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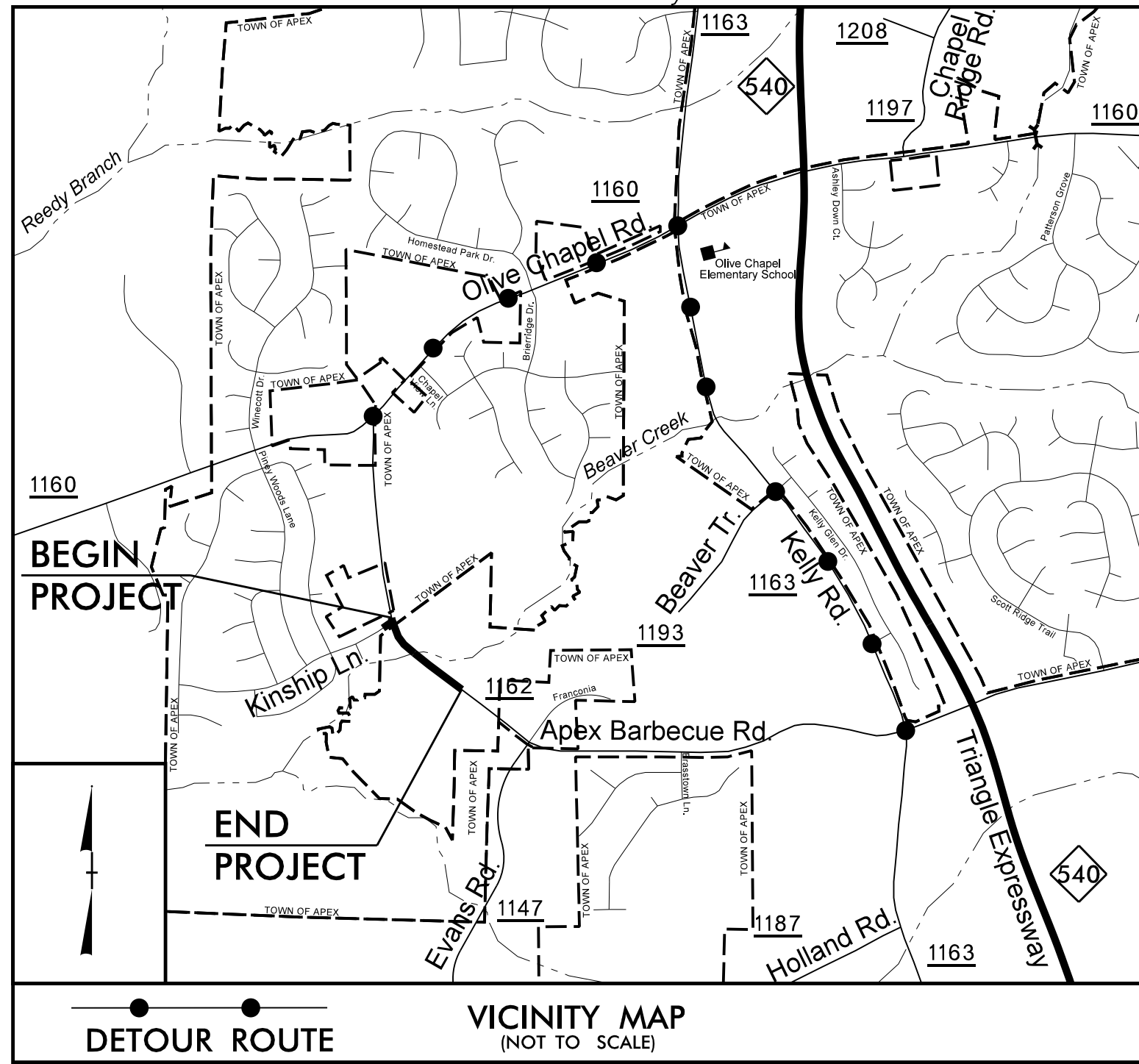
**This file or an individual page  
shall not be considered a certified document.**

09/08/18

**TIP PROJECT: B-5161**

**CONTRACT: C204098**

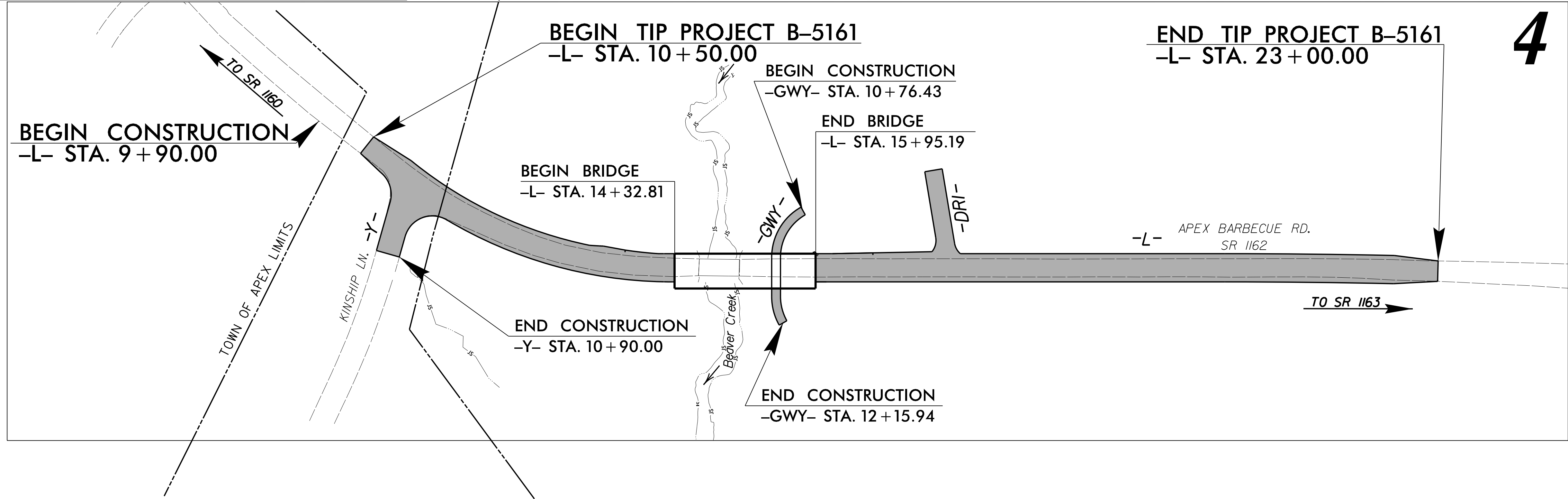
See Sheet 1A for Index of Sheets  
See Sheet 1B for Sheet Symbolology  
See Sheet 1C-1 for Survey Control Sheet



STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
**WAKE COUNTY**

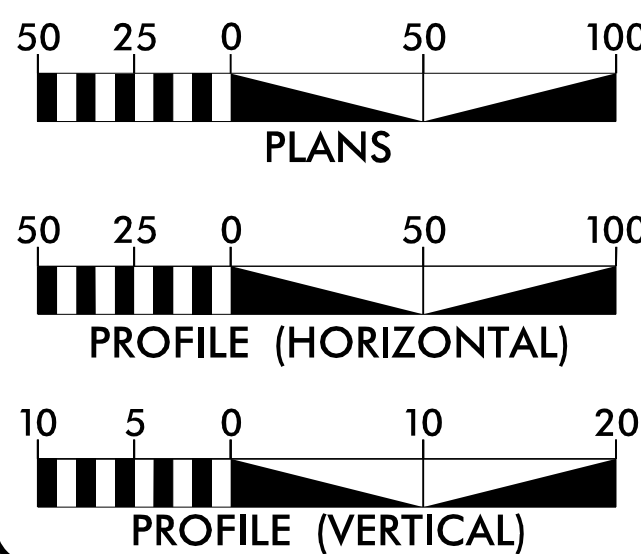
**LOCATION: BRIDGE NO. 362 OVER BEAVER CREEK  
ON SR 1162 (APEX BARBECUE ROAD)**  
**TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURE**

STATE	TIP PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5161	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
42336.1.1	BRZ-1162(6)	P.E.	
42336.2.1	BRZ-1162(6)	RW, UTILITIES	
42336.3.1	BRZ-1162(6)	CONST.	



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

**GRAPHIC SCALES**



**DESIGN DATA**

ADT 2018 = 3,970  
ADT 2038 = 10,360  
K = 10 %  
D = 70 %  
T = 5 %\*  
V = 40 MPH  
\*TTST=1% DUAL=4%  
FUNC CLASS =  
LOCAL RURAL  
SUBREGIONAL TIER

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT B-5161 = 0.206 MILES  
LENGTH STRUCTURES TIP PROJECT B-5161 = 0.031 MILES  
TOTAL LENGTH TIP PROJECT B-5161 = 0.237 MILES



2018 STANDARD SPECIFICATIONS

**RIGHT OF WAY DATE:**  
OCTOBER 16, 2017

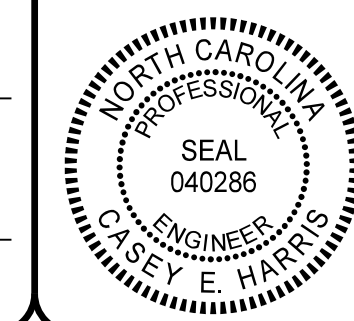
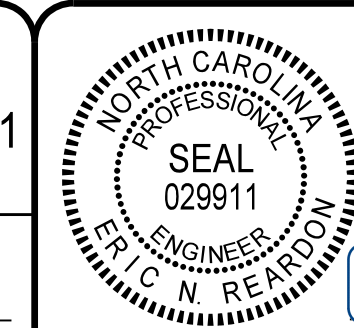
**LETTING DATE:**  
MAY 15, 2018

Prepared In the Office of:  
HDR Engineering, Inc. of the Carolinas  
555 Fayetteville St., Suite 900 Raleigh, NC 27601  
N.C.B.E.L.S. License Number: F-0116

**PHILLIP E. ROGERS, P.E.**  
PROJECT ENGINEER

**CASEY E. HARRIS, P.E.**  
PROJECT DESIGN ENGINEER

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



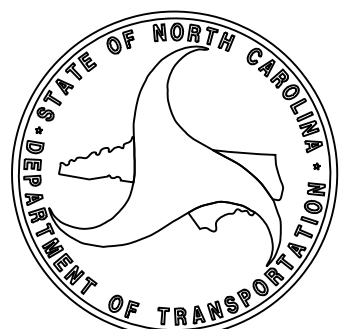
**HYDRAULICS  
ENGINEER**

DocuSigned by:  
**Eric N. Rendon**  
2/27/2018 P.E.  
SIGNATURE

**ROADWAY DESIGN  
ENGINEER**

DocuSigned by:  
**Casey Harris**  
2/26/2018 P.E.  
SIGNATURE

**DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA**



## INDEX OF SHEETS

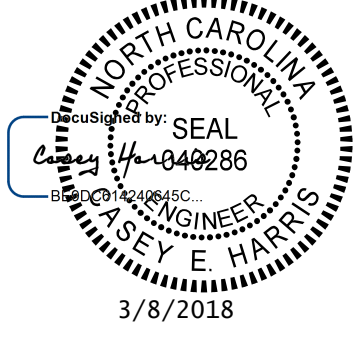

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
1C-1	SURVEY CONTROL SHEET
1E-1	R/W AND EASEMENT COORDINATE LIST
2A-1 THRU 2A-3	PAVEMENT SCHEDULE, TYPICAL SECTIONS, INCIDENTAL MILLING AND DETAIL SHOWING METHOD OF WEDGING
2C-1	STRUCTURE ANCHOR UNITS, GUARDRAIL ANCHOR UNIT TYPE III
2C-2	GUARDRAIL INSTALLATION, AT-1 SYSTEM
2C-3	TOWN OF APEX STANDARDS, GREENWAY SECTIONS
2C-4	GUARDRAIL INSTALLATION, STANDARD W-BEAM GUARDRAIL
3B-1	GUARDRAIL SUMMARY, SUMMARY OF EARTHWORK AND ASPHALT PAVEMENT REMOVAL AND BREAKUP SUMMARY
3D-1	SUMMARY OF DRAINAGE QUANTITIES
4 THRU 5	PLAN & PROFILE SHEETS
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TMP-1 THRU TMP-4	TRANSPORTATION MANAGEMENT PLANS
PMP-1	PAVEMENT MARKING PLAN
EC-1 THRU EC-5	EROSION CONTROL PLANS
RF-1	REFORESTATION PLAN SHEET
SIGN-1 THRU SIGN-2	SIGNING PLANS
UC-1 THRU UC-4	UTILITY CONSTRUCTION PLANS
UD-1 THRU UD-2	UTILITIES BY OTHERS PLANS
X-1A	CROSS-SECTION SHEET INDEX
X-1B	CROSS-SECTION SUMMARY SHEET
X-1 THRU X-10	CROSS-SECTIONS
S-1 THRU S-27	STRUCTURE PLANS

## 2018 ROADWAY ENGLISH STANDARD DRAWINGS

EFF. 01-16-2018  
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
<b>DIVISION 2 - EARTHWORK</b>	
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
<b>DIVISION 3 - PIPE CULVERTS</b>	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
<b>DIVISION 4 - MAJOR STRUCTURES</b>	
422.02	Bridge Approach Fills - Type II Modified Approach Fill
<b>DIVISION 5 - SUBGRADE, BASES AND SHOULDERS</b>	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
<b>DIVISION 8 - INCIDENTALS</b>	
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 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
840.00	Concrete Base Pad for Drainage Structures
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.19	Concrete Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.28	Brick Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
848.01	Concrete Sidewalk
848.04	Street Turnout
848.05	Curb Ramp - Proposed Curb & Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.01	Rip Rap in Channels
876.04	Drainage Ditches with Class 'B' Rip Rap

PROJECT REFERENCE NO. <b>B-5161</b>	SHEET NO. <b>1A</b>
ROADWAY DESIGN ENGINEER	
	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
 HDR Engineering, Inc. of the Carolinas 555 Fayetteville St., Suite 900, Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116	

## GENERAL NOTES

EFFECTIVE: 01-16-2018  
REVISED:

GRADE LINE:  
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.

STREET TURNOUT:

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

GUARDRAIL:

THE GUARDRAIL LOCATIONS SHOWN ON THE PLANS MAY BE ADJUSTED DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHOULD CONSULT WITH THE ENGINEER PRIOR TO ORDERING GUARDRAIL MATERIAL.

TEMPORARY SHORING:

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC WILL BE PAID FOR AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104-7.

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:

TOWN OF APEX  
AT&T  
TIME WARNER CABLE  
PROGRESS ENERGY

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

RIGHT-OF-WAY MARKERS:

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

CURB RAMPS

CURB RAMPS ARE SHOWN ON THE PLANS AT APPROXIMATE LOCATIONS. CONSTRUCT ALL CURB RAMPS ACCORDANCE WITH STD 848.05 and/or 848.06.

# STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

## CONVENTIONAL PLAN SHEET SYMBOLS

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

### BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○
Property Corner	-----
Property Monument	□
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	☠
Potential Contamination Area: Soil	☠
Known Contamination Area: Water	☠
Potential Contamination Area: Water	☠
Contaminated Site: Known or Potential	☠

### BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	○
Sign	○
Well	⊕
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	○
Switch	□
RR Abandoned	-----
RR Dismantled	-----

### RIGHT OF WAY:

Baseline Control Point	◆
Existing Right of Way Marker	△
Existing Right of Way Line	-----
Proposed Right of Way Line	-----
Proposed Right of Way Line with Iron Pin and Cap Marker	-----
Proposed Right of Way Line with Concrete or Granite R/W Marker	-----
Proposed Control of Access Line with Concrete C/A Marker	-----

### EXISTING CONTROL OF ACCESS:

Existing Control of Access	-----
Proposed Control of Access	-----
Existing Easement Line	-----
Proposed Temporary Construction Easement	-----
Proposed Temporary Drainage Easement	-----
Proposed Permanent Drainage Easement	-----
Proposed Permanent Drainage / Utility Easement	-----
Proposed Permanent Utility Easement	-----
Proposed Temporary Utility Easement	-----
Proposed Aerial Utility Easement	-----
Proposed Permanent Easement with Iron Pin and Cap Marker	-----

### ROADS AND RELATED FEATURES:

Existing Edge of Pavement	-----
Existing Curb	-----
Proposed Slope Stakes Cut	-----
Proposed Slope Stakes Fill	-----
Proposed Curb Ramp	-----
Existing Metal Guardrail	-----
Proposed Guardrail	-----
Existing Cable Guiderail	-----
Proposed Cable Guiderail	-----

### EQUALITY SYMBOL:

Equality Symbol	-----
-----------------	-------

### VEGETATION:

Single Tree	○
Single Shrub	○
Hedge	-----
Woods Line	-----

Orchard	-----
Vineyard	-----

### EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	-----
Bridge Wing Wall, Head Wall and End Wall	-----
MINOR:	
Head and End Wall	-----
Pipe Culvert	-----
Footbridge	-----
Drainage Box: Catch Basin, DI or JB	-----
Paved Ditch Gutter	-----
Storm Sewer Manhole	-----
Storm Sewer	-----

### UTILITIES:

POWER:	
Existing Power Pole	-----
Proposed Power Pole	-----
Existing Joint Use Pole	-----
Proposed Joint Use Pole	-----
Power Manhole	-----
Power Line Tower	-----
Power Transformer	-----
U/G Power Cable Hand Hole	-----
H-Frame Pole	-----
U/G Power Line LOS B (S.U.E.*)	-----
U/G Power Line LOS C (S.U.E.*)	-----
U/G Power Line LOS D (S.U.E.*)	-----

### TELEPHONE:

Existing Telephone Pole	-----
Proposed Telephone Pole	-----
Telephone Manhole	-----
Telephone Pedestal	-----
Telephone Cell Tower	-----
U/G Telephone Cable Hand Hole	-----
U/G Telephone Cable LOS B (S.U.E.*)	-----
U/G Telephone Cable LOS C (S.U.E.*)	-----
U/G Telephone Cable LOS D (S.U.E.*)	-----
U/G Telephone Conduit LOS B (S.U.E.*)	-----
U/G Telephone Conduit LOS C (S.U.E.*)	-----
U/G Telephone Conduit LOS D (S.U.E.*)	-----
U/G Fiber Optics Cable LOS B (S.U.E.*)	-----
U/G Fiber Optics Cable LOS C (S.U.E.*)	-----
U/G Fiber Optics Cable LOS D (S.U.E.*)	-----

### WATER:

Water Manhole	-----
Water Meter	-----
Water Valve	-----
Water Hydrant	-----
U/G Water Line LOS B (S.U.E.*)	-----
U/G Water Line LOS C (S.U.E.*)	-----
U/G Water Line LOS D (S.U.E.*)	-----
Above Ground Water Line	-----

### TV:

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

### GAS:

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

### SANITARY SEWER:

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

### MISCELLANEOUS:

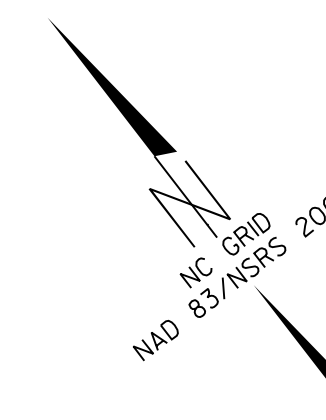
Utility Pole	-----
Utility Pole with Base	-----
Utility Located Object	-----
Utility Traffic Signal Box	-----
Utility Unknown U/G Line LOS B (S.U.E.*)	-----
U/G Tank; Water, Gas, Oil	-----
Underground Storage Tank, Approx. Loc.	-----
A/G Tank; Water, Gas, Oil	-----
Geoenvironmental Boring	-----
U/G Test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

04/06/15  
2/20/2018  
S:\Roadway\NPrco\B5161.RD.V\_TSH.dgn  
3:27:45 PM

# SURVEY CONTROL SHEET B-5161

○ B5161-1  
 N= 720346.233  
 E= 2027907.296

○ B5161-2



ROW MARKER CONCRETE OR GRANITE -E-

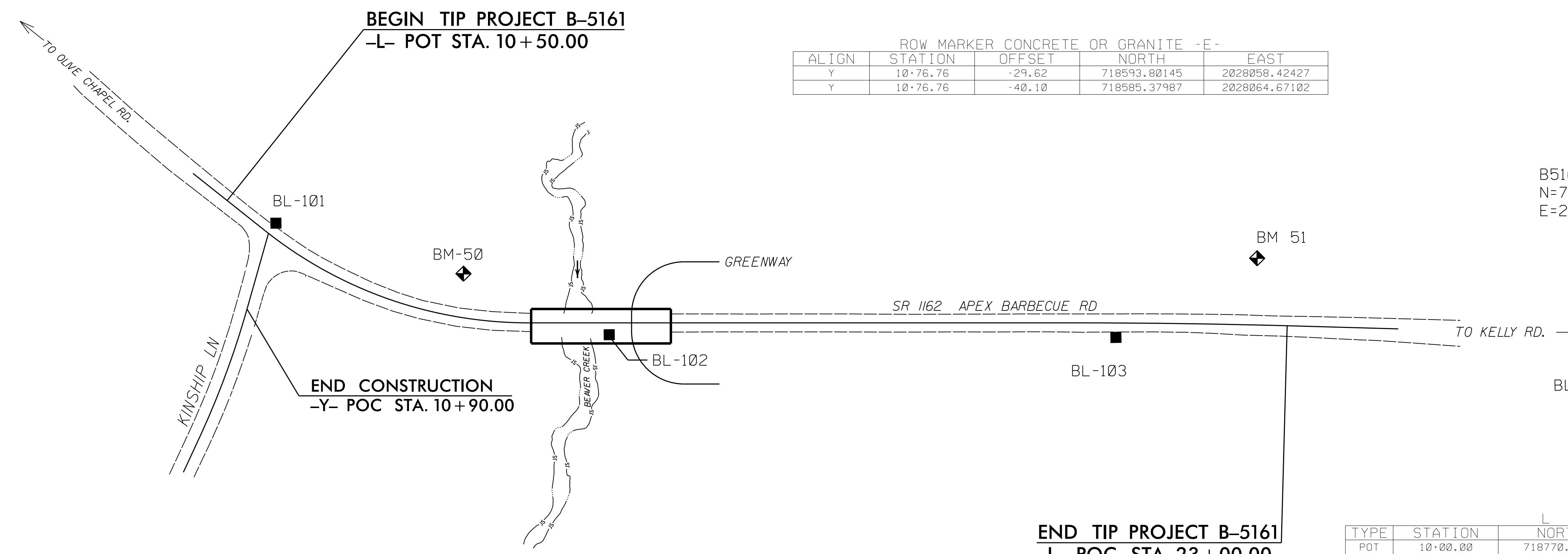
ALIGN	STATION	OFFSET	NORTH	EAST
L	11+28.42	-54.85	718661.56700	2028159.81600
L	11+38.88	-30.38	718645.22888	2028139.26041
L	12+00.00	-60.00	718604.44568	2028186.99043
L	14+31.53	-60.00	718447.57274	2028312.60229
L	14+31.53	60.00	718352.54776	2028239.32028
L	20+58.22	-60.00	718064.86386	2028808.86197
L	20+58.22	60.00	717969.83887	2028735.57996
L	23+00.00	60.00	717820.63527	2028923.77040
L	23+00.00	30.00	717843.89449	2028942.72540
L	23+00.00	-30.00	717890.40564	2028980.62944
L	23+00.00	-60.00	717913.65752	2028999.57846

ROW MARKER CONCRETE OR GRANITE -E-

ALIGN	STATION	OFFSET	NORTH	EAST
Y	10+76.76	-29.62	718593.80145	2028058.42427
Y	10+76.76	-40.10	718585.37987	2028064.67102

○ B5161-4  
 N=717379.308  
 E=2031271.069

○ B5161-3  
 N=717454.133  
 E=2029677.853



**END TIP PROJECT B-5161**  
 -L- POC STA. 23+00.00

L

TYPE	STATION	NORTH	EAST
POT	10+00.00	718770.4829	2028075.9451
PC	11+05.70	718667.8621	2028101.2827
PT	14+31.53	718400.0603	2028275.9613
PC	20+58.22	718017.3514	2028772.2210
PT	23+09.23	717861.3108	2028968.8276
POT	25+91.99	717682.4582	2029187.8343

Y

TYPE	STATION	NORTH	EAST
POT	10+00.00	718663.3159	2028102.4285
PC	10+89.62	718609.9217	2028030.4449
PT	12+50.21	718524.9971	2027894.3573
POT	12+90.88	718506.3016	2027858.2369

BL POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
GPS2	B5161-2	719261.3480	2027983.2720	303.53	OUTSIDE PROJECT LIMITS	
101	BL-101	718667.3330	2028116.3070	276.38	11+09.94	14.44 LT
102	BL-102	718333.0970	2028340.5750	267.09	15+23.59	13.57 RT
103	BL-103	717976.2380	2028798.1800	281.21	21+03.97	16.59 RT
104	BL-104	717595.6030	2029231.3470	326.37	OUTSIDE PROJECT LIMITS	

\*\*\*\*\*  
 50 ELEVATION + 267.81  
 N 718490 E 2028251  
 L STATION 13+48.00 50 LEFT  
 RRS IN 24" GUM  
 \*\*\*\*\*

\*\*\*\*\*  
 51 ELEVATION + 296.56  
 N 717949 E 2028982  
 L STATION 22+64.00 76 LEFT  
 RRS 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 "B5161-2" WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 719,261.348(ft) EASTING: 2,027,983.272(ft) ELEVATION: 303.53(ft)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99989559

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B5161-2" TO -L- STATION 10+50 IS  
 S 10°58'49.3" E 549.47'

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

**GEOID G03NC**  
**NOTE: DRAWING NOT TO SCALE**

**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.

5/15/17  
 2/7/2018  
 2:15:56 PM  
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# RIGHT OF WAY CONTROL SHEET



REVISIONS

ROW MARKER REBAR AND CAP				
ALIGN	STATION	OFFSET	NORTH	EAST
Y	10+76.76	-29.62	718593.8015	2028058.4243

ROW MARKER REBAR AND CAP				
ALIGN	STATION	OFFSET	NORTH	EAST
L	12+00.00	-60.00	718604.4457	2028186.9904
L	20+58.22	-60.00	718064.8639	2028808.8620
L	20+58.22	60.00	717969.8389	2028735.5800
L	23+00.00	60.00	717820.6353	2028923.7704
L	23+00.00	30.00	717843.8945	2028942.7254
L	23+00.00	-30.00	717890.4056	2028980.6294
L	23+00.00	-60.00	717913.6575	2028999.5705
L	14+31.53	-60.00	718447.5727	2028312.6023
L	14+31.53	60.00	718352.5478	2028239.3203
L	9+86.86	-35.00	718791.4418	2028106.8600
L	11+28.42	-54.85	718661.5670	2028159.8160
L	11+69.34	60.00	718585.3799	2028064.6710

PERMANENT EASEMENT MARKER REBAR AND CAP				
ALIGN	STATION	OFFSET	NORTH	EAST
L	17+72.00	-60.00	718239.6535	2028582.2117
L	17+72.00	-100.00	718271.3285	2028606.6390
L	19+00.00	-85.00	718181.2829	2028698.8388
L	19+49.50	-60.00	718131.2572	2028722.7695
L	18+40.00	60.00	718103.1021	2028562.7772
L	18+40.00	115.00	718059.5490	2028529.1896
L	19+10.00	115.00	718016.8011	2028584.6208
L	19+10.00	60.00	718060.3542	2028618.2084
L	15+40.00	-60.00	718381.3321	2028398.4967
L	13+50.00	-84.00	718512.0262	2028277.5817
L	12+90.00	-60.00	718536.4683	2028226.7533

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 12th day of January, 2018.

*Jeffrey S. Coats*  
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.

8/17/99

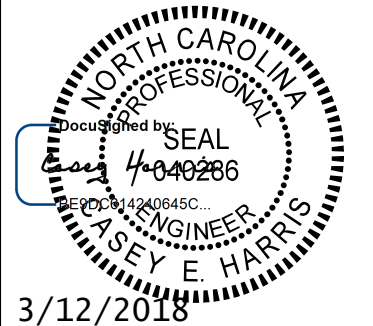
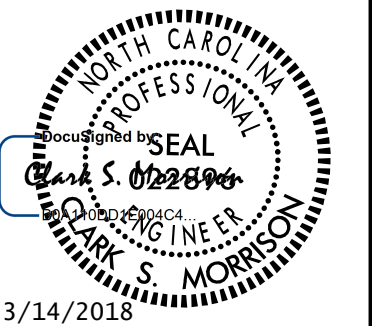

# FINAL PAVEMENT SCHEDULE

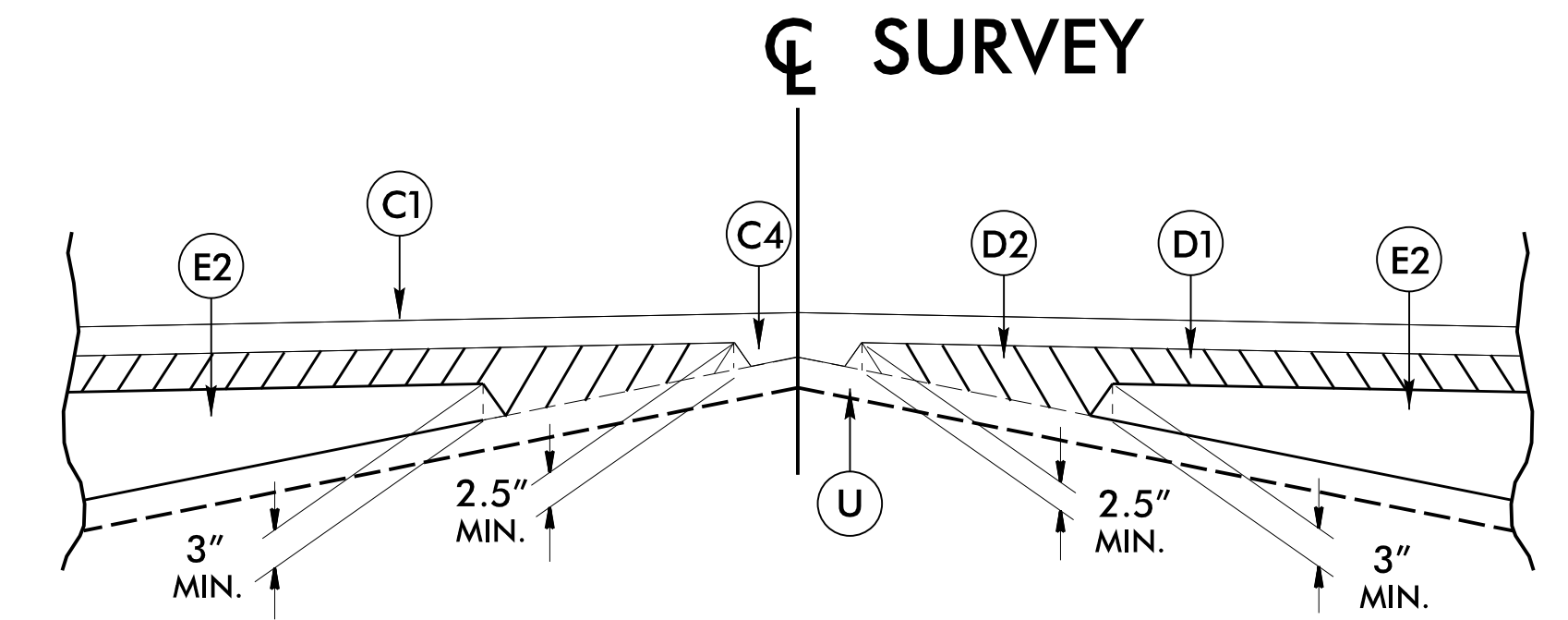
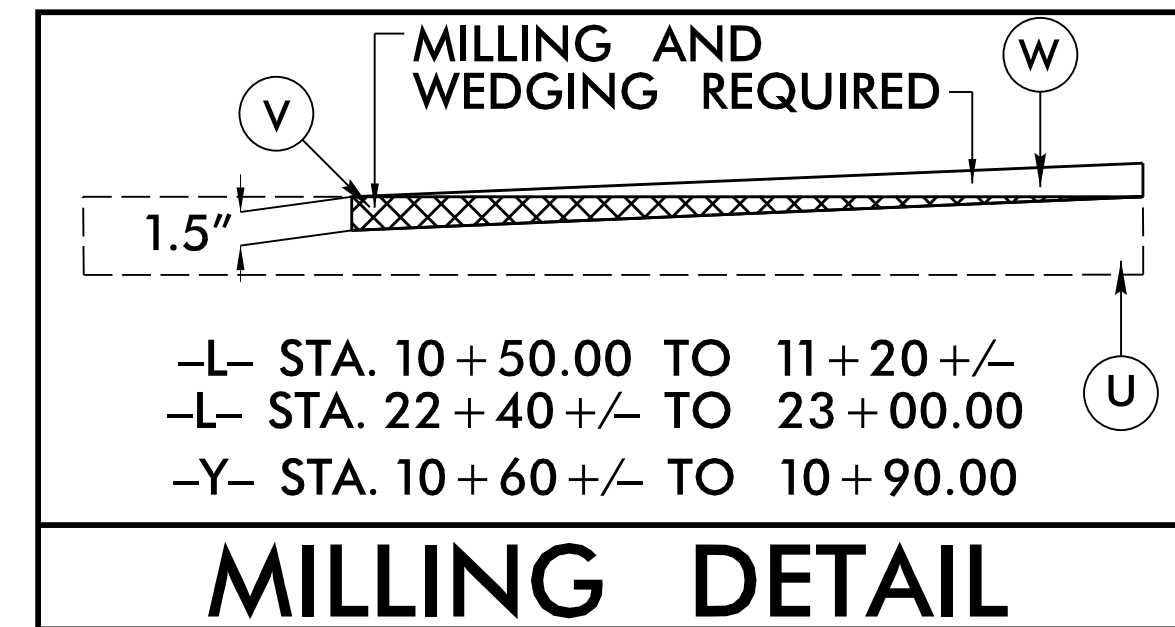
A1	4" CONCRETE GREENWAY.
C1	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C2	PROP. APPROX. 2.0" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. APPROX. 3.0" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C4	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 1.5" IN DEPTH.
D1	PROP. APPROX. 4.0" 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 4.0" IN DEPTH.
E1	PROP. APPROX. 4.0" 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 GREATER THAN 5.5" DEPTH OR LESS THAN 3.0" IN DEPTH.
J1	PROP. 6" AGGREGATE BASE COURSE.
J2	PROP. 8" AGGREGATE BASE COURSE.
J3	PROP. VAR. DEPTH AGGREGATE BASE COURSE.
P	PRIME COAT AT THE RATE OF 0.35 GAL. PER SQ. YD.
R1	2'-6" CONCRETE CURB & GUTTER.
R2	SHOULDER BERM GUTTER.
S	4" CONCRETE SIDEWALK.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	VARIABLE MILLING 0" TO 1.5" DEPTH.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL, SHEET 2A-1).

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

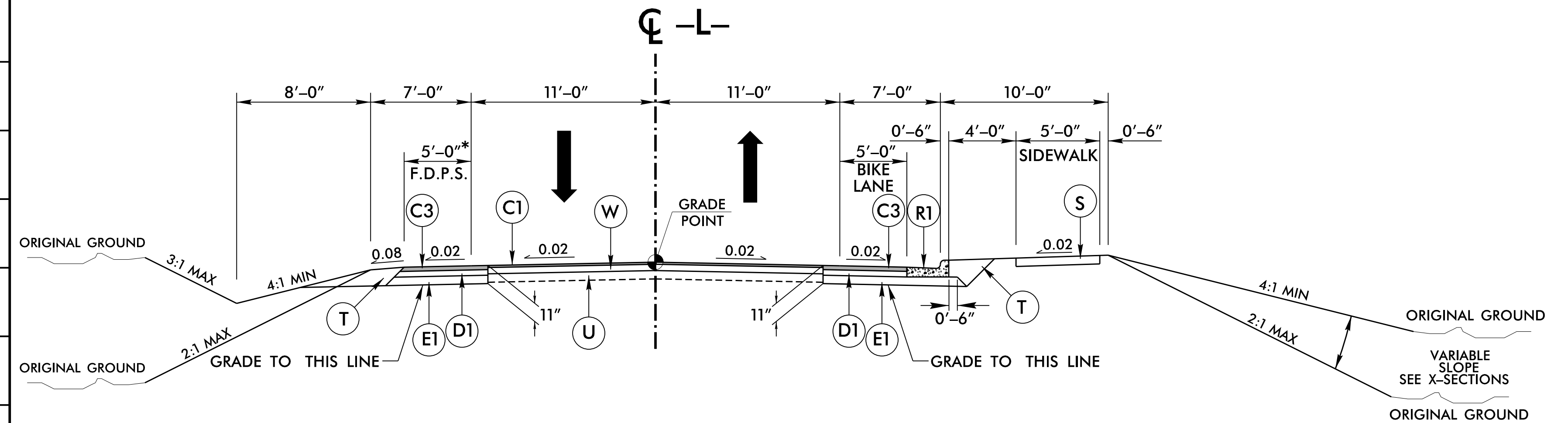
REVISIONS

3/12/2018  
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PROJECT REFERENCE NO. B-5161	SHEET NO. 2A-1
ROADWAY DESIGN ENGINEER 	PAVEMENT DESIGN ENGINEER 
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
 HDR Engineering, Inc. of the Carolinas 555 Fayetteville St. Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116	



Detail Showing Method of Wedging: W



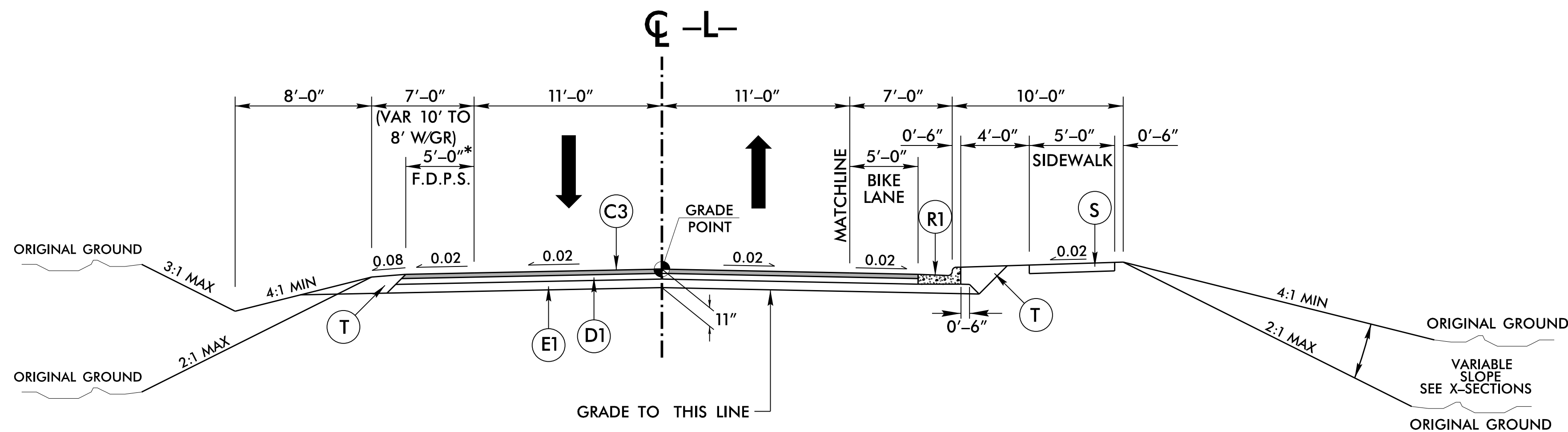
## TYPICAL SECTION NO. 1

LINE	FROM STATION	TO STATION
-L-	10 + 50.00	11 + 80.00
-L-	21 + 55.00	23 + 00.00

\*ADDITIONAL WIDTH FOR BICYCLE ACCOMMODATIONS.

8/17/99

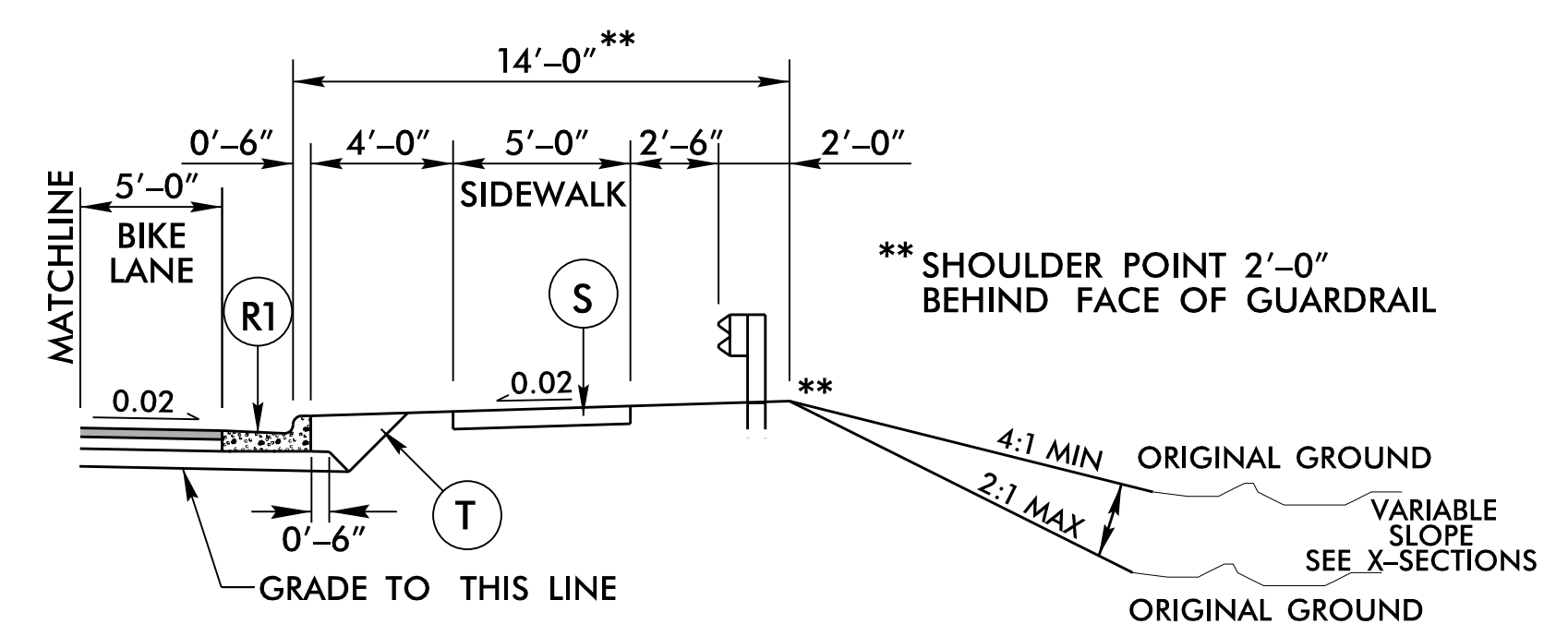
REVISIONS



### TYPICAL SECTION NO. 2

LINE	FROM STATION	TO STATION
-L-	11+80.00	14+32.81 (BEGIN BRIDGE)
-L-	15+95.19 (END BRIDGE)	21+55.00

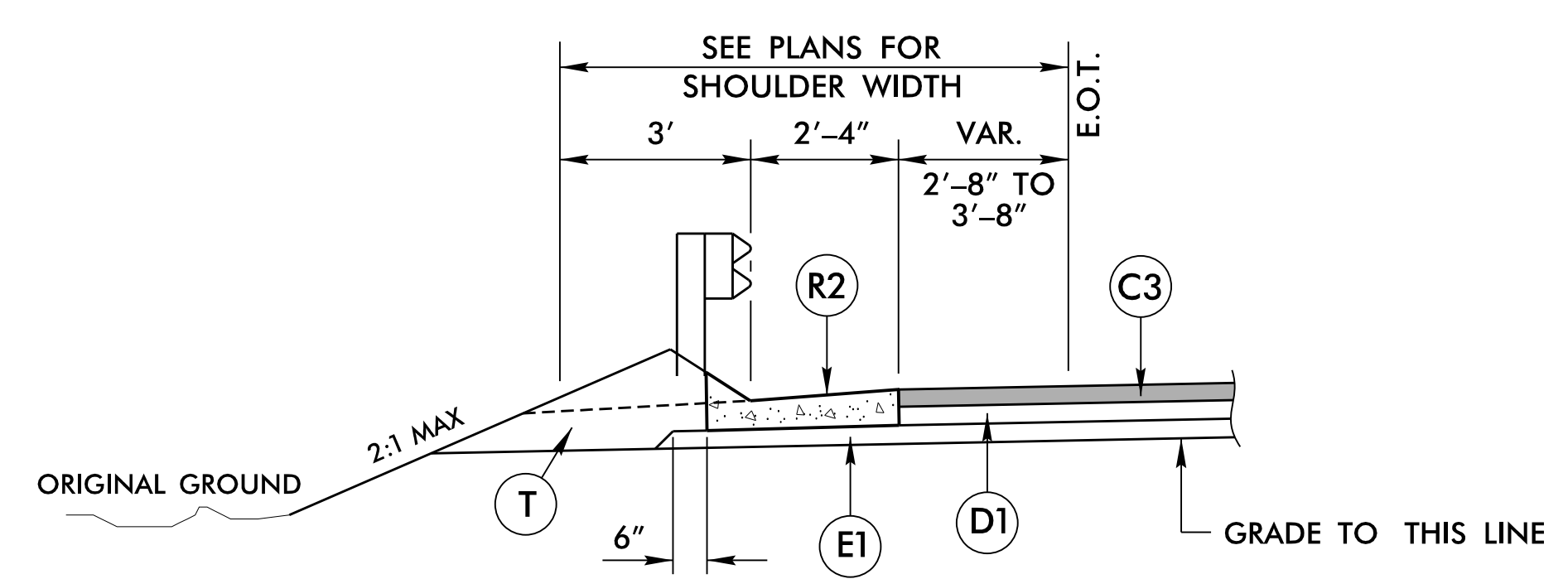
\* ADDITIONAL WIDTH FOR BICYCLE ACCOMMODATIONS. PAVE TO FACE OF GUARDRAIL.



### TYPICAL SECTION NO. 2A

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 2

LINE	FROM STATION	TO STATION
-L-	13+00.00 RT	18+50.00 RT



### TYPICAL SECTION NO. 2B

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 2

LINE	FROM STATION	TO STATION
-L-	13+76 (LT.)	14+22 (LT.)
-L-	16+06 (LT.)	16+59 (LT.)

PROJECT REFERENCE NO.	SHEET NO.
B-5161	2A-2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

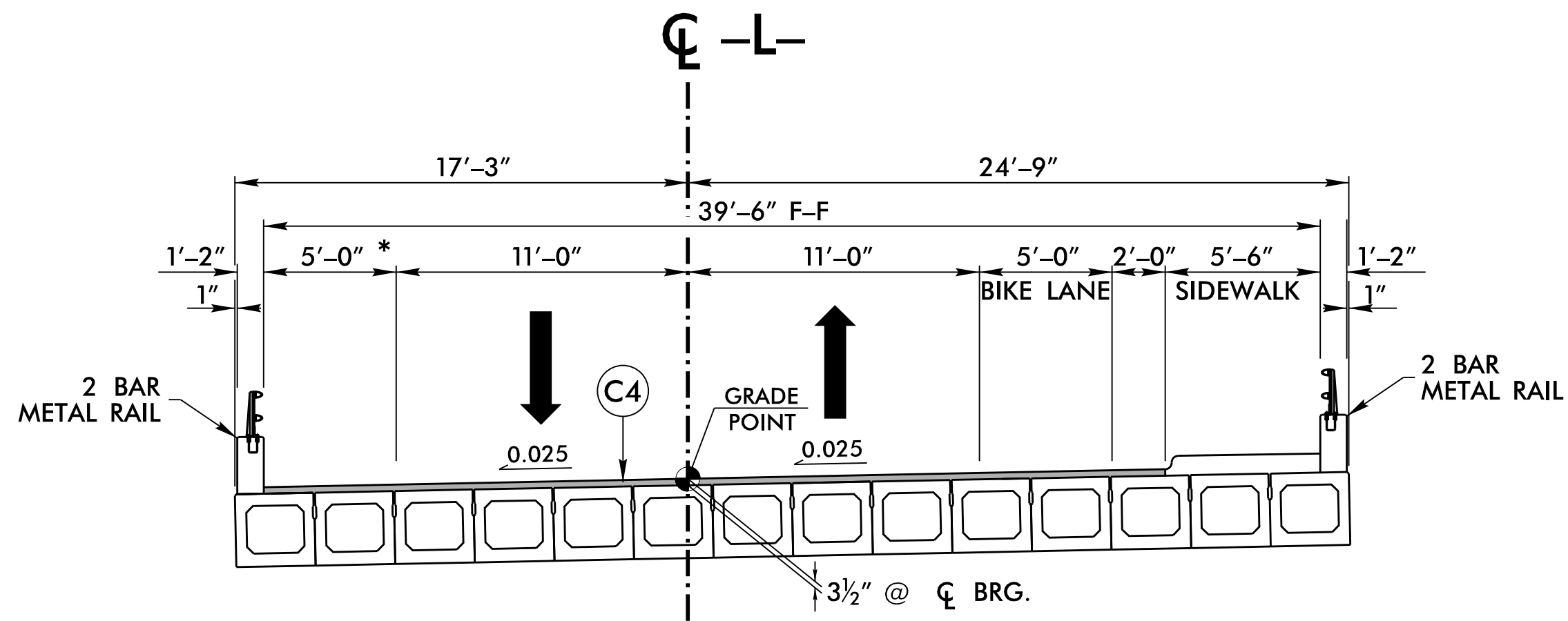
**HDR** HDR Engineering, Inc. of the Carolinas  
555 Fayetteville St. Suite 900 Raleigh, N.C. 27601  
N.C.B.E.L.S. License Number: F-0116

### FINAL PAVEMENT SCHEDULE

A1	4" CONC. GREENWAY
C1	1.5" S9.5B
C2	2.0" S9.5B
C3	3.0" S9.5B
C4	VAR S9.5B
D1	4.0" I19.0C
D2	VAR I19.0C
E1	4.0" B25.0C
E2	VAR B25.0C
J1	6" ABC
J2	8" ABC
J3	VAR. ABC
P	PRIME COAT
R1	2'-6" CURB AND GUTTER
R2	SHOULDER BERM GUTTER
S	4" CONC. SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	0" TO 1.5" MILLING
W	WEDGING

3/12/2018  
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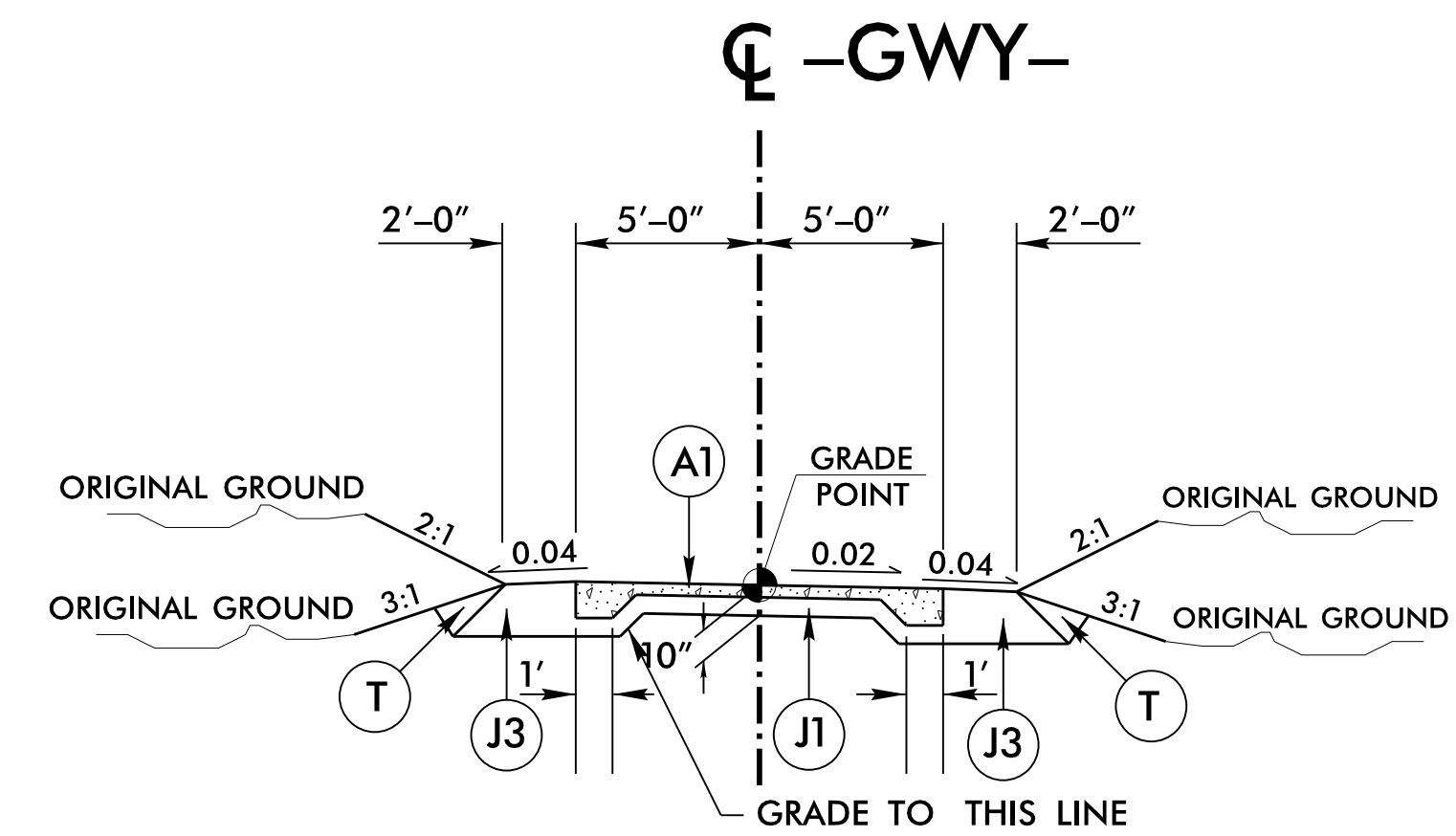


### TYPICAL SECTION NO. 3

14 - 33" BOX BEAM UNITS = 42'-0"

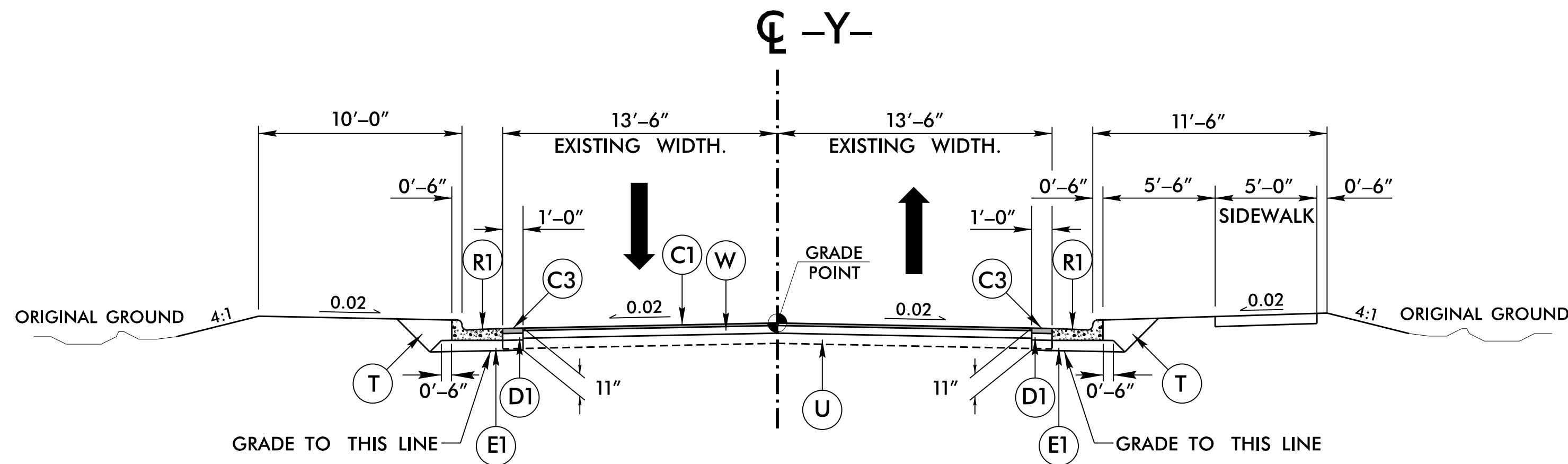
LINE	FROM STATION	TO STATION
-L-	14 + 32.81 (BEGIN BRIDGE)	15 + 95.19 (END BRIDGE)

\* ADDITIONAL WIDTH FOR BICYCLE ACCOMMODATIONS



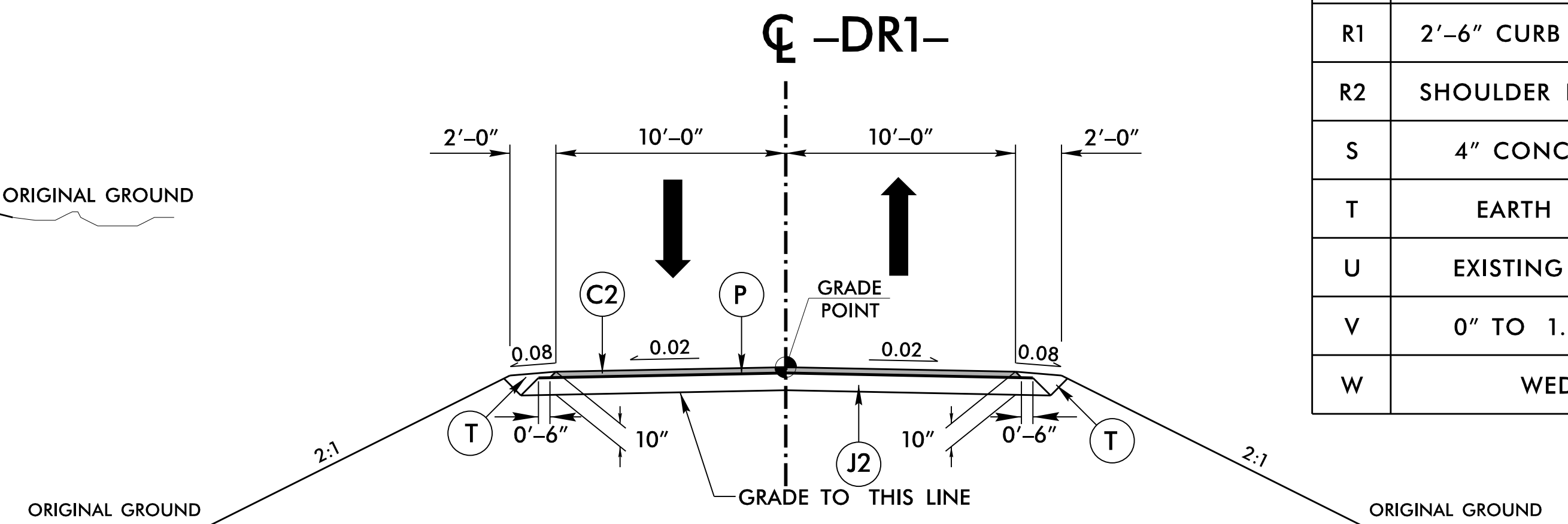
### TYPICAL SECTION NO. 4

LINE	FROM STATION	TO STATION
-GWY-	10 + 76.43	12 + 15.94



### TYPICAL SECTION NO. 5

LINE	FROM STATION	TO STATION
-Y-	10 + 17.23	10 + 90.00



### TYPICAL SECTION NO. 6

LINE	FROM STATION	TO STATION
-DR1-	10 + 11.15	11 + 12.00

PROJECT REFERENCE NO. <b>B-5161</b>	SHEET NO. <b>2A-3</b>
ROADWAY DESIGN ENGINEER 	PAVEMENT DESIGN ENGINEER 

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

**HDR** HDR Engineering, Inc. of the Carolinas  
555 Fayetteville St. Suite 900 Raleigh, N.C. 27601  
N.C.B.E.L.S. License Number: F-0116

#### FINAL PAVEMENT SCHEDULE

A1	4" CONC. GREENWAY
C1	1.5" S9.5B
C2	2.0" S9.5B
C3	3.0" S9.5B
C4	VAR S9.5B
D1	4.0" I19.0C
D2	VAR I19.0C
E1	4.0" B25.0C
E2	VAR B25.0C
J1	6" ABC
J2	8" ABC
J3	VAR. ABC
P	PRIME COAT
R1	2'-6" CURB AND GUTTER
R2	SHOULDER BERM GUTTER
S	4" CONC. SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	0" TO 1.5" MILLING
W	WEDGING

REVISIONS

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 Jhowerton AT: USD-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**

ROADWAY DETAIL DRAWING FOR  
**STRUCTURE ANCHOR UNITS**  
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 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.

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 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

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- LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
- SEE SHEET 3 FOR POST SECTIONS 1 THRU 9.

**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.:

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

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

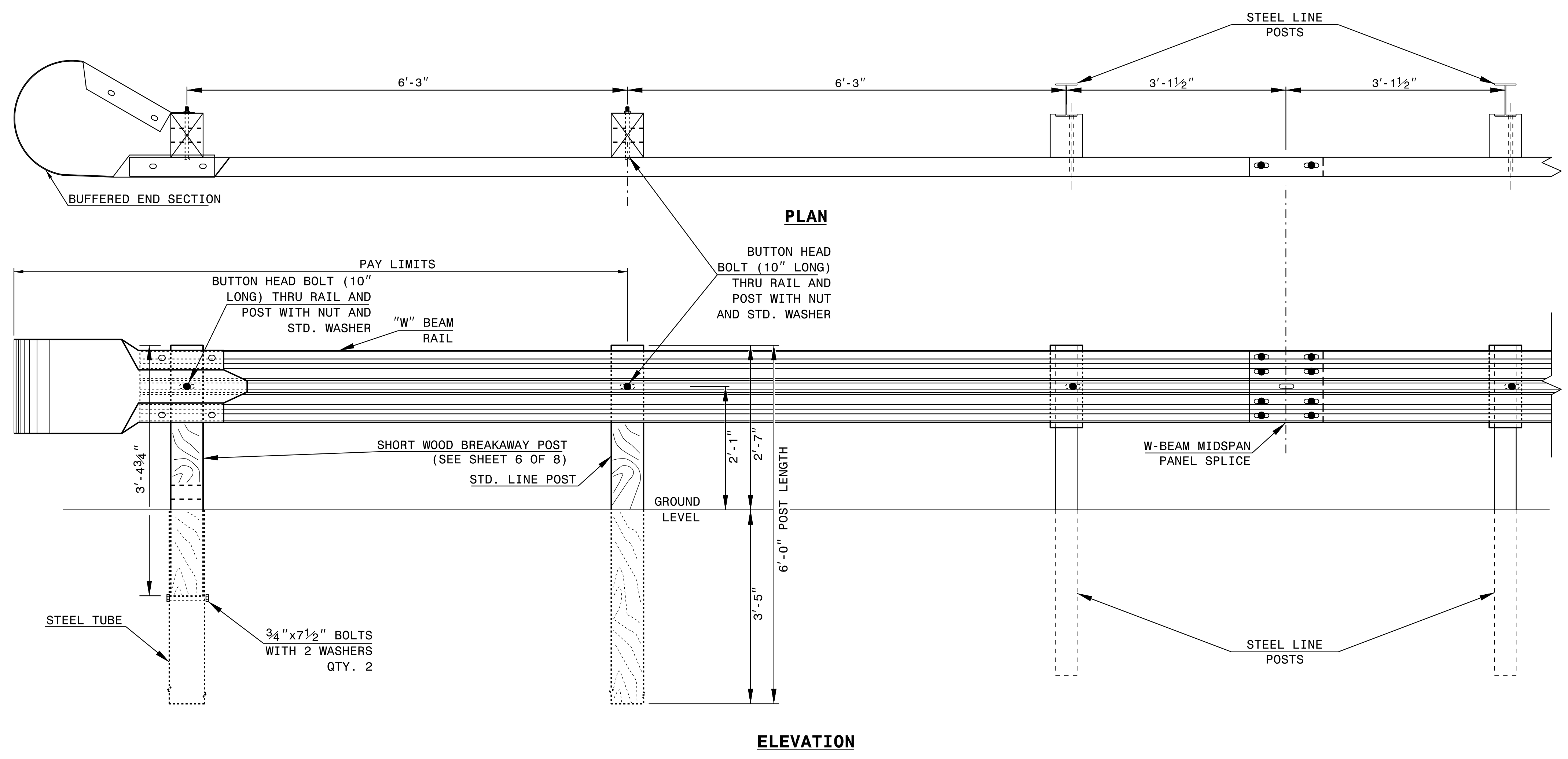
ROADWAY DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

SHEET OF

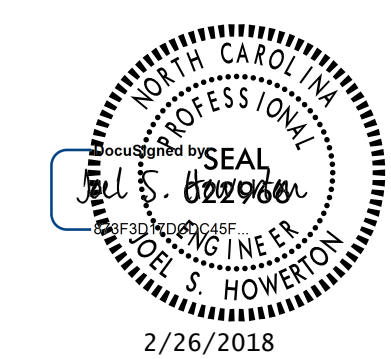
STATE OF  
NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

SHEET OF



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



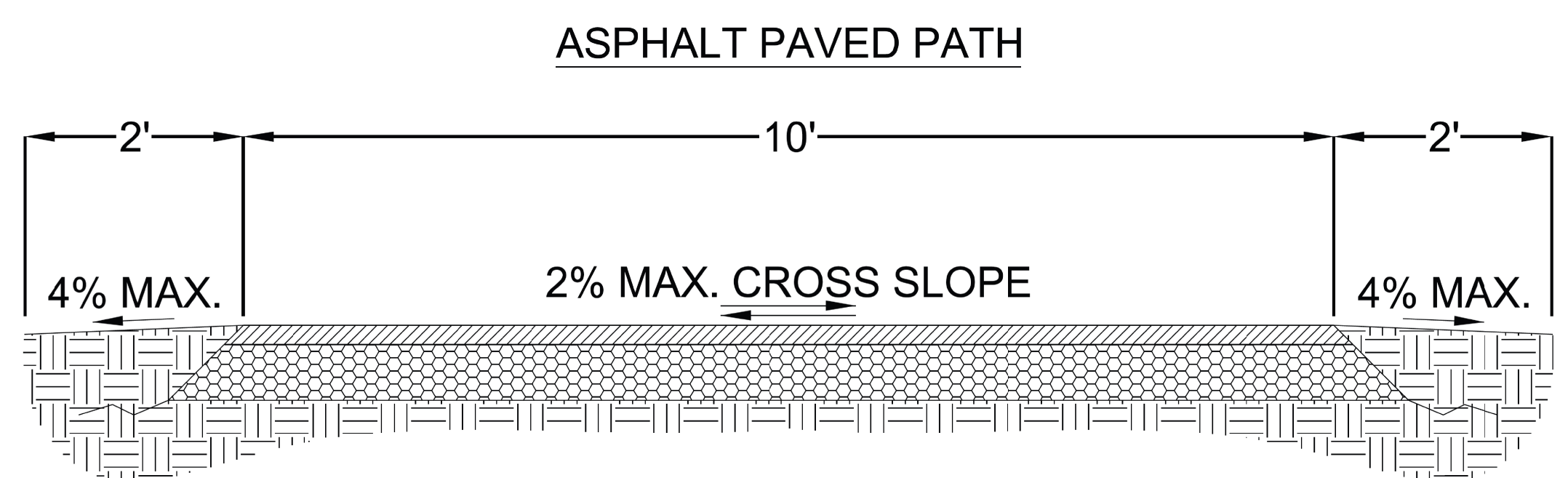
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**CONTRACTS STANDARDS  
AND DEVELOPMENT UNIT**  
Office 919-707-6950 FAX 919-250-4119

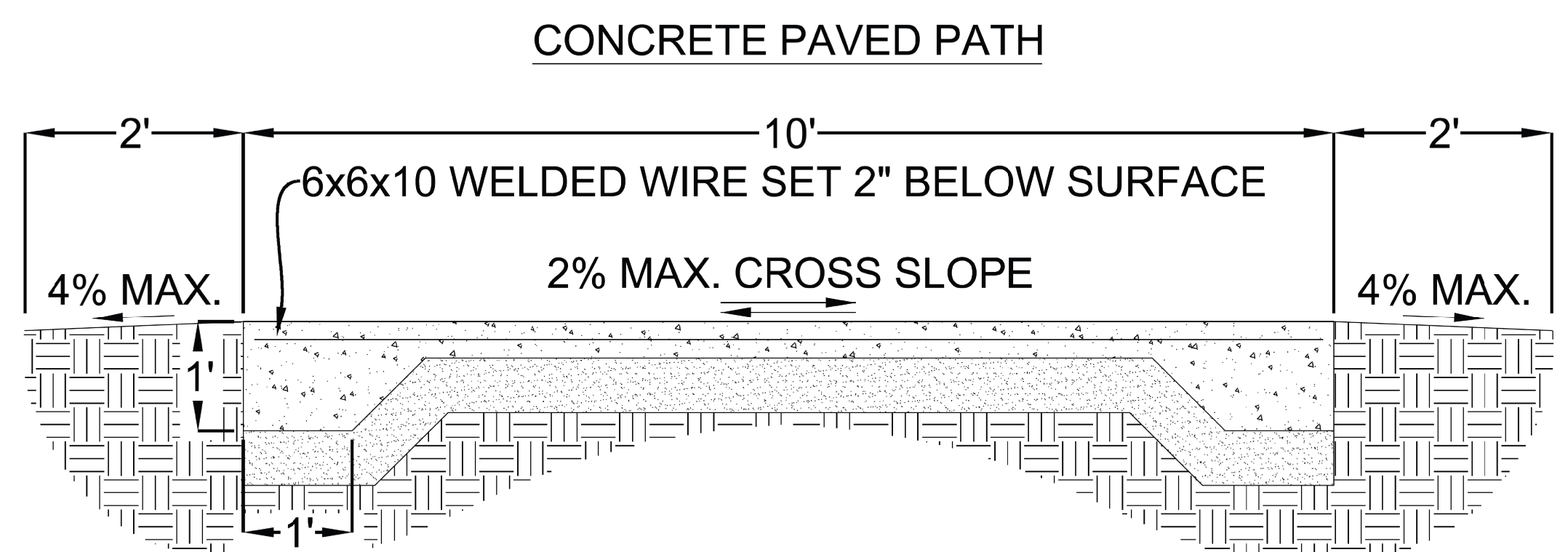
**A.T. - 1 SYSTEM**

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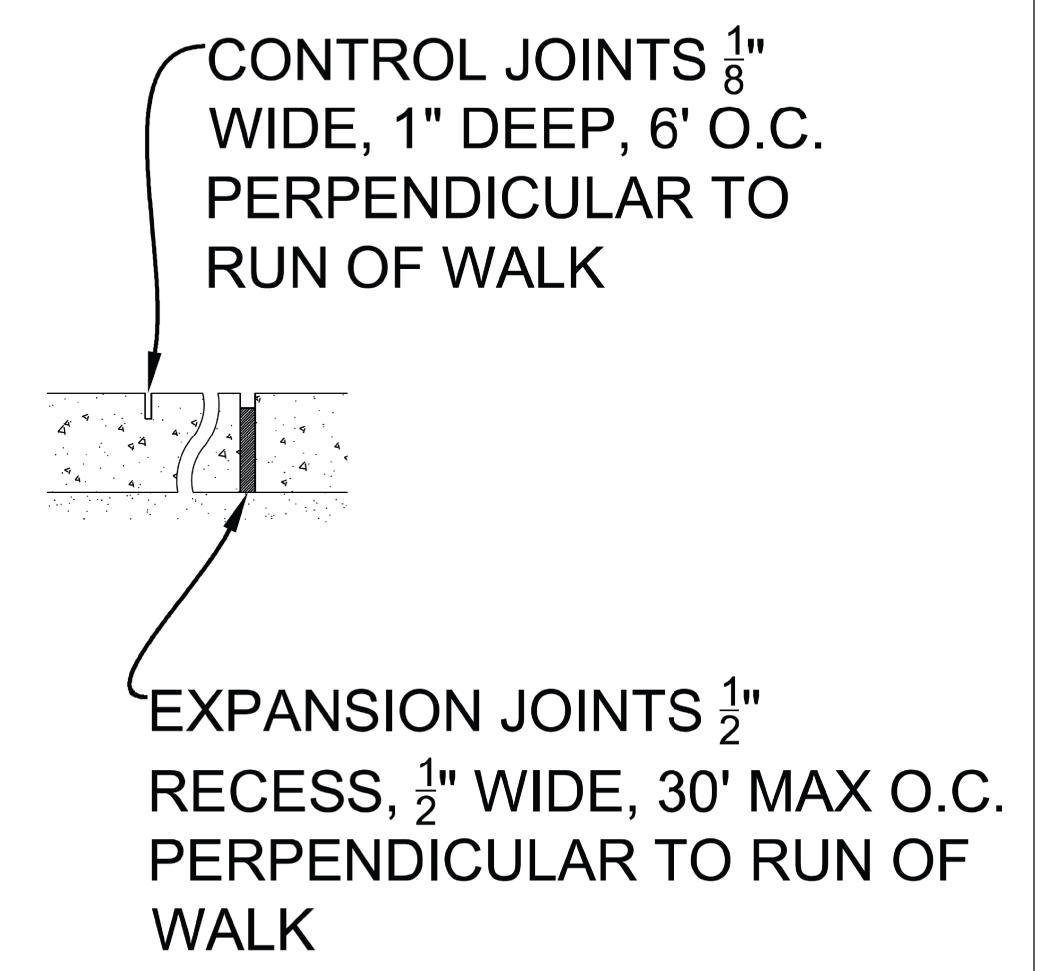
8/17/99



**PAVEMENT DESIGN:**  
 2" ASPHALT CONCRETE SURFACE COURSE  
 6" AGGREGATE BASE COURSE  
 WOVEN GEOTEXTILE FABRIC



**PAVEMENT DESIGN:**  
 4" CONCRETE  
 6" AGGREGATE BASE COURSE



**NOTES:**

1. ALL LOCATION & SIZES OF DRAIN PIPE TO BE VERIFIED AND APPROVED BY THE TOWN OF APEX CONSTRUCTION MANAGEMENT DEPARTMENT.
2. ALL DRAIN PIPE BELOW THE GREENWAY SHALL BE 15" MINIMUM DIAMETER RCP.
3. ALL LUMBER USED SHALL BE PRESSURE TREATED AND RATED FOR GROUND CONTACT.
4. SUBGRADE SHALL BE STABLE AND COMPACTED.

**TOWN OF APEX  
STANDARDS**  
 EFFECTIVE: NOVEMBER 20, 2007

**GREENWAY SECTIONS**

STD. NO.
<b>200.03</b>
SHEET 1 OF 1

3/9/2018 11:59 AM \\BSP161.LRDY\_P5H02C3.dgn

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

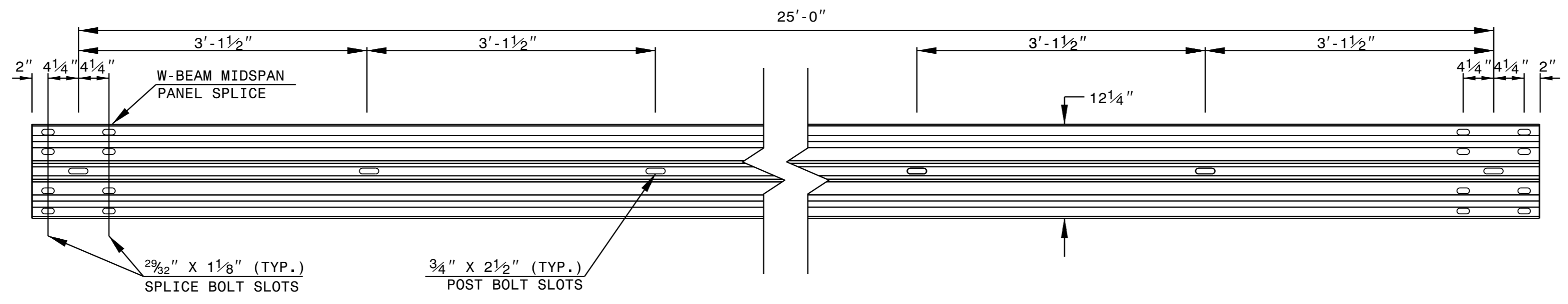
ROADWAY DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

SHEET 6 OF 8  
**862D02**

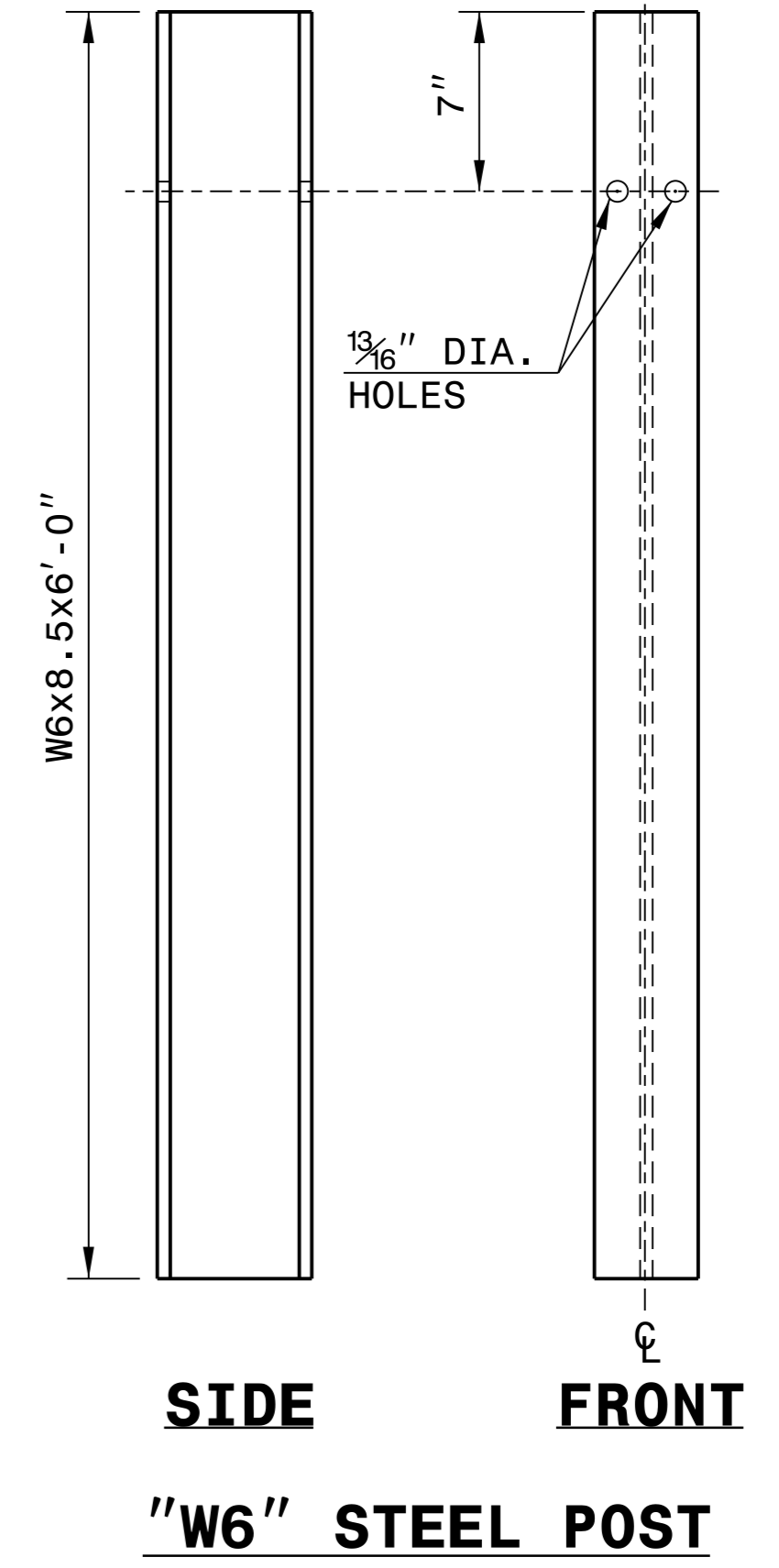
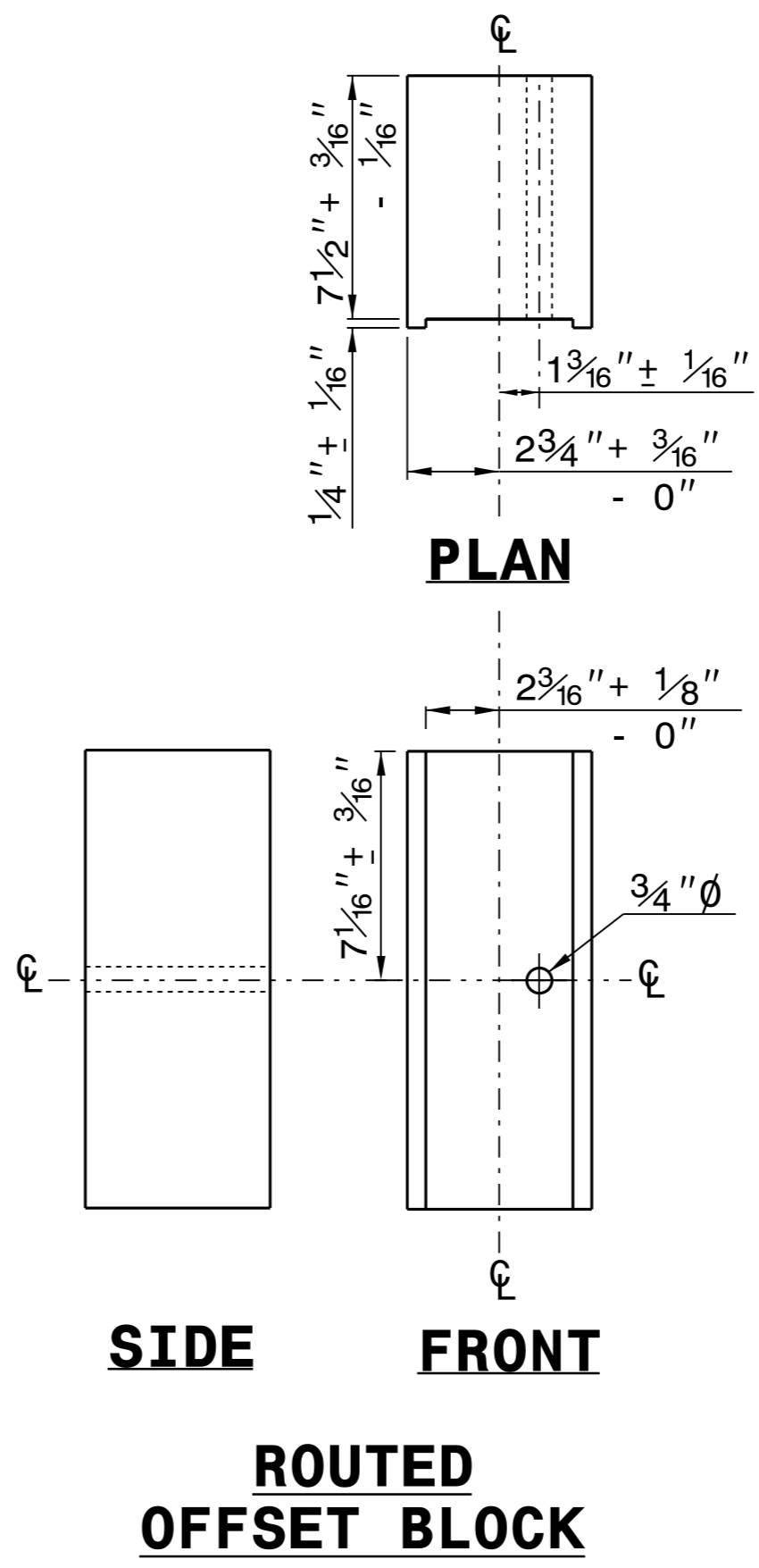
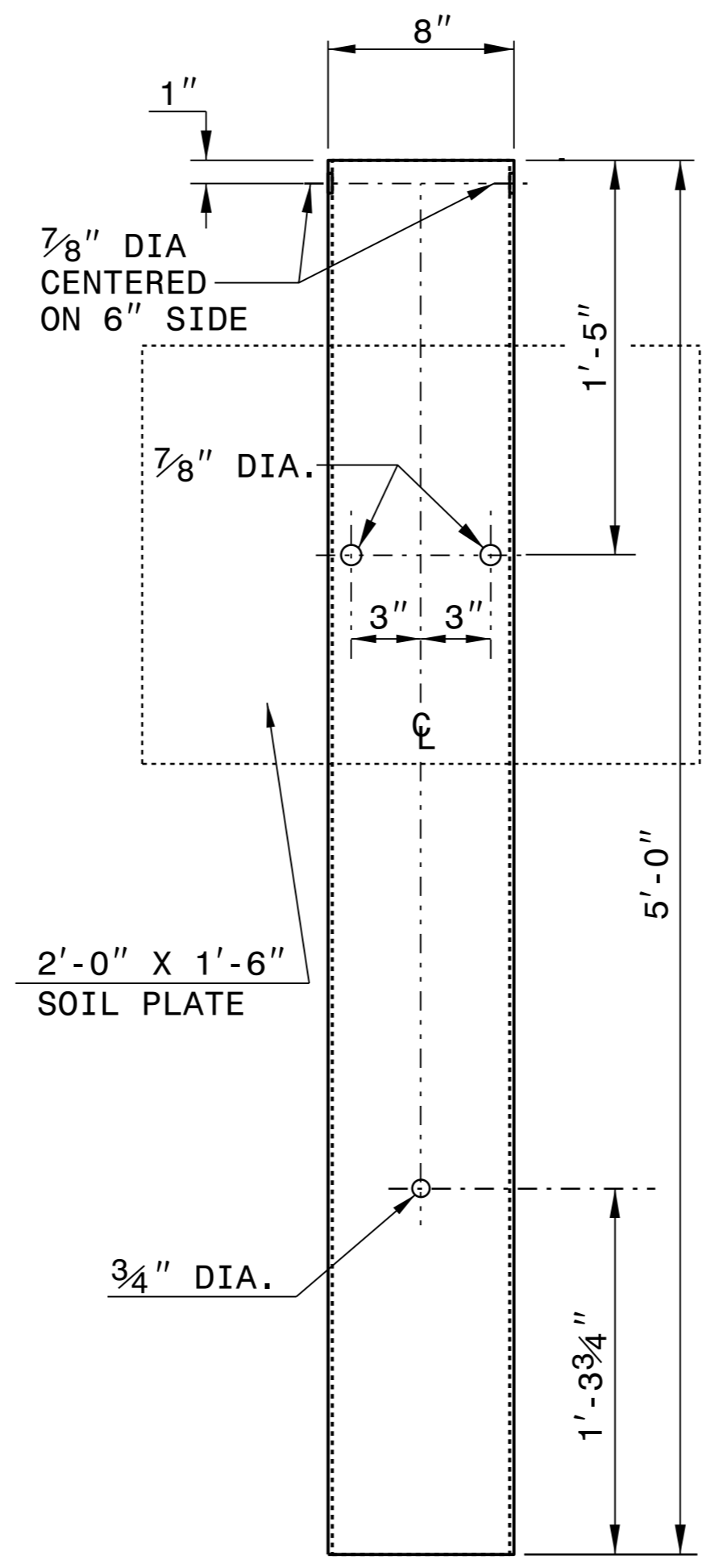
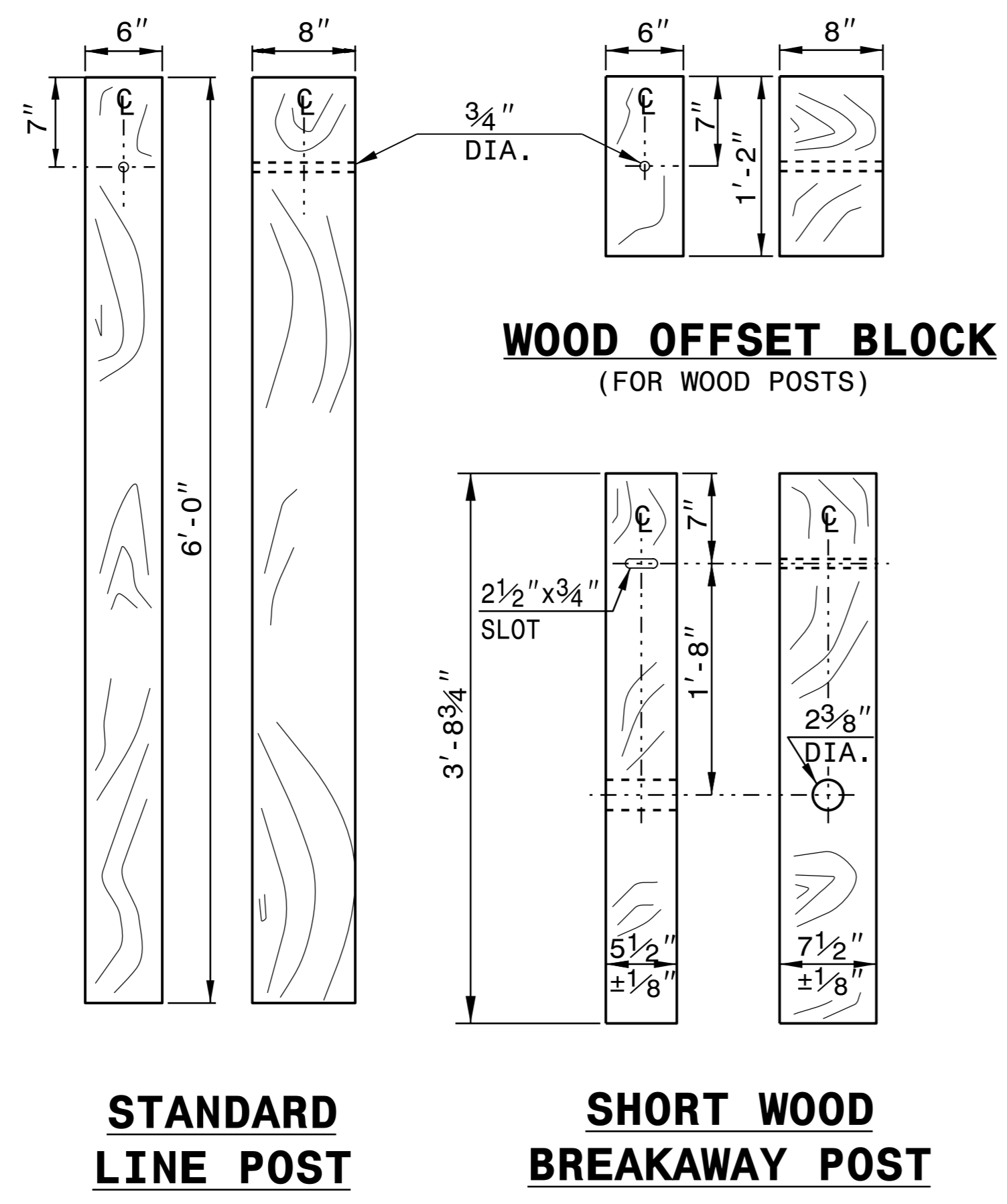
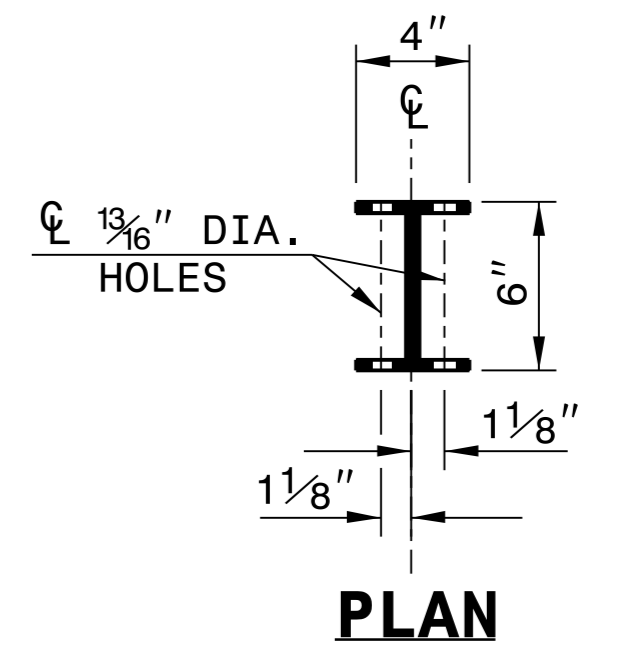
STATE OF NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

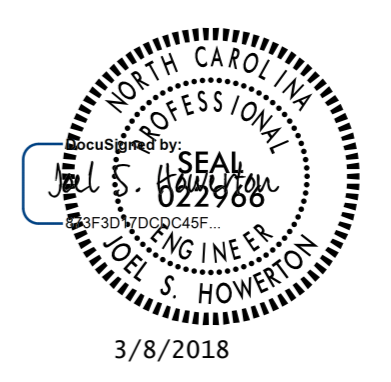
SHEET 6 OF 8  
**862D02**



**STANDARD W-BEAM GUARDRAIL**



**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.:	

### SUMMARY OF EARTHWORK

IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	EMBANK. + %	BORROW	WASTE
-L- STA. 10+50.00 TO STA. 14+32.81 (BEGIN BRIDGE)	128	2,964	2,836	0
-Y- STA. 10+17.23 TO STA. 10+90.00	11	36	25	0
SUBTOTAL	139	3,000	2,861	0
-L- STA. 15+95.19 (END BRIDGE) TO STA. 23+00.00	327	11,767	11,440	0
-DR1- STA. 10+11.15 TO STA. 11+12.00	2	433	431	0
SUBTOTAL	329	12,200	11,871	0
-GWY- STA. 10+76.43 TO STA. 11+15.00 (BEGIN BRIDGE EXCAVATION)	33			33
-GWY- STA. 11+90.00 (END BRIDGE EXCAVATION) TO STA. 12+15.94	25			25
SUBTOTAL	58			58
TOTAL	526	15,200	14,732	58
MATERIAL FOR SHOULDER CONSTRUCTION		142	142	
WASTE IN LIEU OF BORROW			-58	-58
PROJECT TOTAL	526	15,342	14,816	0
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT			740	0
GRAND TOTAL	526	15,342	15,556	0
SAY	600		15,600	0

ESTIMATED UNDERCUT EXCAVATION = 300 CY  
 ESTIMATED SELECT GRANULAR MATERIAL = 300 CY  
 ESTIMATED GEOTEXTILE FOR SOIL STABILIZATION = 300 SY  
 ESTIMATED DDE = 130 CY

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

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

### SUMMARY OF PAVEMENT REMOVAL

IN SQUARE YARDS

LOCATION	ASPHALT REMOVAL	ASHPALT BREAK UP	CONCRETE REMOVAL	CONCRETE BREAK UP
-L- STA. 11+80 TO 12+60	211			
-L- STA. 12+60 TO 14+34(BEG BRIDGE)		413		
-L- STA. 15+94(END BRIDGE) TO 21+10		1,178		
-L- STA. 21+10 TO 21+55	103			
TOTAL	314	1,591		
SAY	320	1,600		

REVISIONS

\*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	XI	GREU TL-2	M-350	XIII	CAT-1	VI MOD	TYPE III	AT-1	EA	G					NG					
																															EA	G	NG		
-L-	12+89.06	14+32.81 (BR)	RT	143.75'					12'	14'	100'		3.25'																						
-L-	13+51.56	14+32.81 (BR)	LT	81.25'					7'	10'		37.5'		1.3'																					
-L-	15+95.19 (BR)	19+26.44	RT	331.25'					12'	14'	100'		6.5'																						
-L-	15+95.19 (BR)	17+23.55	LT	118.75'	37.50'				7'	10'		100'		2'																					
			SUBTOTAL	675'																															
			DEDUCTIONS																																
			GREU 350 @ 25'X3	-75'																															
			TYPE III @ 18.75'X4	-75'																															
			TYPE AT-1 @ 6.25'X1		-6.25'																														
			TOTAL	525'	31.25'																														
			SAY	550'	37.50'																														
				ADDITIONAL GUARDRAIL POSTS = 5																															

2/26/2018 11:17:40 AM N:\proj\B5161\_R0Y\_SUM.dgn



PROJECT REFERENCE NO. <b>B-5161</b>	SHEET NO. <b>4</b>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
3/21/2018	

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

HDR Engineering, Inc. of the Carolinas  
555 Fayetteville St. Suite 900 Raleigh, N.C. 27601  
N.C.B.E.L.S. License Number: F-0116

**-L-**

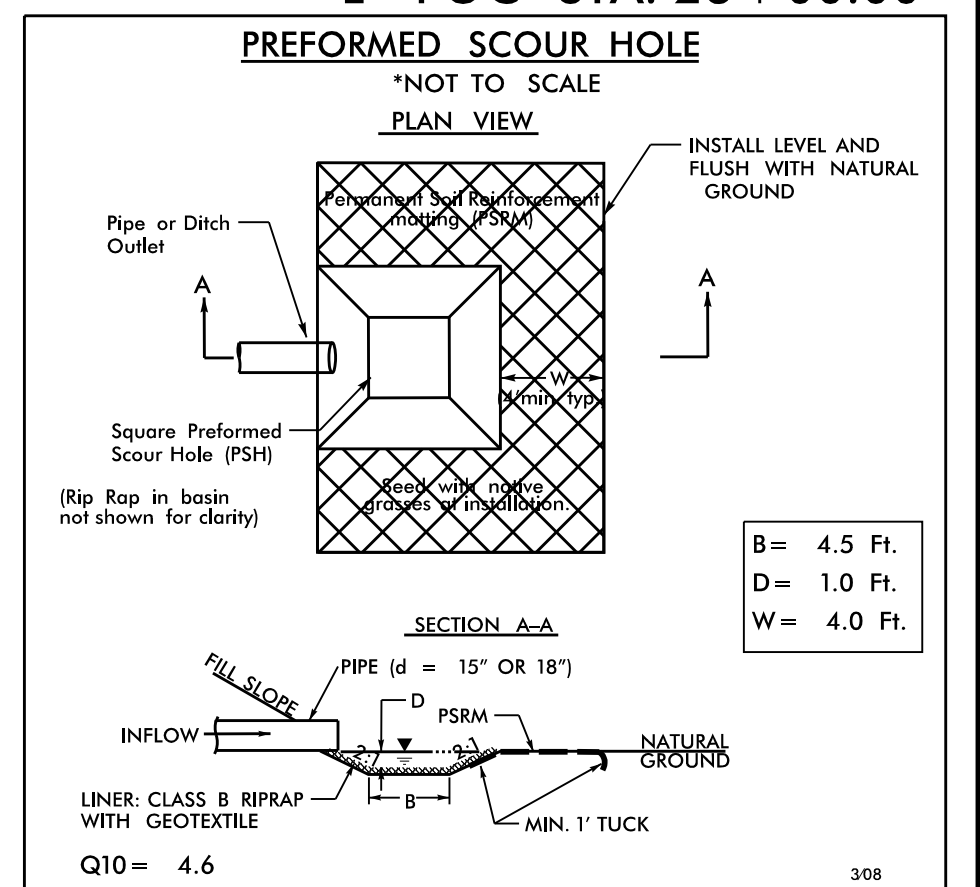
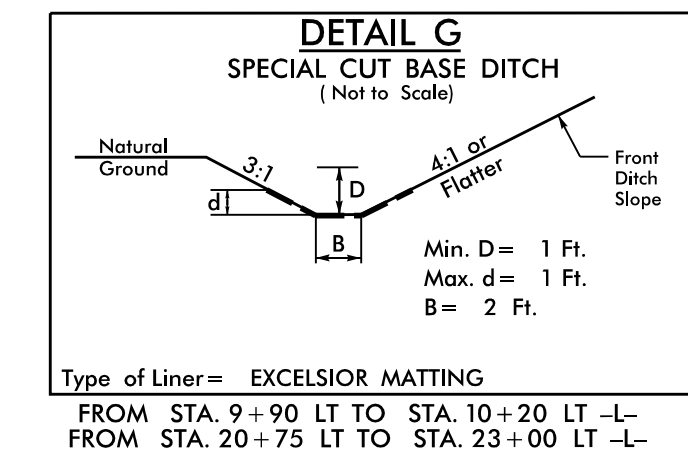
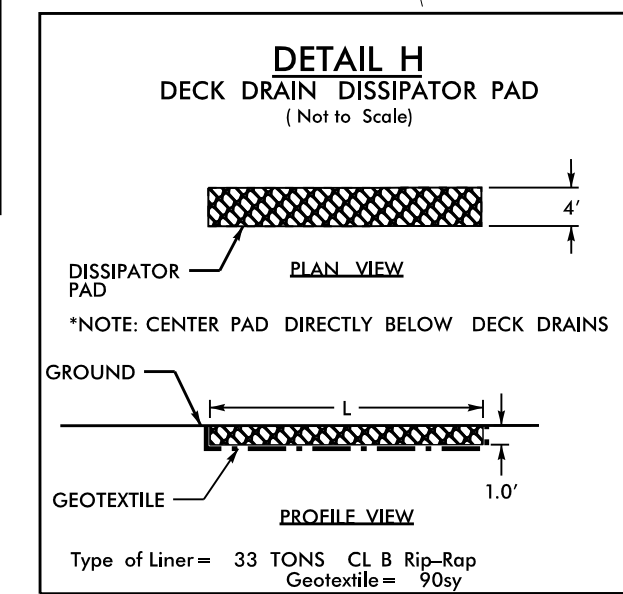
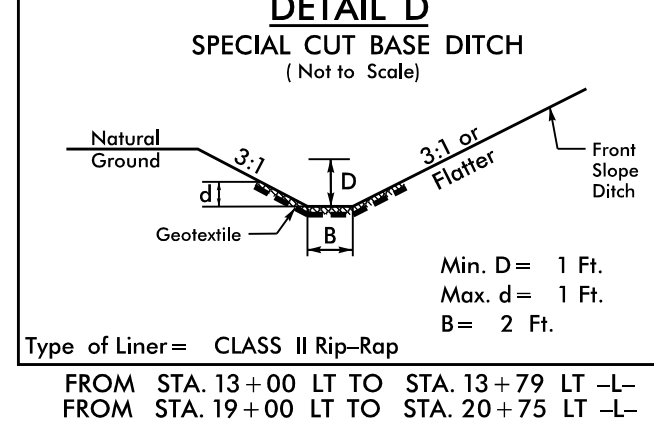
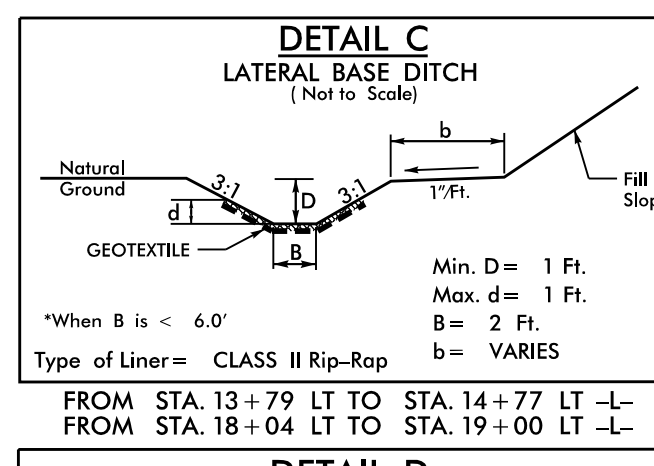
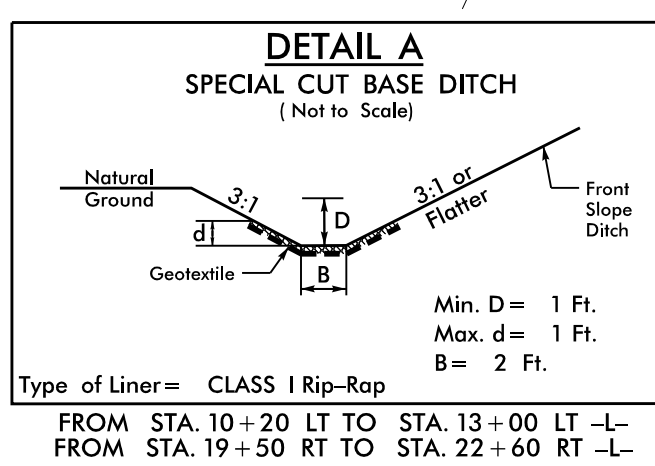
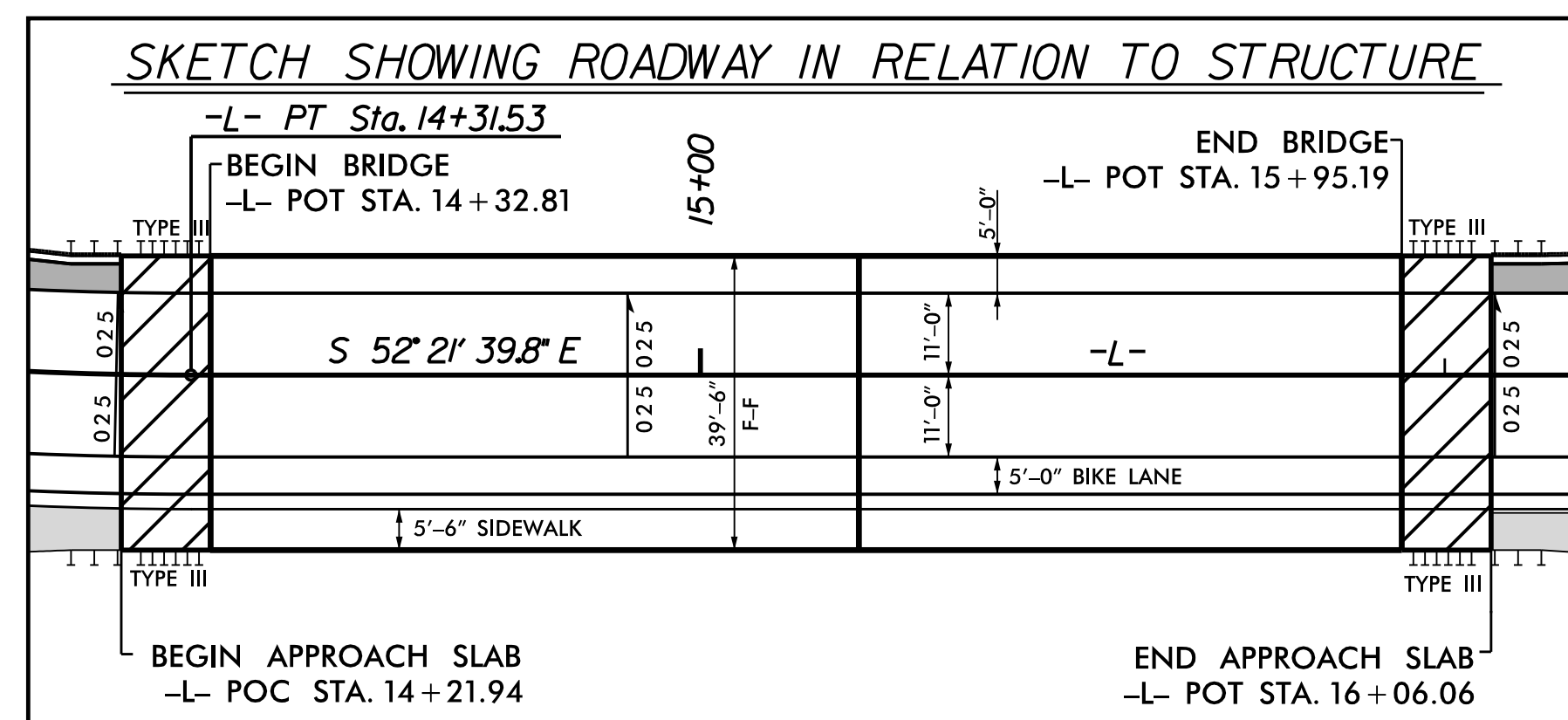
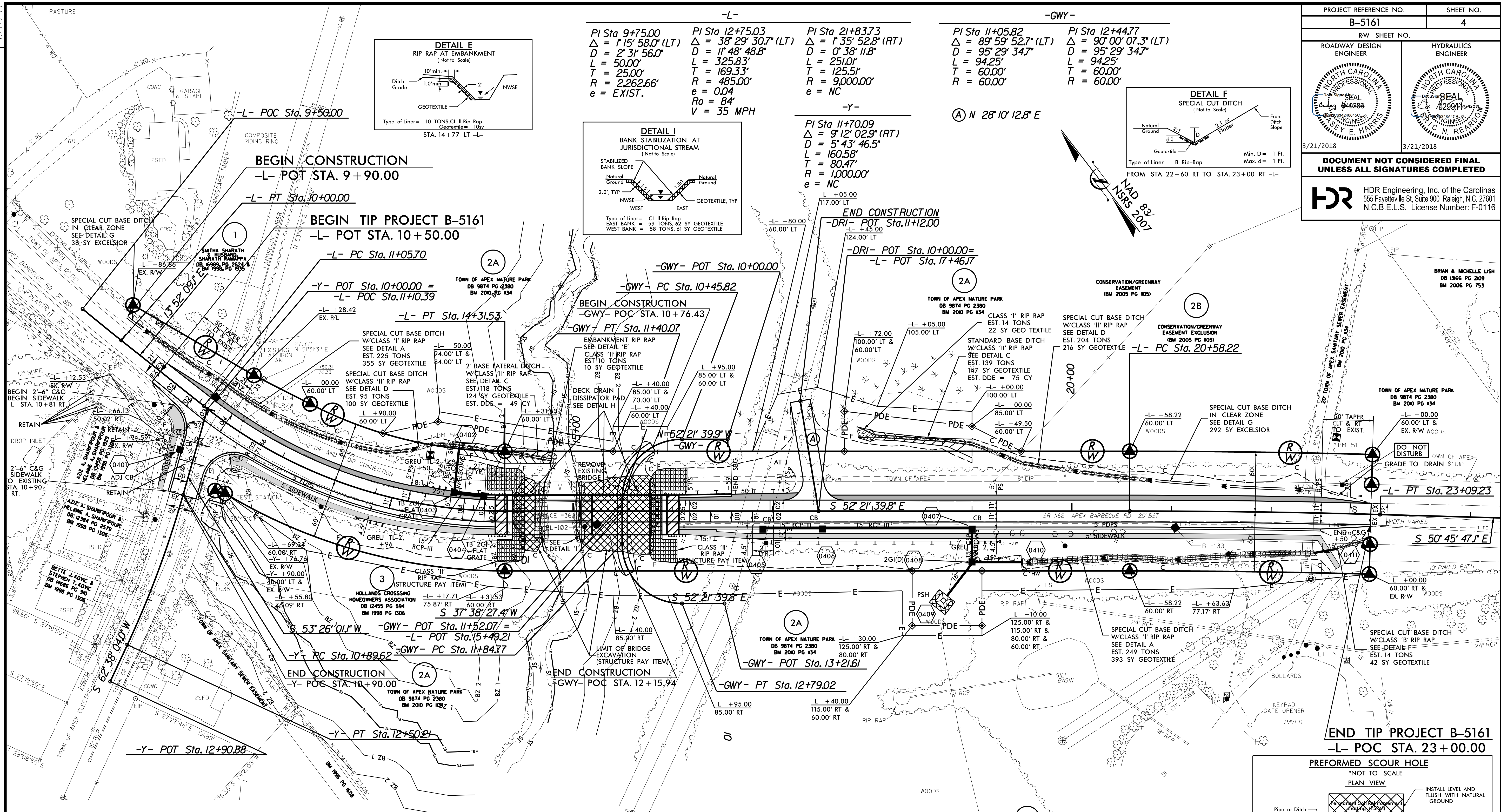
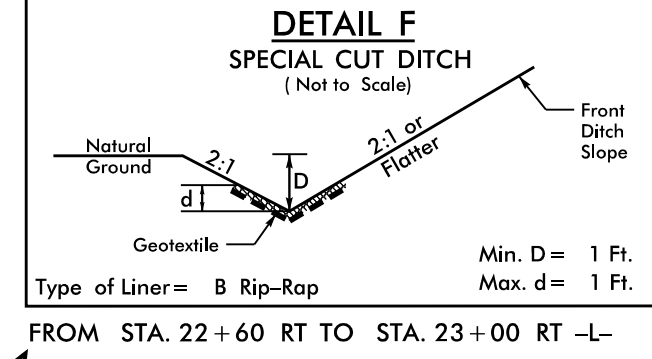
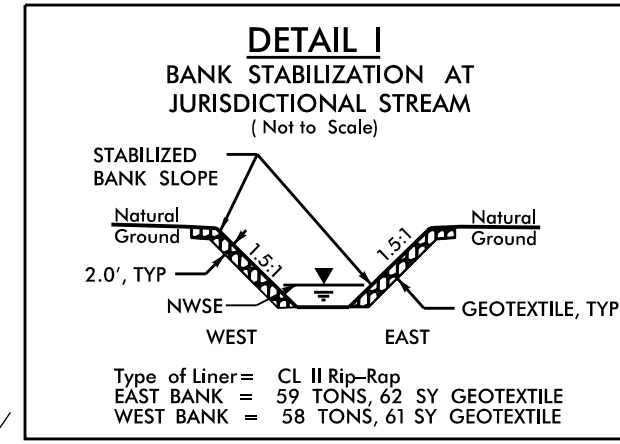
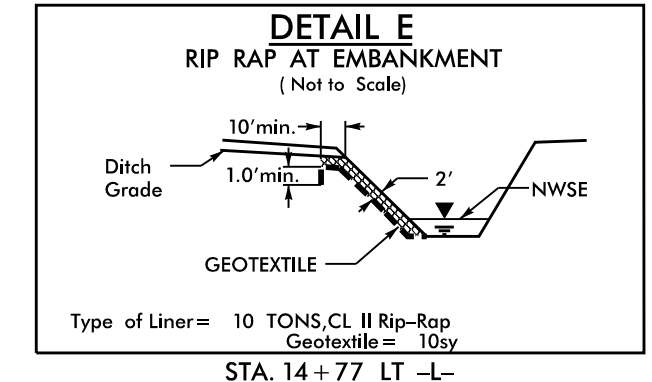
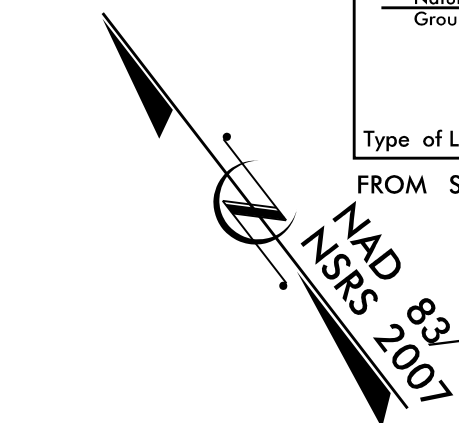
PI Sta 9+75.00 Δ = 1'15" 58.0" (LT) D = 2'31" 56.0" L = 50.00' T = 25.00' R = 2,262.66' e = EXIST.	PI Sta 12+75.03 Δ = 38'29" 30.7" (LT) D = 1'48" 48.8" L = 325.83' T = 169.33' R = 485.00' e = 0.04 Ro = 84' V = 35 MPH	PI Sta 21+83.73 Δ = 1'35" 52.8" (RT) D = 0'38" 11.8" L = 251.0' T = 125.5' R = 9,000.00' e = NC	PI Sta 11+05.82 Δ = 89'59" 52.7" (LT) D = 95'29" 34.7" L = 94.25' T = 60.00' R = 60.00'	PI Sta 12+44.77 Δ = 90'00" 07.3" (LT) D = 95'29" 34.7" L = 94.25' T = 60.00' R = 60.00'
--	--	---	--	--

**-Y-**

PI Sta 11+70.09  
Δ = 9'12" 02.9" (RT)  
D = 5'43" 46.5"  
L = 160.58'  
T = 80.47'  
R = 1,000.00'  
e = NC

**-GWY-**

Ⓐ N 28°10' 12.8" E



2' MINIMUM PLANTER WIDTH BETWEEN BACK OF CURB AND SIDEWALK  
-Y- TURNOUT RADII = 32'  
SEE SHEET NO. 5 FOR -L-, -Y-, -DRI- AND -GWY- PROFILES  
SEE SHEETS S-1 THROUGH S-27 FOR STRUCTURE SHEETS

REVISIONS

3/21/2018  
2:02:50 PM  
N:\Projects\B5161\RDY\_PSH04



DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

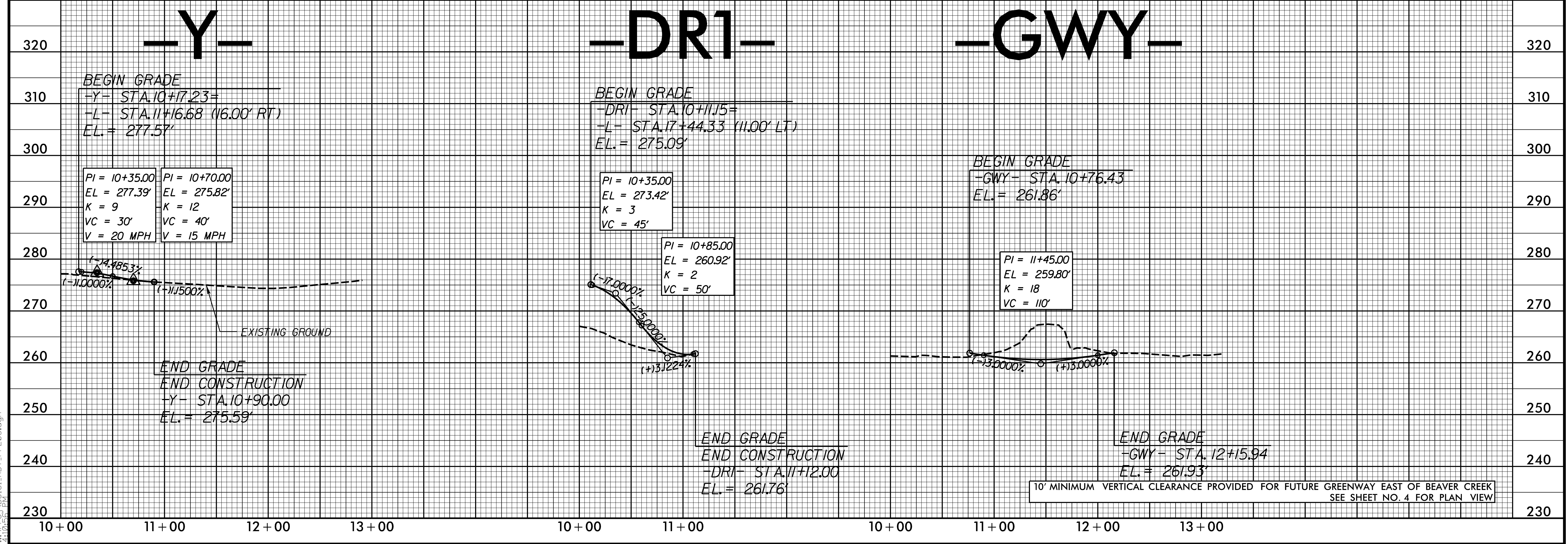
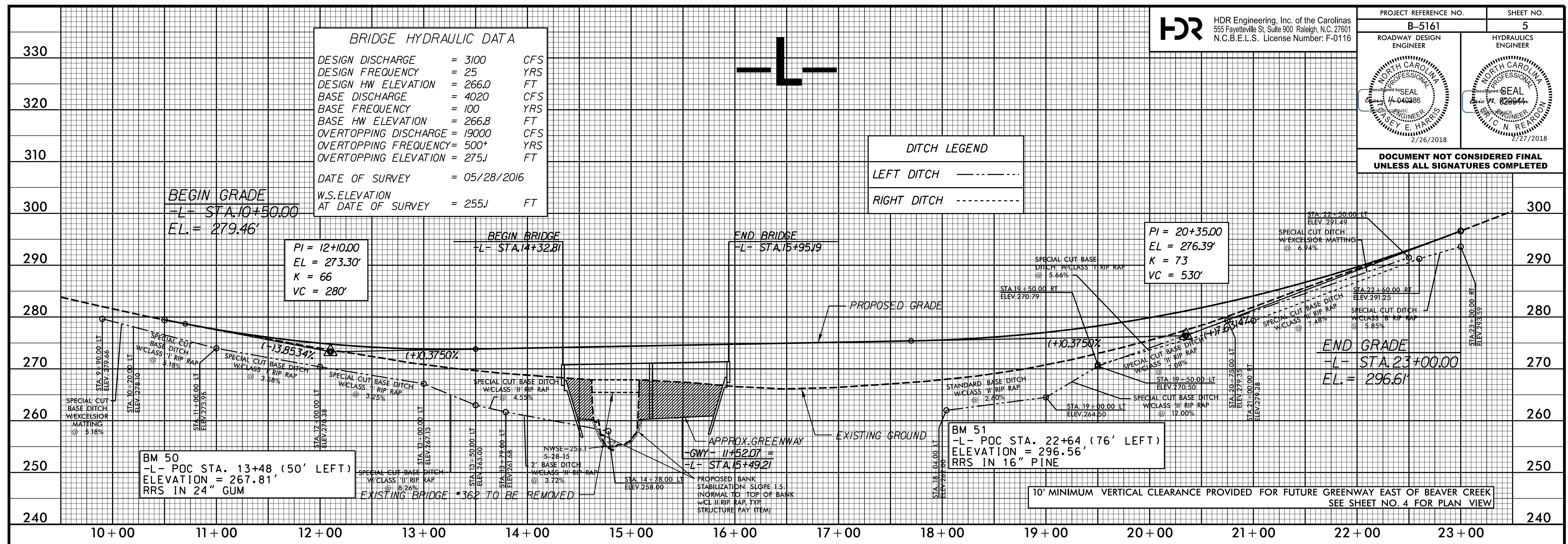
**BRIDGE HYDRAULIC DATA**

DESIGN DISCHARGE	= 3100	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 266.0	FT
BASE DISCHARGE	= 4020	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 266.8	FT
OVERTOPPING DISCHARGE	= 19000	CFS
OVERTOPPING FREQUENCY	= 500*	YRS
OVERTOPPING ELEVATION	= 275.1	FT
DATE OF SURVEY	= 05/28/2016	
W.S. ELEVATION AT DATE OF SURVEY	= 255.1	FT

**DITCH LEGEND**

LEFT DITCH - - - - -

RIGHT DITCH - - - - -



2/20/2018 10:51:16 AM RDY\_PFL05.dgn

95/88/56

TIP PROJECT: B-5161

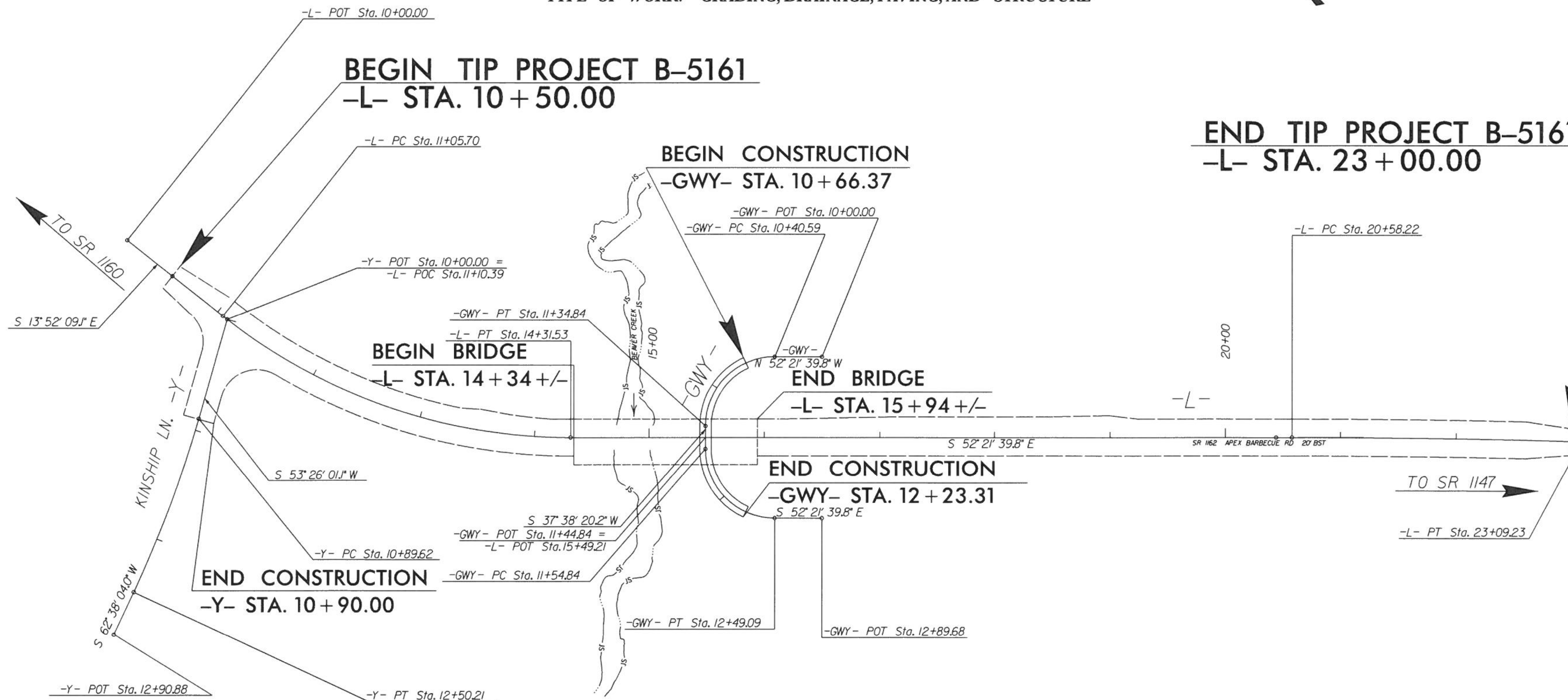
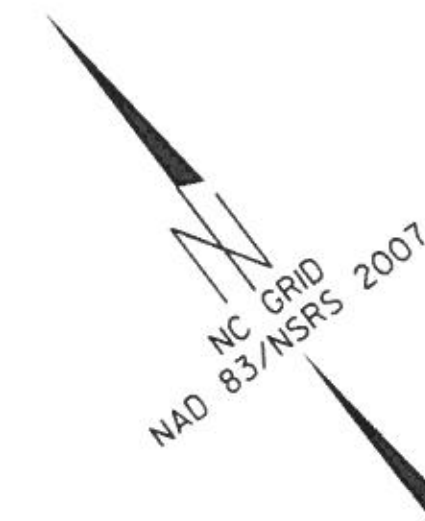
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

RIGHT OF WAY, EASEMENTS  
AND PROPERTY TIES

WAKE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5161	RW-1	

LOCATION: BRIDGE NO. 362 OVER BEAVER CREEK ON SR 1162  
TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURE



GRAPHIC SCALES



LENGTH ROADWAY TIP PROJECT B-5161 = 0.207 MILES  
 LENGTH STRUCTURES TIP PROJECT B-5161 = 0.030 MILES  
 TOTAL LENGTH TIP PROJECT B-5161 = 0.237 MILES

Prepared in the Office of SEPI Engineering for  
DIVISION OF HIGHWAYS

1000 Birch Ridge Dr., Raleigh NC, 27610

2017 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:  
OCTOBER 16, 2017

LETTING DATE:  
MAY 15, 2018

DAVID STUTTS, P.E.  
NCDOT CONTACT

PROFESSIONAL LAND  
SURVEYOR

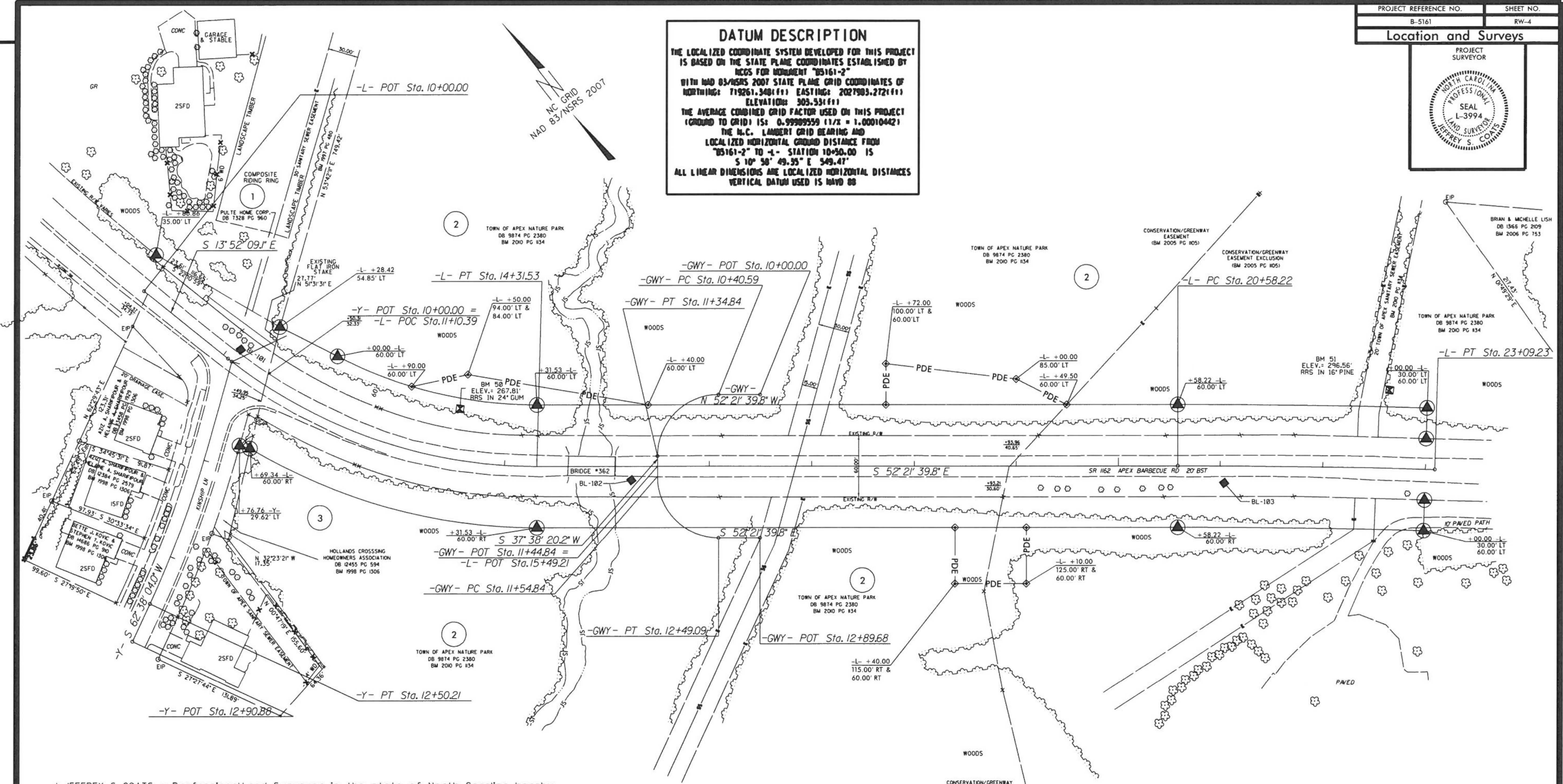
*Jeffrey S. Coats*  
SIGNATURE





**DATUM DESCRIPTION**  
 THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCCS FOR MONUMENT "05161-2" WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 719261.348(11) EASTING: 2027903.272(11) ELEVATION: 305.53(11)  
 THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99999559 (1/X = 1.00010442)  
 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "05161-2" TO -L- STATION 10+50.00 IS S 10° 50' 49.35" E 549.47'  
 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES  
 VERTICAL DATUM USED IS NAVD 88

REVISIONS



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 February, 2018.

*Jeffrey S. Coats*  
 Professional Land Surveyor L-3994  
 PLS #



-L-	-Y-	-GWY-
PI Sta 12+75.03 Δ = 38° 29' 30.7" (LT) D = 11' 48" 48.8" L = 325.83' T = 169.33' R = 485.00' e = 0.04 Ro = 84' V = 35 MPH	PI Sta 21+83.73 Δ = 1° 35' 52.8" (RT) D = 0' 38" 11.8" L = 251.01' T = 125.51' R = 9,000.00' e = NC	PI Sta 11+70.09 Δ = 9° 12' 02.9" (RT) D = 5' 43' 46.5" L = 160.58' T = 80.47' R = 1,000.00' e = NC
		PI Sta 12+14.84 Δ = 90° 00' 00.0" (LT) D = 95' 29' 34.7" L = 94.25' T = 60.00' R = 60.00'
		PI Sta 11+00.59 Δ = 90° 00' 00.0" (LT) D = 95' 29' 34.7" L = 94.25' T = 60.00' R = 60.00'

**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.