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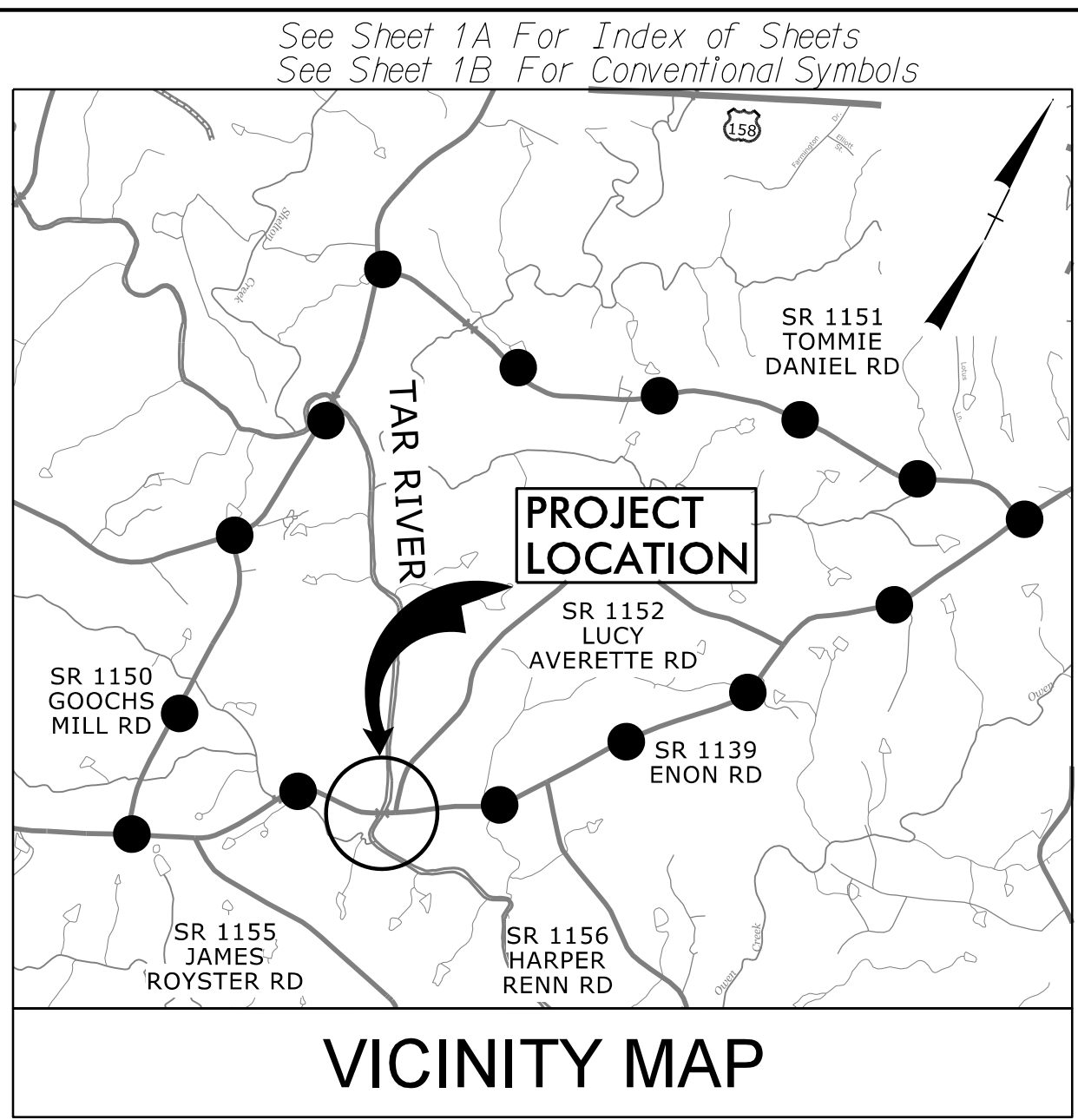
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09_08/2018

TIP PROJECT: B-5320

CONTRACT: C204099



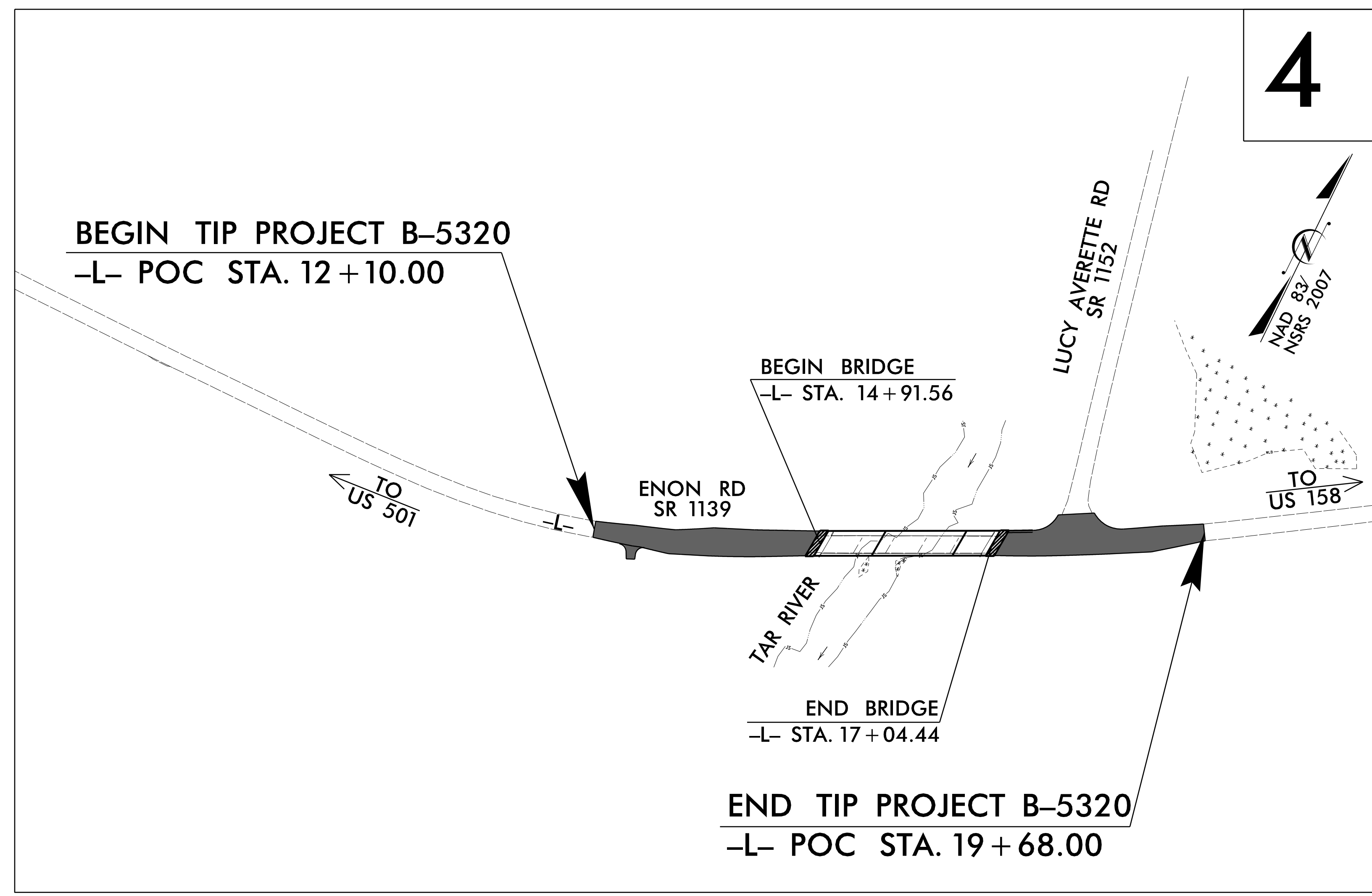
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GRANVILLE COUNTY

**LOCATION: REPLACE BRIDGE NO. 96.
OVER TAR RIVER ON SR 1139 (ENON RD)**

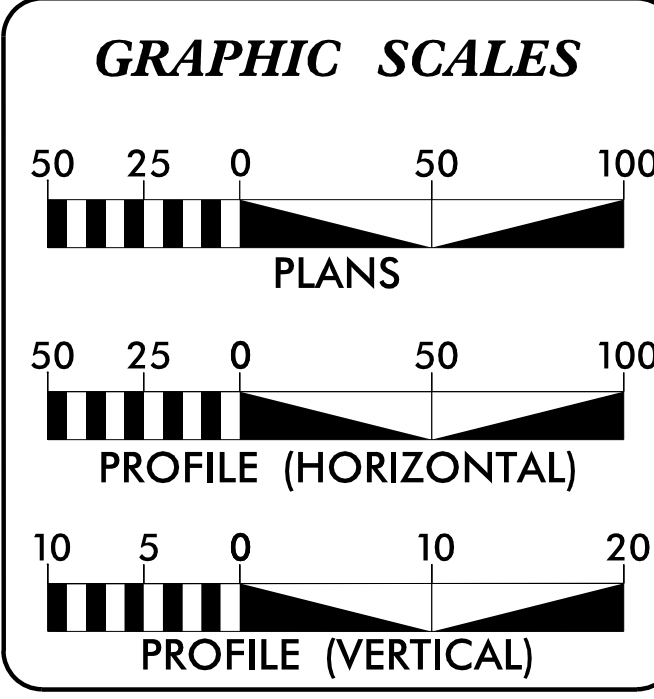
**TYPE OF WORK: GRADING, PAVING, DRAINAGE, AND
STRUCTURE**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5320	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
46034.1.1	BRZ-1139(4)	PE	
46034.2.1	BRZ-1139(4)	RW & UTILITY	
46034.3.1	BRZ-1139(4)	CONST.	



DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

NCDOT CONTACT: DAVID STUTTS, PE
STRUCTURES MANAGEMENT UNIT



DESIGN DATA

ADT 2018 =	1409
ADT 2038 =	2105
K =	9 %
D =	55 %
T =	8 % *
V =	60 MPH
* (TTST = 3% + DUAL = 5%)	
FUNC CLASS =	MINOR COLLECTOR SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY PROJECT B-5320	=	0.104 MI
LENGTH STRUCTURE PROJECT B-5320	=	0.040 MI
TOTAL LENGTH PROJECT B-5320	=	0.144 MI

PREPARED IN THE OFFICE OF:

wsp
434 Fayetteville Street, Suite 1500 Raleigh, NC 27601
Tel. (919) 836-4040 www.wsp-pb.com
License No. F-0891

WSP
FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
2018 STANDARD SPECIFICATIONS

<p>RIGHT OF WAY DATE: SEPTEMBER 15, 2017</p> <p>LETTING DATE: MAY 15, 2018</p>	<p>RONYELL A. THIGPEN, PE PROJECT ENGINEER</p> <p>HOLLY CHRISTENBURY, PE PROJECT DESIGN ENGINEER</p>
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HYDRAULICS ENGINEER

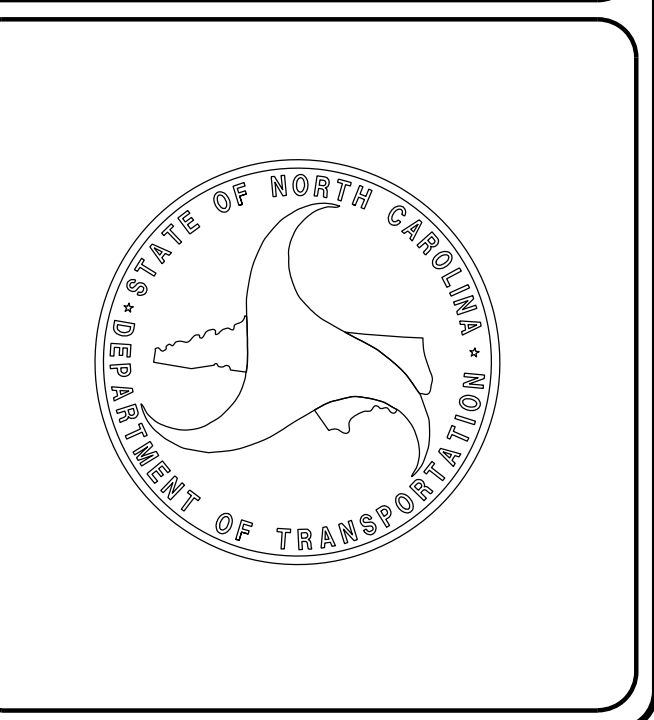
DocuSigned by:
Vidya Mohandas
907C26E6E08404
SIGNATURE:

P.E.

