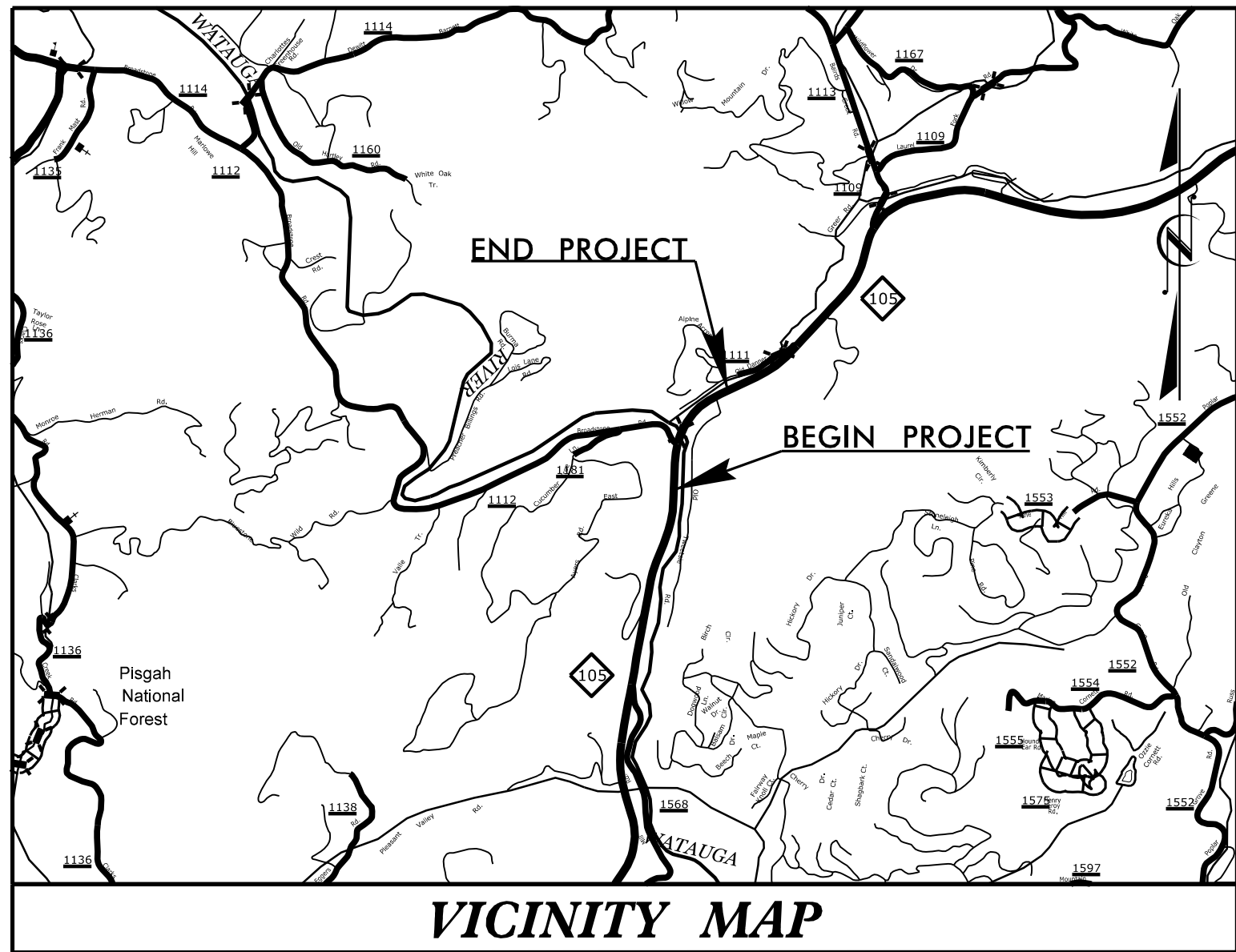


See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Plan Sheet Symbols



VICINITY MAP

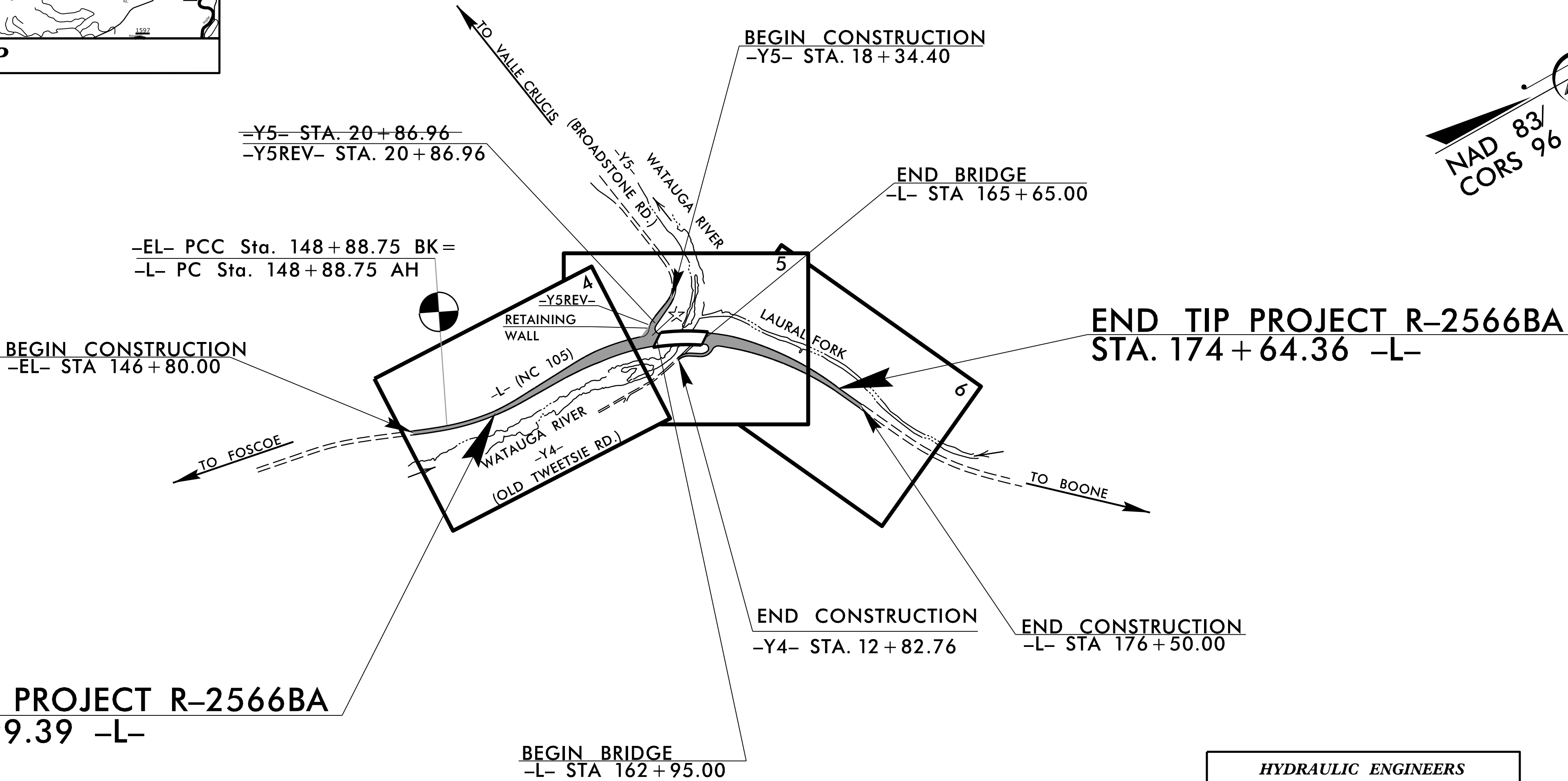
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WATAUGA COUNTY

LOCATION: NC 105 – CONSTRUCT NEW BRIDGE OVER WATAUGA RIVER AND LEFT-TURN LANE AT SR 1112 (BROADSTONE RD.) WITHIN THE LIMITS OF R-2566B

TYPE OF WORK: DRAINAGE, GRADING, PAVING, SIGNALS & STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2566BA	1	
STATE PROJ.NO.	P.A. PROJ. NO.	DESCRIPTION	
37512.1.4	NHP-0105(005)	PE	
37512.2.3		UTIL., ROW	
37512.3.3		CONST.	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

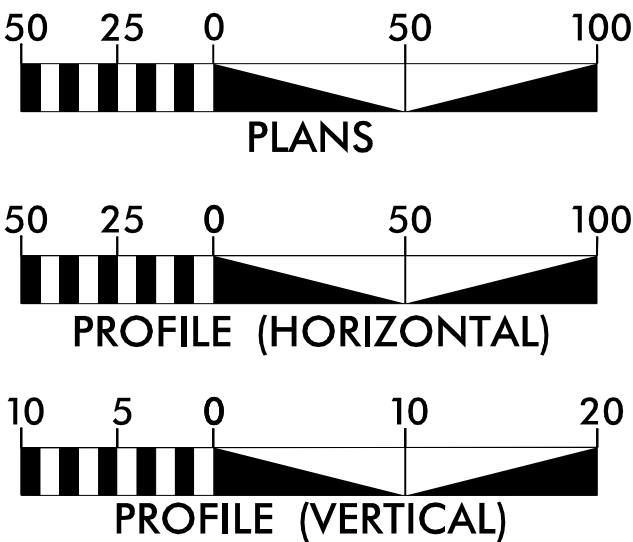


☆ EXISTING TRAFFIC SIGNAL TO BE RETROFITTED

HYDRAULIC ENGINEERS

TGS ENGINEERS
706 HILLSBOROUGH ST. SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

GRAPHIC SCALES



DESIGN DATA

ADT 2021 = 15,500
ADT 2045 = 21,400
K = 7 %
D = 65 %
T = 4 % *
V = 60 MPH
* TTST=1% DUAL=3%
FUNC CLASS=ARTERIAL
STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2566BA = 0.378 MILES
LENGTH STRUCTURE TIP PROJECT R-2566BA = 0.051 MILES
TOTAL LENGTH OF TIP PROJECT R-2566BA = 0.429 MILES



Prepared for the North Carolina Department
of Transportation in the Office of:

1223 JONES FRANKLIN ROAD
RALEIGH, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8077

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
SEPTEMBER 21, 2018

LETTING DATE:
NOVEMBER 16, 2021

NCDOT CONTACT:

EDWARD G. WETHERILL, PE
PROJECT ENGINEER

BOB A. MAY, PE
PROJECT DESIGN ENGINEER

NATHAN N. ADIMA, PE
ROADWAY DESIGN PROJECT ENGINEER

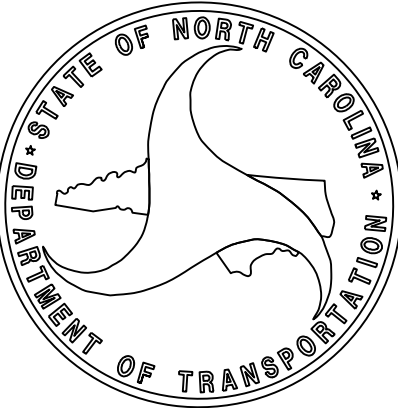
HYDRAULICS ENGINEER

8/4/2021

DocuSigned by:
David B. Petty
SIGNATURE: 409880465

ROADWAY DESIGN
ENGINEER
8/4/2021

DocuSigned by:
Bob A. May
SIGNATURE: 244229493



8/17/99

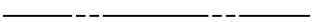
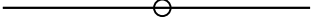
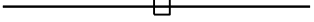
6/27/2021
R-2566BA_Rdy.psh_01A_Index.dgn
USER:RDM

		 1223 Jones Franklin Rd. Raleigh, N.C. 27606 License No. F-0377 Bus: 919 851 8077 Fax: 919 851 8107 TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION		PROJECT REFERENCE NO. <i>R-2566BA</i>	SHEET NO. <i>1A</i>
				ROADWAY DESIGN ENGINEER 7/21/2021  DocuSigned by <i>Paul A. May</i>	
				DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
		GENERAL NOTES:		2018 SPECIFICATIONS EFFECTIVE: 01-16-2018 REVISED:	
INDEX OF SHEETS				EFF. 01-16-2018 REV.	
SHEET NUMBER SHEET		GRADING AND SURFACING OR RESURFACING AND WIDENING:		2018 ROADWAY ENGLISH STANDARD DRAWINGS	
1 TITLE SHEET		THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.		The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch – N. C. Department of Transportation – Raleigh, N. C., Dated January, 2018 are applicable to this project and by reference hereby are considered a part of these plans:	
1A INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS		CLEARING:		STD.NO. TITLE	
1B CONVENTIONAL SYMBOLS		CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.		DIVISION 2 – EARTHWORK	
2A-1 THRU 2A-3 PAVEMENT SCHEDULE AND TYPICAL SECTIONS		SUPERELEVATION:		200.03 Method of Clearing – Method III	
2A-4 RETAINING WALL NO. 1 PLAN VIEW ENVELOPE		SHOULDER CONSTRUCTION:		225.02 Guide for Grading Subgrade – Secondary and Local	
2C-1 THRU 2C-11 SPECIAL DETAILS (TYPE III SHOP CURVED 31"n. W BEAM RAIL SECTION DETAIL, TUB 60"n RCP W/ MH, TEMP. ANCHOR UNIT TYPE W-BEAM, TEMP. B-77 TO PCB, TYPE III MODIFIED FOR POST AND BEAM, REINFORCED CONCRETE ENDWALL FOR 60" PIPE 60 SKEW) AT-1 END UNIT DETAIL, 2'-9" C&G DETAIL, DETAIL OF 1'-6" TO 2'-9" C&G TRANSITION SECTION & TRAFFIC BEARING 4G1 DETAIL		SIDE ROADS:		225.04 Method of Obtaining Superelevation – Two Lane Pavement	
2D-1 THRU 2D-3 BIOFILTRATION CONVEYANCE PLANS AND PROFILE AND DETAILS		SUBSURFACE DRAINS:		225.06 Method of Grading Sight Distance at Intersections	
2G-1 SLOPE STABILIZATION DETAIL		UNDERDRAINS:		DIVISION 3 – PIPE CULVERTS	
3B-1 THRU 3B-2 ROADWAY SUMMARIES EARTHWORK, TEMPORARY SHORING, PAVEMENT REMOVAL, SHOULDER BERM GUTTER, 1'-6" CURB & GUTTER, 2'-9" CURB & GUTTER, TEMPORARY GUARDRAIL, AND GUARDRAIL.		GUARDRAIL:		300.01 Method of Pipe Installation	
3D-1 THRU 3D-2 DRAINAGE SUMMARIES		TEMPORARY SHORING:		DIVISION 4 – MAJOR STRUCTURES	
3G-1 GEOTECHNICAL SUMMARIES		END BENTS:		422.01 Bridge Approach Fills – Type I Standard Approach Fill	
3P-1 PARCEL INDEX SHEET		UTILITIES:		DIVISION 5 – SUBGRADE, BASES AND SHOULDERS	
4 THRU 6 PLAN SHEETS		RIGHT-OF-WAY MARKERS:		560.01 Method of Shoulder Construction – High Side of Superelevated Curve – Method I	
7 THRU 8 PROFILE SHEETS		ROCK		560.02 Method of Shoulder Construction – High Side of Superelevated Curve – Method II	
RW01 THRU RW06 RIGHT OF WAY SHEETS				DIVISION 6 – ASPHALT BASES AND PAVEMENTS	
TMP-1 THRU TMP-21 TRAFFIC MANAGEMENT PLANS				654.01 Pavement Repairs	
PMP-1 THRU PMP-3 PAVEMENT MARKING PLANS				DIVISION 8 – INCIDENTALS	
EC-1 THRU EC-10 EROSION CONTROL PLANS				815.02 Subsurface Drain	
RF-1 REFORESTATION PLANS				815.03 Pipe Underdrain and Blind Drain	
SIGN-1 THRU SIGN-4 SIGNING PLANS				840.00 Concrete Base Pad for Drainage Structures	
SIG-1 THRU SIG-8 SIGNAL PLANS				840.01 Brick Catch Basin – 12" thru 54" Pipe	
SIG-M1 THRU SIG-M8 STANDARD DRAWINGS FOR ALL METAL POLES				840.02 Concrete Catch Basin – 12" thru 54" Pipe	
UO-1 THRU UO-4 UTILITIES BY OTHERS PLANS				840.03 Frame, Grates and Hood – for Use on Standard Catch Basin	
X-0 CROSS-SECTION INDEX				840.14 Concrete Drop Inlet – 12" thru 30" Pipe	
X-1A CROSS-SECTION SUMMARY SHEET				840.15 Brick Drop Inlet – 12" thru 30" Pipe	
X-1 THRU X- 69 CROSS-SECTIONS				840.16 Drop Inlet Frame and Grates – for use with Std. Dwg 840.14 and 840.15	
S-1 THRU S-79 STRUCTURE PLANS				840.17 Concrete Grated Drop Inlet Type 'A' – 12" thru 72" Pipe	
W1 THRU W2 RETAINING WALL NO. 1 PLANS				840.18 Concrete Grated Drop Inlet Type 'B' – 12" thru 36" Pipe	
				840.24 Frames and Narrow Slot Sag Grates	
				840.25 Anchorage for Frames – Brick or Concrete or Precast	
				840.26 Brick Grated Drop Inlet Type 'A' – 12" thru 72" Pipe	
				840.27 Brick Grated Drop Inlet Type 'B' – 12" thru 36" Pipe	
				840.29 Frames and Narrow Slot Flat Grates	
				840.35 Traffic Bearing Grated Drop Inlet – for Cast Iron Double Frame and Grates	
				840.45 Precast Drainage Structure	
				840.46 Traffic Bearing Precast Drainage Structure	
				840.66 Drainage Structure Steps	
				846.01 Concrete Curb, Gutter and Curb & Gutter	
				846.04 Drop Inlet Installation in Shoulder Berm Gutter	
				850.01 Concrete Paved Ditches	
				850.11 Guide for Berm Drainage Outlet – 24" and 30" Pipe	
				852.10 Median Construction – with Curb and Gutter	
				857.01 Precast Reinforced Concrete Barrier – 41" Single Faced	
				862.01 Guardrail Placement	
				862.02 Guardrail Installation	
				862.03 Structure Anchor Units	
				862.04 Anchoring End of Guardrail – B-77 and B-83 Anchor Units	
				876.01 Rip Rap in Channels	
				876.02 Guide for Rip Rap at Pipe Outlets	
				876.04 Drainage Ditches with Class 'B' Rip Rap	

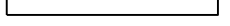
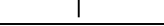
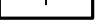
CONVENTIONAL PLAN SHEET SYMBOLS

PROJECT REFERENCE NO.	SHEET NO.
R-2566BA	1B

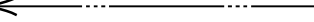
BOUNDARIES AND PROPERTY:

State Line	
County Line	
Township Line	
City Line	
Reservation Line	
Property Line	
Existing Iron Pin	
Computed Property Corner	
Property Monument	
Parcel/Sequence Number	
Existing Fence Line	
Proposed Woven Wire Fence	
Proposed Chain Link Fence	
Proposed Barbed Wire Fence	
Existing Wetland Boundary	
Proposed Wetland Boundary	
Existing Endangered Animal Boundary	
Existing Endangered Plant Boundary	
Existing Historic Property Boundary	
Known Contamination Area: Soil	
Potential Contamination Area: Soil	
Known Contamination Area: Water	
Potential Contamination Area: Water	
Contaminated Site: Known or Potential	

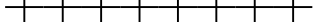
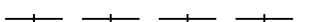
BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	
Sign	
Well	
Small Mine	
Foundation	
Area Outline	
Cemetery	
Building	
School	
Church	
Dam	

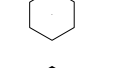
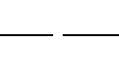
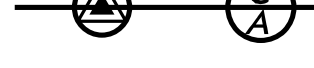
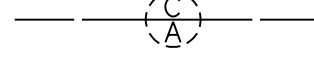
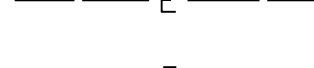
HYDROLOGY:

Stream or Body of Water	
Hydro, Pool or Reservoir	
Jurisdictional Stream	
Buffer Zone 1	
Buffer Zone 2	
Flow Arrow	
Disappearing Stream	
Spring	
Wetland	
Proposed Lateral, Tail, Head Ditch	
False Sump	

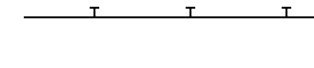
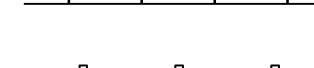
RAILROADS:

Standard Gauge	
RR Signal Milepost	
Switch	
RR Abandoned	
RR Dismantled	

RIGHT OF WAY & PROJECT CONTROL:

Secondary Horiz and Vert Control Point	
Primary Horiz Control Point	
Primary Horiz and Vert Control Point	
Exist Permanent Easment Pin and Cap	
New Permanent Easement Pin and Cap	
Vertical Benchmark	
Existing Right of Way Marker	
Existing Right of Way Line	
New Right of Way Line	
New Right of Way Line with Pin and Cap	
New Right of Way Line with Concrete or Granite R/W Marker	
New Control of Access Line with Concrete C/A Marker	
Existing Control of Access	
New Control of Access	
Existing Easement Line	
New Temporary Construction Easement	
New Temporary Drainage Easement	
New Permanent Drainage Easement	
New Permanent Drainage /Utility Easement	
New Permanent Utility Easement	
New Temporary Utility Easement	
New Aerial Utility Easement	

ROADS AND RELATED FEATURES:

Existing Edge of Pavement	
Existing Curb	
Proposed Slope Stakes Cut	
Proposed Slope Stakes Fill	
Proposed Curb Ramp	
Existing Metal Guardrail	
Proposed Guardrail	
Existing Cable Guiderail	
Proposed Cable Guiderail	
Equality Symbol	
Pavement Removal	

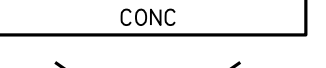
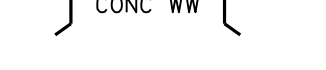
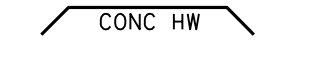
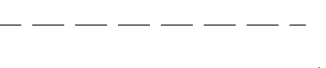
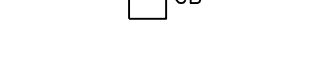
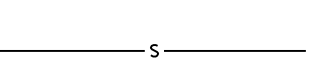
VEGETATION:

Single Tree	
Single Shrub	

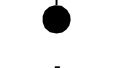
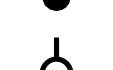
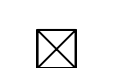
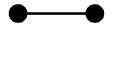
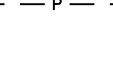
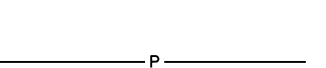
*S.U.E. = Subsurface Utility Engineering

Hedge	
Woods Line	
Orchard	
Vineyard	

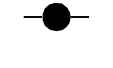
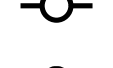
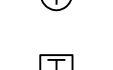
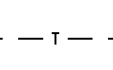
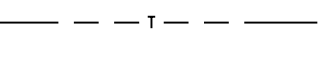
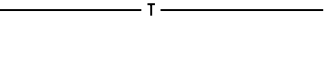
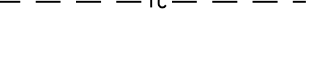
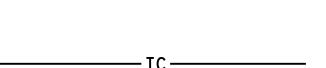
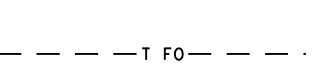
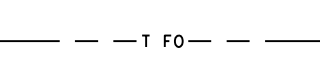
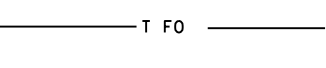
EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	
Bridge Wing Wall, Head Wall and End Wall	
MINOR:	
Head and End Wall	
Pipe Culvert	
Footbridge	
Drainage Box: Catch Basin, DI or JB	
Paved Ditch Gutter	
Storm Sewer Manhole	
Storm Sewer	

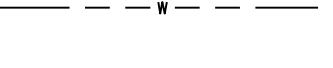
UTILITIES:

POWER:	
Existing Power Pole	
Proposed Power Pole	
Existing Joint Use Pole	
Proposed Joint Use Pole	
Power Manhole	
Power Line Tower	
Power Transformer	
U/G Power Cable Hand Hole	
H-Frame Pole	
U/G Power Line LOS B (S.U.E.*)	
U/G Power Line LOS C (S.U.E.*)	
U/G Power Line LOS D (S.U.E.*)	

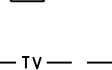
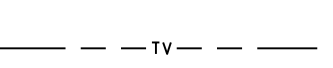
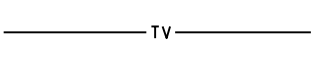
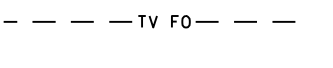
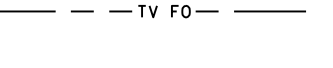
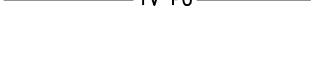
TELEPHONE:

Existing Telephone Pole	
Proposed Telephone Pole	
Telephone Manhole	
Telephone Pedestal	
Telephone Cell Tower	
U/G Telephone Cable Hand Hole	
U/G Telephone Cable LOS B (S.U.E.*)	
U/G Telephone Cable LOS C (S.U.E.*)	
U/G Telephone Cable LOS D (S.U.E.*)	
U/G Telephone Conduit LOS B (S.U.E.*)	
U/G Telephone Conduit LOS C (S.U.E.*)	
U/G Telephone Conduit LOS D (S.U.E.*)	
U/G Fiber Optics Cable LOS B (S.U.E.*)	
U/G Fiber Optics Cable LOS C (S.U.E.*)	
U/G Fiber Optics Cable LOS D (S.U.E.*)	

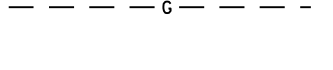
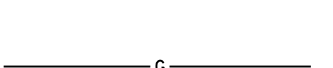
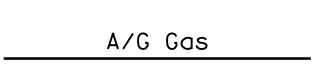
WATER:

Water Manhole	
Water Meter	
Water Valve	
Water Hydrant	
U/G Water Line LOS B (S.U.E.*)	
U/G Water Line LOS C (S.U.E.*)	
U/G Water Line LOS D (S.U.E.*)	
Above Ground Water Line	

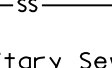
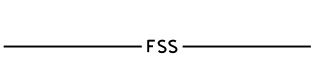
TV:

TV Pedestal	
TV Tower	
U/G TV Cable Hand Hole	
U/G TV Cable LOS B (S.U.E.*)	
U/G TV Cable LOS C (S.U.E.*)	
U/G TV Cable LOS D (S.U.E.*)	
U/G Fiber Optic Cable LOS B (S.U.E.*)	
U/G Fiber Optic Cable LOS C (S.U.E.*)	
U/G Fiber Optic Cable LOS D (S.U.E.*)	

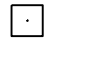
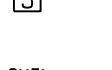
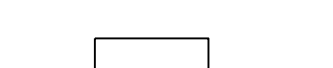
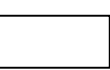
GAS:

Gas Valve	
Gas Meter	
U/G Gas Line LOS B (S.U.E.*)	
U/G Gas Line LOS C (S.U.E.*)	
U/G Gas Line LOS D (S.U.E.*)	
Above Ground Gas Line	

SANITARY SEWER:

Sanitary Sewer Manhole	
Sanitary Sewer Cleanout	
U/G Sanitary Sewer Line	
Above Ground Sanitary Sewer	
SS Forced Main Line LOS B (S.U.E.*)	
SS Forced Main Line LOS C (S.U.E.*)	
SS Forced Main Line LOS D (S.U.E.*)	

MISCELLANEOUS:

Utility Pole	
Utility Pole with Base	
Utility Located Object	
Utility Traffic Signal Box	
Utility Unknown U/G Line LOS B (S.U.E.*)	
U/G Tank; Water, Gas, Oil	
Underground Storage Tank, Approx. Loc.	
A/G Tank; Water, Gas, Oil	
Geoenvironmental Boring	
U/G Test Hole LOS A (S.U.E.*)	
Abandoned According to Utility Records	
End of Information	

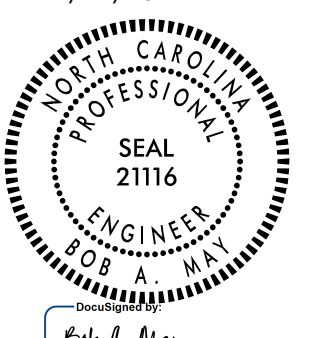
6/22/99

6/22/2021
R-2566BA_Rd.psh_02A-1.txd
11:58:00 AM

PAVEMENT SCHEDULE					
FINAL PAVEMENT DESIGN					
C1	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.	E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R4	SHOULDER BERM GUTTER
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.	R6	SINGLE FACED CONCRETE BARRIER
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1½" IN DEPTH.	E3	PROP. APPROX. 10" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD. IN EACH OF TWO LAYERS	T	EARTH MATERIAL.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	J1	PROP. 8" AGGREGATE BASE COURSE.	U	EXISTING PAVEMENT.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.	R1	1'-6" CONCRETE CURB AND GUTTER.	V	MILLING BITUMINOUS PAVEMENT. 1.5" DEPTH.
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.		R3	2'-9" CONCRETE CURB AND GUTTER.	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL SHEET NO. 2A-1)

