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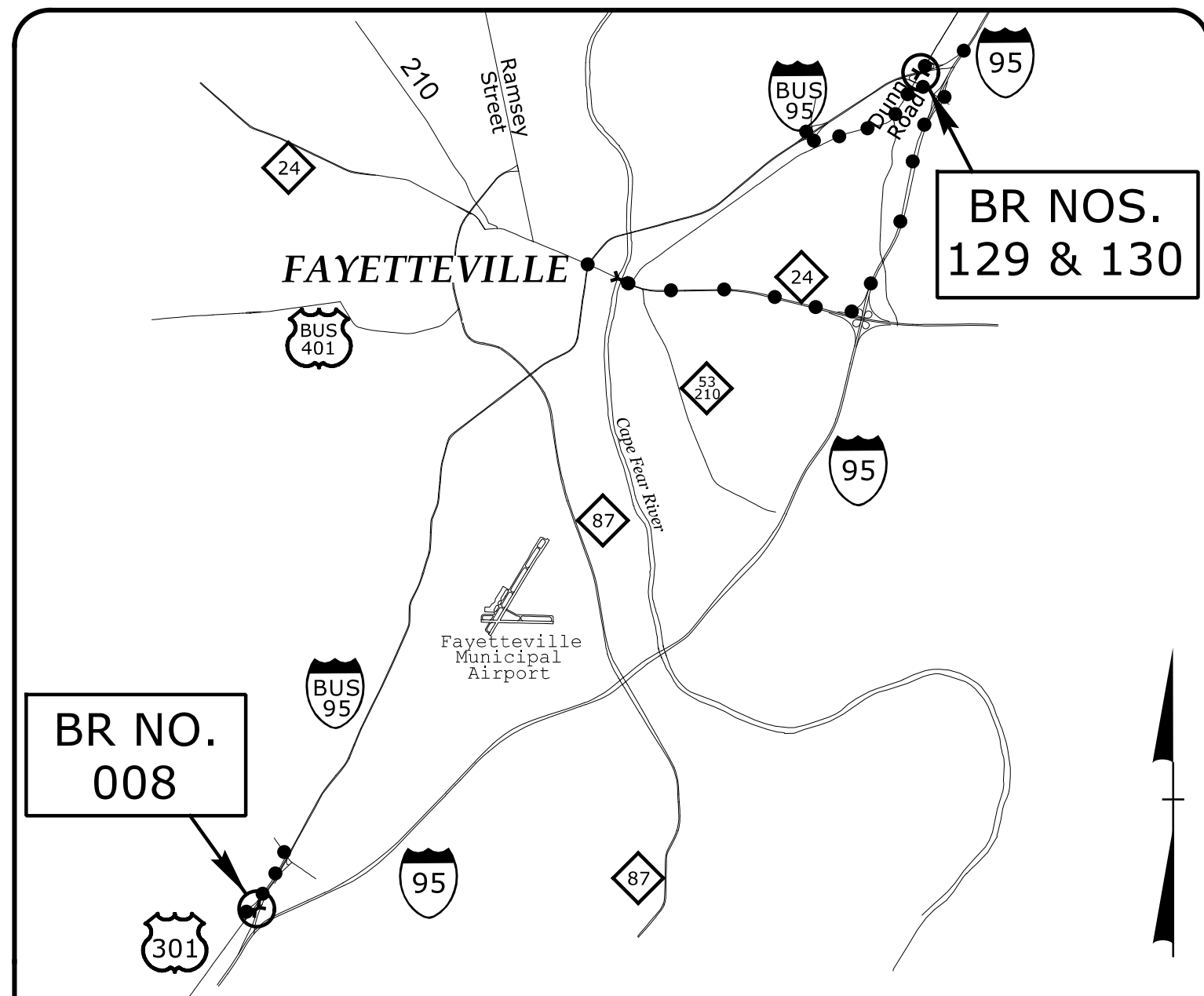
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09_08/2017

CONTRACT: C204093 BRIDGES 008, 129, & 130

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



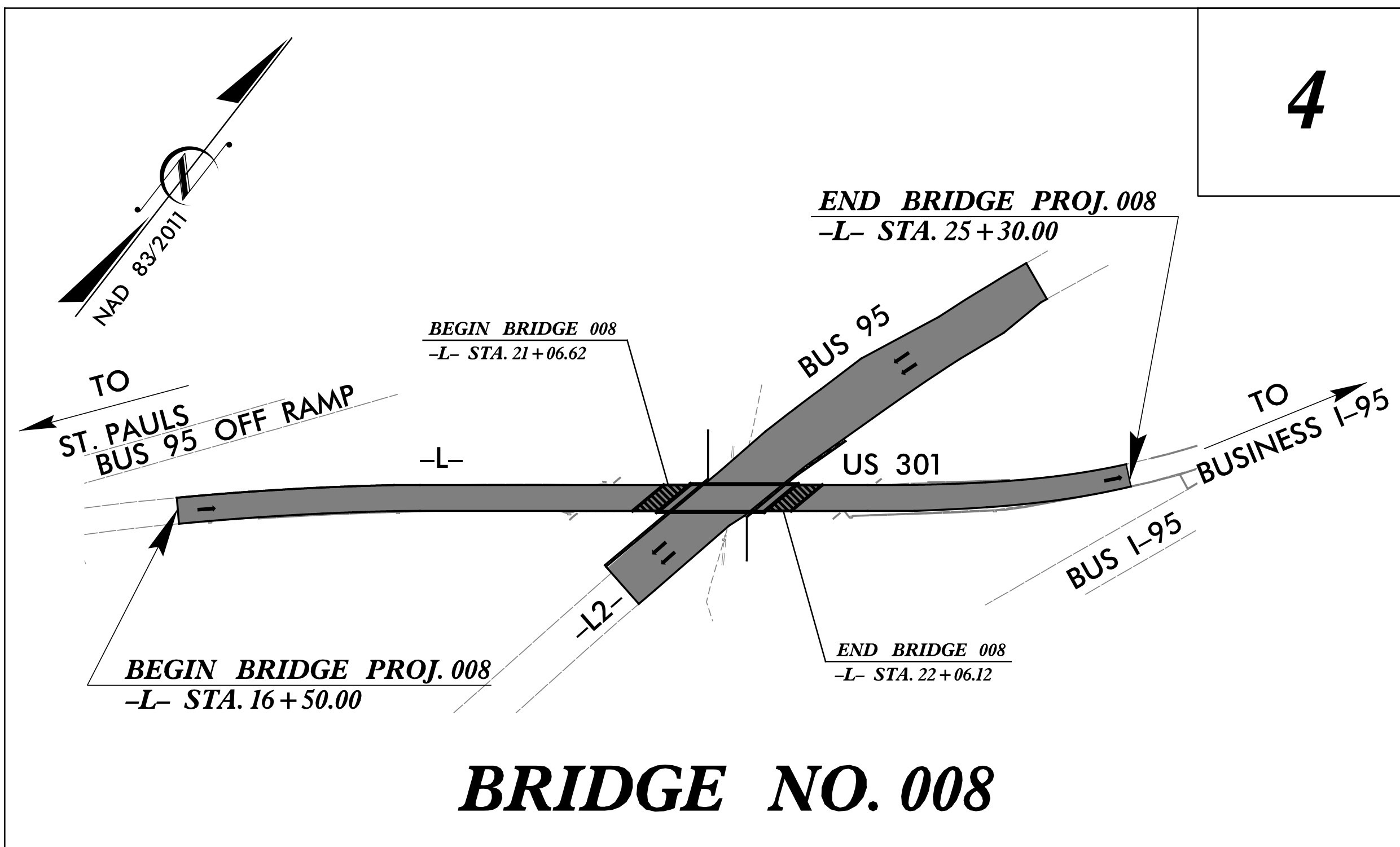
VICINITY MAP
NOT TO SCALE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

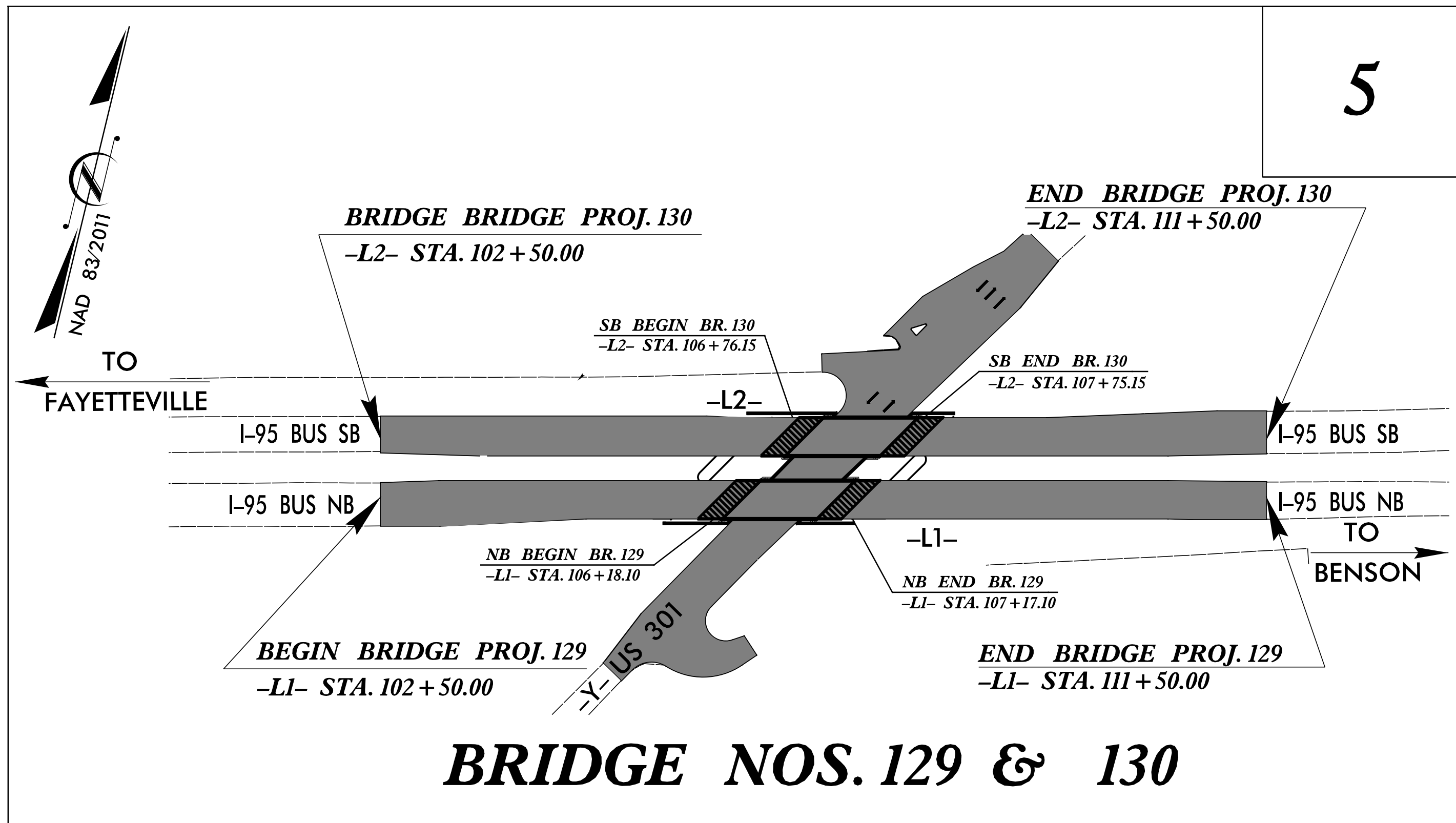
CUMBERLAND COUNTY

**LOCATION: BRIDGE NOS. 129 & 130 ON I-95 BUSINESS LOOP
OVER US 301 AND BRIDGE NO. 008 ON US 301
OVER I-95 BUSINESS LOOP SBL**
TYPE OF WORK: GRADING, PAVING, DRAINAGE, & STRUCTURES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BRIDGES 008, 129, & 130	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
41665.7A		PE & CONST	

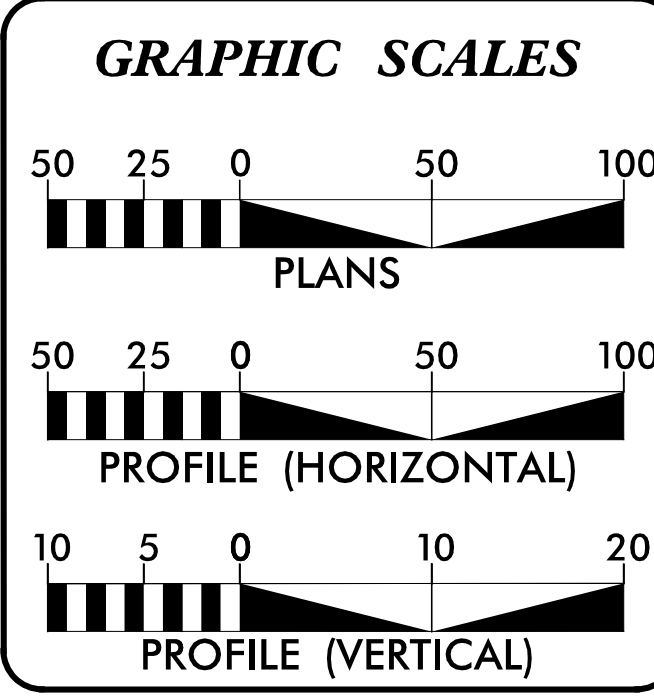


BRIDGE NO. 008



BRIDGE NOS. 129 & 130

NOTE: THIS IS A CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.



DESIGN DATA

BRIDGE 008:
V = 40 MPH

BRIDGES 129 & 130
V = 60 MPH

FUNC CLASS =

INTERSTATE TIER

PROJECT LENGTH

TIP PROJECT BRIDGE 008:
LENGTH ROADWAY = 0.148 MI.
LENGTH STRUCTURE = 0.019 MI.
TOTAL LENGTH OF PROJECT = 0.167 MI.

TIP PROJECT BRIDGES 129 & 130:
LENGTH ROADWAY (EACH) = 0.151 MI.
LENGTH STRUCTURE (EACH) = 0.019 MI.
TOTAL LENGTH OF PROJECT (EACH) = 0.170 MI.

Prepared In the Office of:

vhb
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
NC License No. C-21705

SUNGATE DESIGN GROUP, P.A.
1115 POWER FARMER DRIVE
RALEIGH, NC 27608
TEL: 919.876.1111 FAX: 919.876.1111
1000A/D/C/14994/C3

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: N/A

LETTING DATE: DECEMBER 19, 2017

TIM GOINS, PE
PROJECT ENGINEER

LIZ LAWES, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

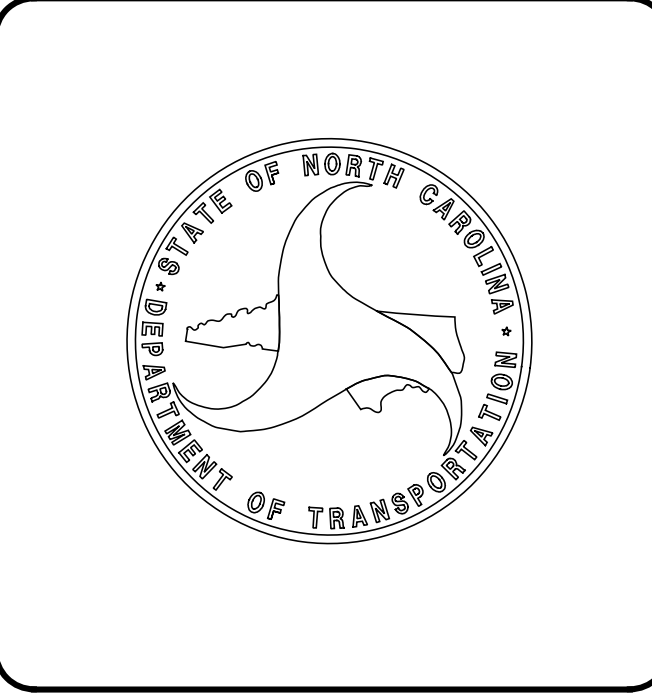
11/2/2017

DocuSigned by:
Joshua G. Dalton
1000A/D/C/14994/C3

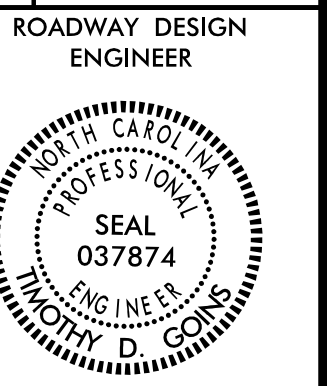
SIGNATURE: _____

ROADWAY DESIGN ENGINEER

SIGNATURE: _____



9/28/2017
Br008_Rdy_title01.dgn
elawes



EFF. 01-17-2012
REV. 05-24-2017

2012 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, 2012 are applicable to this project and by reference hereby are considered a part of these plans:

SHEET NUMBER	SHEET	STD. NO.	TITLE
1	TITLE SHEET		
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS		
1B	CONVENTIONAL SYMBOLS		
1C-1 THRU 1C-2	SURVEY CONTROL SHEETS		
2A-1 THRU 2A-4	PAVEMENT SCHEDULE AND TYPICAL SECTIONS		
2C-1 THRU 2C-14	GUARDRAIL DETAILS		
2C-15	COAL COMBUSTION DETAIL		
2C-16	MODIFIED CONCRETE FLUME DETAIL		
2D-1	DRAINAGE DETAIL		
2G-1	ROCK PLATING DETAIL		
3B-1	ROADWAY SUMMARIES		
3D-1	DRAINAGE SUMMARIES		
3G-1	GEOTECHNICAL SUMMARIES		
4 THRU 9	PLAN AND PROFILE SHEET		
TMP-1 THRU TMP-7	TRAFFIC MANAGEMENT PLANS		
PMP-1 THRU PMP-3	PAVEMENT MARKING PLANS		
EC-01 THRU EC-07	EROSION CONTROL PLANS		
SIGN-1 THRU SIGN-3	SIGNING PLANS		
UO-1 THRU UO-2	UTILITIES BY OTHERS PLANS		
X-1A	CROSS-SECTION SUMMARY SHEET		
X-1 THRU X-20	CROSS-SECTIONS		
S-1 THRU S-24	STRUCTURE PLANS		
W-1 THRU W-9	WALL PLANS		
		DIVISION 2 - EARTHWORK	
		200.03	Method of Clearing - Method III
		225.01	Guide for Grading Subgrade - Interstate and Freeway
		225.04	Method of Obtaining Superelevation - Two Lane Pavement
		225.05	Method of Obtaining Superelevation - Divided Highways
		DIVISION 3 - PIPE CULVERTS	
		300.01	Method of Pipe Installation
		DIVISION 4 - MAJOR STRUCTURES	
		422.10	Reinforced Bridge Approach Fills
		DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
		560.02	Method of Shoulder Construction - High Side of Superelevated Curve - Method II (Sheet 2 of 3 is no longer applicable)
		DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
		665.01	Asphalt Shoulders - Milled Rumble Strips
		DIVISION 8 - INCIDENTALS	
		815.02	Subsurface Drain
		840.00	Concrete Base Pad for Drainage Structures
		840.14	Concrete Drop Inlet - 12" thru 30" Pipe
		840.15	Brick Drop Inlet - 12" thru 30" Pipe
		840.17	Concrete Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
		840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
		840.19	Concrete Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
		840.20	Frames and Wide Slot Flat Grates
		840.25	Anchorage for Frames - Brick or Concrete or Precast
		840.26	Brick Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
		840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
		840.28	Brick Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
		840.29	Frames and Narrow Slot Flat Grates
		840.31	Concrete Junction Box - 12" thru 66" Pipe
		840.32	Brick Junction Box - 12" thru 66" Pipe
		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
		840.54	Manhole Frame and Cover
		840.66	Drainage Structure Steps
		846.01	Concrete Curb, Gutter and Curb & Gutter
		846.04	Drop Inlet Installation in Shoulder Berm Gutter
		862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
		866.02	Woven Wire Fence - with Wood Post
		876.01	Rip Rap in Channels
		876.02	Guide for Rip Rap at Pipe Outlets

GENERAL NOTES:

2012 SPECIFICATIONS
EFFECTIVE: 01-17-2012
REVISED: 01-24-2017

GRADING AND SURFACING OR RESURFACING AND WIDENING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING:

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

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. 560.02

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.

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.

SUBSURFACE PLANS:

NO SUBSURFACE PLANS ARE AVAILABLE ON THIS PROJECT. THE CONTRACTOR SHOULD MAKE HIS OWN INVESTIGATION AS TO THE SUBSURFACE CONDITIONS.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE

- Spectrum
- Windstream
- Duke Energy Progress
- Century Link Telecommunications, Charter Communications

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.

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	_____ X
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	▽
Proposed Lateral, Tail, Head Ditch	▬
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	_____ (R/W)
New Right of Way Line with Pin and Cap	_____ (R/W) ▲
New Right of Way Line with Concrete or Granite R/W Marker	_____ (R/W) ▲
New Control of Access Line with Concrete C/A Marker	_____ (C/A)
Existing Control of Access	_____ (C/A)
New Control of Access	_____ (C/A)
Existing Easement Line	--- E ---
New Temporary Construction Easement	--- E ---
New Temporary Drainage Easement	--- TDE ---
New Permanent Drainage Easement	--- PDE ---
New Permanent Drainage / Utility Easement	--- DUE ---
New Permanent Utility Easement	--- PUE ---
New Temporary Utility Easement	--- TUE ---
New Aerial Utility Easement	--- AUE ---

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	--- T ---
Proposed Guardrail	--- T ---
Existing Cable Guiderail	--- T ---
Proposed Cable Guiderail	--- T ---
Equality Symbol	⊕
Pavement Removal	▨

VEGETATION:

Single Tree	☼
Single Shrub	☼

Note: Not to Scale *S.U.E. = *Subsurface Utility Engineering*

Hedge	_____
Woods Line	_____
Orchard	☼ ☼ ☼ ☼
Vineyard	□ Vineyard

EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	CONC
Bridge Wing Wall, Head Wall and End Wall	CONC WW
MINOR:	
Head and End Wall	CONC HW
Pipe Culvert	_____
Footbridge	_____
Drainage Box: Catch Basin, DI or JB	□ CB
Paved Ditch Gutter	_____
Storm Sewer Manhole	⊙
Storm Sewer	--- S ---

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.*)	--- P ---
U/G Power Line LOS C (S.U.E.*)	--- P ---
U/G Power Line LOS D (S.U.E.*)	--- P ---

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.*)	--- T ---
U/G Telephone Cable LOS C (S.U.E.*)	--- T ---
U/G Telephone Cable LOS D (S.U.E.*)	--- T ---
U/G Telephone Conduit LOS B (S.U.E.*)	--- TC ---
U/G Telephone Conduit LOS C (S.U.E.*)	--- TC ---
U/G Telephone Conduit LOS D (S.U.E.*)	--- TC ---
U/G Fiber Optics Cable LOS B (S.U.E.*)	--- T FO ---
U/G Fiber Optics Cable LOS C (S.U.E.*)	--- T FO ---
U/G Fiber Optics Cable LOS D (S.U.E.*)	--- T FO ---

WATER:

Water Manhole	⊙
Water Meter	○
Water Valve	⊗
Water Hydrant	⊕
U/G Water Line LOS B (S.U.E.*)	--- W ---
U/G Water Line LOS C (S.U.E.*)	--- W ---
U/G Water Line LOS D (S.U.E.*)	--- W ---
Above Ground Water Line	--- A/G Water ---

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	⊕
Utility Unknown U/G Line LOS B (S.U.E.*)	--- 2UTL ---
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.

SURVEY CONTROL SHEET 250008

W/EXISTING ALIGNMENTS PRIOR TO CONSTRUCTION

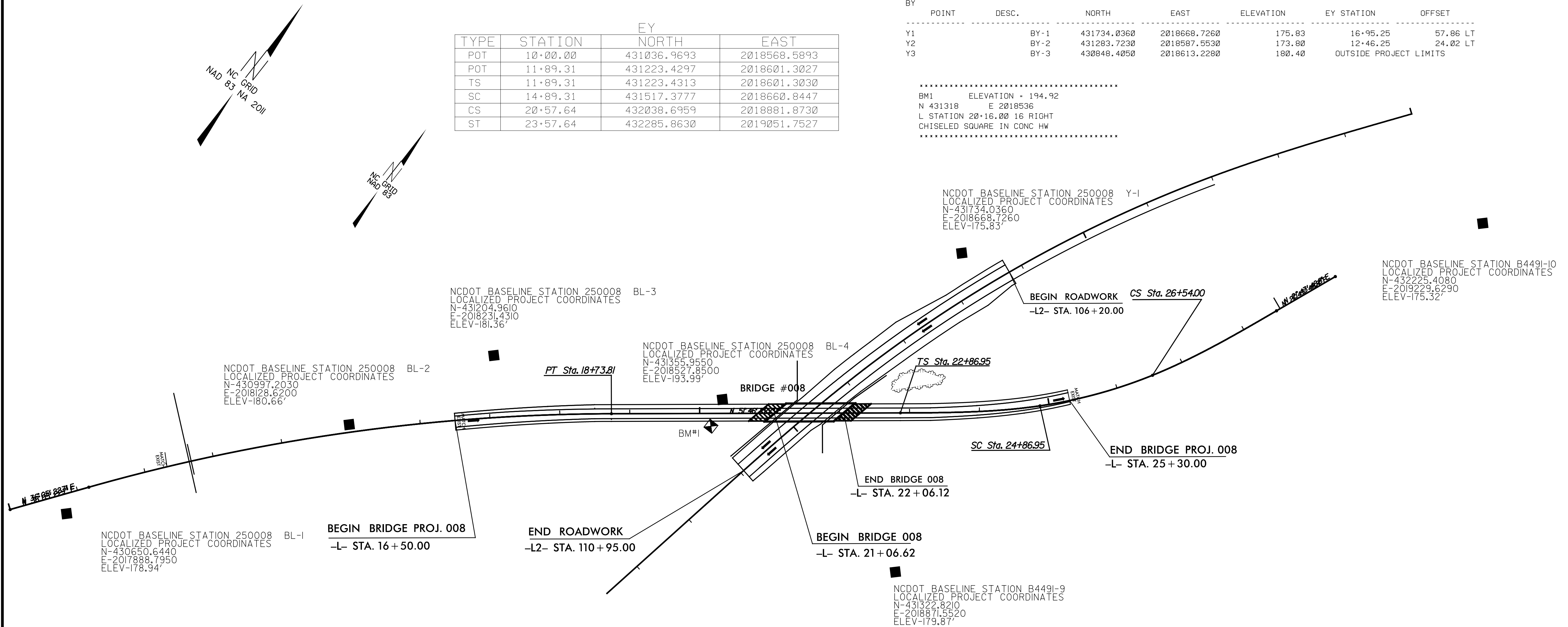
L			
TYPE	STATION	NORTH	EAST
POT	10+00.00	430605.2190	2017822.8320
PC	11+16.96	430699.7349	2017891.7281
PT	18+73.81	431243.0985	2018415.1907
TS	22+86.95	431498.7402	2018739.7383
SC	24+86.95	431629.7144	2018890.6465
CS	26+54.00	431763.2428	2018990.3617
ST	28+54.00	431945.1314	2019073.0904
POT	29+51.29	432035.5063	2019109.1092

EY			
TYPE	STATION	NORTH	EAST
POT	10+00.00	431036.9693	2018568.5893
POT	11+89.31	431223.4297	2018601.3027
TS	11+89.31	431223.4313	2018601.3030
SC	14+89.31	431517.3777	2018660.8447
CS	20+57.64	432038.6959	2018881.8730
ST	23+57.64	432285.8630	2019051.7527

BL							
POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET	
1	BL-1	430650.6440	2017888.7950	178.94	10+75.56	26.55	RT
2	BL-2	430997.2030	2018128.6200	180.66	14+96.72	9.92	LT
3	BL-3	431204.9610	2018231.4310	181.36	17+10.99	88.69	LT
4	BL-4	431355.9550	2018527.8500	193.99	20+32.15	18.94	LT
5	BL-5	431555.8480	2018837.5370	186.95	23+98.37	17.32	RT
110	BL-110	432225.4080	2019229.6290	175.32	OUTSIDE PROJECT LIMITS		
109	BL-109	431322.8210	2018871.5520	179.87	22+81.65	219.76	RT

BY							
POINT	DESC.	NORTH	EAST	ELEVATION	EY STATION	OFFSET	
Y1	BY-1	431734.0360	2018668.7260	175.83	16+95.25	57.86	LT
Y2	BY-2	431283.7230	2018587.5530	173.80	12+46.25	24.02	LT
Y3	BY-3	430848.4050	2018613.2280	180.40	OUTSIDE PROJECT LIMITS		

.....
 BM1 ELEVATION = 194.92
 N 431318 E 2018536
 L STATION 20+16.00 16 RIGHT
 CHISELED SQUARE IN CONC HW



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4491-3"

WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF
 NORTHING: 435172.075(ft) EASTING: 2020944.310(ft)
 ELEVATION: 163.58(ft)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999884503

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4491-3" TO -L- STATION 10+00.00 IS
 S55°26'49.10"W 80.09'

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
 VERTICAL DATUM USED IS NAVD 88

NOTES:

○ INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL AND VERTICAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
 PROJECT CONTROL ESTABLISHED USING GNSS (GLOBAL NAVIGATION SATELLITE SYSTEM).

THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
[HTTPS://CONNECT.NCDOT.GOV/RESOURCES/LOCATION/](https://connect.ncdot.gov/resources/location/)

THE FILES TO BE FOUND ARE AS FOLLOWS:
 250008.LS.CONTROL.TXT

SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

NOTE: DRAWING NOT TO SCALE

6/2/99
 9/11/2017
 250008_ls_1c-1.dgn

SURVEY CONTROL SHEET 250129

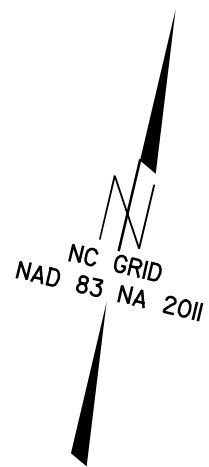
W/EXISTING ALIGNMENTS PRIOR TO CONSTRUCTION

L			
TYPE	STATION	NORTH	EAST
POT	100+00.00	486769.0776	2062035.6790
EQB	112+00.00	487050.5034	2063202.2121
EOA	114+11.29	487050.5034	2063202.2121

L1			
TYPE	STATION	NORTH	EAST
POT	0+00.00	487332.5390	2062932.0230
EQB	0+47.37	487292.0760	2062907.3840
EOA	0+00.00	487292.0760	2062907.3840

L2			
TYPE	STATION	NORTH	EAST
POT	0+00.00	487014.8660	2062733.3120
EQB	0+06.80	487008.8130	2062730.2060
EOA	0+00.00	487008.8130	2062730.2060

Y			
TYPE	STATION	NORTH	EAST
POT	10+00.00	487282.3094	2062915.9905
POT	18+00.04	486596.2652	2062504.4031



BL	POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
1		BL-1	486642.5100	2061835.6300	119.58	OUTSIDE PROJECT LIMITS	
2		BL-2	486888.5900	2062296.6400	136.06	102+81.71	54.98 LT
3		BL-3	486951.5100	2062834.0800	139.92	108+18.92	9.90 RT
4		BL-4	487113.4300	2063494.9500	126.72	OUTSIDE PROJECT LIMITS	
101		GPS-101	487346.6200	2064050.2900	119.60	OUTSIDE PROJECT LIMITS	
102		GPS-102	487761.0300	2064804.5700	122.51	OUTSIDE PROJECT LIMITS	

BY	POINT	DESC.	NORTH	EAST	ELEVATION	EY STATION	OFFSET
Y1		BY-1	487488.5400	2063086.4000	125.80	OUTSIDE PROJECT LIMITS	
Y2		BY-2	486477.5800	2062458.9600	120.92	OUTSIDE PROJECT LIMITS	

.....
 BM1 ELEVATION = 140.48
 N 486954 E 2062810
 L STATION 107+96.00 2 RIGHT
 CHISELED SQUARE IN CONC HW

◆ NCDOT BASELINE STATION 250129 Y1
 LOCALIZED PROJECT COORDINATES
 N-487488.5400
 E-2063086.4000
 ELEV-125.80'

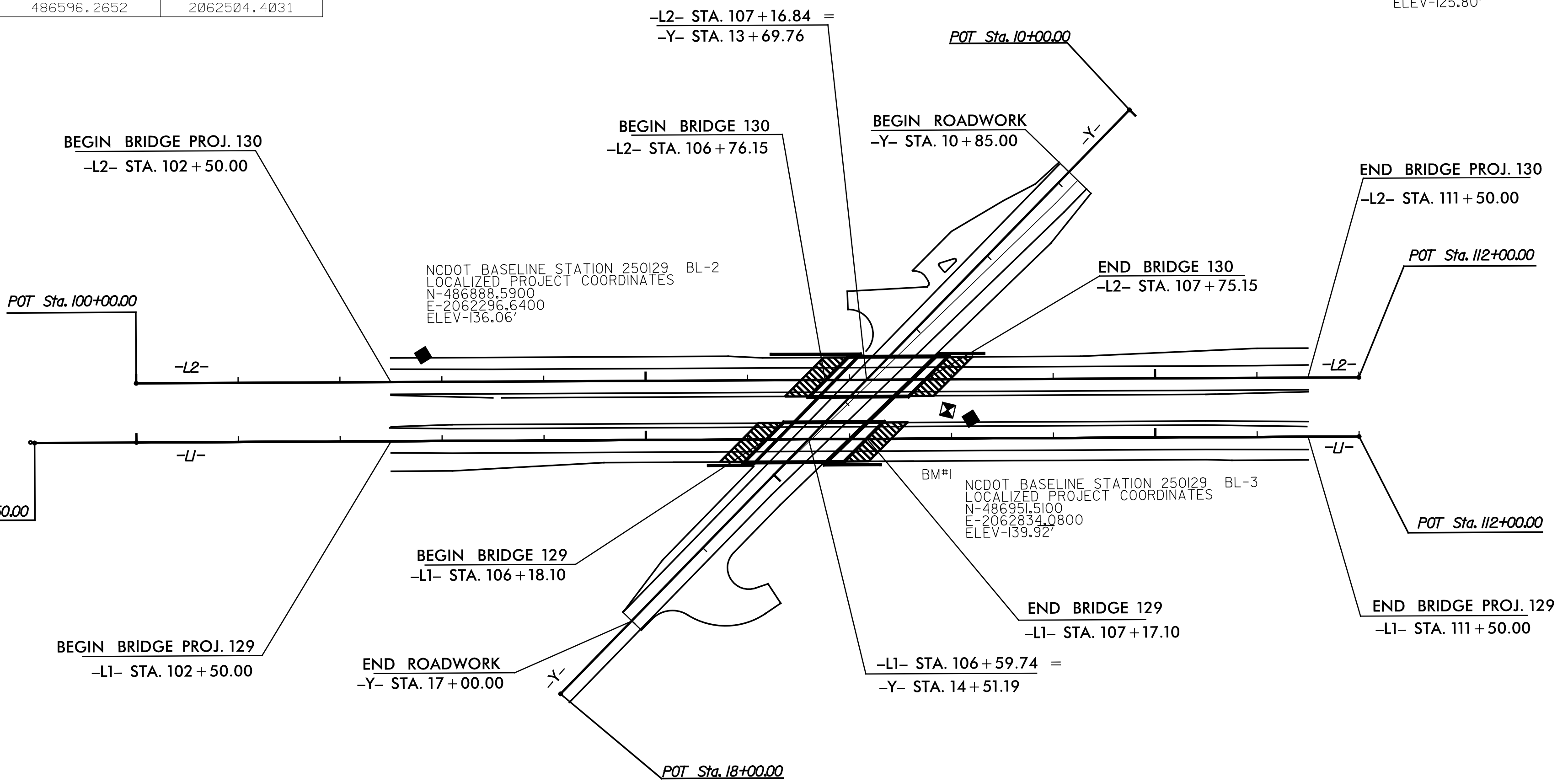
◆ NCDOT BASELINE STATION 250129 BL-1
 LOCALIZED PROJECT COORDINATES
 N-486642.5100
 E-2061835.6300
 ELEV-119.58'

◆ NCDOT BASELINE STATION 250129 BL-2
 LOCALIZED PROJECT COORDINATES
 N-486888.5900
 E-2062296.6400
 ELEV-136.06'

◆ BM#1 NCDOT BASELINE STATION 250129 BL-3
 LOCALIZED PROJECT COORDINATES
 N-486951.5100
 E-2062834.0800
 ELEV-139.92'

◆ NCDOT BASELINE STATION 250129 BL-4
 LOCALIZED PROJECT COORDINATES
 N-487113.4300
 E-2063494.9500
 ELEV-126.72'

◆ NCDOT BASELINE STATION 250129 Y2
 LOCALIZED PROJECT COORDINATES
 N-486477.5800
 E-2062458.9600
 ELEV-120.92'



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "250129-GPS101" WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF NORTHING: 487346.624(ft) EASTING: 2064050.286(ft) ELEVATION: 119.60(ft)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9998760753

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "250129-GPS101" TO -L- STATION 10+00.00 IS N57°40'44.93"E 236.73

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

NOTES:

○ INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL AND VERTICAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT. PROJECT CONTROL ESTABLISHED USING GNSS (GLOBAL NAVIGATION SATELLITE SYSTEM).

THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
[HTTPS://CONNECT.NCDOT.GOV/RESOURCES/LOCATION/](https://connect.ncdot.gov/resources/location/)

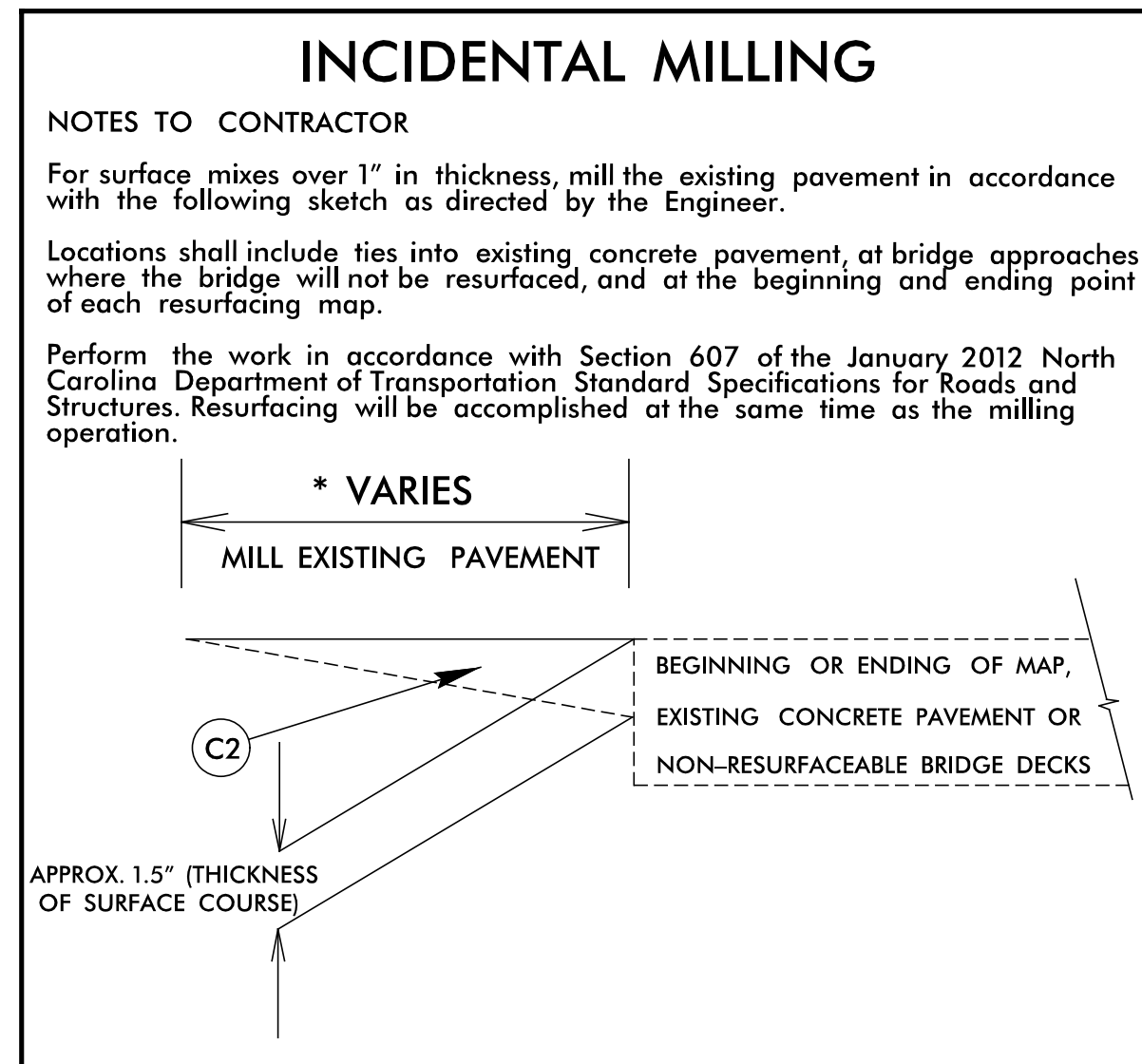
THE FILES TO BE FOUND ARE AS FOLLOWS:
 250129-LS-CONTROL.TXT

SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

NOTE: DRAWING NOT TO SCALE

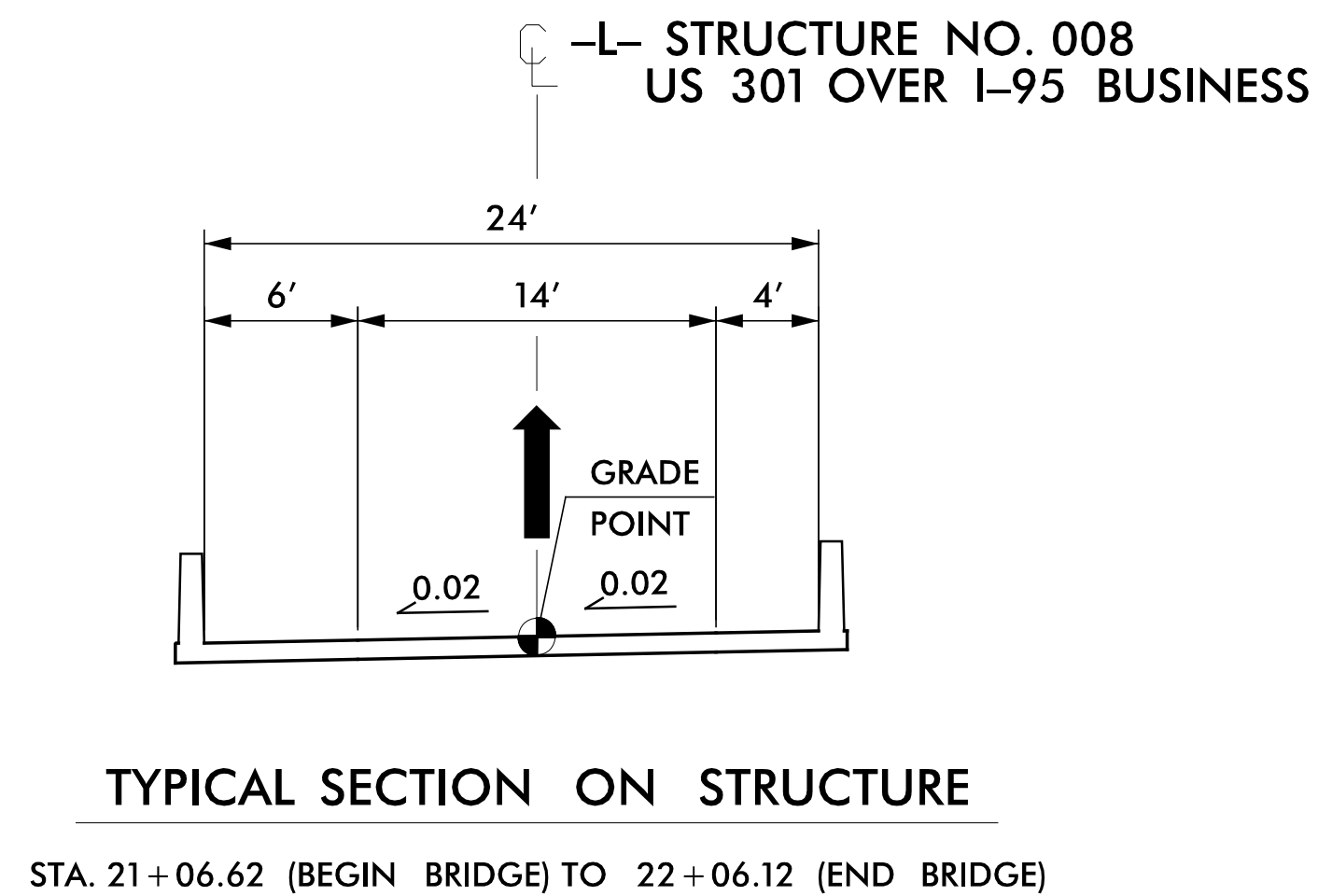
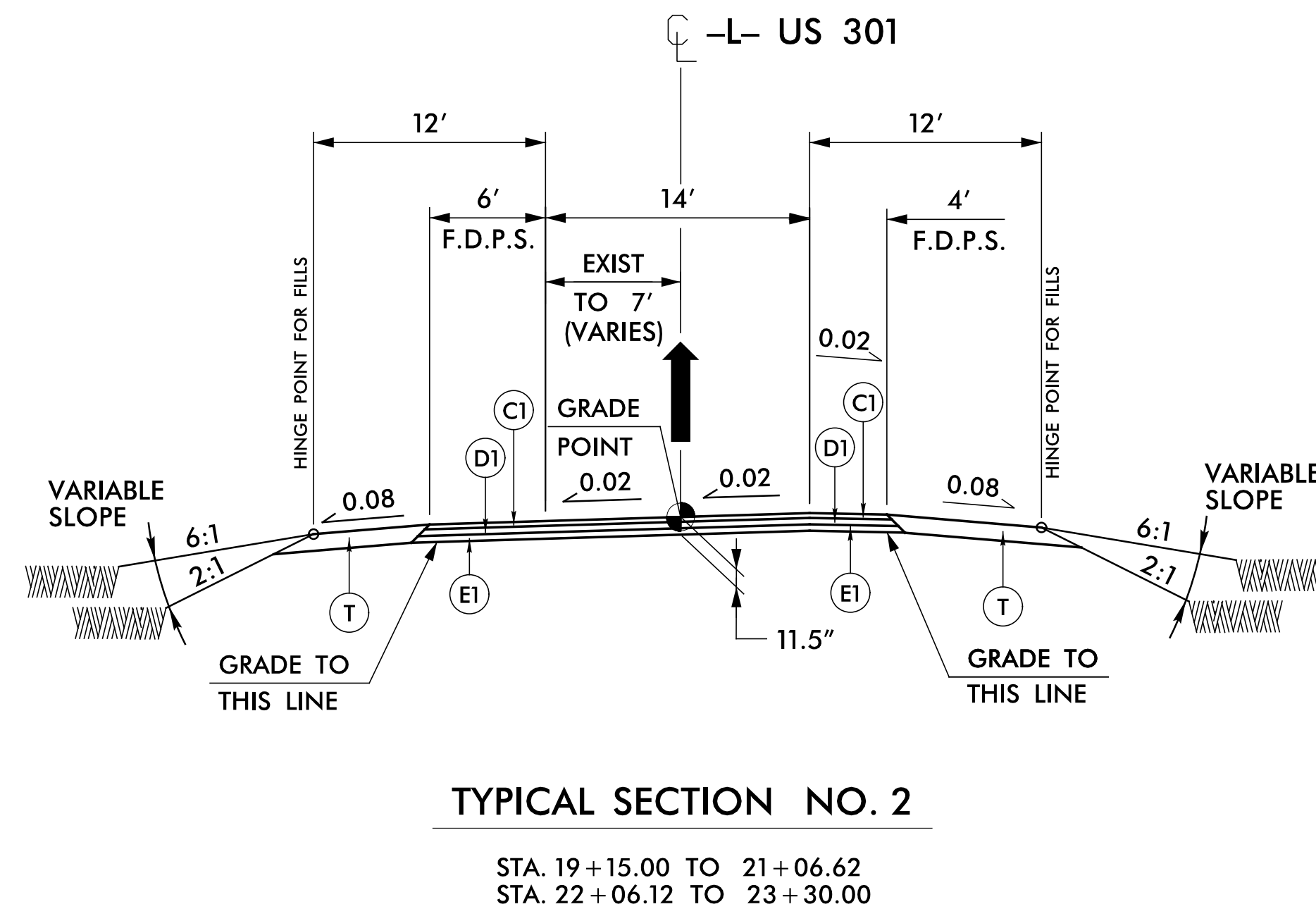
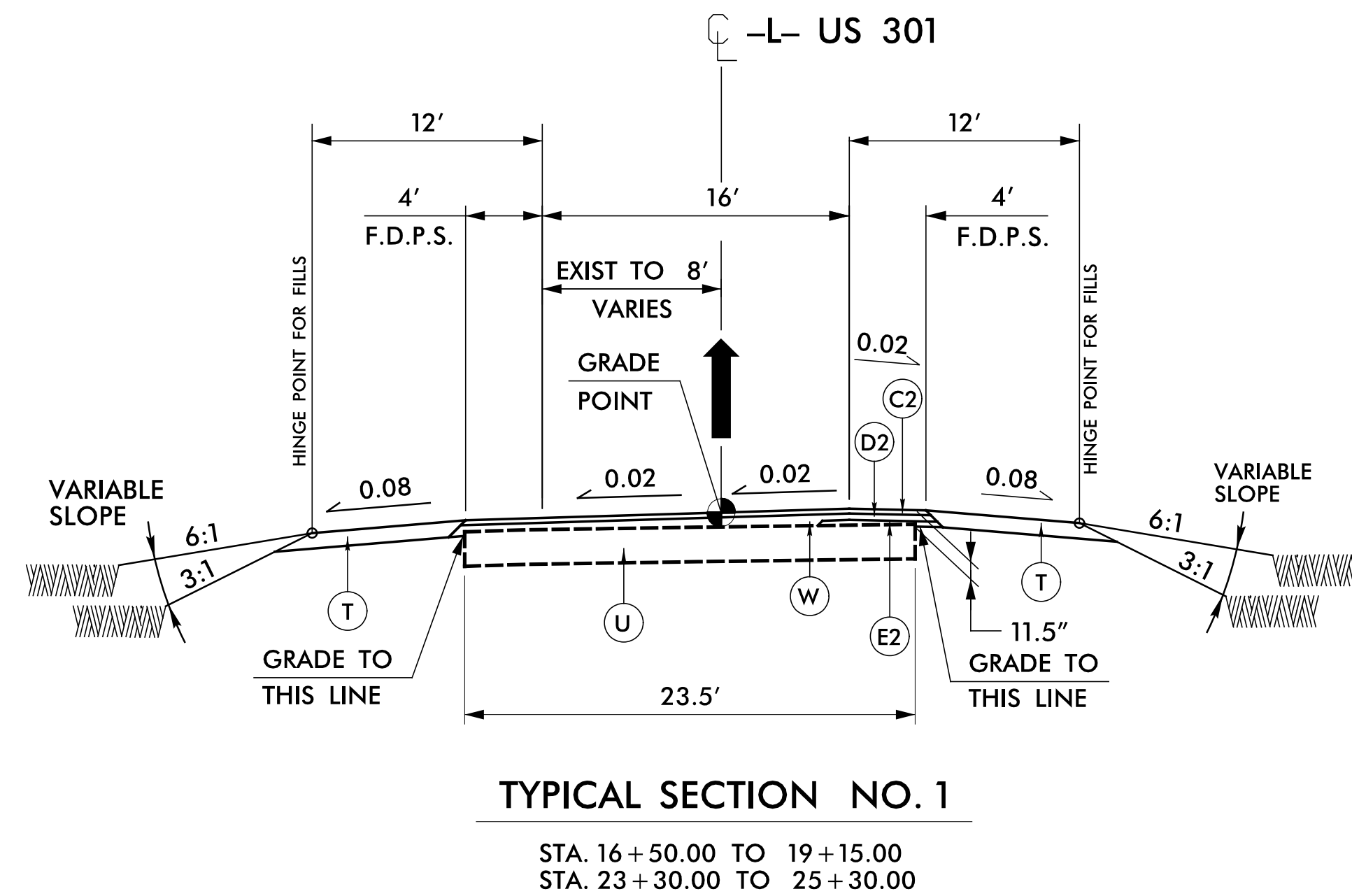
PAVEMENT SCHEDULE	
FINAL PAVEMENT DESIGN	
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 1.5" IN DEPTH OR GREATER THAN 2" DEPTH.
D1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE 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 2.5" IN DEPTH OR GREATER THAN 4" DEPTH.
E1	PROP. APPROX. 4.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5.5" DEPTH.
R	SHOULDER BERM GUTTER.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	3" MILLING
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE DETAIL SHOWING METHOD OF WEDGING).

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



MILLING LIMITS:

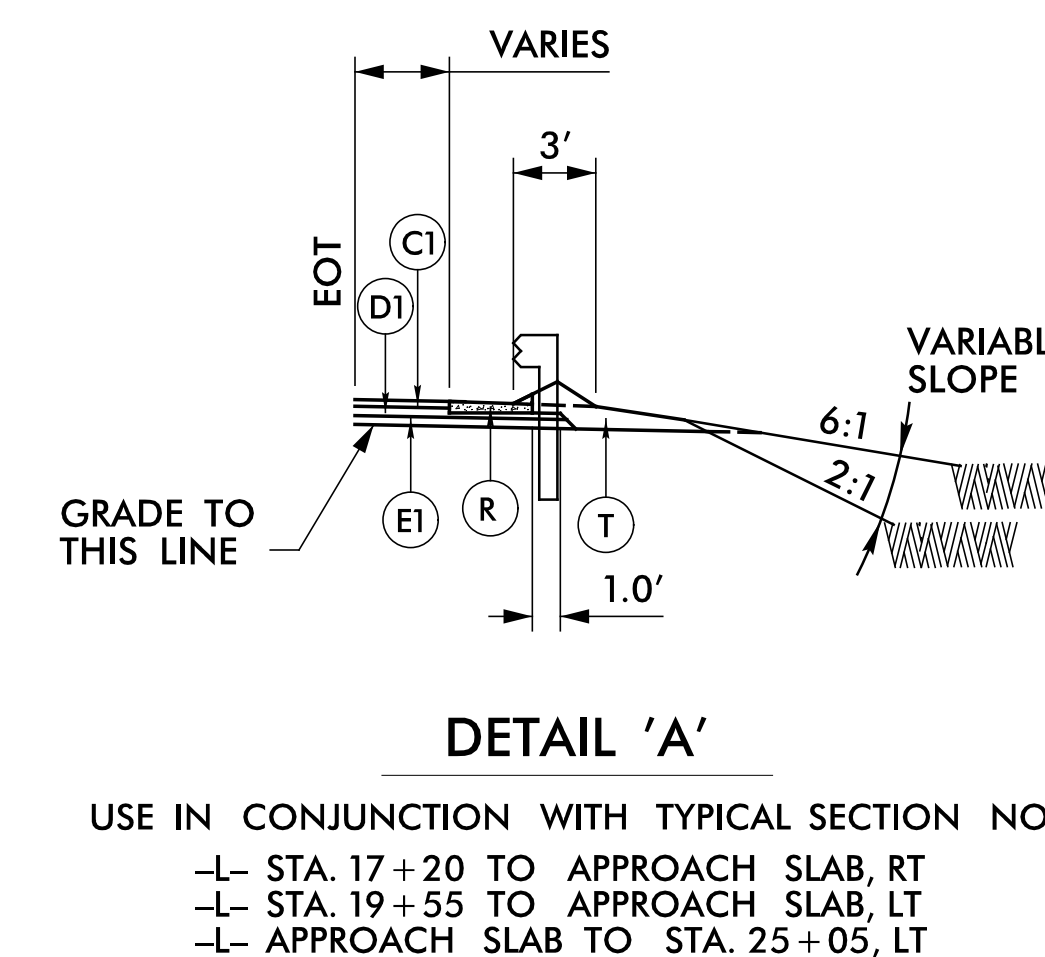
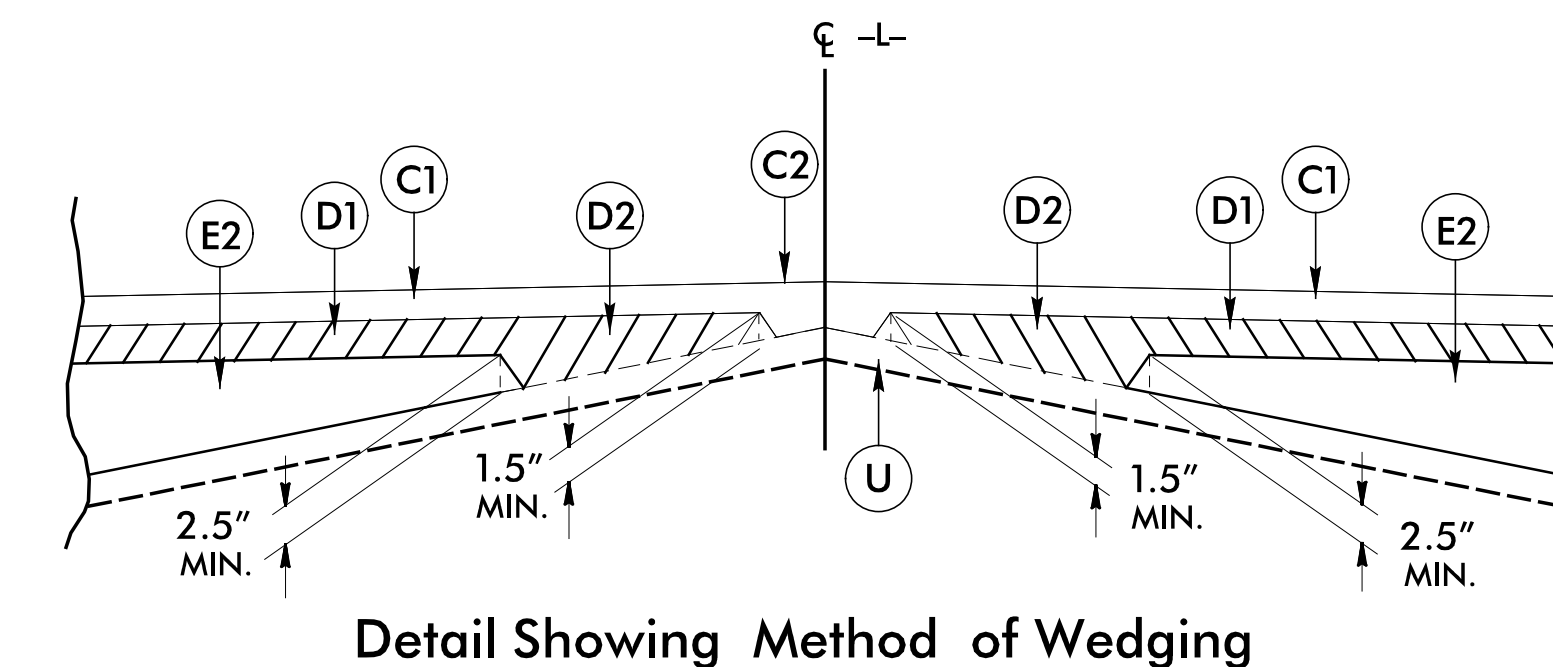
- L- STA. 16+50 TO 17+25
- L- STA. 24+55 TO 25+30



vhb
 940 Main Campus Drive, Suite 500
 Raleigh, NC 27606
 NC License No. C-3705

PROJECT REFERENCE NO. 41665.7A	SHEET NO. 2A-1
RW SHEET NO.	
ROADWAY DESIGN ENGINEER MOTHOY D. GONZALEZ	PAVEMENT DESIGN ENGINEER Steve D. Kendall

BR 008



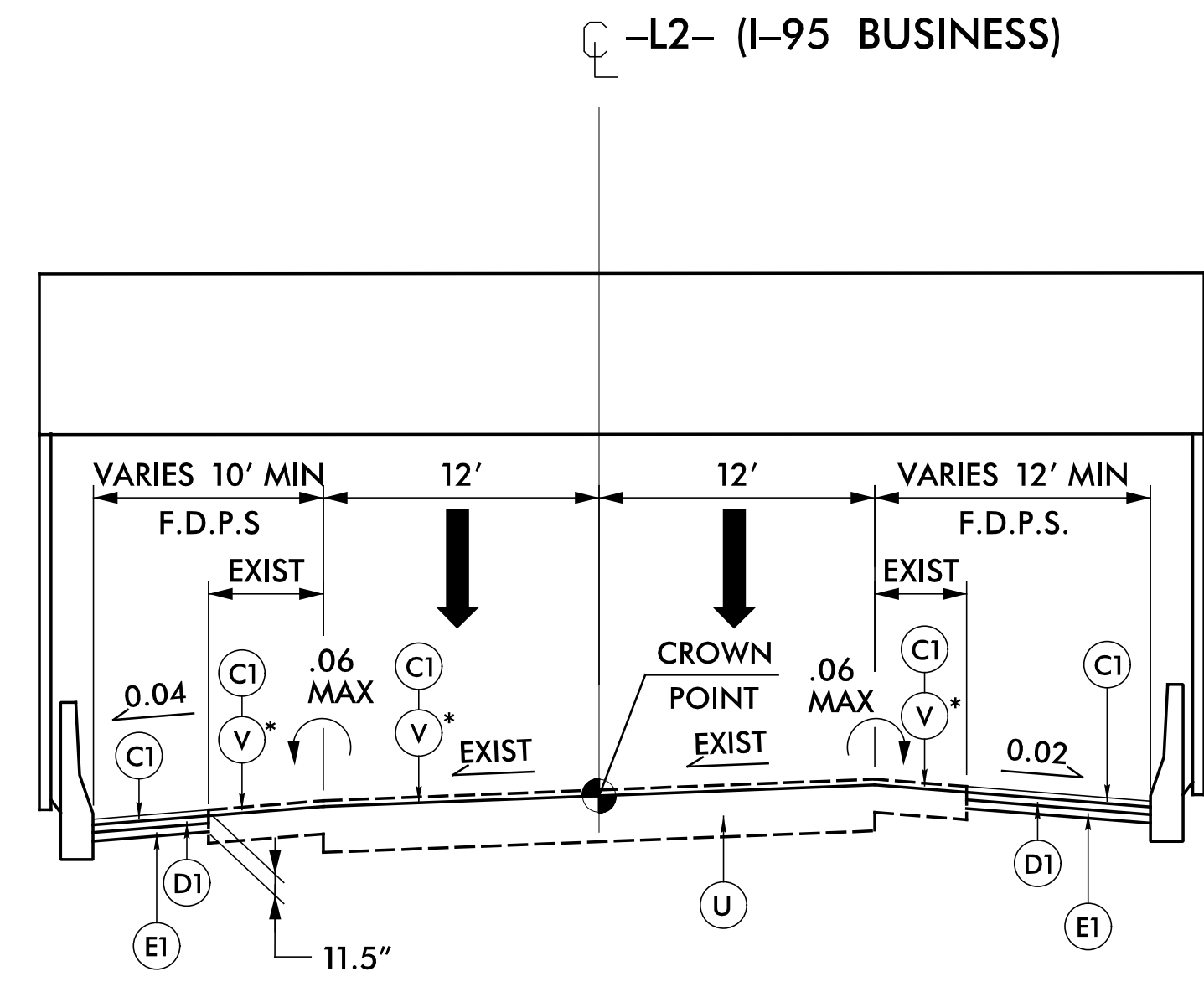
PAVEMENT SCHEDULE	
FINAL PAVEMENT DESIGN	
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
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R	SHOULDER BERM GUTTER.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	3" MILLING.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE DETAIL SHOWING METHOD OF WEDGING).

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

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940 Main Campus Drive, Suite 500
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NC License No. C-3705

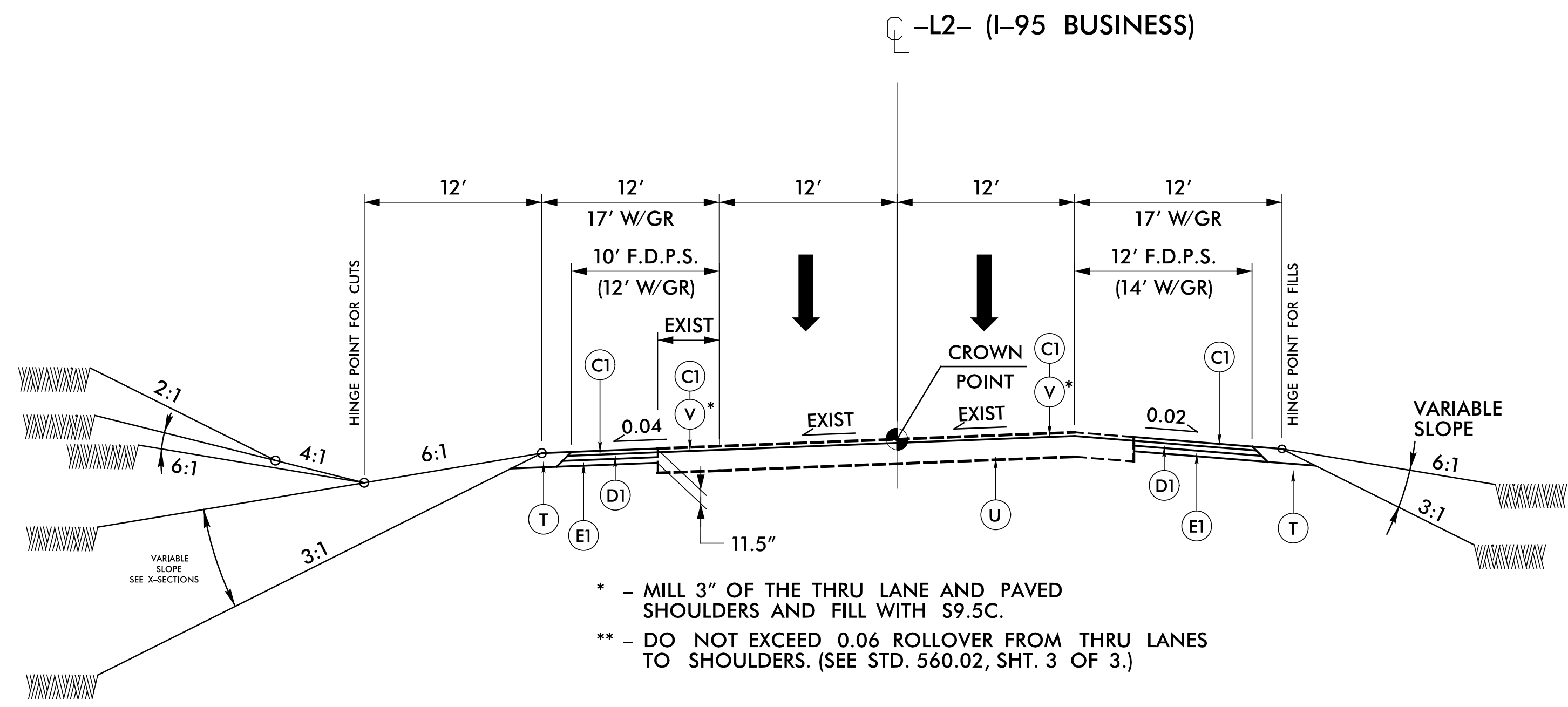
PROJECT REFERENCE NO. 41665.7A	SHEET NO. 2A-2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

BR 008



- * - MILL 3" OF THE THRU LANE AND PAVED SHOULDERS AND FILL WITH S9.5C.
- ** - DO NOT EXCEED 0.06 ROLLOVER FROM THRU LANES TO SHOULDERS. (SEE STD. 560.02, SHT. 3 OF 3.)

TYPICAL SECTION NO. 3
STA. 109+47.00 TO 109+89.56

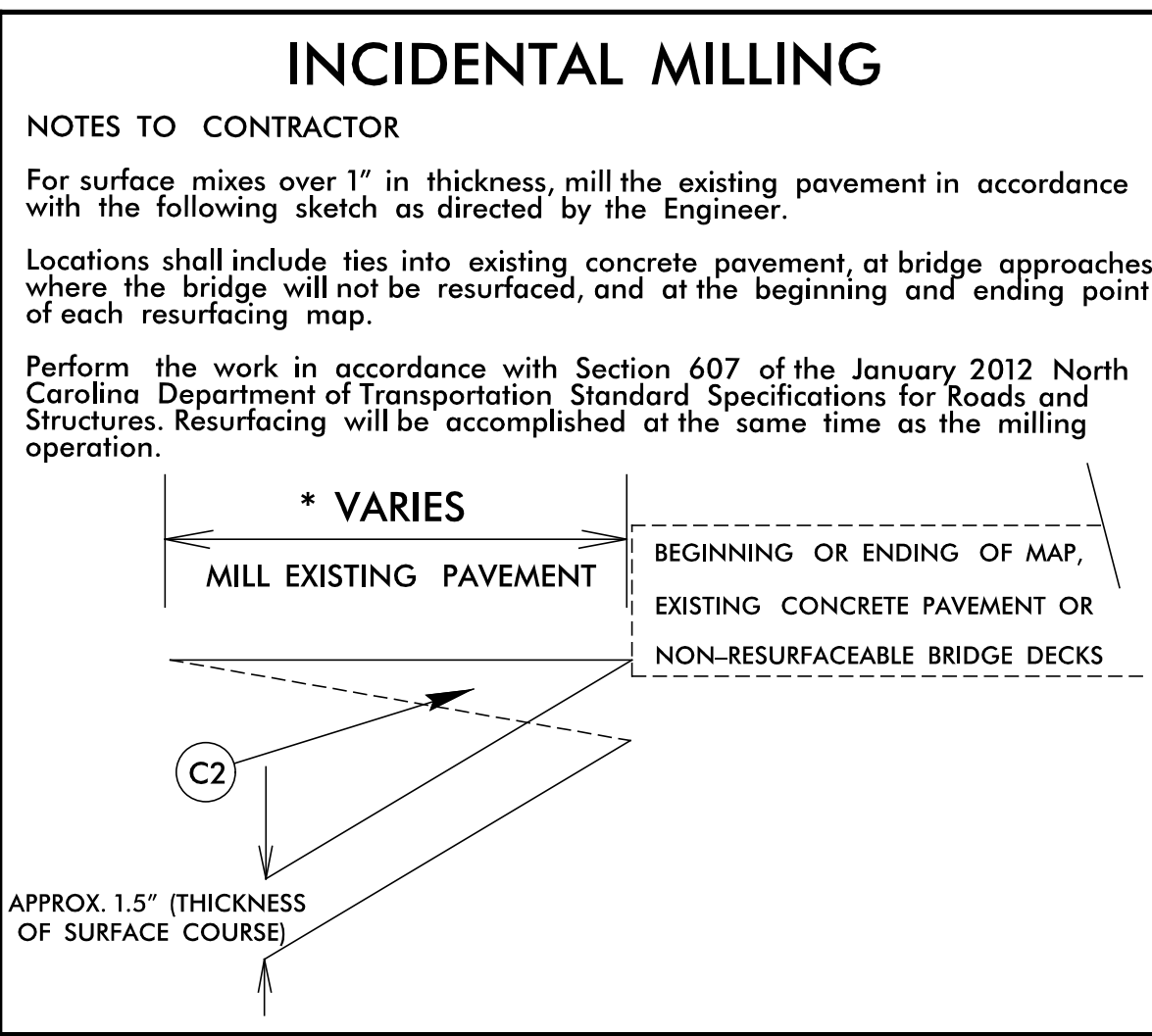


- * - MILL 3" OF THE THRU LANE AND PAVED SHOULDERS AND FILL WITH S9.5C.
- ** - DO NOT EXCEED 0.06 ROLLOVER FROM THRU LANES TO SHOULDERS. (SEE STD. 560.02, SHT. 3 OF 3.)

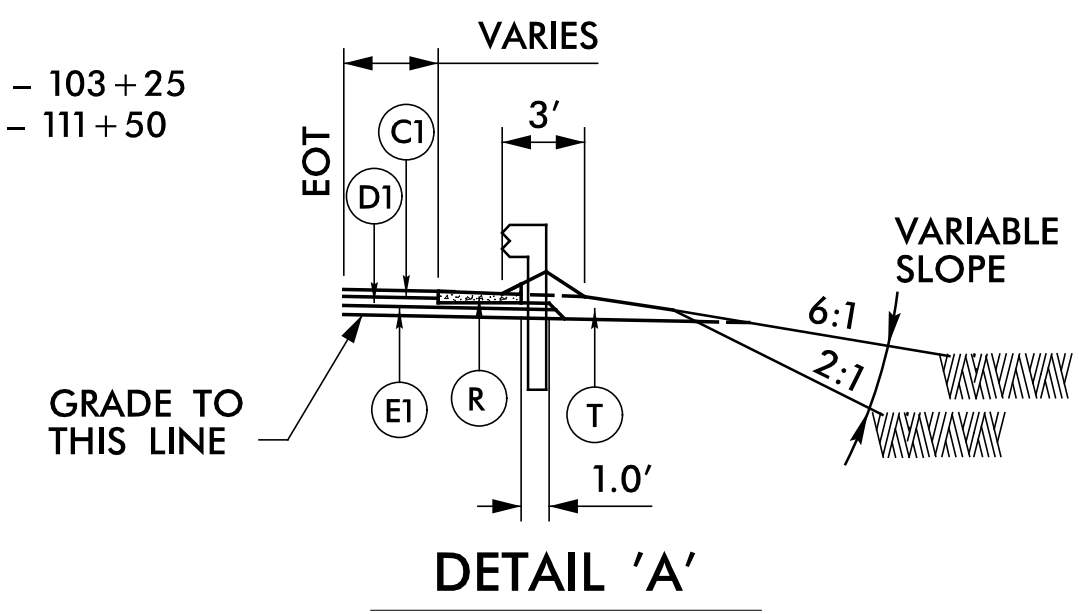
TYPICAL SECTION NO. 4
STA. 106+20 TO 109+47
STA. 109+89.56 TO 110+95

PAVEMENT SCHEDULE	
FINAL PAVEMENT DESIGN	
C1	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.
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E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5.5" DEPTH.
R	SHOULDER BERM GUTTER.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	3" MILLING.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE DETAIL SHOWING METHOD OF WEDGING).
Y	MILLED RUMBLE STRIPS.

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

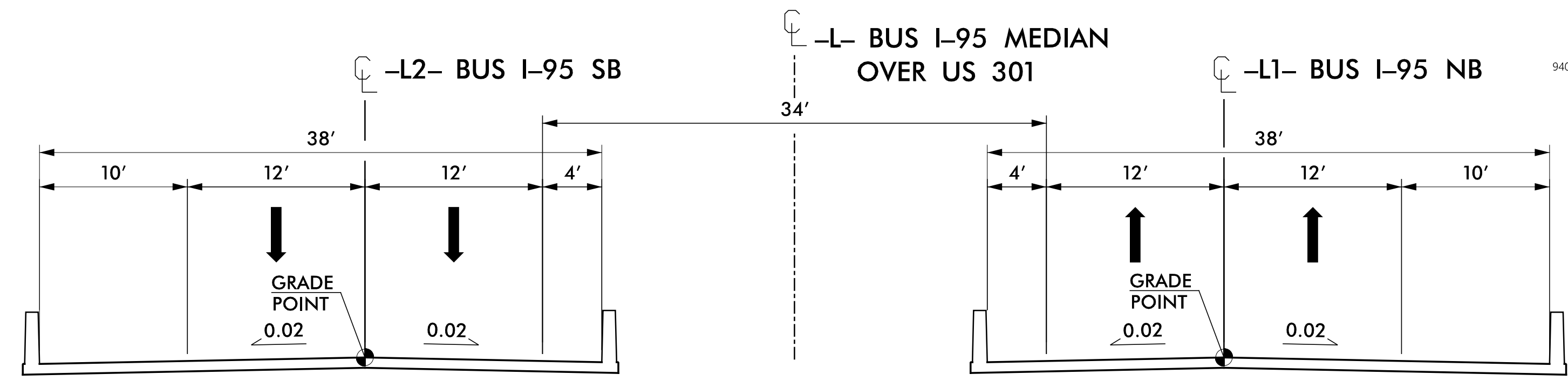


MILLING LIMITS
 -L1- & -L2- STA. 102 + 50 - 103 + 25
 -L1- & -L2- STA. 110 + 75 - 111 + 50



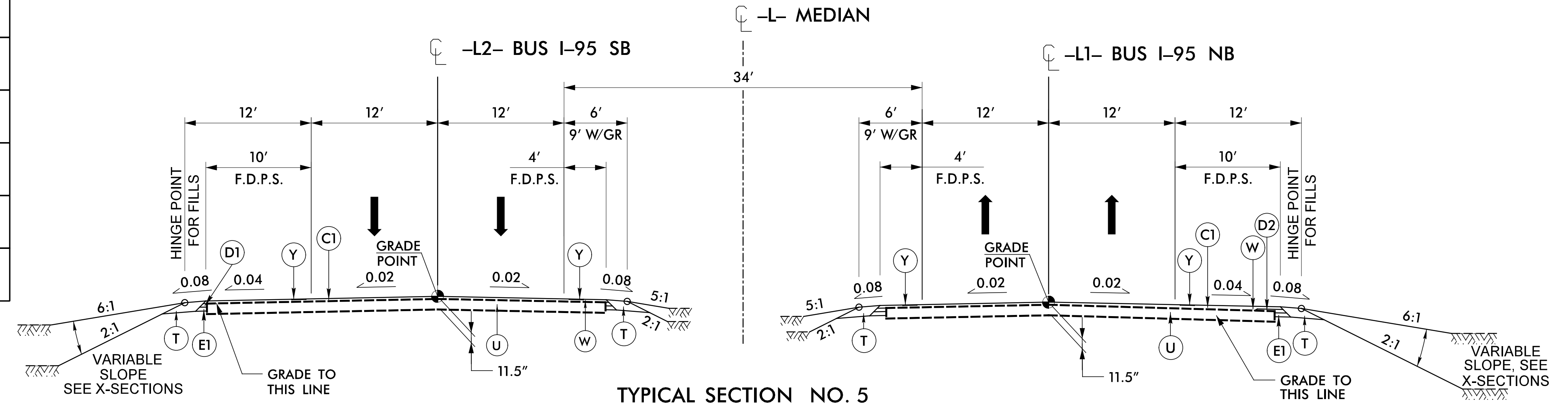
USE IN CONJUNCTION WITH TYPICAL SECTION NO. 2

FROM STA. 104 + 95 TO APPROACH SLAB -L1- RT
 FROM STA. 105 + 55 TO APPROACH SLAB -L1- LT
 FROM APPROACH SLAB TO STA. 107 + 55 -L1- RT
 FROM APPROACH SLAB TO STA. 108 + 12 -L1- LT
 FROM STA. 105 + 80 TO APPROACH SLAB -L2- RT
 FROM STA. 106 + 12 TO APPROACH SLAB -L2- LT
 FROM APPROACH SLAB TO STA. 108 + 38 -L2- RT
 FROM APPROACH SLAB TO STA. 108 + 55 -L2- LT
 FROM STA. 15 + 08 TO STA. 15 + 80 -Y- RT



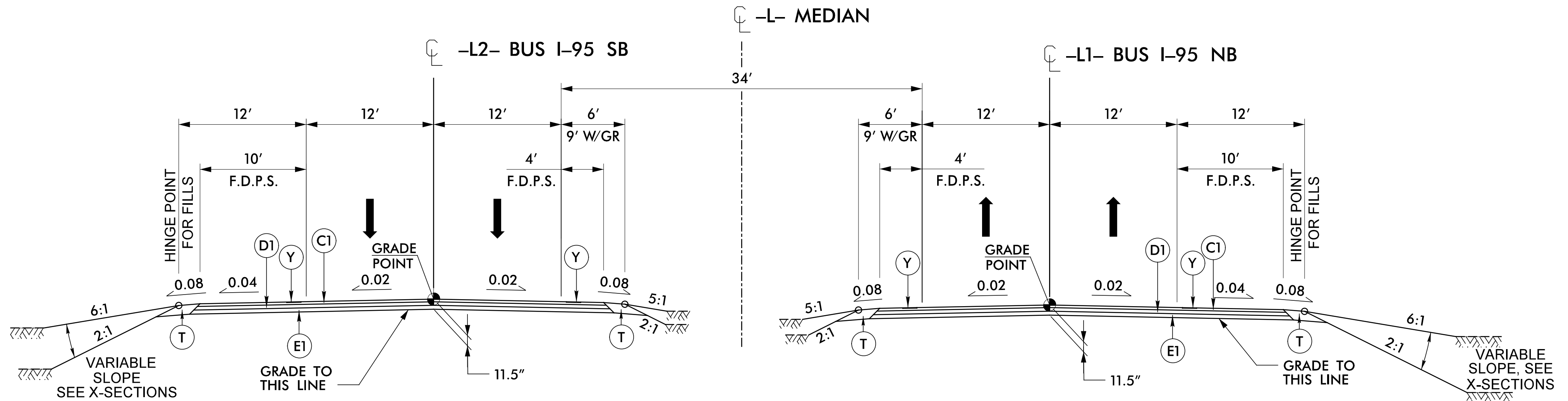
TYPICAL SECTION ON STRUCTURE

STA. 106 + 18.10 - 107 + 17.10 -L1-
 STA. 106 + 76.15 - 107 + 75.15 -L2-



TYPICAL SECTION NO. 5

STA. 102 + 50 - 104 + 95 -L1-
 STA. 108 + 25 - 111 + 50 -L1-
 STA. 102 + 50 - 105 + 45 -L2-
 STA. 108 + 65 - 111 + 50 -L2-



TYPICAL SECTION NO. 6

STA. 104 + 95 - 106 + 18.10 -L1-
 STA. 107 + 17.10 - 108 + 25 -L1-
 STA. 105 + 45 - 106 + 76.15 -L2-
 STA. 107 + 75.15 - 108 + 65 -L2-



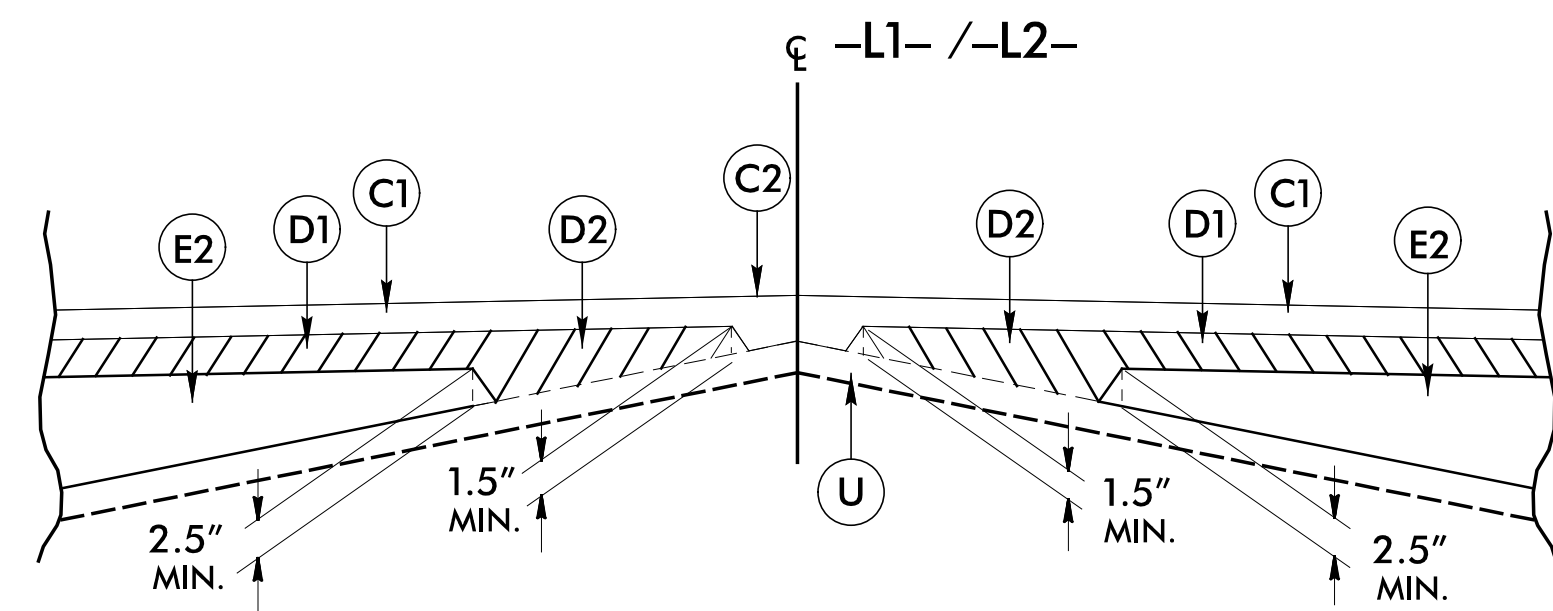
940 Main Campus Drive, Suite 500
 Raleigh, NC 27606
 NC License No. C-3705

PROJECT REFERENCE NO.	SHEET NO.
41665.7A	2A-3
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

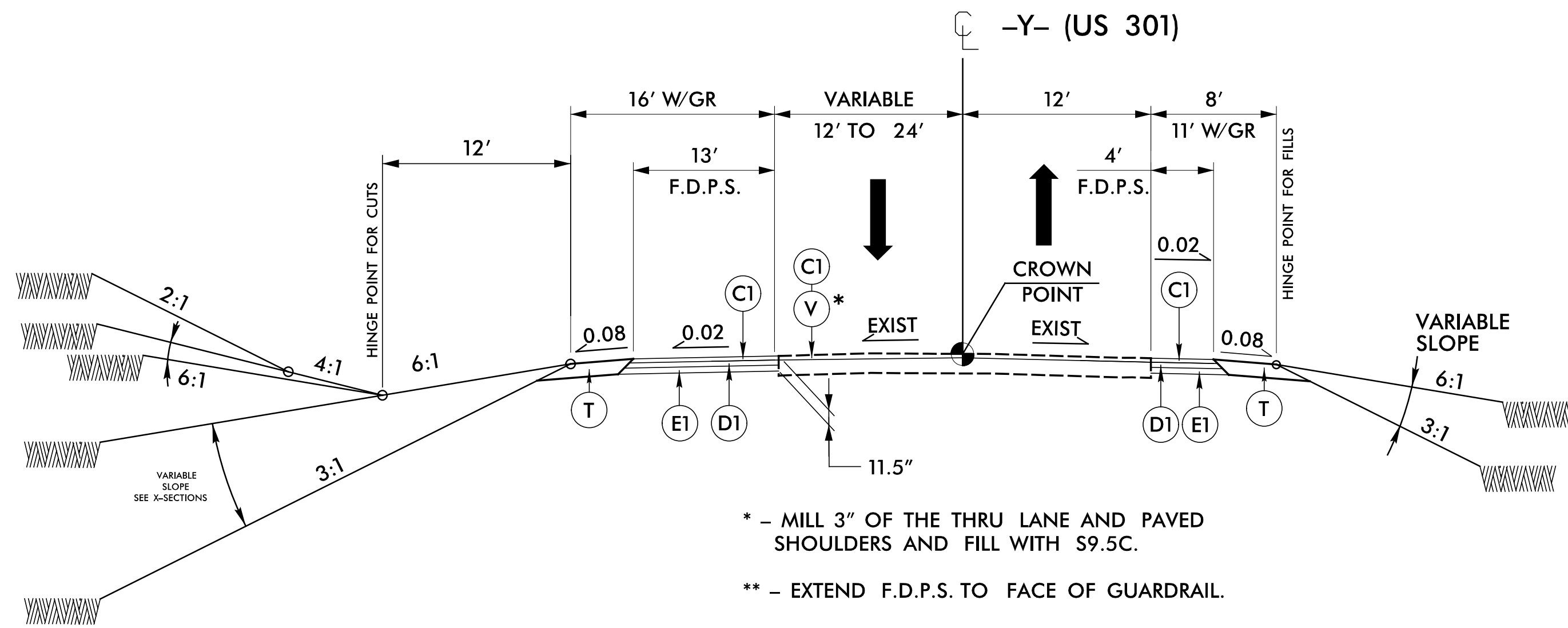
BR 129 & 130

PAVEMENT SCHEDULE	
FINAL PAVEMENT DESIGN	
C1	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.
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R	SHOULDER BERM GUTTER.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	3" MILLING.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE DETAIL SHOWING METHOD OF WEDGING).
Y	MILLED RUMBLE STRIPS.

