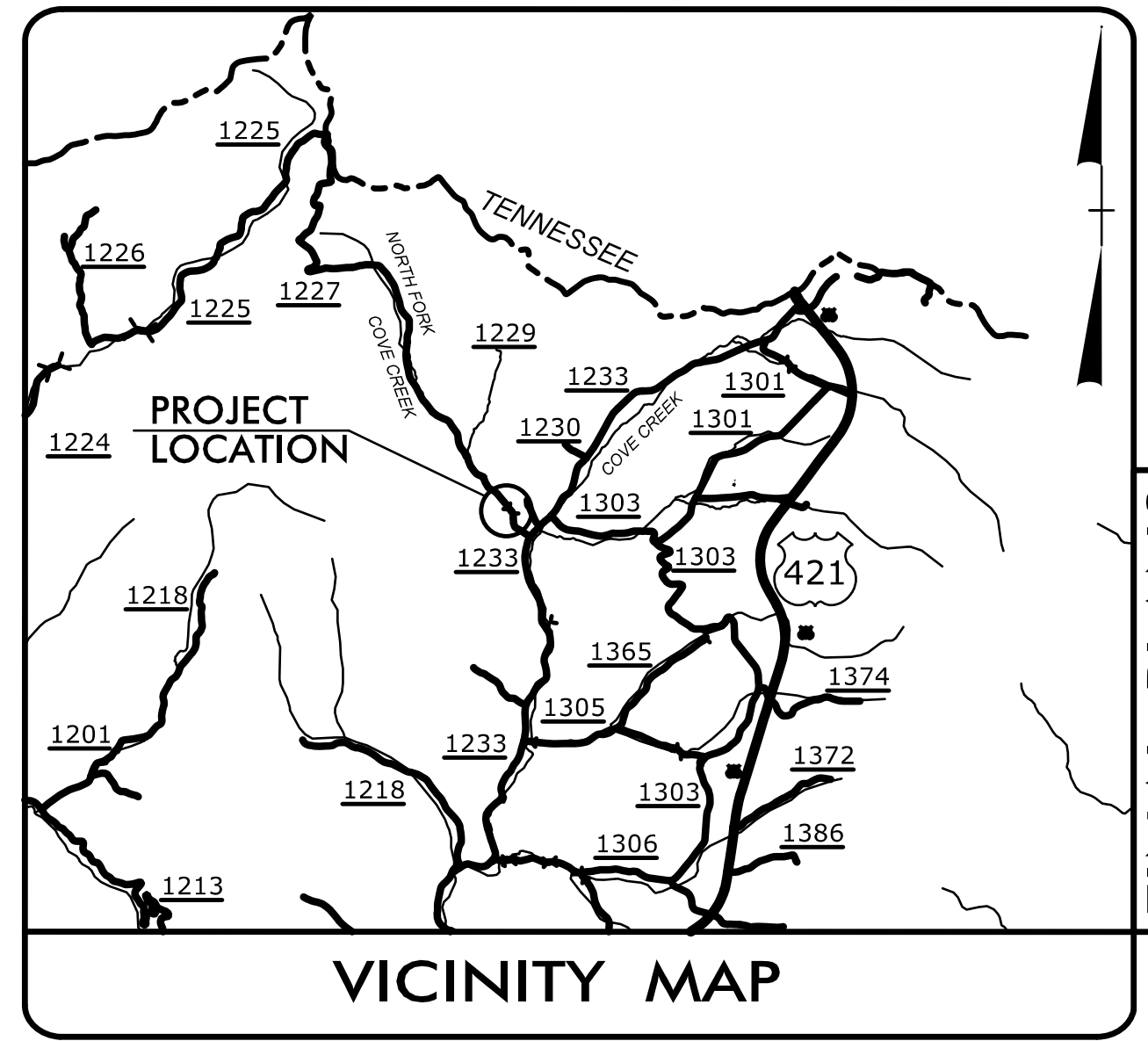


09.08/2019

PROJECT: BP11.R002

CONTRACT: DK00345

See Sheet 1A For Index of Sheets



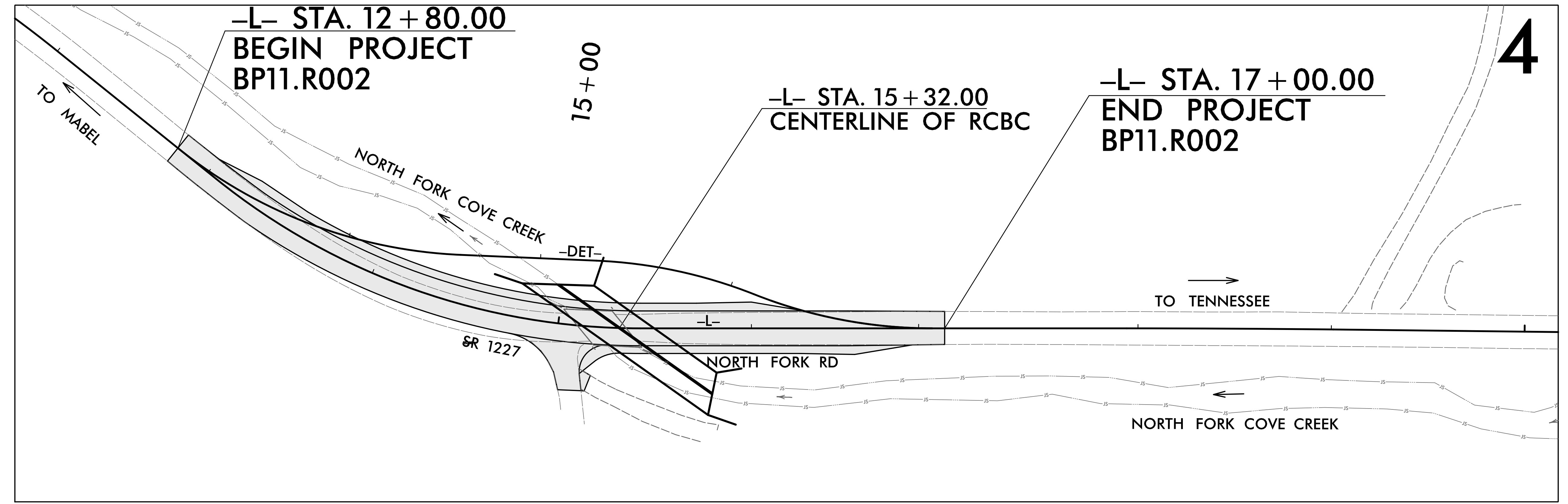
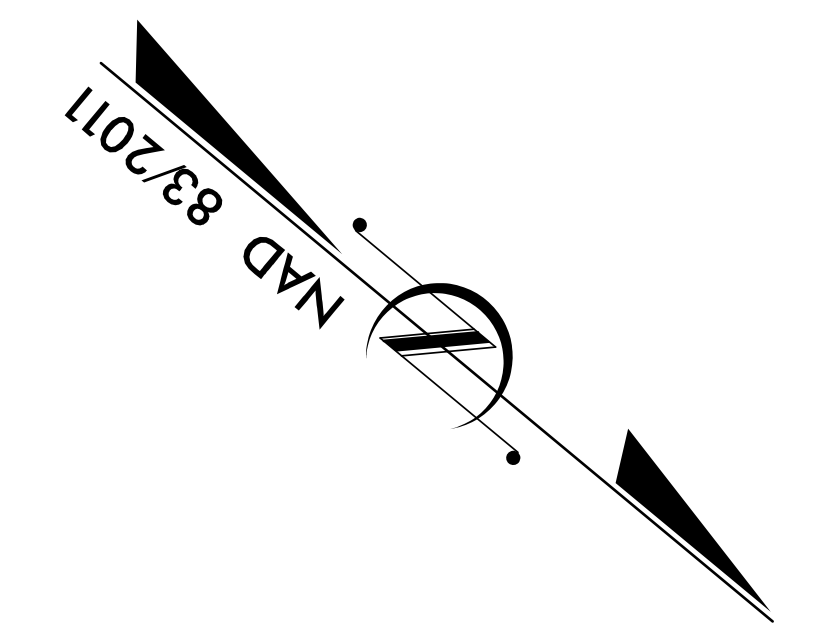
FINAL PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
WATAUGA COUNTY

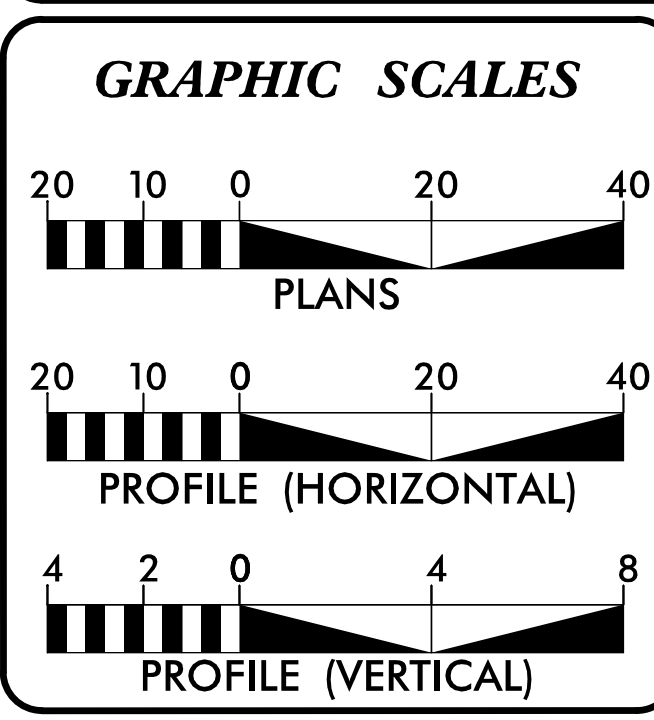
**LOCATION: BRIDGE #940087 OVER NORTH FORK COVE CREEK
ON SR 1227 (NORTH FORK RD)**

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP11.R002	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
BP11.R002.1	N/A	PE	
BP11.R002.2	N/A	RW & UTIL.	
BP11.R002.3	N/A	CONST.	



DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



DESIGN DATA

ADT 2021 = 315
ADT 2045 = 399
T = 6 % *
V = 35 MPH
* TTST = 3% DUAL = 3%
FUNC CLASS = LOCAL - RURAL
SUB REGIONAL TIER

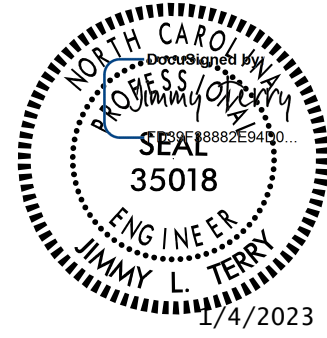
PROJECT LENGTH

LENGTH ROADWAY PROJECT BP11.R002 #940087	=	0.08 MILES
TOTAL LENGTH PROJECT BP11.R002 #940087	=	0.08 MILES

NCDOT CONTACT: Rob Weisz, PE	
PLANS PREPARED BY: TGS ENGINEERS 201 W. MARION ST SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275	PLANS PREPARED FOR: NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION 11 801 Statesville Rd N. Wilkesboro, NC 28659
RIGHT OF WAY DATE: MARCH 1, 2022	JIMMY L. TERRY, PE PROJECT ENGINEER
LETTING DATE: NOVEMBER 16, 2023	AUSTIN R. TURNER, PE PROJECT DESIGN ENGINEER
<small>2018 STANDARD SPECIFICATIONS</small>	

 HYDRAULICS ENGINEER 10/3/2023 DocuSigned by: SIGNATURE:	 ROADWAY DESIGN ENGINEER 10/2/2023 DocuSigned by: SIGNATURE:
---	---



PROJECT REFERENCE NO.	SHEET NO.
<i>BPII.R002</i>	<i>1A</i>
ROADWAY DESIGN ENGINEER	
	

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

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2A-1	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2B-1	ROADWAY DETAIL - DETOUR
2C-1	SPECIAL DETAIL - W BEAM RAIL SECTION
2C-2	SPECIAL DETAIL - GUARDRAIL AT-1 END UNIT
2C-3	SPECIAL DETAIL - 8' GUARDRAIL POST
2G-1	GEOTECHNICAL DETAIL - STANDARD TEMPORARY SHORING
3B-1	ROADWAY SUMMARIES
4	PLAN SHEET
5	PROFILE SHEET
RW-01 THRU RW-04	SURVEY CONTROL SHEETS
TMP-1 THRU TMP-5	TRANSPORTATION MANAGEMENT PLANS
PMP-1 THRU PMP-2	PAVEMENT MARKING PLANS
EC-1 THRU EC-7	EROSION CONTROL PLANS
UO-1 THRU UO-2	UTILITIES BY OTHERS PLANS
X-1A	CROSS-SECTION INDEX
X-1B	CROSS-SECTION SUMMARY SHEET
X-1 THRU X-6	CROSS-SECTIONS
C-1 THRU C-10	CULVERT PLANS
CULVERT STANDARD NOTES	

GENERAL NOTES

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 II.

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

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

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

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

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

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

UTILITIES:
UTILITY OWNERS ON THIS PROJECT ARE BREMC, SKYLINE TELEPHONE MC AND CHARTER.
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 OTHERS.

STANDARD DRAWINGS

EFF. 01-16-2018
REV.
2018 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January, 2018 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
815.02	Subsurface Drain
862.01	Guardrail Placement
862.02	Guardrail Installation
866.04	Barbed Wire Fence with Wood Posts (2 - 7 Strands)
876.01	Rip Rap in Channels

12/2/2016

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

BOUNDARIES AND PROPERTY:

State Line	_____
County Line	_____
Township Line	_____
City Line	_____
Reservation Line	_____
Property Line	_____
Existing Iron Pin	○ EIP
Computed Property Corner	_____ X
Property Monument	□ ECM
Parcel/Sequence Number	①23
Existing Fence Line	-X-X-X-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	□
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	-WLB-
Proposed Wetland Boundary	-WLB-
Existing Endangered Animal Boundary	-EAB-
Existing Endangered Plant Boundary	-EPB-
Existing Historic Property Boundary	-HPB-
Known Contamination Area: Soil	-S-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	○ S
Well	○ W
Small Mine	⊗
Foundation	□
Area Outline	□
Cemetery	□
Building	□
School	□
Church	□
Dam	_____

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY & PROJECT CONTROL:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

Single Tree	○
Single Shrub	○

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

Hedge	_____
Woods Line	_____
Orchard	_____
Vineyard	_____

EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	_____
Bridge Wing Wall, Head Wall and End Wall	_____
MINOR:	
Head and End Wall	_____
Pipe Culvert	_____
Footbridge	_____
Drainage Box: Catch Basin, DI or JB	_____
Paved Ditch Gutter	_____
Storm Sewer Manhole	_____
Storm Sewer	_____

UTILITIES:

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

TELEPHONE:

Existing Telephone Pole	_____
Proposed Telephone Pole	_____
Telephone Manhole	_____
Telephone Pedestal	_____
Telephone Cell Tower	_____
U/G Telephone Cable Hand Hole	_____
U/G Telephone Cable LOS B (S.U.E.*)	_____
U/G Telephone Cable LOS C (S.U.E.*)	_____
U/G Telephone Cable LOS D (S.U.E.*)	_____
U/G Telephone Conduit LOS B (S.U.E.*)	_____
U/G Telephone Conduit LOS C (S.U.E.*)	_____
U/G Telephone Conduit LOS D (S.U.E.*)	_____
U/G Fiber Optics Cable LOS B (S.U.E.*)	_____
U/G Fiber Optics Cable LOS C (S.U.E.*)	_____
U/G Fiber Optics Cable LOS D (S.U.E.*)	_____

WATER:

Water Manhole	_____
Water Meter	_____
Water Valve	_____
Water Hydrant	_____
U/G Water Line LOS B (S.U.E.*)	_____
U/G Water Line LOS C (S.U.E.*)	_____
U/G Water Line LOS D (S.U.E.*)	_____
Above Ground Water Line	_____

TV:

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

GAS:

Gas Valve	_____
Gas Meter	_____
U/G Gas Line LOS B (S.U.E.*)	_____
U/G Gas Line LOS C (S.U.E.*)	_____
U/G Gas Line LOS D (S.U.E.*)	_____
Above Ground Gas Line	_____

SANITARY SEWER:

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

MISCELLANEOUS:

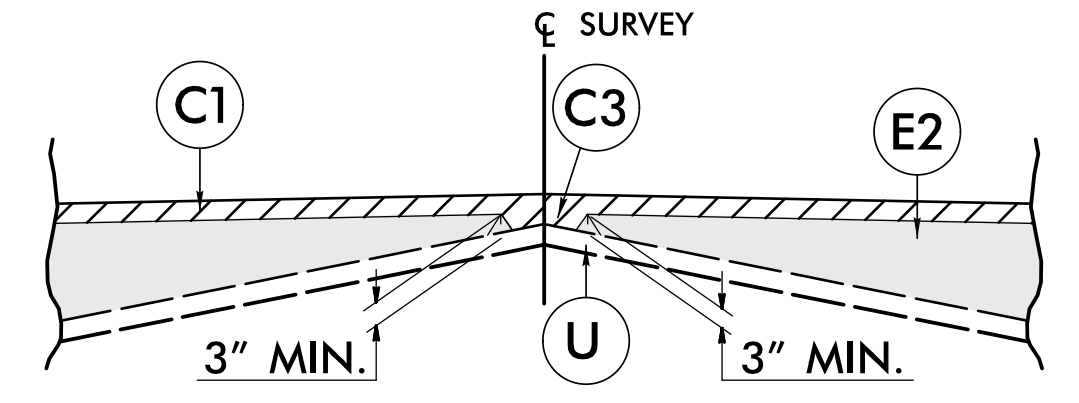
Utility Pole	_____
Utility Pole with Base	_____
Utility Located Object	_____
Utility Traffic Signal Box	_____
Utility Unknown U/G Line LOS B (S.U.E.*)	_____
U/G Tank; Water, Gas, Oil	_____
Underground Storage Tank, Approx. Loc.	_____
A/G Tank; Water, Gas, Oil	_____
Geoenvironmental Boring	_____
U/G Test Hole LOS A (S.U.E.*)	_____
Abandoned According to Utility Records	_____
End of Information	_____

6/2/2019

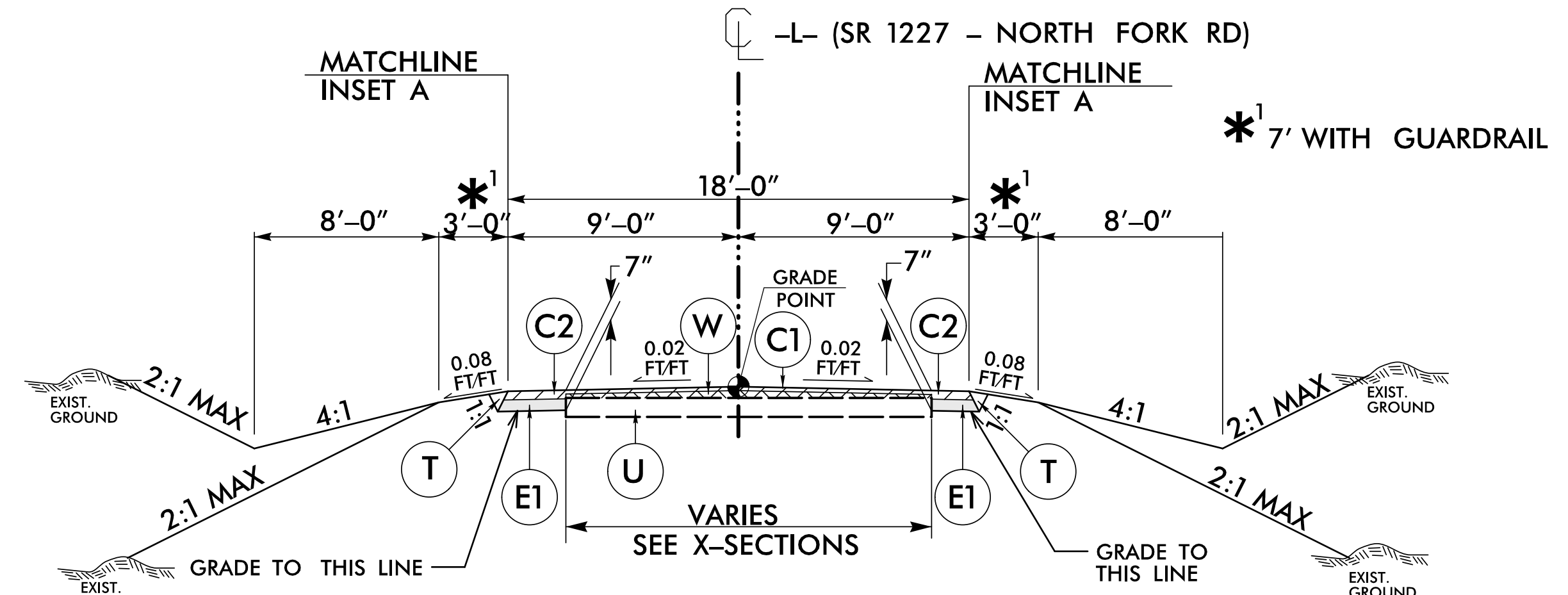
PROJECT REFERENCE NO. BPII.R002	SHEET NO. 2A-1
ROADWAY DESIGN ENGINEER JIMMY L. TERRY 35018 1/4/2023	PAVEMENT DESIGN ENGINEER RAMIE A. SPAIN 049851 1/4/2023
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
TGS ENGINEERS 201 W. MARION ST SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275	

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1" OR GREATER THAN 1 1/2" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" OR GREATER THAN 5 1/2" IN DEPTH.
J	6" AGGREGATE BASE COURSE.
P1	PRIME COAT AT THE RATE OF 0.35 GAL. PER SQ. YD.
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING EXISTING PAVEMENT (SEE MILLING DETAILS THIS SHEET)
W	WEDGING EXISTING PAVEMENT (SEE WEDGING DETAILS THIS SHEET)

PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE SHOWN.



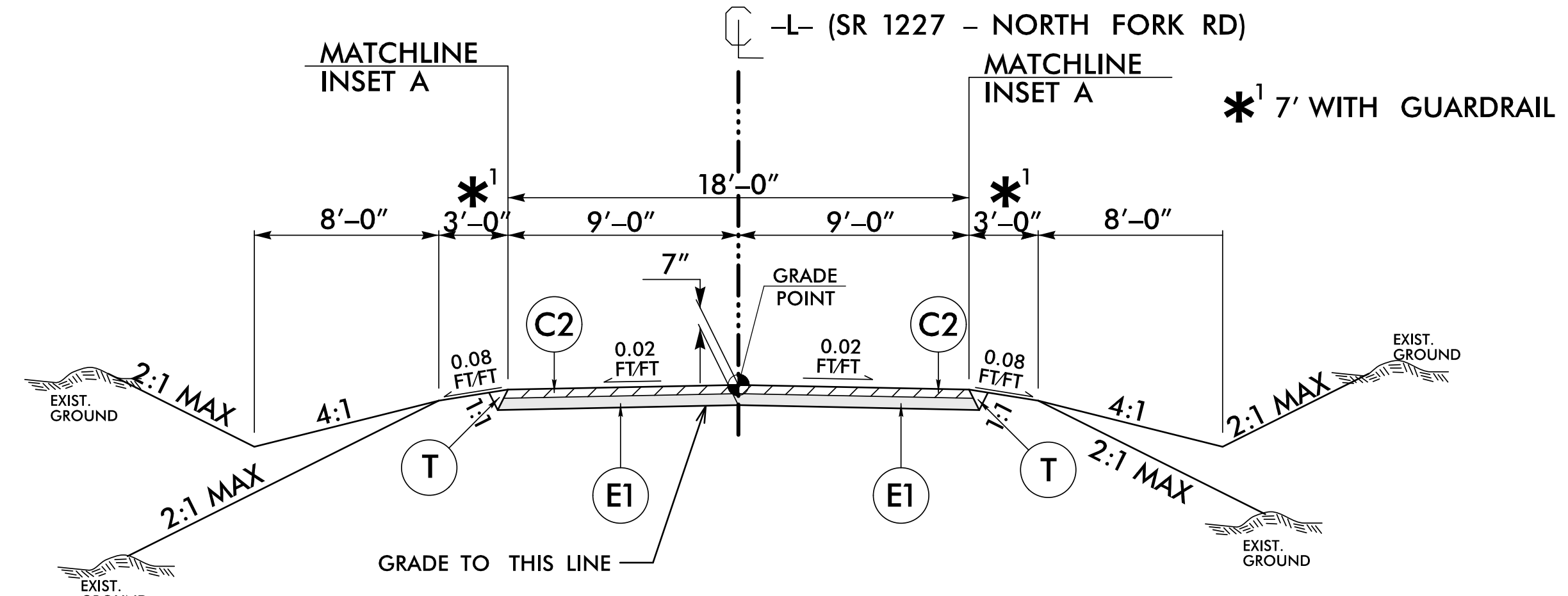
Detail Showing Method of Wedging



TYPICAL SECTION NO. 1

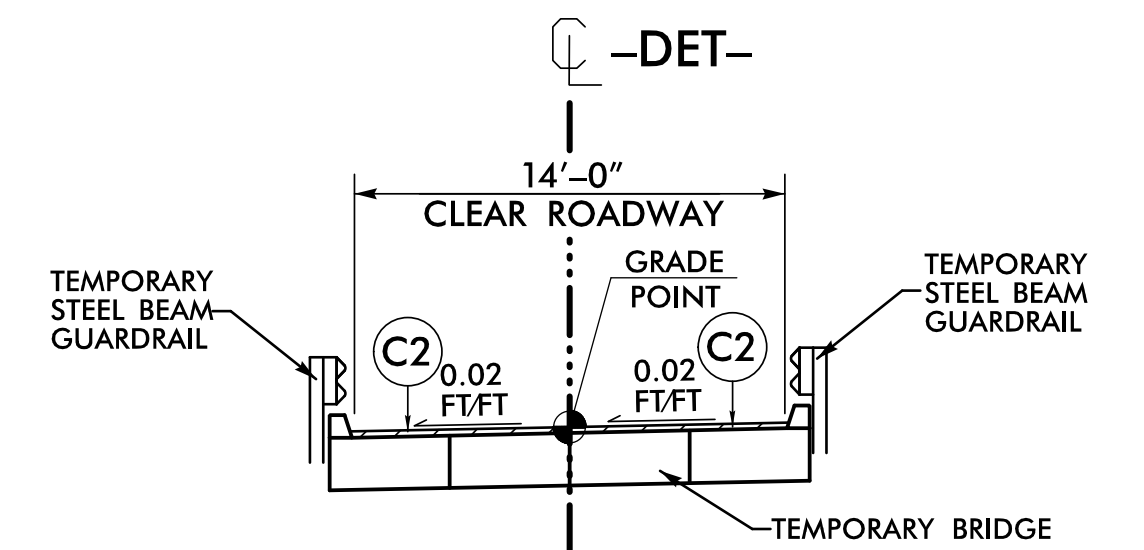
USE TYPICAL SECTION NO. 1
-L- STA. 13+30.00 TO -L- STA. 14+50.00
-L- STA. 16+00.00 TO -L- STA. 16+50.00

NOTE: TRANSITION BETWEEN EXISTING AND TYP. SECT. NO.1 AS FOLLOWS:
-L- STA. 12+80.00 TO -L- STA. 13+30.00
-L- STA. 16+50.00 TO -L- STA. 17+00.00



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2
-L- STA. 14+50.00 TO -L- STA. 16+00.00



TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4
-DET- STA. 11+48 +/- TO -L- STA. 12+13 +/-

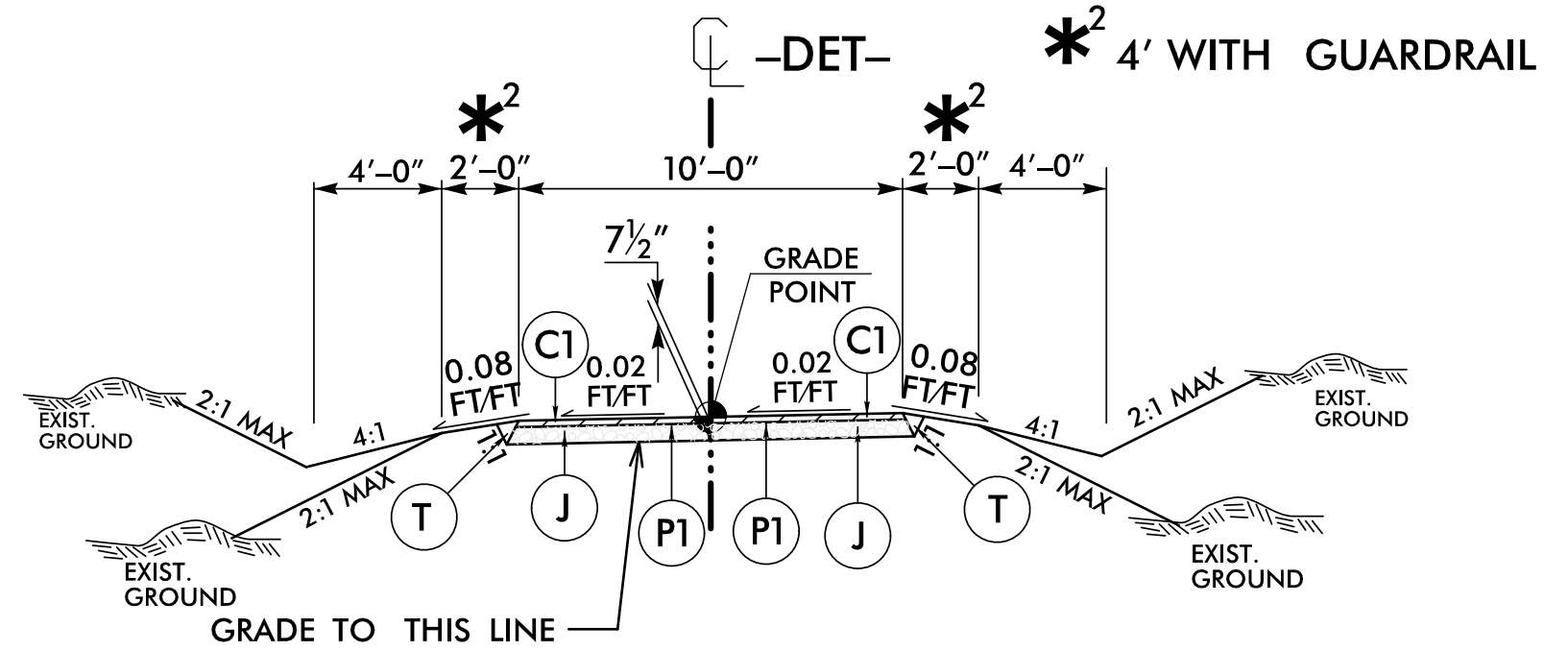
* ADD 3' FOR GUARDRAIL LOCATIONS
ADD MINIMUM 2' PAST PAVED SHOULDER LIMITS FOR ALL OTHER LOCATIONS

NOTE:
AT GUARDRAIL LOCATIONS PAVE TO FACE OF GUARDRAIL UNLESS SHOWN OTHERWISE ON PLANS.

INSET A

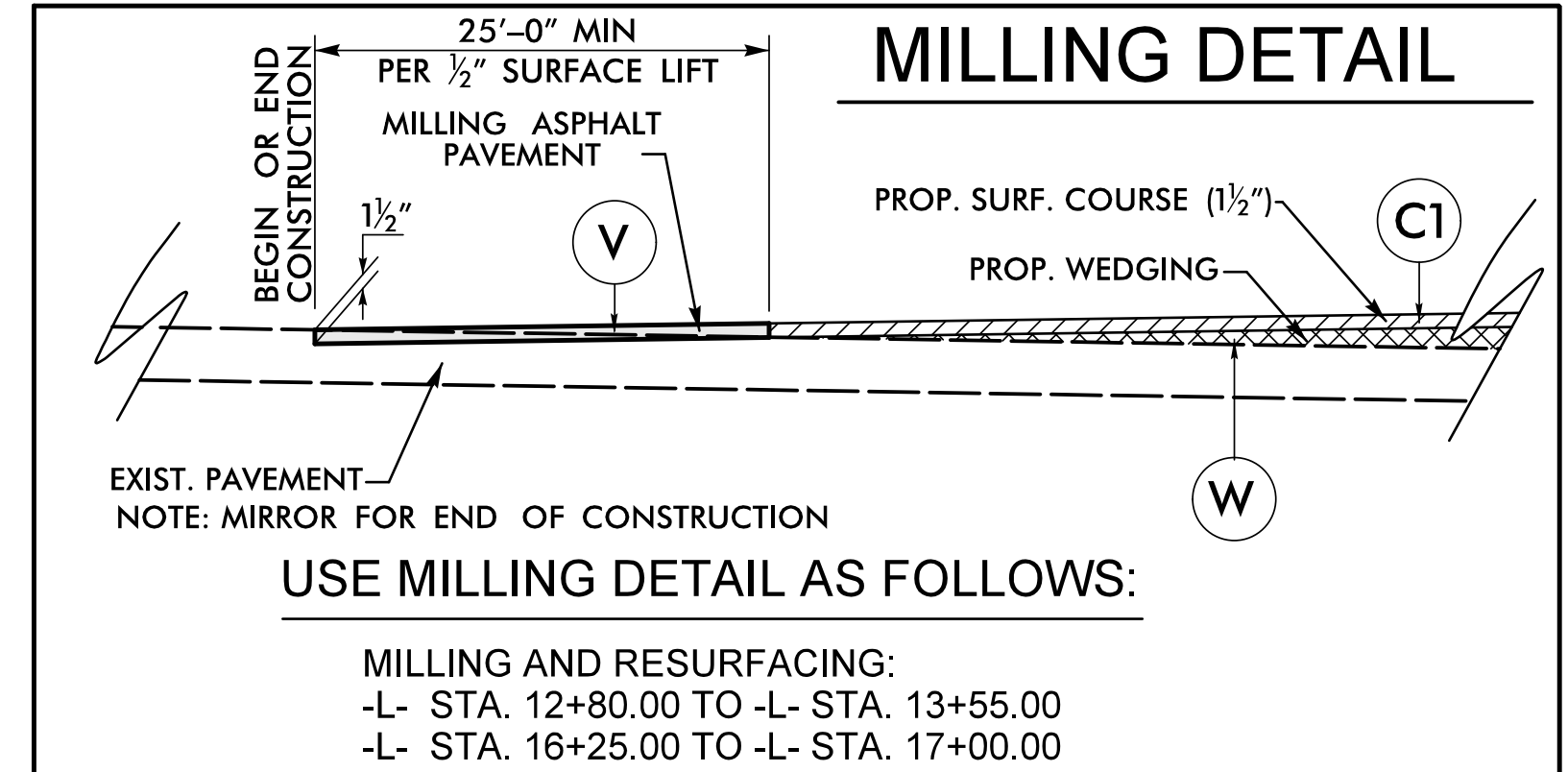
USE INSET A

** FDPS WIDTH	STA. TO STA.
0'-0" TO 4'-6"	-L- STA. 13+00.42 TO -L- STA. 16+27.40 LT -L- STA. 15+12.95 TO -L- STA. 16+83.11 RT



TYPICAL SECTION NO. 3

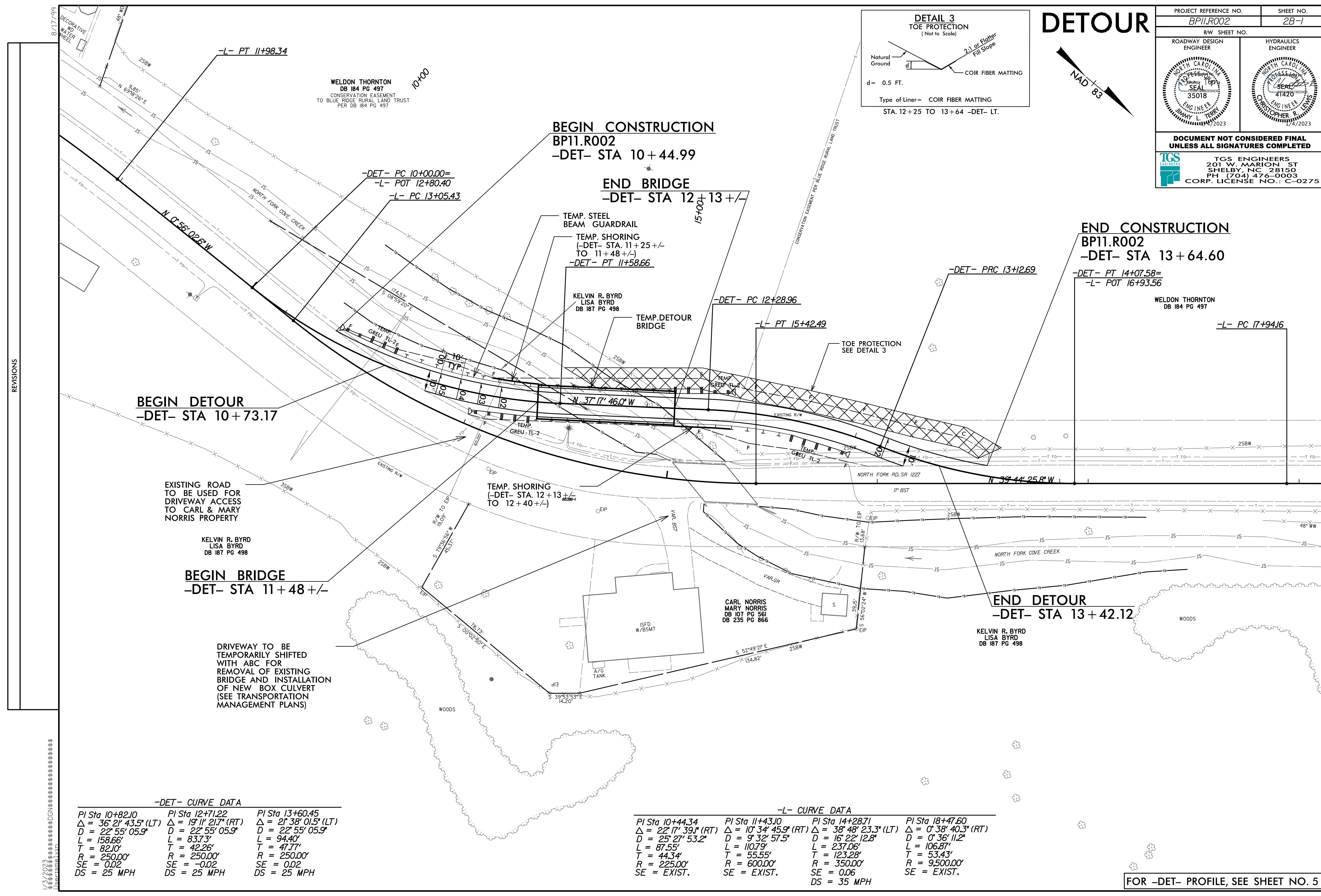
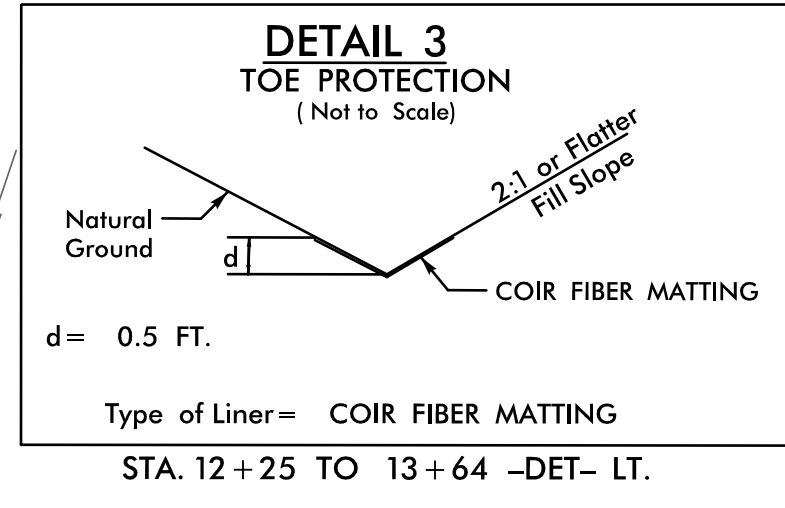
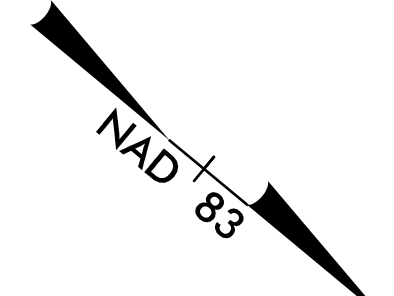
USE TYPICAL SECTION NO. 3
-DET- STA. 10+73.17 TO -DET- STA. 11+48 +/-
-DET- STA. 12+13 +/- TO -DET- STA. 13+42.12



1/7/2027
User: smel1111

PROJECT REFERENCE NO. BP11.R002	SHEET NO. 2B-1
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
 TGS ENGINEERS 201 W. MARION ST SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275	

DETOUR



BEGIN DETOUR
-DET- STA 10+73.17

EXISTING ROAD
TO BE USED FOR
DRIVEWAY ACCESS
TO CARL & MARY
NORRIS PROPERTY

BEGIN BRIDGE
-DET- STA 11+48 +/-

DRIVEWAY TO BE
TEMPORARILY SHIFTED
WITH ABC FOR
REMOVAL OF EXISTING
BRIDGE AND INSTALLATION
OF NEW BOX CULVERT
(SEE TRANSPORTATION
MANAGEMENT PLANS)

BEGIN CONSTRUCTION
BP11.R002
-DET- STA 10+44.99

END BRIDGE
-DET- STA 12+13 +/-

END CONSTRUCTION
BP11.R002
-DET- STA 13+64.60

END DETOUR
-DET- STA 13+42.12

-DET- CURVE DATA

PI Sta 10+82.10 Δ = 36° 21' 43.5" (LT) D = 22° 55' 05.9" L = 158.66' T = 82.10' R = 250.00' SE = 0.02 DS = 25 MPH	PI Sta 12+71.22 Δ = 19° 11' 21.7" (RT) D = 22° 55' 05.9" L = 83.73' T = 42.26' R = 250.00' SE = -0.02 DS = 25 MPH	PI Sta 13+60.45 Δ = 21° 38' 01.5" (LT) D = 22° 55' 05.9" L = 94.40' T = 47.77' R = 250.00' SE = 0.02 DS = 25 MPH
--	--	---

-L- CURVE DATA

PI Sta 10+44.34 Δ = 22° 17' 39.1" (RT) D = 25° 27' 53.2" L = 87.55' T = 44.34' R = 225.00' SE = EXIST.	PI Sta 11+43.10 Δ = 10° 34' 45.9" (RT) D = 9° 32' 57.5" L = 110.79' T = 55.55' R = 600.00' SE = EXIST.	PI Sta 14+28.71 Δ = 38° 48' 23.3" (LT) D = 16° 22' 12.8" L = 237.06' T = 123.28' R = 350.00' SE = 0.06 DS = 35 MPH	PI Sta 18+47.60 Δ = 0° 38' 40.3" (RT) D = 0° 36' 11.2" L = 106.87' T = 53.43' R = 9,500.00' SE = EXIST.
--	--	---	---

FOR -DET- PROFILE, SEE SHEET NO. 5

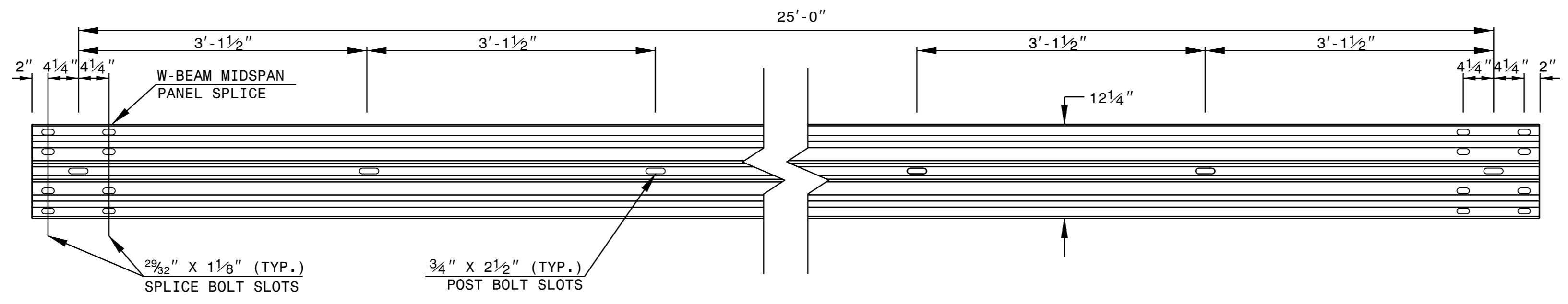
REVISIONS

1/3/2023

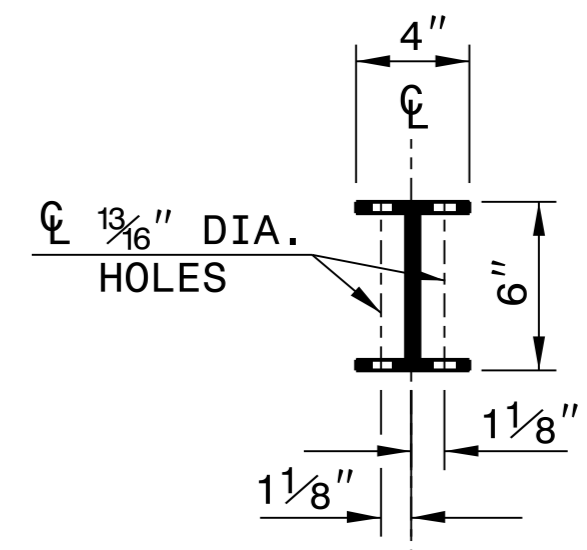
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

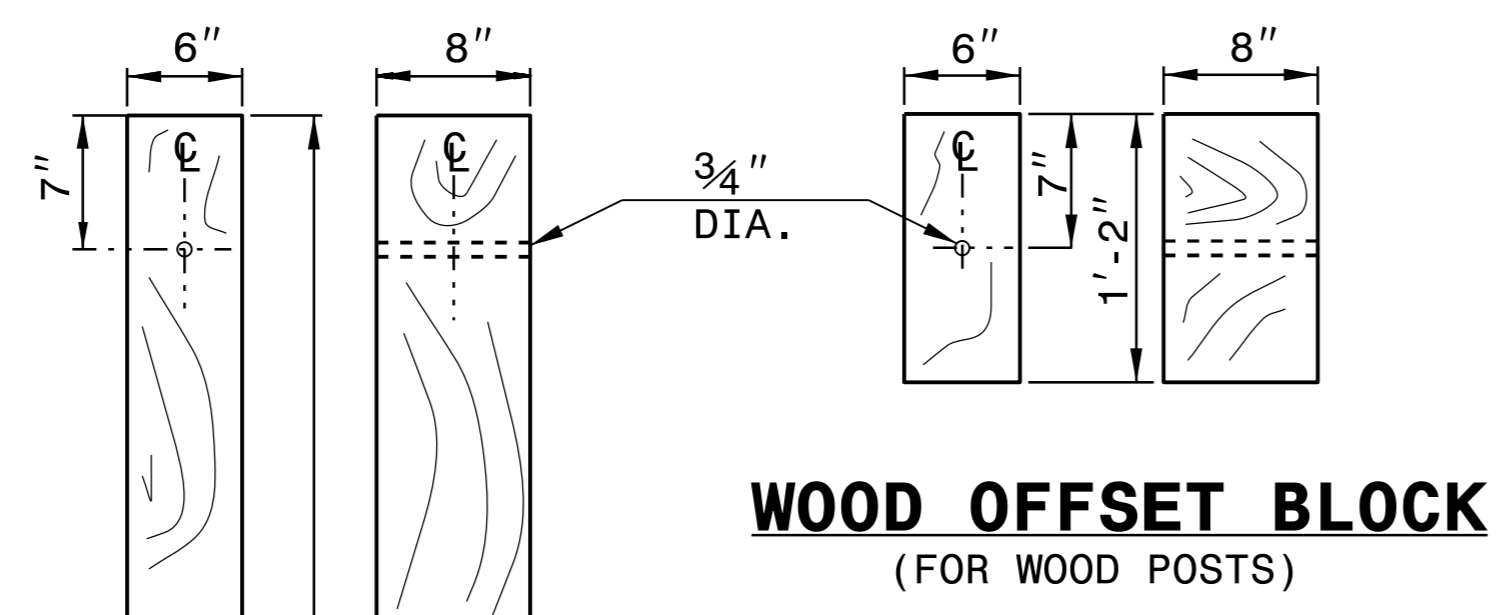
SHEET 6 OF 8
862D02



STANDARD W-BEAM GUARDRAIL



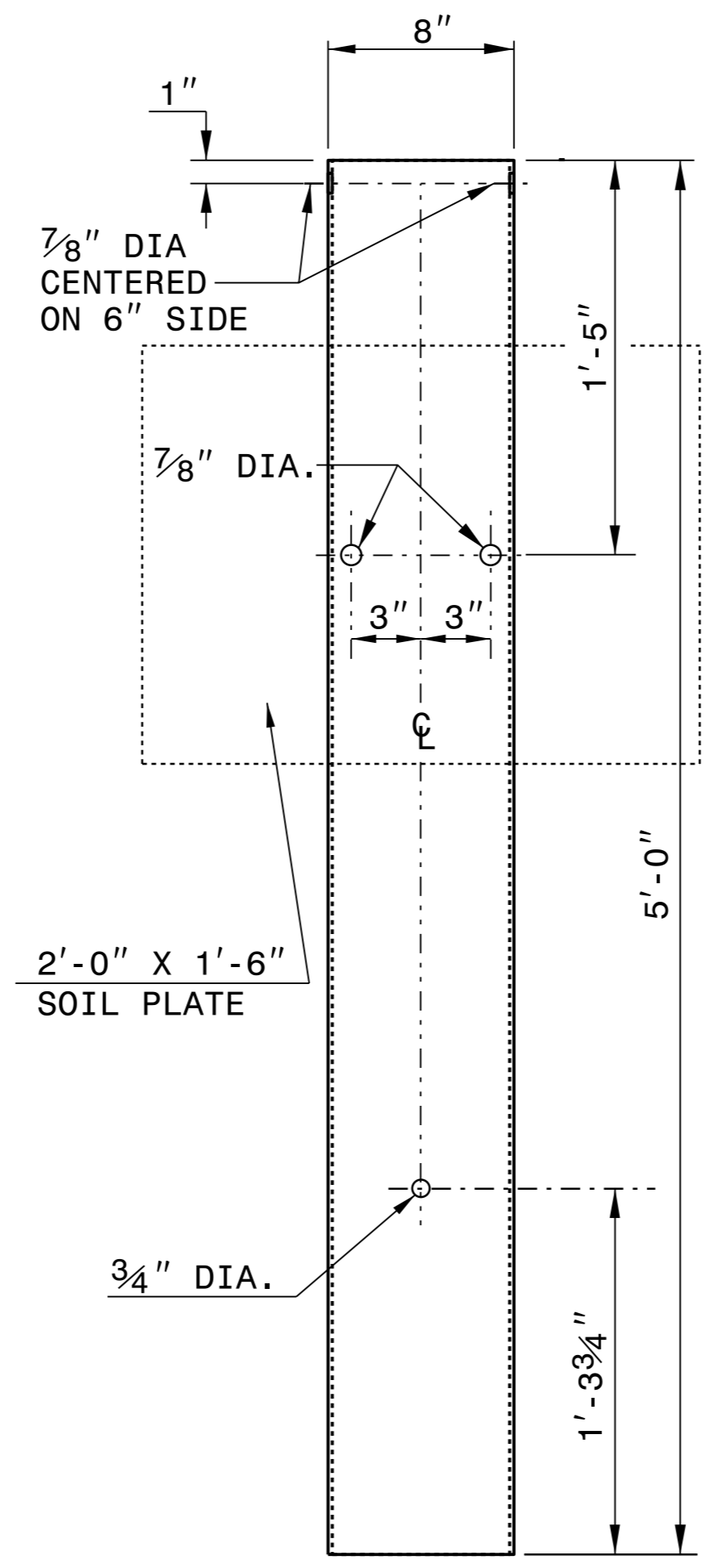
PLAN



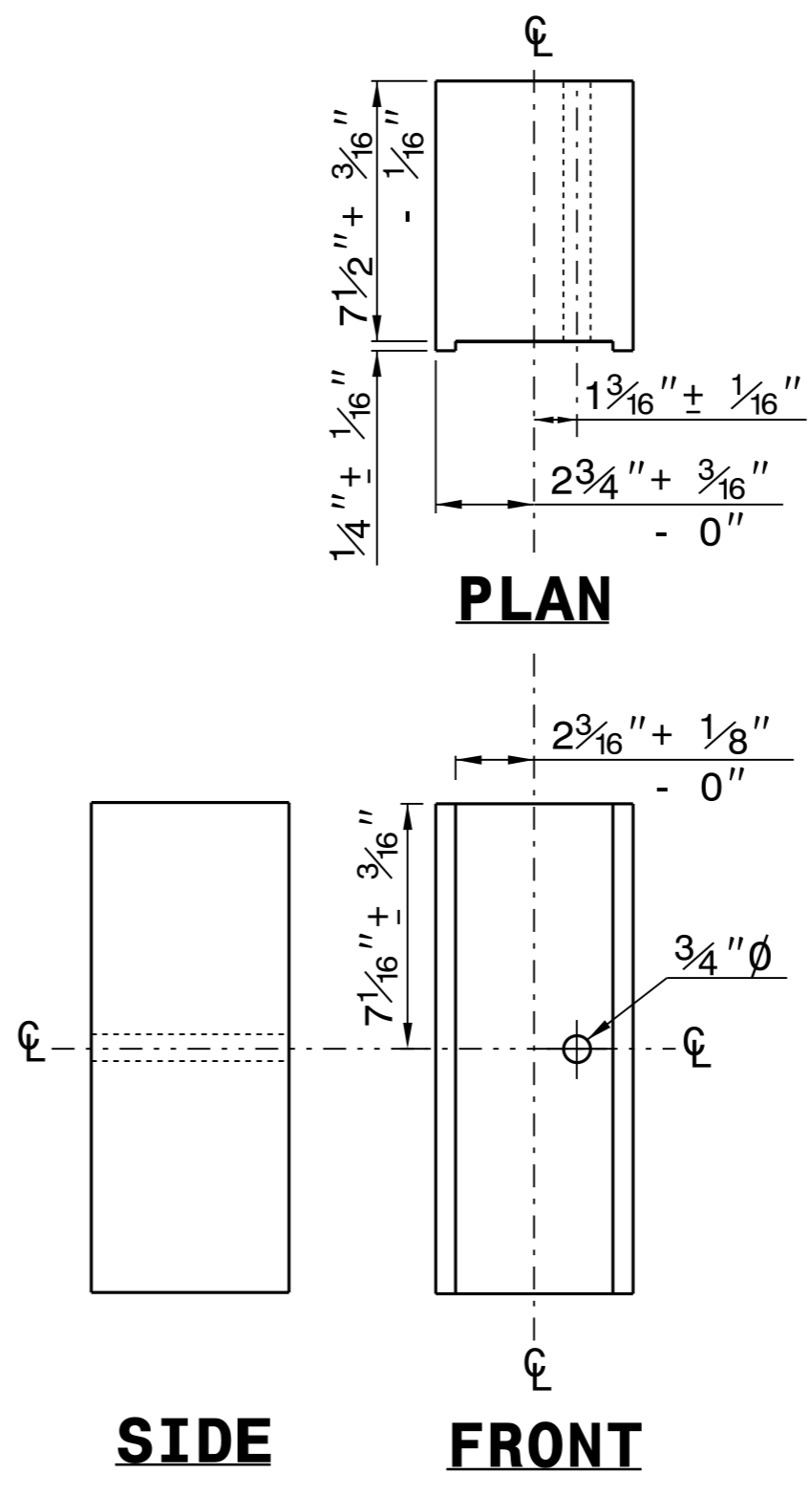
**WOOD OFFSET BLOCK
(FOR WOOD POSTS)**

**STANDARD
LINE POST**

**SHORT WOOD
BREAKAWAY POST**



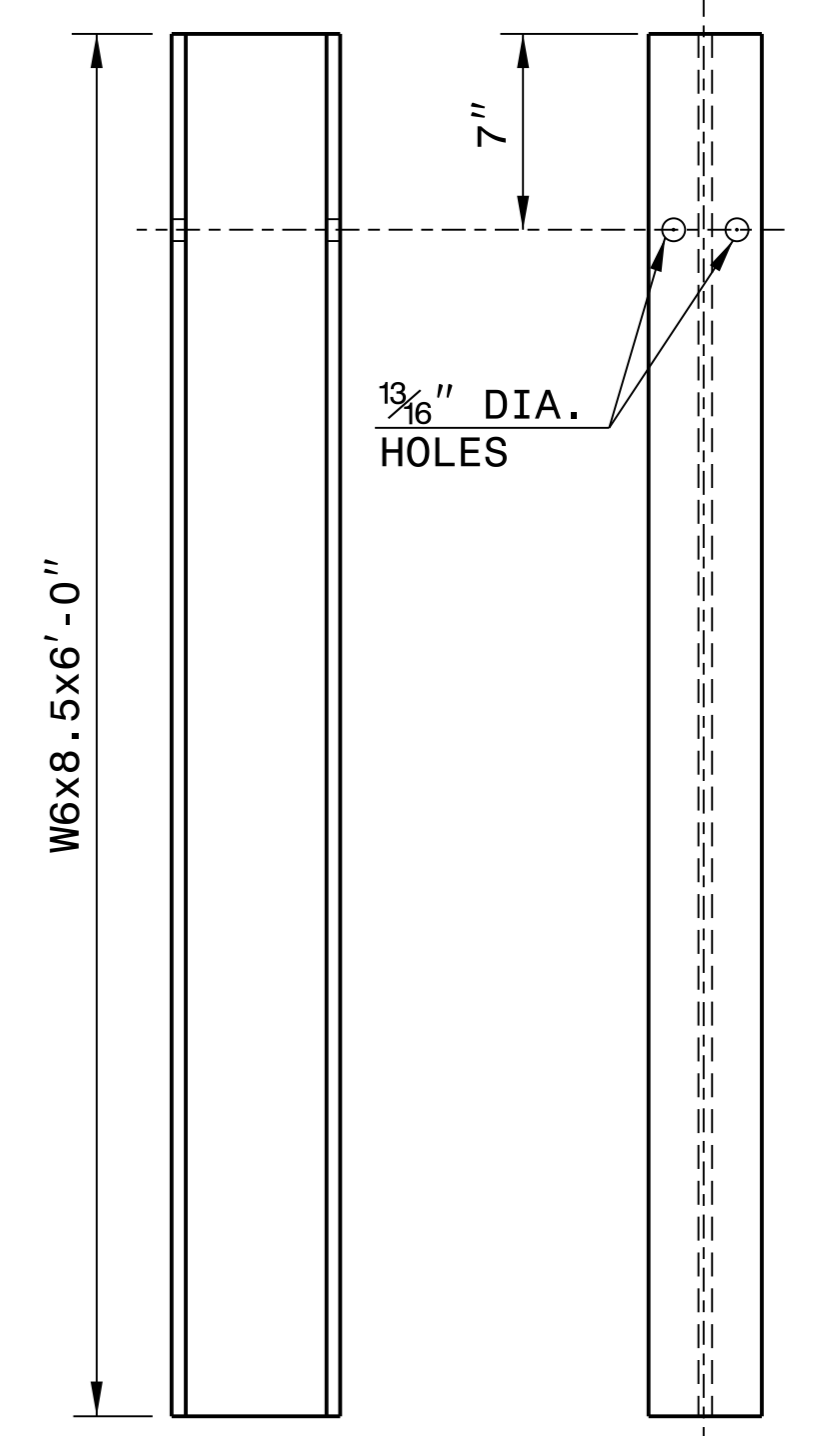
**STEEL TUBE
TS 6"x8"x0.1875"**



SIDE

FRONT

**ROUTED
OFFSET BLOCK**



SIDE

FRONT

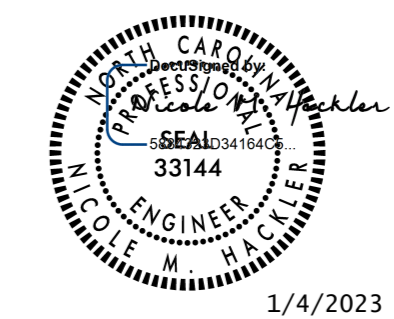
"W6" STEEL POST

SYSTEM PARTS

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02



1/4/2023

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

SEE TITLE BLOCK

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

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

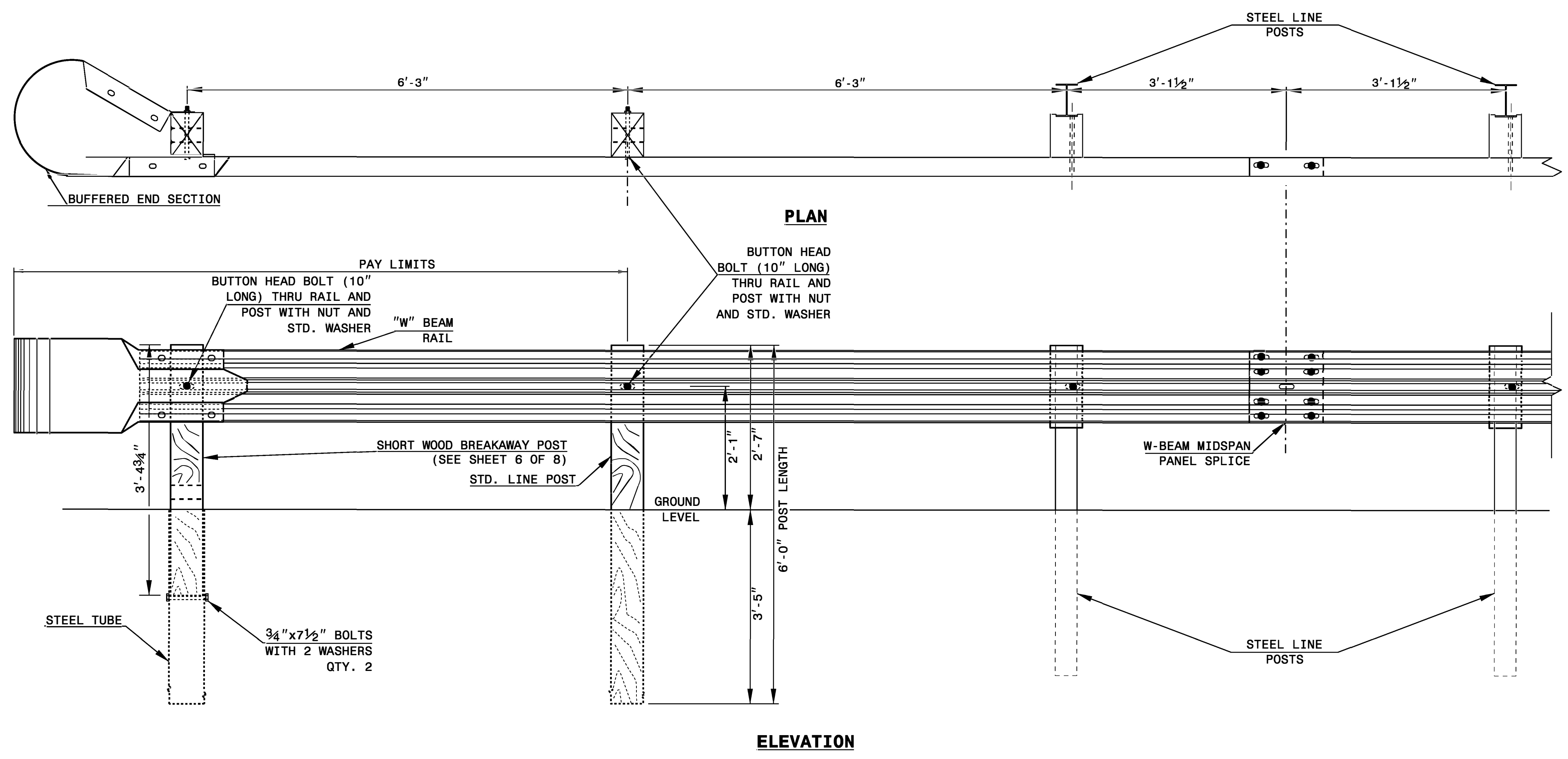
ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET OF

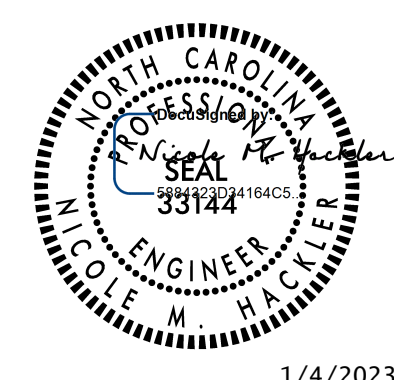
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET OF



TRAILING END UNIT ASSEMBLY
A.T. - 1 SYSTEM



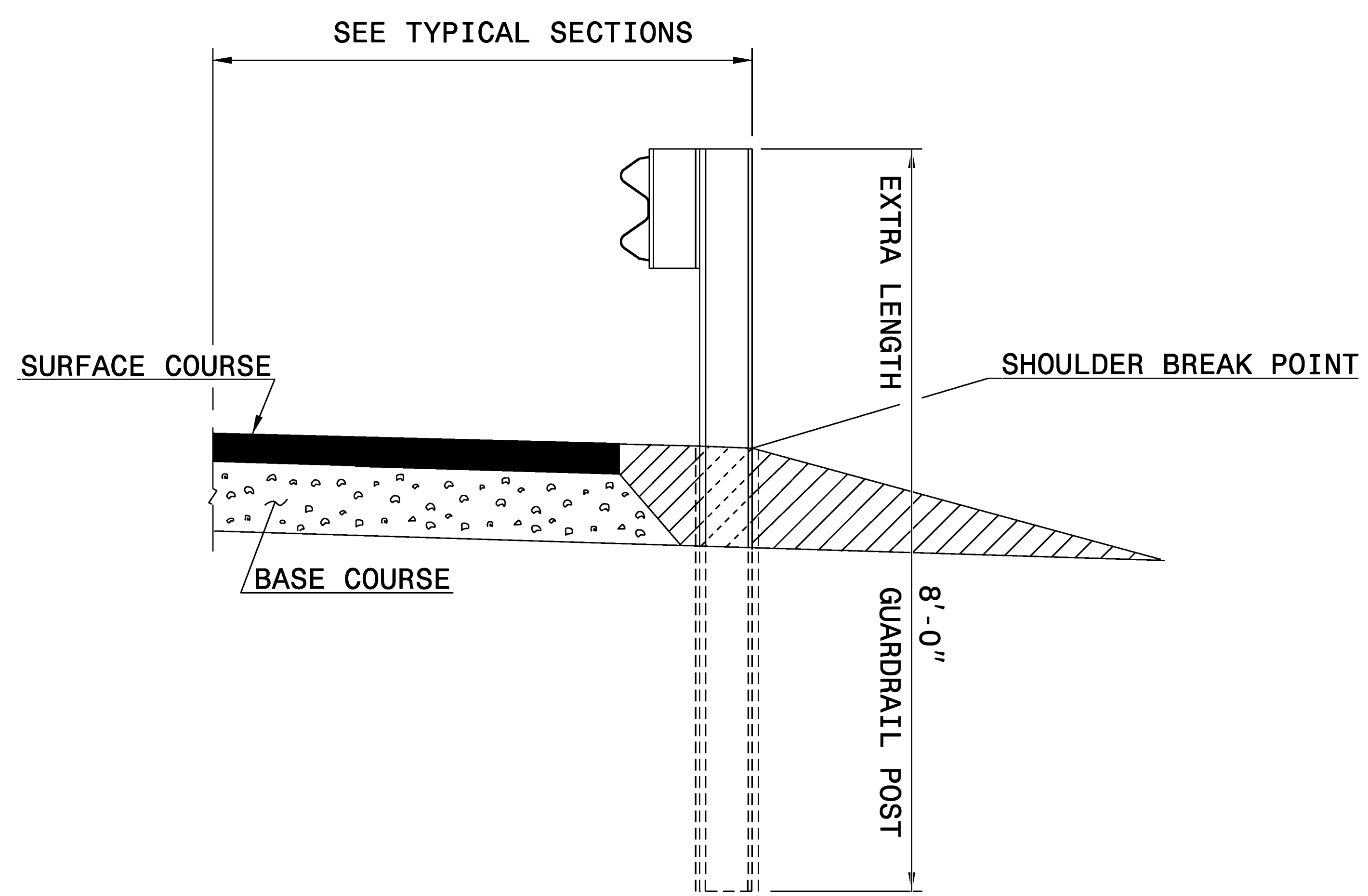
1/4/2023

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

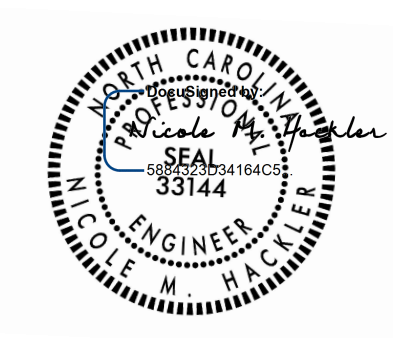
**CONTRACTS STANDARDS
AND DEVELOPMENT UNIT**
Office 919-707-6950 FAX 919-250-4119

A.T. - 1 SYSTEM

ORIGINAL BY: _____	DATE: _____
MODIFIED BY: _____	DATE: _____
CHECKED BY: _____	DATE: _____
FILE SPEC.: _____	



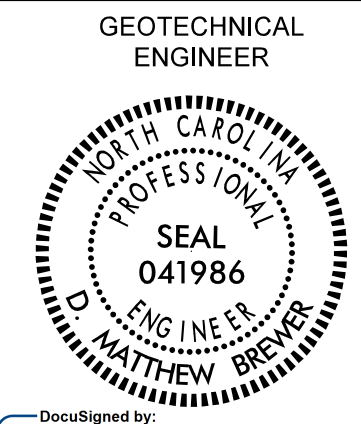
09-MAY-2018 14:21
 S:\Contracts\Specifications\Specs\1 Details\Jhewerton\7 postguardrail.dgn
 Jhewerton AT CSU-212815



1/4/2023

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

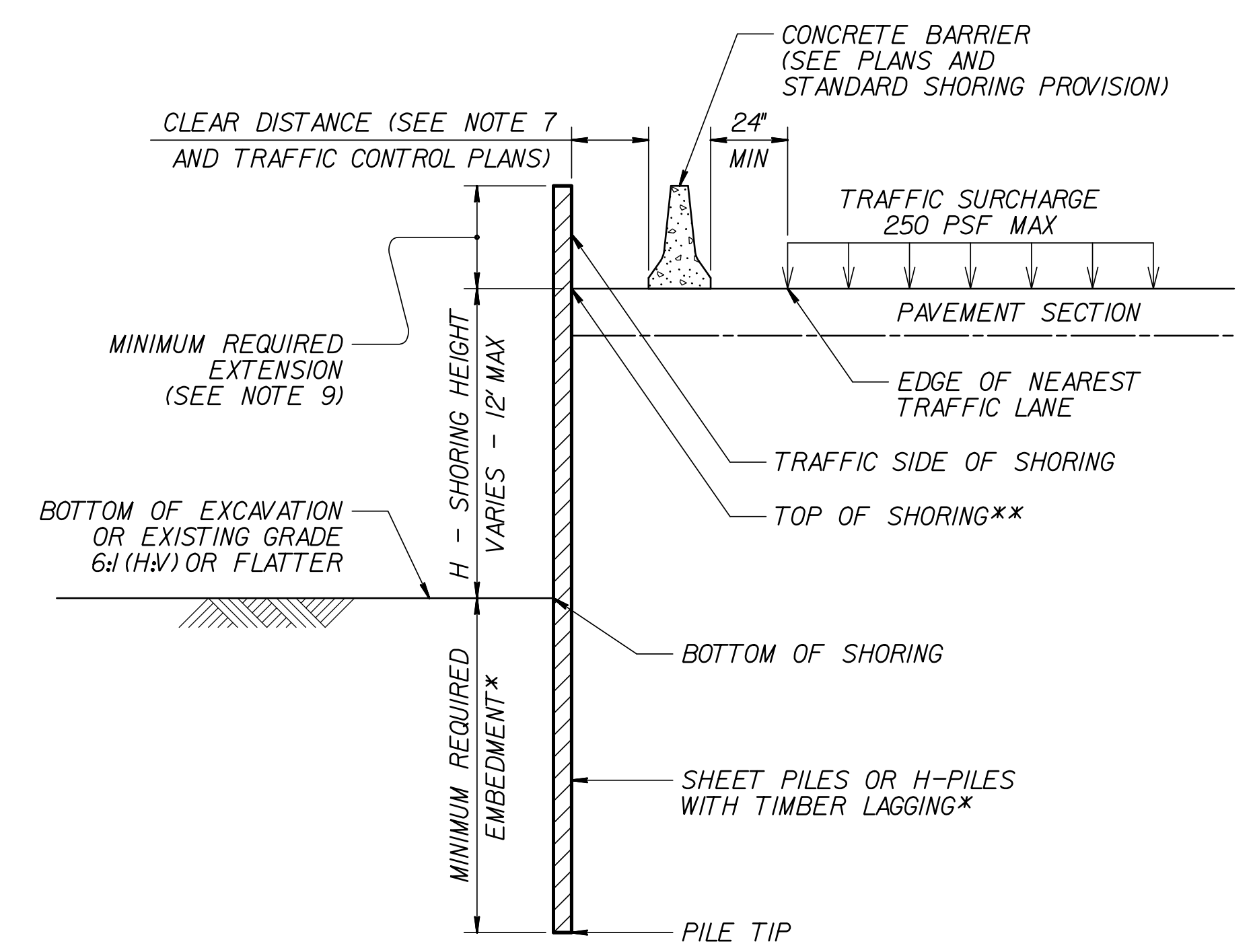
CONTRACT STANDARDS AND DEVELOPMENT UNIT	
Office 919-707-6950	FAX 919-250-4119
8' GUARDRAIL POST	
ORIGINAL BY: <u>L. Robinson</u>	DATE: <u>1995</u>
MODIFIED BY: <u>L. Robinson</u>	DATE: <u>Feb. 1996</u>
CHECKED BY: _____	DATE: _____
FILE SPEC.: <u>s:7postguardrail.dgn</u>	

PROJECT REFERENCE NO. BP11.R002	SHEET NO. 2G-1
GEOTECHNICAL ENGINEER  SEAL 041986 ENGINEER MATTHEW BREWER DocuSign by: Matthew Brewer 1/4/2023 DATE SIGNATURE DATE	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

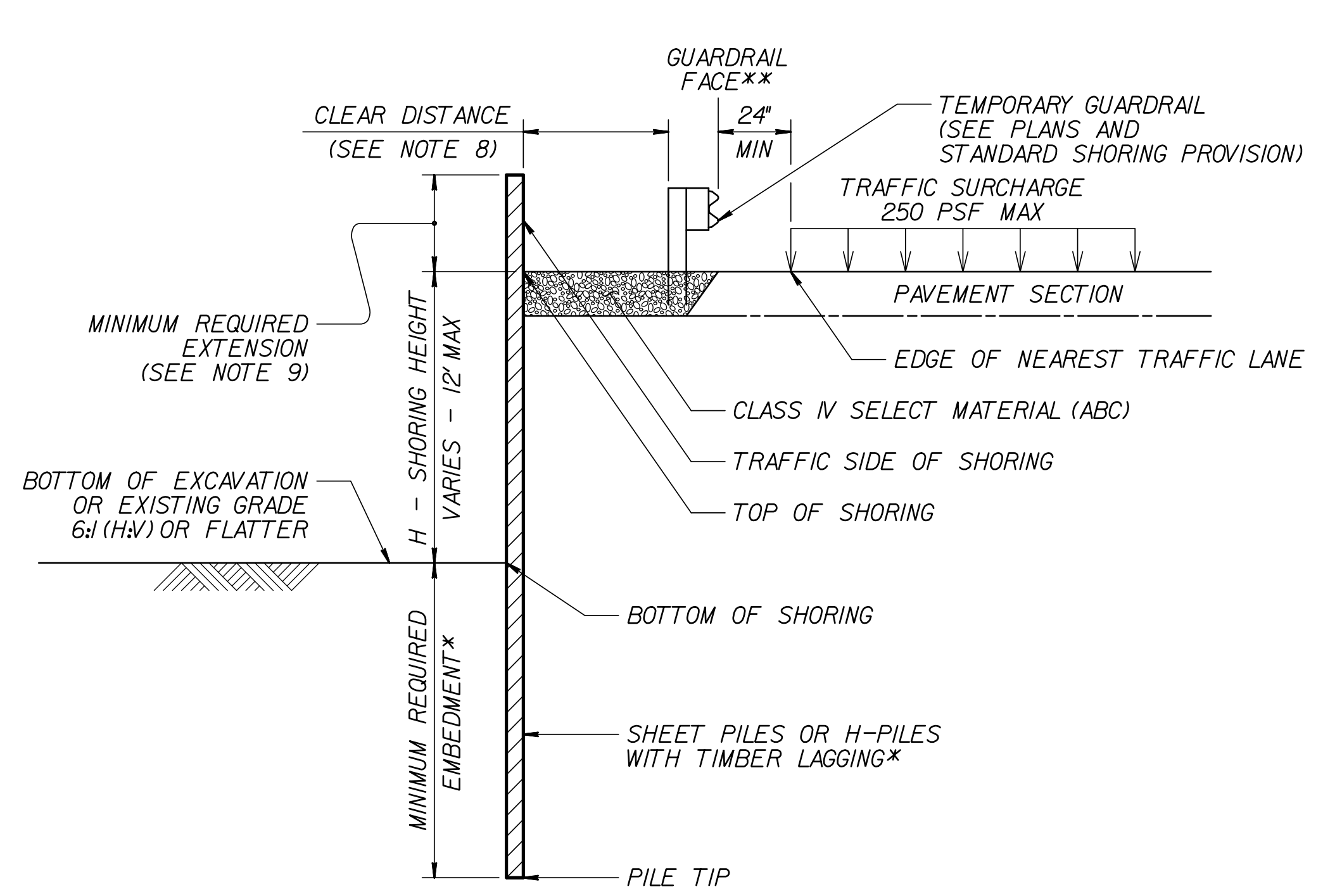
GROUNDWATER CONDITION (SEE NOTE 6)	H SHORING HEIGHT (FT)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT					SURCHARGE CASE WITH TRAFFIC IMPACT				
		SHEET PILES		H-PILES WITH TIMBER LAGGING			SHEET PILES		H-PILES WITH TIMBER LAGGING		
		MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (IN ³ /FT)	MINIMUM REQUIRED EMBEDMENT* (FT) (SEE NOTE 10)			MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (IN ³ /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
 - CONTACT THE ENGINEER IF PILES DO NOT ATTAIN THE MINIMUM REQUIRED EMBEDMENT.

