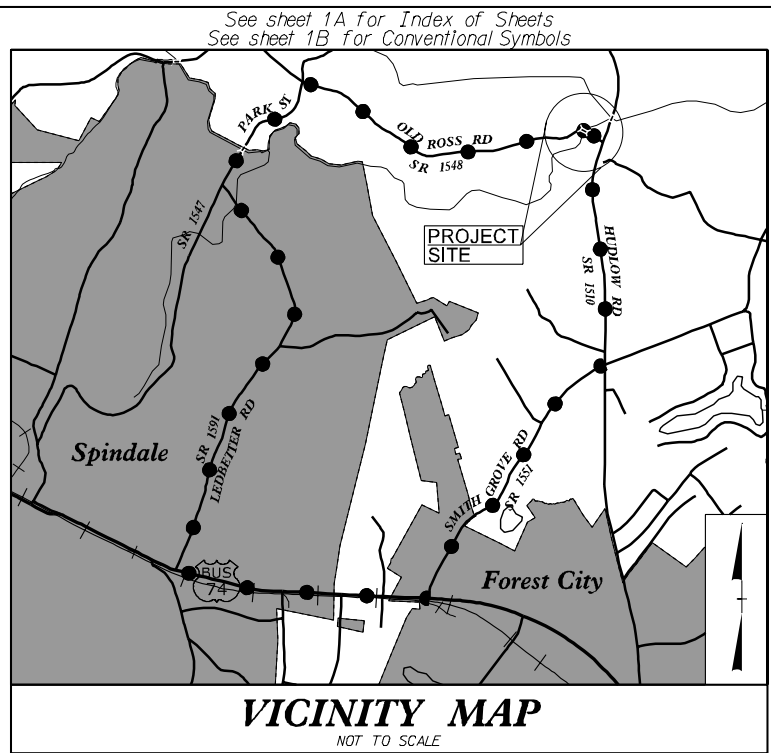


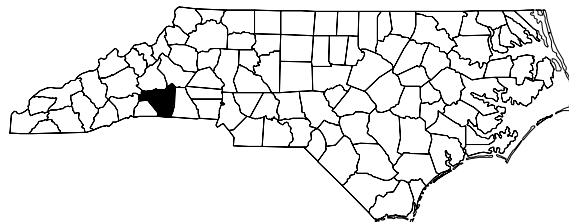
09/08/99

TIP PROJECT: BP13.R032

CONTRACT: DM00362



●●● OFF-SITE DETOUR
 ■ CITY LIMITS



**BP13.R032 RUTHERFORD 159
 FINAL COMPLETE PLAN SET**

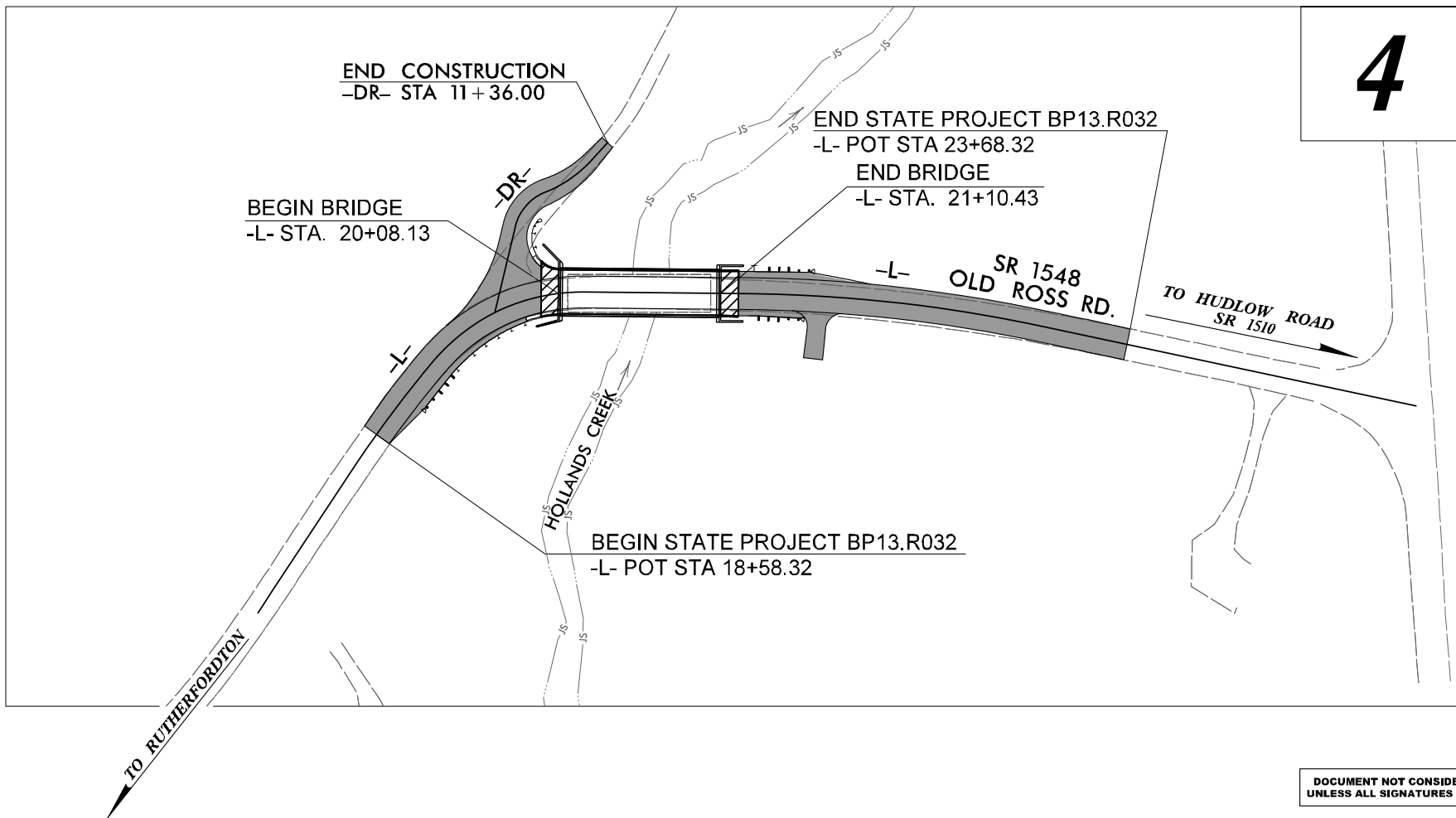
STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

RUTHERFORD COUNTY

**LOCATION: REPLACE BRIDGE NO. 159 OVER HOLLAND CREEK
 ON SR 1548 (OLD ROSS RD)**

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

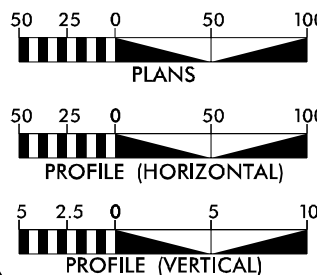
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP13.R032	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
BP13.R032.1	N/A	PE	
BP13.R032.2	N/A	R/W & UTIL.	
BP13.R032.3	N/A	CONSTRUCTION	



NOTE: DESIGN EXCEPTION IS REQUIRED FOR DESIGN SPEED OF 20 MPH

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES



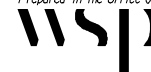
DESIGN DATA

ADT 2019 = 450
 V = 20 MPH
 FUNC CLASS = LOCAL
 SUB REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT BP13.R032 = 0.078 MILES
 LENGTH STRUCTURES TIP PROJECT BP13.R032 = 0.019 MILES
 TOTAL LENGTH TIP PROJECT BP13.R032 = 0.097 MILES

Prepared In the Office of



WSP USA
 434 FANNINGVILLE STREET
 SUITE 1500
 RALEIGH, NC 27601
 TEL: 1-919-836-4040
 FAX: 1-919-836-4099
 LICENSE NO. E-0165

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
 DECEMBER 9, 2022

LETTING DATE:
 MAY 15, 2024

NCDOT CONTACT:

SHANE I. SHARPE, PE
 PROJECT ENGINEER

DREW DAACK, EIT
 PROJECT DESIGN ENGINEER

EDDIE DOUGLAS
 DIVISION 13 BRIDGE PROGRAM MANAGER

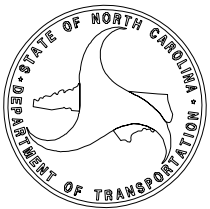
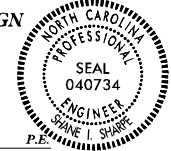
HYDRAULICS ENGINEER

Designed by:
 Charles Heafner
 SIGNATURE: 3/11/2024
 P.E.



