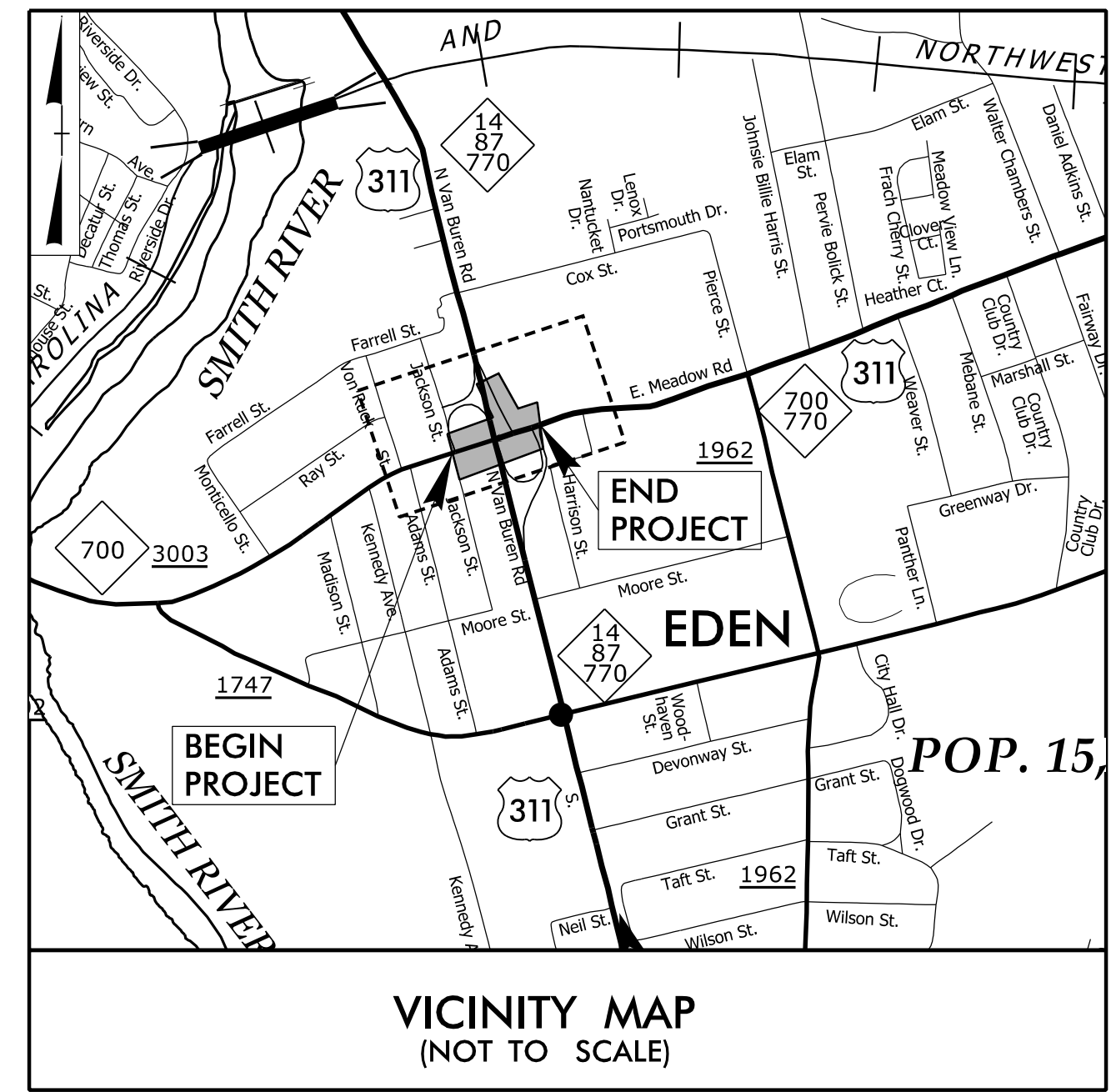


09.08/2019

**TIP PROJECT: B-5737**

**CONTRACT: C204480**

See Sheet 1A For Index Of Sheet  
See Sheet 1B For Conventional Symbols



STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

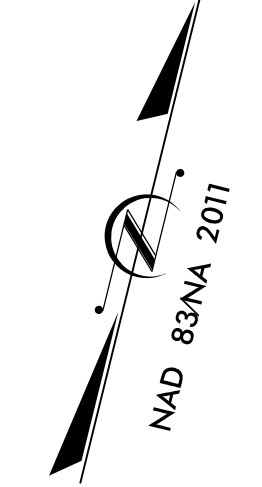
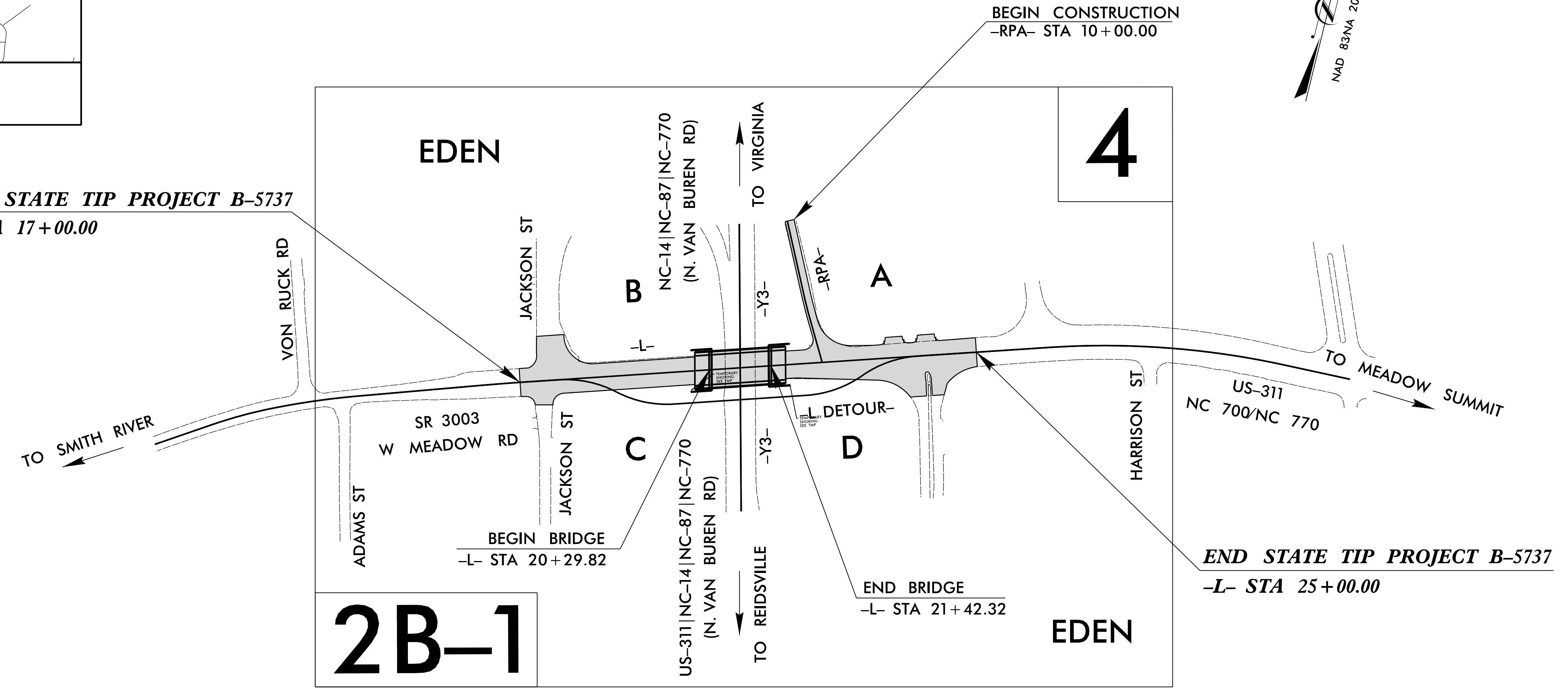
# ROCKINGHAM COUNTY

**LOCATION: REPLACE BRIDGE NO.108 OVER US 311/NC 14/NC 87/NC 770  
ON US 311/NC 700/NC 770, SR 3003 (W.MEADOW RD)**

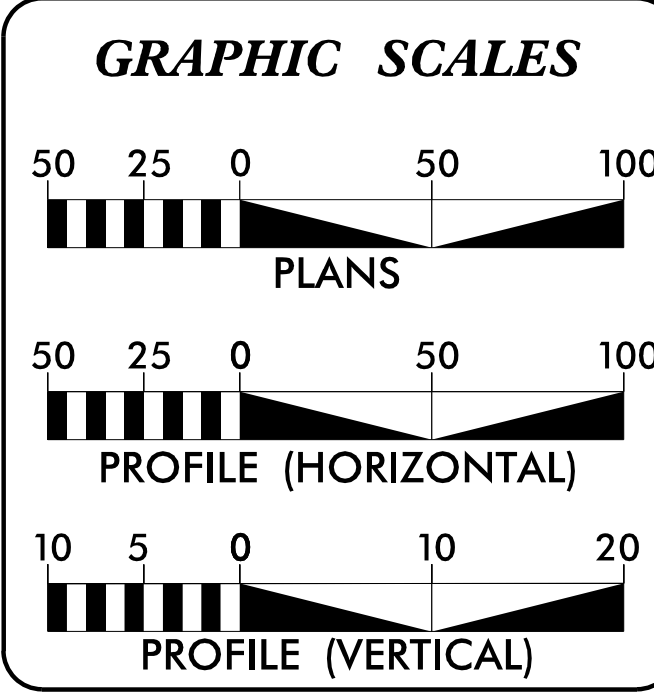
**TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	<b>B-5737</b>	<b>1</b>	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
45693.1.1	N/A	P.E.	
45693.2.1	N/A	ROW /UTIL.	
45693.3.1	N/A	CONST.	

**BEGIN STATE TIP PROJECT B-5737**  
**-L- STA 17+00.00**



DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



**DESIGN DATA**

ADT 2022 =	11,380
ADT 2042 =	12,180
K =	8 %
D =	55 %
T =	14 % *
V =	40 MPH
* TTST = 12% DUAL = 2%	
FUNC CLASS =	MINOR-ARTERIAL
REGIONAL TIER	

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT B-5737 =	0.131
LENGTH STRUCTURE TIP PROJECT B-5737 =	0.021
TOTAL LENGTH TIP PROJECT B-5737 =	0.152

Prepared for NCDOT in the Office of:

**moffatt & nichol**  
4700 FALLS OF NEUSE ROAD, SUITE 300  
RALEIGH, NORTH CAROLINA 27609  
(919) 781-4626 VOICE (919) 781-4869 FAX  
NC License NO.: F-0105

2018 STANDARD SPECIFICATIONS

**RIGHT OF WAY DATE:**  
JULY 6, 2021

**LETTING DATE:**  
MARCH 15, 2022

**TRENT HUFFMAN, PE**  
PROJECT ENGINEER

**GRAY MODLIN, PE**  
PROJECT DESIGN ENGINEER

**DAVID STUTTS, P.E.**  
NCDOT CONTACT

**HYDRAULICS ENGINEER**

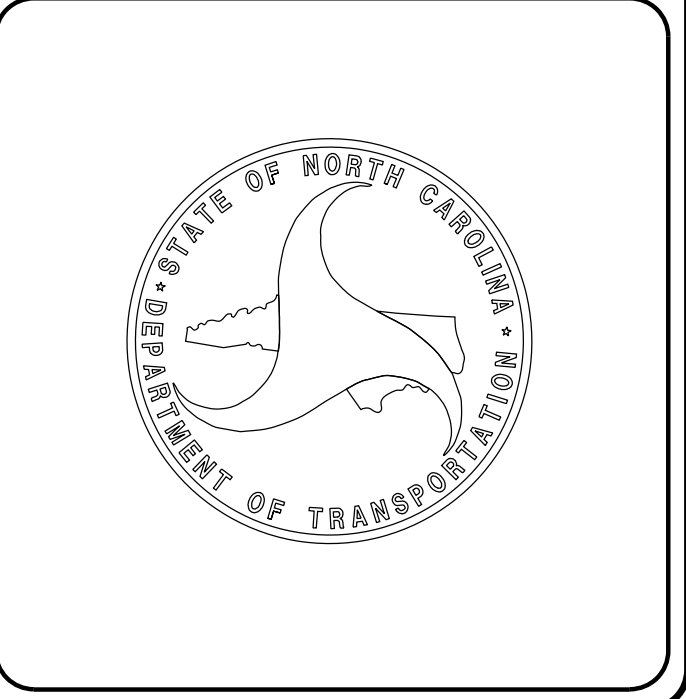
**moffatt & nichol**

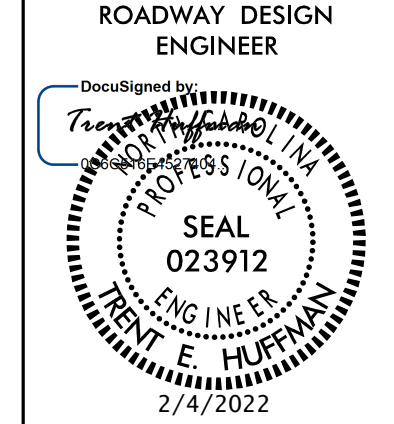
DocuSigned by:  
*Camryn Long*  
SIGNATURE:msc P.E. 1/12/2022

**ROADWAY DESIGN ENGINEER**

**moffatt & nichol**

DocuSigned by:  
*Trent E Huffman*  
SIGNATURE:tee P.E. 1/12/2022





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	ROADWAY DETAILS
2C-1 THRU 2C-6	SPECIAL DETAILS
2G-1 THRU 2G-3	TEMPORARY SHORING DETAILS
3B-1 THRU 3B-2	ROADWAY SUMMARIES
3D-1	DRAINAGE SUMMARIES
3G-1	GEOTECHNICAL SUMMARIES
4 THRU 5	PLAN AND PROFILE SHEET
RW-01 THRU RW-04	RIGHT OF WAY SHEETS
TMP-1 THRU TMP- 10	TRAFFIC MANAGEMENT PLANS
PMP-1 THRU PMP- 3	PAVEMENT MARKING PLANS
EC-1 THRU EC- 6	EROSION CONTROL PLANS
SIGN-1 THRU SIGN- 4	SIGNING PLANS
UC-1 THRU UC-5	UTILITIES CONSTRUCTION PLANS
UO-1 THRU UO-3	UTILITIES BY OTHERS PLANS
X-0	CROSS-SECTION INDEX SHEET
X-1A	CROSS-SECTION SUMMARY SHEET
X-1 THRU X-8	CROSS-SECTIONS
S-1 THRU S-28	STRUCTURE PLANS
W-1 THRU W-4	WALL PLANS

2018 ROADWAY ENGLISH STANDARD DRAWINGS

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	
200.02	Method of Clearing – Method II
225.02	Guide for Grading Subgrade – Secondary and Local
225.04	Method of Obtaining Superelevation – Two Lane Pavement
DIVISION 3 – PIPE CULVERTS	
300.01	Method of Pipe Installation
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 Superelevated Curve – Method I
DIVISION 6 – ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
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
840.45	Precast Drainage Structure
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
848.01	Concrete Sidewalk
848.03	Driveway Turnout – Drop Curb Type
848.04	Street Turnout
848.05	Curb Ramp – Proposed Curb & Gutter
848.06	Curb Ramp – Existing Curb & Gutter
852.01	Concrete Islands
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.02	Guide for Rip Rap at Pipe Outlets

EFF. 01-16-2018  
REV.

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

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

**GRADE LINE:**  
GRADING AND SURFACING:  
THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED 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 METHOD II.

**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

**SIDE ROADS:**  
THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.

**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 THE PLANS OR AS DIRECTED BY THE ENGINEER.

**STREET TURNOUT:**  
STREET RETURNS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 848.04 USING THE RADII NOTED ON PLANS.

**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 NOT SHOWN ON THE PLANS WILL BE PAID FOR AT THE CONTRACT PRICE FOR "TEMPORARY SHORING".

**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:  
WATER – CITY OF EDEN  
SEWER – CITY OF EDEN  
POWER (DISTRIBUTION) – DUKE ENERGY  
GAS – PIEDMONT NATURAL GAS  
COMMUNICATIONS – SPECTRUM  
COMMUNICATIONS – CENTURYLINK  
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.

**CURB RAMPS**  
CURB RAMPS ARE SHOWN ON THE PLANS AT APPROXIMATE LOCATIONS. CONSTRUCT ALL CURB RAMPS ACCORDANCE WITH STD 848.05 and/or 848.06 SEE ROADWAY DETAIL SHEET 2C-2 AND 2C-3.



# STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

## CONVENTIONAL PLAN SHEET SYMBOLS

12/2/2016

### BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○ EIP
Computed Property Corner	-----
Property 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	○ S
Well	○ W
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	--- FLOW ---
False Sump	▽

### RAILROADS:

Standard Gauge	-----
RR Signal Milepost	○ MILEPOST 35
Switch	□ 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 Easement 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	--- C ---
Proposed Slope Stakes Fill	--- F ---
Proposed Curb Ramp	--- CR ---
Existing Metal Guardrail	-----
Proposed Guardrail	-----
Existing Cable Guiderail	-----
Proposed Cable Guiderail	-----
Equality Symbol	⊕
Pavement Removal	⊗

### VEGETATION:

Single Tree	○
Single Shrub	○

*Note: Not to Scale*      \*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:

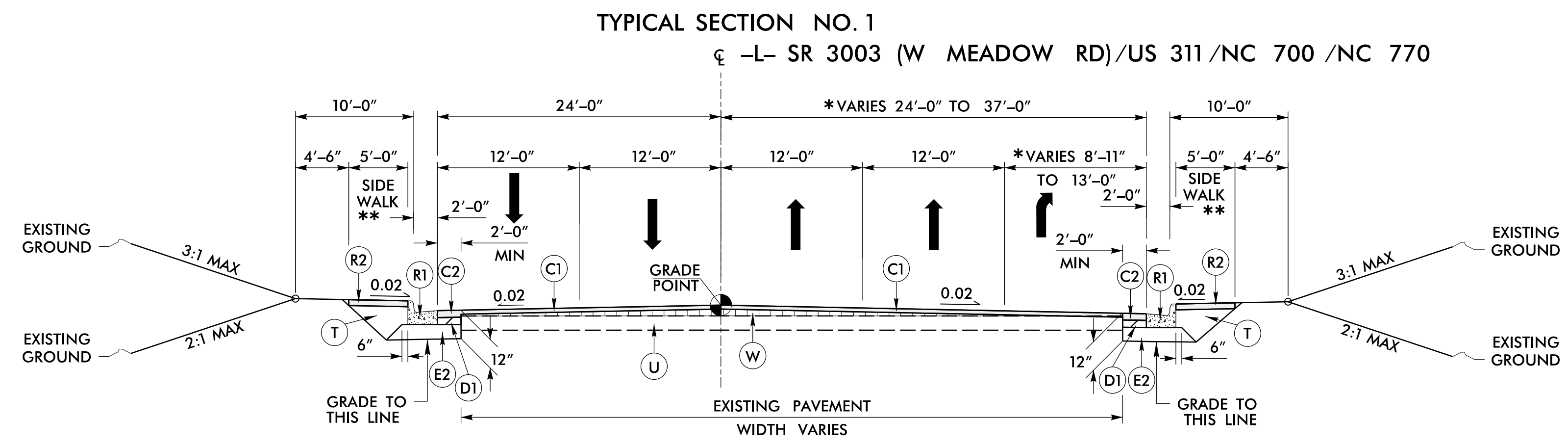
Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	⊠
Utility Unknown U/G Line LOS B (S.U.E.*)	-----
U/G Tank; Water, Gas, Oil	□
Underground Storage Tank, Approx. Loc.	⊕
A/G Tank; Water, Gas, Oil	□
Geoenvironmental Boring	⊕
U/G Test Hole LOS A (S.U.E.*)	○
Abandoned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

8/17/99

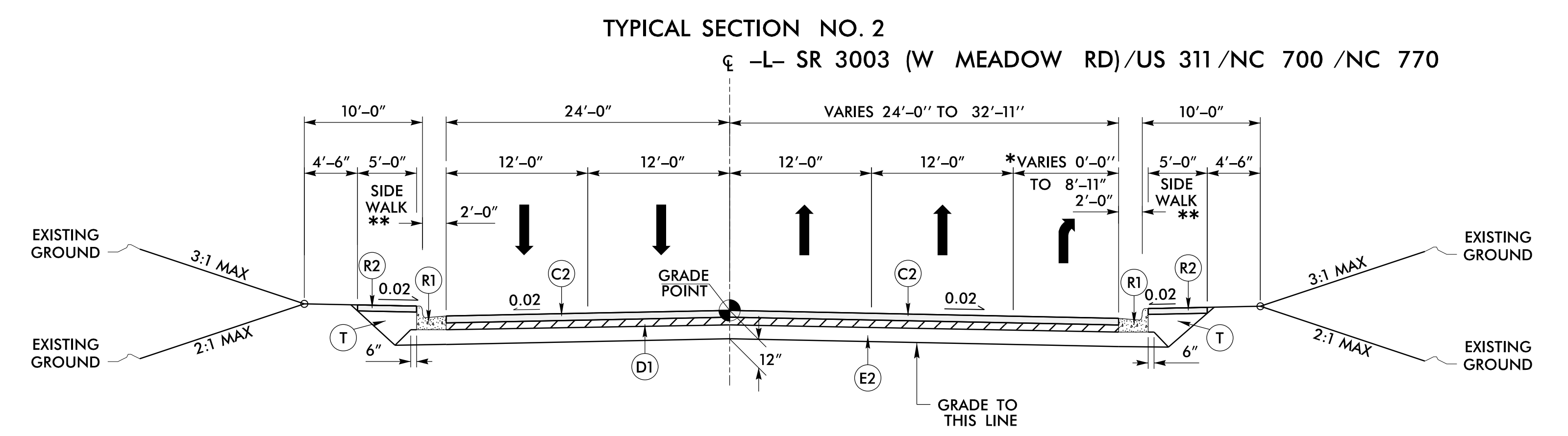
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RW SHEET NO.	
ROADWAY DESIGN ENGINEER E. HUFFMAN	PAVEMENT DESIGN ENGINEER CLARK S. MORRISON
SEAL 023912 1/12/2022	SEAL 022896 1/14/2022
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