PROJECT REFERENCE NO.
R-2566BA

SHEET NO.
2A-1

ROADWAY DESIGN
ENGINEER
7/21/2021


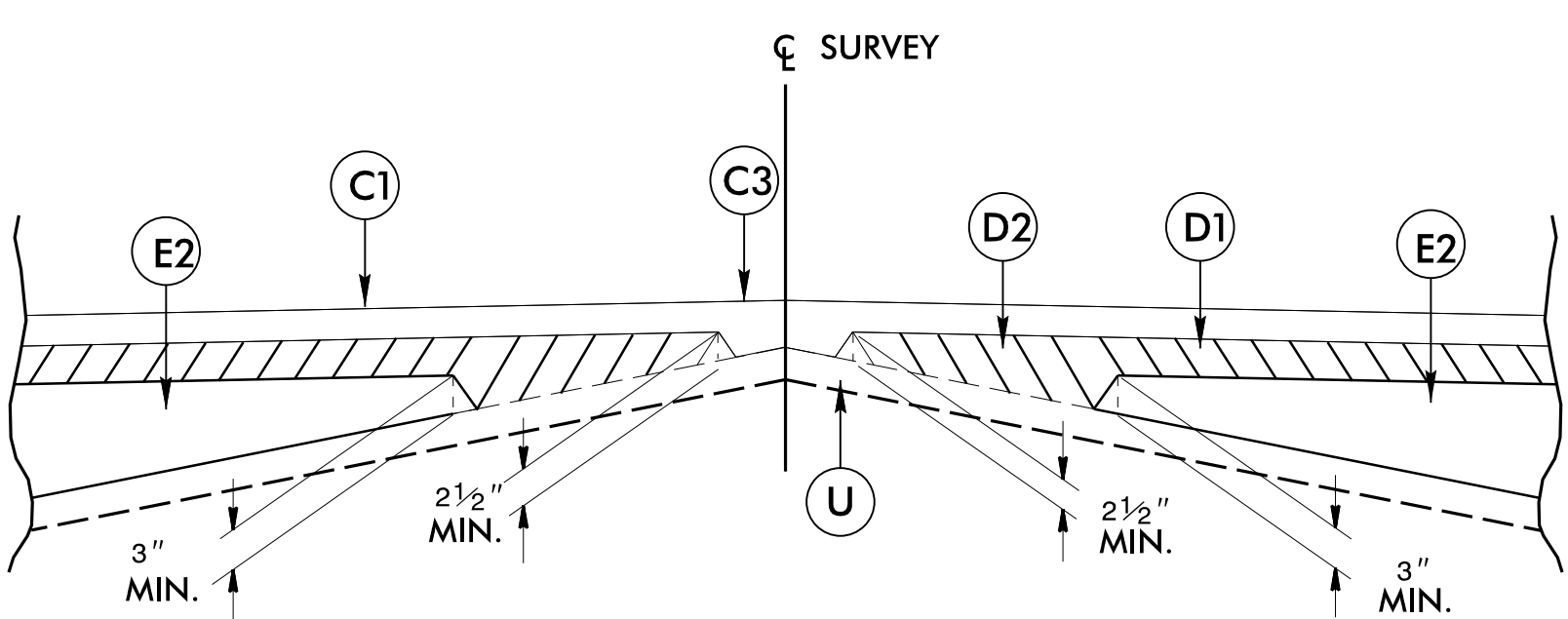
PAVEMENT DESIGN
ENGINEER
7/26/2021


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

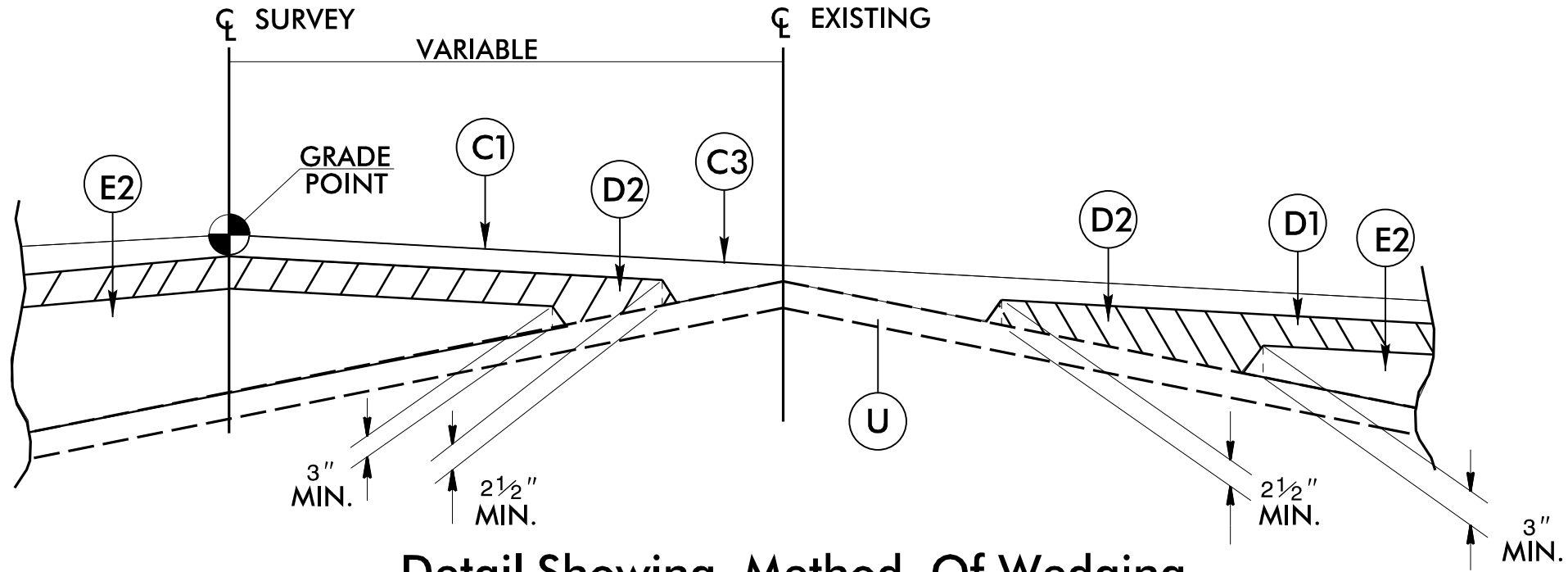


1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION



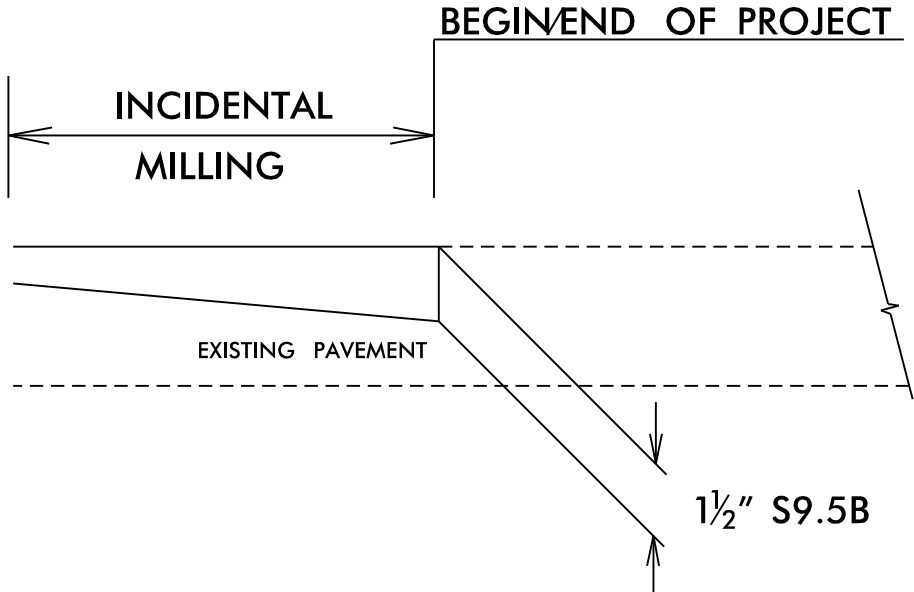
Detail Showing Method of Wedging



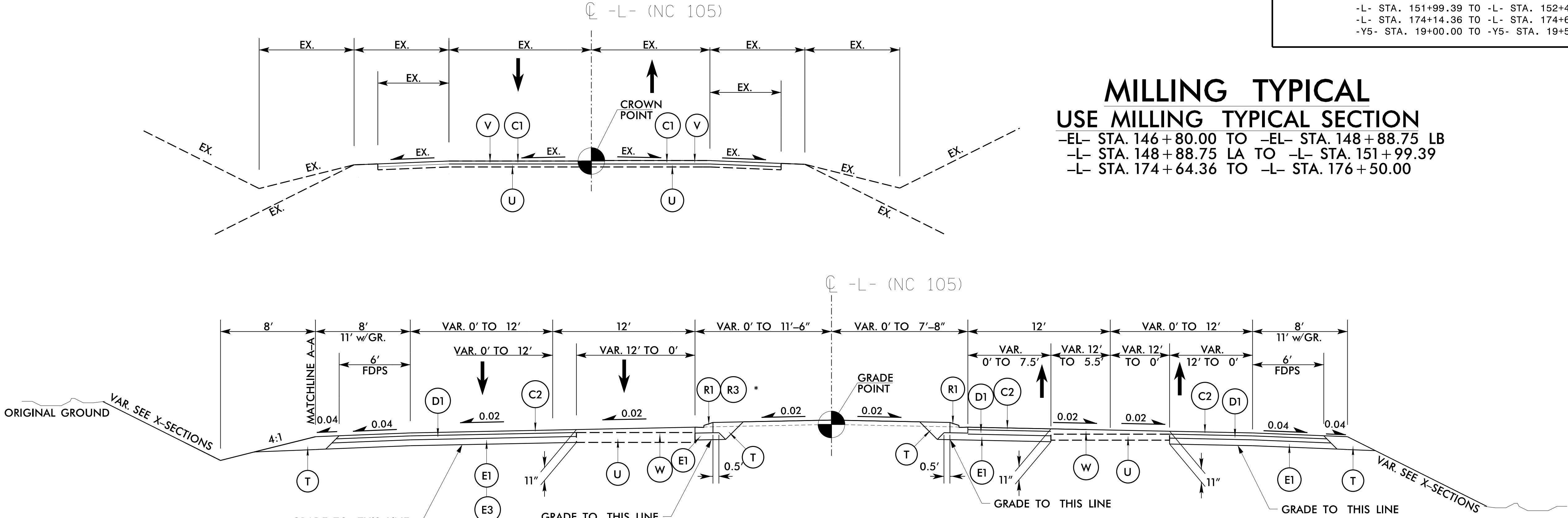
Detail Showing Method Of Wedging

NOTES TO CONTRACTOR

Perform the work in accordance with Section 607 of the January 2018 North Carolina Department of Transportation Standard Specifications for Roads and Structures. Resurfacing will be accomplished at the same time as the milling operation.



NOTE: UTILIZE INCIDENTAL MILLING TO MAKE PAVEMENT TIE-INS
-L- STA. 151+99.39 TO -L- STA. 152+49.39
-L- STA. 174+14.36 TO -L- STA. 174+64.36
-Y5- STA. 19+00.00 TO -Y5- STA. 19+50.00



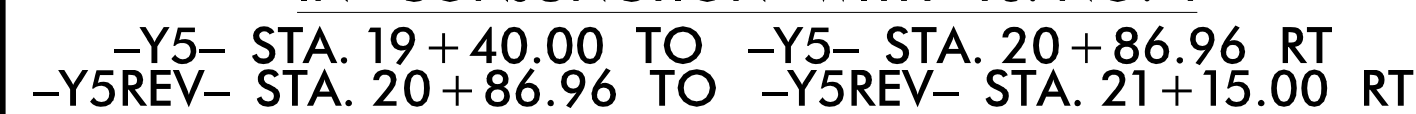
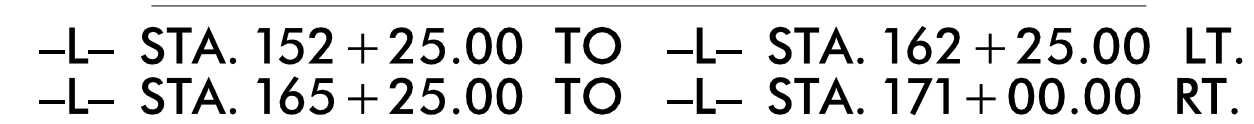
MILLING TYPICAL
USE MILLING TYPICAL SECTION
-EL- STA. 146+80.00 TO -EL- STA. 148+88.75 LB
-L- STA. 148+88.75 LA TO -L- STA. 151+99.39
-L- STA. 174+64.36 TO -L- STA. 176+50.00

TYPICAL SECTION NO. 1
USE TYPICAL SECTION NO. 1

-L- STA. 151+99.39 TO -L- STA. 162+95.00 (BEGIN BRIDGE)

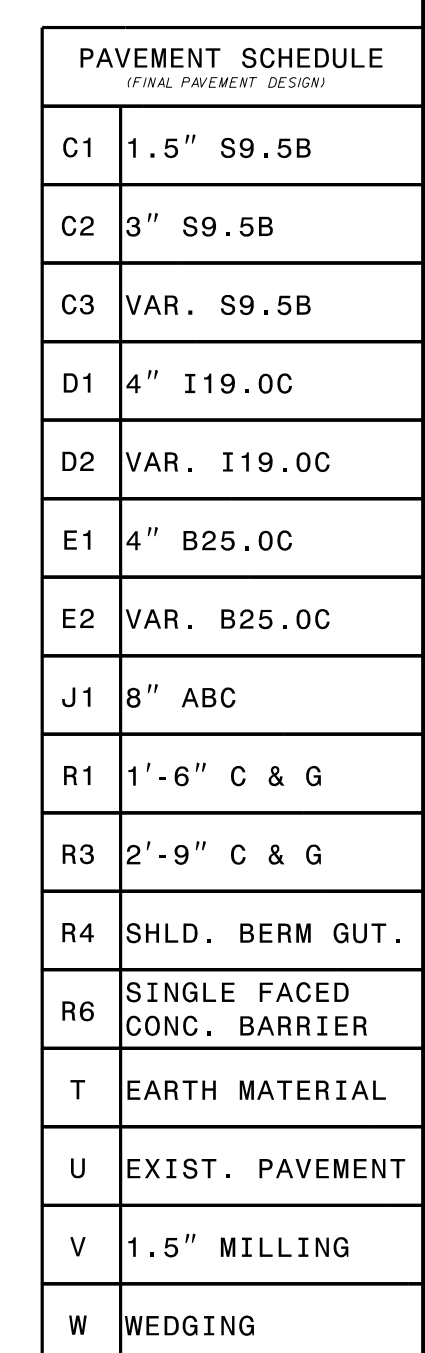
** NOTE: UTILIZE E3 FROM -L- STA. 157+50 TO 159+50 LEFT.

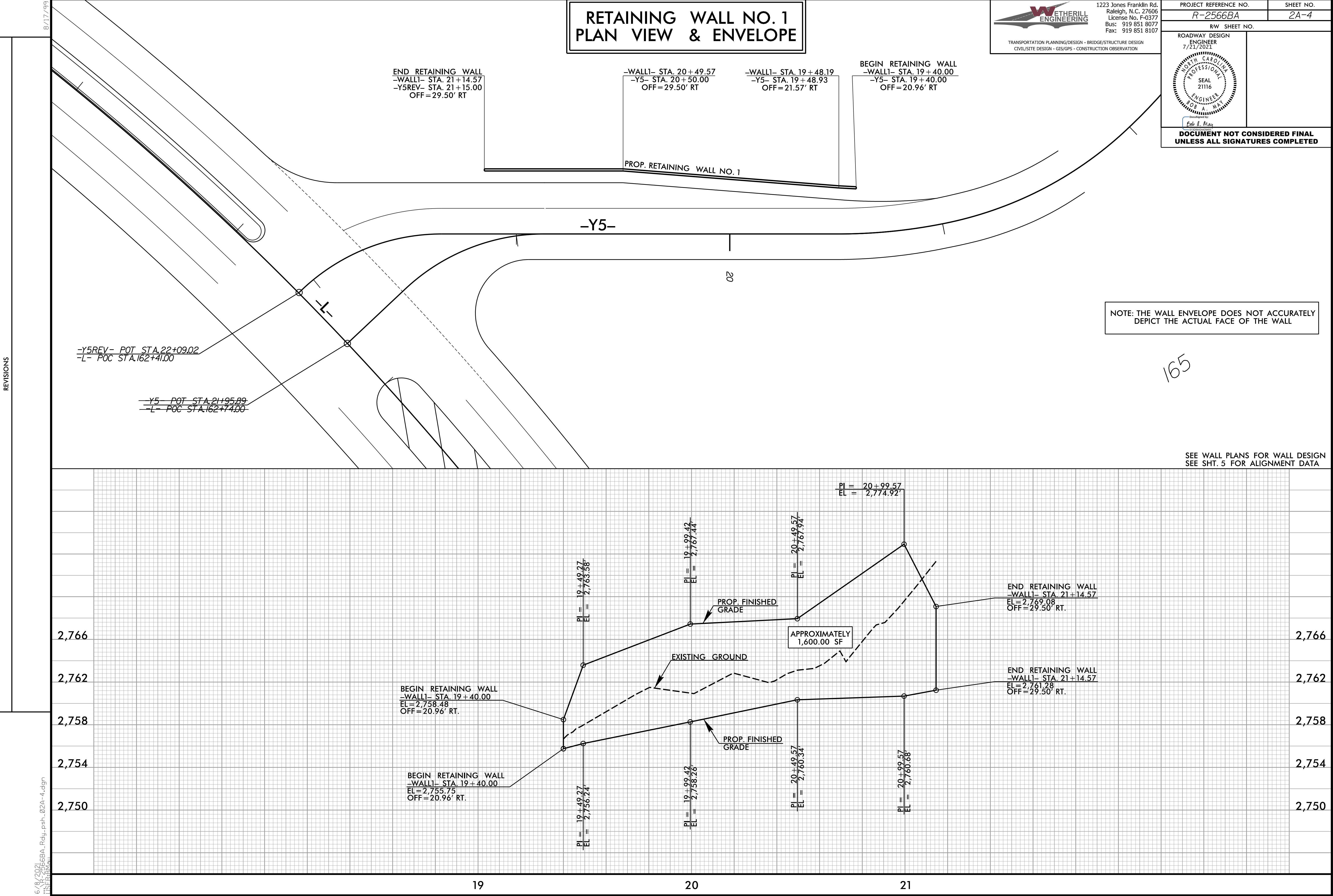
* USE 2'-9" CURB & GUTTER
-L- STA. 154+71.00 TO -L- STA. 162+05.48
* TRANSITION FROM 1'-6" C&G TO 2'-9" C&G -L- STA. 154+46 to 154+71 LT.



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

PAVEMENT SCHEDULE (FINAL PAVEMENT DESIGN)	
C1	1.5" S9.5B
C2	3" S9.5B
C3	VAR. S9.5B
D1	4" I19.0C
D2	VAR. I19.0C
E1	4" B25.0C
E2	VAR. B25.0C
J1	8" ABC
R1	1'-6" C & G
R3	2'-9" C & G
R4	SHLD. BERM GUT.
R6	SINGLE FACED CONC. BARRIER
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V	1.5" MILLING
W	WEDGING



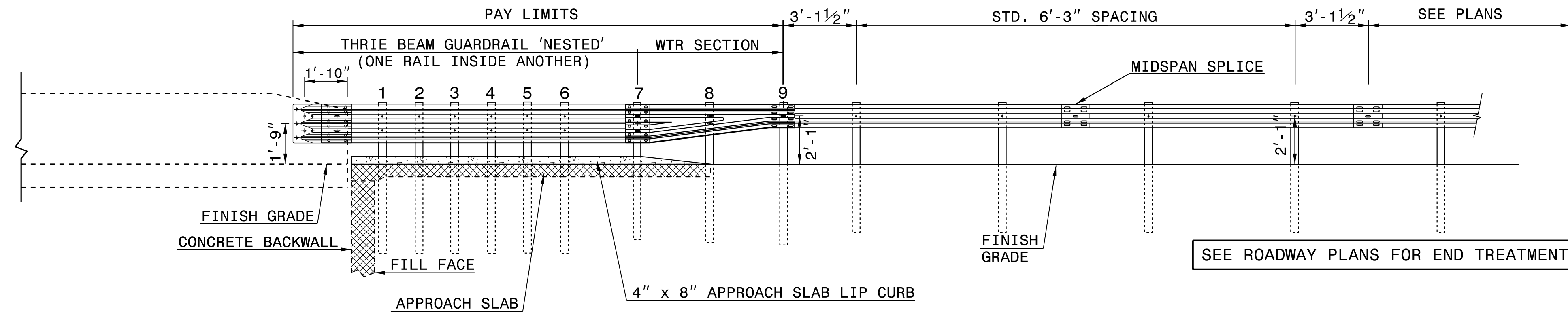


STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
TYPE III - SHOP CURVED
STRUCTURE ANCHOR UNIT

SHEET 1 OF 1

TYPE III SC



NOTE:

**POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE $11\frac{1}{2}$ " IF CONCRETE BACKWALL IS NOT PRESENT.

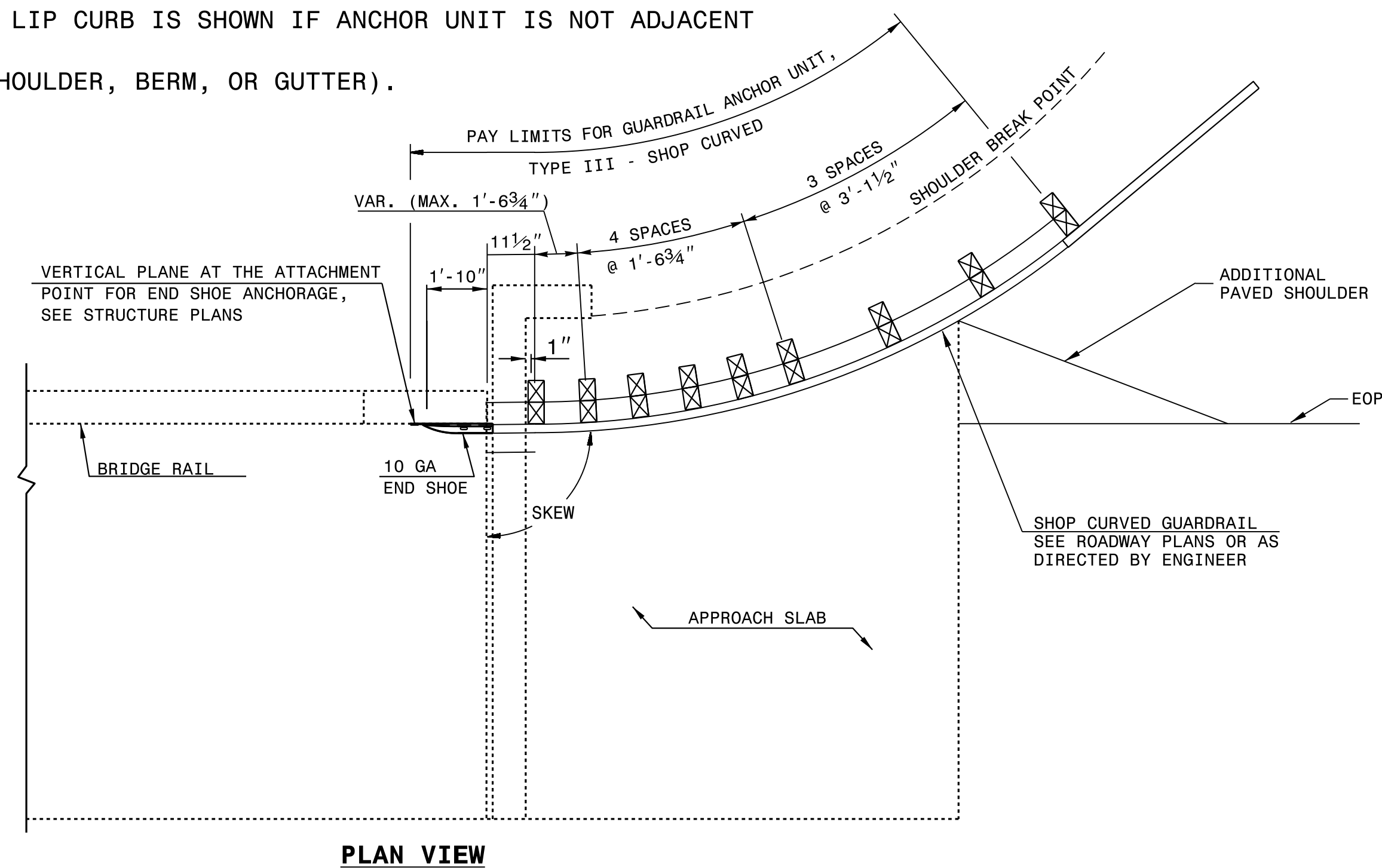
-SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.

-MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).

-USE NO STEEL POSTS WITHIN THE GUARDRAIL ANCHOR UNIT LIMITS.

-LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.

-SEE STANDARD 862.03 SHEET 4 FOR POST SECTIONS 1 THRU 9.



GUARDRAIL ANCHOR UNIT, TYPE III - SHOP CURVED
FOR ATTACHMENT TO RAIL ON BRIDGE

ENGLISH DETAIL DRAWING FOR
**TYPE III - SHOP CURVED
STRUCTURE ANCHOR UNIT**

SHEET 1 OF 1

TYPE III SC

**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: E.E.Ward DATE: 4-4-02
MODIFIED BY: T.S.Spell DATE: 2-01-18
CHECKED BY: _____ DATE: _____
FILE SPEC.: \\jhowerton\guardrail\3\inguardrail\typeiiiisc.

DocuSigned by:
Joel S. Howerton
873FE3D17DCDC45F

8/3/2021



PROJECT REFERENCE NO.	SHEET NO.
R-2566BA	2C-2
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

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

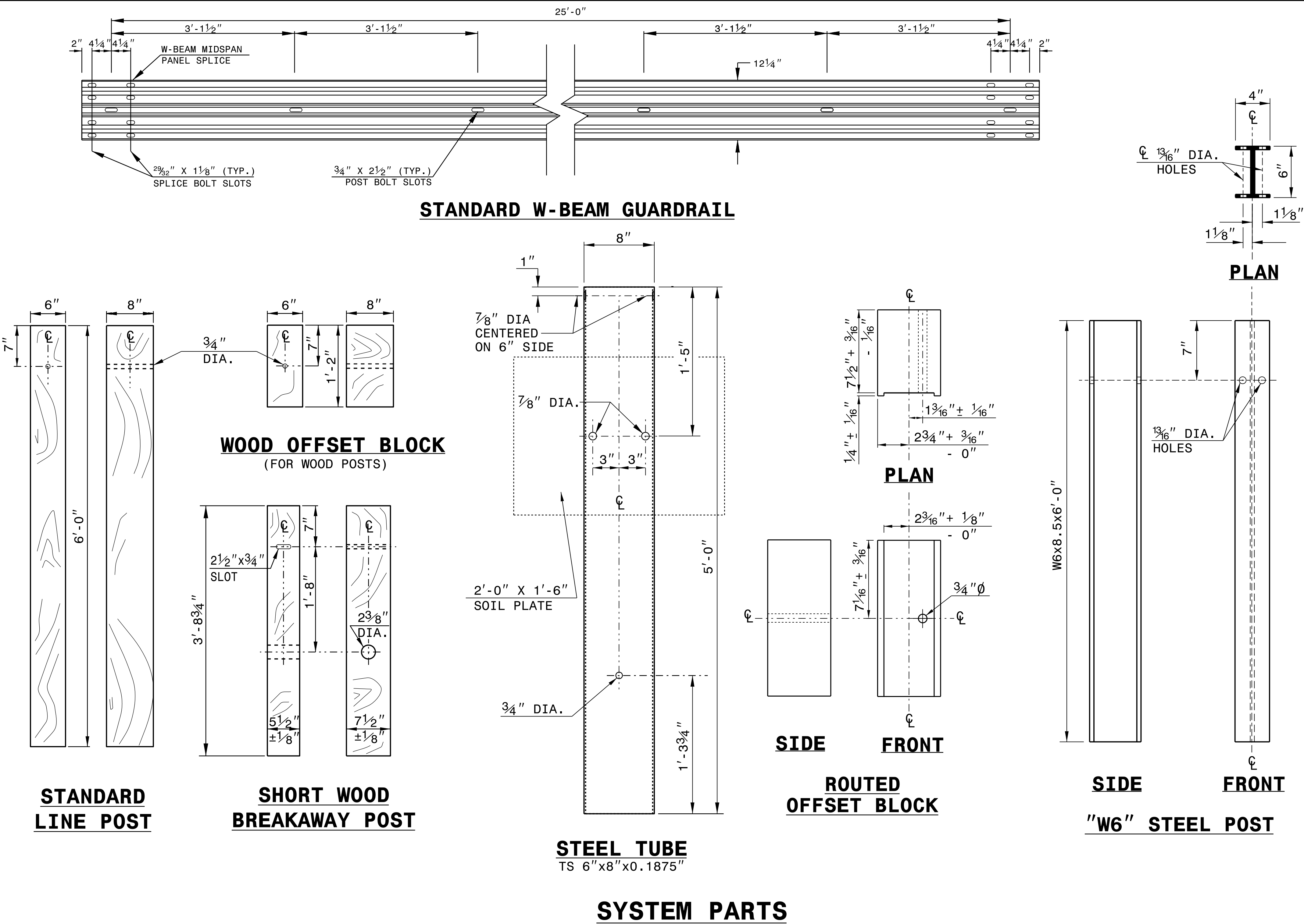
ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02

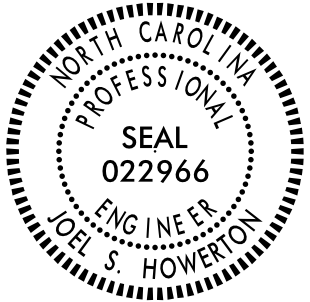
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02



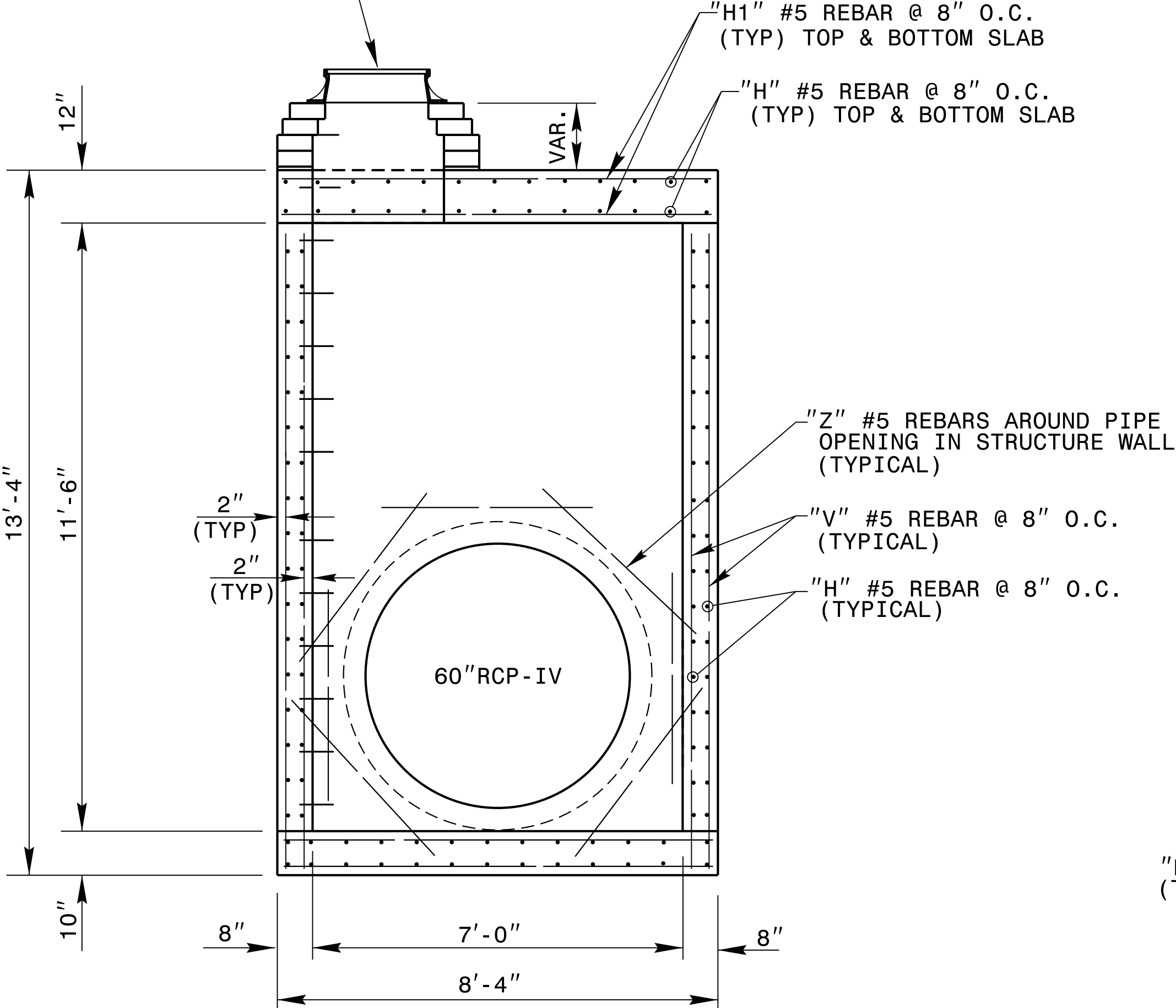
DocuSigned by:
Joel S. Howerton
873F3D17DDC0C45F



