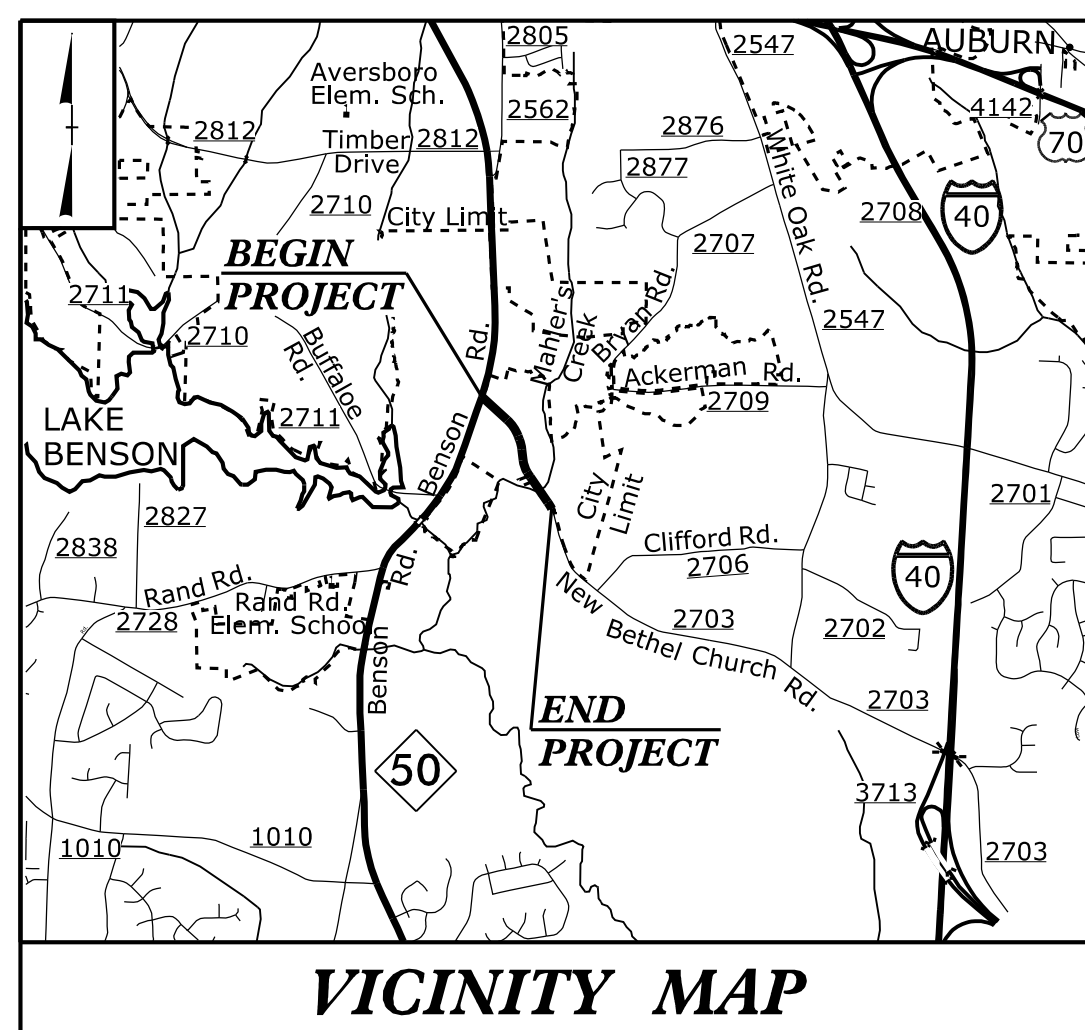


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and sealed by the individuals whose names and license  
numbers appear on each page, on the dates appearing  
with their signature on that page.**

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

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



STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**WAKE COUNTY**

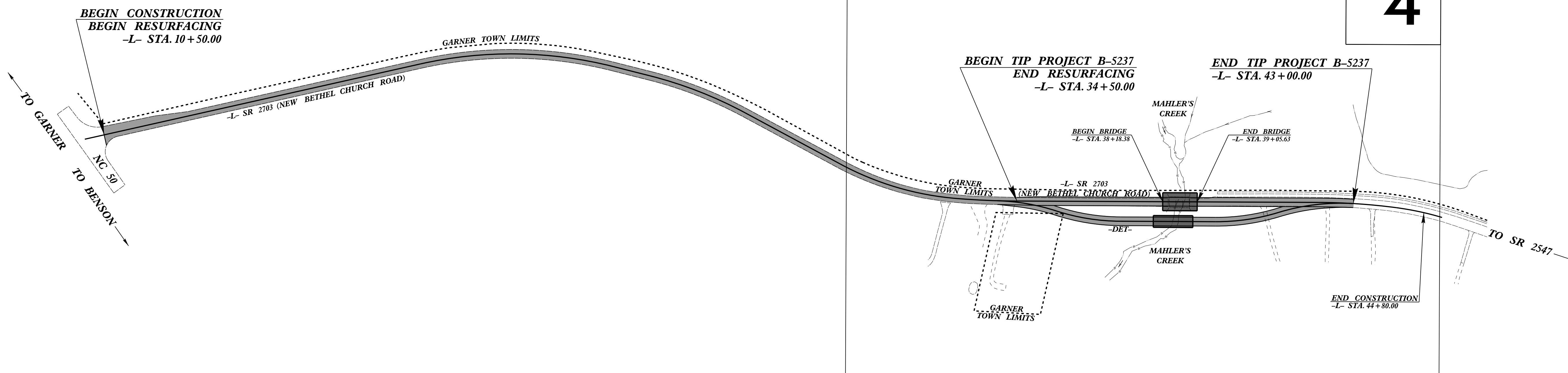
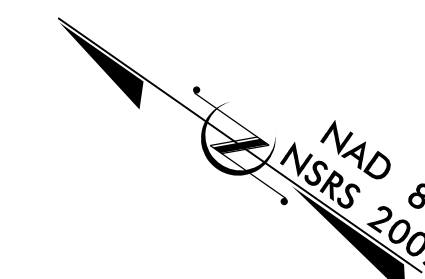
**LOCATION: BRIDGE NO. 248 OVER MAHLER'S CREEK  
ON SR 2703 (NEW BETHEL CHURCH ROAD)**

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	<b>B-5237</b>	<b>1</b>	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
42838.1.1	BRZ-2703(1)	PE	
42838.2.1		RW & UTILITY	
42838.3.1	BRZ-2703(1)	CONST	

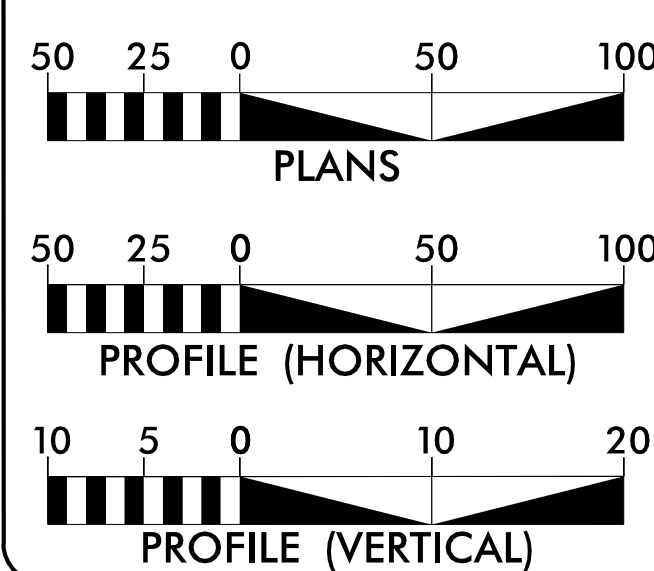
**TIP PROJECT: B-5237**

**CONTRACT: C204112**



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

**GRAPHIC SCALES**



**DESIGN DATA**

ADT 2018 = 4650  
ADT 2038 = 9065  
K = 10 %  
D = 60 %  
T = 4 % \*  
V = 40 MPH  
\*(TTST = 1% + DUAL = 3%)  
FUNC CLASS =  
LOCAL  
SUBREGIONAL TIER

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT B-5237 = 0.144 MILES  
LENGTH STRUCTURE TIP PROJECT B-5237 = 0.017 MILES  
TOTAL LENGTH TIP PROJECT B-5237 = 0.161 MILES

Prepared for NCDOT in the Office of:  
**Mead&Hunt**  
133 Fayetteville Street, Suite 210  
Raleigh, North Carolina 27601  
919-714-8670 | meadhunt.com  
NC License No. F-1235

2018 STANDARD SPECIFICATIONS

**RIGHT OF WAY DATE:**  
AUGUST 22, 2017

**LETTING DATE:**  
JUNE 19, 2018

**RICK DECOLA, PE**  
PROJECT ENGINEER

**DAVID STUTTS, PE**  
NCDOT CONTACT

**HYDRAULICS ENGINEER**

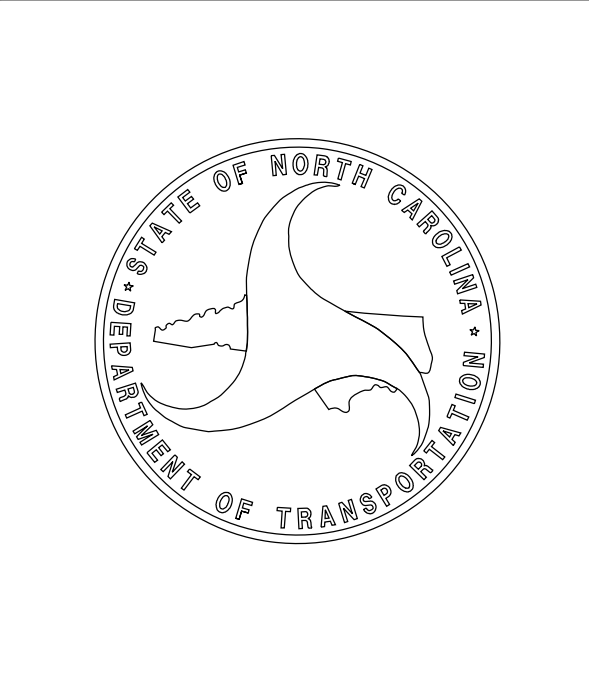
DocuSigned by:  
*Roger Weaden*  
3/15/2018

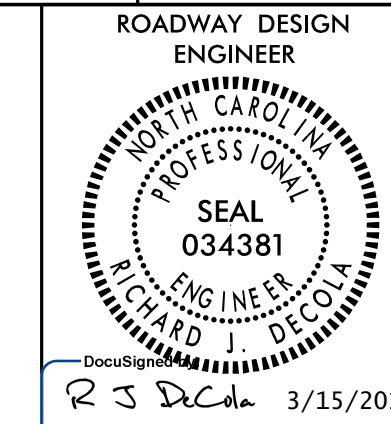
SIGNATURE:

**ROADWAY DESIGN ENGINEER**

DocuSigned by:  
*R J Decola*  
3/15/2018

SIGNATURE:





**DOCUMENT NOT CONSIDERED FINAL  
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SHEET NUMBER	INDEX OF SHEETS SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
1C-1	SURVEY CONTROL SHEET
1E-1	RIGHT OF WAY CONTROL SHEET
2A-1 THRU 2A-2	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2B-1	TEMPORARY DETOUR PLAN SHEET
2C-1	GUARDRAIL INSTALLATION DETAIL
2C-2	STRUCTURE ANCHOR UNIT DETAILS
2G-1	STANDARD TEMPORARY SHORING DETAIL
3B-1	EARTHWORK, PAVEMENT REMOVAL, SHOULDER BERM GUTTER, AND GUARDRAIL SUMMARIES
3D-1	DRAINAGE SUMMARY
4	PLAN SHEET
5	PROFILE SHEET
TMP-1 THRU TMP-6	TRAFFIC MANAGEMENT PLANS
PMP-1	PAVEMENT MARKING PLANS
EC-1 THRU EC-7	EROSION CONTROL PLANS
RF-1	REFORESTATION PLANS
SIGN-1	SIGNING PLANS
UC-1 THRU UC-5	UTILITIES CONSTRUCTION PLANS
UD-1 THRU UD-2	UTILITIES BY OTHERS PLANS
X-1A	CROSS-SECTION SUMMARY SHEET
X-1 THRU X-8	CROSS-SECTIONS
S-1 THRU S-21	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 III.

**SUPERELEVATION:**

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

**SHOULDER CONSTRUCTION:**

ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01.

**SIDE ROADS:**

THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.

**GUARDRAIL:**

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

**TEMPORARY SHORING:**

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC NOT SHOWN ON THE PLANS WILL BE PAID FOR AT THE CONTRACT PRICE FOR "TEMPORARY SHORING".

**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 PROGRESS, TOWN OF GARNER, CITY OF RALEIGH, TIME WARNER CABLE, AT&T, PSNC

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.

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
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Super-elevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 4 - MAJOR STRUCTURES	
422.02	Bridge Approach Fills - Type II Modified Approach Fill
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Super-elevated Curve - Method 1
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
840.00	Concrete Base Pad for Drainage Structures
840.01	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
840.29	Frames and Narrow Slot Flat Grates
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.46	Traffic Bearing Precast Drainage Structure
840.54	Manhole Frame and Cover
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
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap



# STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

## CONVENTIONAL PLAN SHEET SYMBOLS

12/2/2016

### BOUNDARIES AND PROPERTY:

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

### BUILDINGS AND OTHER CULTURE:

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

### HYDROLOGY:

Stream or Body of Water	-----
Hydro, Pool or Reservoir	□
Jurisdictional Stream	--- JS ---
Buffer Zone 1	--- BZ 1 ---
Buffer Zone 2	--- BZ 2 ---
Flow Arrow	←
Disappearing Stream	→
Spring	○
Wetland	--- WLB ---
Proposed Lateral, Tail, Head Ditch	--- FLOW ---
False Sump	▽

### RAILROADS:

Standard Gauge	-----
RR Signal Milepost	○ MILEPOST 35
Switch	□ SWITCH
RR Abandoned	-----
RR Dismantled	-----

### RIGHT OF WAY & PROJECT CONTROL:

Secondary Horiz and Vert Control Point	◆
Primary Horiz Control Point	○
Primary Horiz and Vert Control Point	◆
Exist Permanent Easement Pin and Cap	◇
New Permanent Easement Pin and Cap	◆
Vertical Benchmark	⊠
Existing Right of Way Marker	△
Existing Right of Way Line	-----
New Right of Way Line	○ R W
New Right of Way Line with Pin and Cap	○ R W ◆
New Right of Way Line with Concrete or Granite R/W Marker	△ R W
New Control of Access Line with Concrete C/A Marker	△ C/A
Existing Control of Access	△ C/A
New Control of Access	△ C/A
Existing Easement Line	--- E ---
New Temporary Construction Easement	--- E ---
New Temporary Drainage Easement	--- TDE ---
New Permanent Drainage Easement	--- PDE ---
New Permanent Drainage / Utility Easement	--- DUE ---
New Permanent Utility Easement	--- PUE ---
New Temporary Utility Easement	--- TUE ---
New Aerial Utility Easement	--- AUE ---

### ROADS AND RELATED FEATURES:

Existing Edge of Pavement	-----
Existing Curb	-----
Proposed Slope Stakes Cut	--- C ---
Proposed Slope Stakes Fill	--- F ---
Proposed Curb Ramp	--- CR ---
Existing Metal Guardrail	--- T ---
Proposed Guardrail	--- T ---
Existing Cable Guiderail	--- T ---
Proposed Cable Guiderail	--- T ---
Equality Symbol	⊕
Pavement Removal	⊠

### VEGETATION:

Single Tree	☀
Single Shrub	☁

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

Hedge	-----
Woods Line	-----
Orchard	☀ ☀ ☀ ☀
Vineyard	□ Vineyard

### EXISTING STRUCTURES:

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

### UTILITIES:

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

### TELEPHONE:

Existing Telephone Pole	●
Proposed Telephone Pole	○
Telephone Manhole	⊕
Telephone Pedestal	⊠
Telephone Cell Tower	⊠
U/G Telephone Cable Hand Hole	□
U/G Telephone Cable LOS B (S.U.E.*)	--- T ---
U/G Telephone Cable LOS C (S.U.E.*)	--- T ---
U/G Telephone Cable LOS D (S.U.E.*)	--- T ---
U/G Telephone Conduit LOS B (S.U.E.*)	--- TC ---
U/G Telephone Conduit LOS C (S.U.E.*)	--- TC ---
U/G Telephone Conduit LOS D (S.U.E.*)	--- TC ---
U/G Fiber Optics Cable LOS B (S.U.E.*)	--- T FO ---
U/G Fiber Optics Cable LOS C (S.U.E.*)	--- T FO ---
U/G Fiber Optics Cable LOS D (S.U.E.*)	--- T FO ---

### WATER:

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

### TV:

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

### GAS:

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

### SANITARY SEWER:

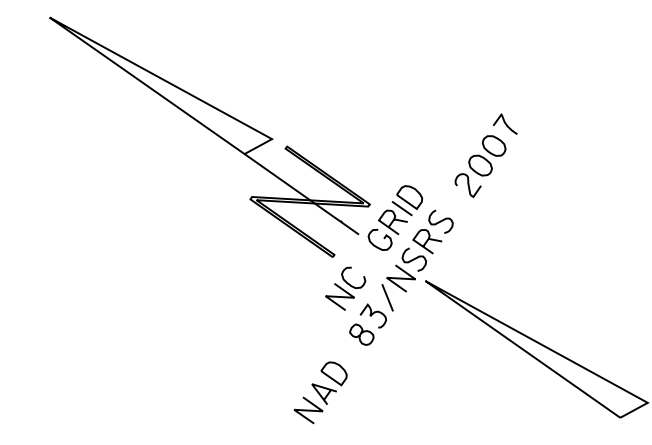
Sanitary Sewer Manhole	⊕
Sanitary Sewer Cleanout	⊕
U/G Sanitary Sewer Line	--- SS ---
Above Ground Sanitary Sewer	--- A/G Sanitary Sewer ---
SS Forced Main Line LOS B (S.U.E.*)	--- FSS ---
SS Forced Main Line LOS C (S.U.E.*)	--- FSS ---
SS Forced Main Line LOS D (S.U.E.*)	--- FSS ---

### MISCELLANEOUS:

Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	⊠
Utility Unknown U/G Line LOS B (S.U.E.*)	--- 7UTL ---
U/G Tank; Water, Gas, Oil	□
Underground Storage Tank, Approx. Loc.	⊠ UST
A/G Tank; Water, Gas, Oil	□
Geoenvironmental Boring	⊕
U/G Test Hole LOS A (S.U.E.*)	⊕
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.