PAVEMENT SCHEDULE			
(FINAL PAVEMENT DESIGN PER LETTER FROM CLARK MORRISON DATED 2/11/2020)			
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	J1	PROP. 10" AGGREGATE BASE COURSE.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	R1	2'-6" CONCRETE CURB AND GUTTER
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1½" IN DEPTH.	R2	4" CONCRETE SIDEWALK
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R3	PORTABLE CONCRETE BARRIER
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.	P	PRIME COAT AT AN AVERAGE RATE OF 0.35 GALS PER SQ. YD.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	T	EARTH MATERIAL
E2	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.	U	EXISTING PAVEMENT
E3	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.	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL SHEET 2A-3)

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



**USE TYPICAL SECTION NO. 1**  
 -L- STA 17+00.00 TO 18+30.00  
 -L- STA 22+70.00 TO 25+00.00  
 \* NOTE: TURN LANE TAPER ENDS AT STATION 23+24.50  
 \*\* SEE PLANS FOR SIDEWALK LOCATION



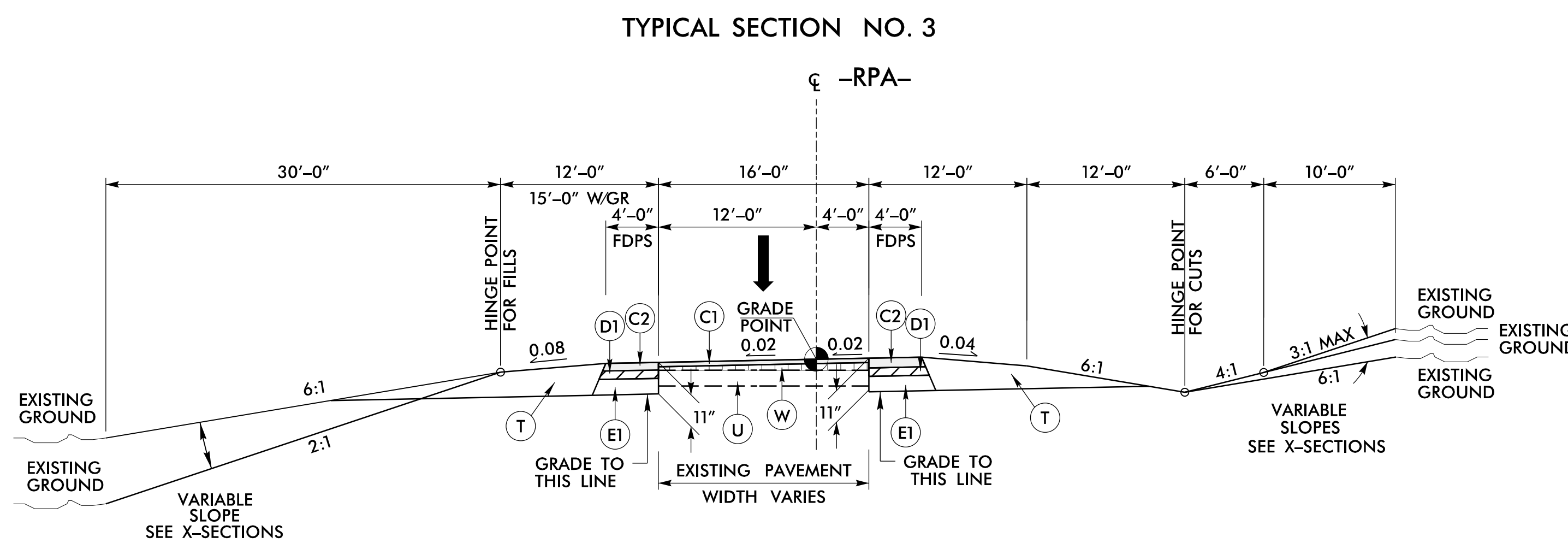
**USE TYPICAL SECTION NO. 2**  
 -L- STA 18+30 TO 20+29.82 (BEGIN BRIDGE)  
 -L- STA 21+42.32 (END BRIDGE) TO 22+70.00  
 \* NOTE: TURN LANE TAPER BEGINS AT STATION 21+82.80  
 \*\* SEE PLANS FOR SIDEWALK LOCATION

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 8/30/2021 10:01:10 AM  
 moffatt & nichol

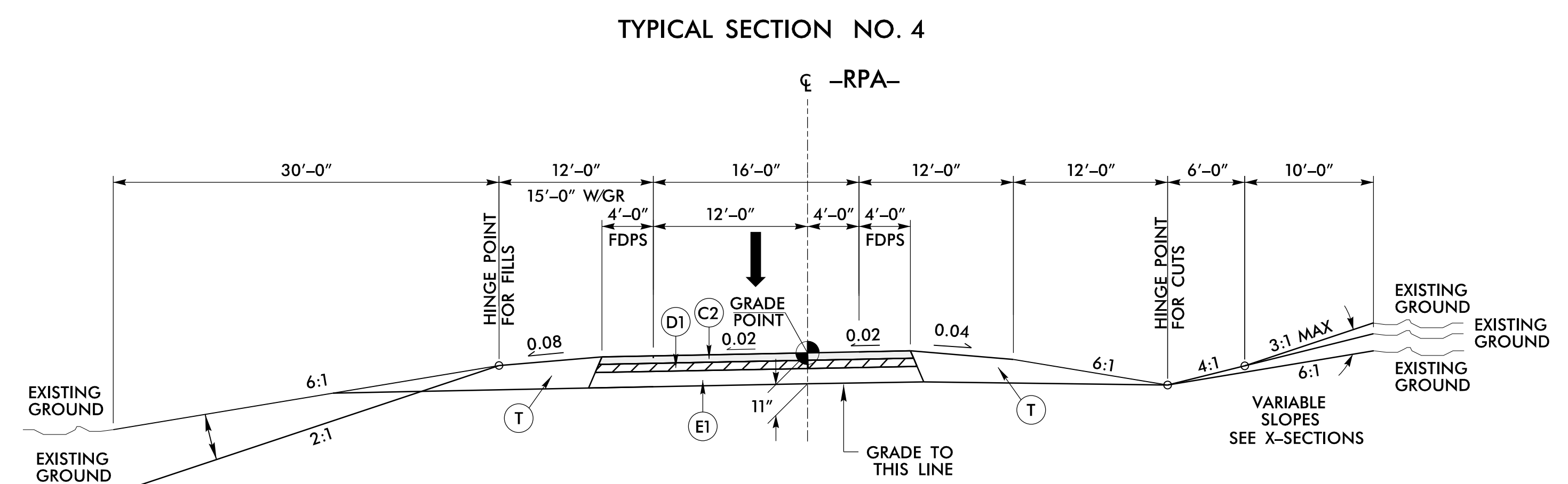


C1	1 1/2" S9.5C
C2	3" S9.5C
D1	4" I19.0C
J1	10" ABC
E1	4" B25.0C
R1	2'-6" CURB & GUTTER
R3	PORTABLE CONC. BARRIER
P	PRIME COAT
T	EARTH
U	EXIST PAVEMENT
W	WEDGING

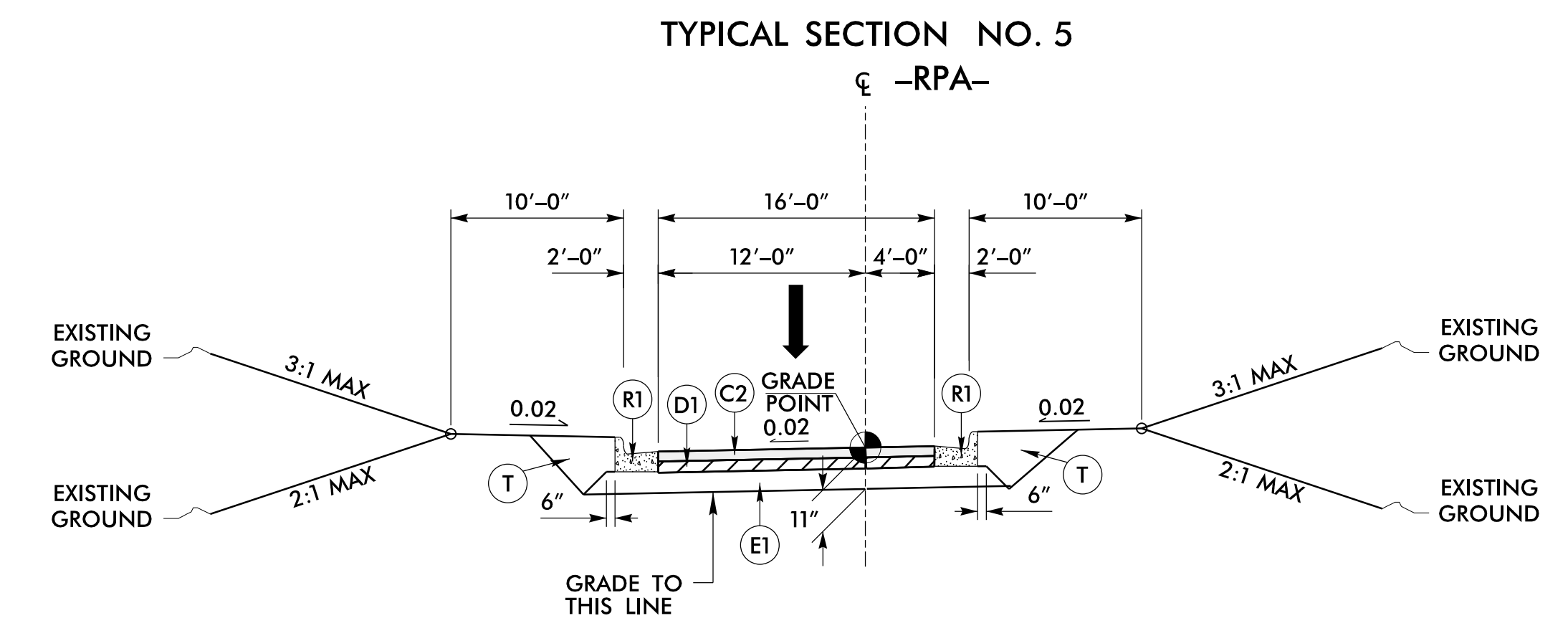
PROJECT REFERENCE NO.	SHEET NO.
B-5737	2A-2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
1/12/2022	1/14/2022
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
moffatt & nichol	



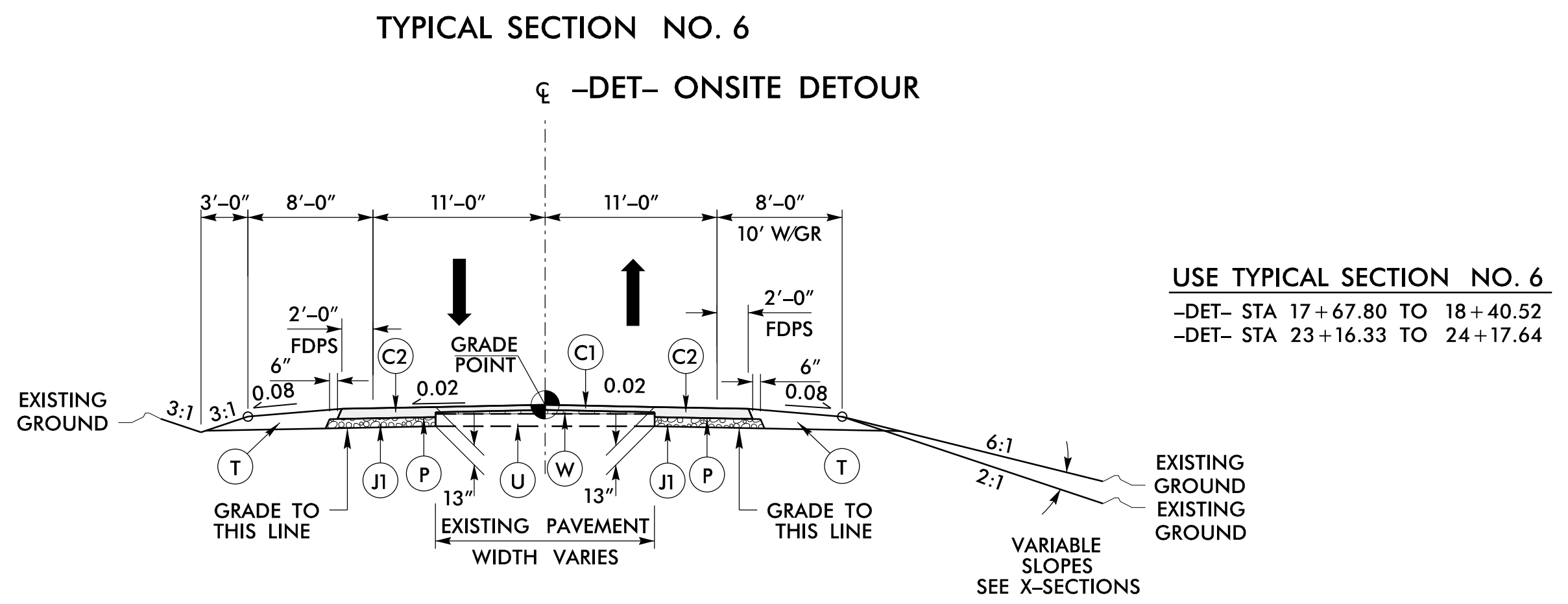
**USE TYPICAL SECTION NO. 3**  
 -RPA- STA 10+00.00 TO 11+00.00  
 NOTE: 4:1 MAX SLOPES INSIDE THE INTERCHANGE



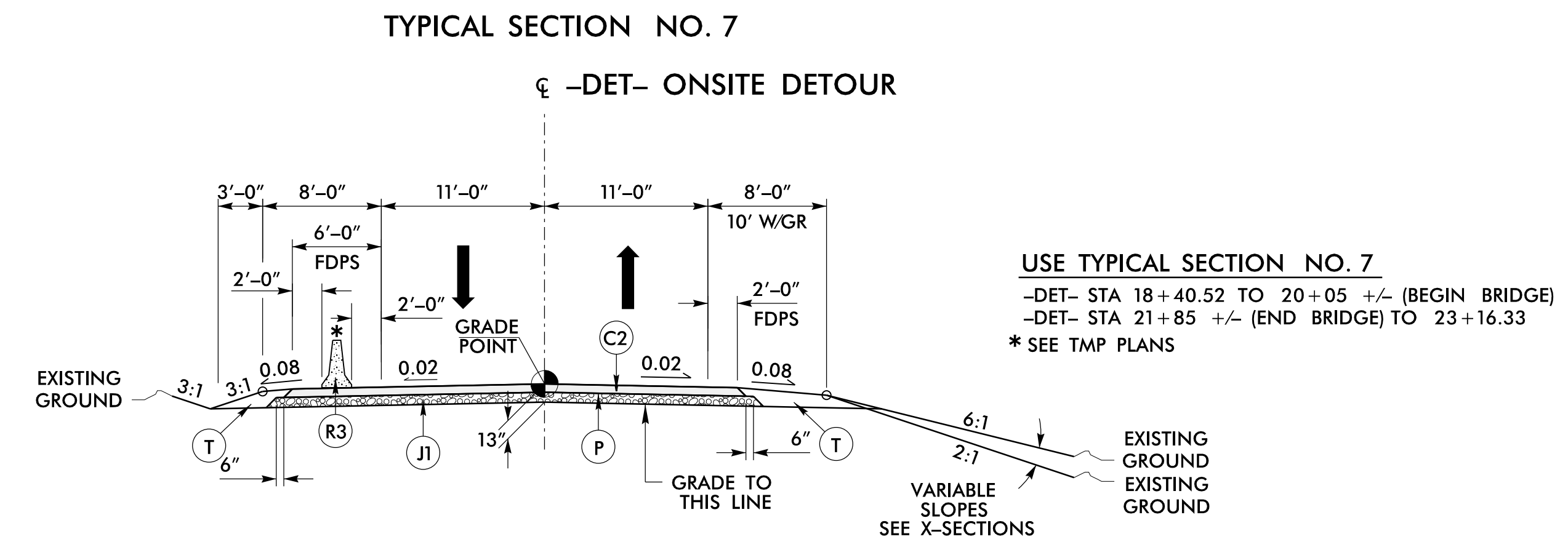
**USE TYPICAL SECTION NO. 4**  
 -RPA- STA 11+00.00 TO 11+82.72  
 NOTE: 4:1 MAX SLOPES INSIDE THE INTERCHANGE



**USE TYPICAL SECTION NO. 5**  
 -RPA- STA 11+82.72 TO 12+30.29  
 NOTE: 4:1 MAX SLOPES INSIDE THE INTERCHANGE



**USE TYPICAL SECTION NO. 6**  
 -DET- STA 17+67.80 TO 18+40.52  
 -DET- STA 23+16.33 TO 24+17.64

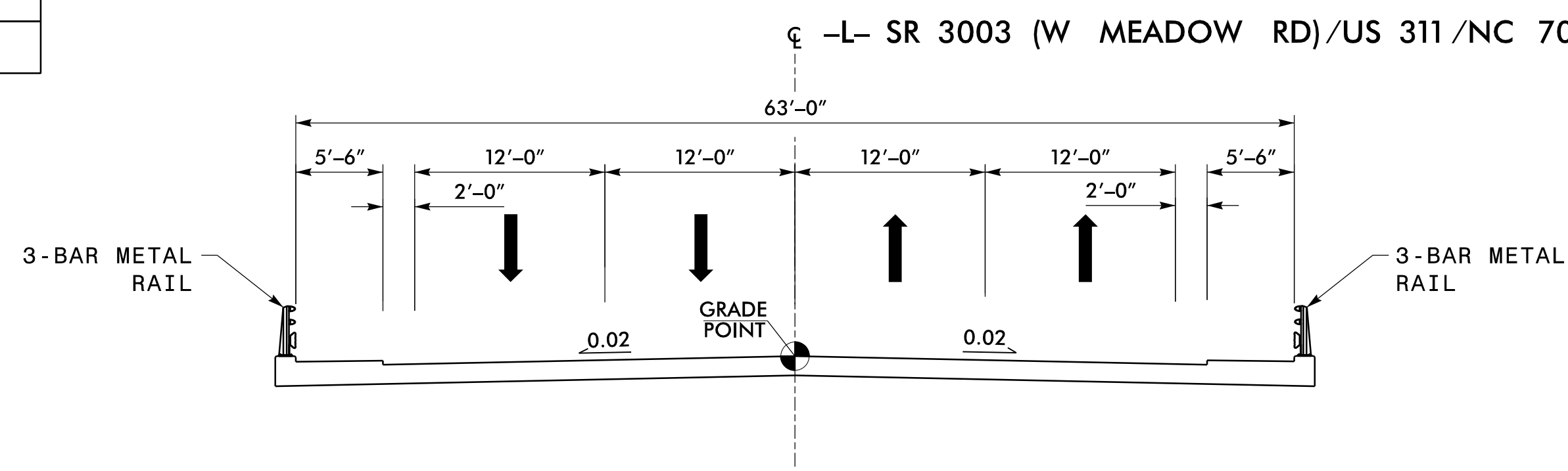


**USE TYPICAL SECTION NO. 7**  
 -DET- STA 18+40.52 TO 20+05 +/- (BEGIN BRIDGE)  
 -DET- STA 21+85 +/- (END BRIDGE) TO 23+16.33  
 \* SEE TMP PLANS

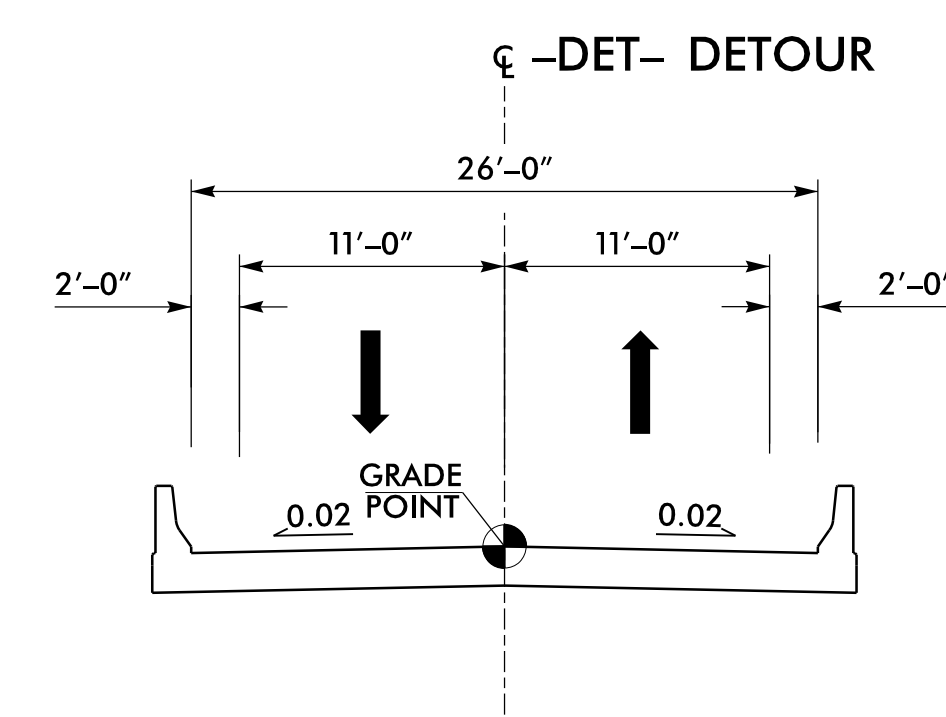
1/13/2021  
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 amed

