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09/08/09

See Sheet 1A For Index of Sheets

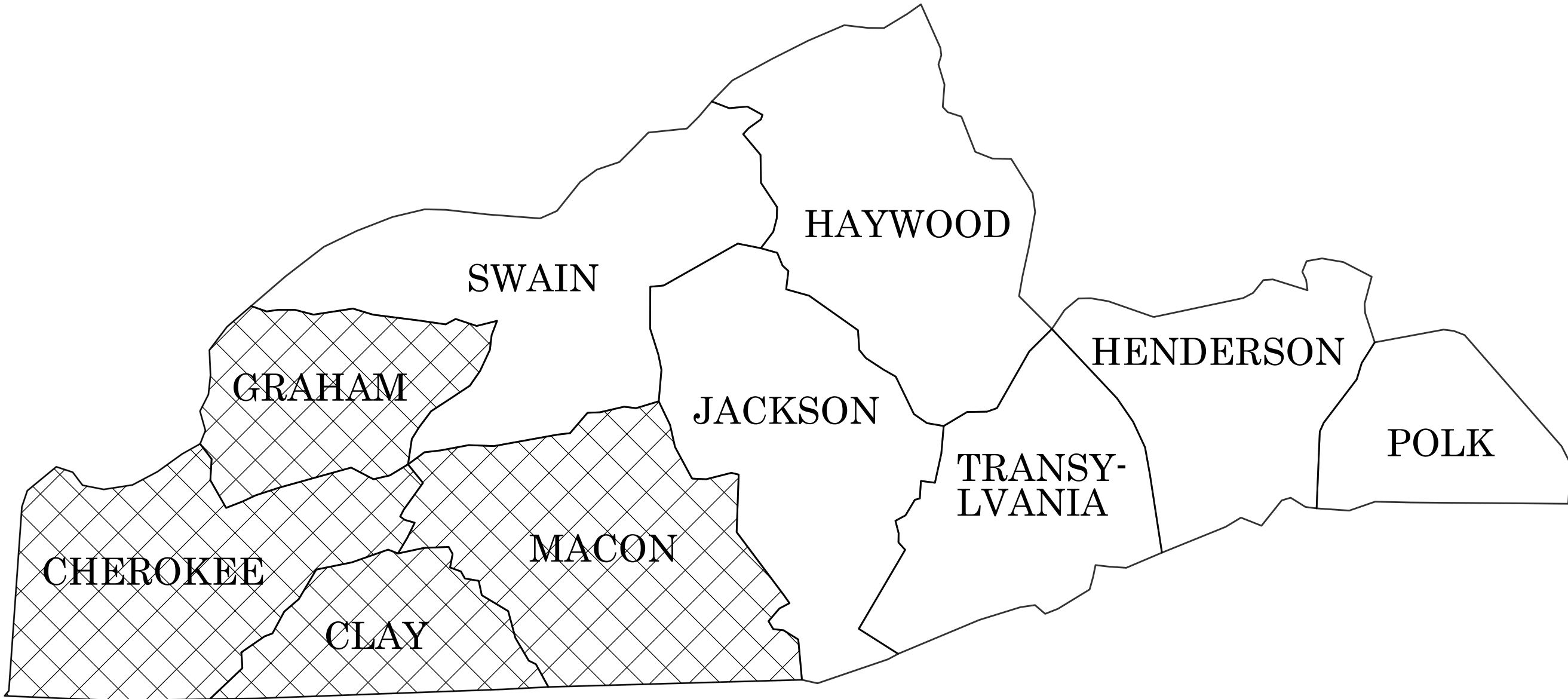
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

DIVISION 14

LOCATION: *VARIOUS LOCATIONS*
ACROSS DISTRICT 3 IN DIVISION 14

TYPE OF WORK: *ID/IQ ON-CALL GUARDRAIL*
REPAIR & MAINTENANCE SERVICES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	DN12177657	1	9
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
GMR14.CHE.1P			
GMR14.CHE.2P			
GMR14.CLA.1P			
GMR14.CLA.2U			
GMR14.GRA.1P			
GMR14.GRA.2P			
GMR14.MAC.1P			
GMR14.MAC.2P			



CONTRACT: DN12177657

Prepared in the Office of:
DIVISION OF HIGHWAYS
253 WEBSTER RD., SYLVA NC, 28779

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
N/A

LETTING DATE:
JULY 22, 2025

JESSE RUSSELL, P.E.
PROJECT ENGINEER

JAMES HOLLINGSWORTH P.E.
PROJECT DESIGN ENGINEER



09/08/09

CONTRACT: DN12177657

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	DN12177657	1-A	5
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
GMR14.CHE.1P	N/A	CONSTRUCTION	
GMR14.CHE.2P		CONSTRUCTION	
GMR14.CLA.1P		CONSTRUCTION	
GMR14.CLA.2P		CONSTRUCTION	
GMR14.GRA.1P		CONSTRUCTION	
GMR14.GRA.2P		CONSTRUCTION	
GMR14.MAC.2P		CONSTRUCTION	
GMR14.MAC.2P		CONSTRUCTION	

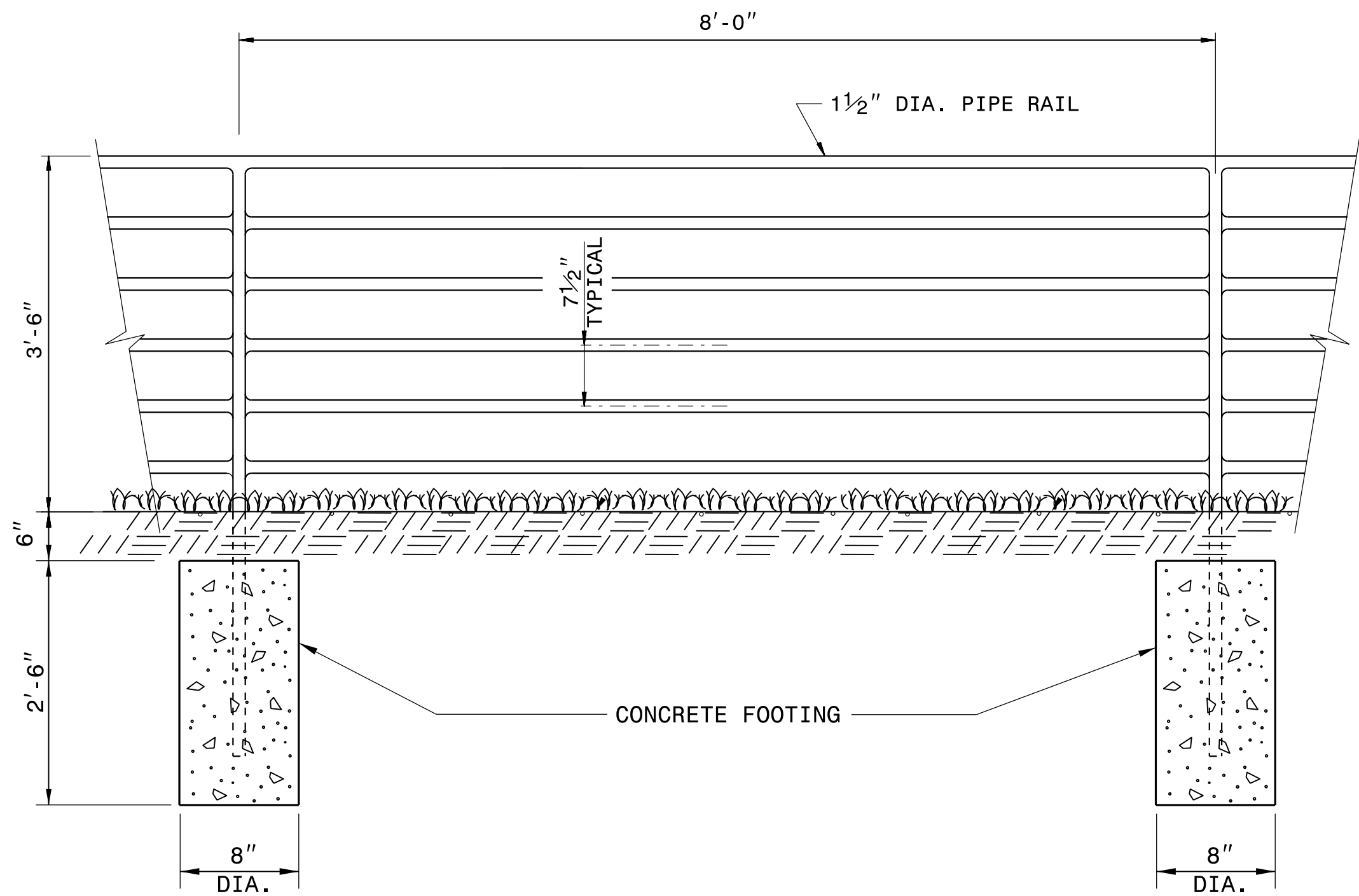
INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, AND STANDARD DRAWINGS
2-2B	ROADWAY DETIALS

