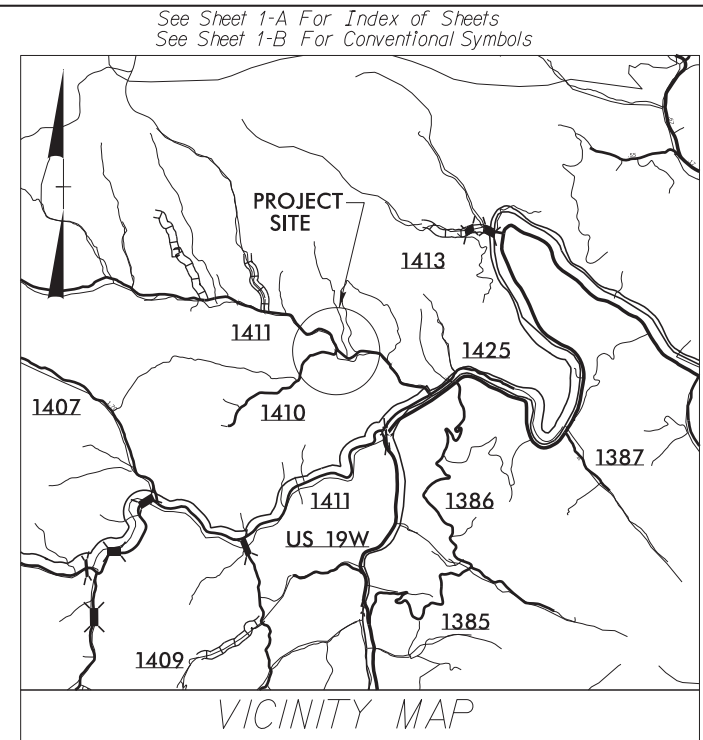


09/28/21  
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 M:\2016\221601946\_09 NCDOT Division 13 Bridge Replacements\13BP13.R160\_Yancey\_990274\Roadway\Proj\990274\_Rdy\_tsh.dgn  
 \$\$\$SERNAME\$\$\$

**CONTRACT: DM00337 STATE PROJECT: BP13.R001**



STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS  

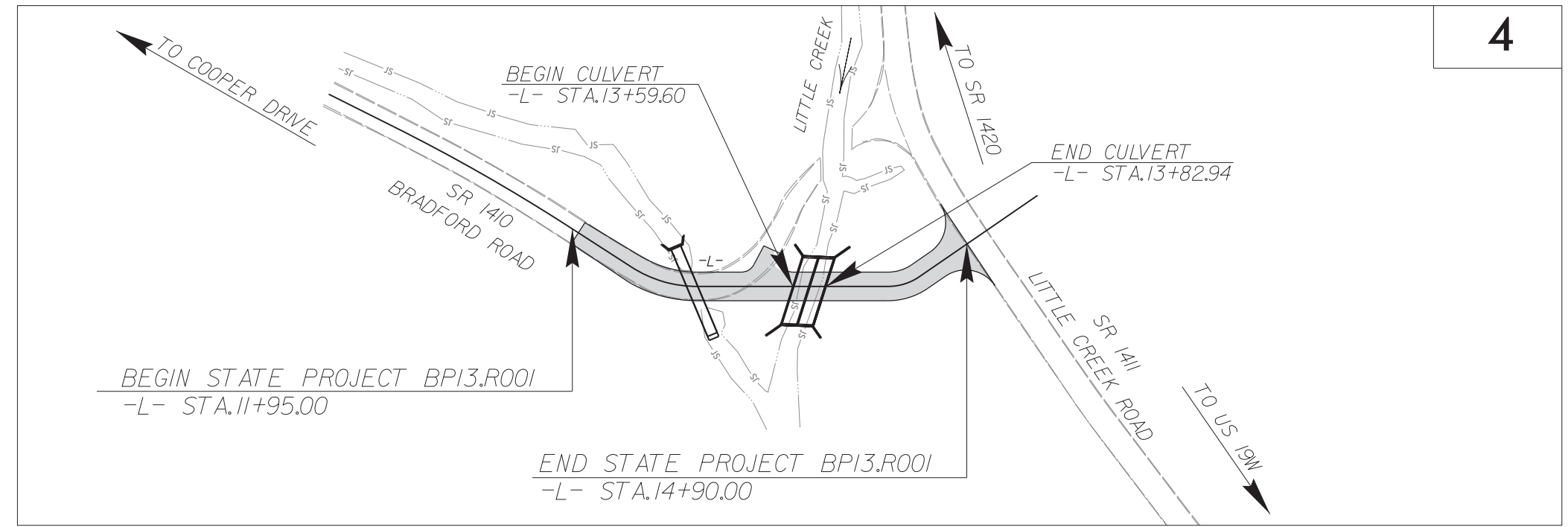

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**YANCEY COUNTY**

**LOCATION: REPLACE BRIDGE NO. 274 OVER LITTLE CREEK ON SR 1410 (BRADFORD ROAD)**

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

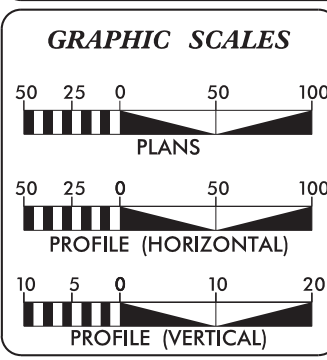
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP13.R001	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
BP13.R001.1		PE	
BP13.R001.2		RW & UTIL	
BP13.R001.3		CON	



4



DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



**DESIGN DATA**

ADT 2016 = 330

V = 15 MPH

FUNC CLASS = LOCAL

SUB - REGIONAL TIER

**PROJECT LENGTH**

LENGTH OF ROADWAY STATE PROJECT BP13.R001 = .052 MILES

LENGTH OF STRUCTURE STATE PROJECT BP13.R001 = .004 MILES

TOTAL LENGTH OF STATE PROJECT BP13.R001 = .056 MILES

Prepared in the Office of:

**KCI Associates of N.C., P.A.**  
4505 Falls of Neuse Road, Suite 400  
Raleigh, NC 27609  
Phone (919) 783-9214  
Fax (919) 783-9266

Plans Prepared For:

**NCDOT - DIVISION 13**  
55 Orange Street  
Asheville, NC 28801

2024 STANDARD SPECIFICATIONS

**RIGHT OF WAY DATE:**  
NOVEMBER 5, 2021

**LETTING DATE:**  
JANUARY 17, 2024

**NCDOT CONTACT:** EDDIE DOUGLAS  
NCDOT DIVISION 13

**CHARLES L. FLOWE, P.E.**  
KCI ROADWAY PRACTICE LEAD

**RONALD D. ALLEN, P.E.**  
KCI ROADWAY PROJECT MANAGER

**HYDRAULICS ENGINEER**

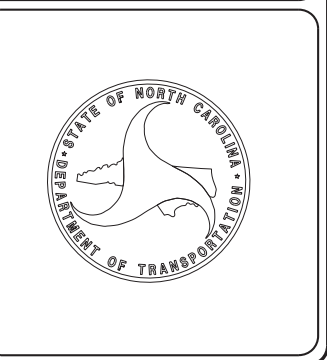
10/10/2023

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Joshua G. Dalton  
1698AD2BC14594C23  
SIGNATURE:

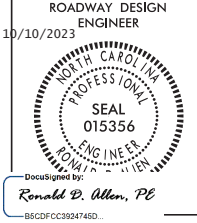
**ROADWAY DESIGN ENGINEER**

10/10/2023

DocuSigned by:  
Ronald D. Allen, PE  
982CF6C392A746D2  
SIGNATURE:



8/17/99



06-SEP-2023 10:51 AM  
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SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2A-1	TYPICAL SECTIONS, PAVEMENT SCHEDULE, WEDGING DETAIL, PROFILE KEY-IN DETAIL, AND GUARDRAIL INSET
2C-1	REINFORCED CONCRETE END WALL FOR 87" X 63" ARCH PIPE - 90° SKEW
3B-1	SUMMARY OF EARTHWORK, SUMMARY OF SHOULDER BERM GUTTER, SUMMARY OF PAVEMENT REMOVAL, AND SUMMARY OF GUARDRAIL
3G-1	SUMMARY OF GEOTECHNICAL QUANTITIES
4	PLAN SHEET
5	PROFILE SHEET
RW01	TITLE SHEET FOR SURVEY & RW SHEETS
RW02C-1 TO RW02C-3	SURVEY CONTROL SHEETS
RW02D-1	PROPOSED ALIGNMENT CONTROL SHEET
RW03E-1	RIGHT OF WAY CONTROL SHEET
RW04	RIGHT OF WAY SHEET
TMP-1 TO TMP-3E	TRANSPORTATION MANAGEMENT PLANS
PMP-1 TO PMP-2	PAVEMENT MARKING PLANS
EC-1 TO EC-7	EROSION CONTROL PLANS
RF-1	REFORESTATION DETAIL SHEET
X-0	CROSS SECTION SUMMARY SHEET
X-1 TO X-18	-L- CROSS-SECTIONS
C01-01 TO C01-02	METAL STRUCTURAL PLATE ARCH CULVERT PLANS
C02-01 TO C02-05	DOUBLE 10' X 7' CONCRETE BOX CULVERT PLANS

**GENERAL NOTES:**

2024 SPECIFICATIONS  
EFFECTIVE: 01-16-2024  
REVISED:

**GRADING AND SURFACING OR RESURFACING AND WIDENING:**

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

**CLEARING:**

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

**SUPERELEVATION:**

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

**SHOULDER CONSTRUCTION:**

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

**SIDE ROADS:**

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

**SUBSURFACE DRAINS:**

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

**GUARDRAIL:**

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

**TEMPORARY SHORING:**

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

**RIGHT-OF-WAY MARKERS:**

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

EFF. 01-16-2024  
REV.

2024 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, 2024 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
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

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

*Note: Not to Scale*

### BOUNDARIES AND PROPERTY:

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

### BUILDINGS AND OTHER CULTURE:

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

### HYDROLOGY:

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

### RAILROADS:

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

### RIGHT OF WAY & PROJECT CONTROL:

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

### ROADS AND RELATED FEATURES:

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

Woods Line	-----
Orchard	⊗
Vineyard	□

### EXISTING STRUCTURES:

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

### UTILITIES:

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

POWER:	
Existing Power Pole	●
Proposed Power Pole	○
Existing Joint Use Pole	●
Proposed Joint Use Pole	○
Power Manhole	⊗
Power Line Tower	⊗
Power Transformer	⊗
U/G Power Cable Hand Hole	PH
H-Frame Pole	●
U/G Power Line Test Hole (SUE - LOS A)*	⊗
U/G Power Line (SUE - LOS B)*	P
U/G Power Line (SUE - LOS C)*	P
U/G Power Line (SUE - LOS D)*	P

### TELEPHONE:

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

### 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	A/G Water

### TV:

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

### GAS:

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

### SANITARY SEWER:

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

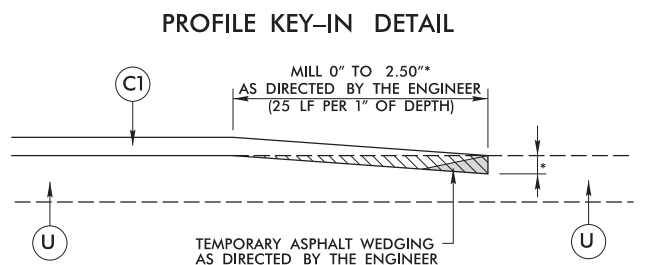
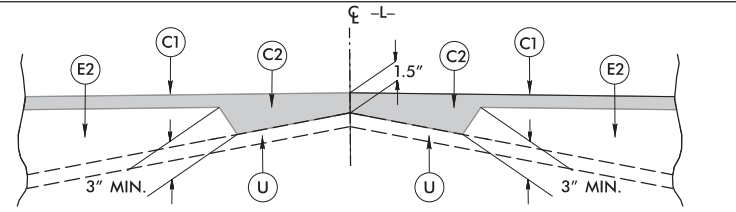
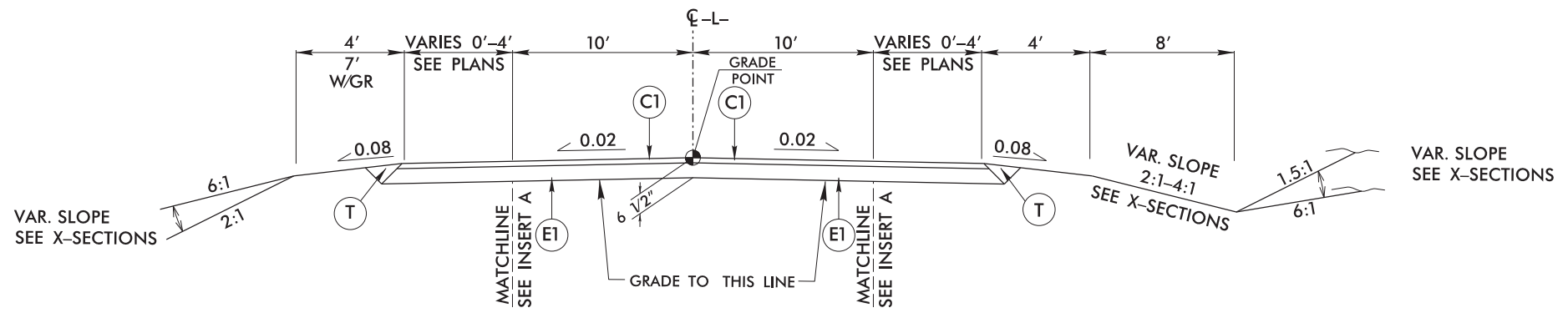
### MISCELLANEOUS:

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

6/22/99  
 DC-021-2027-14-35  
 MS-2016-016-01601609  
 NCDOT Division 13 Bridge Replacements 0.17BP.13.R.160.Yancey-990274\Roadway\Proj\990274.Rdy\_tup.dgn  
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FINAL PAVEMENT SCHEDULE	
C1	PROP. APPROX. 2½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
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 1½" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.

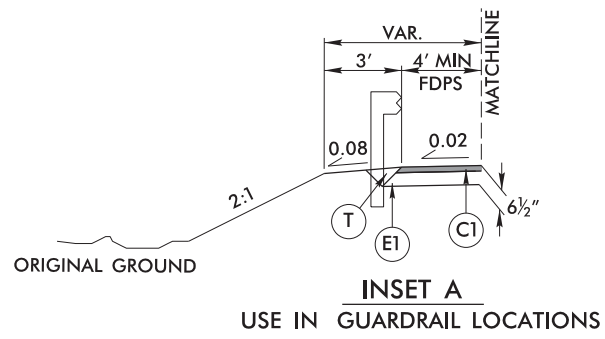
ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE NOTED.



TEMPORARY ASPHALT WEDGING AS DIRECTED BY THE ENGINEER

\* MILL DEPTH AS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER

\*\* SEE TYPICALS FOR MIX TYPE



PROJECT REFERENCE NO. BPI3.R001	SHEET NO. 2A-1
ROADWAY DESIGN ENGINEER 10/10/2016 SEAL 015356 Ronald D. Allen, PE	PAVEMENT DESIGN ENGINEER 10/10/2016 SEAL 024964 Joseph Holland
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
KCI Engineers • Planners • Scientists • Construction Managers 4505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609 Phone (919) 783-9214 • Fax (919) 783-9266	



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

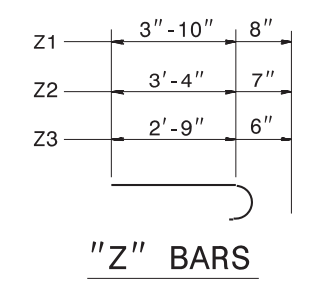
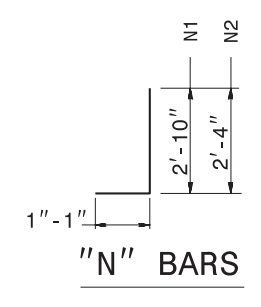
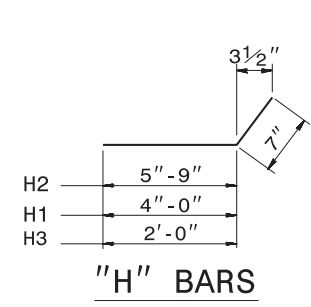
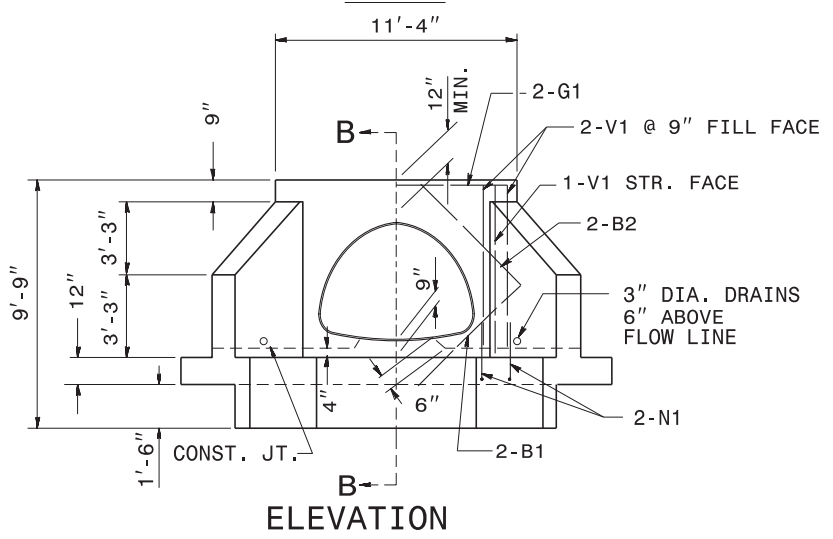
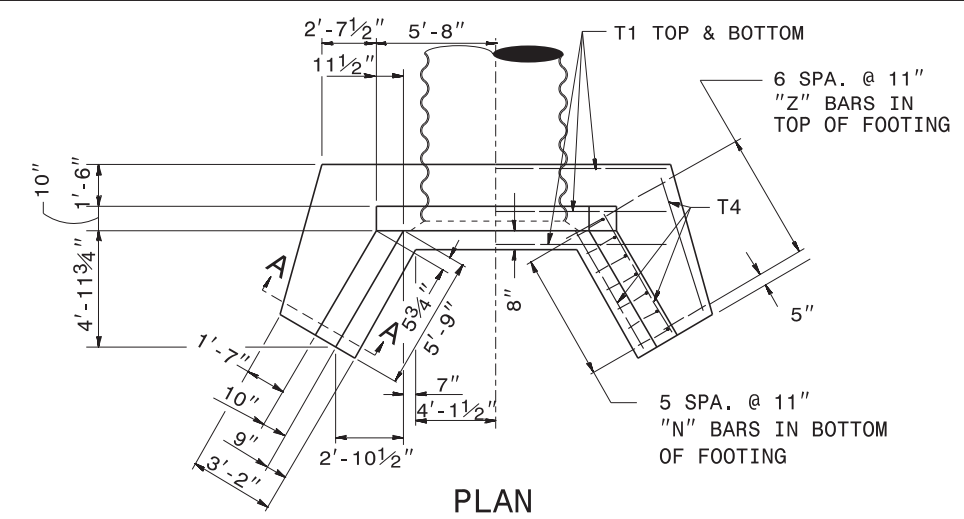
ENGLISH DETAIL DRAWING FOR  
**REINFORCED CONCRETE ENDWALL**  
FOR 87" X 63" ARCH PIPE - 90° SKEW

SHEET 1 OF 1  
**838D33**

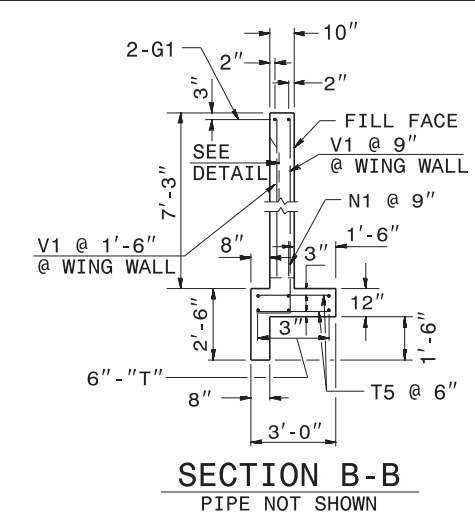
STATE OF NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR  
**REINFORCED CONCRETE ENDWALL**  
FOR 87" X 63" ARCH PIPE - 90° SKEW

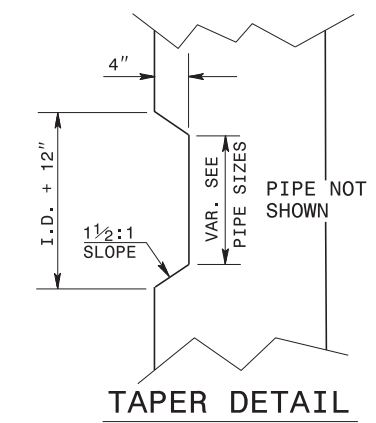
SHEET 1 OF 1  
**838D33**



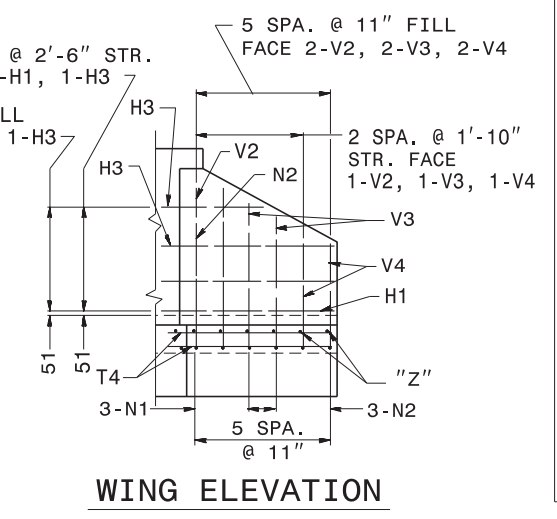
"H", "N", & "Z" BAR DIMENSIONS ARE OUT TO OUT.



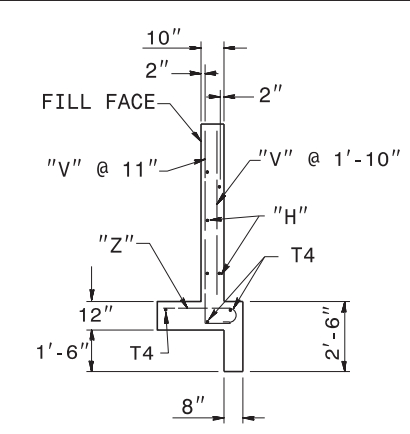
**SECTION B-B**  
PIPE NOT SHOWN



**TAPER DETAIL**



**WING ELEVATION**



**SECTION A-A**  
SEE STD. 838.45 FOR GENERAL NOTES.

BILL OF MATERIAL FOR ENDWALL				
REINF. STEEL			1 PIPE	
BAR	SIZE	LENGTH	NO.	WEIGHT
B1	#4	5'-6"	4	15
B2	#4	4'-6"	4	12
G1	#7	11'-5 1/2"	2	47
H1	#4	6'-4"	10	42
H2	#4	4'-7"	2	6
H3	#4	2'-7"	4	7
N1	#5	3'-11"	10	41
N2	#4	3'-5"	6	14
T1	#4	15'-11 1/2"	6	64
T4	#4	6'-0"	6	24
T5	#4	2'-6"	38	63
V1	#4	6'-9"	6	27
V2	#4	5'-2"	6	21
V3	#4	4'-1"	6	16
V4	#4	2'-11"	6	12
Z1	#6	4'-6"	6	41
Z2	#5	3'-11"	4	16
Z3	#4	3'-3"	4	9
REINF. STEEL LBS.			477	
CON./C.S. CU. YDS			7.5	

10/10/2023



DocuSigned by:  
Nicole M. Hecker  
5884323D34164C5

CONTRACT STANDARDS & DEVELOPMENT UNIT  
STANDARDS AND SPECIAL DESIGN  
Office 919-250-4128 FAX 919-250-4119

**SEE PLATE FOR TITLE**

ORIGINAL BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
MODIFIED BY: k Kempf DATE: 4-30-15  
CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
FILE SPEC.: k Kempf/eng1sh/R5206archendwall 87x63 90sk.dgn

12/06/07

COMPUTED BY: T. KRAUSS DATE: 06/6/2022  
CHECKED BY: R. ALLEN DATE: 06/6/2022

PROJECT REFERENCE NO. SHEET NO.  
BP13.R001 3B-1

### STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

#### EARTHWORK (CUBIC YARDS)

STATION	STATION	UNCL. EXCAV.	EMBANK. +15%	BORROW	WASTE
PHASE 2 DETOUR					
-L- 12+00.00	-L- 13+50.00	1001	44	0	957
MAINLINE CONSTRUCTION					
-L- 12+00.00	-L- 14+90.00	16	1053	1037	0
TOTALS					
		1017	1097	1037	957
WASTE IN LIEU OF BORROW				-957	-957
PROJECT TOTAL				80	
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT				4	
GRAND TOTAL					
		1017		84	
SAY		1120		100	

UNDERCUT = 450 CY  
GEOTEXTILE FOR SOIL STABILIZATION = 200 SY  
SELECT GRANULAR MATERIAL = 400 CY

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

#### EXISTING PAVEMENT REMOVAL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD <sup>2</sup>
-L-	12+00	DRIVEWAY TIE	-	326.36
-L-	DRIVEWAY TIE	BEG EX BRG	-	26.03
-L-	END EX BRG	SR 1411	-	113.53
TOTAL:				465.92
SAY:				490

#### RIP RAP, FABRIC, & DDE

GT - GEOTEXTILE FABRIC  
DDE - DRAINAGE DITCH EXCAVATION

LINE	STATION	STATION	LOC	CLASS & TONS			GT (SY)	DDE (CY)	DETAIL	COMMENTS
				I	II	B				
-L-	12+25	12+94	RT			45	80		6	
-L-	12+75	12+75	LT	18			30	14	4	
-L-	12+92	12+92	RT	25			40	13	5	
-L-	13+64	13+64	RT			95	125	42	3	EST. 35 SY CFM
-L-	13+78	13+78	LT			60	95	65	2	EST. 35 SY CFM
-L-	13+80	13+80	LT					75	7	EST. 70 SY CFM
TOTALS				43	123	45	370	209		
SAY				45	125	45	370	210		

FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.  
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.  
G = GATING IMPACT ATTENUATOR TYPE 350  
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

#### GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS							TEMP. CRASH CUSHIONS	SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS										
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	XI MOD	B-77	GRAU 350	M-350	TEMP. W-BEAM RETROFIT	TYPE III	VI MOD						GREU TL-2	AT-1								
				EA	G	NG																														
-L-	13+04.32	14+29.20	RIGHT	125.00			13+60.39	13+82.15	4.00'	7.00'	25'	25'	0.5'	0.5'																						
-L-	13+54.52	14+40.05	LEFT	75.00	25.00		13+82.15	13+60.39	4.00'	7.00'	25'	25'	2.75'	0.5'																						
-L-	13+64.81	13+66.82	LEFT	25.00																																
SUBTOTAL				225.00	25.00																															
LESS ANCHOR DEDUCTIONS:																																				
GREU TL-2 3 @ 25.00' =				-75.00'																																
AT-1 1 @ 6.25' =				-6.25'																																
ANCHOR DEDUCTION TOTAL:				-81.25'																																
PROJECT TOTAL				143.75'	25.00																															
SAY				150.00'	25.00																															
ADDITIONAL GUARDRAIL POST =				6 EA																																

13 Bridge Replacements 0.17BP.13.R.160. Yancey\_990274\Roadway\Pro\990274.Rdy\_sum.dgn

COMPUTED BY: DMM DATE: 7/20/2021  
 CHECKED BY: JCK DATE: 7/20/2021

(12-17-19)

PROJECT NO. SHEET NO.  
 BP13.R001 3G-1

**STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS**

**SUMMARY OF SUBSURFACE DRAINAGE**

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

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

**SUMMARY OF GEOTEXTILE  
 FOR PAVEMENT STABILIZATION**

LINE	Station	Station	Geotextile for Pavement Stabilization SY	Class IV Subgrade Stabilization TONS
CONTINGENCY				
			<b>TOTAL SY/TONS:</b>	0 0*

\*Total tons of "Class IV Subgrade Stabilization" is only the estimated quantity for pavement stabilization and may only represent a portion of the subgrade stabilization quantity shown in the Item Sheets of the Proposal.

**SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION**

LINE	Station	Station	Aggregate Type* ASU(1/2)/AST	Aggregate Thickness INCHES [8" for ASU(2)]	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Soil Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY			ASU	12	100	200	500		
					<b>TOTAL CY/TONS/SY:</b>	100	200**	500**	0 0

\*ASU(1/2) = Aggregate Subgrade (Type 1 or 2)  
 \*AST = Aggregate Stabilization  
 \*\*Total tons of "Class IV Subgrade Stabilization" and total square yards of "Geotextile for Soil Stabilization" are only the estimated quantities for ASU(1/2)/AST and may only represent a portion of the subgrade stabilization and geotextile quantities shown in the Item Sheets of the Proposal.

**SUMMARY OF ROCK PLATING**

LINE	Beginning Slope (H:V)	Approx. Station	Ending Slope (H:V)	Approx. Station	Location LT/RT	Rock Plating Detail No. 1/2/3/4	Riprap Class* 1/2/B	Rock Plating SY
							<b>TOTAL SY:</b>	0

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

**SUMMARY OF REINFORCED SOIL SLOPES AND SLOPE EROSION CONTROL**

LINE	Beginning Slope/ RSS (H:V)	Approx. Station	Ending Slope/ RSS (H:V)	Approx. Station	Location LT/RT	Reinforced Soil Slope (RSS) SY	Geocells SY	Coir Fiber Mat SY	Matting for Erosion Control SY
						<b>TOTAL SY:</b>	0	0	0* 0**

\*Total square yards of "Coir Fiber Mat" is only the estimated quantity for slopes steeper than 2:1 (H:V) and may only represent a portion of the coir fiber mat quantity shown in the Item Sheets of the Proposal.  
 \*\*Total square yards of "Matting for Erosion Control" is only the estimated quantity for RSS and may only represent a portion of the matting quantity shown in the Item Sheets of the Proposal.

**SUMMARY OF PRE-SPLITTING OF ROCK**

LINE	Beginning Rock Cut Slope (H:V)	Approx. Station	Ending Rock Cut Slope (H:V)	Approx. Station	Location LT/RT	Pre-splitting of Rock SY	
						<b>TOTAL SY:</b>	0

**SUMMARY OF HORIZONTAL DRAINS**

LINE	Approximate Station	Location LT/RT	Elevation Above or Below Grade (+/-) FT	Inclination Angle DEGREES	PVC Pipe Schedule 40/80 or NO PIPE	Horizontal Drain FT	Horizontal Drain W/O Pipe FT
CONTINGENCY							
						<b>TOTAL FT:</b>	0 0

**SUMMARY OF SETTLEMENT GAUGES**

Gauge No.	LINE and Station	Offset	
		Distance FT	Direction LT/RT
<b>TOTAL GAUGES (EACH):</b>			

**SUMMARY OF SURCHARGES  
 AND SURCHARGE WAITING PERIODS**

LINE	Station	Station	Surcharge Height FT	MONTHS

**SUMMARY OF EMBANKMENT  
 WAITING PERIODS**

LINE	Station	Station	MONTHS

**SUMMARY OF BRIDGE WAITING PERIODS**

Bridge Description	End Bent/ Bent No.	MONTHS

8/17/99

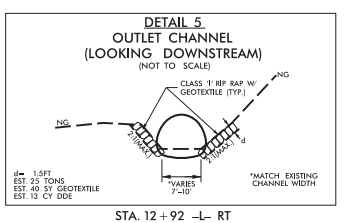
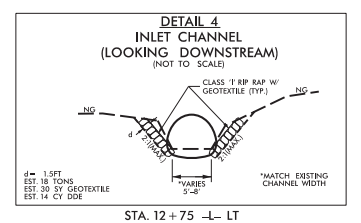
-L-

FOR -L- PROFILE SEE SHEET 5

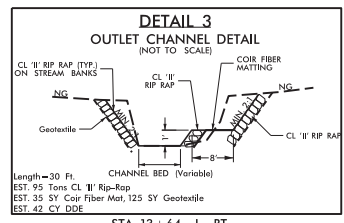
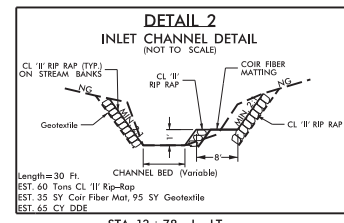
PROJECT REFERENCE NO. BP13.R001	SHEET NO. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 10/10/2023	HYDRAULICS ENGINEER 10/10/2023
Designed by: Ronald D. Allen, PE	Designed by: Joshua G. Dalton
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

PI Sta 12+69.21 Δ = 32° 48' 54.2" (LT)  
 D = 67' 24" 24.5"  
 L = 48.68'  
 T = 25.03'  
 R = 85.00'  
 SE = .04  
 RO = 81.6'  
 DS = 20mph

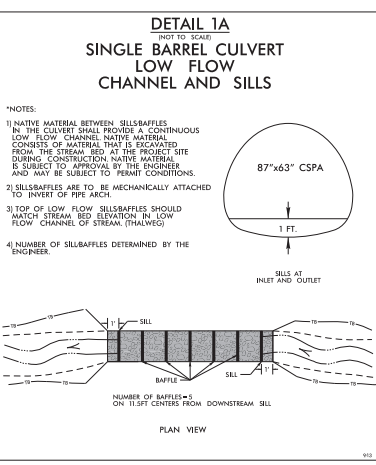
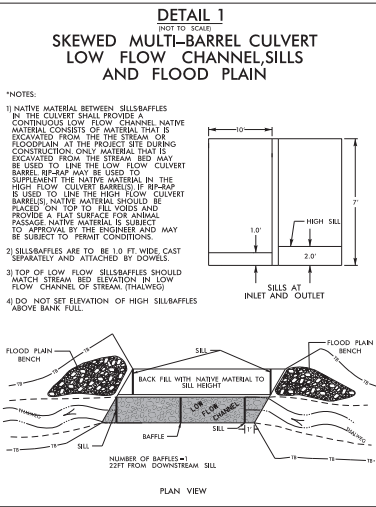
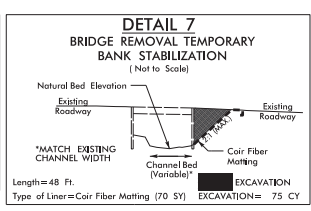
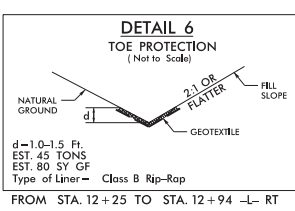
PI Sta 14+38.35 Δ = 34° 31' 51.3" (LT)  
 D = 146' 54" 44.1"  
 L = 23.50'  
 T = 12.12'  
 R = 39.00'  
 SE = .04  
 RO = 81.6'  
 DS = 15mph



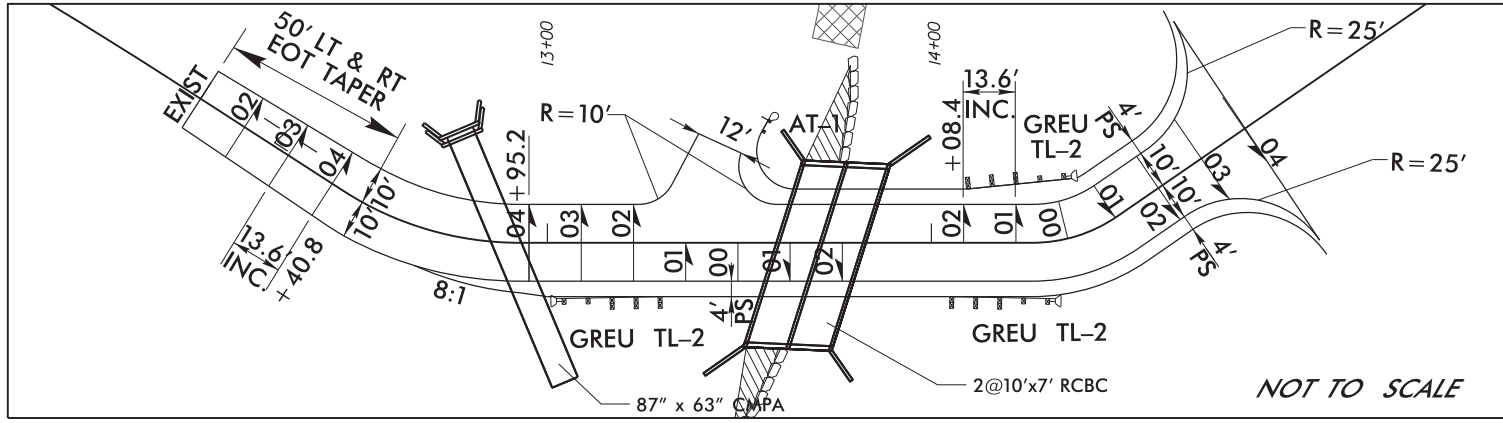
END STATE PROJECT BP13.R001  
-L- POT STA 14+90.00



BEGIN STATE PROJECT BP13.R001  
-L- POT STA 11+95.00



DETAIL OF PROPOSED CULVERTS, GUARDRAIL, AND SUPERELEVATION



NOT TO SCALE

SEE CULVERT PLANS FOR DETAIL #1  
SKEWED MULTI-BARREL CULVERT W / SILLS

REVISIONS

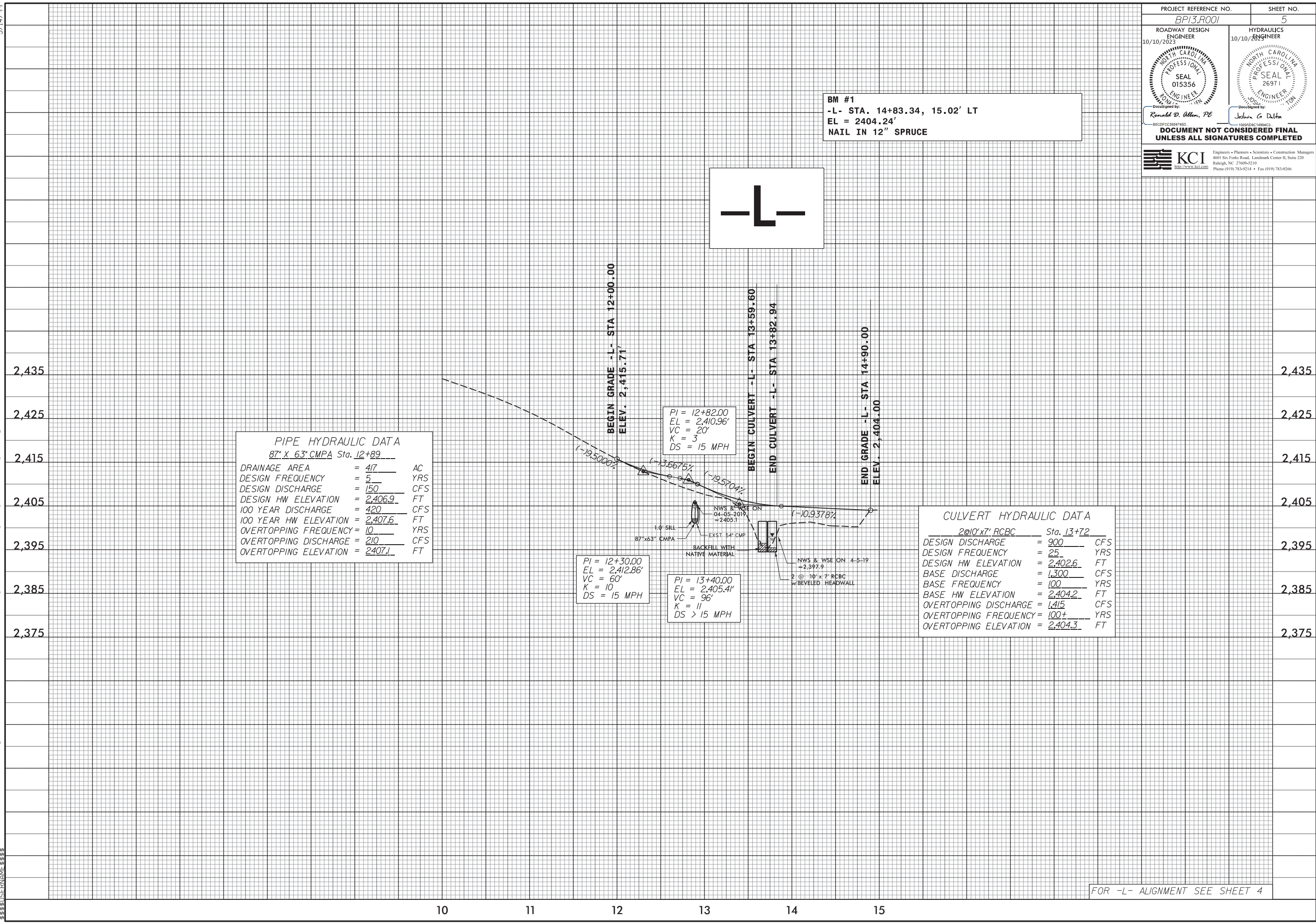
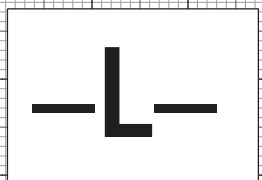
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5/14/99  
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PROJECT REFERENCE NO. <i>BPI3.R001</i>	SHEET NO. 5
ROADWAY DESIGN ENGINEER 10/10/2023	HYDRAULICS ENGINEER 10/10/2023
DocuSigned by: Ronald B. Allen, PE 85CDFCC3924745D	DocuSigned by: Joshua G. Dalton 1089AD8C14994C3
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