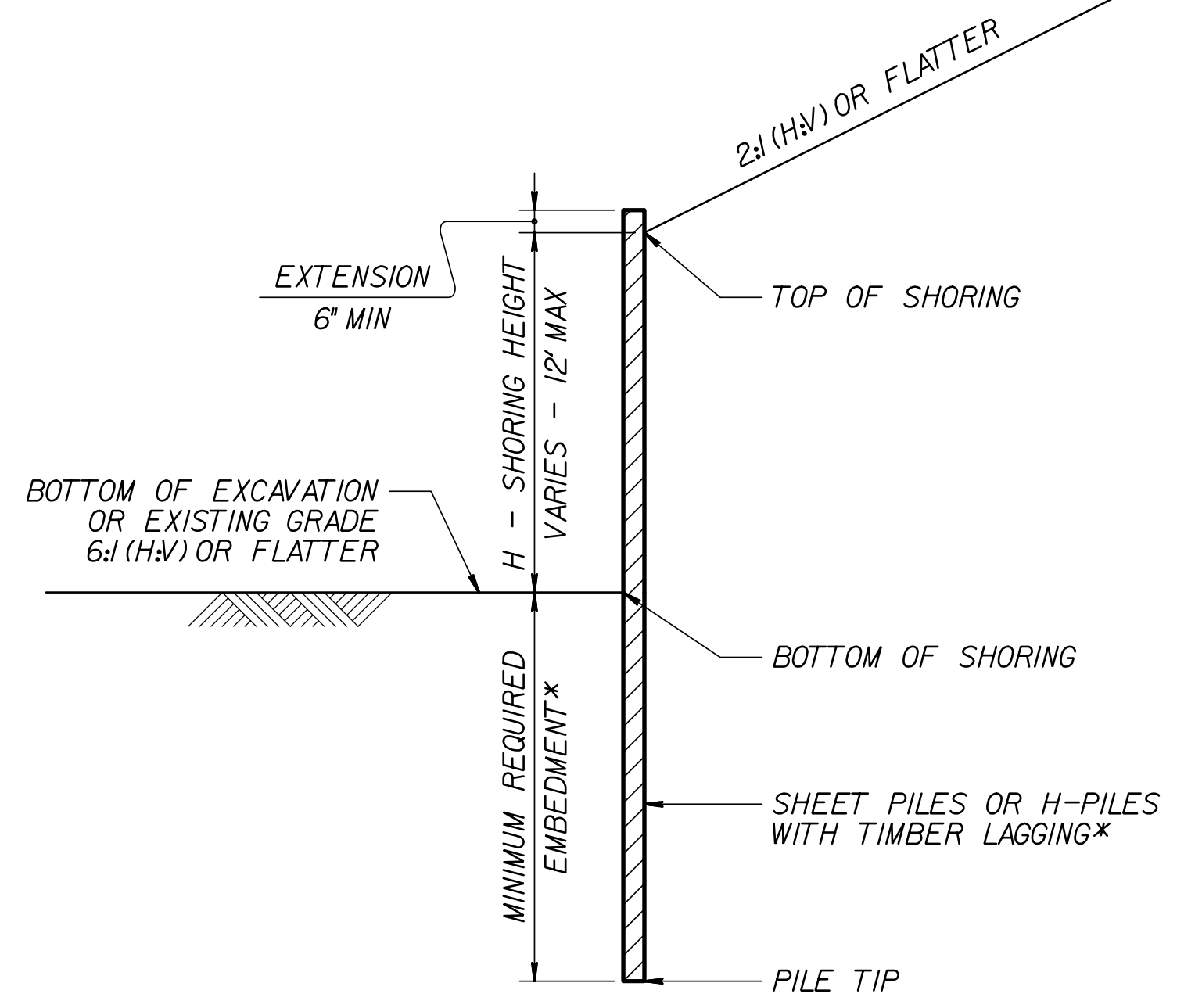
MINIMUM REQUIRED EMBEDMENT AND SECTION MODULUS
***DO NOT USE H-PILES WITH TIMBER LAGGING FOR GROUNDWATER CONDITION, SHORING HEIGHT AND H-PILE SIZE SHOWN IF MINIMUM REQUIRED EMBEDMENT IS "--".**



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

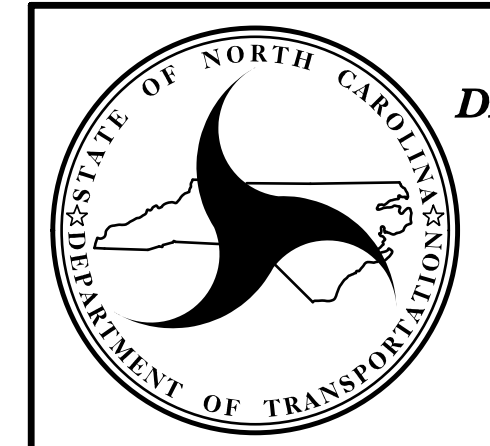


TEMPORARY GUARDRAIL
****GUARDRAIL FACE = EDGE OF PAVEMENT**



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

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

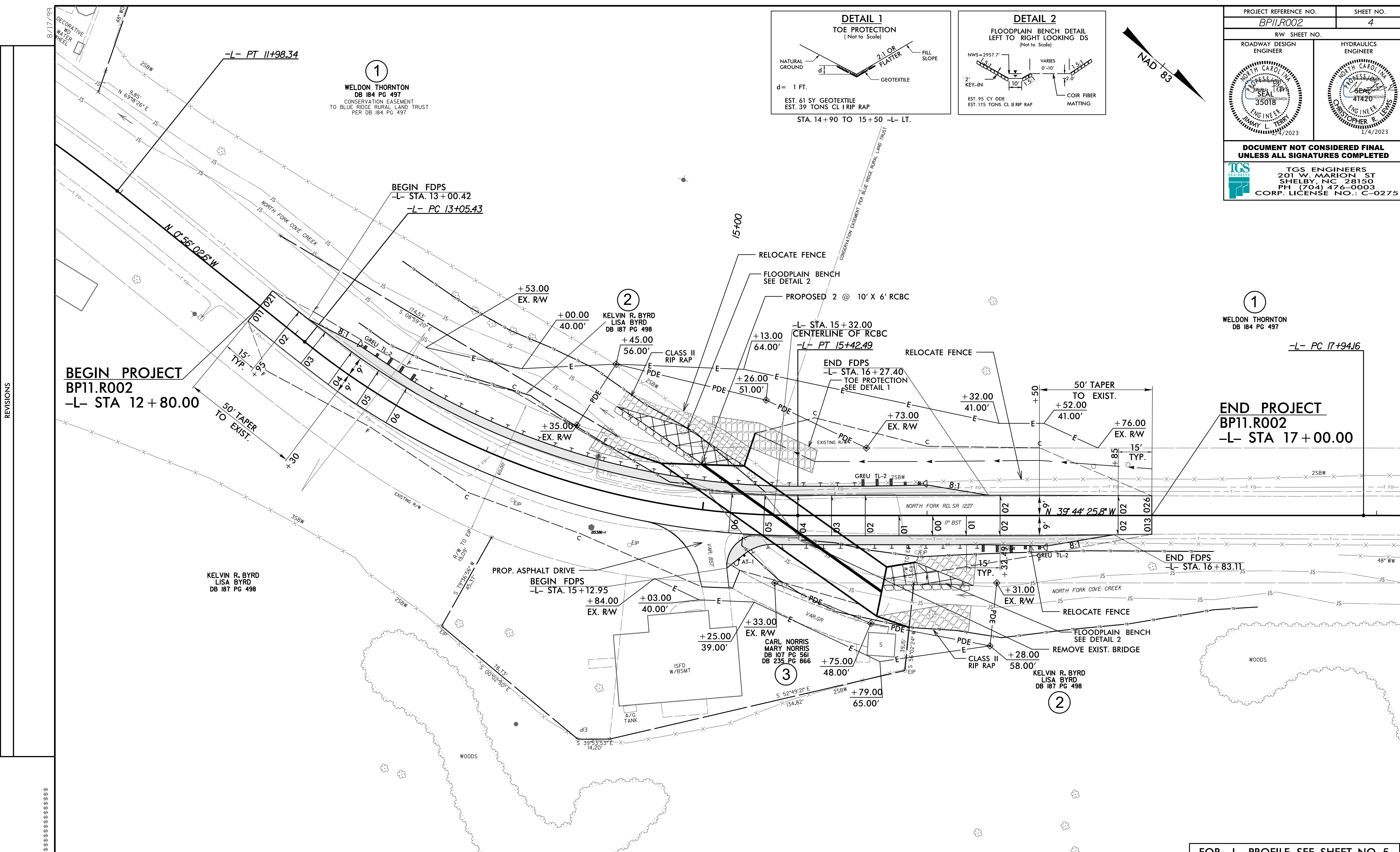
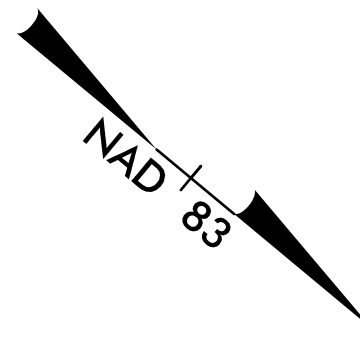
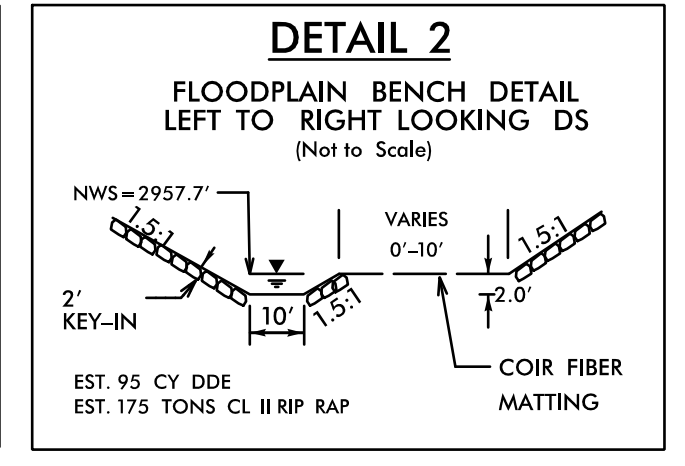
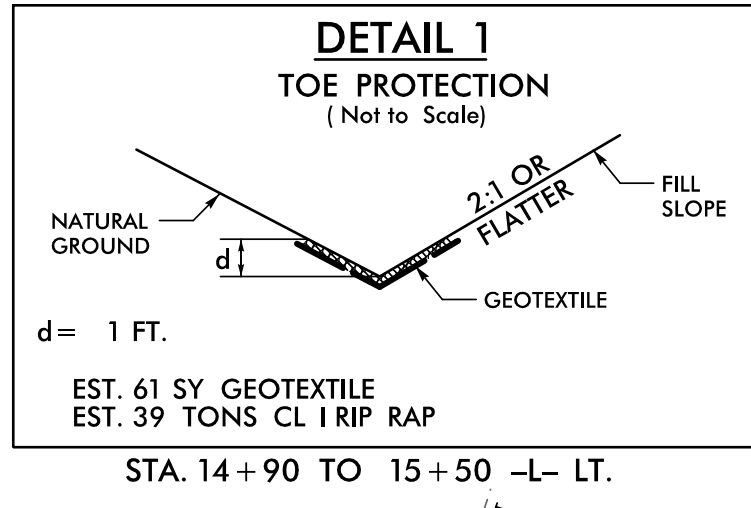


NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.01

STANDARD TEMPORARY SHORING

PROJECT REFERENCE NO. BP11.R002	SHEET NO. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
 TGS ENGINEERS 201 W. MARION ST SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275	



BEGIN PROJECT
BP11.R002
-L- STA 12+80.00

END PROJECT
BP11.R002
-L- STA 17+00.00

-L- CURVE DATA

PI Sta	PI Sta	PI Sta	PI Sta
10+44.34	11+43.10	14+28.71	18+47.60
$\Delta = 22^\circ 17' 39.1''$ (RT)	$\Delta = 10^\circ 34' 45.9''$ (RT)	$\Delta = 38^\circ 48' 23.3''$ (LT)	$\Delta = 0^\circ 38' 40.3''$ (RT)
D = 25' 27" 53.2"	D = 9' 32" 57.5"	D = 16' 22" 12.8"	D = 0' 36" 11.2"
L = 87.55'	L = 110.79'	L = 237.06'	L = 106.87'
T = 44.34'	T = 55.55'	T = 123.28'	T = 53.43'
R = 225.00'	R = 600.00'	R = 350.00'	R = 9,500.00'
SE = EXIST.	SE = EXIST.	SE = 0.06	SE = EXIST.
		DS = 35 MPH	

FOR -L- PROFILE, SEE SHEET NO. 5

SEE C-1 TO C-10 FOR CULVERT PLANS

NOTE: USE EXTRA DEPTH GUARDRAIL
POSTS FROM -L- STA. 15+75 TO 16+50 RT

NOTE: GUARDRAIL OVER CULVERT WILL REQUIRE
A MOMENT SLAB. (SEE STRUCTURE PLANS FOR DETAILS)

REVISIONS

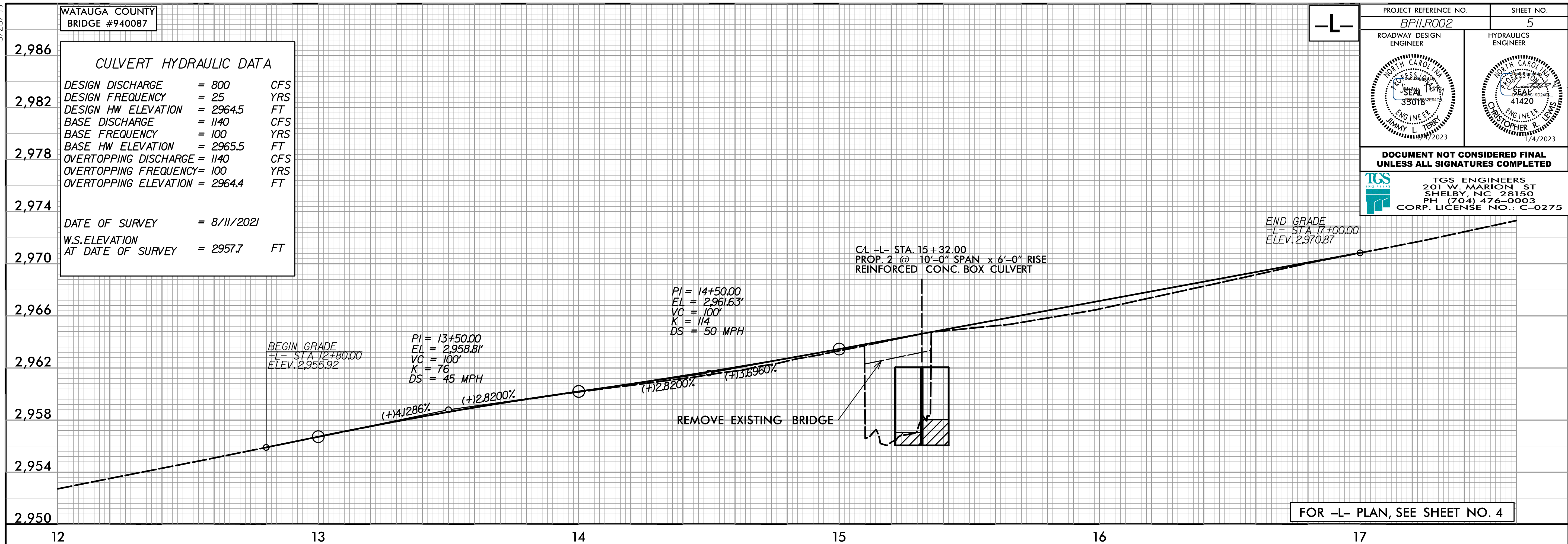
1/3/2023

5/28/23

WATAUGA COUNTY
BRIDGE #940087

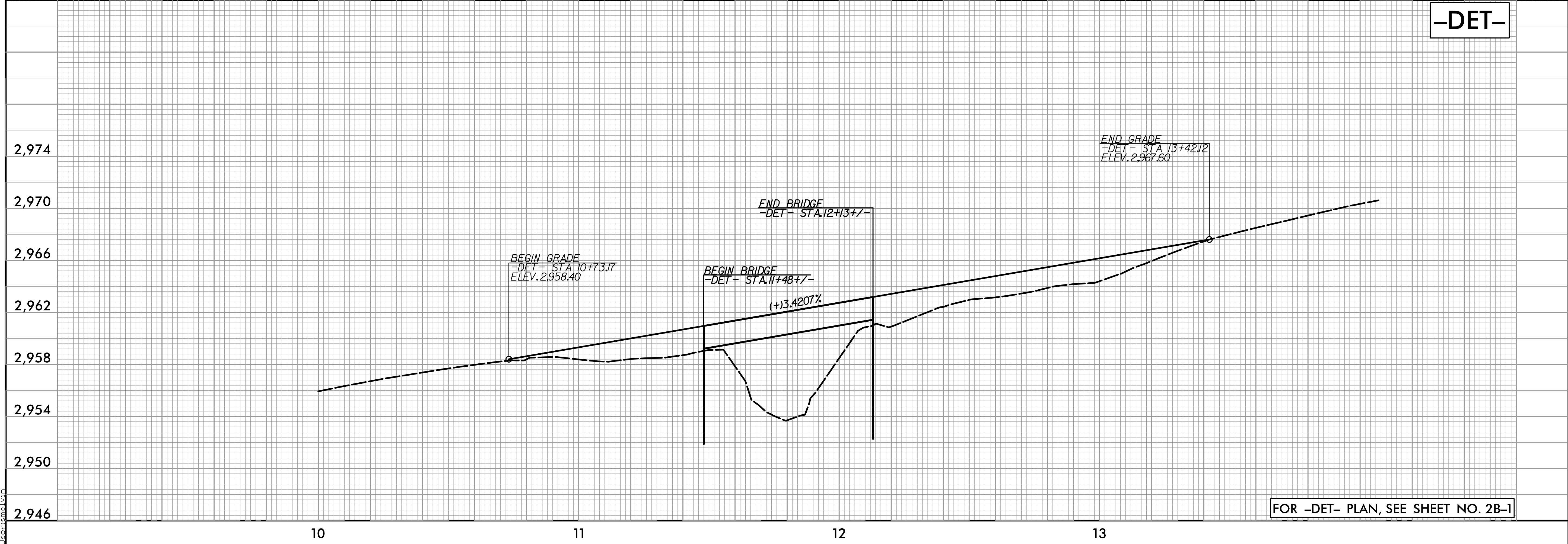
CULVERT HYDRAULIC DATA		
DESIGN DISCHARGE	= 800	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 2964.5	FT
BASE DISCHARGE	= 1140	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 2965.5	FT
OVERTOPPING DISCHARGE	= 1140	CFS
OVERTOPPING FREQUENCY	= 100	YRS
OVERTOPPING ELEVATION	= 2964.4	FT
DATE OF SURVEY	= 8/11/2021	
W.S. ELEVATION AT DATE OF SURVEY	= 2957.7	FT

PROJECT REFERENCE NO. BPII.R002	SHEET NO. 5
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
 TGS ENGINEERS 201 W. MARION ST SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275	



FOR -L- PLAN, SEE SHEET NO. 4

-DET-



FOR -DET- PLAN, SEE SHEET NO. 2B-1

1/3/2023
User: jsmel1110

09/08/99

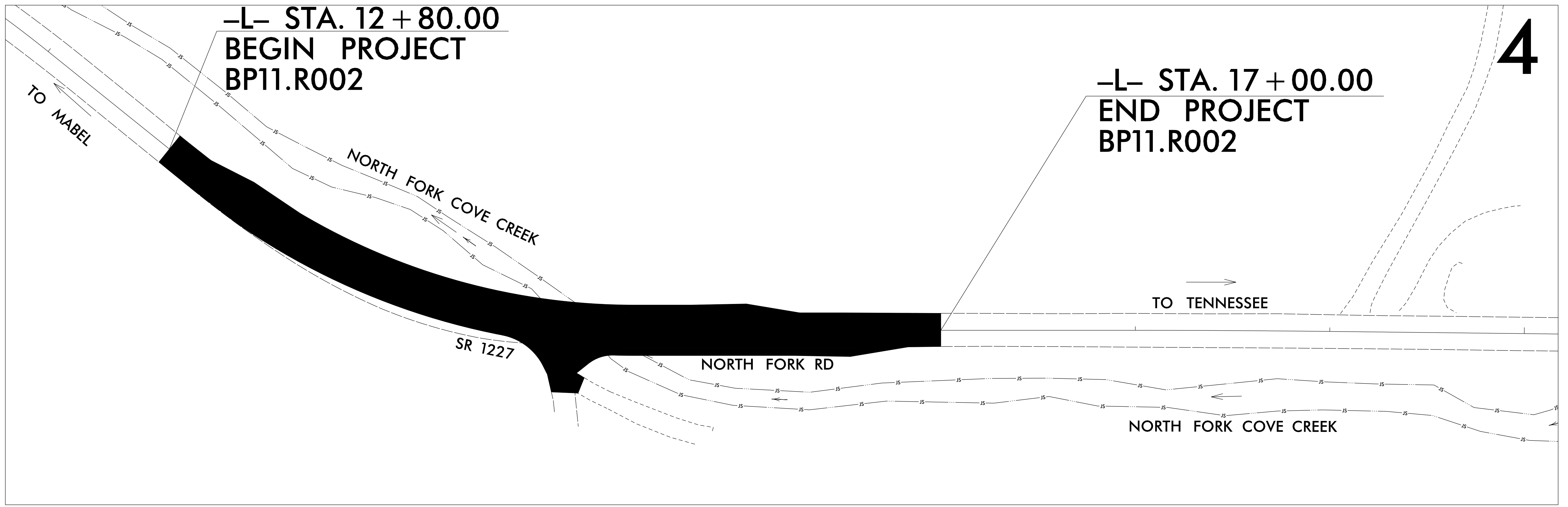
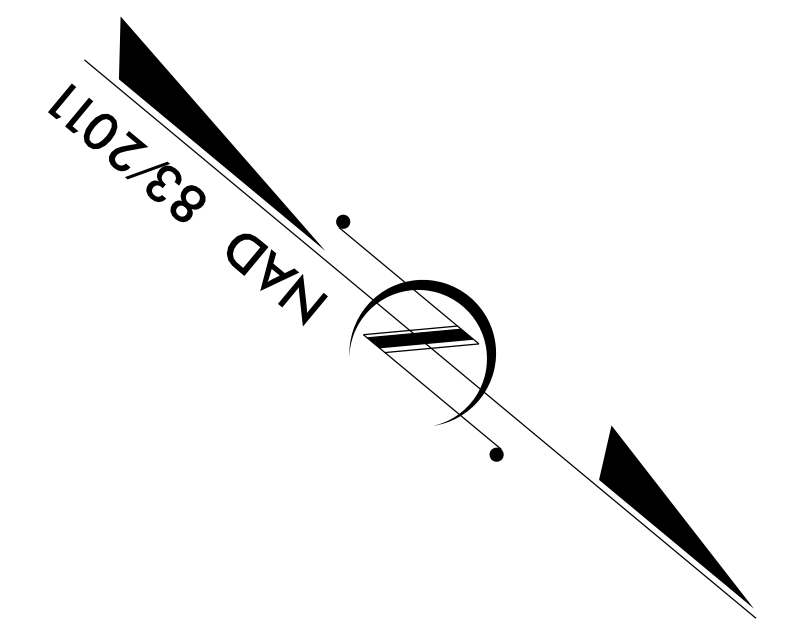
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP11.R002	RW01	XX

TIP PROJECT: BP11.R002

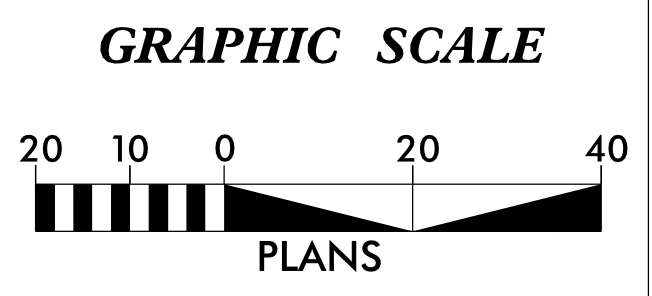
STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

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

WATAUGA COUNTY



3-MAY-2022 09:32 I:\392\NCDOT_Survey\392\AH_Watauga Co RW Staking\06 Working Folders\Survey\Dwgs\Watauga 87_Is_Row01.dgn F:\z\flow AT MC-ACARVER01-NB



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B5386-1" WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF NORTHING: 946630.5981(ft) EASTING: 1183987.4016(ft) ELEVATION: 2962.42(ft)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9999097329

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B5386-1" TO -L- STATION 12+80 IS S5°58'37"E 177.1943(ft)

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

Prepared in the Office of:

Mattern & Craig
 ENGINEERS SURVEYORS

12 BROAD STREET
 ASHEVILLE, NORTH CAROLINA 28801
 (828) 254-2201
 FAX (828) 254-4562
 NC LIC. NO. C-1154

2018 STANDARD SPECIFICATIONS

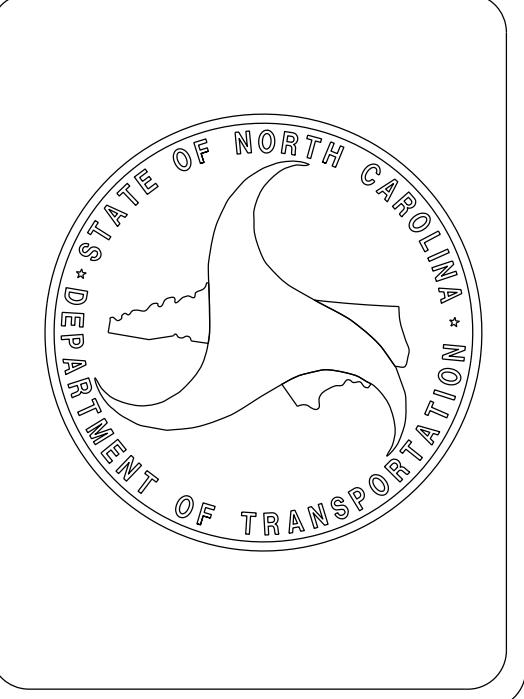
RIGHT OF WAY DATE: MARCH 1, 2022	LETTING DATE: MARCH 2023
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PROFESSIONAL LAND SURVEYOR

DocuSigned by:
 Michael L. Zieton
 01E1C08A005472

5/31/2022

SIGNATURE: _____ Date: _____

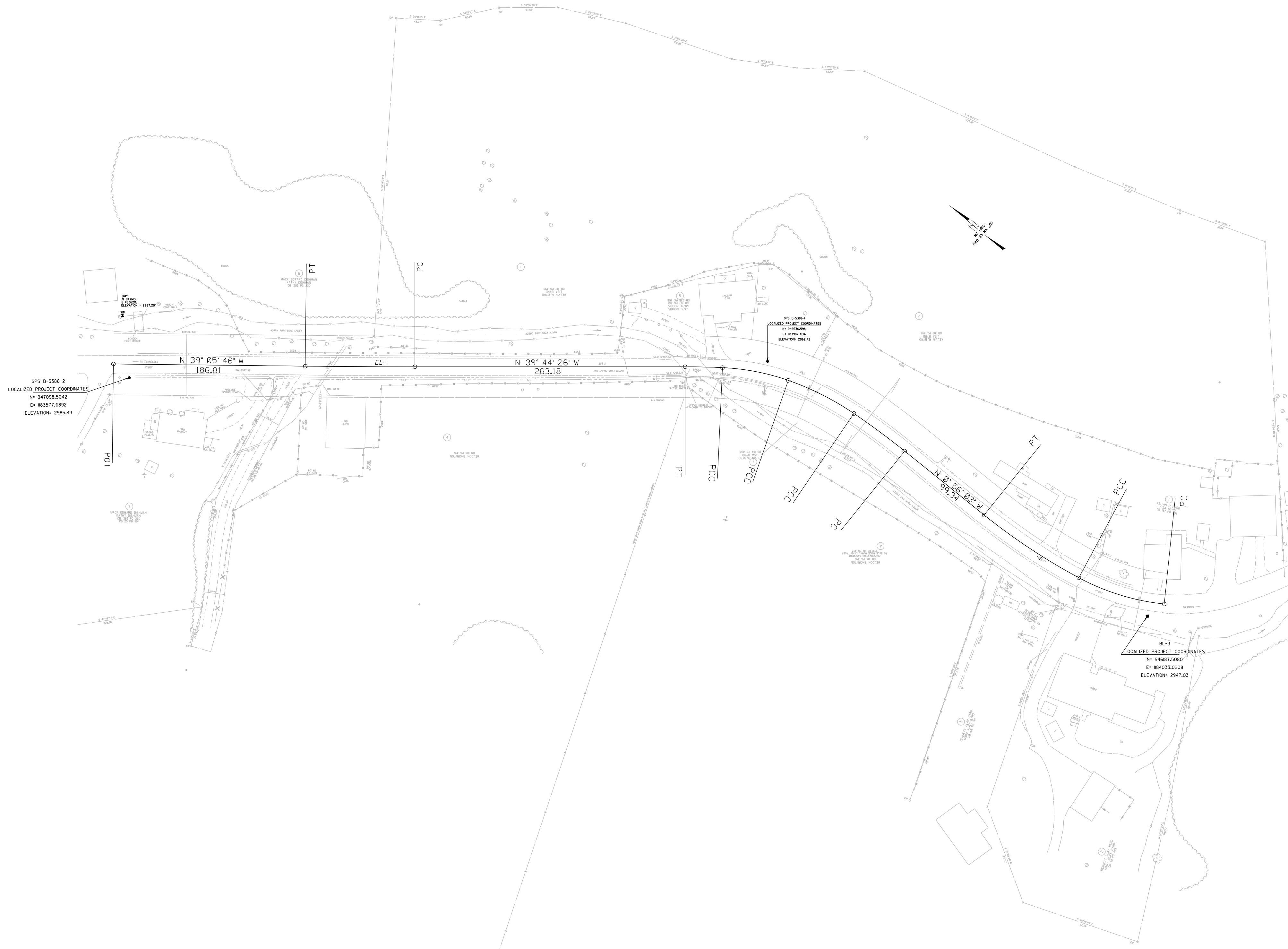




DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION



I, R. LANDON WAGONER, PLS, certify that the Project Control was verified under my supervision from an actual GPS survey made under my supervision and the following information was used to perform the survey:

Class of survey: AA
 Type of GPS field procedure: RTN
 Dates of survey: 02/2017
 Datum/Epoch: NAD 83/NA 2011
 Published/Fixed-control use: N/A
 Localized around: B5386-1
 Northing: 946630.5981
 Easting: 1183987.4016
 Combined grid factor: 0.9999097329
 Geoid model: 12B
 Units: ENGLISH

I also certify that the Baseline Control for this project was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:20,000 (Class AA) and Vertical accuracy to Class A. Field work was performed from 02/2017 to 03/2017, and all coordinates are based on NAD 83/2011 and all elevations are based on NAVD 88; that this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 12th day of October, 2022.

Designed by:

 Professional Land Surveyor L-4301


DATUM DESCRIPTION
 THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "B5386-1" WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF NORTHING: 946630.5981(ft); EASTING: 1183987.4016(ft); ELEVATION: 2962.42(ft)
 THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9999097329
 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B5386-1" TO -L- STATION 10+00.00 IS S 08°13'16" E 453.13'
 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

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.

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO. 94-0087	SHEET NO. RW02C-2
Location and Surveys	
	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

I, R. LANDON WAGONER, PLS, certify that the Project Control was verified under my supervision from an actual GPS survey made under my supervision and the following information was used to perform the survey:

Class of survey: **AA**
 Type of GPS field procedure: RTN
 Dates of survey: 02/2017
 Datum/Epoch: NAD 83/NA 2011
 Published/Fixed-control use: N/A
 Localized around: B5386-1
 Northing: 946630.5981
 Easting: 1183987.4016
 Combined grid factor: 0.9999097329
 Geoid model: 12B
 Units: ENGLISH

I also certify that the Baseline Control for this project was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:20,000 (Class AA) and Vertical accuracy to Class A. Field work was performed from 02/2017 to 03/2017, and all coordinates are based on NAD 83/2011 and all elevations are based on NAVD 88; that this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 12th day of October, 2022.


 R. Landon Wagener
Professional Land Surveyor

Professional Land Surveyor L-4301

BL	POINT	DESC.	NORTH	EAST	ELEVATION
3		BL-3	946187.5080	1184033.0208	2947.03
1		GPS B5386-1	946630.5981	1183987.4016	2962.42
2		GPS B5386-2	947098.5042	1183577.6892	2985.43

 BM1 ELEVATION = 2987.29
 N 947143 E 1183620
 RAILROAD SPIKE SET IN 30" OAK TREE

EL	POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
PC		946182.454	1184052.695							
CURVE				N 22°39'38.0" W	87.00	22°17'39.1"(RT)	25°27'53.2"	87.55	44.34	225.00
PCC		946262.736	1184019.178							
CURVE				N 06°13'25.5" W	110.63	10°34'45.9"(RT)	09°32'57.5"	110.79	55.55	600.00
PT		946372.714	1184007.184							
LINE				N 00°56'02.6" W	99.34					
PC		946472.042	1184005.565							
CURVE				N 03°12'33.4" W	61.53	04°33'01.7"(LT)	07°23'34.8"	61.55	30.79	775.00
PCC		946533.480	1184002.120							
CURVE				N 12°57'36.3" W	71.56	14°57'04.0"(LT)	20°50'05.4"	71.76	36.09	275.00
PCC		946603.214	1183986.071							
CURVE				N 28°47'02.4" W	65.34	16°41'48.3"(LT)	25°27'53.2"	65.57	33.02	225.00
PCC		946660.478	1183954.611							
CURVE				N 38°26'11.2" W	36.41	02°36'29.3"(LT)	07°09'43.1"	36.42	18.21	800.00
PT		946689.000	1183931.975							
LINE				N 39°44'25.8" W	263.18					
PC		946891.375	1183763.718							
CURVE				N 39°25'05.7" W	106.87	00°38'40.3"(RT)	00°36'11.2"	106.87	53.43	9500.00
PT		946973.933	1183695.861							
LINE				N 39°05'45.5" W	186.81					
POT		947118.914	1183578.054							


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.

REVISIONS

6/2/19

PROPOSED ALIGNMENT CONTROL SHEET

PROJECT REFERENCE NO. BP11.R002	SHEET NO. RW02D-1
Location and Surveys	
MATTERN AND CRAIG ENGINEERS & SURVEYORS 12 BROAD STREET ASHEVILLE NORTH CAROLINA 28801 (828) 254-2201 FAX (828) 254-4562 NC LIC. NO. C-1154	
PROJECT SURVEYOR 	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

I, R. L. Zietlow, PLS, certify that the data compiled came from available surveys/mapping performed by others and provided to me by NCDOT and do not certify to the accuracy or quality of the individual data sources.

This 31st day of May, 2022.

DocuSigned by:

 84E55C984005472...
 Professional Land Surveyor L-5235

-L- NORTH FORK RD. SR 1227

TYPE	STATION	NORTH	EAST
PC	10+00.00	946182.4544	1184052.6952
PCC	10+87.55	946262.7363	1184019.1775
PT	11+98.34	946372.7144	1184007.1839
PC	13+05.43	946479.7976	1184005.4381
PT	15+42.49	946697.8512	1183924.6163
PC	17+94.16	946891.3752	1183763.7183
PT	19+01.03	946973.9330	1183695.8605
POT	20+87.84	947118.9143	1183578.0542

REVISIONS

3 MAY 2022 12:57 P:\001\00000000\Survey\3921AH_Watouge Co RW Staking\06 Working Folders\Survey\Dwg\Watouge_87_1s.rwd-1.dgn
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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 INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

RIGHT OF WAY CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
BP11.R002	RW03E-1

Location and Surveys

MATTEN AND CRAIG
ENGINEERS & SURVEYORS
12 BROAD STREET
ASHEVILLE NORTH CAROLINA 28801
(828) 254-2201
FAX (828) 254-4562
NC LIC. NO. C-1154

PROJECT SURVEYOR



DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

I, R. L. Zietlow, certify that the right of way and permanent easement monumentation for this project shown herein was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:10,000 (Class A). Field work was performed from 5/23/22 to 5/27/22, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 31st day of May, 2022.

DocuSigned by:
I. R. L. Zietlow

Professional Land Surveyor L-5235

REVISIONS


ROW MARKER PERMANENT EASEMENT - E

ALIGN	STATION	OFFSET	NORTH	EAST
L	14+35.00	-25.03	946596.5849	1183956.4802
L	14+45.00	-56.00	946592.6467	1183924.5214
L	15+26.00	-51.00	946654.2064	1183894.1472
L	15+33.00	30.14	946709.1065	1183954.2729
L	15+73.00	-30.00	946702.1331	1183882.0419
L	15+75.00	48.00	946753.5373	1183940.7412
L	16+28.00	58.00	946800.6846	1183914.5472
L	16+31.00	30.00	946785.0907	1183891.0987

NOTES:

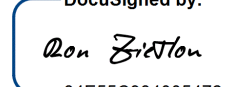
1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
3. RIGHT OF WAY MONUMENTATION ESTABLISHED 5/23/22 TO 5/27/22 .

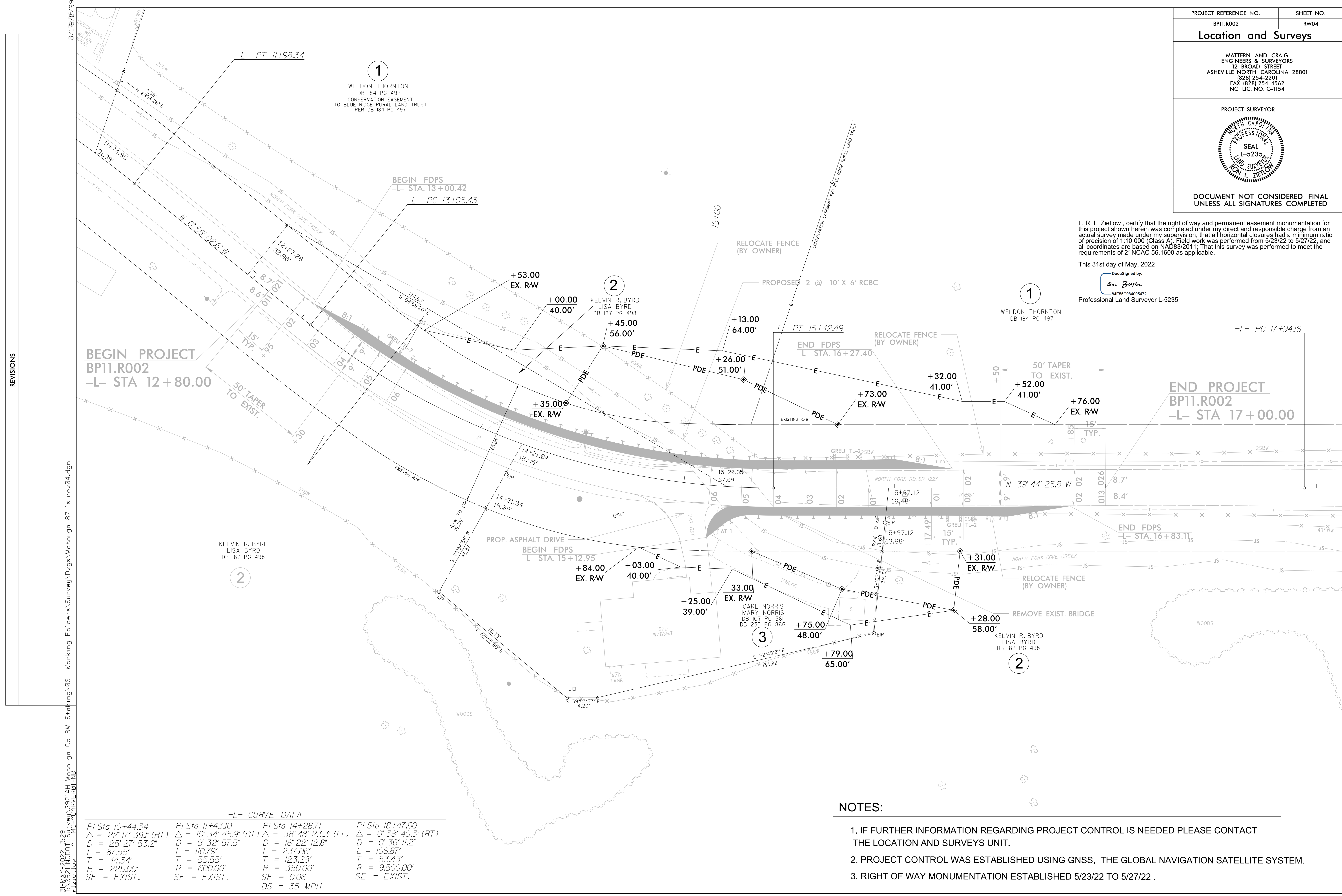
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 I. R. L. Zietlow
 AT MP-ACAPRVER01-NB

PROJECT REFERENCE NO.	SHEET NO.
BP11.R002	RW04
Location and Surveys	
MATTERN AND CRAIG ENGINEERS & SURVEYORS 12 BROAD STREET ASHEVILLE NORTH CAROLINA 28801 (828) 254-2201 FAX (828) 254-4562 NC LIC. NO. C-1154	
PROJECT SURVEYOR	
	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

I, R. L. Zietlow, certify that the right of way and permanent easement monumentation for this project shown herein was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:10,000 (Class A). Field work was performed from 5/23/22 to 5/27/22, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 31st day of May, 2022.

DocuSigned by:

 84E55C84005472
 Professional Land Surveyor L-5235



-L- CURVE DATA

PI Sta	PI Sta	PI Sta	PI Sta
10+44.34	11+43.10	14+28.71	18+47.60
$\Delta = 22^\circ 17' 39.1''$ (RT)	$\Delta = 10^\circ 34' 45.9''$ (RT)	$\Delta = 38^\circ 48' 23.3''$ (LT)	$\Delta = 0^\circ 38' 40.3''$ (RT)
D = 25' 27" 53.2"	D = 9' 32" 57.5"	D = 16' 22" 12.8"	D = 0' 36" 11.2"
L = 87.55'	L = 110.79'	L = 237.06'	L = 106.87'
T = 44.34'	T = 55.55'	T = 123.28'	T = 53.43'
R = 225.00'	R = 600.00'	R = 350.00'	R = 9,500.00'
SE = EXIST.	SE = EXIST.	SE = 0.06	SE = EXIST.
		DS = 35 MPH	

- NOTES:**
1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
 2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
 3. RIGHT OF WAY MONUMENTATION ESTABLISHED 5/23/22 TO 5/27/22 .

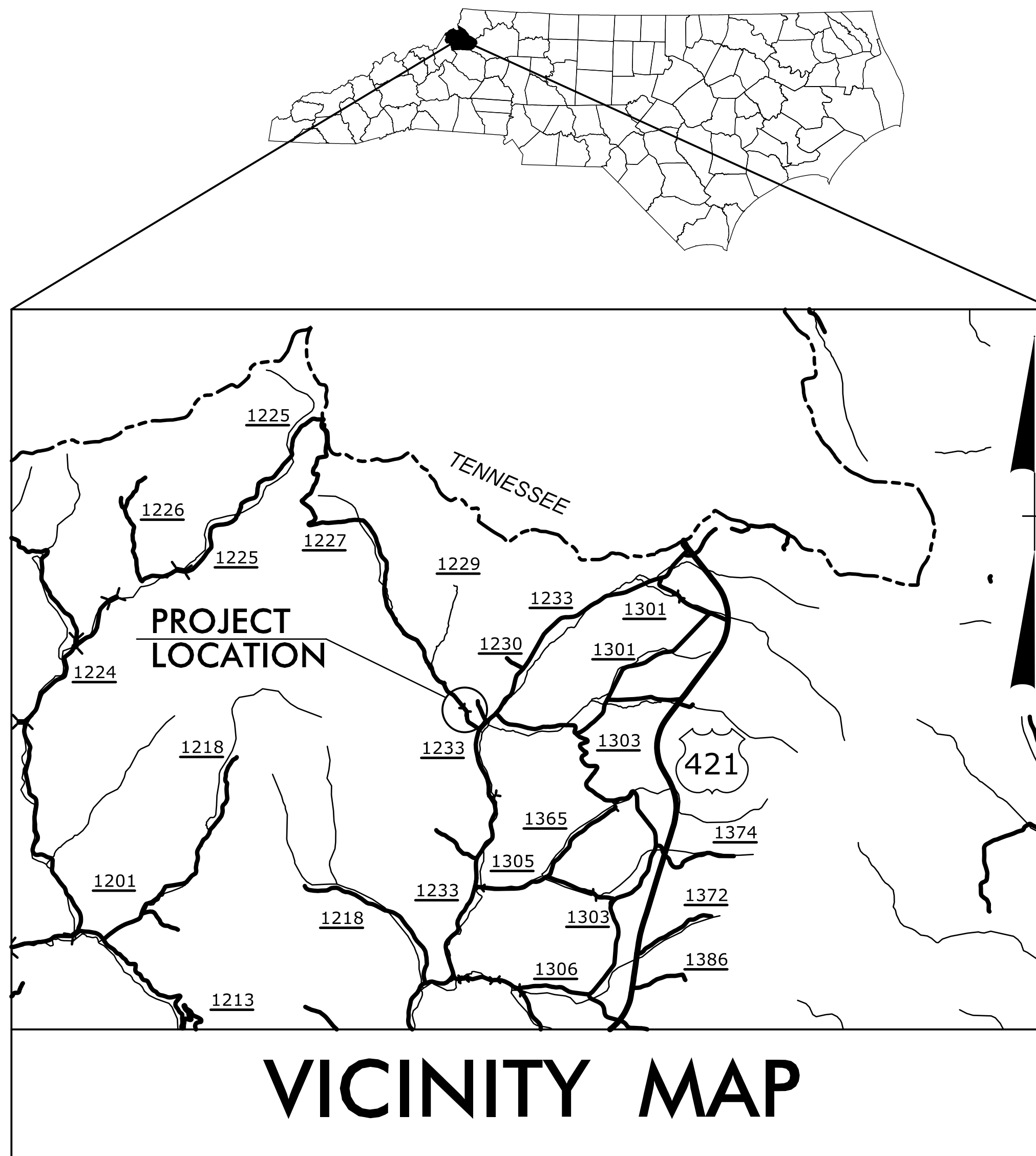
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STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

WATAUGA COUNTY



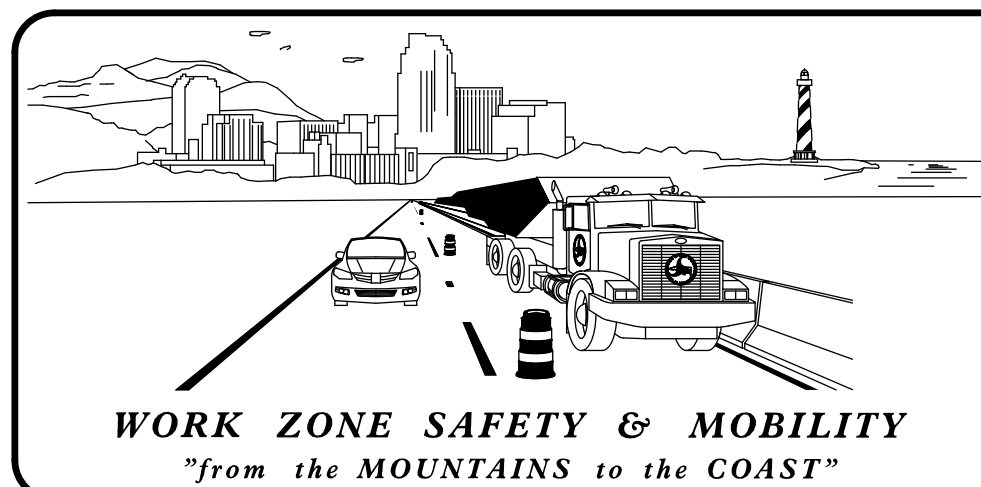
INDEX OF SHEETS

<u>SHEET NO.</u>	<u>TITLE</u>
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, AND LOCAL NOTES)
TMP-2	TEMPORARY TRAFFIC CONTROL PHASING NOTES
TMP-3	TEMPORARY TRAFFIC CONTROL PHASE I DETAILS
TMP-4	TEMPORARY TRAFFIC CONTROL PHASE II DETAILS
TMP-5	TEMPORARY TRAFFIC CONTROL PHASE III DETAILS

SHEET NO.
TMP-1

PROJECT: BPII.R002

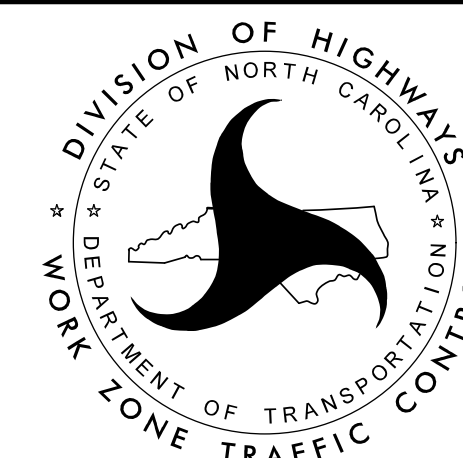
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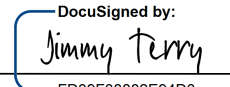
PLAN PREPARED FOR N.C.D.O.T. BY:

TGS ENGINEERS
 TGS ENGINEERS
 201 W. MARION ST
 SHELBY, NC 28150
 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275

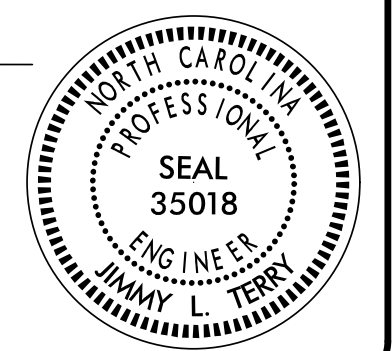
JIMMY TERRY, PE PROJECT ENGINEER
 DAVID HAMRICK, EIT DESIGN ENGINEER



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UNLESS ALL SIGNATURES COMPLETED**

APPROVED: 
 DATE: 1/4/2023

SEAL



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
1101.01	WORK ZONE ADVANCE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.03	TEMPORARY ROAD CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1130.01	DRUM
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGING DEVICES
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTI-LANE ROADWAYS
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION
1264.01	OBJECT MARKERS - TYPES
1264.02	OBJECT MARKERS - INSTALLATION

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
- TEMPORARY

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

TEMPORARY PAVEMENT MARKING SCHEDULE


SYMBOL	DESCRIPTION
PAINT (4")	
P1	WHITE EDGELINE
P13	YELLOW DOUBLE CENTER
PAINT (24")	
P61	WHITE STOPBAR
EXISTING MARKINGS	
X	YELLOW DOUBLE CENTER

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APPROVED: DATE: 1/4/2023

LIST OF APPLICABLE
ROADWAY STANDARD
DRAWINGS AND LEGEND

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

PROJ. REFERENCE NO.	SHEET NO.
BP11.R002	TMP-1B
 TGS ENGINEERS 201 W. MARION ST SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275	

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.

LANE AND SHOULDER CLOSURE REQUIREMENTS

- A) REMOVE LANE CLOSURE DEVICES FROM THE LANE WHEN WORK IS NOT BEING PERFORMED BEHIND THE LANE CLOSURE OR WHEN A LANE CLOSURE IS NO LONGER NEEDED OR AS DIRECTED BY THE ENGINEER.
- B) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 15 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN SHOULDER USING ROADWAY STANDARD DRAWING NO. 1101.04 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL OR A LANE CLOSURE IS INSTALLED.
- C) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO AN UNDIVIDED FACILITY AND WITHIN 5 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.
- D) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN A LANE OF TRAVEL OF AN UNDIVIDED OR DIVIDED FACILITY, CLOSE THE LANE ACCORDING TO THE TRAFFIC CONTROL PLANS, ROADWAY STANDARD DRAWINGS, OR AS DIRECTED BY THE ENGINEER. CONDUCT THE WORK SO THAT ALL PERSONNEL AND/OR EQUIPMENT REMAIN WITHIN THE CLOSED TRAVEL LANE.

PAVEMENT EDGE DROP OFF REQUIREMENTS

- E) BACKFILL AT A 6:1 SLOPE UP TO THE EDGE AND ELEVATION OF EXISTING PAVEMENT IN AREAS ADJACENT TO AN OPENED TRAVEL LANE THAT HAS AN EDGE OF PAVEMENT DROP-OFF AS FOLLOWS:

 BACKFILL DROP-OFFS THAT EXCEED 2 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS OF 45 MPH OR GREATER.

 BACKFILL DROP-OFFS THAT EXCEED 3 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS LESS THAN 45 MPH.

 BACKFILL WITH SUITABLE COMPACTED MATERIAL, AS APPROVED BY THE ENGINEER, AT NO EXPENSE TO THE DEPARTMENT.
- F) DO NOT EXCEED A DIFFERENCE OF 2 INCHES IN ELEVATION BETWEEN OPEN LANES OF TRAFFIC FOR NOMINAL LIFTS OF 1.5 INCHES. INSTALL ADVANCE WARNING "UNEVEN LANES" SIGNS (W8-11) 200 FT IN ADVANCE AND A MINIMUM OF EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

TRAFFIC PATTERN ALTERATIONS

- G) NOTIFY THE ENGINEER THIRTY (30) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

- H) INSTALL ADVANCE WORK ZONE WARNING SIGNS WHEN WORK IS WITHIN 40 FT FROM THE EDGE OF TRAVEL LANE AND NO MORE THAN THREE (3) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.
- I) PROVIDE SIGNING AND DEVICE REQUIRED TO CLOSE THE ROAD ACCORDING TO THE ROADWAY STANDARD DRAWING AND TRAFFIC CONTROL PLANS.
- J) COVER OR REMOVE ALL SIGNS AND DEVICES REQUIRED TO CLOSE THE ROAD WHEN ROAD CLOSURE IS NOT IN OPERATION.
- K) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.
- L) INSTALL BLACK ON ORANGE "DIP" SIGNS (W8-2) AND/OR "BUMP" SIGNS (W8-1) 200 FT IN ADVANCE OF THE UNEVEN AREA, OR AS DIRECTED BY THE ENGINEER.

TRAFFIC CONTROL DEVICES

- M) WHEN LANE CLOSURES ARE NOT IN EFFECT SPACE CHANNELIZING DEVICES IN WORK AREAS NO GREATER IN FEET THAN TWICE THE POSTED SPEED LIMIT (MPH) EXCEPT, 10 FT ON-CENTER IN RADII, AND 3 FT OFF THE EDGE OF AN OPEN TRAVELWAY. REFER TO STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES SECTIONS 1130 (DRUMS), 1135 (CONES) AND 1180 (SKINNY DRUMS) FOR ADDITIONAL REQUIREMENTS.
- N) PLACE TYPE III BARRICADES, WITH "ROAD CLOSED" SIGN R11-2 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE ENTIRE ROADWAY.

PAVEMENT MARKINGS AND MARKERS

- O) INSTALL TEMPORARY PAVEMENT MARKINGS AND TEMPORARY PAVEMENT MARKERS ON INTERIM LAYERS OF PAVEMENT AS FOLLOWS:

ROAD NAME	MARKING	MARKER
NORTH FORK ROAD (-L-)	PAINT	NONE
- P) PLACE ONE APPLICATION OF PAINT FOR TEMPORARY TRAFFIC PATTERNS. PLACE A SECOND APPLICATION OF PAINT SIX (6) MONTHS AFTER THE INITIAL APPLICATION AND EVERY SIX MONTHS AS DIRECTED BY THE ENGINEER.
- Q) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.
- R) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS BY THE END OF EACH DAY'S OPERATION.

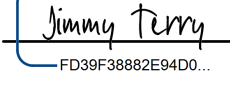
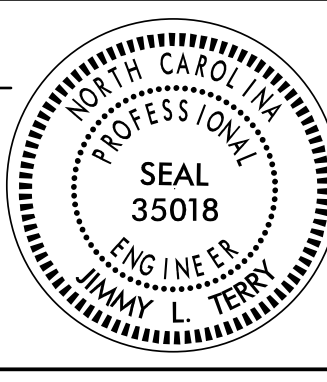
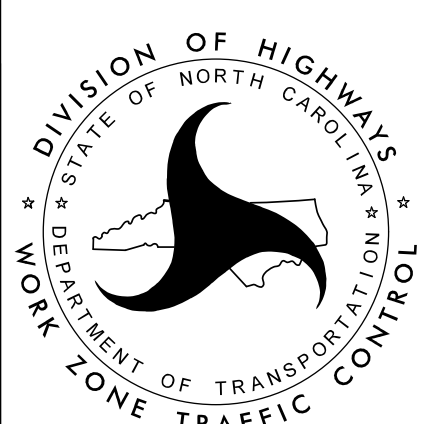
LOCAL NOTES

THE CONTRACTOR SHALL MAINTAIN EXISTING DRIVEWAY ACCESS AT ALL TIMES DURING THE CONSTRUCTION AND/OR RELOCATE IF NECESSARY TO ACCOMMODATE CONSTRUCTION.

MANAGEMENT STRATEGIES


PROPOSED SR 1227(NORTH FORK RD) WILL BE CONSTRUCTED USING AN ON-SITE DETOUR WITH LANE SHIFTS OR CLOSURES, SHOULDER CLOSURES, PORTABLE TRAFFIC SIGNAL SYSTEM, TEMPORARY LANE CLOSURES AND FLAGGERS.

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APPROVED:  DATE: 1/4/2023 SEAL 		<h3>TRANSPORTATION OPERATIONS PLAN</h3>
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PHASING

Watauga County
Bridge #940087

PROJ. REFERENCE NO.	SHEET NO.
BP11.R002	TMP-2
 TGS ENGINEERS 201 W. MARION ST SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275	

Phase I

STEP 1:

INSTALL ALL ADVANCE WORK ZONE WARNING SIGNS ON -L- IN ACCORDANCE WITH NCDOT STD DRAWING 1101.01, SHEET 3 OF 3.

STEP 2: (TMP-3)

WITH THE EXISTING TRAFFIC IN ORIGINAL PATTERN CONSTRUCT THE ON-SITE DETOUR FROM DET STA. 10+45+/- TO DET STA. 13+65+/-, INCLUDING A TEMPORARY BRIDGE FROM DET STA 11+48+/- TO DET STA. 12+13+/-.

STEP 3: (TMP-3)

INSTALL A PORTABLE TRAFFIC SIGNAL SYSTEM AND SIGNAGE REALIGN THE EXISTING DRIVE RT OF -L- 15+00± AS SHOWN ON PLANS

PLACE TEMPORARY PAVEMENT MARKINGS

CLOSE EXISTING NORTH FORK RD TO TRAFFIC AND SHIFT TRAFFIC ONTO THE ON-SITE DETOUR USING A ONE LANE TWO-WAY TRAFFIC PATTERN.

Phase II

STEP 1: (TMP-4)

WITH NORTH FORK RD TRAFFIC ON THE ON-SITE DETOUR AND UTILIZING THE REALIGNED DRIVEWAY AND THE EXISTING ROAD AS ACCESS AS SHOWN ON PLANS, PERFORM THE FOLLOWING:

REMOVE THE EXISTING BRIDGE OVER NORTH FORK COVE CREEK.

CONSTRUCT THE PROPOSED BOX CULVERT AT -L- STA 15+32+/- (SEE EROSION CONTROL AND STRUCTURE PLANS FOR CULVERT CONSTRUCTION SEQUENCE).

CONSTRUCT THE FOLLOWING UP TO BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COURSE :
-L- STA 14+85± TO 16+00± AS SHOWN ON PLANS.
TIE-IN TO EXISTING PAVEMENT.

THE CONTRACTOR MAY ELECT TO BEGIN WORK DESCRIBED IN STEP 2 PRIOR TO COMPLETION OF STEP 1.

STEP 2: (TMP-4)

PERFORM WORK TO CONSTRUCT TIE-INS UP TO THE EXISTING EDGE OF PAVEMENT AS SHOWN ON PLANS UP TO BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COURSE.

CONSTRUCT THE DRIVEWAY RT OF -L- STA 15+00±

PHASE III

STEP 1: (TMP-5)

PLACE TEMPORARY PAVEMENT MARKINGS AS SHOWN ON PLAN.

REMOVE THE PORTABLE SIGNAL SYSTEM AND ALL SIGNAGE

PRIOR TO SHIFTING TRAFFIC THE CONTRACTOR SHALL INSTALL TEMPORARY GUARDRAIL PROTECTING ONCOMING TRAFFIC AT THE SOUTHEAST WING WALL.

SHIFT TRAFFIC ONTO THE FINAL ALIGNMENT.

STEP 2: (TMP-5)

REMOVE THE ON-SITE DETOUR INCLUDING THE TEMPORARY BRIDGE

STEP 3: (TMP-6)

USING TEMPORARY LANE AND SHOULDER CLOSURES CONSTRUCT THE WINGWALL AS SHOWN ON PLANS.

USING TEMPORARY LANE CLOSURES AND FLAGGERS IN ACCORDANCE WITH NCDOT RDY 1101.02, SHEET 1 OF 14 CONSTRUCT THE FOLLOWING UP TO BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COURSE:
-L- STA 12+80± TO 14+85± AND -L- STA 16+00± TO 17+00± AS SHOWN ON PLANS.

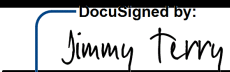
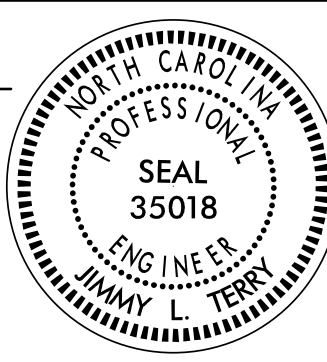

STEP 4: (TMP-5)

USING TEMPORARY LANE CLOSURES AND FLAGGERS IN ACCORDANCE WITH NCDOT RDY 1101.02, SHEET 1 OF 14 PLACE THE FINAL LAYER OF SURFACE COURSE FROM -L- STA 12+80.00 TO 17+00.00.


USING TEMPORARY LANE CLOSURES AND FLAGGERS IN ACCORDANCE WITH NCDOT RDY 1101.02, SHEET 1 OF 14 PLACE THE FINAL PAVEMENT MARKINGS AS SHOWN IN PAVEMENT MARKING PLANS.

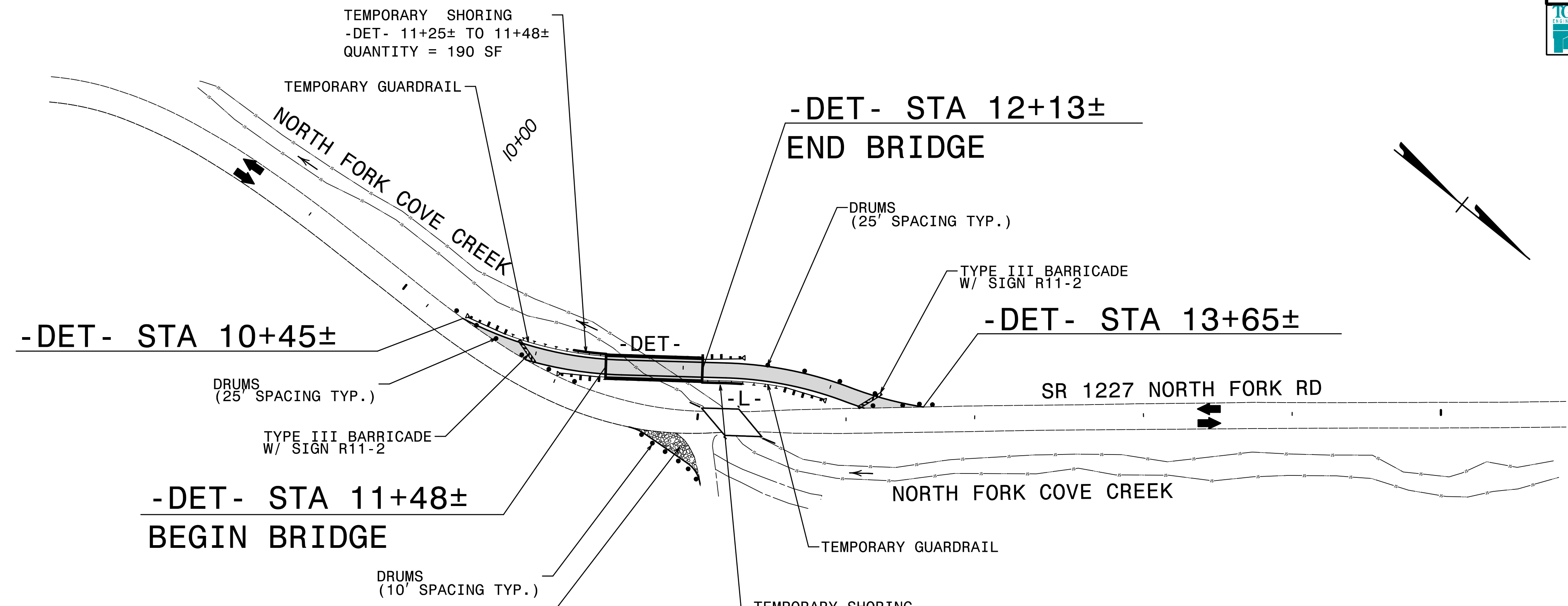
REMOVE ALL TRAFFIC CONTROL DEVICES AND OPEN TO FINAL TRAFFIC PATTERN.

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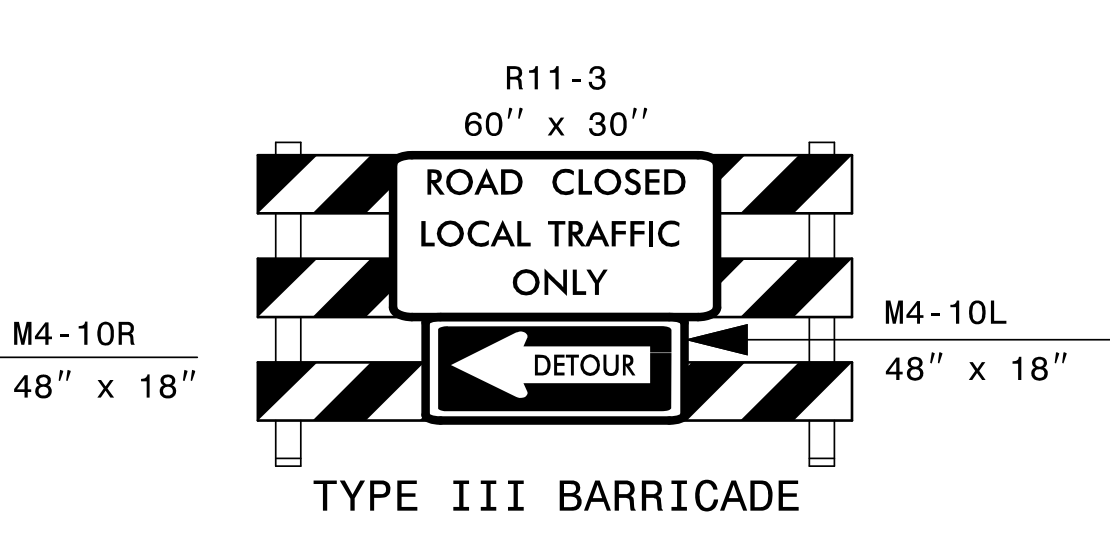
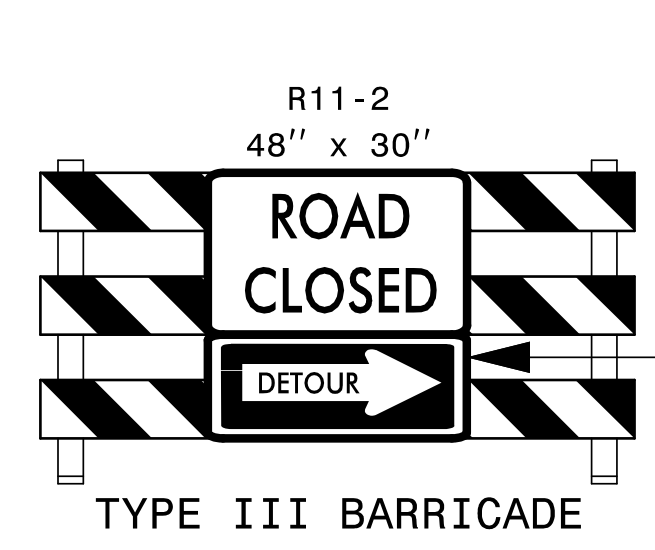
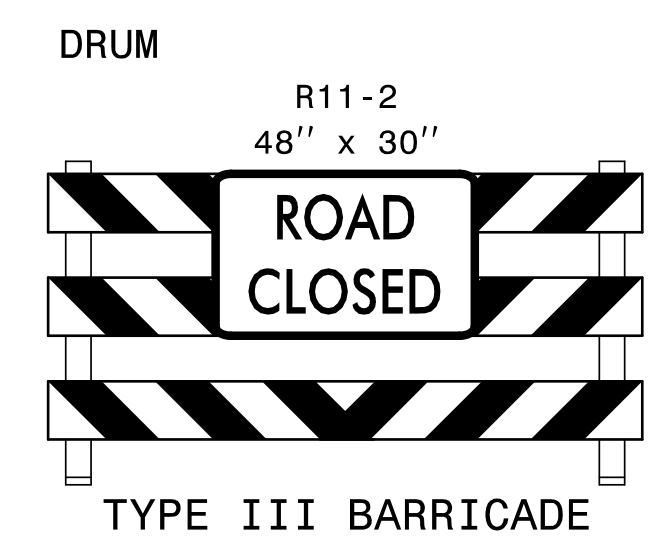
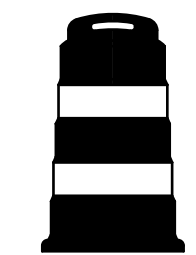
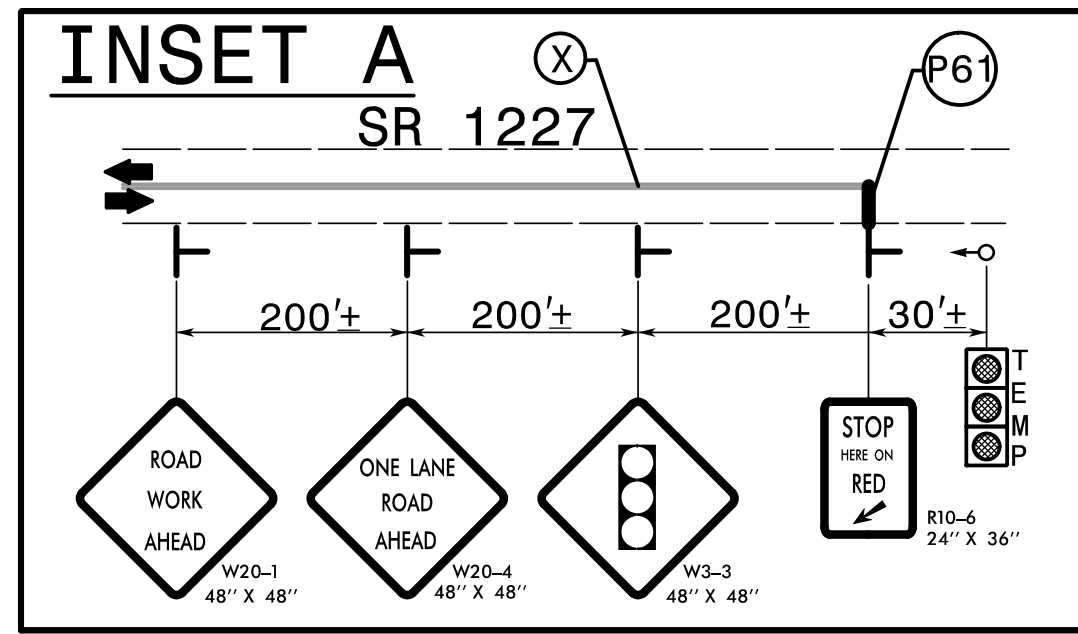
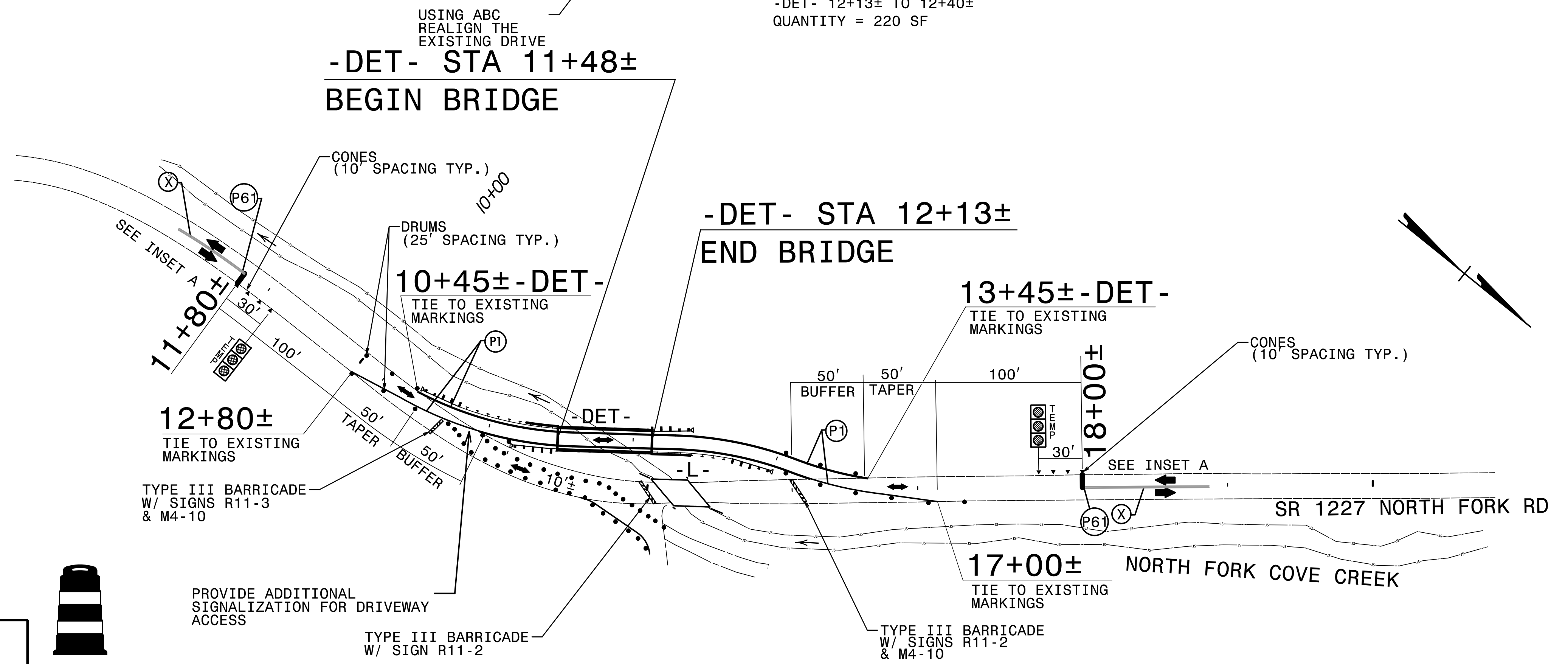
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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

PHASE I, STEP 2:

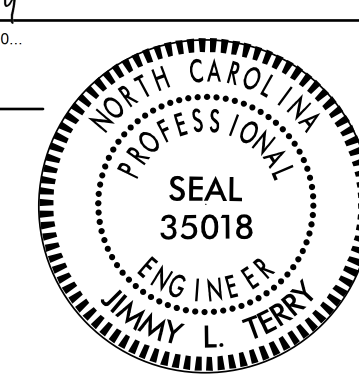
Watauga County Bridge #940087	PROJ. REFERENCE NO. BP11.R002	SHEET NO. TMP-3
 TGS ENGINEERS 201 W. MARION ST SUITE 200 SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275		



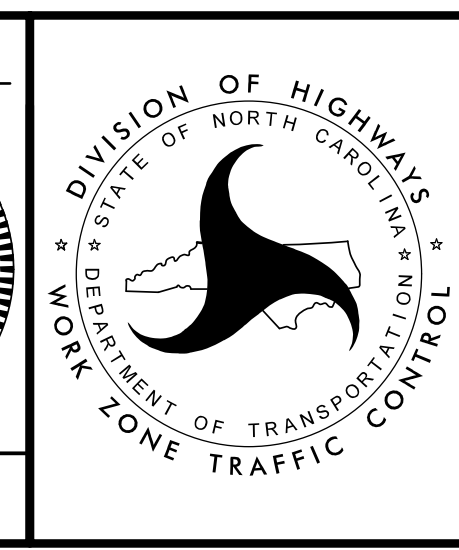
PHASE I, STEP 3:



APPROVED: *Jimmy Terry*
 DATE: 1/4/2023



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




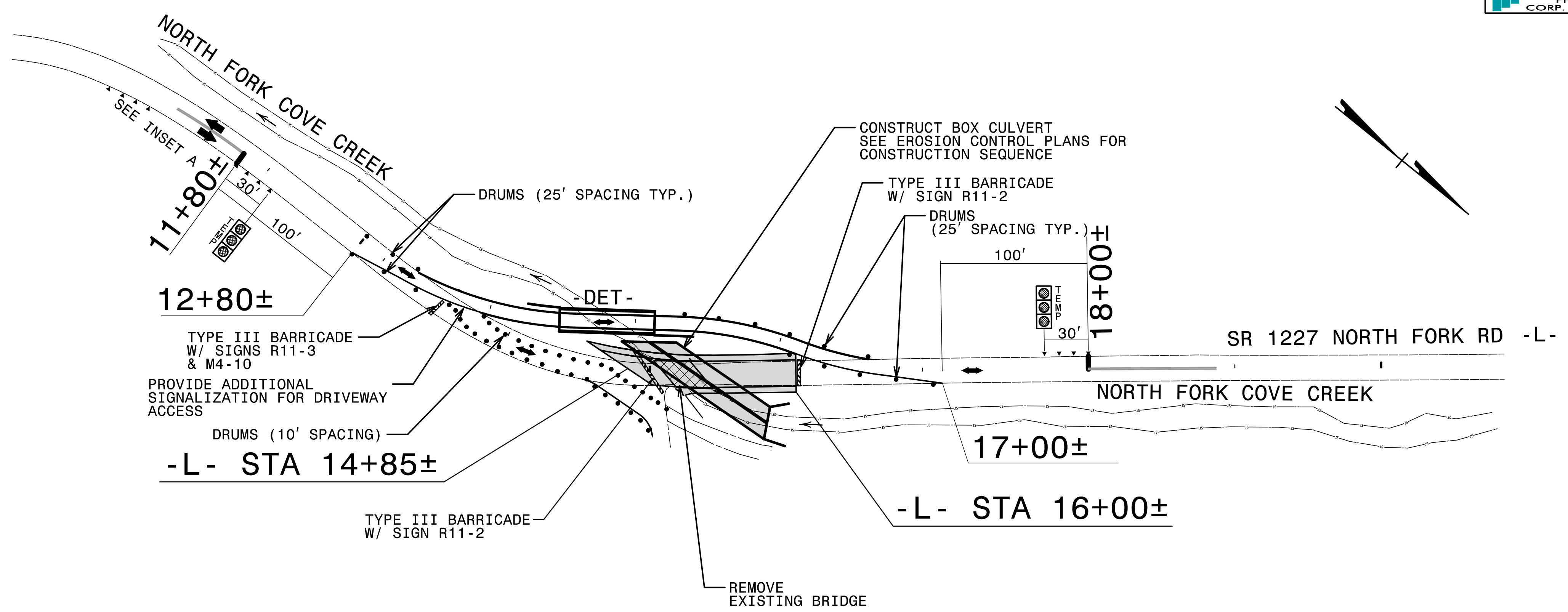
PHASE I DETAILS

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 User: jsmelvin

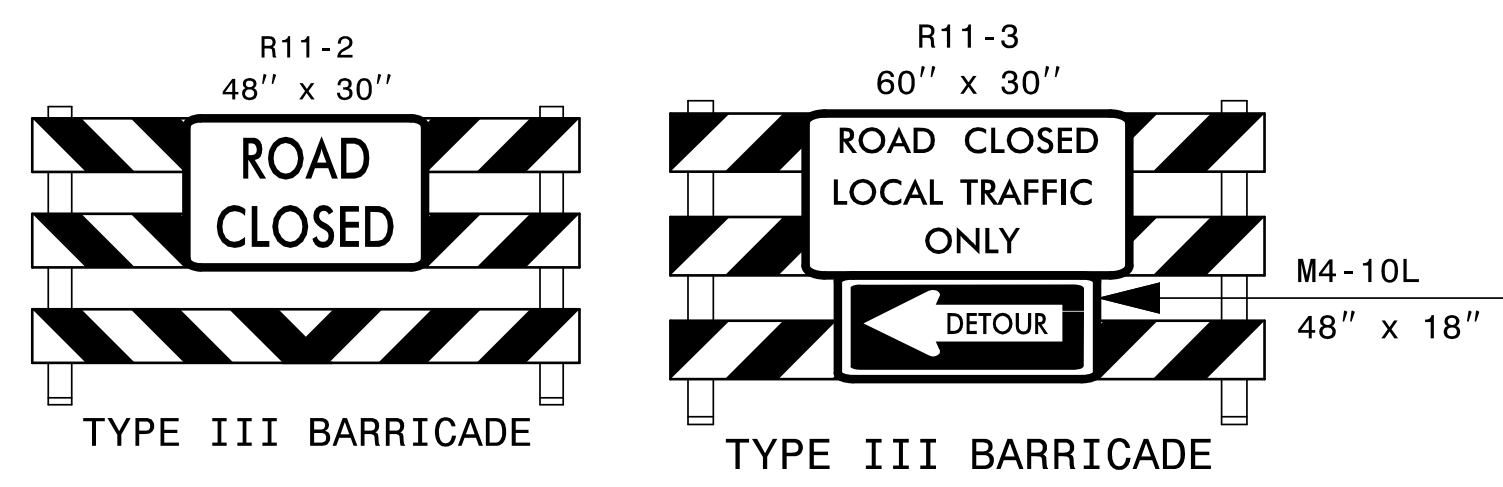
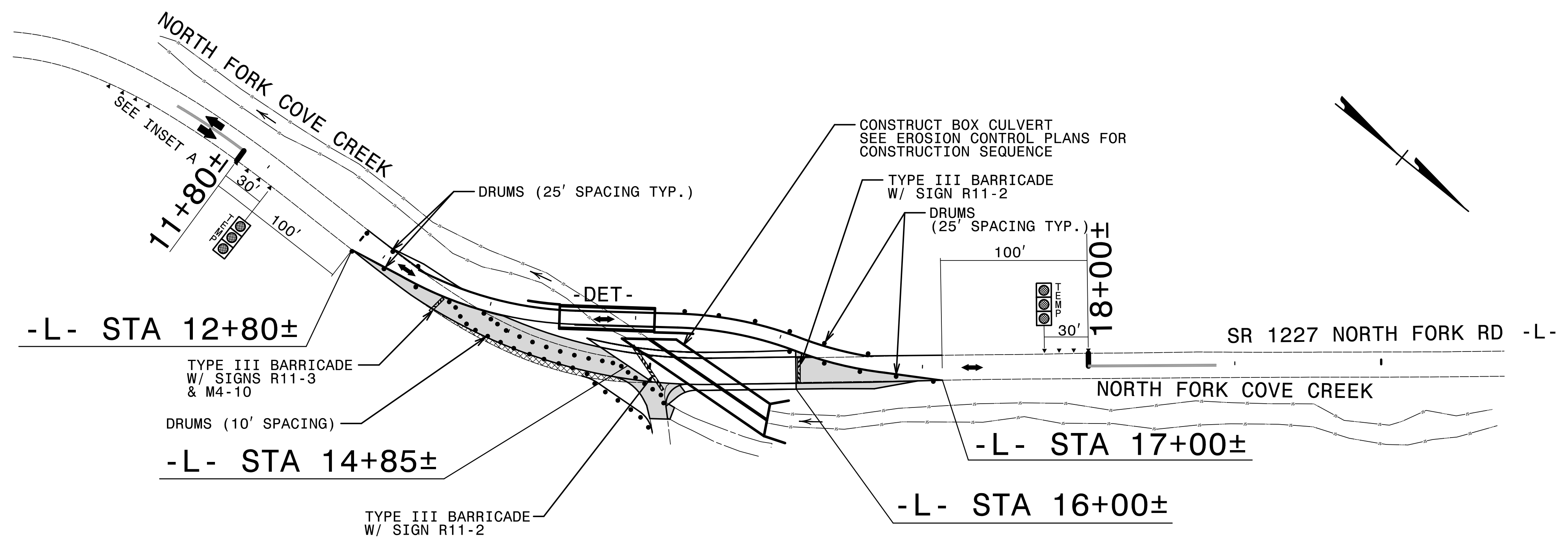
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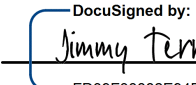
Watauga County
Bridge #940087

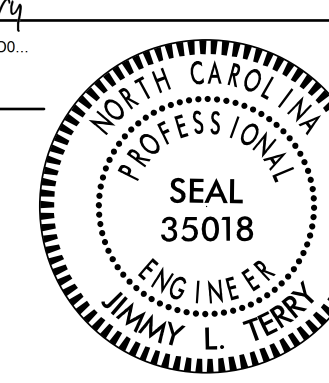
PROJ. REFERENCE NO. BP11.R002	SHEET NO. TMP-4
 TGS ENGINEERS 201 W. MARION ST SUITE 200 SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275	



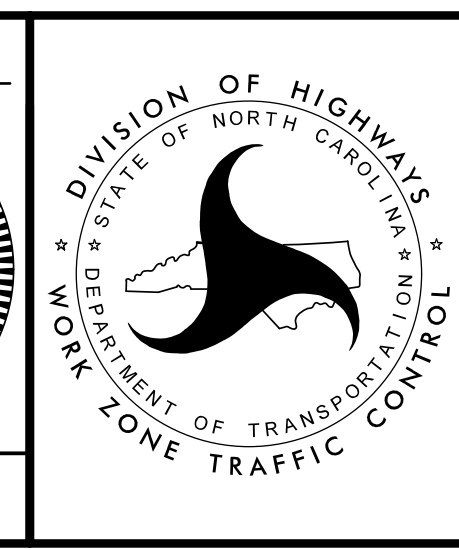
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APPROVED: 
 DATE: 1/4/2023




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

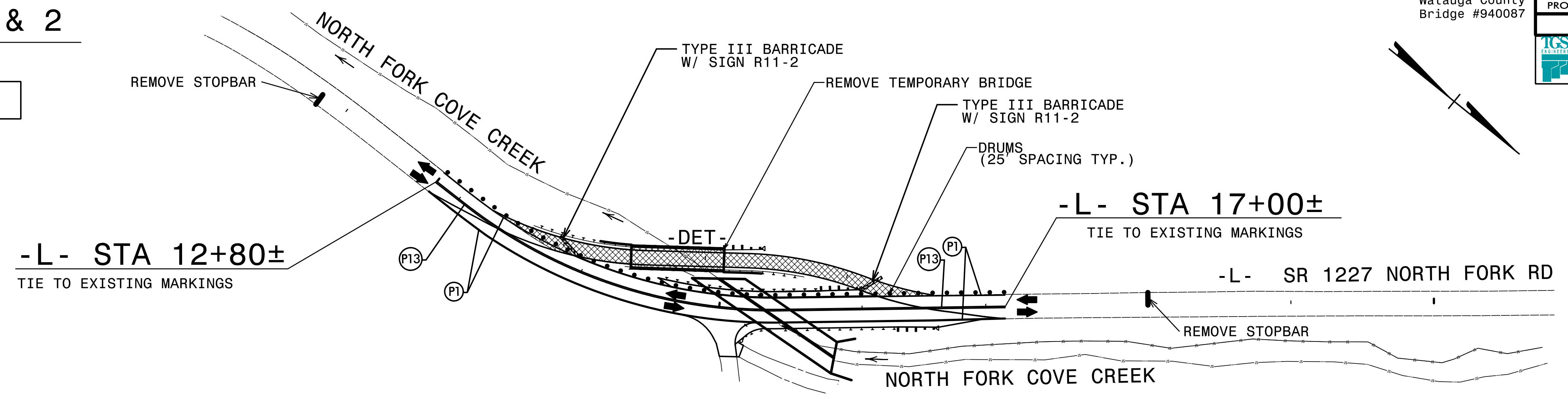
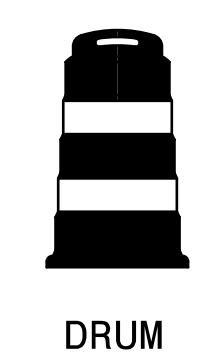
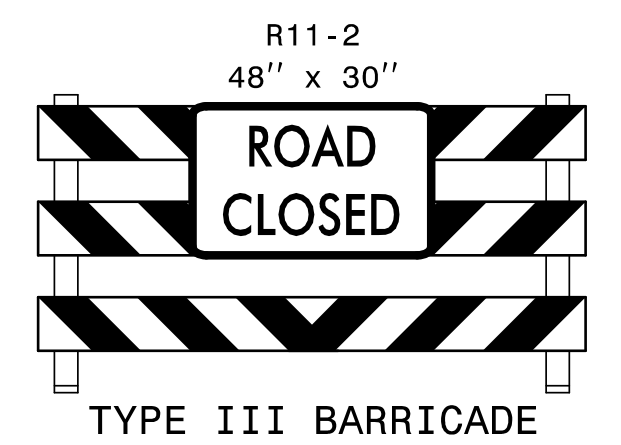


PHASE II DETAILS

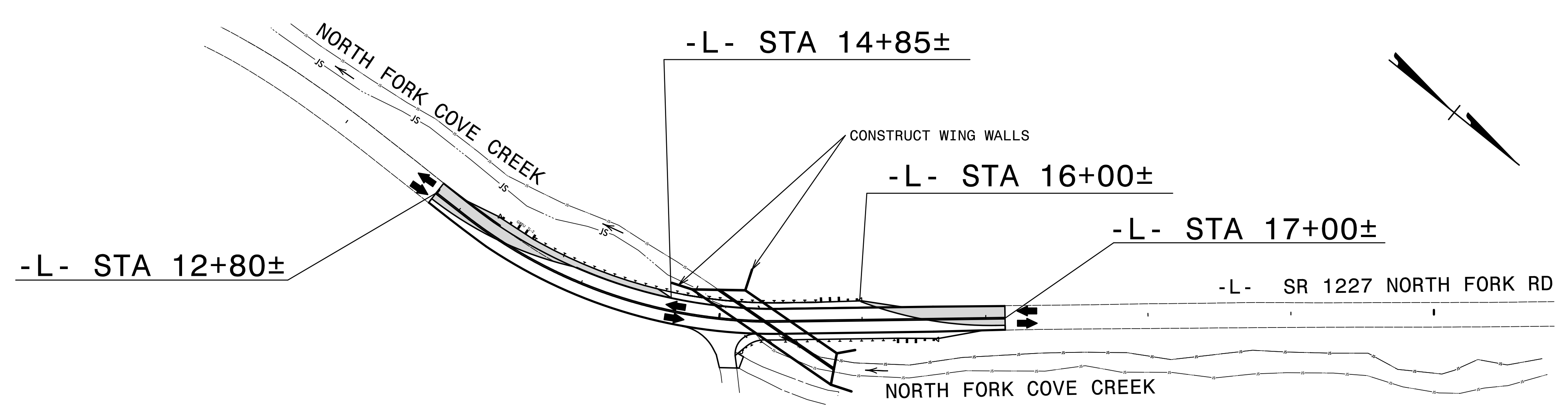
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 User: jsmelvin

PROJ. REFERENCE NO.	SHEET NO.
BP11.R002	TMP-5
 TGS ENGINEERS 201 W. MARION ST SUITE 200 SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275	

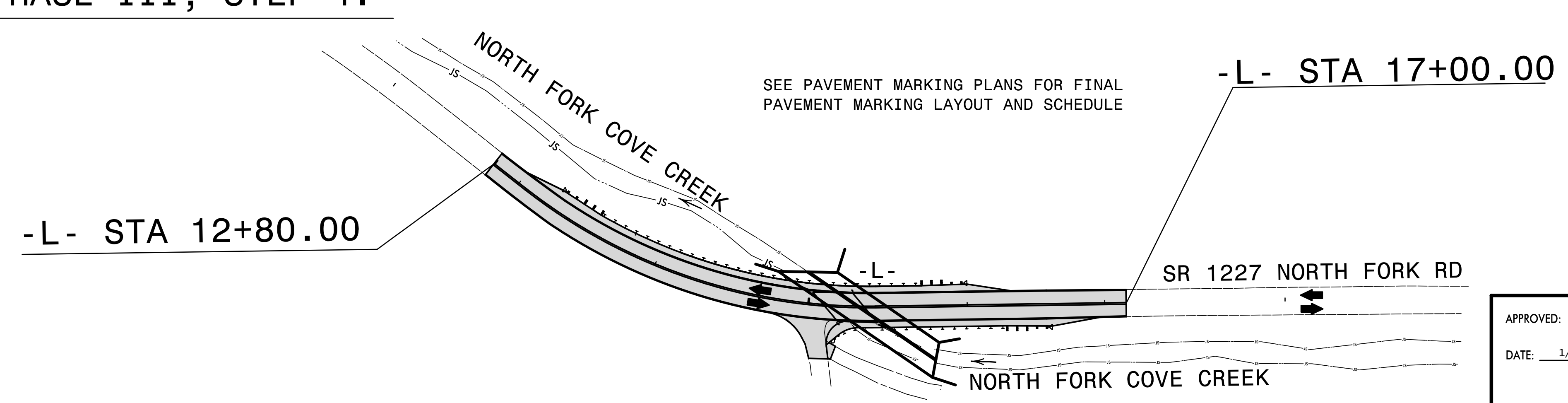
PHASE III, STEPS 1 & 2

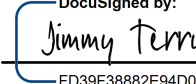


PHASE III, STEP 3:

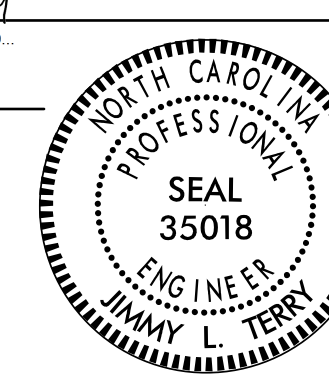


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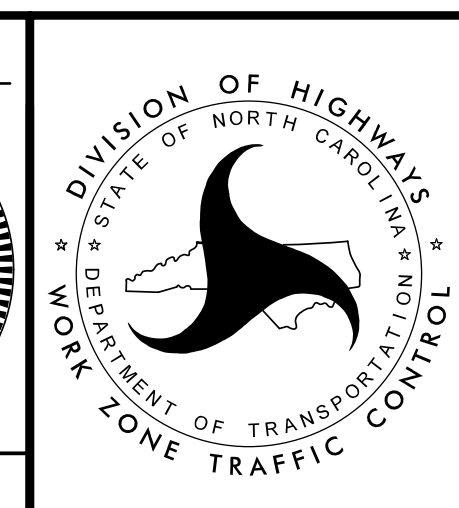


APPROVED: 
DocuSigned by:
Jimmy Terry
FD39F3882E84D0...