ROADWAY DESIGN ENGINEER

DocuSigned by:
Holly Christenbury
21C000A5712461
SIGNATURE:

P.E.



3/1/2018 R:\Roadway\Proj\B5320_Rdy_TSH.dgn USHC0407

INDEX OF SHEETS:

SHEET NUMBER	SHEET DESCRIPTION
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES AND LIST OF STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
1C-1	SURVEY CONTROL SHEET
1E-1	RIGHT OF WAY AND PERMANENT EASEMENT -E- IRON PIN AND CAP CONTROL SHEET
2A-1 THRU 2A-2	PAVEMENT SCHEDULE, TYPICAL SECTIONS AND MILLING DETAIL
2C-1	TYPE III ANCHOR DETAIL
2C-2	GUARDRAIL INSTALLATION DETAIL
3B-1	GUARDRAIL SUMMARY, SUMMARY OF EARTHWORK AND PAVEMENT REMOVAL SUMMARY
3D-1	SUMMARY OF DRAINAGE
4	PLAN SHEET
5	PROFILE SHEETS
RW-1 AND RW-4	RIGHT-OF-WAY PLANS
TMP-1 THRU TMP-5	TRANSPORTATION MANAGEMENT PLANS
PMP-1	PAVEMENT MARKING PLANS
EC-1 THRU EC-5	EROSION CONTROL PLANS
RF-1	REFORESTATION PLANS
UBO-1 THRU UBO-2	UTILITIES BY OTHER PLANS
X-1A	CROSS-SECTIONS SUMMARY
X-1 THRU X-7	CROSS-SECTIONS
S-1 THRU S-26	STRUCTURE PLANS

GENERAL NOTES: 2018 SPECIFICATIONS
EFFECTIVE: 01-16-18
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 DRIVE EXISTING 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 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:
CENTURYLINK
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

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:

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 Superelevation - Two Lane Pavement
225.06	Method of Grading Sight Distance at Intersections
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 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
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 Grates
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.66	Drainage Structure Steps
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

B-17/99

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

BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○ EIP
Computed Property Corner	-----
Property Monument	□ ECM
Parcel/Sequence Number	①23
Existing Fence Line	-x-x-x-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	□
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	--- WLB ---
Proposed Wetland Boundary	--- WLB ---
Existing Endangered Animal Boundary	--- EAB ---
Existing Endangered Plant Boundary	--- EPB ---
Existing Historic Property Boundary	--- HPB ---
Known Contamination Area: Soil	☠-s-☠
Potential Contamination Area: Soil	☠-s-☠
Known Contamination Area: Water	☠-w-☠
Potential Contamination Area: Water	☠-w-☠
Contaminated Site: Known or Potential	---

BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	○
Sign	○ S
Well	○ W
Small Mine	✕
Foundation	□
Area Outline	□
Cemetery	□
Building	□
School	□
Church	□
Dam	---

HYDROLOGY:

Stream or Body of Water	-----
Hydro, Pool or Reservoir	□
Jurisdictional Stream	--- JS ---
Buffer Zone 1	--- BZ 1 ---
Buffer Zone 2	--- BZ 2 ---
Flow Arrow	←
Disappearing Stream	→
Spring	○
Wetland	---
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	○ S
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.*)	--- 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.*)	---
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.*)	--- 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:

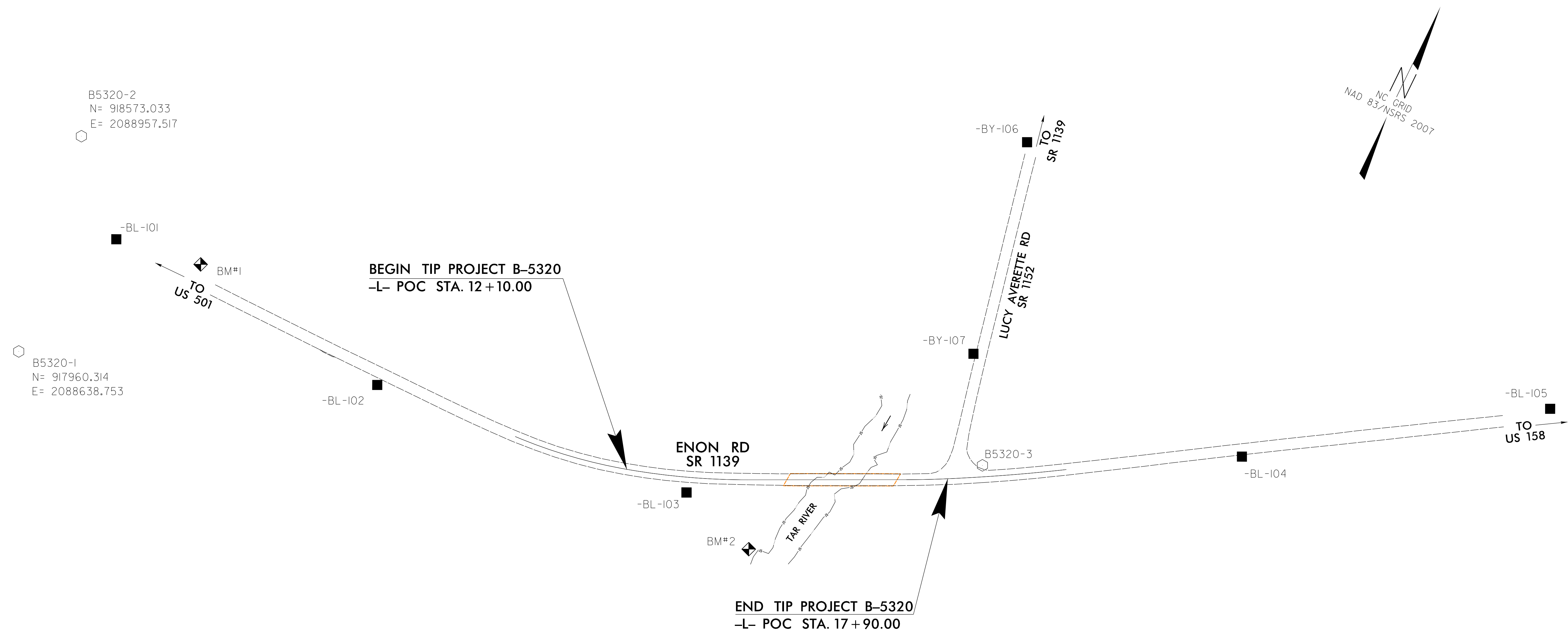
Sanitary Sewer Manhole	⊕
Sanitary Sewer Cleanout	⊕
U/G Sanitary Sewer Line	--- SS ---
Above Ground Sanitary Sewer	--- A/G Sanitary Sewer ---
SS Forced Main Line LOS B (S.U.E.*)	--- FSS ---
SS Forced Main Line LOS C (S.U.E.*)	--- FSS ---
SS Forced Main Line LOS D (S.U.E.*)	--- FSS ---

MISCELLANEOUS:

Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	⊕
Utility Unknown U/G Line LOS B (S.U.E.*)	--- 7UTL ---
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 B-5320

PROJECT REFERENCE NO. B-5320	SHEET NO. 1C-1
Location and Surveys	



BL POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
101	BL101	918799.5750	2089438.7540	394.79	OUTSIDE PROJECT LIMITS	
102	BL102	918769.7920	2089975.9180	405.55	OUTSIDE PROJECT LIMITS	
103	BL103	918839.8830	2090561.2720	396.06	13+20.59	27.41 RT
3	B5320-3	919117.1680	2091018.9840	387.99	18+52.75	20.67 LT
104	BL104	919336.0480	2091431.9530	388.79	OUTSIDE PROJECT LIMITS	
105	BL105	919656.5640	2091893.1790	406.98	OUTSIDE PROJECT LIMITS	

BY POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
106	BY106	919675.1270	2090836.4060	386.05	19+97.04	593.24 LT
107	BY107	919290.5860	2090916.4000	385.50	18+49.10	222.12 LT

..... BM1 ELEVATION = 403.74 N 918825 E 2089595 L STATION 10+00.00 N 87°21'43.7" W DIST 645.68 RR SPIKE IN 20" OAK BM2 ELEVATION = 381.99 N 918797 E 2090707 L STATION 14+30.00 125 RIGHT RR SPIKE IN 18" ELM
---	---

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B5320-3" WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 919,117.168(ft) EASTING: 2,0910,18.984(ft) ELEVATION: 387.99'(ft)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9999823200

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B5320-3" TO -L- STATION 12+10.00 IS
 S 63°22'13.8" W 640.27'

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

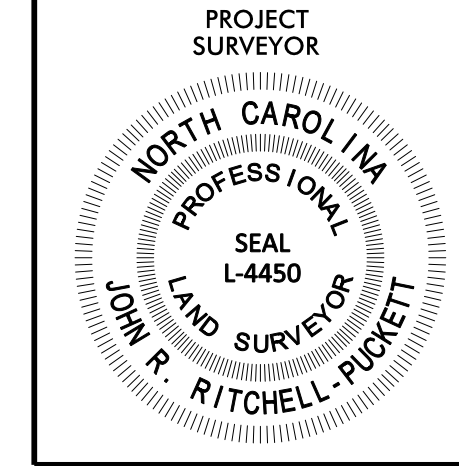
NOTES:

○ INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL AND VERTICAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
 SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

GEOID G09NC
NOTE: DRAWING NOT TO SCALE

RIGHT OF WAY AND PERMANENT EASEMENT -E- IRON PIN AND CAP CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
B-5320	1E-1
Location and Surveys	



REVISIONS

25 JAN-2018 09:26 P:\Projects\B-5320\Bridges\96-cover-Tar-River-on-SR-11\LocationSurveys\B-5320_NCDOT-fs_060415_RW4_1E1_cropped.dgn

ROW MARKER IRON PIN AND CAP-E				
ALIGN	STATION	OFFSET	NORTH	EAST
L	12+10.00	30.00	918901.3543	2090454.9250
L	12+10.00	-30.00	918859.0120	2090438.3243
L	13+00.00	50.00	918811.2685	2090549.3755
L	13+00.00	-50.00	918905.1339	2090514.8894
L	14+30.13	50.00	918864.3292	2090673.7222
L	14+30.13	-50.00	918954.1749	2090629.8159
L	17+14.38	50.00	918989.1333	2090929.1094
L	17+14.38	-50.00	919078.9789	2090885.2031
L	17+80.95	-50.00	919108.4676	2090942.7453
L	17+88.99	50.00	919024.2873	2090997.3198
L	18+44.02	-50.00	919138.4256	2090997.0034
L	19+00.00	50.00	919079.7925	2091095.4649
L	19+05.00	-50.00	919168.4620	2091048.9599
L	19+68.00	30.00	919132.4901	2091144.0875
L	19+68.00	-30.00	919183.5266	2091112.5395

ROW MARKER PERMANENT EASEMENT-E				
ALIGN	STATION	OFFSET	NORTH	EAST
L	14+00.00	55.00	918846.3712	2090647.5133
L	14+00.00	50.00	918850.9143	2090645.4251
L	14+45.00	55.00	918866.3656	2090689.2772
L	14+45.00	50.00	918870.8579	2090687.0819
L	17+14.38	60.00	918980.1481	2090933.4987
L	17+60.00	60.00	919001.4150	2090975.6167
L	17+60.00	50.00	919010.2821	2090970.9934

I, John R. Ritchell-Puckett, 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).

