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STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5351	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
46065.1.1	BRNHS-0029(55)	PE	
46065.2.1		ROW,UTIL	
46065.3.1		CONST	

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

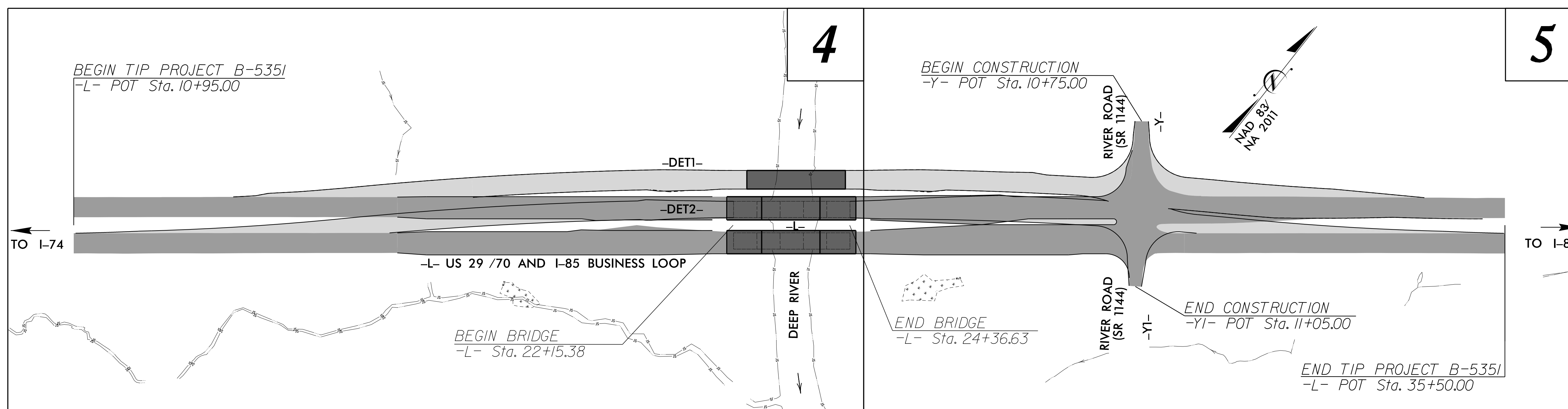
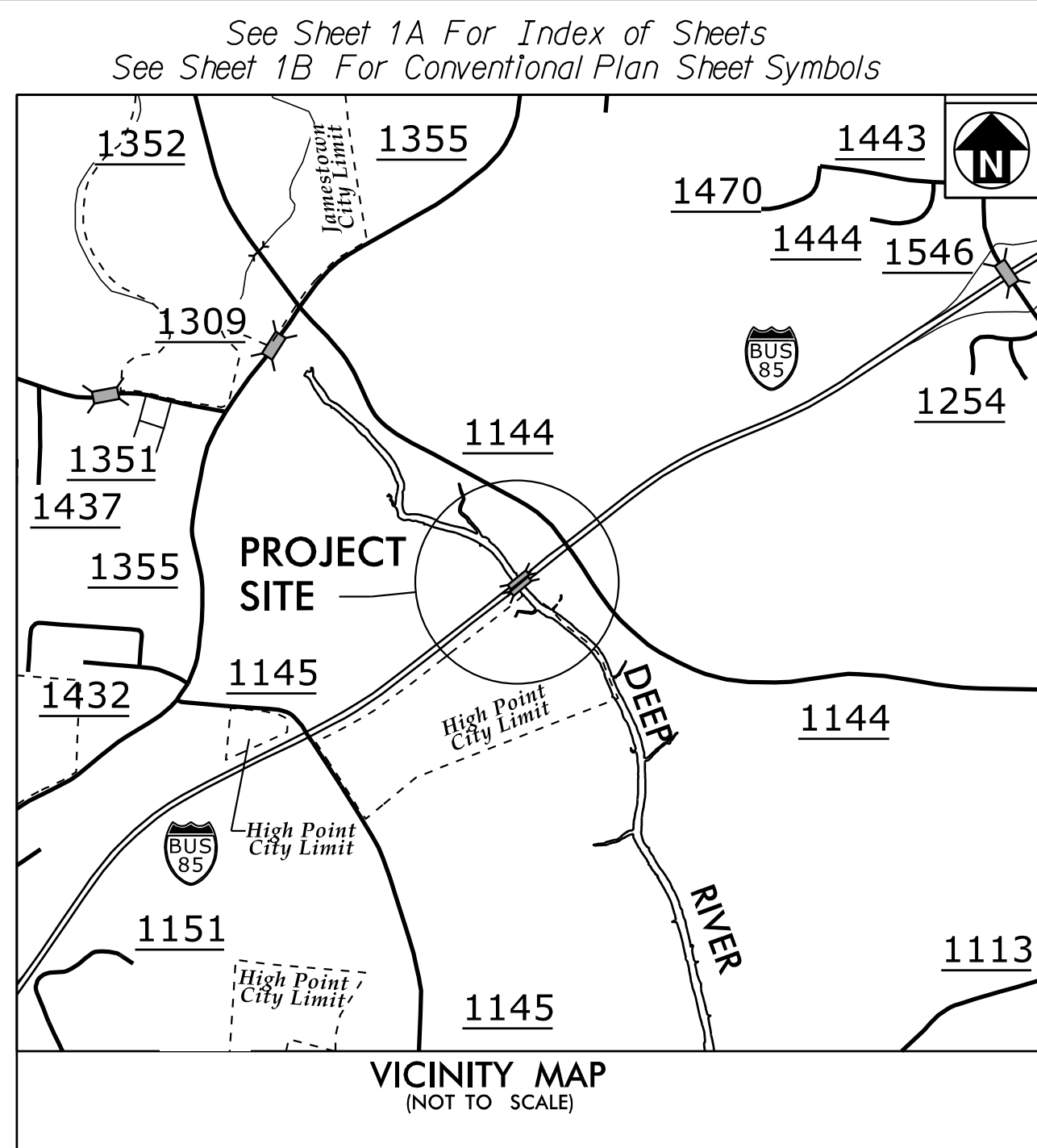
# GUILFORD COUNTY

**LOCATION: REPLACE BRIDGE NO. 242 AND BRIDGE NO. 237 OVER DEEP RIVER  
IN HIGH POINT ON US 29 /70 /I-85 BUSINESS**

**TYPE OF WORK: GRADING, PAVING, DRAINAGE, SIGNALS AND STRUCTURES**

**TIP PROJECT: B-5351**

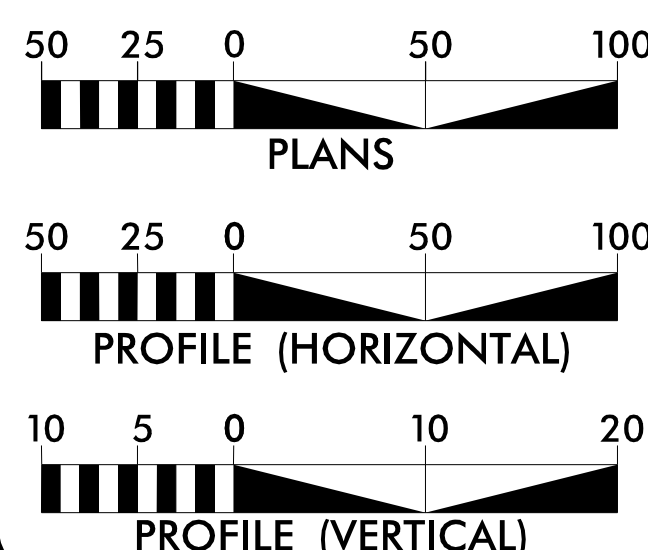
**CONTRACT: C204100**



THIS IS A PARTIAL CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON PLANS.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

**GRAPHIC SCALES**



**DESIGN DATA**

ADT 2018 = 34,500  
ADT 2038 = 42,900  
K = 10 %  
D = 55 %  
T = 8 % \*  
V = 60 MPH  
\* (TTST = 3% + DUAL 5%)  
FUNC CLASS = MAJOR ARTERIAL REGIONAL TIER

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT B-5351 = 0.423 MILES  
LENGTH STRUCTURE TIP PROJECT B-5351 = 0.042 MILES  
TOTAL LENGTH OF TIP PROJECT B-5351 = 0.465 MILES

PLANS PREPARED FOR THE NCDOT BY:

**M** MOTT MACDONALD  
PO Box 700  
Fayetteville, NC 27526  
(919) 552-2253  
(919) 552-2254 (Fax)  
www.mottmac.com/americas  
LICENSE NO. F-0669

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

2018 STANDARD SPECIFICATIONS

**RIGHT OF WAY DATE:**  
OCTOBER 20, 2017

**LETTING DATE:**  
JUNE 19, 2018

**DAVID C. WALLER, PE**  
PROJECT ENGINEER  
PEF ENGINEER

**JORDAN WOODARD, PE**  
PROJECT DESIGN ENGINEER  
PEF ENGINEER

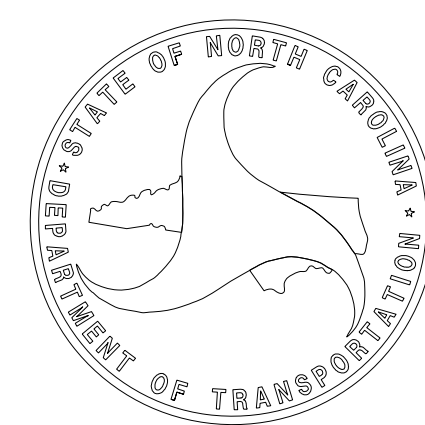
**DAVID STUTTS, PE**  
NCDOT CONTACT

**HYDRAULICS ENGINEER**

*(Signature)*  
DocuSign Envelope ID: 7A073A3A-2018 8:15:56 AM EDT  
P.E.


**ROADWAY DESIGN ENGINEER**

*(Signature)*  
DocuSign Envelope ID: 7A073A3A-2018 4:17:19 PM EDT  
P.E.





8/17/19

PROJECT REFERENCE NO. <i>B-5351</i>	SHEET NO. <i>1A</i>
ROADWAY DESIGN ENGINEER 	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES AND LIST OF STANDARDS
1B	CONVENTIONAL SYMBOLS
1C-1	SURVEY CONTROL SHEETS
2A-1 THRU 2A-3	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2B-1 THRU 2B-4	DETAIL OF TEMPORARY DETOURS
2C-1	GUARDRAIL STRUCTURE ANCHOR DETAIL
2C-2	COAL COMBUSTION PRODUCT PLACEMENT DETAIL
2C-3	GUARDRAIL INSTALLATION DETAIL
2C-4	DETAIL OF TEMPORARY STEEL COVER OVER DRAINAGE STRUCTURE
2G-1	TEMPORARY SHORING DETAIL
3B-1	ROADWAY SUMMARIES
3D-1 THRU 3D-2	DRAINAGE SUMMARIES
3G-1	GEOTECHNICAL SUMMARIES
3P-1	PARCEL INDEX SHEET
4 THRU 5	PLANS SHEETS
6 THRU 9	PROFILE SHEETS
TMP-1 THRU TMP-11	TRANSPORTATION MANAGEMENT PLANS
PMP-1 THRU PMP-3	PAVEMENT MARKING PLANS
EC-1 THRU EC-15	EROSION CONTROL PLANS
RF-1	REFORESTATION PLAN
SIGN-1 THRU SIGN-7	SIGNING PLANS
SIG-1 THRU SIG-MB	SIGNAL PLANS
UD-1 THRU UD-3	UTILITIES BY OTHERS PLANS
X-1A THRU X-1B	CROSS SECTION SUMMARY SHEET
X-1 THRU X-68	CROSS SECTIONS
S-1 THRU S-35	STRUCTURE PLANS

**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 II.

**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.

**SUBSURFACE DRAINS:**

SUBSURFACE DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.02 AT LOCATIONS DIRECTED BY THE ENGINEER.

**GUARDRAIL:**

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

**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 AND NORTH STATE COMMUNICATIONS

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

EFF. 01-16-2018  
REV.

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, 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>	
200.02	Method of Clearing - Method II
225.01	Guide for Grading Subgrade - Interstate and Freeway
225.02	Guide for Grading Subgrade - Secondary and Local
225.05	Method of Obtaining Superelevation - Divided Highways
225.06	Method of Grading Sight Distance at Intersections
<b>DIVISION 3 - PIPE CULVERTS</b>	
300.01	Method of Pipe Installation
<b>DIVISION 4 - MAJOR STRUCTURES</b>	
422.01	Bridge Approach Fills - Type I Standard Approach Fill
422.03	Reinforced Bridge Approach Fills - Type A Alternate Approach Fill for Integral Abutment
<b>DIVISION 5 - SUBGRADE, BASES AND SHOULDERS</b>	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
560.02	Method of Shoulder Construction - High Side of Superelevated Curve - Method II
<b>DIVISION 6 - ASPHALT BASES AND PAVEMENTS</b>	
654.01	Pavement Repairs
665.01	Asphalt Shoulders - Milled Rumble Strips
<b>DIVISION 8 - INCIDENTALS</b>	
815.02	Subsurface Drain
816.01	Concrete Pads - for Shoulder Drain Installation
840.00	Concrete Base Pad for Drainage Structures
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.19	Concrete Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.20	Frames and Wide Slot Flat Grates
840.22	Frames and Wide Slot Sag Grates
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.28	Brick Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.34	Traffic Bearing Junction Box - for Use with Pipes 42" and Under
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
840.52	Precast Manhole - 4', 5' and 6' Diameter
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
840.71	Concrete and Brick Pipe Plug
840.72	Pipe Collar
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 (Special Detail for Type III Anchor Units Sheets 1 of 7 and 2 of 7)
866.02	Woven Wire Fence - with Wood Post
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

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# 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	○
Computed 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	RLB
Proposed Wetland Boundary	RLB
Existing Endangered Animal Boundary	EAB
Existing Endangered Plant Boundary	EPB
Existing Historic Property Boundary	HFB
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	○
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	-----

Note: Not to Scale

\*S.U.E. = Subsurface Utility Engineering

## RIGHT OF WAY & PROJECT CONTROL:

Secondary Horiz and Vert Control Point	○
Primary Horiz Control Point	○
Primary Horiz and Vert Control Point	○
Exist Permanent 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	-----
New Right of Way Line with Pin and Cap	○
New Right of Way Line with Concrete or Granite RW Marker	△
New Control of Access Line with Concrete C/A Marker	○
Existing Control of Access	○
New Control of Access	○
Existing Easement Line	-----
New Temporary Construction Easement	-----
New Temporary Drainage Easement	-----
New Permanent Drainage Easement	-----
New Permanent Drainage / Utility Easement	-----
New Permanent Utility Easement	-----
New Temporary Utility Easement	-----
New Aerial Utility Easement	-----

## ROADS AND RELATED FEATURES:

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

## VEGETATION:

Single Tree	○
Single Shrub	○

Hedge	-----
Woods Line	-----
Orchard	-----
Vineyard	-----

## 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.*)	-----

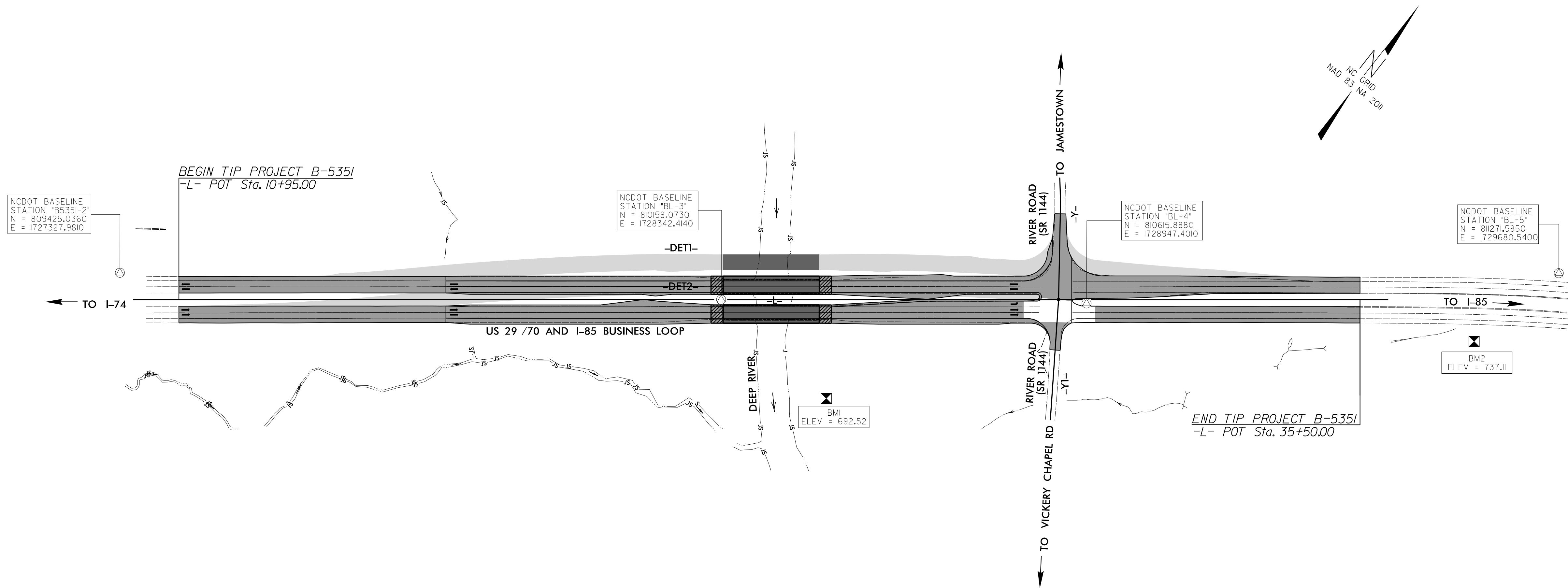
## MISCELLANEOUS:

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	AATUR
End of Information	E.O.I.

12/01/2005

# B-5351 SURVEY CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
B-5351	1C-1
Location and Surveys	



### BASELINE DATA

BL	POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
1	B5351-1		808877.5402	1726498.6969	797.54	OUTSIDE PROJECT LIMITS	
2	B5351-2		809425.0360	1727327.9810	760.69	OUTSIDE PROJECT LIMITS	
3	BL-3		810158.0730	1728342.4140	709.11	22+22.93	5.76 LT
4	BL-4		810615.8880	1728947.4010	713.05	29+81.49	7.88 RT
5	BL-5		811271.5850	1729680.5400	735.10	OUTSIDE PROJECT LIMITS	

### NOTES

1. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:  
[HTTP://WWW.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/](http://www.doh.dot.state.nc.us/preconstruct/highway/location/project/)

THE FILES TO BE FOUND ARE AS FOLLOWS:  
 b5351\_ls\_control.txt

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

⊗ INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.

PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.

### DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B5351-2"  
 WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF  
 NORTHING: 809425.0360(±) EASTING: 1727327.9810(±)  
 ELEVATION: 760.69'(±)  
 THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9999196900  
 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B5351-2" TO -L- STATION 10+95.00 IS  
 N 76°20'51" E 134.76'  
 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES  
 VERTICAL DATUM USED IS NAVD 88

### BENCHMARK DATA

.....  
 BM1 ELEVATION = 692.52  
 N 810126 E 1728644  
 L STATION 24+41.00 205 RIGHT  
 RR SPIKE IN 12' SYCAMORE  
 .....  
 BM2 ELEVATION = 737.11  
 N 811051 E 1729630  
 L STATION 36+08.00  
 RR SPIKE IN 20' DOUBLE OAK  
 .....

NOTE: DRAWING NOT TO SCALE

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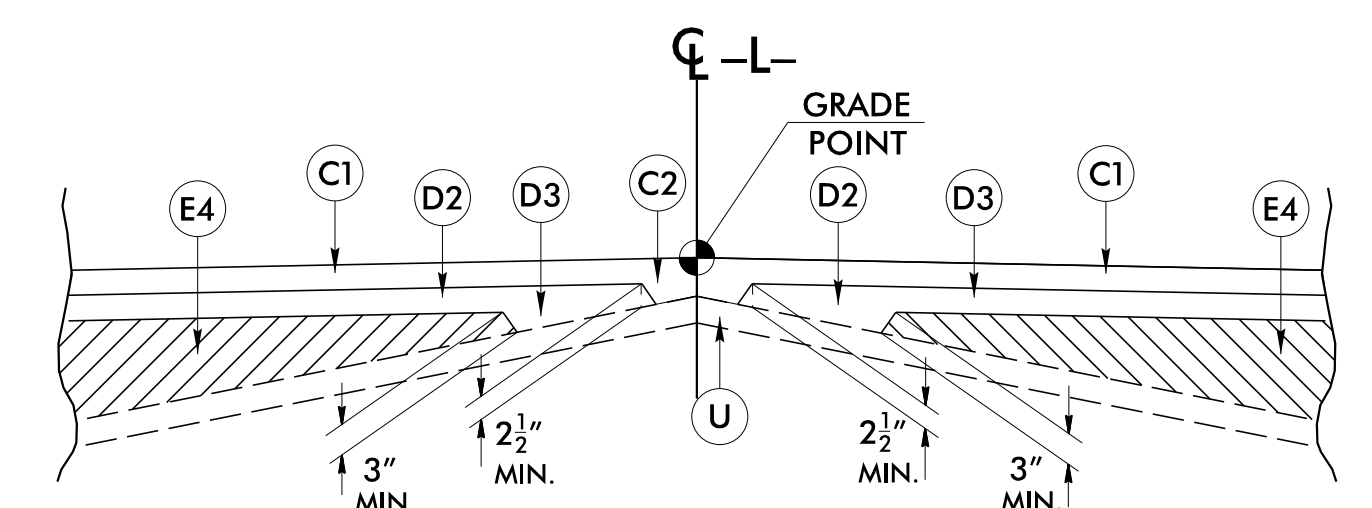


6/2/2019

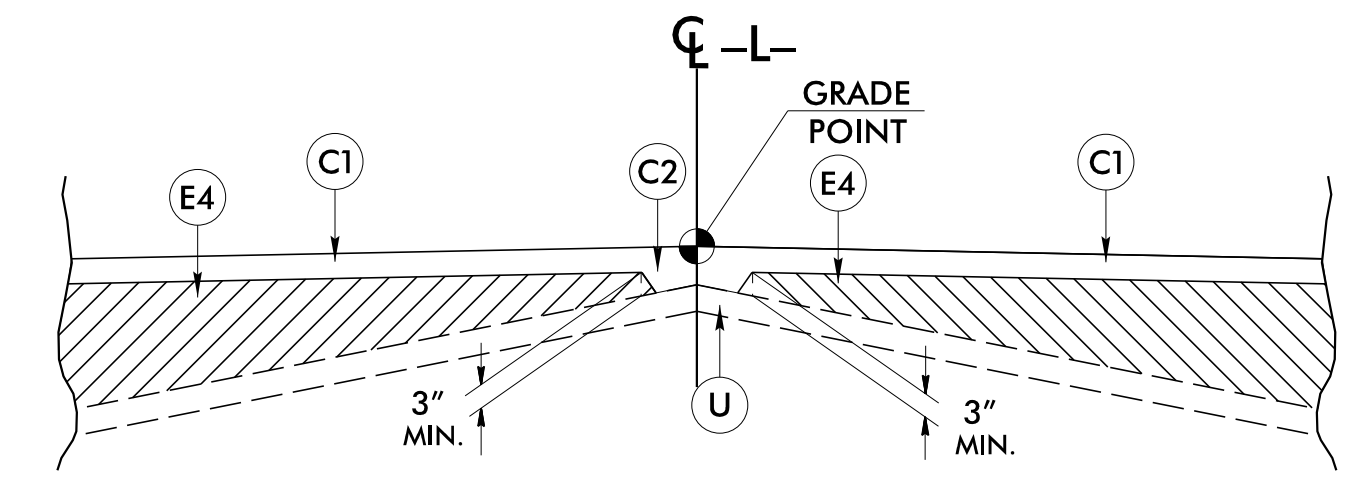
PAVEMENT SCHEDULE (FINAL PAVEMENT DESIGN 9/9/17)			
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	J	8" PROP. AGGREGATE BASE COURSE
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1 1/2" IN DEPTH OR GREATER THAN 2" IN DEPTH.	R1	SHOULDER BERM GUTTER.
D1	PROP. APPROX. 2 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	T	EARTH MATERIAL.
D2	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	U	EXISTING PAVEMENT.
D3	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 1/2" IN DEPTH OR GREATER THAN 4" IN DEPTH.	V	INCIDENTAL MILLING (0" TO 3")
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	W1 W2	WEDGING (SEE DETAIL SHOWING METHOD OF WEDGING).
E2	PROP. APPROX. 5 1/2" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.	Y	MILLED RUMBLE STRIPS
E3	PROP. APPROX. 7 1/2" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 427.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.		
E4	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.		

