

09/08/2019

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

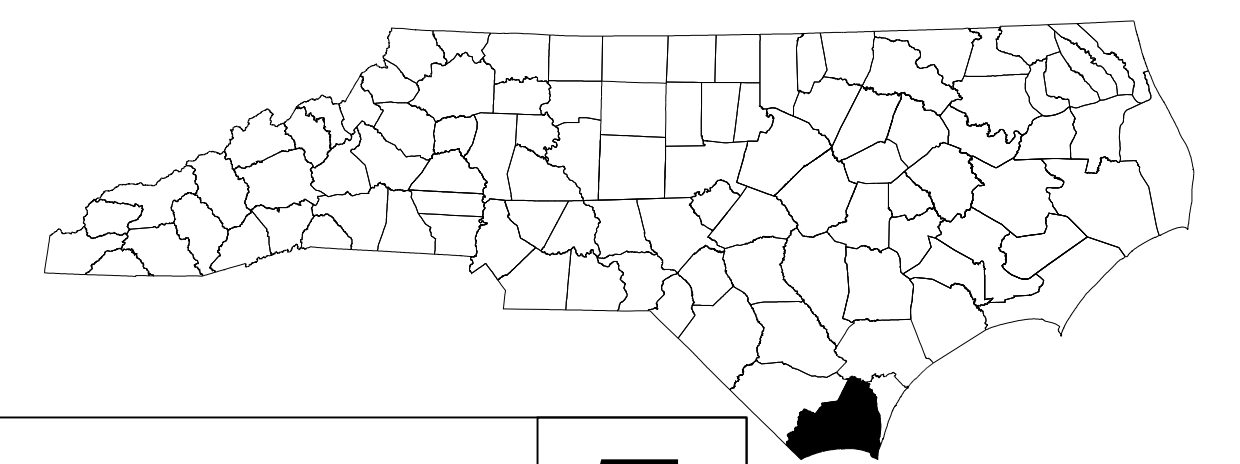
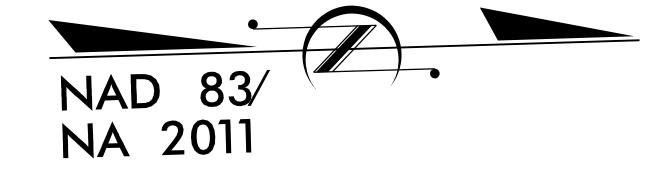
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BRUNSWICK COUNTY

LOCATION: REPLACE BRIDGE 15 OVER CALABASH RIVER ON NC 179B (BEACH DR. SW)

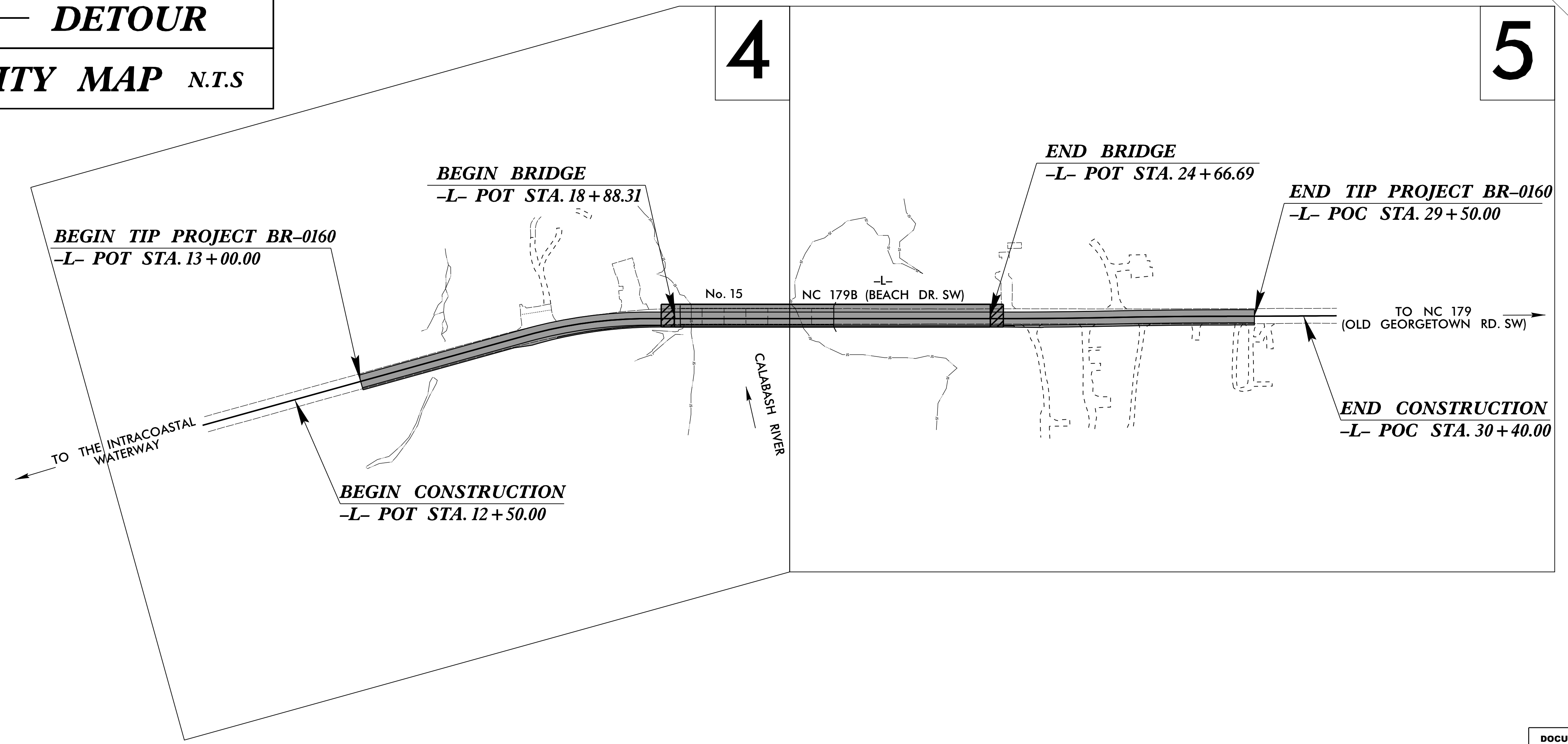
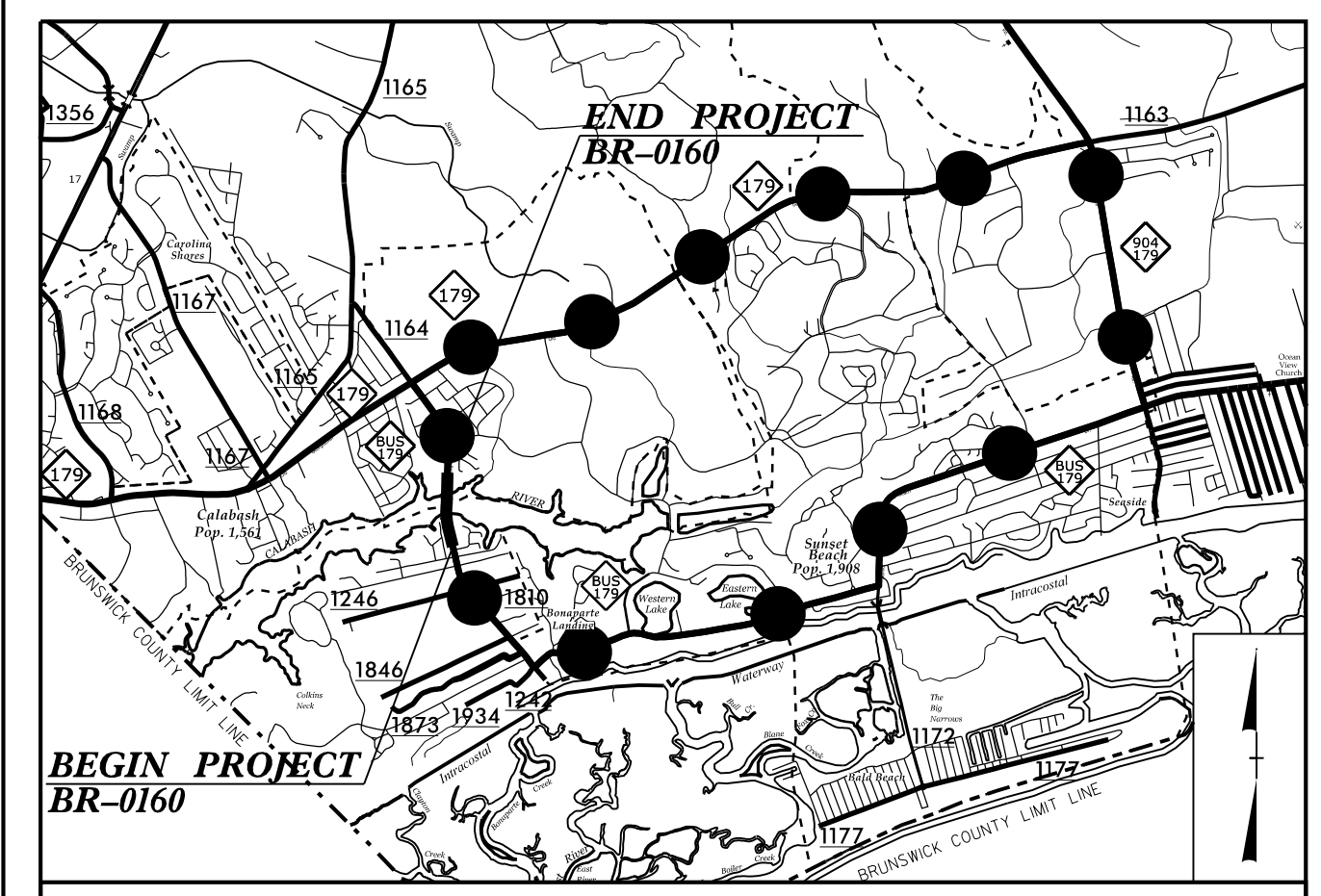
TYPE OF WORK: DRAINAGE, GRADING, PAVING, AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR-0160	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
67160.1.1	N/A	PE	
67160.2.1	N/A	ROW	
67160.2.2	N/A	UTIL	
67160.3.1	N/A	CONST	

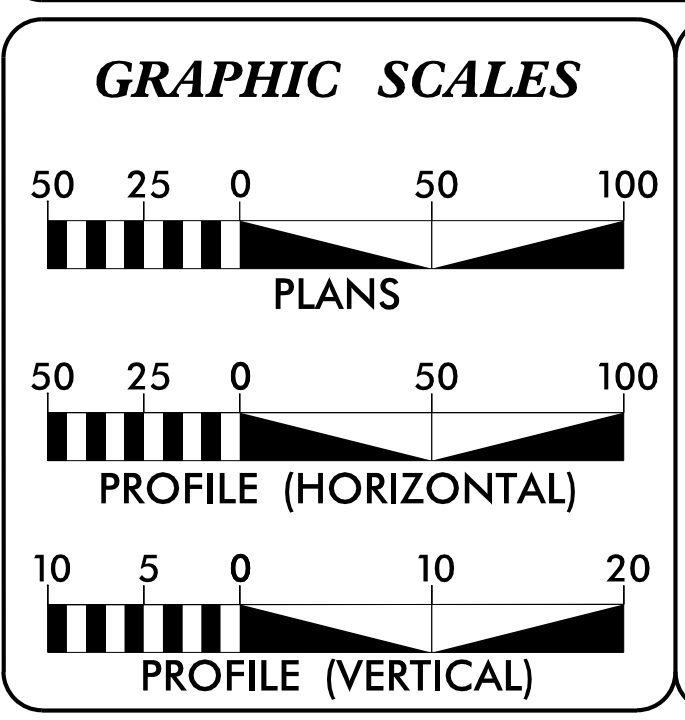


TIP PROJECT: BR-0160

CONTRACT: C204853



DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



DESIGN DATA

ADT 2023 =	8,800
ADT 2043 =	15,200
K =	
D =	
T =	7%
V =	50 MPH
FUNC CLASS =	MAJOR COLLECTOR REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY PROJECT BR-0160	=	0.203 MILE
LENGTH STRUCTURE PROJECT BR-0160	=	0.110 MILE
TOTAL LENGTH PROJECT BR-0160	=	0.313 MILE

PREPARED IN THE OFFICE OF:

RS&H
8521 SIX FORKS ROAD, SUITE 400
RALEIGH, NC 27615
NC FIRM LICENSE No: F-0493

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
FEBRUARY 17, 2022

LETTING DATE:
MAY 16, 2023

RICHARD BOLLINGER, PE
PROJECT ENGINEER

JARED BOND, PE
PROJECT DESIGN ENGINEER

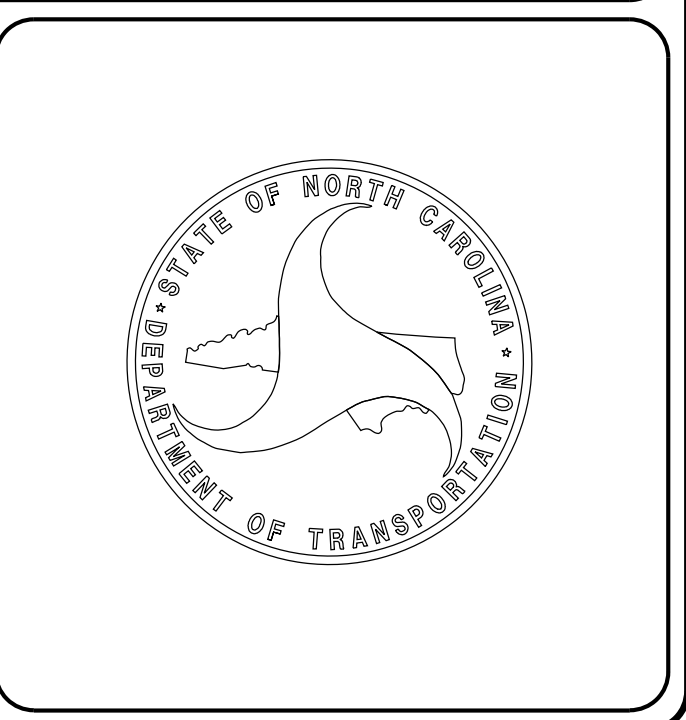
DEREK PIELECH, PE
NCDOT CONTACT

HYDRAULICS ENGINEER

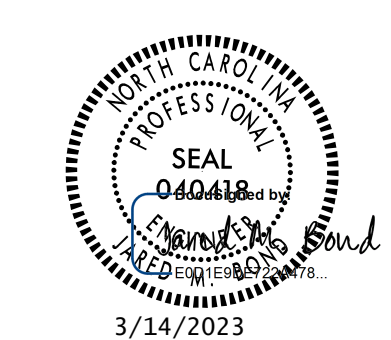
SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.



06-MAR-2023 12:41
R:\Roadway\Proj\BR0160_Rdy_tsh.dgn
\$\$\$\$\$SERVNAME\$\$\$\$\$

PROJECT REFERENCE NO.	SHEET NO.
BR-0160	1A
ROADWAY DESIGN ENGINEER	
	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

RS&H 8521 SIX FORKS ROAD, SUITE 400
RALEIGH, NC 27615
NC FIRM LICENSE No: F-0493

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2A-1 THRU 2A-3	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2B-1	2'-6" CURB AND GUTTER TRANSITION DETAIL
2B-2	42" SLOTTED VERTICAL CONCRETE BARRIER WITH MOMENT SLAB DETAIL
2C-1	GUARDRAIL DETAIL - GUARDRAIL ANCHOR UNIT TYPE III
2C-2	GUARDRAIL DETAIL - GUARDRAIL INSTALLATION
2C-3	HANDRAIL DETAIL - PEDESTRIAN HANDRAIL
2C-4	METHOD OF CLEARING DETAIL - MODIFIED METHOD III
2C-5	ROADWAY DETAIL - ROCK PLATING
2G-1	GEOTEXTILE FOR SOIL STABILIZATION DETAIL
3B-1	SUMMARY OF EARTHWORK, ASPHALT PAVEMENT REMOVAL SUMMARY, SUMMARY OF BREAKING EXISTING ASPHALT PAVEMENT, SHOULDER BERM GUTTER SUMMARY, GUARDRAIL SUMMARY
3D-1	SUMMARY OF DRAINAGE
3G-1	GEOTECHNICAL SUMMARIES
3P-1	PARCEL INDEX SHEET
4 THRU 5	PLAN SHEETS
6	PROFILE SHEET
RW01 THRU RW05	RIGHT-OF-WAY SHEETS
TMP-1 THRU TMP-3	TRANSPORTATION MANAGEMENT PLANS
PMP-1 THRU PMP-3	PAVEMENT MARKING PLANS
E-1 THRU E-3	ELECTRICAL PLANS
EC-1 THRU EC-7	EROSION CONTROL PLANS
SIGN-1 THRU SIGN-4	SIGNING PLANS
UC-1 THRU UC-7	UTILITY CONSTRUCTION PLANS
UO-1 THRU UO-03	UTILITY BY OTHERS PLANS
X-1	CROSS-SECTION SUMMARY SHEET
X-2 THRU X-12	CROSS-SECTIONS
S1-1 THRU S1-42	STRUCTURE PLANS
SN	STRUCTURE STANDARD NOTES SHEET

GENERAL NOTES

GENERAL NOTES: 2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018
REVISED:

GRADING:
THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED OR FUTURE SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING:
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY MODIFIED METHOD III (SEE SHEET 2C-4 FOR DETAIL).

SUPERELEVATION:
ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:
ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01

SUBSURFACE DRAINS:
SUBSURFACE DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.02 AT LOCATIONS DIRECTED BY THE ENGINEER.

DRIVEWAYS:
DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.03 AT LOCATIONS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER.

GUARDRAIL:
THE GUARDRAIL LOCATIONS SHOWN ON THE PLANS MAY BE ADJUSTED DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHOULD CONSULT WITH THE ENGINEER PRIOR TO ORDERING GUARDRAIL MATERIAL.

TEMPORARY SHORING:
SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC WILL BE PAID FOR AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104-7.

END BENTS:
THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-SECTION PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE.

UTILITIES:
UTILITY OWNERS ON THIS PROJECT ARE BRUNSWICK COUNTY PUBLIC WORKS, BRUNSWICK EMC, FOCUS BROADBAND.
ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

RIGHT-OF-WAY MARKERS:
ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY OTHERS.

STANDARD DRAWINGS

2018 ROADWAY ENGLISH STANDARD DRAWINGS
EFF. 01-16-2018
REV.

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:

STD. NO.	TITLE
DIVISION 2 - EARTHWORK	
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Super-elevation - Two Lane Pavement
275.01	Rock Plating
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 4 - MAJOR STRUCTURES	
422.01	Bridge Approach Fills - Type I Standard Approach Fill
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Super-elevated Curve - Method 1
DIVISION 8 - INCIDENTALS	
815.02	Subsurface Drain
840.00	Concrete Base Pad for Drainage Structures
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.19	Concrete Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.24	Frames and Narrow Slot Sag Grates
840.28	Brick Grated Drop Inlet Type 'D' - 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
848.02	Driveway Turnout - Radius Type
852.10	Median Construction - with Curb and Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure 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

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale

BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin (EIP)	○
Computed Property Corner	×
Existing Concrete Monument (ECM)	◻
Parcel/Sequence Number	(123)
Existing Fence Line	-x-x-x-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	□
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	---WLB---
Proposed Wetland Boundary	WLB
Existing Endangered Animal Boundary	---EAB---
Existing Endangered Plant Boundary	---EPB---
Existing Historic Property Boundary	---HPB---
Known Contamination Area: Soil	---S---
Potential Contamination Area: Soil	---S---
Known Contamination Area: Water	---W---
Potential Contamination Area: Water	---W---
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	---JS---
Buffer Zone 1	---BZ 1---
Buffer Zone 2	---BZ 2---
Flow Arrow	←
Disappearing Stream	→
Spring	○
Wetland	---WLB---
Proposed Lateral, Tail, Head Ditch	→
False Sump	▽

RAILROADS:

Standard Gauge	-----
RR Signal Milepost	○
Switch	□
RR Abandoned	-----
RR Dismantled	-----

RIGHT OF WAY & PROJECT CONTROL:

Primary Horiz Control Point	○
Primary Horiz and Vert Control Point	●
Secondary Horiz and Vert Control Point	◆
Vertical Benchmark	⊕
Existing Right of Way Monument	△
Proposed Right of Way Monument (Rebar and Cap)	▲
Proposed Right of Way Monument (Concrete)	▲
Existing Permanent Easement Monument	◇
Proposed Permanent Easement Monument (Rebar and Cap)	◆
Existing C/A Monument	△
Proposed C/A Monument (Rebar and Cap)	▲
Proposed C/A Monument (Concrete)	▲
Existing Right of Way Line	-----
Proposed Right of Way Line	-----
Existing Control of Access Line	-----
Proposed Control of Access Line	-----
Proposed ROW and CA Line	-----
Existing Easement Line	-----
Proposed Temporary Construction Easement	-----
Proposed Temporary Drainage Easement	-----
Proposed Permanent Drainage Easement	-----
Proposed Permanent Drainage/Utility Easement	-----
Proposed Permanent Utility Easement	-----
Proposed Temporary Utility Easement	-----
Proposed Aerial Utility Easement	-----

ROADS AND RELATED FEATURES:

Existing Edge of Pavement	-----
Existing Curb	-----
Proposed Slope Stakes Cut	---C---
Proposed Slope Stakes Fill	---F---
Proposed Curb Ramp	○
Existing Metal Guardrail	-----
Proposed Guardrail	-----
Existing Cable Guiderail	-----
Proposed Cable Guiderail	-----
Equality Symbol	⊕
Pavement Removal	▨
VEGETATION:	
Single Tree	○
Single Shrub	○
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:

* SUE - Subsurface Utility Engineering
LOS - Level of Service - A, B, C or D (Accuracy)

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 Test Hole (SUE - LOS A)*	⊕
U/G Power Line (SUE - LOS B)*	-----
U/G Power Line (SUE - LOS C)*	-----
U/G Power Line (SUE - LOS D)*	-----

TELEPHONE:

Existing Telephone Pole	●
Proposed Telephone Pole	○
Telephone Manhole	○
Telephone Pedestal	⊕
Telephone Cell Tower	⊕
U/G Telephone Cable Hand Hole	○
U/G Telephone Test Hole (SUE - LOS A)*	⊕
U/G Telephone Cable (SUE - LOS B)*	-----
U/G Telephone Cable (SUE - LOS C)*	-----
U/G Telephone Cable (SUE - LOS D)*	-----
U/G Telephone Conduit (SUE - LOS B)*	-----
U/G Telephone Conduit (SUE - LOS C)*	-----
U/G Telephone Conduit (SUE - LOS D)*	-----
U/G Fiber Optics Cable (SUE - LOS B)*	-----
U/G Fiber Optics Cable (SUE - LOS C)*	-----
U/G Fiber Optics Cable (SUE - LOS D)*	-----

WATER:

Water Manhole	○
Water Meter	○
Water Valve	⊗
Water Hydrant	⊕
U/G Water Line Test Hole (SUE - LOS A)*	⊕
U/G Water Line (SUE - LOS B)*	-----
U/G Water Line (SUE - LOS C)*	-----
U/G Water Line (SUE - LOS D)*	-----
Above Ground Water Line	-----

TV:

TV Pedestal	⊕
TV Tower	⊗
U/G TV Cable Hand Hole	○
U/G TV Test Hole (SUE - LOS A)*	⊕
U/G TV Cable (SUE - LOS B)*	-----
U/G TV Cable (SUE - LOS C)*	-----
U/G TV Cable (SUE - LOS D)*	-----
U/G Fiber Optic Cable (SUE - LOS B)*	-----
U/G Fiber Optic Cable (SUE - LOS C)*	-----
U/G Fiber Optic Cable (SUE - LOS D)*	-----

GAS:

Gas Valve	◇
Gas Meter	⊕
U/G Gas Line Test Hole (SUE - LOS A)*	⊕
U/G Gas Line (SUE - LOS B)*	-----
U/G Gas Line (SUE - LOS C)*	-----
U/G Gas Line (SUE - LOS D)*	-----
Above Ground Gas Line	-----

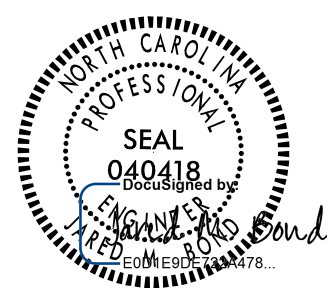

SANITARY SEWER:

Sanitary Sewer Manhole	⊕
Sanitary Sewer Cleanout	⊕
U/G Sanitary Sewer Line	-----
Above Ground Sanitary Sewer	-----
SS Force Main Line Test Hole (SUE - LOS A)*	⊕
SS Force Main Line (SUE - LOS B)*	-----
SS Force Main Line (SUE - LOS C)*	-----
SS Force Main Line (SUE - LOS D)*	-----

MISCELLANEOUS:

Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	⊕
Utility Unknown U/G Line (SUE - LOS B)*	-----
U/G Tank; Water, Gas, Oil	▭
Underground Storage Tank, Approx. Loc.	⊕
A/G Tank; Water, Gas, Oil	▭
Geoenvironmental Boring	⊕
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.