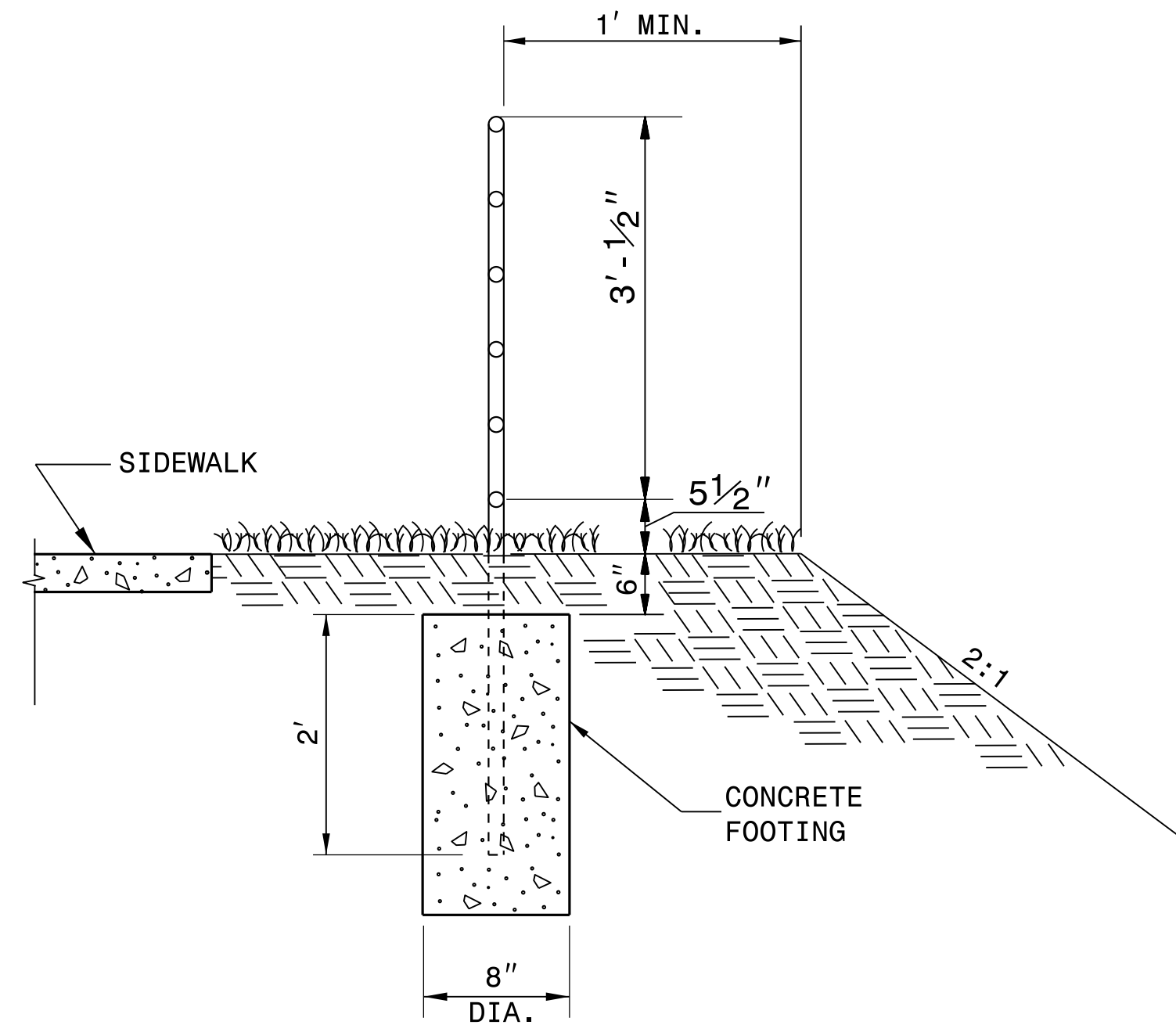
2024 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Contracts Standards and Development Unit – N. C. Department of Transportation – Raleigh, N. C., Dated January 16, 2024 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 8 – INCIDENTALS	
862.01	Guardrail Placement (Use Details in Lieu of Standards for Sheets 4, 6, 12, and 14 of 15)
862.02	Guardrail Installation
862.03	Structure Anchor Units (Use Detail in Lieu of Standard for Sheet 8 of 9)
862.04	Anchoring End of Guardrail – for B-77 and B-83 Anchor Units
865.01	Cable Guiderail



ELEVATION



SECTION VIEW

NOTES:

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

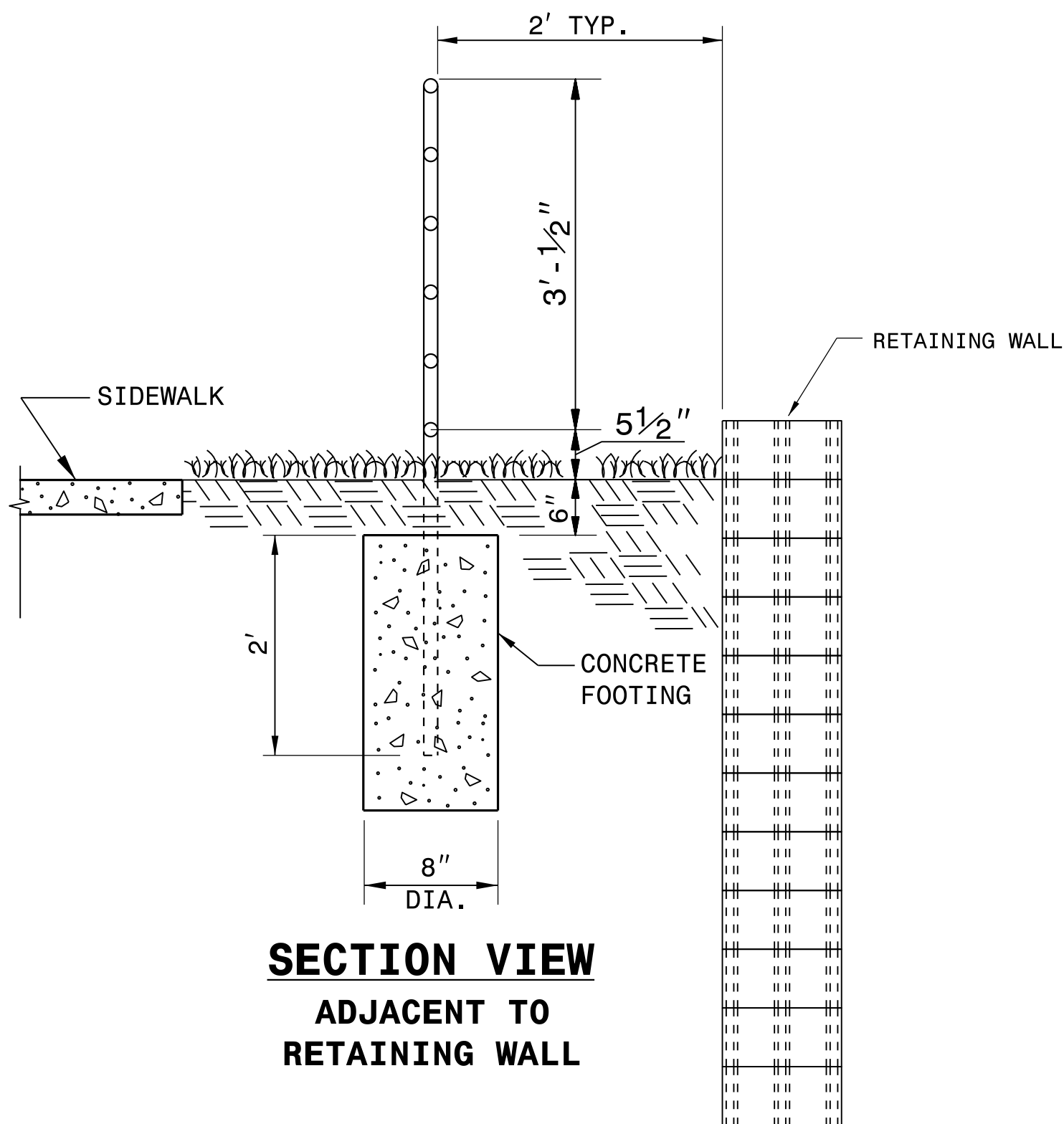
REPAIR GALVANIZING IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1076.

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

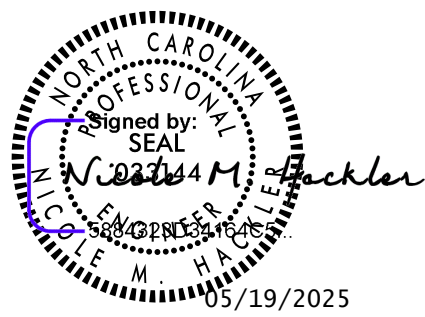
WELD IN ACCORDANCE WITH ARTICLE 1072-18 OF THE STANDARD SPECIFICATIONS.

USE CLASS 'B' CONCRETE FOR HANDRAIL FOOTINGS.

PLACEMENT OF HANDRAIL IN RELATION TO RETAINING WALL AND SIDEWALK MAY BE MODIFIED AS DIRECTED BY THE ENGINEER.