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

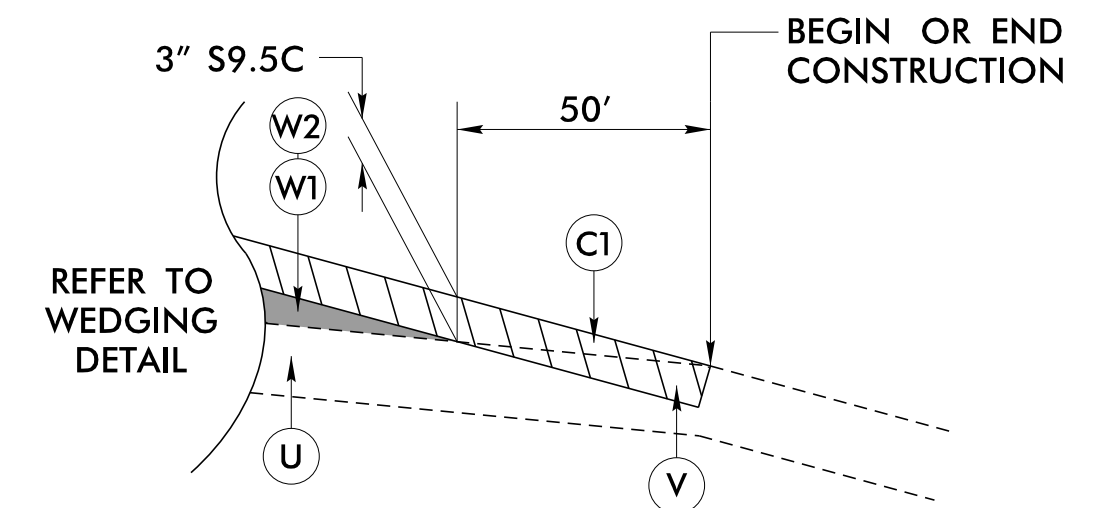
PROJECT REFERENCE NO. B-5351	SHEET NO. 2A-1
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
Prepared in the Office of:	
	PO Box 700 Fuquay-Varina, NC 27526 MOTT MACDONALD www.mottmac.com/americas



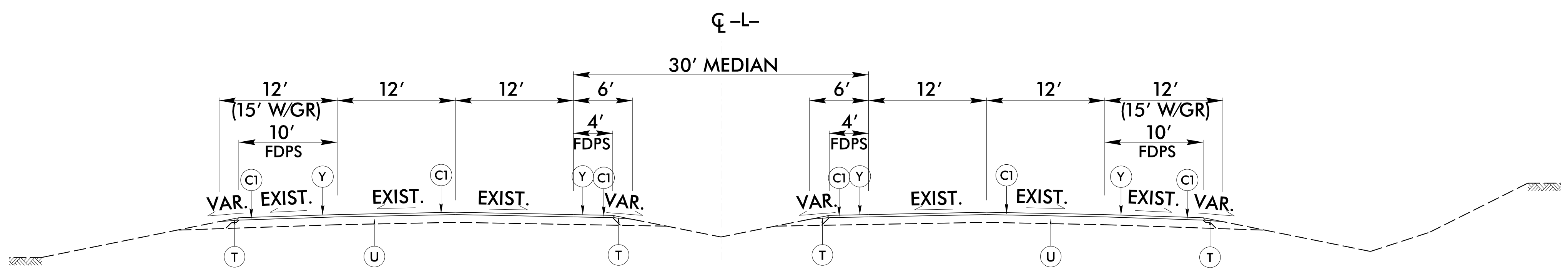
DETAIL SHOWING METHOD OF WEDGING (W1)



DETAIL SHOWING METHOD OF WEDGING (W2)

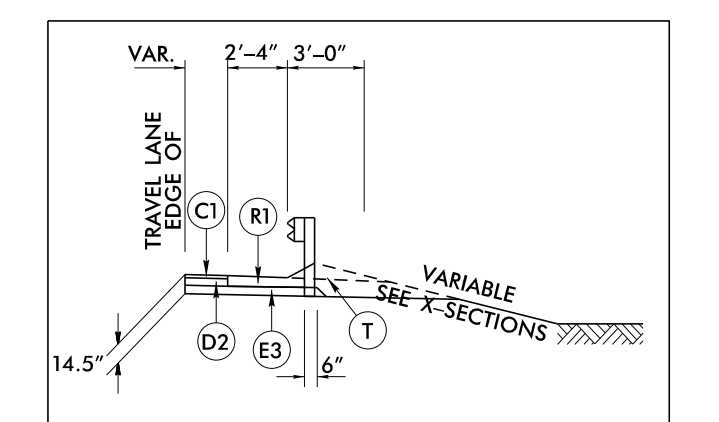


MILLING DETAIL  
DETAIL SHOWING PROFILE VIEW



TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1:  
 -L- STA 10+95.00 TO 17+00.00  
 -L- STA 29+50.00 TO 35+50.00



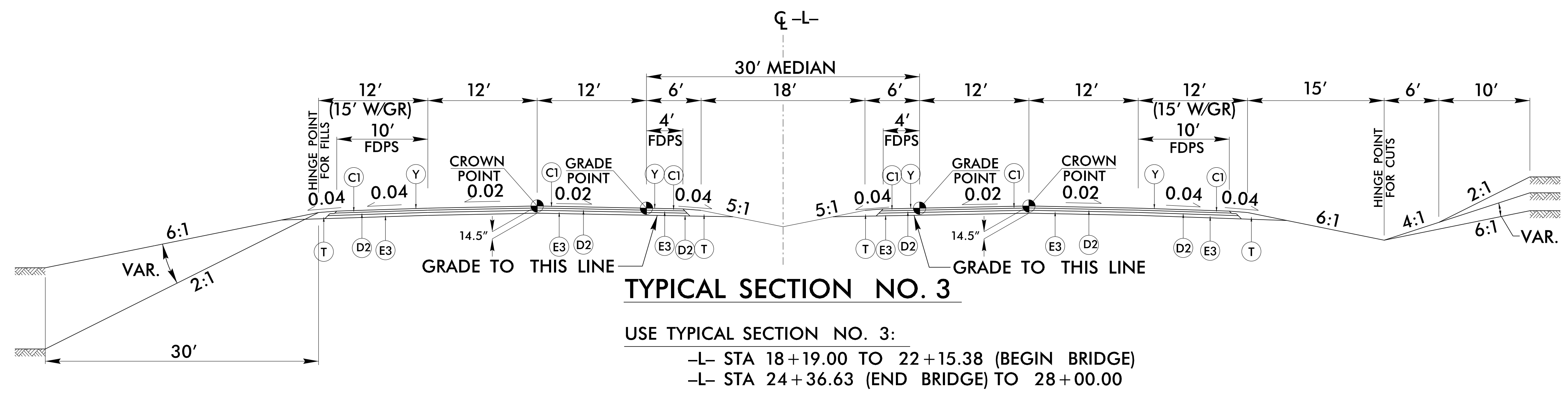
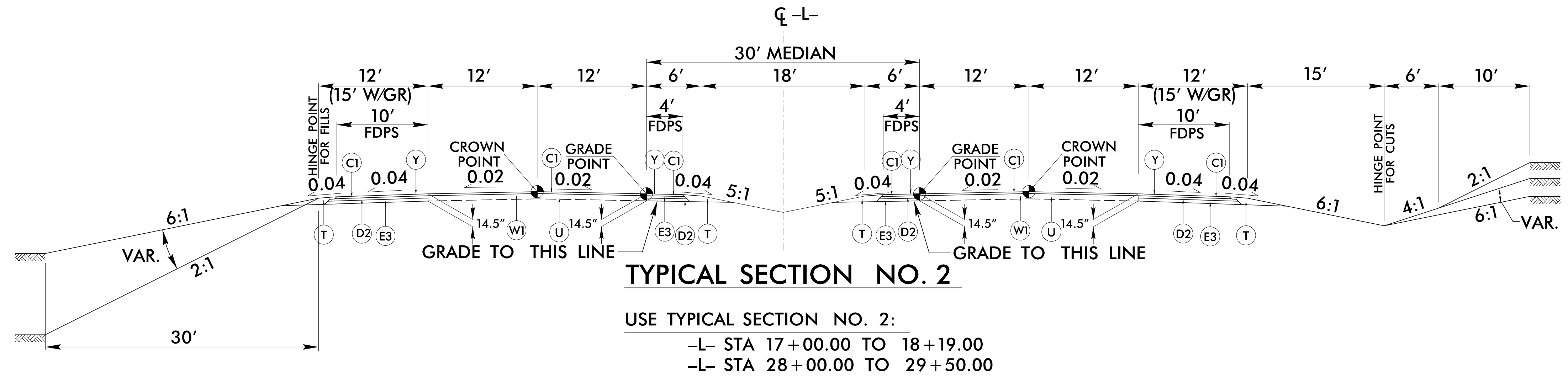
DETAIL FOR SHOULDER BERM GUTTER IN CONJUNCTION WITH GUARDRAIL  
 -L- STA 24+60.00 TO 24+72.50 RT  
 -L- STA 24+60.00 TO 24+70.00 RT MED  
 -L- STA 24+60.00 TO 24+70.00 LT MED  
 -L- STA 24+60.00 TO 24+70.00 LT

3:56:08 PM  
 P:\Projects\B5351\rdj\_tjpr.dgn  
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6/2/09

PAVEMENT SCHEDULE	
C1	3" S9.5C
C2	VAR. S9.5C
D1	2 1/2" I19.0C
D2	4" I19.0C
D3	VAR. I19.0C
E1	4" B25.0C
E2	5 1/2" B25.0C
E3	7 1/2" B25.0C
E4	VAR. B25.0C
J	8" ABC
R1	SBG
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W1	WEDGING
W2	
Y	RUMBLE STRIPS

PROJECT REFERENCE NO. B-5351	SHEET NO. 2A-2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
<p><b>DOCUMENT NOT CONSIDERED FINAL</b> <b>UNLESS ALL SIGNATURES COMPLETED</b></p>	
Prepared in the Office of: <b>M</b> MOTT MACDONALD & E, LLC PO Box 700 Fuquay-Varina, NC 27526 www.mottmac.com/americas	

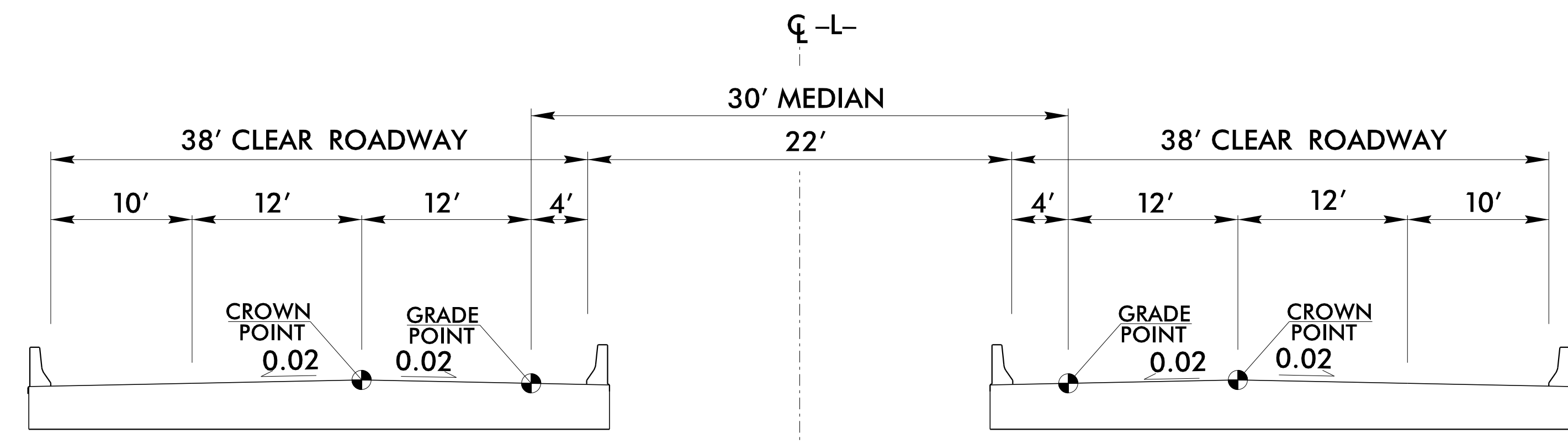


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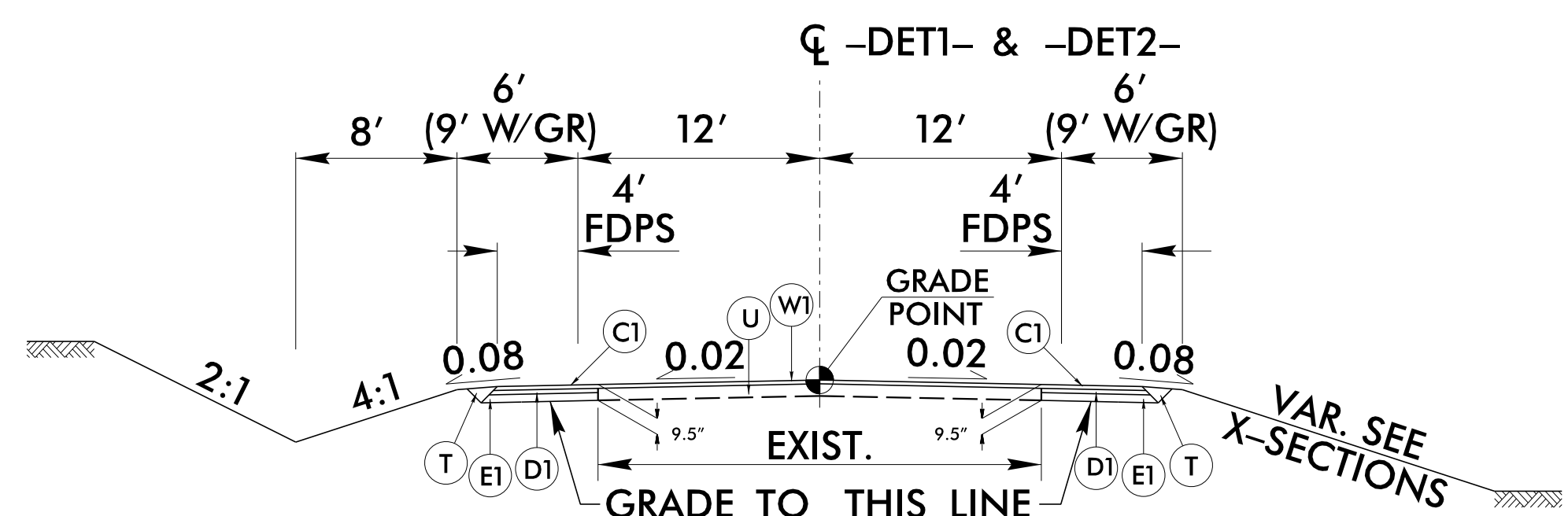
6/2/09

PAVEMENT SCHEDULE	
C1	3" S9.5C
C2	VAR. S9.5C
D1	2 1/2" I19.0C
D2	4" I19.0C
D3	VAR. I19.0C
E1	4" B25.0C
E2	5 1/2" B25.0C
E3	7 1/2" B25.0C
E4	VAR. B25.0C
J	8" ABC
R1	SBG
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W1	WEDGING
W2	
Y	RUMBLE STRIPS



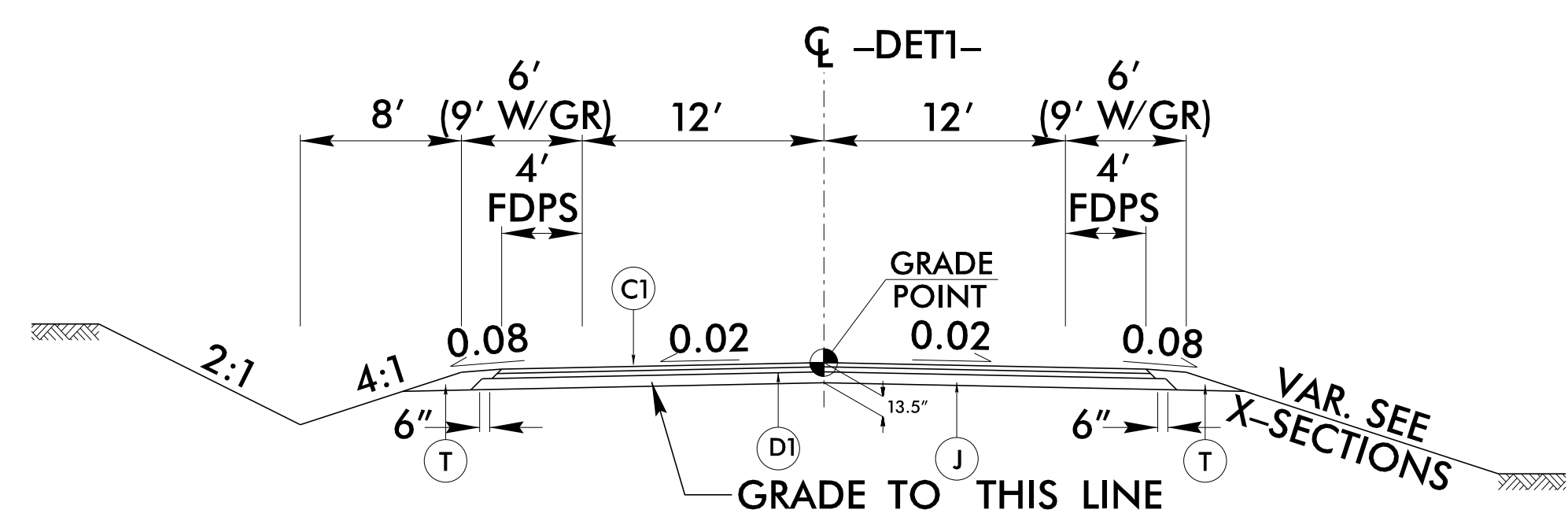
**TYPICAL SECTION NO. 4 (-L- BRIDGE)**

USE TYPICAL SECTION NO. 4:  
 -L- STA 22+15.38 (BEGIN BRIDGE) TO 24+36.63 (END BRIDGE)



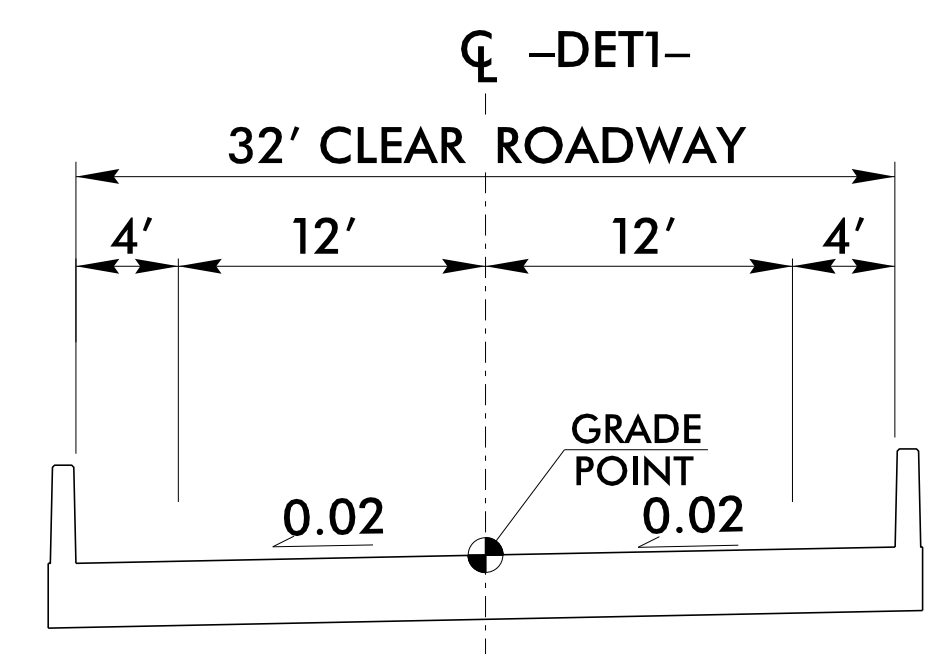
**TYPICAL SECTION NO. 5**

USE TYPICAL SECTION NO. 5:  
 -DET1- STA 10+00.00 TO 13+79.94  
 -DET1- STA 27+13.87 TO 33+74.66  
 -DET2- STA 10+00.00 TO 21+30.71 (EXISTING BRIDGE)  
 -DET2- STA 23+30.34 (EXISTING BRIDGE) TO 34+53.94