8/17/99

PROJECT REFERENCE NO. <i>BR-0160</i>		SHEET NO. <i>2A-1</i>	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		PAVEMENT DESIGN ENGINEER	
 SEAL 040418 3/14/2023		 SEAL 022622 3/14/2023	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

RS&H 8521 SIX FORKS ROAD, SUITE 400
 RALEIGH, NC 27615
 NC FIRM LICENSE No: F-0493

FINAL PAVEMENT DESIGN			
A	CONCRETE WEARING SURFACE (STRUCTURE PAY ITEM)	R1	2'-6" CONCRETE CURB AND GUTTER
C1	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ YD.	R2	4" CONCRETE ISLAND COVER
C2	PROP. APPROX. 3.0" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	R3	SHOULDER BERM GUTTER
D1	PROP. APPROX. 4.0" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R4	42" SLOTTED VERTICAL CONCRETE BARRIER W/ MOMENT SLAB
E1	PROP. APPROX. 4.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	T	EARTH MATERIAL
J1	6" AGGREGATE BASE COURSE		

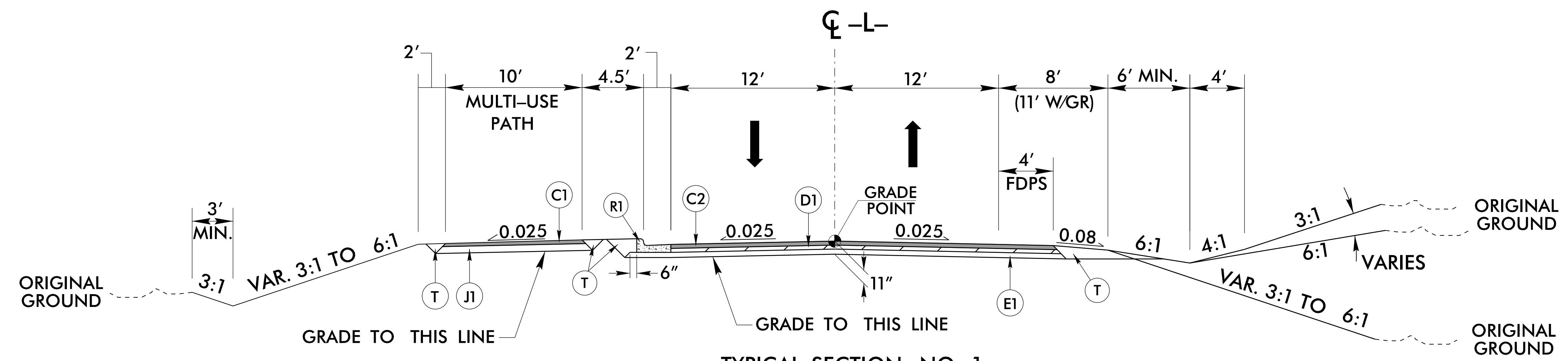
NOTE: PAVEMENT EDGES ARE 1:1 UNLESS SHOWN OTHERWISE.

8/17/99

PROJECT REFERENCE NO. BR-0160	SHEET NO. 2A-2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
3/14/2023	3/14/2023

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

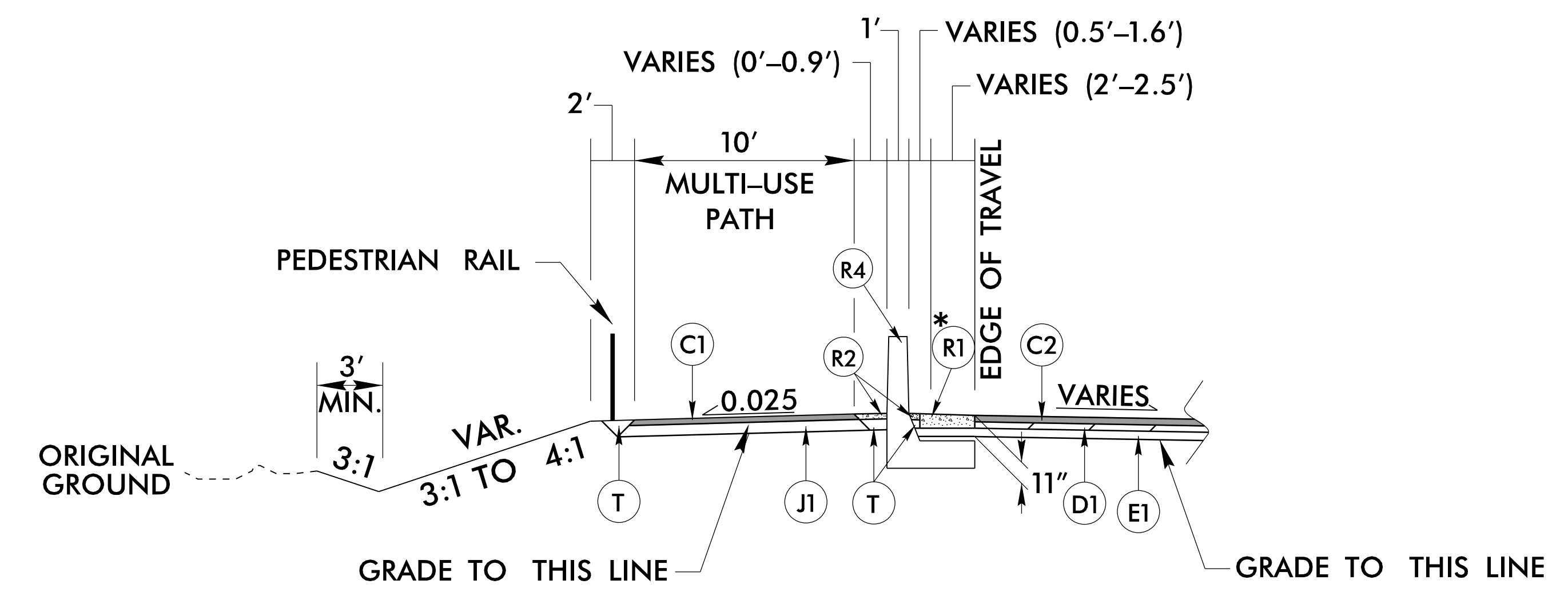
RS&H
8521 SIX FORKS ROAD, SUITE 400
RALEIGH, NC 27615
NC FIRM LICENSE No: F-0493



TYPICAL SECTION NO. 1

-L- STA. 13+00.00 TO -L- STA. 18+88.31 (BEGIN BRIDGE)
 (END BRIDGE) -L- STA. 24+66.69 TO -L- STA. 29+50.00

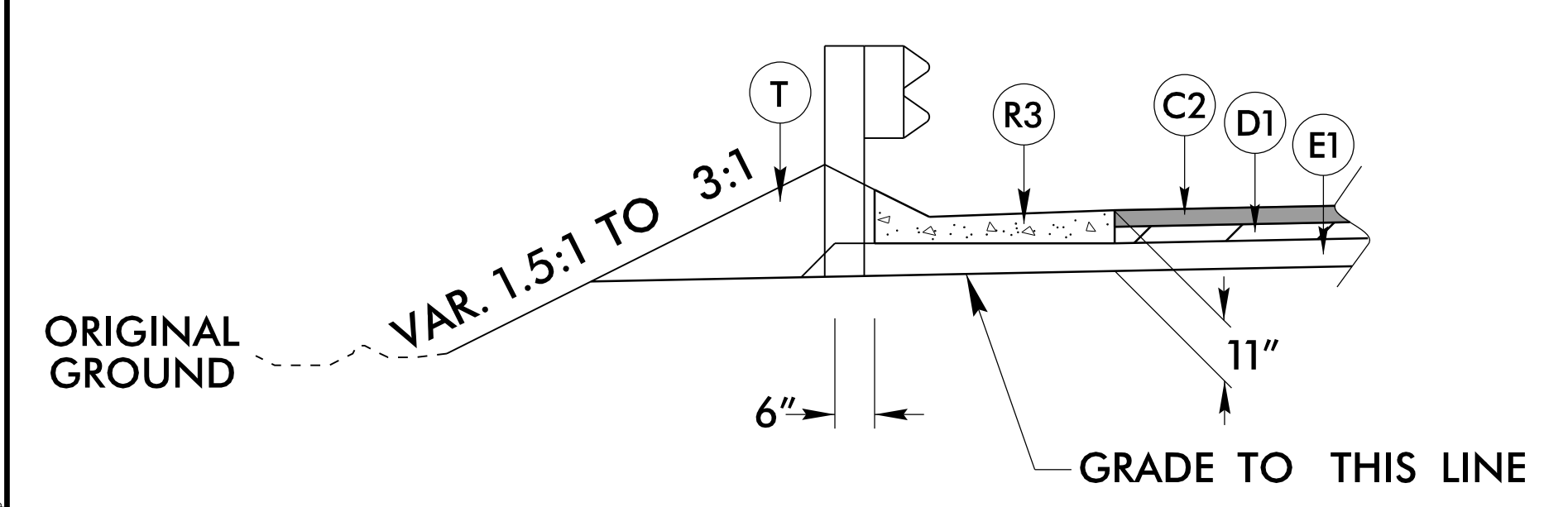
C1	1.5" S9.5B
C2	3.0" S9.5C
D1	4.0" I19.0C
E1	4.0" B25.0C
J1	6" ABC
R1	2'-6" C&G
R2	4" CONC. COVER
R3	SBG
R4	42" SLOTTED VERT. CONC. BAR. W/ MOMENT SLAB
T	EARTH MATERIAL



TYPICAL SECTION NO. 1A

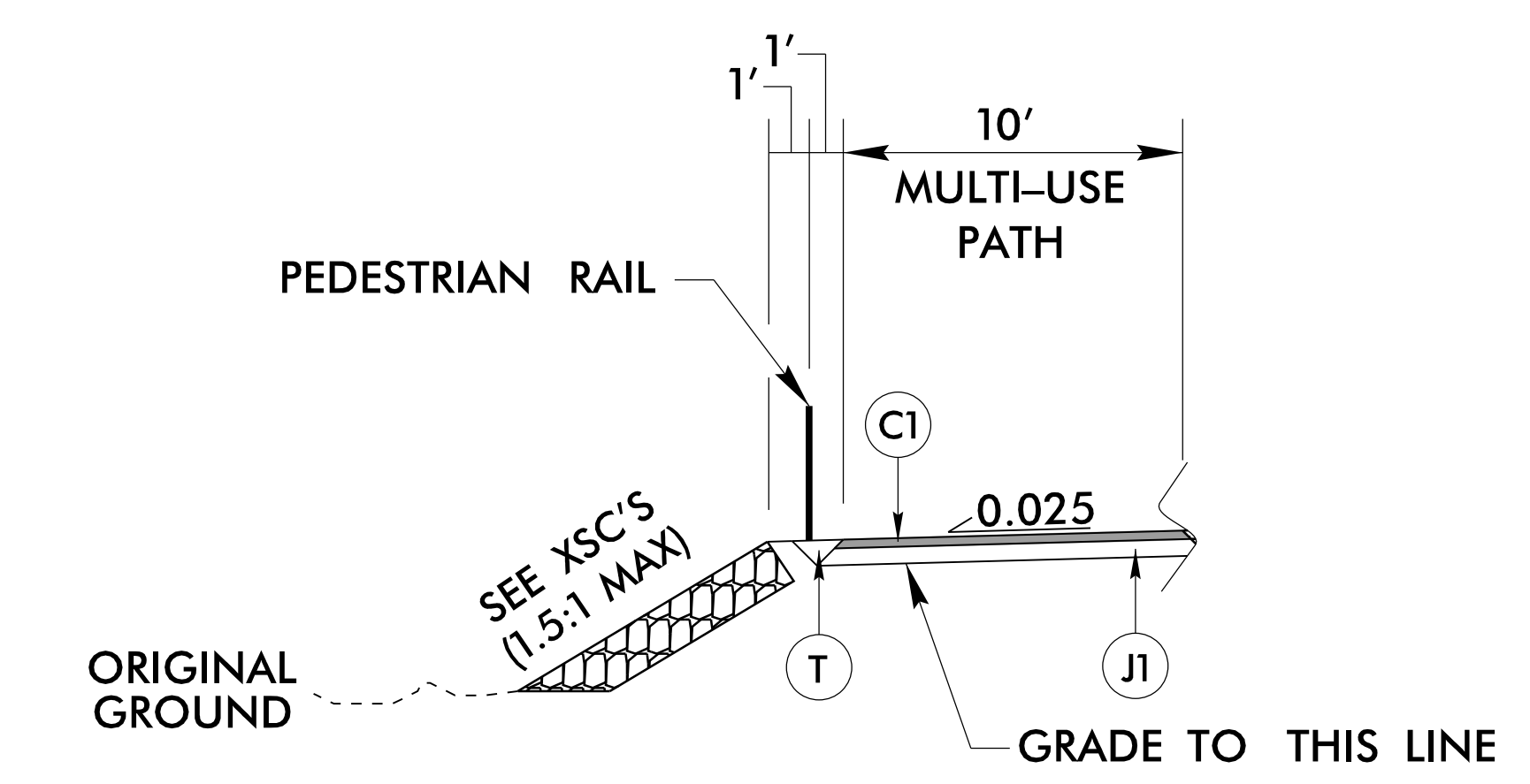
USE IN CONJUNCTION WITH TYPICAL SECTION NO. 1
 -L- STA. 17+90.00 TO -L- STA. 18+64.31
 -L- STA. 24+90.69 TO -L- STA. 25+40.56

* NOTE: TO BE PAID FOR AS 2'-6" CURB AND GUTTER. SEE SHEET 2B-1 FOR CURB TRANSITION DETAILS. GRADE GUTTER TO DRAIN AWAY FROM BARRIER.



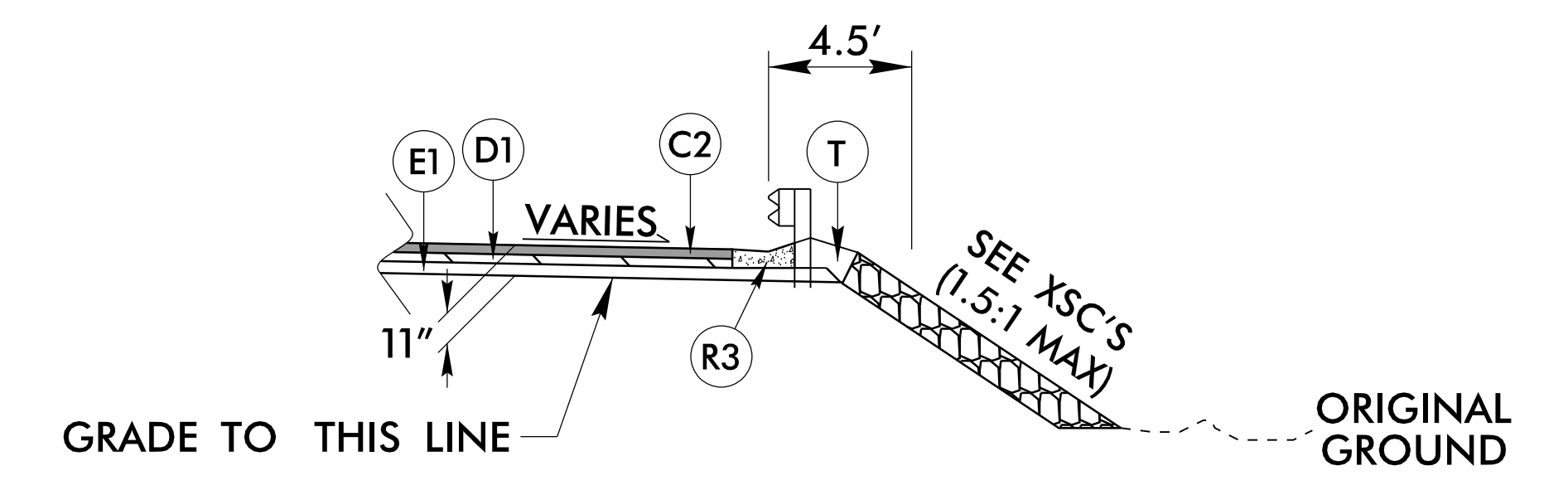
SHOULDER BERM GUTTER DETAIL

-L- STA. 16+69.56 TO -L- STA. 18+64.31 RT.
 -L- STA. 24+90.69 TO -L- STA. 25+10.44 RT.



DETAIL A - ROCK PLATING

-L- STA. 17+37.50 TO -L- STA. 18+64.31 LT.

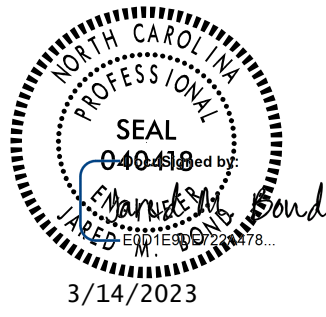
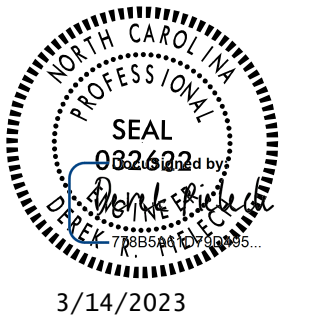


DETAIL B - ROCK PLATING

-L- STA. 17+37.50 TO -L- STA. 18+64.31 RT.