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

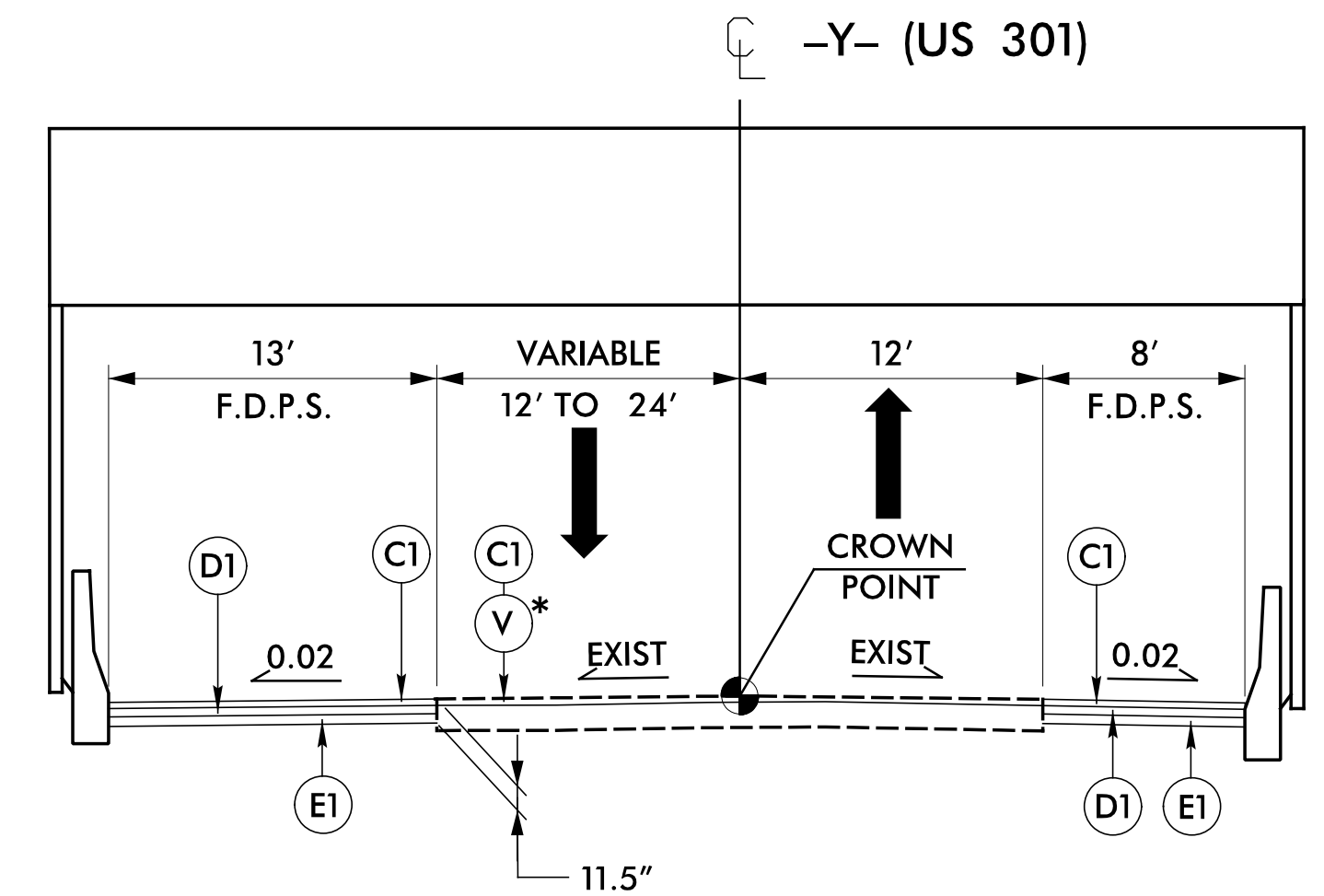


Detail Showing Method of Wedging



TYPICAL SECTION NO. 7

STA. 10+85 - 12+99
STA. 15+10 - 17+00



TYPICAL SECTION NO. 8

STA. 12+99 - 15+10

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Raleigh, NC 27606
NC License No. C-3705

PROJECT REFERENCE NO. 41665.7A	SHEET NO. 2A-4
ROADWAY DESIGN ENGINEER SEAL 037874 WORTHY D. GORDON	PAVEMENT DESIGN ENGINEER SEAL 033296 TERRY D. KENDALL

BR 129 & 130

04-MAY-2017 15:14 S:\Contracts\ContractDetails\Standard Drawings\2012 Standard Drawings\Details in Lieu of Standards\Drawings\862d01 862d01 862d01.dgn
 JHowerton RA CS0-29295

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

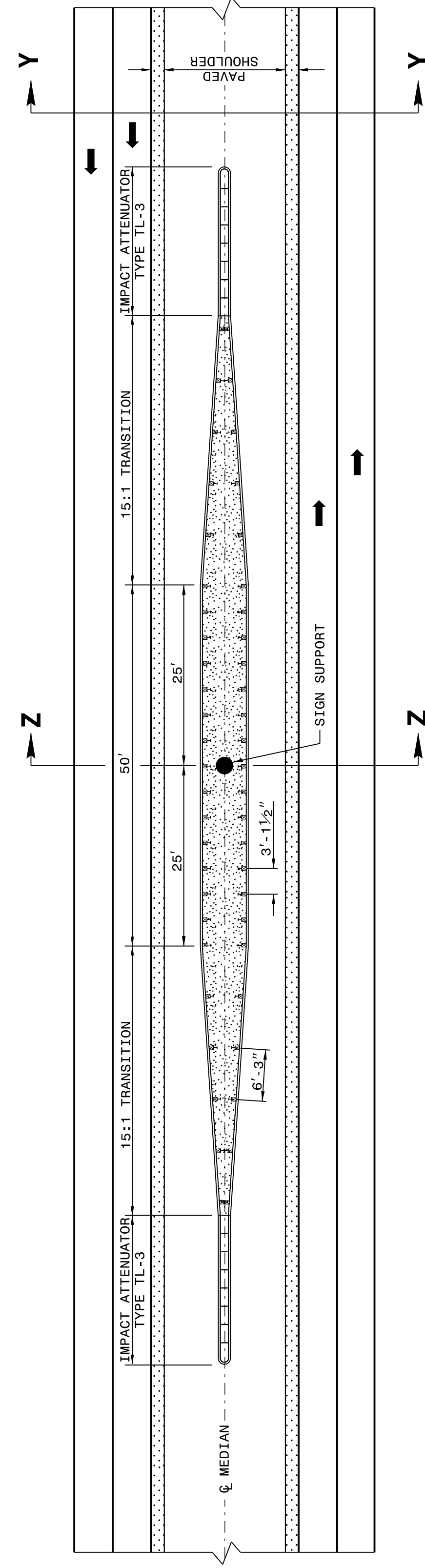
ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 2 OF 11
862D01

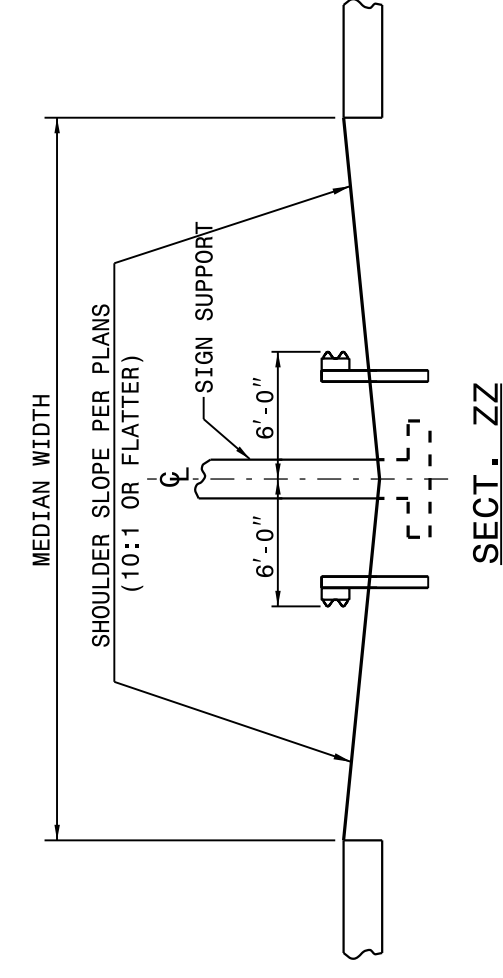
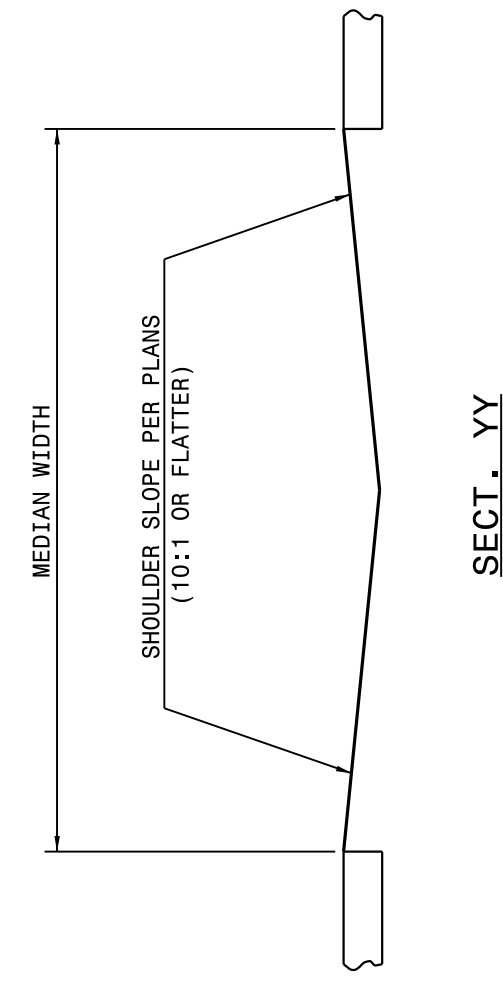
STATE OF NORTH CAROLINA
 DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 2 OF 11
862D01



NOTE SPECIAL LAYER OF PAVEMENT
 USE 3'-1 1/2" POST SPACING ON THE 50' OF GUARDRAIL PARALLEL TO LANES AND 6'-3" POST SPACING ON 15:1 TRANSITION SECTIONS.
 GRADE MEDIAN IN THE VICINITY OF THE SIGN SUPPORT AS ILLUSTRATED IN THE ROADWAY STANDARD DRAWINGS (STANDARD 862D01 SHEET 1 OF 12).

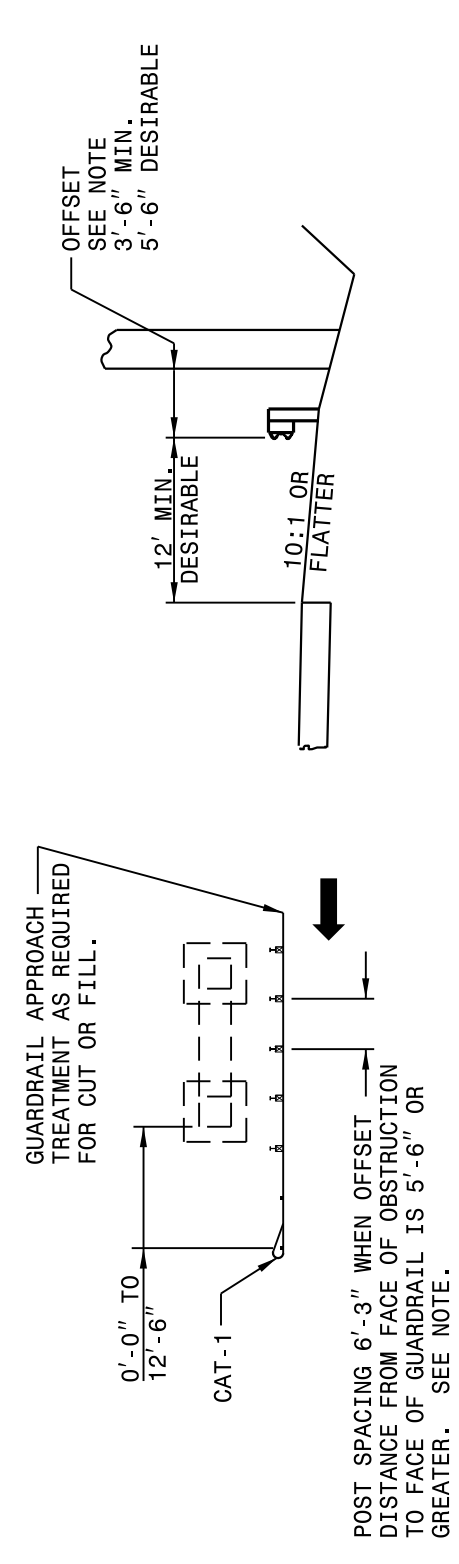
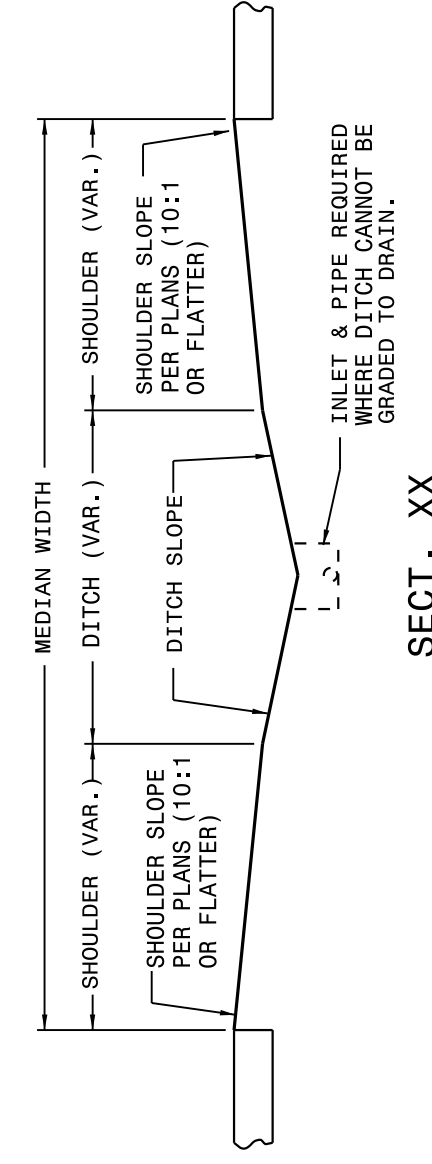
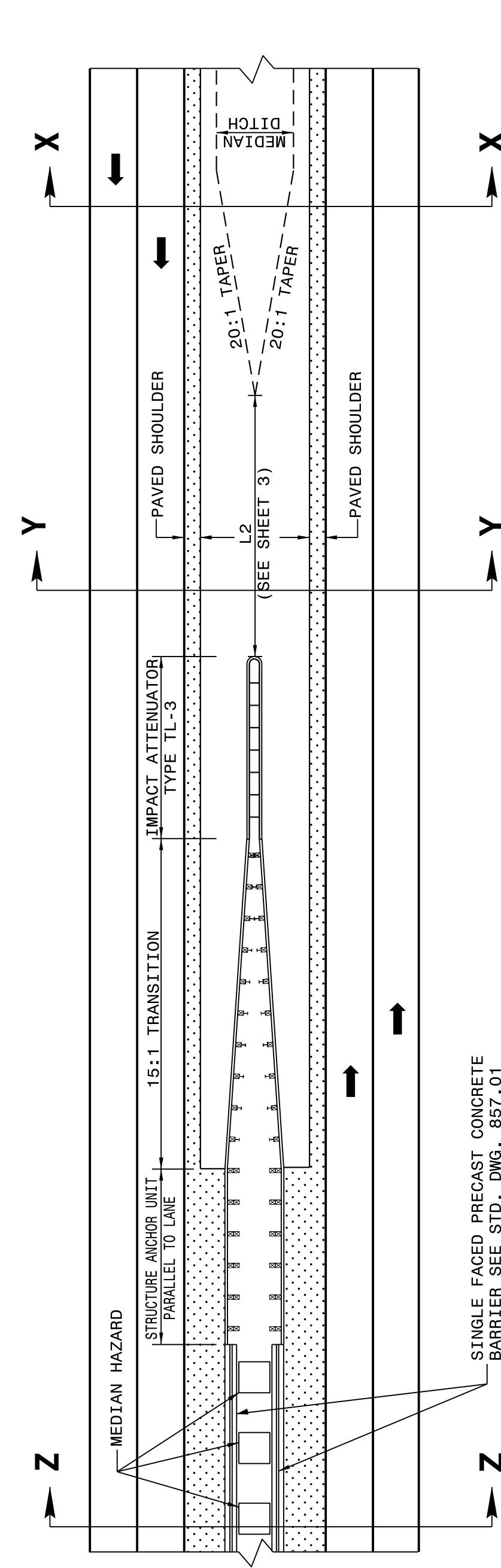


DETAIL OF GUARDRAIL AT MEDIAN SIGN SUPPORT

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 1 OF 11
862D01



NOTE: WHEN OFFSET DISTANCE FROM FACE OF OBSTRUCTION TO FACE OF GUARDRAIL IS BETWEEN 3'-6" AND 5'-6" BEGIN 3'-1 1/2" POST SPACING AT A POINT 25' BEFORE REACHING THE OBSTRUCTION AND CARRY THROUGHOUT ITS LENGTH. IF THE OFFSET IS LESS THAN 3'-6" USE CONCRETE BARRIER.

DETAIL OF RIGHT SIDE GUARDRAIL AT UNDERPASS

SHEET 1 OF 11
862D01

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

DETAIL OF MEDIAN TREATMENT AT UNDERPASS

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

SEE TITLE BLOCK

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

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

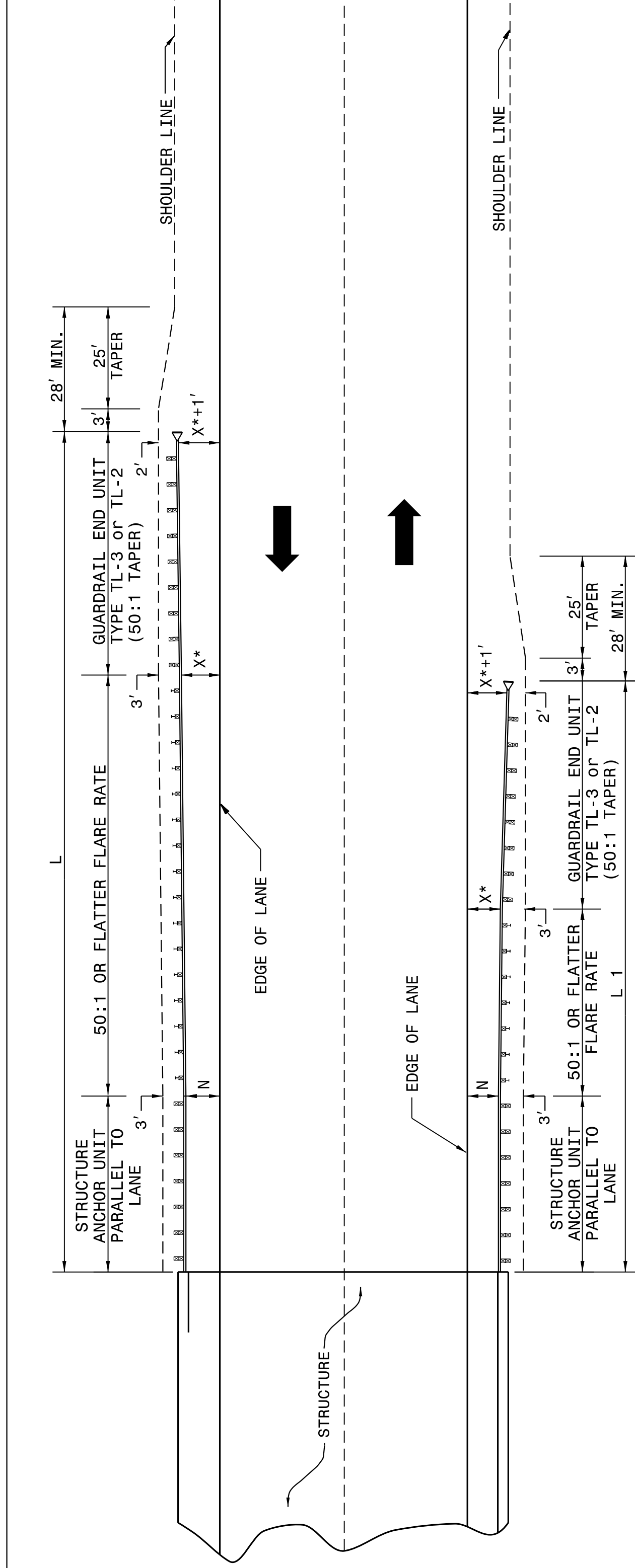


3-AUG-2017 07:57 S:\Contracts\Special Details\Standard Drawings\Division 8\862d01 862d03 862d01.dgn Jhowerton AT USD-292595

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 4 OF 11
862D01



ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

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

SHEET 4 OF 11
862D01

GUARDRAIL INSTALLATION AT BRIDGE APPROACHES FOR TWO-LANE, TWO-WAY TRAFFIC

DESIGN SPEED (MPH)	"L" APPROACH LENGTH (FT.)		"L" TRAILING LENGTH (FT.)	
	DESIGN YEAR ADT OVER 2000	CURRENT YEAR ADT UNDER 400	DESIGN YEAR ADT OVER 2000	CURRENT YEAR ADT UNDER 400
70	362.5'	362.5'	350.0'	287.5'
60	300.0'	287.5'	275.0'	225.0'
50	212.5'	212.5'	200.0'	162.5'
40	175.0'	150.0'	137.5'	112.5'
X *	8'	6'	4'	4'

* USE FLARE RATE AS THE CONTROL IF THE "X" DISTANCE IS NOT OBTAINED. ("X" IS BASED ON SHOULDER WIDTHS IN THE HIGHWAY DESIGN BRANCH MANUAL, PART 1, 1-4B, F1).

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

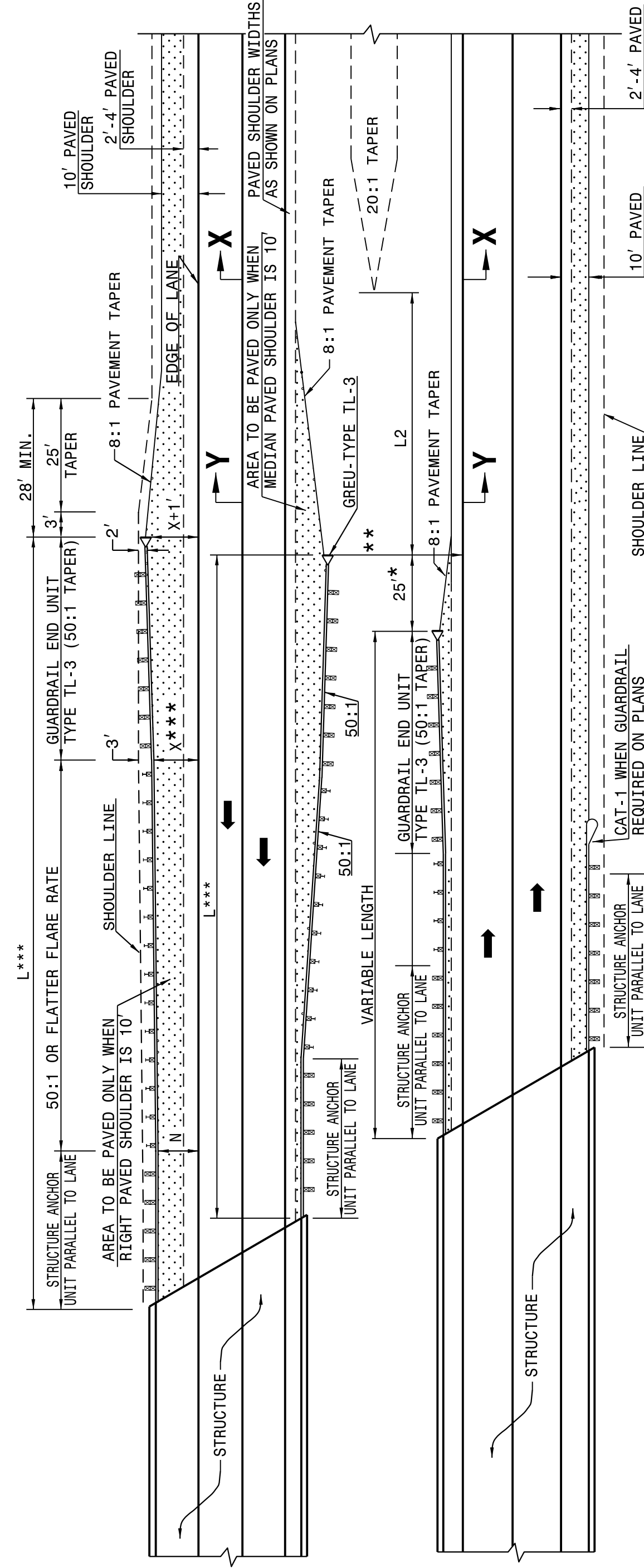
SEE STD. 862.03 FOR STRUCTURE ANCHOR UNITS

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

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

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

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



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

DIMENSIONS FOR LENGTH OF GUARDRAIL APPROACHING DUAL LANE BRIDGES

MEDIAN WIDTH	-L-***		-L2- DIM.
	60 MPH	50 MPH	
30'	300.0'	250.0'	80.0'
36'	300.0'	250.0'	60.0'
40' & ABOVE	300.0'	250.0'	40.0'

NOTES: * MINOR VARIATION TO THE 25'-0" DIMENSION IS PERMISSIBLE TO ACCOMMODATE THE 12'-6" IN GUARDRAIL LENGTHS.

** NO GUARDRAIL IS REQUIRED ON THE TRAILING END WHEN THIS DISTANCE EXCEEDS CLEAR ROADSIDE RECOVERY AREA FOR THE APPROPRIATE DESIGN SPEED.

*** BASED ON "X" OF 12' USE FLARE RATE AS THE CONTROL IF THE "X" DISTANCE IS NOT OBTAINED. ("X" IS BASED ON SHOULDER WIDTHS IN THE HIGHWAY DESIGN BRANCH MANUAL, PART 1, 1-4B, F1A).
"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL WHERE GUARDRAIL IS PARALLEL TO LANE. THE DESIGN LAYOUT FOR LENGTHS SHOWN ON THIS STANDARD ARE MINIMUM DESIGN LENGTHS. SEE SHEET 1 OF 12 FOR SECTIONS XX, YY
SEE STD. 862.03 FOR STRUCTURE ANCHOR UNITS

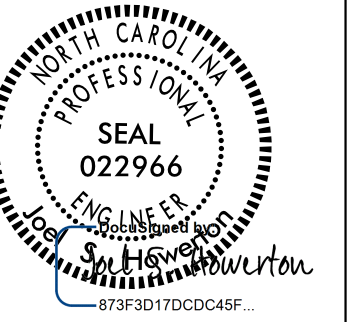
DETAIL OF GUARDRAIL APPROACHING DUAL LANE BRIDGES

SHEET 3 OF 11
862D01

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:
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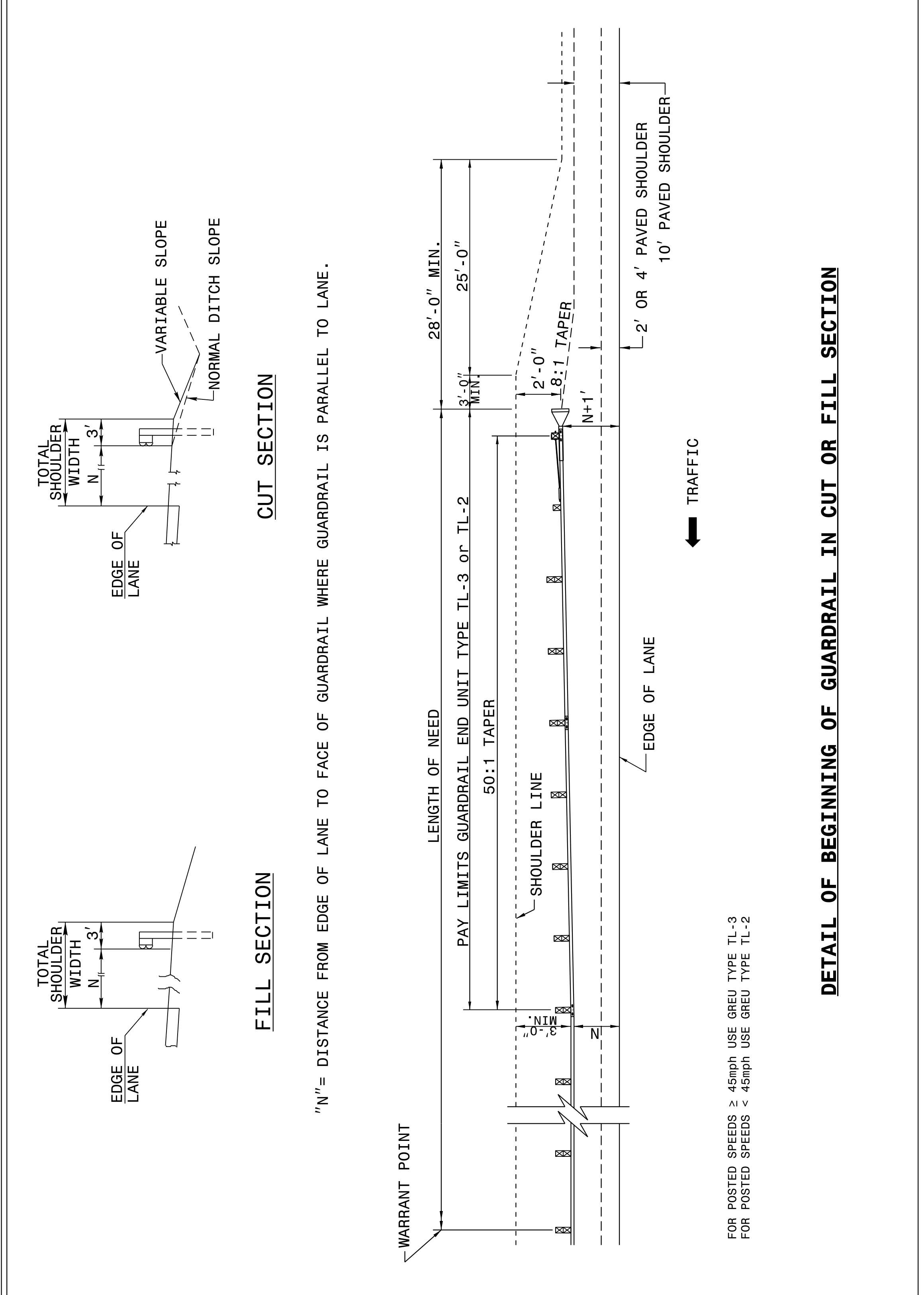
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PROJECT REFERENCE NO. 41665.7A SHEET NO. 2C-2

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ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

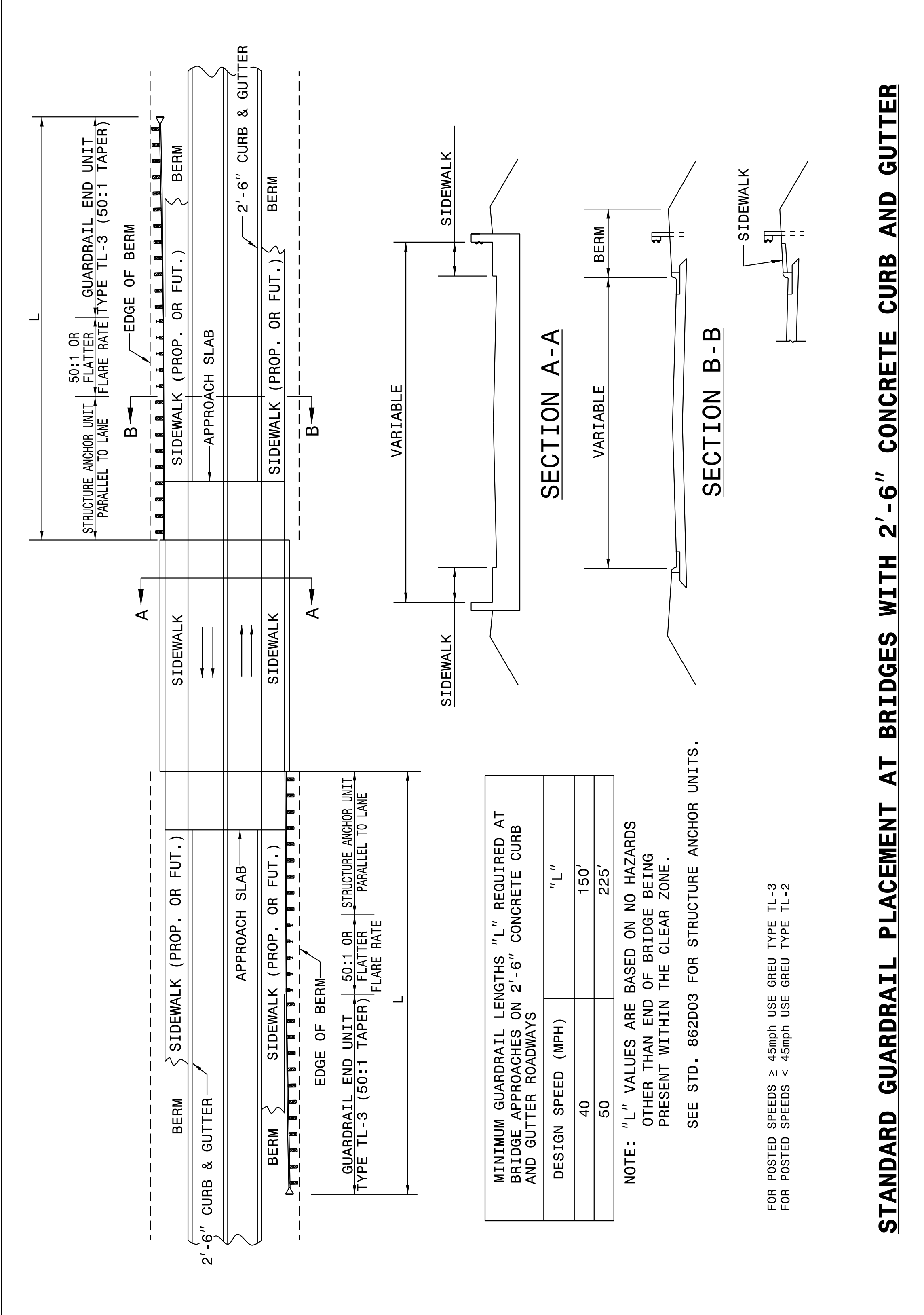
ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 6 OF 11
862D01

SHEET 6 OF 11
862D01

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DESIGN SPEED (MPH)	"L"
40	150'
50	225'

MINIMUM GUARDRAIL LENGTHS "L" REQUIRED AT BRIDGE APPROACHES ON 2'-6" CONCRETE CURB AND GUTTER ROADWAYS

NOTE: "L" VALUES ARE BASED ON NO HAZARDS OTHER THAN END OF BRIDGE BEING PRESENT WITHIN THE CLEAR ZONE.

SEE STD. 862D03 FOR STRUCTURE ANCHOR UNITS.

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 5 OF 11
862D01

SHEET 5 OF 11
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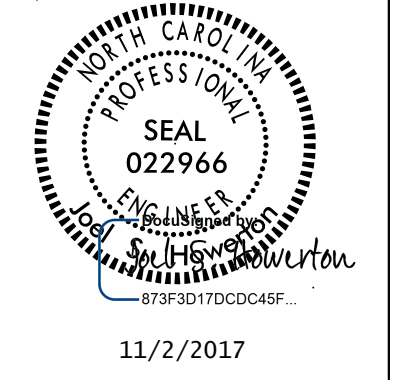
STANDARD GUARDRAIL PLACEMENT AT BRIDGES WITH 2'-6" CONCRETE CURB AND GUTTER

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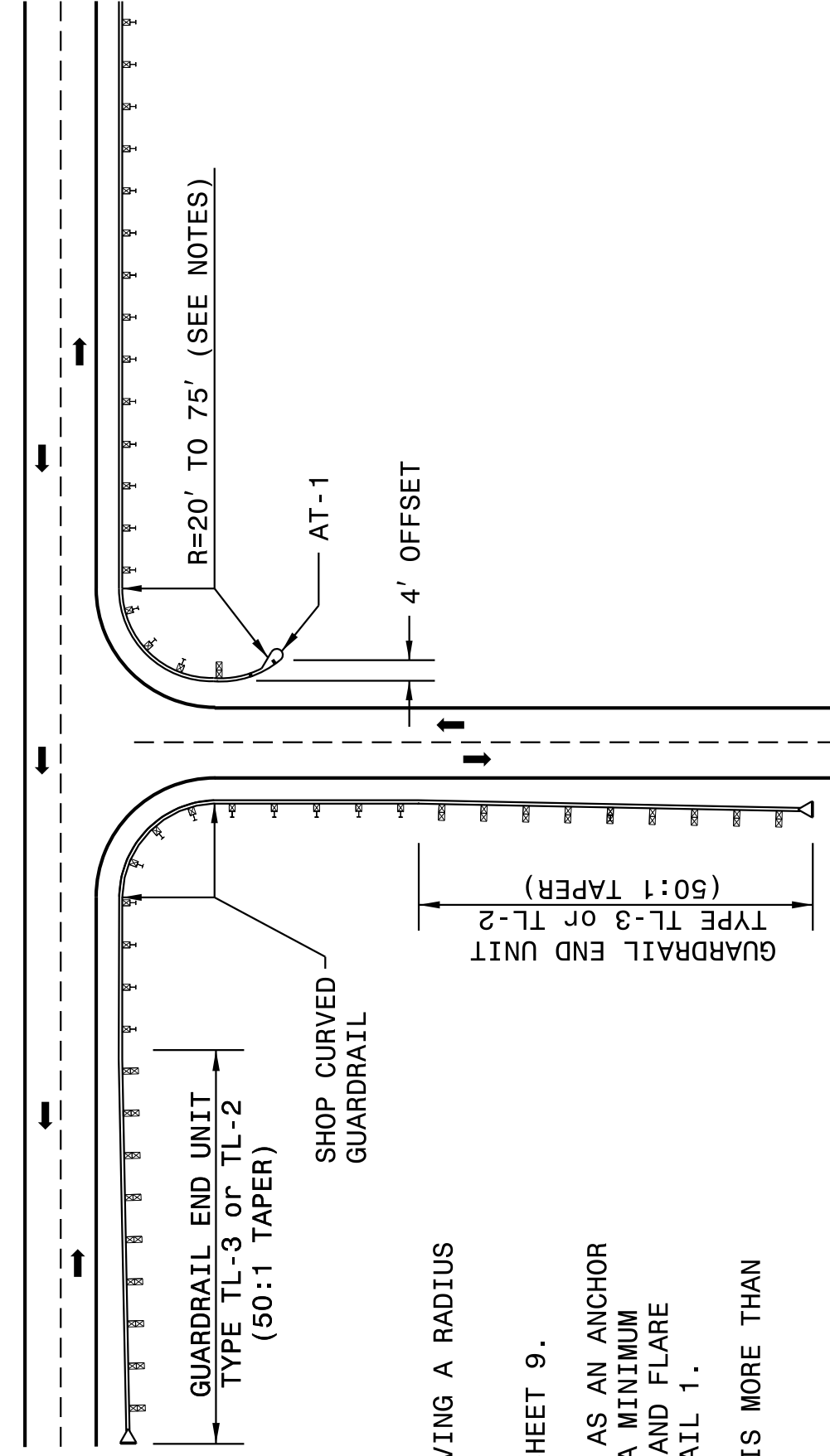
ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 8 OF 11
862D01

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ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 8 OF 11
862D01

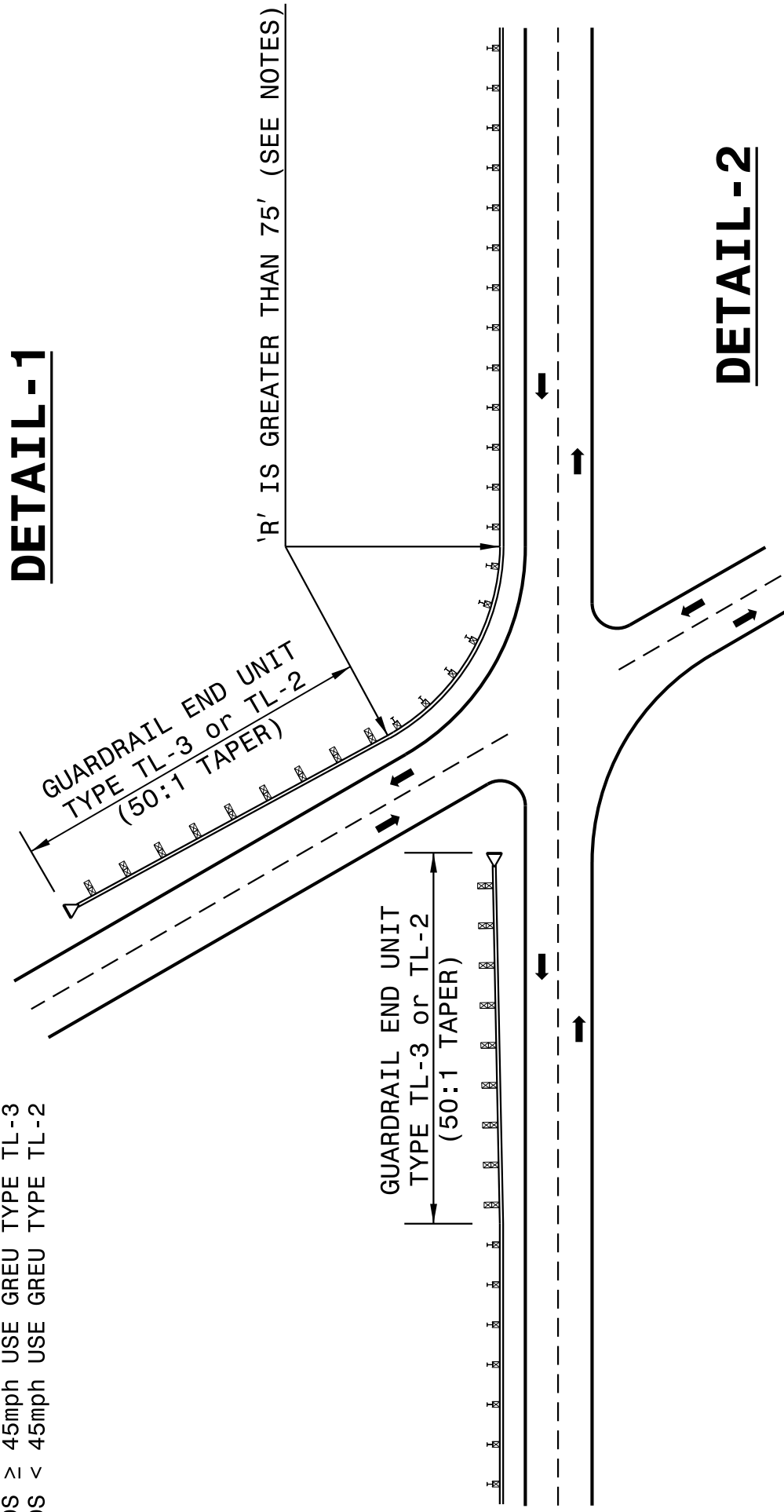


NOTES:
 SHOP CURVED GUARDRAIL IS DEFINED AS HAVING A RADIUS OF 150' OR LESS.
 WHEN RADIUS IS LESS THAN 20' REFER TO SHEET 9.
 WHENEVER SHOP CURVED GUARDRAIL IS USED AS AN ANCHOR AND THE RADIUS IS FROM 20' TO 75', USE A MINIMUM LENGTH OF 50' OF SHOP CURVED GUARDRAIL AND FLARE WITH AN AT-1 ANCHOR UNIT. REFER TO DETAIL 1.
 WHENEVER SHOP CURVED GUARDRAIL RADIUS IS MORE THAN 75', REFER TO DETAIL 2.

