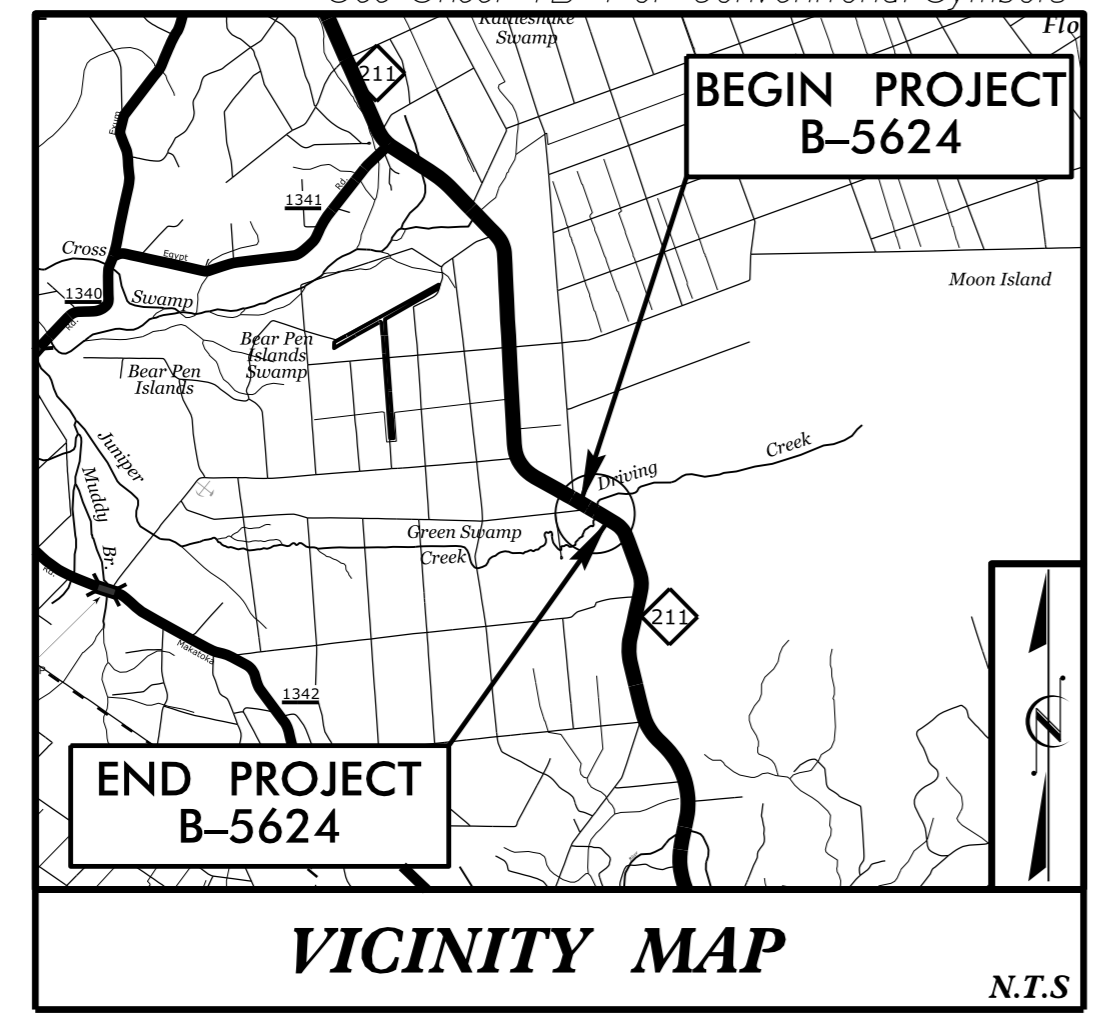


09/08/19

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



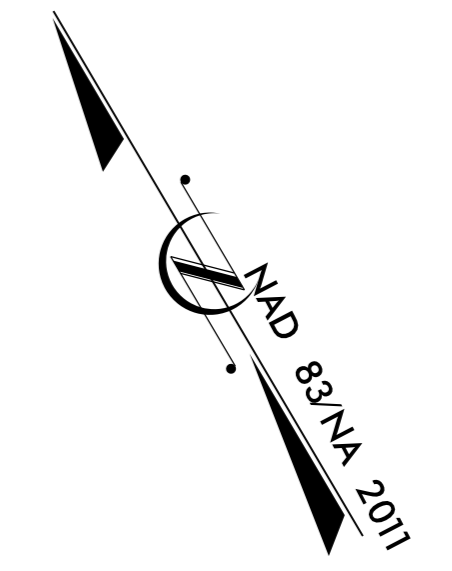
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**BRUNSWICK COUNTY**

**LOCATION: REPLACE BRIDGE NO. 57 OVER DRIVING CREEK  
ON NC 211 (GREEN SWAMP ROAD NW)**

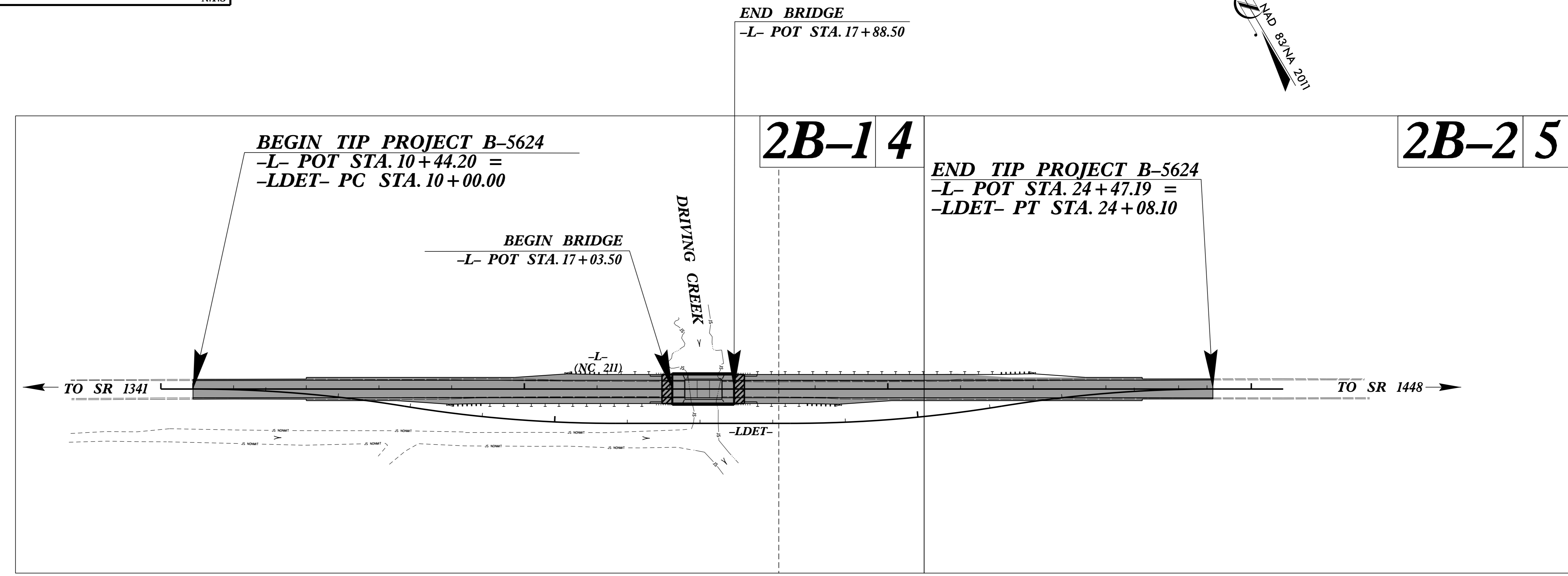
**TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5624	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
45579.1.1	N/A	PE	
45579.2.1	N/A	UTIL./ROW	
45579.3.1	N/A	CONST.	

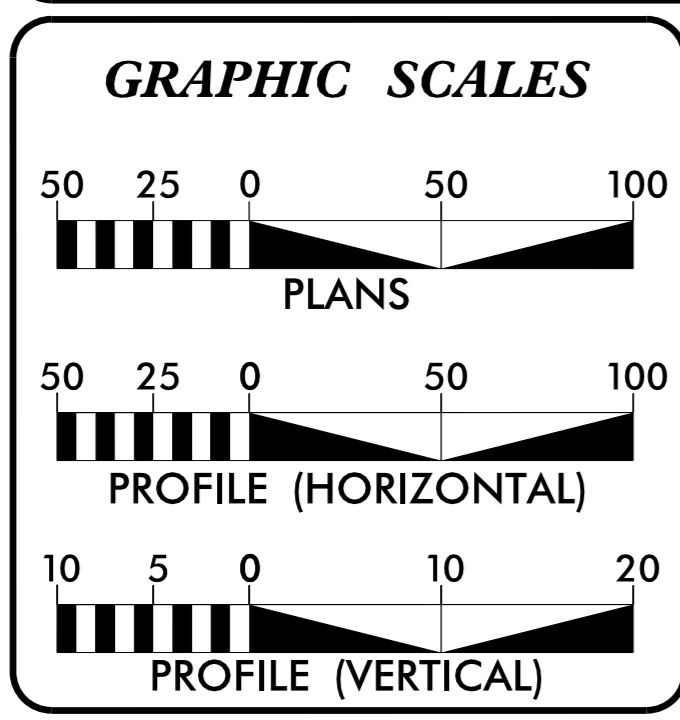


**TIP PROJECT: B-5624**

**CONTRACT: C204629**



DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



**DESIGN DATA**

ADT 2021 =	1,971
ADT 2040 =	3,000
K =	9 %
D =	55 %
T =	15 % *
V =	60 MPH
* TTST =	9% DUAL 6%
FUNC CLASS =	MAJOR COLLECTOR REGIONAL TIER

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT B-5624 =	0.250 MILES
LENGTH STRUCTURE TIP PROJECT B-5624 =	0.016 MILES
<b>TOTAL LENGTH TIP PROJECT B-5624 =</b>	<b>0.266 MILES</b>

Prepared in the Office of:  
**CDM Smith**  
CDM Smith Inc.  
5400 Glenwood Avenue  
Suite 400  
Raleigh, NC 27612-3228  
NC CDA No. F-1255

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
2018 STANDARD SPECIFICATIONS

**RIGHT OF WAY DATE:**  
JANUARY 19, 2021

**LETTING DATE:**  
NOVEMBER 16, 2021

**ADAM M. CONRAD, P.E.**  
PROJECT ENGINEER

**RYAN J. DEMUYNCK, E.I.**  
PROJECT DESIGN ENGINEER

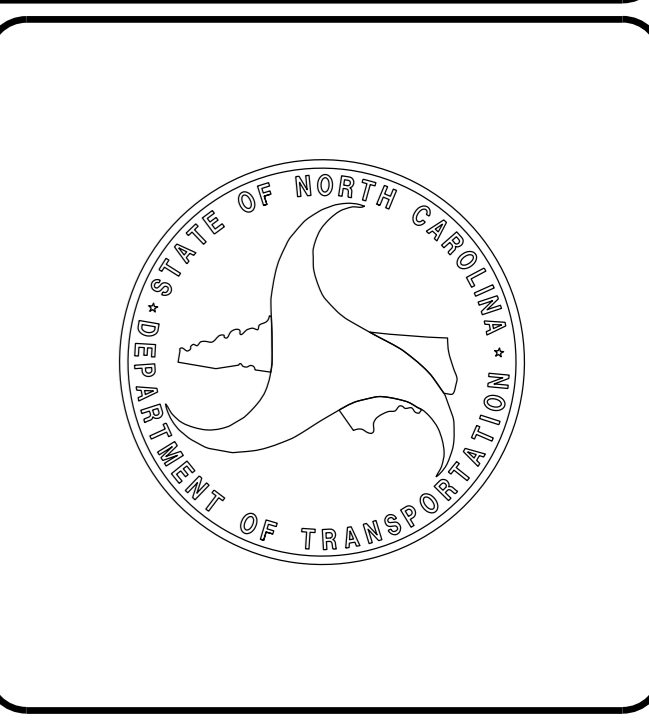
**DAVID STUTTS, P.E.**  
NCDOT CONTACT

**HYDRAULICS ENGINEER**

DocuSigned by:  
Joshua G. Dalton  
1088AD8C14994C3  
SIGNATURE:

**ROADWAY DESIGN ENGINEER**

DocuSigned by:  
Adam M. Conrad, P.E., Ph.D.  
1088D8F7A87D84AD  
SIGNATURE:





# 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	○ <sub>EP</sub>
Computed Property Corner	----->
Property Monument	□ <sub>EDM</sub>
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	----- <sub>HLB</sub>
Proposed Wetland Boundary	----- <sub>HLB</sub>
Existing Endangered Animal Boundary	----- <sub>EAB</sub>
Existing Endangered Plant Boundary	----- <sub>EPB</sub>
Existing Historic Property Boundary	----- <sub>HBP</sub>
Known Contamination Area: Soil	---S---S---
Potential Contamination Area: Soil	---S---S---
Known Contamination Area: Water	---W---W---
Potential Contamination Area: Water	---W---W---
Contaminated Site: Known or Potential	☠ ?

### BUILDINGS AND OTHER CULTURE:

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

### HYDROLOGY:

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

### RAILROADS:

Standard Gauge	----- <sub>CSX TRANSPORTATION</sub>
RR Signal Milepost	○ <sub>MILEPOST 35</sub>
Switch	□ <sub>SWITCH</sub>
RR Abandoned	-----
RR Dismantled	-----

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

### RIGHT OF WAY & PROJECT CONTROL:

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

### ROADS AND RELATED FEATURES:

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

### VEGETATION:

Single Tree	☼
Single Shrub	☼

Hedge	-----
Woods Line	-----
Orchard	☼☼☼☼
Vineyard	▭ <sub>Vineyard</sub>

### EXISTING STRUCTURES:

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

### 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.*)	----- <sub>P</sub>
U/G Power Line LOS C (S.U.E.*)	----- <sub>P</sub>
U/G Power Line LOS D (S.U.E.*)	----- <sub>P</sub>

### 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.*)	----- <sub>T</sub>
U/G Telephone Cable LOS C (S.U.E.*)	----- <sub>T</sub>
U/G Telephone Cable LOS D (S.U.E.*)	----- <sub>T</sub>
U/G Telephone Conduit LOS B (S.U.E.*)	----- <sub>TC</sub>
U/G Telephone Conduit LOS C (S.U.E.*)	----- <sub>TC</sub>
U/G Telephone Conduit LOS D (S.U.E.*)	----- <sub>TC</sub>
U/G Fiber Optics Cable LOS B (S.U.E.*)	----- <sub>T FO</sub>
U/G Fiber Optics Cable LOS C (S.U.E.*)	----- <sub>T FO</sub>
U/G Fiber Optics Cable LOS D (S.U.E.*)	----- <sub>T FO</sub>