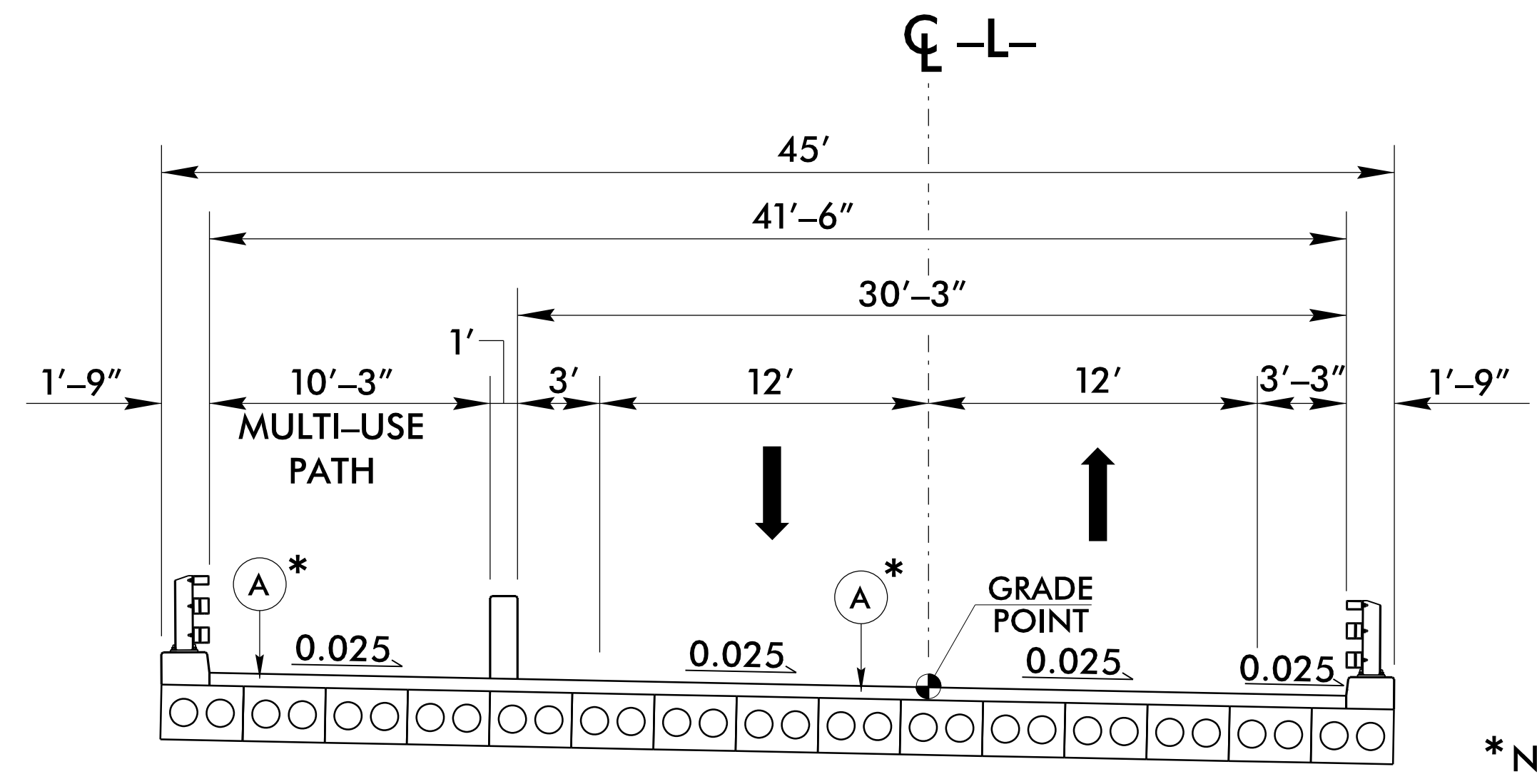
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8/17/99

PROJECT REFERENCE NO. <i>BR-0160</i>		SHEET NO. <i>2A-3</i>	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		PAVEMENT DESIGN ENGINEER	
			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

RS&H 8521 SIX FORKS ROAD, SUITE 400
 RALEIGH, NC 27615
 NC FIRM LICENSE No: F-0493

A	CONC. WR. SURF.
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* NOTE: STRUCTURE PAY ITEM

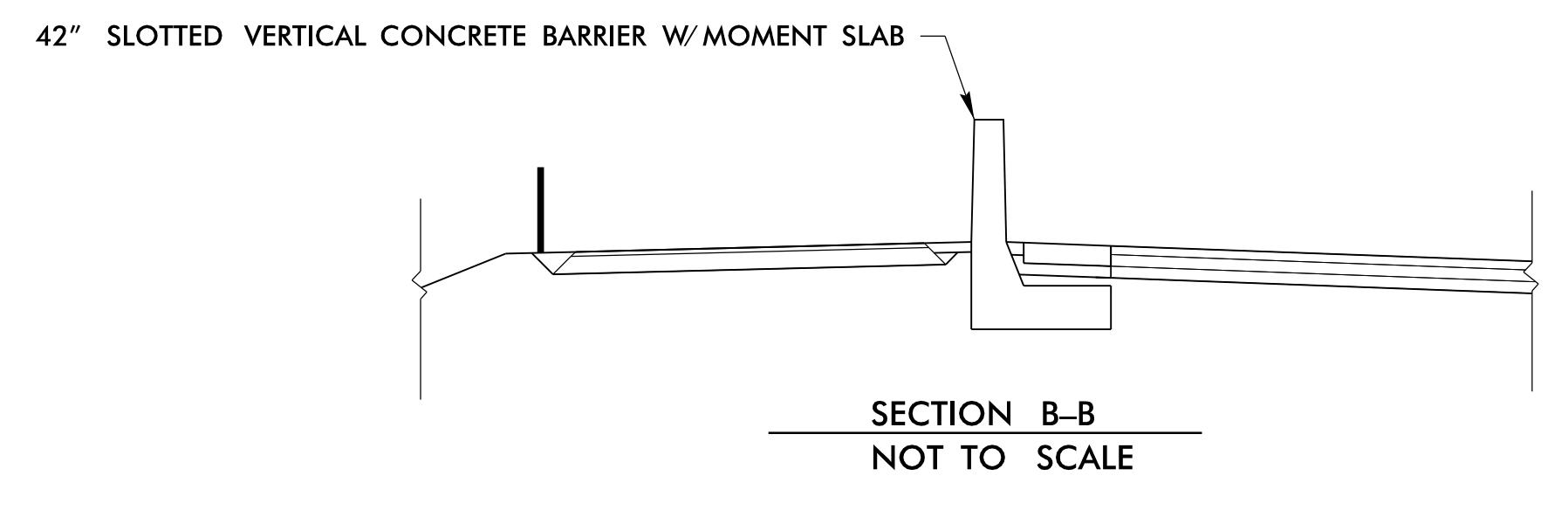
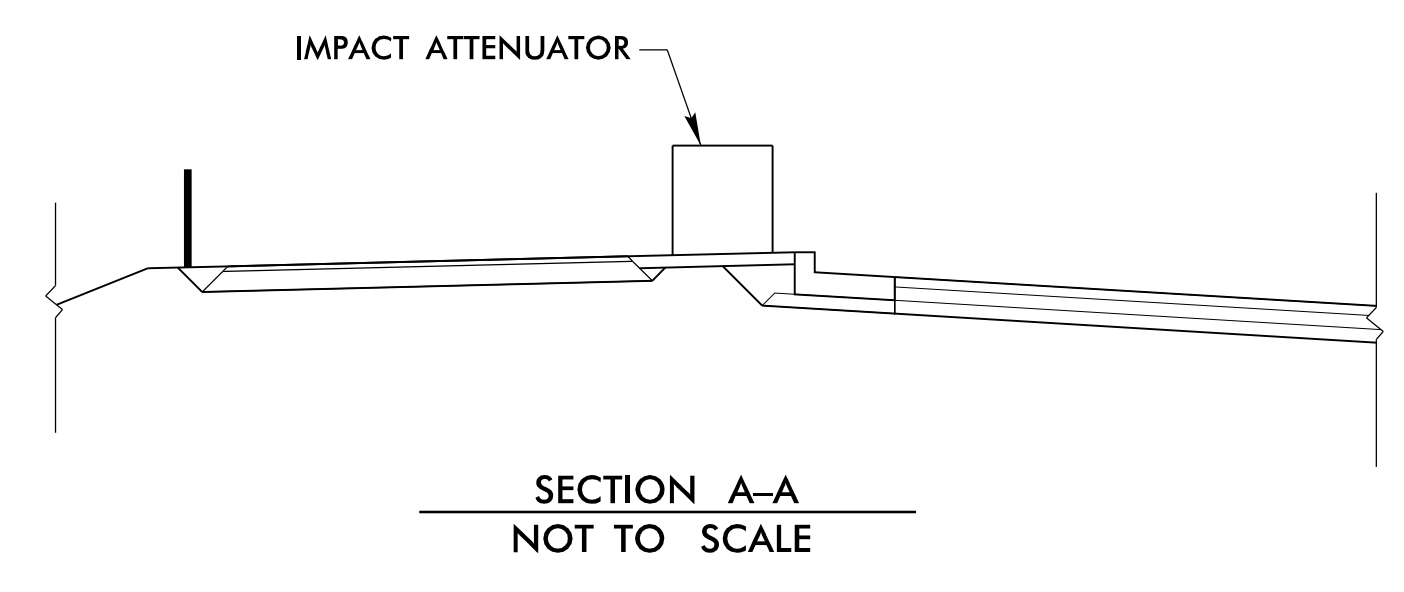
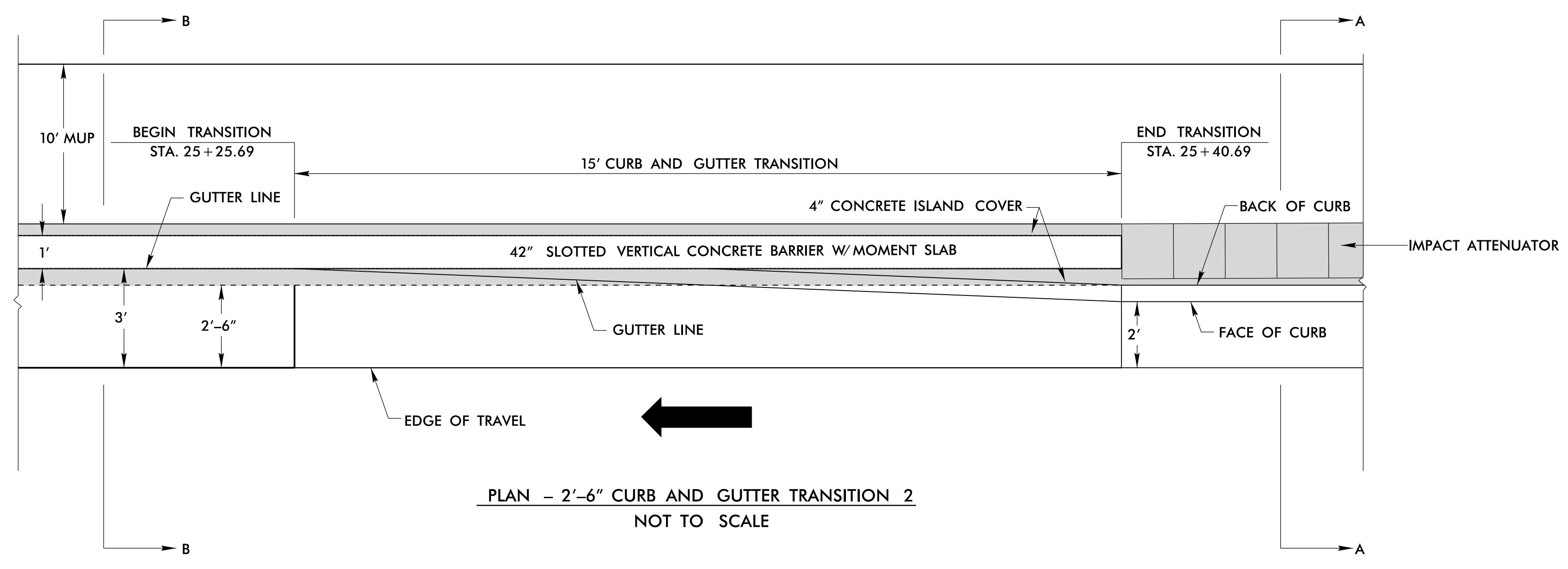
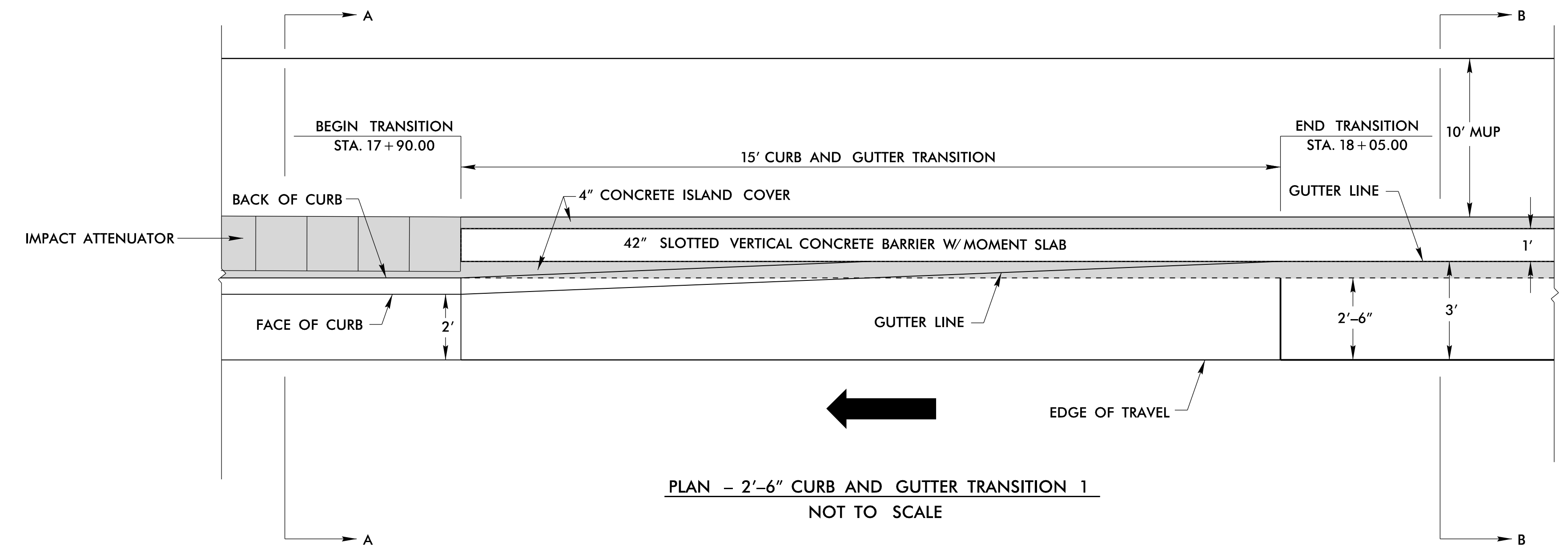
TYPICAL SECTION NO. 2

-L- STA. 18 + 88.31 (BEGIN BRIDGE) TO -L- STA. 24 + 66.69 (END BRIDGE)
 SEE STRUCTURE PLANS FOR DETAILS

13-MAR-2023 16:42
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 USER:RNF

8/17/99

PROJECT REFERENCE NO. <i>BR-0160</i>	SHEET NO. <i>2B-1</i>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	
<p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p>	
<small>8521 SIX FORKS ROAD, SUITE 400 RALEIGH, NC 27615 NC FIRM LICENSE No: F-0493</small>	



14-MAR-2023 11:24
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R:\Roadway\Projects\BR0160_Rdwy_Type_2B-1.dgn

8/17/99
15:\work\2023\1472\15\Design\Transportation\1034226004_BR-0160_Brunswick_15\Design\Structures\eng_data\Misc\Barrier_Design\Moment_Slab_Detail.dgn
15-MAR-2023 14:72
\$\$\$\$\$USERNAME\$\$\$\$\$

NOTES:

THE BARRIER RAIL SHALL NOT BE CAST UNTIL ALL MOMENT SLAB AND STEM CONCRETE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

THE MOMENT SLAB AND BARRIER RAIL SHALL BE CLASS AA CONCRETE.

ALL REINFORCING STEEL IN THE BARRIER RAIL AND MOMENT SLAB SHALL BE EPOXY COATED.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND MOMENT SLAB IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED APPROXIMATELY AT EACH QUARTER POINT BETWEEN RAIL EXPANSION JOINTS.

FIELD BEND BARS AS NECESSARY.

BELOW MOMENT SLAB, PROVIDE 6" MINIMUM THICKNESS OF CLASS VI SELECT MATERIAL FOUNDATION CONDITIONING MATERIAL.

TRANSITION BARRIER RAIL FROM FULL HEIGHT TO MATCH ATTENUATOR HEIGHT AT THE END OF RAIL OVER A 10'-0" LENGTH. FIELD CUT #5 S1 AND BEND #5 "B" BARS IN RAIL TO FIT.

MINIMUM SPLICE LENGTH: #5 = 3'-1".

CONTRACTOR TO VERIFY LOCATION OF PROPOSED DRAINAGE JUNCTION BOX BEFORE CASTING MOMENT SLAB. ADJUST LIMITS OF MOMENT SLAB AS NEEDED TO MAINTAIN CLEARANCE.

VERTICAL CONCRETE BARRIER RAIL ON MOMENT SLAB TO BE A ROADWAY PAY ITEM.

ALL REINFORCMENT TO MAINTAIN A MINIMUM 2" CLEAR COVER U.N.O.

F.O.B. = FACE OF BARRIER RAIL.

E.O.S. = EDGE OF SLAB.

T.O.S. = TOP OF SLAB.

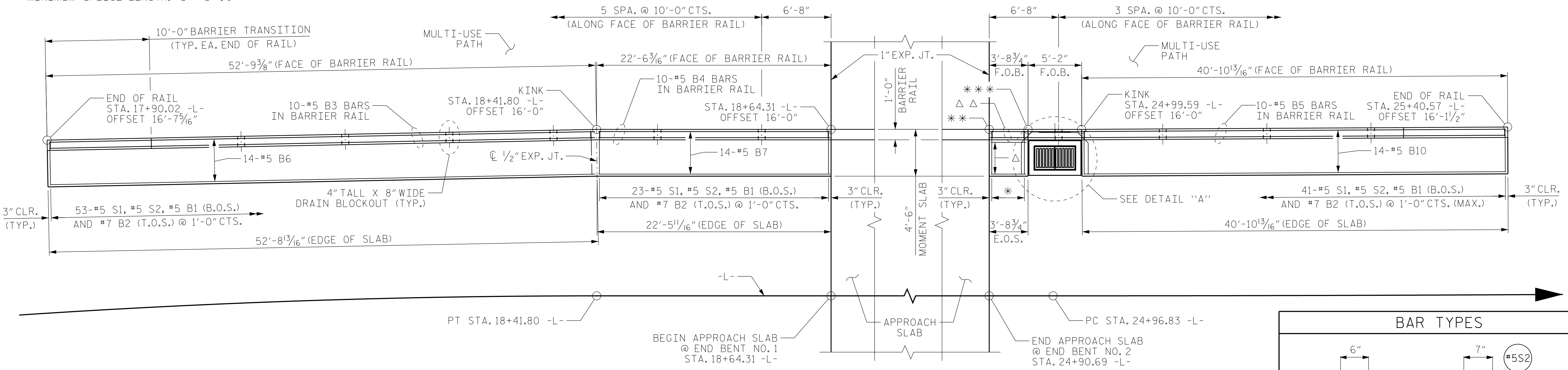
B.O.S. = BOTTOM OF SLAB.

FOR MULTI-USE PATH LIGHTING DETAILS, SEE ELECTRICAL PLANS.

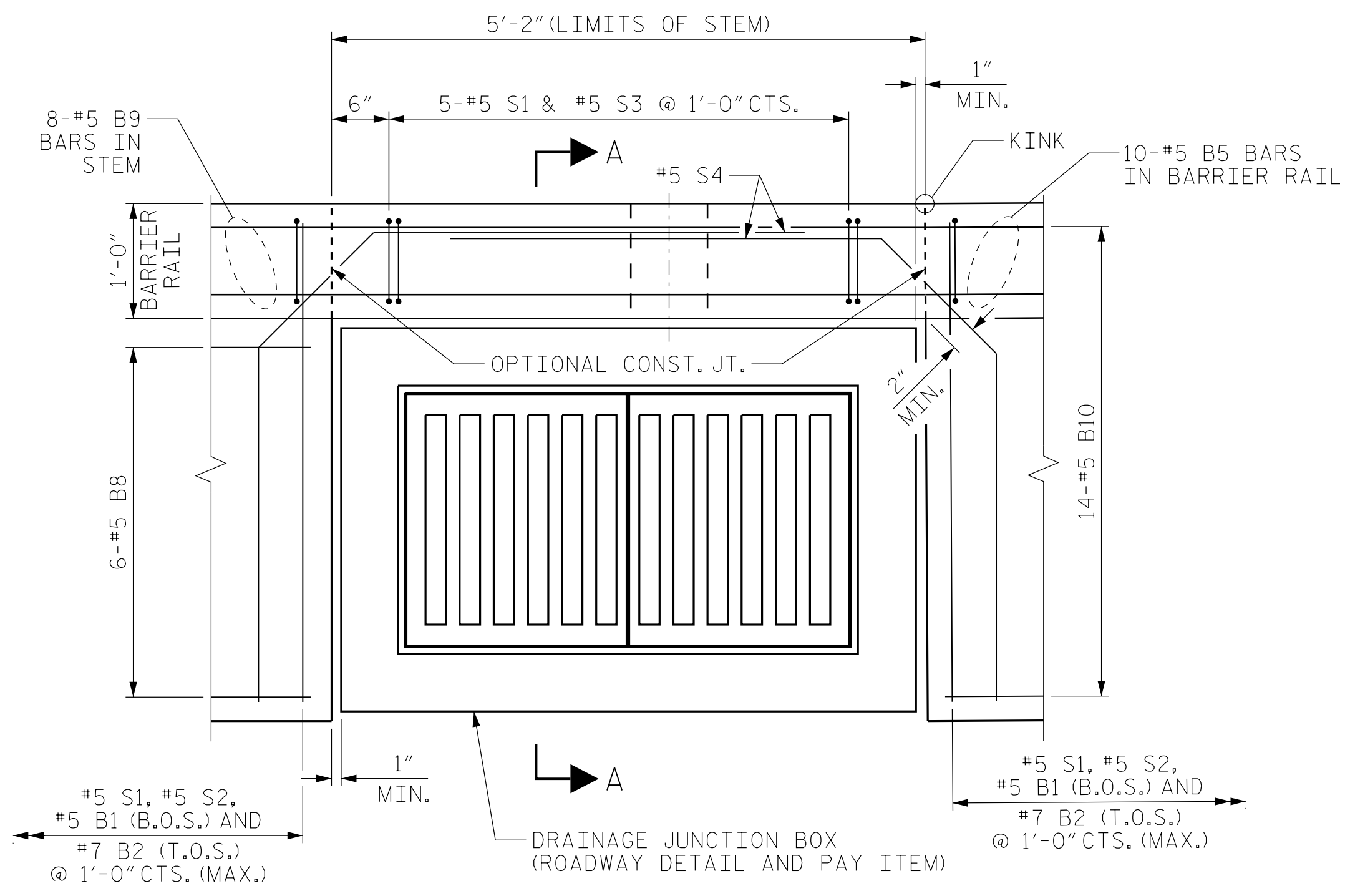
- △ 6-#5 B8
- △△ 8-#5 B9 BARS IN STEM
- * 4-#5 S1, #5 S2, #5 B1 (B.O.S.) AND #7 B2 (T.O.S.) @ 1'-0" CTS. (MAX.)
- ** STA. 24+90.69 -L- OFFSET 16'-0"
- *** STA. 24+94.42 -L- OFFSET 16'-0"
- ⊕ 3/4" PVC CONDUIT FOR MULTI-USE PATH LIGHTING

PROJECT REFERENCE NO. <i>BR-0160</i>	SHEET NO. <i>2B-2</i>
ROADWAY DESIGN ENGINEER 	STRUCTURE DESIGN ENGINEER
3/14/2023	3/14/2023
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

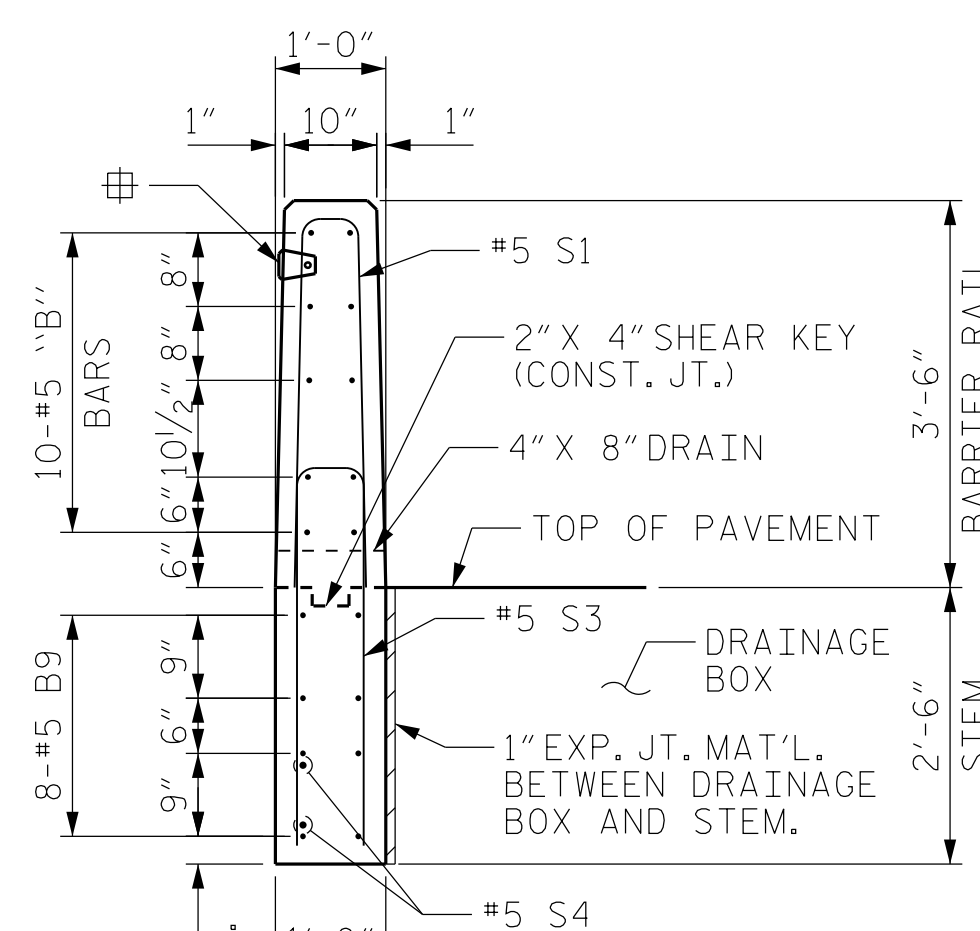
RS&H 8521 SIX FORKS ROAD, SUITE 400
RALEIGH, NC 27615
NC FIRM LICENSE No: F-0493