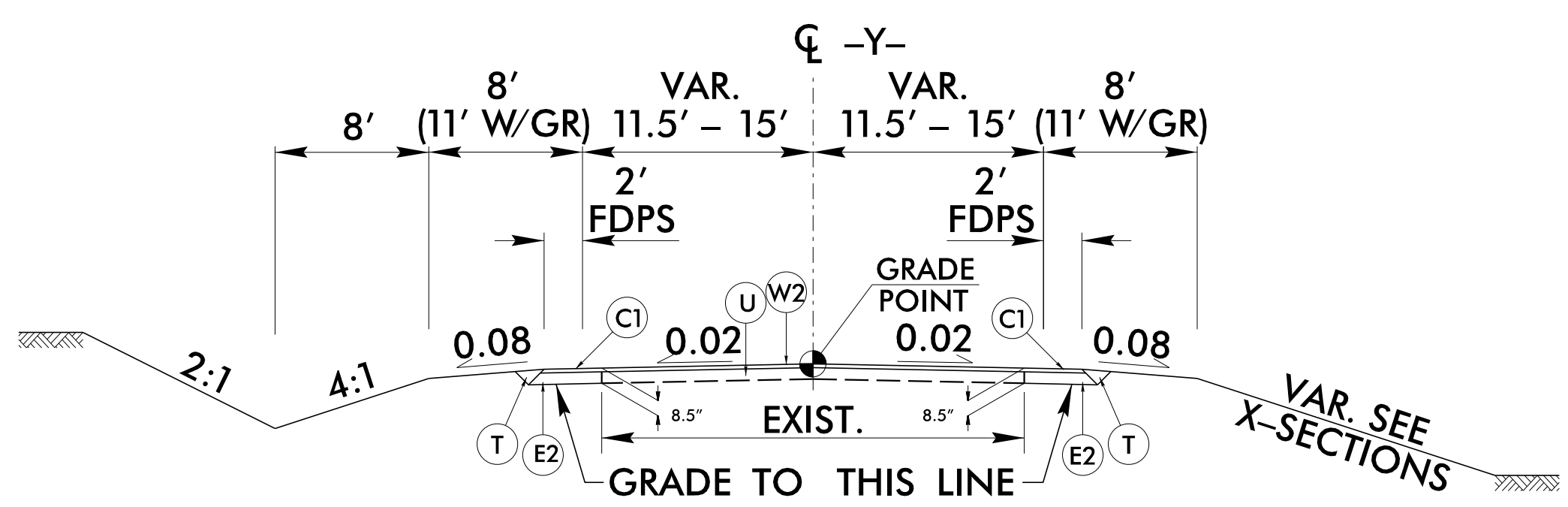
**TYPICAL SECTION NO. 6**

USE TYPICAL SECTION NO. 6:  
 -DET1- STA 13+79.94 TO 21+11.00 +/- (BEGIN BRIDGE)  
 -DET1- STA 22+80.00 +/- (END BRIDGE) TO 27+13.87



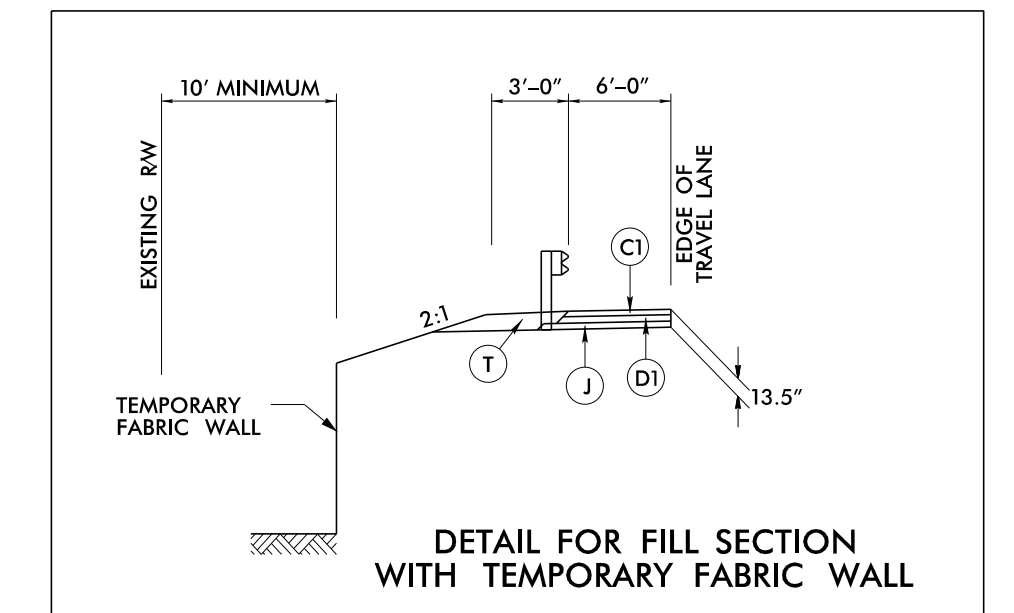
**TYPICAL SECTION NO. 7 (DETOUR BRIDGE)**

USE TYPICAL SECTION NO. 7:  
 -DET1- STA 21+11.00 +/- (BEGIN BRIDGE) TO 22+80.00 +/- (END BRIDGE)



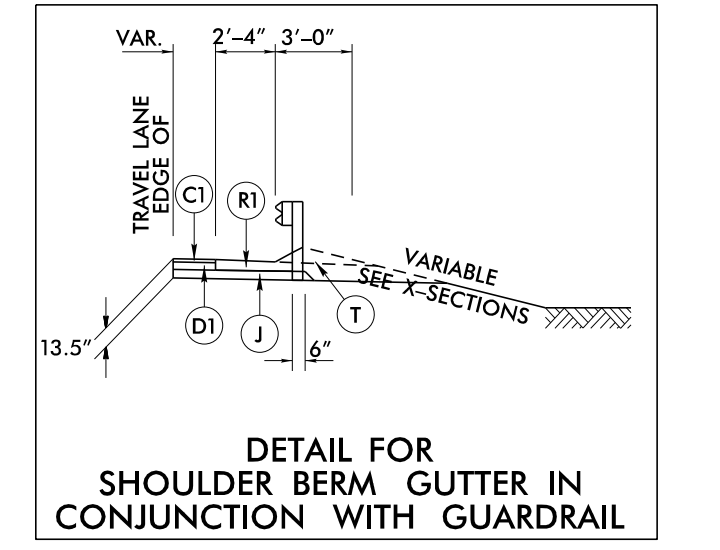
**TYPICAL SECTION NO. 8**

USE TYPICAL SECTION NO. 8:  
 -Y- STA 10+75.00 TO 11+81.14



USE IN CONJUNCTION WITH T.S. NO. 6:  
 -DET1- STA 20+78.00 TO 21+38.00 LT  
 -DET1- STA 22+57.68 TO 24+82.00 LT

PROJECT REFERENCE NO. <b>B-5351</b>	SHEET NO. <b>2A-3</b>
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
<b>DOCUMENT NOT CONSIDERED FINAL</b>	
<b>UNLESS ALL SIGNATURES COMPLETED</b>	
Prepared in the Office of:	
	MOTT MACDONALD P.O. Box 700 Fuquay-Varina, NC 27526 www.mottmac.com/americas



-DET1- STA 22+80.00 TO 23+00.00 RT

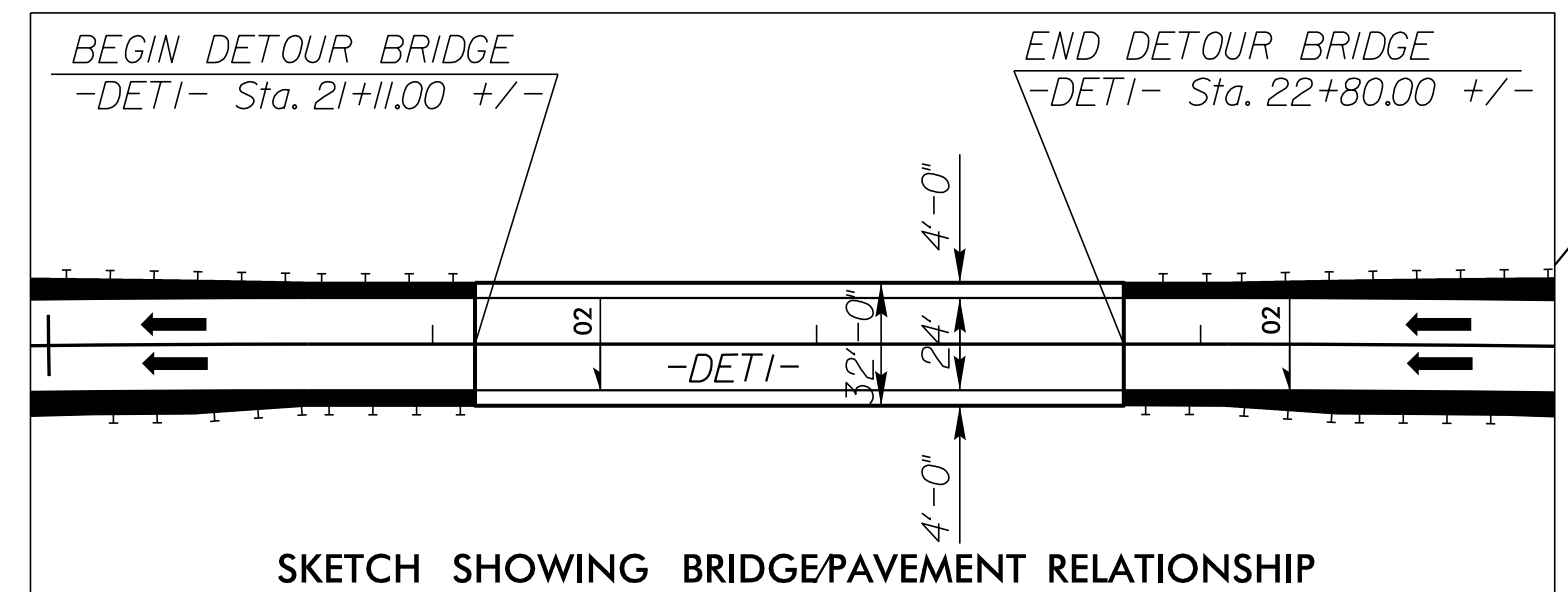
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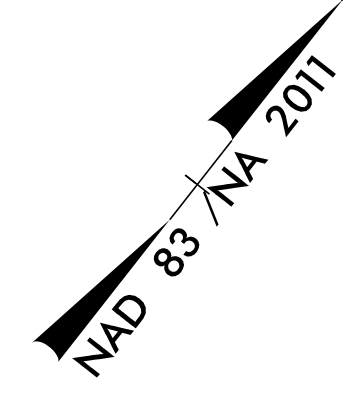
B.17/7.09

# DETAIL OF TEMPORARY DETOUR

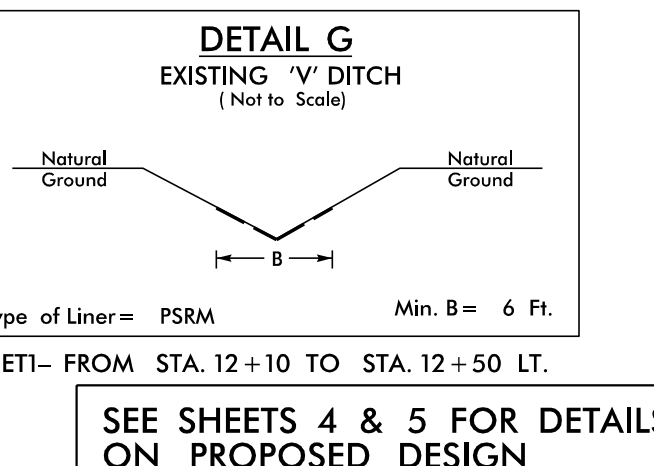
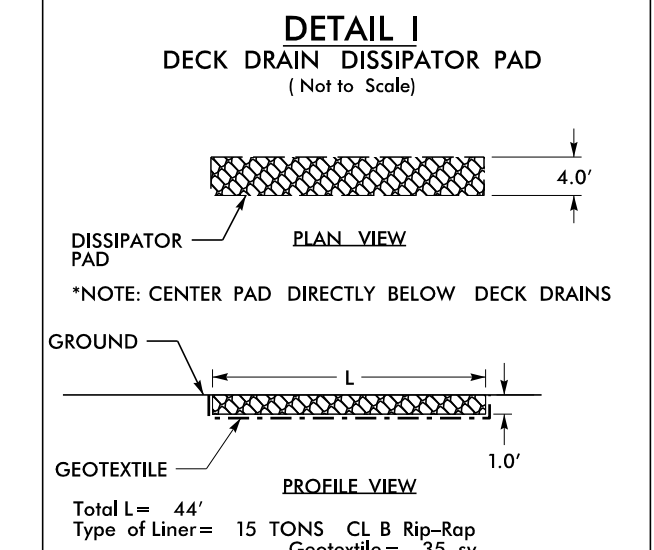
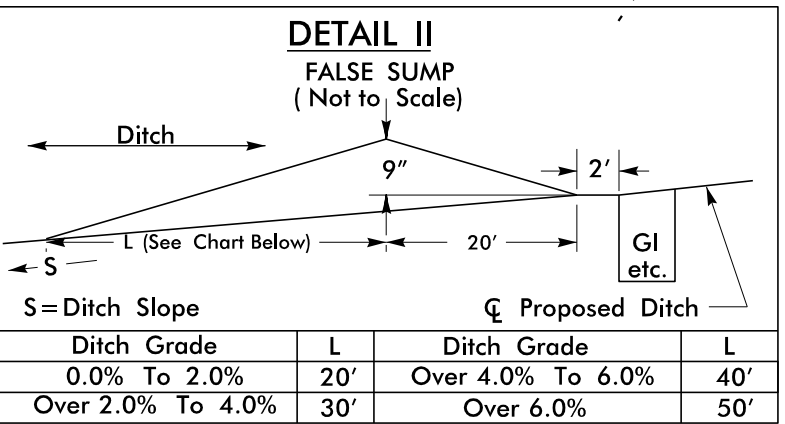
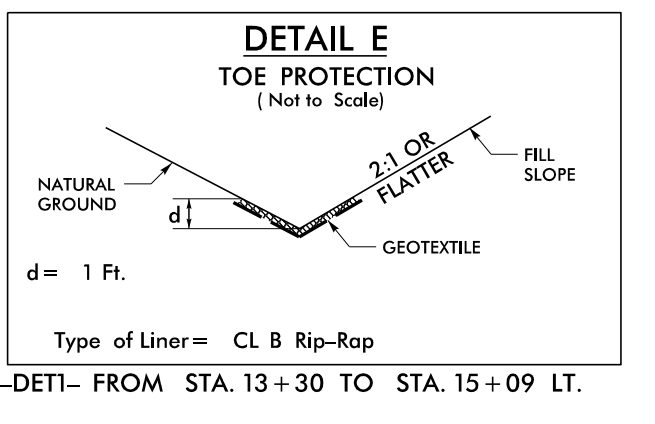
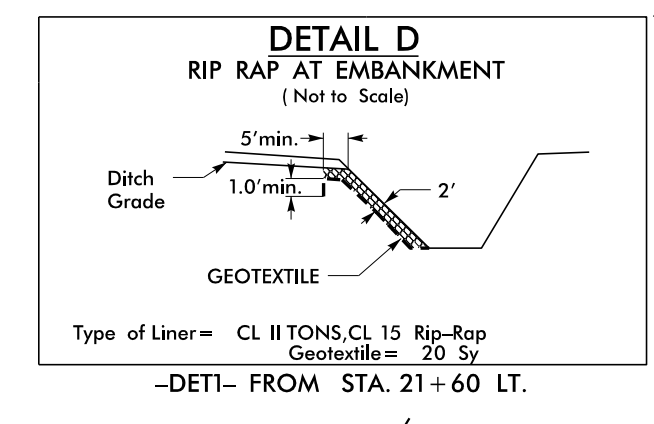
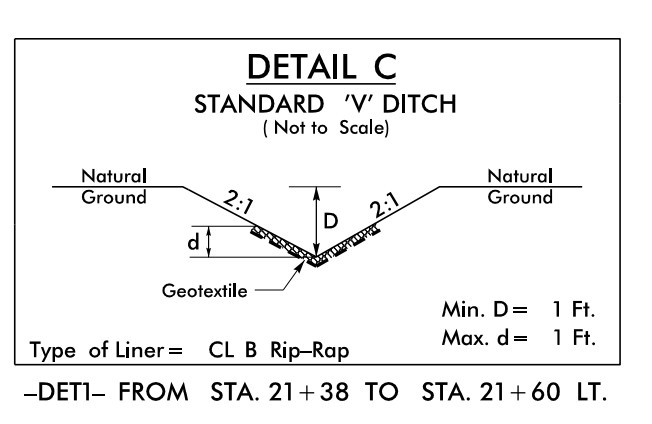
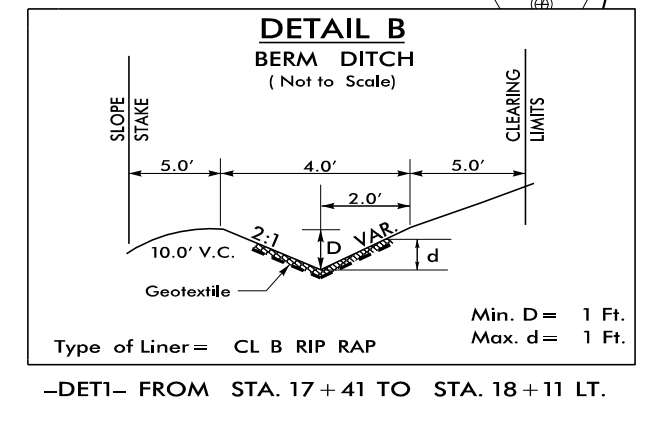
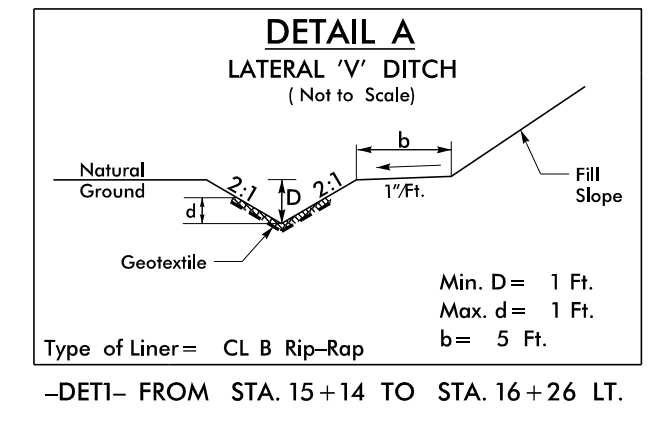
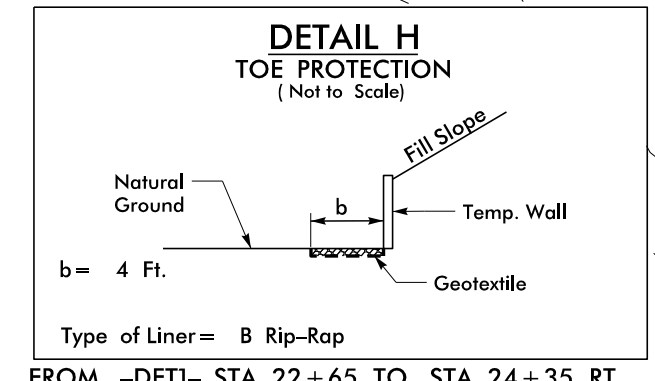
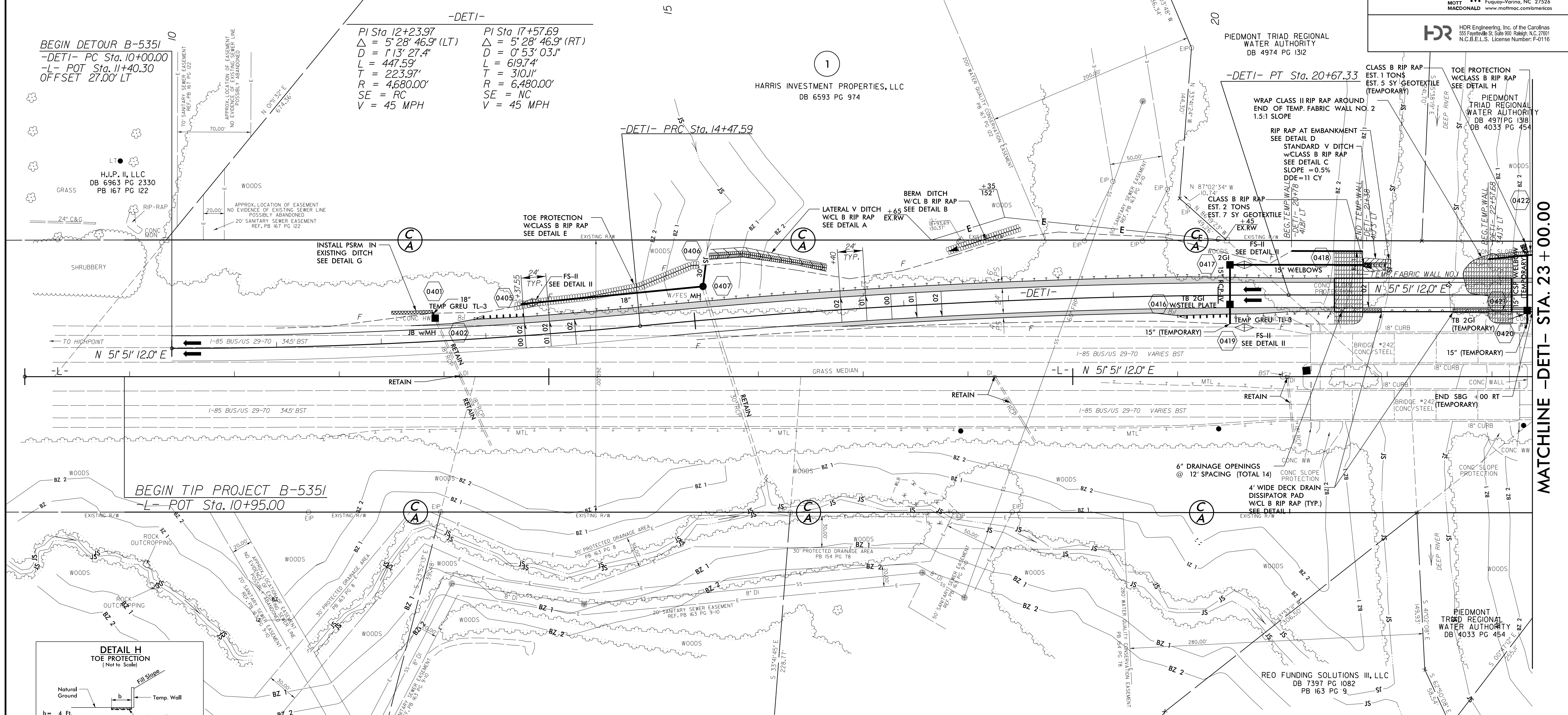
## -DET1-



6" DECK DRAINS @ 12' O.C., -DET1- FROM STA. 21+18 TO STA. 22+74 RT SHLD.



