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

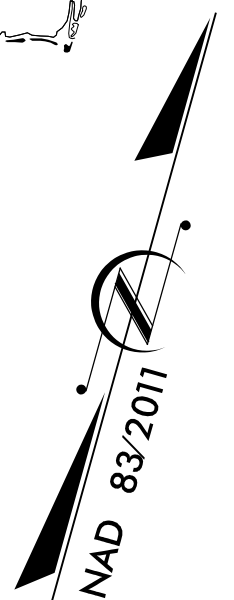
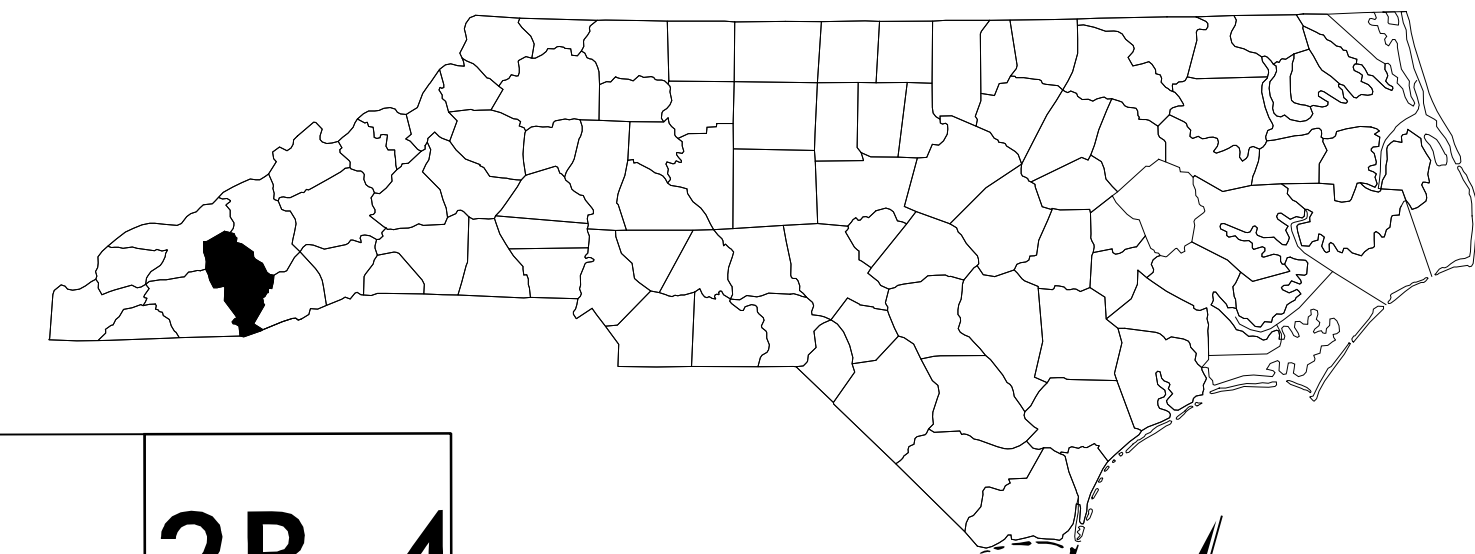
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# JACKSON COUNTY

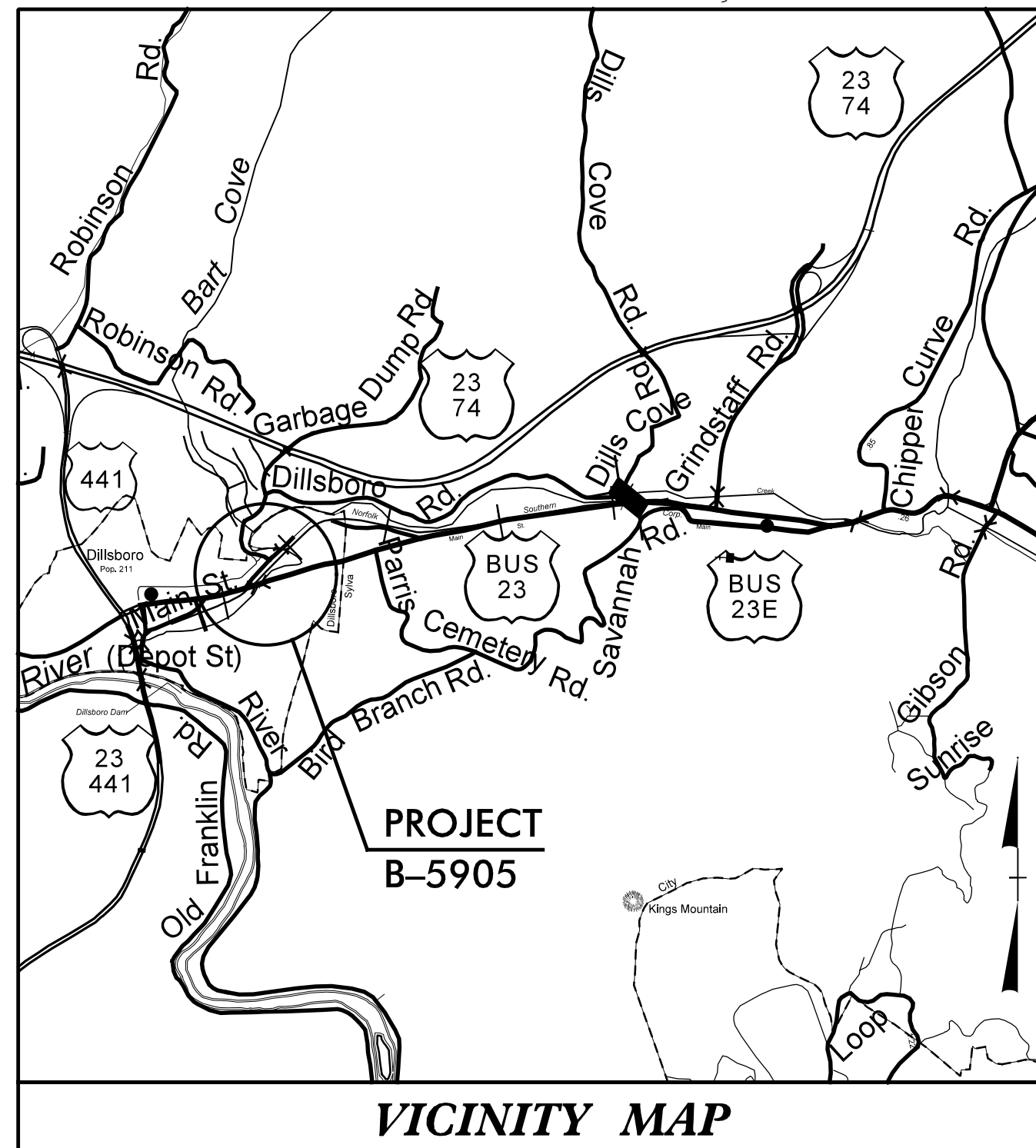
**LOCATION: BRIDGE 27 OVER SCOTT CREEK AND  
SOUTHERN RAILROAD ON US 23 BUSINESS**

**TYPE OF WORK: GRADING, DRAINAGE, PAVING, RETAINING WALLS,  
SIGNAL, AND STRUCTURE**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	<b>B-5905</b>	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
48037.1.1	BRNHS-0023(28)	P.E.	
48037.2.2	BRNHS-0023(28)	RW & UTILITIES.	
48037.3.3	BRNHS-0023(28)	CONSTRUCTION	

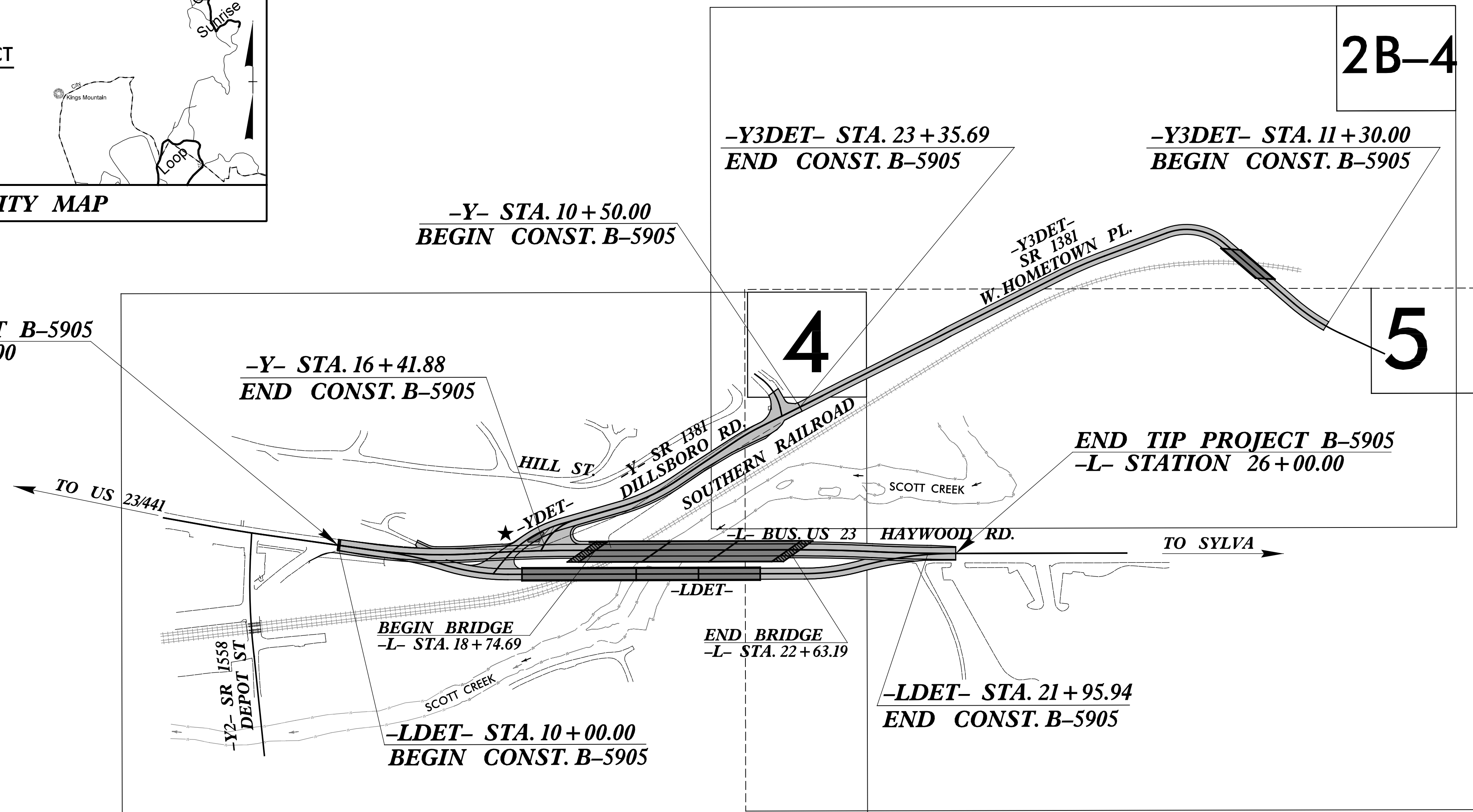


**TIP PROJECT: B-5905**



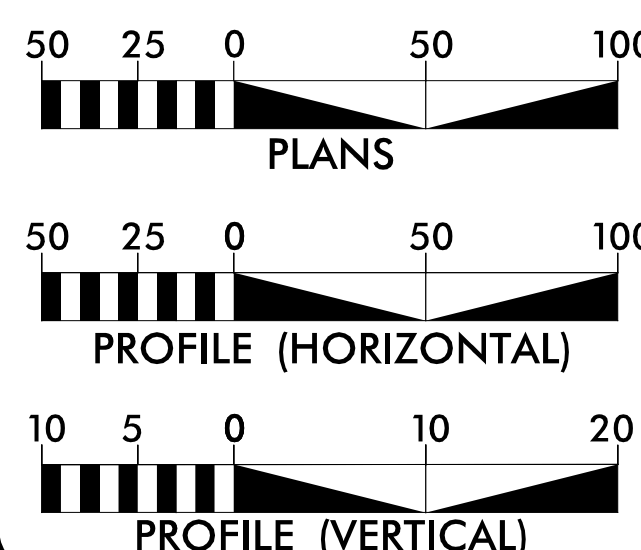
VICINITY MAP

**BEGIN TIP PROJECT B-5905**  
**-L- STATION 13+55.00**



**CONTRACT: C204330**

**GRAPHIC SCALES**



**DESIGN DATA**

ADT 2018 = 9,605  
ADT 2038 = 12,423  
K = 9 %  
D = 65 %  
T = 6 % \*  
V = 40 MPH  
\* TTST = 1 DUAL 5  
FUNC CLASS = MINOR ARTERIAL  
STATEWIDE TIER

**PROJECT LENGTH**

LENGTH OF ROADWAY TIP PROJECT B-5905 = 0.162 Mi.  
LENGTH OF STRUCTURE TIP PROJECT B-5905 = 0.074 Mi.  
TOTAL LENGTH OF TIP PROJECT B-5905 = 0.236 Mi.

Prepared for the North Carolina Department of Transportation  
In the Office of:

**vhb** 940 Main Campus Drive, Suite 500  
Raleigh, NC 27606  
NC License No. C-3705

**SUNGATE DESIGN GROUP, P.A.**  
606 JONES FARMWAY, SUITE 200  
RALEIGH, NORTH CAROLINA 27606  
TEL: (919) 202-2200 FAX: (919) 202-2209  
WWW.SUNGATEDESIGN.COM

2018 STANDARD SPECIFICATIONS

**RIGHT OF WAY DATE:**  
JUNE 30, 2017

**LETTING DATE:**  
JUNE 18, 2019

PROJECT ENGINEER: \_\_\_\_\_  
PROJECT DESIGN ENGINEER: **TIM GOINS, P.E.**

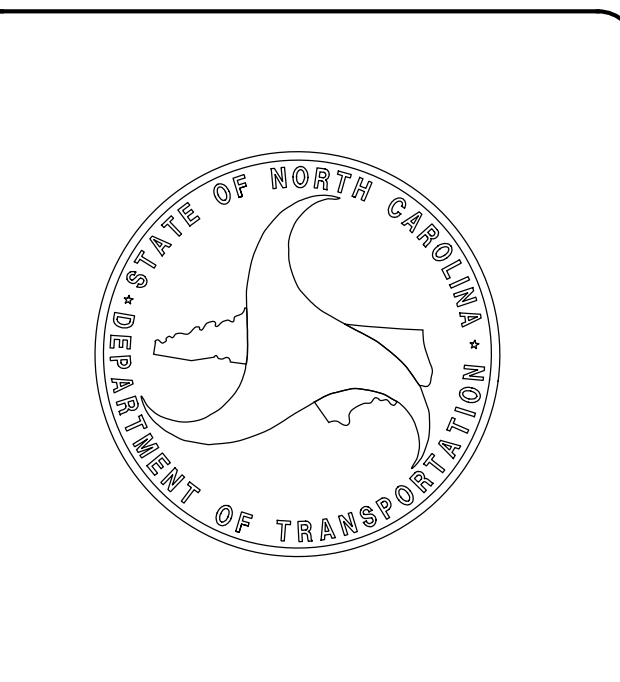
**HYDRAULICS ENGINEER**

5/16/2019

DocuSigned by:  
Joshua G. Dalton  
1099AD9C14994C3...  
SIGNATURE: \_\_\_\_\_  
P.E.


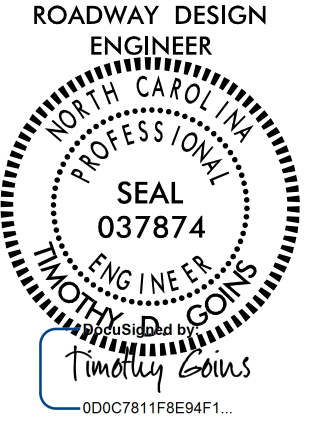
**ROADWAY DESIGN ENGINEER**

DocuSigned by:  
Timothy Goins  
000C7811F8E94F1...  
SIGNATURE: \_\_\_\_\_  
P.E.



★ PROPOSED TRAFFIC SIGNAL  
DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



PROJECT REFERENCE NO. <i>B-5905</i>	SHEET NO. <i>1A</i>
 VHB Engineering NC, P.C. (C-3705) 940 Main Campus Drive, Suite 500 Raleigh, NC 27606	ROADWAY DESIGN ENGINEER  SEAL 037874 TIMOTHY LEWIS ENGINEER 00007811F8E54F1
	<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>

EFF. 01-16-2018  
REV.

2018 ROADWAY ENGLISH STANDARD DRAWINGS

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.

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.

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.

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 Corporation, Frontier Communications, Tuckaseegee Water & Sewer, and Morris Broadband. ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

RIGHT-OF-WAY MARKERS:

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

CURB RAMPS

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

ROCK

ROCK IS ANTICIPATED BETWEEN . BLASTING MAY BE REQUIRED FOR EXCAVATION ON THE PROJECT. SEE SECTION 220 OF THE STANDARD SPECIFICATIONS AND IF APPLICABLE, ROCK BLASTING PROVISION.

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:

SHEET NUMBER	SHEET	STD. NO.	TITLE
1	TITLE SHEET	DIVISION 2 - EARTHWORK	
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS	200.02	Method of Clearing - Method II
1B	CONVENTIONAL SYMBOLS	225.02	Guide for Grading Subgrade - Secondary and Local
2A-1 THRU 2A-4	PAVEMENT SCHEDULE AND TYPICAL SECTIONS	225.04	Method of Obtaining Super-elevation - Two Lane Pavement
2B-1 THRU 2B-5	ROADWAY DETAILS	DIVISION 3 - PIPE CULVERTS	
2C-1 THRU 2C-3	STRUCTURE ANCHOR UNITS, GUARDRAIL INSTALLATION	300.01	Method of Pipe Installation
2G-1	TEMPORARY SHORING DETAIL	DIVISION 4 - MAJOR STRUCTURES	
2G-2 THRU 2G-4	TEMPORARY WALL DETAILS	422.01	Bridge Approach Fills - Type I Standard Approach Fill
3B-1	EARTHWORK SUMMARY, PAVEMENT SUMMARY, GUARDRAIL SUMMARY	DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
3D-1	DRAINAGE SUMMARIES	560.01	Method of Shoulder Construction - High Side of Super-elevated Curve - Method I
3G-1	GEOTECHNICAL SUMMARIES	DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
3P-1	PARCEL INDEX SHEET	654.01	Pavement Repairs
4 THRU 6	PLAN AND PROFILE SHEETS	DIVISION 8 - INCIDENTALS	
RW01 THRU RW05	SURVEY CONTROL RIGHT OF WAY SHEETS	806.01	Concrete Right-of-Way Marker
TMP-1 THRU TMP-9	TRAFFIC MANAGEMENT PLANS	806.02	Granite Right-of-Way Marker
PMP-1 THRU PMP-2	PAVEMENT MARKING PLANS	815.02	Subsurface Drain
EC-1 THRU EC-10	EROSION CONTROL PLANS	840.00	Concrete Base Pad for Drainage Structures
RF-1	REFORESTATION PLANS	840.01	Brick Catch Basin - 12" thru 54" Pipe
SIGN-1 THRU SIGN-4	SIGNING PLANS	840.02	Concrete Catch Basin - 12" thru 54" Pipe
SIG-1 THRU SIG-6	SIGNAL PLANS	840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
UC-1 THRU UC-5	UTILITIES CONSTRUCTION PLANS	840.14	Concrete Drop Inlet - 12" thru 30" Pipe
UO-1 THRU UO-4	UTILITIES BY OTHERS PLANS	840.15	Brick Drop Inlet - 12" thru 30" Pipe
W-1 THRU W-10	RETAINING WALL PLANS	840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
X-1A	CROSS-SECTION SUMMARY SHEET	840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
X-1 THRU X-84	CROSS-SECTIONS	840.24	Frames and Narrow Slot Sag Grates
S-1 THRU S-52	STRUCTURE PLANS	840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
		840.29	Frames and Narrow Slot Flat Grates
		840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
		840.45	Precast Drainage Structure
		840.46	Traffic Bearing Precast Drainage Structure
		840.66	Drainage Structure Steps
		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
		848.01	Concrete Sidewalk
		848.02	Driveway Turnout - Radius Type
		848.05	Curb Ramp - Proposed Curb & Gutter
		850.01	Concrete Paved Ditches
		852.01	Concrete Islands
		857.01	Precast Reinforced Concrete Barrier - 41" Single Faced
		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)
		862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
		866.01	Chain Link Fence - 4', 5' and 6' High Fence
		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	_____ X
Property Monument	□ ECM
Parcel/Sequence Number	①23
Existing Fence Line	-X-X-X-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	□
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	--- WLB ---
Proposed Wetland Boundary	WLB
Existing Endangered Animal Boundary	--- EAB ---
Existing Endangered Plant Boundary	--- EPB ---
Existing Historic Property Boundary	--- HPB ---
Known Contamination Area: Soil	☠ S ☠
Potential Contamination Area: Soil	☠ S ☠
Known Contamination Area: Water	☠ W ☠
Potential Contamination Area: Water	☠ W ☠
Contaminated Site: Known or Potential	☠ ?

### BUILDINGS AND OTHER CULTURE:

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

### HYDROLOGY:

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

### RAILROADS:

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

### RIGHT OF WAY & PROJECT CONTROL:

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

### ROADS AND RELATED FEATURES:

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

### VEGETATION:

Single Tree	☀
Single Shrub	☁

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

Hedge	_____
Woods Line	_____
Orchard	_____
Vineyard	_____ (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.*)	--- 2UTL ---
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.