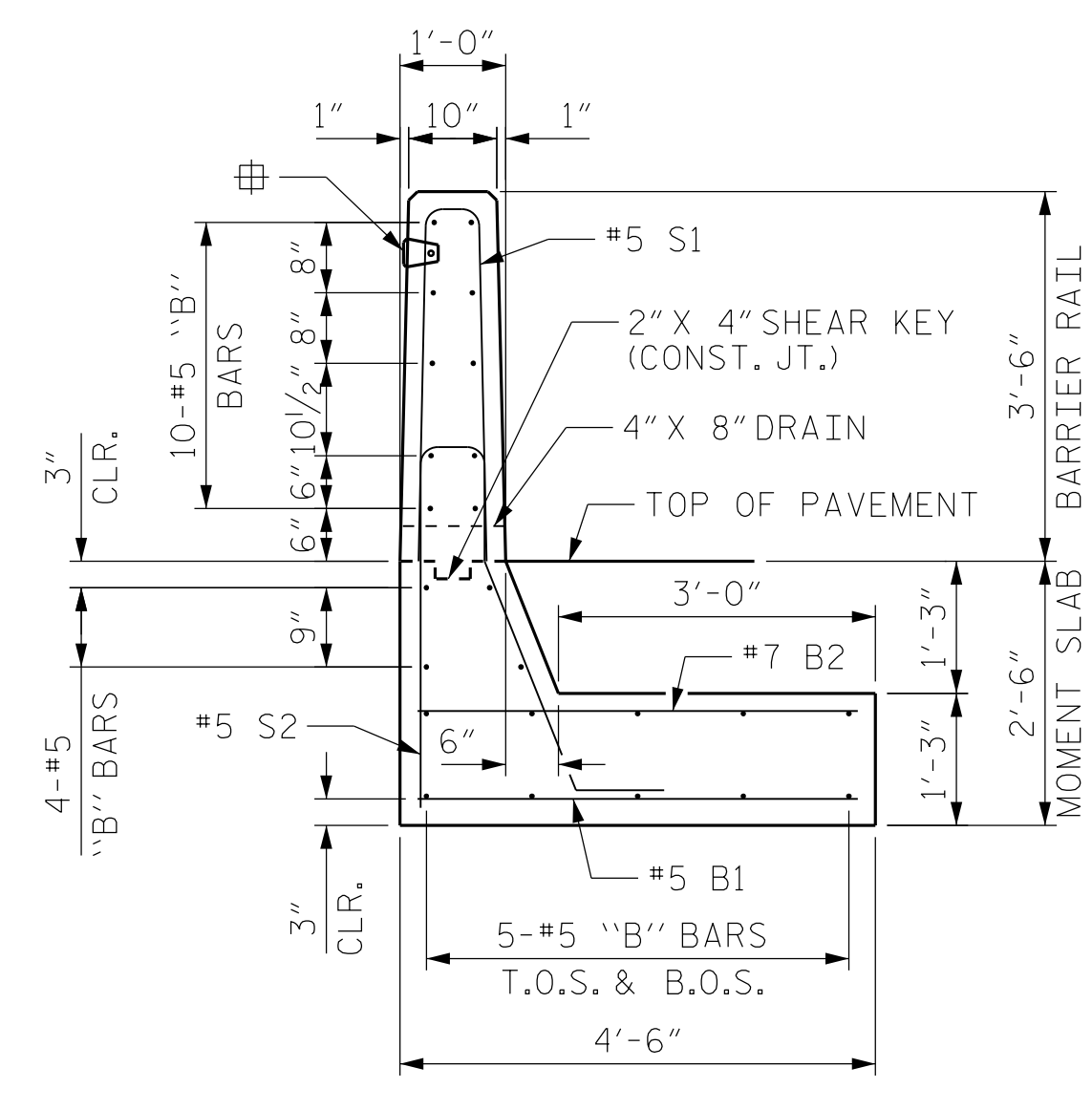
PLAN



DETAIL "A"
#5 B9 BARS TO SPLICE WITH #5 B10 BARS AFTER KINK POINT



SECTION A-A
(LOOKING UPSTATION)
(DRAINAGE BOX NOT SHOWN FOR CLARITY)



SECTION THRU RAIL
(LOOKING UPSTATION)

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT

* EPOXY COATED REINFORCING STEEL	6,688 LBS.
CLASS AA CONCRETE	47.2 CU. YDS.

QUANTITIES SHOWN ARE FOR BIDDING PURPOSES ONLY.

TITLE:
42" SLOTTED VERTICAL CONCRETE BARRIER WITH MOMENT SLAB DETAIL

TIP NO.:
BR-0160

DESIGNED BY:
N. CUANY, PE

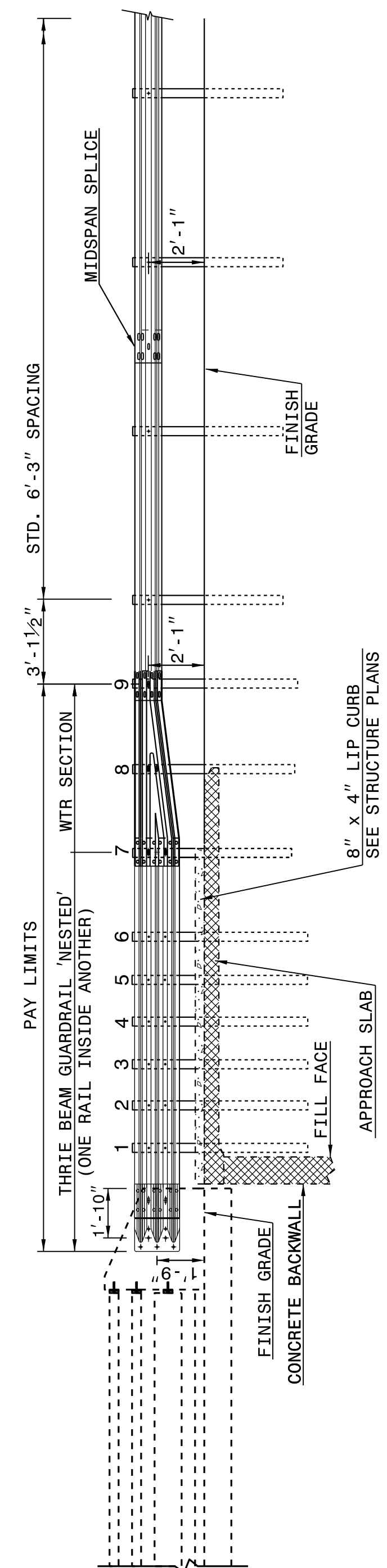
COUNTY:
BRUNSWICK

CHECKED BY:
M. O'CONNOR, PE

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

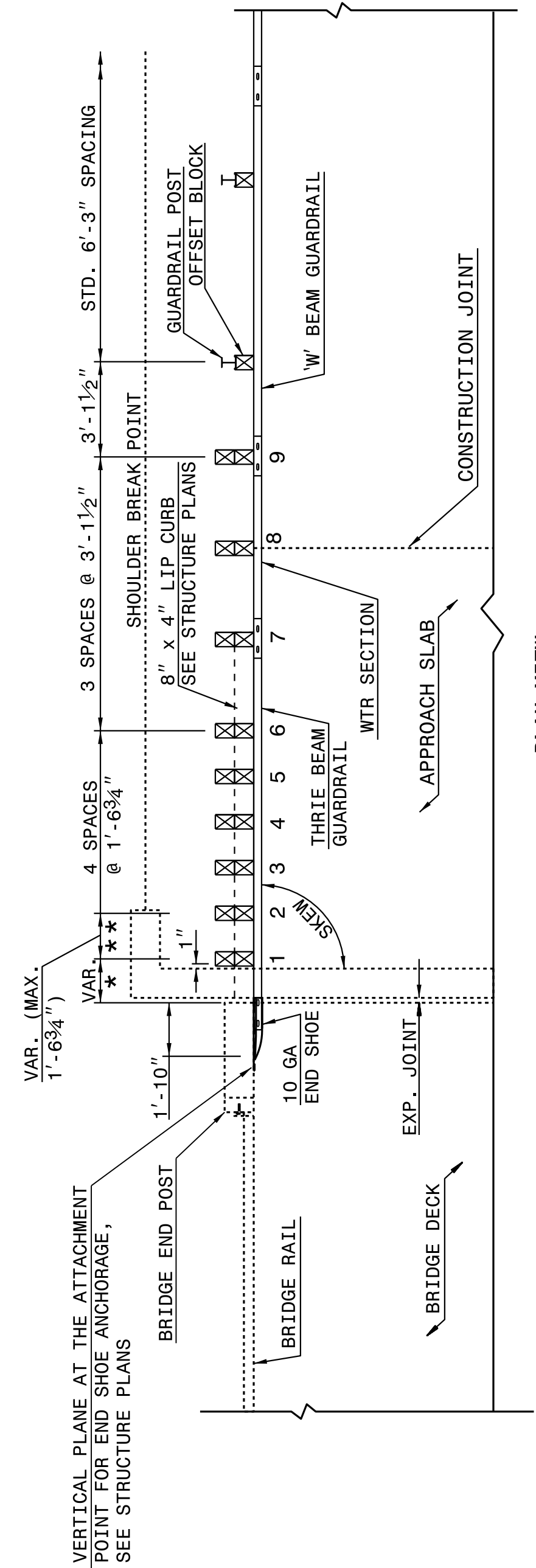
ROADWAY DETAIL DRAWING FOR STRUCTURE ANCHOR UNITS GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE

SHEET 1 OF 7 **862D03**



ELEVATION

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 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).
 -LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
 -SEE SHEET 3 FOR POST SECTIONS 1 THRU 9.



PLAN VIEW

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

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

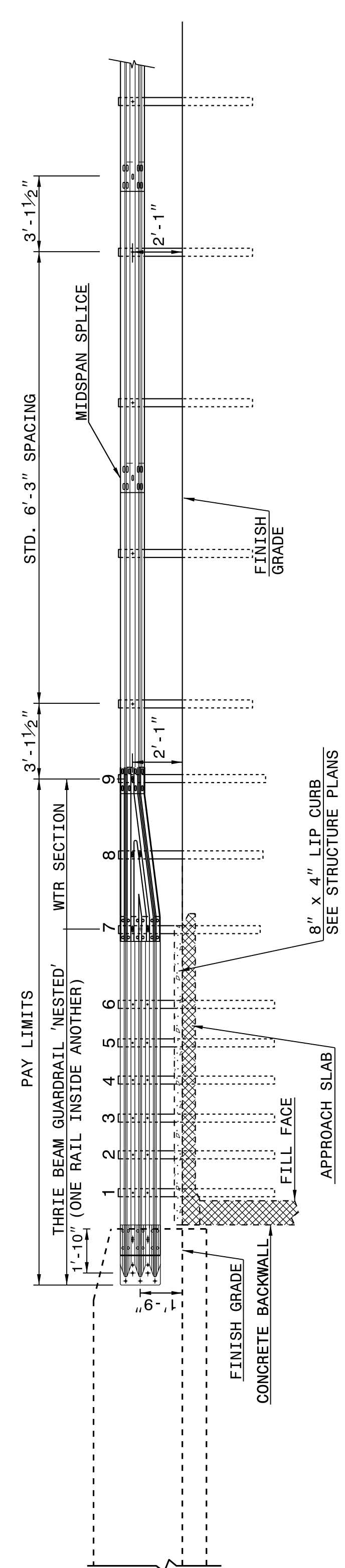
ROADWAY DETAIL DRAWING FOR STRUCTURE ANCHOR UNITS GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE

SHEET 1 OF 7 **862D03**

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

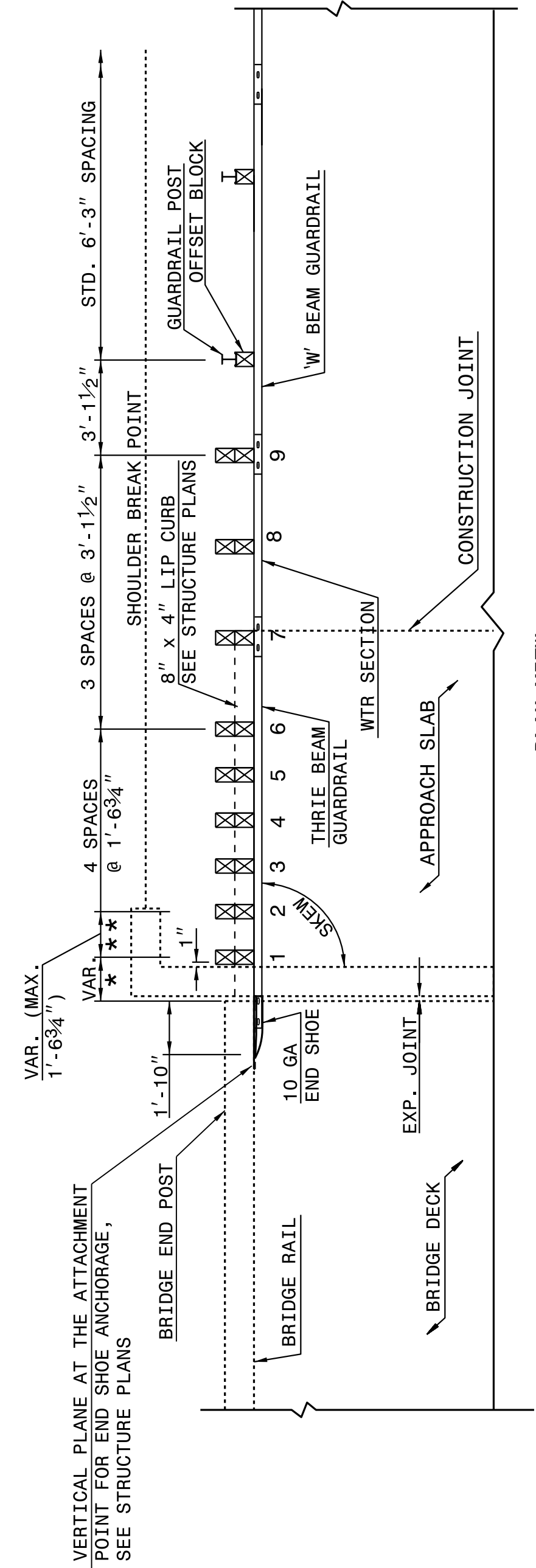
ROADWAY DETAIL DRAWING FOR STRUCTURE ANCHOR UNITS GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER

SHEET 2 OF 7 **862D03**



ELEVATION

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 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).
 -LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
 -SEE SHEET 3 FOR POST SECTIONS 1 THRU 9.



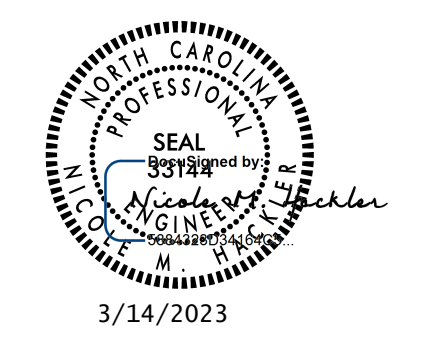
PLAN VIEW

GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER

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**



3/14/2023

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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:

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

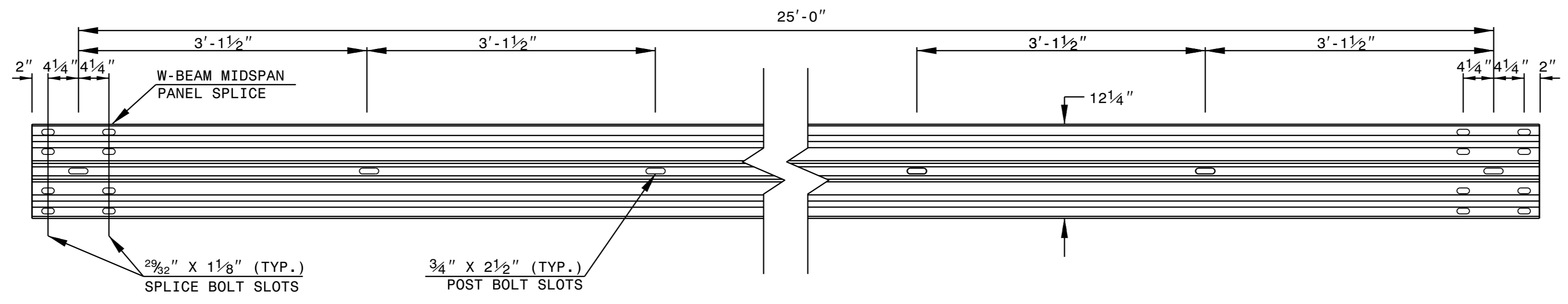
ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02

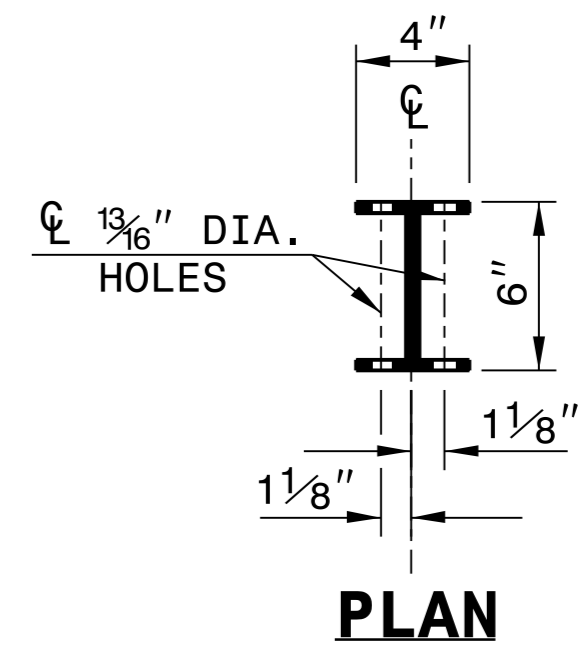
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