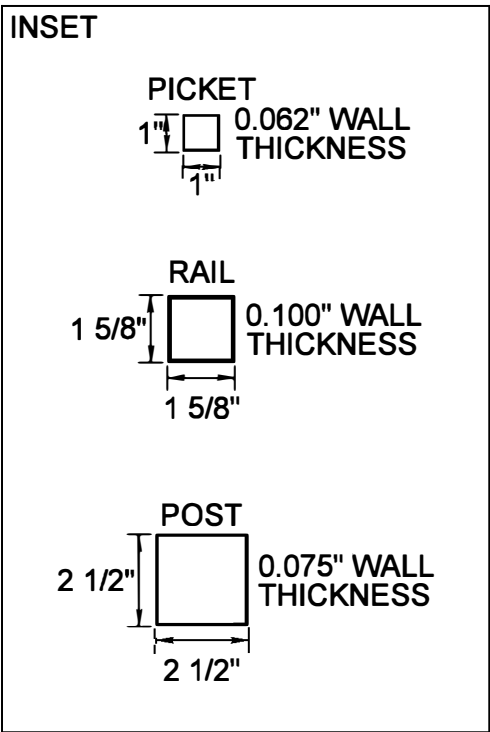
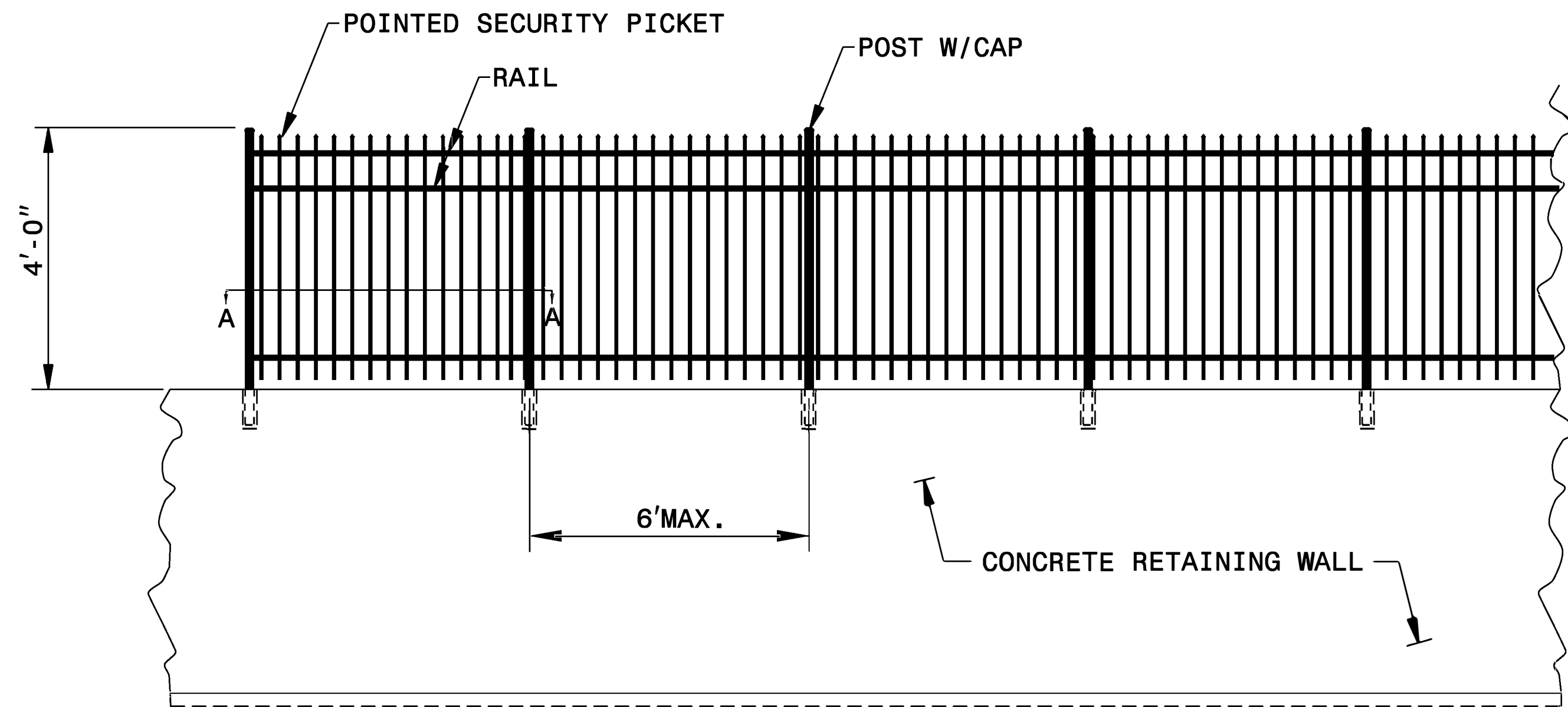


SECTION VIEW
ADJACENT TO
RETAINING WALL



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CONTRACT STANDARDS AND DEVELOPMENT UNIT	
Office 919-707-6950 FAX 919-250-4119	
PEDESTRIAN SAFETY RAIL	
ORIGINAL BY:	DATE:
MODIFIED BY: K.A. KEMPF	DATE: 7-20-23
CHECKED BY:	DATE:
FILE SPEC.: details\kempf\english\safety rails 2024.dgn	



MATERIAL THICKNESS

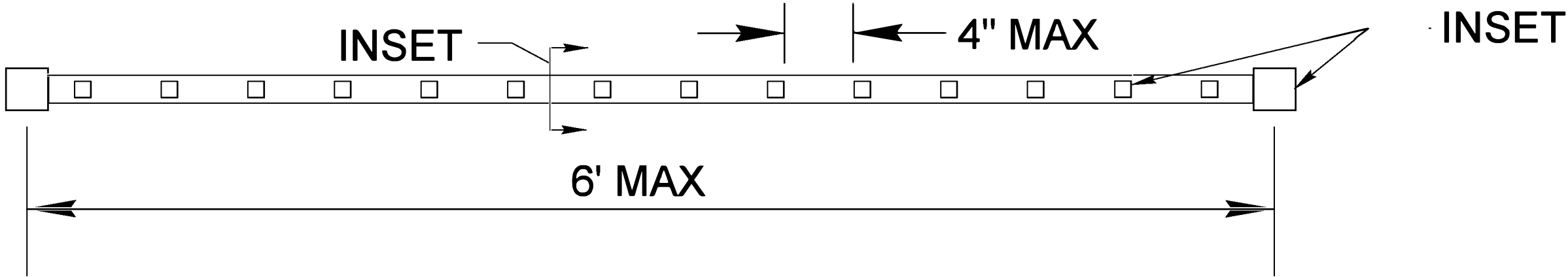
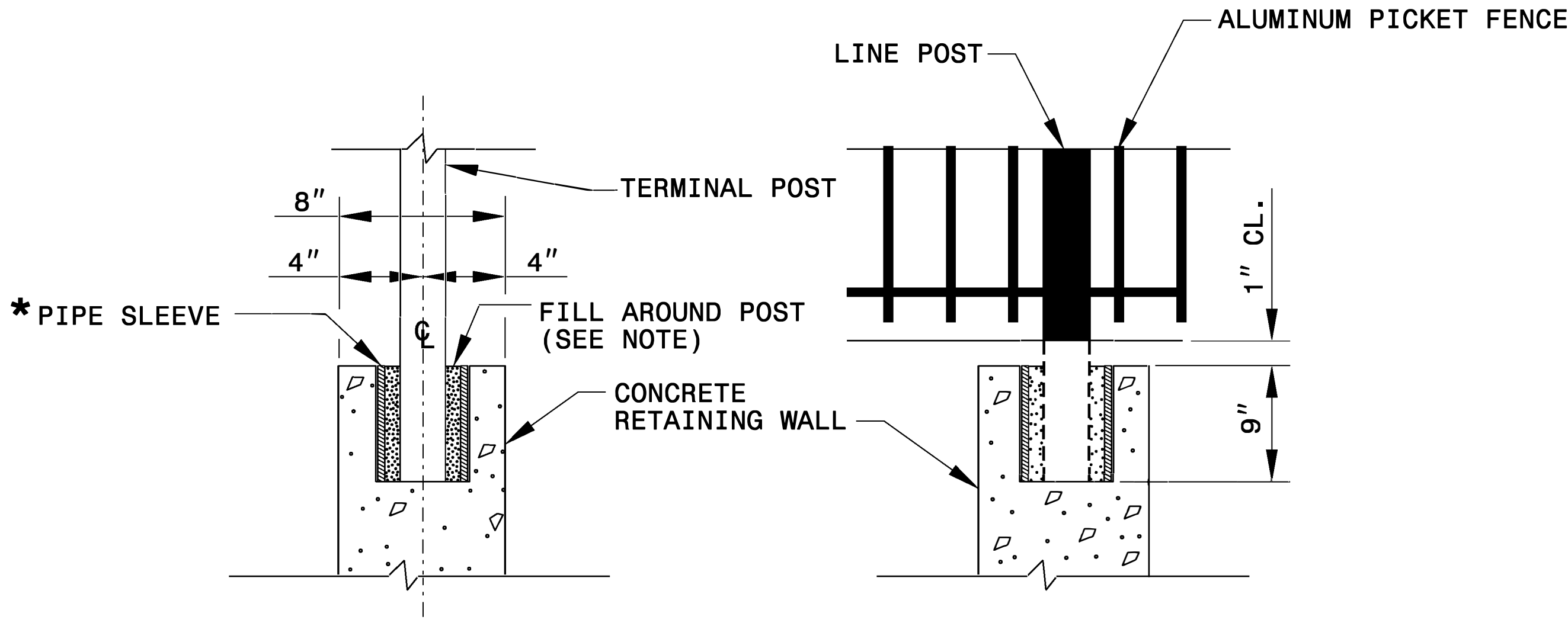
RETAINING WALL MOUNTED ALUMINUM PICKET FENCE

NOTE:

PLACEMENT OF PIPE SLEEVES SHALL CORRESPOND TO LINE POST AND TERMINAL POST AS SHOWN.

*PIPE SLEEVES SHALL BE INSTALLED IN THE CONCRETE RETAINING WALL WITH ALUMINUM ALLOY POST AS INDICATED.

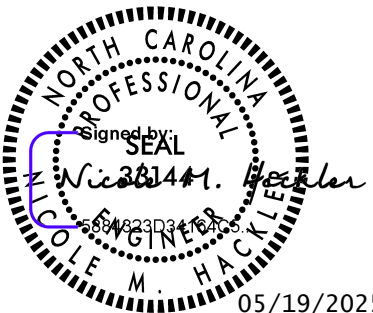
FILL SPACE BETWEEN POST AND PIPE MATERIAL ACCORDING TO FENCE INSTALLATION SPECIFICATIONS OR MATERIAL APPROVED BY ENGINEER.



SECTION A-A

NOTES:

- 1) SUBMIT ALTERNATE FENCE MATERIAL TO ENGINEER FOR APPROVAL.
- 2) SUBMIT ANY VARIATIONS IN FENCE DIMENSIONS TO ENGINEER FOR APPROVAL.
- 3) POST MAY BE DRIVEN IF IT CAUSES NO STRUCTURAL DAMAGE. (SEE MANUFACTURERS RECOMMENDATIONS)
- 4) THE FENCE WILL BE BLACK POWDER COATED.



