANEL NUMBER	1-12	13-14	15-16	17-20	21-40	41-46	47-48	49-58
TOP ELEVATION	2115'	2116'	2117'	2118'	2119'	2118'	2117'	2116'
PANEL LENGTH	15'	15'	15'	15'	15'	15'	15'	15'





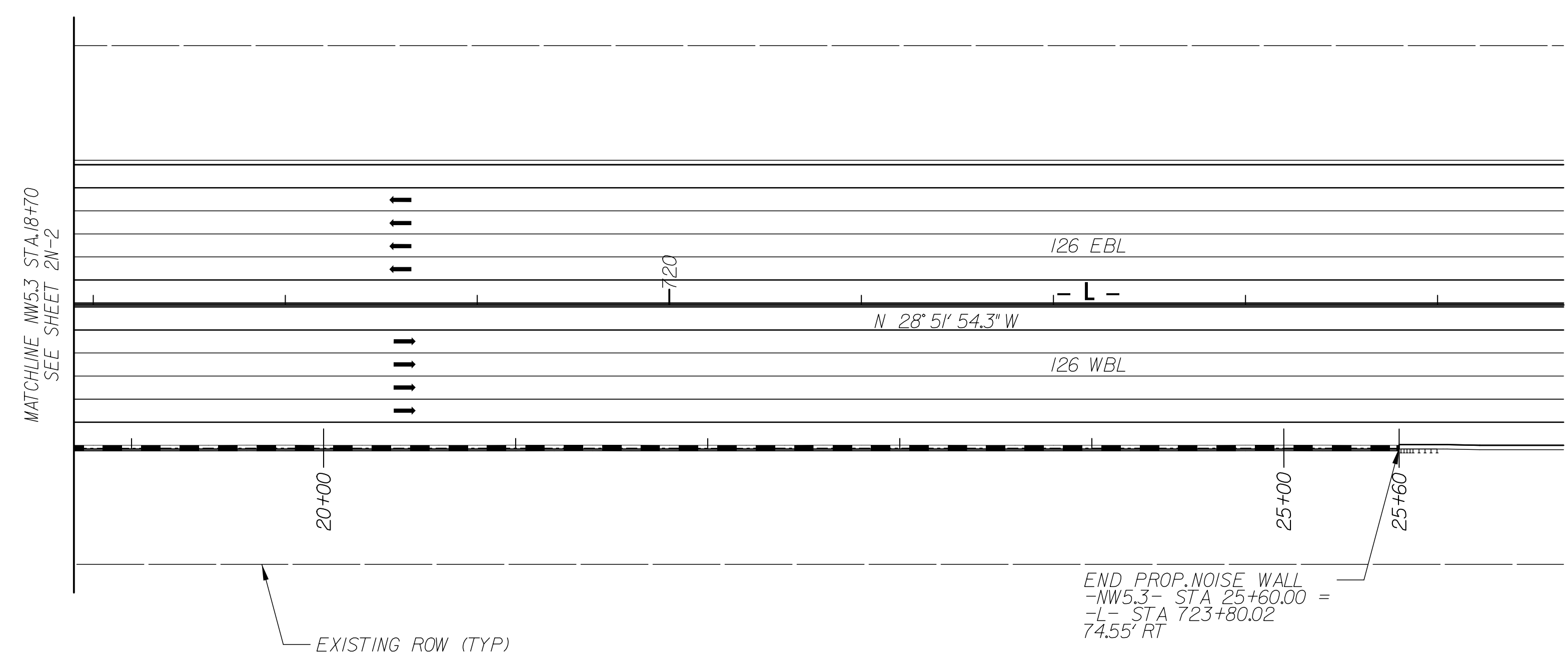
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PROJECT REFERENCE NO. 1-4400C
SHEET NO. 2N-3

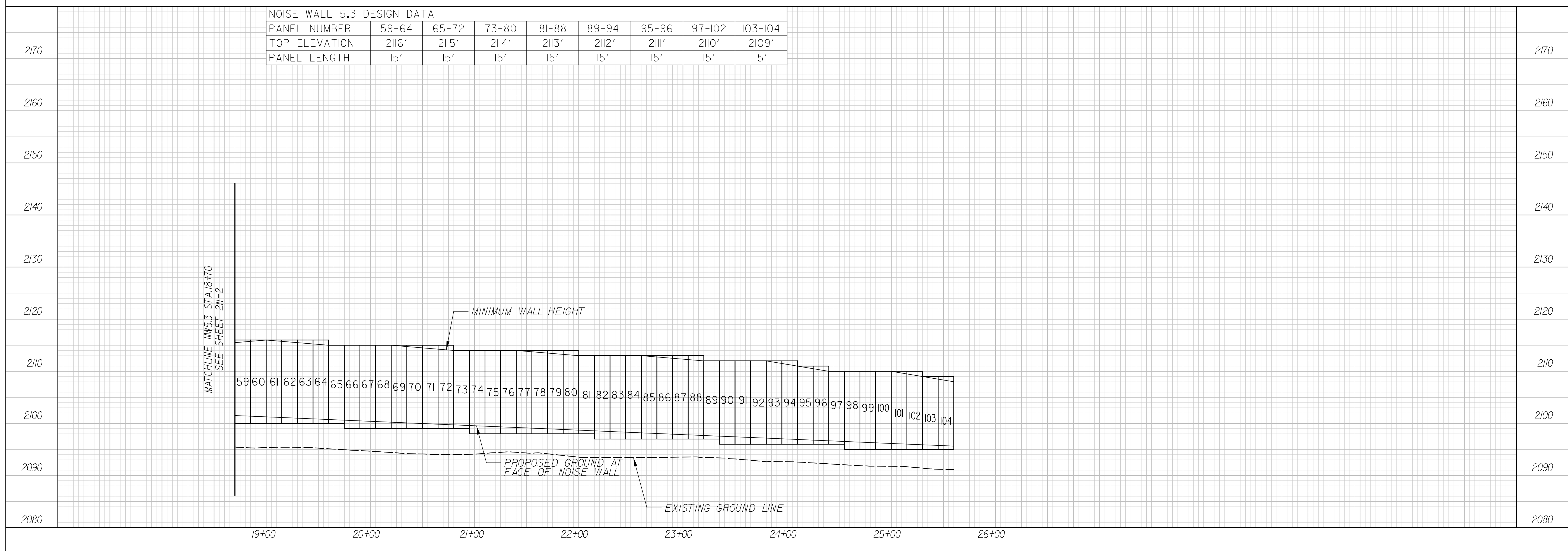


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PLAN AND PROFILE OF NOISE WALL 5.3



PANEL NUMBER	59-64	65-72	73-80	81-88	89-94	95-96	97-102	103-104
TOP ELEVATION	2116'	2115'	2114'	2113'	2112'	2111'	2110'	2109'
PANEL LENGTH	15'	15'	15'	15'	15'	15'	15'	15'



12/06/07

COMPUTED BY: KWR DATE: 05/2019
 CHECKED BY: CML DATE: 05/2019

STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

PROJECT REFERENCE NO. SHEET NO.
 I-4400C 3B-3

SUMMARY OF CONCRETE BARRIER
 (IN LINEAR FEET AND EACH)

SURVEY LINE	STATION	STATION	LOCATION LT/RT/MED	PRECAST REINFORCED CONC. BARRIER (LF)	TYPE I SINGLE SLOPE CONCRETE BARRIER (LF)	TYPE II SINGLE SLOPE CONCRETE BARRIER (LF)	CONC. BARRIER TRANSITION SECTION (EA)	MEDIAN HAZARD PROTECTION (EA) (SEE DETAIL 2C-08)	CONCRETE BARRIER RAIL W/MOMENT SLAB (LF) (STRUCT. PAY ITEM)	MOMENT SLAB W/SOUNDWALL (LF) (STRUCT. PAY ITEM)
L	650+50.00	658+59.25	MED		794.25		1			
L	660+73.75	669+00.00	MED		811.25		1			
L	661+35.00	664+49.16	RT						314.33	
L	660+13.21	663+21.15	LT						308.10	
Y1ORPC	10+00.00	16+00.00	RT							592.65
Y1ORPC	16+00.00	18+75.00	RT	275.38						
Y1ORPB	10+00.00	15+00.00	LT						494.62	
L	669+00.00	674+68.00	MED			568.00				
L	674+68.00	675+25.00	MED				1			
L	675+25.00	676+75.00	MED					150.00		
L	676+75.00	677+32.00	MED				1			
L	674+25.00	676+00.00	LT	178.39						
L	676+00.00	678+50.00	RT	245.13						
Y1ORPA_SPUR_RT	10+00.00	11+61.12	RT						144.61	
Y1ORPA	20+00.00	27+38.39	RT						753.06	
Y10	328+83.27	330+59.35	MED LT	157.25			1			
Y10	328+75.00	330+49.93	MED RT	154.90			1			
Y10	333+76.40	335+52.50	MED RT	156.64			1			
Y10	333+83.93	335+59.87	MED LT	157.40			1			
L	677+32.00	707+20.00	MED			2928.00				
L	687+20.00	687+45.00	MED				1			
L	687+45.00	687+55.00	MED					10.00		
L	687+55.00	687+80.00	MED				1			
L	687+80.00	707+20.00	MED							
L	707+20.00	707+70.00	MED				1			
L	707+70.00	708+30.00	MED					60.00		
L	708+30.00	708+80.00	MED				1			
L	708+80.00	713+70.00	MED			490.00				
L	713+70.00	713+95.00	MED				1			
L	713+95.00	714+05.00	MED					10.00		
L	714+05.00	714+30.00	MED				1			
L	714+30.00	754+98.00	MED		4053.00		1			
L	708+20.00	723+80.00	RT	1560.00						
L	757+44.00	766+70.00	MED		911.00		1			
L	766+70.00	766+95.00	MED				1			
L	766+95.00	767+05.00	MED					10.00		
L	767+05.00	767+30.00	MED				1			
L	767+30.00	791+83.17	MED			2453.17				
L	791+83.17	812+00.00	MED		2016.83					
L	812+00.00	814+50.00	MED			250.00				
L	814+50.00	815+00.00	MED				1			
L	815+00.00	815+60.00	MED					60.00		
L	815+60.00	816+10.00	MED				1			
L	814+65.00	816+00.00	LT	135.00						
L	812+50.00	817+00.00	RT	450.00						
L	816+10.00	831+00.00	MED			1490.00				
L	831+00.00	832+00.00	MED		100.00					
TOTAL:				3470.09	7080.83	8179.17	18	300.00	2014.71	592.65
SAY:				3500	7090	8200	18	300.00	STRUC. PAY ITEM	STRUC. PAY ITEM

NOTE:
 THESE QUANTITIES DO NOT INCLUDE
 I-26 REST AREA QUANTITIES. SEE REST AREA
 PLANS.