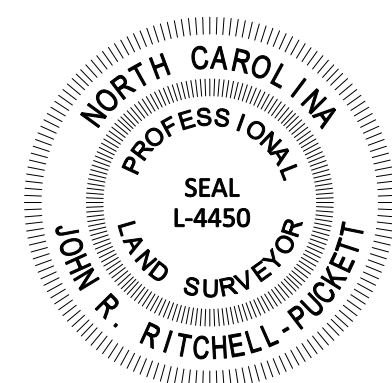
Witness my original signature, registration number and seal this 29th day of January, 2018.

John R. Ritchell-Puckett

 Professional Land Surveyor

L-4450
 PLS #

Seal



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.

6/2/2018

FINAL PAVEMENT SCHEDULE

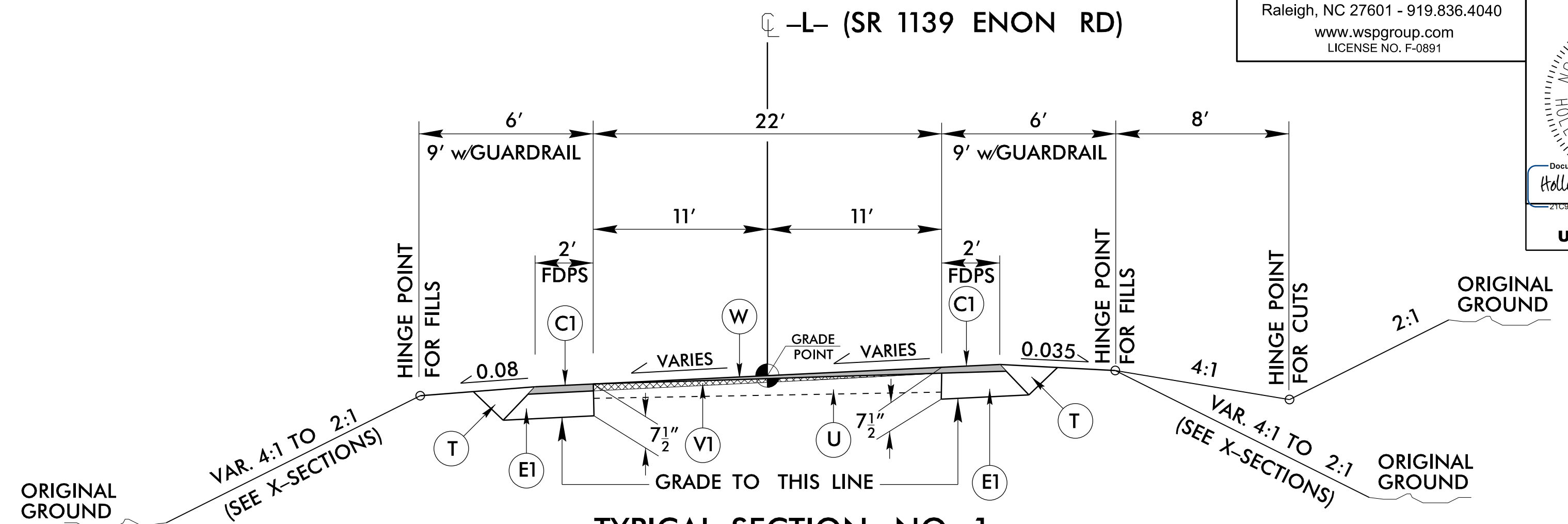
C1	PROP. APPROX. 2.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 1.25" IN DEPTH OR GREATER THAN 2" IN DEPTH.
E1	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 570 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 1/2" IN DEPTH.
J	PROP. 6" AGGREGATE BASE COURSE.
R1	SHOULDER BERM GUTTER
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	INCIDENTAL MILLING
V1	VARIABLE DEPTH MILLING, 0" TO 2.0"
W	WEDGING (SEE DETAIL THIS SHEET).

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

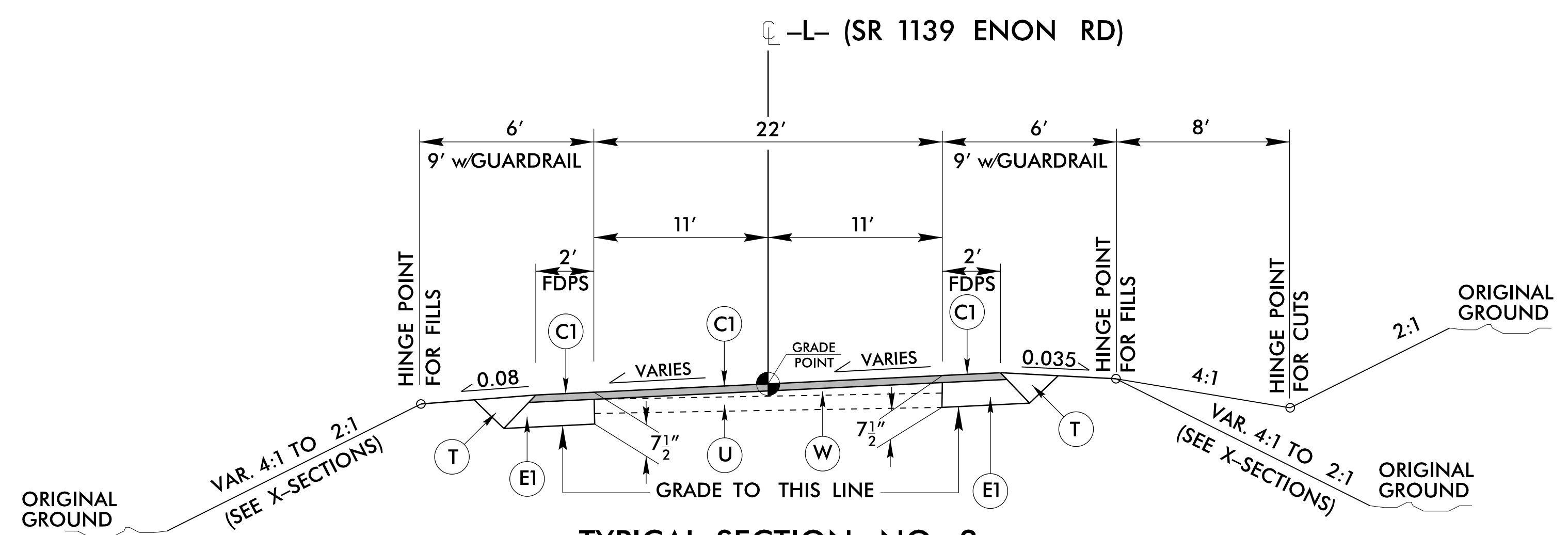
wsp
 434 Fayetteville Street Suite 1500
 Raleigh, NC 27601 - 919.836.4040
 www.wspgroup.com
 LICENSE NO. F-0891

PROJECT REFERENCE NO. B-5320	SHEET NO. 2A-1
ROADWAY DESIGN ENGINEER SEAL 043139 HOLLY CHRISTENBURY	PAVEMENT DESIGN ENGINEER SEAL 022896 CLARK MORRISON

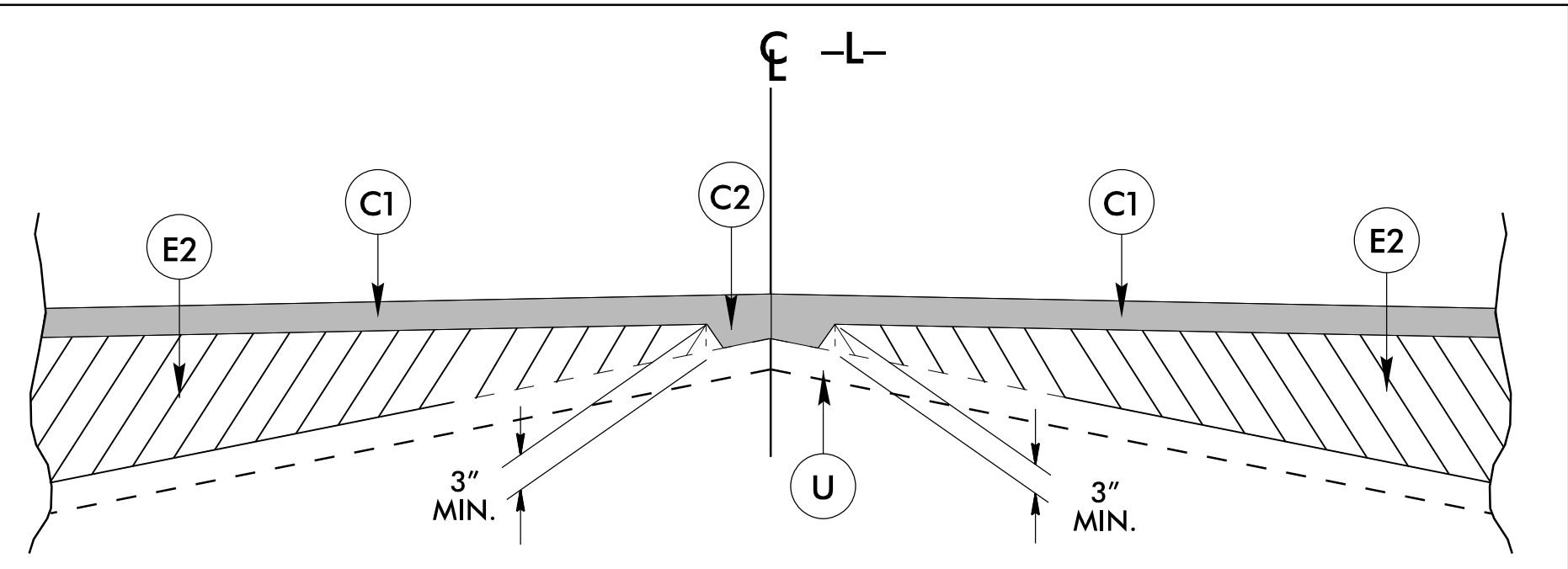
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



