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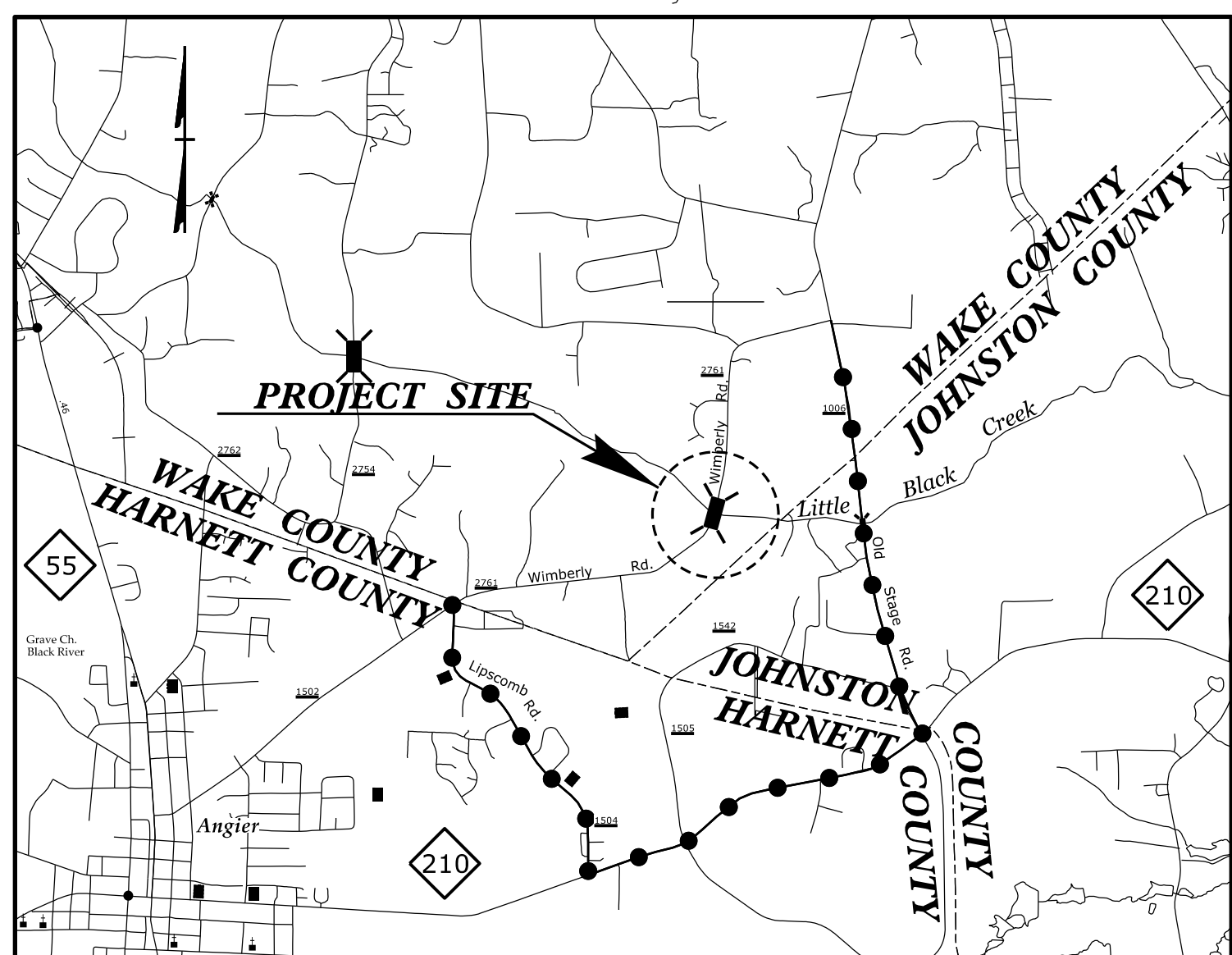
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TIP PROJECT: B-4833

CONTRACT: C204263

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



VICINITY MAP
 DETOUR ROUTE

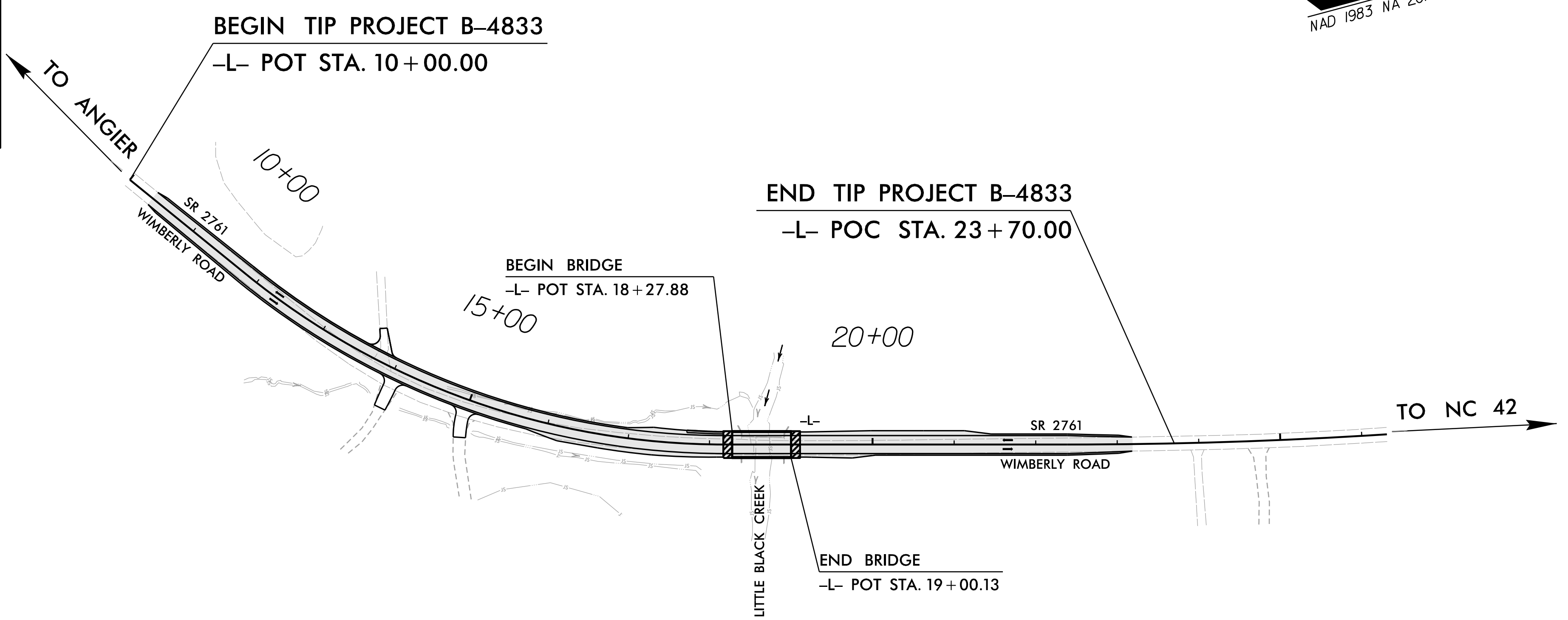
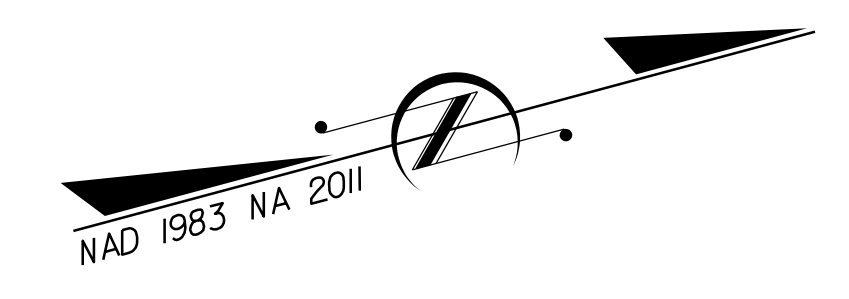
STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS
WAKE COUNTY

**LOCATION: BRIDGE NO. 376 OVER LITTLE BLACK CREEK
 ON SR 2761 (WIMBERLY ROAD)**

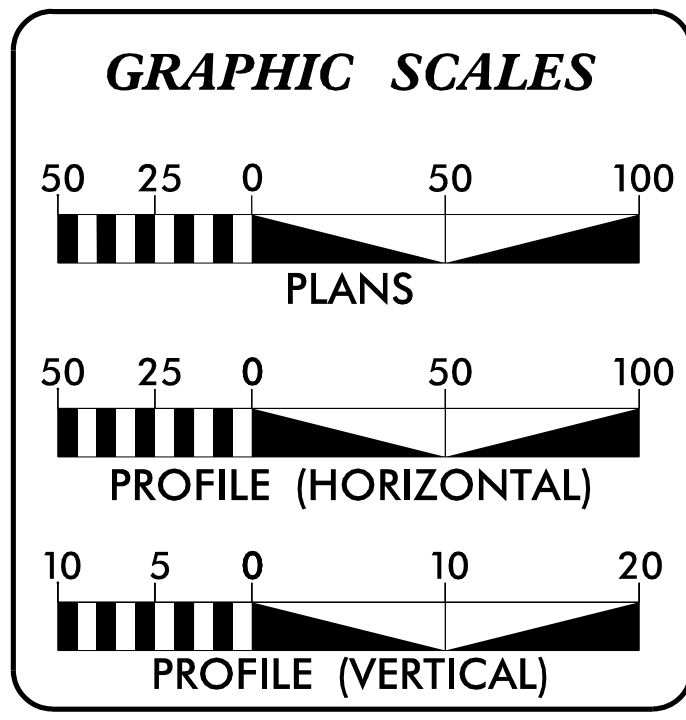
TYPE OF WORK: GRADING, PAVING, DRAINAGE, & STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4833	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
38603.1.FD1	BRZ-2761 (1)	PE, UTIL.	
17BP.5.R.96	N/A	R/W, CONST.	

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



*DESIGN EXCEPTION REQUIRED FOR DESIGN SPEED OF 50 MPH



DESIGN DATA

ADT 2015 = 1,100
ADT 2040 = 2,000
K = 9%
D = 65%
T = 5%*
** V = 50 MPH
* TTST = 1% DUAL 4%
FUNC CLASS = LOCAL SUB-REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY PROJECT B-4833 = 0.245 MILES
LENGTH STRUCTURE PROJECT B-4833 = 0.014 MILES
TOTAL LENGTH PROJECT B-4833 = 0.259 MILES

NCDOT CONTACT: LISA GILCHRIST, E.I.
 DIVISION 5 - BRIDGE PROGRAM MANAGER
 PH: 919-733-4699

Prepared in the Office of:
RAMEY KEMP ASSOCIATES, INC.
 Transportation Engineers
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 NC License No. C-0910

2018 STANDARD SPECIFICATIONS

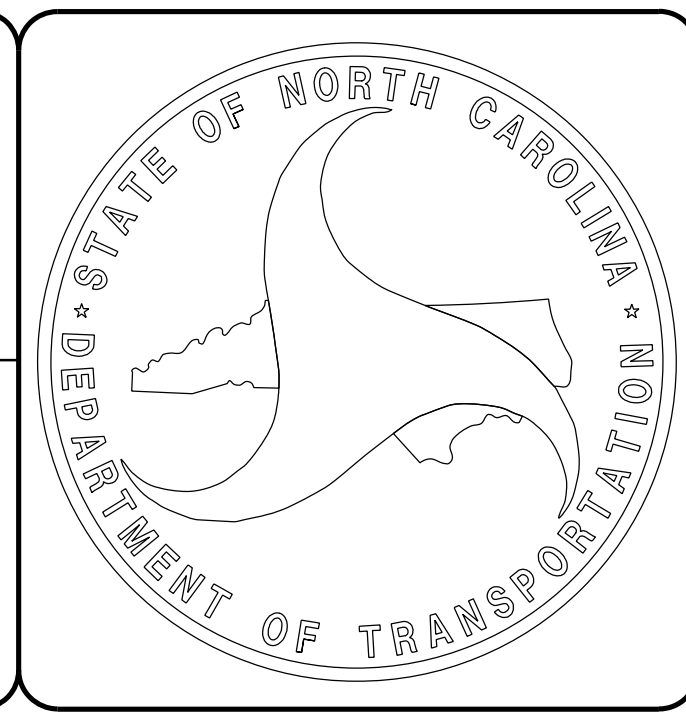
NOVEMBER 15, 2017 RIGHT OF WAY DATE:	CLAUDETTE M.K. ROQUE, P.E. PROJECT ENGINEER
NOVEMBER 20, 2018 LETTING DATE:	G. SCOTT SALLADE, E.I. PROJECT DESIGNER

HYDRAULICS ENGINEER

DocuSigned by:
 Andrew T. Nottingham
 264F58C51A84421
 SIGNATURE: Andrew T. Nottingham
 9/21/2018

ROADWAY DESIGN ENGINEER

DocuSigned by:
 Claudette M. Ramey Kemp
 4B9307206CC441
 SIGNATURE: Claudette M. Ramey Kemp
 9/21/2018

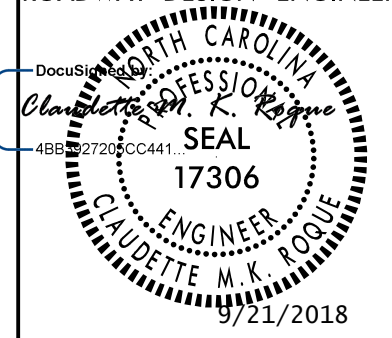


STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

INDEX OF SHEETS, GENERAL NOTES AND 2018 ROADWAY ENGLISH STANDARD DRAWINGS


PROJECT REFERENCE NO.		SHEET NO.
B-4833		1A
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
38603.1.FD1	BRZ-2761 (1)	PE, UTIL.
17BP.5.R.96	N/A	R /W, CONST.

ROADWAY DESIGN ENGINEER



Documented by: *M.K. Clouette*

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

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. 560.01

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.

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.

END BENTS:

THE SURVEYOR 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 :

CenturyLink
Duke Energy

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

RIGHT-OF-WAY MARKERS:

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

2018 ROADWAY ENGLISH STANDARD DRAWINGS

EFF. 1-16-2018
REV.