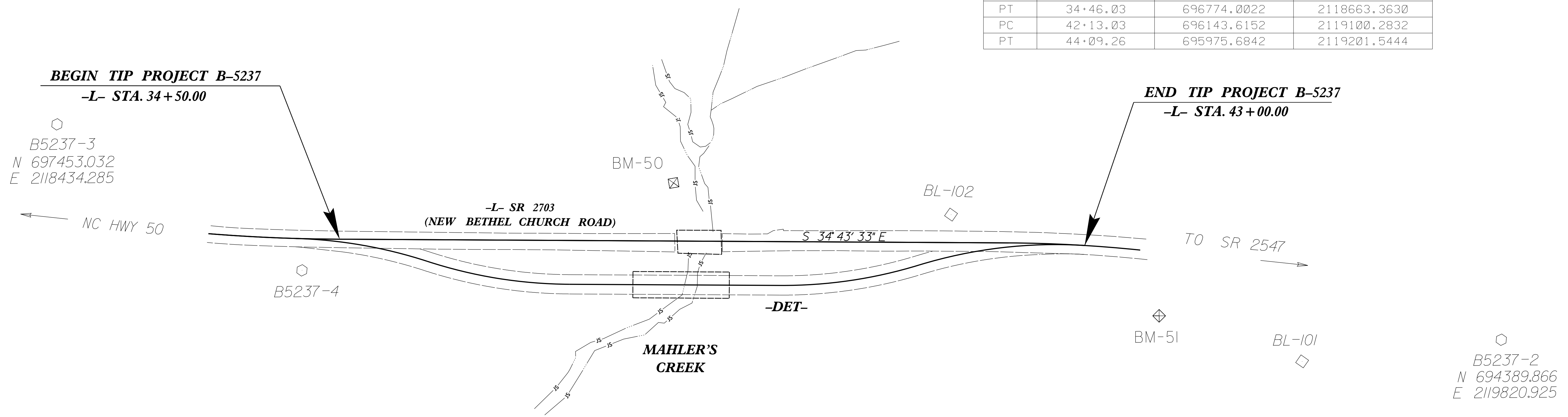
# SURVEY CONTROL SHEET B-5237

PROJECT REFERENCE NO.	SHEET NO.
B-5237	1C-1
Location and Surveys	



BASELINE POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
101	BL-101	695514.6844	2119372.2017	254.48'	OUTSIDE PROJECT LIMITS	
102	BL-102	696214.9004	2119087.4242	231.63'	41+47.12	30.04 LT
4	B5237-4	696796.7590	2118632.2020	246.89'	34+09.81	12.98 RT

TYPE	STATION	NORTH	EAST
POT	10+00.00	698790.1688	2117442.9562
PC	18+69.16	698204.5459	2118085.2100
PT	23+61.24	697801.3466	2118359.3787
PC	24+56.77	697712.0340	2118393.2866
PT	27+15.47	697461.3677	2118454.5374
PC	29+88.61	697190.0692	2118486.2786
PCC	33+00.00	696897.0060	2118584.7184
PT	34+46.03	696774.0022	2118663.3630
PC	42+13.03	696143.6152	2119100.2832
PT	44+09.26	695975.6842	2119201.5444



**BEGIN TIP PROJECT B-5237**  
**-L- STA. 34+50.00**

**END TIP PROJECT B-5237**  
**-L- STA. 43+00.00**

B5237-3  
 N 697453.032  
 E 2118434.285

B5237-2  
 N 694389.866  
 E 2119820.925

**BENCHMARKS**  
 \*\*\*\*\*  
 50            ELEVATION = 228.58  
 N 696496       E 2118937  
 L STATION 38+30.00    66' LEFT  
 RR SPIKE IN 12" ASH TREE  
 \*\*\*\*\*  
 \*\*\*\*\*  
 51            ELEVATION = 297.52  
 N 694778       E 2119545  
 L STATION 44+09.00  
 RR SPIKE IN 14" PINE TREE  
 S 13° 13' 38" E    756.58'  
 \*\*\*\*\*

**DATUM DESCRIPTION**

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "B5237-1" WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 693649.803(fft) EASTING: 2120669.063 (fft) ELEVATION: (fft)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99988927

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GRID DISTANCE FROM "B5237-1" TO -L- 34+50 IS S 32° 41' 52" E 3,708.64'

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

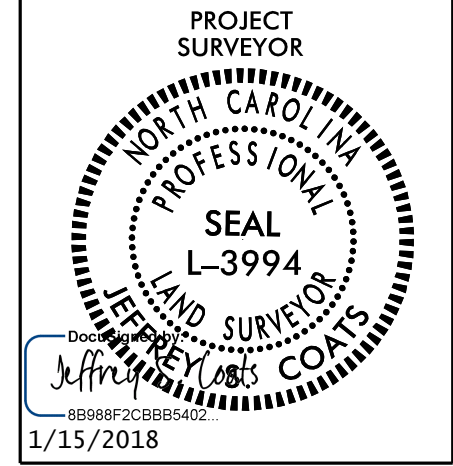
- NOTES:**
1. SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
- INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.  
 PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.  
 NETWORK ESTABLISHED FROM NGS ONLINE POSITIONING SERVICE (OPUS)

**GEOID G09NC**  
**NOTE: DRAWING NOT TO SCALE**

6/2/09  
 P:\DEC-2017\_09-48  
 R:\CADD\Projects\B5237-1s-1C.dgn  
 B5237-1C-1.dwg  
 12/11/2017 10:00 AM

# RIGHT OF WAY CONTROL SHEET B-5237

PROJECT REFERENCE NO. <b>B-5237</b>	SHEET NO. <b>1E-1</b>
Location and Surveys	



ROW MARKER REBAR AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
L	34+50.00	-29.89	696787.7644	2118690.1886
L	34+50.00	-60.00	696804.9181	2118714.9379
L	39+70.00	-60.00	696377.5367	2119011.1553
L	39+70.00	-29.40	696360.1058	2118986.0060
L	34+50.00	30.12	696753.5841	2118640.8733
L	34+50.00	45.00	696745.1049	2118628.6397
L	36+75.00	45.00	696560.1805	2118756.8105
L	37+75.00	70.00	696463.7505	2118793.2282
L	40+25.00	70.00	696258.2785	2118935.6405
L	41+25.00	50.00	696187.4827	2119009.0432
L	42+13.03	50.00	696115.1319	2119059.1894
L	43+00.00	30.00	696055.1032	2119122.2116

PERMANENT EASEMENT MARKER REBAR AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
L	40+66.00	-29.64	696281.3405	2119040.8885
L	40+40.00	-106.00	696346.2084	2119088.8375
L	40+87.00	-29.69	696264.1106	2119052.8941
L	40+60.00	-113.00	696333.7582	2119105.9837
L	30+66.50	30.50	697106.6546	2118469.5655
L	30+71.50	47.00	697097.8673	2118454.6406
L	35+73.00	108.00	696608.1252	2118646.9273
L	35+71.00	124.00	696600.6545	2118632.6378
L	35+91.50	126.50	696582.3817	2118642.2609
L	35+93.50	110.50	696589.8523	2118656.5504
L	38+84.50	111.50	696350.1133	2118821.4965
L	38+84.50	127.00	696341.2837	2118808.7572
L	39+05.00	127.00	696324.4350	2118820.4350
L	39+05.00	111.50	696333.2646	2118833.1743
L	44+80.00	64.50	695887.2543	2119171.3665
L	44+80.00	30.00	695900.2044	2119203.3437

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 5th day of October, 2017.

----- L-3994  
Professional Land Surveyor PLS #

**NOTES:**

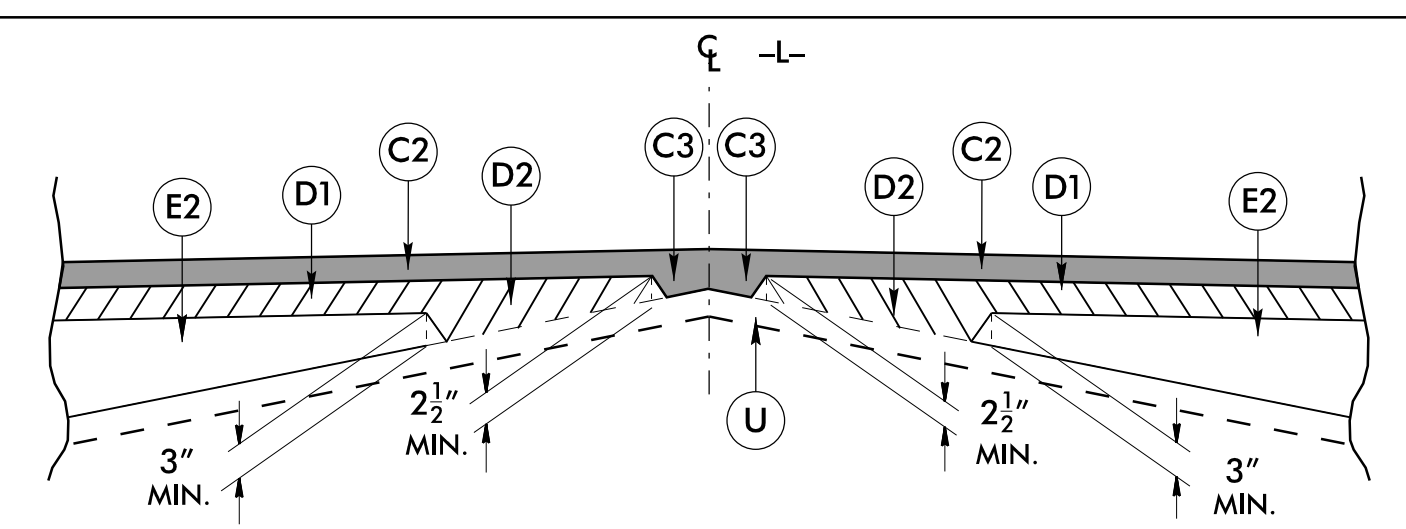
1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.



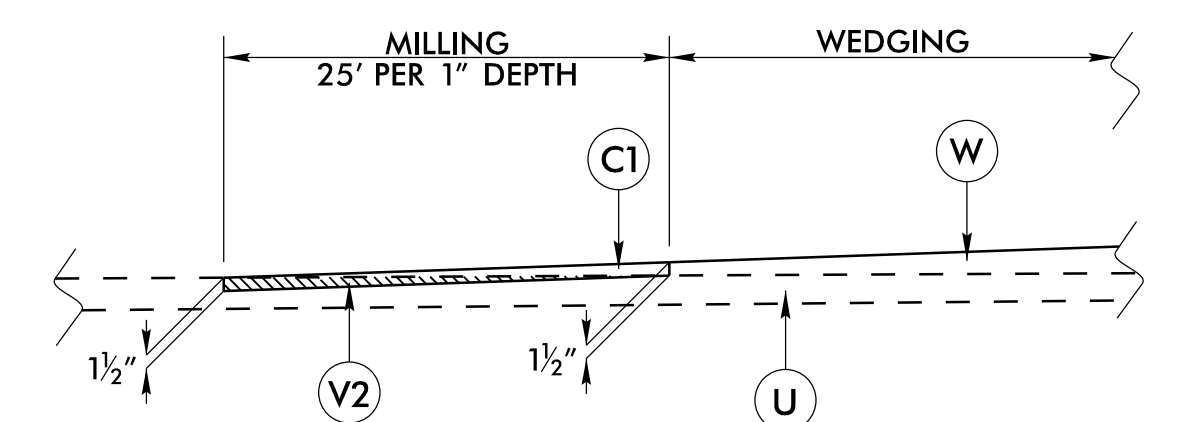
6/2/2018

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	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 2" IN DEPTH.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 2½" OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
J1	PROP. 8" AGGREGATE BASE COURSE
R1	2'-6" CONCRETE CURB AND GUTTER
R2	CONCRETE SHOULDER BERM GUTTER
S	4" CONCRETE SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V1	ASPHALT PAVEMENT MILLING 0" TO 3"
V2	INCIDENTAL MILLING
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL)

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

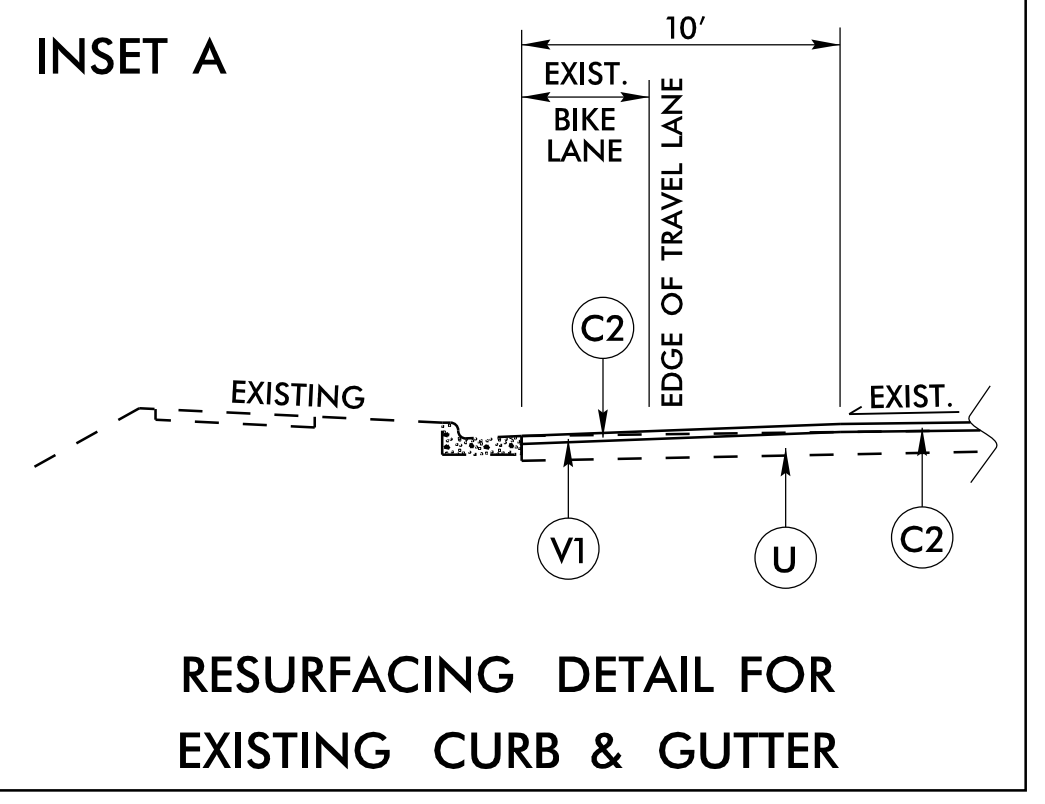


STANDARD WEDGING DETAIL

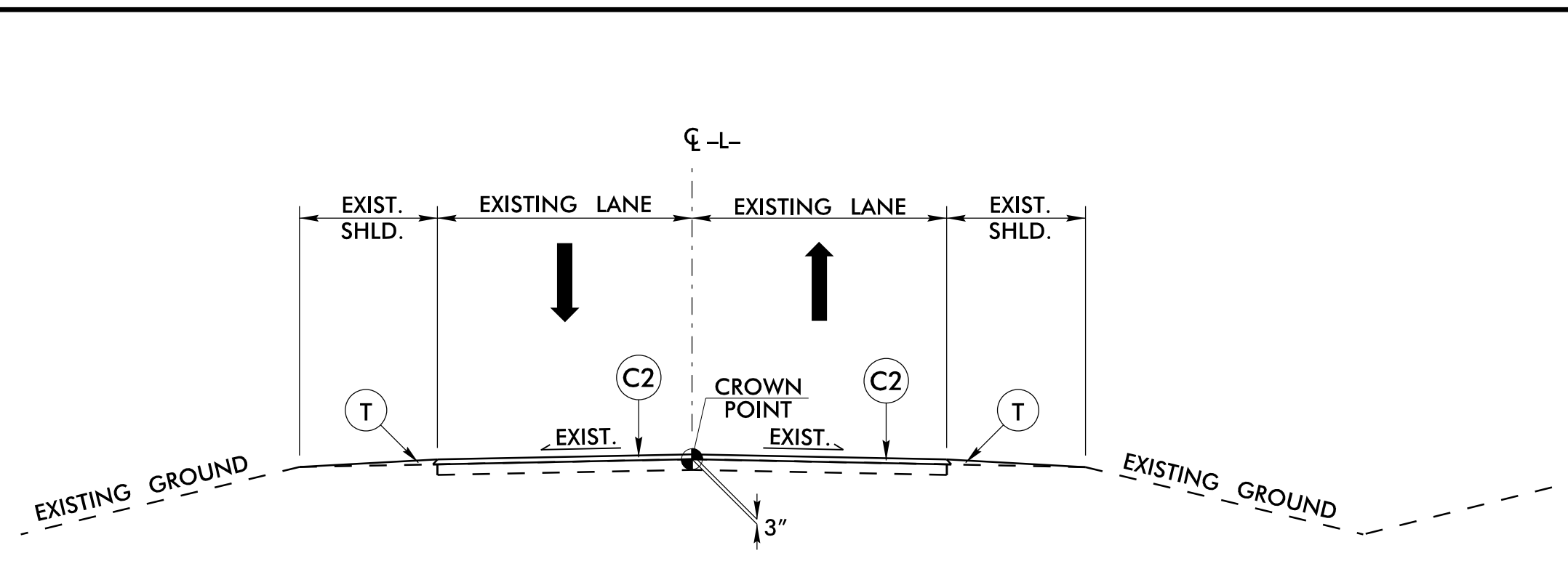


NOTE: FEATHER OUT THE FIRST 1½" LIFT OF SURFACE COURSE AND TIE THE SECOND 1½" LIFT INTO THE MILLED JOINT.