MAINTAIN CLEAR SIGHT DISTANCE.

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

DETAIL - 1



DETAIL - 2

GUARDRAIL TREATMENT AT INTERSECTIONS

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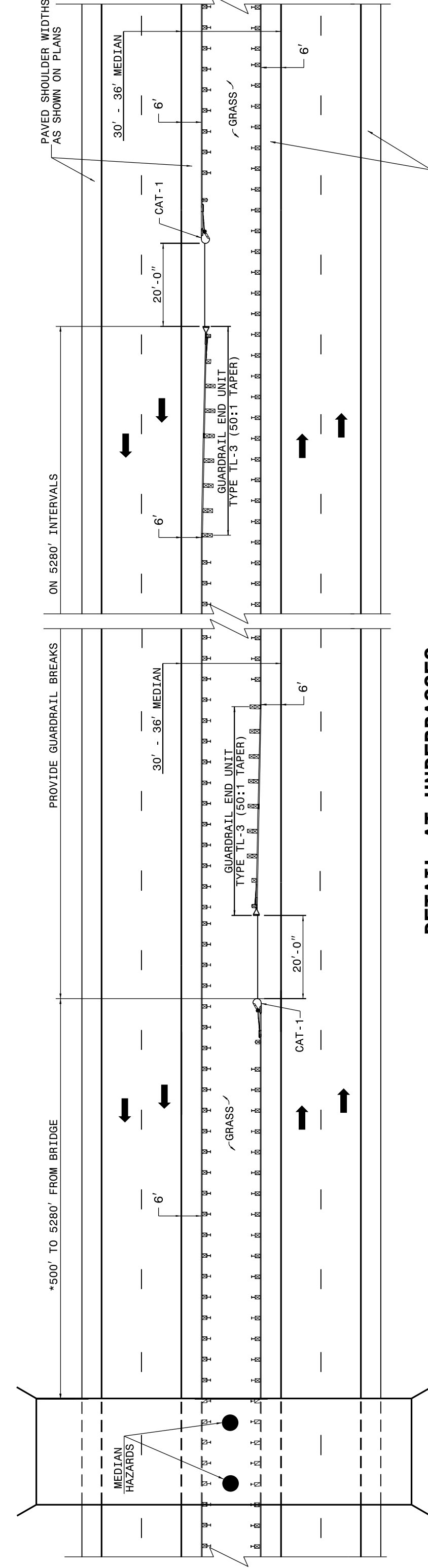
ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

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862D01

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ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 7 OF 11
862D01

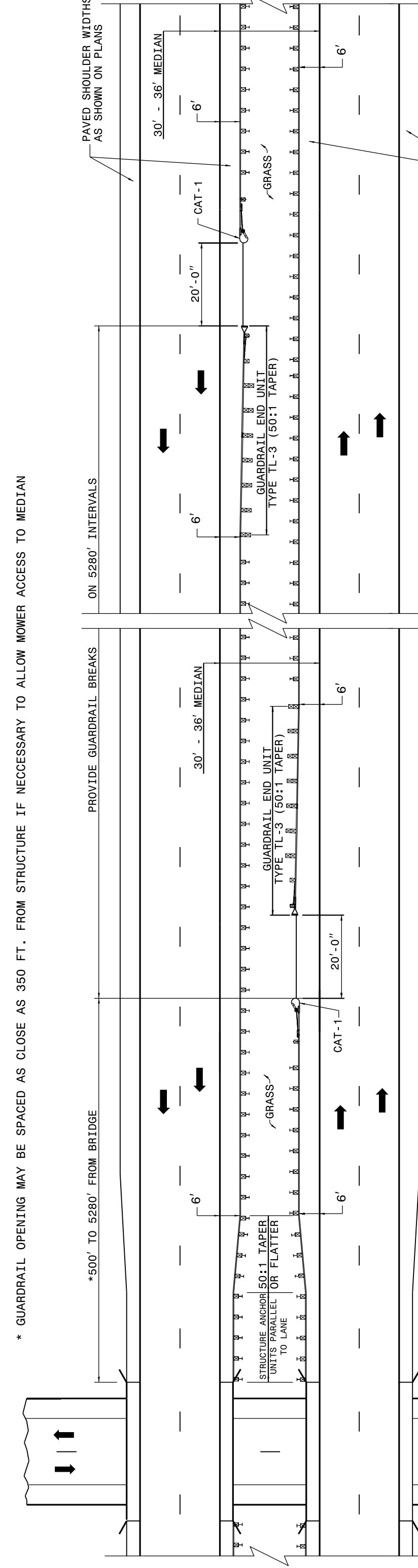


DETAIL AT UNDERPASSES

* GUARDRAIL OPENING MAY BE SPACED AS CLOSE AS 350 FT. FROM STRUCTURE IF NECESSARY TO ALLOW MOWER ACCESS TO MEDIAN

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 7 OF 11
862D01



DETAIL AT OVERPASSES

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

GUARDRAIL BREAK INTERVALS WITH 30' - 36' MEDIANS

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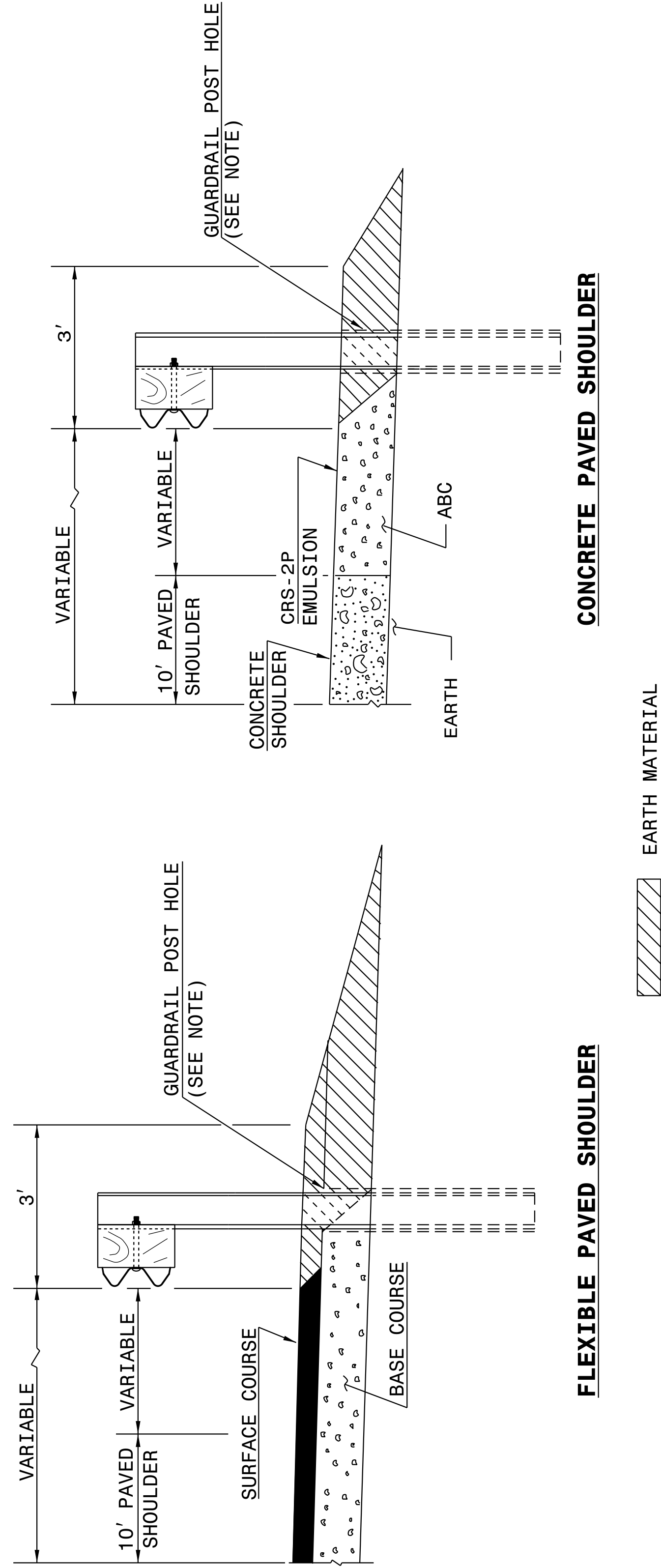
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ENGLISH DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 10 OF 11
862D01



NOTE:
WHEN WOODEN GUARDRAIL POSTS ARE USED, DRILL HOLES THROUGH EARTH MATERIAL AND BASE COURSE. THE POST MAY THEN BE DRIVEN TO THE PROPER DEPTH. DRILL THE HOLE OF SUFFICIENT SIZE TO ACCOMMODATE THE PARTICULAR POST BEING USED. BACKFILL AND TAMP HOLES USING THE EXCAVATED MATERIAL.

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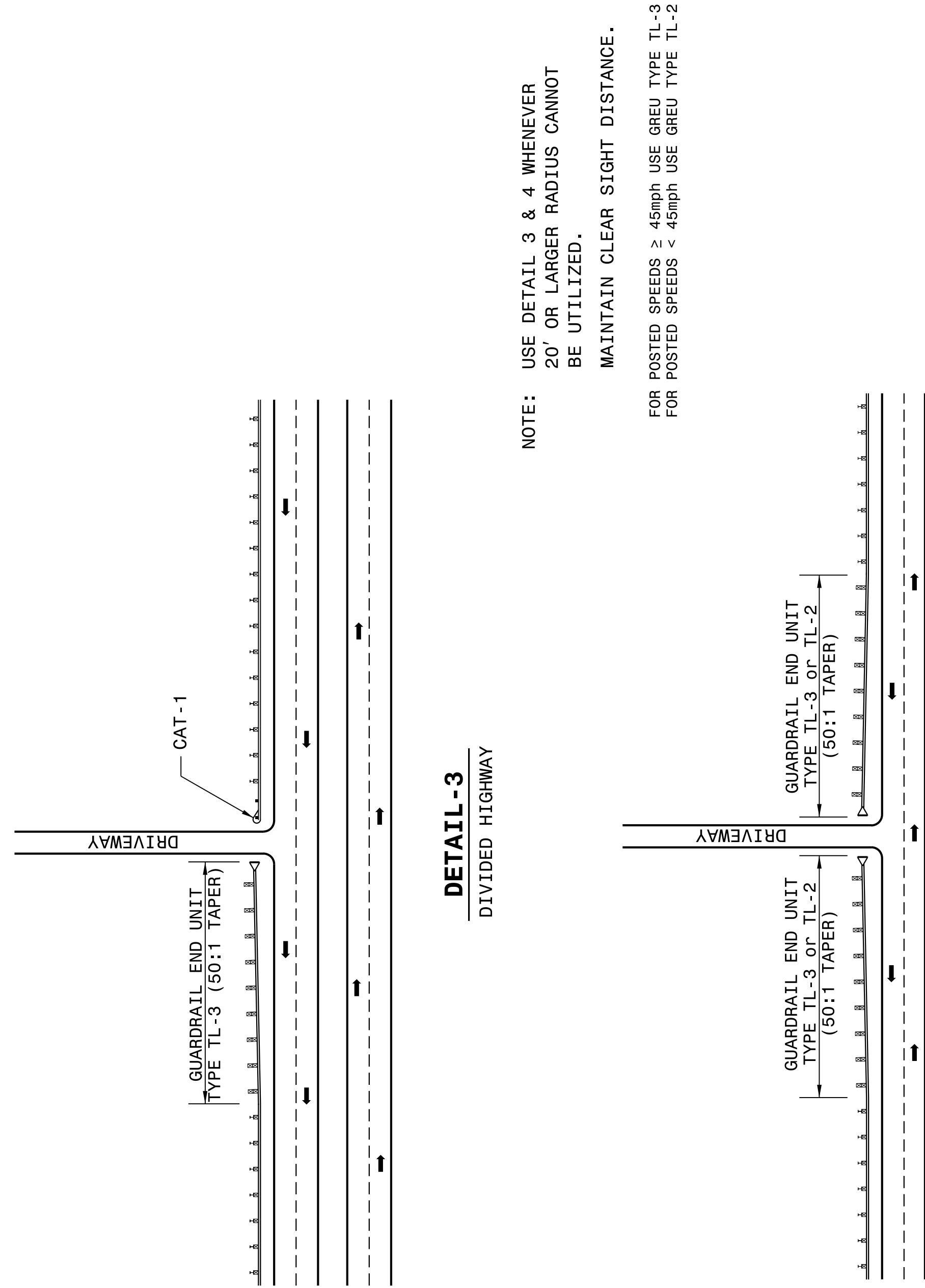
ENGLISH DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 9 OF 11
862D01

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ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 9 OF 11
862D01



NOTE:
USE DETAIL 3 & 4 WHENEVER 20' OR LARGER RADIUS CANNOT BE UTILIZED.
MAINTAIN CLEAR SIGHT DISTANCE.

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

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ROADWAY DETAIL DRAWING FOR
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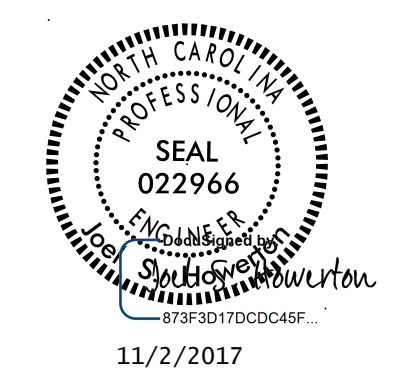
SHEET 9 OF 11
862D01

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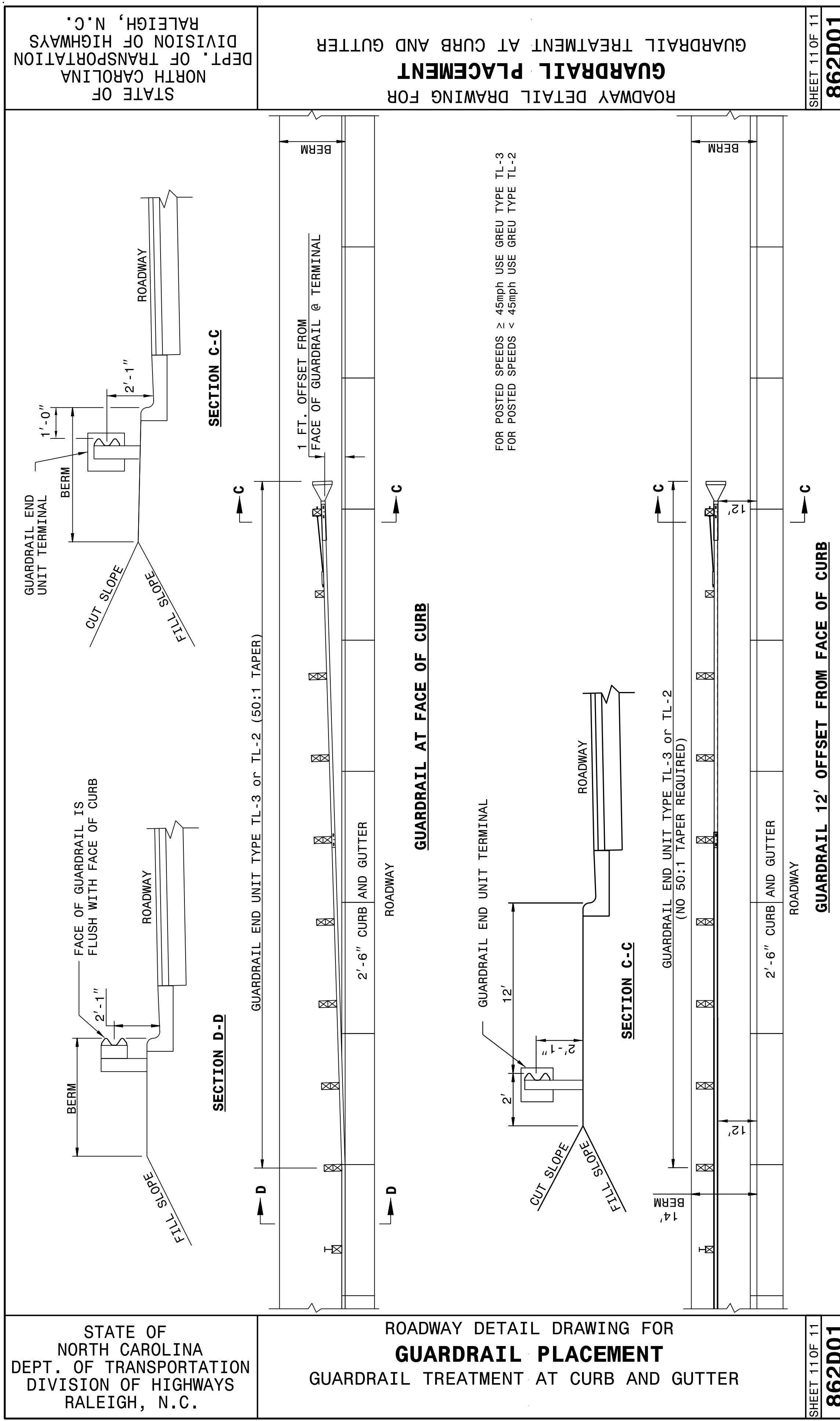
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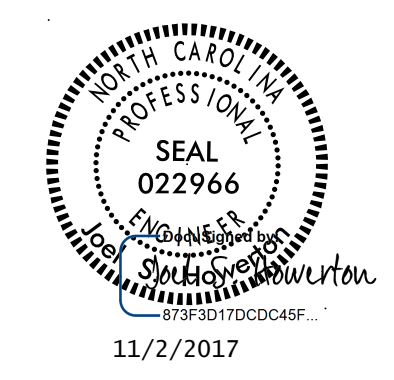


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SHEET 11 OF 11
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SHEET 11 OF 11
862D01



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PROJECT REFERENCE NO.	SHEET NO.
41665.7A	2C-7

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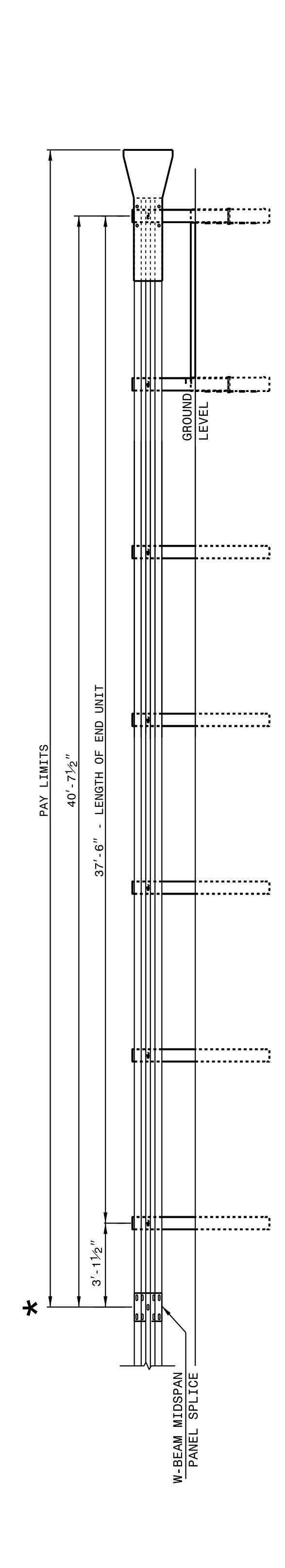
ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 2 OF 8
862D02

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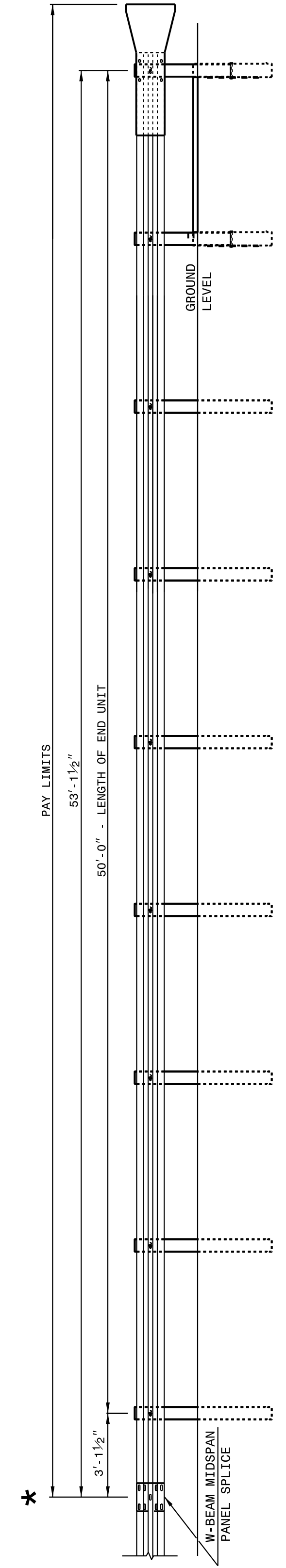
ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 2 OF 8
862D02



**FLARED AND TANGENT
 ELEVATION VIEW**

* WHEN INSTALLING GUARDRAIL END UNITS THAT ARE 2'-1" MOUNTING HEIGHT TO EXISTING GUARDRAIL, REMOVE THE EXISTING GUARDRAIL TO TRANSITION FROM THE EXISTING HEIGHT TO THE PROPOSED 2'-1" HEIGHT. SEE 862.02, SHEET 4 OF 8 FOR TRANSITION DETAILS.



**FLARED AND TANGENT
 ELEVATION VIEW**

APPROACH END UNITS

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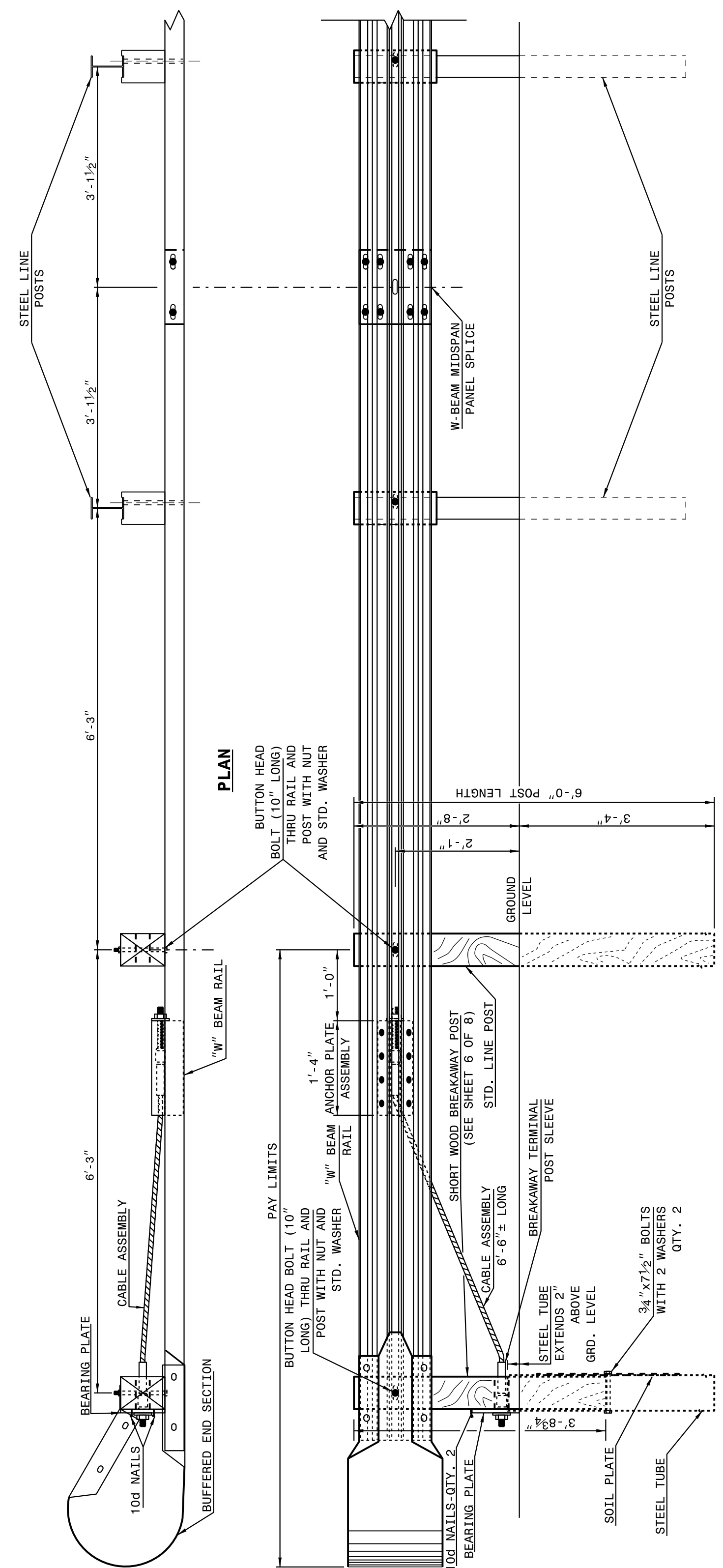
ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 1 OF 8
862D02

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ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 1 OF 8
862D02



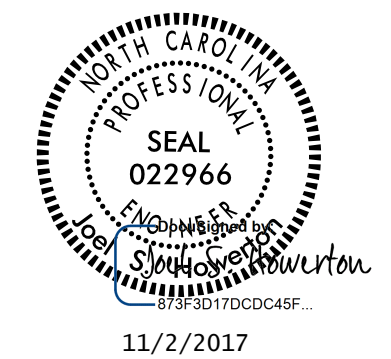
ELEVATION

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

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ROADWAY DETAIL DRAWING FOR
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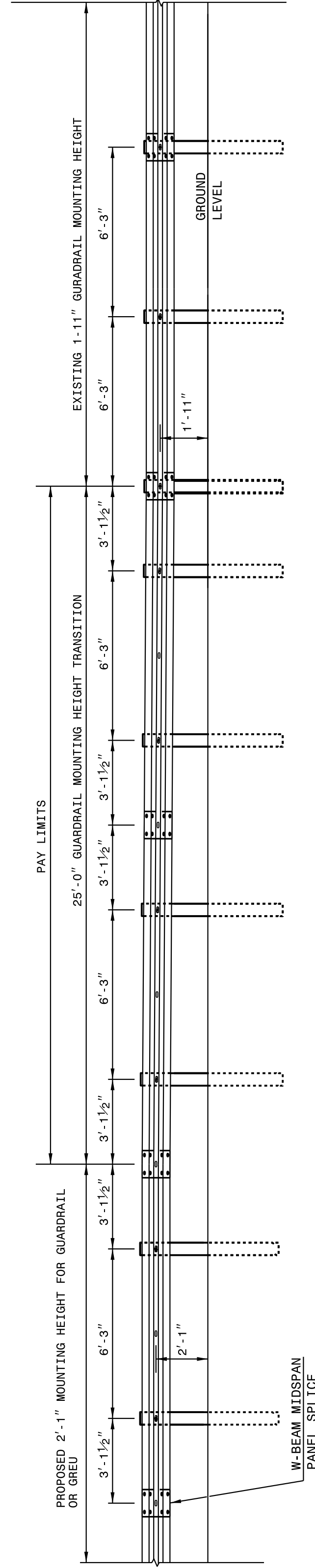
SHEET 4 OF 8
862D02

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ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 4 OF 8
862D02

NOTE: IF EXISTING GUARDRAIL IS LOWER THAN 1'-11", USE AN ADDITIONAL 12'-6" LONG SECTION OF GUARDRAIL, FOR EVERY 1" OF HEIGHT DIFFERENCE, TO TRANSITION FROM EXISTING GUARDRAIL TO PROPOSED 2'-1" GUARDRAIL.



ELEVATION VIEW

TRANSITION FROM OR 1'-11" TO 2'-1" W-BEAM GUARDRAIL MOUNTING HEIGHT

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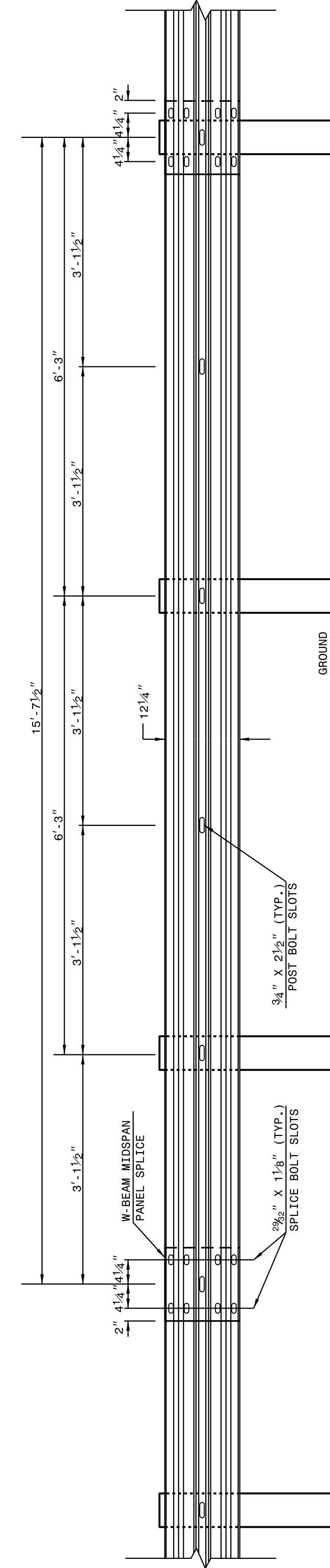
ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 3 OF 8
862D02

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ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 3 OF 8
862D02



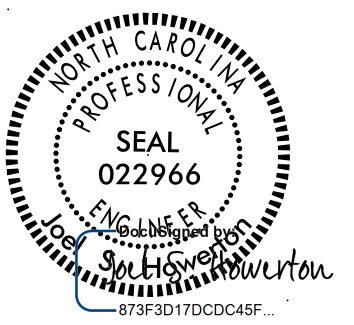
15'-7 1/2" W-BEAM GUARDRAIL PANEL

NOTE: USE 5-SPACE 15'-7 1/2" W-BEAM GUARDRAIL PANEL AT THE DOWNSTREAM END OF AN END UNIT OR EXISTING GUARDRAIL THAT DOES NOT OFFSET THE W-BEAM PANEL SPLICE TO MIDSPAN

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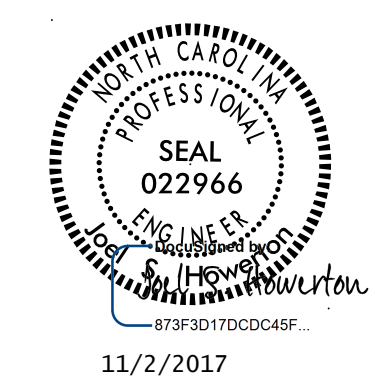
STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	ROADWAY DETAIL DRAWING FOR GUARDRAIL INSTALLATION	SHEET 6 OF 8 862D02
SYSTEM PARTS		
<p style="text-align: center;">WOOD OFFSET BLOCK (FOR WOOD POSTS)</p>	<p style="text-align: center;">STEEL TUBE TS 6" X 8" X 0.1875"</p>	
<p style="text-align: center;">STANDARD LINE POST</p>	<p style="text-align: center;">ROUTED OFFSET BLOCK</p>	
<p style="text-align: center;">SHORT WOOD BREAKAWAY POST</p>	<p style="text-align: center;">W6" STEEL POST</p>	
ROADWAY DETAIL DRAWING FOR GUARDRAIL INSTALLATION		
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 5 OF 8 862D02
TYPICAL GUARDRAIL AND GUARDRAIL POST ALTERNATIVES		
<p style="text-align: center;">ISOMETRIC VIEW</p>	<p style="text-align: center;">FRONT - MID SPAN SPLICE</p>	
<p style="text-align: center;">PLAN</p>	<p style="text-align: center;">SIDE</p>	
<p>NOTES:</p> <ul style="list-style-type: none"> A - 5/8" DIA. BUTTON HEAD SPLICE BOLT 1 1/4" LONG (8 REQ. PER SPLICE JOINT). B - 5/8" DIA. BUTTON HEAD BOLT 7 1/2" / 9" LONG WITH NUT FOR BOLTING 6" / 8" ROUTED OFFSET BLOCK TO STEEL POSTS. C - FIELD PUNCHING OF HOLES INTO GUARDRAIL AS DIRECTED BY THE ENGINEER. 		
ROADWAY DETAIL DRAWING FOR GUARDRAIL INSTALLATION		
STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	ROADWAY DETAIL DRAWING FOR GUARDRAIL INSTALLATION	SHEET 5 OF 8 862D02

PROJECT REFERENCE NO. 41665.7A	SHEET NO. 2C-9
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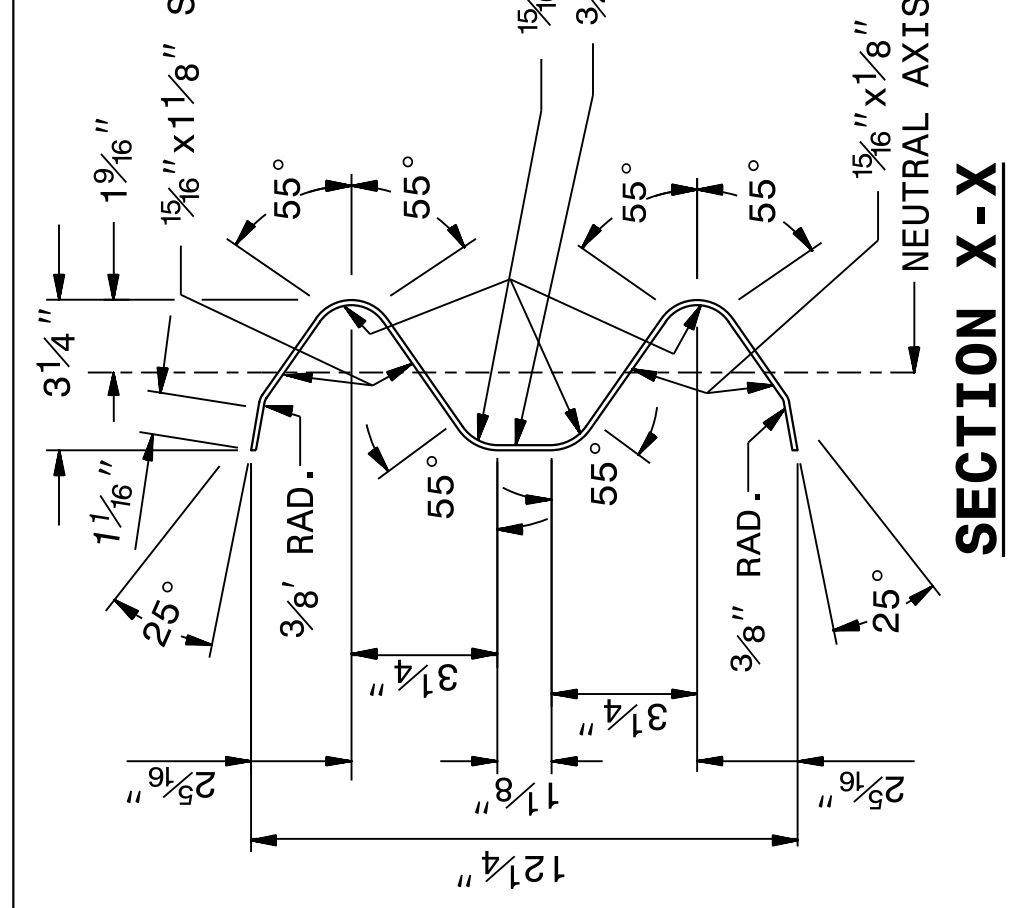
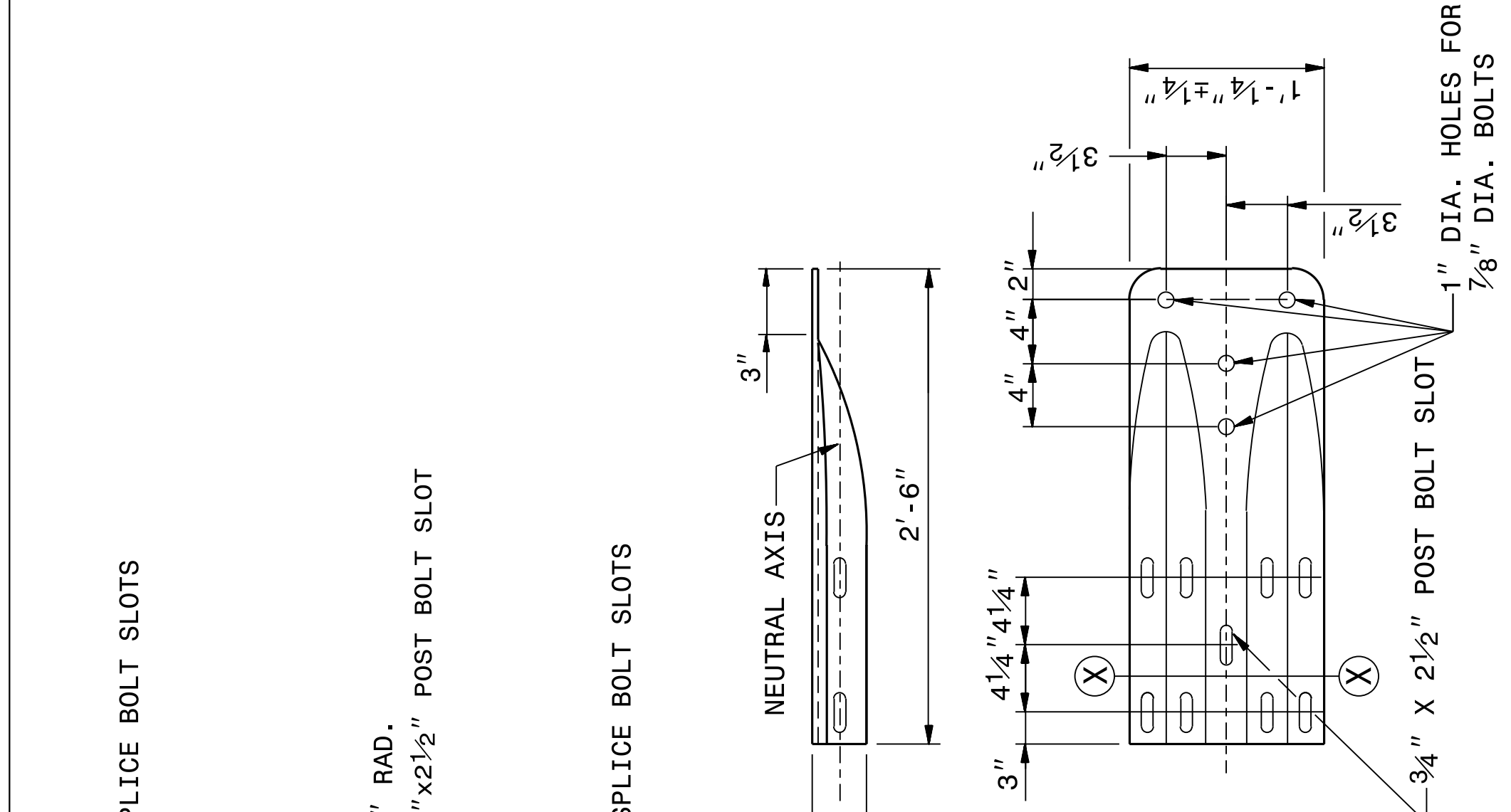


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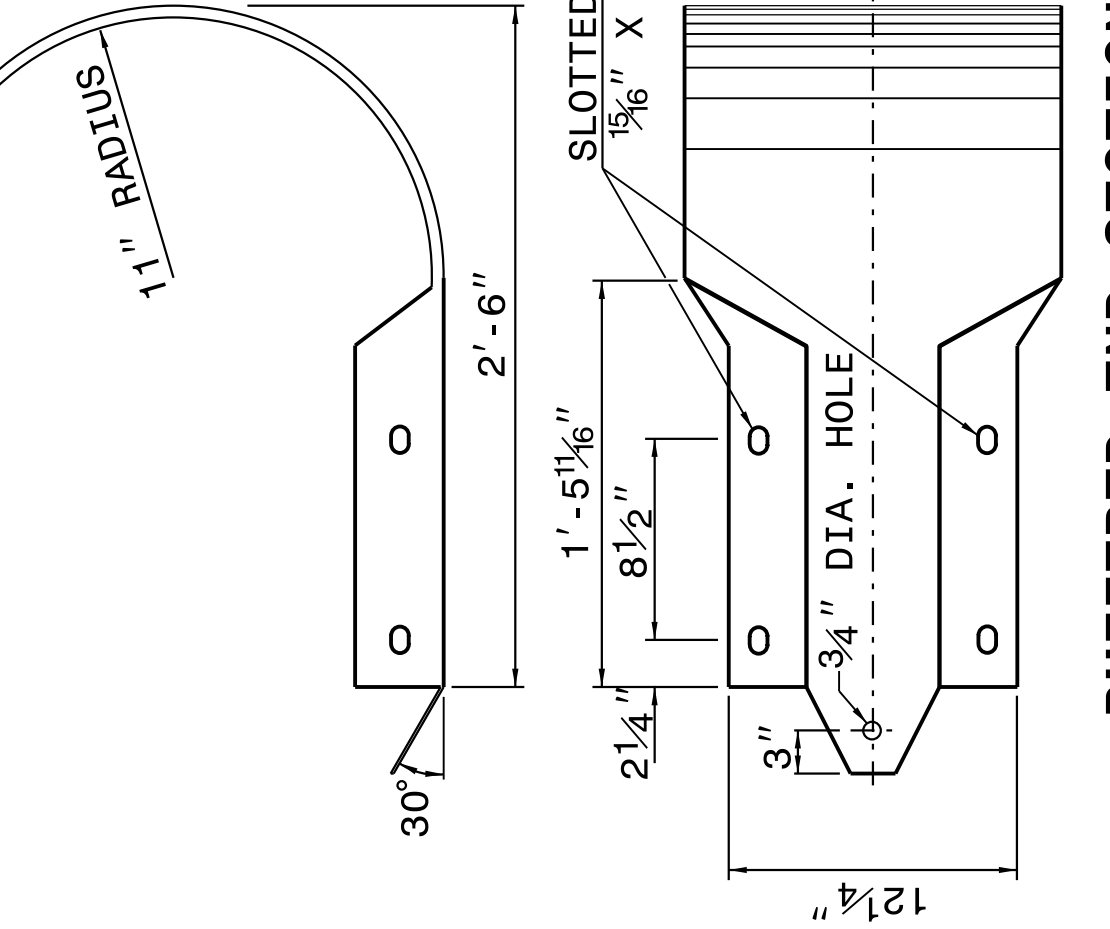
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ROADWAY DETAIL DRAWING FOR
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SHEET 8 OF 8
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SECTION X-X