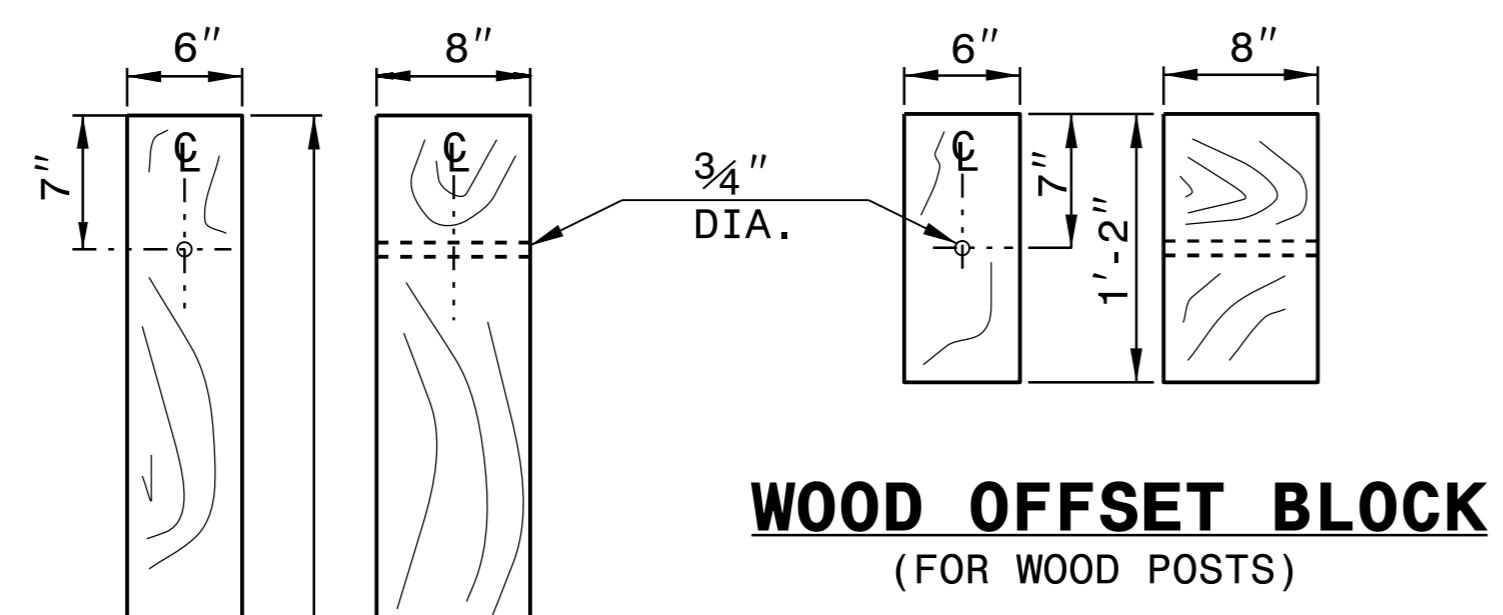
SHEET 6 OF 8
862D02



STANDARD W-BEAM GUARDRAIL



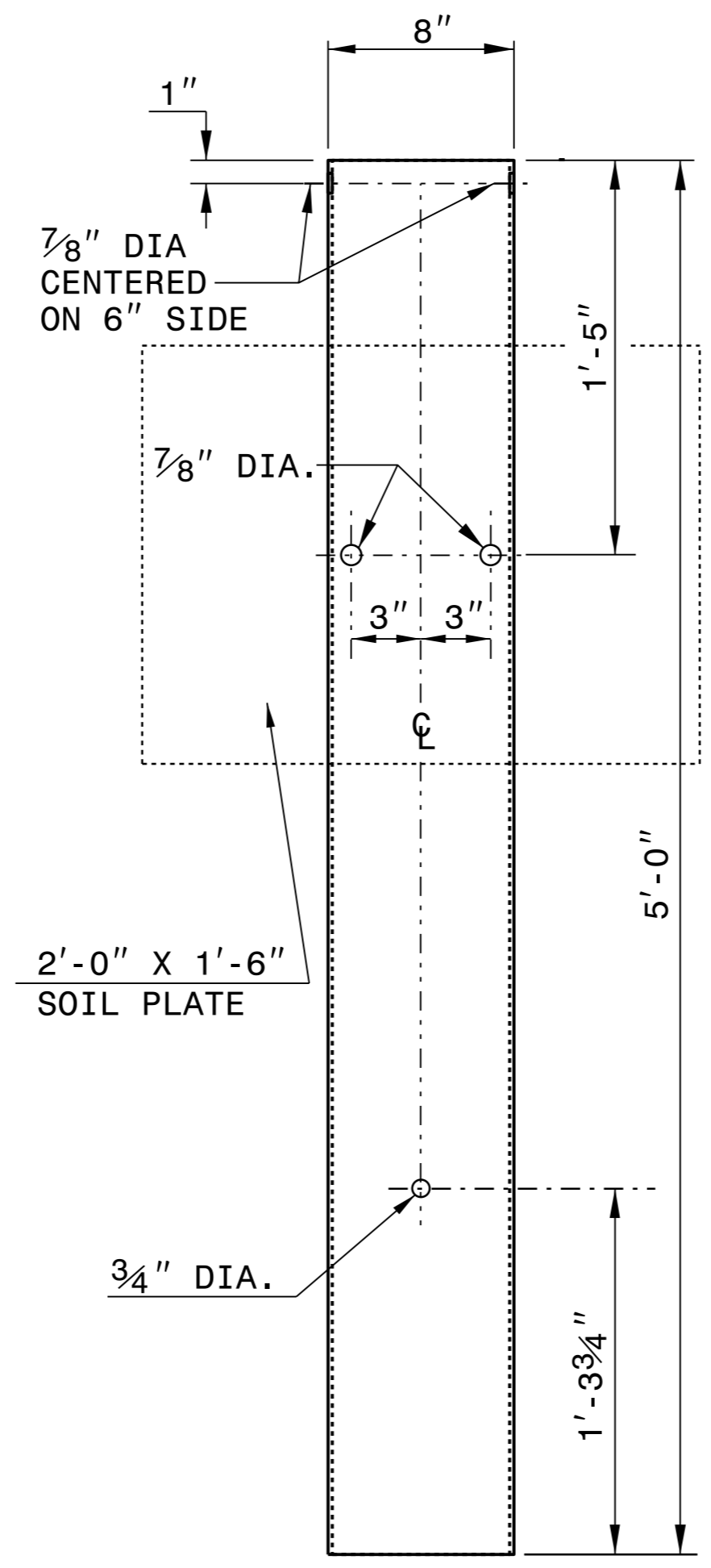
PLAN



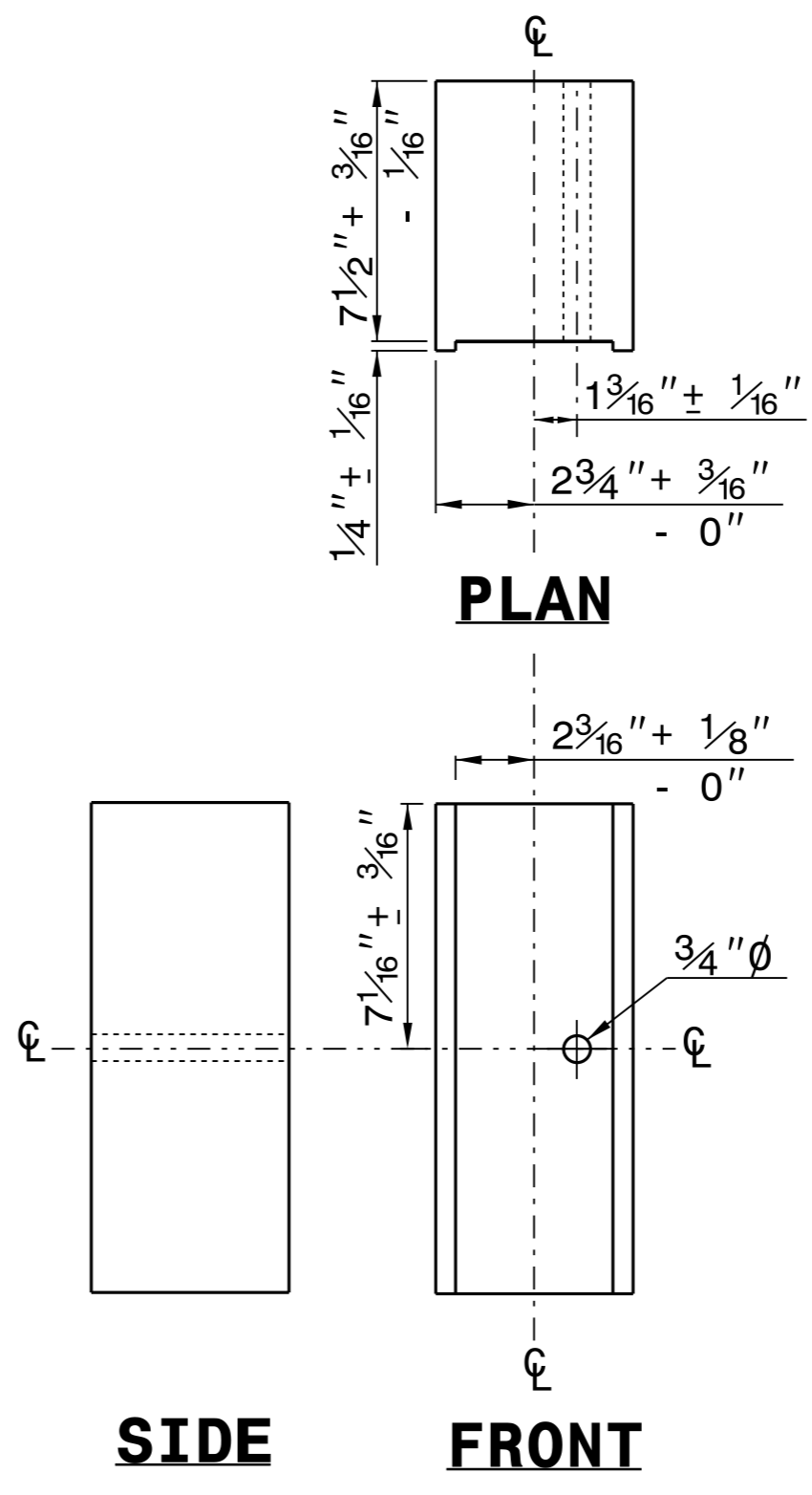
**WOOD OFFSET BLOCK
(FOR WOOD POSTS)**

**STANDARD
LINE POST**

**SHORT WOOD
BREAKAWAY POST**



**STEEL TUBE
TS 6"x8"x0.1875"**

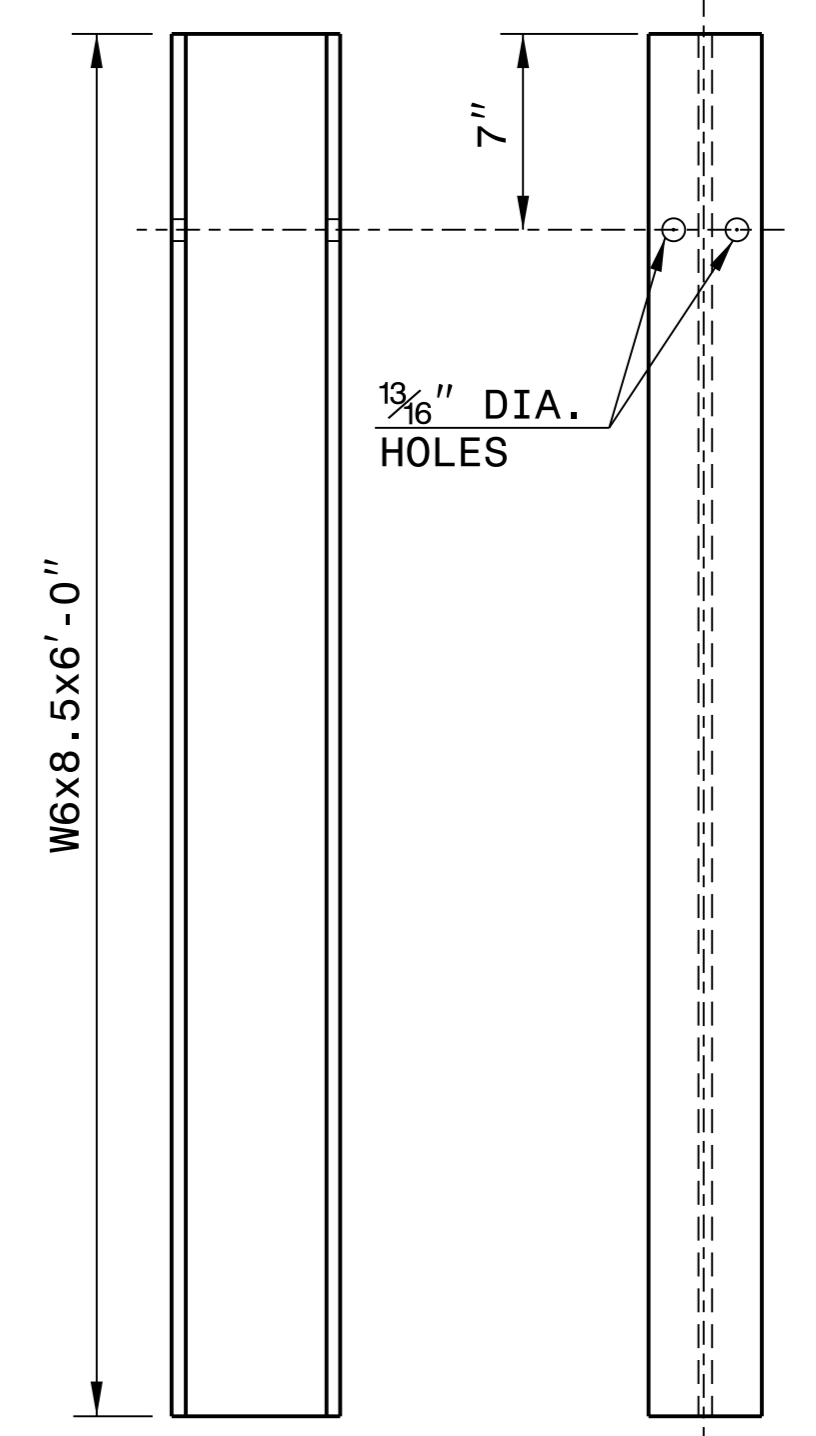


PLAN

SIDE

FRONT

**ROUTED
OFFSET BLOCK**

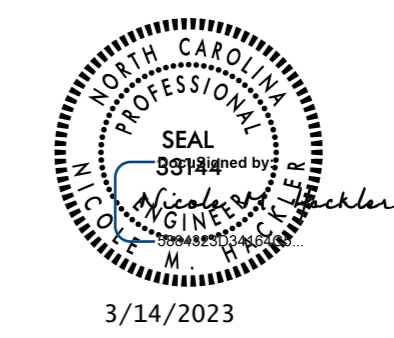


SIDE

FRONT

"W6" STEEL POST

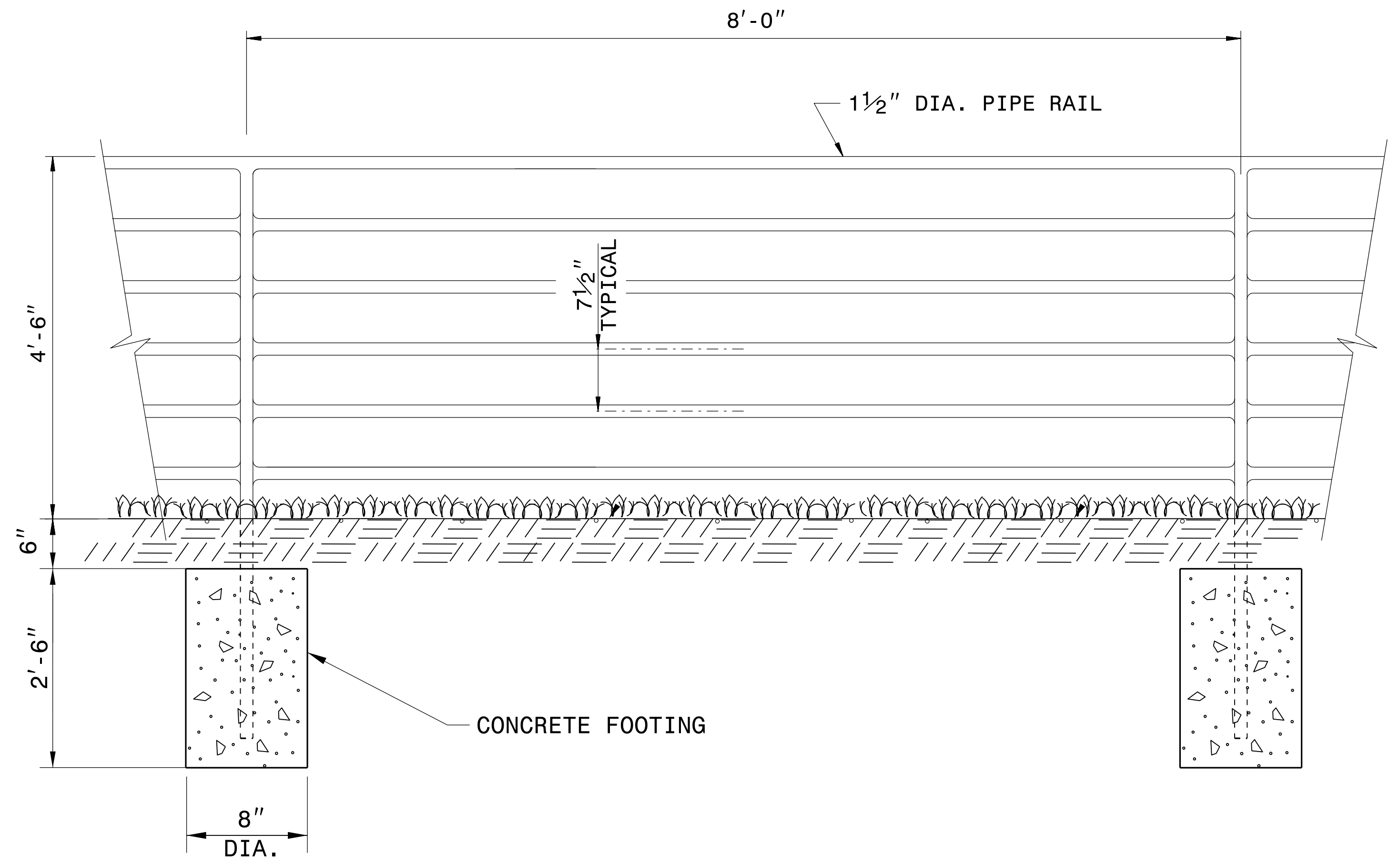
SYSTEM PARTS



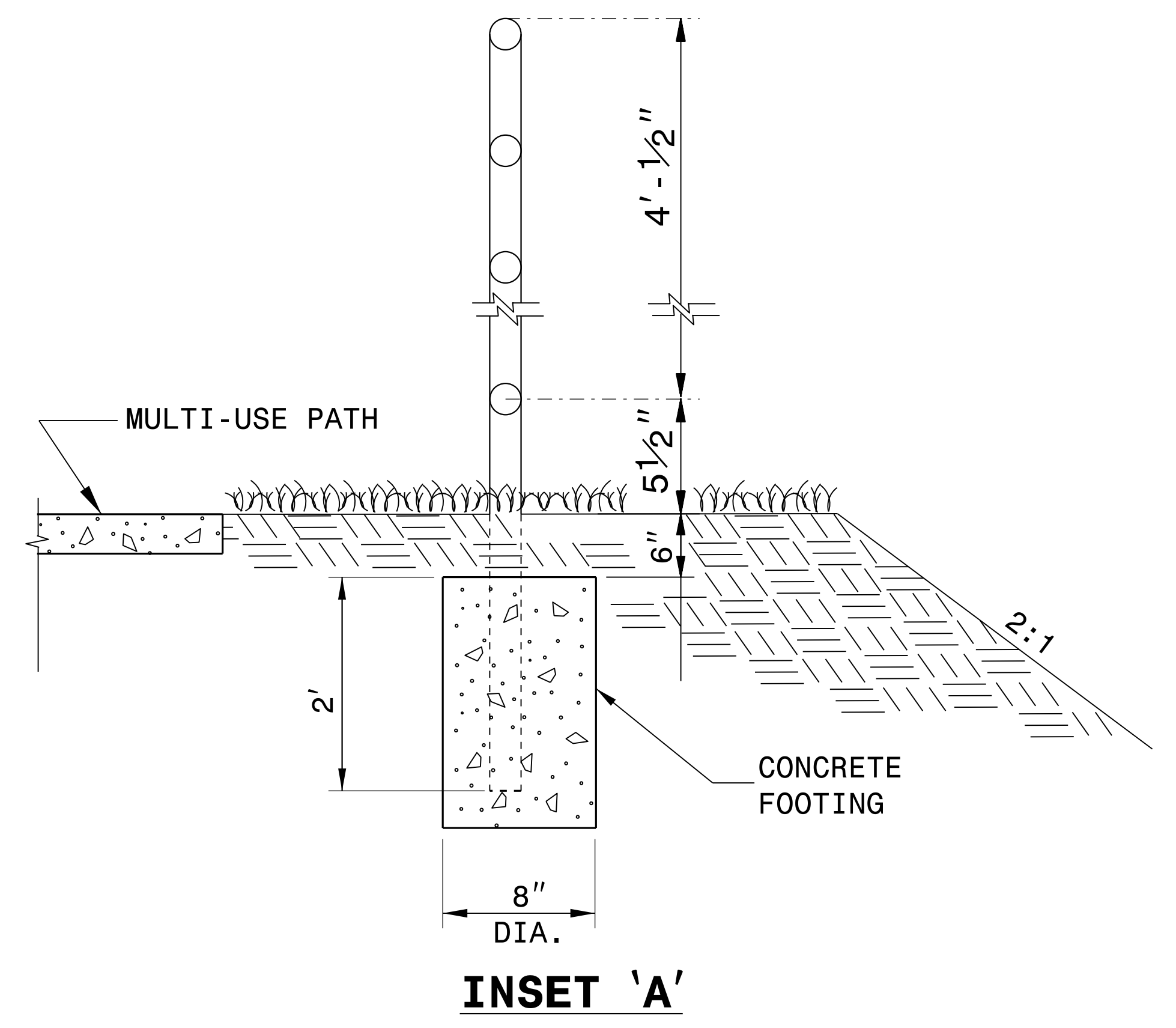
**CONTRACTS STANDARDS
AND DEVELOPMENT UNIT**
Office 919-707-6950 FAX 919-250-4119

SEE TITLE BLOCK

ORIGINAL BY: J. HOWERTON	DATE: 3-7-2018
MODIFIED BY:	DATE:
CHECKED BY:	DATE:
FILE SPEC.:	



ELEVATION OF HANDRAIL



NOTES:

CONSTRUCT PROPOSED STEEL PIPE RAIL OF 1 1/2" DIAMETER SCHEDULE 40 PLAIN END GALVANIZED STEEL PIPE MEETING THE REQUIREMENTS OF ASTM A53.

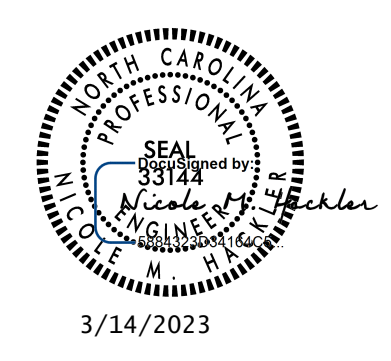
REPAIR GALVANIZING IN ACCORDANCE WITH SECTION 1076 OF THE NCDOT STANDARD SPECIFICATIONS.

PAINT, IF REQUIRED BY THE ENGINEER, IN ACCORDANCE WITH SECTION 1080 OF THE STANDARD SPECIFICATIONS.

WELD IN ACCORDANCE WITH ARTICLE 1072-18 OF THE STANDARD SPECIFICATIONS.

USE CLASS 'B' CONCRETE FOR HANDRAIL FOOTINGS.

PLACEMENT OF HANDRAIL IN RELATION TO SHOULDER BREAK POINT AND PATH MAY BE MODIFIED AS DIRECTED BY THE ENGINEER.