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch – N. C. Department of Transportation – Raleigh, N. C., Dated January, 2018 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 – EARTHWORK	
200.03	Method of Clearing – Method III
225.02	Guide for Grading Subgrade – Secondary and Local
225.04	Method of Obtaining Superlevation – Two Lane Pavement
DIVISION 3 – PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 4 – MAJOR STRUCTURES	
422.02	Bridge Approach Fills – Type II Modified 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	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
838.01	Concrete Endwall for Single and Double Pipe Culverts – 15" thru 48" Pipe 90 Degree Skew
838.11	Brick Endwall for Single and Double Pipe Culverts – 15" thru 48" Pipe 90 Degree Skew
838.80	Precast Endwalls – 12" thru 72" Pipe 90 Degree Skew
840.00	Concrete Base Pad for Drainage Structures
840.25	Anchorage for Frames – Brick/Concrete/Precast Concrete
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet – for Cast Iron Double Frame and Grates
840.46	Traffic Bearing Precast Drainage Structure
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS
1B	CONVENTIONAL SYMBOLS
1C-1 THRU 1C-3	SURVEY CONTROL SHEETS
1D-1	PROPOSED ALIGNMENT CONTROL SHEET
1E-1	RIGHT OF WAY CONTROL SHEET
2A-1	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2C-1	AT-1 ANCHOR UNIT DETAIL
2C-2	TYPE III ANCHOR UNIT DETAIL
2C-3	W-BEAM RAIL SECTION
3B-1	EARTHWORK, PAVEMENT REMOVAL, GUARDRAIL SUMMARIES, AND PARCEL INDEX
3D-1	DRAINAGE SUMMARY SHEET
3G-1	GEOTECHNICAL SUMMARY SHEET
4	PLAN SHEET
5	PROFILE SHEET
RW-1 AND RW-4	RIGHT OF WAY SHEETS
TMP-1 THRU TMP-3	TRAFFIC CONTROL PLANS
PMP-1	SIGNING AND PAVEMENT MARKING PLAN
EC-1 THRU EC-5	EROSION CONTROL PLANS
RF-1	REFORESTATION PLANS
UO-1 THRU UO-2	UTILITIES BY OTHERS PLANS
X-1A	CROSS-SECTION SUMMARY SHEET
X-1 THRU X-8	CROSS-SECTIONS
S-1 THRU S-13	STRUCTURE PLANS
SN	STRUCTURE STANDARD NOTES

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS CONVENTIONAL PLAN SHEET SYMBOLS

PROJECT REFERENCE NO.		SHEET NO.
B-4833		1B
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
38603.1.FD1	BRZ-2761 (1)	PE, UTIL.
17BP.5.R.96	N/A	R /W, CONST.

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	②③
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	-----

Note: Not to Scale

*S.U.E. = Subsurface Utility Engineering

RIGHT OF WAY & PROJECT CONTROL:

Secondary Horiz and Vert Control Point	◆
Primary Horiz Control Point	○
Primary Horiz and Vert Control Point	●
Exist Permanent Easment Pin and Cap	◇
New Permanent Easment 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	-----
Existing Metal Guardrail	-----
Proposed Guardrail	-----
Existing Cable Guiderail	-----
Proposed Cable Guiderail	-----
Equality Symbol	⊕
Pavement Removal	▨

VEGETATION:

Single Tree	○
Single Shrub	○

Hedge	-----
Woods Line	-----
Orchard	○
Vineyard	□ 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	-----

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	A/G Water

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	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.*)	-----
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.	UST
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.

PROJECT REFERENCE NO.		SHEET NO.
B-4833		1C-1
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
38603.1.FD1	BRZ-2761 (1)	PE, UTIL.
17BP.5.R.96	N/A	R /W, CONST.
PROJECT SURVEYOR		

B4833-1
 N= 645715.8160
 E= 2086071.8440
 ELEV.=320.61'

B4833-2
 N= 645805.6190
 E= 2086840.1400
 ELEV.=309.21'

BM 1
 N= 646292.3580
 E= 2087850.9760
 ELEV.=256.00'

BL-103
 N= 646470.3910
 E= 2088039.2320
 ELEV.=240.53'

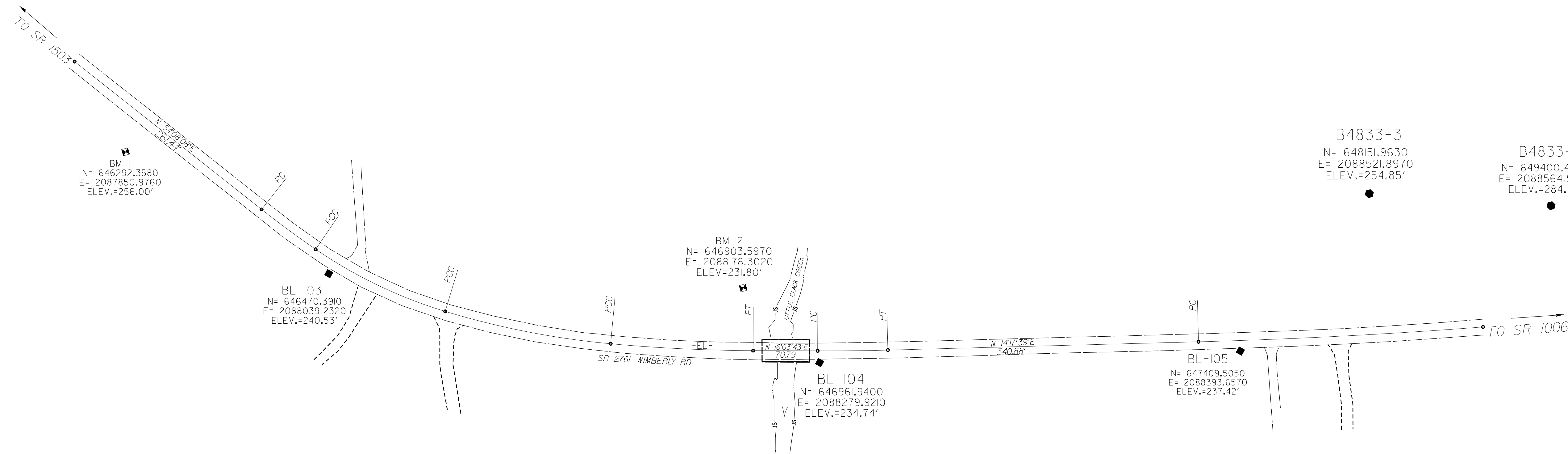
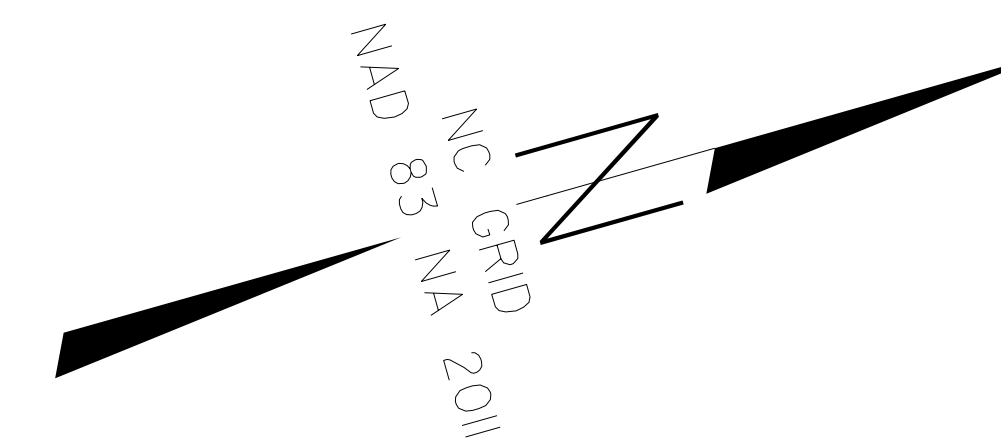
BM 2
 N= 646903.5970
 E= 2088178.3020
 ELEV.=231.80'

BL-104
 N= 646961.9400
 E= 2088279.9210
 ELEV.=234.74'

BL-105
 N= 647409.5050
 E= 2088393.6570
 ELEV.=237.42'

B4833-3
 N= 648151.9630
 E= 2088521.8970
 ELEV.=254.85'

B4833-4
 N= 649400.4770
 E= 2088564.5590
 ELEV.=284.79'



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "B4833-4"

WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF
 NORTHING: 649400.477(±) EASTING: 2088564.559(±)
 ELEVATION: 284.79(±)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99987542

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4833-2" TO -EL- STATION 10+00.00 IS
 N 62°54'53" E 1010.17

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

NOTE: DRAWING NOT TO SCALE

NOTES:

- IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
- PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

2.7718

SURVEY CONTROL SHEET B-4833
WITH EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO.		SHEET NO.
B-4833		1C-2
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
38603.1.FD1	BRZ-2761 (1)	PE, UTIL.
17BP.5.R.96	N/A	R /W, CONST.
PROJECT SURVEYOR		

BASELINE

BL	POINT	DESC.	NORTH	EAST	ELEVATION
102		BL-102	646156.9130	2087612.1760	272.01
103		BL-103	646470.3910	2088039.2320	240.53
104		BL-104	646961.9400	2088279.9210	234.74
105		BL-105	647409.5050	2088393.6570	237.42
3		B4833-3	648151.9630	2088521.8970	254.85

 BM 1 ELEVATION = 256.00'
 N 646292 E 2087850

RR SPIKE IN 14" SWEET GUM

BM 2 ELEVATION = 231.80'
 N 646904 E 2088178

RR SPIKE IN 20" OAK

NOTES:

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NOTE: DRAWING NOT TO SCALE

SURVEY CONTROL SHEET B-4833

WITH EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO.		SHEET NO.
B-4833		1C-3
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
38603.1.FD1	BRZ-2761 (1)	PE, UTIL.
17BP.5.R.96	N/A	R /W, CONST.
PROJECT SURVEYOR		

EL	POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
	POT	646265.565	2087739.528							
	LINE			N 54°08'24.3" E	261.44					
	PC	646418.718	2087951.412							
	CURVE			N 52°11'00.3" E	73.66	03°54'48.1*(LT)	05°18'42.9"	73.67	36.85	1078.63
	PCC	646463.879	2088009.599							
	CURVE			N 41°26'20.7" E	157.64	17°34'31.0*(LT)	11°06'19.2"	158.26	79.76	515.93
	PCC	646582.056	2088113.929							
	CURVE			N 26°52'34.8" E	184.97	11°33'00.8*(LT)	06°14'01.6"	185.28	92.96	919.12
	PCC	646747.047	2088197.548							
	CURVE			N 18°34'53.6" E	156.44	05°02'21.5*(LT)	03°13'13.0"	156.49	78.29	1779.22
	PT	646895.329	2088247.398							
	LINE			N 16°03'42.8" E	70.78					
	PC	646963.349	2088266.982							
	CURVE			N 15°10'41.1" E	77.12	01°46'03.4*(LT)	02°17'30.6"	77.13	38.57	2500.00
	PT	647037.783	2088287.174							
	LINE			N 14°17'39.4" E	340.88					
	PC	647368.111	2088371.339							
	CURVE			N 12°50'13.6" E	312.67	02°54'51.7*(LT)	00°55'55.2"	312.70	156.38	6147.65
	PT	647368.111	2088371.339							

NOTES:

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NOTE: DRAWING NOT TO SCALE

PROPOSED ALIGNMENT CONTROL SHEET B-4833

PROJECT REFERENCE NO.		SHEET NO.
B-4833		1D-1
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
38603.1.FD1	BRZ-2761 (1)	PE, UTIL.
17BP.5.R.96	N/A	R /W, CONST.
PROJECT SURVEYOR		

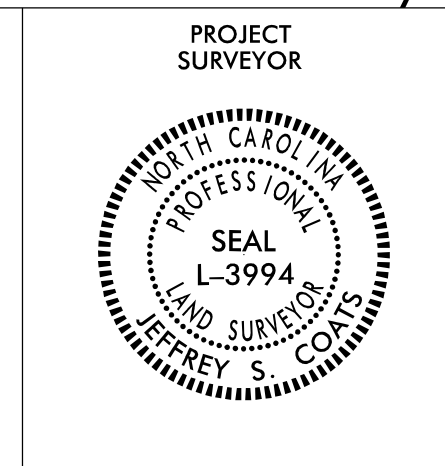
		L	
TYPE	STATION	NORTH	EAST
POT	10+00.00	646265.5650	2087739.5280
PC	11+84.46	646373.6198	2087889.0199
PT	18+19.16	646886.0620	2088242.3772
PC	22+38.50	647291.0430	2088351.1699
PT	26+30.87	647672.9630	2088440.8070

- NOTES:
-
1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
 2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

NOTE: DRAWING NOT TO SCALE

RIGHT OF WAY CONTROL SHEET B-4833

PROJECT REFERENCE NO. B-4833	SHEET NO. 1E-1
Location and Surveys	



ROW MARKER REBAR AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
L	10+30.00	-30.00	646307.4527	2087746.2674
L	10+30.00	-40.00	646315.5572	2087740.4093
L	10+30.00	45.00	646246.6688	2087790.2028
L	10+30.00	30.00	646258.8256	2087781.4157
L	11+84.46	45.00	646337.1524	2087915.3852
L	11+84.46	-40.00	646406.0408	2087865.5917
L	12+50.00	-40.00	646444.5433	2087915.0875
L	13+00.00	45.00	646414.0200	2088008.9009
L	13+00.00	-55.00	646487.1810	2087940.7286
L	13+25.00	65.00	646417.8828	2088041.8566
L	14+25.00	65.00	646496.8504	2088113.9662
L	14+50.00	55.00	646523.8942	2088122.7310
L	14+77.12	55.00	646546.8475	2088139.9931
L	14+88.29	43.39	646563.1763	2088137.4511
L	15+34.11	41.21	646604.1030	2088162.4351
L	15+35.13	55.00	646597.5870	2088174.6344
L	17+50.00	-55.00	646838.1717	2088170.0577
L	18+19.16	55.00	646871.7929	2088295.4939
L	18+19.16	-60.00	646901.6283	2088184.4316
L	22+38.50	55.00	647276.7739	2088404.2866
L	22+38.50	-60.00	647306.6093	2088293.2243
L	23+55.95	30.00	647397.5203	2088409.6700
L	23+59.84	55.00	647395.3118	2088434.8793
L	23+70.00	-60.00	647432.7165	2088325.6594
L	23+70.00	-30.00	647425.5548	2088354.7920

PERMANENT EASEMENT MARKER REBAR AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
L	11+95.00	55.00	646335.6387	2087930.2535
L	11+95.00	45.00	646343.6763	2087924.3039
L	12+20.00	55.00	646351.6765	2087951.3215
L	12+20.00	45.00	646359.5512	2087945.1580
L	14+05.00	-55.00	646558.4614	2088009.0533
L	14+05.00	-60.00	646561.7122	2088005.2543
L	14+25.00	-77.50	646587.1466	2088003.7263
L	14+55.00	-75.00	646607.1774	2088022.7898
L	14+55.00	-55.00	646595.0099	2088038.6628
L	15+36.19	69.64	646590.6682	2088187.5876
L	15+50.00	55.00	646610.9289	2088182.9964
L	15+50.00	65.00	646605.6861	2088191.5119
L	15+95.00	55.00	646652.1034	2088206.9926
L	15+95.00	80.00	646640.0416	2088228.8904
L	16+20.00	80.00	646663.9962	2088241.6686
L	16+20.00	60.00	646673.1713	2088223.8973
L	16+60.00	55.00	646713.5159	2088238.0746
L	18+05.00	55.00	646857.3359	2088291.4920
L	18+15.00	75.00	646862.2618	2088313.6322
L	18+15.00	60.00	646866.2182	2088299.1634
L	18+40.00	75.00	646886.7275	2088320.2150
L	18+40.00	55.00	646891.9162	2088300.8998

I, JEFFREY S. COATS, a Professional Land Surveyor in the state of North Carolina hereby certify to the best of my knowledge and belief that the following work item(s) (R/W Staking) performed under my responsible charge meet NCDOT Survey Standards as directed in the NCDOT Location & Surveys guidelines and procedures.