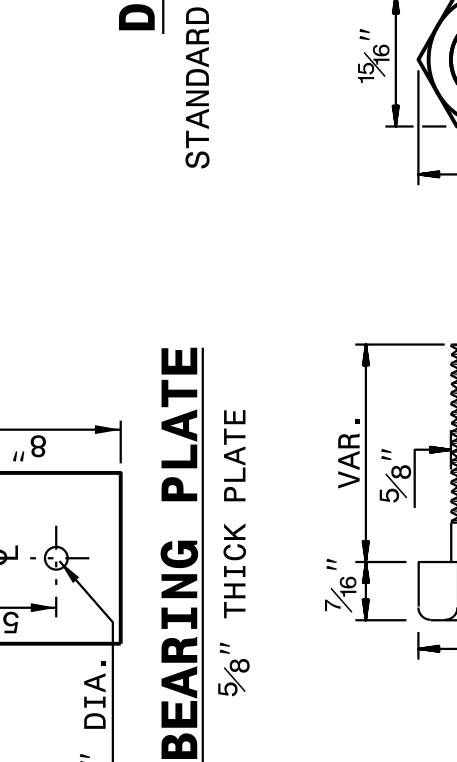
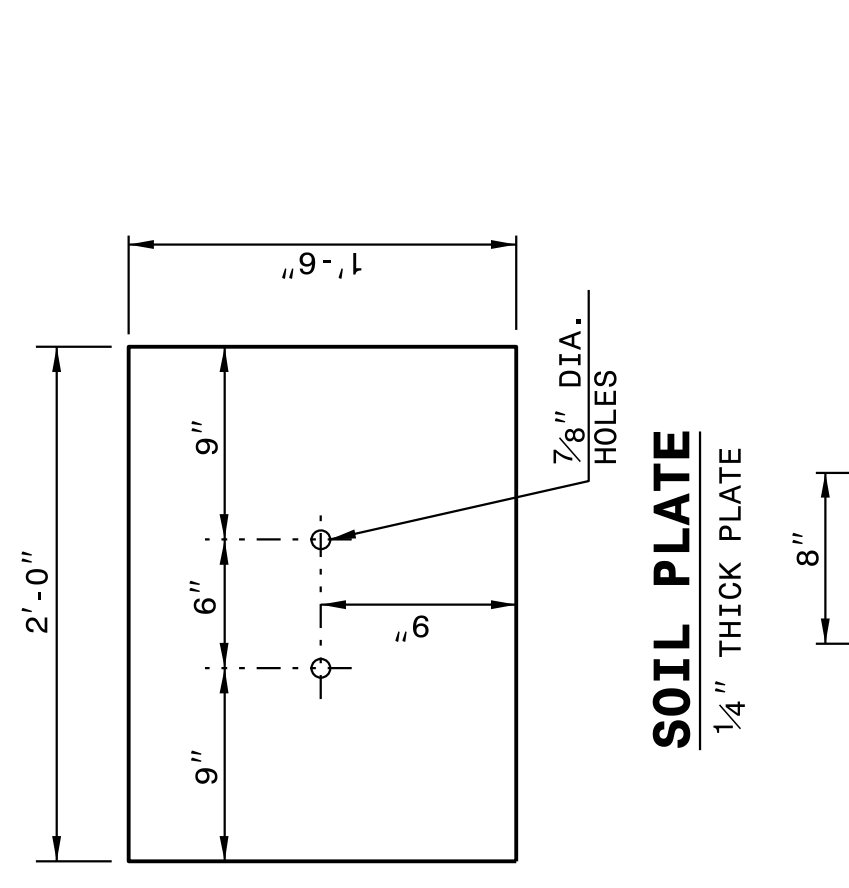
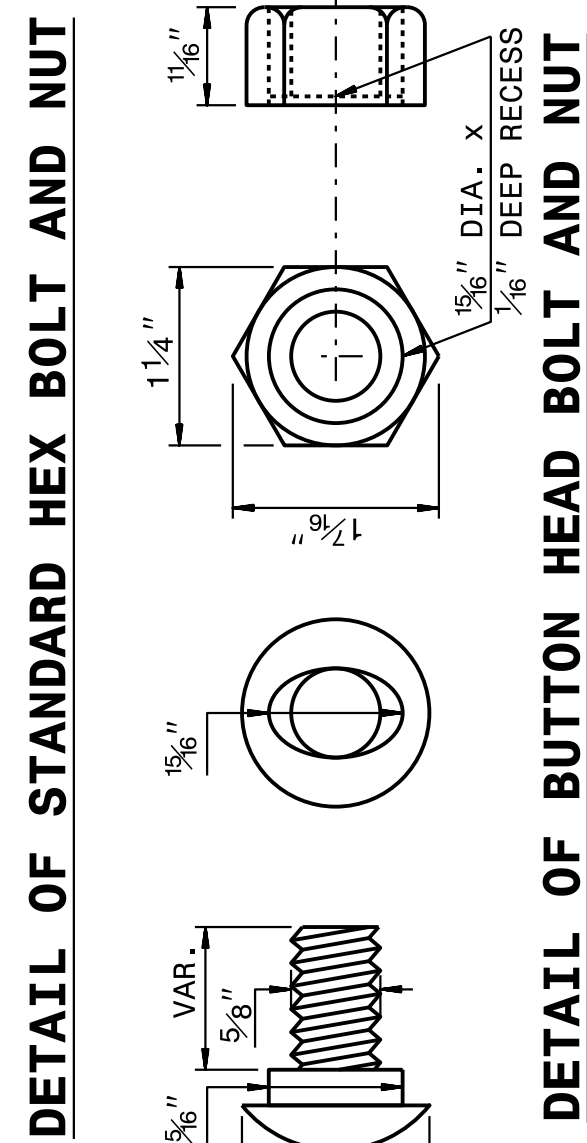
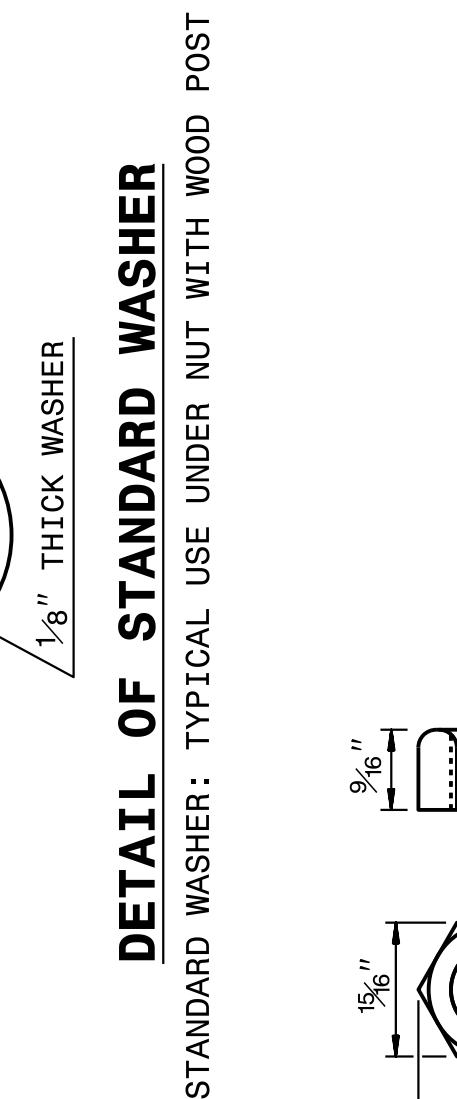
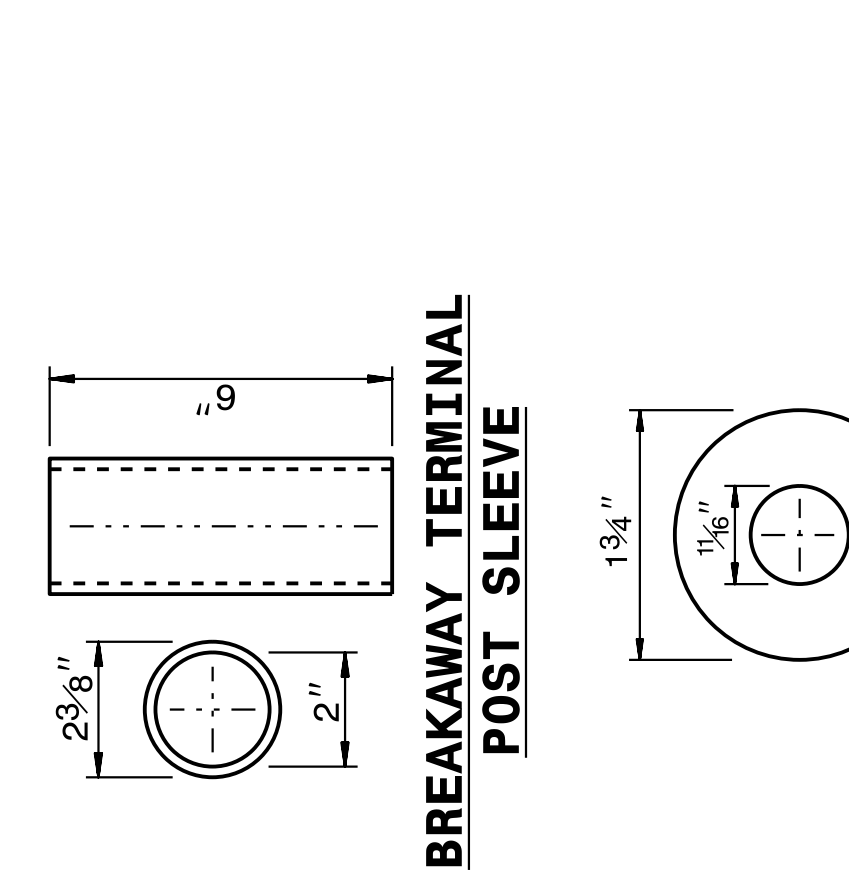
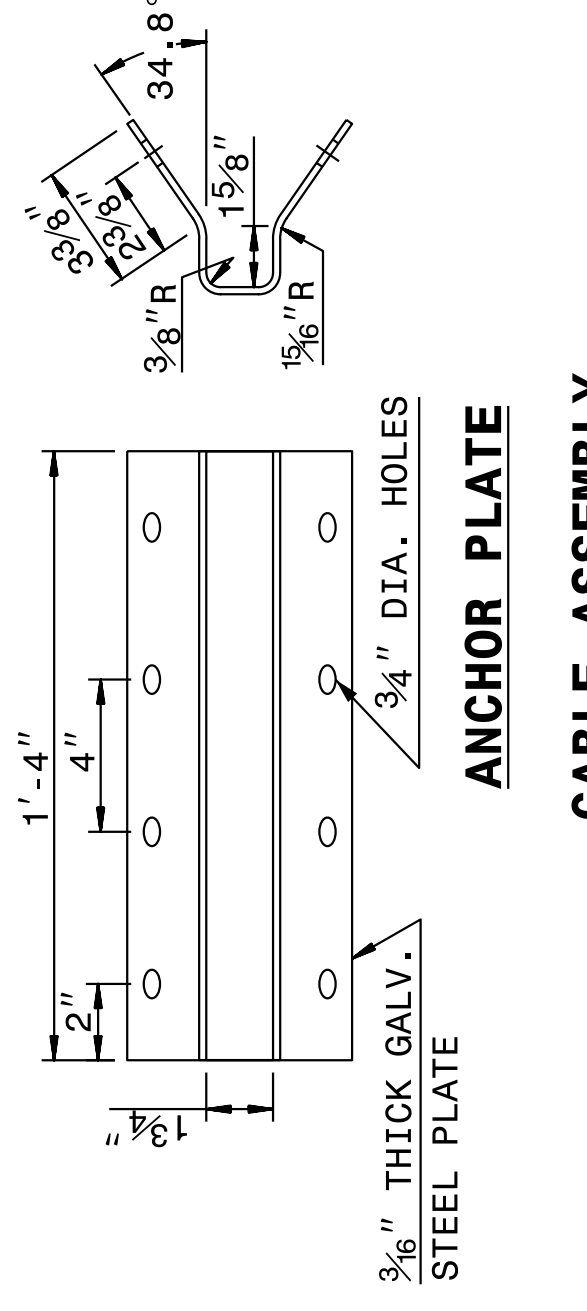
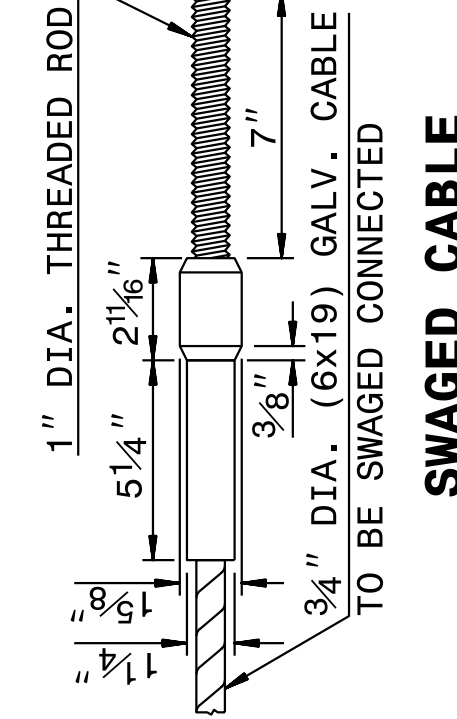
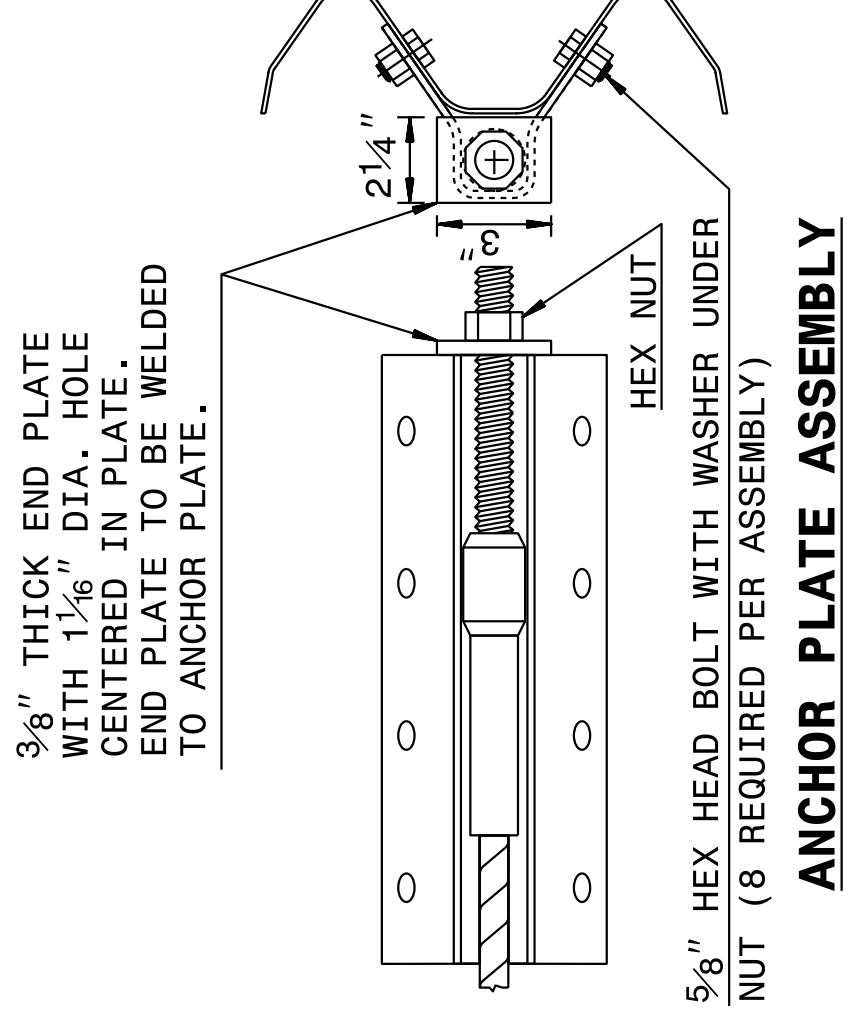
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SYSTEM PARTS - GENERAL USE

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ROADWAY DETAIL DRAWING FOR
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SHEET 7 OF 8
862D02



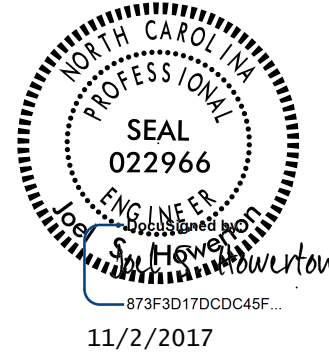
SYSTEM PARTS

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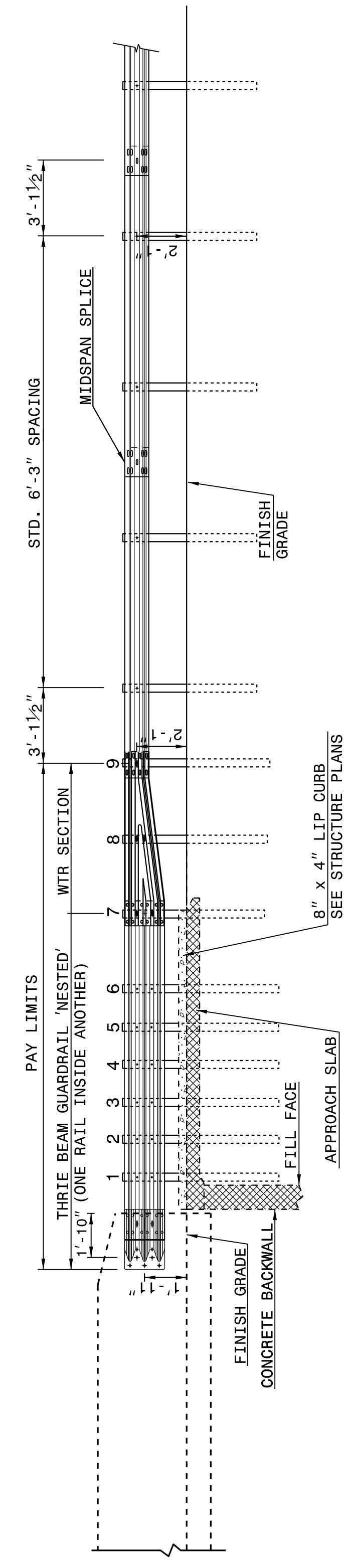
ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
 GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO
 RAIL ON BRIDGE - SUB REGIONAL TIER

SHEET 2 OF 7
862D03

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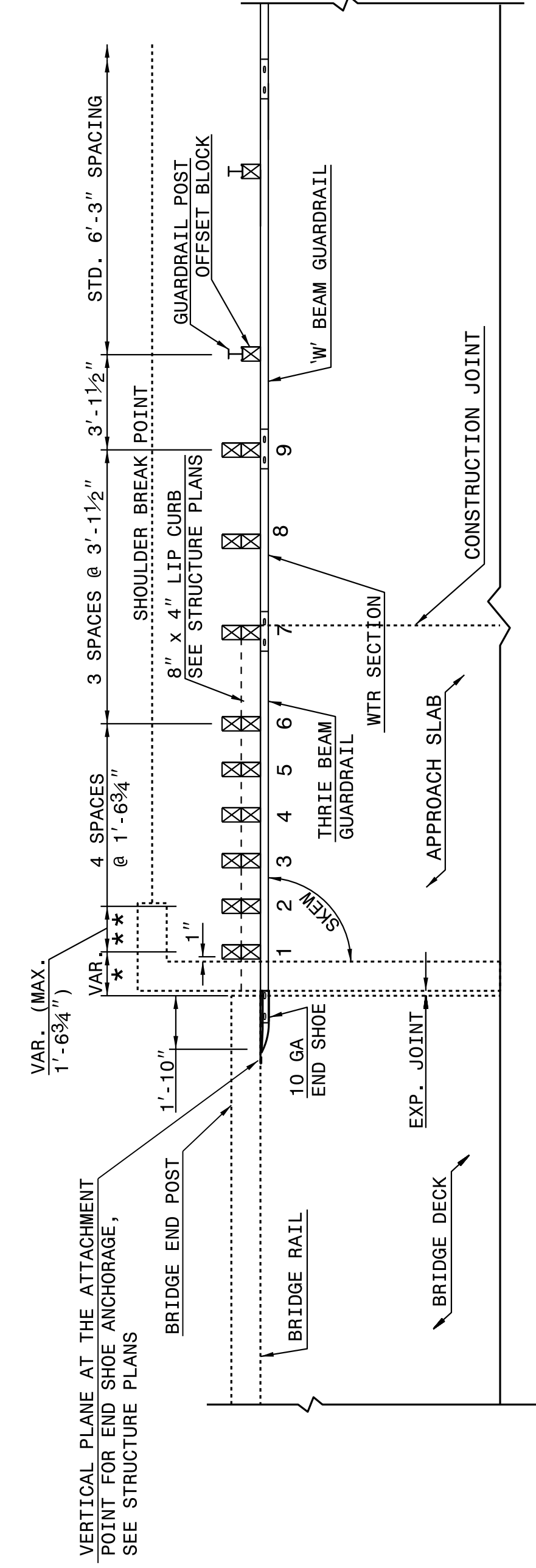
ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
 GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO
 RAIL ON BRIDGE - SUB REGIONAL TIER

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 11½" 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 5 FOR POST SECTIONS 1 THRU 9.



PLAN VIEW

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

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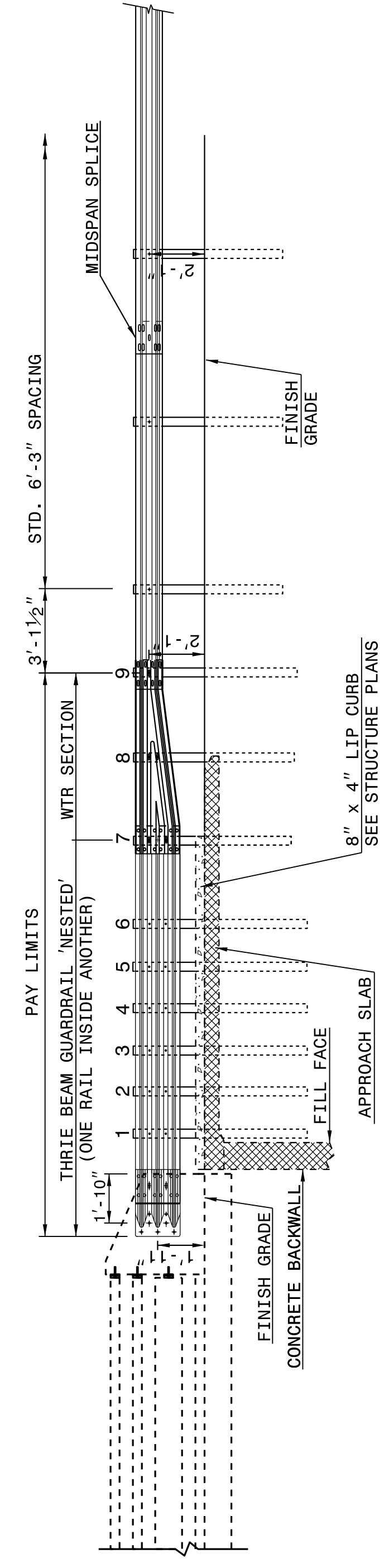
ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
 GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE

SHEET 1 OF 7
862D03

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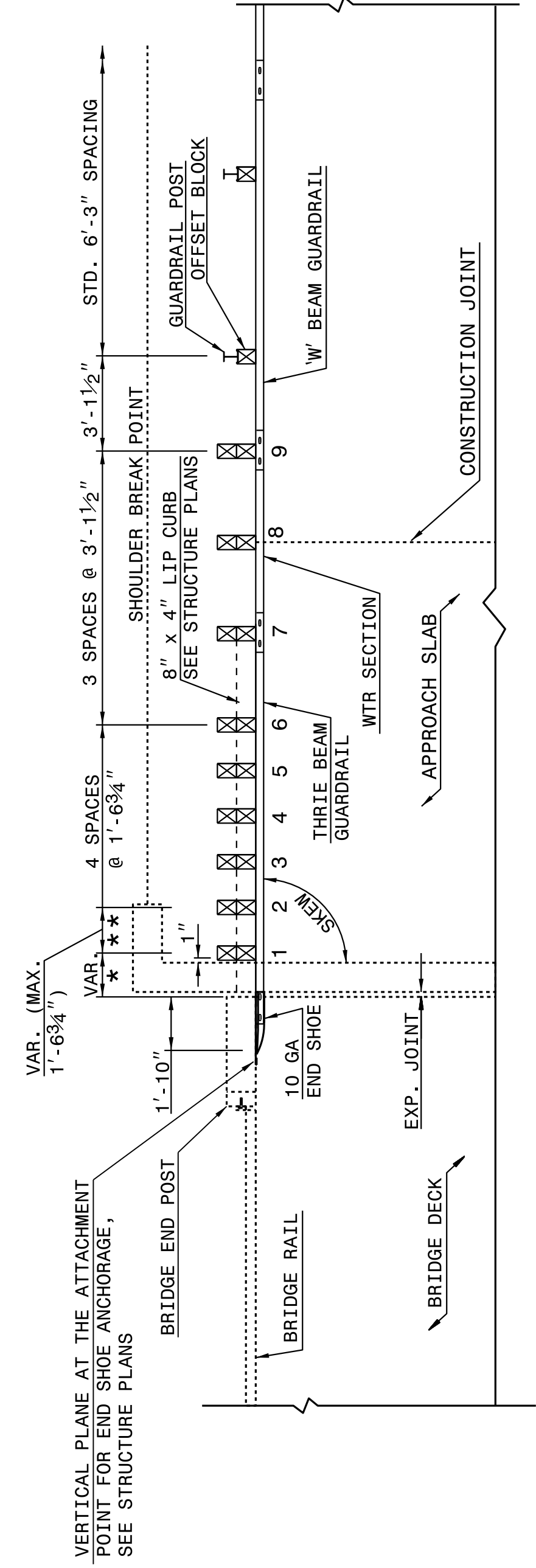
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STRUCTURE ANCHOR UNITS
 GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE

SHEET 1 OF 7
862D03



ELEVATION

NOTE:
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 *THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" 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 5 FOR POST SECTIONS 1 THRU 9.



PLAN VIEW

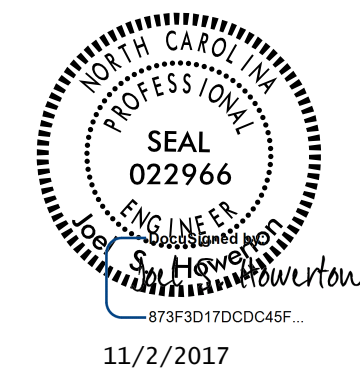
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 FOR ATTACHMENT TO RAIL ON BRIDGE**

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 AND DEVELOPMENT UNIT**
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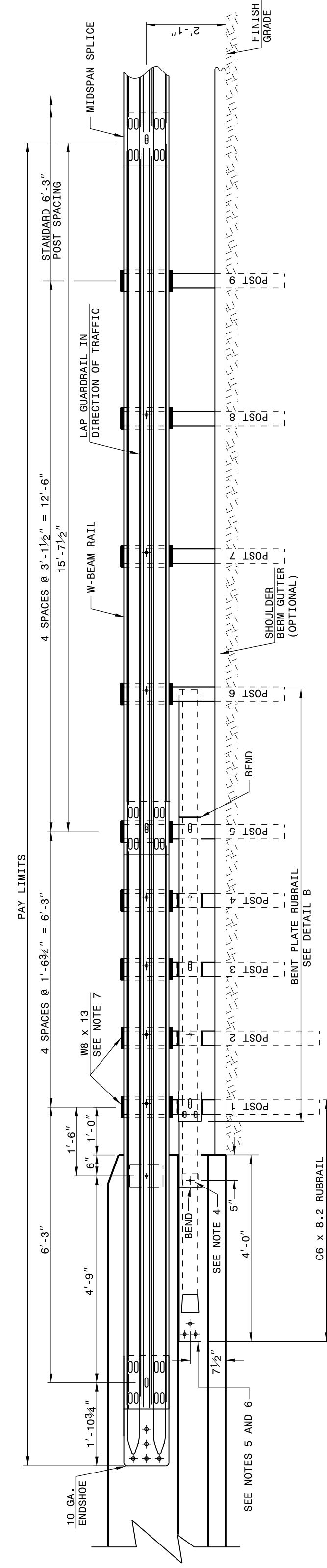
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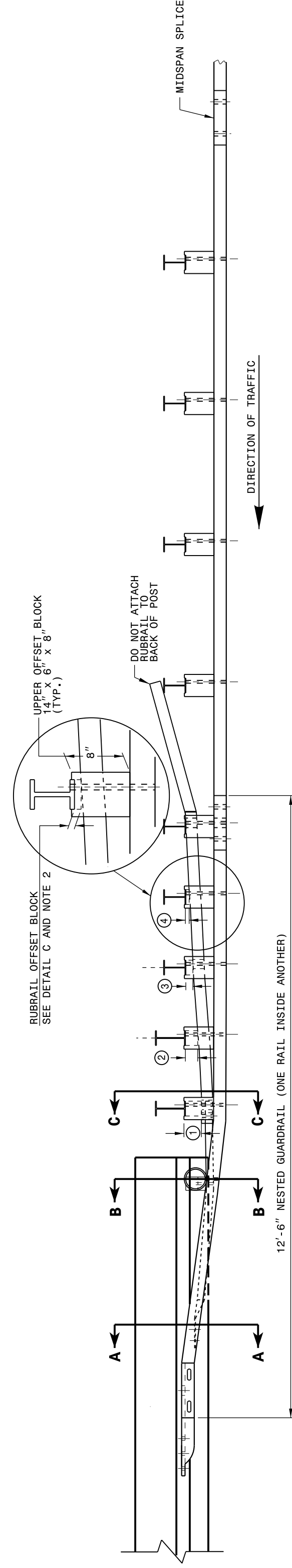
ROADWAY DETAIL DRAWING FOR
GUARDRAIL ANCHOR UNIT
 GUARDRAIL ANCHOR UNIT TYPE B-77
 FOR F-SHAPE BARRIER

SHEET 4 OF 7
862D03



ELEVATION

- GENERAL NOTES:
- POSTS 1 THROUGH 5 REQUIRE AN ADDITIONAL HOLE TO ATTACH LOWER BLOCKOUTS AND/OR RUBRAIL. RUBRAIL BLOCKOUTS LOCATED ON POSTS 1 THROUGH 4 ARE OFFSET DRILLED AND SECURED WITH 3/8\"/>
 - RUBRAIL BLOCKOUTS LOCATED ON POSTS 1 THROUGH 4 ARE OFFSET DRILLED AND SECURED WITH 3/8\"/>
 - 5/8\"/>
 - SEE DETAIL D FOR SLOPED RUBRAIL BLOCKOUT. BLOCKOUT IS ATTACHED TO RAIL ELEMENT ONLY. USE 3/8\"/>
 - SHOP FABRICATE THE C6 X 8.2 RUBRAIL END TO BE CONSISTENT WITH THE SLOPE OF THE F SHAPE AND ATTACH FLUSH WITH THE SLOPED END OF THE BARRIER OR BRIDGE RAIL.
 - ANCHORAGE: (a) AT EXISTING BRIDGE RAIL AND NEW OR EXISTING BARRIERS, ANCHOR RUBRAIL USING THREE 5/8\"/>
 - POSTS 1 AND 2 ARE W8 X 13, 7'-6\"/>



PLAN

GUARDRAIL ANCHOR UNIT TYPE B-77

SHEET 4 OF 7
862D03

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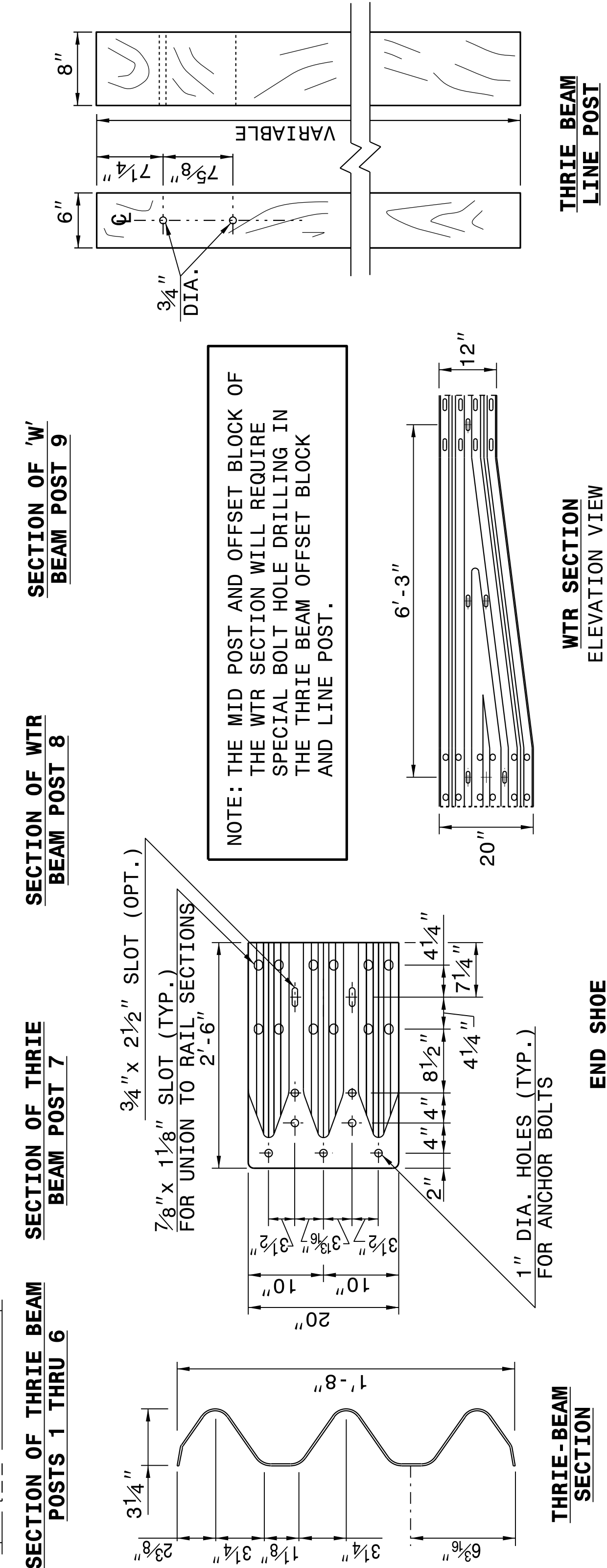
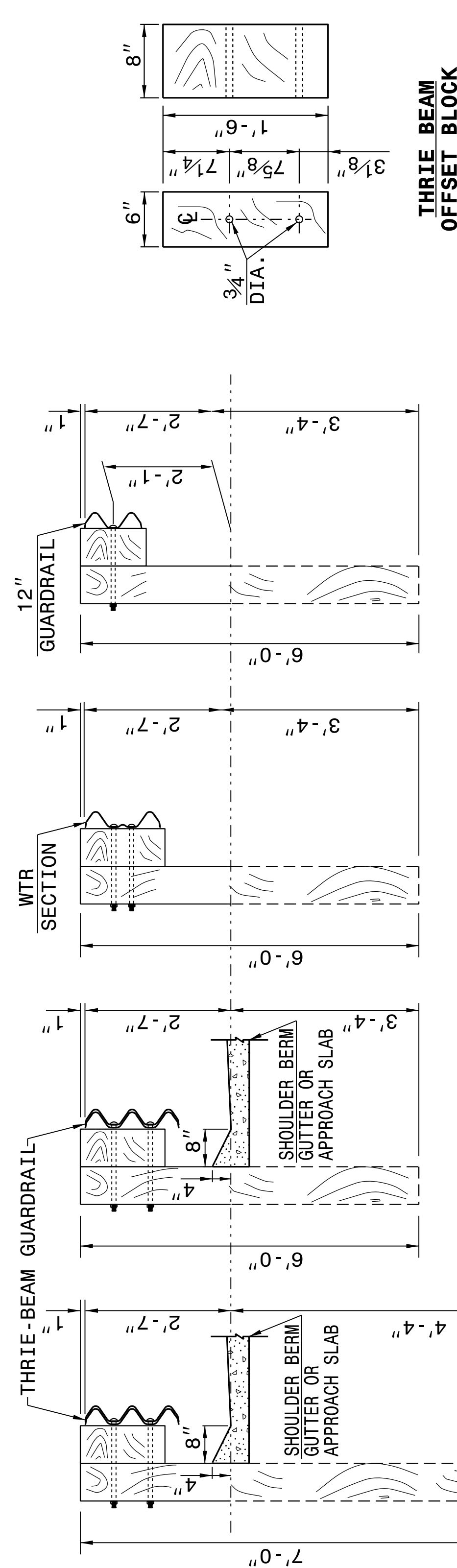
ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNIT
 FOR F-SHAPE BARRIER

SHEET 4 OF 7
862D03

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ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
 GUARDRAIL ANCHOR UNIT, TYPE III

SHEET 3 OF 7
862D03



NOTE: THE MID POST AND OFFSET BLOCK OF THE WTR SECTION WILL REQUIRE SPECIAL BOLT HOLE DRILLING IN THE THRIE BEAM OFFSET BLOCK AND LINE POST.

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ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
 GUARDRAIL ANCHOR UNIT, TYPE III

SHEET 3 OF 7
862D03

CONTRACT STANDARDS AND DEVELOPMENT UNIT
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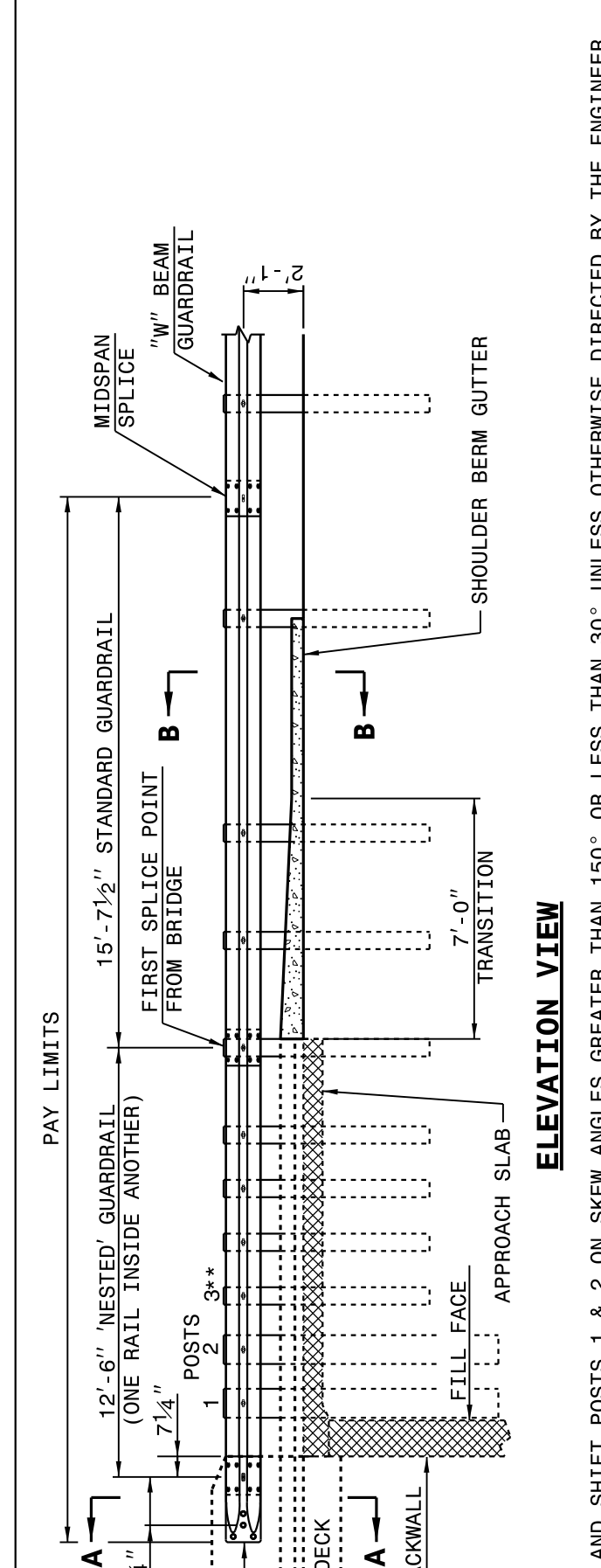
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STRUCTURE ANCHOR UNITS
 GUARDRAIL ANCHOR UNIT TYPE B-83

SHEET 6 OF 7
862D03

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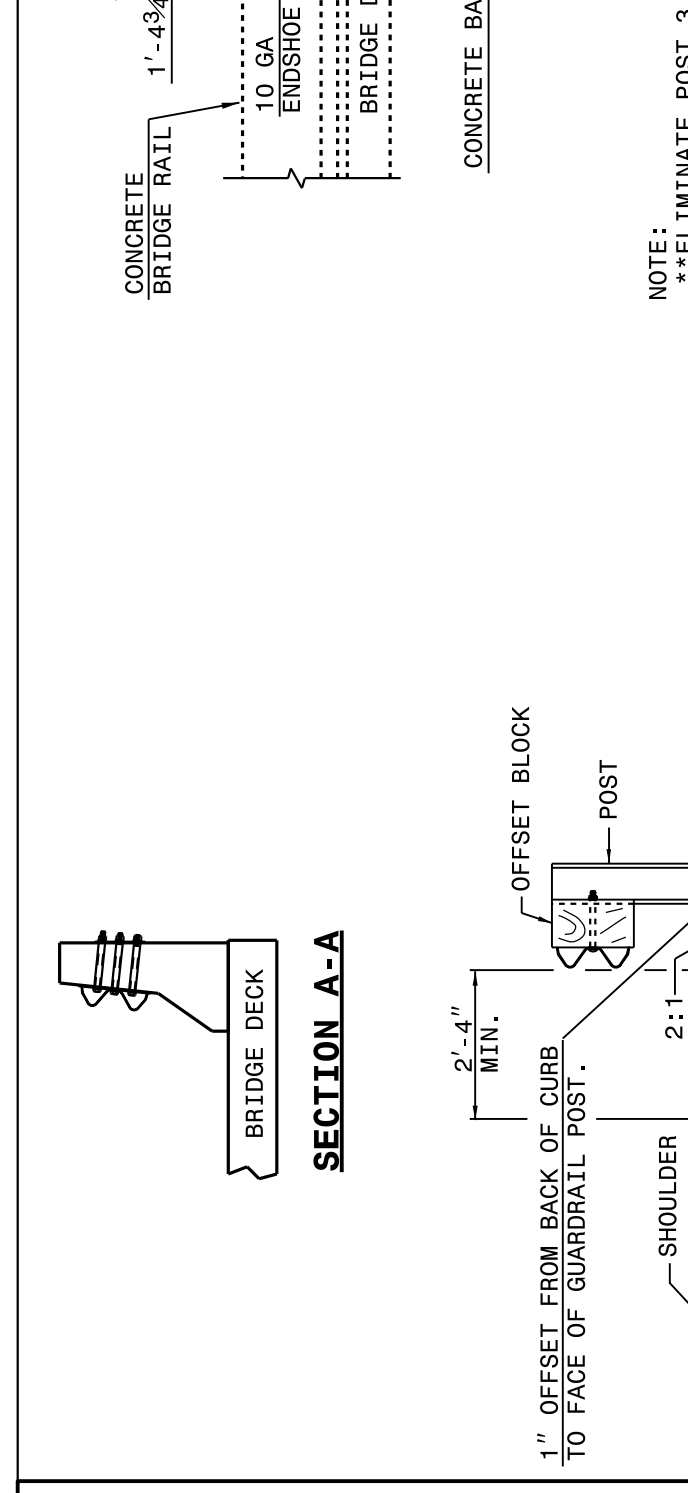
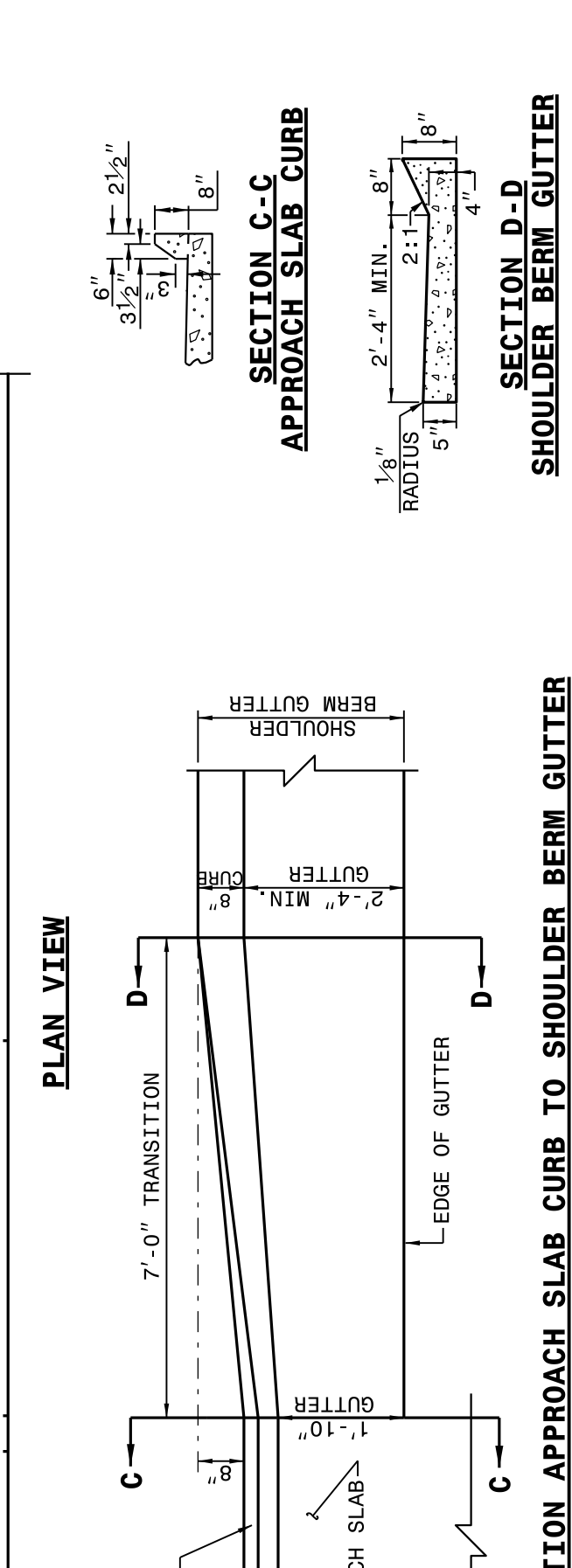
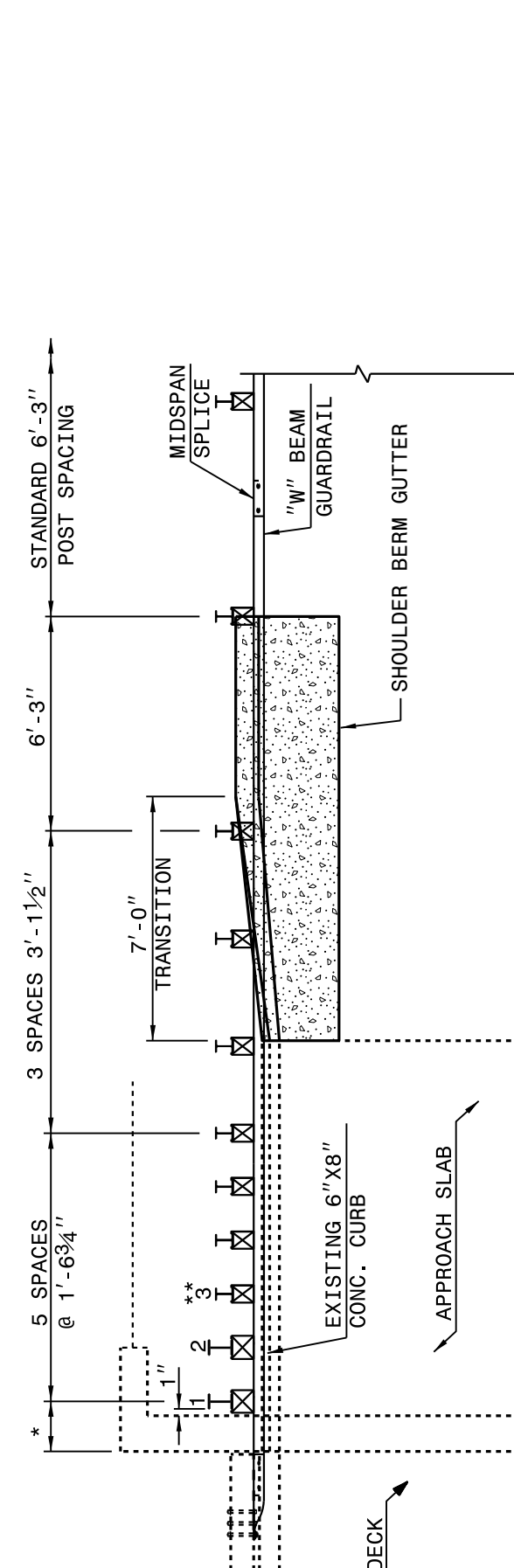
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STRUCTURE ANCHOR UNITS
 GUARDRAIL ANCHOR UNIT TYPE B-83