DATE: 1/4/2023



DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



PHASE III DETAILS

1/3/2023 11:41:00 AM
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 User: jsmelvin

PROJECT: BP11.R002

**STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION**

**PAVEMENT MARKING PLAN
WATAUGA COUNTY**

LOCATION: BRIDGE #940087 OVER NORTH FORK COVE CREEK ON SR 1227 (NORTH FORK RD)

PROJECT NO. BP11.R002	SHEET NO. PMP-1
APPROVED: <small>DocuSigned by: Jimmy Terry FD39F3882E4D0...</small>	
DATE: 1/4/2023	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
TGS ENGINEERS 201 W. MARION ST SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275	

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 MULTI-LANE ROADWAYS
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

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 ON THE FINAL SURFACE AS FOLLOWS:

ROAD NAME	MARKING	MARKER
NORTH FORK 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 AND MARKERS.

FINAL PAVEMENT MARKING SCHEDULE

SYMBOL	DESCRIPTION
PAVEMENT MARKINGS PAINT (4")	
P1	WHITE EDGELINE
P13	YELLOW DOUBLE CENTER

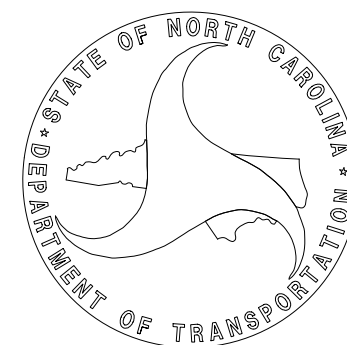
INDEX

SHEET NO.	DESCRIPTION
PMP-1	PAVEMENT MARKING PLAN TITLE AND SCHEDULE SHEET
PMP-2	PAVEMENT MARKING DETAIL

PLAN PREPARED FOR N.C.D.O.T. BY:

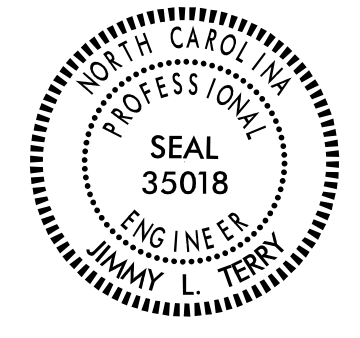
TGS ENGINEERS
 201 W. MARION ST
 SHELBY, NC 28150
 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275

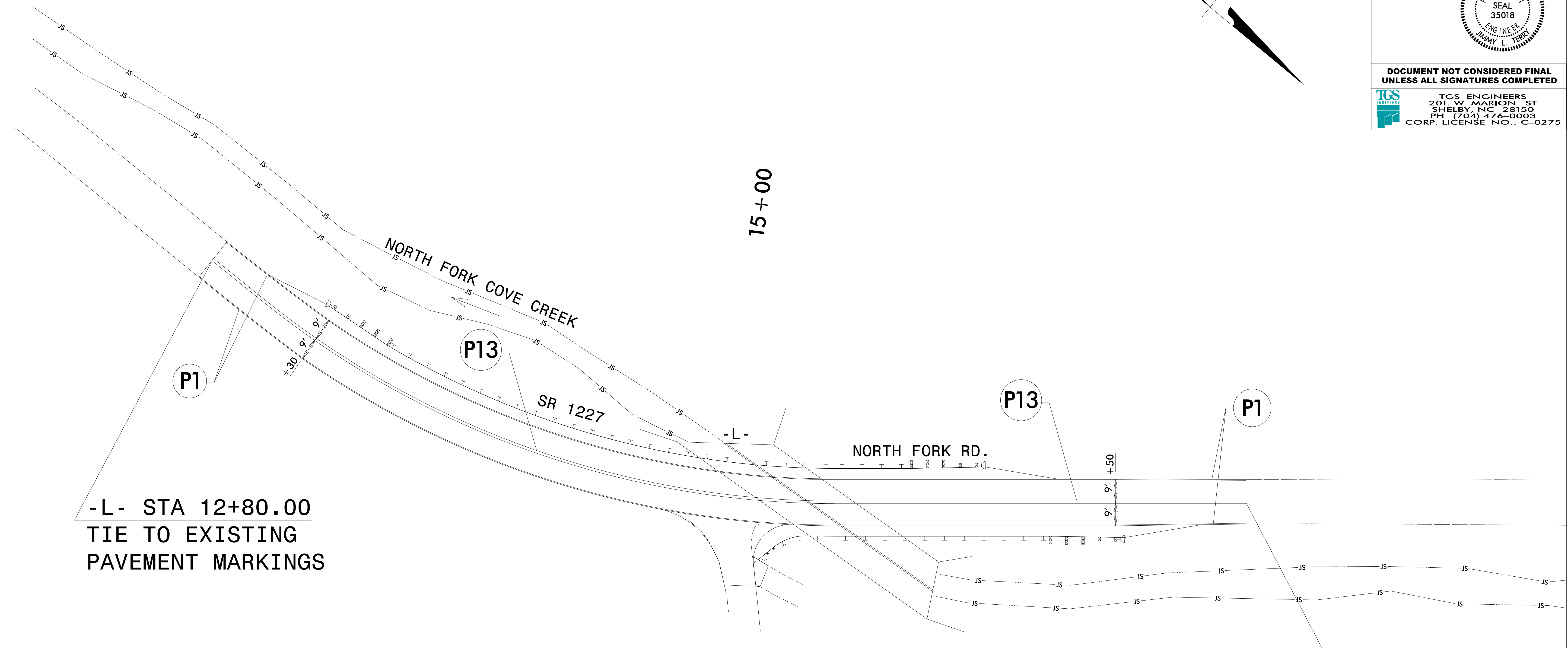
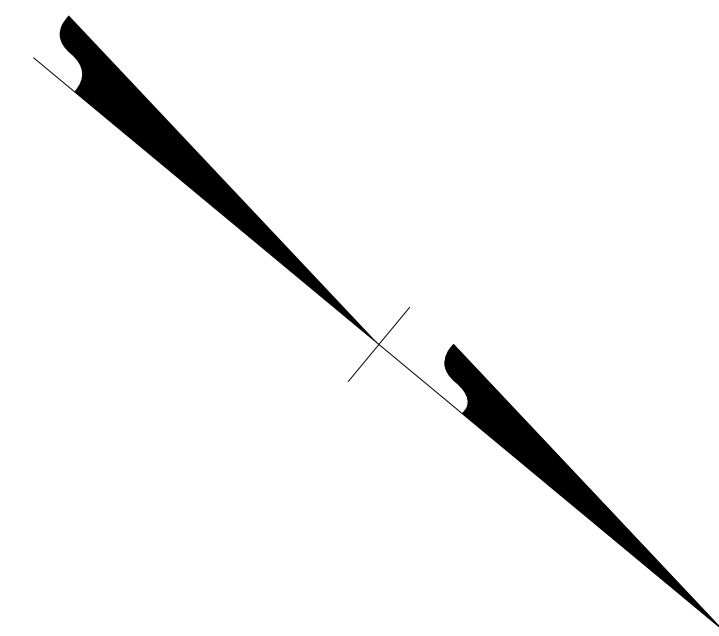
JIMMY TERRY, PE PROJECT ENGINEER
DAVID HAMRICK, EIT DESIGN TECHNICIAN



SEE PMP-1 FOR FINAL PAVEMENT MARKING SCHEDULE

WATAUGA COUNTY
BRIDGE #87

PROJECT NO. BP11.R002	SHEET NO. PMP-2
APPROVED:  F039F3882E4D0...	
DATE: 1/4/2023	
SEAL	
	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
 TGS ENGINEERS 201 W. MARION ST SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275	



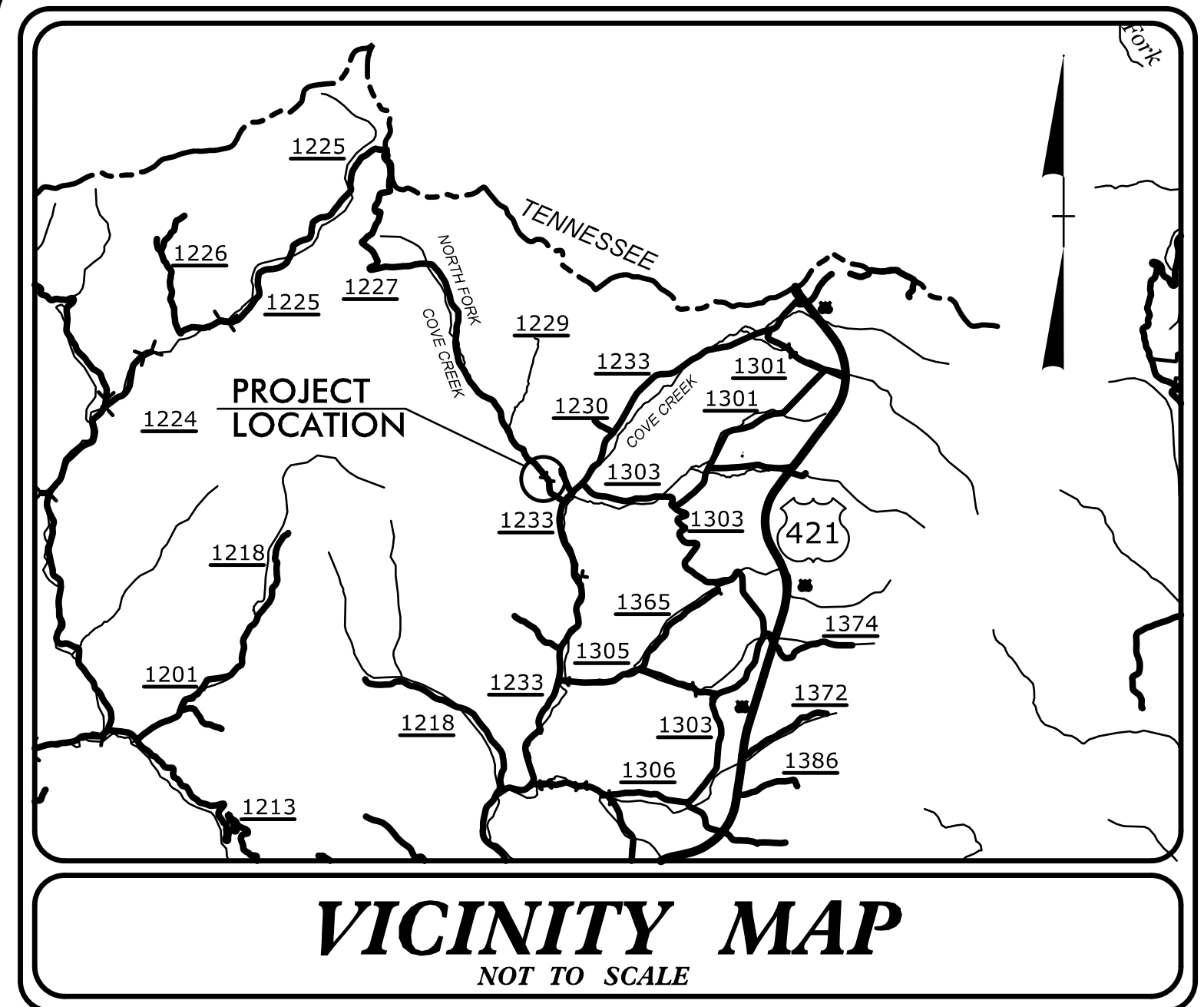
-L- STA 12+80.00
TIE TO EXISTING
PAVEMENT MARKINGS

-L- STA 17+00.00
TIE TO EXISTING
PAVEMENT MARKINGS

PAVEMENT MARKING DETAIL

PROJECT: BP11.R002

CONTRACT: DK00345



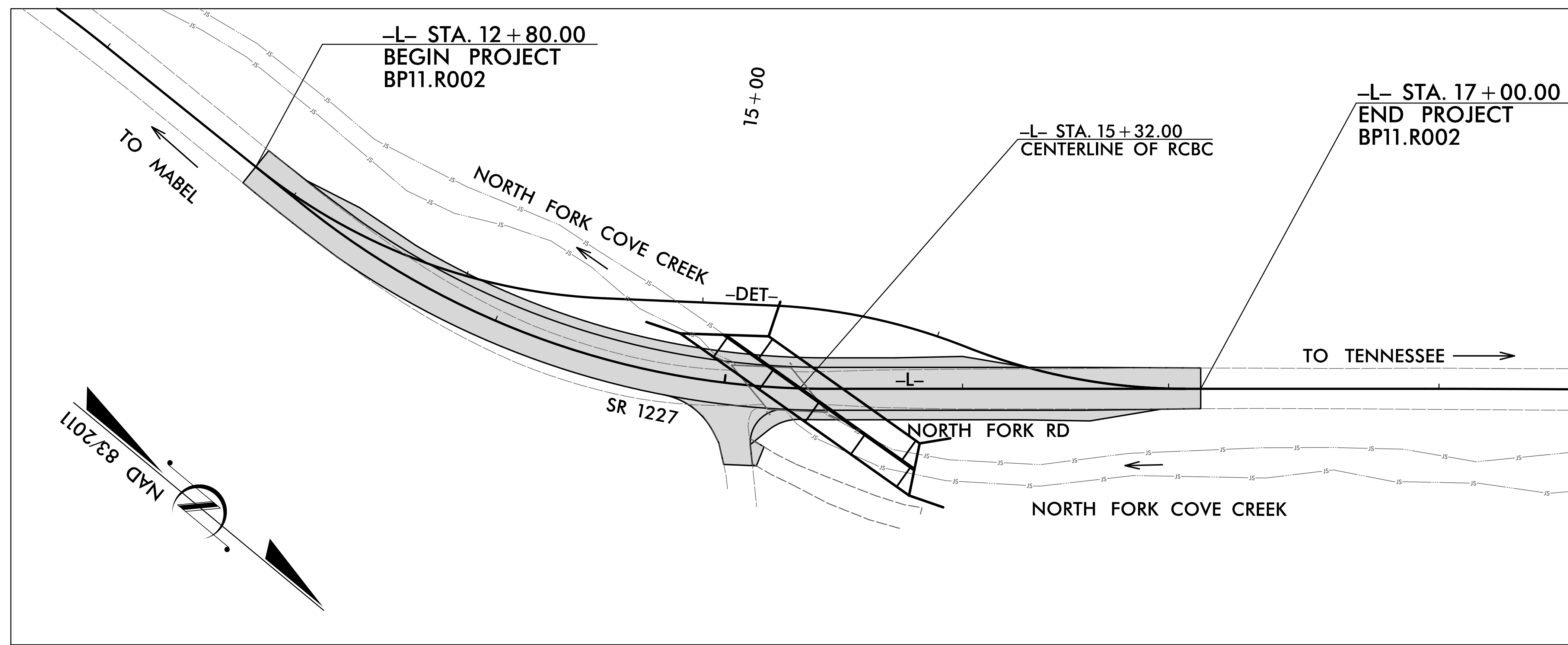
VICINITY MAP
NOT TO SCALE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

WATAUGA COUNTY

**LOCATION: BRIDGE NO. 940087 OVER NORTH FORK COVE CREEK
ON SR 1227 (NORTH FORK ROAD)**

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

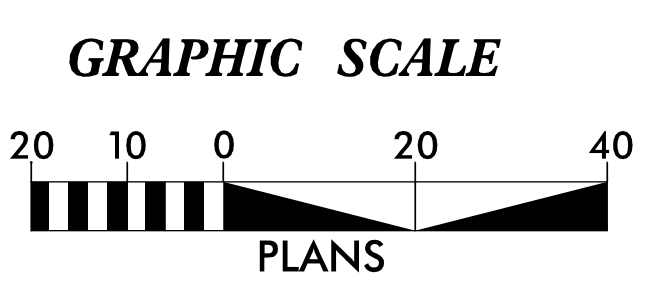


STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP11.R002	EC-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
BP11.R002.1	N/A	PE	
BP11.R002.2	N/A	RW & UTIL.	
BP11.R002.3	N/A	CONST.	

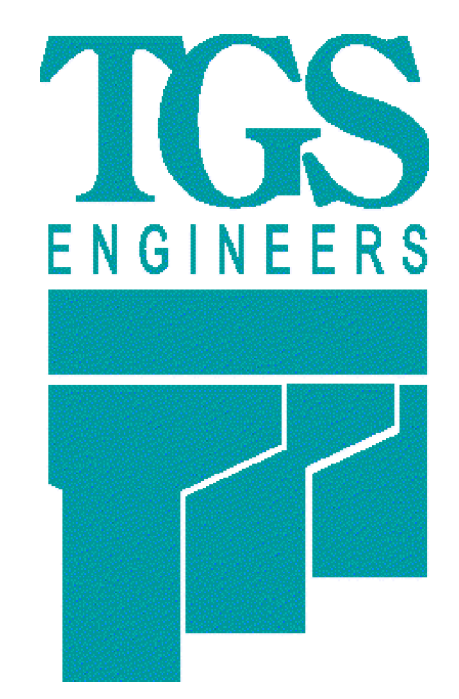
EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	TD
1630.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	TSF
1606.01	Special Sediment Control Fence	SSCF
1622.01	Temporary Berms and Slope Drains	TBSD
1630.02	Silt Basin Type B	SB
1633.01	Temporary Rock Silt Check Type-A	TRSCA
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	TRSCA-PAM
1633.02	Temporary Rock Silt Check Type-B	TRSCB
	Wattle / Coir Fiber Wattle	WCFW
	Wattle / Coir Fiber Wattle with Polyacrylamide (PAM)	WCFW-PAM
1634.01	Temporary Rock Sediment Dam Type-A	TRSDA
1634.02	Temporary Rock Sediment Dam Type-B	TRSDB
1635.01	Rock Pipe Inlet Sediment Trap Type-A	RPISTRA
1635.02	Rock Pipe Inlet Sediment Trap Type-B	RPISTRB
1630.04	Stilling Basin	SB
1630.06	Special Stilling Basin	SSB
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C
	Skimmer Basin	SKB
	Tiered Skimmer Basin	TSKB
	Infiltration Basin	IB

THIS PROJECT CONTAINS
EROSION CONTROL PLANS
FOR CLEARING AND
GRUBBING PHASE OF
CONSTRUCTION.



**THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH
THE APPLICABLE REGULATIONS SET FORTH BY THE NCG-010000
GENERAL CONSTRUCTION PERMIT EFFECTIVE APRIL 1, 2019
AND ISSUED BY THE NORTH CAROLINA DEPARTMENT OF
ENVIRONMENTAL QUALITY DIVISION OF WATER RESOURCES.**



Prepared In the Office of:
TGS ENGINEERS
201 W. MARION ST-STE 200
SHELBY, NC 28150

Designed by:
Andrew H. Cochran, PE **3015**
NAME LEVEL III CERTIFICATION NO.

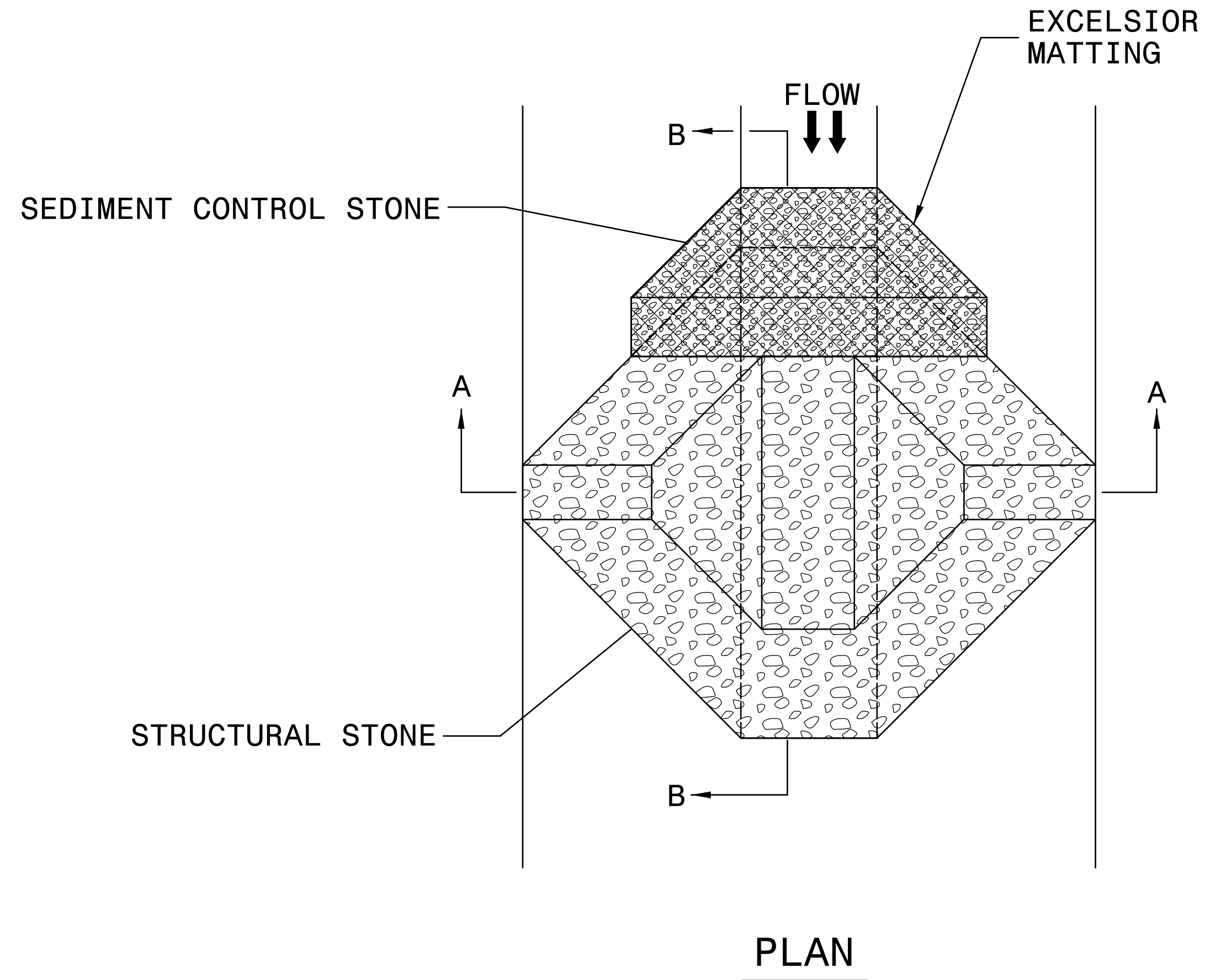
Roadway Standard Drawings

The following roadway english standards as appear in "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2018 and the latest revision thereto are applicable to this project and by reference hereby are considered a part of these plans.

1604.01 Railroad Erosion Control Detail	1632.01 Rock Inlet Sediment Trap Type A
1605.01 Temporary Silt Fence	1632.02 Rock Inlet Sediment Trap Type B
1606.01 Special Sediment Control Fence	1632.03 Rock Inlet Sediment Trap Type C
1607.01 Gravel Construction Entrance	1633.01 Temporary Rock Silt Check Type A
1622.01 Temporary Berms and Slope Drains	1633.02 Temporary Rock Silt Check Type B
1630.01 Riser Basin	1634.01 Temporary Rock Sediment Dam Type A
1630.02 Silt Basin Type B	1634.02 Temporary Rock Sediment Dam Type B
1630.03 Temporary Silt Ditch	1635.01 Rock Pipe Inlet Sediment Trap Type A
1630.04 Stilling Basin	1635.02 Rock Pipe Inlet Sediment Trap Type B
1630.05 Temporary Diversion	1640.01 Coir Fiber Baffle
1630.06 Special Stilling Basin	1645.01 Temporary Stream Crossing
1631.01 Matting Installation	

PROJECT REFERENCE NO. <i>BPII.R002</i>	SHEET NO. <i>EC-2</i>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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



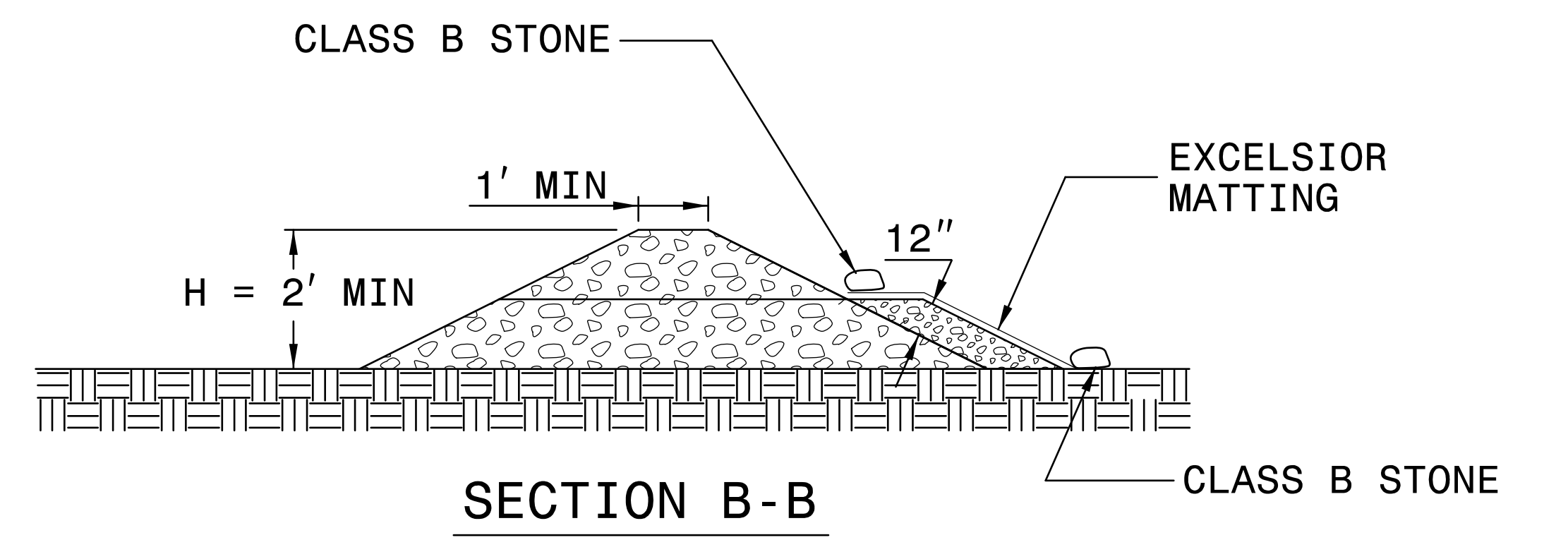
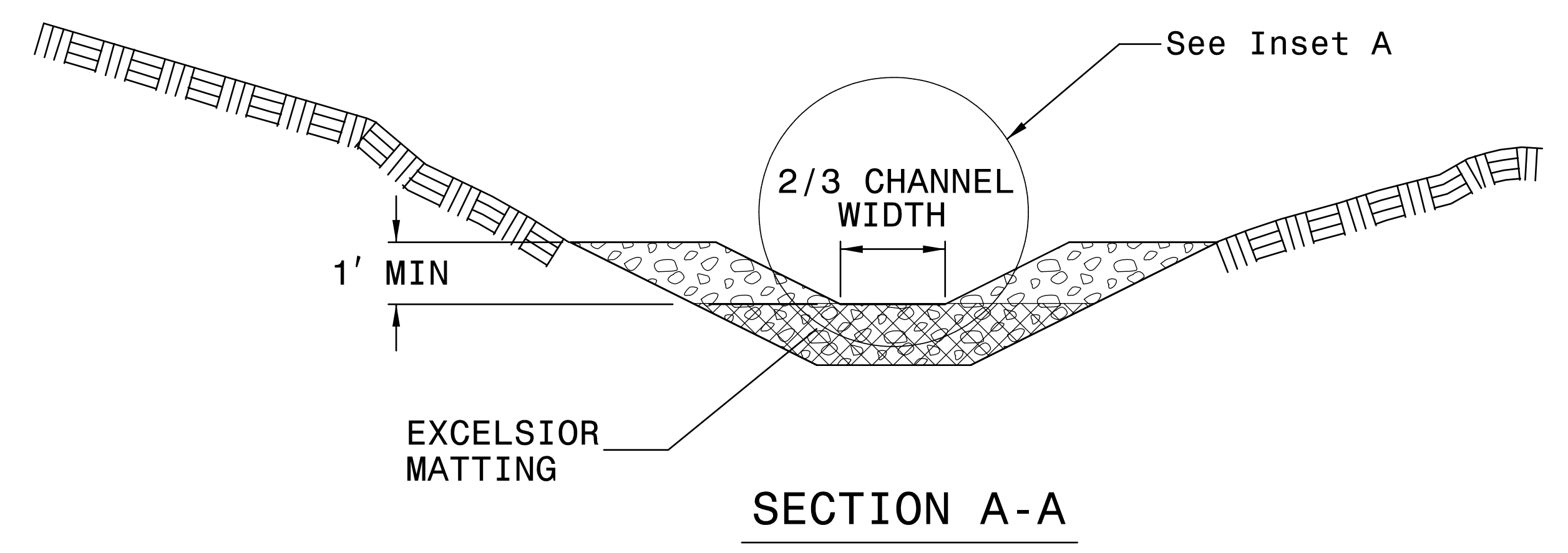
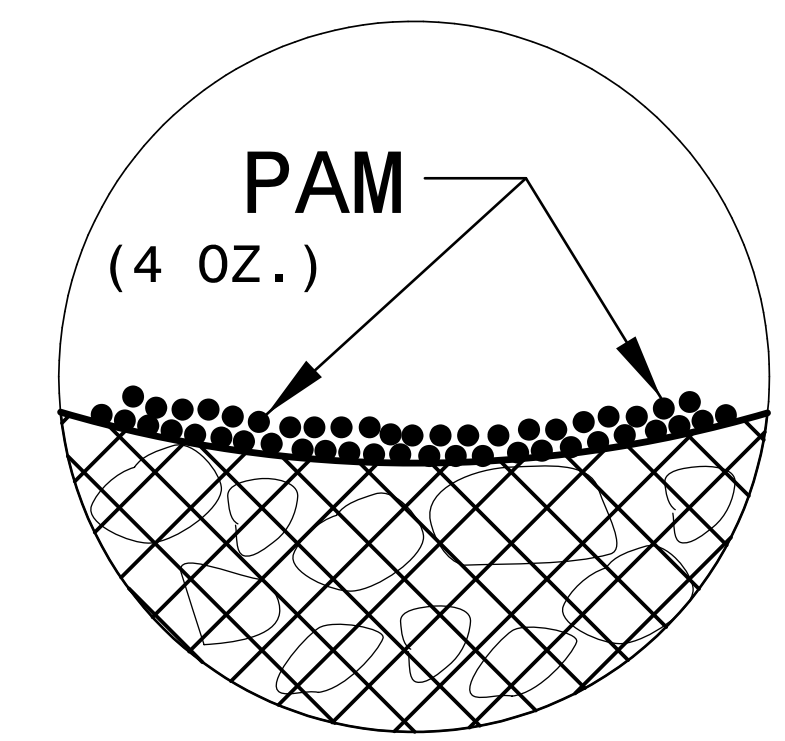
NOTES:

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

PROJECT REFERENCE NO. <i>BPII.R002</i>	SHEET NO. <i>EC-3</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

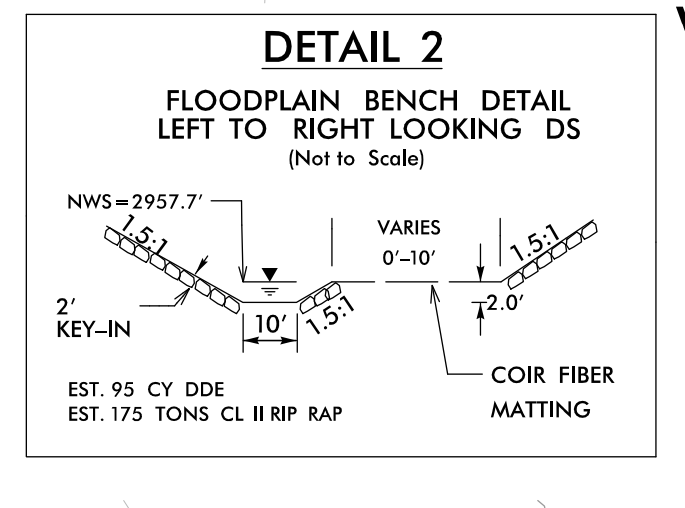
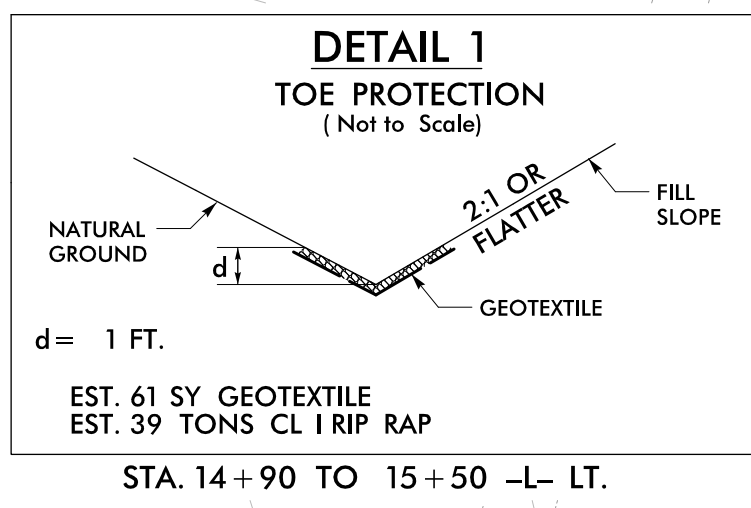
SOIL STABILIZATION TIMEFRAMES

<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	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES 3:1 OR FLATTER	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH.
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	NONE, EXCEPT FOR PERIMETERS AND HQW ZONES.

NOTE: PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE - B AND TEMPORARY ROCK SILT CHECKS TYPE - A AT DRAINAGE OUTLETS.

CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 4

NOTE: UTILIZE SPECIAL STILLING BASIN(S) AS STILLING BASIN WHERE APPLICABLE

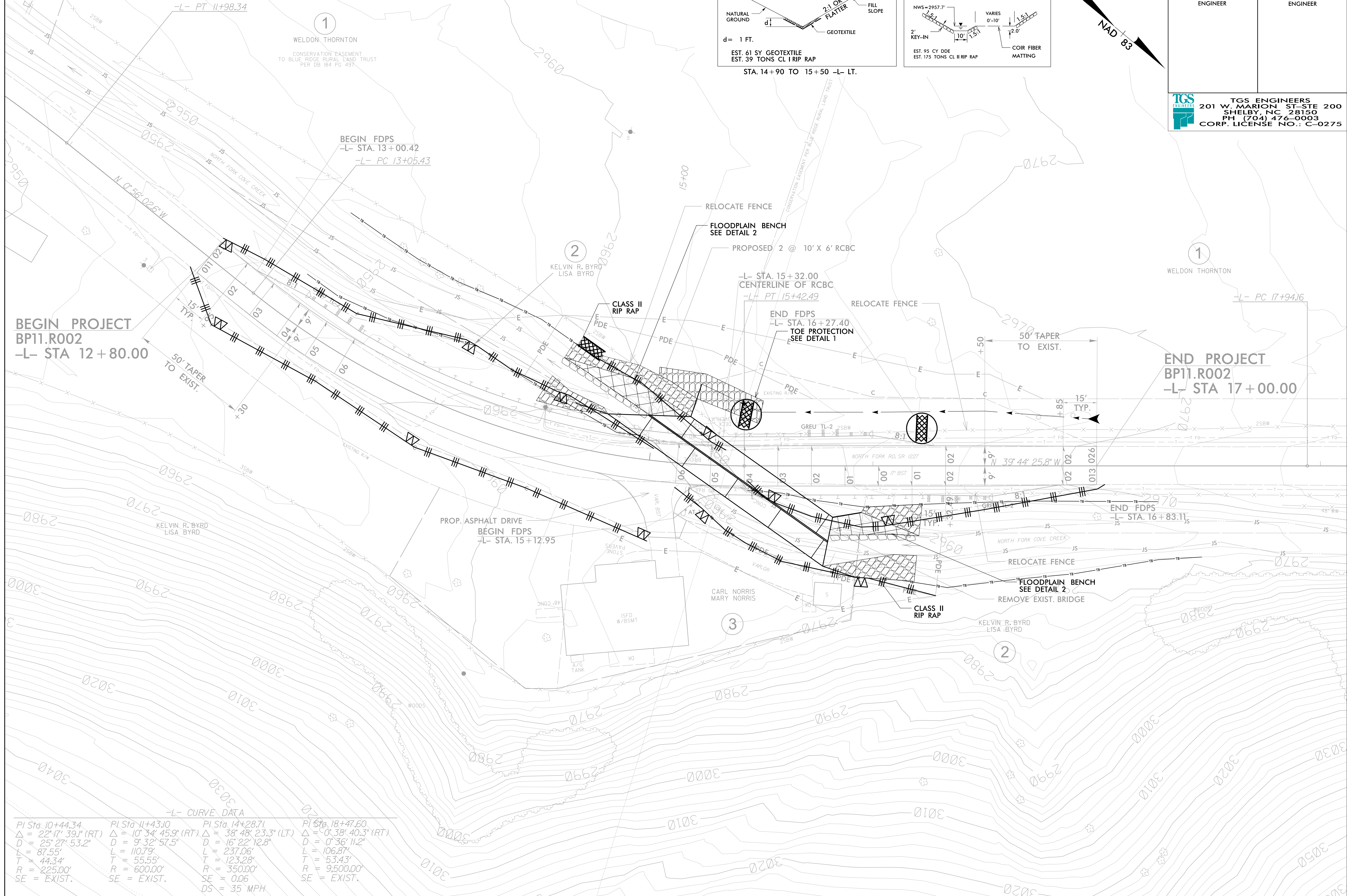


Watauga County Bridge #940087

NAD 83

PROJECT REFERENCE NO. BP11.R002	SHEET NO. EC-4/CONST.4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

TGS ENGINEERS
201 W. MARION ST. STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275



-L- CURVE DATA

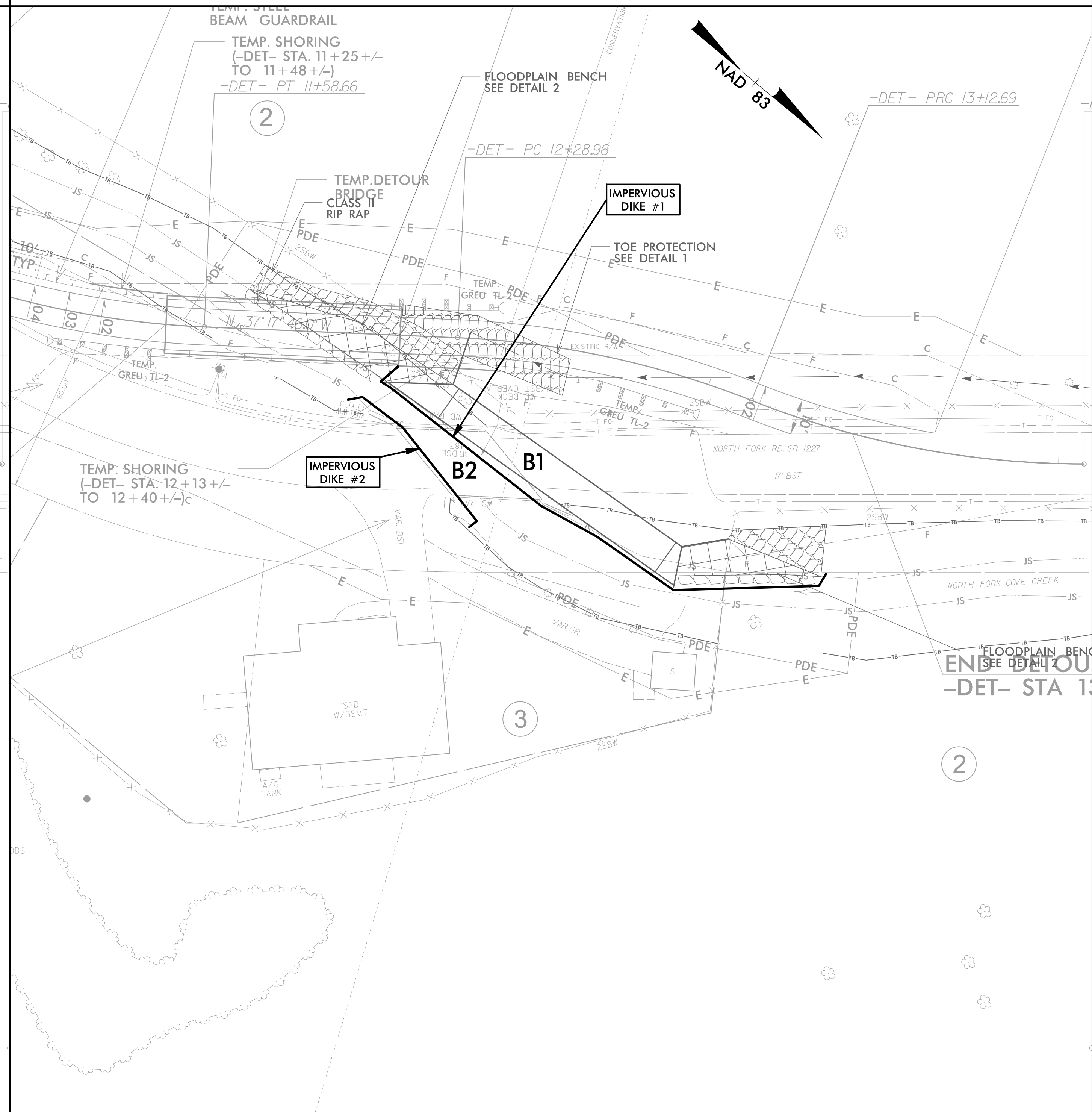
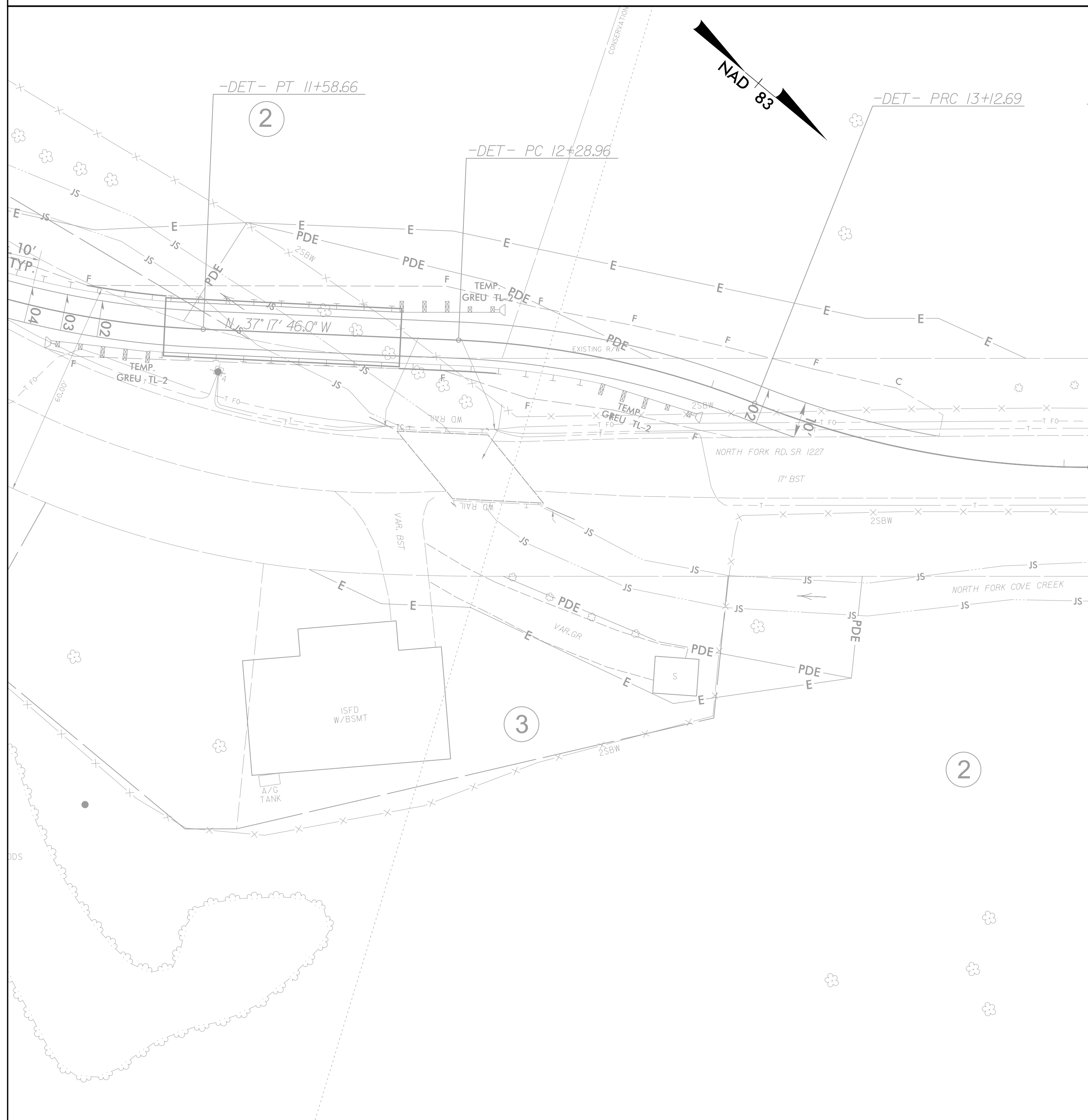
PI Sta. 10+44.34 Δ = 22° 17' 39.1" (RT) D = 25' 27" 53.2" L = 87.55' T = 44.34' R = 225.00' SE = EXIST.	PI Sta. 11+43.10 Δ = 10° 34' 45.9" (RT) D = 9' 32" 57.5" L = 110.79' T = 55.55' R = 600.00' SE = EXIST.	PI Sta. 14+28.71 Δ = 38° 48' 23.3" (LT) D = 16' 22" 12.8" L = 237.06' T = 123.28' R = 350.00' SE = 0.06 DS = 35 MPH	PI Sta. 18+47.60 Δ = 0° 38' 40.3" (RT) D = 0' 36" 11.2" L = 106.87' T = 53.43' R = 9500.00' SE = EXIST.
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PROJECT REFERENCE NO.	SHEET NO.
BPII.R002	EC-5/CONST.4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CULVERT CONSTRUCTION SEQUENCE STA. -L- 15 + 32

1. INSTALL PERIMETER EROSION CONTROL MEASURES.
2. BUILD DETOUR ACCORDING TO PLANS.
3. SHIFT TRAFFIC ONTO COMPLETED DETOUR ROADWAY.

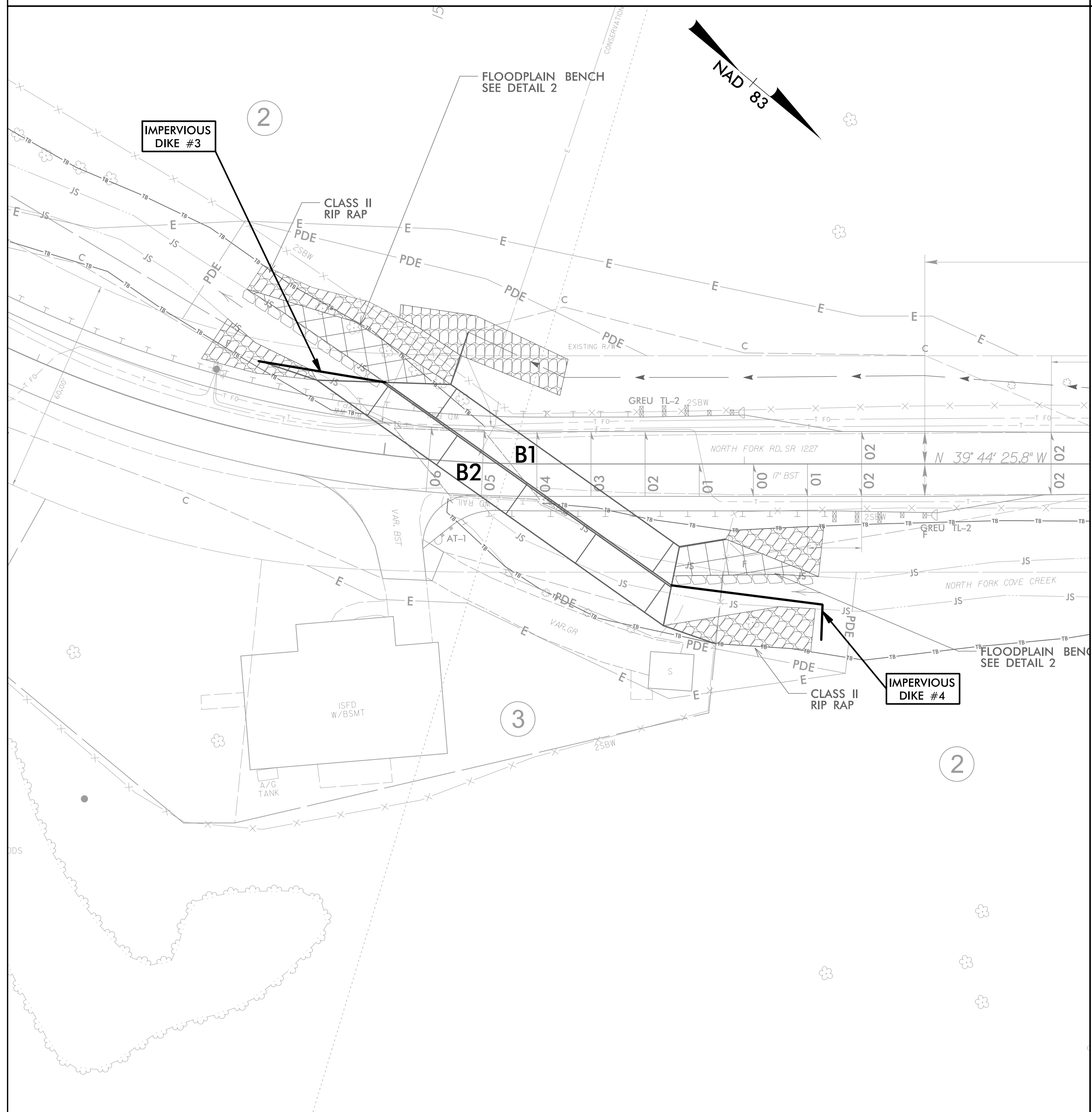
1. INSTALL IMPERVIOUS DIKE #1 FOR CONSTRUCTION OF BOX CULVERT B1.
2. INSTALL IMPERVIOUS DIKE #2 FOR REMOVAL OF EXISTING BRIDGE #87
3. DEWATER WORK SITE AS NEEDED INTO SPECIAL STILLING BASIN.
4. REMOVE EXISTING BRIDGE #87.




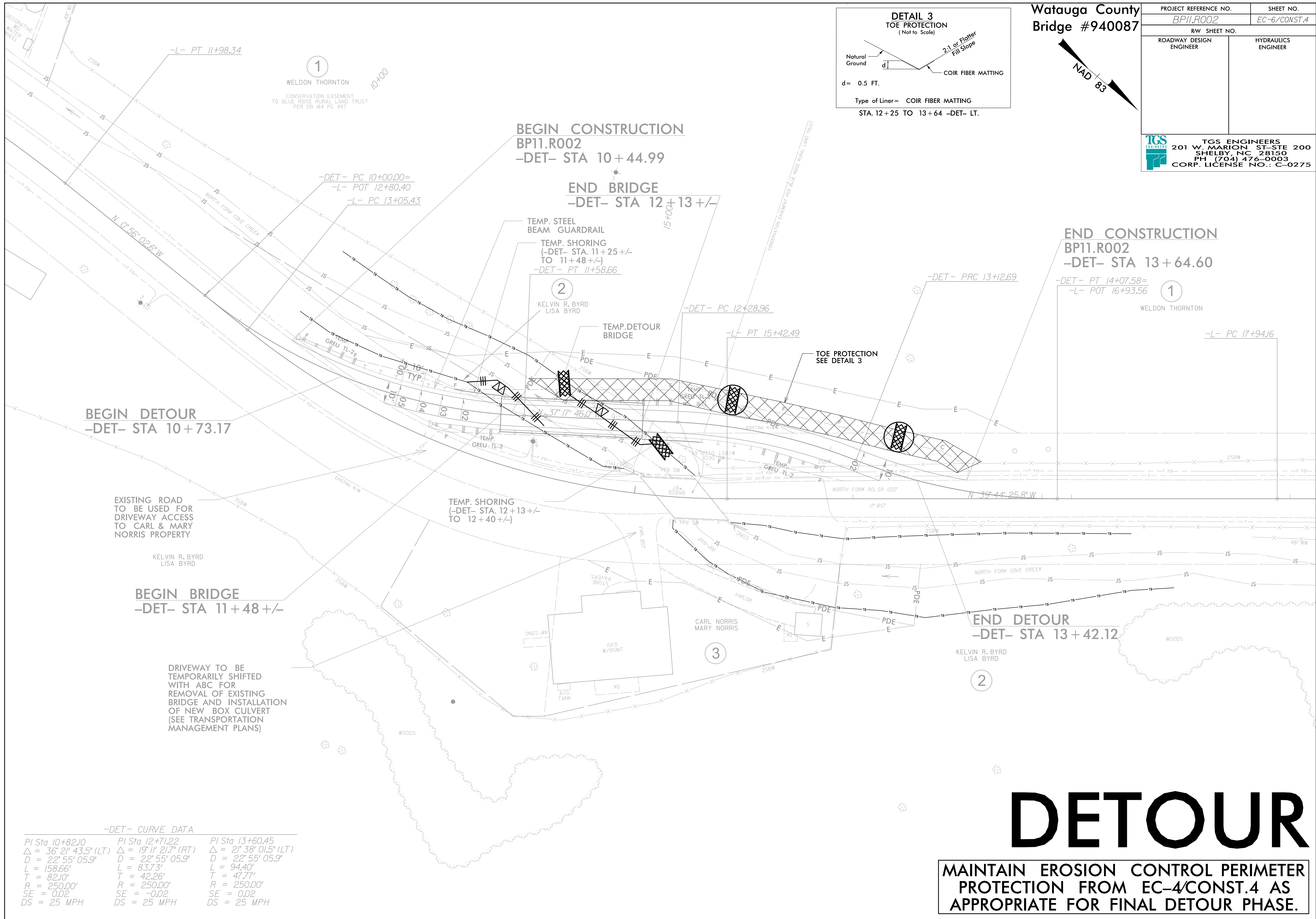
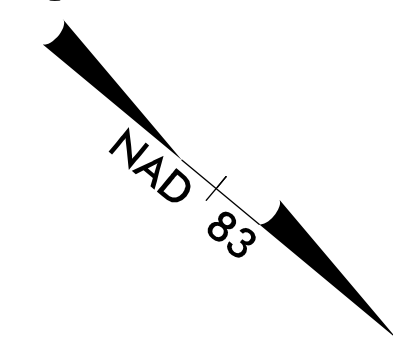
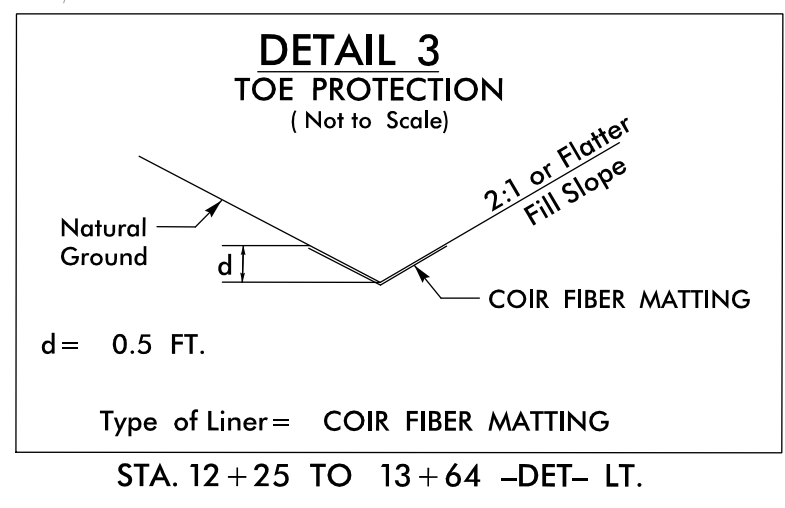
PROJECT REFERENCE NO.	SHEET NO.
BPII.R002	EC-5A/CONST.4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CULVERT CONSTRUCTION SEQUENCE STA. -L- 15 + 32

1. REMOVE IMPERVIOUS DIKES #1 AND #2 AND INSTALL IMPERVIOUS DIKES #3 & #4 AS SHOWN TO DIVERT WATER INTO NEWLY CONSTRUCTED BOX CULVERT B1.
2. DEWATER WORK SITE AS NEEDED INTO SPECIAL STILLING BASIN.
3. CONSTRUCT BOX CULVERT B2.
4. UPON COMPLETION OF BOX CULVERT B2, REMOVE IMPERVIOUS DIKES #3 AND #4 AND REESTABLISH STREAM ACCORDING TO PLANS.
5. COMPLETE ROADWAY CONSTRUCTION, DIVERT TRAFFIC, AND REMOVE DETOUR ACCORDING TO FINAL CONSTRUCTION PLANS.



PROJECT REFERENCE NO. BP11.R002	SHEET NO. EC-6/CONST.4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
 TGS ENGINEERS 201 W. MARION ST. STE 200 SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275	




-DET- CURVE DATA

PI Sta 10+82.10	PI Sta 12+71.22	PI Sta 13+60.45
$\Delta = 36^\circ 21' 43.5''$ (LT)	$\Delta = 19^\circ 11' 21.7''$ (RT)	$\Delta = 21^\circ 38' 01.5''$ (LT)
D = 22' 55" 05.9"	D = 22' 55" 05.9"	D = 22' 55" 05.9"
L = 158.66'	L = 83.73'	L = 94.40'
T = 82.10'	T = 42.26'	T = 47.77'
R = 250.00'	R = 250.00'	R = 250.00'
SE = 0.02	SE = -0.02	SE = 0.02
DS = 25 MPH	DS = 25 MPH	DS = 25 MPH

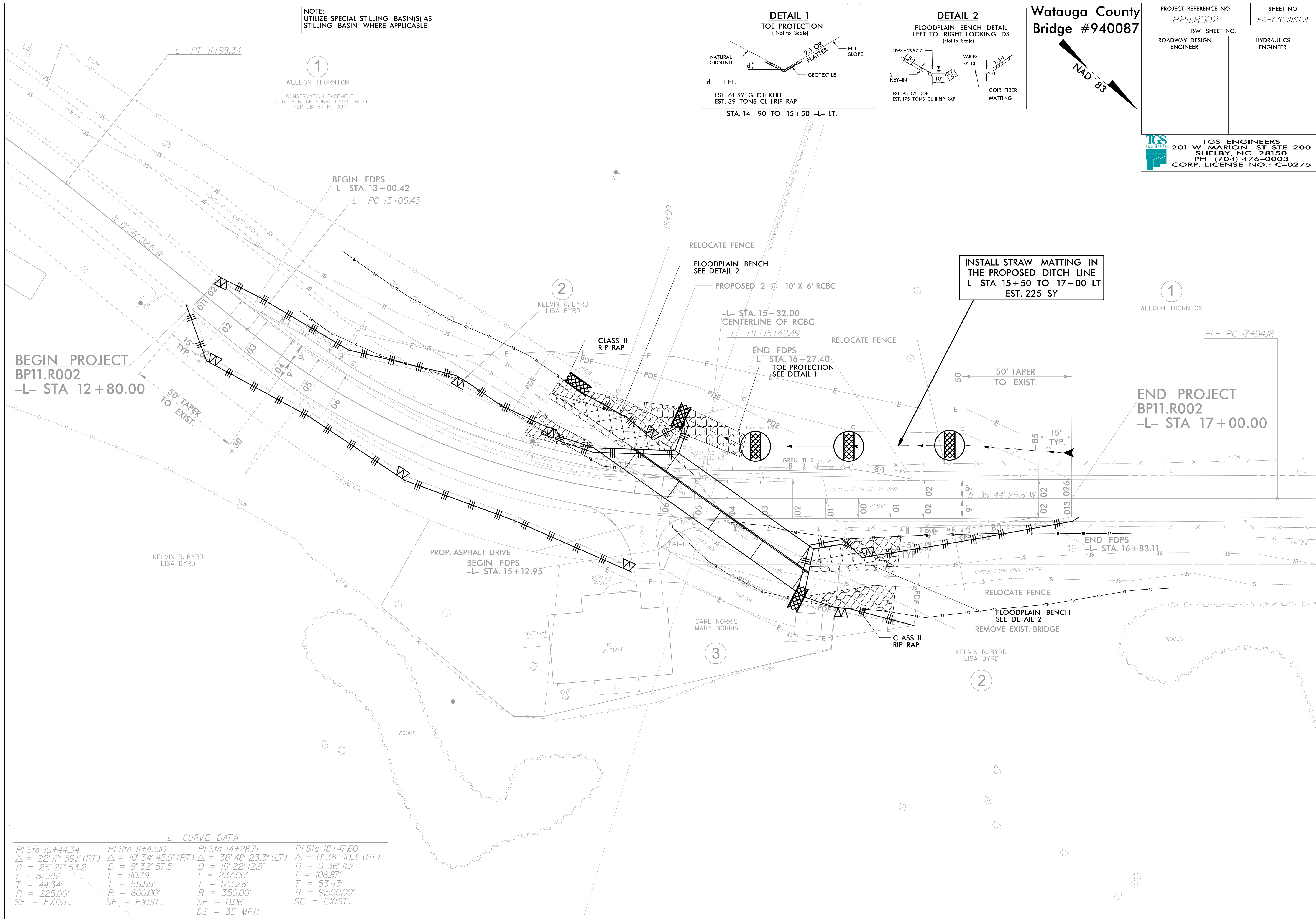
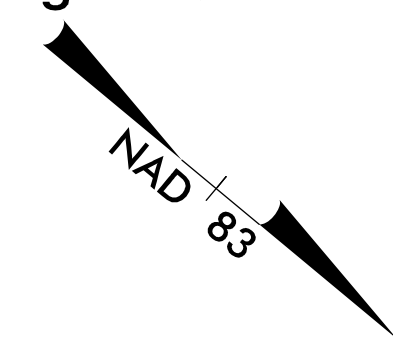
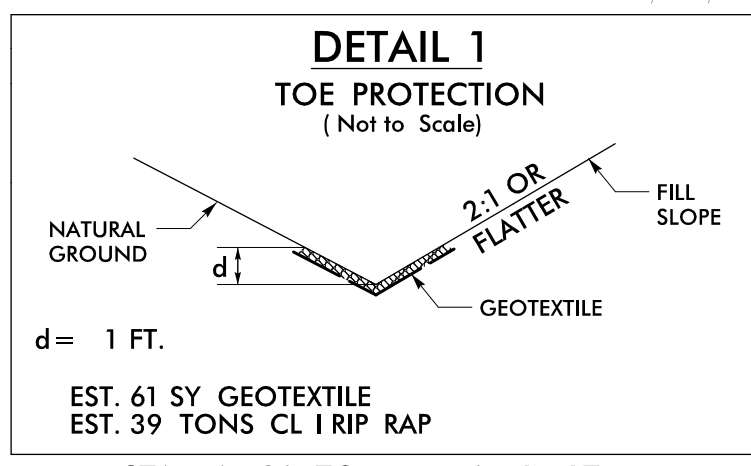
DETOUR

MAINTAIN EROSION CONTROL PERIMETER PROTECTION FROM EC-4/CONST.4 AS APPROPRIATE FOR FINAL DETOUR PHASE.

Watauga County Bridge #940087

PROJECT REFERENCE NO. <i>BP11.R002</i>	SHEET NO. <i>EC-7/CONST.4</i>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
 TGS ENGINEERS 201 W. MARION ST-STE 200 SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275	

NOTE:
UTILIZE SPECIAL STILLING BASIN(S) AS
STILLING BASIN WHERE APPLICABLE



1
WELDON THORNTON
CONSERVATION EASEMENT
TO BLUE RIDGE RURAL LAND TRUST
PER DB 184 PG 497

2
KELVIN R. BYRD
LISA BYRD

1
WELDON THORNTON

3

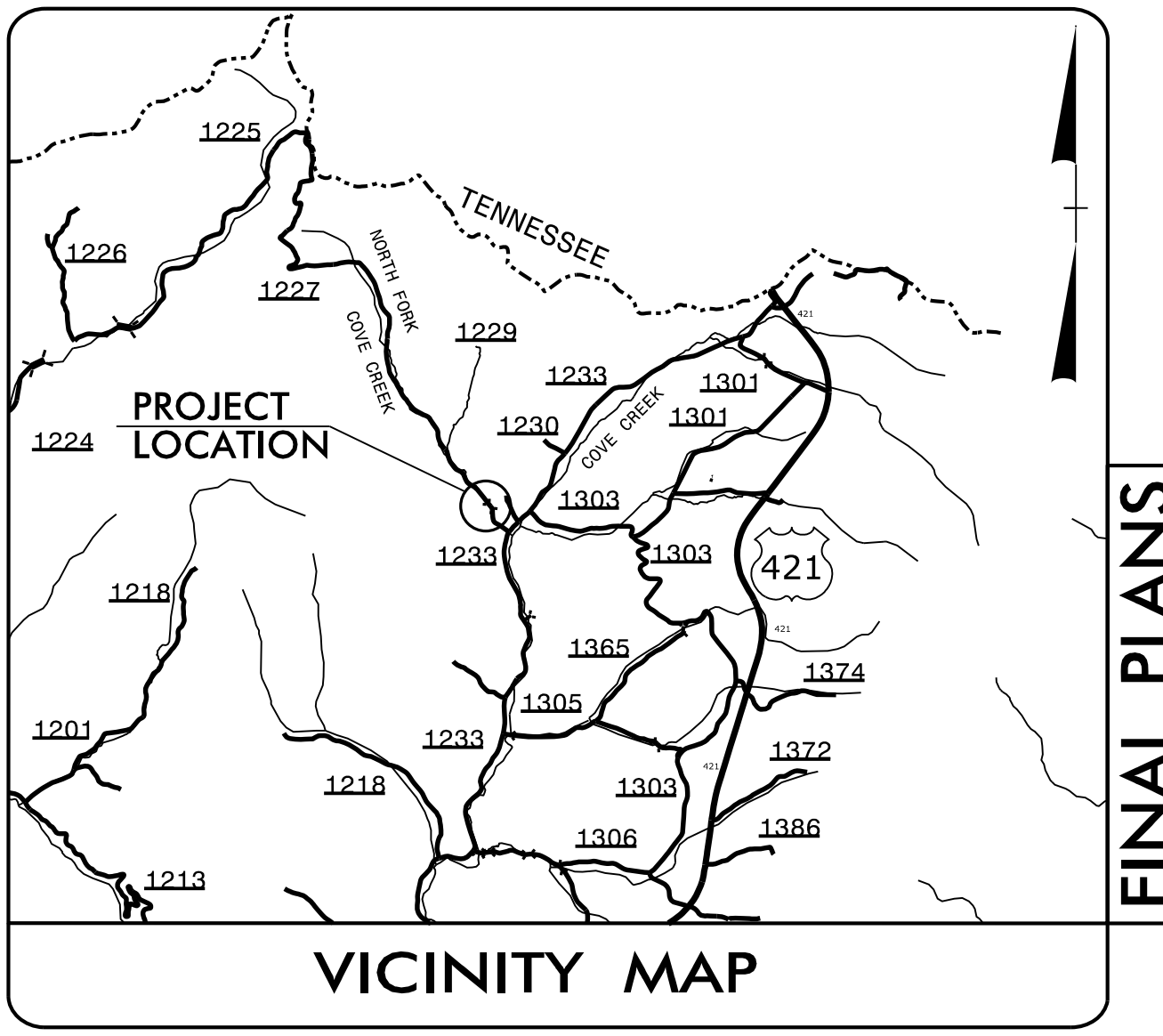
2

-L- CURVE DATA

PI Sta 10+44.34 Δ = 22° 17' 39.1" (RT) D = 25' 27" 53.2" L = 87.55' T = 44.34' R = 225.00' SE = EXIST.	PI Sta 11+43.10 Δ = 10° 34' 45.9" (RT) D = 9' 32' 57.5" L = 110.79' T = 55.55' R = 600.00' SE = EXIST.	PI Sta 14+28.71 Δ = 38° 48' 23.3" (LT) D = 16' 22' 12.8" L = 237.06' T = 123.28' R = 350.00' SE = 0.06 DS = 35 MPH	PI Sta 18+47.60 Δ = 0° 38' 40.3" (RT) D = 0' 36' 11.2" L = 106.87' T = 53.43' R = 9,500.00' SE = EXIST.
--	--	---	---

03-JAN-2023 16:16 C:\UBO_FILES\2022\Watauga #87 (BP11.R002)\UBOs\Utilities\Engineering\UBO\Proj\BP11.R002_ut_tsh_U001_psh.dgn \$\$\$USERNAME\$\$\$

TIP PROJECT: BP11.R002



FINAL PLANS

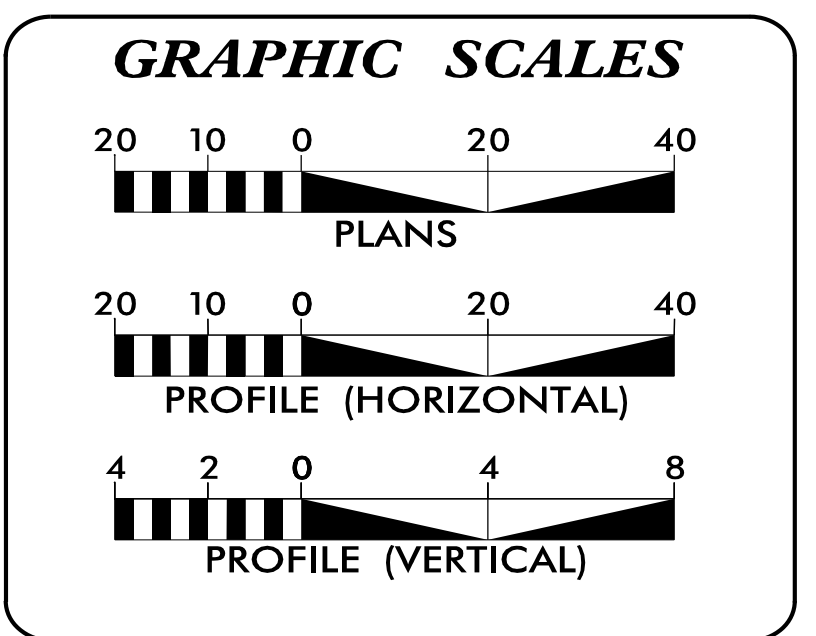
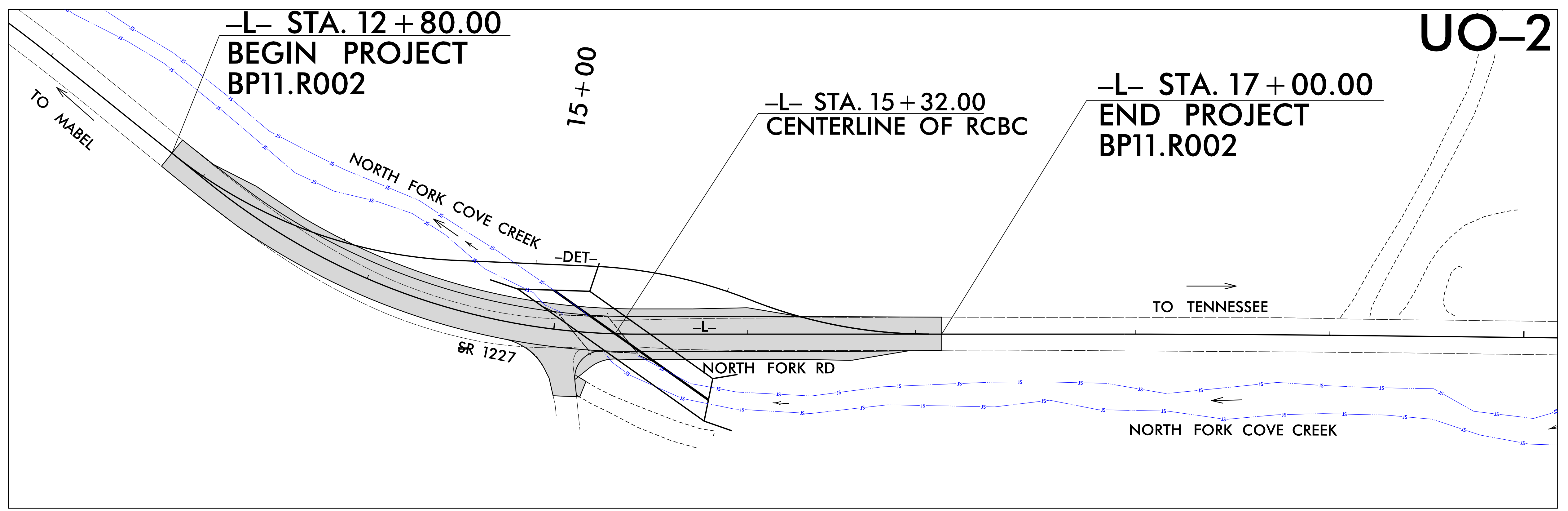
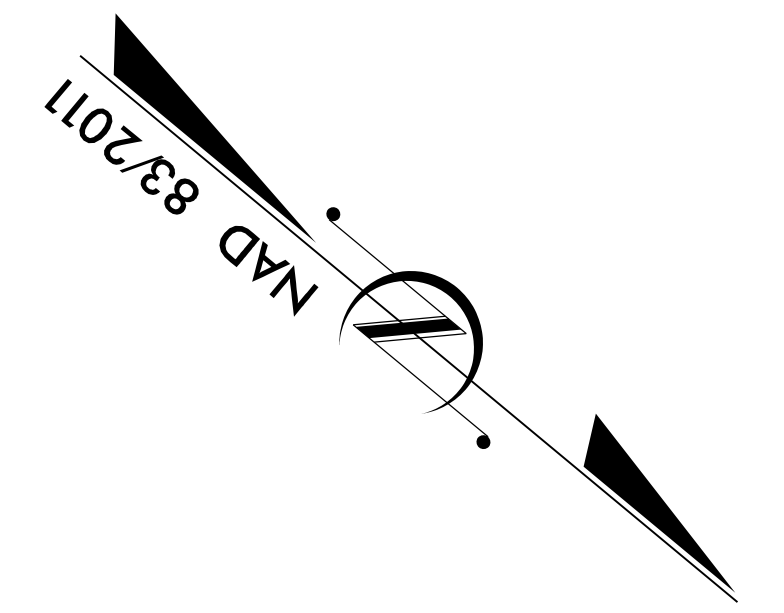
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

**UTILITIES BY OTHERS PLANS
WATAUGA COUNTY**

LOCATION: BRIDGE #940087 OVER NORTH FORK COVE CREEK
ON SR 1227 (NORTH FORK RD)
TYPE OF WORK: POWER DISTRIBUTION AND COMMUNICATIONS

T.I.P. NO.	SHEET NO.
BP11.R002	UO-1

NOTE:
ALL UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR UTILITY WORK SHOWN ON THIS SHEET.