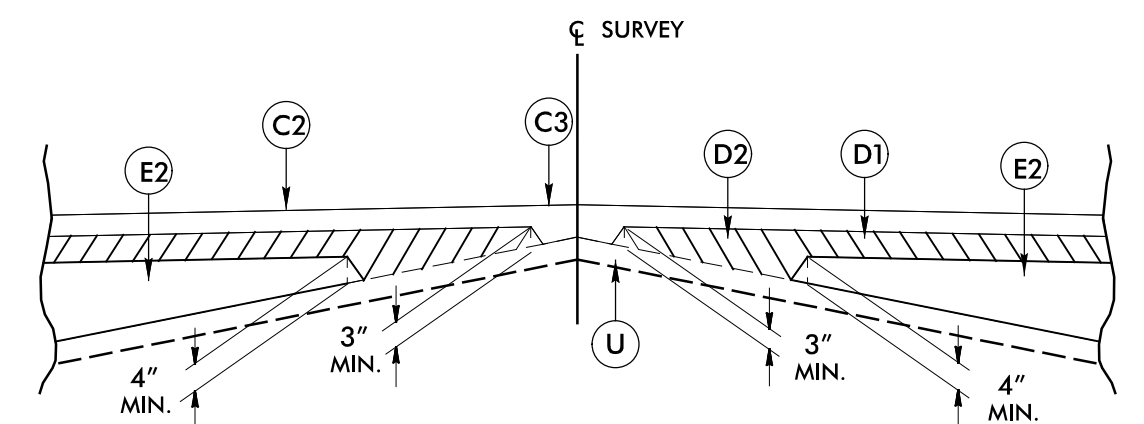


6/2/99

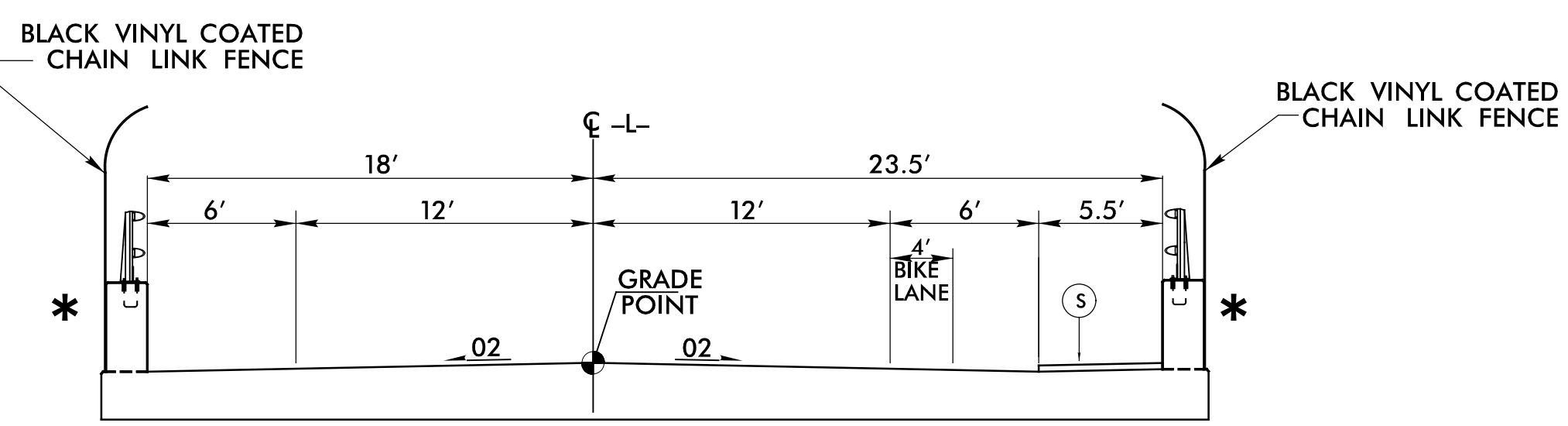
PROJECT REFERENCE NO. B-5905	SHEET NO. 2A-1
ROADWAY DESIGN ENGINEER TIMOTHY GOINS SEAL 037874 NORTH CAROLINA PROFESSIONAL ENGINEER	PAVEMENT DESIGN ENGINEER CLARK S. MORRIS SEAL 00287 NORTH CAROLINA PROFESSIONAL ENGINEER
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

PAVEMENT SCHEDULE FINAL PAVEMENT DESIGN	
C1	PROP. APPROX. 1 1/2" 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 1.5" 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 2-1/2" 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" OR GREATER THAN 5"
J1	PROP. 8" AGGREGATE BASE COURSE.
J2	PROP. VAR. DEPTH AGGREGATE BASE COURSE.
P	PRIME COAT
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	MILLING BITUMINOUS PAVEMENT, 1.5" DEPTH.
S	4" CONCRETE SIDEWALK.
R	2'-6" CONCRETE CURB AND GUTTER.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL SHEET NO. 2A-1)

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



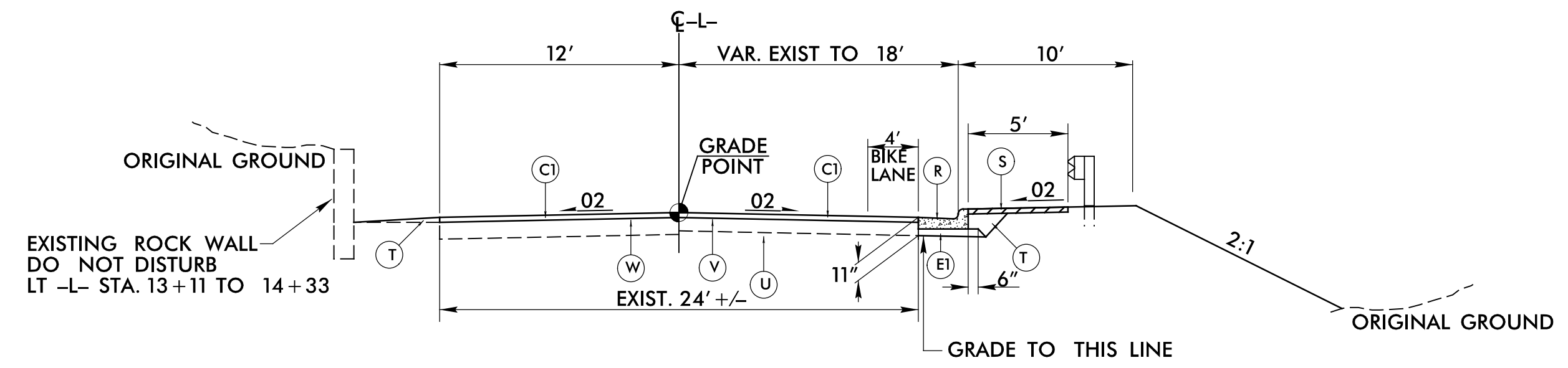
Detail Showing Method of Wedging



TYPICAL SECTION ON STRUCTURE

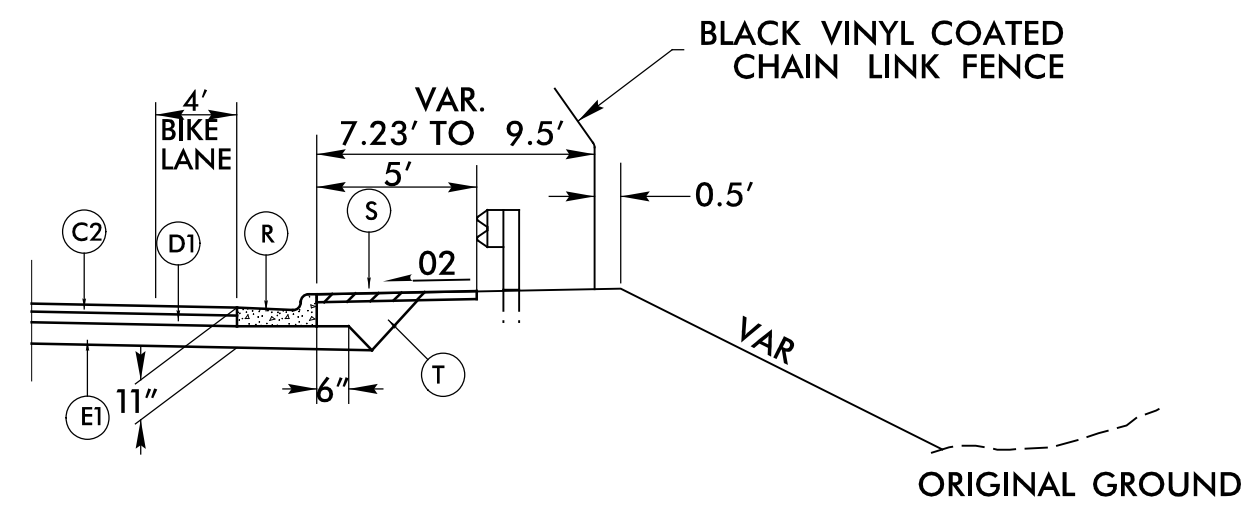
\*BICYCLE SAFE RAIL REQUIRED

-L- STA. 18+74.69 (BEGIN BRIDGE) TO 22+63.19 (END BRIDGE)



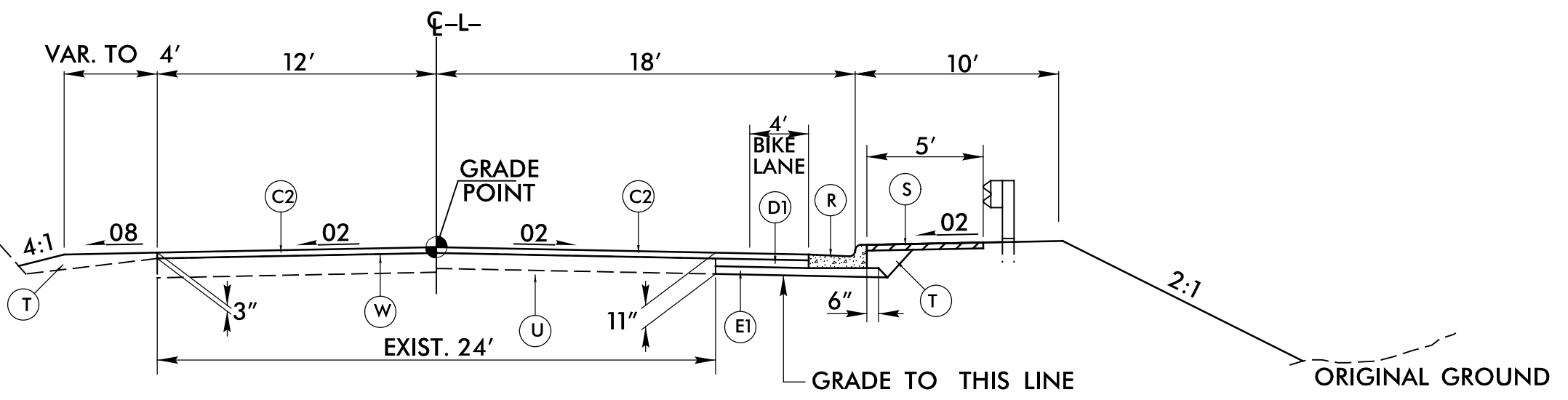
TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1 AS FOLLOWS:  
-L- STA. 13+55.00 TO 14+05.00



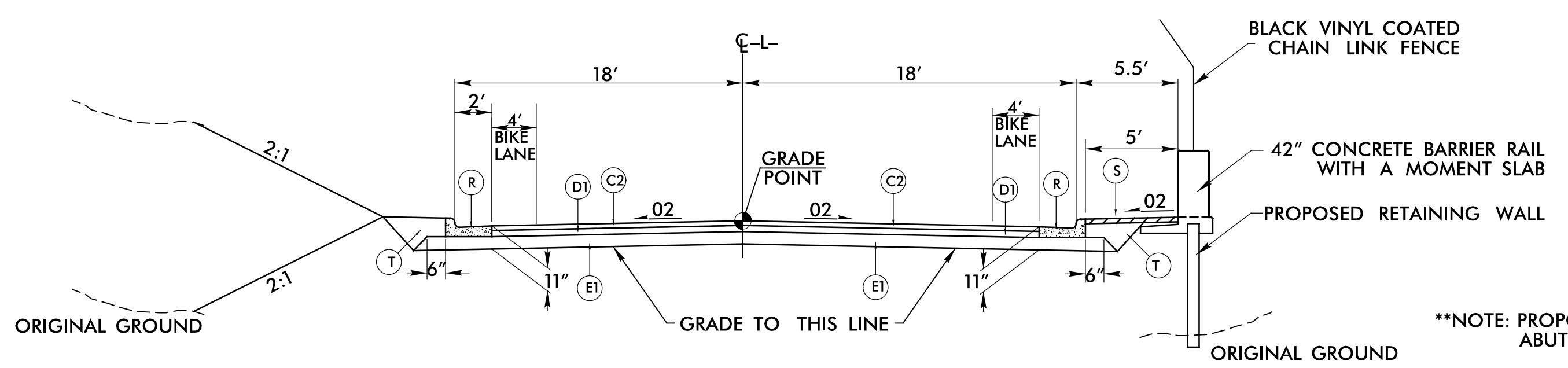
INSET 3A

TO BE USED IN CONJUNCTION WITH TYPICAL SECTION NO. 3  
-L- RT STA. 15+82.00 TO STA. 17+25.00



TYPICAL SECTION NO. 2

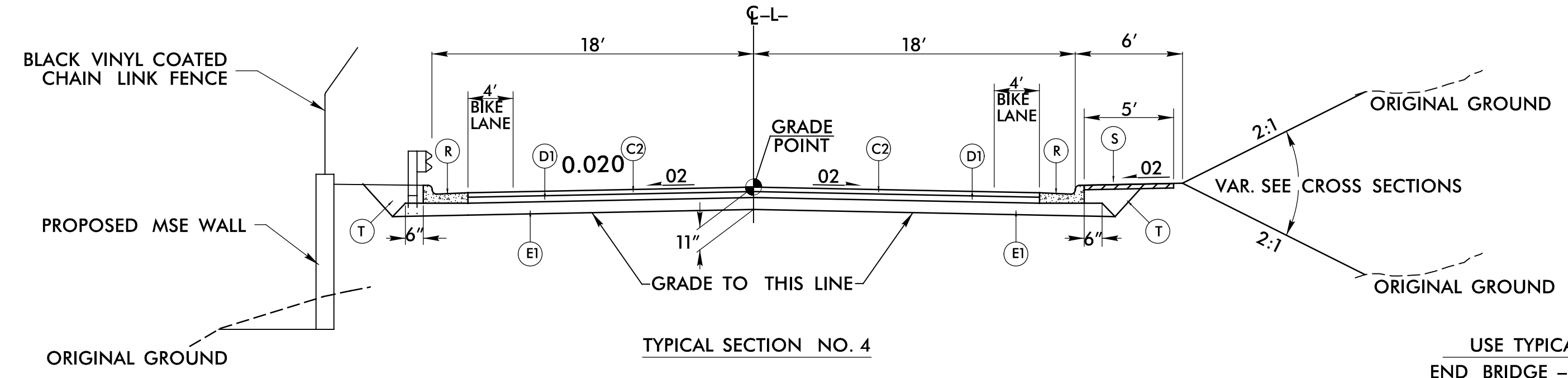
USE TYPICAL SECTION NO. 2 AS FOLLOWS:  
-L- STA. 14+05.00 TO 15+82.00



TYPICAL SECTION NO. 3

\*\*NOTE: PROPOSED RETAINING WALL TIES TO EXISTING ABUTMENT WALL AT -L- STA. 17+79.37

USE TYPICAL SECTION NO. 3 AS FOLLOWS:  
-L- STA. 15+82.00 TO BEG. BRIDGE 18+74.69



TYPICAL SECTION NO. 4

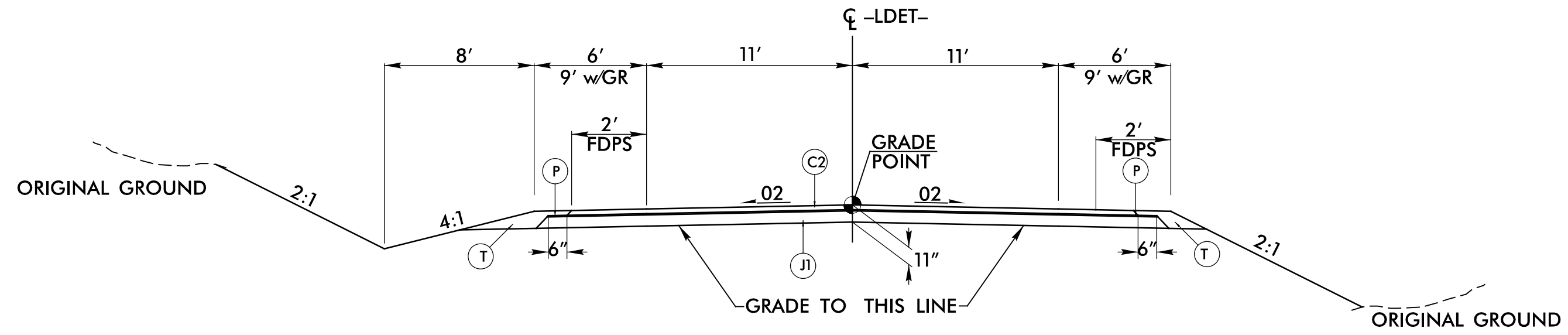
USE TYPICAL SECTION NO. 4 AS FOLLOWS:  
END BRIDGE -L- STA. 22+63.19 TO 23+50.00

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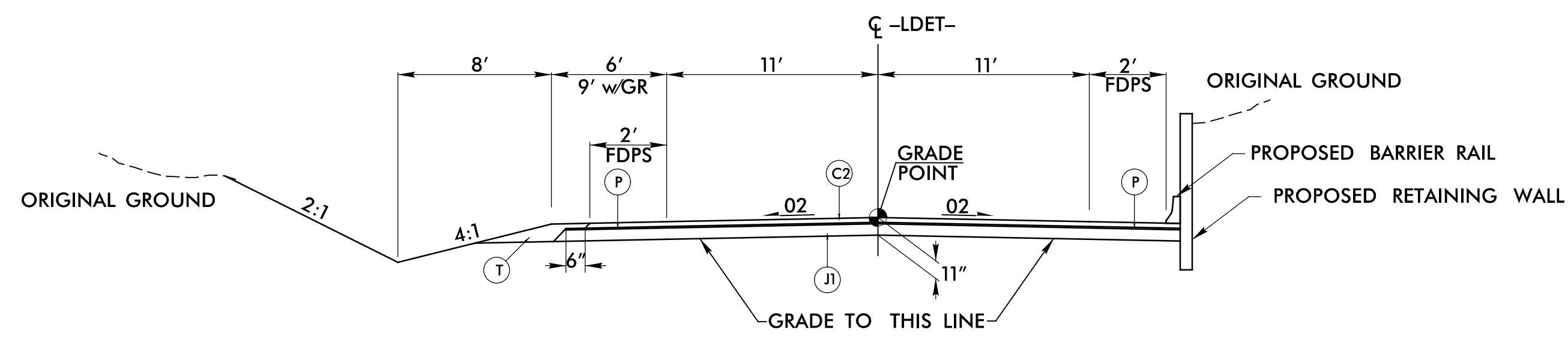
6/2/99

PAVEMENT SCHEDULE FINAL PAVEMENT DESIGN	
C2	3" S9.5B
J1	8" ABC.
P	PRIME COAT
T	EARTH MATERIAL.



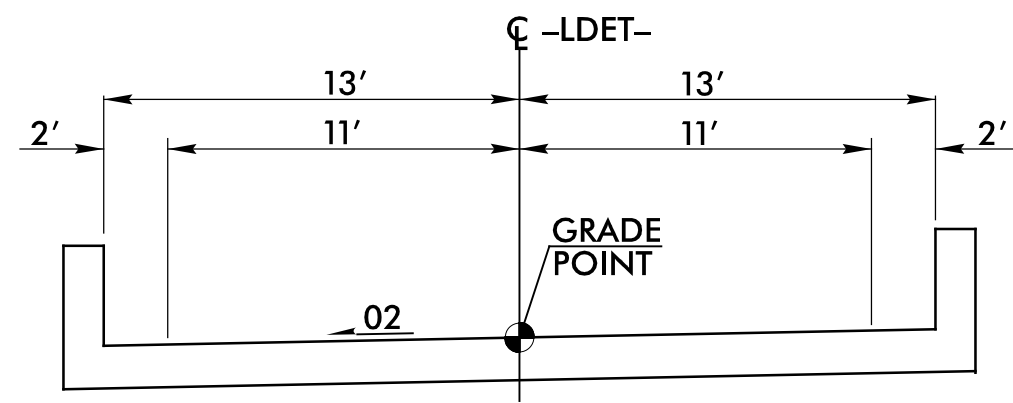
TYPICAL SECTION NO. 8

USE TYPICAL SECTION NO. 8 AS FOLLOWS:  
 -LDET- STA. 11+70.00 TO 12+27.19  
 -LDET- STA. 18+55.48 TO 21+15.00



TYPICAL SECTION NO. 9

USE TYPICAL SECTION NO. 9 AS FOLLOWS:  
 -LDET- STA. 12+27.19 TO 13+76.11



TYPICAL SECTION NO. 10

USE TYPICAL SECTION NO. 10 AS FOLLOWS:  
 -LDET- STA. 13+76.11 TO 18+55.48

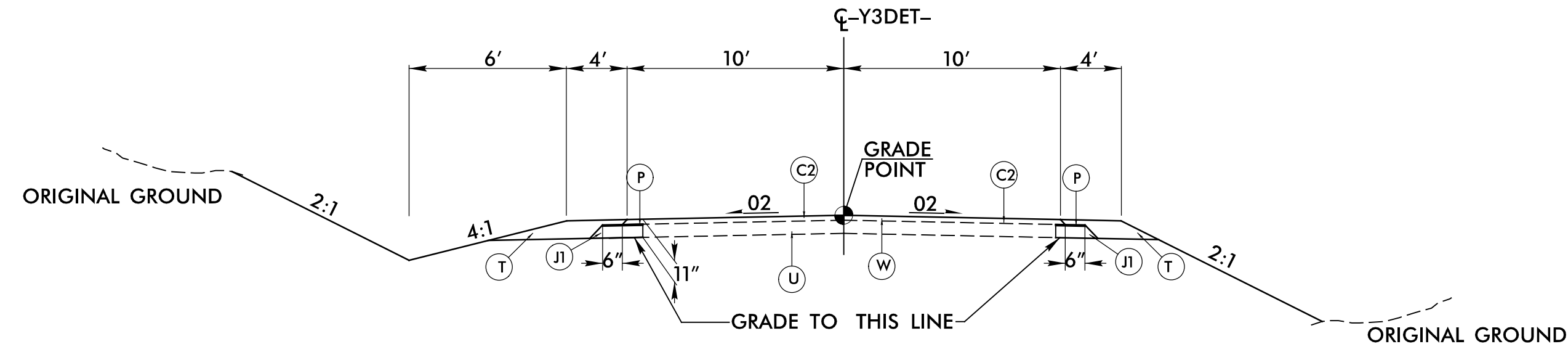
PROJECT REFERENCE NO. B-5905	SHEET NO. 2A-3
ROADWAY DESIGN ENGINEER TIMOTHY D. GOINS SEAL 037874 NORTH CAROLINA PROFESSIONAL ENGINEER	PAVEMENT DESIGN ENGINEER CLARK S. MORRISON SEAL 022896 NORTH CAROLINA PROFESSIONAL ENGINEER
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