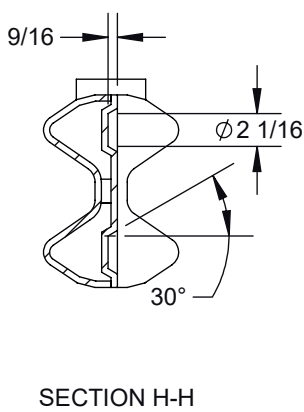
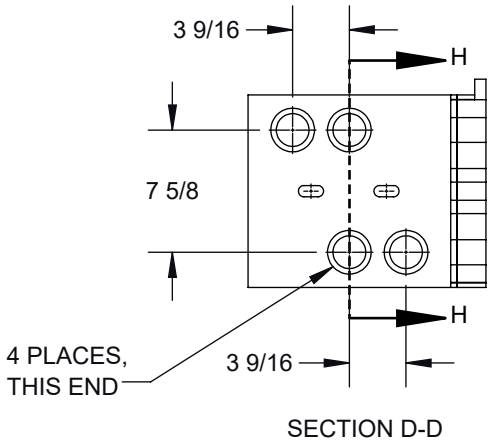
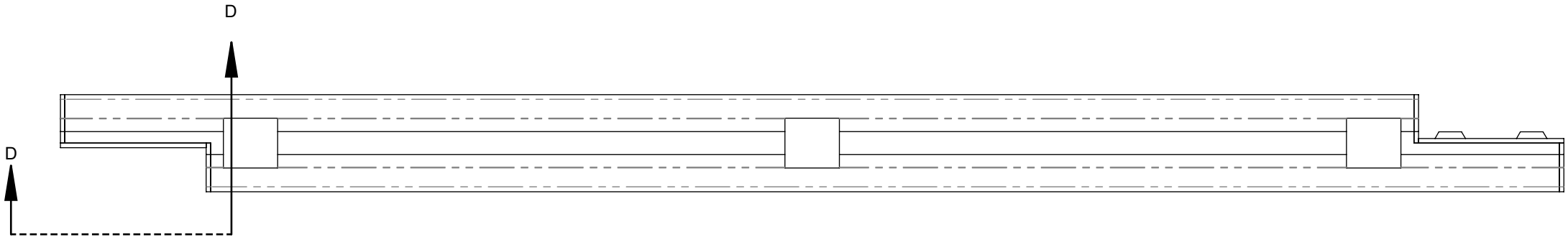
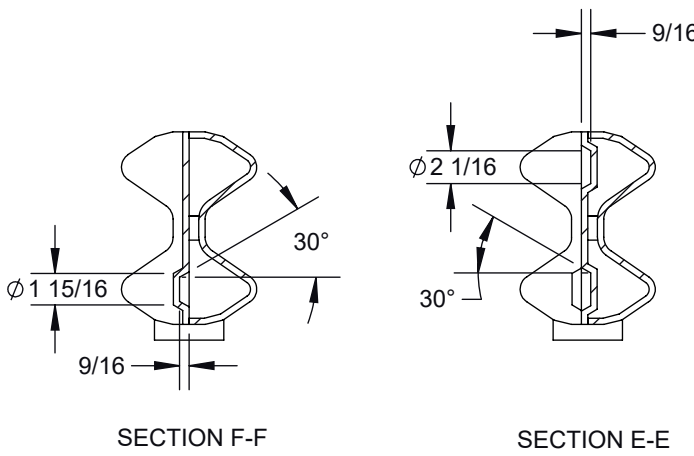
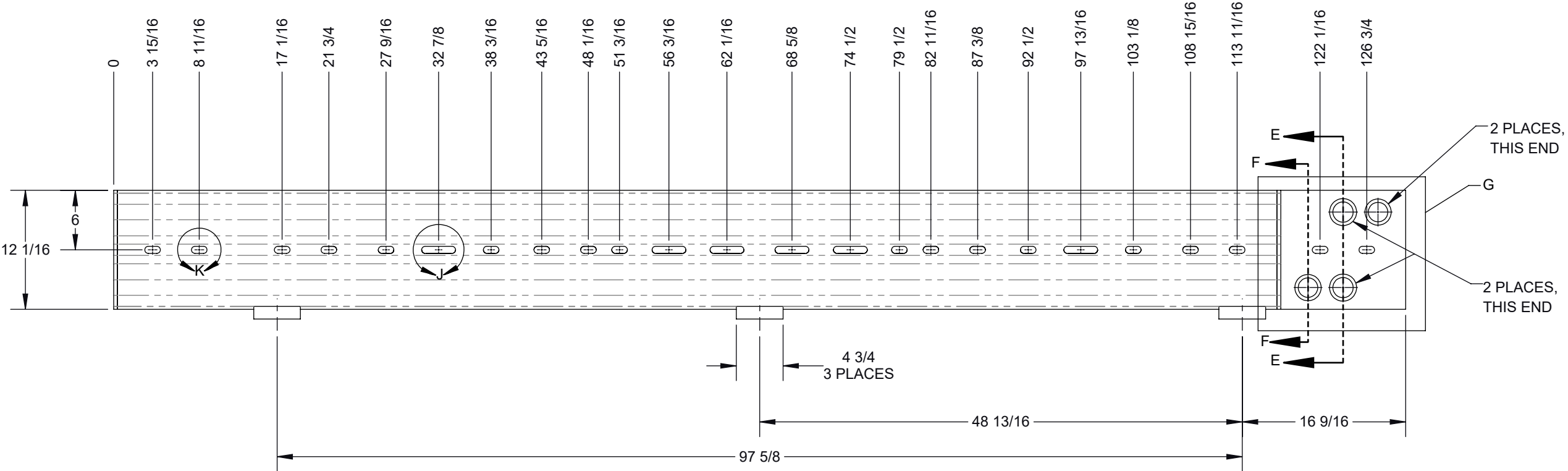
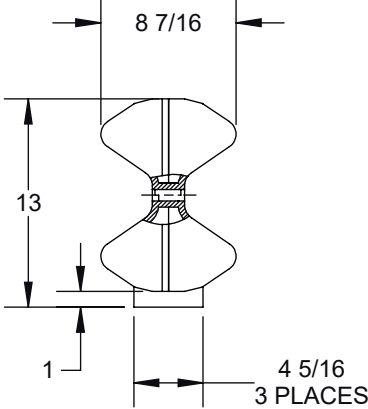
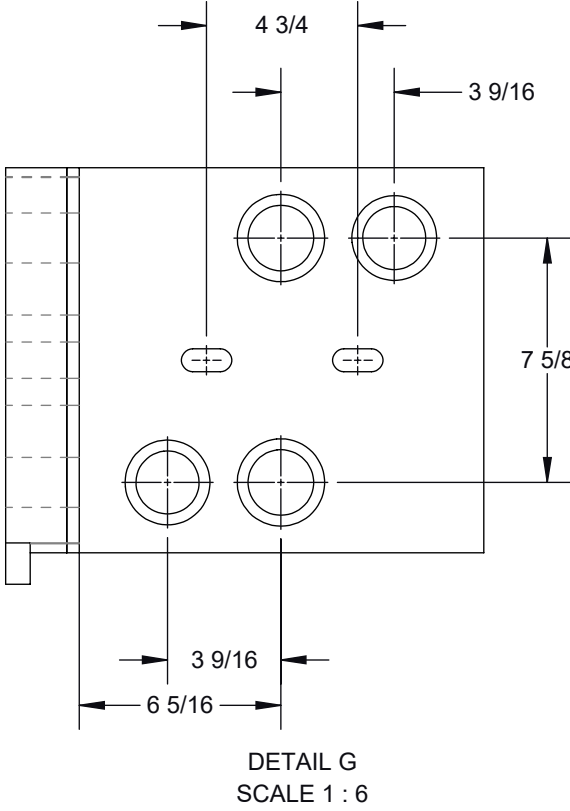
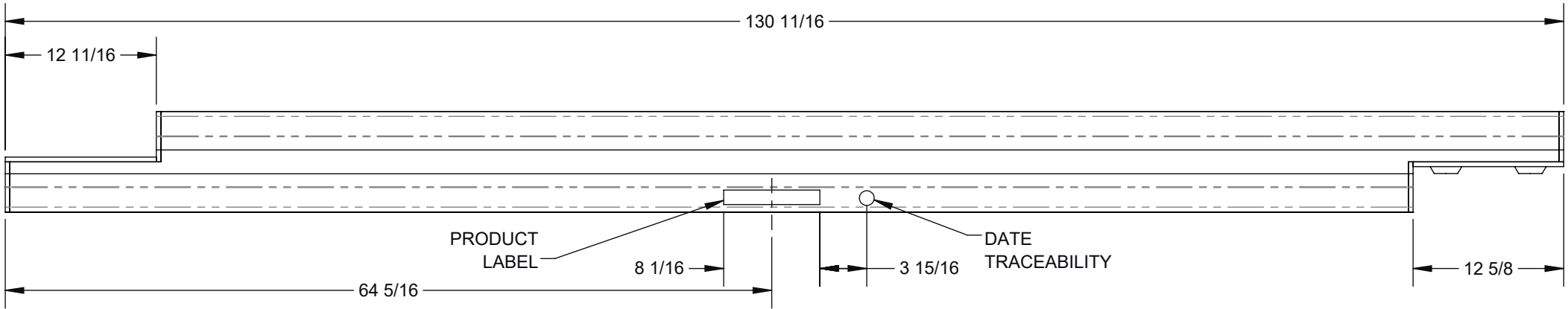
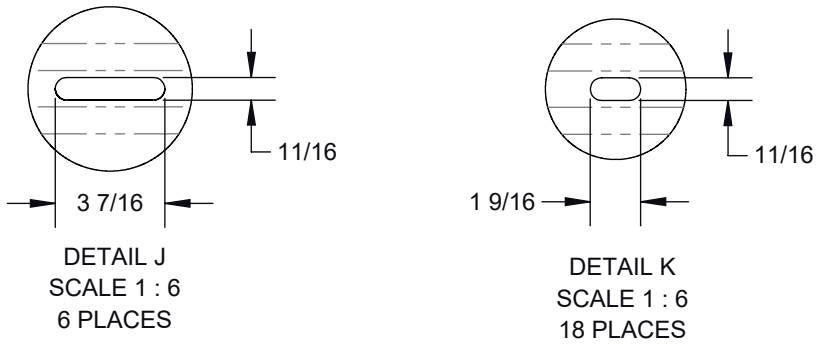
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CONTRACT STANDARDS & DEVELOPMENT UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119

RETAINING WALL ALUMINUM PICKET FENCE

ORIGINAL BY: _____ DATE: _____
MODIFIED BY: rnbritt DATE: 09-16-11
CHECKED BY: _____ DATE: _____
FILE SPEC.: details/english/misc/aluminumfenceretwall.dgn

NOTES:
1. SNOLINE PRODUCT.