ROADWAY DESIGN ENGINEER

Designed by:
 Shane I. Sharpe
 SIGNATURE: 3/11/2024
 P.E.



8/17/99

PROJECT REFERENCE NO. <i>BPI3.R032</i>	SHEET NO. <i>1A</i>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 1/29/2024	
<p align="center">DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p>	
PLANS PREPARED BY: 	
WSP USA 434 FAYETTEVILLE STREET SUITE 1500 RALEIGH, NC 27601 TEL: 1.919.836.4040 FAX: 1.919.836.4099 LICENSE NO. F-0165	

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2A-1	PAVEMENT SCHEDULE, AND TYPICAL SECTIONS
2C-1	ROADWAY DETAIL SHEET
3B-1	ROADWAY SUMMARIES
3D-1	DRAINAGE SUMMARIES
4	PLAN & PROFILE SHEET
RW-1 THRU RW-4	SURVEY CONTROL, EXISTING CENTERLINES, RIGHT OF WAY, EASEMENT AND PROPERTY TIES
TMP-1 THRU TMP-4	TRAFFIC MANAGEMENT PLANS
PMP-1 THRU PMP-2	PAVEMENT MARKING PLANS
EC-1 THRU EC-5	EROSION CONTROL PLANS
SIGN-001 THRU SIGN-003	SIGNING PLANS
UO-1 THRU UO-2	UTILITIES BY OTHERS PLANS
X-1A	CROSS-SECTION SUMMARY SHEET
X-1 THRU X-11	CROSS-SECTIONS
S-1 THRU S-20	STRUCTURE PLANS
SN	STANDARD NOTES

GENERAL NOTES

GENERAL NOTES: 2024 SPECIFICATIONS EFFECTIVE: 01-16-2024
REVISED:

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

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

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

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

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

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

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

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

END BENTS:
THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-SECTION PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE.

UTILITIES:
UTILITY OWNERS ON THIS PROJECT ARE AT&T
ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

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

ROADWAY ENGLISH STANDARD DRAWINGS

2024 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Contracts Standards and Development Unit – N. C. Department of Transportation – Raleigh, N. C., Dated January 16, 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 Superlevation – Two Lane Pavement
DIVISION 3 – PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 4 – MAJOR STRUCTURES	
423.01	Bridge Approach Fills – Type 1 Approach Fill for Bridge Abutment
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
840.00	Concrete Base Pad for Drainage Structures
840.25	Anchorage for Frames – Brick or Concrete or Precast
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet – for Cast Iron Double Frame and Grates
840.46	Traffic Bearing Precast Drainage Structure
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.01	Rip Rap in Channels and Ditches
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

EFF. 01-16-2024
REV.

11:26:11 AM
8/08/24
12/2/2024
11:26:11 AM
8/08/24
12/2/2024
11:26:11 AM
8/08/24
12/2/2024
11:26:11 AM
8/08/24
12/2/2024
11:26:11 AM
8/08/24
12/2/2024

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-----
Potential Contamination Area: Soil	-----S-----
Known Contamination Area: Water	-----W-----
Potential Contamination Area: Water	-----W-----
Contaminated Site: Known or Potential	☠ ?

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

Stream or Body of Water	-----
Hydro, Pool or Reservoir	-----
Jurisdictional Stream	-----JS-----
Buffer Zone 1	-----BZ 1-----
Buffer Zone 2	-----BZ 2-----
Flow Arrow	←
Disappearing Stream	-----
Spring	○
Wetland	-----
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	-----E-----
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	-----
Proposed Guardrail	-----
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	-----
Bridge Wing Wall, Head Wall and End Wall	-----
MINOR:	
Head and End Wall	-----
Pipe Culvert	-----
Footbridge	-----
Drainage Box: Catch Basin, DI or JB	-----
Paved Ditch Gutter	-----
Storm Sewer Manhole	-----
Storm Sewer	-----

UTILITIES:

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

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

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	⊠
U/G TV Test Hole (SUE - LOS A)*	⊕
U/G TV Cable (SUE - LOS B)*	-----TV-----
U/G TV Cable (SUE - LOS C)*	-----TV-----
U/G TV Cable (SUE - LOS D)*	-----TV-----
U/G Fiber Optic Cable (SUE - LOS B)*	-----TV FO-----
U/G Fiber Optic Cable (SUE - LOS C)*	-----TV FO-----
U/G Fiber Optic Cable (SUE - LOS D)*	-----TV FO-----