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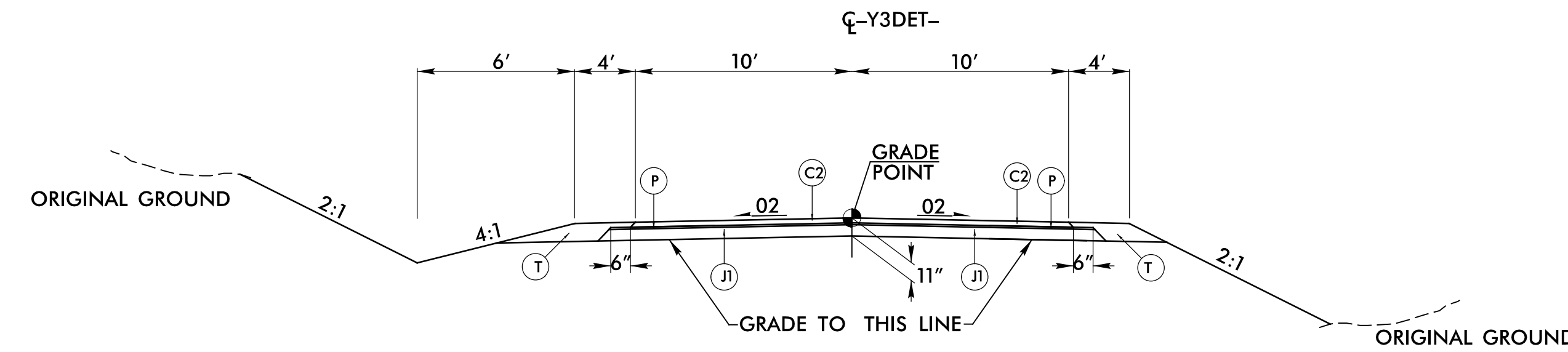
6/2/99

PAVEMENT SCHEDULE	
FINAL PAVEMENT DESIGN	
C2	3" S9.5B
J1	8" ABC.
P	PRIME COAT
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	WEDGING



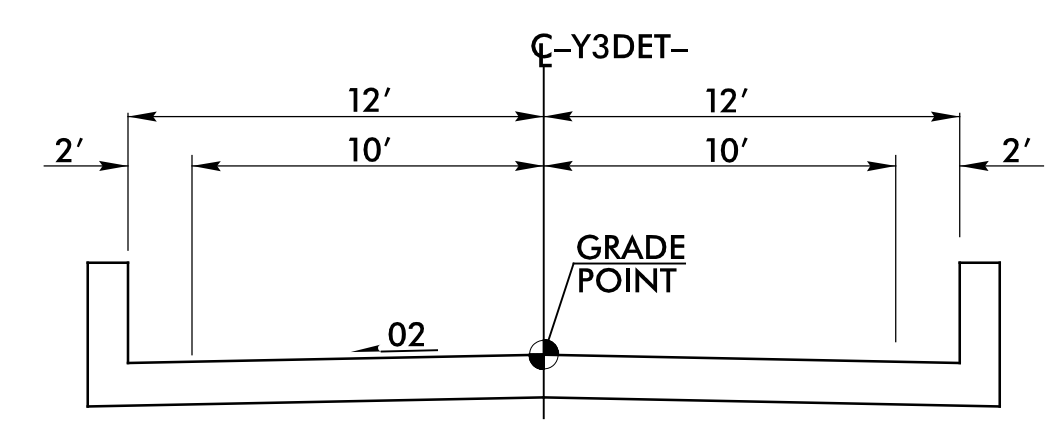
TYPICAL SECTION NO. 11

USE TYPICAL SECTION NO. 11 AS FOLLOWS:  
 -Y3DET- STA. 18+75.00 TO 20+25.00  
 NOTE: MILLING AND OVERLAY 1.5" FROM  
 -Y3DET- STA. 20+25.00 TO 23+35.69



TYPICAL SECTION NO. 12

USE TYPICAL SECTION NO. 12 AS FOLLOWS:  
 -Y3DET- STA. 11+30 TO 12+85.45 (BEGIN BRIDGE)  
 -Y3DET- STA. 13+76.23 (END BRIDGE) TO 18+75.00



TYPICAL SECTION NO. 13

USE TYPICAL SECTION NO. 13 AS FOLLOWS:  
 -Y3DET- STA. 12+85.45 (BEGIN BRIDGE) TO 13+76.23 (END BRIDGE)

PROJECT REFERENCE NO. B-5905	SHEET NO. 2A-4
ROADWAY DESIGN ENGINEER SEAL 037874 TIMOTHY S. MORRIS	PAVEMENT DESIGN ENGINEER SEAL 022898 TIMOTHY S. MORRIS
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

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 emmccab



# -L- DETOUR

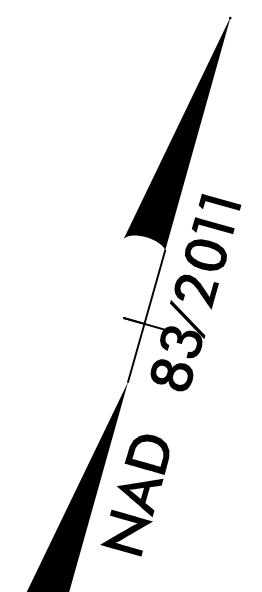
### UTILITY OWNERS

DUKE ENERGY CORPORATION  
1020 W. CHATHAM ST.  
CARY, N.C. 27511

FRONTIER COMMUNICATIONS  
84 ALLEN STREET  
SYLVA, N.C. 28779

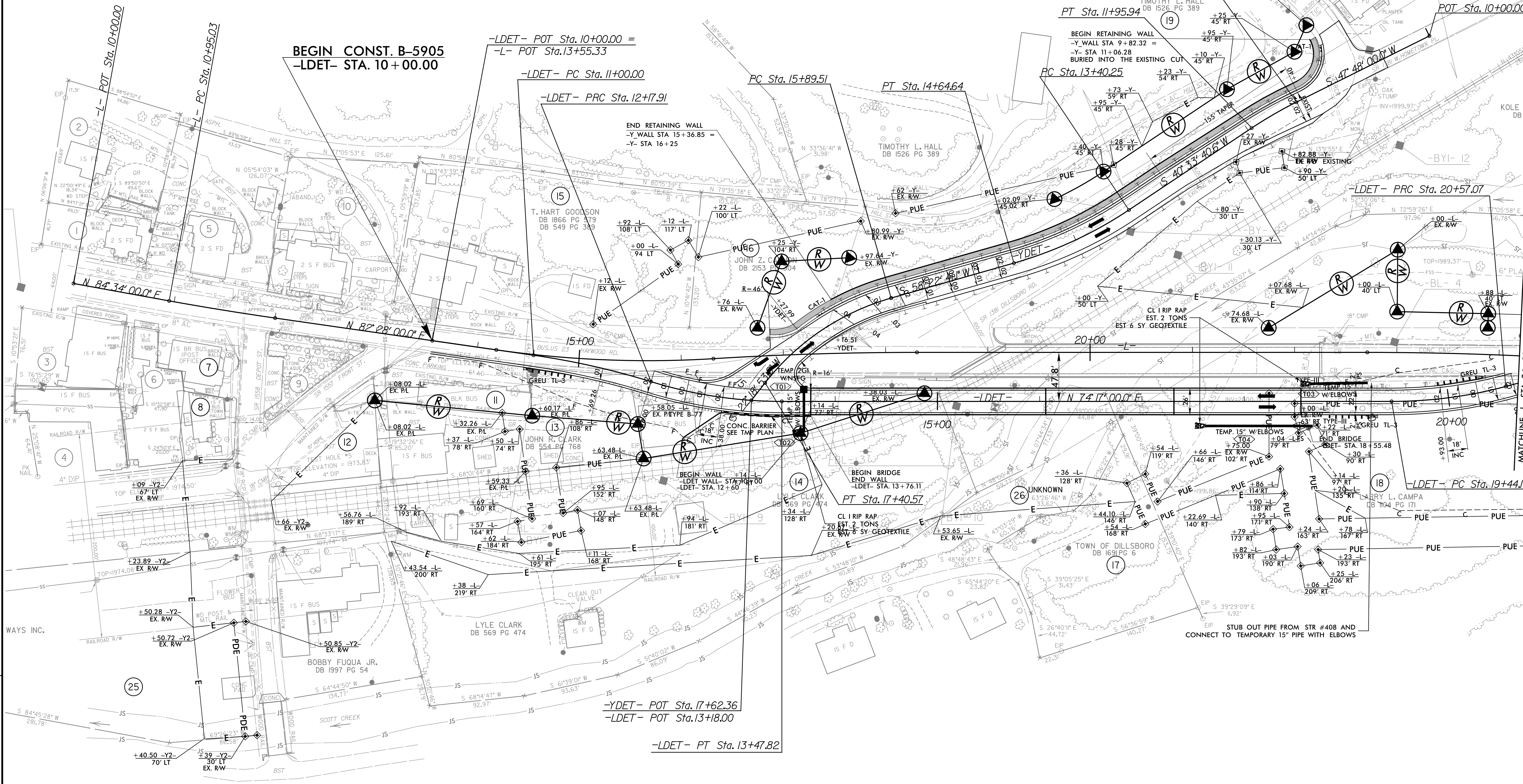
TUCKASEE WATER & SEWER  
1246 W. MAIN ST.  
SYLVA, N.C. 28779

MORRIS BROADBAND  
134 SKYLAND DR.  
SYLVA, N.C. 28779



PROJECT REFERENCE NO. <b>B-5905</b>	SHEET NO. <b>2B-1</b>
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER <b>SEAL 037874</b> TIMOTHY L. HALL	ENGINEER JOSHUA G. DALTON
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

REVISIONS



**BEGIN CONST. B-5905  
-LDET- STA. 10+00.00**

**-LDET- POT Sta. 10+00.00 =  
-L- POT Sta. 13+55.33**

**-LDET- PC Sta. 11+00.00  
-LDET- PRC Sta. 12+17.91**

**END RETAINING WALL  
-Y WALL STA 15+36.85 =  
-Y- STA 16+25**

**-YDET- POT Sta. 17+62.36  
-LDET- POT Sta. 13+18.00**

-LDET-		
PI Sta 11+59.08	PI Sta 12+83.36	PI Sta 20+00.93
$\Delta = 9' 00'' 26.8''$ (RT)	$\Delta = 17' 11'' 26.8''$ (LT)	$\Delta = 14' 56'' 30.9''$ (LT)
$D = 7' 38'' 22.0''$	$D = 13' 13'' 56.2''$	$D = 13' 13'' 56.2''$
$L = 117.9''$	$L = 129.92''$	$L = 112.92''$
$T = 59.08''$	$T = 65.45''$	$T = 56.78''$
$R = 750.00'$	$R = 433.00'$	$R = 433.00'$

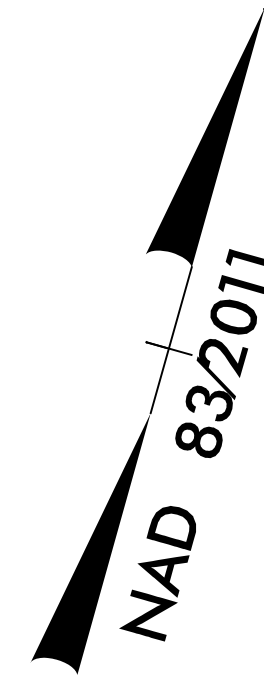
-YDET-		
PI Sta 11+70.70	PI Sta 14+02.95	PI Sta 16+67.63
$\Delta = 7' 14'' 19.4''$ (LT)	$\Delta = 17' 49'' 00.5''$ (RT)	$\Delta = 36' 03'' 47.3''$ (LT)
$D = 14' 19'' 26.2''$	$D = 14' 19'' 26.2''$	$D = 23' 52'' 23.7''$
$L = 50.54''$	$L = 124.38''$	$L = 151.06''$
$T = 25.30''$	$T = 62.70''$	$T = 78.13''$
$R = 400.00'$	$R = 400.00'$	$R = 240.00'$

SEE SHEET 2B-3 FOR -LDET- & -YDET- PROFILES  
SEE SHEETS W-1 THRU W-10 FOR RETAINING WALLS

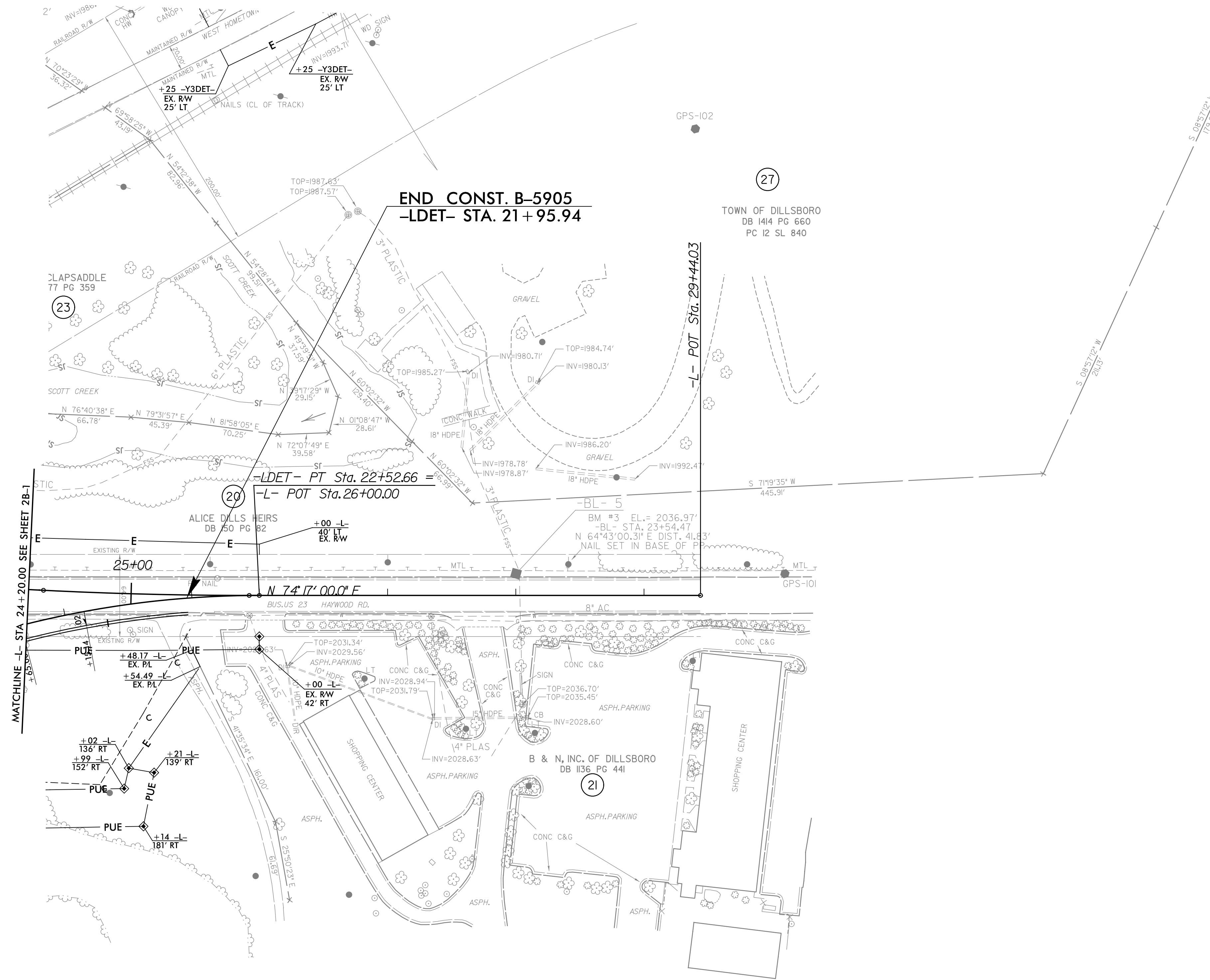


# -L- DETOUR

PROJECT REFERENCE NO. B-5905	SHEET NO. 2B-2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER SEAL 037874 TIMOTHY G. BOUS	HYDRAULICS ENGINEER SEAL 26971 JOSHUA G. DALTON
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



(28)  
UNKNOWN



TOWN OF DILLSBORO  
DB 1414 PG 660  
PC 12 SL 840

CLAPSADDLE  
77 PG 359

Alice DILLS HEIRS  
DB 50 PG 82

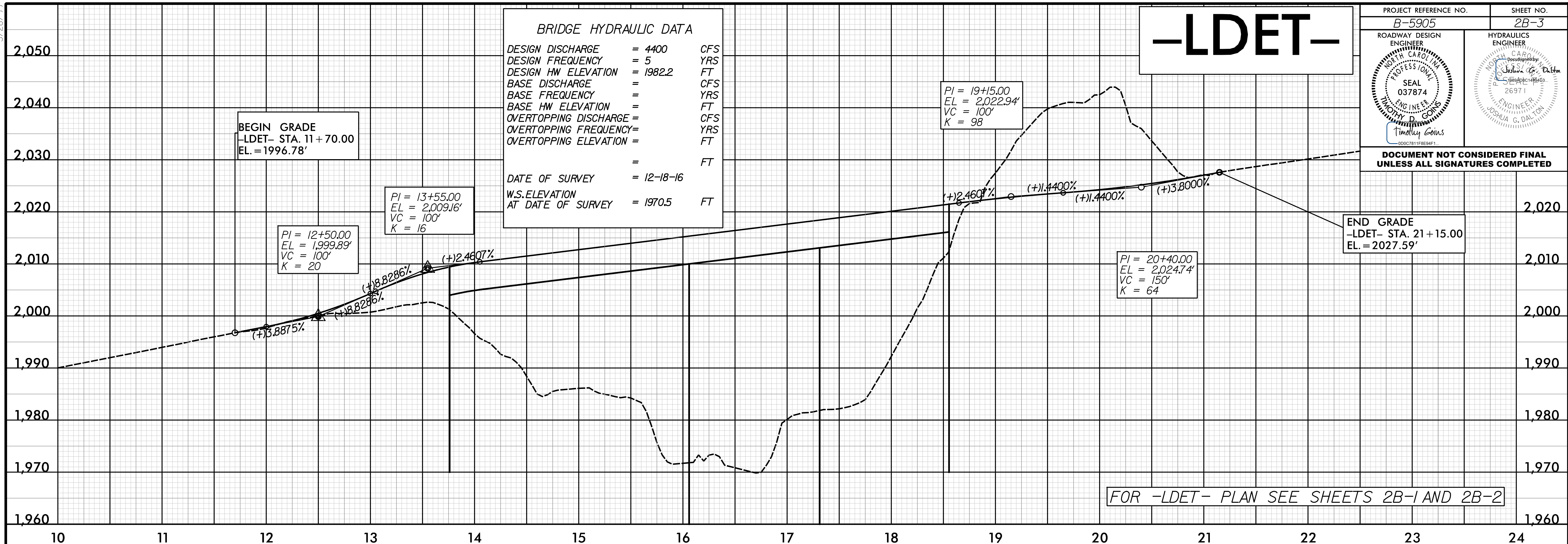
B & N, INC. OF DILLSBORO  
DB 1136 PG 441

-LDET-	
PI Sta	21+55.42
Δ	14° 56' 31.0" (RT)
D	7' 38" 22.0"
L	195.59'
T	98.35'
R	750.00'

SEE SHEET 2B-3 FOR -LDET- PROFILE

REVISIONS

5/28/99



PROJECT REFERENCE NO. B-5905 SHEET NO. 2B-3

ROADWAY DESIGN ENGINEER SEAL 037874

HYDRAULICS ENGINEER SEAL 26971

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



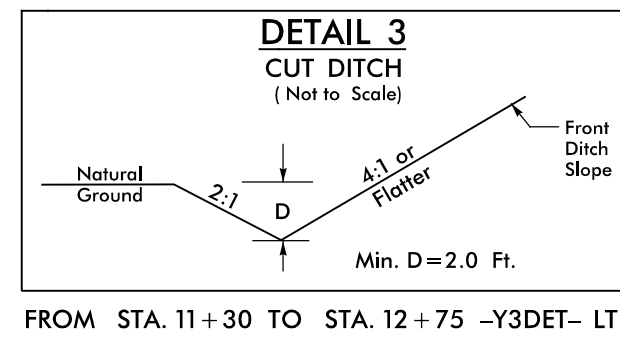
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# -Y3DET-

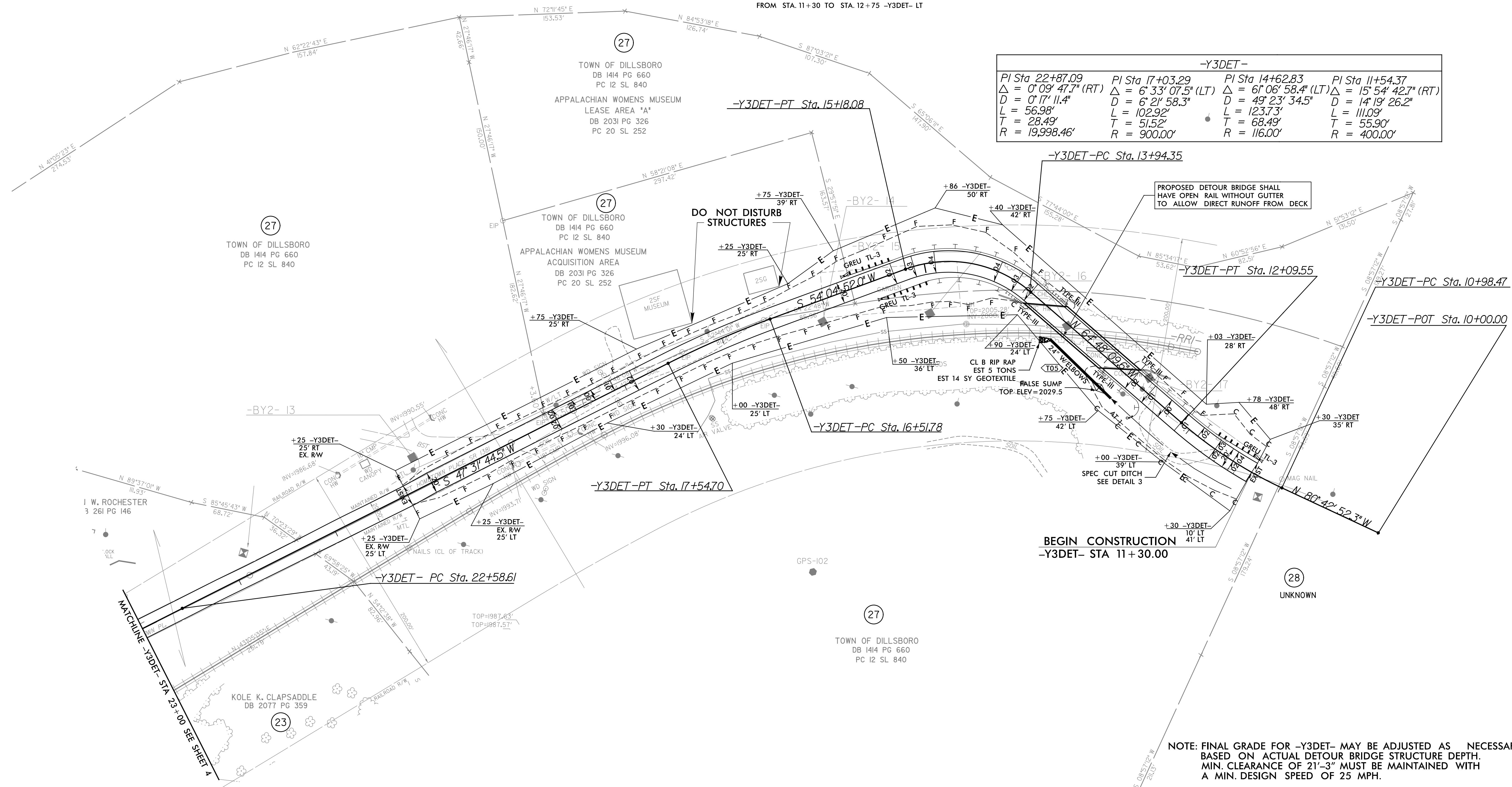


PROJECT REFERENCE NO. B-5905	SHEET NO. 2B-4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER TIMOTHY D. GOONS PROFESSIONAL SEAL 037874 ENGINEER TIMOTHY D. GOONS	HYDRAULICS ENGINEER JOSHUA G. DALTON PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



FROM STA. 11+30 TO STA. 12+75 -Y3DET- LT

-Y3DET-			
PI Sta 22+87.09	PI Sta 17+03.29	PI Sta 14+62.83	PI Sta 11+54.37
$\Delta = 0^{\circ} 09' 47.7''$ (RT)	$\Delta = 6^{\circ} 33' 07.5''$ (LT)	$\Delta = 61^{\circ} 06' 58.4''$ (LT)	$\Delta = 15^{\circ} 54' 42.7''$ (RT)
D = 0' 17' 11.4"	D = 6' 21' 58.3"	D = 49' 23' 34.5"	D = 14' 19' 26.2"
L = 56.98'	L = 102.92'	L = 123.73'	L = 111.09'
T = 28.49'	T = 51.52'	T = 68.49'	T = 55.90'
R = 19,998.46'	R = 900.00'	R = 116.00'	R = 400.00'



NOTE: FINAL GRADE FOR -Y3DET- MAY BE ADJUSTED AS NECESSARY BASED ON ACTUAL DETOUR BRIDGE STRUCTURE DEPTH. MIN. CLEARANCE OF 21'-3" MUST BE MAINTAINED WITH A MIN. DESIGN SPEED OF 25 MPH.