CONTRACTS STANDARDS AND DEVELOPMENT UNIT Office 919-707-6950 FAX 919-250-4119	
SEE TITLE BLOCK	
ORIGINAL BY: J. HOWERTON	DATE: 3-7-2018
MODIFIED BY:	DATE:
CHECKED BY:	DATE:
FILE SPEC.:	

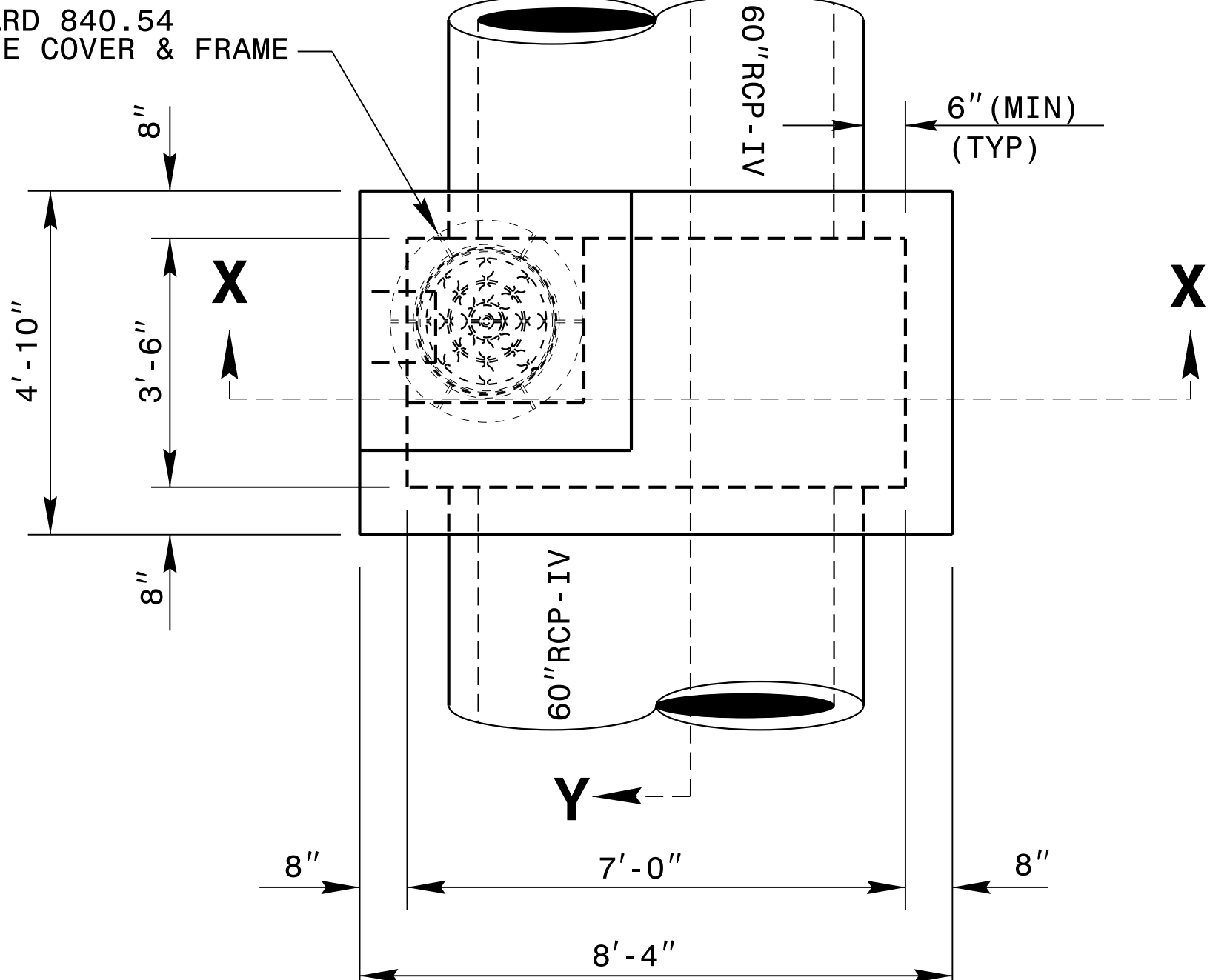
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R-2566BA	2C-3

SEE STANDARD 840.54
FOR MANHOLE COVER & FRAME

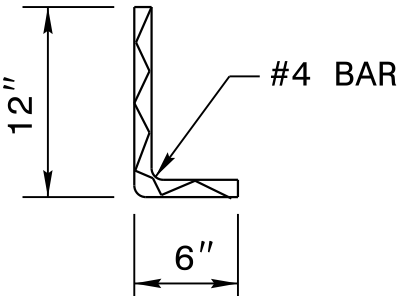


SECTION X-X

SEE STANDARD 840.54
FOR MANHOLE COVER & FRAME

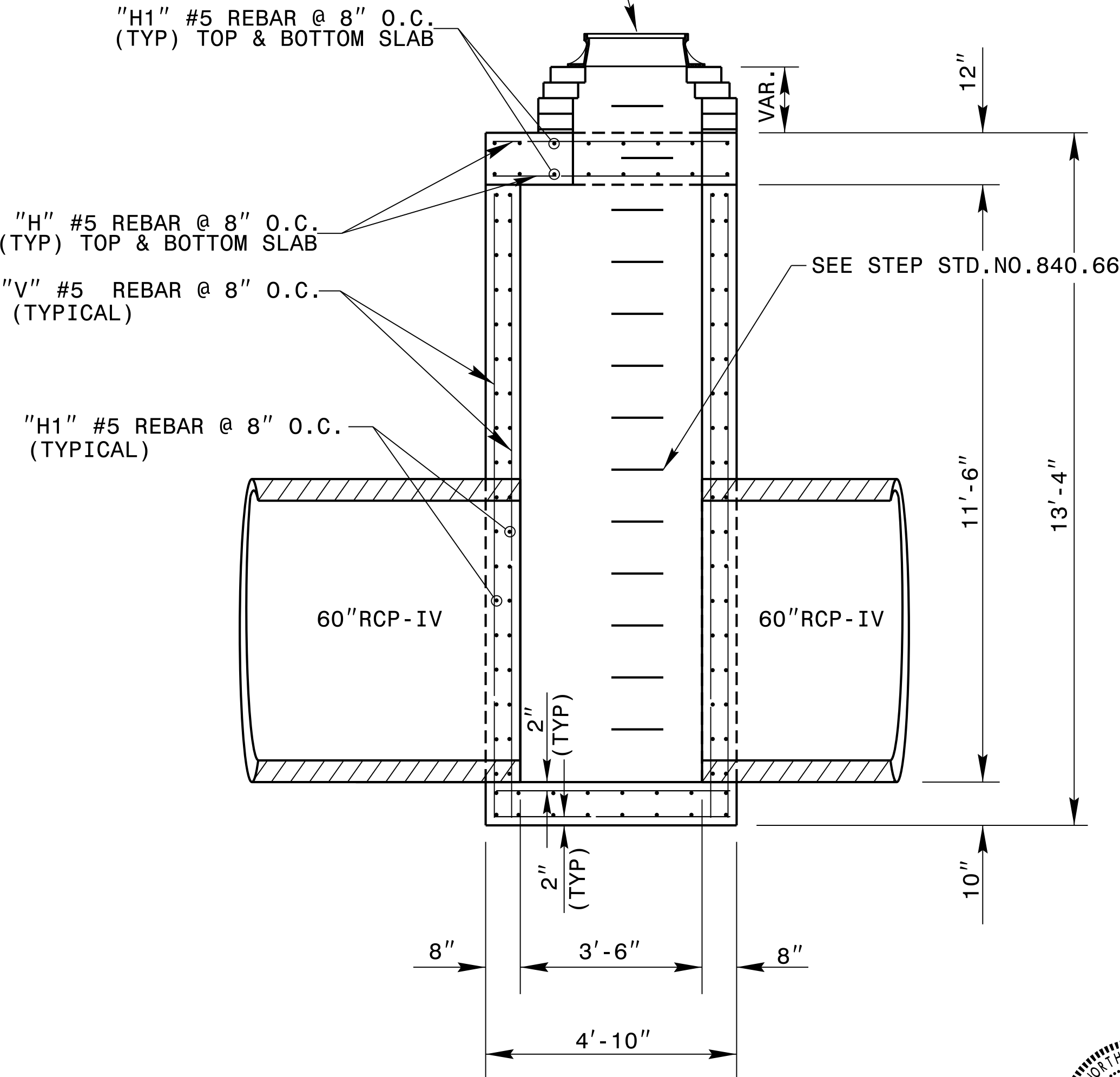


PLAN VIEW



DOWEL

SEE STANDARD 840.54
FOR MANHOLE COVER & FRAME



SECTION Y-Y

GENERAL NOTES:
USE CLASS "AA" CONCRETE THROUGHOUT.
PROVIDE ALL JUNCTION BOXES OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.
OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2" KEYWAY, OR #4 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.
DIMENSIONS MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER.
INSTALL MANHOLE IN POSITION AS DIRECTED BY THE ENGINEER. CUT AND BEND ALL REBAR CROSSING THIS OPENING TO ALLOW 2" MINIMUM CONCRETE COVERAGE.
CHAMFER ALL EXPOSED CORNERS 1".
2" MINIMUM CONCRETE COVERAGE ON ALL REBAR.

BILL OF MATERIALS

BAR	NO.	SIZE	LENGTH	WEIGHT
H	120	#5	4'-6"	563
H1	100	#5	8'-0"	834
V	76	#5	12'-0"	951
Z	28	#5	4'-0"	117
TOTAL REINF. STEEL (LBS.)				2465
TOTAL CONC. (CU. YDS.)				9.5

* 0.30 CU. YD. PER FOOT OF RISER HEIGHT
* 1.30 CU. YD. DEDUCTION FOR 2-60" RC PIPE
* NO DEDUCTION HAS BEEN MADE FOR PIPES

DOCUMENT NOT CONSIDERED FINAL
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CONTRACT STANDARDS & DEVELOPMENT UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-707-6950 FAX 919-250-4119

**TRAFFIC BEARING JUNCTION BOX
FOR 60"RCP-IV**

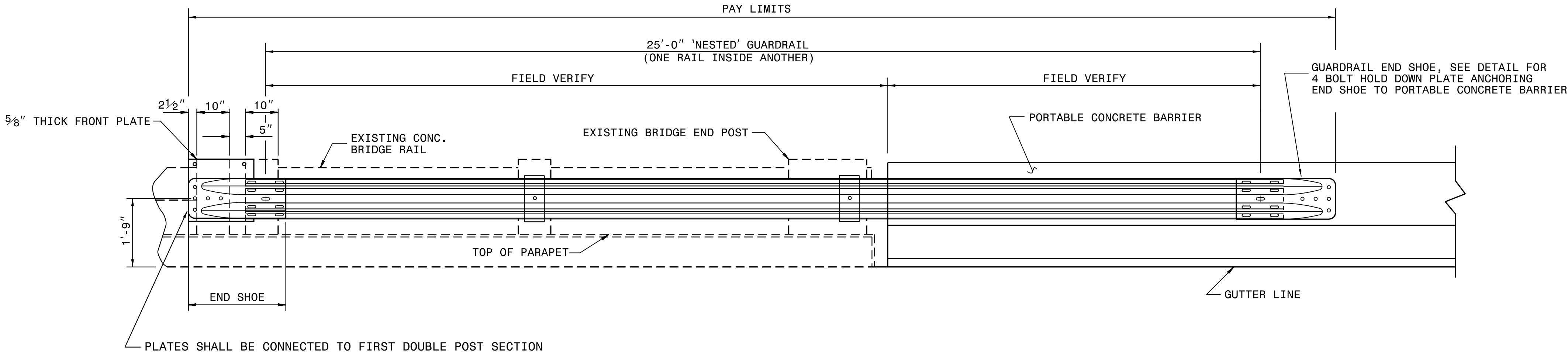
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MODIFIED BY: kkempf DATE: 07/13/17
CHECKED BY: _____ DATE: _____
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DocuSigned by:
Jael S. Howerton
873F3D17CDDC45F...

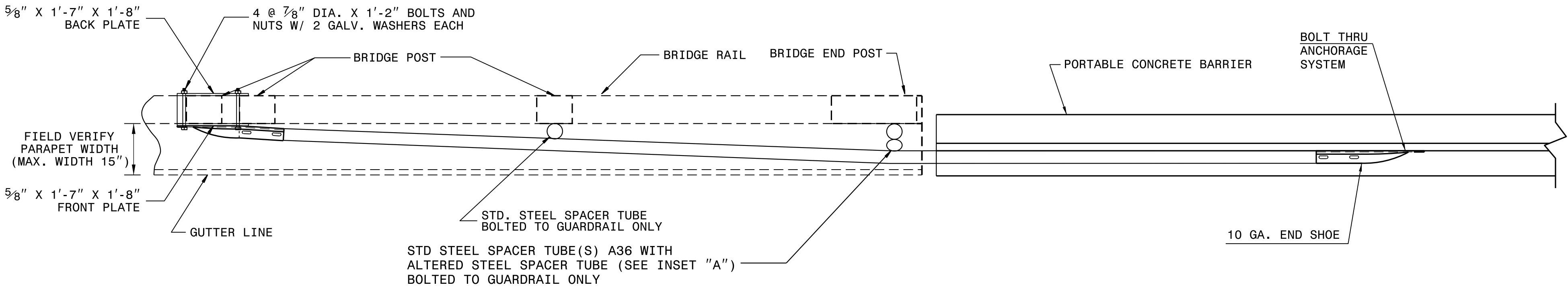
8/3/2021



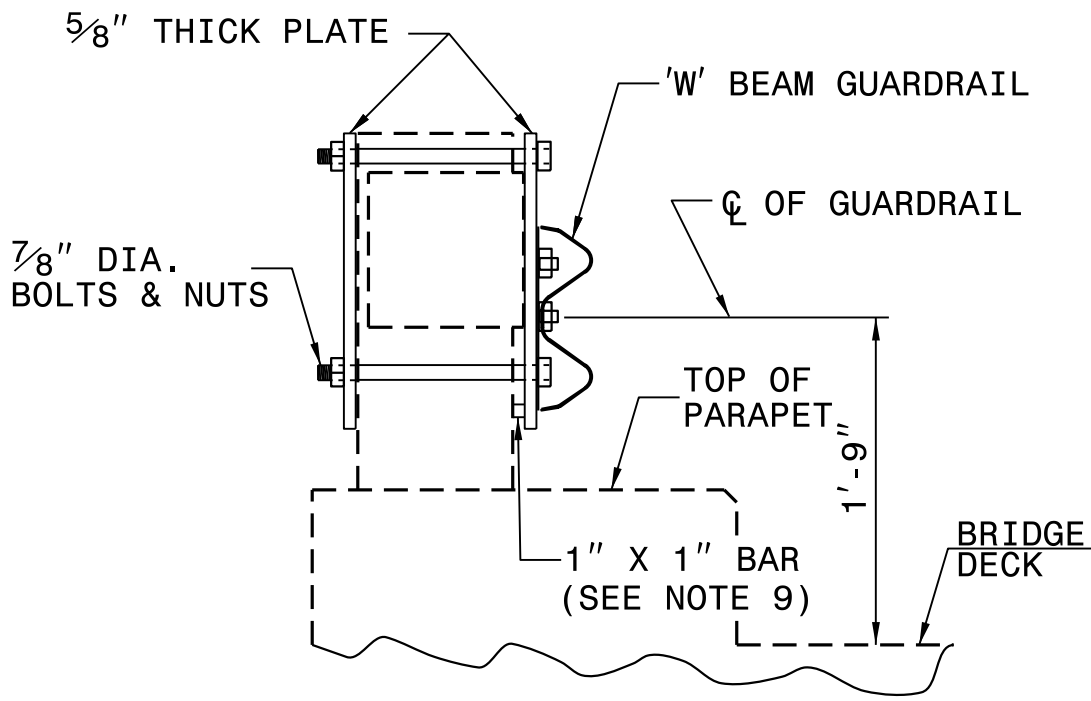
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R-2566BA	2C-4



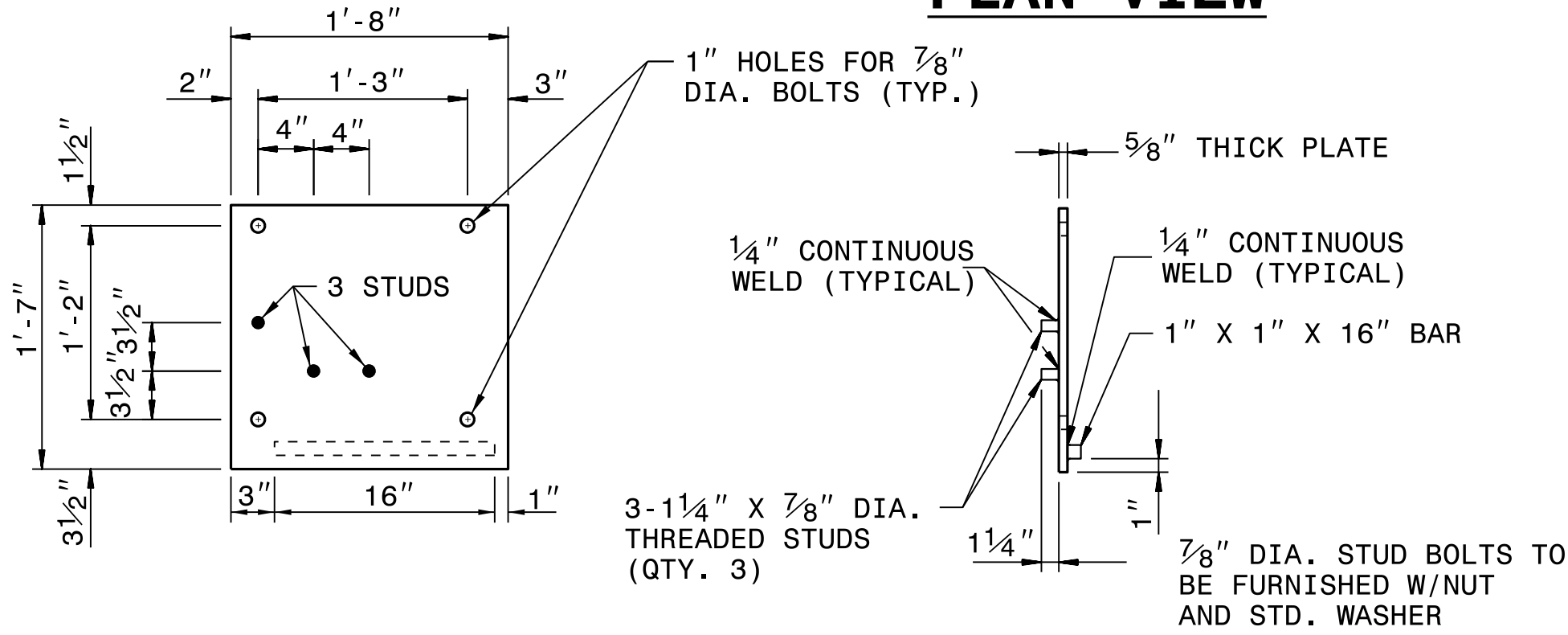
ELEVATION VIEW



PLAN VIEW



SECTION VIEW

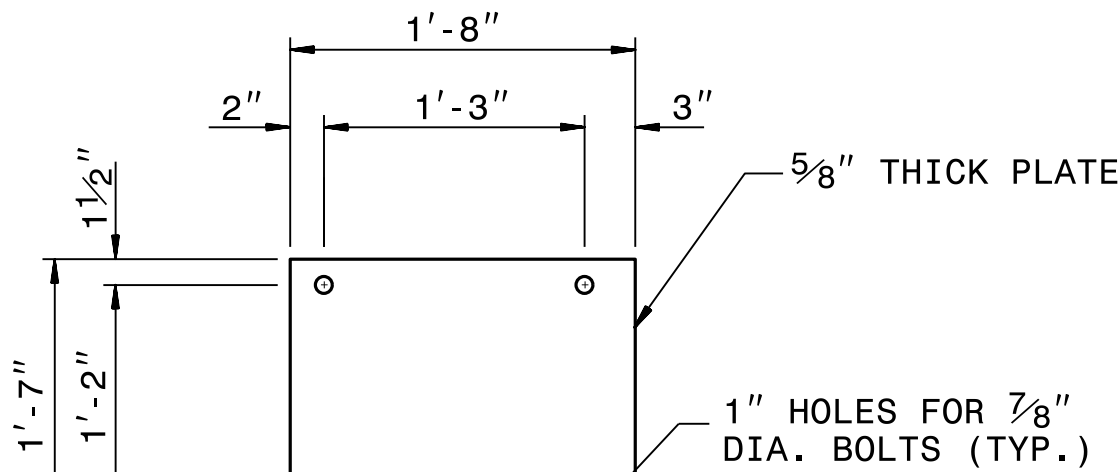


STUDS MAY BE ADJUSTED TO MEET FIELD CONDITIONS

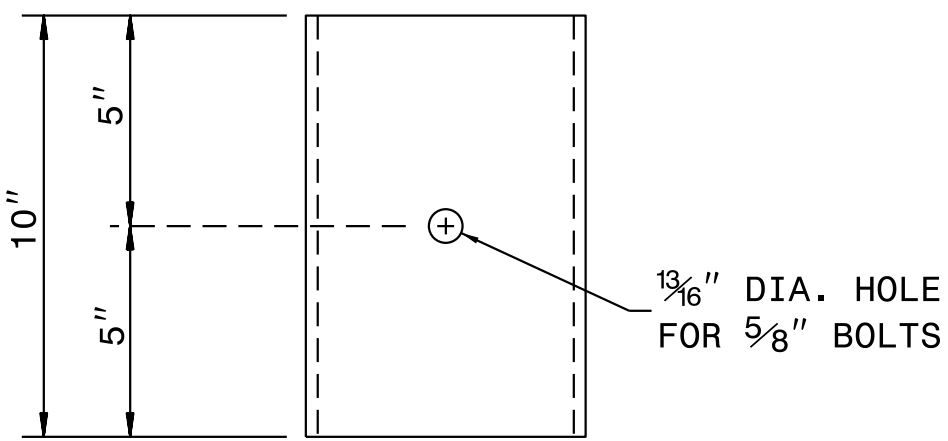
FRONT VIEW

SIDE VIEW

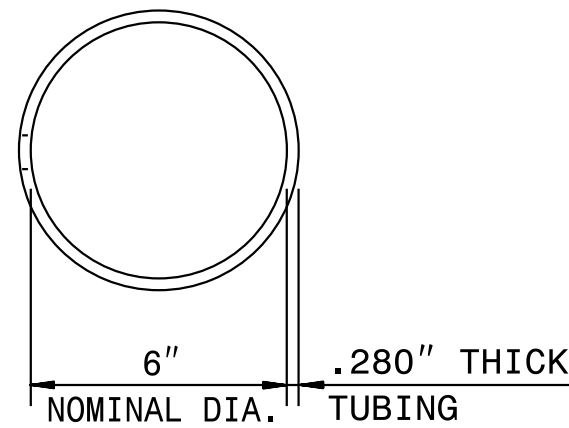
FRONT PLATE



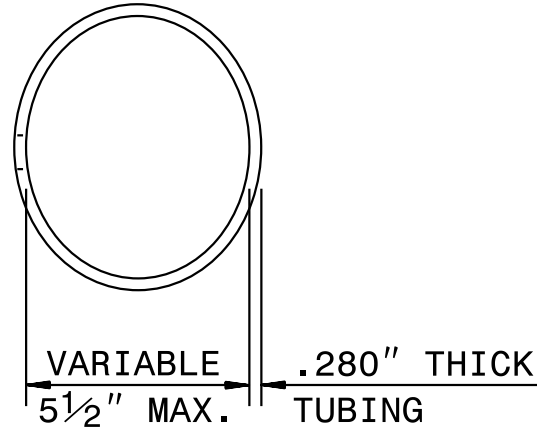
BACK PLATE



FRONT VIEW



PLAN VIEW



PLAN VIEW INSET "A"

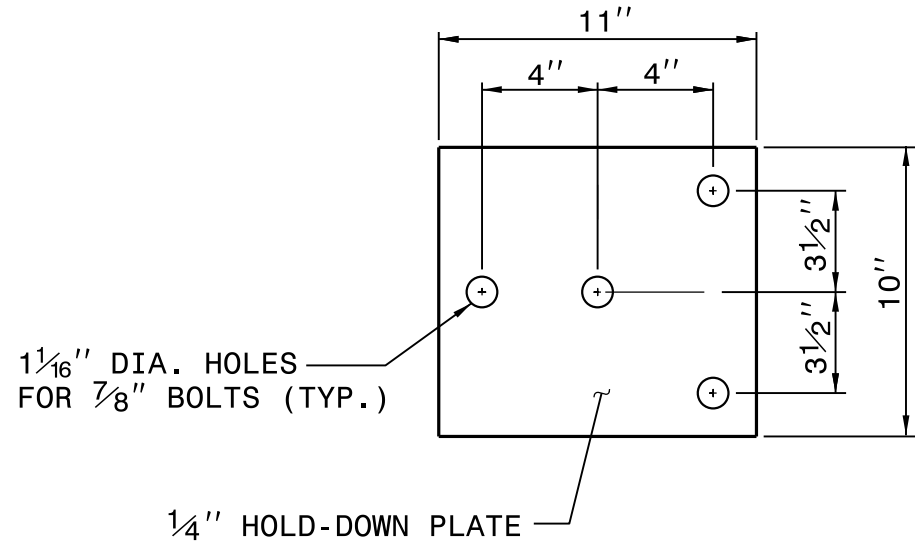
STEEL SPACER TUBE

NOTES FOR 4 BOLT HOLD DOWN PLATE

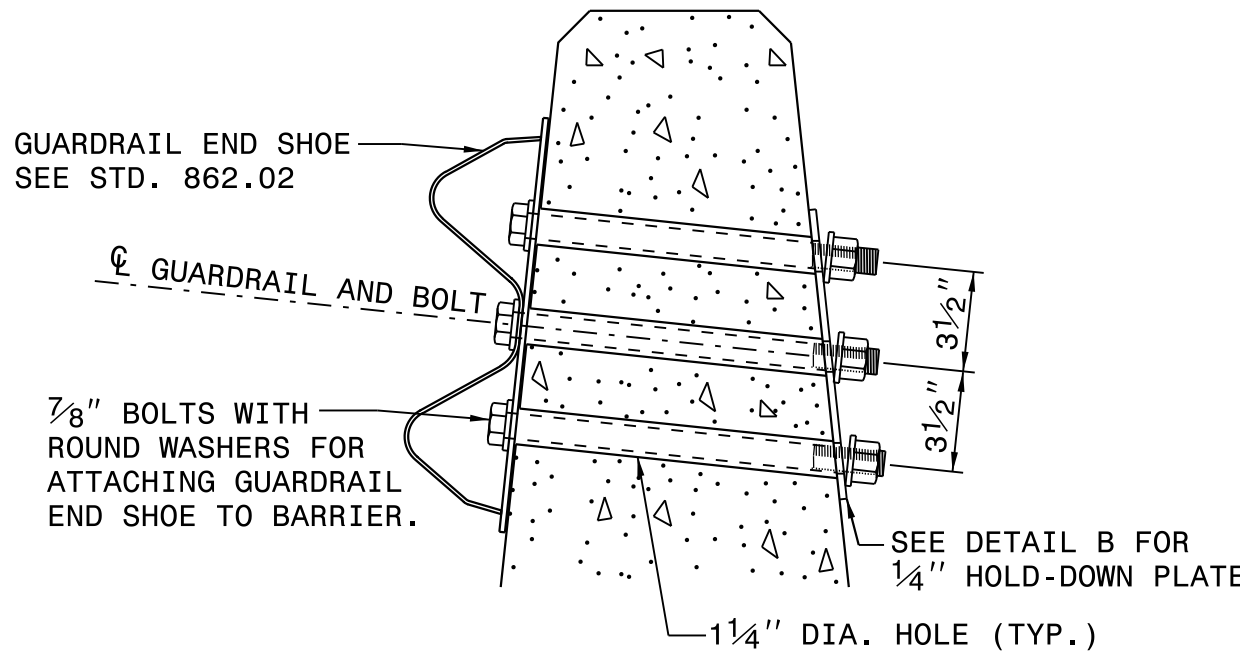
THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 4 - 7/8" DIA. BOLTS WITH NUTS AND WASHERS.

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 1/4" 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.



4 BOLT HOLD DOWN PLATE



PART SECTION OF BARRIER OR RAIL THRU END SHOE SECTION AND 4 BOLT HOLD DOWN PLATE

Docusign by:
Jael S. Howerton
878F3017DCDC45F...