**BM #1**  
 -L- STA. 14+83.34, 15.02' LT  
 EL = 2404.24'  
 NAIL IN 12" SPRUCE



PIPE HYDRAULIC DATA		
87" X 63" CMPA Sta. 12+89		
DRAINAGE AREA	= 417	AC
DESIGN FREQUENCY	= 5	YRS
DESIGN DISCHARGE	= 150	CFS
DESIGN HW ELEVATION	= 2406.9	FT
100 YEAR DISCHARGE	= 420	CFS
100 YEAR HW ELEVATION	= 2407.6	FT
OVERTOPPING FREQUENCY	= 10	YRS
OVERTOPPING DISCHARGE	= 210	CFS
OVERTOPPING ELEVATION	= 2407.1	FT

PI = 12+82.00  
 EL = 2410.96'  
 VC = 20'  
 K = 3  
 DS = 15 MPH

PI = 12+30.00  
 EL = 2412.86'  
 VC = 60'  
 K = 10  
 DS = 15 MPH

PI = 13+40.00  
 EL = 2405.41'  
 VC = 96'  
 K = 11  
 DS > 15 MPH

CULVERT HYDRAULIC DATA		
2@10'x7' RCBC Sta. 13+72		
DESIGN DISCHARGE	= 900	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 2402.6	FT
BASE DISCHARGE	= 1,300	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 2404.2	FT
OVERTOPPING DISCHARGE	= 1,415	CFS
OVERTOPPING FREQUENCY	= 100+	YRS
OVERTOPPING ELEVATION	= 2404.3	FT

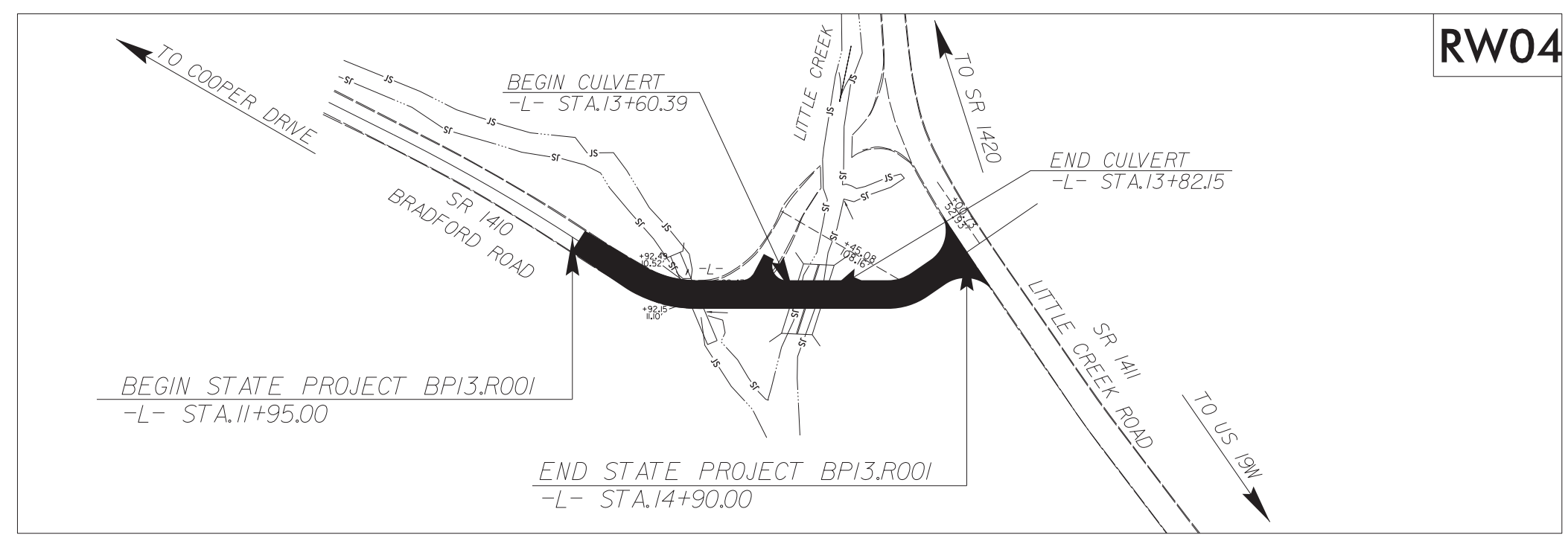
FOR -L- ALIGNMENT SEE SHEET 4

09/06/99

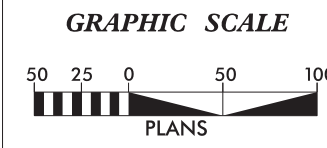
TIP PROJECT: BP13.R001

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP13.R001	RW01	07

STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS  
 SURVEY CONTROL, EXISTING CENTERLINES,  
 RIGHT OF WAY, EASEMENTS AND PROPERTY TIES  
**YANCEY COUNTY**



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



**DATUM DESCRIPTION**  
 THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "GPS B4687-1" WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF NORTHING: 835,205.6163(ft) EASTING: 997,826.9249(ft) ELEVATION: 2,266.84(ft)  
 THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999869147  
 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "GPS B4687-1" TO -L- STATION 11+95 IS N 67-19'47.9" W 3567.78(ft)  
 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

Prepared in the Office of:

**V&M**  
**Vaughn & Melton**  
 1318-F Patton Avenue  
 Asheville, NC 28806  
 Firm License # F-1088

2018 STANDARD SPECIFICATIONS

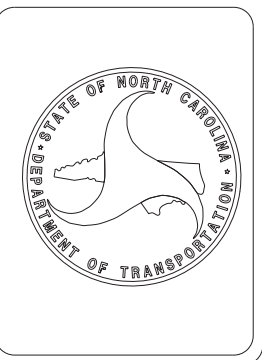
**RIGHT OF WAY DATE:** 01/04/2022  
**LETTING DATE:** 01/17/2024

PROFESSIONAL LAND SURVEYOR

DocuSigned by:  
  
 F1570CB85C7248A...

**SEAL**  
 NORTH CAROLINA  
 PROFESSIONAL LAND SURVEYOR  
 L-4529  
 MARKA PARRILLO

Signature: \_\_\_\_\_ Date: \_\_\_\_\_









# SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

EL POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	836999.165	994609.888							
LINE			S 28°56'27.0" E	88.84					
PC	836921.423	994652.876							
CURVE			S 24°30'37.2" E	128.63	08°51'39.6"(RT)	06°52'55.4"	128.76	64.51	832.54
PT	836804.387	994706.237							
LINE			S 20°04'47.4" E	53.73					
PC	836753.922	994724.685							
CURVE			S 30°59'09.8" E	68.11	21°48'44.9"(LT)	31°49'51.6"	68.53	34.68	180.00
PCC	836695.530	994759.751							
CURVE			S 45°32'34.3" E	70.04	07°18'04.1"(LT)	10°25'02.7"	70.09	35.09	550.00
PT	836646.477	994809.743							
LINE			S 49°11'36.4" E	93.46					
PC	836585.400	994880.485							
CURVE			S 50°40'21.6" E	111.32	02°57'30.5"(LT)	02°39'26.7"	111.33	55.68	2156.07
PT	836514.853	994966.592							
LINE			S 52°09'06.9" E	79.84					
PC	836465.868	995029.634							
CURVE			S 58°46'57.5" E	57.74	13°15'41.3"(LT)	22°55'05.9"	57.86	29.06	250.00
PCC	836435.945	995079.009							
CURVE			S 84°59'00.3" E	66.99	39°08'24.2"(LT)	57°17'44.8"	68.31	35.55	100.00
PCC	836430.087	995145.744							
CURVE			N 68°24'41.8" E	73.48	14°04'11.5"(LT)	19°05'54.9"	73.67	37.02	300.00
PT	836457.125	995214.074							
LINE			N 61°22'36.1" E	25.70					
POT	836469.437	995236.634							

EY POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	836628.843	994345.965							
LINE			S 78°05'21.1" E	50.76					
PC	836618.368	994395.628							
CURVE			S 74°58'06.0" E	139.31	06°14'30.2"(RT)	04°28'41.3"	139.38	69.76	1279.45
PT	836582.237	994530.174							
LINE			S 71°50'50.9" E	54.05					
PC	836565.398	994581.532							
CURVE			S 88°06'00.0" E	48.06	32°30'18.2"(LT)	66°44'01.7"	48.71	25.03	85.86
PCC	836563.805	994629.563							
CURVE			N 47°46'29.1" E	55.14	55°44'43.5"(LT)	97°09'32.7"	57.38	31.19	58.97
PCC	836600.861	994670.394							
CURVE			N 16°12'41.7" E	28.17	07°22'51.3"(LT)	26°11'07.9"	28.19	14.11	218.81
PT	836627.908	994678.258							
LINE			N 12°31'16.1" E	13.68					
PC	836641.259	994681.223							
CURVE			N 21°52'17.6" E	19.80	18°42'02.9"(RT)	94°02'46.3"	19.88	10.03	60.92
PT	836659.630	994688.598							
LINE			N 31°13'19.1" E	24.39					
PC	836680.490	994701.242							
CURVE			N 36°11'52.4" E	18.95	09°57'06.6"(RT)	52°26'23.0"	18.98	9.51	109.26
PT	836695.786	994712.436							
LINE			N 41°10'25.7" E	39.08					
POT	836725.199	994738.162							

**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/

27 JUN 2018 2:00:34 PM NCDOT\A 99-0274 Div13 Bridge Survey\DELIVERABLES\6-27-2018\990274\_1s\_rw02c-3.dgn

6/2/19

# PROPOSED ALIGNMENT CONTROL SHEET

PROJECT REFERENCE NO. BP13.R001	SHEET NO. RW02D-1
<b>Location and Surveys</b>	
	
PROJECT SURVEYOR 	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

I, Mark A. Parris, 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 4<sup>th</sup> day of January, 2022.

DocuSigned by:  
  
 Professional Land Surveyor L-4529

REVISIONS


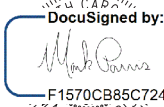
TYPE	STATION	NORTH	EAST
POT	10+00.00	836628.8434	994345.9647
PC	10+50.76	836618.3679	994395.6278
PT	11+90.14	836582.2368	994530.1737
PC	12+44.19	836565.3983	994581.5317
PT	12+92.87	836563.9360	994629.5289
PC	14+26.23	836597.6932	994758.5472
PT	14+49.73	836609.9363	994778.1952
POT	15+50.00	836685.8288	994843.7190

### NOTES:

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

28-DEC-2021 09:58  
 R:\NCS\2021\12-36\_Yancey\_274\_Staking\Survey\RW\_Sheets\990274\_1s\_RW02D-1.dgn  
 Jcgarland

# RIGHT OF WAY CONTROL SHEET

PROJECT REFERENCE NO. BP13.R001	SHEET NO. RW03E-1
<b>Location and Surveys</b>	
	
PROJECT SURVEYOR DocuSigned by:  F1570CB85C7248A... MARK A. PARRIS	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	


## ROW MARKER IRON PIN AND CAP -E

ALIGN	STATION	OFFSET	NORTH	EAST
L	11+95.00	-25.00	836604.4777	994542.5828
L	11+95.00	-9.00	836589.2740	994537.5981
L	12+00.00	20.00	836560.1595	994533.3144
L	12+00.00	9.00	836570.6121	994536.7414
L	13+17.00	-14.90	836584.4617	994649.1032
L	13+25.00	110.00	836465.6519	994688.4587
L	13+34.34	-30.48	836603.9246	994661.9317
L	13+48.20	-53.67	836629.8596	994669.4722
L	13+55.00	-66.89	836644.3751	994672.7063
L	13+65.00	-105.00	836683.7751	994672.7340
L	13+91.02	-111.89	836697.0312	994696.1616
L	13+91.87	-129.37	836714.1563	994692.5620
L	14+25.00	40.00	836558.6848	994767.4832
L	14+87.01	48.93	836606.1734	994839.5917
L	15+04.52	-159.87	836755.8873	994692.9907
L	15+15.64	-142.64	836753.0333	994713.2980

## ROW MARKER PERMANENT EASEMENT -E

ALIGN	STATION	OFFSET	NORTH	EAST
L	12+42.00	-55.00	836618.3418	994596.5901

I, Mark A. Parris, 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 12/27 to 12/28, and all coordinates are based on NAD83/2011. That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

DocuSigned by: February, 2022.  
  
 Professional Land Surveyor L-4529

REVISIONS

02-FEB-2022 15:25 V:\NCS\Survey\112-36\_YoncoBy\_274\_Staking\Survey\RW\_Sheets\990274\_1s\_RW03E-1.dgn pashuman

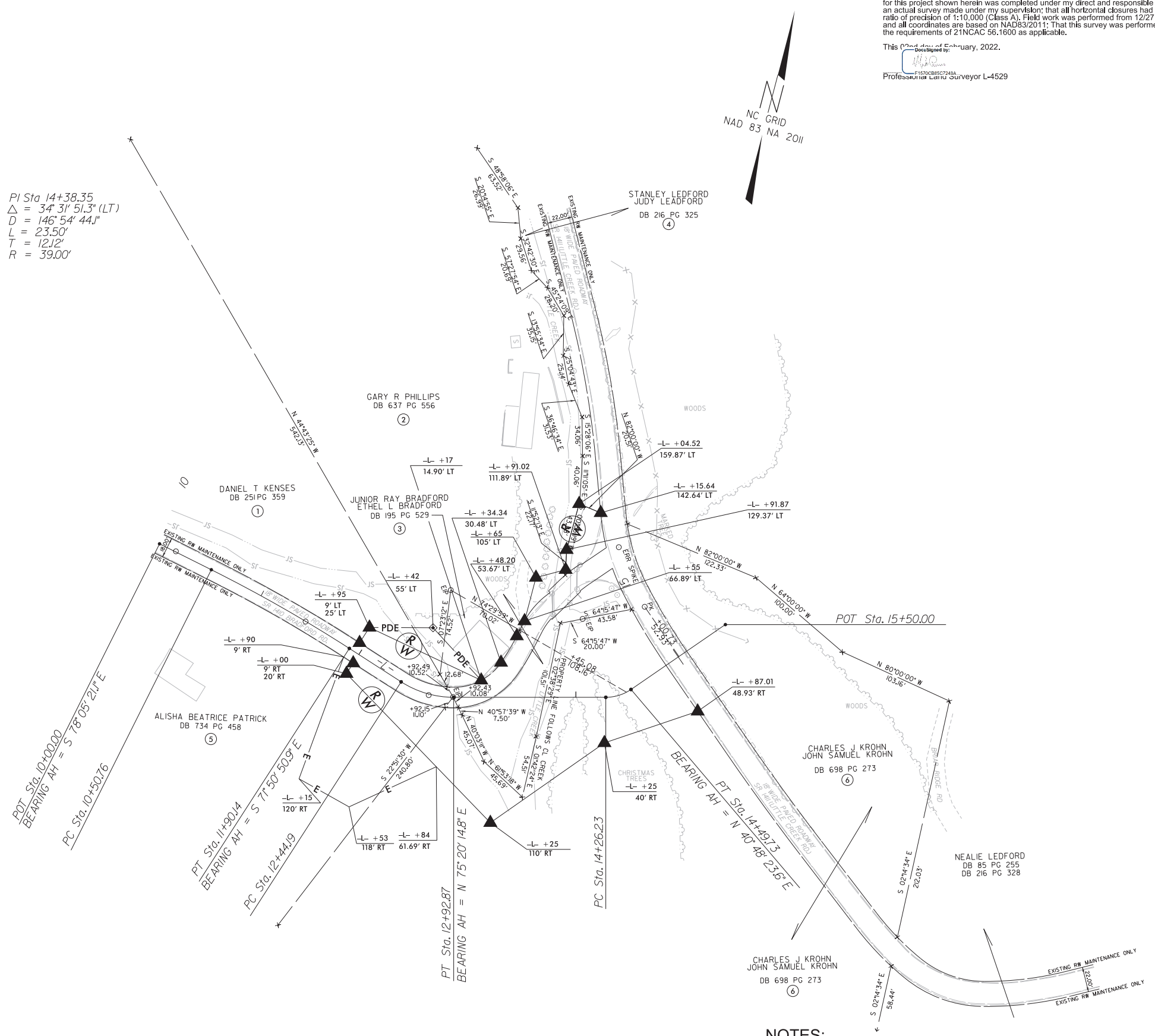
### NOTES:

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 12/27 TO 12/28 .

REVISIONS



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pushman

PI Sta 12+69.21      PI Sta 14+38.35  
 $\Delta = 32^{\circ} 48' 54.2" (LT)$        $\Delta = 34^{\circ} 31' 51.3" (LT)$   
 $D = 67' 24" 24.5"$        $D = 146' 54" 44.1"$   
 $L = 48.68'$        $L = 23.50'$   
 $T = 25.03'$        $T = 12.12'$   
 $R = 85.00'$        $R = 39.00'$



I, Mark A. Parris, 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 12/27 to 12/28, and all coordinates are based on NAD83/2011. That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.  
 This 02nd day of February, 2022.  
 Mark A. Parris  
 F1570C885C7248A  
 Professional Land Surveyor L-4529



PROJECT REFERENCE NO. BP13.R001	SHEET NO. RW04
<b>Location and Surveys</b>	
	
PROJECT SURVEYOR	
	
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**NOTES:**

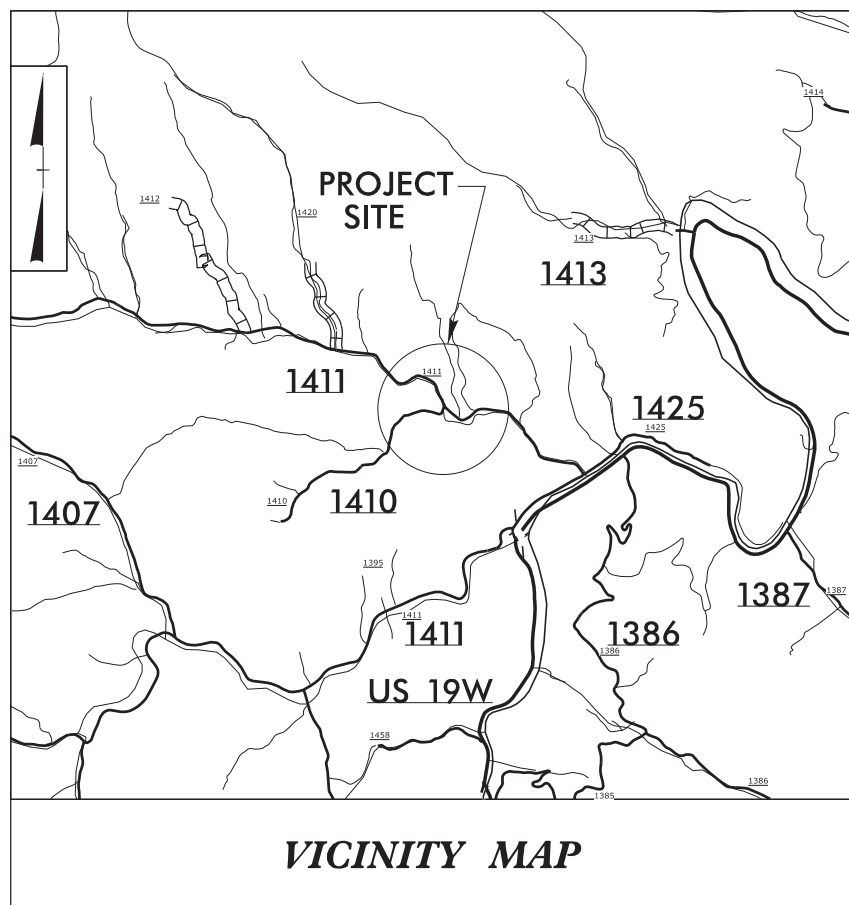
1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
3. RIGHT OF WAY MONUMENTATION ESTABLISHED 12/27 TO 12/28.



STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**TRANSPORTATION MANAGEMENT PLAN**

**YANCEY COUNTY**



**LOCATION: REPLACE BRIDGE NO. 274  
OVER LITTLE CREEK  
ON SR 1410 (BRADFORD ROAD)**

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

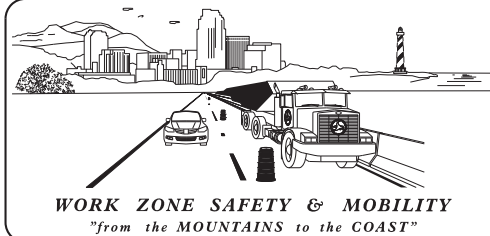
**INDEX OF SHEETS**

SHEET NO.	TITLE
TMP-1	TITLE SHEET, VICINITY MAP, AND INDEX OF SHEETS
TMP-1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS AND LEGEND
TMP-1B	TRANSPORTATION OPERATIONS PLAN: (MANAGEMENT STRATEGIES, GENERAL NOTES, LOCAL NOTES)
TMP-1C	PHASING
TMP-2A	ADVANCE SIGNING DETAIL FOR TEMPORARY SIGNAL (WESTBOUND LANE SHIFT)
TMP-2B	ADVANCE SIGNING DETAIL FOR TEMPORARY SIGNAL (EASTBOUND LANE SHIFT)
TMP-2C	ADVANCE SIGNING DETAIL FOR TEMPORARY SIGNAL (WESTBOUND LANE SHIFT)
TMP-2D	ADVANCE SIGNING DETAIL FOR TEMPORARY SIGNAL (EASTBOUND LANE SHIFT)
TMP-3A	TEMPORARY TRAFFIC CONTROL PHASE 1 DETAIL
TMP-3B	TEMPORARY TRAFFIC CONTROL PHASE 2 DETAIL
TMP-3C	TEMPORARY TRAFFIC CONTROL PHASE 3 DETAIL
TMP-3D	TEMPORARY TRAFFIC CONTROL PHASE 4 DETAIL
TMP-3E	TEMPORARY TRAFFIC CONTROL PHASE 5 DETAIL

SHEET NO.  
TMP-1

**CONTRACT: DM00337 PROJECT: BPI3.R001**

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**PLANS PREPARED BY:**

TYLER KRAUSS, PE  
**PROJECT ENGINEER**

RONALD D. ALLEN, PE  
**PROJECT MANAGER**

KCI ASSOCIATES OF NC, PA

**NCDOT CONTACTS:**

D. A. PARKER, PE  
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KARMEN DAIS  
**PROJECT DESIGN ENGINEER**



**KCI ASSOCIATES OF N.C.**

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ENVIRONMENTAL - CEI  
LAND SURVEYING  
SUBSURFACE UTILITY ENGINEERING

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APPROVED: Ronald D. Allen, PE  
DATE: 10/30/2023

SEAL



# ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2024 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1101.01	WORK ZONE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.03	TEMPORARY ROAD CLOSURES
1101.04	TEMPORARY SHOULDER 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	DRUMS
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGING DEVICES
1160.01	TEMPORARY CRASH CUSHION
1180.01	SKINNY - DRUMS
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

# 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

USER DEFINED (IF NEEDED)

USER DEFINED (IF NEEDED)

## SIGNALS

- EXISTING
- PROPOSED
- TEMPORARY

## PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

## TEMPORARY PAVEMENT MARKING

DESCRIPTION	PAY ITEM
P1 - WHITE EDGELINE	PAINT (4")
P61 - WHITE STOPBAR	PAINT (24")

## 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

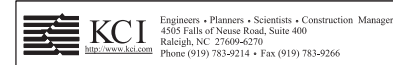
## PAVEMENT MARKERS

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

## PAVEMENT MARKING SYMBOLS

- PAVEMENT MARKING SYMBOLS

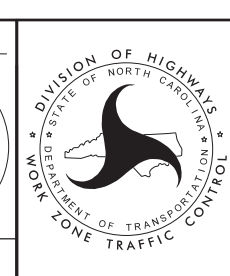
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DocuSigned by:  
*Ronald D. Allen, PE*  
APPROVED: \_\_\_\_\_  
DATE: 10/10/2023

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**ROADWAY STANDARD  
DRAWINGS & LEGEND**

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

PROJ. REFERENCE NO.	SHEET NO.
BP13.R001	TMP-1B

## 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 UNDESIRE 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.
- E) 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

- F) 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.
- G) 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) 100 FT IN ADVANCE AND A MINIMUM OF EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

### TRAFFIC PATTERN ALTERATIONS

- H) NOTIFY THE ENGINEER TWENTY ONE (21) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATIONS.

### SIGNING

- I) 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.
- J) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.
- K) INSTALL BLACK ON ORANGE "DIP" SIGNS (W8-2) AND/OR "BUMP" SIGNS (W8-1) 100 FT IN ADVANCE OF THE UNEVEN AREA, OR AS DIRECTED BY THE ENGINEER.

### TRAFFIC BARRIER

- L) 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.

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.

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

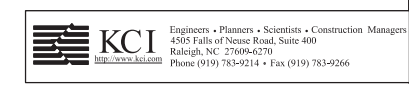
ROAD NAME:	MARKING	MARKER
SR 1410 (BRADFORD ROAD)	PAINT	TEMPORARY RAISED

- Q) PLACE ON 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.

### MISCELLANEOUS

- T) IN THE EVENT OF A TIE-IN CANNOT BE MADE IN ONE DAY'S TIME, BRING THE TIE-IN AREA TO AN APPROPRIATE ROADWAY ELEVATION AS DETERMINED BY THE ENGINEER. PLACE BLACK ON ORANGE "LOOSE GRAVEL" SIGNS (W8-7) AND BLACK ON ORANGE "PAVEMENT ENDS" SIGNS (W8-3) 100 FT AND 200 FT RESPECTIVELY IN ADVANCE OF THE UNEVEN AREAS. USE DRUMS TO DELINEATE THE EDGE OF ROADWAY ALONG UNPAVED AREAS.

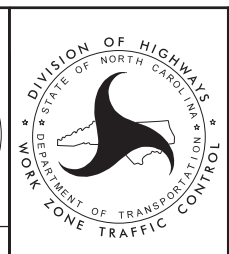
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DocuSigned by:  
**Ronald D. Allen, PE**  
APPROVED: \_\_\_\_\_  
DATE: 10/10/2023

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PROJ. REFERENCE NO.	SHEET NO.
BP13.R001	TMP-1C

# PHASING

IN A CONTINUOUS MANNER, COMPLETE THE FOLLOWING PHASES:

### PHASE 1

USING ROADWAY STANDARD DRAWING 1101.01 SHEET 3 OF 3 AND ROADWAY STANDARD DRAWING 1101.03 SHEET 3 OF 9 COMPLETE THE FOLLOWING:

CONSTRUCT PROPOSED 2 @ 10'X7' RCBC AT APPROXIMATELY -L- STA 13+72.

CONSTRUCT NEW PAVEMENT (EXCLUDING FINAL LAYER) FROM APPROXIMATELY STA -L- 13+50 TO EXISTING SR 1411. MAINTAIN TRAFFIC ALONG EXISTING SR 1410. (SEE SHEET 3A)

### PHASE 2

USING ROADWAY STANDARD DRAWING 1101.02 SHEET 17 OF 19 AND TEMPORARY PORTABLE TRAFFIC SIGNALS, COMPLETE THE FOLLOWING:

MOVE TRAFFIC INTO WEST BOUND LANE AS A ONE-LANE, TWO-WAY OPERATION. (SEE SHEET 2A,3B)

EXTEND EXISTING CMP BY APPROXIMATELY 40 FEET USING 54" TEMPORARY PIPE. CONSTRUCT FILL AND TEMPORARY PAVEMENT.

### PHASE 3

USING ROADWAY STANDARD DRAWING 1101.02 SHEET 17 OF 19 AND TEMPORARY PORTABLE TRAFFIC SIGNALS, COMPLETE THE FOLLOWING:

MOVE TRAFFIC INTO EAST BOUND LANE AS A ONE-LANE, TWO-WAY OPERATION. (SEE SHEET 2B,3C)

REMOVE EXISTING HEADWALL AND APPROXIMATELY 14 FEET OF EXISTING CMP.

INSTALL APPROXIMATELY 30 FEET OF 87" X 63" CMPA, CONSTRUCT HEADWALL, AND UPSTREAM BANK STABILIZATION.

### PHASE 4

USING ROADWAY STANDARD DRAWING 1101.02 SHEET 17 OF 19 AND TEMPORARY PORTABLE TRAFFIC SIGNALS, COMPLETE THE FOLLOWING:

MOVE TRAFFIC INTO WEST BOUND LANE AS A ONE-LANE, TWO-WAY OPERATION. (SEE SHEET 2C,3D)

COMPLETE INSTALLATION OF 87" X 63" CAPA AND DOWNSTREAM BANK STABILIZATION.

CONSTRUCT NEW PAVEMENT (EXCLUDING FINAL LAYER) IN EAST BOUND LANE FROM -L- STA 12+00 TO NEW PAVEMENT CONSTRUCTED IN PHASE 1.

### PHASE 5

USING ROADWAY STANDARD DRAWING 1101.02 SHEET 17 OF 19 AND TEMPORARY PORTABLE TRAFFIC SIGNALS, COMPLETE THE FOLLOWING:

MOVE TRAFFIC INTO EAST BOUND LANE AS A ONE-LANE, TWO-WAY OPERATION. (SEE SHEET 2D,3E)

CONSTRUCT NEW PAVEMENT (EXCLUDING FINAL LAYER) IN WEST BOUND LANE FROM -L- STA 12+00 TO NEW PAVEMENT CONSTRUCTED IN PHASE 1.

REMOVE EXISTING BRIDGE AND NORTH SIDE APPROACH PAVEMENT UP TO SR 1411. REMOVE ANY ADDITIONAL PAVEMENT AS DIRECTED ON THE PLANS.

INSTALL CHANNEL STABILIZATION ON UPSTREAM END OF THE DOUBLE RCBC.

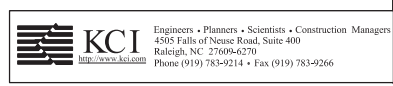
### PHASE 6

USING ROADWAY STANDARD DRAWING 1101.02 SHEET 17 OF 19 AND TEMPORARY PORTABLE TRAFFIC SIGNALS, COMPLETE THE FOLLOWING:

CONSTRUCT THE FINAL LAYER OF PAVEMENT AND PAVEMENT MARKINGS AS DIRECTED BY THE PLANS.

INSTALL STOP SIGN AT INTERSECTION WITH SR 1411.

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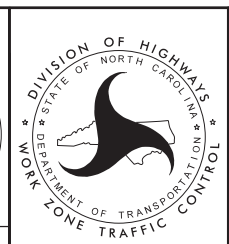
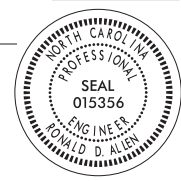
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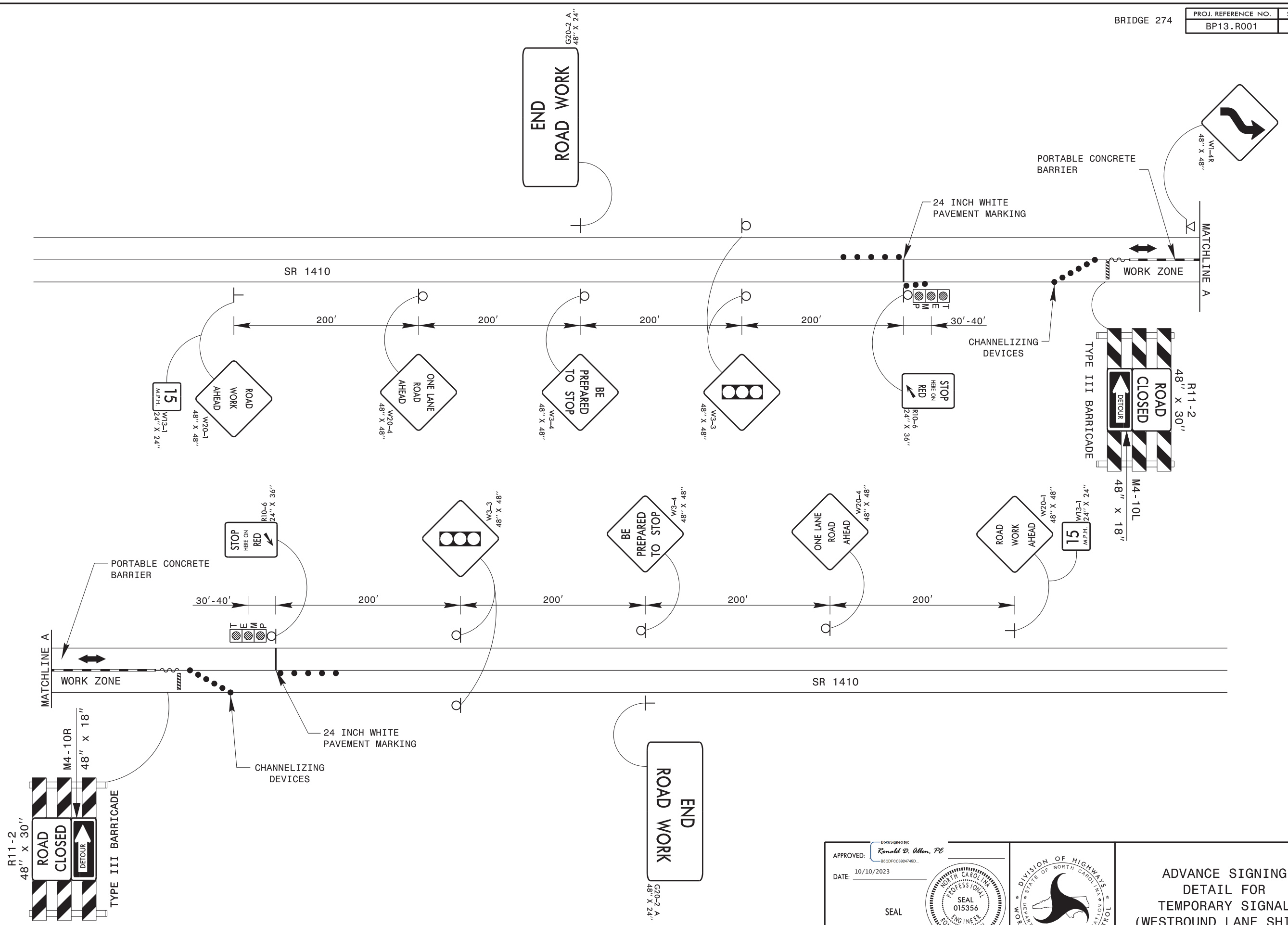
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PHASING

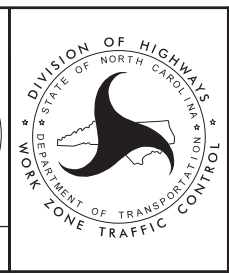




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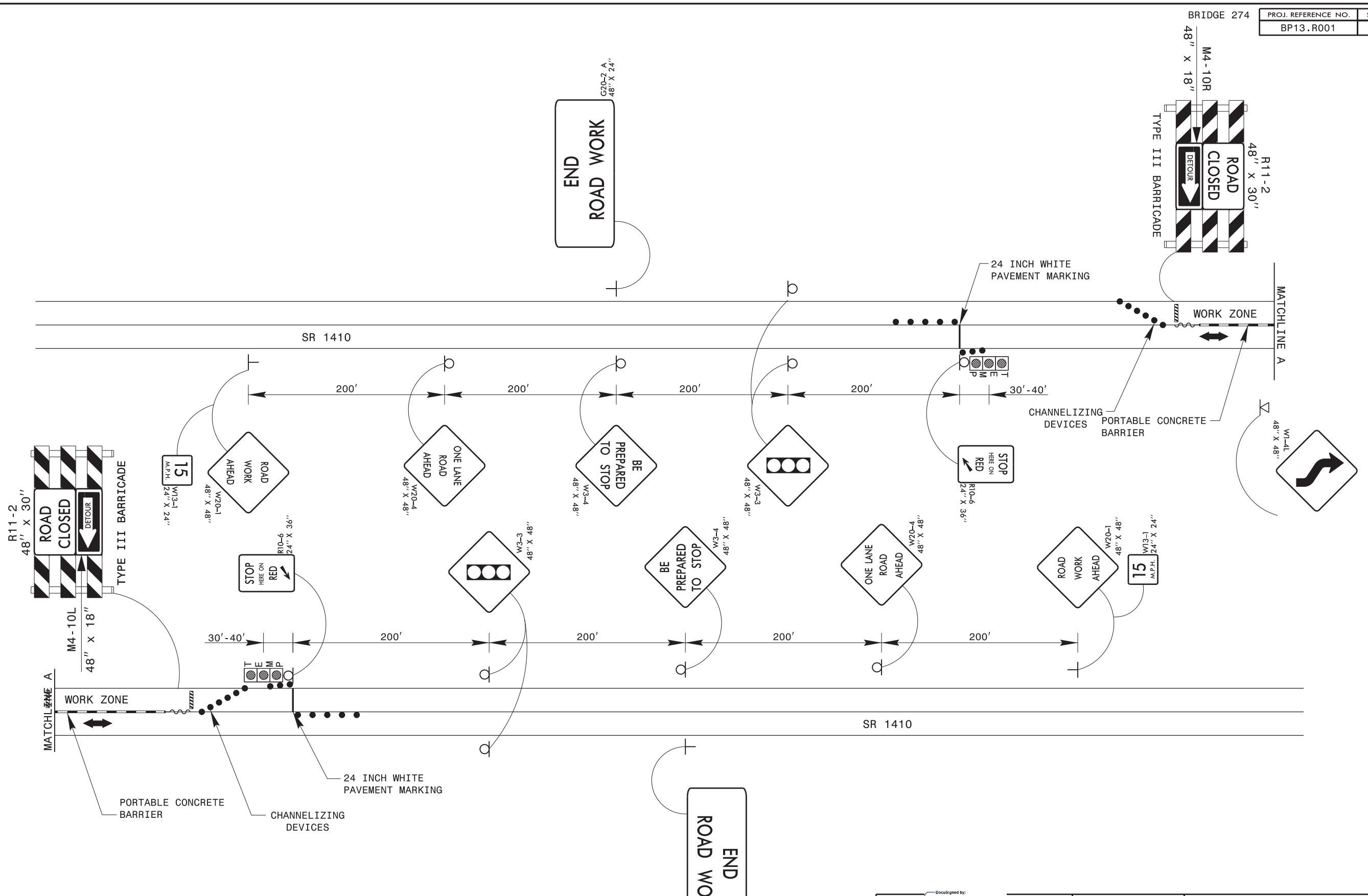
**KCI** Engineers • Planners • Scientists • Construction Managers  
 4505 Falls of Neuse Road, Suite 400  
 Raleigh, NC 27608-6270  
 Phone (919) 783-9214 • Fax (919) 783-9266