INDEX OF SHEETS

SHEET NO.:	DESCRIPTION:
UO-1	TITLE SHEET
UO-2	UBO PLAN SHEET

UTILITY OWNERS WITH CONFLICTS

(A) POWER - BLUE RIDGE EMC
(B) COMMUNICATIONS - SKYLINE

PREPARED IN THE OFFICE OF:

TELICS
1598 WESTBROOK PLAZA DR.
SUITE 202
WINSTON-SALEM, NC 27103
(336) 705-8844

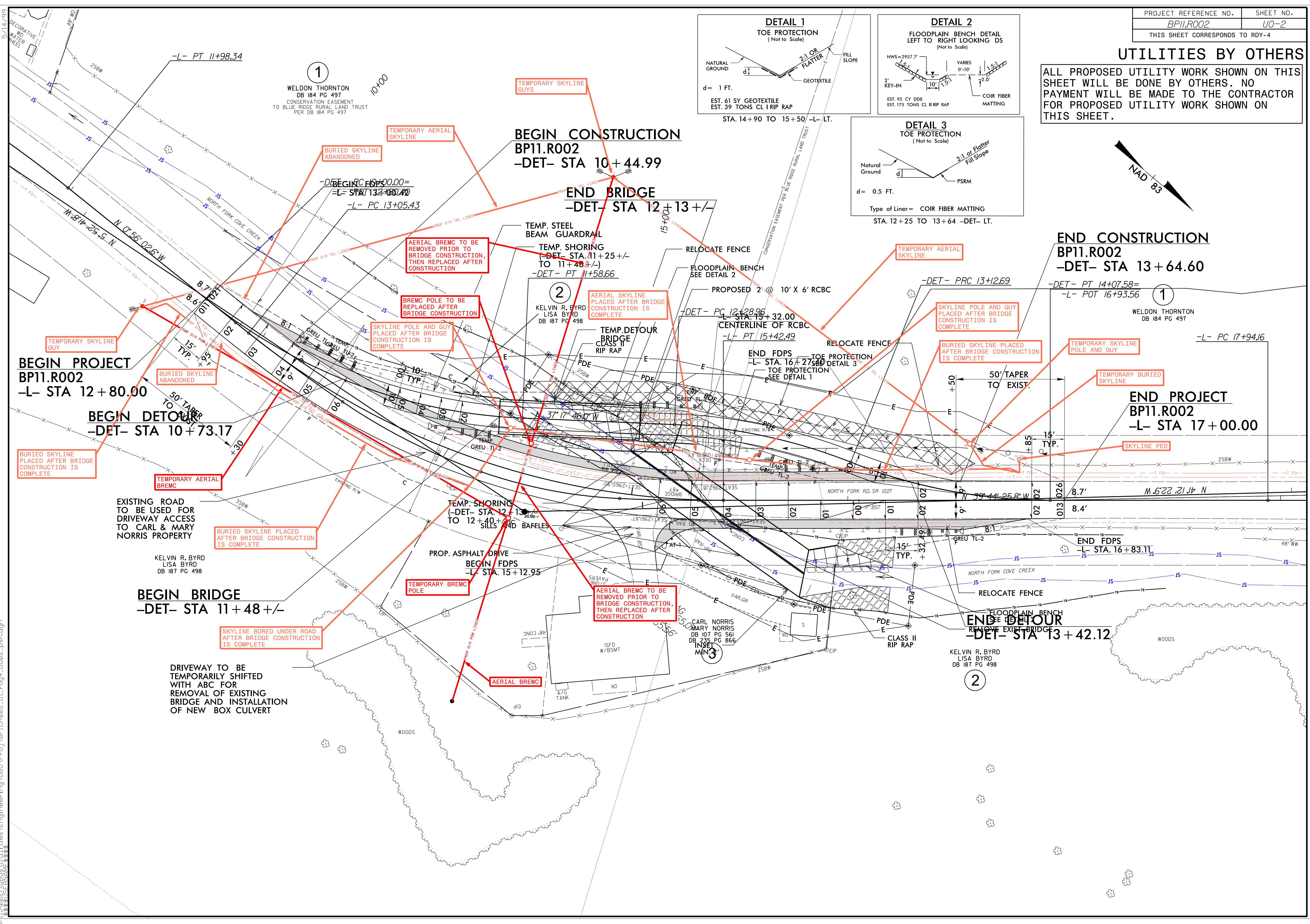
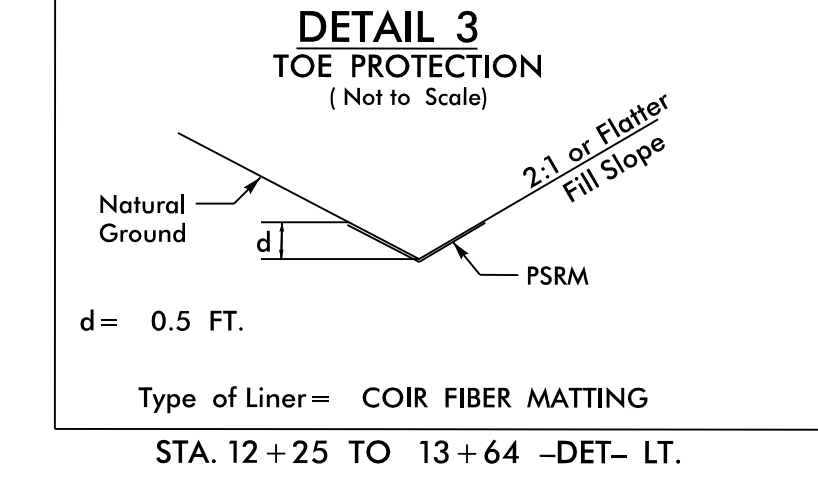
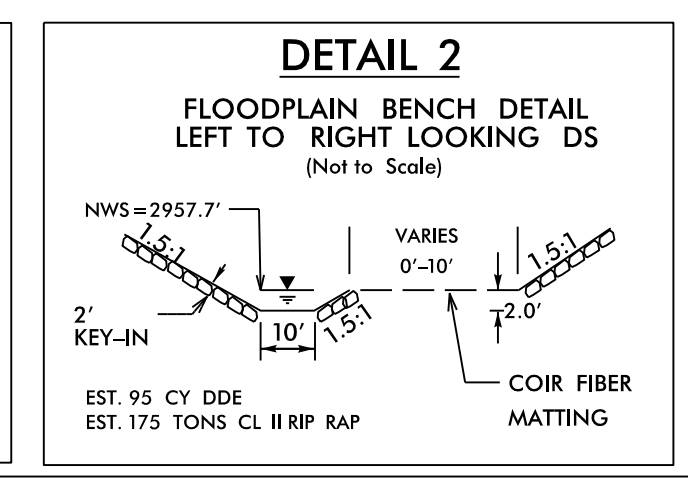
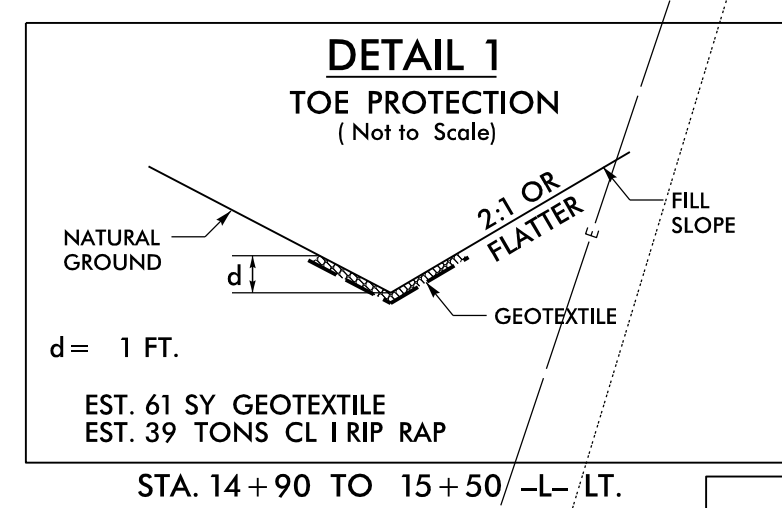
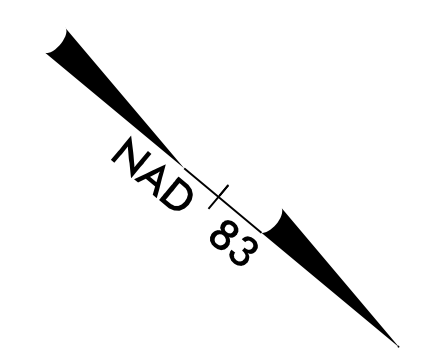
CORY WOOD	UTILITY PROJECT MANAGER
CORY WOOD	PROJECT UTILITY COORDINATOR

**DIVISION OF HIGHWAYS
DIVISION II**
801 STATESVILLE RD
NORTH WILKESBORO, NC 28659

BRANDON GREER	DIVISION UTILITY ENGINEER
SUSAN HUFFMAN	DIVISION UTILITY COORDINATOR

UTILITIES BY OTHERS

ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR PROPOSED UTILITY WORK SHOWN ON THIS SHEET.



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PROJECT REFERENCE NO.	SHEET NO.
BP11.R002	X-1A
RW SHEET NO.	

BP11.R002 CROSS-SECTION INDEX

XS - INDEX X-1A
 XS - SUMMARY X-1B
 - DET - X-1 THRU X-3
 - L - X-4 THRU X-6

REVISIONS

8/17/99

I:\3\2003\K\K001\Div 11 Waterage 87\Roadway\XSC\Waterage 87_Rdy_xpl_Index.dgn
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STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

PROJ. REFERENCE NO.	SHEET NO.
BP11.R002	X-1B

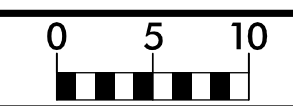
NOTE: EMBANKMENT COLUMN DOES NOT INCLUDE BACKFILL FOR UNDERCUT

CROSS-SECTION SUMMARY

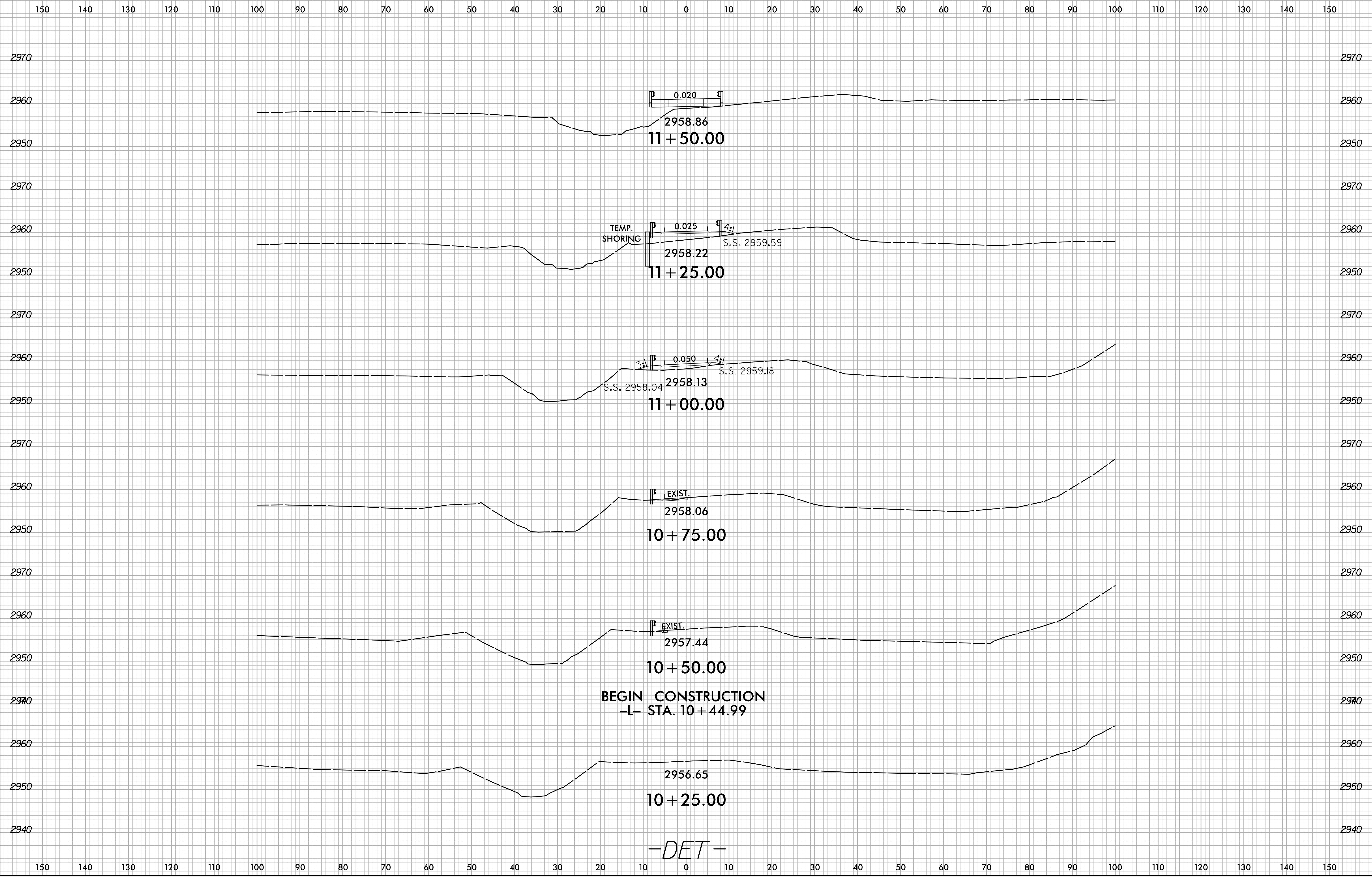
Station	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)																	
Det																			
10+44.99	0	0																	
10+50.00	0	0																	
10+75.00	1	0																	
11+00.00	1	6																	
11+25.00	0	19																	
11+48.00	0	24																	
Station	Uncl. Exc.	Embt																	
Det	(cu. yd.)	(cu. yd.)																	
12+13.00	0	0																	
12+25.00	0	19																	
12+50.00	0	34																	
12+75.00	0	29																	
13+00.00	0	27																	
13+25.00	0	20																	
13+50.00	2	8																	
13+64.60	2	1																	
Station	Uncl. Exc.	Embt																	
L	(cu. yd.)	(cu. yd.)																	
12+80.00	0	0																	
13+00.00	0	1																	
13+50.00	0	5																	
14+00.00	3	2																	
14+50.00	5	0																	
15+00.00	3	9																	
15+10.00	1	6																	
15+50.00	4	36																	
16+00.00	1	35																	
16+50.00	1	10																	
17+00.00	0	1																	
Station	Uncl. Exc.	Embt																	
L	(cu. yd.)	(cu. yd.)																	
12+80.00	0	0																	
13+00.00	0	0																	
13+50.00	0	2																	
14+00.00	17	2																	
14+30.18	20	0																	
14+50.00	6	2																	
15+00.00	0	5																	
15+10.00	8	0																	
15+50.00	52	0																	
16+00.00	36	2																	
16+50.00	16	10																	
17+00.00	6	8																	

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

6/23/16
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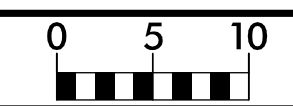


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BP11.R002	X-1

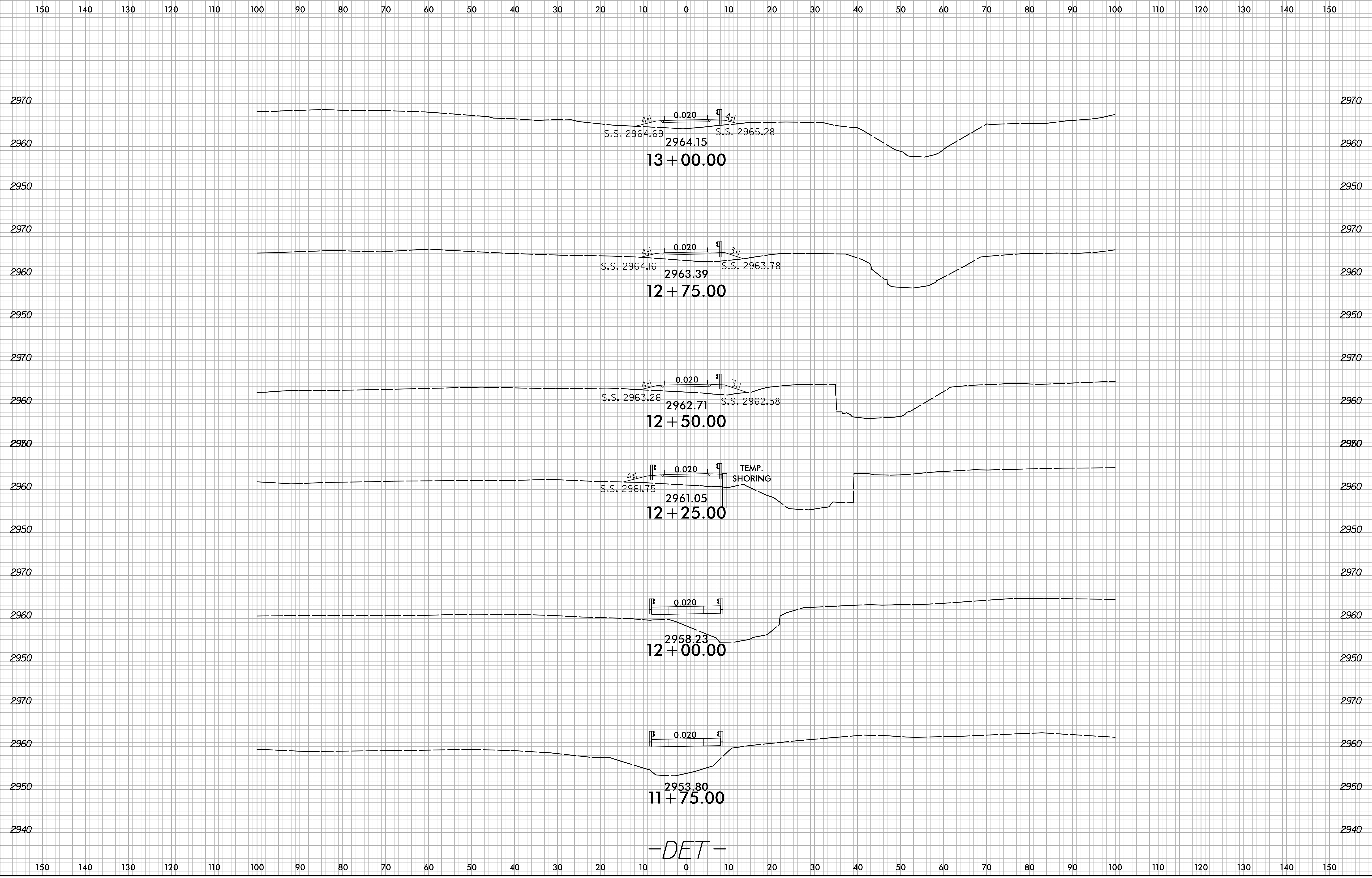


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6/23/16
1/3/2023
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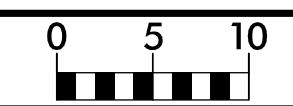


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BP11.R002	X-2



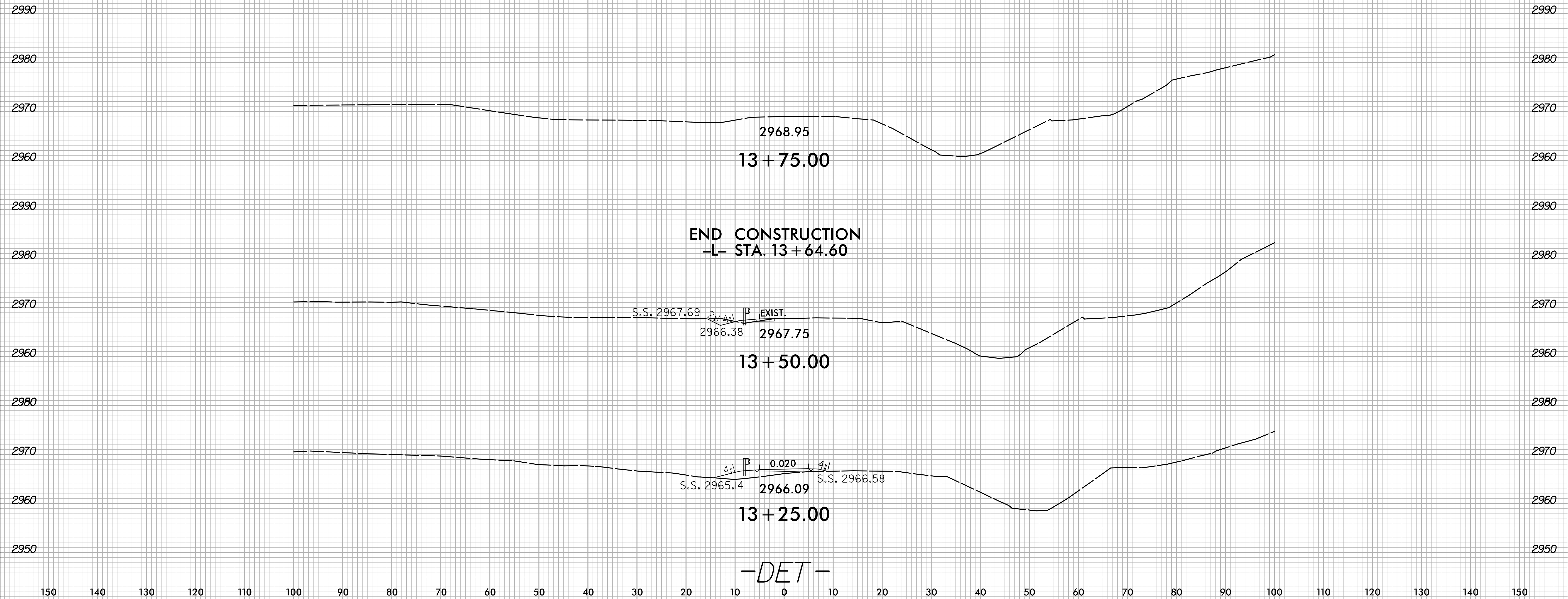
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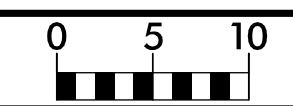
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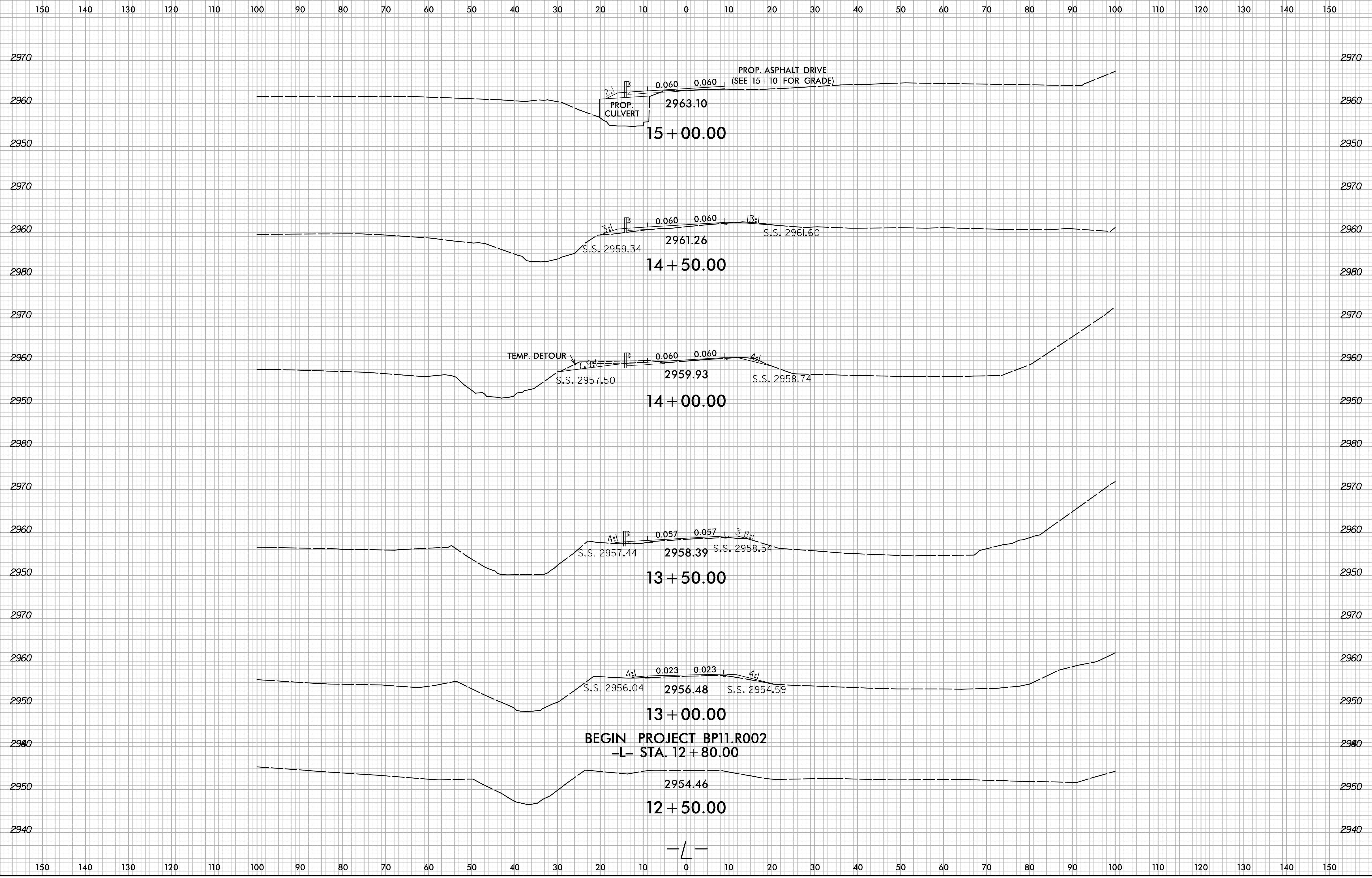
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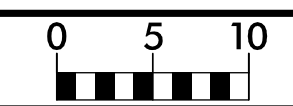


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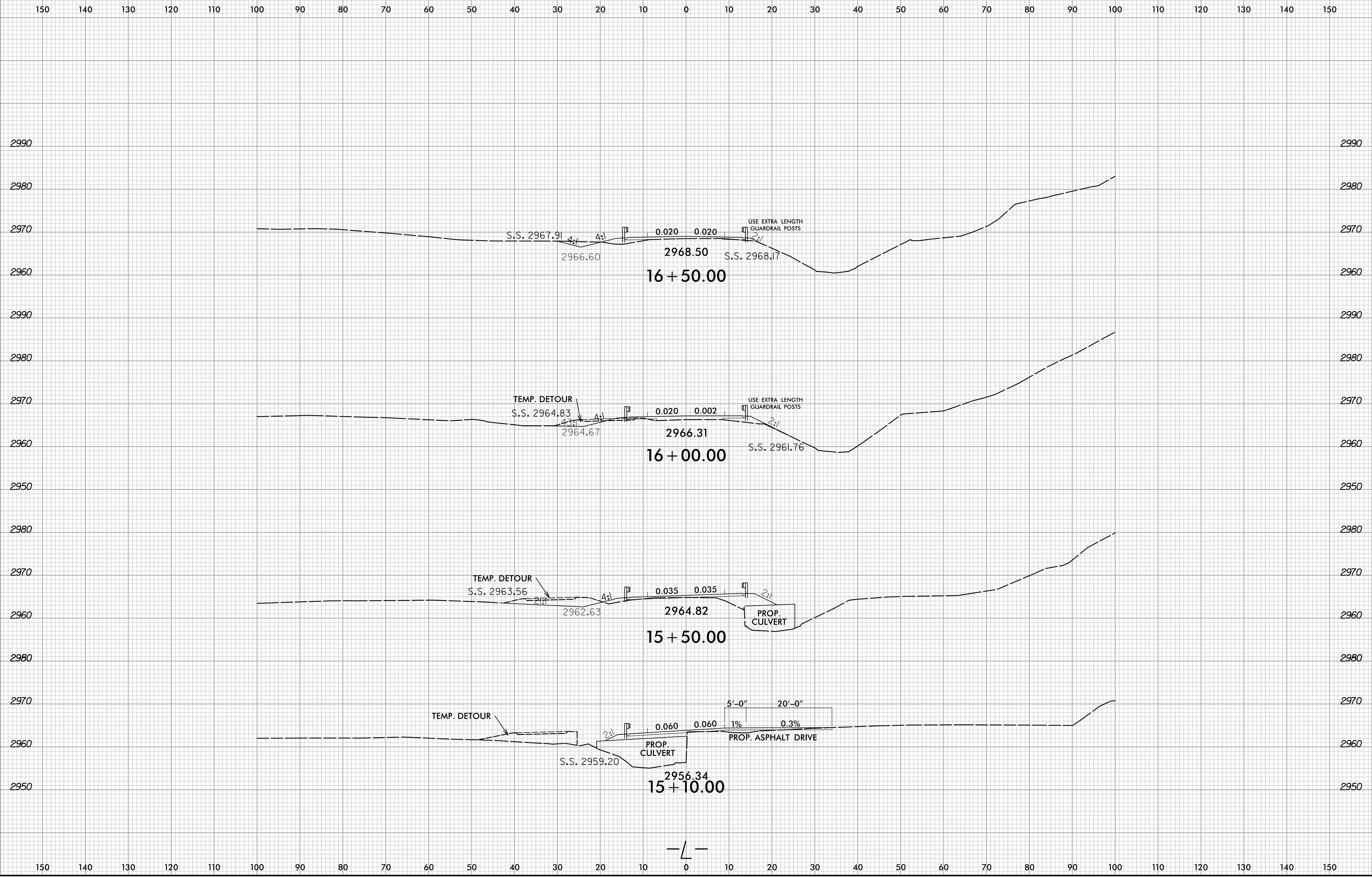


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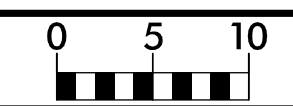


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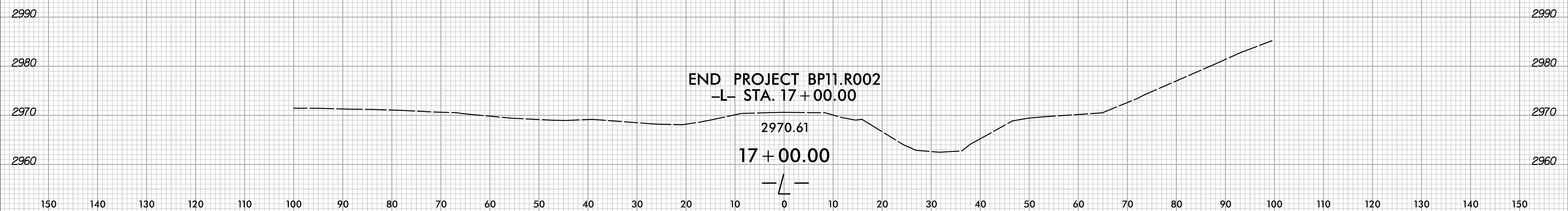
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6/23/16



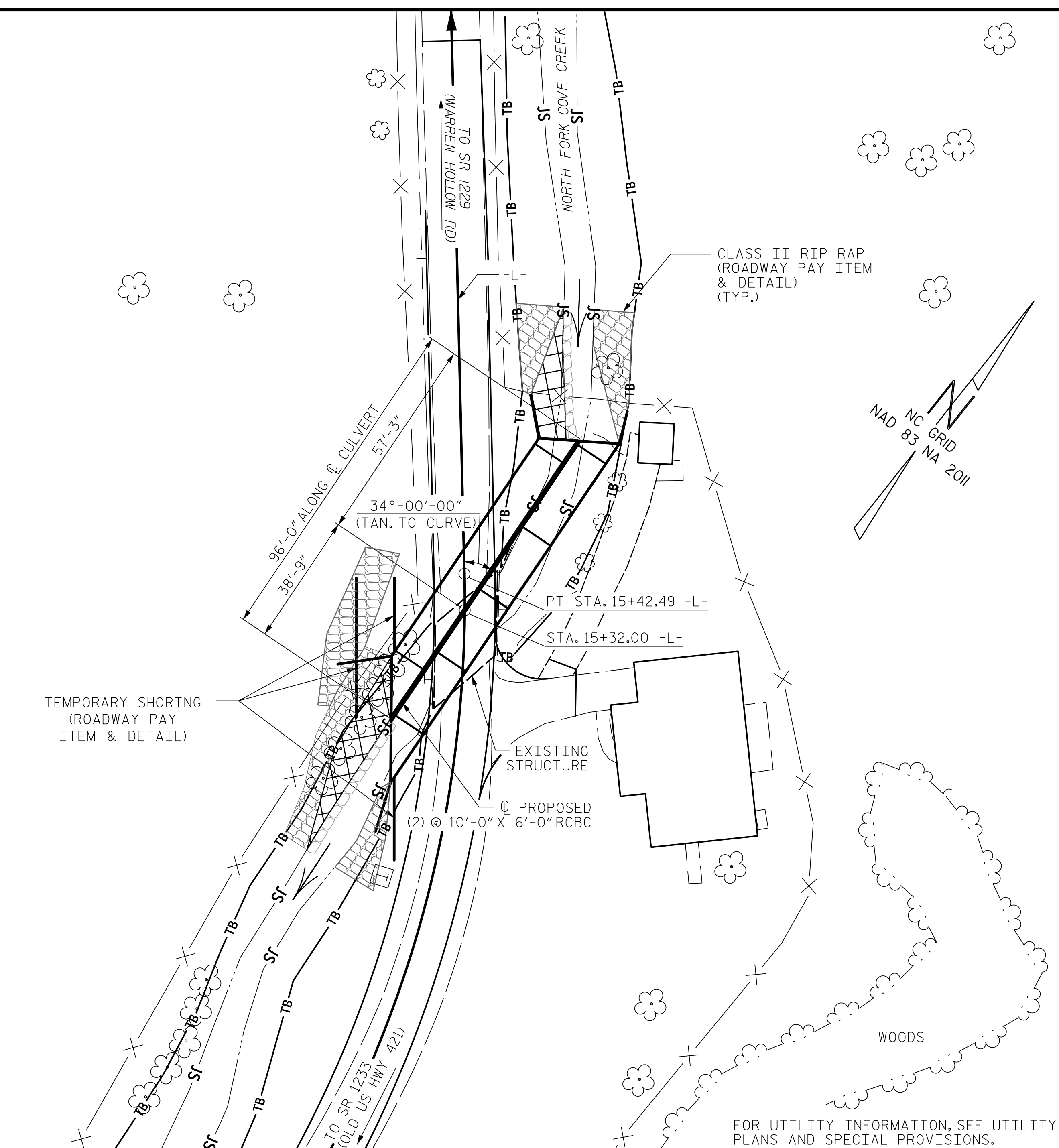
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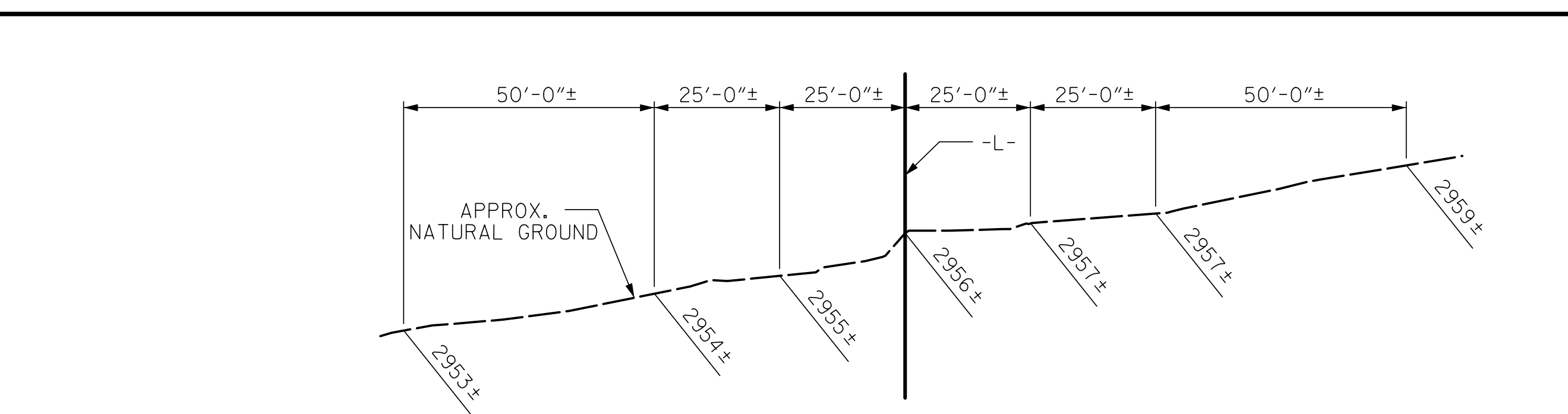


1/3/2023
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 User:rsimplym

BENCH MARK #1: RAILROAD SPIKE SET IN 30" OAK; 56' RT OF STA. 20+71.35 -L-; ELEV. = 2987.29



LOCATION SKETCH



PROFILE ALONG CULVERT

DRAWN BY : ZCS DATE : 11/21
 CHECKED BY : MGC DATE : 2/22

NOTES:

- ASSUMED LIVE LOAD ----- HL-93 OR ALTERNATE LOADING.
- DESIGN FILL----- 3.5' MAX.; 1.59' MIN.
- FOR OTHER DESIGN DATA AND NOTES, SEE STANDARD NOTES SHEET.
- 3"Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.
- CONCRETE IN CULVERT TO BE POURED IN THE FOLLOWING ORDER:
 1. PHASE I WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF VERTICAL WALLS.
 2. THE REMAINING PORTIONS OF PHASE I WALLS AND PHASE I WINGS FULL HEIGHT.
 3. PHASE II WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF VERTICAL WALLS.
 4. THE REMAINING PORTIONS OF PHASE II WALLS AND PHASE II WINGS FULL HEIGHT.
 5. ROOF SLAB AND HEADWALLS.
- THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.
- DIMENSIONS FOR WING LAYOUT AS WELL AS ADDITIONAL REINFORCING STEEL EMBEDDED IN BARREL ARE SHOWN ON WING SHEET.
- TRANSVERSE CONSTRUCTION JOINTS SHALL BE USED IN THE BARREL, SPACED TO LIMIT THE POURS TO A MAXIMUM OF 70 FT. LOCATION OF JOINTS SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.
- AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE AS PROVIDED IN THE SPLICE LENGTH CHART SHOWN ON THE PLANS. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.
- FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
- AT THE CONTRACTOR'S OPTION HE MAY SUBMIT, TO THE ENGINEER FOR APPROVAL, DESIGN AND DETAIL DRAWINGS FOR A PRECAST REINFORCED CONCRETE BOX CULVERT IN LIEU OF THE CAST-IN-PLACE CULVERT SHOWN ON THE PLANS. THE DESIGN SHALL PROVIDE THE SAME SIZE AND NUMBER OF BARRELS AS USED ON THE CAST-IN-PLACE DESIGN. FOR OPTIONAL PRECAST REINFORCED CONCRETE BOX CULVERT, SEE SPECIAL PROVISIONS.
- EXCAVATE 12 INCHES BELOW THE BOTTOM OF THE CULVERT AND REPLACE WITH FOUNDATION CONDITIONING MATERIAL IN ACCORDANCE WITH ARTICLE 414 OF THE STANDARD SPECIFICATIONS. FOUNDATION CONDITIONING MATERIAL SHOULD CONSIST OF SELECT MATERIAL CLASS V OR VI FOR CULVERTS.
- IF REQUIRED, UNDERCUT LOOSE SOILS THAT MAY BE ENCOUNTERED BENEATH THE FOUNDATION CONDITIONING MATERIAL. BACKFILL UNDERCUT AREAS WITH FOUNDATION CONDITIONING MATERIAL.
- REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.
- 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 15+32.00 -L-.
- FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.
- FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.
- FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURE AT STATION 11+81.00 -DET-, SEE SPECIAL PROVISIONS.

THE EXISTING 1 SPAN STRUCTURE (1 @ 26'-0") CONSISTING OF A TIMBER DECK ON STEEL I-BEAMS WITH A 4 1/2" ASPHALT WEARING SURFACE AND A CLEAR ROADWAY WIDTH OF 18'-1" AND A SUBSTRUCTURE CONSISTING OF TIMBER CAPS/ TIMBER POST & SEAL ABUTMENTS AND TIMBER CAP/ TIMBER POST & SEAL CRUTCH BENT AND LOCATED AT THE SITE OF THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT. FOR REMOVAL OF EXISTING STRUCTURE, SEE SPECIAL PROVISIONS.

TOTAL STRUCTURE QUANTITIES

CLASS A CONCRETE		
BARREL @ 2.1 CY/FT	201.6	C.Y.
WINGS, ETC.	31.9	C.Y.
SILLS	3.3	C.Y.
TOTAL	236.8	C.Y.
REINFORCING STEEL		
BARREL & SILLS	27,745	LBS.
WINGS, ETC.	1,526	LBS.
TOTAL	29,271	LBS.
CULVERT EXCAVATION	LUMP SUM	
FOUNDATION COND. MAT'L.	170	TONS
REMOVAL OF EXISTING STRUCTURE	LUMP SUM	
ASBESTOS ASSESSMENT	LUMP SUM	
CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURE AT STA. 11+81.00 -DET-	LUMP SUM	

ROADWAY DATA

GRADE POINT ELEV. @ STA. 15+32.00 -L- = 2964.66
 BED ELEV. @ STA. 15+32.00 -L- = 2954.77
 ROADWAY SLOPES = 2:1

HYDROGRAPHIC DATA

DESIGN DISCHARGE = 800 CFS
 FREQUENCY OF DESIGN FLOOD = 25 YRS
 DESIGN HIGH WATER ELEVATION = 2964.5 MI.
 DRAINAGE AREA = 2.6 SQ. MI.
 BASE DISCHARGE (Q100) = 1140 CFS
 BASE HIGH WATER ELEVATION = 2965.5 *

OVERTOPPING FLOOD DATA

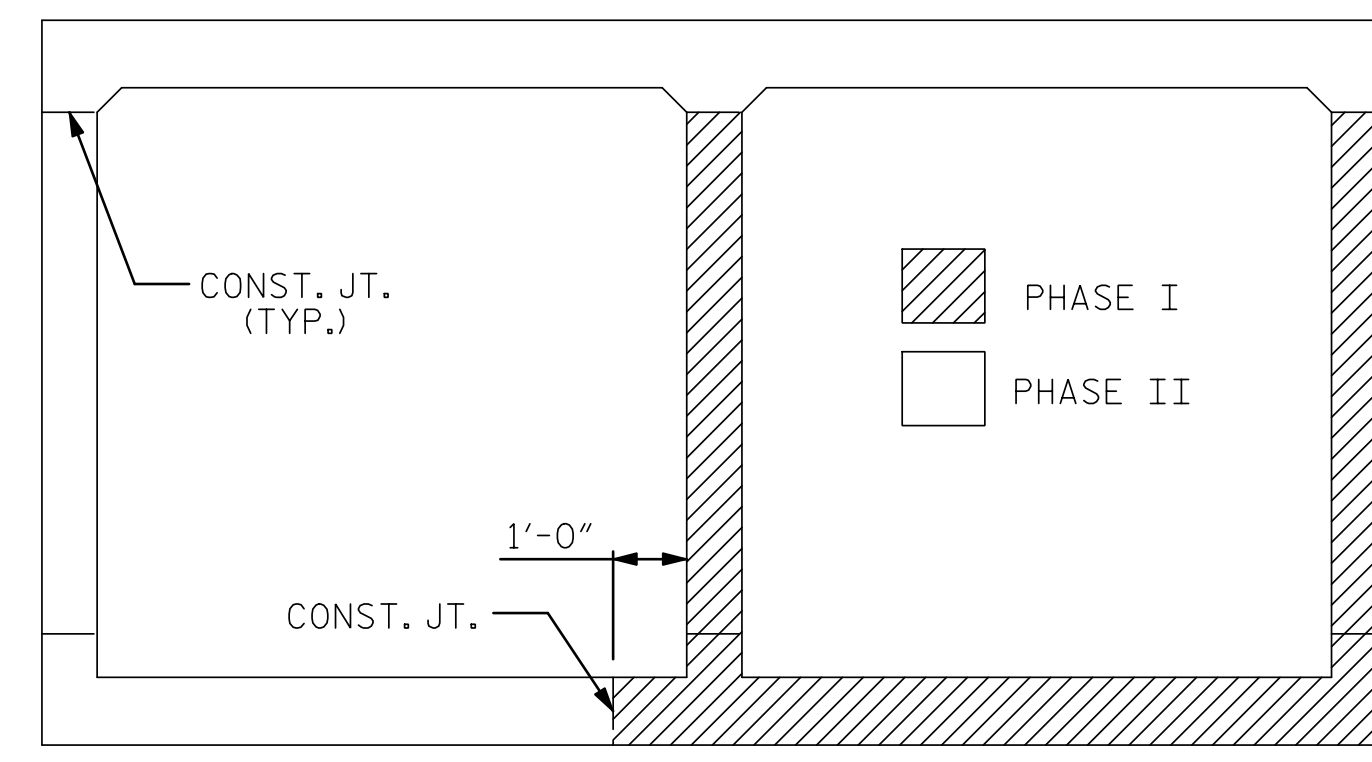
OVERTOPPING DISCHARGE = 1140 CFS
 FREQUENCY OF OVERTOPPING FLOOD = 100 YRS
 OVERTOPPING FLOOD ELEVATION = 2964.4 +

+ LOW POINT IS SHOULDER POINT AT STATION 15+10 -L-, PROPOSED DRIVEWAY TIE.

* DUE TO THE SLOPE OF THE STREAM, THE OVERTOPPING ELEVATION IS LOWER THAN THE WSE'S WHICH ARE REPORTED AT THE UPSTREAM TOE SECTION.

PROJECT NO. BP11.R002
WATAUGA COUNTY
 STATION: 15+32.00 -L-

SHEET 1 OF 10 REPLACES BRIDGE #940087



CONSTRUCTION PHASING

(LOOKING DOWNSTREAM)

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

DOUBLE 10 FT. x 6 FT. CONCRETE BOX CULVERT
 34° SKEW

10/2/2023 | 1:51 PM EDT

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
 804-C N. LAFAYETTE ST
 SHELBY, NC 28150
 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275

REVISIONS		SHEET NO.
NO.	BY:	DATE:
1		3
2		4
TOTAL SHEETS		10

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE								COMMENT NUMBER		
						MOMENT				SHEAR						
						LIVE-LOAD FACTORS (γ _{LL})	RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	RATING FACTOR	BOX NO.	ELEMENT TYPE		DISTANCE FROM LEFT END OF ELEMENT (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	1	1.03	--	1.75	1.19	1	TOP SLAB	5.75	1.03	1	TOP SLAB	1.91		
	HL-93 (OPERATING)	N/A		1.33	--	1.35	1.54	1	TOP SLAB	5.75	1.33	1	TOP SLAB	1.91		
	HS-20 (INVENTORY)	36.000	2	1.07	38.52	1.75	1.18	1	TOP SLAB	5.75	1.07	1	TOP SLAB	1.91		
	HS-20 (OPERATING)	36.000		1.39	50.04	1.35	1.53	1	TOP SLAB	5.75	1.39	1	TOP SLAB	1.91		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH		2.29	30.92	1.40	2.29	1	TOP SLAB	5.75	2.47	1	TOP SLAB	1.91		
		SNGARBS2	20.000		2.14	42.80	1.40	2.14	1	TOP SLAB	5.75	2.21	1	TOP SLAB	1.91	
		SNAGRIS2	22.000		2.28	50.16	1.40	2.28	1	TOP SLAB	5.75	2.36	1	TOP SLAB	1.91	
		SNCOTTS3	27.250		1.28	34.88	1.40	1.49	1	TOP SLAB	5.75	1.28	1	TOP SLAB	1.91	
		SNAGGRS4	34.925		1.48	51.69	1.40	1.48	1	BOTT SLAB	1.13	1.53	1	BOTT SLAB	1.79	
		SNS5A	35.550		1.47	52.26	1.40	1.57	1	BOTT SLAB	1.13	1.47	1	TOP SLAB	1.91	
		SNS6A	39.950		1.45	57.93	1.40	1.55	1	BOTT SLAB	1.13	1.45	1	TOP SLAB	1.91	
	SNS7B	42.000		1.45	60.90	1.40	1.52	1	BOTT SLAB	1.13	1.45	1	TOP SLAB	1.91		
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.65	54.45	1.40	1.66	1	BOTT SLAB	1.13	1.65	1	BOTT SLAB	1.79	
		TNT4A	33.075		1.49	49.28	1.40	1.77	1	TOP SLAB	5.75	1.49	1	TOP SLAB	1.91	
		TNT6A	41.600		1.47	61.15	1.40	1.59	1	BOTT SLAB	1.13	1.47	1	TOP SLAB	1.91	
		TNT7A	42.000		1.47	61.74	1.40	1.57	1	BOTT SLAB	1.13	1.47	1	TOP SLAB	1.91	
		TNT7B	42.000		1.47	61.74	1.40	1.65	1	BOTT SLAB	1.13	1.47	1	TOP SLAB	1.91	
		TNAGRIT4	43.000		1.46	62.78	1.40	1.62	1	BOTT SLAB	1.13	1.46	1	TOP SLAB	1.91	
TNAGT5A		45.000		1.46	65.70	1.40	1.52	1	BOTT SLAB	1.13	1.46	1	TOP SLAB	1.91		
TNAGT5B	45.000		3	1.28	57.60	1.40	1.28	1	BOTT SLAB	1.13	1.28	1	BOTT SLAB	1.79		

LOAD FACTORS:

DESIGN LOAD RATING FACTORS

LOAD TYPE	MAX FACTOR	MIN FACTOR
DC	1.25	0.90
DW	1.50	0.65
EV	1.30	0.90
EH	1.35	0.90
ES	1.35	0.90
LS	1.75	--
WA	1.00	--

NOTE:

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

COMMENTS:

- 1.
- 2.
- 3.
- 4.

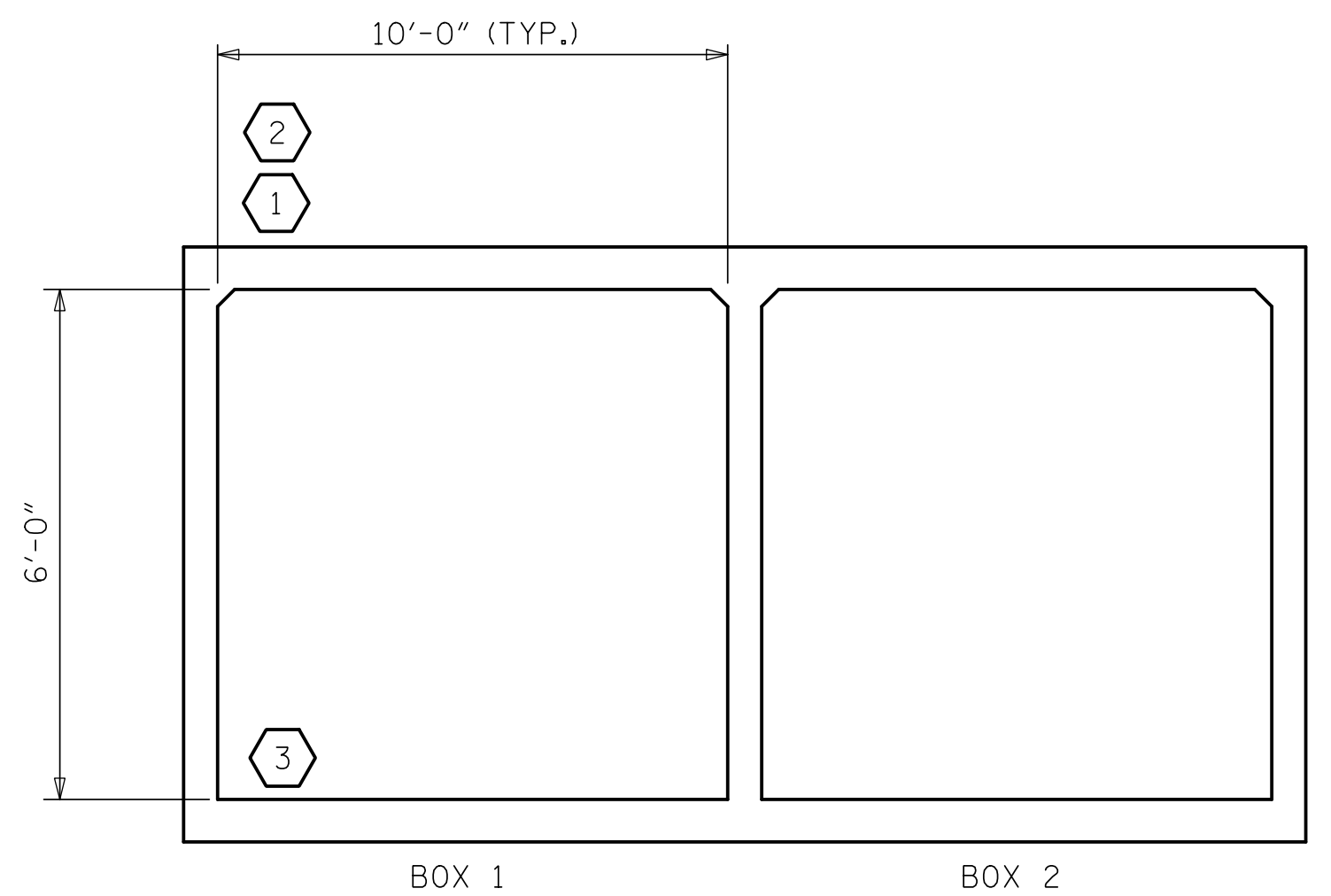
CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

2 DESIGN LOAD RATING (HS-20)

3 LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE



LRFR SUMMARY
(LOOKING DOWNSTREAM)

PROJECT NO. BP11.R002
WATAUGA COUNTY
 STATION: 15+32.00 -L-

SHEET 2 OF 10

10/2/2023 | 1:51 PM EDT

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

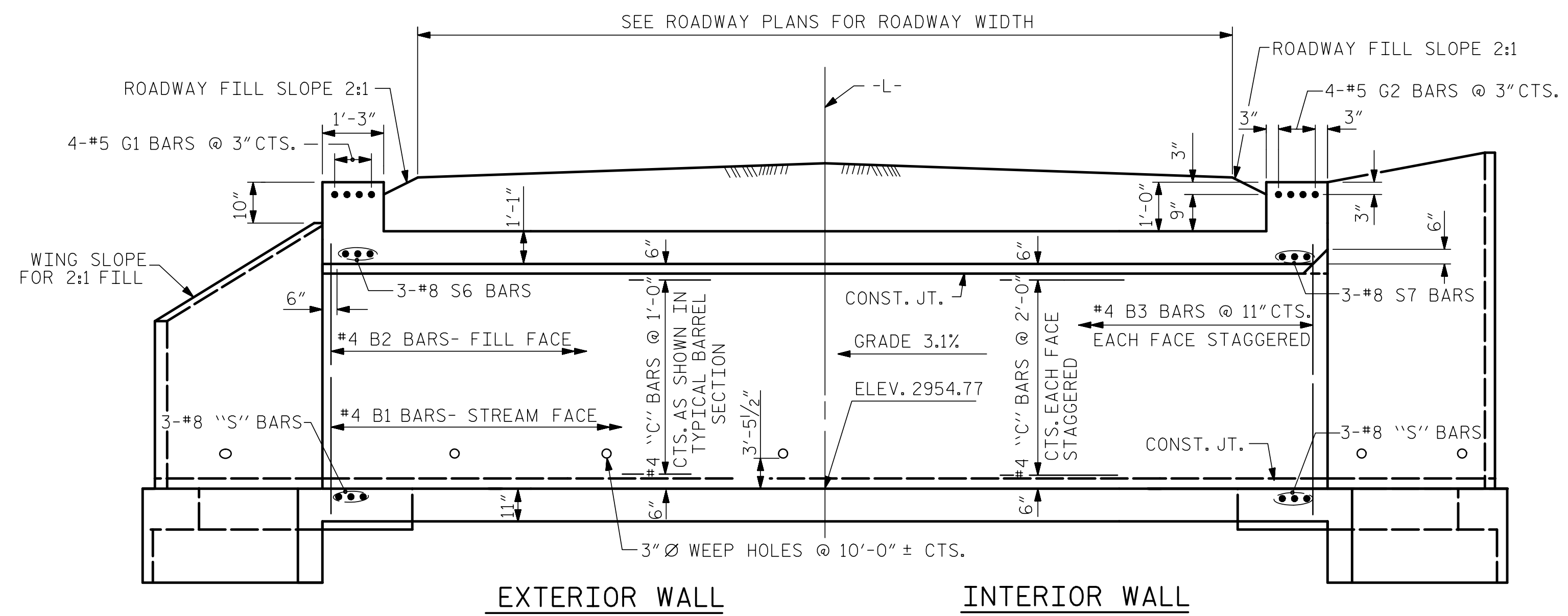
TGS ENGINEERS
804-C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

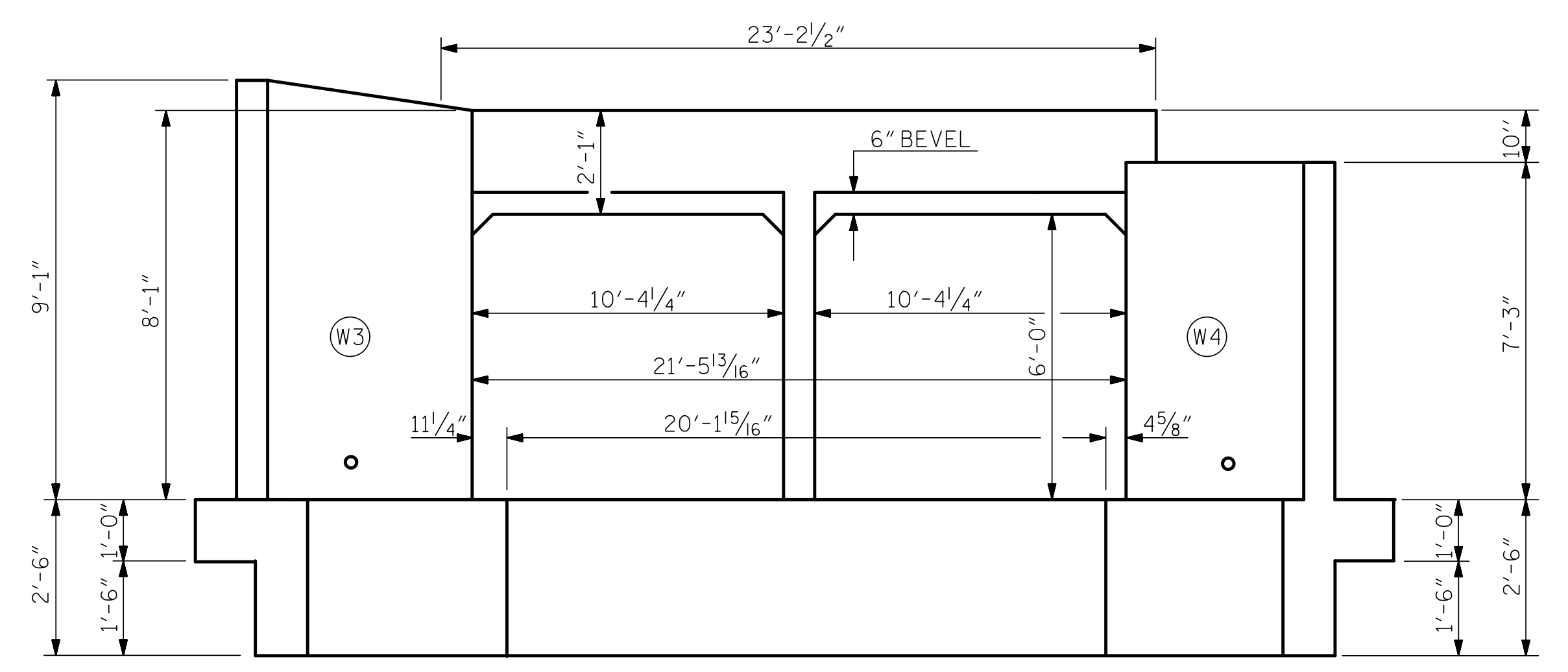
STANDARD
LRFR SUMMARY FOR
REINFORCED CONCRETE
BOX CULVERTS
(NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			C-2
2			4			TOTAL SHEETS 10

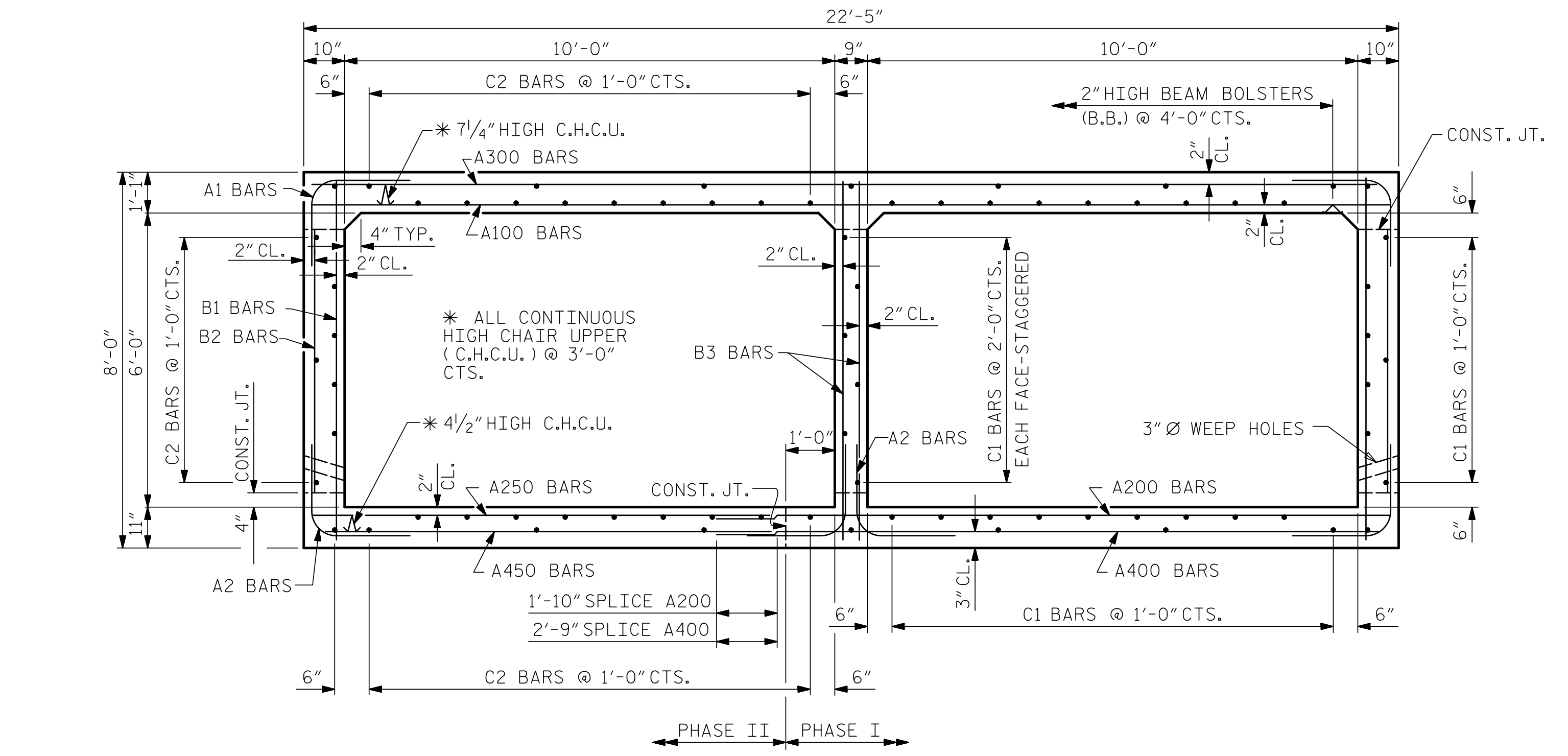
ASSEMBLED BY : ZCS	DATE : 2/22
CHECKED BY : MCC	DATE : 2/22
DRAWN BY : WMC 7/11	REV. 10/1/11 MAA/GM
CHECKED BY : GM 7/11	REV. 12/17 MAA/THC



CULVERT SECTION NORMAL TO ROADWAY

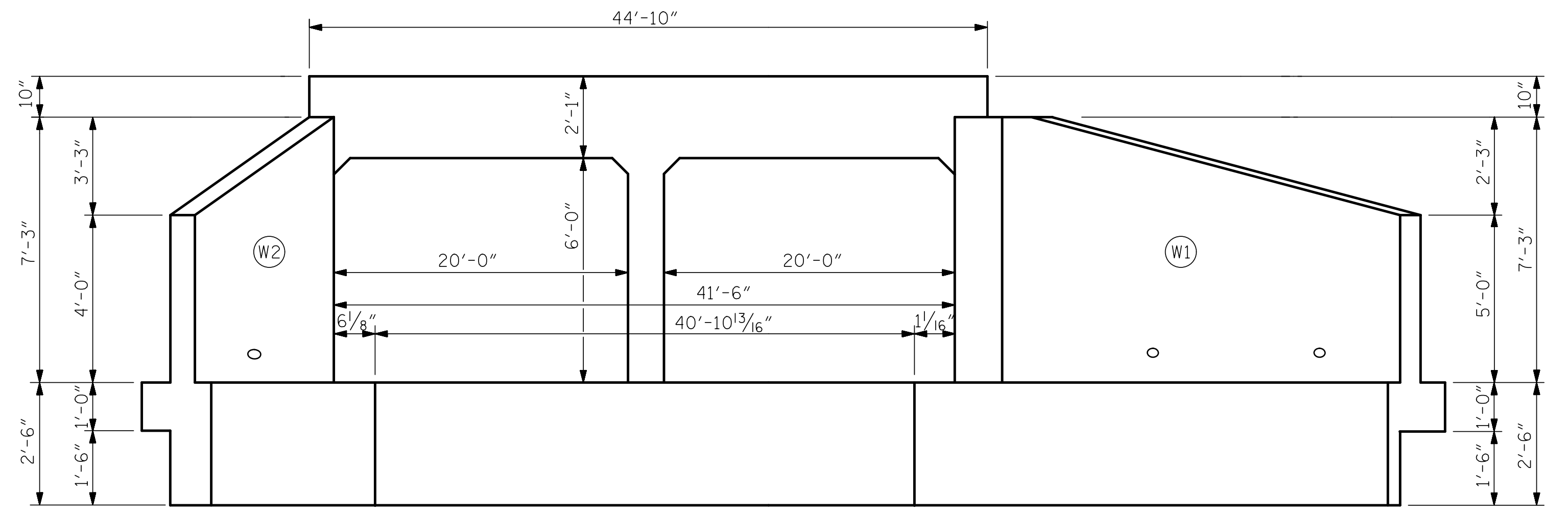


INLET END ELEVATION NORMAL TO SKEW



RIGHT ANGLE SECTION OF BARREL

THERE ARE 74 "C" BARS IN SECTION OF BARREL.
(LOOKING DOWNSTREAM)



OUTLET END ELEVATION NORMAL TO SKEW

PROJECT NO. BP11.R002
WATAUGA COUNTY
 STATION: 15+32.00 -L-

SHEET 3 OF 10

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

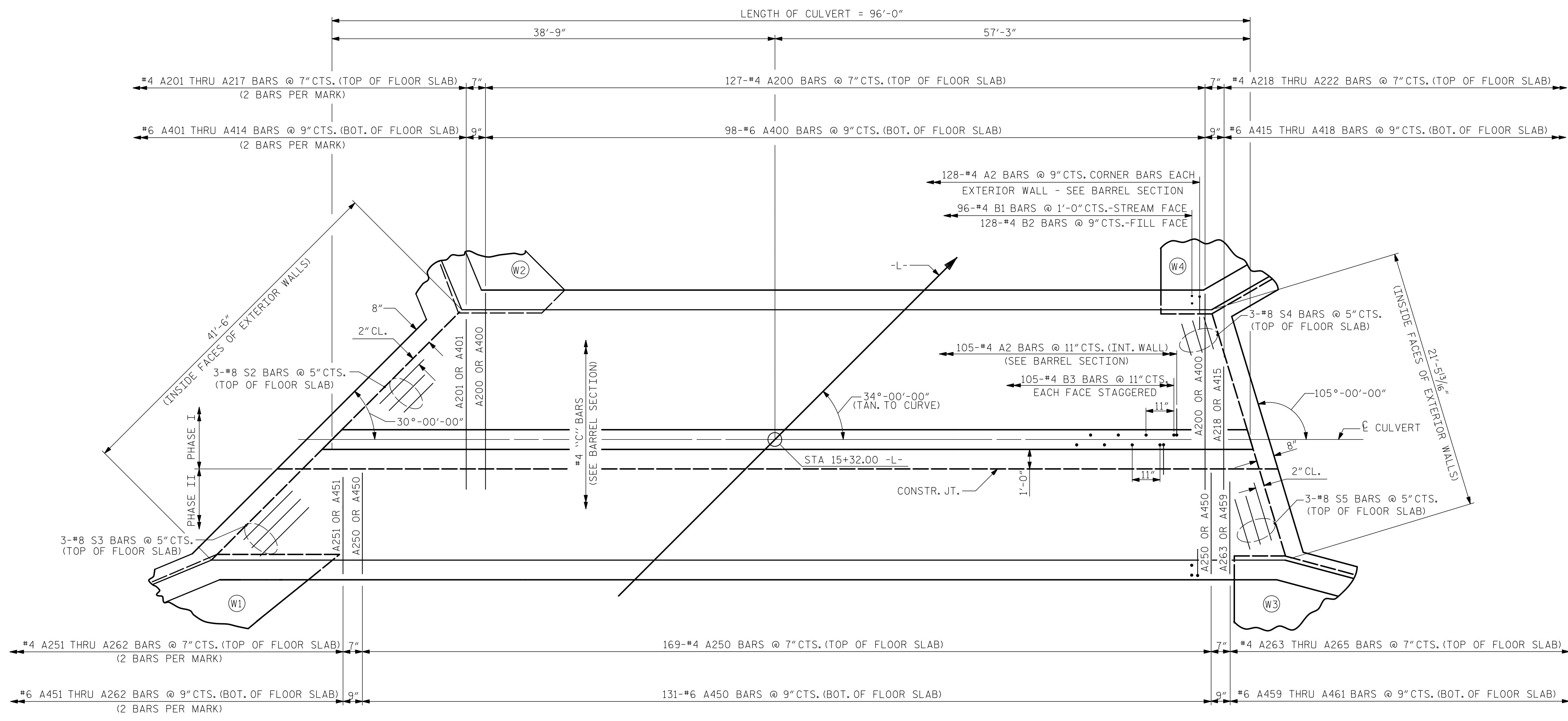
**DOUBLE 10 FT. X 6 FT.
 CONCRETE BOX CULVERT
 34° SKEW**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-3
1			3			TOTAL SHEETS
2			4			10

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
 804-C N. LAFAYETTE ST
 SHELBY, NC 28150
 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275

ASSEMBLED BY : ZCS DATE : 11/21
 CHECKED BY : MGC DATE : 2/22



PLAN - FLOOR SLAB
 FOR S1 BARS IN FLOOR SLAB & WINGS, SEE WING SHEETS.

PROJECT NO. BP11.R002
WATAUGA COUNTY
 STATION: 15+32.00 -L-

SHEET 4 OF 10

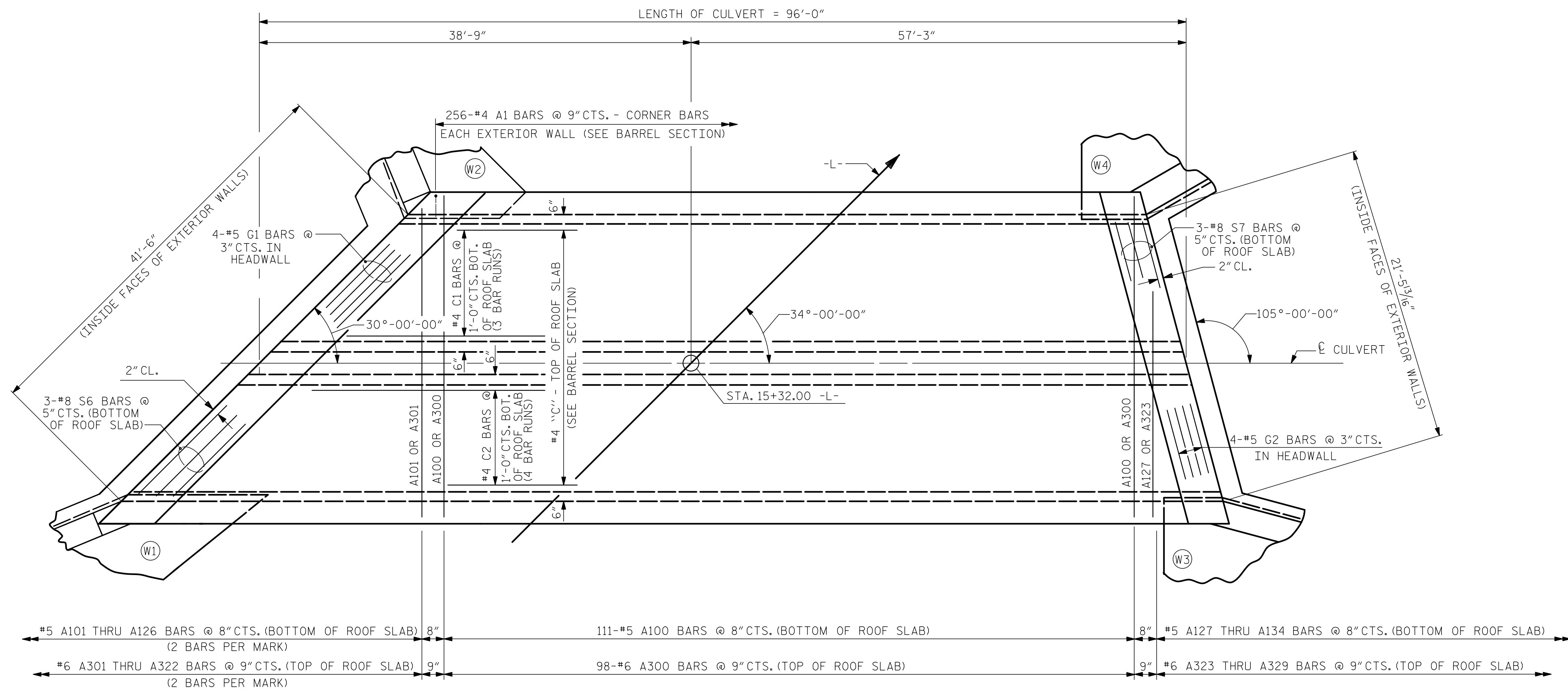
10/2/2023 1:51 PM EDT

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**DOUBLE 10 FT. X 6 FT.
 CONCRETE BOX CULVERT
 34° SKEW**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-4
1			3			TOTAL SHEETS
2			4			10

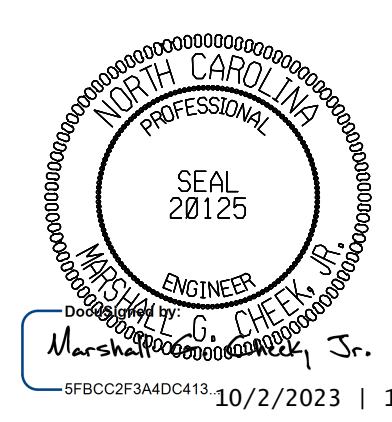
ASSEMBLED BY : ZCS DATE : 11/21
 CHECKED BY : MGC DATE : 2/22



PLAN - ROOF SLAB

PROJECT NO. BP11.R002
WATAUGA COUNTY
 STATION: 15+32.00 -L-

SHEET 5 OF 10



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

DOUBLE 10 FT. X 6 FT.
 CONCRETE BOX CULVERT
 34° SKEW

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED						REVISIONS						SHEET NO.	
TGS ENGINEERS 804-C N. LAFAYETTE ST SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275						NO.	BY:	DATE:	NO.	BY:	DATE:	C-5	
						1			3			TOTAL SHEETS	
						2			4			10	

ASSEMBLED BY : ZCS DATE : 11/21
 CHECKED BY : MGC DATE : 2/22

NOTES

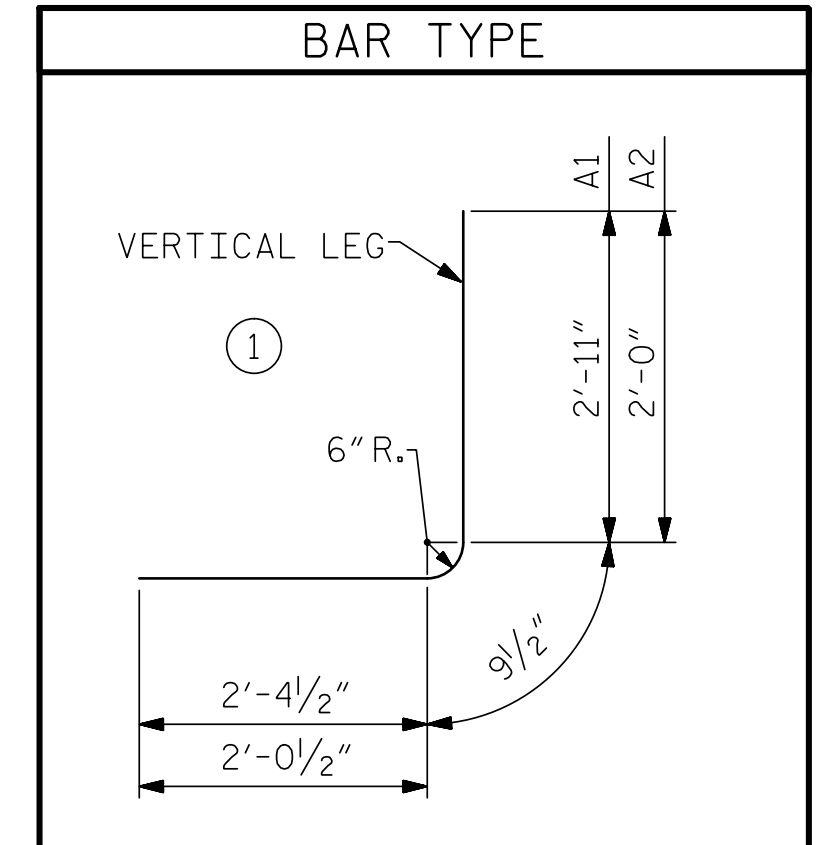
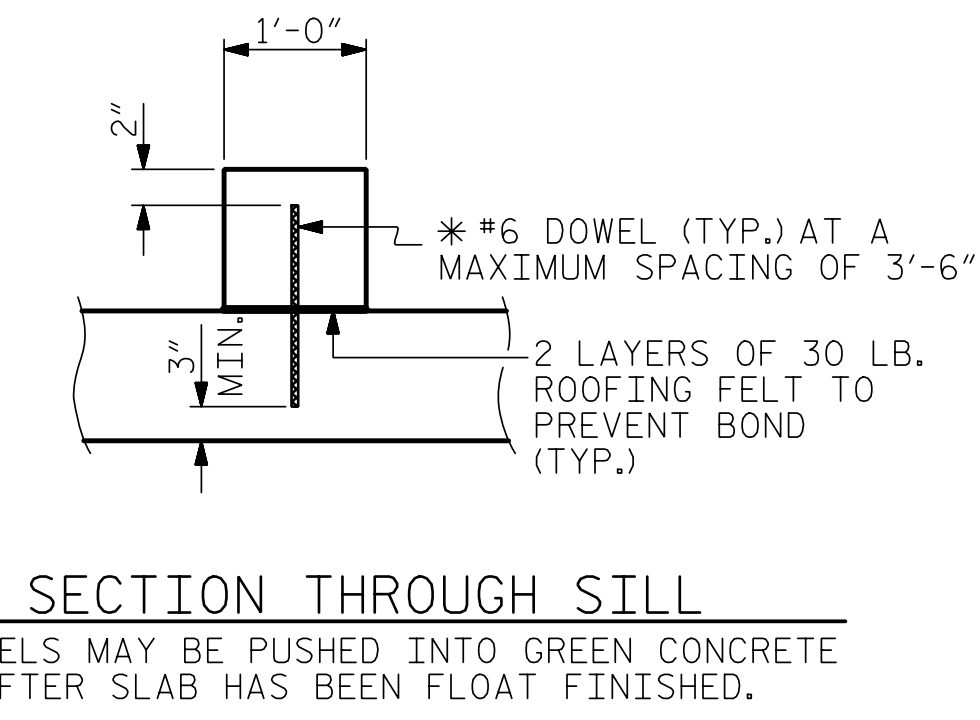
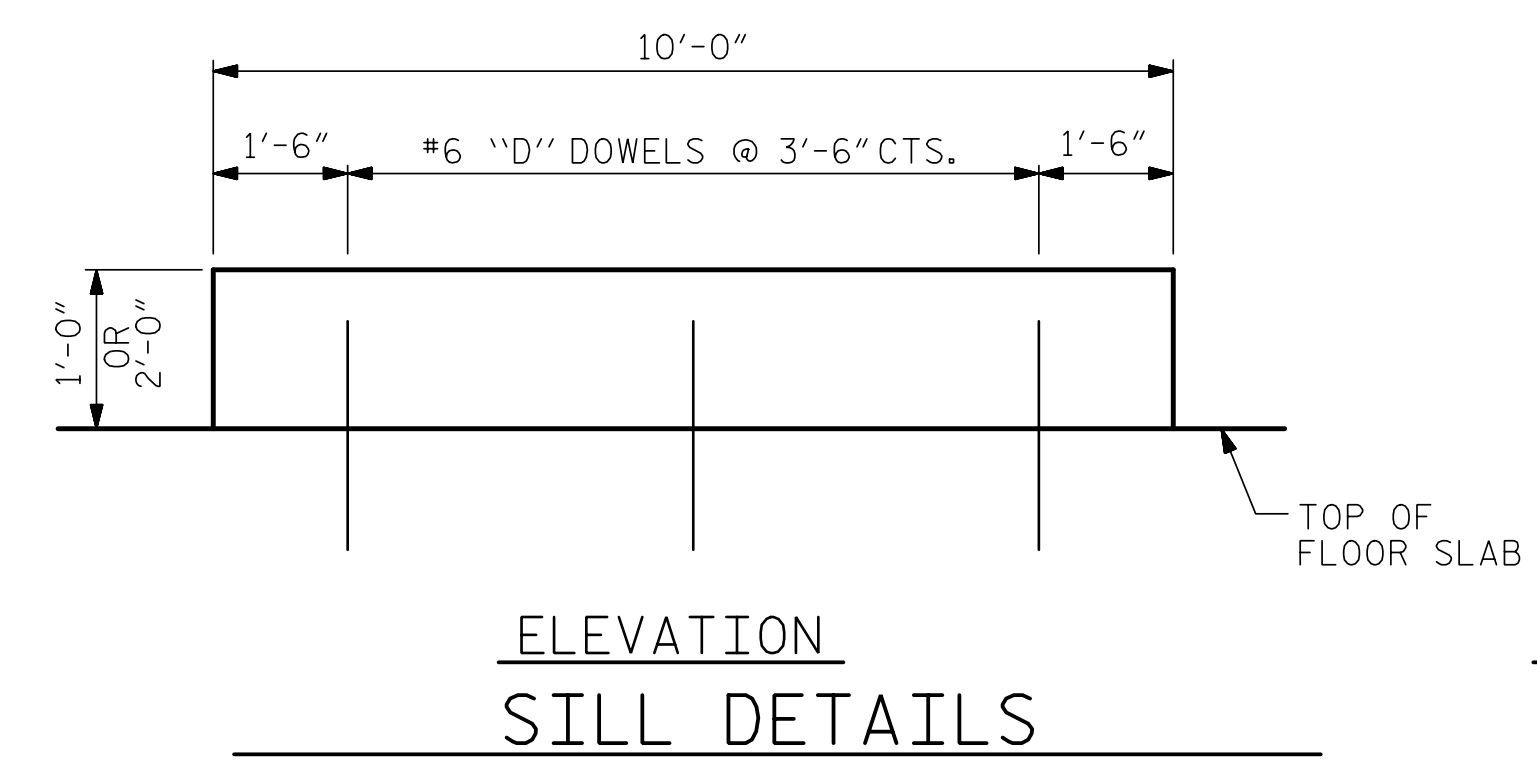
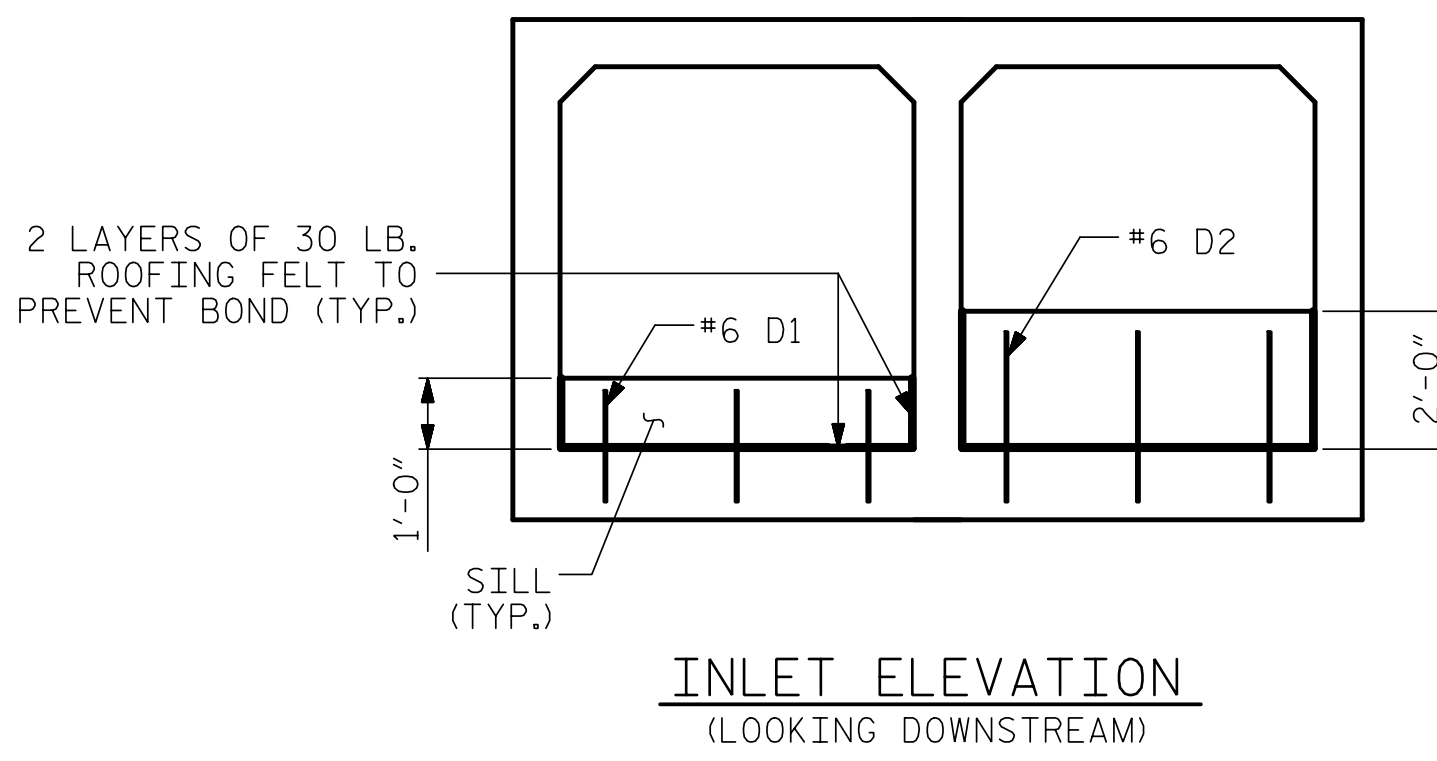
NATIVE MATERIAL BETWEEN SILLS/BAFFLES IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM OR FLOODPLAIN AT THE PROJECT SITE DURING CONSTRUCTION. ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE LOW FLOW CULVERT BARREL. RIP RAP MAY BE USED TO SUPPLEMENT THE NATIVE MATERIAL IN THE HIGH FLOW CULVERT BARRELS. IF RIP RAP IS USED TO LINE THE HIGH FLOW CULVERT BARREL, NATIVE MATERIAL SHOULD BE PLACED ON TOP TO FILL VOIDS AND PROVIDE A FLAT SURFACE FOR ANIMAL PASSAGE. NATIVE MATERIAL IS SUBJECT TO THE APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

THE ENTIRE COST OF WORK REQUIRED TO PLACE EXCAVATED MATERIAL OR SUPPLEMENTAL MATERIAL AS SHOWN ON THE PLANS SHALL BE INCLUDED IN THE CONTRACT LUMP SUM PRICE BID FOR CULVERT EXCAVATION.