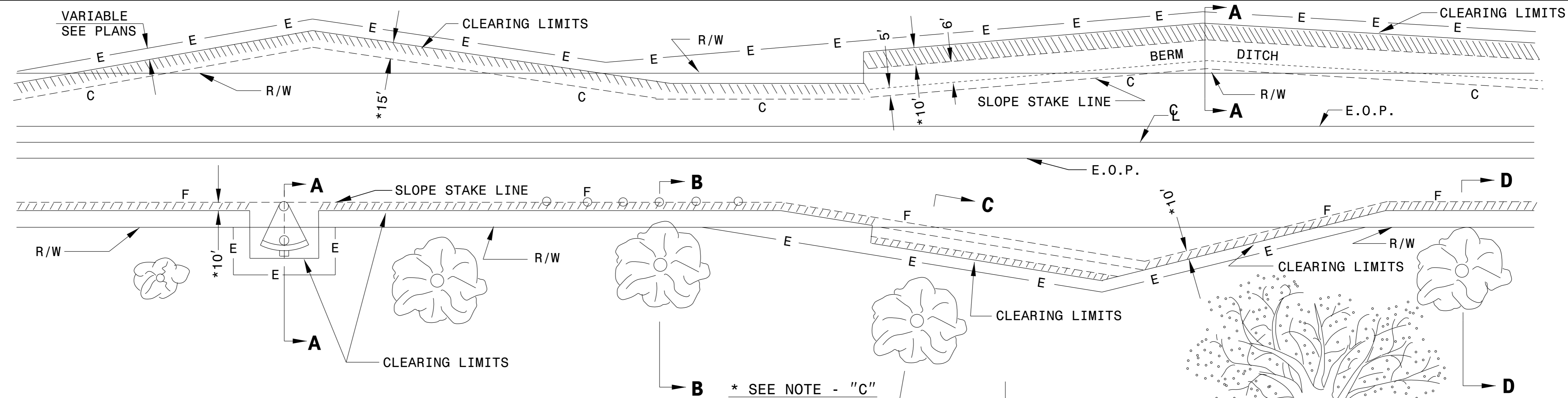
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CONTRACT STANDARDS AND DEVELOPMENT UNIT	
Office 919-707-6950 FAX 919-250-4119	
PROPOSED BIKE/PED SAFETY RAIL	
ORIGINAL BY: E.E. WARD	DATE: 12-99
MODIFIED BY:	DATE:
CHECKED BY:	DATE:
FILE SPEC.: jhowerton/handrail_adjacent_to_sidewalk.dgn	

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

ENGLISH DETAIL DRAWING FOR
METHOD OF CLEARING
 MODIFIED METHOD - III

SHEET 1 OF 1
200D03



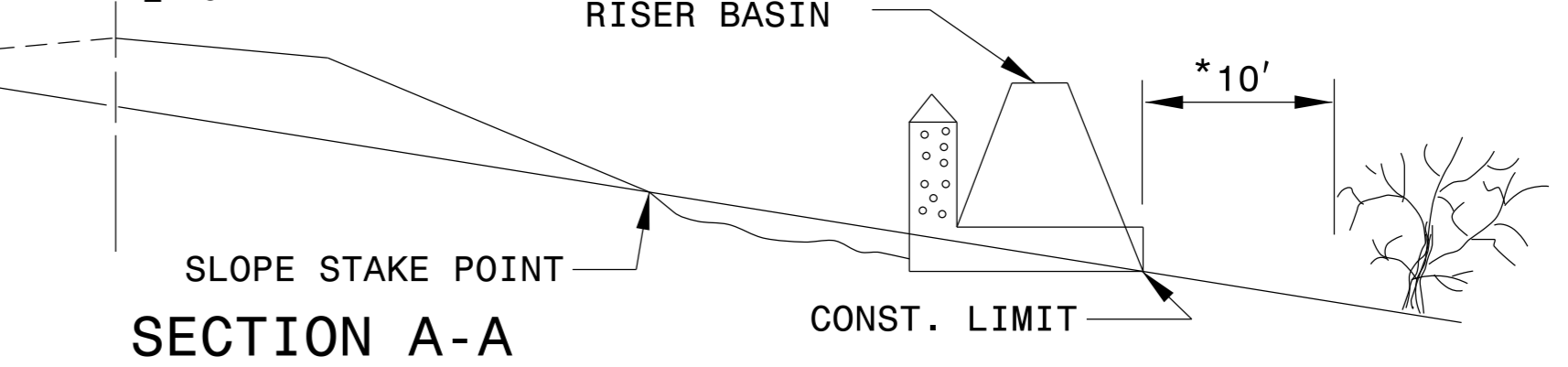
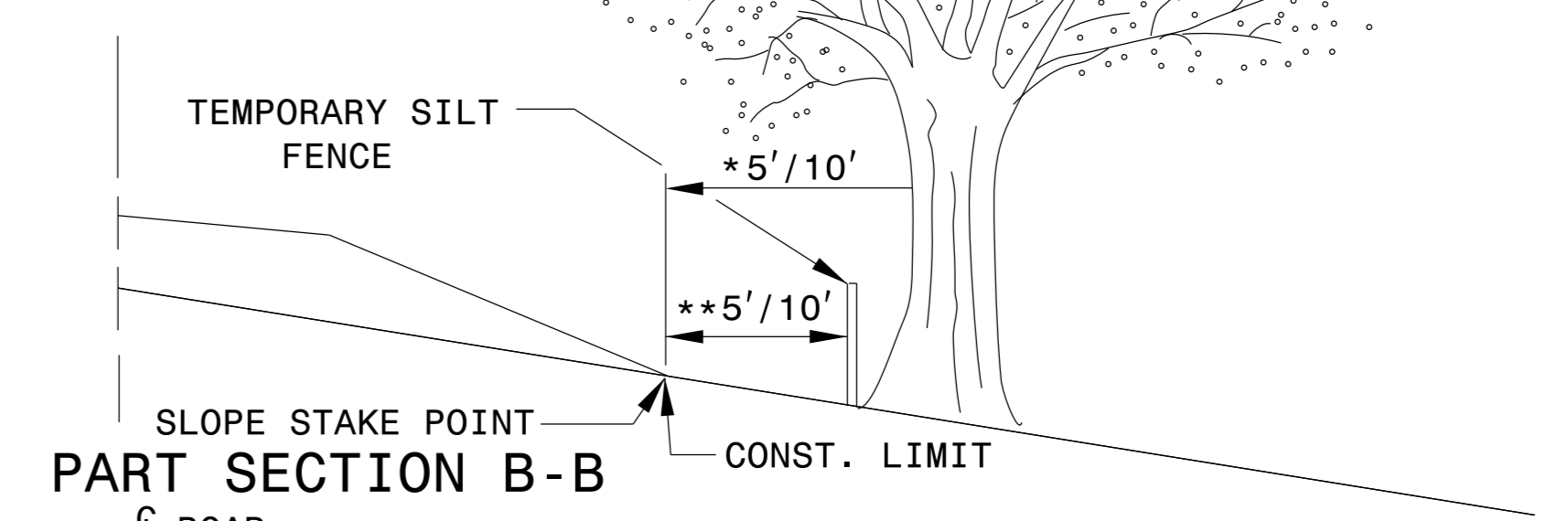
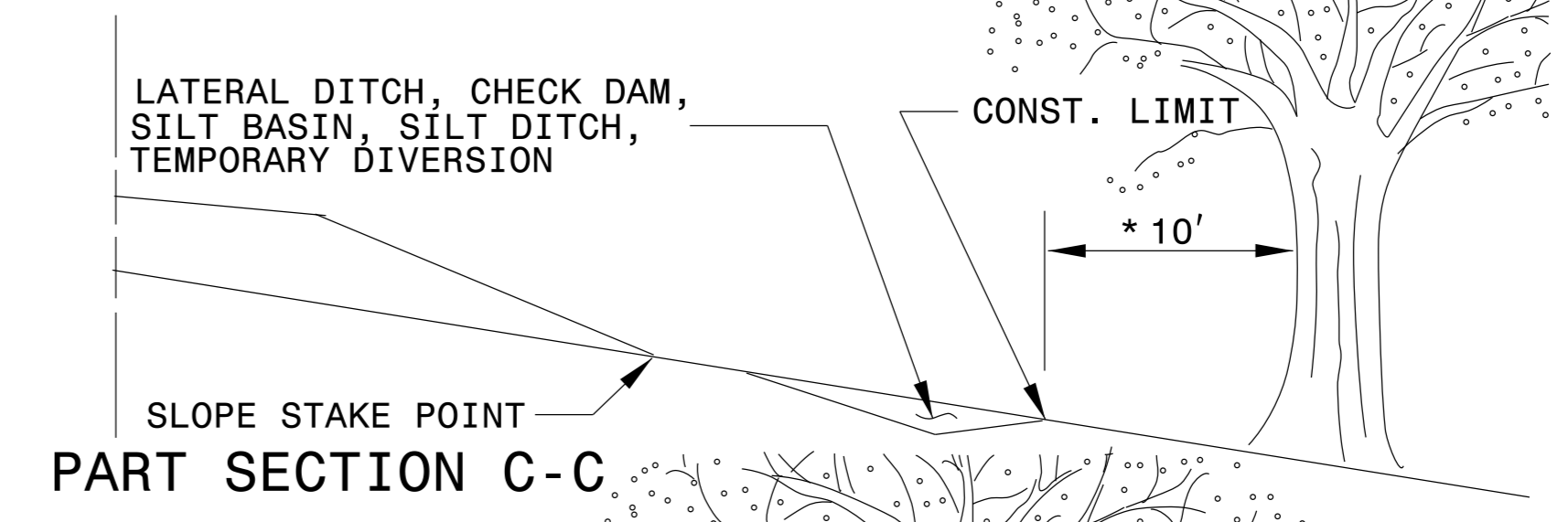
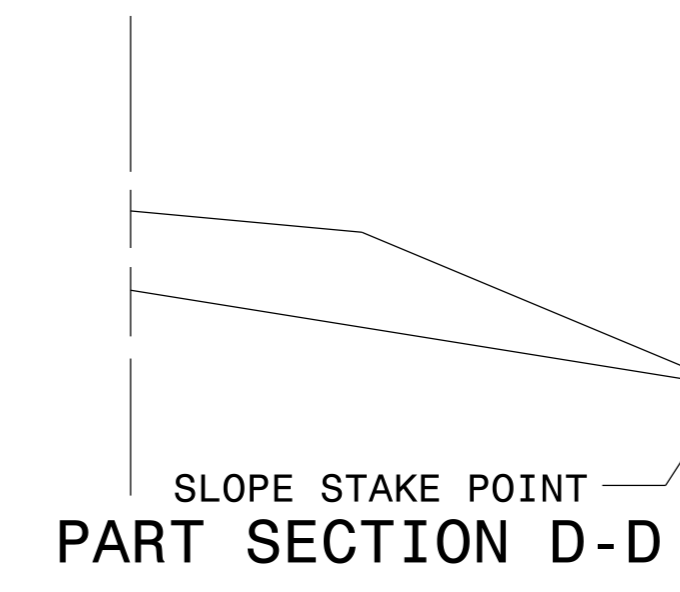
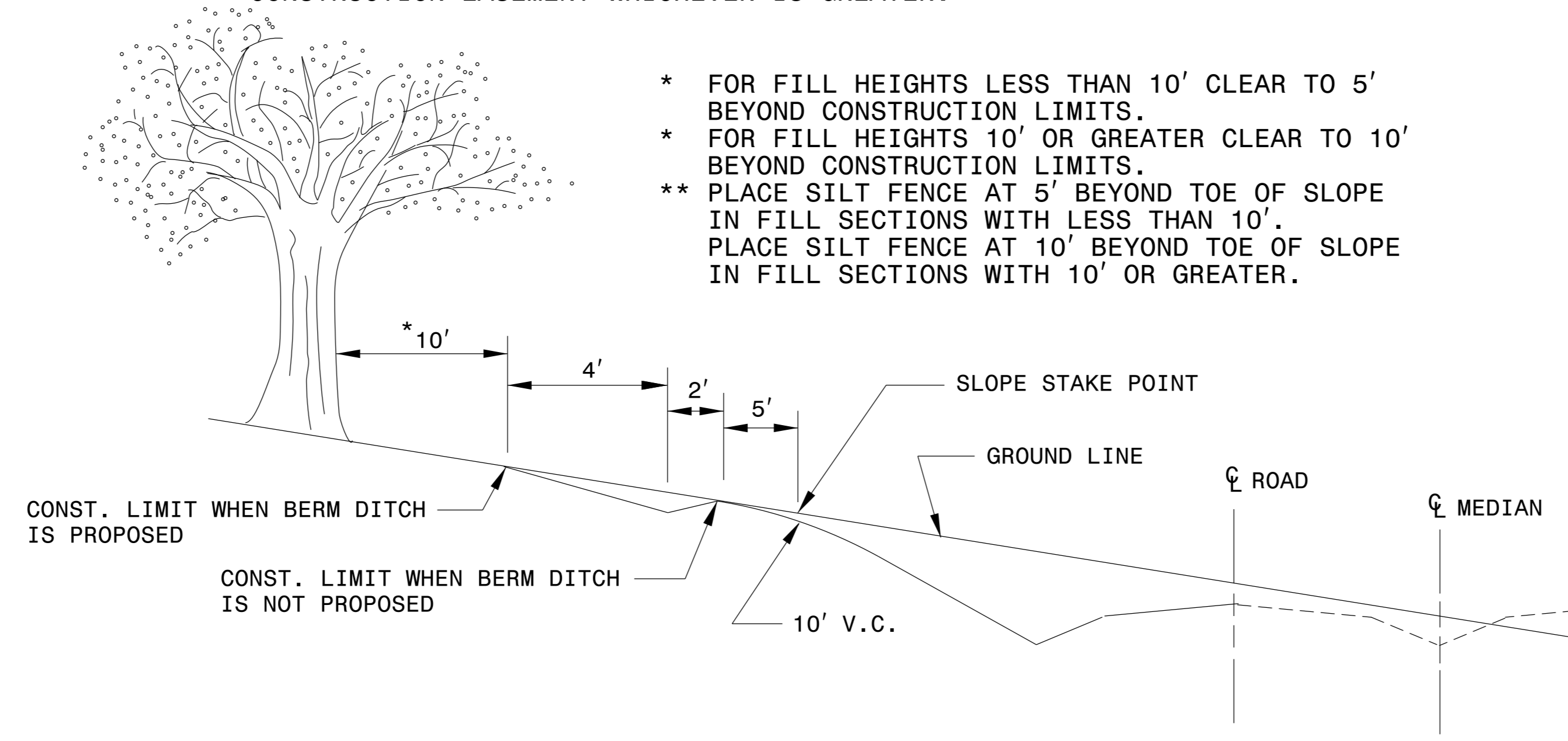
GENERAL NOTES:

1. REMOVE TREES OUTSIDE THE CLEARING LIMIT WHEN, IN THE OPINION OF THE ENGINEER, THE UTILITY OF A TREE WILL BE DESTROYED BY THE CONSTRUCTION OR THE CLEARING OPERATION.
2. CLEAR IN ACCORDANCE WITH THIS STANDARD EXCEPT WHERE ADDITIONAL CLEARING IS REQUIRED FOR SAFETY AS SHOWN ON THE PLANS.

METHOD III CLEARING LIMITS

- (A) CUTS -- CLEAR TO CONSTRUCTION LIMITS.
- (B) FILLS - CLEAR TO 5'/10' * BEYOND CONSTRUCTION LIMITS, UNLESS SPECIFIED OTHERWISE BY WETLAND PERMIT.
- (C) CUTS AND FILLS - WHEN THE CLEARING LIMITS (A AND B) EXCEED THE PROPOSED R/W OR PROPOSED CONSTRUCTION EASEMENTS, THEN CLEAR ONLY TO THE R/W OR CONSTRUCTION EASEMENT WHICHEVER IS GREATER.

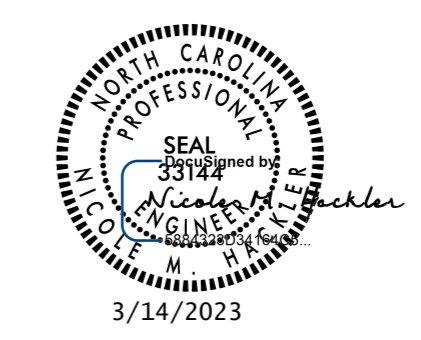
- * FOR FILL HEIGHTS LESS THAN 10' CLEAR TO 5' BEYOND CONSTRUCTION LIMITS.
- * FOR FILL HEIGHTS 10' OR GREATER CLEAR TO 10' BEYOND CONSTRUCTION LIMITS.
- ** PLACE SILT FENCE AT 5' BEYOND TOE OF SLOPE IN FILL SECTIONS WITH LESS THAN 10'. PLACE SILT FENCE AT 10' BEYOND TOE OF SLOPE IN FILL SECTIONS WITH 10' OR GREATER.



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

ENGLISH DETAIL DRAWING FOR
METHOD OF CLEARING
 MODIFIED METHOD - III

SHEET 1 OF 1
200D03



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SEE TITLE BLOCK

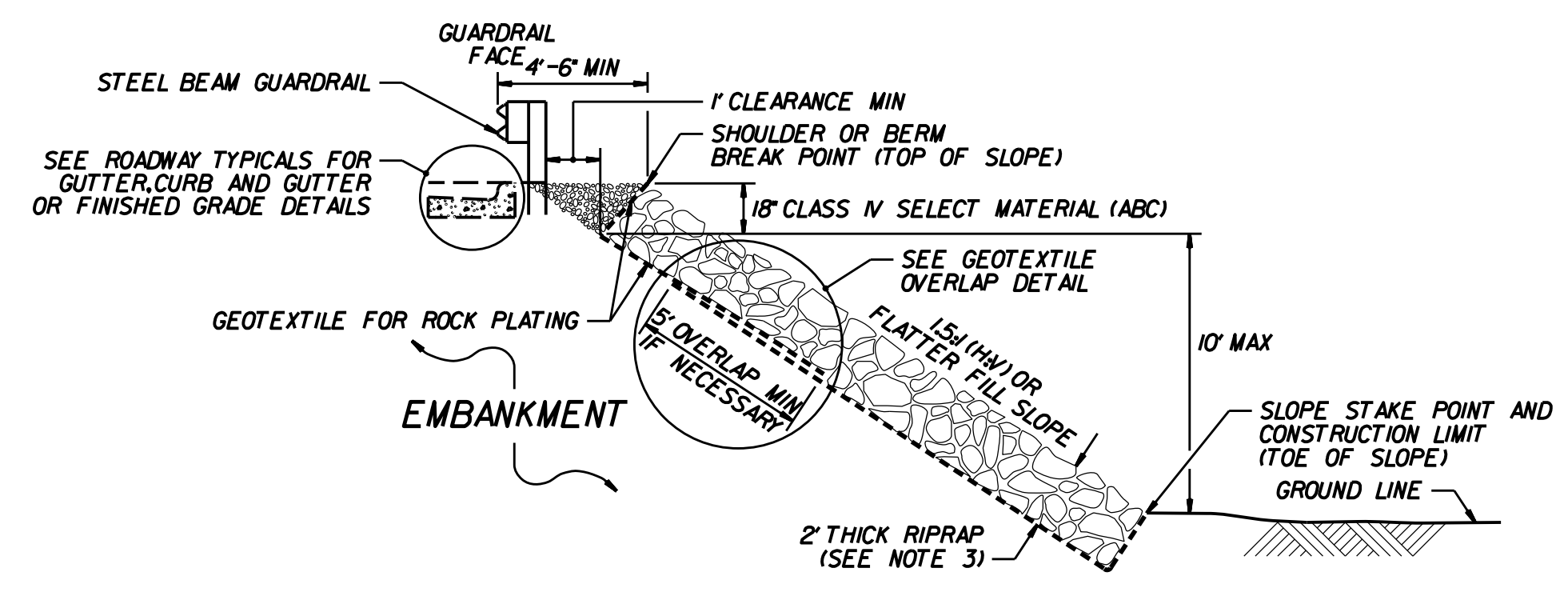
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DIVISION OF HIGHWAYS
RALEIGH, N.C.