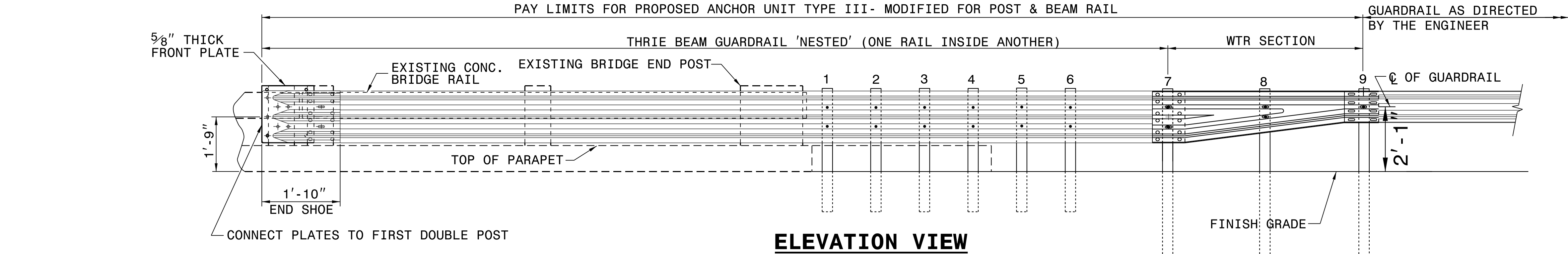
8/3/2021



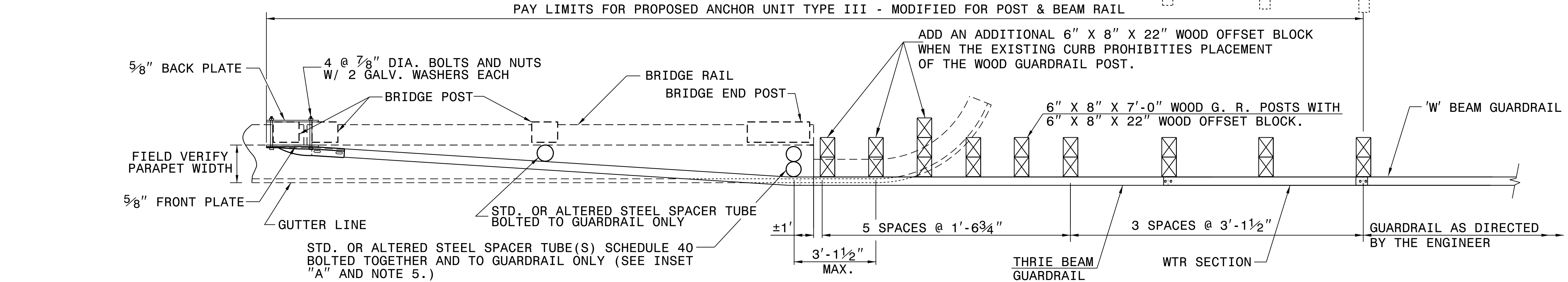
CONTRACT STANDARDS AND DEVELOPMENT UNIT Office 919-707-6950 FAX 919-250-4119	
TEMPORARY ANCHOR UNIT TYPE W-BEAM	
ORIGINAL BY: E.E. WARD	DATE: 4-03
MODIFIED BY: E.E. WARD	DATE: 6-04
CHECKED BY:	DATE:
FILE SPEC.: \\usr\details\stand\862stds\anc.dgn	

- GENERAL NOTES:
- 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.
 - TAP NUTS FOR THE 7/8" DIA. STUDS AND BOLTS AFTER GALVANIZING SEE A.S.T.M. A-563.
 - 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.
 - ADDITIONAL FIELD HOLES MAY BE DRILLED IN STEEL RAIL AS DIRECTED BY THE ENGINEER.
 - 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.
 - DO NOT DRILL BRIDGE RAIL IN ORDER TO INSTALL GUARDRAIL ANCHOR UNIT.
 - KEEP TOE OF PORTABLE CONCRETE BARRIER FLUSH WITH FACE OF PARAPET.
 - ATTACH 1" X 1" BAR AND THREADED STUDS TO PLATE WITH 1/4" WELDS ALL AROUND.
 - 1" X 1" BAR MAY NOT BE NEEDED ON BRIDGE RAILS WHERE FACE OF RAIL DOES NOT PROJECT BEYOND FACE OF POST.

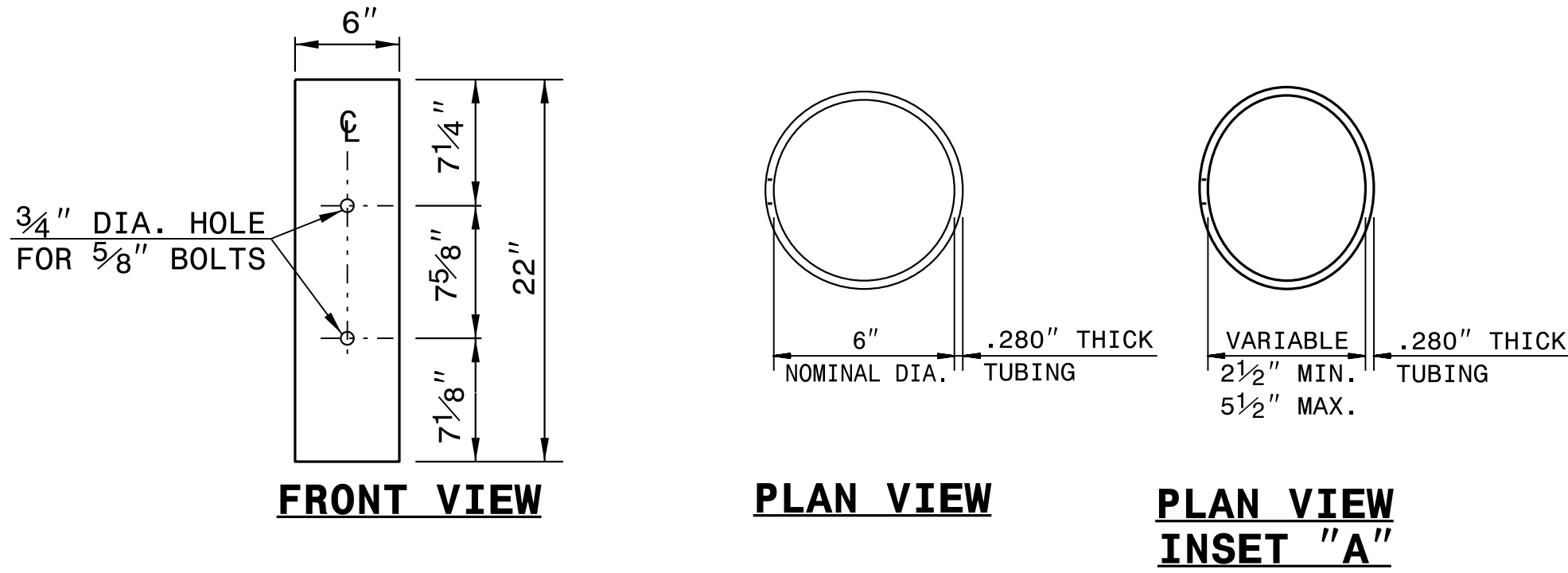
PROJECT REFERENCE NO.	SHEET NO.
R-2566BA	2C-6



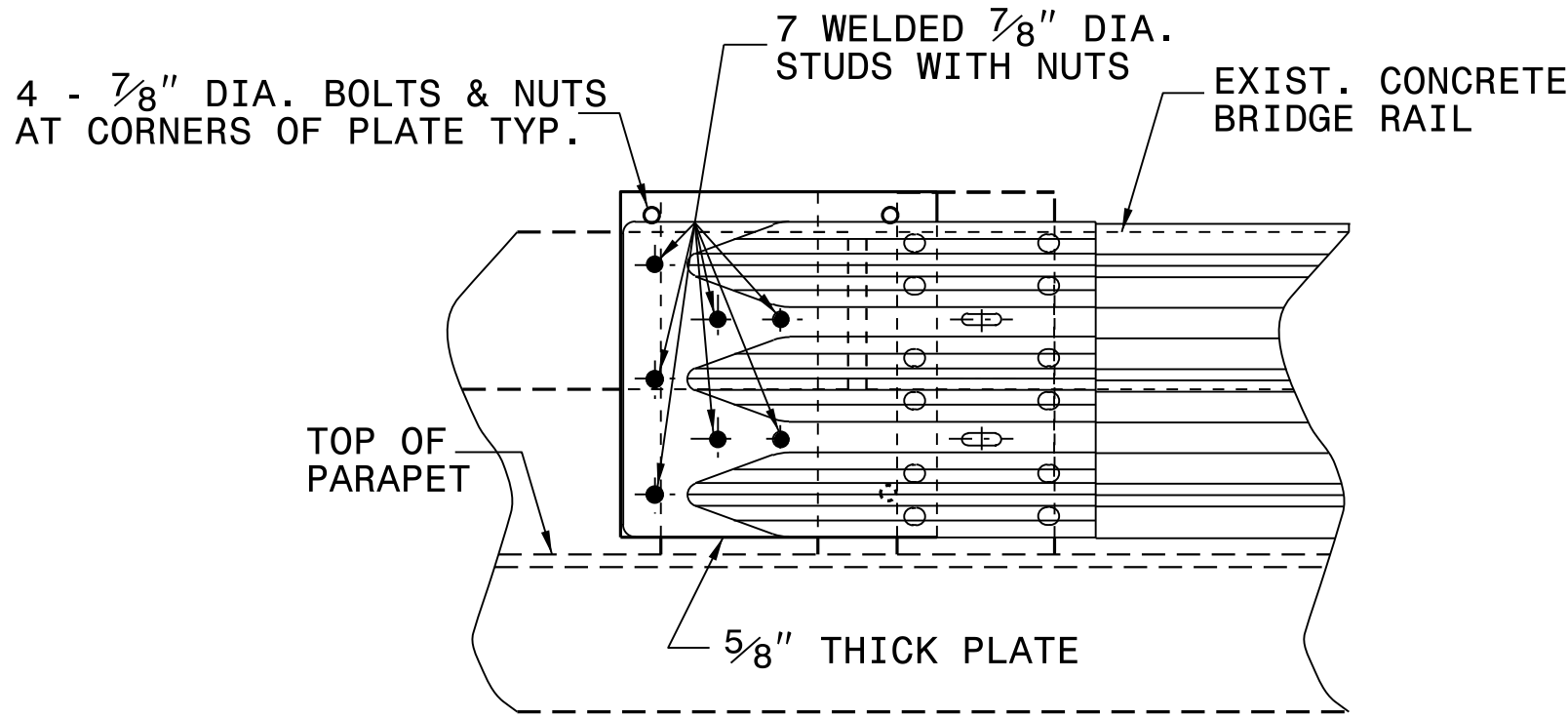
ELEVATION VIEW



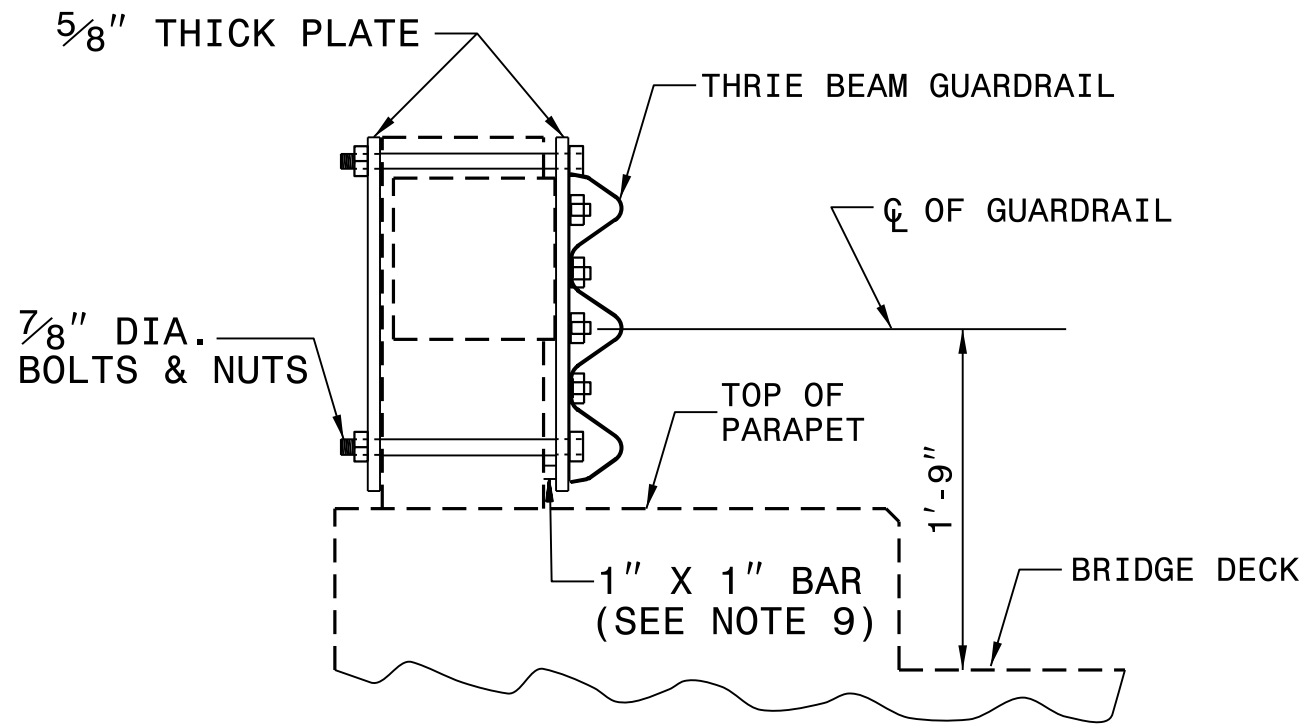
PLAN VIEW



STEEL SPACER TUBE

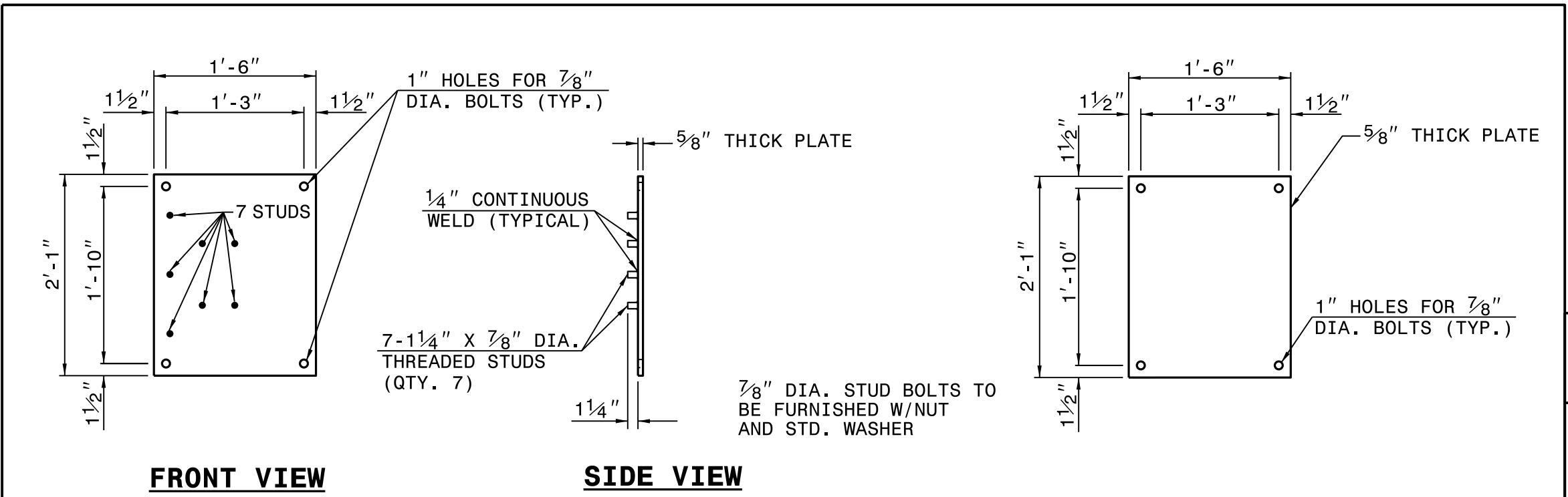


ELEVATION VIEW



SECTION VIEW

- 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. USE THIS DETAIL ONLY FOR BRIGES WITH POST AND BEAM TYPE RAIL.
 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.
 10. PROVIDE SHOP DRAWINGS OF THE PLATES TO THE ENGINEER FOR APPROVAL BEFORE FABRICATING THE PLATES.
 11. LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
 12. SEE ROADWAY STANDARD DRAWING 862.03 SHEET 3 FOR ADDITIONAL INFORMATION ON THE TYPE III ANCHOR UNIT



FRONT VIEW

SIDE VIEW

FRONT PLATE

BACK PLATE

BRIDGE PLATES



DocuSigned by:
Joel S. Howerton
873F3D17DC0C45F

8/3/2021

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UNLESS ALL SIGNATURES COMPLETED

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

**TYPE III MODIFIED
FOR POST AND BEAM RAIL**

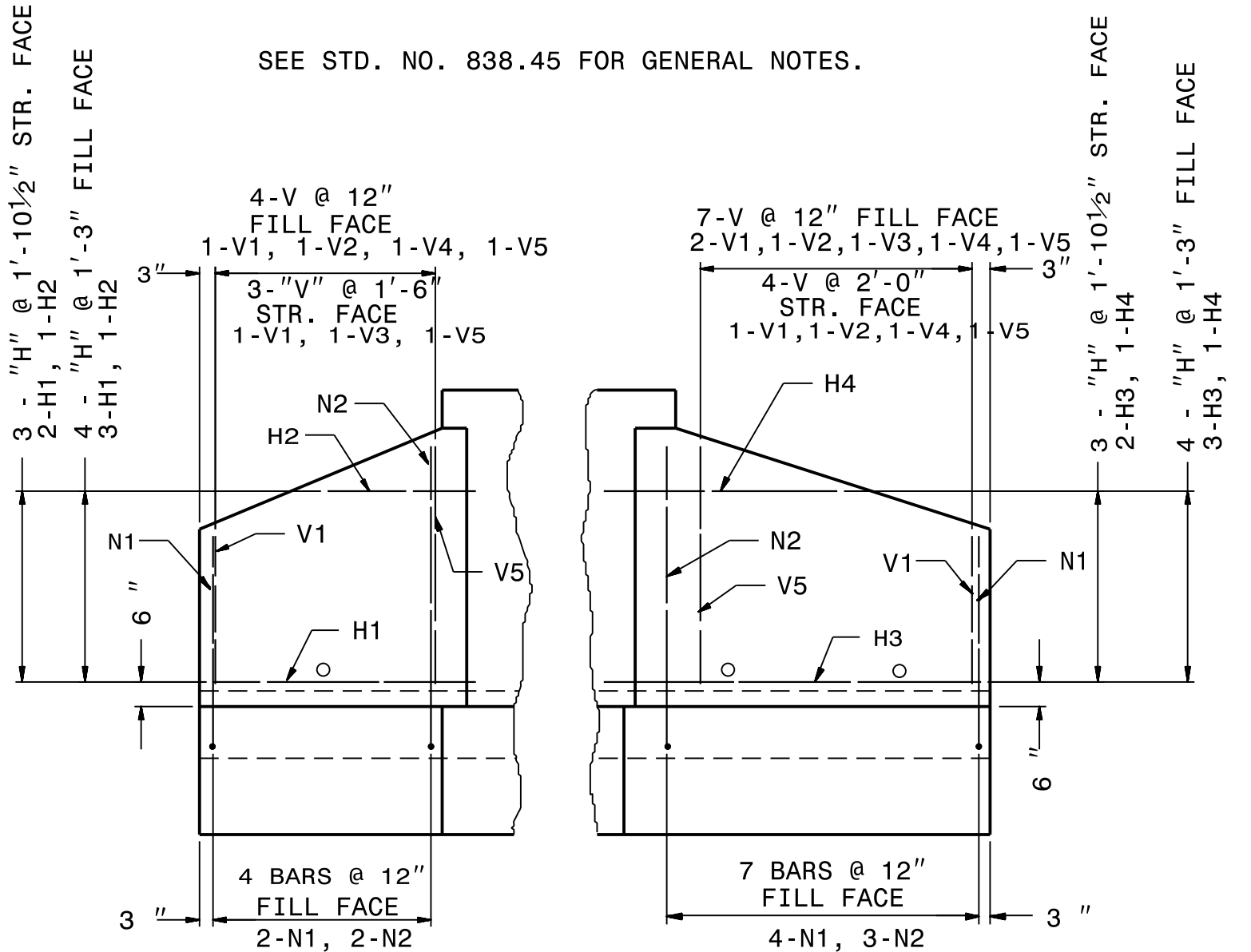
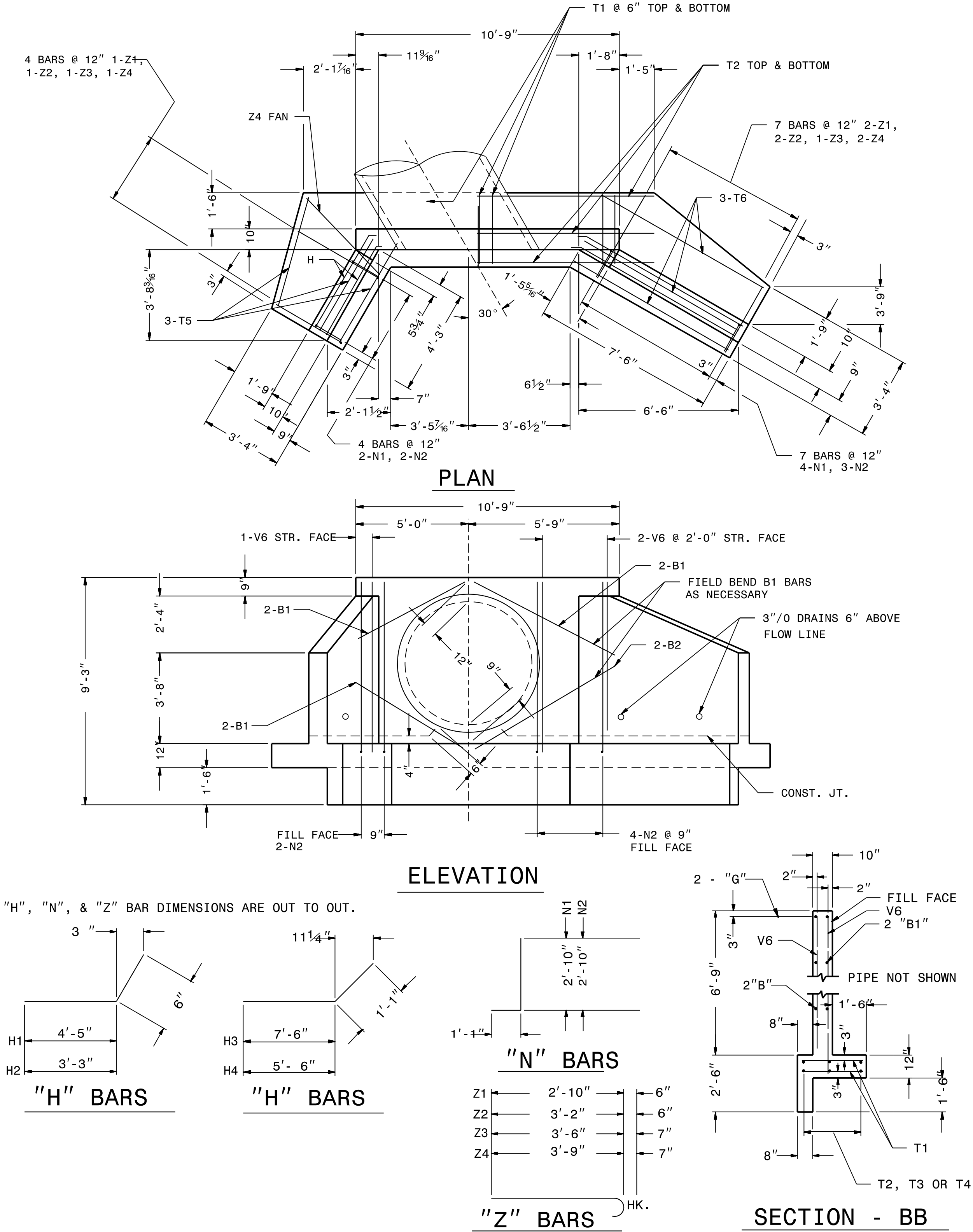
ORIGINAL BY: E.E. WARD DATE: 01-03
MODIFIED BY: JS Howerton DATE: 01-18
CHECKED BY: DATE:
FILE SPEC.: s:details\stand\bpii original.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2566BA	2C-7

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

ENGLISH DETAIL DRAWING FOR
REINFORCED CONCRETE ENDWALL
FOR SINGLE 60° PIPE 60° OR 120° SKEW

SHEET OF
838d27

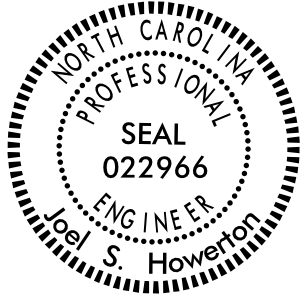


BILL OF MATERIAL FOR ENDWALLS					
REINF. STEEL			1 - PIPES		
BAR	SIZE	LENGTH	NO.	WEIGHT	
Z1	#4	3'-4"	3	7	
Z2	#4	3'-7"	3	7	
Z3	#5	4'-1"	2	9	
Z4	#5	4'-4"	4	18	
N1	#4	3'-5"	6	14	
N2	#4	3'-11"	11	45	
V1	#4	3'-3"	5	11	
V2	#4	3'-11"	3	8	
V3	#4	4'-3"	2	6	
V4	#4	4'-6"	3	9	
V5	#4	5'-1"	5	17	
V6	#4	6'-3"	9	38	
H1	#4	4'-11"	5	16	
H2	#4	3'-9"	2	5	
H3	#4	8'-7"	5	29	
H4	#4	6'-7"	2	9	
G1	#7	10'-5"	2	43	
T1	#4	2'-6"	42	70	
T2	#4	13'-11"	6	56	
T5	#4	4'-6"	3	9	
T6	#4	7'-0"	3	14	
B1	#4	5'-0"	6	20	
B2	#4	6'-6"	2	9	
REINF. STEEL LBS.				469	
CONC./C.M. CU. YDS.				6.7	
CONC./R.C. CU. YDS.				6.4	

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

ENGLISH DETAIL DRAWING FOR
REINFORCED CONCRETE ENDWALL
FOR SINGLE 60° PIPE 60° OR 120° SKEW

SHEET OF
838d27



DocuSigned by:
Joel S. Howerton
873F3D17DCDC45F...

8/3/2021

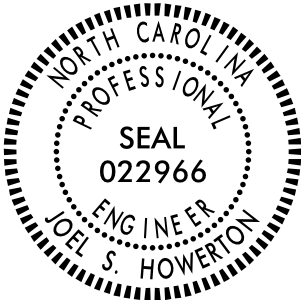
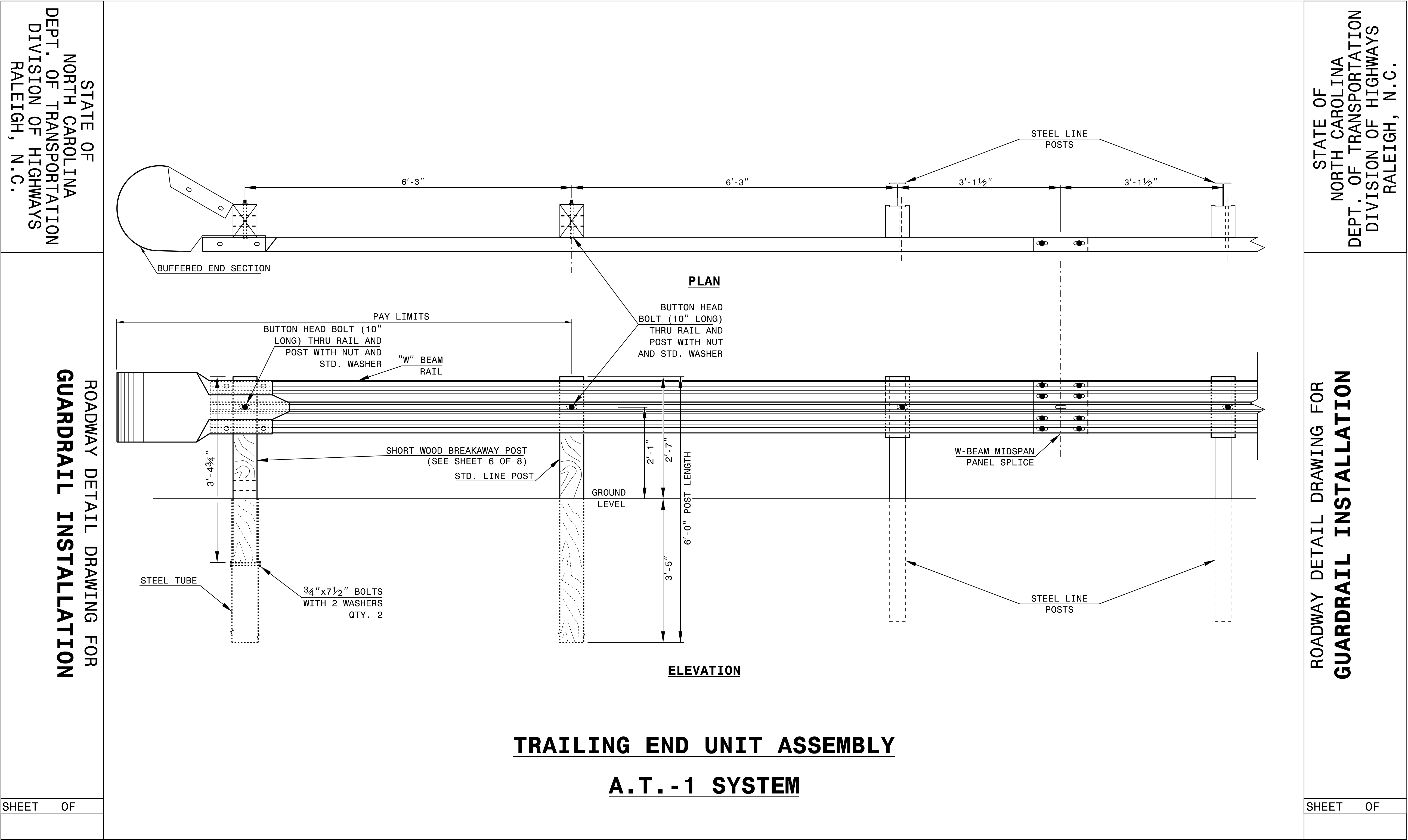
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CONTRACT STANDARDS & DEVELOPMENT UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-707-6950 FAX 919-250-4119

SEE PLATE FOR TITLE

ORIGINAL BY: _____ DATE: _____
MODIFIED BY: rnbritt DATE: 05-08-06
CHECKED BY: _____ DATE: _____
FILE SPEC.: s:nbritt/english/hydro/838d24 54 endwall 60sk.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2566BA	2C-8



DocuSigned by:
Joel S. Howerton
873F3D17DCC645F...