DETAIL OF MILLING AT PAVEMENT TIE-INS

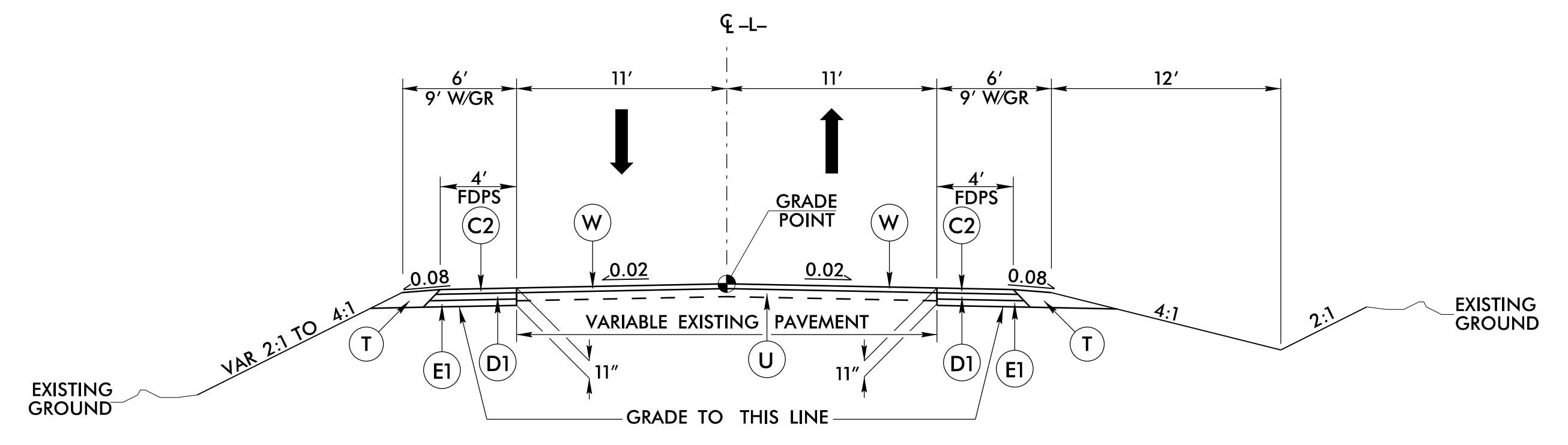


RESURFACING DETAIL FOR EXISTING CURB & GUTTER



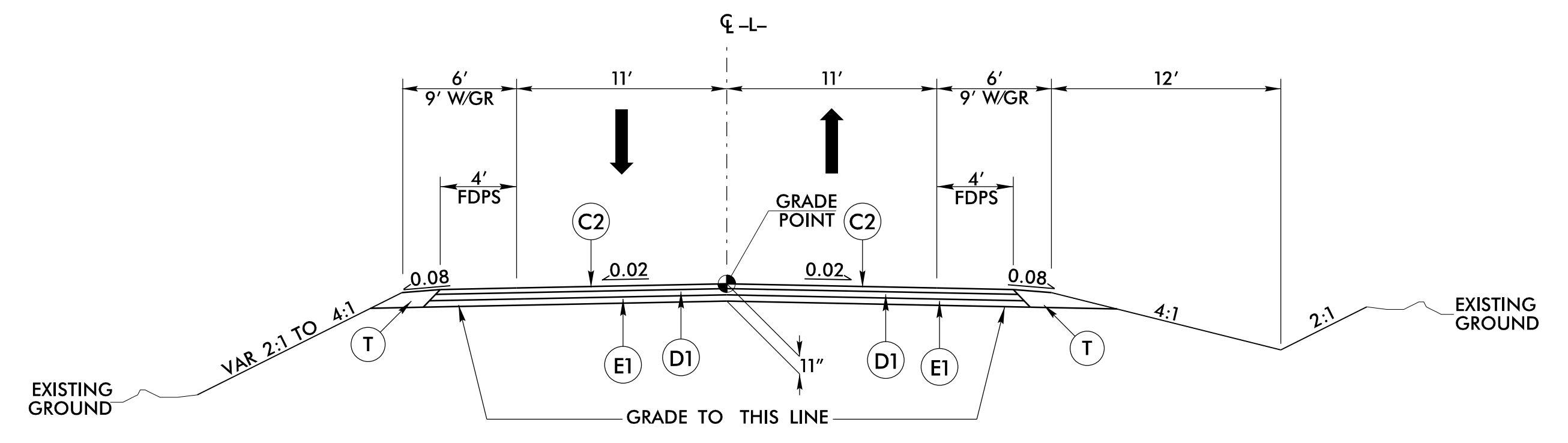
TYPICAL SECTION NO. 1  
RESURFACING DETAIL  
SEE INSET A FOR CURB & GUTTER SECTIONS

USE TYPICAL SECTION NO. 1  
-L- STA. 10+50.00 TO STA. 34+50.00



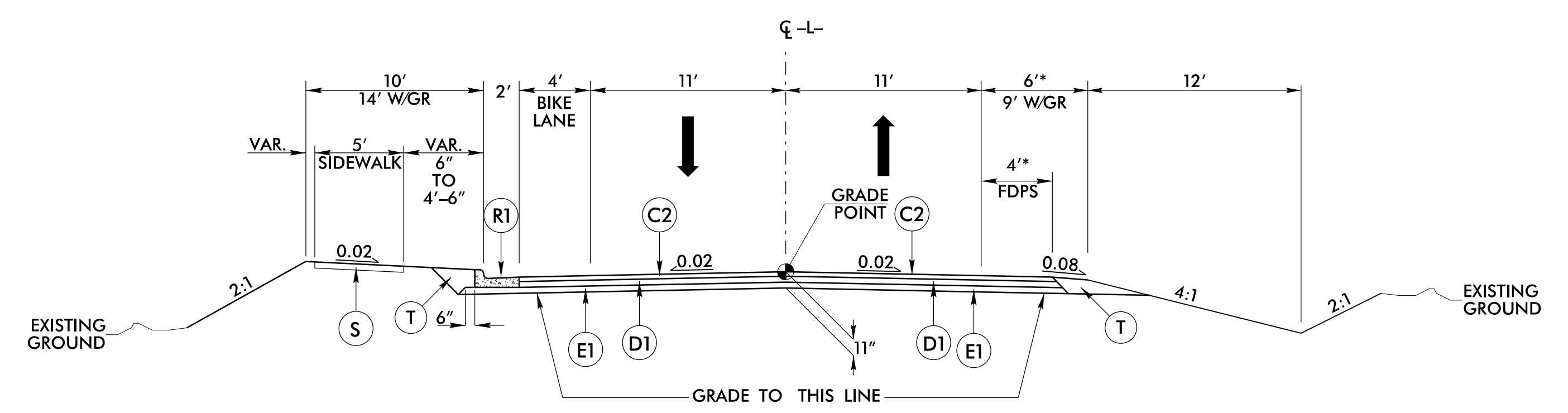
TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2  
-L- STA. 34+50.00 TO STA. 36+00.00



TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3  
-L- STA. 36+00.00 TO STA. 37+60.00



TYPICAL SECTION NO. 4

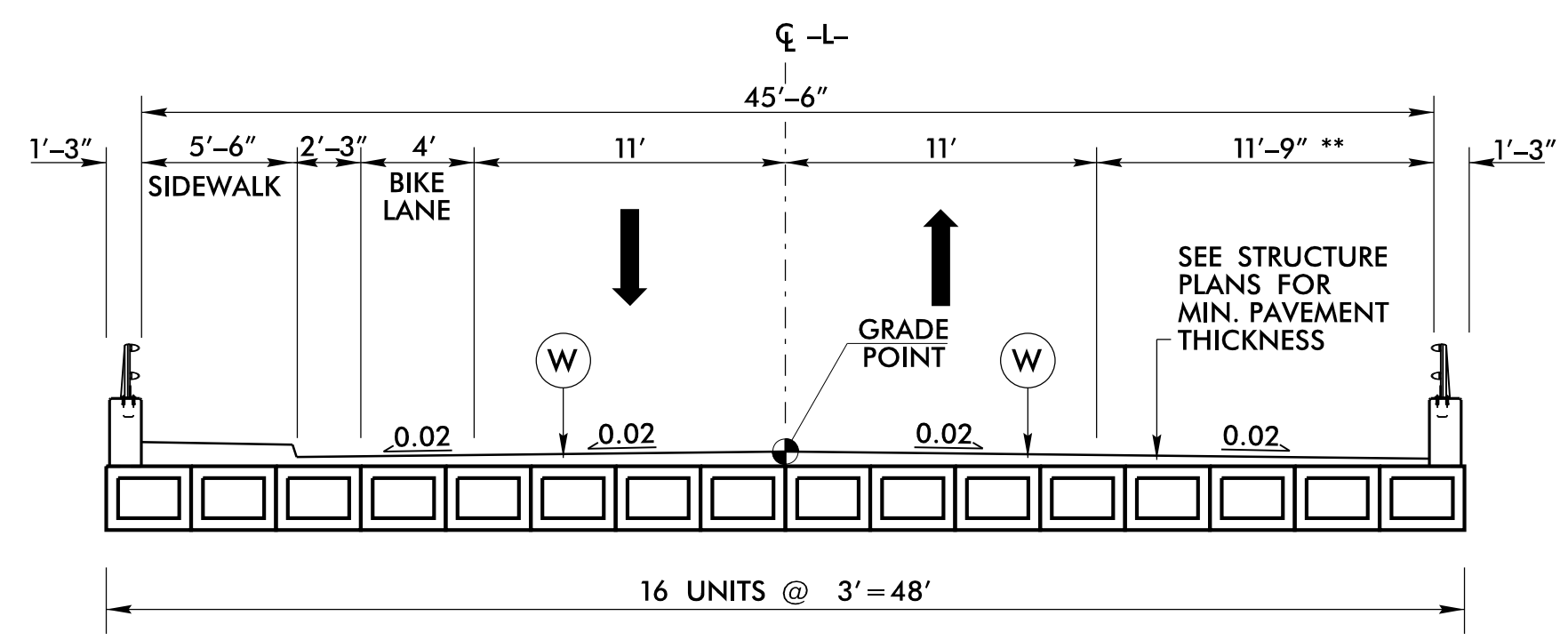
\* SEE INSET B FOR SHOULDER WIDENING

USE TYPICAL SECTION NO. 4  
-L- STA. 37+60.00 TO STA. 38+18.38 (BEGIN BRIDGE)  
-L- STA. 39+05.63 (END BRIDGE) TO STA. 40+50.00

PROJECT REFERENCE NO. B-5237	SHEET NO. 2A-1
ROADWAY DESIGN ENGINEER SEAL 034381 RICHARD J. DELOA 1/18/2018	PAVEMENT DESIGN ENGINEER SEAL 022896 CLARK S. MORRISON 1/22/2018
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Mead & Hunt 133 Fayetteville Street, Suite 210 Raleigh, North Carolina 27601 919-714-8670   meadhunt.com NC License No. F-1235	

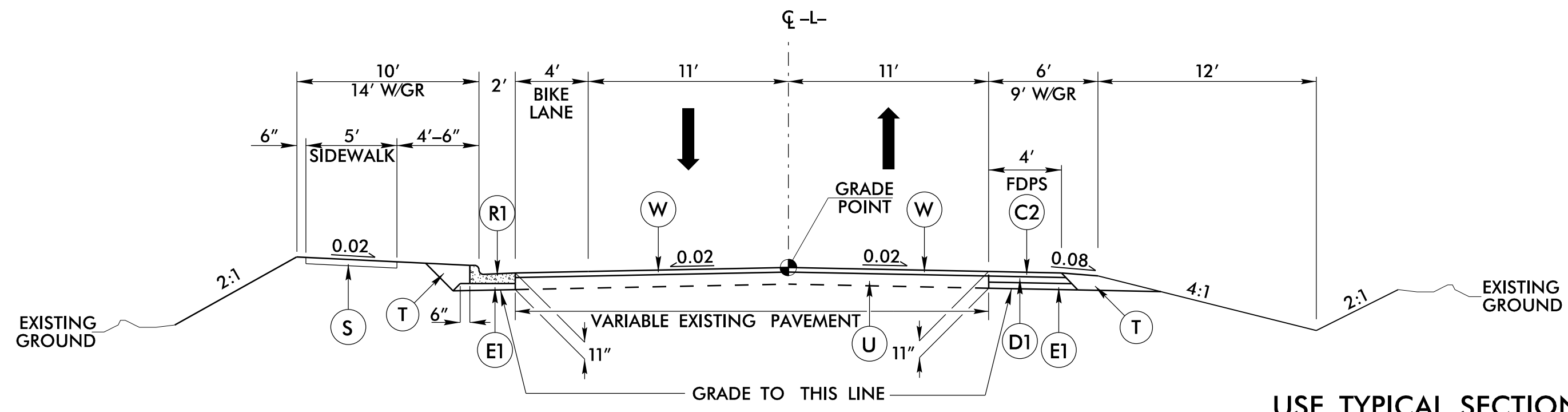
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6/2/2018



**TYPICAL SECTION NO. 5**  
**\*\*WIDENING FOR FUTURE SIDEWALK AND BIKE LANE**

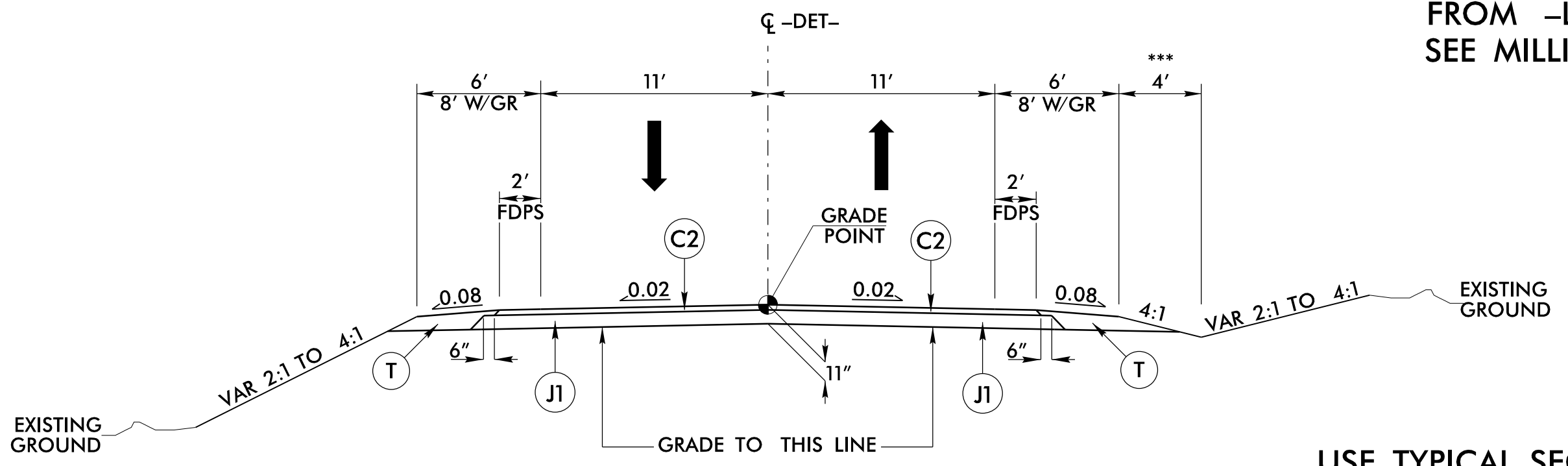
**USE TYPICAL SECTION NO. 5**  
 -L- STA. 38+18.38 (BEGIN BRIDGE) TO STA. 39+05.63 (END BRIDGE)