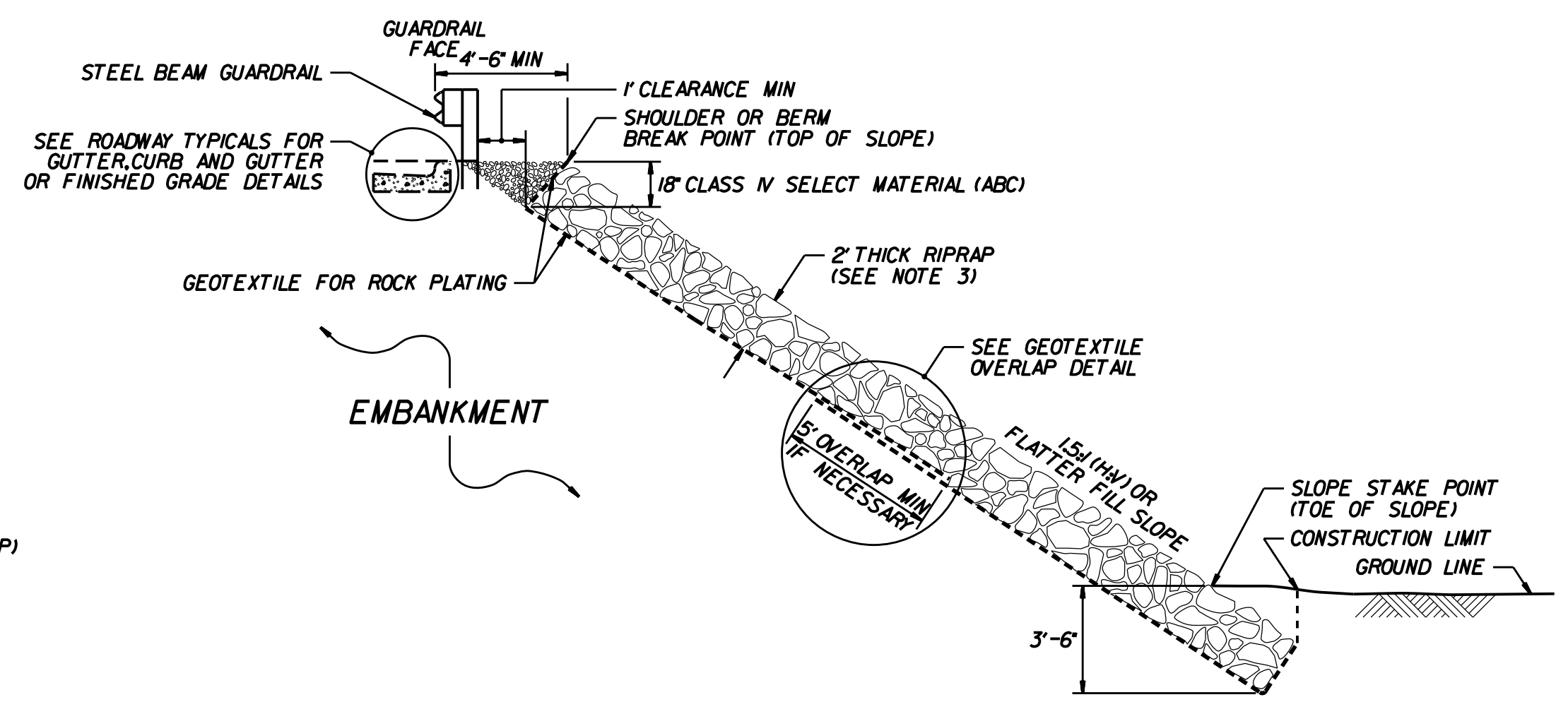
ROADWAY DETAIL DRAWING FOR
ROCK PLATING

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

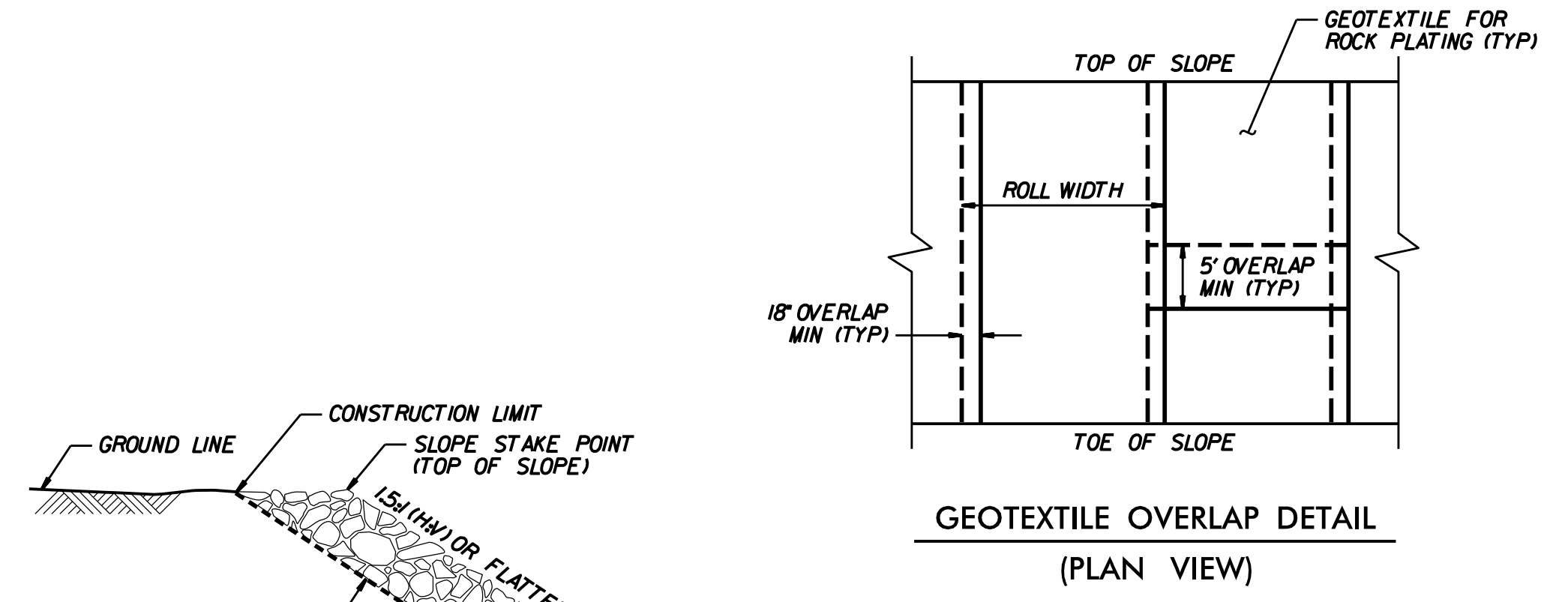
ROADWAY DETAIL DRAWING FOR
ROCK PLATING



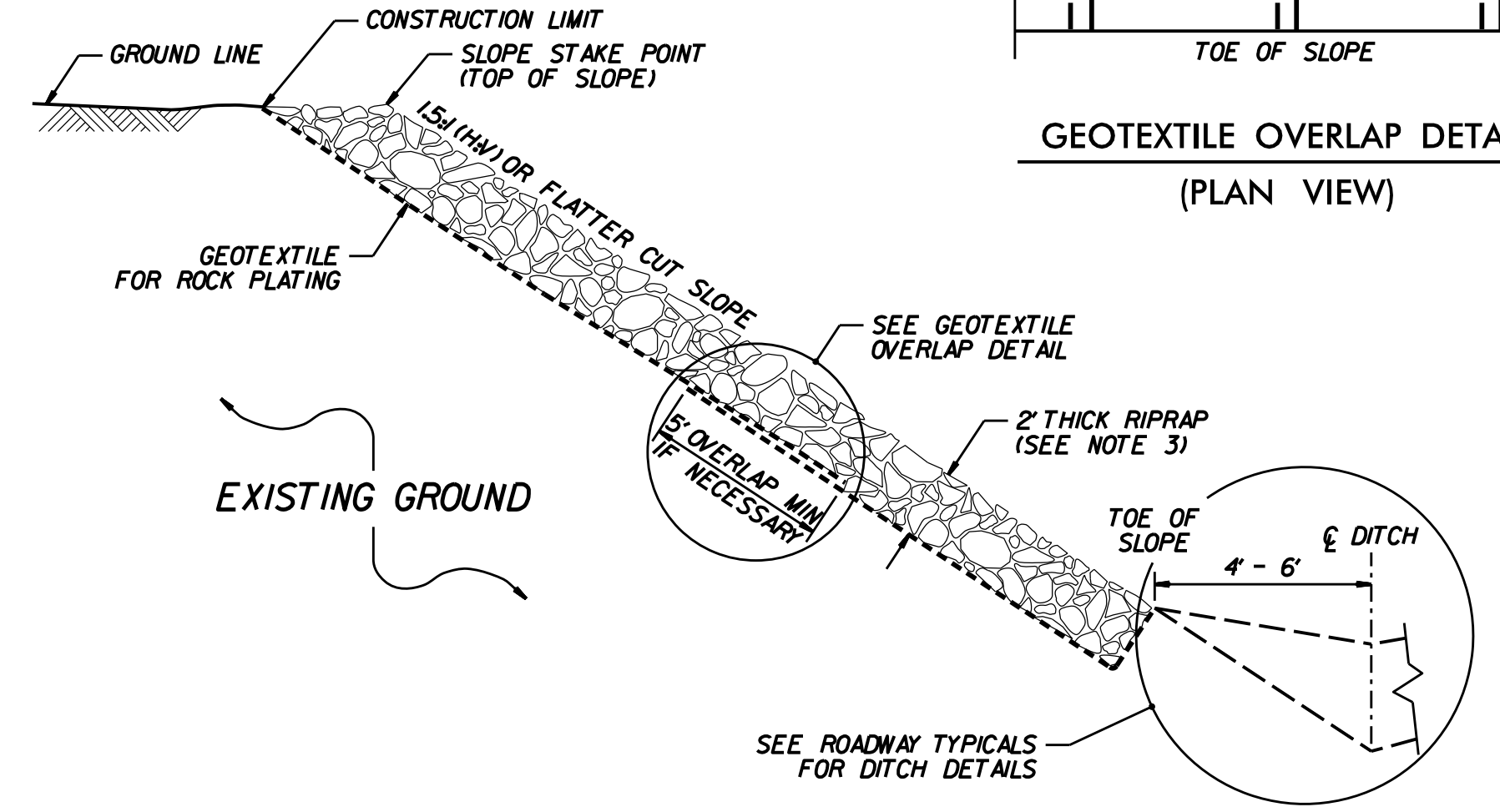
ROCK PLATING DETAIL NO. 1 - TYPICAL SECTION



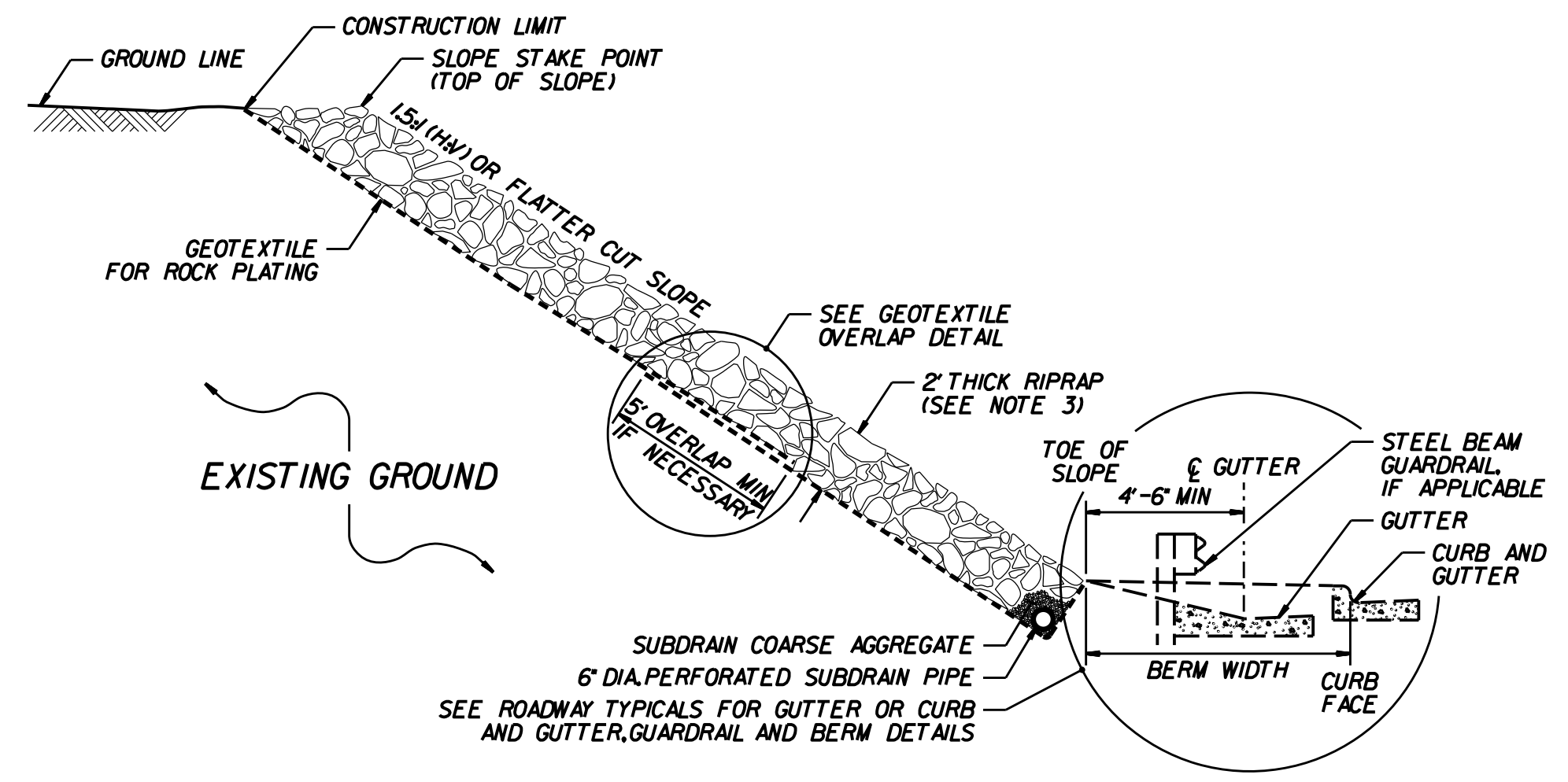
ROCK PLATING DETAIL NO. 2 - TYPICAL SECTION



GEOTEXTILE OVERLAP DETAIL (PLAN VIEW)



ROCK PLATING DETAIL NO. 3 - TYPICAL SECTION

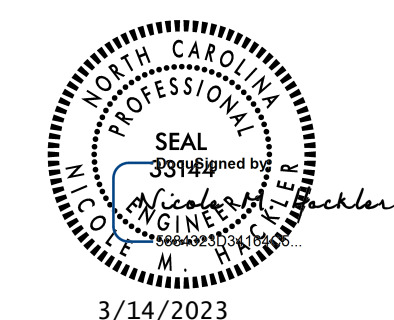


ROCK PLATING DETAIL NO. 4 - TYPICAL SECTION

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

SHEET 1 OF 1
275D01


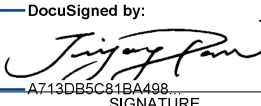
SHEET 1 OF 1
275D01

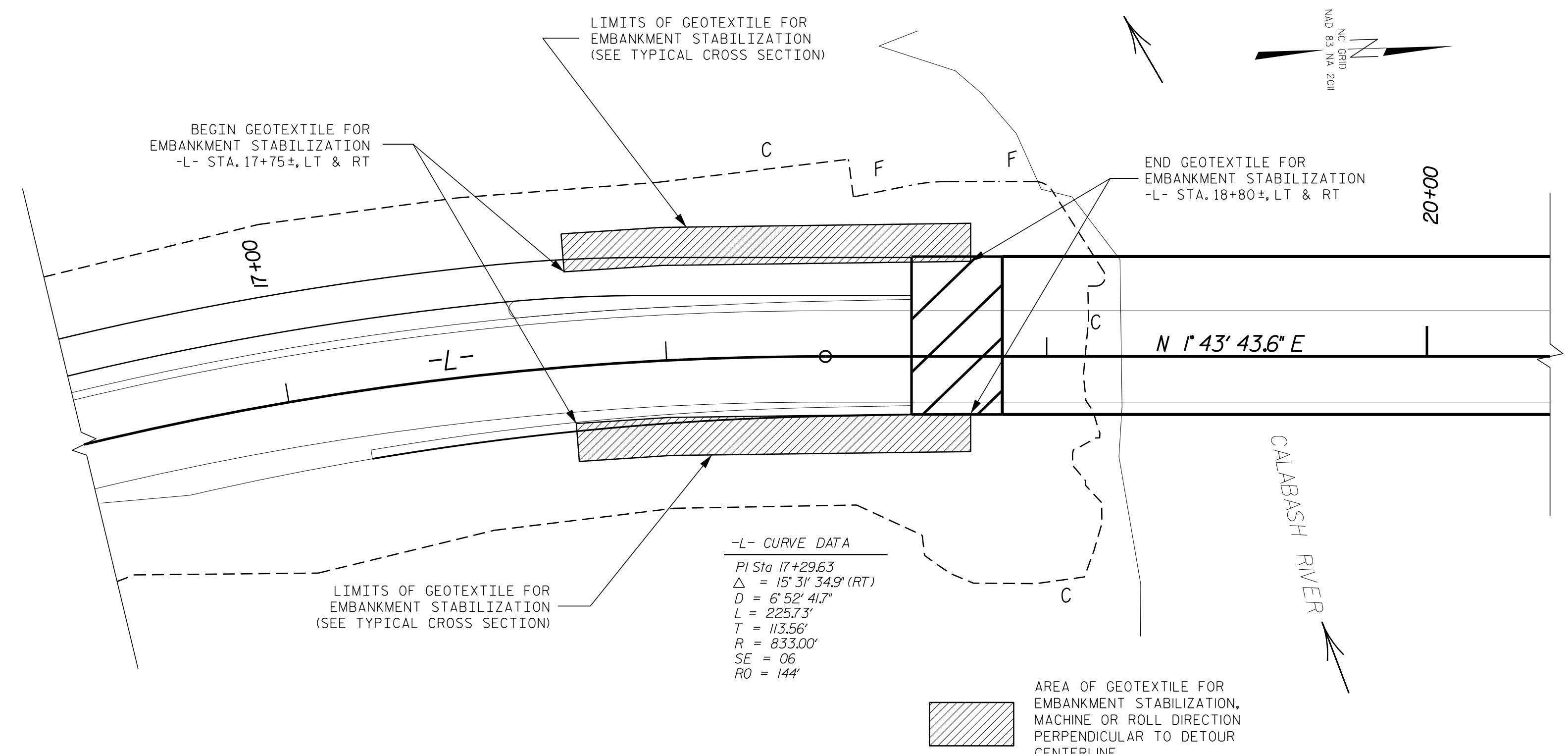


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Office 919-707-6900 FAX 919-250-4119

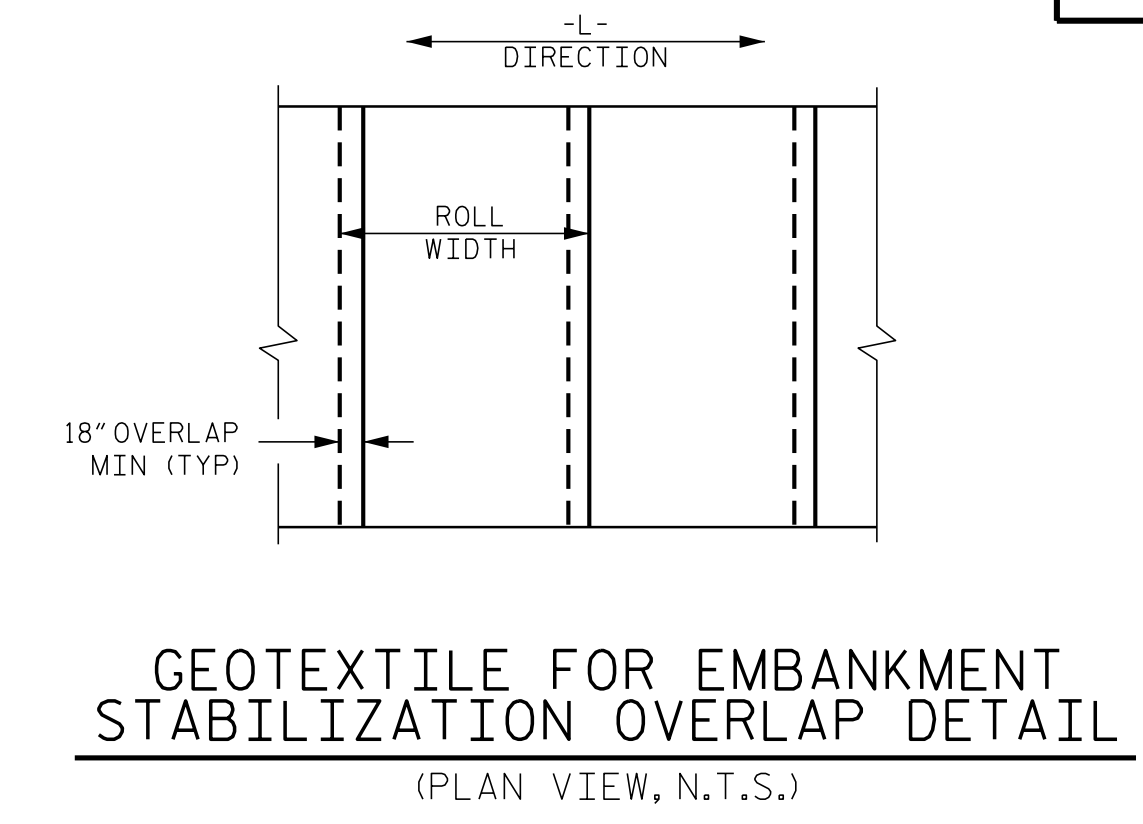
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 FILE SPEC.: _____

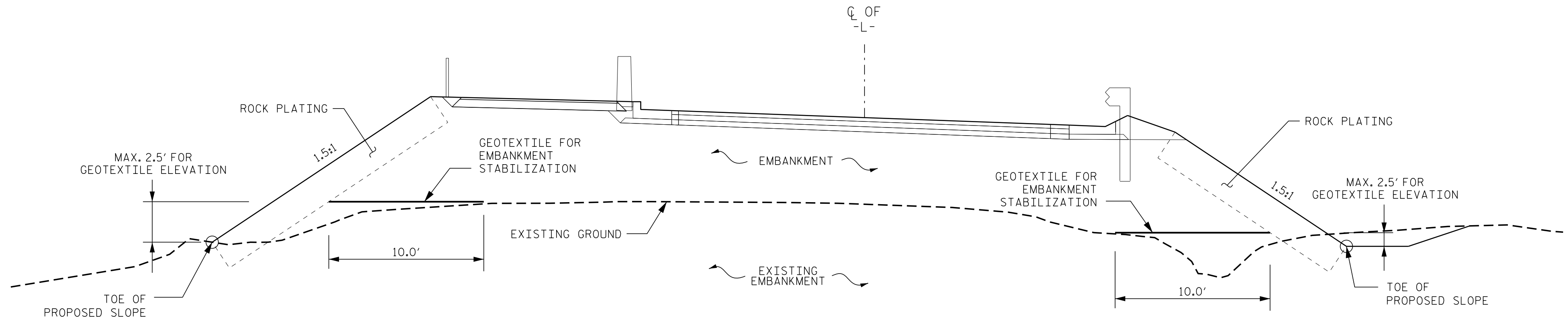
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GEOTECHNICAL ENGINEER  DocuSigned by:  05/11/2022 <small>DATE</small>		ENGINEER <small>SIGNATURE</small> <small>DATE</small>	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			



PLAN VIEW
N.T.S.



GEOTEXTILE FOR EMBANKMENT STABILIZATION OVERLAP DETAIL
(PLAN VIEW, N.T.S.)



TYPICAL CROSS SECTION
N.T.S.

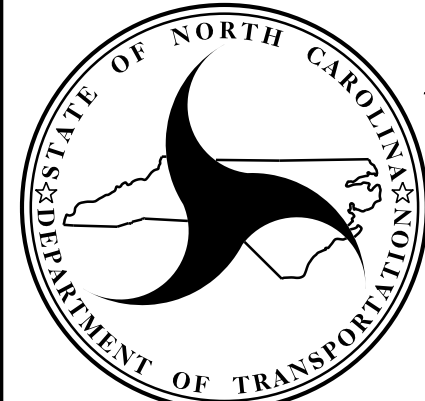
NOTES

- FOR GEOTEXTILE FOR EMBANKMENT STABILIZATION, SEE GEOTEXTILE FOR EMBANKMENT STABILIZATION SPECIAL PROVISION.
- CONSTRUCT EMBANKMENT TO THE ELEVATION OF GEOTEXTILE FOR EMBANKMENT STABILIZATION AS SHOWN IN THE PLAN OR AS DIRECTED BY THE ENGINEER.
- PLACE GEOTEXTILE FOR EMBANKMENT STABILIZATION PERPENDICULAR TO EMBANKMENT CENTERLINE OF -L- ALIGNMENT AS SHOWN IN THE PLAN OR AS DIRECTED BY THE ENGINEER.
- PLACE THE GEOTEXTILE WITHOUT ANY WRINKLES OR CREASES.
- NO SEAMS OR JOINTS ARE ALLOWED IN THE MACHINE DIRECTION OF GEOTEXTILE.
- THE TERMS ROLL AND MACHINE DIRECTION ARE USED INTERCHANGEABLY.
- ALL JOINTS IN THE CROSS MACHINE DIRECTION MUST BE OVERLAPPED A MINIMUM OF 18 INCHES.

GEOTEXTILE FOR EMBANKMENT STABILIZATION QUANTITIES

LINE	STATIONS	OFFSET	QUANTITIES
-L-	STA. 17+75± TO STA. 18+80±	LT	120 SY
-L-	STA. 17+75± TO STA. 18+80±	RT	120 SY
TOTAL			240 SY

PREPARED BY: J. PARK	DATE: 05/2022
REVIEWED BY: J. BATTS	DATE: 05/2022



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

**GEOTECHNICAL
ENGINEERING UNIT**

GEOTEXTILE FOR EMBANKMENT STABILIZATION DETAILS					
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

12/06/07

COMPUTED BY: EWB DATE: 11/23/22
 CHECKED BY: DDM DATE: 11/23/22

STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

PROJECT REFERENCE NO. BR-0160
 SHEET NO. 3B-1

**SUMMARY OF EARTHWORK
 IN CUBIC YARDS**

STATION	STATION	UNCL. EXCAV.	UNSUIT. UNCLASS.	EMBANK. +%	BORROW	WASTE
-L- 13+00.00	-L- 18+88.31 (BR)	720		2,721	2,001	
-L- 24+66.69 (BR)	-L- 29+50.00	1,152		909		243
SUBTOTALS:		1,872		3,630	2,001	243
CAUSEWAY REMOVAL						
-L- 21+50.00	-L- 24+65.00	4,790	150			4,790
SUBTOTALS:		4,790	150			4,790
TOTALS:		6,662	150	3,630	2,001	5,033
EARTH WASTE TO REPLACE BORROW					-2,001	-2,001
PROJECT TOTALS:		6,662	150	3,630		3,032
GRAND TOTALS:		6,662	150	3,630	0	3,032
SAY:		6,700				

EST. SHOULDER BORROW = 160 CY
 EST. UNDERCUT EXCAVATION = 300 CY

THESE EARTHWORK QUANTITIES ARE BASED IN PART ON SUBSURFACE DATA PROVIDED BY THE GEOTECHNICAL ENGINEERING UNIT.