I further certify that the right of way and permanent easement points shown herein and outlined in the tables shown hereon (localized coordinates, station/offset) have been checked and are accurate representations of the right of way and permanent easement points depicted on the corresponding highway plans. I also certify that the right of way and permanent easement points shown herein have been field monumented under my supervision from existing survey control provided by others; that the depicted property data shown herein were surveyed by others; and these monuments denote the right of way and easement boundaries at the time of staking which may be subject to change due to right of way revisions (See deeds for final determination).

Witness my original signature, registration number and seal this 27th day of June, 2018.

Professional Land Surveyor

L-3994
PLS #

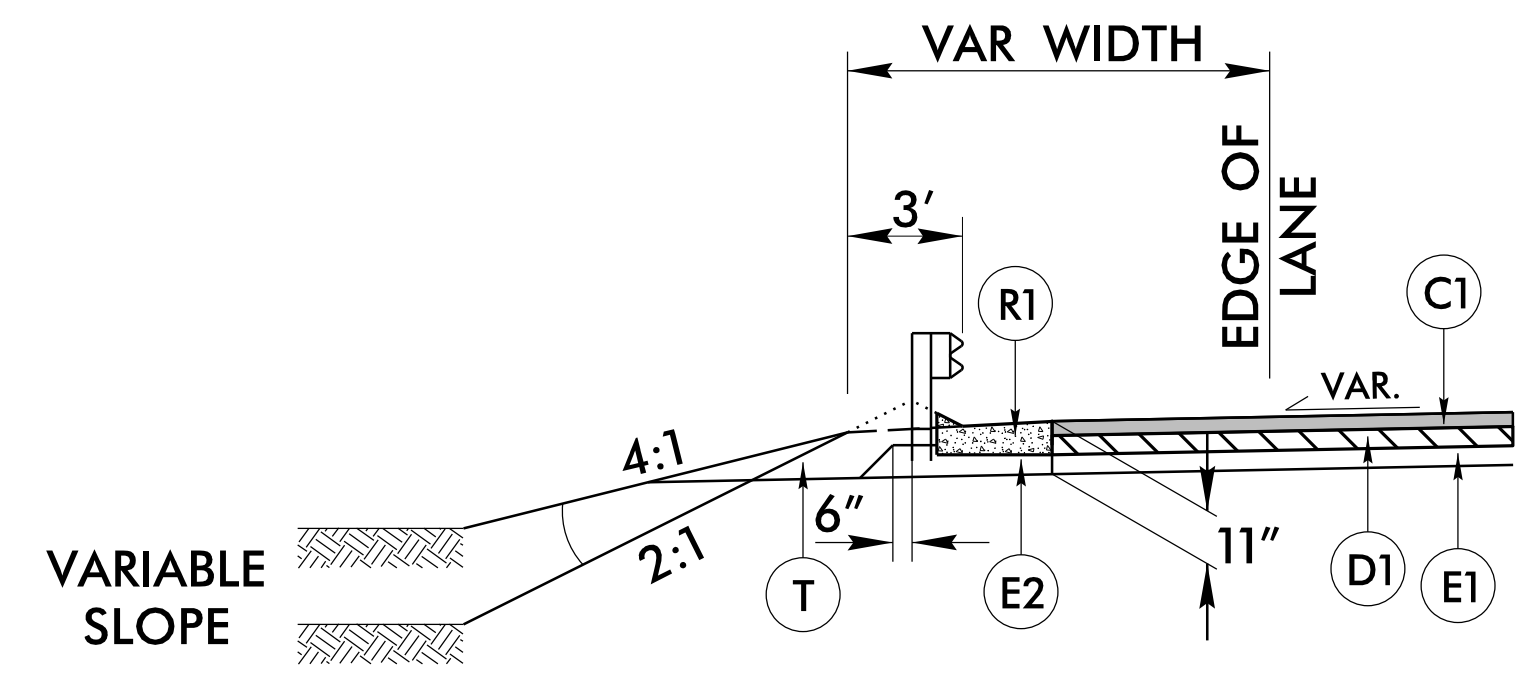


NOTES:

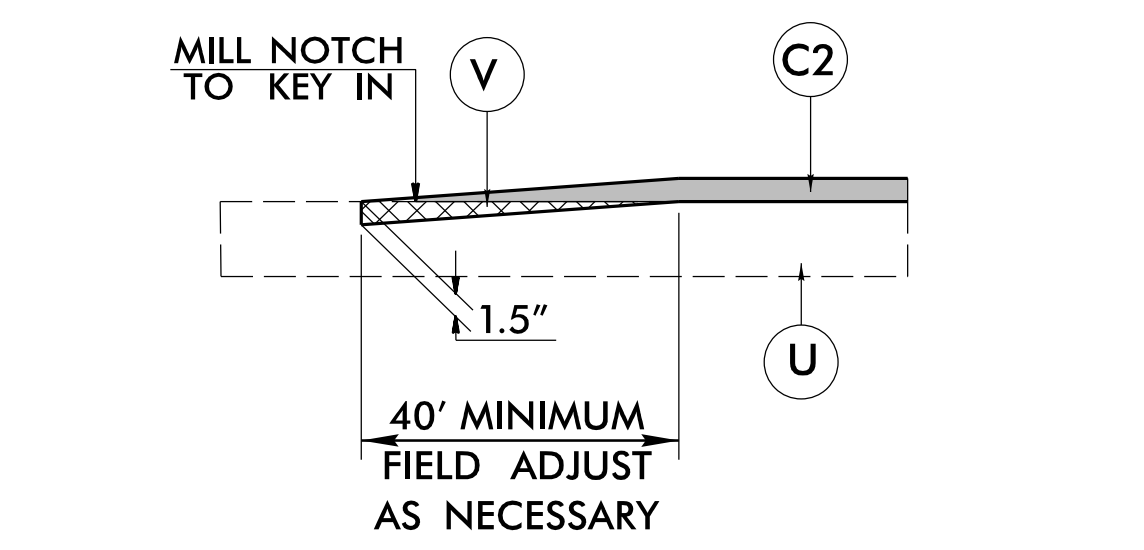
1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 3.0" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NO LESS THAN 2" IN DEPTH.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
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 2.5" OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 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" OR GREATER THAN 5.5" IN DEPTH.
R1	SHOULDER BERM GUTTER
T	COMPACTED EARTH MATERIAL
U	EXISTING PAVEMENT
V	VAR. DEPTH MILLING
W	WEDGING (SEE WEDGING DETAIL)

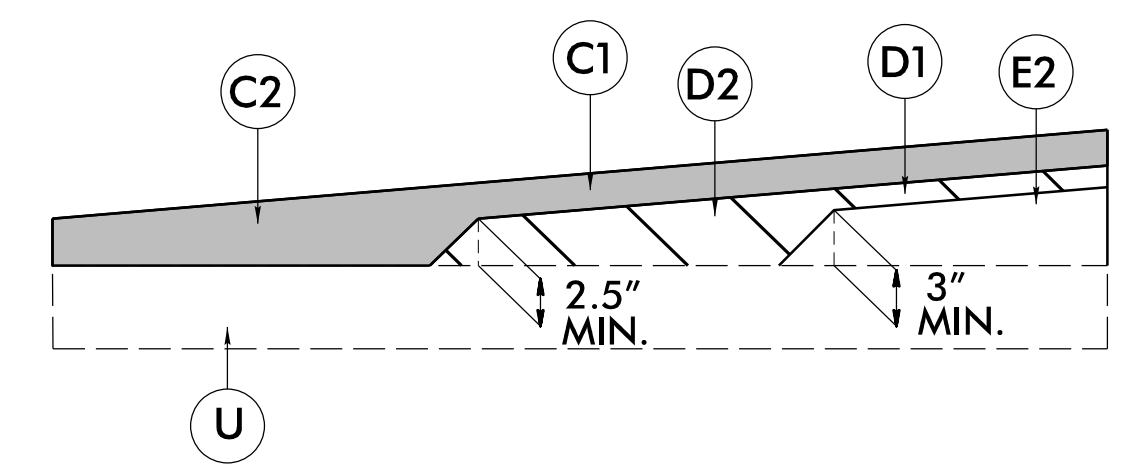
NOTES: 1. ALL PAVEMENT SLOPES ARE 1:1 UNLESS OTHERWISE SPECIFIED.
2. PAVE SHOULDER TO FACE OF GUARDRAIL



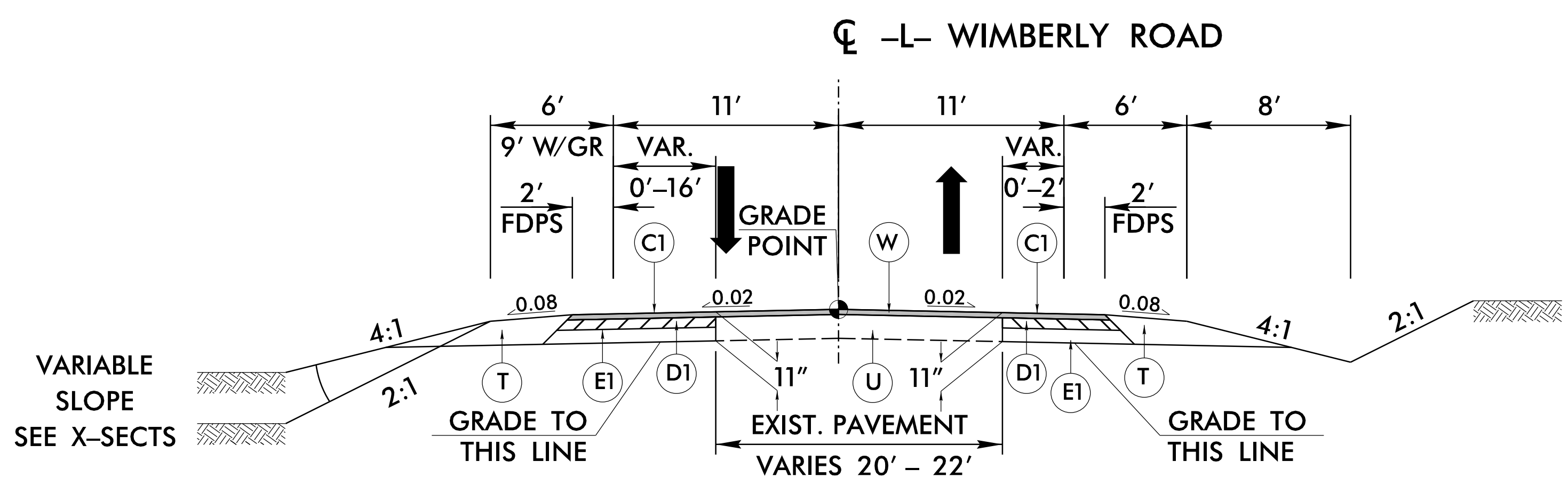
DETAIL FOR SHOULDER BERM GUTTER
USE IN CONJUNCTION WITH TYPICAL SECTION NO. 2



INCIDENTAL MILLING DETAIL

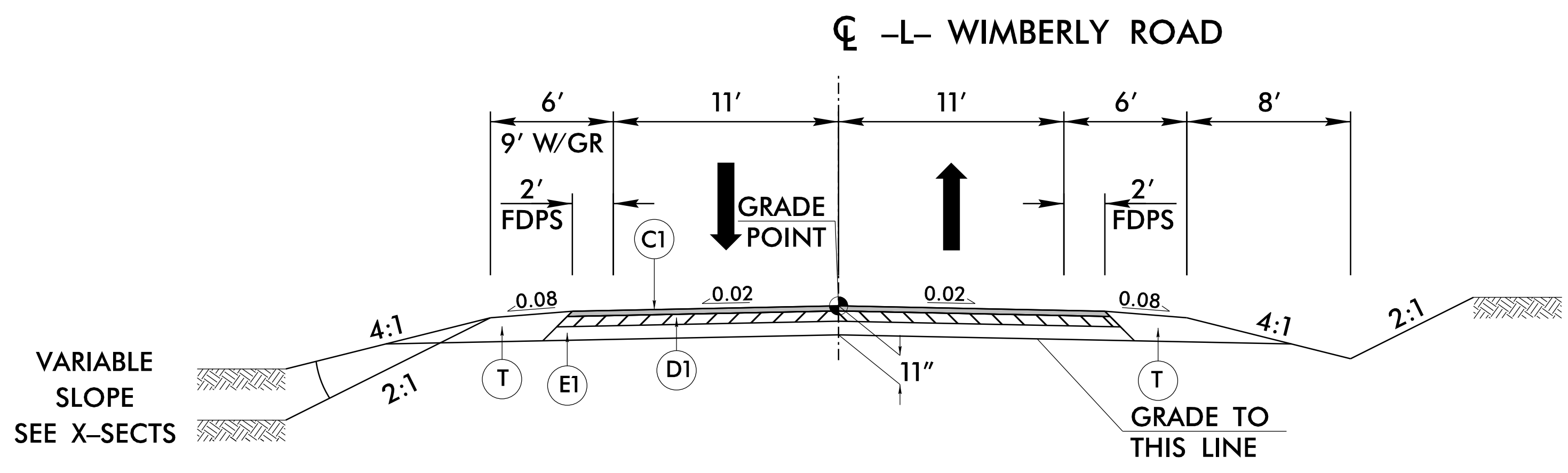


WEDGING DETAIL FOR RESURFACING
USE IN CONJUNCTION WITH TYPICAL SECTION NO. 1



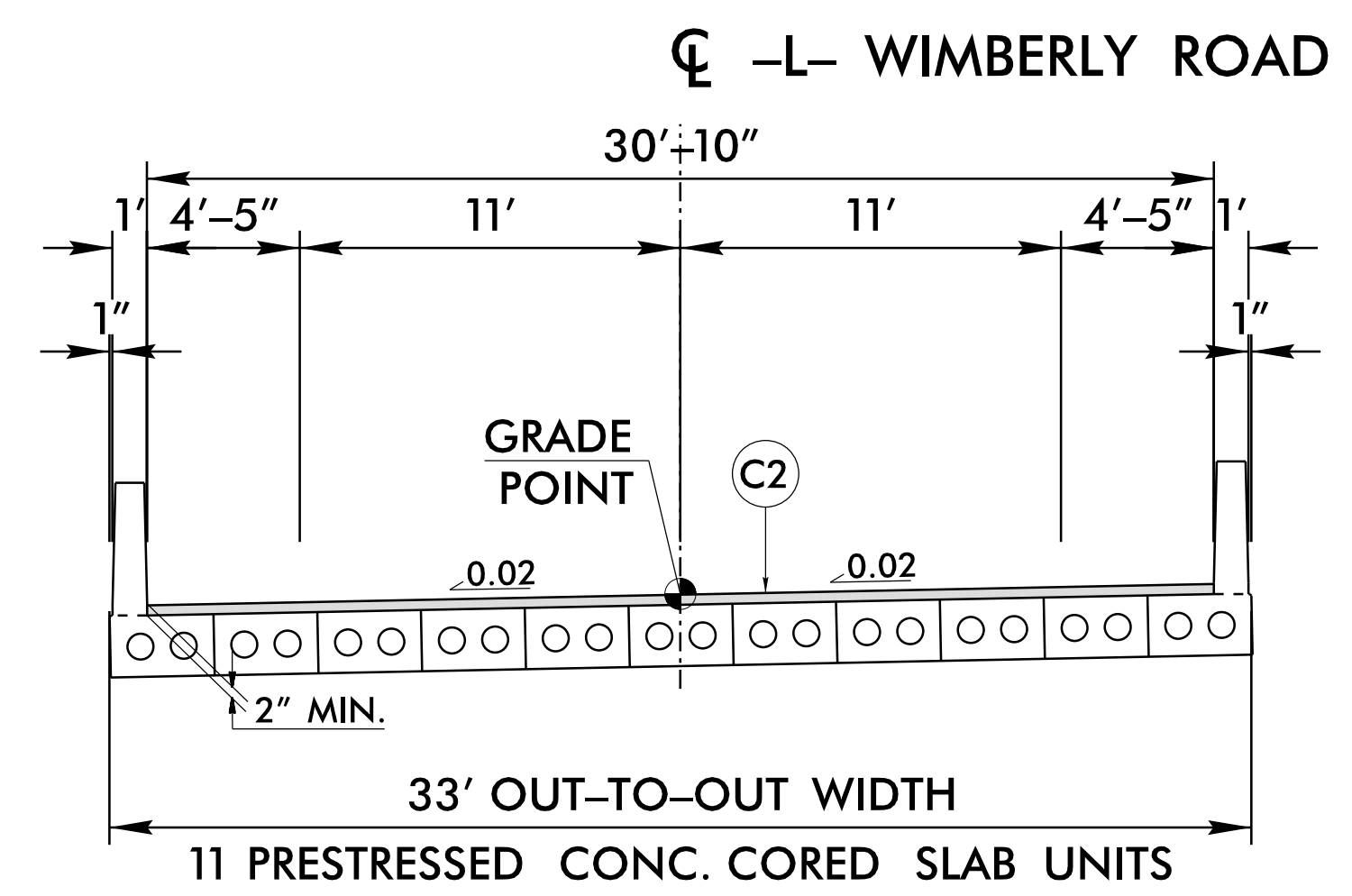
TYPICAL SECTION NO. 1

-L- STA. 10+36.46 TO -L- STA. 13+25.00
-L- STA. 20+25.00 TO -L- STA. 23+18.17



TYPICAL SECTION NO. 2

-L- STA. 13+25.00 TO -L- STA. 18+27.88 (BEGIN BRIDGE)
-L- STA. 19+00.13 (END BRIDGE) TO -L- STA. 20+25.00



BRIDGE TYPICAL SECTION

-L- STA. 18+27.88 (BEGIN BRIDGE) TO -L- STA. 19+00.13 (END BRIDGE)
FOR BRIDGE 376 OVER LITTLE BLACK CREEK
NOTE: SEE STRUCTURE PLANS FOR PAVEMENT DEPTHS ON STRUCTURES

PROJECT REFERENCE NO.	SHEET NO.	
B-4833	2A-1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
38603.1.FD1	BRZ-2761 (1)	PE, UTIL.
17BP.5.R.96	N/A	R/W, CONST.
ROADWAY DESIGN ENGINEER PAVEMENT DESIGN ENGINEER		

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

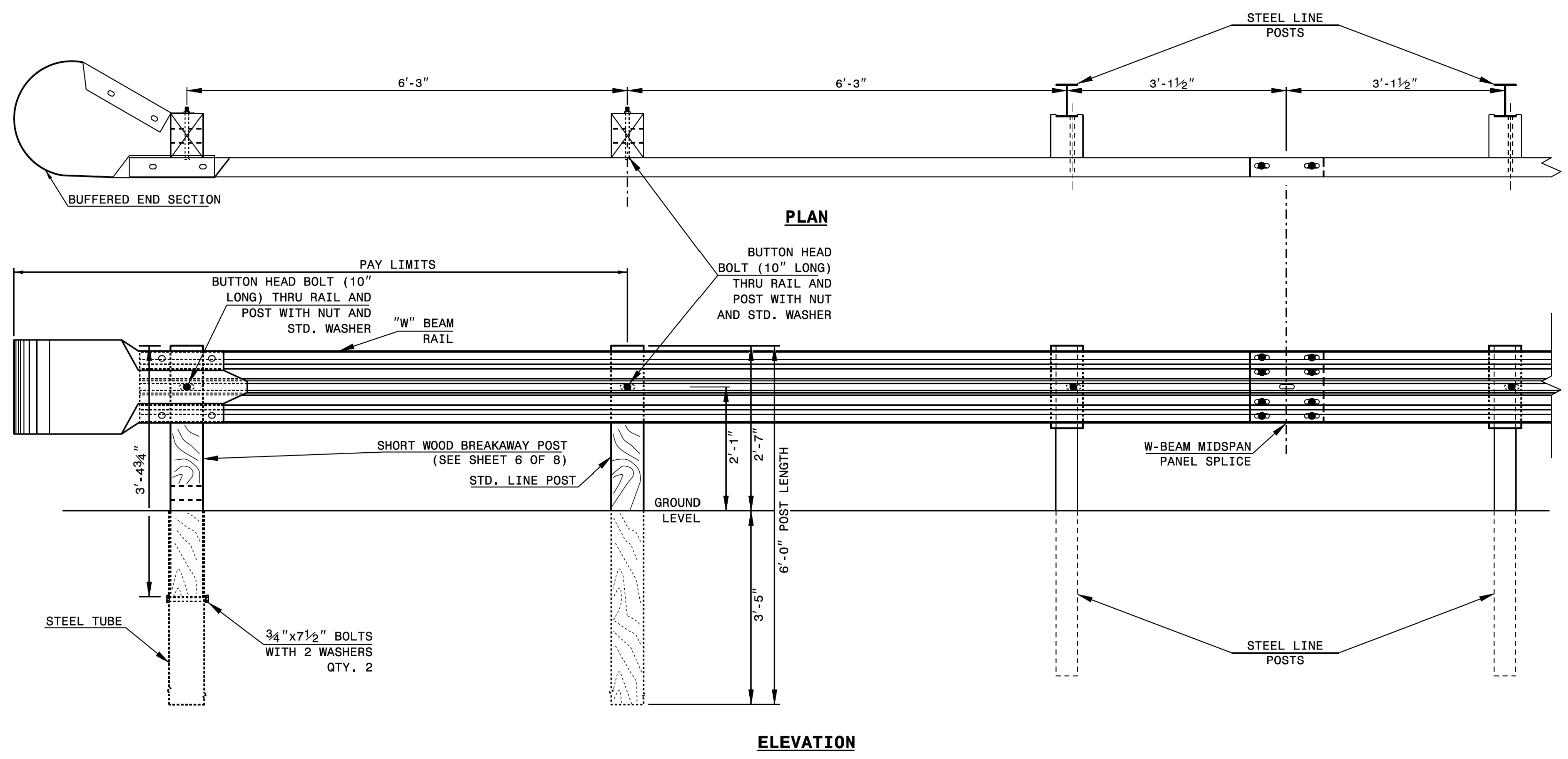
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

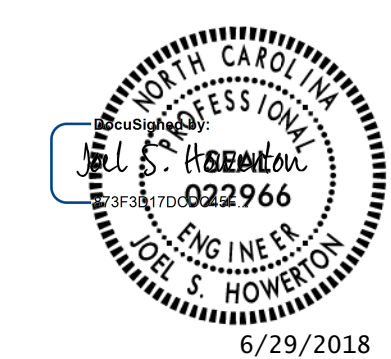
ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET OF

SHEET OF



TRAILING END UNIT ASSEMBLY
A.T. - 1 SYSTEM



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

A.T. - 1 SYSTEM

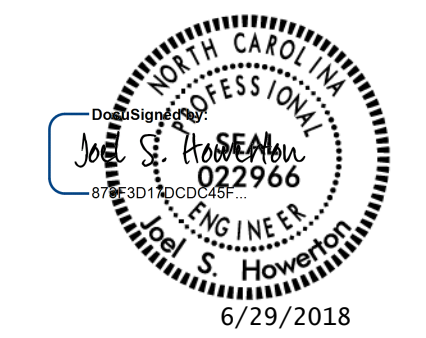
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 MODIFIED BY: _____ DATE: _____
 CHECKED BY: _____ DATE: _____
 FILE SPEC.: _____

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

I4-DEC-2017 10:36
 S:\Contracts\Standard Drawings\Standard Drawings\Details in Lieu of Standards\Division 8\0862d0301.dgn
 Jhowerton AT CSU-292595

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
<p>NOTE:</p> <ul style="list-style-type: none"> **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 3 FOR POST SECTIONS 1 THRU 9. 		
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
<p>NOTE:</p> <ul style="list-style-type: none"> **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 3 FOR POST SECTIONS 1 THRU 9. 		
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER		



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UNLESS ALL SIGNATURES COMPLETED

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

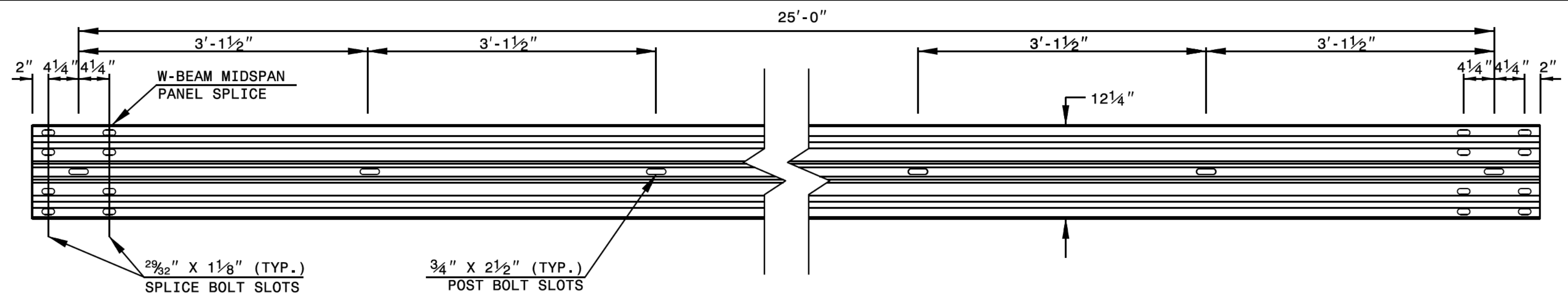
SEE TITLE BLOCK

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

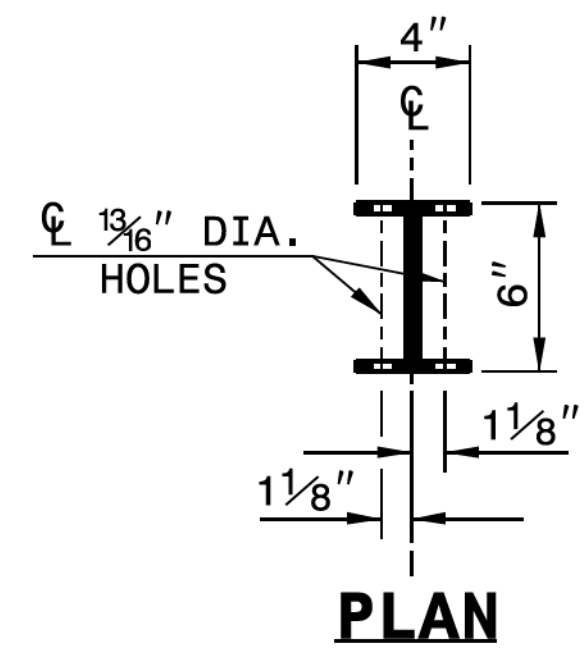
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

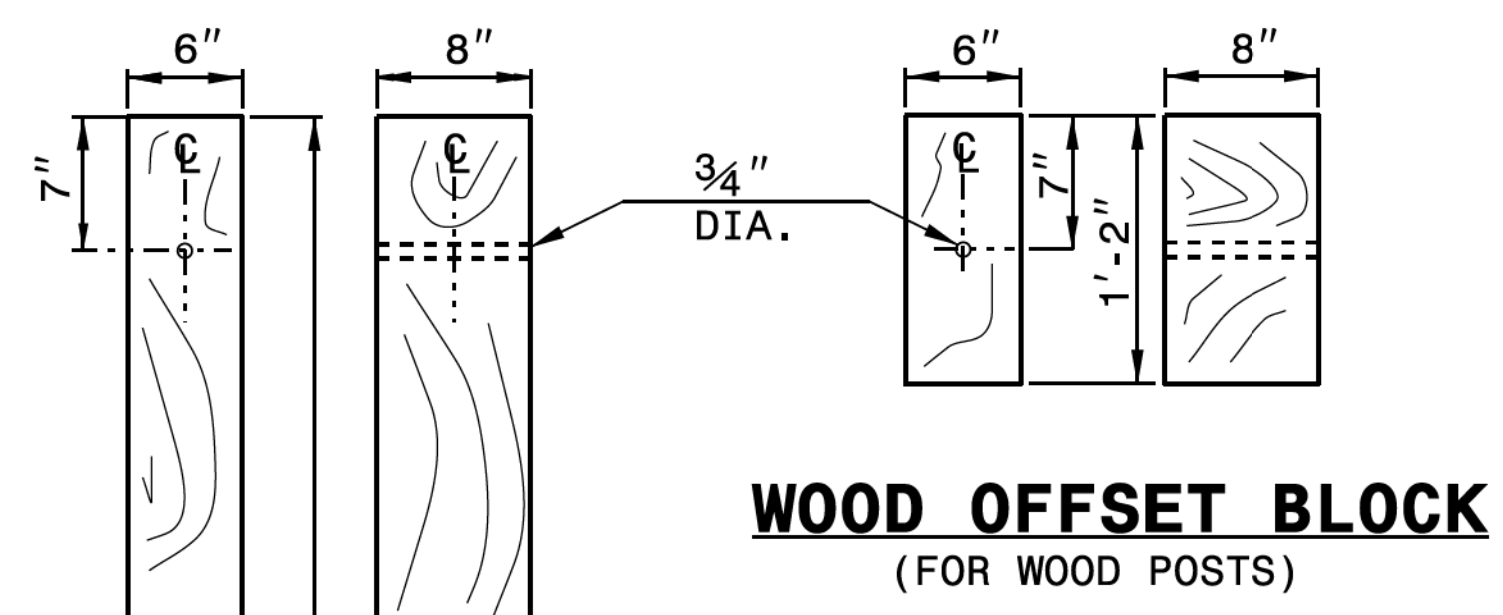
SHEET 6 OF 8
862D02



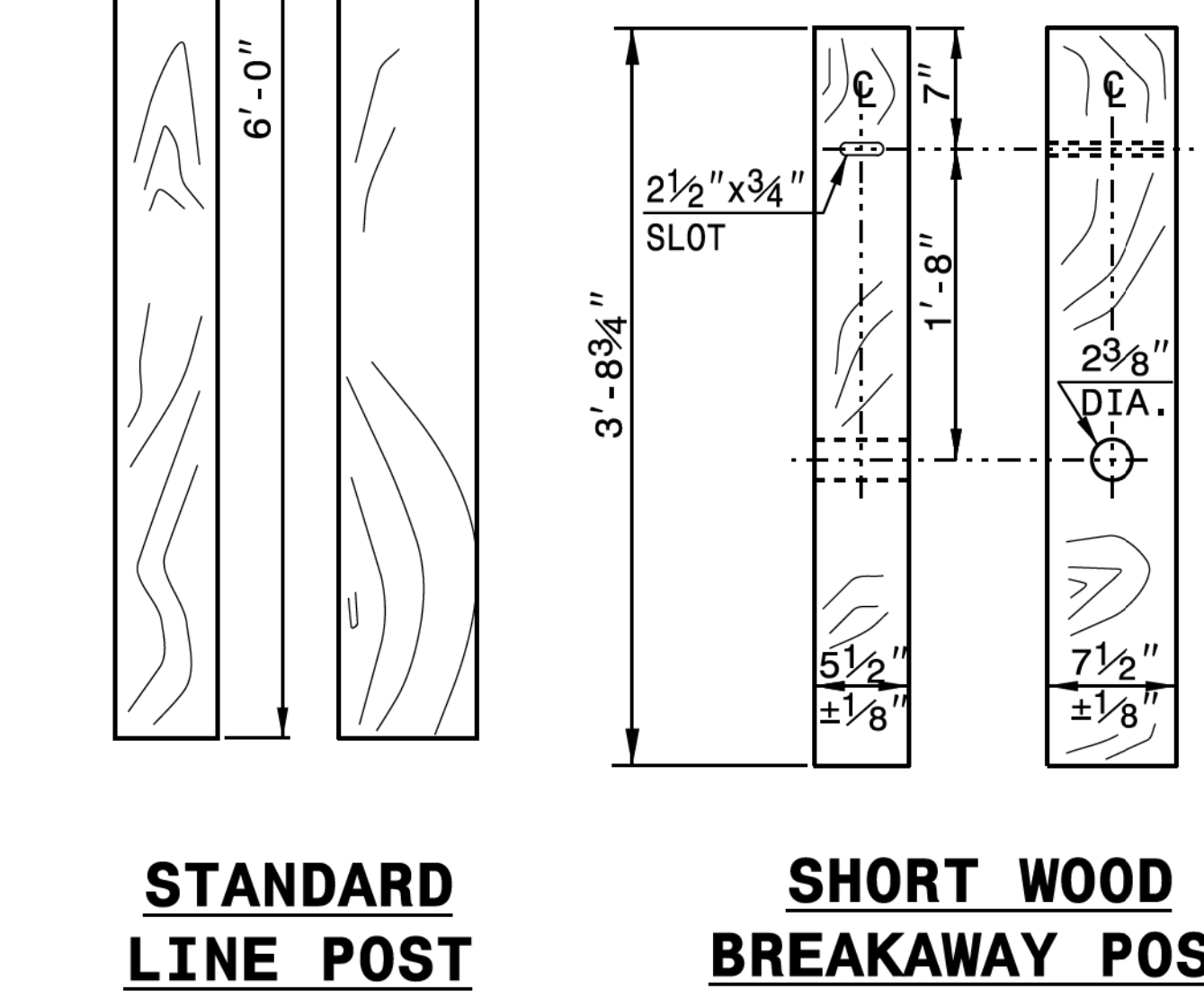
STANDARD W-BEAM GUARDRAIL



PLAN

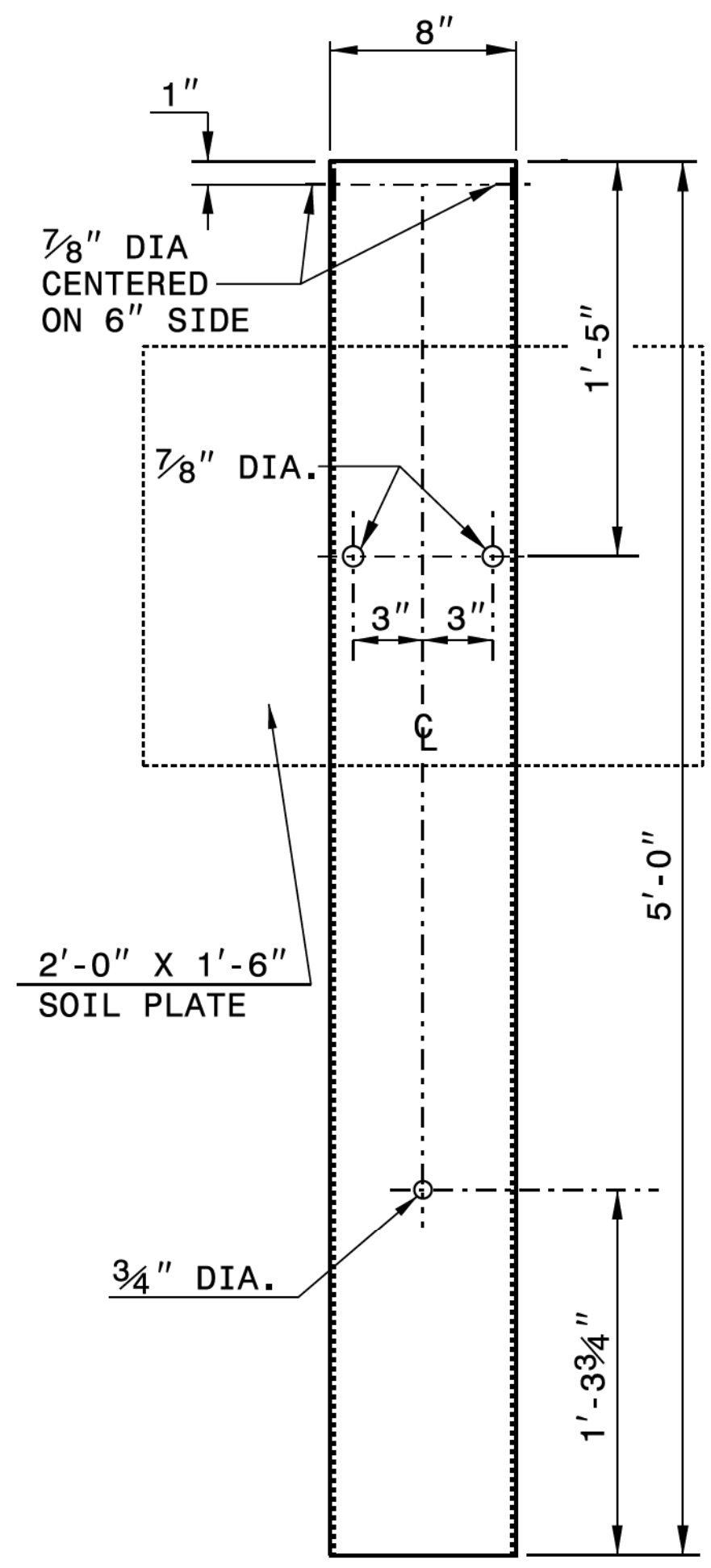


**WOOD OFFSET BLOCK
(FOR WOOD POSTS)**

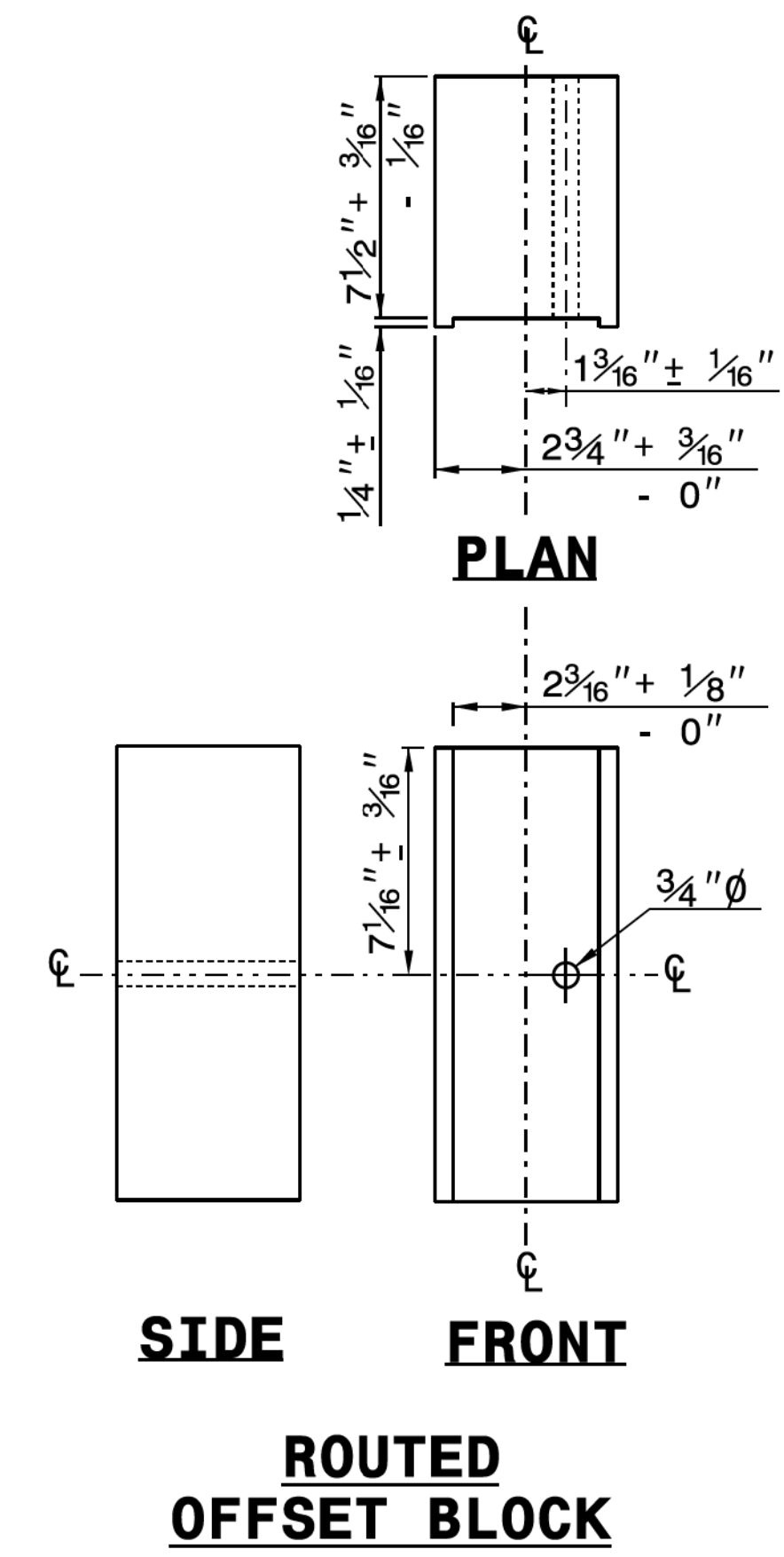


STANDARD LINE POST

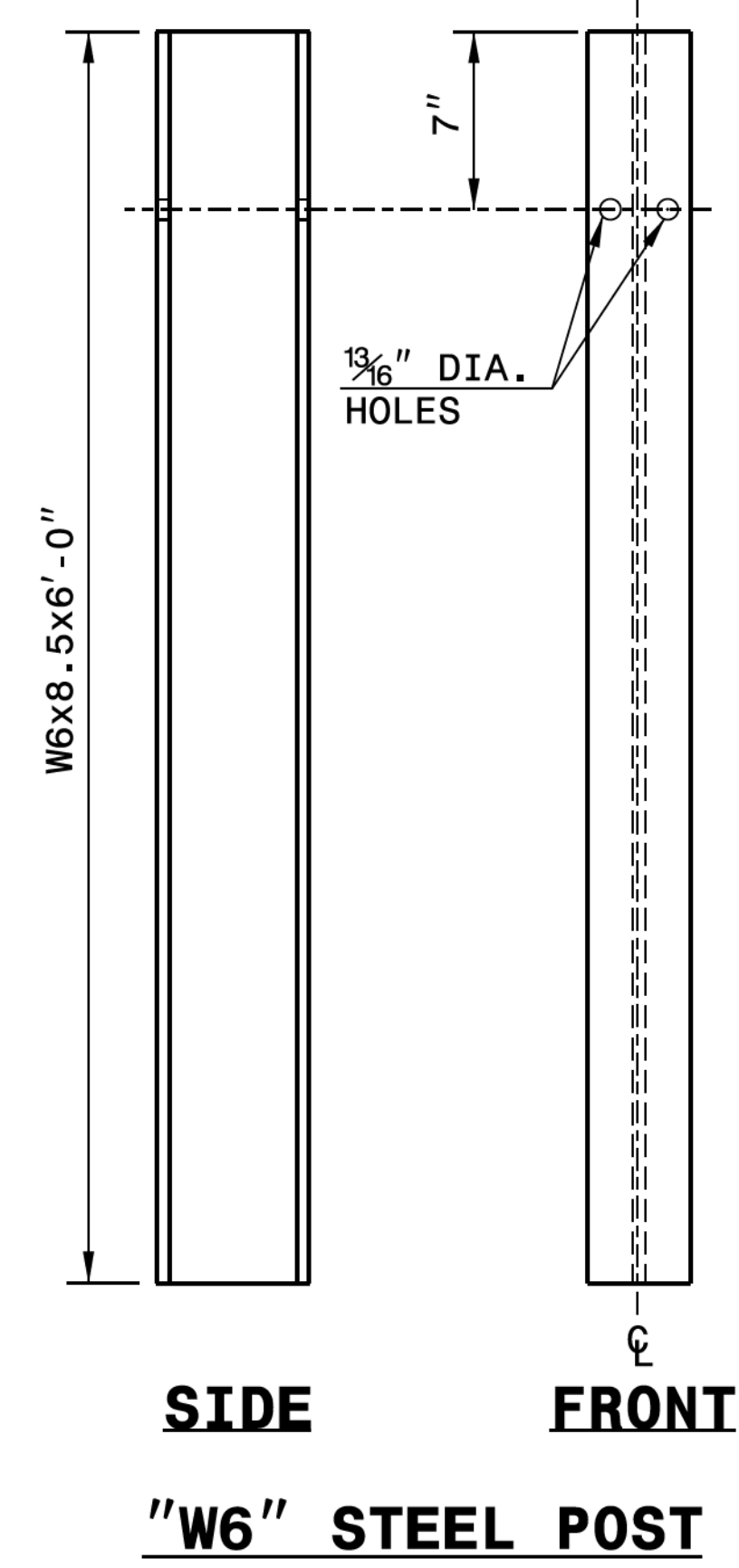
SHORT WOOD BREAKAWAY POST



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



ROUTED OFFSET BLOCK



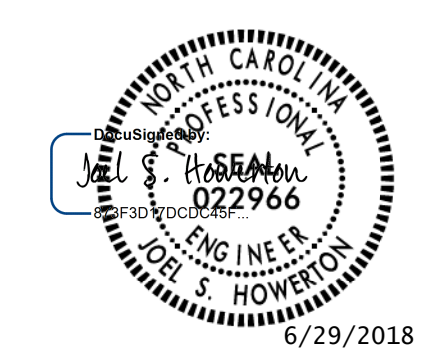
"W6" STEEL POST

SYSTEM PARTS

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02



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

SEE TITLE BLOCK

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

COMPUTED BY: DWB DATE: 10-18-17
 CHECKED BY: CTT DATE: 10-18-17

(1-16-18)

PROJECT NO.
B-4833

SHEET NO.
3G-1

**STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS**

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
			CONTINGENCY	ASU	100	200	300		
				TOTAL CY/TONS/SY:	100	200**	300**	0	0

*ASU = Aggregate Subgrade

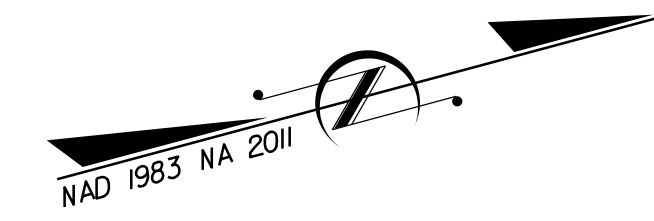
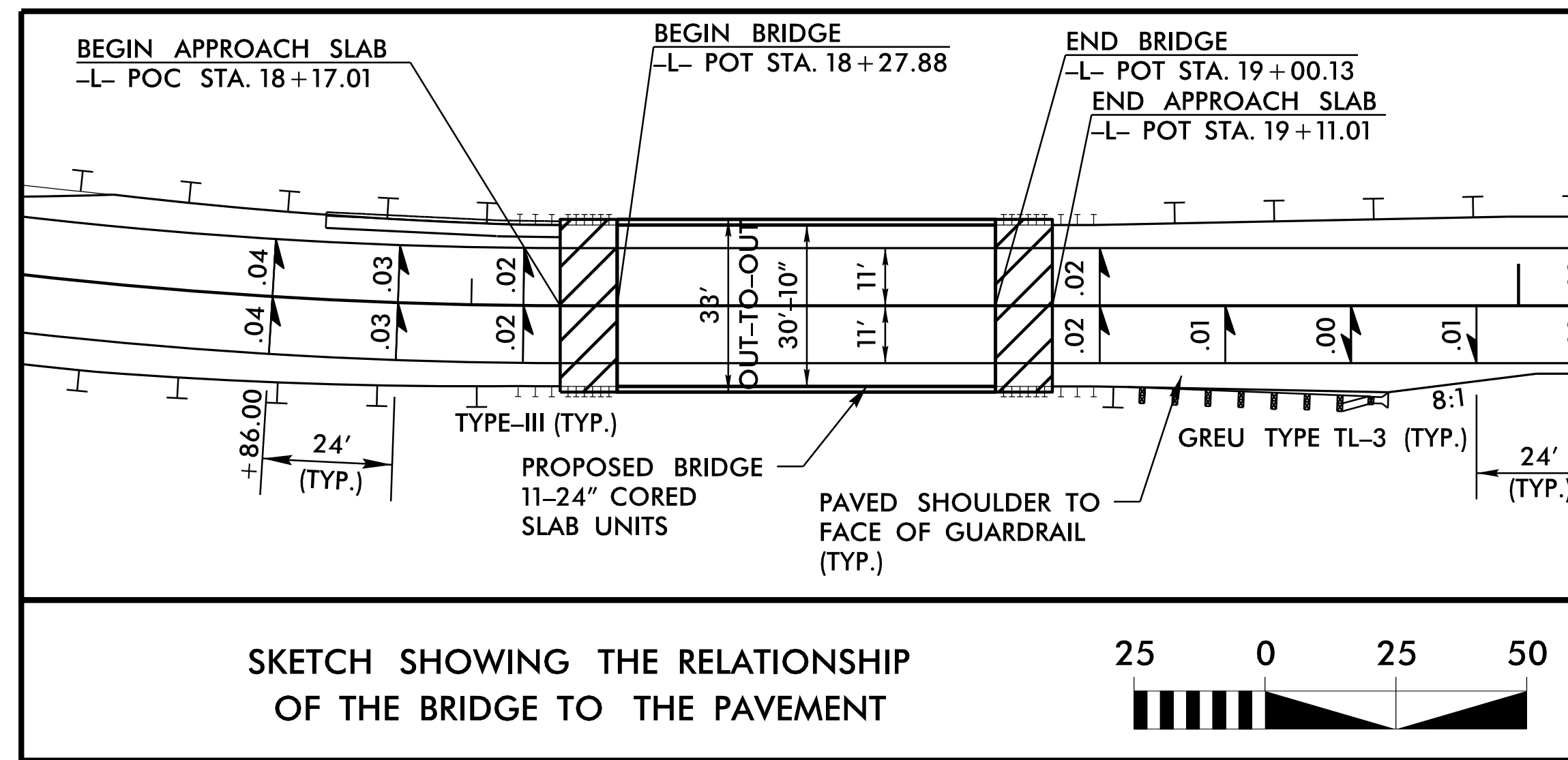
*AST = Aggregate Stabilization

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

*DESIGN EXCEPTION REQUIRED FOR DESIGN SPEED OF 50 MPH

NOTES:

- USE 12' MIN. WIDTH DRIVEWAYS WITH 5' MIN. RADII; OTHERWISE MATCH EXISTING.

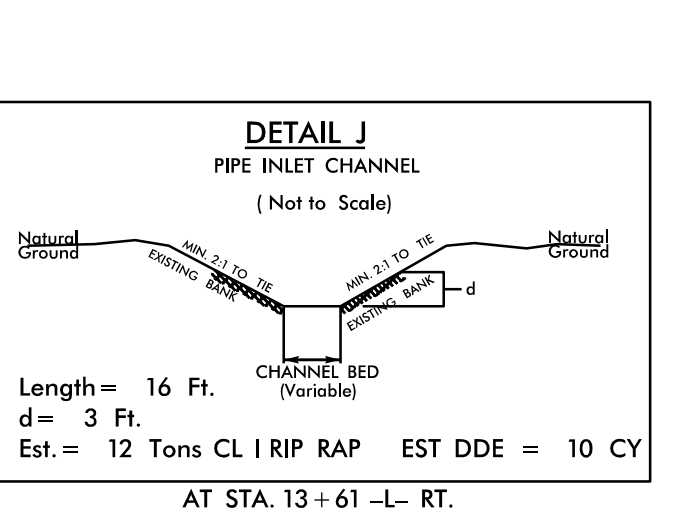
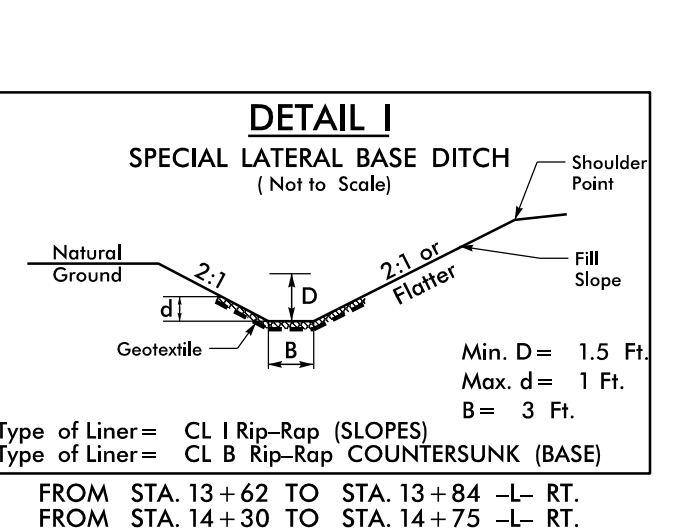
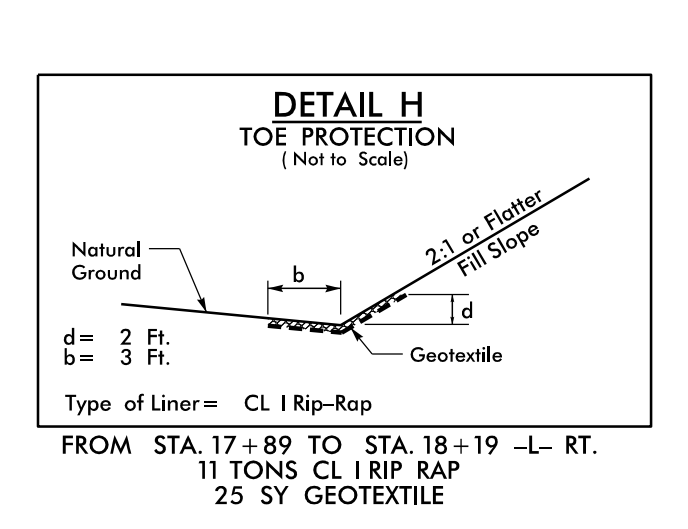
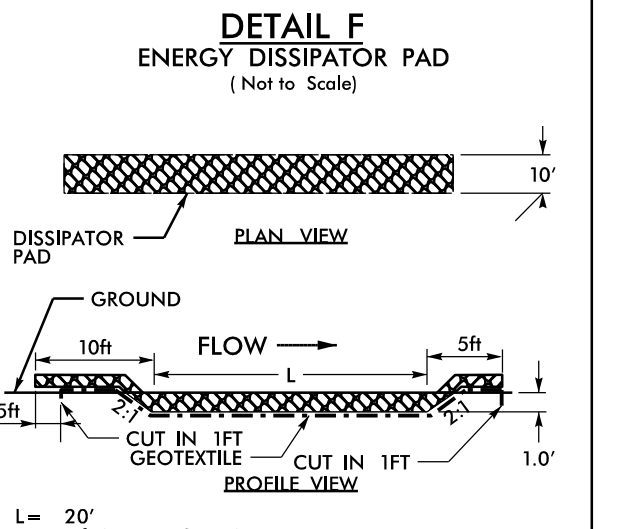
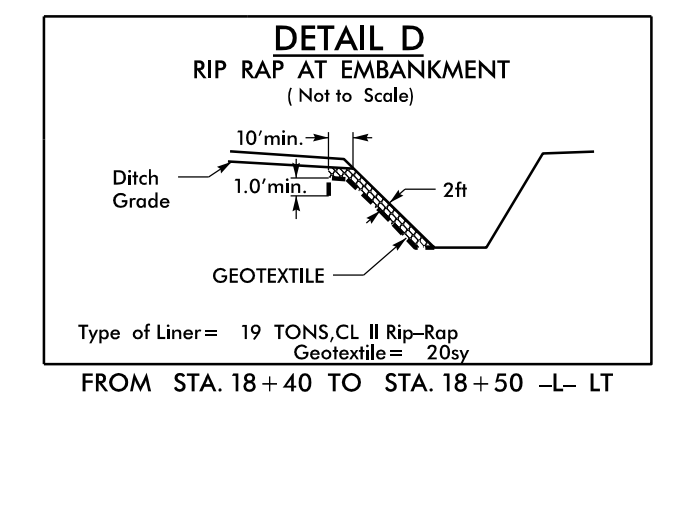
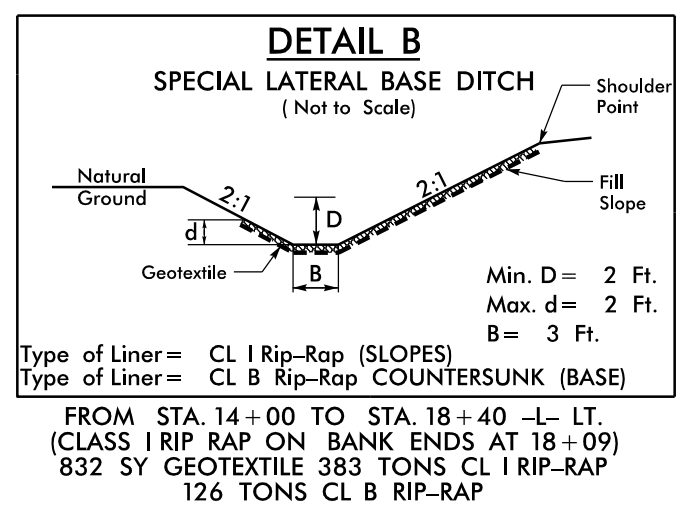
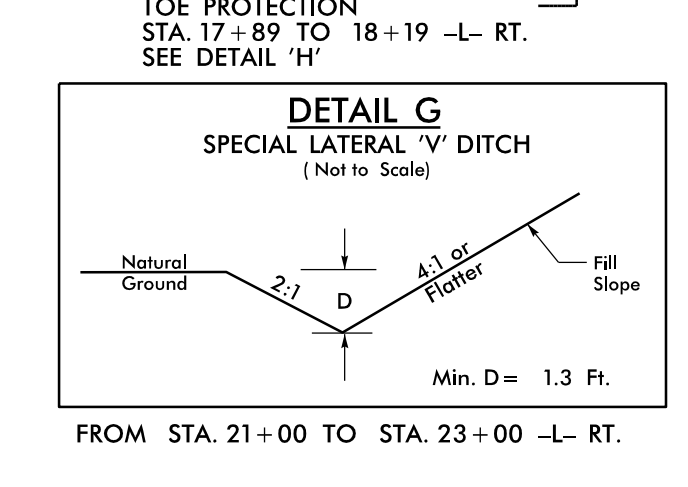
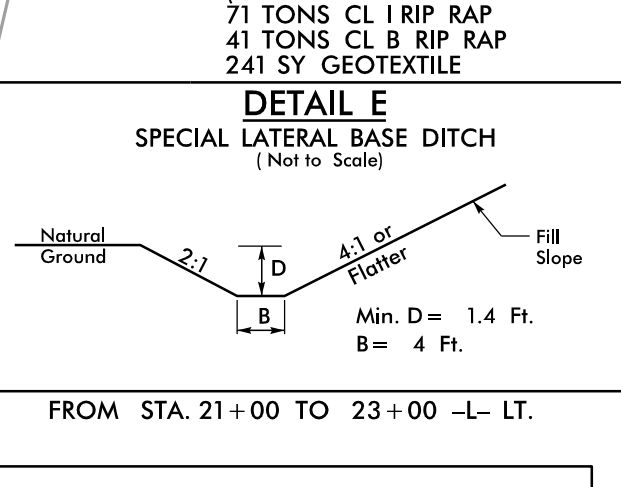
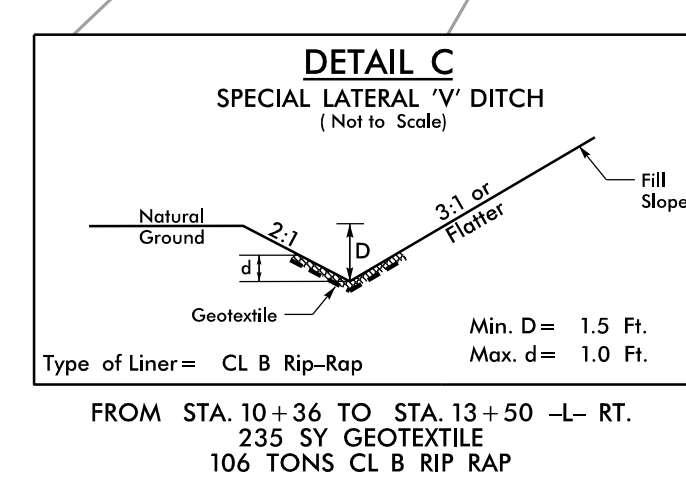
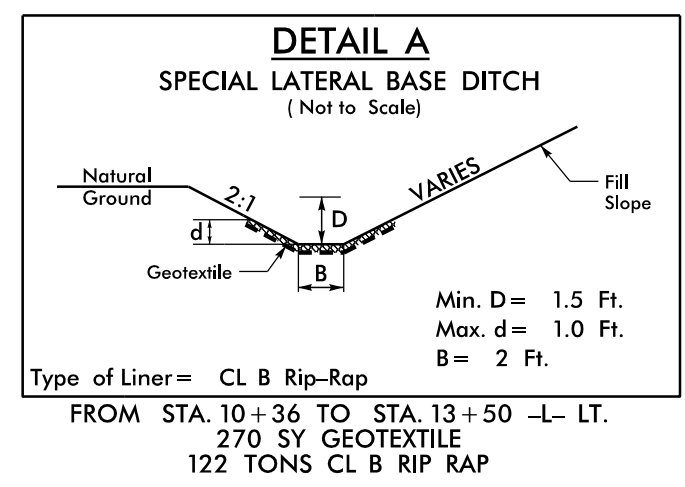
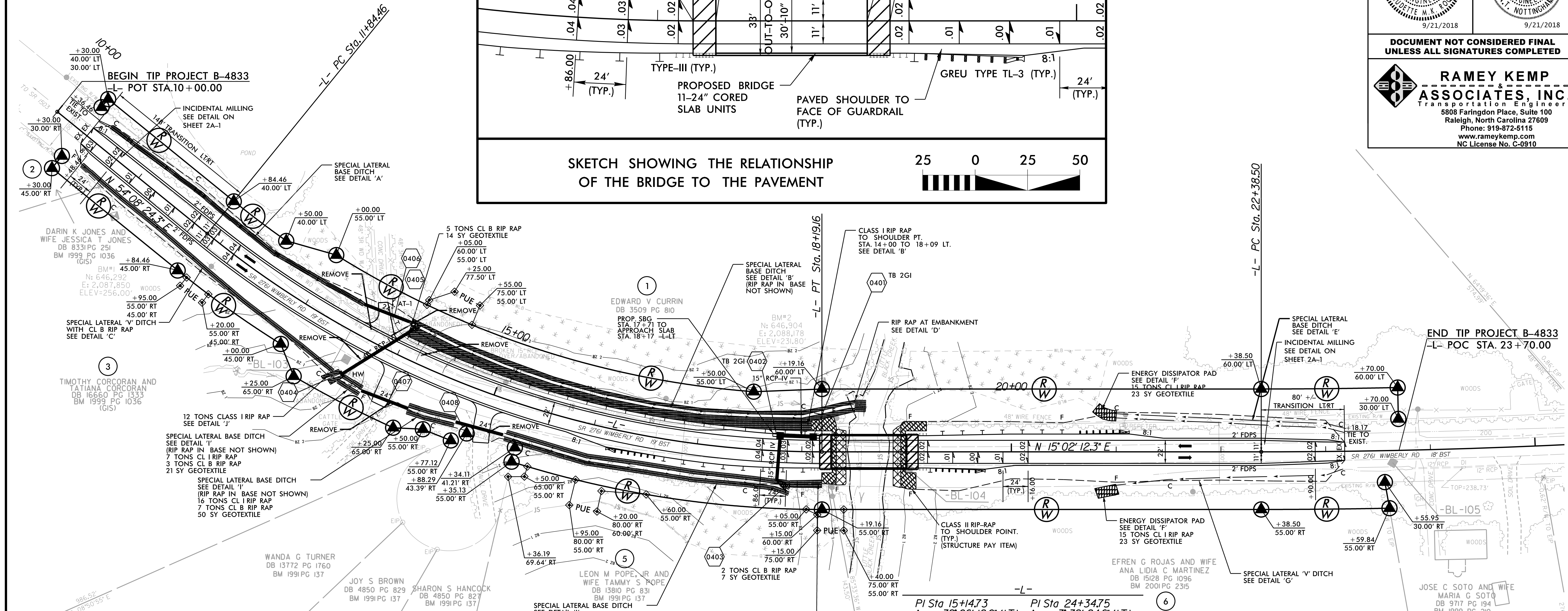


PROJECT REFERENCE NO.	SHEET NO.
B-4833	4
STATE PROJ. NO.	F. A. PROJ. NO.
38603.1.FD1	BRZ-2761 (1)
DESCRIPTION	PE, UTIL.
17BP.5.R.96	N/A
R/W, CONST.	R/W, CONST.
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<i>Clayton R. K. Payne</i> SEAL 17306 9/21/2018	<i>Andrew L. Nottingham</i> SEAL 17306 9/21/2018

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RAMEY KEMP ASSOCIATES, INC.
 Transportation Engineers
 5808 Faringdon Place, Suite 100
 Raleigh, North Carolina 27609
 Phone: 919-872-5115
 www.rameykemp.com
 NC License No. C-0910

REVISIONS



PI Sta 15+14.73
 $\Delta = 39^{\circ} 06' 12.0''$ (LT)
 $D = 6' 09' 39.0''$
 $L = 634.71'$
 $T = 330.27'$
 $R = 930.00'$
 $*DS = 50$ MPH
 $e = 0.04$
 $Runoff = 96'$

PI Sta 24+34.75
 $\Delta = 3^{\circ} 39' 24.6''$ (LT)
 $D = 0' 55' 55.2''$
 $L = 392.36'$
 $T = 196.25'$
 $R = 6,147.65'$
 $e = Exist.$

FOR -L- PROFILE SEE SHEET 5

BRIDGE APPROACH SLAB

FOR STRUCTURE PLANS, SEE SHEET S-1 THRU S-13

9/21/2018 10:30:00 AM C:\Users\rdj\Documents\4833.Rdy_psh_04.dgn

PROJECT REFERENCE NO.		SHEET NO.	
B-4833		5	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
38603.1.FD1	BRZ-2761 (1)	PE, UTIL.	
17BP.5.R.96	N/A	R/W, CONST.	
ROADWAY DESIGN ENGINEER	HYDRAULIC ENGINEER		

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RAMEY KEMP ASSOCIATES, INC.
Transportation Engineers
5808 Faringdon Place, Suite 100
Raleigh, North Carolina 27609
Phone: 919-872-5115
www.rameykemp.com
NC License No. C-0910

-L- SR 2761 (WIMBERLY ROAD)

PIPE HYDRAULIC DATA
-L- Sta.13+86

DRAINAGE AREA	= 100	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 70	CFS
DESIGN HW ELEVATION	= 239.7	FT
100 YEAR DISCHARGE	= 113	CFS
100 YEAR HW ELEVATION	= 243.20	FT
OVERTOPPING FREQUENCY	= *5	YRS
OVERTOPPING DISCHARGE	= *35	CFS
OVERTOPPING ELEVATION	= 238.3	FT

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 690	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 231.8	FT
BASE DISCHARGE	= 1,000	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 232.7	FT
OVERTOPPING DISCHARGE	= 1,500	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 235.7	FT

BM #2: RAILROAD SPIKE IN 20" OAK
66.4304' LEFT OF -L- STA. 18+19.47
(65.61' LEFT OF -BL- STA. 14+79.99)
EL=231.80'

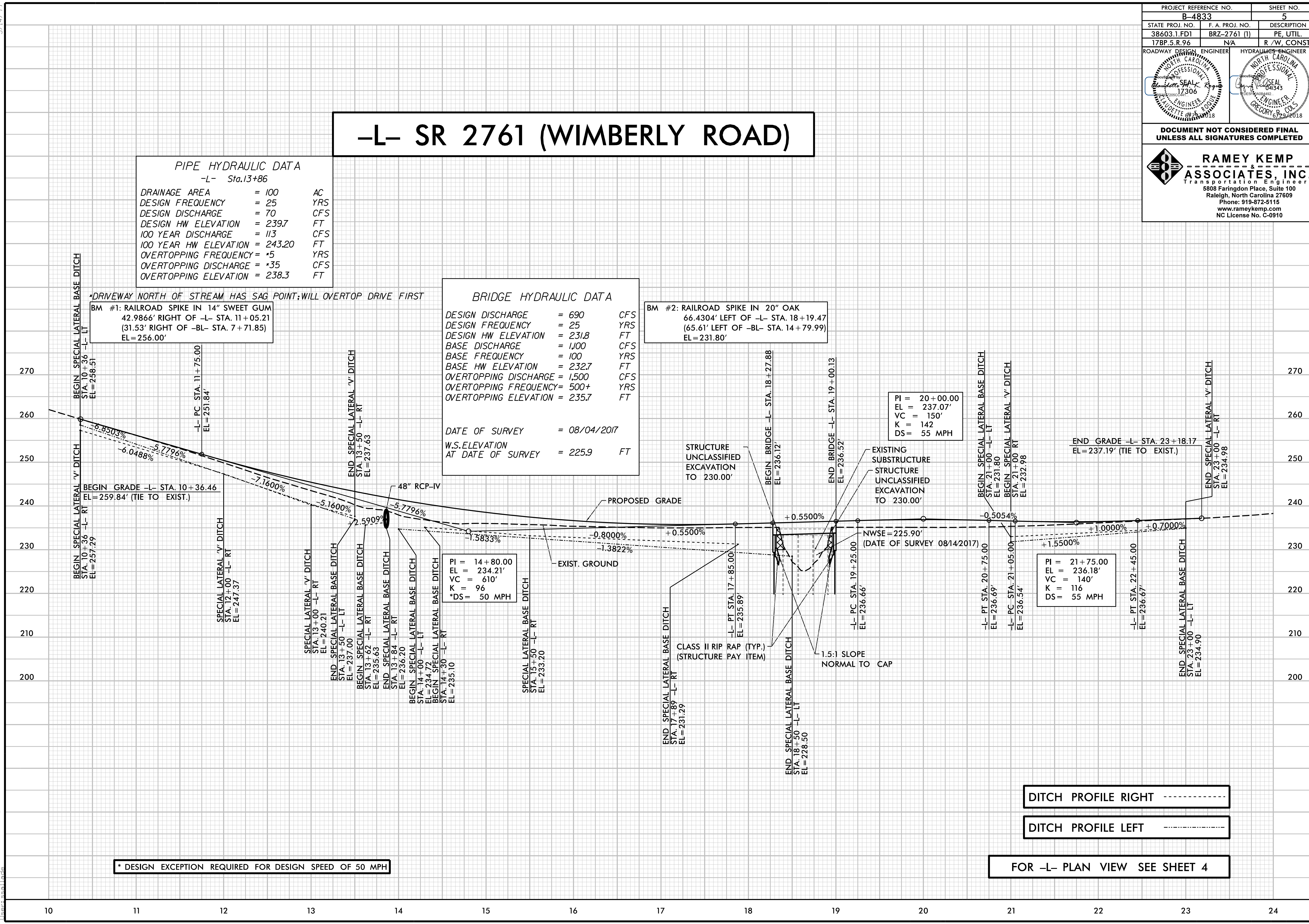
*DRIVEWAY NORTH OF STREAM HAS SAG POINT; WILL OVERTOP DRIVE FIRST
BM #1: RAILROAD SPIKE IN 14" SWEET GUM
42.9866' RIGHT OF -L- STA. 11+05.21
(31.53' RIGHT OF -BL- STA. 7+71.85)
EL=256.00'

DATE OF SURVEY = 08/04/2017
W.S. ELEVATION AT DATE OF SURVEY = 225.9 FT

PI = 20+00.00
EL = 237.07'
VC = 150'
K = 142
DS = 55 MPH

PI = 21+75.00
EL = 236.18'
VC = 140'
K = 116
DS = 55 MPH

PI = 14+80.00
EL = 234.21'
VC = 610'
K = 96
*DS = 50 MPH



* DESIGN EXCEPTION REQUIRED FOR DESIGN SPEED OF 50 MPH

DITCH PROFILE RIGHT -----
DITCH PROFILE LEFT -----
FOR -L- PLAN VIEW SEE SHEET 4

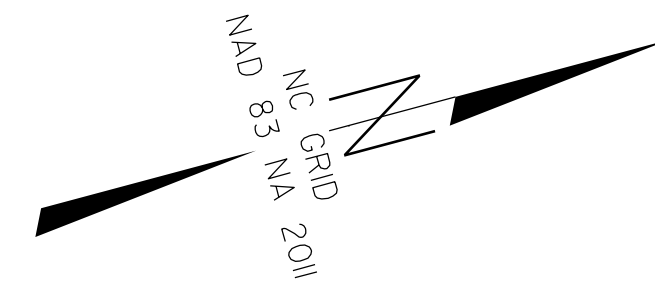
TIP PROJECT: B-4833

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

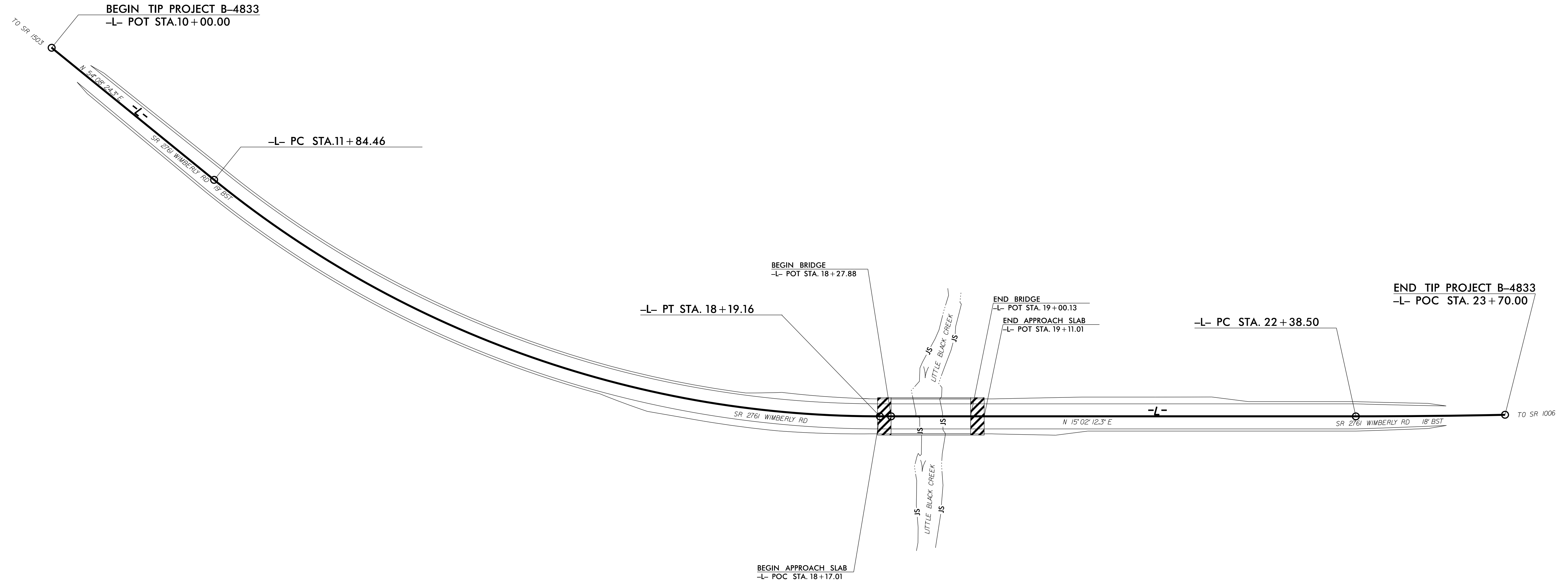
RIGHT OF WAY, EASEMENTS
AND PROPERTY TIES

WAKE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4833	RW-1	



LOCATION: BRIDGE NO. 376 OVER LITTLE BLACK CREEK ON SR 2761
TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURE



PROJECT LENGTH

LENGTH ROADWAY PROJECT B-4833 = 0.245 MILES
LENGTH STRUCTURE PROJECT B-4833 = 0.014 MILES
TOTAL LENGTH PROJECT B-4833 = 0.259 MILES

NCDOT CONTACT: LISA GILCHRIST, E.I.
DIVISION 5 - BRIDGE PROGRAM MANAGER
PH: 919-733-4699

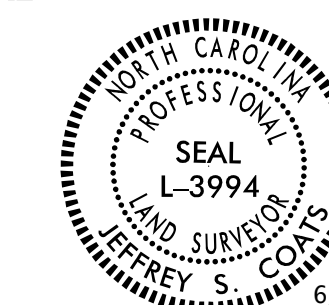
Prepared In the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
NOVEMBER 15, 2017

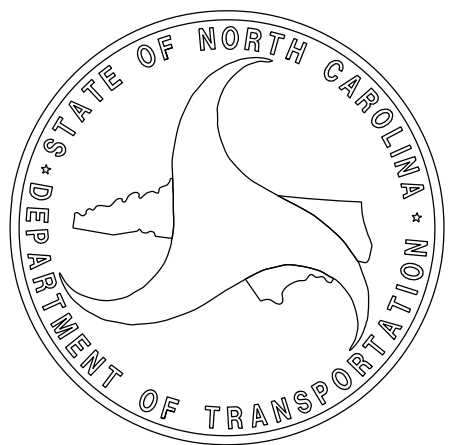
LETTING DATE:
SEPTEMBER 26, 2018

PROFESSIONAL LAND SURVEYOR



DocuSigned by:
Jeffrey S. Coats
8098882C18B85402
SIGNATURE:

6/29/2018



I, JEFFREY S. COATS, a Professional Land Surveyor in the state of North Carolina hereby certify to the best of my knowledge and belief that the following work item(s) (R/W Staking) performed under my responsible charge meet NCDOT Survey Standards as directed in the NCDOT Location & Surveys guidelines and procedures.

I further certify that the right of way and permanent easement points shown herein and outlined in the tables shown hereon (localized coordinates, station/offset) have been checked and are accurate representations of the right of way and permanent easement points depicted on the corresponding highway plans. I also certify that the right of way and permanent easement points shown herein have been field monumented under my supervision from existing survey control provided by others; that the depicted property data shown herein were surveyed by others; and these monuments denote the right of way and easement boundaries at the time of staking which may be subject to change due to right of way revisions (See deeds for final determination).

Witness my original signature, registration number and seal this 1st day of June, 2018.

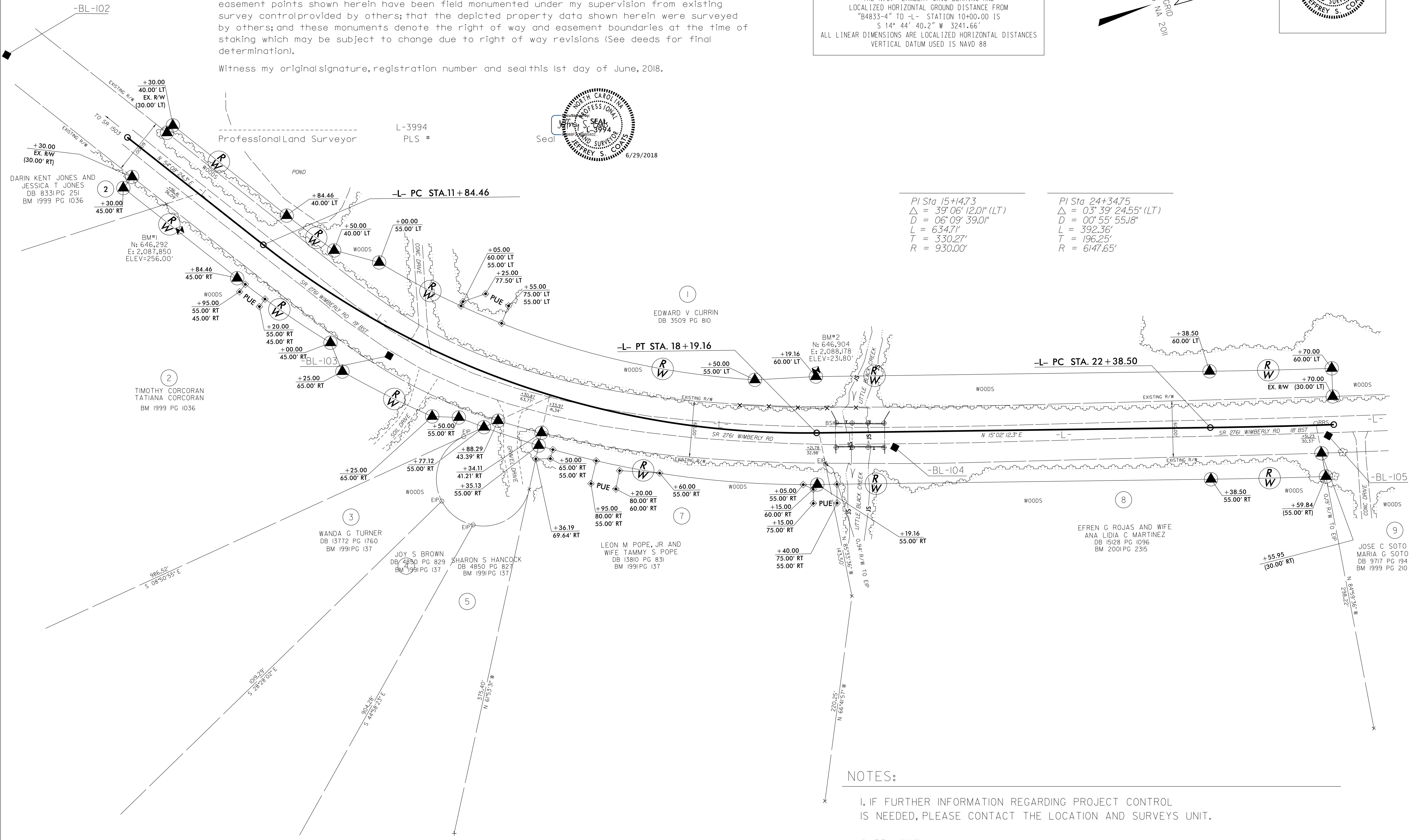
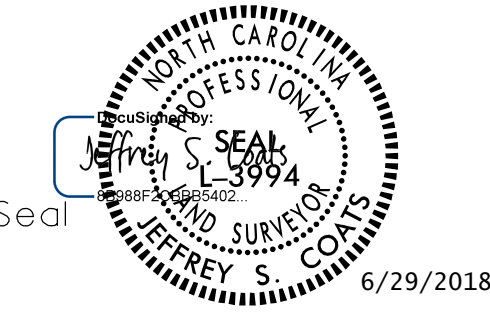
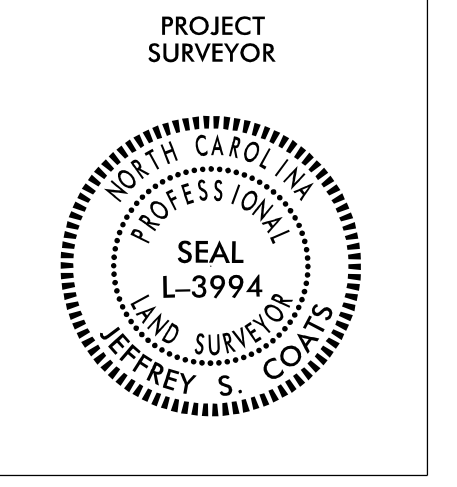
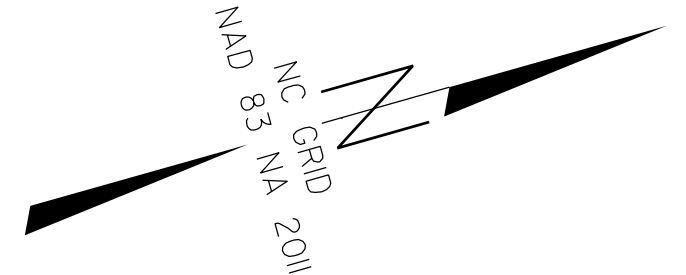
DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "B4833-4" WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF NORTHING: 649400.477(±) EASTING: 2088564.559(±) ELEVATION: 284.79'(±)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99987542

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4833-4" TO -L- STATION 10+00.00 IS S 14° 44' 40.2" W 3241.66'

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



PI Sta 15+14.73 $\Delta = 39^{\circ} 06' 12.0''$ (LT) $D = 06^{\circ} 09' 39.0''$ $L = 634.71'$ $T = 330.27'$ $R = 930.00'$	PI Sta 24+34.75 $\Delta = 03^{\circ} 39' 24.55''$ (LT) $D = 00^{\circ} 55' 55.18''$ $L = 392.36'$ $T = 196.25'$ $R = 6147.65'$
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NOTES:

- IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
- PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.