**TYPICAL SECTION NO. 6**

**USE TYPICAL SECTION NO. 6**  
 -L- STA. 40+50.00 TO STA. 42+50.00

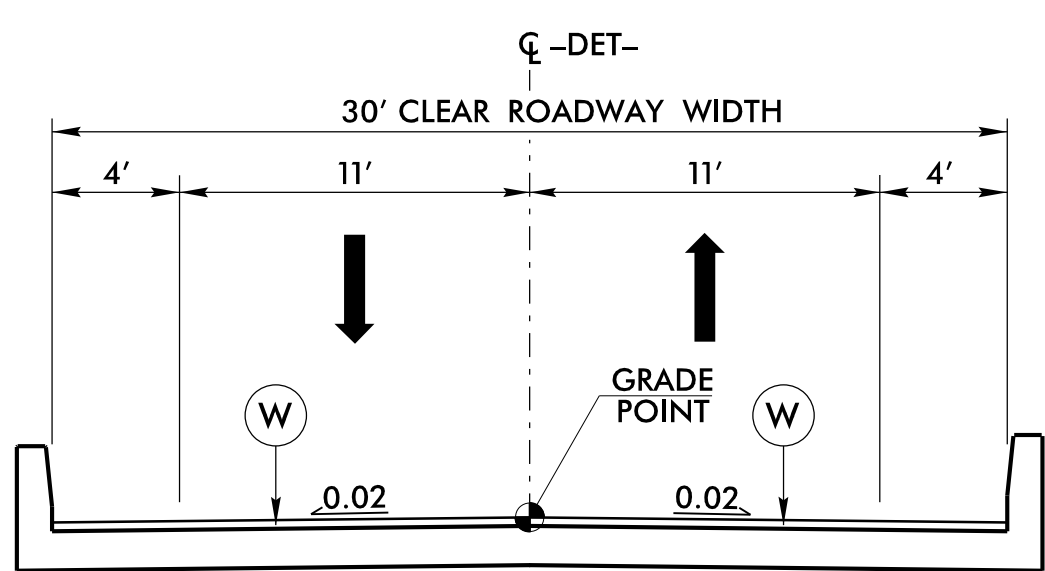
**NOTE: TRANSITION FROM TYPICAL SECTION NO. 6 TO EXISTING FROM -L- STA. 42+50.00 TO 43+00.00 SEE MILLING DETAIL**



**TYPICAL SECTION NO. 7**

**\*\*\*MINIMUM 1' DITCH DEPTH**

**USE TYPICAL SECTION NO. 7**  
 -DET- STA. 34+94.78 TO STA. 38+00.00 (BEGIN BRIDGE)  
 -DET- STA. 39+00.00 (END BRIDGE) TO STA. 41+85.73



**TYPICAL SECTION NO. 8**

**USE TYPICAL SECTION NO. 8**  
 -DET- STA. 38+00.00 (BEGIN BRIDGE) TO STA. 39+00.00 (END BRIDGE)

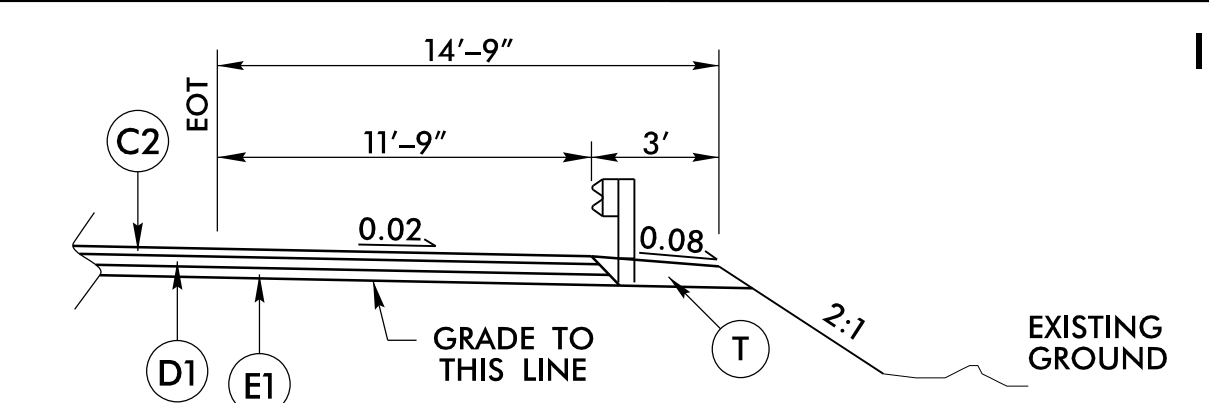
PROJECT REFERENCE NO. <i>B-5237</i>	SHEET NO. <i>2A-2</i>
ROADWAY DESIGN ENGINEER PROFESSIONAL SEAL 034381 <i>Richard J. DeLoia</i> 1/18/2018	PAVEMENT DESIGN ENGINEER PROFESSIONAL SEAL 022896 <i>Clark S. Morrison</i> 1/22/2018

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

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 133 Fayetteville Street, Suite 210  
 Raleigh, North Carolina 27601  
 919-714-8670 | meadhunt.com  
 NC License No. F-1235

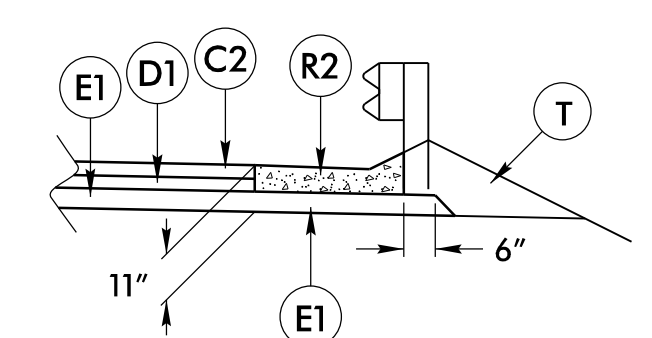
**PAVEMENT SCHEDULE**

C1	1 1/2" TYPE S9.5B
C2	3" TYPE S9.5B
C3	VAR. TYPE S9.5B
D1	4" TYPE I19.0C
D2	VAR. TYPE I19.0C
E1	4" TYPE B25.0C
E2	VAR. TYPE B25.0C
J1	8" AGGREGATE BASE COURSE
R1	2'-6" CONCRETE C&G
R2	CONC. SHOULDER BERM GUTTER
S	4" CONCRETE SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V1	0"-3" PAVEMENT MILLING
V2	INCIDENTAL MILLING
W	WEDGING



**INSET B**

**WIDENING FOR FUTURE SIDEWALK AND BIKE LANE**  
**USE INSET B**  
 -L- STA. 37+56.90 RT. TO STA. 38+18.38 RT. (BEGIN BRIDGE)  
 -L- STA. 39+05.63 RT. (END BRIDGE) TO STA. 39+66.95 RT.



**SHOULDER BERM GUTTER DETAIL**

**USE DETAIL**  
 -L- STA. 39+16.51 TO STA. 39+35.00 RT.

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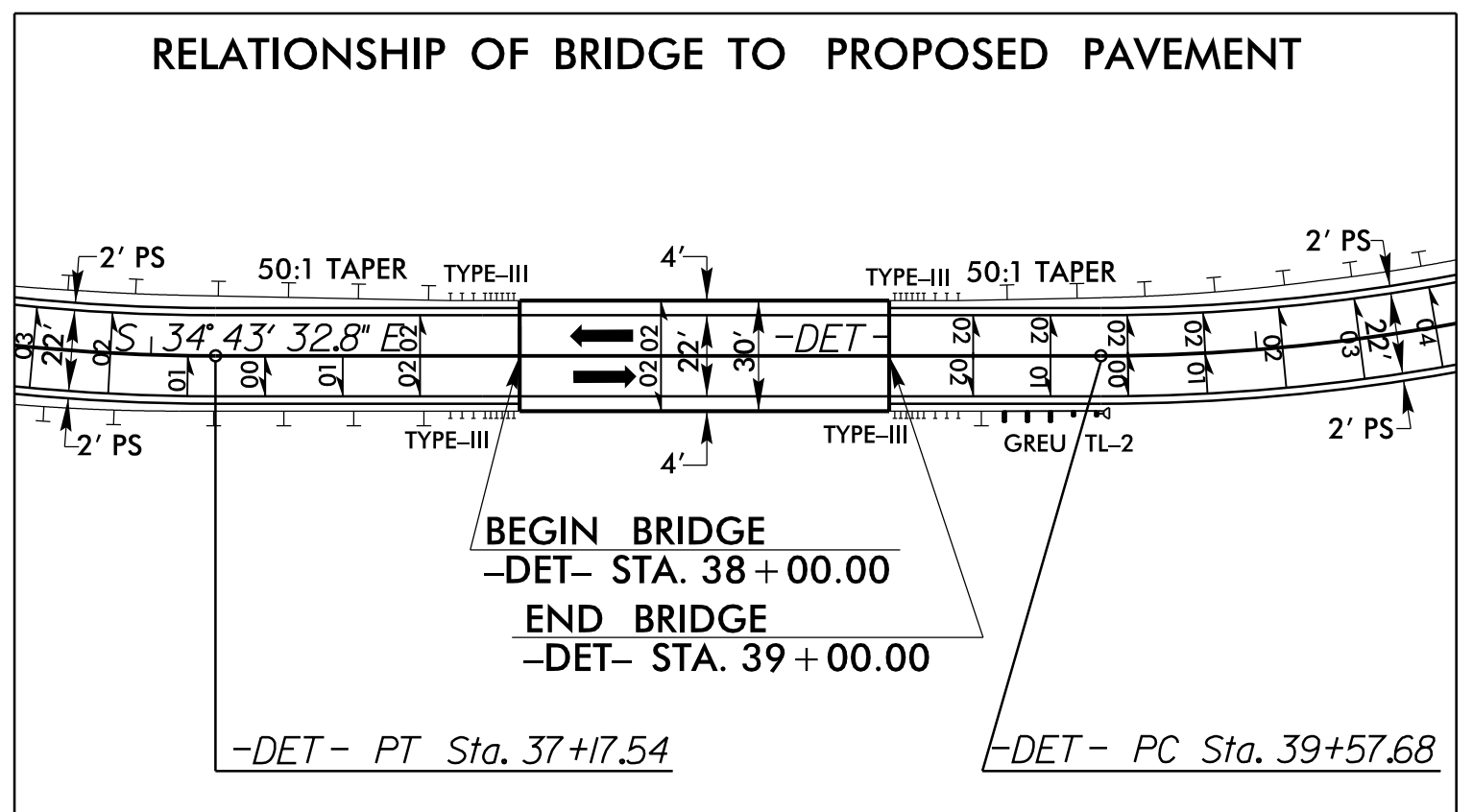
8.17.19

-L- CURVE DATA

PI Sta 21+9.80 Δ = 26° 51' 04.5" (RT) D = 5' 27' 24.3" L = 492.07' T = 250.64' R = 1,050.00'	PI Sta 25+86.78 Δ = 14° 06' 58.7" (RT) D = 5' 27' 24.3" L = 258.69' T = 130.01' R = 1,050.00'	PI Sta 31+46.58 Δ = 23° 47' 17.3" (LT) D = 7' 38' 22.0" L = 311.39' T = 157.97' R = 750.00'	PI Sta 33+73.05 Δ = 4° 15' 52.3" (LT) D = 2' 55' 13.1" L = 146.03' T = 73.05' R = 1,961.98'	PI Sta 43+11.28 Δ = 7° 16' 19.9" (RT) D = 3' 42' 21.4" L = 196.23' T = 98.25' R = 1,546.05'	PI Sta 44+68.50 Δ = 9° 02' 12.3" (RT) D = 7' 38' 34.4" L = 118.24' T = 59.24' R = 749.66'
-------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------

-DET- CURVE DATA

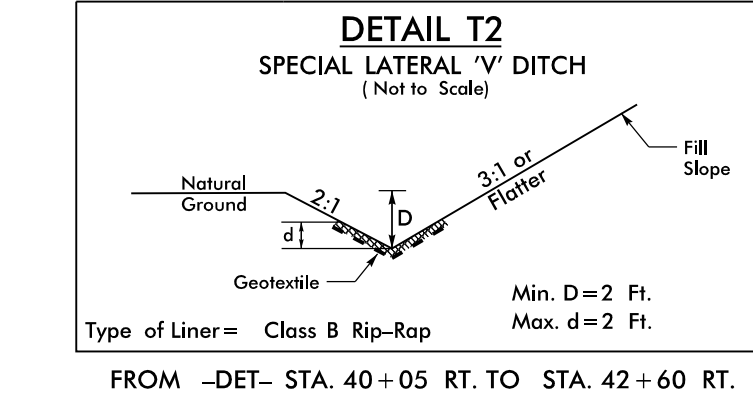
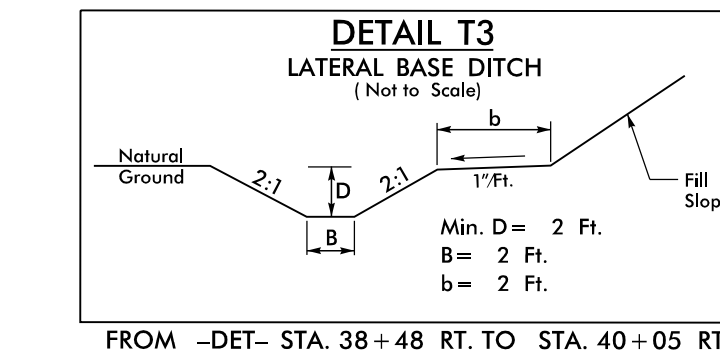
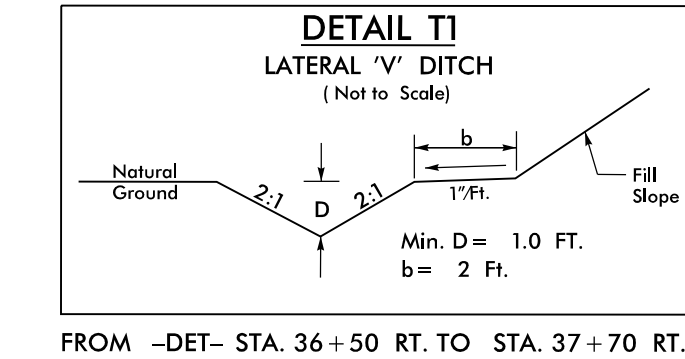
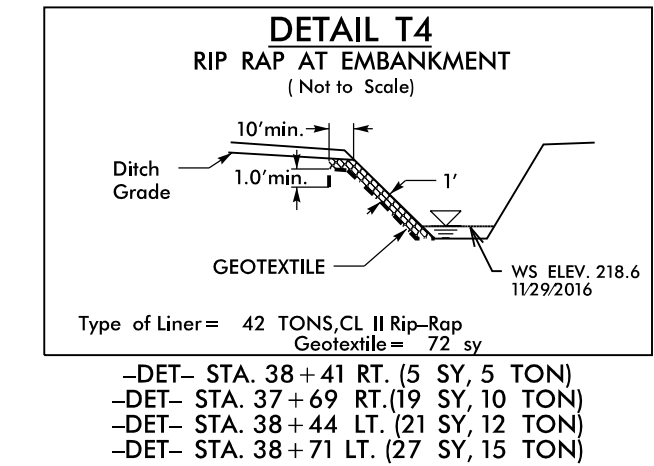
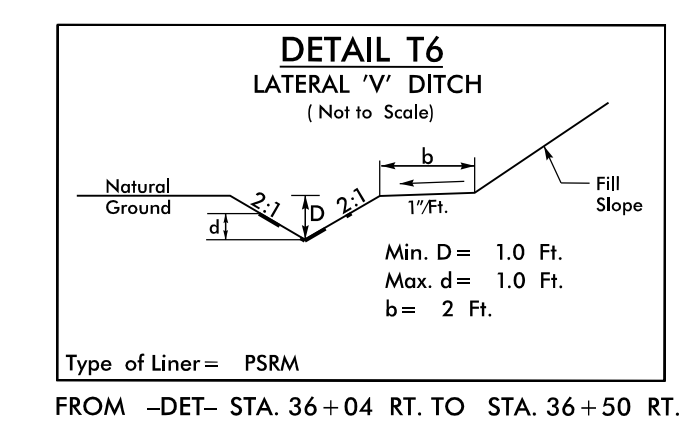
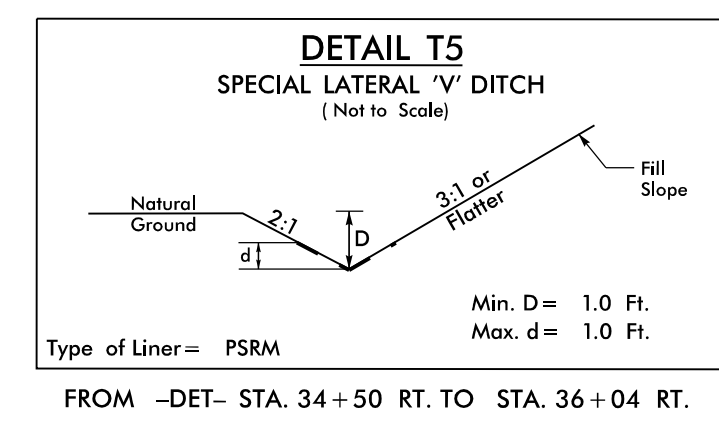
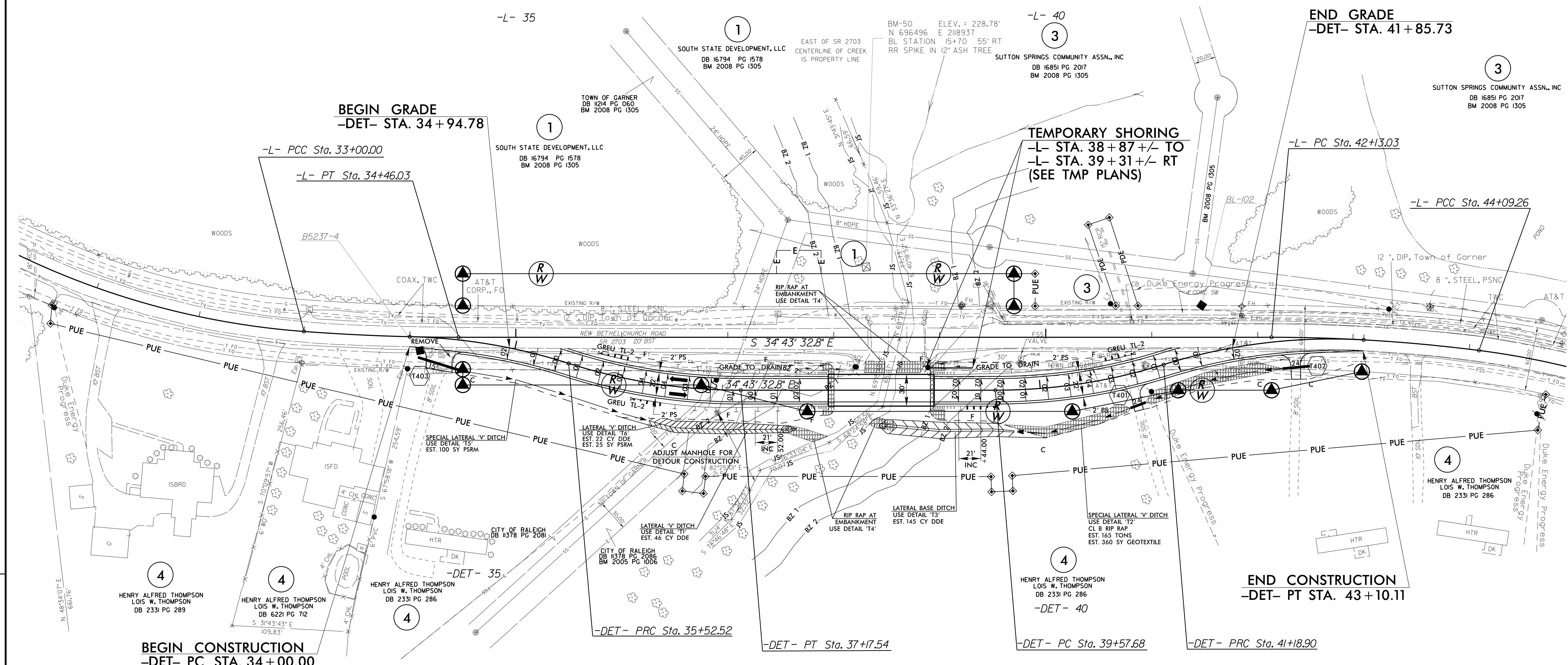
PI Sta 34+76.78 Δ = 16° 23' 43.4" (RT) D = 10' 44' 58.8" L = 152.52' T = 76.78' R = 533.00' SE = 4% RO = 84'	PI Sta 36+35.70 Δ = 17° 44' 22.6" (LT) D = 10' 44' 58.8" L = 165.02' T = 83.18' R = 533.00' SE = 4% RO = 84'	PI Sta 40+38.91 Δ = 17° 19' 52.9" (LT) D = 10' 44' 58.8" L = 161.23' T = 81.23' R = 533.00' SE = 4% RO = 84'	PI Sta 42+15.55 Δ = 20° 33' 16.1" (RT) D = 10' 44' 58.8" L = 191.21' T = 96.64' R = 533.00' SE = 4% RO = 84'
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NAD 83/NSRS 2007

