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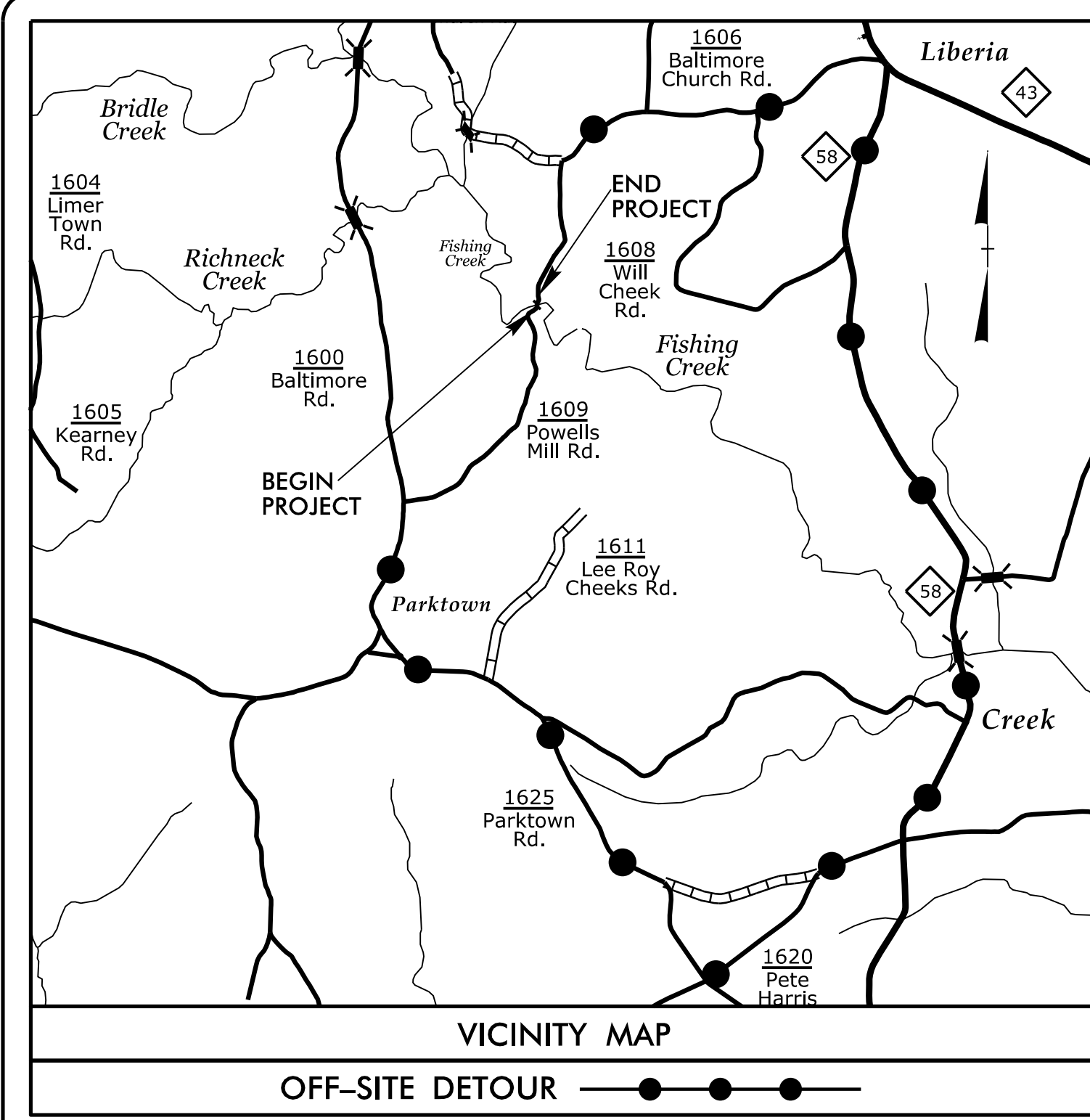
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09\_08/2019

**TIP PROJECT: 17BP.5.R.88**

**CONTRACT: DE00335**



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

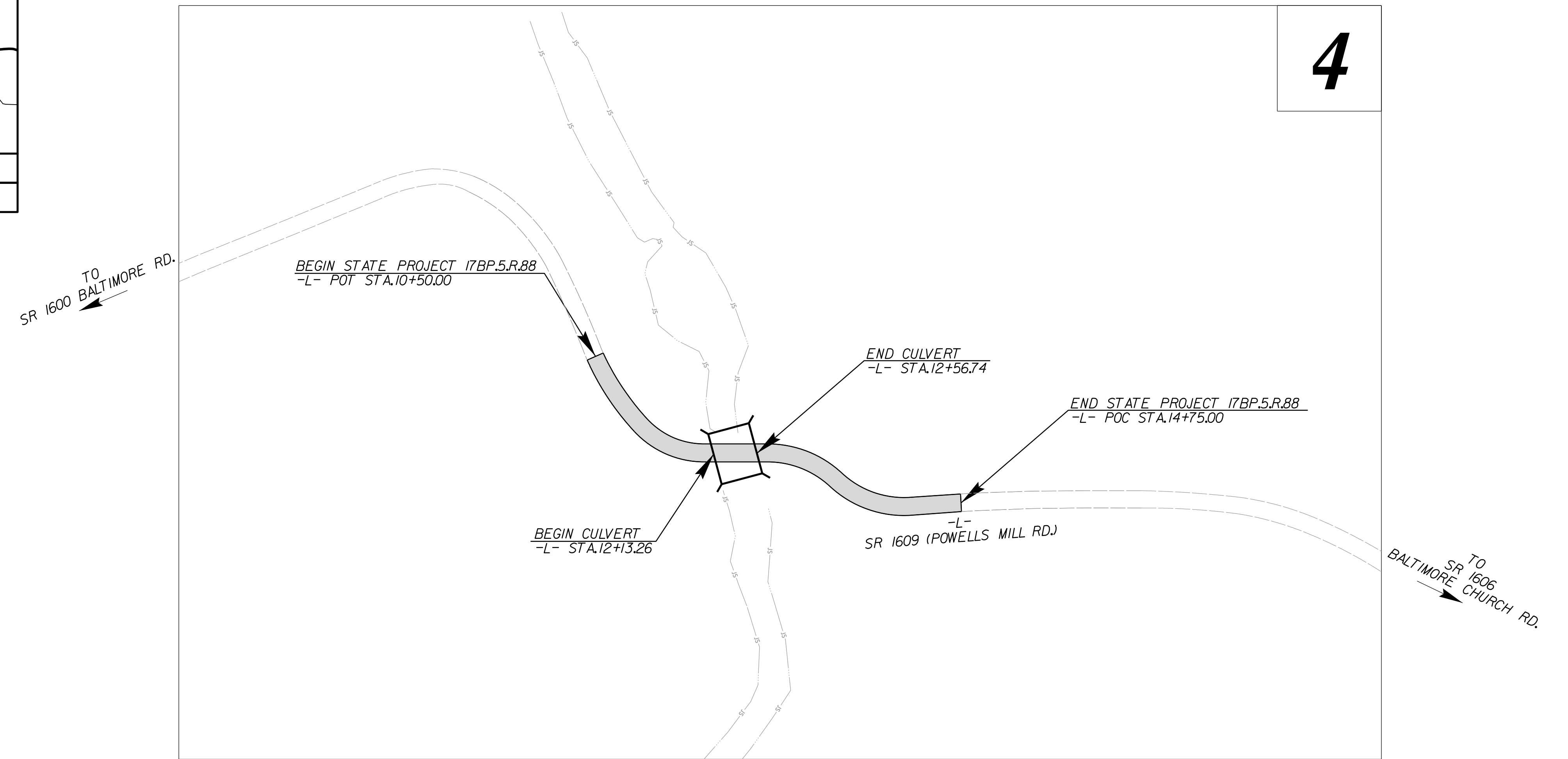
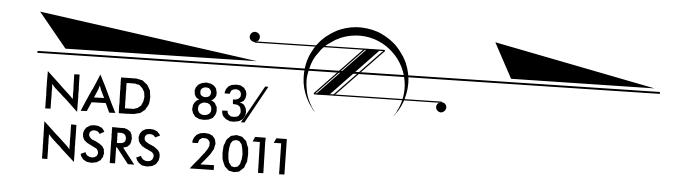
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**WARREN COUNTY**

**LOCATION: BRIDGE NO. 135 OVER FISHING CREEK  
ON SR 1609 (POWELLS MILL RD.)**

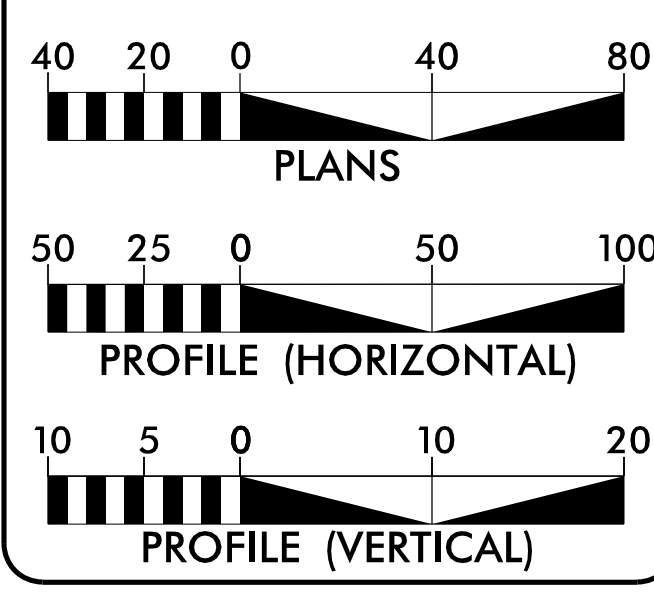
**TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND CULVERT**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.5.R.88	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
17BP.5.R.88	N/A	PE	
17BP.5.R.88	N/A	ROW	
17BP.5.R.88	N/A	UTILITIES	
17BP.5.R.88	N/A	CONSTRUCTION	



DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

**GRAPHIC SCALES**



**DESIGN DATA**

ADT = 80 VPD  
V = 20 MPH  
CLASS = RURAL LOCAL  
SUBREGIONAL TIER

**PROJECT LENGTH**

LENGTH ROADWAY STATE PROJECT 17BP.5.R.88 = 0.072 mi.  
LENGTH STRUCTURES STATE PROJECT 17BP.5.R.88 = 0.008 mi.  
TOTAL LENGTH STATE PROJECT 17BP.5.R.88 = 0.080 mi.

Prepared in the Offices of:

**STEWART**  
223 S. WEST ST., STE 1100  
RALEIGH, NC 27603  
T 919.380.8750  
Firm License #1-C-1051  
www.stewartinc.com  
PROJECT # 1816012.00

**vhb**  
VHB Engineering NC, P.C. (C-3705)  
940 Main Campus Drive, Suite 500  
Raleigh, NC 27606

2018 STANDARD SPECIFICATIONS

**RIGHT OF WAY DATE:**  
AUGUST 15, 2018

**RIGHT OF WAY COMPLETE:**  
JUNE 7, 2021

**LETTING DATE:**  
APRIL 13, 2022

**ANDY YOUNG, PE**  
PROJECT ENGINEER

**JOSHUA ROEMER**  
PROJECT DESIGN ENGINEER

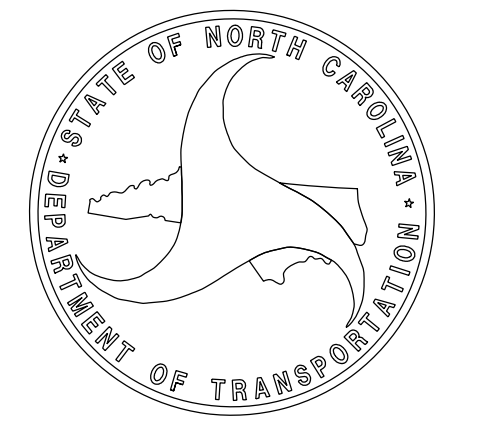
**LISA GILCHRIST, EI**  
NCDOT CONTACT

**HYDRAULICS ENGINEER**

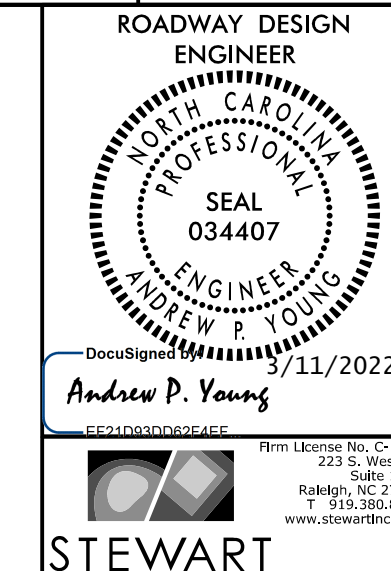
DocuSigned by:  
*Frank Fleming*  
3/11/2022  
P.E.

DocuSigned by:  
*Andrew P. Young*  
3/11/2022  
P.E.

**ROADWAY DESIGN ENGINEER**



3/11/2022  
U:\Projects\1920135-RDY-TSH.dgn  
USER:ayoung



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

INDEX OF SHEETS

SHEET NUMBER	SHEET	EFF. 01-16-2018 REV.
1	TITLE SHEET	2018 ROADWAY ENGLISH STANDARD DRAWINGS
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS	The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January, 2018 are applicable to this project and by reference hereby are considered a part of these plans:
1B	CONVENTIONAL SYMBOLS	
2A-1	PAVEMENT SCHEDULE AND TYPICAL SECTIONS	STD.NO. TITLE DIVISION 2 - EARTHWORK
2C-1	GUARDRAIL INSTALLATION DETAIL	200.03 Method of Clearing - Method III 225.02 Guide for Grading Subgrade - Secondary and Local 225.04 Method of Obtaining Super-elevation - Two Lane Pavement
3B-1	ROADWAY SUMMARIES	
3D-1	DRAINAGE SUMMARY	DIVISION 3 - PIPE CULVERTS 300.01 Method of Pipe Installation
4	PLAN SHEET	DIVISION 5 - SUBGRADE, BASES AND SHOULDERS 560.01 Method of Shoulder Construction - High Side of Super-elevated Curve - Method I
5	PROFILE SHEET	
RW01	RIGHT OF WAY TITLE SHEET	DIVISION 8 - INCIDENTALS
RW02C-1	SURVEY CONTROL SHEET	806.01 Concrete Right-of-Way Marker 806.02 Granite Right-of-Way Marker 862.01 Guardrail Placement 862.02 Guardrail Installation (Special Detail for Sheet 6 of 8)
RW02D-1	PROPOSED ALIGNMENT CONTROL SHEET	876.01 Rip Rap in Channels 876.02 Guide for Rip Rap at Pipe Outlets 876.04 Drainage Ditches with Class B Rip Rap
RW03E-1	RIGHT OF WAY CONTROL SHEET	
RW04	RIGHT OF WAY SHEET	
TMP-1 THRU TMP-3	TRAFFIC MANAGEMENT PLANS	
PMP-1	PAVEMENT MARKING PLANS	
EC-1 THRU EC-5	EROSION CONTROL PLANS	
RF-1	REFORESTATION PLAN	
UO-1 THRU UO-2	UTILITIES BY OTHERS	
X-1A	CROSS SECTION SUMMARY SHEET	
X-1 THRU X-3	CROSS SECTIONS	
C-1 THRU C-5	CULVERT PLANS	

GENERAL NOTES: 2018 SPECIFICATIONS EFFECTIVE: 01-16-2018 REVISED:

GRADE LINE:  
GRADING AND SURFACING: THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING: CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

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

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

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

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

UTILITIES: UTILITY OWNERS ON THIS PROJECT ARE Duke Energy - Power  
ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

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

# STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale

## BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin (EIP)	○
Computed Property Corner	×
Existing Concrete 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-☠-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	○
Well	○
Small Mine	×
Foundation	□
Area Outline	□
Cemetery	□
Building	□
School	□
Church	□
Dam	□

## HYDROLOGY:

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

## RAILROADS:

Standard Gauge	-----
RR Signal Milepost	○
Switch	□
RR Abandoned	-----
RR Dismantled	-----

## RIGHT OF WAY & PROJECT CONTROL:

Primary Horiz Control Point	○
Primary Horiz and Vert Control Point	●
Secondary Horiz and Vert Control Point	◆
Vertical Benchmark	⊕
Existing Right of Way Monument	△
Proposed Right of Way Monument (Rebar and Cap)	▲
Proposed Right of Way Monument (Concrete)	▲
Existing Permanent Easement Monument	◇
Proposed Permanent Easement Monument (Rebar and Cap)	◆
Existing C/A Monument	△
Proposed C/A Monument (Rebar and Cap)	▲
Proposed C/A Monument (Concrete)	▲
Existing Right of Way Line	-----
Proposed Right of Way Line	-----
Existing Control of Access Line	-----
Proposed Control of Access Line	-----
Proposed ROW and CA Line	-----
Existing Easement Line	-----
Proposed Temporary Construction Easement	E
Proposed Temporary Drainage Easement	TDE
Proposed Permanent Drainage Easement	PDE
Proposed Permanent Drainage/Utility Easement	DUE
Proposed Permanent Utility Easement	PUE
Proposed Temporary Utility Easement	TUE
Proposed Aerial Utility Easement	AUE

## ROADS AND RELATED FEATURES:

Existing Edge of Pavement	-----
Existing Curb	-----
Proposed Slope Stakes Cut	C
Proposed Slope Stakes Fill	F
Proposed Curb Ramp	CR
Existing Metal Guardrail	T
Proposed Guardrail	T
Existing Cable Guiderail	□
Proposed Cable Guiderail	□
Equality Symbol	⊕
Pavement Removal	⊗
VEGETATION:	
Single Tree	○
Single Shrub	○
Hedge	-----

Woods Line	-----
Orchard	○
Vineyard	□

## EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	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	○
Storm Sewer	S

## UTILITIES:

\* SUE - Subsurface Utility Engineering  
LOS - Level of Service - A,B,C or D (Accuracy)

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	PH
H-Frame Pole	●
U/G Power Line Test Hole (SUE - LOS A)*	⊕
U/G Power Line (SUE - LOS B)*	P
U/G Power Line (SUE - LOS C)*	P
U/G Power Line (SUE - LOS D)*	P

## TELEPHONE:

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

## WATER:

Water Manhole	○
Water Meter	○
Water Valve	⊗
Water Hydrant	⊕
U/G Water Line Test Hole (SUE - LOS A)*	⊕
U/G Water Line (SUE - LOS B)*	P
U/G Water Line (SUE - LOS C)*	P
U/G Water Line (SUE - LOS D)*	P
Above Ground Water Line	A/G Water

## TV:

TV Pedestal	□
TV Tower	⊗
U/G TV Cable Hand Hole	PH
U/G TV Test Hole (SUE - LOS A)*	⊕
U/G TV Cable (SUE - LOS B)*	TV
U/G TV Cable (SUE - LOS C)*	TV
U/G TV Cable (SUE - LOS D)*	TV
U/G Fiber Optic Cable (SUE - LOS B)*	TV FO
U/G Fiber Optic Cable (SUE - LOS C)*	TV FO
U/G Fiber Optic Cable (SUE - LOS D)*	TV FO

## GAS:

Gas Valve	◇
Gas Meter	⊕
U/G Gas Line Test Hole (SUE - LOS A)*	⊕
U/G Gas Line (SUE - LOS B)*	G
U/G Gas Line (SUE - LOS C)*	G
U/G Gas Line (SUE - LOS D)*	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 Force Main Line Test Hole (SUE - LOS A)*	⊕
SS Force Main Line (SUE - LOS B)*	FSS
SS Force Main Line (SUE - LOS C)*	FSS
SS Force Main Line (SUE - LOS D)*	FSS

## MISCELLANEOUS:

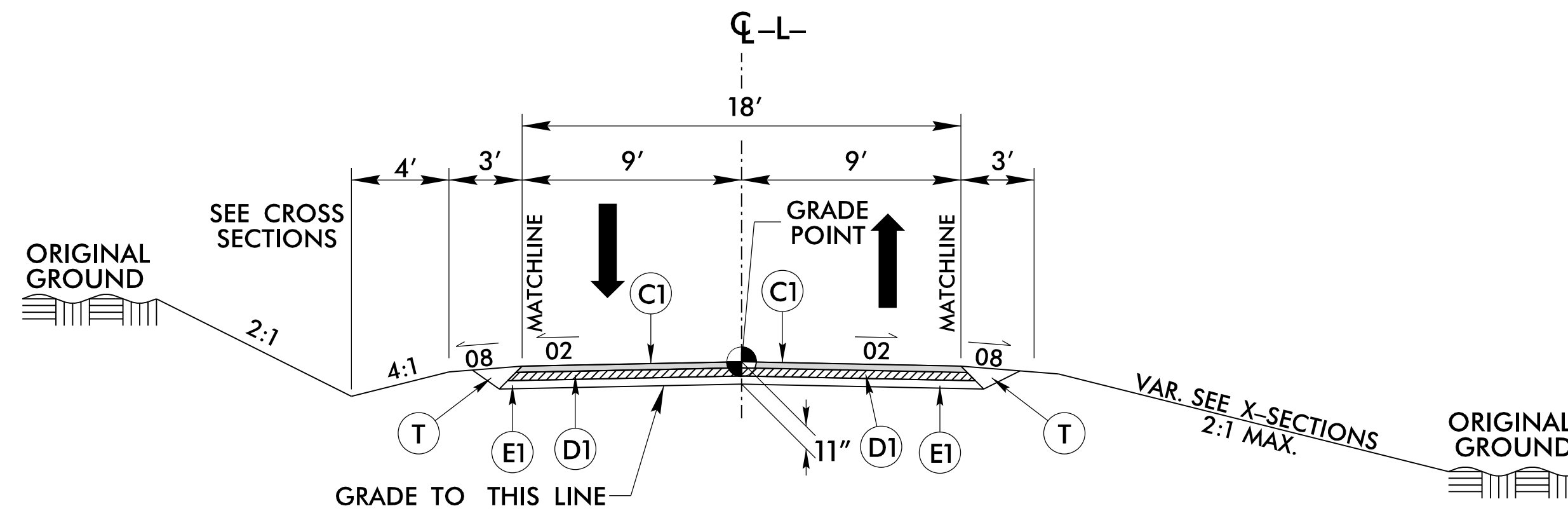
Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	⊕
Utility Unknown U/G Line (SUE - LOS B)*	UTL
U/G Tank; Water, Gas, Oil	□
Underground Storage Tank, Approx. Loc.	UST
A/G Tank; Water, Gas, Oil	□
Geoenvironmental Boring	⊕
Abandoned According to Utility Records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

5/14/99

**PAVEMENT SCHEDULE**  
(FINAL PAVEMENT DESIGN)

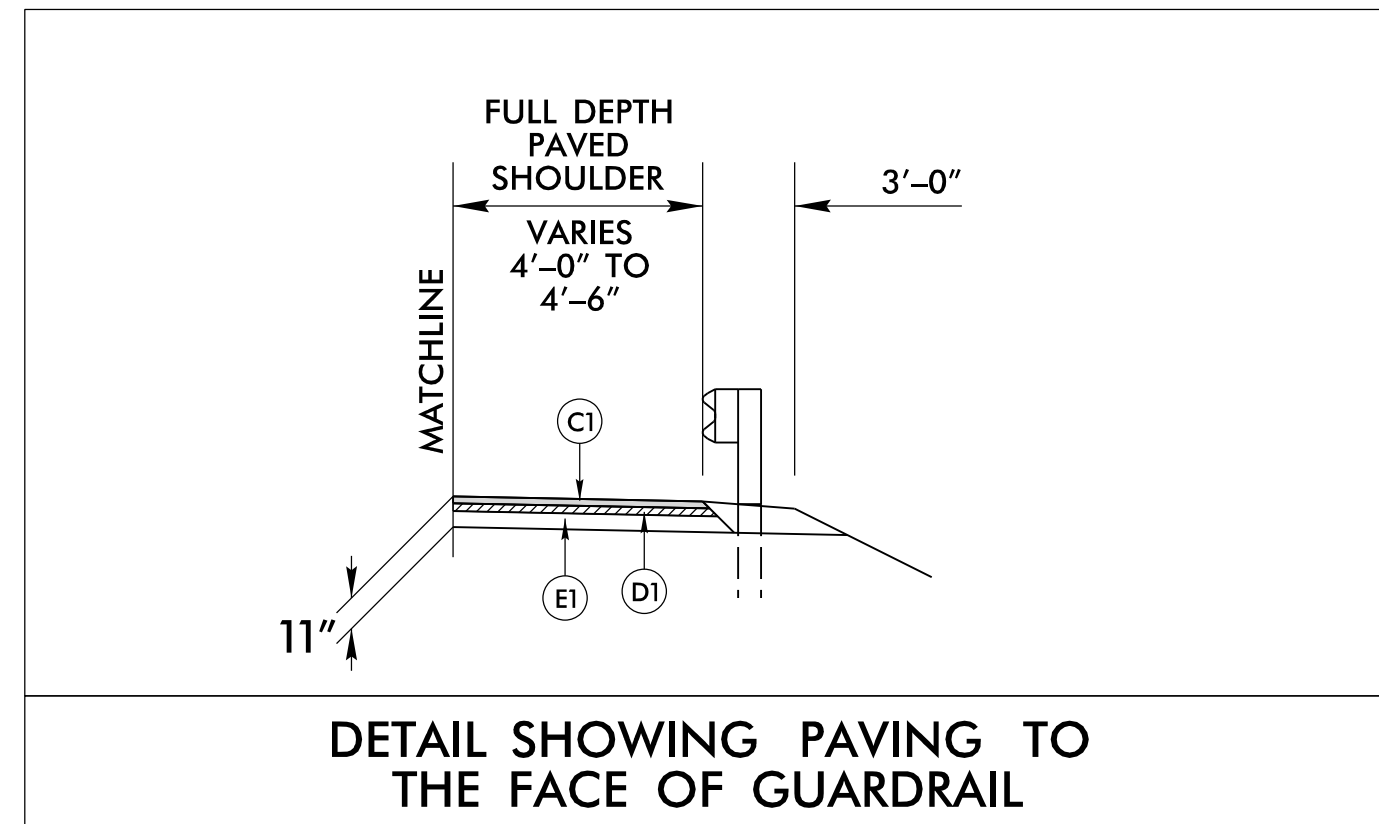
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
T	EARTH MATERIAL

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

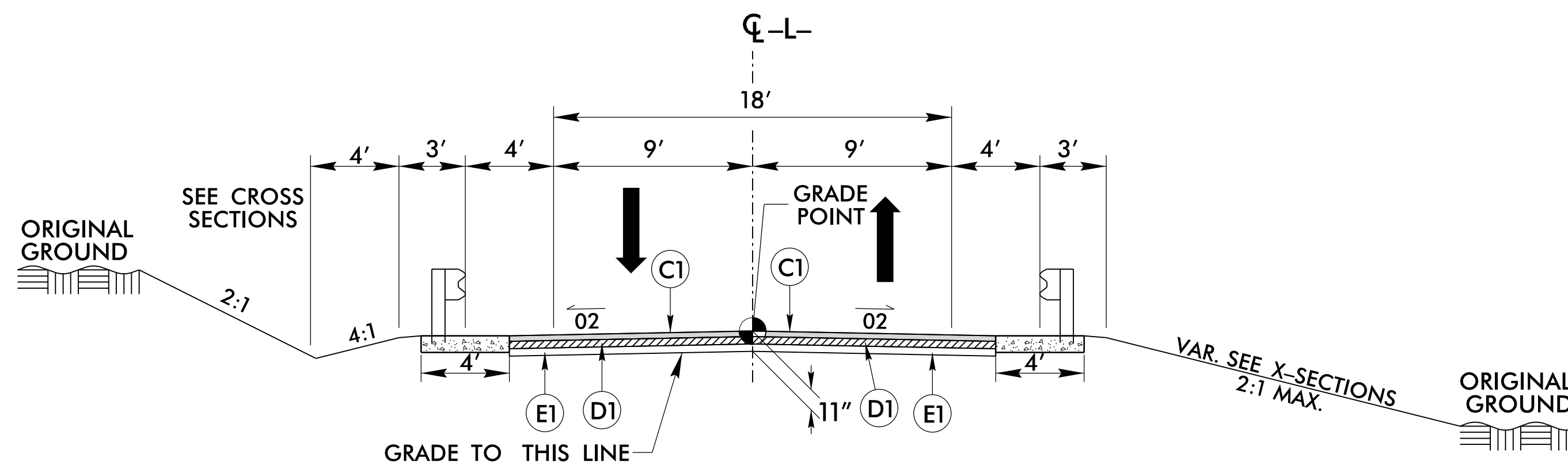


**TYPICAL SECTION NO. 1**

-L- STA. 10+50.00 TO -L- STA. 12+09.78  
-L- STA. 12+53.26 TO -L- STA. 14+75.00



**DETAIL SHOWING PAVING TO THE FACE OF GUARDRAIL**



**TYPICAL SECTION NO. 2**

-L- STA. 12+09.78 TO -L- STA. 12+53.26

NOTE:  
SEE STRUCTURE PLANS FOR CONCRETE FOOTER WITH GUARDRAIL ATTACHMENT.