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COMPUTED BY: CML DATE: 01/2019
 CHECKED BY: KWR DATE: 01/2019

PROJECT REFERENCE NO. SHEET NO.
 I-4400C 3B-5

STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

**SUMMARY OF
 4" SHOULDER DRAINS**
 (IN LINEAR FEET AND EACH)

LINE	BEG. STATION	END STATION	SHOULDER DRAIN LF	SHOULDER LF	OUTLET PIPE LF	CONC. PADS EA
OUTSIDE SHOULDER (EASTBOUND)						
-L-	650+50.00	657+74.10	724.10	724.10	24.00	
-L-	660+53.50	668+20.00	766.50	766.50	16.20	
-L-	668+00.00	671+00.00	300.00	300.00	28.80	1
-L-	696+27.00	754+73.83	5846.83	5846.83	426.40	15
-L-	758+38.61	768+00.00	961.39	961.39	65.80	2
-L-	793+25.00	800+00.00	675.00	675.00	18.00	
-L-	802+00.00	832+00.00	3000.00	3000.00	228.80	6
MEDIAN SHOULDER (EASTBOUND)						
-L-	650+50.00	658+00.00	750.00	750.00	18.00	
-L-	661+09.06	754+73.83	9364.77	9364.77	160.80	
-L-	758+37.62	818+40.00	6002.38	6002.38	106.20	
-L-	830+45.00	832+00.00	155.00	155.00	86.70	1
OUTSIDE SHOULDER (WESTBOUND)						
-L-	650+50.00	658+00.00	750.00	750.00	124.22	2
-L-	661+58.90	668+33.00	674.10	674.10	16.20	
-L-	669+00.00	691+00.00	2200.00	2200.00	244.00	5
-L-	694+90.00	754+73.83	5983.83	5983.83	334.00	9
-L-	758+36.18	785+00.00	2663.82	2663.82	200.30	6
-L-	786+75.00	803+50.00	1675.00	1675.00	66.00	
-L-	804+81.00	818+40.00	1359.00	1359.00	40.80	
-L-	830+00.00	832+00.00	200.00	200.00	26.60	
MEDIAN SHOULDER (WESTBOUND)						
-L-	650+50.00	658+00.00	750.00	750.00	18.00	
-L-	661+09.06	669+50.00	840.94	840.94	19.00	
-L-	698+47.00	754+73.83	5626.83	5626.83	84.00	
-L-	758+37.17	768+00.00	962.83	962.83	18.00	
-L-	793+25.00	832+00.00	3875.00	3875.00	74.70	
		TOTAL:	56107.34	56107.34	2445.52	47
		SAY:	57000	57000	2500	50

NOTE:
 THESE QUANTITIES DO NOT INCLUDE
 I-26 REST AREA QUANTITIES. SEE REST AREA
 PLANS.

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COMPUTED BY: DMG DATE: 3/12/2019
 CHECKED BY: KWR DATE: 3/12/2019

STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

PROJECT REFERENCE NO. 1-4400C
 SHEET NO. 3B-6

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

SUMMARY OF EARTHWORK
 (IN CUBIC YARDS)

Quantities are approximate only. The Resident Engineer will re-cross-section the work accurately when the project is staked out. These cross-section notes will be used in computing the final quantities for which the contractor will be paid.

STATION TO STATION	UNCL. EXCAV.	SHALLOW UNDERCUT	EMBANK. +%	BORROW	WASTE
AREA 1A (-L- 650+50 TO NSRR BRIDGE)					
-L- (EB) 650+50.00 TO 658+00.00 LT	720		11,459	10,739	
-L- (MEDIAN) 650+50.00 TO 658+50.00	211		1,734	1,523	
-L- (WB) 650+50.00 TO 659+00.00 RT	1,070		11,417	10,347	
AREA 1A SUBTOTAL	2,001		24,610	22,609	
AREA 1A TOTAL	2,001		24,610	22,609	
AREA 1B (NSRR BRIDGE TO -Y10- (US-25) BRIDGE, INCLUDING Y10RPB, Y10RPC and Y10 SOUTH OF I-26)					
-L- (EB) 660+50.00 TO 676+00.00 LT	2,700		2,551		149
-L- (MEDIAN) 661+00.00 TO 676+00.00	949		2,257	1,308	
-L- (WB) 661+50.00 TO 676+00.00 RT	4,991		3,295		1,696
-Y10RPB- 10+00.00 TO 19+12.16	690		5,383	4,693	
-Y10RPC- 10+00.00 TO 23+24.74	12,840		4,716		8,124
-Y10RPB_SPUR_LT- 10+00.00 TO 13+88.39	82		2,405	2,323	
-Y10RPB_SPUR_RT- 10+00.00 TO 12+35.69	193		115		78
-Y10RPC_SPUR_LT- 10+00.00 TO 12+23.29	270		215		55
-Y10RPC_SPUR_RT- 10+00.00 TO 11+85.15	86		298	212	
-Y10- 315+00.00 TO 330+50.00	2,473		438		2,035
AREA 1B SUBTOTAL	25,274		21,673	8,536	12,137
WASTE TO REPLACE BORROW				-8,536	-8,536
AREA 1B TOTAL	25,274		21,673		3,601
AREA 1C (-Y10- (US-25) BRIDGE TO -L- 702+00, INCLUDING Y10RPA, Y10RPD, Y10 NORTH OF I-26, Y17 and Y23)					
-L- (EB) 676+00.00 TO 702+00.00 LT	7,388		1,234		6,154
-L- (MEDIAN) 676+00.00 TO 702+00.00	1,130		262		868
-L- (WB) 676+00.00 TO 702+00.00 RT	14,119		17		14,102
-Y10RPA- 10+00.00 TO 27+38.39	3,536		50,277	46,741	
-Y10RPD- 10+00.00 TO 28+30.86	45,446		25,236		20,210
-Y10RPA_SPUR_LT- 10+00.00 TO 12+50.91	191		1,543	1,352	
-Y10RPA_SPUR_RT- 10+00.00 TO 11+61.12	127		2,049	1,922	
-Y10RPD_SPUR_LT- 10+00.00 TO 12+38.76	464		15		449
-Y10RPD_SPUR_RT- 10+00.00 TO 14+04.33	83		3,818	3,735	
-Y10- 334+00.00 TO 348+25.00	2,683		912		1,771
-Y17- 10+98.80 TO 13+50.00	57		560	503	
-Y21- 10+50.00 TO 16+64.55	540		254		286
AREA 1C SUBTOTAL	75,764		86,177	54,253	43,840
WASTE TO REPLACE BORROW				-43,840	-43,840
AREA 1C TOTAL	75,764		86,177	10,413	
AREA 1 TOTAL (AREA 1A + AREA 1B + AREA 1C)	103,039		132,460	33,022	3,601
AREA 2A (-L- 702+00 TO -L- 710+00, INCLUDING Y11 and Y23)					
-L- (EB) 702+00.00 TO -L- 710+00.00 LT	7,914		174		7,740
-L- (MEDIAN) 702+00.00 TO -L- 710+00.00	612				612
-L- (WB) 702+00 TO -L- 710+00.00 RT	14,198		151		14,047
-Y11- 10+80.00 TO 15+50.00	318		2,333	2,015	
-Y11- 18+00.00 TO 23+13.40	236		3,537	3,301	
-Y23- 12+25.00 TO 15+69.00	71		1,969	1,898	
AREA 2A SUBTOTAL	23,349		8,164	7,214	22,399
WASTE TO REPLACE BORROW				-7,214	-7,214
AREA 2A TOTAL	23,349		8,164		15,185
AREA 2B (-L- 710+00 TO -L- 735+00)					
-L- (EB) 710+00.00 TO -L- 735+00.00 LT	4,624		7,314	2,690	
-L- (MEDIAN) 710+00.00 TO -L- 735+00.00	1,185				1,185
-L- (WB) 710+00 TO -L- 735+00.00 RT	4,376		9,439	5,063	
AREA 2B SUBTOTAL	10,185		16,753	7,753	1,185
WASTE TO REPLACE BORROW				-1,185	-1,185
AREA 2B TOTAL	10,185		16,753	6,568	
AREA 2 TOTAL (AREA 2A + AREA 2B)	33,534		24,917	6,568	15,185

STATION TO STATION	UNCL. EXCAV.	SHALLOW UNDERCUT	EMBANK. +%	BORROW	WASTE
AREA 3A (-L- 735+00 TO BRIDGE OVER CANE CREEK)					
-L- (EB) 735+00.00 TO -L- 754+98.83 LT	5,039		13,325	8,286	
-L- (MEDIAN) 735+00.00 TO -L- 754+98.83	1,356				1,356
-L- (WB) 735+00 TO -L- 754+98.83 RT	4,844		14,458	9,614	
AREA 3A SUBTOTAL	11,239		27,783	17,900	1,356
WASTE TO REPLACE BORROW				-1,356	-1,356
AREA 3A TOTAL	11,239		27,783	16,544	
AREA 3B (BRIDGE OVER CANE CREEK TO -L- 764+00)					
-L- (EB) 757+43.17 TO -L- 764+00.00 LT	1,120		6,057	4,937	
-L- (MEDIAN) 757+43.17 TO -L- 764+00.00	378		54		324
-L- (WB) 757+43.17 TO -L- 764+00.00 RT	1,169		5,310	4,141	
AREA 3B SUBTOTAL	2,667		11,421	9,078	324
WASTE TO REPLACE BORROW				-324	-324
AREA 3B TOTAL	2,667		11,421	8,754	
AREA 3 TOTAL (AREA 3A + AREA 3B)	13,906		39,204	25,298	0
AREA 4A (-L- 764+00 TO -L- 812+50)					
-L- (EB) 764+00.00 TO 812+50.00 LT	24,578		20,335		4,243
-L- (MEDIAN) 764+00.00 TO 812+50.00	1,419		357		1,062
-L- (WB) 764+00.00 TO 812+50.00 RT	14,941		13,822		1,119
-RESTA- 10+00.00 TO 17+00.00	12,467		274		12,193
-RETB- 10+00.00 TO 17+00.00	5,917		1,218		4,699
-RETC- 10+00.00 TO 17+50.00	5,016		187		4,829
-RETD- 10+00.00 TO 17+25.00	8,630				8,630
AREA 4A SUBTOTAL	72,968		36,193		36,775
WASTE TO REPLACE BORROW					
AREA 4A TOTAL	72,968		36,193		36,775
AREA 4B (-L- 812+50 TO -L- 832+00 INCLUDING Y12 and Y20)					
-L- (EB) 812+50.00 TO 832+00.00 LT	11,641		4,246		7,395
-L- (MEDIAN) 812+50.00 TO 832+00.00	1,006		67		939
-L- (WB) 812+50.00 TO 832+00.00 RT	11,616		1,348		10,268
-Y12- 16+00.00 TO 21+50.00	1,458		12,645	11,187	
-Y12- 24+00.00 TO 29+30.00	262		1,762	1,500	
-Y20- 10+12.00 TO 11+50.00	51		281	230	
AREA 4B SUBTOTAL	26,034		20,349	12,917	18,602
WASTE TO REPLACE BORROW				-12,917	-12,917
AREA 4B TOTAL	26,034		20,349		5,685
AREA 4 TOTAL (AREA 4A + AREA 4B)	99,002		56,542		42,460
PROJECT SUBTOTAL (AREA 1 + AREA 2 + AREA 3 + AREA 4)	249,481		253,123	64,888	61,246
ESTIMATED LOSS DUE TO CLEARING & GRUBBING		-14,000			14,000
ESTIMATED SHOULDER MATERIAL			10,005		10,005
REST AREA WASTE TO REPLACE BORROW					-75,662
PROJECT TOTAL (AREA 1 + AREA 2 + AREA 3 + AREA 4)	235,481		263,128	13,231	61,246
ESTIMATED 5% FOR REPLACING TOPSOIL ON BORROW PIT				662	
GRAND TOTAL (CUBIC YARDS)	235,481		263,128	13,893	61,246
SAY (CUBIC YARDS)	235,500			13,900	
ESTIMATED DRAINAGE DITCH EXCAVATION =			26,000		
ESTIMATED -L- PAVEMENT STRUCTURE VOLUME =			66,000		