THE ENTIRE COST OF WORK REQUIRED TO CONSTRUCT THE SILLS SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

BAR SCHEDULE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A100	111	#5	STR	22'-0"	2547	A200	127	#4	STR	14'-4"	1216	A300	98	#6	STR	22'-0"	3238	A400	98	#6	STR	15'-3"	2245	A1	256	#4	1	6'-1"	1040
A101	2	#5	STR	21'-2"	44	A201	2	#4	STR	13'-10"	18	A301	2	#6	STR	21'-3"	64	A401	2	#6	STR	14'-7"	44	A2	466	#4	1	4'-10"	1505
A102	2	#5	STR	20'-5"	43	A202	2	#4	STR	13'-1"	17	A302	2	#6	STR	20'-5"	61	A402	2	#6	STR	13'-8"	41						
A103	2	#5	STR	19'-8"	41	A203	2	#4	STR	12'-5"	17	A303	2	#6	STR	19'-7"	59	A403	2	#6	STR	12'-10"	39	B1	192	#4	STR	7'-6"	962
A104	2	#5	STR	18'-11"	39	A204	2	#4	STR	11'-9"	16	A304	2	#6	STR	18'-8"	56	A404	2	#6	STR	12'-0"	36	B2	256	#4	STR	5'-4"	912
A105	2	#5	STR	18'-2"	38	A205	2	#4	STR	11'-1"	15	A305	2	#6	STR	17'-10"	54	A405	2	#6	STR	11'-1"	33	B3	210	#4	STR	7'-6"	1052
A106	2	#5	STR	17'-4"	36	A206	2	#4	STR	10'-5"	14	A306	2	#6	STR	16'-11"	51	A406	2	#6	STR	10'-3"	31						
A107	2	#5	STR	16'-7"	35	A207	2	#4	STR	9'-9"	13	A307	2	#6	STR	16'-1"	48	A407	2	#6	STR	9'-4"	28	C1	123	#4	STR	33'-6"	2752
A108	2	#5	STR	15'-10"	33	A208	2	#4	STR	9'-1"	12	A308	2	#6	STR	15'-3"	46	A408	2	#6	STR	8'-6"	26	C2	132	#4	STR	31'-0"	2733
A109	2	#5	STR	15'-1"	31	A209	2	#4	STR	8'-5"	11	A309	2	#6	STR	14'-4"	43	A409	2	#6	STR	7'-8"	23						
A110	2	#5	STR	14'-3"	30	A210	2	#4	STR	7'-9"	10	A310	2	#6	STR	13'-6"	41	A410	2	#6	STR	6'-9"	20	D1	15	#6	STR	1'-6"	34
A111	2	#5	STR	13'-6"	28	A211	2	#4	STR	7'-1"	9	A311	2	#6	STR	12'-7"	38	A411	2	#6	STR	5'-11"	18	D2	6	#6	STR	2'-6"	23
A112	2	#5	STR	12'-9"	27	A212	2	#4	STR	6'-5"	9	A312	2	#6	STR	11'-9"	35	A412	2	#6	STR	5'-1"	15						
A113	2	#5	STR	12'-0"	25	A213	2	#4	STR	5'-9"	8	A313	2	#6	STR	10'-11"	33	A413	2	#6	STR	4'-2"	13	G1	4	#5	STR	44'-2"	184
A114	2	#5	STR	11'-2"	23	A214	2	#4	STR	5'-0"	7	A314	2	#6	STR	10'-0"	30	A414	2	#6	STR	3'-4"	10	G2	4	#5	STR	22'-10"	95
A115	2	#5	STR	10'-5"	22	A215	2	#4	STR	4'-4"	6	A315	2	#6	STR	9'-2"	28	A415	1	#6	STR	13'-7"	20						
A116	2	#5	STR	9'-8"	20	A216	2	#4	STR	3'-8"	5	A316	2	#6	STR	8'-3"	25	A416	1	#6	STR	10'-10"	16	S2	6	#8	STR	28'-10"	462
A117	2	#5	STR	8'-11"	19	A217	2	#4	STR	3'-0"	4	A317	2	#6	STR	7'-5"	22	A417	1	#6	STR	8'-0"	12	S3	6	#8	STR	19'-0"	304
A118	2	#5	STR	8'-1"	17	A218	1	#4	STR	13'-0"	9	A318	2	#6	STR	6'-7"	20	A418	1	#6	STR	5'-3"	8	S4	6	#8	STR	16'-9"	268
A119	2	#5	STR	7'-4"	15	A219	1	#4	STR	10'-10"	7	A319	2	#6	STR	5'-8"	17							S5	6	#8	STR	9'-8"	155
A120	2	#5	STR	6'-7"	14	A220	1	#4	STR	8'-8"	6	A320	2	#6	STR	4'-10"	15	A450	131	#6	STR	9'-5"	1853	S6	3	#8	STR	44'-2"	354
A121	2	#5	STR	5'-10"	12	A221	1	#4	STR	6'-6"	4	A321	2	#6	STR	3'-11"	12	A451	2	#6	STR	8'-9"	26	S7	3	#8	STR	22'-10"	183
A122	2	#5	STR	5'-0"	10	A222	1	#4	STR	4'-4"	3	A322	2	#6	STR	3'-1"	9	A452	2	#6	STR	7'-10"	24						
A123	2	#5	STR	4'-3"	9							A323	1	#6	STR	20'-4"	31	A453	2	#6	STR	7'-0"	21						
A124	2	#5	STR	3'-6"	7	A250	169	#4	STR	9'-5"	1063	A324	1	#6	STR	17'-6"	26	A454	2	#6	STR	6'-1"	18						
A125	2	#5	STR	2'-9"	6	A251	2	#4	STR	9'-0"	12	A325	1	#6	STR	14'-9"	22	A455	2	#6	STR	5'-3"	16						
A126	2	#5	STR	2'-0"	4	A252	2	#4	STR	8'-3"	11	A326	1	#6	STR	11'-11"	18	A456	2	#6	STR	4'-5"	13						
A127	1	#5	STR	19'-7"	20	A253	2	#4	STR	7'-7"	10	A327	1	#6	STR	9'-1"	14	A457	2	#6	STR	3'-6"	11						
A128	1	#5	STR	17'-1"	18	A254	2	#4	STR	6'-11"	9	A328	1	#6	STR	6'-4"	10	A458	2	#6	STR	2'-8"	8						
A129	1	#5	STR	14'-7"	15	A255	2	#4	STR	6'-3"	8	A329	1	#6	STR	3'-6"	5	A459	1	#6	STR	9'-1"	14						
A130	1	#5	STR	12'-1"	13	A256	2	#4	STR	5'-7"	7						A460	1	#6	STR	6'-4"	10							
A131	1	#5	STR	9'-7"	10	A257	2	#4	STR	4'-11"	7						A461	1	#6	STR	3'-6"	5							
A132	1	#5	STR	7'-1"	7	A258	2	#4	STR	4'-3"	6																		
A133	1	#5	STR	4'-7"	5	A259	2	#4	STR	3'-7"	5																		
A134	1	#5	STR	2'-2"	2	A260	2	#4	STR	2'-11"	4																		
						A261	2	#4	STR	2'-3"	3																		
						A262	2	#4	STR	1'-7"	2																		
						A263	1	#4	STR	7'-7"	5																		
						A264	1	#4	STR	5'-5"	4																		
						A265	1	#4	STR	3'-3"	2																		
																						REINFORCING STEEL		27,745 LBS					



DIMENSIONS ARE OUT TO OUT

SPLICE LENGTHS CHART

BAR	SIZE	SPLICE LENGTH
"B"	#4	1'-10"
"C"	#4	1'-10"
"S"	#8	3'-8"

PROJECT NO. BP11.R002
WATAUGA COUNTY
 STATION: 15+32.00 -L-
 SHEET 6 OF 10

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

DOUBLE 10 FT. X 6 FT.
 CONCRETE BOX CULVERT
 34° SKEW

9/29/2022
 10/2/2023 1:51 PM EDT

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
 706 HILLSBOROUGH STREET
 SUITE 200
 RALEIGH, NC 27603
 PH (919) 773-8887
 CORP. LICENSE NO.: C-0275

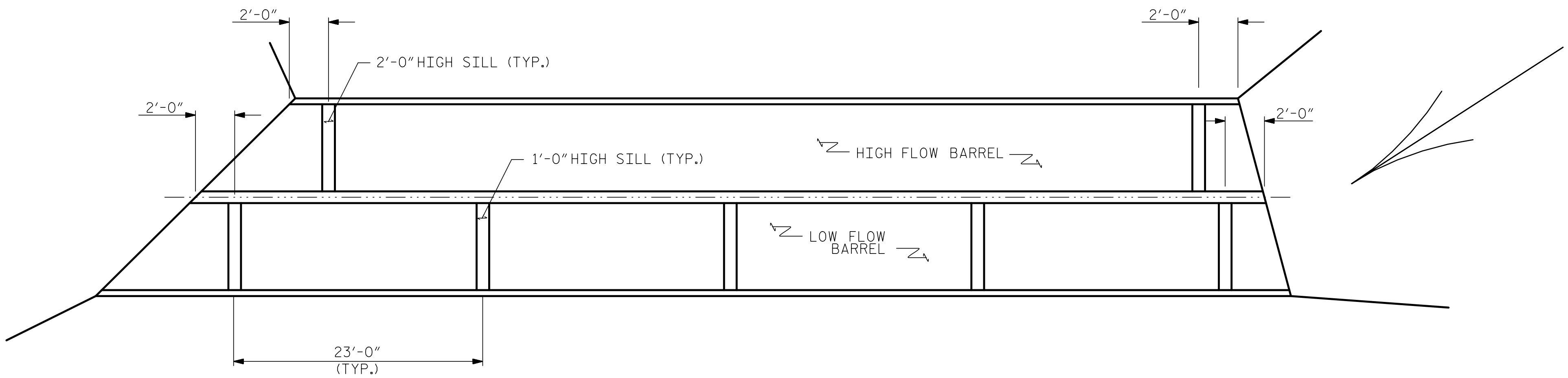
REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

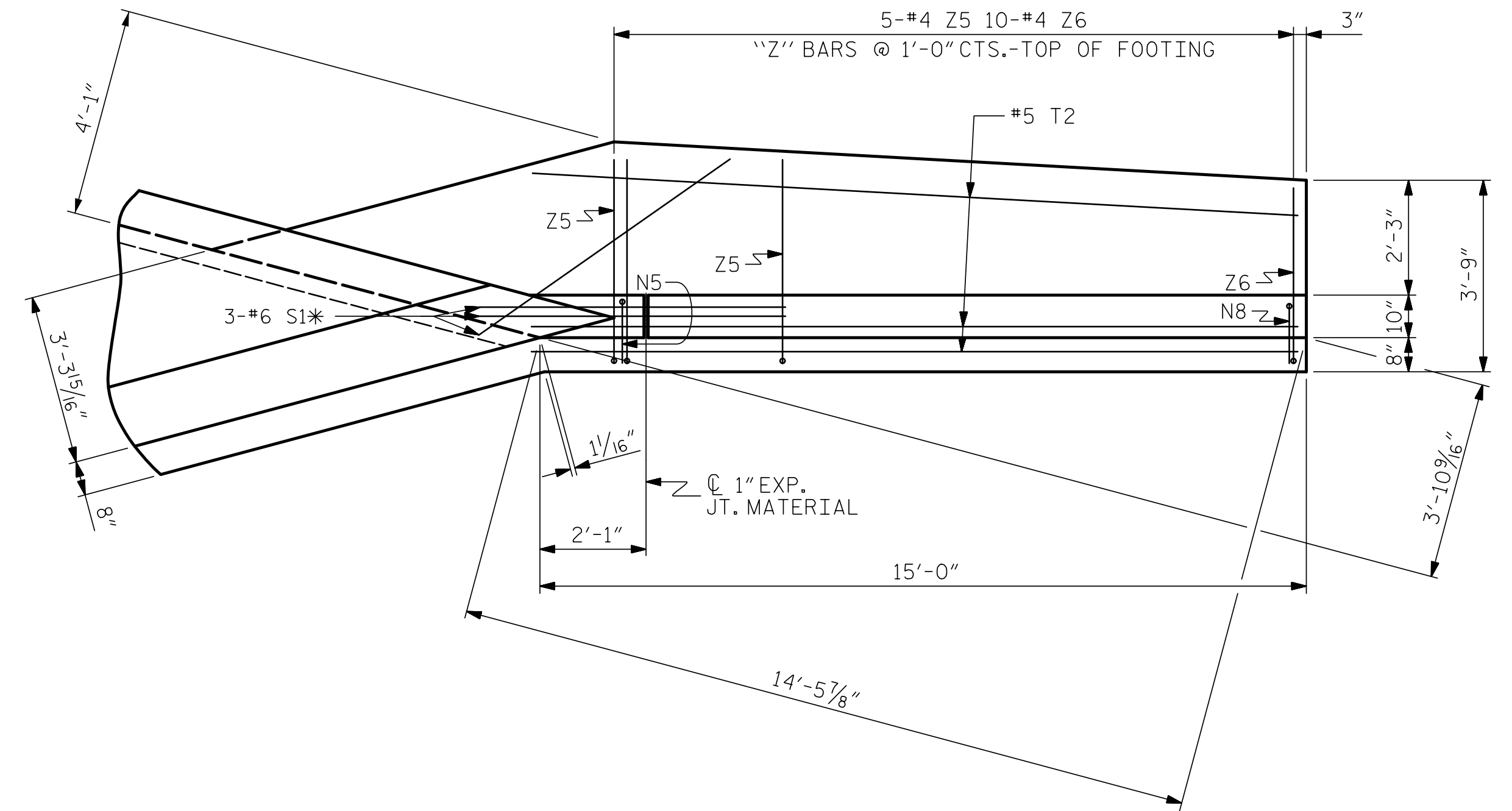
SHEET NO. C-6
 TOTAL SHEETS 10

DRAWN BY : ZCS DATE : 11/21
 CHECKED BY : MGC DATE : 2/22

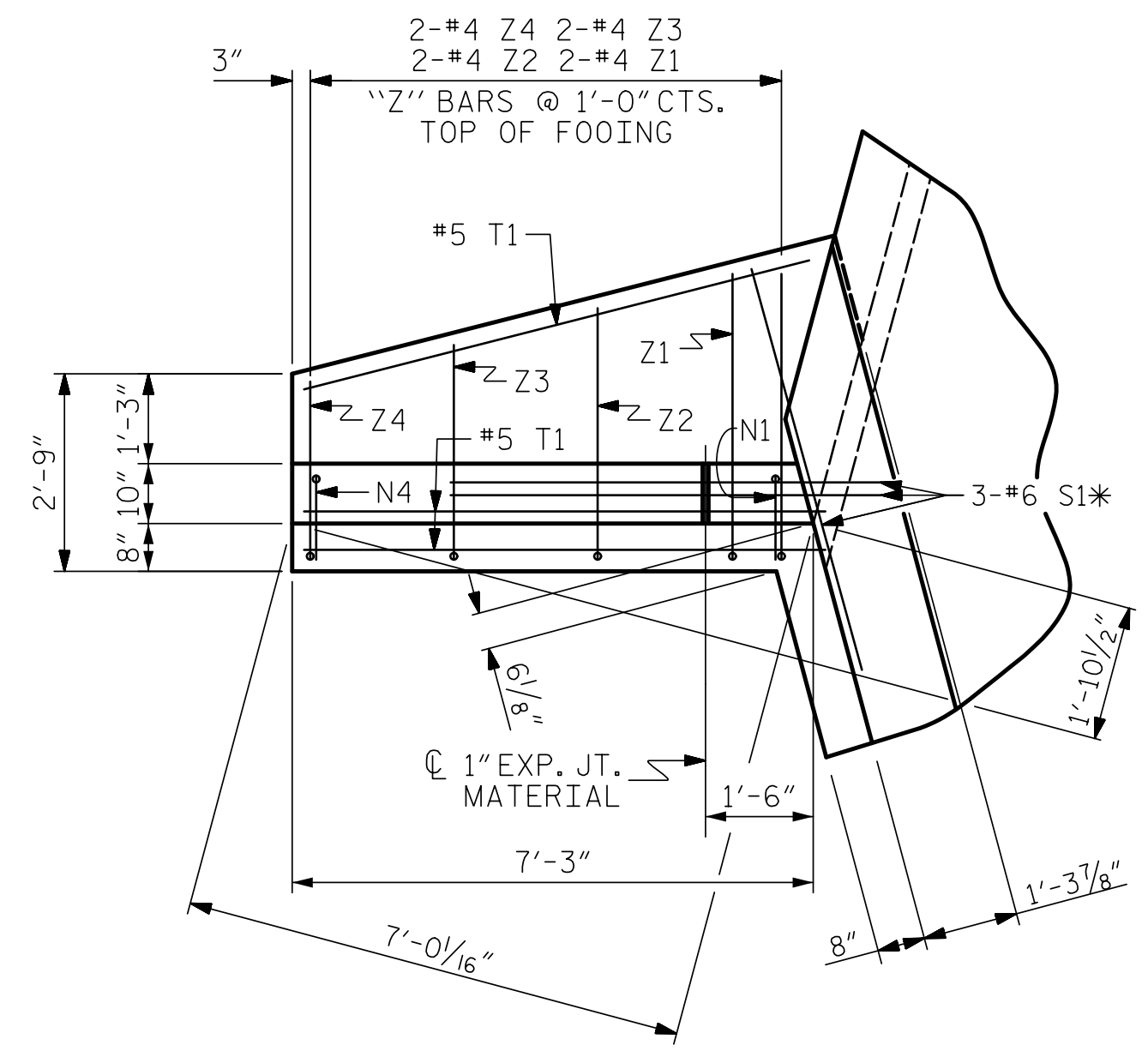
PLAN OF FLOOR SILL LAYOUT



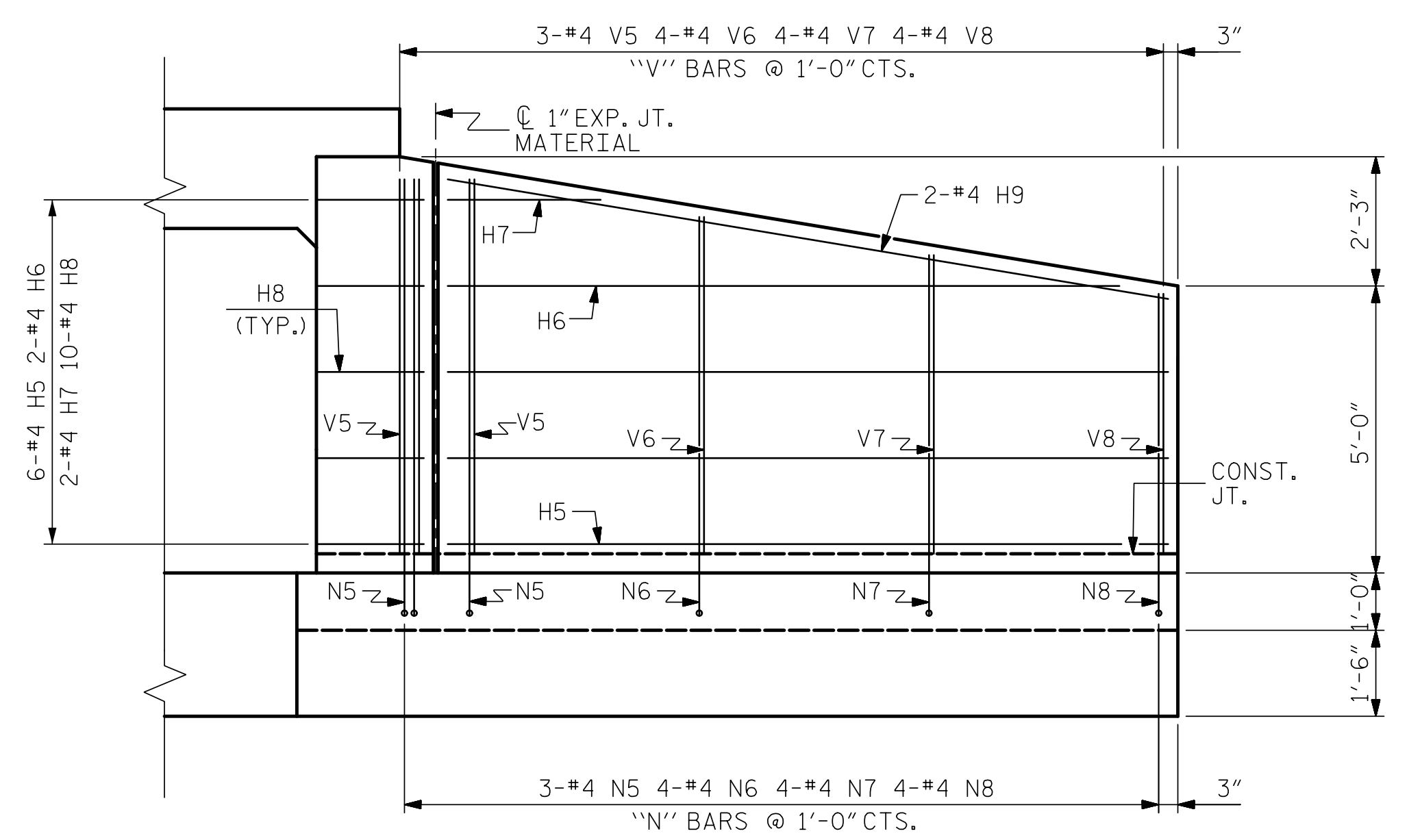
* S1 BARS @ BOTTOM OF FLOOR SLAB & FOOTING



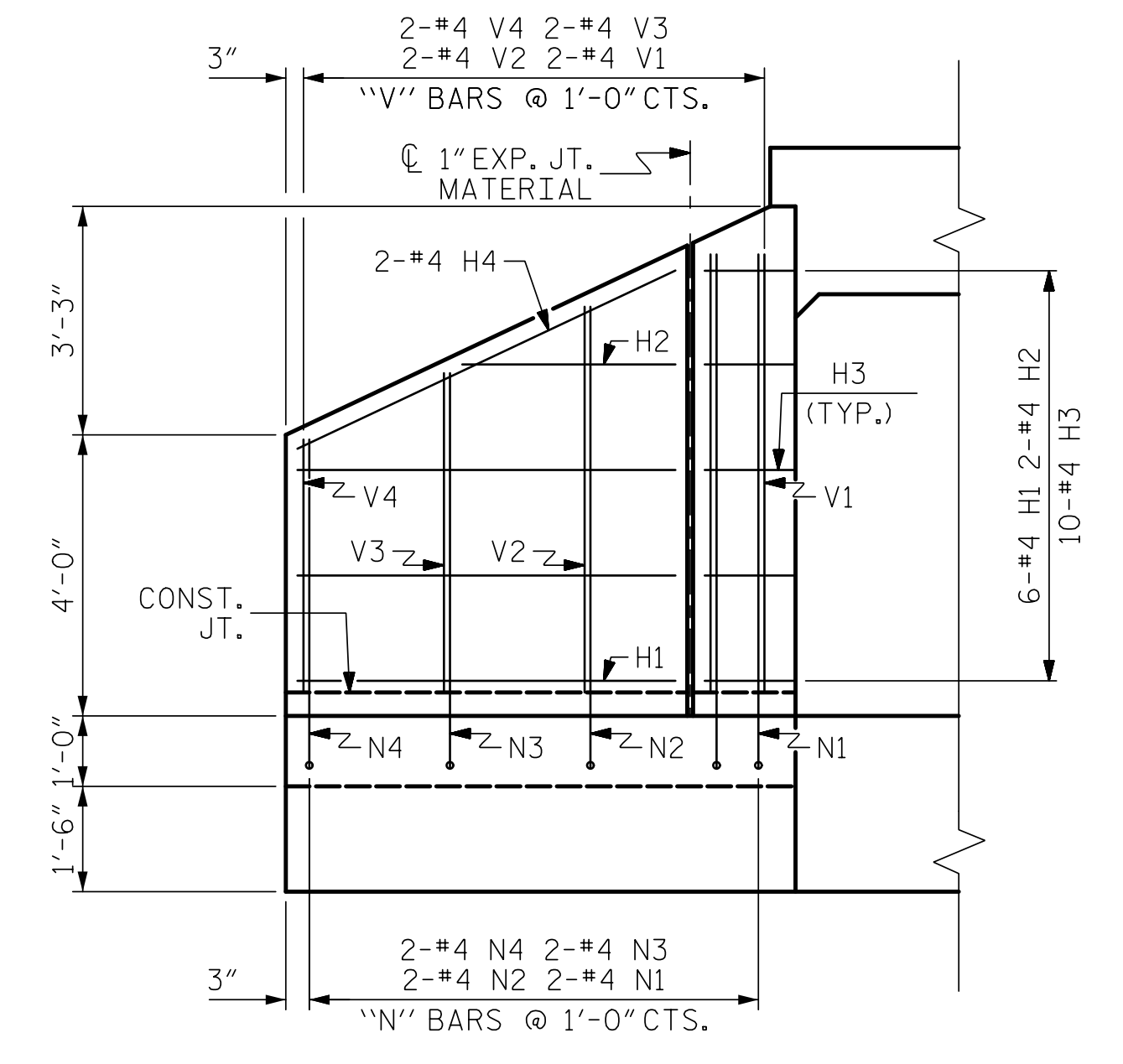
PLAN W1



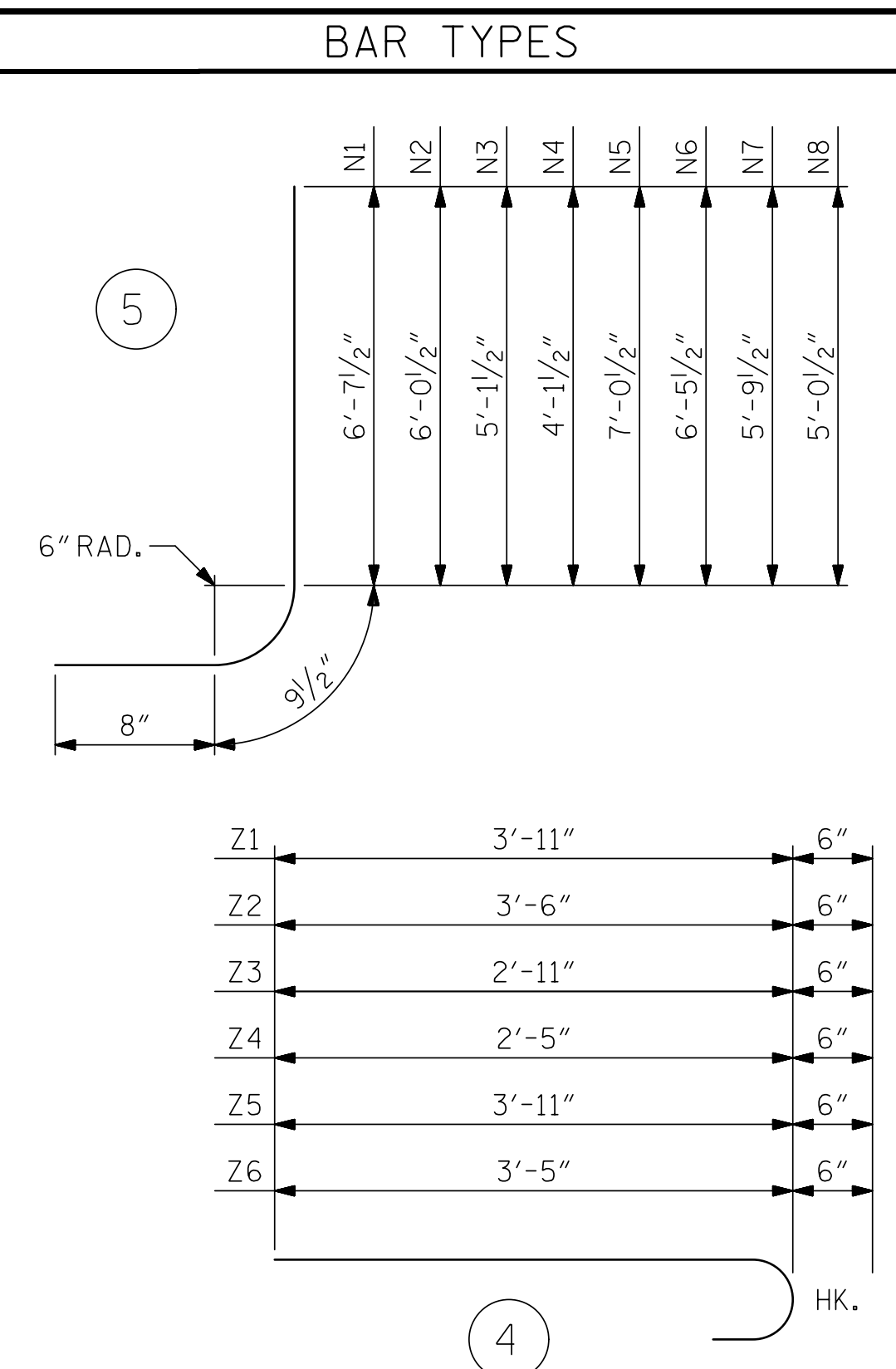
PLAN W2



ELEVATION W1



ELEVATION W2



BILL OF MATERIAL WINGS 1 & 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	6	#4	STR	5'-4"	21
H2	2	#4	STR	3'-0"	4
H3	10	#4	2	3'-3"	22
H4	2	#4	STR	5'-10"	8
H5	6	#4	STR	12'-6"	50
H6	2	#4	STR	11'-8"	16
H7	2	#4	STR	2'-8"	4
H8	10	#4	1	3'-3"	22
H9	2	#4	STR	12'-8"	17
N1	2	#4	5	8'-1"	11
N2	2	#4	5	7'-6"	10
N3	2	#4	5	6'-7"	9
N4	2	#4	5	5'-7"	7
N5	3	#4	5	8'-6"	17
N6	4	#4	5	7'-11"	21
N7	4	#4	5	7'-3"	19
N8	4	#4	5	6'-6"	17
T1	3	#5	STR	7'-3"	23
T2	3	#5	STR	15'-0"	47
V1	2	#4	STR	6'-2"	8
V2	2	#4	STR	5'-5"	7
V3	2	#4	STR	4'-6"	6
V4	2	#4	STR	3'-7"	5
V5	3	#4	STR	6'-3"	13
V6	4	#4	STR	5'-8"	15
V7	4	#4	STR	5'-0"	13
V8	4	#4	STR	4'-6"	12
Z1	2	#4	4	4'-5"	6
Z2	2	#4	4	4'-0"	5
Z3	2	#4	4	3'-5"	5
Z4	2	#4	4	2'-11"	4
Z5	5	#4	4	4'-5"	15
Z6	10	#4	4	3'-11"	26
S1	6	#6	STR	6'-0"	54

REINFORCING STEEL FOR 2 WINGS		539 LBS
CLASS A CONCRETE		
2 WINGS	8.8 CY	
1 HEADWALL	2.1 CY	
1 END CURTAIN WALL	2.7 CY	
TOTAL	13.6 CY	

NOTES:
 A THREE FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.
 G1 BARS IN HEADWALL ARE INCLUDED WITH THE BARREL REINFORCING STEEL.
 FOR TYPICAL WING SECTION, SEE SHEET 8 OF 10.

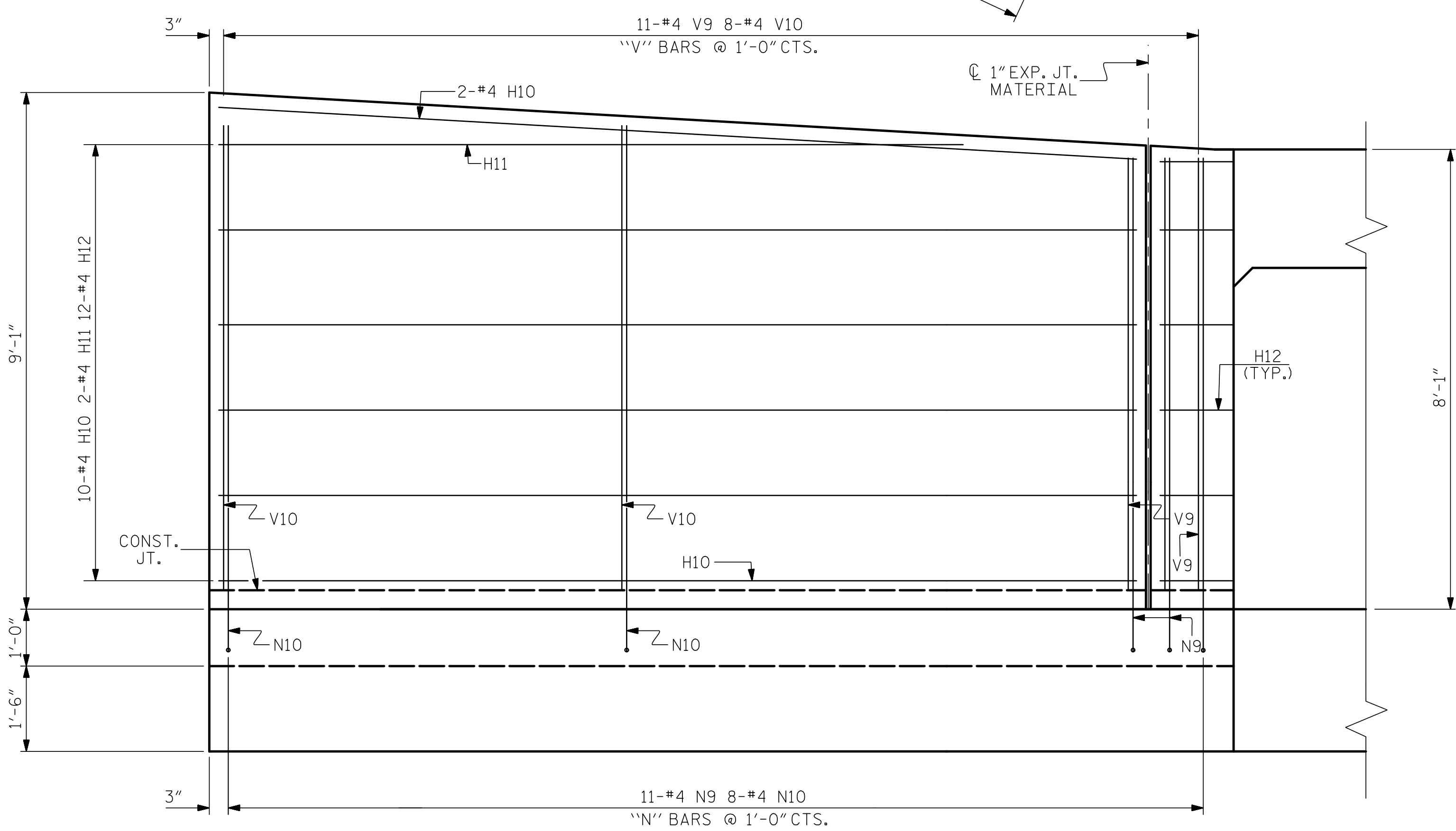
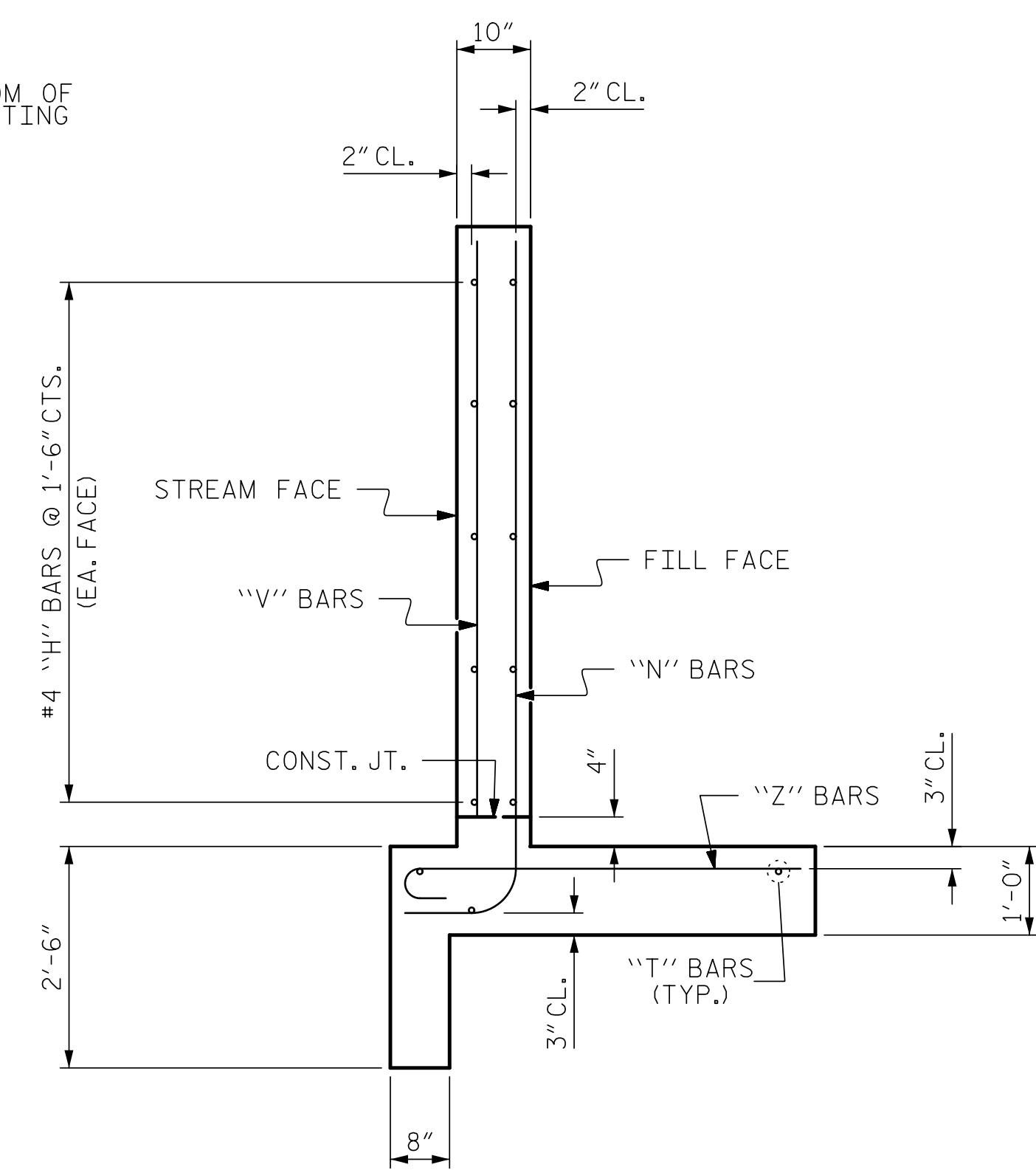
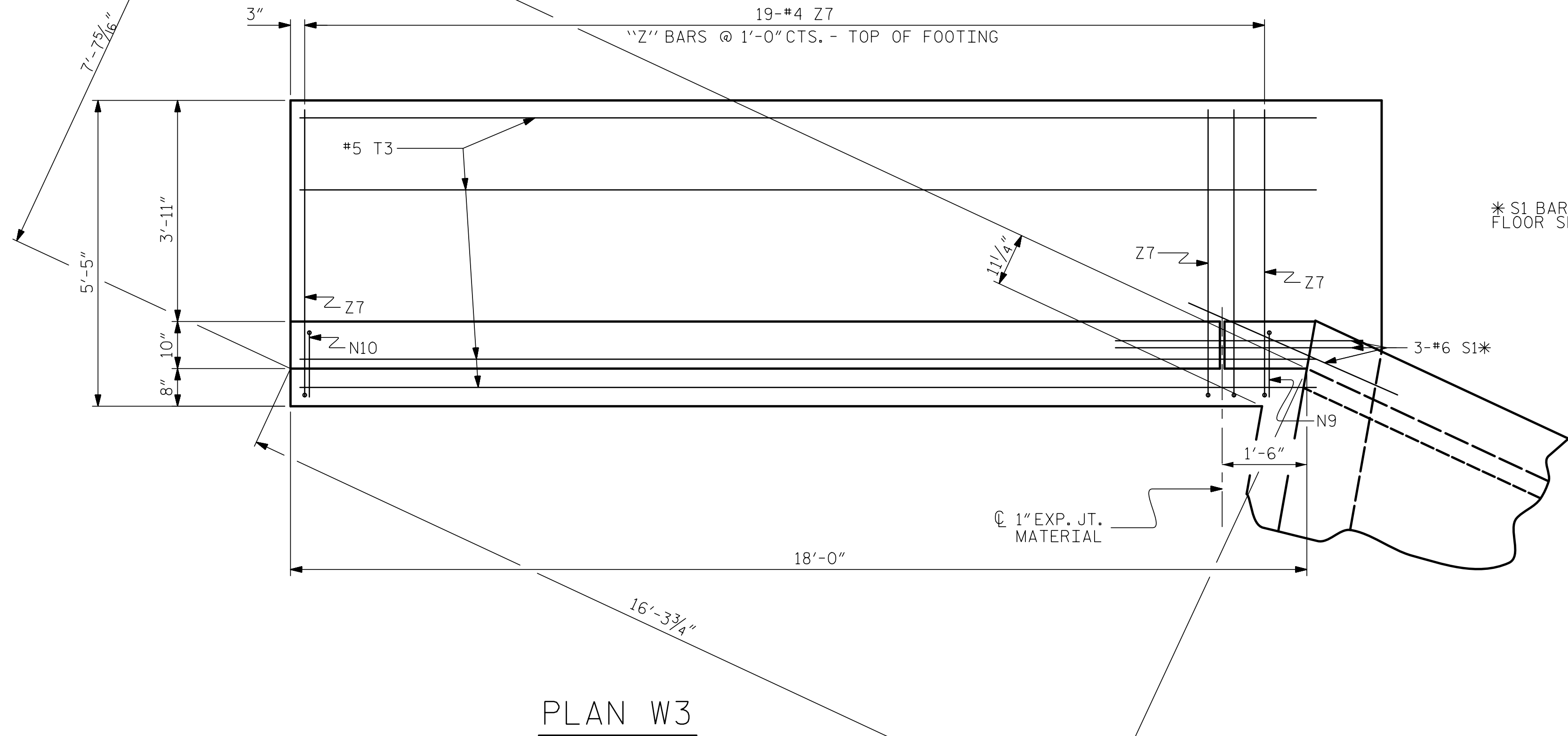
PROJECT NO. BP11.R002
WATAUGA COUNTY
 STATION: 15+32.00 -L-

SHEET 7 OF 10

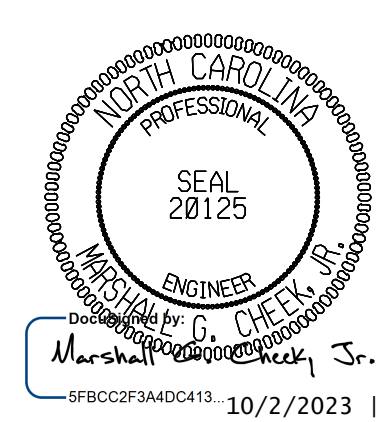
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
OUTLET WINGS FOR DOUBLE 10 FT. X 6 FT. CONCRETE BOX CULVERT 34° SKEW					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO.	
C-7	TOTAL SHEETS 10

ASSEMBLED BY : ZCS DATE : 2/22
 CHECKED BY : MGC DATE : 2/22



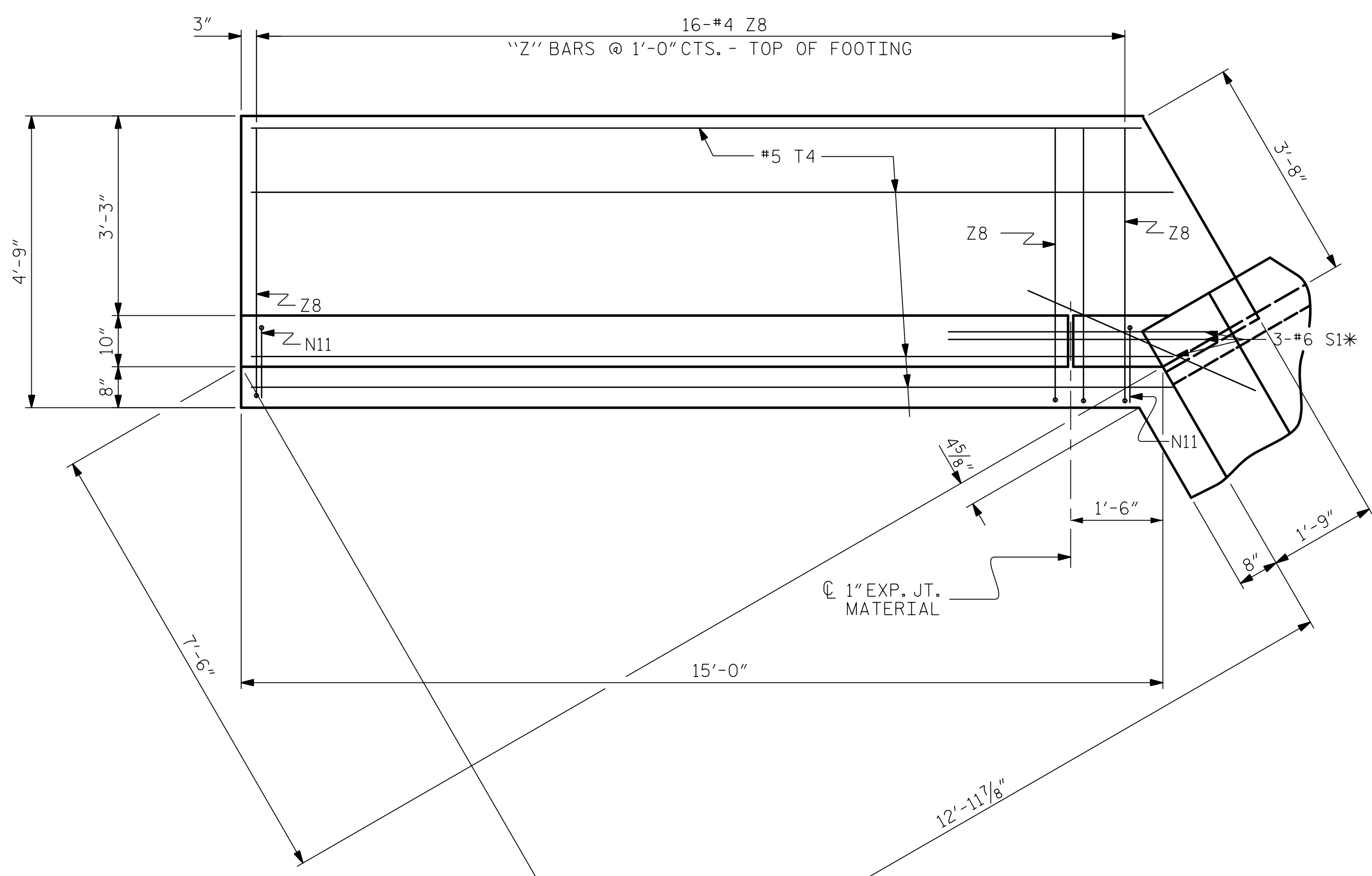
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WATAUGA COUNTY
 STATION: 15+32.00 -L-
 SHEET 8 OF 10



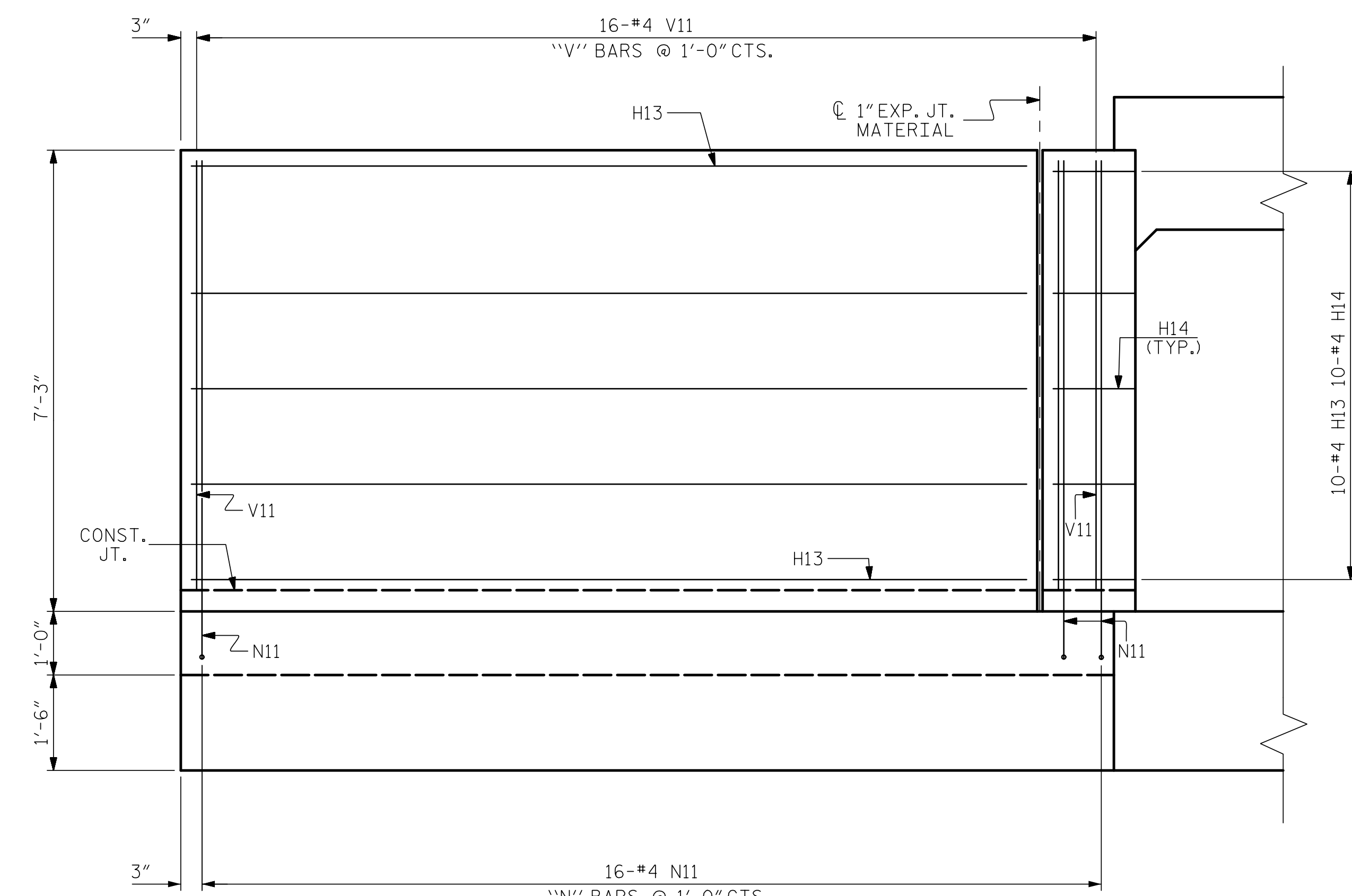
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**WING 3
 FOR
 DOUBLE 10 FT. X 6 FT.
 CONCRETE BOX CULVERT**

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED						REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	C-8							
1			3			TOTAL SHEETS							
2			4			10							

ASSEMBLED BY : ZCS DATE : 2/22
 CHECKED BY : MGC DATE : 2/22



PLAN W4



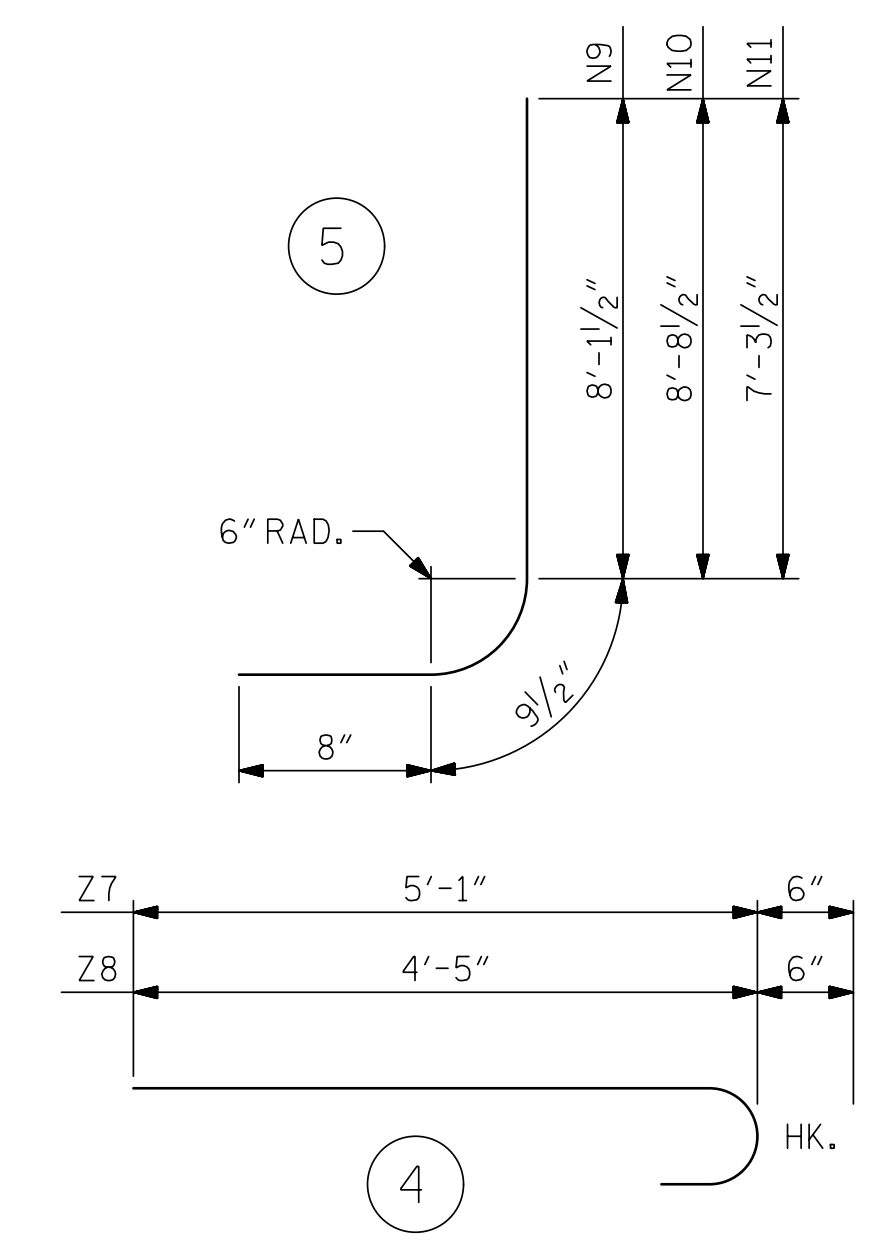
ELEVATION W4

ASSEMBLED BY : ZCS DATE : 2/22
 CHECKED BY : MGC DATE : 2/22

10/3/2022
 X:\NCDOT\Div 11 Watauga 87\Structures\Final Plans\DCNs\411.017.BP11.R002.SMJ.CU09.940087.dgn
 User:zsmith

* S1 BARS @ BOTTOM OF FLOOR SLAB & FOOTING

BAR TYPES



BILL OF MATERIAL WINGS 3 & 4

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H10	12	#4	STR	16'-1"	129
H11	2	#4	STR	13'-1"	17
H12	12	#4	3	3'-3"	26
H13	10	#4	STR	13'-1"	87
H14	10	#4	4	3'-3"	22
N9	11	#4	5	9'-7"	70
N10	8	#4	5	10'-2"	54
N11	16	#4	5	8'-9"	94
T3	4	#5	STR	18'-0"	75
T4	4	#5	STR	15'-0"	63
V9	11	#4	STR	7'-7"	56
V10	8	#4	STR	8'-2"	44
V11	16	#4	STR	6'-9"	72
Z7	19	#4	4	5'-7"	71
Z8	16	#4	4	4'-11"	53
S1	6	#6	STR	6'-0"	54

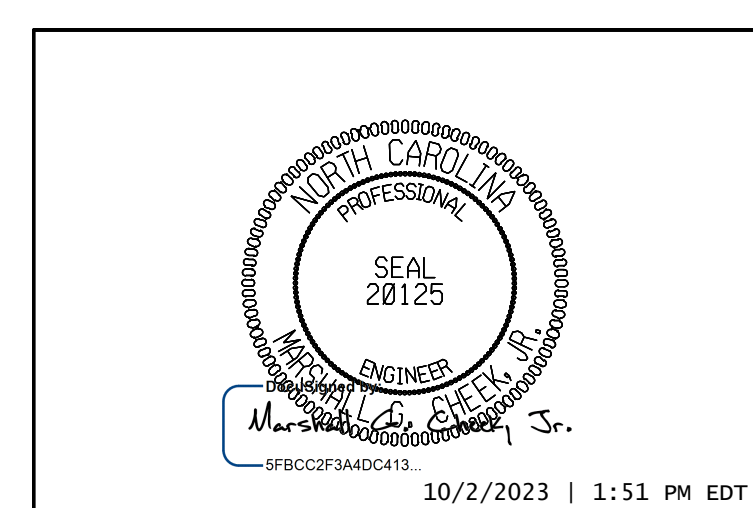
REINFORCING STEEL FOR 2 WINGS 987 LBS

CLASS A CONCRETE
 2 WINGS 15.9 CY
 1 HEADWALL 1.1 CY
 1 END CURTAIN WALL 1.3 CY
 TOTAL 18.3 CY

NOTES:
 A THREE FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.
 G2 BARS IN HEADWALL ARE INCLUDED WITH THE BARREL REINFORCING STEEL.
 FOR TYPICAL WING SECTION, SEE SHEET 8 OF 10.

PROJECT NO. BP11.R002
WATAUGA COUNTY
 STATION: 15+32.00 -L-

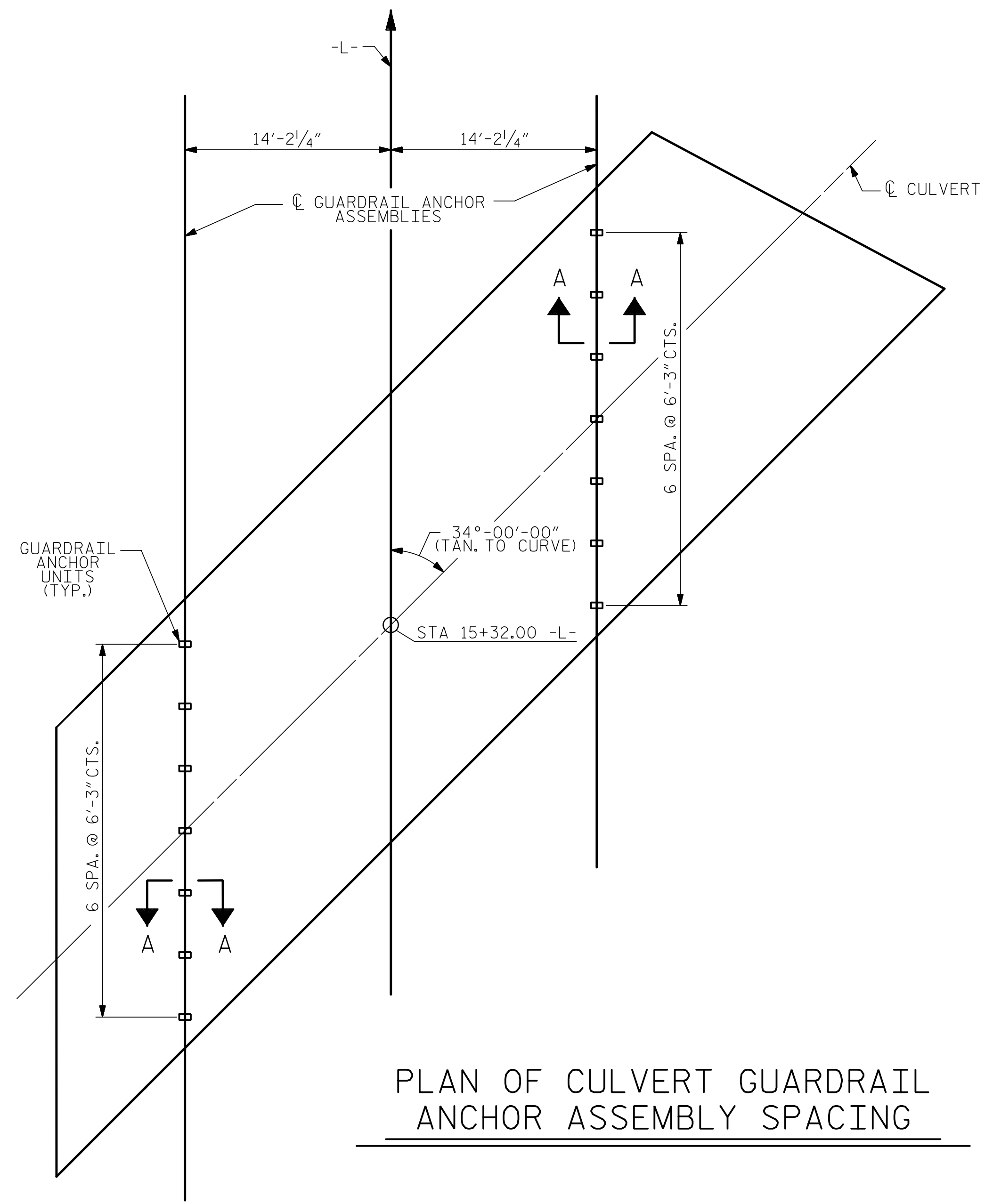
SHEET 9 OF 10



10/2/2023 | 1:51 PM EDT
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 TGS ENGINEERS
 804-C N. LAFAYETTE ST
 SHELBY, NC 28150
 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 WING 4 AND
 BILL OF MATERIAL
 FOR INLET WINGS OF
 CONCRETE BOX CULVERT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-9
1			3			TOTAL SHEETS
2			4			10



PLAN OF CULVERT GUARDRAIL ANCHOR ASSEMBLY SPACING

- THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS SHALL CONSIST OF THE FOLLOWING COMPONENTS :
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2 1/2".
 - B. 4 - 1" Ø X 2 1/4" BOLTS WITH WASHERS, BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 1" Ø X 2 1/4" GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)
 - C. WIRE STRUTS SHOWN IN THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS DETAIL ARE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 P.S.I. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.
- GUARDRAIL ANCHOR ASSEMBLY WITH BOLTS SHALL BE ASSEMBLED IN THE SHOP. BOLT THREADS MAY BE RECUT AS NECESSARY TO INSURE FIT.

NOTES

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CLASS "A" CONCRETE.

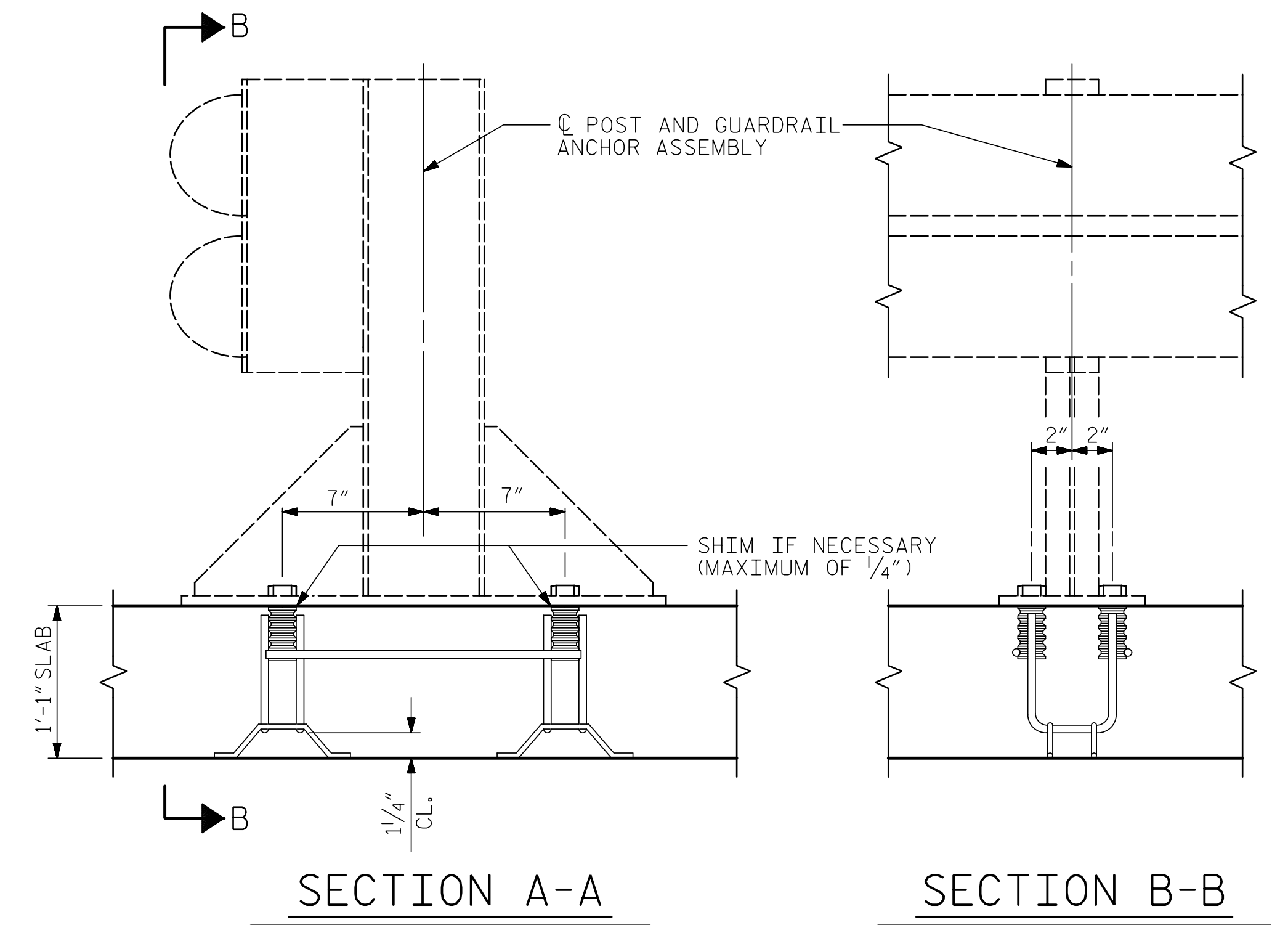
FERRULES TO BE PLUGGED DURING POURING OF SLAB AS RECOMMENDED BY THE MANUFACTURER.

AT THE CONTRACTOR'S OPTION, FERRULES WITH OPEN OR CLOSED ENDS MAY BE USED.

PAYMENT FOR GUARDRAIL, POSTS, AND POST BASE PLATES IS INCLUDED IN ROADWAY PAY ITEMS.

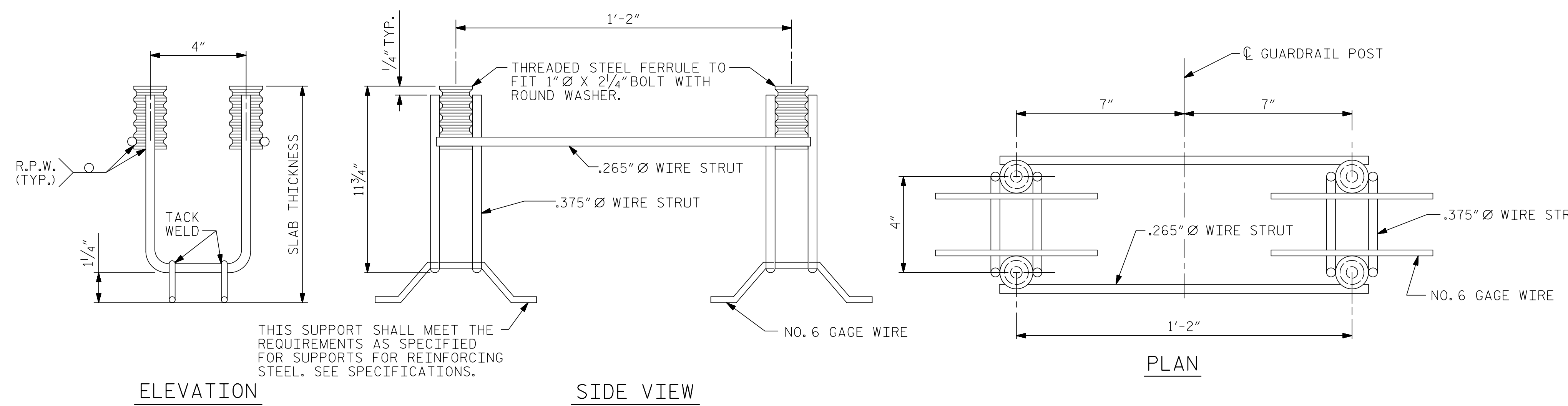
SLAB REINFORCING STEEL MAY BE SHIFTED AS NECESSARY TO CLEAR GUARDRAIL ANCHOR ASSEMBLY. CARE SHOULD BE TAKEN TO KEEP THE SHIFTING OF REINFORCING STEEL TO A MINIMUM.

THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF GUARDRAIL ANCHOR ASSEMBLY. LEVEL TWO FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 1" Ø BOLT IS 21.8 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS.



SECTION A-A

SECTION B-B



ELEVATION

SIDE VIEW

PLAN

THIS SUPPORT SHALL MEET THE REQUIREMENTS AS SPECIFIED FOR SUPPORTS FOR REINFORCING STEEL. SEE SPECIFICATIONS.

PROJECT NO. BP11.R002
WATAUGA COUNTY
 STATION: 15+32.00 -L-
 SHEET 10 OF 10

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 ANCHORAGE DETAILS FOR
 GUARDRAIL ANCHOR ASSEMBLY
 FOR CULVERTS

10/2/2023 | 1:51 PM EDT

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TGS ENGINEERS
 804-C N. LAFAYETTE ST
 SHELBY, NC 28150
 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-10
1			3			TOTAL SHEETS
2			4			10

ASSEMBLED BY :	ZCS	DATE :	9/22
CHECKED BY :	MGC	DATE :	10/22
DRAWN BY :	FCJ	REV. 10/1/11	MAA/GM
CHECKED BY :	ARB	REV. 12/17	MAA/THC
		REV. 6/19	MAA/THC

GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS

STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	-----	A.A.S.H.T.O. (CURRENT)
LIVE LOAD	-----	SEE PLANS
IMPACT ALLOWANCE	-----	SEE A.A.S.H.T.O.
STRESS IN EXTREME FIBER OF STRUCTURAL STEEL - AASHTO M270 GRADE 36	- -	20,000 LBS. PER SQ. IN.
	- -	AASHTO M270 GRADE 50W
	- -	27,000 LBS. PER SQ. IN.
	- -	AASHTO M270 GRADE 50
	- -	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION - GRADE 60	- - -	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION	-----	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR	-----	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR UNTREATED EXTREME FIBER STRESS	- - -	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER	- - - -	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH	- - - -	30 LBS. PER CU. FT. (MINIMUM)

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2018 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N.C. DEPARTMENT OF TRANSPORTATION.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; AND CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP.

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 1/4" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A 1/4" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 12" INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT, ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.

ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 3/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16" INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.



ENGLISH

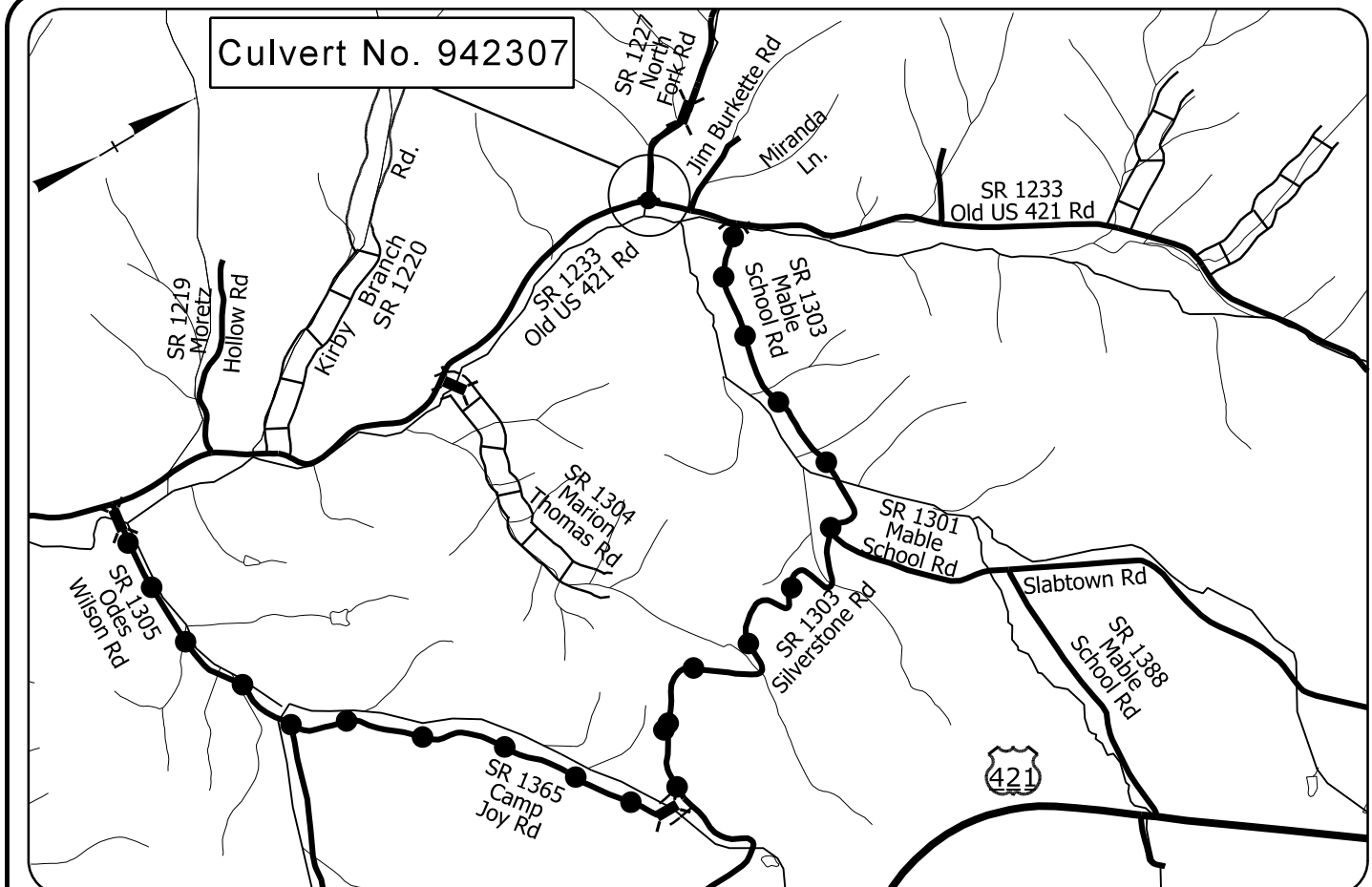
JANUARY, 1990

STD. NO. SN

05/08/2023

PROJECT: 17BP.11.C.2

CONTRACT: DK00345



VICINITY MAP
● OFFSITE DETOUR

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

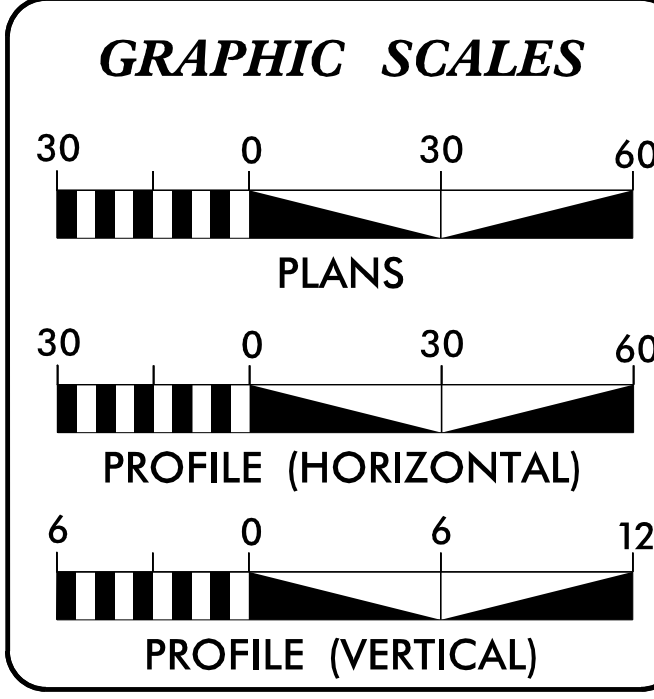
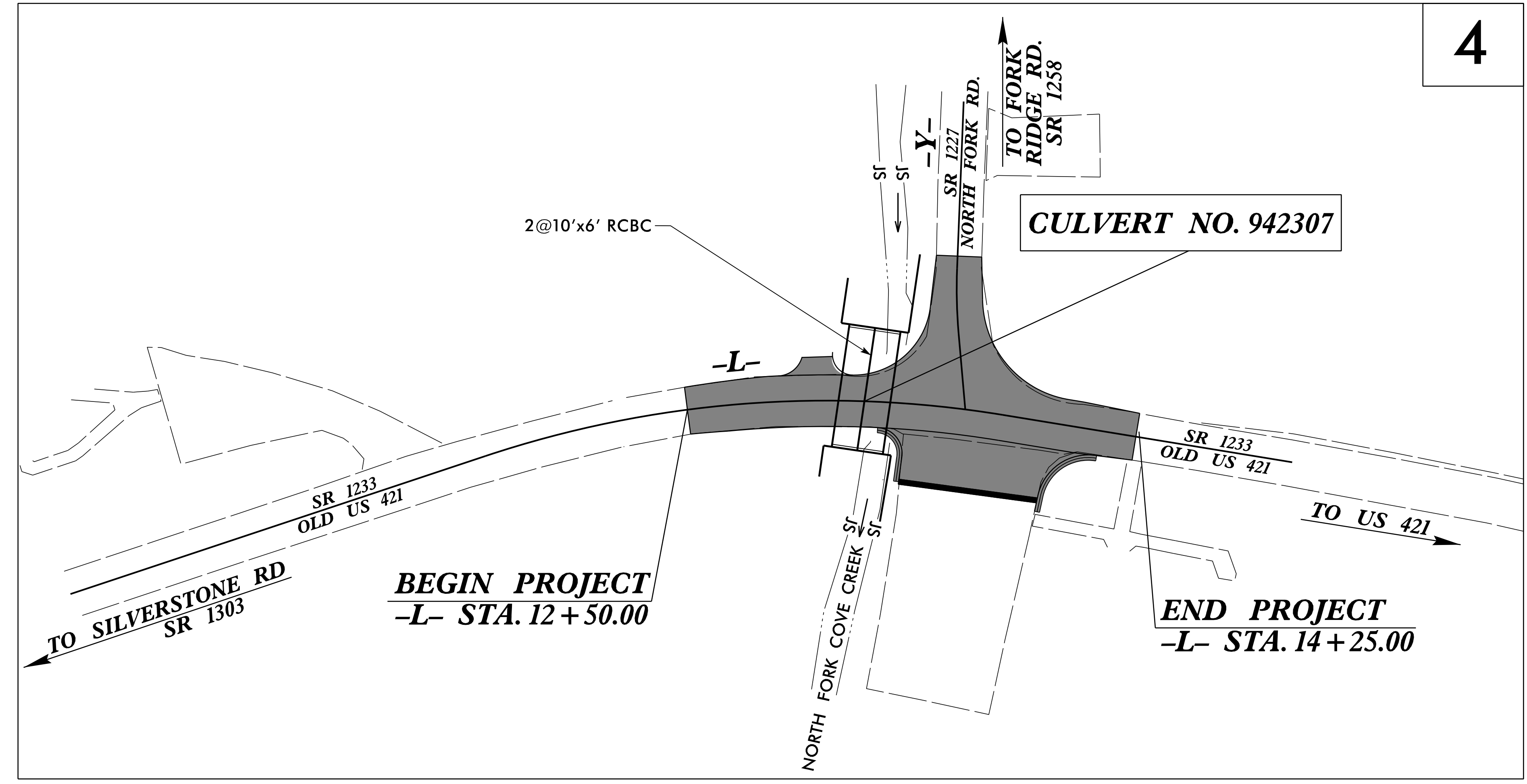
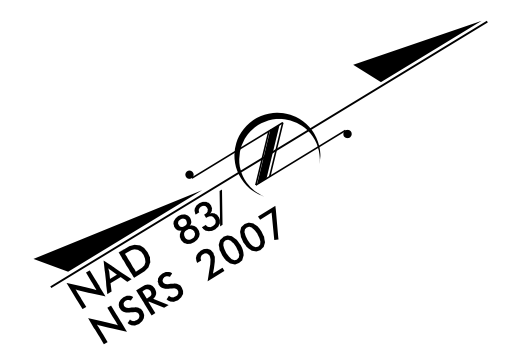
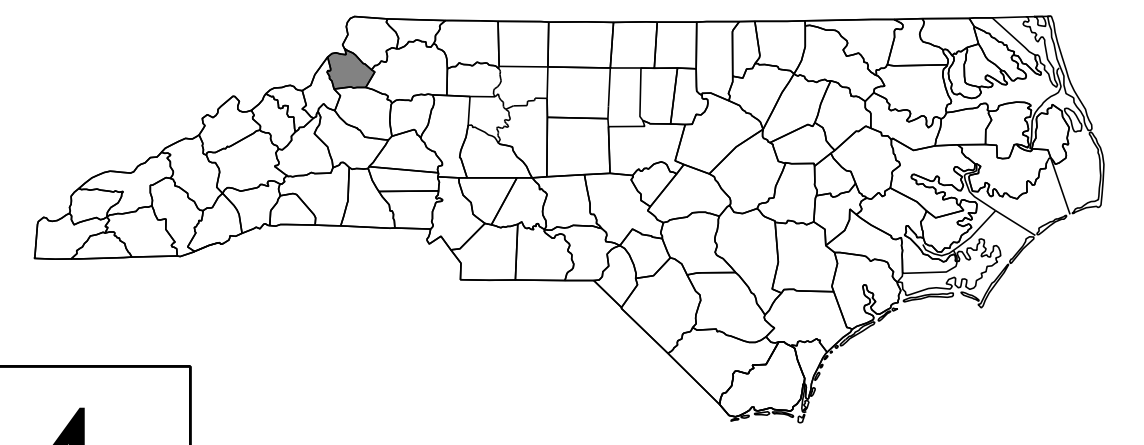
WATAUGA COUNTY

**LOCATION: REPLACEMENT OF CULVERT NO. 942307 ON OLD US 421
OVER NORTH FORK COVE CREEK**

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.11.C.2	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
17BP.11.C.2		PE, ROW, UTIL. & CONST.	