SHEET 6 OF 7
862D03

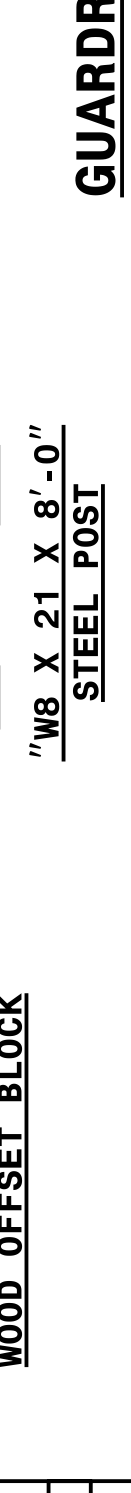
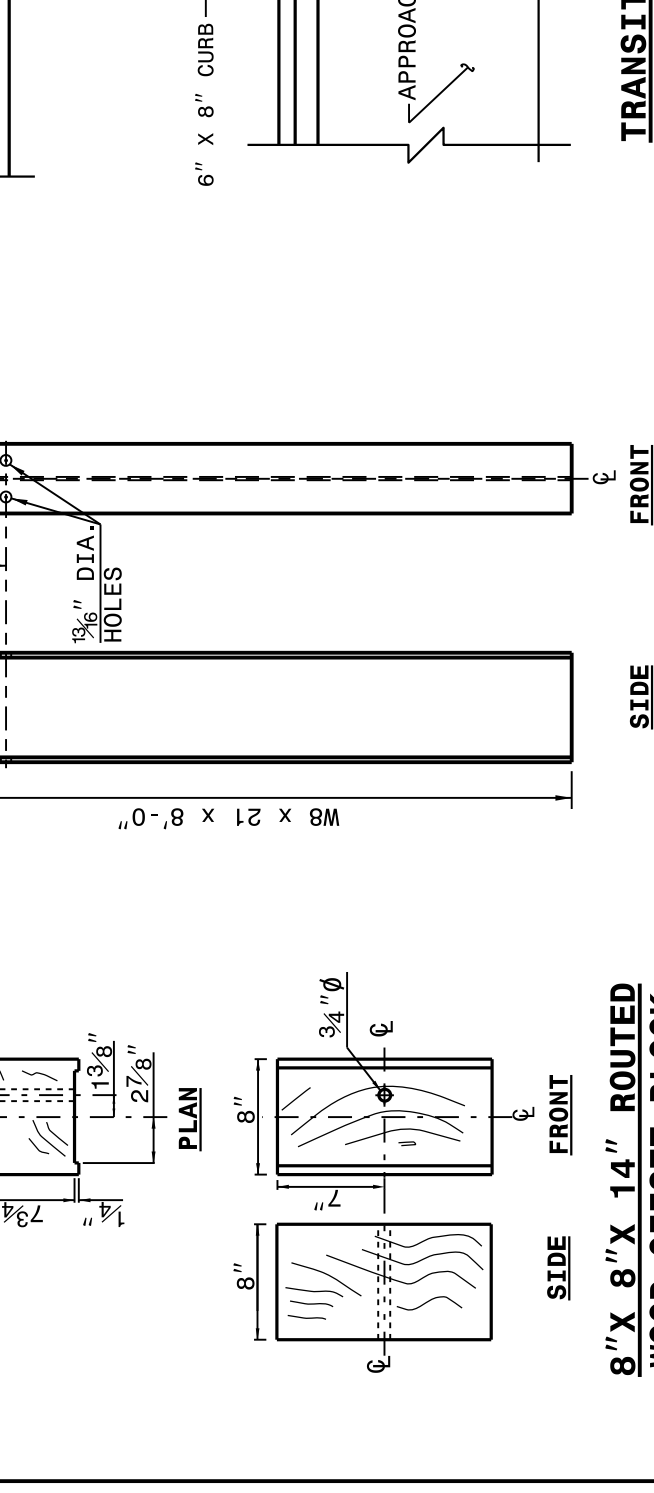
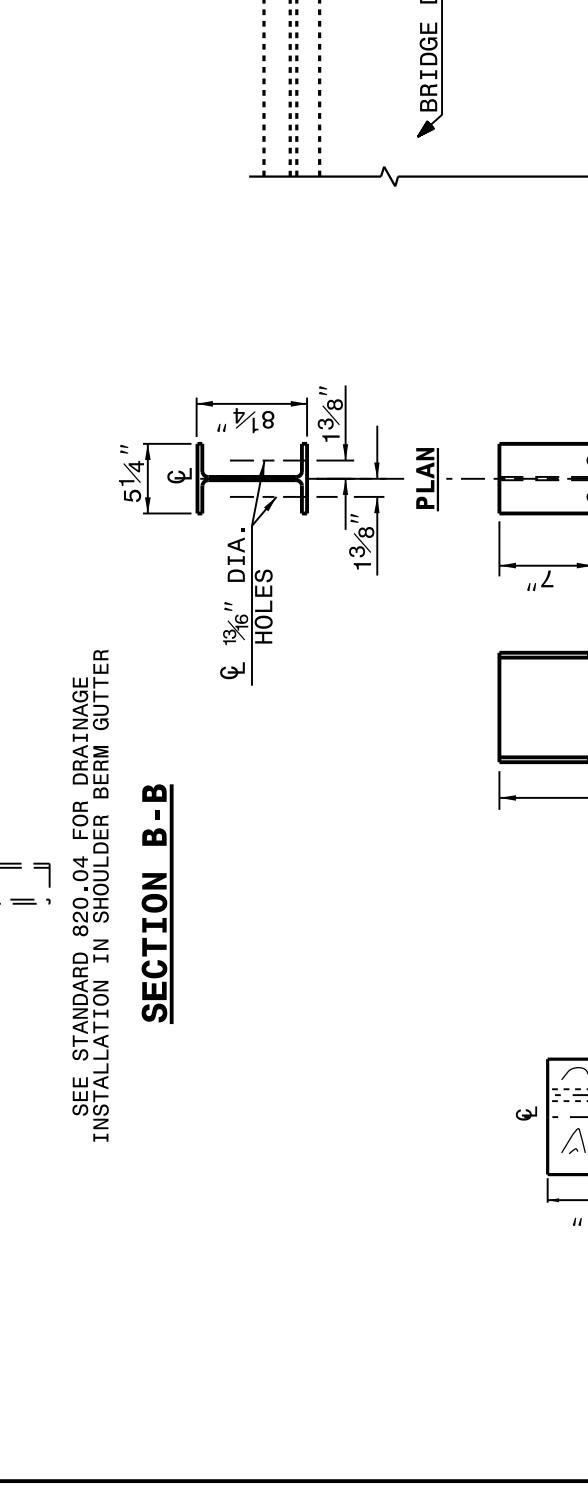


ELEVATION VIEW

NOTE:
 **ELIMINATE POST 3 AND SHIFT POSTS 1 & 2 ON SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
 *MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
 -USE NO WOOD POSTS WITHIN THE GUARDRAIL ANCHOR UNIT LIMITS.
 -POSTS 1 AND 2 ARE TO BE 21' X 8\"/>



SEE STANDARD 820.04 FOR DRAINAGE INSTALLATION IN SHOULDER BERM GUTTER



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ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
 GUARDRAIL ANCHOR UNIT TYPE B-83

SHEET 6 OF 7
862D03

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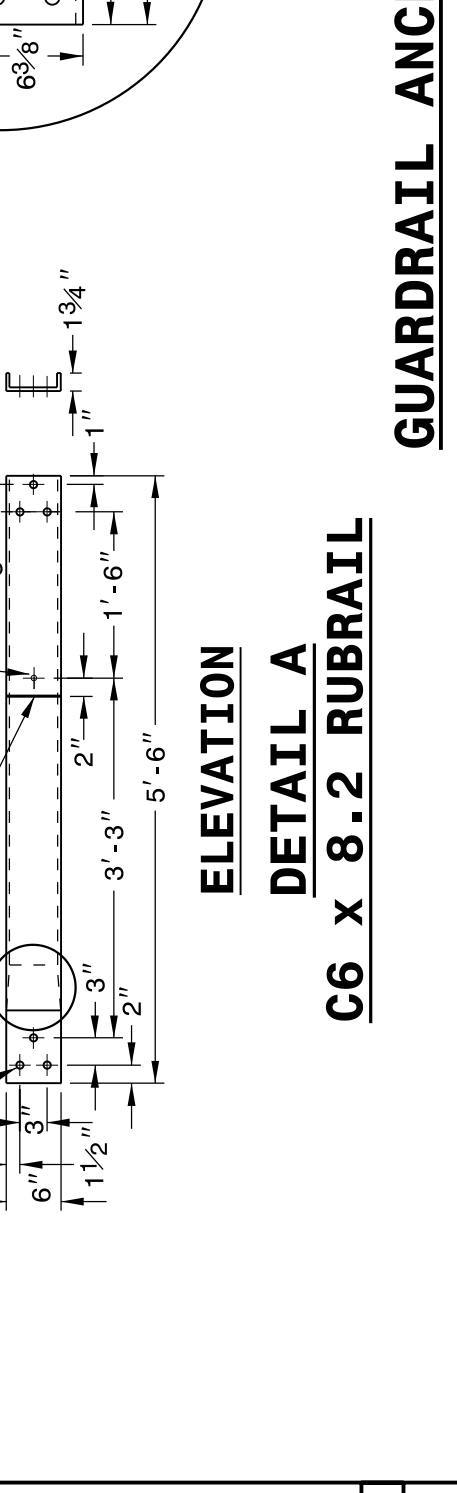
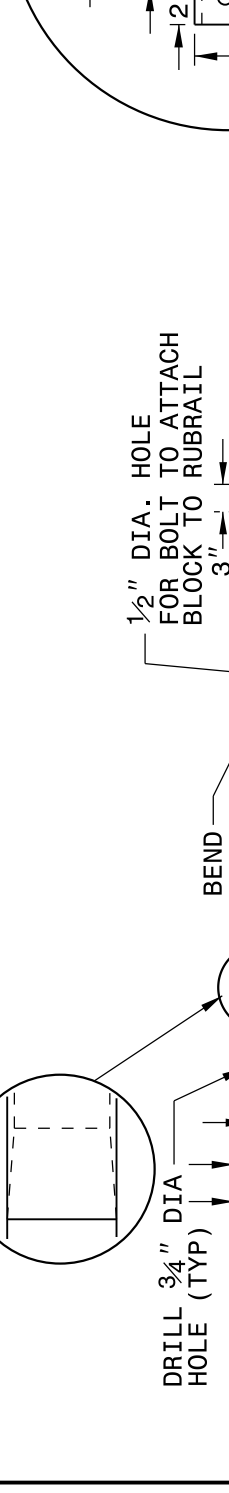
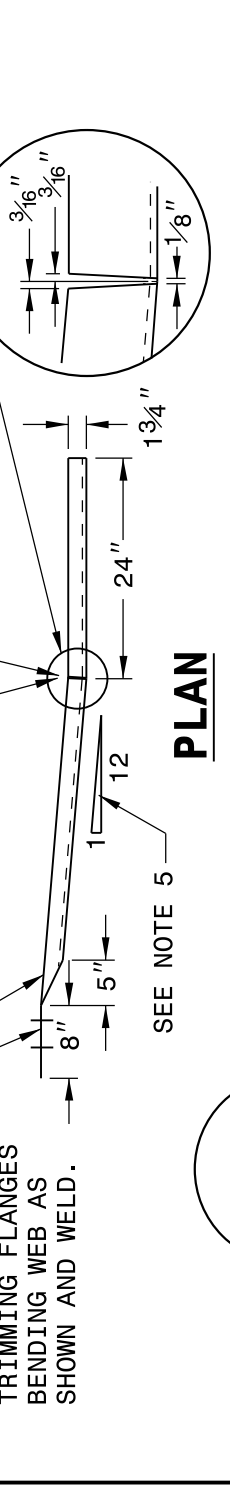
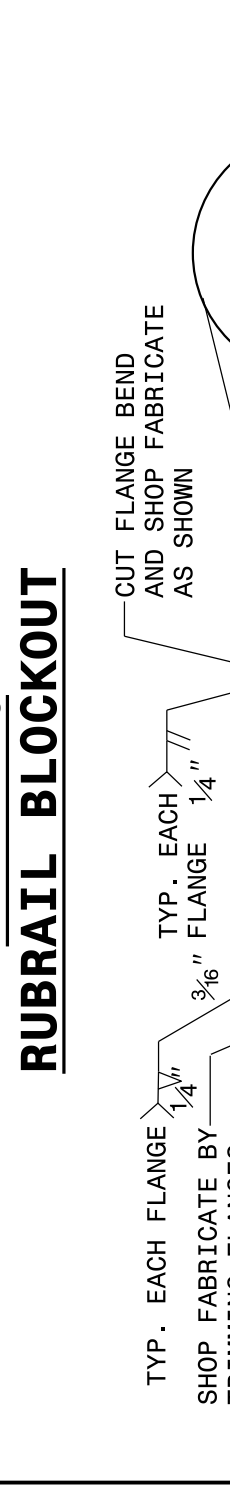
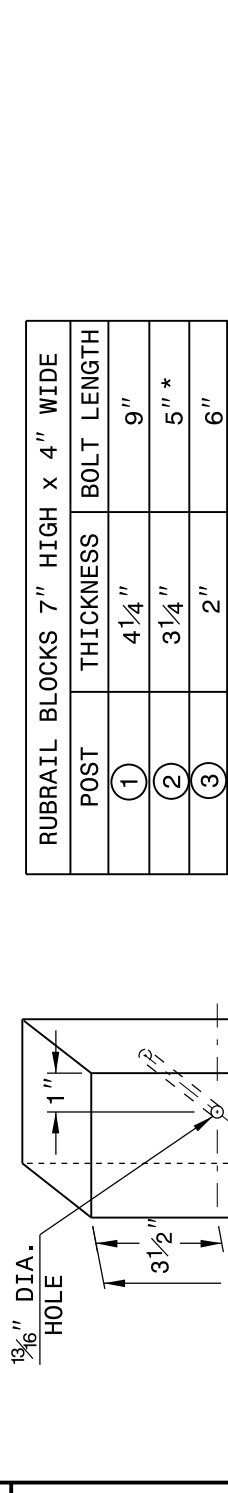
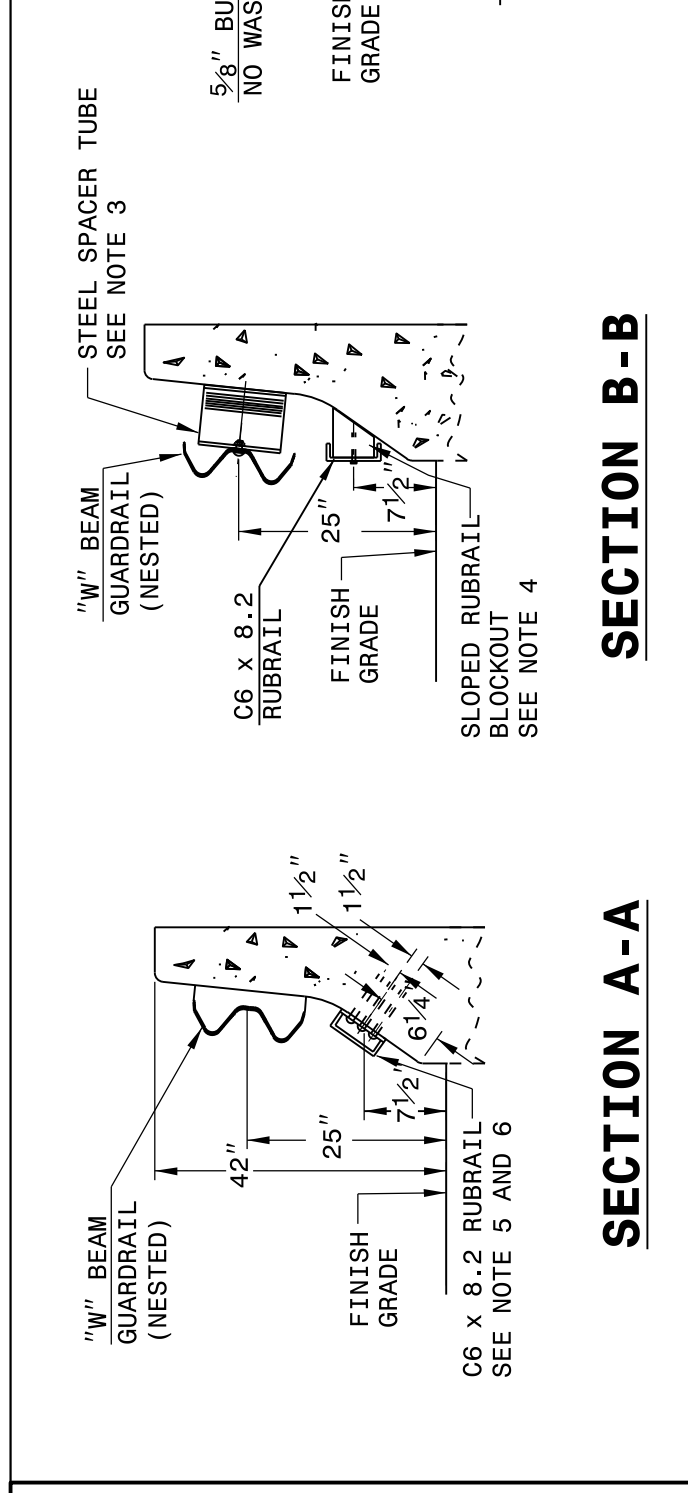
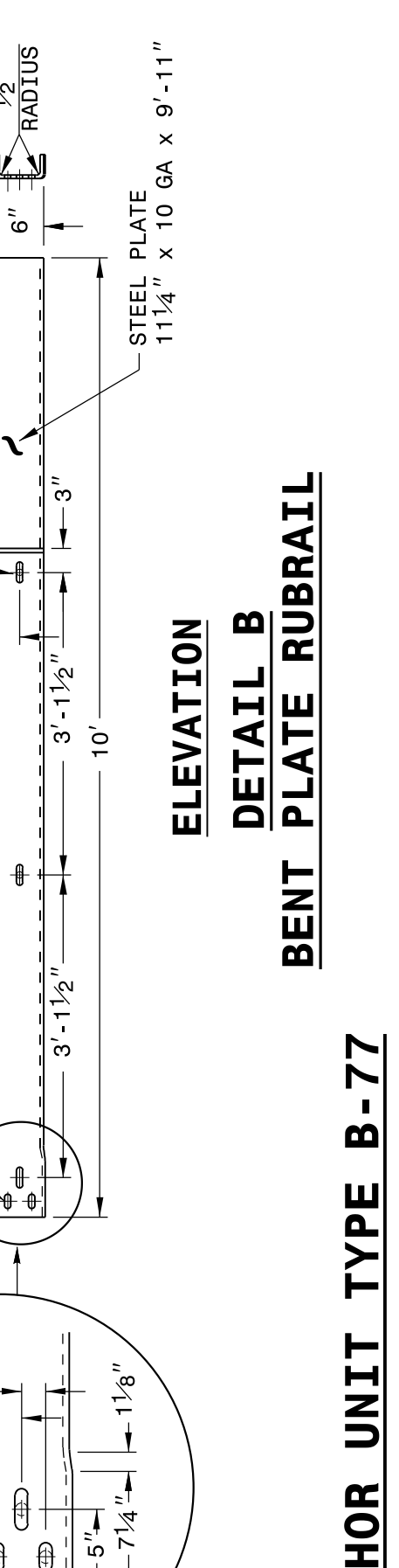
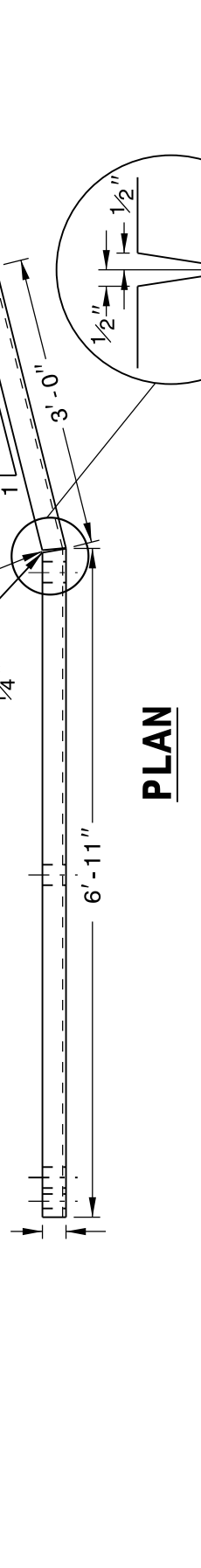
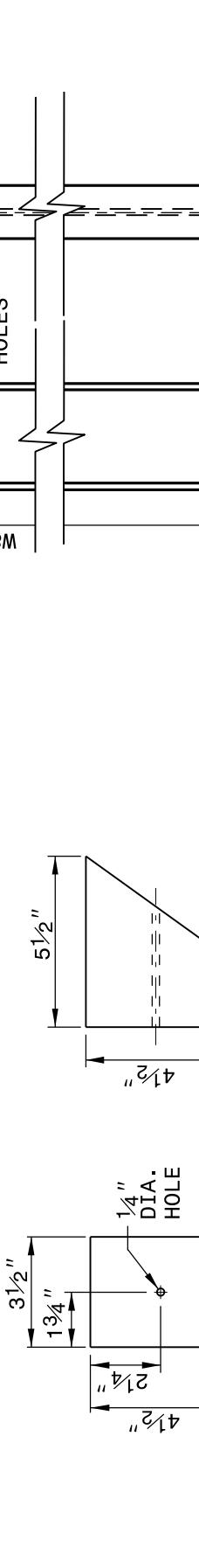
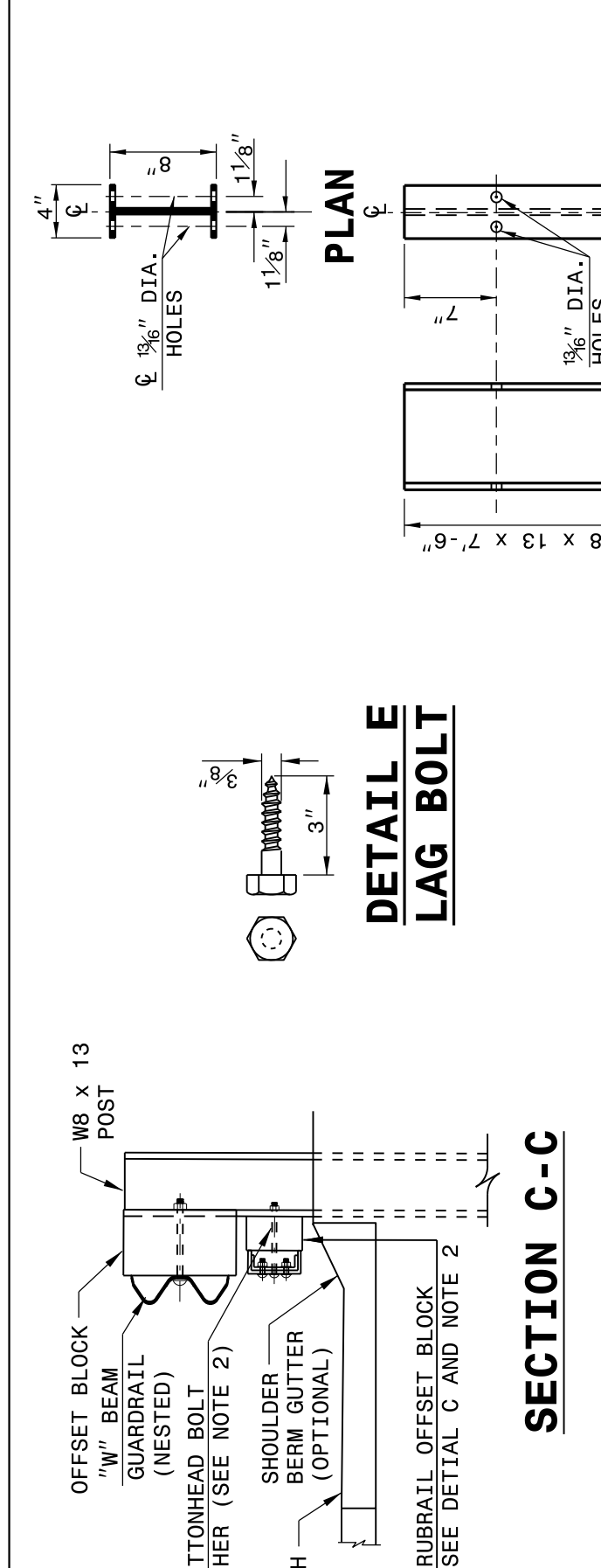
ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNIT
 GUARDRAIL ANCHOR UNIT TYPE B-77
 FOR F-SHAPE BARRIER

SHEET 5 OF 7
862D03

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ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNIT
 GUARDRAIL ANCHOR UNIT TYPE B-77
 FOR F-SHAPE BARRIER

SHEET 5 OF 7
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ROADWAY DETAIL DRAWING FOR
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 GUARDRAIL ANCHOR UNIT TYPE B-77
 FOR F-SHAPE BARRIER

SHEET 5 OF 7
862D03

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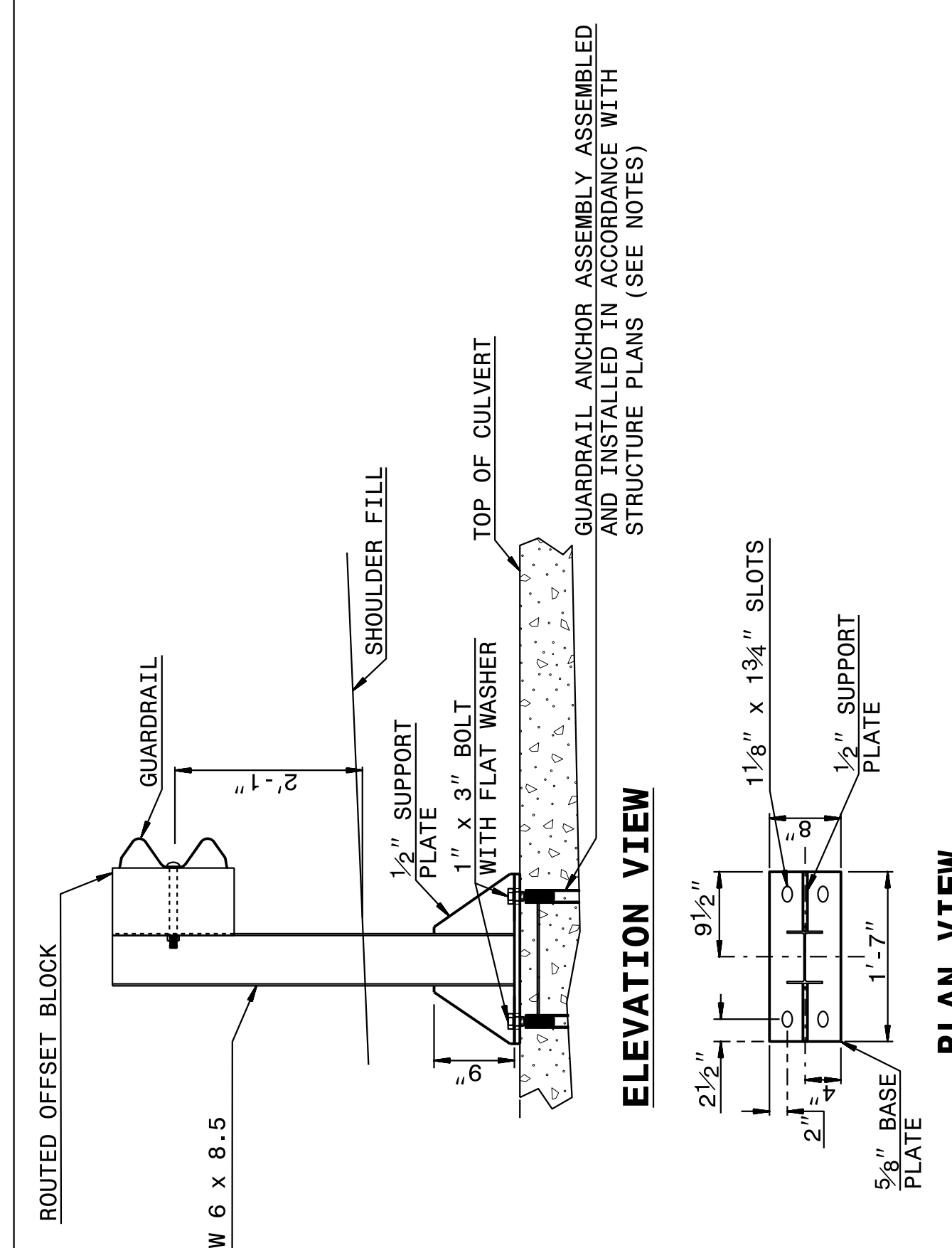
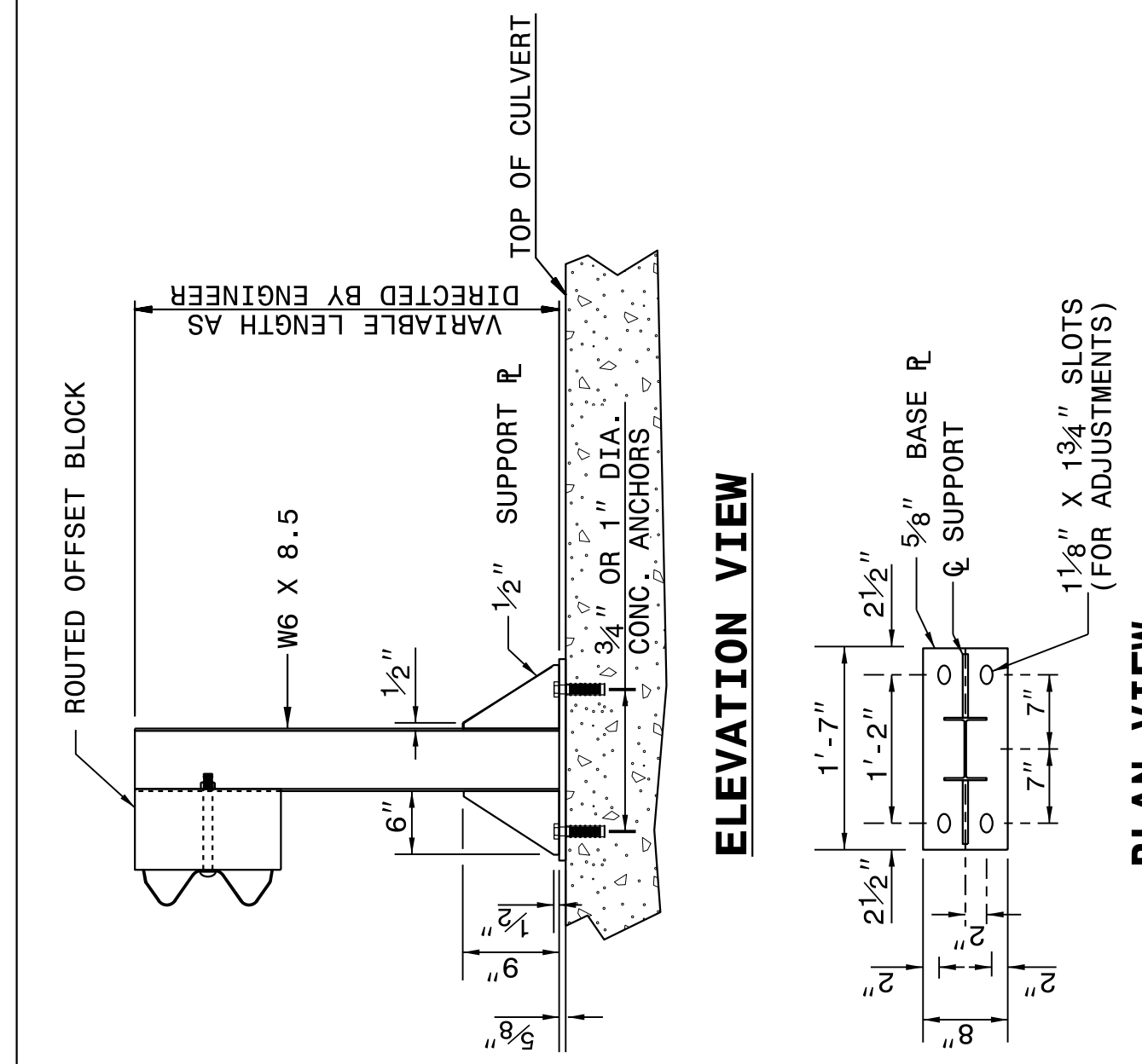


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ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
 ANCHORAGE FOR GUARDRAIL POST ON BOX CULVERT

SHEET 7 OF 7
862D03



NOTES FOR:
 -USE CONCRETE ANCHORS CONSISTING OF A STUD BOLT WITH NUT AND WASHER. USE STUDS THREADED ON ONE END AND HAVING AN EXPANDED WEDGE ASSEMBLY POSITIONED AROUND A TAPERED AREA AT THE OTHER END. USE ANCHORS WHICH PROVIDE A MINIMUM SAFE HOLDING POWER OF 2875 LBS. FOR A 3/4" OR 1" DIAMETER BOLT. CALCULATE HOLDING POWER BASED ON 1/4 THE ACTUAL HOLDING POWER OF THE ANCHOR IN 3500 PSI CONCRETE AS DETERMINED BY AN APPROVED COMMERCIAL TESTING LABORATORY.
 -USE ANCHORS GALVANIZED IN ACCORDANCE WITH A.S.T.M. A-153. SIZE HOLES FOR THE CONCRETE ANCHORS IN ACCORDANCE WITH THE ANCHOR MANUFACTURER'S RECOMMENDATIONS. DRILL HOLES WITH A CARBIDE OR DIAMOND TIPPED MASONRY BIT POWERED BY A ROTARY OR ROTARY IMPACT DRILL. NO OTHER IMPACT TOOLS WILL BE PERMITTED. DRILL HOLES VERTICALLY. FURNISH DOCUMENTATION OF HOLE SIZE RECOMMENDED FOR THE SPECIFIED ANCHOR TO THE ENGINEER BEFORE DRILLING HOLES. THOROUGHLY CLEAN HOLES FOR ANCHORS OF ALL CONCRETE CHIPS, DUST, GREASE, OIL, ETC. BEFORE ANCHORS ARE INSTALLED. REPAIR ALL DAMAGE CAUSED BY THIS WORK TO THE SATISFACTION OF THE ENGINEER.

NEW STRUCTURES:
 -ATTACH POST TO INSERT ASSEMBLY UNITS (USING ANCHOR BOLTS SUPPLIED WITH INSERTS) WHICH HAVE BEEN CAST INTO THE STRUCTURE DURING CONSTRUCTION.

EXISTING STRUCTURES:
 -USE CONCRETE ANCHORS CONSISTING OF A STUD BOLT WITH NUT AND WASHER. USE STUDS THREADED ON ONE END AND HAVING AN EXPANDED WEDGE ASSEMBLY POSITIONED AROUND A TAPERED AREA AT THE OTHER END. USE ANCHORS WHICH PROVIDE A MINIMUM SAFE HOLDING POWER OF 2875 LBS. FOR A 3/4" OR 1" DIAMETER BOLT. CALCULATE HOLDING POWER BASED ON 1/4 THE ACTUAL HOLDING POWER OF THE ANCHOR IN 3500 PSI CONCRETE AS DETERMINED BY AN APPROVED COMMERCIAL TESTING LABORATORY.