PROJECT REFERENCE NO. B-5237	SHEET NO. 2B-1
RW SHEET NO.	
ROADWAY DESIGN ENGINEER R J DeCh...	HYDRAULICS ENGINEER Roger Meador
SEAL 034381 2/2/2018	SEAL 21656 2/2/2018
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
<b>Mead &amp; Hunt</b>	
133 Fayetteville Street, Suite 210 Raleigh, North Carolina 27601 919-714-8570   meadandhunt.com NC License No. F-1235	

## TEMPORARY DETOUR



NOTE: ALL TEMP DRIVEWAY RADII ARE 10'  
FOR -L- DESIGN, SEE SHEET 4  
FOR -DET- PROFILE, SEE SHEET 5

REVISIONS

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

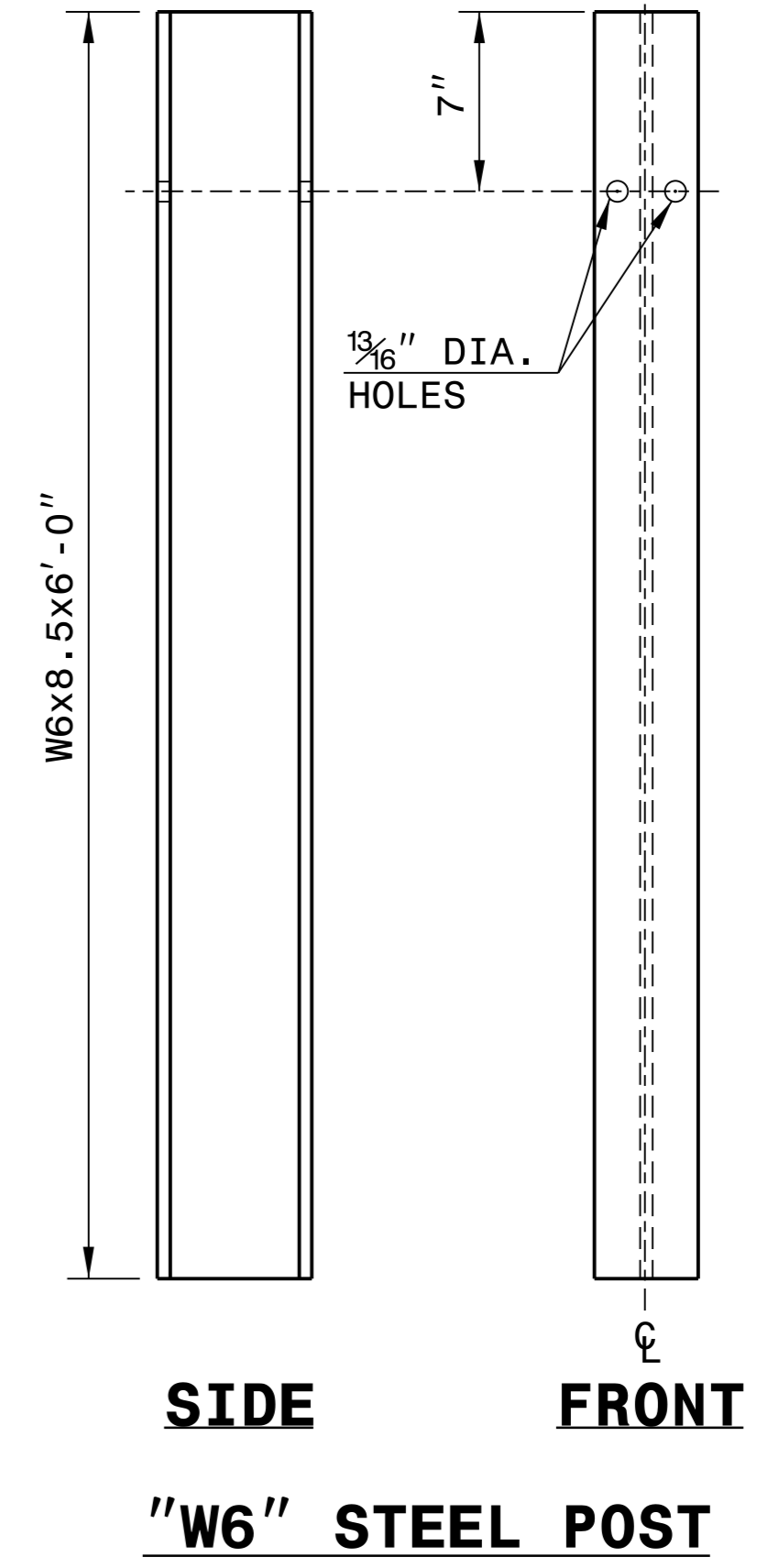
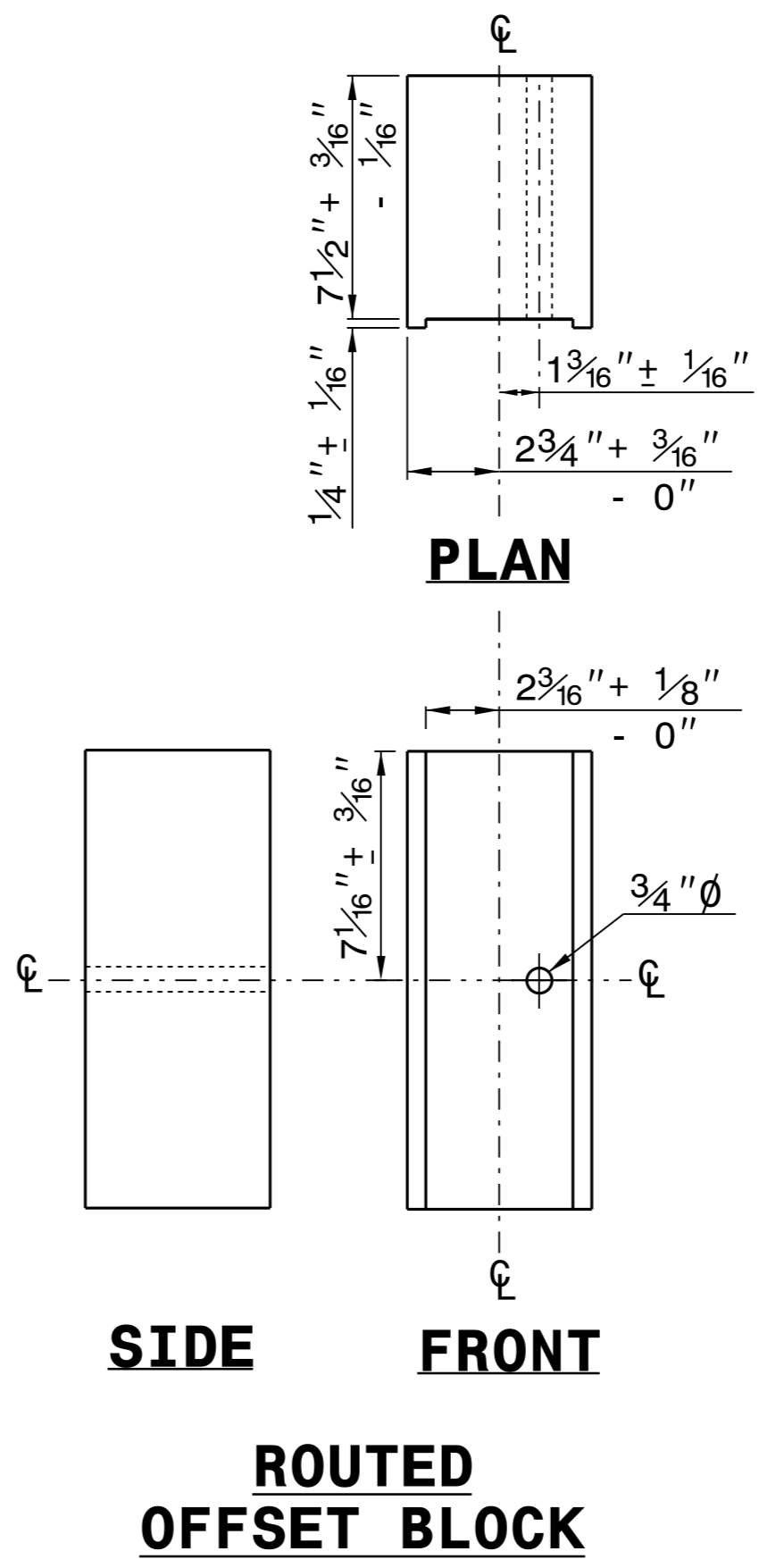
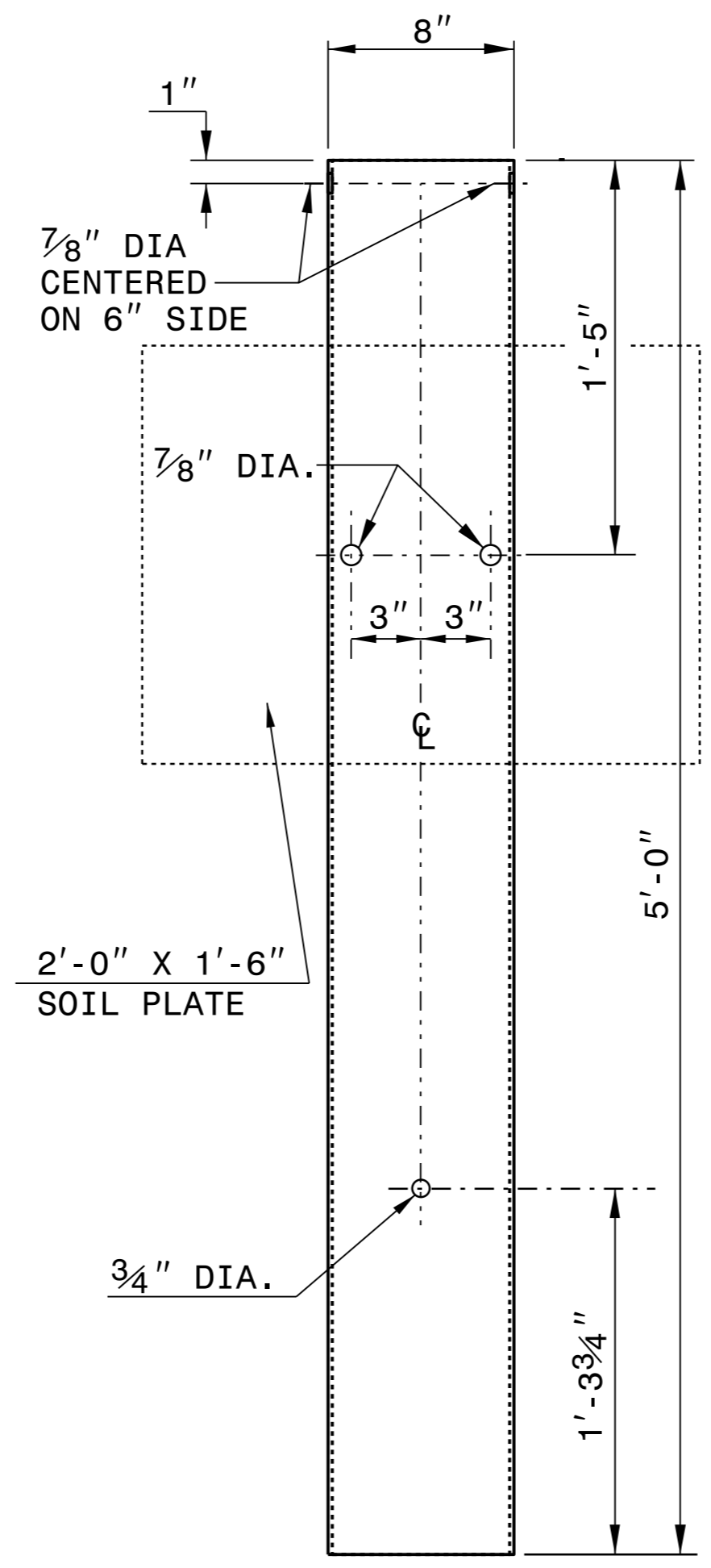
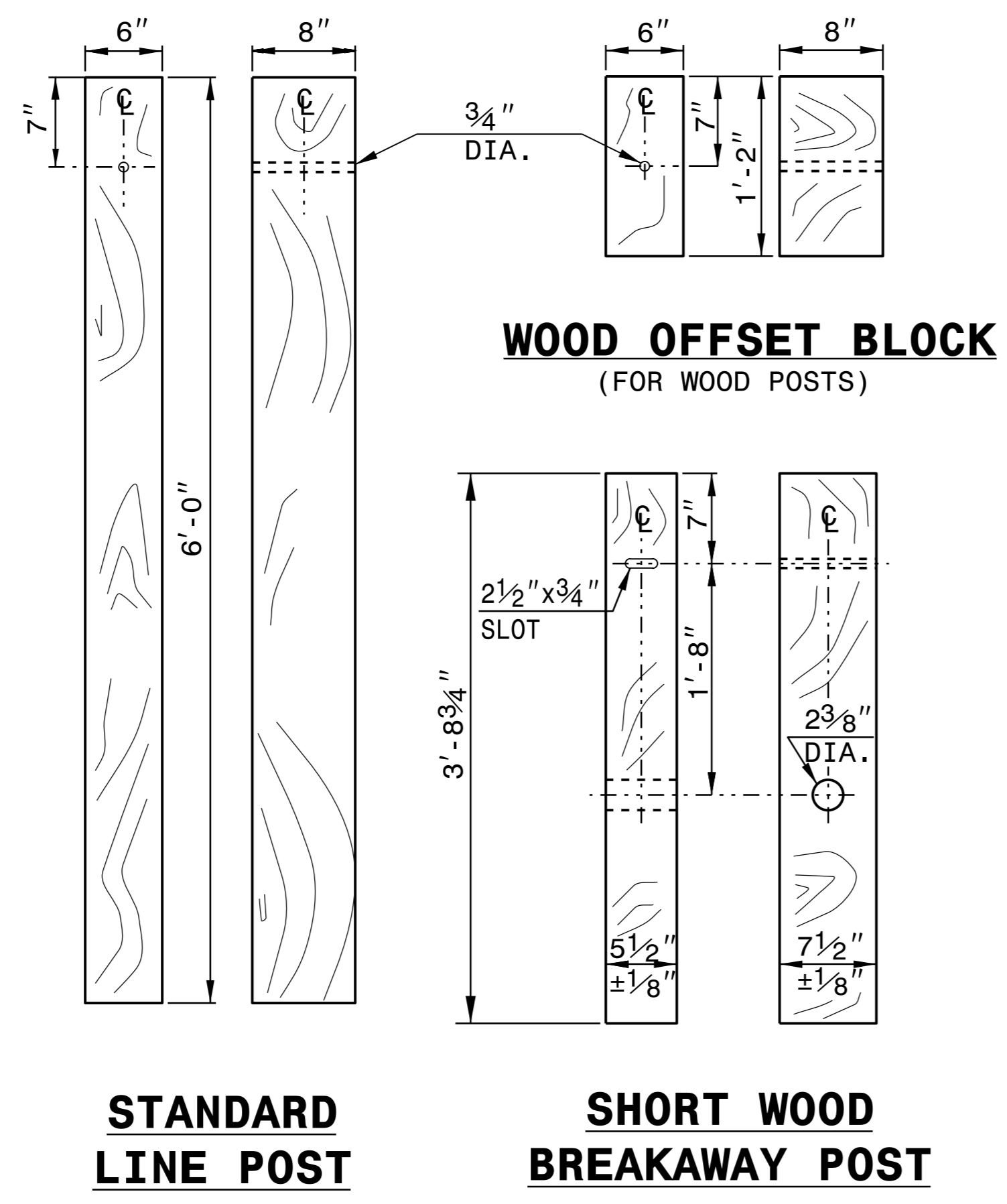
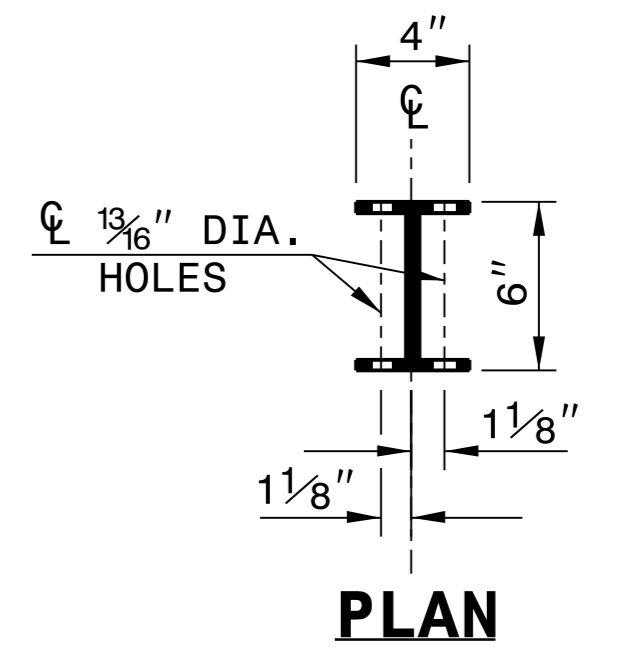
ROADWAY DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