8/3/2021

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CONTRACTS STANDARDS AND DEVELOPMENT UNIT Office 919-707-6950 FAX 919-250-4119	
A.T. - 1 SYSTEM	
ORIGINAL BY: _____	DATE: _____
MODIFIED BY: _____	DATE: _____
CHECKED BY: _____	DATE: _____
FILE SPEC.: _____	

PROJECT REFERENCE NO.	SHEET NO.
R-2566BA	2C-9

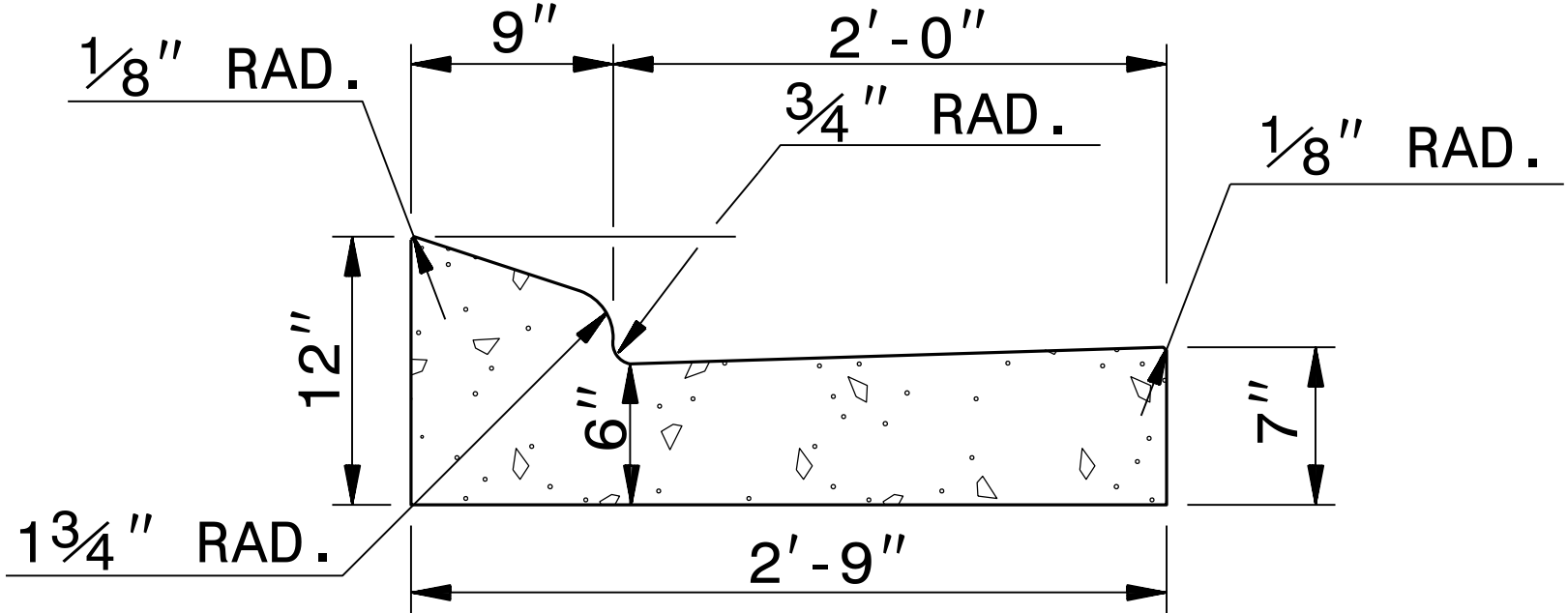
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR

2'-9" CONCRETE CURB & GUTTER

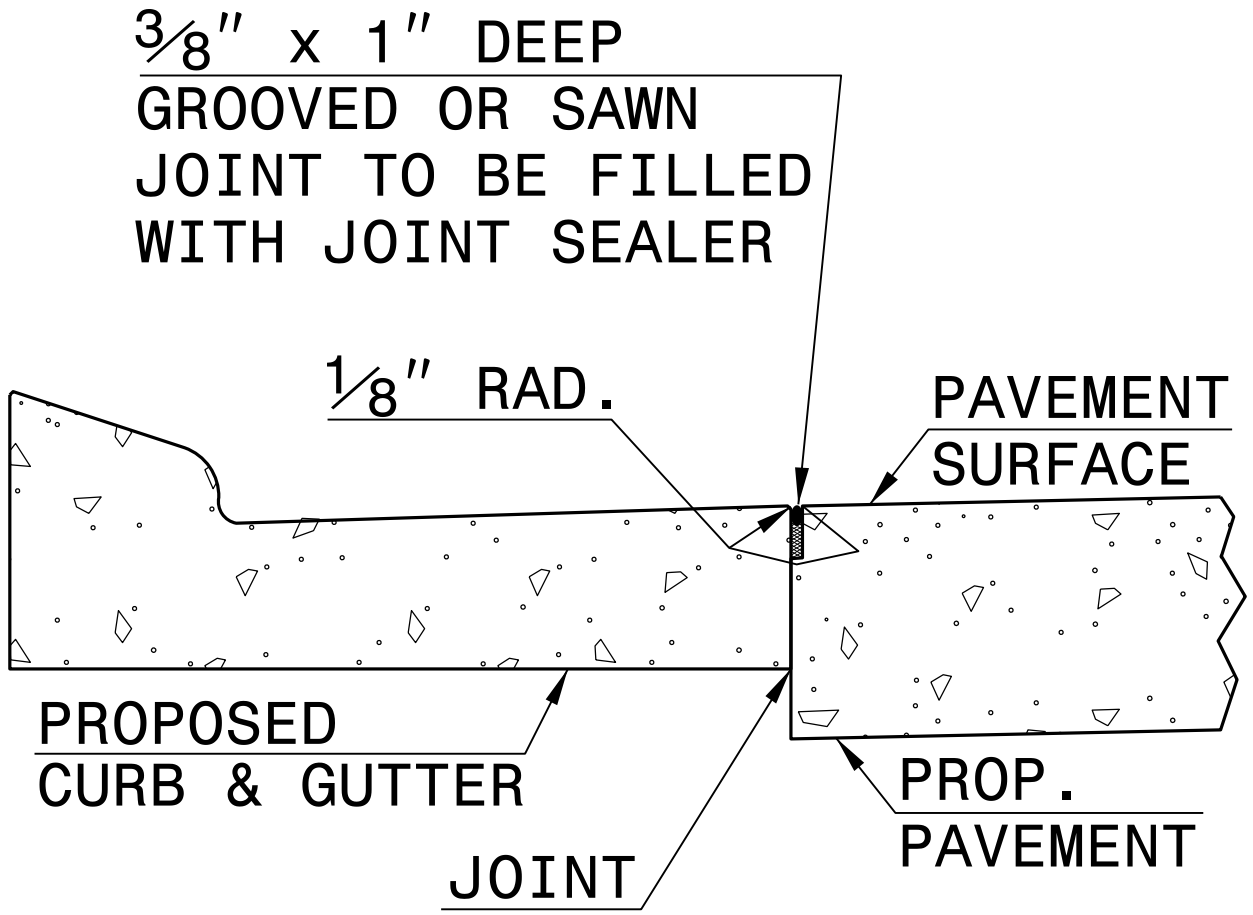
SHEET 1 OF 1
846D01

- GENERAL NOTES:
- PLACE CONTRACTION JOINTS AT 10' INTERVALS, EXCEPT THAT A 15' SPACING MAY BE USED WHEN A MACHINE IS USED OR WHEN SATISFACTORY SUPPORT FOR THE FACE FORM CAN BE OBTAINED WITHOUT THE USE OF TEMPLATES AT 10' INTERVALS.
 - JOINT SPACING MAY BE ALTERED IF REQUIRED BY THE ENGINEER.
 - CONTRACTION JOINTS MAY BE INSTALLED WITH THE USE OF TEMPLATES OR FORMED BY OTHER APPROVED METHODS. MAKE NON-TEMPLATE FORMED JOINTS A MIN. OF 1½" DEEP.
 - FILL ALL CONSTRUCTION JOINTS WITH JOINT FILLER AND SEALER.
 - SPACE EXPANSION JOINTS AT 90' INTERVALS AND ADJACENT TO ALL RIGID OBJECTS.
 - SEE RDWY. STD. DWG. NO. 846.01, SHEET 2 OF 3 FOR PLACEMENT IN SUPERELEVATIONS. (USE 2'-6" CURB AND GUTTER RATES)

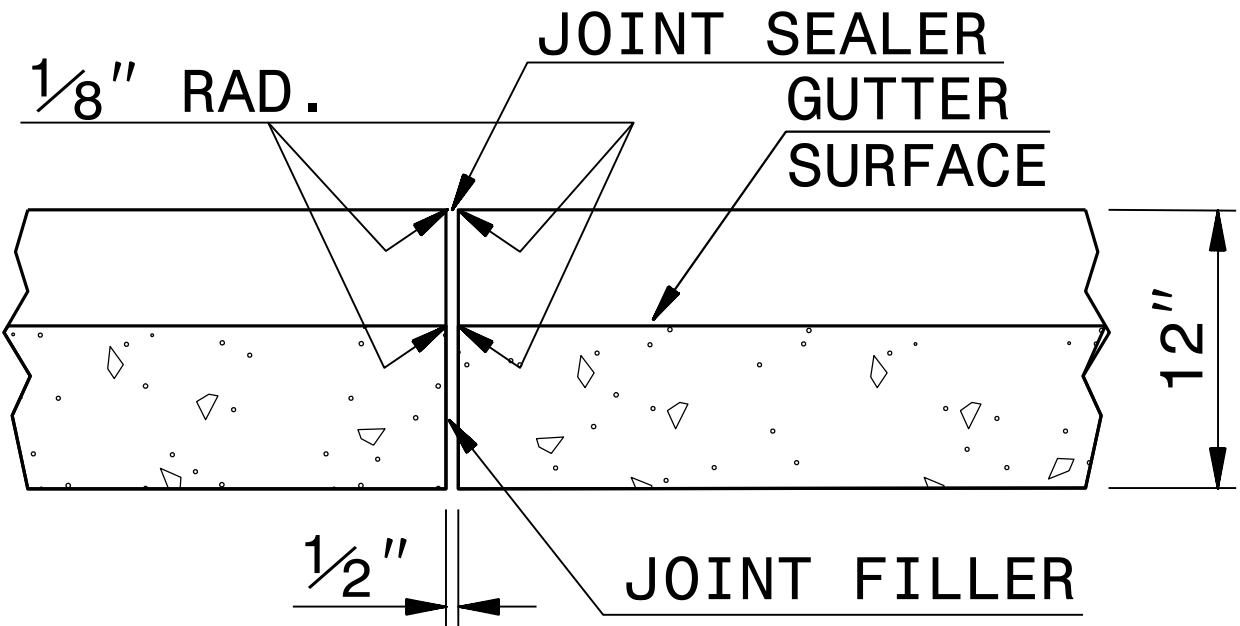


2'-9" CURB AND GUTTER

SECTION VIEW OF CURB AND GUTTER



LONGITUDINAL JOINT



**TRANSVERSE EXPANSION JOINT
IN CURB AND GUTTER**

SECTION VIEW OF JOINTS

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

ENGLISH DETAIL DRAWING FOR

2'-9" CONCRETE CURB & GUTTER

SHEET 1 OF 1
846D01

DocuSigned by:
Jael S. Howerton
873F3D17DCDC45F...

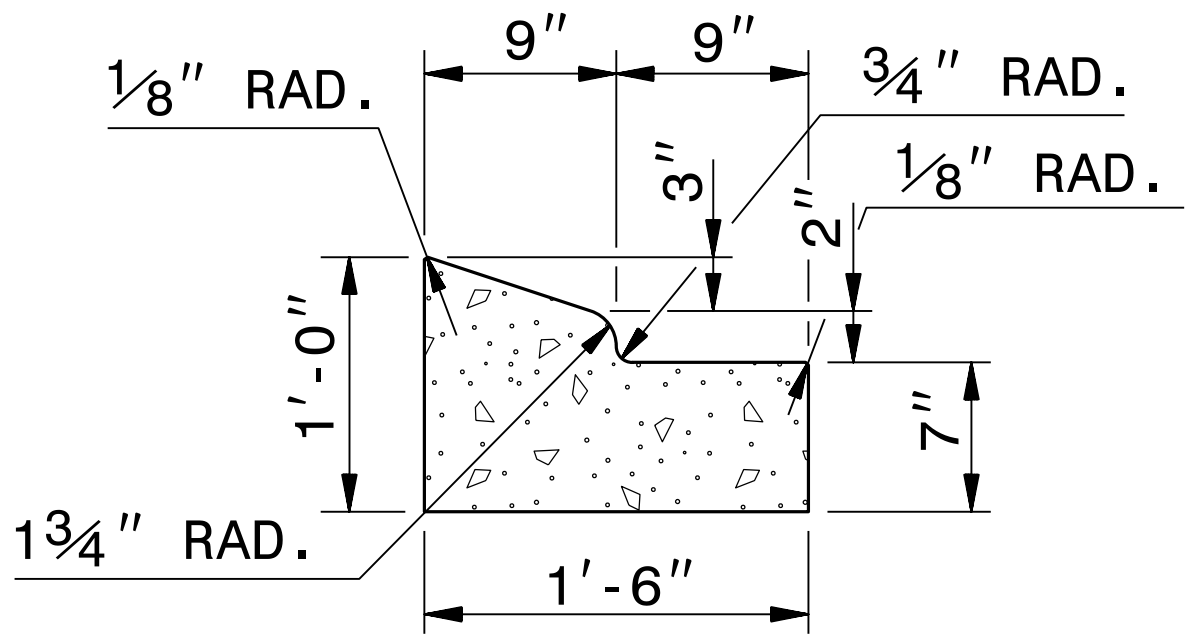


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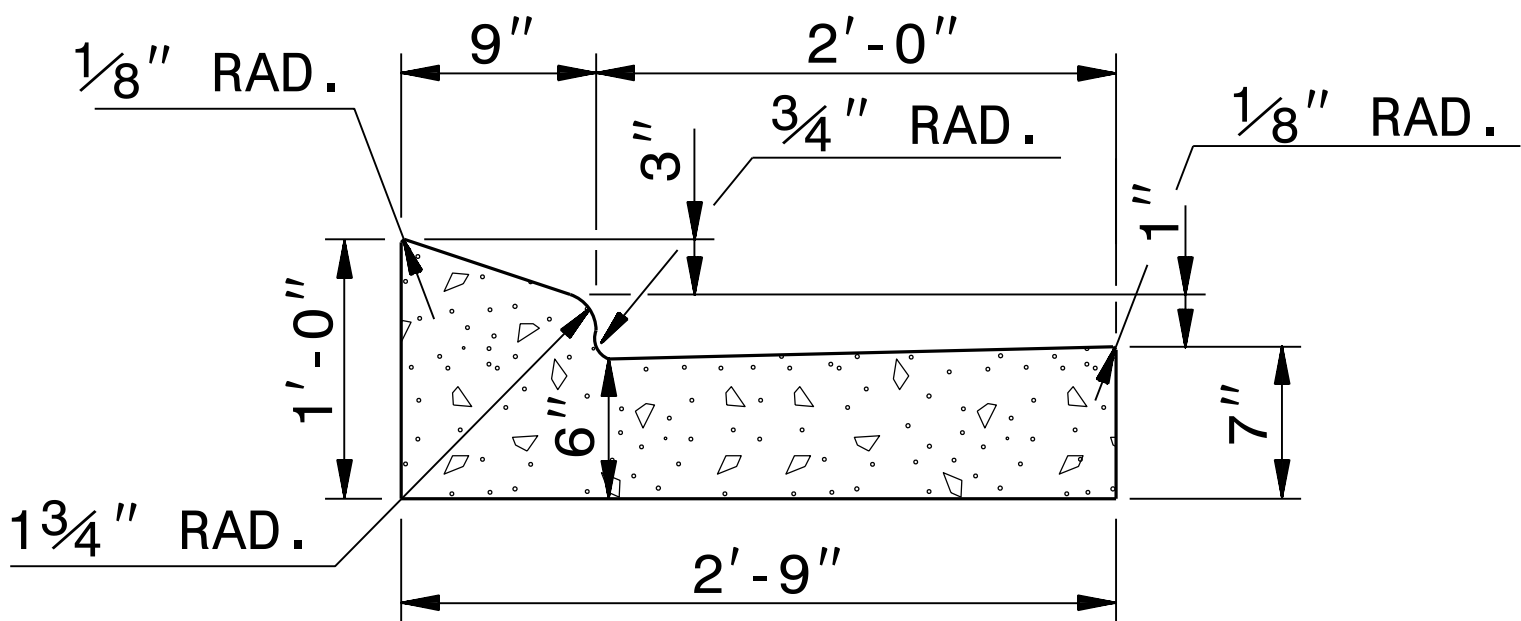
CONTRACT STANDARDS AND DEVELOPMENT UNIT Office 919-707-6950 FAX 919-250-4119
SEE PLATE FOR TITLE
ORIGINAL BY: STD. 846.01 DATE: _____ MODIFIED BY: E.E. WARD DATE: 8-15-00 CHECKED BY: _____ DATE: _____ FILE SPEC.: /usr/details/stand/c&g2'-9.dgn

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-2566BA	2C-10



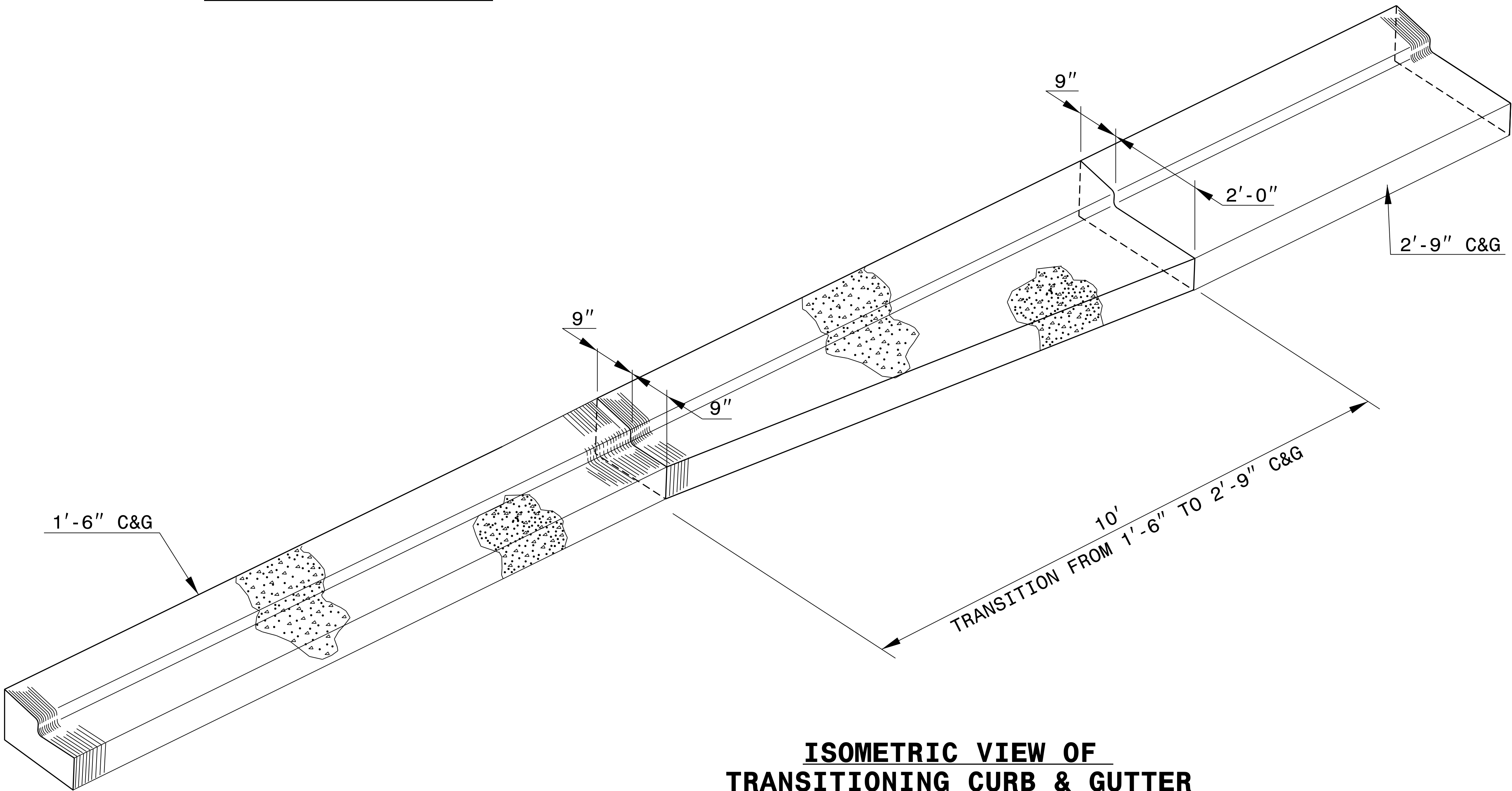
1'-6" CURB AND GUTTER



2'-9" CURB AND GUTTER

NOTE: SEE STD. DWG. 846.01 FOR ADDITIONAL CURB AND GUTTER INFORMATION.

SEE ROADWAY PLANS FOR LOCATION OF CURB TRANSITION.



**ISOMETRIC VIEW OF
TRANSITIONING CURB & GUTTER**

DocuSigned by:
Jael S. Howerton
879F3D179C0C46F...

8/3/2021

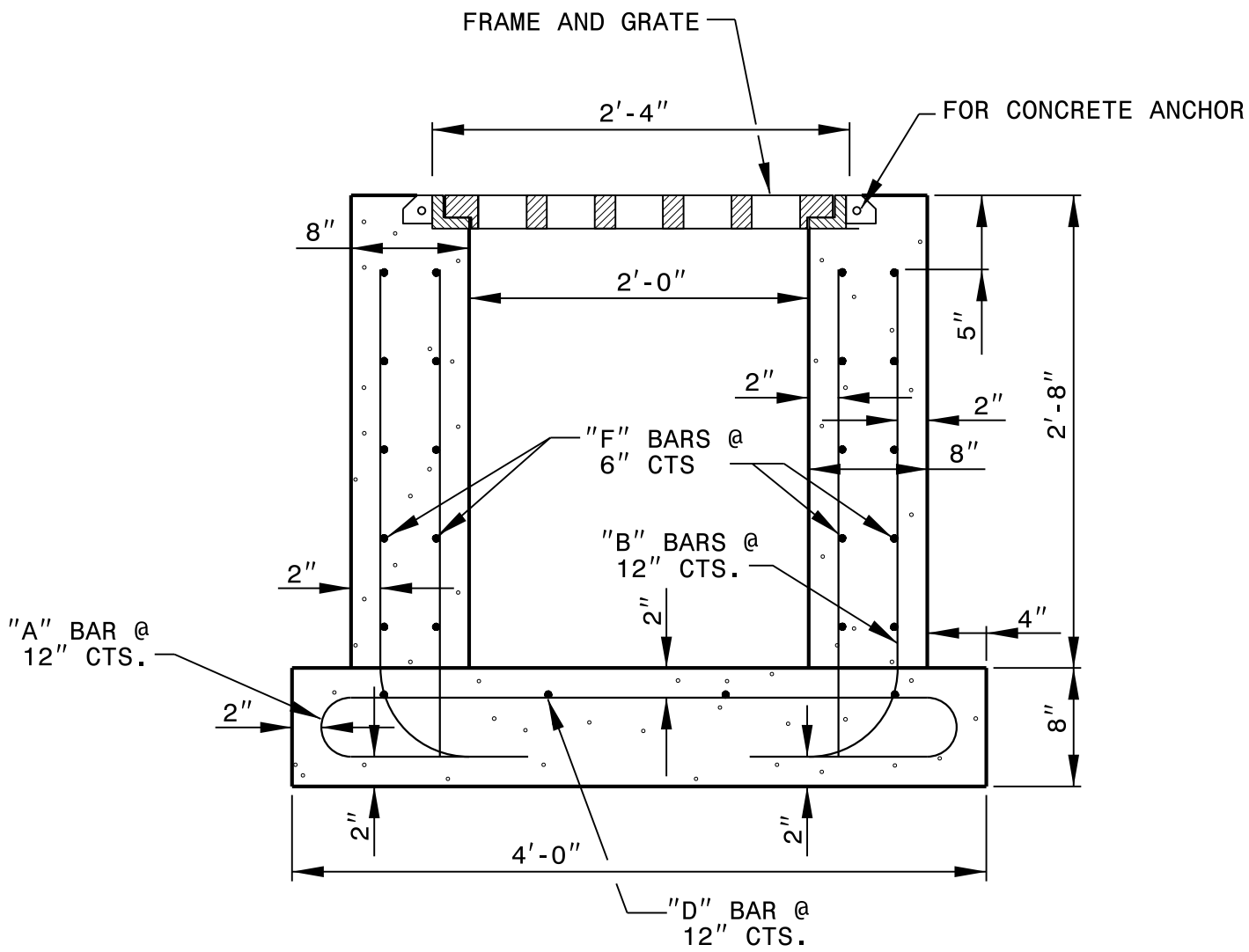


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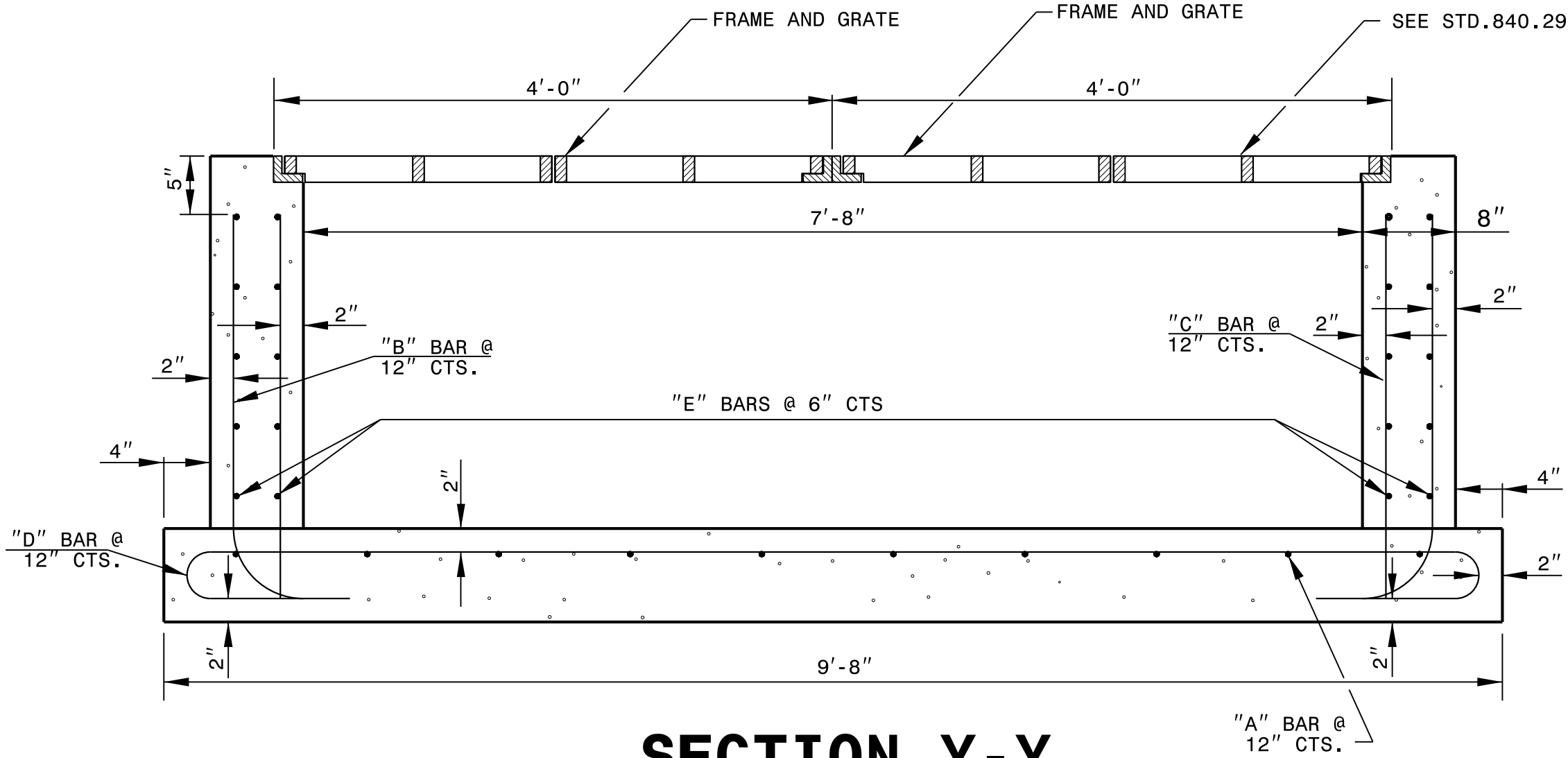
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AND DEVELOPMENT UNIT**
Office 919-707-6950 FAX 919-250-4119

**DETAIL OF 1'-6"
TO 2'-9" CURB & GUTTER
TRANSITION SECTION**

ORIGINAL BY: T.S.SPELL DATE: NOV. 26, 2001
MODIFIED BY: T.S.SPELL DATE: JAN. 23, 2007
CHECKED BY: DATE:
FILE SPEC.: D8174:/usr/details/stand/cqtransit.dgn