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COMPUTED BY: JCR, TSA, JCD, JJZ DATE: 06/04/2019
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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

NOTE: THESE QUANTITIES DO NOT INCLUDE REST AREA QUANTITIES. SEE REST AREA PLANS.

PROJECT NO. I-4400C SHEET NO. 3D-2

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 ALL PIPES)

Table with columns for LINE & STATION, OFFSET, STRUCTURE NUMBER, TOP ELEVATION, INVERT ELEVATION, C. S. PIPE (12-48), R. C. PIPE CLASS IV (12-60), R. C. PIPE CLASS V (12-18), ENDWALLS, QUANTITIES FOR DRAINAGE STRUCTURES, FRAME, GRATES, AND HOOD, and REMARKS. Includes a SHEET TOTALS row at the bottom.

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NOTE: THESE QUANTITIES DO NOT INCLUDE REST AREA QUANTITIES. SEE REST AREA PLANS.

PROJECT NO. I-4400C SHEET NO. 3D-3

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 ALL PIPES)

Table with columns: LINE & STATION, OFFSET, STRUCTURE NUMBER, TOP ELEVATION, INVERT ELEVATION, MINIMUM REQUIRED SLOPE, C. S. PIPE (12-48), R. C. PIPE CLASS IV (12-60), R. C. PIPE CLASS V (12-18), ENDWALLS, QUANTITIES FOR DRAINAGE STRUCTURES, FRAME, GRATES, AND HOOD, GRAPE TYPE, and REMARKS. Includes a SHEET TOTALS row at the bottom.

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COMPUTED BY: JCR, TSA, JCD, JJZ DATE: 06/04/2019
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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

NOTE: THESE QUANTITIES DO NOT INCLUDE REST AREA QUANTITIES. SEE REST AREA PLANS.

PROJECT NO. I-4400C SHEET NO. 3D-4

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 ALL PIPES)

Table with columns for LINE & STATION, OFFSET, STRUCTURE NUMBER, TOP ELEVATION, INVERT ELEVATION, MINIMUM REQUIRED SLOPE, C. S. PIPE (12-48), R. C. PIPE CLASS IV (12-60), R. C. PIPE CLASS V (12-18), ENDWALLS, QUANTITIES FOR DRAINAGE STRUCTURES, FRAME, GRATES, AND HOOD, and REMARKS. Includes a SHEET TOTALS row at the bottom.

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

NOTE: THESE QUANTITIES DO NOT INCLUDE REST AREA QUANTITIES. SEE REST AREA PLANS.

PROJECT NO. I-4400C SHEET NO. 3D-5

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 ALL PIPES)

Table with columns for LINE & STATION, OFFSET, STRUCTURE NUMBER, TOP ELEVATION, INVERT ELEVATION, MINIMUM REQUIRED SLOPE, C. S. PIPE (12-48 inch), R. C. PIPE CLASS IV (12-60 inch), R. C. PIPE CLASS V (12-18 inch), ENDWALLS, QUANTITIES FOR DRAINAGE STRUCTURES, FRAME, GRATES, AND HOOD, and REMARKS. Includes a SHEET TOTALS row at the bottom.

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NOTE:
THESE QUANTITIES DO NOT INCLUDE
REST AREA QUANTITIES. SEE REST
AREA PLANS.

PROJECT NO. I-4400C SHEET NO. 3D-6

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 ALL PIPES)

Table with columns: LINE & STATION, OFFSET, STRUCTURE NUMBER, TOP ELEVATION, INVERT ELEVATION, MINIMUM REQUIRED SLOPE, C. S. PIPE (12-48 inch), R. C. PIPE CLASS IV (12-60 inch), R. C. PIPE CLASS V (12-18 inch), ENDWALLS, REINFORCED ENDWALLS, QUANTITIES FOR DRAINAGE STRUCTURES, FRAME, GRATES, AND HOOD, GRADE TYPE, and REMARKS. Includes a SHEET TOTALS row at the bottom.

ABBREVIATIONS
C.A.A. CORRUGATED ALUMINIUM ALLOY
C.B. CATCH BASIN
C.S. CORRUGATED STEEL
D.I. DROP INLET
G.D.I. GRATED DROP INLET
H.D.P.E. HIGH DENSITY POLYETHYLENE
J.B. JUNCTION BOX
M.H. MANHOLE
N.S. NARROW SLOT
P.V.C. POLYVINYL CHLORIDE
R.C. REINFORCED CONCRETE
T.B.D.I. TRAFFIC BEARING DROP INLET
T.B.J.B. TRAFFIC BEARING JUNCTION BOX
W.S. WIDE SLOT

SHEET TOTALS

260 400 80 218 211 211 5.000 23 1 1 12 19 3 7 18 2 12 153

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NOTE:
THESE QUANTITIES DO NOT INCLUDE
REST AREA QUANTITIES. SEE REST
AREA PLANS.

PROJECT NO. I-4400C SHEET NO. 3D-7

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 ALL PIPES)

Table with columns: LINE & STATION, OFFSET, STRUCTURE NUMBER, TOP ELEVATION, INVERT ELEVATION, MINIMUM REQUIRED SLOPE, C. S. PIPE (12-48), R. C. PIPE CLASS IV (12-60), R. C. PIPE CLASS V (12-18), ENDWALLS, QUANTITIES FOR DRAINAGE STRUCTURES, FRAME, GRATES, AND HOOD, GRAPE TYPE, and REMARKS. Includes a SHEET TOTALS row at the bottom.

ABBREVIATIONS
C.A.A. CORRUGATED ALUMINIUM ALLOY
C.B. CATCH BASIN
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R.C. REINFORCED CONCRETE
T.B.D.I. TRAFFIC BEARING DROP INLET
T.B.J.B. TRAFFIC BEARING JUNCTION BOX
W.S. WIDE SLOT

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

NOTE: THESE QUANTITIES DO NOT INCLUDE REST AREA QUANTITIES. SEE REST AREA PLANS.

PROJECT NO. I-4400C SHEET NO. 3D-8

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 ALL PIPES)

Table with columns for Line & Station, Offset, Structure Number, Invert Elevation, Pipe Size, C.S. Pipe, R.C. Pipe Class IV, R.C. Pipe Class V, Quantities for Drainage Structures, Frame, Grates, and Hood, and Remarks. Includes a SHEET TOTALS row at the bottom.

CVPL507

COMPUTED BY: JCR, TSA, JCD, JJZ DATE: 06/04/2019
CHECKED BY: JJZ DATE: 06/06/2019

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

NOTE: THESE QUANTITIES DO NOT INCLUDE REST AREA QUANTITIES. SEE REST AREA PLANS.

PROJECT NO. I-4400C SHEET NO. 3D-9

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 ALL PIPES)

Table with columns for LINE & STATION, OFFSET, STRUCTURE NUMBER, TOP ELEVATION, INVERT ELEVATION, MINIMUM REQUIRED SLOPE, C. S. PIPE (12-48), R. C. PIPE CLASS IV (12-60), R. C. PIPE CLASS V (12-18), ENDWALLS, QUANTITIES FOR DRAINAGE STRUCTURES, FRAME, GRATES, AND HOOD, and REMARKS. Includes a SHEET TOTALS row at the bottom.

CVPL507

COMPUTED BY: JCR, TSA, JCD, JJZ DATE: 06/04/2019
CHECKED BY: JJZ DATE: 06/06/2019

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

NOTE:
THESE QUANTITIES DO NOT INCLUDE
REST AREA QUANTITIES. SEE REST
AREA PLANS.

PROJECT NO. I-4400C SHEET NO. 3D-11

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 ALL PIPES)

Table with columns for LINE & STATION, OFFSET, STRUCTURE NUMBER, TOP ELEVATION, INVERT ELEVATION, MINIMUM REQUIRED SLOPE, C. S. PIPE (12-48), R. C. PIPE CLASS IV (12-60), R. C. PIPE CLASS V (12-18), ENDWALLS, QUANTITIES FOR DRAINAGE STRUCTURES, FRAME, GRATES, AND HOOD, and REMARKS. Includes a SHEET TOTALS row at the bottom.

CVPL507

COMPUTED BY: JCR, TSA, JCD, JJZ DATE: 06/04/2019
CHECKED BY: JJZ DATE: 06/06/2019

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

NOTE: THESE QUANTITIES DO NOT INCLUDE REST AREA QUANTITIES. SEE REST AREA PLANS.

PROJECT NO. I-4400C SHEET NO. 3D-12

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 ALL PIPES)

Table with columns for Line & Station, Offset, Structure Number, Top Invert Elevation, Invert Elevation, % Minimum Required Slope, C.S. Pipe (12-48 inch), R.C. Pipe Class IV (12-60 inch), R.C. Pipe Class V (12-18 inch), Pipe Material (36" Welded Steel, 18" OD Pipe, etc.), Quantities for Drainage Structures (Grate Type, Frame, etc.), and Remarks. Includes a SHEET TOTALS row at the bottom.