APPROVED: *Ronald D. Allen, PE*  
 DATE: 10/10/2023  
 SEAL



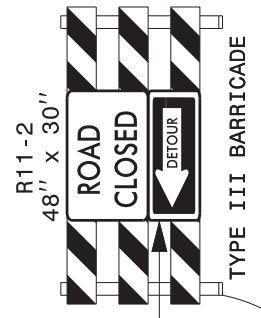
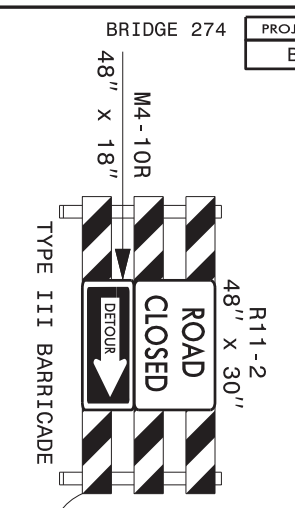
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 DETAIL FOR  
 TEMPORARY SIGNAL  
 (WESTBOUND LANE SHIFT)**

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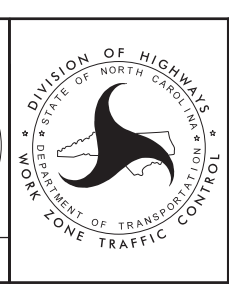
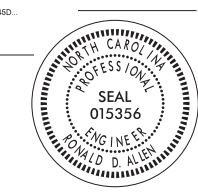


END  
ROAD WORK

END  
ROAD WORK

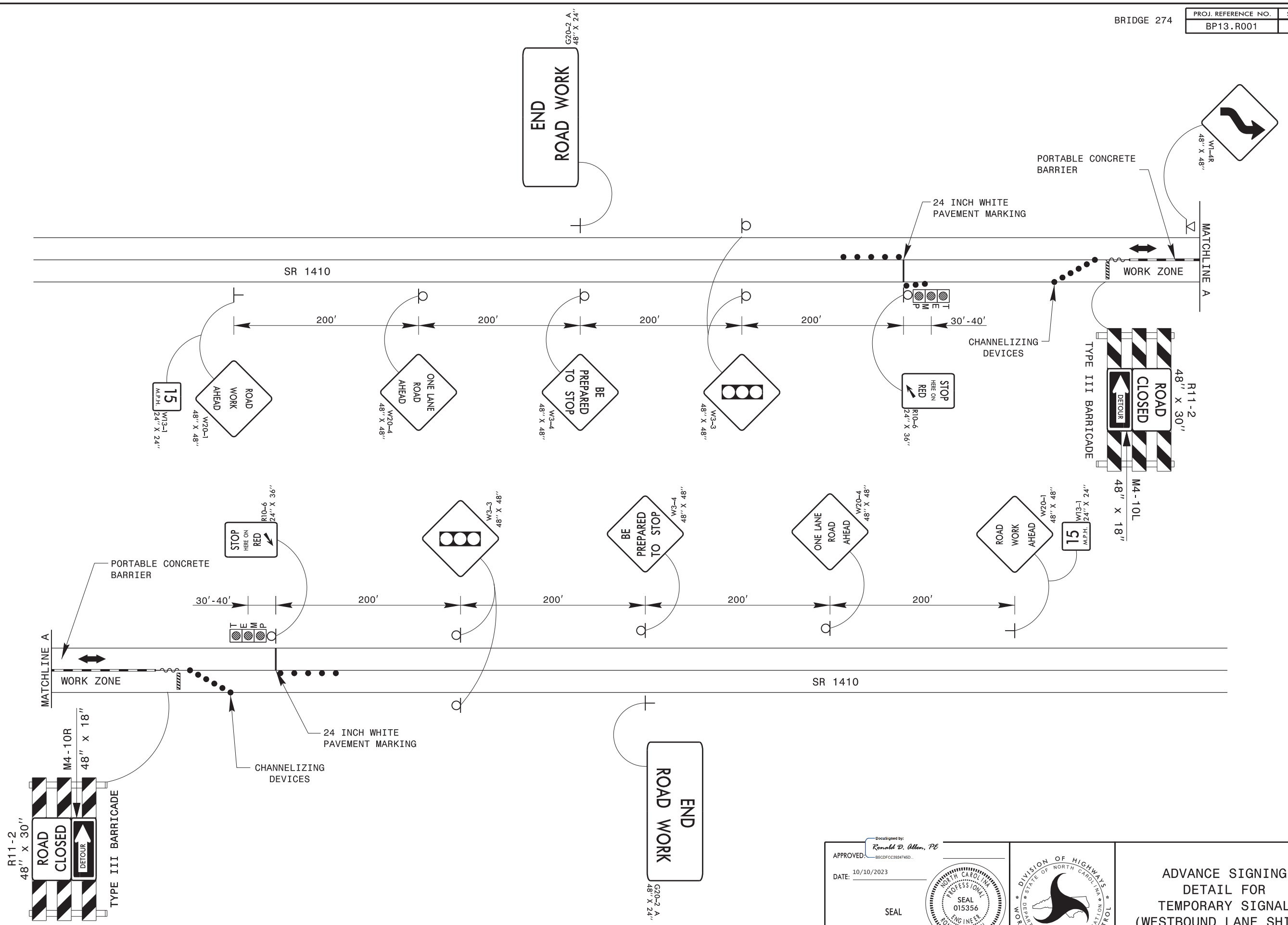


Approved by: *Ronald D. Allen, PE*  
 APPROVED: \_\_\_\_\_  
 DATE: 10/10/2023  
 SEAL



**ADVANCE SIGNING  
 DETAIL FOR  
 TEMPORARY SIGNAL  
 (EASTBOUND LANE SHIFT)**

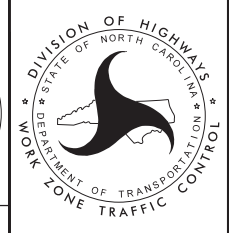
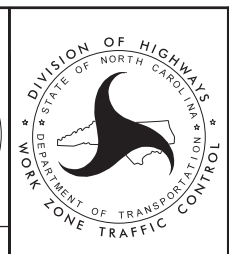
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 Phone (919) 783-9214 • Fax (919) 783-9266



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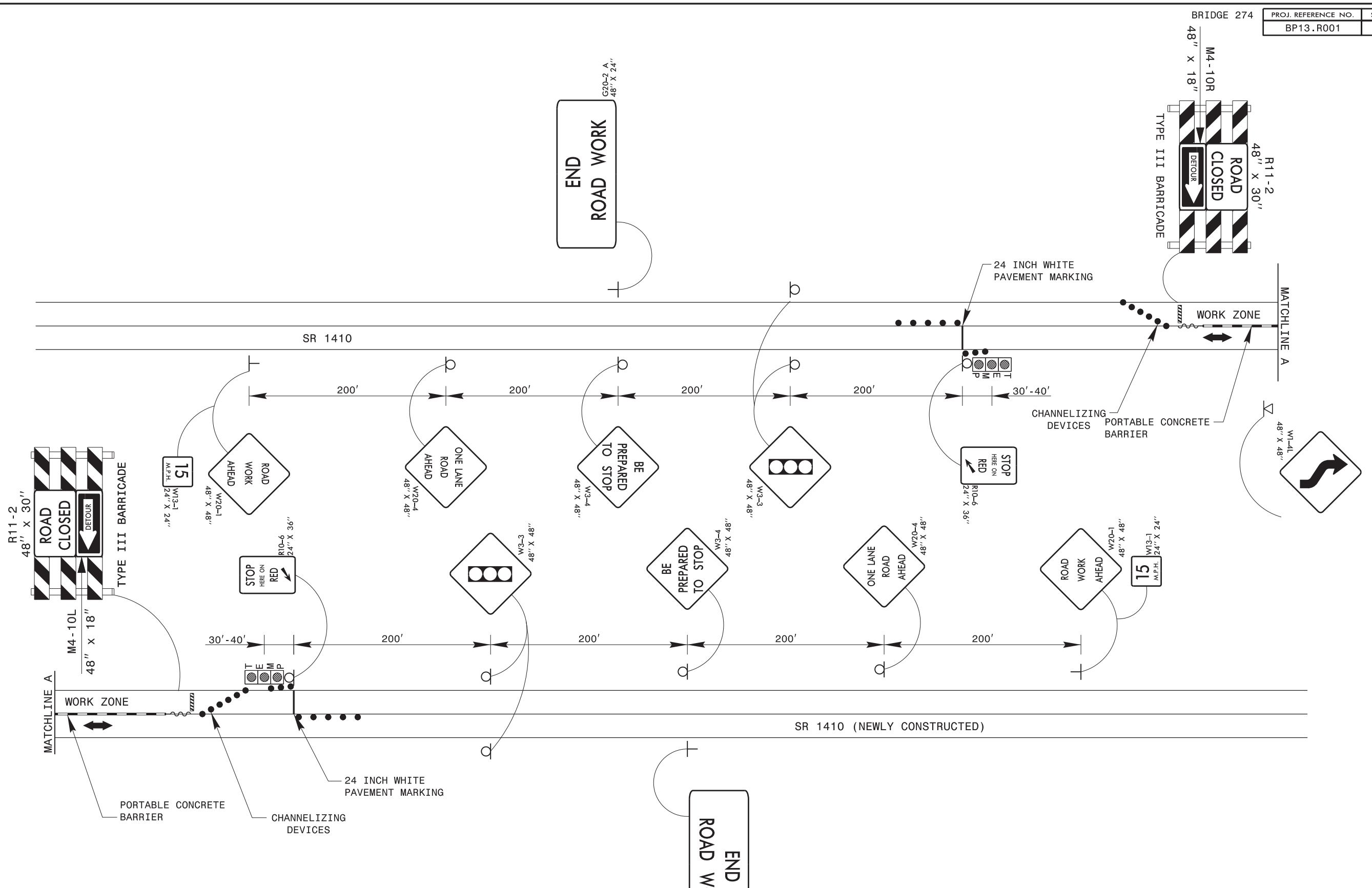
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Documented by:  
**Ronald D. Allen, PE**  
 APPROVED: \_\_\_\_\_  
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**ADVANCE SIGNING  
 DETAIL FOR  
 TEMPORARY SIGNAL  
 (WESTBOUND LANE SHIFT)**

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END ROAD WORK

G20-2 A  
48" X 24"

END ROAD WORK

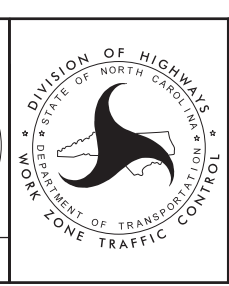
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48" X 24"

APPROVED: *Ronald D. Allen, PE*  
BSCDFCC392474SD

DATE: 10/10/2023

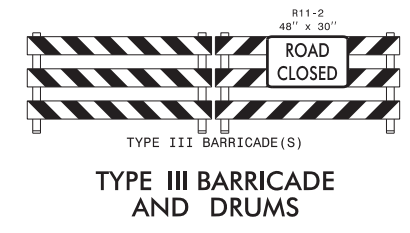
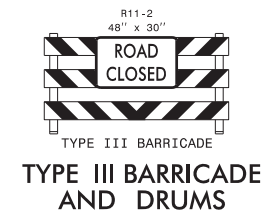
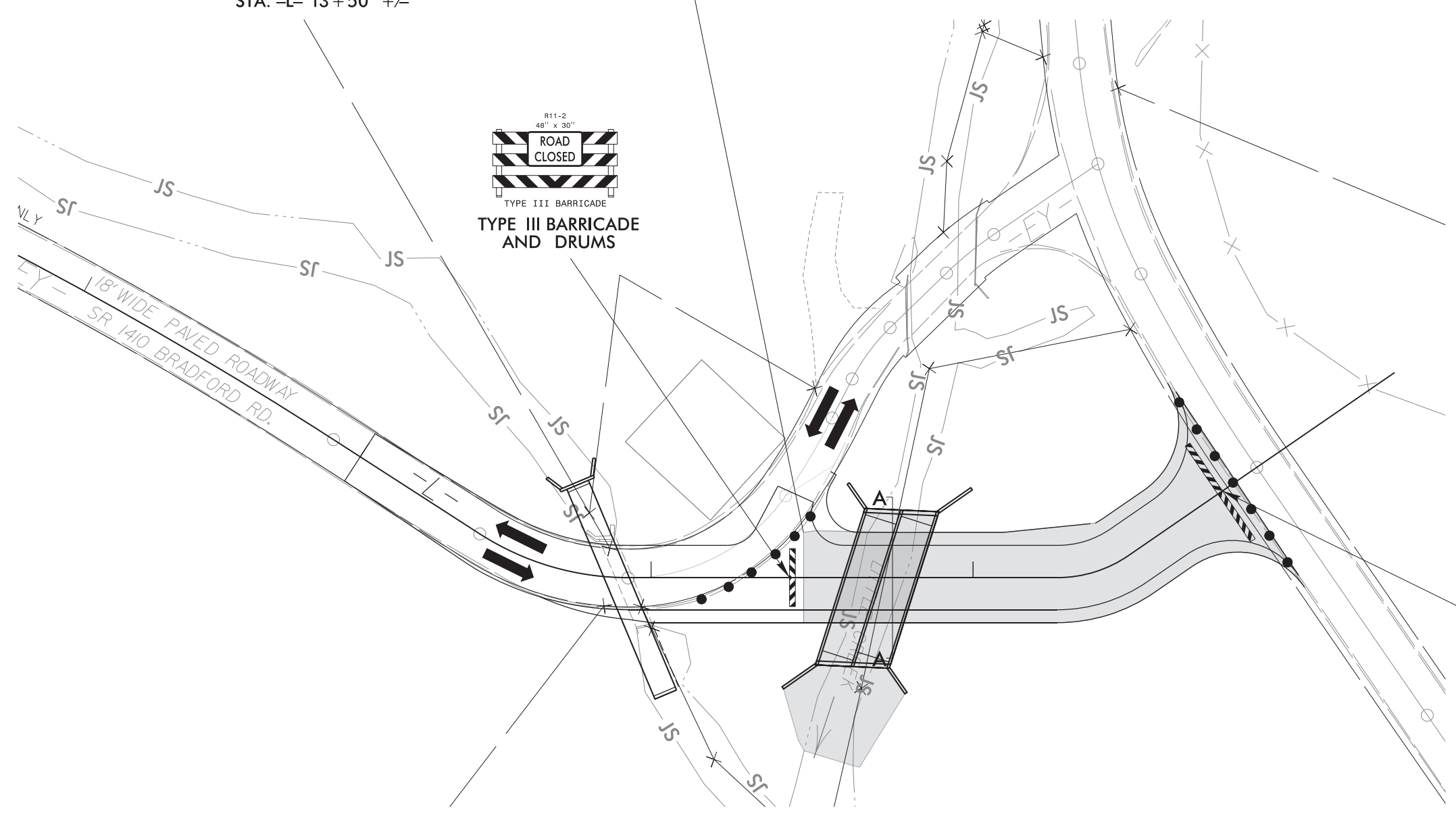
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UNLESS ALL SIGNATURES COMPLETED**



ADVANCE SIGNING  
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 (EASTBOUND LANE SHIFT)

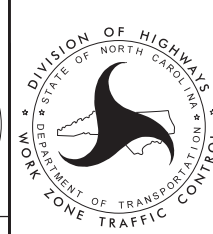
CONSTRUCT NEW PAVEMENT  
STA. -L- 13+50 +/-



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APPROVED: *Ronald D. Allen, PE*  
38CDFCC3924745D...  
 DATE: 10/10/2023  
 SEAL



**TEMPORARY TRAFFIC CONTROL  
 PHASE 1 DETAIL**

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



BEGIN TEMPORARY PAVEMENT MARKINGS

-L- STA 12+00 +/-

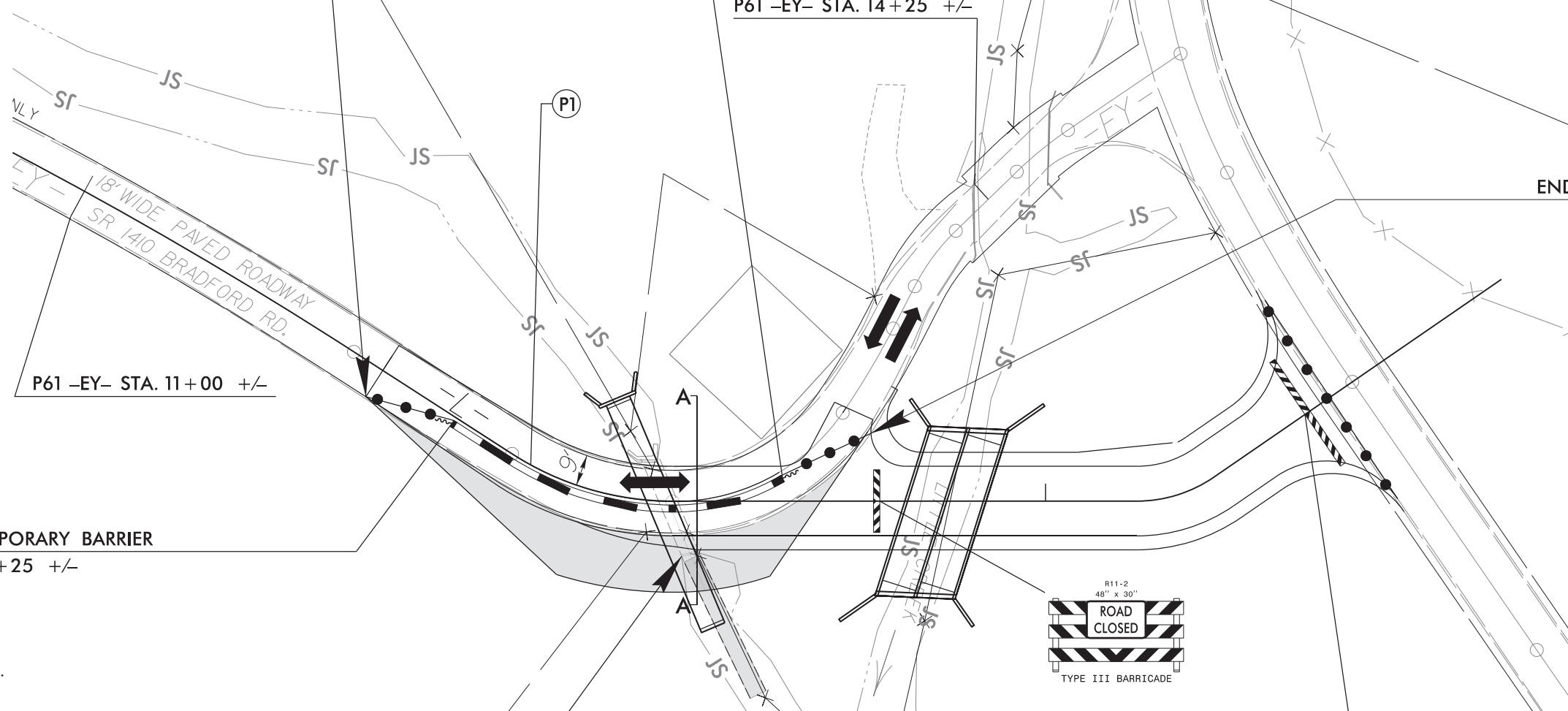
END TEMPORARY BARRIER

-L- STA 13+25 +/-

BRIDGE 274

PROJ. REFERENCE NO.	SHEET NO.
BP13.R001	TMP-3B

REFER TO SHEET 2A FOR TEMP SIGNAL

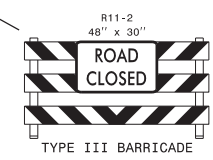


END TEMPORARY PAVEMENT MARKINGS

-L- STA 13+50 +/-

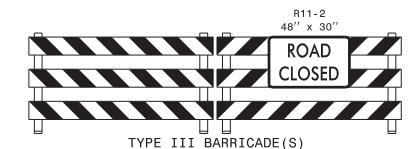
BEGIN TEMPORARY BARRIER

-L- STA 12+25 +/-

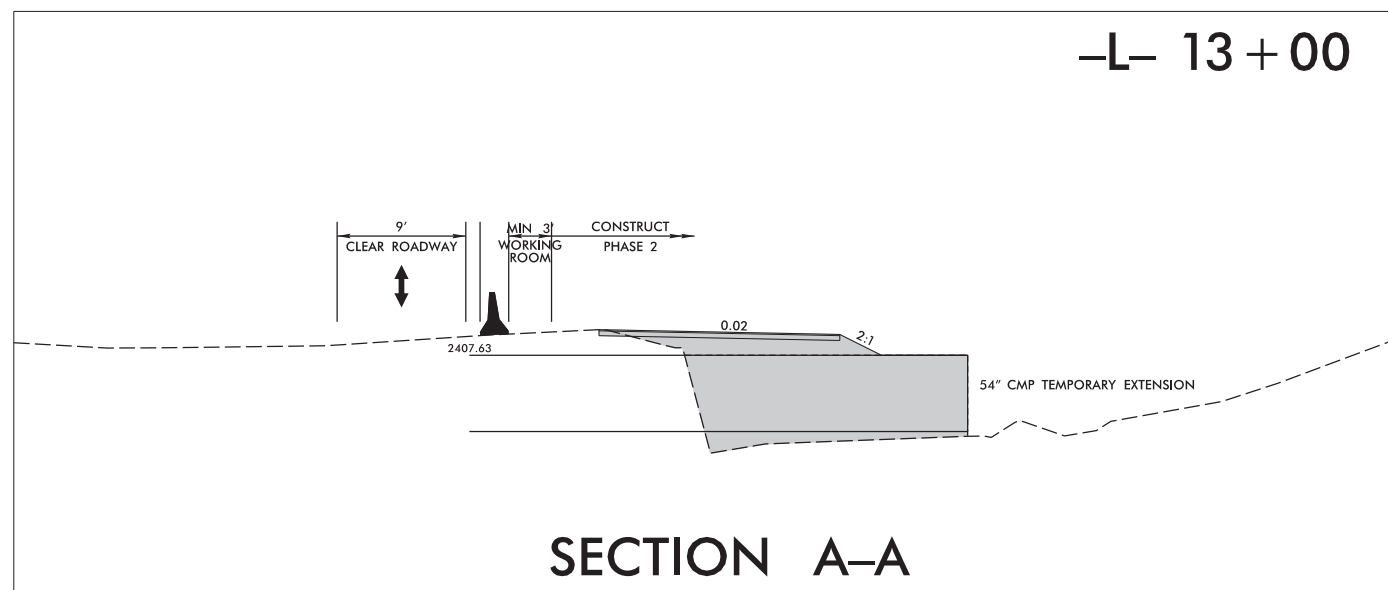


PHASE 2 CONSTRUCTION PROPOSED DOWNSTREAM STRUCTURE CONSTRUCTION

KEEP ROADWAY CLOSED WITH TYPE III BARRICADES AND DRUMS



-L- 13+00

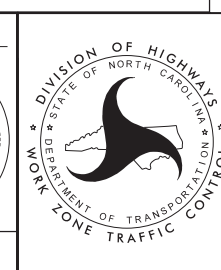


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APPROVED: *Ronald D. Allen, PE*  
 DATE: 10/10/2023

SEAL

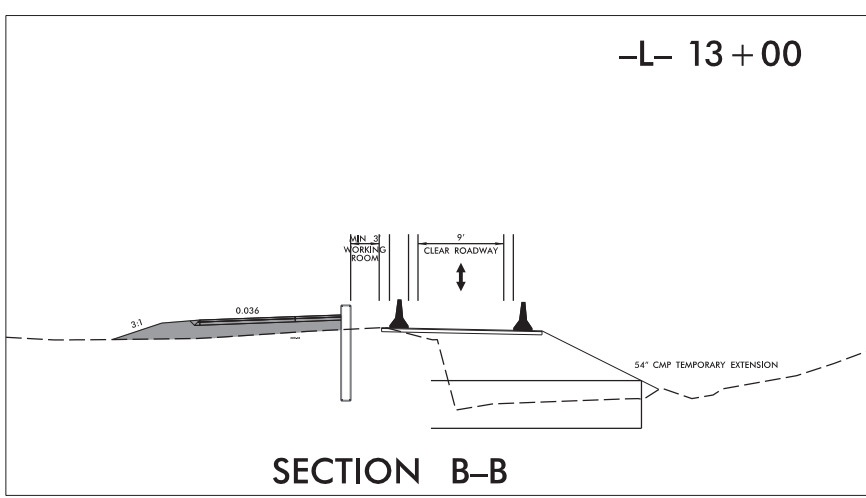
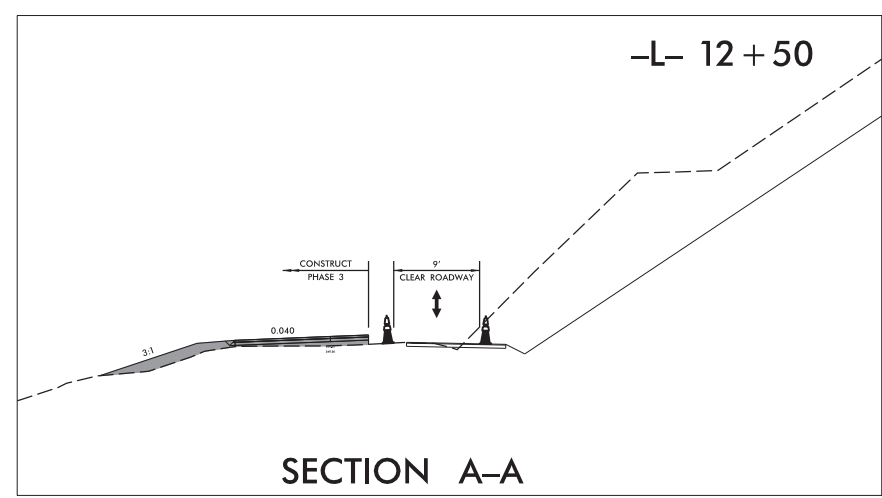
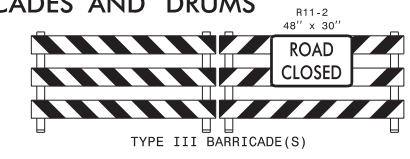
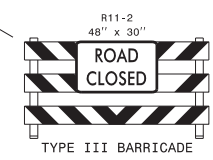
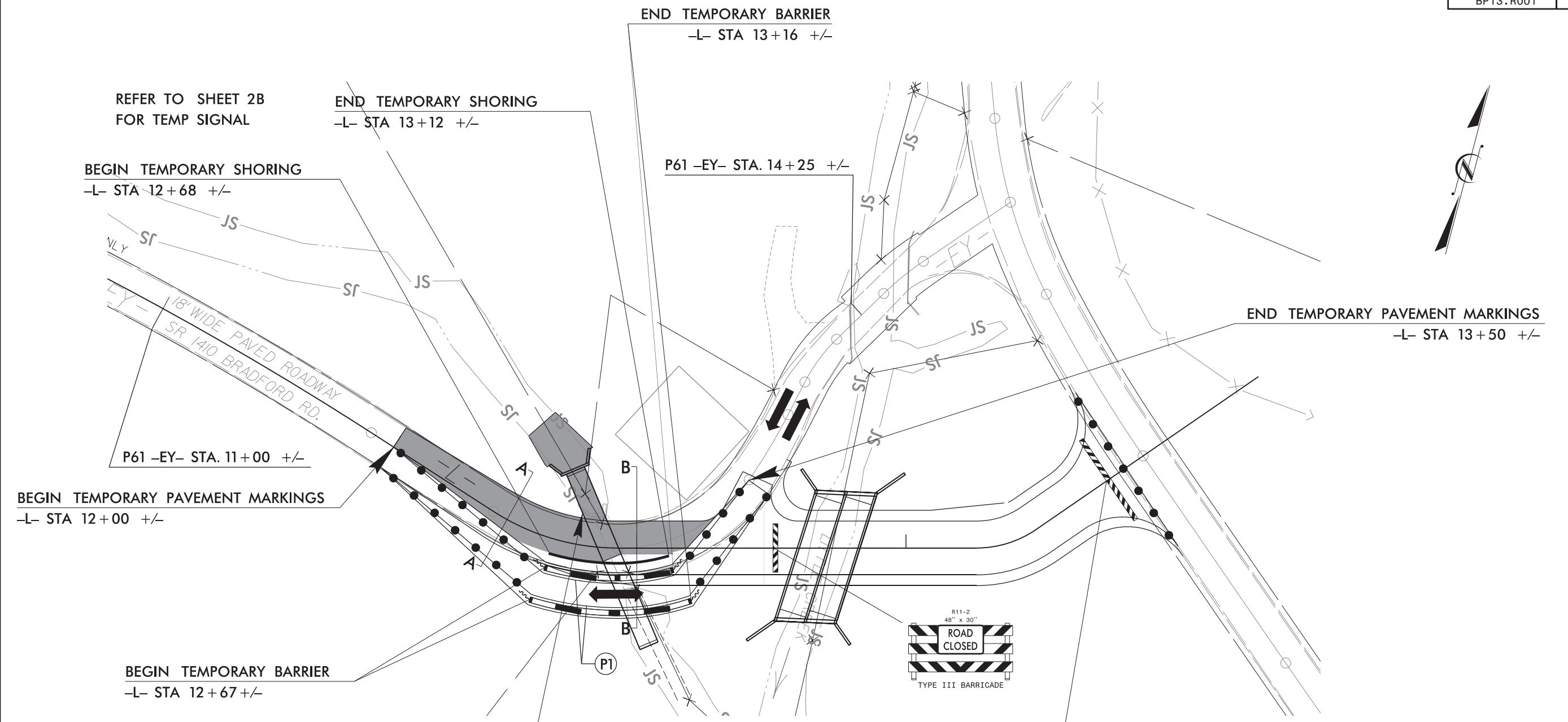
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



**TEMPORARY TRAFFIC CONTROL PHASE 2 DETAIL**

Division of Highways  
 Department of Transportation  
 Work Zone Traffic Control

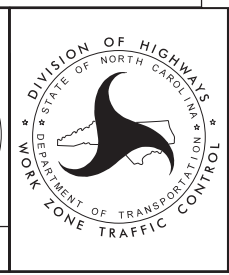
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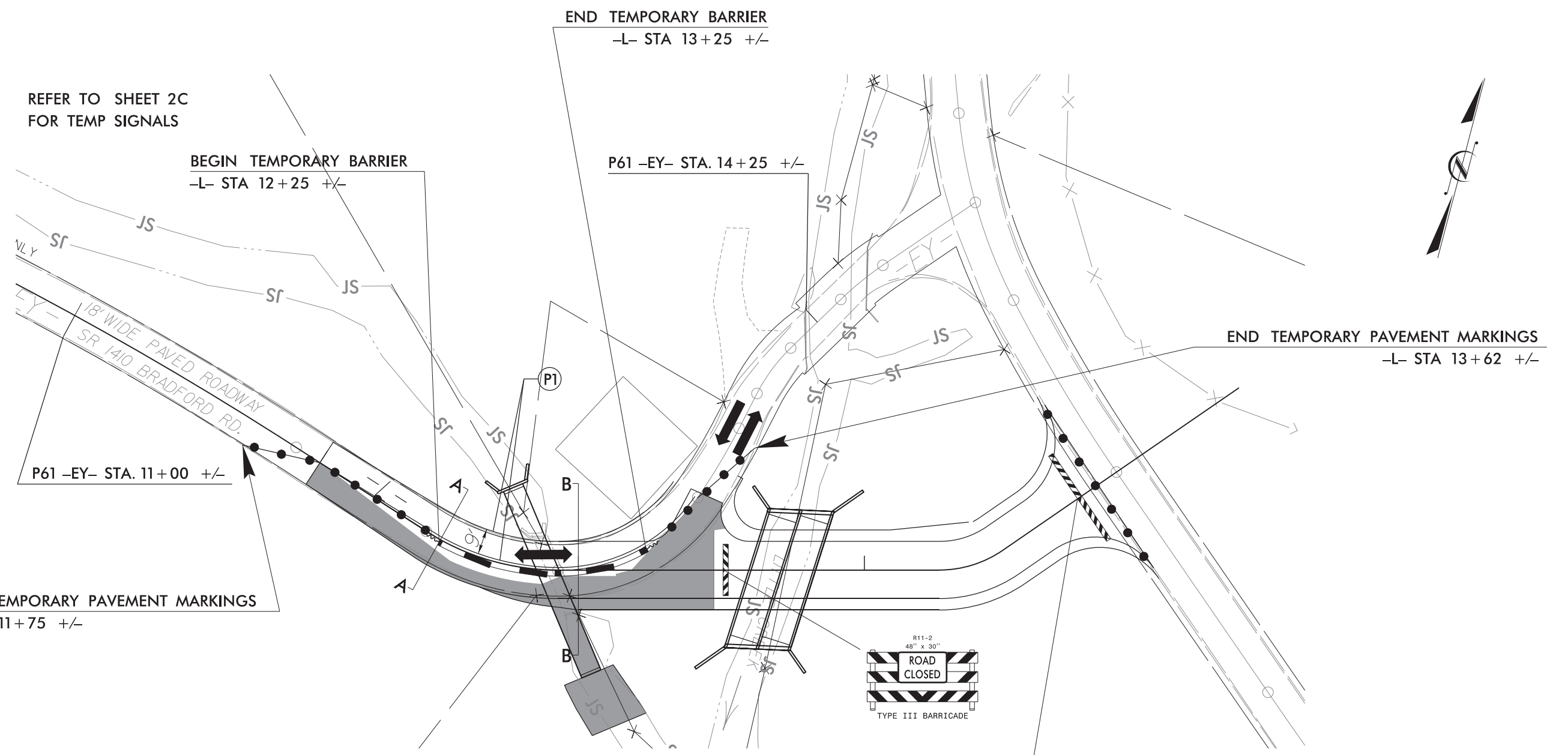
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 DATE: 10/10/2023  
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**TEMPORARY TRAFFIC CONTROL PHASE 3 DETAIL**

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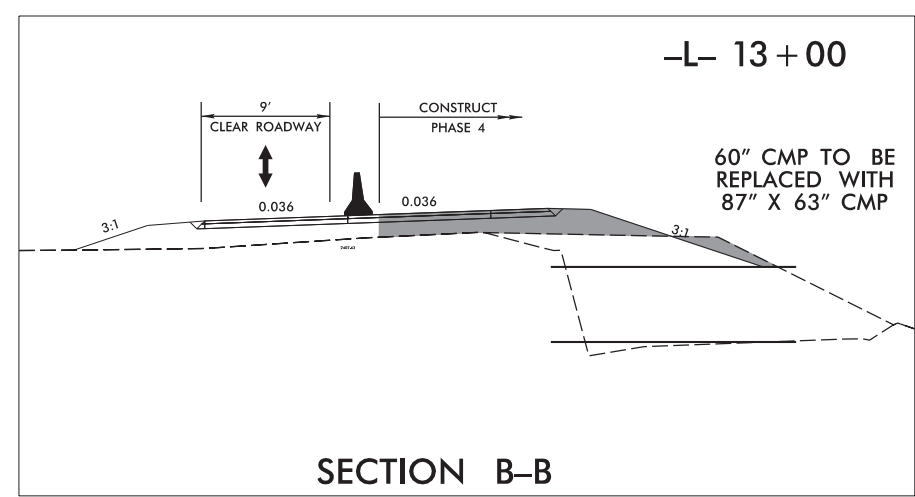
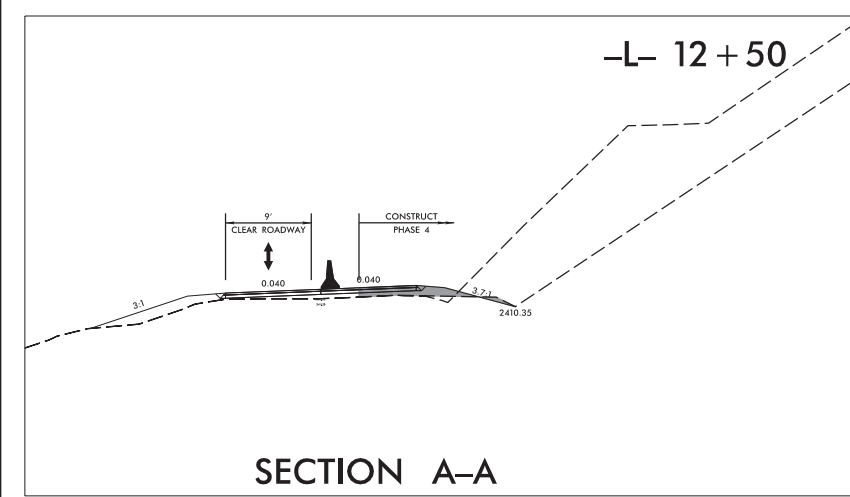
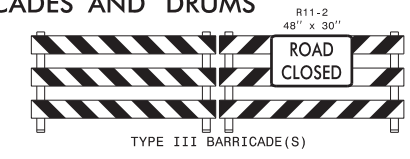
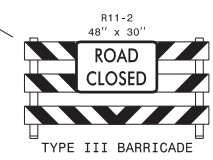


REFER TO SHEET 2C  
FOR TEMP SIGNALS

BEGIN TEMPORARY PAVEMENT MARKINGS  
-L- STA 11+75 +/-

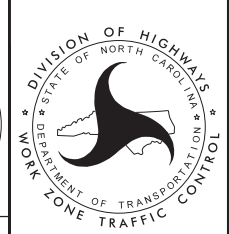
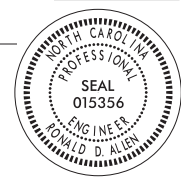
PHASE 4 CONSTRUCTION  
PROPOSED DOWNSTREAM STRUCTURE CONSTRUCTION

KEEP ROADWAY CLOSED WITH TYPE III  
BARRICADES AND DRUMS



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Raleigh, NC 27609-6270  
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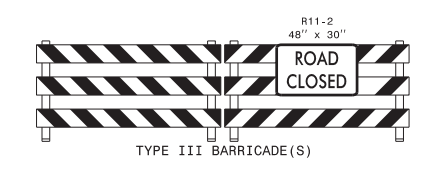
APPROVED: *Ronald D. Allen, PE*  
DATE: 10/10/2023  
SEAL



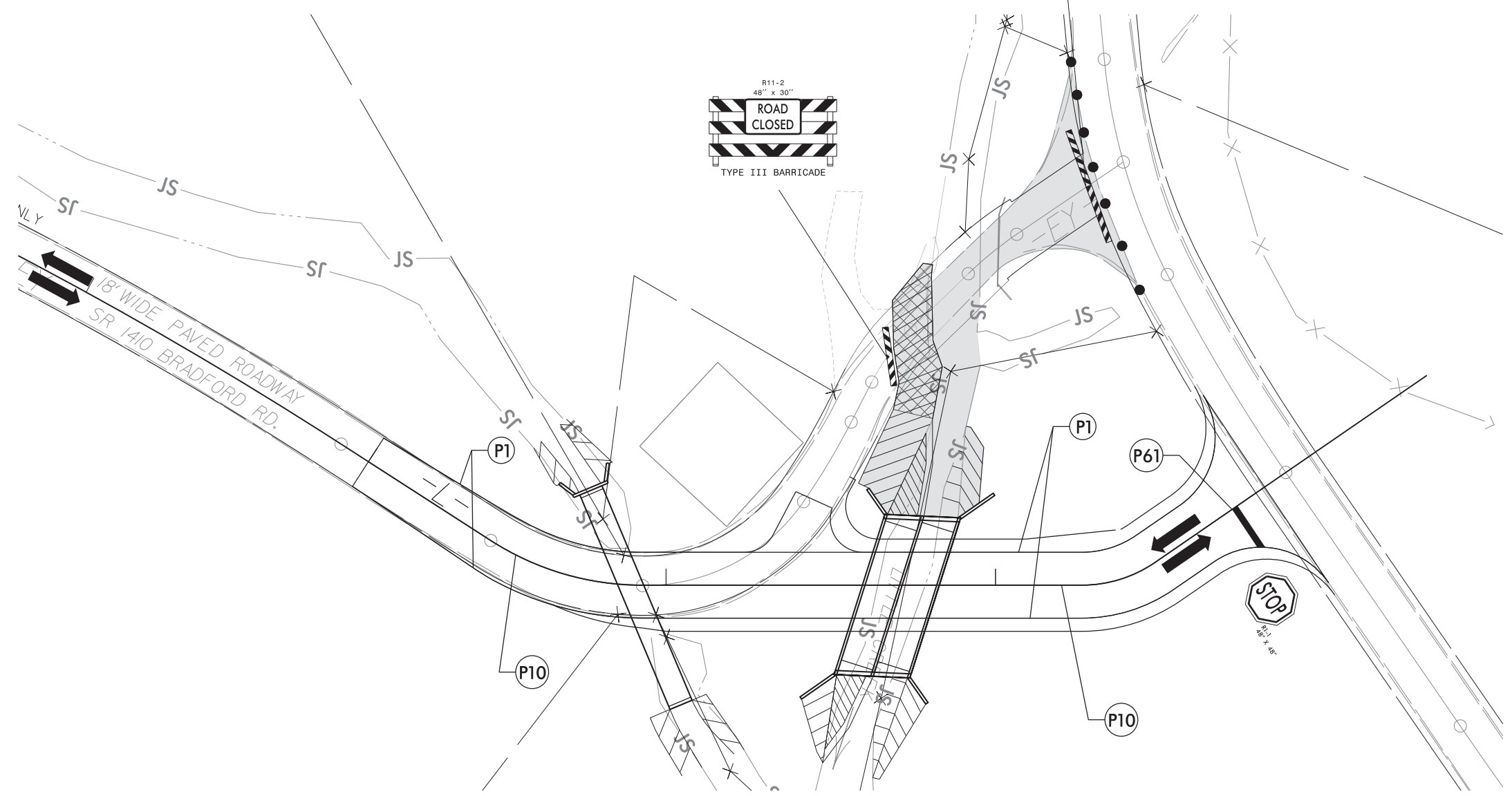
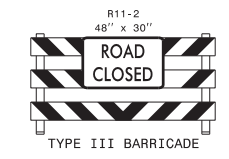
**TEMPORARY TRAFFIC CONTROL  
PHASE 4 DETAIL**

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\$\$\$\$\$USERNAME\$\$\$\$\$



KEEP OLD ROADWAY CLOSED WITH TYPE III BARRICADES AND DRUMS



PHASE 5 CONSTRUCTION  
PROPOSED UPSTREAM STRUCTURE CONSTRUCTION

06-SEP-2023 11:42  
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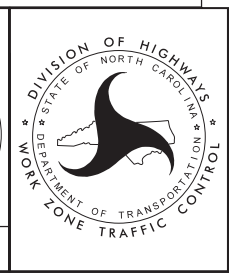
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DocuSigned by:  
**Ronald D. Allen, PE**  
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DATE: 10/10/2023

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**TEMPORARY TRAFFIC CONTROL  
PHASE 5 DETAIL**

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



PROJECT REFERENCE NO. <i>BPI3.R001</i>	SHEET NO. <i>PMP-1</i>
APPROVED BY <i>Ronald D. Allen, PE</i>	
DATE: 10/10/2023	
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STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**PAVEMENT MARKING PLANS**

**YANCEY COUNTY**

LOCATION: BRIDGE No. 274 ON SR 1410 (BRADFORD ROAD)  
OVER LITTLE CREEK

PROJECT: BPI3.R001

CONTRACT: DM00337

**ROADWAY STANDARD DRAWING**

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2024 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
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 AND PAVEMENT MARKERS ON THE FINAL SURFACE AS FOLLOWS:
 

ROAD NAME	MARKING	MARKER
-L- SR 1410 (BRADFORD ROAD)	PAINT	NONE
- B) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.
- C) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS.
- D) PASSING ZONES WILL BE DETERMINED IN THE FIELD AND MUST BE APPROVED BY THE ENGINEER.