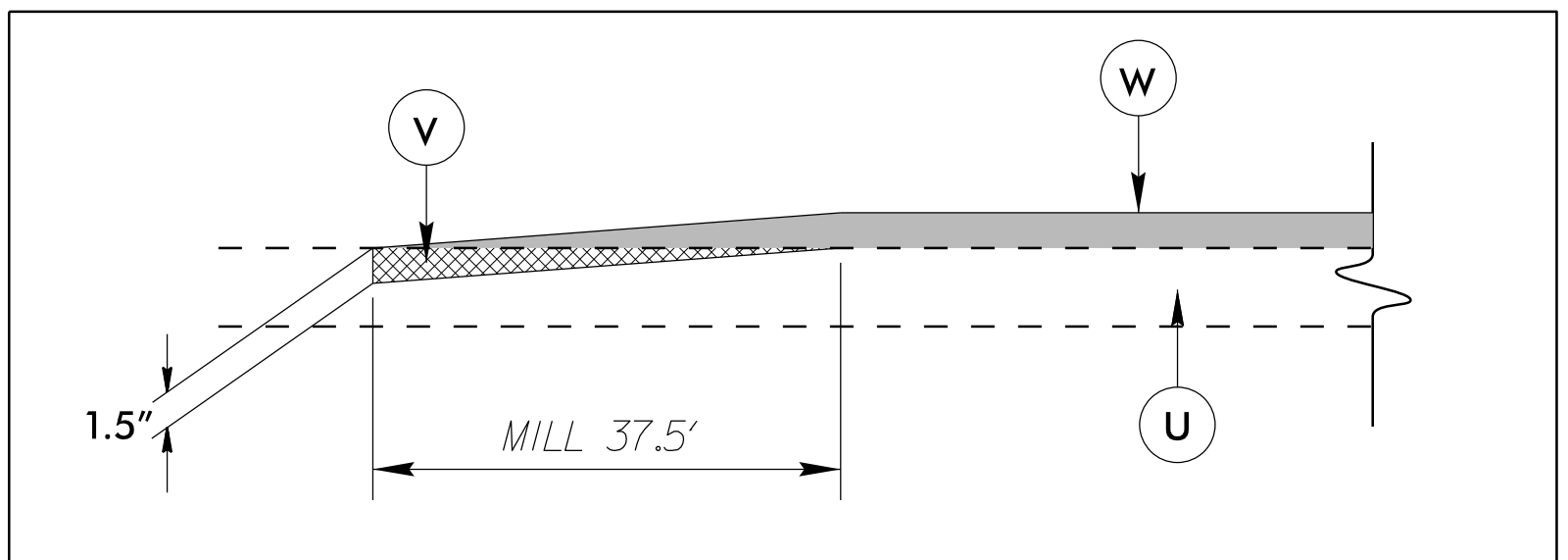
TYPICAL SECTION NO. 1
 -L- 12+10.00 TO 12+60.00
 (TRANSITION FROM EXISTING TO TYPICAL SECTION NO. 1)
 -L- 12+60.00 TO 13+00.00
 -L- 17+55.00 TO 18+50.00
 -L- 19+18.00 TO 19+68.00
 (TRANSITION FROM TYPICAL SECTION NO. 1 TO EXISTING)



TYPICAL SECTION NO. 2
 -L- STA 13+00.00 TO 14+40.00
 -L- STA 18+50.00 TO 19+18.00



WEDGING DETAIL



NOTE: USE IN CONJUNCTION WITH TYPICAL NO. 1

MILLING DETAIL

6/14/2018
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6/2/2018

FINAL PAVEMENT SCHEDULE

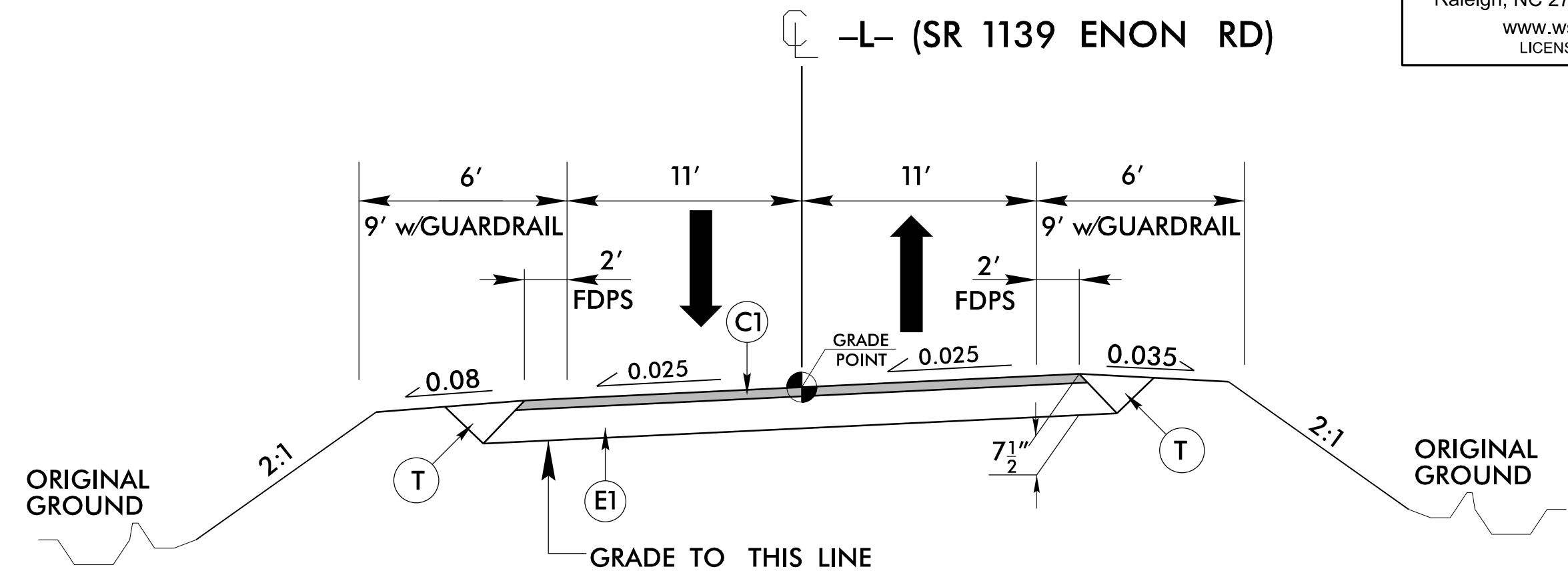
C1	PROP. APPROX. 2.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 1.25" IN DEPTH OR GREATER THAN 2" IN DEPTH.
E1	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 570 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 1/2" IN DEPTH.
J	PROP. 6" AGGREGATE BASE COURSE.
R1	SHOULDER BERM GUTTER
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	INCIDENTAL MILLING
V1	VARIABLE DEPTH MILLING, 0" TO 2.0"
W	WEDGING (SEE DETAIL THIS SHEET).

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

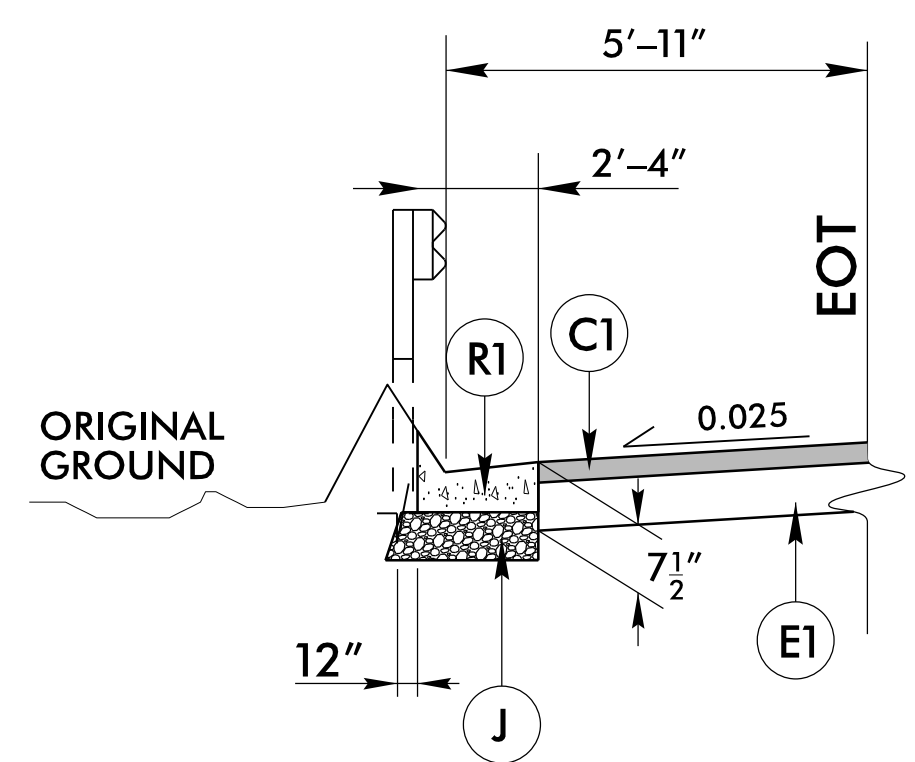
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PROJECT REFERENCE NO. B-5320	SHEET NO. 2A-2
ROADWAY DESIGN ENGINEER <i>Holly Christenbury</i> SEAL 043139	PAVEMENT DESIGN ENGINEER <i>Clark Morrison</i> SEAL 022896