ABBREVIATIONS table listing codes like C.A.A., C.B., C.S., D.I., G.D.I., H.D.P.E., J.B., M.H., N.S., P.V.C., R.C., T.B.D.I., T.B.J.B., W.S. and their corresponding descriptions.

CVPL507

COMPUTED BY: JCR, TSA, JCD, JJZ DATE: 06/04/2019
CHECKED BY: JJZ DATE: 06/06/2019

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

NOTE: THESE QUANTITIES DO NOT INCLUDE REST AREA QUANTITIES. SEE REST AREA PLANS.

PROJECT NO. I-4400C SHEET NO. 3D-15

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 ALL PIPES)

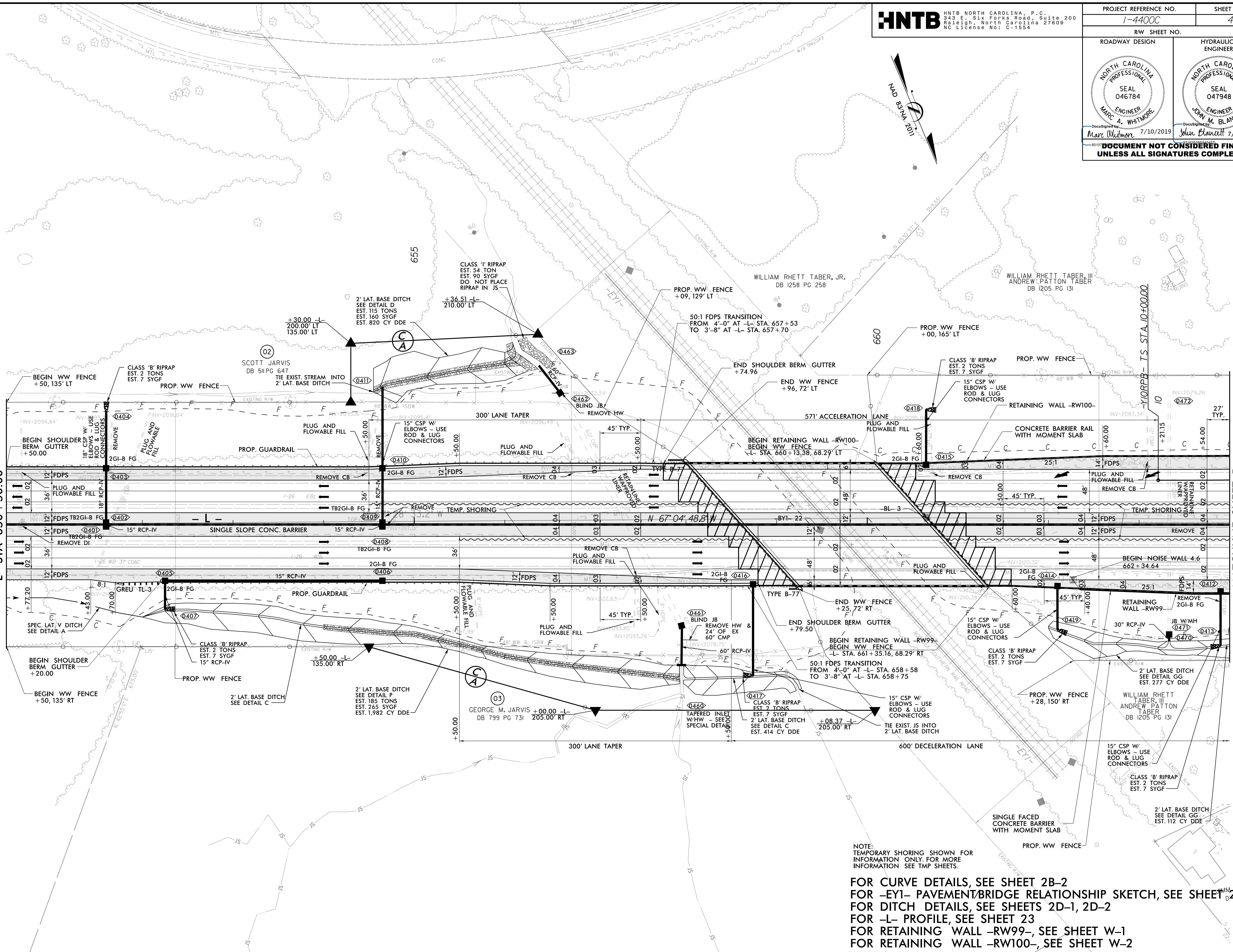
Table with columns: LINE & STATION, OFFSET, STRUCTURE NUMBER, TOP ELEVATION, INVERT ELEVATION, MINIMUM REQUIRED SLOPE, C. S. PIPE (12-48), R. C. PIPE CLASS IV (12-60), R. C. PIPE CLASS V (12-18), ENDWALLS, QUANTITIES FOR DRAINAGE STRUCTURES, FRAME, GRATES, AND HOOD, GRAPE TYPE, and REMARKS. Includes a SHEET TOTALS row at the bottom.

7/19/2017

PROJECT REFERENCE NO. 1-4400C		SHEET NO. 4	
ROADWAY DESIGN		HYDRAULICS ENGINEER	
<p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p>			

MATCHLINE 1-4400BB
-L- STA 650 + 50.00

MATCHLINE SHEET 5
-L- STA 664 + 00.00



NOTE:
TEMPORARY SHORING SHOWN FOR
INFORMATION ONLY. FOR MORE
INFORMATION SEE TMP SHEETS.

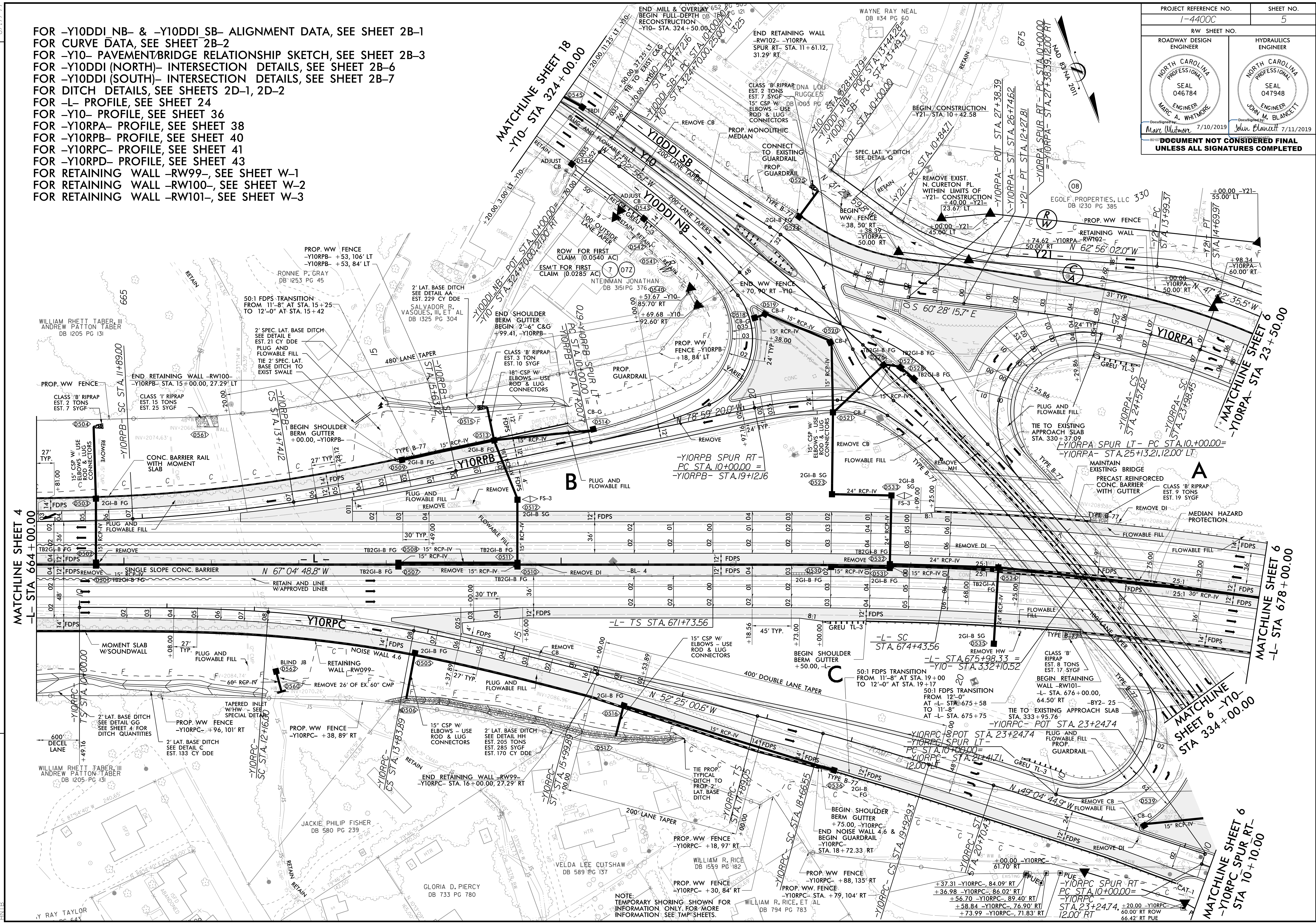
- FOR CURVE DETAILS, SEE SHEET 2B-2
- FOR -EY1- PAVEMENT BRIDGE RELATIONSHIP SKETCH, SEE SHEET 2B-3
- FOR DITCH DETAILS, SEE SHEETS 2D-1, 2D-2
- FOR -L- PROFILE, SEE SHEET 23
- FOR RETAINING WALL -RW99-, SEE SHEET W-1
- FOR RETAINING WALL -RW100-, SEE SHEET W-2

REVISIONS

10-JUL-2019 10:20
1-4400C-RD-1-SS4
HNTB

PROJECT REFERENCE NO. 1-4400C	SHEET NO. 5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