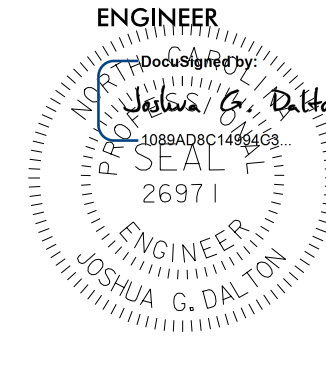
NOTE: AFTER TRAFFIC IS SHIFTED TO FINAL PATTERN, -Y3DET- AND TEMP BRIDGE IS TO BE REMOVED IN ITS ENTIRETY, AND RETURNED TO ORIGINAL GROUND PRIOR TO CONSTRUCTION.

SEE SHEET 2B-5 FOR -Y3DET- PROFILE

REVISIONS

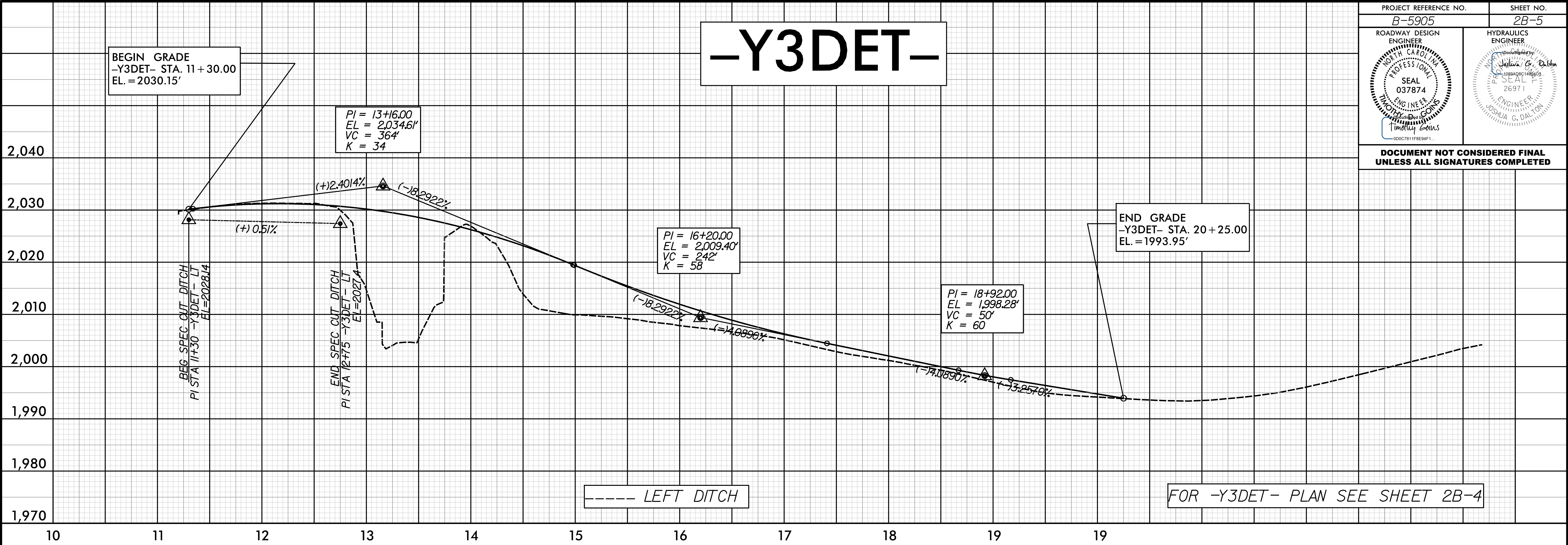
3/14/2019  
B5905-Rdy\_pah\_Y3DET\_2B-4.dgn  
mumcoast

5/28/99

PROJECT REFERENCE NO. <b>B-5905</b>	SHEET NO. <b>2B-5</b>
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER 

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

# -Y3DET-





I4-DEC-2017 10:36  
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 Jhowerton AT: USD-292595

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	ROADWAY DETAIL DRAWING FOR <b>STRUCTURE ANCHOR UNITS</b> GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE	SHEET 1 OF 7 <b>862D03</b>
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> </div> <div style="width: 50%;"> <p><b>ELEVATION</b></p> <p>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.</p> </div> </div>		
<b>GUARDRAIL ANCHOR UNIT, TYPE III                  FOR ATTACHMENT TO RAIL ON BRIDGE</b>		
STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.		

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	ROADWAY DETAIL DRAWING FOR <b>STRUCTURE ANCHOR UNITS</b> GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER	SHEET 2 OF 7 <b>862D03</b>
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> </div> <div style="width: 50%;"> <p><b>ELEVATION</b></p> <p>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.</p> </div> </div>		
<b>GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO                  RAIL ON BRIDGE - SUB REGIONAL TIER</b>		
STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.		



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UNLESS ALL SIGNATURES COMPLETED

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

SEE TITLE BLOCK

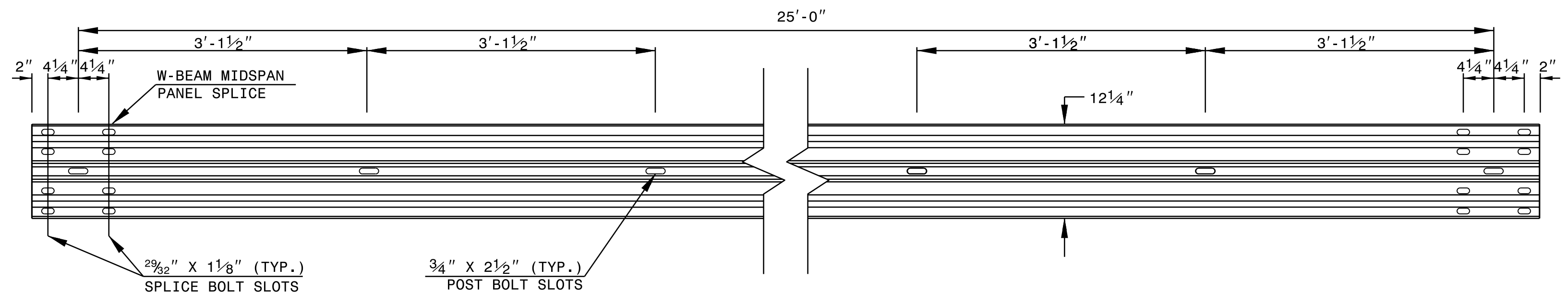
ORIGINAL BY: J. HOWERTON	DATE: 06-22-12
MODIFIED BY:	DATE:
CHECKED BY:	DATE:
FILE SPEC.:	



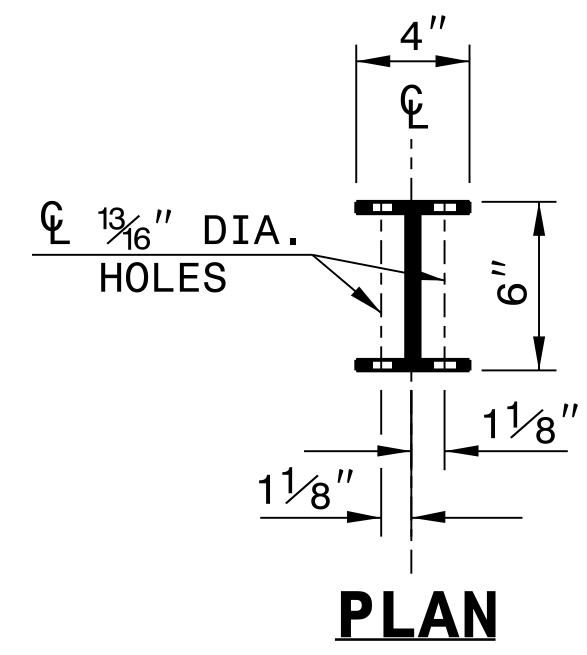
STATE OF NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

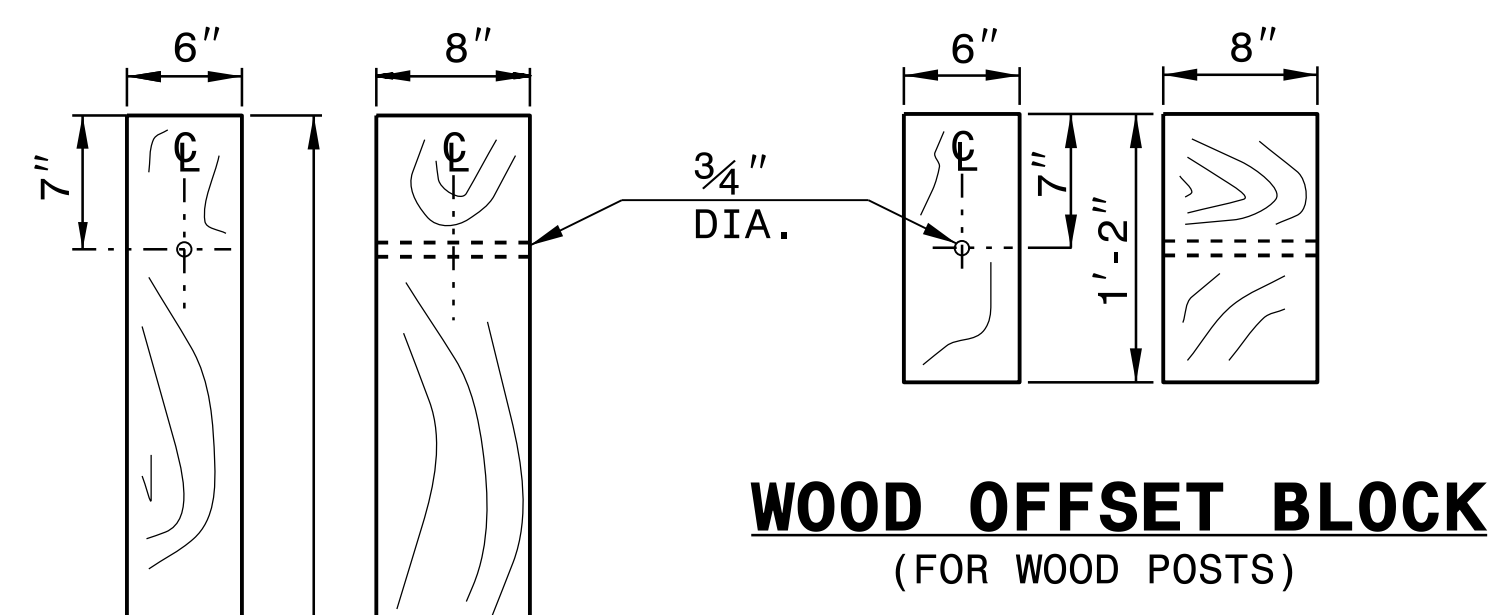
SHEET 6 OF 8  
**862D02**



**STANDARD W-BEAM GUARDRAIL**



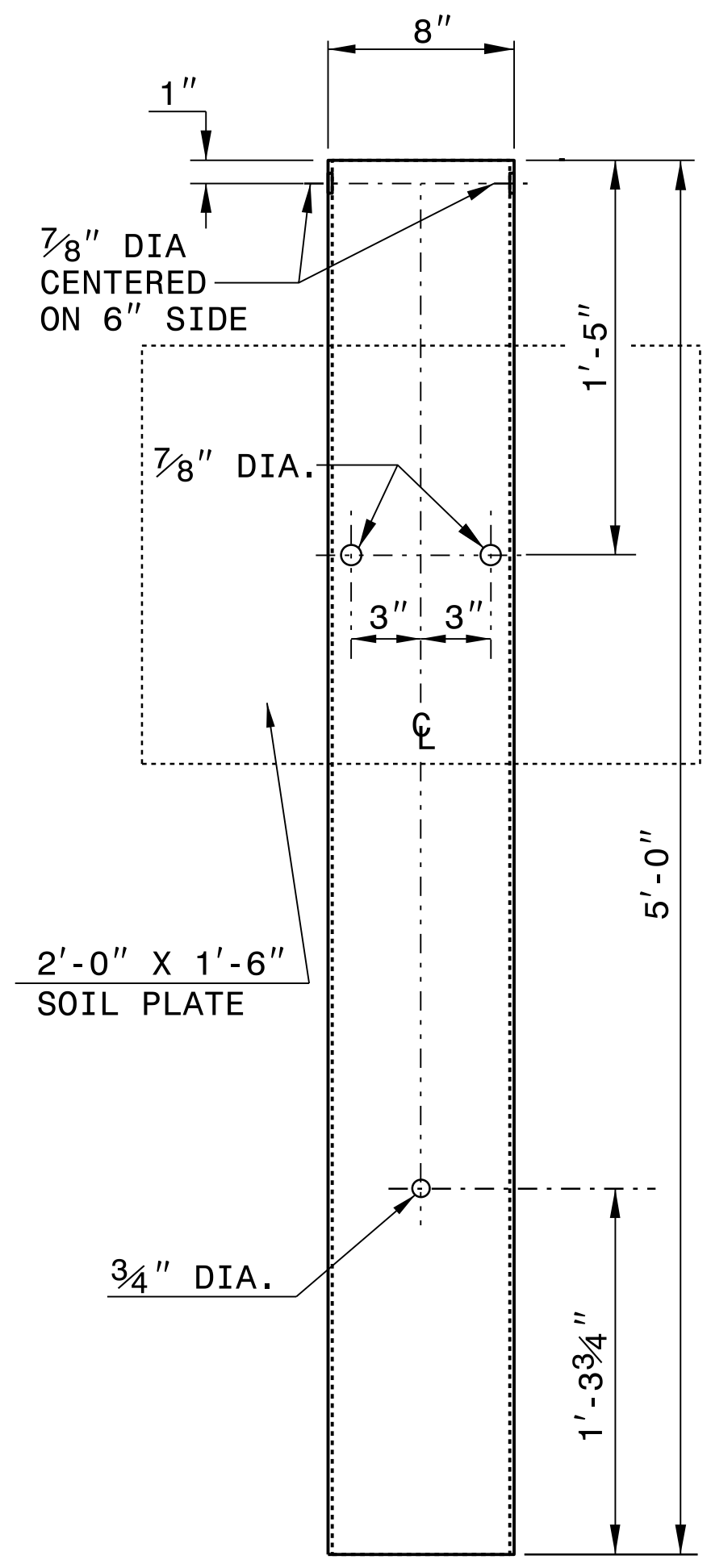
**PLAN**



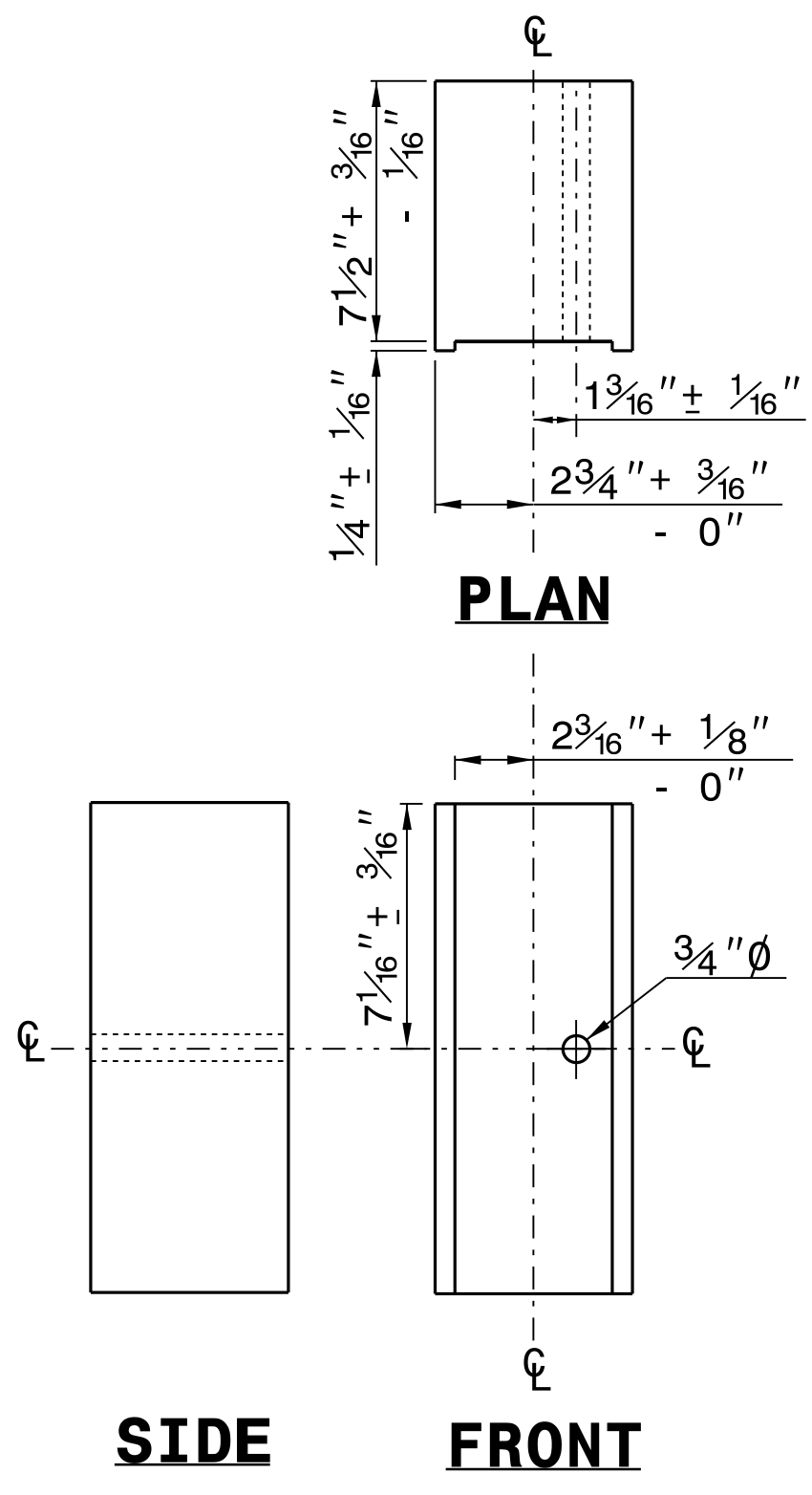
**WOOD OFFSET BLOCK  
(FOR WOOD POSTS)**