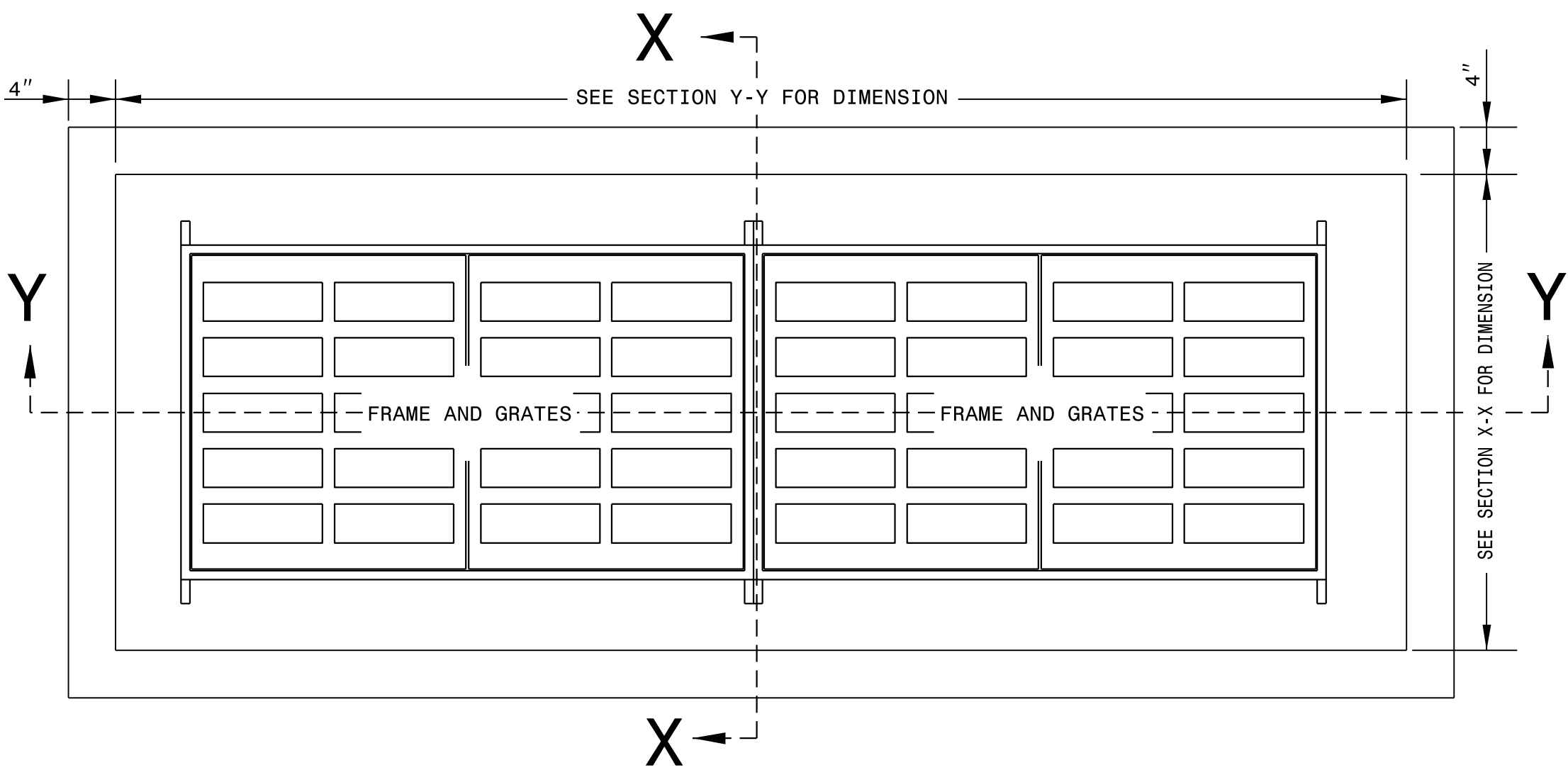


SECTION X-X

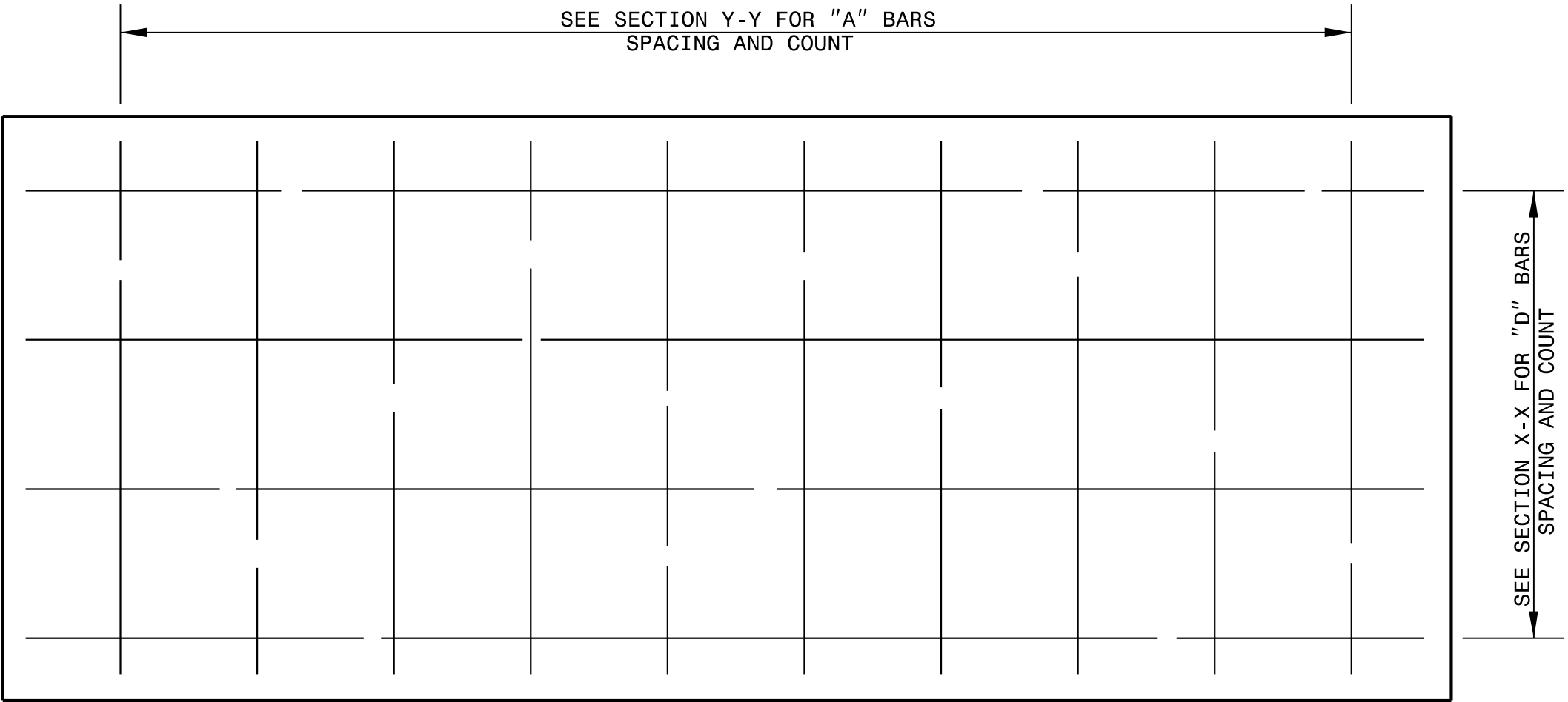


SECTION Y-Y

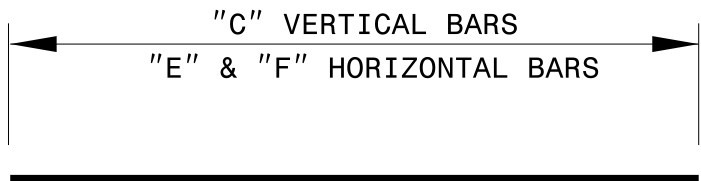
- GENERAL NOTES:
- ALL EXPOSED CONCRETE CORNERS SHALL BE CHAMFERED 1".
 - FORMS SHALL BE USED TO CONSTRUCT THE BOTTOM SLAB.
 - IF PIPES ARE SET IN THE BASE SHALL FOLLOW CONSTRUCTION PROCEDURE SHOWN BY STD. DWG. 840.00.
 - PRECAST UNITS MADE OF CLASS "AA" CONCRETE MAY BE USED IN LIEU OF BRICK MASONRY CONSTRUCTION.
 - REINFORCING STEEL COST SHALL BE INCLUSIVE IN THE UNIT OR PER METER BID PRICE FOR "MASONRY DRAINAGE STRUCTURE".
 - REFERENCE STD. DWG. 840.25 FOR FRAME ANCHORAGE.
 - DROP INLETS OVER 3'-6" DEEP SHALL BE PROVIDED WITH STEPS AS DIRECTED BY STD. DWG. 840.66.
 - FRAME AND GRATES SHALL BE SEPARATE CONTRACT ITEM.
 - HORIZONTAL AND VERTICAL DIMENSION MAY BE ADJUSTED AS THE FIELD CONDITIONS AND/OR ALTERNATE DESIGN REQUIRE.
 - MAXIMUM HEIGHT FOR THIS STRUCTURE SHALL BE 15'.
 - ALL ADJUSTMENTS ARE TO BE MADE AS DIRECTED BY THE ENGINEER.
 - DEPTH OF STEEL GRATE WILL REQUIRE DEEPER SEAT ALONG SHORT WALLS.



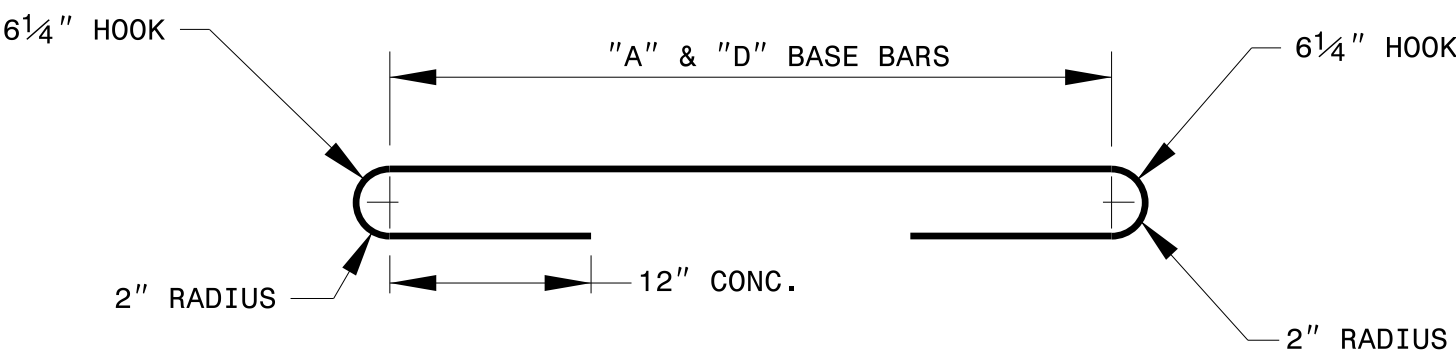
PLAN



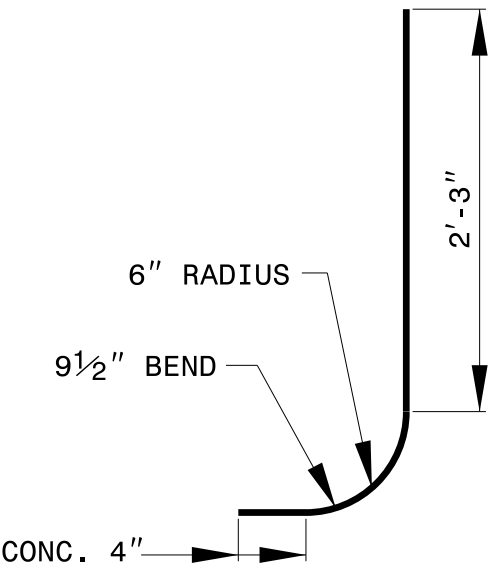
PLAN OF BASE



STRAIGHT BARS



BASE BARS



CORNER BARS

BILL OF MATERIALS						
COMMON		CONCRETE ALT.				
BAR	SIZE	LENGTH	QUANTITY	WEIGHT		
A	#5	6'-4 1/2"	10	67		
B	#5	3'-4 1/2"	24	84		
C	#5	2'-8"	24	67		
D	#5	12'-6"	4	22		
E	#5	3'-0"	20	62		
F	#5	8'-6"	20	179		
REINF. STEEL (TOTAL WEIGHT LBS.)				481		
CONCRETE IN BASE (CU.YDS.)				0.93		
CONCRETE IN WALLS (CU.YDS.)				1.42		
CONCRETE TOTAL (CU.YDS.)				2.35		
CONC. CU.YDS. PER WALL/FOOT OF HEIGHT				1.74		
LBS. OF REINF. STEEL IN WALL/FOOT OF HEIGHT				494		

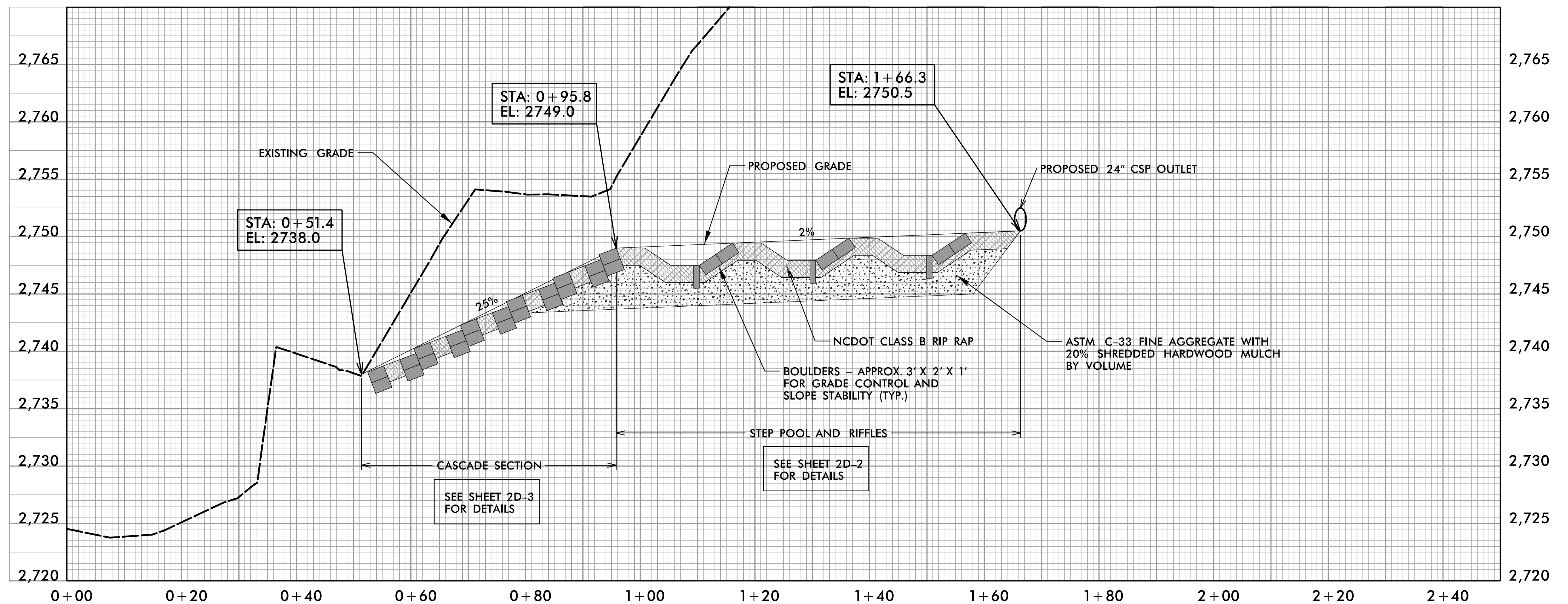


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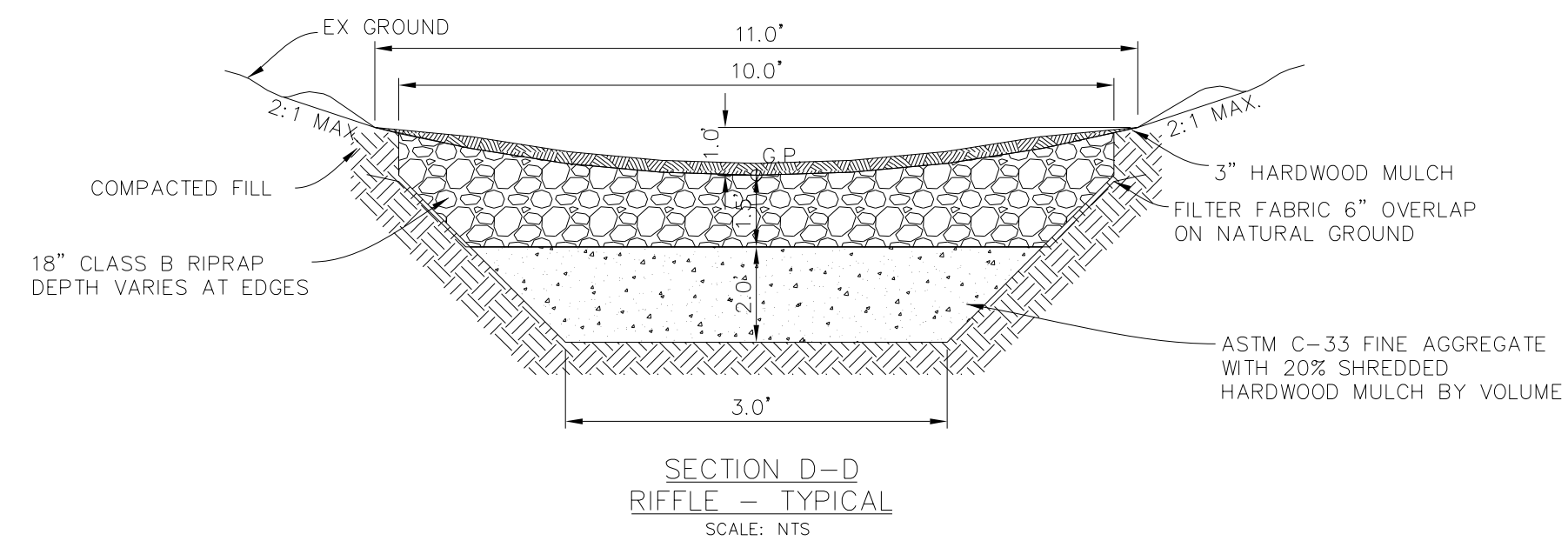
CONTRACT STANDARDS
AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

TRAFFIC BEARING
4GI

ORIGINAL BY: _____ DATE: _____
MODIFIED BY: rnbritt DATE: 6-15-16
CHECKED BY: _____ DATE: _____
FILE SPEC. details/nbritt/english/urban./u2810ctb4gi.dgn



PROJECT REFERENCE NO.	SHEET NO.
R-2566BA	2D-2
RW SHEET NO.	
	HYDRAULICS ENGINEER 8/3/2021
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



1. BOULDERS SHOULD BE APPROX. 3'x2'x1'
2. FOOTER BOULDER SHALL EXTEND 2 FEET BELOW THE BOTTOM OF THE STEP POOL
3. RIP RAP SHALL BE PLACED IN 8" LIFTS WITH APPROXIMATELY 2" OF FILTER MIX (ASTM C-33 FINE AGGREGATE, WITH 20% SHREDDED HARDWOOD MULCH BY VOLUME) BETWEEN LIFTS (NOT SHOWN IN DETAILS).
4. SEE PROFILE, SHEET 2D-1, FOR FINISH GRADE ELEVATIONS.
5. FILTER FABRIC LEADING EDGE WILL BE BURIED 6" INTO RIP RAP AND COVERED WITH RIP RAP.
6. FILTER FABRIC SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1056 - ENGINEERING FABRICS OF THE NCDOT STANDARD SPECIFICATIONS FOR TYPE 2 FABRIC

5/14/99

6/8/2021
R-2566BA_Hyd.psh.02D-3.dgn
USF181801

BIOFILTRATION CONVEYANCE DETAILS

STEP POOL AND RIFFLE



TGS ENGINEERS
706 HILLSBOROUGH ST. SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

PROJECT REFERENCE NO.

R-2566BA

SHEET NO.

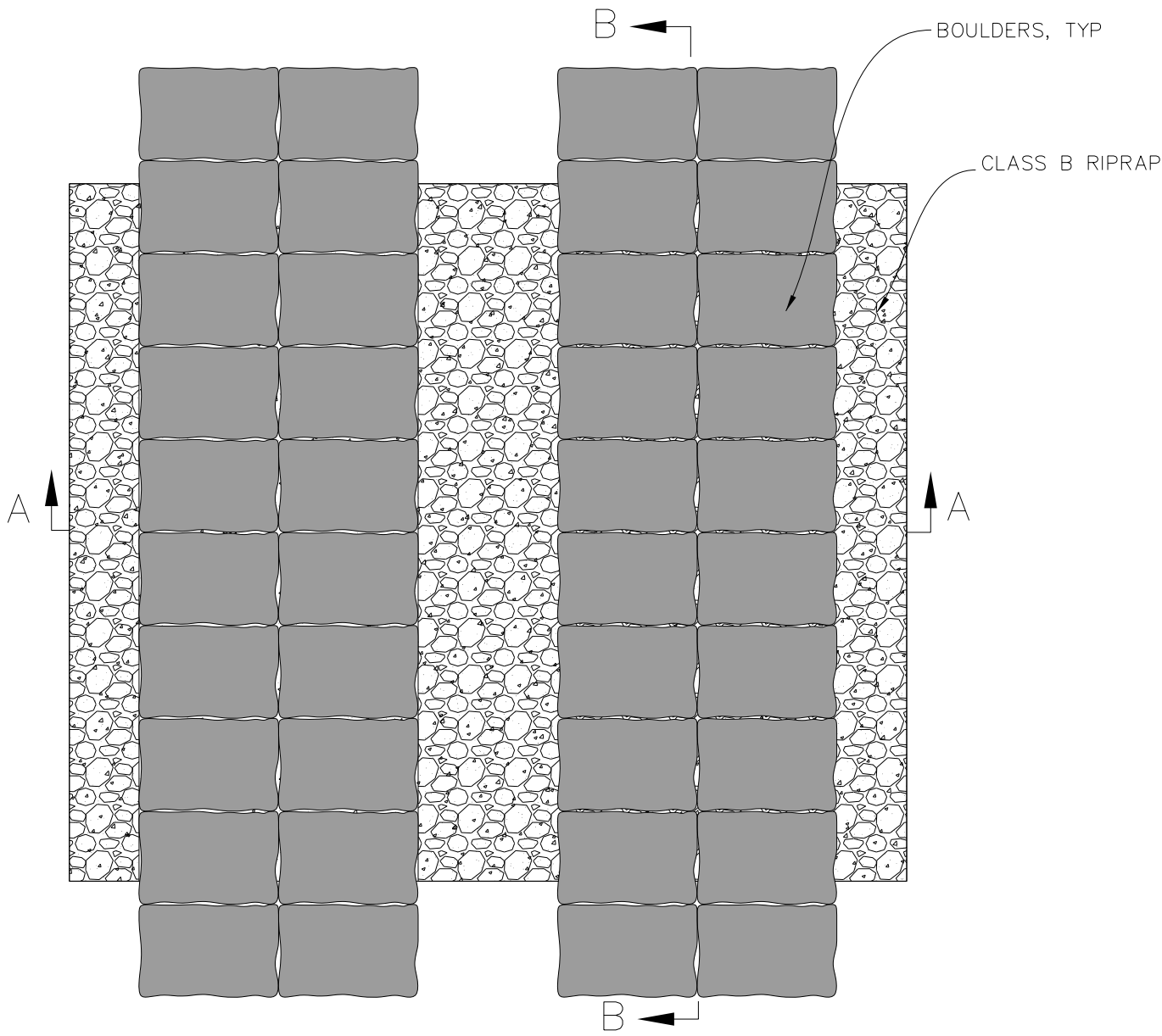
2D-3

RW SHEET NO.

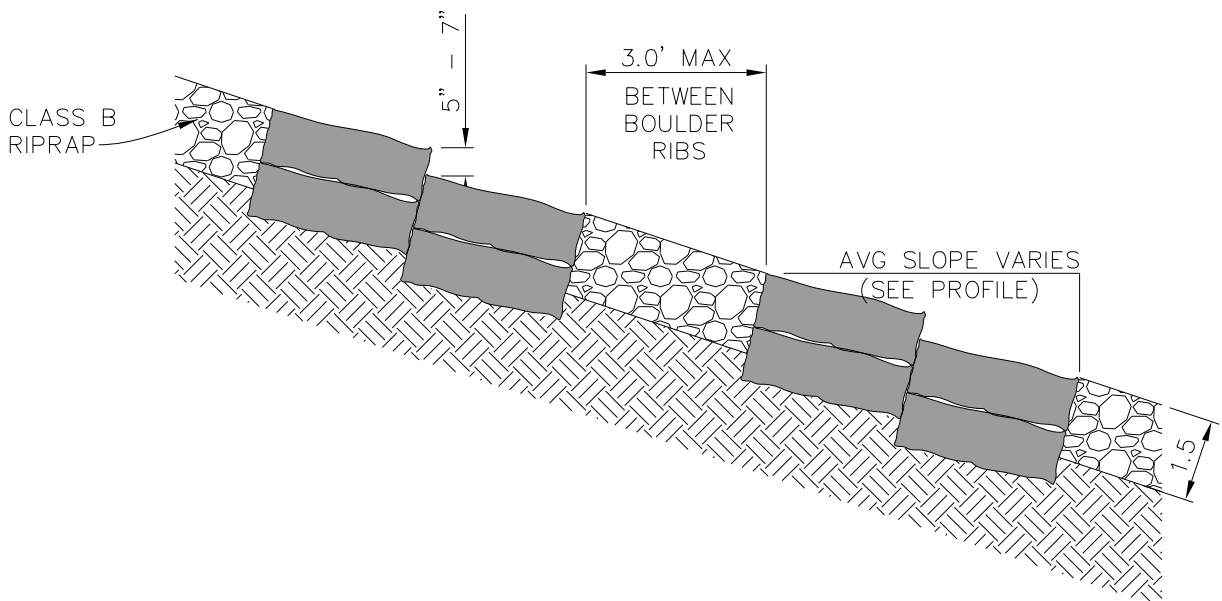
HYDRAULICS
ENGINEER
7/30/2021



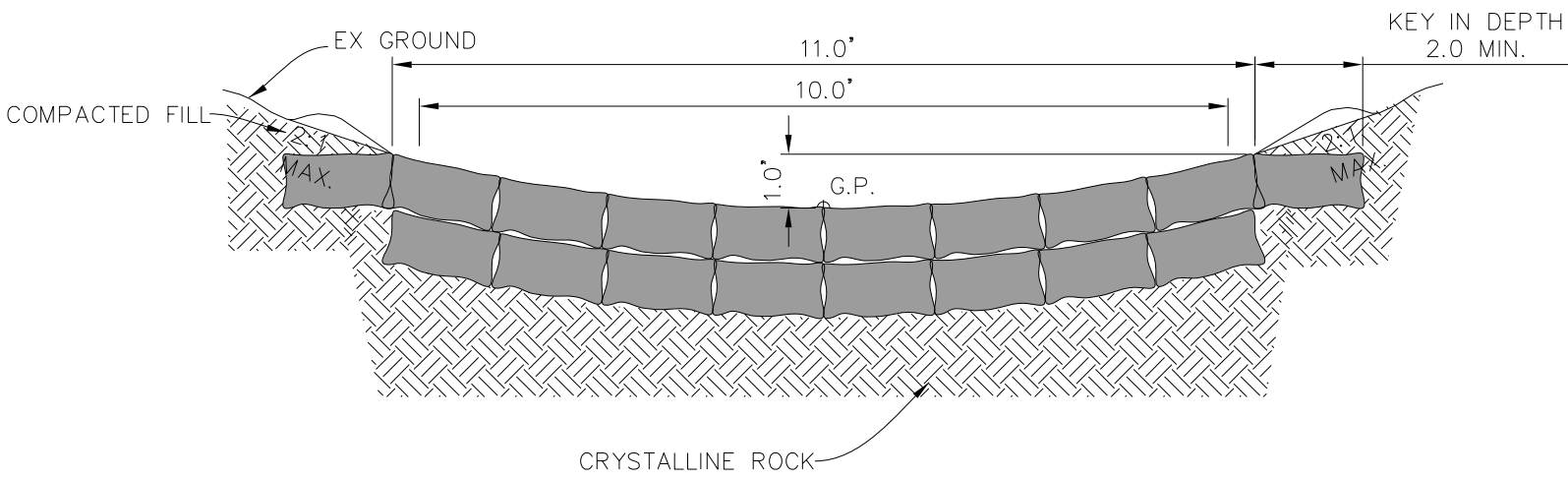
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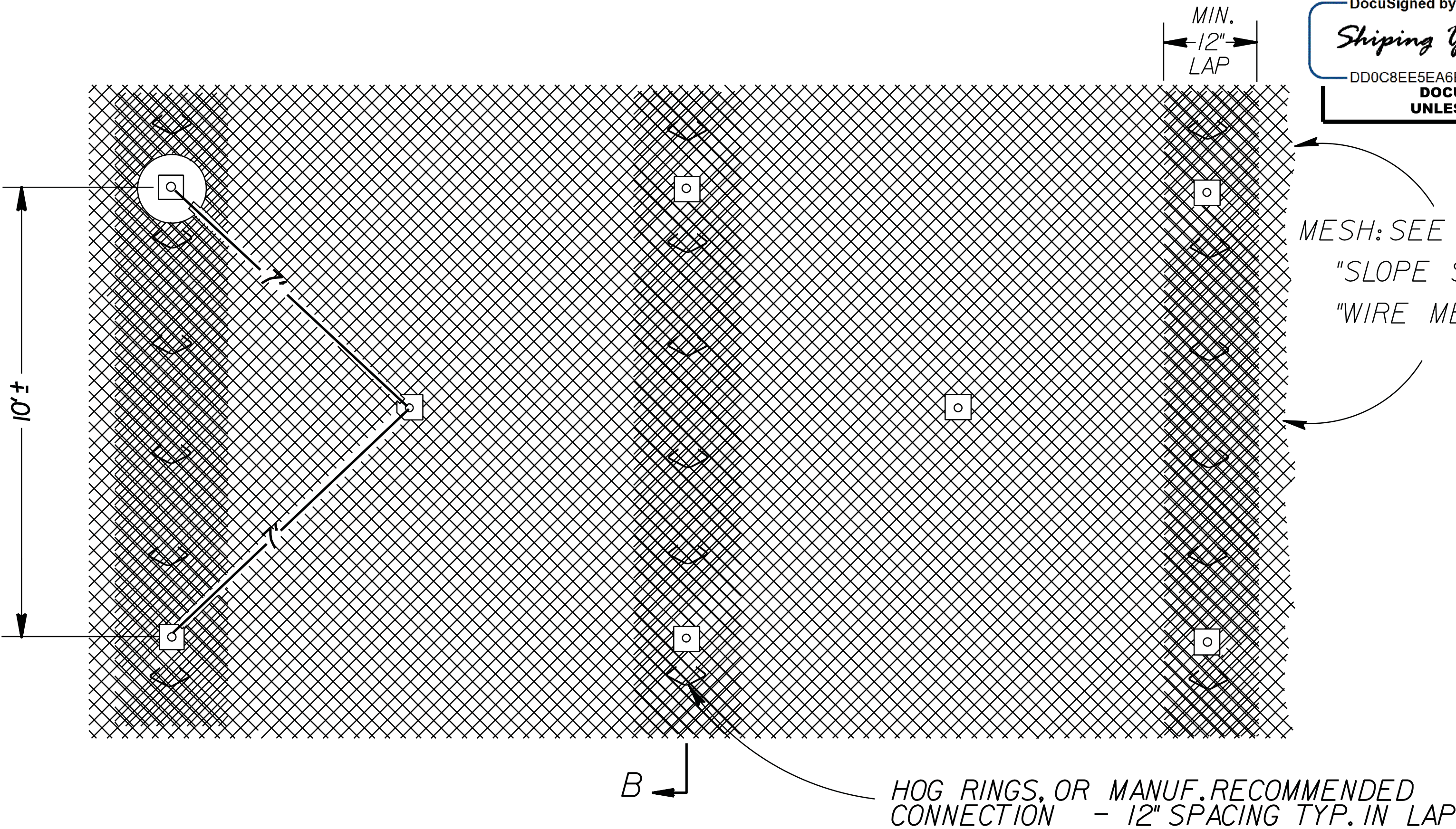
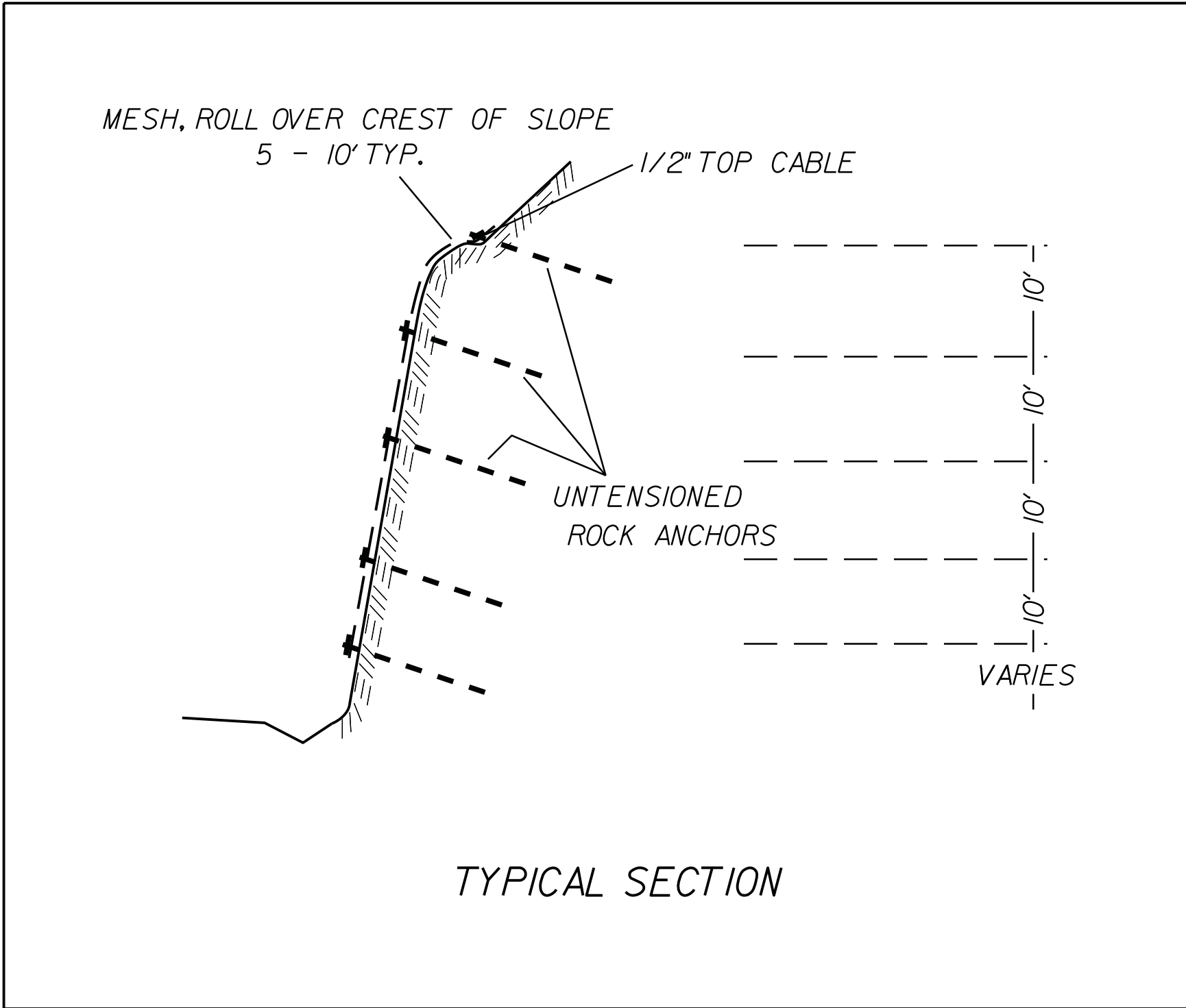
CASCADE PLAN
SCALE: NTS