FOR -Y10DDI NB- & -Y10DDI SB- ALIGNMENT DATA, SEE SHEET 2B-1
 FOR CURVE DATA, SEE SHEET 2B-2
 FOR -Y10- PAVEMENT/BRIDGE RELATIONSHIP SKETCH, SEE SHEET 2B-3
 FOR -Y10DDI (NORTH)- INTERSECTION DETAILS, SEE SHEET 2B-6
 FOR -Y10DDI (SOUTH)- INTERSECTION DETAILS, SEE SHEET 2B-7
 FOR DITCH DETAILS, SEE SHEETS 2D-1, 2D-2
 FOR -L- PROFILE, SEE SHEET 24
 FOR -Y10- PROFILE, SEE SHEET 36
 FOR -Y10RPA- PROFILE, SEE SHEET 38
 FOR -Y10RPB- PROFILE, SEE SHEET 40
 FOR -Y10RPC- PROFILE, SEE SHEET 41
 FOR -Y10RPD- PROFILE, SEE SHEET 43
 FOR RETAINING WALL -RW99-, SEE SHEET W-1
 FOR RETAINING WALL -RW100-, SEE SHEET W-2
 FOR RETAINING WALL -RW101-, SEE SHEET W-3



REVISIONS

MATCHLINE SHEET 4
-L- STA 664 + 00.00

MATCHLINE SHEET 6
-L- STA 678 + 00.00

MATCHLINE SHEET 6 -Y10-
STA 334 + 00.00

MATCHLINE SHEET 6
-Y10RPC SPUR RT-
STA 10 + 10.00

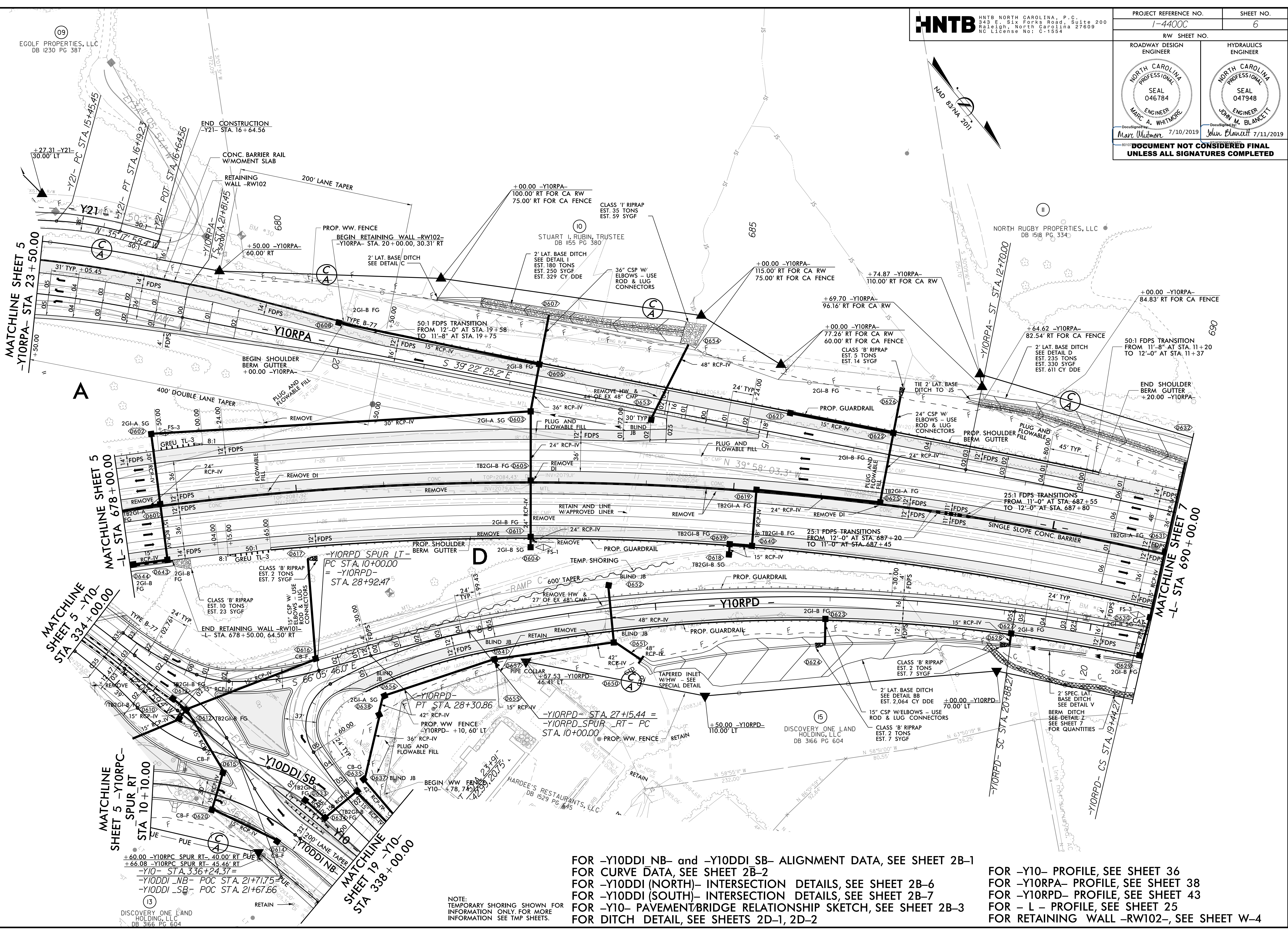
NOTE:
TEMPORARY SHORING SHOWN FOR
INFORMATION ONLY. FOR MORE
INFORMATION SEE TMP SHEETS.

8.17.7.99

10-JUL-2019 10:50
1-4400C-RD-1854-S5

7/19/2017

PROJECT REFERENCE NO. 1-4400C	SHEET NO. 6
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
Marc Whitmore 7/10/2019	John Blainett 7/11/2019
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



REVISIONS

10-JUL-2019 10:20
14-4400C-RD-L-584-S6
HNTB

+60.00 -Y1ORPC SPUR RT- 40.00' RT PUE
 +66.08 -Y1ORPC SPUR RT- 45.46' RT
 -Y10- STA. 336+24.37=
 -Y10DDI NB- POC STA. 21+71.75 PUE
 -Y10DDI SB- POC STA. 21+67.66

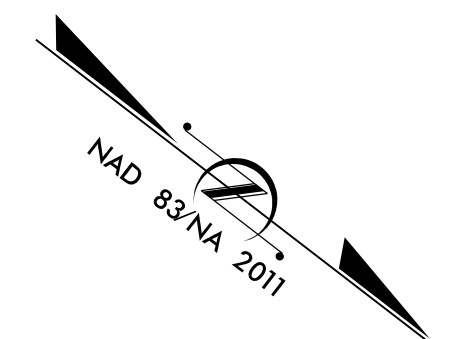
NOTE:
TEMPORARY SHORING SHOWN FOR
INFORMATION ONLY. FOR MORE
INFORMATION SEE TMP SHEETS.

FOR -Y10DDI NB- and -Y10DDI SB- ALIGNMENT DATA, SEE SHEET 2B-1
 FOR CURVE DATA, SEE SHEET 2B-2
 FOR -Y10DDI (NORTH)- INTERSECTION DETAILS, SEE SHEET 2B-6
 FOR -Y10DDI (SOUTH)- INTERSECTION DETAILS, SEE SHEET 2B-7
 FOR -Y10- PAVEMENT/BIDGE RELATIONSHIP SKETCH, SEE SHEET 2B-3
 FOR DITCH DETAIL, SEE SHEETS 2D-1, 2D-2

FOR -Y10- PROFILE, SEE SHEET 36
 FOR -Y1ORPA- PROFILE, SEE SHEET 38
 FOR -Y1ORPD- PROFILE, SEE SHEET 43
 FOR - L - PROFILE, SEE SHEET 25
 FOR RETAINING WALL -RW102-, SEE SHEET W-4

7/19/2017

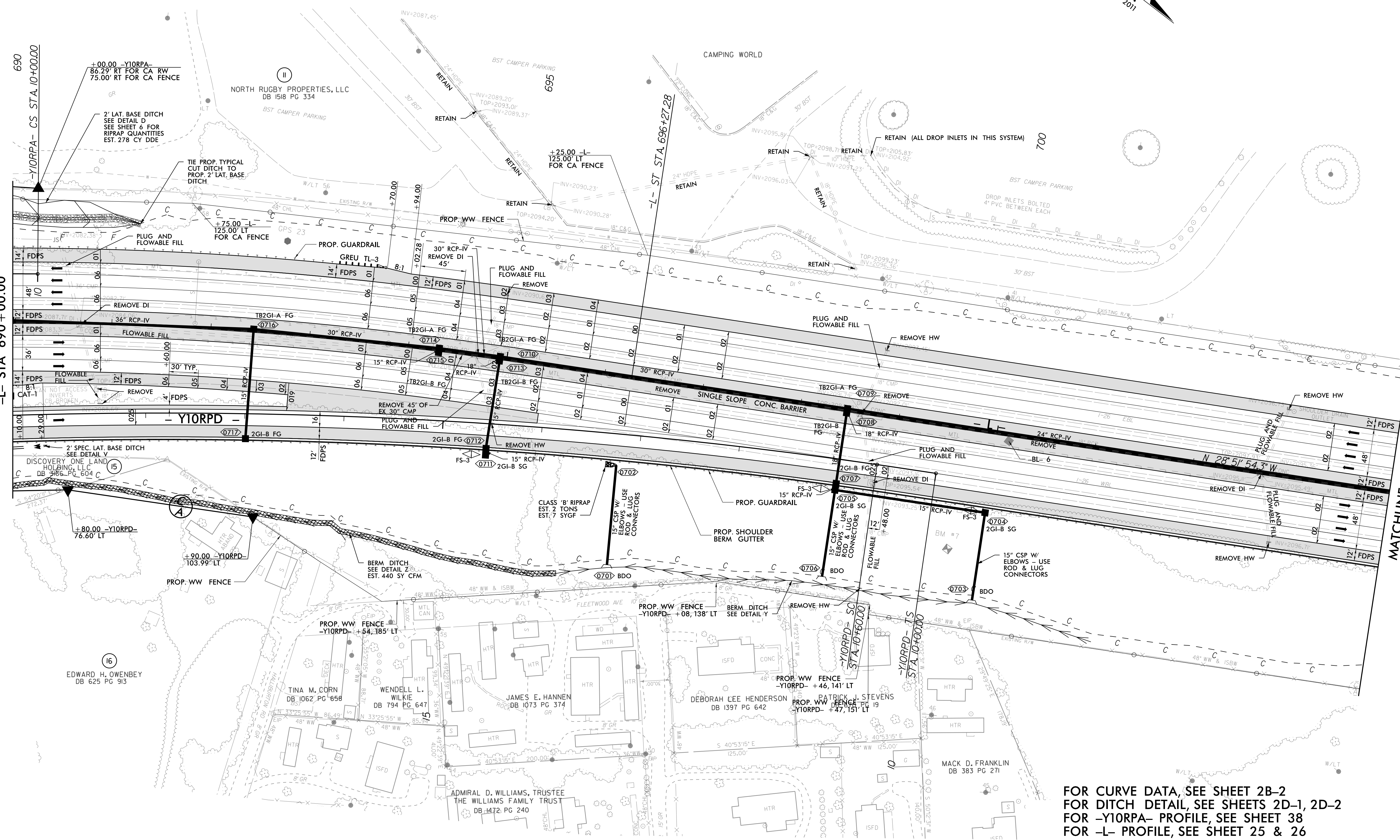
PROJECT REFERENCE NO. 1-4400C		SHEET NO. 7
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
Marc Whitmore 7/10/2019	John Blancett 7/11/2019	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		