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DESIGN DATA

ADT 2023 =	325
ADT 2043 =	490
DHV =	NA
D =	50%
T =	6%
V =	40 MPH
FUNC CLASS =	LOCAL
SUB REGIONAL TIER	

PROJECT LENGTH

LENGTH ROADWAY PROJECT 17BP.11.C.2 =	0.033 MILES
TOTAL LENGTH PROJECT 17BP.11.C.2 =	0.033 MILES

RK&K
RUMMEL, KLEPPER & KAHL, LLP
8601 Six Forks Road, Forum 1, Suite 700
RALEIGH, NORTH CAROLINA 27615-3960
NC LICENSE NO. E-0112
919-878-9560

DIVISION OF HIGHWAYS

2018 STANDARD SPECIFICATIONS

Brandon McInnis, P.E.
PROJECT ENGINEER

Mary Mays Yahl, P.E.
PROJECT ENGINEER

RIGHT OF WAY DATE:
OCTOBER 31, 2022

LETTING DATE:
NOVEMBER 16, 2023

HYDRAULICS ENGINEER

DocuSigned by:
Douglas M. Keller
0C02EAEAD1B848B

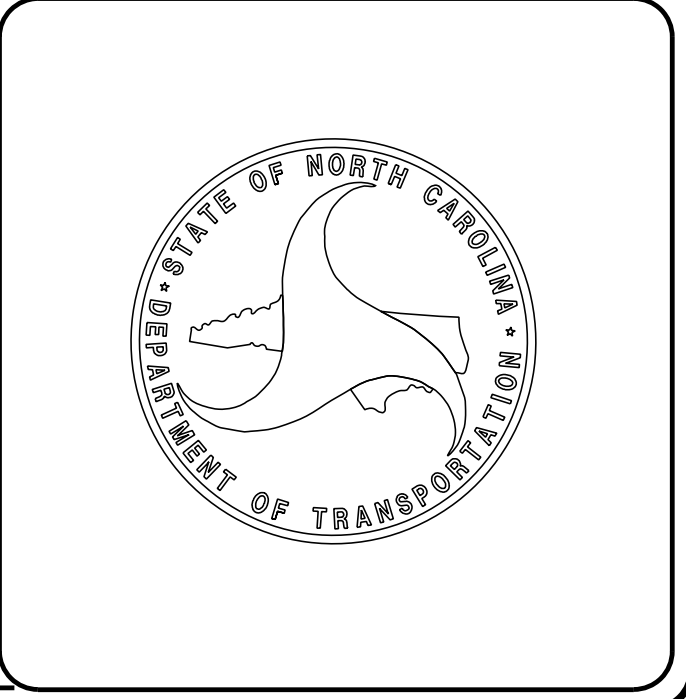
SIGNATURE:

ROADWAY DESIGN ENGINEER

DocuSigned by:
Mary Mays Yahl
779C2B0928740E

SIGNATURE:

Professional Engineer Seals:
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038644
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040878



9/27/2023
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deFault

PROJECT REFERENCE NO. 17BP.II.C.2	SHEET NO. 1-A
ROADWAY DESIGN ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

SHEET NUMBER	INDEX OF SHEETS SHEET
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
1C-1	SURVEY CONTROL SHEETS
2A-1	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2D-1	DRAINAGE DETAILS
2G-1	GEOTECHNICAL DETAILS
3B-1	ROADWAY SUMMARIES
3D-1	DRAINAGE SUMMARIES
4	PLAN AND PROFILE SHEET
TMP-1 THRU TMP-5	TRAFFIC MANAGEMENT PLANS
PMP-1 THRU PMP-2	PAVEMENT MARKING PLANS
EC-1 THRU EC-5	EROSION CONTROL PLANS
UD-1 THRU UD-2A	UTILITIES BY OTHERS PLANS
X-1 THRU X-4	CROSS-SECTIONS
S-1 THRU S-4	STRUCTURE PLANS

EFF. 01-16-2018
REV.

2018 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January, 2018 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
225.06	Method of Grading Sight Distance at Intersections
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
840.00	Concrete Base Pad for Drainage Structures
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.19	Concrete Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.24	Frames and Narrow Slot Sag Grates
840.30	Driveway Drop Inlet
840.45	Precast Drainage Structure
846.01	Concrete Curb, Gutter and Curb & Gutter
848.02	Driveway Turnout - Radius Type
876.01	Rip Rap in Channels

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

GRADING AND SURFACING OR RESURFACING AND WIDENING:
THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

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

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

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

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

DRIVEWAYS:
DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.02 USING 3 FOOT RADIUS OR RADIUS AS SHOWN ON THE PLANS. LOCATIONS OF DRIVES WILL BE AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

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

UTILITIES:
UTILITY OWNERS ON THIS PROJECT ARE Blue Ridge EMC - Power (Dist)
Skyline Telecommunications - Telephone, F/D
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 OTHERS.

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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	②3
Existing Fence Line	-x-x-x-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	□
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	---WLB---
Proposed Wetland Boundary	---WLB---
Existing Endangered Animal Boundary	---EAB---
Existing Endangered Plant Boundary	---EPB---
Existing Historic Property Boundary	---HPB---
Known Contamination Area: Soil	---S---
Potential Contamination Area: Soil	---S---
Known Contamination Area: Water	---W---
Potential Contamination Area: Water	---W---
Contaminated Site: Known or Potential	☠ ?

BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	○
Sign	⊙
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	-----
Proposed Temporary Drainage Easement	-----
Proposed Permanent Drainage Easement	-----
Proposed Permanent Drainage/Utility Easement	-----
Proposed Permanent Utility Easement	-----
Proposed Temporary Utility Easement	-----
Proposed Aerial Utility Easement	-----

ROADS AND RELATED FEATURES:

Existing Edge of Pavement	-----
Existing Curb	-----
Proposed Slope Stakes Cut	-----
Proposed Slope Stakes Fill	-----
Proposed Curb Ramp	-----
Existing Metal Guardrail	-----
Proposed Guardrail	-----
Existing Cable Guiderail	-----
Proposed Cable Guiderail	-----
Equality Symbol	⊙
Pavement Removal	⊠
Single Tree	⊙
Single Shrub	⊙
Hedge	-----

VEGETATION:

Woods Line	-----
Orchard	⊙
Vineyard	⊠

EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	-----
Bridge Wing Wall, Head Wall and End Wall	-----
MINOR:	
Head and End Wall	-----
Pipe Culvert	-----
Footbridge	-----
Drainage Box: Catch Basin, DI or JB	-----
Paved Ditch Gutter	-----
Storm Sewer Manhole	⊙
Storm Sewer	-----

UTILITIES:

** 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	⊙
H-Frame Pole	⊙
U/G Power Line Test Hole (SUE - LOS A)*	⊙
U/G Power Line (SUE - LOS B)*	-----
U/G Power Line (SUE - LOS C)*	-----
U/G Power Line (SUE - LOS D)*	-----
TELEPHONE:	
Existing Telephone Pole	⊙
Proposed Telephone Pole	⊙
Telephone Manhole	⊙
Telephone Pedestal	⊙
Telephone Cell Tower	⊙
U/G Telephone Cable Hand Hole	⊙
U/G Telephone Test Hole (SUE - LOS A)*	⊙
U/G Telephone Cable (SUE - LOS B)*	-----
U/G Telephone Cable (SUE - LOS C)*	-----
U/G Telephone Cable (SUE - LOS D)*	-----
U/G Telephone Conduit (SUE - LOS B)*	-----
U/G Telephone Conduit (SUE - LOS C)*	-----
U/G Telephone Conduit (SUE - LOS D)*	-----
U/G Fiber Optics Cable (SUE - LOS B)*	-----
U/G Fiber Optics Cable (SUE - LOS C)*	-----
U/G Fiber Optics Cable (SUE - LOS D)*	-----

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)*	-----
U/G Water Line (SUE - LOS C)*	-----
U/G Water Line (SUE - LOS D)*	-----
Above Ground Water Line	-----

TV:

TV Pedestal	⊙
TV Tower	⊙
U/G TV Cable Hand Hole	⊙
U/G TV Test Hole (SUE - LOS A)*	⊙
U/G TV Cable (SUE - LOS B)*	-----
U/G TV Cable (SUE - LOS C)*	-----
U/G TV Cable (SUE - LOS D)*	-----
U/G Fiber Optic Cable (SUE - LOS B)*	-----
U/G Fiber Optic Cable (SUE - LOS C)*	-----
U/G Fiber Optic Cable (SUE - LOS D)*	-----

GAS:

Gas Valve	⊙
Gas Meter	⊙
U/G Gas Line Test Hole (SUE - LOS A)*	⊙
U/G Gas Line (SUE - LOS B)*	-----
U/G Gas Line (SUE - LOS C)*	-----
U/G Gas Line (SUE - LOS D)*	-----
Above Ground Gas Line	-----

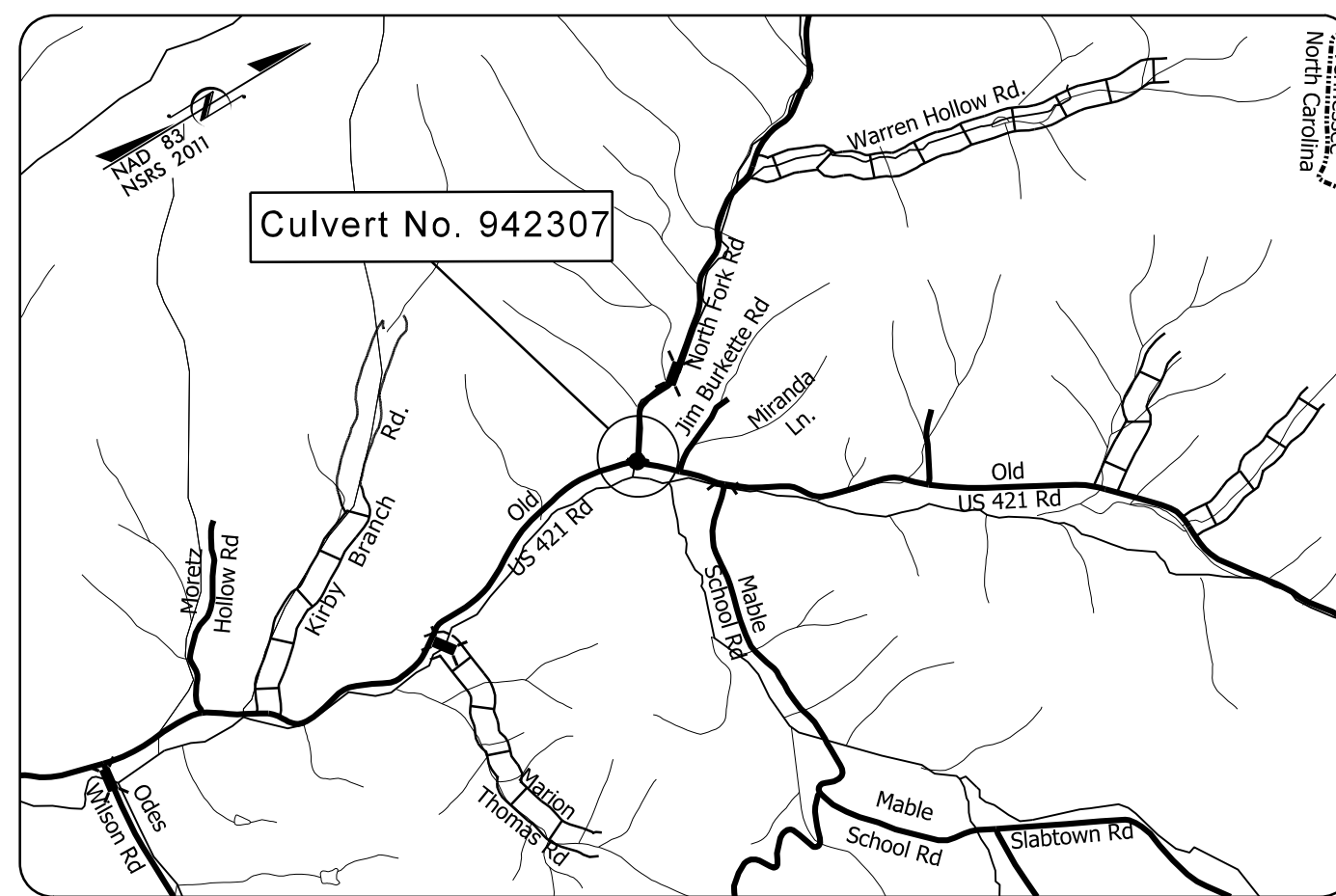
SANITARY SEWER:

Sanitary Sewer Manhole	⊙
Sanitary Sewer Cleanout	⊙
U/G Sanitary Sewer Line	-----
Above Ground Sanitary Sewer	-----
SS Force Main Line Test Hole (SUE - LOS A)*	⊙
SS Force Main Line (SUE - LOS B)*	-----
SS Force Main Line (SUE - LOS C)*	-----
SS Force Main Line (SUE - LOS D)*	-----

MISCELLANEOUS:

Utility Pole	⊙
Utility Pole with Base	⊙
Utility Located Object	⊙
Utility Traffic Signal Box	⊙
Utility Unknown U/G Line (SUE - LOS B)*	-----
U/G Tank; Water, Gas, Oil	⊙
Underground Storage Tank, Approx. Loc.	⊙
A/G Tank; Water, Gas, Oil	⊙
Geoenvironmental Boring	⊙
Abandoned According to Utility Records	⊙
End of Information	⊙

SURVEY CONTROL SHEET 942307



VICINITY MAP

BL POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
BL1		945543.8330	1184408.4720	2923.53	10+14.97	13.62 LT
SR12331		945650.8000	1184461.2900	2924.09	11+30.94	14.35 RT
BL2		945804.9910	1184515.6670	2927.09	12+99.70	14.13 RT
SR12332		945933.2950	1184576.2077	2928.91	14+39.44	16.85 LT
BL3		946086.5300	1184715.1590	2929.90	OUTSIDE PROJECT LIMITS	

 BM1 ELEVATION = 2924.08
 N 945805 E 1184631
 L STATION 13+77.00 108 RIGHT
 NAIL SET IN ASPHALT

 BM2 ELEVATION = 2927.48
 N 945927 E 1184758
 OUTSIDE PROJECT LIMITS
 NAIL SET IN POLE

BEGIN PROJECT
-L- STA. 12+50.00
N = 945767.9327
E = 1184480.8803

BL- 1
 LOCALIZED PROJECT COORDINATES
 N = 945543.8330
 E = 1184408.4720
 ELEVATION = 2923.53'

NC DOT GPS STATION SRI233-1
 LOCALIZED PROJECT COORDINATES:
 N = 945650.8000
 E = 1184461.2900
 ELEVATION = 2924.09'

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "SR1233-2"
 WITH NAD 83/NSRS 2011 STATE PLANE GRID COORDINATES OF NORTHING: 945933.2950 (ft) EASTING: 1184576.2077 (ft) ELEVATION: 2928.91 (ft)
 THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9999107233
 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "SR1233-2" TO -L- STATION 12+50.00 IS
 S 29° 57' 45" W 190.87'
 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
 VERTICAL DATUM USED IS NAVD 88

CULVERT NO. 942307

2@10'x6' RCBC

END PROJECT
-L- STA. 14+25.00
N = 945911.3776
E = 1184579.6753

BL- 2
 LOCALIZED PROJECT COORDINATES
 N = 945804.9910
 E = 1184515.6670
 ELEVATION = 2927.09'

NC DOT GPS STATION SRI233-2
 LOCALIZED PROJECT COORDINATES:
 N = 945933.2950
 E = 1184576.2077
 ELEVATION = 2928.91'

BL- 3
 LOCALIZED PROJECT COORDINATES
 N = 946086.5300
 E = 1184715.1590
 ELEVATION = 2929.90'

NOTES:

- THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
[HTTPS://CONNECT.NCDOT.GOV/RESOURCES/LOCATION/](https://connect.ncdot.gov/resources/location/)
 THE FILES TO BE FOUND ARE AS FOLLOWS:
 942307_LS_CONTROL.TXT
- SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
- INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
 PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
 SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

NOTE: DRAWING NOT TO SCALE



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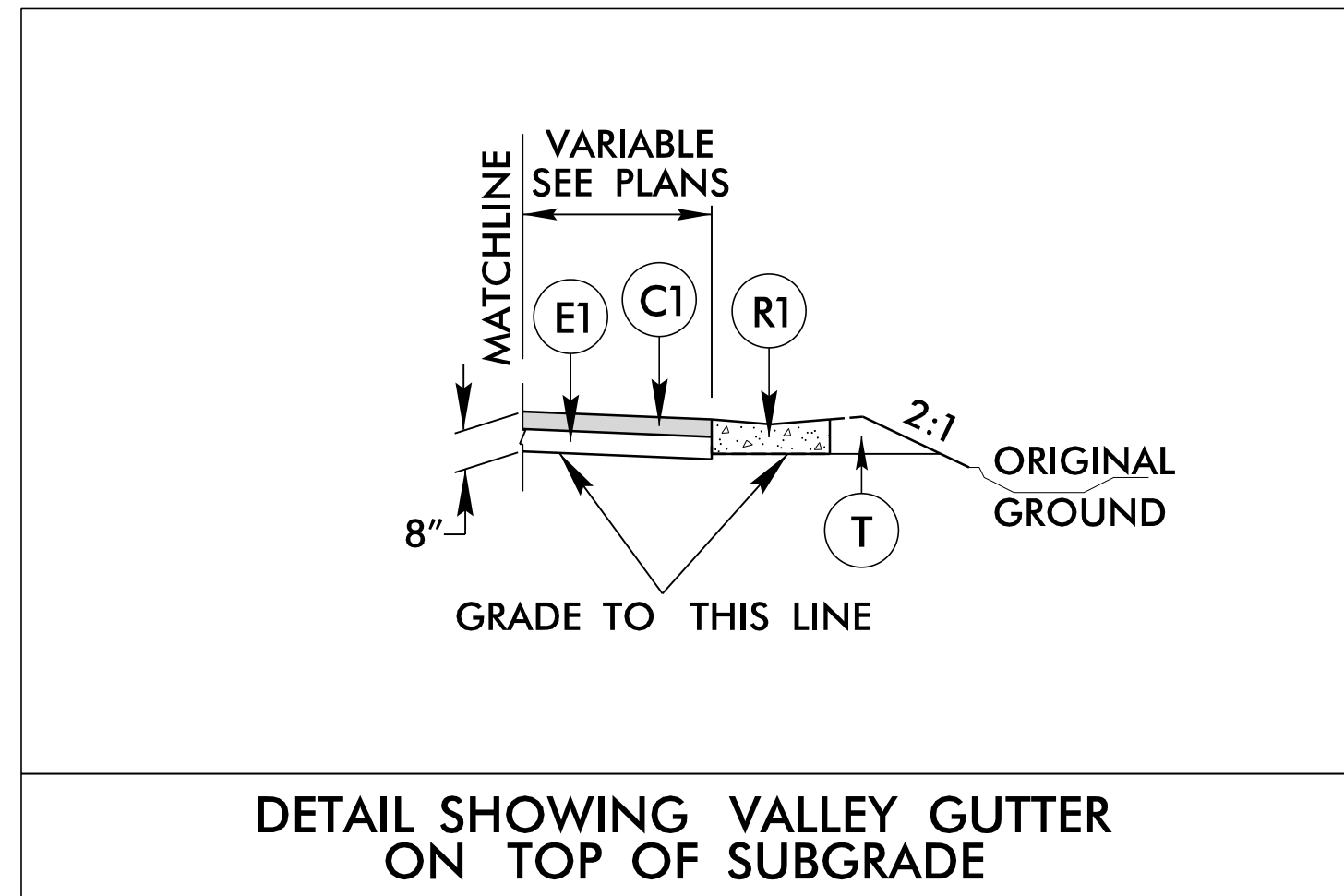
6/2/2023
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 7/7/2023
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6/2/99

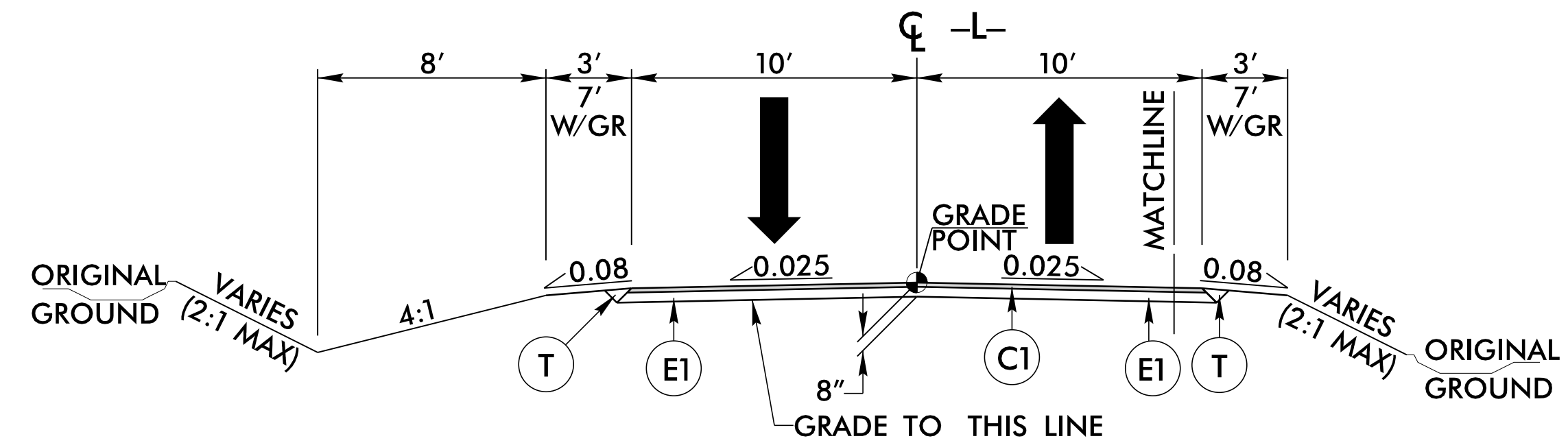
FINAL PAVEMENT SCHEDULE			
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	R1	VALLEY GUTTER
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT TO EXCEED 1.5" IN DEPTH.	T	EARTH MATERIAL
E1	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.	U	EXISTING PAVEMENT
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.	W	WEDGING

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

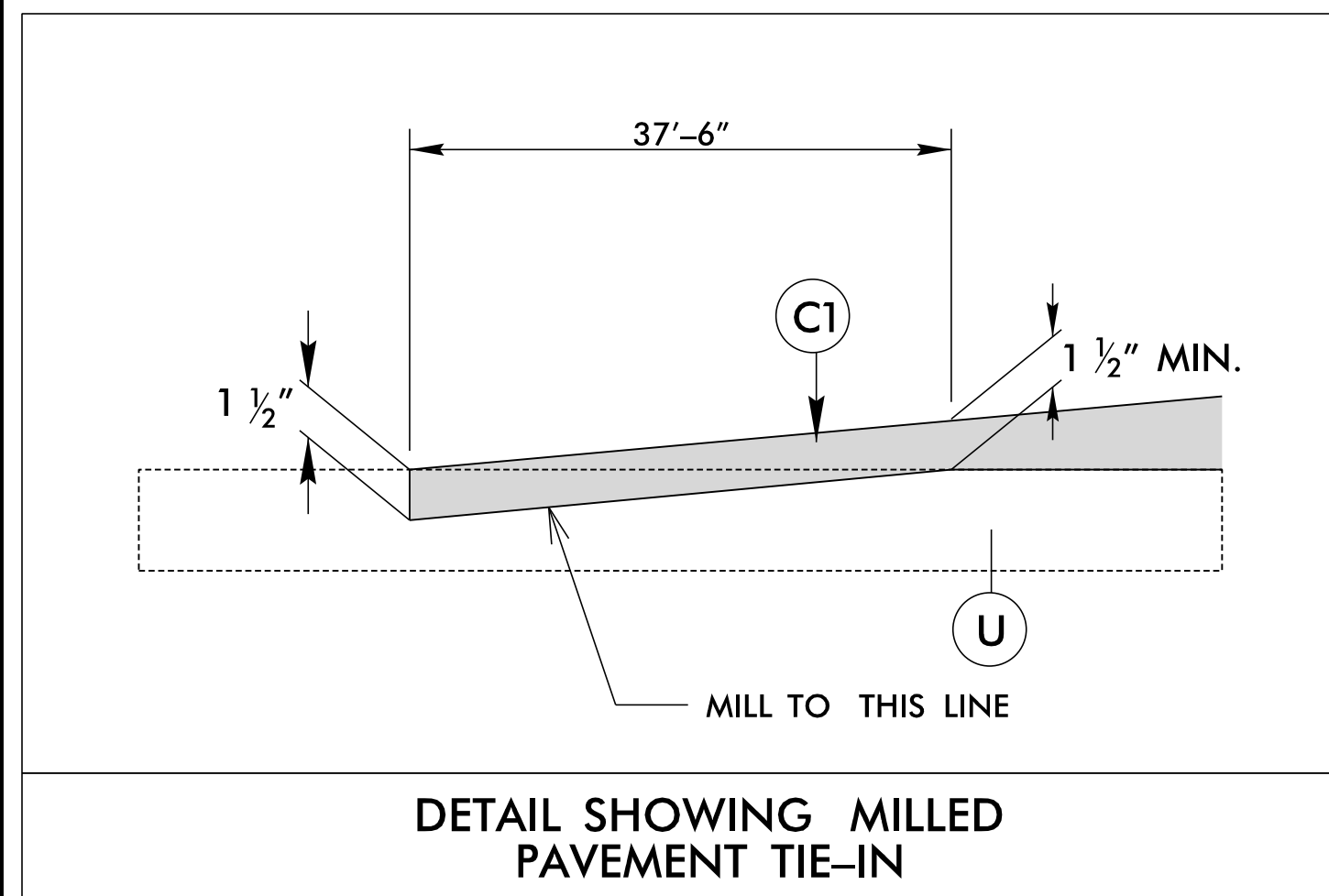
PROJECT REFERENCE NO. 17BPJIC.2	SHEET NO. 2A-1
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
<p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p>	



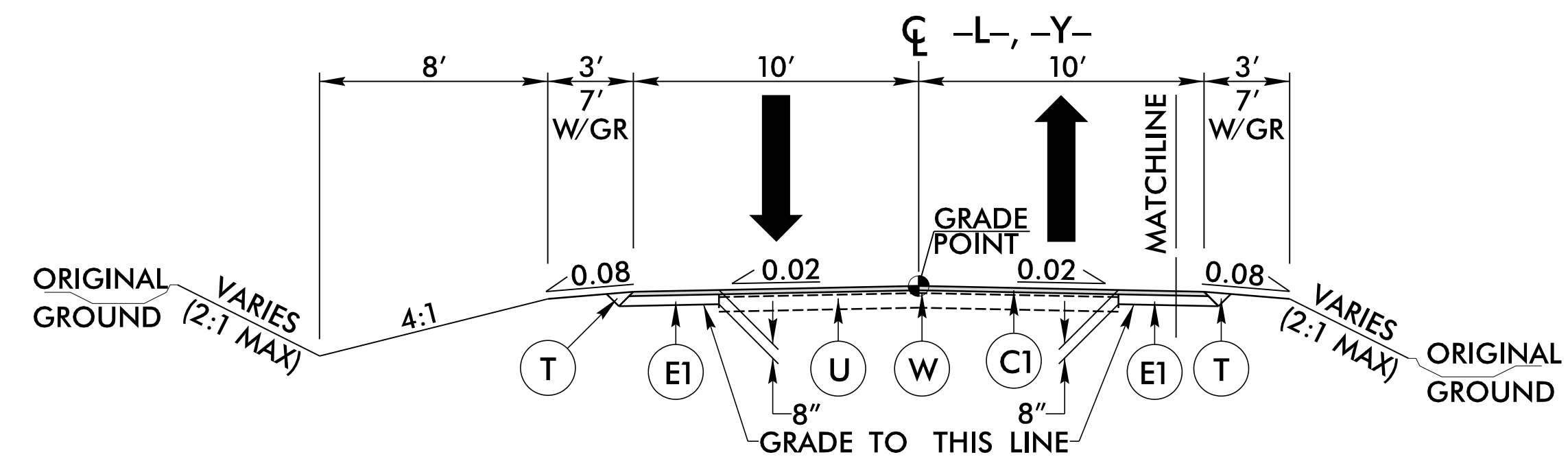
DETAIL SHOWING VALLEY GUTTER ON TOP OF SUBGRADE



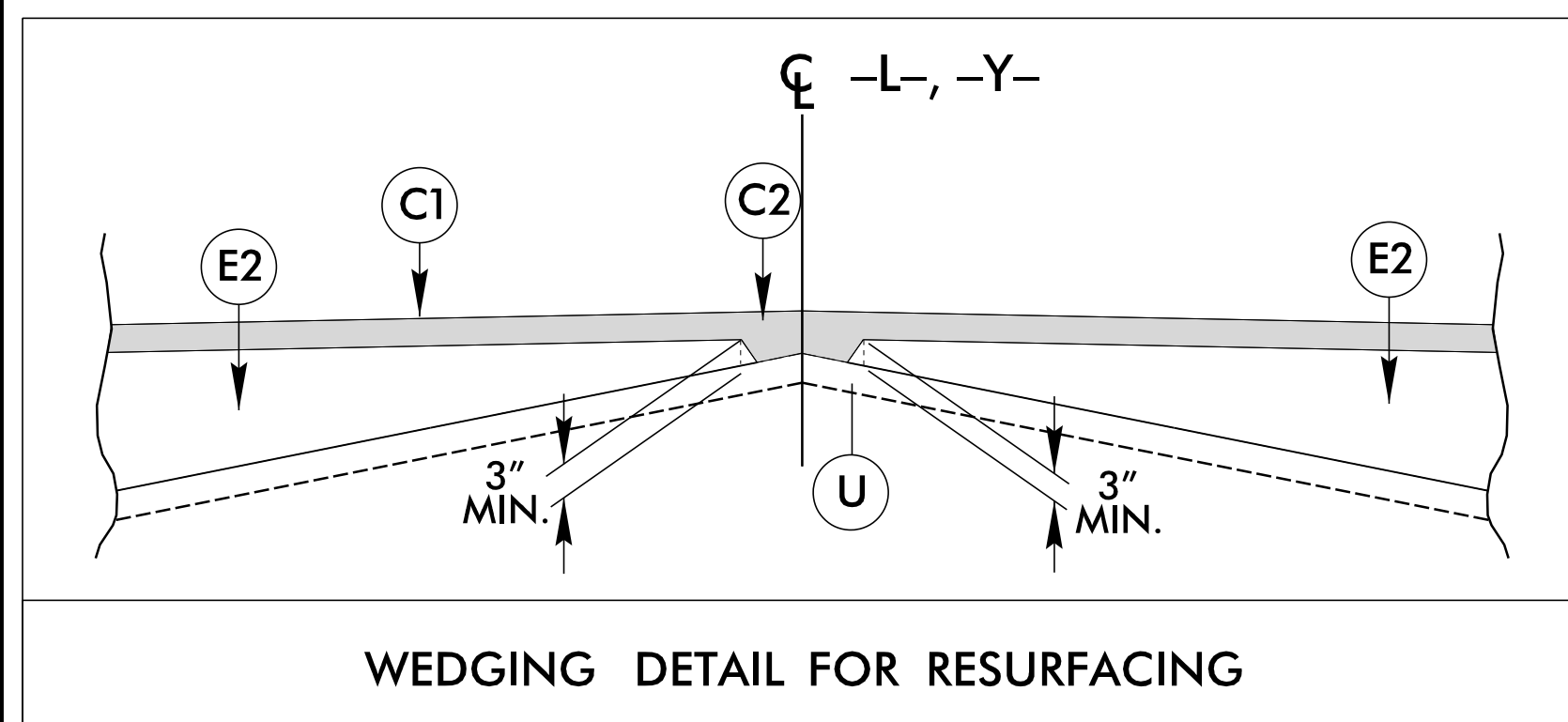
TYPICAL SECTION NO. 1
-L- STA. 12+95.00 TO 13+45.00



DETAIL SHOWING MILLED PAVEMENT TIE-IN



TYPICAL SECTION NO. 2
-L- STA. 12+50.00 TO 12+95.00
-L- STA. 13+45.00 TO 14+25.00
-Y- STA. 10+60.00 TO 11+09.35



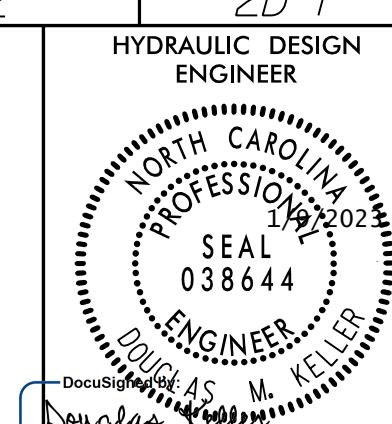
WEDGING DETAIL FOR RESURFACING

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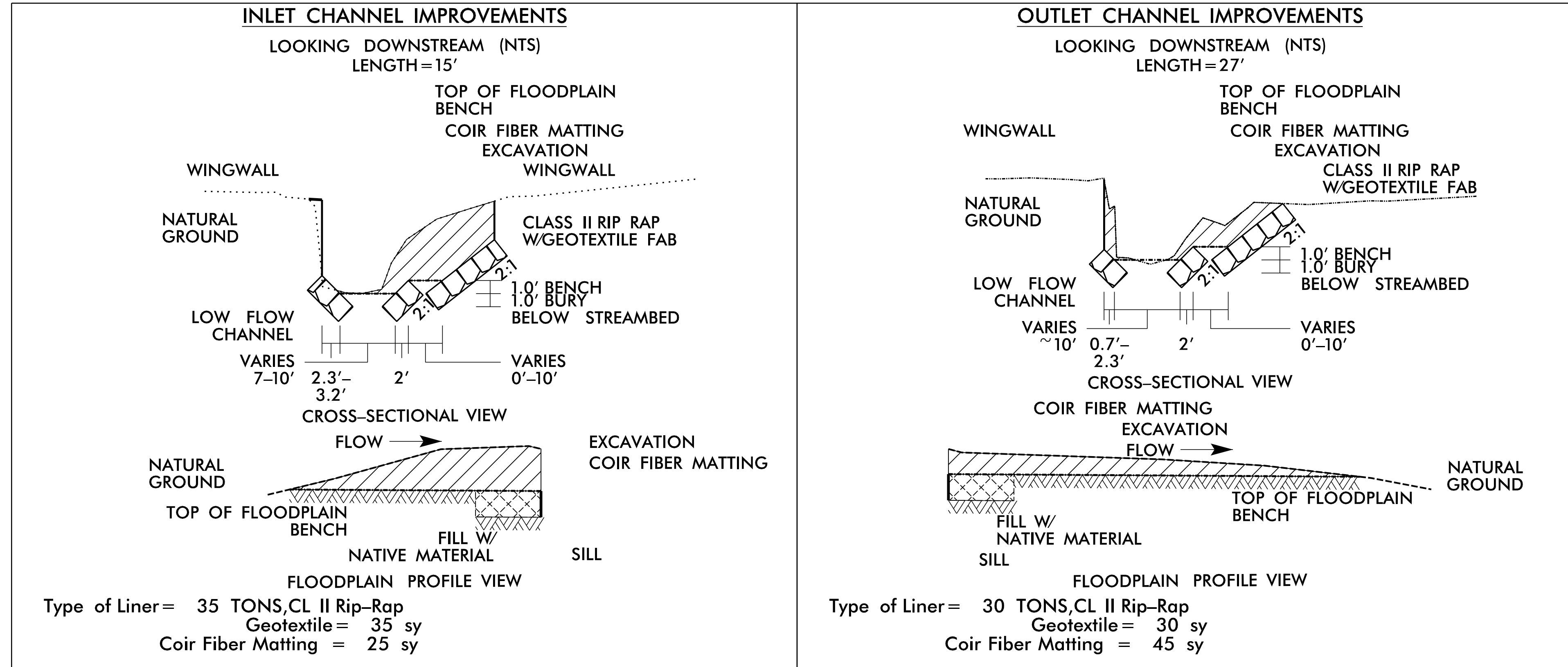
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7/7/2023
R:\R\2023\17BPJIC.2\ProJ\942307_rdy_tup.dgn
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PROJECT REFERENCE NO.	SHEET NO.
17BP.JI.C.2	2D-1
HYDRAULIC DESIGN ENGINEER	
	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

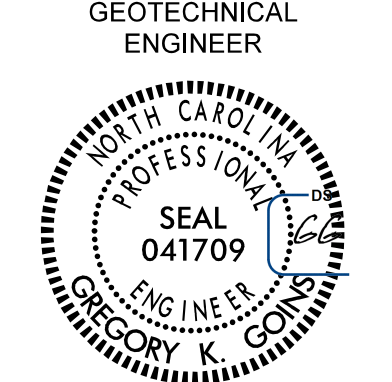
DRAINAGE DETAILS




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GEOTECHNICAL ENGINEER  SEAL 041709 ENGINEER GREGORY K. GOINS 2/10/2022 DATE	ENGINEER SIGNATURE _____ DATE _____
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

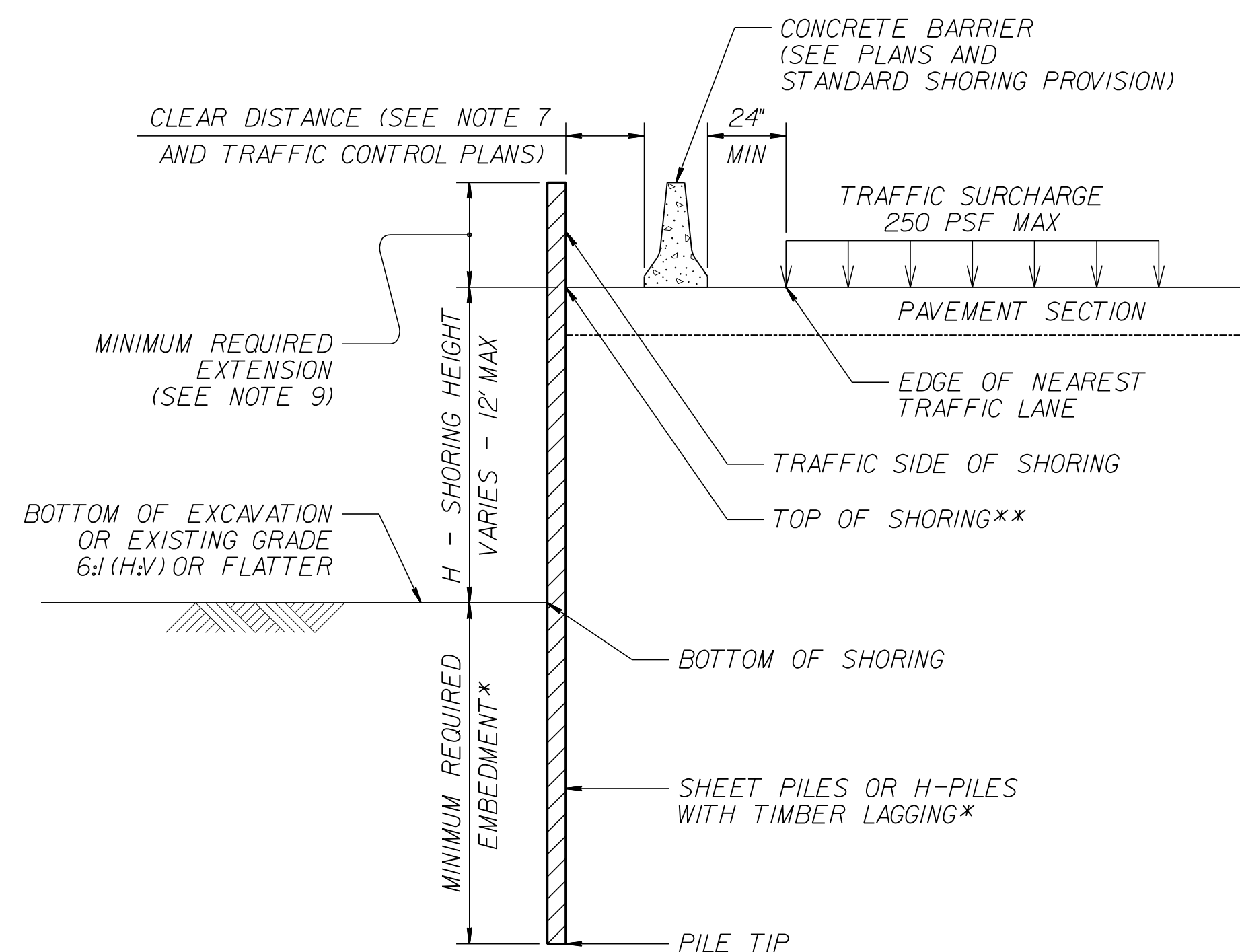
GROUNDWATER CONDITION (SEE NOTE 6)	H SHORING HEIGHT (FT)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT					SURCHARGE CASE WITH TRAFFIC IMPACT				
		SHEET PILES		H-PILES WITH TIMBER LAGGING			SHEET PILES		H-PILES WITH TIMBER LAGGING		
		MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS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

NOTES:

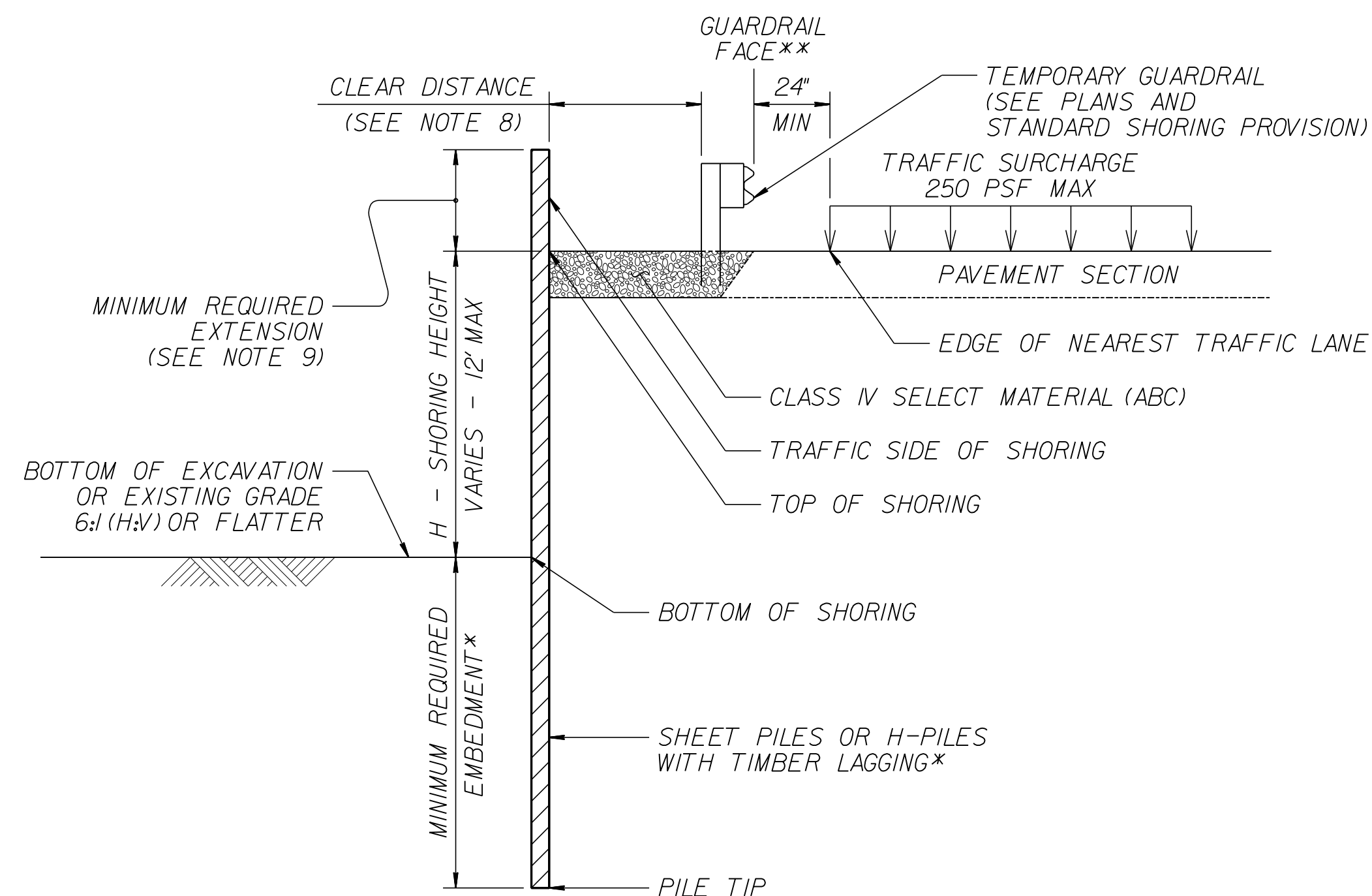
- AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY SHORING AS NOTED IN THE PLANS.
- FOR STANDARD TEMPORARY SHORING, SEE STANDARD SHORING PROVISION.
- STANDARD TEMPORARY SHORING IS BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
UNIT WEIGHT, $\gamma = 120$ PCF
FRICTION ANGLE, $\phi = 30$ DEGREES
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
- CONTACT THE ENGINEER IF PILES DO NOT ATTAIN THE MINIMUM REQUIRED EMBEDMENT.

MINIMUM REQUIRED EMBEDMENT AND SECTION MODULUS

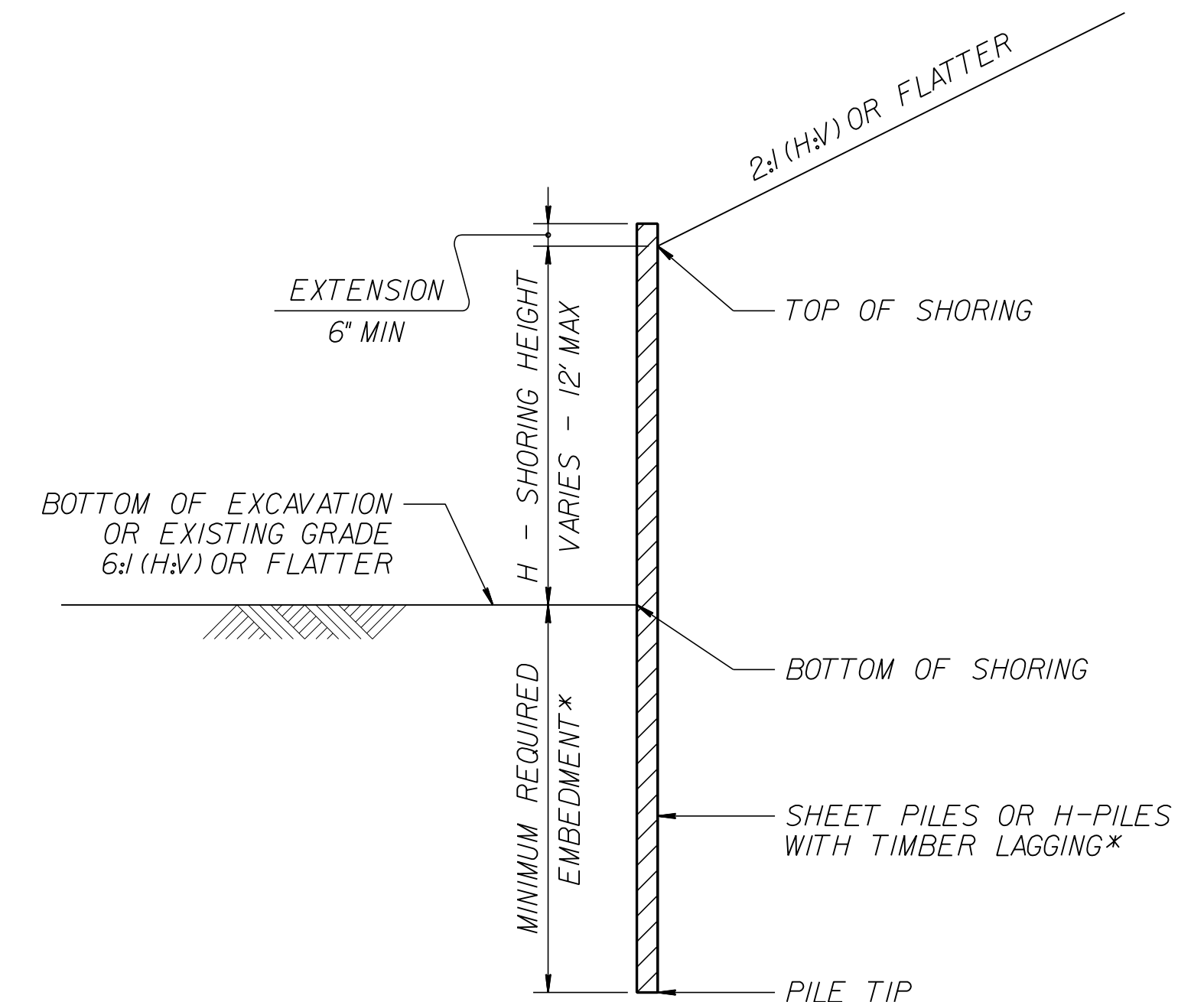
***DO NOT USE H-PILES WITH TIMBER LAGGING FOR GROUNDWATER CONDITION, SHORING HEIGHT AND H-PILE SIZE SHOWN IF MINIMUM REQUIRED EMBEDMENT IS "--".**



CONCRETE BARRIER
**TOP OF SHORING = EDGE OF PAVEMENT



TEMPORARY GUARDRAIL
**GUARDRAIL FACE = EDGE OF PAVEMENT

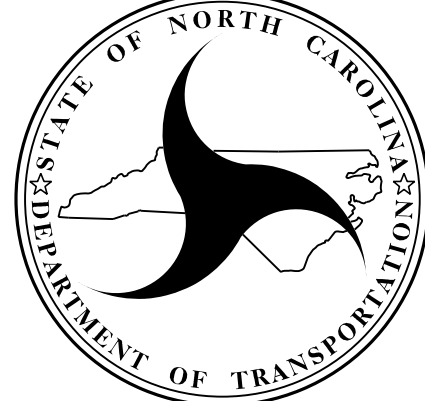


STANDARD TEMPORARY SHORING (SLOPE CASE)
*SEE TABLE ABOVE.

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

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**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

REMOVAL OF EXISTING ASPHALT PAVEMENT SUMMARY

IN SQUARE YARDS

LINE	STATION	STATION	LOCATION	LENGTH OR AREA	WIDTH	SQUARE YARDS
-L-	12+95.00	13+45.00	CL	1022.09		113.57
					TOTAL	113.57
					SAY	120

CONCRETE VALLEY GUTTER SUMMARY

IN LINEAR FEET

LINE	STATION	STATION	SIDE	GROSS	DEDUCTIONS		NET
				LENGTH	DRIVES	OTHERS	LENGTH
-L-	13+24.34	13+34.18	RT	25			25
-L-	13+90.88	14+11.16	RT	35			35
						TOTAL	60
						SAY	60

SUMMARY OF EARTHWORK

IN CUBIC YARDS

CHAIN	BEGINNING STATION	ENDING STATION	UNCL. EXCA. C.Y.	UNDERCUT C.Y.	EMBANK. +% C.Y.	BORROW C.Y.	WASTE C.Y.
SUMMARY 1							
-L-	12+50.00	14+25.00	15		12		3
-Y-	10+75.00	11+00.00			5	5	
SUBTOTAL			15		17	5	3
SHEET TOTALS			15		17	5	3
GRAND TOTAL			15			2	
SAY			20			10	

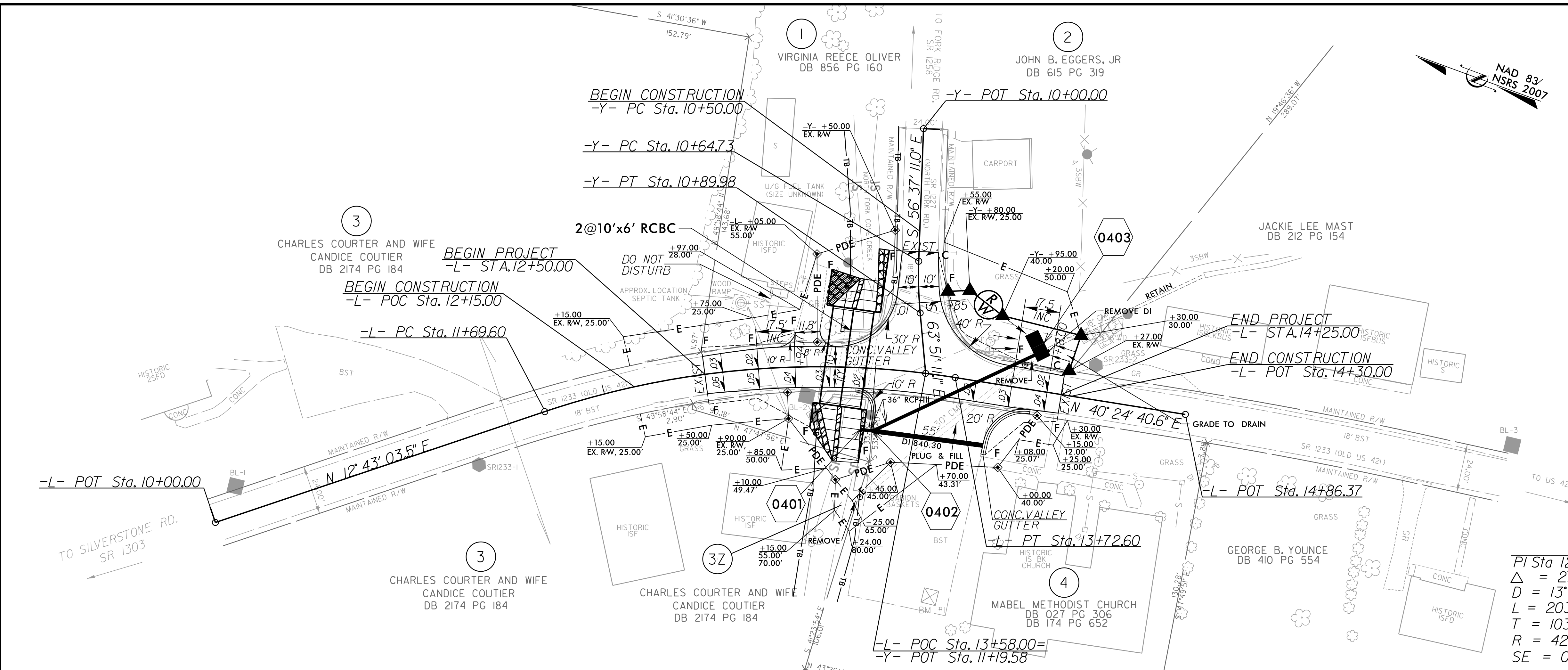
Note: Earthwork quantities are calculated by the Roadway Design Unit. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

APPROXIMATE QUANTITIES ONLY. UNCLASSIFIED EXCAVATION, BORROW EXCAVATION, FINE GRADING, CLEARING AND GRUBBING, AND REMOVAL OF EXISTING PAVEMENT WILL BE PAID FOR AT THE LUMP SUM PRICE FOR "GRADING".

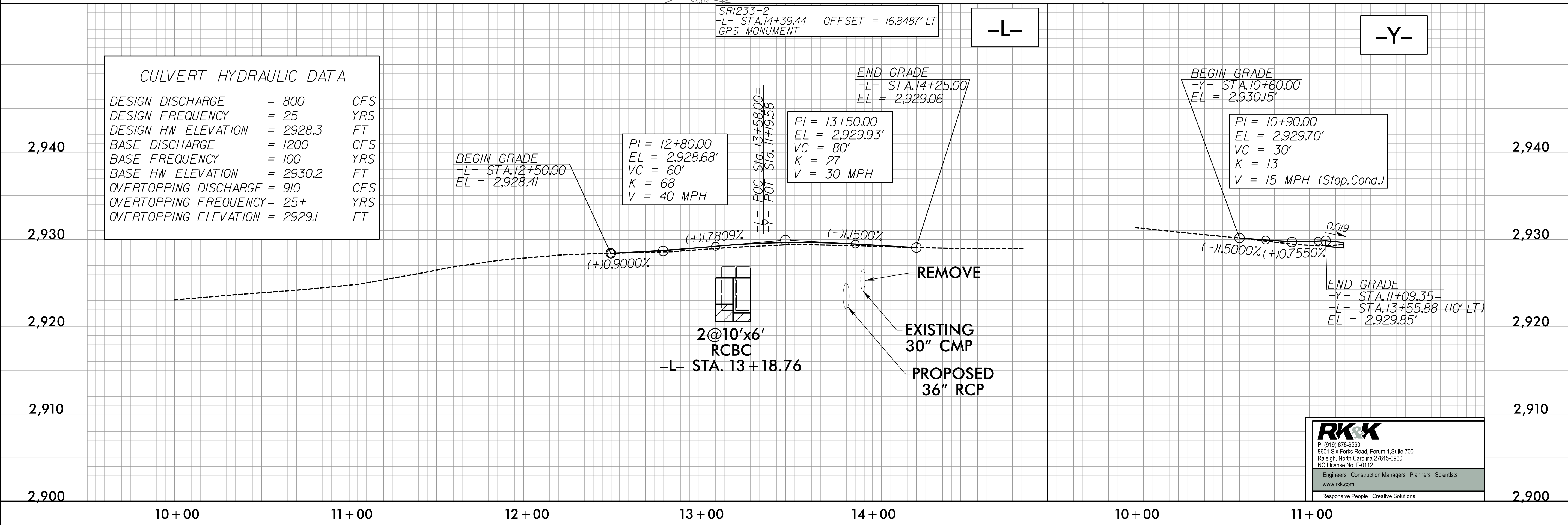
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PROJECT REFERENCE NO. 17BP.11.C.2	SHEET NO. 04
ROADWAY DESIGN ENGINEER MARY E. MAYS	HYDRAULICS ENGINEER DOUGLAS W. KELLER
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-L-	-Y-
PI Sta 12+73.12	PI Sta 10+77.37
$\Delta = 27' 41' 37.2''$ (RT)	$\Delta = 7' 14' 00.0''$ (LT)
D = 13' 38' 30.7"	D = 28' 38' 52.4"
L = 203.0'	L = 25.25'
T = 103.53'	T = 12.64'
R = 420.00'	R = 200.00'
SE = 0.02	SE = 0.02



CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 800	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 2928.3	FT
BASE DISCHARGE	= 1200	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 2930.2	FT
OVERTOPPING DISCHARGE	= 910	CFS
OVERTOPPING FREQUENCY	= 25+	YRS
OVERTOPPING ELEVATION	= 2929.1	FT

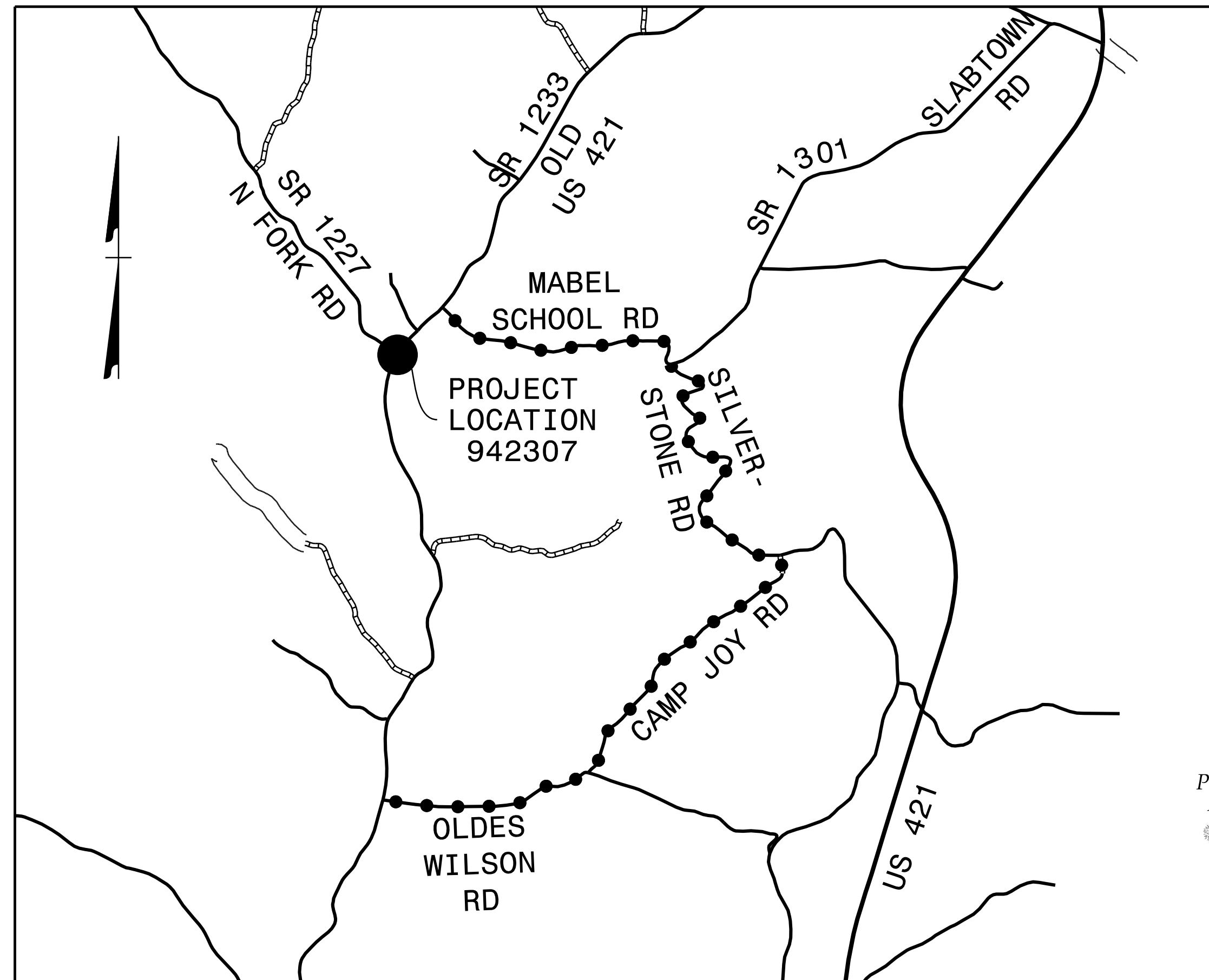
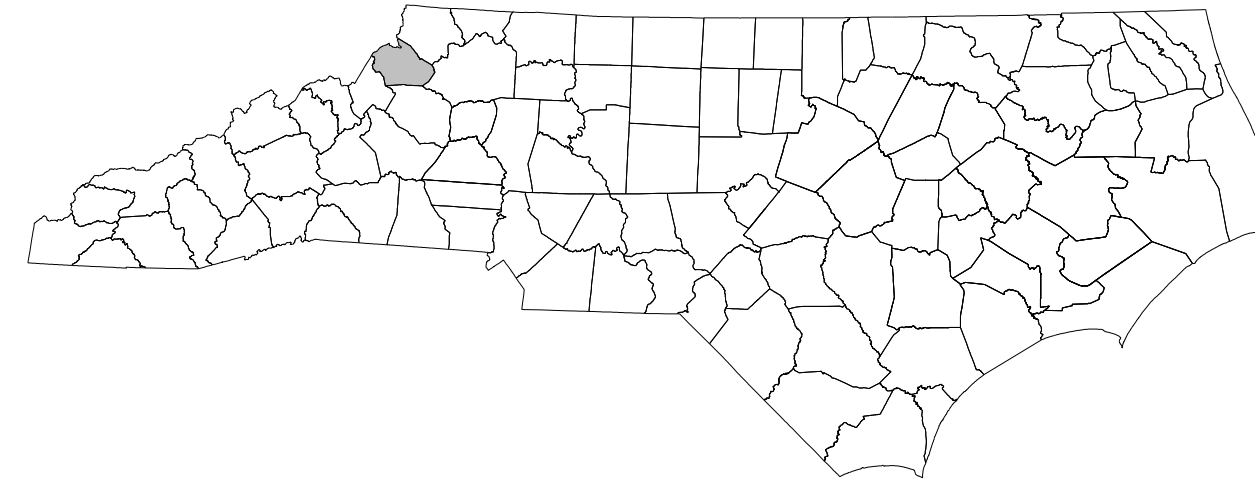
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STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

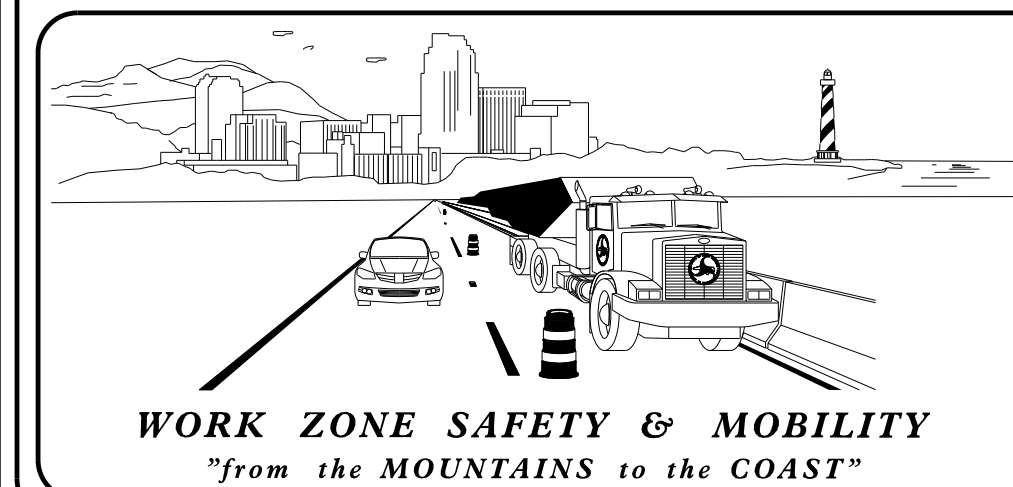
WATAUGA COUNTY



<u>SHEET NO.</u>	<u>TITLE</u>
TMP-1	TITLE SHEET, VICINITY MAP, AND INDEX OF SHEETS
TMP-1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, AND LEGEND
TMP-1B AND 1C	TRANSPORTATION OPERATIONS PLAN: GENERAL NOTES
TMP-2	PORTABLE CONCRETE BARRIER AT TEMPORARY SHORING LOCATIONS
TMP-2A	TEMPORARY SHORING DATA
TMP-2B	OFFSITE DETOUR DETAIL
TMP-2C	SPECIAL SIGN DESIGN
TMP-3	TEMPORARY TRAFFIC CONTROL PHASING
TMP-4	TEMPORARY TRAFFIC CONTROL PHASE I DETAIL
TMP-5	TEMPORARY TRAFFIC CONTROL PHASE II DETAIL
TMP-6	TEMPORARY TRAFFIC CONTROL PHASE III DETAIL

SHEET NO.
TMP-1
PROJECT: 17BP-11.C.2

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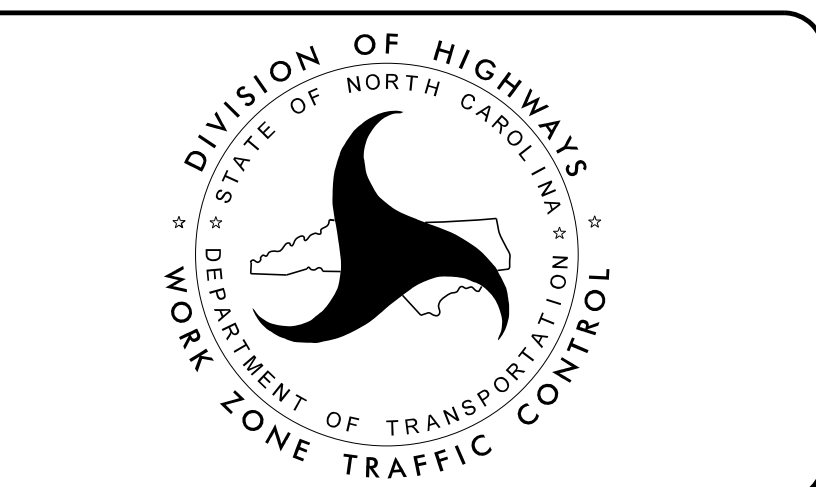
PLANS PREPARED BY:

K. BISBY, PE
 SENIOR PROJECT ENGINEER

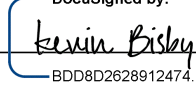
A. TUTT
 SENIOR DESIGNER

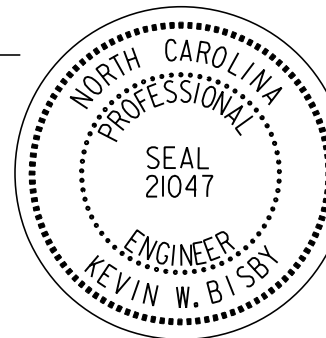
NCDOT CONTACT:

ROB N. WEISZ, PE
 DIVISION BRIDGE PROGRAM MANAGER



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DocuSigned by: Kevin Bisby
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DATE: 7/12/2023

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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
1101.01	WORK ZONE ADVANCE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.03	TEMPORARY ROAD CLOSURES
1101.05	WORK ZONE VEHICLE ACCESSES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1130.01	DRUM
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGING DEVICES
1160.01	TEMPORARY CRASH CUSHION
1170.01	POSITIVE PROTECTION
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTI-LANE ROADWAYS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS

PROJ. REFERENCE NO.	SHEET NO.
17BP.11.C.2	TMP-1A

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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
- TEMPORARY

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
- PORTABLE CONCRETE BARRIER
- PORTABLE CONCRETE BARRIER (EXISTING)
- SHORING
- PORTABLE CONCRETE BARRIER (SECTION VIEW)
- DRUM (SECTION VIEW)

PAVEMENT MARKING SYMBOLS

- PAVEMENT MARKING SYMBOLS

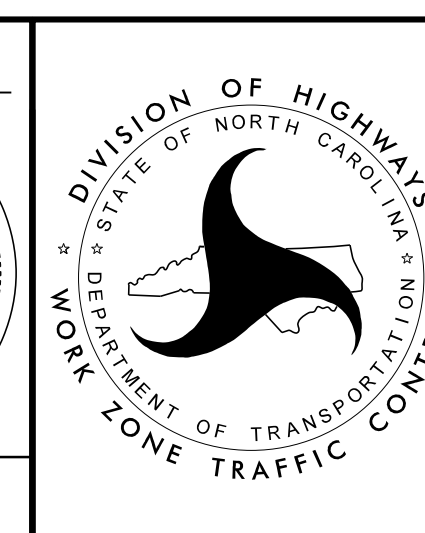
TEMPORARY PAVEMENT MARKING SCHEDULE

PAINT	
Symbol	Description
P1	WHITE EDGE LINE (4")
P5	2 FT. - 6 FT./SP WHITE MINISKIP (4")
P13	YELLOW DOUBLE CENTER (4")
P61	WHITE STOPBAR (24")

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ROADWAY STANDARD DRAWINGS & LEGEND

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GENERAL NOTES

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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.

LANE AND SHOULDER CLOSURE REQUIREMENTS

A) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO AN UNDIVIDED FACILITY AND WITHIN 5 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO A DIVIDED FACILITY AND WITHIN 10 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

B) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN A LANE OF TRAVEL OF AN UNDIVIDED OR DIVIDED FACILITY, CLOSE THE LANE ACCORDING TO THE TRAFFIC CONTROL PLANS, ROADWAY STANDARD DRAWINGS, OR AS DIRECTED BY THE ENGINEER. CONDUCT THE WORK SO THAT ALL PERSONNEL AND/OR EQUIPMENT REMAIN WITHIN THE CLOSED TRAVEL LANE.

C) DO NOT WORK SIMULTANEOUSLY WITHIN 15 FT ON BOTH SIDES OF AN OPEN TRAVELWAY, RAMP, OR LOOP WITHIN THE SAME LOCATION UNLESS PROTECTED WITH GUARDRAIL OR BARRIER.

PAVEMENT EDGE DROP OFF REQUIREMENTS

D) BACKFILL AT A 6:1 SLOPE UP TO THE EDGE AND ELEVATION OF EXISTING PAVEMENT IN AREAS ADJACENT TO AN OPENED TRAVEL LANE THAT HAS AN EDGE OF PAVEMENT DROP-OFF AS FOLLOWS:

BACKFILL DROP-OFFS THAT EXCEED 2 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS OF 45 MPH OR GREATER.

BACKFILL DROP-OFFS THAT EXCEED 3 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS LESS THAN 45 MPH.

BACKFILL WITH SUITABLE COMPACTED MATERIAL, AS APPROVED BY THE ENGINEER, AT NO EXPENSE TO THE DEPARTMENT.

E) DO NOT EXCEED A DIFFERENCE OF 2 INCHES IN ELEVATION BETWEEN OPEN LANES OF TRAFFIC FOR NOMINAL LIFTS OF 1.5 INCHES. INSTALL ADVANCE WARNING "UNEVEN LANES" SIGNS (W8-11) IN ADVANCE AND A MINIMUM OF EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

TRAFFIC PATTERN ALTERATIONS

F) NOTIFY THE ENGINEER THIRTY (30) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

G) INSTALL ADVANCE WORK ZONE WARNING SIGNS WHEN WORK IS WITHIN 40 FT FROM THE EDGE OF TRAVEL LANE AND NO MORE THAN THREE (3) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.

H) 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.

I) 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.

J) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

TRAFFIC BARRIER

K) INSTALL TEMPORARY BARRIER ACCORDING TO THE TRANSPORTATION MANAGEMENT PLANS A MAXIMUM OF TWO (2) WEEKS PRIOR TO BEGINNING WORK IN ANY LOCATION. ONCE TEMPORARY BARRIER IS INSTALLED AT ANY LOCATION PROCEED IN A CONTINUOUS MANNER TO COMPLETE THE PROPOSED WORK IN THAT LOCATION UNLESS OTHERWISE STATED IN THE TRANSPORTATION MANAGEMENT PLANS OR AS DIRECTED BY THE ENGINEER.

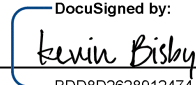


L) DO NOT PLACE BARRIER DIRECTLY ON ANY SURFACE OTHER THAN ASPHALT OR CONCRETE.

ONCE TEMPORARY BARRIER IS INSTALLED AT ANY LOCATION AND NO WORK IS PERFORMED BEHIND THE TEMPORARY BARRIER FOR A PERIOD LONGER THAN TWO (2) MONTHS, REMOVE / RESET TEMPORARY BARRIER AT NO COST TO THE DEPARTMENT UNLESS OTHERWISE STATED IN THE TRANSPORTATION MANAGEMENT PLANS, TEMPORARY BARRIER IS PROTECTING A HAZARD, OR AS DIRECTED BY THE ENGINEER.

INSTALL TEMPORARY BARRIER WITH THE TRAFFIC FLOW BEGINNING WITH THE UPSTREAM SIDE OF TRAFFIC. REMOVE TEMPORARY BARRIER AGAINST THE TRAFFIC FLOW BEGINNING WITH THE DOWNSTREAM SIDE OF TRAFFIC.

INSTALL AND SPACE DRUMS NO GREATER THAN TWICE THE POSTED SPEED LIMIT (MPH) TO CLOSE OR KEEP THE SECTION OF THE ROADWAY CLOSED UNTIL THE TEMPORARY BARRIER CAN BE PLACED OR AFTER THE TEMPORARY BARRIER IS REMOVED.

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GENERAL NOTES

M) PROTECT THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER AT ALL TIMES DURING THE INSTALLATION AND REMOVAL OF THE BARRIER BY EITHER A TRUCK MOUNTED ATTENUATOR (MAXIMUM 72 HOURS) OR A TEMPORARY CRASH CUSHION.

PROTECT THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER FROM ONCOMING TRAFFIC AT ALL TIMES BY A TEMPORARY CRASH CUSHION UNLESS THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER IS OFFSET FROM ONCOMING TRAFFIC AS FOLLOWS OR AS SHOWN IN THE PLANS: (SEE ALSO 1101.05)

POSTED SPEED LIMIT	MINIMUM OFFSET
40 OR LESS	15 FT
45 - 50	20 FT
55	25 FT
60 MPH or HIGHER	30 FT

TRAFFIC CONTROL DEVICES

N) WHEN LANE CLOSURES ARE NOT IN EFFECT SPACE CHANNELIZING DEVICES IN WORK AREAS NO GREATER IN FEET THAN TWICE THE POSTED SPEED LIMIT (MPH) EXCEPT, 10 FT ON-CENTER IN RADII, AND 3 FT OFF THE EDGE OF AN OPEN TRAVELWAY. REFER TO STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES SECTIONS 1130 (DRUMS), 1135 (CONES) AND 1180 (SKINNY DRUMS) FOR ADDITIONAL REQUIREMENTS.

O) PLACE TYPE III BARRICADES, WITH "ROAD CLOSED" SIGN R11-2 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE ENTIRE ROADWAY.

PAVEMENT MARKINGS AND MARKERS

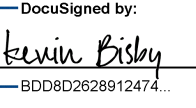
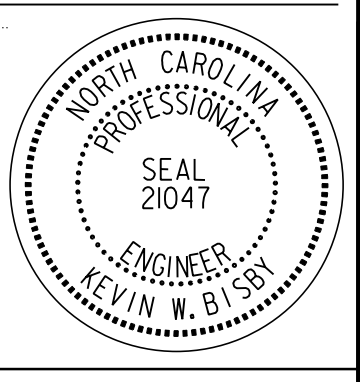
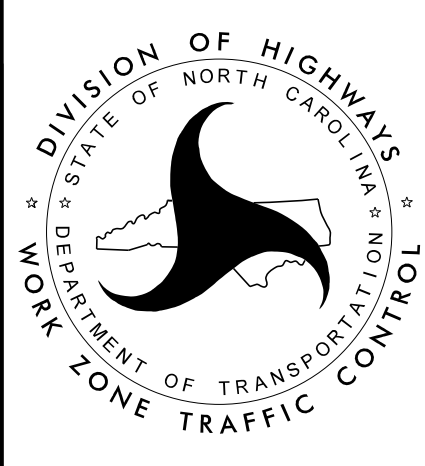
P) INSTALL TEMPORARY PAVEMENT MARKINGS AND TEMPORARY PAVEMENT MARKERS ON INTERIM LAYERS OF PAVEMENT AS FOLLOWS:

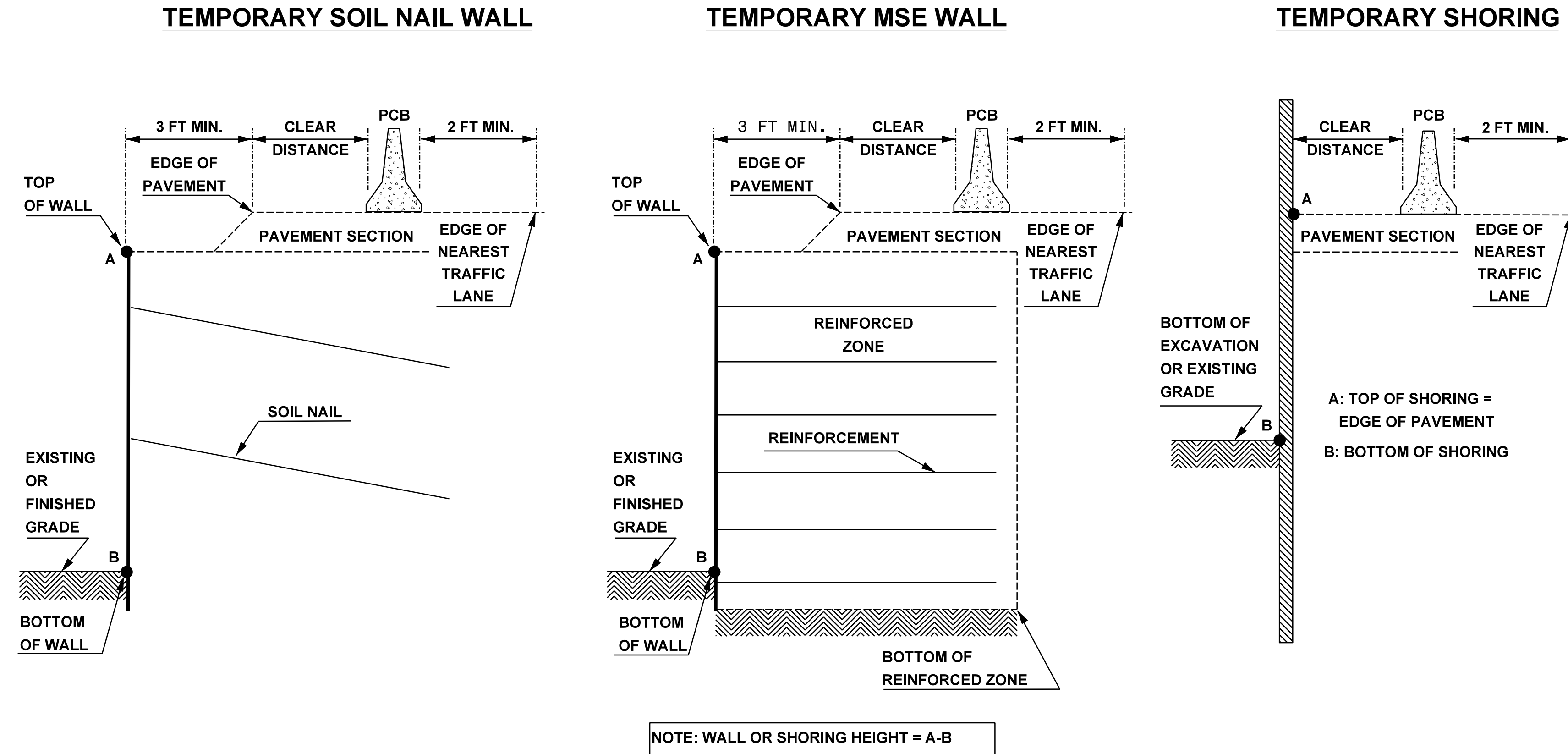
ROAD NAME	MARKING	MARKER
ALL ROADS	PAINT	NONE

Q) PLACE ONE APPLICATION OF PAINT FOR TEMPORARY TRAFFIC PATTERNS. PLACE A SECOND APPLICATION OF PAINT SIX (6) MONTHS AFTER THE INITIAL APPLICATION AND EVERY SIX MONTHS AS DIRECTED BY THE ENGINEER.