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ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
 ANCHORAGE FOR GUARDRAIL POST ON BOX CULVERT

SHEET 7 OF 7
862D03

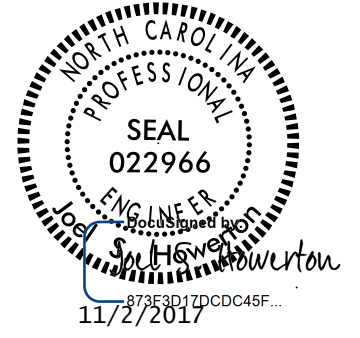
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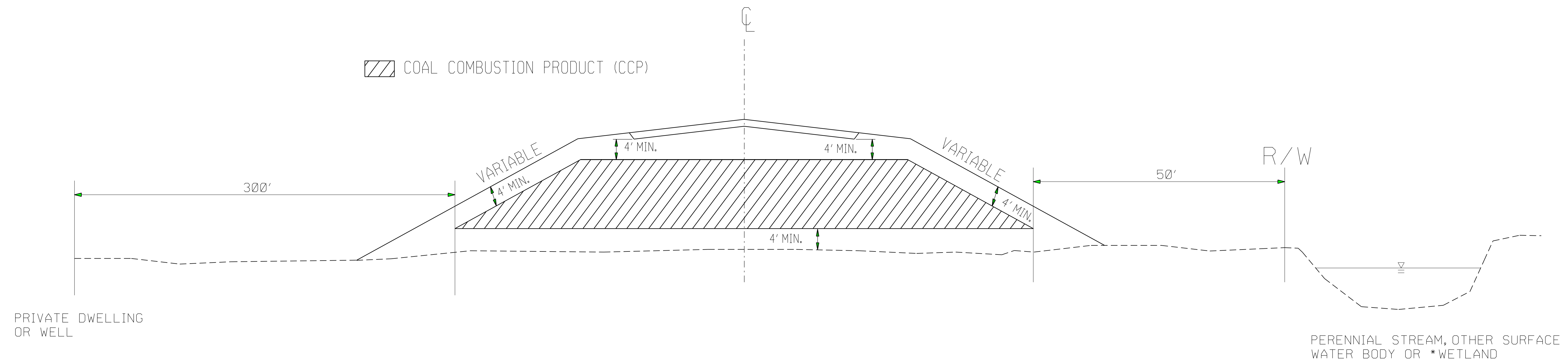
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FILE SPEC.: _____	



COAL COMBUSTION PRODUCT PLACEMENT



PRIVATE DWELLING
OR WELL

PERENNIAL STREAM, OTHER SURFACE
WATER BODY OR *WETLAND

*(OBTAIN PERMISSION FROM ARMY
CORPS OF ENGINEERS)

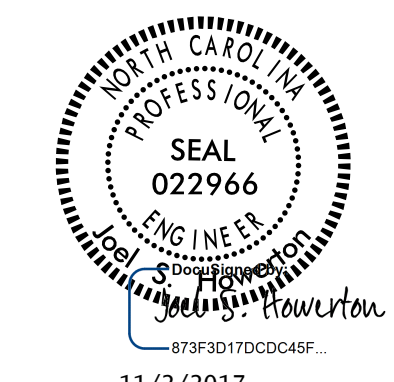
PLACE CCP IN HATCHED AREA IN ACCORDANCE
WITH THE PROJECT SPECIAL PROVISIONS

PLACE CCP A MINIMUM OF 5' ABOVE
SEASONAL HIGH GROUND WATER

PLACE AT LOCATIONS AS APPROVED BY THE ENGINEER

PLACE SOIL BORROW MATERIAL ON THE OUTSIDE
OF CCP AS EACH LIFT OF CCP IS PLACED

DOCUMENT NOT CONSIDERED FINAL
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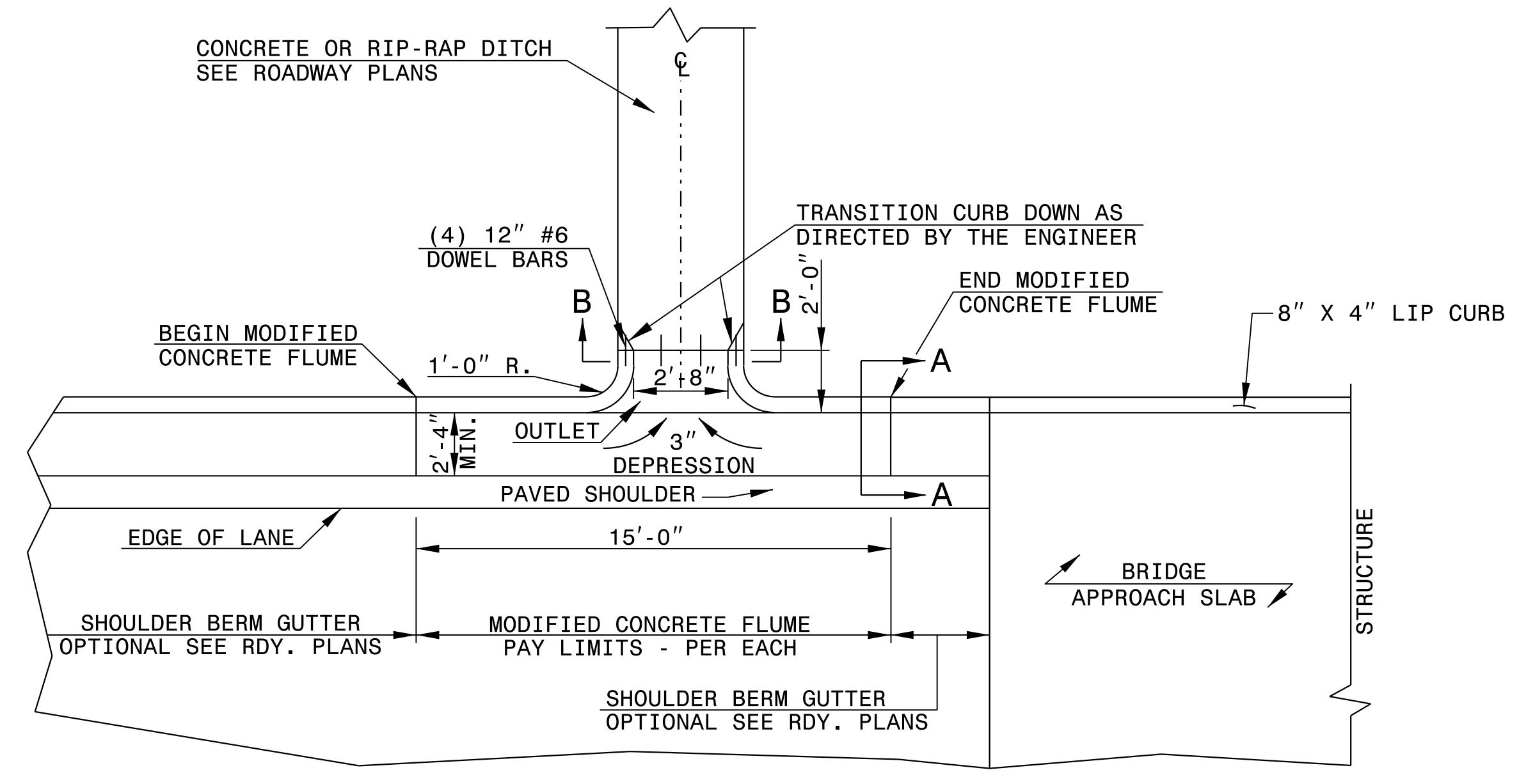
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Office 919-707-6950 FAX 919-250-4119	
COAL COMBUSTION PRODUCT PLACEMENT DETAIL	
ORIGINAL BY: J.S.H.	DATE: 3/16/15
MODIFIED BY:	DATE:
CHECKED BY:	DATE:
FILE SPEC.: joel/coal combustion material detail.dgn	

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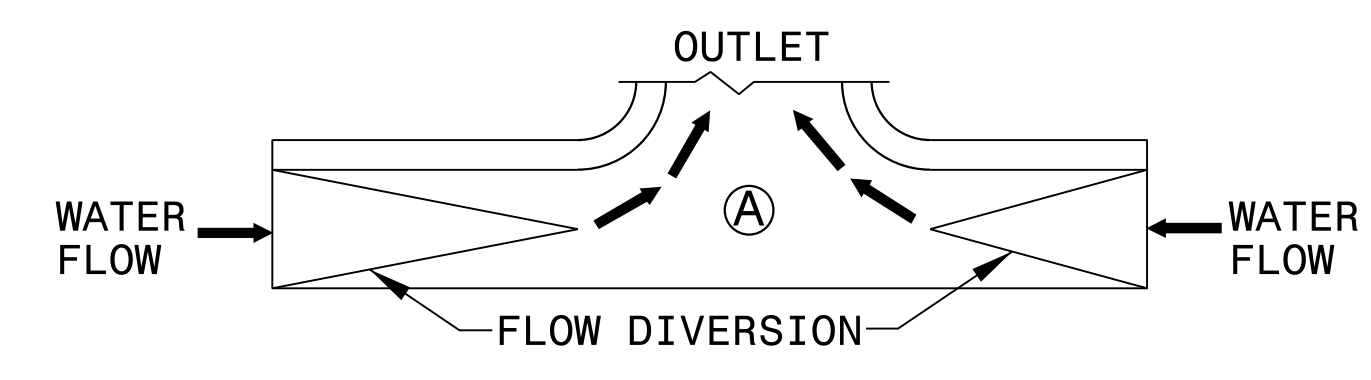
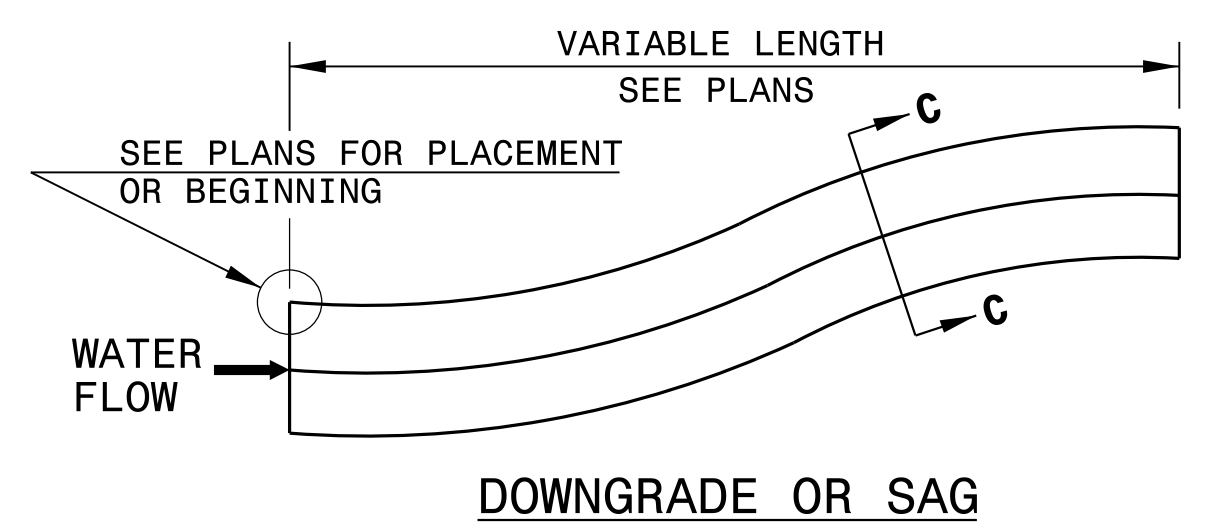
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ENGLISH DETAIL DRAWING FOR
MODIFIED CONCRETE FLUME
 WITH CONCRETE OR RIP-RAP DITCH

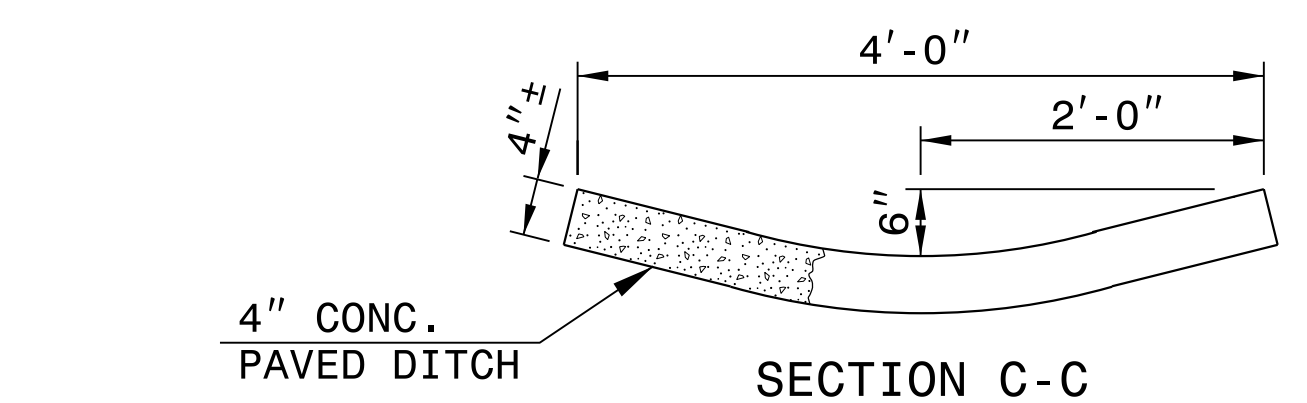
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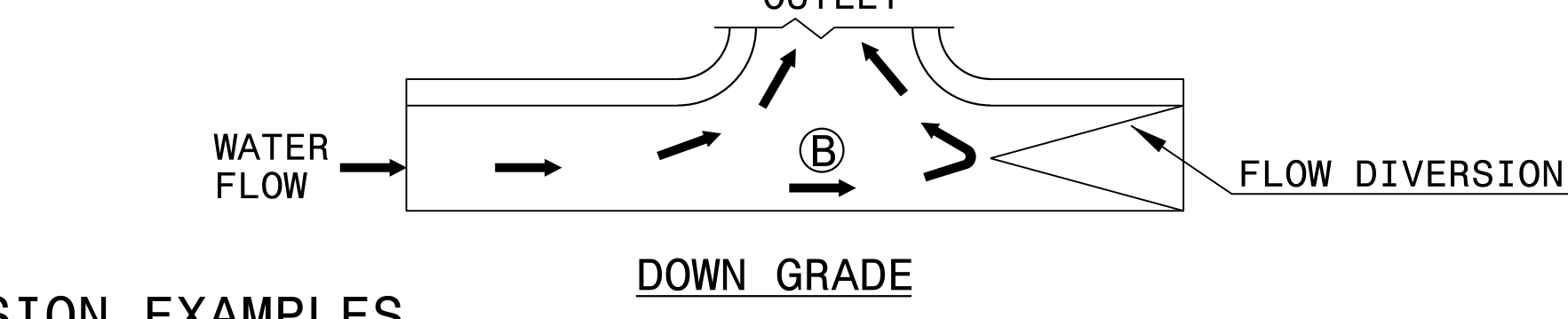
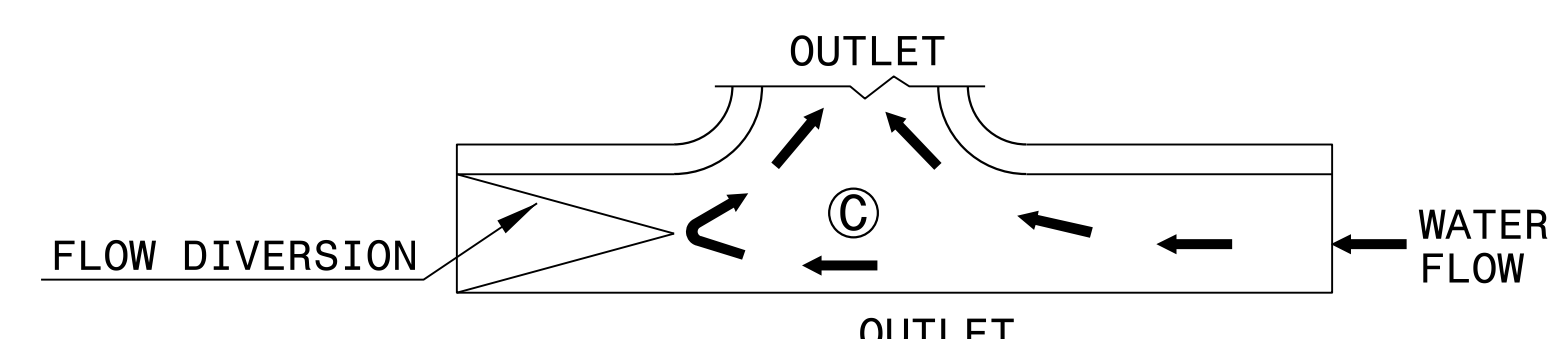
PLAN VIEW



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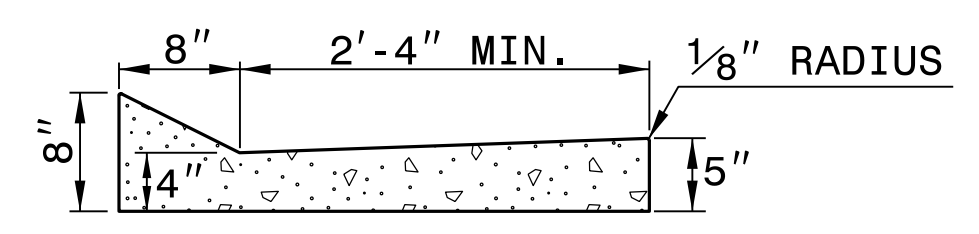


SECTION C-C

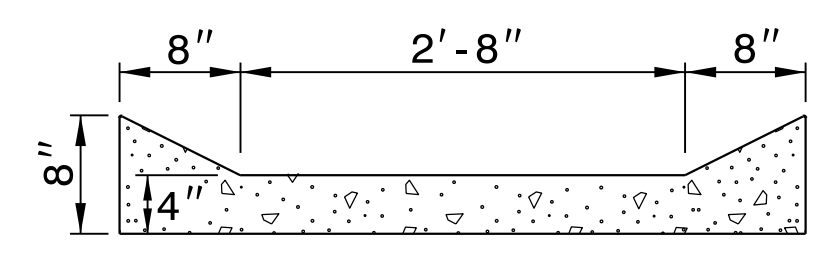


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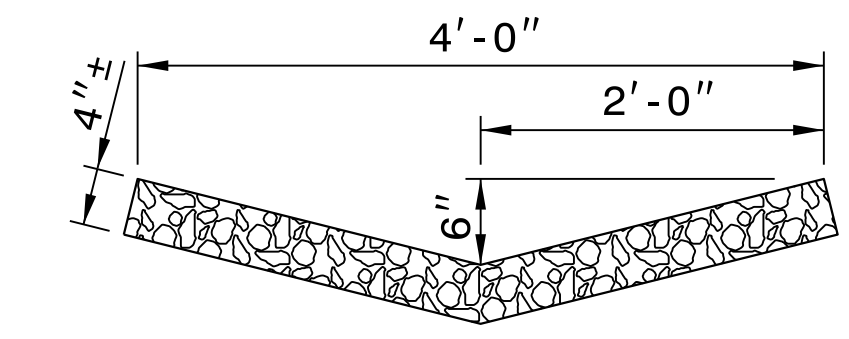
FLOW DIVERSION EXAMPLES



SECTION A-A



SECTION B-B



RIP-RAP LINED DITCH

NOTES:

- CONSTRUCT MODIFIED CONCRETE FLUME AND SHOULDERS BERM GUTTER IN ACCORDANCE WITH THIS DETAIL.
- CONSTRUCT CONCRETE DITCH IN ACCORDANCE WITH STD. DWG. NO. 850.01.
- CONSTRUCT RIP RAP LINED DITCH IN ACCORDANCE WITH THIS DETAIL, IF CALLED FOR IN PLANS.
- CONCRETE OR RIP RAP LINED DITCH SHALL BE THE TYPE AND LENGTH SPECIFIED BY THE ROADWAY PLANS. THE DITCH SHALL TERMINATE AS SHOWN ON THE PLANS. IF NO TERMINATION IS INDICATED PLACE RIP-RAP AT THE END OF THE DITCH AS INDICATED BY STD. DWG. 876.02 FOR AN 18" PIPE. TRANSITIONS FROM THE DITCH TO TERMINATION SHALL BE AS DIRECTED BY THE ENGINEER.
- MODIFICATIONS SHALL BE AS DICTATED BY SITE CONDITIONS AND DIRECTED BY THE ENGINEER.

STATE OF NORTH CAROLINA
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ENGLISH DETAIL DRAWING FOR
MODIFIED CONCRETE FLUME
 WITH CONCRETE OR RIP-RAP DITCH

SHEET 1 OF 1
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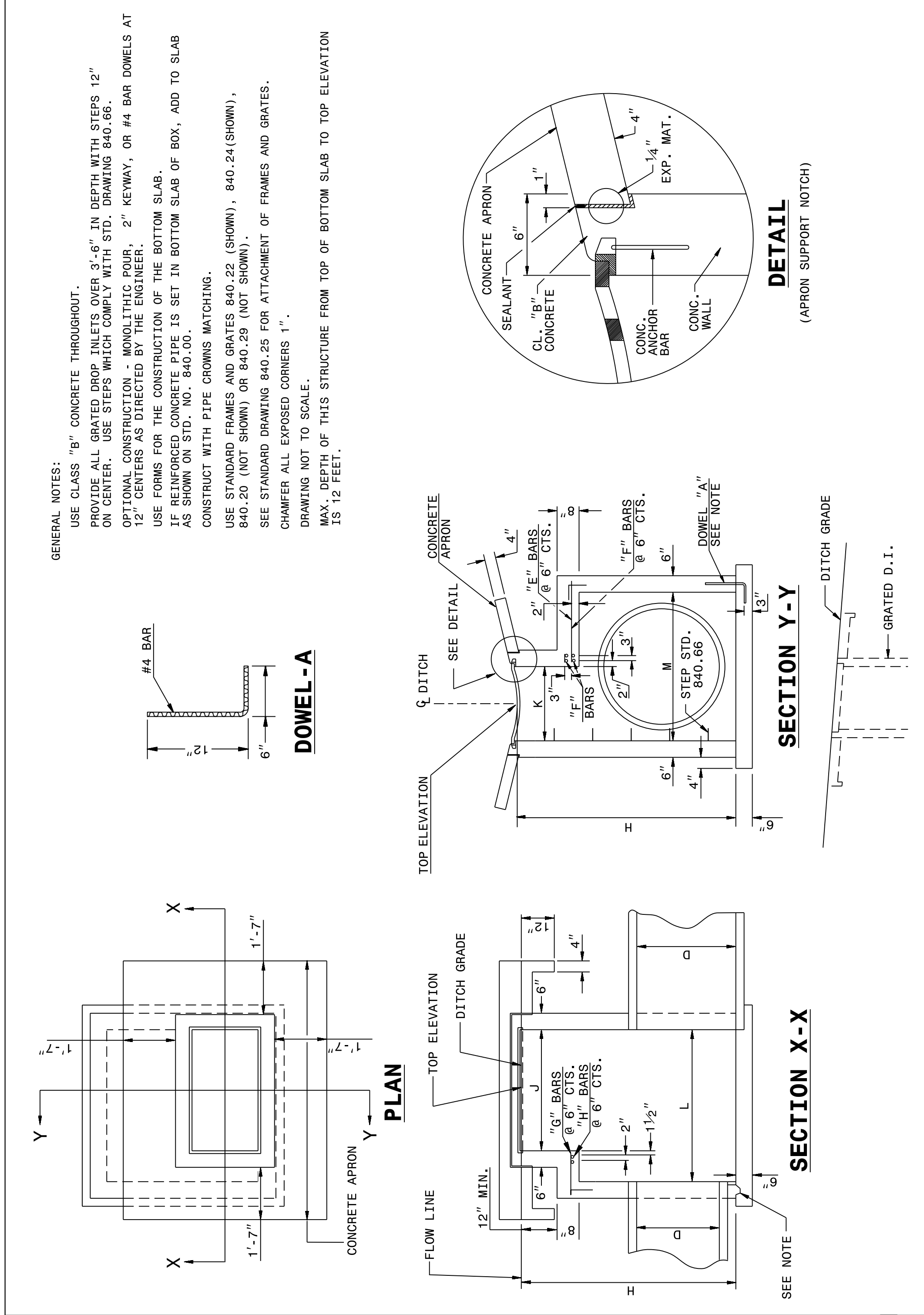
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ORIGINAL BY: E.E. Ward	DATE: Apr. 2002
MODIFIED BY: E.E. Ward	DATE: July 2004
CHECKED BY:	DATE:
FILE SPEC.:	

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

ENGLISH DETAIL DRAWING FOR CONCRETE GRATED DROP INLET TYPE 'A' MINIMUM DEPTH 12" THRU 72" PIPE

SHEET 1 OF 2
840d17



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

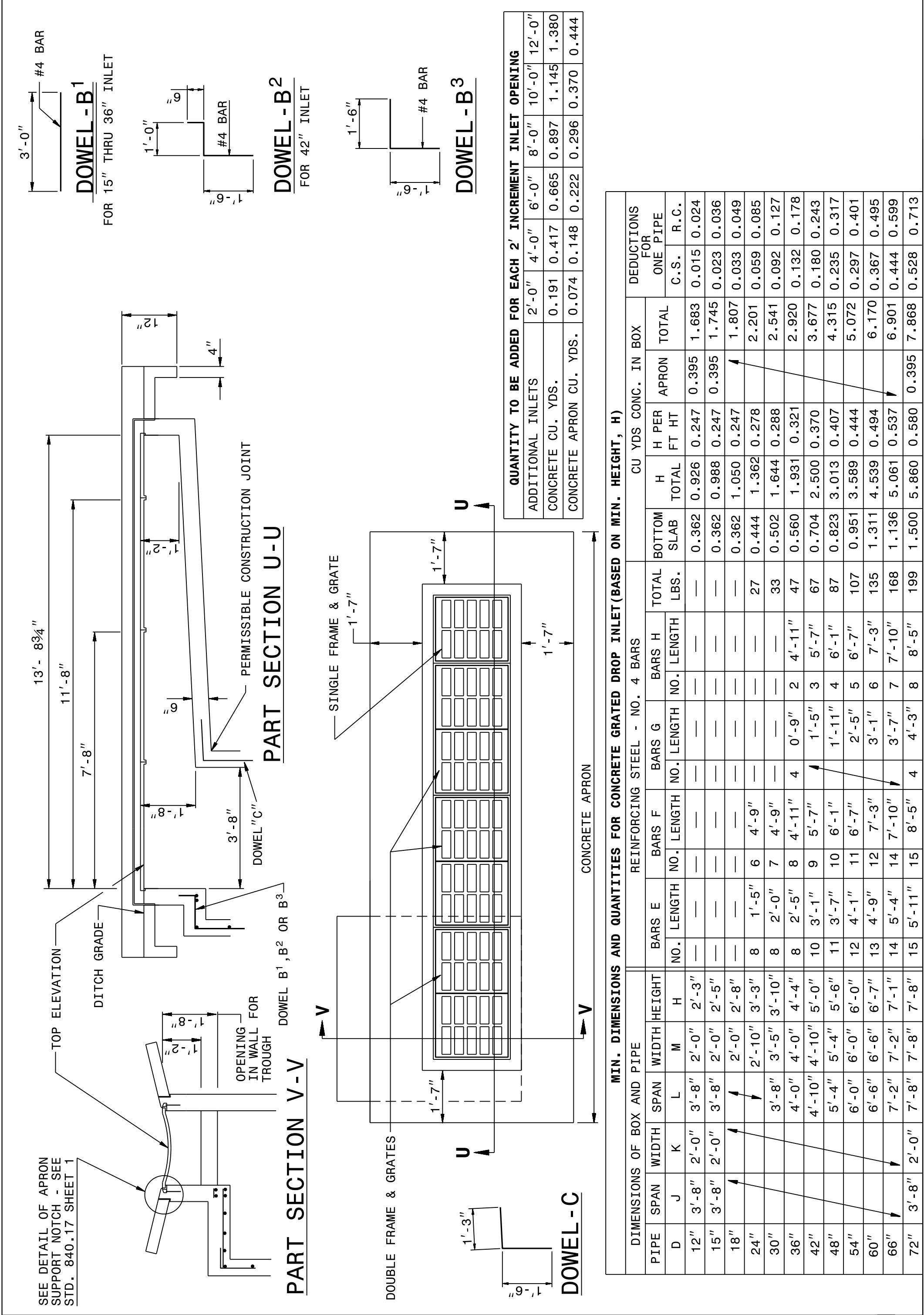
ENGLISH DETAIL DRAWING FOR CONCRETE GRATED DROP INLET TYPE 'A' MINIMUM DEPTH 12" THRU 72" PIPE

SHEET 1 OF 2
840d17

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

ENGLISH DETAIL DRAWING FOR CONCRETE GRATED DROP INLET TYPE 'A' MINIMUM DEPTH 12" THRU 72" PIPE

SHEET 2 OF 2
840d17



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

ENGLISH DETAIL DRAWING FOR CONCRETE GRATED DROP INLET TYPE 'A' MINIMUM DEPTH 12" THRU 72" PIPE

SHEET 2 OF 2
840d17

I:\SEP-2017\1155\port\assets\Special Details\jhowerton\840d17 Minimum Depth Type A.dgn
 jhowerton At 11:55 AM 9/25/2015

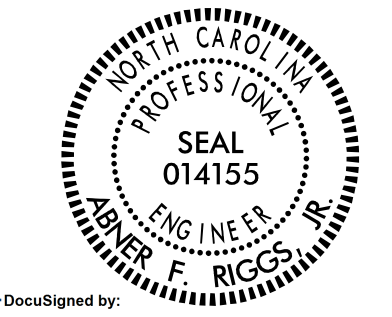
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

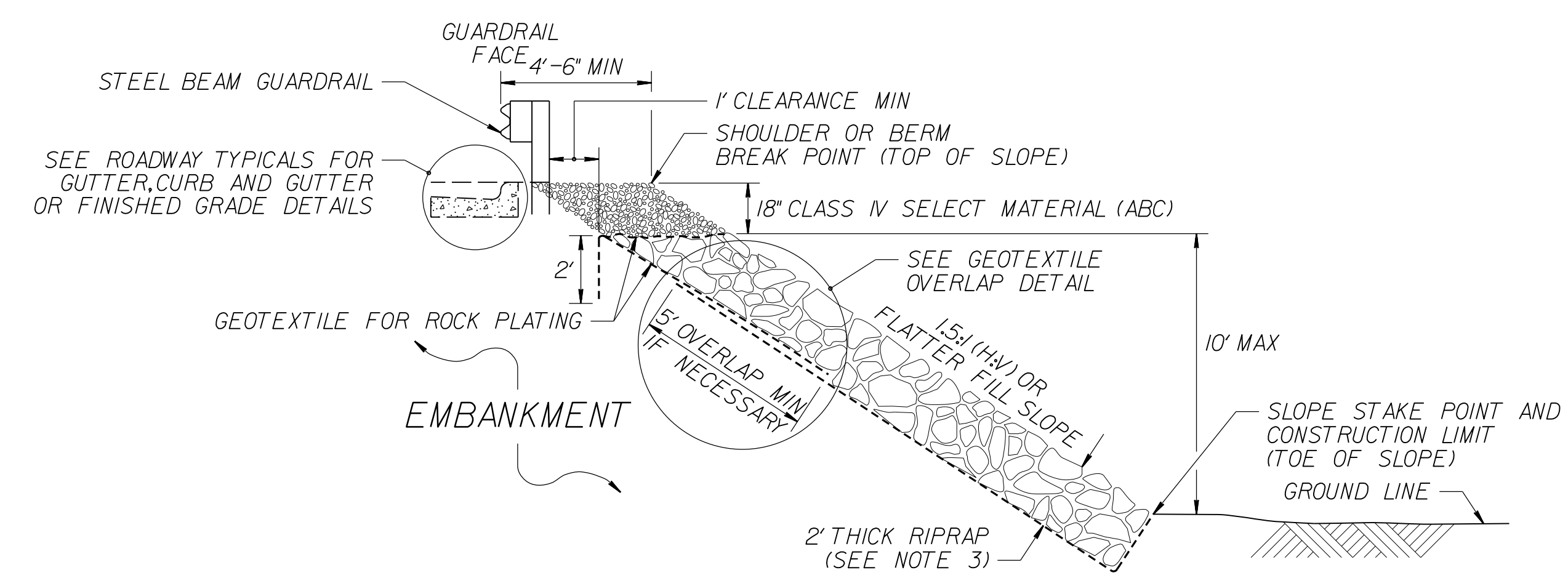
CONTRACT STANDARDS AND DEVELOPMENT UNIT
 Office 919-707-6950 FAX 919-250-4119

SEE TITLE BLOCK

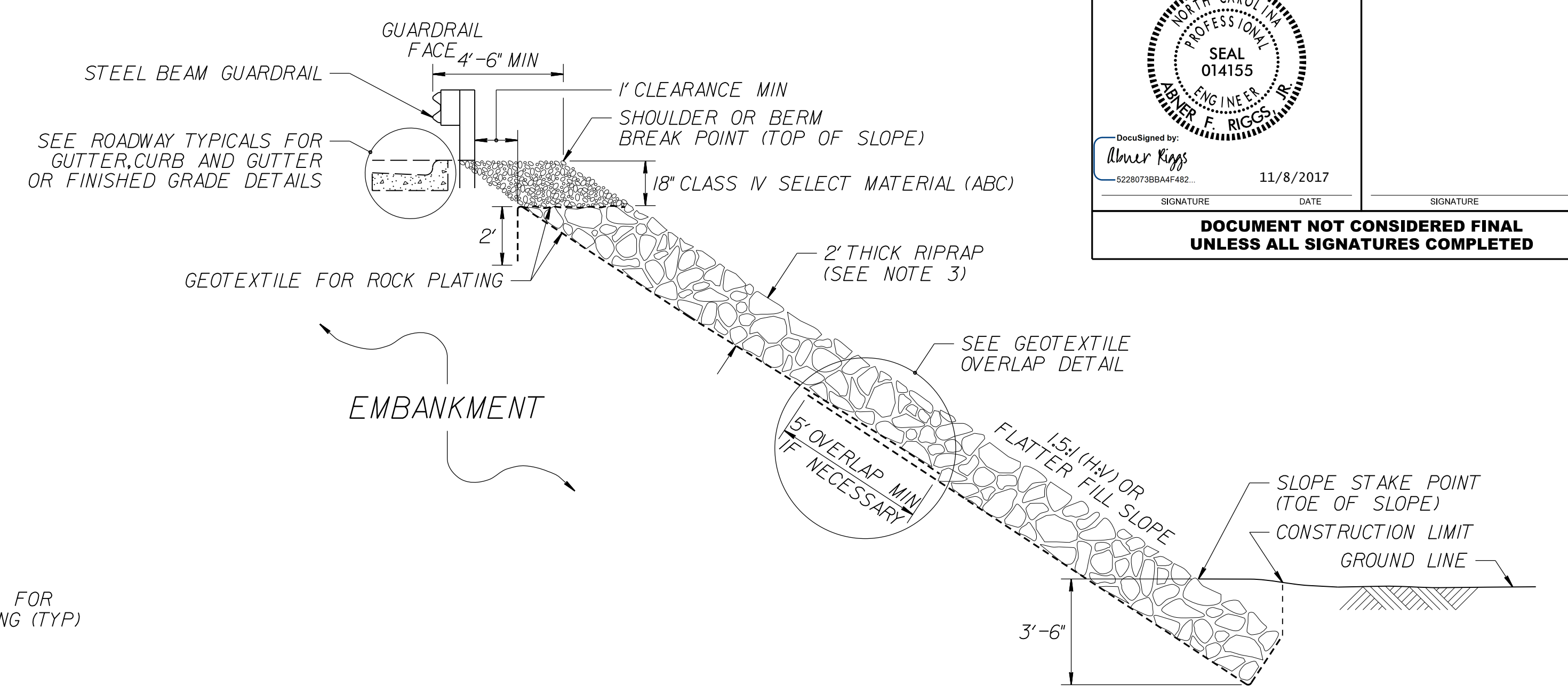
ORIGINAL BY: J. Howerton DATE: 1/22/14
 MODIFIED BY: DATE:
 CHECKED BY: DATE:
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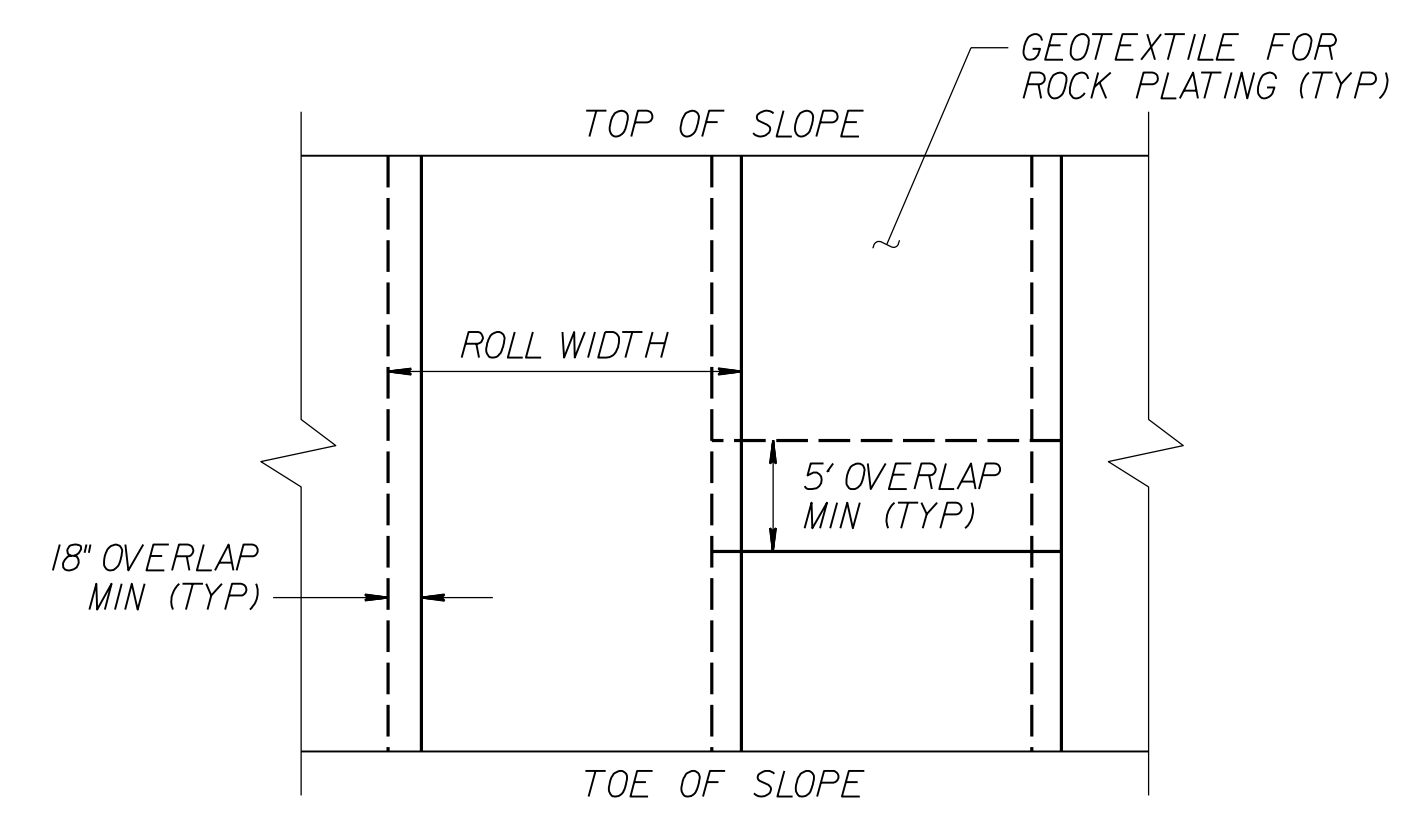
PROJECT REFERENCE NO. 41665.7A		SHEET NO. 2G-1	
GEOTECHNICAL ENGINEER 		ENGINEER _____ SIGNATURE DATE	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			



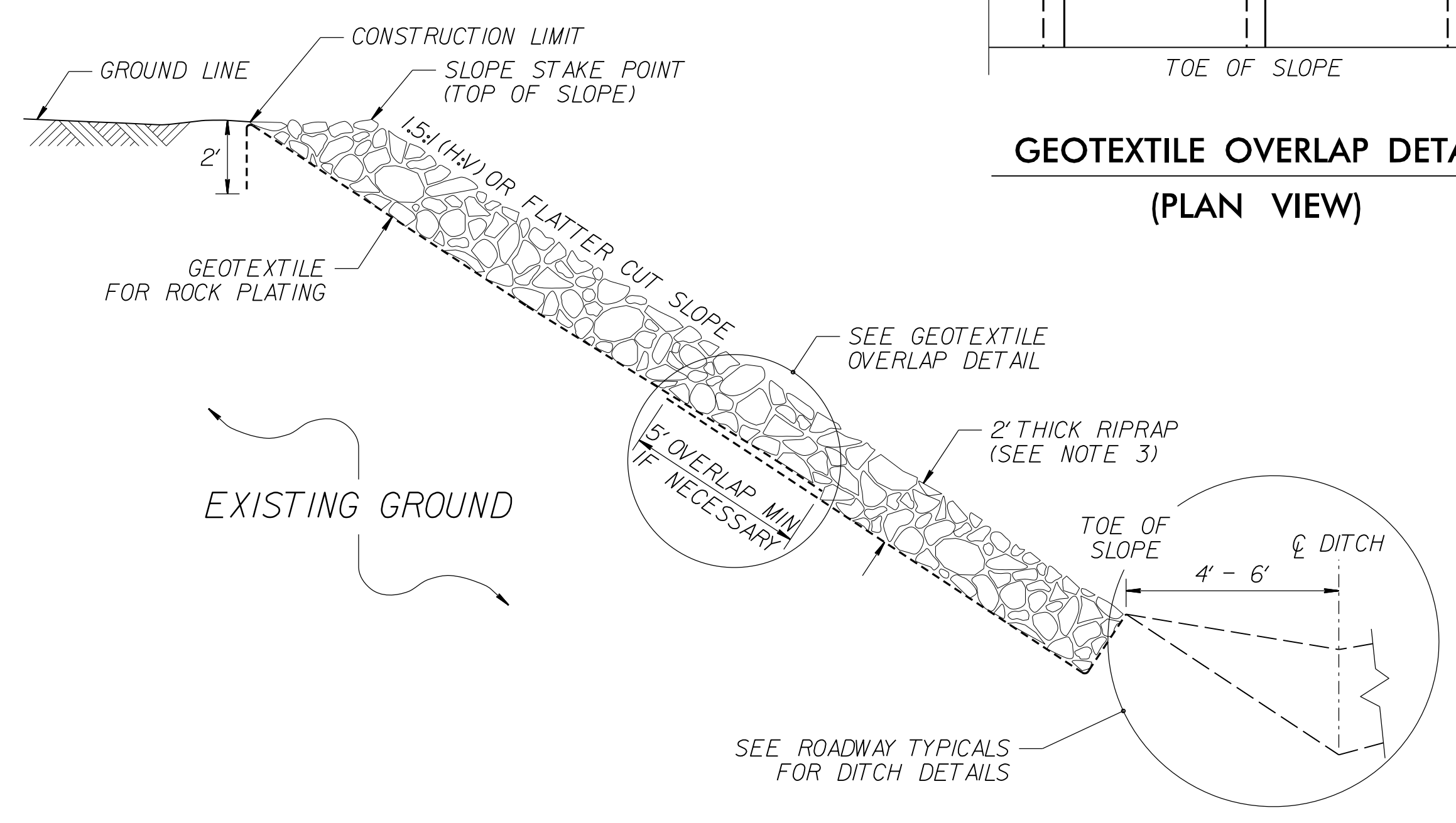
ROCK PLATING DETAIL NO. 1 – TYPICAL SECTION



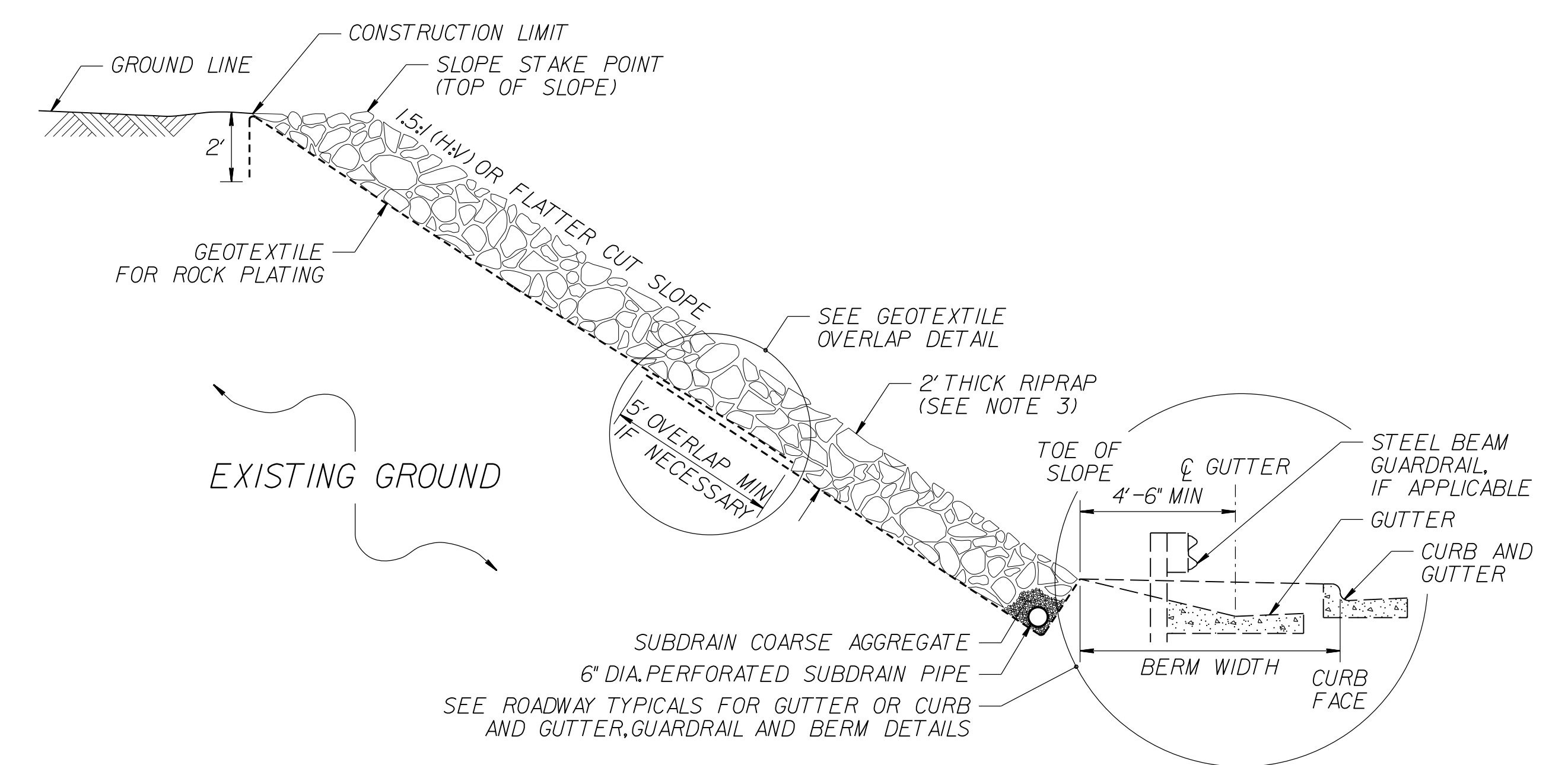
ROCK PLATING DETAIL NO. 2 – TYPICAL SECTION



GEOTEXTILE OVERLAP DETAIL (PLAN VIEW)

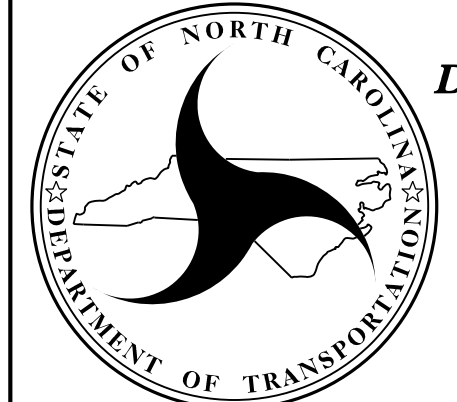


ROCK PLATING DETAIL NO. 3 – TYPICAL SECTION



ROCK PLATING DETAIL NO. 4 – TYPICAL SECTION

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

 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT	STANDARD DETAIL NO. 1802.01
	STANDARD ROCK PLATING

DATE: 2-19-13

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK

IN CUBIC YARDS

STATION	STATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT +%	BORROW	WASTE
B-008						
-L- 16+50.00	-L- 21+06.62	175		4,110	3,935	
-L- 22+06.12	-L- 25+30.00	146		2,854	2,708	
	SUBTOTAL	321		6,964	6,643	
-L2- 106+20	-L2- 110+75	355		371	16	
	SUBTOTAL	355		371	16	0
B-129-130						
-L1-&-L2-102+50	-L1-&-L2-106+76.15	211		4,106	3,895	
-L1-&-L2-107+17.10	-L1-&-L2-111+50	316		2,428	2,112	
	SUBTOTAL	527		6,534	6,007	0
-Y-10+85	-Y-17+00	704		81		623
	SUBTOTAL	704		81		623
	TOTAL	1,907		13,950	12,666	623
MATERIAL FOR SHOULDER CONSTRUCTION LOSS DUE TO CLEARING & GRUBBING WASTE IN LIEU OF BORROW		-100		863	863	100
						-623
PROJECT TOTAL		1,807		14,813	13,006	
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT						650.3
GRAND TOTAL		1,807			13,656	
SAY		1,865			13,700	

PAVEMENT REMOVAL SUMMARY

IN SQUARE YARDS

SURVEY LINE	Station	Station	LOCATION LT/RT/CL	ASPHALT REMOVAL
Br. 008				
-L-	19+15	21+06.62	LT & RT	514.16
-L-	22+06.12	23+00	LT & RT	247.17
Br. 129 & 130				
-L1-	104+95	106+18.12	LT&RT	507.19
-L1-	107+17.12	108+25	LT&RT	468.11
-L2-	105+45	106+76.15	LT&RT	576.35
-L2-	107+75.15	108+65	LT&RT	366.68
TOTAL:				2679.66
SAY:				2690

SHOULDER BERM GUTTER SUMMARY

LINE	Station	Station	LENGTH
BRIDGE 008			
-L-	17+20	20+70.07	350.07
-L-	19+55	20+98.67	143.67
-L-	22+45.05	25+05	259.95
BRIDGE 129 - 130			
-L1-	104+95	105+72.51	77.51
-L1-	105+55	106+10.51	55.51
-L1-	107+18.68	107+55	36.32
-L1-	107+56.68	108+12	55.32
-L2-	105+80	106+36.57	56.57
-L2-	106+12	106+74.57	62.57
-L2-	107+86.74	108+38	51.26
-L2-	108+20.71	108+55	34.29
-Y-	15+08	15+80	72
TOTAL:			1255.04
SAY:			1260

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

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

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 SHOULDER WIDTH	FLARE LENGTH		W		ANCHORS					IMPACT ATTENUATOR		SINGLE FACED CONCRETE BARRIER	REMOVE EXISTING GUARDRAIL	REMOVE & STOCKPILE EXISTING GUARDRAIL	REMARKS		
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	XI MOD	XI	GREU TL-3	B-77	TYPE III	CAT-1	G					NG	
L	17+29.92	21+23.67	LT	393.75			21+23.67		4	10																Br.008	
L	16+63.82	20+95.07	RT	431.25			20+95.07		4	10																Br.008	
L	21+91.46	24+41.46	RT	250				21+91.46	4	10																Br.008	
L	22+20.06	25+32.56	LT	312.5				22+20.06	4	10																Br.008	
L1	99+66.26	105+97.51	RT	631.25			100+91.26		10	10																Br. 129	
L1	103+54.26	106+35.51	LT	281.25			106+35.51		4	4																Br. 129	
L1	106+93.68	112+06.18	RT	512.5				112+00	10	10																Br. 129	
L1	107+31.68	109+87.93	LT	256.25					4	4																Br. 129	
L2	101+12.07	106+99.57	LT	587.5				101+12.07	10	12																Br. 130	
L2	104+55.32	106+61.57	RT	206.25				106+61.57	4	6																Br. 130	
L2	107+89.90	109+71.15	RT	181.25			109+71.15				50															Br. 008	
L2	106+68.69	108+49.94	LT	181.25			108+49.94				50															Br. 008	
L2	107+95.74	111+01.99	LT	306.25			107+95.74		10	12																Br. 130	
L2	107+57.74	109+88.99	RT	231.25																						Br. 130	
Y	13+71.65	16+41.63	RT	187.5	56																						
Y	11+42.45	15+36.27	LT	337.5	56.5																						
SUBTOTAL				5287.5	112.5																						
GREU TL-3	10 @ 50			-500																							
TYPE III	12 @ 18.75			-225																							
B-77	6 @ 18.75			-112.5																							
CAT-1	4 @ 6.25			-25																							
SUBTOTAL				-862.5																							
TOTAL				4425	112.5																						10 ADDITIONAL GUARDRAIL

COMPUTED BY: _____ RIGGS, A.F. DATE: Nov-17
 CHECKED BY: _____ NASH, A.A. DATE: Nov-17

PROJECT NO. 41665.7A SHEET NO. 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
Br.008				SD	200
Br. 129-130				SD	400
CONTINGENCY					TOTAL LF: 600

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

SUMMARY OF BRIDGE WAITING PERIODS

Bridge Description	End Bent/ Bent No.	MONTHS
BR.ON US 301 OVER I-95 BUS.LOOP SB AT 22+57.23	1&2	1

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

LINE	Station	Station	Aggregate Type* ASU/AST	Aggregate Thickness INCHES	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Soil Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
Br 008			ASU	12	100	200	300		
Br 129 & 130			ASU	12	100	200	300		
CONTINGENCY					TOTAL CY/TONS/SY:	200	400*	0	0

ASU = Aggregate Subgrade, AST = Aggregate Stabilization

*Total square yards of "Geotextile for Soil Stabilization" is only the estimated quantity for ASU/AST and may only represent a portion of the geotextile quantity shown in the Item Sheets of the Proposal.