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

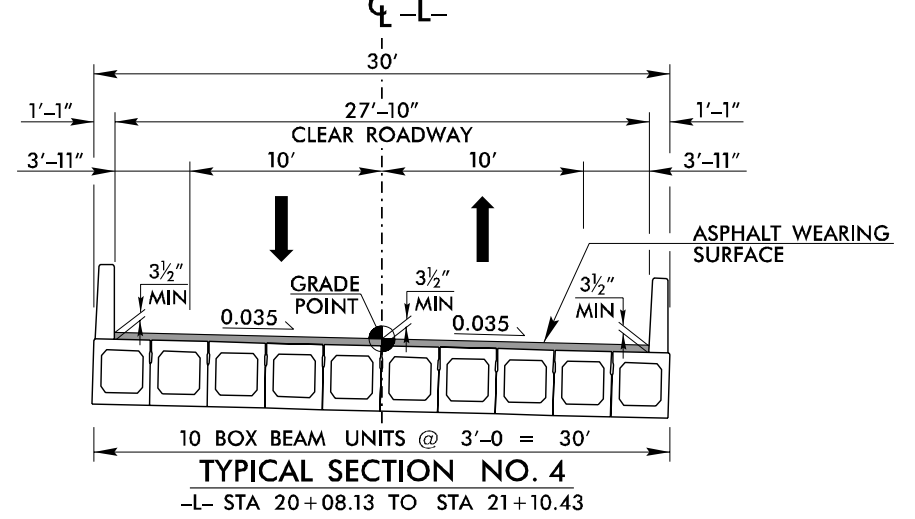
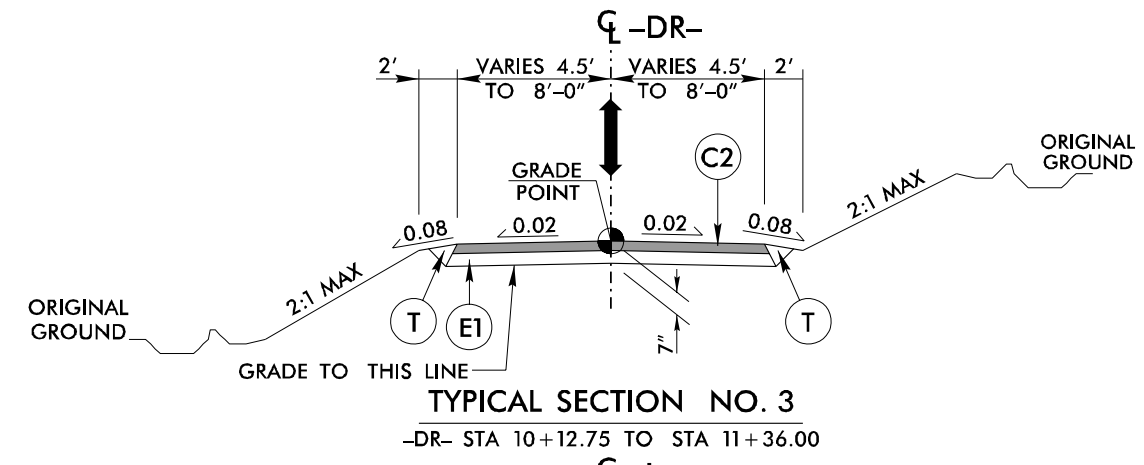
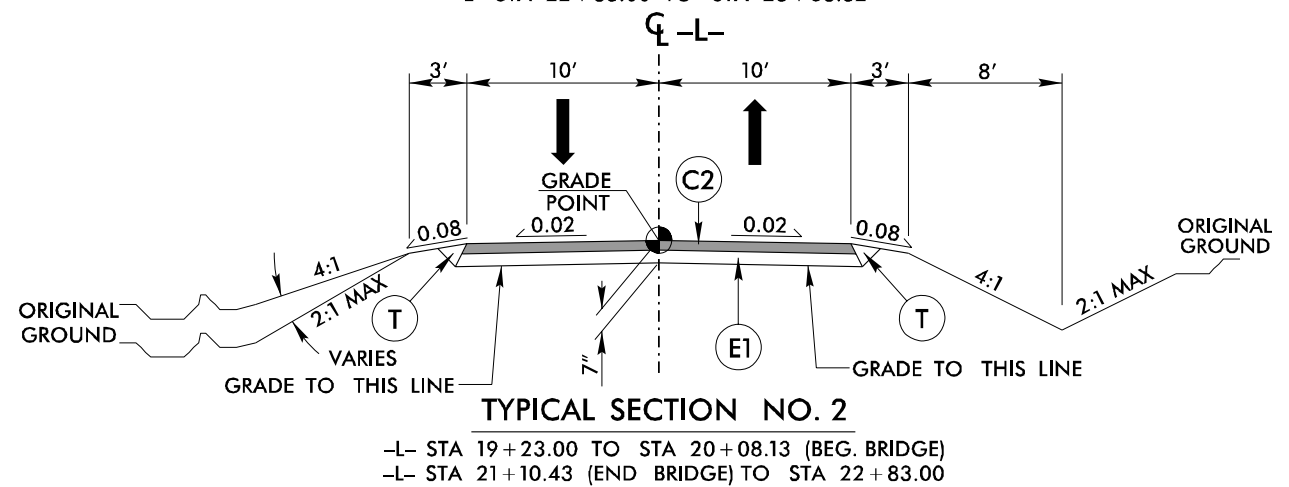
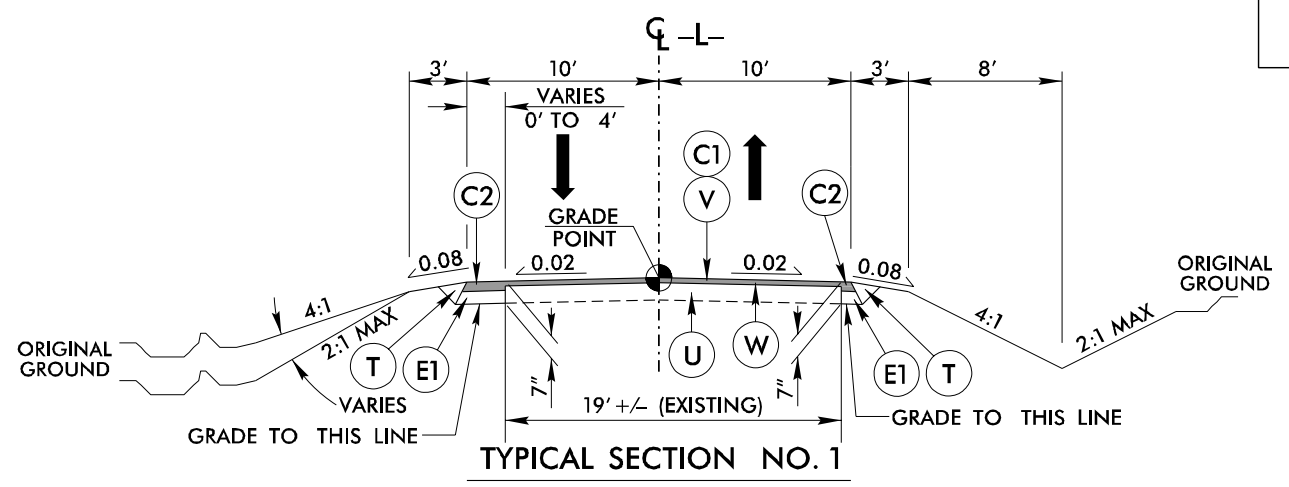
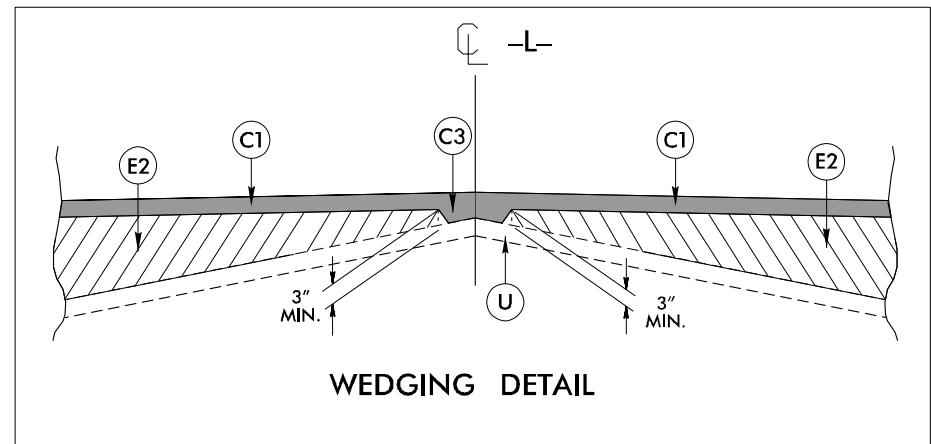
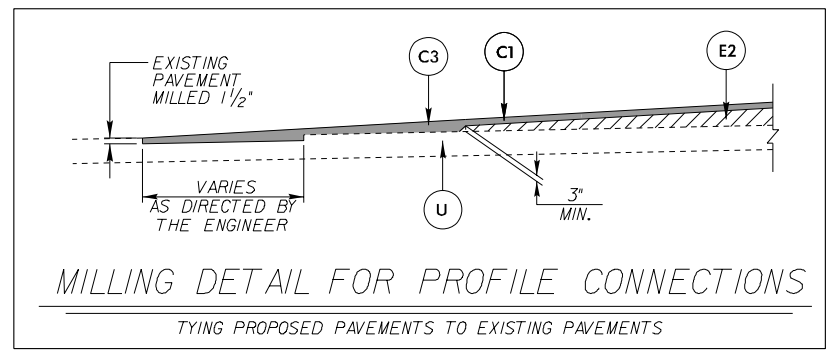
Utility Pole	●
Utility Pole with Base	⊠
Utility Located Object	○
Utility Traffic Signal Box	⊠
Utility Unknown U/G Line (SUE - LOS B)*	-----UTL-----
U/G Tank; Water, Gas, Oil	-----
Underground Storage Tank, Approx. Loc.	-----UST-----
A/G Tank; Water, Gas, Oil	-----
Geoenvironmental Boring	⊕
Abandoned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