PROJECT REFERENCE NO. B-5351		SHEET NO. 2B-1	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
MOTT MACDONALD 18 & E, LLC LICENSE NO. E-0669		HDR ENGINEERING LICENSE NO. E-0116	
<p><b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b></p> <p>Prepared in the Office of:</p>			



SEE SHEETS 4 & 5 FOR DETAILS ON PROPOSED DESIGN

SEE SHEET 8 FOR -DET1- PROFILE

MATCHLINE -DET1- STA. 23+00.00

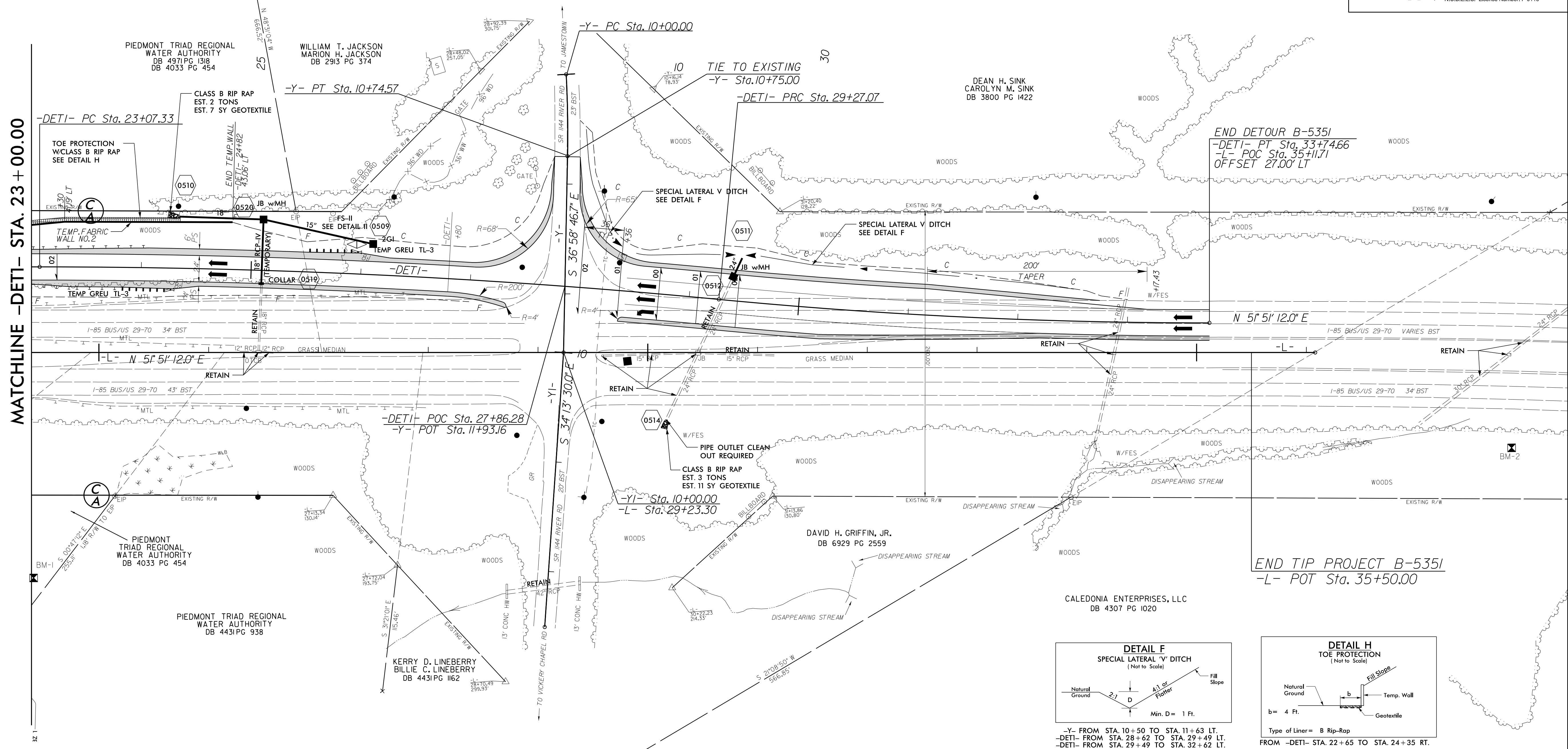
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10/17/2010



# DETAIL OF TEMPORARY DETOUR

## -DET1-

PROJECT REFERENCE NO. B-5351	SHEET NO. 2B-2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
MOTT MACDONALD I & E, LLC License No. F-0669	HDR ENGINEERING License No. F-0116
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
Prepared in the Office of:	M MOTT MACDONALD
	PO Box 700 Fuquay-Varina, NC 27526 www.mottmac.com/america



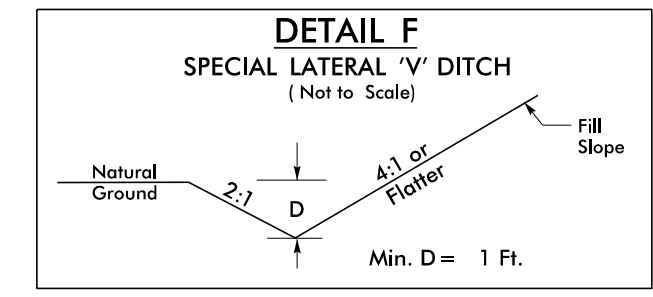
MATCHLINE -DET1- STA. 23+00.00

32

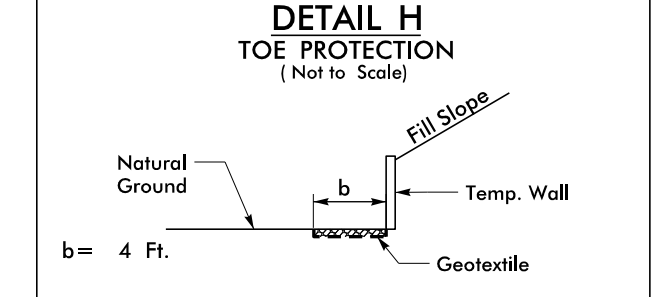
-Y-  
 PI Sta 10+37.30  
 $\Delta = 4' 16'' 22.0''$  (RT)  
 $D = 5' 43'' 46.5''$   
 $L = 74.57'$   
 $T = 37.30'$   
 $R = 1,000.00'$

-DET1-  
 PI Sta 26+17.43  
 $\Delta = 5' 28'' 46.9''$  (RT)  
 $D = 0' 53'' 03.1''$   
 $L = 619.74'$   
 $T = 310.11'$   
 $R = 6,480.00'$   
 SE = NC  
 $V = 45$  MPH

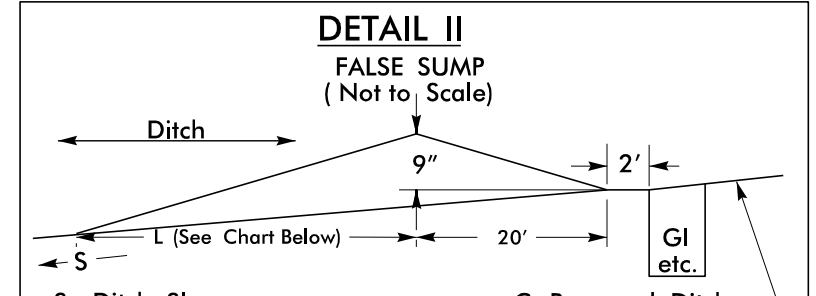
-DET1-  
 PI Sta 31+51.03  
 $\Delta = 5' 28'' 46.9''$  (LT)  
 $D = 1' 13'' 27.4''$   
 $L = 447.59'$   
 $T = 223.97'$   
 $R = 4,680.00'$   
 SE = RC  
 $V = 45$  MPH



-Y- FROM STA. 10+50 TO STA. 11+63 LT.  
 -DET1- FROM STA. 28+62 TO STA. 29+49 LT.  
 -DET1- FROM STA. 29+49 TO STA. 32+62 LT.



FROM -DET1- STA. 22+65 TO STA. 24+35 RT.  
 Type of Liner = B Rip-Rap



Ditch Grade		Proposed Ditch	
L	Ditch Grade	L	Ditch Grade
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

-DET1- STA. 25+95 LT.

END TIP PROJECT B-5351  
 -L- POT Sta. 35+50.00

SEE SHEETS 4 & 5 FOR DETAILS ON PROPOSED DESIGN  
 SEE SHEET 8 FOR -DET1- PROFILE

8/17/99  
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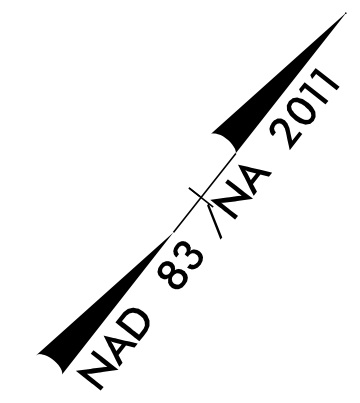




8.17.17/99

# DETAIL OF TEMPORARY DETOUR

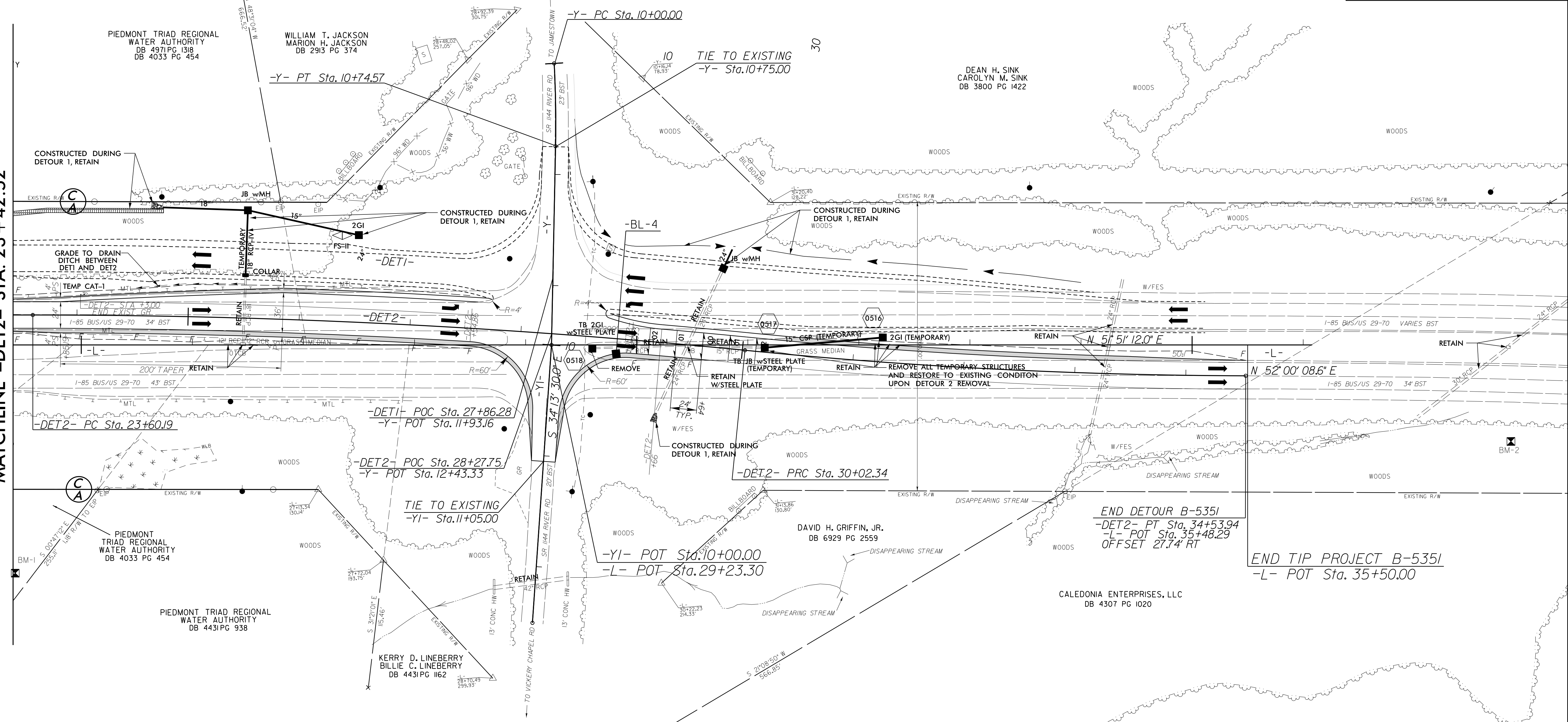
## -DET2-



PROPOSED DRAINAGE FEATURES CONSTRUCTED DURING DETOUR 1 WILL BE RETAINED. ALL DRAINAGE FEATURES LABELED AS TEMPORARY SHOULD BE REMOVED AFTER DETOUR REMOVAL

PROJECT REFERENCE NO. B-5351	SHEET NO. 2B-4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER 
<p><b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b></p> <p>Prepared in the Office of: <b>M</b> MOTT MACDONALD</p> <p>PO Box 700 Fuquay-Varina, NC 27526 www.mottmac.com/motmac</p> <p><b>HDR</b> HDR Engineering, Inc. of the Carolinas 655 Fayetteville St., Suite 900, Raleigh, NC 27601 N.C.E.L.S. License Number: F-0116</p>	

MATCHLINE -DET2- STA. 23+42.52



-Y-  
 PI Sta 10+37.30  
 $\Delta = 4' 16'' 22.0''$  (RT)  
 $D = 5' 43'' 46.5''$   
 $L = 74.57'$   
 $T = 37.30'$   
 $R = 1,000.00'$

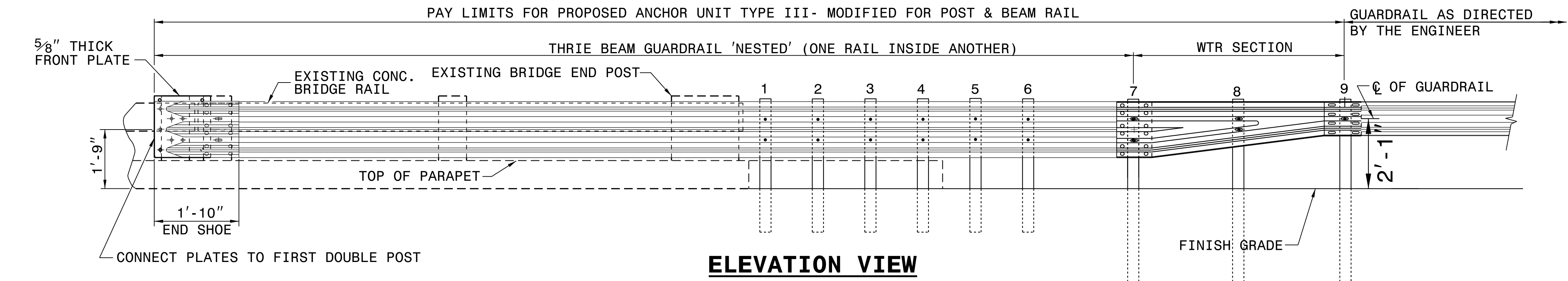
-DET2-  
 PI Sta 26+81.53  
 $\Delta = 5' 40'' 40.4''$  (RT)  
 $D = 0' 53'' 03.1''$   
 $L = 642.15'$   
 $T = 321.34'$   
 $R = 6,480.00'$   
 $SE = NC$   
 $V = 45$  MPH

PI Sta 32+28.32  
 $\Delta = 5' 31'' 43.8''$  (LT)  
 $D = 1' 13'' 27.4''$   
 $L = 451.60'$   
 $T = 225.98'$   
 $R = 4,680.00'$   
 $SE = NC$   
 $V = 45$  MPH

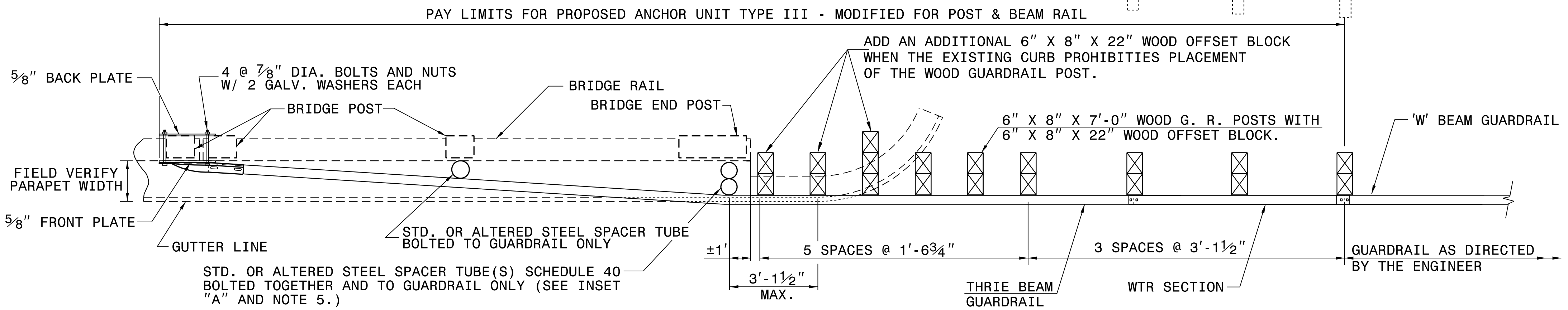
SEE SHEETS 4 & 5 FOR DETAILS ON PROPOSED DESIGN  
 SEE SHEET 9 FOR -DET2- PROFILE

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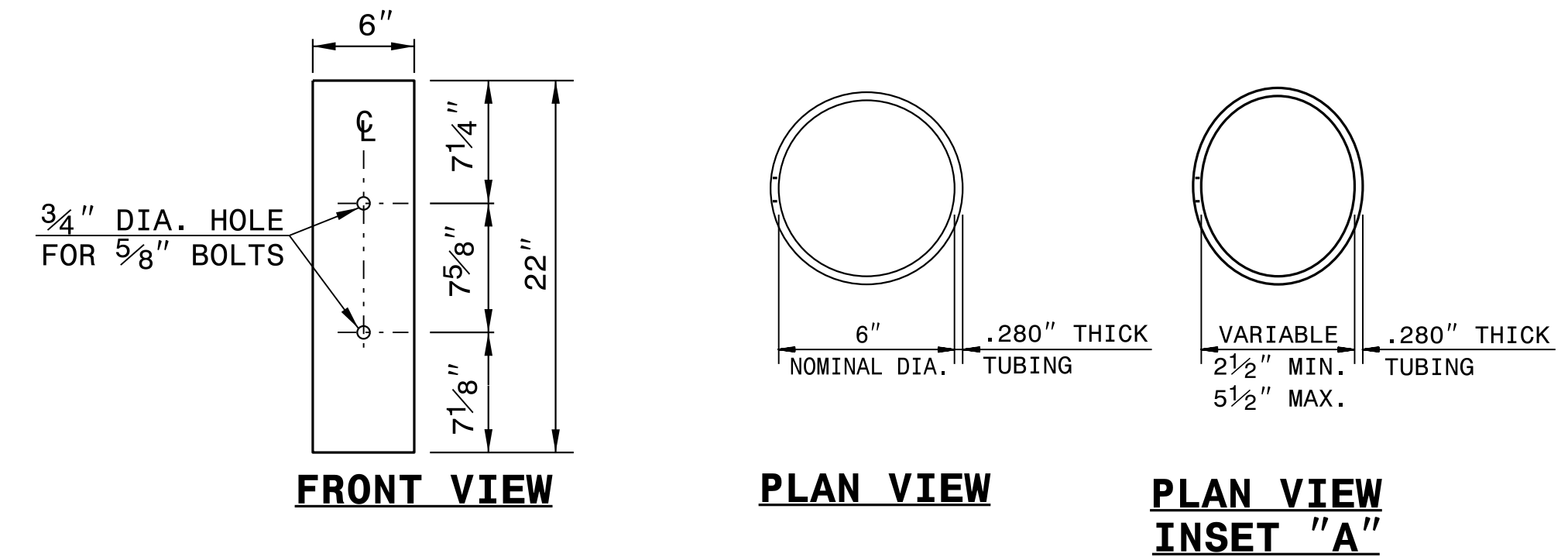