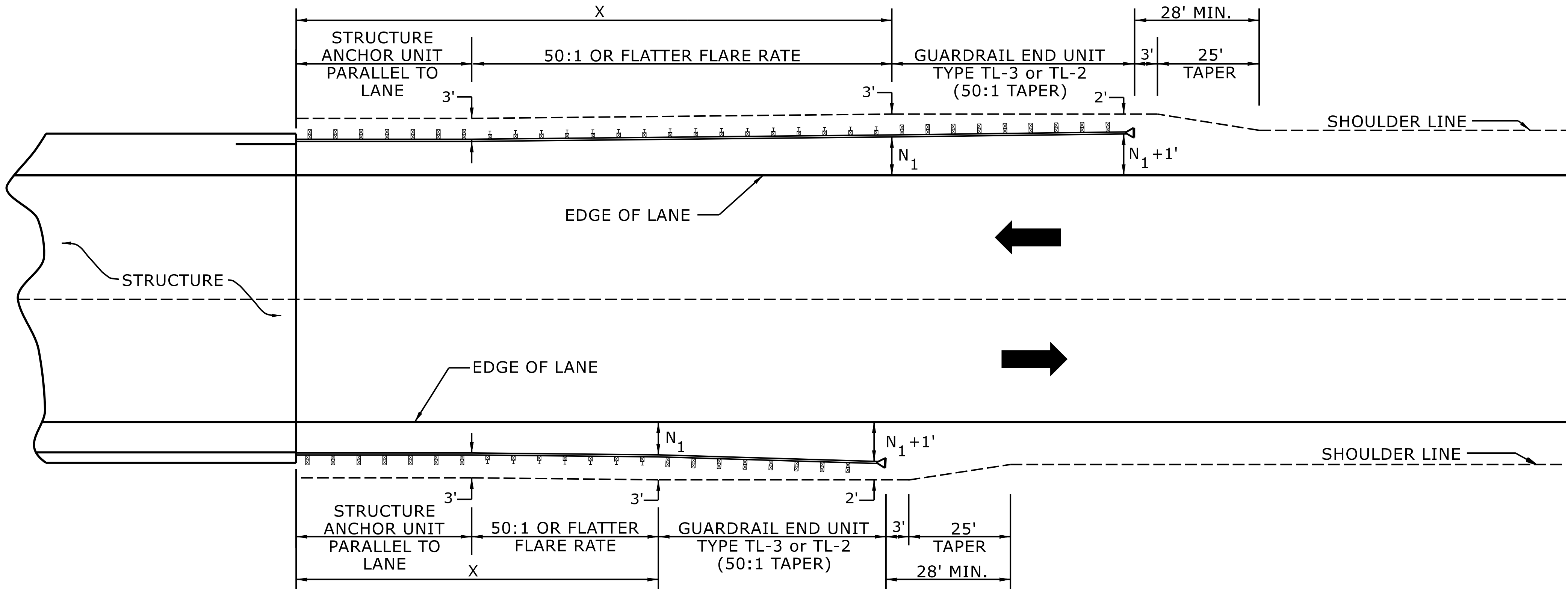
WEIGHT: 15KG ±.50
THICKNESS: 5mm

05/21/25	REDRAWN IN SOLIDWORKS	N/A	JA	
09/08/14	(C) ADDED FOOT HEIGHT QUOTA	N/A		RBC
05/07/14	(B) MODIFIED WEIGHT FROM 20KG TO 15KG	N/A		RBC
	(B) TOLERANCE FROM ±3 TO ±.5			
07/25/13	(A) INITIAL RELEASE	N/A		RBC
REV DATE	REVISION	ECN	BY	APP

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WATERMARK Work In Progress		PART NUMBER DR46003-ORDINATE		SHEET 1 OF 1
DO NOT SCALE DRAWING UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN mm		DESCRIPTION PROTECTION DR46		
TOLERANCE: X = ±2 X.X = ±1.0 X.XX = ±0.25 X.X* = ±2* REMOVE ALL BURRS AND SHARP CORNERS		MATERIAL POLYETHYLENE		
SCALE 1:12		FINISH --		
QR CODE		REV:C		
THIRD ANGLE PROJECTION				



USE FLARE RATE AS THE CONTROL IF THE "N₁" DISTANCE IS NOT OBTAINED.
("N₁" IS BASED ON SHOULDER WIDTHS IN THE ROADWAY DESIGN MANUAL)

SEE STD. 862.03 FOR STRUCTURE ANCHOR UNITS

FOR POSTED SPEEDS ≥ 45MPH USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45MPH USE GREU TYPE TL-2

GUARDRAIL LENGTH OF NEED (X) IS CALCULATED BASED ON THE AASHTO ROADSIDE DESIGN GUIDE.

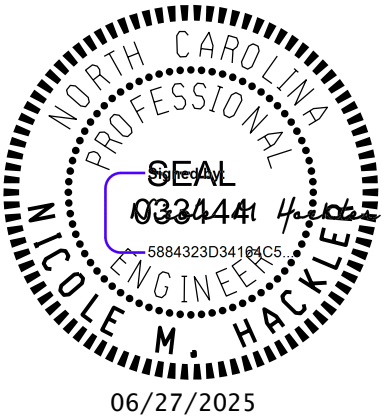
LENGTHS AND OFFSETS FOR PROPOSED GUARDRAIL AT TWO LANE - TWO WAY LOCATIONS

STATE OF
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RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 4 OF 15

862D01



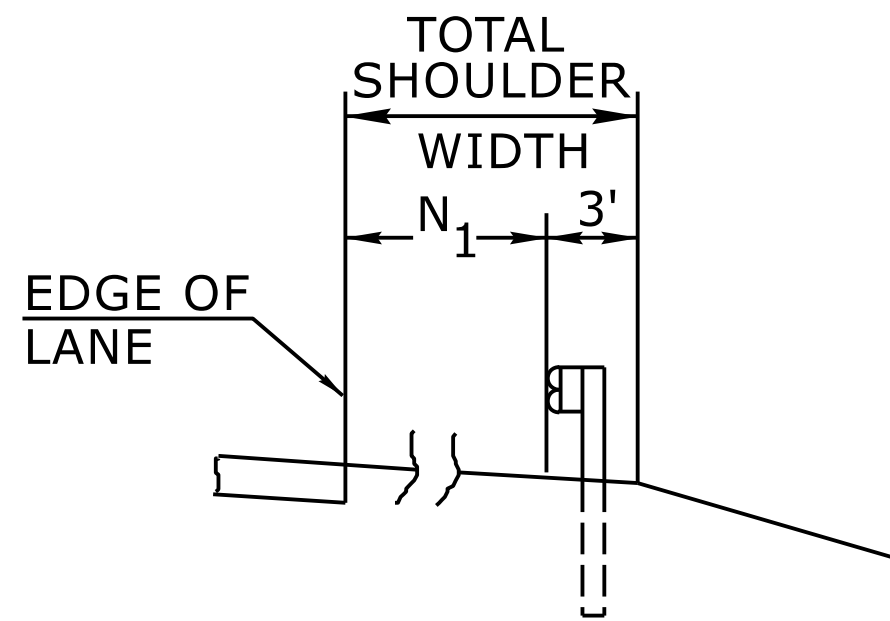
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UNLESS ALL SIGNATURES COMPLETED

**CONTRACTS STANDARDS
AND DEVELOPMENT UNIT**

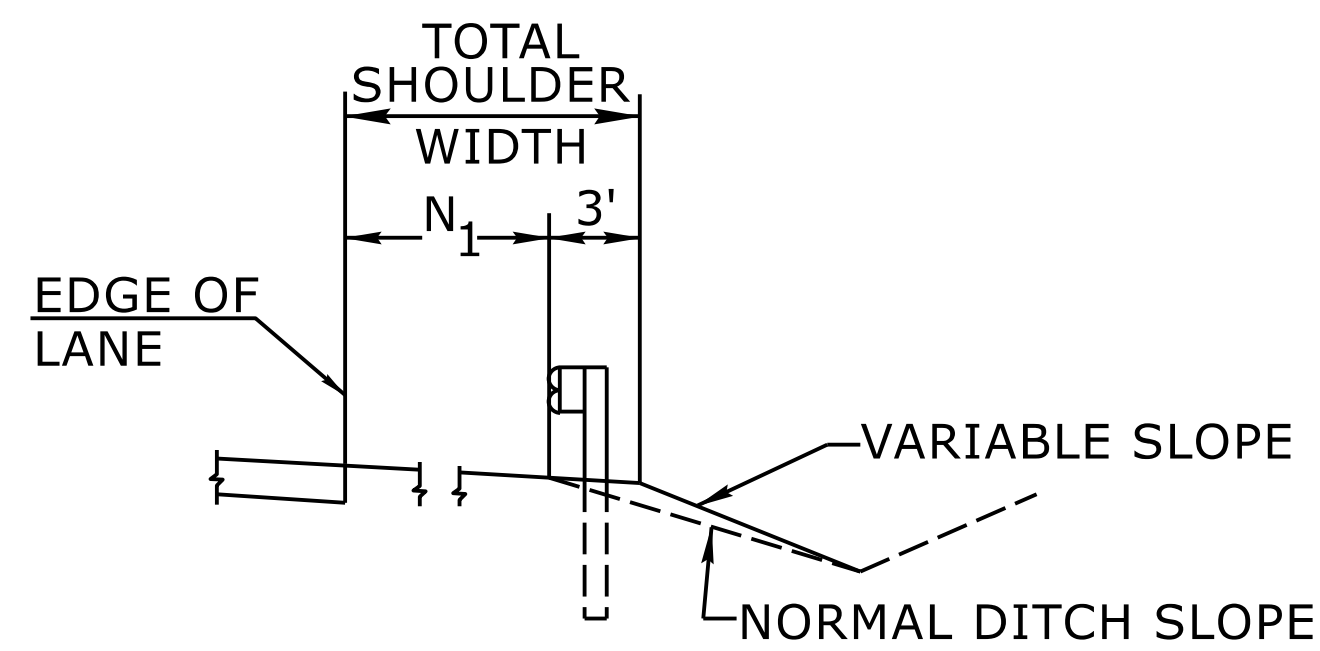
Office 919-707-6950 FAX 919-250-4119

SEE TITLE BLOCK

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MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:

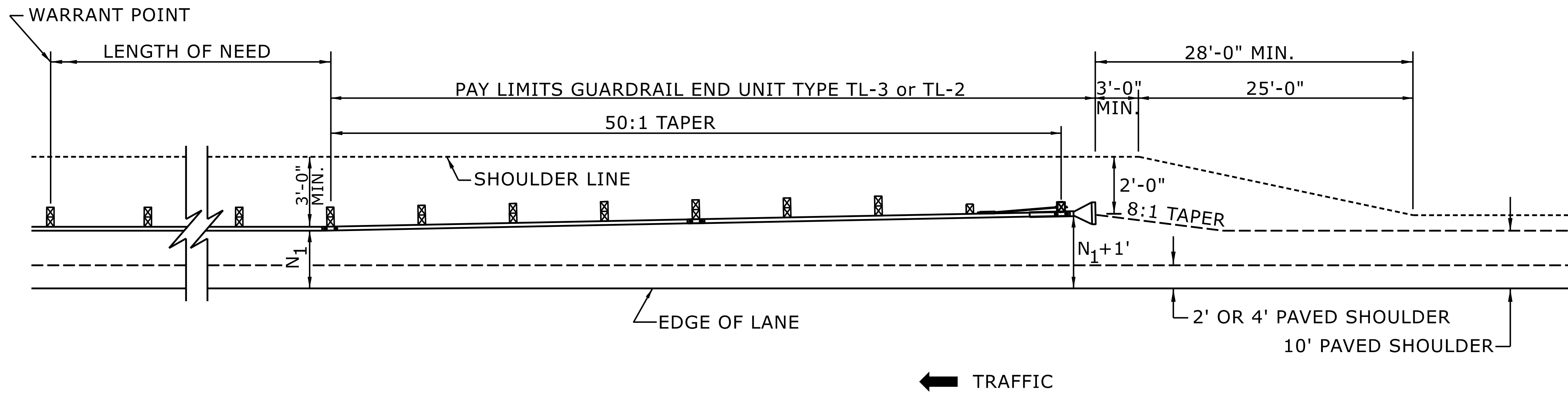


FILL SECTION



CUT SECTION

"N₁"= DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL WHERE GUARDRAIL IS PARALLEL TO LANE.

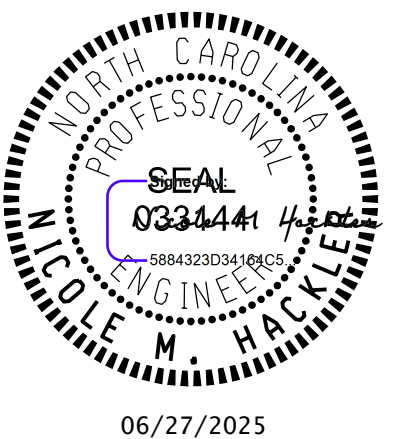


FOR POSTED SPEEDS \geq 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS $<$ 45mph USE GREU TYPE TL-2

DETAIL OF BEGINNING OF GUARDRAIL IN CUT OR FILL SECTION

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 6 OF 15
862D01



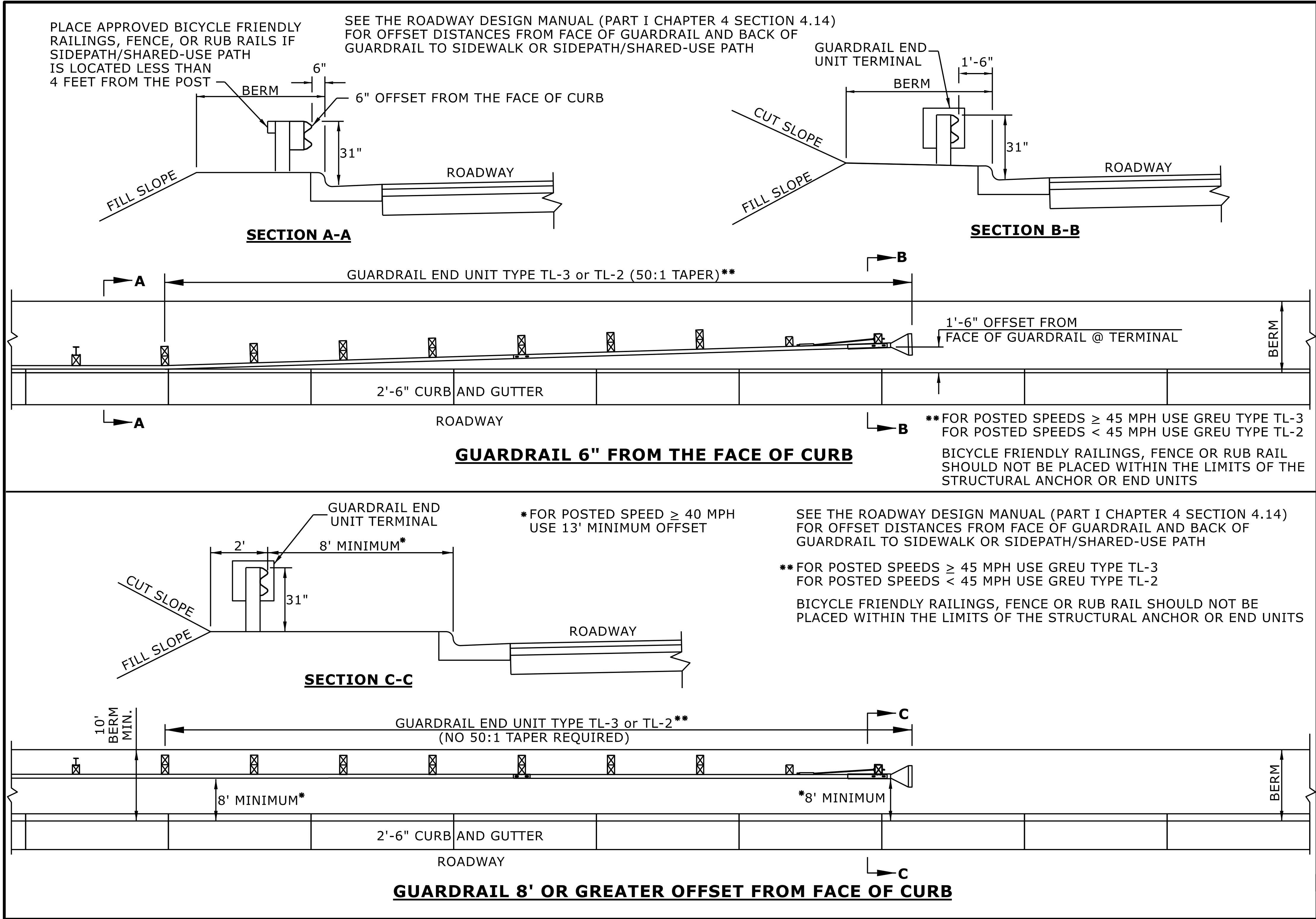
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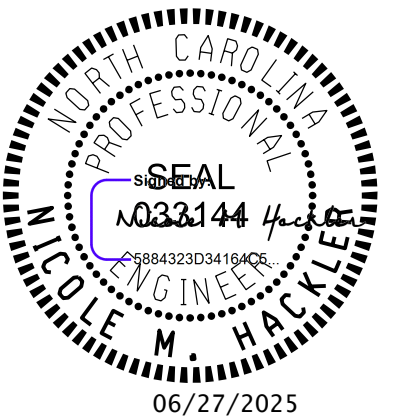
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MODIFIED BY:	DATE:
CHECKED BY:	DATE:
FILE SPEC.:	



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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT
GUARDRAIL TREATMENT AT CURB AND GUTTER

SHEET 12 OF 15
862D01



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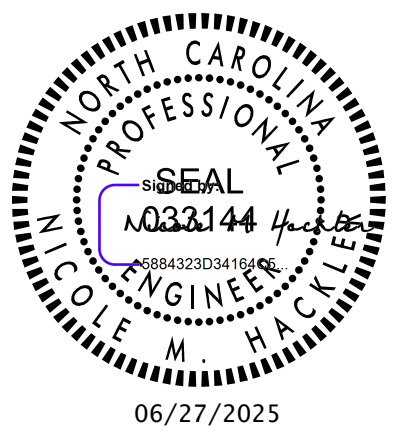
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FILE SPEC.:	

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DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 5 OF 9
862D02