**PAVEMENT MARKING SCHEDULE**

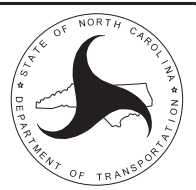
SYMB	DESCRIPTION
P1	PAINT (4") WHITE EDGELINE
P10	PAINT (4") YELLOW DOUBLE CENTER
P61	PAINT (24") WHITE STOPBAR

**INDEX**

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

KELVIN L. JORDAN SIGNING & DELINEATION REGIONAL ENGINEER

RENEE B. ROACH, PE, CPM STATE SIGNING & DELINEATION ENGINEER



PLANS PREPARED BY:  
RON ALLEN, PE PROJECT ENGINEER  
TYLER KRAUSS, PE PROJECT DESIGN ENGINEER



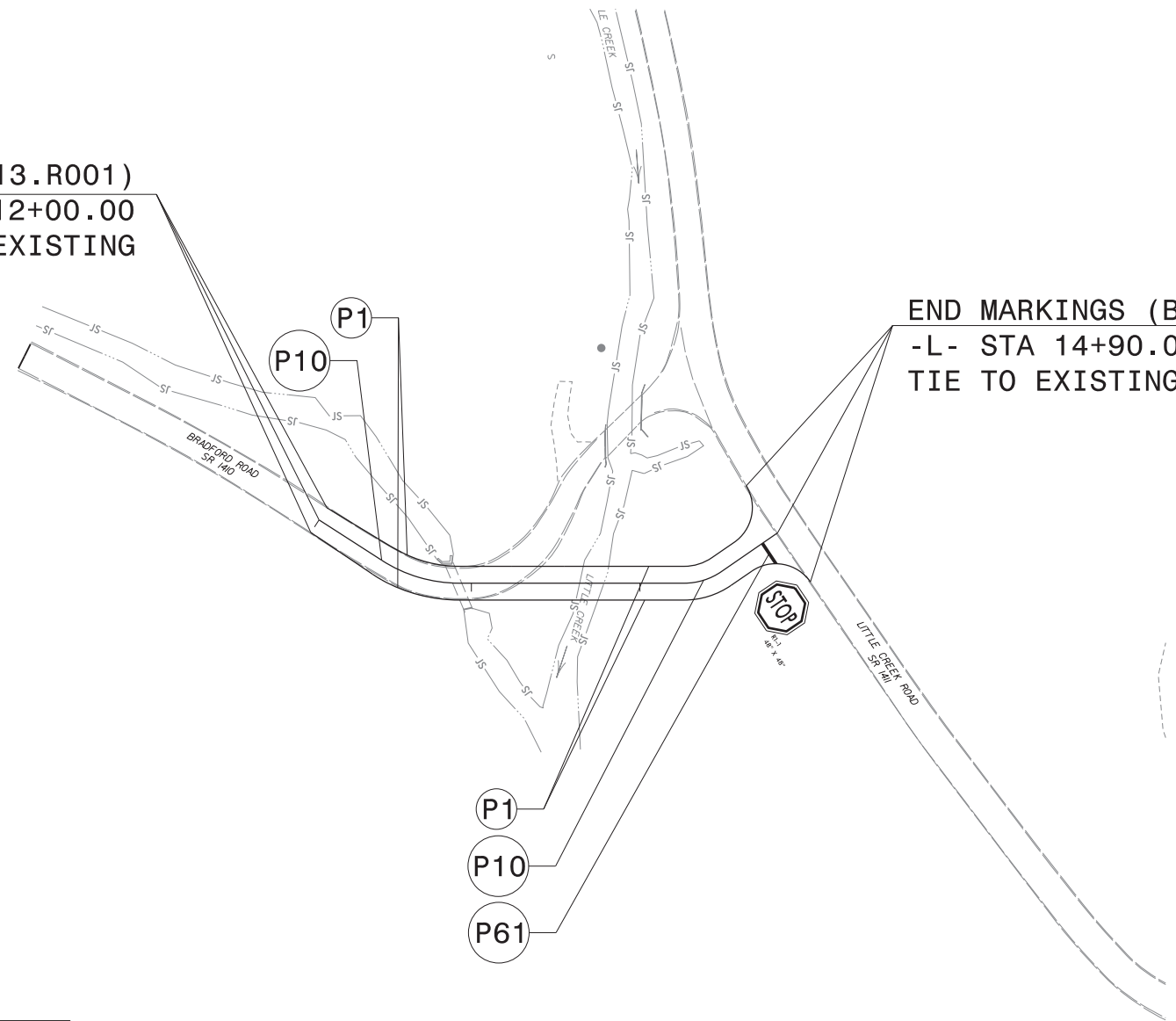
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 \$\$\$USERNAME\$\$\$





BEGIN MARKINGS (BP13.R001)  
 -L- STA 12+00.00  
 TIE TO EXISTING

END MARKINGS (BP13.R001)  
 -L- STA 14+90.00  
 TIE TO EXISTING



PAVEMENT MARKING LEGEND	
	WHITE EDGELINE (4")
	YELLOW DOUBLE CENTER (4")
	WHITE STOP BAR (24")

31-JUL-2023 17:13  
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 LAND SURVEYING  
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 ENGINEERING  
 4505 FALLS OF NEUSE ROAD  
 SUITE 400  
 RALEIGH, NORTH CAROLINA 27609  
 (919) 783-9214  
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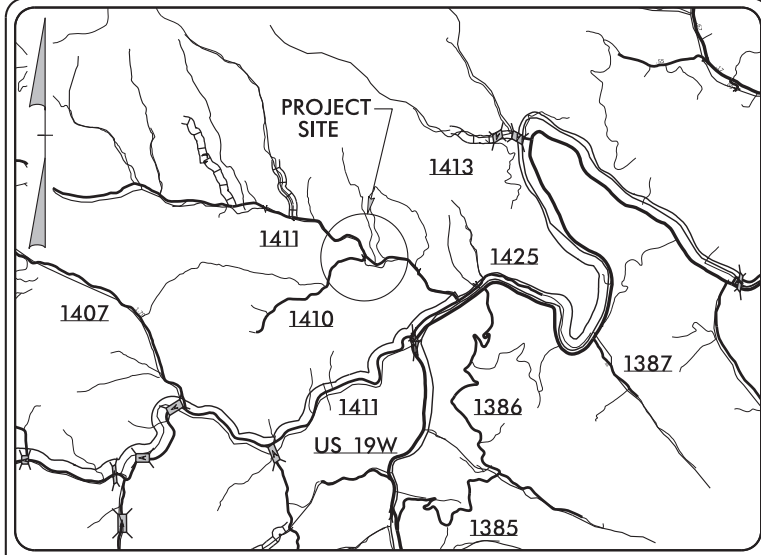
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 APPROVED: \_\_\_\_\_  
 DATE: 10/10/2023  
 SEAL:

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PAVEMENT MARKING DETAIL

**TIP PROJECT: BP13.R001**



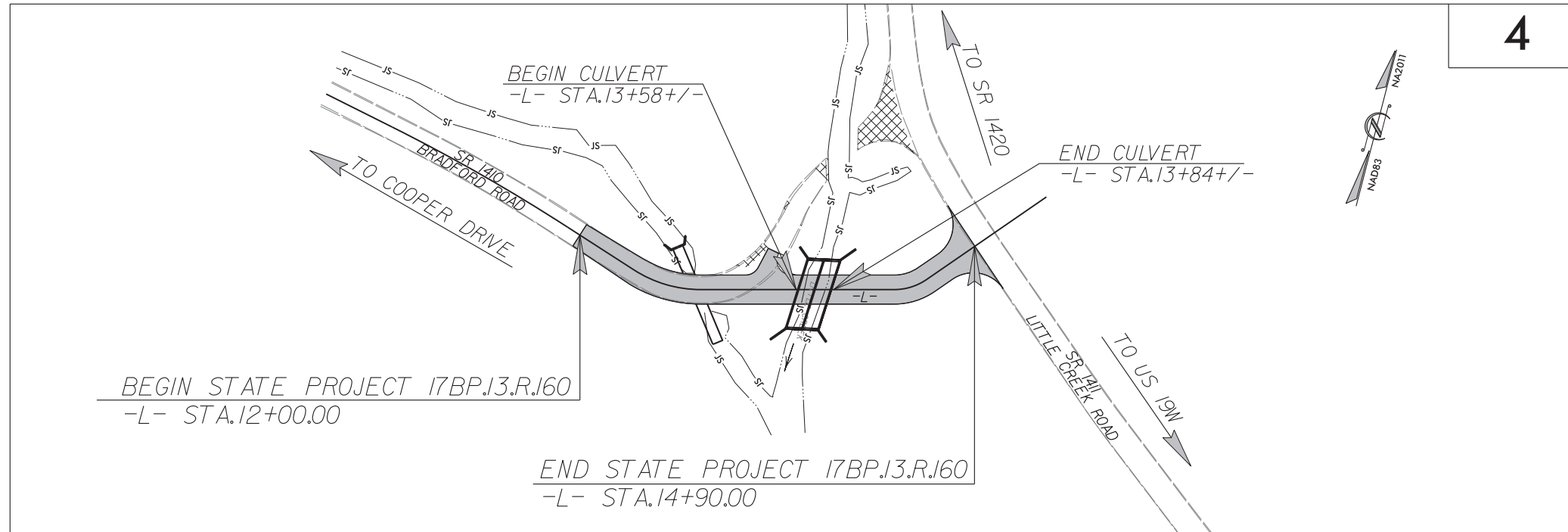
**VICINITY MAP**  
NOT TO SCALE

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

**LOCATION: REPLACE BRIDGE NO. 274 OVER LITTLE CREEK ON SR 1410 (BRADFORD ROAD)**

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP13.R001	EC-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
BP13.R001.1		PE	
BP13.R001.2		RW & UTIL	
BP13.R001.3		CON	

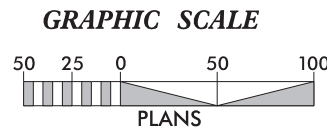


**4**

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 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.

Company Logo

Prepared In the Office of:  
**SUNGATE DESIGN GROUP, P.A.**

905 JONES FRANKLIN ROAD  
RALEIGH, NORTH CAROLINA 27606  
TEL (919) 859-2243  
ENG FIRM LICENSE NO. C-890

Designed by:  
**BRIAN N. ELAM, PE** 3195  
NAME LEVEL III CERTIFICATION NO.

Roadway Standard Drawings  
The "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2024 and the latest revision thereto are applicable to this project and by reference hereby are considered a part of these plans.

# DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

PROJECT REFERENCE NO. <i>BPI3.R001</i>	SHEET NO. <i>EC-02</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

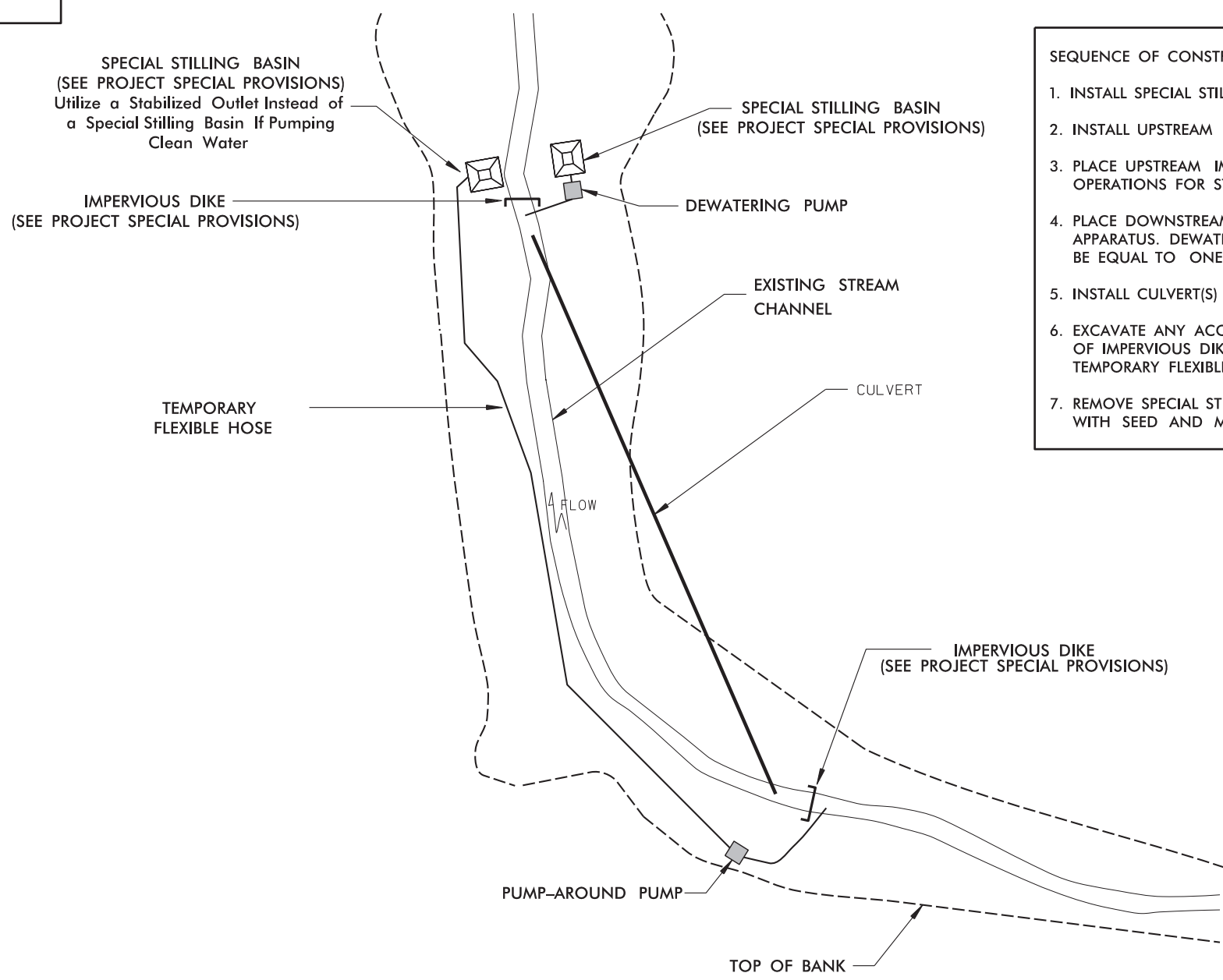
## EROSION & SEDIMENT CONTROL LEGEND

Std. #	Description	Symbol	Std. #	Description	Symbol
1605.01	Temporary Silt Fence		1633.01	Temporary Rock Silt Check Type A	
1606.01	Special Sediment Control Fence		1633.02	Temporary Rock Silt Check Type B	
1622.01	Temporary Berms and Slope Drains		1633.03	Temporary Rock Silt Check Type A with Excelsior Matting and Flocculant	
1630.02	Silt Basin Type B		1634.01	Temporary Rock Sediment Dam Type A	
1630.03	Temporary Silt Ditch		1634.02	Temporary Rock Sediment Dam Type B	
1630.04	Stilling Basin		1635.01	Rock Pipe Inlet Sediment Trap Type A	
1630.05	Temporary Diversion		1635.02	Rock Pipe Inlet Sediment Trap Type B	
1630.06	Special Stilling Basin		1636.01	Excelsior Wattle Check	
1630.07	Skimmer Basin		1636.01	Excelsior Wattle Check with Flocculant	
1630.08	Tiered Skimmer Basin		1636.01	Coir Fiber Wattle Check	
1630.09	Earthen Dam with Skimmer		1636.01	Coir Fiber Wattle Check with Flocculant	
	Infiltration Basin		1636.02	Silt Fence Excelsior Wattle Break	
	Rock Inlet Sediment Trap:			Silt Fence Coir Fiber Wattle Break	
1632.01	Type A		1636.03	Excelsior Wattle Barrier	
1632.02	Type B		1636.03	Coir Fiber Wattle Barrier	
1632.03	Type C				

PROJECT REFERENCE NO.	SHEET NO.
BP13.R001	EC-2A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

# EXAMPLE OF PUMP-AROUND OPERATION

- NOTES:
- 1) All excavation shall be performed in only dry or isolated areas of the work zone.
  - 2) Impervious dikes are to be used to isolate work from stream flow when necessary.
  - 3) Maintenance of stream flow operations shall be incidental to the work. This includes polyethylene sheeting, diversion pipes, pumps and hoses.
  - 4) Pumps and hoses shall be of sufficient size to dewater the work area.



- SEQUENCE OF CONSTRUCTION FOR TYPICAL WORK AREA
1. INSTALL SPECIAL STILLING BASIN(S).
  2. INSTALL UPSTREAM PUMP AND TEMPORARY FLEXIBLE HOSE.
  3. PLACE UPSTREAM IMPERVIOUS DIKE AND BEGIN PUMPING OPERATIONS FOR STREAM DIVERSION.
  4. PLACE DOWNSTREAM IMPERVIOUS DIKE AND PUMPING APPARATUS. DEWATER ENTRAPPED AREA. AREA TO BE DEWATERED SHALL BE EQUAL TO ONE DAY'S WORK.
  5. INSTALL CULVERT(S) IN ACCORDANCE WITH THE PLANS.
  6. EXCAVATE ANY ACCUMULATED SILT AND DEWATER BEFORE REMOVAL OF IMPERVIOUS DIKES. REMOVE IMPERVIOUS DIKES, PUMPS, AND TEMPORARY FLEXIBLE HOSE. (DOWNSTREAM IMPERVIOUS DIKES FIRST).
  7. REMOVE SPECIAL STILLING BASIN(S) AND BACKFILL. STABILIZE DISTURBED AREA WITH SEED AND MULCH.





DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

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PROJECT REFERENCE NO. <i>BPI3.R001</i>	SHEET NO. <i>EC-3A</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

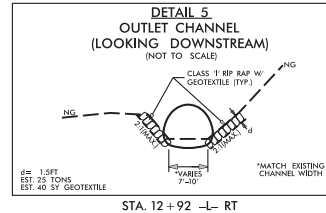
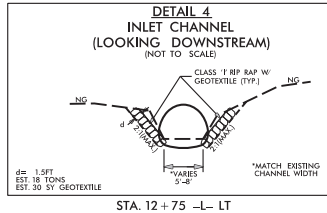
## ***SOIL STABILIZATION TIMEFRAMES***

<i>SITE DESCRIPTION</i>	<i>STABILIZATION TIME</i>	<i>TIMEFRAME EXCEPTIONS</i>
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	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.

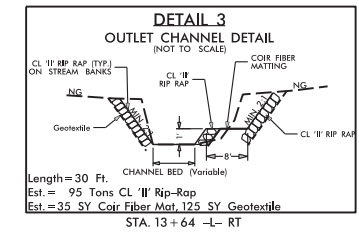
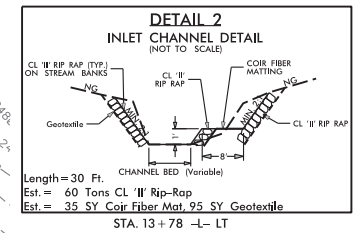
PROJECT REFERENCE NO.	SHEET NO.
BP13.R001	EC-04/CONST.04
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CLEARING AND GRUBBING  
EROSION CONTROL FOR  
CONSTRUCTION SHEET 04

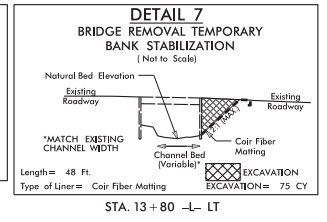
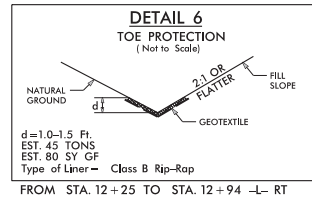
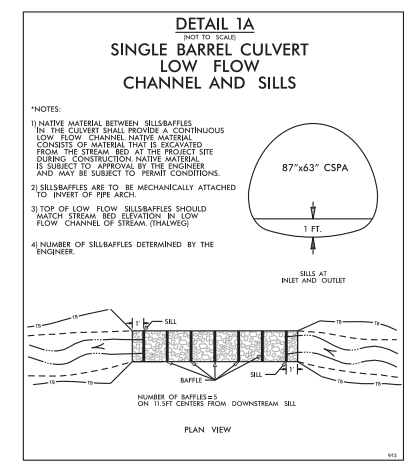
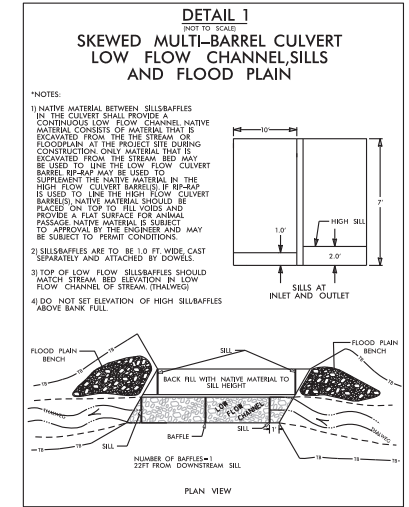
NOTE:  
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE - B  
AND TEMPORARY ROCK SILT CHECKS TYPE - A AT  
DRAINAGE OUTLETS.



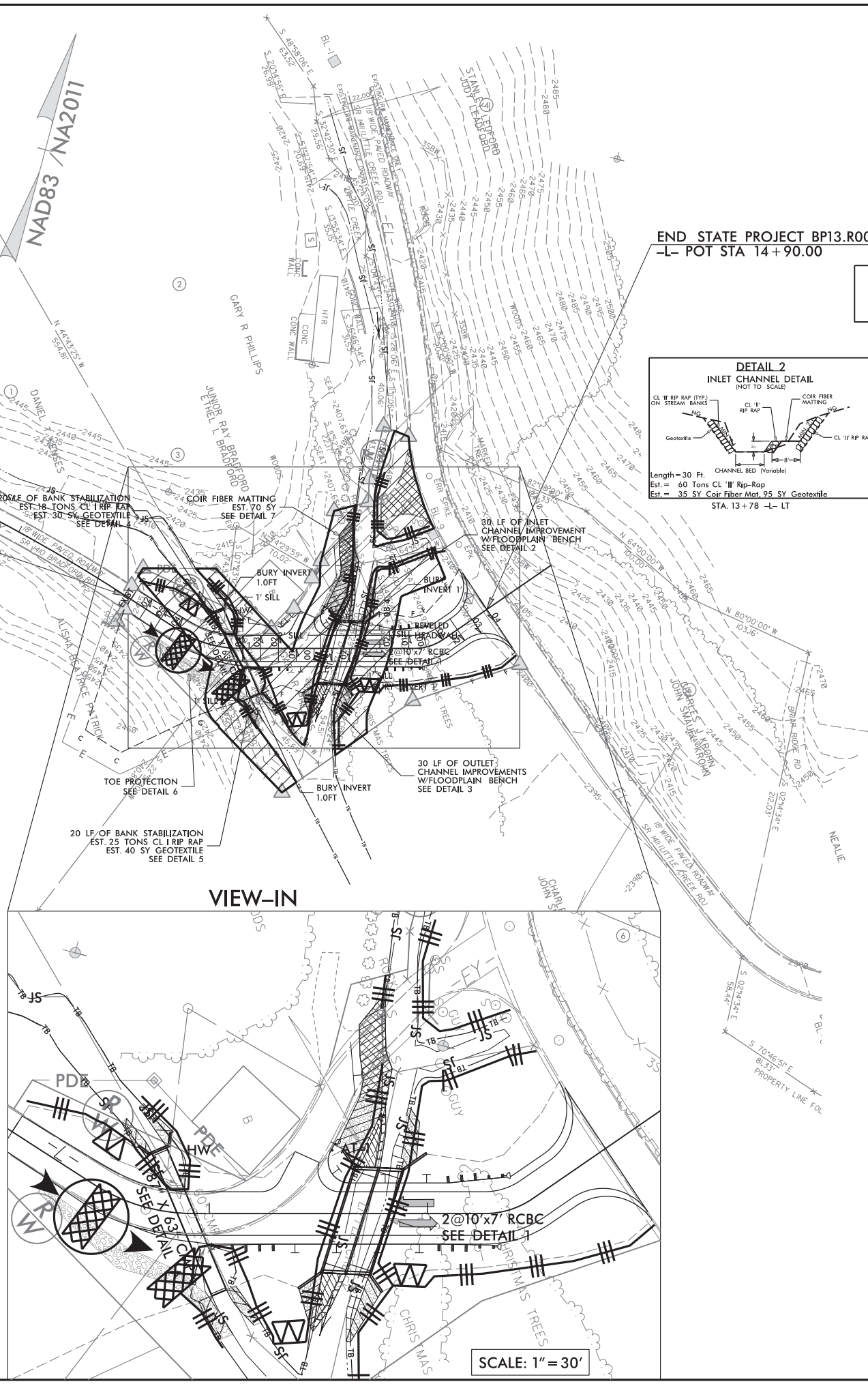
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-L- POT STA 14+90.00



BEGIN STATE PROJECT BP13.R001  
-L- POT STA 11+95.00



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



SCALE: 1" = 30'

# 2@10'X7' RCBC CONSTRUCTION SEQUENCE STA. 13+71 -L- LITTLE CREEK

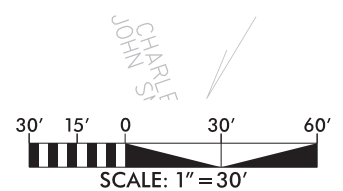
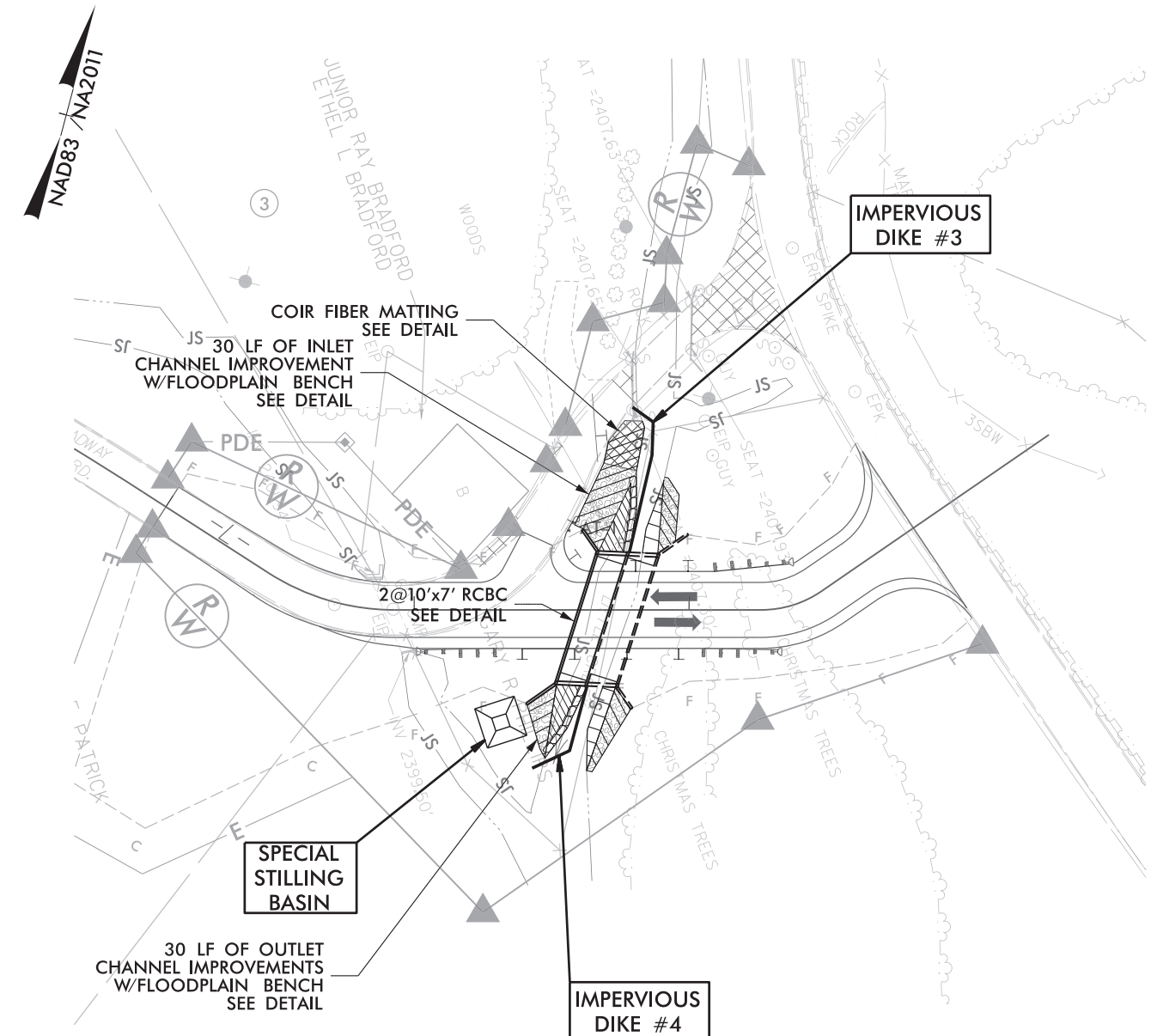
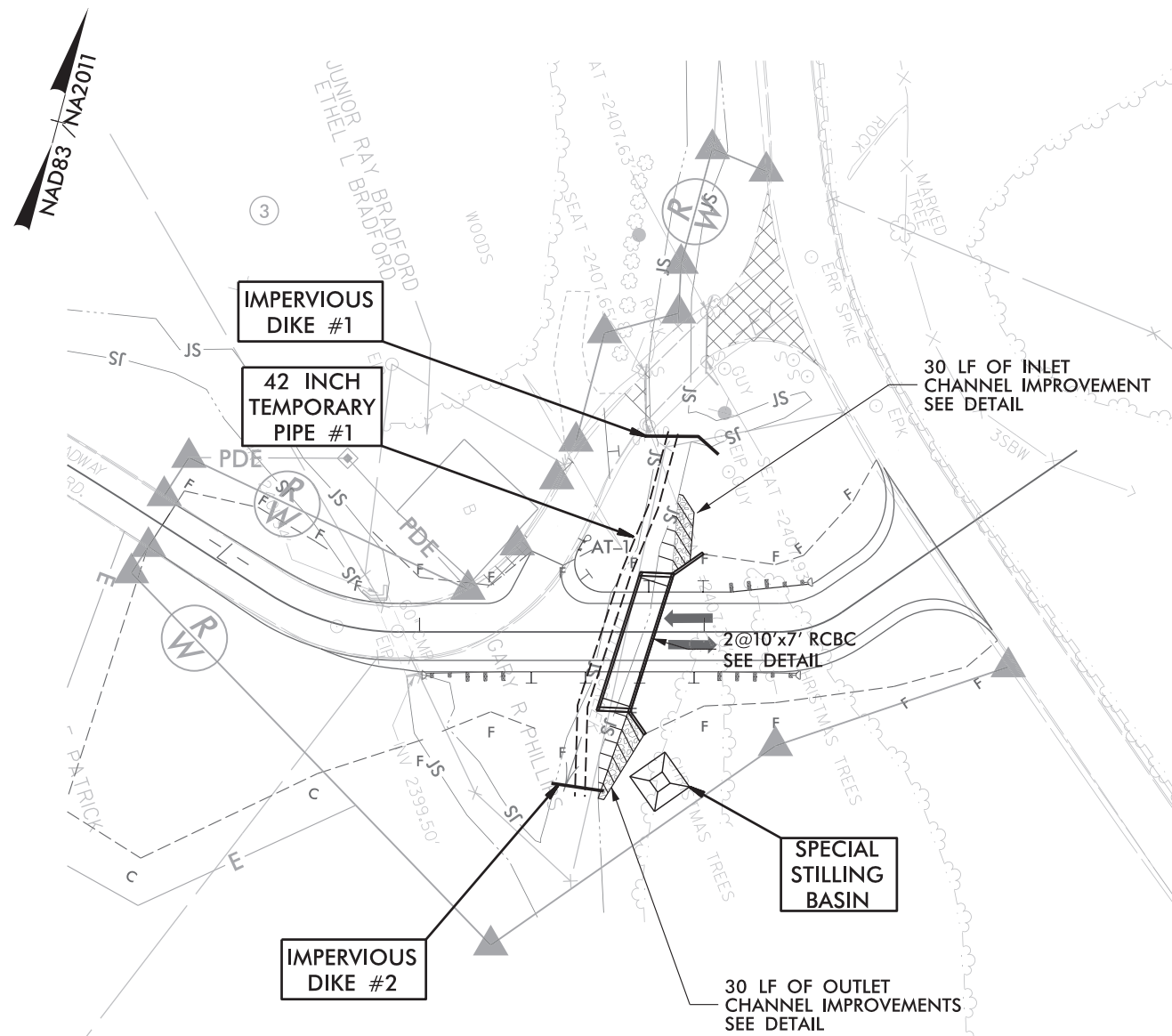
PROJECT REFERENCE NO. BP13.R001	SHEET NO. EC-04A/CONST.04
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

## PHASE I

- 1.) UTILIZE SPECIAL STILLING BASIN(S) AS NEEDED THROUGHOUT CULVERT CONSTRUCTION.
- 2.) INSTALL IMPERVIOUS DIKES #1 AND #2 AND TEMPORARY 42" PIPE #1.
- 3.) DEWATER CONSTRUCTION AREA, UTILIZING SPECIAL STILLING BASIN(S) FOR PUMPED EFFLUENT.
- 4.) RETAIN EXISTING BRIDGE FOR TRAFFIC.
- 5.) CONSTRUCT EASTERN BARREL OF 2@10'X7' RCBC WITH 1' SILLS.
- 6.) CONSTRUCT EASTERN OUTLET CHANNEL IMPROVEMENTS AND INLET CHANNEL IMPROVEMENTS.
- 7.) EXCAVATE ANY ACCUMULATED SILT AND DEWATER BEFORE REMOVAL OF IMPERVIOUS DIKES.
- 8.) REMOVE IMPERVIOUS DIKES AND TEMPORARY 42" PIPE #1.

## PHASE II

- 1.) INSTALL IMPERVIOUS DIKES #3 AND #4 AND DIVERT FLOW THROUGH EASTERN BARREL OF 2@10'X7' RCBC WITH 1' SILLS.
- 2.) DEWATER CONSTRUCTION AREA, UTILIZING SPECIAL STILLING BASIN(S) FOR PUMPED EFFLUENT.
- 3.) CONSTRUCT WESTERN BARREL OF 2@10'X7' RCBC WITH 2' SILLS.
- 4.) CONSTRUCT WESTERN OUTLET CHANNEL IMPROVEMENT AND EASTERN INLET CHANNEL IMPROVEMENT UP TO EXISTING BRIDGE.
- 5.) EXCAVATE ANY ACCUMULATED SILT AND DEWATER BEFORE REMOVAL OF IMPERVIOUS DIKES.
- 6.) REMOVE ANY REMAINING SPECIAL STILLING BASIN(S) AND IMPERVIOUS DIKES.
- 7.) COMPLETE CONSTRUCTION OF PROPOSED ROADWAY IN ACCORDANCE WITH TMP PHASE I.