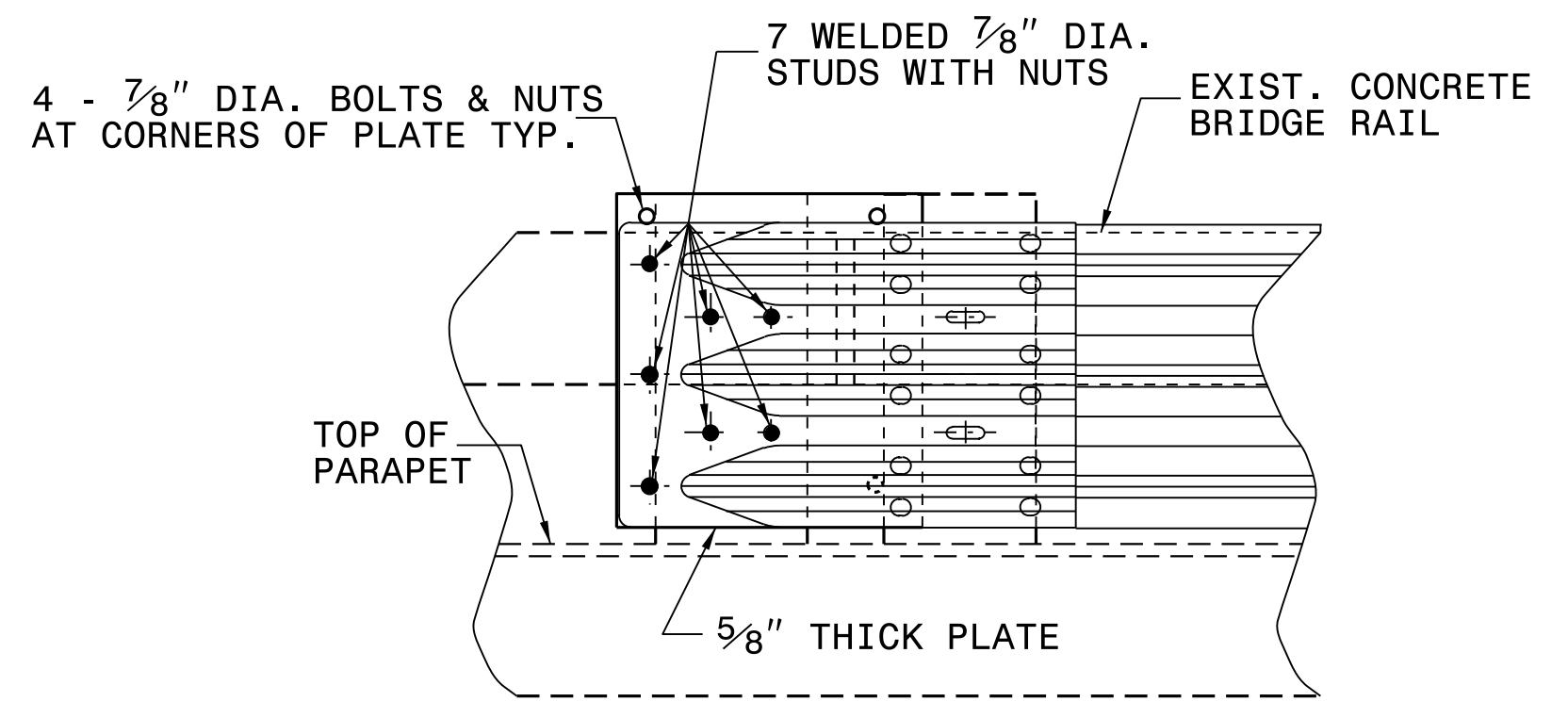
**ELEVATION VIEW**



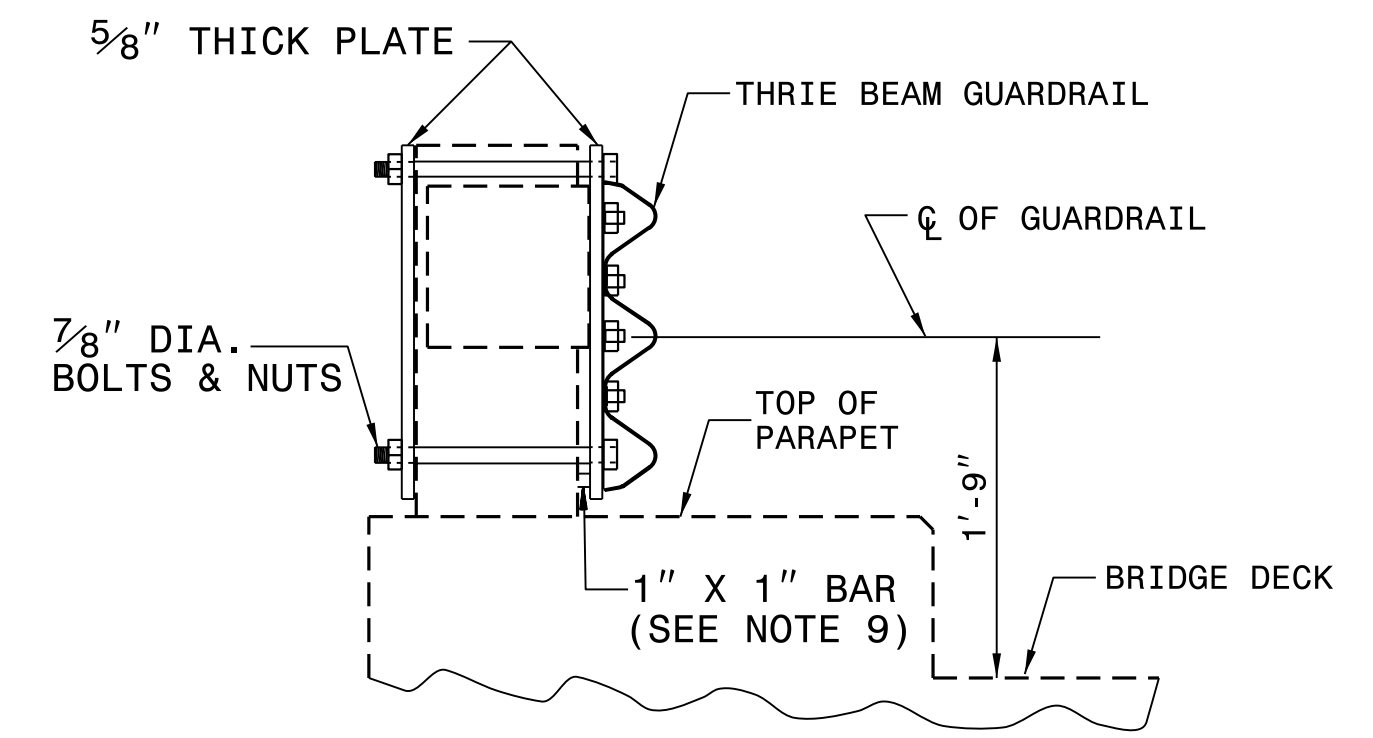
**PLAN VIEW**



**STEEL SPACER TUBE**

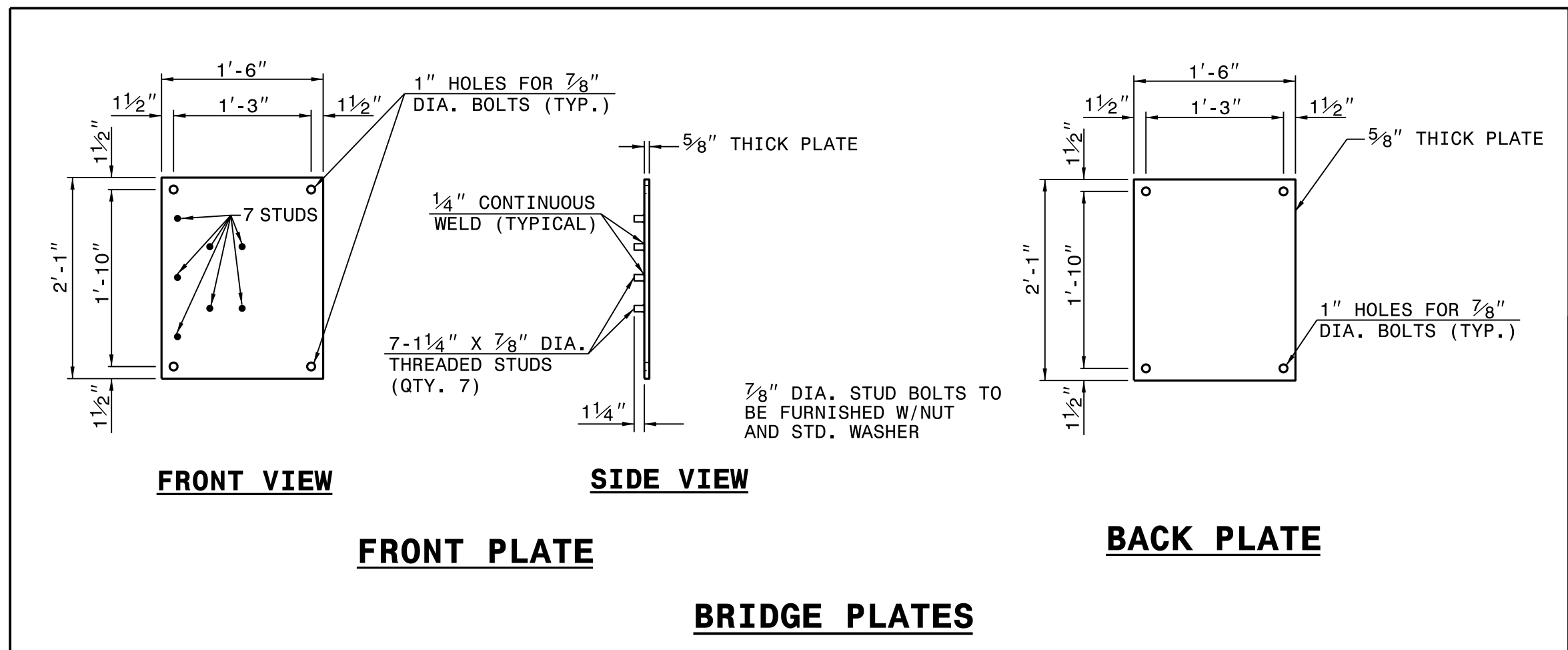


**ELEVATION VIEW**



**SECTION VIEW**

- GENERAL NOTES:**
1. USE NUTS, BOLTS, AND WASHERS CONFORMING TO THE REQUIREMENTS OF A.S.T.M. A-307 AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF STAND. SPECS.
  2. TAP NUTS FOR THE 7/8" DIA. STUDS AND BOLTS AFTER GALVANIZING SEE A.S.T.M. A-563.
  3. USE PLATES AND TUBES CONFORMING TO THE REQUIREMENTS OF A.S.T.M. A-36 AND GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH SECTION 1076 OF STAND. SPECS.
  4. ADDITIONAL FIELD HOLES MAY BE DRILLED IN STEEL RAIL AS DIRECTED BY THE ENGINEER.
  5. INSTALL FACE OF GUARDRAIL AS NEAR AS POSSIBLE TO PLUMB WITH THE PARAPET FACE AT BRIDGE END POST SPACER TUBE LOCATION BY USING STANDARD OR ALTERED SPACER TUBES OR A COMBINATION THEREOF OR AS DIRECTED BY THE ENGINEER. FOR VERY SMALL PARAPET WIDTHS, GUARDRAIL MAY BE INSTALLED AGAINST BRIDGE RAIL WITHOUT SPACER TUBES.
  6. DO NOT DRILL BRIDGE RAIL IN ORDER TO INSTALL GUARDRAIL ANCHOR UNIT.
  7. USE THIS DETAIL ONLY FOR BRIGES WITH POST AND BEAM TYPE RAIL.
  8. ATTACH 1" X 1" BAR AND THREADED STUDS TO PLATE WITH 1/4" WELDS ALL AROUND.
  9. 1" X 1" BAR MAY NOT BE NEEDED ON BRIDGE RAILS WHERE FACE OF RAIL DOES NOT PROJECT BEYOND FACE OF POST.
  10. PROVIDE SHOP DRAWINGS OF THE PLATES TO THE ENGINEER FOR APPROVAL BEFORE FABRICATING THE PLATES.
  11. LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
  12. SEE ROADWAY STANDARD DRAWING 862.03 SHEET 3 FOR ADDITIONAL INFORMATION ON THE TYPE III ANCHOR UNIT



**FRONT PLATE**

**BRIDGE PLATES**

**BACK PLATE**



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

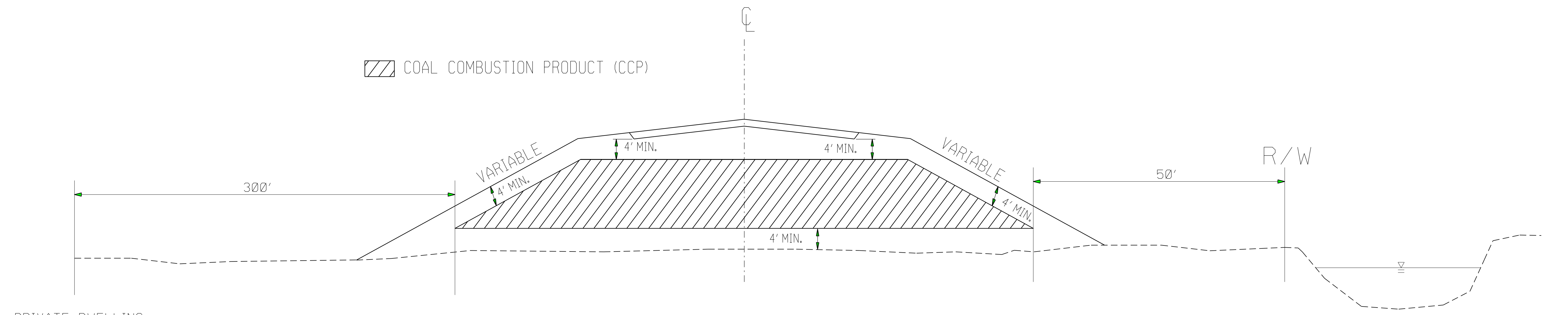
**CONTRACT STANDARDS  
AND DEVELOPMENT UNIT**  
Office 919-707-6950 FAX 919-250-4119

**TYPE III MODIFIED  
FOR POST AND BEAM RAIL**

ORIGINAL BY: E.E. WARD	DATE: 01-03
MODIFIED BY: JS Howerton	DATE: 01-18
CHECKED BY:	DATE:
FILE SPEC.: s:\details\stand\bpii original.dgn	

24-JAN-2018 14:51 S:\Contracts\Stand\stand\bp\_iii original.dgn J:\power\ton AT\_CSD-292595

# COAL COMBUSTION PRODUCT PLACEMENT



PRIVATE DWELLING OR WELL

PERENNIAL STREAM, OTHER SURFACE WATER BODY OR \*WETLAND

\*(OBTAIN PERMISSION FROM ARMY CORPS OF ENGINEERS)

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

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

PLACE AT LOCATIONS AS APPROVED BY THE ENGINEER

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



<b>CONTRACT STANDARDS AND DEVELOPMENT UNIT</b>	
Office 919-707-6950 FAX 919-250-4119	
<b>COAL COMBUSTION PRODUCT PLACEMENT DETAIL</b>	
ORIGINAL BY: J.S.H.	DATE: 3/16/15
MODIFIED BY:	DATE:
CHECKED BY:	DATE:
FILE SPEC.: joel/coal combustion material detail.dgn	

07-SEP-2017 08:21 S:\Contracts\Special Details\Jhoverton\Coal Combustion Product Detail.dgn Jhoverton AT USD-232595



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

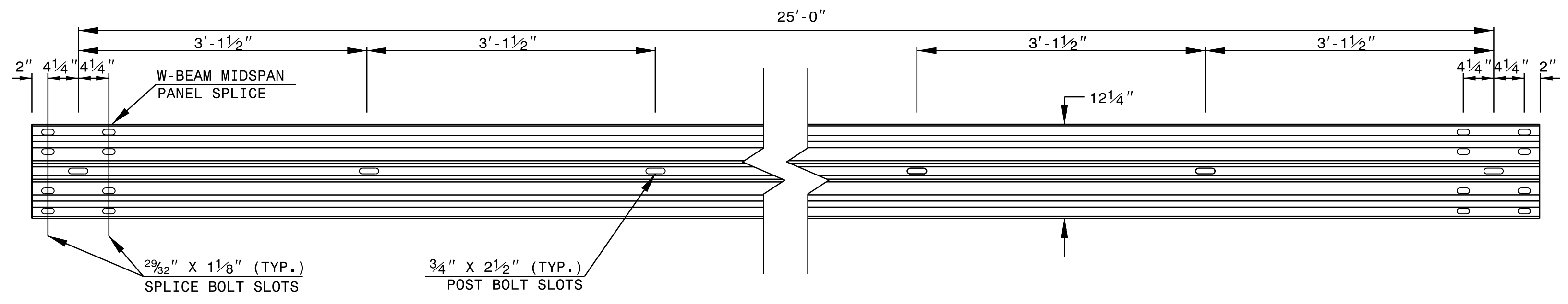
ROADWAY DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

SHEET 6 OF 8  
**862D02**

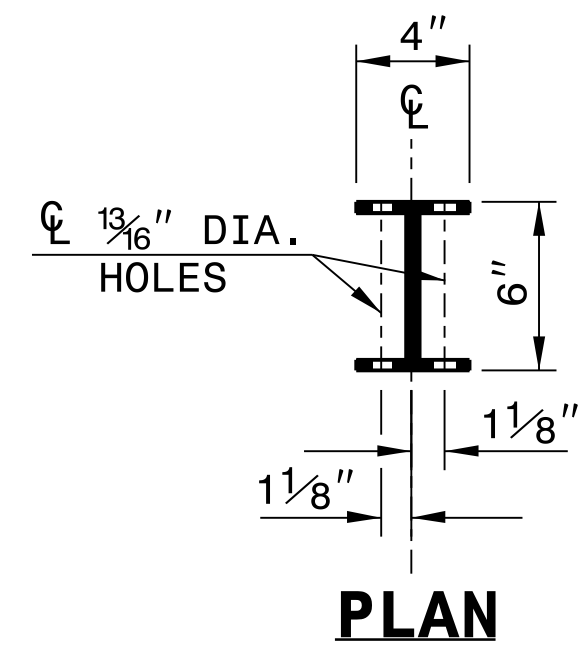
STATE OF NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