8/17/99

PAVEMENT SCHEDULE

C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1.5" IN DEPTH.
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.
J	PROP. 6" AGGREGATE BASE COURSE.
R1	SHOULDER BERM GUTTER
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	MILLING BITUMINOUS PAVEMENT INCIDENTAL MILLING DEPTH.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL SHEET No. 2A-1)

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



WSP USA
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4099
FAX: 1.919.836.4099
LICENSE NO. F-0165

PROJECT REFERENCE NO.
BPI3.R032

SHEET NO.
2A-1

ROADWAY DESIGN ENGINEER
1/26/2024

PAVEMENT DESIGN ENGINEER
1/26/2024

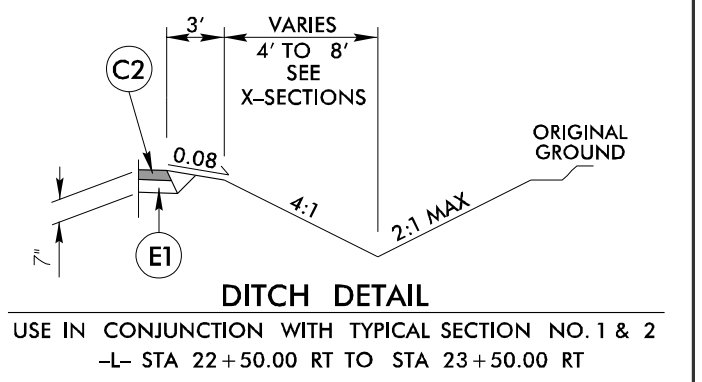
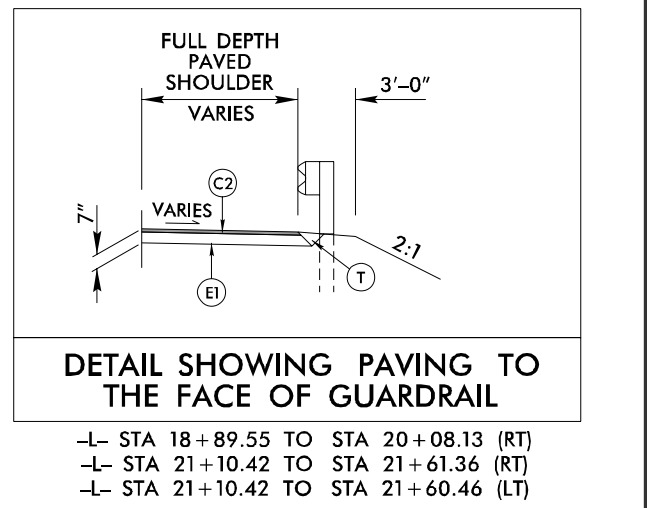
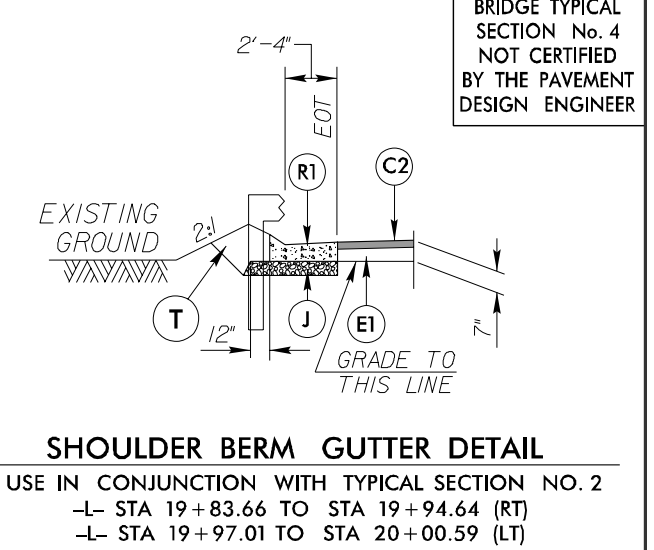
SEAL 040734
SEAL 044590

Slawon J. Sharr
Andrew V. Wynn, P.E., P.D.

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

PLANS PREPARED BY:
WSP

WSP USA
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4099
FAX: 1.919.836.4099
LICENSE NO. F-0165

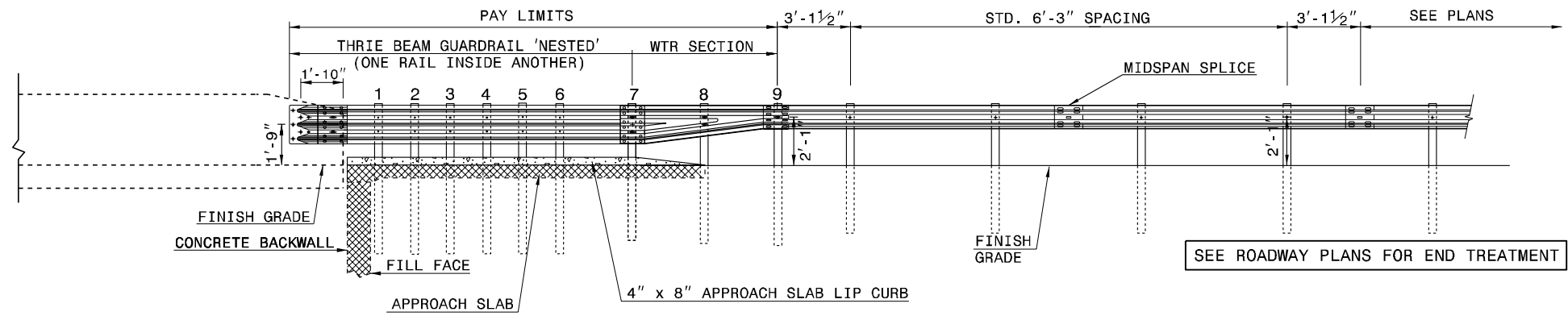


1/27/24 8:58 PM B00153 PCY_TYP-02a.dgn 1/27/24

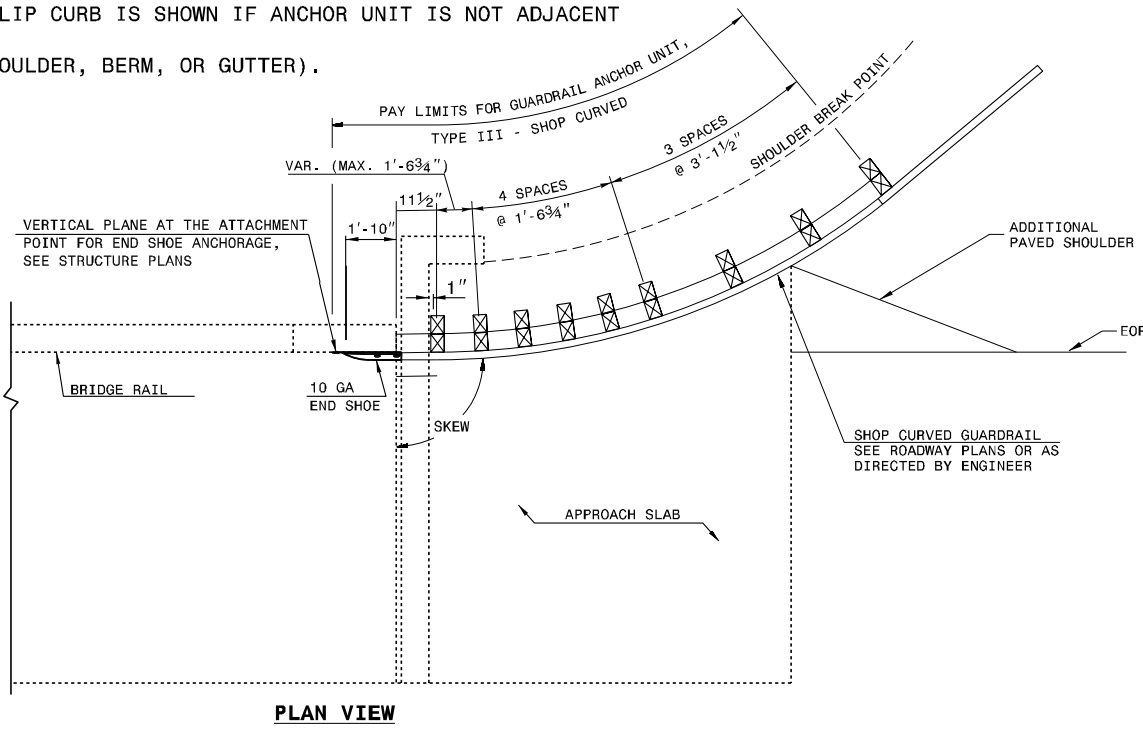
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
**TYPE III - SHOP CURVED
STRUCTURE ANCHOR UNIT**