**STANDARD  
LINE POST**

**SHORT WOOD  
BREAKAWAY POST**



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

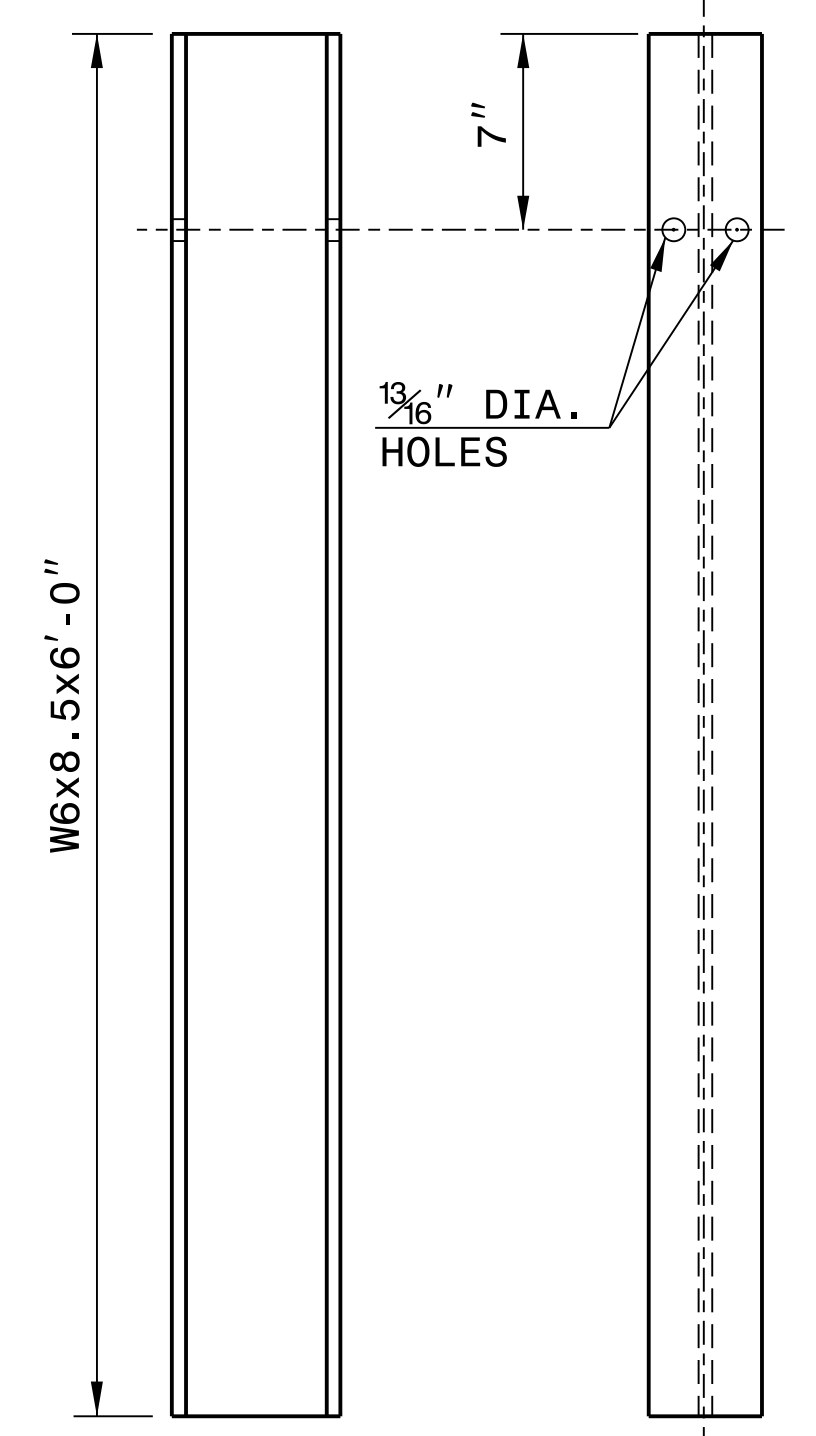


**PLAN**

**SIDE**

**FRONT**

**ROUTED  
OFFSET BLOCK**



**SIDE**

**FRONT**

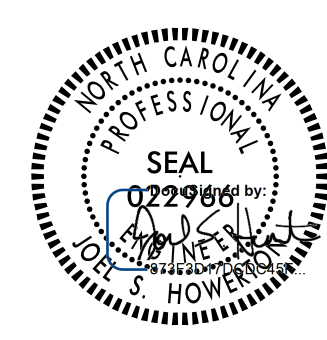
**"W6" STEEL POST**

**SYSTEM PARTS**

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

ROADWAY DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

SHEET 6 OF 8  
**862D02**



**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.: \_\_\_\_\_

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

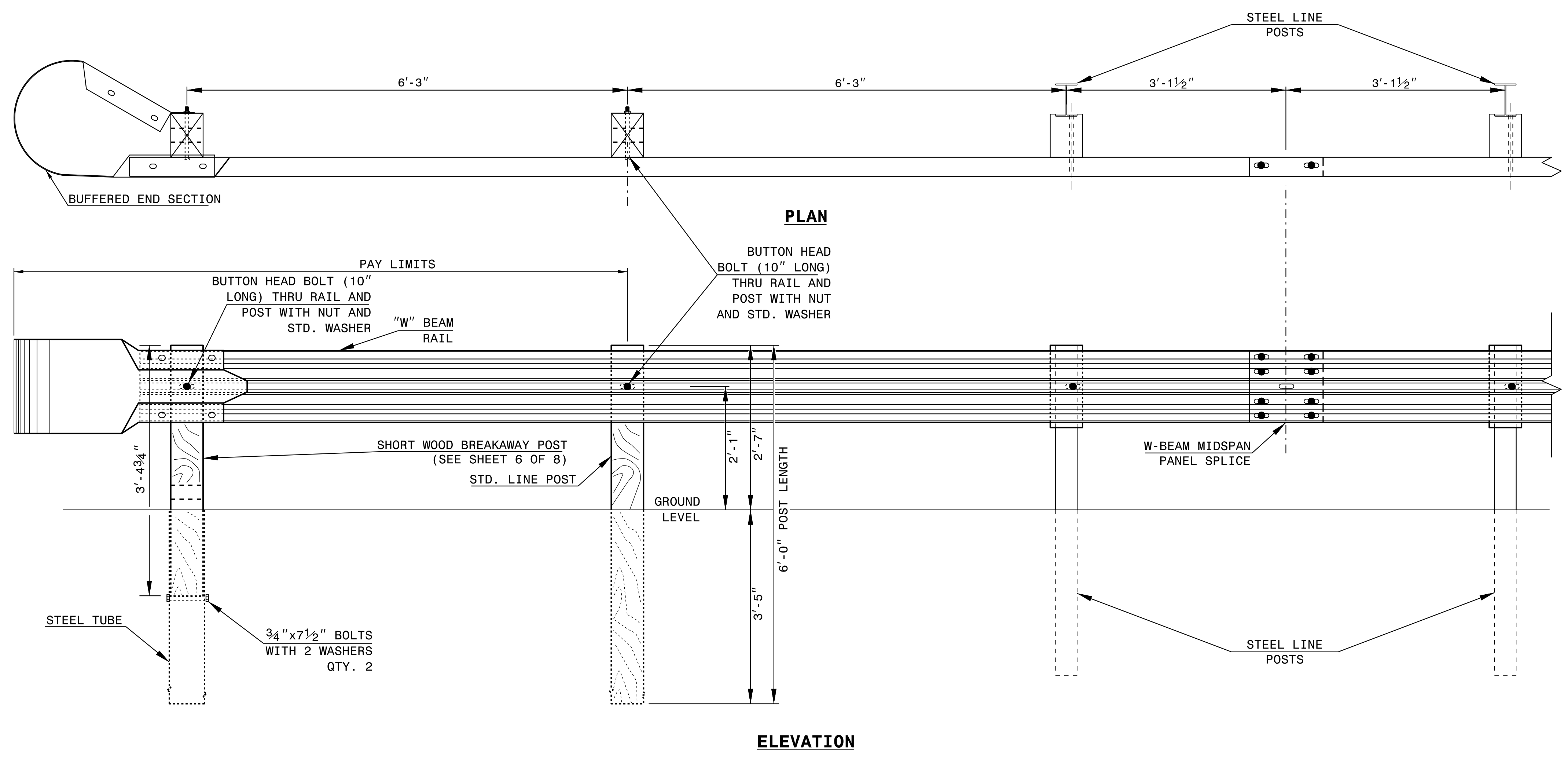
ROADWAY DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

SHEET OF

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

ROADWAY DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

SHEET OF



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



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UNLESS ALL SIGNATURES COMPLETED

<b>CONTRACTS STANDARDS AND DEVELOPMENT UNIT</b>	
Office 919-707-6950 FAX 919-250-4119	
<b>A.T. - 1 SYSTEM</b>	
ORIGINAL BY: _____	DATE: _____
MODIFIED BY: _____	DATE: _____
CHECKED BY: _____	DATE: _____
FILE SPEC.: _____	





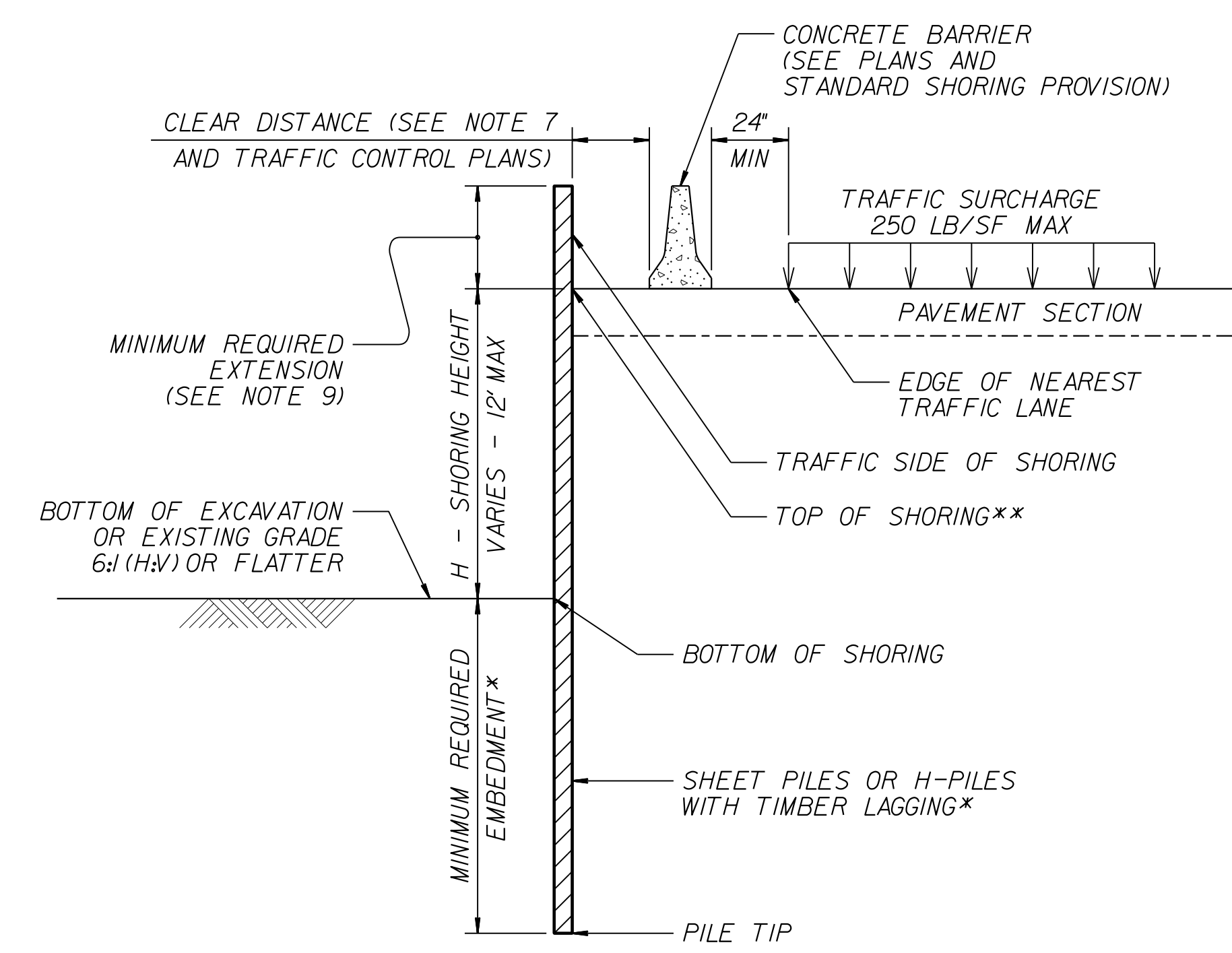
GROUNDWATER CONDITION (SEE NOTE 6)	H SHORING HEIGHT (FT)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT					SURCHARGE CASE WITH TRAFFIC IMPACT				
		SHEET PILES		H-PILES WITH TIMBER LAGGING			SHEET PILES		H-PILES WITH TIMBER LAGGING		
		MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (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
12	22.5	33.0	--	--	--	22.0	33.0	--	--	21.5	
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**

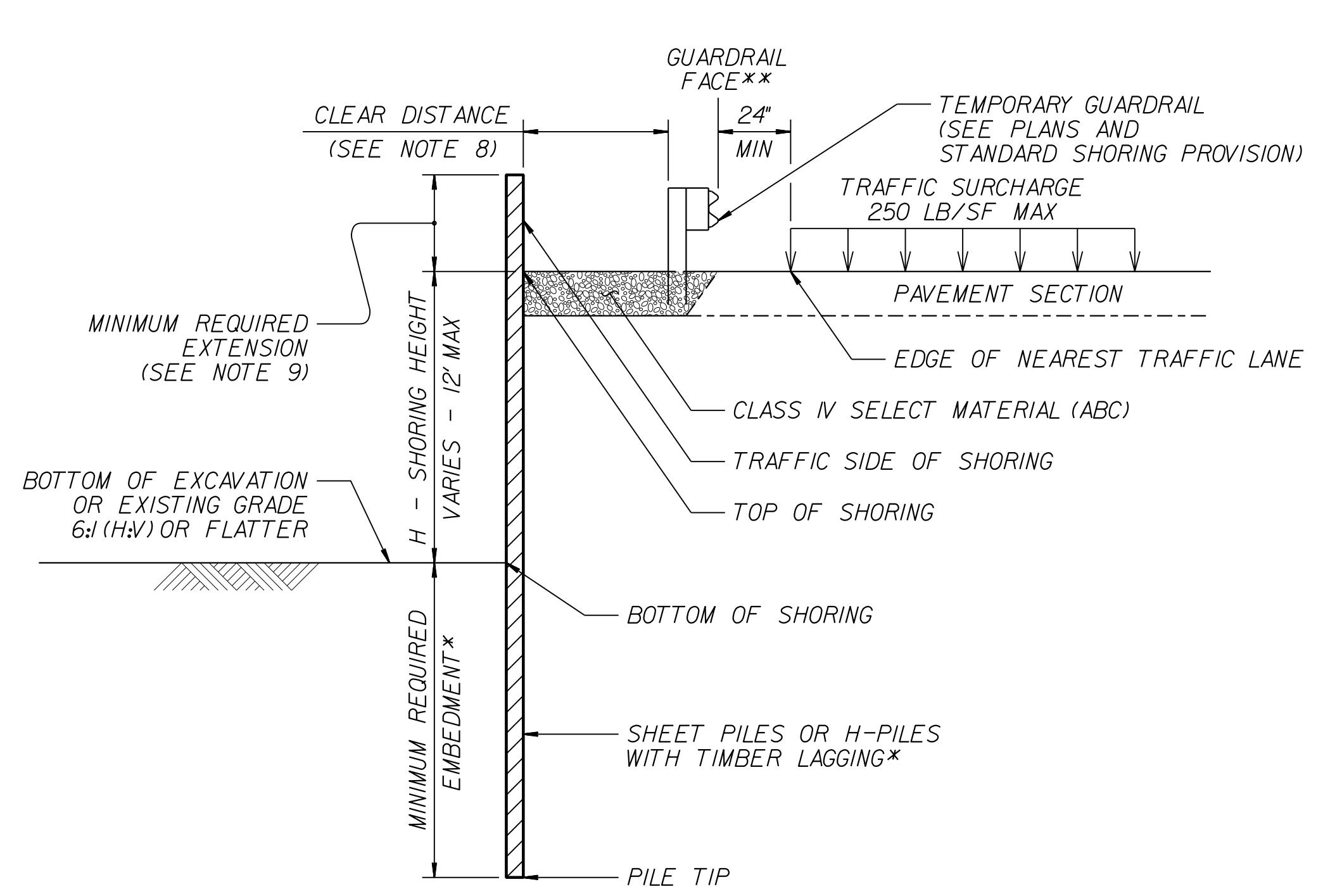
\*DO NOT USE H-PILES WITH TIMBER LAGGING FOR GROUNDWATER CONDITION, SHORING HEIGHT AND H-PILE SIZE SHOWN IF MINIMUM REQUIRED EMBEDMENT IS "--".

**NOTES:**

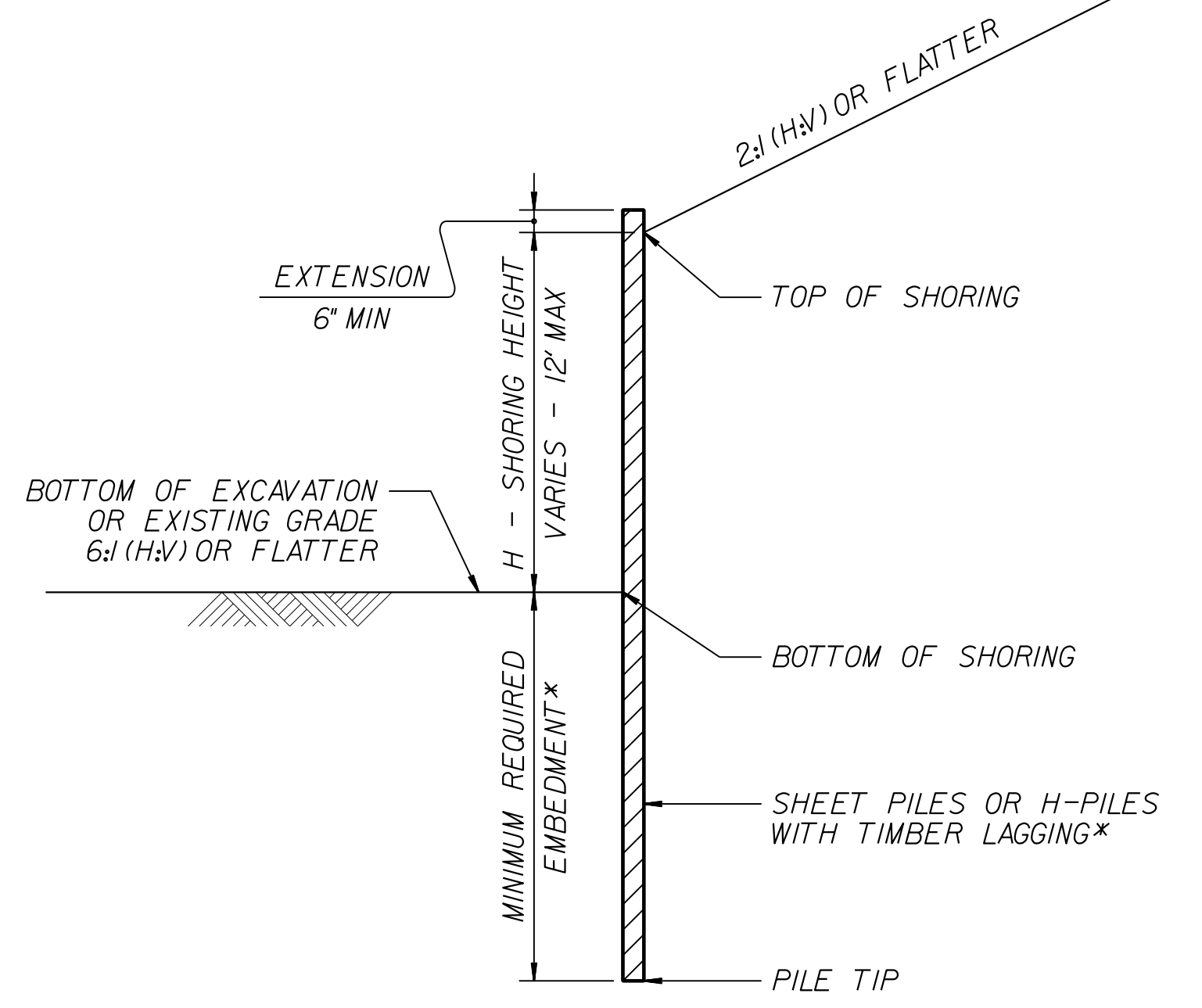
- AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY SHORING AS NOTED IN THE PLANS.
- FOR STANDARD TEMPORARY SHORING, SEE STANDARD SHORING PROVISION.
- STANDARD TEMPORARY SHORING IS BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:  
UNIT WEIGHT,  $\gamma = 120$  LB/CF  
FRICTION ANGLE,  $\phi = 30$  DEGREES  
COHESION,  $c = 0$  LB/SF
- 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

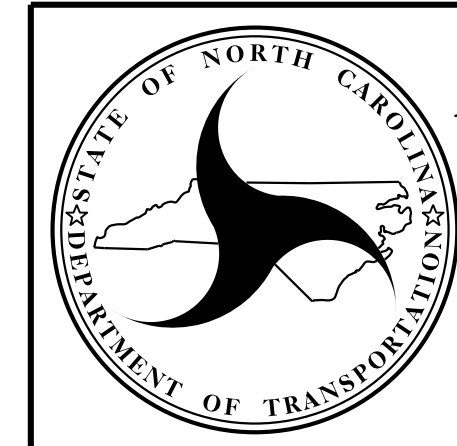


**TEMPORARY GUARDRAIL**  
\*\*GUARDRAIL FACE =  
EDGE OF PAVEMENT



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

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

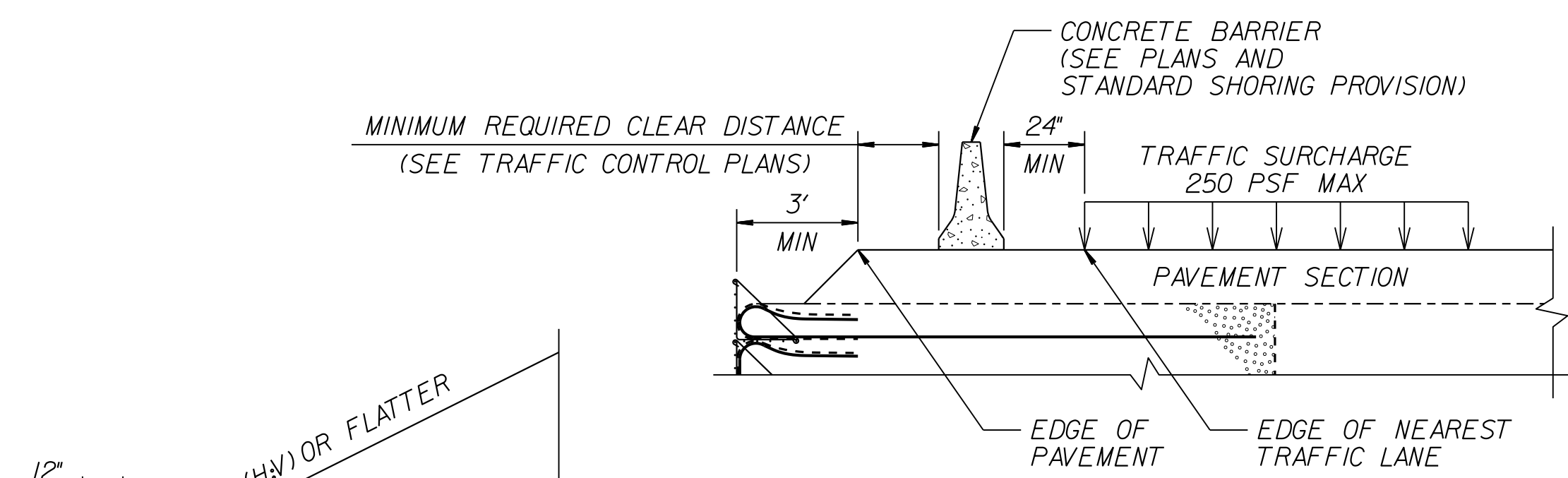


NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
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**GEOTECHNICAL  
ENGINEERING UNIT**