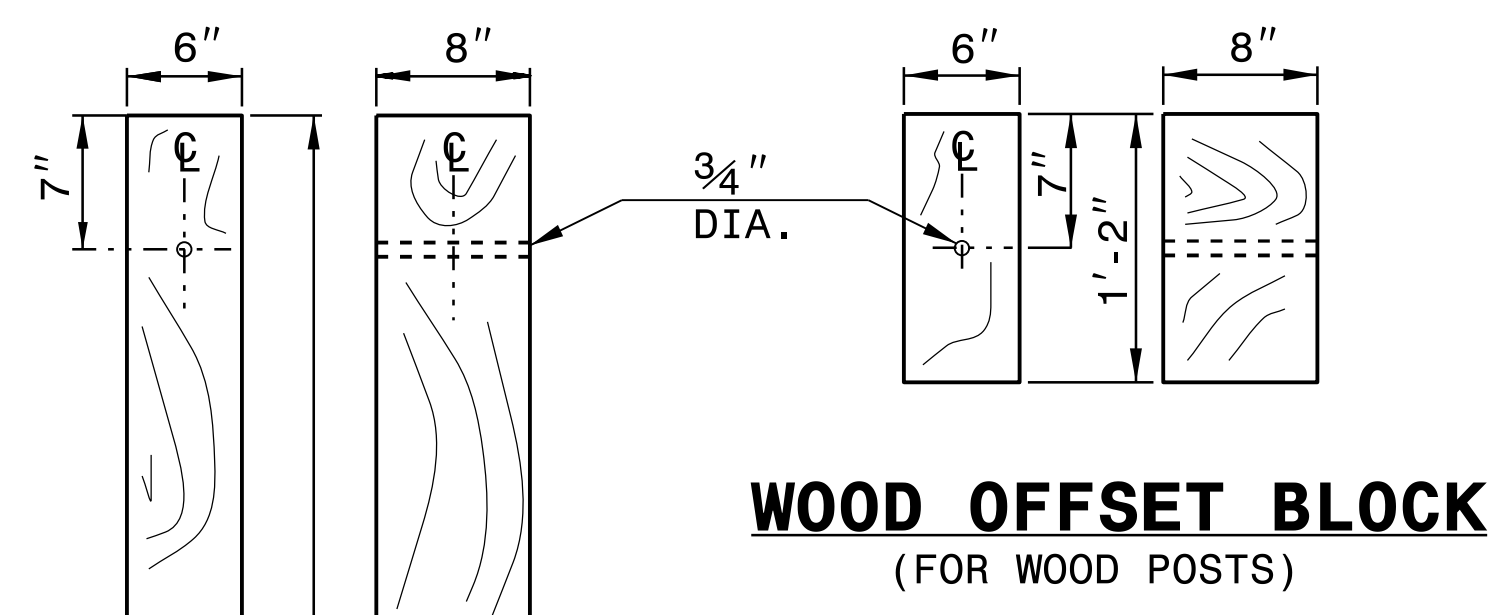
SHEET 6 OF 8  
**862D02**



**STANDARD W-BEAM GUARDRAIL**



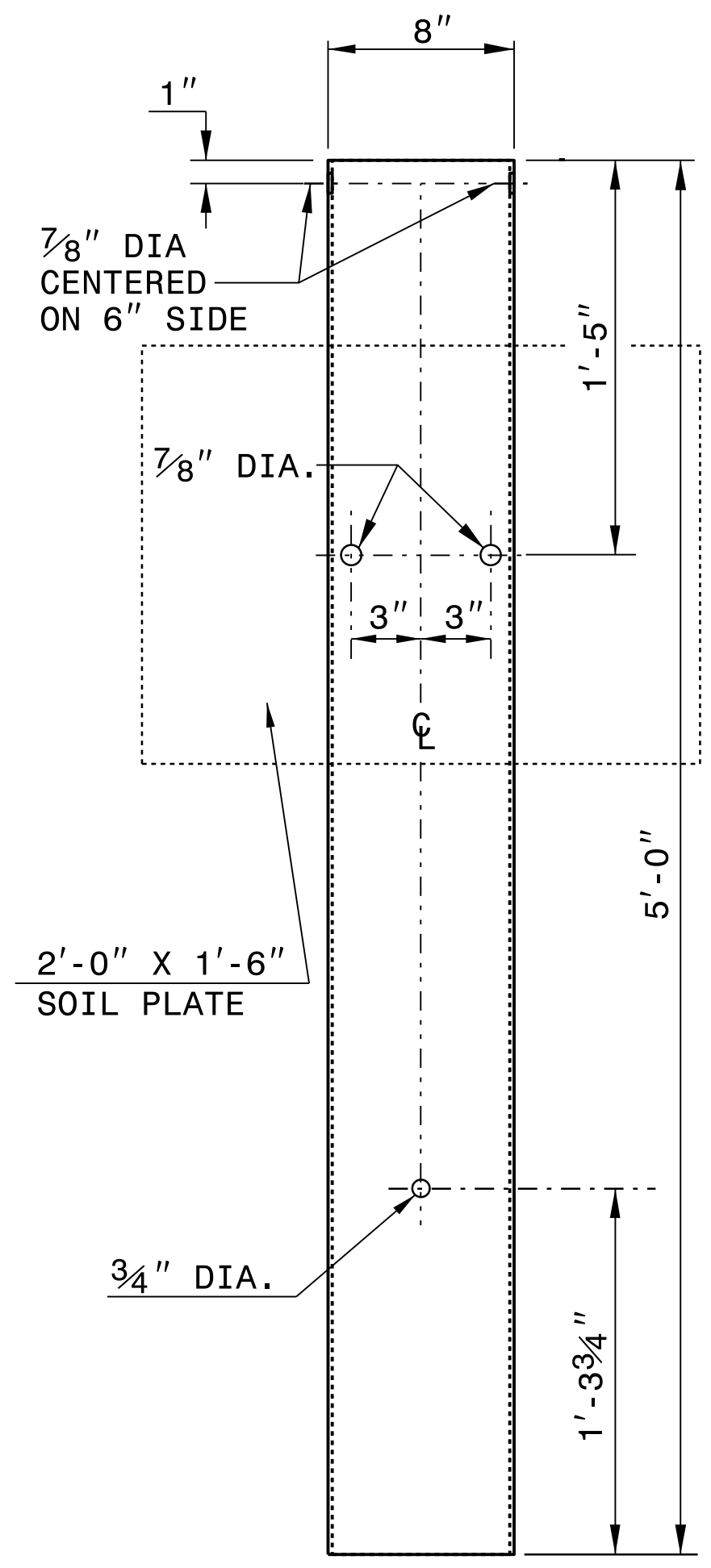
**PLAN**



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

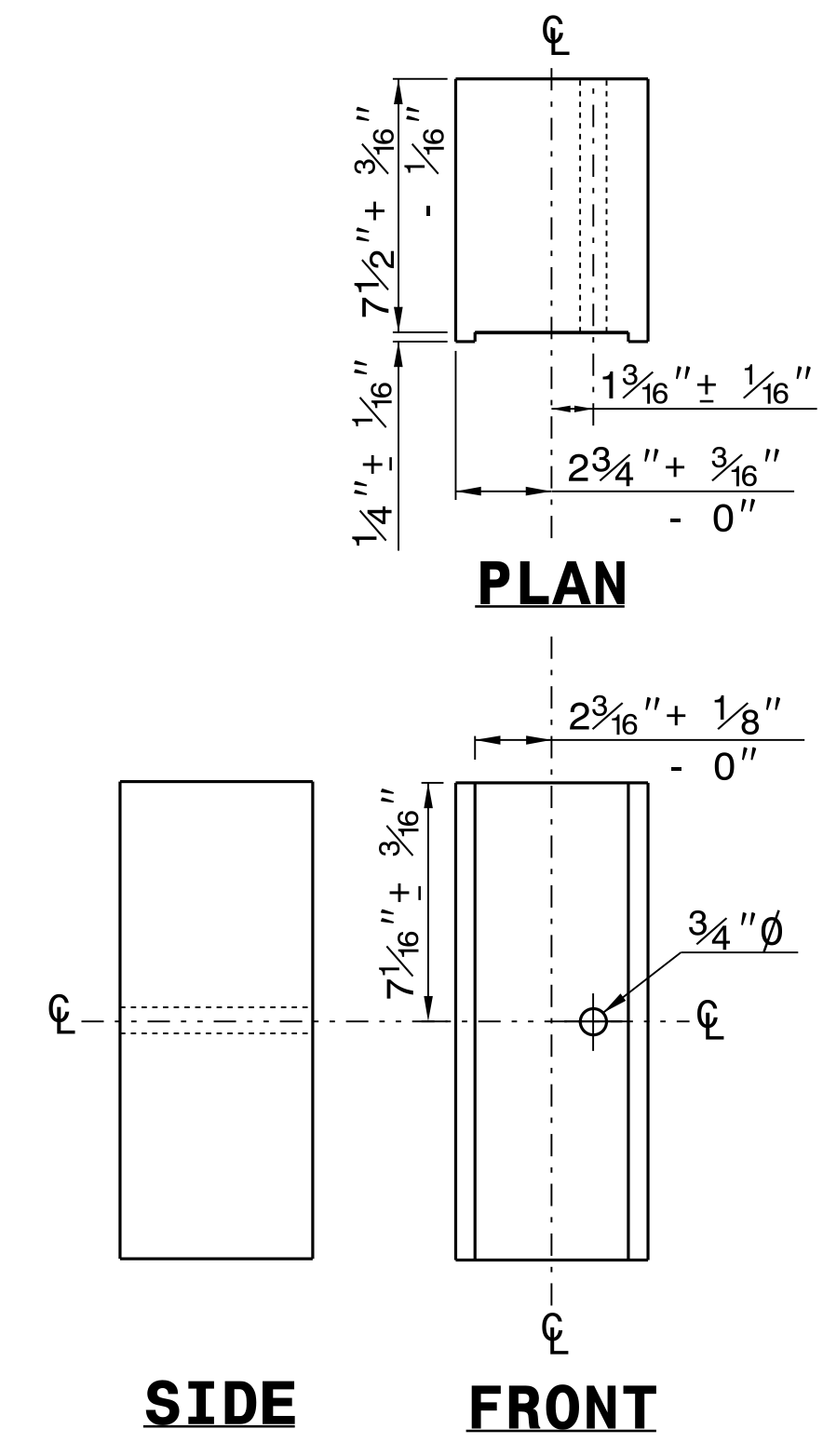
**STANDARD  
LINE POST**

**SHORT WOOD  
BREAKAWAY POST**



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

**SYSTEM PARTS**

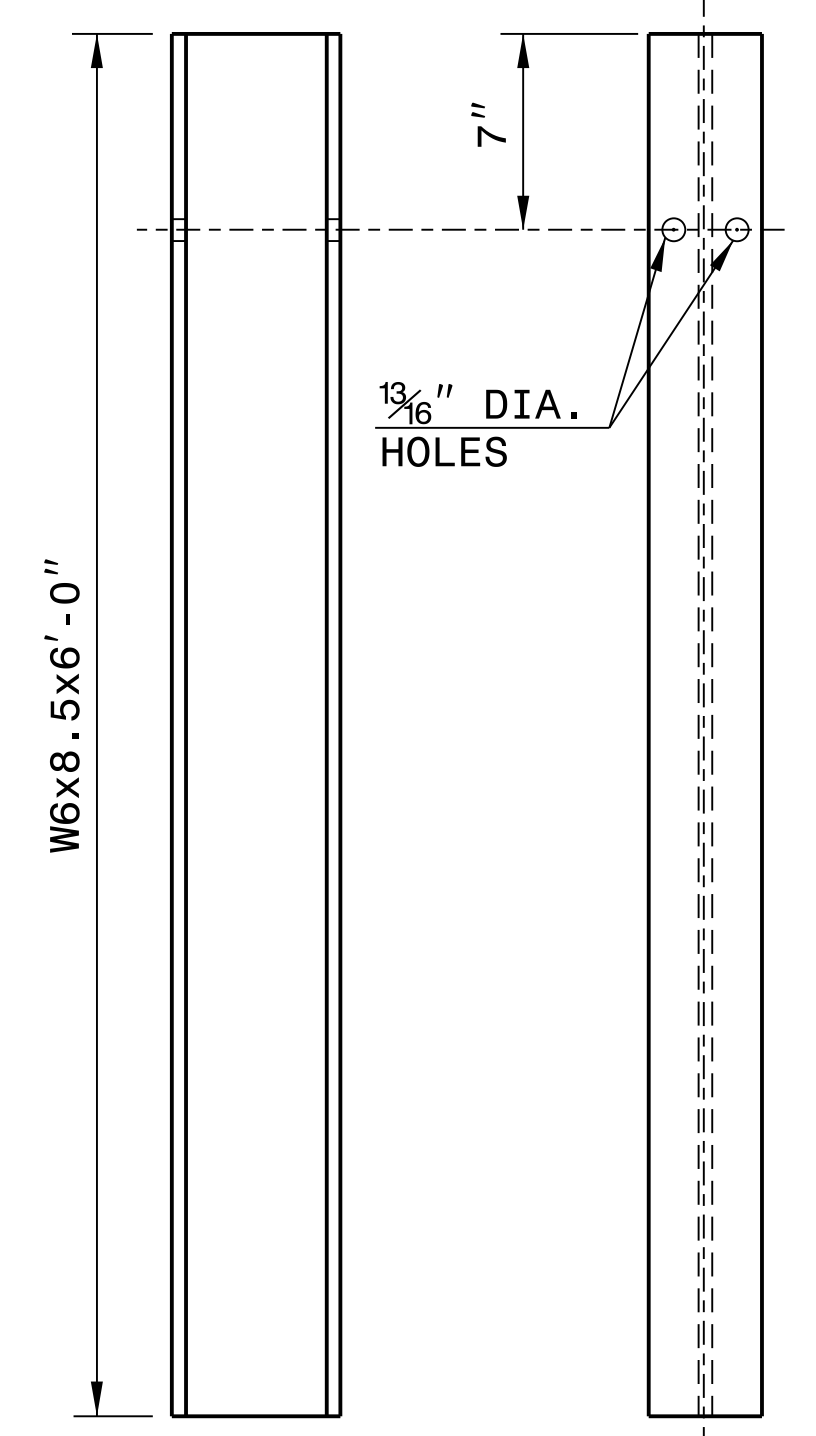


**PLAN**

**SIDE**

**FRONT**

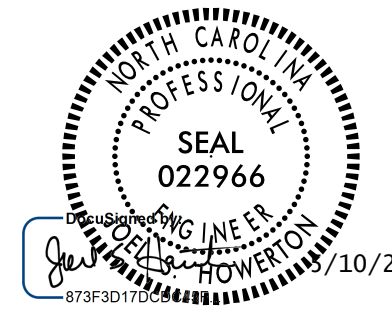
**ROUTED  
OFFSET BLOCK**



**SIDE**

**FRONT**

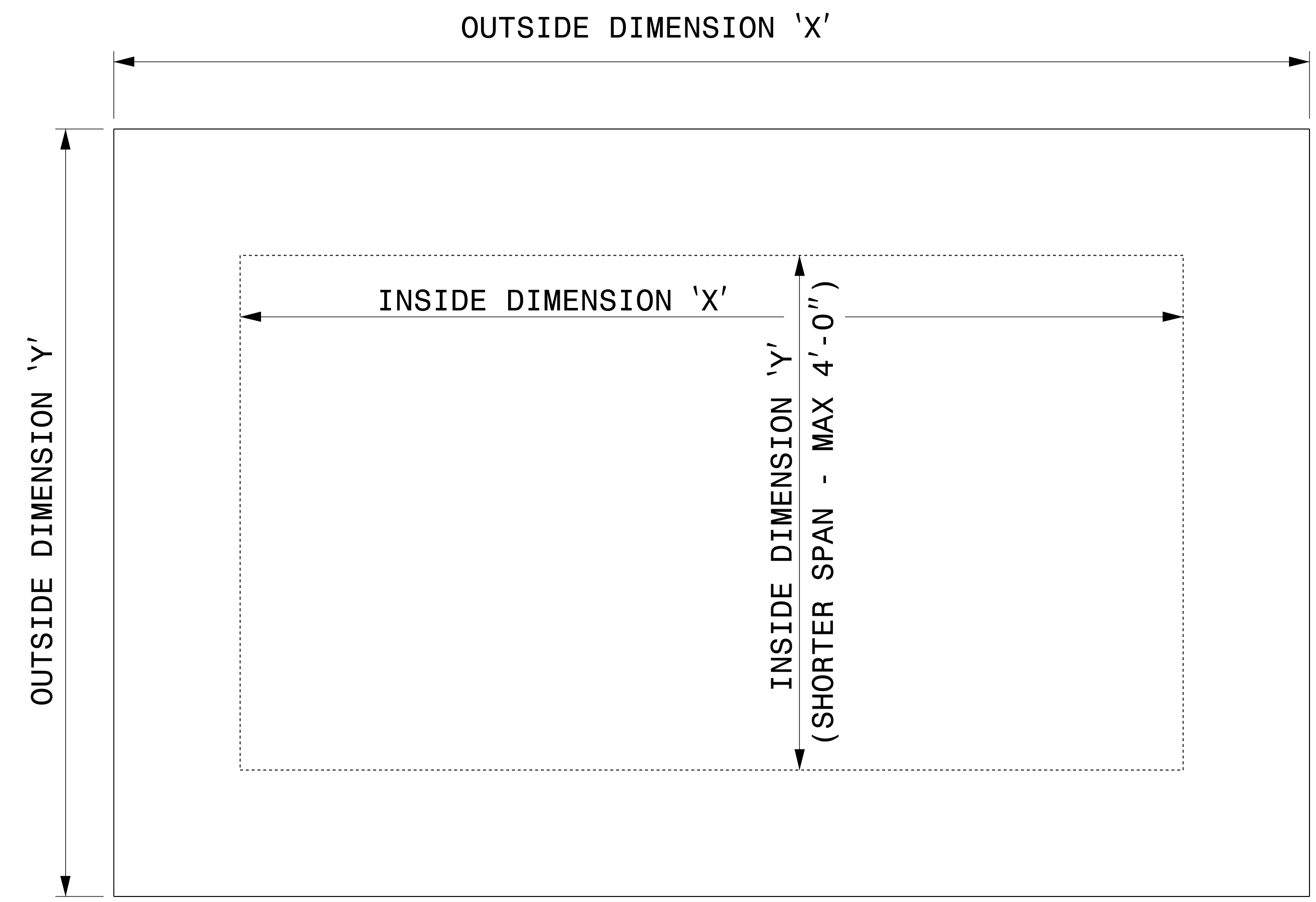
**"W6" STEEL POST**



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

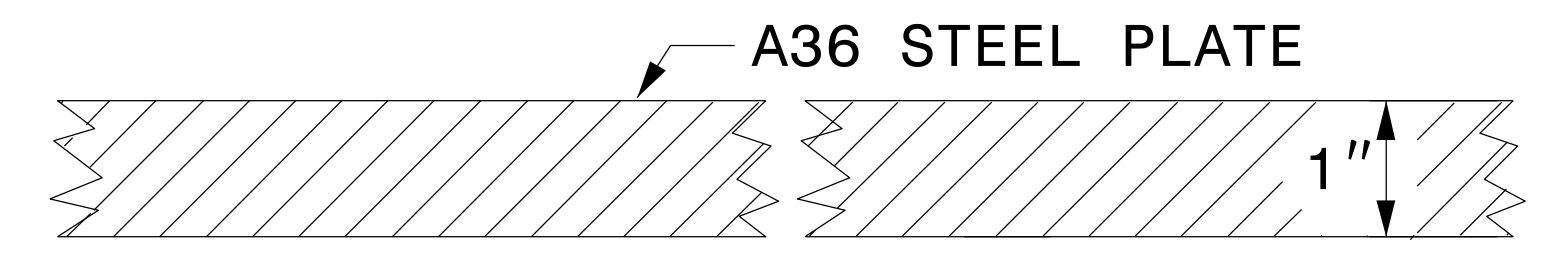
**SEE TITLE BLOCK**

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



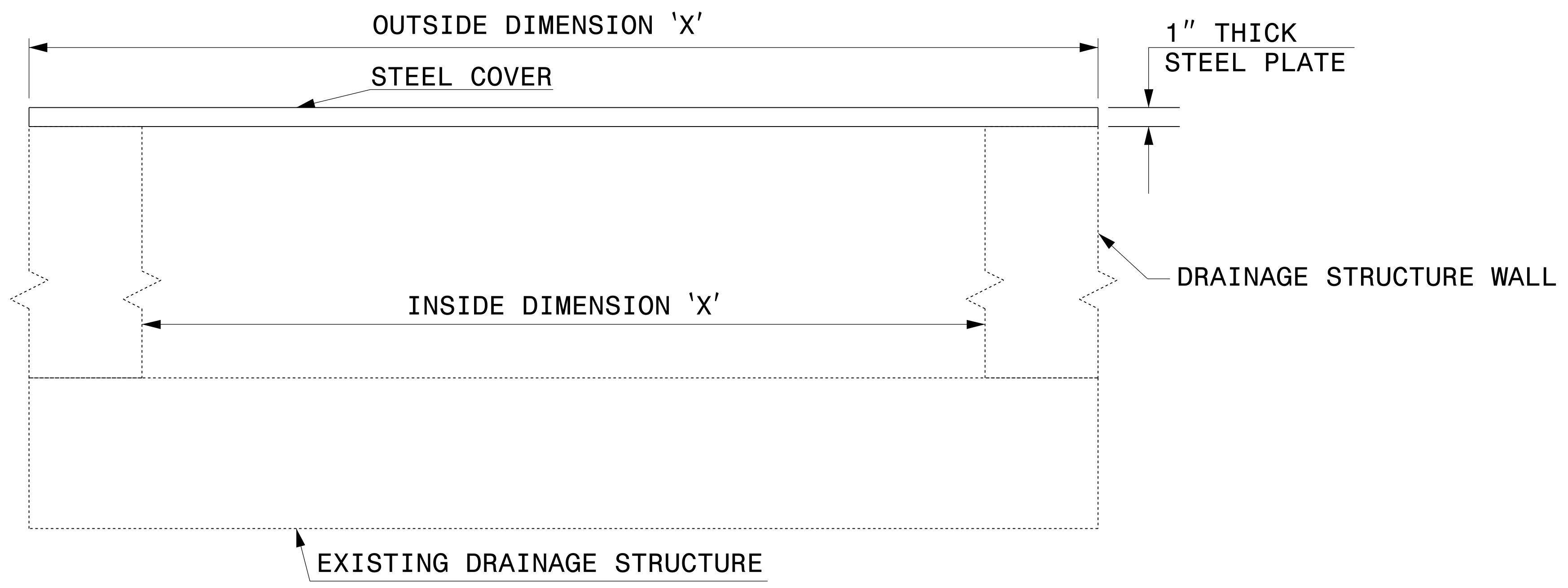
GENERAL NOTES:

- USE GRADE A36 STEEL
- STEEL COVERS ARE FOR TEMPORARY USE DURING PHASE CONSTRUCTION.
- FILL SHALL BE PLACED DIRECTLY OVER THE STEEL PLATES.
- SEE ROADWAY PLANS AND PROVISIONS FOR LOCATIONS
- QUANTITIES TO BE PAID FOR AT THE UNIT PRICE BID PER EACH.

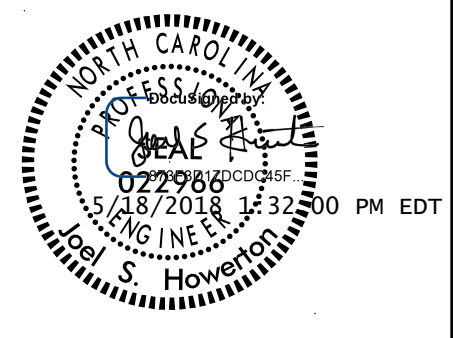


SECTION VIEW OF STEEL TOP PLATE

PLAN VIEWS



ELEVATION VIEWS



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

**DETAIL OF TEMPORARY 1" STEEL COVER OVER DRAINAGE STRUCTURE**

ORIGINAL BY: E.E. WARD DATE: 2-2-98  
 MODIFIED BY: DATE: \_\_\_\_\_  
 CHECKED BY: DATE: \_\_\_\_\_  
 FILE SPEC.: eric/usr/details/metric/stand/st1cvr2.dgn

\$\$\$\$\$TIME\$\$\$\$\$  
\$\$\$\$\$USER\$\$\$\$\$









RALCND7184WV

COMPUTED BY: KMS DATE: 09122017
CHECKED BY: TJC DATE: 02282018

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO. SHEET NO.
B-5351 3D-1

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout. See "Standard Specifications For Roads and Structures, Section 300-5".

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & UNDER)

Table with columns for LINE & STATION, OFFSET, STRUCTURE NUMBER, INVERT ELEVATION, MINIMUM REQUIRED SLOPE, Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC), C. S. PIPE, R. C. PIPE CLASS IV, ENDWALLS, REINFORCED ENDWALLS, QUANTITIES FOR DRAINAGE STRUCTURES, FRAME, GRATES, AND HOOD, CONCRETE TRANSITIONAL SECTION, and REMARKS. Includes a SHEET TOTALS row at the bottom.





COMPUTED BY: Geotech DATE: \_\_\_\_\_  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

(1-16-18)

PROJECT NO.	SHEET NO.
B-5351	3G-1

**STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS**

**SUMMARY OF SUBSURFACE DRAINAGE**

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
-L-	24+50	28+50	LT to RT	SD	400
CONTINGENCY					
				<b>TOTAL LF:</b>	400

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

**SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION**

LINE	Station	Station	Aggregate Type* ASU/AST	Aggregate Thickness INCHES	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Soil Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY					250	500	200		
			<b>TOTAL CY/TONS/SY:</b>		250	500**	200**	0	0

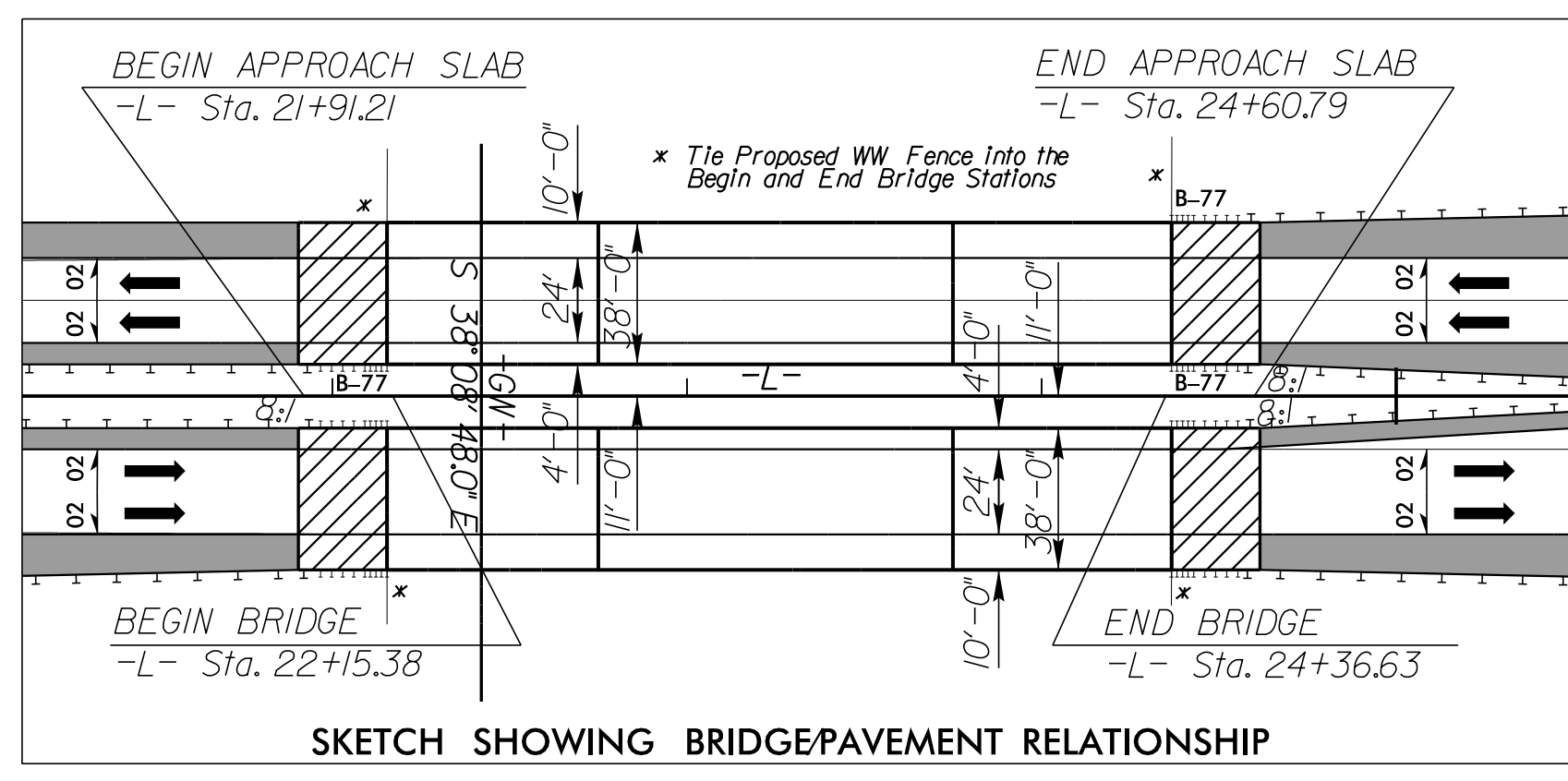
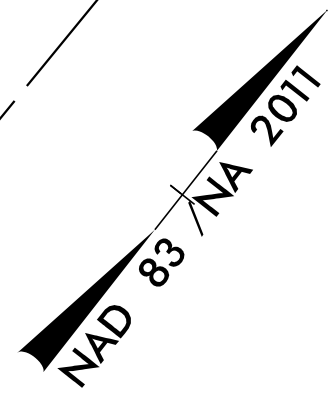
\*ASU = Aggregate Subgrade  
 \*AST = Aggregate Stabilization  
 \*\*Total tons of "Class IV Subgrade Stabilization" and total square yards of "Geotextile for Soil Stabilization" are only the estimated quantities for ASU/AST and may only represent a portion of the subgrade stabilization and geotextile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