SHEET 1 OF 1
TYPE III SC



- NOTE:
- **POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
 - *THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11 1/2" IF CONCRETE BACKWALL IS NOT PRESENT.
 - SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.
 - MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
 - USE NO STEEL POSTS WITHIN THE GUARDRAIL ANCHOR UNIT LIMITS.
 - LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
 - SEE STANDARD 862.03 SHEET 4 FOR POST SECTIONS 1 THRU 9.



**GUARDRAIL ANCHOR UNIT, TYPE III - SHOP CURVED
FOR ATTACHMENT TO RAIL ON BRIDGE**

SHEET 1 OF 1
TYPE III SC

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



Designed by:
Nicole M. Hecker
1/29/2024

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

SEE PLATE FOR TITLE

ORIGINAL BY: E.E.Ward	DATE: 4-4-02
MODIFIED BY: T.S.Spell	DATE: 2-01-18
CHECKED BY:	DATE:
FILE SPEC.: jhowerton\guardrail\31inguardrail\typeiiiisc.dgn	

01-FEB-2018 09:49
S:\Contracts\Special Details\jhowerton\Guardrail\31 inch Guardrail\type_iii.sc.dgn
jhowerton AT CSD-232595

5/14/99

12/06/07

COMPUTED BY: DTD DATE: 2/16/22
CHECKED BY: EDM DATE: 11/29/23

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO. SHEET NO.
BPI3.R032 3B-1

SUMMARY OF EARTHWORK

Table with columns: STATION, UNCL. EXCAV., EMBANK. +%, BORROW, WASTE. Rows include station ranges like 18+58.32 -L- to 20+08.13 -L- and project totals.

NOTE: EARTHWORK QUANTITIES ARE CALCULATED BY THE ROADWAY DESIGNER.

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

CONTINGENCY: EST. UNDERCUT EXCAVATION = 450 CY
EST. GEOTEXTILE FOR SOIL STABILIZATION = 200 SY
EST. SELECT GRANULAR MATERIAL = 400 CY

SHOULDER BERM
GUTTER SUMMARY

Table with columns: SURVEY LINE, STATION, STATION, LENGTH. Rows include L (RT) and L (LT) with station ranges and lengths.

PAVEMENT REMOVAL SUMMARY

Table with columns: SURVEY LINE, STATION, STATION, LOCATION LT/RT/CL, YD'. Rows include L, DR, and L with station ranges and locations.

SUMMARY OF BREAKING
EXISTING ASPHALT PAVEMENT

Table with columns: SURVEY LINE, STATION, STATION, LOCATION LT/RT/CL, YD'. Rows include L with station ranges and locations.

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

GUARDRAIL SUMMARY

Large summary table with columns: SURVEY LINE, BEG. STA., END STA., LOCATION, LENGTH, WARRANT POINT, FLARE LENGTH, W, ANCHORS, IMPACT ATTENUATOR TYPE 350, SINGLE FACED GUARDRAIL, REMOVE EXISTING GUARDRAIL, REMOVE AND STOCKPILE EXISTING GUARDRAIL, REMARKS.

14:28:47 PM 12/27/2024

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
				TOTAL LF:	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				
			TOTAL SY/TONS:	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			1		100	200	500		
			TOTAL CY/TONS/SY:		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.

PROJECT REFERENCE NO. **BP13.R032** SHEET NO. **4**

RW SHEET NO. **1/26/2024** HYDRAULICS ENGINEER **1/25/2024**

ROADWAY DESIGN ENGINEER **1/26/2024** SEAL **040734** NORTH CAROLINA PROFESSIONAL ENGINEER

SEAL **032312** NORTH CAROLINA PROFESSIONAL ENGINEER

Skane I. Sharp **Heather Charles**

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY: **WSP** WSP USA 434 EYETTEVILLE STREET SUITE 1500 RALEIGH, NC 27601 TEL: 1.919.836.4040 FAX: 1.919.836.4099 LICENSE NO. F-0165

-L- CURVE DATA

PI Sta 18+77.19	PI Sta 19+74.37	PI Sta 22+19.59
$\Delta = 6'52" 43.5"$ (RT)	$\Delta = 50'10" 16.5"$ (RT)	$\Delta = 1'26" 30.0"$ (RT)
$D = 8'30" 00.0"$	$D = 47'15" 00.0"$	$D = 6'0" 52.1"$
$L = 80.93'$	$L = 106.18'$	$L = 189.71'$
$T = 40.51'$	$T = 56.77'$	$T = 95.71'$
$R = 674.07'$	$R = 121.26'$	$R = 950.00'$
$e = EXIST.$	$e = 4%$	$e = 3.5%$
	$Ro = 52'$	$Ro = 63'$
	$Ds = 20 \text{ MPH}$	$Ds = 40 \text{ MPH}$

-DR- CURVE DATA

PI Sta 10+71.09	PI Sta 11+05.40
$\Delta = 52'43" 23.5"$ (RT)	$\Delta = 23'52" 08.5"$ (LT)
$D = 184'49" 30.3"$	$D = 76'23" 39.7"$
$L = 28.53'$	$L = 31.24'$
$T = 15.36'$	$T = 15.85'$
$R = 31.00'$	$R = 75.00'$

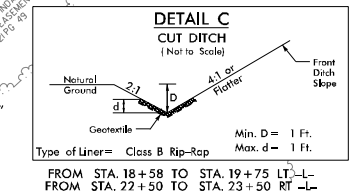
END CONSTRUCTION -DR- STA 11+36.00

-DR- PT Sta. 11+20.79

-DR- PC Sta. 10+89.55

-DR- PT Sta. 10+84.25

-DR- PC Sta. 10+55.73



END STATE PROJECT BP13.R032 -L- STA 23+68.32

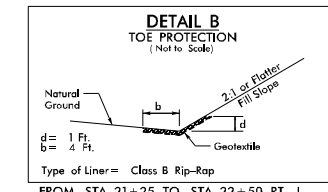
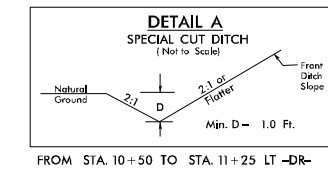
SCOTT C. HOLBROOK DB 104 PG 602