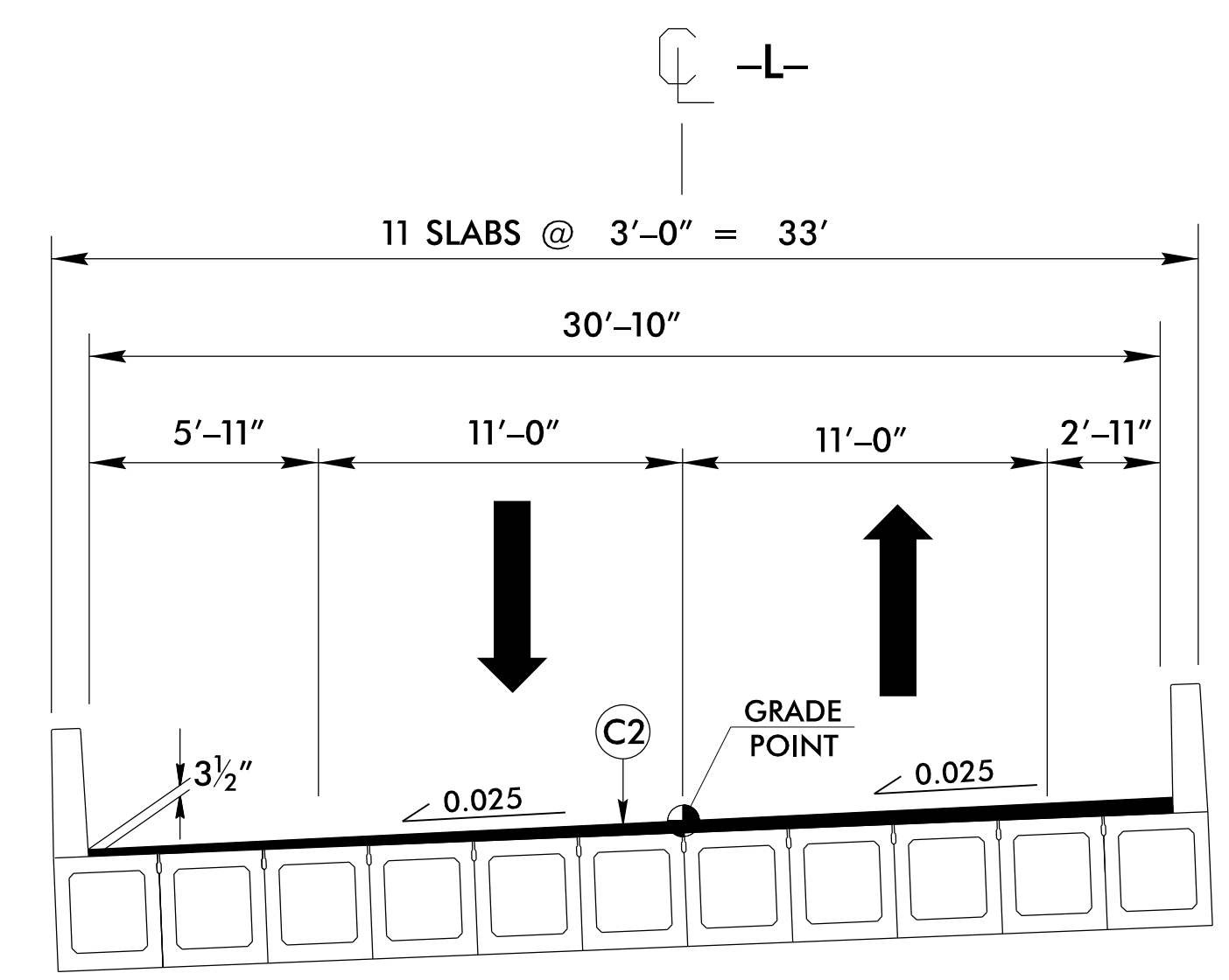
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



TYPICAL SECTION NO. 3
 IN CONJUNCTION WITH DETAIL A
 -L- STA 14+40.00 TO 14+91.56 (BEGIN BRIDGE)
 -L- STA 17+04.44 (END BRIDGE) TO 17+55.00



DETAIL A
 SHOULDER BERM GUTTER
 -L- STA. 17+23.65 TO 17+55.00 (LT)
 NOTE: USE IN CONJUNCTION WITH TYPICAL NO. 3



TYPICAL SECTION NO. 4
 -L- STA. 14+91.56 (BEGIN BRIDGE)
 TO STA. 17+04.44 (END BRIDGE)

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 Jhowerton AT: USD-292595

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
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

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

PLAN VIEW

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

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 3 FOR POST SECTIONS 1 THRU 9.

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
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 1 OF 7
862D03

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

PLAN VIEW

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

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 3 FOR POST SECTIONS 1 THRU 9.

DOCUMENT NOT CONSIDERED FINAL
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**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.:	

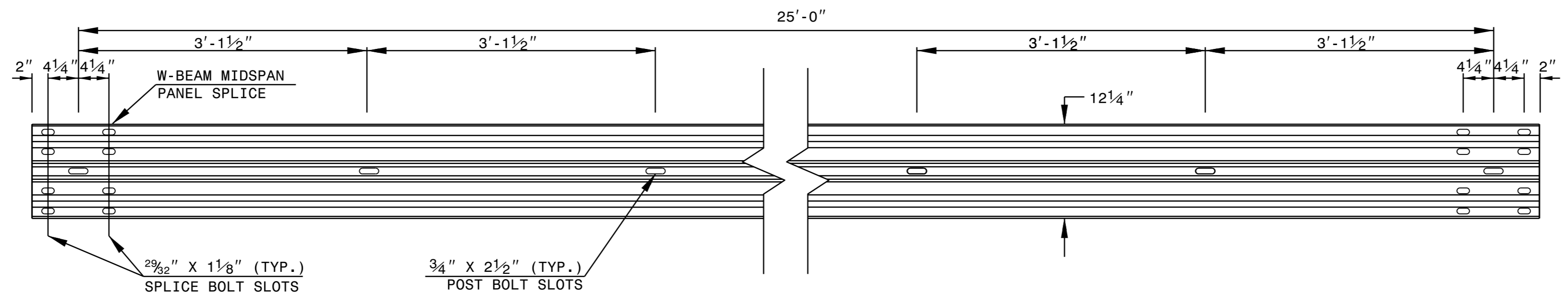


DocuSigned by:
Daniel S. Howerton
3/14/2018

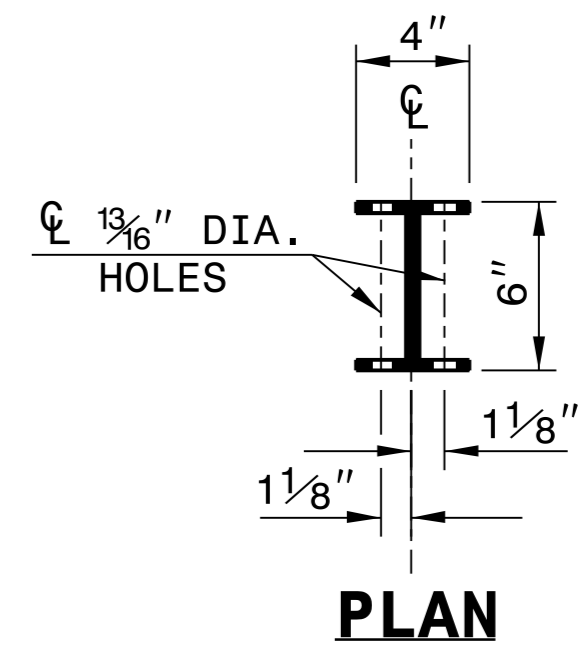
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