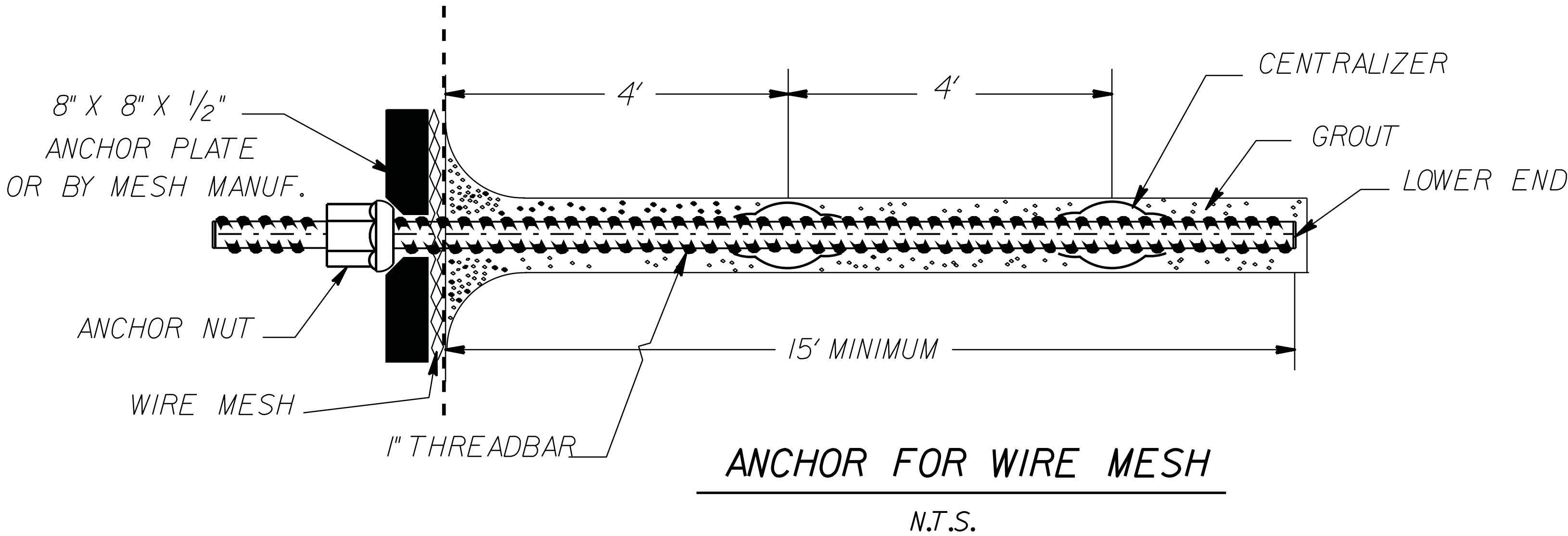
CASCADE PROFILE
OVER CRYSTALLINE ROCK
SCALE: NTS
SECTION A-A



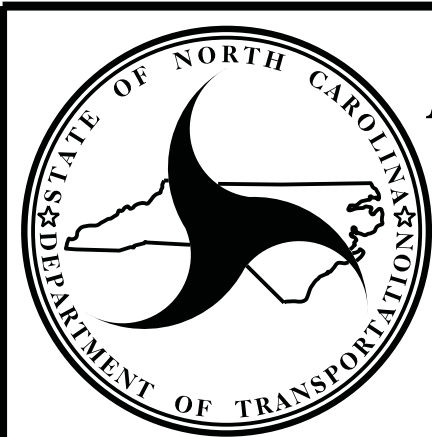
CASCADE SECTION
OVER CRYSTALLINE ROCK
SCALE: NTS
SECTION B-B

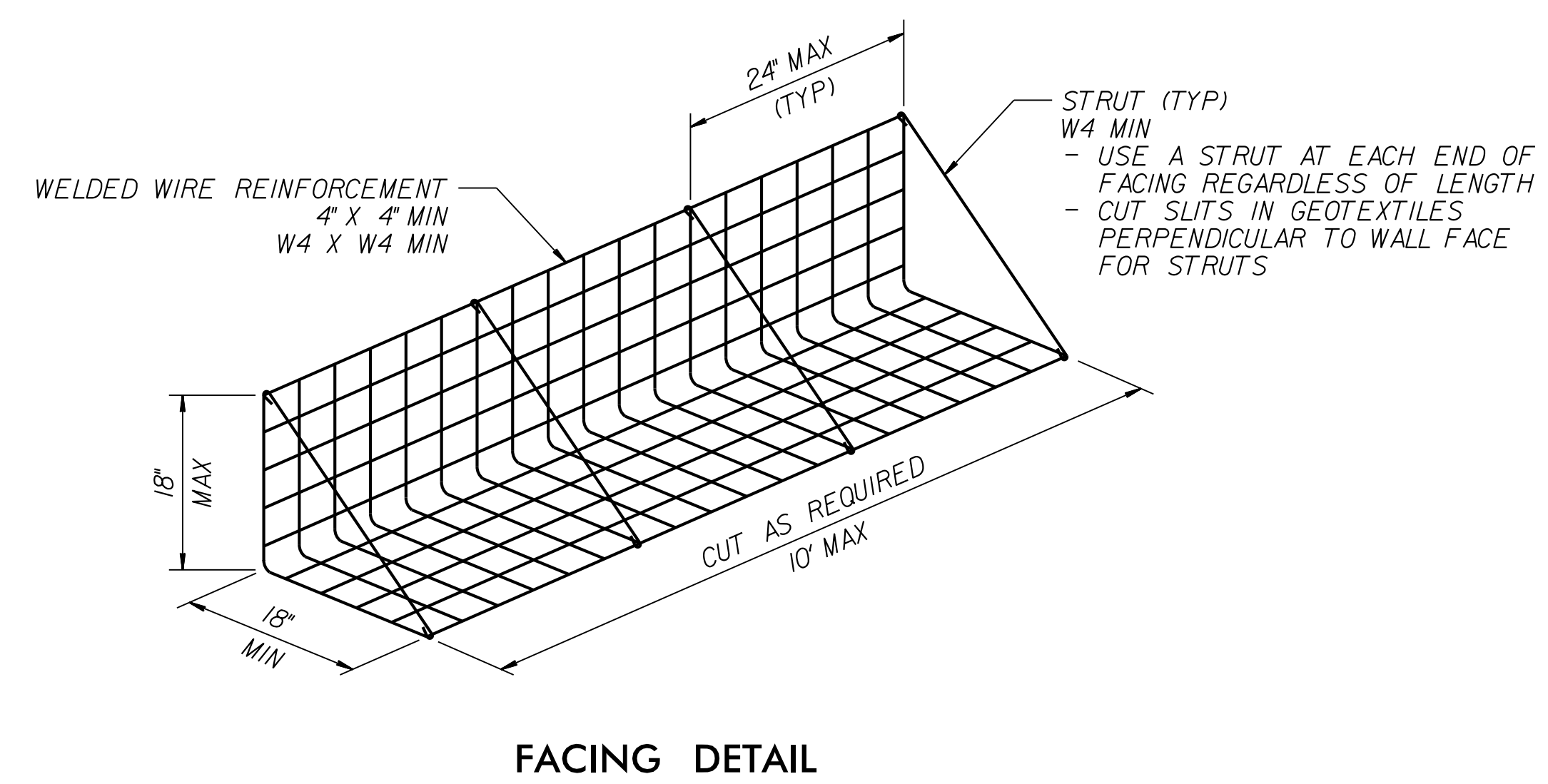
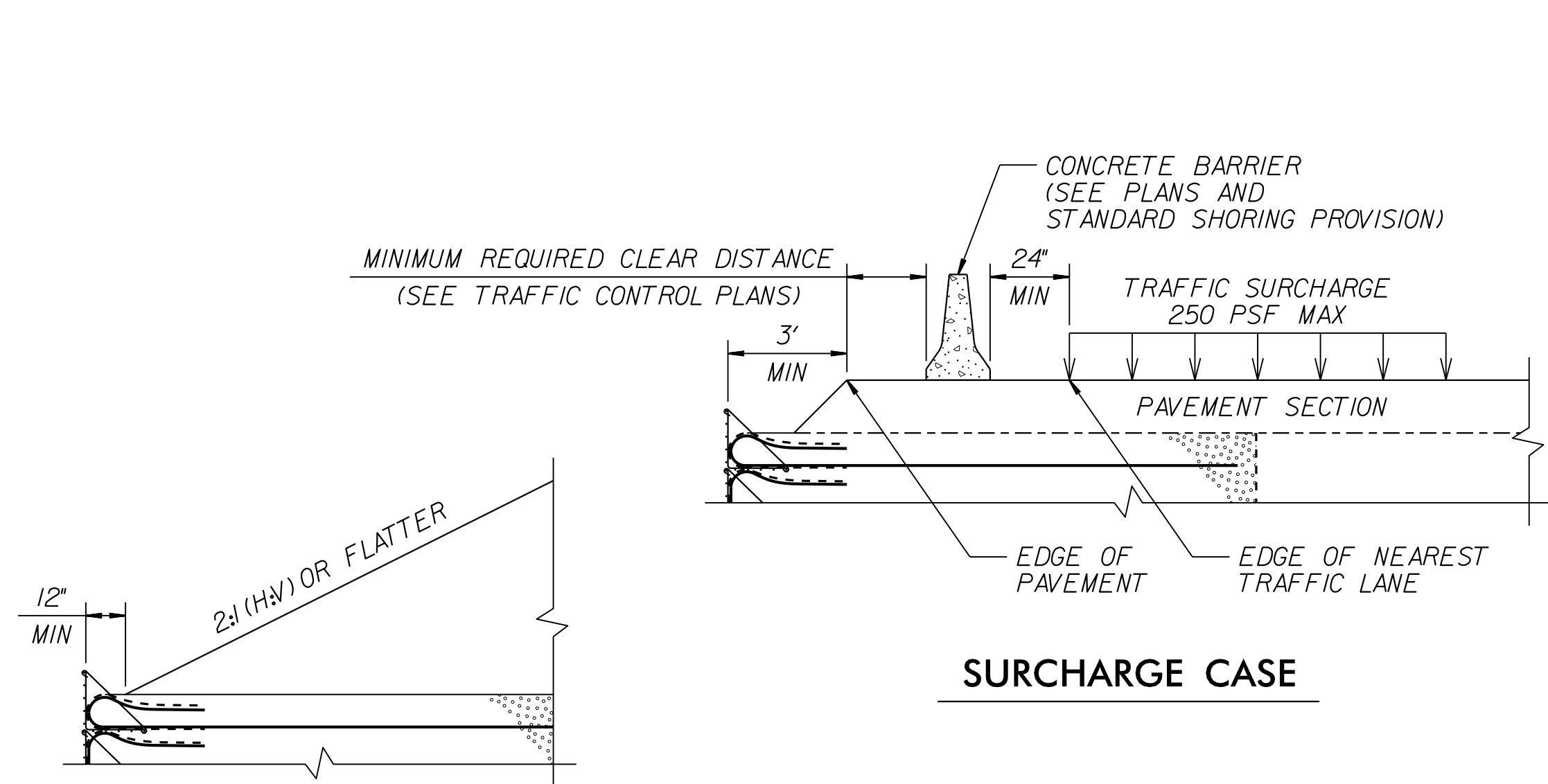


DETAIL OF WIRE MESH
N.T.S.

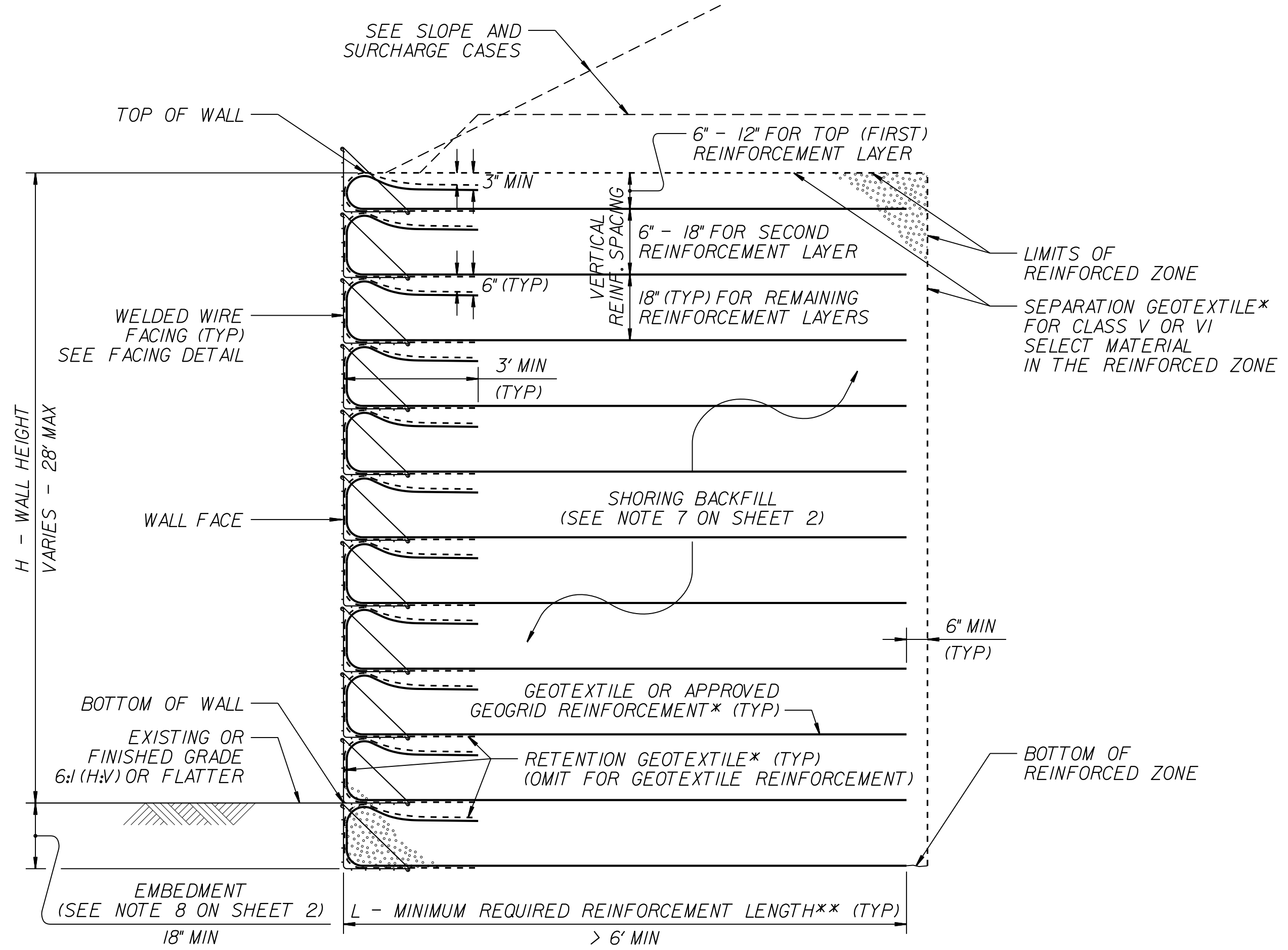


CONTINGENCY QUANTITY	
WIRE MESH	400 ± SY.
ANCHOR FOR WIRE MESH	40 x 15' 600 ± LF.



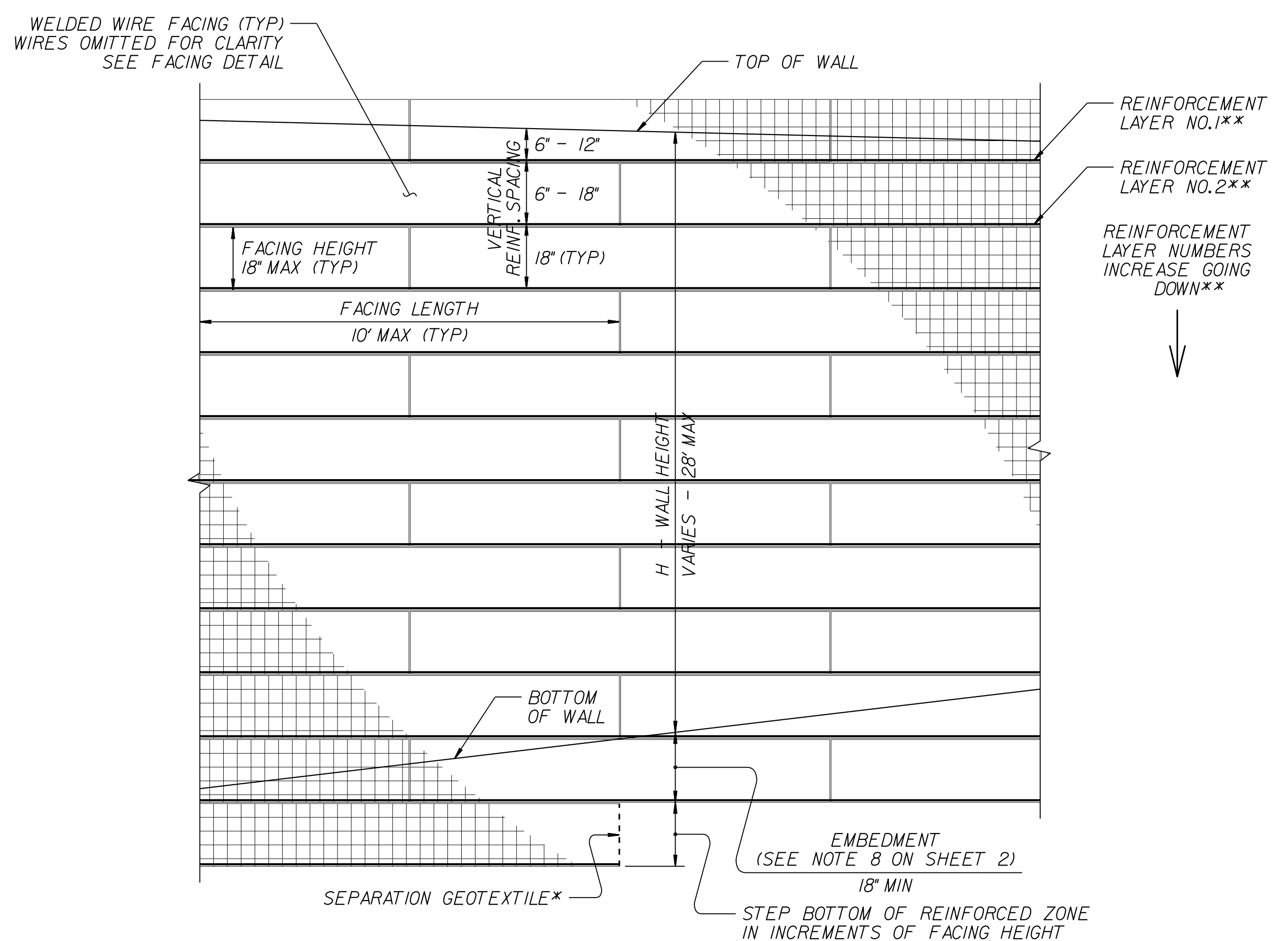


SLOPE CASE



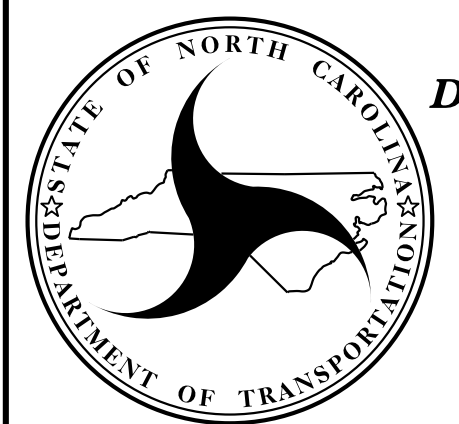
STANDARD TEMPORARY WALL

(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.

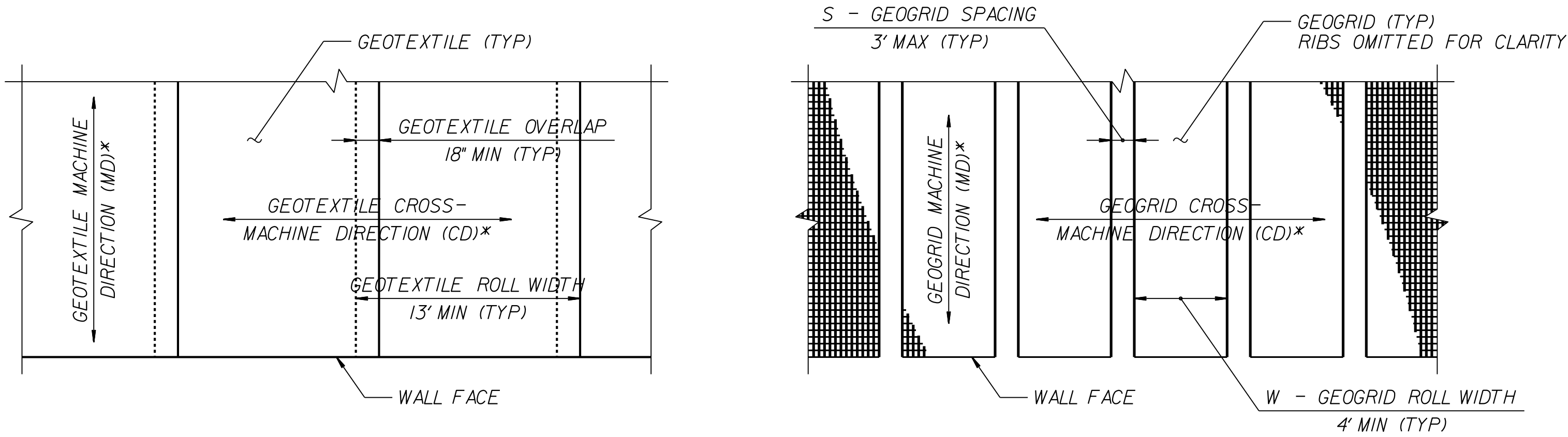


NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL
ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

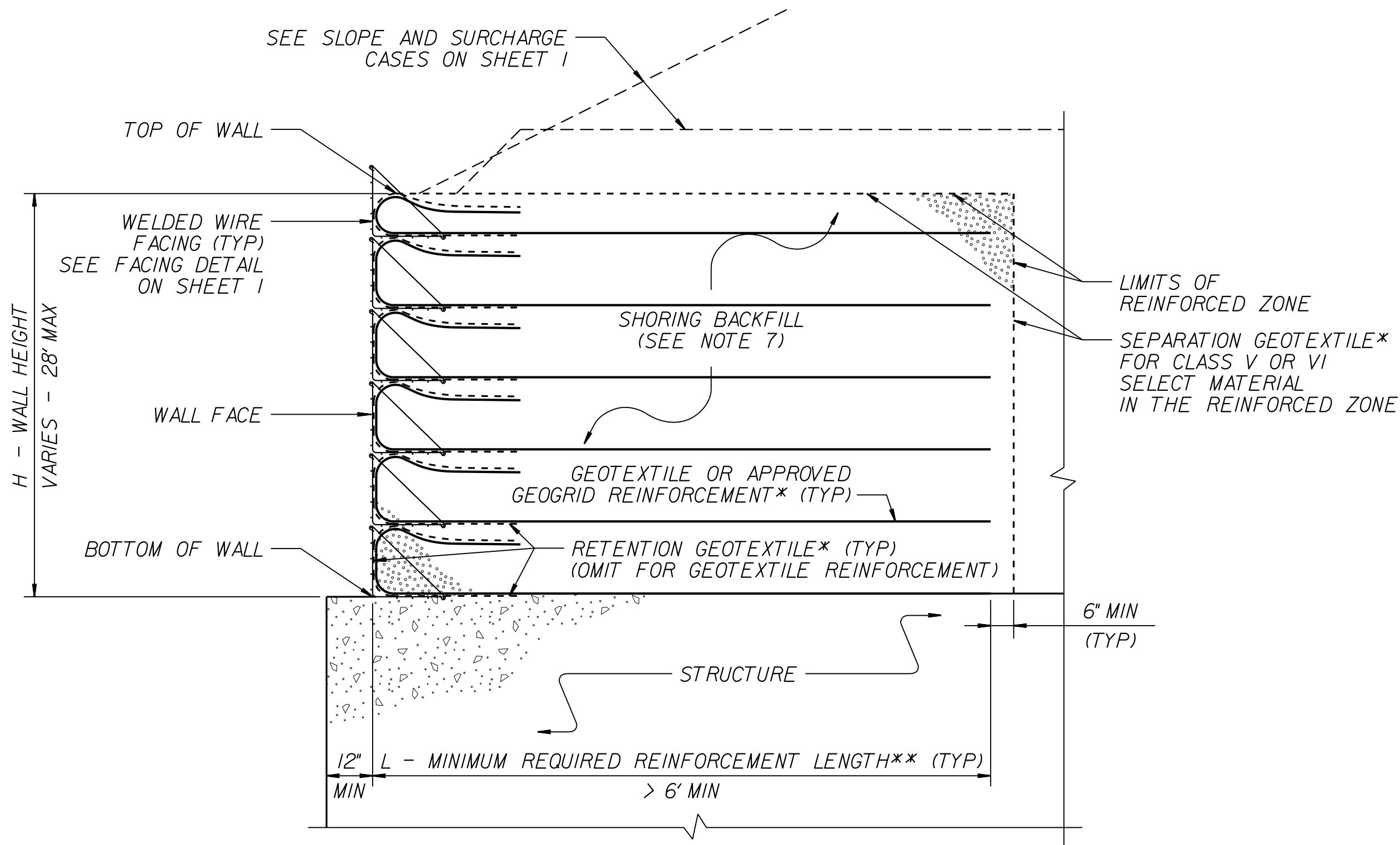
STANDARD
TEMPORARY WALL
SHEET 1 OF 3



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, γ = 120 PCF
FRICTION ANGLE, ϕ = 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) + 4.5' 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.

PROJECT REFERENCE NO.
R-2566BA

SHEET NO.
2G-4

GEOTECHNICAL ENGINEER



DocuSigned by:
Scott A. Hidden 6/26/2019

DATE

SIGNATURE

DATE

ENGINEER

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

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.

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	
	> 7 FOR H < 20' > 10 FOR H ≥ 20'	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	
		CLASS V OR CLASS VI SELECT MATERIAL	6	6	7	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)

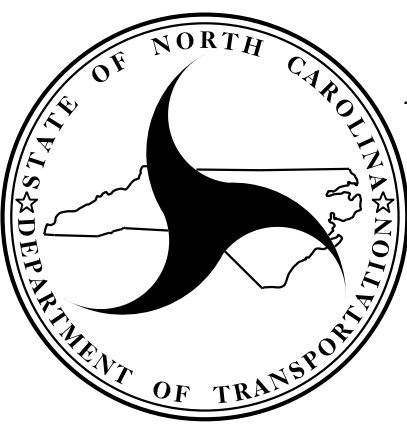
REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL	A-2-4 SOIL	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL
1	2400	2400	2400	2400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

GEOTEXTILE REINFORCEMENT
ULTIMATE TENSILE STRENGTH (LB/FT)

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

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

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



NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL
ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD
TEMPORARY WALL
SHEET 3 OF 3

DATE: 11-19-13

5/28/99

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
R-2566BA	3B-1

SUMMARY OF EARTHWORK
(IN CUBIC YARDS)

STATION	STATION	UNCL. EXCAV.	EMBANK. + %	BORROW	WASTE
-L- LT. 151 + 99.34	-L- LT. 162 + 74.00	72,363	343	0	72,020
-L- LT. 162 + 74.00	-L- LT. 163 + 32.97	6	3	0	3
-Y5- 19 + 00.00	-Y5REV- 21 + 95.89	453	321	0	132
-L- LT. 165 + 89.00	-L- LT. 174 + 64.36	1,009	153	0	856
SUBTOTALS:		73,831	820	0	73,011
-L- RT. 151 + 99.39	-L- LT. 162 + 62.38	540	296	0	244
-L- RT. 165 + 44.72	-L- RT. 166 + 40.00	2,624	35	0	2,589
-Y4- 10 + 00.00	-Y4- 12 + 82.76	24,495	0	0	24,495
-L- RT. 166 + 40.00	-L- RT. 174 + 64.36	47,145	634	0	46,511
SUBTOTALS:		74,804	965	0	73,839
TOTALS:		148,635	1,785	0	146,850
LOSS DUE TO CLEARING AND GRUBBING		-70	0	0	-70
PROJECT TOTALS:		148,565	1,785	0	146,780
GRAND TOTALS:		148,565	1,785	0	146,780
SAY:		156,000			

DDE = 196 CY
SHALLOW UNDERCUT = 100 CY
CONTINGENCY UNDERCUT = 450 CY
PAVEMENT STRUCTURE VOL. = 5,459
SHOULDER BORROW = 550 CY

Note: "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."