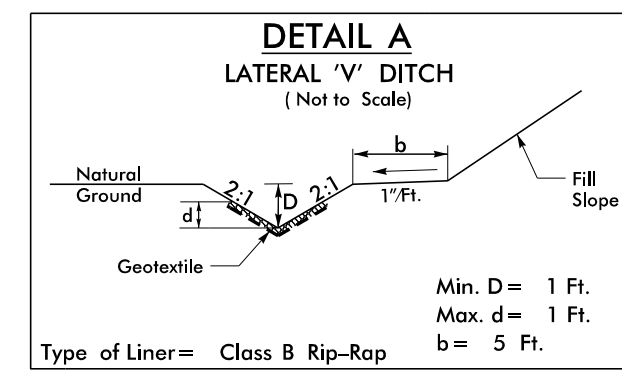
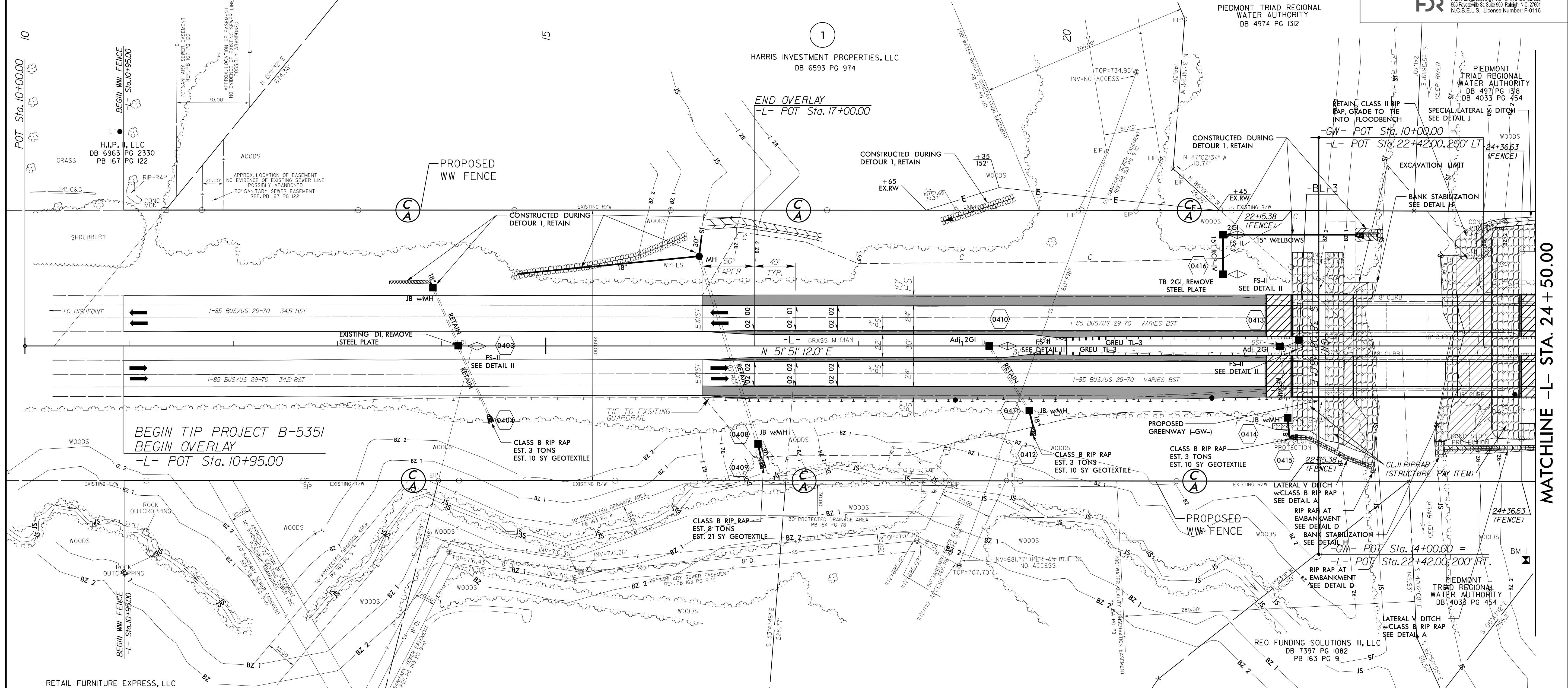


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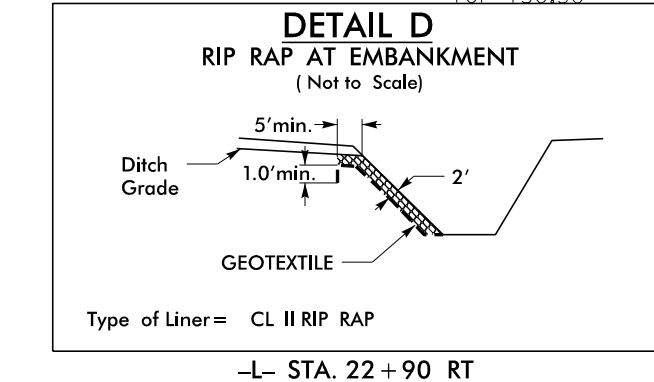
PROPOSED DRAINAGE FEATURES CONSTRUCTED DURING DETOUR 1 & 2 WILL BE RETAINED. ALL DRAINAGE FEATURES LABELED AS TEMPORARY SHOULD BE REMOVED AFTER DETOUR REMOVAL



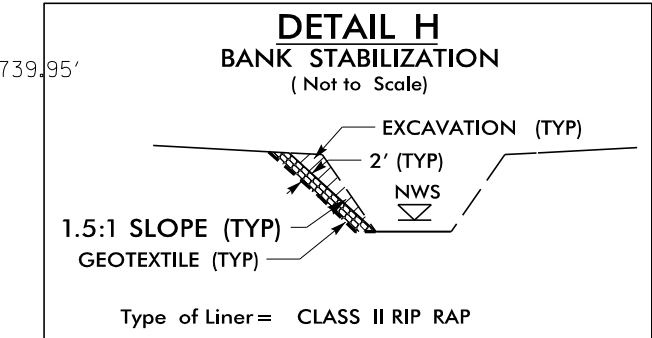
PROJECT REFERENCE NO. B-5351		SHEET NO. 4	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		SEAL 22606	
MOTT MACDONALD & E, LLC LICENSE NO. F-0669		SEAL 34364	
MOTT MACDONALD & E, LLC LICENSE NO. F-0669		HDR ENGINEERING LICENSE NO. F-0116	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
Prepared in the Office of:			
MOTT MACDONALD		MOTT MACDONALD & E, LLC Fuquay-Varina, NC 27526 www.mottmac.com/aminco	
HDR Engineering, Inc. of the Carolinas 255 Fayetteville St., Suite 900, Raleigh, NC 27601 N.C.B.E.L.S. License Number: F-0116		HDR ENGINEERING Fuquay-Varina, NC 27526 www.mottmac.com/aminco	



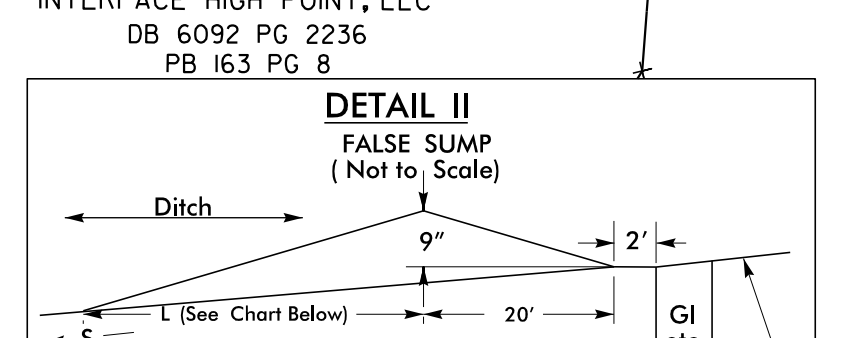
Type of Liner = Class B Rip-Rap  
Min. D = 1 Ft.  
Max. d = 1 Ft.  
b = 5 Ft.



Type of Liner = CL II RIP RAP  
EST. 10 TONS CL II RIP RAP, EST. 15 SY GEOTEXTILE  
-L- STA. 22+90 RT  
-L- STA. 23+62 TO STA. 24+65 RT.  
EST. 20 TONS CL II RIP RAP, EST. 35 SY GEOTEXTILE

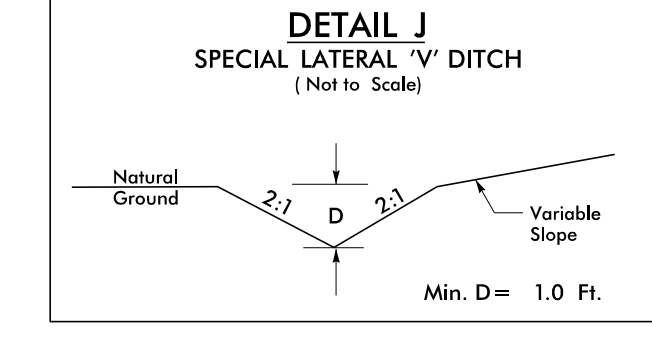


Type of Liner = CLASS II RIP RAP  
-L- STA. 22+90, EST. 485 CY EXCAVATION  
EST. 750 TONS CL II RIP RAP  
EST. 475 SY GEOTEXTILE  
-L- STA. 23+75  
EST. 500 CY EXCAVATION  
EST. 710 TONS CL II RIP RAP  
EST. 750 SY GEOTEXTILE



S = Ditch Slope	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

-L- FROM STA. 14+18 MED.  
-L- FROM STA. 19+28 MED.  
-L- FROM STA. 22+19 MED.



Min. D = 1.0 Ft.  
FROM -L- STA. 24+00 TO STA. 25+73

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17/13/17

MATCHLINE -L- STA. 24 + 50.00

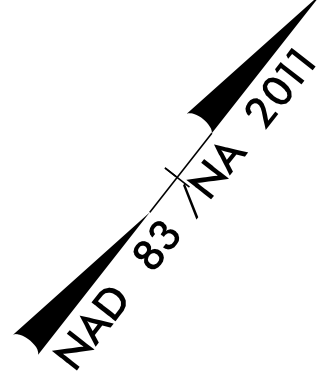
SEE SHEET 6 FOR -L- PROFILE



8/17/19

PROPOSED DRAINAGE FEATURES CONSTRUCTED DURING DETOUR 1 & 2 WILL BE RETAINED, ALL DRAINAGE FEATURES LABELED AS TEMPORARY SHOULD BE REMOVED AFTER DETOUR REMOVAL

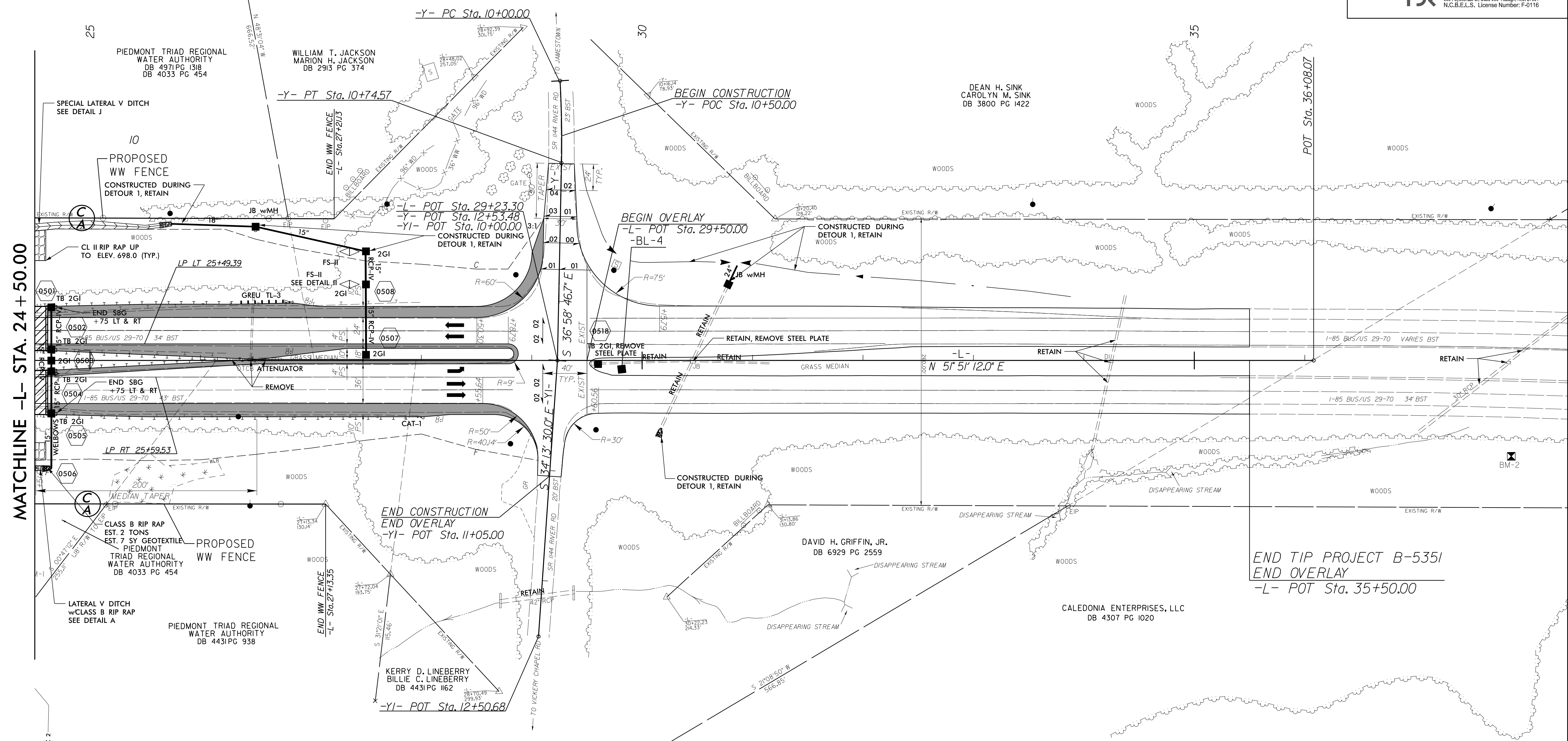
-Y-  
 PI Sta 10+37.30  
 $\Delta = 4' 16'' 22.0''$  (RT)  
 $D = 5' 43'' 46.5''$   
 $L = 74.57'$   
 $T = 37.30'$   
 $R = 1,000.00'$



TRAFFIC DIAGRAM

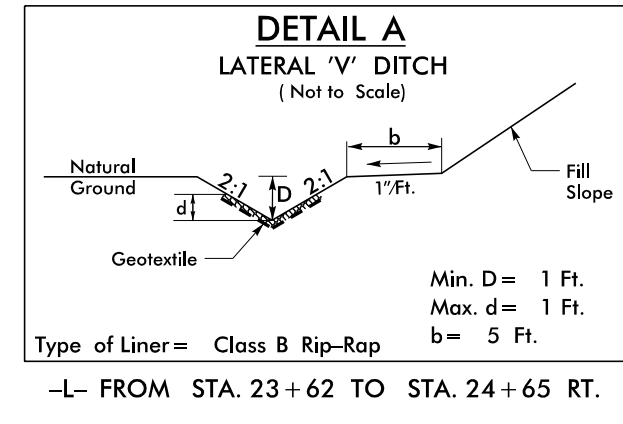
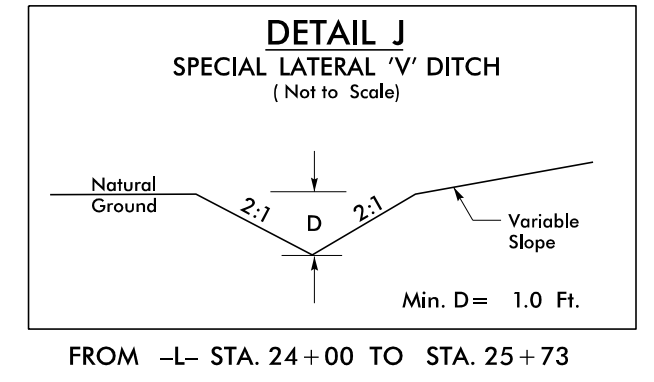
		3,600	ADT 2018
		5,300	ADT 2038
	SR 1144 RIVER RD		
900		2,500	
1,700		4,000	
	US 29/70		
34,500	I-85 BUS.	125	35,900
42,900		220	44,100
		25	
		120	
	SR 1144 RIVER RD		
		310	
		710	

PROJECT REFERENCE NO. B-5351	SHEET NO. 5
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DAVID L. GIVENS 7/18/2018 10:47 AM EDT MOTT MACDONALD 18 & E, LLC LICENSE NO. F-0669	WILLIAM H. GIVENS 7/15/2018 11:01 AM EDT HDR ENGINEERING LICENSE NO. F-0116
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
Prepared in the Office of:	M MOTT MACDONALD PO Box 700 Fuquay-Varina, NC 27526 www.mottmac.com/america



MATCHLINE -L- STA. 24 + 50.00

END TIP PROJECT B-5351  
 END OVERLAY  
 -L- POT Sta. 35+50.00



**DETAIL II**  
 FALSE SUMP  
 (Not to Scale)

Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

S = Ditch Slope  
 L = (See Chart Below)  
 C = Proposed Ditch

-L- FROM STA. 14+18 MED.  
 -L- FROM STA. 19+28 MED.

SEE SHEET 7 FOR -L- PROFILE  
 SEE SHEET 9 FOR -Y- PROFILE

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 P:\B5351



5/28/19

BEGIN PROJECT  
BEGIN OVERLAY  
STA. 10+95.00

-L\_LT-

END OVERLAY  
BEGIN GRADE  
STA. 17+00.00  
EL = 726.24'

PI = 19+60.00  
EL = 714.42'  
VC = 520'  
K = 137

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE = 11122 CFS  
DESIGN FREQUENCY = 50 YRS  
DESIGN HW ELEVATION = 696.6 FT  
BASE DISCHARGE = 12390 CFS  
BASE FREQUENCY = 100 YRS  
BASE HW ELEVATION = 697.6 FT  
OVERTOPPING DISCHARGE = 38000 CFS  
OVERTOPPING FREQUENCY = 500+/- YRS  
OVERTOPPING ELEVATION = 710.6 FT

DATE OF SURVEY = 3-10-17

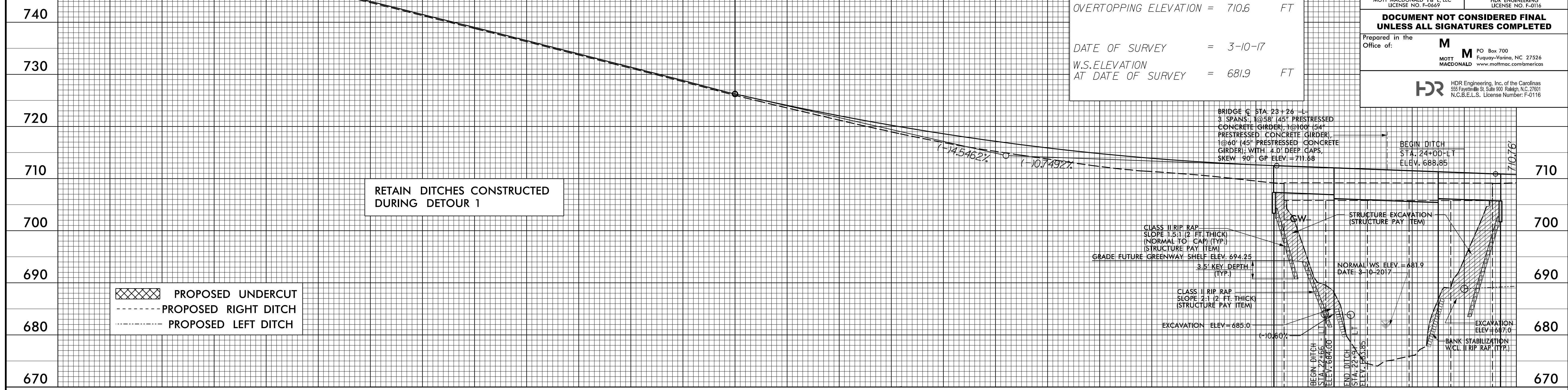
W.S. ELEVATION  
AT DATE OF SURVEY = 681.9 FT

PROJECT REFERENCE NO. B-5351	SHEET NO. 6
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
MOTT MACDONALD I & E, LLC LICENSE NO. F-0669	
HDR ENGINEERING LICENSE NO. F-0116	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
Prepared in the Office of: <b>M</b>	
MOTT MACDONALD PO Box 700 Fuquay-Varina, NC 27526 www.mottmac.com/americas	
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	

BRIDGE C STA. 23+26 -L-  
3 SPANS: 1@58' (45° PRESTRESSED CONCRETE GIRDER), 1@100' (54° PRESTRESSED CONCRETE GIRDER), 1@60' (45° PRESTRESSED CONCRETE GIRDER); WITH 4.0' DEEP CAPS, SKEW 90° GP ELEV = 711.68

BEGIN DITCH  
STA. 24+00-RT  
ELEV. 688.85

710.75



BEGIN PROJECT  
BEGIN OVERLAY  
STA. 10+95.00

-L\_RT-

END OVERLAY  
BEGIN GRADE  
STA. 17+00.00  
EL = 726.07'

PI = 19+60.00  
EL = 714.42'  
VC = 520'  
K = 139

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE = 11122 CFS  
DESIGN FREQUENCY = 50 YRS  
DESIGN HW ELEVATION = 696.6 FT  
BASE DISCHARGE = 12390 CFS  
BASE FREQUENCY = 100 YRS  
BASE HW ELEVATION = 697.6 FT  
OVERTOPPING DISCHARGE = 38000 CFS  
OVERTOPPING FREQUENCY = 500+/- YRS  
OVERTOPPING ELEVATION = 710.6 FT