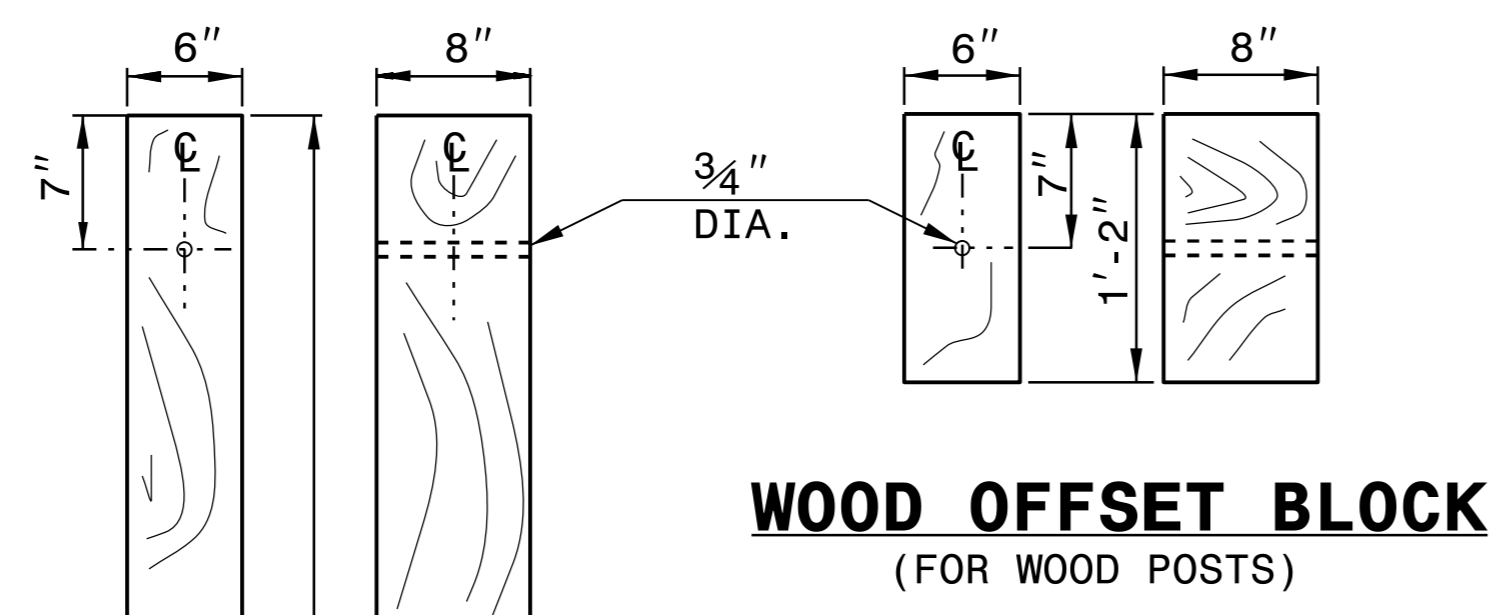
SHEET 6 OF 8
862D02



STANDARD W-BEAM GUARDRAIL



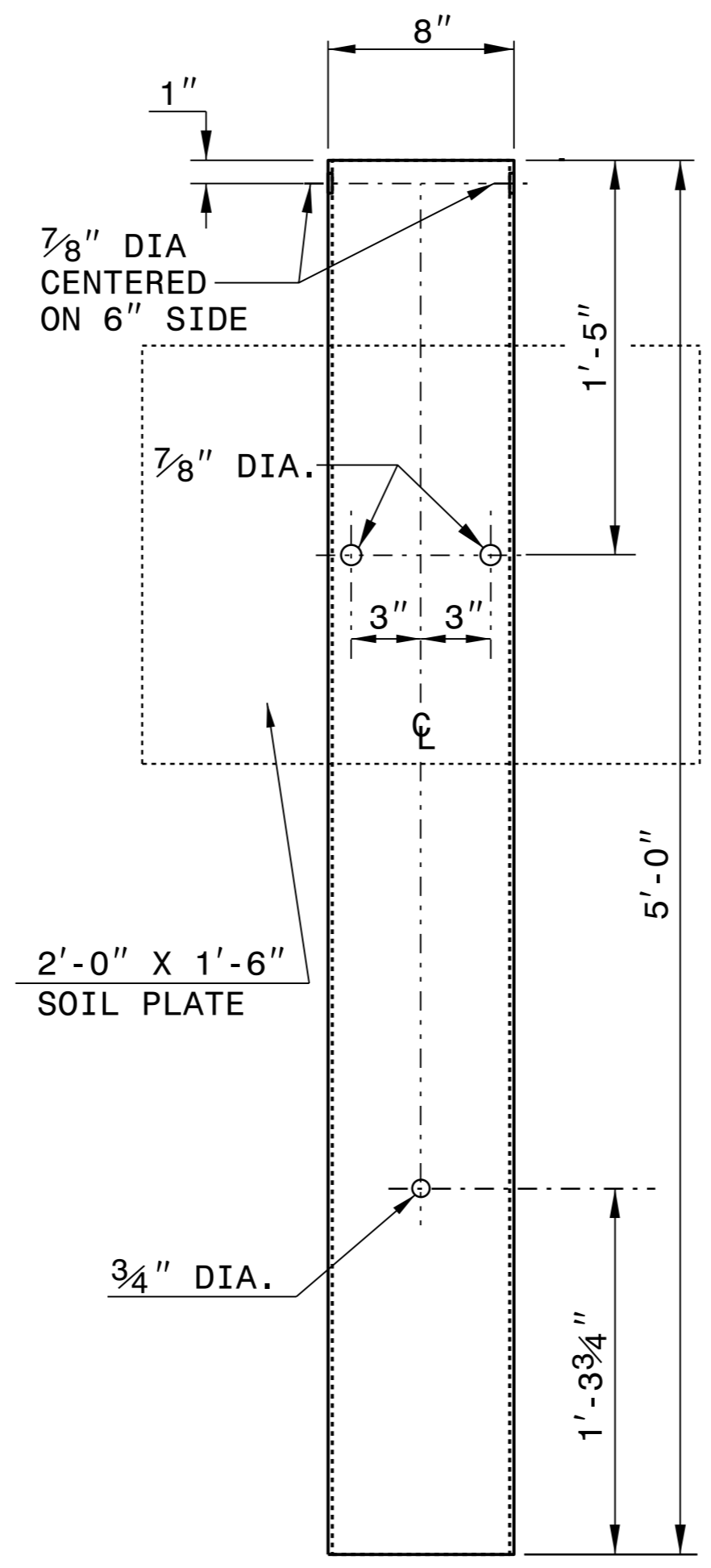
PLAN



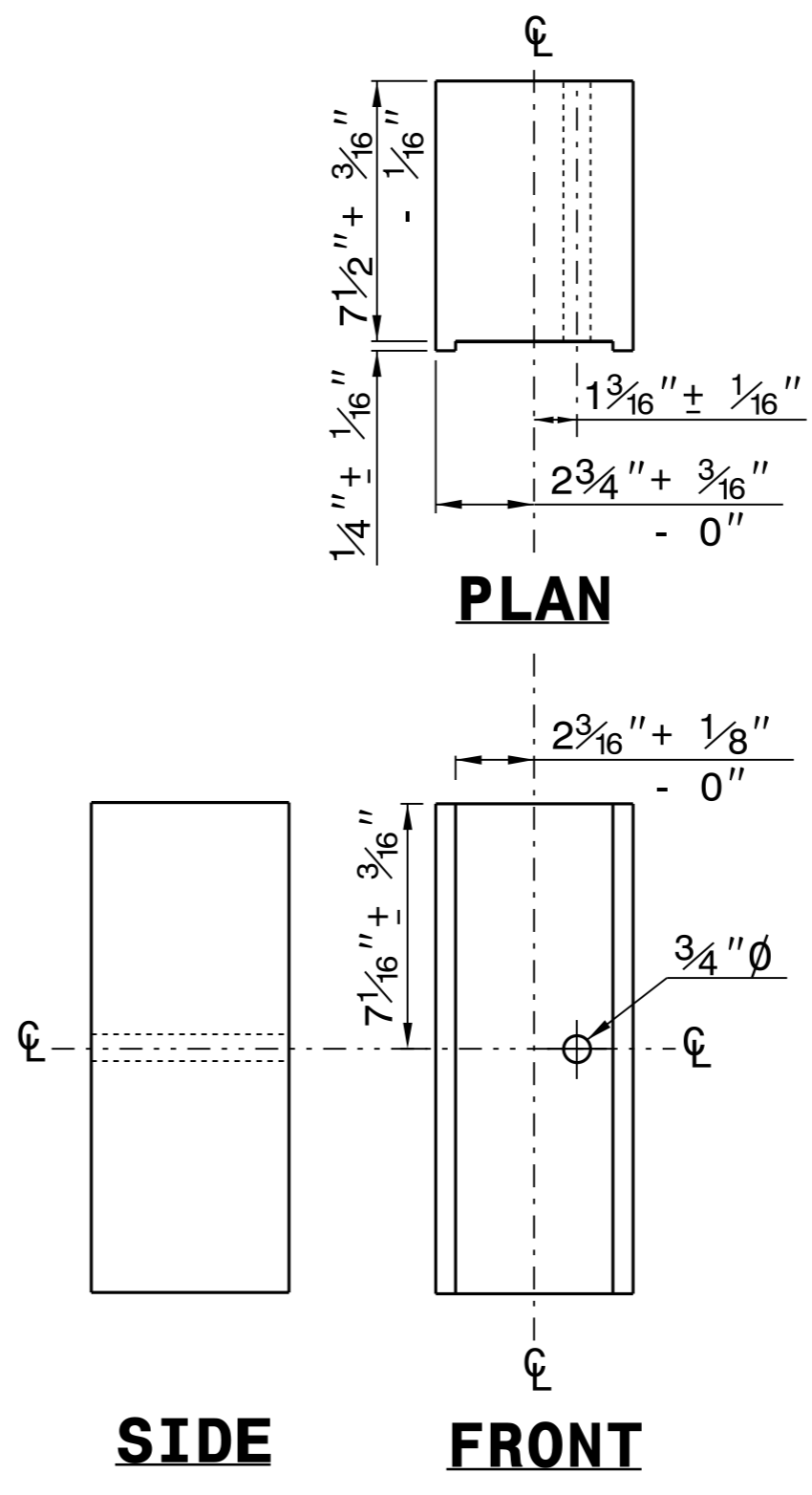
**WOOD OFFSET BLOCK
(FOR WOOD POSTS)**

**STANDARD
LINE POST**

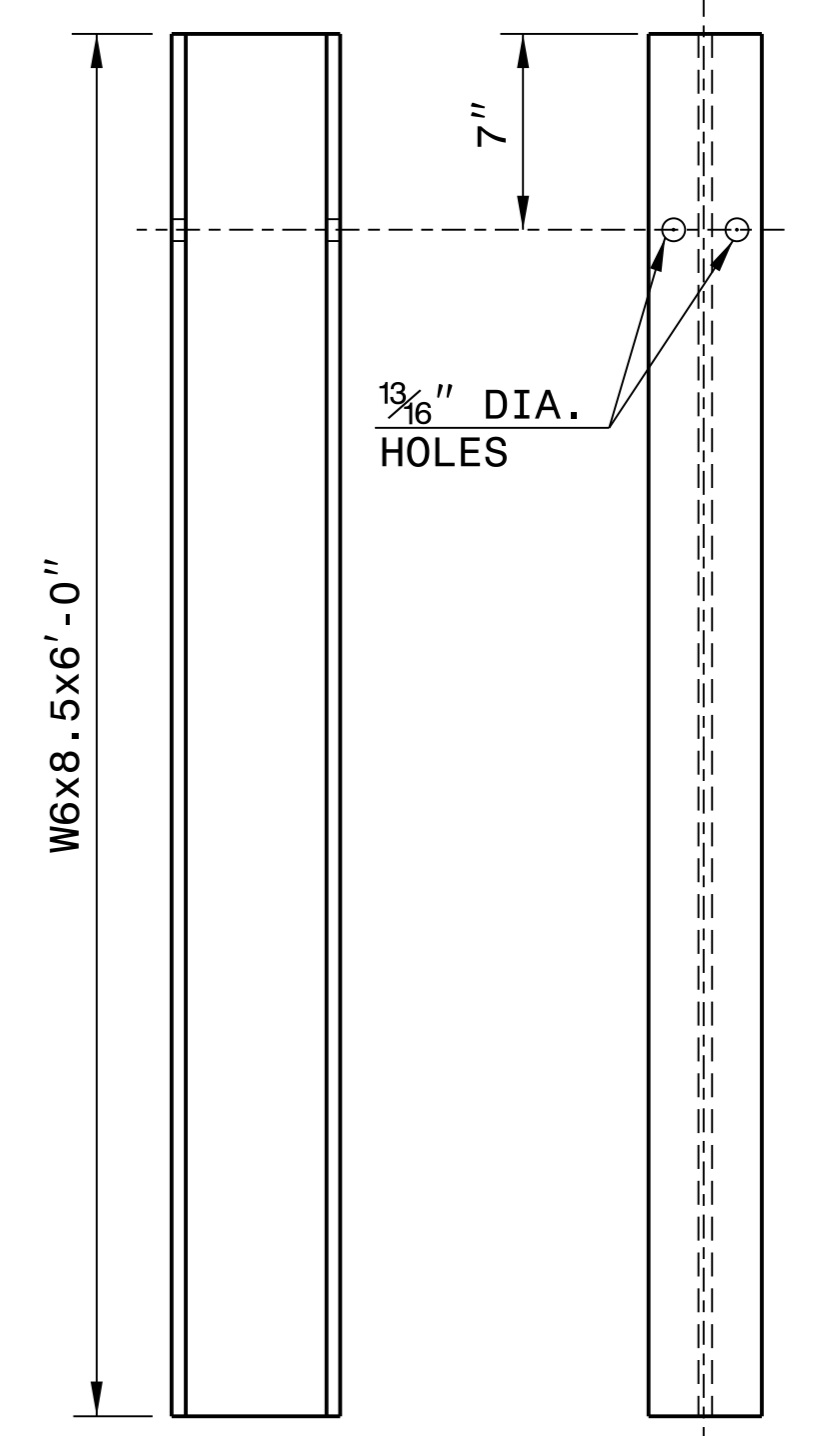
**SHORT WOOD
BREAKAWAY POST**



**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



DocuSigned by:
J. Howerton
3/14/2018

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AND DEVELOPMENT UNIT**
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SEE TITLE BLOCK

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

12/06/07

COMPUTED BY: HEC	DATE: 8-30-2017
CHECKED BY: RAT	DATE: 9-14-2017

**STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS**

PROJECT REFERENCE NO. <i>B-5320</i>	SHEET NO. <i>3B-1</i>
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PAVEMENT REMOVAL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD
L	14+40.00	14+99.00	CL	136.14
L	16+98.00	17+55.00	CL	132.77
			TOTAL:	268.91
			SAY:	270

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LENGTH	
L	17+23.65	17+55.00	31.35	
			TOTAL:	31.35
			SAY:	40

SUMMARY OF EARTHWORK

STATION	STATION	UNCL. EXCAV. CY	EMBANK. +% CY	BORROW CY	WASTE CY
12+10.00	14+91.56	105	526	421	
17+04.44	19+68.00	52	338	286	
SUBTOTALS:		157	864	707	
EST. 5% TO REPLACE TOP SOIL BORROW				35	
PROJECT TOTALS:		157	864	742	
GRAND TOTALS:					
SAY:		160		750	

UNDERCUT EXCAVATION: 200 CY
 SELECT GRANULAR MATERIAL: 200 CY
 GEOTEXTILE FOR SOIL STABILIZATION: 200 SY
 DDE: 12 CY

These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

Approximate quantities only. Unclassified excavation, borrow excavation, fine grading, clearing and grubbing, and removal of existing pavement will be paid for at the contract lump sum price for "Grading."