PROJECT REFERENCE NO. <i>17BP.5.R.88</i>	SHEET NO. <i>2A-1</i>
ROADWAY DESIGN ENGINEER ANDREW P. YOUNG SEAL 034407 DocuSigned by: Andrew P. Young 3/11/2022	PAVEMENT DESIGN ENGINEER CLARK S. MORRISON SEAL 22896 DocuSigned by: Clark S. Morrison 3/11/2022
STEWART	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

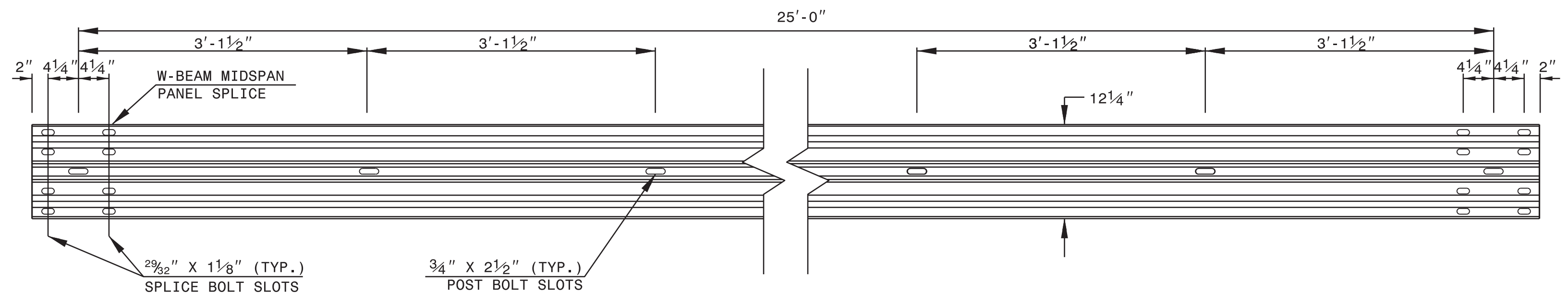
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USER:RDY

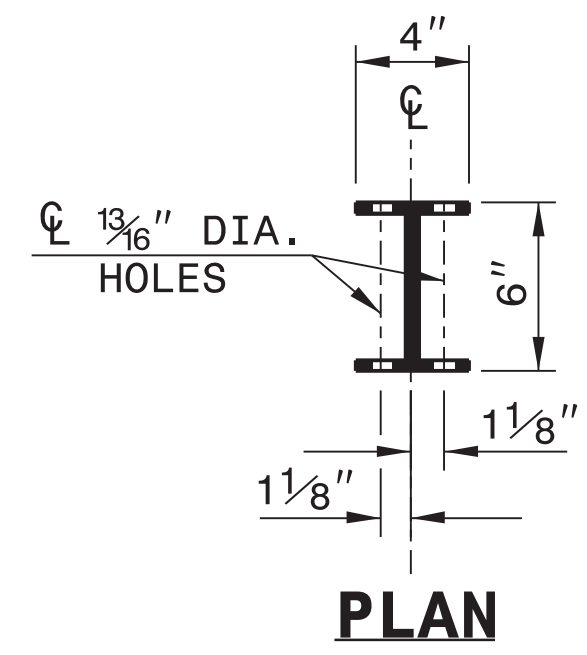
STATE OF NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

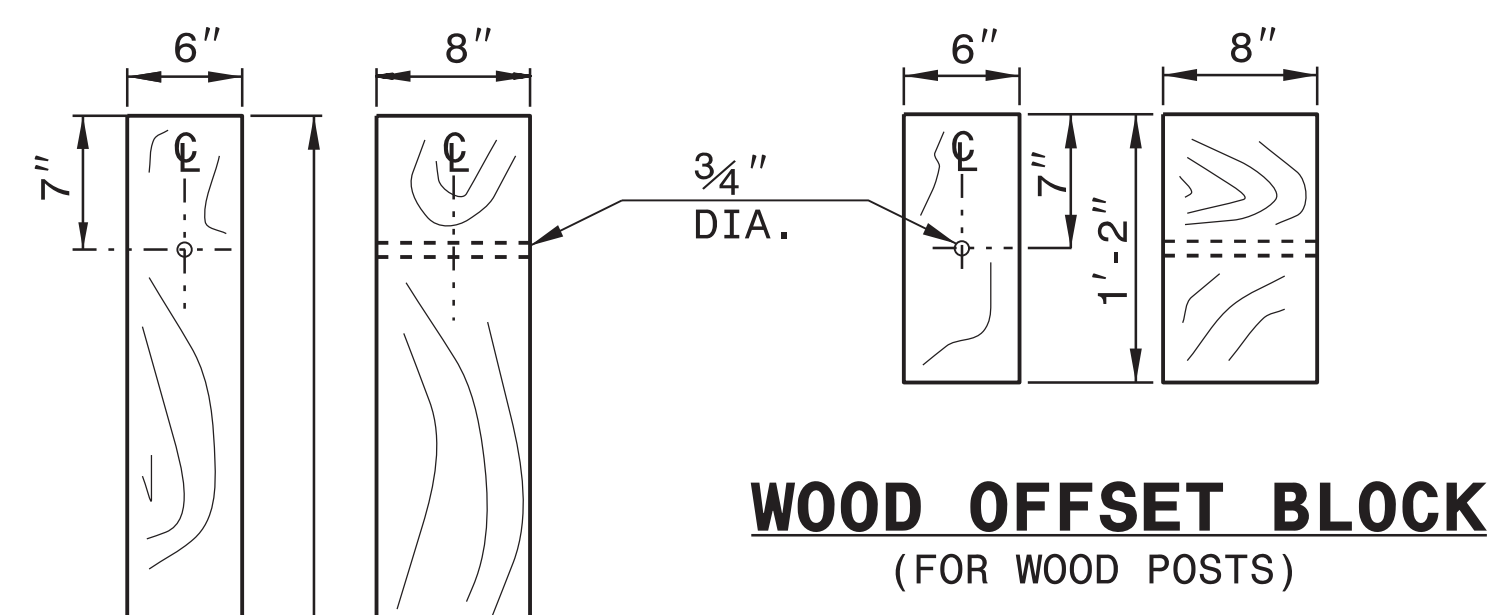
SHEET 6 OF 8  
**862D02**



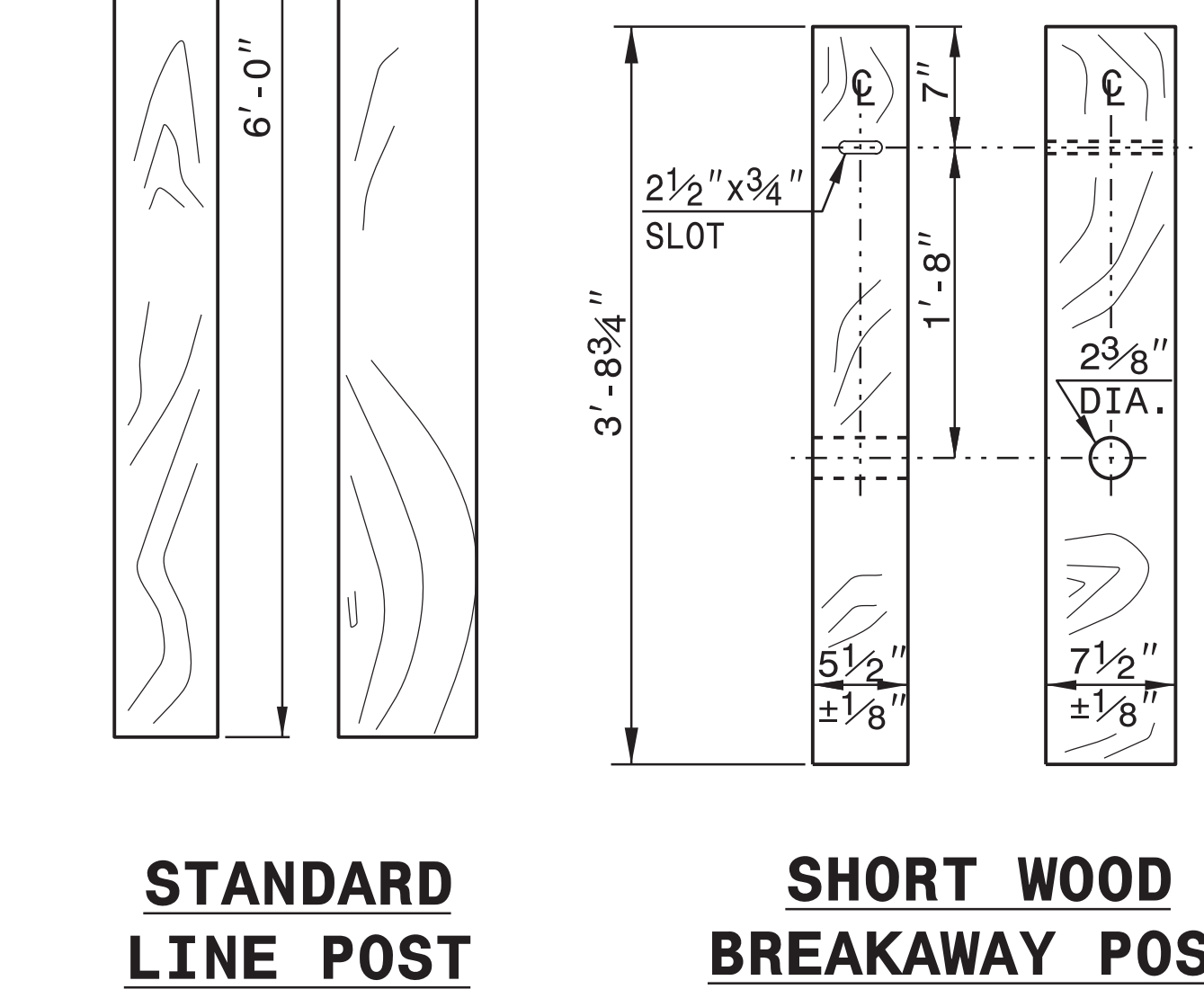
**STANDARD W-BEAM GUARDRAIL**



**PLAN**

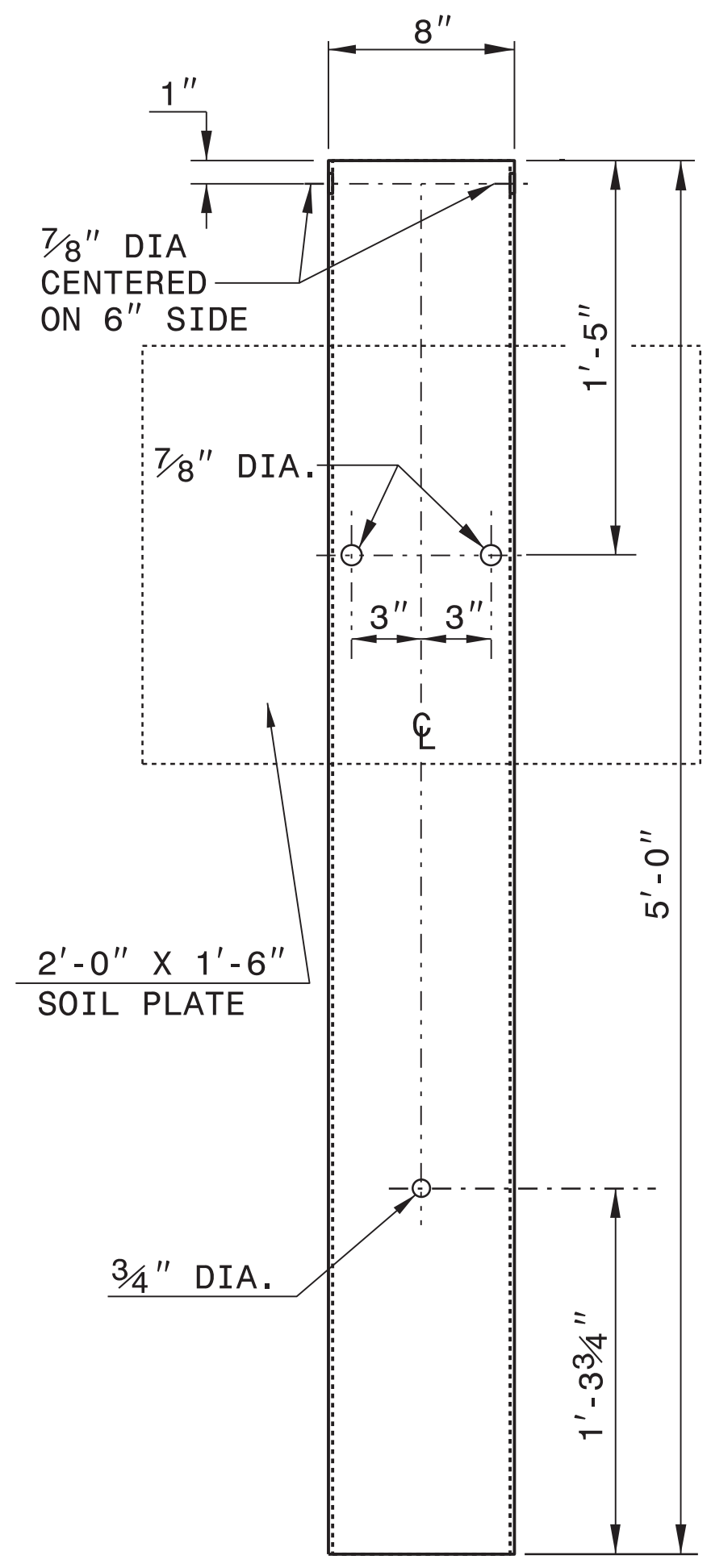


**WOOD OFFSET BLOCK  
(FOR WOOD POSTS)**

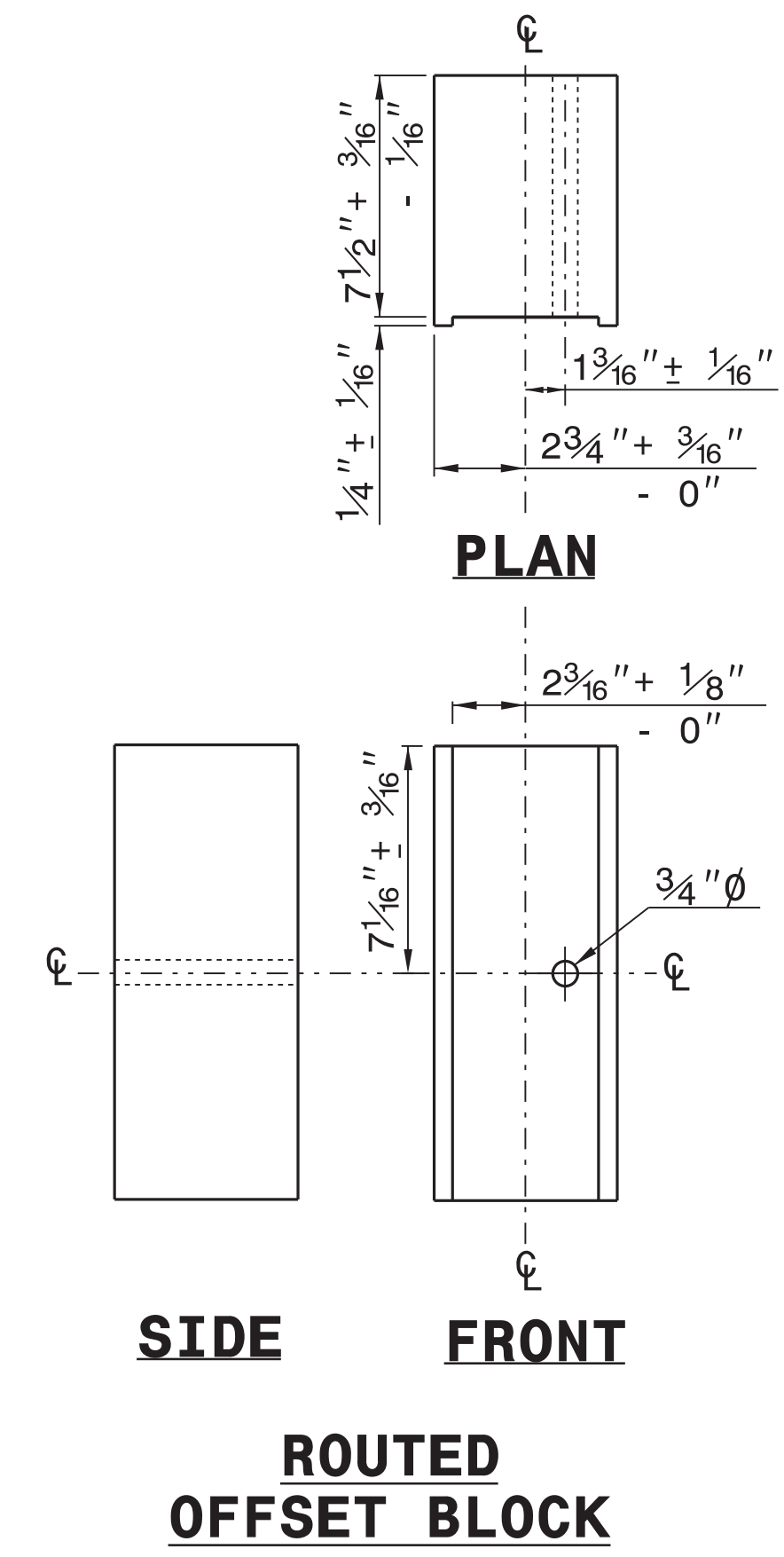


**STANDARD  
LINE POST**

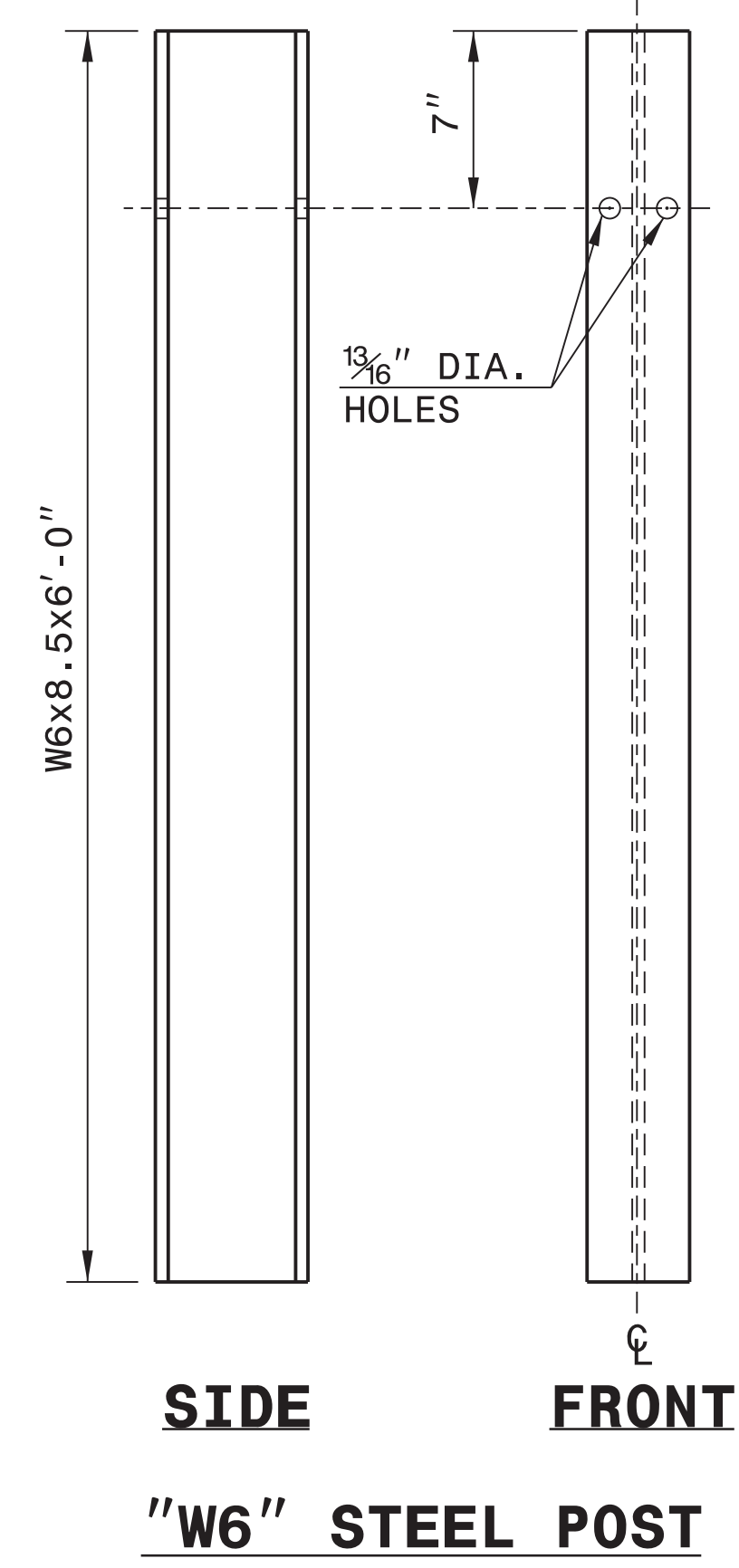
**SHORT WOOD  
BREAKAWAY POST**



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



**ROUTED  
OFFSET BLOCK**



**"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

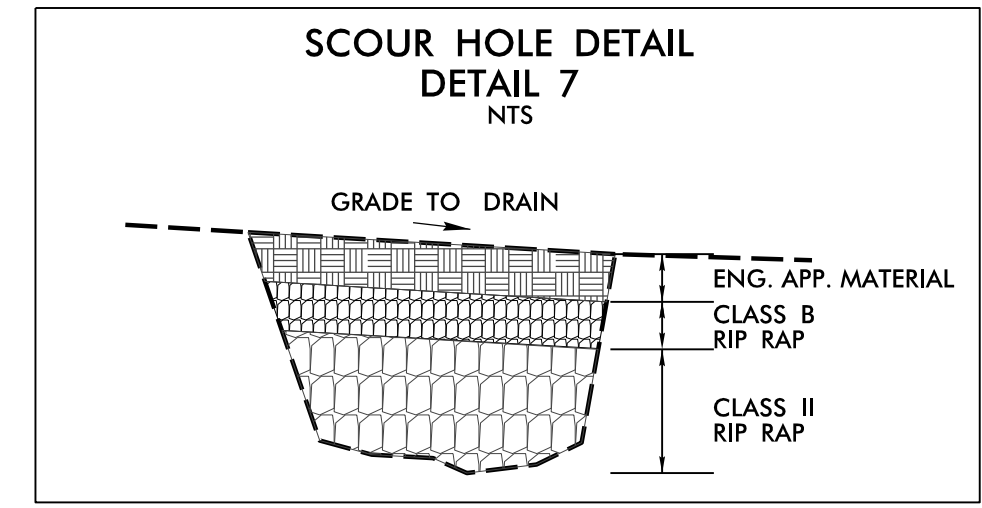
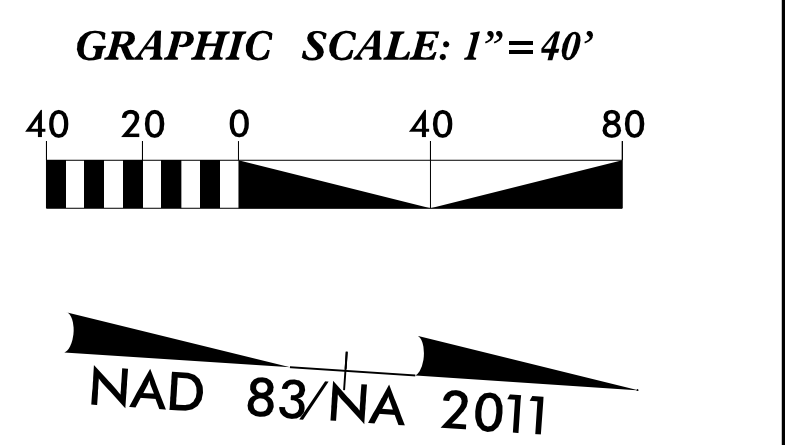
**SEE TITLE BLOCK**

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







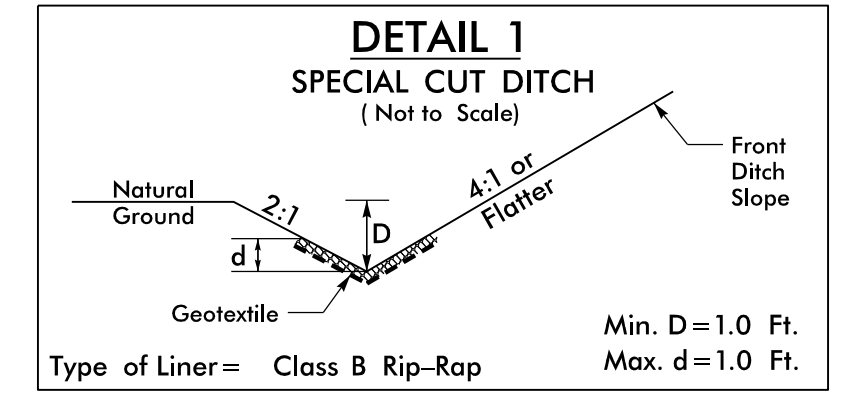
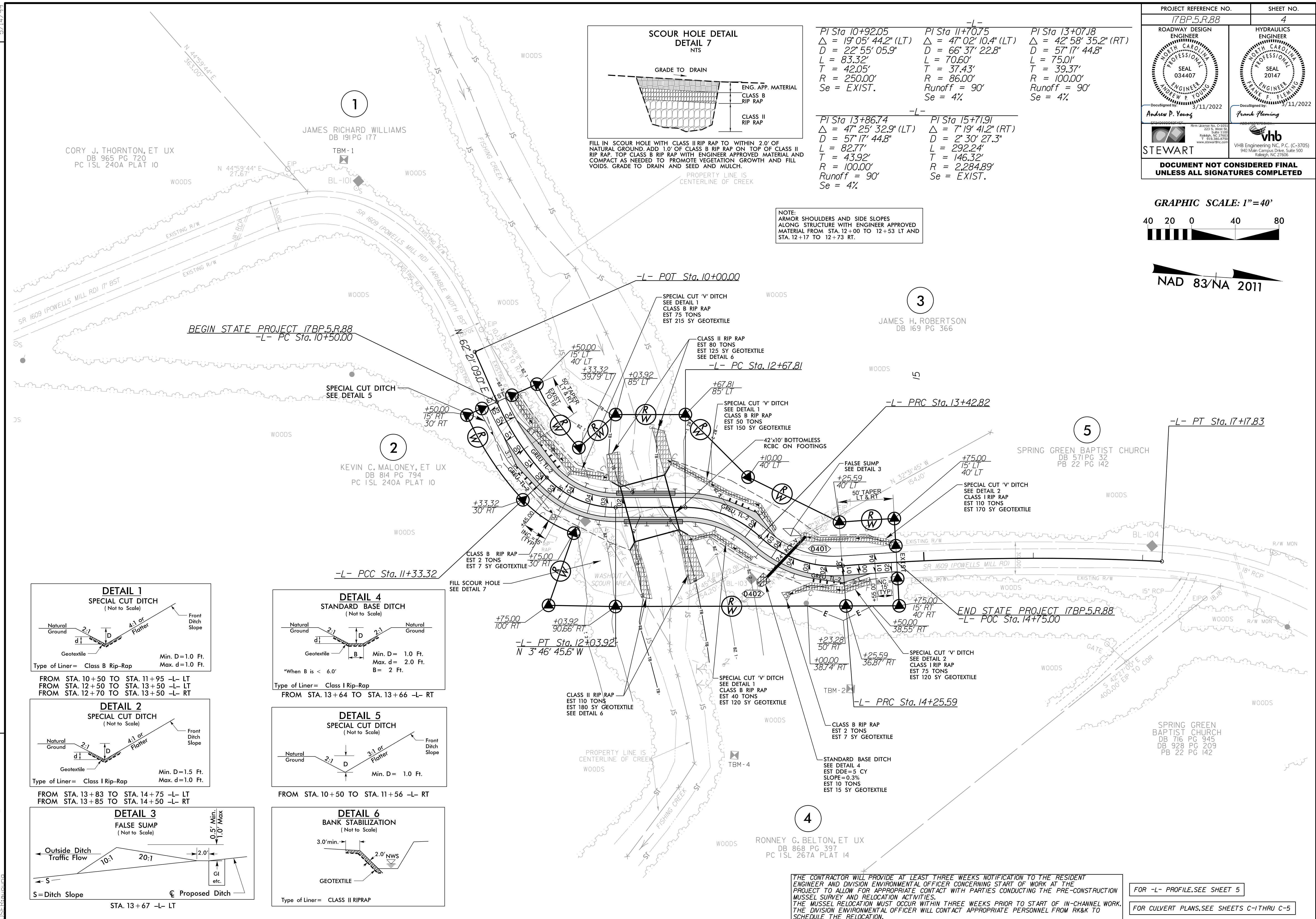


FILL IN SCOUR HOLE WITH CLASS II RIP RAP TO WITHIN 2.0' OF NATURAL GROUND. ADD 1.0' OF CLASS B RIP RAP ON TOP OF CLASS II RIP RAP. TOP CLASS B RIP RAP WITH ENGINEER APPROVED MATERIAL AND COMPACT AS NEEDED TO PROMOTE VEGETATION GROWTH AND FILL VOIDS. GRADE TO DRAIN AND SEED AND MULCH.

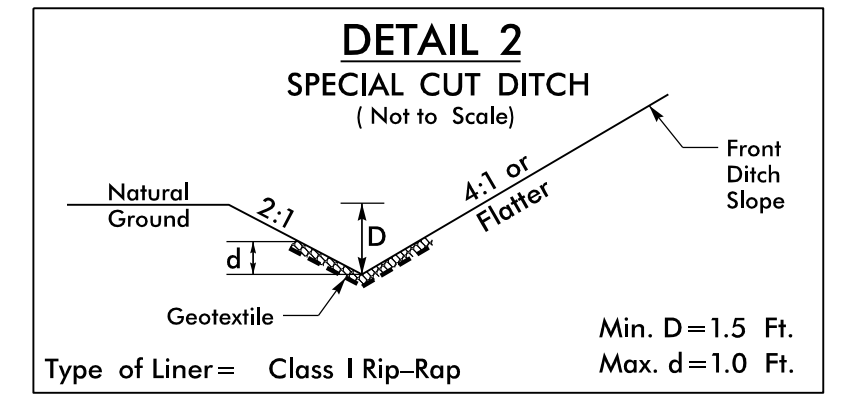
-L-		
PI Sta 10+92.05 Δ = 19° 05' 44.2" (LT) D = 22° 55' 05.9" L = 83.32' T = 42.05' R = 250.00' Se = EXIST.	PI Sta 11+70.75 Δ = 47° 02' 10.4" (LT) D = 66° 37' 22.8" L = 70.60' T = 37.43' R = 86.00' Runoff = 90' Se = 4%	PI Sta 13+07.18 Δ = 42° 58' 35.2" (RT) D = 57° 17' 44.8" L = 75.01' T = 39.37' R = 100.00' Runoff = 90' Se = 4%
-L-		
PI Sta 13+86.74 Δ = 47° 25' 32.9" (LT) D = 57° 17' 44.8" L = 82.77' T = 43.92' R = 100.00' Runoff = 90' Se = 4%	PI Sta 15+71.91 Δ = 7° 19' 41.2" (RT) D = 2° 30' 27.3" L = 292.24' T = 146.32' R = 2,284.89' Se = EXIST.	

NOTE:  
ARMOR SHOULDERS AND SIDE SLOPES ALONG STRUCTURE WITH ENGINEER APPROVED MATERIAL FROM STA. 12+00 TO 12+53 LT AND STA. 12+17 TO 12+73 RT.

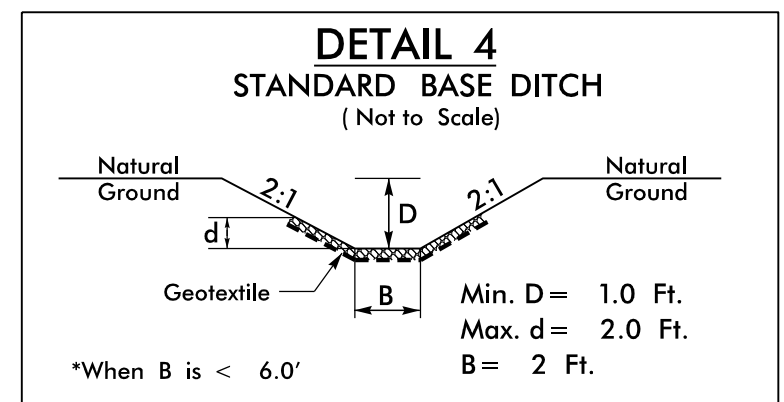
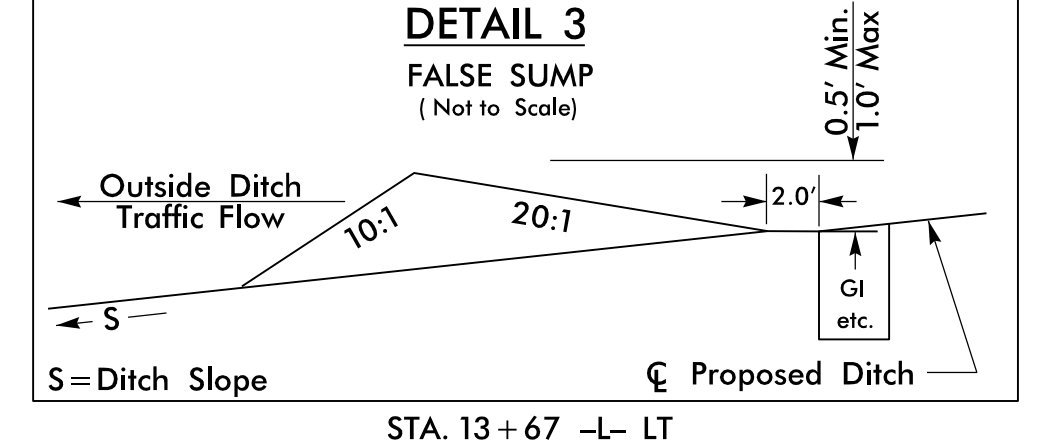
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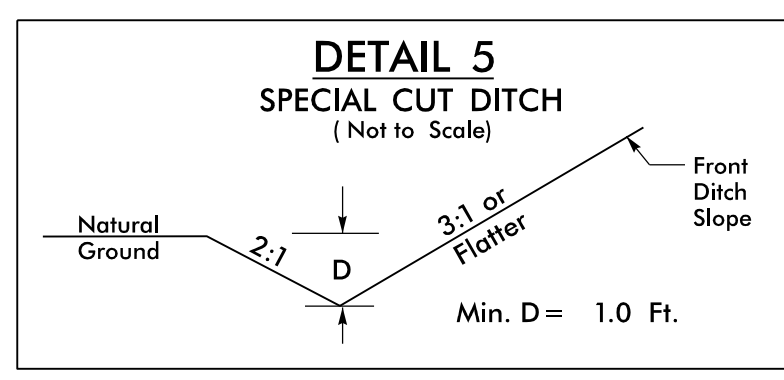
FROM STA. 10+50 TO STA. 11+95 -L- LT  
FROM STA. 12+50 TO STA. 13+50 -L- LT  
FROM STA. 12+70 TO STA. 13+50 -L- RT



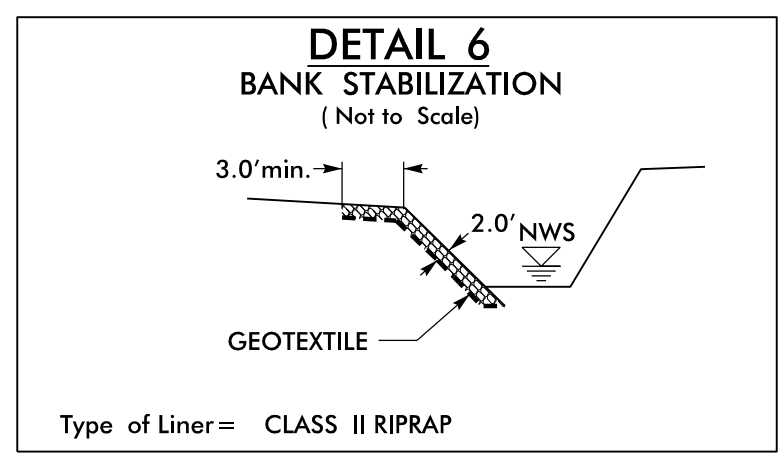
FROM STA. 13+83 TO STA. 14+75 -L- LT  
FROM STA. 13+85 TO STA. 14+50 -L- RT



FROM STA. 13+64 TO STA. 13+66 -L- RT



FROM STA. 10+50 TO STA. 11+56 -L- RT



THE CONTRACTOR WILL PROVIDE AT LEAST THREE WEEKS NOTIFICATION TO THE RESIDENT ENGINEER AND DIVISION ENVIRONMENTAL OFFICER CONCERNING START OF WORK AT THE PROJECT TO ALLOW FOR APPROPRIATE CONTACT WITH PARTIES CONDUCTING THE PRE-CONSTRUCTION MUSSEL SURVEY AND RELOCATION ACTIVITIES. THE MUSSEL RELOCATION MUST OCCUR WITHIN THREE WEEKS PRIOR TO START OF IN-CHANNEL WORK. THE DIVISION ENVIRONMENTAL OFFICER WILL CONTACT APPROPRIATE PERSONNEL FROM RK&K TO SCHEDULE THE RELOCATION.