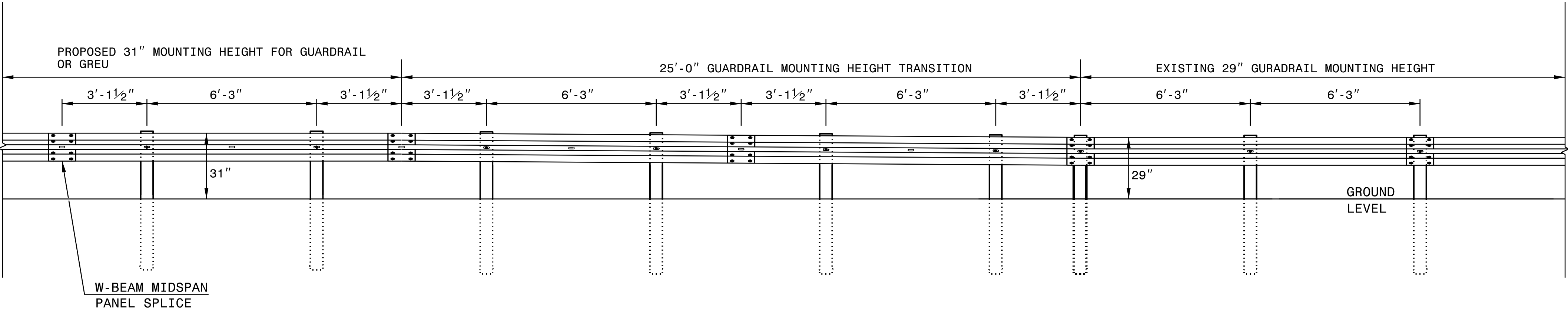
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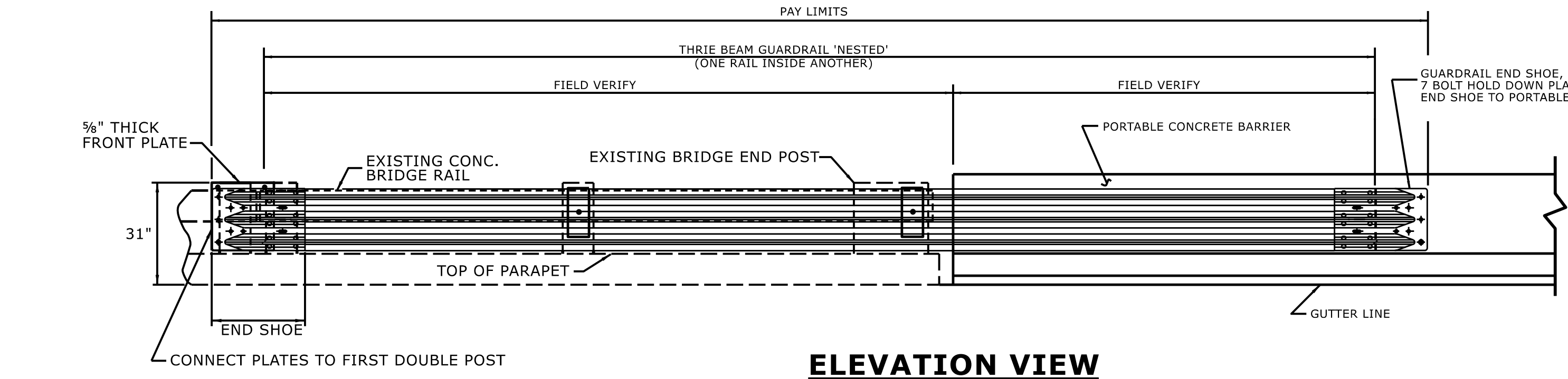
ORIGINAL BY: K. Aldridge DATE: 02-25
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:

**NOTE: IF EXISTING GUARDRAIL IS LOWER THAN 29", USE AN ADDITIONAL 12'-6" LONG SECTION OF GUARDRAIL,
FOR EVERY 1" OF HEIGHT DIFFERENCE, TO TRANSITION FROM EXISTING GUARDRAIL TO PROPOSED 31" GUARDRAIL.**

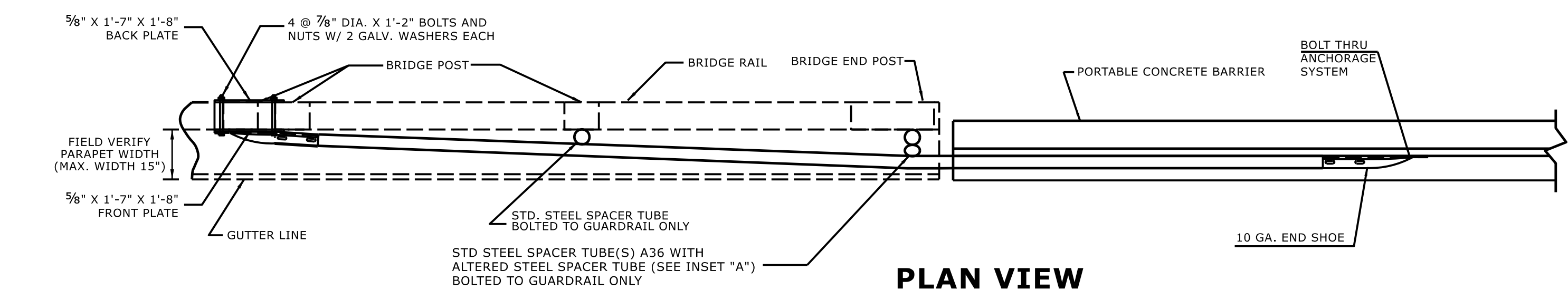


ELEVATION VIEW

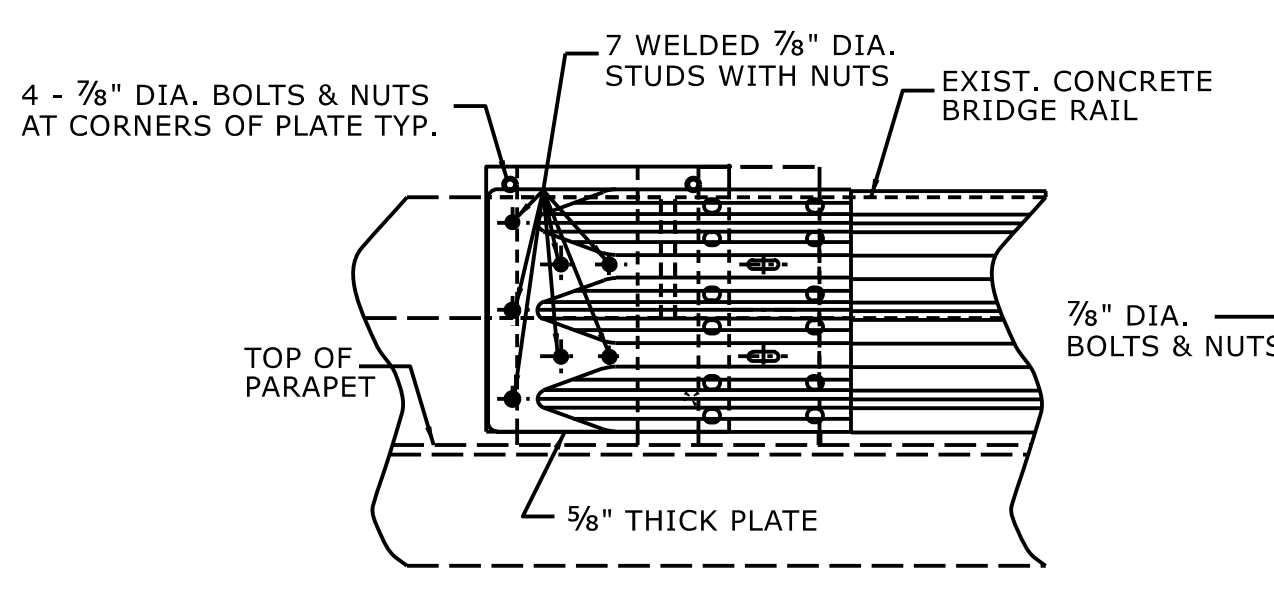
TRANSITION FROM 29" TO 31" W-BEAM GUARDRAIL MOUNTING HEIGHT