APPROXIMATE QUANTITIES ONLY. UNCLASSIFIED EXCAVATION, SHOULDER BORROW, FINE GRADING, CLEARING AND GRUBBING, AND REMOVAL OF EXISTING PAVEMENT WILL BE PAID FOR AT THE LUMP SUM PRICE FOR "GRADING".

ASPHALT PAVEMENT REMOVAL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD ²
-L-	13+00.00	18+99.24	CL	1,864.30
-L-	21+80.17	29+50.00	CL	2,395.03
TOTAL:				4,259.33
SAY:				4,260

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LENGTH
-L- (RT.)	16+69.56	18+64.31	194.8'
-L- (RT.)	24+90.69	25+10.44	19.8'
TOTAL:			214.5'
SAY:			215'

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

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS					IMPACT ATTENUATOR TYPE TL-3			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	GREU TL-3	TYPE III	EA	G	NG								
-L-	16+19.56	18+88.31	RT	268.75			BRIDGE		3'-3"	6'-3"	50.00		1.00			1	1										
-L-	24+66.69	25+60.44	RT	93.75				BRIDGE	14'-3"	17'-3"		50.00				1	1										
-L-	24+66.69	26+60.44	LT	193.75			BRIDGE		3'-3"	6'-3"	50.00					1	1										
-L-	17+90.00		LT																								
-L-	25+40.56		LT																								
SUBTOTALS				556.25																							
ANCHOR DEDUCTION				206.25																							
TOTAL				350.00												3	3										
SAY				375.00											3	3											

ANCHOR DEDUCTION
 GREU TL-3: 3 @ 50' = 150'
 TYPE III: 3 @ 18.75' = 56.25'
 GRAND TOTAL = 206.50'
 ADDITIONAL GUARDRAIL POSTS = 5

ATTENUATOR LOCATED AT BARRIER WALL TERMINUS.
 ATTENUATOR LOCATED AT BARRIER WALL TERMINUS.

10-MAR-2023 17:40 BR0160_Rdly_sum_3B-1.dgn

COMPUTED BY: Tyler Bottoms DATE: 2/1/22
 CHECKED BY: Jinyoung Park DATE: 5/11/22

(12-17-19)

PROJECT NO.	SHEET NO.
BR-0160	3G-1

**STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS**

SUMMARY OF SUBSURFACE DRAINAGE

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

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

SUMMARY OF ROCK PLATING

LINE	Beginning Slope (H:V)	Approx. Station	Ending Slope (H:V)	Approx. Station	Location LT/RT	Rock Plating Detail No. 1/2/3/4	Riprap Class* 1/2/B	Rock Plating SY
-L-	2.75:1	17+37.50±	1.5:1	18+64.44±	LT	3		190
-L-	2.75:1	17+37.50±	1.5:1	18+64.44±	RT	1		180
							TOTAL SY:	370

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

SUMMARY OF BRIDGE WAITING PERIODS

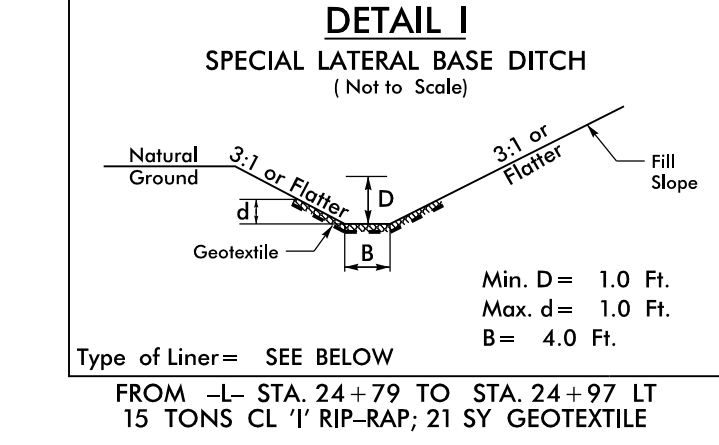
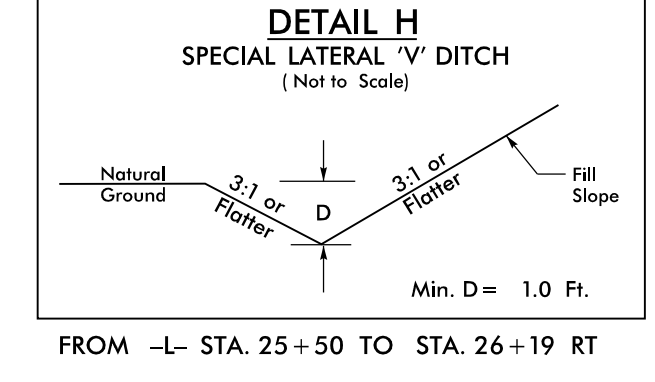
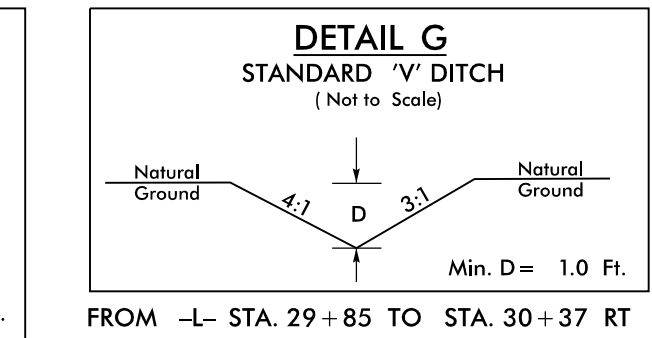
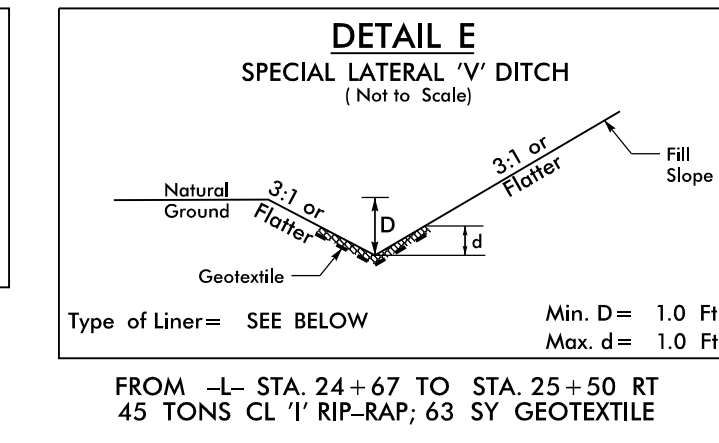
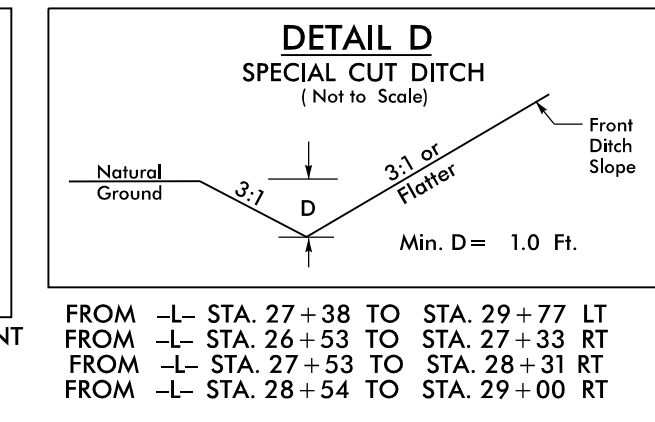
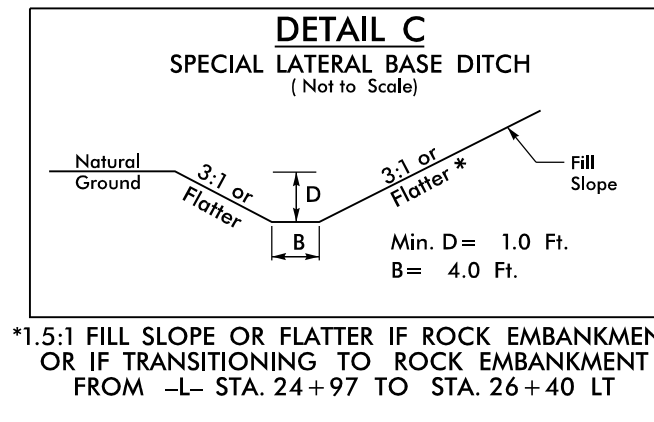
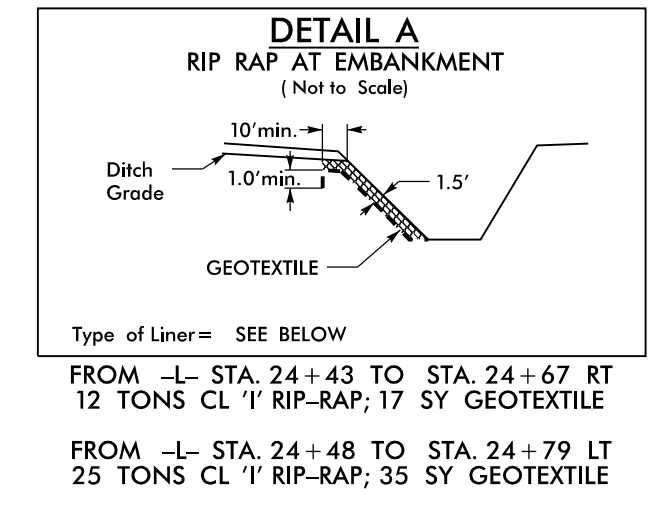
Bridge Description	End Bent/ Bent No.	MONTHS
Bridge No. 15 on -L- (NC 179B) over Calabash River	EB1	1
Bridge No. 15 on -L- (NC 179B) over Calabash River	EB2	1

8/17/99

PROJECT REFERENCE NO. <i>BR-0160</i>	SHEET NO. <i>5</i>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

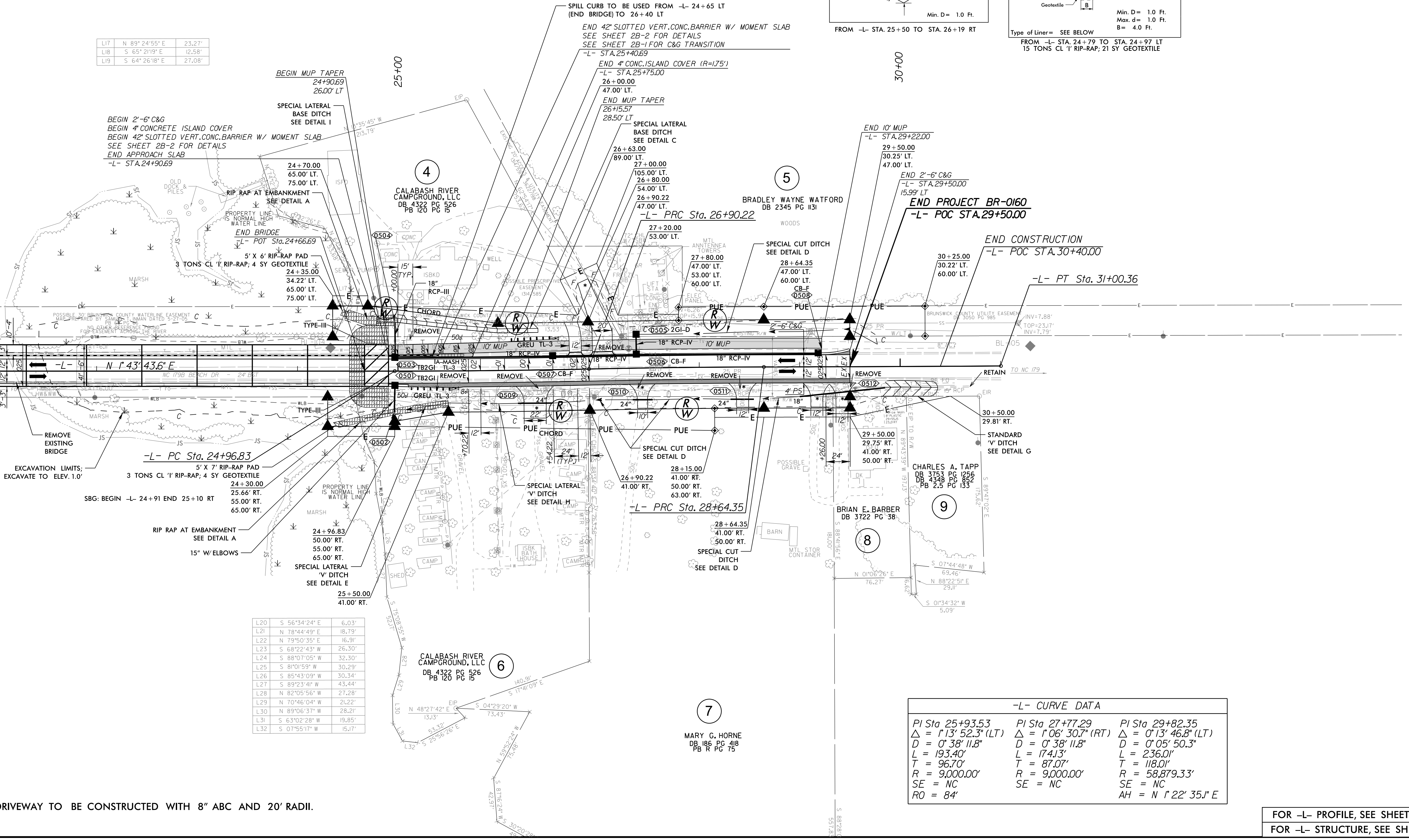
RS&H 8521 SIX FORKS ROAD, SUITE 400
RALEIGH, NC 27615
NC FIRM LICENSE No. F-0493



NAD 83/NA 2011

L17	N 89° 24' 55" E	23.27'
L18	S 65° 21' 19" E	12.58'
L19	S 64° 26' 18" E	27.08'

MATCHLINE SHEET 4 -L- STA. 21+00.00



L20	S 56° 34' 24" E	6.03'
L21	N 78° 44' 49" E	18.79'
L22	N 79° 50' 35" E	16.9'
L23	S 68° 22' 43" W	26.30'
L24	S 88° 07' 05" W	32.30'
L25	S 81° 01' 59" W	30.29'
L26	S 85° 43' 09" W	30.34'
L27	S 89° 23' 41" W	43.44'
L28	N 82° 05' 56" W	27.28'
L29	N 70° 46' 04" W	21.22'
L30	N 89° 06' 37" W	28.21'
L31	S 63° 02' 28" W	19.85'
L32	S 07° 55' 17" W	15.17'

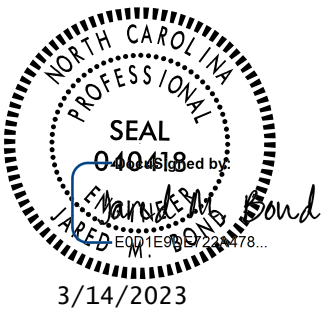
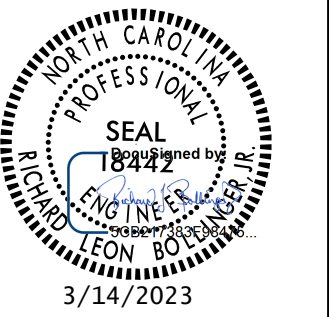
-L- CURVE DATA

PI Sta. 25+93.53 Δ = 1° 13' 52.3" (LT) D = 0° 38' 11.8" L = 193.40' T = 96.70' R = 9,000.00' SE = NC RO = 84'	PI Sta. 27+77.29 Δ = 1° 06' 30.7" (RT) D = 0° 38' 11.8" L = 174.13' T = 87.07' R = 9,000.00' SE = NC	PI Sta. 29+82.35 Δ = 0° 13' 46.8" (LT) D = 0° 05' 50.3" L = 236.01' T = 118.01' R = 58,879.33' SE = NC AH = N 1° 22' 35.1" E
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FOR -L- PROFILE, SEE SHEET NO. 6
FOR -L- STRUCTURE, SEE SHEET S-2

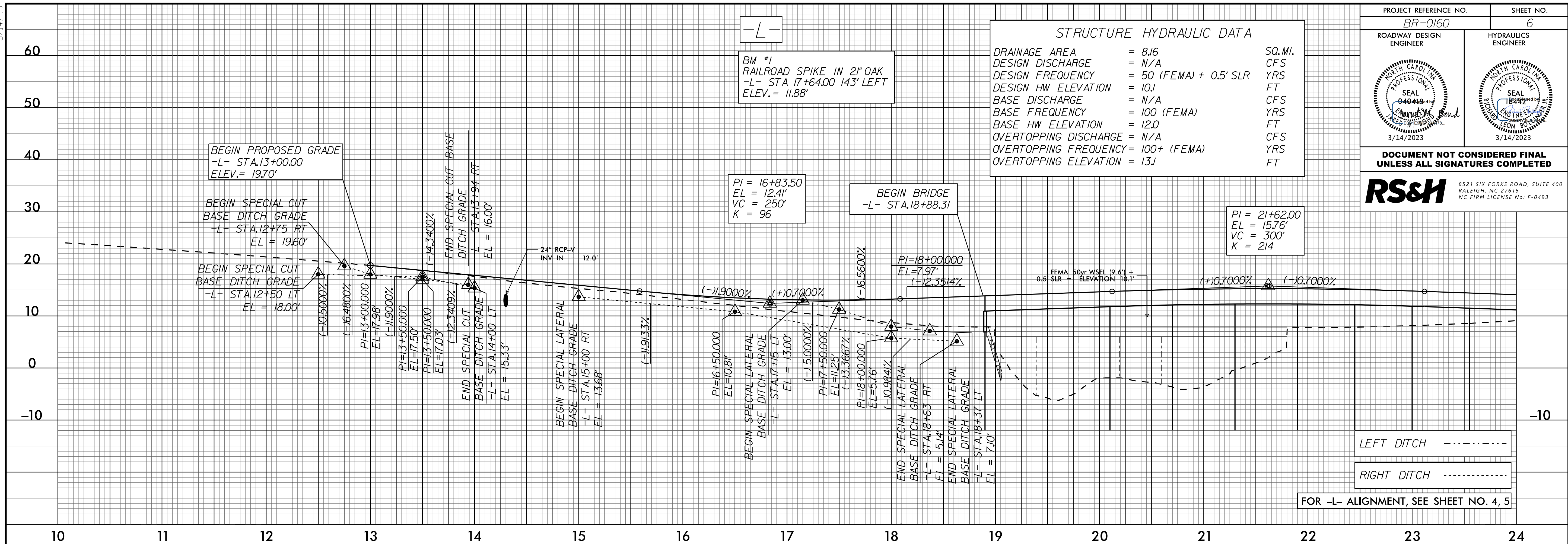
DC-MAR-2023 10:29
RS-ROADWAY-CP-13R01160_Rdu_psh_5.dgn
8:58:58 AM 3/14/2023

5/14/99

PROJECT REFERENCE NO. <i>BR-0160</i>		SHEET NO. 6	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
			
3/14/2023		3/14/2023	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
RS&H 8521 SIX FORKS ROAD, SUITE 400 RALEIGH, NC 27615 NC FIRM LICENSE No: F-0493			

STRUCTURE HYDRAULIC DATA

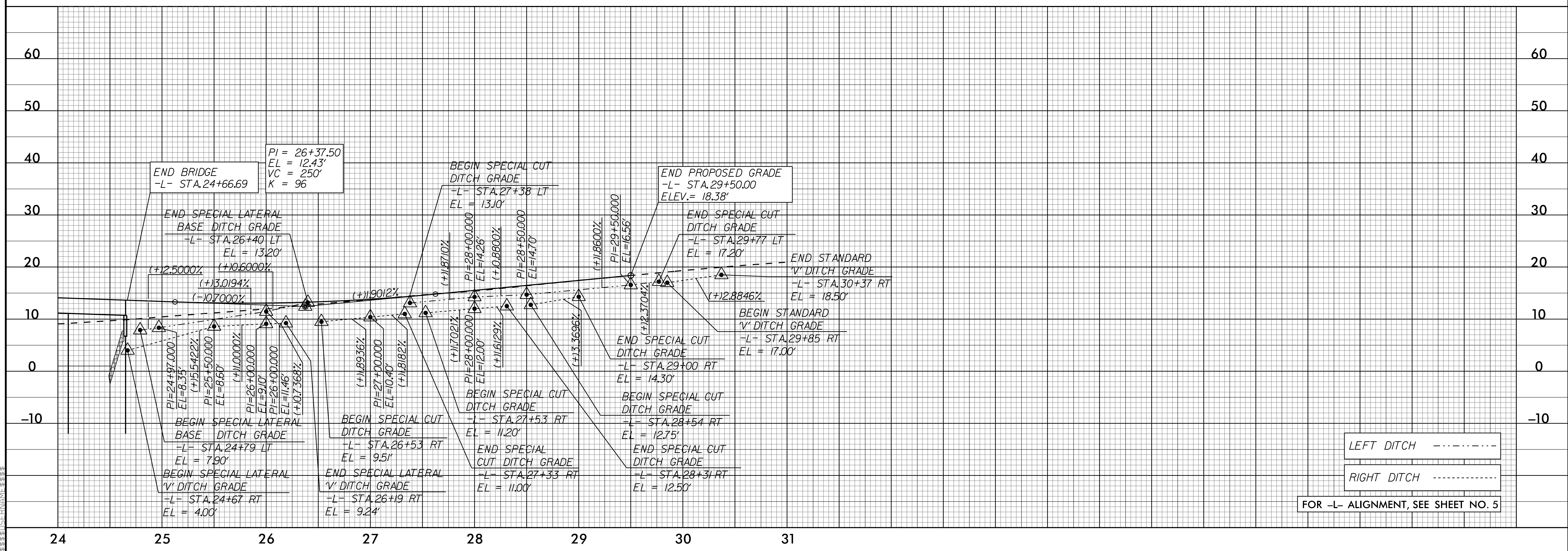
DRAINAGE AREA	= 8.16	SQ. MI.
DESIGN DISCHARGE	= N/A	CFS
DESIGN FREQUENCY	= 50 (FEMA) + 0.5' SLR	YRS
DESIGN HW ELEVATION	= 10.1	FT
BASE DISCHARGE	= N/A	CFS
BASE FREQUENCY	= 100 (FEMA)	YRS
BASE HW ELEVATION	= 12.0	FT
OVERTOPPING DISCHARGE	= N/A	CFS
OVERTOPPING FREQUENCY	= 100+ (FEMA)	YRS
OVERTOPPING ELEVATION	= 13.1	FT



LEFT DITCH -----

RIGHT DITCH -----

FOR -L- ALIGNMENT, SEE SHEET NO. 4, 5



LEFT DITCH -----

RIGHT DITCH -----

FOR -L- ALIGNMENT, SEE SHEET NO. 5

22-FEB-2023 15:58 BR0160_P01_P01.dwg
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