REVISIONS

MATCHLINE SHEET 6
-L- STA 690 + 00.00

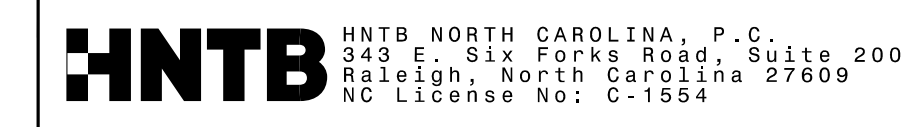
MATCHLINE SHEET 8
-L- STA 704 + 00.00



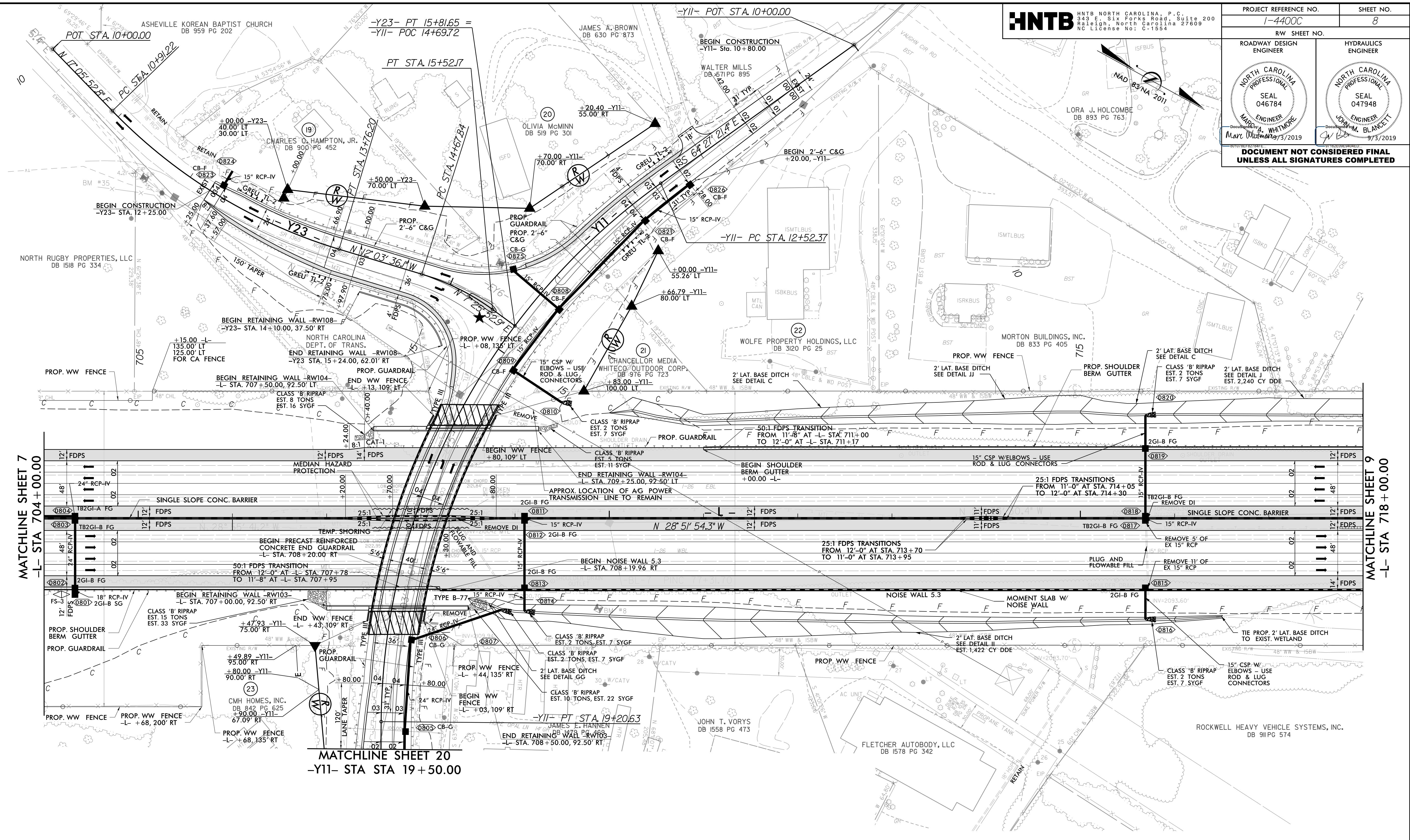
FOR CURVE DATA, SEE SHEET 2B-2
 FOR DITCH DETAIL, SEE SHEETS 2D-1, 2D-2
 FOR -Y1ORPA- PROFILE, SEE SHEET 38
 FOR -L- PROFILE, SEE SHEET 25 & 26

10-4400C-RD-1-854-S7

7/19/2017



PROJECT REFERENCE NO. 1-4400C		SHEET NO. 8
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		



REVISIONS

MATCHLINE SHEET 7
-L- STA 704+00.00

MATCHLINE SHEET 9
-L- STA 718+00.00

MATCHLINE SHEET 20
-Y11- STA STA 19+50.00

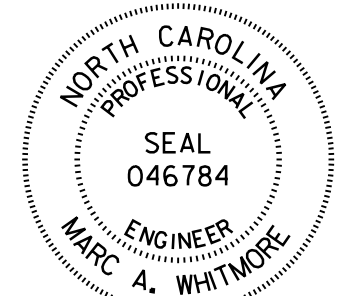

★ PROPOSED TRAFFIC SIGNAL

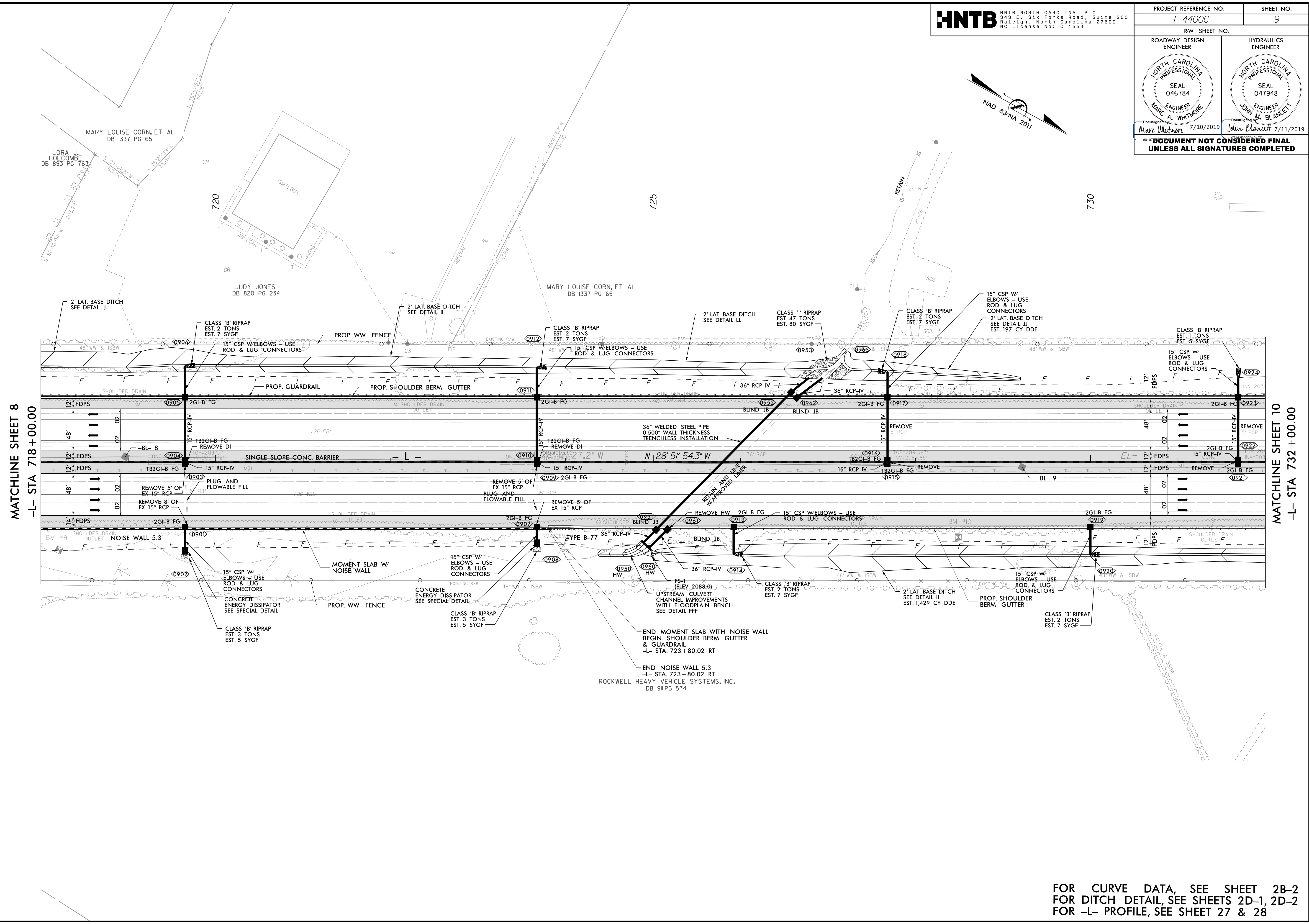
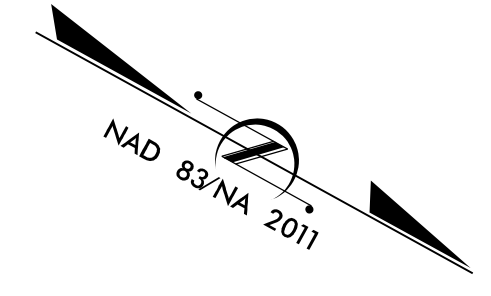
FOR CURVE DATA, SEE SHEET 2B-2
 FOR -Y11- PAVEMENT/BRIDGE RELATIONSHIP SKETCH, SEE SHEET 2B-3
 FOR -L- PROFILE, SEE SHEET 26 & 27
 FOR -Y11- INTERSECTION DETAIL, SEE SHEET 2B-9
 FOR DITCH DETAIL, SEE SHEETS 2D-1, 2D-2
 FOR -Y11- PROFILE, SEE SHEET 45
 FOR -Y23- PROFILE, SEE SHEET 49
 FOR RETAINING WALL -RW103-, SEE SHEET W-5
 FOR RETAINING WALL -RW104-, SEE SHEET W-6

NOTE:
 TEMPORARY SHORING SHOWN FOR
 INFORMATION ONLY. FOR MORE
 INFORMATION SEE TMP SHEETS.