BEGIN STATE PROJECT BP13.R032 -L- STA 18+58.32

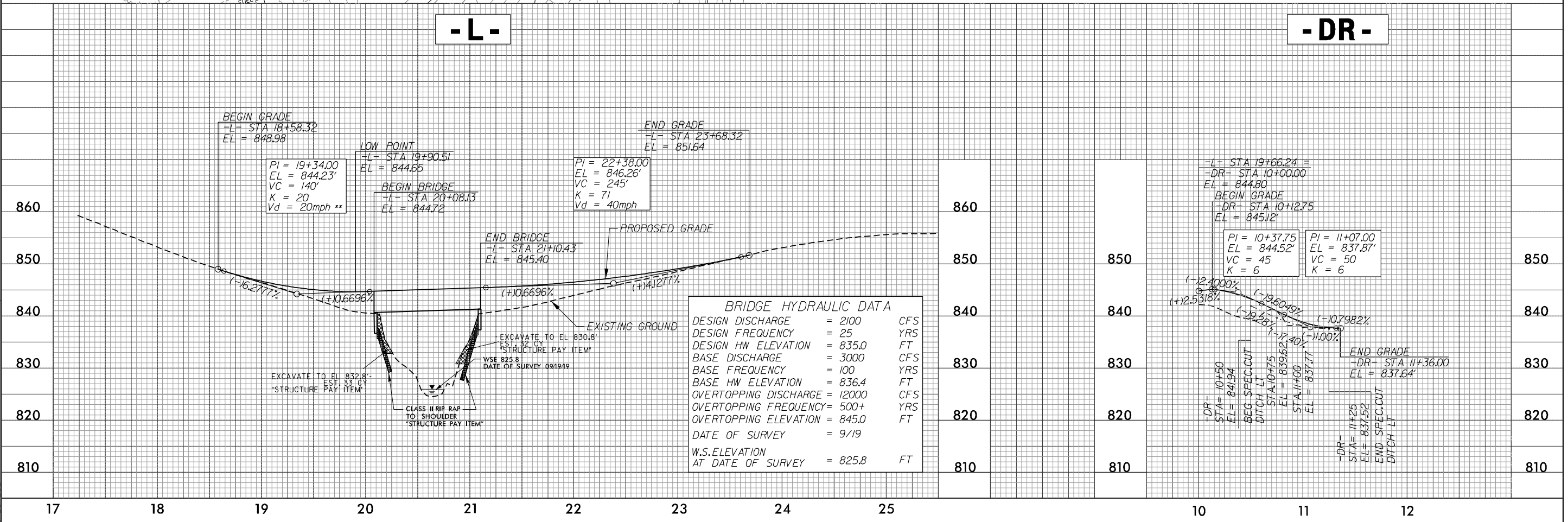
-L- PCC Sta. 19+66.24 = -DR- POT Sta. 10+00.00

-L- PCC Sta. 19+17.61

***NOTE: DESIGN EXCEPTION IS REQUIRED



SEE STRUCTURE PLAN SHEETS S-1 THRU S-20



1/25/24 3:14 PM 15_140Y_PSH-04.dgn

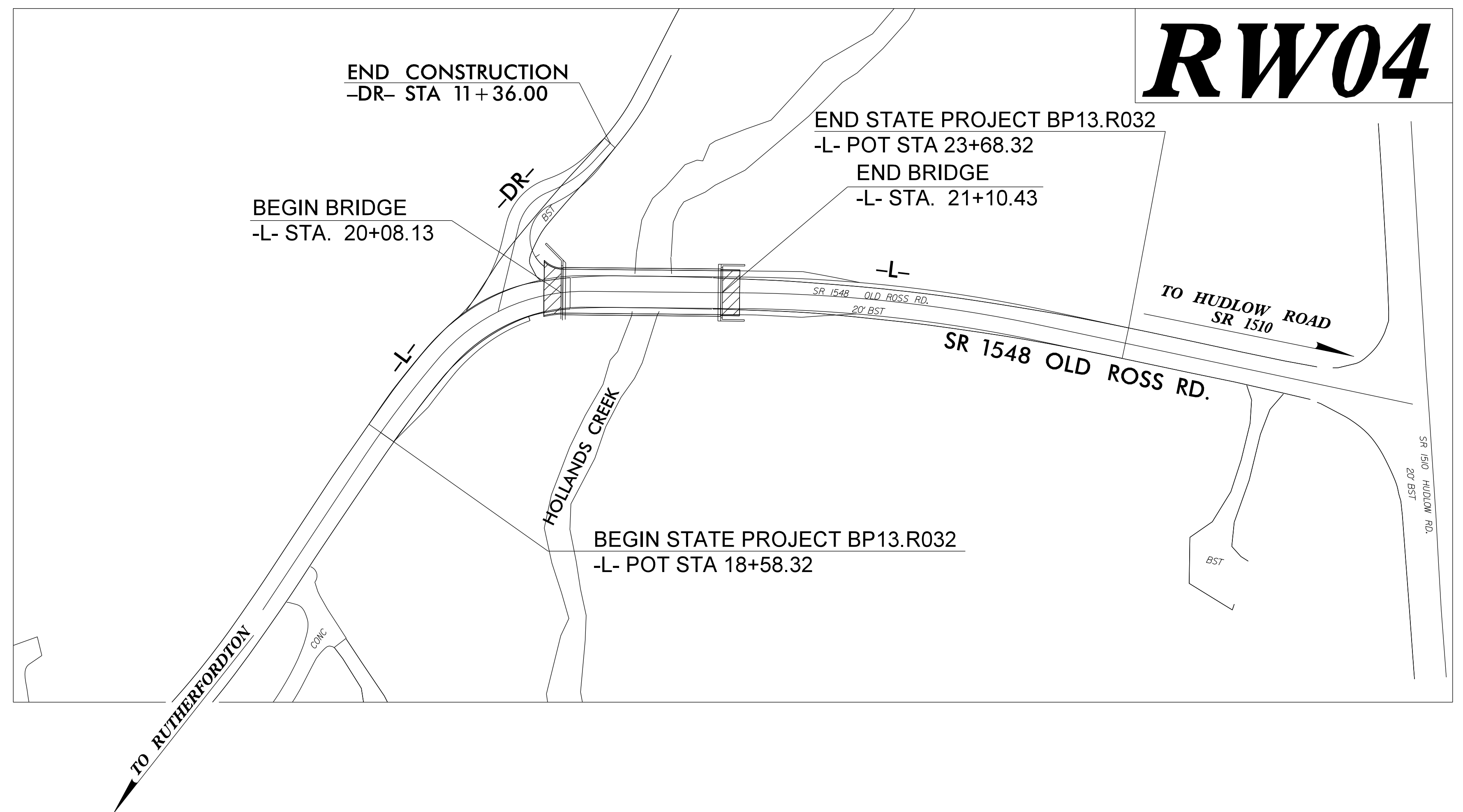
09/06/99

TIP PROJECT: BP13.R032

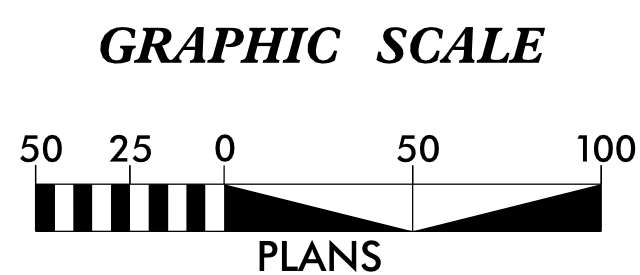
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP13.R032	RW01	05

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

RUTHERFORD COUNTY



RW04



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "80-0159-2" WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF NORTHING: 605,773.1590(ft) EASTING: 1,137,835.1190(ft) ELEVATION: 876.61(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9998381593 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "80-0159-2" TO -L- STATION 17+23.32 IS N 85-37'22" X 608.83(ft) ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

Prepared in the Office of:

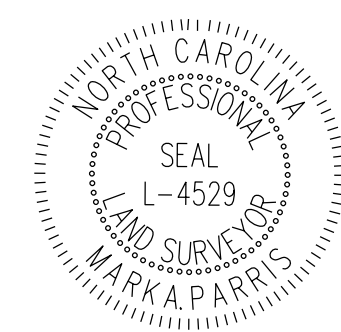


2024 STANDARD SPECIFICATIONS

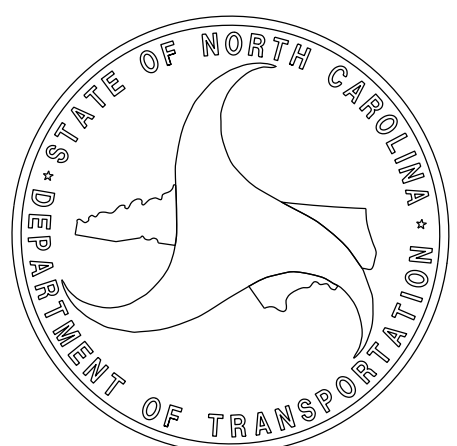
RIGHT OF WAY DATE:
08/23/2022

LETTING DATE:
5/15/2024

PROFESSIONAL LAND SURVEYOR



DocuSigned by:
Mark A. Parris
F1570CB85C7248A...



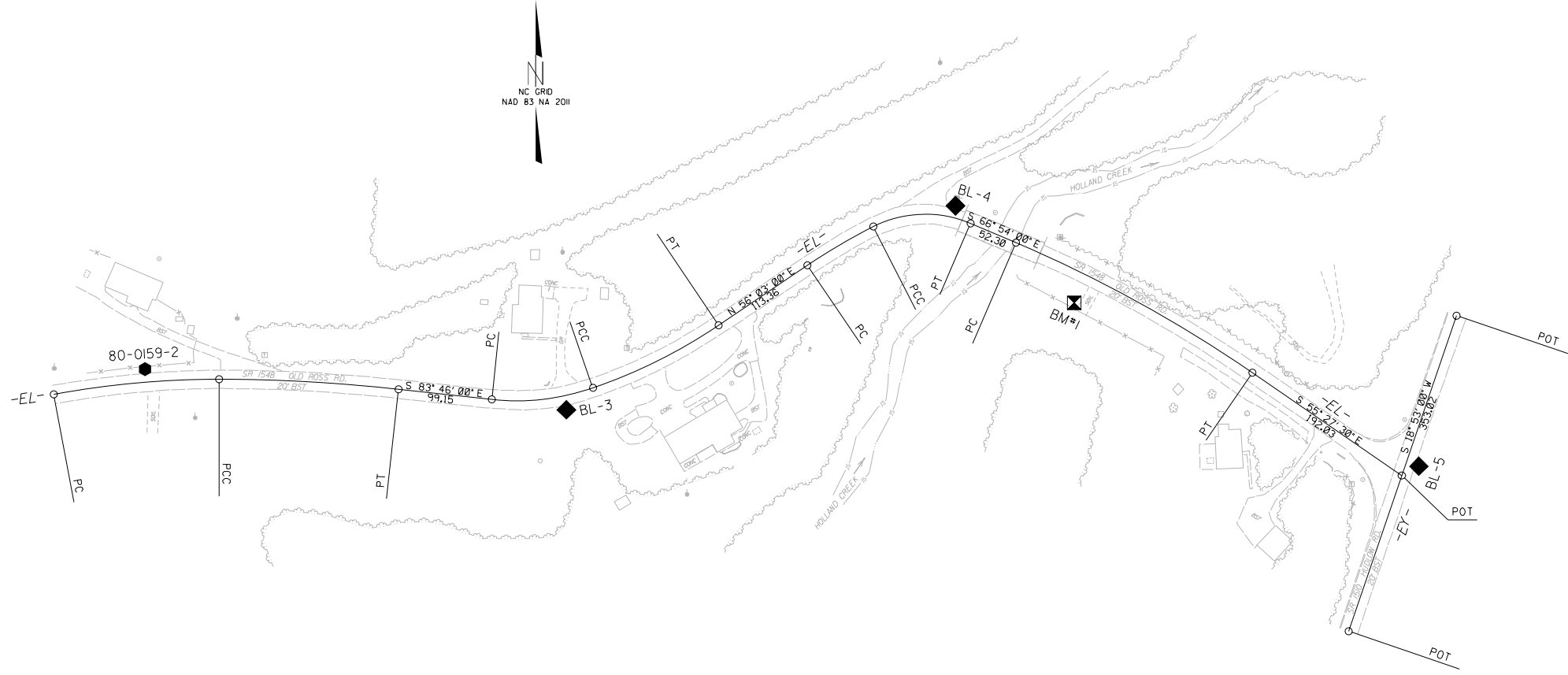
SIGNATURE: Mark A. Parris Date: 03/22/2023

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

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

REVISIONS




**SEE SHEET RW02C-2
FOR FURTHER
ALIGNMENT DETAILS**

NOTES:

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

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO. BPI3.R032	SHEET NO. RW02C-2
Location and Surveys	
	

BL	POINT	DESC.	NORTH	EAST	ELEVATION
	GPS1	80-0159-1	605616.6060	1137218.4610	893.38
	GPS2	80-0159-2	605773.1590	1137835.1190	876.61
	3	BL-3	605730.0840	1138280.9980	869.94
	4	BL-4	605946.0600	1138692.8200	840.03
	5	BL-5	605670.4690	1139183.1290	854.06

.....
 BM1 ELEVATION = 841.64
 N 605843 E 1138818
 RR SPIKE SET IN 20' SYCAMORE

EL POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
PC	605746.426	1137738.391							
CURVE			N 84°46'04.2" E	175.68	10°33'19.8"(RT)	06°00'00.0"	175.92	88.21	954.93
PCC	605762.447	1137913.335							
CURVE			S 86°51'38.0" E	190.30	06°11'15.9"(RT)	03°15'00.0"	190.39	95.29	1762.95
PT	605752.025	1138103.350							
LINE			S 83°46'00.0" E	99.15					
PC	605741.259	1138201.918							
CURVE			N 83°36'02.5" E	107.79	25°15'55.0"(LT)	23°15'00.0"	108.67	55.23	246.43
PCC	605753.273	1138309.036							
CURVE			N 63°30'32.5" E	148.76	14°55'05.0"(LT)	10°00'00.0"	149.18	75.01	572.96
PT	605819.628	1138442.176							
LINE			N 56°03'00.0" E	113.36					
PC	605882.937	1138536.212							
CURVE			N 59°29'21.8" E	80.88	06°52'43.5"(RT)	08°30'00.0"	80.93	40.51	674.07
PCC	605923.998	1138605.892							
CURVE			N 88°00'51.8" E	102.82	50°10'16.5"(RT)	47°15'00.0"	106.18	56.77	121.26
PT	605927.561	1138708.652							
LINE			S 66°54'00.0" E	52.30					
PC	605907.043	1138756.756							
CURVE			S 61°10'45.0" E	285.57	11°26'30.0"(RT)	04°00'00.0"	286.04	143.50	1432.39
PT	605769.379	1139006.950							
LINE			S 55°27'30.0" E	192.03					
POT	605660.494	1139165.132							

EY POINT	N	E	BEARING	DIST
POT	605829.870	1139223.067		
LINE			S 18°53'00.0" W	353.02
POT	605495.854	1139108.816		

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.