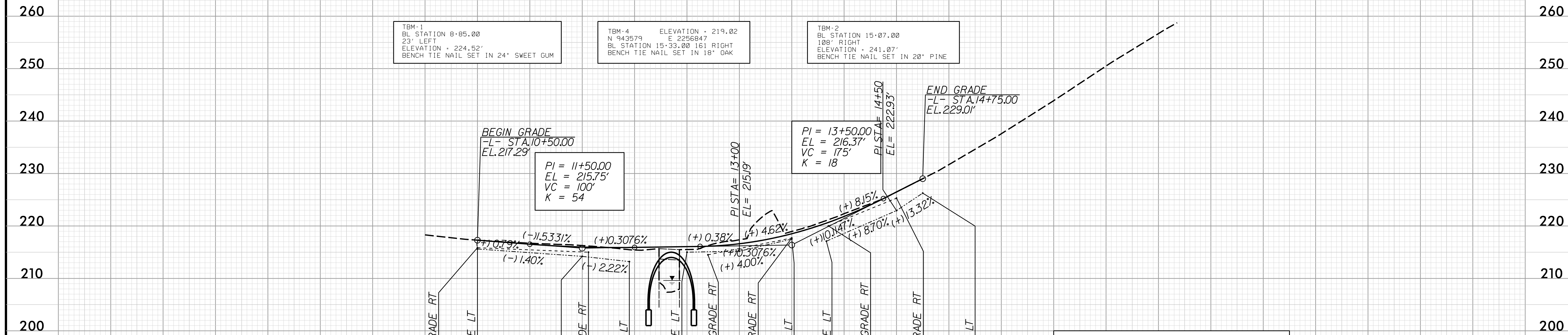
FOR -L- PROFILE, SEE SHEET 5  
FOR CULVERT PLANS, SEE SHEETS C-1 THRU C-5

5/28/99

PROJECT REFERENCE NO. <b>17BP.5.R.88</b>	SHEET NO. <b>5</b>
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 034407 ANDREW P. YOUNG	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 20147 FRANK FLEMING
DocuSigned by: <b>Andrew P. Young</b> 3/11/2022	DocuSigned by: <b>Frank Fleming</b> 3/11/2022
STEWART	vhb VHB Engineering NC, P.C. (C-3705) 940 Main Campus Drive, Suite 500 Raleigh, NC 27605

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

-L-



DITCH LEGEND	
RIGHT DITCH	-----
LEFT DITCH	-----

CULVERT HYDRAULIC DATA	
DESIGN DISCHARGE	= 2600 CFS
DESIGN FREQUENCY	= 2 YR
DESIGN HW ELEVATION	= 220.6 FT
BASE DISCHARGE	= 11147 CFS
BASE FREQUENCY	= 100 YR
BASE HW ELEVATION	= 229.3 FT
OVERTOPPING DISCHARGE	= 824 CFS
OVERTOPPING FREQUENCY	= 2 YR
OVERTOPPING ELEVATION	= 216.1 FT

FOR -L- PLAN VIEW SEE SHEET 4

FOR CULVERT PLANS, SEE SHEETS C-1 THRU C-5

3/11/2022 9:20:35 AM Reddy\_PFL05.dgn

10 11 12 13 14 15

09/06/19

TIP PROJECT: 92-0135

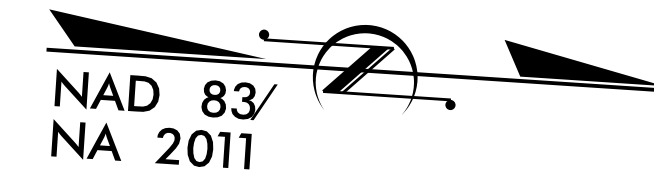
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	92-0135	RW01	

STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS

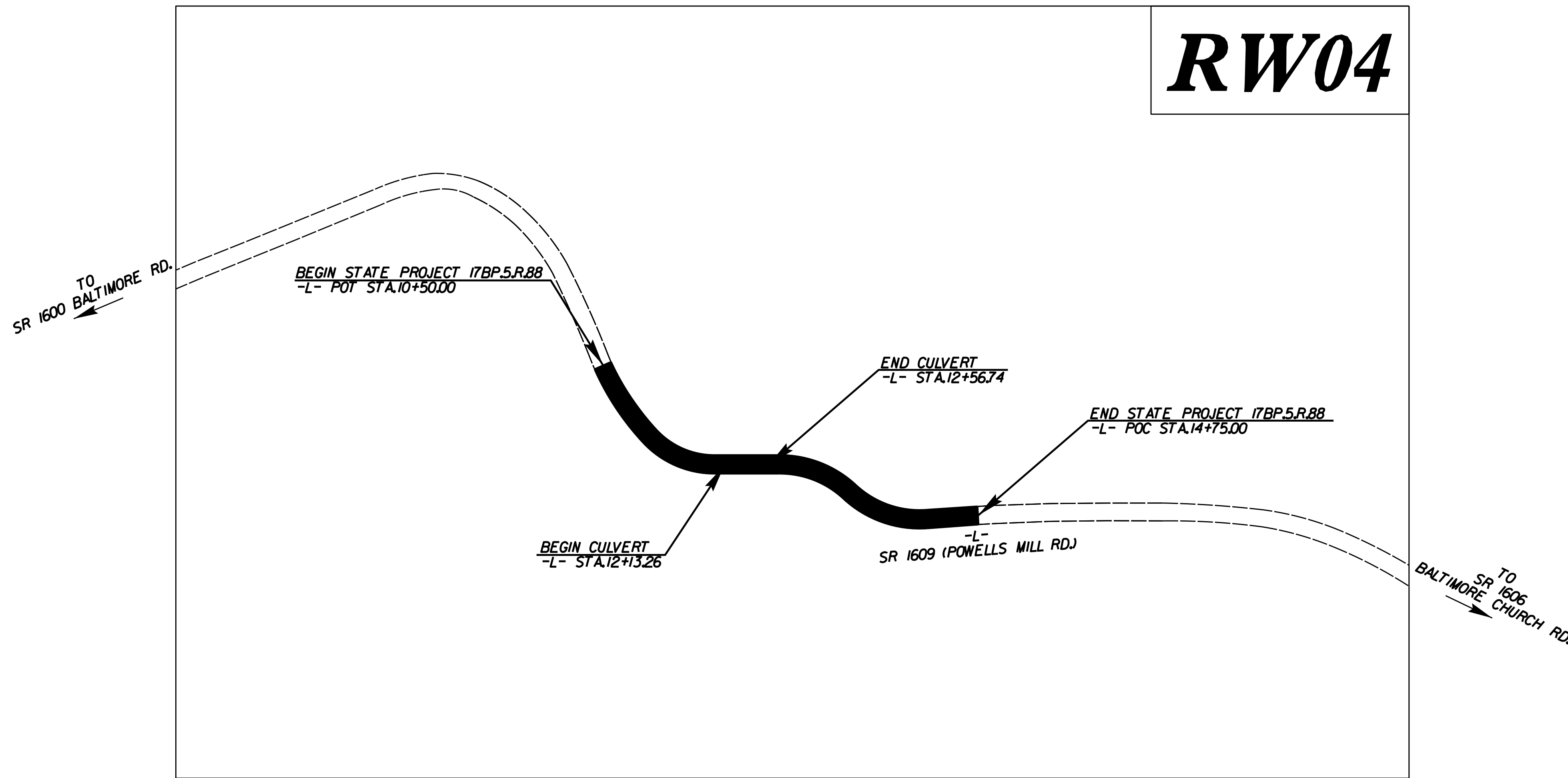
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SURVEY CONTROL, EXISTING CENTERLINES,  
 RIGHT OF WAY, EASEMENTS AND PROPERTY TIES

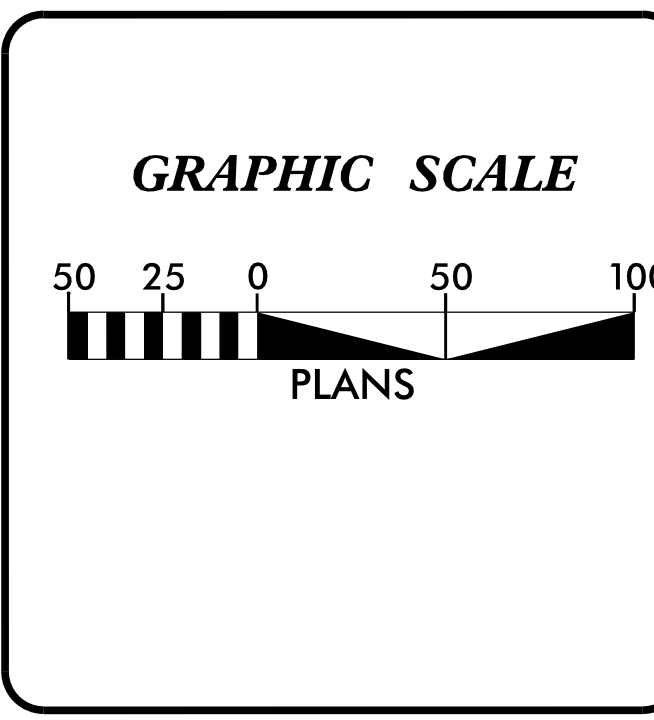
**WARREN COUNTY**



**RW04**



\$\$\$\$\$ SYSTEM \$\$\$\$\$\$  
 \$\$\$ DDN \$\$\$  
 \$\$\$ USERNAME \$\$\$



**DATUM DESCRIPTION**

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "920135 GPS-2" WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF NORTHING: 944,435.382(ft) EASTING: 2,256,842.367(ft) ELEVATION: 287.561(ft)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.000045283

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "920135 GPS-2" TO -L- STATION 10+50.00 IS S 15-31'05.3" W 1,136.214(ft)

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

Prepared in the Office of:

1223 Jones Franklin Rd.  
 Raleigh, N.C. 27606  
 License No. F-0377  
 Bus: 919 851 8077  
 Fax: 919 851 8107

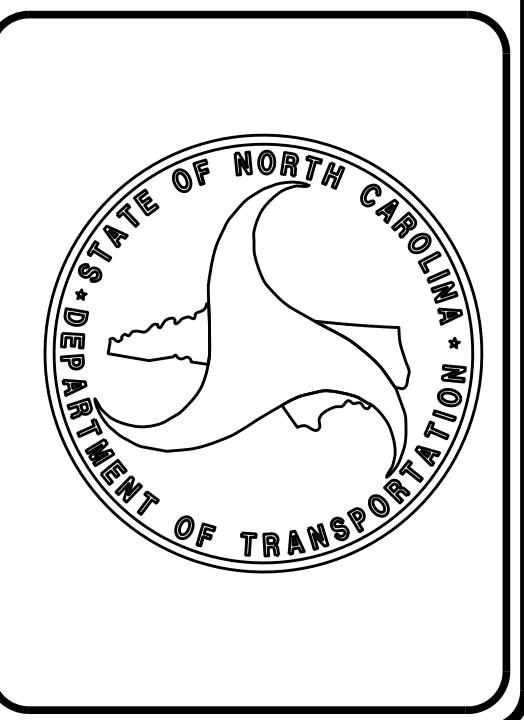
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN  
 CIVIL/SITE DESIGN - SURVEYING - CONSTRUCTION OBSERVATION

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: \_\_\_\_\_ LETTING DATE: \_\_\_\_\_

PROFESSIONAL LAND SURVEYOR


*Anthony K. Alford*  
 SIGNATURE: \_\_\_\_\_ Date: 12/11/2018

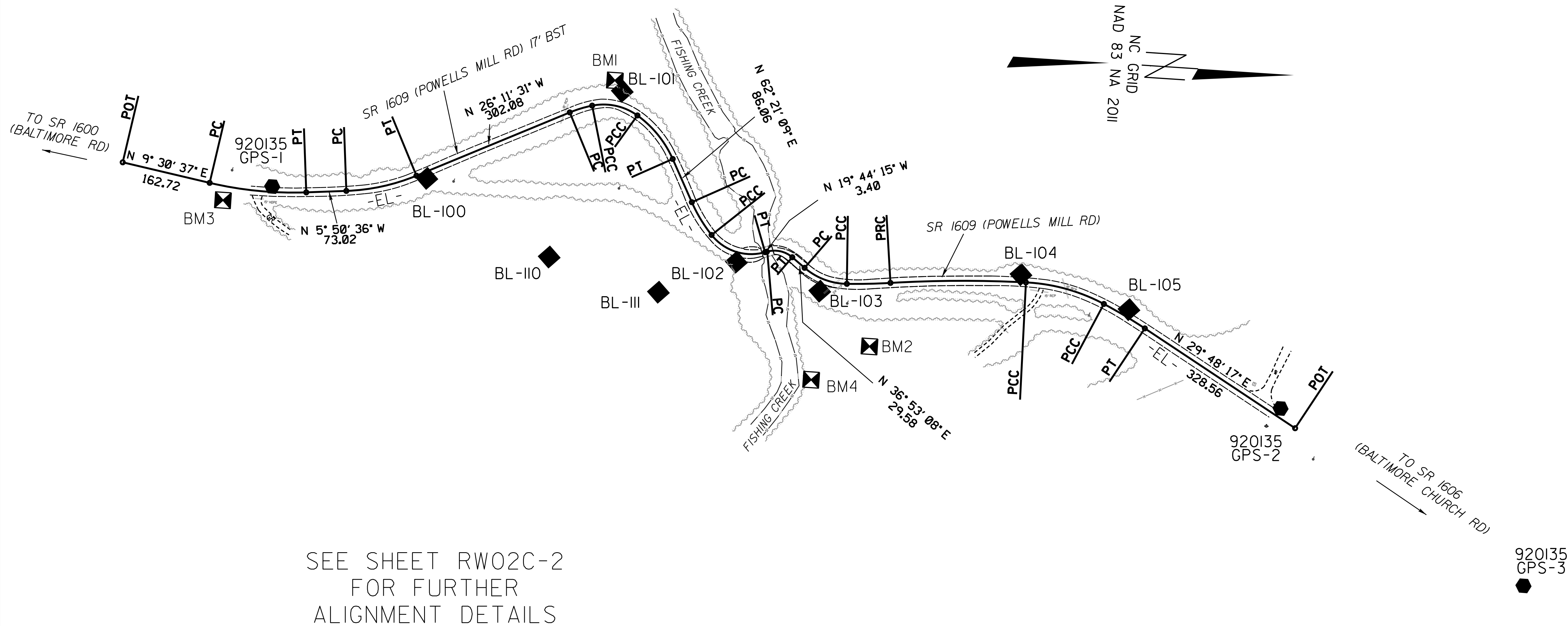


6/2/09

# SURVEY CONTROL SHEET

## W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO. 92-0135	SHEET NO. RW02C-1
<b>Location and Surveys</b>	
	
1223 Jones Franklin Rd. Raleigh, N.C. 27606 License No. F43277 Bus: 919 851 8077 Fax: 919 851 8107	
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN CIVIL/SITE DESIGN - SURVEYING - CONSTRUCTION OBSERVATION	



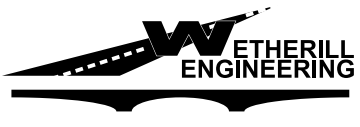
### NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

SCHEMATIC CONSTRUCTION

6/2/09

# PROPOSED ALIGNMENT CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
92-0135	RW02D-1
<b>Location and Surveys</b>	
	
<small>1223 Jones Franklin Rd. Raleigh, N.C. 27606 License No. F-3377 Bus: 919 851 8077 Fax: 919 851 8107</small>	
<small>TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN CIVIL/SITE DESIGN - SURVEYING - CONSTRUCTION OBSERVATION</small>	

REVISIONS

L			
TYPE	STATION	NORTH	EAST
POT	10+00.00	943317.3859	2256494.0893
PC	10+50.00	943340.5874	2256538.3803
PCC	11+33.32	943390.7246	2256604.4448
PT	12+03.92	943455.3264	2256627.6250
PC	12+67.81	943519.0762	2256623.4138
PRC	13+42.82	943588.8666	2256645.6987
PRC	14+25.59	943666.3781	2256667.1715
PT	17+17.83	943957.4898	2256643.9301
POT	17+17.83	943957.4898	2256643.9301


### NOTES:

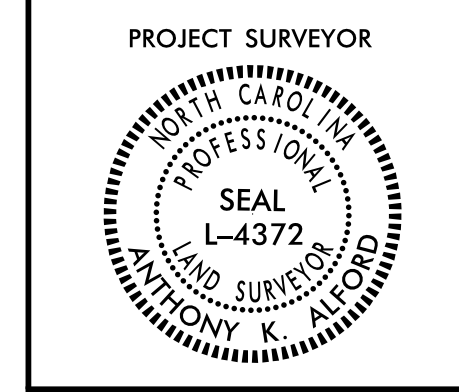
1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. THE PROPOSED ALIGNMENT CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATINO REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

6/2/09



6/2/19

PROJECT REFERENCE NO. 92-0135	SHEET NO. RW04
<b>Location and Surveys</b>	
	
1223 Jones Franklin Rd. Raleigh, N.C. 27605 License No. F-3377 Bus: 919 851 8077 Fax: 919 851 8107	
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN CIVIL/SITE DESIGN - SURVEYING - CONSTRUCTION OBSERVATION	



I, ANTHONY K. ALFORD, a Professional Land Surveyor in the state of North Carolina hereby certify to my knowledge and belief that the following work item(s) (R/W Staking) performed under my responsible charge meet NCDOT Survey Standards as directed in the NCDOT Location & Surveys guidelines and procedures.

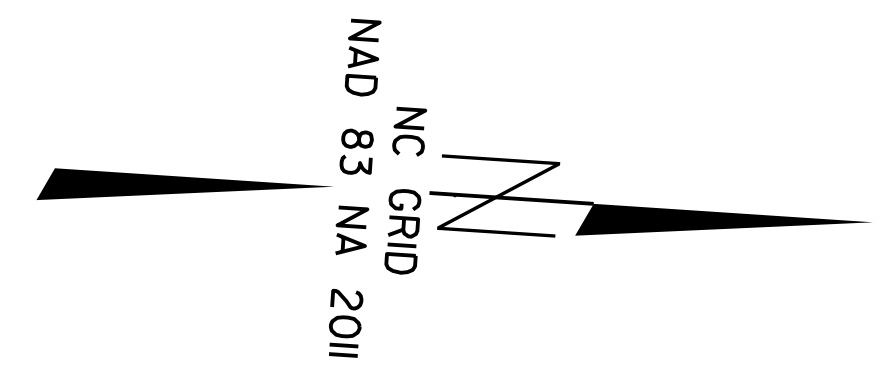
I further certify that the right of way and permanent easement points shown herein and outlined in the tables shown hereon (localized coordinates, station/offset) have been checked and are accurate representations of the right of way and permanent easement points depicted on the corresponding highway plans. I also certify that the right of way and permanent easement points shown herein have been field monumented under my supervision from existing survey control provided by others; that the depicted property data shown herein were surveyed by others; and these monuments denote the right of way and easement boundaries at the time of staking which may be subject to change due to right of way revisions (See deeds for final determination).

Witness my original signature, registration number and seal this 11th day of December, 2018.

*Anthony K. Alford*  
Professional Land Surveyor

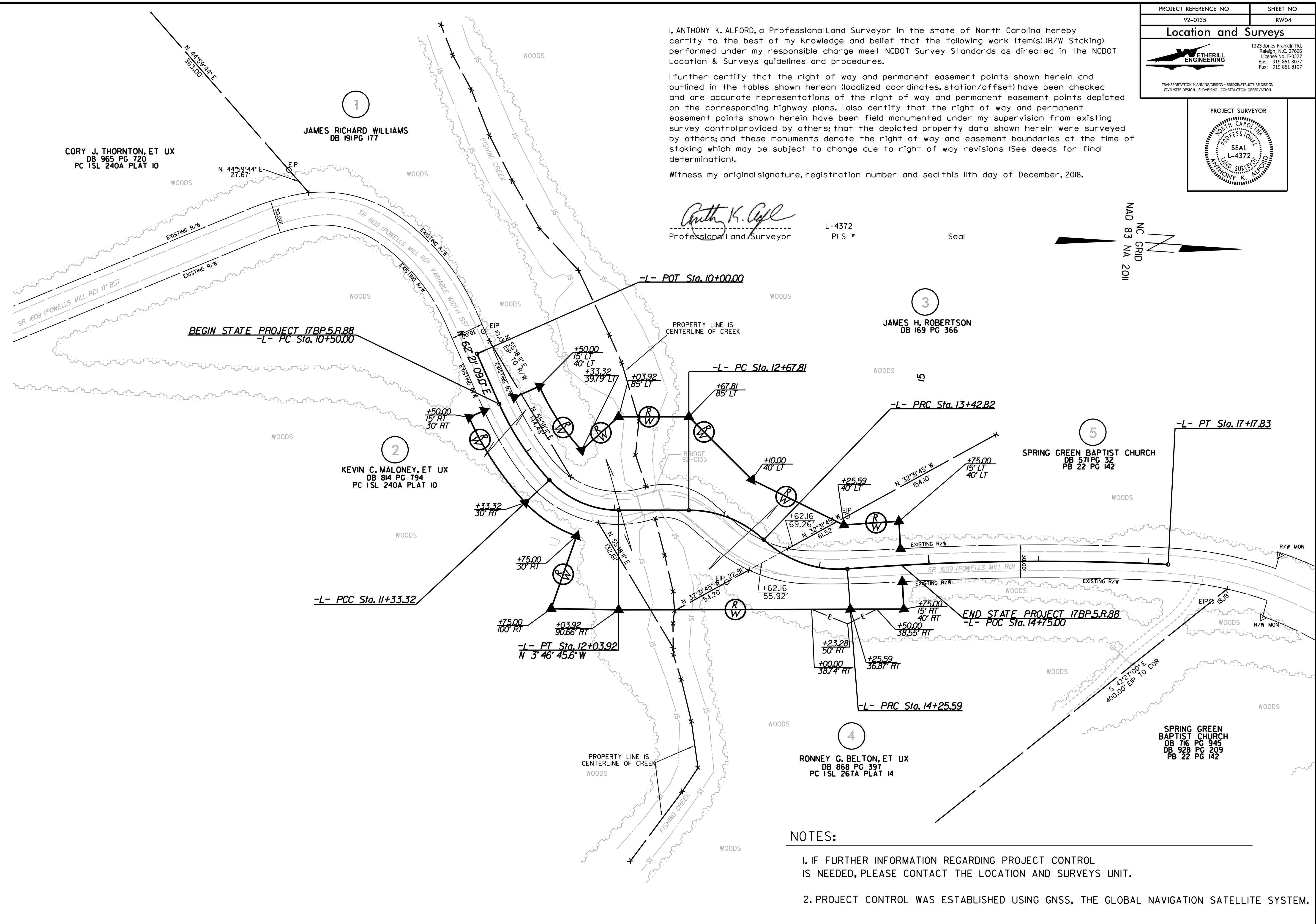
L-4372  
PLS #

Seal



REVISIONS

I:\DEC-2018\1204\_Location and Surveys\92-0135 RW\19124\_30\80-Drawings\920135\_1s\_rw04.dgn  
PLOT DATE: 12/11/2018 10:04 AM  
PLOT BY: AL



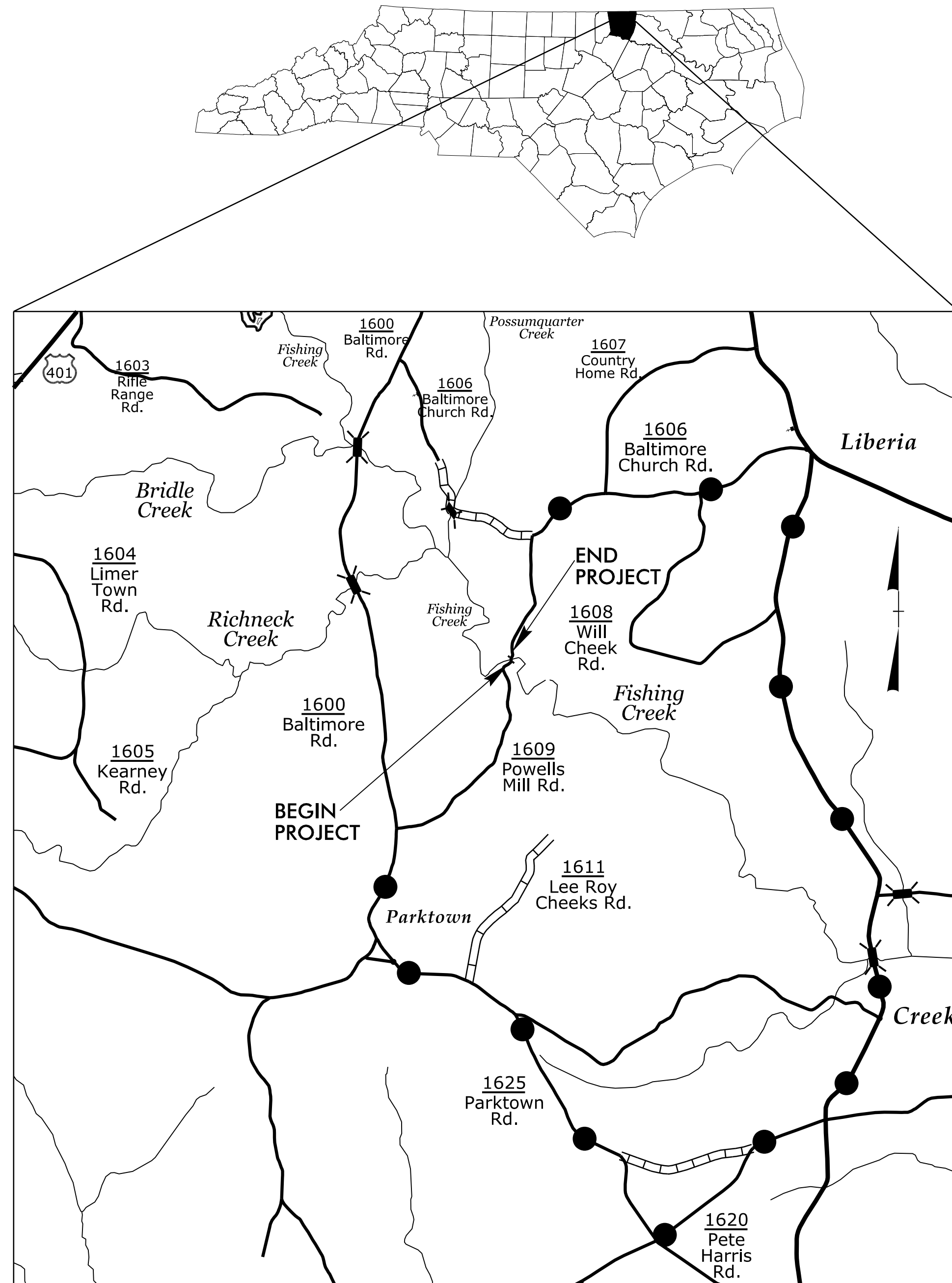
**NOTES:**

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

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**TRANSPORTATION MANAGEMENT PLAN**

**WARREN COUNTY**



OFF-SITE DETOUR —●—●—●—

**INDEX OF SHEETS**

SHEET NO.	TITLE
TMP-1	TITLE SHEET, VICINITY MAP, AND INDEX OF SHEETS
TMP-1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, AND LEGEND
TMP-1B	TRANSPORTATION OPERATIONS PLAN: (MANAGEMENT STRATEGIES, GENERAL NOTES, LOCAL NOTES, AND PHASING)
TMP-2	SPECIAL SIGN DESIGN
TMP-3	OFF-SITE DETOUR

SHEET NO.  
TMP-1

**17BP.5.R.88**

**TIP PROJECT:**

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



PLANS PREPARED BY:

**STEWART**  
223 S. WEST ST., STE 1100  
RALEIGH, NC 27603  
Y 919.380.8750  
Firm License #: C-1051  
www.stewartinc.com

ANDY YOUNG, PE  
PROJECT ENGINEER

JOSHUA ROEMER  
PROJECT DESIGN ENGINEER



APPROVED: Andrew P. Young  
DATE: 3/11/2022

SEAL

3/11/2022  
TCN\920135\_TC-TMP\_01.dgn  
USER:ayoung



# ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2018 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1101.03	TEMPORARY ROAD CLOSURES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1130.01	DRUM
1145.01	BARRICADES

# LEGEND

## GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- TEMP. SHORING (LOCATION PURPOSES ONLY)

WORK AREA

REMOVAL

## SIGNALS

- EXISTING
- PROPOSED
- T
- E
- M
- P

## PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

## TRAFFIC CONTROL DEVICES

- BARRICADE (TYPE III)
- CONE
- DRUM
- SKINNY DRUM
- TUBULAR MARKER
- TEMPORARY CRASH CUSHION
- FLASHING ARROW BOARD
- FLAGGER
- LAW ENFORCEMENT
- TRUCK MOUNTED ATTENUATOR (TMA)
- CHANGEABLE MESSAGE SIGN

## TEMPORARY SIGNING


- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

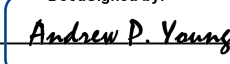
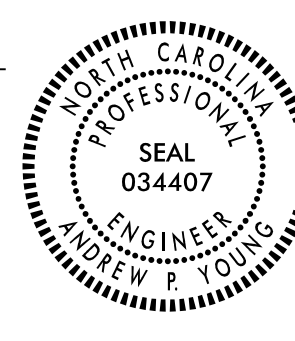
## PAVEMENT MARKERS


- CRYSTAL/CRYSTAL
- CRYSTAL/RED
- YELLOW/YELLOW

## PAVEMENT MARKING SYMBOLS

- PAVEMENT MARKING SYMBOLS

  
**STEWART**  
 Firm License No. C-1051  
 223 S. West St.  
 Suite 1100  
 Raleigh, NC 27603  
 T 919.380.8750  
 www.stewartinc.com

APPROVED:   
DocuSigned by:  
Andrew P. Young  
-EP21D93D62F4EF-  
 DATE: 3/11/2022  
 SEAL  
  
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UNLESS ALL SIGNATURES COMPLETED**

  
 DIVISION OF HIGHWAYS  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 WORK ZONE TRAFFIC CONTROL

**ROADWAY STANDARD  
DRAWINGS & LEGEND**

## MANAGEMENT STRATEGIES

DURING CONSTRUCTION OF PROPOSED STRUCTURE BRIDGE No. 135 OVER FISHING CREEK, SR 1609 (POWELLS MILL RD.) WILL BE CLOSED TO THROUGH TRAFFIC. THROUGH TRAFFIC ON SR 1609 (POWELLS MILL RD.) WILL BE MAINTAINED USING AN OFF-SITE DETOUR.