### WATER:

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

### TV:

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

### GAS:

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

### SANITARY SEWER:

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

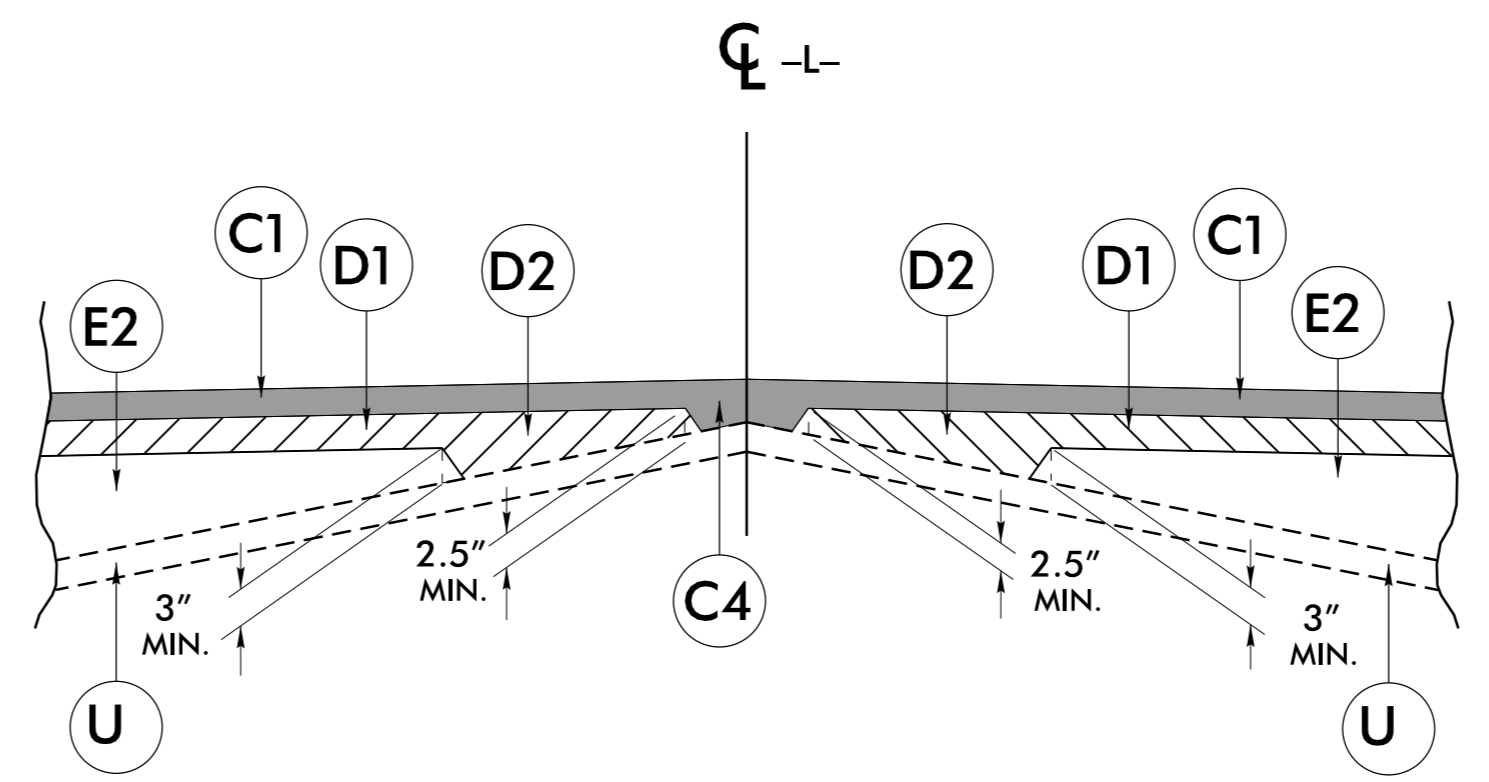
### MISCELLANEOUS:

Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	⊠
Utility Unknown U/G Line LOS B (S.U.E.*)	----- <sub>U/L</sub>
U/G Tank; Water, Gas, Oil	▭
Underground Storage Tank, Approx. Loc.	⊕ <sub>UST</sub>
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.

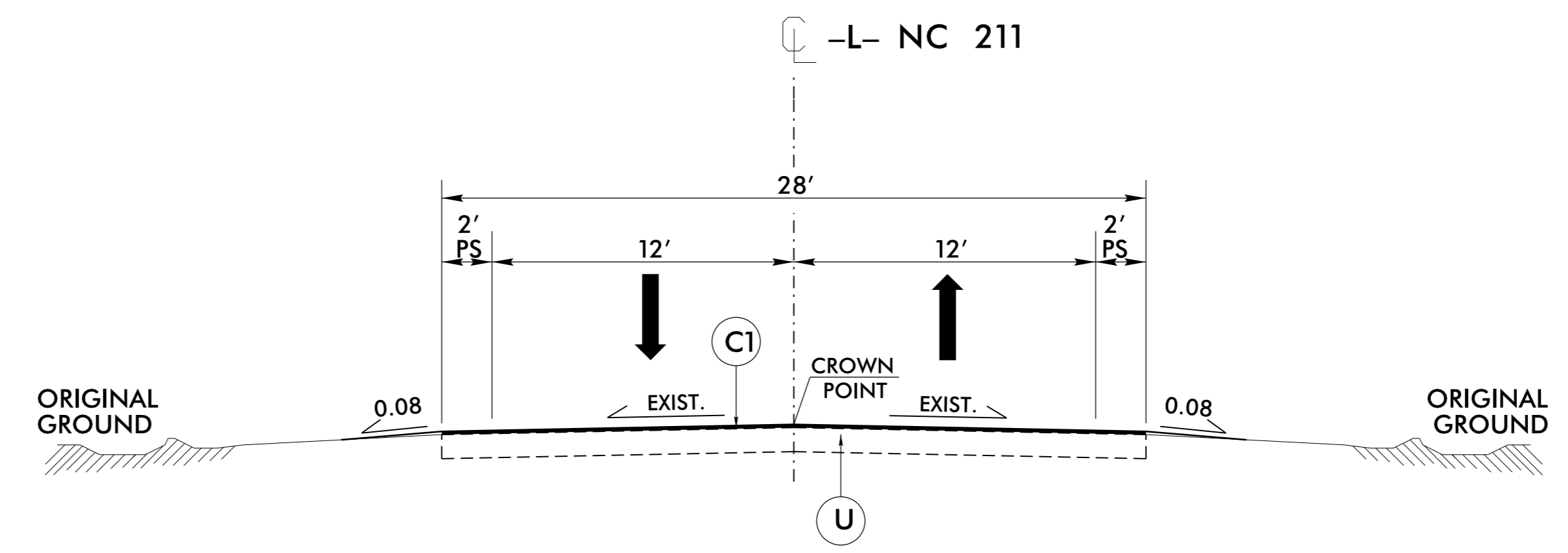
6/2/99

PAVEMENT SCHEDULE (FINAL PAVEMENT DESIGN)	
C1	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C2	PROP. APPROX. 2.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF THE TWO LAYERS.
C3	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF THE TWO LAYERS.
C4	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1" IN DEPTH OR GREATER THAN 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 2.5" IN DEPTH OR GREATER THAN 4.0" 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 5.5" IN DEPTH.
J1	6" AGGREGATE BASE COURSE
R1	SHOULDER BERM GUTTER
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	INCIDENTAL MILLING
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE -L- WEDGING DETAIL)

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

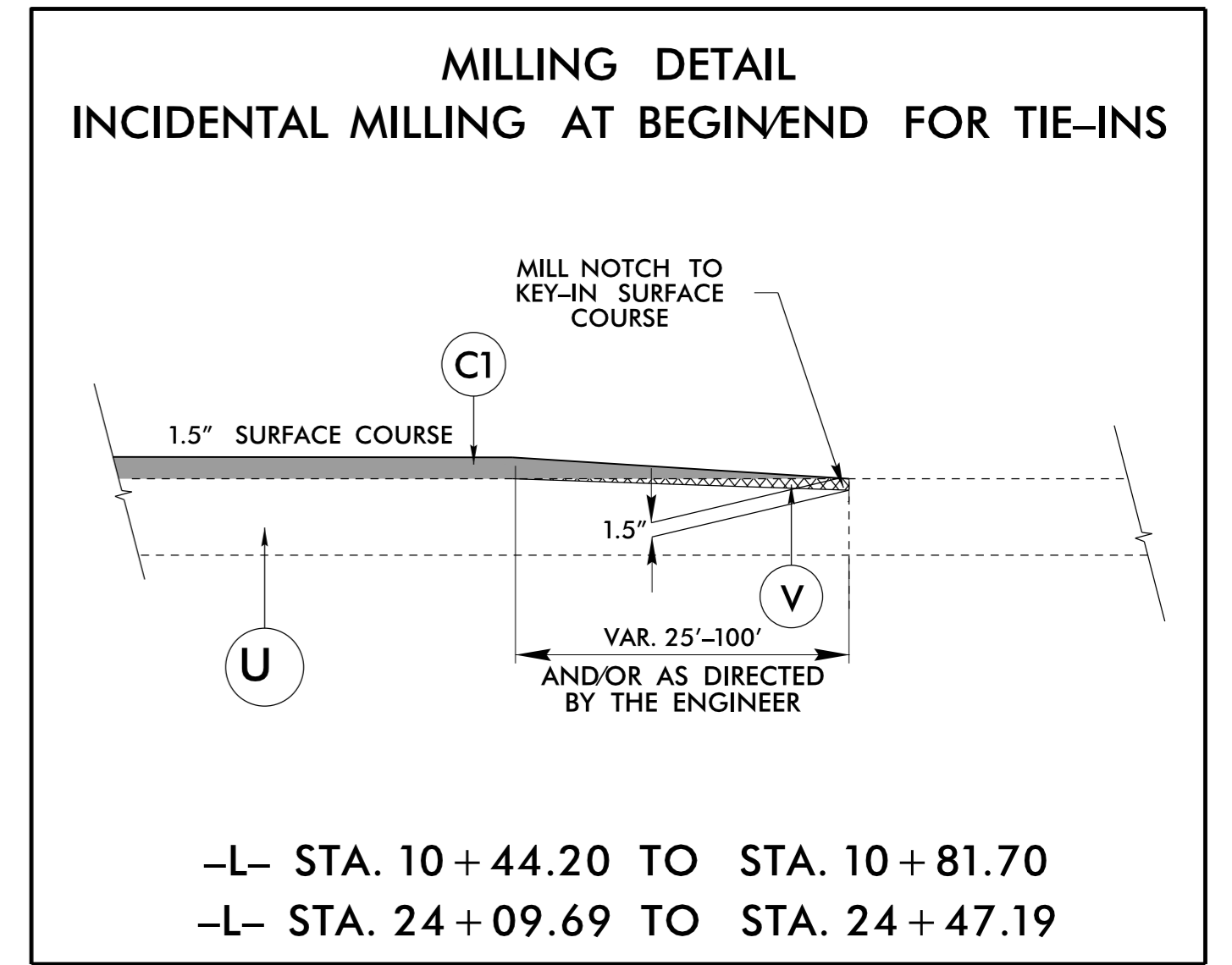


Detail Showing Method of Wedging - W

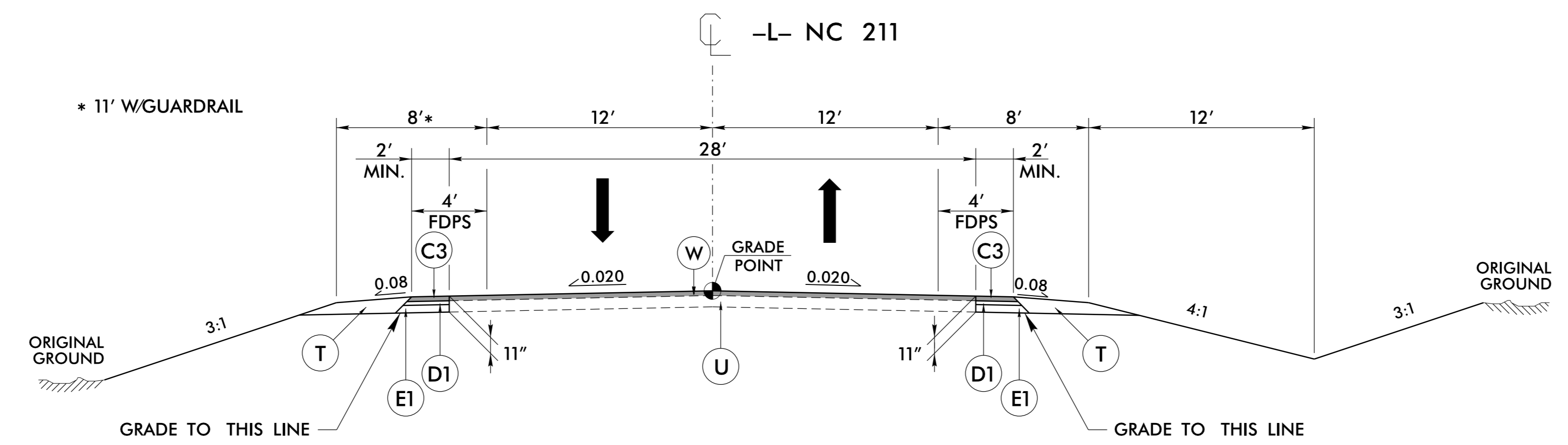


TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1  
 -L- STA. 10+44.20 TO STA. 12+00.00  
 -L- STA. 23+50.00 TO STA. 24+47.19



-L- STA. 10+44.20 TO STA. 10+81.70  
 -L- STA. 24+09.69 TO STA. 24+47.19



TYPICAL SECTION NO. 2

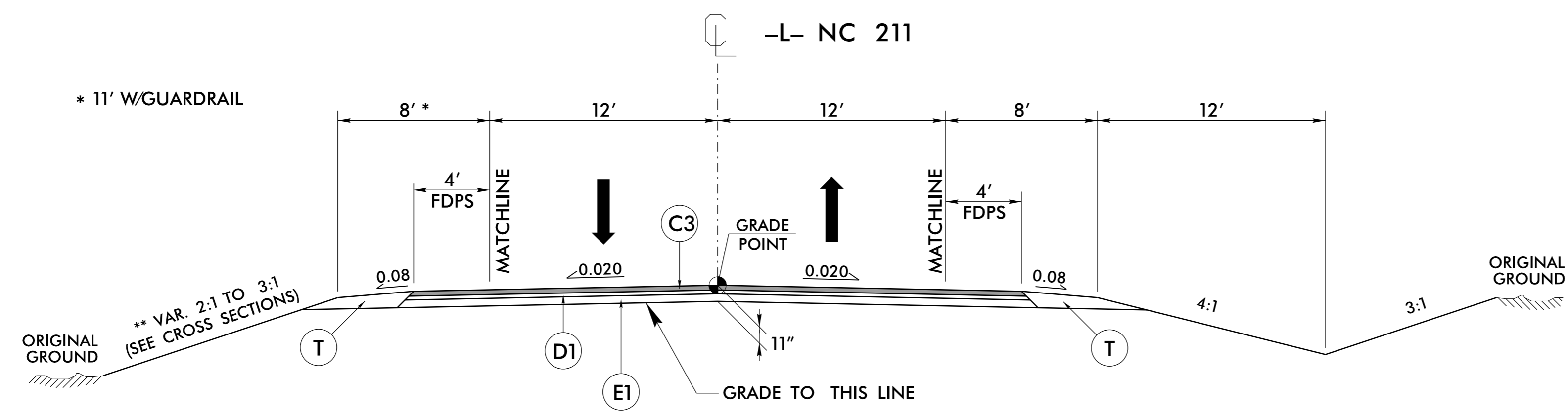
USE TYPICAL SECTION NO. 2  
 -L- STA. 12+00.00 TO STA. 14+23.00  
 -L- STA. 21+04.35 TO STA. 23+50.00

PROJECT REFERENCE NO. B-5624	SHEET NO. 2A-1
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
<p><b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b></p>	

-SYSTEM- \\P:\p\B5624\_Rdy\_tup.dgn

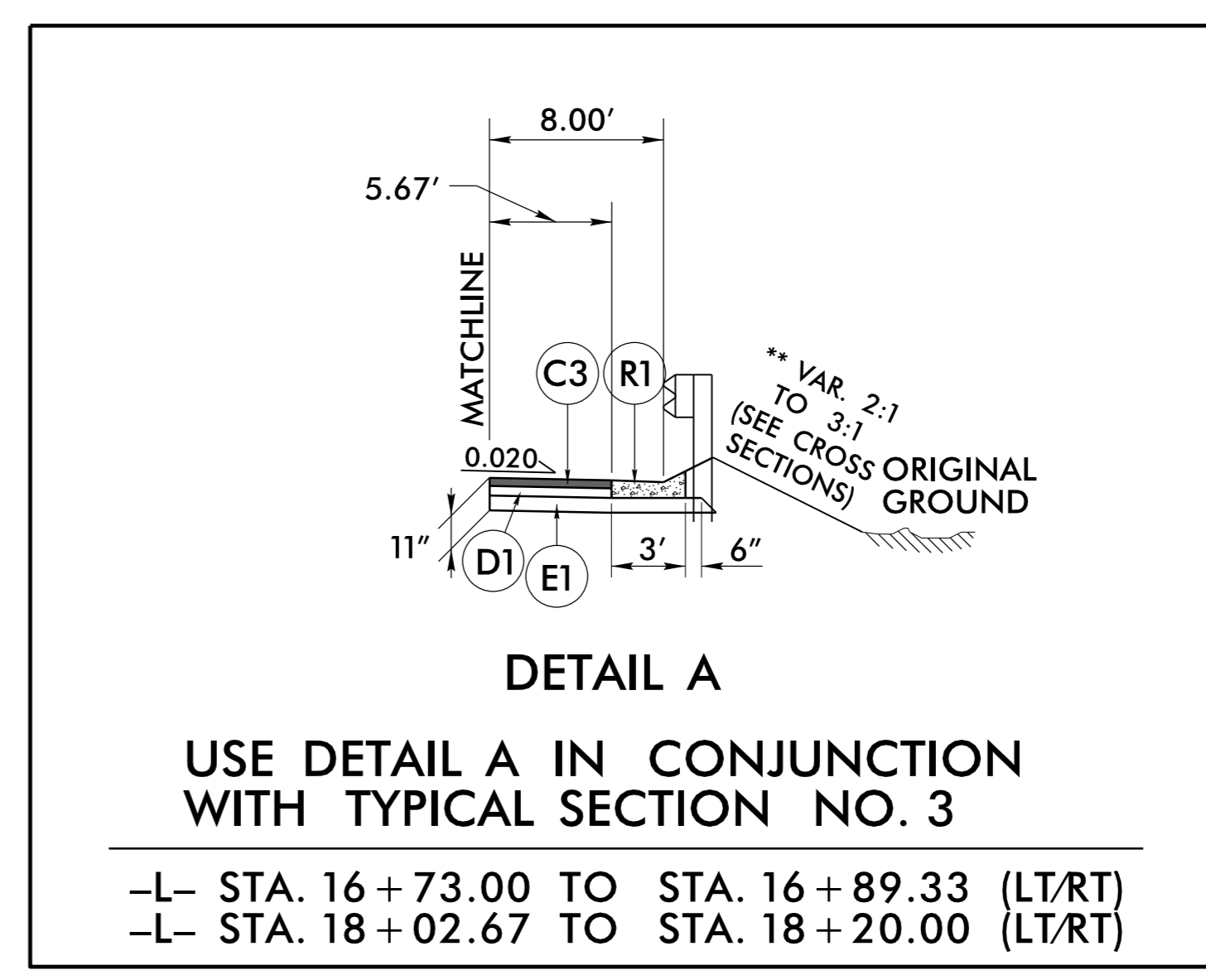
6/2/99

PROJECT REFERENCE NO. B-5624	SHEET NO. 2A-2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



**\*\*NOTE: 2:1 SLOPES USED WITH ROCK PLATING**

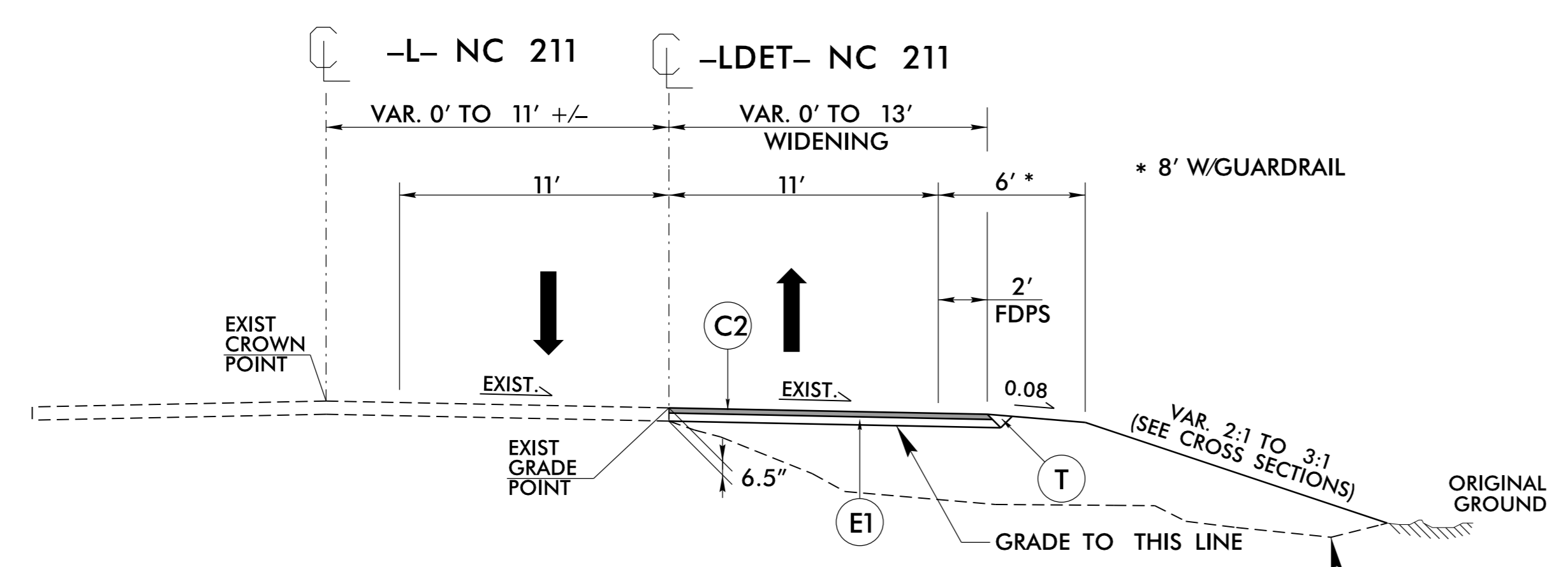
**TYPICAL SECTION NO. 3**  
 USE TYPICAL SECTION NO. 3  
 -L- STA. 14+23.00 TO STA. 17+03.50 (BEGIN BRIDGE)  
 -L- STA. 17+88.50 (END BRIDGE) TO STA. 21+04.35



-L- STA. 16+73.00 TO STA. 16+89.33 (LT/RT)  
 -L- STA. 18+02.67 TO STA. 18+20.00 (LT/RT)

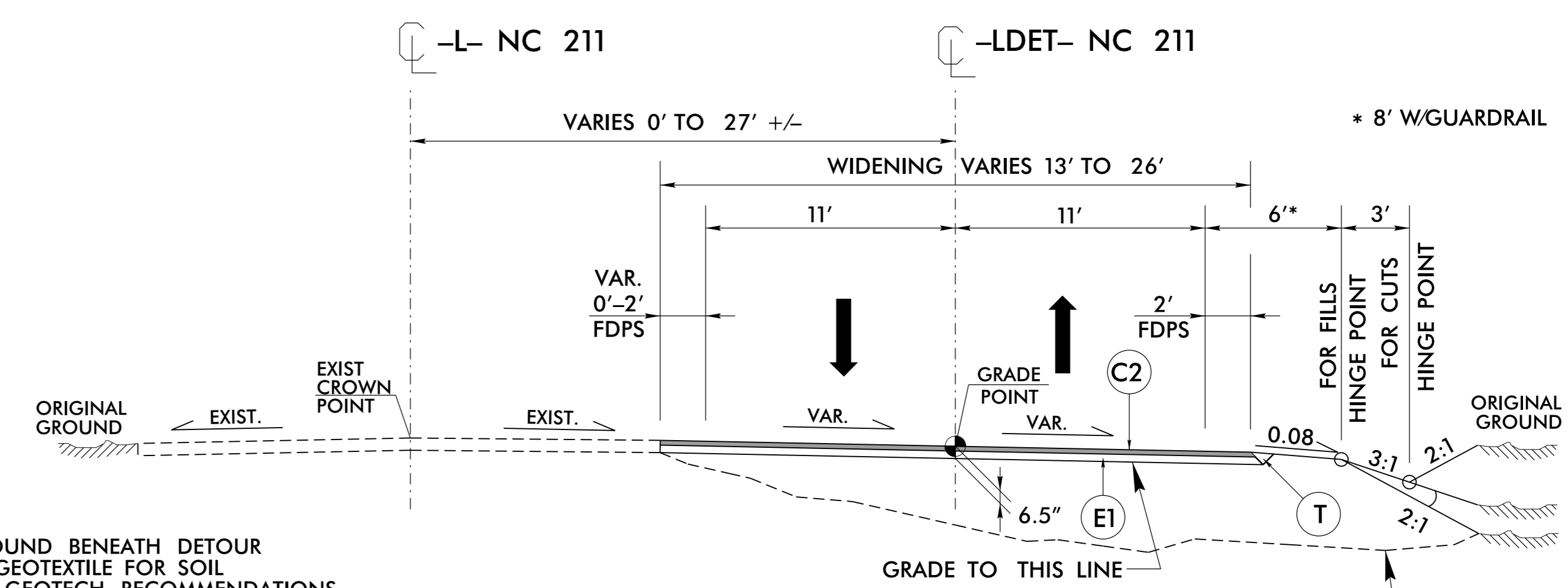
PAVEMENT SCHEDULE	
FINAL PAVEMENT DESIGN	
C1	1.5" S9.5B
C2	2.5" S9.5B
C3	3" S9.5B
C4	VAR. S9.5B
D1	4" I19.0C
D2	VAR. I19.0C
E1	4" B25.0C
E2	VAR. B25.0C
J1	6" ABC
R1	SBG
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V	INCIDENTAL MILLING
W	WEDGING

PAVEMENT EDGESLOPES 1:1 UNLESS NOTED OTHERWISE



**TYPICAL SECTION NO. 4**  
 USE TYPICAL SECTION NO. 4  
 -LDET- STA. 10+51.36 TO STA. 12+05.29  
 -LDET- STA. 21+97.96 TO STA. 23+95.49

LINE EXISTING GROUND BENEATH DETOUR  
 FILL SLOPES WITH GEOTEXTILE FOR SOIL  
 STABILIZATION PER GEOTECH RECOMMENDATIONS



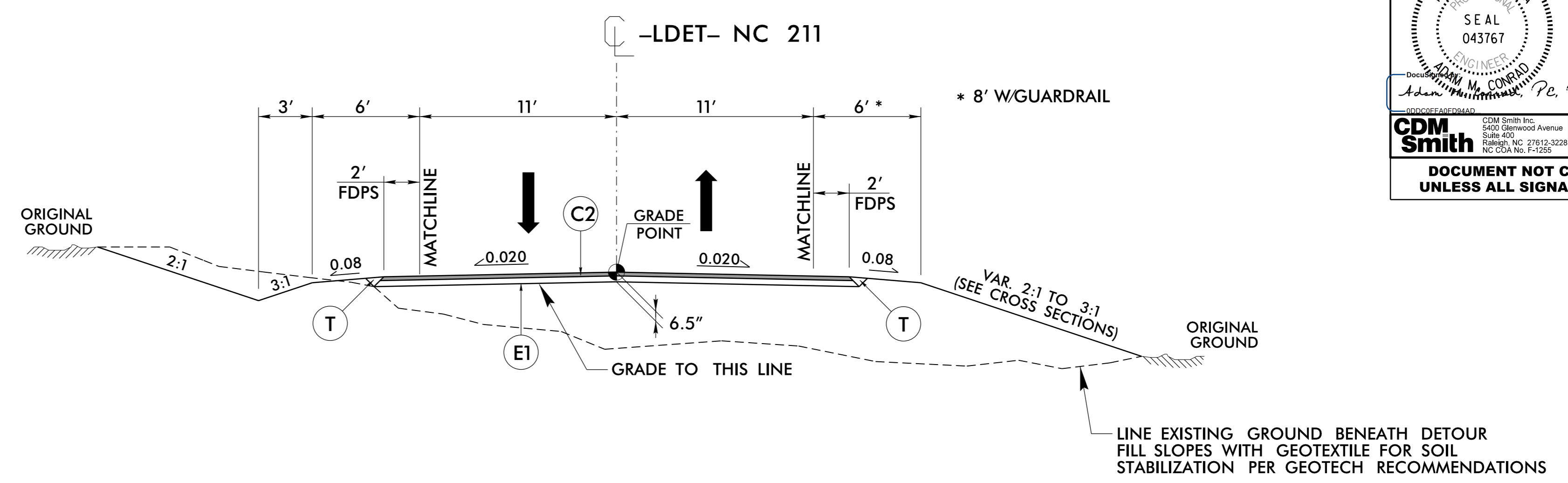
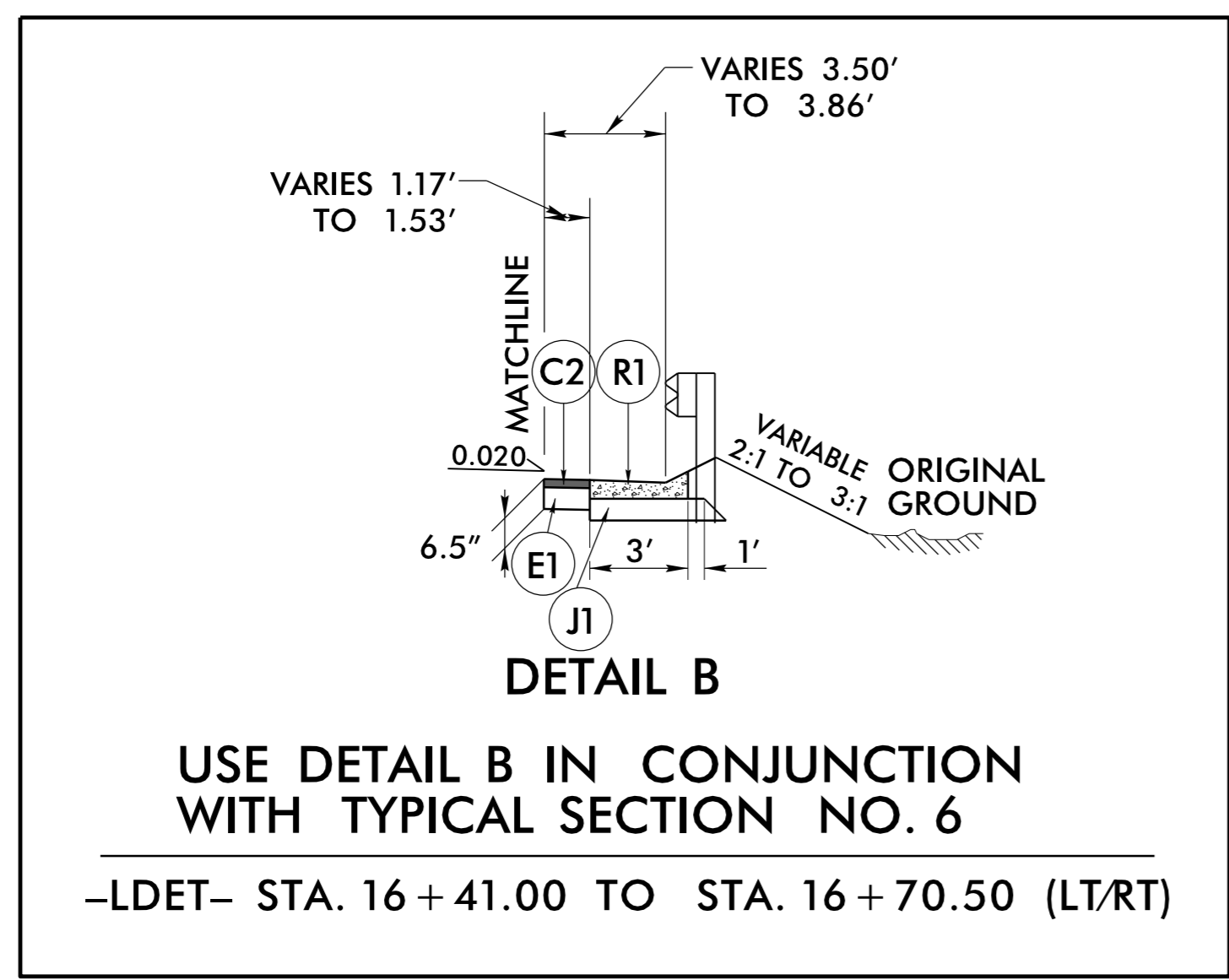
**TYPICAL SECTION NO. 5**  
 USE TYPICAL SECTION NO. 5  
 -LDET- STA. 12+05.29 TO -LDET- STA. 13+13.64  
 -LDET- STA. 20+92.24 TO -LDET- STA. 21+97.96

LINE EXISTING GROUND BENEATH DETOUR  
 FILL SLOPES WITH GEOTEXTILE FOR SOIL  
 STABILIZATION PER GEOTECH RECOMMENDATIONS

-SYSTEM- \\P:\p\B5624\_Rdy\_tup.dgn  
 11/15/00 10:00:00

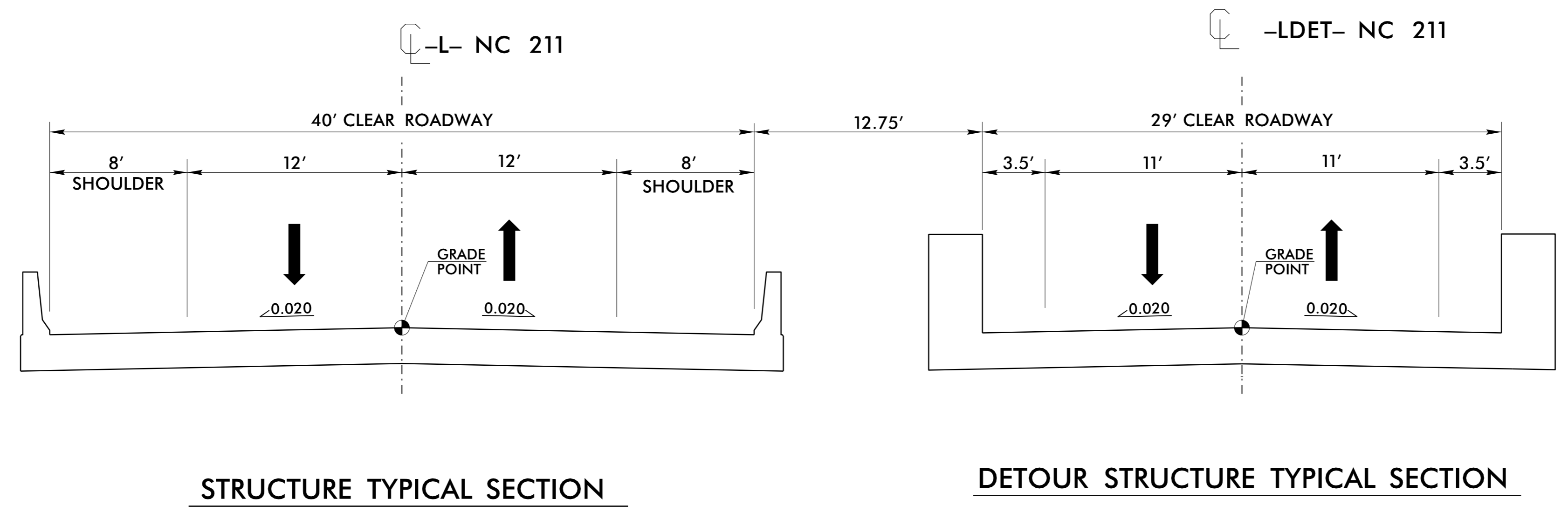
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PROJECT REFERENCE NO. B-5624	SHEET NO. 2A-3
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
CDM Smith Inc. 5400 Glenwood Avenue Suite 400 Raleigh, NC 27612-3228 NC CEA No. 1-1256	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

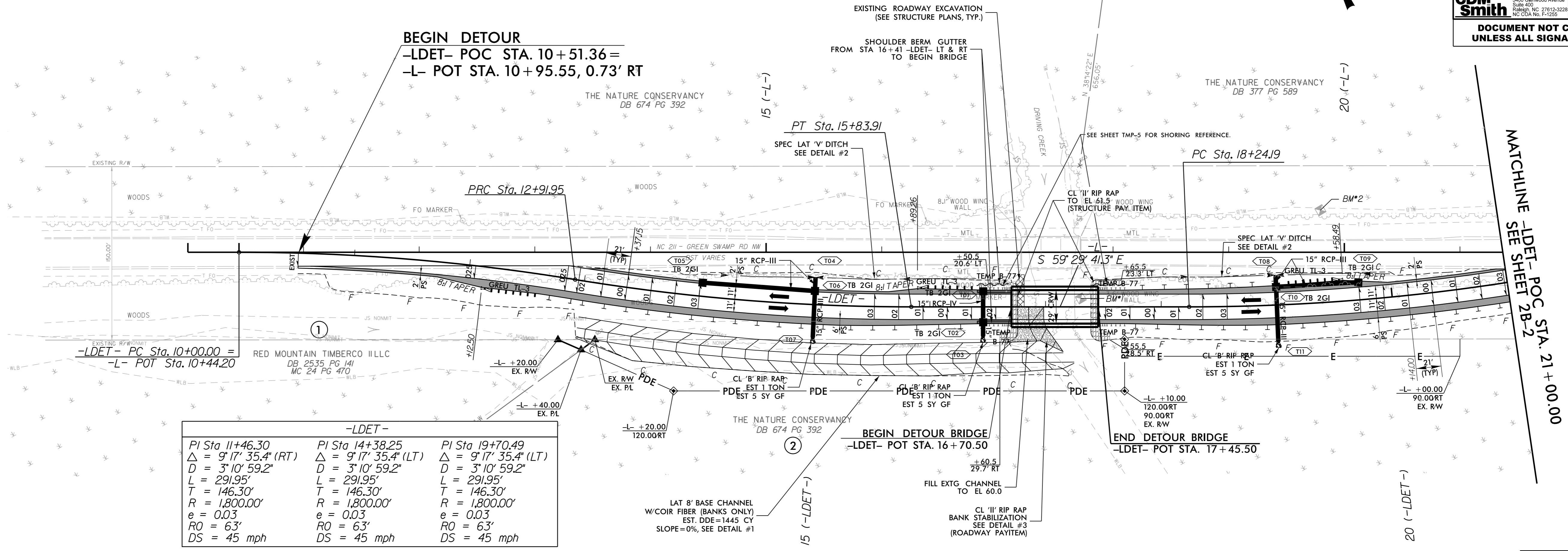
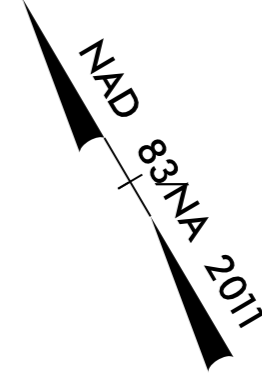
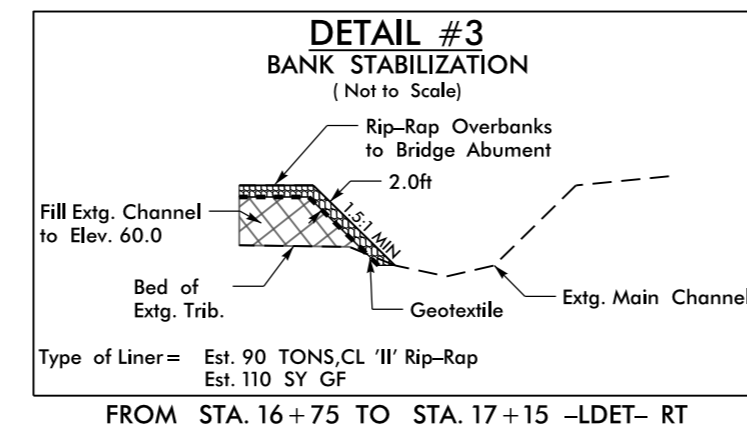
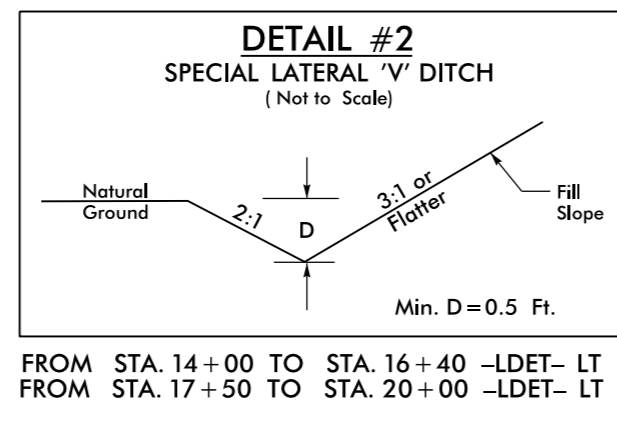
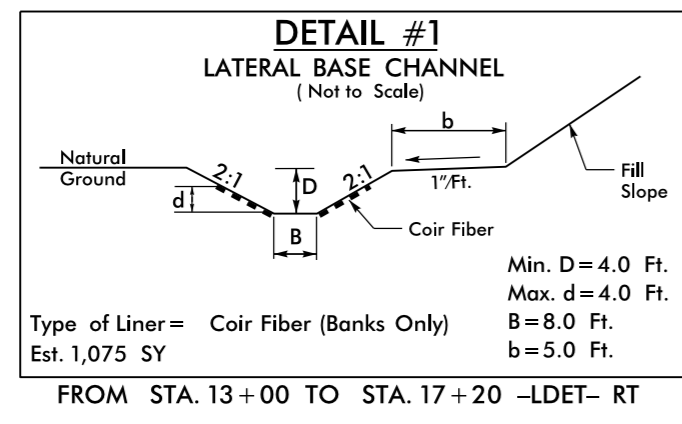


PAVEMENT SCHEDULE	
FINAL PAVEMENT DESIGN	
C1	1.5" S9.5B
C2	2.5" S9.5B
C3	3" S9.5B
C4	VAR. S9.5B
D1	4" I19.0C
D2	VAR. I19.0C
E1	4" B25.0C
E2	VAR. B25.0C
J1	6" ABC
R1	SBG
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V	INCIDENTAL MILLING
W	WEDGING

PAVEMENT EDGESLOPES 1:1 UNLESS NOTED OTHERWISE

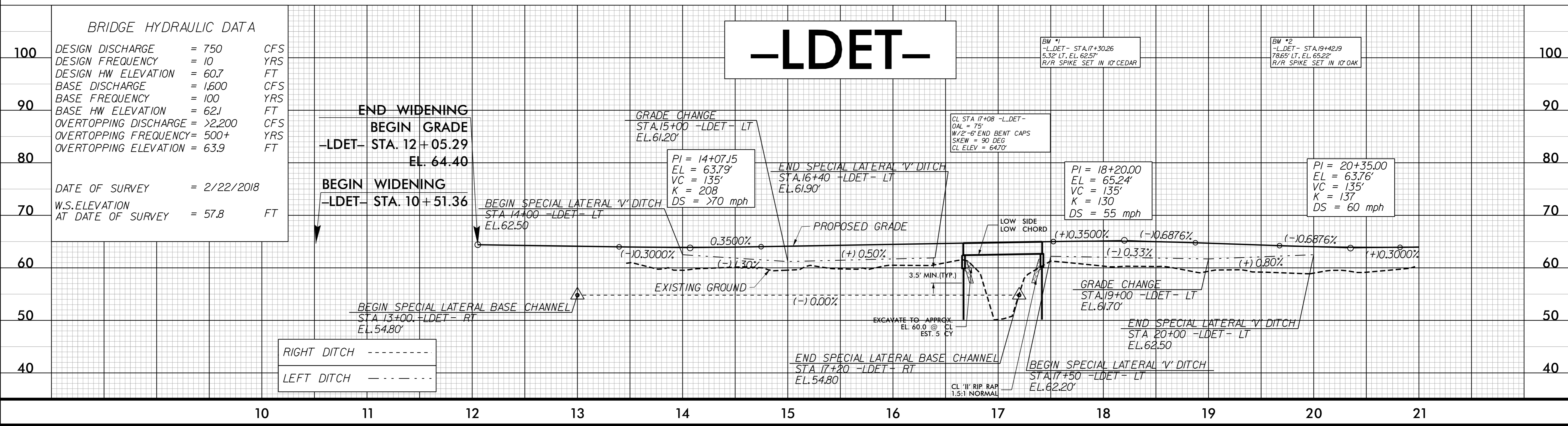


PROJECT REFERENCE NO. B-5624	SHEET NO. 2B-1
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



-LDET-

PI Sta 11+46.30 Δ = 9'17" 35.4" (RT) D = 3'10" 59.2" L = 291.95' T = 146.30' R = 1,800.00' e = 0.03 RO = 63' DS = 45 mph	PI Sta 14+38.25 Δ = 9'17" 35.4" (LT) D = 3'10" 59.2" L = 291.95' T = 146.30' R = 1,800.00' e = 0.03 RO = 63' DS = 45 mph	PI Sta 19+70.49 Δ = 9'17" 35.4" (LT) D = 3'10" 59.2" L = 291.95' T = 146.30' R = 1,800.00' e = 0.03 RO = 63' DS = 45 mph
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REVISIONS

-SYSTIMEB6624\_Pd1.psh\_2B1.dgn  
11/15/2021 10:00 AM

FOR -L- SEE SHEET NO. 4



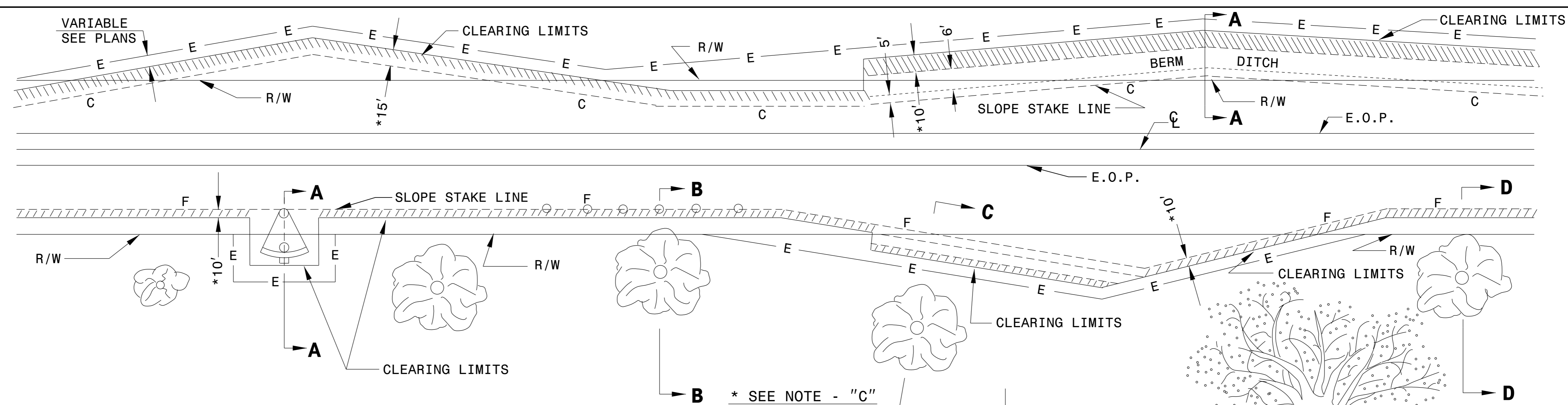


STATE OF NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR  
**METHOD OF CLEARING**  
MODIFIED METHOD - III

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

ENGLISH DETAIL DRAWING FOR  
**METHOD OF CLEARING**  
MODIFIED METHOD - III



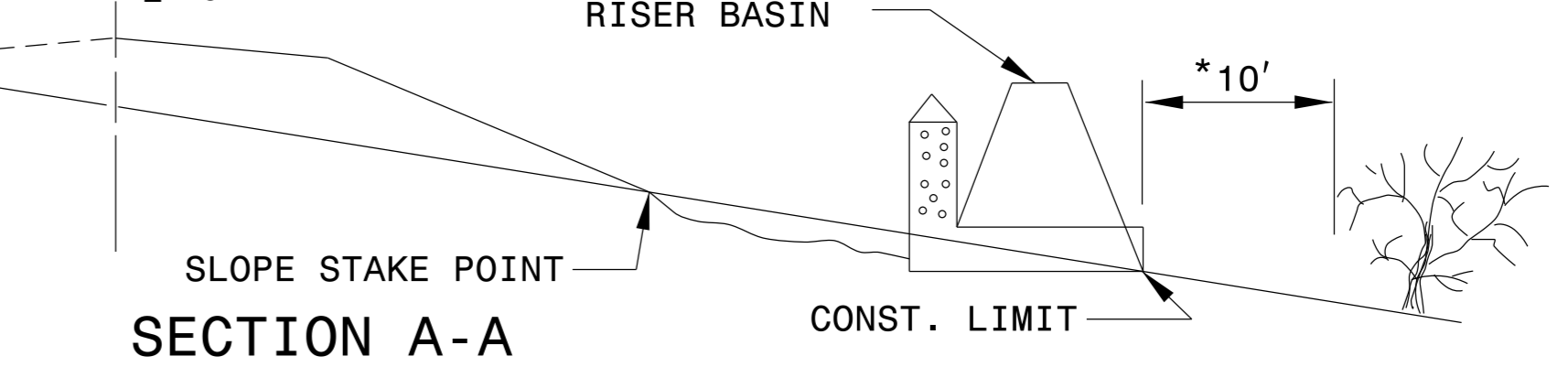
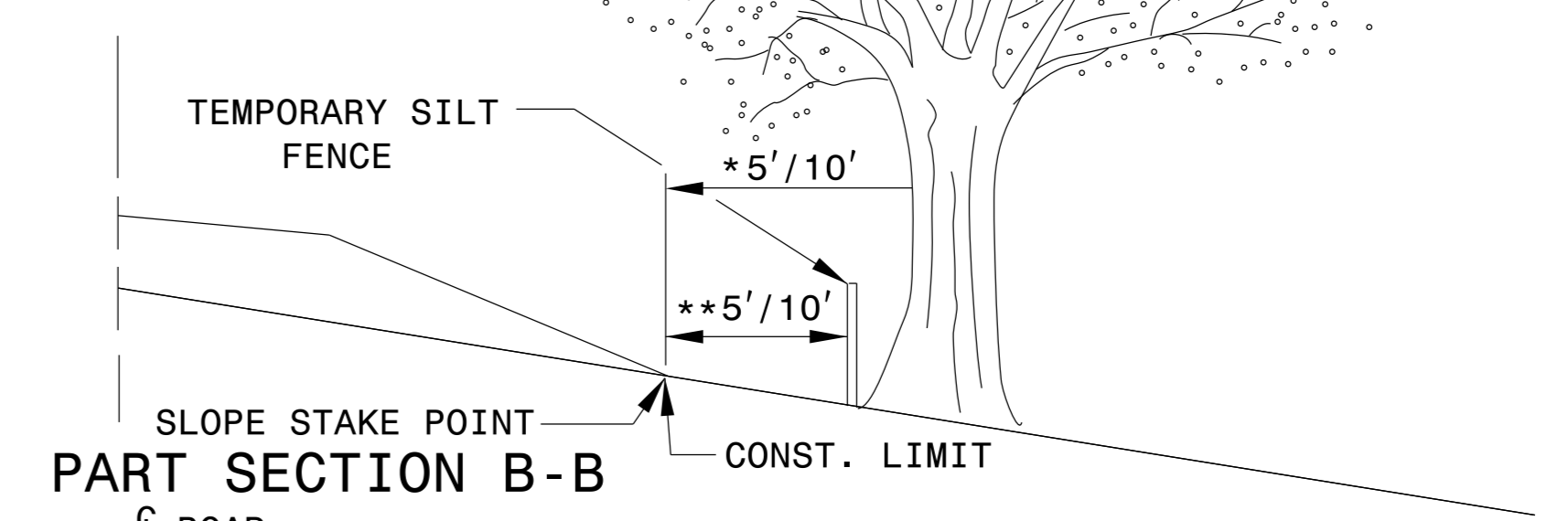
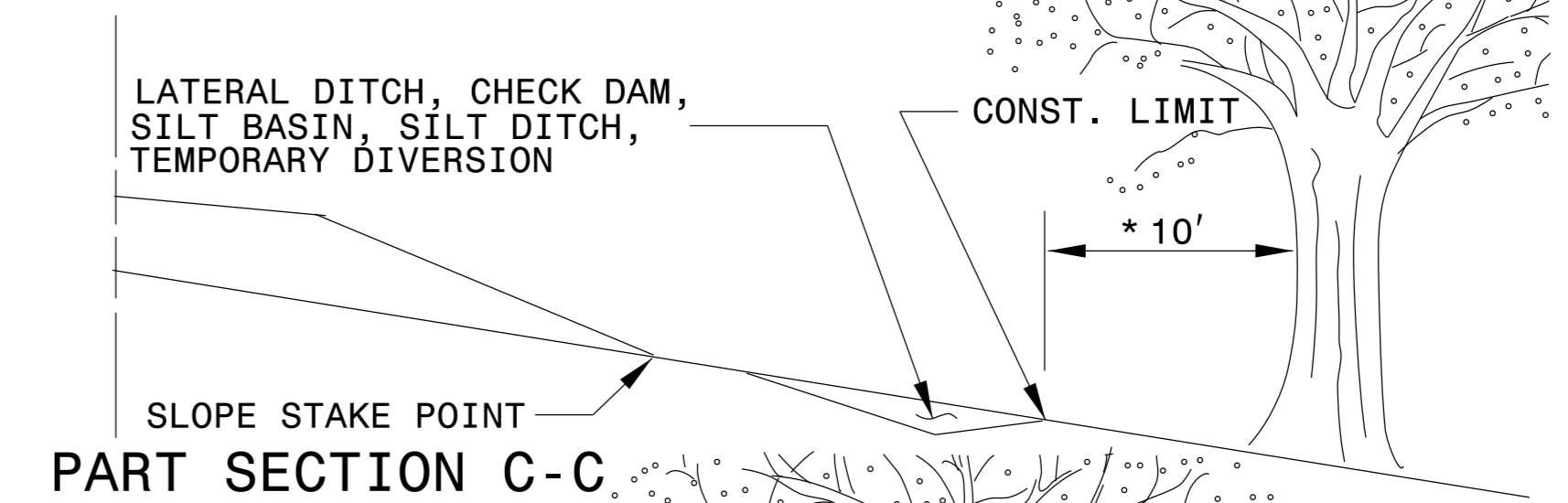
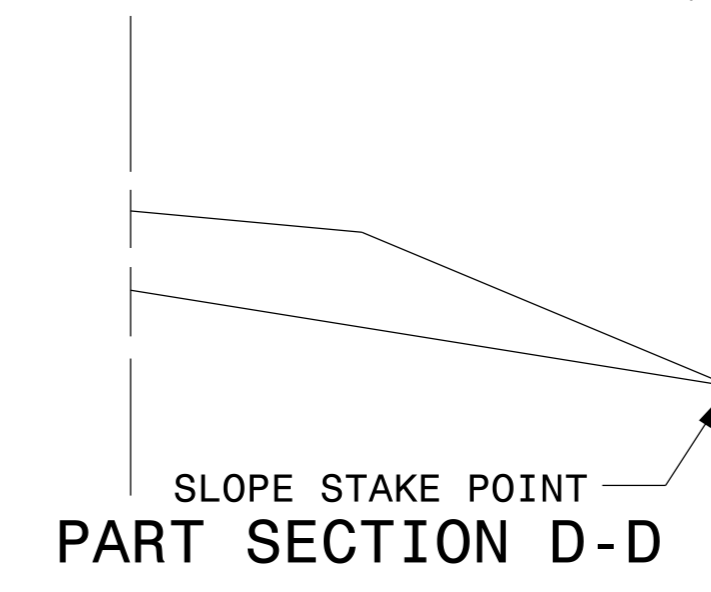
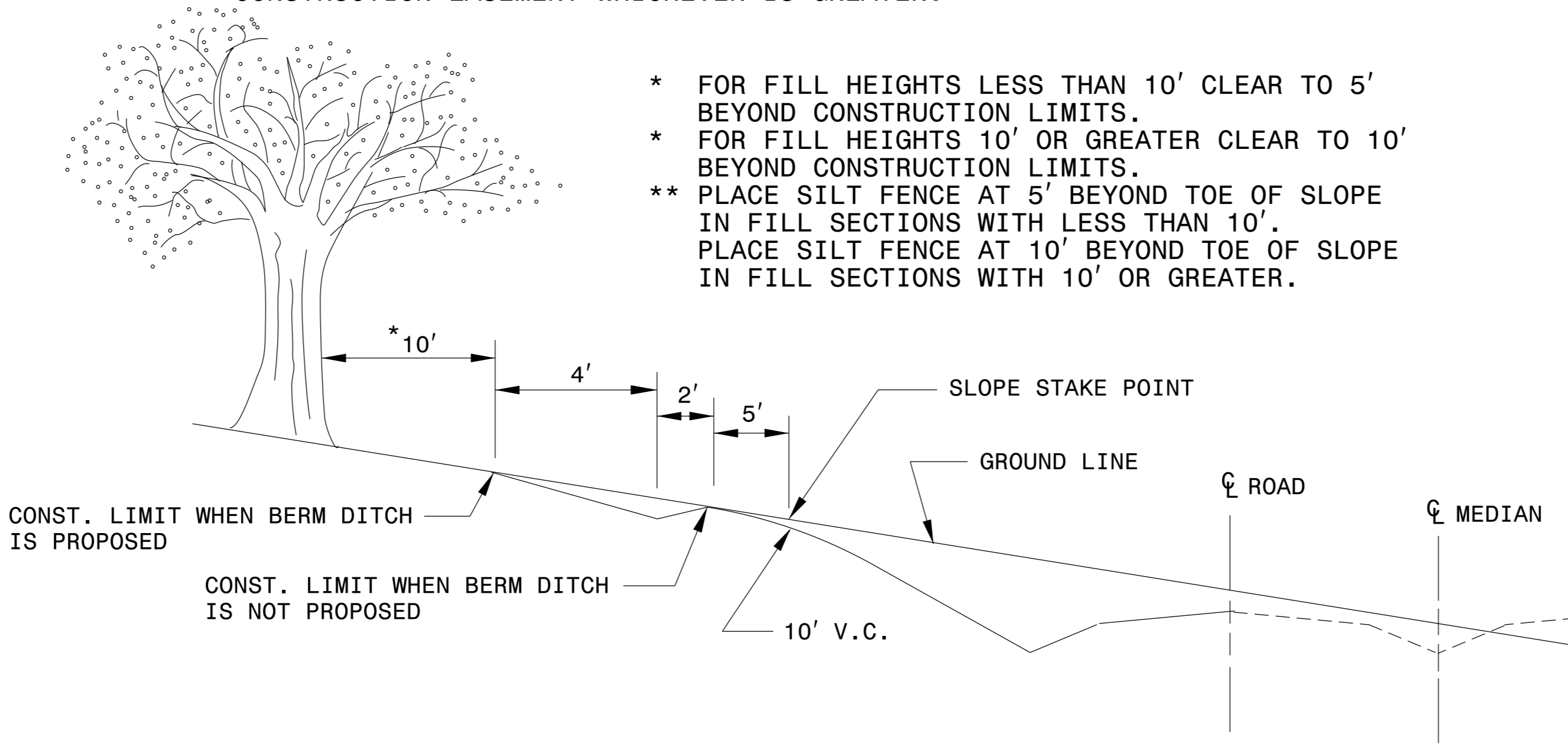
**GENERAL NOTES:**

1. REMOVE TREES OUTSIDE THE CLEARING LIMIT WHEN, IN THE OPINION OF THE ENGINEER, THE UTILITY OF A TREE WILL BE DESTROYED BY THE CONSTRUCTION OR THE CLEARING OPERATION.
2. CLEAR IN ACCORDANCE WITH THIS STANDARD EXCEPT WHERE ADDITIONAL CLEARING IS REQUIRED FOR SAFETY AS SHOWN ON THE PLANS.

**METHOD III CLEARING LIMITS**

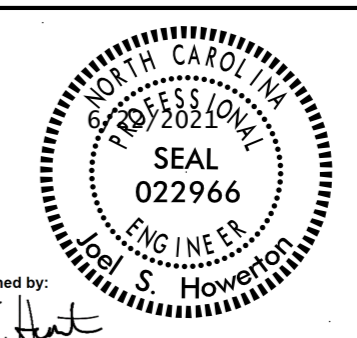
- (A) CUTS -- CLEAR TO CONSTRUCTION LIMITS.
- (B) FILLS - CLEAR TO 5'/10' \* BEYOND CONSTRUCTION LIMITS, UNLESS SPECIFIED OTHERWISE BY WETLAND PERMIT.
- (C) CUTS AND FILLS - WHEN THE CLEARING LIMITS (A AND B) EXCEED THE PROPOSED R/W OR PROPOSED CONSTRUCTION EASEMENTS, THEN CLEAR ONLY TO THE R/W OR CONSTRUCTION EASEMENT WHICHEVER IS GREATER.

- \* FOR FILL HEIGHTS LESS THAN 10' CLEAR TO 5' BEYOND CONSTRUCTION LIMITS.
- \* FOR FILL HEIGHTS 10' OR GREATER CLEAR TO 10' BEYOND CONSTRUCTION LIMITS.
- \*\* PLACE SILT FENCE AT 5' BEYOND TOE OF SLOPE IN FILL SECTIONS WITH LESS THAN 10'. PLACE SILT FENCE AT 10' BEYOND TOE OF SLOPE IN FILL SECTIONS WITH 10' OR GREATER.



SHEET 1 OF 1  
**200D03**

SHEET 1 OF 1  
**200D03**



DocuSigned by:  
*David S. Hart*  
879F30770C0C45F

**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: T.S.S. DATE: FEB. 2000  
 MODIFIED BY: K.A.K. DATE: AUG. 2016  
 CHECKED BY: DATE:  
 FILE SPEC.: kkempff/english/0200d301.dgn

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

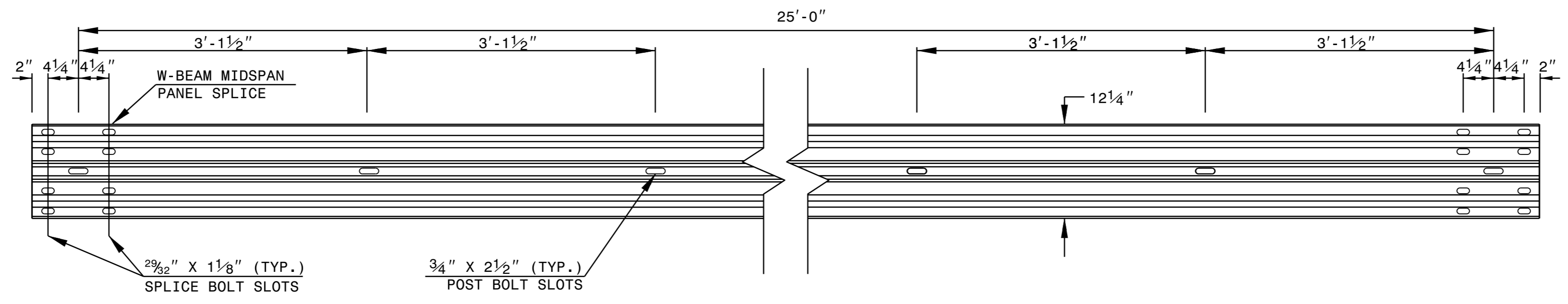
ROADWAY DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

SHEET 6 OF 8  
**862D02**

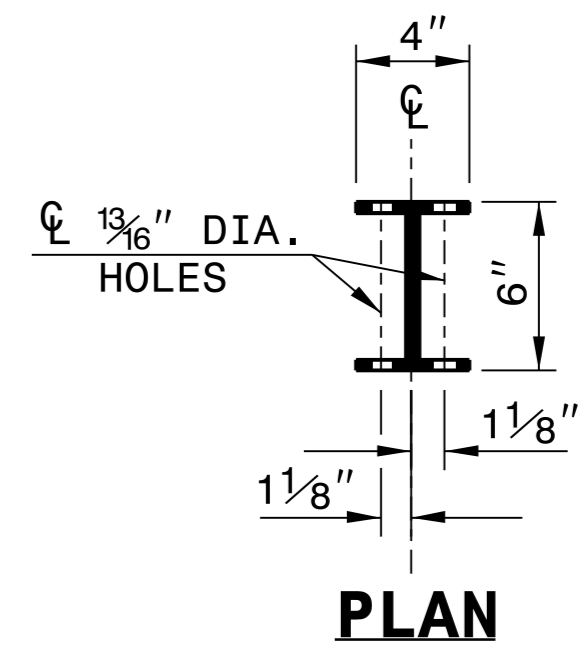
STATE OF NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

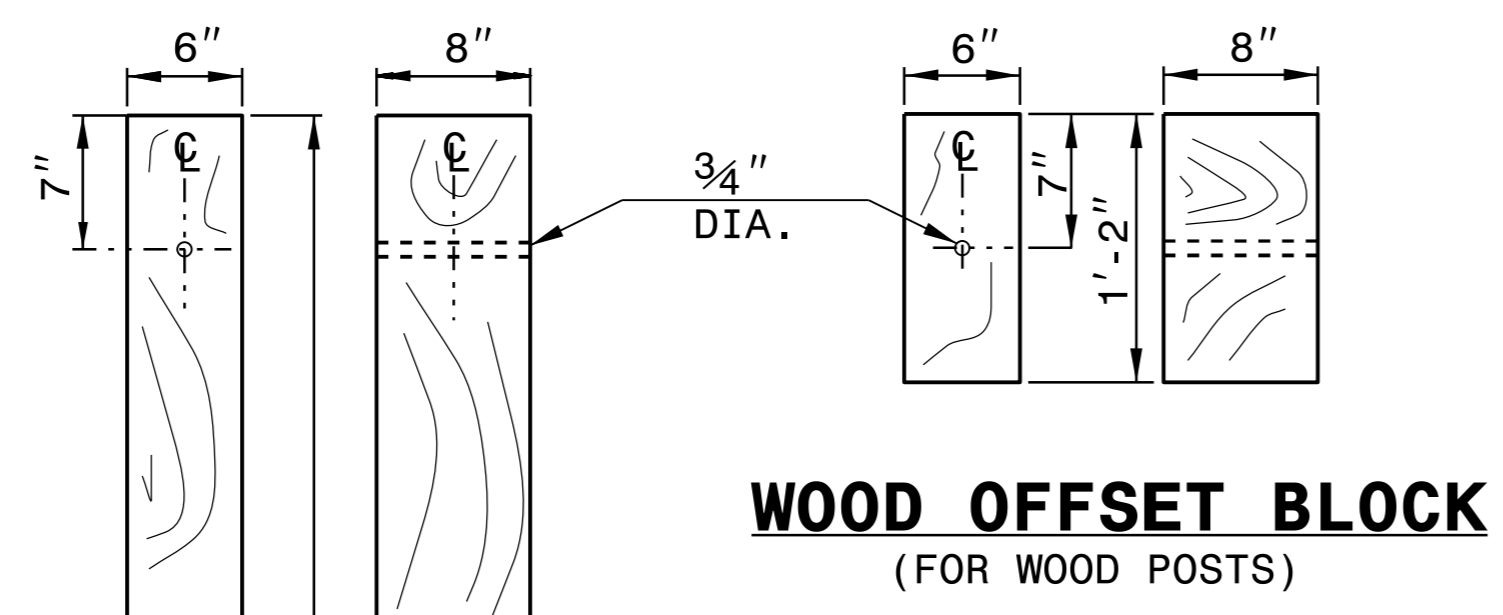
SHEET 6 OF 8  
**862D02**



**STANDARD W-BEAM GUARDRAIL**



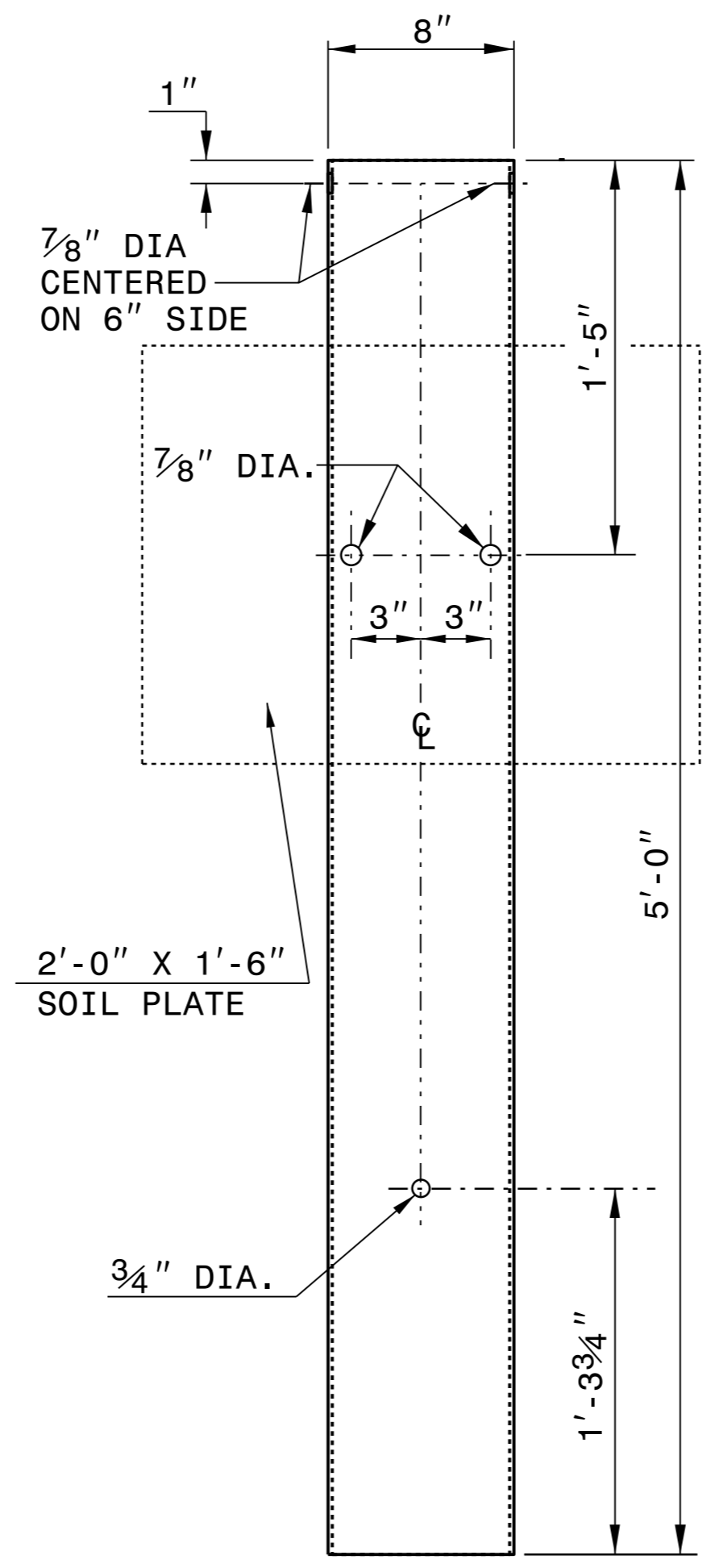
**PLAN**



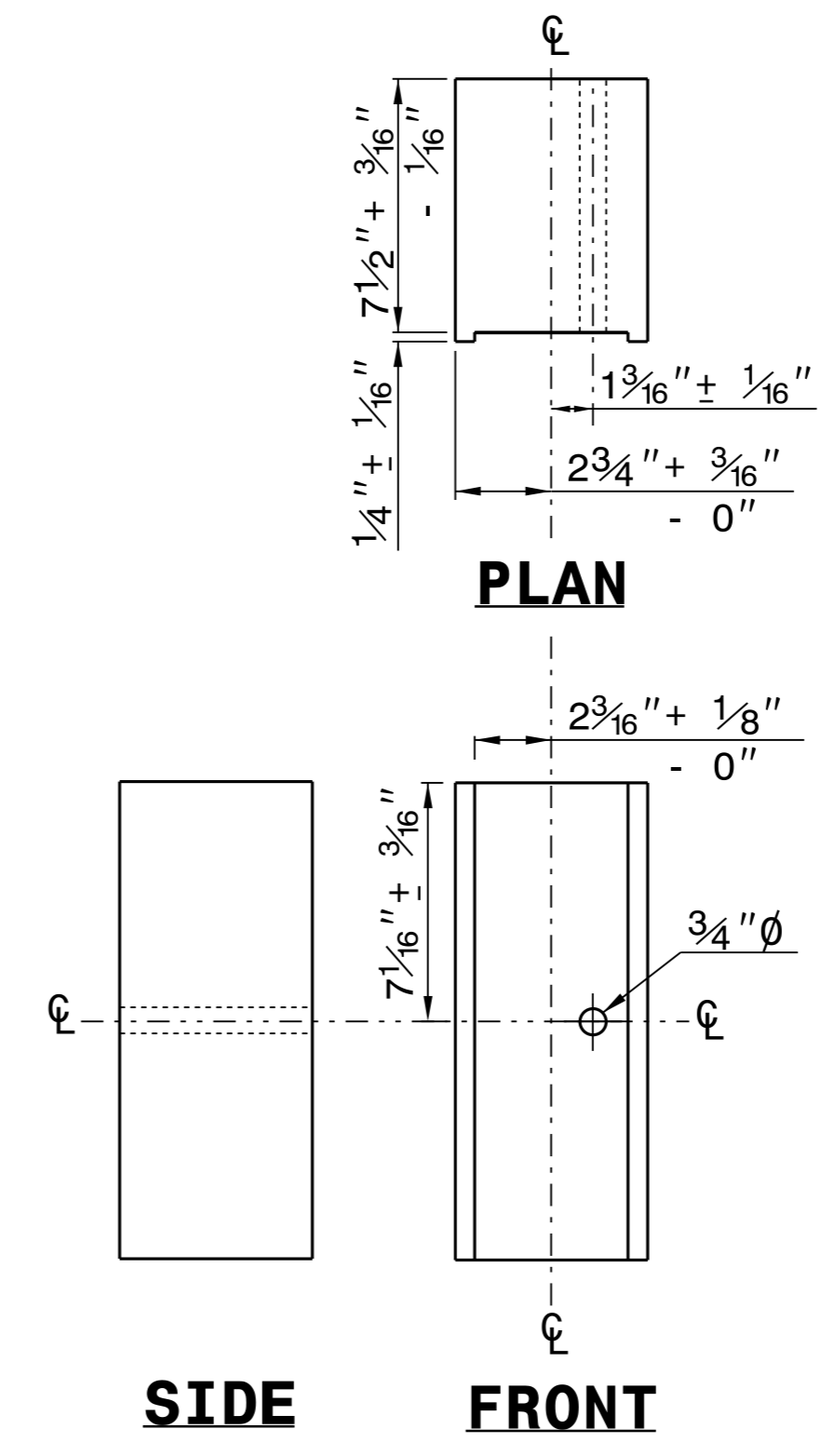
**WOOD OFFSET BLOCK  
(FOR WOOD POSTS)**

**STANDARD  
LINE POST**

**SHORT WOOD  
BREAKAWAY POST**



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

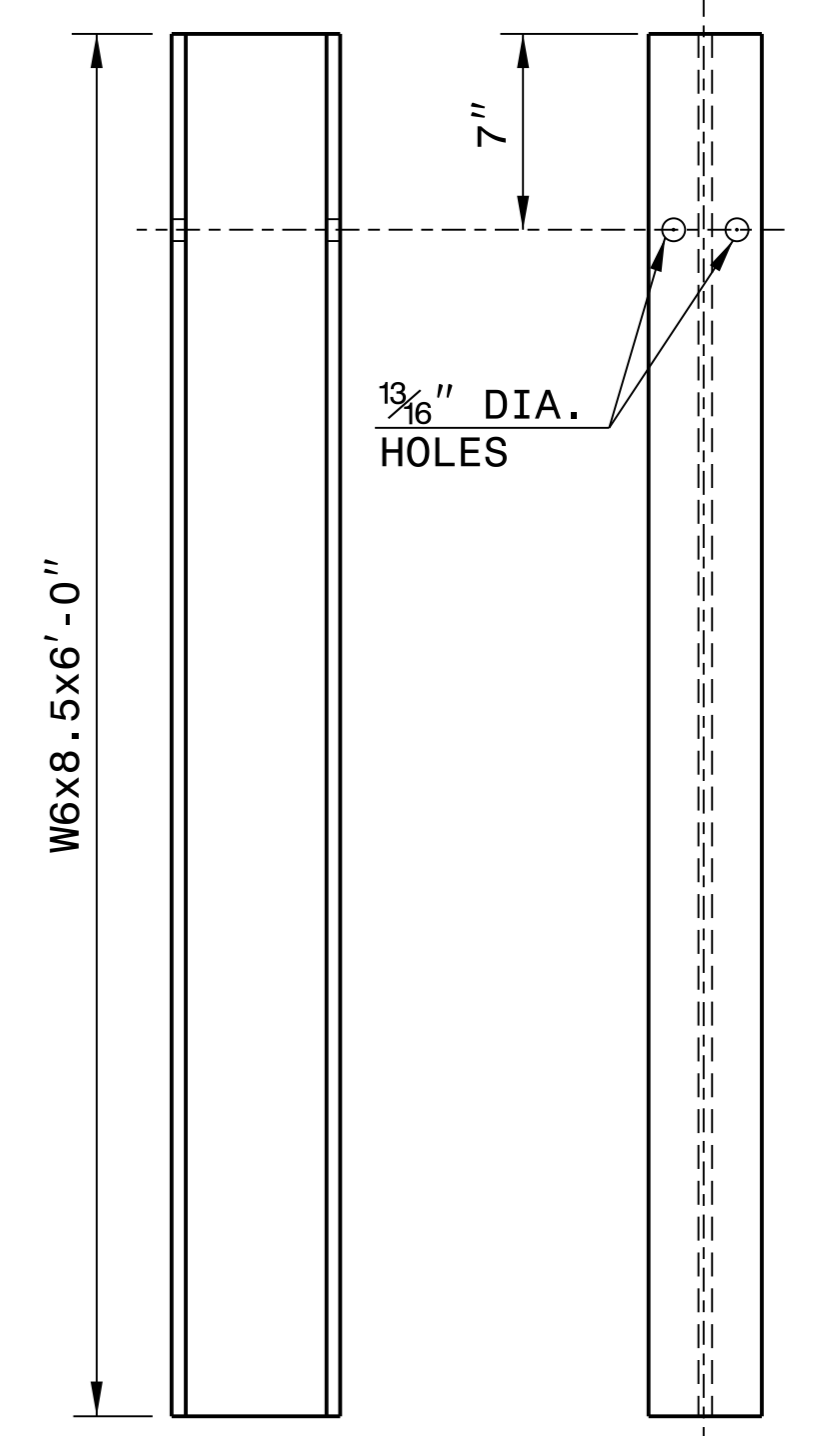


**PLAN**

**SIDE**

**FRONT**

**ROUTED  
OFFSET BLOCK**



**SIDE**

**FRONT**

**"W6" STEEL POST**

**SYSTEM PARTS**

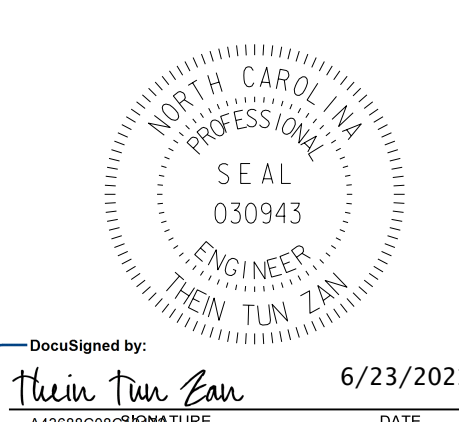


DocuSigned by:  
J. Howerton  
673F3D17DCDC49F

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

<b>PROJECT REFERENCE NO.</b> B-5624		<b>SHEET NO.</b> 2G-1
GEOTECHNICAL ENGINEER 		ENGINEER
DocuSigned by: Thein Tun Zan 6/23/2021		DATE
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>		

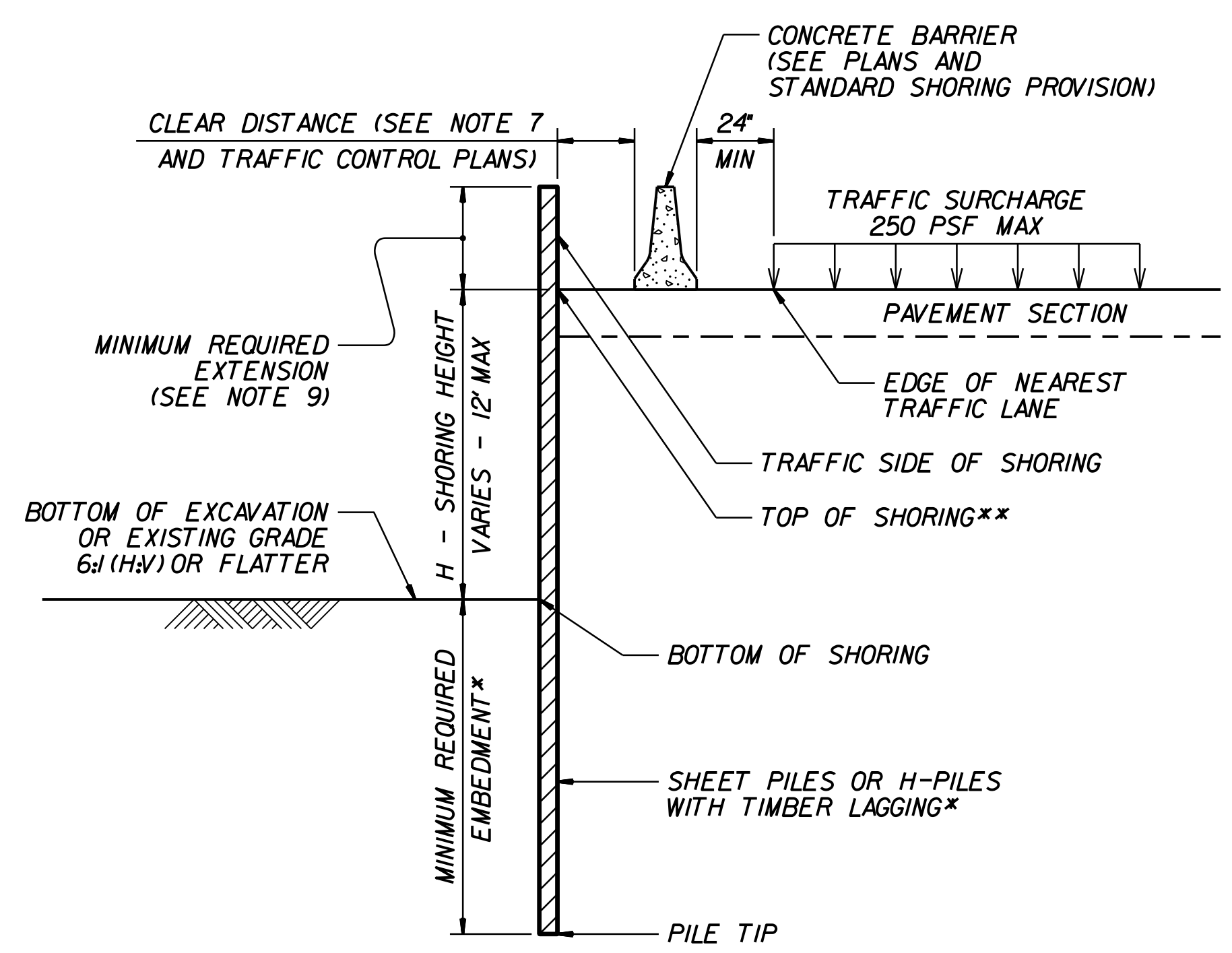
GROUNDWATER CONDITION (SEE NOTE 6)	H SHORING HEIGHT (FT)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT						SURCHARGE CASE WITH TRAFFIC IMPACT					
		SHEET PILES		H-PILES WITH TIMBER LAGGING				SHEET PILES		H-PILES WITH TIMBER LAGGING			
		MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS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

**NOTES:**

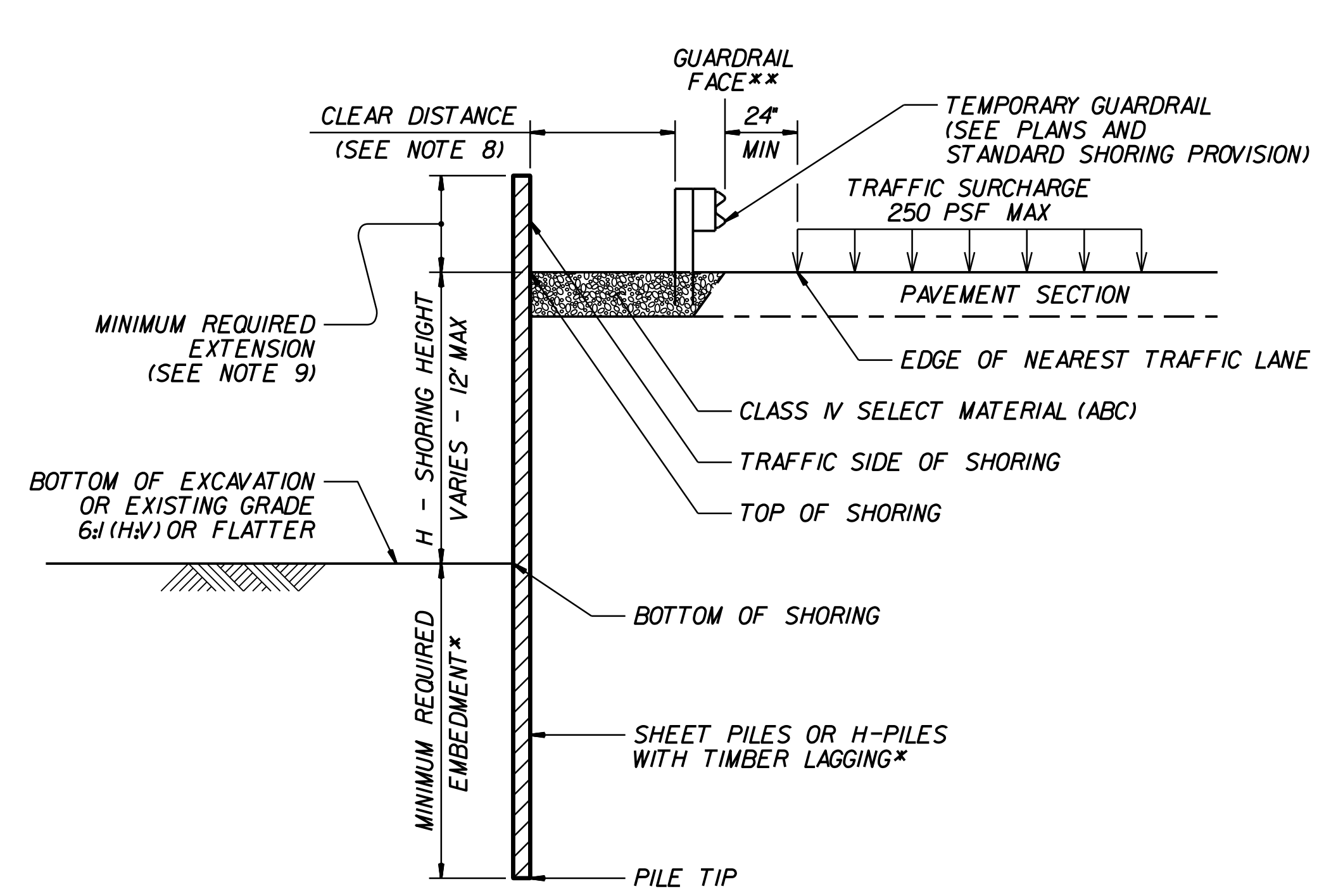
- AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY SHORING AS NOTED IN THE PLANS.
- FOR STANDARD TEMPORARY SHORING, SEE STANDARD SHORING PROVISION.
- STANDARD TEMPORARY SHORING IS BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:  
UNIT WEIGHT,  $\gamma = 120$  PCF  
FRICTION ANGLE,  $\phi =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

**MINIMUM REQUIRED EMBEDMENT AND SECTION MODULUS**

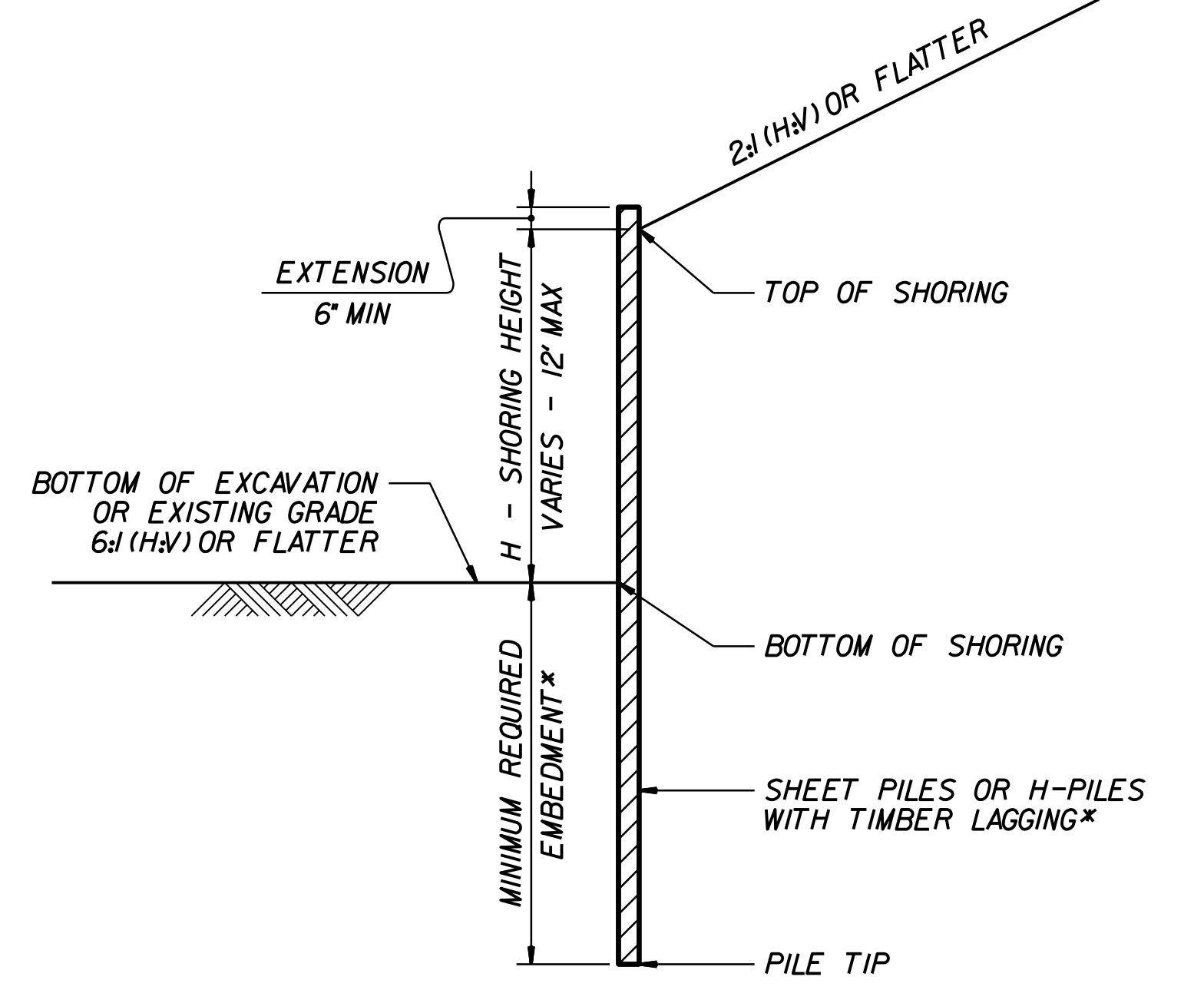
\*DO NOT USE H-PILES WITH TIMBER LAGGING FOR GROUNDWATER CONDITION, SHORING HEIGHT AND H-PILE SIZE SHOWN IF MINIMUM REQUIRED EMBEDMENT IS "--".



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

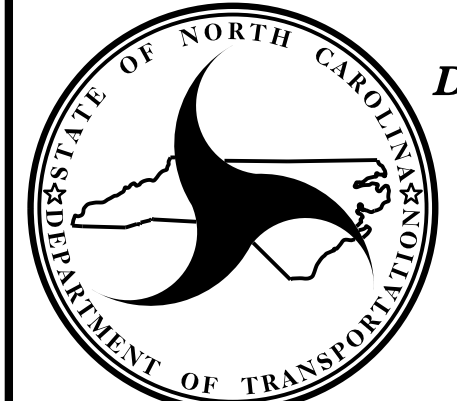


**TEMPORARY GUARDRAIL**  
\*\*GUARDRAIL FACE = EDGE OF PAVEMENT



**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**

DATE: 11-19-13

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

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

GUARDRAIL SUMMARY (LF)

Table with columns: SURVEY LINE, BEG. STA., END STA., LOCATION, LENGTH (STRAIGHT, SHOP CURVED, DOUBLE FACED), WARRANT POINT (APPROACH END, TRAILING END), "N" DIST. FROM E.O.L., TOTAL SHOUL. WIDTH, FLARE LENGTH (APPROACH END, TRAILING END), W (APPROACH END, TRAILING END), ANCHORS (GREU TL-3, III, B-77, TEMP GREU TL-3, TEMP B-77), IMPACT ATTENUATOR TYPE 350 (EA, G, NG), SINGLE FACED GUARDRAIL, REMOVE EXISTING GUARDRAIL, REMOVE AND STOCKPILE EXISTING GUARDRAIL, REMARKS.

SUMMARY OF EARTHWORK (CY)

Table with columns: LOCATION, UNCLASSIFIED EXCAVATION, UNDERCUT, EMBT + %, BORROW, WASTE. Includes rows for -LDET- 10+51.36 to 16+70.50, -L 12+00.00 to 17+03.50, -L 17+88.50 to 23+50.00, and GRAND TOTAL.

EST. DDE = 1,445 CY  
UNDERCUT (CONTINGENCY) = 300 CY  
SELECT GRANULAR MATERIAL (CONTINGENCY) = 600 CY

NOTE: Earthwork quantities are calculated by the Engineer. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

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

REMOVAL OF EXISTING ASPHALT PAVEMENT SUMMARY (SY)

Table with columns: LINE, STATION - STATION, LOCATION, REMOVAL (SY). Includes rows for -L- 14+23.00 to 14+43.49, -LDET- 10+51.41 to 17+08.50, and GRAND TOTAL.

BREAKING OF EXISTING ASPHALT PAVEMENT SUMMARY (SY)

Table with columns: LINE, STATION - STATION, LOCATION, BREAKING (SY). Includes rows for -L- 14+43.49 to 17+03.50, -L- 17+88.50 to 20+42.09, and GRAND TOTAL.

SUMMARY OF SHOULDER BERM GUTTER (LF)

Table with columns: LINE, STATION, STATION, LENGTH (LF). Includes rows for -L- LT 16+73.00 to 16+89.33, -L- RT 16+73.00 to 16+89.33, and GRAND TOTAL.



COMPUTED BY: Thein Tun Zan DATE: 12-21-2020  
 CHECKED BY: James Batts DATE: 12-21-2020

(12-17-19)

PROJECT NO.  
B-5624

SHEET NO.  
3G-1

**STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS**

**SUMMARY OF SUBSURFACE DRAINAGE**

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
CONTINGENCY				SD	200
				<b>TOTAL LF:</b>	200

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

**SUMMARY OF ROCK PLATING**

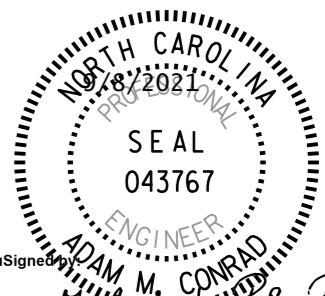
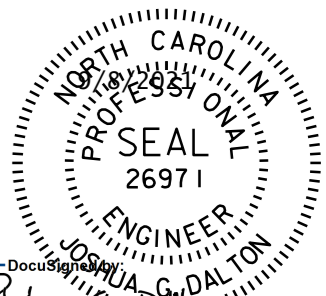

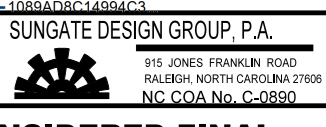
LINE	Beginning Slope (H:V)	Approx. Station	Ending Slope (H:V)	Approx. Station	Location LT/RT	Rock Plating Detail No. 1/2/3/4	Riprap Class* 1/2/B	Rock Plating SY
L	2.5:1	15+75	2:1	17+04	LT	1	*	300
L	2:1	17+89	2.5:1	21+75	LT	1	*	800
							<b>TOTAL SY:</b>	1,100

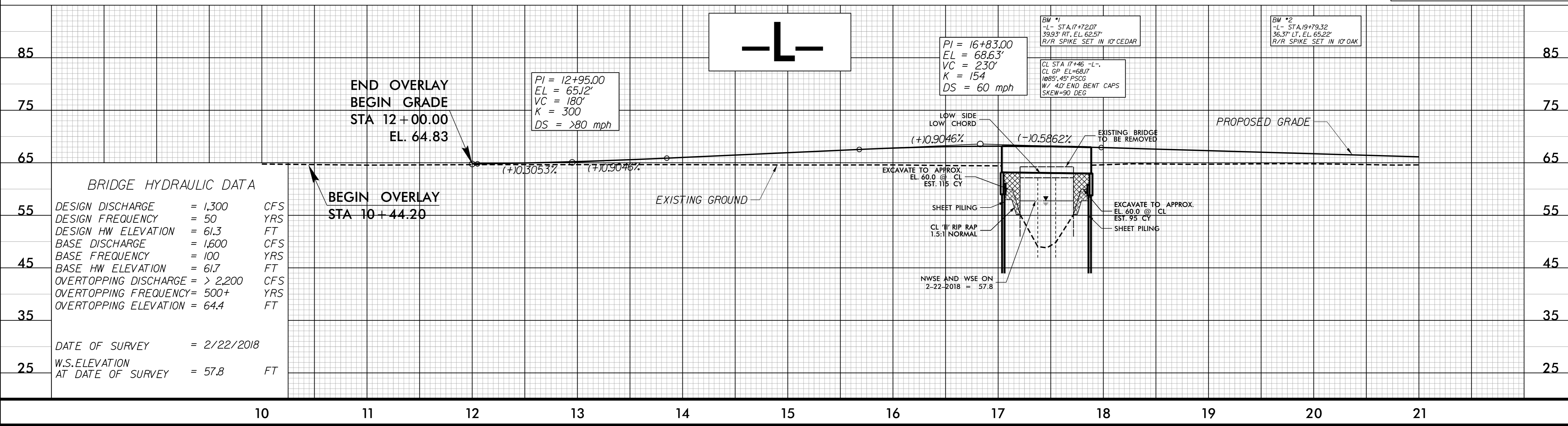
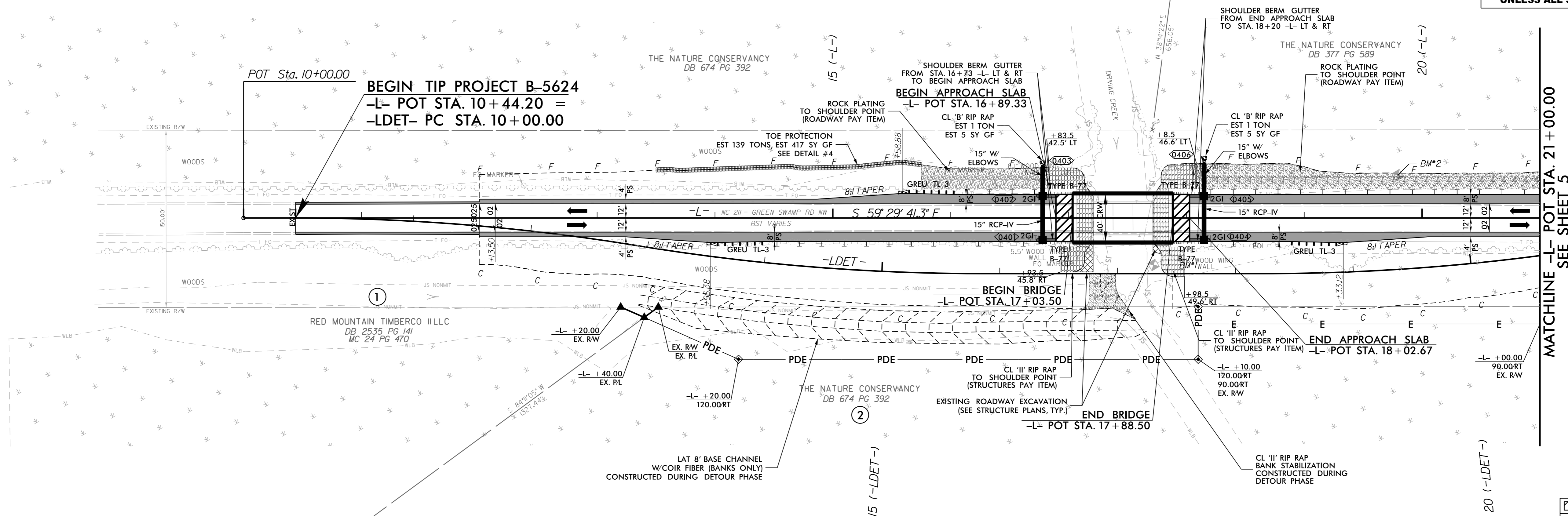
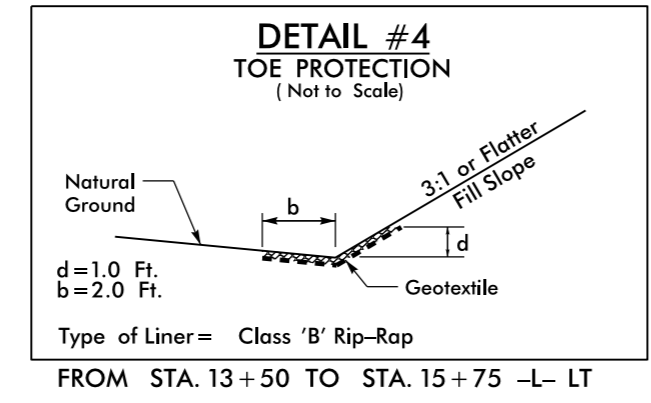
\*Use Class 1, 2 or B riprap if riprap class is not shown for rock plating location.

**SUMMARY OF GEOTEXTILE FOR SOIL STABILIZATION**

LINE	Approx. Begin Station	Approx. End Station	Est Geotextile for Soil Stabilization Quantity (SY)**
L_DET	17+45	22+80	1,300
CONTINGENCY			300
			<b>TOTAL SY:</b> 1,600

\*\*\*Place Geotextile for Soil Stabilization direction perpendicular to the detour alignment L\_DET.

PROJECT REFERENCE NO. <b>B-5624</b>	SHEET NO. <b>4</b>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
 SEAL 043767 ADAM M. CONRAD, P.E. ADAM M. CONRAD, P.E.	 SEAL 26971 JONATHAN S. DALTON, P.E. JONATHAN S. DALTON, P.E.
 CDM Smith Inc. 3400 Greenwood Avenue Suite 400 Raleigh, NC 27612-3228 NC CCA No. F-1255	 SUNGATE DESIGN GROUP, P.A. 910 JONES FERRIER ROAD HAZEL HORTON-COOKLEY DRIVE NC CCA No. C-2882
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	




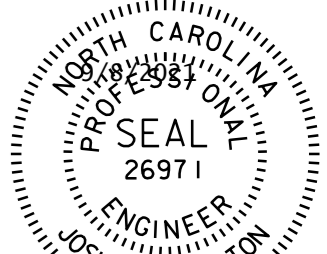

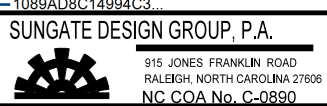
**BRIDGE HYDRAULIC DATA**

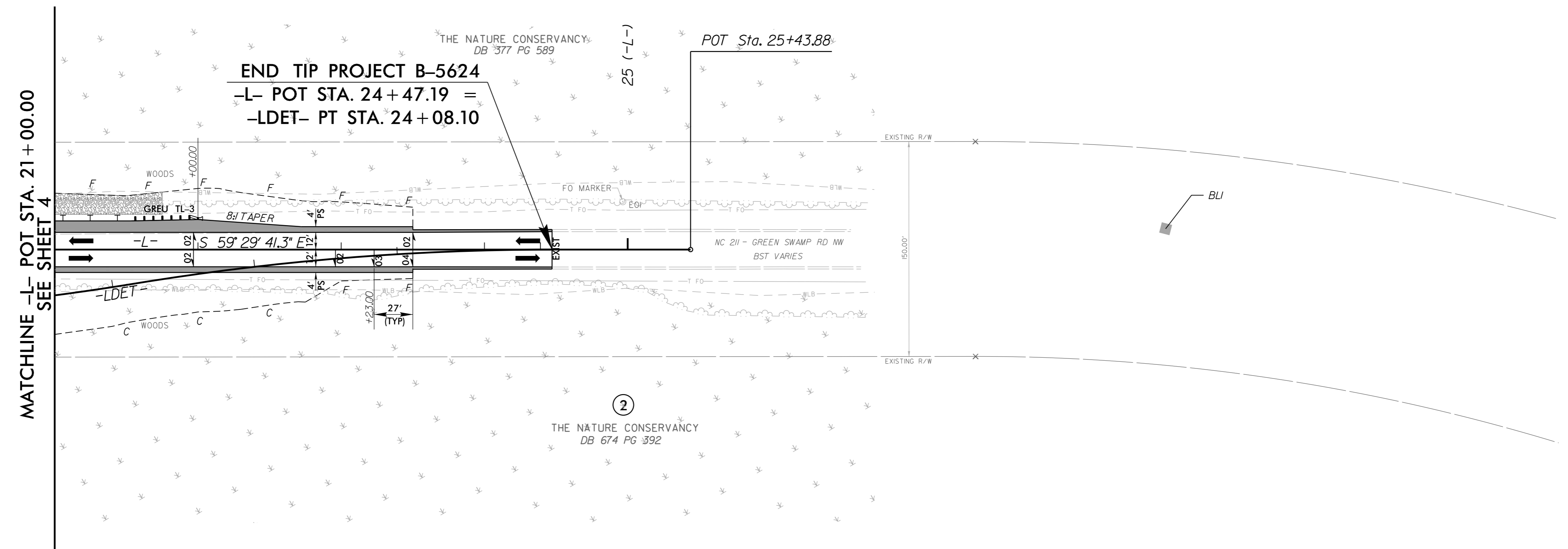
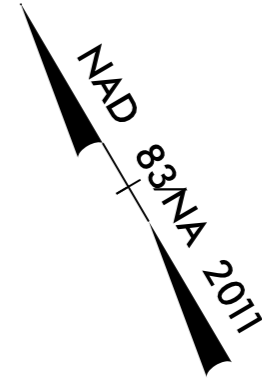
DESIGN DISCHARGE	= 1,300	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 61.3	FT
BASE DISCHARGE	= 1,600	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 61.7	FT
OVERTOPPING DISCHARGE	= > 2,200	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 64.4	FT
DATE OF SURVEY	= 2/22/2018	
W.S.ELEVATION AT DATE OF SURVEY	= 57.8	FT

REVISIONS

-SYSTEM: B6624\_P01.psh\_04.dgn  
11/15/2018 10:00 AM

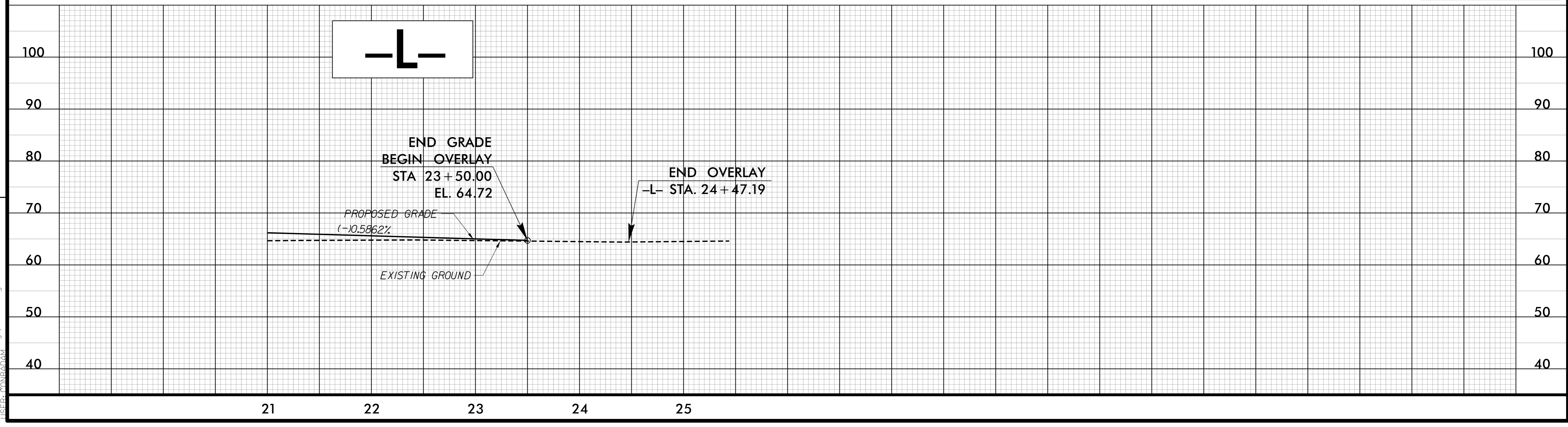
8/17/19

PROJECT REFERENCE NO. <i>B-5624</i>	SHEET NO. 5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
 ADAM M. CONRAD PE	 JOSHUA G. DALTON PE
 CDM Smith Inc. 3400 Greenway Avenue Suite 400 Raleigh, NC 27612-3228 NC COA No. P-1255	 SUNGATE DESIGN GROUP, P.A. 910 JONES FARMWAY ROAD HAZLEHURST, NORTH CAROLINA 27839 NC COA No. C-2882
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	



REVISIONS

FOR -LDET- SEE SHEET NO. 2B-2



-SYSTEM: B6624\_Prdt.psh\_05.dgn  
11/15/19 10:00 AM