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**



**SYSTEM PARTS**



DocuSigned by:  
*J. Howerton*  
673F3D17C0CC45F- 3/16/2018

**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.:	

I4-DEC-2017 10:36 S:\Contracts\Projects\Special Details\Standard Drawings\Division 8\0862d0301.dgn 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

**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.

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

SHEET 2 OF 7  
**862D03**

**NOTE:**

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

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

DocuSigned by:  
*Howerton*  
3/16/2018

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

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

**SEE TITLE BLOCK**

ORIGINAL BY: J HOWERTON  
MODIFIED BY:  
CHECKED BY:  
FILE SPEC.:

DATE: 06-22-12  
DATE:  
DATE:  
DATE:



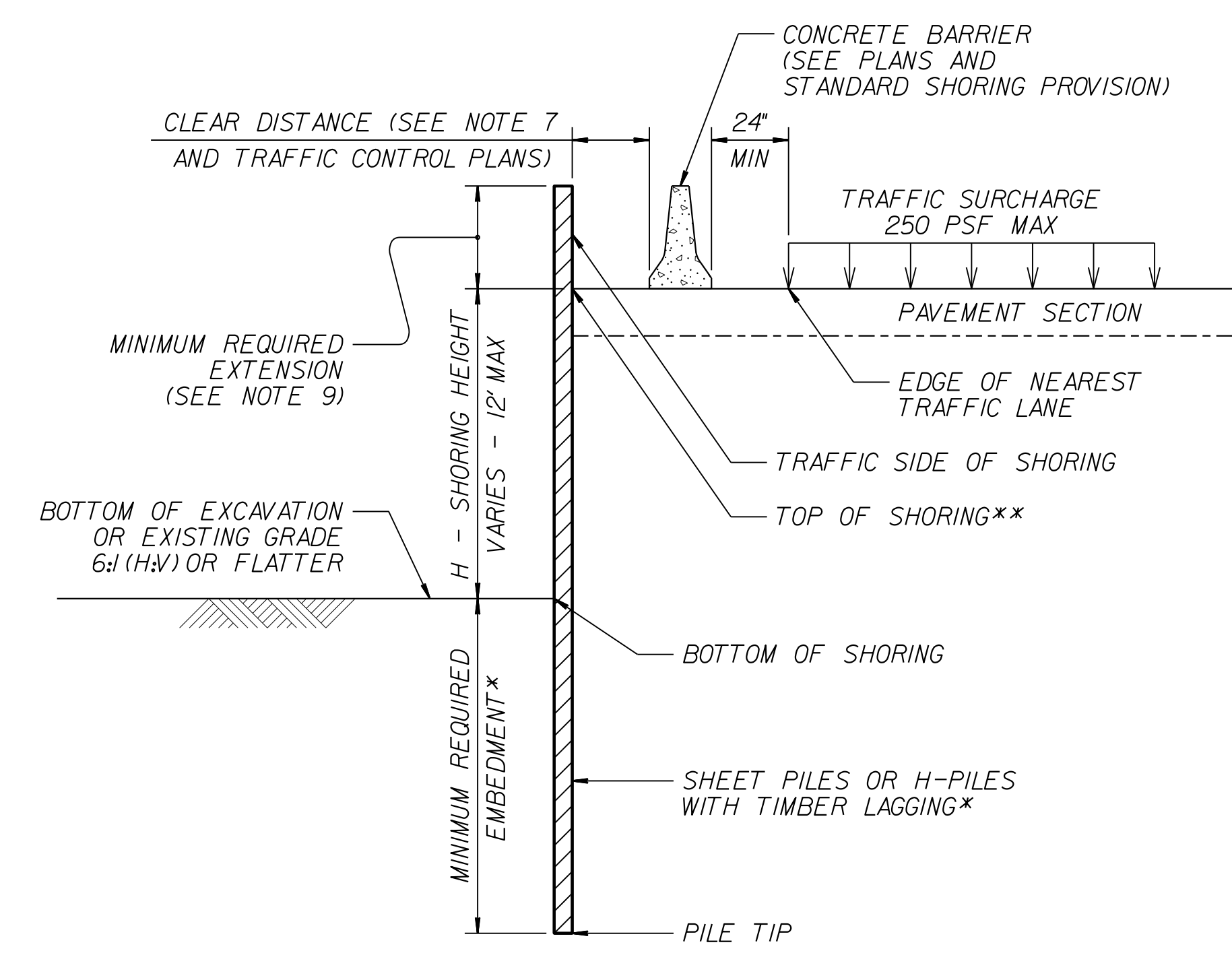
GROUNDWATER CONDITION (SEE NOTE 6)	H SHORING HEIGHT (FT)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT					SURCHARGE CASE WITH TRAFFIC IMPACT				
		SHEET PILES		H-PILES WITH TIMBER LAGGING			SHEET PILES		H-PILES WITH TIMBER LAGGING		
		MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (IN <sup>3</sup> /FT)	MINIMUM REQUIRED EMBEDMENT* (FT) (SEE NOTE 10)			MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (IN <sup>3</sup> /FT)	MINIMUM REQUIRED EMBEDMENT* (FT) (SEE NOTE 10)		
				HP 10x42	HP 12x53	HP 14x73			HP 10x42	HP 12x53	HP 14x73
GROUNDWATER ELEVATION BETWEEN BOTTOM OF SHORING AND PILE TIP	< 6	11.5	4.5	11.5	11.5	11.5	16.0	12.0	13.0	13.0	13.0
	7	13.0	7.0	13.0	13.0	13.0	17.0	14.5	14.5	14.5	14.5
	8	15.0	10.0	--	15.0	15.0	18.0	17.0	--	15.5	15.5
	9	17.0	14.0	--	17.0	17.0	19.0	20.0	--	17.0	17.0
	10	18.5	19.5	--	--	18.5	20.0	23.5	--	--	18.5
	11	20.5	26.0	--	--	--	21.0	28.0	--	--	20.0
GROUNDWATER ELEVATION BELOW PILE TIP	< 6	7.5	3.0	8.0	8.0	8.0	11.0	10.0	9.5	9.5	9.5
	7	8.5	4.5	9.5	9.5	9.5	12.0	12.0	10.5	10.5	10.5
	8	10.0	6.5	10.5	10.5	10.5	12.5	14.0	11.5	11.5	11.5
	9	11.0	9.5	--	12.0	12.0	13.5	16.5	--	12.5	12.5
	10	12.5	13.0	--	--	13.5	14.0	19.5	--	13.5	13.5
	11	13.5	17.0	--	--	14.5	15.0	22.5	--	--	14.5
12	15.0	21.5	--	--	16.0	16.0	25.5	--	--	15.5	

**MINIMUM REQUIRED EMBEDMENT AND SECTION MODULUS**

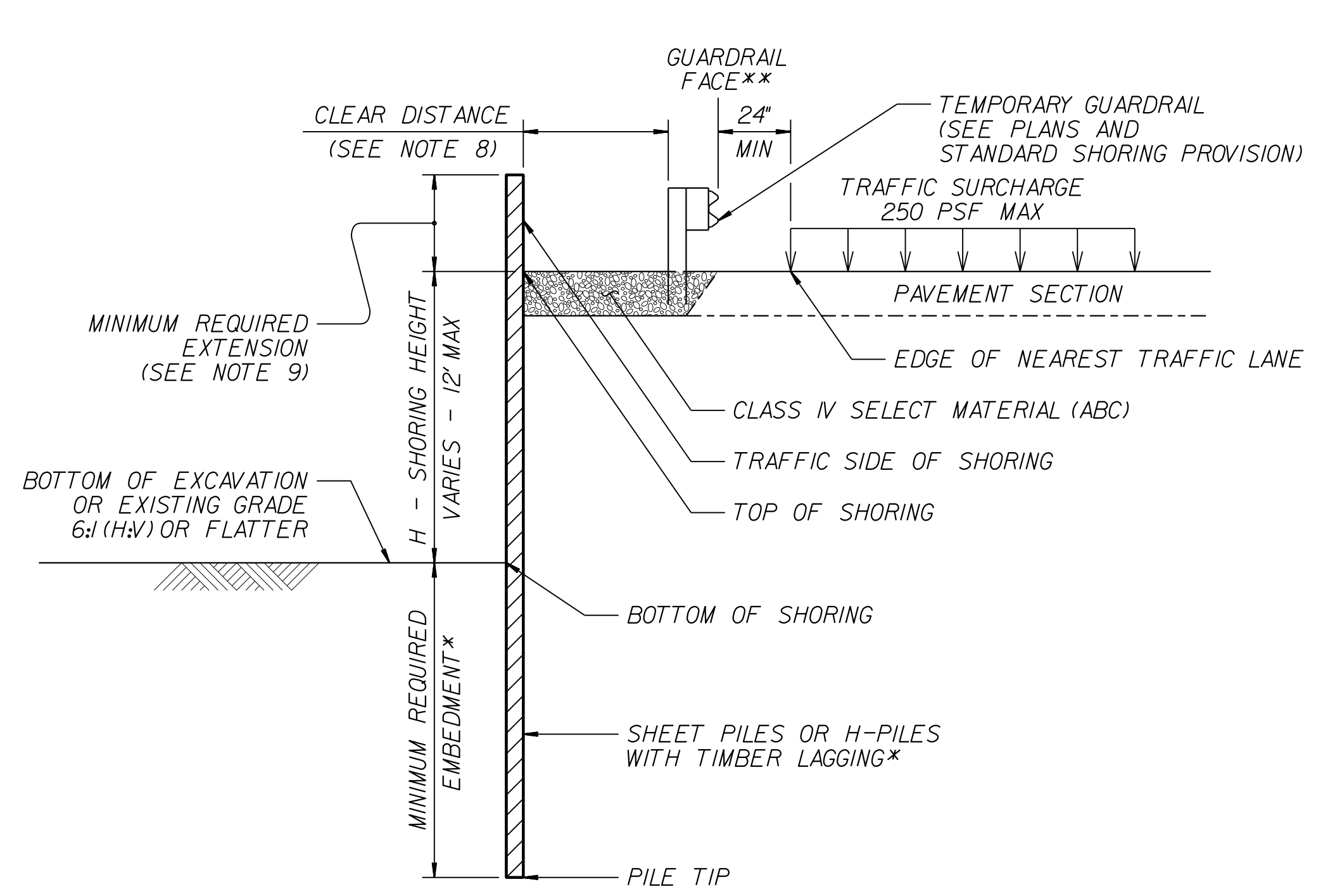
\*DO NOT USE H-PILES WITH TIMBER LAGGING FOR GROUNDWATER CONDITION, SHORING HEIGHT AND H-PILE SIZE SHOWN IF MINIMUM REQUIRED EMBEDMENT IS "--".