C1	1 1/2" S9.5C
C3	VAR. DEPTH S9.5C
D1	4" I19.0C
D2	VAR. DEPTH I19.0C
E3	VAR. DEPTH B25.0C
U	EXIST PAVEMENT
W	WEDGING

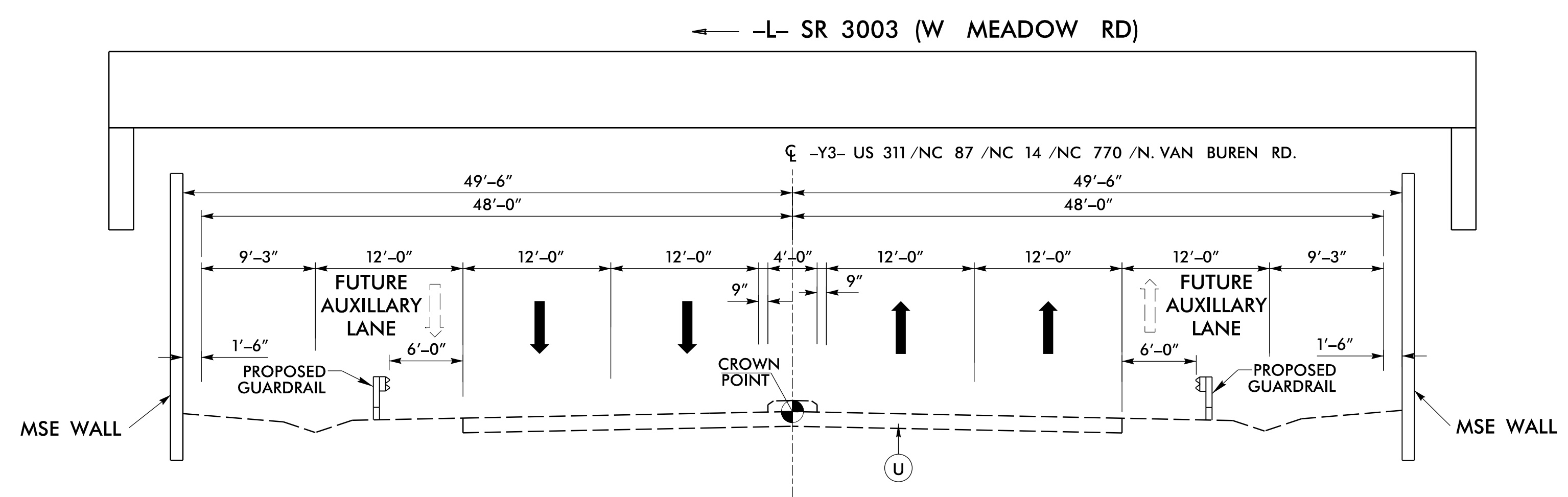
PROJECT REFERENCE NO. B-5737	SHEET NO. 2A-3
RW SHEET NO.	
ROADWAY DESIGN ENGINEER TRAVIS R. HUBBARD SEAL 023912 1/12/2022	PAVEMENT DESIGN ENGINEER CURT S. MORRISON SEAL 022896 1/14/2022
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
<small>4700 FALLS OF NEUSE ROAD, SUITE 300 RALEIGH, NORTH CAROLINA 27609 919/978-4620 VOICE 919/978-1888 FAX NC LICENSE NO. P-0105</small>	



**STRUCTURE TYPICAL SECTION NO.1**  
-L- STA 20+29.82 TO 21+42.32

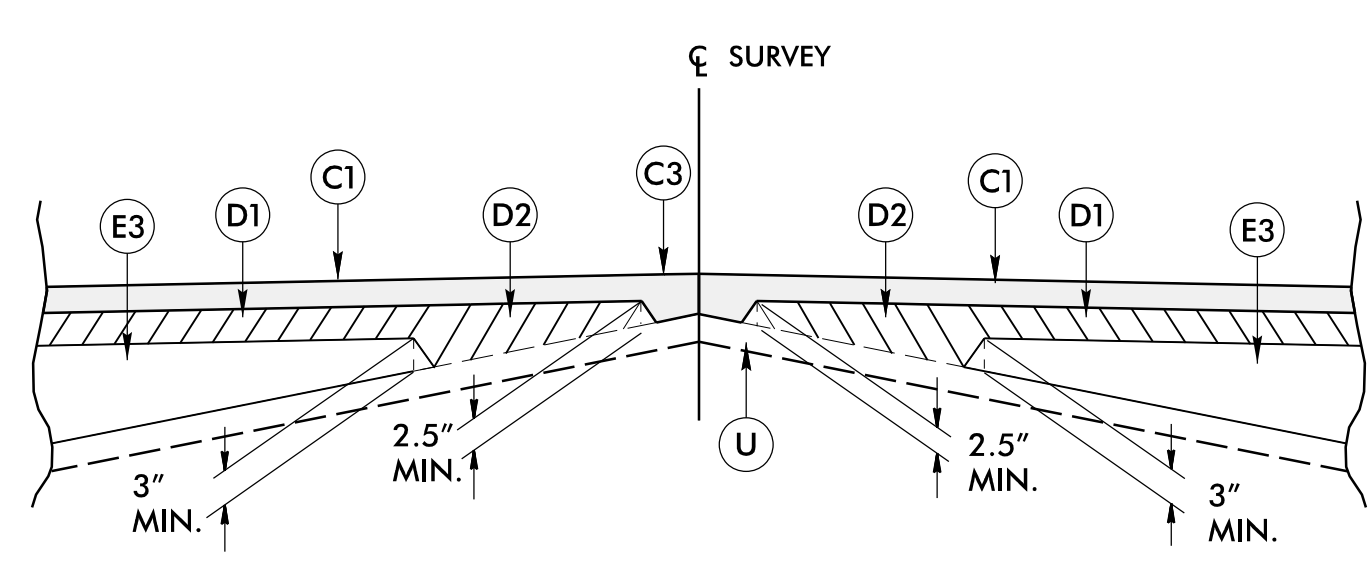


**STRUCTURE TYPICAL SECTION NO.2**  
-DET- STA 20+05 +/- TO 21+85 +/-

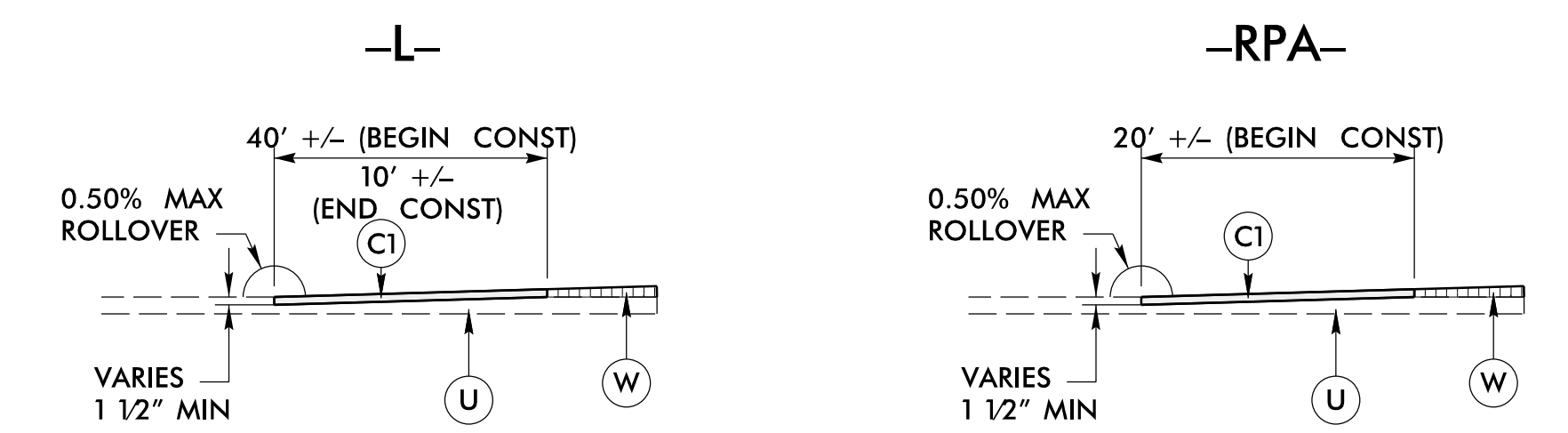
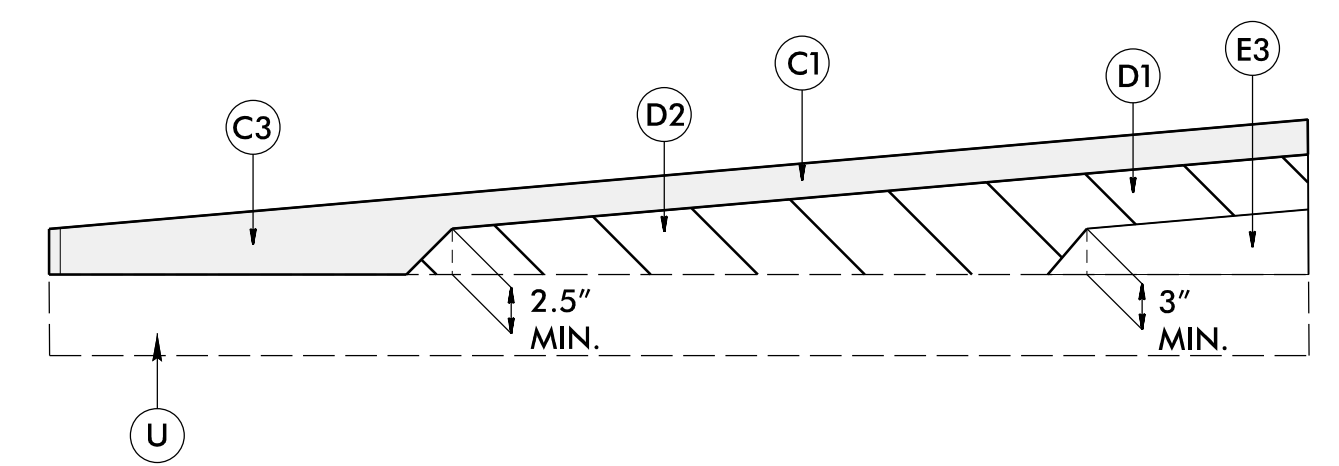


**TYPICAL SECTION UNDER BRIDGE**

**WEDGING DETAIL NO.1**



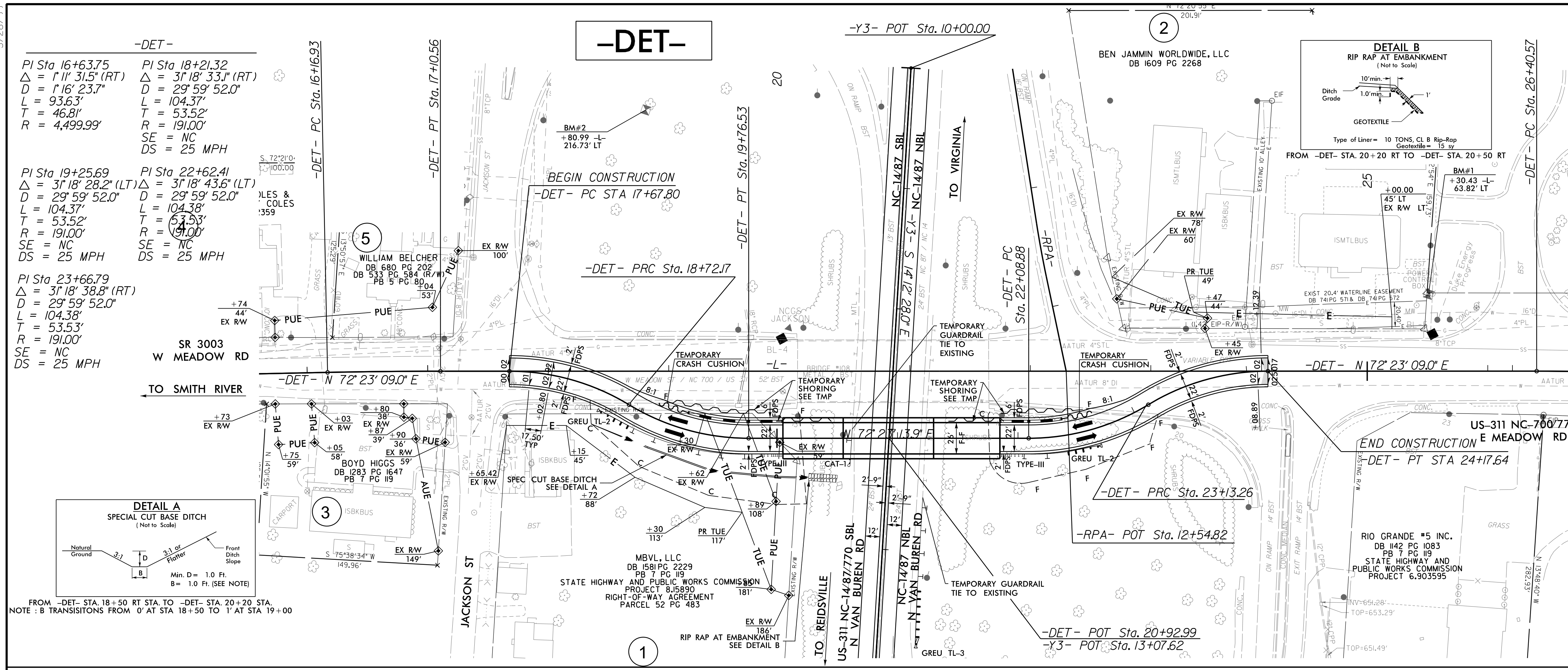
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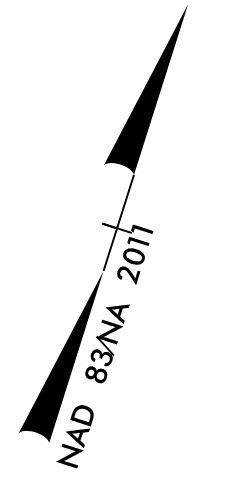
**INCIDENTAL MILLING DETAILS**



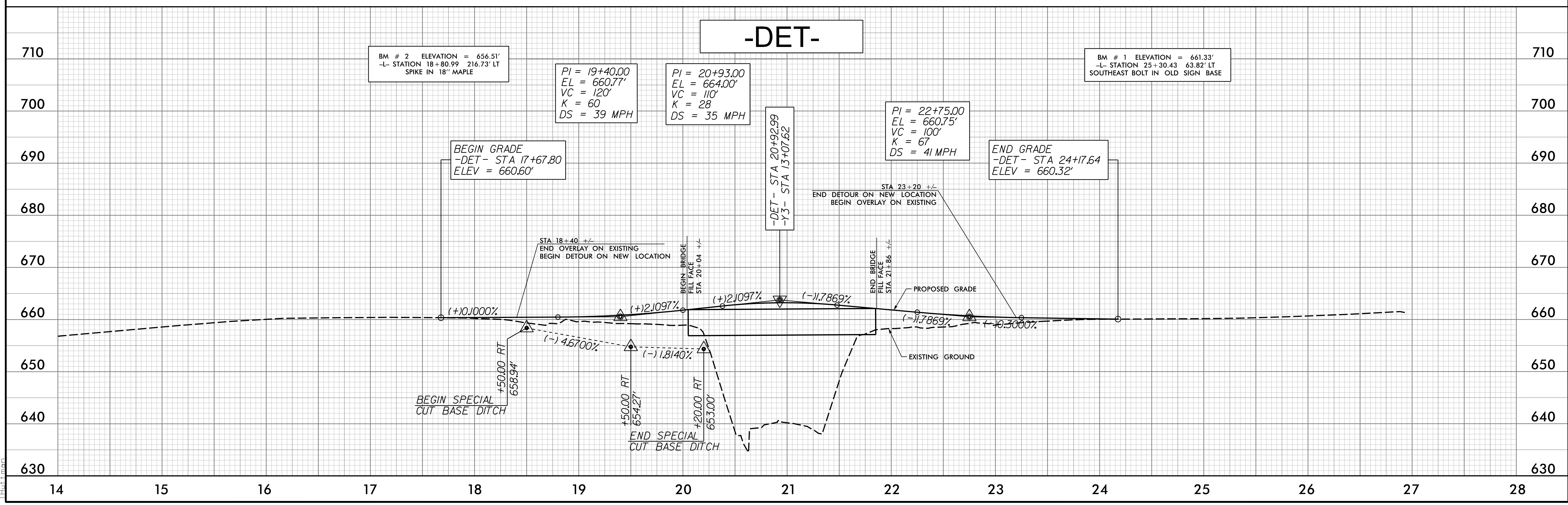
5/28/2022



PROJECT REFERENCE NO. <b>B-5737</b>	SHEET NO. <b>2B-1</b>
ROADWAY DESIGN ENGINEER <b>E. HURTT</b>	HYDRAULICS ENGINEER <b>CAMERON M. LONG</b>
SEAL 023912	SEAL 034333
2/3/2022	2/3/2022
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
moffatt & nichol	