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

S) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS BY THE END OF EACH DAY'S OPERATION.

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NOTES

- 1- REFER TO THE TRAFFIC CONTROL PLANS FOR TEMPORARY SHORING LOCATIONS AND NOTES.
- 2- REFER TO THE "TEMPORARY SHORING" STANDARD PROVISION FOR INFORMATION ABOUT TEMPORARY SHORING AND PORTABLE CONCRETE BARRIER (PCB).
- 3- PCB IS REQUIRED IF TEMPORARY SHORING/WALL IS LOCATED WITHIN THE CLEAR ZONE IN ACCORDANCE WITH THE AASHTO ROADSIDE DESIGN GUIDE. DO NOT PLACE BARRIER DIRECTLY ON ANY SURFACE OTHER THAN ASPHALT OR CONCRETE. (CONTACT NCDOT PAVEMENT MANAGEMENT FOR APPLICABLE PAVEMENT DESIGN).
- 4- BASED ON THE CLEAR DISTANCE, OFFSET, DESIGN SPEED AND PAVEMENT TYPE, CHOOSE AN UNANCHORED OR ANCHORED PCB FROM THE TABLE SHOWN IN FIGURE B. CLEAR DISTANCE IS DEFINED AS SHOWN IN FIGURE A AND OFFSET IS DEFINED AS SHOWN IN FIGURE B.
- 5- AT THE CONTRACTOR'S OPTION OR IF THE MINIMUM REQUIRED CLEAR DISTANCE IS NOT AVAILABLE, SET PCB NEXT TO AND UP AGAINST THE TRAFFIC SIDE OF THE TEMPORARY SHORING/WALLS EXCEPT FOR BARRIER ABOVE TEMPORARY WALLS. PCB WITH THE MINIMUM REQUIRED CLEAR DISTANCE IS REQUIRED ABOVE TEMPORARY WALLS.
- 6- USE NCDOT PORTABLE CONCRETE BARRIER (PCB) IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1170.01 AND SECTION 1170 OF THE STANDARD SPECIFICATIONS.
- 7- SET PCB WITH A MINIMUM HORIZONTAL DISTANCE OF 2 FT BETWEEN THE FRONT FACE OF THE BARRIER AND THE EDGE OF THE NEAREST TRAFFIC LANE AS SHOWN IN FIGURE A UNLESS OTHERWISE SHOWN IN THE PLANS OR APPROVED BY THE ENGINEER.
- 8- FOR PCB ABOVE AND BEHIND TEMPORARY WALLS, PROVIDE A MINIMUM DISTANCE OF 3 FT BETWEEN THE EDGE OF PAVEMENT AND THE WALL FACE AS SHOWN IN FIGURE A. IF THIS MINIMUM REQUIRED DISTANCE IS NOT AVAILABLE, CONTACT THE ENGINEER.
- 9- TABLE SHOWN IN FIGURE B IS BASED ON NCDOT RESEARCH PROJECT NO. 2005-010 WITH VEHICLE TYPE USED FOR NCHRP 350 CRASH TESTS.

MINIMUM REQUIRED CLEAR DISTANCE, inches

Barrier Type	Pavement Type	Offset * ft	Design Speed, mph					
			<30	31-40	41-50	51-60	61-70	71-80
Unanchored PCB	Asphalt	<8	24	26	29	32	36	40
		8-14	26	28	31	35	38	42
		14-20	27	29	34	36	39	43
		20-26	28	31	35	38	40	44
		26-32	29	32	36	39	42	45
		32-38	30	34	38	41	43	46
		38-44	31	34	41	43	45	48
	Concrete	44-50	31	35	41	43	46	49
		50-56	32	36	42	44	47	50
		>56	32	36	42	45	47	51
		<8	17	18	21	22	25	26
		8-14	19	20	23	25	26	29
		14-20	22	22	24	26	28	31
		20-26	23	24	26	27	30	34
Anchored PCB	Asphalt	26-32	24	25	27	28	32	35
		32-38	24	26	27	30	33	36
		38-44	25	26	28	30	34	37
		44-50	26	26	28	32	35	37
		50-56	26	26	28	32	35	38
		>56	26	27	29	32	36	38
		All Offsets	24 for All Design Speeds					
Anchored PCB	Concrete (including bridge approach slabs)	All Offsets	12 for All Design Speeds					

* See Figure Below

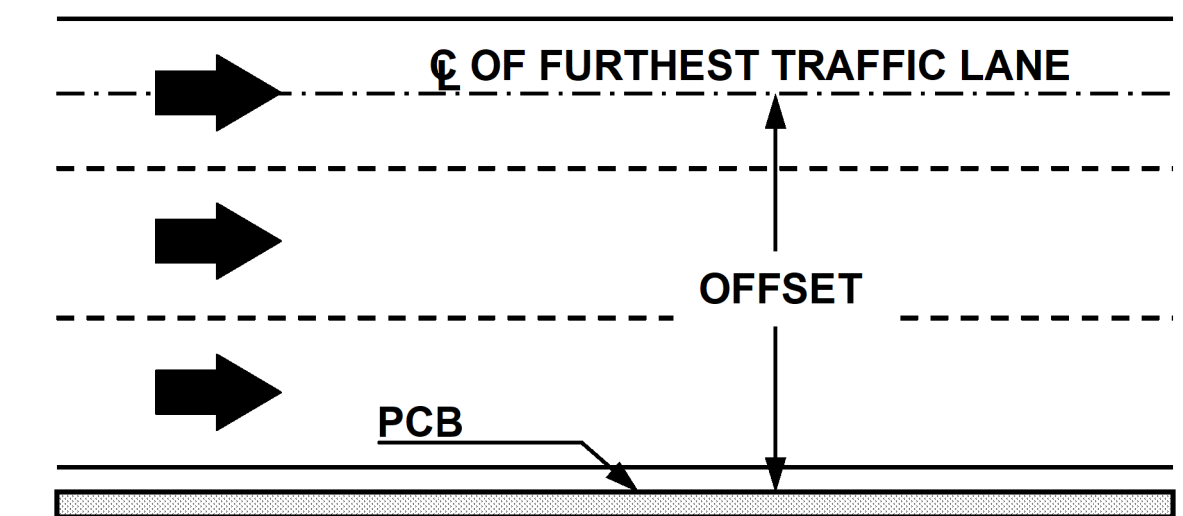


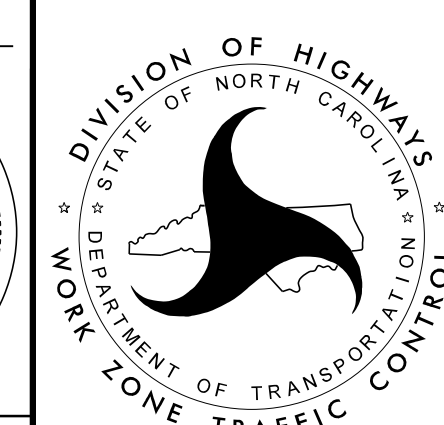
FIGURE B

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DATE: 7/12/2023

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PORTABLE CONCRETE BARRIER
AT
TEMPORARY SHORING LOCATIONS

Shoring Location No.	Begin Station & Offset	End Station & Offset	Estimated Average Height (ft)	Estimated Maximum Height (ft)	Shoring Location, Type, Traffic Control Plan
1	-L- STA 13+28± 38.3 ft RT	-Y- STA 10+40± 11.0 ft RT	10.0	10.1	Culvert Construction (Cut, TC Phase I, TMP-4)
2	-L- STA 12+81± 13.4 ft RT	-Y- STA 10+69± 45.5 ft RT	10.0	10.1	Culvert Construction (Cut, TC Phase I, TMP-4)

THE FOLLOWING NOTES ON PLANS ARE RECOMMENDED FOR THE PROPOSED SHORING LOCATIONS:

SHORING LOCATION NO. 1:

FOR TEMPORARY SHORING AND POSITIVE PROTECTION FOR TEMPORARY SHORING, SEE PLANS AND TEMPORARY SHORING PROVISION.

BEFORE BEGINNING TEMPORARY SHORING DESIGN OR CONSTRUCTION, SURVEY EXISTING GROUND ELEVATIONS IN THE VICINITY OF SHORING LOCATIONS TO DETERMINE ACTUAL SHORING HEIGHTS.

DESIGN TEMPORARY SHORING FROM STATION -L- STA 13+28±, 38.3 FT RT TO STATION -Y- STA 10+40±, 11.0 FT RT, FOR THE FOLLOWING ASSUMED SOIL PARAMETERS AND GROUNDWATER ELEVATION:

UNIT WEIGHT (γ): 120 PCF
FRICTION ANGLE (φ): 30 DEGREES
COHESION (c): 0 PSF
GROUNDWATER ELEVATION: VARIES, ASSUMED ELEVATION ±2923.8 FT

AT THE CONTRACTOR'S OPTION AND AS APPLICABLE, USE STANDARD TEMPORARY SHORING FOR THE TEMPORARY SHORING FROM -L- STA 13+28±, 38.3 FT RT TO STATION -Y- STA 10+40±, 11.0 FT RT. SEE STANDARD DRAWING NO. 1801.01 FOR STANDARD TEMPORARY SHORING.

LIMITED SUBSURFACE INFORMATION IS AVAILABLE IN THE VICINITY OF TEMPORARY SHORING FROM STATION -L- STA 13+28±, 38.3 FT RT TO STATION -Y- STA 10+40±, 11.0 FT RT. THE INFORMATION PROVIDED FOR TEMPORARY SHORING DESIGN WAS ASSUMED AND MAY NOT BE APPLICABLE TO THE ACTUAL SITE CONDITIONS ENCOUNTERED DURING CONSTRUCTION. THE SUBSURFACE INFORMATION THAT IS AVAILABLE CAN BE FOUND IN THE STRUCTURE SUBSURFACE INVENTORY REPORT.

DRIVEN PILING FOR TEMPORARY SHORING FROM -L- STA 13+28±, 38.3 FT RT TO STATION -Y- STA 10+40±, 11.0 FT RT, MAY NOT PENETRATE BELOW ELEVATION 2919.6 FT DUE TO VERY DENSE OR HARD SOIL, BOULDERS OR WEATHERED ROCK.

IT MAY BE PREFERRED TO USE A TEMPORARY SOIL NAIL WALL FOR TEMPORARY SHORING FROM STATION -L- STA 13+28±, 38.3 FT RT TO STATION -Y- STA 10+40±, 11.0 FT RT. FOR TEMPORARY SOIL NAIL WALLS, SEE TEMPORARY SOIL NAIL WALLS PROVISION.

DO NOT USE A TEMPORARY WALL FOR TEMPORARY SHORING FROM STATION -L- STA 13+28±, 38.3 FT RT TO STATION -Y- STA 10+40±, 11.0 FT RT.

SHORING LOCATION NO. 2:

FOR TEMPORARY SHORING AND POSITIVE PROTECTION FOR TEMPORARY SHORING, SEE PLANS AND TEMPORARY SHORING PROVISION.

BEFORE BEGINNING TEMPORARY SHORING DESIGN OR CONSTRUCTION, SURVEY EXISTING GROUND ELEVATIONS IN THE VICINITY OF SHORING LOCATIONS TO DETERMINE ACTUAL SHORING HEIGHTS.

DESIGN TEMPORARY SHORING FROM STATION -L- STA 12+81±, 13.4 FT RT TO STATION -Y- STA 10+69±, 45.5 FT RT, FOR THE FOLLOWING ASSUMED SOIL PARAMETERS AND GROUNDWATER ELEVATION:

UNIT WEIGHT (γ): 120 PCF
FRICTION ANGLE (φ): 30 DEGREES
COHESION (c): 0 PSF
GROUNDWATER ELEVATION: VARIES, ASSUMED ELEVATION ± 2923.8 FT

AT THE CONTRACTOR'S OPTION AND AS APPLICABLE, USE STANDARD TEMPORARY SHORING FOR THE TEMPORARY SHORING FROM STATION -L- STA 12+81±, 13.4 FT RT TO STATION -Y- STA 10+69±, 45.5 FT RT. SEE STANDARD DRAWING NO. 1801.01 FOR STANDARD TEMPORARY SHORING.



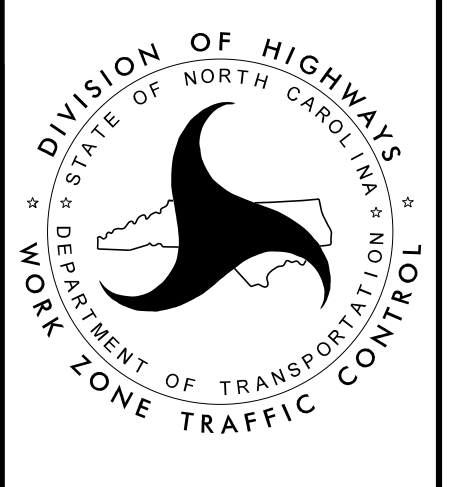
LIMITED SUBSURFACE INFORMATION IS AVAILABLE IN THE VICINITY OF TEMPORARY SHORING FROM STATION -L- STA 12+81±, 13.4 FT RT TO STATION -Y- STA 10+69±, 45.5 FT RT. THE INFORMATION PROVIDED FOR TEMPORARY SHORING DESIGN WAS ASSUMED AND MAY NOT BE APPLICABLE TO THE ACTUAL SITE CONDITIONS ENCOUNTERED DURING CONSTRUCTION. THE SUBSURFACE INFORMATION THAT IS AVAILABLE CAN BE FOUND IN THE STRUCTURE SUBSURFACE INVENTORY REPORT.

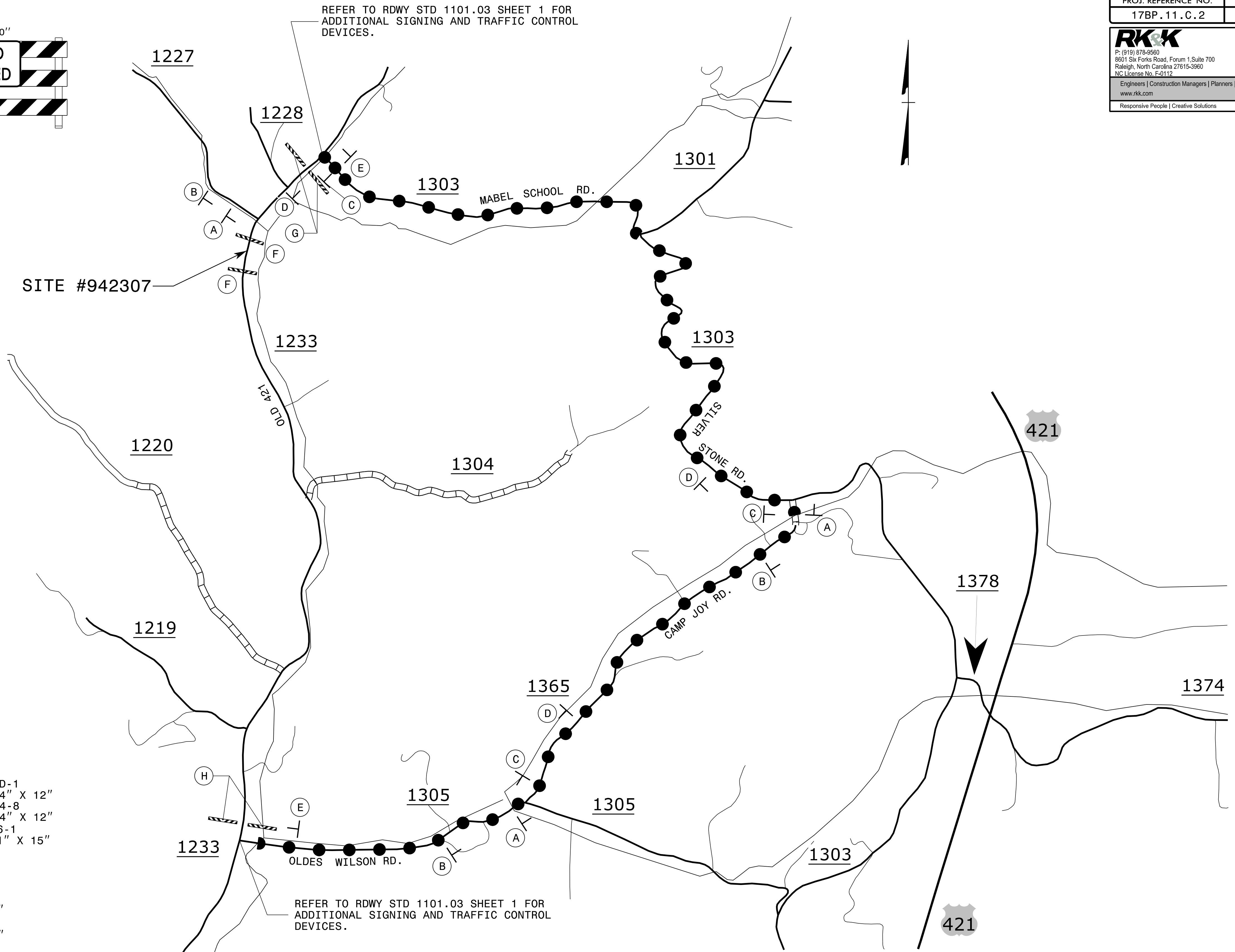
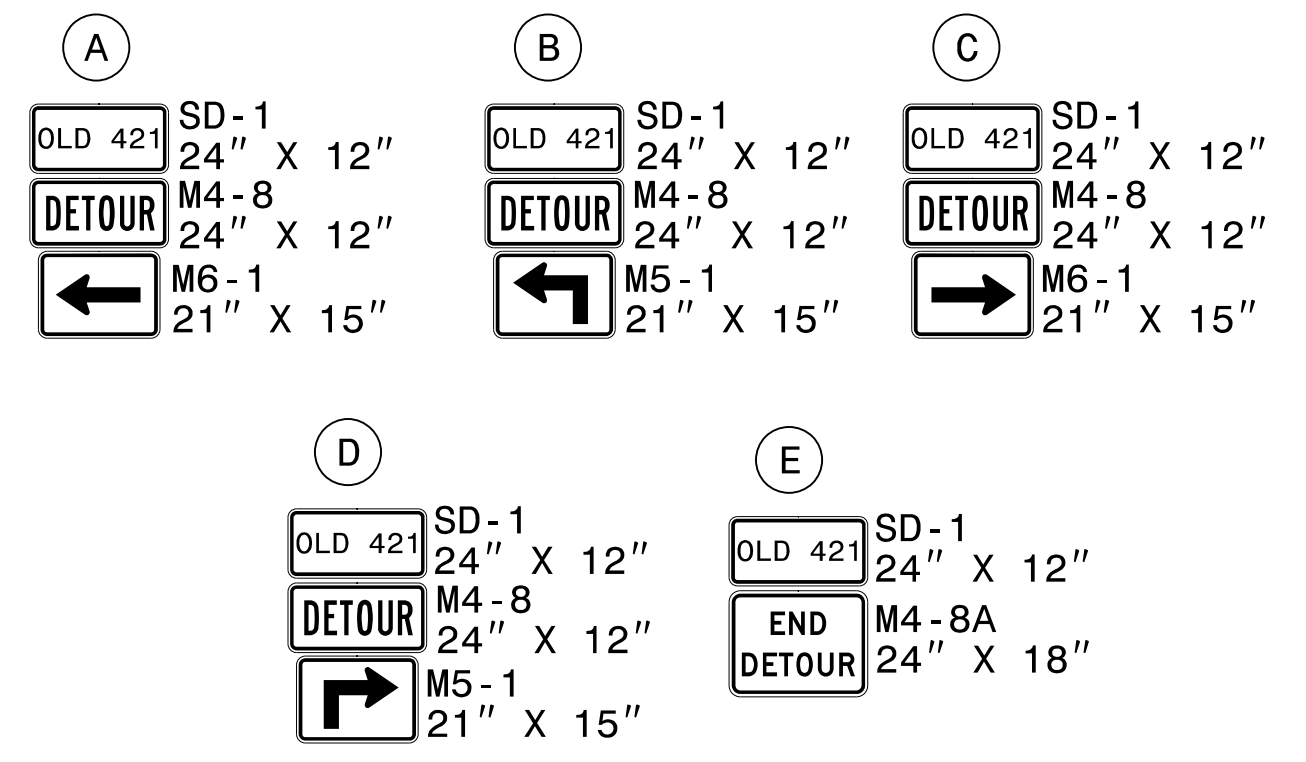
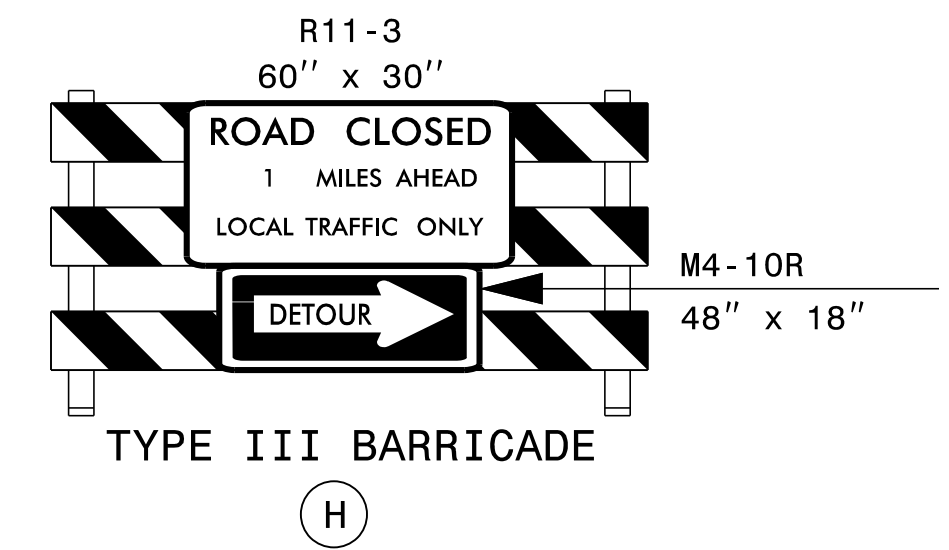
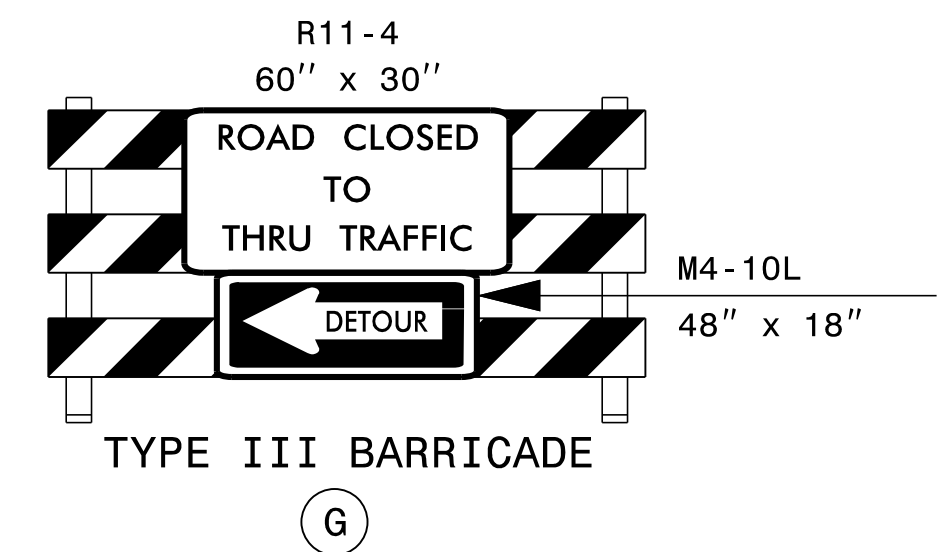
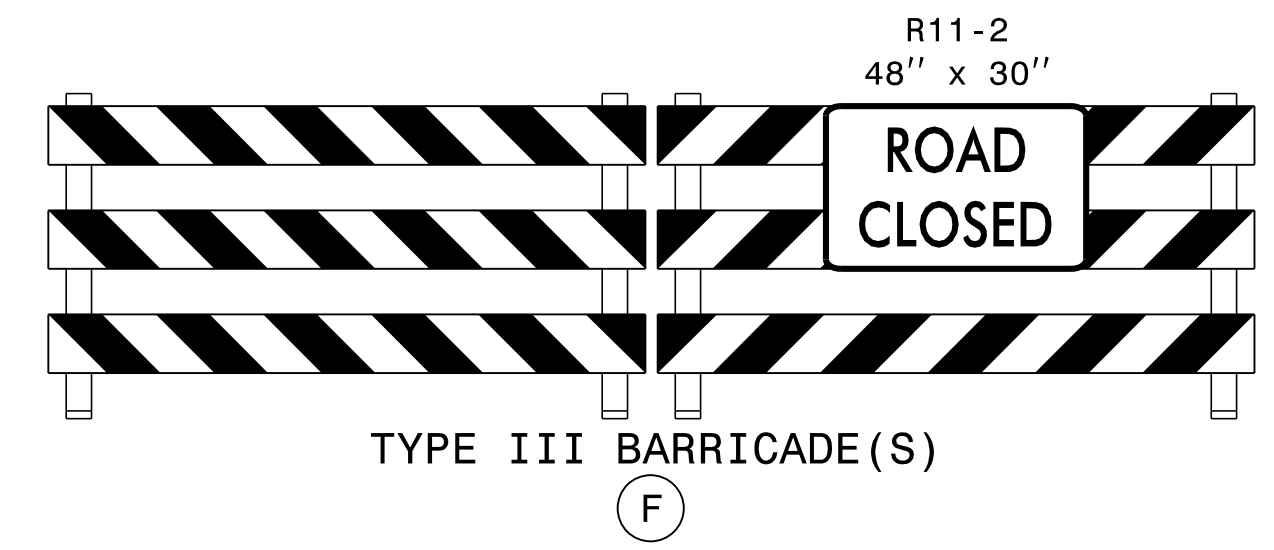
DRIVEN PILING FOR TEMPORARY SHORING FROM -L- STA 12+81±, 13.4 FT RT TO STATION -Y- STA 10+69±, 45.5 FT RT, MAY NOT PENETRATE BELOW ELEVATION 2919.0 FT DUE TO VERY DENSE OR HARD SOIL, BOULDERS OR WEATHERED OR HARD ROCK.

IT MAY BE PREFERRED TO USE A TEMPORARY SOIL NAIL WALL FOR TEMPORARY SHORING FROM STATION -L- STA 12+81±, 13.4 FT RT TO STATION -Y- STA 10+69±, 45.5 FT RT. FOR TEMPORARY SOIL NAIL WALLS, SEE TEMPORARY SOIL NAIL WALLS PROVISION.

DO NOT USE A TEMPORARY WALL FOR TEMPORARY SHORING FROM STATION -L- STA 12+81±, 13.4 FT RT TO STATION -Y- STA 10+69±, 45.5 FT RT.

7/12/2023
942507-TMP-FSH02A.dgn
R015BY

APPROVED:  DATE: 7/12/2023 		TEMPORARY SHORING DATA
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		

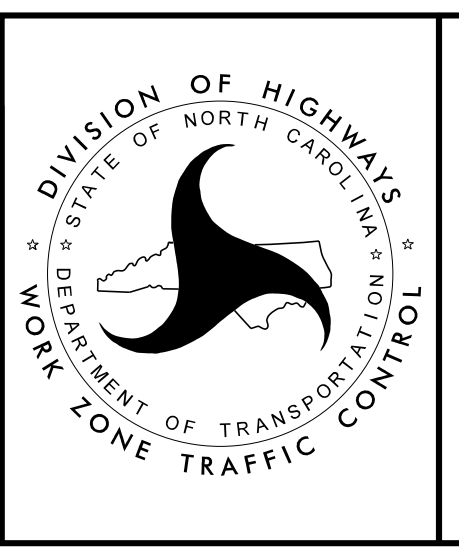


SEE TMP-3 FOR SIGN DESIGN.

APPROVED: *Kevin Bisby*
 DATE: 7/12/2023

SEAL

DOCUMENT NOT CONSIDERED FINAL
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DIVISION OF HIGHWAYS
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 WORK ZONE TRAFFIC CONTROL

OFFSITE DETOUR DETAIL

TRAFFIC CONTROL PHASING

PROJ. REFERENCE NO.	SHEET NO.
17BP.11.C.2	TMP-3

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PHASE I

STEP 1:
ERECT WORK ZONE ADVANCE WARNING SIGNS IN ACCORDANCE WITH RDWY STD 1101.01.

STEP 2:
USING RDWY STD 1101.02 AND 1101.03, CLOSE SR 1233 (OLD US 421) AND CONSTRUCT CULVERT 942307.
(SEE TMP-2B, 2C AND 4)

PHASE II

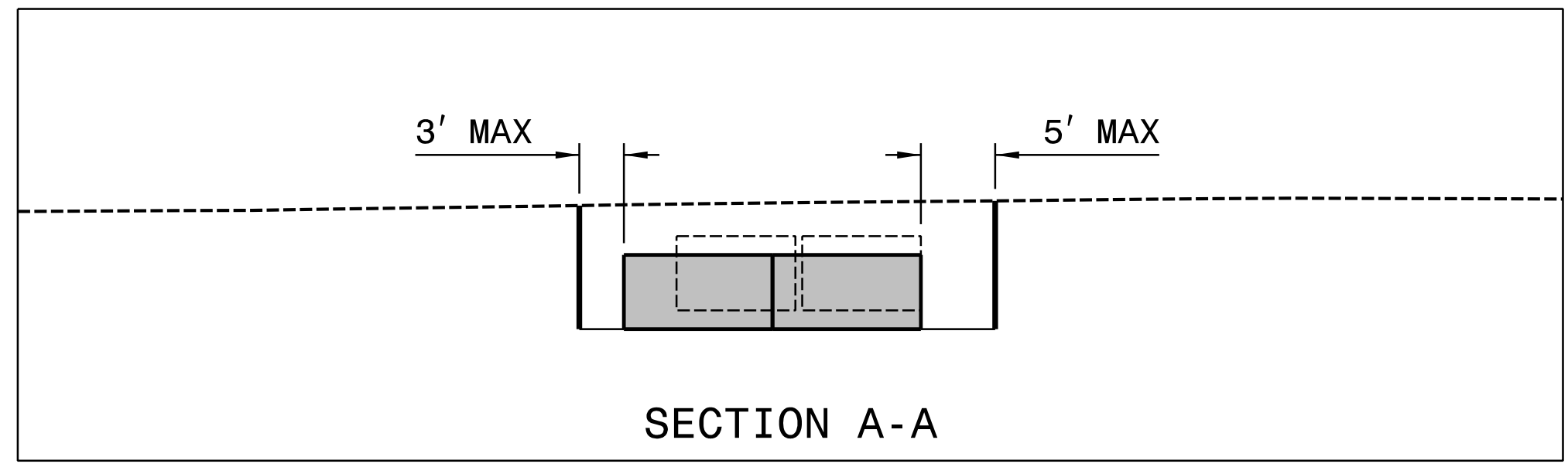
STEP 1:
USING RDWY STD 1101.02, REMOVE THE OFFSITE DETOUR AND RETURN TRAFFIC TO ITS ORIGINAL PATTERN. RE-APPLY PAVEMENT MARKINGS AS SHOWN ON TMP-5.

STEP 2:
USING RDWY STD 1101.02, CONSTRUCT -L- SR 1233 (OLD US 421) AND -Y- SR 1227 (N FORK RD) EXCLUDING THE FINAL LAYER OF SURFACE COURSE. (SEE TMP-5)

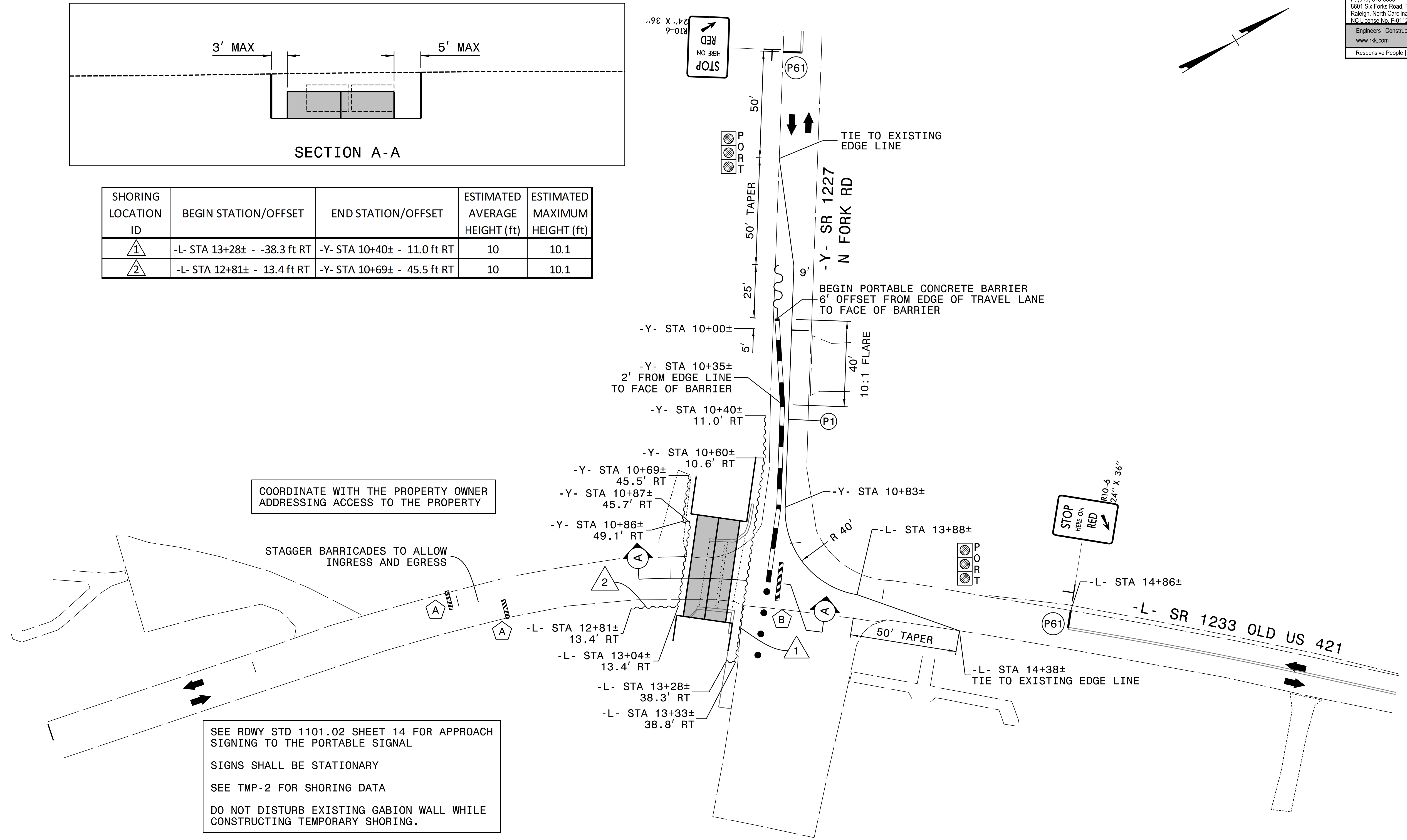
STEP 3:
USING RDWY STD 1101.03, PAVE THE FINAL LAYER OF SURFACE COURSE AND APPLY FINAL PAVEMENT MARKINGS.

7/12/2023
 942307-TMP-PSH03.dgn
 R01sby

APPROVED: DATE: 7/12/2023	SEAL 		TEMPORARY TRAFFIC CONTROL PHASING
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			



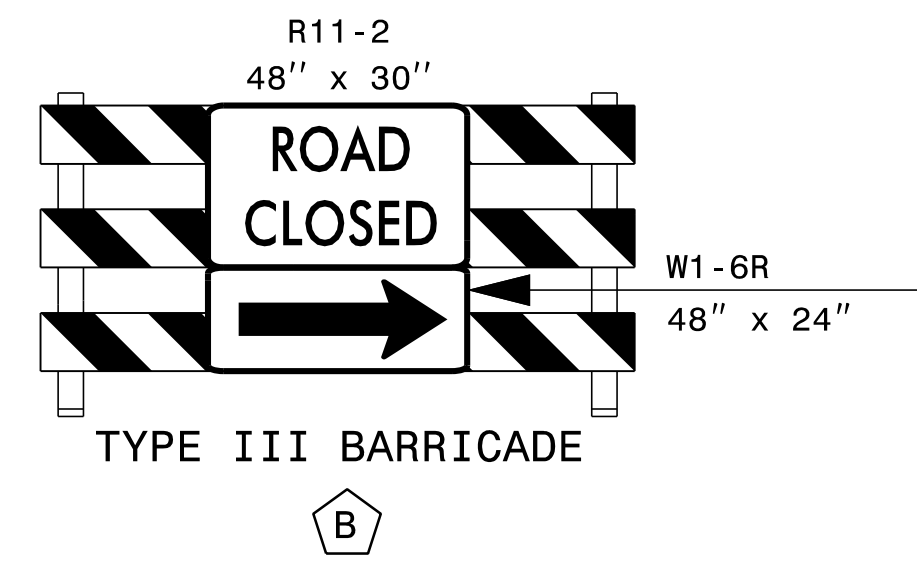
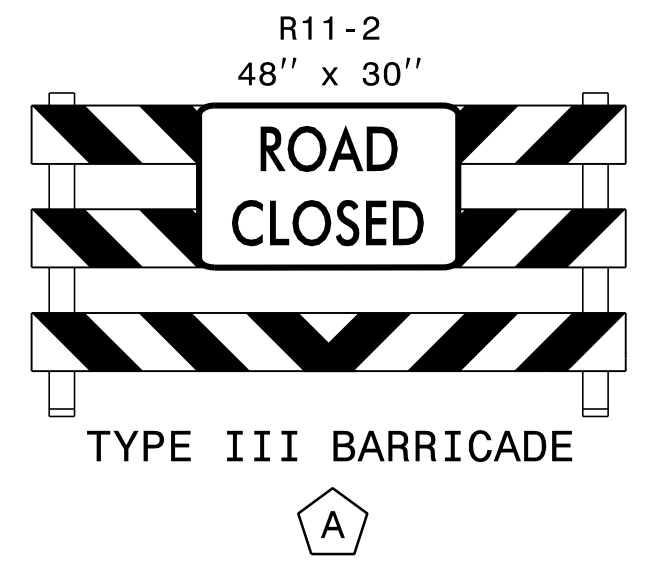
SHORING LOCATION ID	BEGIN STATION/OFFSET	END STATION/OFFSET	ESTIMATED AVERAGE HEIGHT (ft)	ESTIMATED MAXIMUM HEIGHT (ft)
1	-L- STA 13+28± - 38.3 ft RT	-Y- STA 10+40± - 11.0 ft RT	10	10.1
2	-L- STA 12+81± - 13.4 ft RT	-Y- STA 10+69± - 45.5 ft RT	10	10.1



COORDINATE WITH THE PROPERTY OWNER ADDRESSING ACCESS TO THE PROPERTY

STAGGER BARRICADES TO ALLOW INGRESS AND EGRESS

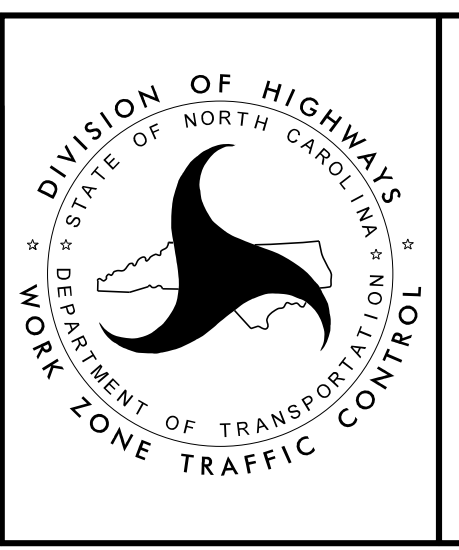
SEE RDWY STD 1101.02 SHEET 14 FOR APPROACH SIGNING TO THE PORTABLE SIGNAL
 SIGNS SHALL BE STATIONARY
 SEE TMP-2 FOR SHORING DATA
 DO NOT DISTURB EXISTING GABION WALL WHILE CONSTRUCTING TEMPORARY SHORING.



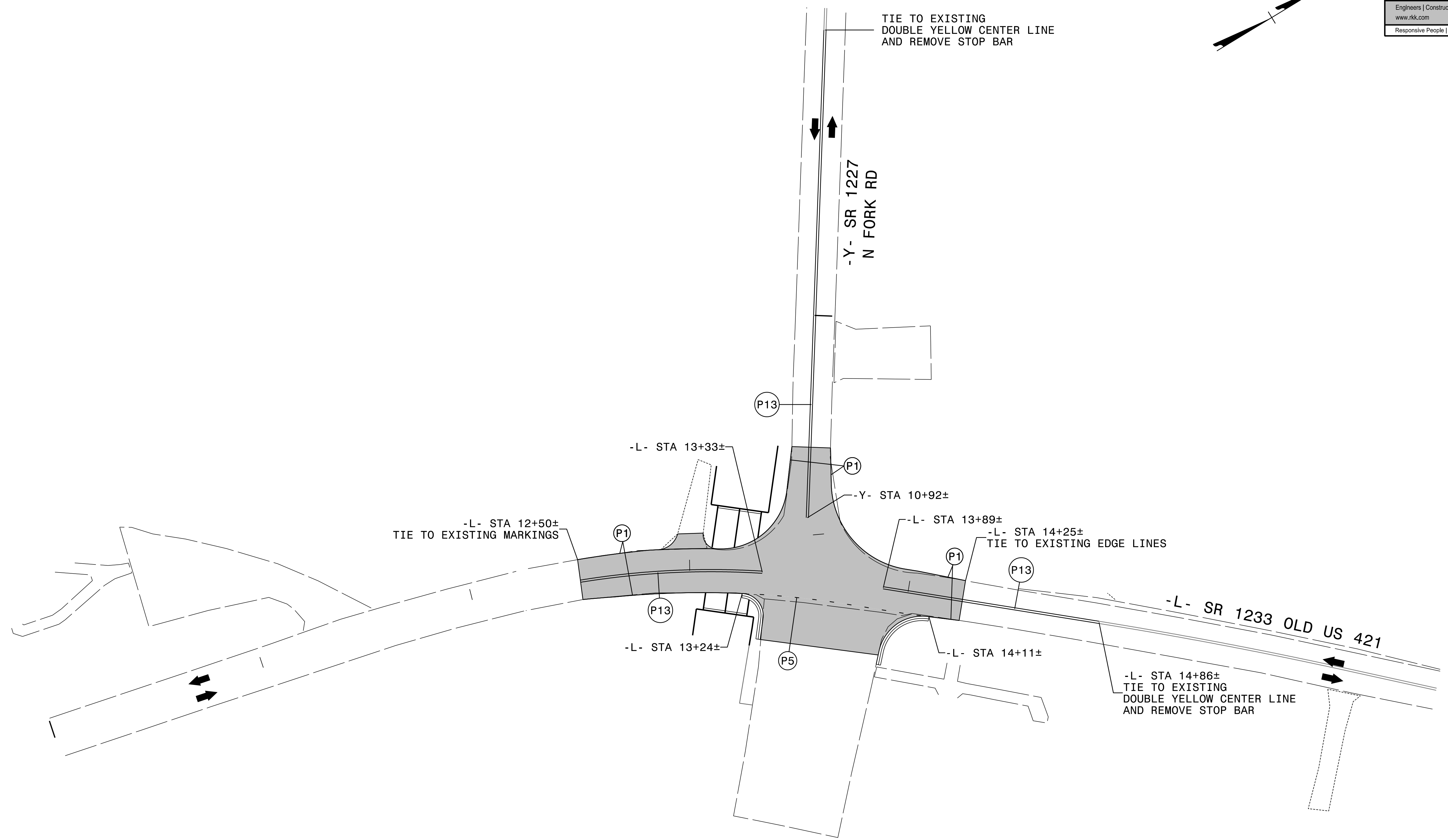
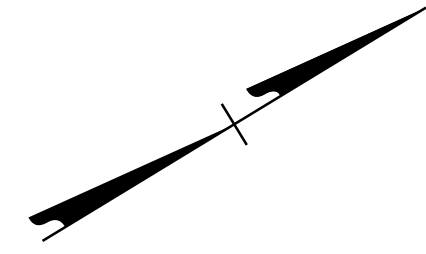
APPROVED: *Kevin Bisby*
 DATE: 7/12/2023

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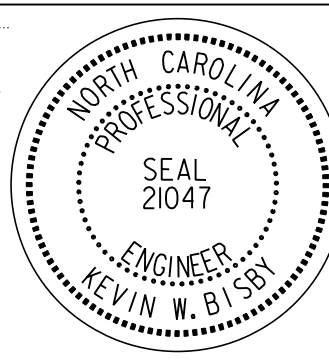
PHASE I DETAIL



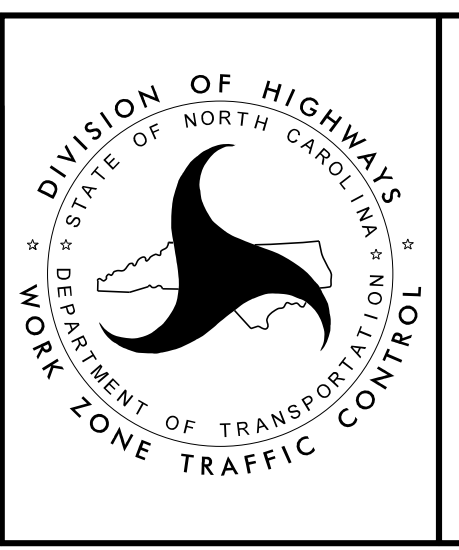
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 Rolsby

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 DATE: 7/12/2023

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PHASE II DETAIL

PROJECT: 17BP.11.C.2

**STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION**

**PAVEMENT MARKING PLAN
WATAUGA COUNTY**

PROJECT 17BP.11.C.2	SHEET NO. PMP-1
<small>DocuSigned by:</small> <small>BD0802E28912472</small>	
APPROVED: _____	
DATE: 7/12/2023	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

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
1205.04	PAVEMENT MARKINGS - INTERSECTIONS

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
OLD US 421 (-L-)	PAINT	NONE
NORTH FORK RD (-Y-)	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 AND MARKERS.

INDEX

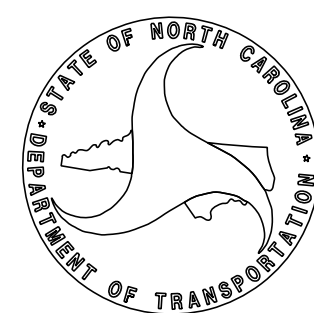
SHEET NO.	DESCRIPTION
PMP-1	PAVEMENT MARKING PLAN TITLE AND SCHEDULE SHEET
PMP-2	PAVEMENT MARKING DETAIL

PAVEMENT MARKING SCHEDULE

- P1 - 4" WHITE EDGE LINE, PAINT
- P5 - 4" 2'-6"/SP WHITE MINI-SKIP LINE, PAINT
- P13 - 4" DOUBLE YELLOW CENTER LINE, PAINT

NCDOT CONTACT

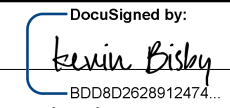

ROB N. WEISZ, PE DIVISION BRIDGE PROGRAM MANAGER

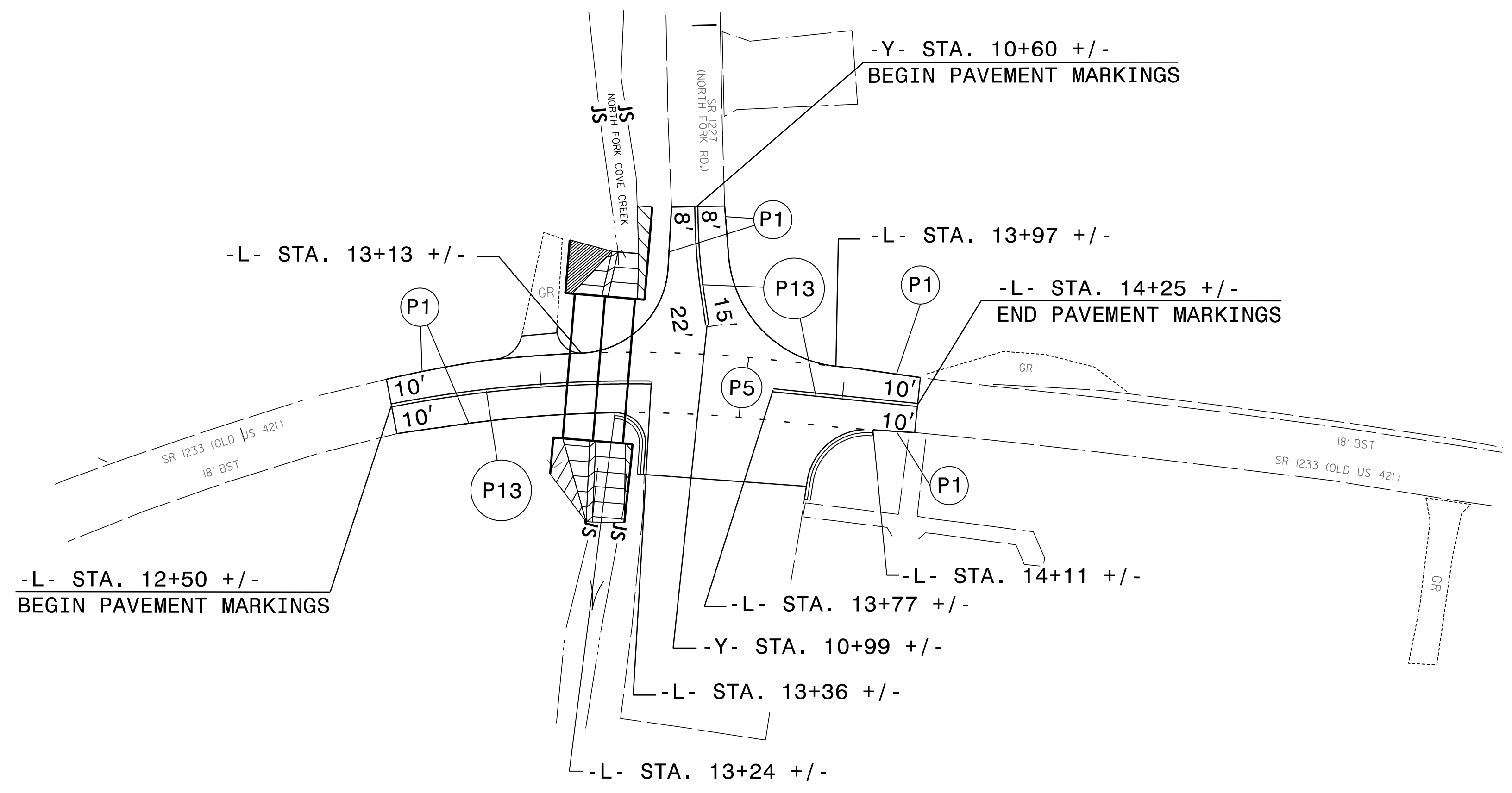
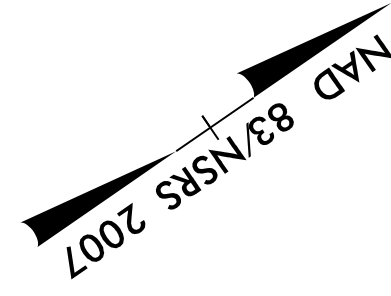


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PROJECT	SHEET NO.
17BP.11.C.2	PMP-2
APPROVED: 	DocuSigned by: Kevin B. Sisk 800802828912474
DATE: 7/12/2023	
SEAL	
	
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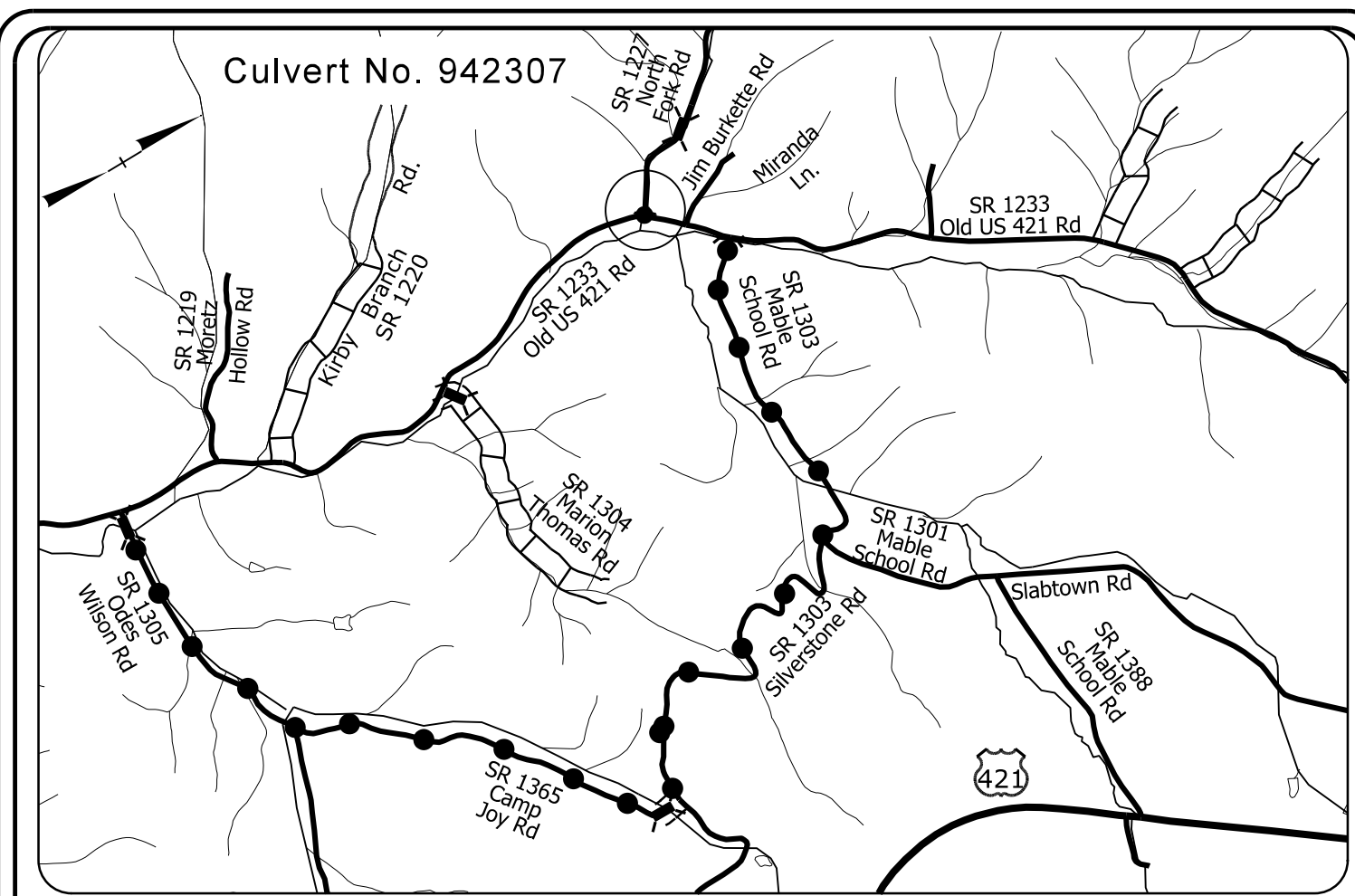


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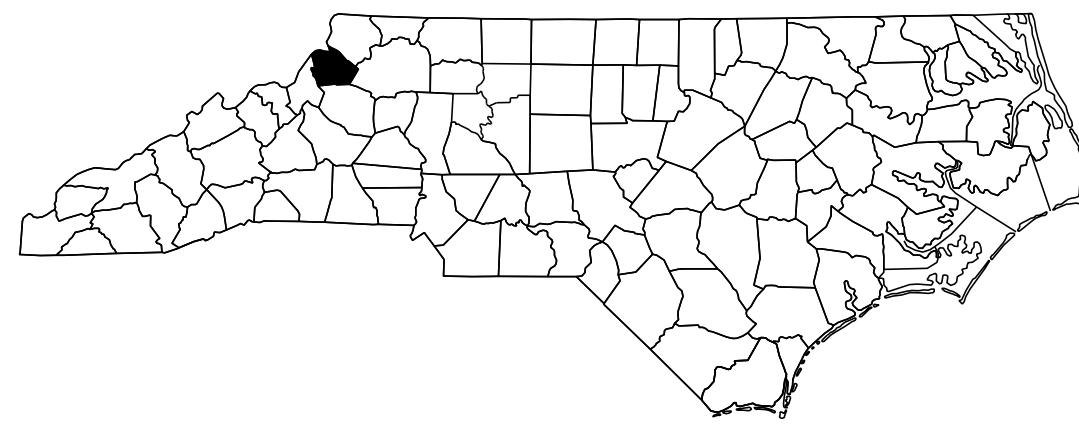
PAVEMENT MARKING DETAIL

TIP PROJECT: 17BP.11.C.2



VICINITY MAP See Sheet 1-A For Index of Sheets
OFFSITE DETOUR See Sheet 1-B For Conventional Symbols

VICINITY MAP
NOT TO SCALE



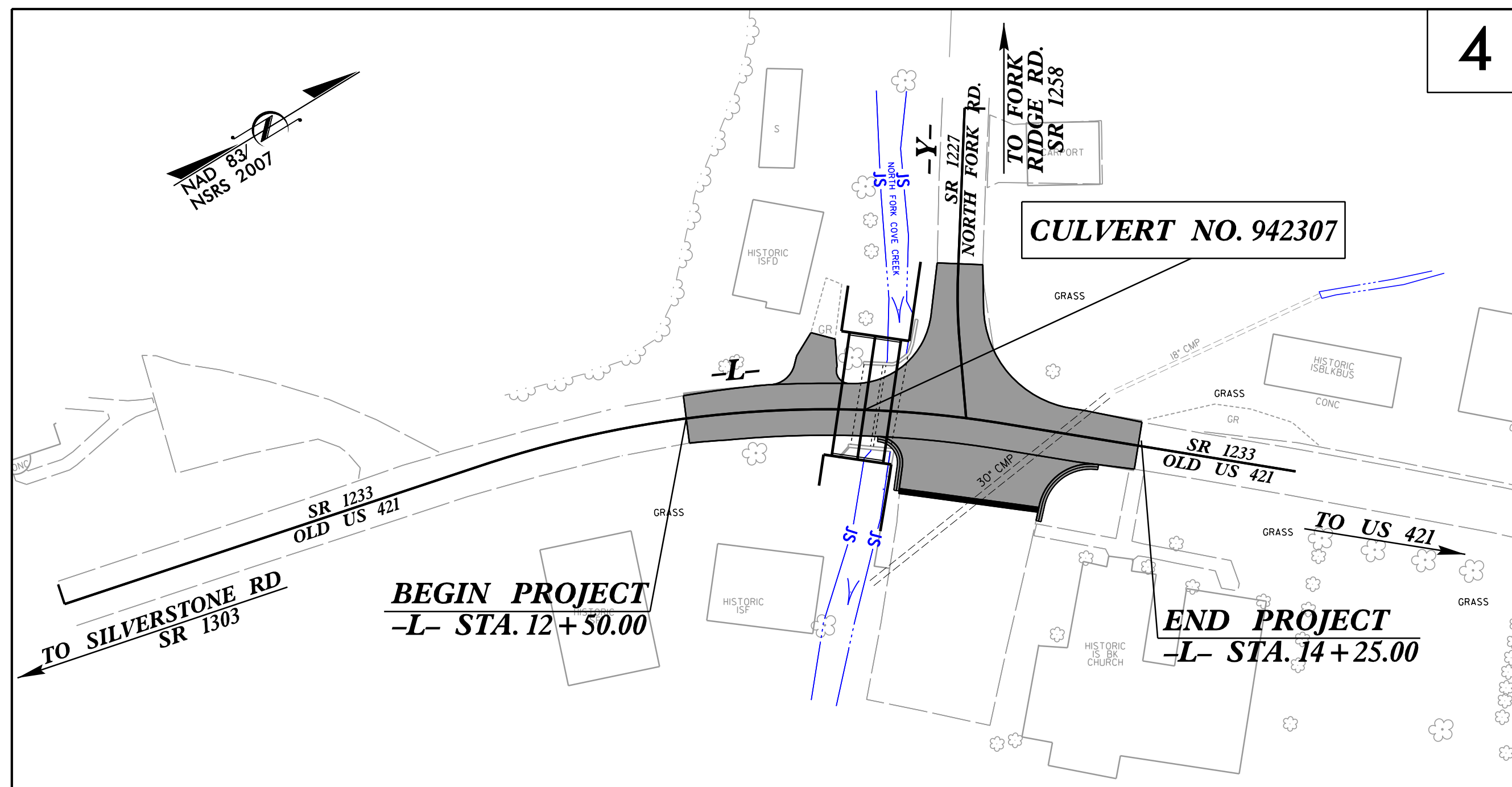
- Clearing and Grubbing Phase
- Final Phase
- Both Phases

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

WATAUGA COUNTY

LOCATION: REPLACEMENT OF CULVERT NO. 942307 ON OLD US 421 OVER NORTH FORK COVE CREEK

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



EROSION AND SEDIMENT CONTROL MEASURES

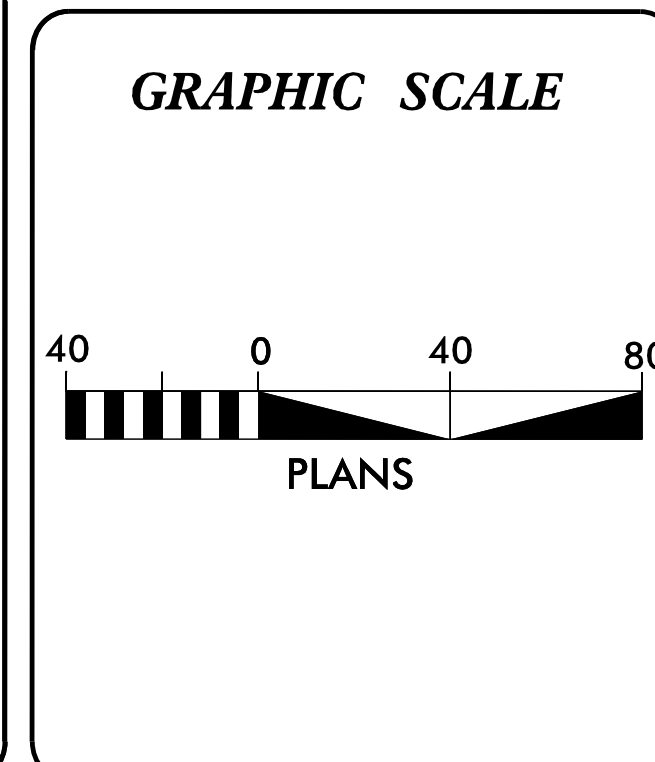
Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	[Symbol]
1630.05	Temporary Diversion	[Symbol]
1605.01	Temporary Silt Fence	[Symbol]
1606.01	Special Sediment Control Fence	[Symbol]
1622.01	Temporary Berms and Slope Drains	[Symbol]
1630.02	Silt Basin Type B	[Symbol]
1633.01	Temporary Rock Silt Check Type-A	[Symbol]
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	[Symbol]
1633.02	Temporary Rock Silt Check Type-B	[Symbol]
	Wattle/Coir Fiber Wattle	[Symbol]
	Wattle/Coir Fiber Wattle with Polyacrylamide (PAM)	[Symbol]
1634.01	Temporary Rock Sediment Dam Type-A	[Symbol]
1634.02	Temporary Rock Sediment Dam Type-B	[Symbol]
1635.01	Rock Pipe Inlet Sediment Trap Type-A	[Symbol]
1635.02	Rock Pipe Inlet Sediment Trap Type-B	[Symbol]
1630.04	Stilling Basin	[Symbol]
1630.06	Special Stilling Basin	[Symbol]
	Rock Inlet Sediment Trap:	
1632.01	Type A	[Symbol]
1632.02	Type B	[Symbol]
1632.03	Type C	[Symbol]
	Skimmer Basin	[Symbol]
	Tiered Skimmer Basin	[Symbol]
	Infiltration Basin	[Symbol]

THIS PROJECT CONTAINS EROSION CONTROL PLANS FOR CLEARING AND GRUBBING PHASE OF CONSTRUCTION.

THIS PROJECT HAS BEEN DESIGNED TO SENSITIVE WATERSHED STANDARDS.

ENVIRONMENTALLY SENSITIVE AREA(S) EXIST ON THIS PROJECT

Refer To E. C. Special Provisions for Special Considerations.



THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE APRIL 1, 2019 AND ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY DIVISION OF WATER RESOURCES.

Prepared in the Office of:

RUMMEL, KLEPPER & KAHL, LLP
8601 SIX FORKS ROAD, FORUM 1, SUITE 700
RALEIGH, NORTH CAROLINA 27615-3960
NC LICENSE NO. F-0112
919-878-9560

Designed by:
Doug Keller, P.E. 3396
NAME LEVEL III CERTIFICATION NO.

Reviewed in the Office of:

ROADSIDE ENVIRONMENTAL UNIT
1 South Wilmington St.
Raleigh, NC 27611

2018 STANDARD SPECIFICATIONS

Reviewed by:
Jeremy Goodwin

Roadway Standard Drawings

The following roadway english standards as appear in "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2018 and the latest revision thereto are applicable to this project and by reference hereby are considered a part of these plans.

1604.01	Railroad Erosion Control Detail	1632.01	Rock Inlet Sediment Trap Type A
1605.01	Temporary Silt Fence	1632.02	Rock Inlet Sediment Trap Type B
1606.01	Special Sediment Control Fence	1632.03	Rock Inlet Sediment Trap Type C
1607.01	Gravel Construction Entrance	1633.01	Temporary Rock Silt Check Type A
1622.01	Temporary Berms and Slope Drains	1633.02	Temporary Rock Silt Check Type B
1630.01	Riser Basin	1634.01	Temporary Rock Sediment Dam Type A
1630.02	Silt Basin Type 1	1634.02	Temporary Rock Sediment Dam Type B
1630.03	Temporary Silt Ditch	1635.01	Rock Pipe Inlet Sediment Trap Type A
1630.04	Stilling Basin	1635.02	Rock Pipe Inlet Sediment Trap Type B
1630.05	Temporary Diversion	1640.01	Coir Fiber Wattle
1630.06	Special Stilling Basin	1645.01	Temporary Stream Crossing
1631.01	Matting Installation		

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

PROJECT REFERENCE NO.	SHEET NO.
17BPJIC.2	EC-3
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	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES 3:1 OR FLATTER	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH.
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	NONE, EXCEPT FOR PERIMETERS AND HQW ZONES.

EROSION CONTROL PLAN

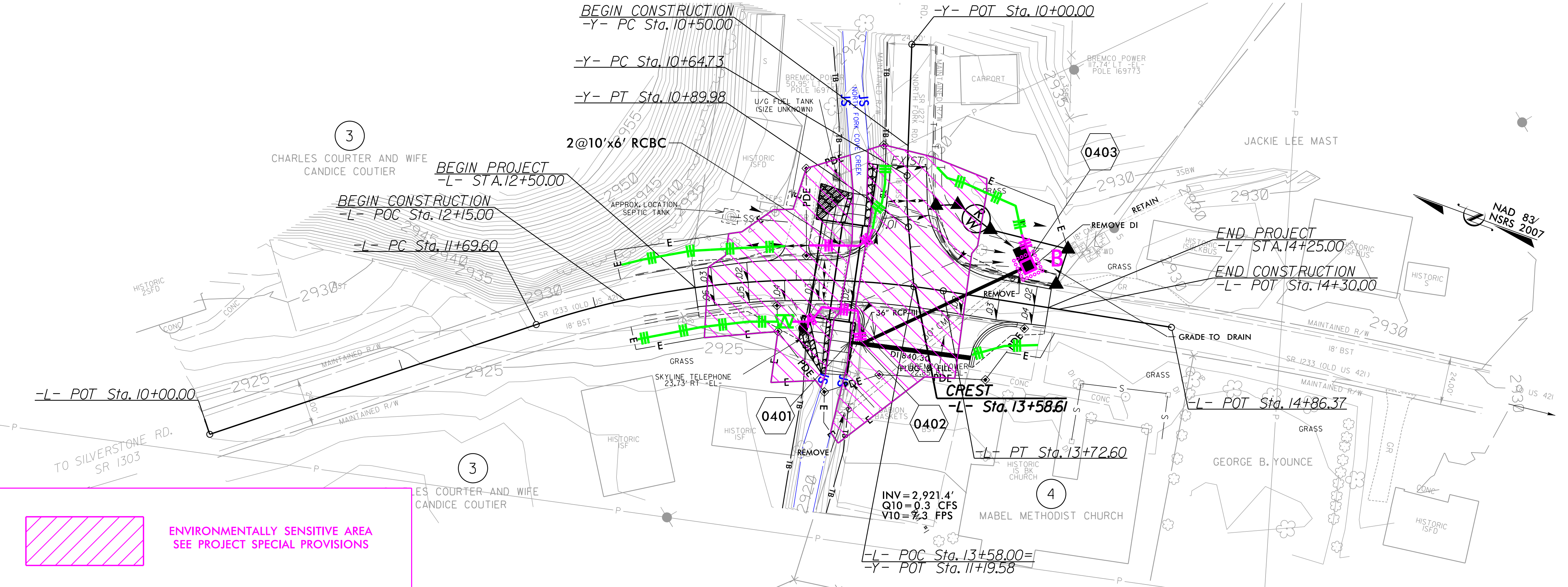
PROJECT REFERENCE NO. 17BP/JIC.2	SHEET NO. EC-4/CONST.04
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

GRAPHIC SCALES

30 0 30 60
PLANS

30 0 30 60
PROFILE (HORIZONTAL)

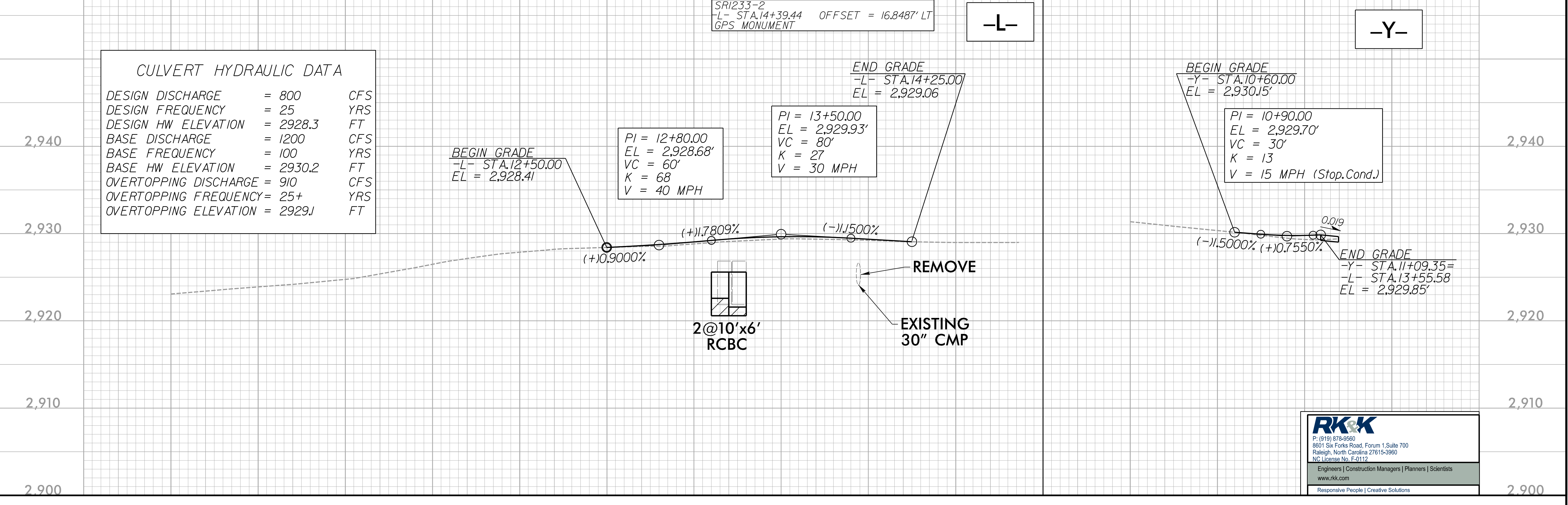
10 0 10 20
PROFILE (VERTICAL)



ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 800	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 2928.3	FT
BASE DISCHARGE	= 1200	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 2930.2	FT
OVERTOPPING DISCHARGE	= 910	CFS
OVERTOPPING FREQUENCY	= 25+	YRS
OVERTOPPING ELEVATION	= 2929J	FT



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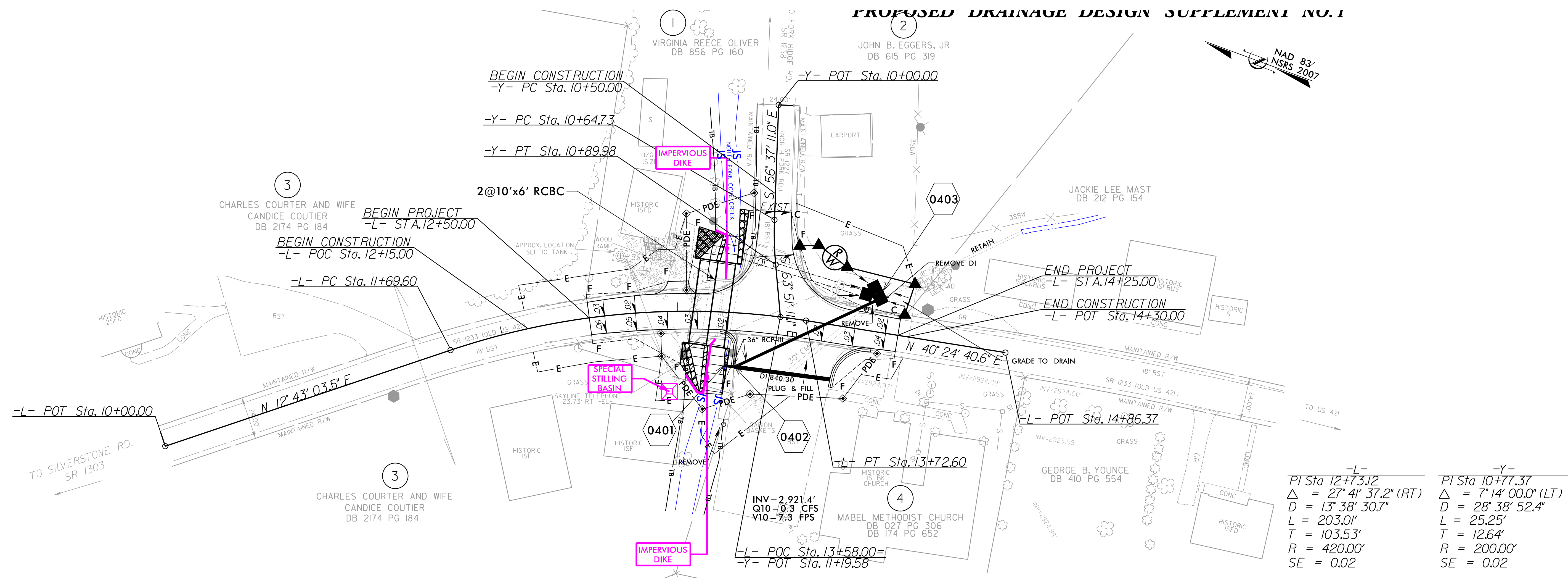
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PROJECT REFERENCE NO.	SHEET NO.
17BPJIC.2	EC-4A/CONST.04
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CULVERT CONSTRUCTION SEQUENCE STA. 13+19 -L-

PHASE 1

1. INSTALL SPECIAL STILLING BASIN AT DOWNSTREAM END OF THE WORK AREA AS SHOWN IN PLAN VIEW.
2. CONSTRUCT AN IMPERVIOUS DIKE IN THE EXISTING CHANNEL AT THE UPSTREAM SIDE TO DIVERT THE FLOW INTO THE SOUTH BARREL OF EXISTING CULVERT.
3. CONSTRUCT AN IMPERVIOUS DIKE IN THE EXISTING CHANNEL AT THE DOWNSTREAM SIDE TO ISOLATE THE WORK AREA.
4. EXCAVATE AND REMOVE NORTH BARREL OF EXISTING CULVERT.
5. CONSTRUCT NORTH BARREL OF PROPOSED CULVERT AND CHANNEL IMPROVEMENTS AT BOTH ENDS OF THE NORTH BARREL OF THE PROPOSED CULVERT. STABILIZE NEW CHANNEL IMPROVEMENTS.
6. UPON COMPLETION OF CONSTRUCTION OF THE NORTH BARREL OF THE PROPOSED CULVERT AND ASSOCIATED CHANNEL IMPROVEMENTS, REMOVE THE IMPERVIOUS DIKES AND DIVERT FLOW THROUGH NEWLY CONSTRUCTED NORTH BARREL.



-L-	-Y-
PI Sta 12+73.12	PI Sta 10+77.37
$\Delta = 27^\circ 41' 37.2''$ (RT)	$\Delta = 7^\circ 14' 00.0''$ (LT)
D = 13' 38' 30.7"	D = 28' 38' 52.4"
L = 203.01'	L = 25.25'
T = 103.53'	T = 12.64'
R = 420.00'	R = 200.00'
SE = 0.02	SE = 0.02

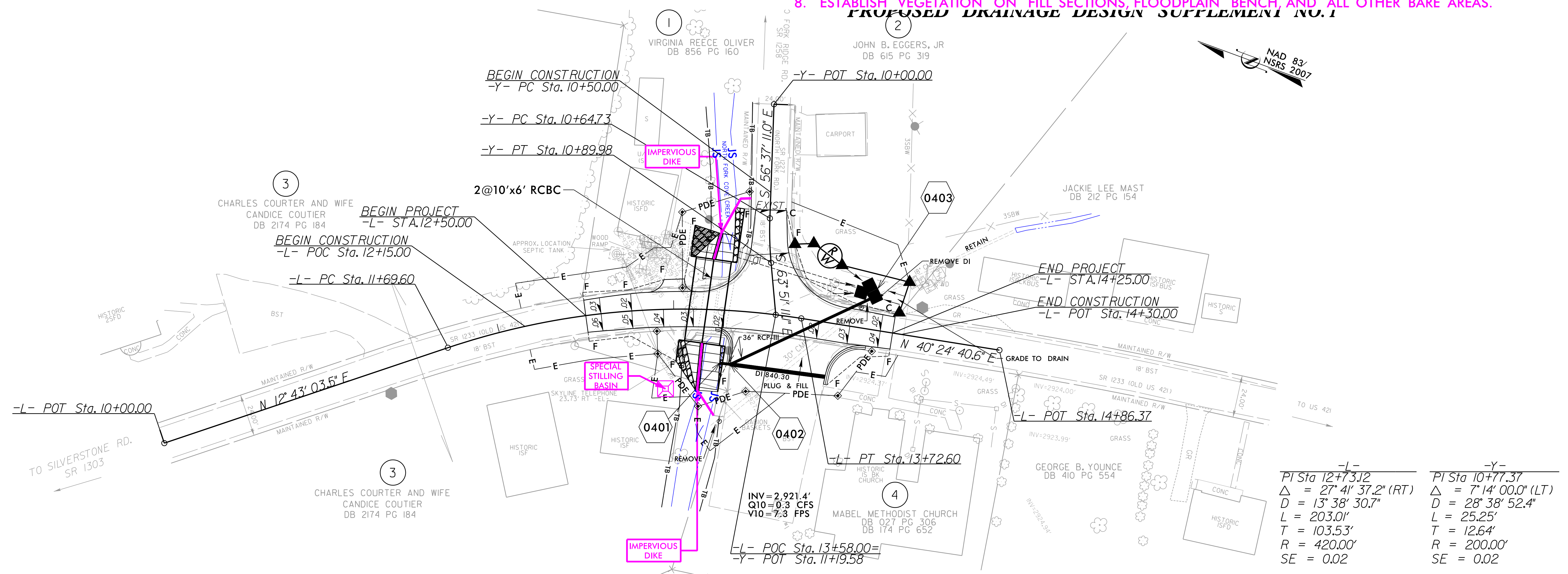
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PROJECT REFERENCE NO.	SHEET NO.
17BPJIC.2	EC-4B/CONST.04
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CULVERT CONSTRUCTION SEQUENCE STA. 13+19 -L-

PHASE 2

1. INSTALL SPECIAL STILLING BASIN AT DOWNSTREAM END OF THE WORK AREA AS SHOWN IN PLAN VIEW.
2. CONSTRUCT AN IMPERVIOUS DIKE IN THE EXISTING CHANNEL AT THE UPSTREAM SIDE TO DIVERT THE FLOW INTO THE NORTH BARREL OF EXISTING CULVERT.
3. CONSTRUCT AN IMPERVIOUS DIKE IN THE EXISTING CHANNEL AT THE DOWNSTREAM SIDE TO ISOLATE THE WORK AREA.
4. REMOVE SOUTH BARREL OF EXISTING CULVERT.
5. CONSTRUCT SOUTH BARREL OF PROPOSED CULVERT AND CHANNEL IMPROVEMENTS AT BOTH ENDS OF THE SOUTH BARREL OF THE PROPOSED CULVERT. STABILIZE NEW CHANNEL IMPROVEMENTS.
6. UPON COMPLETION OF CONSTRUCTION OF THE SOUTH BARREL OF THE PROPOSED CULVERT AND ASSOCIATED CHANNEL IMPROVEMENTS, REMOVE THE IMPERVIOUS DIKES AND DIVERT FLOW THROUGH NEWLY CONSTRUCTED SOUTH BARREL.
7. CONSTRUCT -L- ROADWAY AND EMBANKMENTS.
8. ESTABLISH VEGETATION ON FILL SECTIONS, FLOODPLAIN BENCH, AND ALL OTHER BARE AREAS.