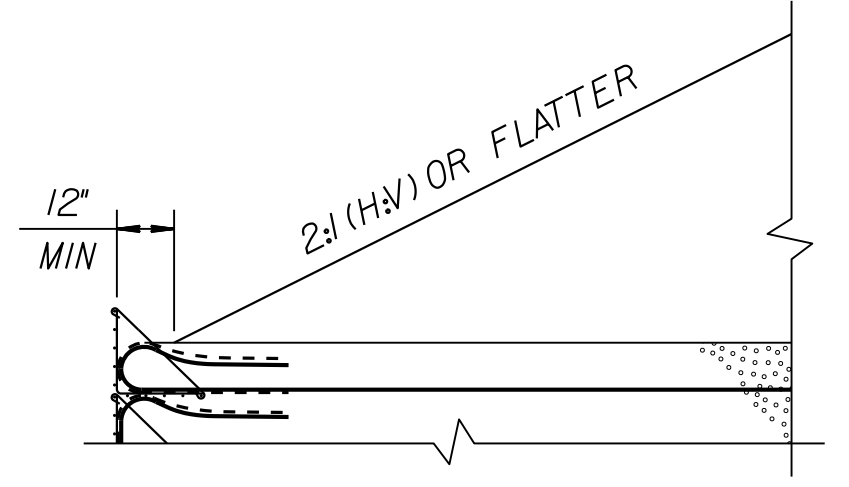
STANDARD DETAIL NO. 1801.01

STANDARD  
TEMPORARY SHORING

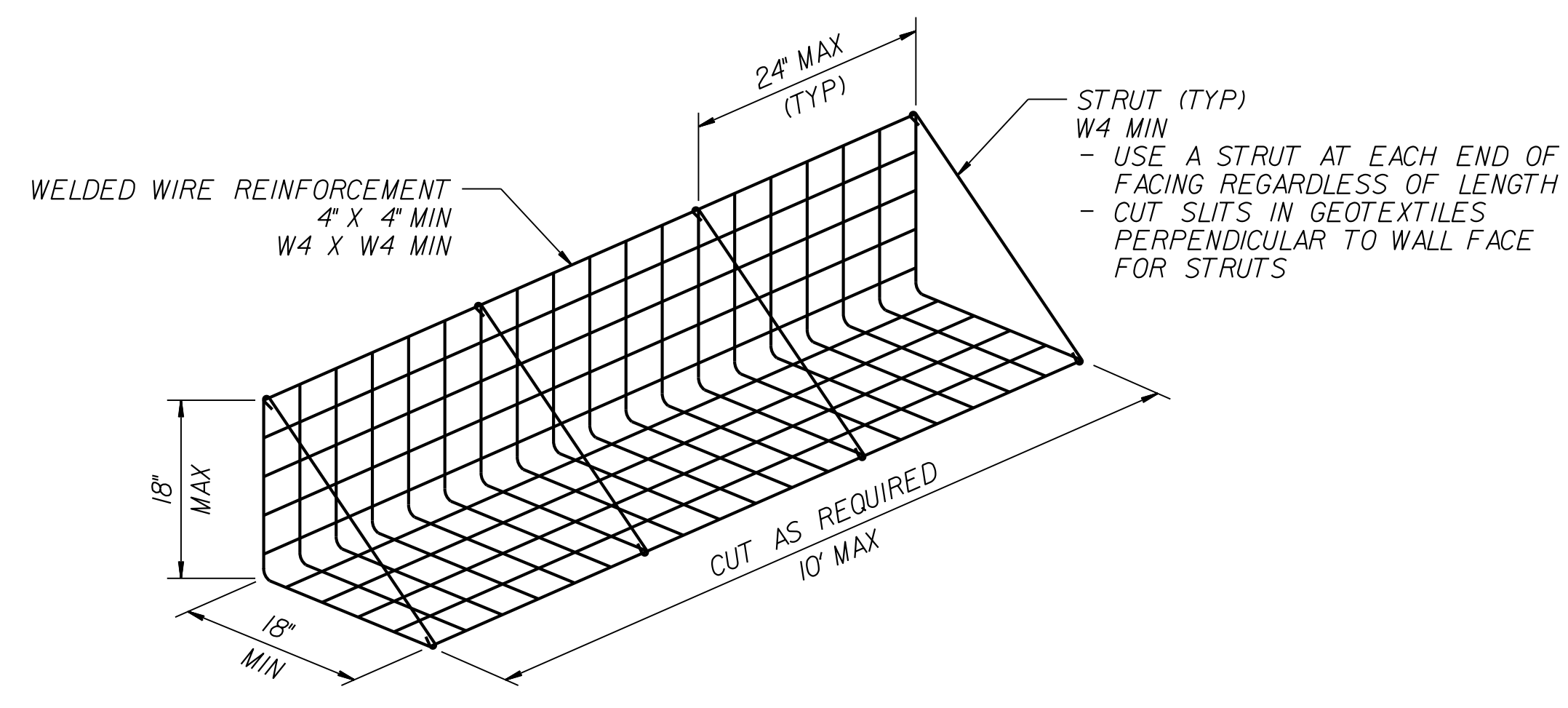




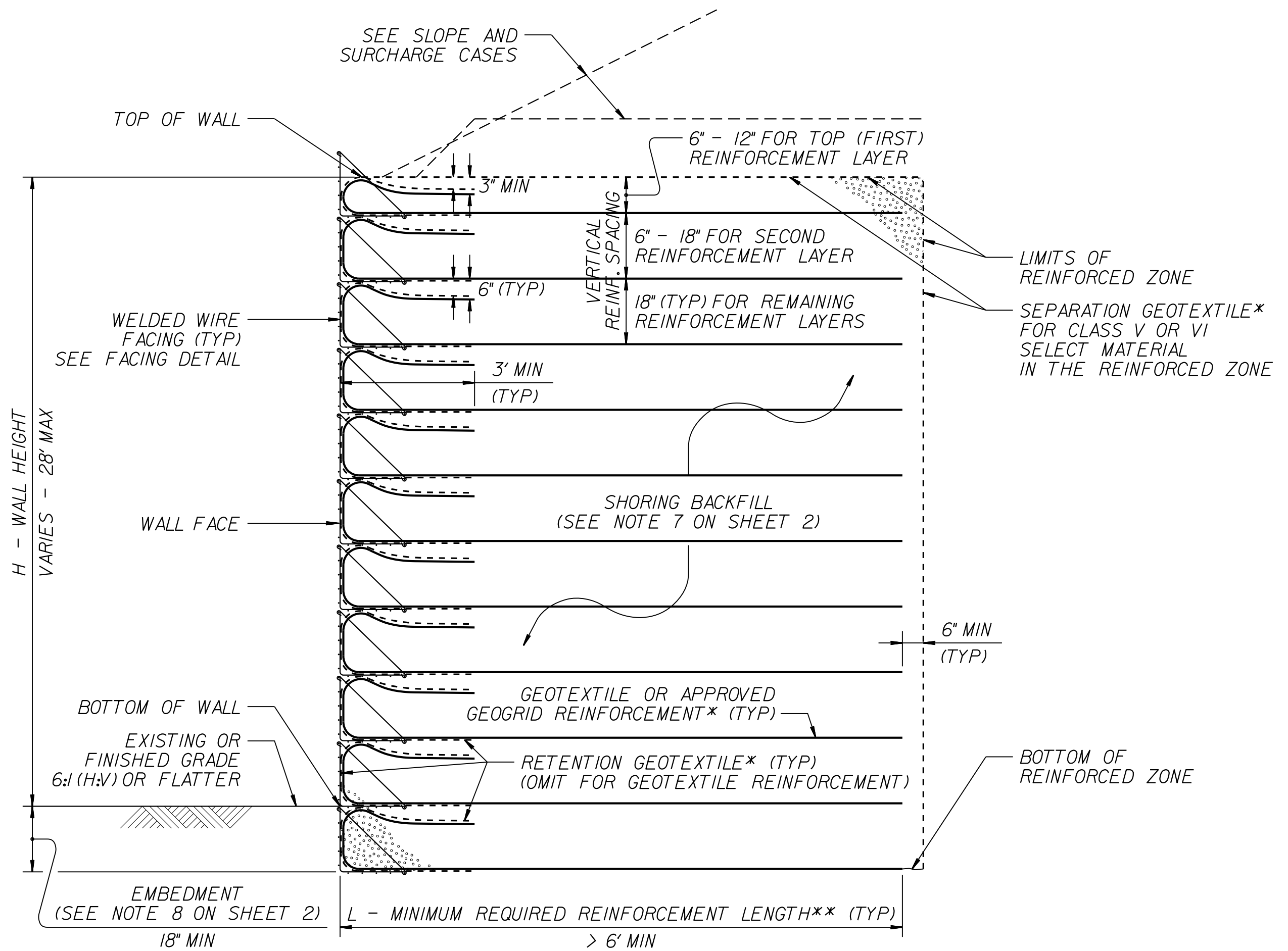
**SURCHARGE CASE**



**SLOPE CASE**

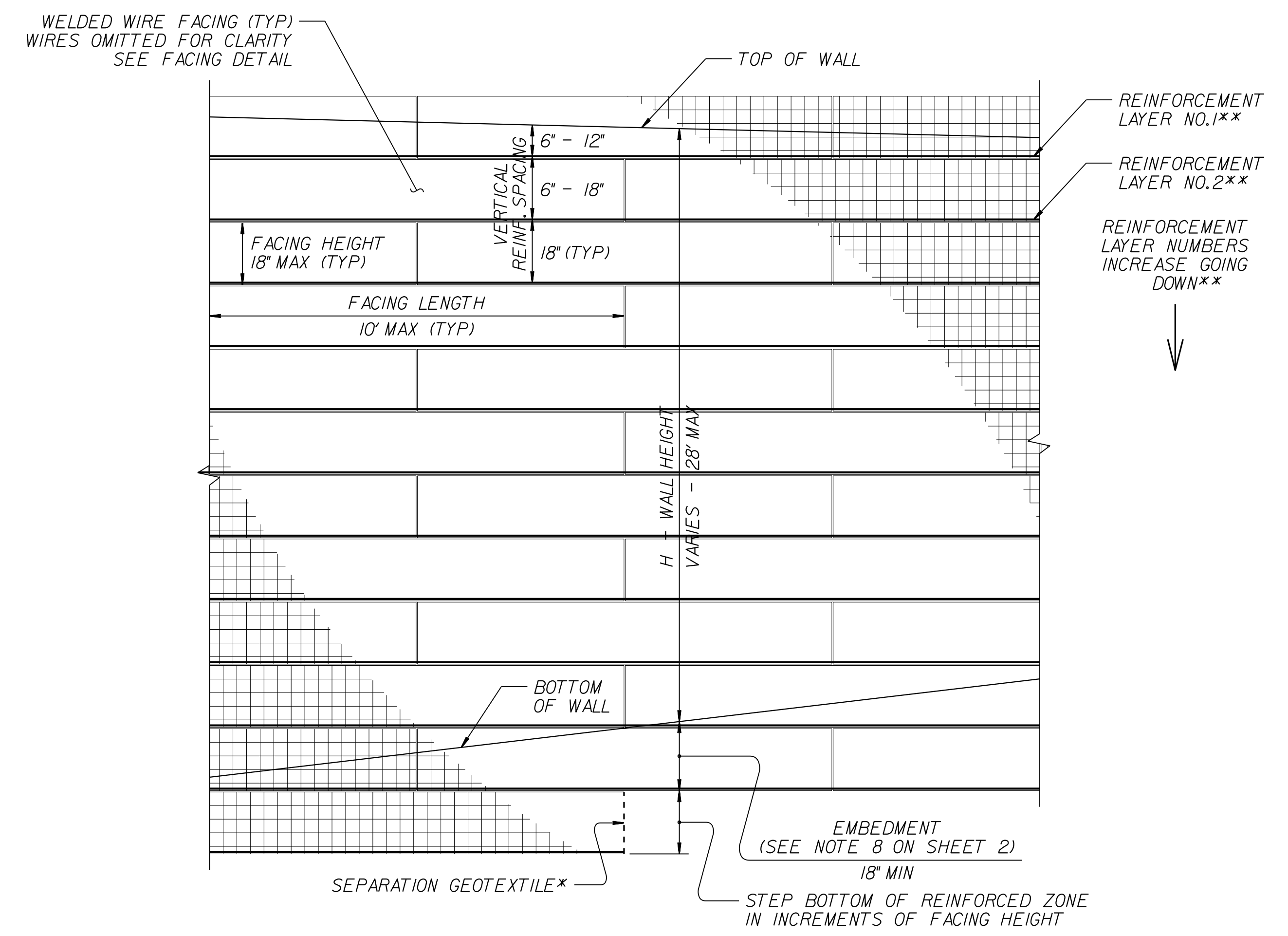


**FACING DETAIL**



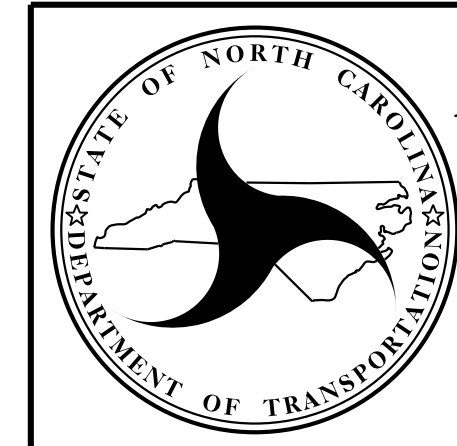
**STANDARD TEMPORARY WALL**

(FOR STANDARD TEMPORARY WALLS ON STRUCTURES, SEE TEMPORARY WALL ON STRUCTURE DETAIL ON SHEET 2.)  
 \*SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.  
 \*\*SEE REINFORCEMENT TABLES ON SHEET 3.



**STANDARD TEMPORARY WALL – PARTIAL ELEVATION**

\*SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.  
 \*\*SEE REINFORCEMENT TABLES ON SHEET 3.




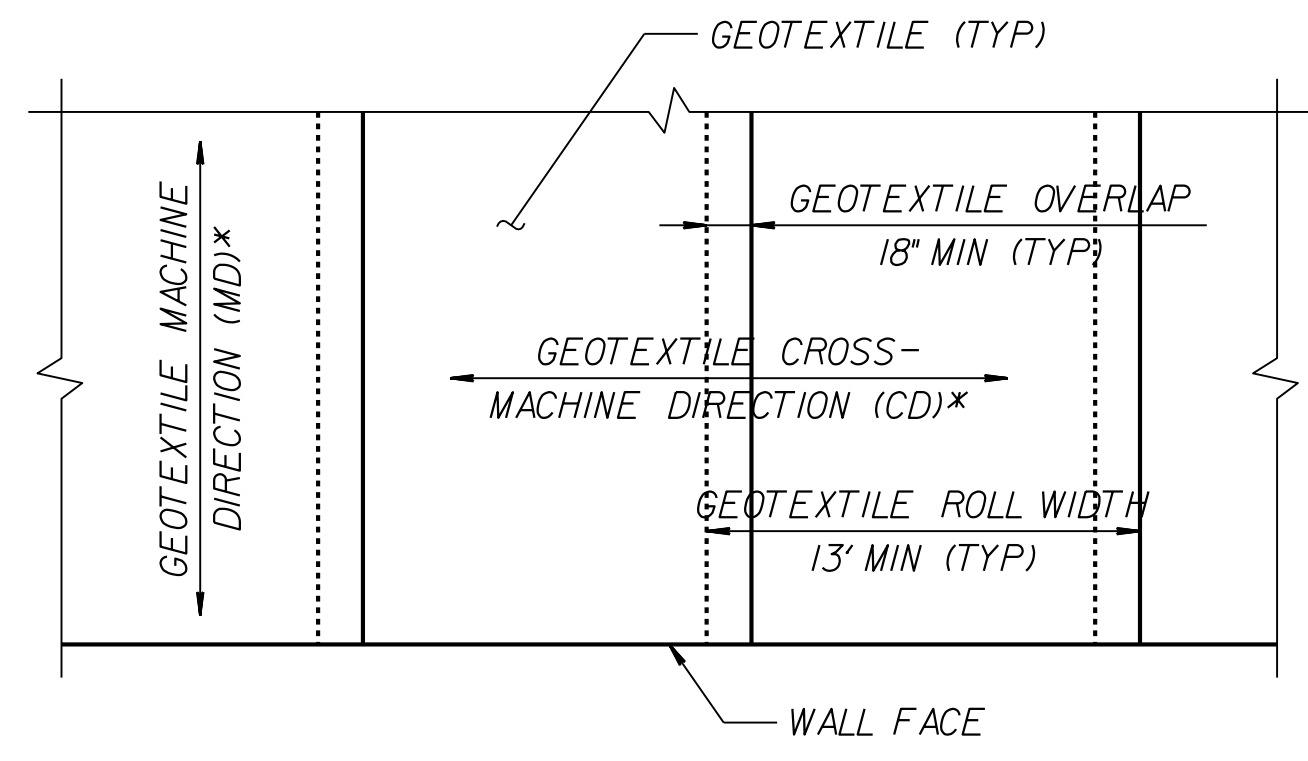
NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
**GEOTECHNICAL  
 ENGINEERING UNIT**

STANDARD DETAIL NO. 1801.02

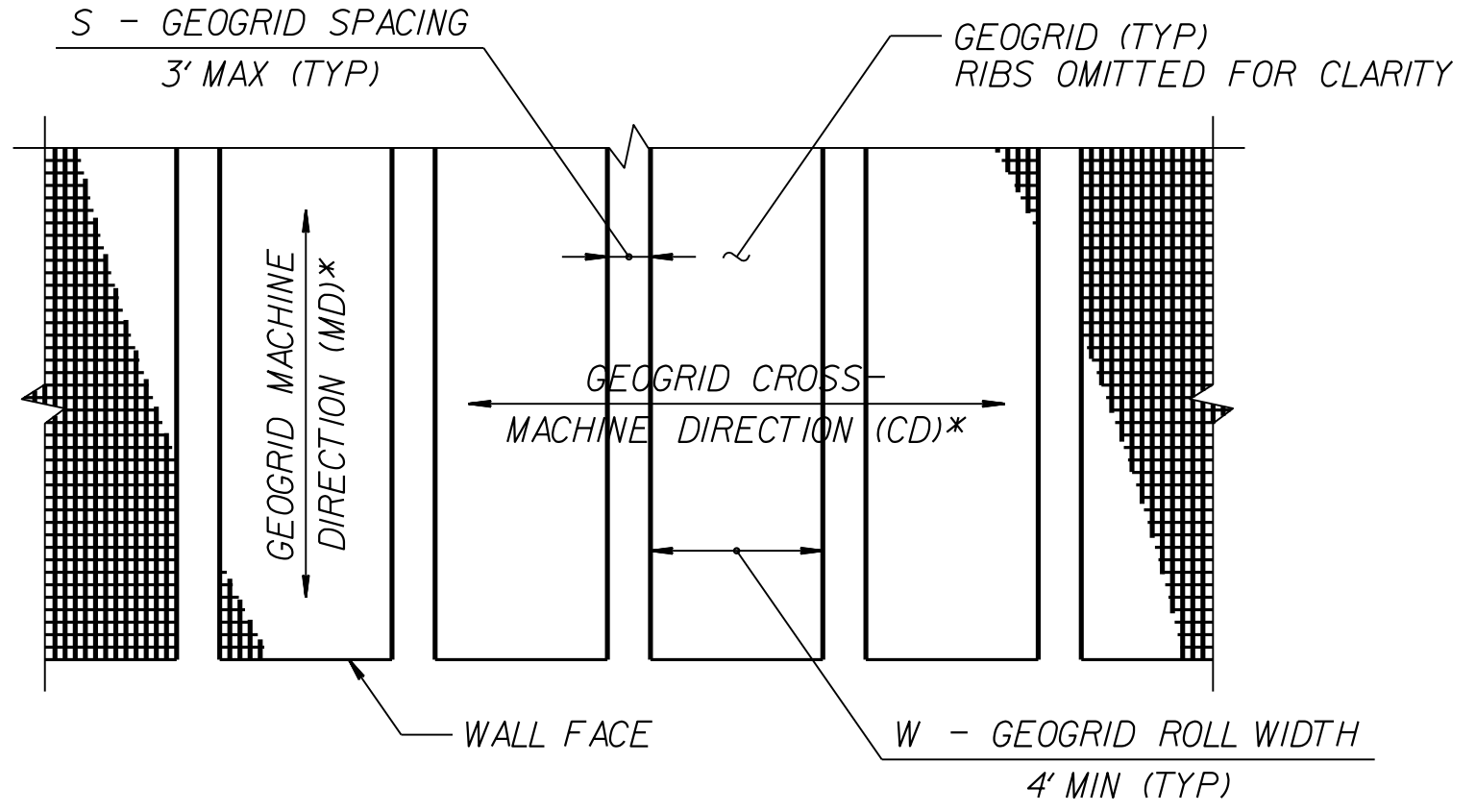
STANDARD  
 TEMPORARY WALL  
 SHEET 1 OF 3



<b>PROJECT REFERENCE NO.</b> B-5905		<b>SHEET NO.</b> 2G-3
GEOTECHNICAL ENGINEER  DocuSigned by: Scott A. Hidden 1/11/2019		ENGINEER
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>		

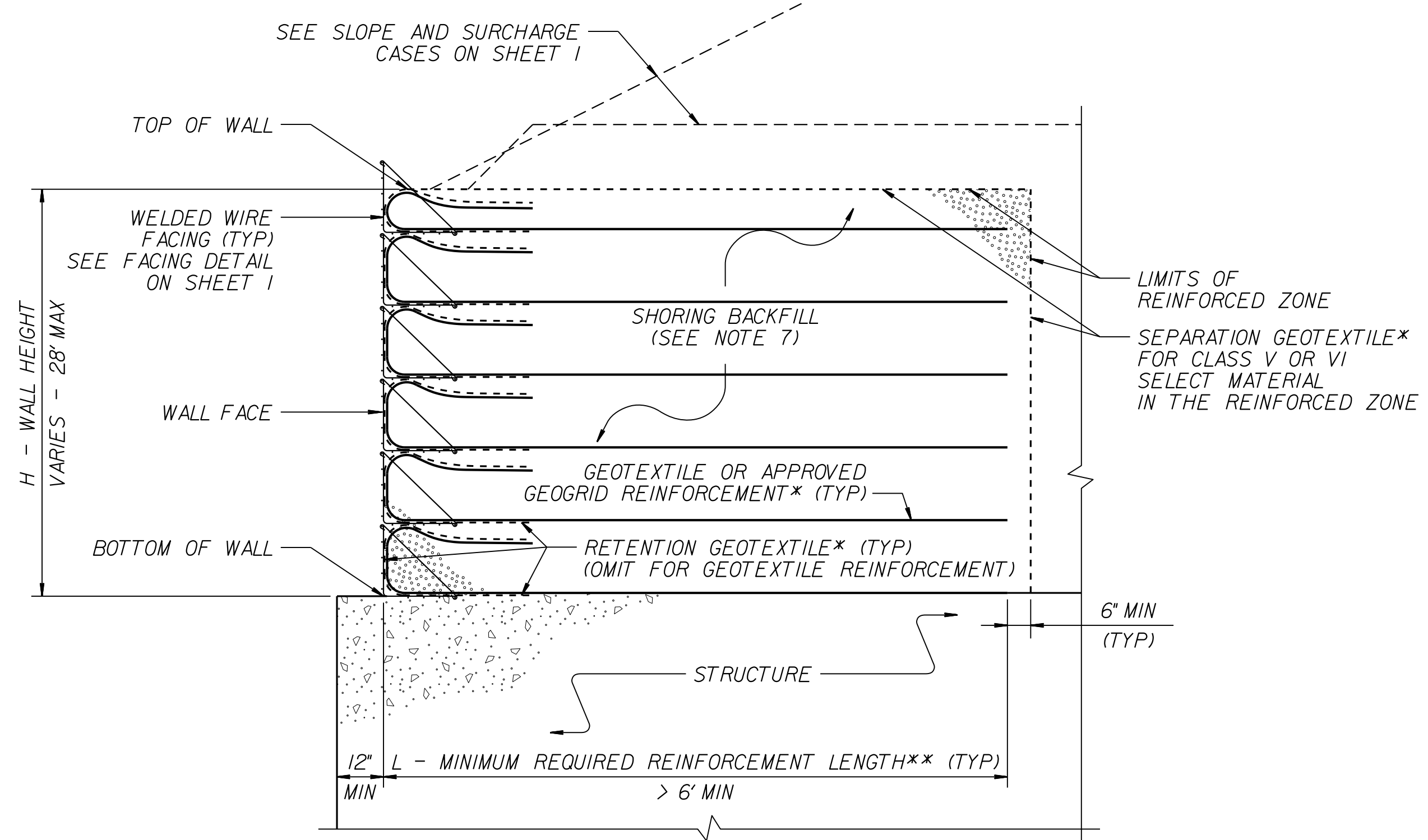


**GEOTEXTILE PLACEMENT**  
(100% COVERAGE MIN FOR GEOTEXTILE REINFORCEMENT)



**GEOGRID PLACEMENT**  
(80% COVERAGE MIN FOR GEOGRID REINFORCEMENT -  $\frac{W}{W+S} \times 100 \geq 80\%$ , SEE NOTE 11)

**GEOSYNTHETIC PLACEMENT DETAILS**  
(PLAN VIEW)  
\*SEE NOTE 12.



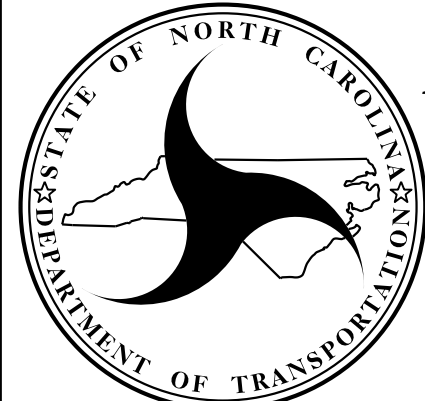
**TEMPORARY WALL ON STRUCTURE DETAIL**  
\*SEE GEOSYNTHETIC PLACEMENT DETAILS.  
\*\*SEE REINFORCEMENT TABLES ON SHEET 3.