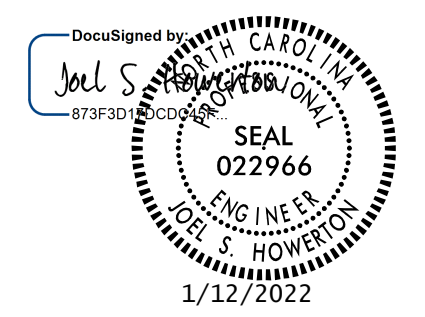
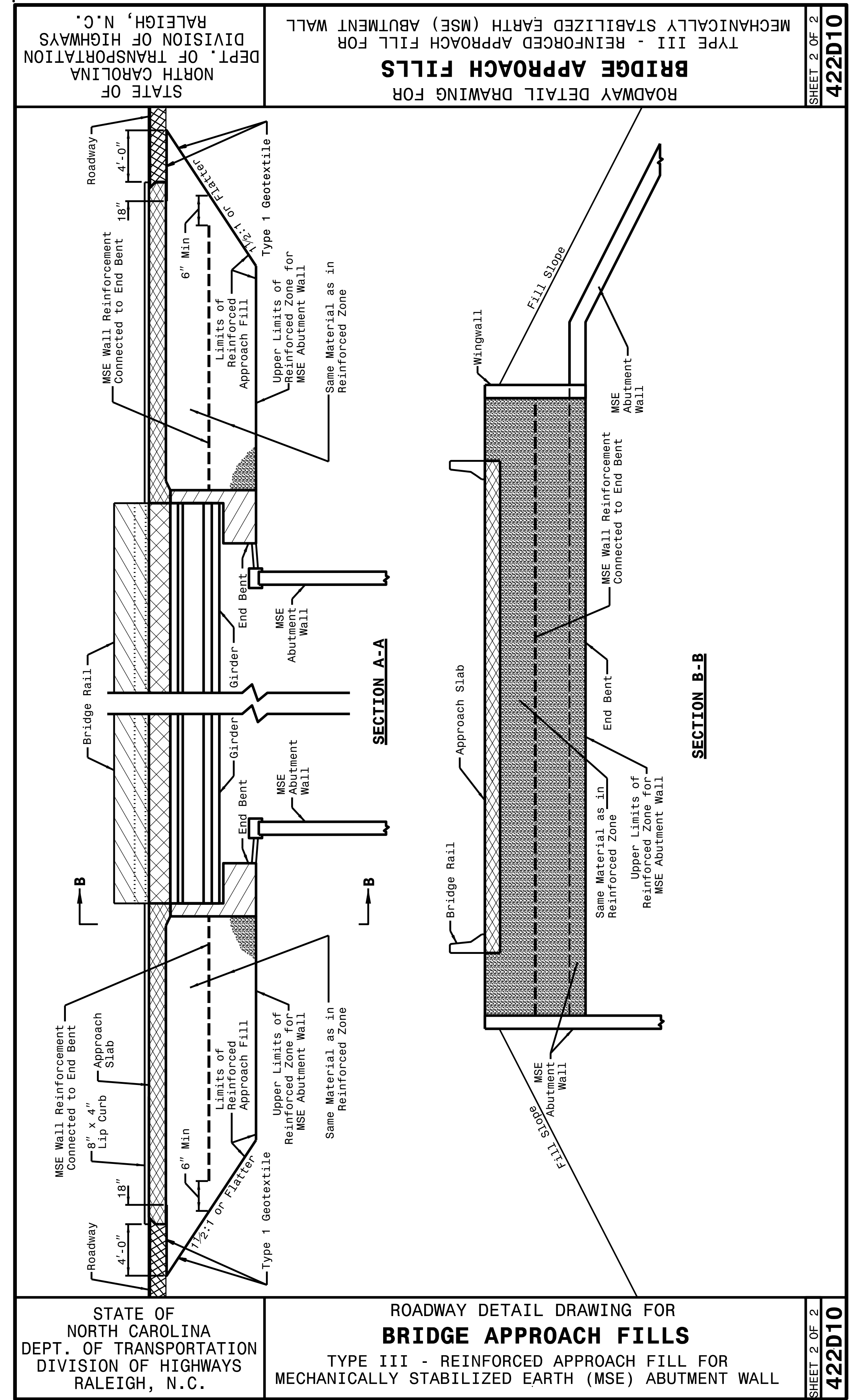
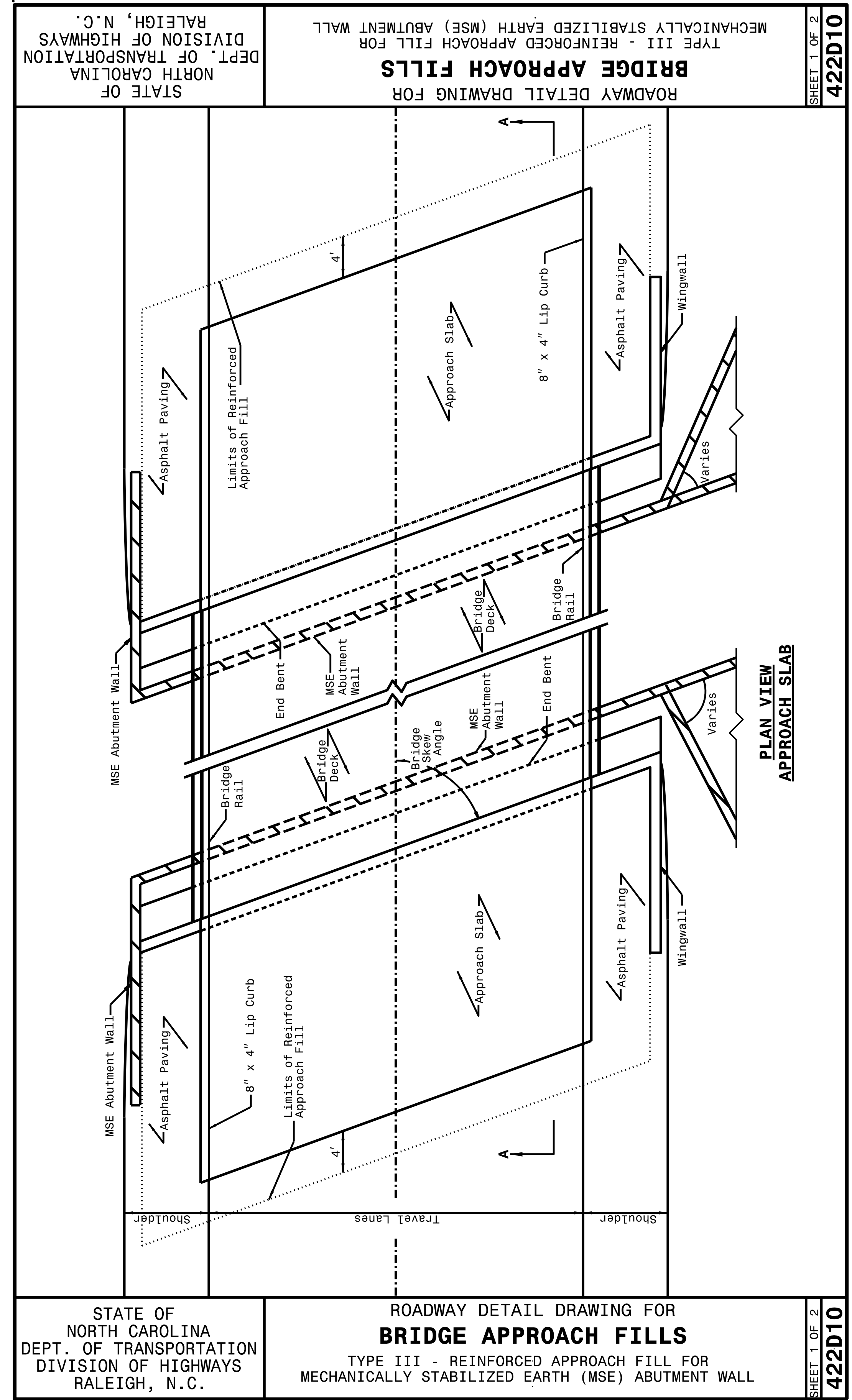


FOR L PLAN, SEE SHEET NO. 4



0:\22\11-103\B5737\Roadway\Proj\B5737\_rdy\_psh\_2B-1.dgn





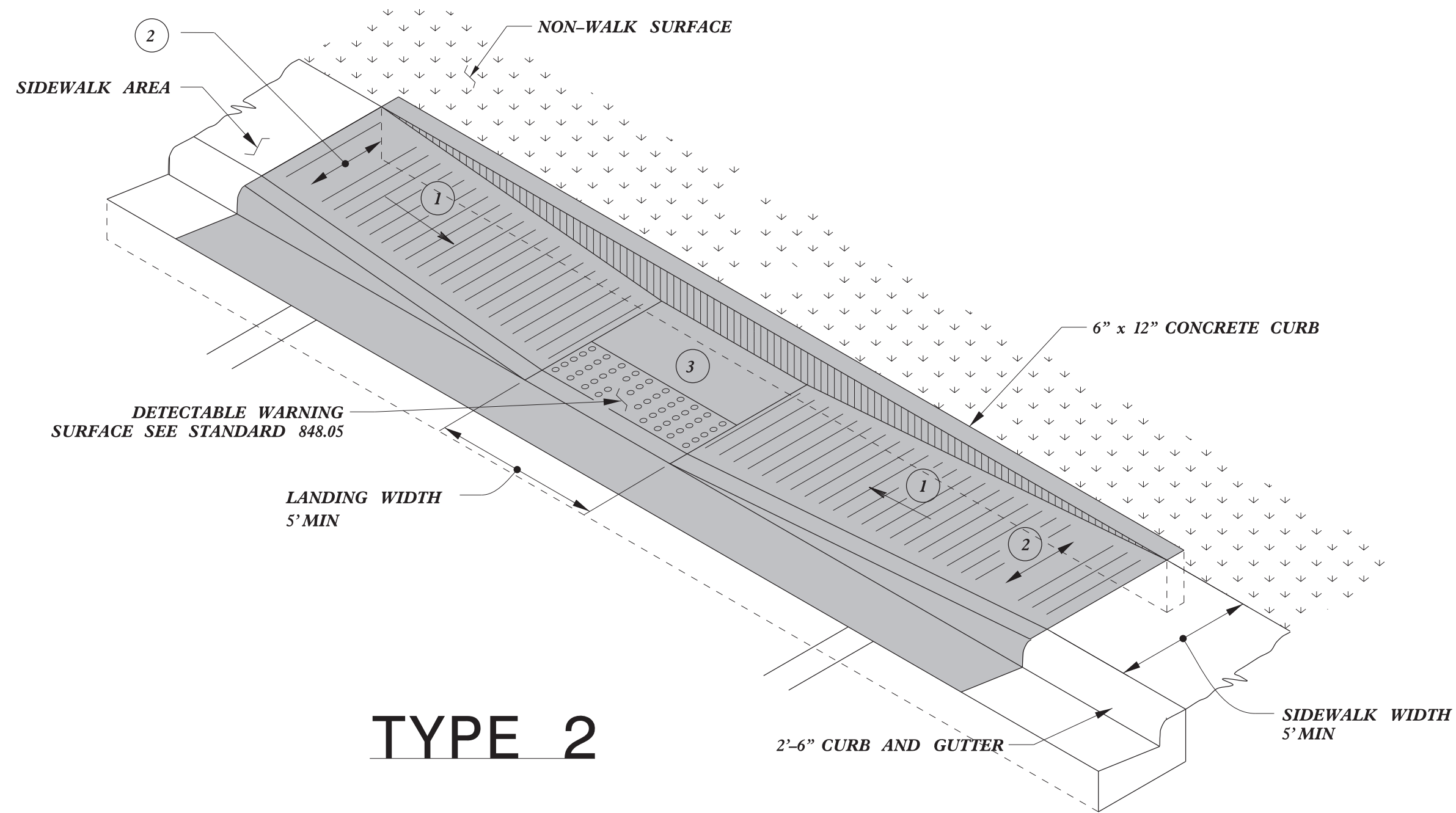
DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

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

**TYPE III  
REINFORCED  
APPROACH FILLS**

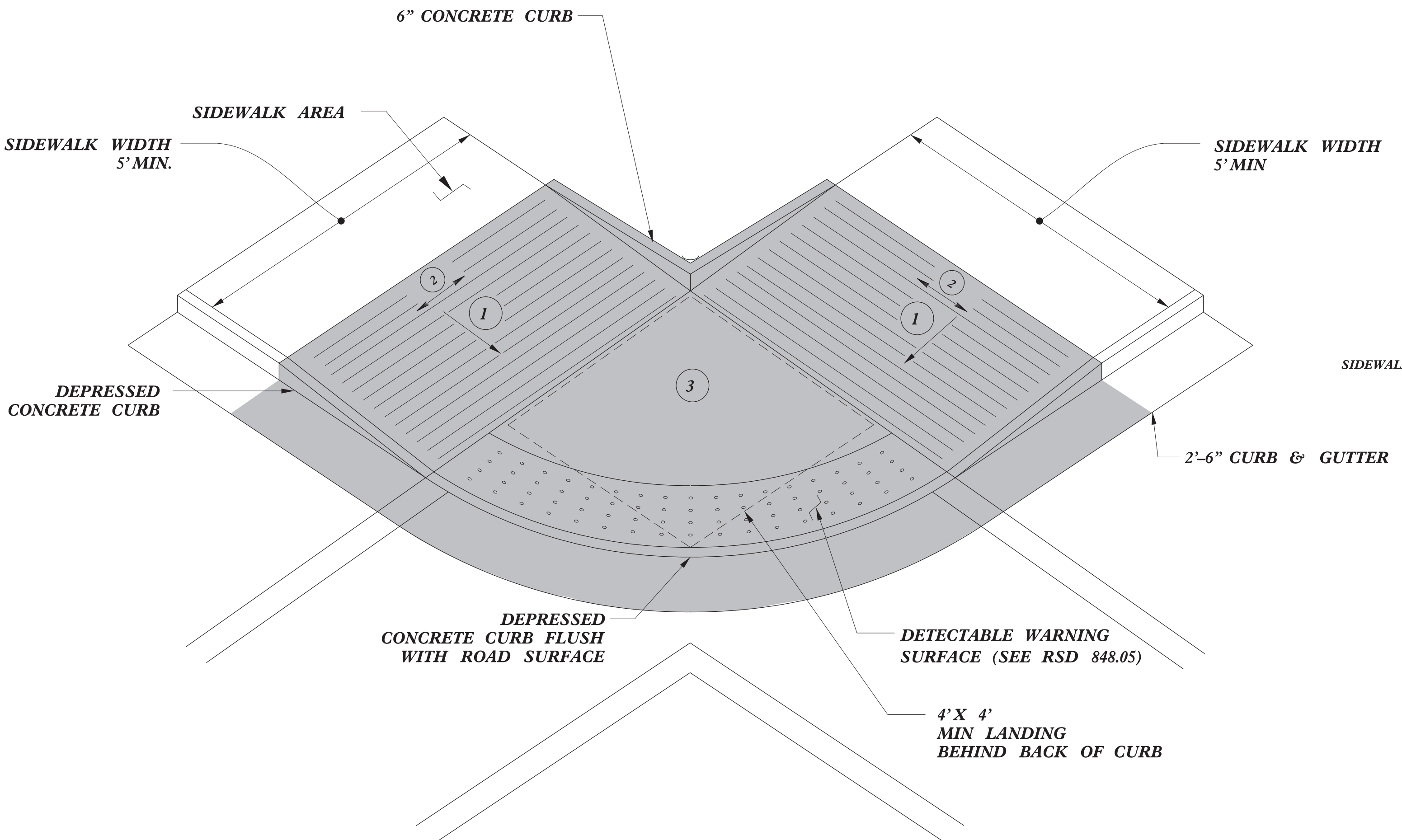
ORIGINAL BY: K. A. KEMPF DATE: JULY 2017  
 MODIFIED BY: DATE: \_\_\_\_\_  
 CHECKED BY: DATE: \_\_\_\_\_  
 FILE SPEC.: 2018 standard drawings\division 422d10.dgn



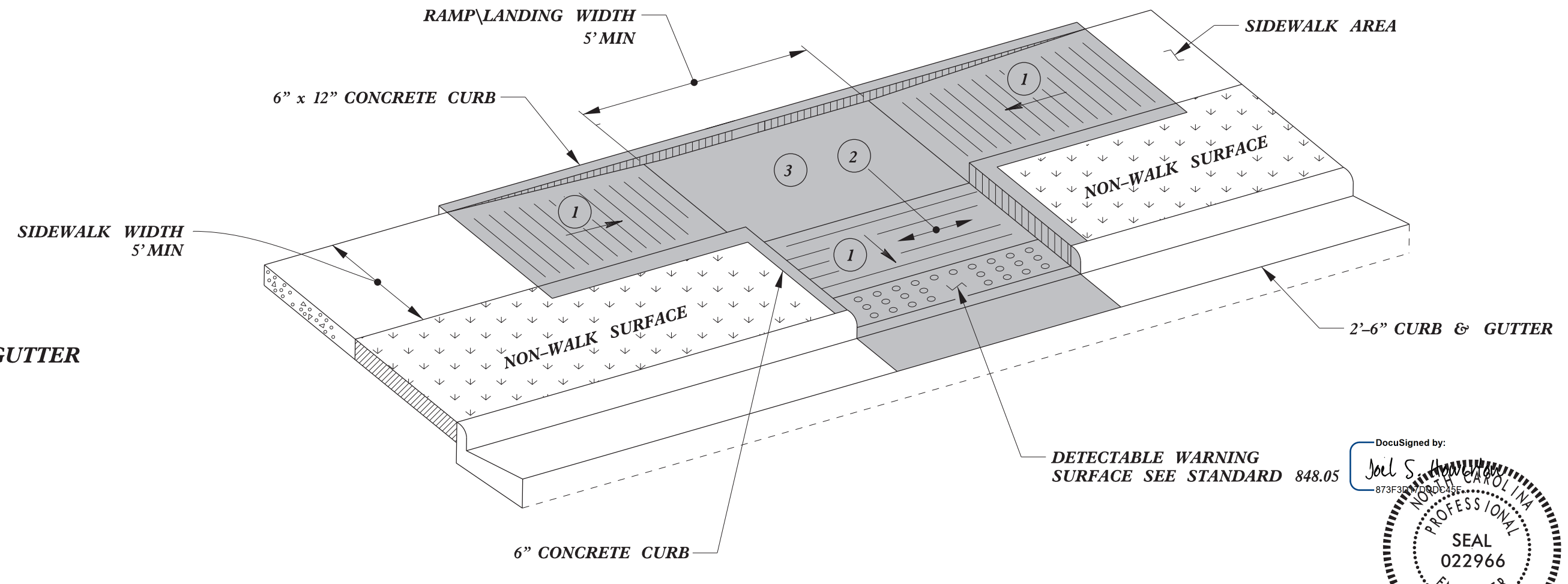


**TYPE 2**

- PAY LIMITS FOR 1 CURB RAMP**
- 1 8.33% (12:1) MAX RAMP SLOPE
  - 2 CROSS SLOPE: 2.00%
  - 3 CURB RAMPS REQUIRE A (4'-0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 2.00% WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SLOPE TO DRAIN TO CURB.



**TYPE 2A**



**TYPE 3**

Designed by:  
  
 1/12/2022

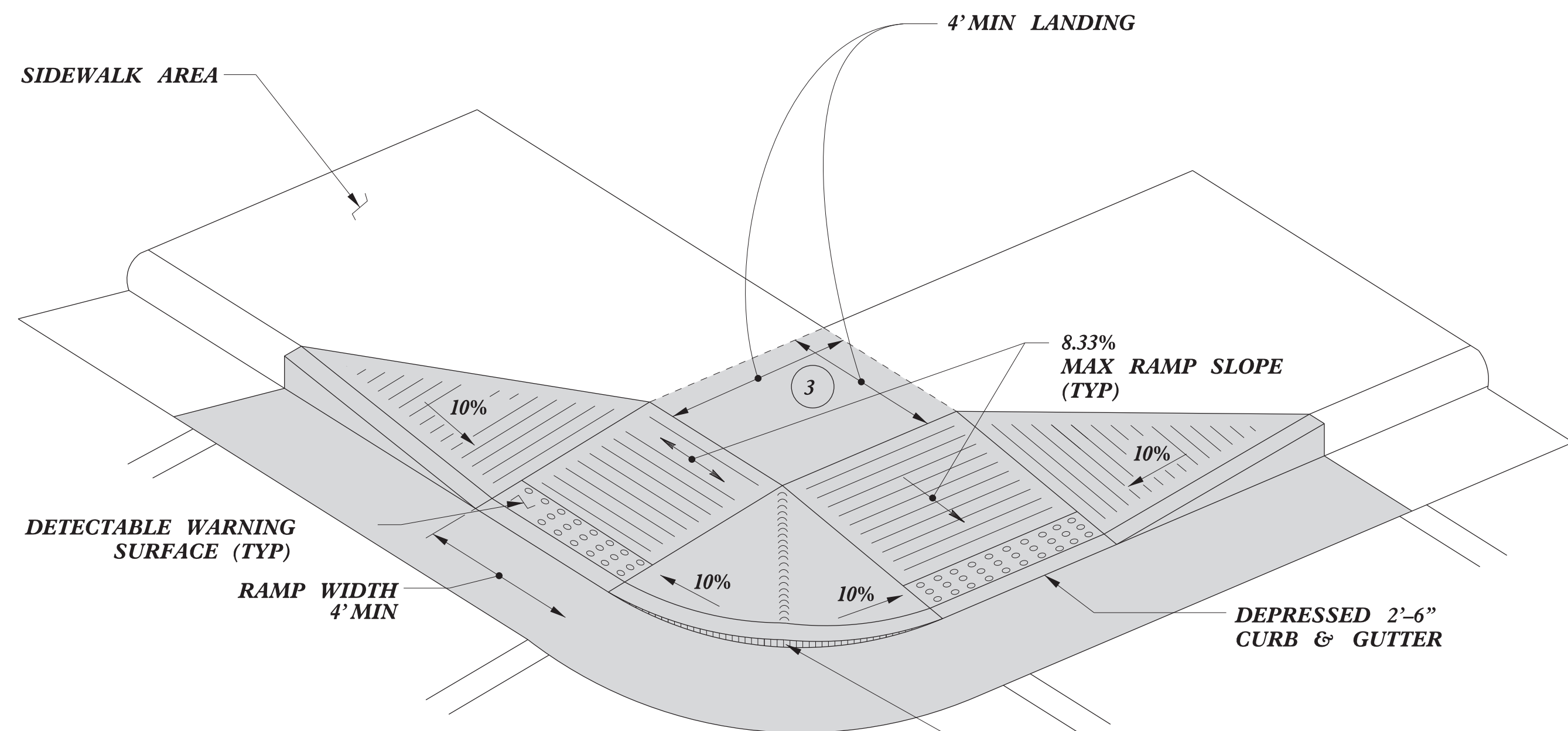
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

<b>CONTRACT STANDARDS AND DEVELOPMENT UNIT</b> Office 919-707-6950 FAX 919-250-4119	
<b>CURB RAMPS</b> Parallel Ramps	
ORIGINAL BY: J.S. HOWERTON	DATE: 7/7/11
MODIFIED BY:	DATE:
CHECKED BY:	DATE:
FILE SPEC.: stds/2012CurbRamp/CurbRampDetails.dgn	