THE OFF-SITE DETOUR WILL INCLUDE SR 1600, SR 1625, SR 1620, NC 58, AND SR 1606 (SEE SHEET TMP-3).

SR 1609 (POWELLS MILL RD.) IS CURRENTLY CLOSED TO TRAFFIC. CONTRACTOR SHALL ENSURE ALL DETOUR SIGNS ARE PLACED ACCORDING TO THESE PLANS.

## GENERAL NOTES

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS, AND ROADWAY DETAILS ARE NOT ATTAINABLE TO MEET FIELD CONDITIONS OR RESULT IN DUPLICATE OR UNDESIRED OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT EXCEPT WHEN OTHERWISE NOTED IN THE PLAN OR DIRECTED BY THE ENGINEER.

### SIGNING

- A) PROVIDE SIGNING AND DEVICES REQUIRED TO CLOSE THE ROAD ACCORDING TO THE ROADWAY STANDARD DRAWINGS AND TRAFFIC CONTROL PLANS.  
  
PROVIDE SIGNING REQUIRED FOR THE OFF-SITE DETOUR ROUTE AS SHOWN IN THE TRAFFIC CONTROL PLANS.
- B) COVER OR REMOVE ALL SIGNS AND DEVICES REQUIRED TO CLOSE THE ROAD WHEN ROAD CLOSURE IS NOT IN OPERATION.  
  
COVER OR REMOVE ALL SIGNS REQUIRED FOR THE OFF-SITE DETOUR WHEN THE DETOUR IS NOT IN OPERATION.
- C) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

## LOCAL NOTES

1. NOTIFY THE ENGINEER AT LEAST 30 DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.
2. NOTIFY THE WARREN COUNTY SCHOOLS TRANSPORTATION DIRECTOR OF THE BRIDGE REMOVAL 30 DAYS PRIOR TO ROAD CLOSURE.
3. NOTIFY THE WARREN COUNTY EMERGENCY MANAGEMENT SERVICES DIRECTOR OF BRIDGE REMOVAL 30 DAYS PRIOR TO ROAD CLOSURE.

## PHASING

### STEP 1:

USING RSD 1101.03, SHEET 1 OF 9, SHEETS TMP-2 AND TMP-3, INSTALL ROAD CLOSURE AND DETOUR SIGNS, PLACE TYPE III BARRICADES TO CLOSE SR 1609 (POWELLS MILL RD.) TO THROUGH TRAFFIC, AND DETOUR TRAFFIC OFF-SITE.

### STEP 2:

REMOVE THE EXISTING STRUCTURE.

### STEP 3:

CONSTRUCT THE PROPOSED CULVERT AND ROADWAY.

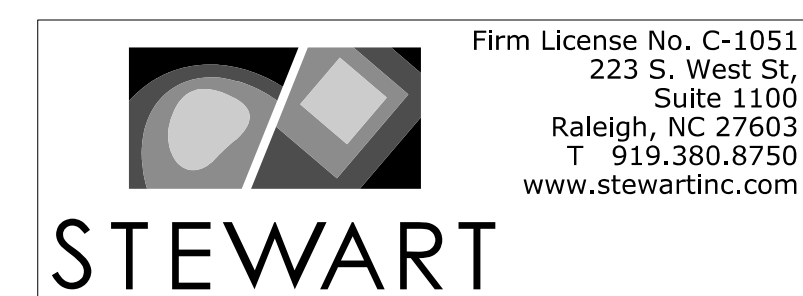
### STEP 4:

PLACE FINAL PAVEMENT MARKINGS ACCORDING TO THE PAVEMENT MARKING PLANS.

### STEP 5:

OPEN SR 1609 (POWELLS MILL RD.) TO TRAFFIC AND REMOVE ALL WORK ZONE TRAFFIC CONTROL DEVICES.

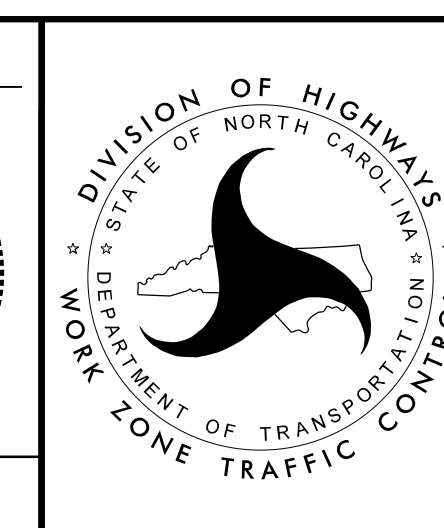
3/9/2022  
\\TCP\920135\_TC\_TMP\_01B.dgn  
USER:mburns



APPROVED: *Andrew P. Young*  
DocuSigned by:  
 Andrew P. Young  
 EF21D63DD62F4EF...  
 DATE: 3/11/2022

SEAL

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UNLESS ALL SIGNATURES COMPLETED



SIGN NUMBER: SP-1      BACKG COLOR: Fluorescent Orange

TYPE: STATIONARY      COPY COLOR: Black

QUANTITY: SEE PLANS

SIGN WIDTH: 2'-6"  
HEIGHT: 1'-6"

TOTAL AREA: 3.8 Sq.Ft.

BORDER TYPE: INSET  
RECESS: 0.38"  
WIDTH: 0.63"  
RADII: 1.5"

NO. Z BARS:  
LENGTH:

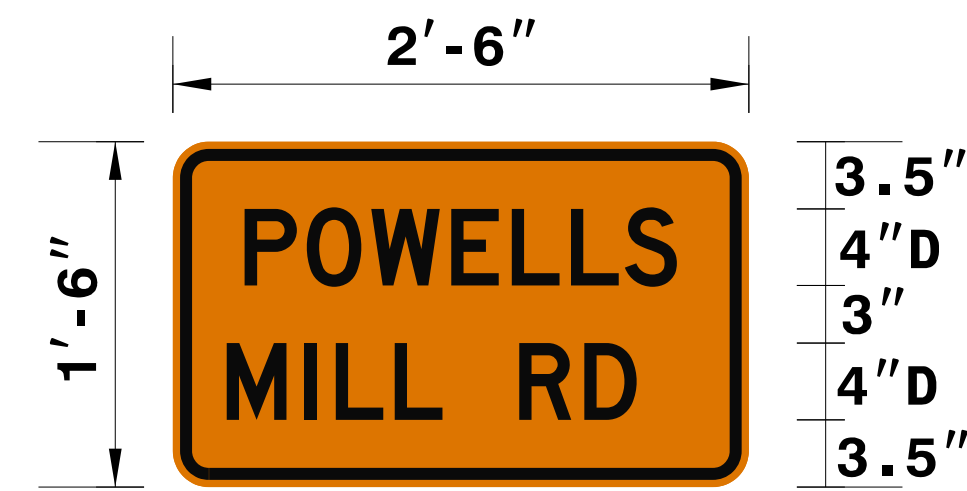
SYMBOL	X	Y	WID	HT

MAT'L: 0.080" (2.0 mm) ALUMINUM

DESIGN BY: Jody Cole  
PROJECT ID: 17BP.5.R.77

CHECKED BY: Andy Young, PE  
LOCATION: Warren County

Aug 21, 2018  
DIV: 5



BORDER R=1.5"  
TH=0.63"  
IN=0.38"

Panel Style: Traffic Control.ssi  
M.U.T.C.D.: 2009 Edition

USE NOTES: 1,2

- Legend and border shall be direct applied black non-reflective sheeting.
- Background shall be NC GRADE B fluorescent orange retroreflective sheeting.

Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter locations are panel edge to lower left corner																	Series/Size
																	Text Length
P	O	W	E	L	L	S											D 2000
3.7	7	10.3	14.5	17.7	20.7	23.5											22.5
M	I	L	L		R	D											D 2000
2.8	6.9	8.5	11.6	14	18	21.4											24.4

FILENAME: 920135\_TC\_TMP\_02

NORTH CAROLINA D.O.T. SIGN DETAIL

3/9/2022  
\\TCP\920135\_TC\_TMP\_02.dgn  
USER:mburns

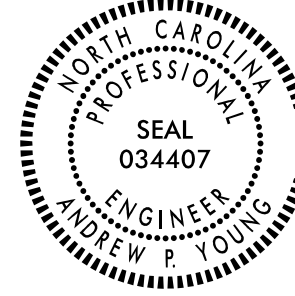


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223 S. West St.  
Suite 1100  
Raleigh, NC 27603  
T 919.380.8750  
www.stewartinc.com

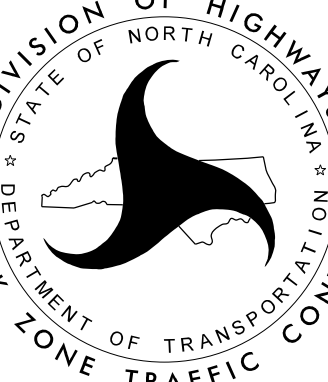
**STEWART**

APPROVED: *Andrew P. Young*  
DATE: 3/11/2022

SEAL

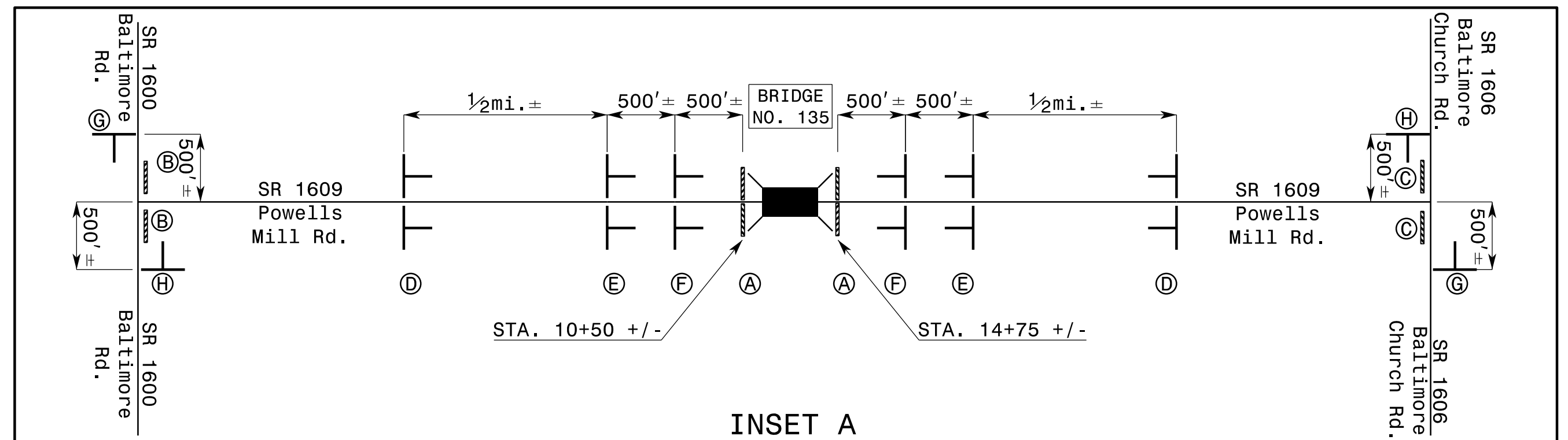
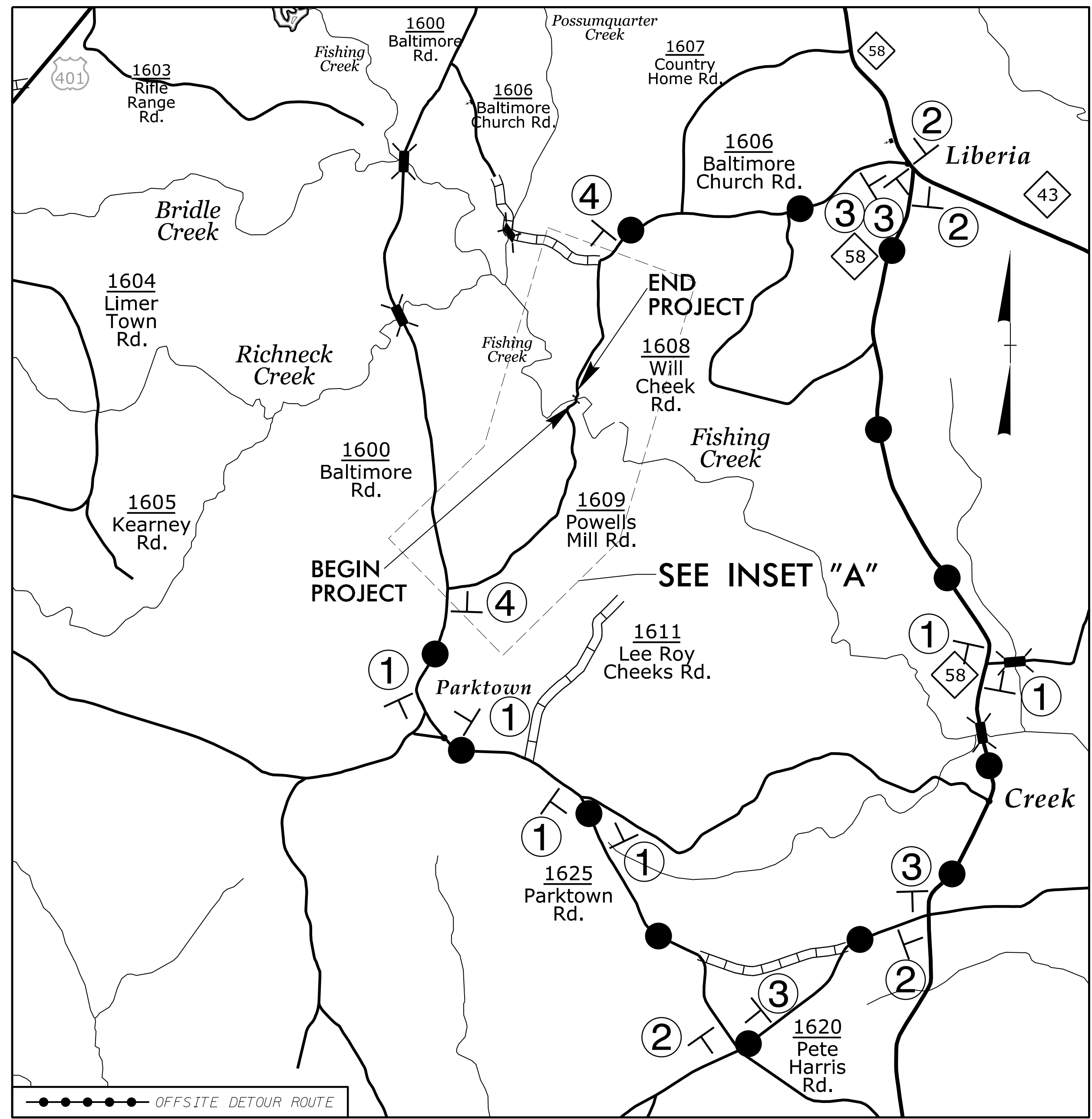


DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

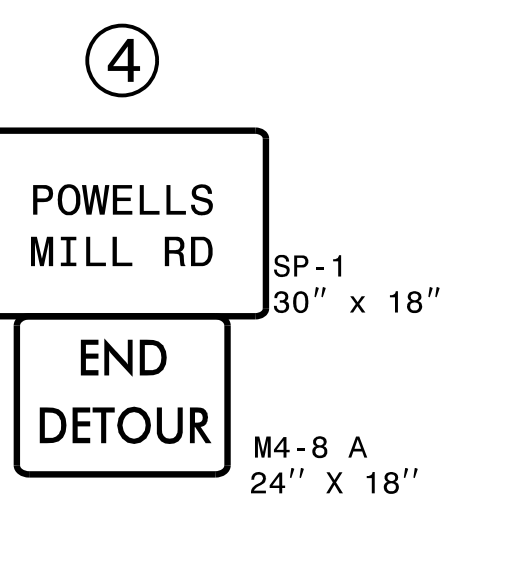
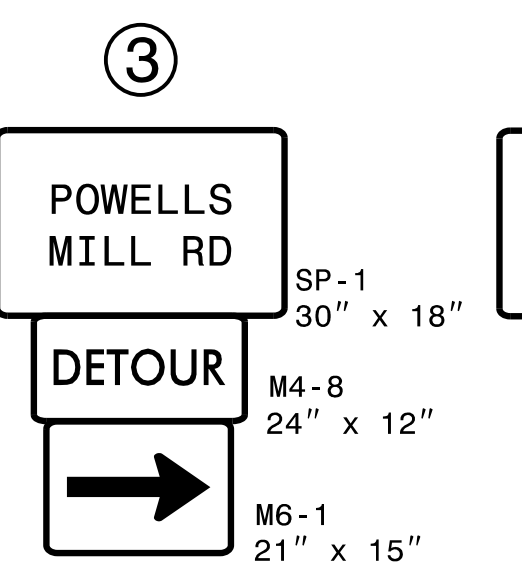
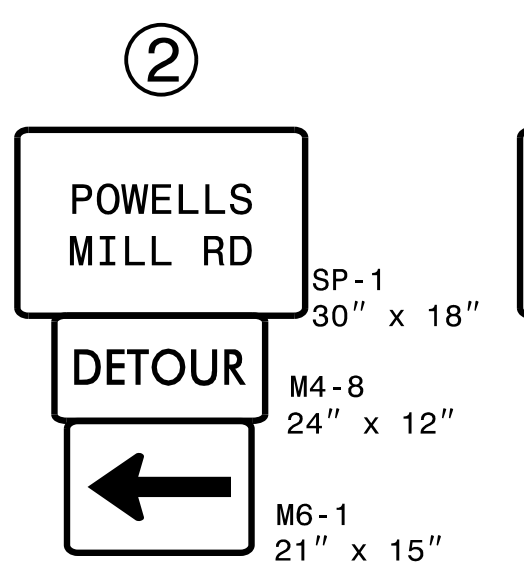
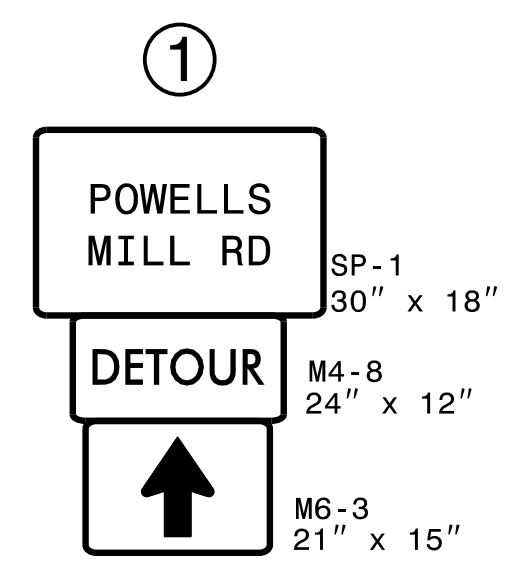
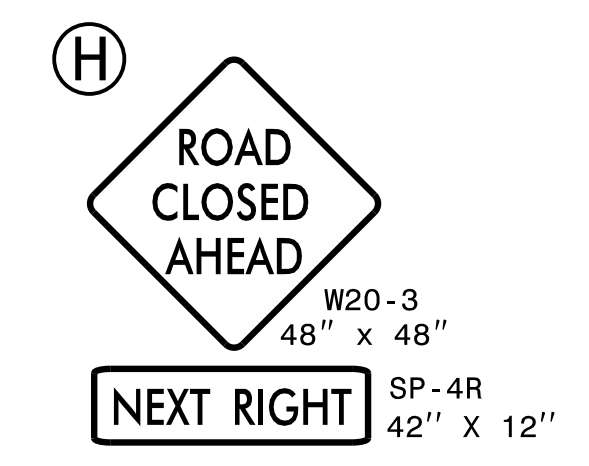
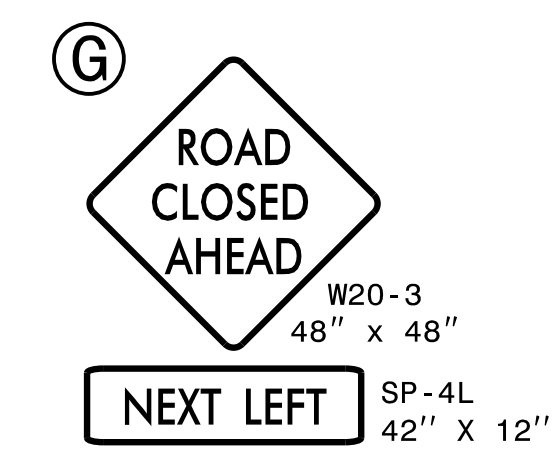
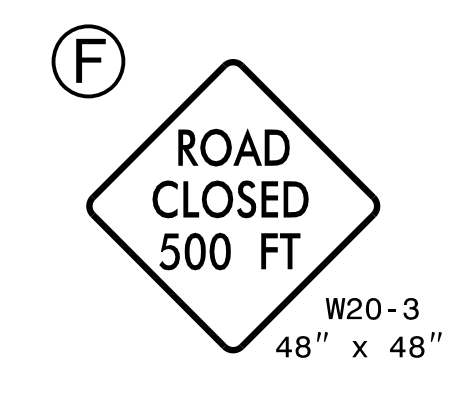
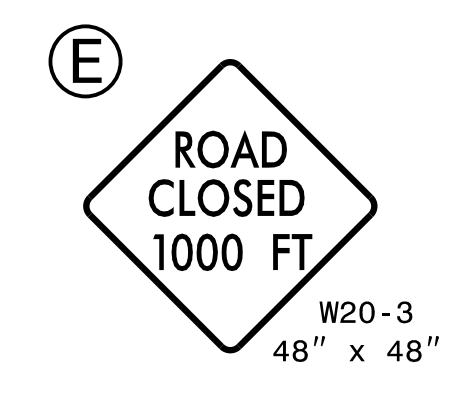
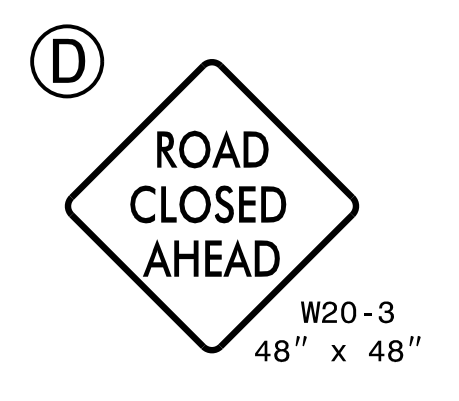
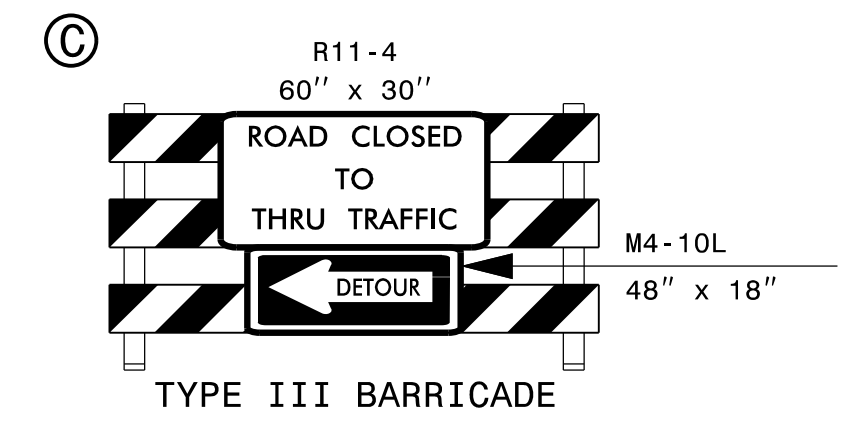
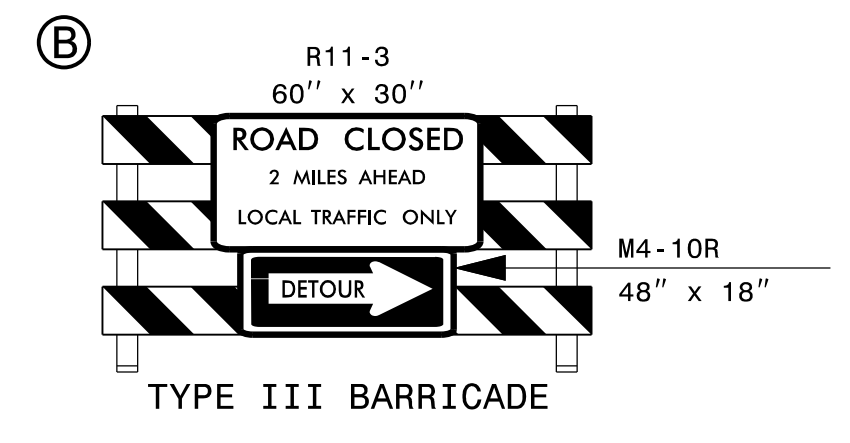
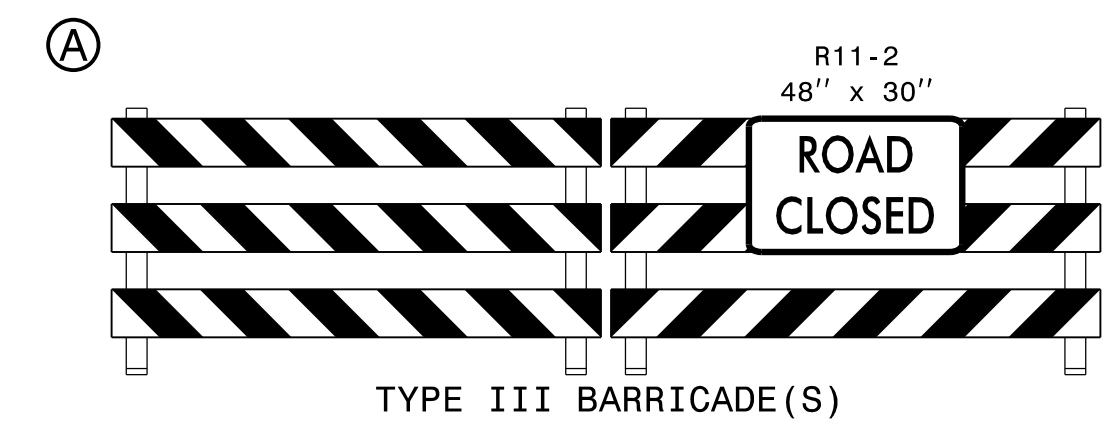


DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
WORK ZONE TRAFFIC CONTROL

SPECIAL SIGN DESIGN



REFER TO ROADWAY STANDARD  
DRAWING 1101.03, SHEET 1 OF 9  
FOR APPLICABLE NOTES.

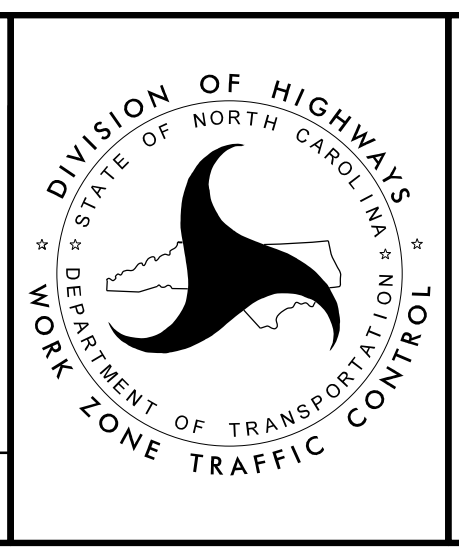


Firm License No. C-1051  
223 S. West St.  
Suite 1100  
Raleigh, NC 27603  
T 919.380.8750  
www.stewartinc.com

APPROVED: *Andrew P. Young*  
DATE: 3/11/2022

SEAL

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



OFF-SITE  
DETOUR

3/9/2022  
TC\920135\_TC\_TMP\_03.dgn  
USER:mburns

**STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION**

**PAVEMENT MARKING PLAN  
WARREN COUNTY**

LOCATION: BRIDGE NO.135 OVER FISHING CREEK ON SR 1609 (POWELLS MILL RD.)

**TIP: 17BP.5.R.88**

**CONTRACT: DE00335**

**ROADWAY STANDARD DRAWING**

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2018 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTILANE ROADWAYS
1205.12	PAVEMENT MARKINGS - BRIDGES
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

**PAVEMENT MARKING SCHEDULE**

SYMBOL	DESCRIPTION
PA	PAINT WHITE EDGELINE (4") X2
PI	PAINT YELLOW DOUBLE CENTER (4") X2

**GENERAL NOTES**

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT, EXCEPT WHEN OTHERWISE NOTED IN THE PLAN, OR DIRECTED BY THE ENGINEER.

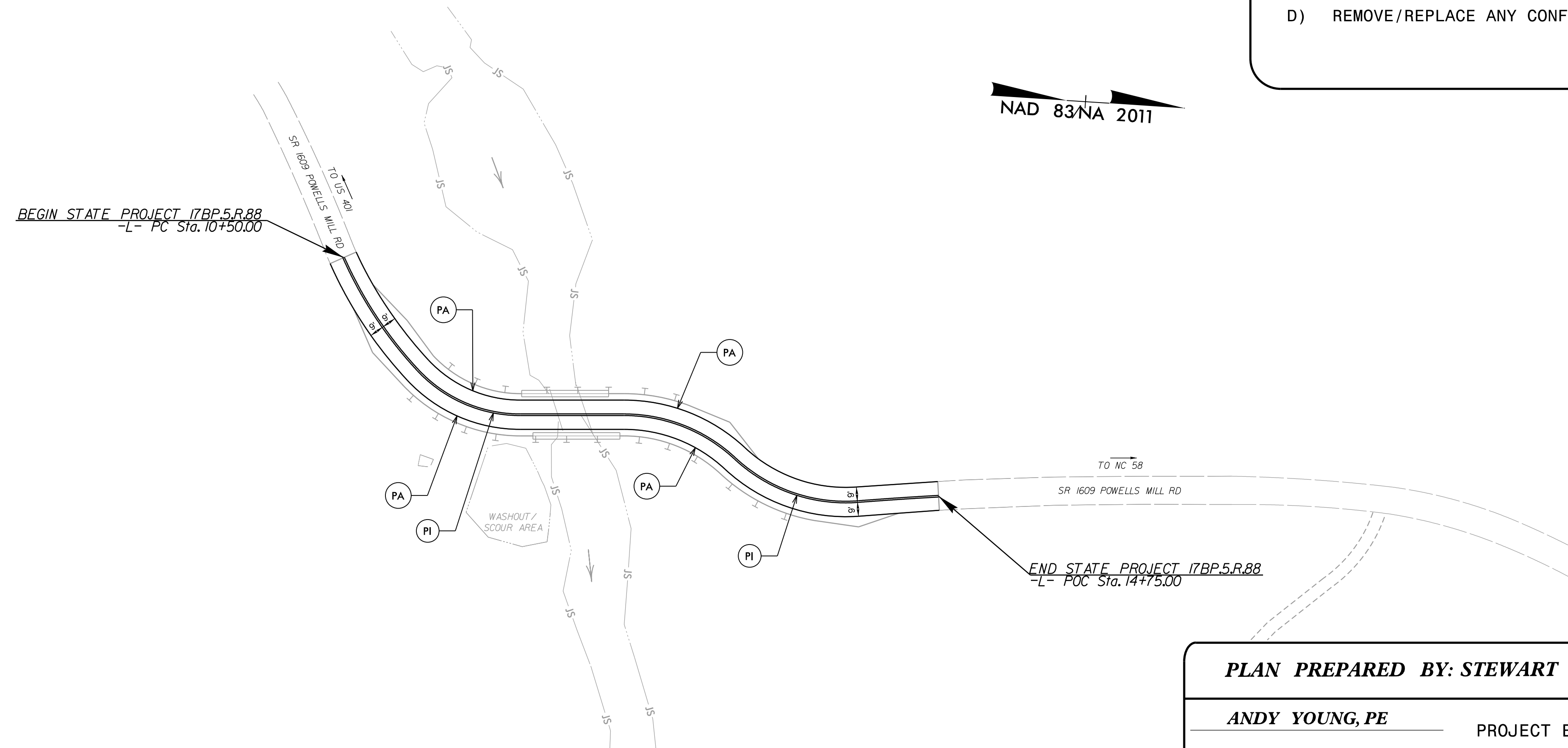
A) INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE AS FOLLOWS:

ROAD NAME	MARKING	MARKER
POWELLS MILL RD	PAINT	NONE

B) PLACE TWO APPLICATIONS OF PAINT PAVEMENT MARKINGS ON THE FINAL WEARING SURFACE. PLACE THE SECOND APPLICATION OF PAINT UPON SUFFICIENT DRYING TIME OF THE FIRST.

C) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

D) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS.



**PLAN PREPARED BY: STEWART**

**ANDY YOUNG, PE** PROJECT ENGINEER

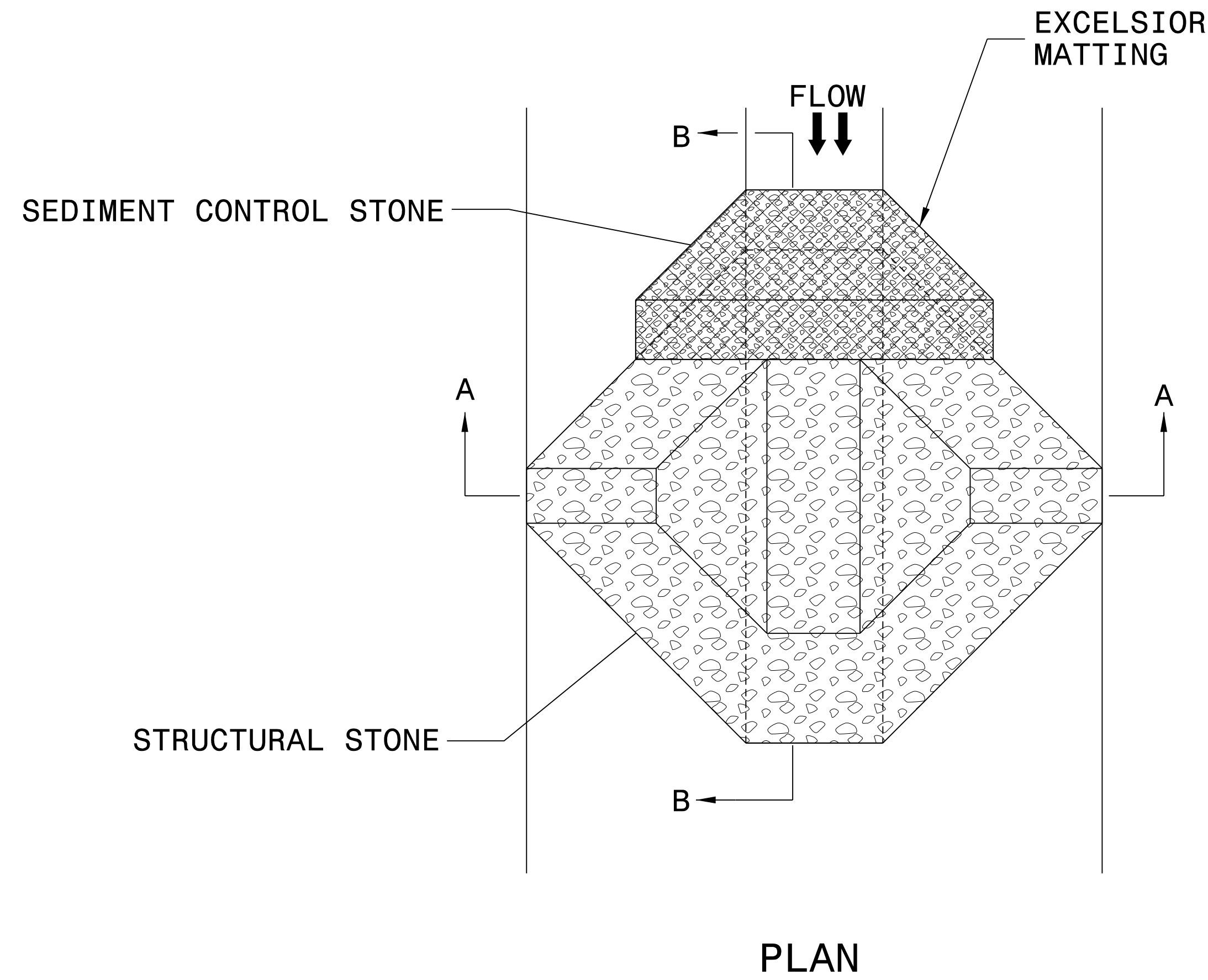
**JOSHUA ROEMER** PROJECT DESIGN ENGINEER





PROJECT REFERENCE NO. 17BP.5.R.88	SHEET NO. EC-2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

# TEMPORARY ROCK SILT CHECK TYPE 'A' WITH EXCELSIOR MATTING AND POLYACRYLAMIDE (PAM)



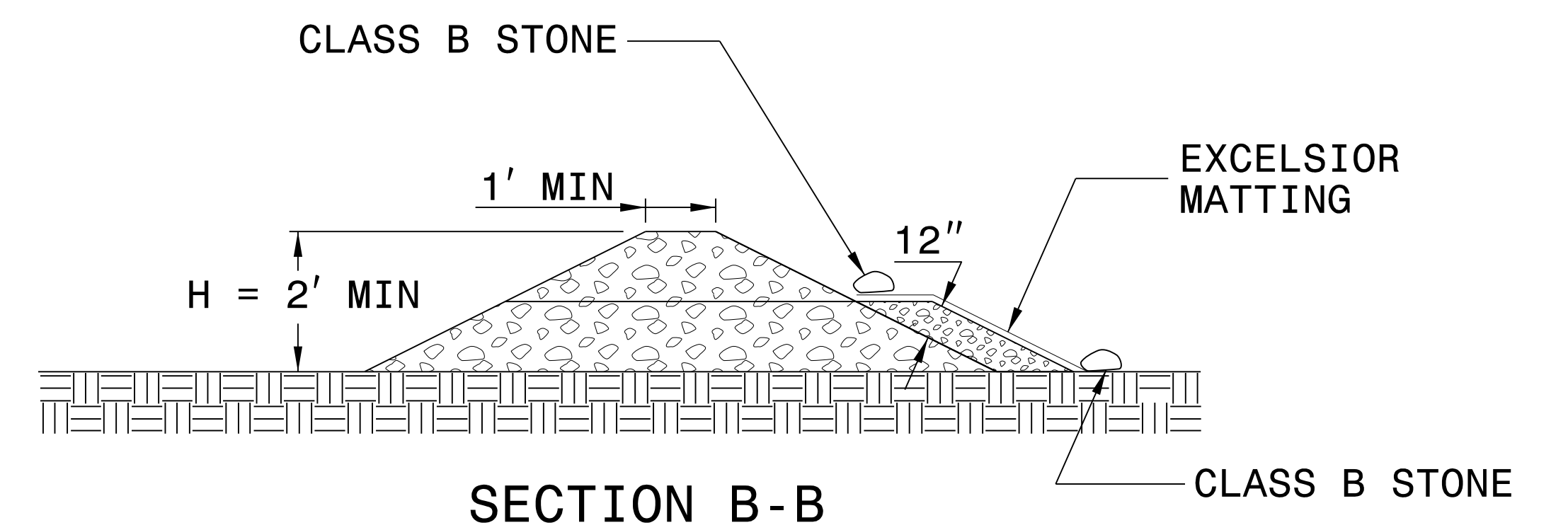
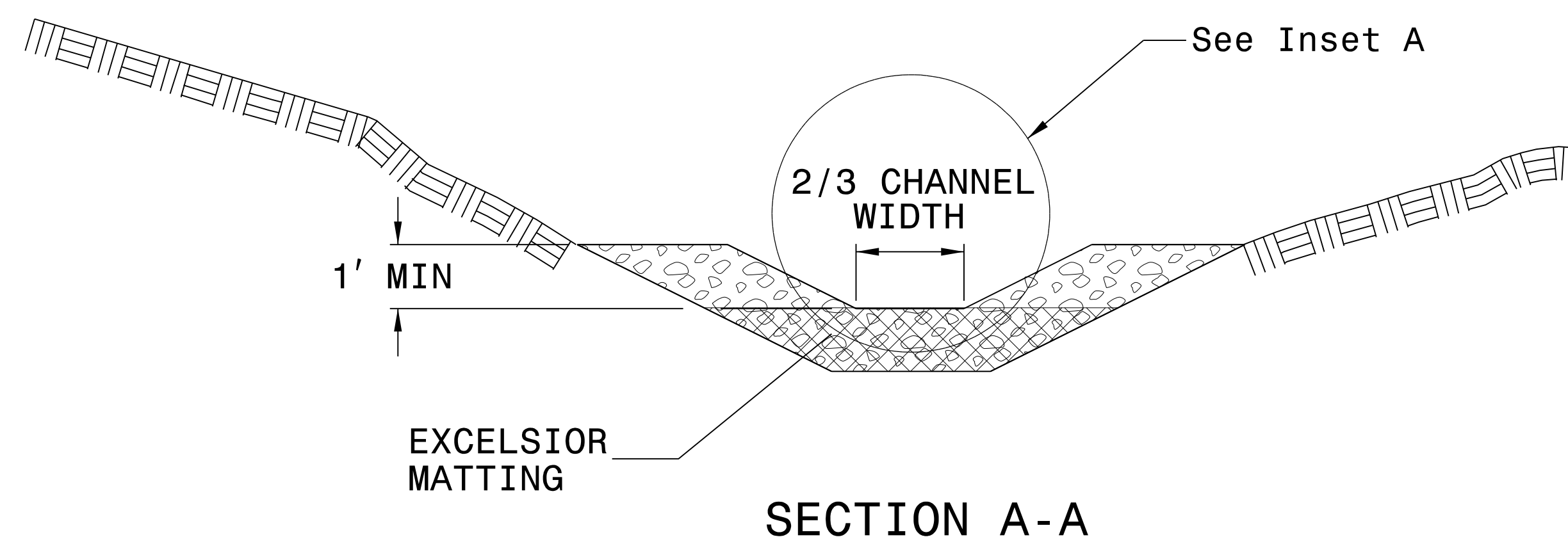
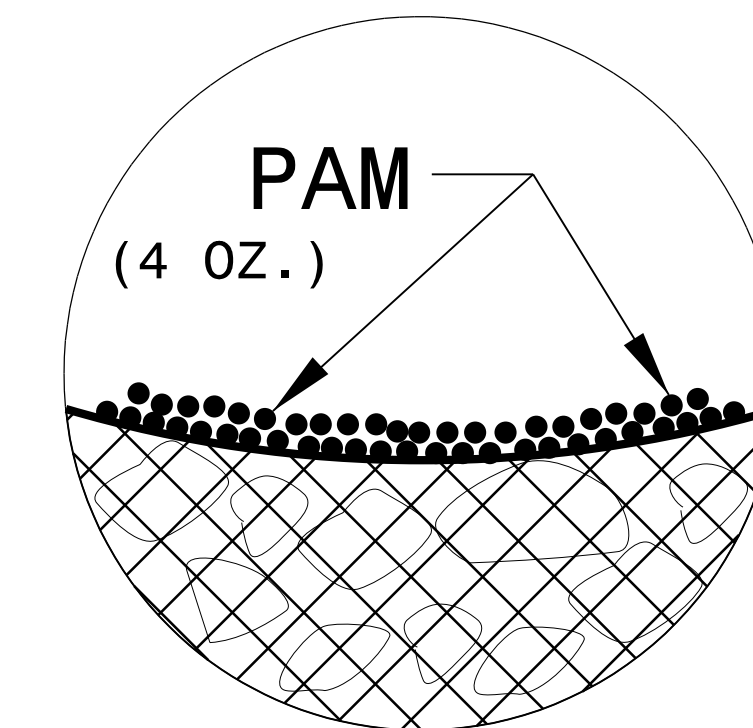
**NOTES:**

INSTALL TEMPORARY ROCK SILT CHECK TYPE A IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1633.01.

USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH ROCK SILT CHECK.

INITIALLY APPLY 4 OUNCES OF POLYACRYLAMIDE (PAM) TO TOP OF MATTING SECTION AND AFTER EVERY RAINFALL EVENT THAT EQUALS OR EXCEEDS 0.50 INCHES.



NOT TO SCALE





DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

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PROJECT REFERENCE NO. <i>17BP.5.R.88</i>	SHEET NO. <i>EC-3A</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

# ***SOIL STABILIZATION TIMEFRAMES***

<i>SITE DESCRIPTION</i>	<i>STABILIZATION TIME</i>	<i>TIMEFRAME EXCEPTIONS</i>
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	<del>IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.</del>
SLOPES 3:1 OR FLATTER	7 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH.
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	7 DAYS	NONE, EXCEPT FOR PERIMETERS AND HQW ZONES.

5/14/99

-Design Standards in Sensitive Watersheds [15A NCAC 04B.0124 (b) \*\*e)] are incorporated into NCDOT projects that occur within or upstream of water bodies that contain federally protected aquatic species. Within the Environmentally Sensitive Areas, the following shall apply:

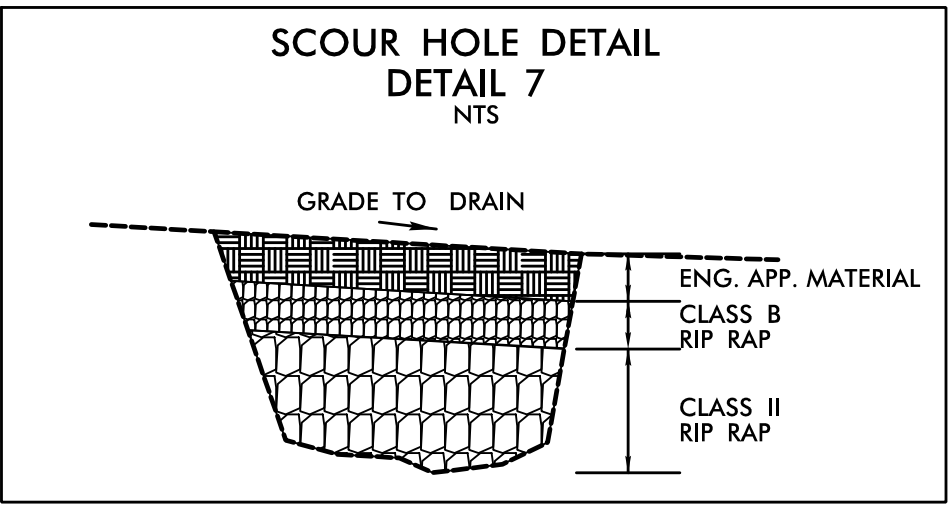
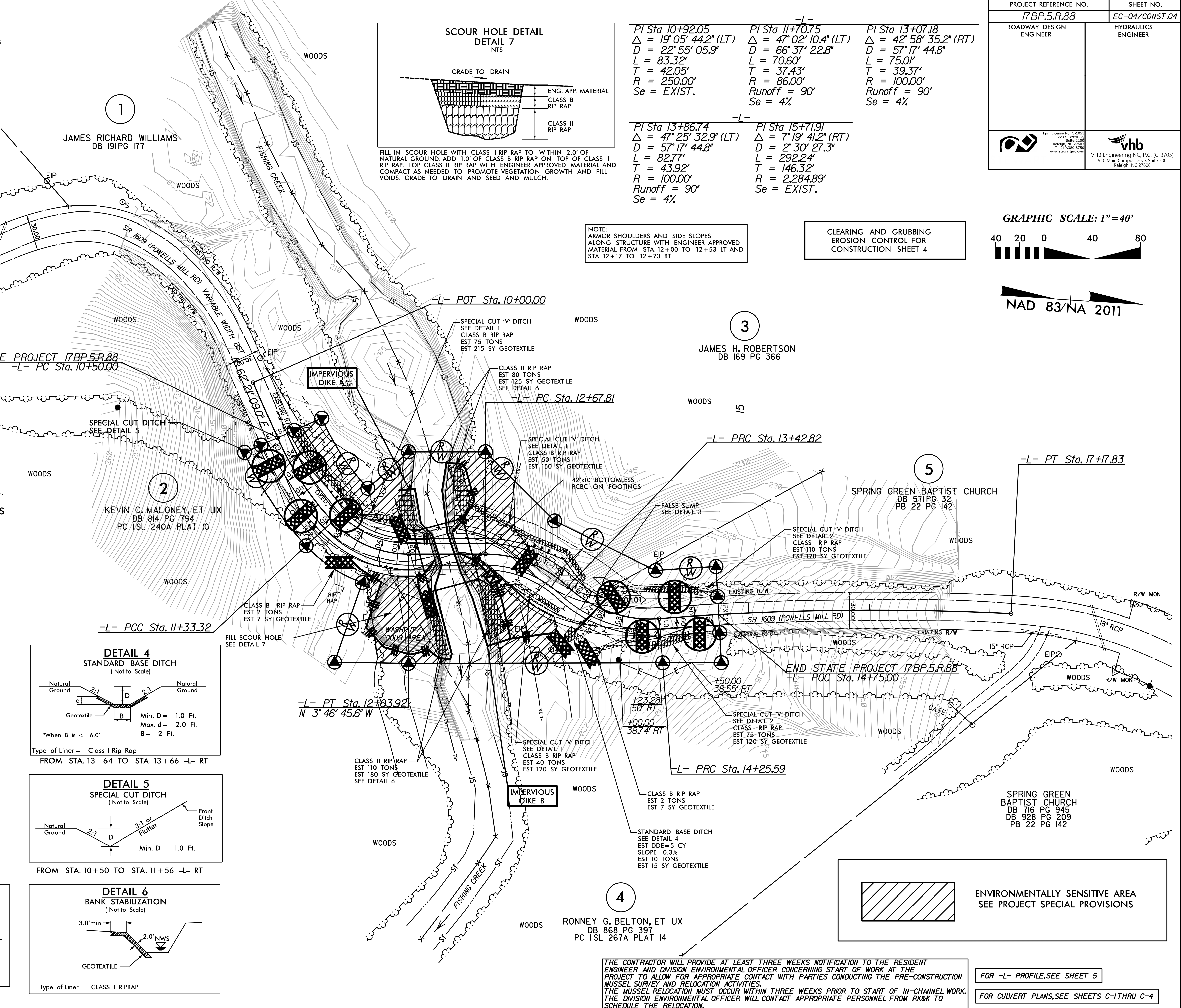
- The contractor may perform cleaning operations but not grubbing operation until immediately prior to beginning grading operations. Erosion control devices shall be installed immediately following the clearing operation.
- Once grading operations begin, work shall progress in a continuous manner until complete.
- Seeding mulching shall be performed on the areas disturbed by construction immediately following final grade establishment.
- Seeding mulching shall be done in stages on cut and fill slopes that are greater than 20 feet in height measure along the slope or greater than two acres in area, whichever is less.

-Special sediment control fence NCDOT Standard No. 1606.01 or a combination of special sediment control fence and standard silt fence will be installed between the top of the stream bank and bridge embankment. Once the disturbed areas of the project draining to these areas have been stabilized, the special sediment control fence and/or standard silt fence and all built up sediment adjacent to these devices will be removed to natural ground and stabilized with appropriate seed mix. Native grass mix will be used on the floodplain.

-All appropriate sedimentation and erosion control measures, throughout the project limits, will be cleaned out as appropriate to ensure proper function of the measures.

-In the event that visible sediment loss from the project is observed at the bridge site, a review of turbidity levels will be made upstream and downstream 400 meters (0.25 miles) to determine if sedimentation effects are occurring beyond the Action Area as defined in the Biological Opinion. If visual observation of turbidity levels downstream appear to be elevated beyond upstream observations, the project inspector will contact the Division Environmental Officer. If determined that project-related sedimentation is occurring beyond 400 meters, the amount or extent of incidental take specified in the Incidental Take Statement (see page 24 of Biological Conference Opinion, USFWS July 16, 2019) has been exceeded and the USFWS must be contacted immediately.

-Embankment construction and grading shall be managed in such a manner as to prevent surface runoff from discharging untreated into the riparian buffer. Instead all interim surfaces will be graded to drain to temporary erosion control devices. Temporary berms, ditches, etc. will be incorporated, as necessary, to treat temporary runoff before discharging into the riparian buffer (as specified in the NCDOT BMP Manual).



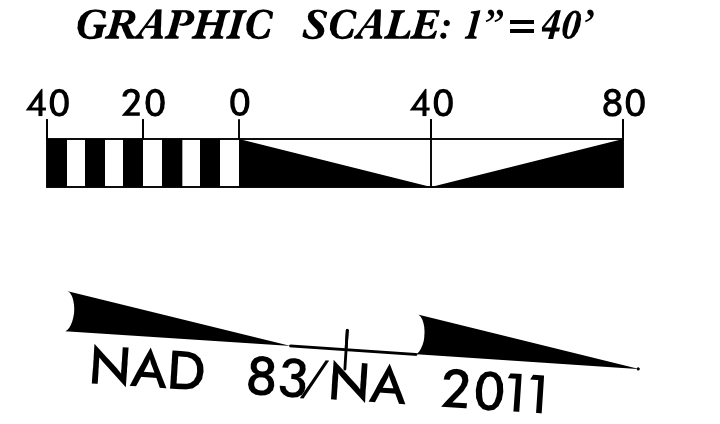
PI Sta 10+92.05	PI Sta 11+70.75	PI Sta 13+07.18
$\Delta = 19' 05" 44.2" (LT)$	$\Delta = 47' 02" 10.4" (LT)$	$\Delta = 42' 58' 35.2" (RT)$
$D = 22' 55' 05.9"$	$D = 66' 37' 22.8"$	$D = 57' 17' 44.8"$
$L = 83.32'$	$L = 70.60'$	$L = 75.01'$
$T = 42.05'$	$T = 37.43'$	$T = 39.37'$
$R = 250.00'$	$R = 86.00'$	$R = 100.00'$
$Se = EXIST.$	$Runoff = 90'$	$Runoff = 90'$
	$Se = 4\%$	$Se = 4\%$

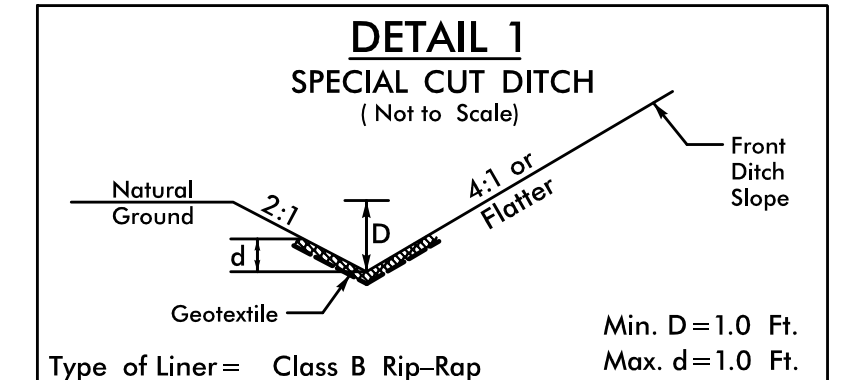
PI Sta 13+86.74	PI Sta 15+71.91
$\Delta = 47' 25' 32.9" (LT)$	$\Delta = 7' 19' 41.2" (RT)$
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$Runoff = 90'$	$Runoff = 90'$
$Se = 4\%$	$Se = EXIST.$

NOTE: ARMOR SHOULDERS AND SIDE SLOPES ALONG STRUCTURE WITH ENGINEER APPROVED MATERIAL FROM STA. 12+00 TO 12+53 LT AND STA. 12+17 TO 12+73 RT.

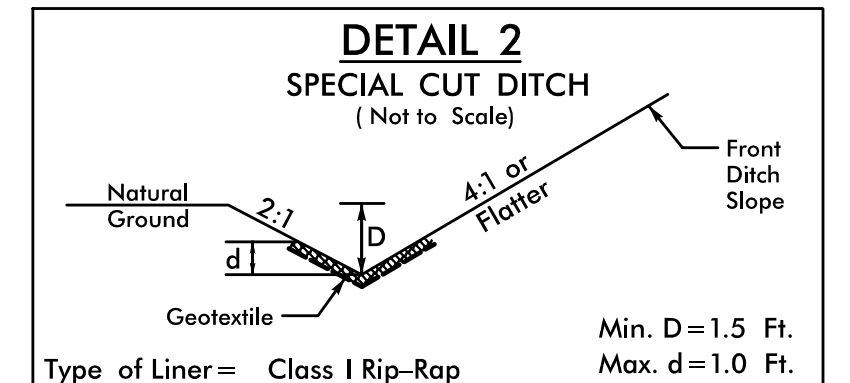
CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 4



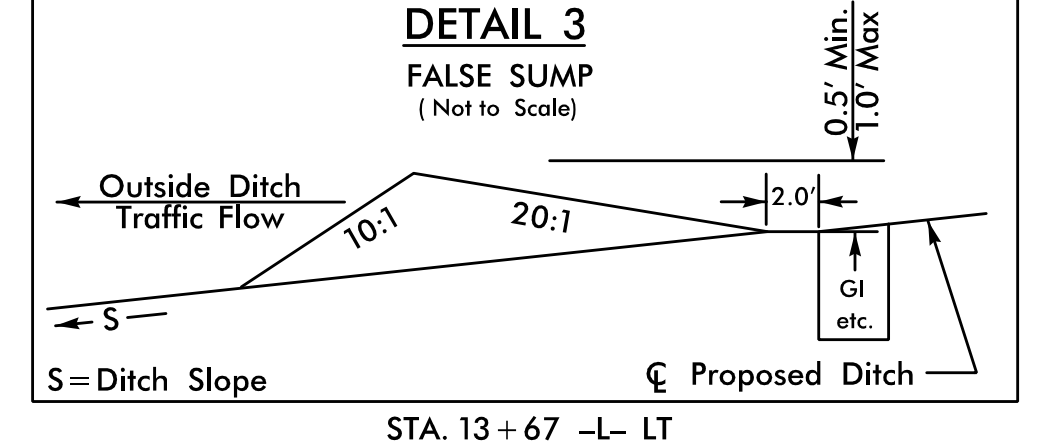
- CONSTRUCTION SEQUENCE**
1. INSTALL IMPERVIOUS DIKE A AND DEWATER SOUTH BANK UTILIZING SPECIAL STILLING BASINS.
  2. CONSTRUCT SOUTH BANK STRUCTURE FOOTINGS AND SOUTH BANK WORK.
  3. REMOVE IMPERVIOUS DIKE A AND AND INSTALL IMPERVIOUS DIKE B. DEWATER NORTH BANK.
  4. CONSTRUCT NORTH BANK STRUCTURE FOOTINGS AND NORTH BANK WORK.
  5. REMOVE IMPERVIOUS DIKE B.
  6. COMPLETE STRUCTURE AND ROADWAY.



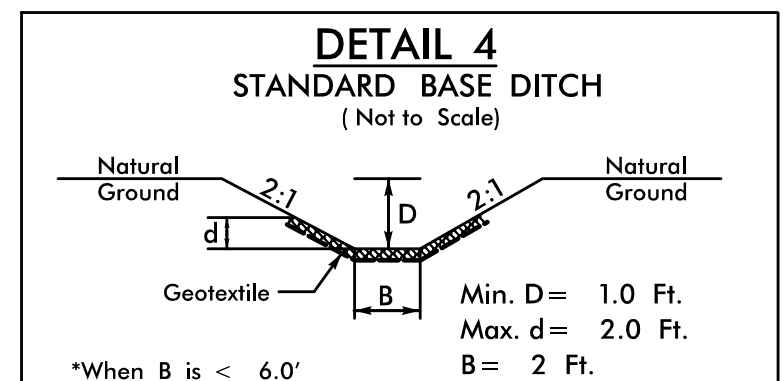
FROM STA. 10+50 TO STA. 11+95 -L- LT  
FROM STA. 12+50 TO STA. 13+50 -L- LT  
FROM STA. 12+70 TO STA. 13+50 -L- RT



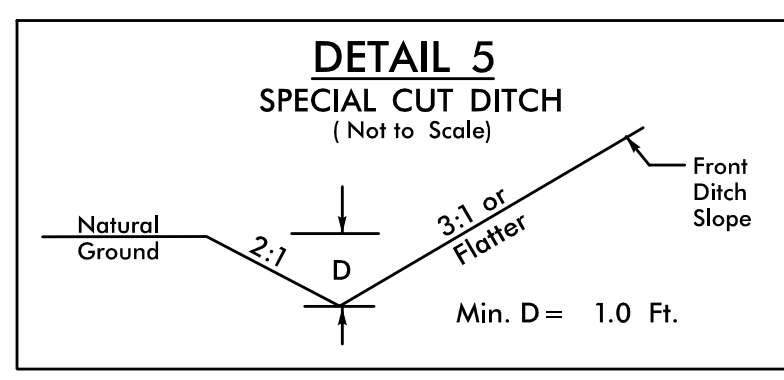
FROM STA. 13+83 TO STA. 14+75 -L- LT  
FROM STA. 13+85 TO STA. 14+50 -L- RT



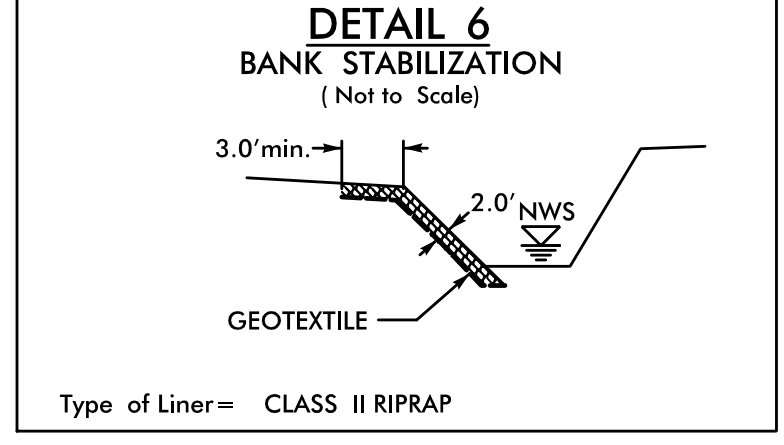
FROM STA. 13+67 -L- LT



FROM STA. 13+64 TO STA. 13+66 -L- RT



FROM STA. 10+50 TO STA. 11+56 -L- RT



FROM STA. 10+50 TO STA. 11+56 -L- RT

REVISIONS

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THE CONTRACTOR WILL PROVIDE AT LEAST THREE WEEKS NOTIFICATION TO THE RESIDENT ENGINEER AND DIVISION ENVIRONMENTAL OFFICER CONCERNING START OF WORK AT THE PROJECT TO ALLOW FOR APPROPRIATE CONTACT WITH PARTIES CONDUCTING THE PRE-CONSTRUCTION MUSSEL SURVEY AND RELOCATION ACTIVITIES. THE MUSSEL RELOCATION MUST OCCUR WITHIN THREE WEEKS PRIOR TO START OF IN-CHANNEL WORK. THE DIVISION ENVIRONMENTAL OFFICER WILL CONTACT APPROPRIATE PERSONNEL FROM RK&K TO SCHEDULE THE RELOCATION.

FOR -L- PROFILE, SEE SHEET 5  
FOR CULVERT PLANS, SEE SHEETS C-1 THRU C-4

5/14/99

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**CONSTRUCTION SEQUENCE**

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2. CONSTRUCT SOUTH BANK STRUCTURE FOOTINGS AND SOUTH BANK WORK.
3. REMOVE IMPERVIOUS DIKE A AND AND INSTALL IMPERVIOUS DIKE B. DEWATER NORTH BANK.
4. CONSTRUCT NORTH BANK STRUCTURE FOOTINGS AND NORTH BANK WORK.
5. REMOVE IMPERVIOUS DIKE B.
6. COMPLETE STRUCTURE AND ROADWAY.