03-SEP-2018 16:03
 Roadway\Projects\14400C_RDY_PSH_SB
 HNTB

7/19/2017

PROJECT REFERENCE NO. 1-4400C	SHEET NO. 9
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
 MARC A. WHITMORE 7/10/2019	 JOHN M. BLAINETT 7/11/2019
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



REVISIONS

MATCHLINE SHEET 8
-L- STA 718 + 00.00

MATCHLINE SHEET 10
-L- STA 732 + 00.00

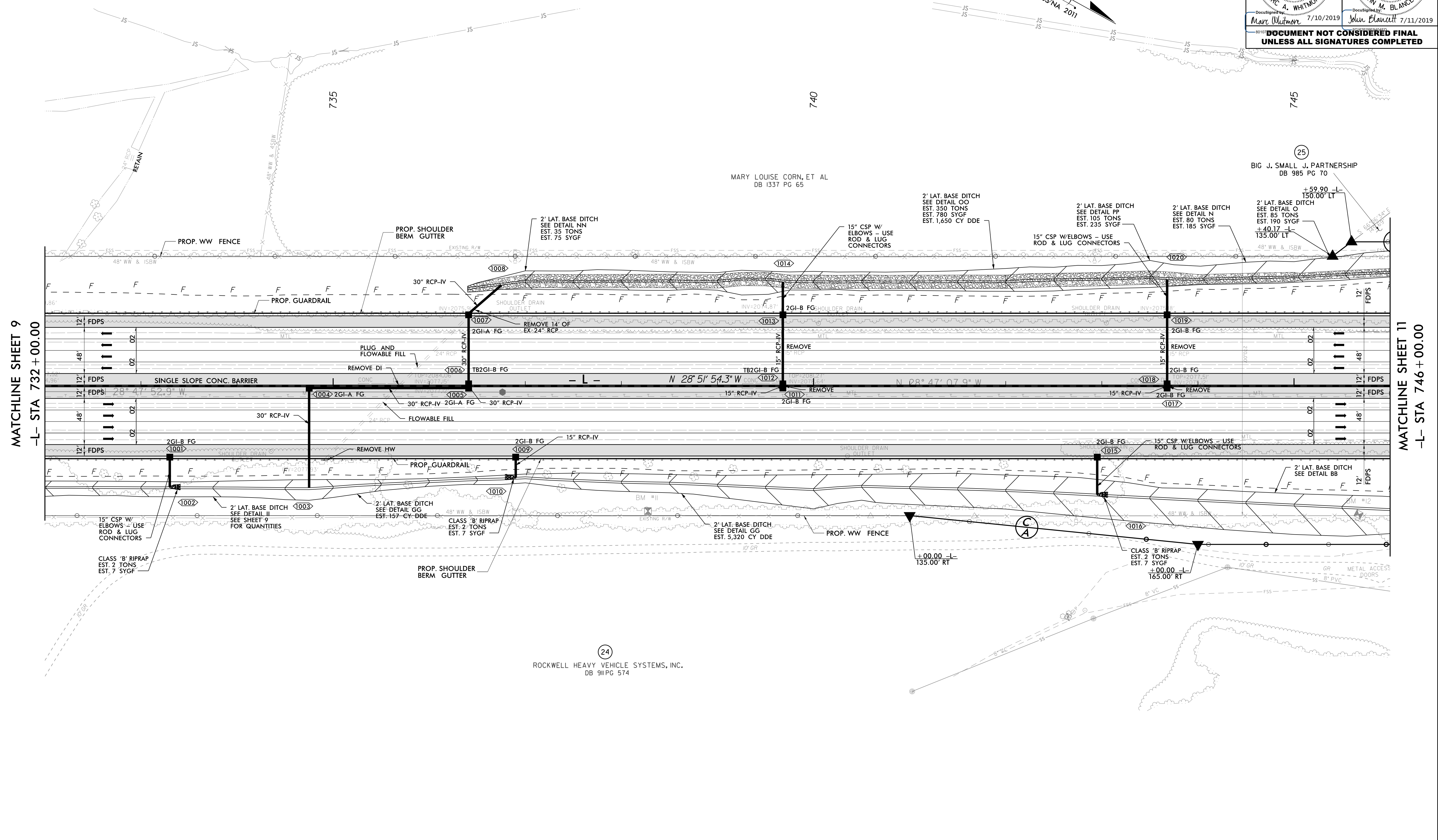
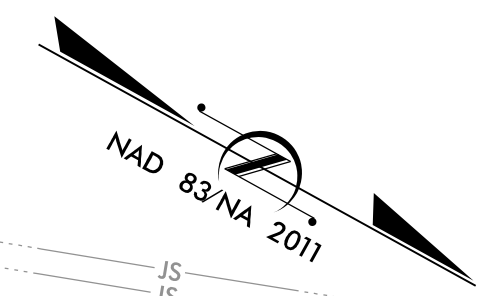
10-JUL-2019 10:21
14-400C-PROV-PSH-S9
HNTB

FOR CURVE DATA, SEE SHEET 2B-2
FOR DITCH DETAIL, SEE SHEETS 2D-1, 2D-2
FOR -L- PROFILE, SEE SHEET 27 & 28

7/19/2017

HNTB HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO. 1-4400C	SHEET NO. 10
RW SHEET NO.	
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 046784 MARC A. WHITMORE 7/10/2019	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 047948 JOHN M. BLANCETT 7/11/2019
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



REVISIONS

MATCHLINE SHEET 9
-L- STA 732 + 00.00

MATCHLINE SHEET 11
-L- STA 746 + 00.00

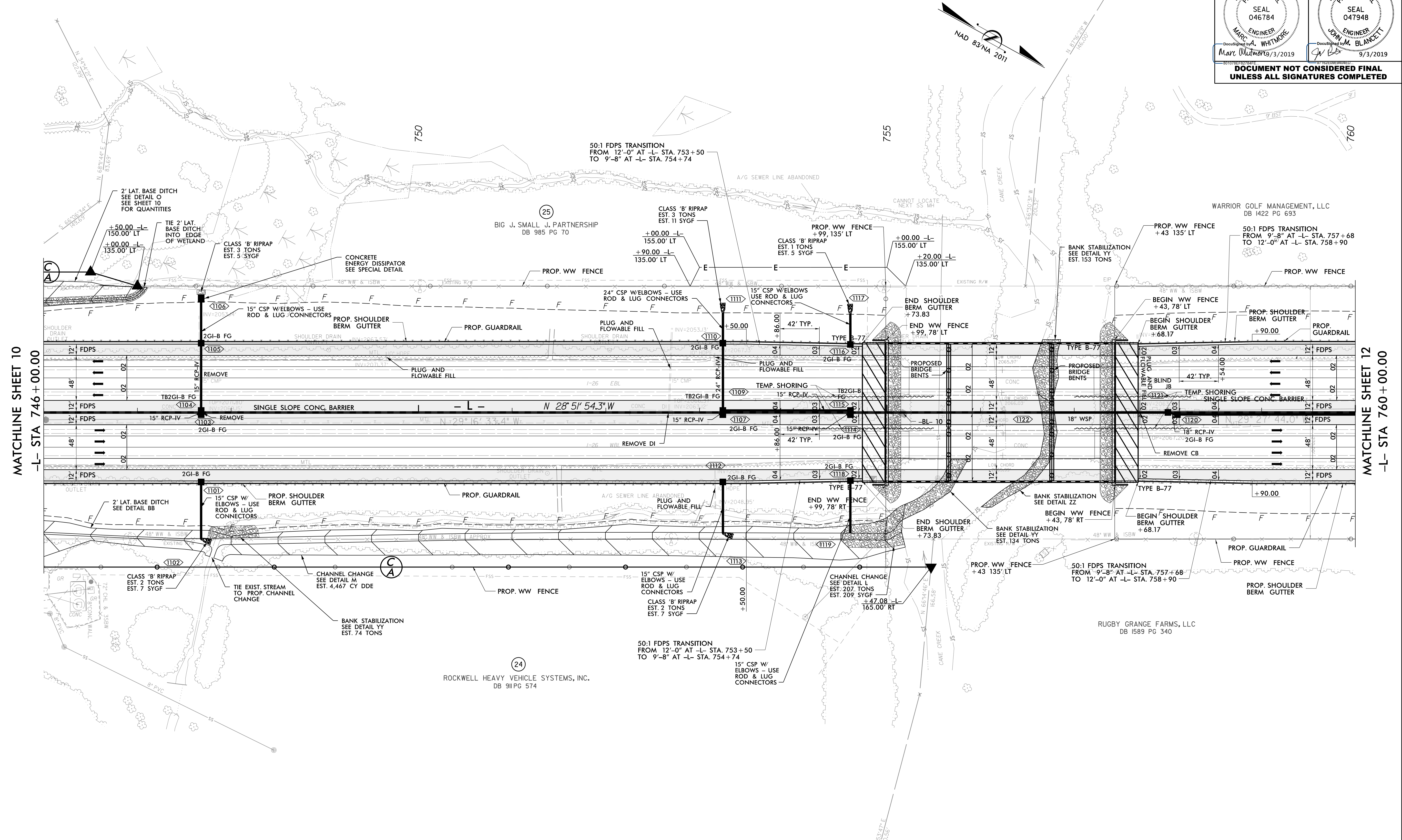
(24)
ROCKWELL HEAVY VEHICLE SYSTEMS, INC.
DB 9H PG 574

FOR CURVE DATA, SEE SHEET 2B-2
FOR DITCH DETAIL, SEE SHEETS 2D-1, 2D-2
FOR -L- PROFILE, SEE SHEET 28 & 29

10-11-2019 10:21 AM
1-4400C-RD-1-854-S10
HNTB

7/19/2017

PROJECT REFERENCE NO. 1-4400C	SHEET NO. 11
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