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL.
 TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
 FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.
 W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.
 G = GATING IMPACT ATTENUATOR TYPE 350
 NG = NON-GATING IMPACT ATTENUATOR TYPE 350

GUARDRAIL SUMMARY

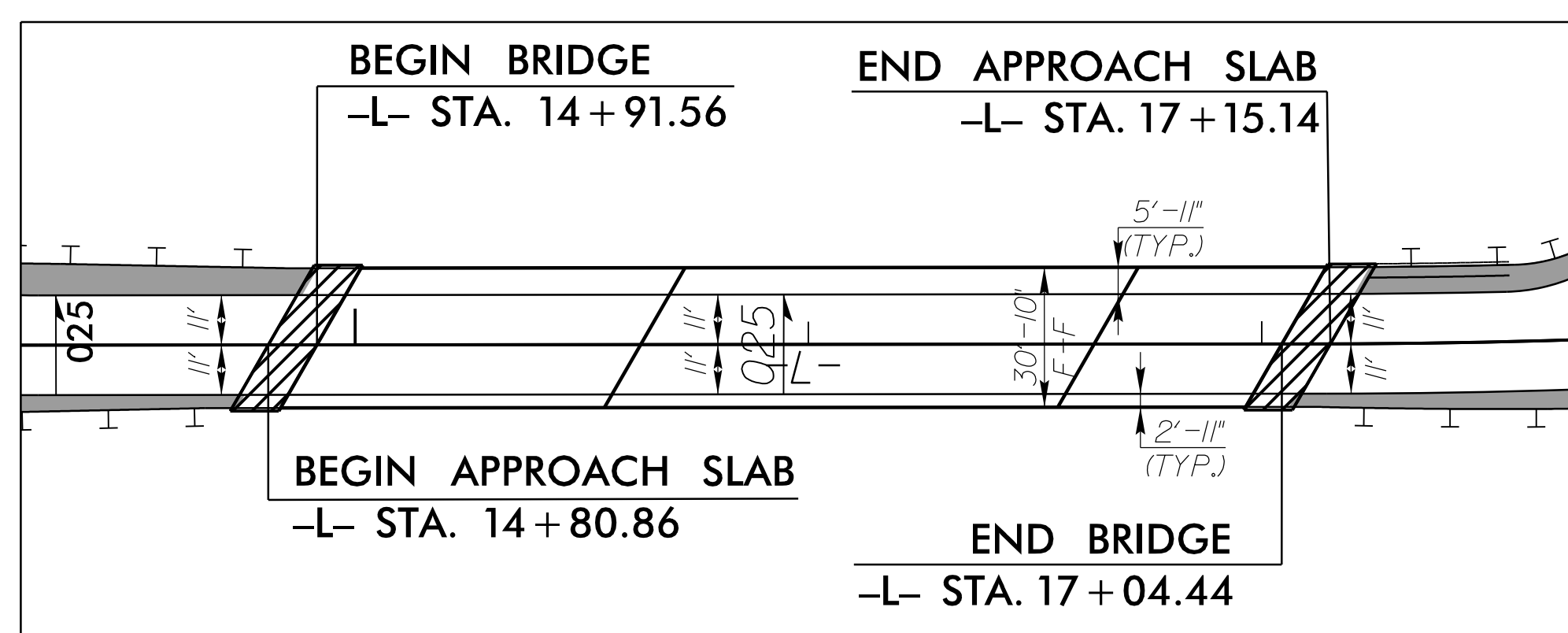
SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS										IMPACT ATTENUATOR TYPE 350			SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS						
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	XI MOD	TYP III	GREU TL-3	M-350	XIII	CAT-1	VI MOD	BIC	AT-1	EA	G	NG											
L	13+58.66	15+03.44	LT	143.75				15+02.77 BRIDGE	5'-11"	8'-11"		125'-0"		2'-1"			1	1																			
L	17+12.09	17+87.11	LT	43.75	37.5			17+12.79 BRIDGE	5'-11"	8'-11"							1																		ATTACH TO EXISTING GUARDRAIL		
L	13+04.68	14+85.64	RT	181.25				14+84.97 BRIDGE	2'-11"	5'-11"	162'-6"		3'-6"				1	1																			
L	16+94.29	19+00.28	RT	206.25				16+94.99 BRIDGE	2'-11"	5'-11"		187'-6"		4'-7"			1	1																			
			SUBTOTAL	575'	37.5'																																
			LESS DEDUCTIONS																																		
			GREU TL-3 (3 x 50) =	150'																																	
			TYPE III (4 x 18.75) =	75'																																	
			SUBTOTAL	225'																																	
			TOTALS	350'	37.5'																																
			SAY	350'	37.5'			ADDITIONAL GUARDRAIL POSTS = 5																													

3/1/2008
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PROJECT REFERENCE NO. B-5320	SHEET NO. 4
ROADWAY DESIGN ENGINEER Holly Christenbury SEAL 043139 EXPIRES 09/30/2018	HYDRAULICS ENGINEER Vidya Mohandas SEAL 043232 EXPIRES 09/30/2018

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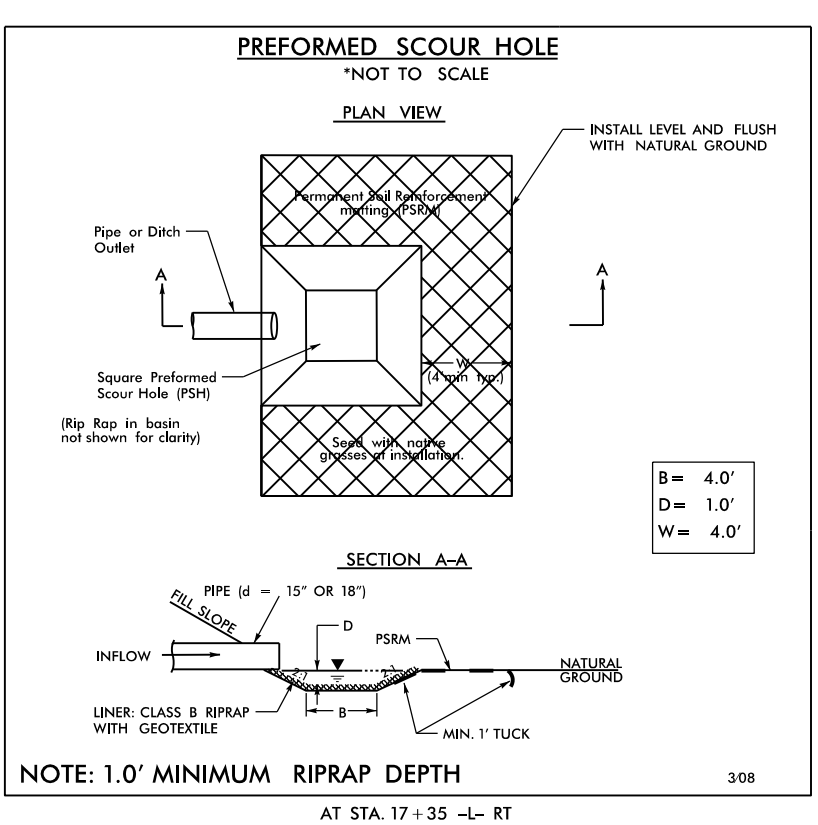
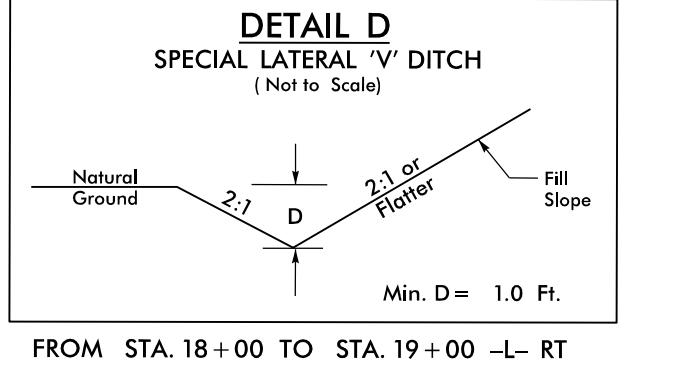
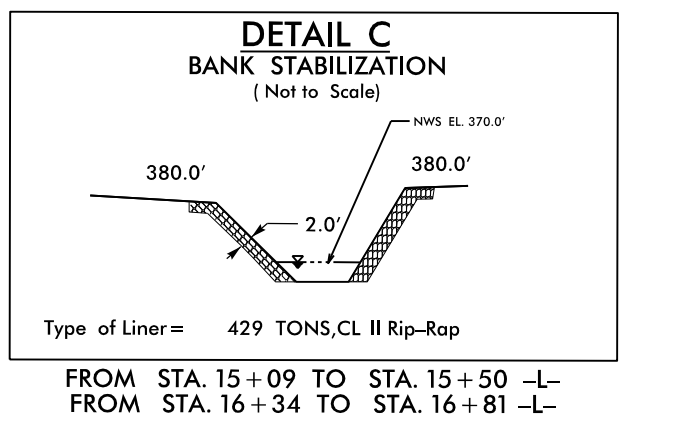
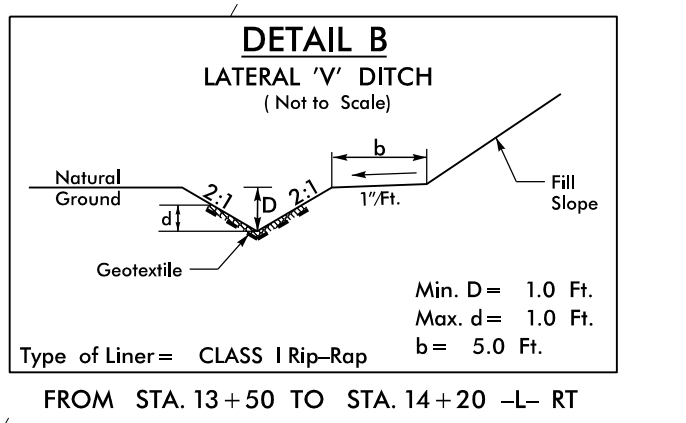
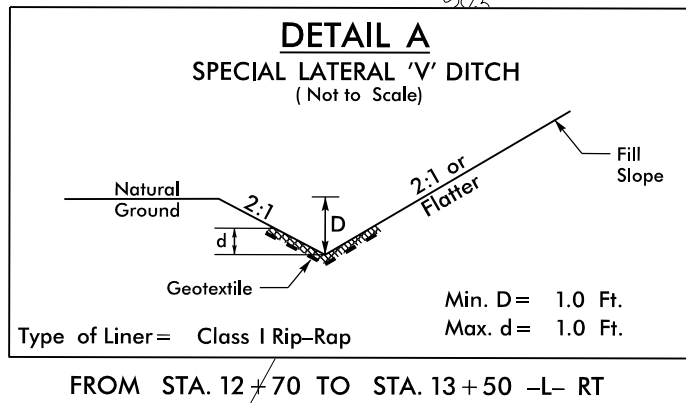
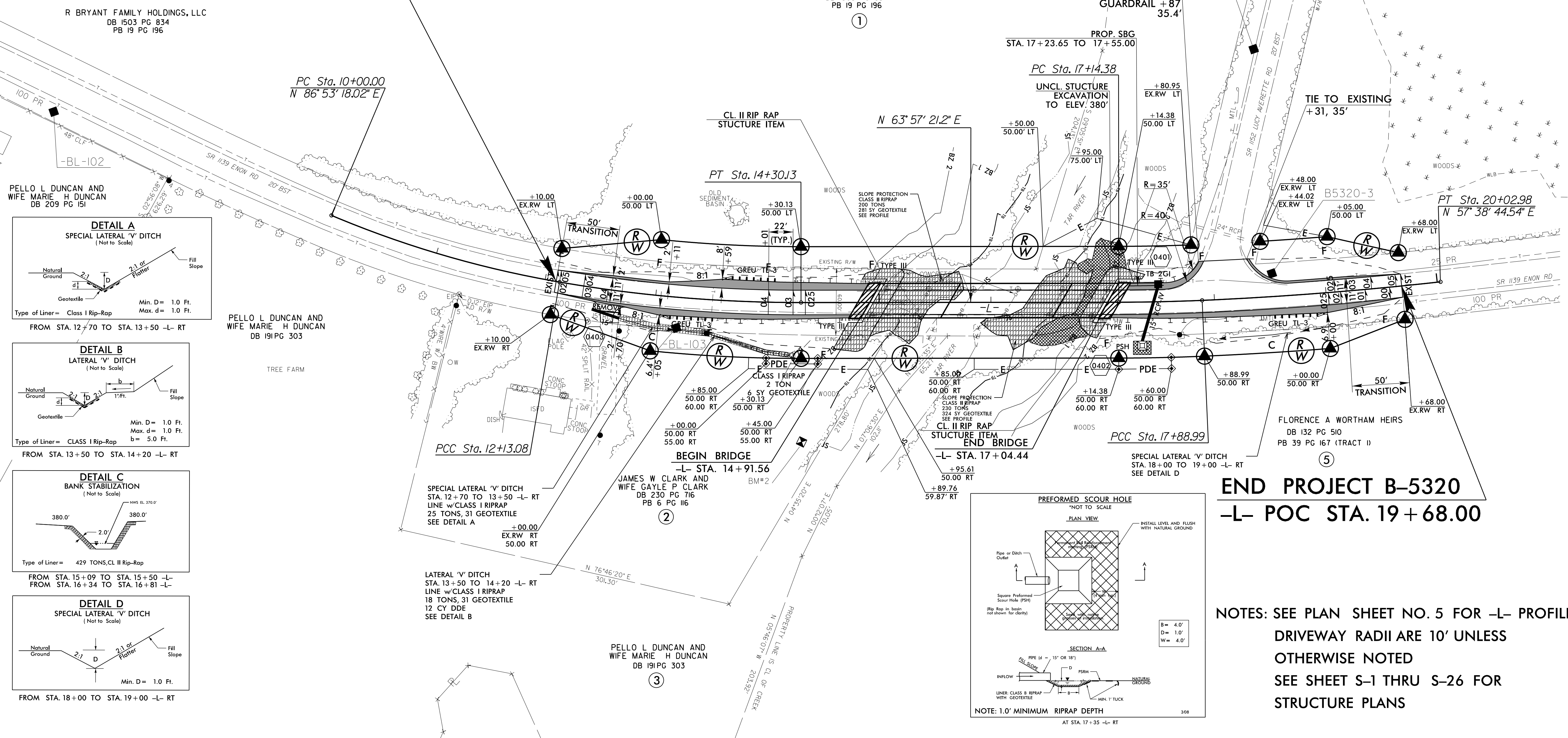
NOTE: NOT TO SCALE

-L- CURVE DATA

PI Sta	Δ	D	L	T	R	BACK
PI Sta 11+07.01	Δ = 13° 08' 24.1" (LT)	D = 6' 10' 00.7"	L = 213.08'	T = 107.01'	R = 929.09'	BACK = N 86° 53' 18.02" E
PI Sta 13+21.87	Δ = 9° 47' 32.6" (LT)	D = 4' 30' 41.3"	L = 217.06'	T = 108.79'	R = 1,270.00'	Ds = 50 MPH SE = 0.04 RO = 88'
PI Sta 17+51.69	Δ = 2° 26' 34.0" (LT)	D = 3' 16' 26.6"	L = 74.61'	T = 37.31'	R = 1,750.00'	SE = EXISTING
PI Sta 18+96.03	Δ = 3° 52' 02.7" (LT)	D = 1' 48' 26.3"	L = 213.99'	T = 107.03'	R = 3,170.24'	AHEAD = N 57° 38' 44.54" E

BEGIN PROJECT B-5320
-L- POC STA. 12+10.00

END PROJECT B-5320
-L- POC STA. 19+68.00



NOTES: SEE PLAN SHEET NO. 5 FOR -L- PROFILE
DRIVEWAY RADII ARE 10' UNLESS OTHERWISE NOTED
SEE SHEET S-1 THRU S-26 FOR STRUCTURE PLANS

REVISIONS

3/1/2018
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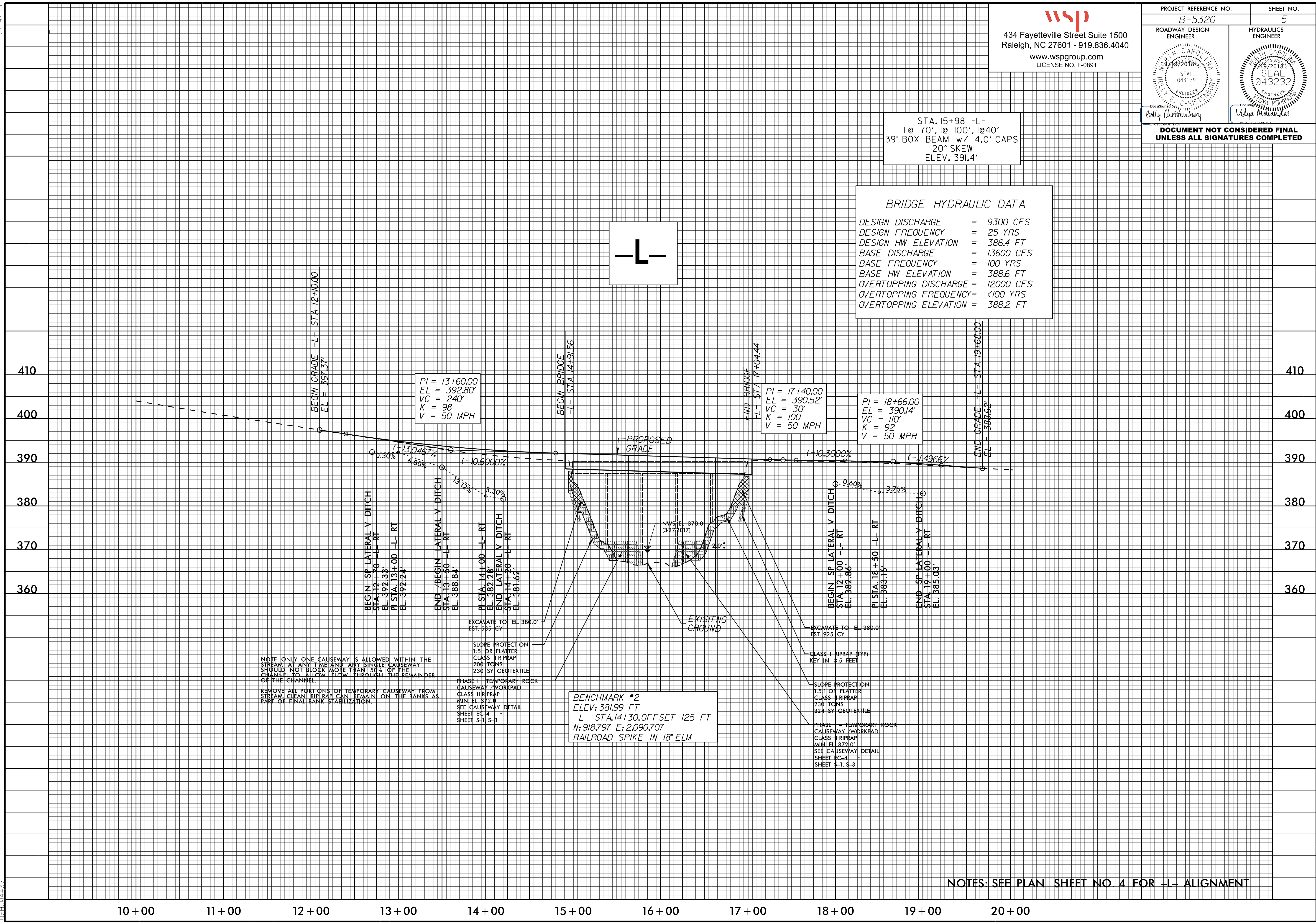
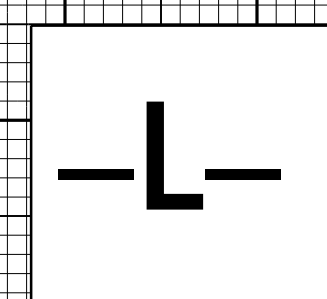
PROJECT REFERENCE NO. B-5320	SHEET NO. 5
ROADWAY DESIGN ENGINEER POLLY CHRISTENHURY	HYDRAULICS ENGINEER VIDYA MOHANDAS

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STA. 15+98 -L-
 1 @ 70', 1 @ 100', 1 @ 40'
 39" BOX BEAM w/ 4.0' CAPS
 120° SKEW
 ELEV. 391.4'

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 9300 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 386.4 FT
BASE DISCHARGE	= 13600 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 388.6 FT
OVERTOPPING DISCHARGE	= 12000 CFS
OVERTOPPING FREQUENCY	= <100 YRS
OVERTOPPING ELEVATION	= 388.2 FT



PI = 13+60.00
 EL = 392.80'
 VC = 240'
 K = 98
 V = 50 MPH

PI = 17+40.00
 EL = 390.52'
 VC = 30'
 K = 100
 V = 50 MPH

PI = 18+66.00
 EL = 390.14'
 VC = 110'
 K = 92
 V = 50 MPH

NOTE: ONLY ONE CAUSEWAY IS ALLOWED WITHIN THE STREAM AT ANY TIME AND ANY SINGLE CAUSEWAY SHOULD NOT BLOCK MORE THAN 50% OF THE CHANNEL TO ALLOW FLOW THROUGH THE REMAINDER OF THE CHANNEL.
 REMOVE ALL PORTIONS OF TEMPORARY CAUSEWAY FROM STREAM. CLEAN RIP-RAP CAN REMAIN ON THE BANKS AS PART OF FINAL BANK STABILIZATION.

EXCAVATE TO EL. 380.0'
 EST. 585 CY

SLOPE PROTECTION
 1:5 OR FLATTER
 CLASS II RIPRAP
 200 TONS
 230 SY GEOTEXTILE

PHASE I - TEMPORARY ROCK CAUSEWAY / WORKPAD
 CLASS II RIPRAP
 MIN. EL. 372.0'
 SEE CAUSEWAY DETAIL SHEET EC-1
 SHEET S-1, S-3

BENCHMARK #2
 ELEV: 381.99 FT
 -L- STA. 14+30, OFFSET 125 FT
 N: 918.797 E: 2.090.707
 RAILROAD SPIKE IN 18" ELM

EXCAVATE TO EL. 380.0'
 EST. 925 CY

CLASS II RIPRAP (TYP)
 KEY IN 3.5 FEET

SLOPE PROTECTION
 1:5:1 OR FLATTER
 CLASS II RIPRAP
 230 TONS
 324 SY GEOTEXTILE

PHASE I - TEMPORARY ROCK CAUSEWAY / WORKPAD
 CLASS II RIPRAP
 MIN. EL. 372.0'
 SEE CAUSEWAY DETAIL SHEET EC-4
 SHEET S-1, S-3

NOTES: SEE PLAN SHEET NO. 4 FOR -L- ALIGNMENT

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10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00 20+00