CHARLE JOHN ST

CHARLE JOHN ST

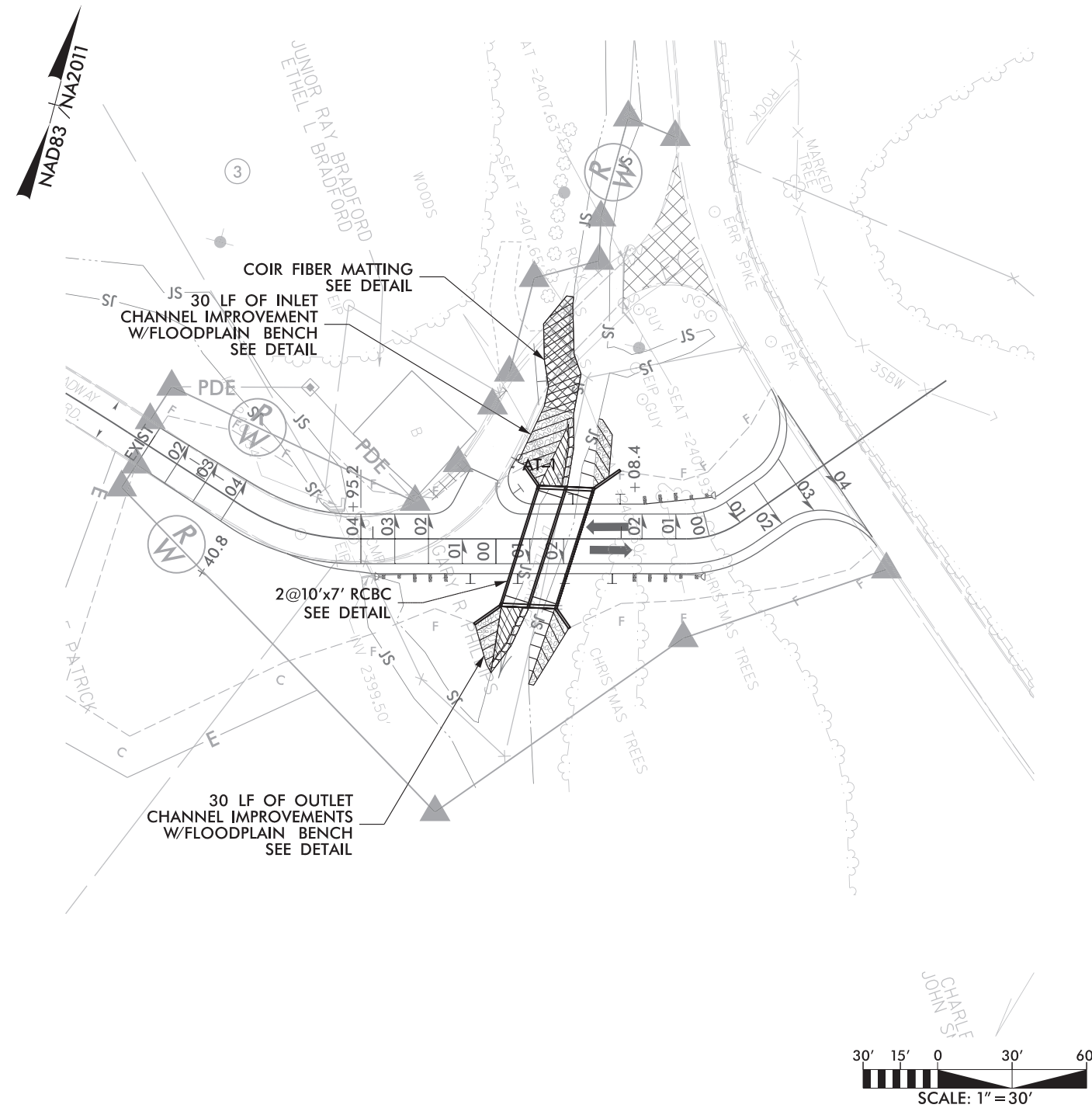


# 2@10'X7' RCBC CONSTRUCTION SEQUENCE STA. 13 + 71 -L- LITTLE CREEK

PROJECT REFERENCE NO. <i>BPI3.R001</i>	SHEET NO. <i>EC-04B/CONST.04</i>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

## PHASE III

- 1.) REMOVE EXISTING BRIDGE IN ACCORDANCE WITH TMP PHASE 5.
- 2.) CONSTRUCT REMAINDER OF INLET CHANNEL IMPROVEMENT.



# 87"X63" CMPA CONSTRUCTION SEQUENCE STA. 12 + 89 -L- UT TO LITTLE CREEK

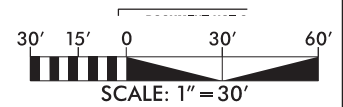
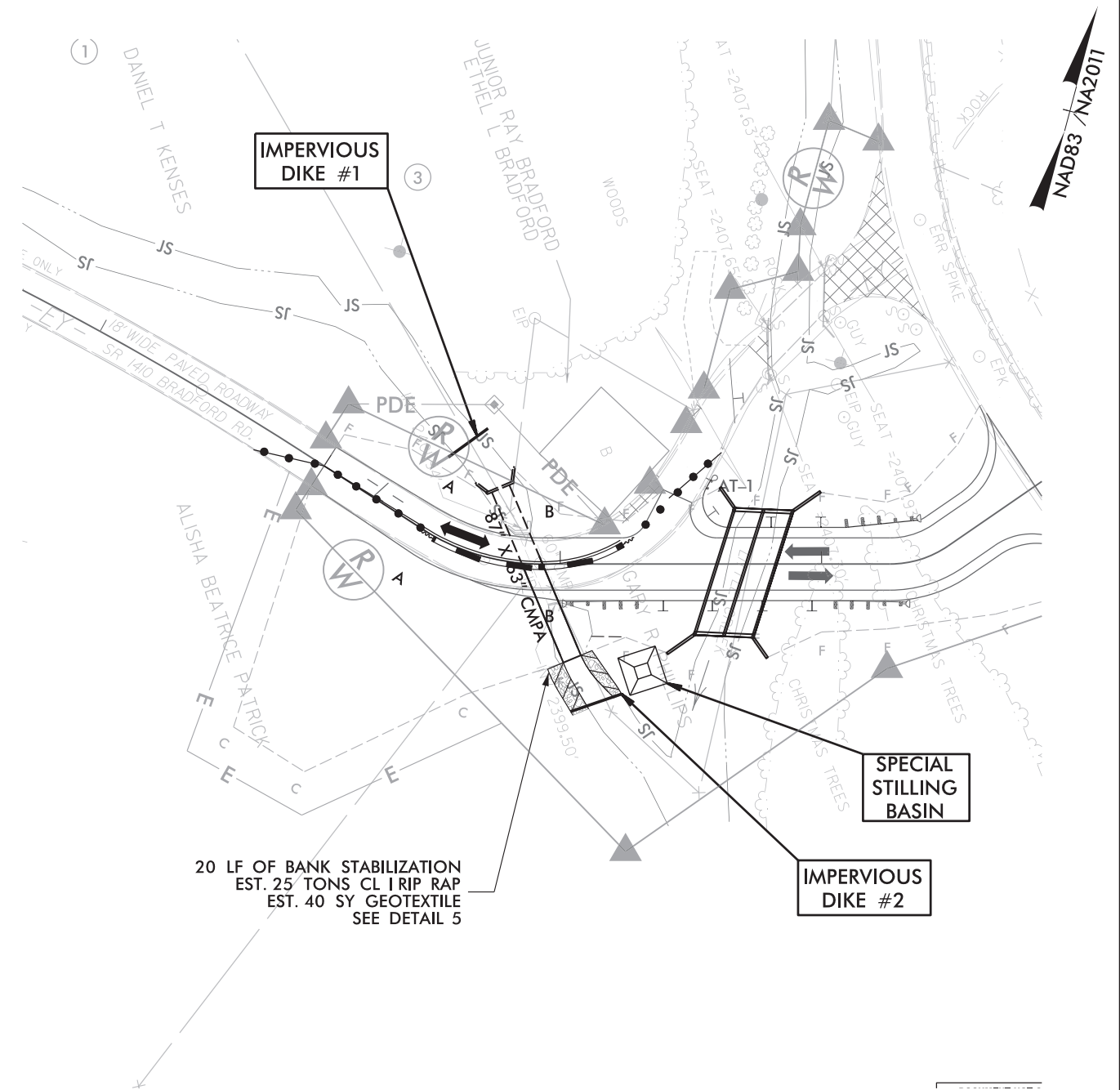
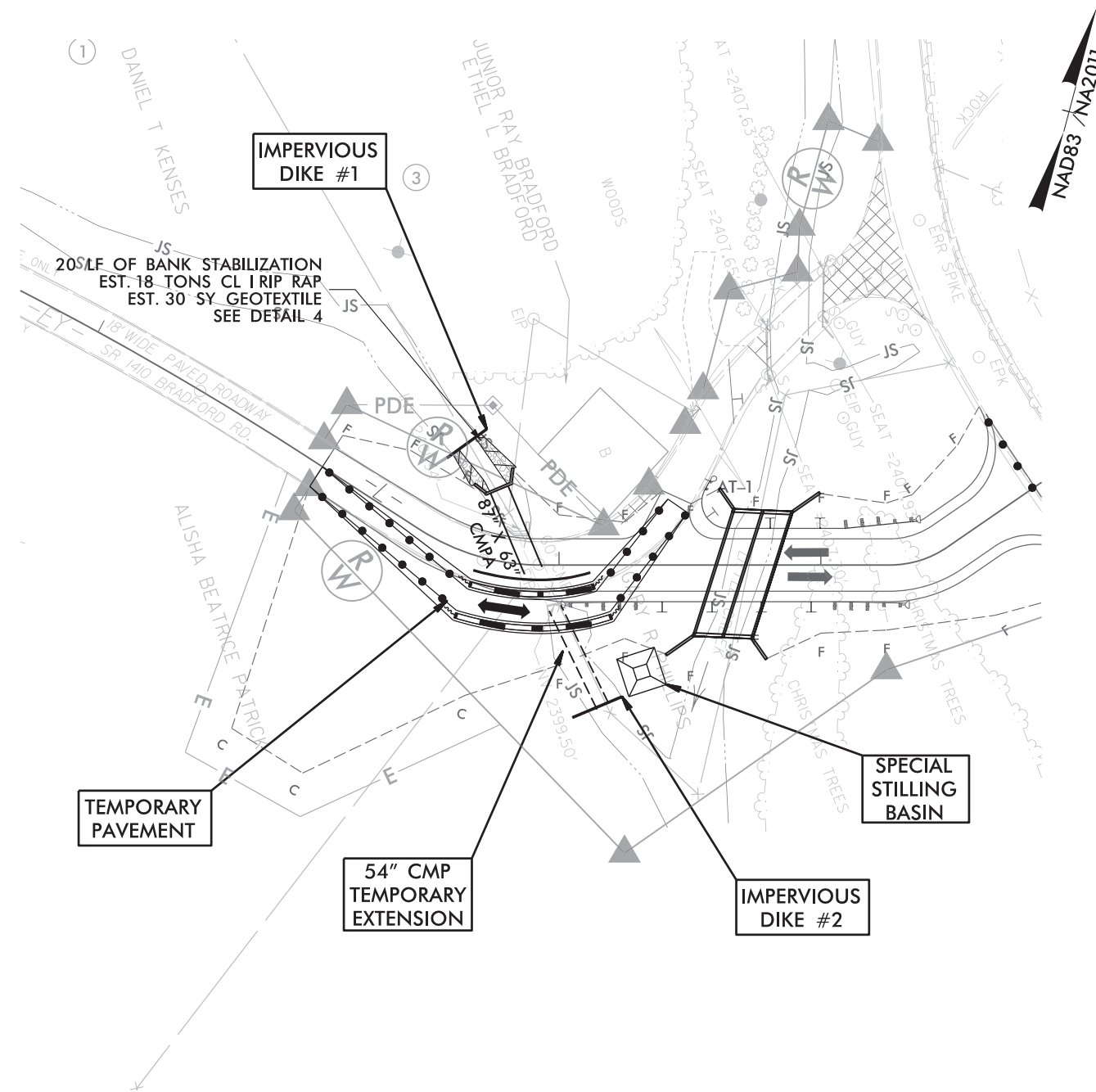
PROJECT REFERENCE NO. BP13.R001	SHEET NO. EC-04C/CONST.04
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

## PHASE I

- 1.) EXTEND EXISTING CMP +/-40', CONSTRUCT FILL AND TEMPORARY PAVEMENT IN ACCORDANCE WITH TMP PHASE 2.
- 2.) SHIFT TRAFFIC TO EASTBOUND LANE AS A ONE-LANE, TWO-WAY OPERATION.
- 3.) INSTALL UPSTREAM PUMP AND TEMPORARY FLEXIBLE HOSE.
- 4.) INSTALL IMPERVIOUS DIKES #1 AND #2 AND BEGIN PUMPING OPERATION FOR STREAM DIVERSION THROUGH EXISTING CMP.
- 5.) DEWATER CONSTRUCTION AREA, UTILIZING SPECIAL STILLING BASIN(S) FOR PUMPED EFFLUENT.
- 6.) REMOVE UPSTREAM HEADWALL AND +/- 14' OF EXISTING 54" CMP.
- 7.) INSTALL +/- 34' OF 87"X63" CMPA AND HEADWALL AND CONSTRUCT UPSTREAM BANK STABILIZATION.
- 8.) COMPLETE WESTBOUND ROADWAY.

## PHASE II

- 1.) CONTINUE PUMP OPERATION TO MANAGE DALY FLOW.
- 2.) SHIFT TRAFFIC TO WESTLAND LANE FOR A ONE-LANE, TWO-WAY OPERATION IN ACCORDANCE WITH TMP PHASE 4.
- 3.) REMOVE REMAINDER OF EXISTING 54" CMP, TEMPORARY EXTENSION, TEMPORARY PAVEMENT, AND TEMPORARY FILL.
- 4.) COMPLETE INSTALLATION OF 87"X63" CMPA AND CONSTRUCT DOWNSTREAM BANK STABILIZATION.
- 5.) EXCAVATE ANY ACCUMULATED SILT AND DEWATER BEFORE REMOVAL OF IMPERVIOUS DIKES.
- 6.) REMOVE ANY REMAINING SPECIAL STILLING BASIN(S) AND IMPERVIOUS DIKES AND DIRECT FLOW THROUGH 87"X63" CMPA.
- 7.) COMPLETE ROADWAY.

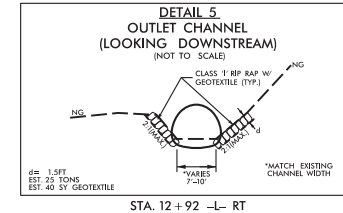
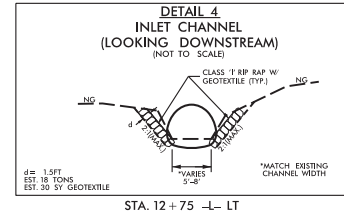




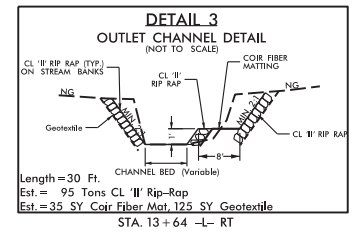
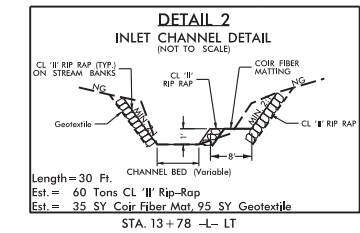
PROJECT REFERENCE NO.	SHEET NO.
BP13.R001	EC-05/CONST.04
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CLEARING AND GRUBBING  
EROSION CONTROL FOR  
CONSTRUCTION SHEET 04

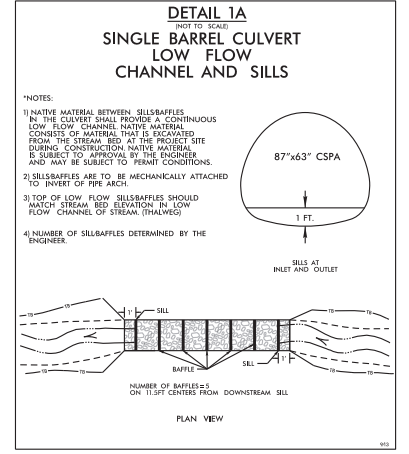
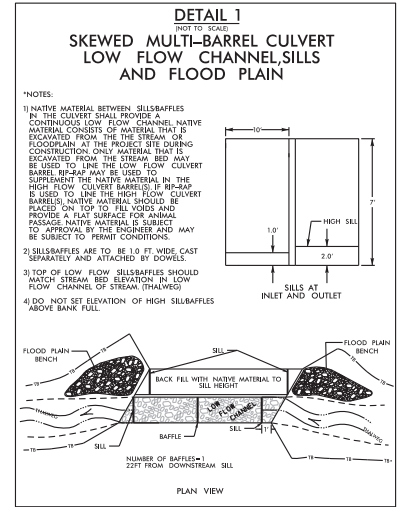
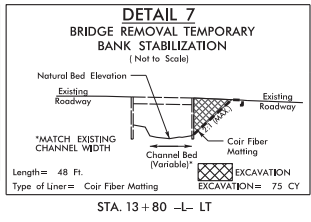
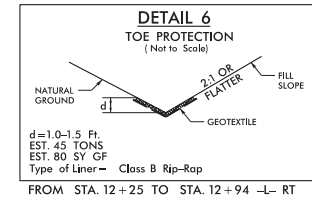
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PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE - B  
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DRAINAGE OUTLETS.



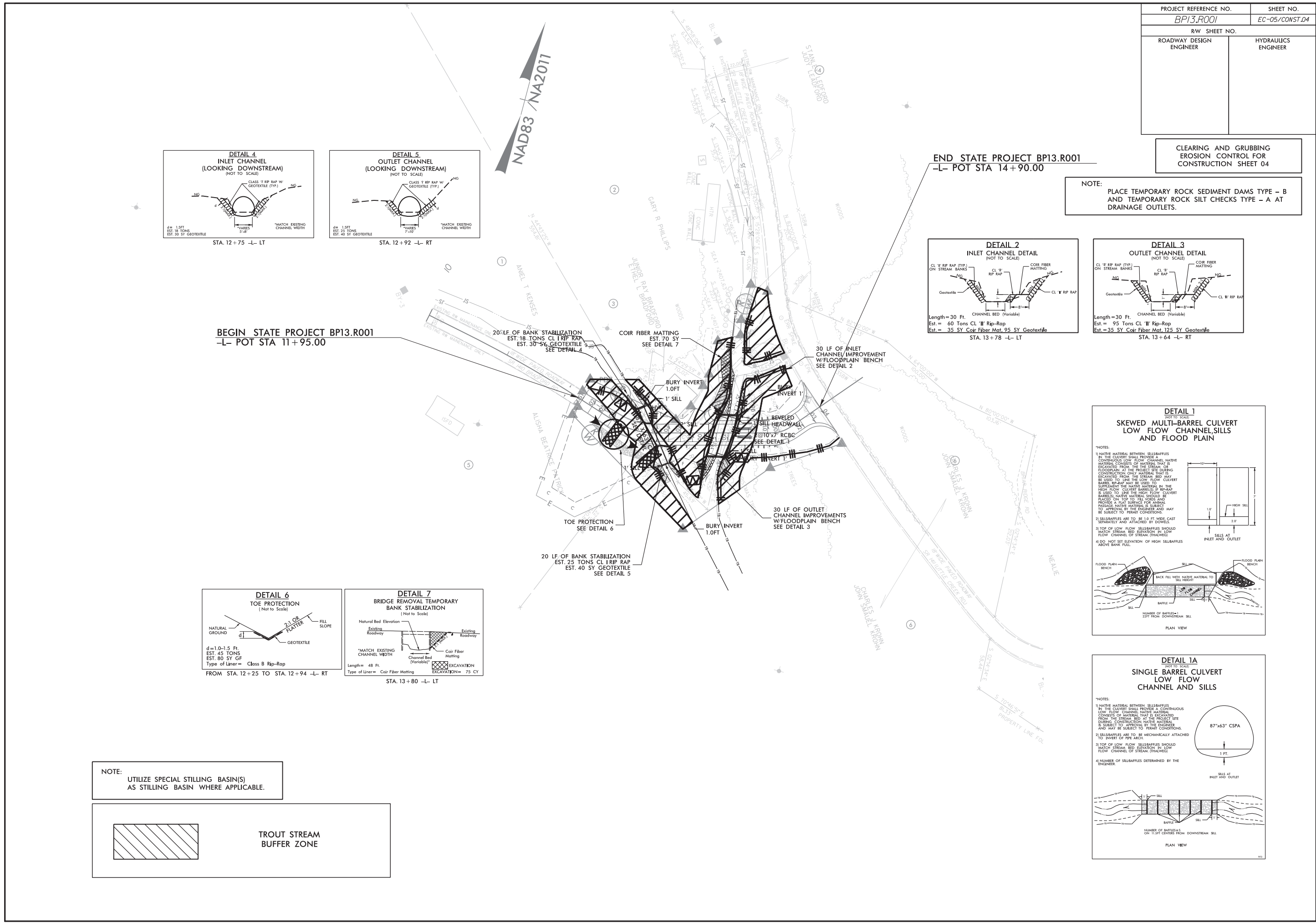
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-L- POT STA 14+90.00



BEGIN STATE PROJECT BP13.R001  
-L- POT STA 11+95.00

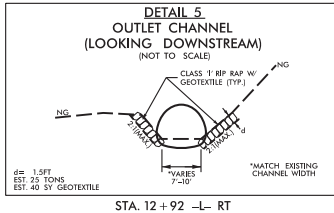
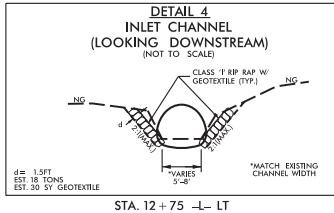


NOTE:  
UTILIZE SPECIAL STILLING BASIN(S)  
AS STILLING BASIN WHERE APPLICABLE.

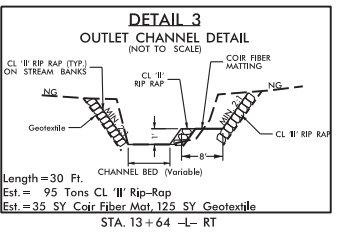
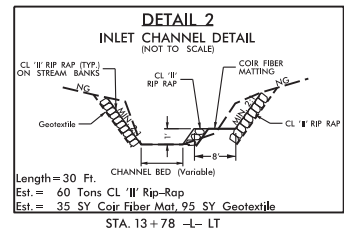


PROJECT REFERENCE NO.	SHEET NO.
BP13.R001	EC-06/CONST.TMP-3B
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

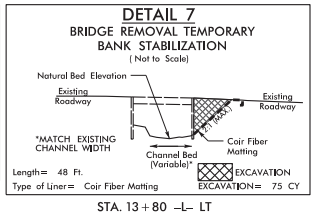
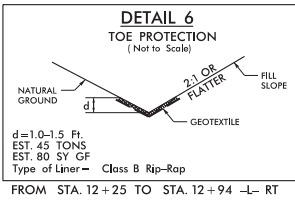
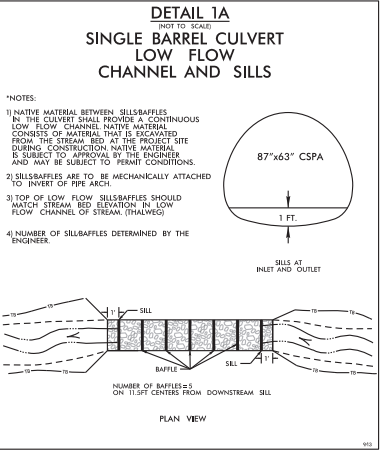
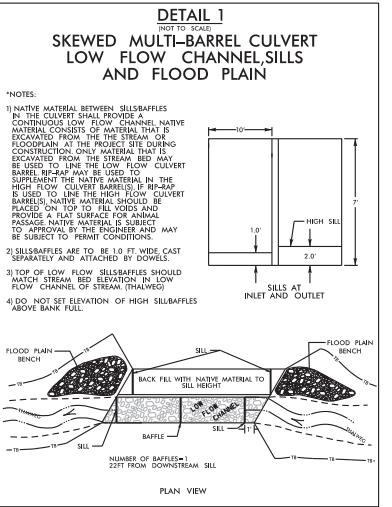
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TRAFFIC CONTROL SHEET TMP-3B



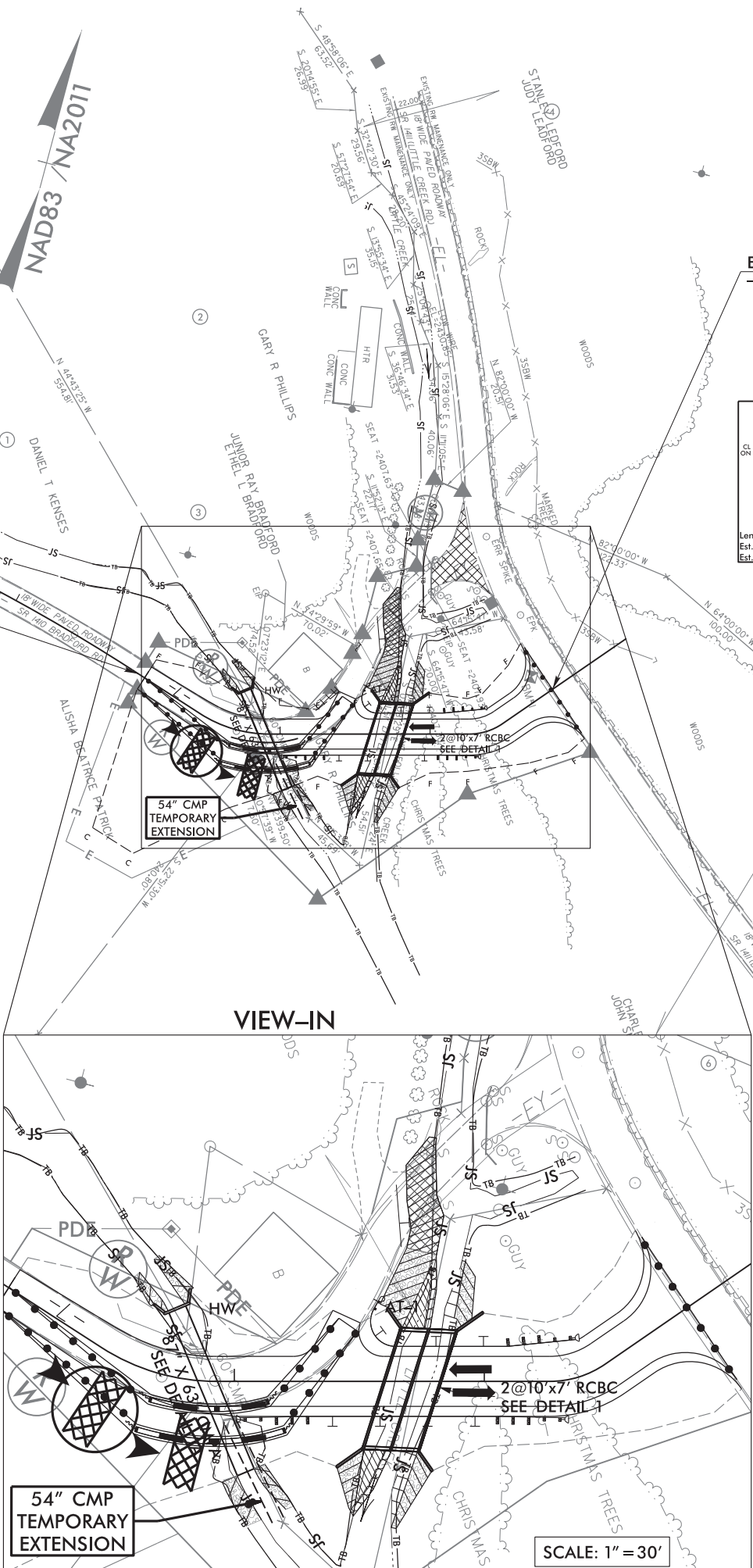
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-L- POT STA 14+90.00



BEGIN STATE PROJECT BP13.R001  
-L- POT STA 11+95.00



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



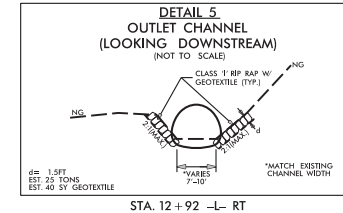
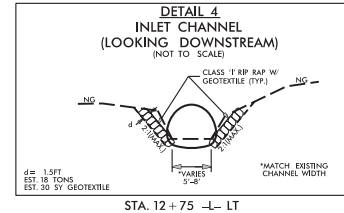
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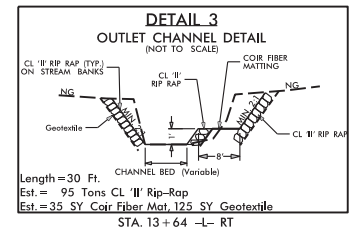
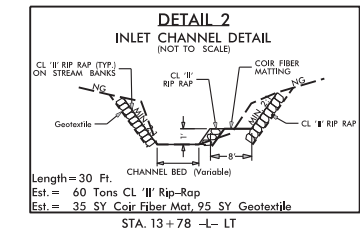


PROJECT REFERENCE NO.	SHEET NO.
BP13.R001	EC-07/CONST.04
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

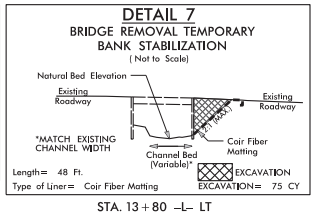
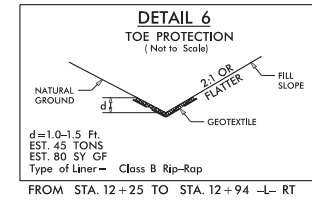
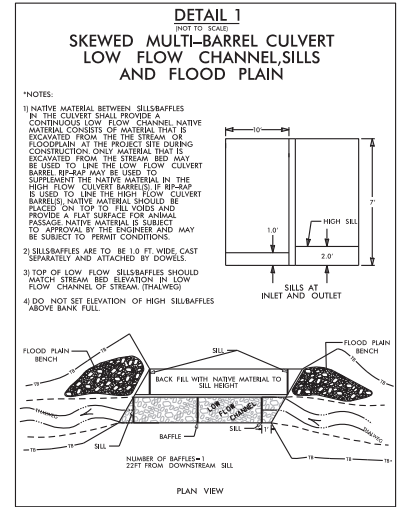
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CONSTRUCTION SHEET 04



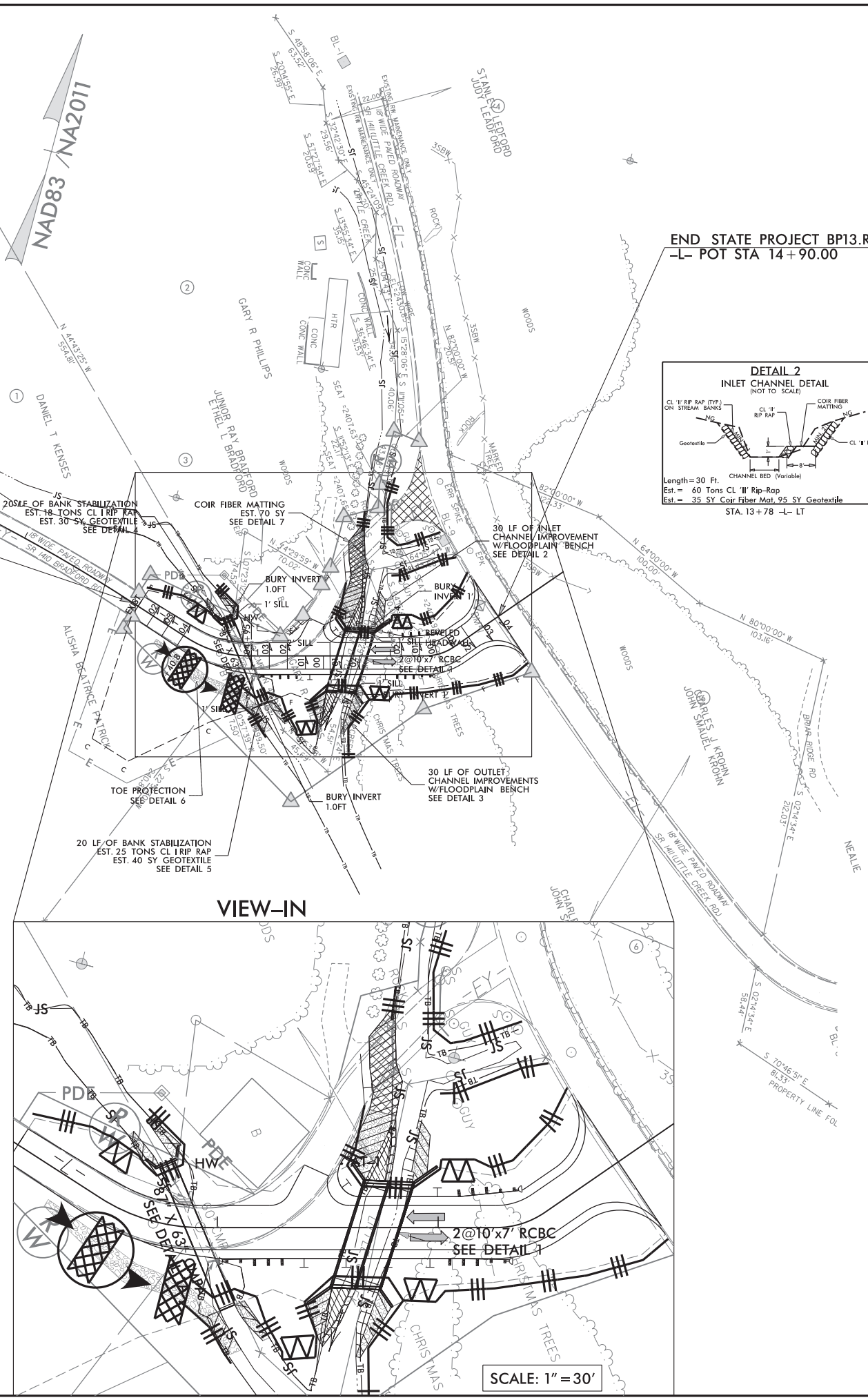
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-L- POT STA 14+90.00



BEGIN STATE PROJECT BP13.R001  
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NOTE:  
UTILIZE SPECIAL STILLING BASIN(S)  
AS STILLING BASIN WHERE APPLICABLE.



VIEW-IN

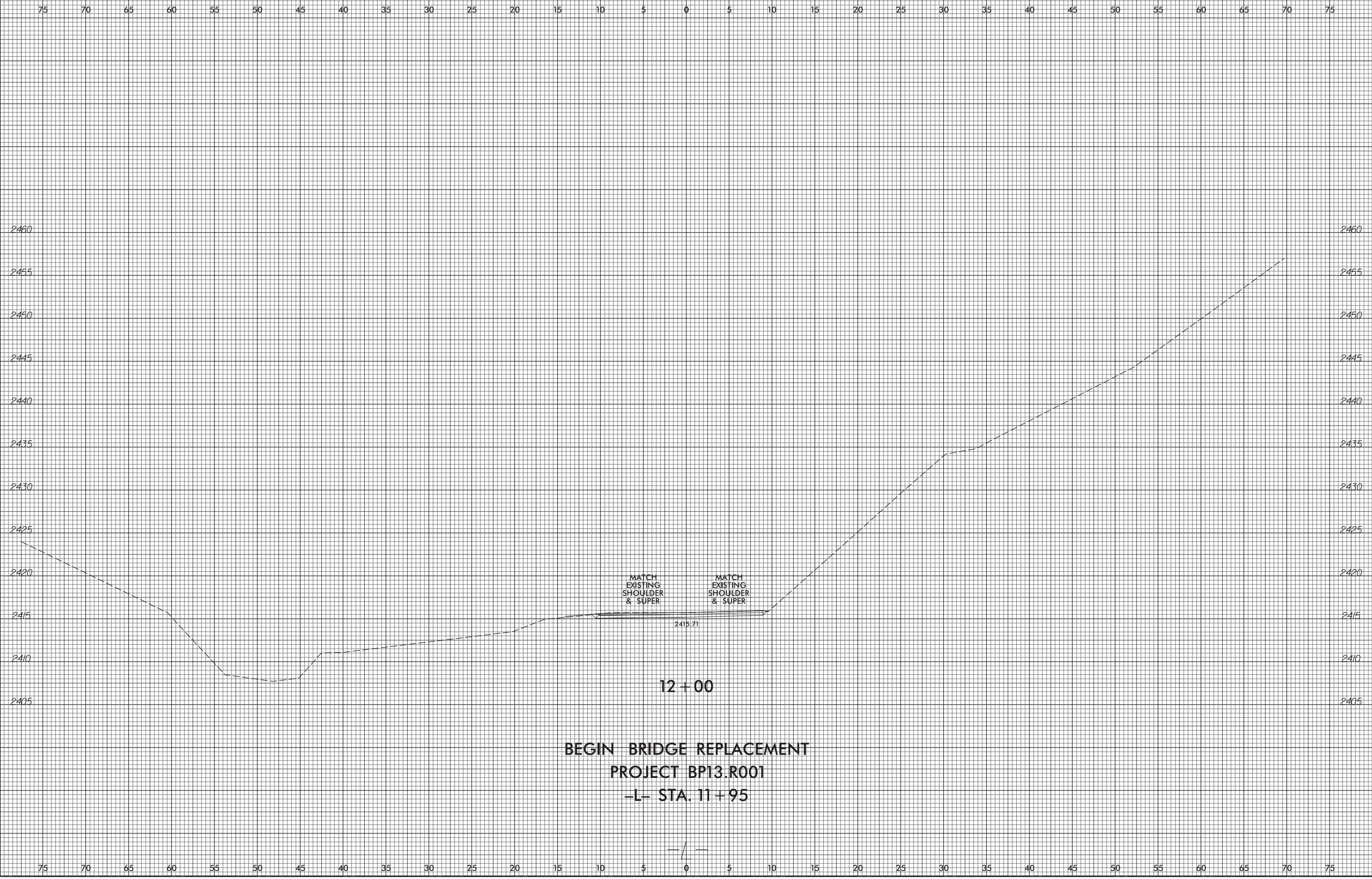
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6/23/16  
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PROJ. REFERENCE NO. BP13.R001	SHEET NO. X-1
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**BEGIN BRIDGE REPLACEMENT**  
**PROJECT BP13.R001**  
**-L- STA. 11+95**

**12+00**

MATCH  
EXISTING  
SHOULDER  
& SUPER

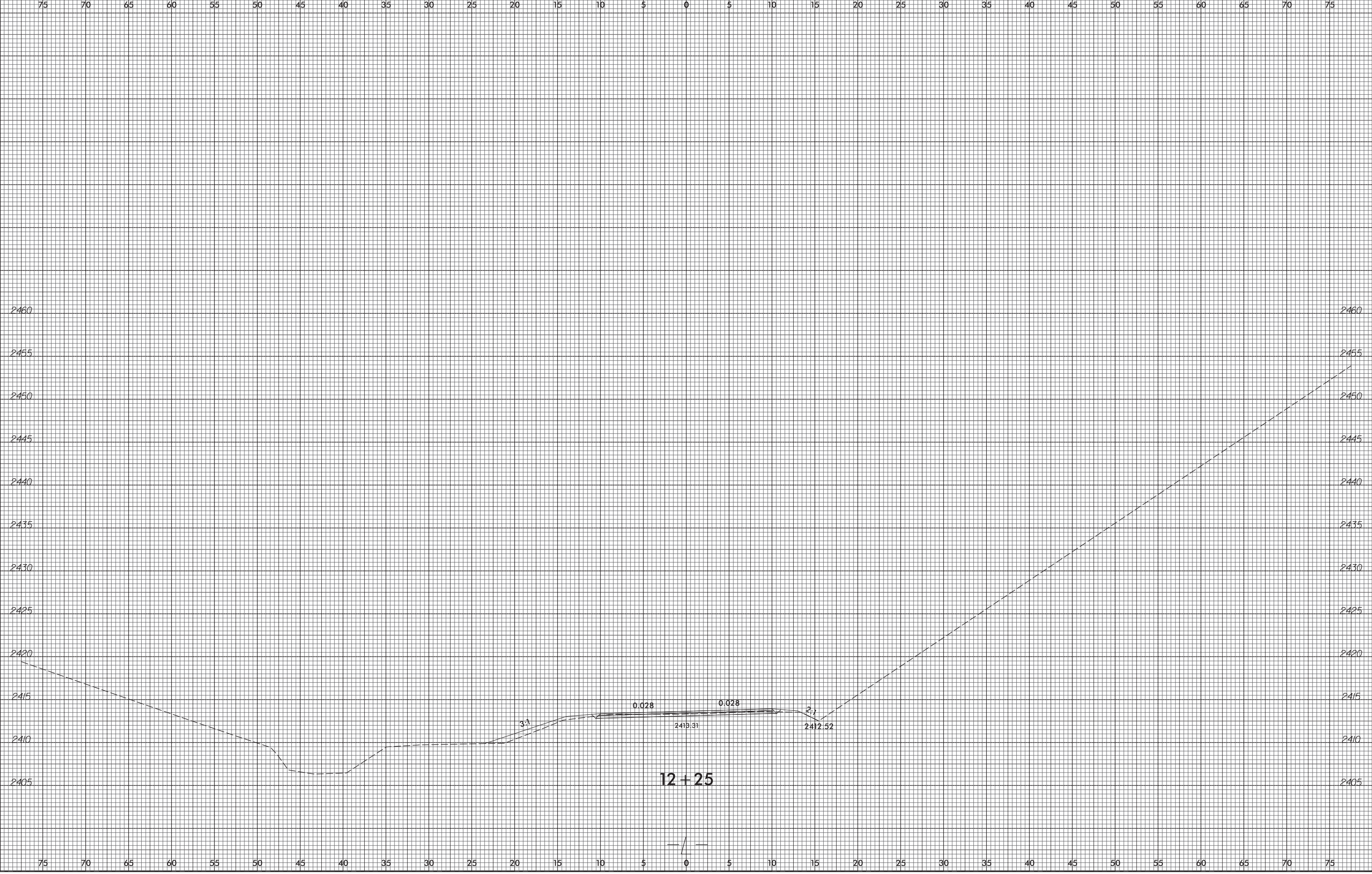
MATCH  
EXISTING  
SHOULDER  
& SUPER

2415.71



6/23/16  
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	BP13.R001	X-2

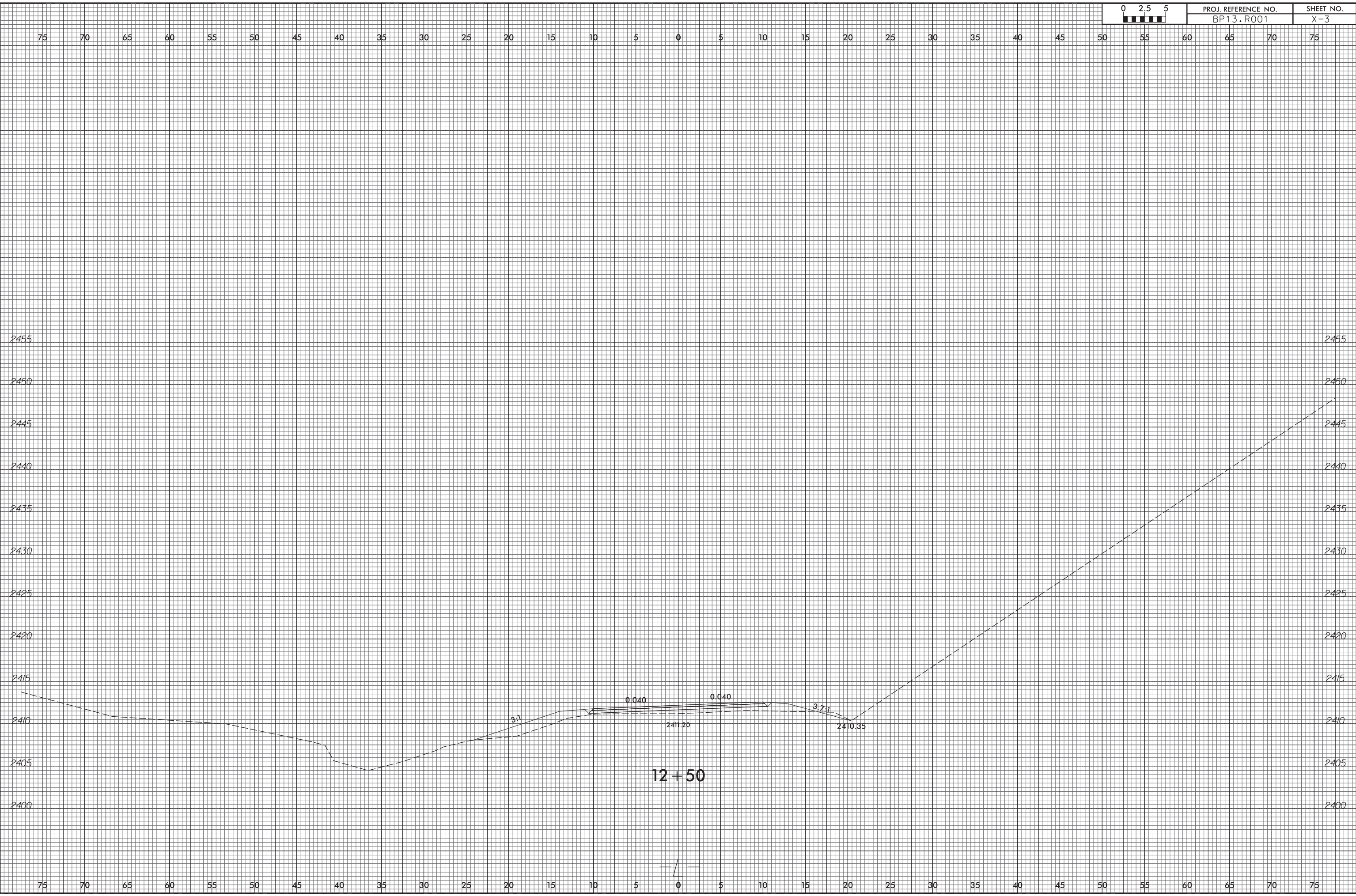


12+25

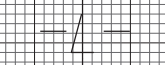
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PROJ. REFERENCE NO.	SHEET NO.
BP13.R001	X-3



12+50



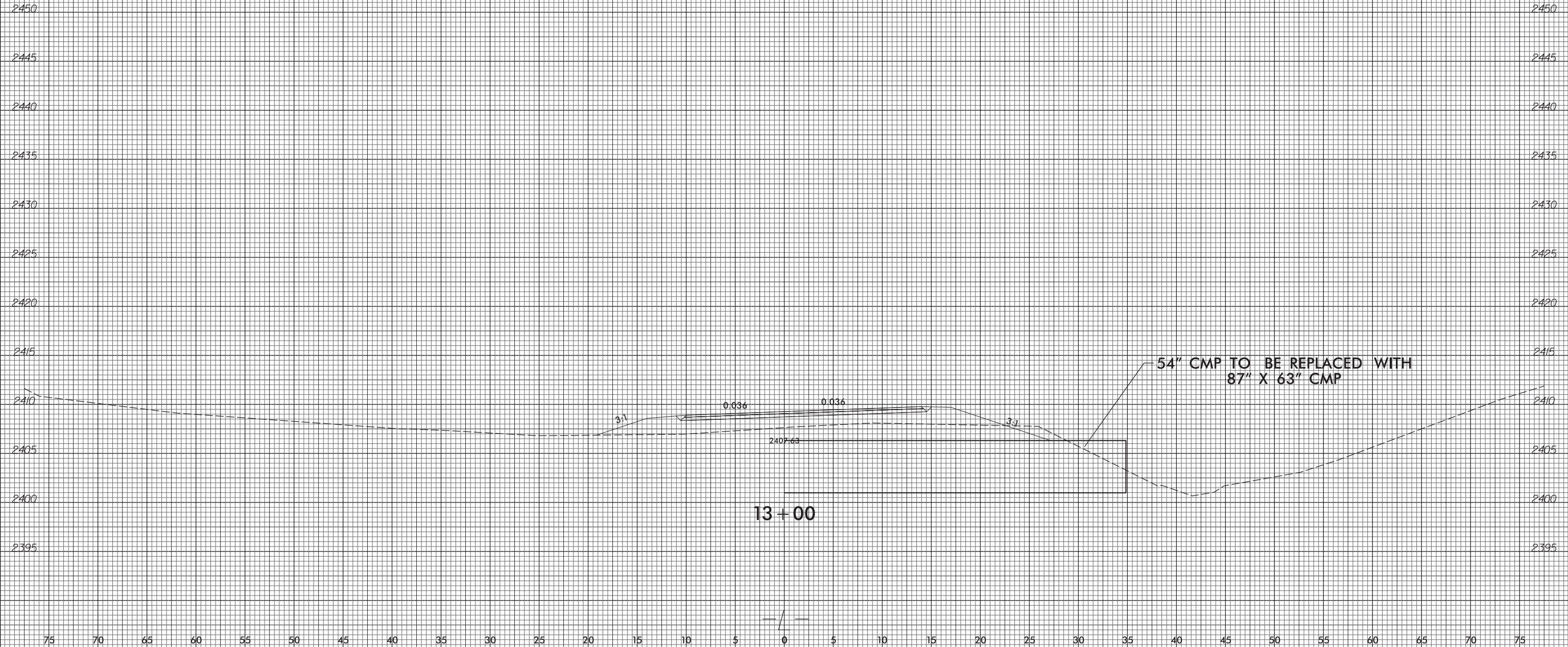


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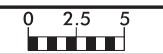
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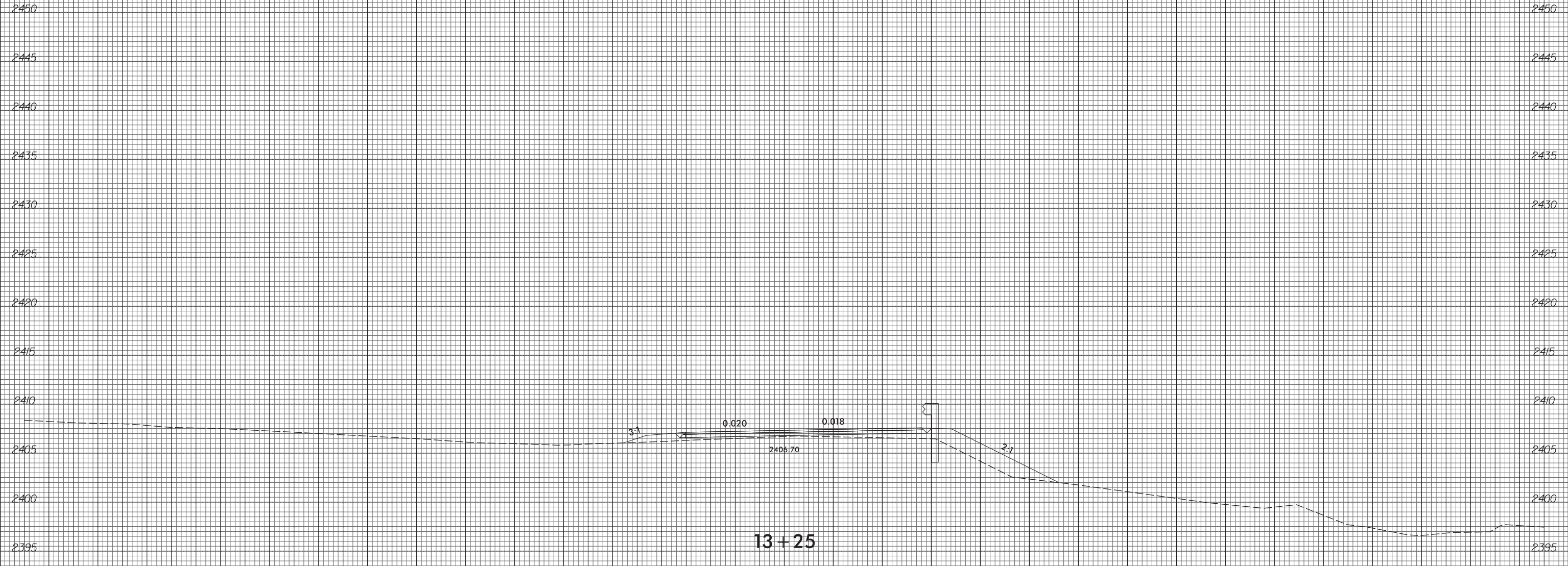
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6/23/16



PROJ. REFERENCE NO.	SHEET NO.
BP13.R001	X-6

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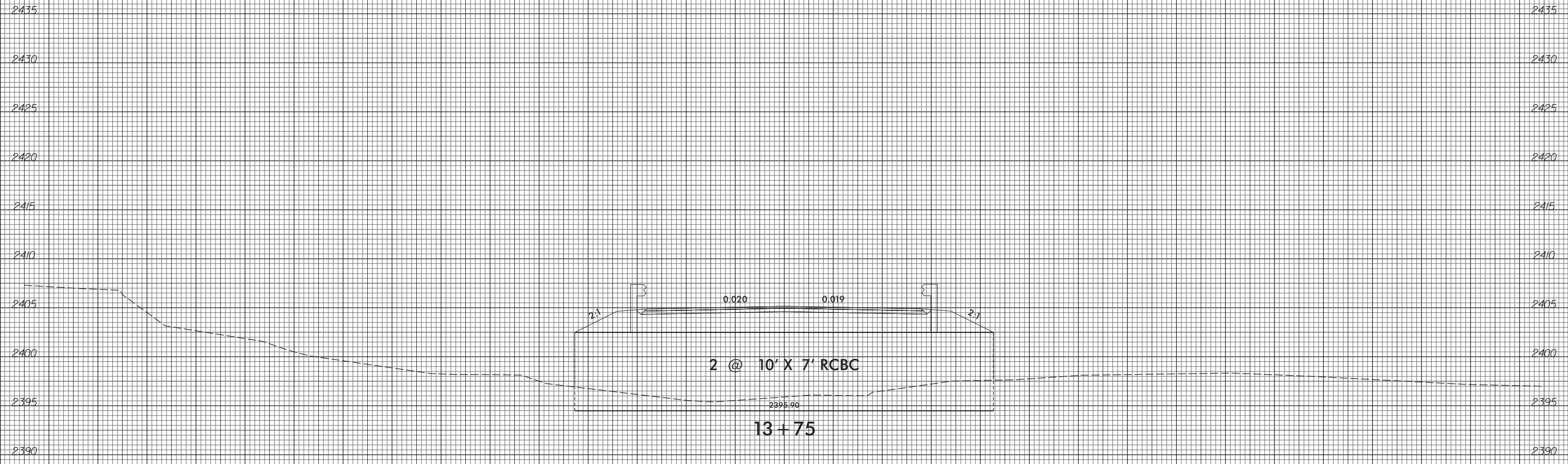
6/23/16



PROJ. REFERENCE NO.	SHEET NO.
BP13.R001	X-8

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END CULVERT STA. 13+82.94



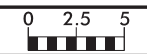
2 @ 10' X 7' RCBC

13+75

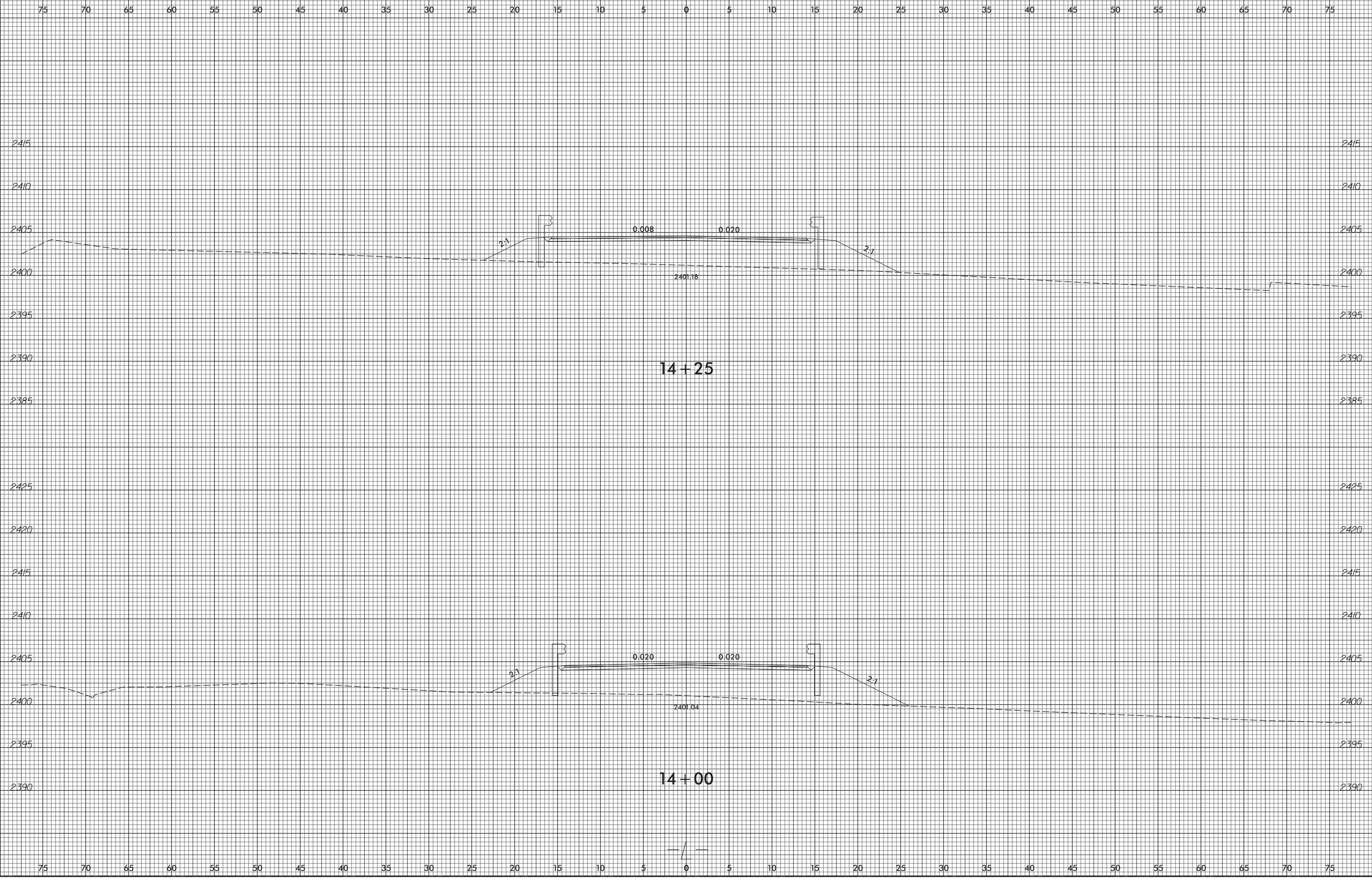
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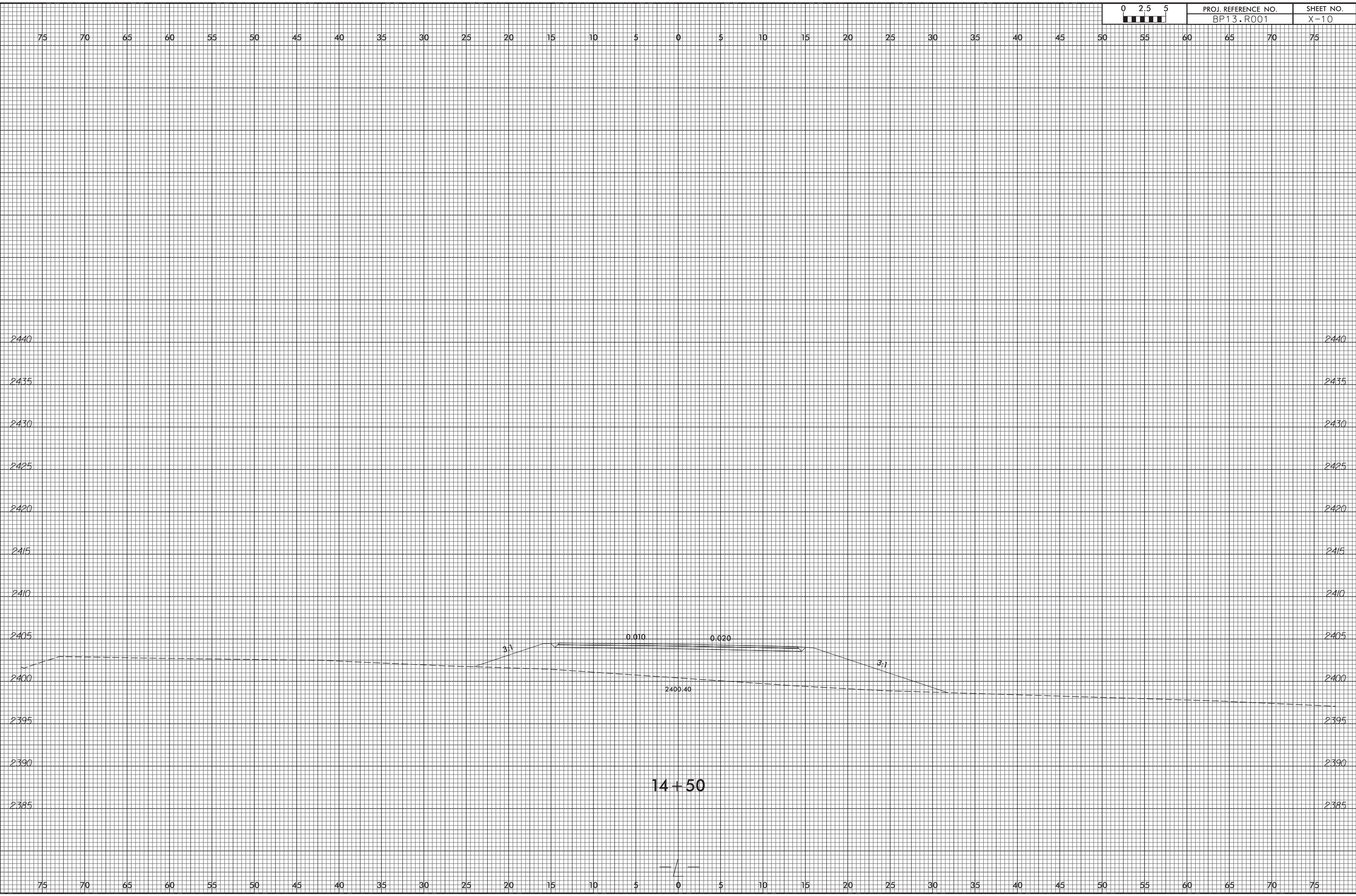


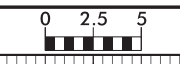
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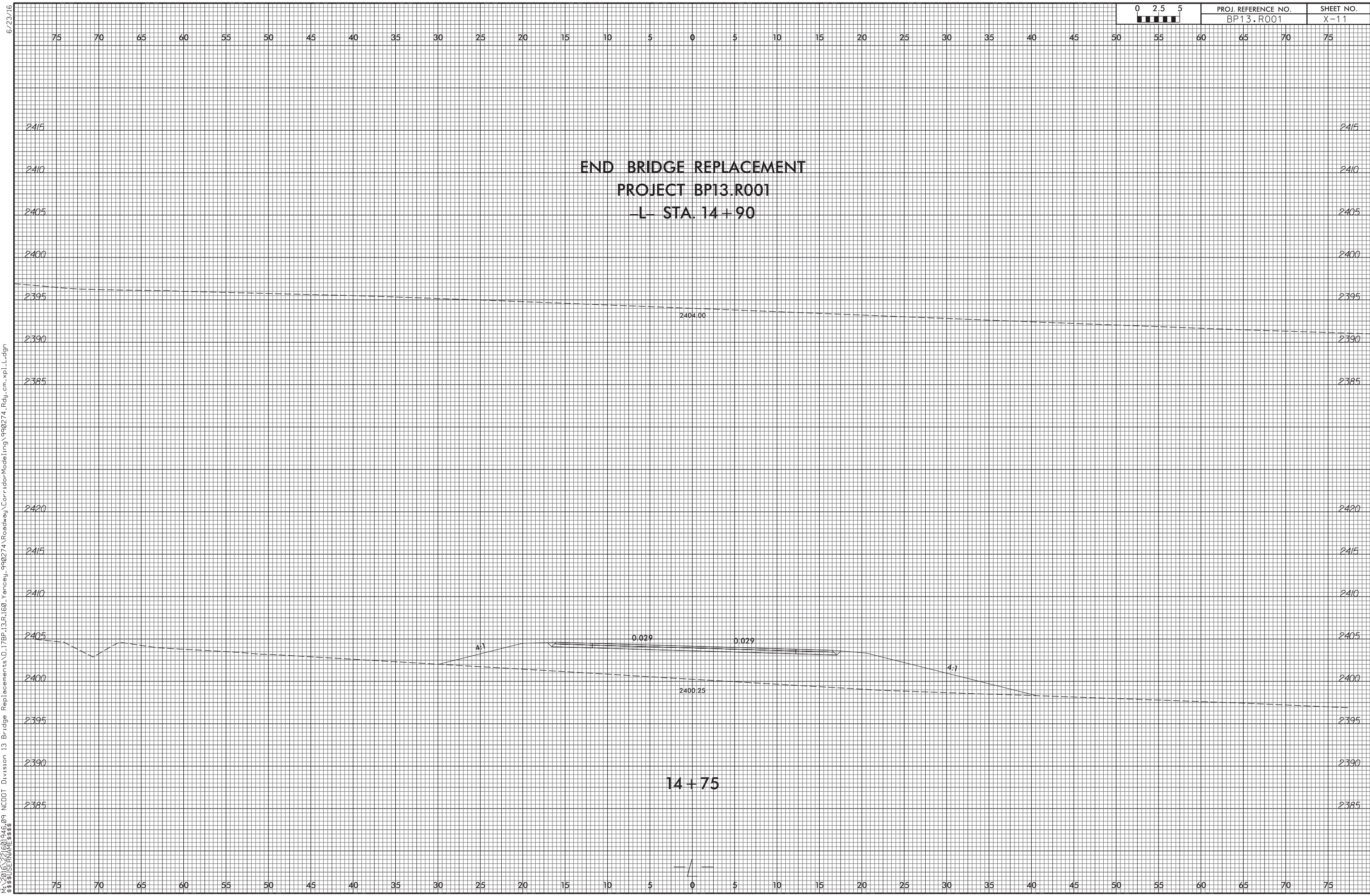


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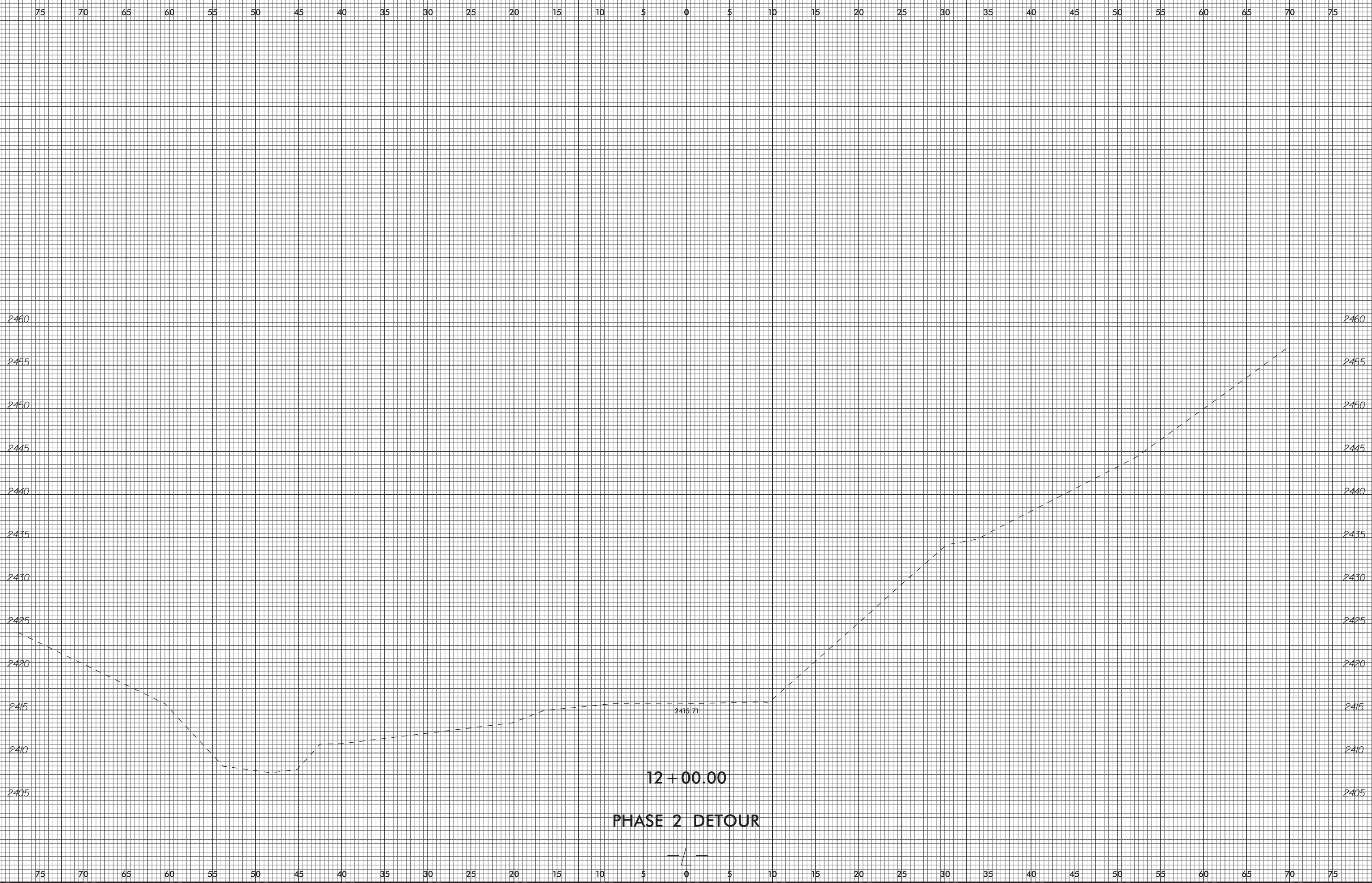


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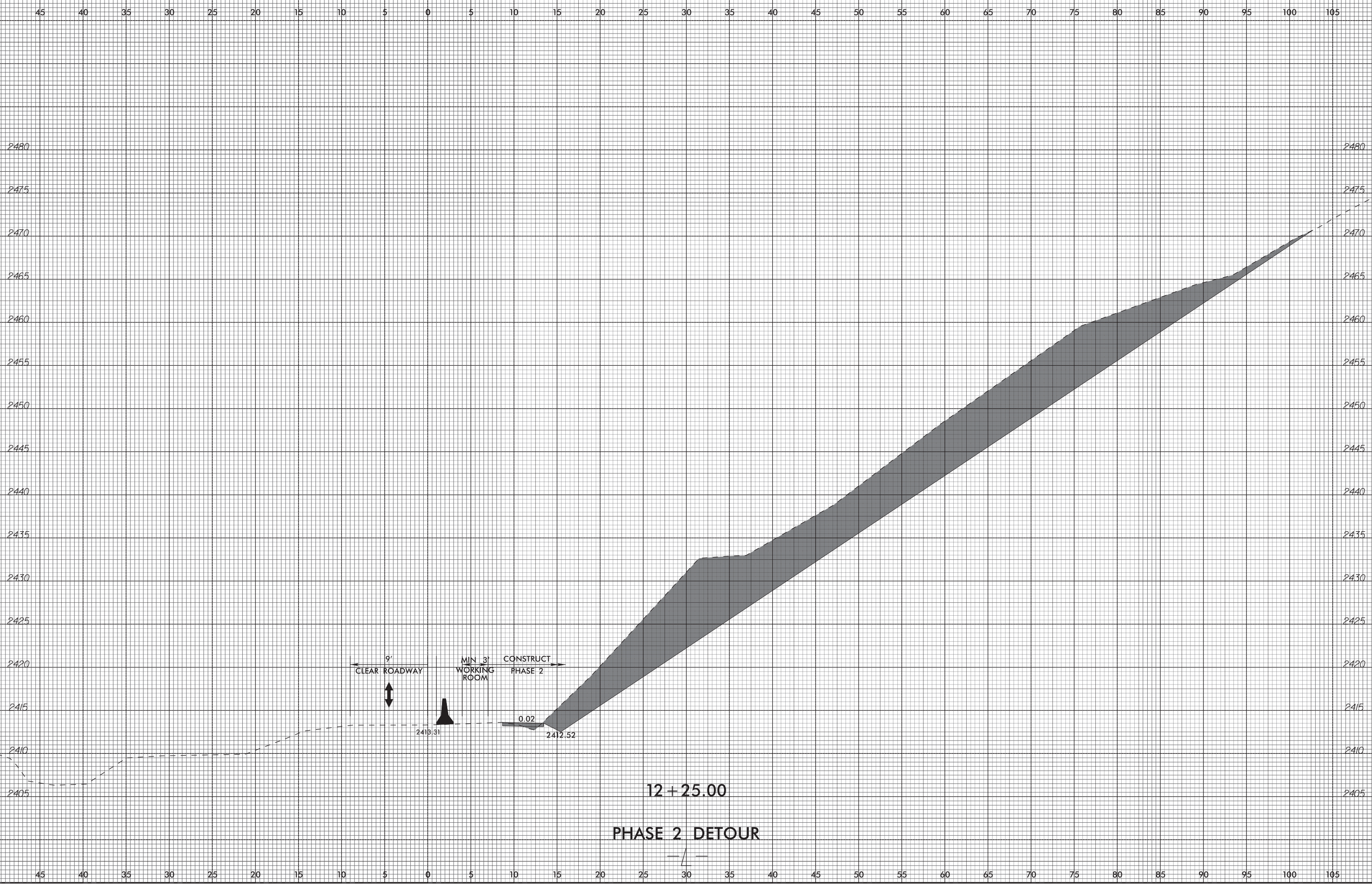
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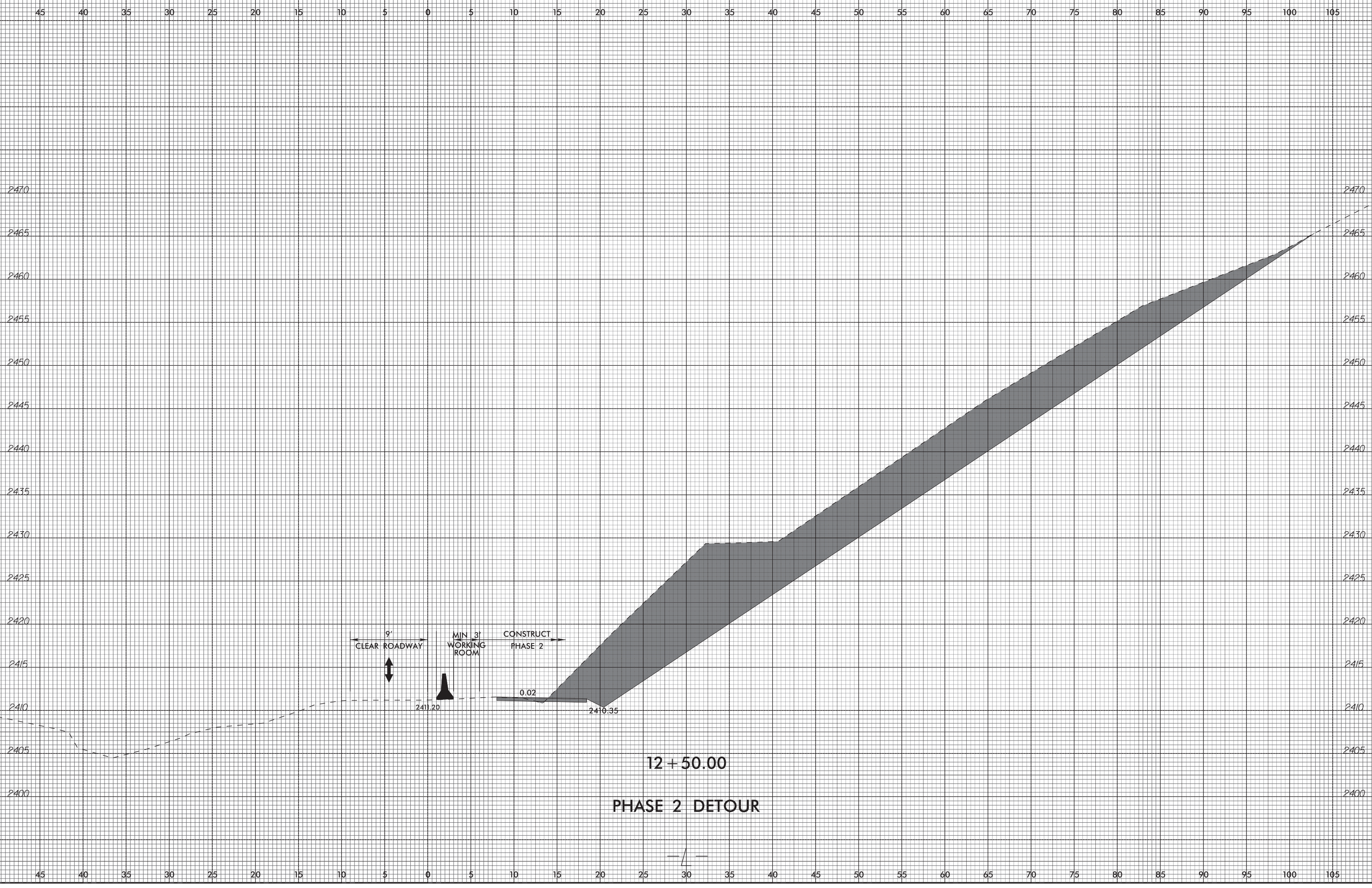
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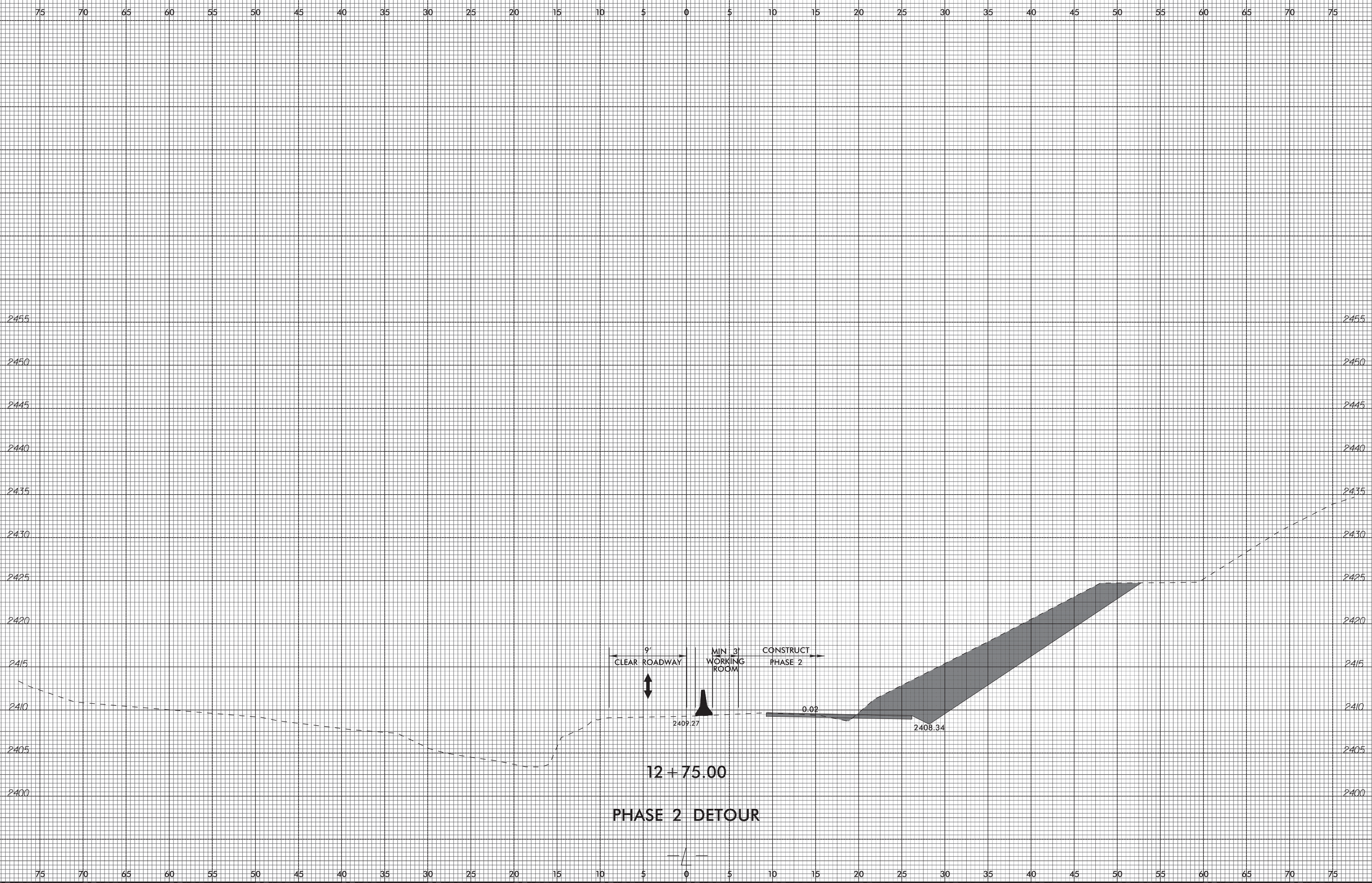


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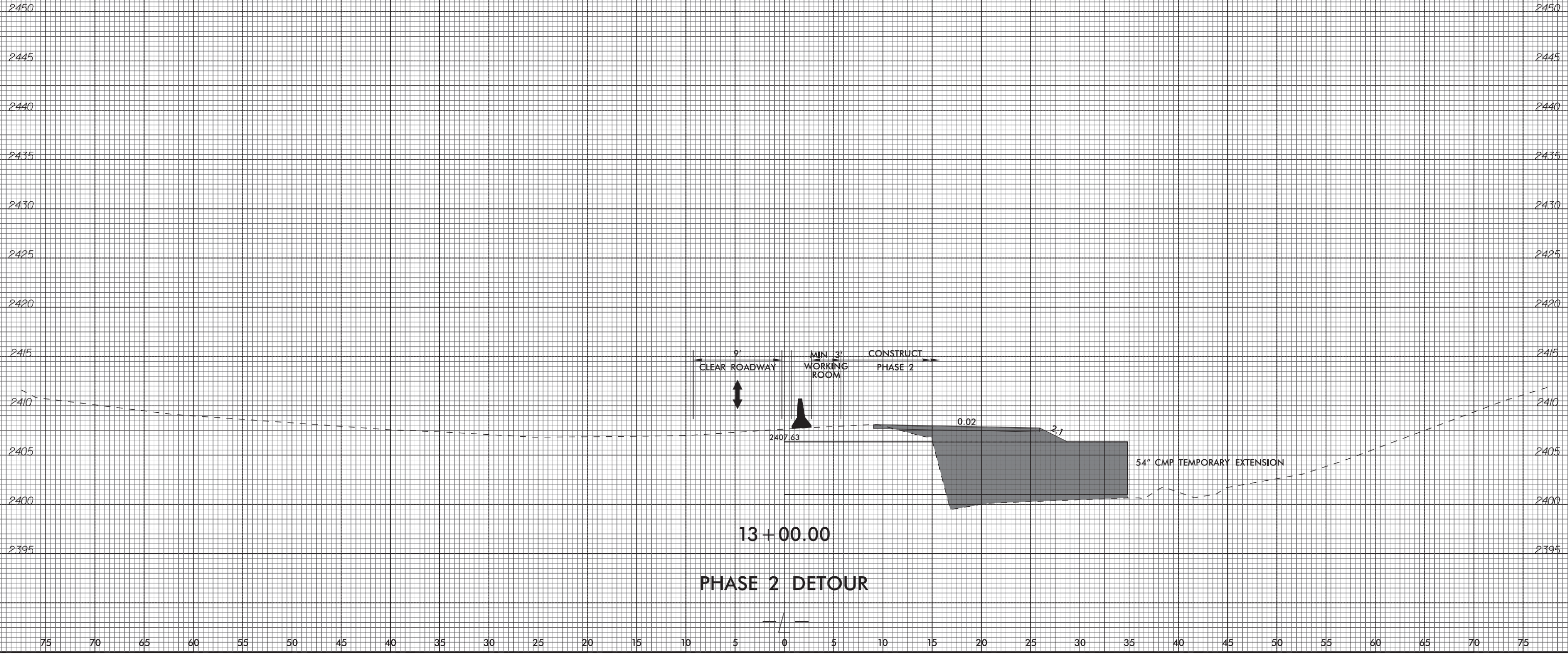


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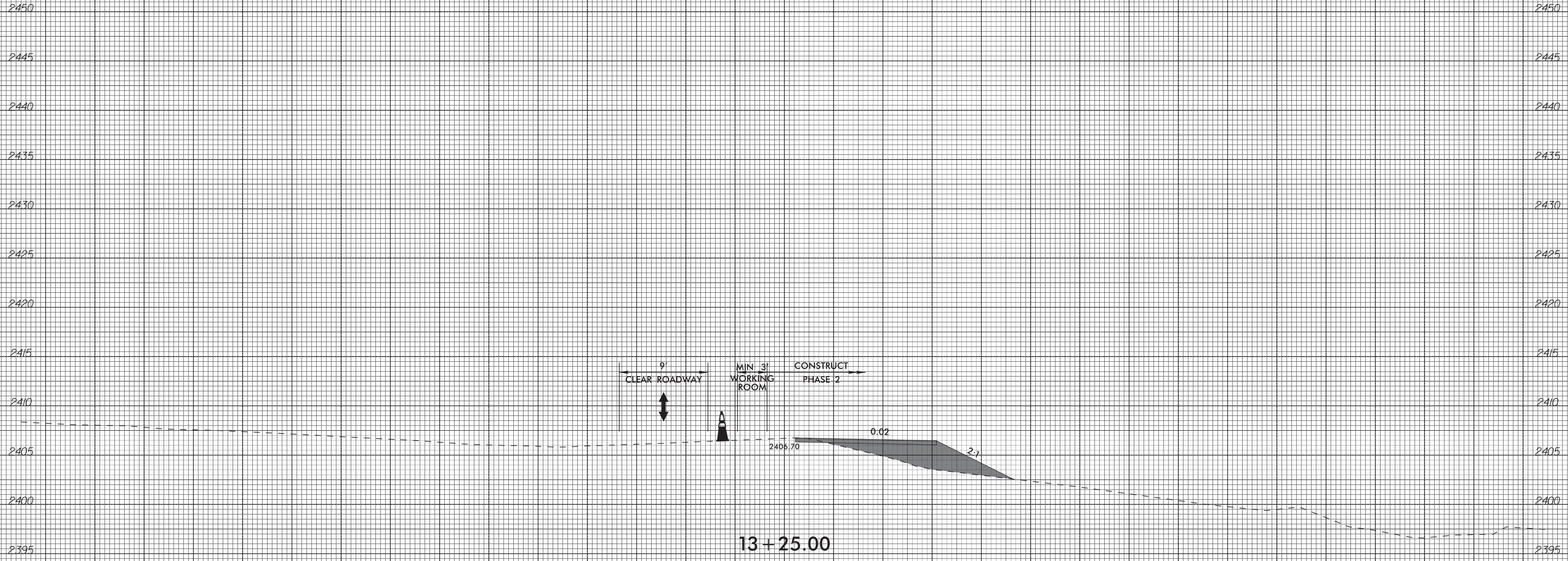
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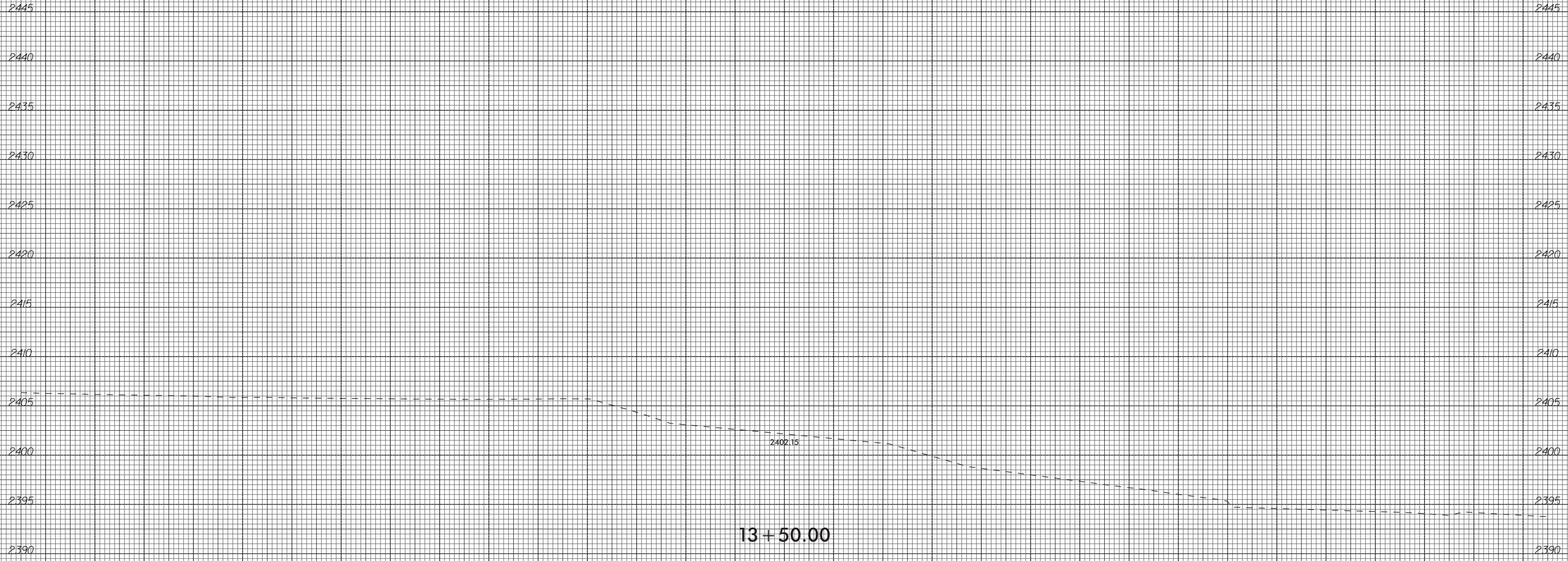
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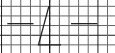
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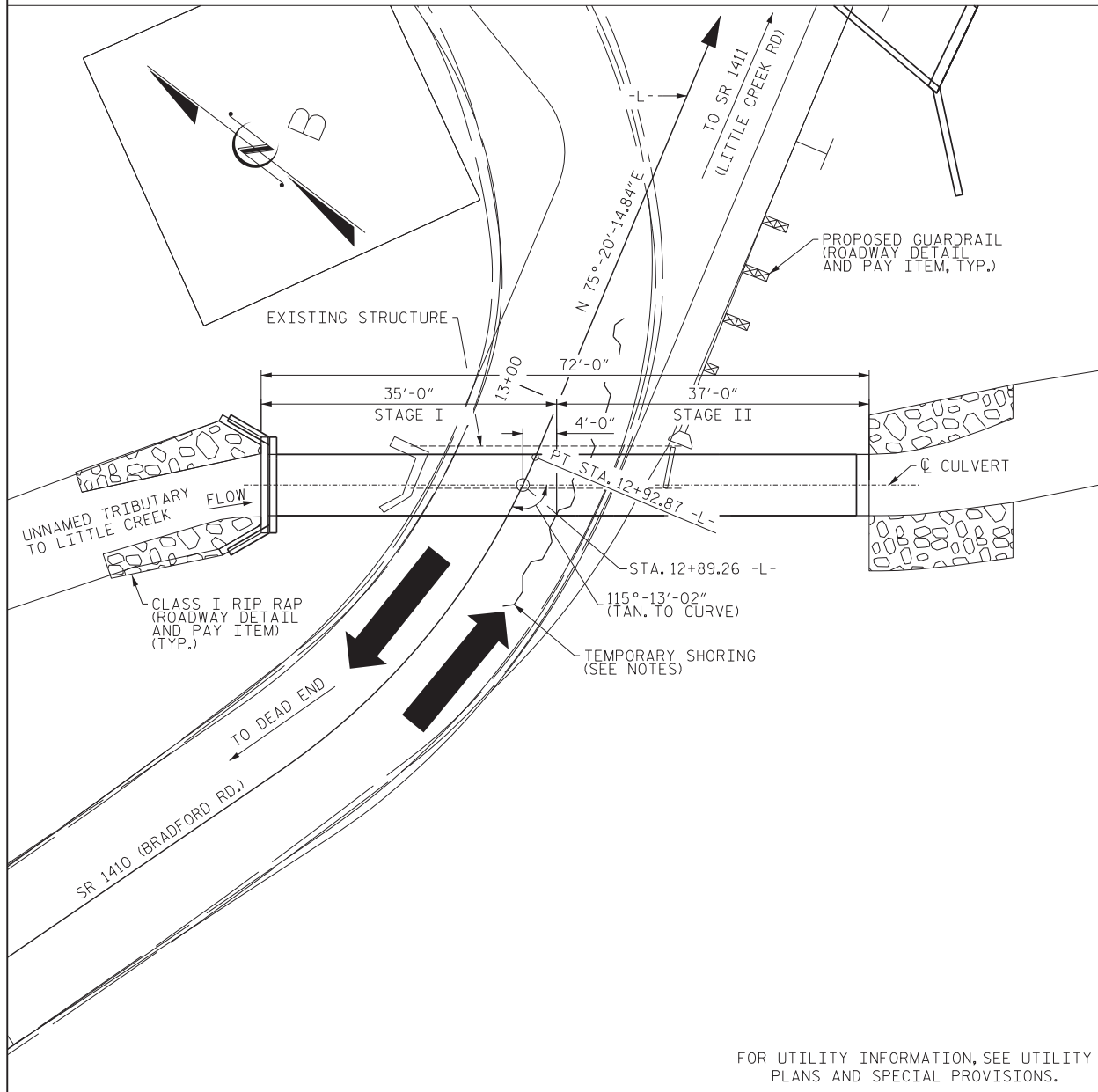
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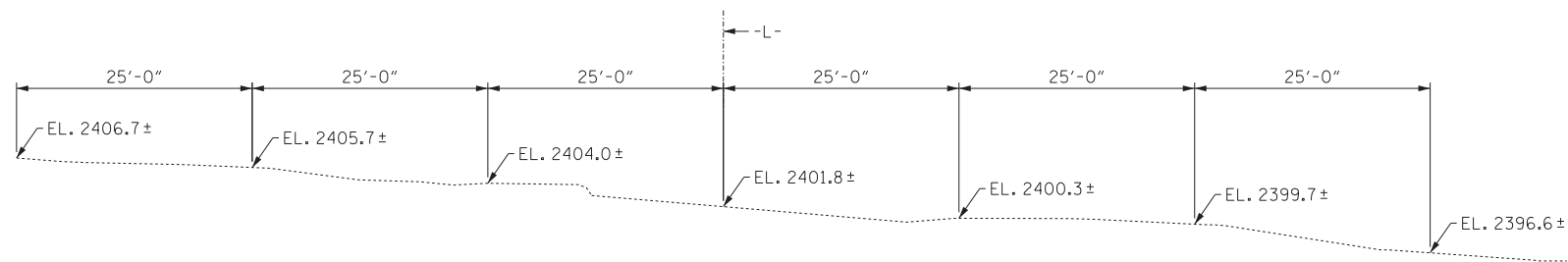


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BM #1 - BENCH TIE NAIL IN SPRUCE STA. 14+83.34 -L-, 15.02' LT EL 2404.24 N 836645 E 994789 NAV 88



LOCATION SKETCH



PROFILE ALONG  $\text{C}$  CULVERT

**ROADWAY DATA**

GRADE POINT ELEV @ STA. 12+89.26 -L- = 2410.25  
 BED ELEV @ STA. 12+89.26 -L- = 2401.05  
 ROADWAY SLOPES = 2:1

**HYDRAULIC DATA**

DESIGN DISCHARGE = 150 CFS  
 FREQUENCY OF DESIGN FLOOD = 5 YRS  
 DESIGN HIGH WATER ELEVATION = 2406.9  
 DRAINAGE AREA = 417 AC  
 BASE DISCHARGE (Q100) = 420 CFS  
 BASE HIGH WATER ELEVATION = 2407.6

**OVERTOPPING FLOOD DATA**

OVERTOPPING DISCHARGE = 210 CFS  
 FREQUENCY OF OVERTOPPING FLOOD = 10 YRS  
 OVERTOPPING FLOOD ELEVATION = 2407.1

OVERTOPS NATURAL GROUND AT STA. 12+24 -L- LT

**TOTAL STRUCTURE QUANTITIES**

FOUNDATION CONDITIONING MATERIAL \_\_\_\_\_ 61 TONS  
 FOUNDATION CONDITIONING GEOTEXTILE \_\_\_\_\_ 32 SY  
 87" x 63" CAA STRUCTURAL PLATE \_\_\_\_\_ 72 LIN. FT.  
 PIPE ARCH \_\_\_\_\_

NOTES:

ASSUMED LIVE LOAD -----HL-93 OR ALTERNATE LOADING.  
 DESIGN FILL----- MIN = 2.7' MAX = 5.0'  
 MATERIALS SHALL MEET THE REQUIREMENTS OF THE NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES DATED JANUARY 2024.

THE DETAILS SHOWN ARE FOR GENERAL LAYOUT ONLY. THE FABRICATOR SHALL PROVIDE DESIGNS AND DETAILS THAT MEET THE REQUIREMENTS OF AASHTO SECTION 12 AND ARE SEALED BY A NORTH CAROLINA REGISTERED PROFESSIONAL ENGINEER.

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

AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING STRUCTURE, CONSISTING OF 1 - 54" CORRUGATED METAL PIPE CULVERT WITH A CLEAR ROADWAY WIDTH OF 17 FT ±, AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED.

FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR METAL STRUCTURAL PLATE ARCH CULVERT, SEE SPECIAL PROVISIONS.

FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

FOR CULVERT BACKFILL, SEE SPECIAL PROVISIONS.

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

FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS.

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.

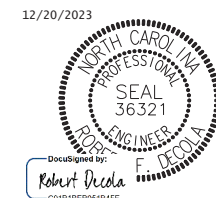
PROJECT NO. BP13.R001

YANCEY COUNTY

STATION: 12+89.26 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 7'-3" x 5'-3"  
 METAL STRUCTURAL  
 PLATE ARCH CULVERT  
 115°-13'-02" SKEW



REVISIONS

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1			3		
2			4		

SHEET NO.	COL-01
TOTAL SHEETS	2

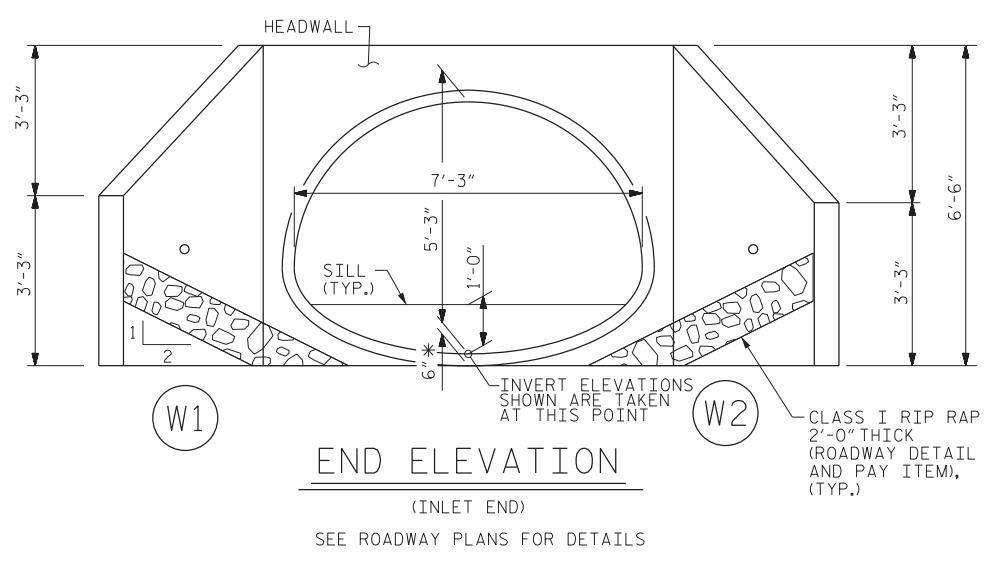
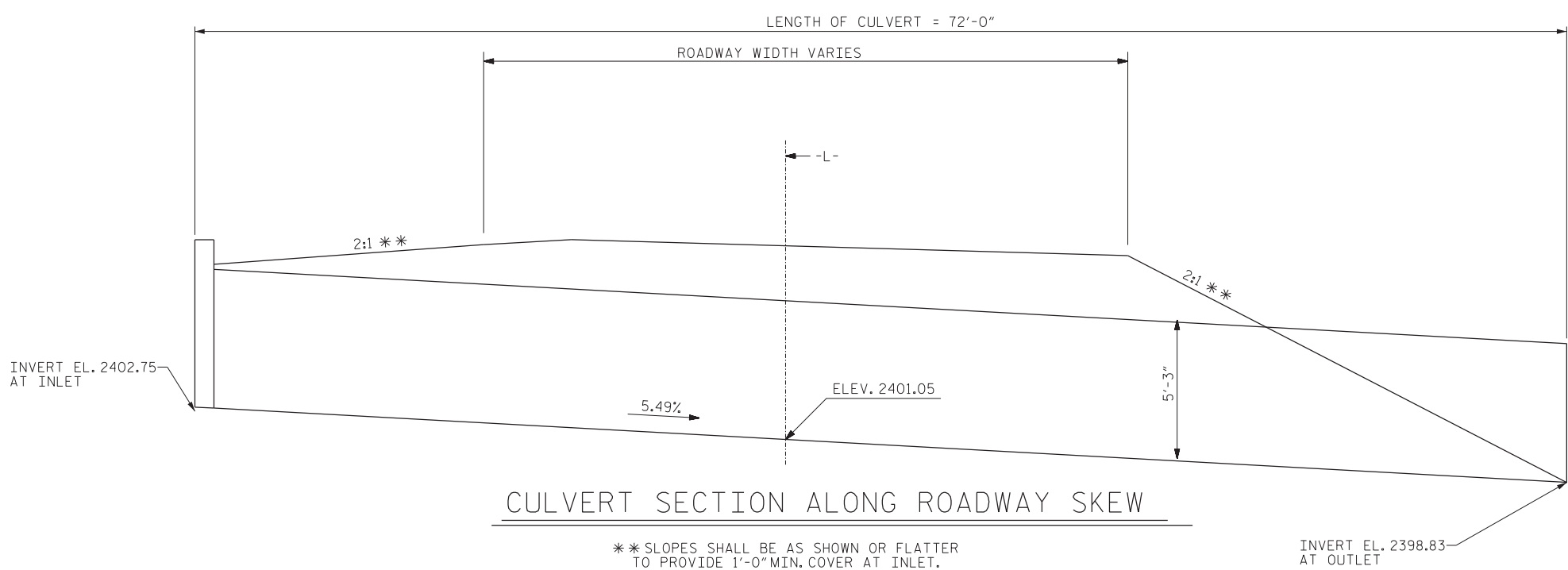
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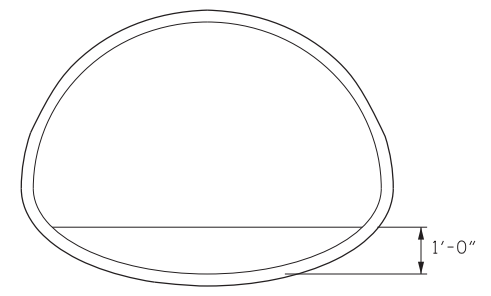
DESIGN ENGINEER OF RECORD:	DATE :
R.F. DeCOLA	
DRAWN BY :	DATE :
R.J. FLORY	02/18/21
CHECKED BY :	DATE :
R.F. DeCOLA	02/20/21

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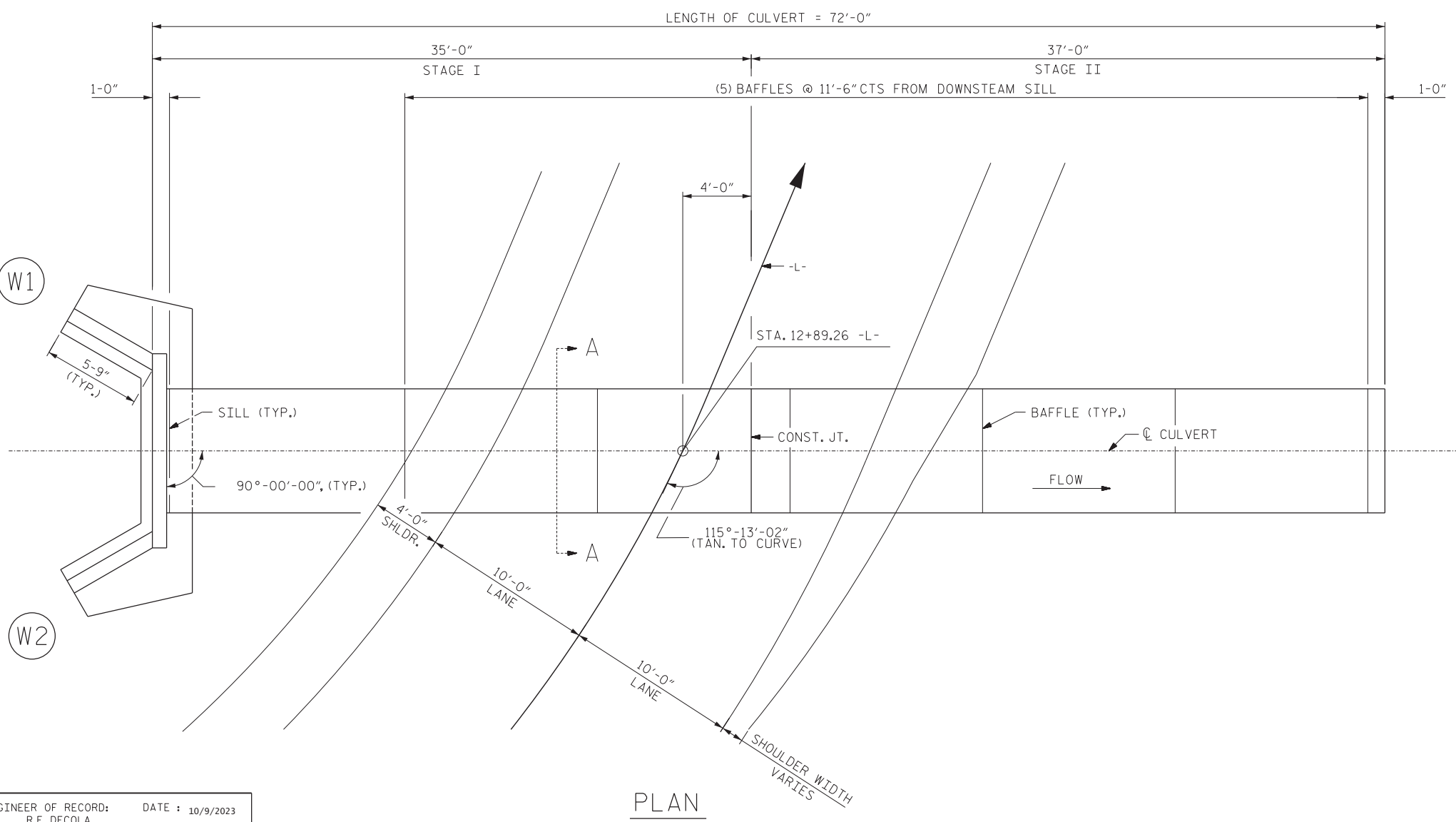


**NOTES:**

- 1) 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 BED AT THE PROJECT SITE DURING CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.
- 2) SILLS/BAFFLES ARE TO BE MECHANICALLY ATTACHED TO INVERT OF PIPE ARCH.
- 3) TOP OF LOW FLOW SILLS/BAFFLES SHOULD MATCH STREAM BED ELEVATION IN LOW FLOW CHANNEL OF STREAM. (THALWEG)



**SECTION A-A**  
TYPICAL EACH SILL/BAFFLE LOCATION



NOTE: ALL DIMENSIONS NOT SHOWN TO BE PROVIDED BY FABRICATOR

PROJECT NO. BP13.R001  
YANCEY COUNTY  
 STATION: 12+89.26 -L-  
 SHEET 2 OF 2

10/9/2023  
 Robert Decola  
 PROFESSIONAL ENGINEER  
 SEAL 36321  
 NORTH CAROLINA  
 ENGINEER

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**7'-3" x 5'-3"**  
**METAL STRUCTURAL**  
**PLATE ARCH CULVERT**  
**115°-13'-02" SKEW**

DESIGN ENGINEER OF RECORD: R.F. DECOLA	DATE : 10/9/2023
DRAWN BY : R.J. FLORY	DATE : 02/09/21
CHECKED BY : R.F. DECOLA	DATE : 02/10/21

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UNLESS ALL SIGNATURES COMPLETED**

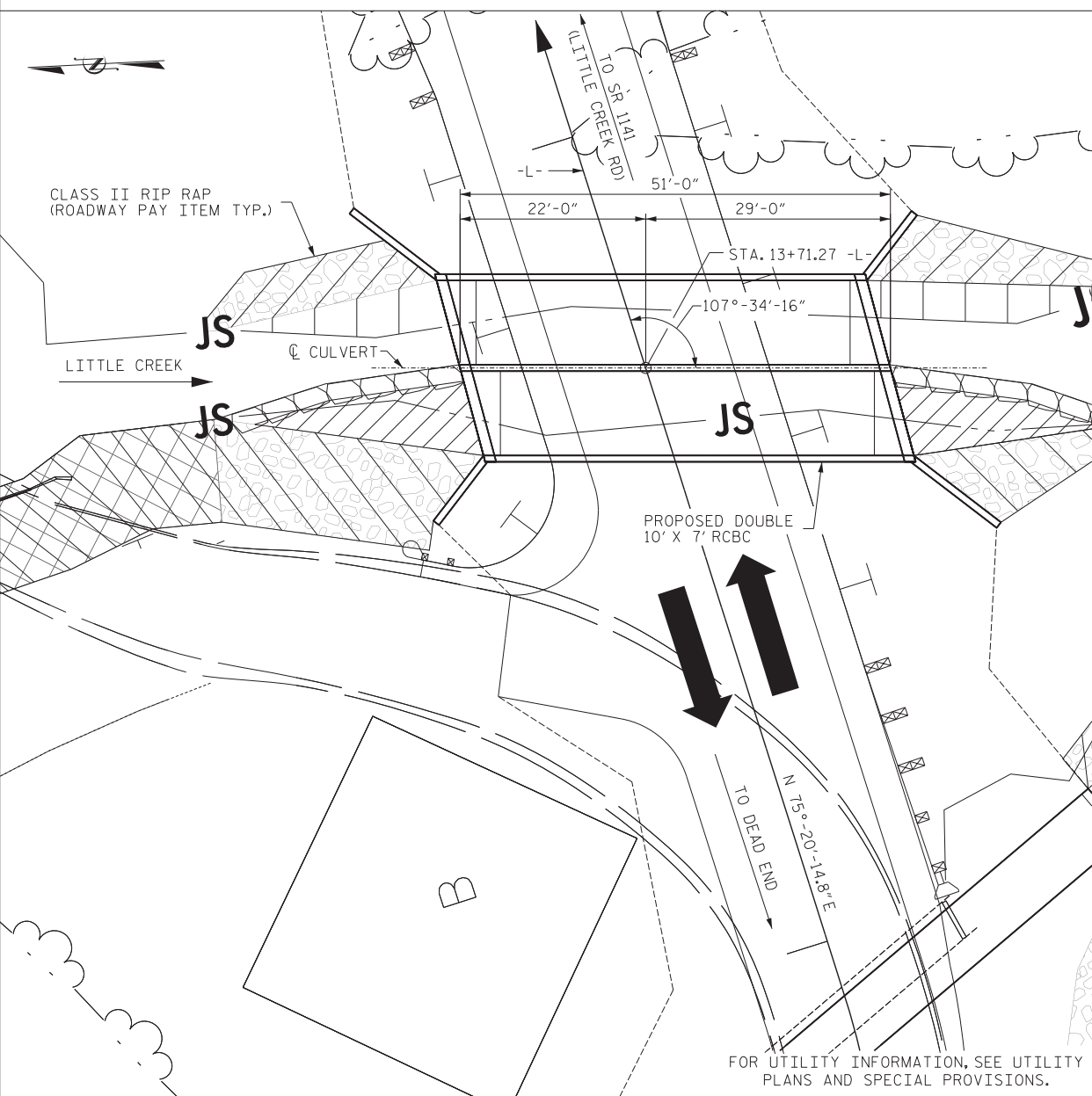
ENGINEERS • PLANNERS • SCIENTISTS • CONSTRUCTION MANAGERS LICENSE NUMBER: C-0764  
**KCI Associates**  
 of North Carolina, P.A.  
 4205 Falls of House Road, Suite 400 Raleigh, NC 27609-6270 Phone (919) 785-9244

REVISIONS		SHEET NO.	
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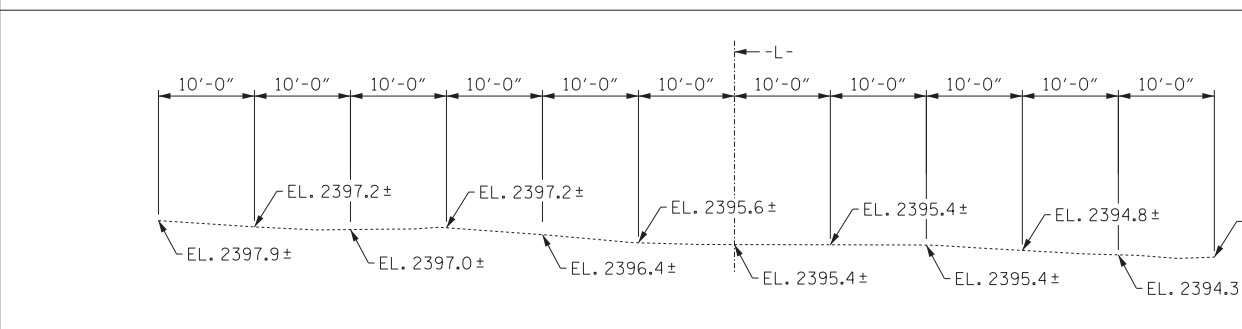
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BM #1 - BENCH TIE NAIL IN SPRUCE STA. 14+83.34 -L-, 15.02' LT EL 2404.24 N 836645 E 994789 NAV 88



LOCATION SKETCH



PROFILE ALONG Q CULVERT

DESIGN ENGINEER OF RECORD: R.F. DeCOLA	DATE : 10/9/2023
DRAWN BY : R.J. FLORY	DATE : 02/18/21
CHECKED BY : R.F. DeCOLA	DATE : 02/20/21

ROADWAY DATA	
GRADE POINT ELEV @ STA. 13+71.27 -L- =	2405.24
BED ELEV @ STA. 13+71.27 -L- =	2394.49
ROADWAY SLOPES =	2:1

HYDRAULIC DATA	
DESIGN DISCHARGE	= 900 CFS
FREQUENCY OF DESIGN FLOOD	= 25 YRS
DESIGN HIGH WATER ELEVATION	= 2402.6
DRAINAGE AREA	= 3.2 SQ MI
BASE DISCHARGE (Q100)	= 1,300 CFS
BASE HIGH WATER ELEVATION	= 2,404.2

OVERTOPPING FLOOD DATA	
OVERTOPPING DISCHARGE	= 1,415 CFS
FREQUENCY OF OVERTOPPING FLOOD	= 100+ YRS
OVERTOPPING FLOOD ELEVATION	= 2,404.3
@ STA. 14+31.34 -L- LT AT SHOULDER POINT	

TOTAL STRUCTURE QUANTITIES	
CULVERT EXCAVATION	LUMP SUM
FOUNDATION CONDITIONING MATERIAL	95 TONS
CLASS A CONCRETE	
BARREL @ 2.514 CY/FT	128.2 C.Y.
WING ETC.	25.4 C.Y.
TOTAL	153.6 C.Y.
REINFORCING STEEL	
BARREL	13,937 LBS.
WINGS ETC.	1,277 LBS.
TOTAL	15,214 LBS.