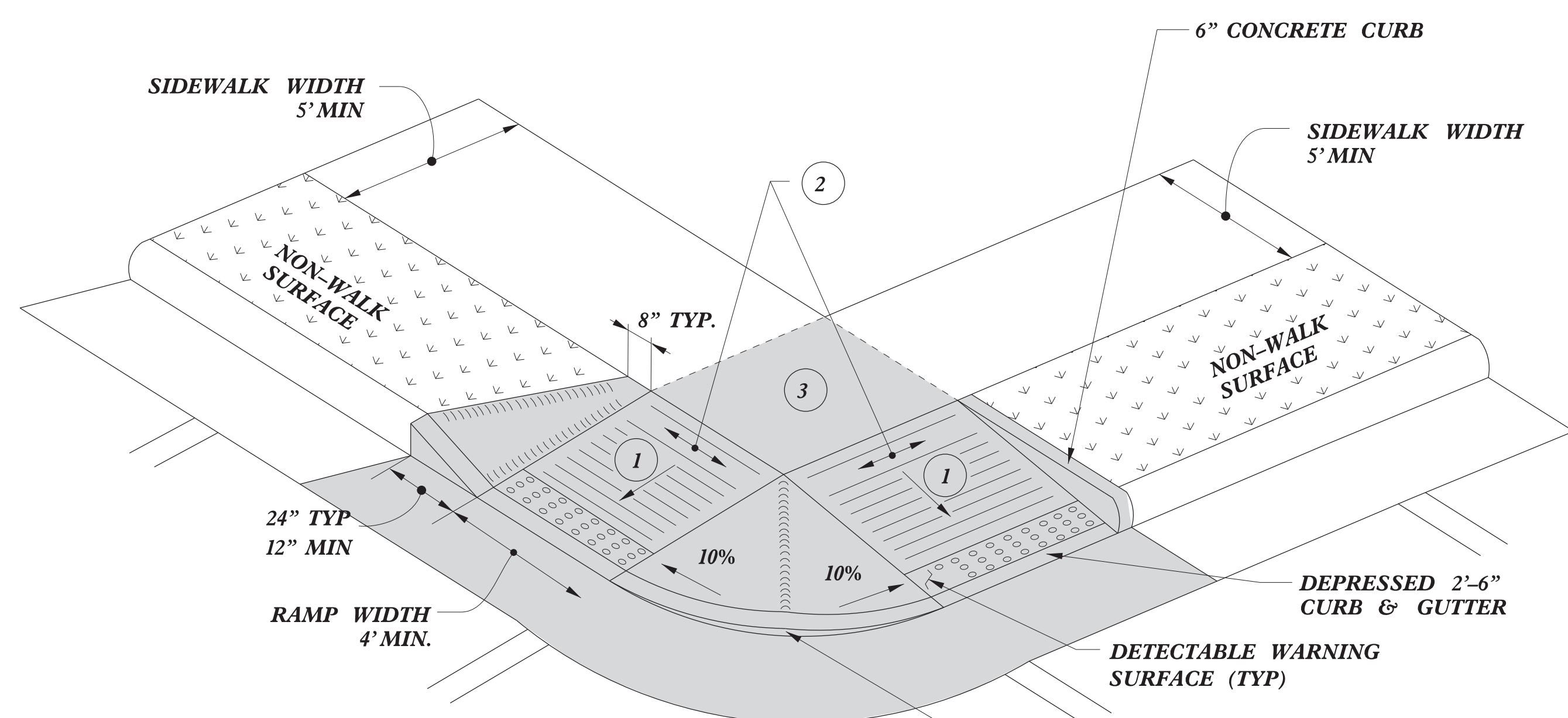
REFER TO ROADWAY STANDARD DRAWING NUMBER 848.05 SHEET 3 OF 3 FOR ALL RAMP NOTES

5/14/99



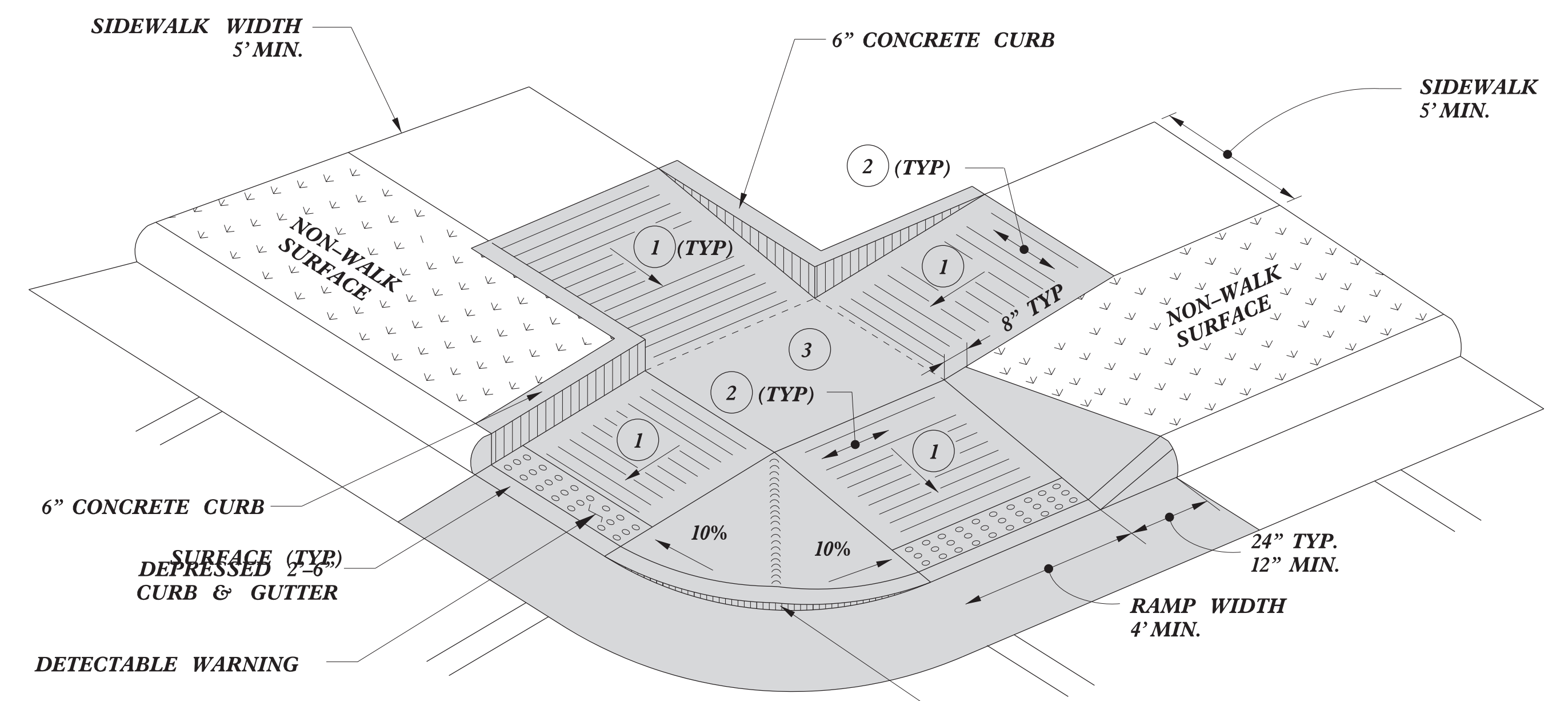


TYPE 4



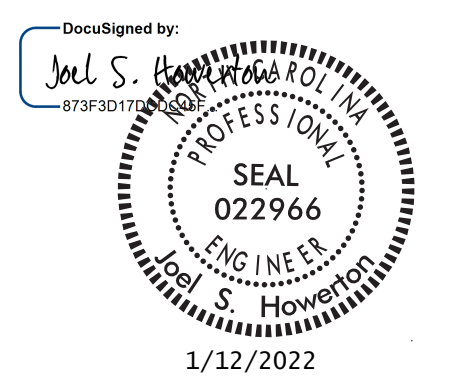
TYPE 4A

PAY LIMITS FOR 2 CURB RAMPS



TYPE 5

- 1 8.33% (12:1) MAX RAMP SLOPE
- 2 CROSS SLOPE: 2.00%
- 3 CURB RAMPS REQUIRE A (4'-0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 2.00% WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SLOPE TO DRAIN TO CURB.



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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**CURB RAMPS**  
Shared Landing

ORIGINAL BY: J.S. HOWERTON DATE: 7/7/11  
 MODIFIED BY: DATE:   
 CHECKED BY: DATE:   
 FILE SPEC: stds/2012CurbRamp/CurbRampDetails.dgn

REFER TO ROADWAY STANDARD DRAWING NUMBER 848.05 SHEET 3 OF 3 FOR ALL RAMP NOTES

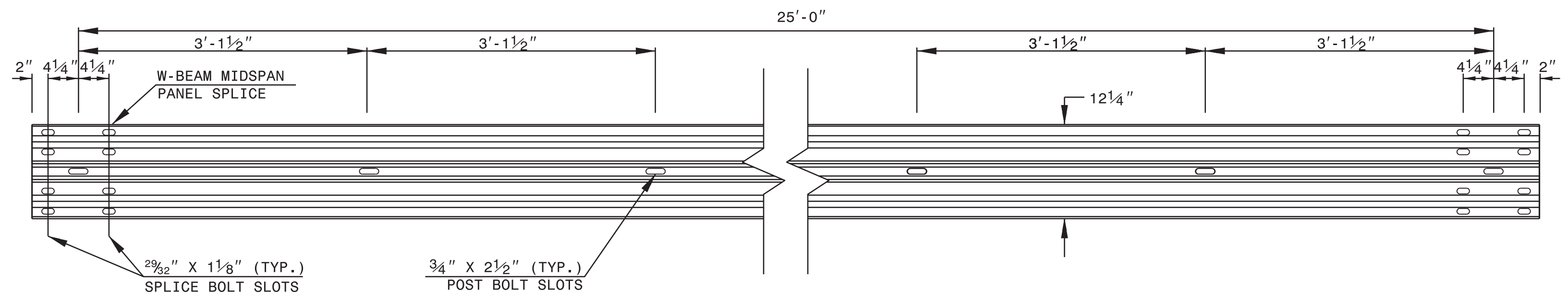
5/14/99  
SYTIME  
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JUSURNAME



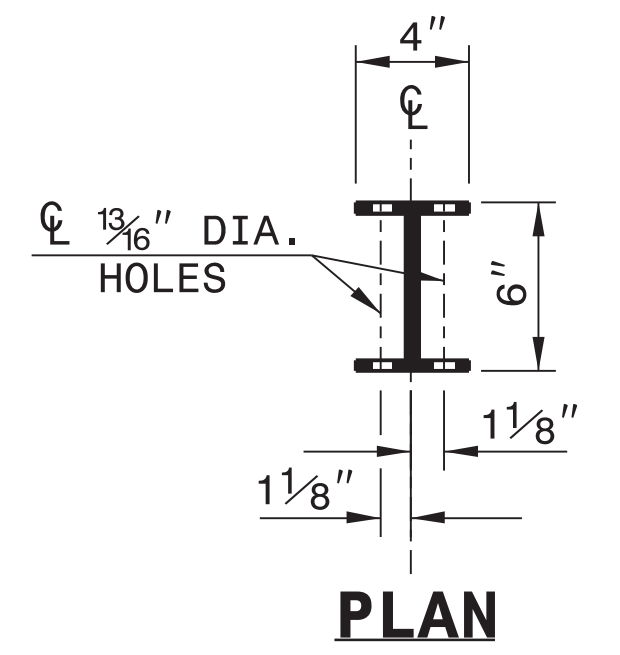
STATE OF NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