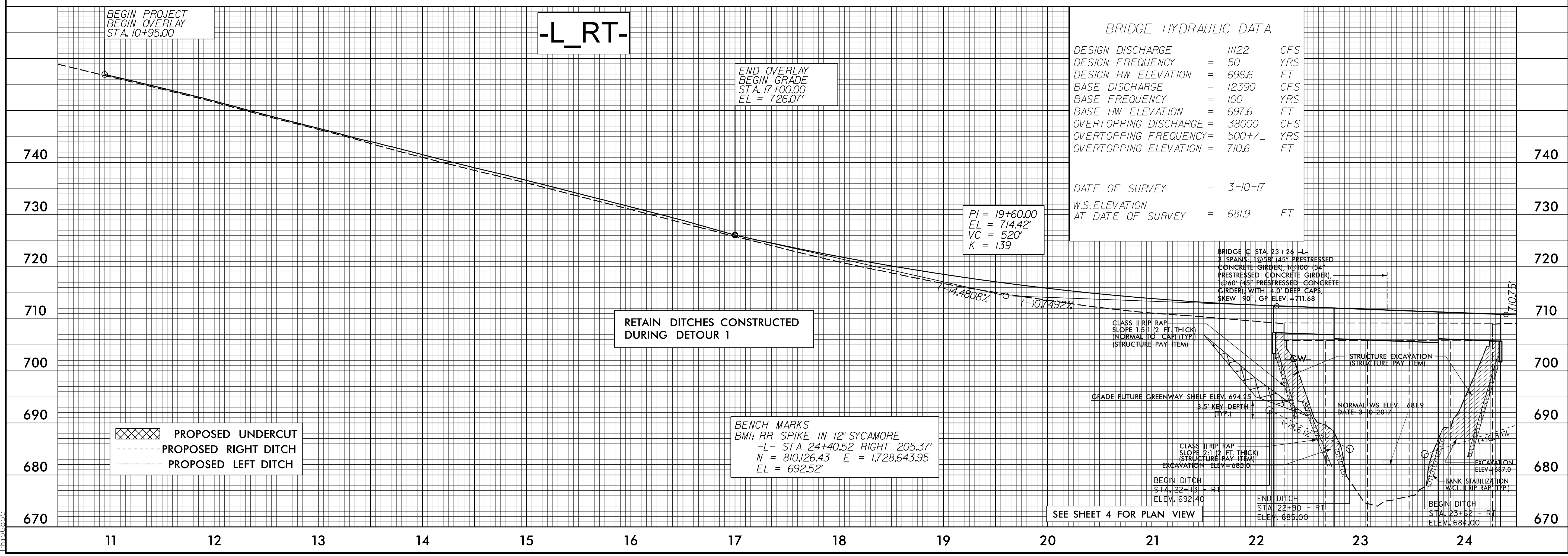
DATE OF SURVEY = 3-10-17

W.S. ELEVATION  
AT DATE OF SURVEY = 681.9 FT

BRIDGE C STA. 23+26 -L-  
3 SPANS: 1@58' (45° PRESTRESSED CONCRETE GIRDER), 1@100' (54° PRESTRESSED CONCRETE GIRDER), 1@60' (45° PRESTRESSED CONCRETE GIRDER); WITH 4.0' DEEP CAPS, SKEW 90° GP ELEV = 711.68

BEGIN DITCH  
STA. 23+90-RT  
ELEV. 685.00

710.75



BEGIN PROJECT  
BEGIN OVERLAY  
STA. 10+95.00

-L\_RT-

BENCH MARKS  
BMI: RR SPIKE IN 12" SYCAMORE  
-L- STA 24+40.52 RIGHT 205.37'  
N = 810,126.43 E = 1,728,643.95  
EL = 692.52'

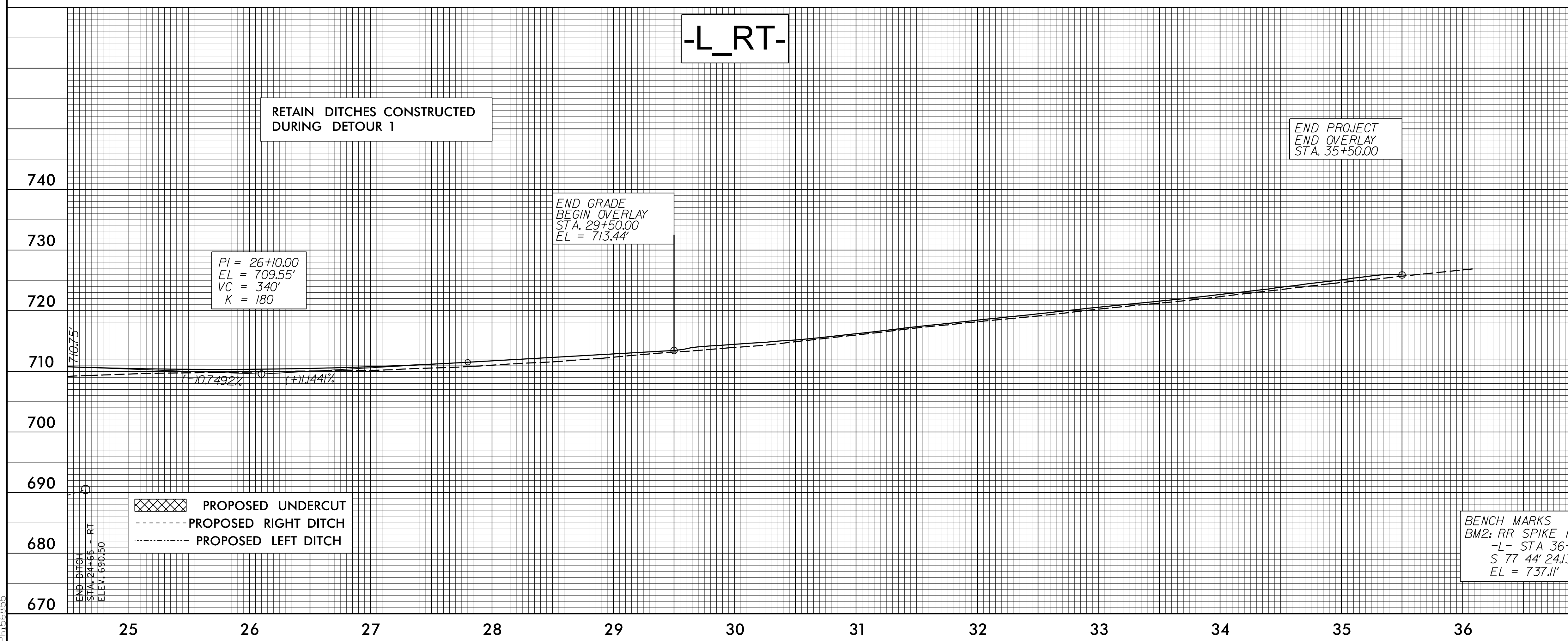
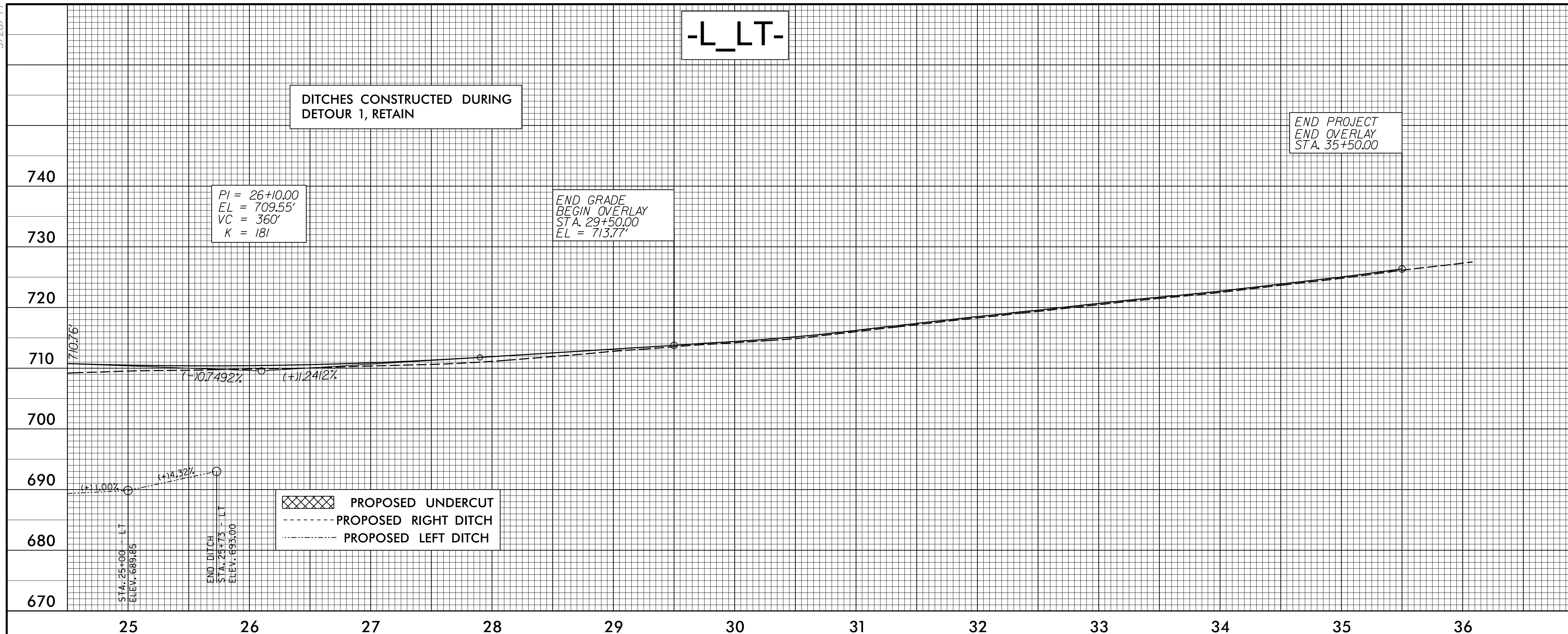
SEE SHEET 4 FOR PLAN VIEW

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5/28/99

PROJECT REFERENCE NO. B-5351	SHEET NO. 7
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER 
<p><b>DOCUMENT NOT CONSIDERED FINAL</b> <b>UNLESS ALL SIGNATURES COMPLETED</b></p> <p>Prepared in the Office of: <b>M</b> MOTT MACDONALD</p> <p>MOTT MACDONALD &amp; E, LLC Fayetteville, NC 27526 www.mottmac.com/americas</p> <p>HDR Engineering, Inc. of the Carolinas 555 Fayetteville St., Suite 800, Raleigh, N.C. 27601 N.C.E.L.S. License Number: F-0116</p>	

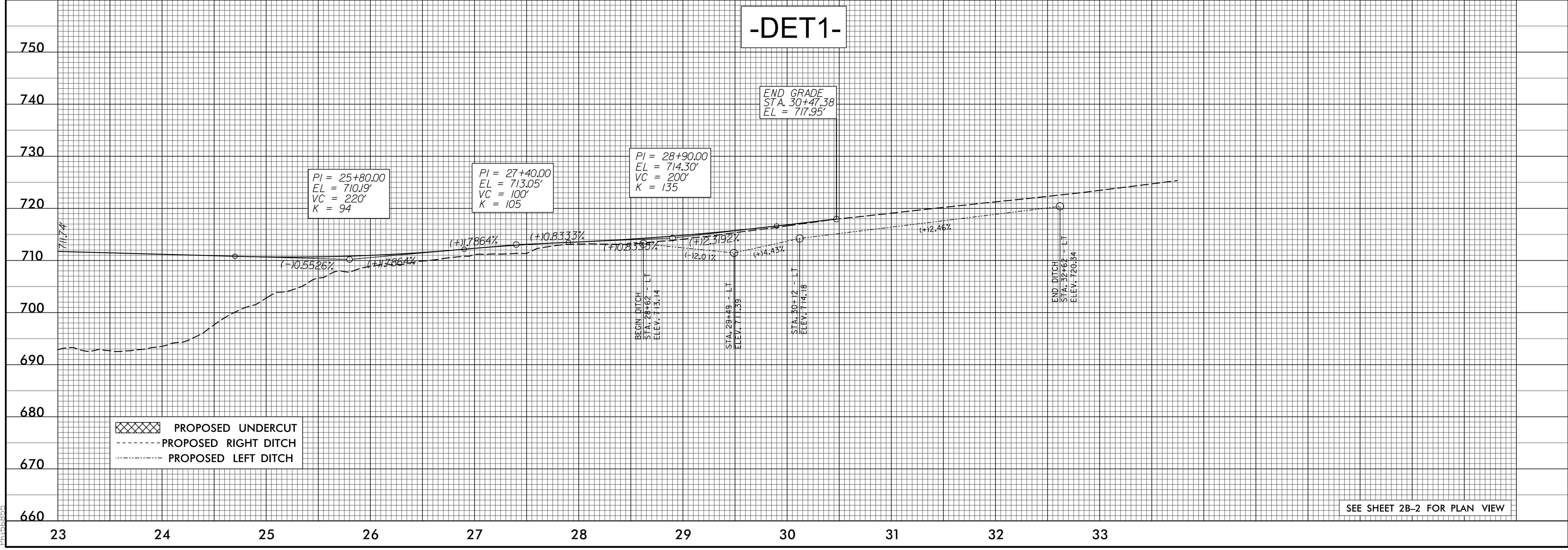
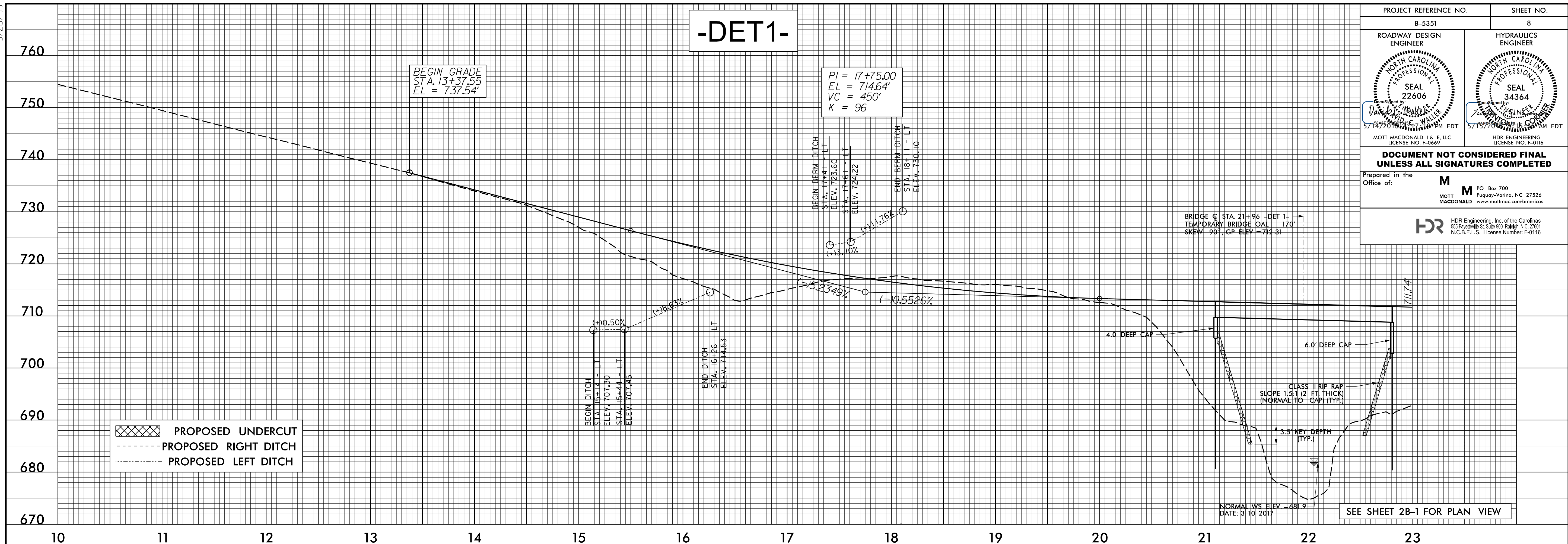


SEE SHEET 5 FOR PLAN VIEW

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5/28/17

PROJECT REFERENCE NO. B-5351		SHEET NO. 8	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
<p><b>DOCUMENT NOT CONSIDERED FINAL</b>  <b>UNLESS ALL SIGNATURES COMPLETED</b></p>			
Prepared in the Office of:			
		MOTT MACDONALD P.O. Box 700 Fuquay-Varina, NC 27526 www.mottmac.com/americas	



8/17/17 4:44 AM  
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P108.dgn

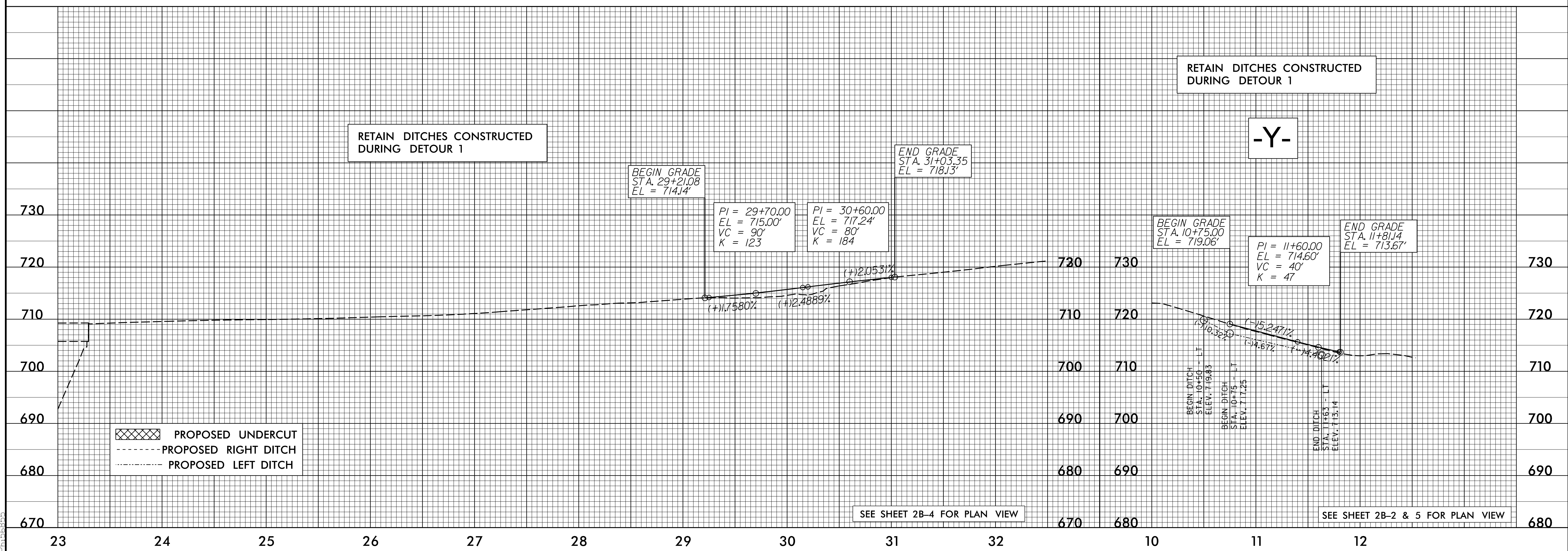
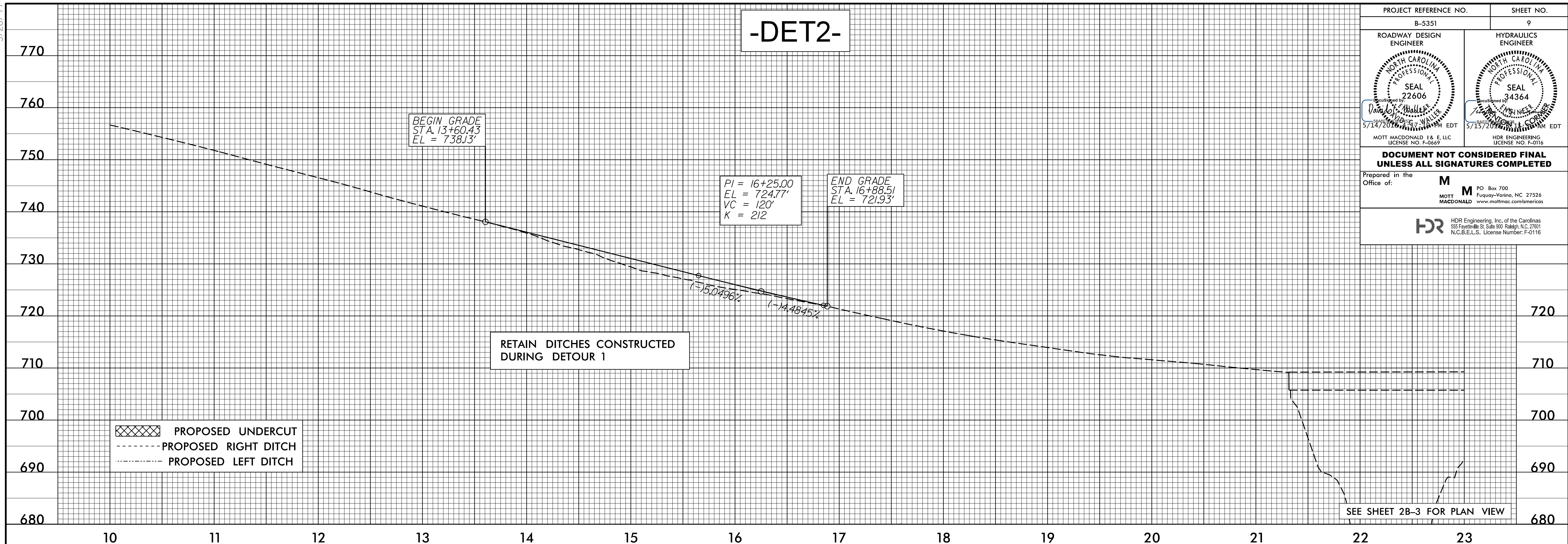
SEE SHEET 2B-1 FOR PLAN VIEW

SEE SHEET 2B-2 FOR PLAN VIEW



5/28/19

PROJECT REFERENCE NO. B-5351	SHEET NO. 9
ROADWAY DESIGN ENGINEER MOTT MACDONALD 1 & E, LLC LICENSE NO. F-0669	HYDRAULICS ENGINEER MOTT MACDONALD 1 & E, LLC LICENSE NO. F-0116
<p><b>DOCUMENT NOT CONSIDERED FINAL</b> <b>UNLESS ALL SIGNATURES COMPLETED</b></p>	
<p>Prepared in the Office of: <b>M</b> MOTT MACDONALD 1 &amp; E, LLC PO Box 700 Fayetteville, NC 27526 www.mottmac.com/americas</p>	
<p>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</p>	



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