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

TEMPORARY SHORING SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	AVERAGE HEIGHT	MAXIMUM HEIGHT	SF
-L-	162 + 59 9.5' RT.	163 + 55 5.4' RT.	CL	9.9 FT.	14.0 FT.	950.40
-L-	165 + 33 5.5' RT.	165 + 91 5.5' RT.	CL	7.1 FT.	12.2 FT.	411.80
-L-	162 + 57 11.5' RT.	162 + 87 11.5' RT.	RT	7.0 FT.	11.9 FT.	210.00
-L-	165 + 60 11.5' RT.	165 + 92 11.5' RT.	CL	6.9 FT.	12.2 FT.	220.80
TOTAL:						1,793.00
SAY:						1,800.00

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LENGTH
-L- RT	159 + 46.92	162 + 37.00	290.08
-L- RT	165 + 70.00	165 + 95.00	25.00
TOTAL:			315.08
SAY:			330.00

1'-6" CURB & GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LENGTH
-L- MED. LT.	153 + 69	154 + 46	77
-L- MED. LT.	153 + 69	162 + 11	842
TOTAL:			919
SAY:			920

2'-9" CURB & GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LENGTH
-L- MED. RT.	154 + 46	154 + 71	25
-L- MED. LT./RT.	154 + 71	162 + 05	734
-L- MED. RT.	162 + 05	162 + 09	4
TOTAL:			763
SAY:			770

TEMPORARY GUARDRAIL SUMMARY

SEE SHEET 2C-4 FOR TEMPORARY ANCHOR UNIT, TYPE W-BEAM
SEE SHEET 2C-5 FOR TEMPORARY GUARDRAIL ANCHOR UNIT, TYPE B-77
SEE SHEET 2C-6 FOR TEMPORARY ANCHOR UNIT, TYPE III MODIFIED FOR POST AND BEAM RAIL

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

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS								IMPACT ATTENUATOR TYPE 350			SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS	
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	TEMP. TYPE III MOD.	TEMP. AT-1	TEMP. TL-2	TEMP. TYPE B-77	TEMP TYPE W-BEAM	CAT-1	VI MOD	BIC	AT-1	EA	G					NG
-L-	165 + 75.86	166 + 26.01	LT.	31.44'	32.48'										1	1													SEE TMP. PHASE 1, STEP 3 FOR LOCATION	
-L-	166 + 48.13	166 + 67.19	LT.		31.41'											1													SEE TMP. PHASE 1, STEP 3 FOR LOCATION REMOVE TEMP. GR AS NEEDED, (APPROX. 82.17'), AND REPLACE WITH SHOP CURVED GR	
-Y4- /-L-	10 + 18.42	166 + 67.19	LT./RT.	117.82'													1	1											SEE TMP. PHASE 1, STEP 2 FOR LOCATION.	
-L-	163 + 23.18		RT.																1										SEE TMP. PHASE 1, STEP 2 FOR LOCATION.	
TOTAL:				149.26'	63.89'										1	2	1	1	1											
			1 TEMP. TYPE III & 18.75'	-18.75'																										
			2 TEMP. AT-1 & 6.25'		-12.50'																									
			1 TEMP. TL-2 & 25.00'	-25.00'																										
			1 TEMP. TYPE B-77 & 22.875'	-22.875'																										
GRAND TOTAL:				82.635'	51.39'										1	2	1	1	1											
SAY:				87.50'	56.25'										1	2	1	1	1											

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STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF SUBSURFACE DRAINAGE

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
CONTINGENCY				SD	200
				TOTAL LF:	200

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

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

LINE	Station	Station	Aggregate Type* ASU(1/2)/ AST	Aggregate Thickness INCHES [8" for ASU(2)]	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Soil Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY			ASU	18	100	200	400		
			TOTAL CY/TONS/SY:		100	200**	400**	0	0

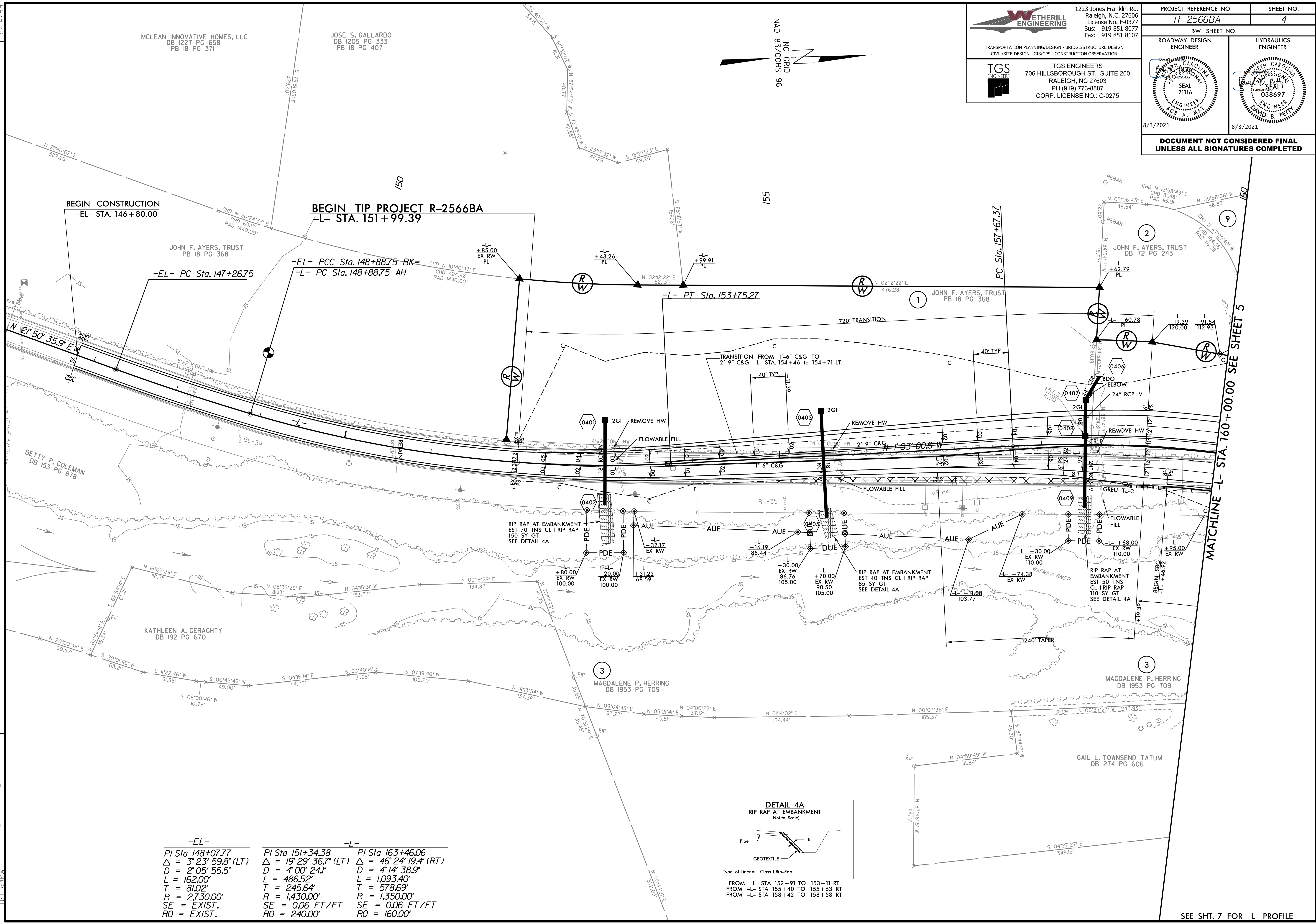
*ASU(1/2) = Aggregate Subgrade (Type 1 or 2)
*AST = Aggregate Stabilization
**Total tons of "Class IV Subgrade Stabilization" and total square yards of "Geotextile for Soil Stabilization" are only the estimated quantities for ASU(1/2)/AST and may only represent a portion of the subgrade stabilization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

SUMMARY OF PRE-SPLITTING OF ROCK

LINE	Beginning Rock Cut Slope (H:V)	Approx. Station	Ending Rock Cut Slope (H:V)	Approx. Station	Location LT/RT	Pre-splitting of Rock SY
L	0.75:1	152+50	0.75:1	162+00	LT	6600
L	0.5:1	165+50	0.5:1	170+50	RT	3700
Y4	0.5:1	10+60	0.5:1	12+50	LT	1500
					TOTAL SY:	11800

5/14/99
7/30/2021
1630/2021
R-2566BA-Rdy.psh_04.dgn
11/15/2021

REVISIONS



1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

TGS ENGINEERS
706 HILLSBOROUGH ST. SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

PROJECT REFERENCE NO.
R-2566BA

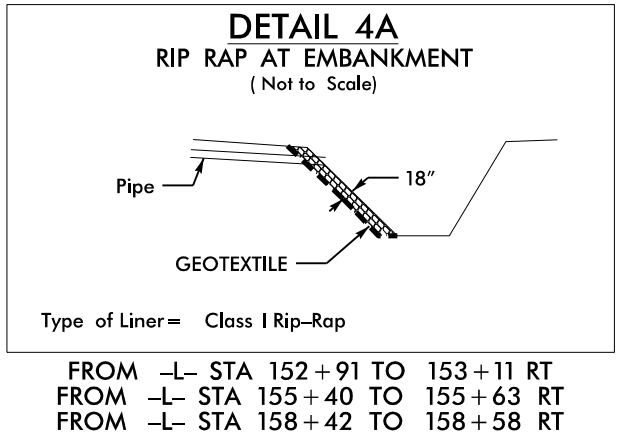
RW SHEET NO.
1

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

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

-EL-	-L-	-L-
PI Sta 148+07.77	PI Sta 151+34.38	PI Sta 163+46.06
Δ = 3' 23' 59.8" (LT)	Δ = 19' 29' 36.7" (LT)	Δ = 46' 24' 19.4" (RT)
D = 2' 05' 55.5"	D = 4' 00' 24.1"	D = 4' 14' 38.9"
L = 162.00'	L = 486.52'	L = 1,093.40'
T = 810.2'	T = 245.64'	T = 578.69'
R = 2,730.00'	R = 1,430.00'	R = 1,350.00'
SE = EXIST.	SE = 0.06 FT/FT	SE = 0.06 FT/FT
RO = EXIST.	RO = 240.00'	RO = 160.00'

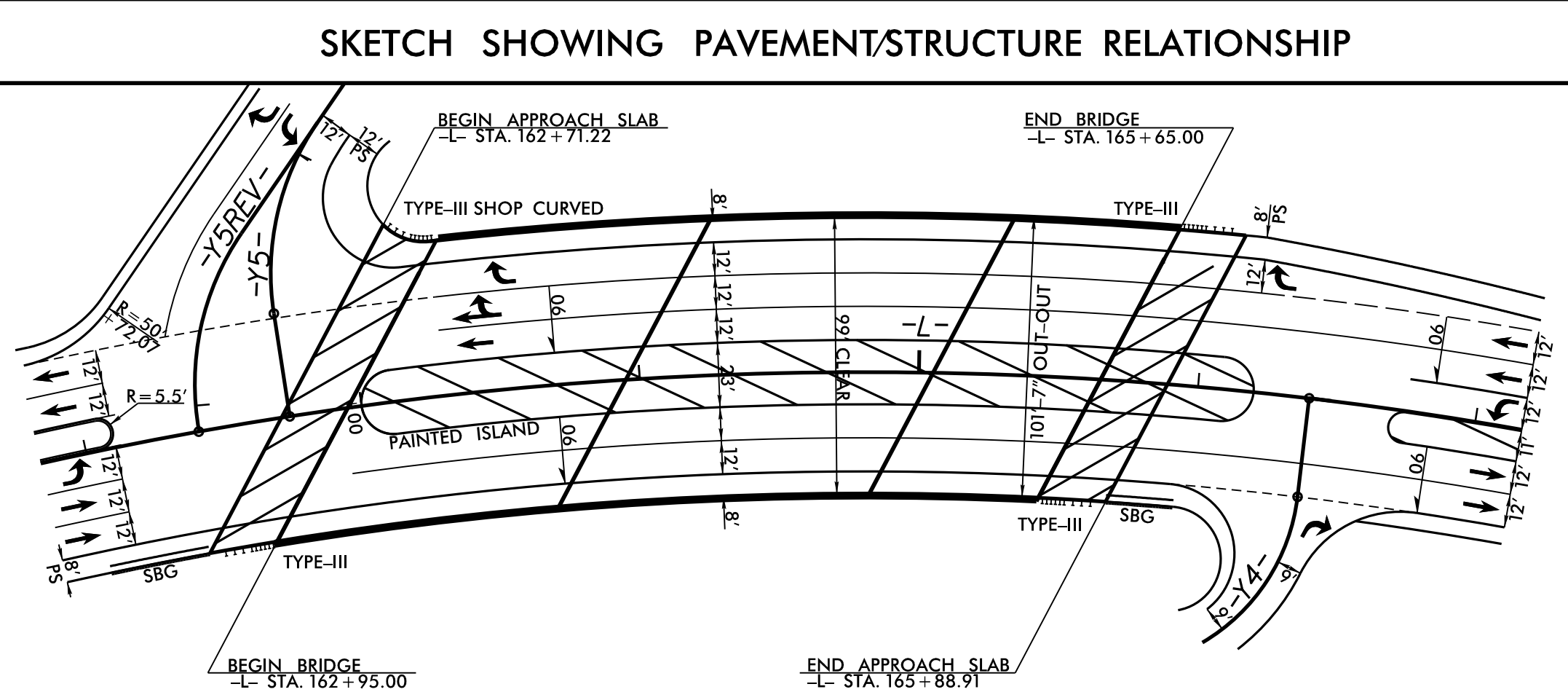
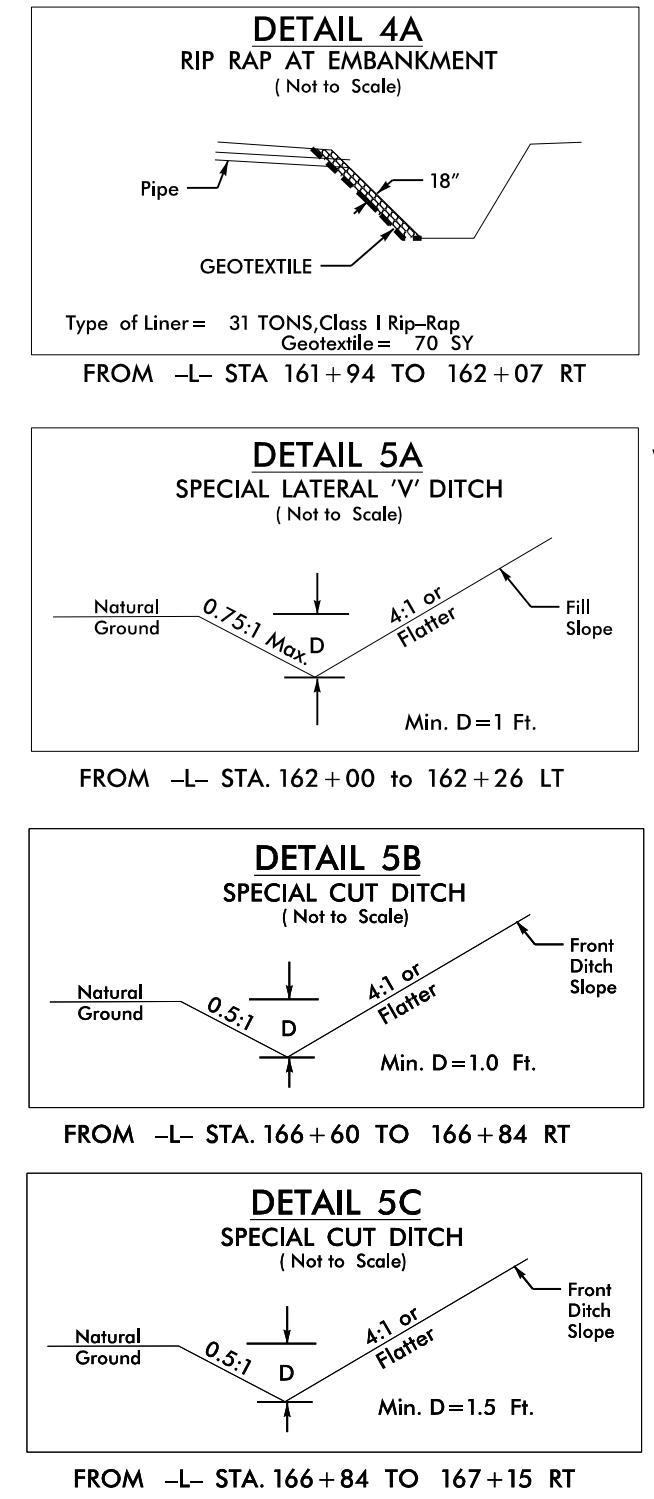
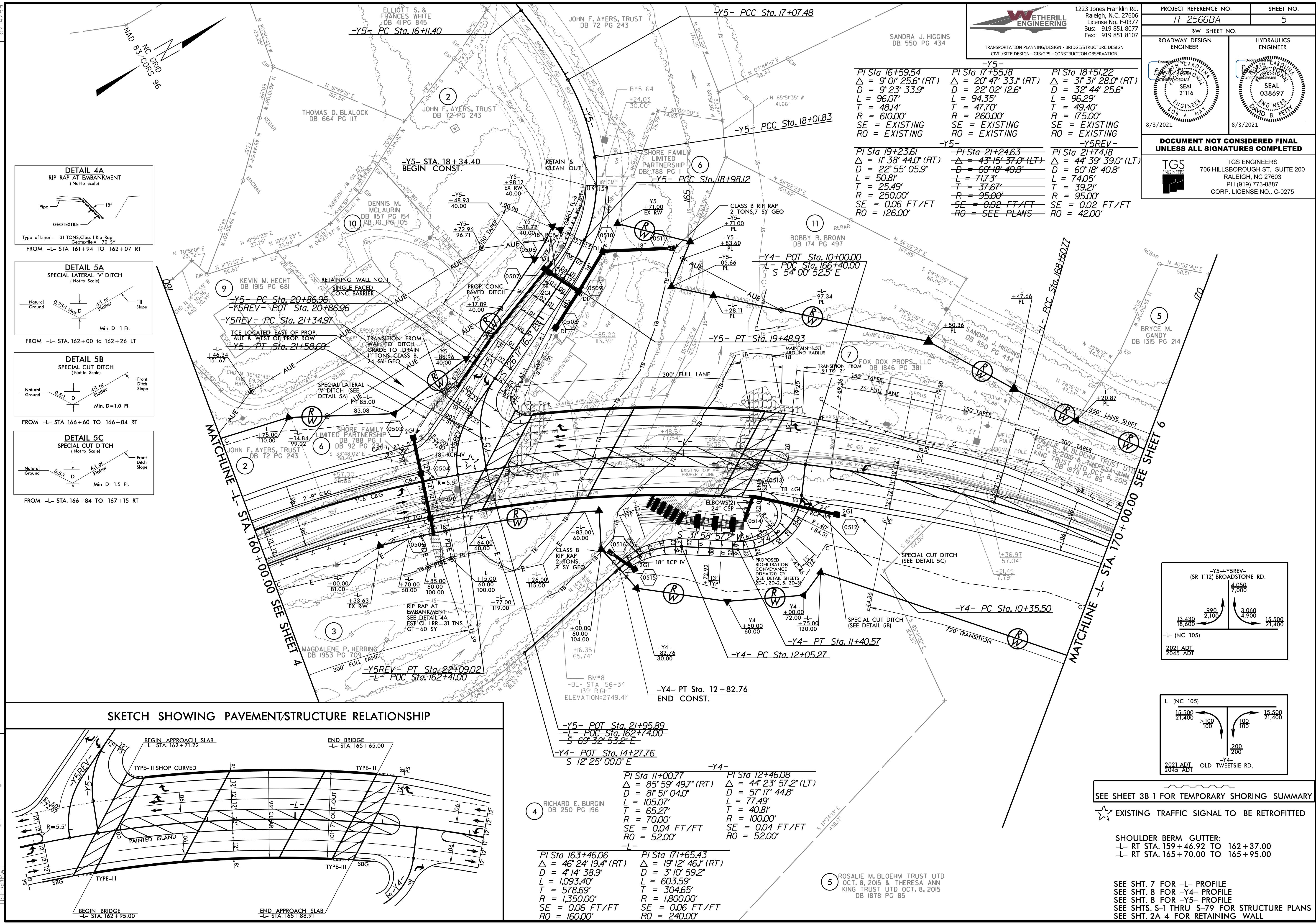


SEE SHT. 7 FOR -L- PROFILE

5/14/2021

7/30/2021 2566BA-Rdy-psh_05.dgn

REVISIONS



4

RICHARD E. BURGIN
DB 250 PG 196

5

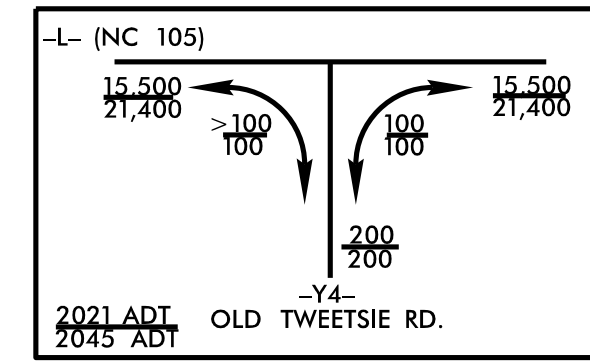
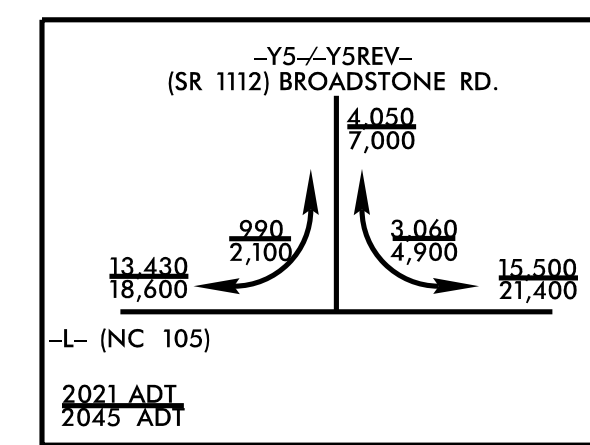
ROSALIE M. BLOEHM TRUST LTD
OCT. 8, 2015 & THERESA ANN
KING TRUST LTD OCT. 8, 2015
DB 1878 PG 85

WETHERILL
ENGINEERING

1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

PROJECT REFERENCE NO.		SHEET NO.
R-2566BA		5
RW SHEET NO.		HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER		DAVID B. PETTY
8/3/2021		8/3/2021
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		
TGS ENGINEERS 706 HILLSBOROUGH ST. SUITE 200 RALEIGH, NC 27603 PH (919) 773-8887 CORP. LICENSE NO.: C-0275		



SEE SHEET 3B-1 FOR TEMPORARY SHORING SUMMARY

EXISTING TRAFFIC SIGNAL TO BE RETROFITTED

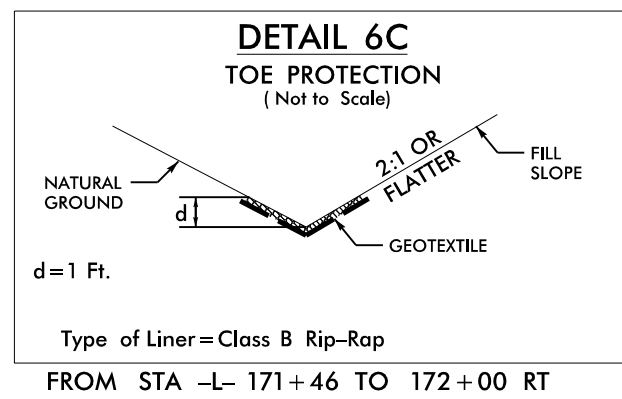
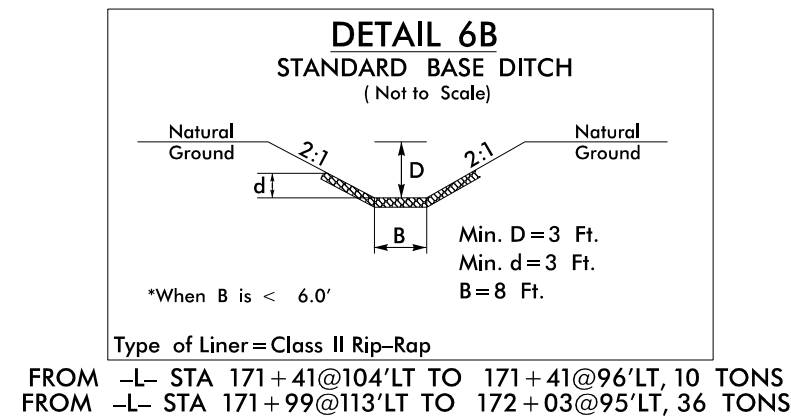
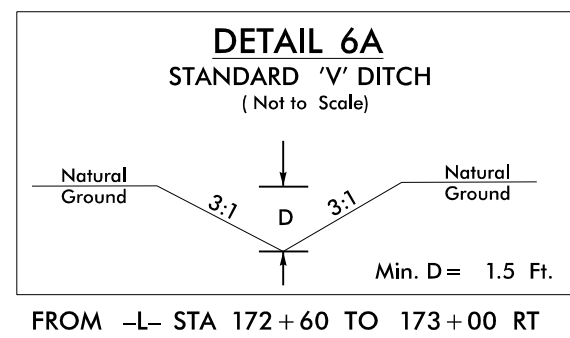
SHOULDER BERM GUTTER:
-L RT STA. 159+46.92 TO 162+37.00
-L RT STA. 165+70.00 TO 165+95.00

SEE SHT. 7 FOR -L- PROFILE
SEE SHT. 8 FOR -Y4- PROFILE
SEE SHT. 8 FOR -Y5- PROFILE
SEE SHTS. S-1 THRU S-79 FOR STRUCTURE PLANS
SEE SHT. 2A-4 FOR RETAINING WALL

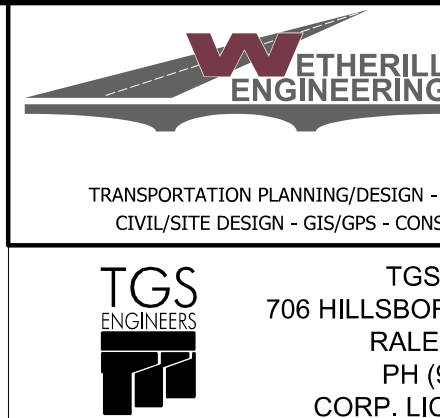
5/14/2021

REVISIONS

6/8/2021 R-2566BA-Rdy.psh_06.dgn



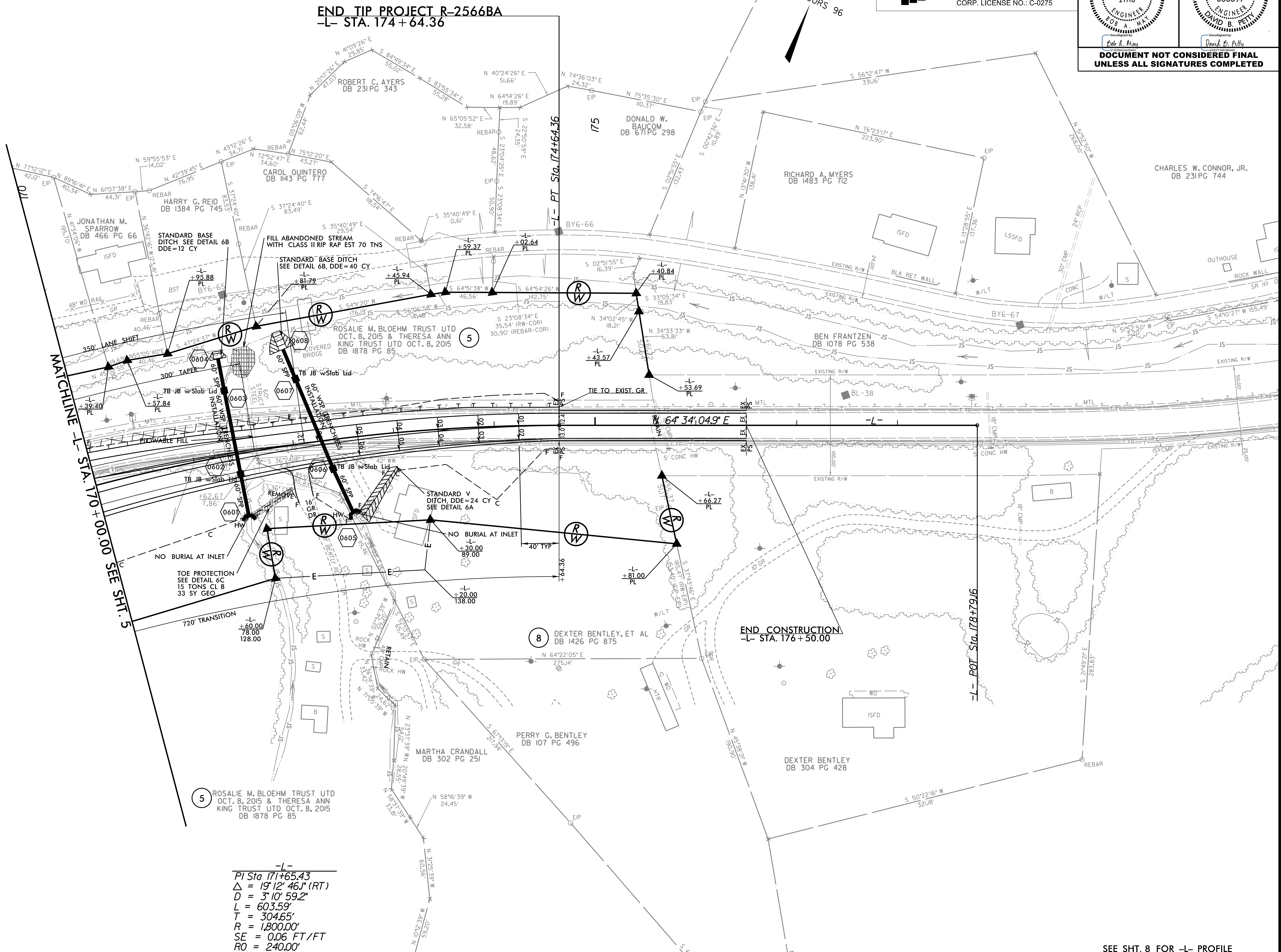
-L-
PI Sta 171+65.43
Δ = 19' 12" 46.1" (RT)
D = 3' 10" 59.2"
L = 603.59'
T = 30465'
R = 1,800.00'
SE = 0.06 FT/FT
RO = 240.00'



1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107

TGS ENGINEERS
706 HILLSBOROUGH ST. SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

PROJECT REFERENCE NO.		SHEET NO.	
R-2566BA		6	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER 7/21/2021		HYDRAULICS ENGINEER 7/30/2021	
			
David B. Petty		David B. Petty	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			



SEE SHT. 8 FOR -L- PROFILE

5/28/99

7/30/2021
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11:58:00 AM