NOTES:

- ASSUMED LIVE LOAD ----- HL-93 OR ALTERNATE LOADING.
- DESIGN FILL----- MIN = 2.5' MAX = 4.8'
- FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.
- 3" Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.
- CONCRETE IN CULVERTS TO BE POURED IN THE FOLLOWING ORDER:
  1. WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.
  2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY 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.
- STEEL IN THE BOTTOM SLAB MAY BE SPLICED AT THE PERMITTED CONSTRUCTION JOINT AT THE CONTRACTOR'S OPTION. EXTRA WEIGHT OF THE STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.
- 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.
- 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.
- 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 COST 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 STA. 13+71.27 -L-".
- 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.
- EXCAVATE 1 FOOT BELOW CULVERT FLOOR AND REPLACE WITH FOUNDATION CONDITIONING MATERIAL IN ACCORDANCE WITH ARTICLE 414 OF THE STANDARD SPECIFICATIONS.
- 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.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

PROJECT NO. BP13.R001  
YANCEY COUNTY  
 STATION: 13+71.27 -L-  
 REPLACES BRIDGE NO. 990274

10/9/2023



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**DOUBLE 10 FT. X 7 FT.  
 CONCRETE BOX CULVERT  
 107°-34'-16" SKEW**

REVISIONS		SHEET NO.
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2		
		TOTAL SHEETS
		5

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KCI PROJ. #22133395.05

### 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						
						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)			
															LIVE-LOAD FACTORS (γ <sub>L</sub> )	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.30	--	1.75	1.30	1	TOP SLAB	5.00	1.46	1	TOP SLAB	10.00		
	HL-93 (OPERATING)	N/A		1.69	--	1.35	1.69	2	TOP SLAB	0.00	1.90	1	TOP SLAB	10.00		
	HS-20 (INVENTORY)	36.000	②	1.54	55.440	1.75	1.54	1	TOP SLAB	10.00	1.95	1	TOP SLAB	10.00		
	HS-20 (OPERATING)	36.000		2.00	72.000	1.35	2.00	1	TOP SLAB	10.00	2.52	1	TOP SLAB	10.00		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		4.25	57.375	1.40	4.25	1	TOP SLAB	5.00	5.16	1	TOP SLAB	10.00	
		SNGARBS2	20.000		3.98	79.600	1.40	3.98	1	TOP SLAB	5.00	4.80	1	TOP SLAB	10.00	
		SNAGRIS2	22.000		4.03	88.660	1.40	4.03	1	TOP SLAB	10.00	5.09	1	TOP SLAB	10.00	
		SNCOTTS3	27.250		2.55	69.488	1.40	2.55	1	TOP SLAB	5.00	2.86	1	TOP SLAB	10.00	
		SNAGGRS4	34.925		2.89	100.933	1.40	2.89	1	TOP SLAB	0.00	3.56	1	TOP SLAB	10.00	
		SNS5A	35.550		2.96	105.228	1.40	2.96	1	TOP SLAB	5.00	3.32	1	TOP SLAB	10.00	
		SNS6A	39.950		2.71	108.265	1.40	2.71	2	TOP SLAB	0.00	3.31	1	TOP SLAB	10.00	
		SNS7B	42.000		2.71	113.820	1.40	2.71	2	TOP SLAB	0.00	3.20	1	TOP SLAB	10.00	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		3.29	108.570	1.40	3.29	1	TOP SLAB	10.00	4.68	1	TOP SLAB	10.00	
		TNT4A	33.075		2.81	92.941	1.40	2.81	2	TOP SLAB	0.00	3.30	1	TOP SLAB	10.00	
		TNT6A	41.600		2.71	112.736	1.40	2.71	1	TOP SLAB	10.00	3.28	1	TOP SLAB	10.00	
		TNT7A	42.000		2.68	112.560	1.40	2.68	2	TOP SLAB	0.00	3.32	1	TOP SLAB	10.00	
		TNT7B	42.000		2.79	117.180	1.40	2.79	2	TOP SLAB	0.00	3.27	1	TOP SLAB	10.00	
		TNAGRIT4	43.000		2.44	104.920	1.40	2.44	1	TOP SLAB	10.00	3.22	1	TOP SLAB	10.00	
		TNAGT5A	45.000		2.44	109.800	1.40	2.44	1	TOP SLAB	10.00	3.29	1	TOP SLAB	10.00	
TNAGT5B	45.000		③	2.24	100.800	1.40	2.24	1	TOP SLAB	10.00	3.19	1	TOP SLAB	10.00		
EMERGENCY VEHICLE (ER)	EV2	28.750		3.00	86.250	1.30	3.00	1	TOP SLAB	5.00	3.80	1	TOP SLAB	10.00		
	EV3	43.000	④	2.22	95.460	1.30	2.22	1	TOP SLAB	5.00	2.57	1	TOP SLAB	10.00		

#### 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.

# CONTROLLING LOAD RATING

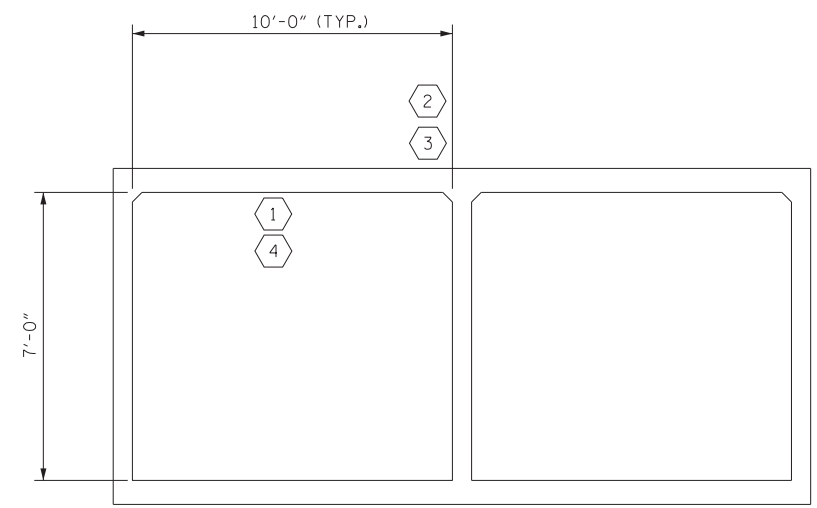
① DESIGN LOAD RATING (HL-93)

② DESIGN LOAD RATING (HS-20)

③ LEGAL LOAD RATING \*\*

④ EMERGENCY VEHICLE LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE



LRFR SUMMARY  
(LOOKING DOWNSTREAM)

DESIGN ENGINEER OF RECORD: R. F. DECOLA	DATE: 10/9/2023
ASSEMBLED BY: R. J. FLORY CHECKED BY: R. F. DECOLA	DATE: 02/09/21 DATE: 02/15/21
DRAWN BY: WMC 7/11 CHECKED BY: GM 7/11	REV. 10/1/11 MAA/GM REV. 12/17 MAA/THC

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

10/9/2023

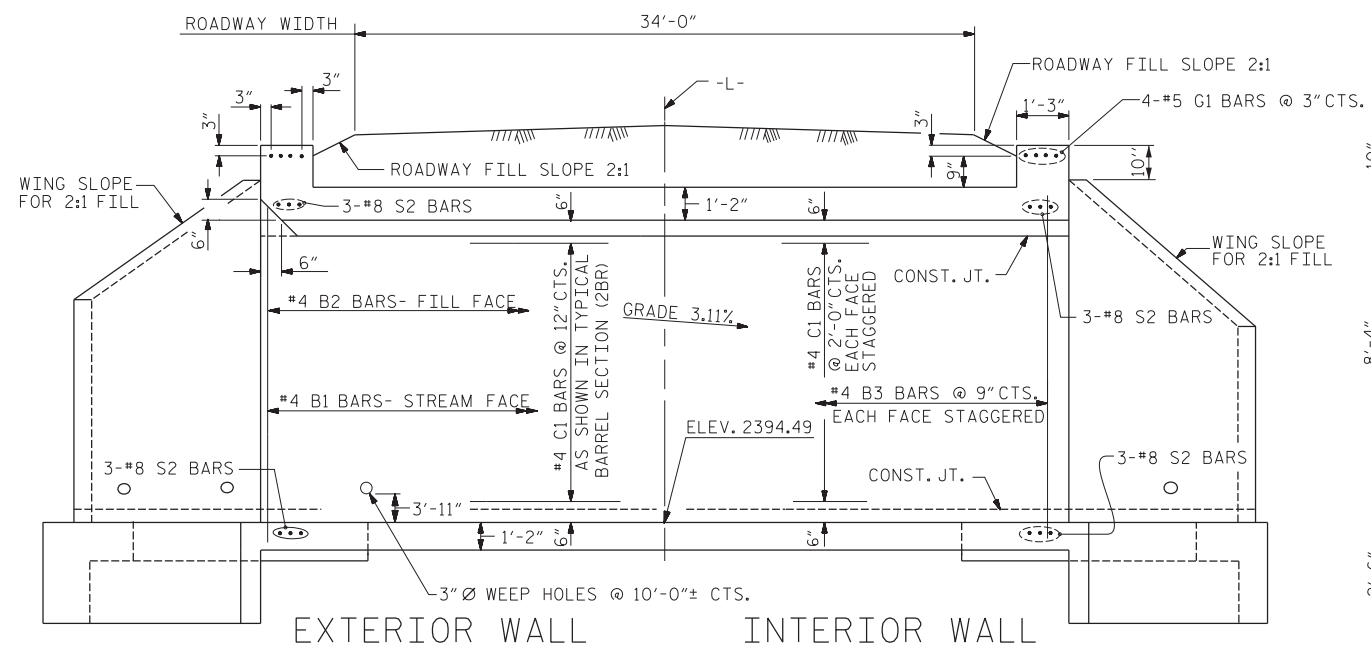
DocuSigned by:  
**Robert Decola**  
CS1B1BEE95184FF

PROJECT NO. BP13.R001  
YANCEY COUNTY  
STATION: 13+71.27 -L-

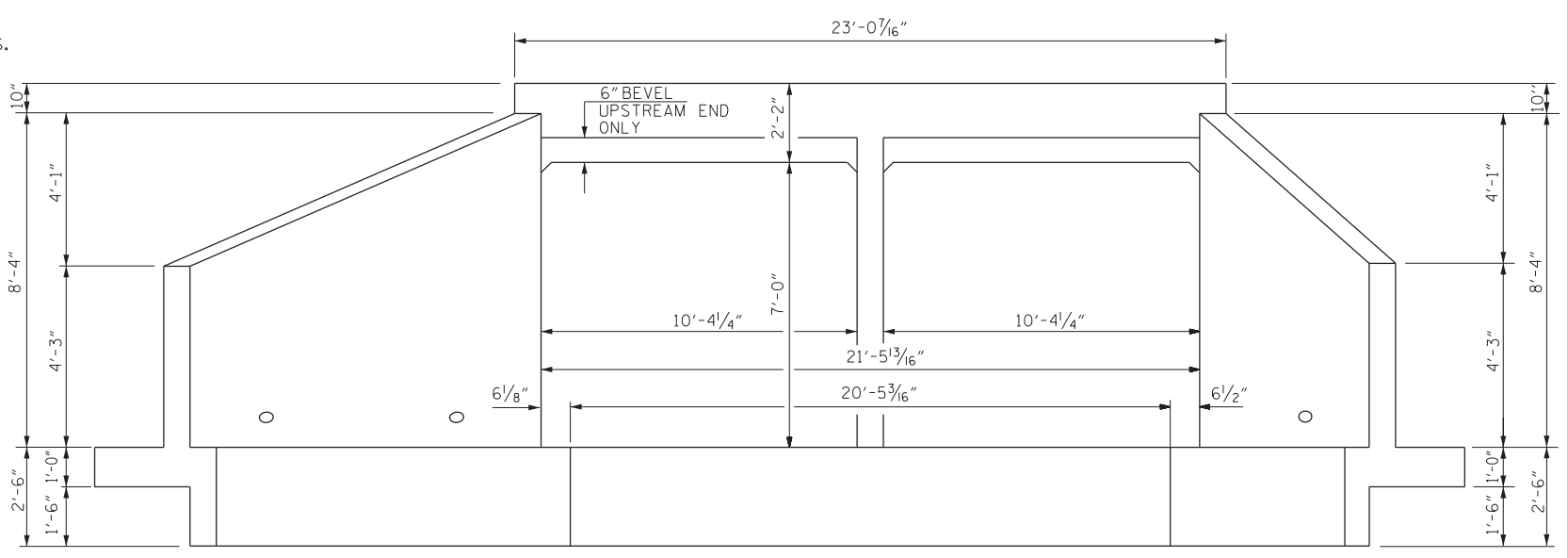
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

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

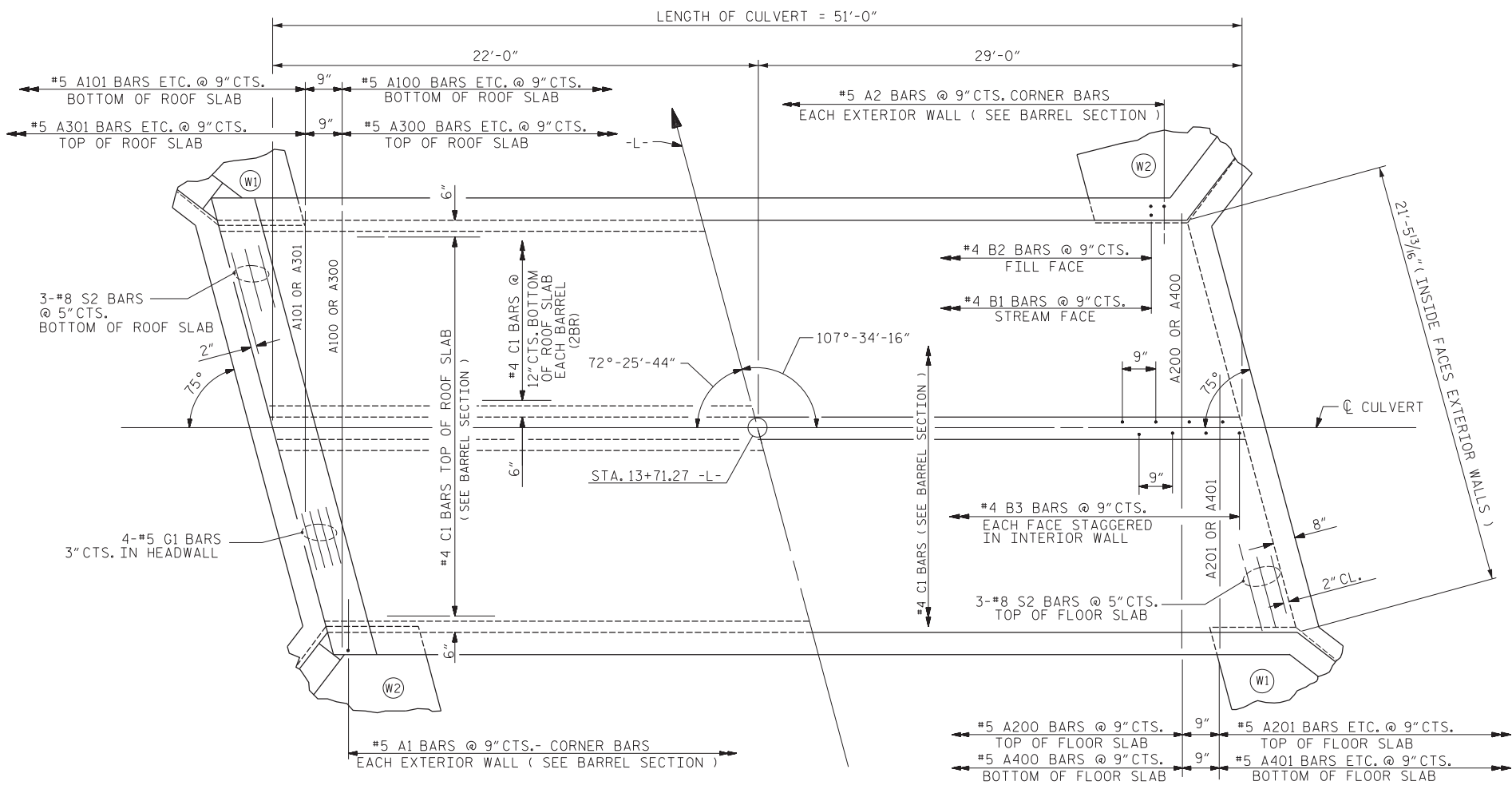
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C02-02
1			3			TOTAL SHEETS 5
2			4			



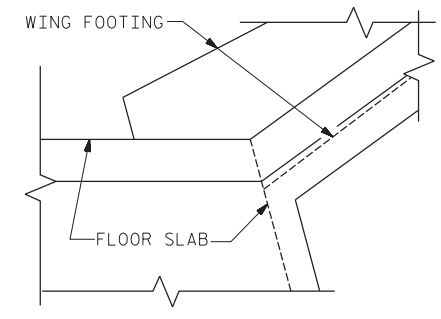
EXTERIOR WALL INTERIOR WALL  
CULVERT SECTION NORMAL TO ROADWAY



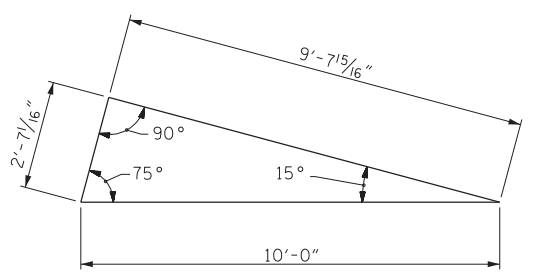
END ELEVATION NORMAL TO SKEW



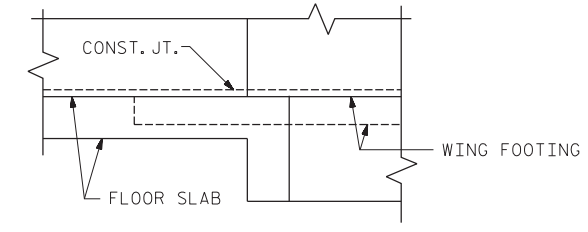
PART PLAN - ROOF SLAB PART PLAN - FLOOR SLAB



CONNECTION OF WING FOOTING AND FLOOR SLAB WHEN SLAB IS THICKER THAN FOOTING



SKEW TRIANGLE



DETAIL

DESIGN ENGINEER OF RECORD: R.F. DECOLA	DATE : 10/9/2023
DRAWN BY : R.J. FLORY	DATE : 02/12/2021
CHECKED BY : R.F. DECOLA	DATE : 02/15/2021

10/9/2023



PROJECT NO. BP13.R001  
YANCEY COUNTY  
STATION: 13+71.27 -L-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
DOUBLE 10 FT. X 7 FT.  
CONCRETE BOX CULVERT  
107°-34'-16" SKEW

REVISIONS

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

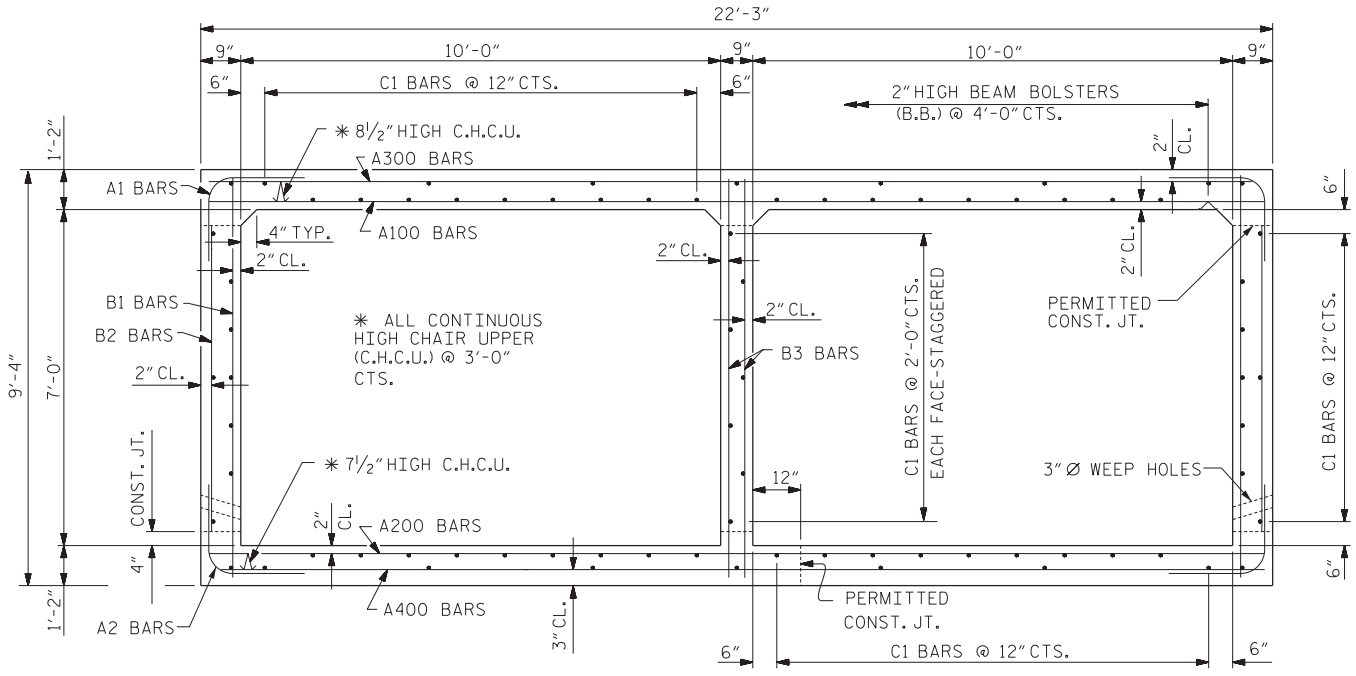
SHEET NO.  
CO2-03  
TOTAL SHEETS  
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DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



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 Robert-DeCola  
 KCI PROJ. #22133395.05

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 Robert F. Decola  
 KCI PROJ. #22133395.05

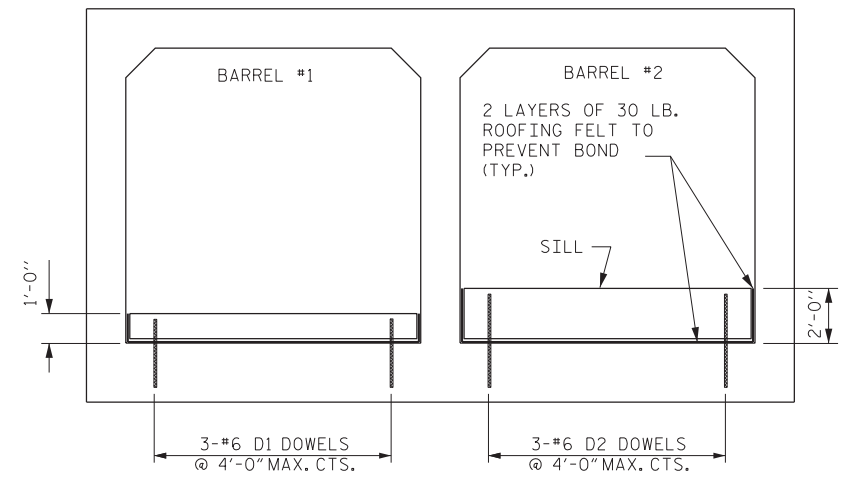


**RIGHT ANGLE SECTION OF BARREL**

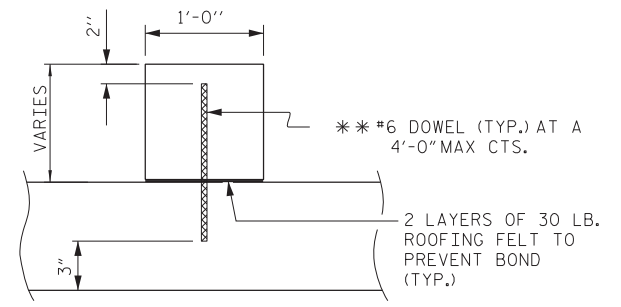
THERE ARE 77 "C" BARS IN SECTION OF BARREL.

**NOTES:**

- 1) NATIVE MATERIAL BETWEEN THE 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.
- 2) SILLS ARE TO BE 1.0 FT WIDE, CAST SEPARATELY AND ATTACHED BY DOWELS.
- 3) TOP OF SILLS SHOULD MATCH STREAM BED ELEVATION IN LOW FLOW CHANNEL OF STREAM. (THAWEG)
- 4) DO NOT SET ELEVATION OF SILL ABOVE BANK FULL.



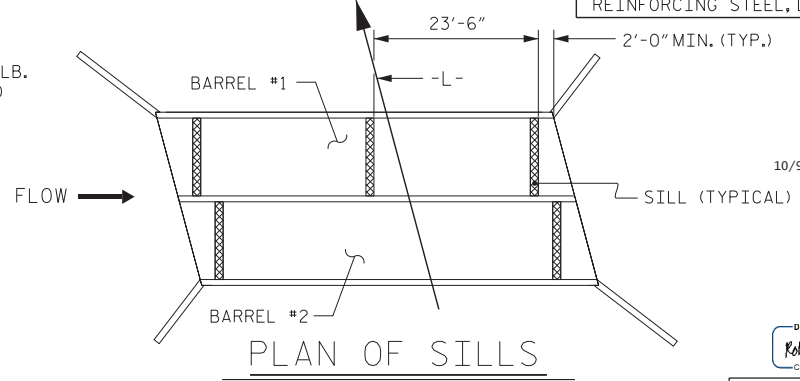
**ELEVATION - INLET END**  
(LOOKING DOWNSTREAM)  
INLET END SHOWN, OUTLET END SIMILAR



**SECTION THROUGH SILL**

\*\* DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER SLAB HAS BEEN FLOAT FINISHED.

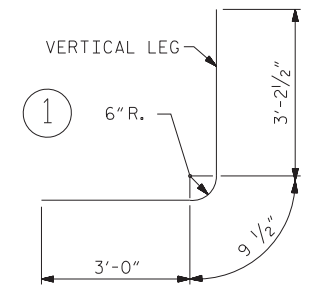
**CULVERT SILL DETAILS**



**PLAN OF SILLS**

BILL OF MATERIAL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	134	5	1	7'-0"	978
A2	134	5	1	7'-0"	978
A100	60	5	STR	21'-11"	1372
A101	2	5	STR	20'-1"	42
A102	2	5	STR	17'-3"	36
A103	2	5	STR	14'-6"	30
A104	2	5	STR	11'-8"	24
A105	2	5	STR	8'-11"	19
A106	2	5	STR	6'-1"	13
A200	60	5	STR	21'-11"	1372
A201	2	5	STR	20'-1"	42
A202	2	5	STR	17'-3"	36
A203	2	5	STR	14'-6"	30
A204	2	5	STR	11'-8"	24
A205	2	5	STR	8'-11"	19
A206	2	5	STR	6'-1"	13
A300	60	5	STR	21'-11"	1372
A301	2	5	STR	20'-1"	42
A302	2	5	STR	17'-3"	36
A303	2	5	STR	14'-6"	30
A304	2	5	STR	11'-8"	24
A305	2	5	STR	8'-11"	19
A306	2	5	STR	6'-1"	13
A400	60	5	STR	21'-11"	1372
A401	2	5	STR	20'-1"	42
A402	2	5	STR	17'-3"	36
A403	2	5	STR	14'-6"	30
A404	2	5	STR	11'-8"	24
A405	2	5	STR	8'-11"	19
A406	2	5	STR	6'-1"	13
B1	134	4	STR	8'-9"	783
B2	134	4	STR	6'-0"	537
B3	136	4	STR	8'-9"	795
C1	154	4	STR	26'-10"	2760
D1	9	6	STR	1'-8"	23
D2	6	6	STR	2'-8"	24
G1	8	5	STR	22'-8"	189
S2	12	8	STR	22'-8"	726
REINFORCING STEEL, LB.					13,937

**BAR TYPES**



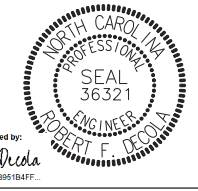
DIMENSIONS ARE OUT TO OUT

**REINFORCING SPLICE LENGTH CHART**

BAR	SPLICE
#4 "B"	1'-10"
#4 C1	2'-5"
#5 "A"	2'-4"

PROJECT NO. BP13.R001  
YANCEY COUNTY  
 STATION: 13+71.27 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**DOUBLE 10 FT. X 7 FT.  
 CONCRETE BOX CULVERT  
 107°-34'-16" SKEW**



DocuSigned by:  
**Robert Decola**  
 C9181B8D951847F...

ENGINEERS PLANNERS SCIENTISTS CONSTRUCTION MANAGERS LICENSE NUMBER: C-01  
**KCI Associates**  
 of North Carolina, P.A.  
 4505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609-6210 Phone (919) 783-9214

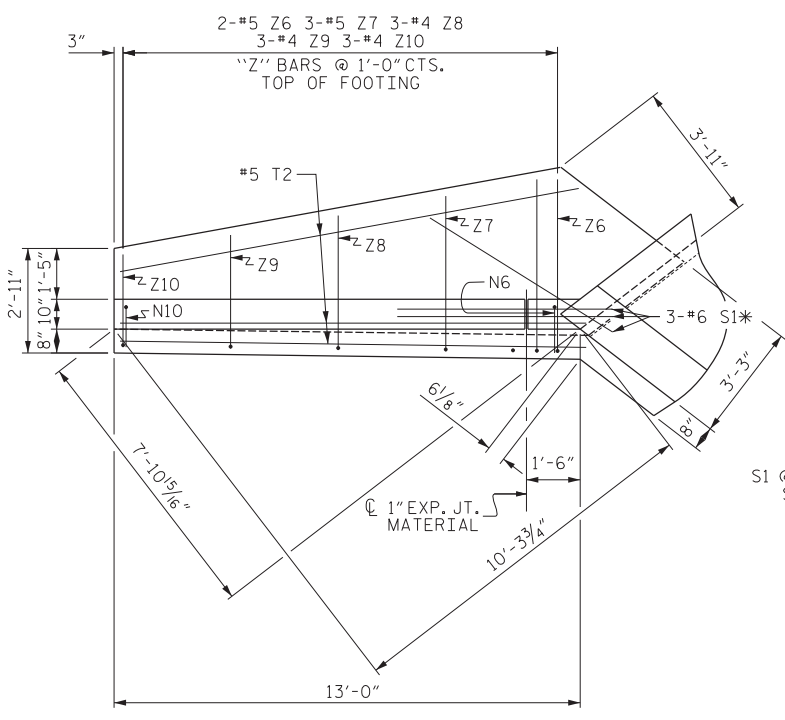
REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
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2			4	

TOTAL SHEETS: 5

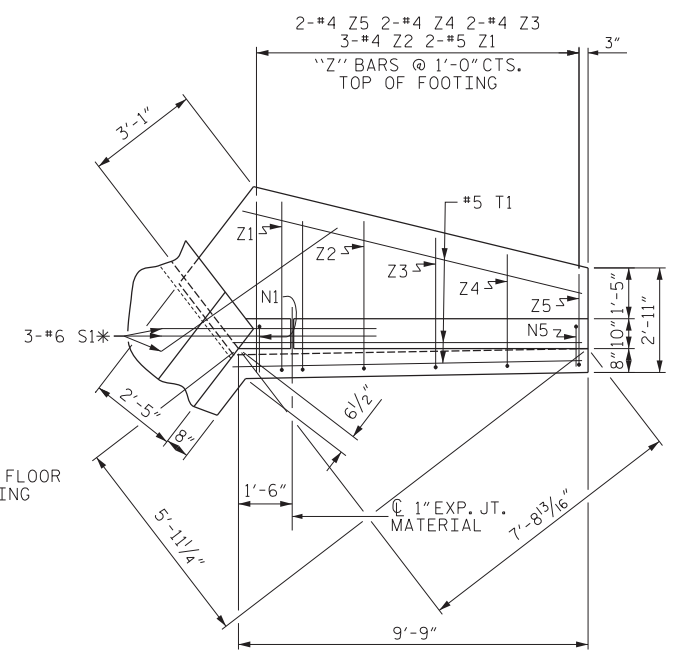
DESIGN ENGINEER OF RECORD: R.F. DECOLA	DATE : 10/9/2023
DRAWN BY : R.J. FLORY	DATE : 01/12/21
CHECKED BY : R.F. DECOLA	DATE : 01/12/21

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

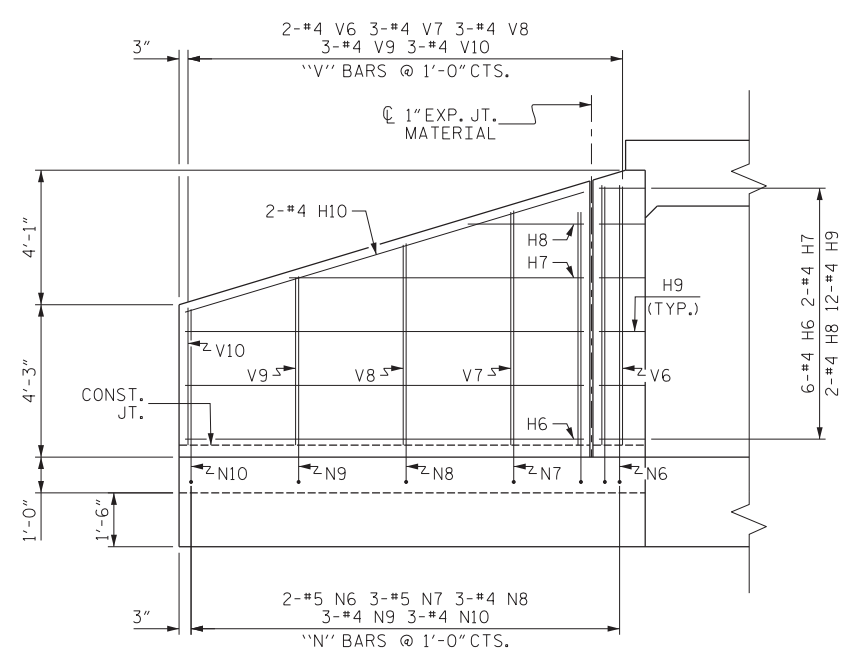
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 KCI PROJ. #22133395.05



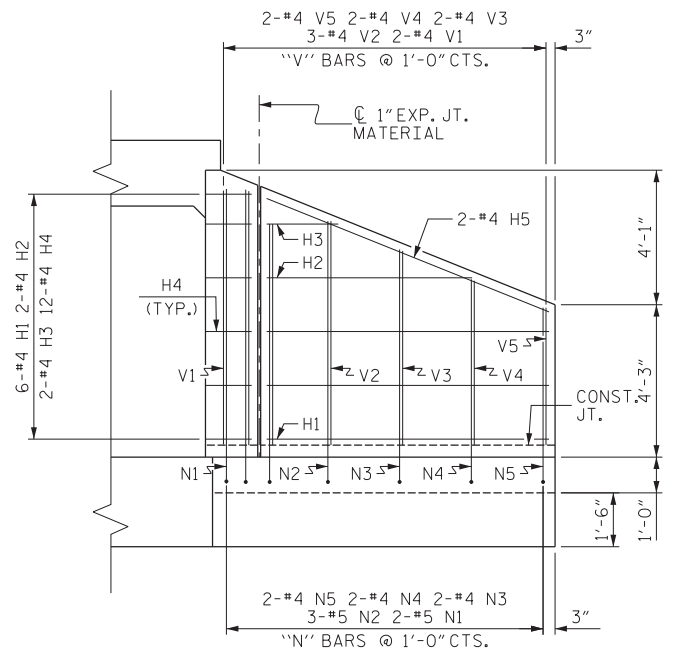
PLAN W1



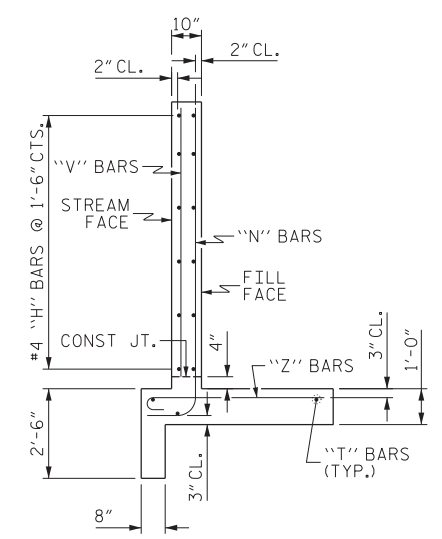
PLAN W2



ELEVATION W1

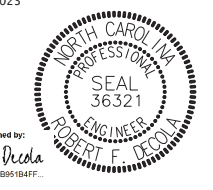


ELEVATION W2



TYPICAL WING SECTION

10/9/2023



ENGINEERS & PLANNERS SCIENTISTS CONSTRUCTION MANAGERS LICENSE NUMBER: C-0111  
**KCI Associates**  
 of North Carolina, P.A.  
 4505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609-6270 Phone (919) 783-9214

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

REVISIONS

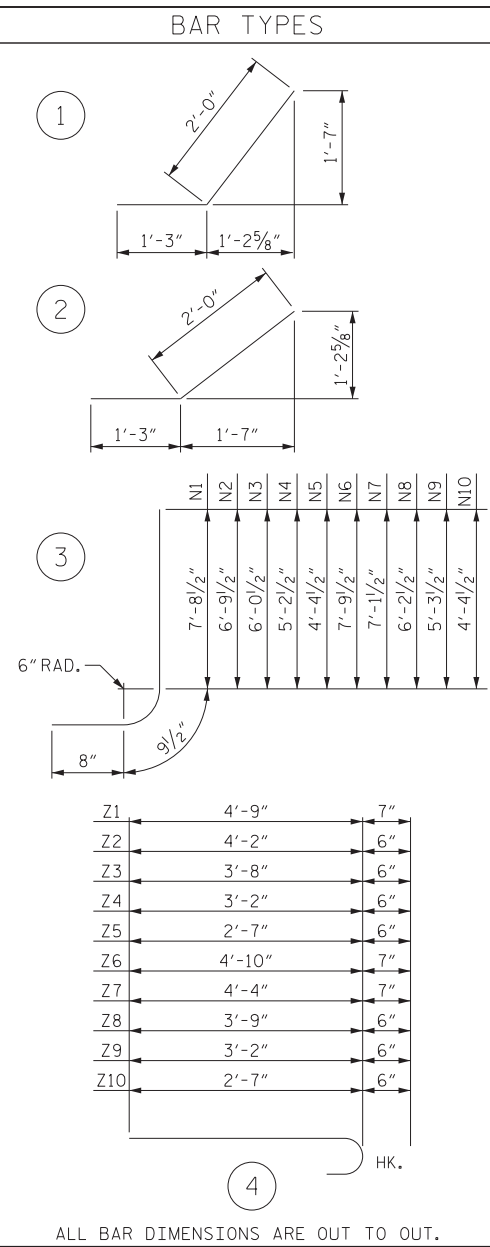
NO.	DATE:	BY:	DATE:
1			
2			
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4			

ASSEMBLED BY : R.J. FLORY DATE : 02/10/21  
 CHECKED BY : R.F. DECOLA DATE : 02/15/21  
 DRAWN BY : CCJ 12/99 REV. 6/19 MAA/THC  
 CHECKED BY : RWW 03/0D

PROJECT NO. BP13.R001  
 YANCEY COUNTY  
 STATION: 13+71.27 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**STANDARD WINGS**  
 FOR  
**CONCRETE BOX CULVERT**  
 H = 7'-0" SLOPE = 2:1  
 107°-34'-16" SKEW

BILL OF MATERIAL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	12	#4	STR	7'-10"	63
H2	4	#4	STR	5'-8"	15
H3	4	#4	STR	2'-0"	5
H4	24	#4	1	3'-3"	52
H5	4	#4	STR	8'-5"	22
H6	12	#4	STR	11'-1"	89
H7	4	#4	STR	8'-2"	22
H8	4	#4	STR	3'-3"	9
H9	24	#4	2	3'-3"	52
H10	4	#4	STR	11'-7"	31
N1	4	#5	3	9'-2"	38
N2	6	#5	3	8'-3"	52
N3	4	#4	3	7'-6"	20
N4	4	#4	3	6'-8"	18
N5	4	#4	3	5'-10"	16
N6	4	#5	3	9'-3"	39
N7	6	#5	3	8'-7"	54
N8	6	#4	3	7'-8"	31
N9	6	#4	3	6'-9"	27
N10	6	#4	3	5'-10"	23
S1	12	#6	STR	6'-0"	108
T1	6	#5	STR	9'-9"	61
T2	6	#5	STR	13'-0"	81
V1	4	#4	STR	7'-1"	19
V2	6	#4	STR	6'-3"	25
V3	4	#4	STR	5'-5"	14
V4	4	#4	STR	4'-7"	12
V5	4	#4	STR	3'-10"	10
V6	4	#4	STR	7'-3"	19
V7	6	#4	STR	6'-6"	26
V8	6	#4	STR	5'-7"	22
V9	6	#4	STR	4'-8"	19
V10	6	#4	STR	3'-10"	15
Z1	4	#5	4	5'-4"	22
Z2	6	#4	4	4'-8"	19
Z3	4	#4	4	4'-2"	11
Z4	4	#4	4	3'-8"	10
Z5	4	#4	4	3'-1"	8
Z6	4	#5	4	5'-5"	23
Z7	6	#5	4	4'-11"	31
Z8	6	#4	4	4'-3"	17
Z9	6	#4	4	3'-8"	15
Z10	6	#4	4	3'-1"	12
REINFORCING STEEL FOR 4 WINGS					1277 LBS
CLASS A CONCRETE					
4 WINGS					18.2 CY
2 HEADWALLS					2.1 CY
2 END CURTAIN WALLS					2.5 CY
5 SILLS					2.6 CY
TOTAL					25.4 CY



SHEET NO.	
C02-05	TOTAL SHEETS 5

### 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 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.

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