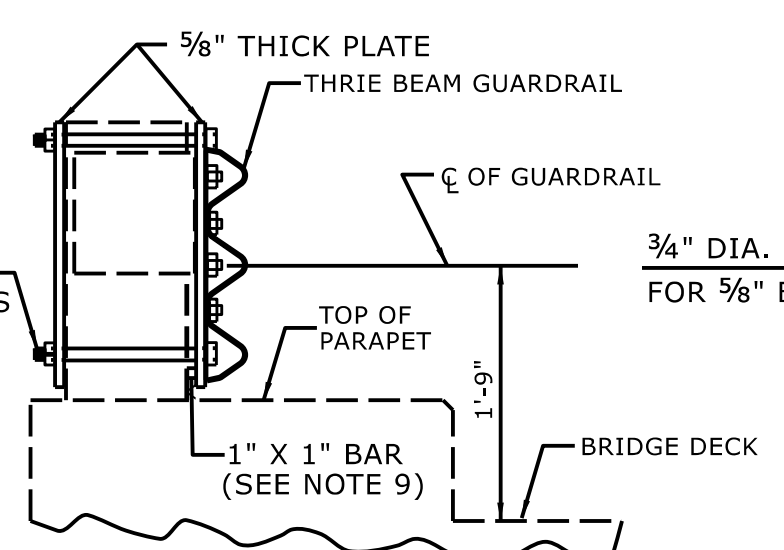
ELEVATION VIEW



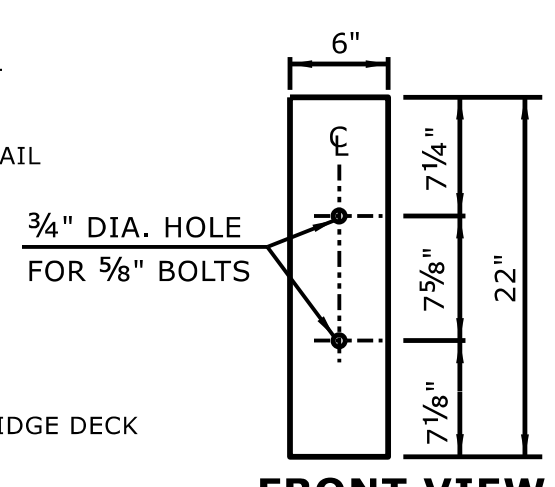
PLAN VIEW



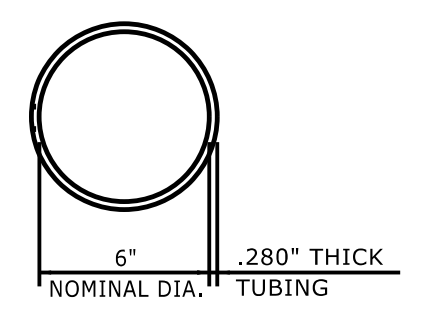
ELEVATION VIEW



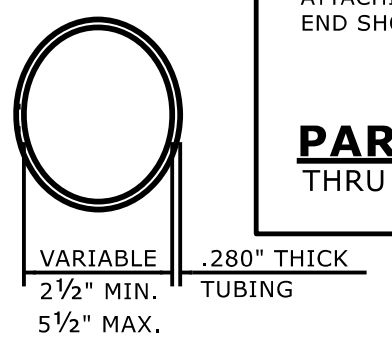
SECTION VIEW



FRONT VIEW

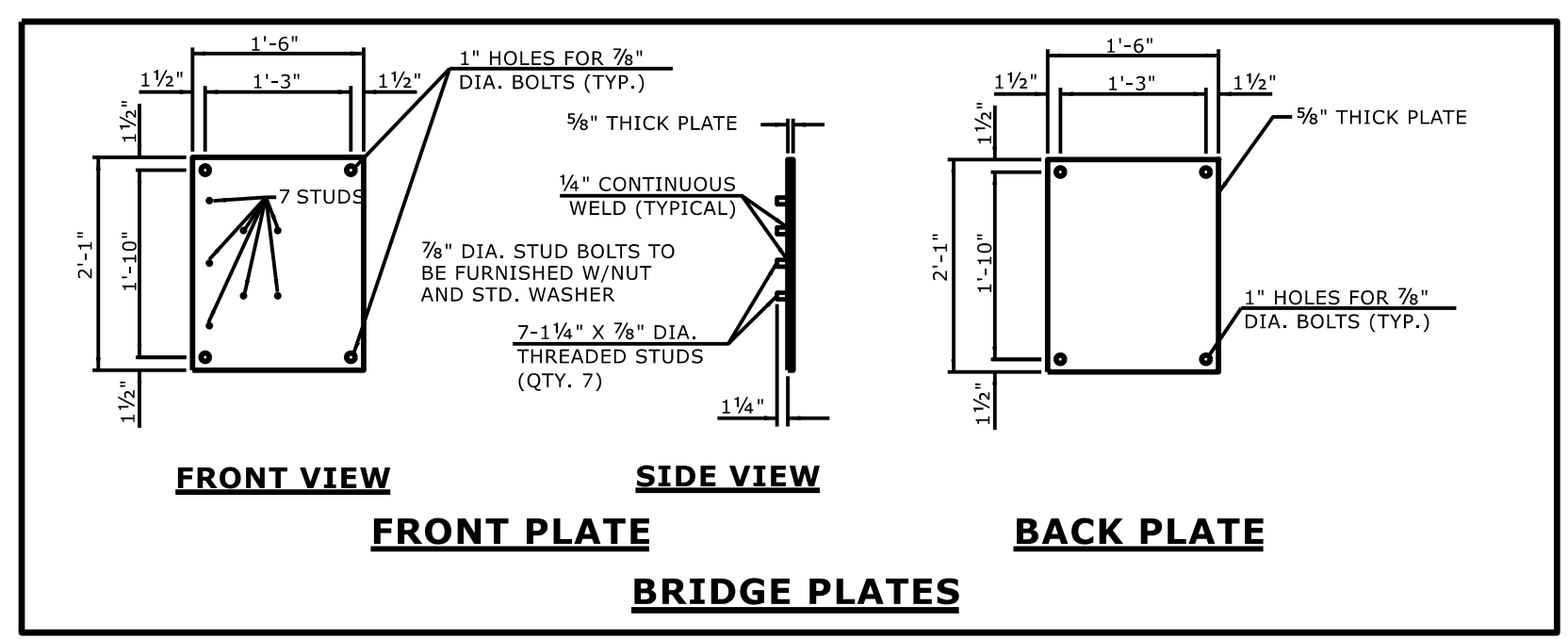


PLAN VIEW



**PLAN VIEW
INSET "A"**

STEEL SPACER TUBE



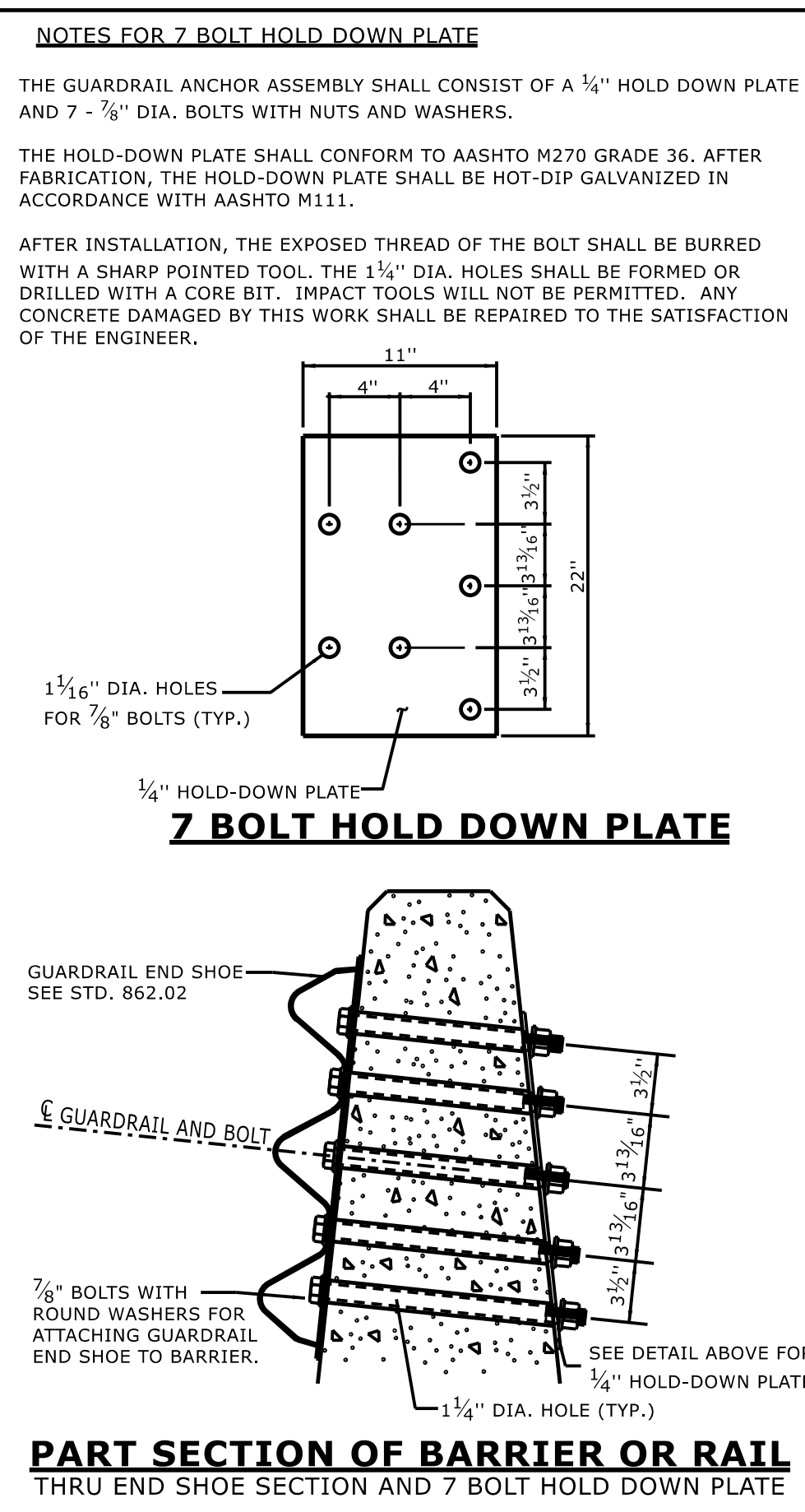
FRONT VIEW

SIDE VIEW

FRONT PLATE

BACK PLATE

BRIDGE PLATES



7 BOLT HOLD DOWN PLATE

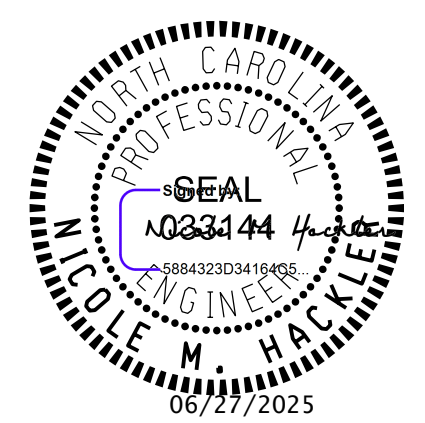
**PART SECTION OF BARRIER OR RAIL
THRU END SHOE SECTION AND 7 BOLT HOLD DOWN PLATE**

- 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

STATE OF
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ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
TEMPORARY ANCHOR UNIT TYPE THRIE-BEAM

SHEET 8 OF 9
862D03



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FILE SPEC.: DATE: