

**This electronic collection of documents is provided
for the convenience of the user
and is Not a Certified Document –**

**The documents contained herein were originally issued
and sealed by the individuals whose names and license
numbers appear on each page, on the dates appearing
with their signature on that page.**

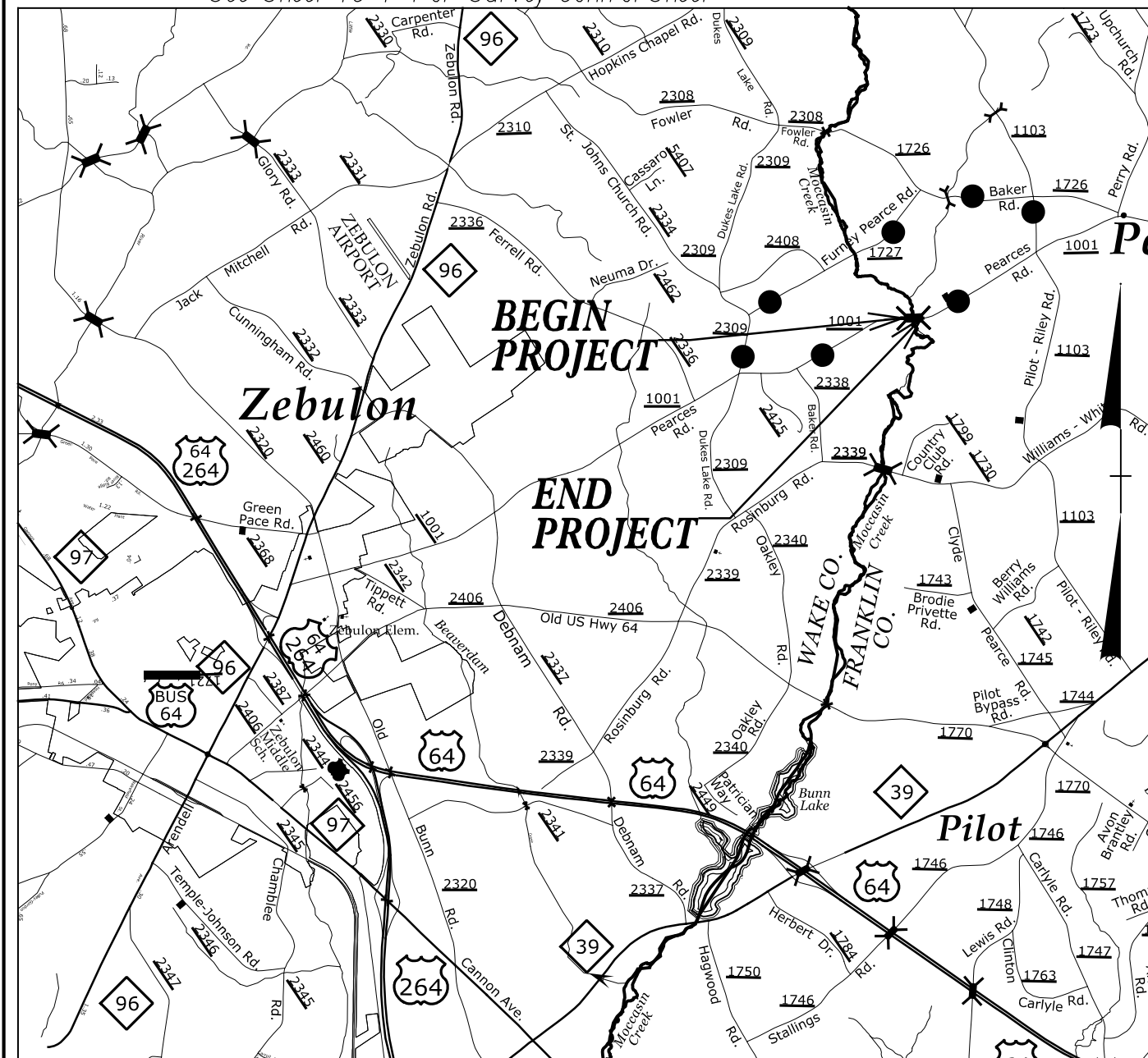
**This file or an individual page
shall not be considered a certified document.**

09/08/2018

TIP PROJECT: B-5140

CONTRACT: C204097

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



VICINITY MAP

●●●●● OFF-SITE DETOUR

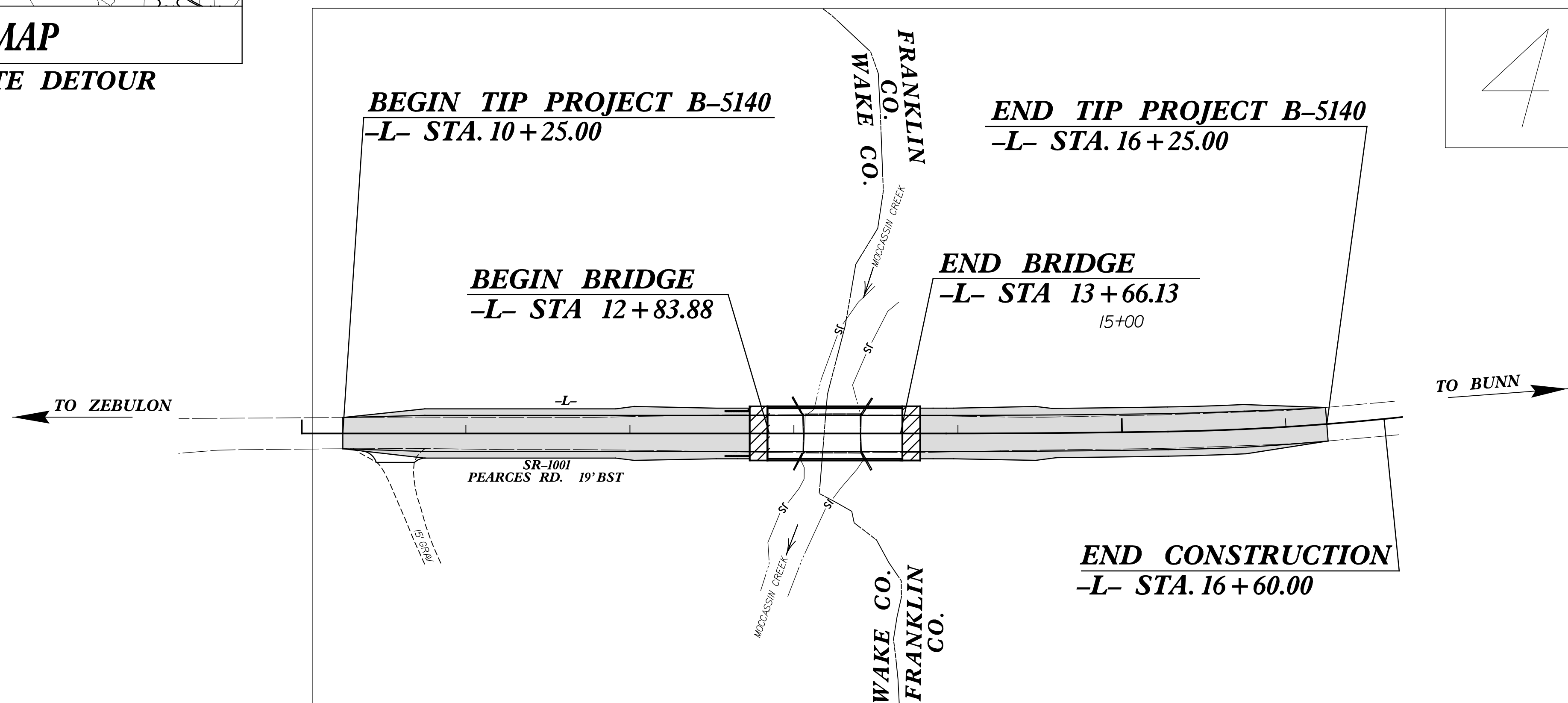
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE & FRANKLIN COUNTIES

**LOCATION: BRIDGE NO. 195 OVER MOCCASIN CREEK
ON SR 1001 (PEARCES ROAD)**

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

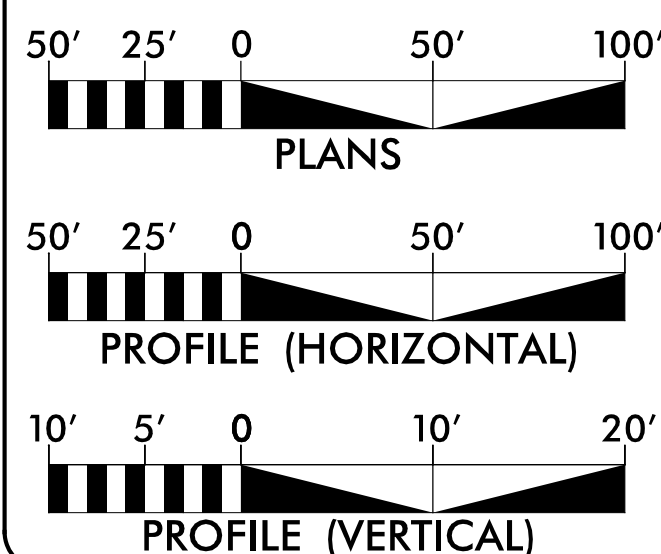
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5140	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
42301.1.1	BRSTP-1001(45)	PE	
42301.2.1		RW	
42301.2.2		UTILITY	
42301.3.1		CONST.	



** DESIGN EXCEPTION REQUIRED FOR SAG VERTICAL CURVE K VALUE

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES



DESIGN DATA

ADT 2018 = 3,535
ADT 2038 = 5,612
K = 11 %
D = 65 %
T = 4 % *
** V = 60 MPH
* TTST = 1% DUAL 3%
FUNC CLASS =
MINOR COLLECTOR
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-5140 = 0.098 MILES
LENGTH STRUCTURE TIP PROJECT B-5140 = 0.016 MILES
TOTAL LENGTH OF TIP PROJECT B-5140 = 0.114 MILES

Prepared In the Office of:

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE SUITE 202
RALEIGH, NC 27612
NC License Number F-0159

ECOLOGICAL ENGINEERING
NC FIRM LICENSE No: F-1146
1151 SE Cary Parkway
Suite 101
Cary, NC 27518
(919) 557-0929

2018 STANDARD SPECIFICATIONS

BRIAN K. EASON, PE
PROJECT ENGINEER

CHRISTINA YOKELEY, EI
PROJECT DESIGN ENGINEER

DAVID STUTTS, PE
NCDOT CONTACT

RIGHT OF WAY DATE:
SEPTEMBER 15, 2017

LETTING DATE:
MAY 15, 2018

HYDRAULICS ENGINEER

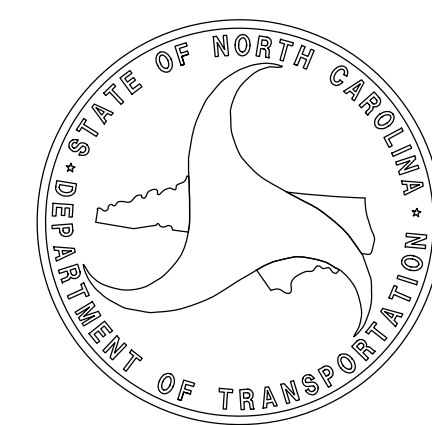
DocuSigned by:
Frank F. Fleming
3/12/2018
SIGNATURE:

ROADWAY DESIGN ENGINEER

DocuSigned by:
Brian K. Eason
3/9/2018
SIGNATURE:

Professional Engineer Seal for Frank F. Fleming, No. 20147.

Professional Engineer Seal for Brian K. Eason, No. 25523.



INDEX OF SHEETS B-5140

SHEET NUMBER	TITLE SHEET	EFF. 01-16-2018
1	TITLE SHEET	REV.
1-A	INDEX OF SHEETS, STANDARD DRAWINGS, GENERAL NOTES	2018 ROADWAY ENGLISH STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS	
1C-1	SURVEY CONTROL SHEET	The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch -
1E-1	RIGHT OF WAY CONTROL SHEET	N. C. Department of Transportation - Raleigh, N. C., Dated January, 2018 are applicable to this project
1E-2	PERMANENT EASEMENT CONTROL SHEET	and by reference hereby are considered a part of these plans:
2A-1	PAVEMENT SCHEDULE AND TYPICAL SECTIONS	
2C-1	STRUCTURE ANCHOR UNITS DETAIL	STD.NO. TITLE
2C-2	GUARDRAIL INSTALLATION DETAIL	DIVISION 2 - EARTHWORK
3B-1	SUMMARY OF EARTHWORK, SHOULDER BERM GUTTER SUMMARY, AND GUARDRAIL SUMMARY	200.03 Method of Clearing - Method III 225.02 Guide for Grading Subgrade - Secondary and Local 225.04 Method of Obtaining Superelevation - Two Lane Pavement
3D-1	SUMMARY OF DRAINAGE QUANTITIES	
4	PLAN SHEET	
5	PROFILE SHEET	DIVISION 3 - PIPE CULVERTS
RW-4	MODIFIED R/W PLAN SHEET	300.01 Method of Pipe Installation
TMP-1 THRU TMP-5	TRANSPORTATION MANAGEMENT PLAN & SIGN DESIGN PLANS	
PMP-1	PAVEMENT MARKING PLAN	DIVISION 4 - MAJOR STRUCTURES
EC-1 THRU EC-5	EROSION CONTROL PLANS	422.02 Bridge Approach Fills - Type II Modified Approach Fill
RF-1	REFORESTATION DETAIL SHEET	
SIGN-1 THRU SIGN-3	SIGNING PLANS	DIVISION 5 - SUBGRADE, BASES AND SHOULDERS
UO-1 THRU UO-2	UTILITIES BY OTHERS PLANS	560.01 Method of Shoulder Construction - High Side of Superelevated Curve - Method I
X-1A	CROSS-SECTIONS SUMMARY	
X-1 THRU X-4	CROSS-SECTIONS	DIVISION 8 - INCIDENTALS
S1-1 THRU S1-17	STRUCTURE PLANS	840.00 Concrete Base Pad for Drainage Structures 840.25 Anchorage for Frames - Brick or Concrete or Precast 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

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

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.

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

UTILITIES:
 UTILITY OWNERS ON THIS PROJECT ARE
 Duke Energy
 AT&T
 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 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	_____
Proposed Guardrail	_____
Existing Cable Guiderail	_____
Proposed Cable Guiderail	_____
Equality Symbol	⊕
Pavement Removal	_____

VEGETATION:

Single Tree	○
Single Shrub	○

Note: Not to Scale

*S.U.E. = Subsurface Utility Engineering

Hedge	_____
Woods Line	_____
Orchard	_____
Vineyard	_____

EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	_____ 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	○ S
Storm Sewer	_____ S

UTILITIES:

POWER:	
Existing Power Pole	●
Proposed Power Pole	○
Existing Joint Use Pole	●
Proposed Joint Use Pole	○
Power Manhole	○ P
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	○ T
Telephone Pedestal	□ T
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	○ W
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

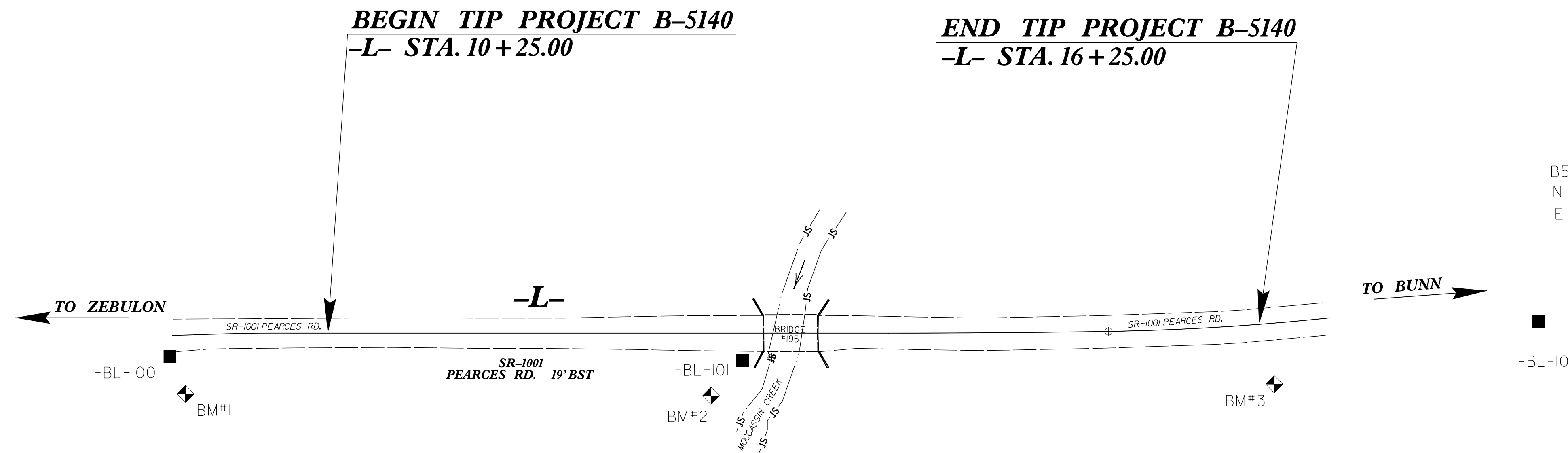
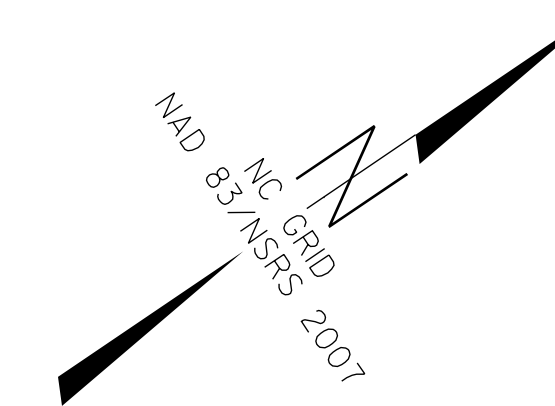
SANITARY SEWER:

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.	⊕ 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.

SURVEY CONTROL SHEET B-5140



B5140-2
 N 784049.233
 E 2204644.892

B5140-1
 N 782941.521
 E 2204543.266

BL POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
100	BL-100	781548.0850	2204002.8180	278.16	OUTSIDE PROJECT LIMITS	
101	BL-101	781852.2050	2204211.8050	266.63	12+92.30	17.52 RT
102	BL-102	782290.7770	2204478.7040	285.72	OUTSIDE PROJECT LIMITS	

.....
BM1	ELEVATION - 282.54	BM2	ELEVATION - 263.98	BM3	ELEVATION - 280.52	
N 781542	E 2204028	N 781822	E 2204219	N 782127	E 2204216	
L STATION 10+00.00		L STATION 12+71.00	40 RIGHT	L STATION 15+24.00	132 LEFT	
RR SPIKE IN 16' PINE		RR SPIKE IN 18' ELM		RR SPIKE IN 16' PINE		
.....

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B5140-1" WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 782,941.521(±) EASTING: 2,204,543.266(±) ELEVATION: 294.76(±)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.00007234

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B5140-1" TO -L- STATION 10+25 IS S 20°51'52.0"W 1392.124'

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 SITE CALIBRATION FOR THE END USER'S GPS EQUIPMENT, IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

GEOID G09NC
NOTE: DRAWING NOT TO SCALE

02/16/16
 2/12/2018
 B5140_1s_1c.dgn
 c:\cadd\tail

6/2/2018

FINAL PAVEMENT SCHEDULE

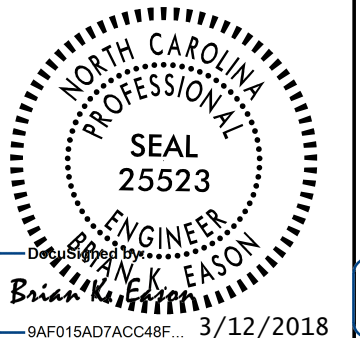
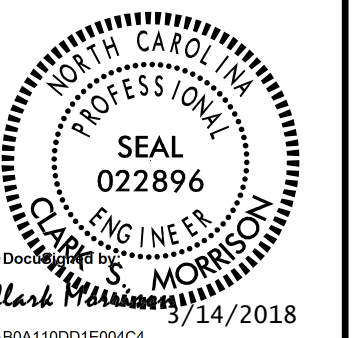
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	R1	SHOULDER BERM GUTTER.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS PER SQ YD PER 1" DEPTH TO BE PLACED IN LAYERS NOT TO EXCEED 1 1/2" IN DEPTH.	T	EARTH MATERIAL.
E1	PROP. APPROX. 5.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.	U	EXISTING PAVEMENT.
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 1/2" IN DEPTH.	V	INCIDENTAL MILLING (VARIABLE DEPTH - SEE DETAIL).
J	PROP. 6" AGGREGATE BASE COURSE.	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL).

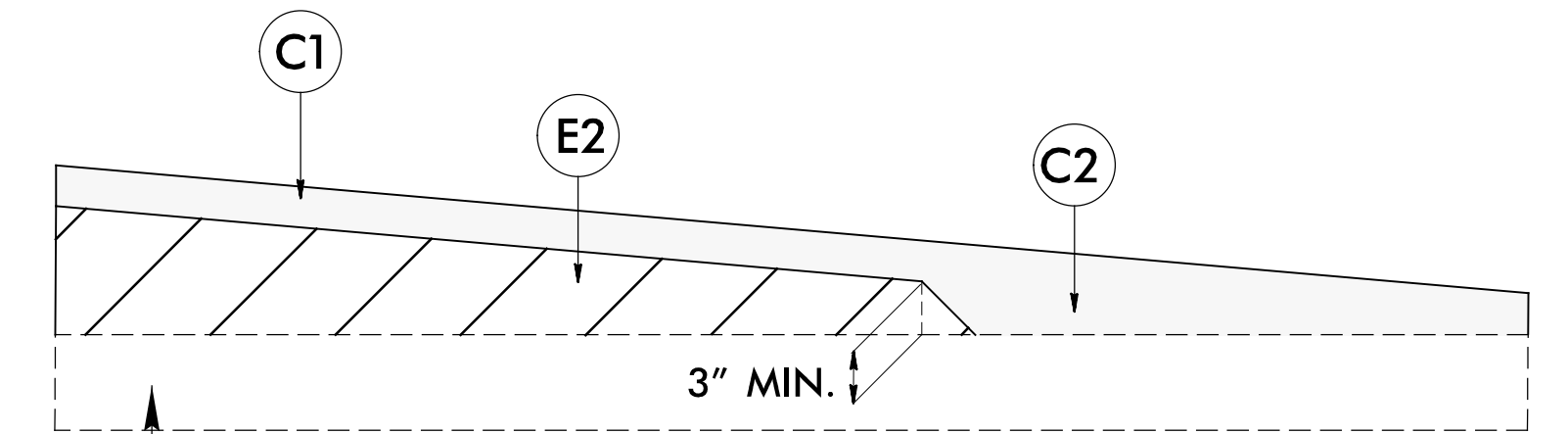
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

LOCHNER
 H. W. LOCHNER, INC.
 2840 PLAZA PLACE, SUITE 202
 RALEIGH, NC 27612
 (919)571-7111

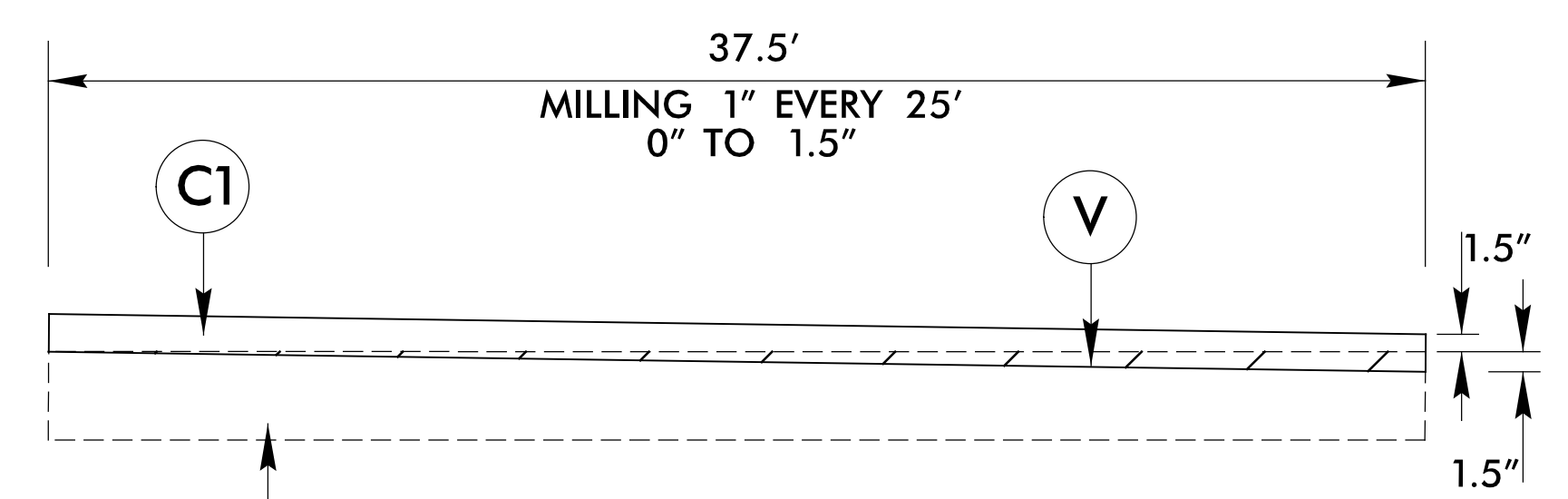
NC License Number F-0159
 NC FIRM LICENSE No: F-1148
 1151 SE Gary Parkway
 Suite 101
 Cary, NC 27518
 (919) 557-0929

ECOLOGICAL ENGINEERING

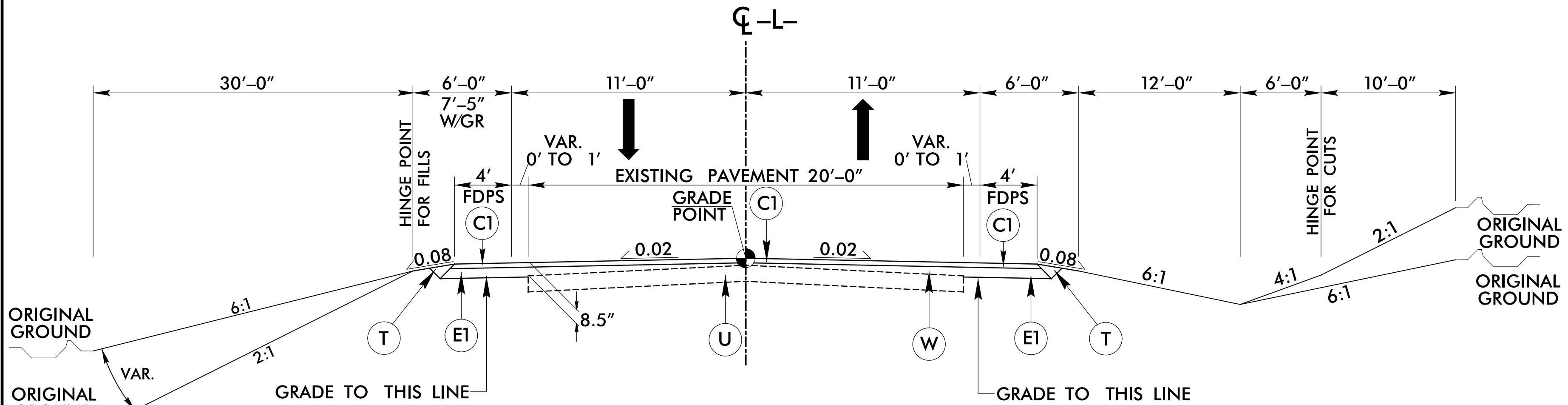
PROJECT REFERENCE NO. B-5140	SHEET NO. 2A-1
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
 Brian K. Eason 3/12/2018	 Clark H. Morrison 1/14/2018
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



WEDGING DETAIL



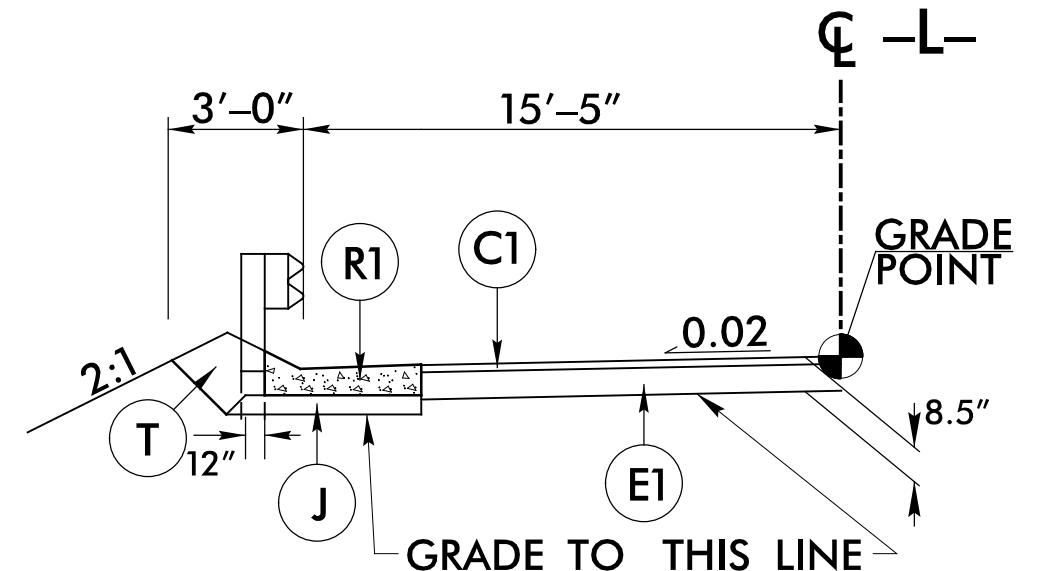
INCIDENTAL MILLING DETAIL
 USE MILLING DETAIL AT RESURFACING TIES



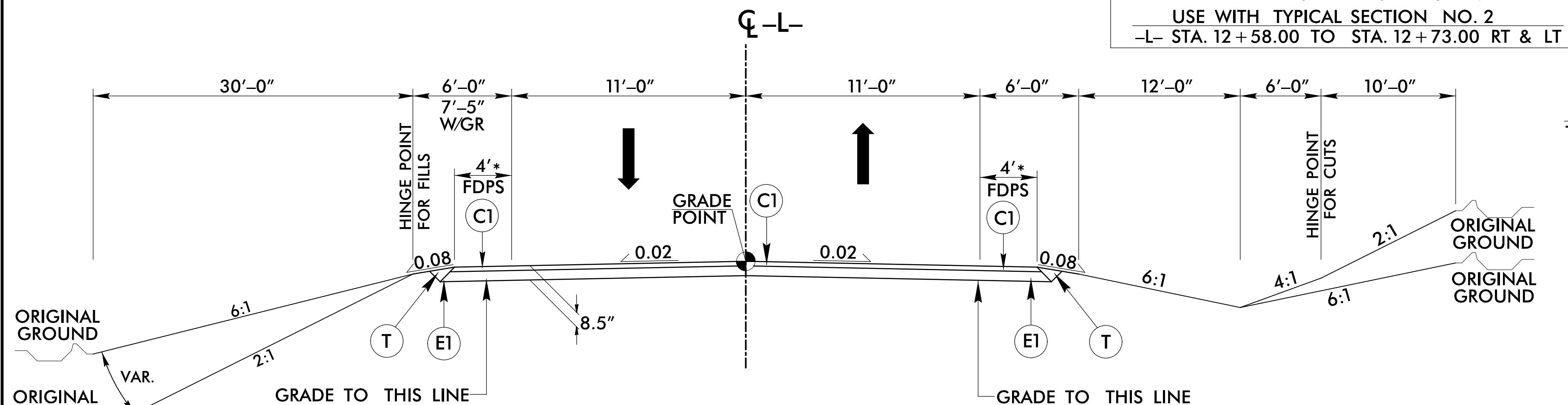
TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1
 -L- STA. 10+75.00 TO STA. 12+10.00
 -L- STA. 14+40.00 TO STA. 15+75.00
 NOTE: TRANSITION FROM EXISTING TO TYPICAL SECTION
 -L- STA. 10+25.00 TO STA. 10+75.00
 NOTE: TRANSITION FROM EXISTING TO TYPICAL SECTION
 -L- STA. 15+75.00 TO STA. 16+25.00

SHOULDER BERM GUTTER DETAIL



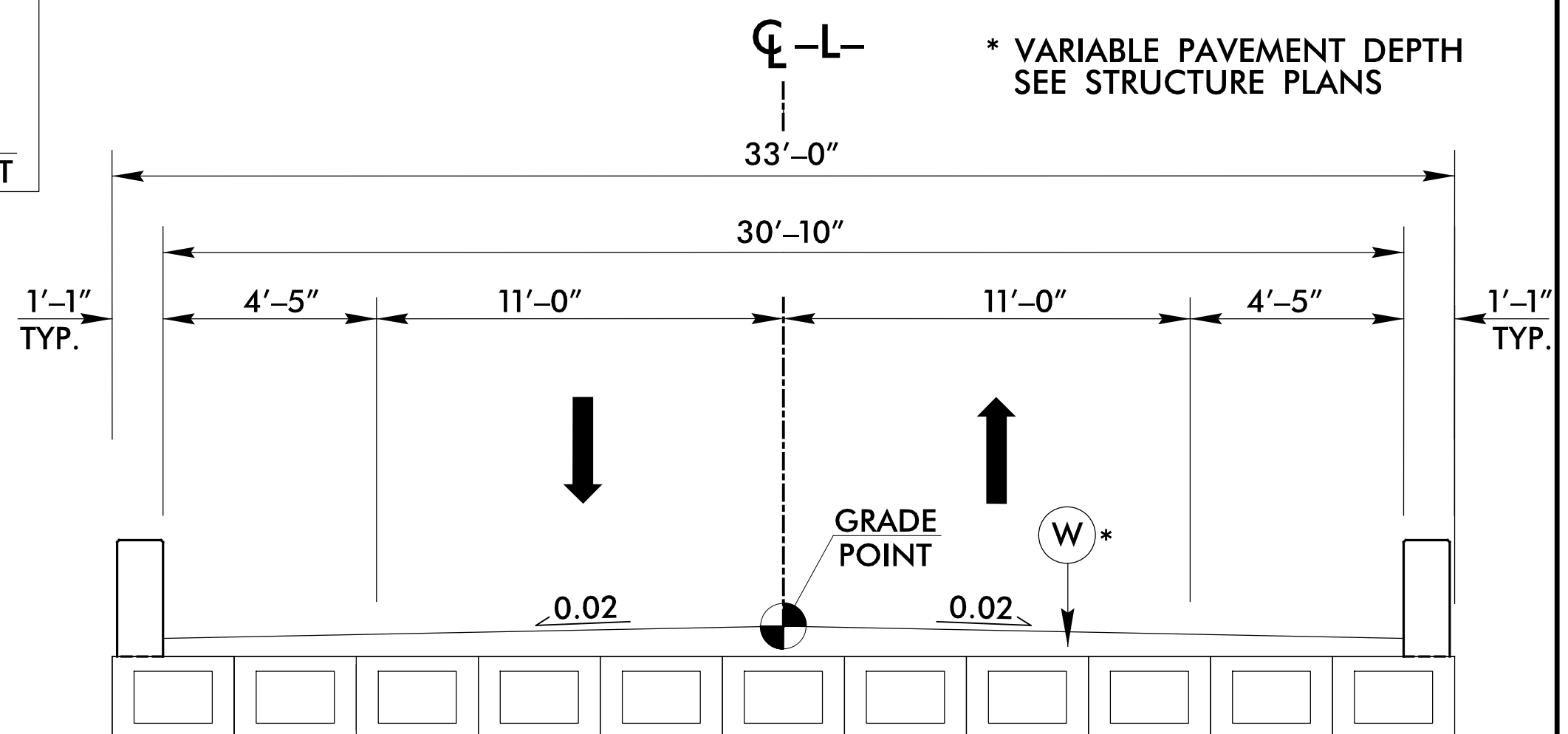
USE WITH TYPICAL SECTION NO. 2
 -L- STA. 12+58.00 TO STA. 12+73.00 RT & LT



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2
 -L- STA. 12+10.00 TO STA. 12+83.88 (BEGIN BRIDGE)
 -L- STA. 13+66.13 (END BRIDGE) TO STA. 14+40.00

* PAVE TO FACE OF GUARDRAIL - SEE PLAN SHEET 4 FOR LOCATION



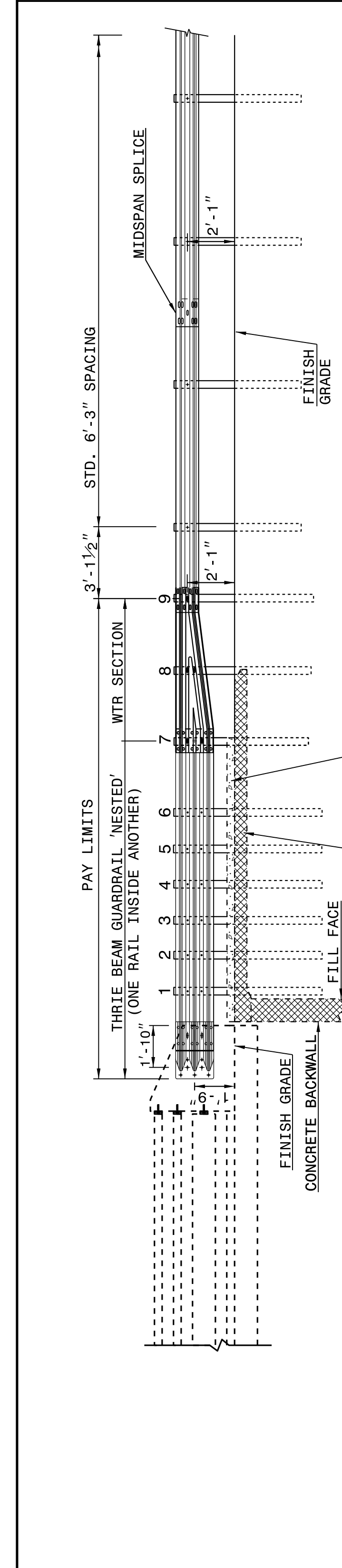
TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3
 -L- STA. 12+83.88 (BEGIN BRIDGE) TO STA. 13+66.13 (END BRIDGE)

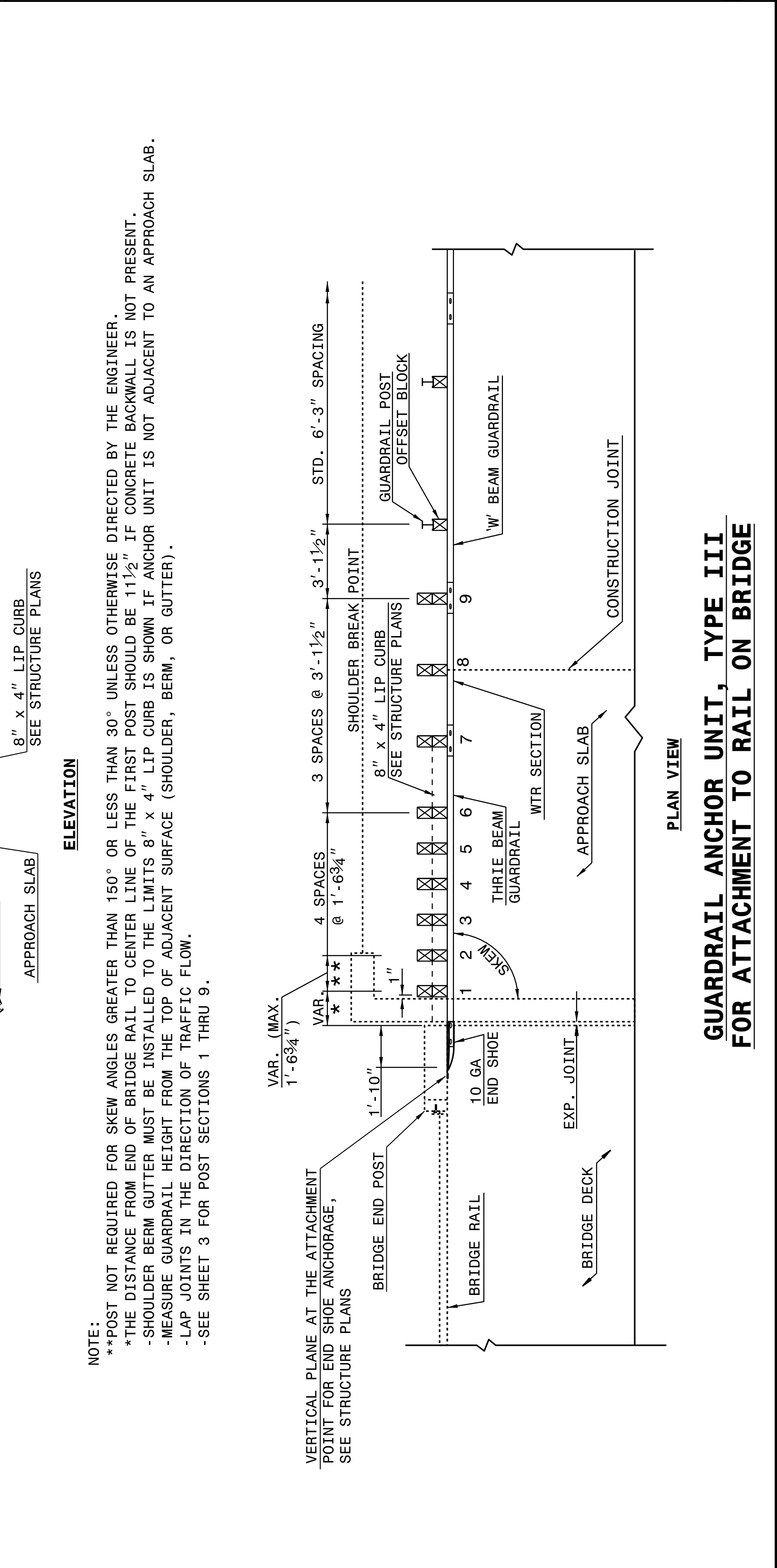
3/6/2018 B61401_rdy_psh_02_TYP.dgn

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.

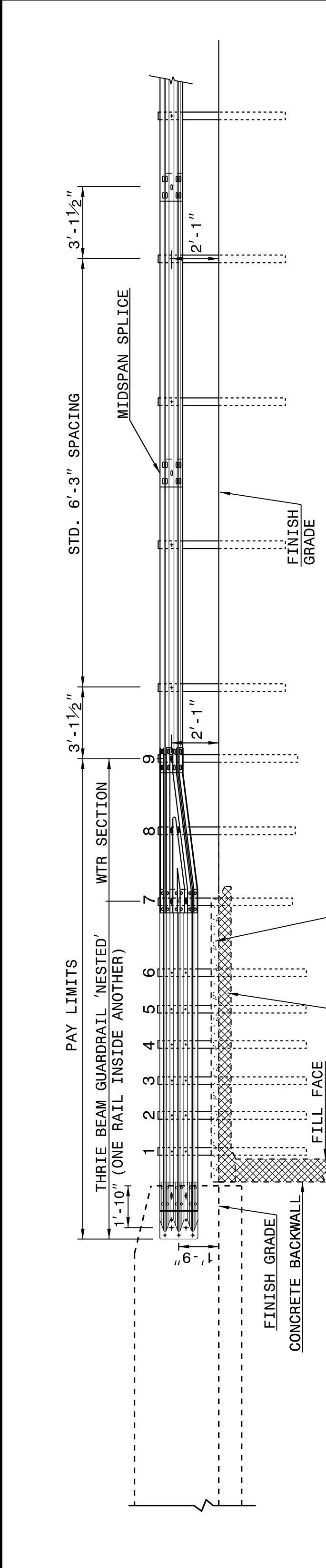


ROADWAY DETAIL DRAWING FOR STRUCTURE ANCHOR UNITS GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE

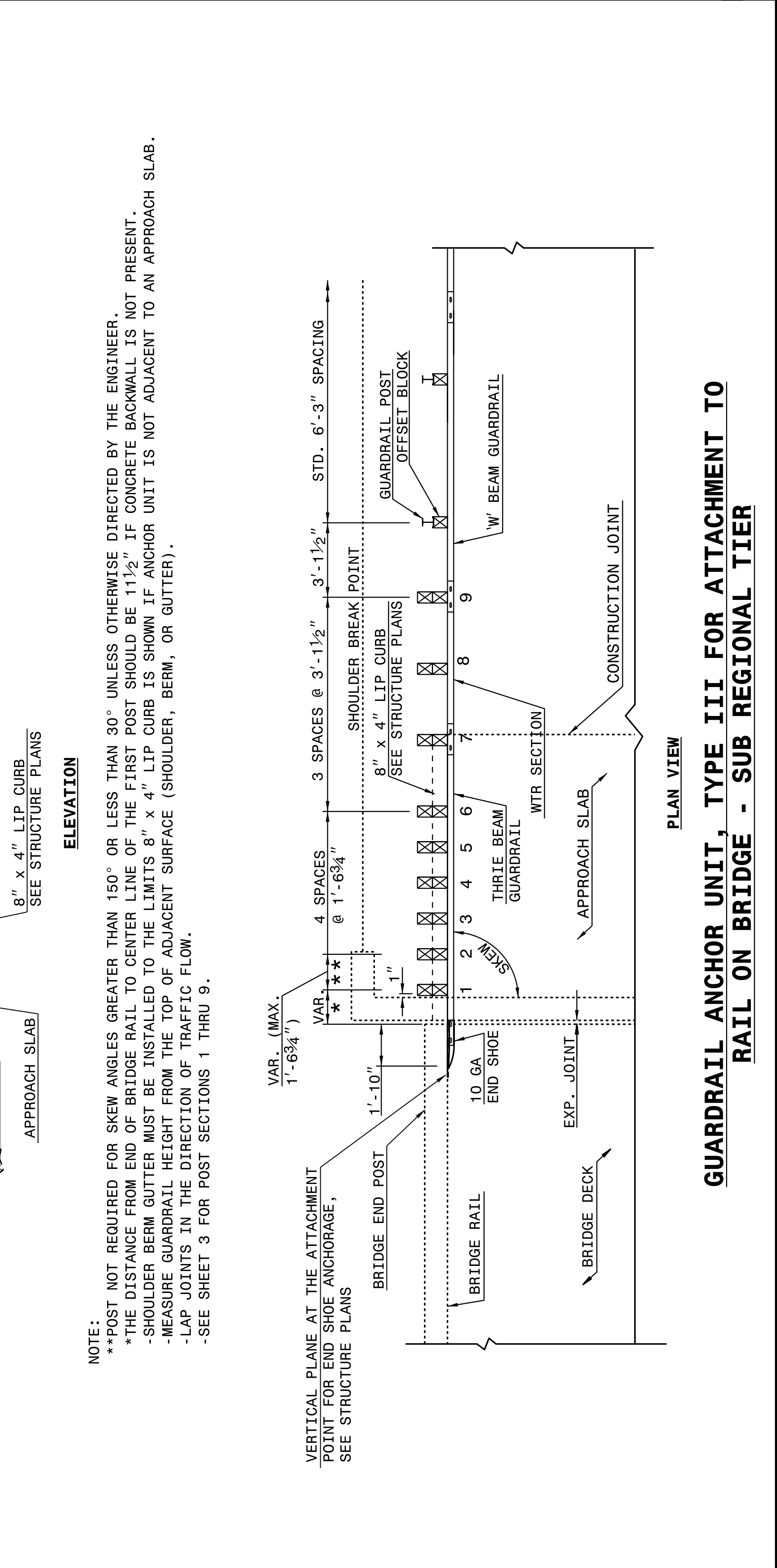


SHEET 1 OF 7 862D03

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

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

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

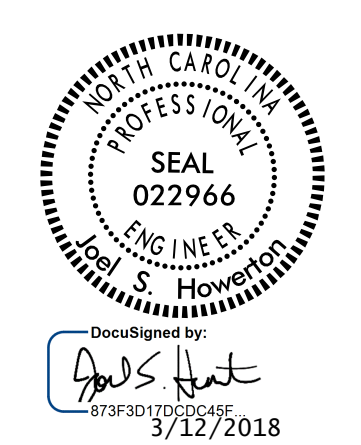
STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

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

SHEET 2 OF 7 862D03

NOTE:
 **POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
 *THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11 1/2" IF CONCRETE BACKWALL IS NOT PRESENT.
 -SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.
 -MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
 -LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
 -SEE SHEET 3 FOR POST SECTIONS 1 THRU 9.

NOTE:
 **POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
 *THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11 1/2" IF CONCRETE BACKWALL IS NOT PRESENT.
 -SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.
 -MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
 -LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
 -SEE SHEET 3 FOR POST SECTIONS 1 THRU 9.



DocuSigned by:
 J. S. Howerton
 873F3D7D20264E
 3/12/2018

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

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

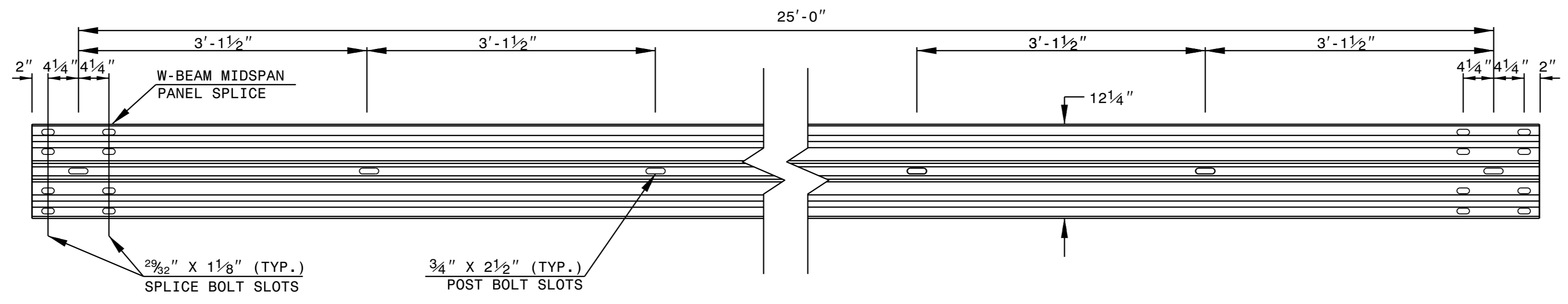
ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02

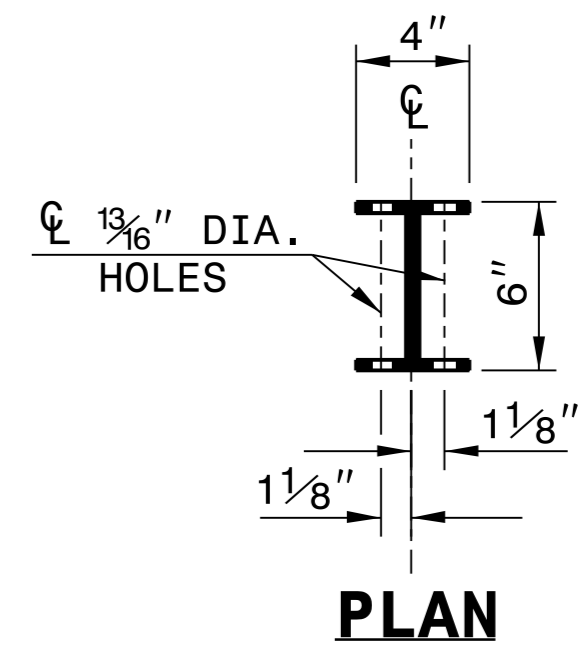
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

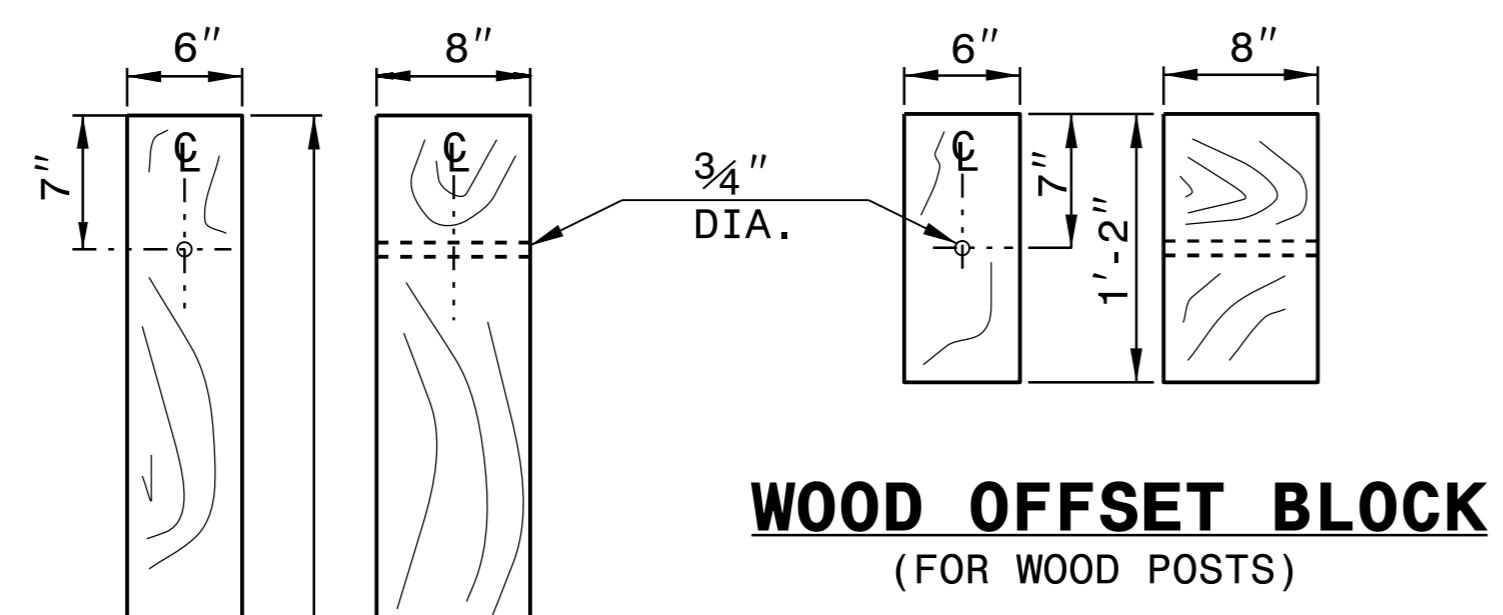
SHEET 6 OF 8
862D02



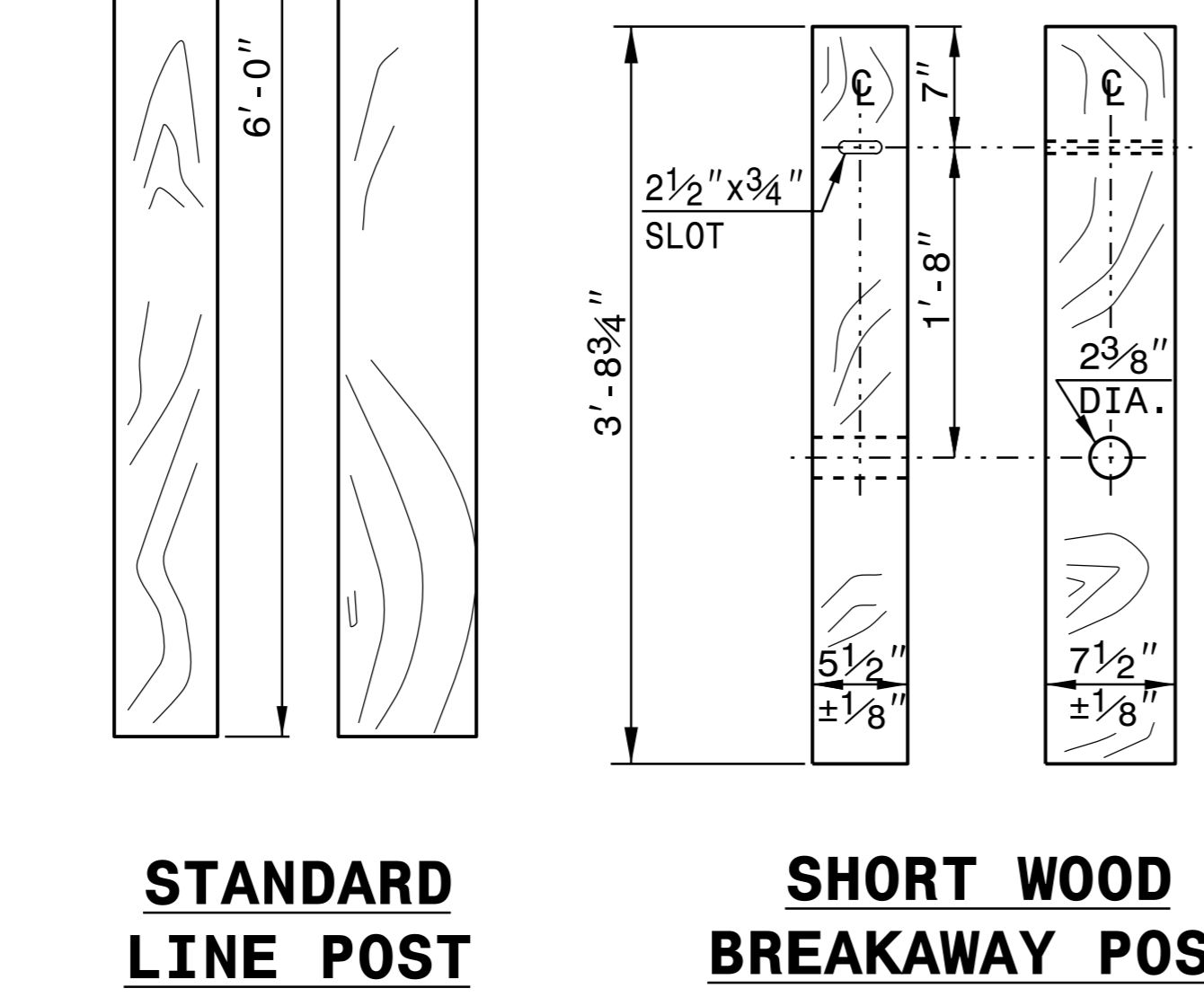
STANDARD W-BEAM GUARDRAIL



PLAN

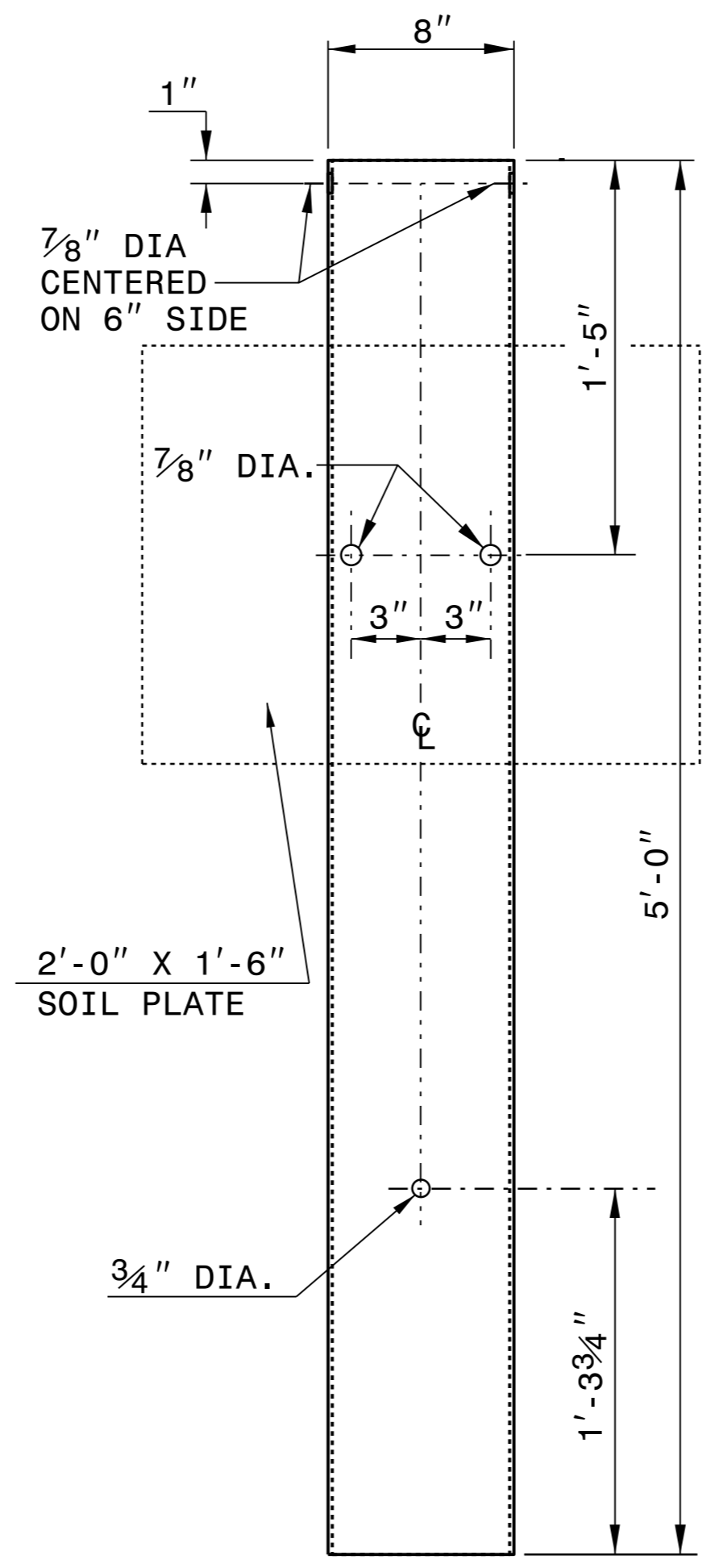


**WOOD OFFSET BLOCK
(FOR WOOD POSTS)**

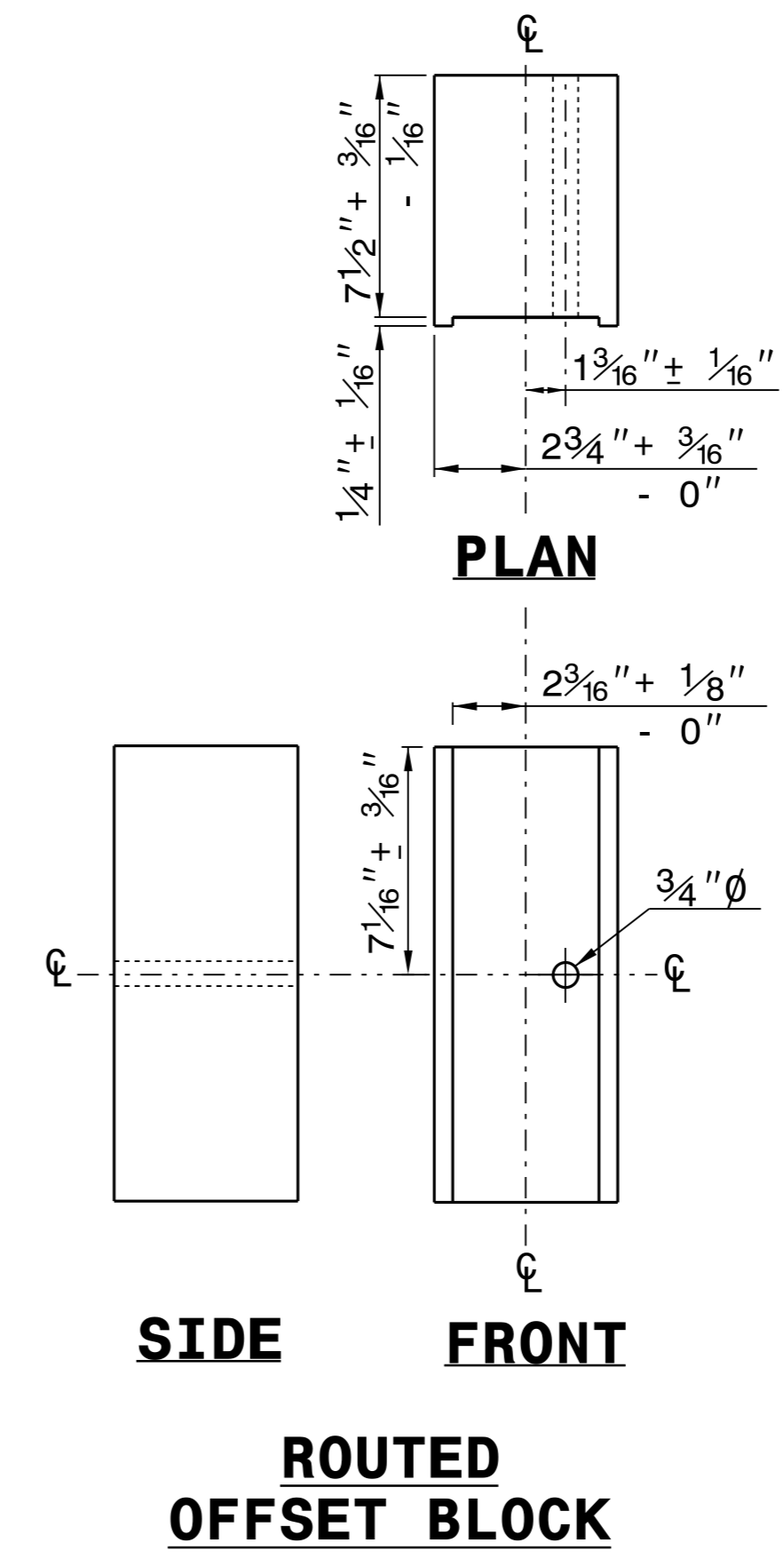


**STANDARD
LINE POST**

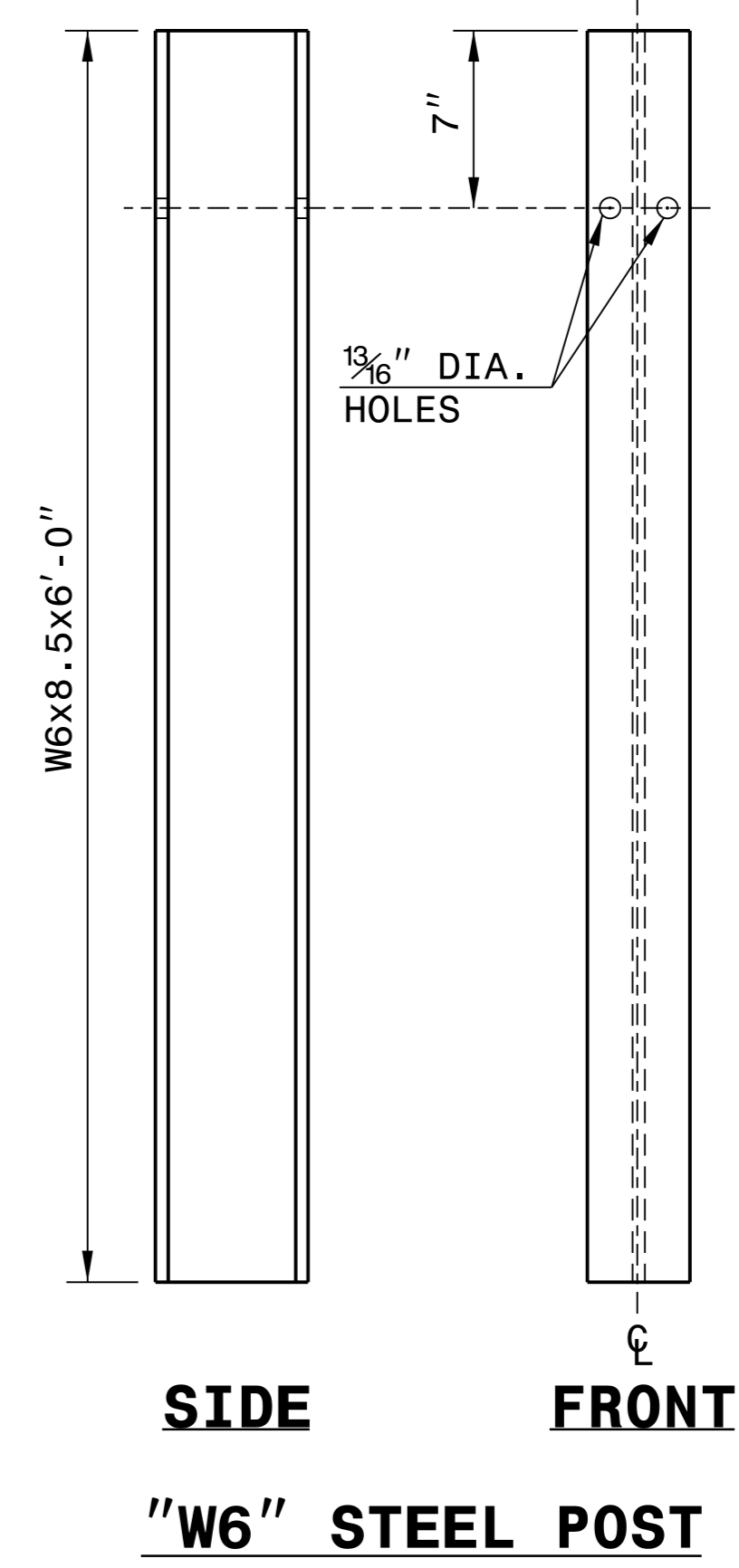
**SHORT WOOD
BREAKAWAY POST**



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

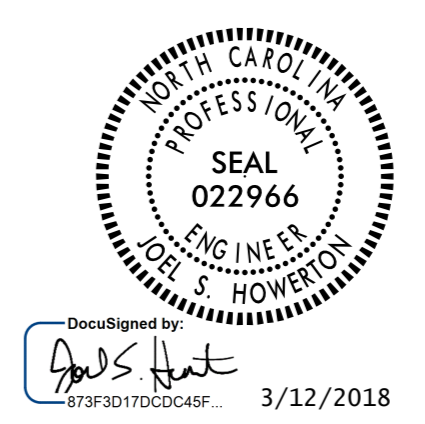


**ROUTED
OFFSET BLOCK**



"W6" STEEL POST

SYSTEM PARTS



**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.:	

8/17/99

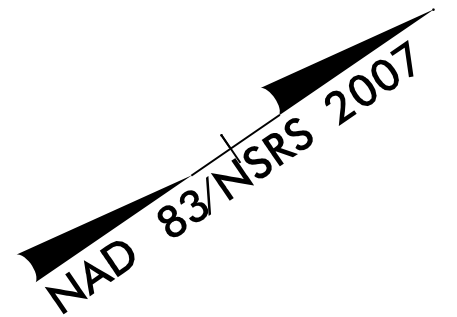
LOCHNER
 H. W. LOCHNER, INC.
 2840 PLAZA PLACE, SUITE 202
 RALEIGH, NC 27612
 (919) 571-7111

NC License
 Number F-0159

NC FIRM LICENSE No: F-1148
 1151 SE Cary Parkway
 Suite 101
 Cary, NC 27518
 (919) 557-0029

ECOLOGICAL ENGINEERING

PROJECT REFERENCE NO. B-5140	SHEET NO. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

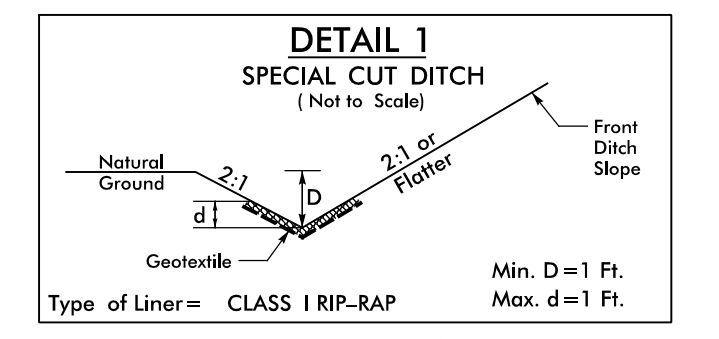


NOTE:
 (CENTERLINE OF CREEK IS COUNTY LINE)
 (WAKE COUNTY)
 (FRANKLIN COUNTY)

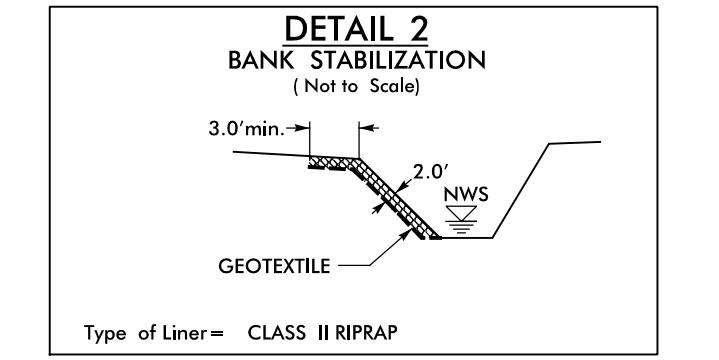
BEGIN TIP PROJECT B-5140
 -L- STA. 10+25.00

END TIP PROJECT B-5140
 -L- STA. 16+25.00

END CONSTRUCTION
 -L- STA. 16+60.00

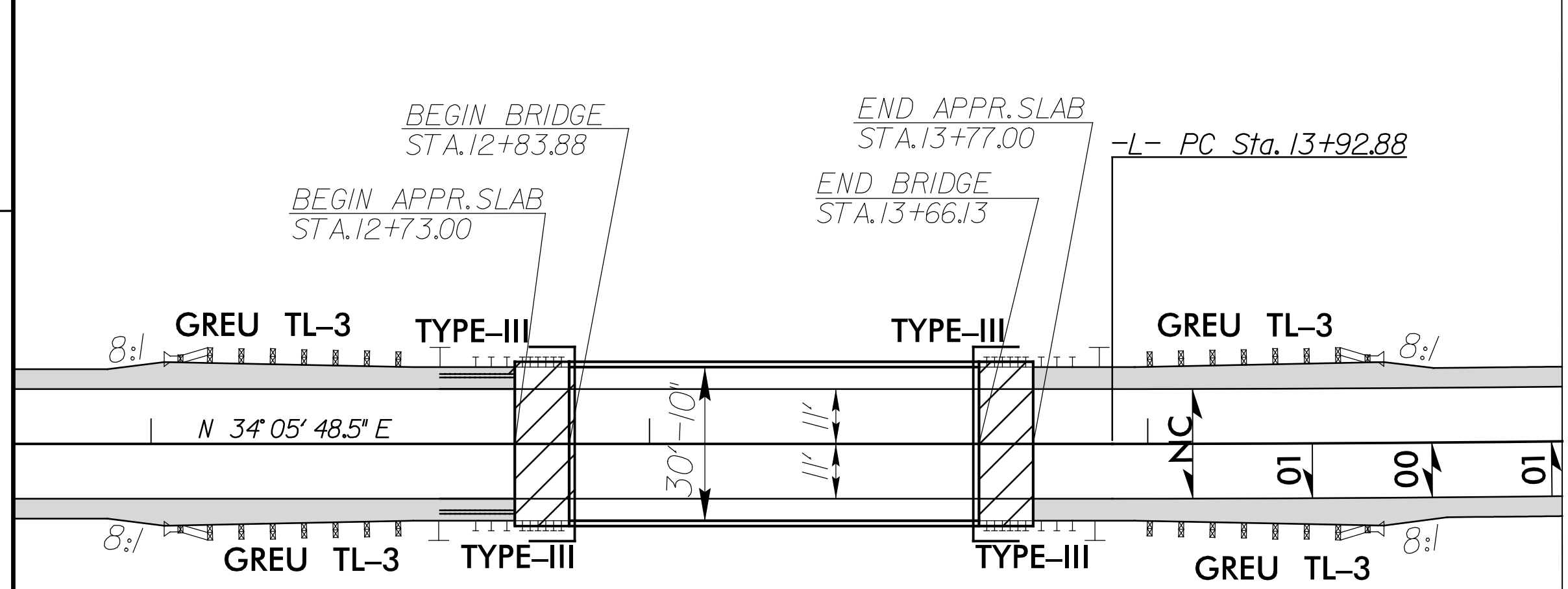


FROM STA. 15+20 TO STA. 16+25 -L- RT (37 TONS CLASS 1 RIP RAP)
 FROM STA. 15+30 TO STA. 16+00 -L- LT (24 TONS CLASS 1 RIP RAP)



Type of Liner = CLASS II RIPRAP
 STA 12+94 TO STA 13+17 -L-
 STA 13+38 -L-

BRIDGE/ PAVEMENT RELATIONSHIP SKETCH



-L-	-L-
PI Sta 14+60.42	PI Sta 15+99.57
$\Delta = 0^\circ 58' 02.7''$ (LT)	$\Delta = 5^\circ 07' 31.6''$ (LT)
$D = 0^\circ 42' 58.3''$	$D = 3^\circ 34' 51.6''$
$L = 135.08'$	$L = 143.13'$
$T = 67.54'$	$T = 71.61'$
$R = 8,000.00'$	$R = 1,600.00'$
$SE = NC$	$SE = 3\%$
	$Ro = 96.00'$

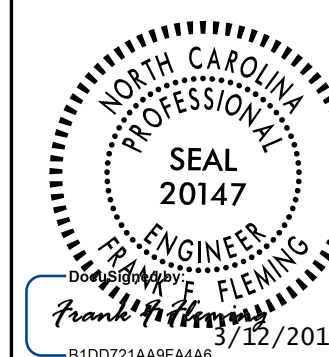
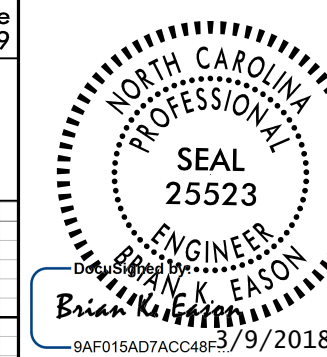
PAVED SHOULDER

SEE SHEET 5 FOR -L- PROFILE

SEE SHEETS S-1 TO S-7 FOR STRUCTURE PLANS

REVISIONS

8/19/2018
 C:\Users\psh_04\dgn
 C:\Users\psh_04\dgn



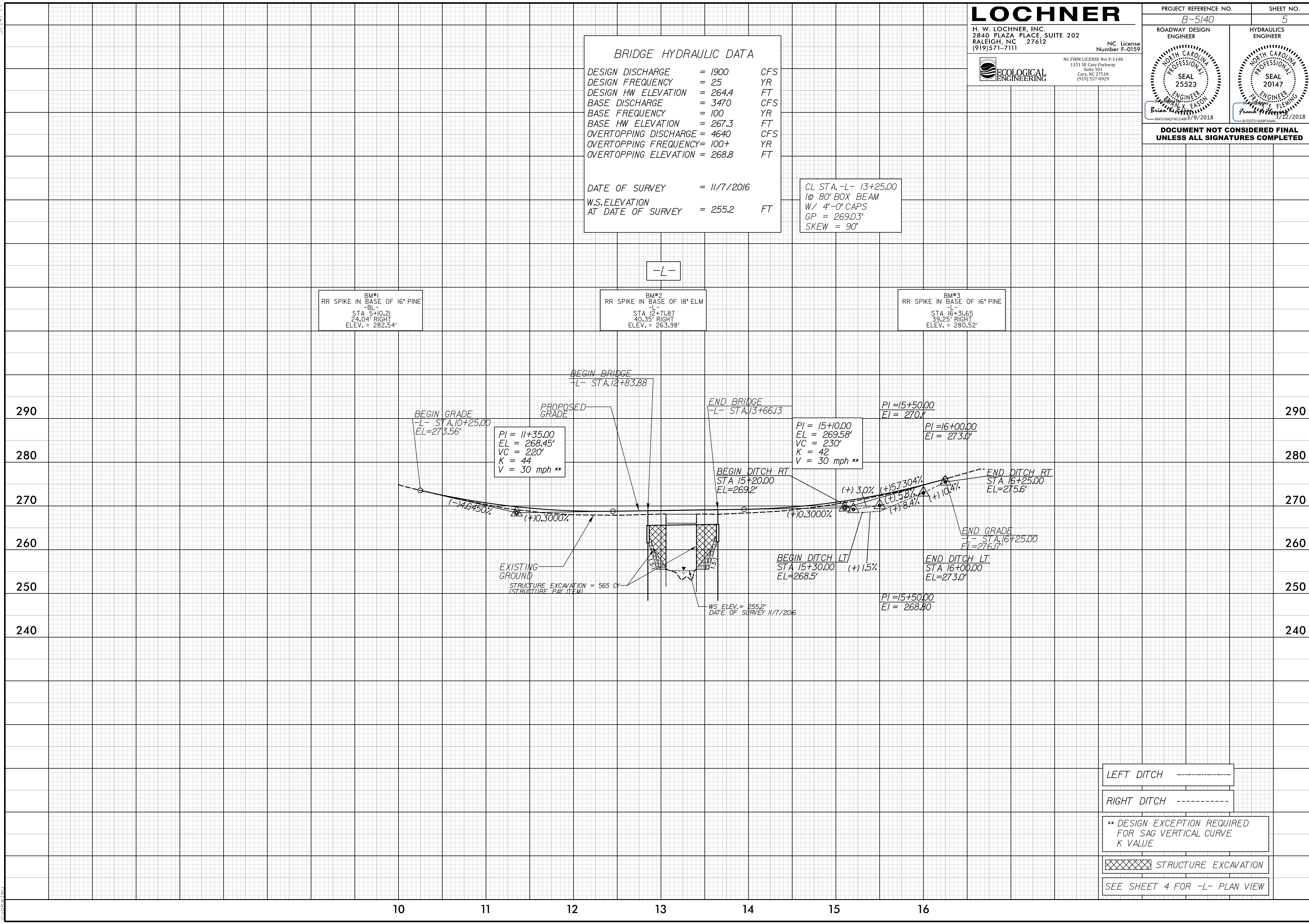
**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE = 1900 CFS
 DESIGN FREQUENCY = 25 YR
 DESIGN HW ELEVATION = 264.4 FT
 BASE DISCHARGE = 3470 CFS
 BASE FREQUENCY = 100 YR
 BASE HW ELEVATION = 267.3 FT
 OVERTOPPING DISCHARGE = 4640 CFS
 OVERTOPPING FREQUENCY = 100+ YR
 OVERTOPPING ELEVATION = 268.8 FT

DATE OF SURVEY = 11/7/2016
 W.S. ELEVATION AT DATE OF SURVEY = 255.2 FT

CL STA. -L- 13+25.00
 1@ 80' BOX BEAM
 W/ 4'-0" CAPS
 GP = 269.03'
 SKEW = 90°



BM#1
RR SPIKE IN BASE OF 16" PINE
-L-
STA 5+10.21
24.04' RIGHT
ELEV. = 282.54'

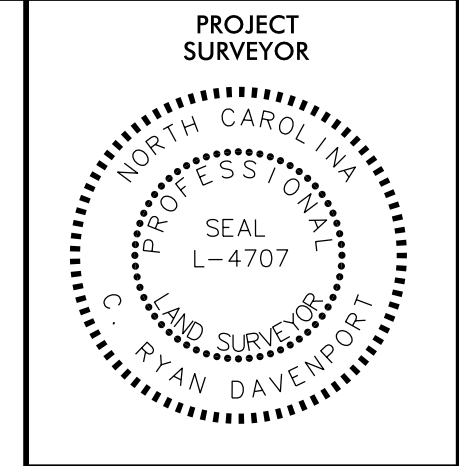
BM#2
RR SPIKE IN BASE OF 18" ELM
-L-
STA 12+71.87
40.35' RIGHT
ELEV. = 263.98'

BM#3
RR SPIKE IN BASE OF 16" PINE
-L-
STA 16+31.65
39.25' RIGHT
ELEV. = 280.52'

PI = 11+35.00
EL = 268.45'
VC = 220'
K = 44
V = 30 mph **

PI = 15+10.00
EL = 269.58'
VC = 230'
K = 42
V = 30 mph **

- LEFT DITCH -----
- RIGHT DITCH -----
- ** DESIGN EXCEPTION REQUIRED FOR SAG VERTICAL CURVE K VALUE
- XXXXX STRUCTURE EXCAVATION
- SEE SHEET 4 FOR -L- PLAN VIEW



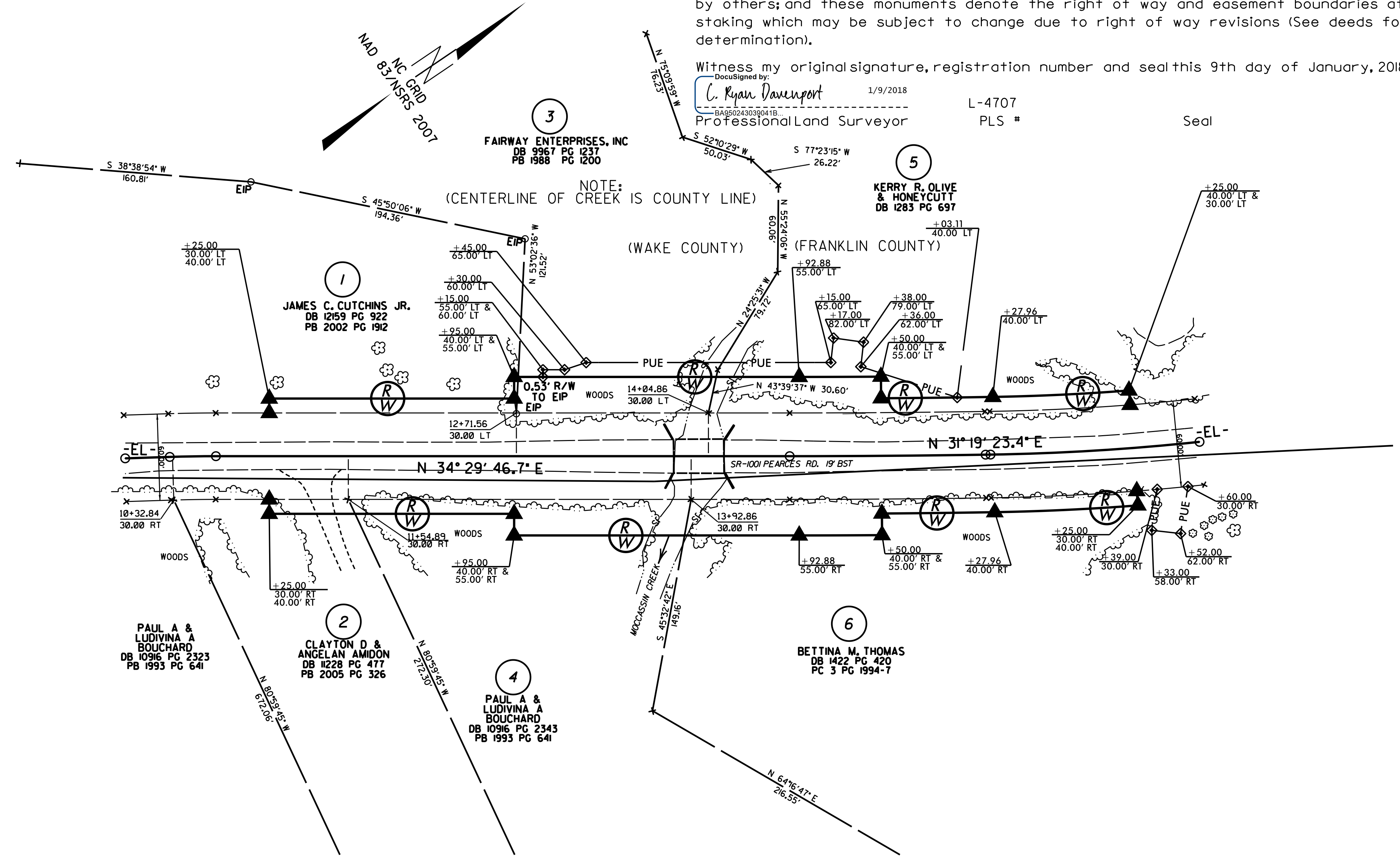
I, C. Ryan Davenport, a Professional Land Surveyor in the state of North Carolina hereby certify to the best of my knowledge and belief that the following work item(s) (Base map Compilation, R/W Staking) performed under my responsible charge meet NCDOT Survey Standards as directed in the NCDOT Location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

I further certify that the data compiled came from available surveys/mapping performed by others and provided to me by NCDOT and do not certify to the accuracy or quality of the individual data sources.

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 9th day of January, 2018.

DocuSigned by:
C. Ryan Davenport 1/9/2018
 Professional Land Surveyor L-4707
 PLS # Seal



REVISIONS

6/2/2018