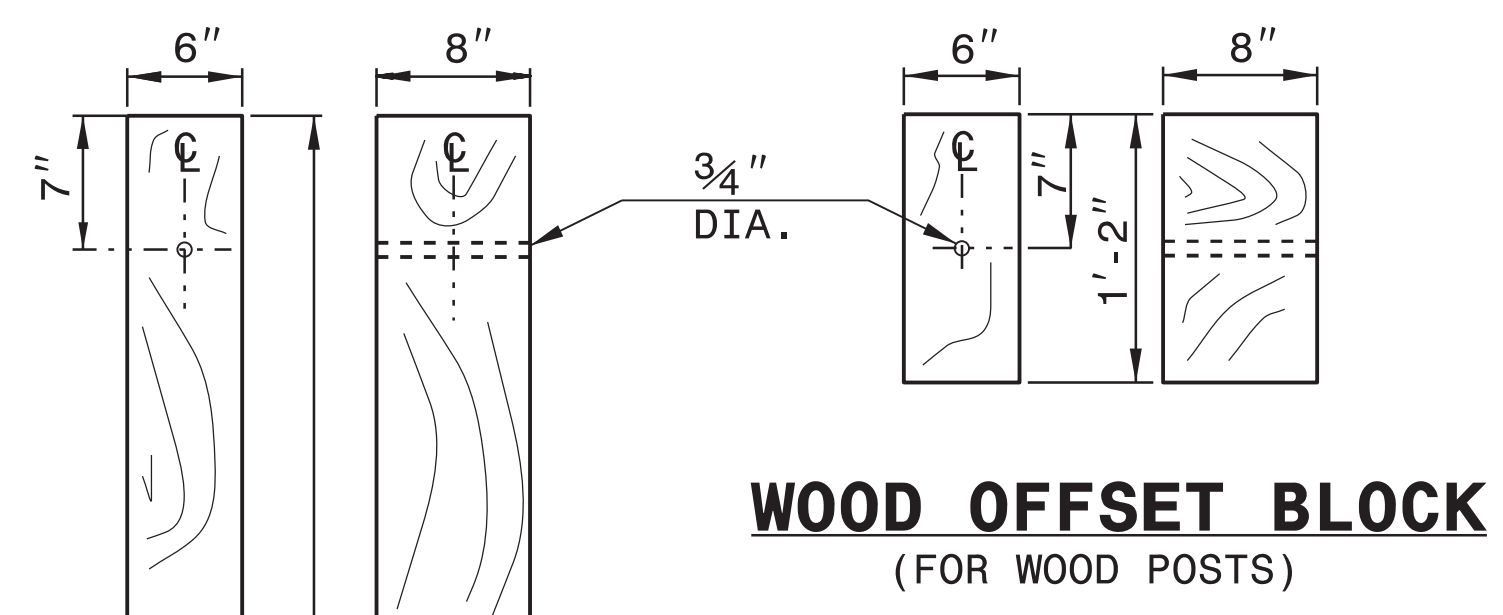
SHEET 6 OF 8  
**862D02**



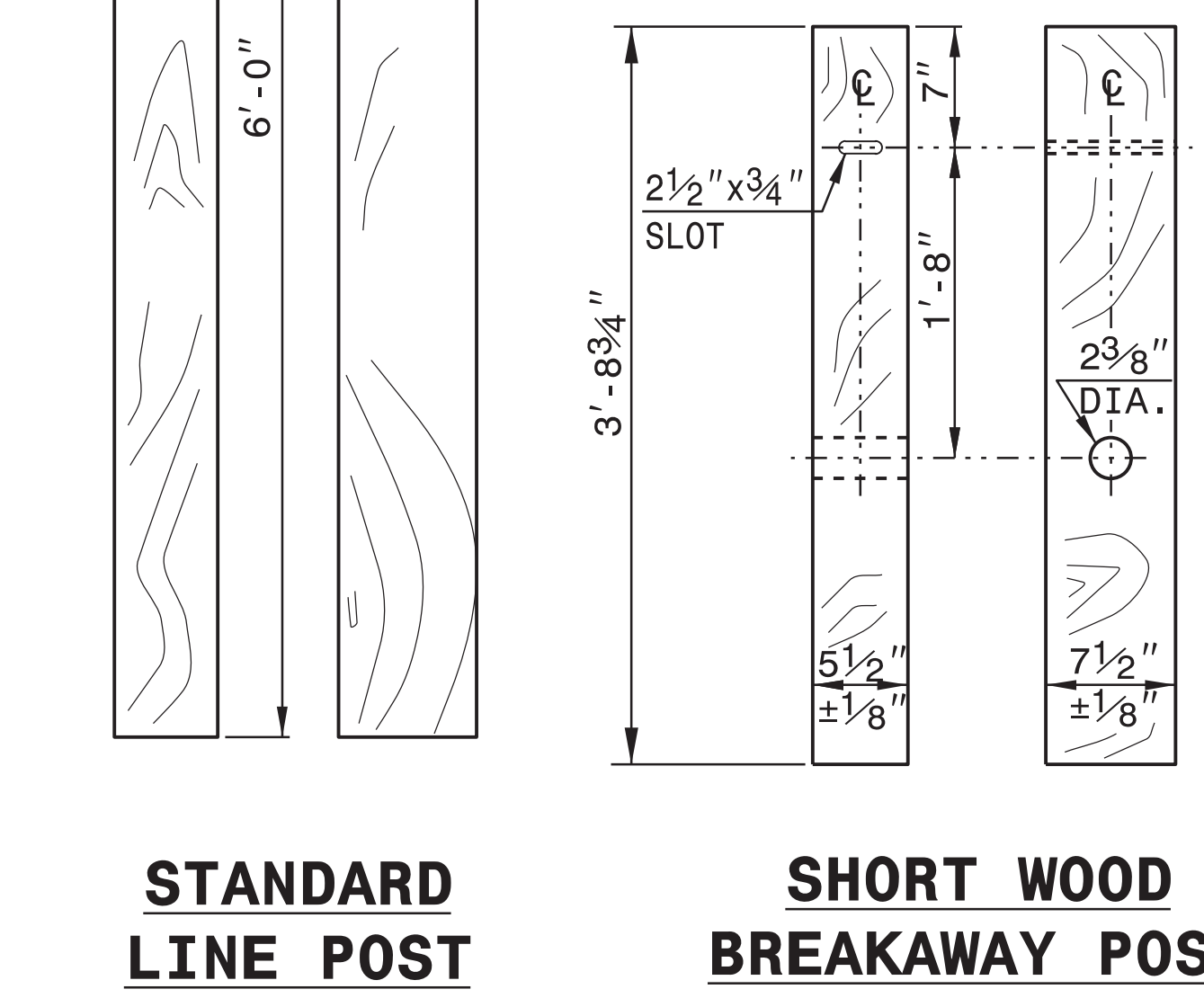
**STANDARD W-BEAM GUARDRAIL**



**PLAN**

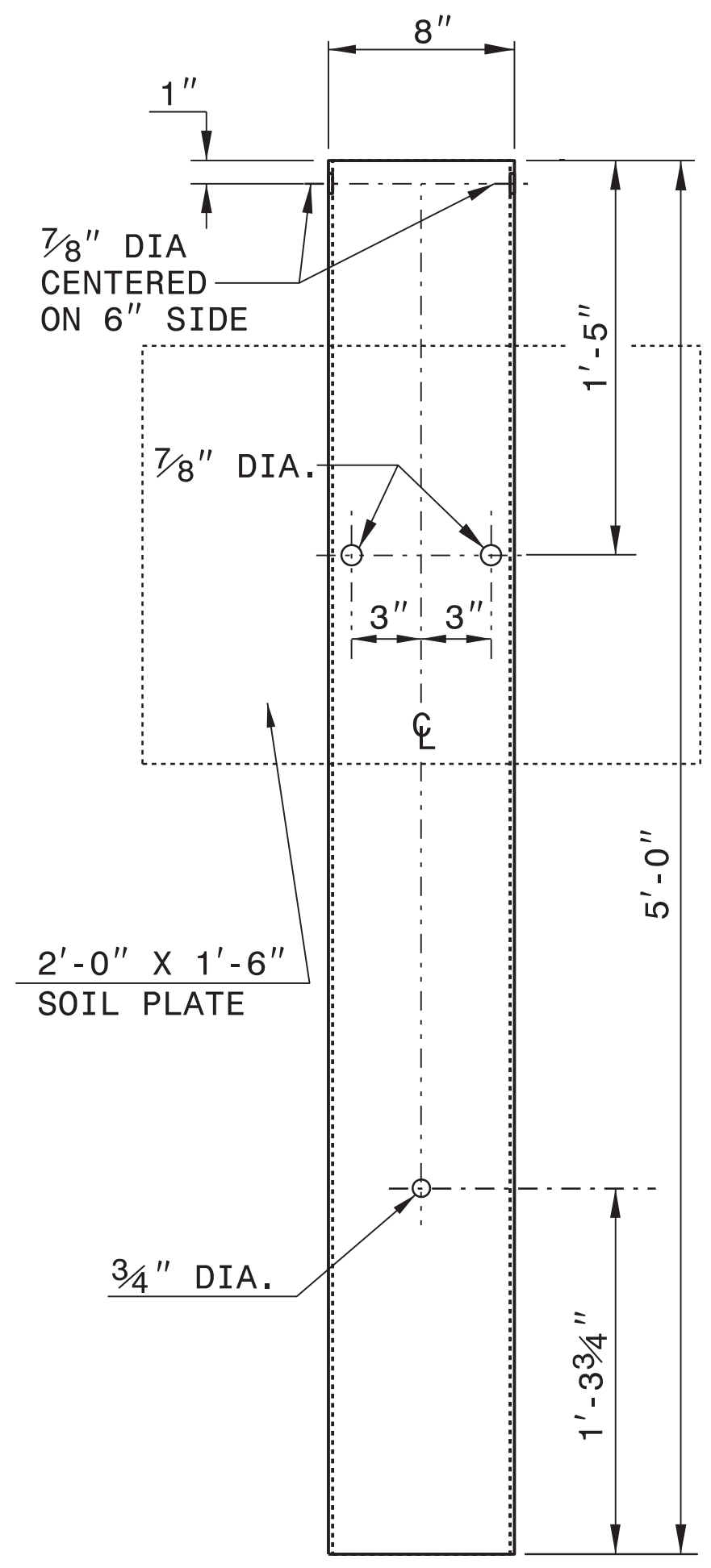


**WOOD OFFSET BLOCK  
(FOR WOOD POSTS)**

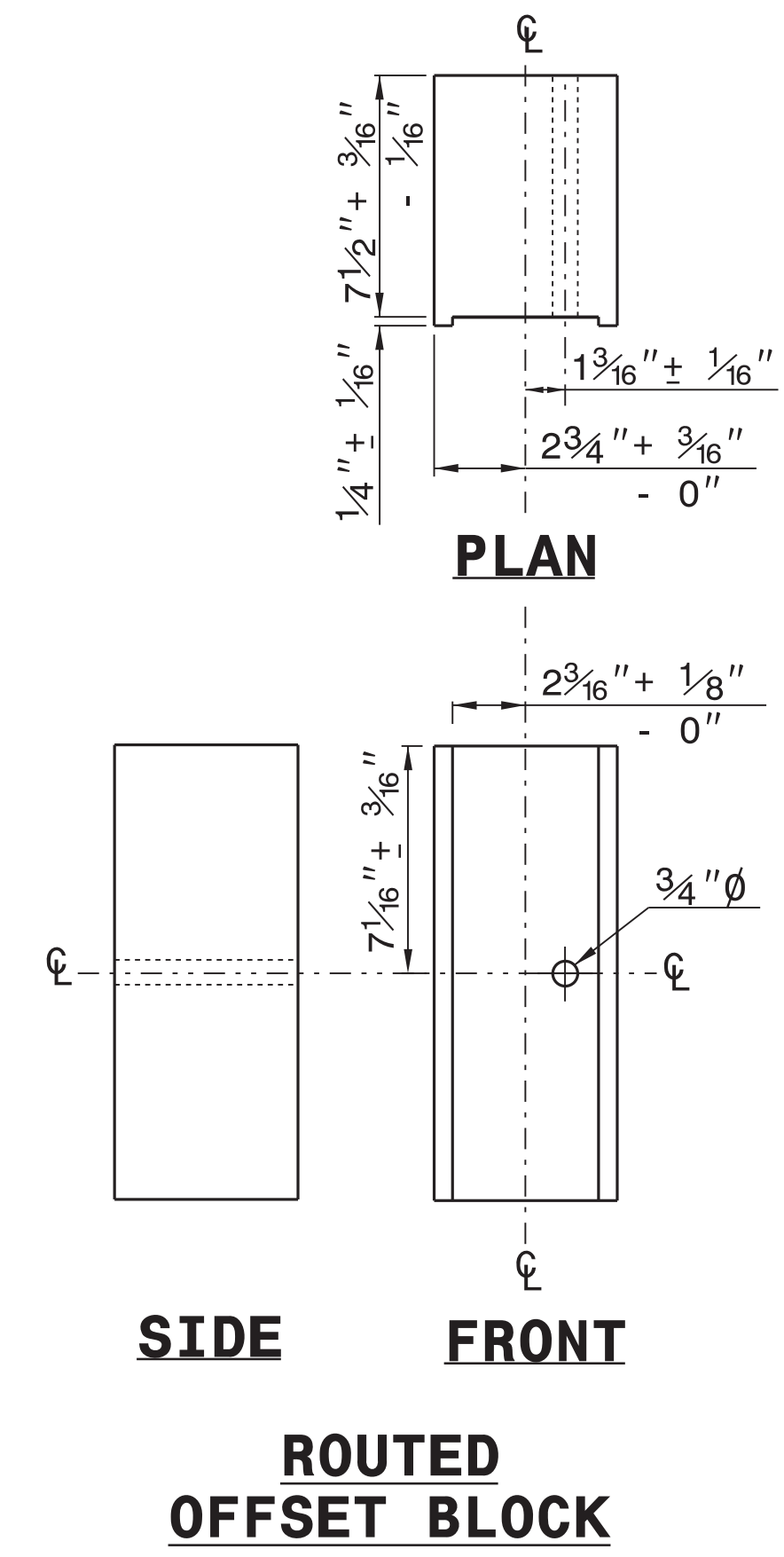


**STANDARD  
LINE POST**

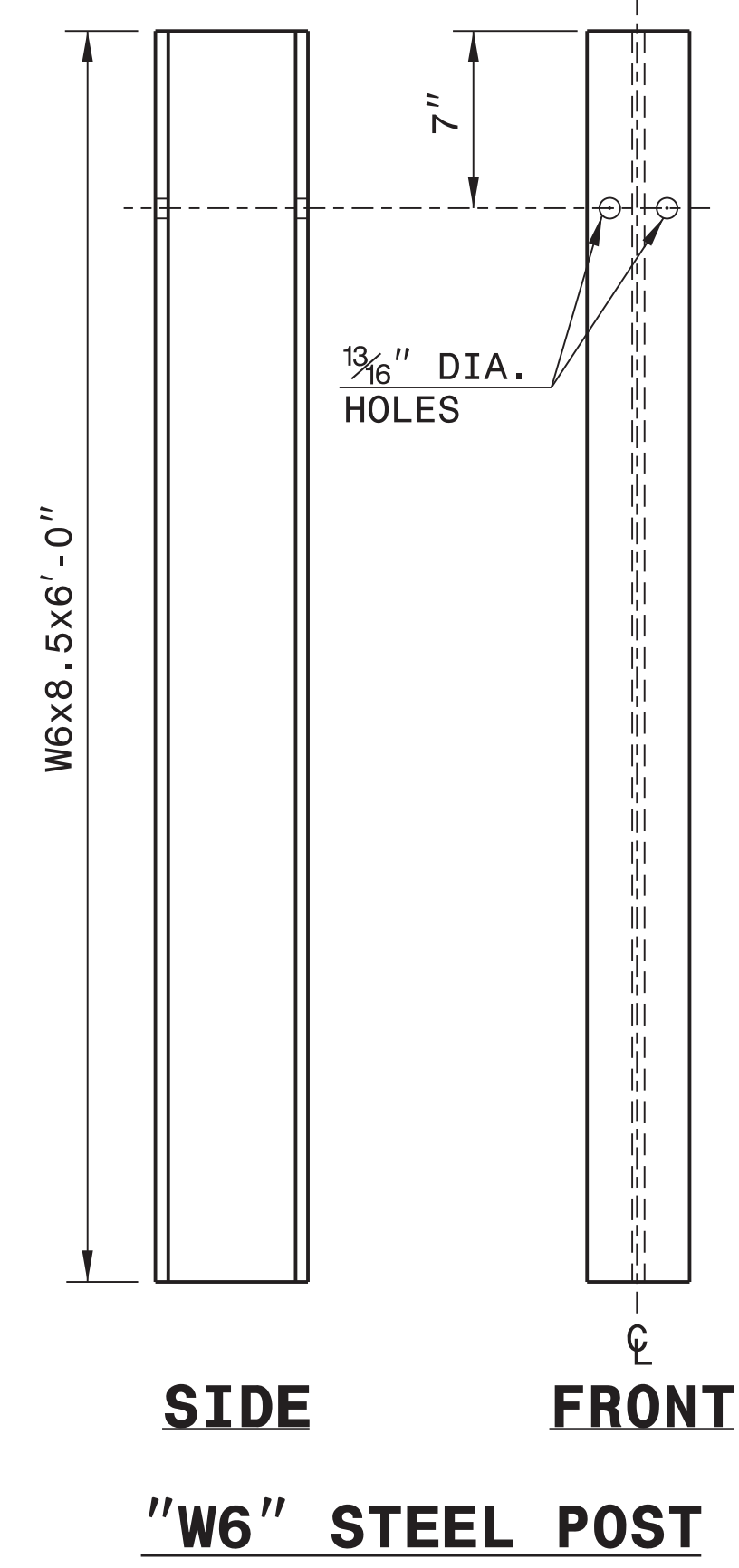
**SHORT WOOD  
BREAKAWAY POST**



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



**ROUTED  
OFFSET BLOCK**



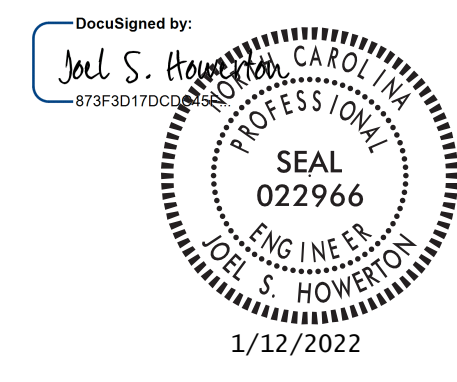
**"W6" STEEL POST**

**SYSTEM PARTS**

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

ROADWAY DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

SHEET 6 OF 8  
**862D02**



1/12/2022

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AND DEVELOPMENT UNIT**  
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**SEE TITLE BLOCK**

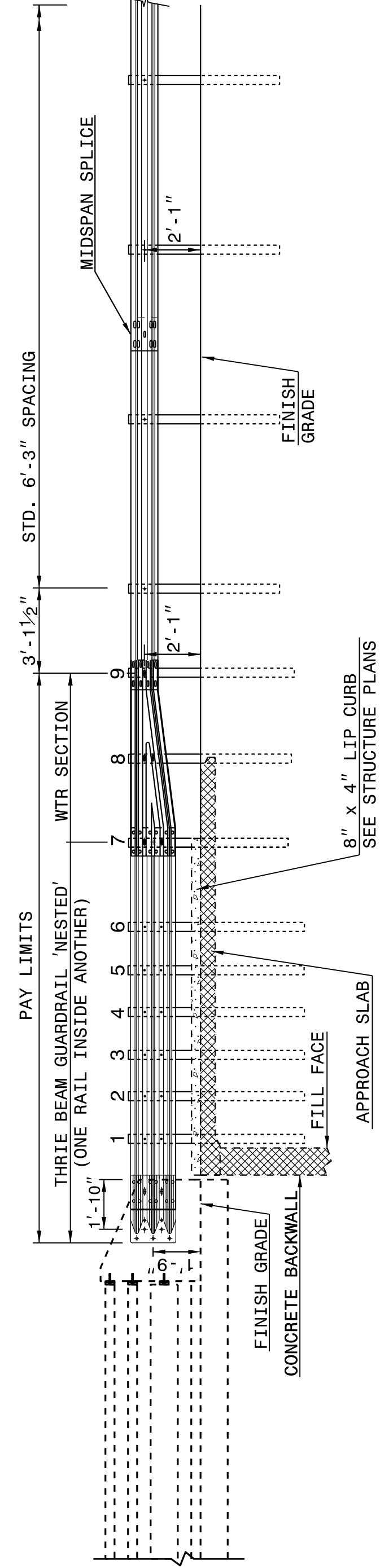
ORIGINAL BY: J. HOWERTON	DATE: 3-7-2018
MODIFIED BY: _____	DATE: _____
CHECKED BY: _____	DATE: _____
FILE SPEC.: _____	

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

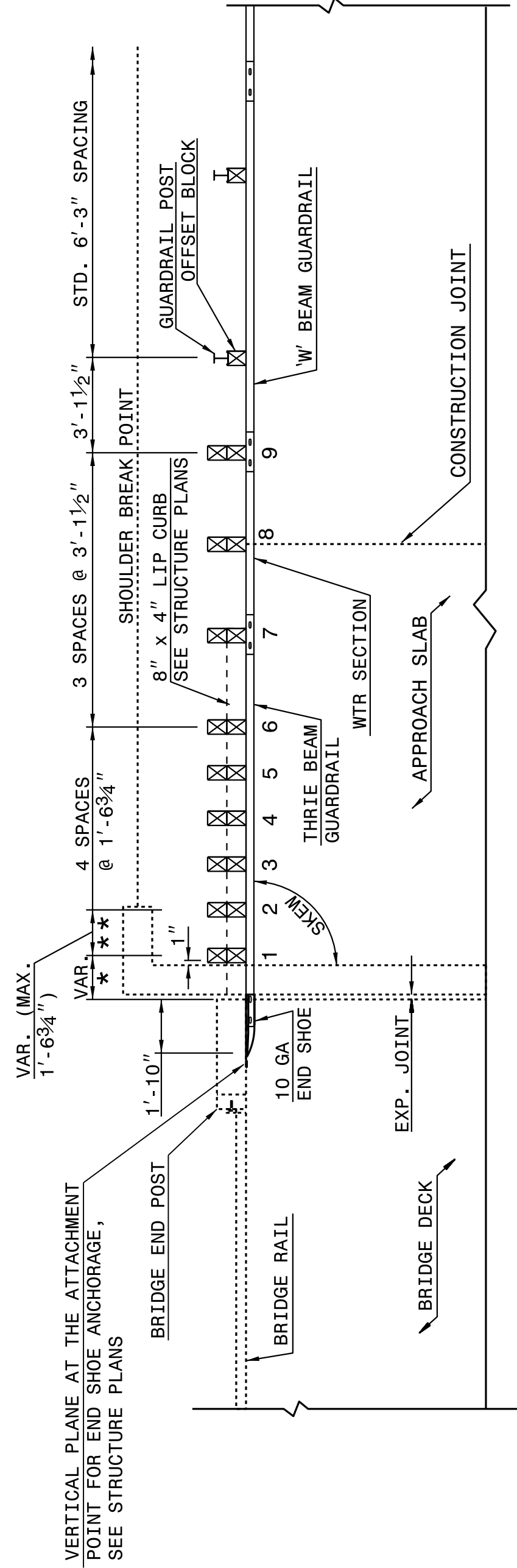
ROADWAY DETAIL DRAWING FOR STRUCTURE ANCHOR UNITS GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE

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

SHEET 1 OF 7  
862D03

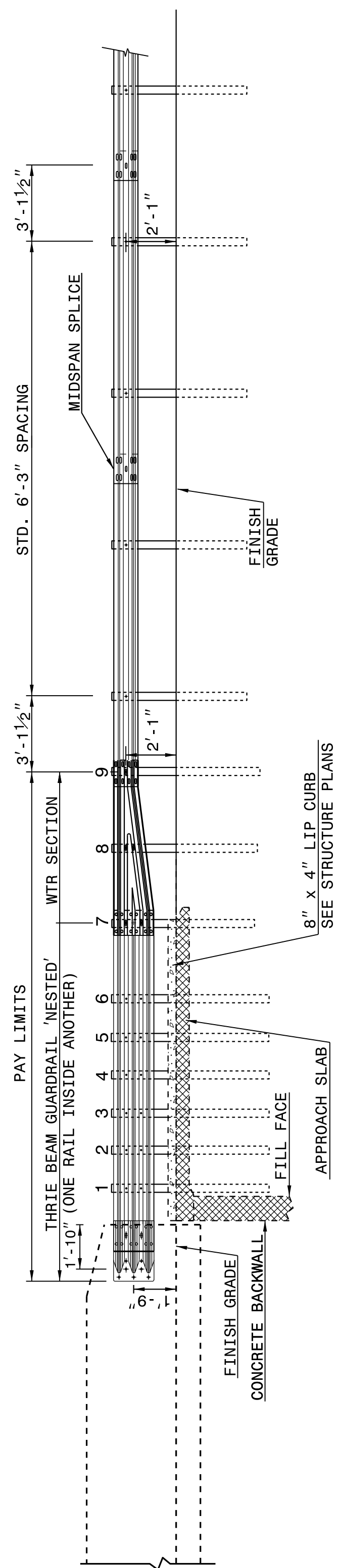
STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

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

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

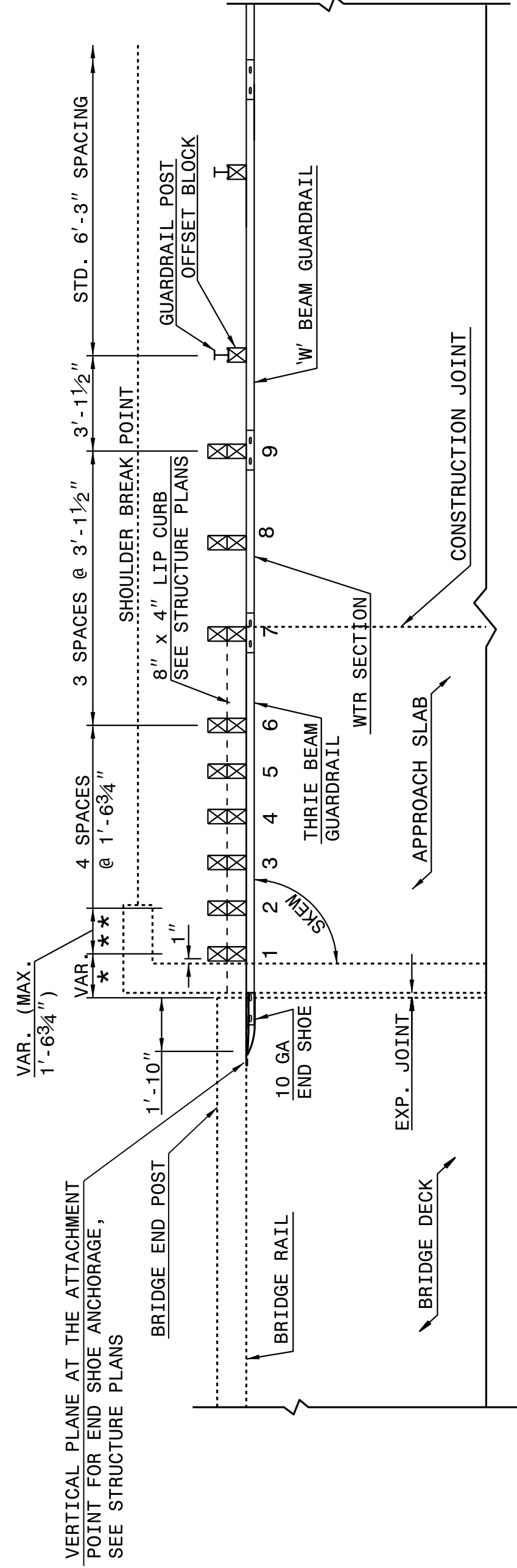
ROADWAY DETAIL DRAWING FOR STRUCTURE ANCHOR UNITS GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER

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.



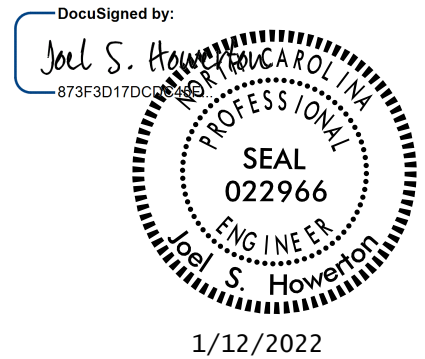
PLAN VIEW

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

SHEET 2 OF 7  
862D03

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

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



1/12/2022

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SEE TITLE BLOCK

ORIGINAL BY: J HOWERTON DATE: 06-22-12  
 MODIFIED BY: DATE:  
 CHECKED BY: DATE:  
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STATE OF  
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DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

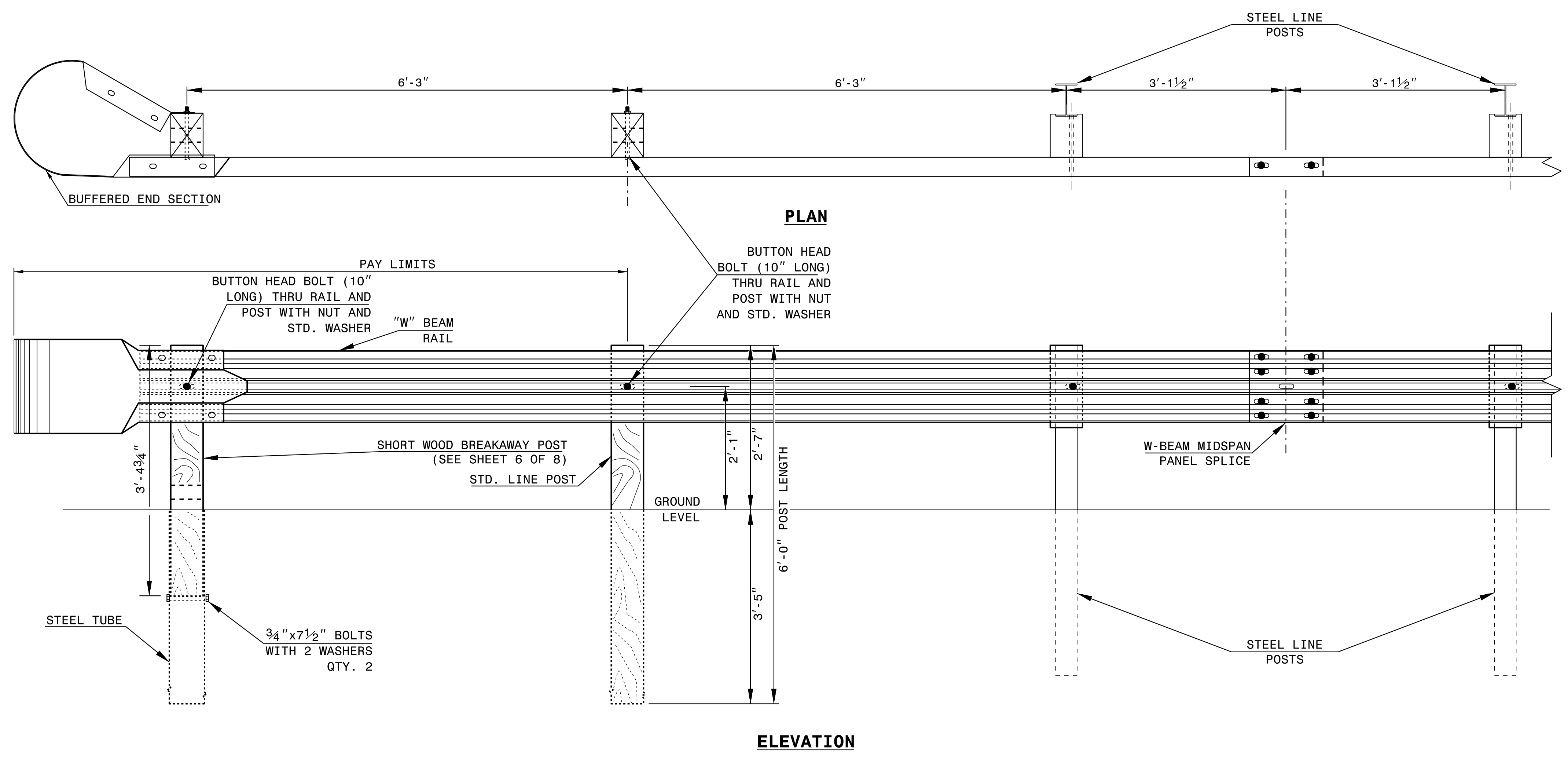
ROADWAY DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