**NOTES:**

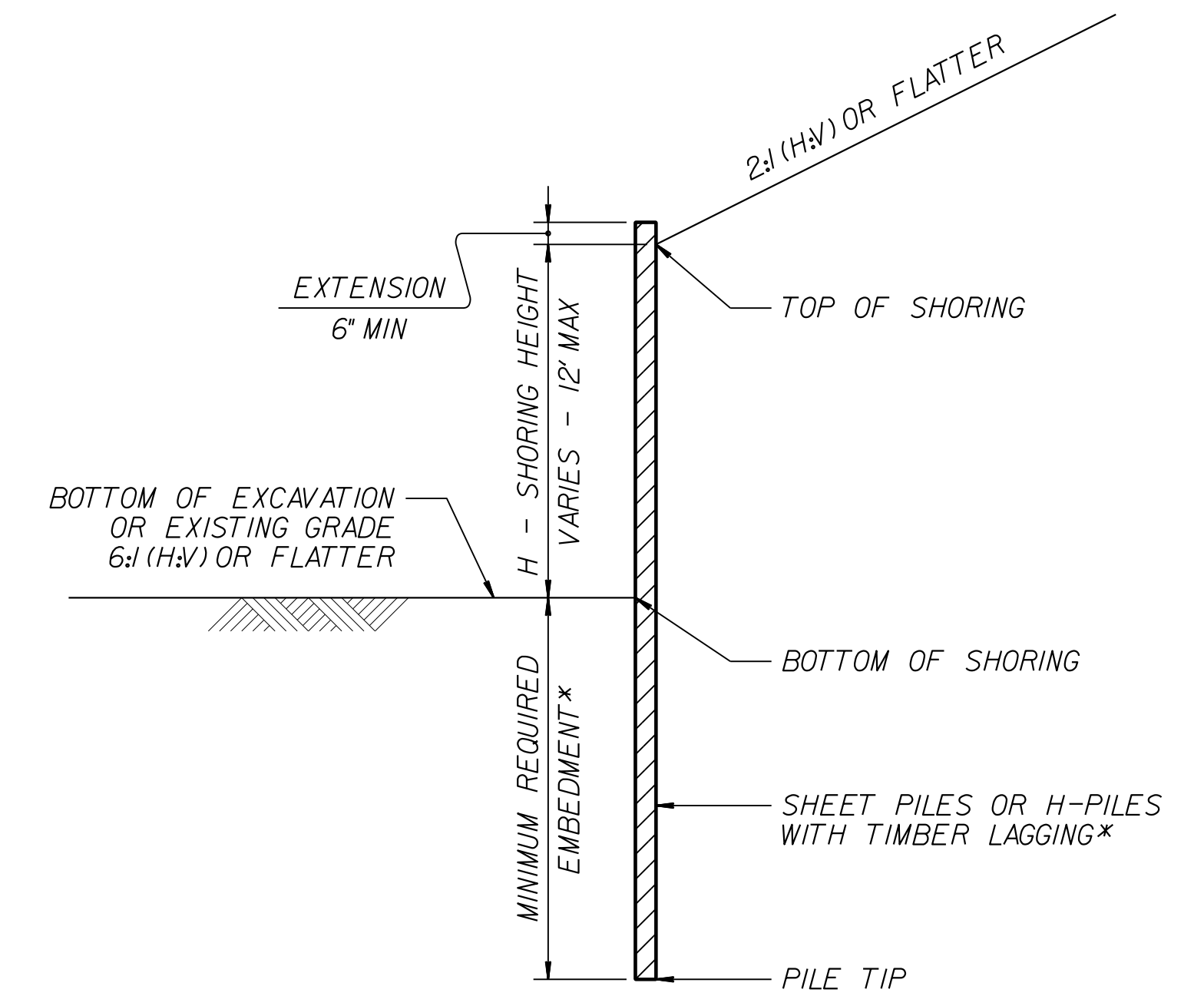
- AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY SHORING AS NOTED IN THE PLANS.
- FOR STANDARD TEMPORARY SHORING, SEE STANDARD SHORING PROVISION.
- STANDARD TEMPORARY SHORING IS BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:  
UNIT WEIGHT,  $\gamma = 120$  PCF  
FRICTION ANGLE,  $\phi = 30$  DEGREES  
COHESION,  $c = 0$  PSF
- DO NOT USE STANDARD TEMPORARY SHORING IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
- DO NOT USE STANDARD TEMPORARY SHORING WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS WITHIN THE EMBEDMENT DEPTH.
- USE GROUNDWATER ELEVATION NOTED IN THE PLANS. IF NO GROUNDWATER ELEVATION IS SHOWN IN THE PLANS, USE "GROUNDWATER ELEVATION BETWEEN BOTTOM OF SHORING AND PILE TIP" FOR GROUNDWATER CONDITION. DO NOT USE STANDARD TEMPORARY SHORING IF GROUNDWATER IS ABOVE BOTTOM OF SHORING.
- AT THE CONTRACTOR'S OPTION OR IF AVAILABLE CLEAR DISTANCE IS LESS THAN THE MINIMUM REQUIRED FOR CONCRETE BARRIER, SET BARRIER NEXT TO AND UP AGAINST TRAFFIC SIDE OF PILES AND USE "SURCHARGE CASE WITH TRAFFIC IMPACT".
- AT THE CONTRACTOR'S OPTION OR IF AVAILABLE CLEAR DISTANCE IS LESS THAN 4' FOR TEMPORARY GUARDRAIL, ATTACH GUARDRAIL TO TRAFFIC SIDE OF PILES AS SHOWN IN THE PLANS AND USE "SURCHARGE CASE WITH TRAFFIC IMPACT".
- MINIMUM REQUIRED EXTENSION IS 6" FOR "SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT" AND 32" FOR "SURCHARGE CASE WITH TRAFFIC IMPACT".
- MINIMUM REQUIRED EMBEDMENT FOR H-PILES WITH TIMBER LAGGING IS BASED ON DRIVEN H-PILES AT MAXIMUM 6' SPACING. AT THE CONTRACTOR'S OPTION, EMBEDMENT DEPTHS MAY BE REDUCED BY 25% FOR DRILLED-IN H-PILES.
- SUBMIT A "STANDARD TEMPORARY SHORING SELECTION FORM" AT LEAST 7 DAYS BEFORE STARTING TEMPORARY SHORING CONSTRUCTION. UP TO 3 SHORING LOCATIONS MAY BE INCLUDED ON EACH FORM. STANDARD SHORING SELECTION FORMS ARE AVAILABLE FROM:  
[connect.ncdot.gov/resources/Geological/Pages/Geotech\\_Forms\\_Details.aspx](http://connect.ncdot.gov/resources/Geological/Pages/Geotech_Forms_Details.aspx)
- CONTACT THE ENGINEER IF PILES DO NOT ATTAIN THE MINIMUM REQUIRED EMBEDMENT.



**CONCRETE BARRIER**  
\*\*TOP OF SHORING =  
EDGE OF PAVEMENT



**TEMPORARY GUARDRAIL**  
\*\*GUARDRAIL FACE =  
EDGE OF PAVEMENT



**STANDARD TEMPORARY SHORING**  
(SLOPE CASE)  
\*SEE TABLE ABOVE.

**STANDARD TEMPORARY SHORING**  
(SURCHARGE CASE)  
\*SEE TABLE ABOVE.



NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
  
**GEOTECHNICAL  
ENGINEERING UNIT**

STANDARD DETAIL NO. 1801.01

STANDARD  
TEMPORARY SHORING







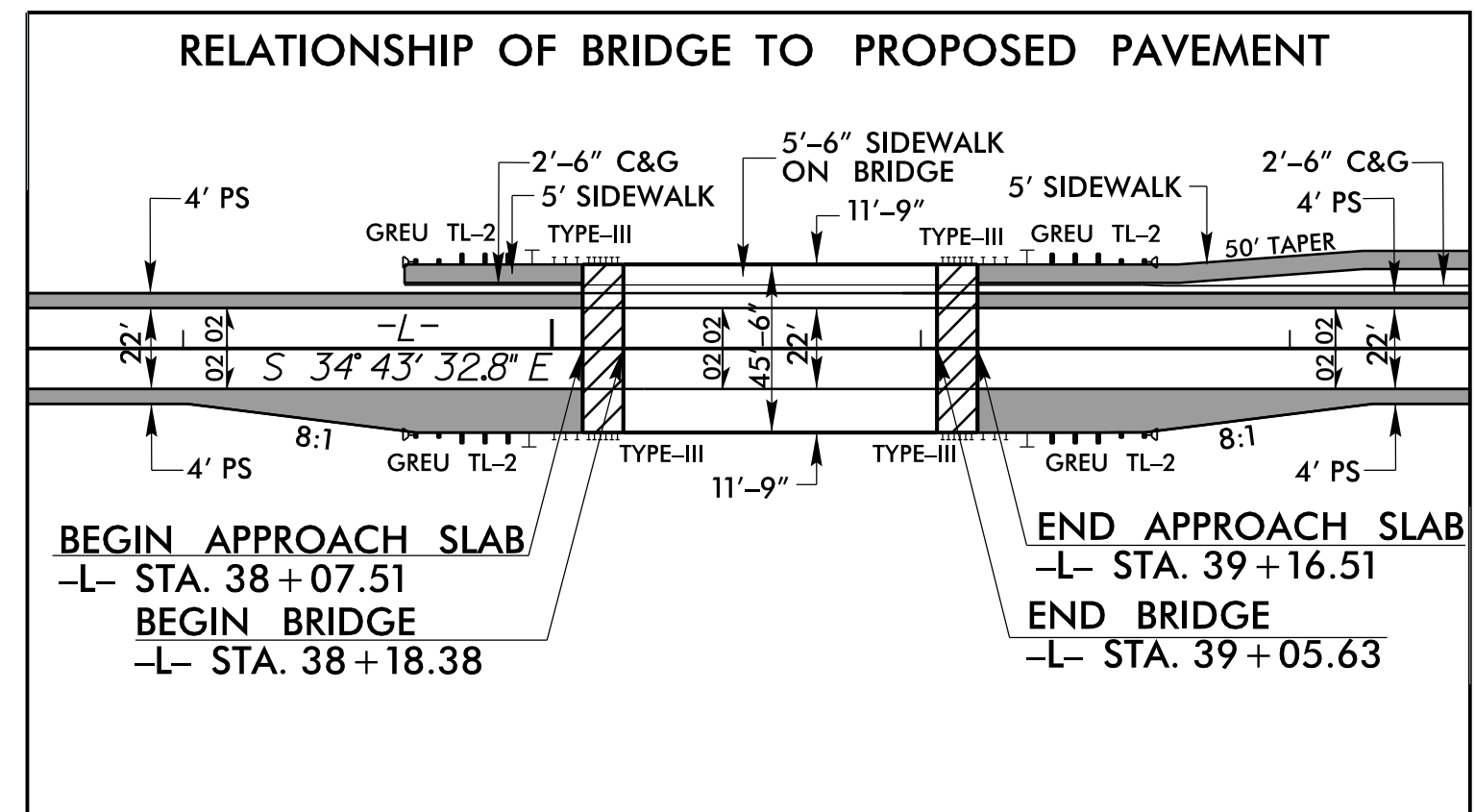
8/17/99

-L- CURVE DATA

PI Sta 21+99.80 Δ = 26° 51' 04.5" (RT) D = 5' 27' 24.3" L = 492.07' T = 250.64' R = 1,050.00'	PI Sta 25+86.78 Δ = 14° 06' 58.7" (RT) D = 5' 27' 24.3" L = 258.69' T = 130.01' R = 1,050.00'	PI Sta 31+46.58 Δ = 23° 47' 17.3" (LT) D = 7' 38' 22.0" L = 311.39' T = 157.97' R = 750.00'	PI Sta 33+73.05 Δ = 4° 15' 52.3" (LT) D = 2' 55' 13.1" L = 146.03' T = 73.05' R = 1,961.98'	PI Sta 43+11.28 Δ = 7° 16' 19.9" (RT) D = 3' 42' 21.4" L = 196.23' T = 98.25' R = 1,546.05'	PI Sta 44+68.50 Δ = 9° 02' 12.3" (RT) D = 7' 38' 34.4" L = 118.24' T = 59.24' R = 749.66'
--------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------

-DET- CURVE DATA

PI Sta 34+76.78 Δ = 16° 23' 43.4" (RT) D = 10' 44' 58.8" L = 152.52' T = 76.78' R = 533.00' SE = 4% RO = 84'	PI Sta 36+35.70 Δ = 17° 44' 22.6" (LT) D = 10' 44' 58.8" L = 165.02' T = 83.18' R = 533.00' SE = 4% RO = 84'	PI Sta 40+38.91 Δ = 17° 19' 52.9" (LT) D = 10' 44' 58.8" L = 161.23' T = 81.23' R = 533.00' SE = 4% RO = 84'	PI Sta 42+15.55 Δ = 20° 33' 16.1" (RT) D = 10' 44' 58.8" L = 191.21' T = 96.64' R = 533.00' SE = 4% RO = 84'
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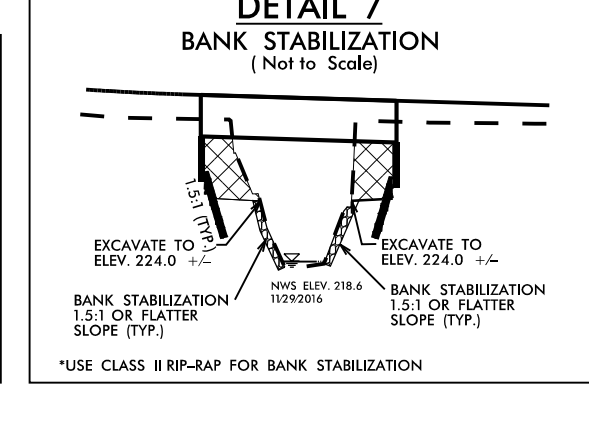
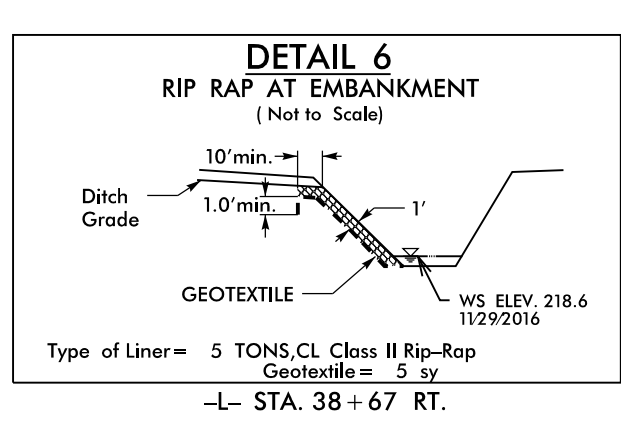
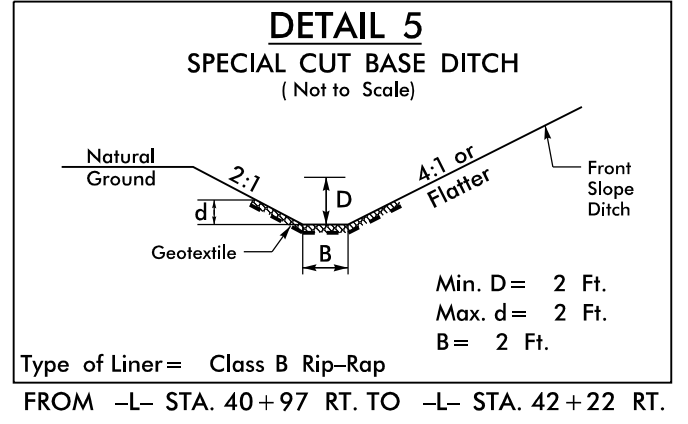
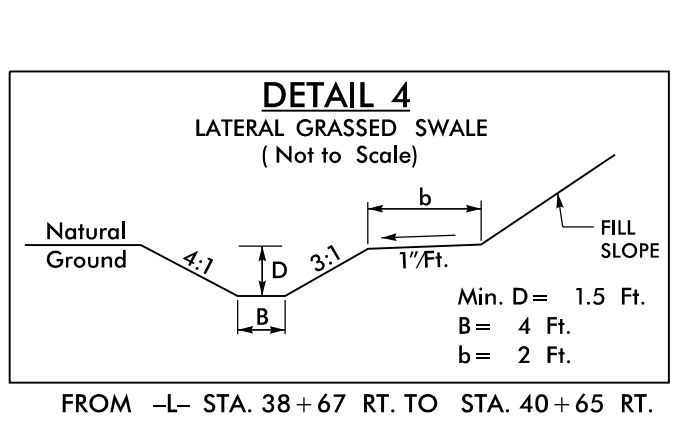
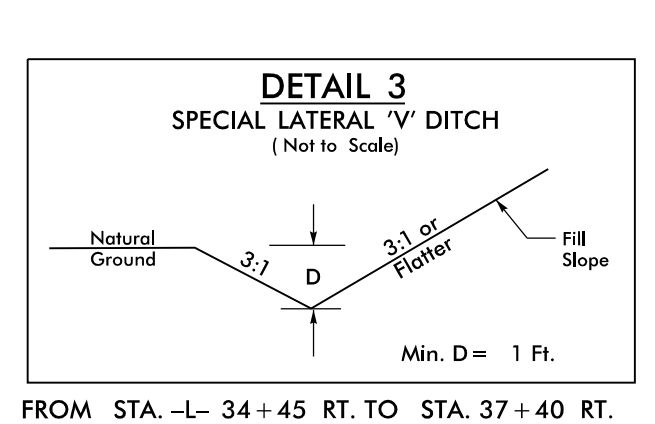
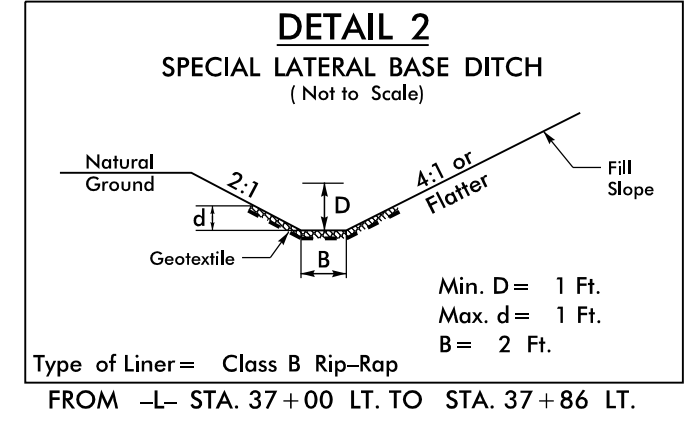
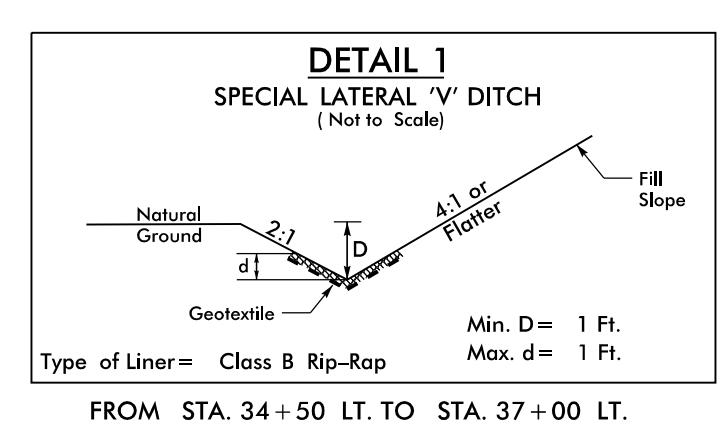
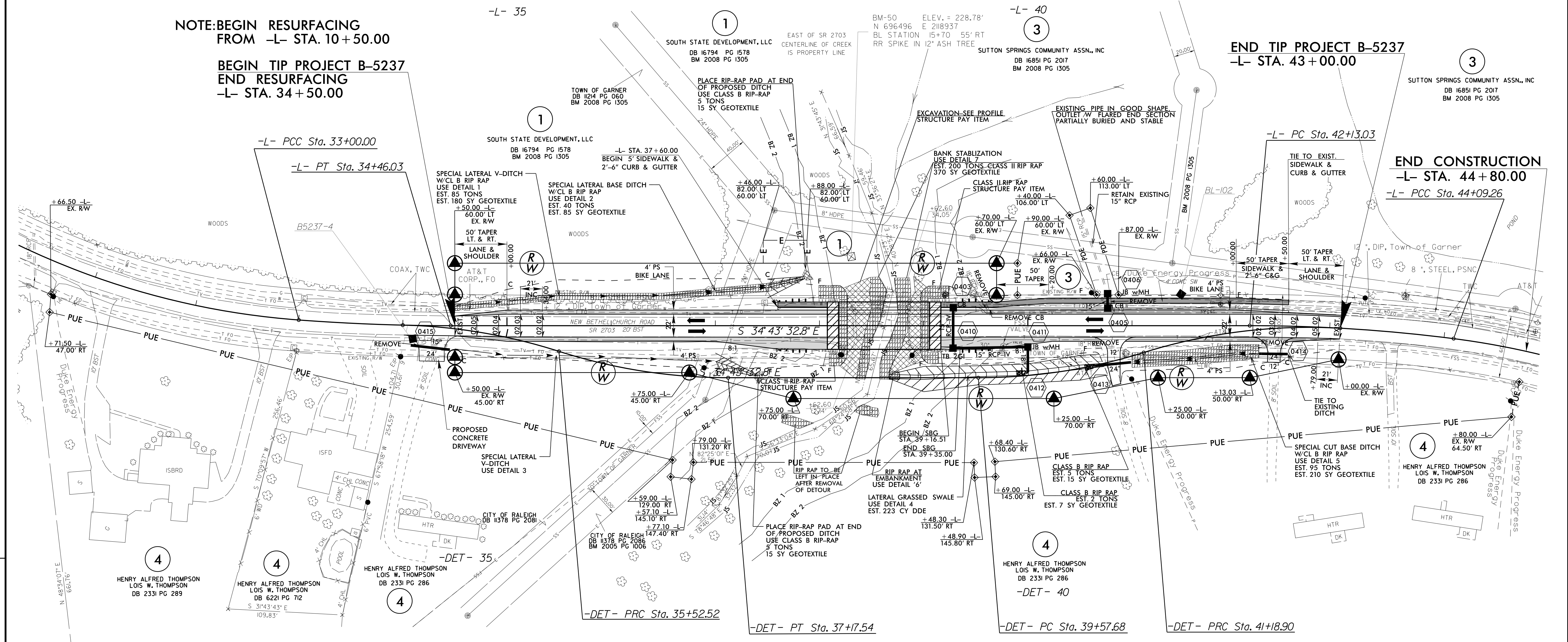