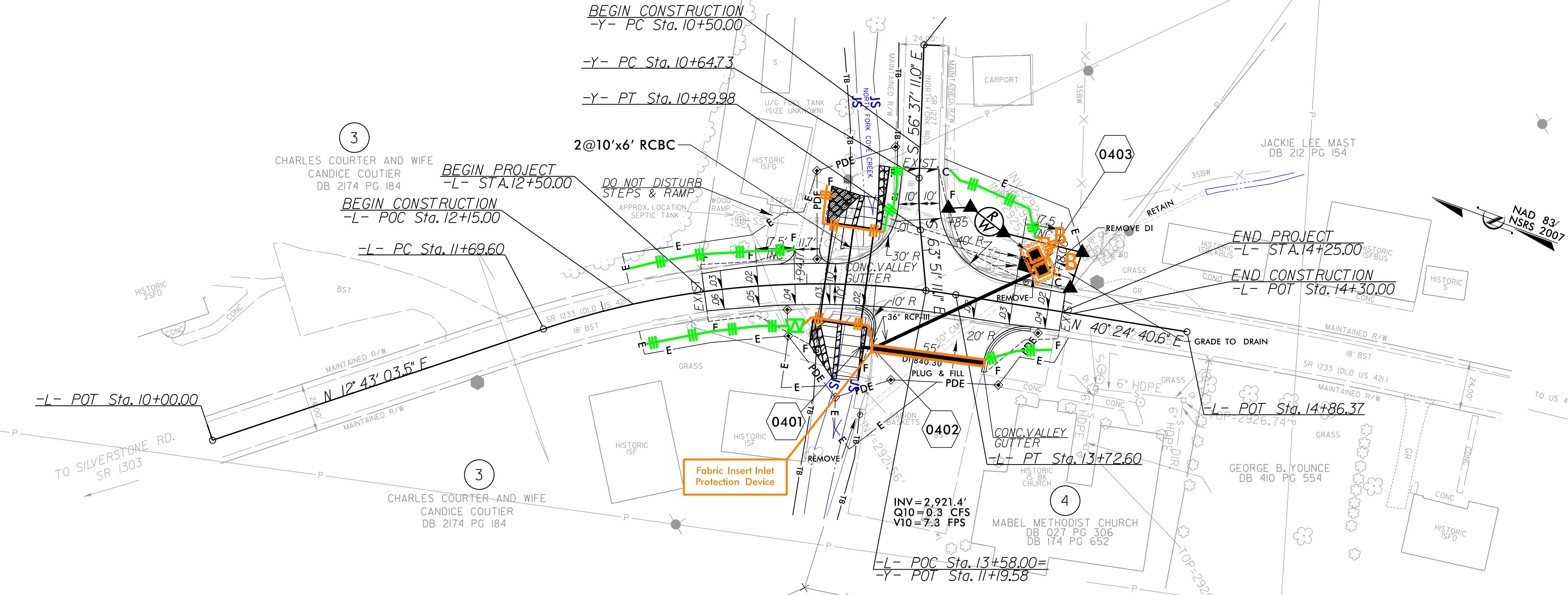
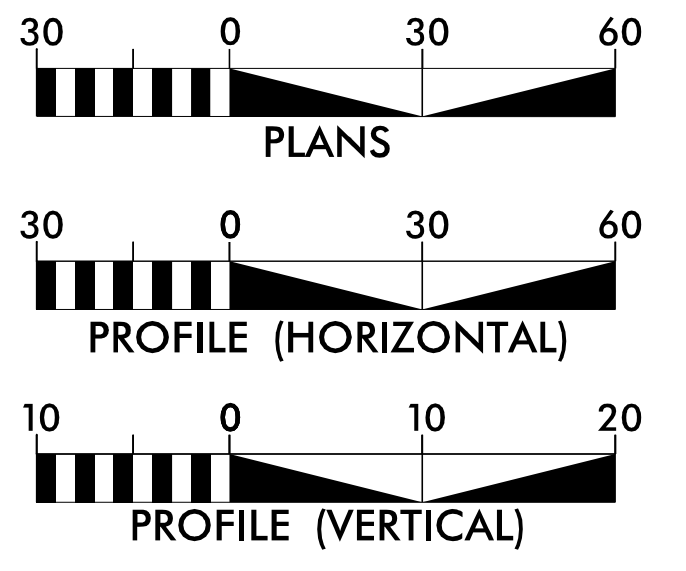


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EROSION CONTROL PLAN

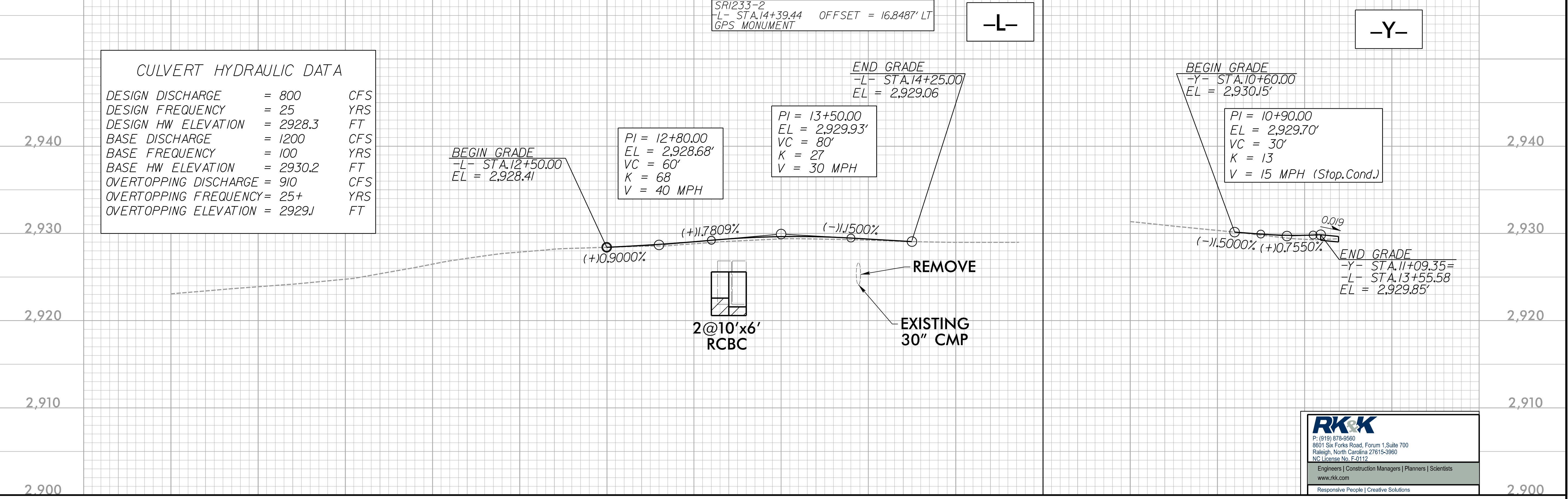
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RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

GRAPHIC SCALES



RFC
RELEASED FOR CONSTRUCTION

DESIGN DISCHARGE	= 800	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 2928.3	FT
BASE DISCHARGE	= 1200	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 2930.2	FT
OVERTOPPING DISCHARGE	= 910	CFS
OVERTOPPING FREQUENCY	= 25+	YRS
OVERTOPPING ELEVATION	= 2929J	FT



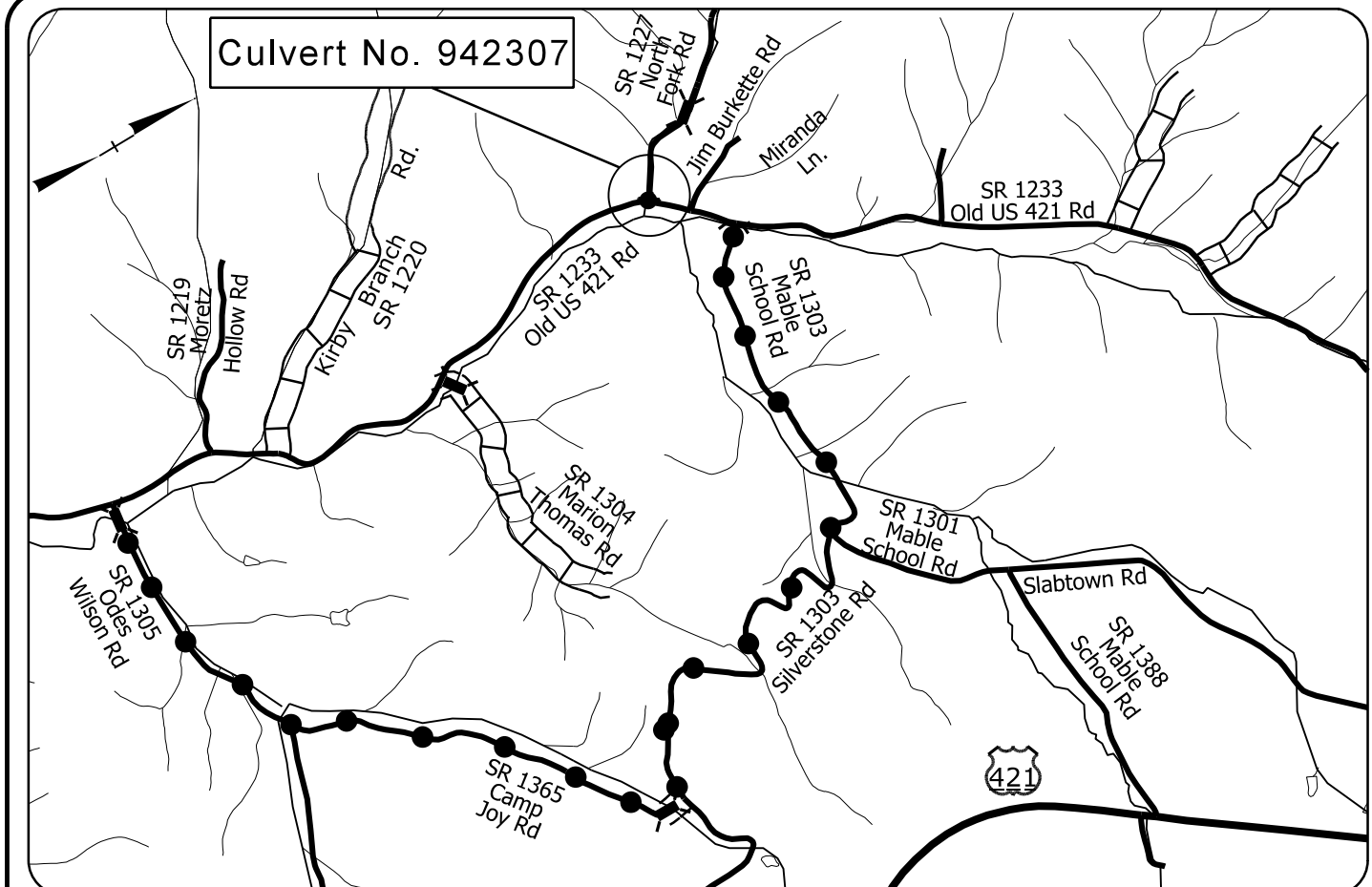
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CONTRACT: PROJECT: 17BP.11.C.2



VICINITY MAP
● OFFSITE DETOUR

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

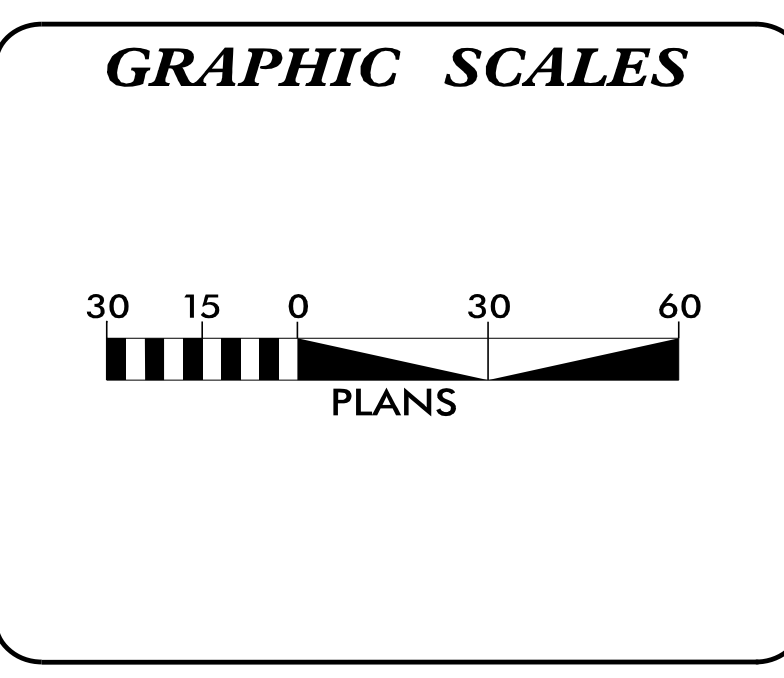
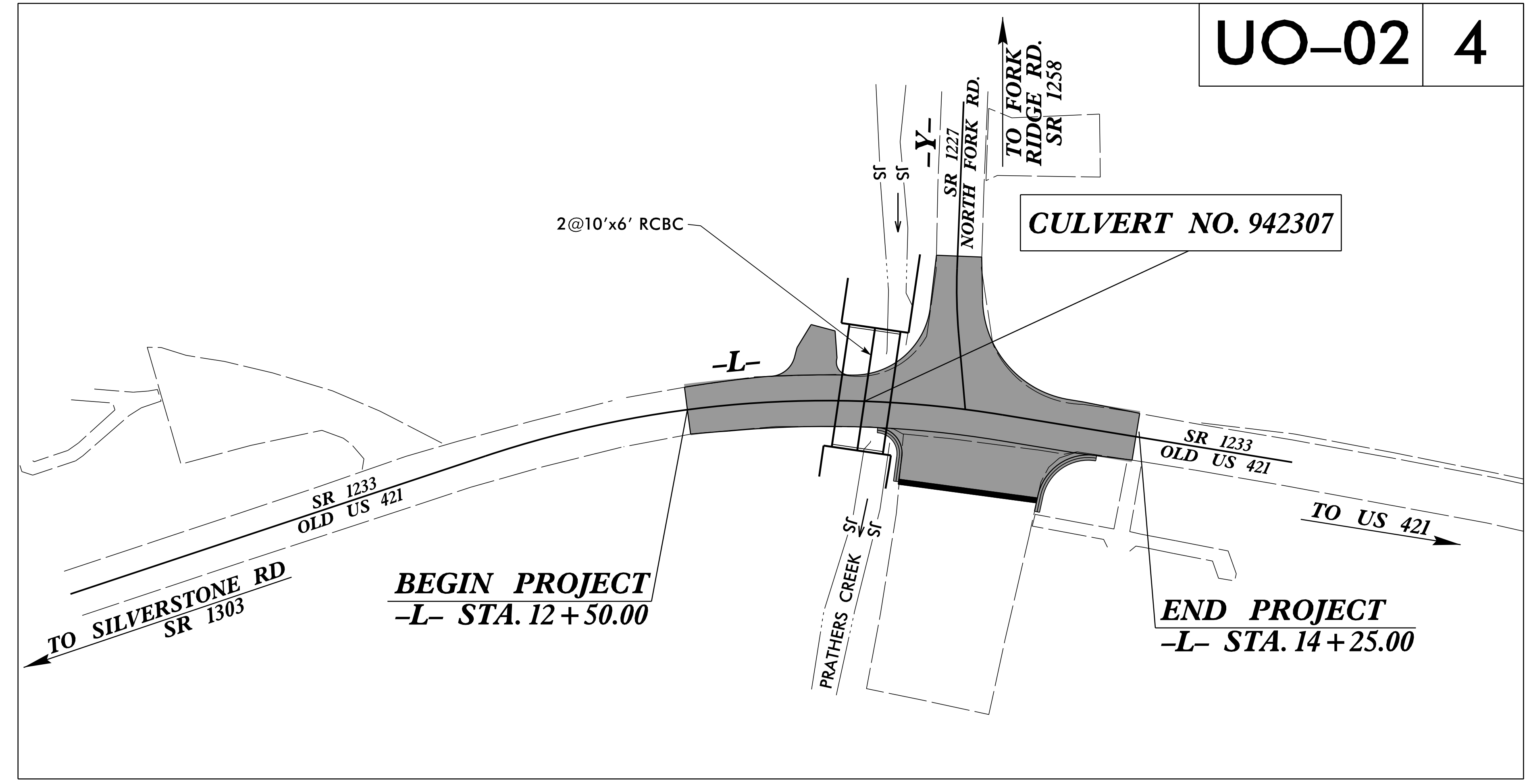
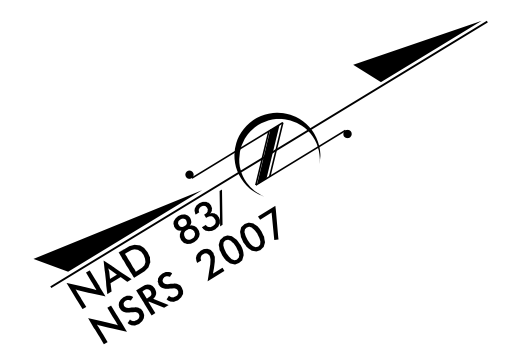
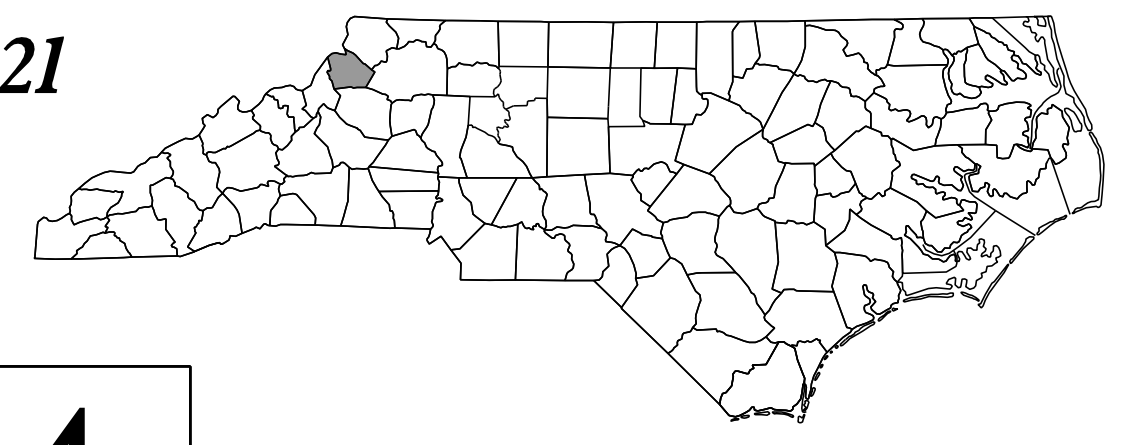
**UTILITIES BY OTHERS PLANS
WATAUGA COUNTY**

**LOCATION: REPLACEMENT OF CULVERT NO. 942307 ON OLD 421
OVER NORTH FORK COVE CREEK**

TYPE OF WORK: UTILITIES

T.I.P. NO.	SHEET NO.
CULVERT 942307	UO-1

NOTE:
ALL UTILITY WORK SHOWN ON THIS SHEET IS DONE BY OTHERS.
NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR UTILITY WORK SHOWN ON THIS SHEET.



INDEX OF SHEETS

SHEET NO.:	DESCRIPTION:
UO-1	TITLE SHEET
UO-02 - UO-02A	UBO PLAN SHEETS

UTILITY OWNERS WITH CONFLICTS

(A) BLUE RIDGE EMC - POWER (DIST)
(B) SKYLINE TELECOMMUNICATIONS - TELEPHONE, F/O

PREPARED IN THE OFFICE OF:

RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1 Suite 700
Raleigh, North Carolina 27615-3960
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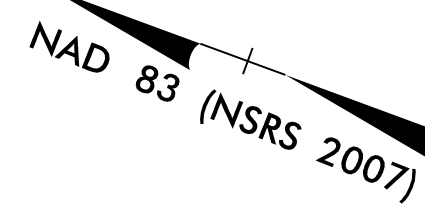
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HOWARD WOODALL, P.E. UTILITY PROJECT MANAGER
MARK LAWSON PROJECT UTILITY COORDINATOR
MARK LAWSON PROJECT UTILITY CADD

**DIVISION OF HIGHWAYS
DIVISION II**

801 STATESVILLE ROAD
NORTH WILKESBORO, NC 28659

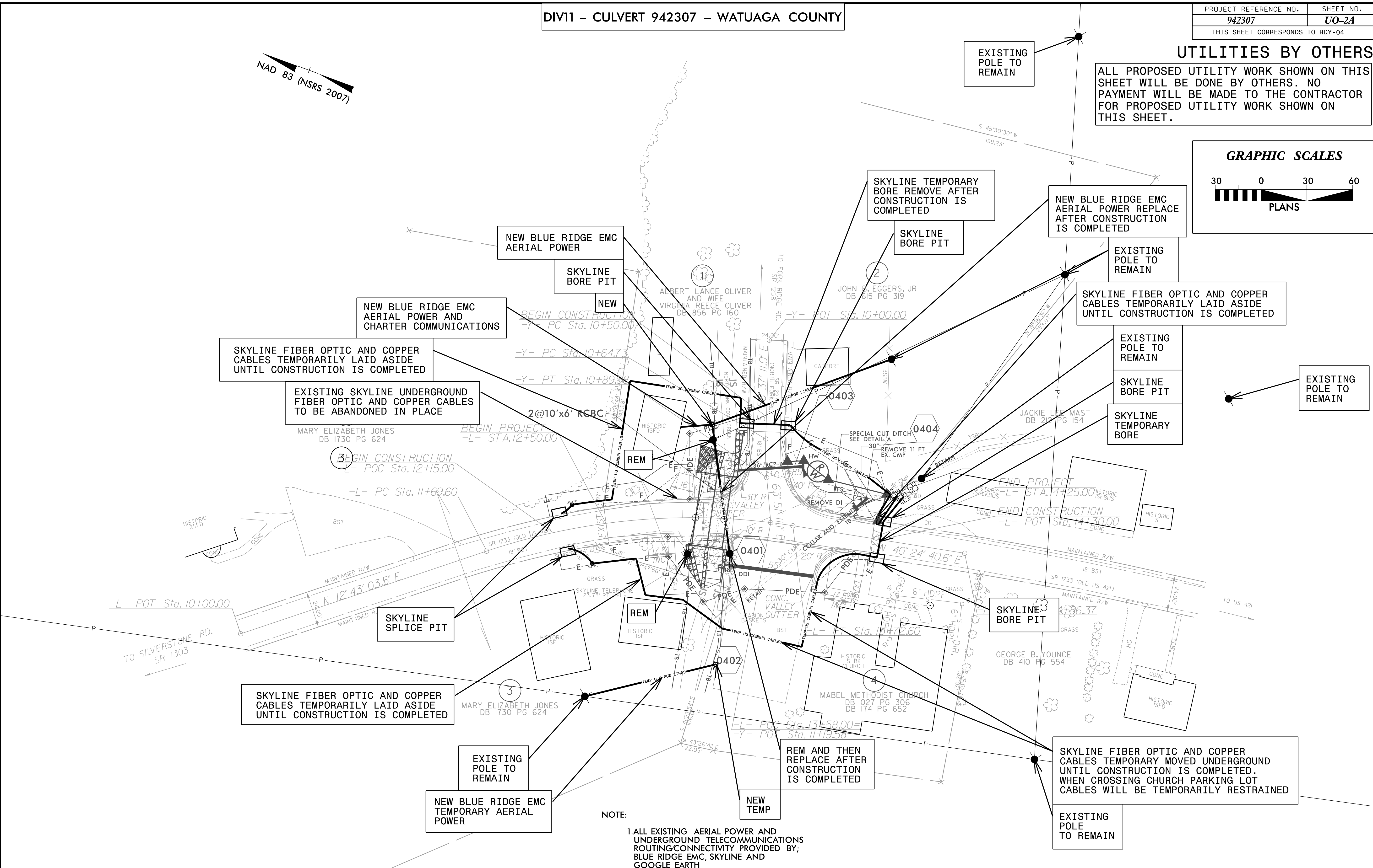
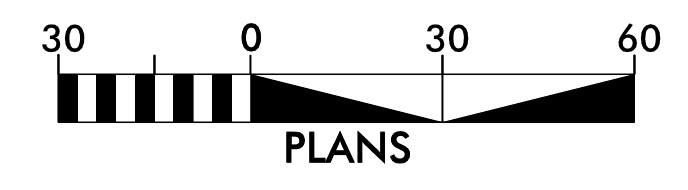
SUSAN O. HUFFMAN	DIVISION CONTACT #1
JOE LAWS	DIVISION CONTACT #2
MARK JOHNSON	DIVISION CONTACT #3
TRENT BEAVER	DIVISION CONTACT #4



UTILITIES BY OTHERS

ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR PROPOSED UTILITY WORK SHOWN ON THIS SHEET.

GRAPHIC SCALES



NOTE:

1. ALL EXISTING AERIAL POWER AND UNDERGROUND TELECOMMUNICATIONS ROUTING/CONNECTIVITY PROVIDED BY; BLUE RIDGE EMC, SKYLINE AND GOOGLE EARTH
2. ALL NEW TEMPORARY SKYLINE RELOCATION WORK WILL BE INSTALLED BY BEING LAID ASIDE, SECURED FROM TREES WHEN CROSSING STREAM OR TEMPORARILY UNDERGROUND (AS NOTED)
3. ALL BORE PITS ARE SUBJECT TO CHANGE AND WILL BE ADJUSTED TO FIT FIELD CONDITIONS

UTILITY OWNERS ON THIS SHEET

BLUE RIDGE EMC - POWER (DIST)
 SKYLINE TELEPHONE - TELEPHONE/FIBER OPTIC
 CHARTER COMMUNICATIONS - CATV

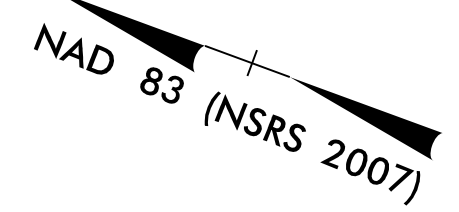


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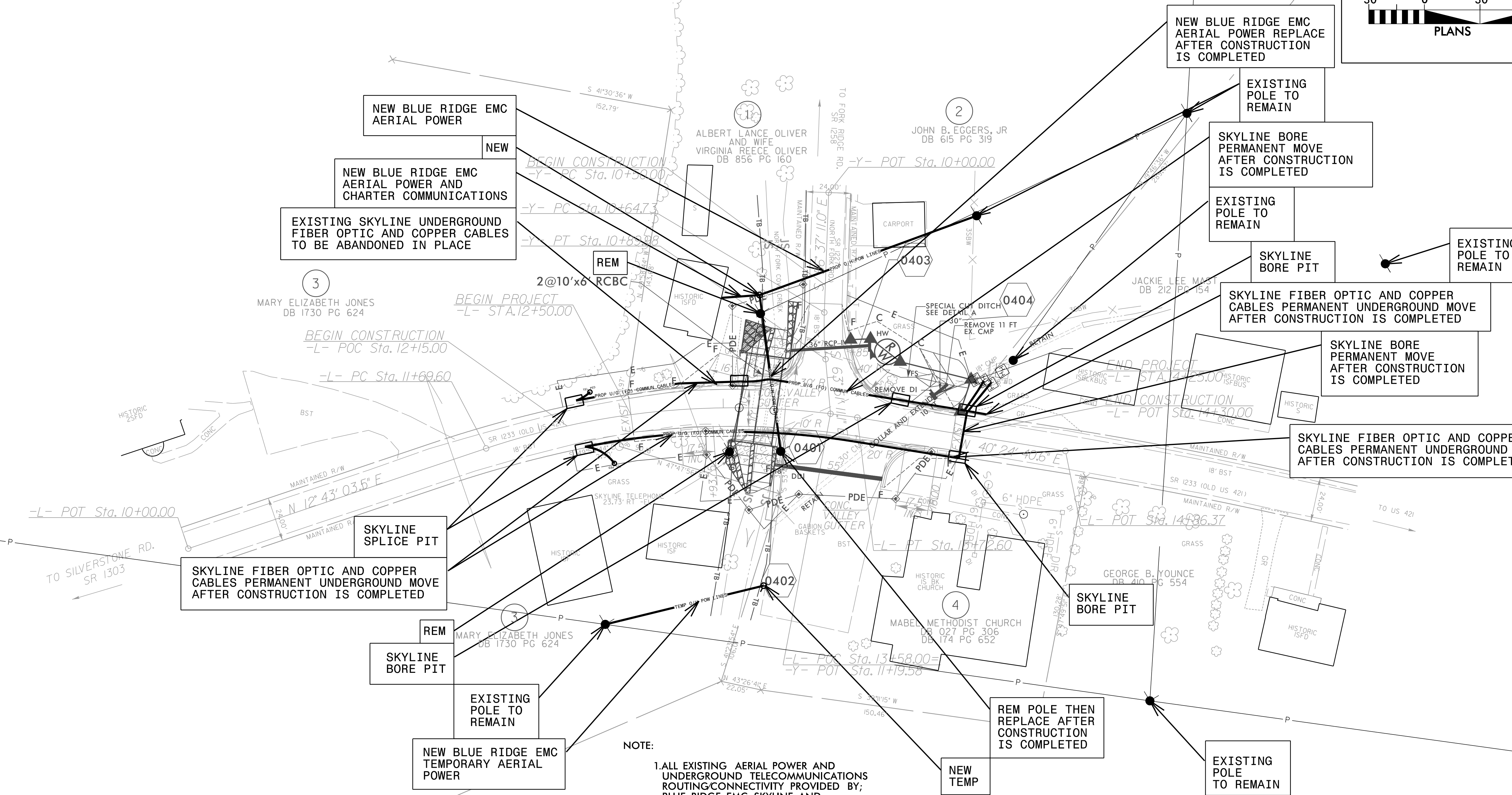
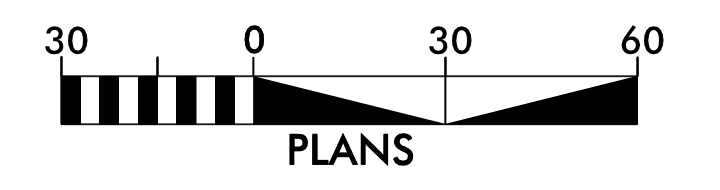
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UTILITIES BY OTHERS

ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR PROPOSED UTILITY WORK SHOWN ON THIS SHEET.

GRAPHIC SCALES



- NOTE:
1. ALL EXISTING AERIAL POWER AND UNDERGROUND TELECOMMUNICATIONS ROUTING/CONNECTIVITY PROVIDED BY; BLUE RIDGE EMC, SKYLINE AND GOOGLE EARTH
 2. ALL NEW SKYLINE RELOCATION WORK WILL BE INSTALLED 3' OFF EOP AT A DEPTH OF 24"
 3. ALL SKYLINE BORES WILL BE 10' UNDER EXISTING PAVEMENT
 4. ALL BORE PITS ARE SUBJECT OT CHANGE WILL BE ADJUSTED TO FIT FIELD CONDITIONS

UTILITY OWNERS ON THIS SHEET

BLUE RIDGE EMC - POWER (DIST)
SKYLINE TELEPHONE - TELEPHONE/FIBER OPTIC
CHARTER COMMUNICATIONS - CATV



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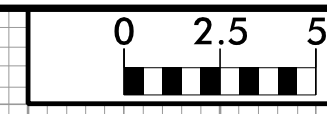
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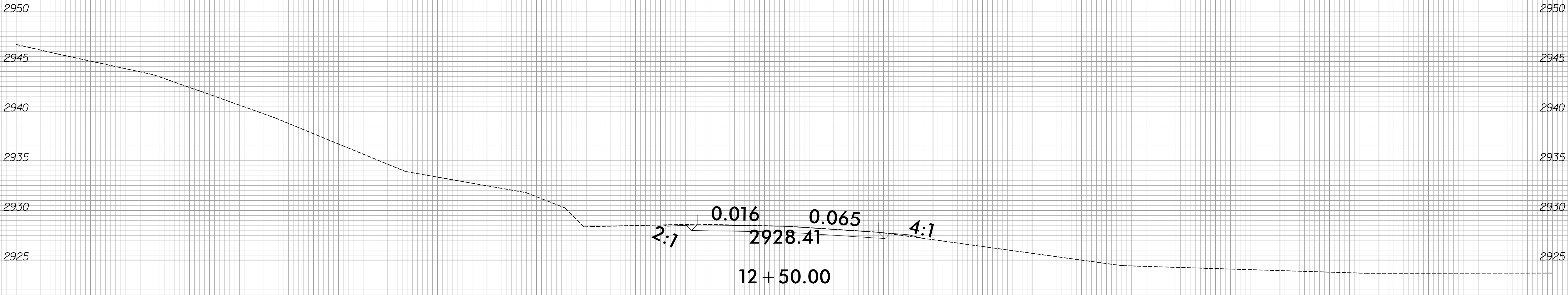
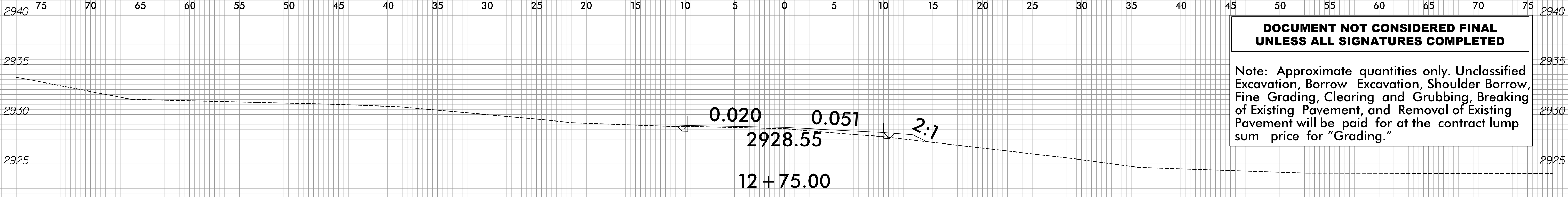
8/23/19



PROJ. REFERENCE NO.	SHEET NO.
17BP.11.C.2	X-1

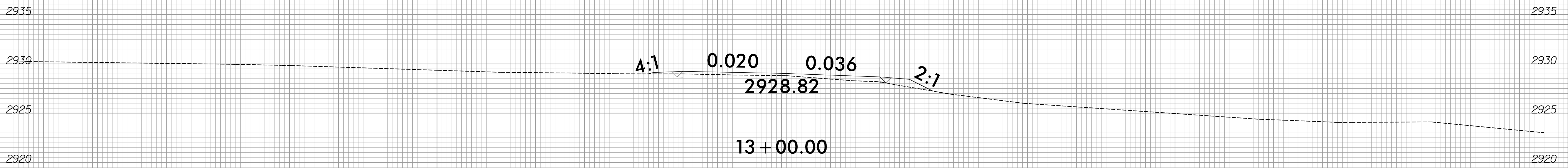
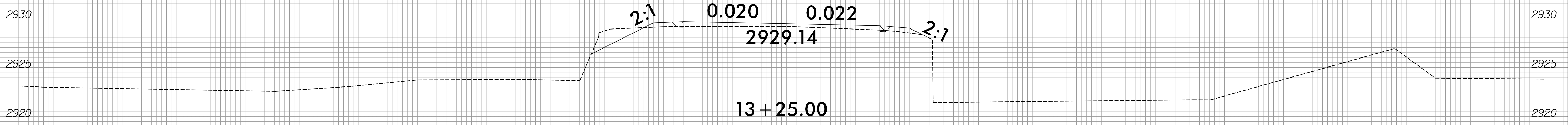
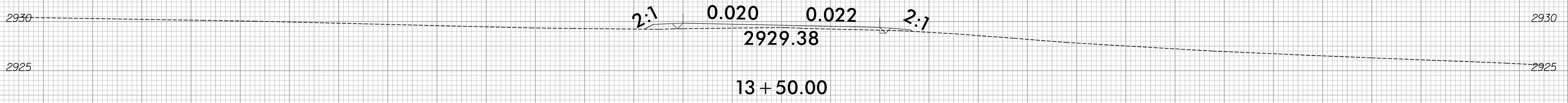
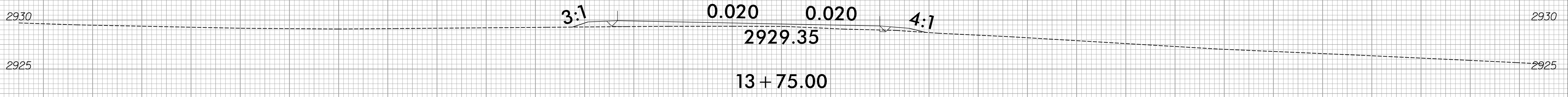
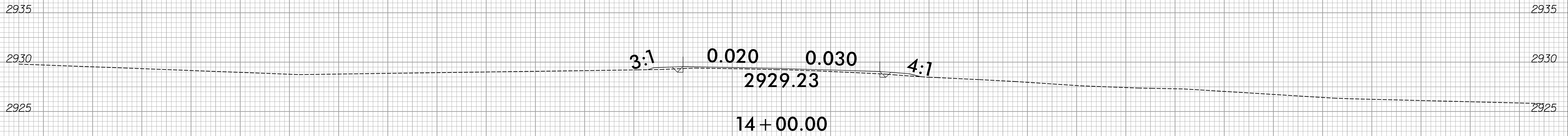
**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

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

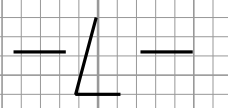


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75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75



8/23/99

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2935 2935

2930 2930

2929.05
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2935 2935

2930 2930

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14 + 25.00

2925 2925

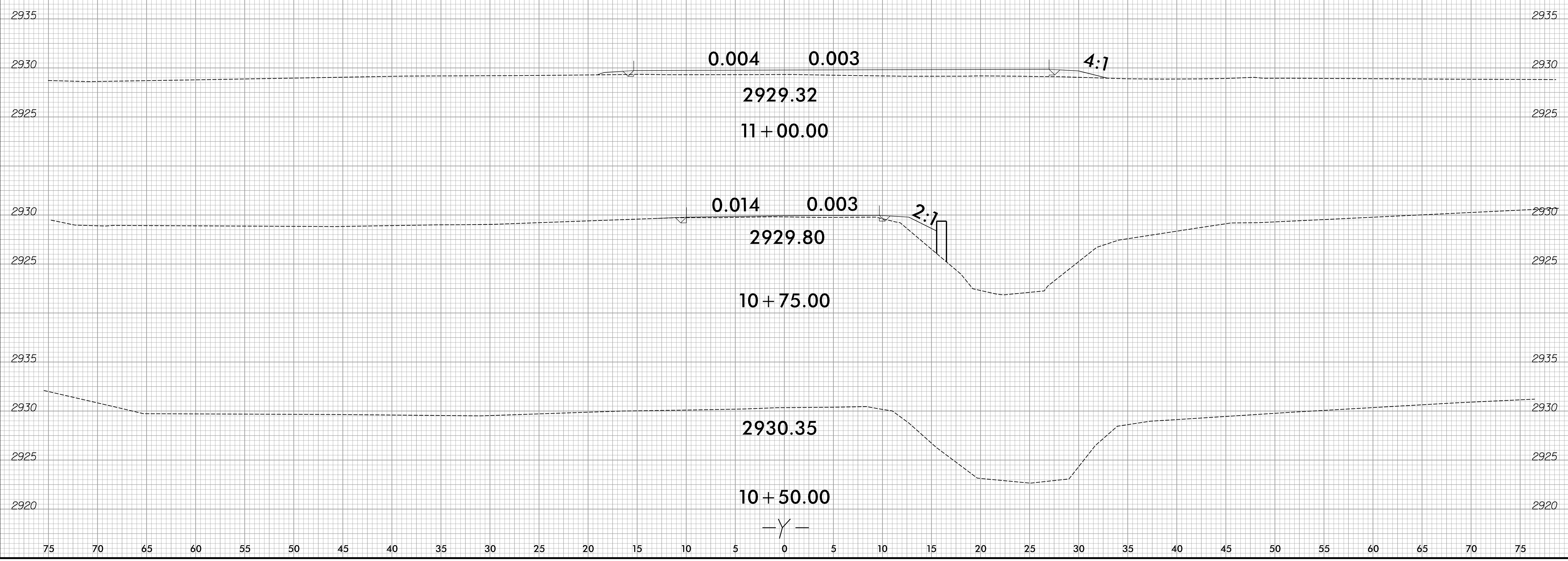
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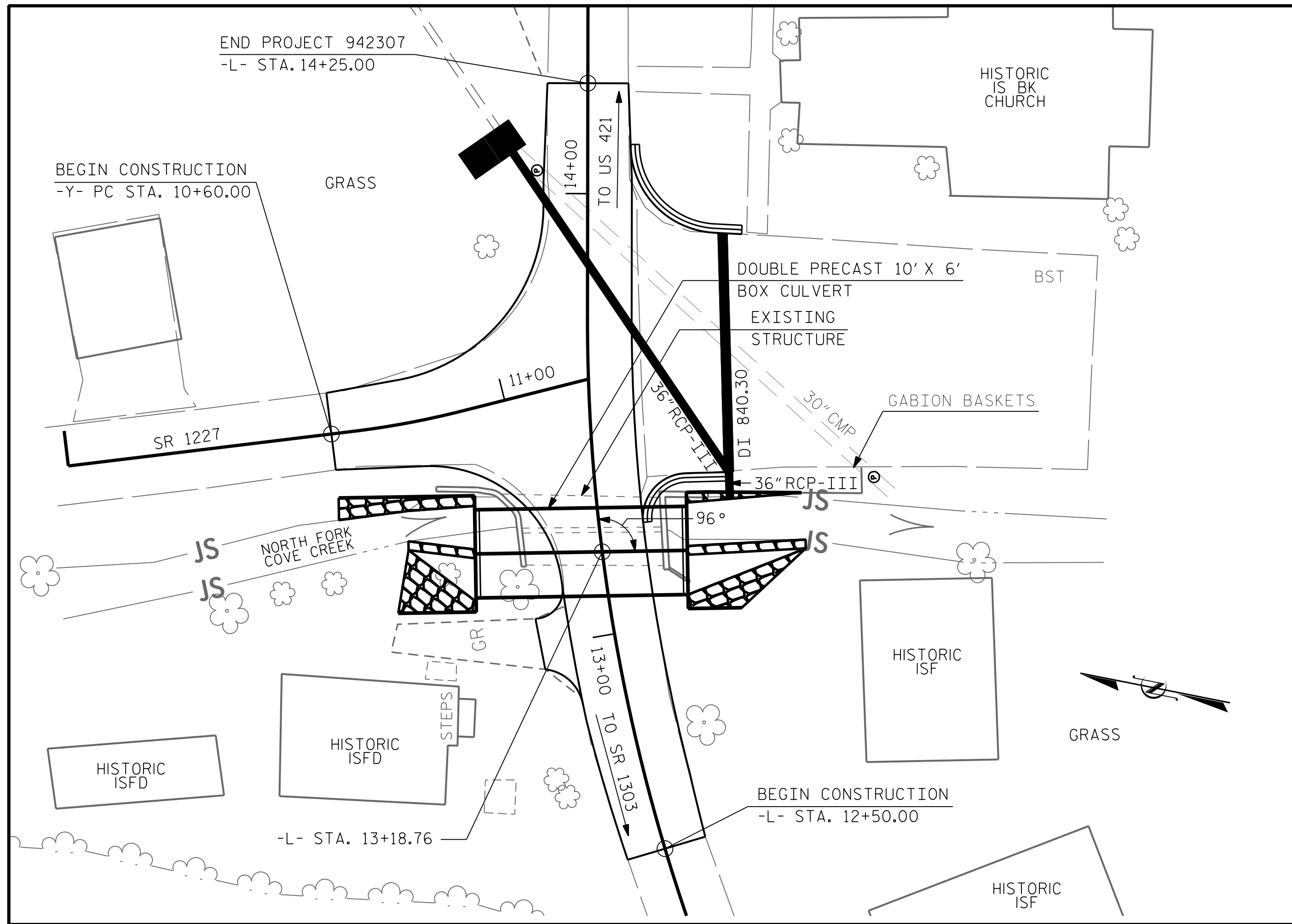
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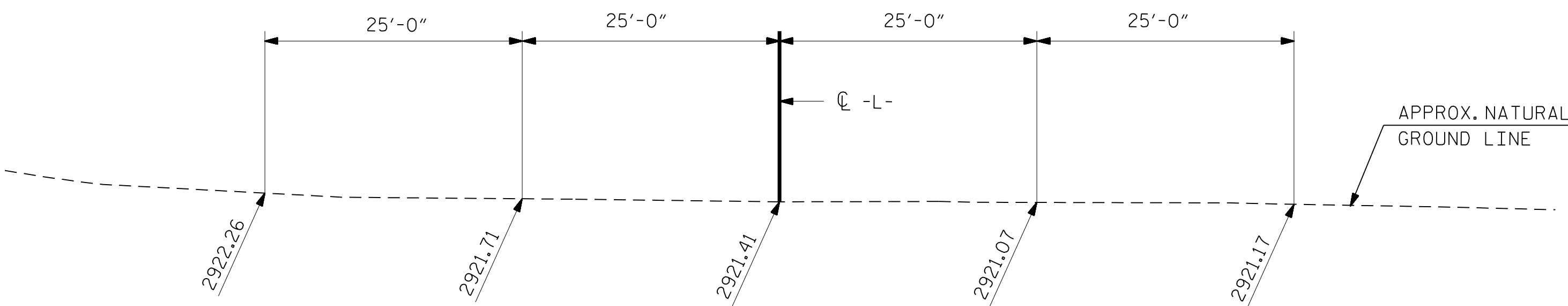
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BM. #1 ON -L- STA. 13+77.29, 107.52' RT. NAIL SET IN ASPHALT EL. 2924.08 N 945805, E 1184631



LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS



PROFILE ALONG CULVERT

TOTAL BILL OF MATERIAL	
PRECAST REINFORCED CONCRETE BOX CULVERT @ STA. 13+18.76 -L-	LUMP SUM
CULVERT EXCAVATION.....	LUMP SUM
FONDATION CONDITIONING MATERIAL BOX CULVERT	84 TONS
REMOVAL OF EXISTING STRUCTURE....	LUMP SUM

NOTES:

ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.

FOR OTHER DESIGN DATA AND NOTES SEE SHEET S-4

3" Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.

THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.

FOR PRECAST REINFORCED CONCRETE BOX CULVERT, SEE SPECIAL PROVISIONS.

THE CONCRETE FOR THE PRECAST UNITS SHALL ATTAIN A MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS OF 5000 PSI. THE CONCRETE FOR THE HEADWALLS, WINGS AND END CURTAIN WALLS SHALL BE CLASS "A" CONCRETE AS PER THE STANDARD SPECIFICATIONS.

CAST-IN-PLACE CONCRETE SHALL BE POURED IN THE FOLLOWING ORDER:

1. WING FOOTINGS, AND CURTAIN WALL.
2. HEADWALLS, WING WALLS.

ALL PRECAST UNITS SHALL BE PLACED PRIOR TO POURING THE WINGS, END CURTAIN WALLS AND HEADWALLS. THE EXTERIOR PRECAST UNITS SHALL BE UNDERMINED TO PROVIDE FOR THE WING FOOTINGS TO BE POURED TO THE DEPTH AND DIMENSIONS AS PROVIDED BY CONTRACTOR.

FOUNDATION CONDITIONING MATERIAL SHALL HAVE A THICKNESS OF AT LEAST 1'-0" BELOW THE BOTTOM OF THE PRECAST UNITS. THE MATERIAL SHALL BE FORMED AND SCREED TO THE PROPER ELEVATION AT LEAST 1'-0" BEYOND THE SIDES OF THE PRECAST UNITS.

THE PRECAST UNITS SHALL BE CAREFULLY POSITIONED ON THE PREPARED FOUNDATION CONDITIONING MATERIAL, FEMALE END UPGRAD WITH THE MALE END FULLY INSERTED AND EACH JOINT CHECKED FOR ALIGNMENT PRIOR TO JACKING THE UNIT INTO PLACE. SATISFACTORY FITTING AND PROPER GRADE SHALL BE MAINTAINED AS THE WORK PROCEEDS.

WHEN ANY PRECAST UNIT IS DAMAGED DURING HANDLING, THE ENGINEER AT HIS DISCRETION SHALL REJECT THE UNIT AS BEING UNFIT FOR INSTALLATION AND THE CONTRACTOR SHALL REMOVE SUCH REJECTED UNIT FROM THE PROJECT. MINOR DAMAGE TO THE UNIT MAY BE REPAIRED BY THE CONTRACTOR WHEN PERMITTED BY THE ENGINEER

A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.

GRADE DATA

GRADE POINT ELEV. @ STA. 13+18.76 -L- ---- 2929.36
 INVERT ELEV. @ STA 13+18.76 -L- ----- 2920.58
 ROADWAY SLOPES ----- 2:1

HYDRAULIC DATA

DESIGN DISCHARGE-----800 C.F.S.
 FREQUENCY OF DESIGN FLOOD-----25 YR.
 DESIGN HIGH WATER ELEVATION-----2928.3
 DRAINAGE AREA-----2.7 SQ. MI.
 BASE DISCHARGE (Q100)-----1200 C.F.S.
 BASE HIGH WATER ELEVATION-----2930.2

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE-----910 C.F.S.
 FREQUENCY OF OVERTOPPING FLOOD-----25 + YR
 OVERTOPPING FLOOD ELEVATION-----2929.1
 OVERTOPPING ELEVATION IS EDGE OF DRIVEWAY AT -L- STA. 13+06.15 LT.

CARE SHALL BE TAKEN DURING BACKFILL AND COMPACTION OPERATION TO MAINTAIN ALIGNMENT AND PREVENT DAMAGE TO THE JOINTS. UNITS WHICH BECOME MISALIGNED, SHOW EXCESSIVE SETTLEMENT, OR HAVE OTHERWISE BEEN DAMAGED BY THE CONTRACTOR'S OPERATION SHALL AT THE DISCRETION OF THE ENGINEER BE REMOVED AND REPLACED BY THE CONTRACTOR AT NO COST TO THE DEPARTMENT OF TRANSPORTATION.

CONCRETE CHAMFERS ON EXTERIOR LONGITUDINAL EDGES OF THE PRECAST UNITS MAY BE AS PER THE FABRICATORS RECOMMENDATION, HOWEVER ALL WORKMANSHIP SHALL PROVIDE CONCRETE COVER OVER THE WELDED WIRE FABRIC AS SPECIFIED ON THE PLANS AND THE CONCRETE CHAMFERS CHOSEN SHALL IN NO WAY FUNCTIONALLY LESSEN THE DESIGN SHOWN ON THE PLANS.

DESIGN EARTH COVER = 1.3 FT.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE 30" Ø PIPE THROUGH THE WING WALL OF THE CULVERT. SEE ROADWAY PLANS FOR DETAILS AND LOCATION.

A CAST-IN-PLACE CULVERT OPTION WILL NOT BE ALLOWED

CULVERT INVERT SHALL BE BURIED 1'-0" BELOW EXISTING STREAM BED.

EXCAVATE A MINIMUM OF 1.0 FEET BELOW BEARING ELEVATION AND REPLACE WITH FOUNDATION CONDITIONING MATERIAL PER SECTION 414 OF THE STANDARD SPECIFICATIONS.

OVEREXCAVATE LOOSE/SOFT MATERIAL IF PRESENT TO SUITABLE BEARING MATERIALS AND REPLACE WITH ADDITIONAL CLASS VI FOUNDATION CONDITIONING MATERIAL.

THE EXISTING STRUCTURE CONSISTING OF A DOUBLE 7' X 5' RCBC APPROXIMATELY 35' IN LENGTH WITH HEADWALL AND WING WALLS SHALL BE REMOVED.

ONE PERMITTED CONSTRUCTION JOINT WILL BE ALLOWED IN THE END CURTAIN WALL.

ONE INCH OF EXPANSION JOINT MATERIAL SHALL BE PROVIDED AT THE JUNCTION OF THE WINGS AND THE PRECAST UNITS.

VERIFY THAT TOP OF WING ELEVATIONS ARE ADEQUATE TO RETAIN THE FILL FROM THE -Y- LINE AND THE ADJACENT PROPERTIES. SEE ROADWAY PLANS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

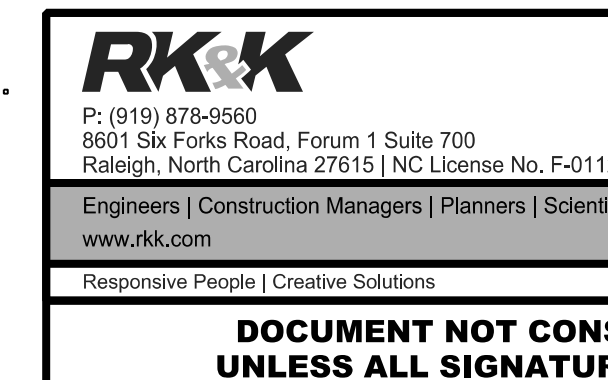
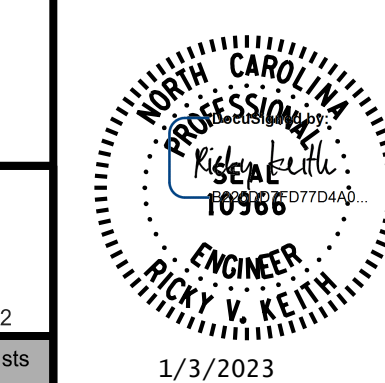
PROJECT NO. 17BP.11.C.2
 WATAUGA COUNTY
 STATION: 13+18.76 -L-

SHEET 1 OF 4 REPLACES BRIDGE NO. 942307

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

PRECAST REINFORCED CONCRETE DOUBLE BARREL BOX CULVERT ON SR 1233 BETWEEN SR 1303 AND US 421
 96° SKEW

CULVERT NO. 2307



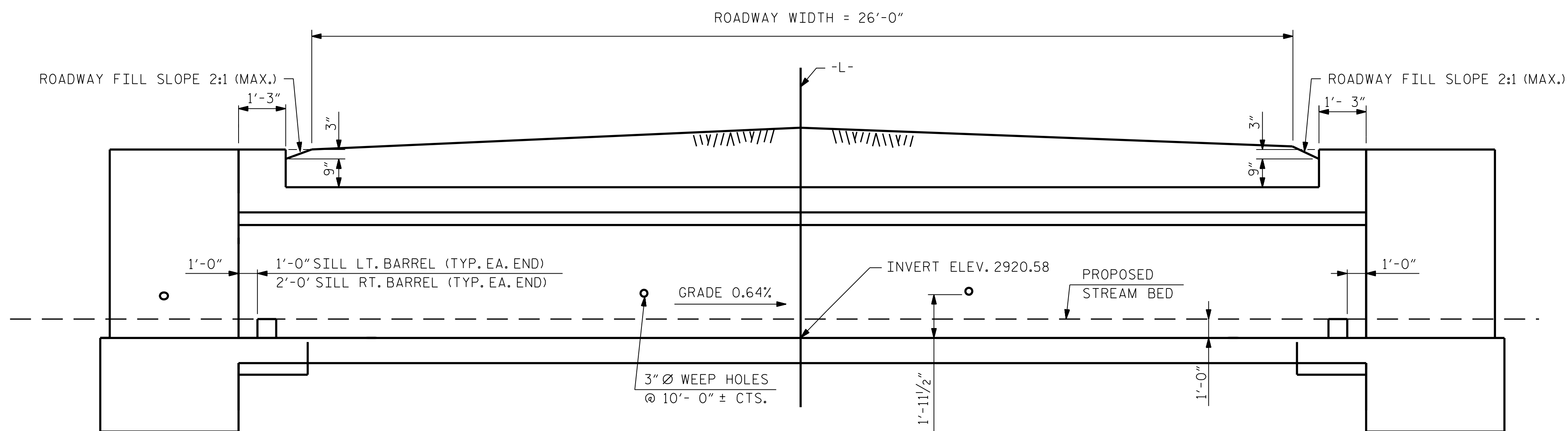
DRAWN BY : B. H. GONFA DATE : APR 2021
 CHECKED BY : O. J. PAITEL DATE : APR 2021
 DESIGN ENGINEER OF RECORD : R. V. KEITH DATE : APR 2021

REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

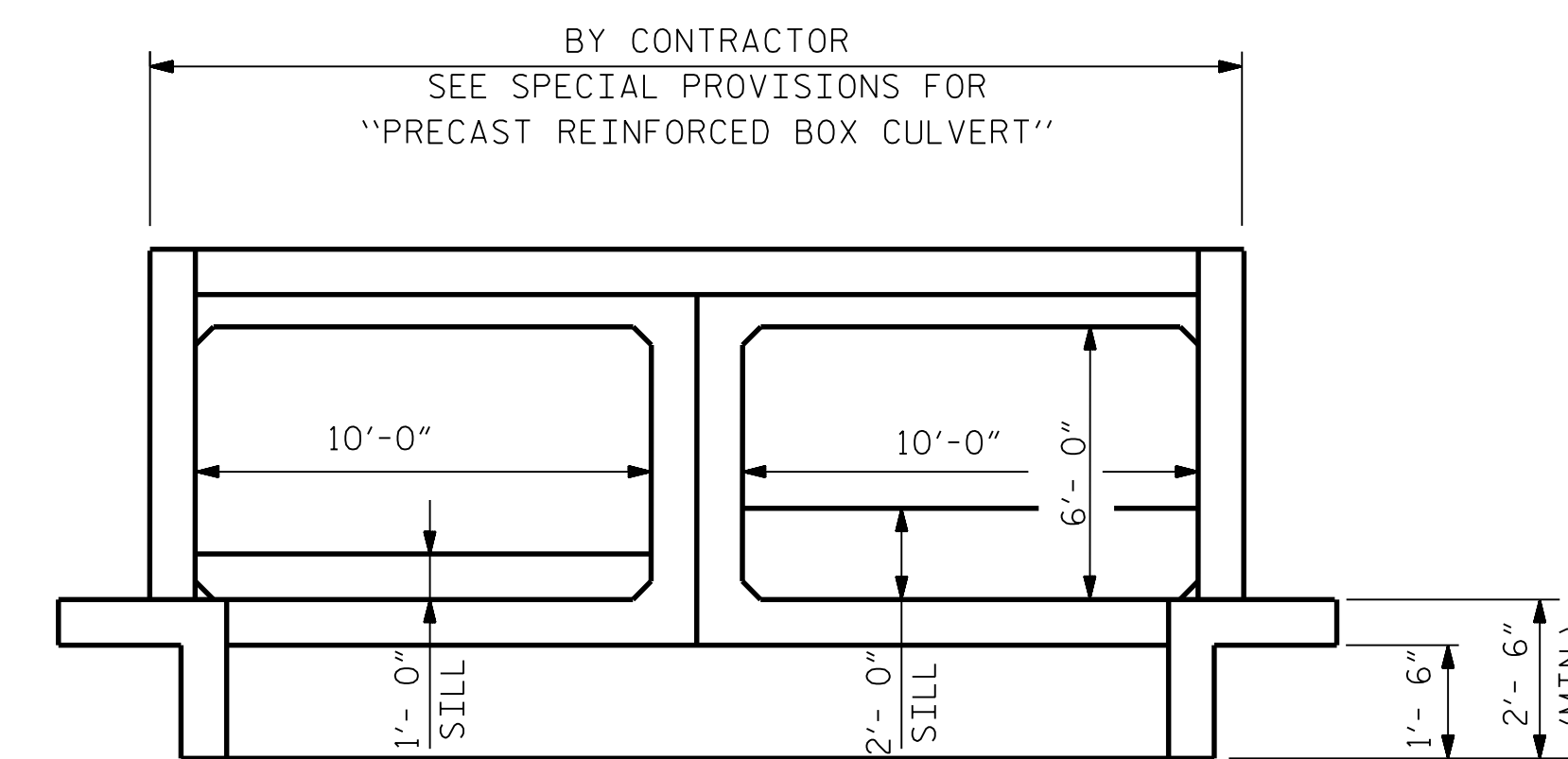
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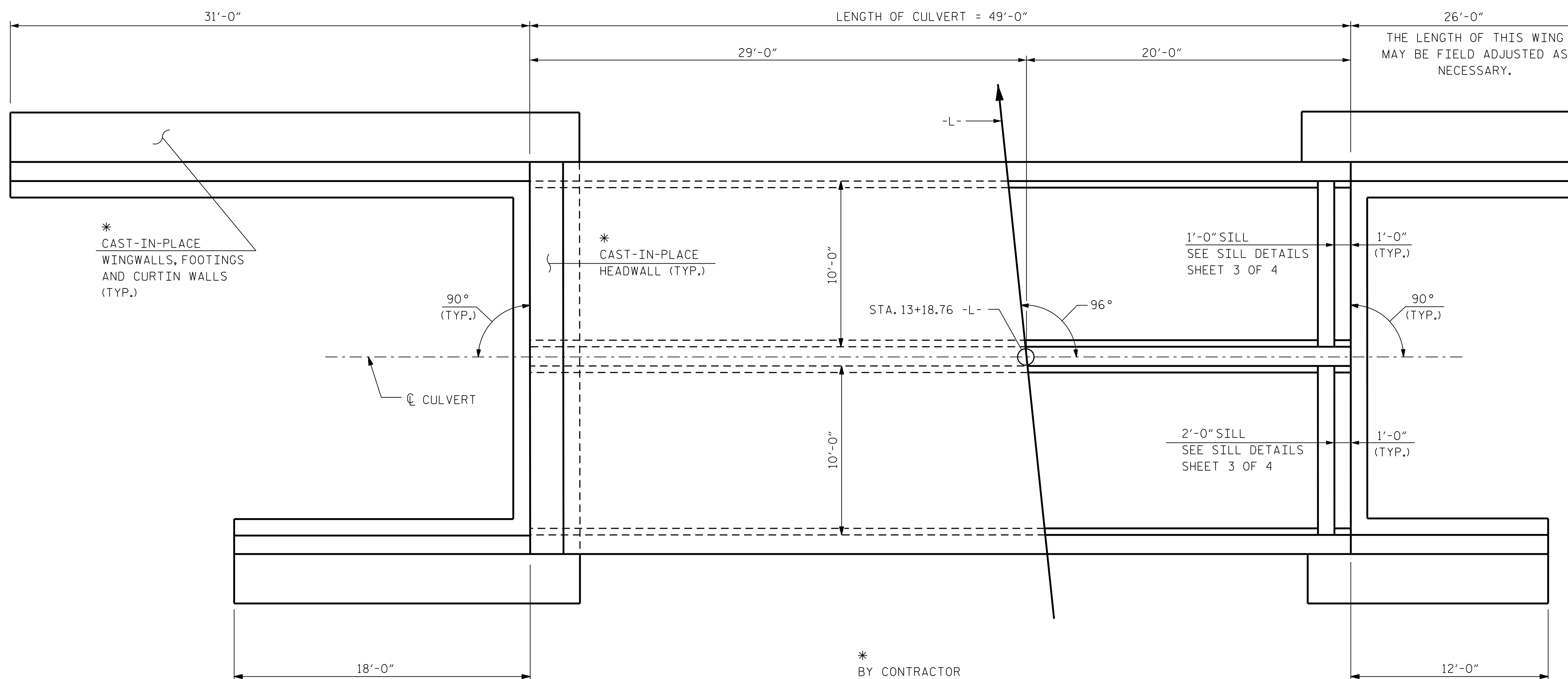
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CULVERT SECTION NORMAL TO ROADWAY



INLET END ELEVATION



PART PLAN - ROOF SLAB

PART PLAN - FLOOR SLAB

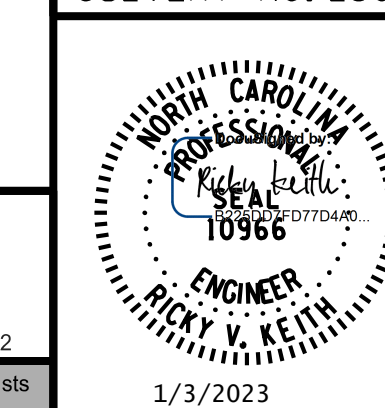
NATIVE MATERIAL BETWEEN SILLS IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM OR FLOODPLAIN AT THE PROJECT SITE DURING CONSTRUCTION. ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE LOW FLOW CULVERT BARREL. RIP-RAP MAY BE USED TO SUPPLEMENT THE NATIVE BED MATERIAL IN THE HIGH FLOW CULVERT BARREL. IF RIP-RAP IS USED TO LINE THE HIGH FLOW BARREL, NATIVE MATERIAL SHOULD BE PLACED ON TOP TO FILL VOIDS AND PROVIDE A FLAT SURFACE FOR ANIMAL PASSAGE. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

SILLS ARE TO 1'-0" WIDE, CAST SEPARATELY AND ATTACHED BY DOWELS.

PROJECT NO. 17BP.11.C.2
 WATAUGA COUNTY
 STATION: 13+18.76 -L-

SHEET 2 OF 4

CULVERT NO. 2307



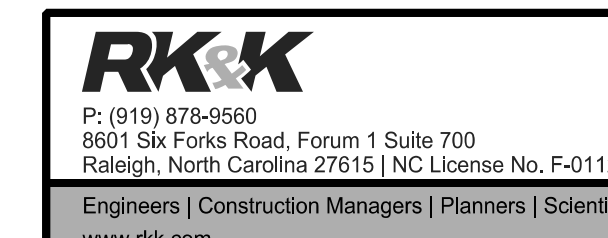
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

PRECAST
 REINFORCED CONCRETE
 BOX CULVERT
 DOUBLE 10 FT. X 6 FT.
 96° SKEW

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
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2			4		

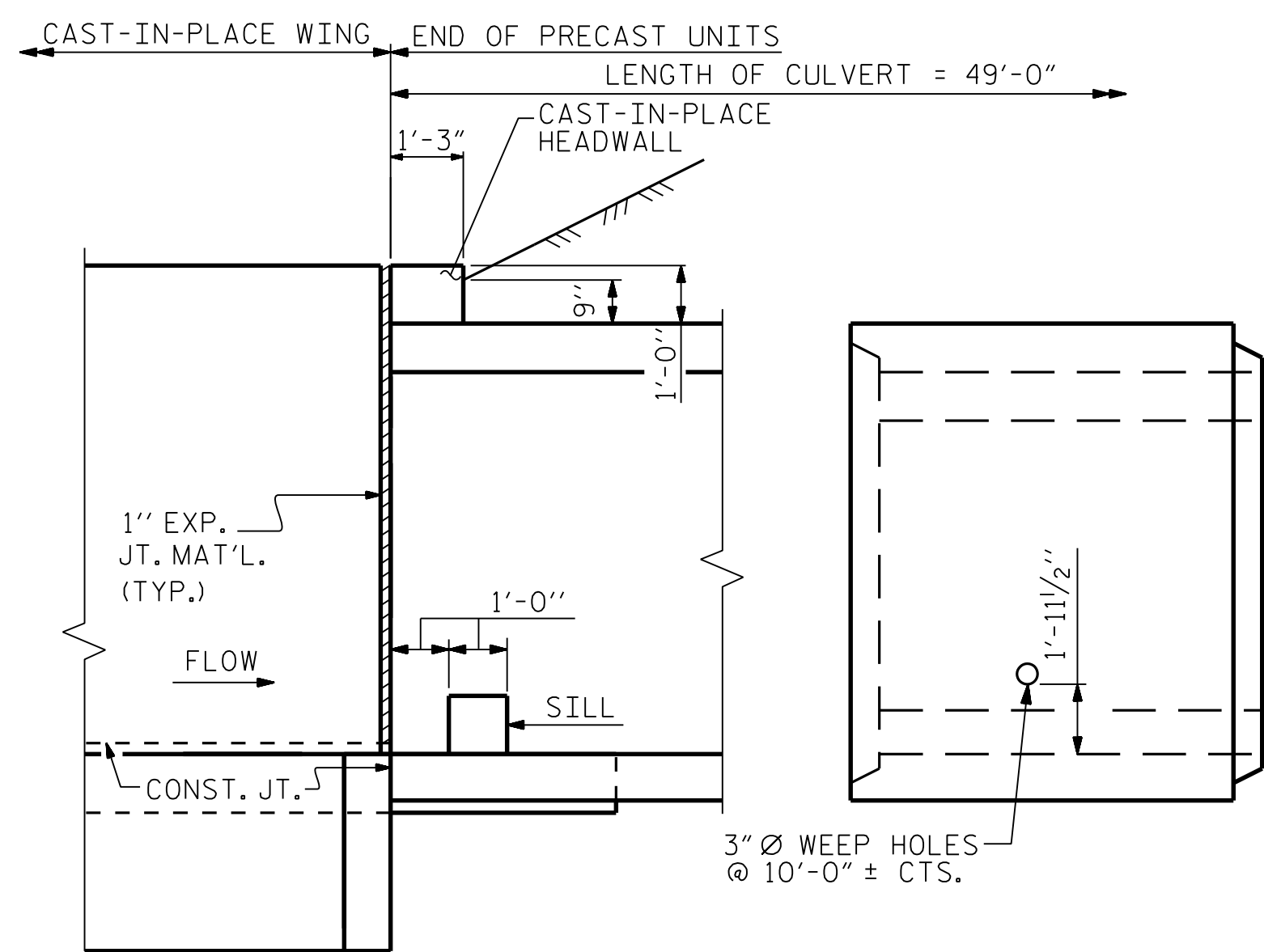
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 CU.2307-2
 TOTAL SHEETS
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 UNLESS ALL SIGNATURES COMPLETED**

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DRAWN BY : B. H. GONFA DATE : APR 2021
 CHECKED BY : O. J. PAITEL DATE : APR 2021
 DESIGN ENGINEER OF RECORD : R. V. KEITH DATE : APR 2021



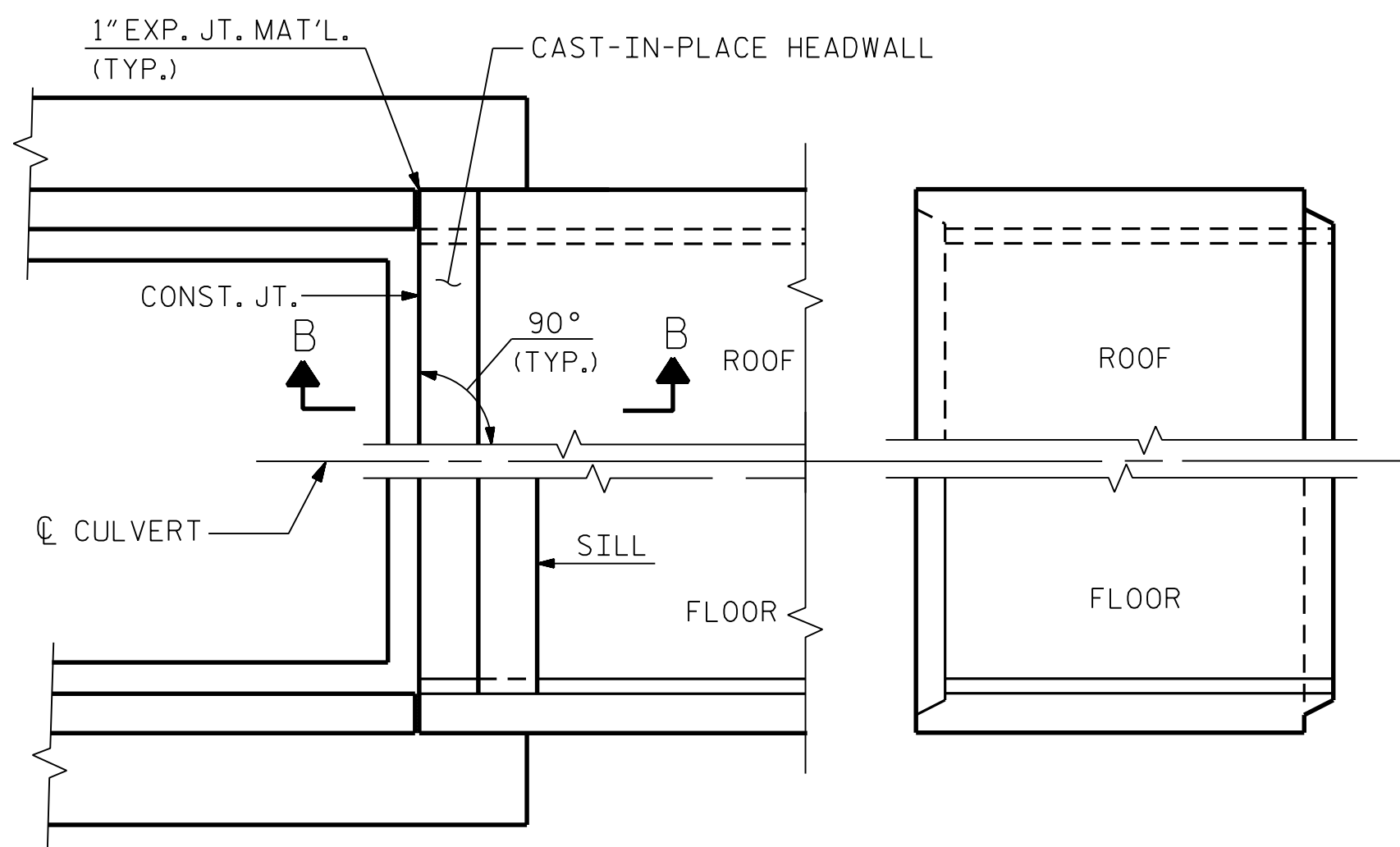
SECTION B-B

(SHOWING INLET END UNIT)
OUTLET END SIMILAR

NOTE: NO END UNIT SHALL BE LESS THAN 3'-0"

TYPICAL PRECAST UNIT

ELEVATION

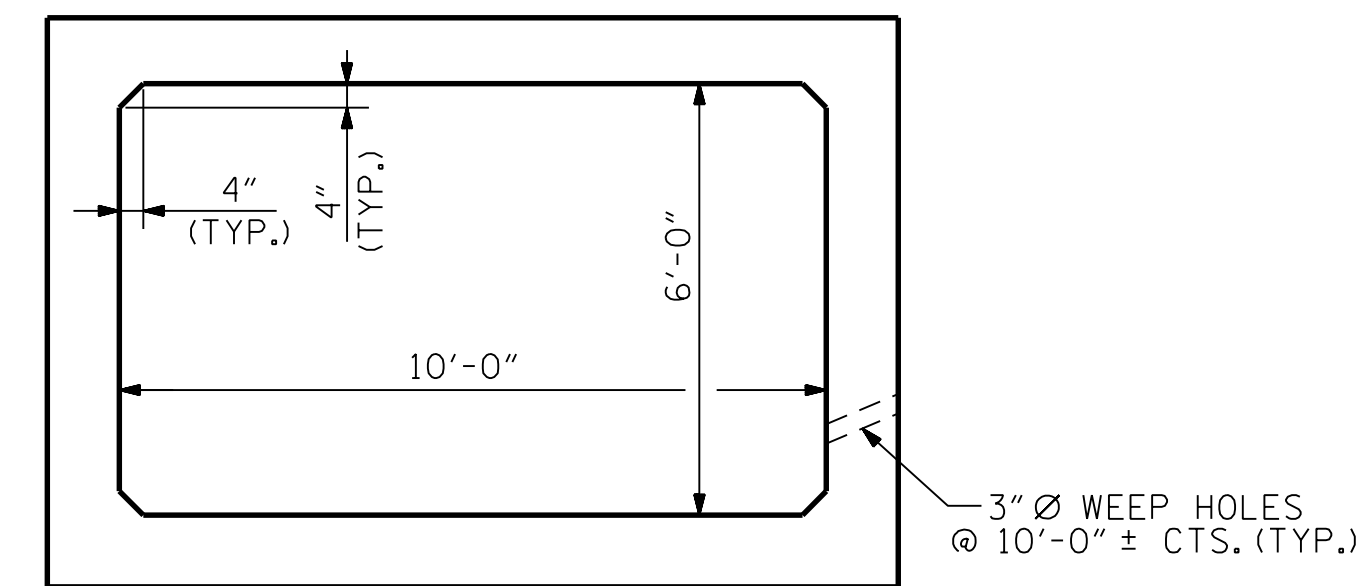


PLAN - END UNIT

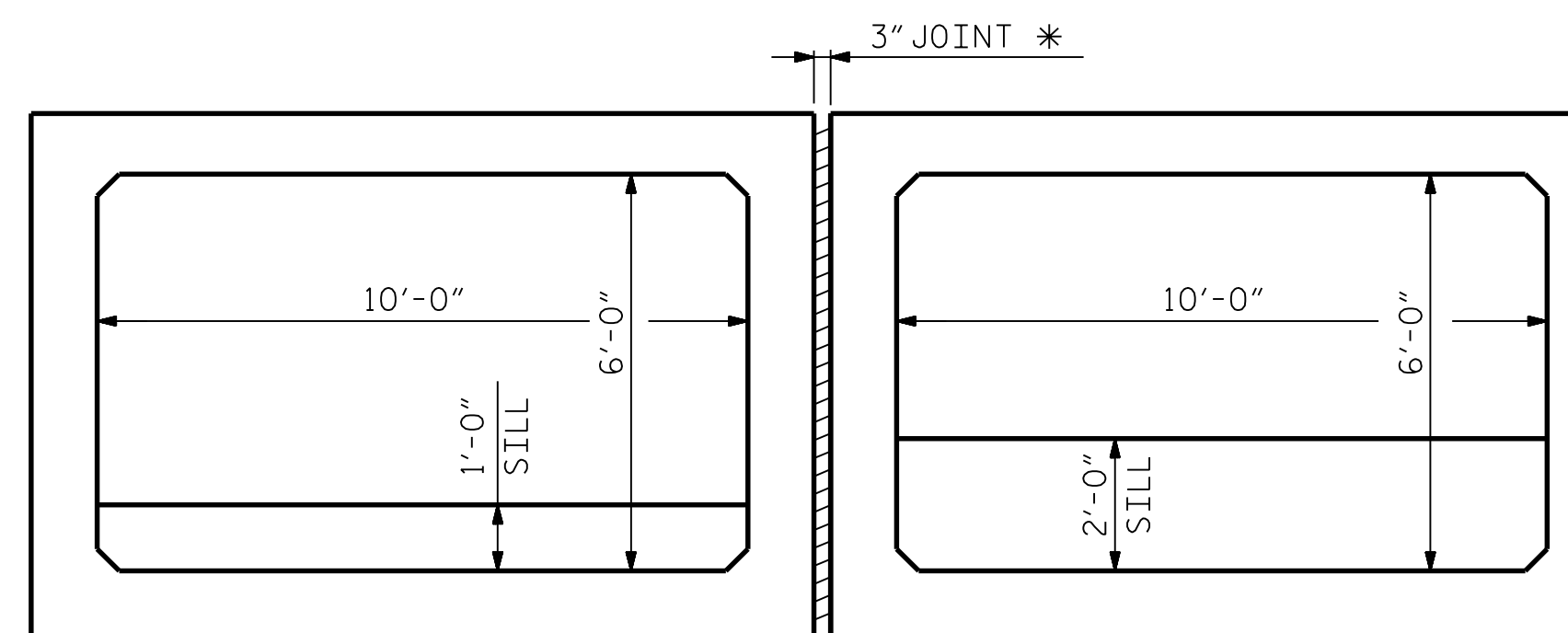
PLAN - TYPICAL PRECAST UNIT

(INTERIOR UNIT SHOWN)

SILLS TO BE CAST SEPARATELY AND ATTACHED BY DOWELS IN INLET AND OUTLET UNITS. INSET SILLS 1'-0" FROM ENDS OF PRECAST UNITS.

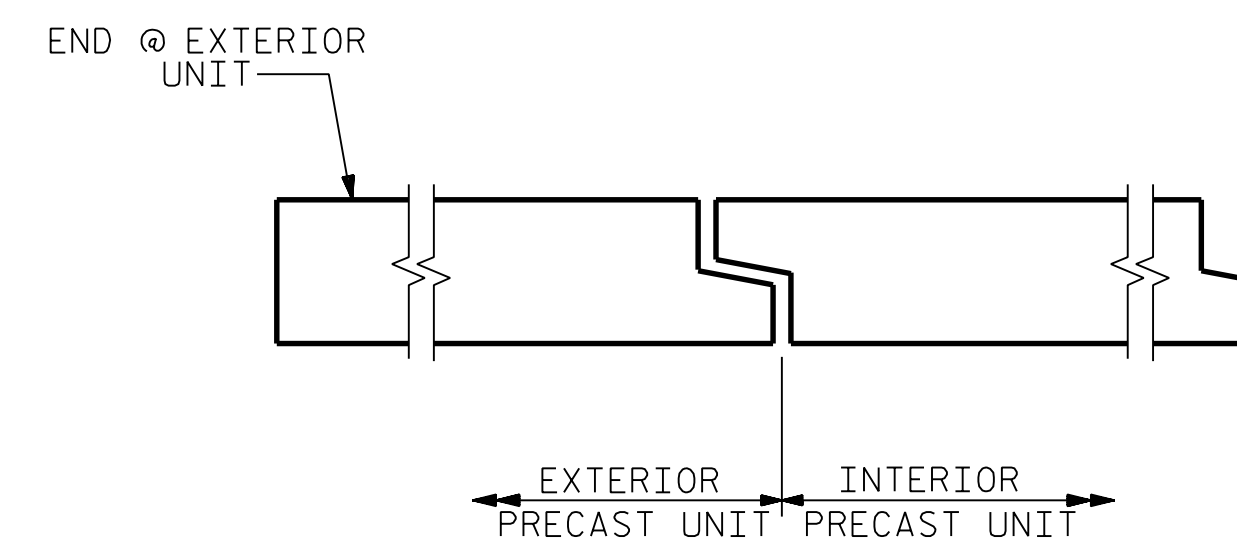


TYPICAL SECTION



TYPICAL SECTION WITH SILLS INLET END

SILLS TO BE CAST SEPARATELY AND ATTACHED BY DOWELS IN INLET AND OUTLET UNITS. INSET SILLS 1'-0" FROM ENDS OF PRECAST UNITS. TWO LAYERS OF 30 LB. ROOFING FELT SHALL BE PLACED UNDER SILLS TO PREVENT BOND. DOWELS SHALL BE ADHESIVELY ANCHORED. NO FIELD TESTING IS REQUIRED.



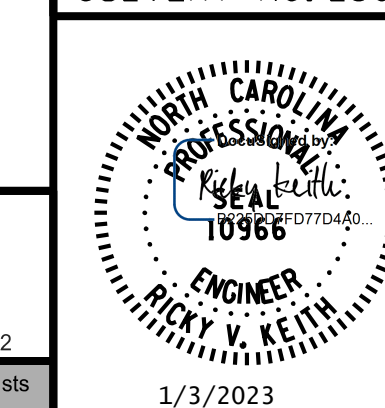
SECTION THRU TOP SLAB
(BOTTOM SLAB JOINT SIMILAR)

* FILL WITH CLASS A CONCRETE (SEE SPECIAL PROVISIONS FOR "PRECAST REINFORCED BOX CULVERT")

PROJECT NO. 17BP.11.C.2
WATAUGA COUNTY
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SHEET 3 OF 4

CULVERT NO. 2307



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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PRECAST REINFORCED CONCRETE BOX CULVERT
DOUBLE 10 FT. X 6 FT.
96° SKEW

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			CU_2307-3
2			4			TOTAL SHEETS 4

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12/28/2022 R:\Structures\DN\Final\17BP.11.C.2.SM.U_CU_2307-3_942307.dgn

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DESIGN ENGINEER OF RECORD : R. V. KEITH DATE : APR 2021

STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	-----	A.A.S.H.T.O. (CURRENT)
LIVE LOAD	-----	SEE PLANS
IMPACT ALLOWANCE	-----	SEE A.A.S.H.T.O.
STRESS IN EXTREME FIBER OF STRUCTURAL STEEL - AASHTO M270 GRADE 36	--	20,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50W	--	27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50	--	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION - GRADE 60	--	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION	-----	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR	-----	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR UNTREATED EXTREME FIBER STRESS	---	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER	-----	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH	-----	30 LBS. PER CU. FT. (MINIMUM)

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2018 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; AND CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP.

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1 1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 1/4" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A 1/4" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 12" INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT, ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.

ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16" INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINIS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

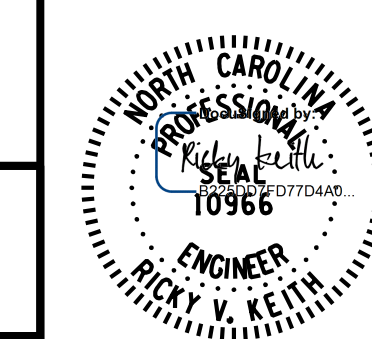
GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.

PROJECT NO. 17BP.11.C.2
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SHEET 4 OF 4

STATE OF NORTH CAROLINA
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**STANDARD
 NOTES**

CULVERT NO. 2307



1/3/2023

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