SHEET OF

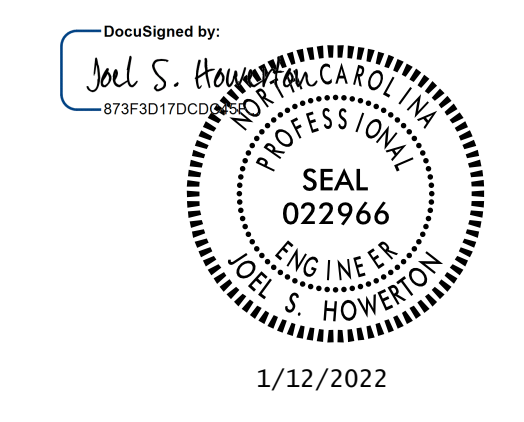
STATE OF  
NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

SHEET OF



**TRAILING END UNIT ASSEMBLY**  
**A.T. - 1 SYSTEM**

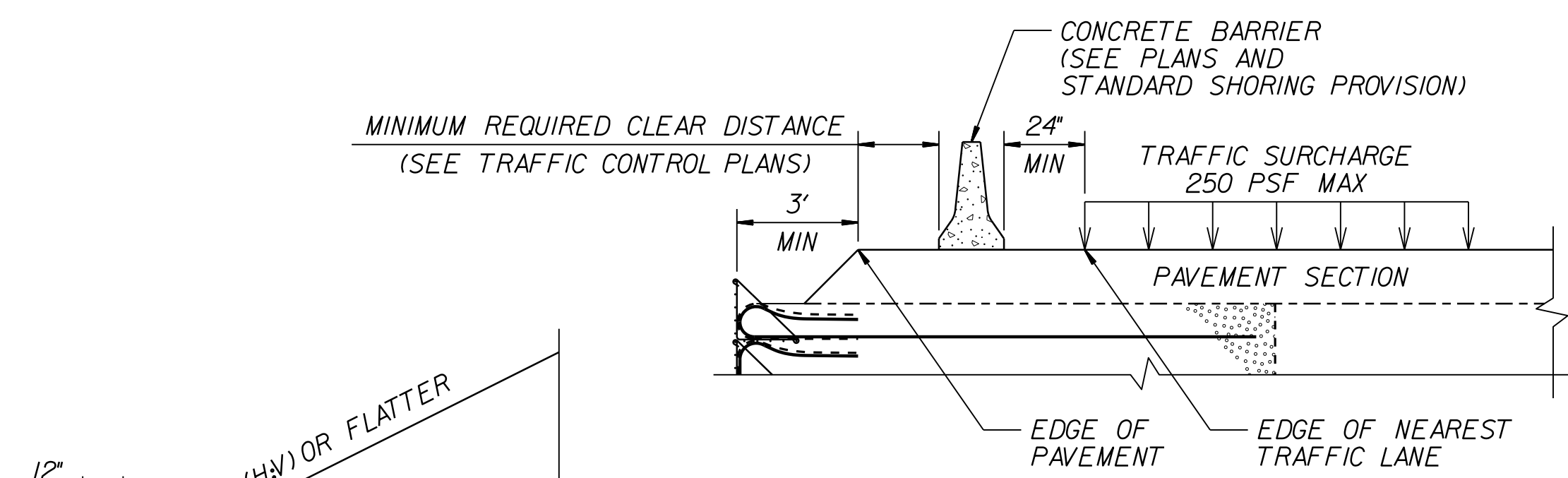


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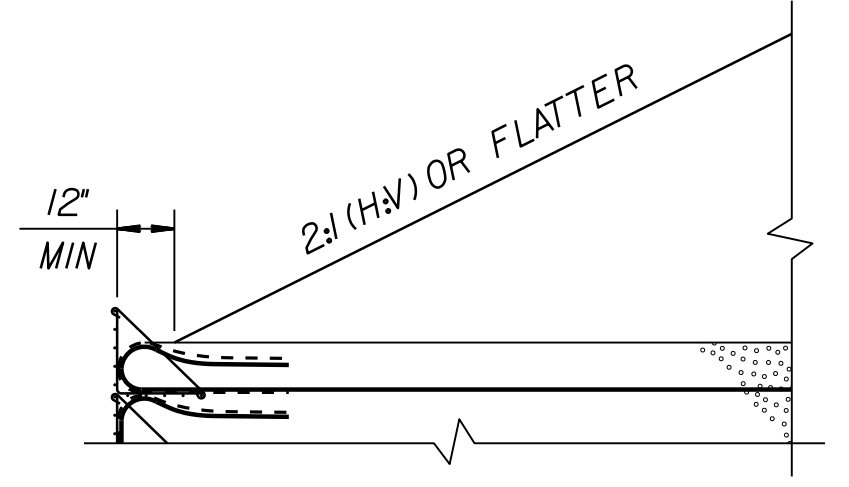
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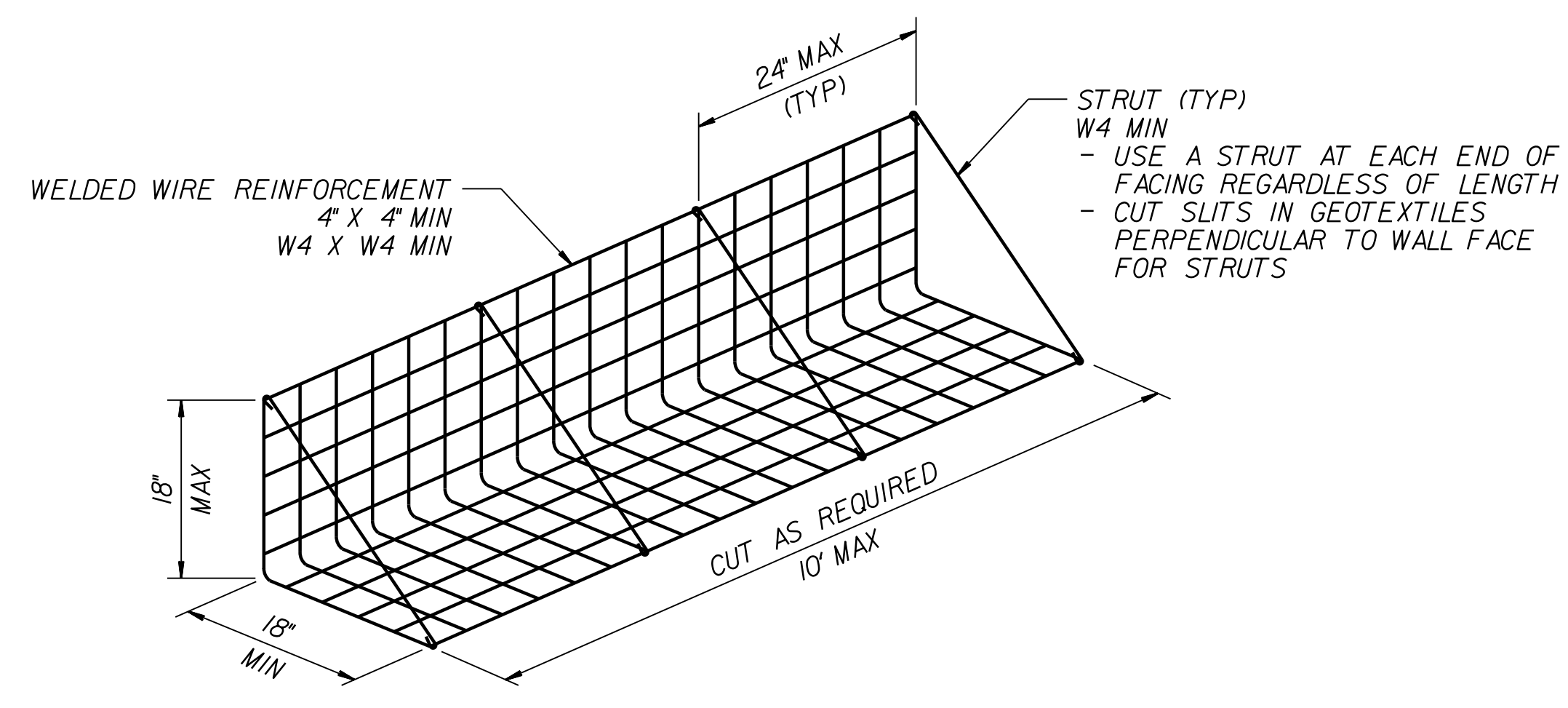
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UNLESS ALL SIGNATURES COMPLETED