**DETAIL 1**  
SPECIAL CUT DITCH  
(Not to Scale)

Type of Liner = Class B Rip-Rap  
Min. D = 1.0 Ft.  
Max. d = 1.0 Ft.

FROM STA. 10+50 TO STA. 11+95 -L- LT  
FROM STA. 12+50 TO STA. 13+50 -L- LT  
FROM STA. 12+70 TO STA. 13+50 -L- RT

**DETAIL 2**  
SPECIAL CUT DITCH  
(Not to Scale)

Type of Liner = Class I Rip-Rap  
Min. D = 1.5 Ft.  
Max. d = 1.0 Ft.

FROM STA. 13+83 TO STA. 14+75 -L- LT  
FROM STA. 13+85 TO STA. 14+50 -L- RT

**DETAIL 3**  
FALSE SUMP  
(Not to Scale)

S = Ditch Slope  
C = Proposed Ditch

STA. 13+67 -L- LT

**DETAIL 4**  
STANDARD BASE DITCH  
(Not to Scale)

\*When B is < 6.0'  
B = 2 Ft.

Type of Liner = Class I Rip-Rap  
FROM STA. 13+64 TO STA. 13+66 -L- RT

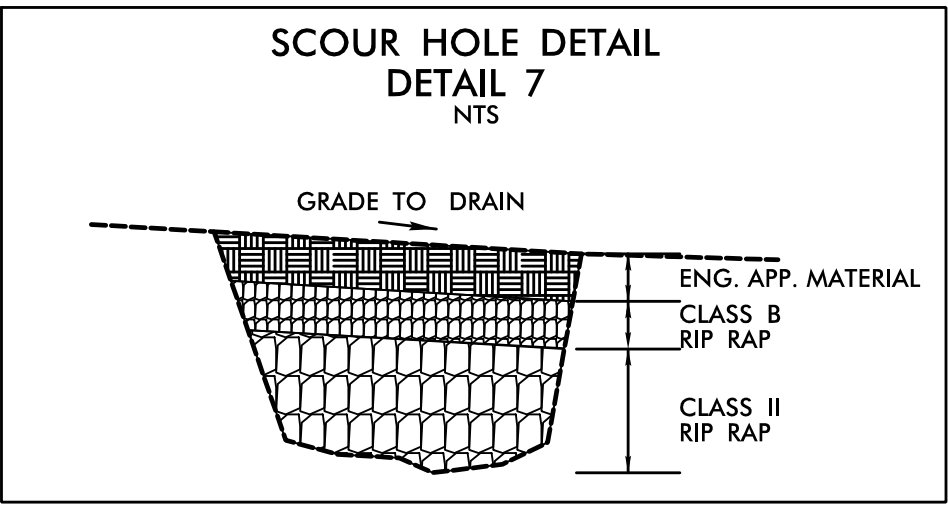
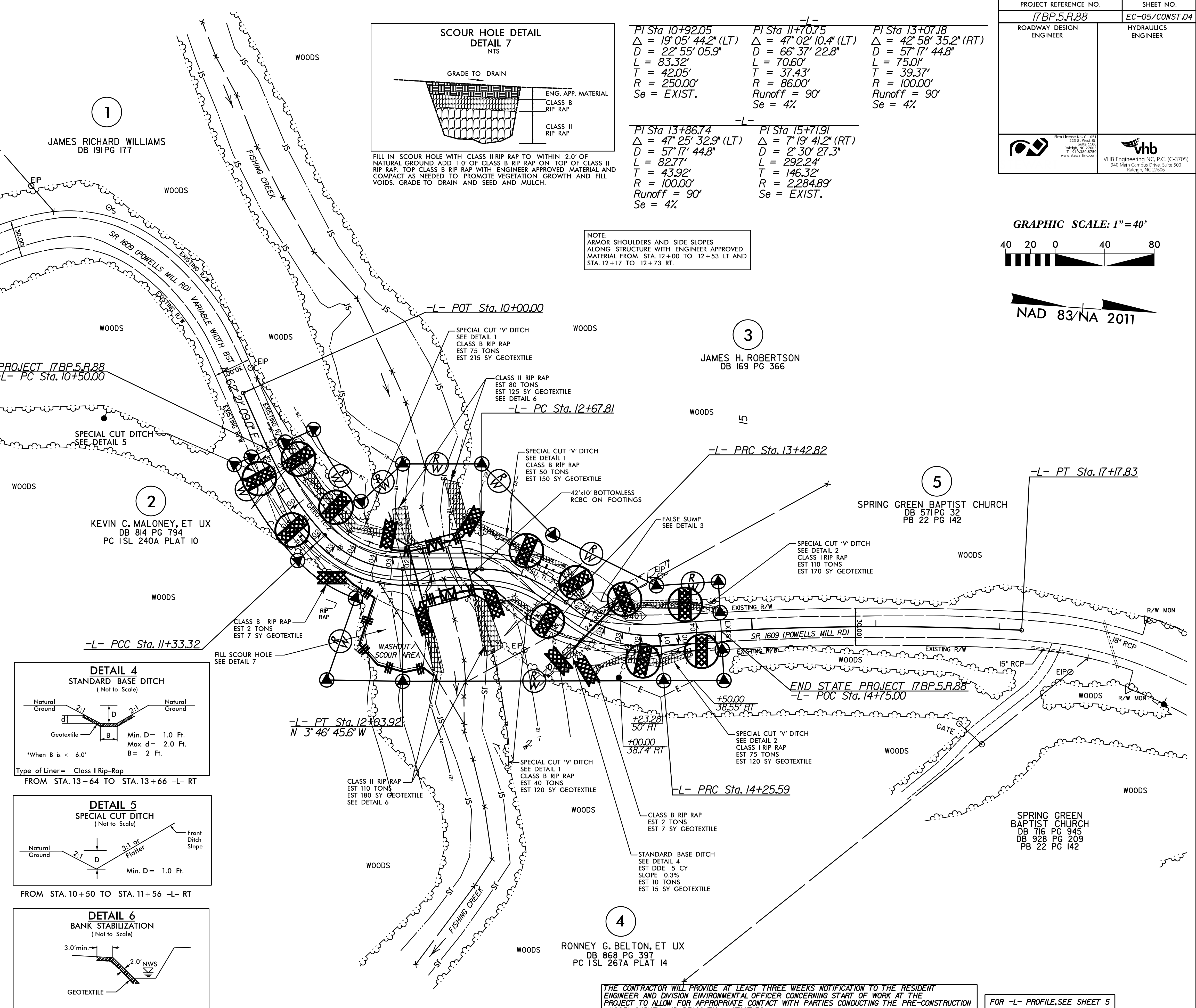
**DETAIL 5**  
SPECIAL CUT DITCH  
(Not to Scale)

Min. D = 1.0 Ft.

FROM STA. 10+50 TO STA. 11+56 -L- RT

**DETAIL 6**  
BANK STABILIZATION  
(Not to Scale)

Type of Liner = CLASS II RIPRAP



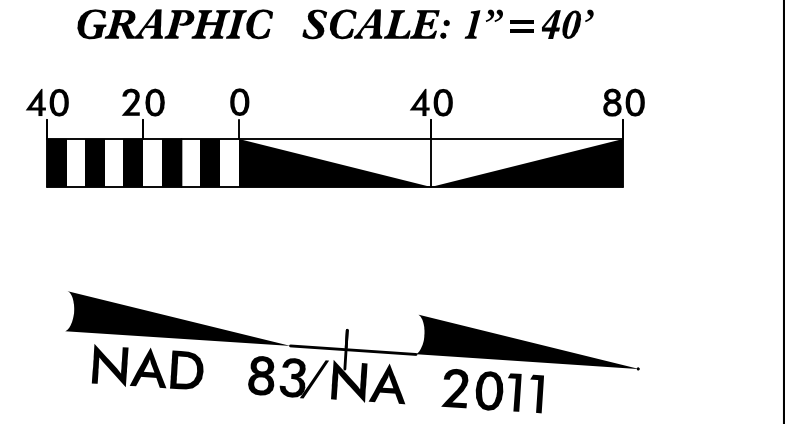
FILL IN SCOUR HOLE WITH CLASS II RIP RAP TO WITHIN 2.0' OF NATURAL GROUND. ADD 1.0' OF CLASS B RIP RAP ON TOP OF CLASS II RIP RAP. TOP CLASS B RIP RAP WITH ENGINEER APPROVED MATERIAL AND COMPACT AS NEEDED TO PROMOTE VEGETATION GROWTH AND FILL VOIDS. GRADE TO DRAIN AND SEED AND MULCH.

PI Sta 10+92.05	PI Sta 11+70.75	PI Sta 13+07.18
$\Delta = 19' 05' 44.2''$ (LT)	$\Delta = 47' 02' 10.4''$ (LT)	$\Delta = 42' 58' 35.2''$ (RT)
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NOTE:  
ARMOR SHOULDERS AND SIDE SLOPES ALONG STRUCTURE WITH ENGINEER APPROVED MATERIAL FROM STA. 12+00 TO 12+53 LT AND STA. 12+17 TO 12+73 RT.



REVISIONS

12:33 PM C:\Users\j... Environmental\Design\PSH\920135\_REU\_PSH04\_Final.dgn

THE CONTRACTOR WILL PROVIDE AT LEAST THREE WEEKS NOTIFICATION TO THE RESIDENT ENGINEER AND DIVISION ENVIRONMENTAL OFFICER CONCERNING START OF WORK AT THE PROJECT TO ALLOW FOR APPROPRIATE CONTACT WITH PARTIES CONDUCTING THE PRE-CONSTRUCTION MUSSEL SURVEY AND RELOCATION ACTIVITIES. THE MUSSEL RELOCATION MUST OCCUR WITHIN THREE WEEKS PRIOR TO START OF IN-CHANNEL WORK. THE DIVISION ENVIRONMENTAL OFFICER WILL CONTACT APPROPRIATE PERSONNEL FROM RK&K TO SCHEDULE THE RELOCATION.

FOR -L- PROFILE, SEE SHEET 5  
FOR CULVERT PLANS, SEE SHEETS C-1 THRU C-4

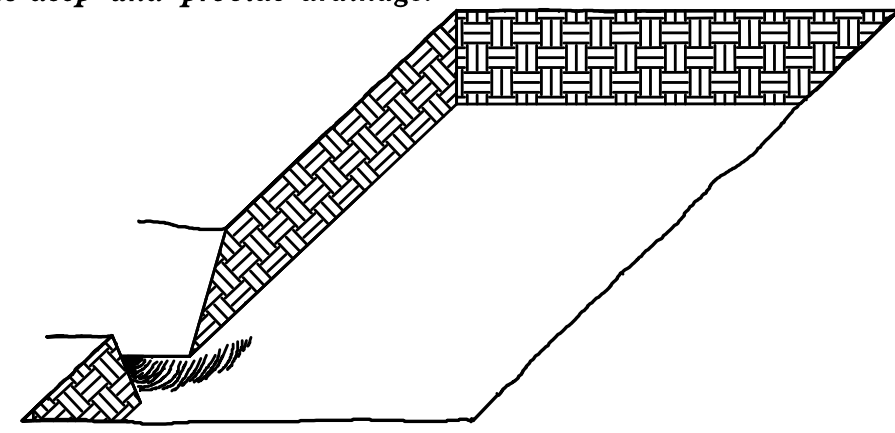
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.5.R.88	RF-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	

# PLANTING DETAILS

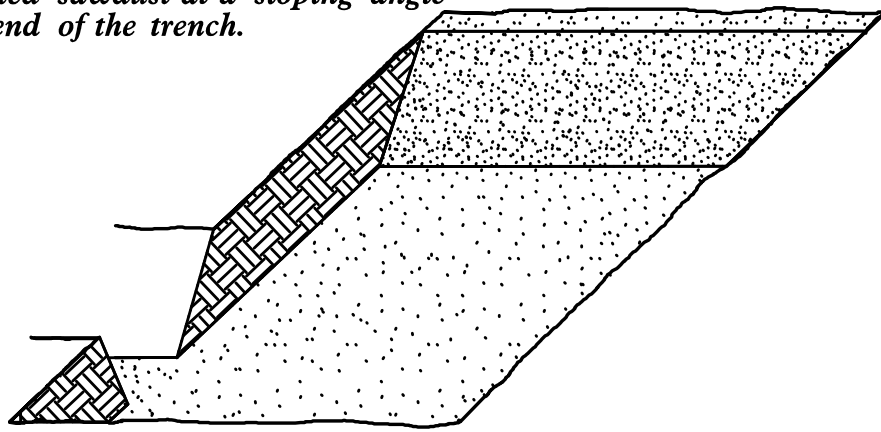
## SEEDLING / LINER BAREROOT PLANTING DETAIL

### HEALING IN

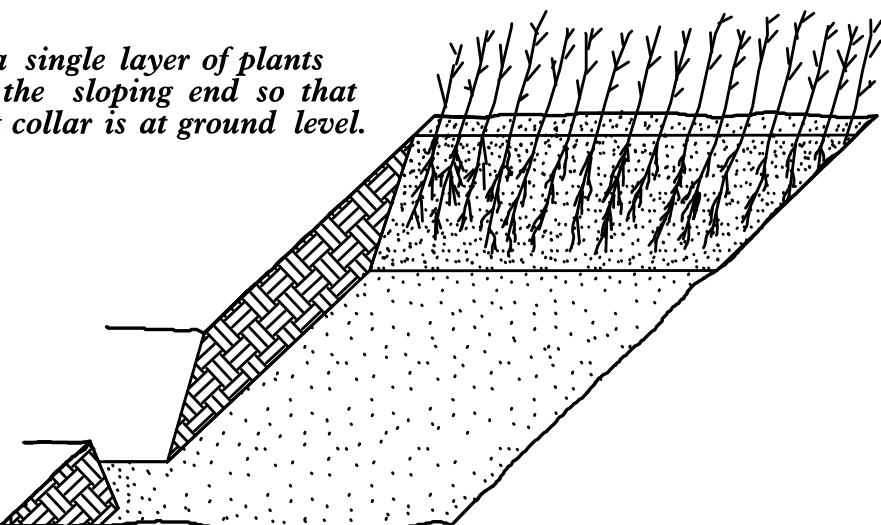
1. Locate a healing-in site in a shady, well protected area.
2. Excavate a flat bottom trench 12 inches deep and provide drainage.



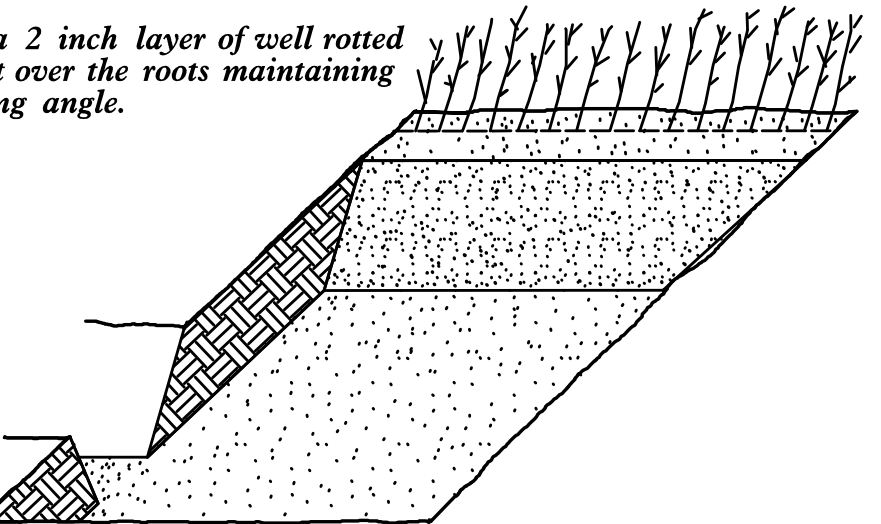
3. Backfill the trench with 2 inches well rotted sawdust. Place a 2 inch layer of well rotted sawdust at a sloping angle at one end of the trench.



4. Place a single layer of plants against the sloping end so that the root collar is at ground level.

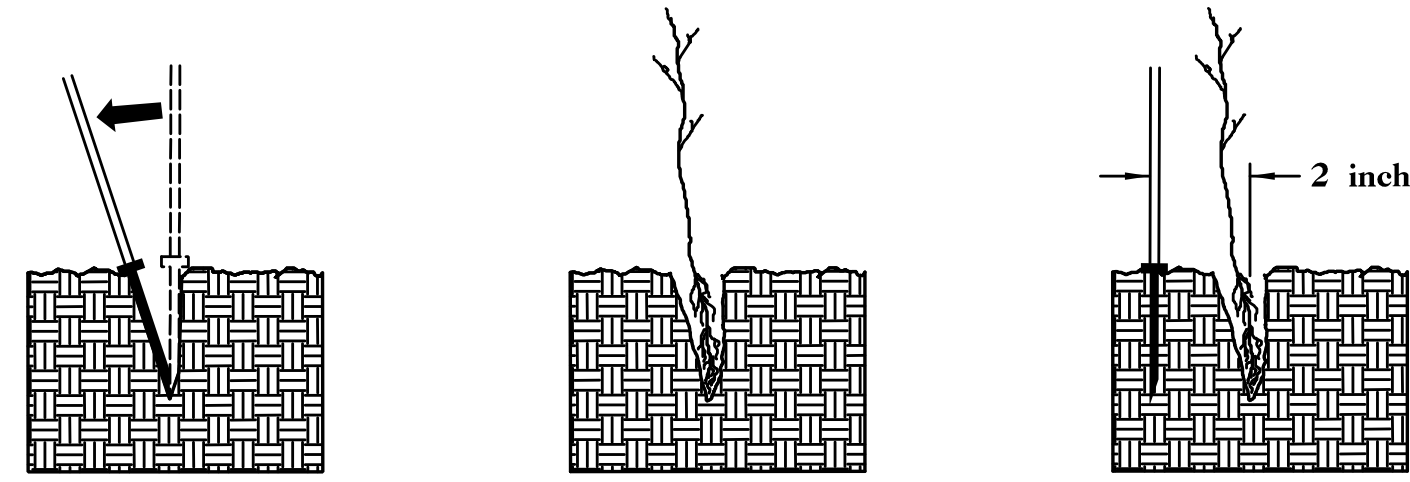


5. Place a 2 inch layer of well rotted sawdust over the roots maintaining a sloping angle.

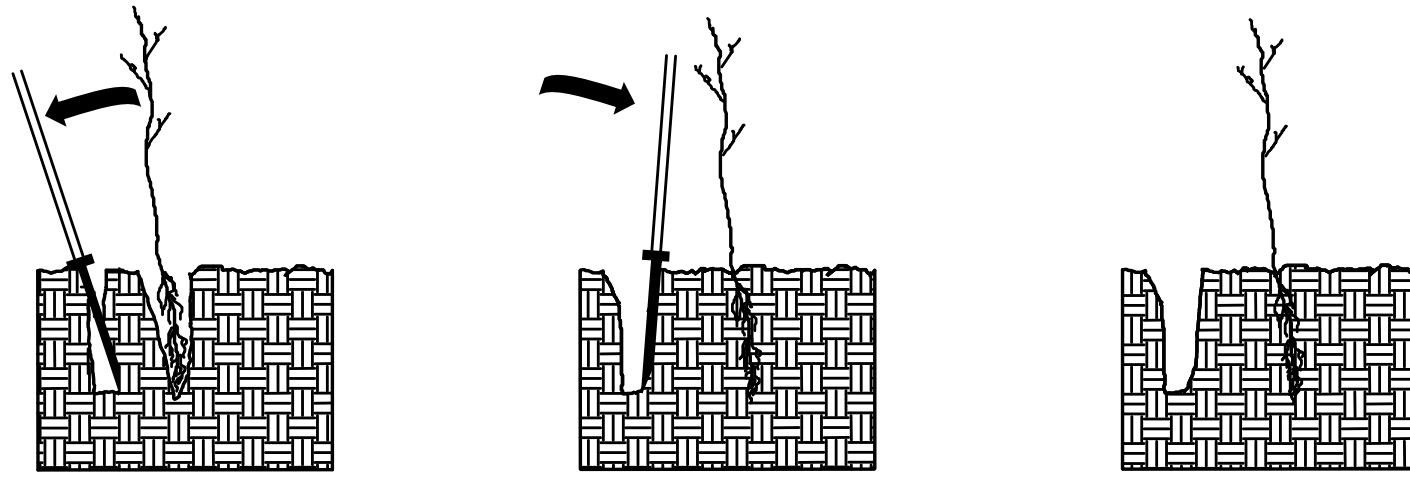


6. Repeat layers of plants and sawdust as necessary and water thoroughly.

### DIBBLE PLANTING METHOD USING THE KBC PLANTING BAR



1. Insert planting bar as shown and pull handle toward planter.
2. Remove planting bar and place seedling at correct depth.
3. Insert planting bar 2 inches toward planter from seedling.



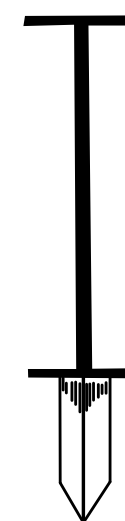
4. Pull handle of bar toward planter, firming soil at bottom.
5. Push handle forward firming soil at top.
6. Leave compaction hole open. Water thoroughly.

### PLANTING NOTES:

**PLANTING BAG**  
During planting, seedlings shall be kept in a moist canvas bag or similar container to prevent the root systems from drying.



**KBC PLANTING BAR**  
Planting bar shall have a blade with a triangular cross section, and shall be 12 inches long, 4 inches wide and 1 inch thick at center.



**ROOT PRUNING**  
All seedlings shall be root pruned, if necessary, so that no roots extend more than 10 inches below the root collar.

## REFORESTATION

- TREE REFORESTATION SHALL BE PLANTED 6 FT. TO 10 FT. ON CENTER, RANDOM SPACING, AVERAGING 8 FT. ON CENTER, APPROXIMATELY 680 PLANTS PER ACRE.

### REFORESTATION

MIXTURE, TYPE, SIZE, AND FURNISH SHALL CONFORM TO THE FOLLOWING:

33%	LIRIODENDRON TULIPIFERA	TULIP POPLAR	12 in - 18 in BR
33%	PLATANUS OCCIDENTALIS	AMERICAN SYCAMORE	12 in - 18 in BR
34%	BETULA NIGRA	RIVER BIRCH	12 in - 18 in BR

## REFORESTATION DETAIL SHEET

N.C.D.O.T. - ROADSIDE ENVIRONMENTAL UNIT

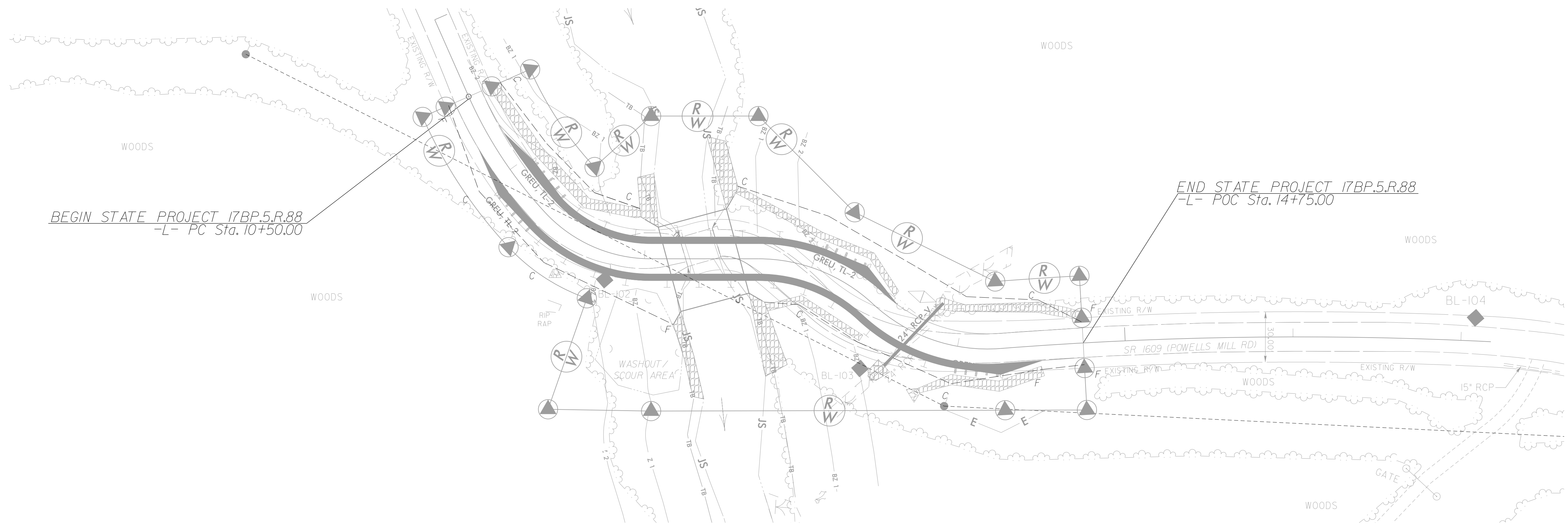
T.I.P. NO.	SHEET NO.
<b>17BP.5.R.88</b>	<b>UO-1</b>

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**UTILITIES BY OTHERS PLANS  
WARREN COUNTY**

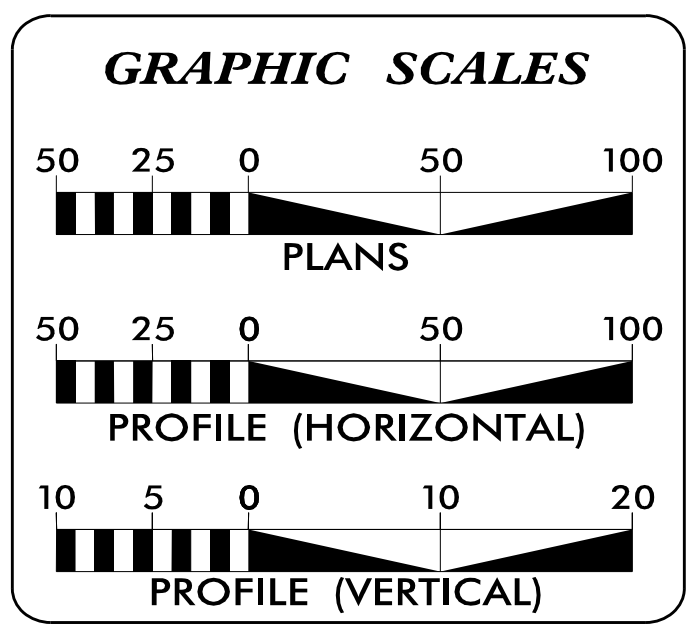
**LOCATION: BRIDGE NO. 135 OVER FISHING CREEK  
ON SR 1609 (POWELLS MILL RD)**

**TYPE OF WORK: POWER RELOCATION**



BEGIN STATE PROJECT 17BP.5.R.88  
-L- PC Sta. 10+50.00

END STATE PROJECT 17BP.5.R.88  
-L- POC Sta. 14+75.00



**INDEX OF SHEETS**

SHEET NO.	DESCRIPTION
UO-1	TITLE SHEET
UO-2	UTILITY BY OTHERS PLAN SHEET

**UTILITY OWNERS ON PROJECT**

(A) HALIFAX ELECTRIC - POWER

CONTACT: MIKE BUTTS  
MBUTTS@HALIFAXEMC.COM  
1-252-445-1198

PREPARED IN THE OFFICE OF:

**STEWART**

221 S. WEST ST., STE. 1100  
RALEIGH, NC 27603  
1-919-380-8728

From License # C-1051  
www.stewartinc.com  
PROJECT # 1711001

DAVID RUGGLES, PE PROJECT ENGINEER  
ELIZABETH PHELPS, EI PROJECT DESIGN ENGINEER

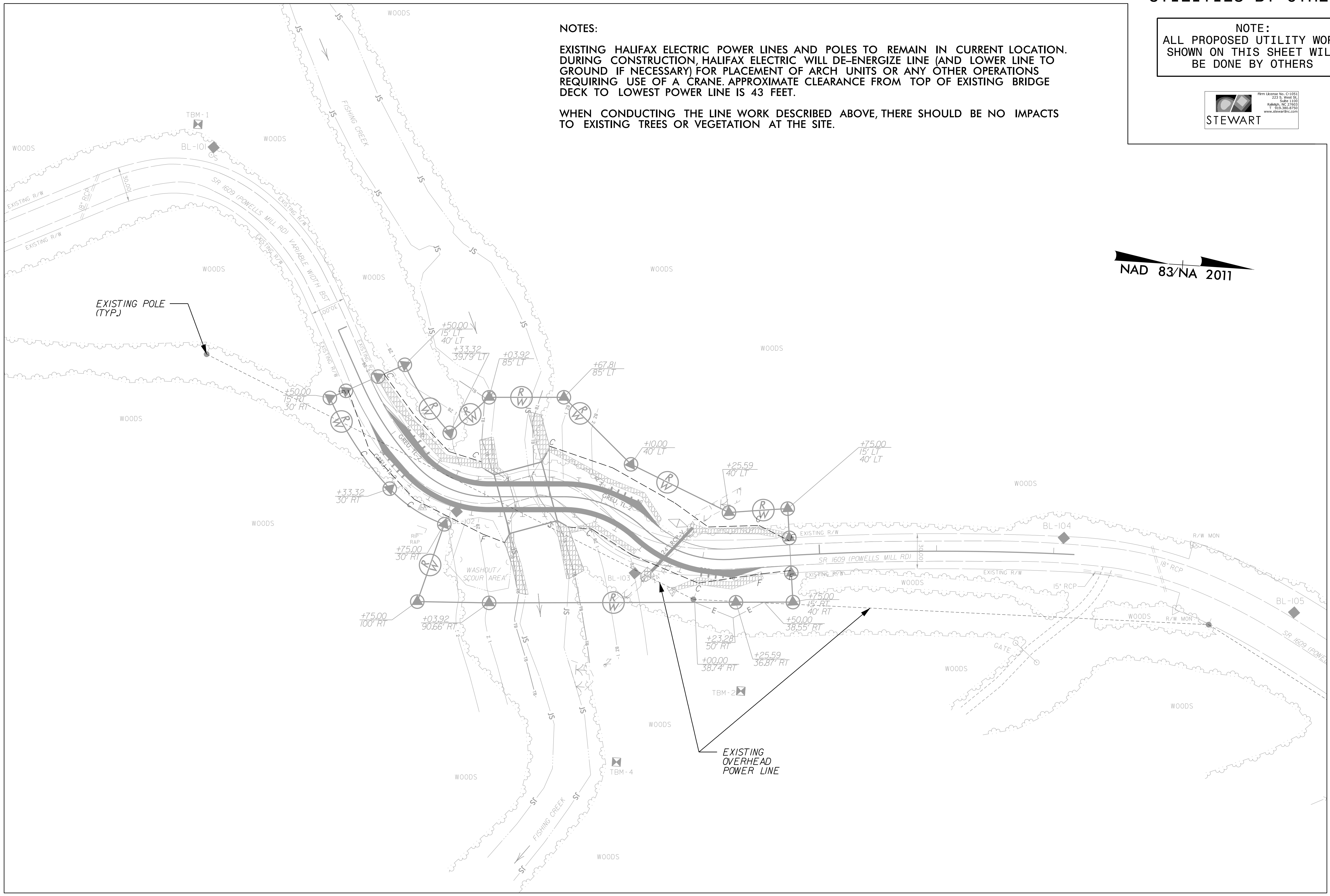
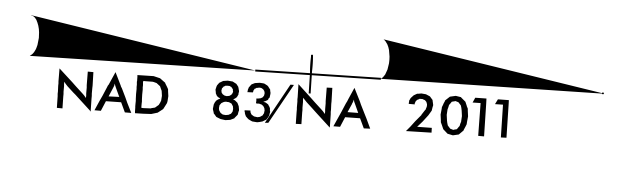
### UTILITIES BY OTHERS

**NOTE:**  
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS



**NOTES:**  
EXISTING HALIFAX ELECTRIC POWER LINES AND POLES TO REMAIN IN CURRENT LOCATION. DURING CONSTRUCTION, HALIFAX ELECTRIC WILL DE-ENERGIZE LINE (AND LOWER LINE TO GROUND IF NECESSARY) FOR PLACEMENT OF ARCH UNITS OR ANY OTHER OPERATIONS REQUIRING USE OF A CRANE. APPROXIMATE CLEARANCE FROM TOP OF EXISTING BRIDGE DECK TO LOWEST POWER LINE IS 43 FEET.