**NOTES:**

- AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY WALLS AS NOTED IN THE PLANS.
- FOR STANDARD TEMPORARY WALLS, SEE STANDARD SHORING PROVISION.
- STANDARD TEMPORARY WALLS ARE 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 WALLS IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
- DO NOT USE STANDARD TEMPORARY WALLS WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS BELOW TEMPORARY WALLS.
- USE GROUNDWATER ELEVATION NOTED IN THE PLANS. IF NO GROUNDWATER ELEVATION IS SHOWN IN THE PLANS, ASSUME GROUNDWATER DEPTH IS LESS THAN 7' BELOW BOTTOM OF REINFORCED ZONE. DO NOT USE STANDARD TEMPORARY WALLS IF GROUNDWATER IS ABOVE BOTTOM OF REINFORCED ZONE.
- DO NOT USE A-2-4 SOIL FOR STANDARD TEMPORARY WALLS AROUND CULVERTS OR IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS FOR SLOPE CASES. DO NOT USE CLASS VI SELECT MATERIAL IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS WITH GEOTEXTILE REINFORCEMENT.
- EMBEDMENT IS NOT REQUIRED FOR STANDARD TEMPORARY WALLS ON STRUCTURES OR ROCK AS DETERMINED BY THE ENGINEER.
- DO NOT USE MORE THAN 4 DIFFERENT REINFORCEMENT STRENGTHS FOR EACH STANDARD TEMPORARY WALL.
- GEOGRIDS ARE TYPICALLY APPROVED FOR ULTIMATE TENSILE STRENGTHS IN THE MACHINE DIRECTION (MD) AND CROSS-MACHINE DIRECTION (CD) OR SHORT-TERM DESIGN STRENGTHS FOR A 3-YEAR DESIGN LIFE IN THE MD BASED ON MATERIAL TYPE. THE LIST OF APPROVED GEOGRIDS WITH DESIGN STRENGTHS IS AVAILABLE FROM:  
[connect.ncdot.gov/resources/Materials/Pages/Materials-Manual-by-Manual.aspx](http://connect.ncdot.gov/resources/Materials/Pages/Materials-Manual-by-Manual.aspx)  
DEFINE MATERIAL TYPE FROM THE WEBSITE ABOVE FOR SHORING BACKFILL AS FOLLOWS:

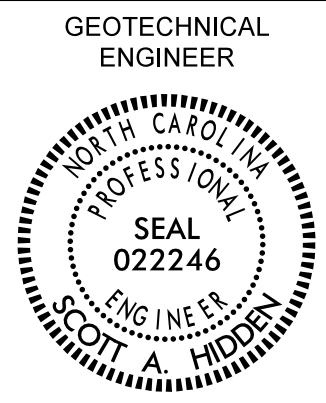
MATERIAL TYPE	SHORING BACKFILL
BORROW	A-2-4 SOIL
FINE AGGREGATE	CLASS II, TYPE I OR CLASS III SELECT MATERIAL
COARSE AGGREGATE	CLASS V OR VI SELECT MATERIAL

- IF THE WEBSITE DOES NOT LIST A SHORT-TERM DESIGN STRENGTH FOR AN APPROVED GEOGRID, USE A SHORT-TERM DESIGN STRENGTH EQUAL TO THE ULTIMATE TENSILE STRENGTH DIVIDED BY 3.5 FOR THE GEOGRID REINFORCEMENT.
- FOR GEOGRID REINFORCEMENT WITH LESS THAN 100% COVERAGE, STAGGER REINFORCEMENT SO GEOGRIDS ARE CENTERED OVER GAPS IN THE REINFORCEMENT LAYER BELOW.
  - AT THE CONTRACTOR'S OPTION, REINFORCEMENT MAY BE INSTALLED WITH THE MD PARALLEL TO THE WALL FACE IF BOTH OF THE FOLLOWING CONDITIONS OCCUR:
    - W (REINFORCEMENT ROLL WIDTH)  $\geq$  (MINIMUM REQUIRED REINFORCEMENT LENGTH) + 4.5' AND
    - REINFORCEMENT STRENGTH IN CD  $\geq$  MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD.
  - SUBMIT A "STANDARD TEMPORARY WALL SELECTION FORM" AT LEAST 7 DAYS BEFORE STARTING TEMPORARY WALL CONSTRUCTION. 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)
  - DO NOT PLACE SHORING BACKFILL OR REINFORCEMENT UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.
  - FOR STANDARD TEMPORARY WALLS WITH PILE FOUNDATIONS IN THE REINFORCED ZONE, DRIVE PILES THROUGH REINFORCEMENT AFTER CONSTRUCTING TEMPORARY WALLS.
  - DO NOT SPLICE OR OVERLAP REINFORCEMENT SO SEAMS ARE PARALLEL TO THE WALL FACE.
  - CONTACT THE ENGINEER WHEN EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH REINFORCEMENT.
  - FOR STANDARD TEMPORARY WALLS WITH INTERIOR ANGLES LESS THAN 90 DEGREES, WRAP GEOSYNTHETICS AT ACUTE CORNERS AS DIRECTED BY THE ENGINEER.
  - FOR STANDARD TEMPORARY WALLS WITH TOP OF WALL WITHIN 5' OF FINISHED GRADE, REMOVE TOP FACING AND INCORPORATE TOP REINFORCEMENT LAYER INTO FILL WHEN PLACING FILL IN FRONT OF WALL.

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

**STANDARD DETAIL NO. 1801.02**  
  
**STANDARD**  
**TEMPORARY WALL**  
**SHEET 2 OF 3**  
  
 DATE: 11-19-13



<b>PROJECT REFERENCE NO.</b> B-5905	<b>SHEET NO.</b> 2G-4
 GEOTECHNICAL ENGINEER ENGINEER	ENGINEER  DATE: 1/11/2019 SIGNATURE: _____
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

SLOPE OR SURCHARGE CASE	GROUNDWATER DEPTH BELOW BOTTOM OF REINFORCED ZONE (SEE NOTE 6 ON SHEET 2) (FT)	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)	H - WALL HEIGHT (FT)																									
			< 4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
SLOPE CASE	> 0	CLASS II, TYPE I, CLASS III, CLASS V OR CLASS VI SELECT MATERIAL	6	6	7	8	9	11	12	13	13	14	15	16	17	18	19	20	21	22	23	24	24	25	26	27	27	
SURCHARGE CASE	> 0 TO 7 FOR H < 20' > 0 TO 10 FOR H ≥ 20'	ALL SHORING BACKFILL TYPES	6	7	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	17	17	18	19	19	20	21	22	
		A-2-4 SOIL	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	16	17	18	18	19	20	20	21	
		CLASS II, TYPE I OR CLASS III SELECT MATERIAL	6	6	7	7	8	8	9	10	10	11	11	12	12	13	14	15	15	16	16	17	17	18	18	19	20	
	> 7 FOR H < 20' > 10 FOR H ≥ 20'	CLASS V OR CLASS VI SELECT MATERIAL	6	6	7	7	7	8	8	9	9	10	10	11	12	13	13	14	14	15	15	16	17	17	18	19	19	

**L - MINIMUM REQUIRED REINFORCEMENT LENGTH (FT)**  
(FOR ALL REINFORCEMENT TYPES)

WALL HEIGHT (H) + EMBEDMENT (FT)	NUMBER OF REINFORCEMENT LAYERS*
2.5 - 4	3
4 - 5.5	4
5.5 - 7	5
7 - 8.5	6
8.5 - 10	7
10 - 11.5	8
11.5 - 13	9
13 - 14.5	10
14.5 - 16	11
16 - 17.5	12
17.5 - 19	13
19 - 20.5	14
20.5 - 22	15
22 - 23.5	16
23.5 - 25	17
25 - 26.5	18
26.5 - 28	19
28 - 29.5	20

\*BASED ON VERTICAL REINFORCEMENT SPACING SHOWN ON SHEET 1.

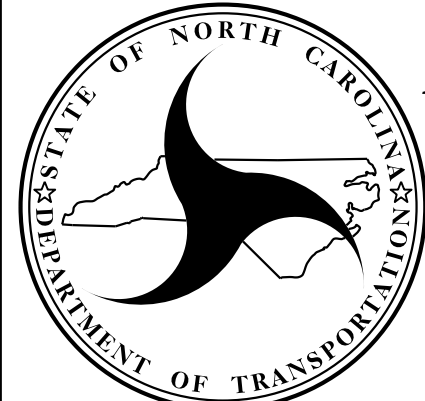
REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II, TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL	A-2-4 SOIL	CLASS II, TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL
1	2400	2400	2400	2400	2400
2	2400	2400	2400	2400	2400
3	2400	2400	2400	2400	2400
4	2400	2400	2500	2400	2400
5	2500	2400	3000	2400	2400
6	3000	2400	3500	2800	2400
7	3500	2700	4000	3200	2600
8	4000	3100	4500	3600	2900
9	4500	3500	5000	4000	3200
10	5000	3900	5500	4400	3500
11	5500	4300	6000	4800	3800
12	6000	4700	6500	5200	4100
13	6500	5100	7000	5600	4400
14	7000	5400	7500	6000	4700
15	7500	5800	8000	6400	5000
16	8000	6200	8500	6800	5300
17	8500	6600	9000	7200	5600
18	9000	7000	9500	7600	5900
19	9500	7400	10000	8000	6200
20	10000	7800	10500	8400	6500

**GEOTEXTILE REINFORCEMENT**  
**ULTIMATE TENSILE STRENGTH (LB/FT)**

REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II, TYPE I OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL	A-2-4 SOIL	CLASS II, TYPE I OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL
1	240	200	340	290	240
2	380	310	520	430	350
3	530	420	700	570	460
4	690	550	870	720	570
5	860	690	1050	860	680
6	1030	830	1220	1000	790
7	1200	970	1400	1150	900
8	1370	1110	1580	1290	1010
9	1550	1240	1750	1430	1120
10	1720	1380	1930	1580	1230
11	1890	1520	2100	1720	1340
12	2060	1660	2280	1860	1450
13	2240	1800	2450	2010	1560
14	2410	1940	2630	2150	1670
15	2580	2080	2800	2290	1780
16	2750	2220	2980	2440	1890
17	2930	2360	3160	2580	2000
18	3100	2500	3330	2720	2110
19	3270	2640	3510	2860	2220
20	3440	2780	3690	3000	2330

**GEOGRID REINFORCEMENT**  
**SHORT-TERM DESIGN STRENGTH (LB/FT)**  
(SEE NOTE 10 ON SHEET 2.)

**MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD**  
(SEE NOTE 9 ON SHEET 2.)  
\*SEE PARTIAL ELEVATION ON SHEET 1 FOR REINFORCEMENT LAYER NUMBERING.



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

STANDARD DETAIL NO. 1801.02

STANDARD  
TEMPORARY WALL  
SHEET 3 OF 3

DATE: 11-19-13







COMPUTED BY: \_DMM\_\_\_\_\_ DATE: \_5.31.17\_\_\_\_\_  
 CHECKED BY: \_SCC\_\_\_\_\_ DATE: \_1.17.19\_\_\_\_\_

(2-16-16)

PROJECT NO. B-5905	SHEET NO. 3G-1
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**STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS**

**SUMMARY OF SUBSURFACE DRAINAGE**

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
CONTINGENCY				SD	1000
				<b>TOTAL LF:</b>	1000

\*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			AST	36	100	200	400		
					<b>TOTAL CY/TONS/SY:</b>	100	200	400**	0

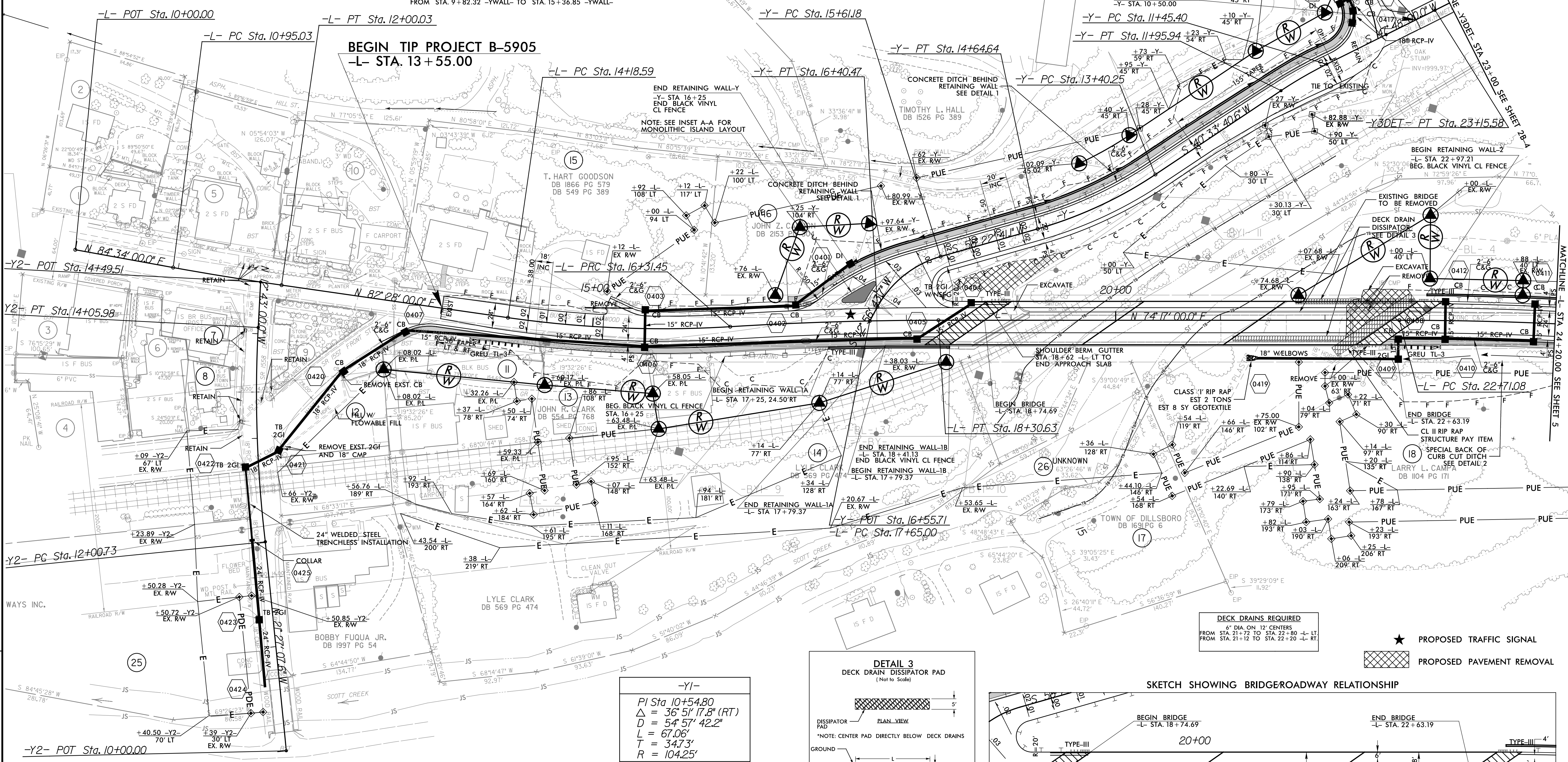
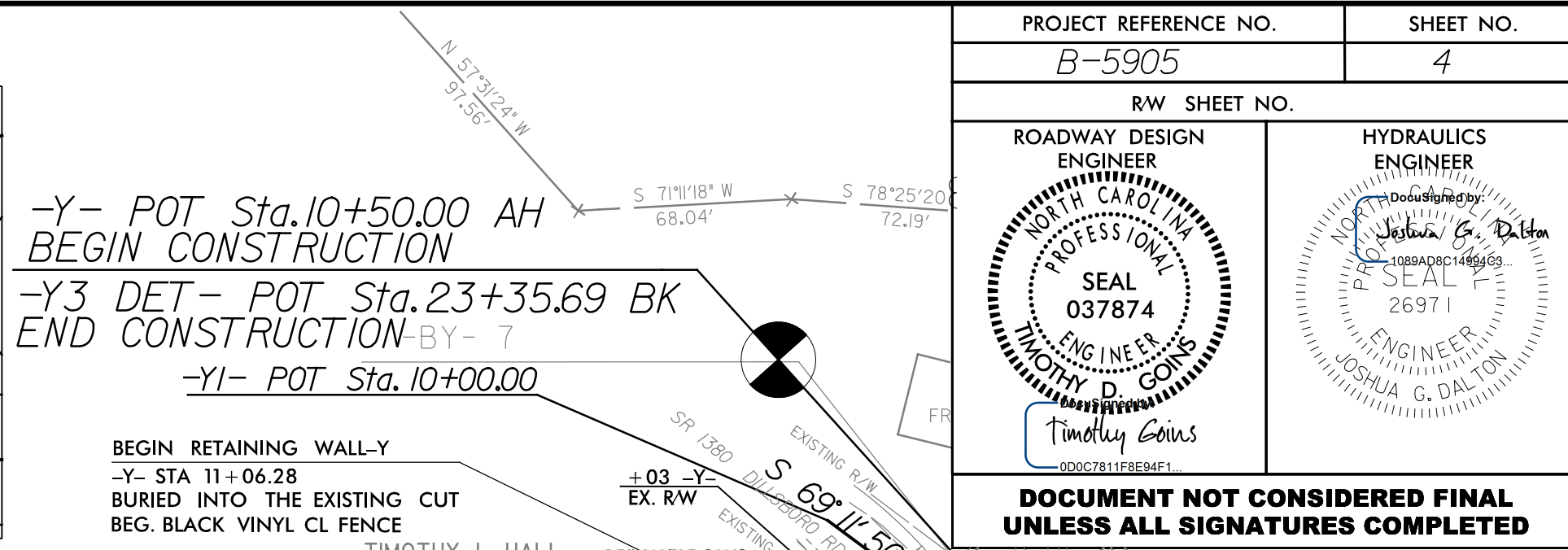
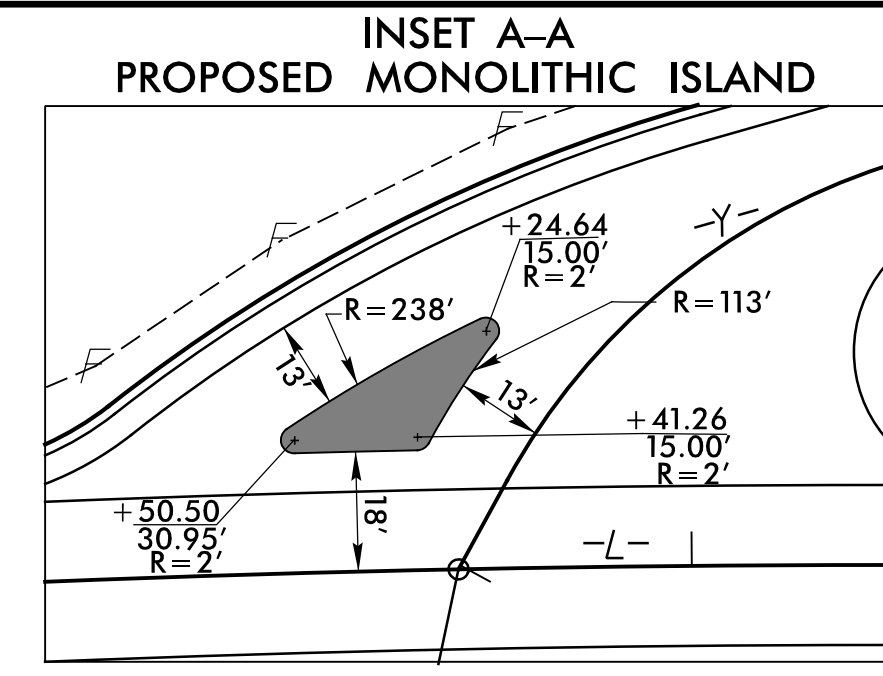
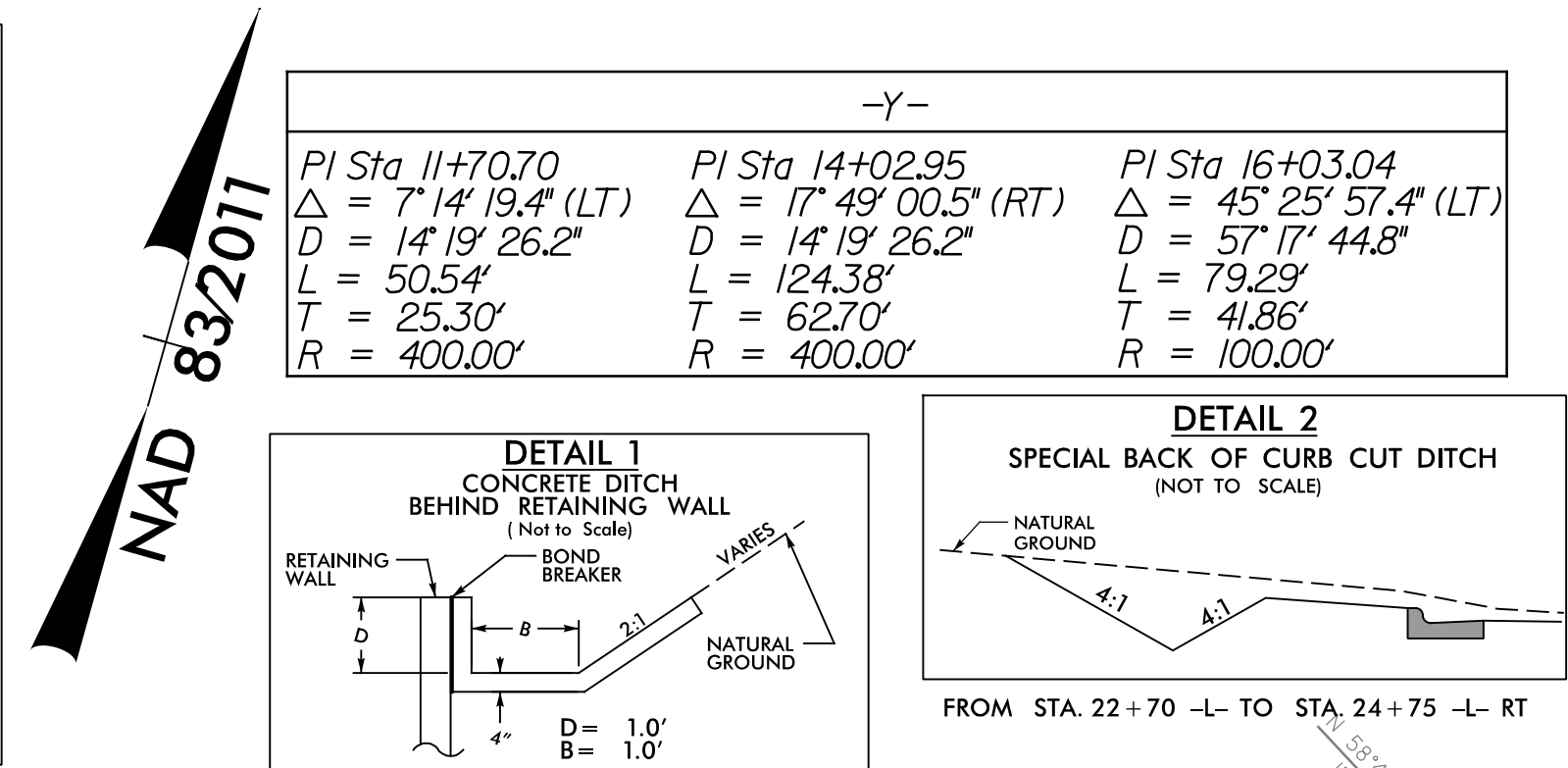
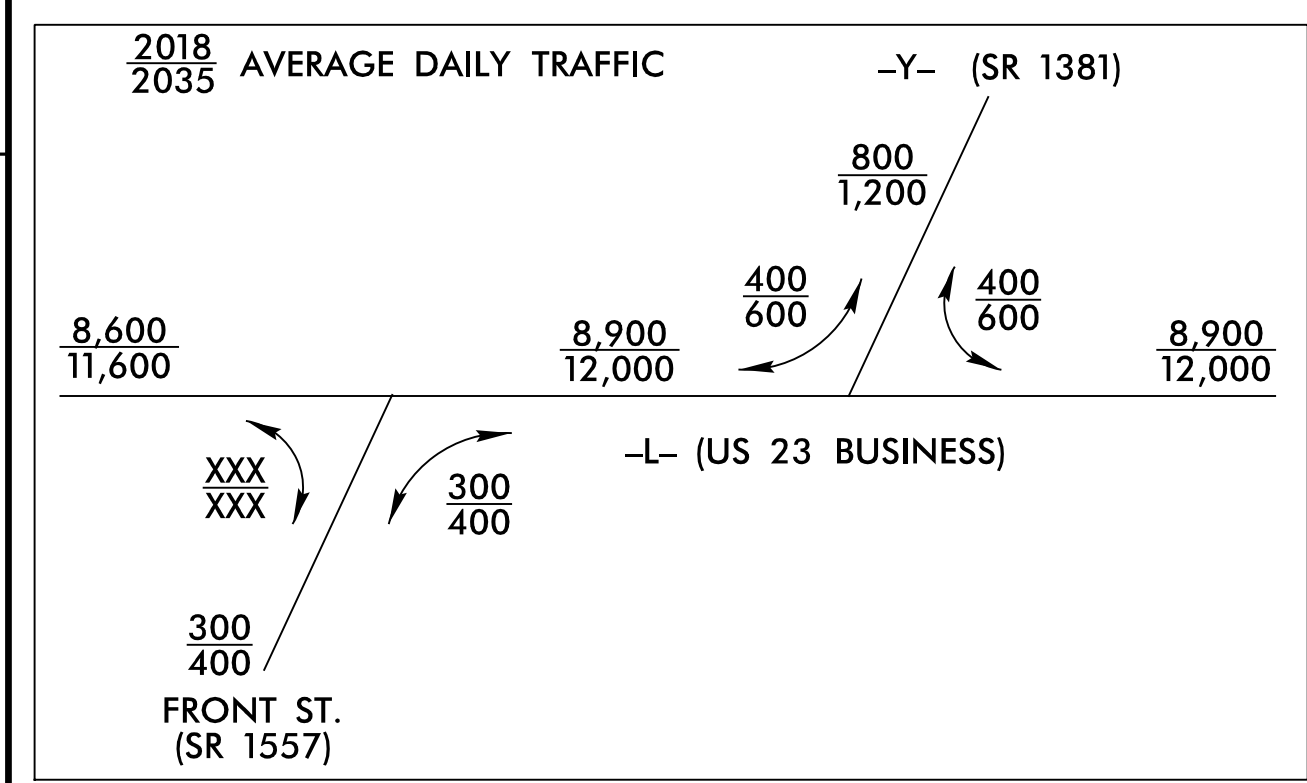
\*ASU = Aggregate Subgrade  
 \*AST = Aggregate Stabilization

\*\*Total square yards of "Geotextile for Soil Stabilization" is only the estimated quantity for ASU/AST and may only represent a portion of the geotextile quantity shown in the Item Sheets of the Proposal.



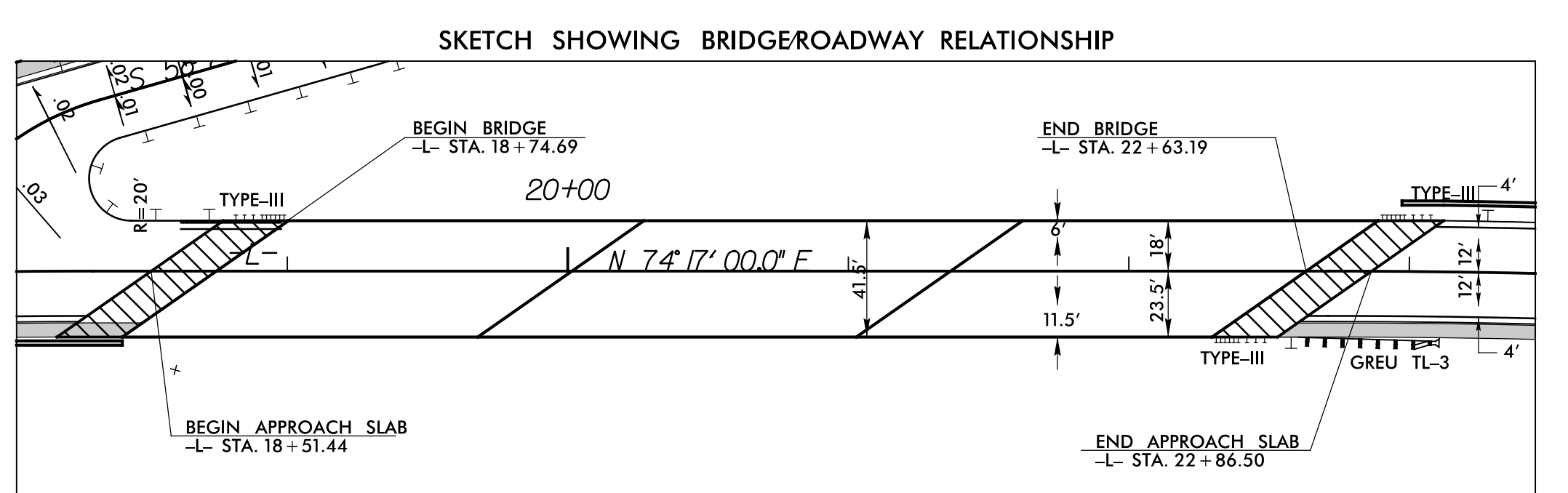
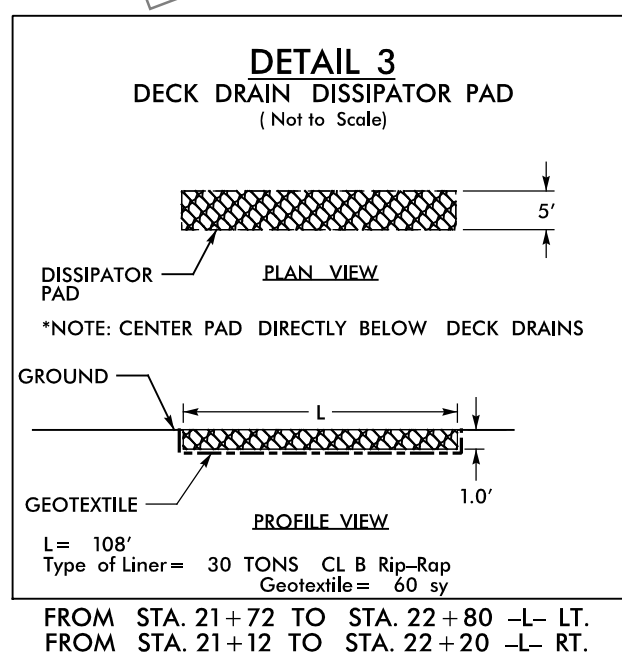


PROJECT REFERENCE NO. <b>B-5905</b>	SHEET NO. <b>4</b>
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER TIMOTHY L. HALL DB 1526 PG 389	SEAL 037874
PROFESSIONAL ENGINEER TIMOTHY D. GOINS DB 1111 PG 389	SEAL 26971
<p><b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b></p>	



<b>-L-</b>	<b>-Y2-</b>
PI Sta 11+47.54 Δ = 2° 06' 00.0" (LT) D = 2° 00' 00.0" L = 105.00' T = 52.51' R = 2,864.79'	PI Sta 13+03.61 Δ = 9° 47' 58.7" (RT) D = 4° 46' 28.7" L = 205.24' T = 102.87' R = 1,200.00'
PI Sta 15+25.39 Δ = 1° 43' 38.4" (LT) D = 5° 30' 33.2" L = 212.87' T = 106.81' R = 1,040.00'	PI Sta 17+31.07 Δ = 3° 32' 38.4" (RT) D = 1° 46' 45.7" L = 160.52' T = 99.62' R = 3,220.00'
PI Sta 17+31.07 Δ = 3° 32' 38.4" (RT) D = 1° 46' 45.7" L = 160.52' T = 99.62' R = 3,220.00'	PI Sta 23+51.35 Δ = 2° 51' 22.2" (RT) D = 1° 46' 45.7" L = 160.52' T = 80.27' R = 3,220.00'

<b>-Y1-</b>
PI Sta 10+54.80 Δ = 36° 51' 17.8" (RT) D = 54° 57' 42.2" L = 67.06' T = 347.3' R = 104.25'



DECK DRAINS REQUIRED  
6" DIA. ON 12" CENTERS  
FROM STA. 21+72 TO STA. 22+80 -L- LT.  
FROM STA. 21+12 TO STA. 22+20 -L- RT.

★ PROPOSED TRAFFIC SIGNAL

▨ PROPOSED PAVEMENT REMOVAL

REVISIONS

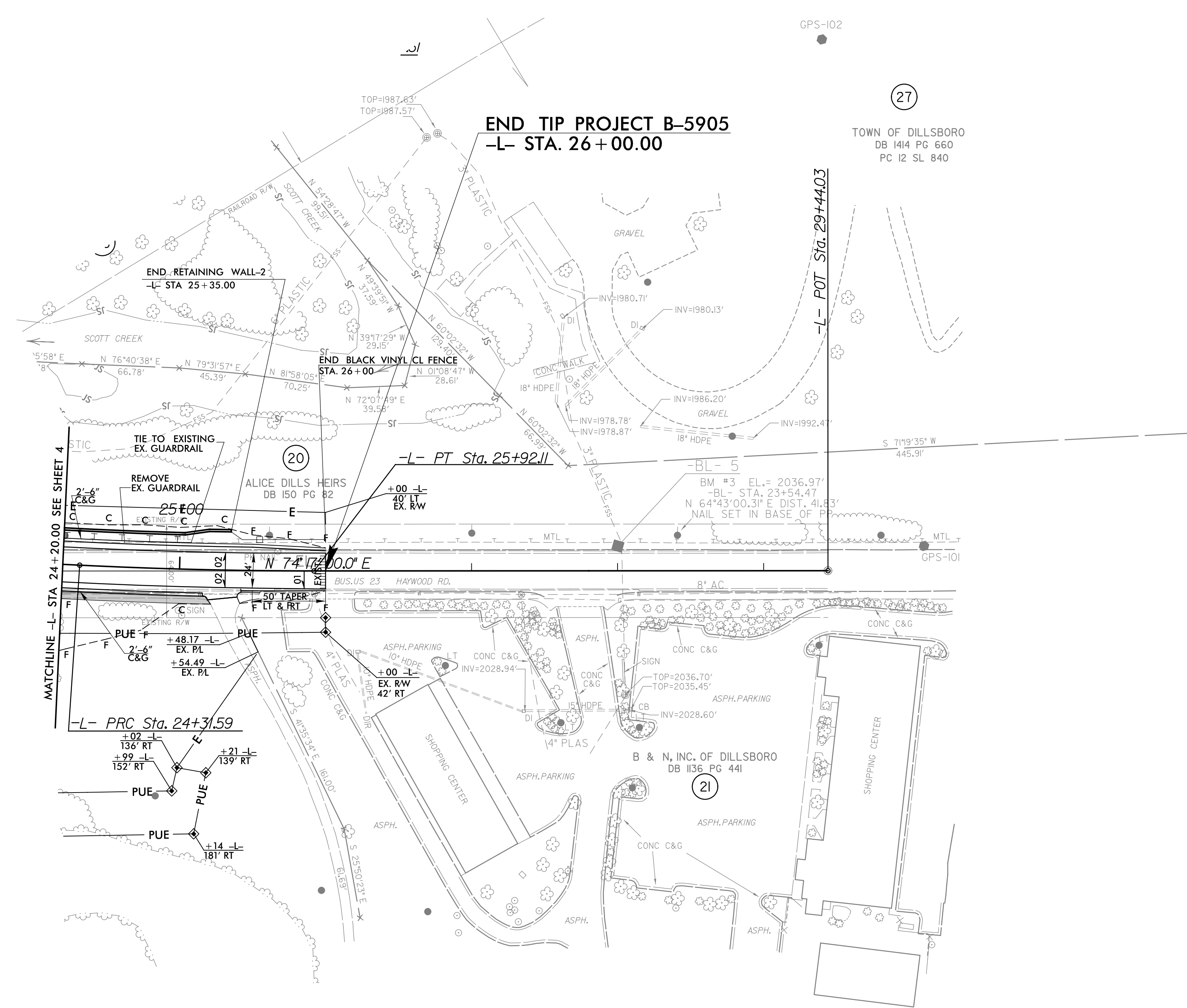
8.17.19.9

3.27.2019



PROJECT REFERENCE NO. B-5905	SHEET NO. 5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER TIMOTHY D. GOONS SEAL 037874 NORTH CAROLINA PROFESSIONAL ENGINEER	HYDRAULICS ENGINEER JOSHUA G. DALTON SEAL 26971 NORTH CAROLINA PROFESSIONAL ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

28 UNKNOWN  
NAD 83/2011



**RIGHT OF WAY AREA DATA**

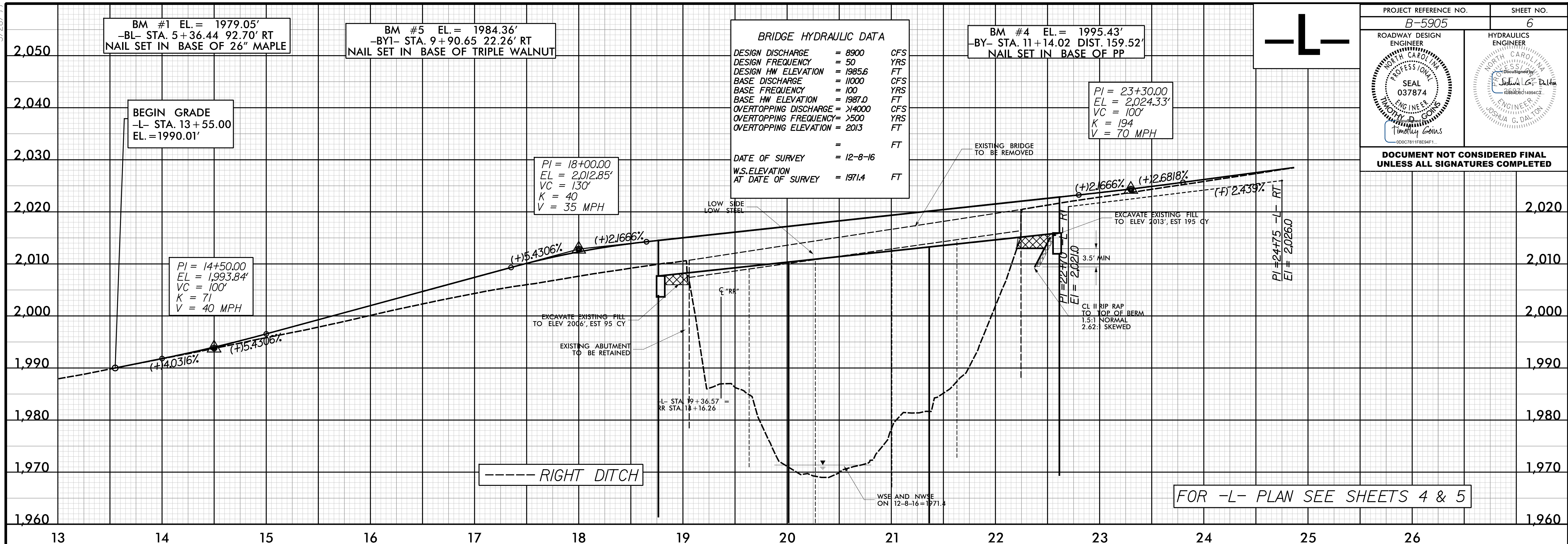
PARCEL NO.	PROPERTY OWNERS NAMES	R/W AREA	PUE AREA	CONST. EASEMENT	PDE AREA
11	WESTERN CAROLINA PROPERTIES	0.1083 acre			
12	STATE OF NC (NO CLAIM)				
13	JOHN R. CLARK	0.0703 acre	0.1249 acre		
14	LYLE CLARK	0.2444 acre	0.06 acre		
15	T. HART GOODSON		0.0883 acre		
16	JOHN Z. CANNON	0.1023 acre	0.1843 acre		
17	TOWN OF DILLSBORO		0.0154 acre	0.0412 acre	
18	LARRY L. CAMPA		0.4624 acre	0.7822 acre	
19	TIMOTHY L. HALL	0.1204 acre	0.055 acre	0.0181 acre	
20	ALICE DILLS HEIRS	0.1404 acre		0.0529 acre	
21	B & N INC OF DILLSBORO		0.013 acre		
23	KOLE K. CLAPSADDLE		0.0147 acre		
25	AMERICAN HERITAGE RAILWAYS	0.4657 acre	0.1996 acre	2.6998 acre	0.0289 acre
26	UNKNOWN			0.1324 acre	
27	TOWN OF DILLSBORO			0.0721 acre	

-L-  
PI Sta 25+11.87  
Δ = 2' 51" 22.2" (LT)  
D = 1' 46" 45.7"  
L = 160.52'  
T = 80.27'  
R = 3,220.00'

SEE SHEET 6 FOR -L- PROFILE

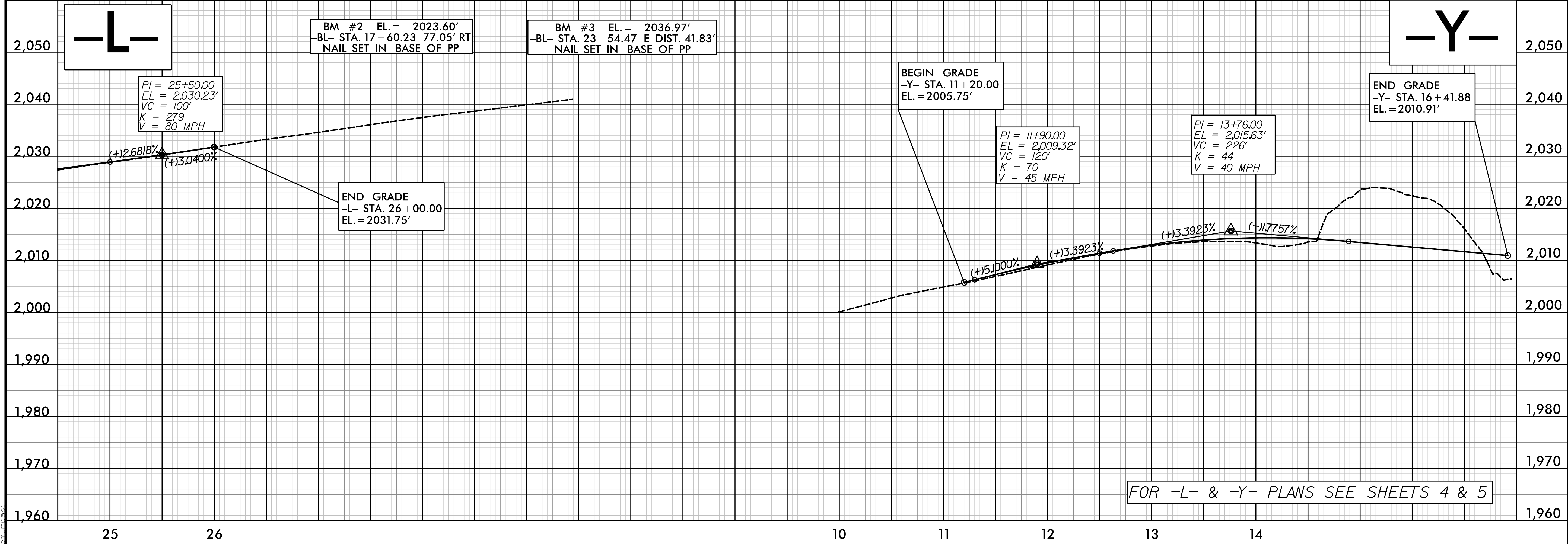
REVISIONS

5/28/2018



PROJECT REFERENCE NO. B-5905	SHEET NO. 6
ROADWAY DESIGN ENGINEER TIMOTHY GOINS SEAL 037874 NORTH CAROLINA PROFESSIONAL ENGINEER	HYDRAULICS ENGINEER JOSHUA G. DALTON SEAL 038260 NORTH CAROLINA PROFESSIONAL ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



-Y-

FOR -L- & -Y- PLANS SEE SHEETS 4 & 5

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