SUMMARY OF ROCK PLATING

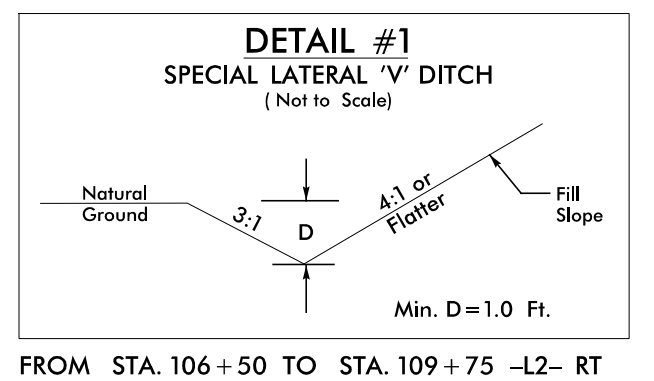
LINE	Beginning Slope (H:V)	Approx. Station	Ending Slope (H:V)	Approx. Station	Location LT/RT	Rock Plating Detail No. 1/2/3/4	Riprap Class* 1/2/B	Rock Plating SY
-L- Br.008	2:1	17+50	2:75	21+00	LT	2		450
-L- Br.008	2:75	22+00	2:1	23+50	LT	2		400
-L- Br.008	2:1	19+00	2:75	21+00	RT	2		800
-L- Br.008	2:75	22+00	2:1	24+00	RT	2		400
-L1-Br.129-130	2:1	107+40	2:1	111+50	RT	2		600
-L2-Br.129-130	2:1	103+00	2:1	106+25	LT	2		750
-L2-Br.129-130	2:1	108+50	2:1	109+00	LT	2		25
TOTAL SY:								3425

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

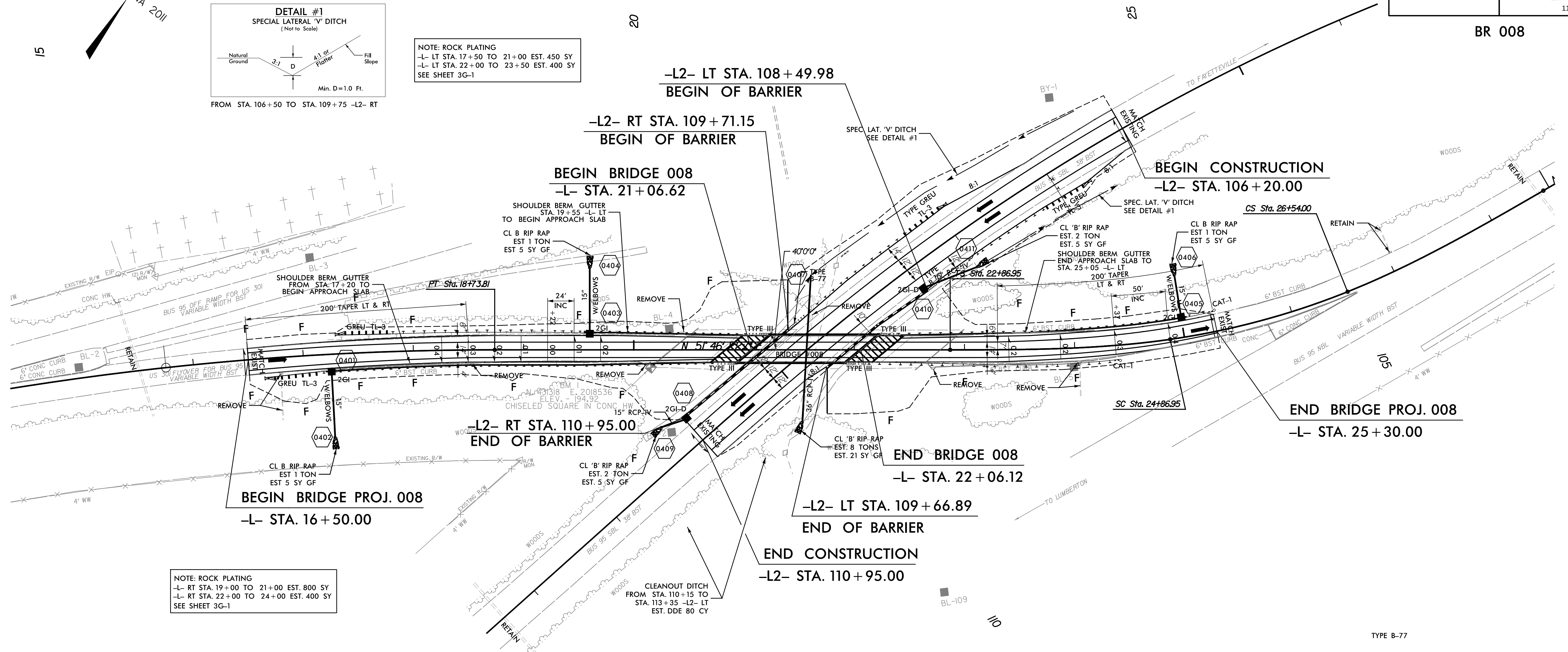


BR 008

-L-			
PI Sta 14+97.77	PIs Sta 24+20.43	PI Sta 25+70.87	PIs Sta 27+20.80
$\Delta = 15^\circ 41' 00.0''$ (RT)	$\Theta_s = 8^\circ 11' 06.4''$	$\Delta = 13^\circ 40' 23.1''$ (LT)	$\Theta_s = 8^\circ 11' 06.4''$
D = 2'04'19.8"	Ls = 200.00'	D = 8'11'06.4"	Ls = 200.00'
L = 756.85'	LT = 133.48'	L = 167.05'	LT = 133.48'
T = 380.81'	ST = 66.80'	T = 83.92'	ST = 66.80'
R = 2,765.00'		R = 700.00'	
SE = SEE PLAN		SE = 0.04	

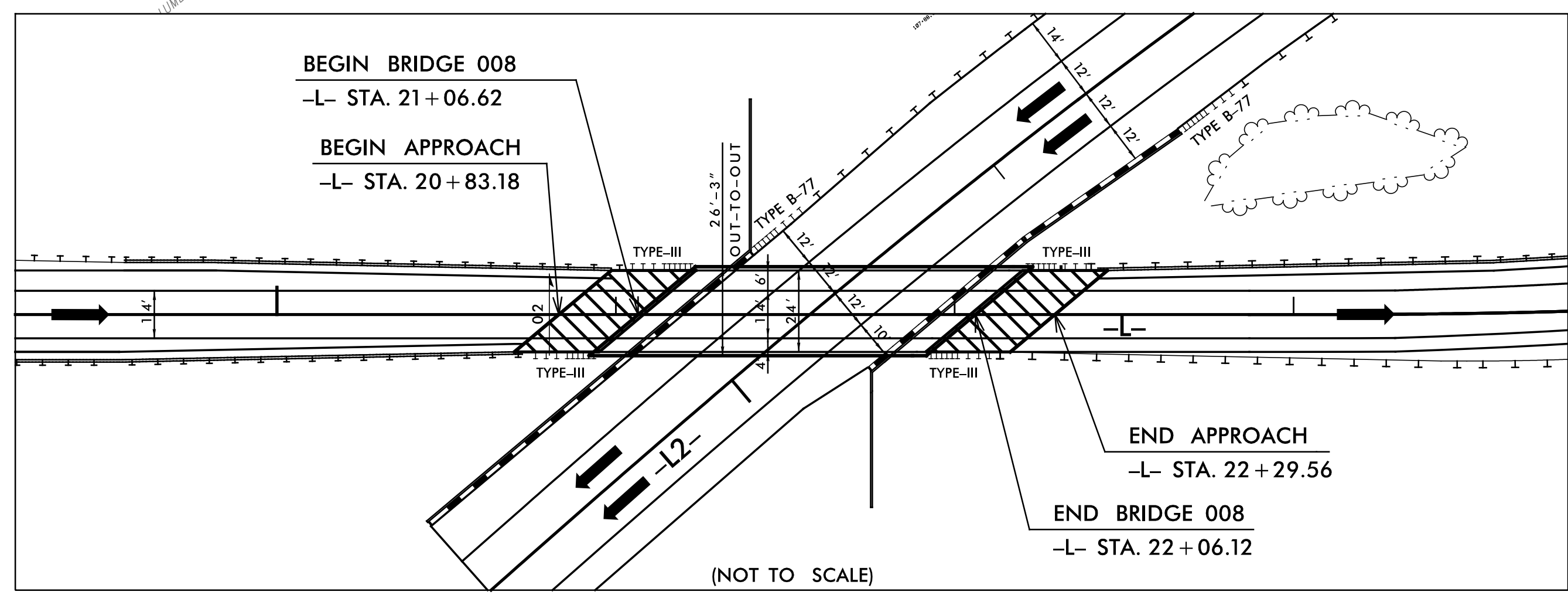


NOTE: ROCK PLATING
-L- LT STA. 17+50 TO 21+00 EST. 450 SY
-L- LT STA. 22+00 TO 23+50 EST. 400 SY
SEE SHEET 3G-1



NOTE: ROCK PLATING
-L- RT STA. 19+00 TO 21+00 EST. 800 SY
-L- RT STA. 22+00 TO 24+00 EST. 400 SY
SEE SHEET 3G-1

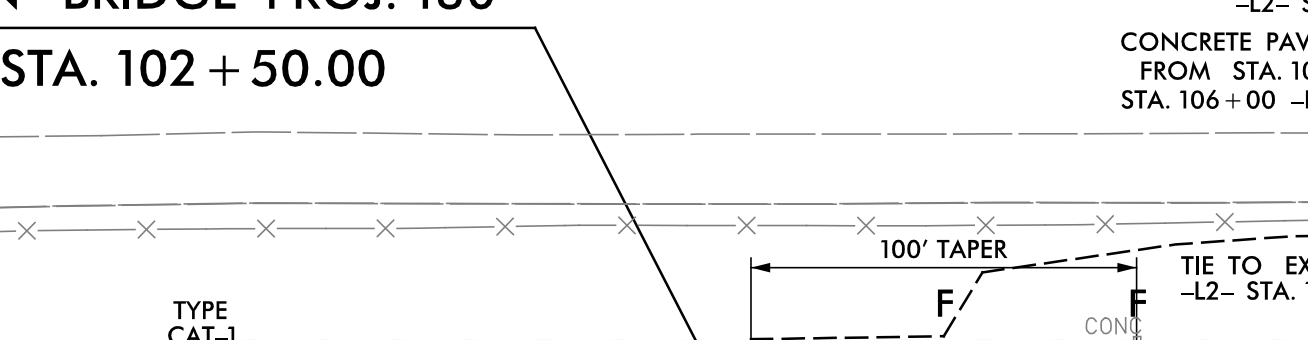
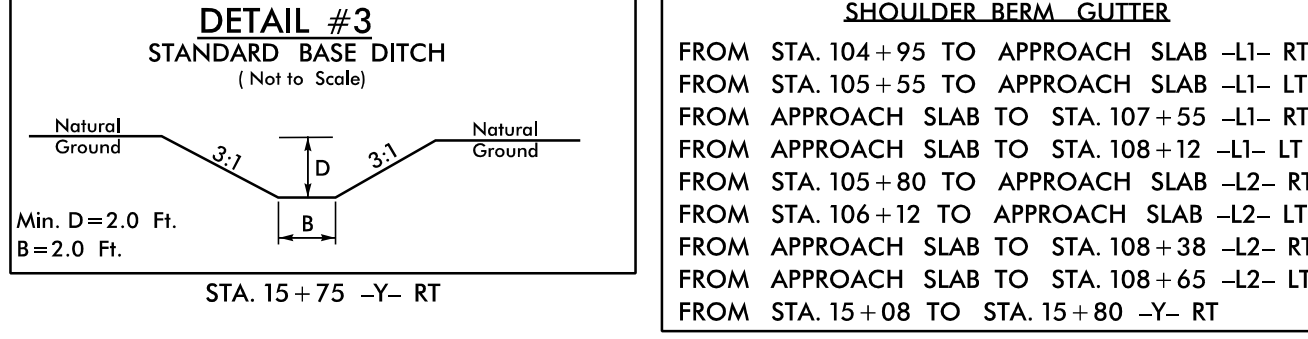
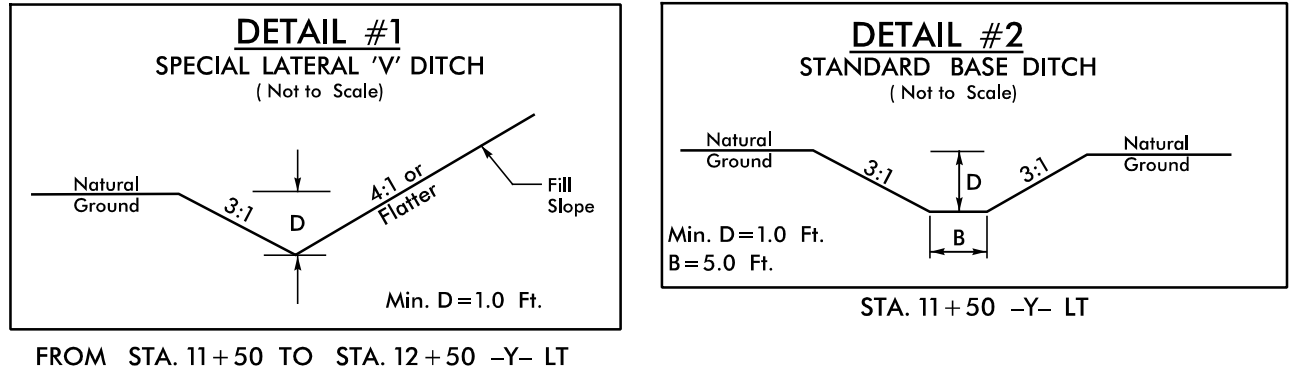
SKETCH OF BRIDGE 008 IN RELATIONSHIP TO PAVEMENT



APPROACH SLAB
FOR -L- PROFILE SEE SHEET 6
FOR STRUCTURE PLANS, SEE SHEETS S-1 THRU S-24

REVISIONS

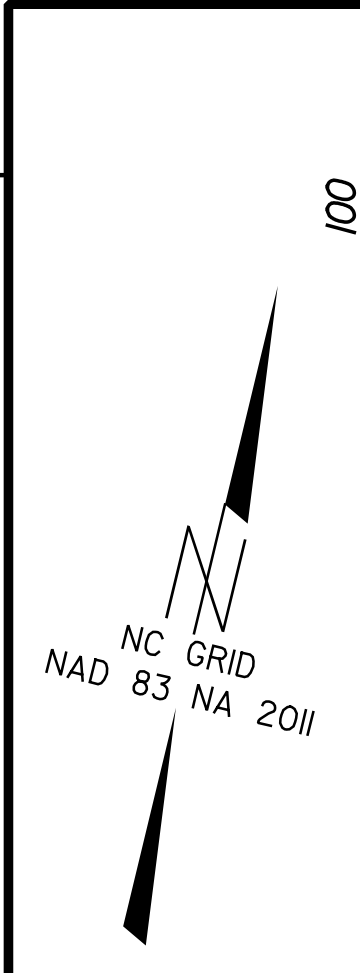
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NOTE: ROCK PLATING
 -L2- LT STA. 103+00 TO 106+25 EST. 750 SY
 -L2- LT STA. 108+50 TO 109+00 EST. 25 SY
 SEE SHEET 3G-1

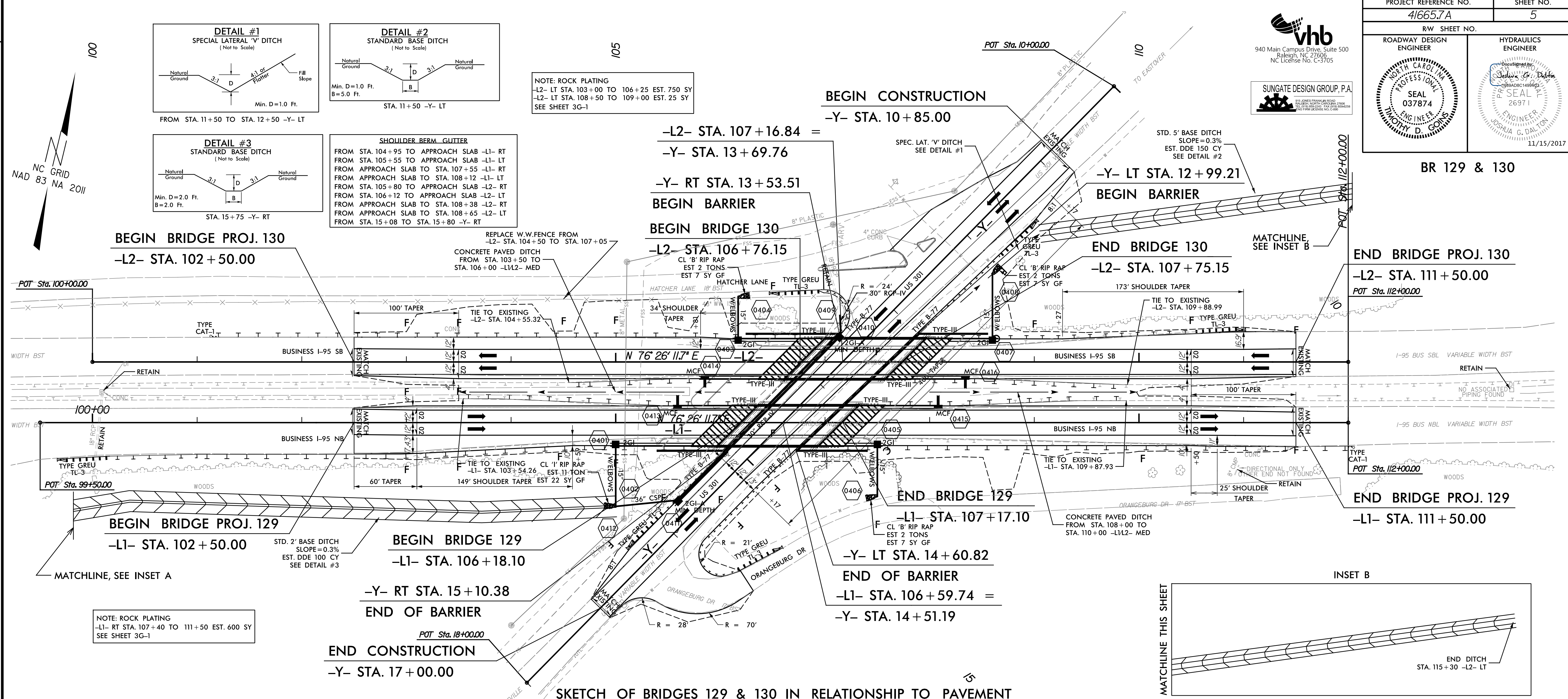
SHOULDER BERM GUTTER
 FROM STA. 104+95 TO APPROACH SLAB -L1- RT
 FROM STA. 105+55 TO APPROACH SLAB -L1- LT
 FROM APPROACH SLAB TO STA. 107+55 -L1- RT
 FROM APPROACH SLAB TO STA. 108+12 -L1- LT
 FROM STA. 105+80 TO APPROACH SLAB -L2- RT
 FROM STA. 106+12 TO APPROACH SLAB -L2- LT
 FROM APPROACH SLAB TO STA. 108+38 -L2- RT
 FROM APPROACH SLAB TO STA. 108+65 -L2- LT
 FROM STA. 15+08 TO STA. 15+80 -Y- RT

REPLACE W.W.FENCE FROM
 -L2- STA. 104+50 TO STA. 107+05
 CONCRETE PAVED DITCH
 FROM STA. 103+50 TO
 STA. 106+00 -L1L2- MED

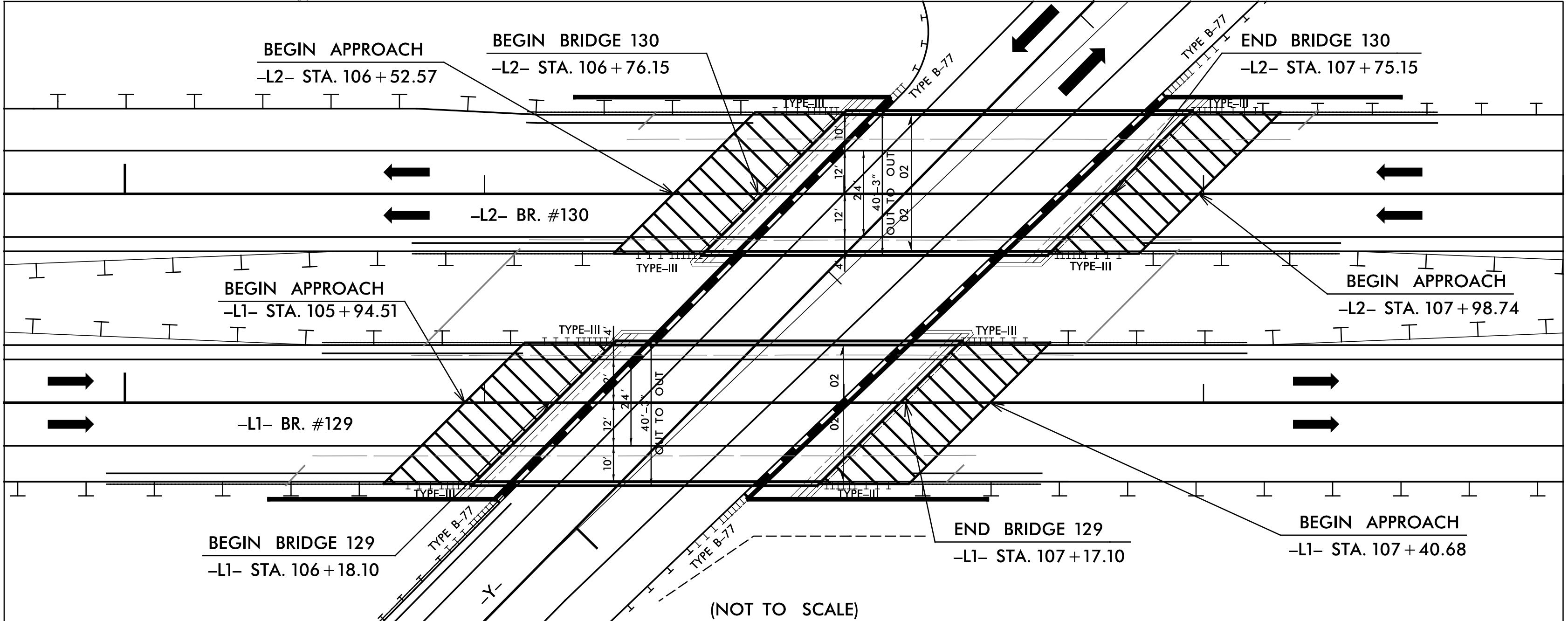
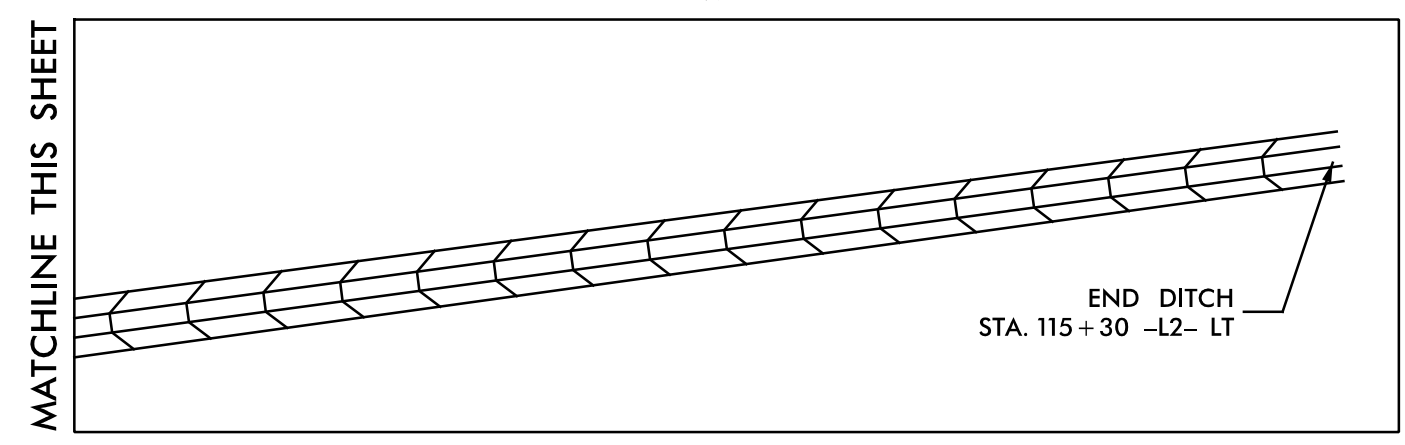
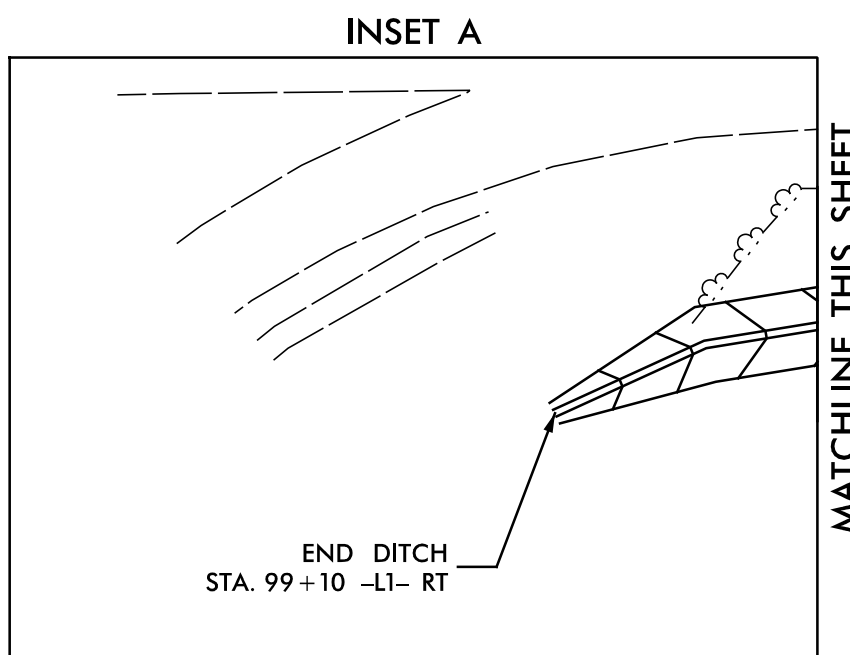


8/17/99

REVISIONS



NOTE: ROCK PLATING
 -L1- RT STA. 107+40 TO 111+50 EST. 600 SY
 SEE SHEET 3G-1



APPROACH SLAB
 FOR -L1- AND -L2- PROFILES, SEE SHEET 8
 FOR STRUCTURE PLANS, SEE SHEETS S-1 THRU S-24

11/14/2017
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5/14/99



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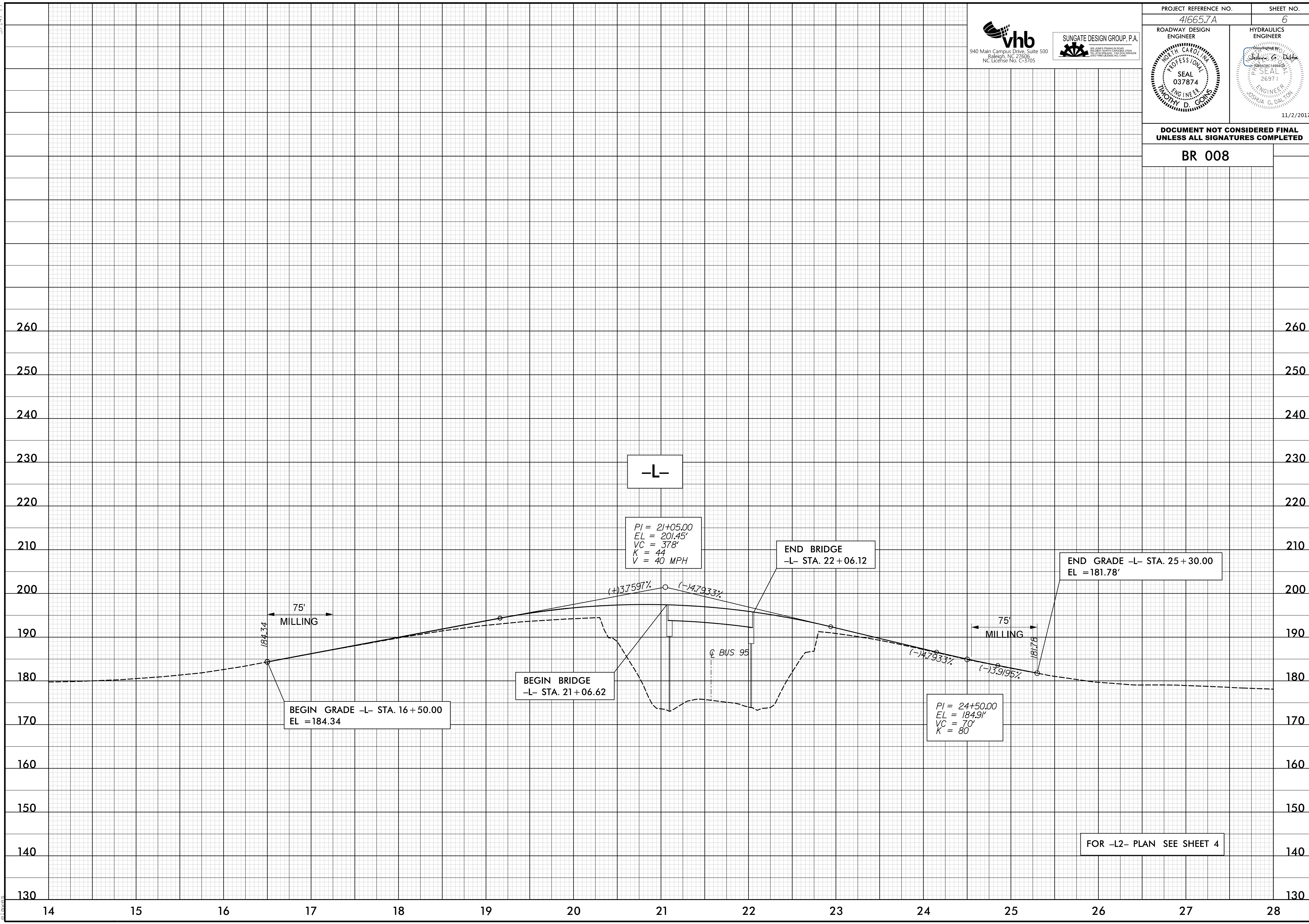
SUNGATE DESIGN GROUP, P.A.

300 JONES FRANKLIN ROAD
SUITE 200 FARMINGTON, MISSISSIPPI 39074
TEL: 662-833-0000 FAX: 662-833-0001
WWW.SUNGATEDESIGN.COM

PROJECT REFERENCE NO. 41665.7A	SHEET NO. 6
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
11/2/2017	

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5/14/99



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300 JONES FRANKLIN ROAD
SUITE 200 RALEIGH, NC 27605
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WWW.SUNGATEDESIGN.COM

PROJECT REFERENCE NO. 41665.7A	SHEET NO. 7
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
11/2/2017	

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BR 008

-L2-

PIPE HYDRAULIC DATA		
24" RCP Sta. 109+70		
DRAINAGE AREA	= 6.2	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 19	CFS
DESIGN HW ELEVATION	= 17.3	FT
100 YEAR DISCHARGE	= 20	CFS
100 YEAR HW ELEVATION	= 173.6	FT
OVERTOPPING FREQUENCY	= 100	YRS
OVERTOPPING DISCHARGE	= 32	CFS
OVERTOPPING ELEVATION	= 175.4	FT

END CONSTRUCTION
-L2- STA. 110+95.00
MATCH EXISTING

BEGIN SPEC LAT DITCH
STA=106+50 -L2- RT
ELEV=172.90

BEGIN CONSTRUCTION
-L2- STA. 106+20.00
MATCH EXISTING

PI STA=109+25 -L2- RT
ELEV=170.50

END SPEC LAT DITCH
STA=109+75 -L2- RT
ELEV=173.00

(-) 0.8727%

(+) 5.00%

24" RCP

FOR -L2- PLAN SEE SHEET 4

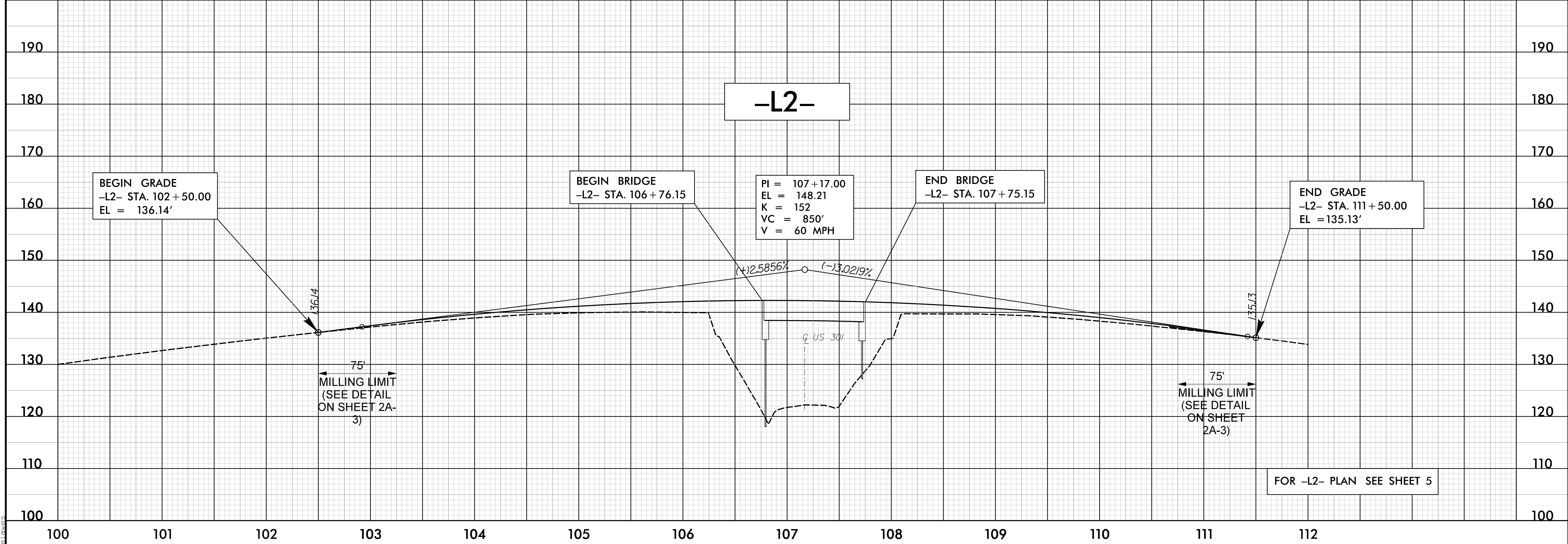
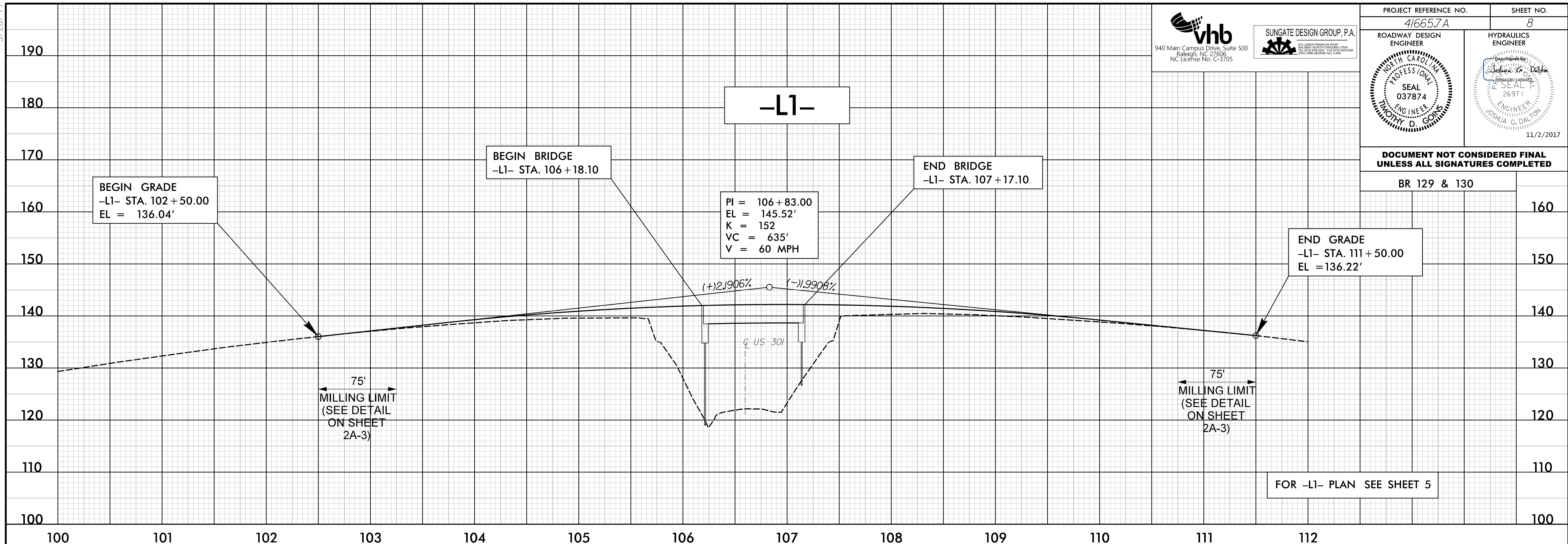
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5/14/99

5/28/99



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Raleigh, NC 27606
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PROJECT REFERENCE NO. 41665.7A	SHEET NO. 8
ROADWAY DESIGN ENGINEER THOMAS D. GOINGS SEAL 037874 PROFESSIONAL ENGINEER NORTH CAROLINA	HYDRAULICS ENGINEER JOSHUA G. DALTON SEAL 26971 PROFESSIONAL ENGINEER NORTH CAROLINA
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BR 129 & 130	
	11/2/2017



8/28/2017
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5/14/99

vhb
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Raleigh, NC 27605
NC License No. C-3705

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115 JONES FRANKLIN ROAD
SUITE 200 RALEIGH, NC 27605
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PROJECT REFERENCE NO.

41665.7A

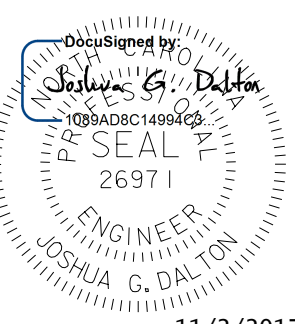
SHEET NO.

9

ROADWAY DESIGN
ENGINEER



HYDRAULICS
ENGINEER



11/2/2017

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BR 129 & 130

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