WHEN CONDUCTING THE LINE WORK DESCRIBED ABOVE, THERE SHOULD BE NO IMPACTS TO EXISTING TREES OR VEGETATION AT THE SITE.



EXISTING POLE (TYP.)

EXISTING OVERHEAD POWER LINE

8/17/99

1/15/2009  
I:\5160\Projects\120135\_UTL\_SH2.dgn  
I:\5160\Projects\120135\_UTL\_SH2.dgn

**STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS**

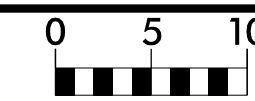
**CROSS-SECTION SUMMARY**

'NOTE: EMBANKMENT COLUMN INCLUDES BACKFILL FOR UNDERCUT

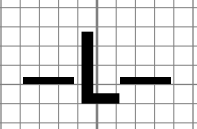
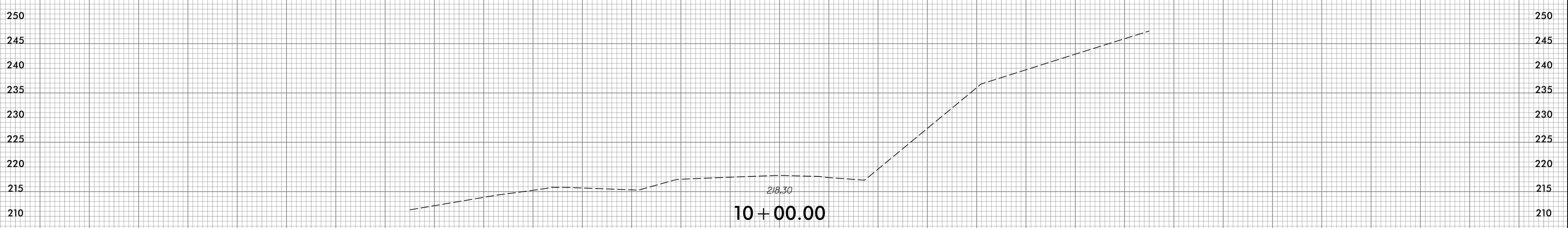
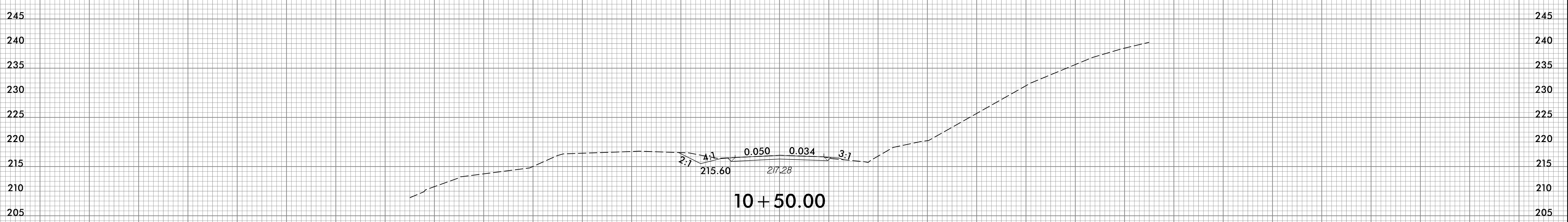
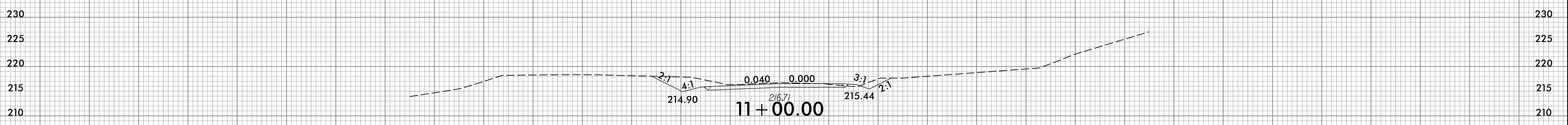
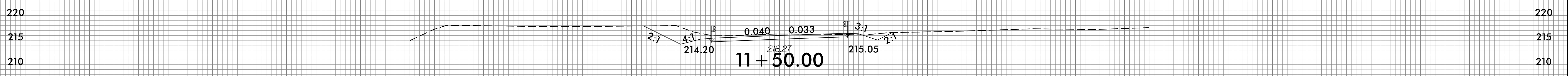
Station	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
10+50.00	0	0
11+00.00	66	2
11+50.00	95	1
12+00.00	61	41
12+14.00	4	21
12+50.00	6	131
13+00.00	99	148
13+50.00	218	0
14+00.00	172	1
14+50.00	72	5
14+75.00	18	2

**Approximate quantities only. Unclassified excavation, borrow excavation, fine grading, clearing and grubbing, breaking of existing pavement and removal of existing pavement will be paid for at the lump sum price for "Grading".**

REVISIONS



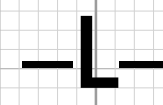
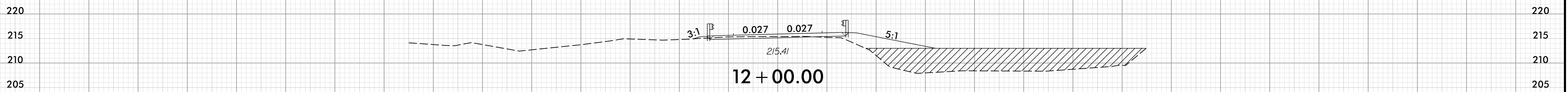
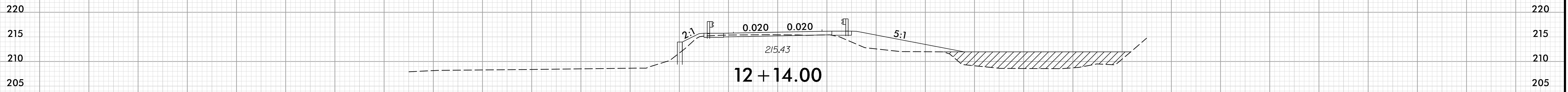
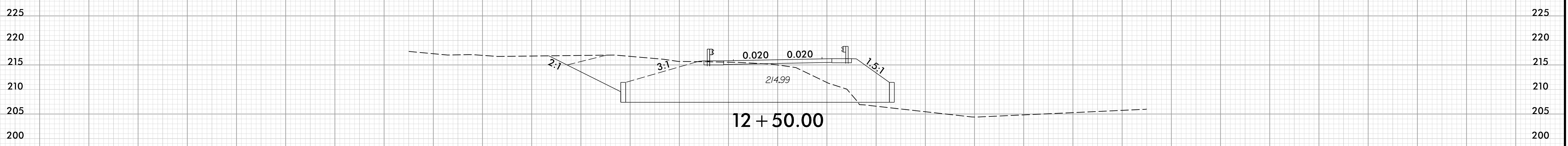
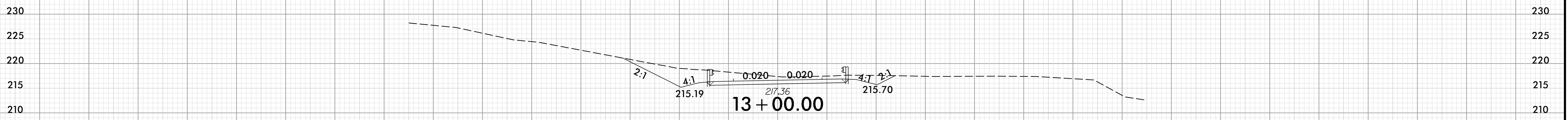
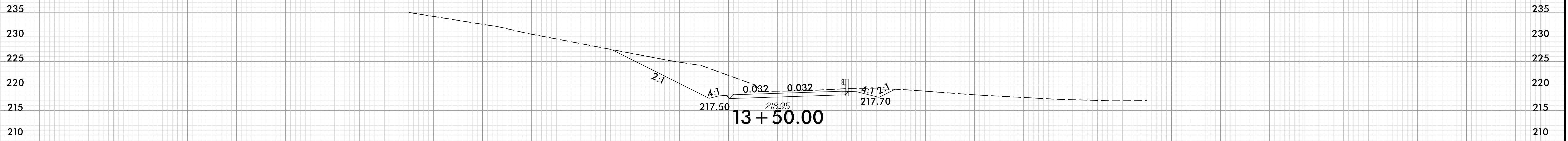
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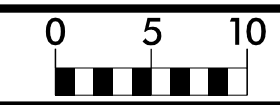


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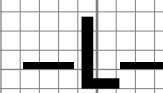
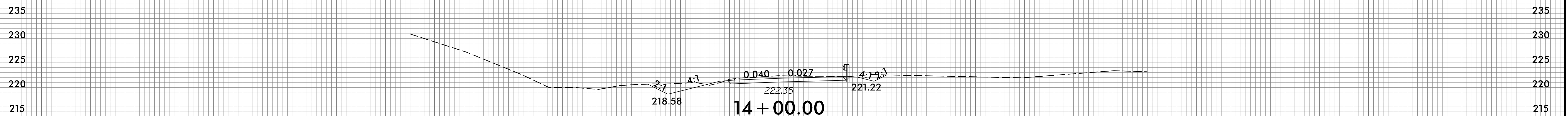
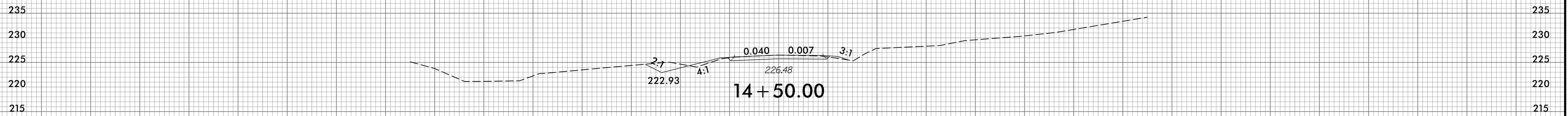
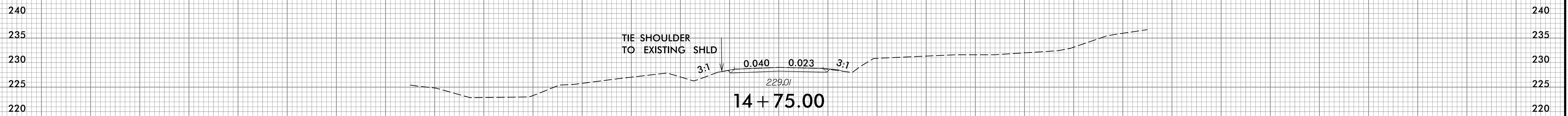
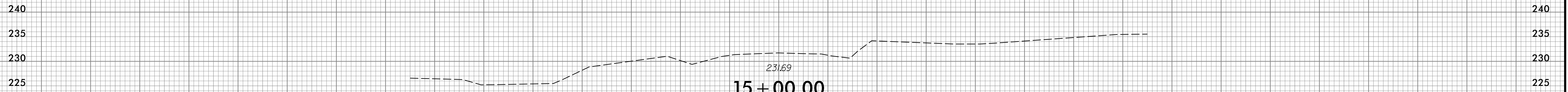
8/23/99



PROJ. REFERENCE NO.  
17BP.5.R.88

SHEET NO.  
X-3

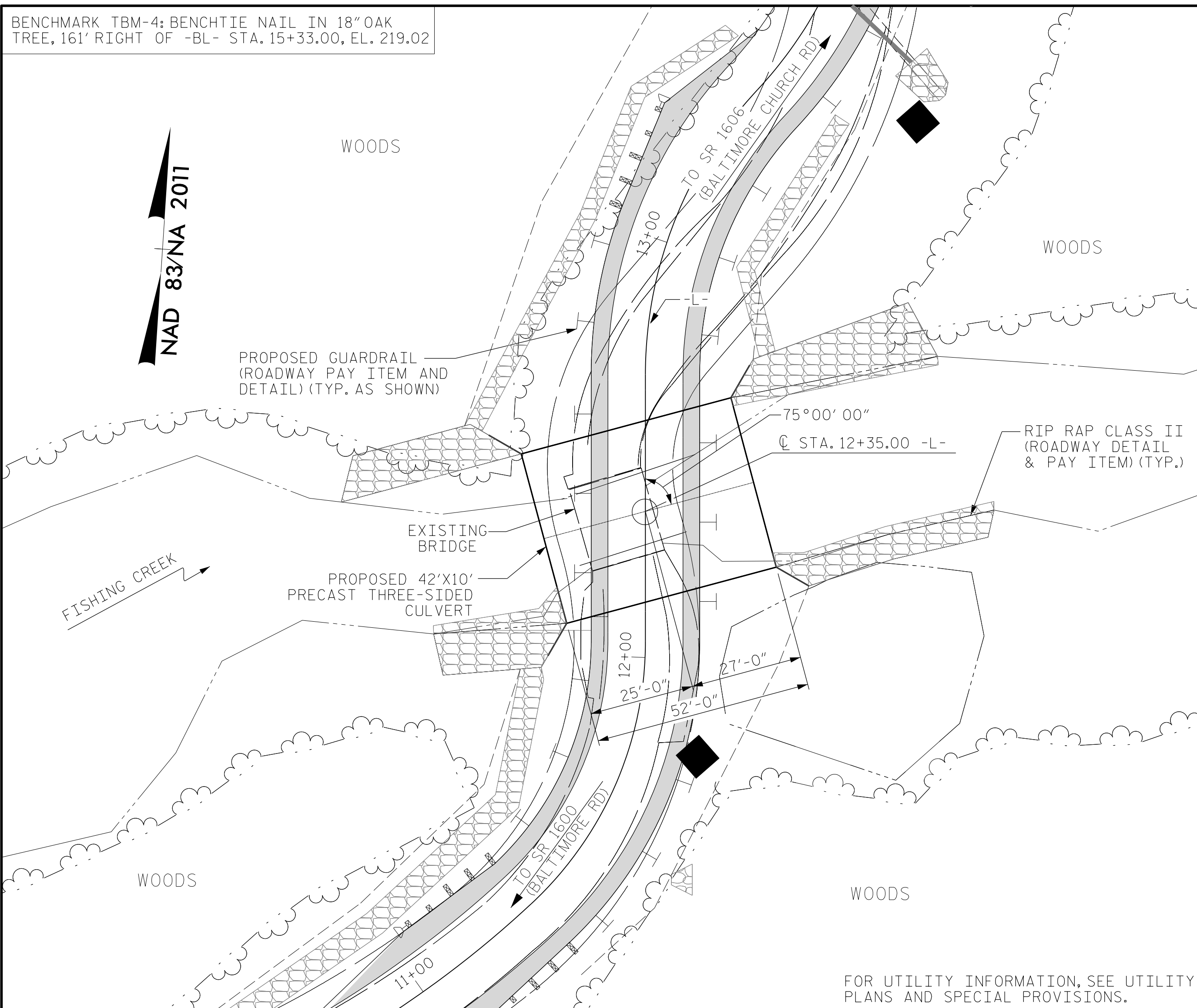
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3/18/2019  
J:\EPCOR\williams

BENCHMARK TBM-4: BENCHTIE NAIL IN 18" OAK TREE, 161' RIGHT OF -BL- STA. 15+33.00, EL. 219.02



LOCATION SKETCH

NOTES:

1. ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
2. DESIGN FILL IS 1.0 FEET.
3. THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.
4. THE SURVEYOR SHALL CHECK THE LENGTH OF CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.
5. THE EXISTING STRUCTURE CONSISTING OF 1 SPAN @ 20'-8" WITH A TIMBER DECK ON STEEL I-BEAMS AND A CLEAR ROADWAY OF 17'-2" ON TIMBER CAPS ON RUBBLE MASONRY ABUTMENTS AND LOCATED AT THE POSTED SITE SHALL BE REMOVED.
6. REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE EXISTING BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.
7. THE BOTTOM OF FOOTING ELEVATIONS MAY BE LOWERED IN ORDER TO SATISFY BEARING CAPACITY AND MINIMUM EMBEDMENT REQUIREMENTS.
8. FOR PRECAST REINFORCED CONCRETE THREE-SIDED CULVERT, SEE SPECIAL PROVISIONS.
9. THE PRECAST CULVERT SECTIONS AND WINGS SHALL BE DESIGNED TO HANDLE FULL DEPTH HYDROSTATIC PRESSURE IF WEEP HOLES ARE NOT UTILIZED. IF PROVIDED, WEEP HOLES SHALL BE LOCATED A MINIMUM HEIGHT OF 6 INCHES ABOVE THE NORMAL FLOW LINE AND HAVE A MAXIMUM SPACING OF 10 FEET.
10. INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 12+35.00 -L-."
11. FOR OTHER DESIGN DATA AND NOTES, SEE STANDARD NOTES SHEET.
12. FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
13. FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
14. FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
15. FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
16. FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
17. FOR CONCRETE SLAB BELOW GUARDRAIL, SEE SPECIAL PROVISIONS.
18. FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.
19. NO EQUIPMENT OR COMPONENTS WILL BE PLACED/STAGED IN FISHING CREEK.
20. THE BRIDGE WILL BE REMOVED FROM THE TOP DOWN, FIRST REMOVING THE ASPHALT WITH CONTAINMENT MEASURES IN PLACE TO PREVENT COMPONENTS OF THE BRIDGE DECK FROM DROPPING INTO THE STREAM. THE METHOD OF CONTAINMENT WILL BE PROPOSED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER. THIS WILL BE FOLLOWED BY REMOVAL OF THE RAIL, DECKING, GIRDERS, ETC. THE CONTRACTOR WILL THEN COMPLETELY ISOLATE THE MASONRY ABUTMENTS USING AN IMPERVIOUS DIKE IN THE STREAM TO ALLOW FOR COMPLETE REMOVAL OF THE ABUTMENTS. THE CONTRACTOR WILL INSTALL ADDITIONAL IMPERVIOUS DIKES IN THE STREAM AS NECESSARY TO ALLOW FOR CONSTRUCTION IN THE DRY OF THE STRUCTURE FOOTINGS AND FOR INSTALLATION OF THE CLASS II RIP RAP BANK STABILIZATION. ALL CONSTRUCTION EQUIPMENT AND PORTIONS OF THE CULVERT STRUCTURE NECESSARY TO COMPLETE THE PROJECT WILL REMAIN BEHIND THE IMPERVIOUS DIKE WHILE WITHIN THE BANKS OF FISHING CREEK. DECK DRAINS WILL NOT BE ALLOWED TO DISCHARGE DIRECTLY INTO THE STREAM.

FOUNDATION NOTES:

1. CARRY IN FOOTINGS FOR THE 3 SIDED CULVERT AT STATION 12+35.00 -L- AT LEAST 12" INTO ROCK WITH A MINIMUM THICKNESS AS SHOWN IN THE PLANS.

ROADWAY DATA

GRADE POINT ELEV. @ STATION 12+35.00 -L- = 216.01  
 TOP OF FOOTING ELEV. @ STATION 12+35.00 -L- = 204.00  
 ROADWAY SLOPES 2:1

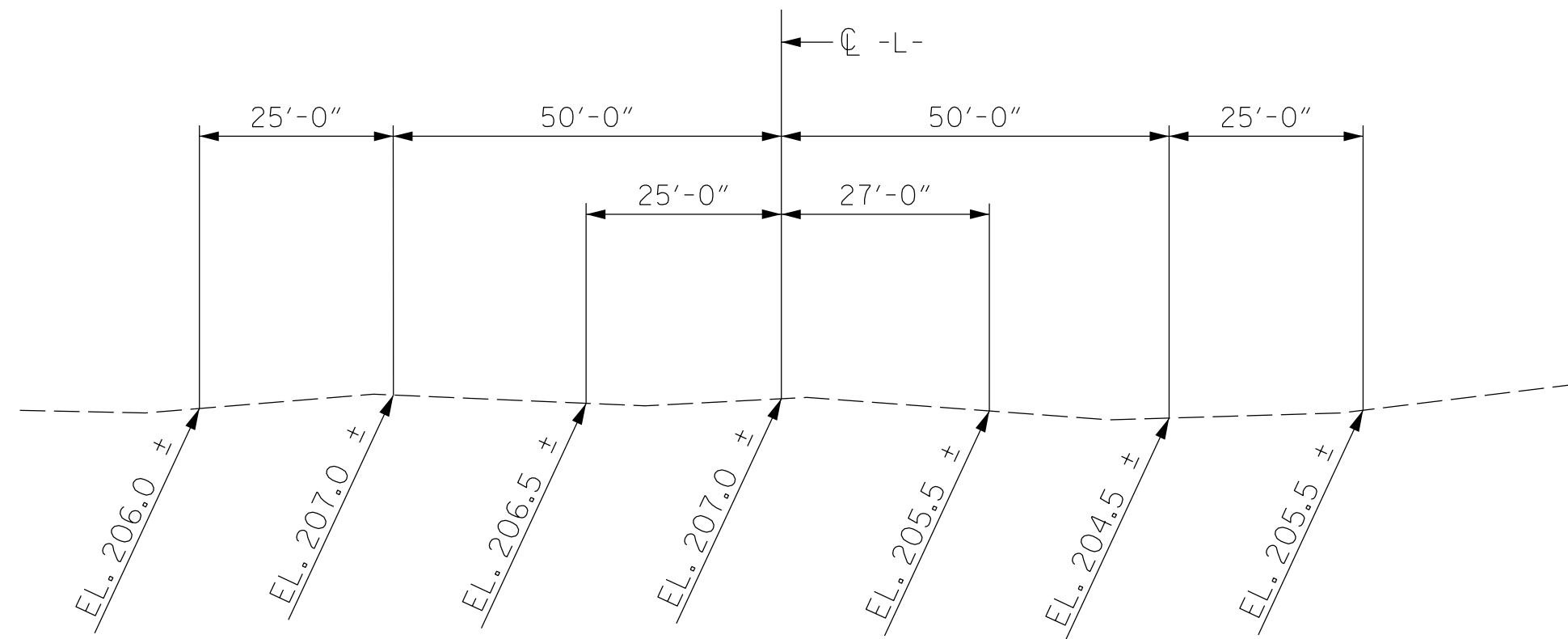
HYDRAULIC DATA

DESIGN DISCHARGE 2600 CFS  
 FREQUENCY OF DESIGN FLOOD 2 YR.  
 DESIGN HIGHWATER ELEV. 220.6 FT.  
 DRAINAGE AREA 75.8 SQ. MI.  
 BASE DISCHARGE (Q100) 11147 CFS  
 BASE HIGHWATER ELEV. 229.3 FT.

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE 824 CFS  
 FREQUENCY OF OVERTOPPING FLOOD <2 YR.  
 OVERTOPPING FLOOD ELEV. 216.1 FT. \*

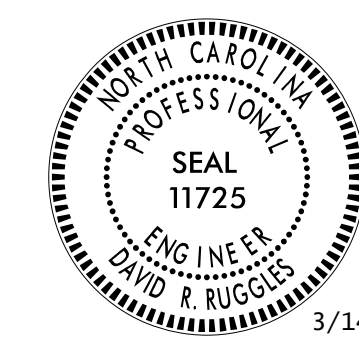
\* OVERTOPS AT STA. 12+00 -L-



PROFILE ALONG C OF CULVERT

TOTAL STRUCTURE QUANTITIES	
REMOVAL OF EXISTING STRUCTURE @ STA. 12+35.00 -L-	LUMP SUM
ASBESTOS ASSESSMENT	LUMP SUM
CLASS A CONCRETE *	61 CU. YDS.
REINFORCING STEEL *	7487 LBS.
42'X10' PRECAST REINFORCED CONCRETE THREE-SIDED CULVERT @ STA. 12+35.00 -L-	LUMP SUM

\* INCLUDES CULVERT FOOTINGS AND GUARDRAIL FOOTINGS



Designed by: David Ruggles  
 C482780DF412422

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

**STEWART**  
 Firm License No. C-1051  
 223 S. West St.  
 Suite 1100  
 Raleigh, NC 27603  
 T 919.380.8750  
 www.stewartinc.com

PROJECT NO. 17BP.5.R.88  
 WARREN COUNTY  
 STATION: 12+35.00 -L-

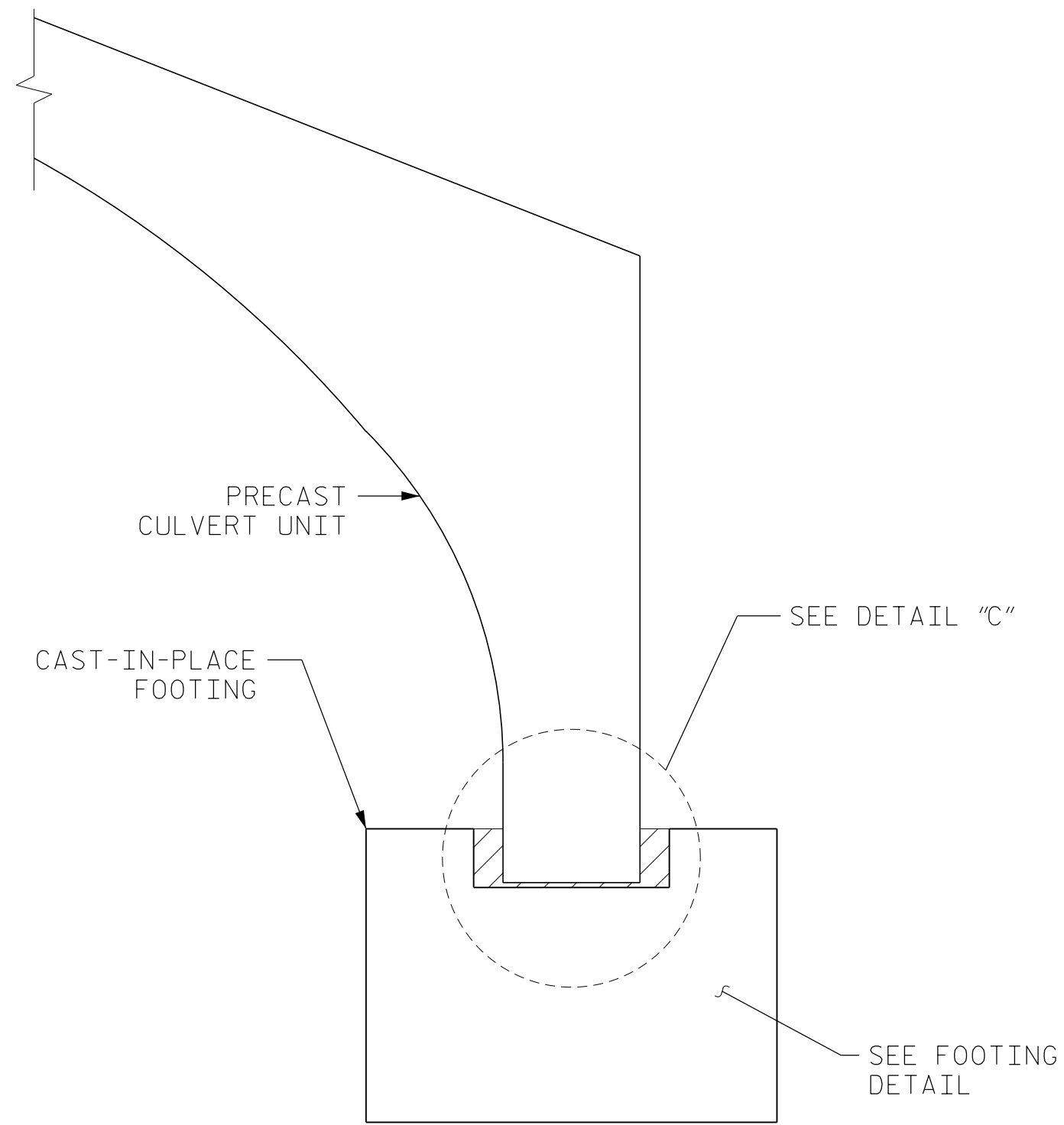
SHEET 1 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
PRECAST REINFORCED CONCRETE THREE-SIDED CULVERT 75° SKEW					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					C-1
					TOTAL SHEETS 5

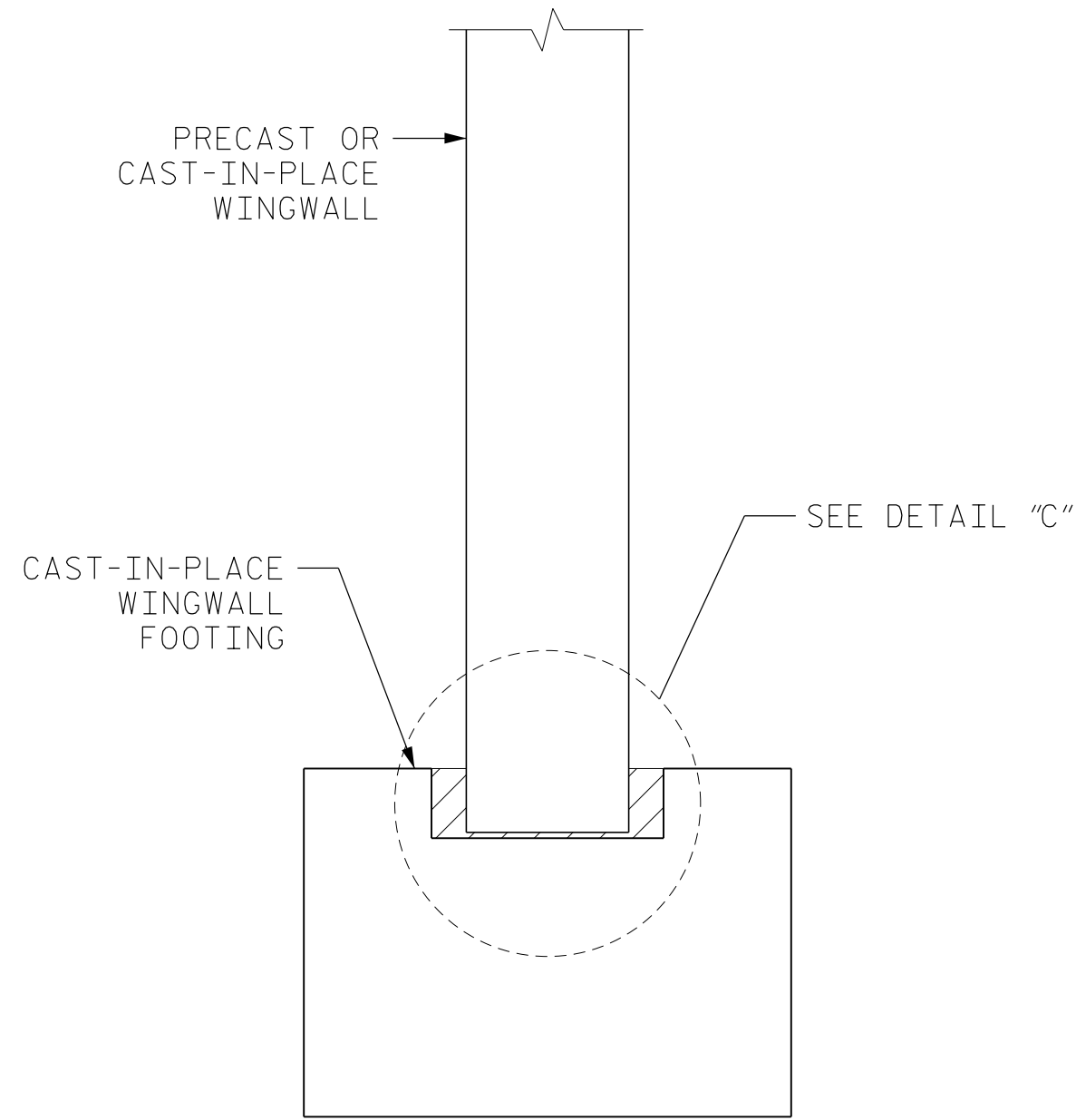
17BP.5.R.88  
 1/31/2022  
 \\400-001-Warren-135-SMU-L501-C-1.dgn  
 USER:ephelps