REVISIONS

MATCHLINE SHEET 10
-L- STA 746 + 00.00

MATCHLINE SHEET 12
-L- STA 760 + 00.00

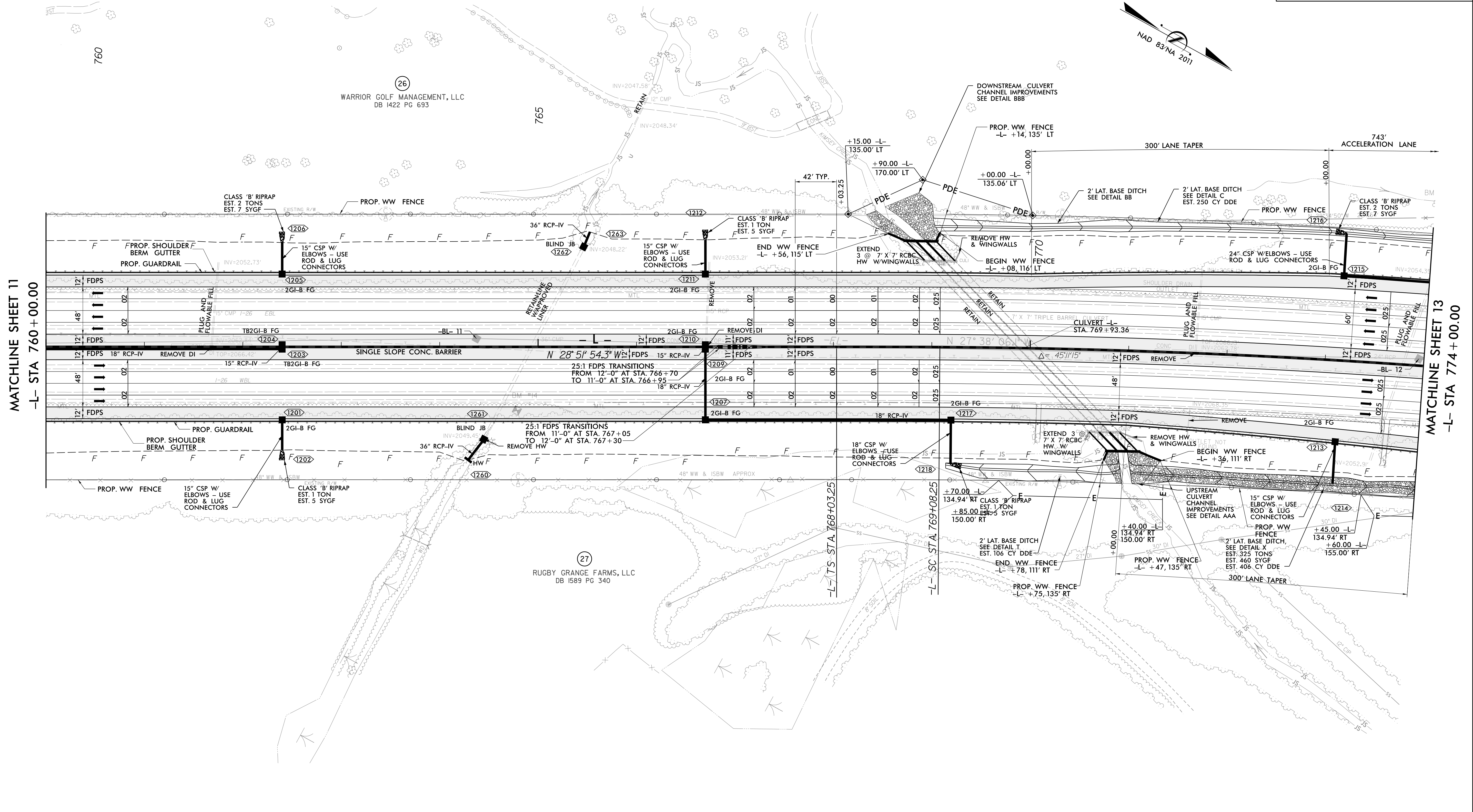
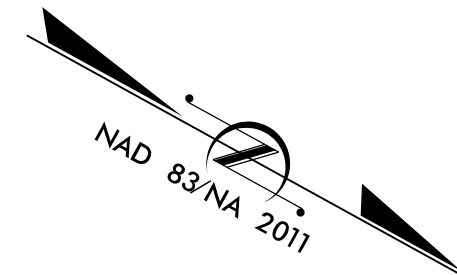
FOR CURVE DATA, SEE SHEET 2B-2
 FOR CANE CREEK PAVEMENT/BRIDGE RELATIONSHIP SKETCH, SEE SHEET 2B-3
 FOR DITCH DETAIL, SEE SHEETS 2D-1, 2D-2
 FOR -L- PROFILE, SEE SHEET 29 & 30

NOTE:
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 INFORMATION SEE TMP SHEETS.

03-SEP-2018 17:24
 R:\Projects\14400C-RDY_PSH_S11
 HNTB

7/19/2017

PROJECT REFERENCE NO. 1-4400C	SHEET NO. 12
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
Documented: Marc Whitmore 9/3/2019	Documented: Low M. Blainett 9/3/2019
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



MATCHLINE SHEET 11
-L- STA 760 + 00.00

MATCHLINE SHEET 13
-L- STA 774 + 00.00

REVISIONS

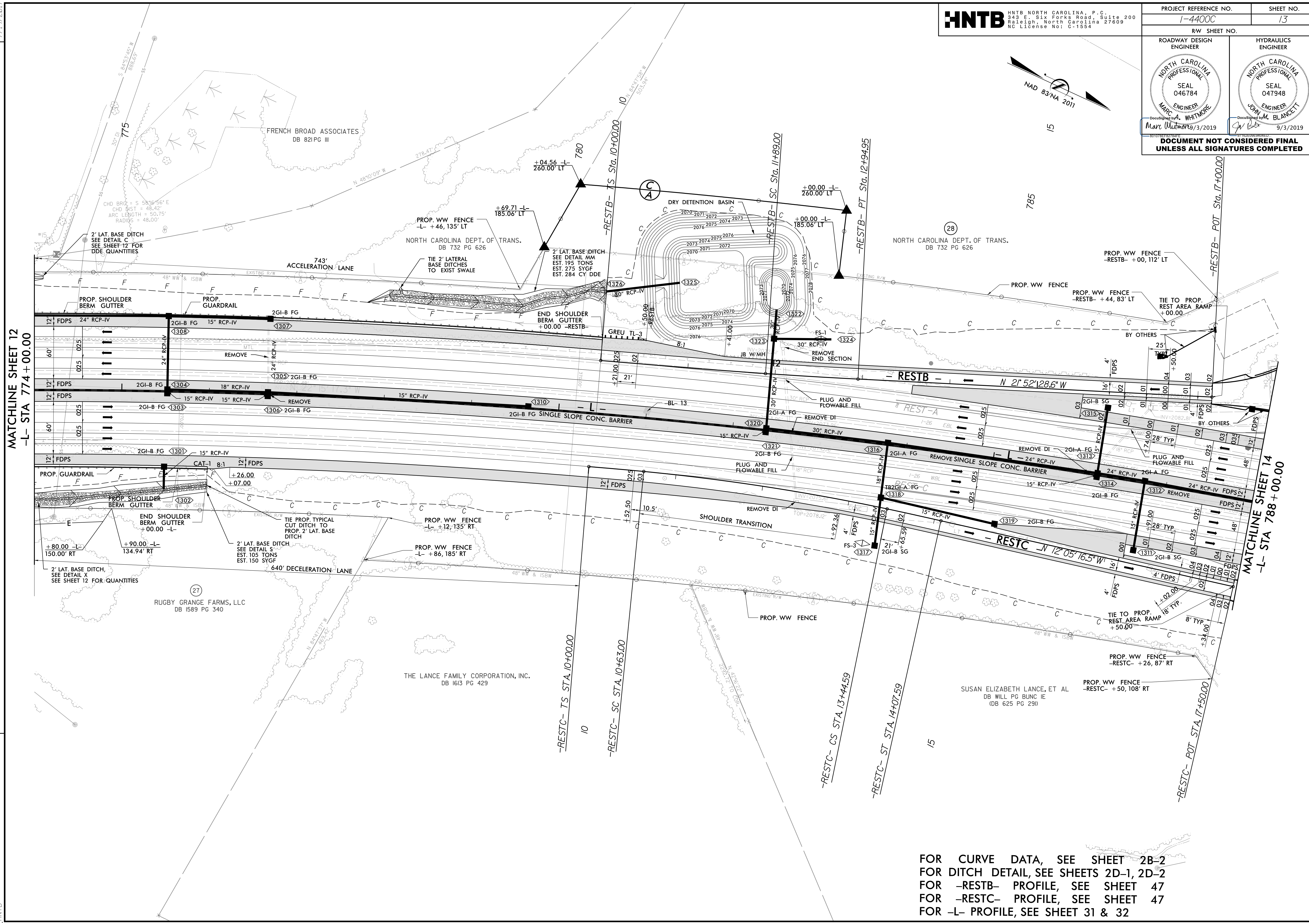
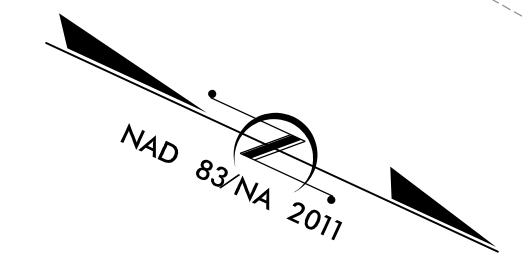
03-SEP-2019 17:23
N:\Roadway\14400C_PSH_S12

FOR CURVE DATA, SEE SHEET 2B-2
FOR DITCH DETAIL, SEE SHEETS 2D-1, 2D-2
FOR -L- PROFILE, SEE SHEET 30 & 31

7/19/2017

HNTB HNTB NORTH CAROLINA, P.C.
 343 E. Six Forks Road, Suite 200
 Raleigh, North Carolina 27609
 NC License No: C-1554

PROJECT REFERENCE NO. 1-4400C	SHEET NO. 13
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p>	



MATCHLINE SHEET 12
 -L- STA 774+00.00

MATCHLINE SHEET 14
 -L- STA 788+00.00

REVISIONS

03-SEP-2019 17:22
 Roadway\p_r_o_j\14400C_RDY_PSH_S13
 HNTB

FOR CURVE DATA, SEE SHEET 2B-2
 FOR DITCH DETAIL, SEE SHEETS 2D-1, 2D-2
 FOR -RESTB- PROFILE, SEE SHEET 47
 FOR -RESTC- PROFILE, SEE SHEET 47
 FOR -L- PROFILE, SEE SHEET 31 & 32