NAD 83/NSRS 2007

PROJECT REFERENCE NO. B-5237	SHEET NO. 4
ROADWAY DESIGN ENGINEER SEAL 034381 R J DeCh...	HYDRAULICS ENGINEER SEAL 21656 Roger W...
2/19/2018	2/19/2018
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
<b>Mead&amp;Hunt</b>	
133 Fayetteville Street, Suite 210 Raleigh, North Carolina 27601 919-714-8570   meadandhunt.com NC License No. F-1235	

**NOTE: BEGIN RESURFACING  
FROM -L- STA. 10+50.00**

**BEGIN TIP PROJECT B-5237  
END RESURFACING  
-L- STA. 34+50.00**



NOTE: ALL DRIVEWAY RADII ARE 15'

FOR -DET- DESIGN, SEE SHEET 2B-1

FOR -L- AND -DET- PROFILE, SEE SHEET 5

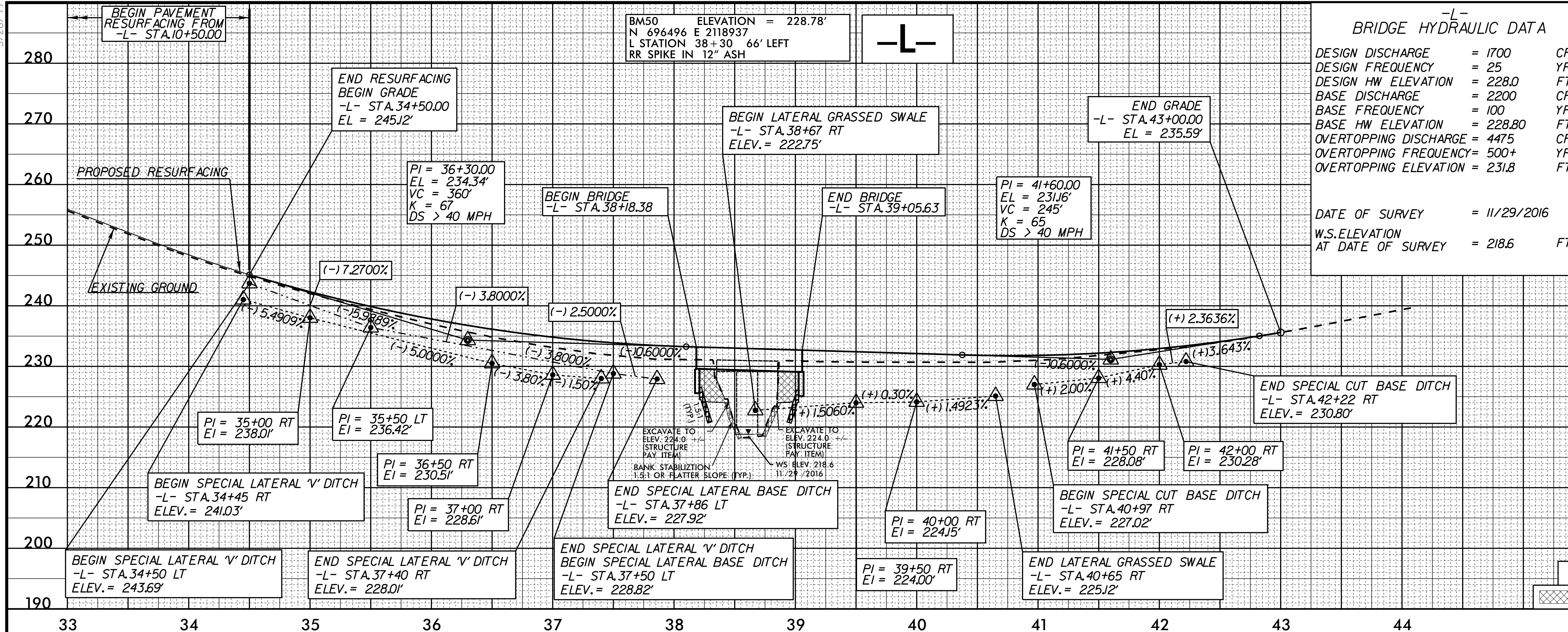
FOR STRUCTURE PLANS, SEE SHEETS S-1 TO S-21

REVISIONS

17-FEB-2018 17:29 R:\Projects\B5237\_Rdy\_PSH\_4.dgn



5/28/2016



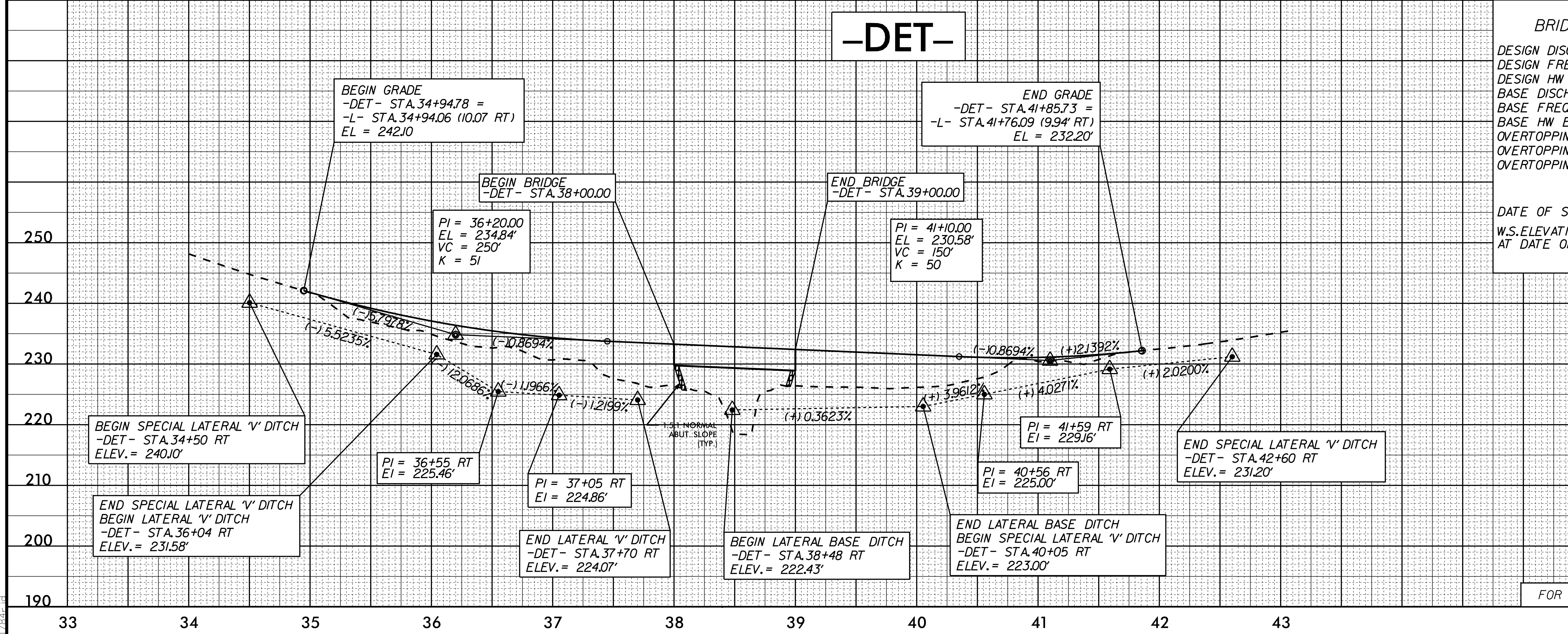
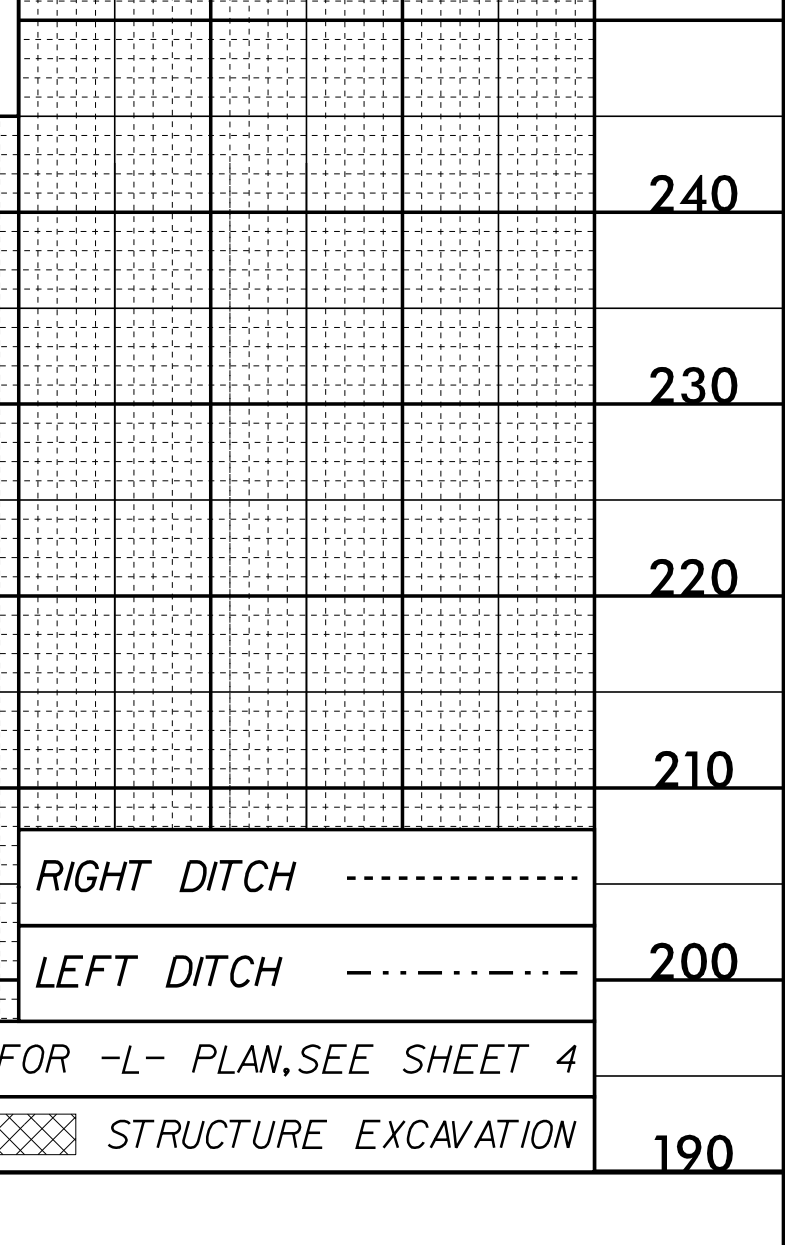
**-L- BRIDGE HYDRAULIC DATA**

DESIGN DISCHARGE	= 1700	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 228.0	FT
BASE DISCHARGE	= 2200	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 228.80	FT
OVERTOPPING DISCHARGE	= 4475	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 231.8	FT

DATE OF SURVEY	= 11/29/2016
W.S. ELEVATION AT DATE OF SURVEY	= 218.6 FT

PROJECT REFERENCE NO.	B-5237	SHEET NO.	5
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>			
<b>Mead &amp; Hunt</b>			
133 Fayetteville Street, Suite 210 Raleigh, North Carolina 27601 919-714-8670   mead@meadhunt.com NC License No. F-1235			

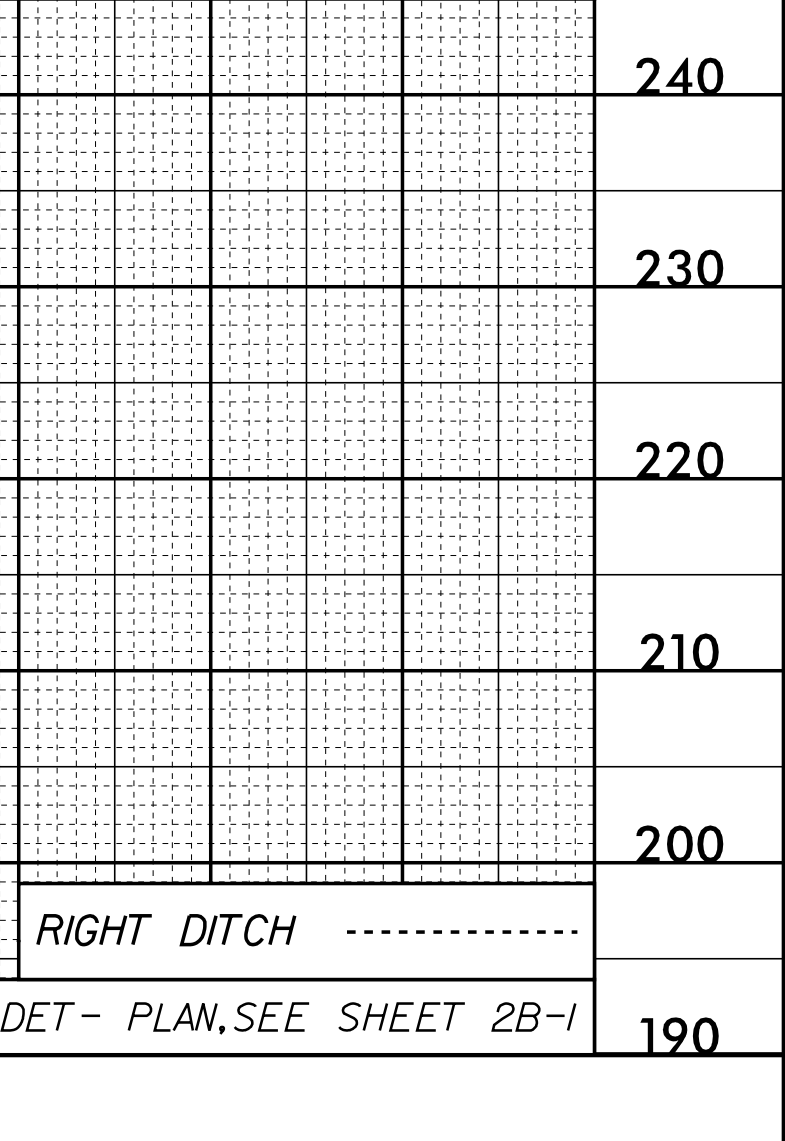


**-DET- BRIDGE HYDRAULIC DATA**

DESIGN DISCHARGE	= 1200	CFS
DESIGN FREQUENCY	= 10	YRS
DESIGN HW ELEVATION	= 227.6	FT
BASE DISCHARGE	= 2200	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 228.9	FT
OVERTOPPING DISCHARGE	= 3600	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 231.1	FT

DATE OF SURVEY	= 11/29/2016
W.S. ELEVATION AT DATE OF SURVEY	= 218.6 FT



15-JAN-2016 10:11 AM C:\Users\jw5237\OneDrive\Projects\B5237\_Rdy\_PEL\_5.dgn