DRAWN BY: E. PHELPS DATE: 4/18  
 CHECKED BY: D. RUGGLES DATE: 4/18  
 DESIGN ENGINEER OF RECORD: D. RUGGLES DATE: 4/18



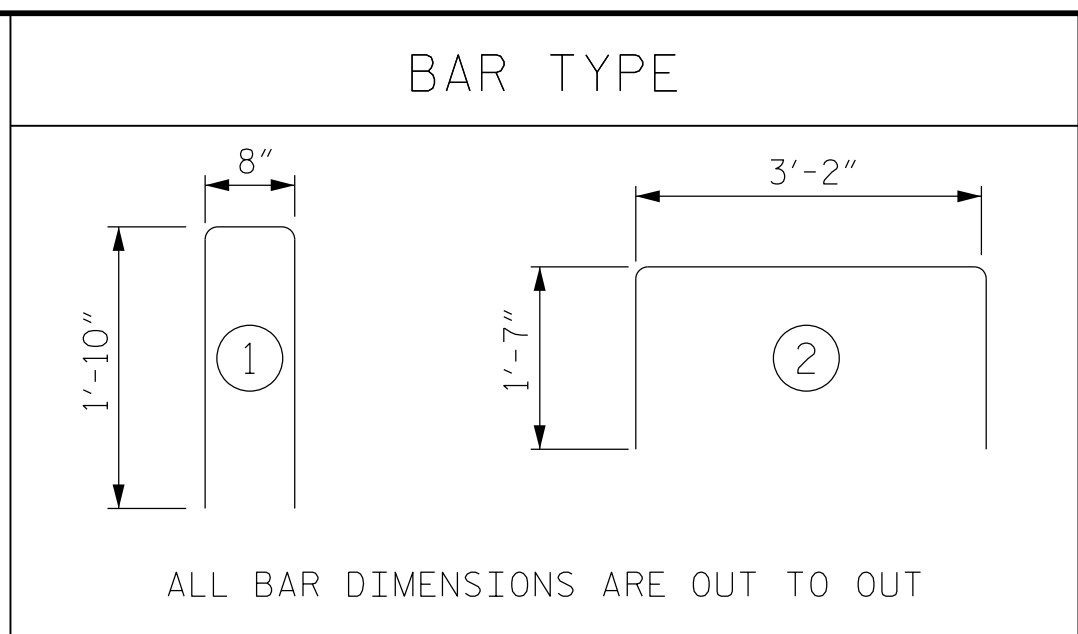


SECTION A-A

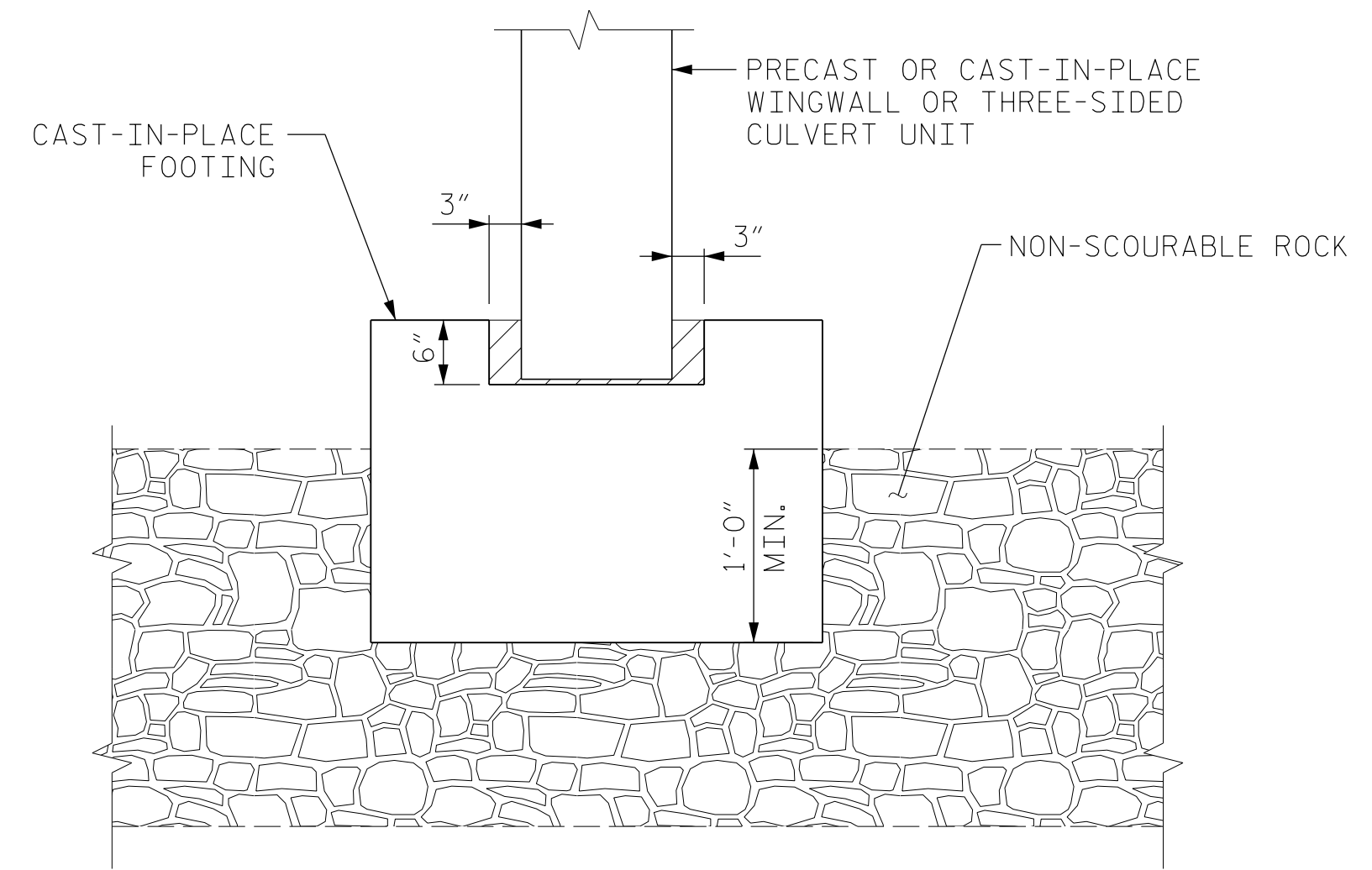


SECTION THRU WINGWALL

CONTRACTOR SUBMITTAL OF WORKING DRAWINGS FOR PRECAST CULVERT SHALL INCLUDE WINGWALLS.

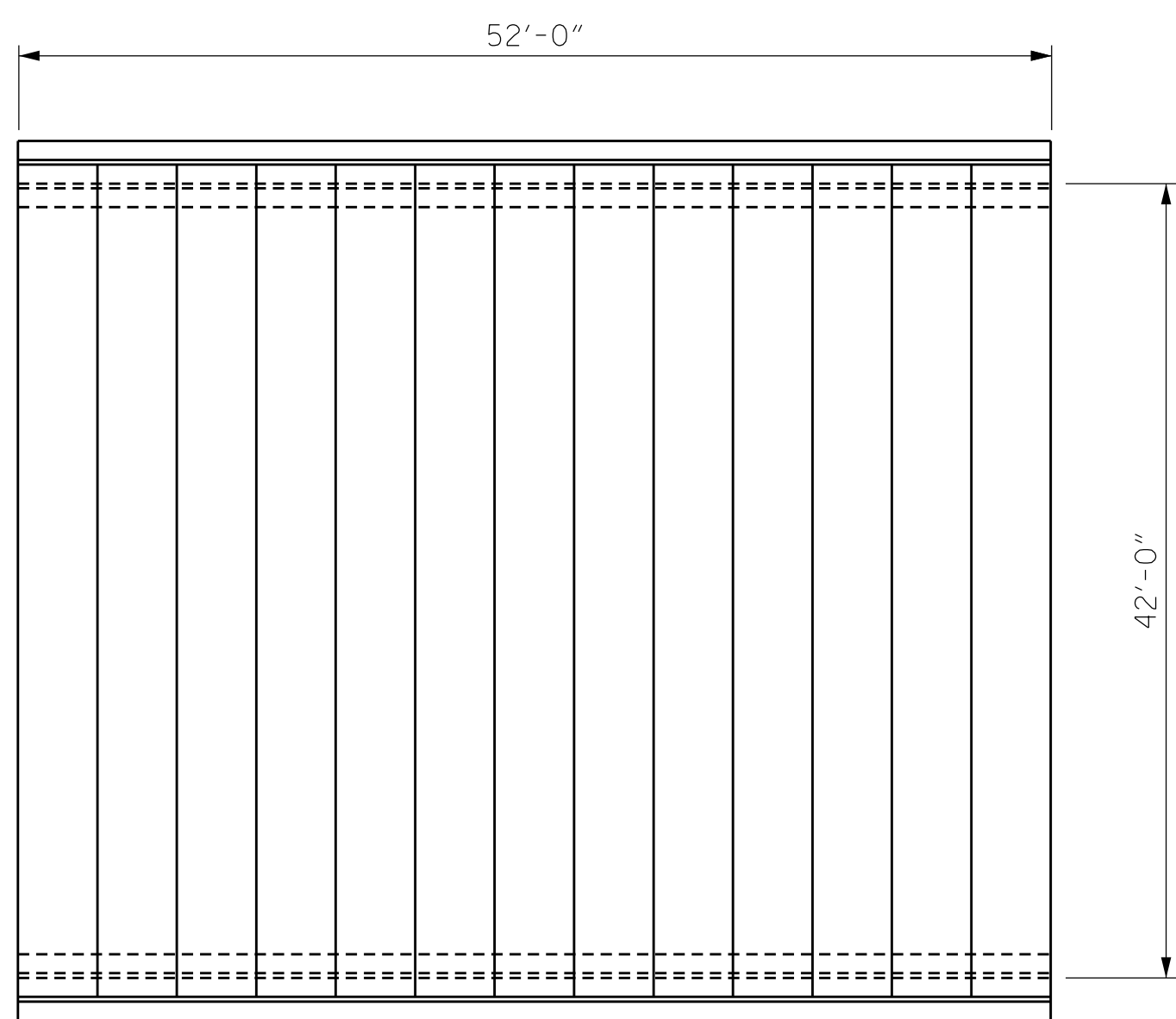


BILL OF MATERIAL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	320	#4	1	4'-4"	926
B1	320	#5	2	6'-4"	2114
C1	48	#6	STR	19'-8"	1418
C2	32	#6	STR	15'-6"	745
REINFORCING STEEL				LBS.	5203
CLASS A CONCRETE				CU.YDS.	47.4

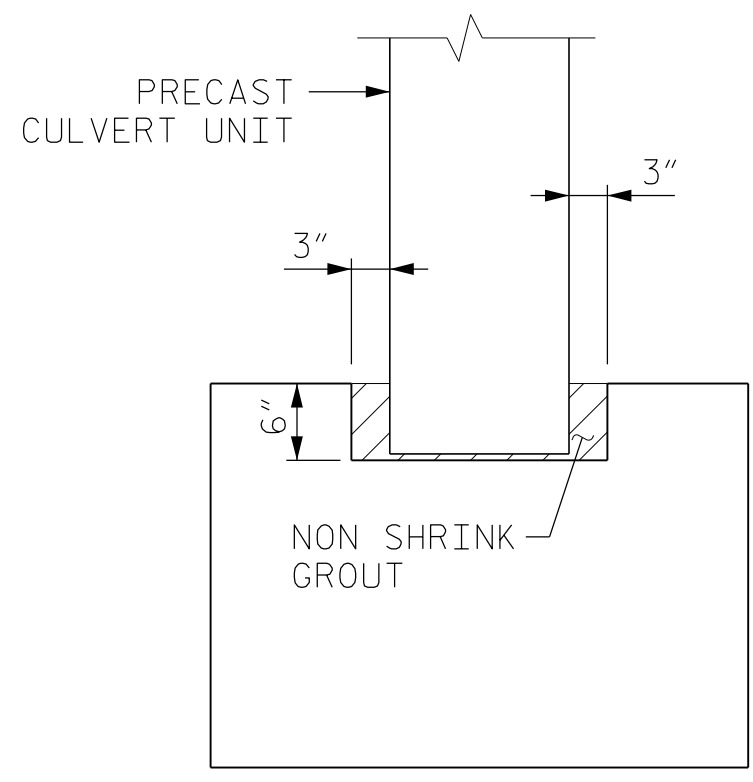


KEYED FOOTING DETAIL

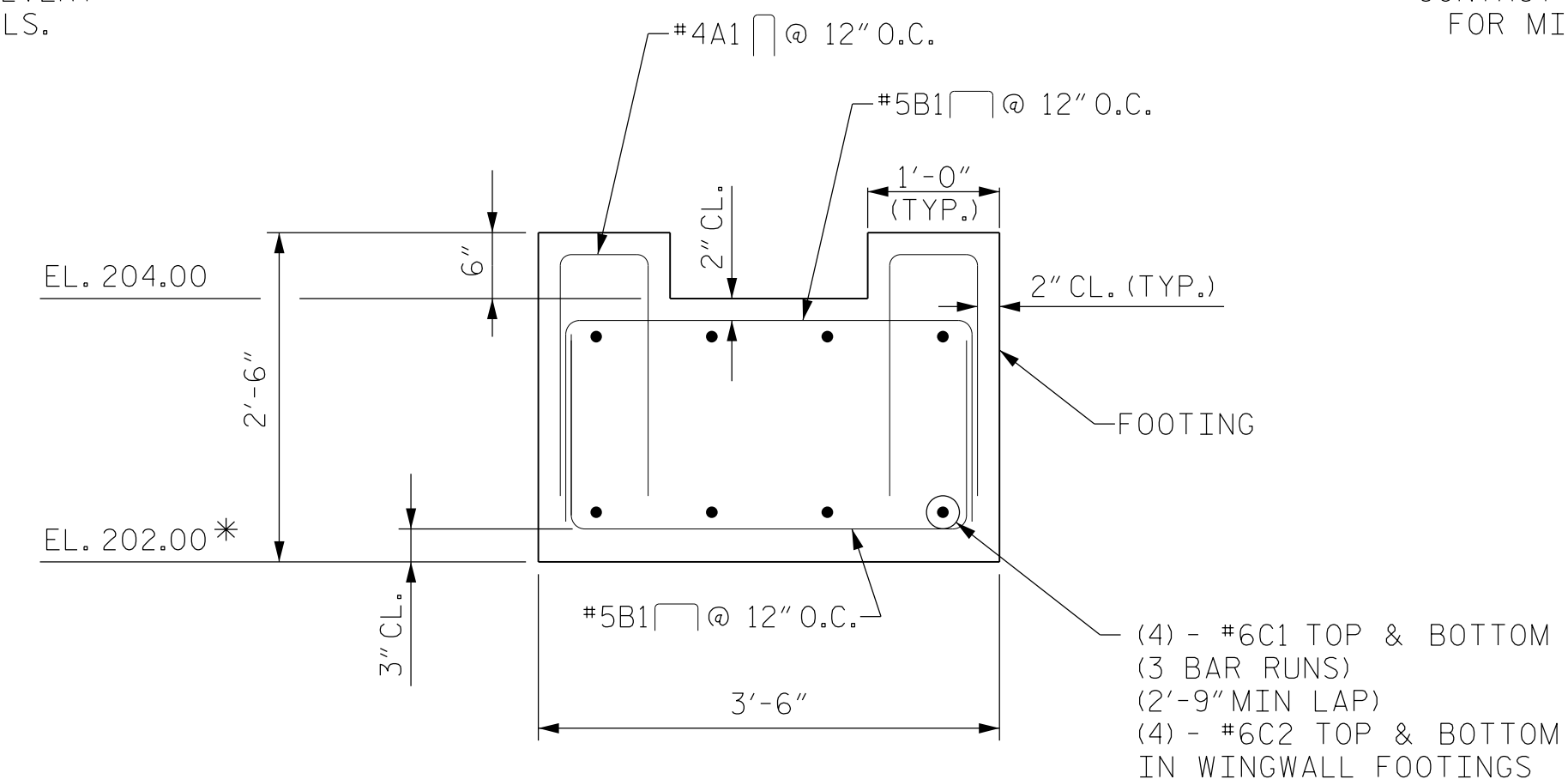
SIDES OF ALL FOOTINGS SHALL BE IN CONTACT WITH NON-SCOURABLE ROCK FOR MINIMUM DIMENSION SHOWN



PLAN OF CONCRETE ARCH



DETAIL "C"



FOOTING DETAIL

\* ADJUST BOTTOM OF FOOTING ELEVATION AS REQUIRED TO PROVIDE 1'-0" MINIMUM KEY INTO ROCK. EXTEND REINFORCEMENT AS REQUIRED.

PROJECT NO. 17BP.5.R.88

WARREN COUNTY

STATION: 12+35.00 -L-

SHEET 3 OF 4



DocuSigned by:  
David Ruggles  
C46278DF4F322  
3/14/2022  
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223 S. West St.  
Suite 1100  
Raleigh, NC 27603  
T 919.380.8750  
www.stewartinc.com



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
PRECAST  
REINFORCED CONCRETE  
THREE-SIDED CULVERT  
75° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-3
1			3			TOTAL SHEETS 5
2			4			

DRAWN BY: E. PHELPS DATE: 4/18  
CHECKED BY: D. RUGGLES DATE: 4/18  
DESIGN ENGINEER OF RECORD: D. RUGGLES DATE: 4/18

17BP.5.R.88  
1/31/2022  
\\400\_003\_Warren\_135\_SMU\_TS02-C-3.dgn  
USER:ephelps

NOTES

EACH POST SHALL BE PROVIDED WITH A 1/2" X 1'-3" THREADED STEEL ROD WITH GALVANIZED NUTS AND WASHERS.

INSTALL RODS ON POSTS BEFORE CONCRETE IS CAST. POSTS SHALL BE PLACED IN FINAL POSITION BEFORE CONCRETE IS CAST.

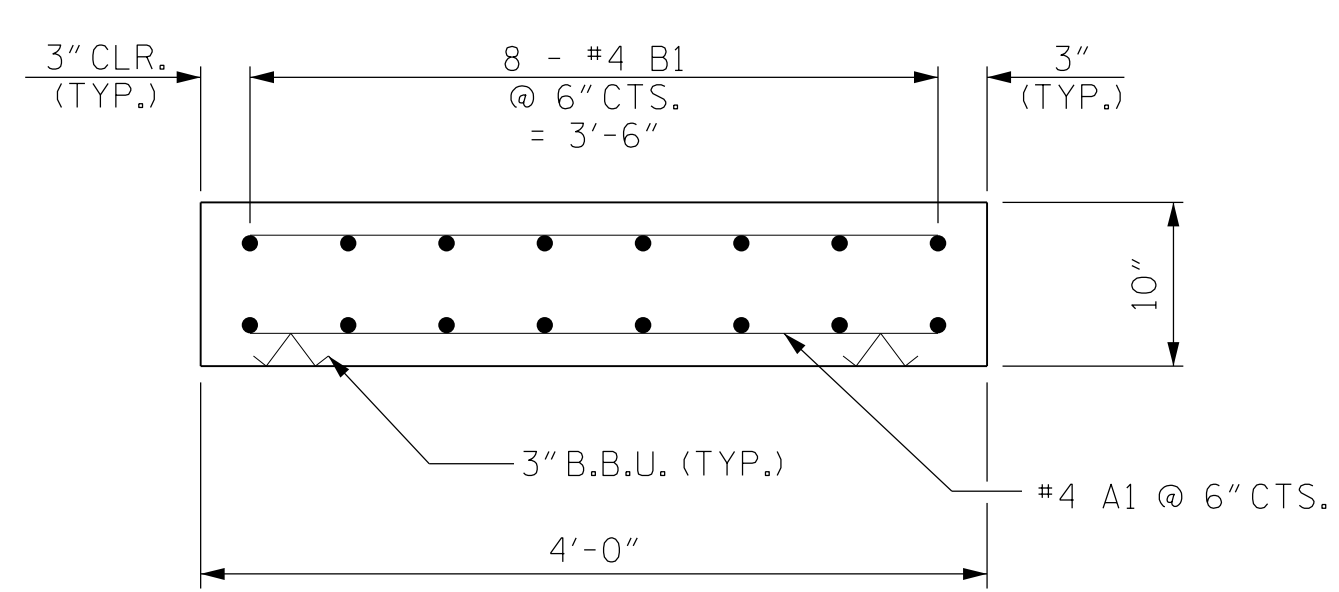
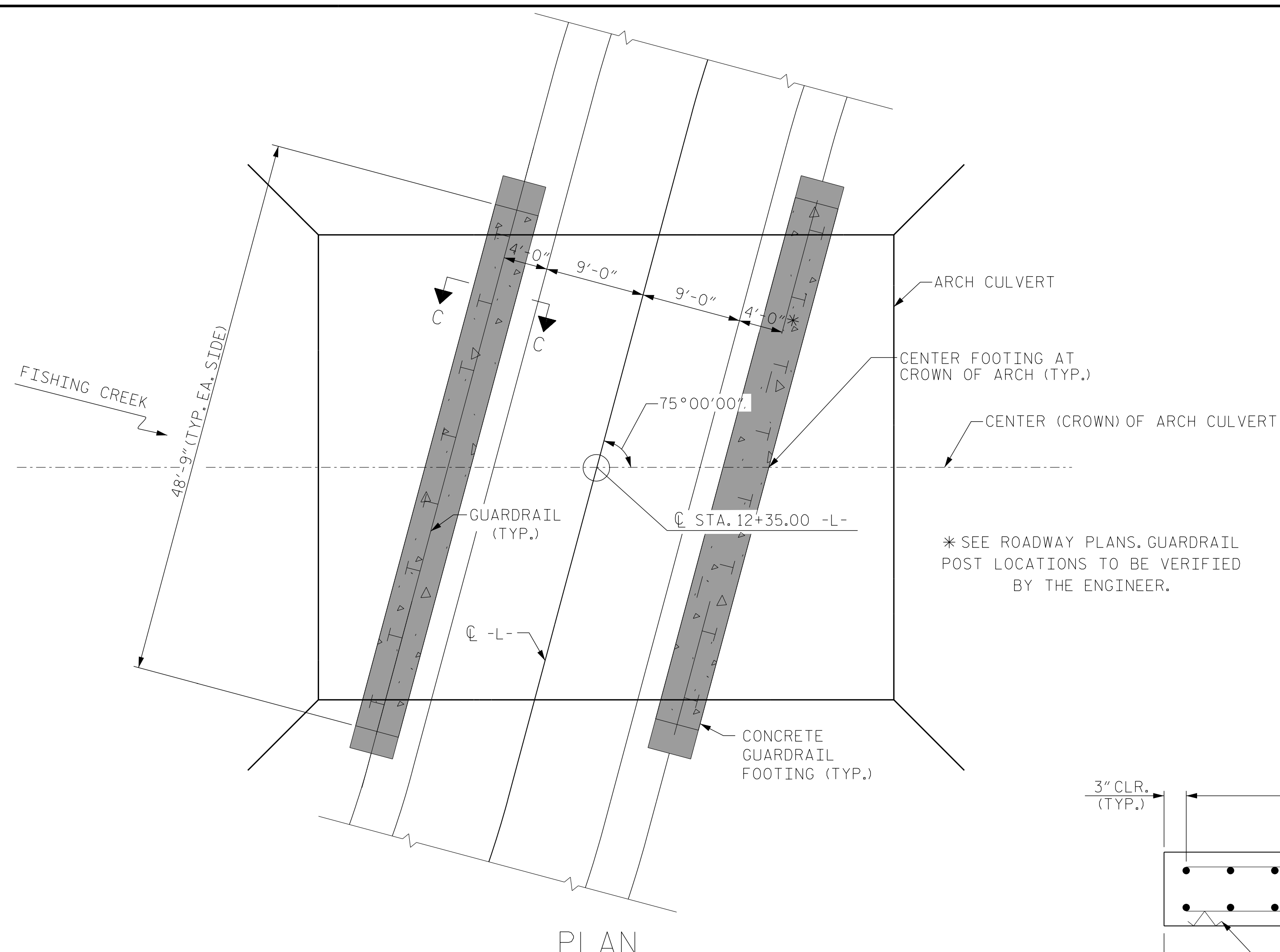
PAYMENT FOR GUARDRAIL, POSTS, AND THREADED STEEL ROD WITH GALVANIZED NUTS AND WASHERS IS INCLUDED IN ROADWAY PAY ITEMS.

SLAB REINFORCING STEEL MAY BE SHIFTED AS NECESSARY TO CLEAR GUARDRAIL POSTS. CARE SHOULD BE TAKEN TO KEEP THE SHIFTING OF REINFORCING STEEL TO A MINIMUM.

TOP OF GUARDRAIL FOOTING IS APPROXIMATELY 0.75 FT BELOW FINISHED GROUND. INSTALL 2 LAYERS OF 30 LB. ROOFING FELT BETWEEN CROWN OF CONCRETE ARCH AND GUARDRAIL FOOTING.

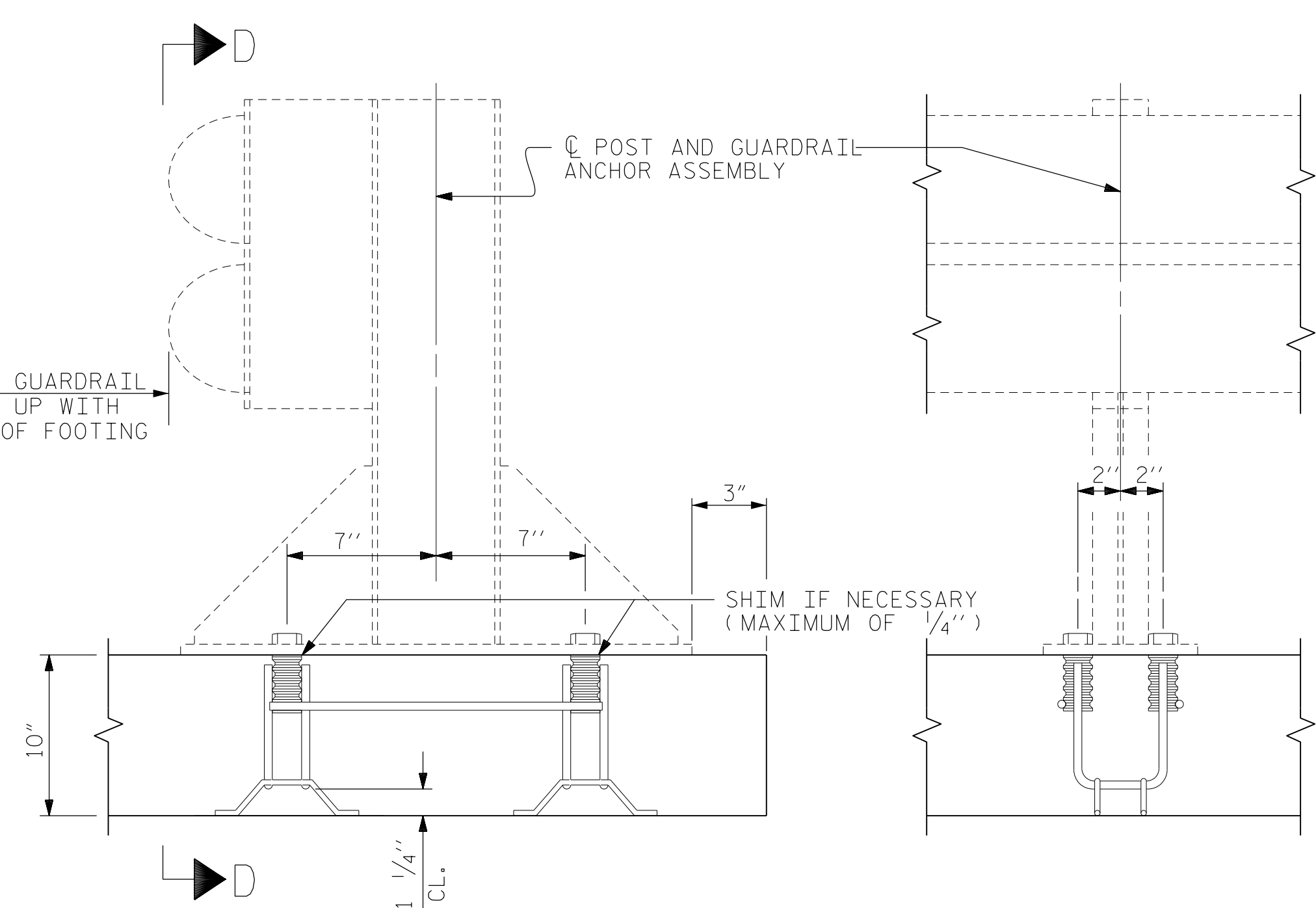
BILL OF MATERIAL FOR ONE FOOTING (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	220	#4	STR	3'-6"	514
B1	32	#4	STR	22'-9"	486
REINFORCING STEEL				LBS.	1000
CLASS A CONCRETE				CU.YDS.	6.0



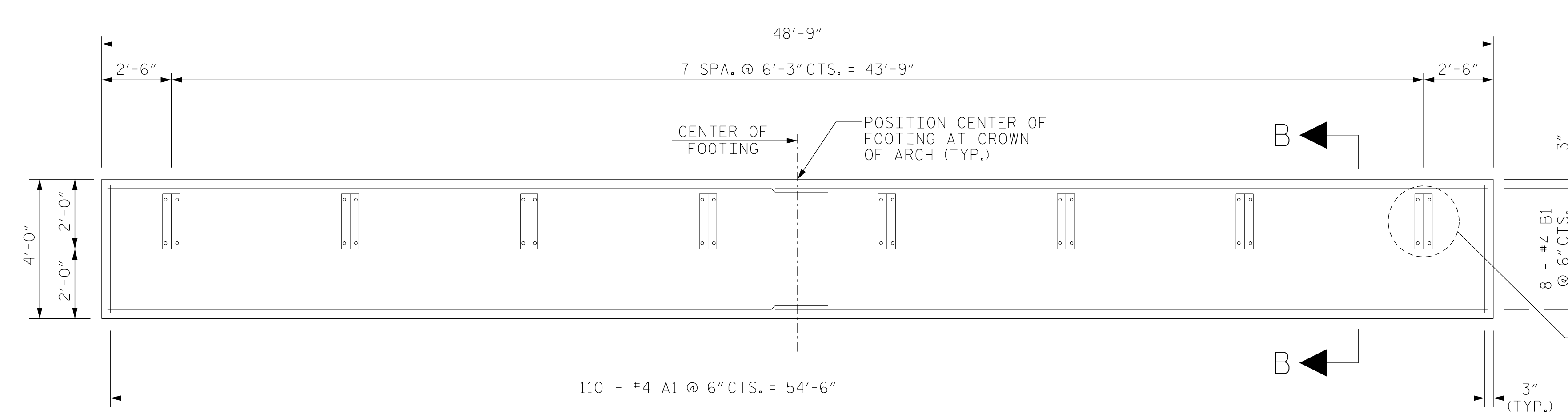
SECTION B-B

NOTE: LAYOUT REINFORCING STEEL SHOULD BE CONDUCTED TO AVOID CONFLICT WITH ANCHOR BOLT LAYOUT FOR GUARDRAIL ATTACHMENT.



SECTION C-C

SECTION D-D



FOOTING PLAN

NOTE: MINIMUM LAP FOR B1 BARS IS 2'-0"

PROJECT NO. 17BP.5.R.88  
 WARREN COUNTY  
 STATION: 12+35.00 -L-  
 SHEET 4 OF 4



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 David Ruggles  
 C482768DF418122

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FOR GUARDRAIL ANCHORAGE, SEE RDWY STD. 862.03, SHEET 7 OF 7.

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 223 S. West St.  
 Suite 1100  
 Raleigh, NC 27603  
 T 919.380.8750  
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-4
1			3			TOTAL SHEETS
2			4			5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GUARDRAIL ASSEMBLY DETAILS

DRAWN BY: E. PHELPS DATE: 4/18  
 CHECKED BY: D. RUGGLES DATE: 4/18  
 DESIGN ENGINEER OF RECORD: D. RUGGLES DATE: 4/18

17BP.5.R.88  
 3/14/2022  
 \\400\_004\_Warren\_135\_SMU\_GRA1\_C-4.dgn  
 USER:dfault