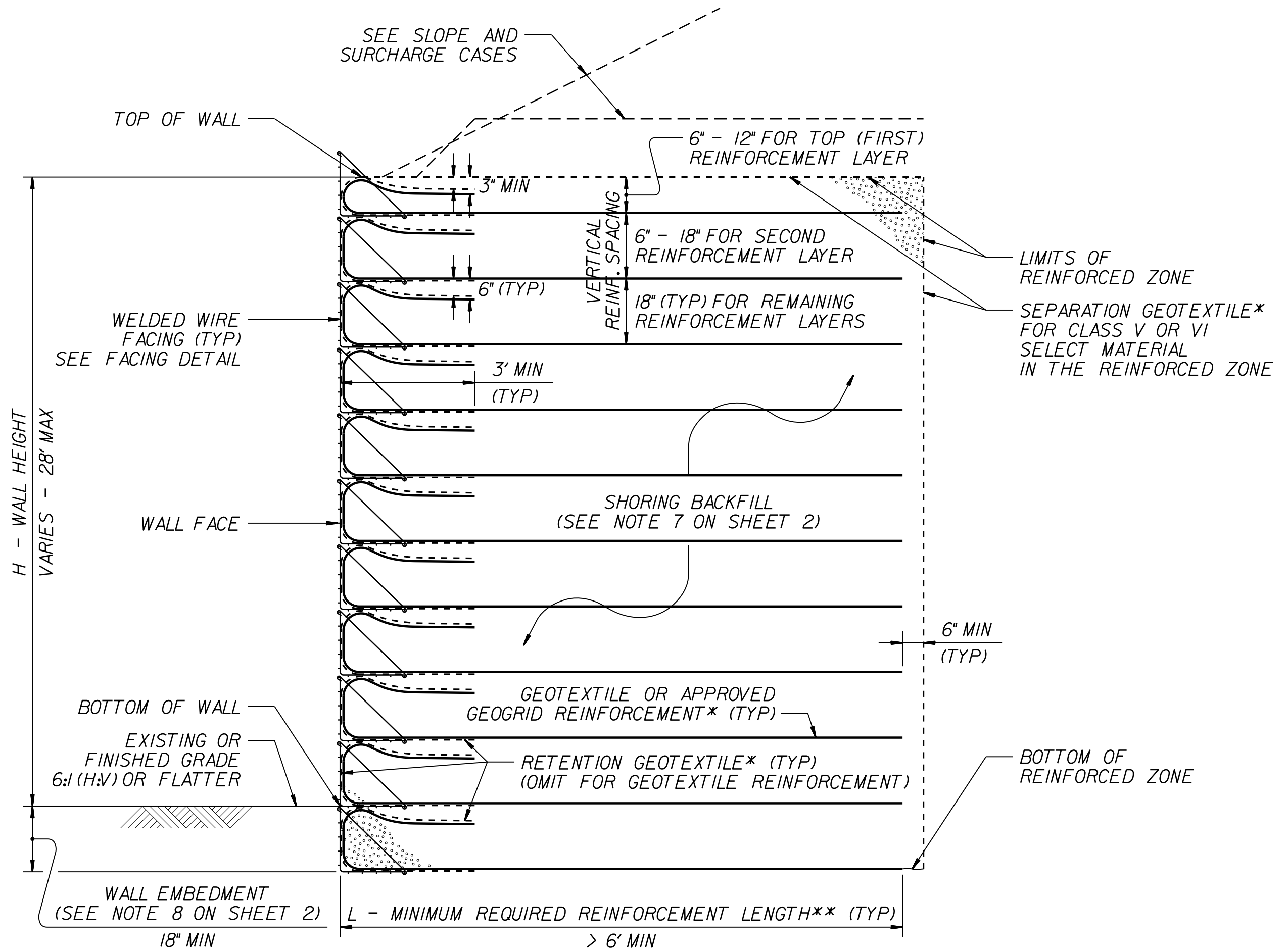
**SURCHARGE CASE**



**SLOPE CASE**

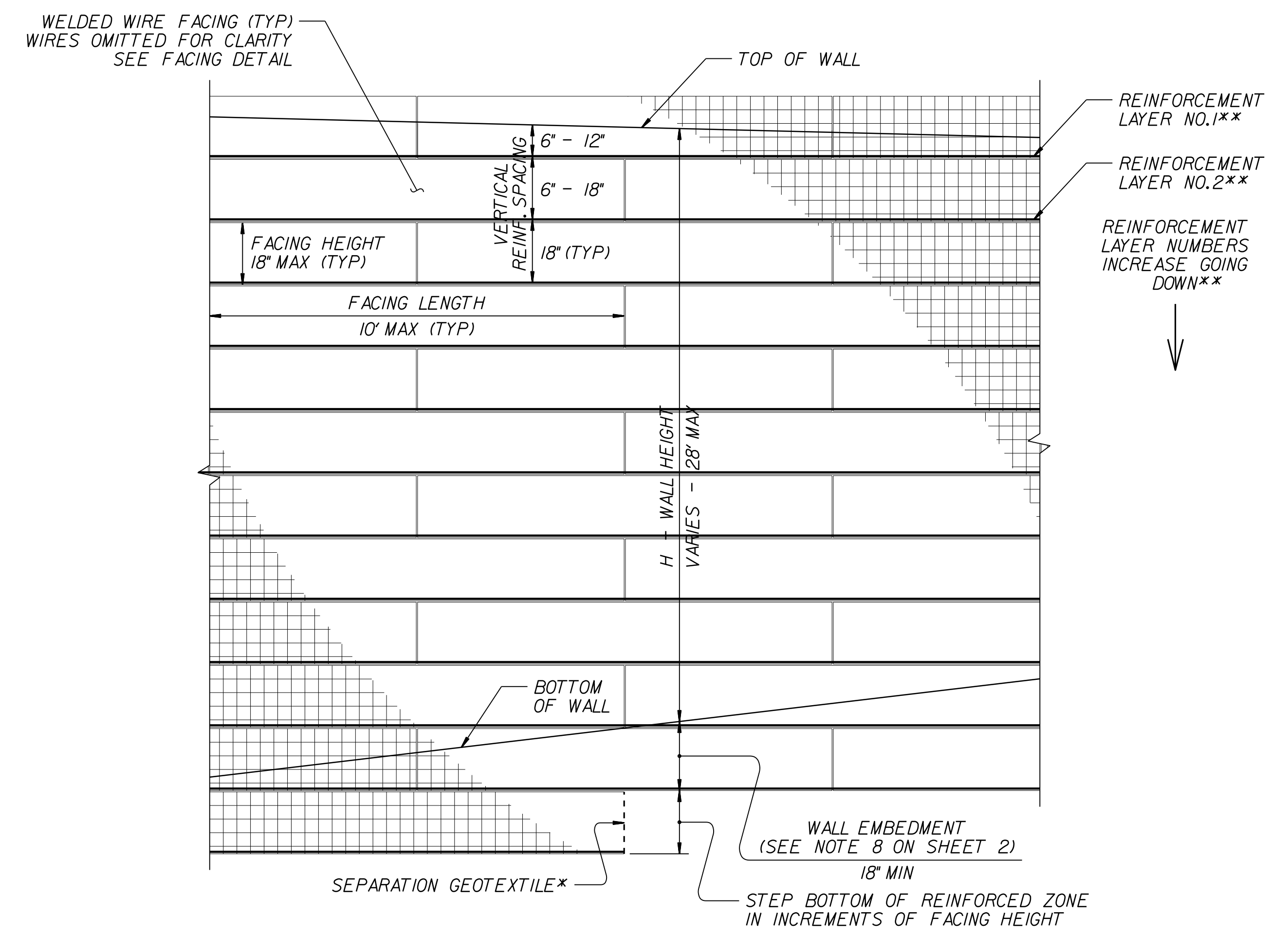


**FACING DETAIL**



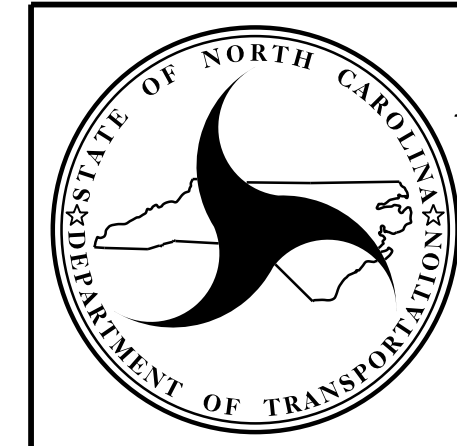
**STANDARD TEMPORARY WALL**

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



**STANDARD TEMPORARY WALL - PARTIAL ELEVATION**

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

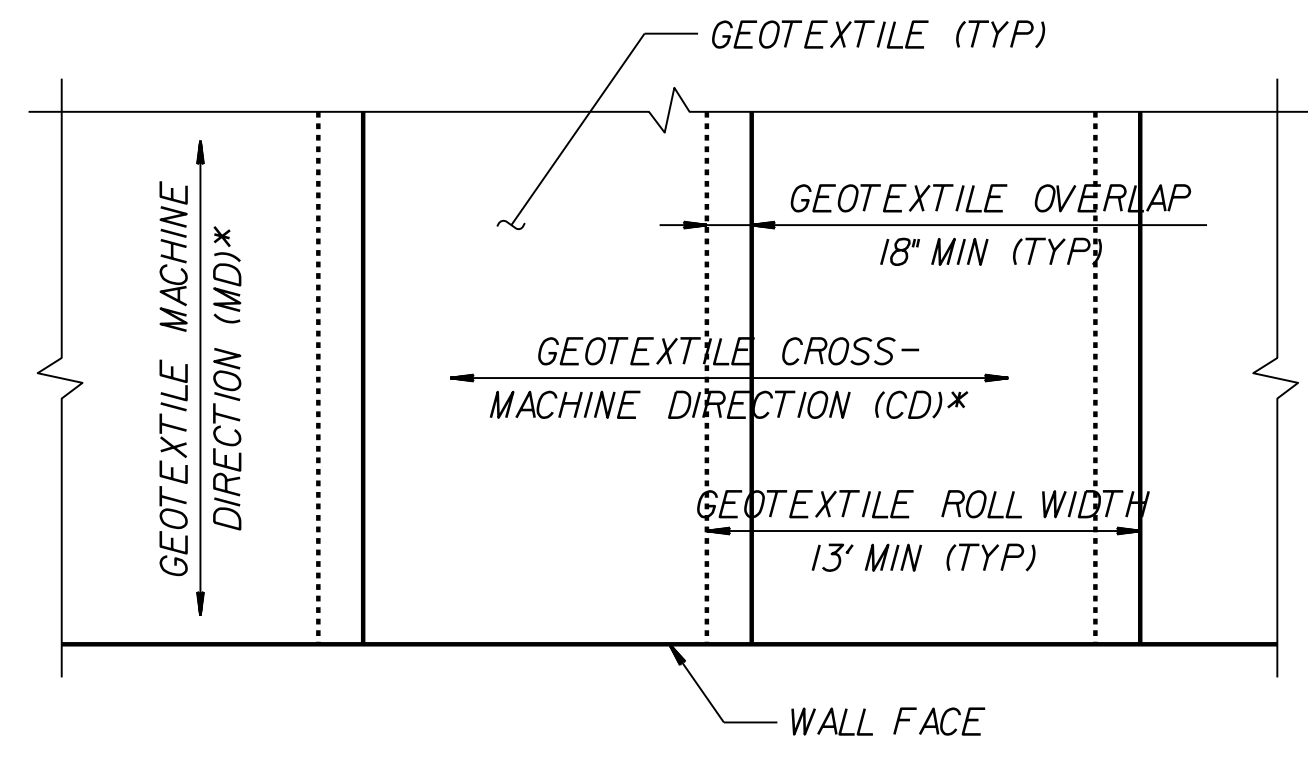


NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
  
**GEOTECHNICAL  
 ENGINEERING UNIT**

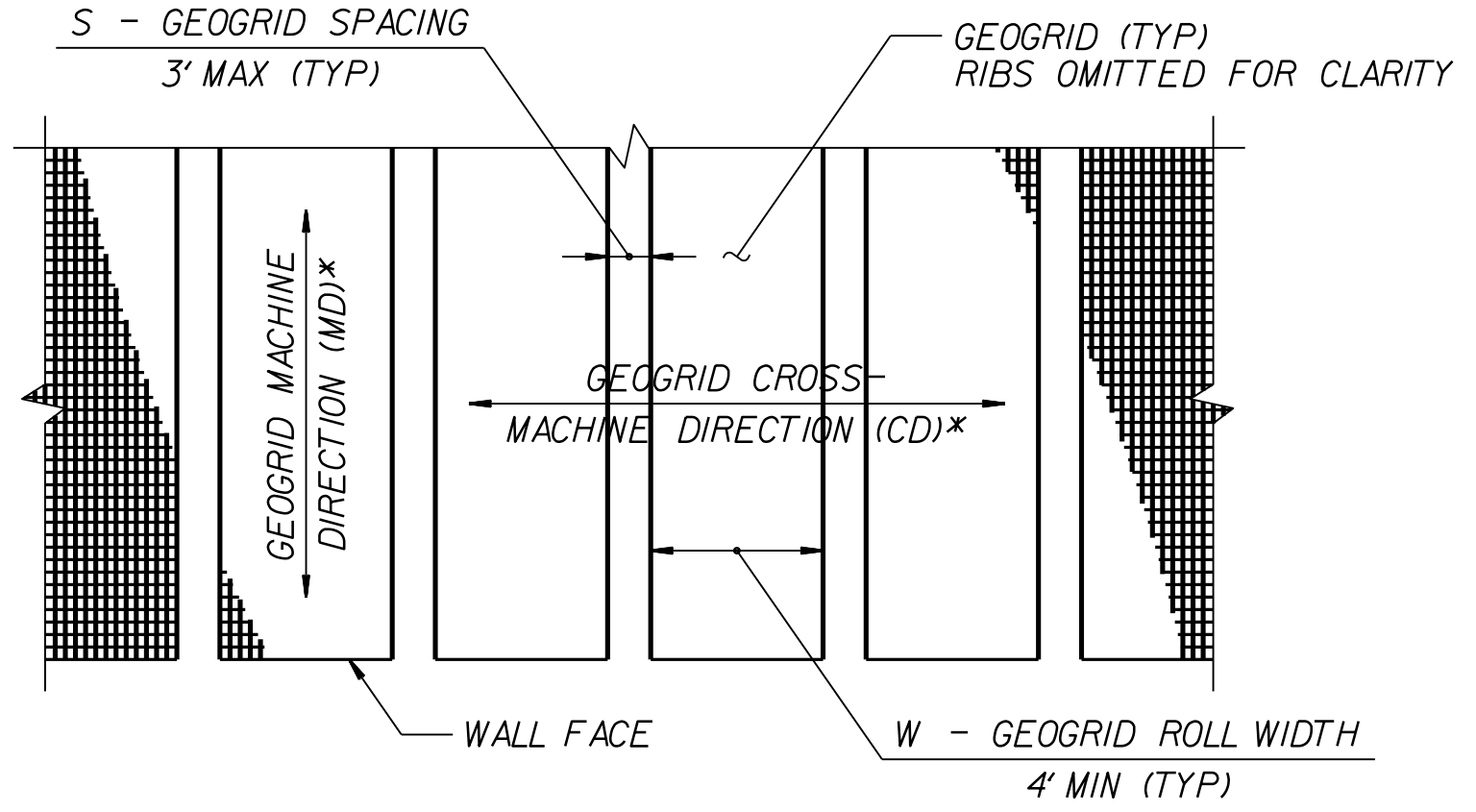
STANDARD DETAIL NO. 1801.02

STANDARD  
 TEMPORARY WALL  
 SHEET 1 OF 3



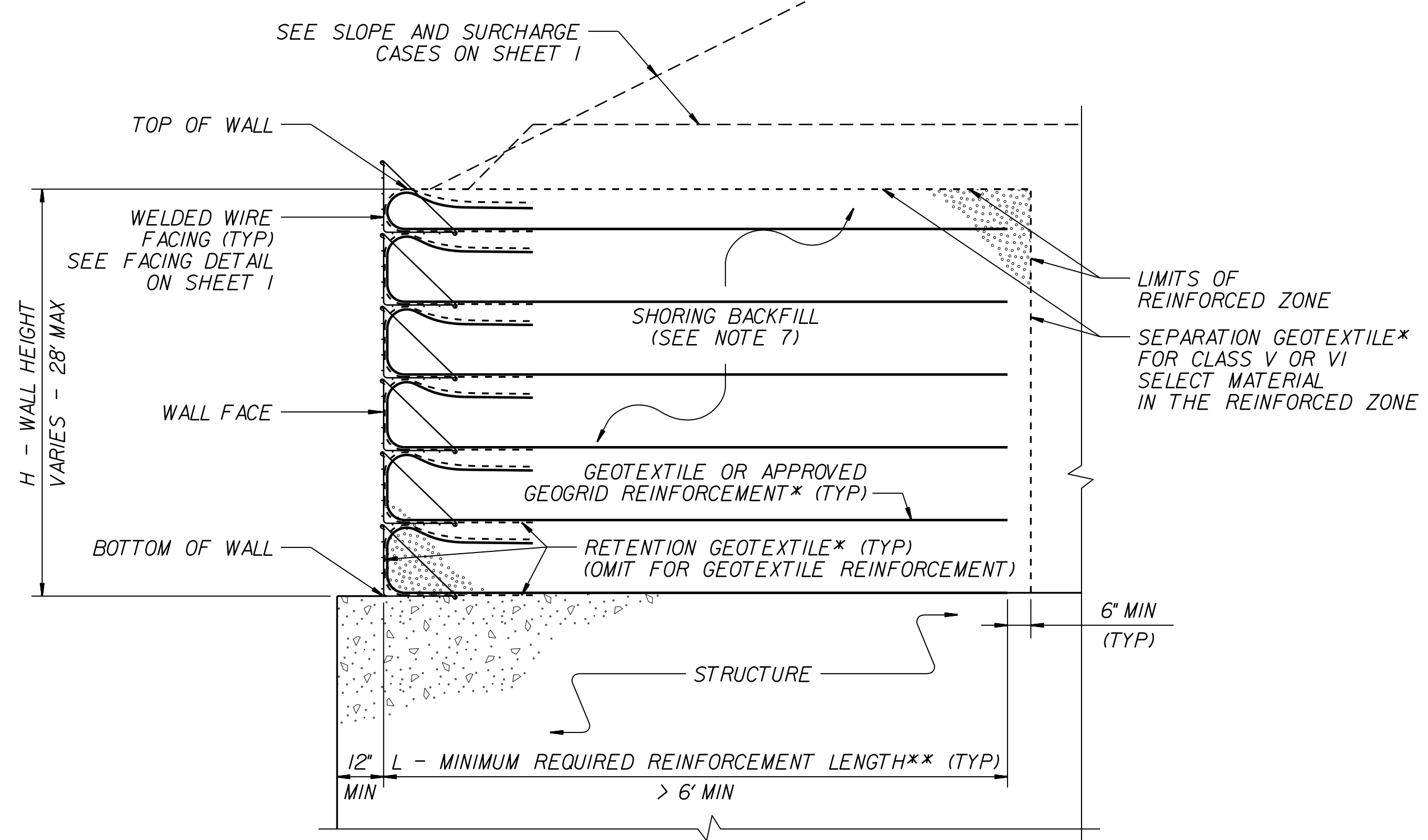


**GEOTEXTILE PLACEMENT**  
(100% COVERAGE MIN FOR GEOTEXTILE REINFORCEMENT)



**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.



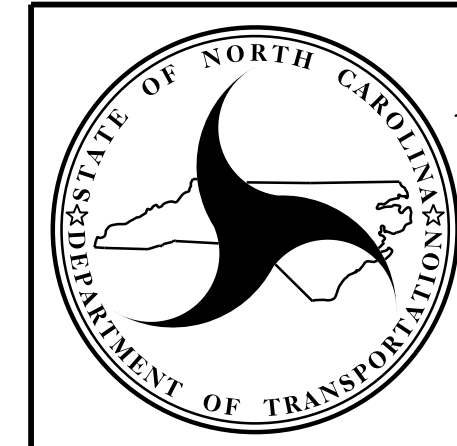
**TEMPORARY WALL ON STRUCTURE DETAIL**  
\*SEE GEOSYNTHETIC PLACEMENT DETAILS.  
\*\*SEE REINFORCEMENT TABLES ON SHEET 3.

**NOTES:**

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

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

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




NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
  
GEOTECHNICAL  
ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD  
TEMPORARY WALL  
SHEET 2 OF 3



<b>PROJECT REFERENCE NO.</b> B-5737	<b>SHEET NO.</b> 2G-3
GEOTECHNICAL ENGINEER  ENGINEER	ENGINEER     DATE: _____ SIGNATURE: _____
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

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

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

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

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


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

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

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

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

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



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

STANDARD DETAIL NO. 1801.02

STANDARD  
TEMPORARY WALL  
SHEET 3 OF 3



STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS

**SUMMARY OF EARTHWORK**

IN CUBIC YARDS

Note: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Fine Grading, Clearing and Grubbing, Breaking of Existing Asphalt Pavement, and Removal of Existing Asphalt Pavement will be paid for at the contract lump sum price for "Grading."

STATION	STATION	UNCL. EXCAV.	UNDERCUT	EMBANK. +%	BORROW	WASTE
-L-						
17+00	20+32	12		1,831	1,819	
21+41	25+00	18		1,675	1,657	
SUBTOTALS:		30		3,506	3,476	
-RPA-						
10+00	12+25	14		655	641	
SUBTOTALS:		14		655	641	
-DET-						
17+68	20+05	369		254		115
21+85	24+18	0		398	398	
SUBTOTALS:		369		652	398	115
TOTAL:		413		4,813	4,515	115
MATERIAL FOR SHOULDER CONSTRUCTION				108	108	
LOSS DUE TO CLEARING AND GRUBBING		-50			50	
ADDITIONAL UNDERCUT						
WASTE IN LIEU OF BORROW					-115	-115
PROJECT TOTALS:		363		4,921	4,558	
EST 5% TO REPLACE TOP SOIL ON BORROW PIT					228	
-DET- DETOUR REMOVAL						
18+50	20+32	52		193	141	
21+41	22+50	142		0		142
WASTE IN LIEU OF BORROW					-142	-142
GRAND TOTALS:		557		5,114	4,785	
SAY:		600			5,000 *	

**SUMMARY OF BREAKING ASPHALT PAVEMENT**

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	SY
-L-	18+30	19+75	CL	807.68
-L-	22+00	22+70	CL	465.88
-RPA-	11+00	12+25	CL	293.00
TOTAL:				1,566.56
SAY:				1,570

**SUMMARY OF REMOVAL ASPHALT PAVEMENT**

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	SY
-L-	19+75	20+07	CL	187.93
-L-	21+67	22+00	CL	219.57
-DET-	18+41	20+05	CL	416.20
-DET-	21+85	23+16	CL	337.53
-L-	17+82	18+30	LT	18.38
-L-	22+70	25+00	LT	32.14
-L-	17+54	18+30	RT	19.42
-L-	22+70	23+80	RT	27.37
TOTAL:				1,258.54
SAY:				1,260

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

**GUARDRAIL SUMMARY**

"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			REMARKS						
				STRAIGHT	SHOP CURVED	FACED	APPROACH BEGIN	TRAILING BEGIN			APPROACH BEGIN	TRAILING BEGIN	GREU TL-2	GREU TL-3	CAT-1	AT-1	TYPE III	TEMPORARY CRASH CUSHION	EA	G	NG	SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL		REMOVE AND STOCKPILE EXISTING GUARDRAIL					
-L-	19+27.19	20+08.44	LT	81.25'				20+08.44	7.5'			25'		0.5'				1											BRIDGE	
-L-	21+67.44	22+03.50	LT	25.00'	50.00'			21+67.44	7.5'																				BRIDGE	
-L-	18+73.33	20+04.58	RT	131.25'				21+67.44	7.5'		25'		0.5'					1											BRIDGE	
-L-	21+63.69	22+19.94	RT	56.25'				20+08.44	7.5'			25'		0.5'				1											BRIDGE	
-Y3-	12+05.84	14+37.09	LT	231.25'					6'	9'	50'		1'																151.65'	
-Y3-	11+04.89	12+98.64	RT	193.75'					6'	9'	50'		1'																127.14'	
TOTAL				718.75'	50.00'													3	2	2	1	4							278.79'	
LESS ANCHOR DEDUCTIONS																														
GREU TL-3				2 @ 50.00'	-100.00'																									
GREU TL-2				3 @ 25.00'	-75.00'																									
TYPE III				4 @ 18.75'	-75.00'																									
AT-1				1 @ 6.25'	-6.25'																									
CAT-1				2 @ 6.25'	-12.50'																									
SUB TOTAL				450.00'	50.00'																									
SAY				450.00'	50.00'													3	2	2	1	4							300.00'	
ADDITIONAL GUARDRAIL POSTS																														5





RAV-2004

COMPUTED BY: JD DATE: 11/01/2021  
CHECKED BY: CL DATE: 11/01/2021

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS

PROJECT NO. B-5737 SHEET NO. 3D-1

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

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

Main data table with columns for Line & Station, Offset, Structure Number, Invert Elevation, Minimum Required Slope, Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC), C.S. Pipe (30-84 inch), R.C. Pipe Class III (12-84 inch), R.C. Pipe Class IV (12-84 inch), Quantities for Drainage Structures (0-10+ feet), Frame, Grates, and Hood, Concrete Transitional Section, and Abbreviations. Includes SHEET TOTALS and PROJECT TOTALS at the bottom.

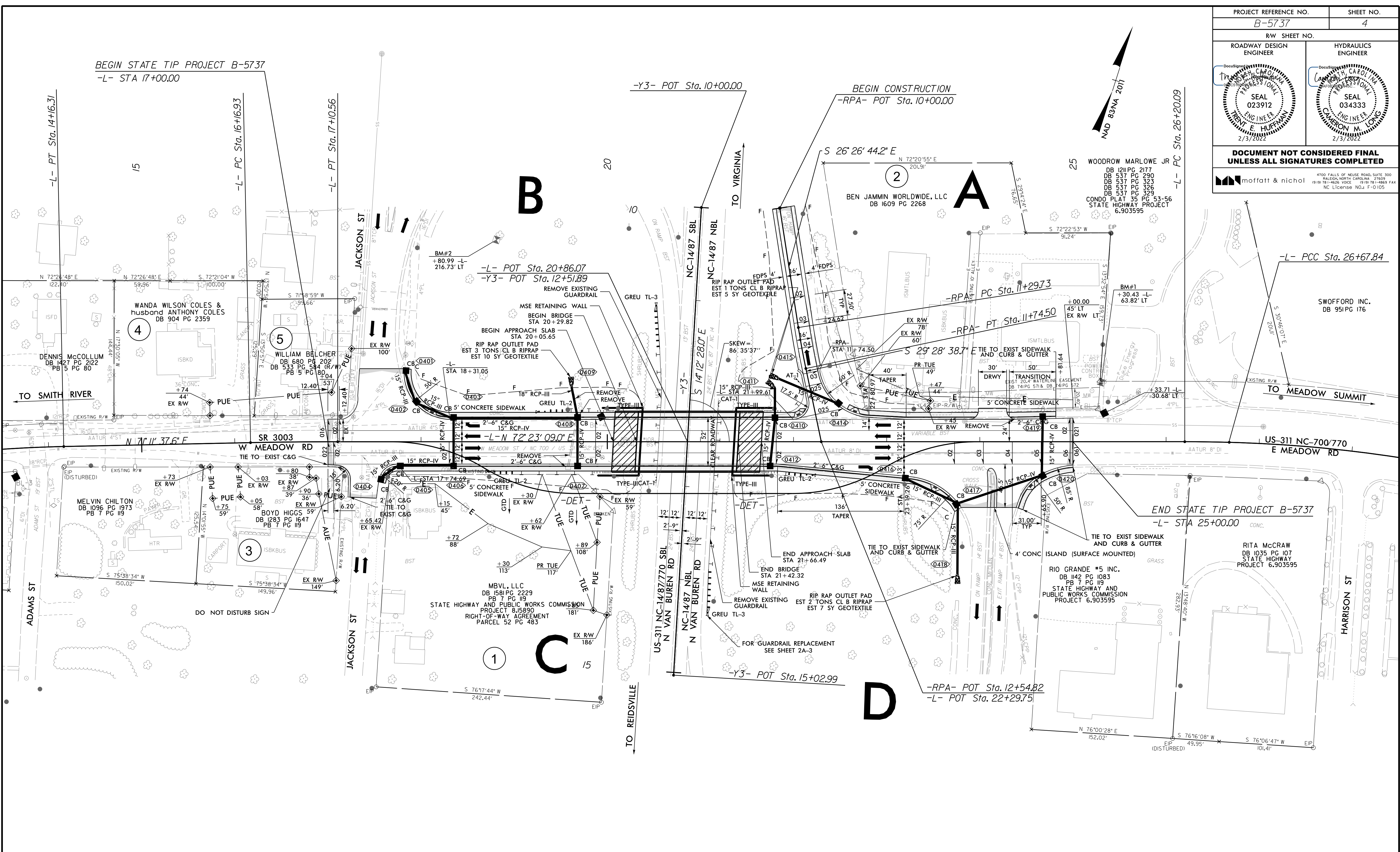
SHEET TOTALS

PROJECT TOTALS





PROJECT REFERENCE NO. <b>B-5737</b>		SHEET NO. <b>4</b>	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		SEAL 023912 2/3/2022	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>			
		<small>4700 FALLS OF NEUSE ROAD, SUITE 300 RALEIGH, NORTH CAROLINA 27609 (919) 781-4626 VOICE (919) 781-8863 FAX NC License No. J-F-0105</small>	



-L-		-RPA-	
PI Sta 13+40.63	PI Sta 16+63.75	PI Sta 28+53.50	PI Sta 11+52.12
$\Delta = 6' 15'' 49.2''$ (RT)	$\Delta = 1' 11'' 31.5''$ (RT)	$\Delta = 14' 26'' 10.3''$ (RT)	$\Delta = 3' 01'' 54.5''$ (LT)
$D = 4' 08'' 02.3''$	$D = 1' 16'' 23.7''$	$D = 3' 54'' 30.9''$	$D = 6' 46'' 21.2''$
$L = 151.52'$	$L = 93.63'$	$L = 369.35'$	$L = 44.77'$
$T = 75.83'$	$T = 46.81'$	$T = 185.66'$	$T = 22.39'$
$R = 1,385.97'$	$R = 4,499.99'$	$R = 1,465.90'$	$R = 846.00'$
			$SE = 04$
			$Runoff = 110'$
			$DS = 40MPH$

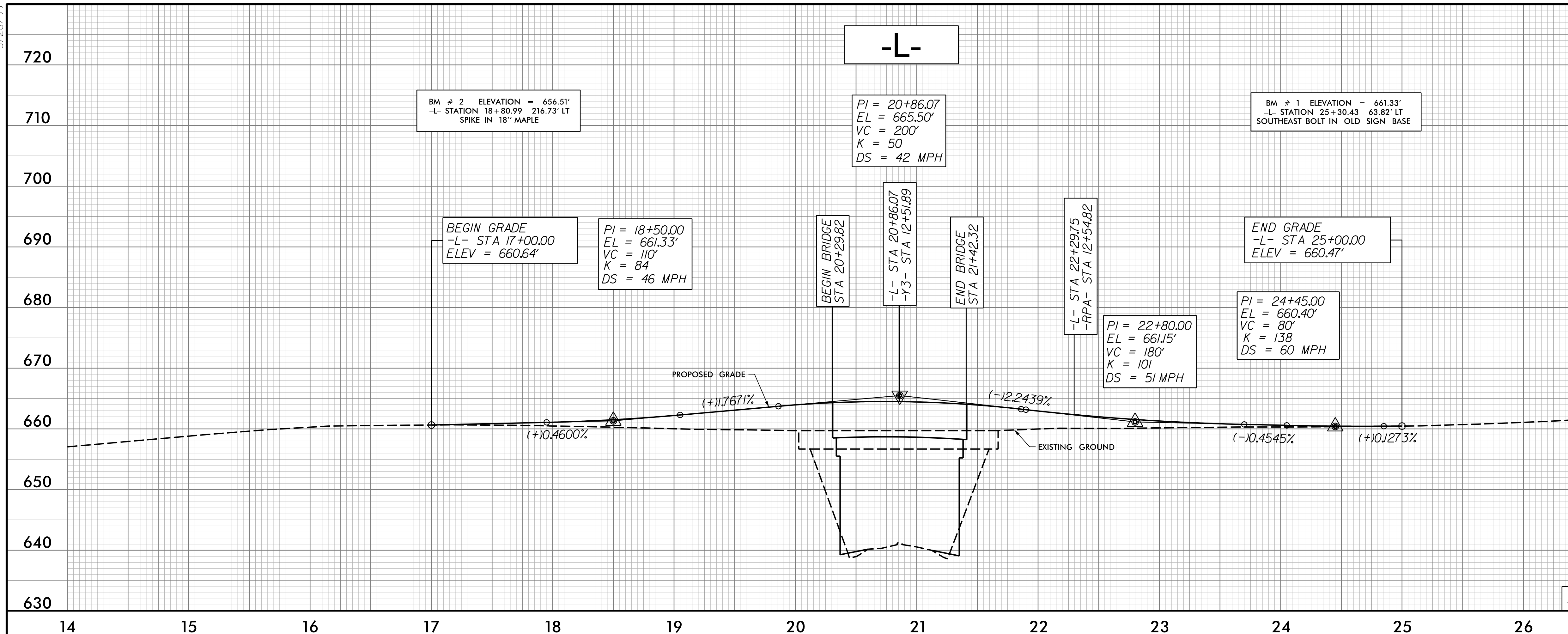
ALL DRIVE RADII 10' UNLESS OTHERWISE NOTED  
 FOR DETOUR, SEE SHEET NO. 2B-1  
 FOR STRUCTURE PLANS SEE S-1 THRU S-28  
 FOR WALL PLANS SEE W-1 THRU W-4  
 FOR PROFILE, SEE SHEET NO. 5

8/17/19  
 2/2/2022  
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 H:\Eman



5/28/2021

PROJECT REFERENCE NO. B-5737	SHEET NO. 5
ROADWAY DESIGN ENGINEER THOMAS H. CARROLL SEAL 023912 1/12/2022	HYDRAULICS ENGINEER CAMERON M. LONG SEAL 034333 1/12/2022
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
moffatt & nichol 4700 FALLS OF NEUSE ROAD, SUITE 300 RALEIGH, NORTH CAROLINA 27609 (919) 781-8000 VOICE (919) 781-7800 FAX NC License No.: F-0105	



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