Location and Surveys



PROJECT SURVEYOR



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

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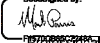
TYPE	STATION	NORTH	EAST
POT	17+23.32	605819.6278	1138442.1764
PC	18+36.68	605882.9365	1138536.2124
PCC	19+17.61	605923.9981	1138605.8916
PT	20+23.79	605927.5608	1138708.6523
PC	21+24.41	605888.0823	1138801.2082
PT	23+14.12	605796.7803	1138967.1431
POT	25+54.49	605660.4942	1139165.1321

DR

TYPE	STATION	NORTH	EAST
POT	10+00.00	605936.9739	1138652.4205
PC	10+55.73	605982.0084	1138685.2411
PT	10+84.25	605994.7436	1138709.6486
PC	10+89.55	605994.8538	1138714.9422
PT	11+20.79	606001.8987	1138745.1507
POT	11+36.60	606008.5944	1138759.4694

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 on 03/09/2023, and all coordinates are based on NAD83/2011; that this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 27 day of March, 2023.




Professional Land Surveyor L-4529

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 03/09/2023 .

REVISIONS

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PROJECT REFERENCE NO. BP13.R032	SHEET NO. RW03E-1
Location and Surveys	
	
PROJECT SURVEYOR	
	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

ROW MARKER IRON PIN AND CAP - E

ALIGN	STATION	OFFSET	NORTH	EAST
L	18+58.32	-50.00	605937.0821	1138527.7753
L	18+58.32	-30.00	605920.1416	1138538.4064
L	19+00.00	30.00	605889.4335	1138604.6653
L	19+17.61	-50.00	605968.5202	1138583.1367
L	20+23.79	45.00	605886.1688	1138690.9971
L	20+23.79	-50.00	605973.5519	1138728.2692
L	21+24.41	-50.00	605934.0750	1138820.8213
L	22+00.00	-50.00	605899.9805	1138892.6915
L	22+00.00	-27.65	605880.1862	1138882.3175
L	22+50.61	32.24	605803.2965	1138897.1974

ROW MARKER PERMANENT EASEMENT - E

ALIGN	STATION	OFFSET	NORTH	EAST
L	19+58.00	60.00	605876.6892	1138652.5662
L	19+60.00	49.10	605887.6347	1138652.2324
L	19+96.00	49.37	605886.8296	1138673.5230
L	19+98.00	60.00	605876.1752	1138672.6761
L	22+42.00	-44.00	605873.4129	1138928.3663
L	22+42.00	-27.68	605859.3052	1138920.1581
L	22+70.00	-44.00	605858.3087	1138953.4682
L	22+70.00	-28.05	605844.7625	1138945.0429

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 on 03/09/2023, and all coordinates are based on NAD83/2011. That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 22 day of March, 2023.


 Professional Land Surveyor L-4529

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 03/09/2023 .

Location and Surveys



PROJECT SURVEYOR



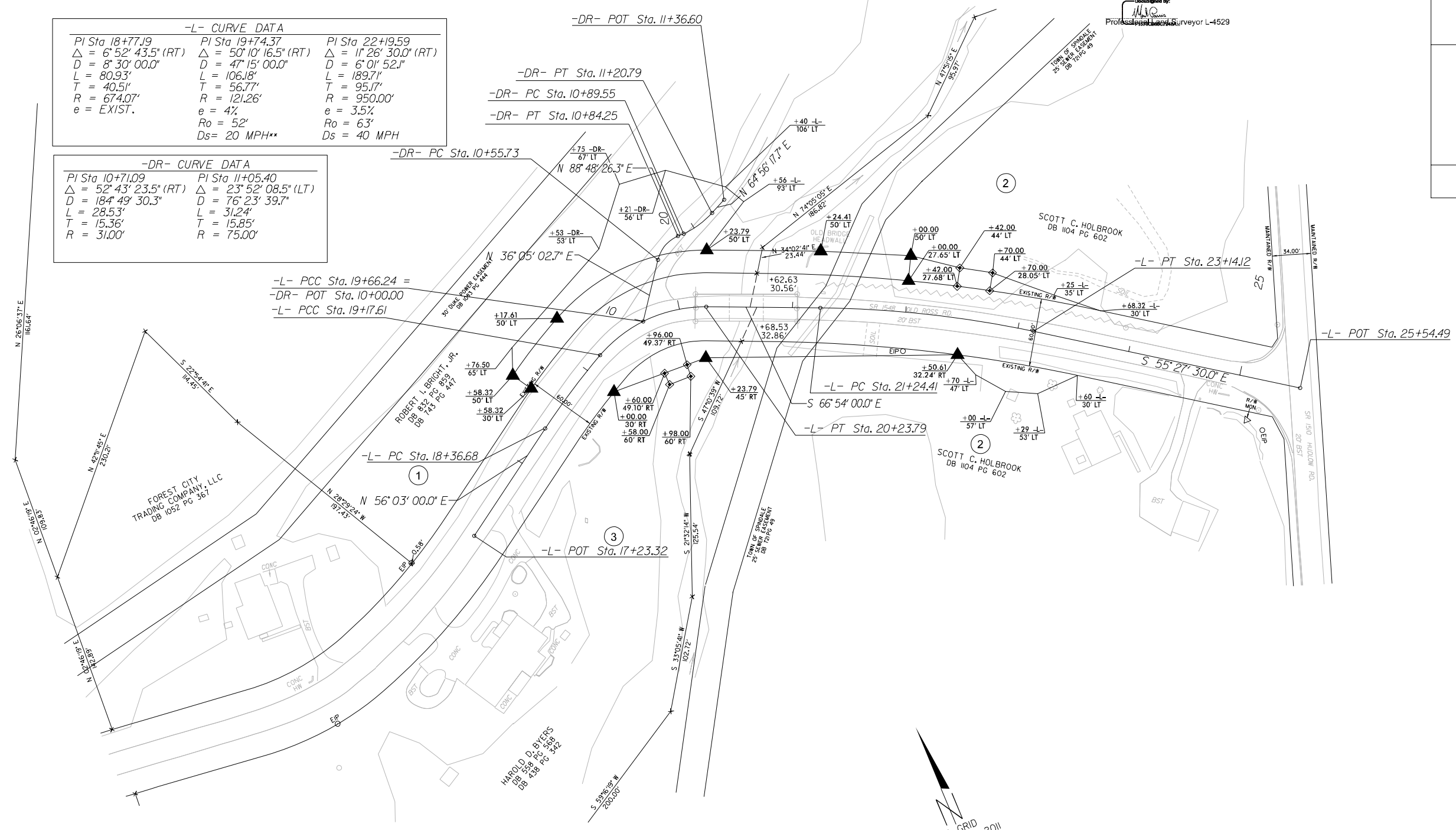
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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 on 03/09/2023, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 22 day of March, 2023.
Mark A. Parris
Professional Surveyor L-4629

-L- CURVE DATA		
PI Sta 18+77.19	PI Sta 19+74.37	PI Sta 22+9.59
$\Delta = 6^{\circ} 52' 43.5''$ (RT)	$\Delta = 50^{\circ} 10' 16.5''$ (RT)	$\Delta = 11^{\circ} 26' 30.0''$ (RT)
D = 8' 30' 00.0"	D = 47' 15' 00.0"	D = 6' 01' 52.1"
L = 80.93'	L = 106.18'	L = 189.71'
T = 40.51'	T = 56.77'	T = 95.17'
R = 674.07'	R = 121.26'	R = 950.00'
e = EXIST.	e = 4%	e = 3.5%
	Ro = 52'	Ro = 63'
	Ds = 20 MPH**	Ds = 40 MPH

-DR- CURVE DATA	
PI Sta 10+71.09	PI Sta 11+05.40
$\Delta = 52^{\circ} 43' 23.5''$ (RT)	$\Delta = 23^{\circ} 52' 08.5''$ (LT)
D = 18' 49' 30.3"	D = 76' 23' 39.7"
L = 28.53'	L = 31.24'
T = 15.36'	T = 15.85'
R = 31.00'	R = 75.00'



REVISIONS

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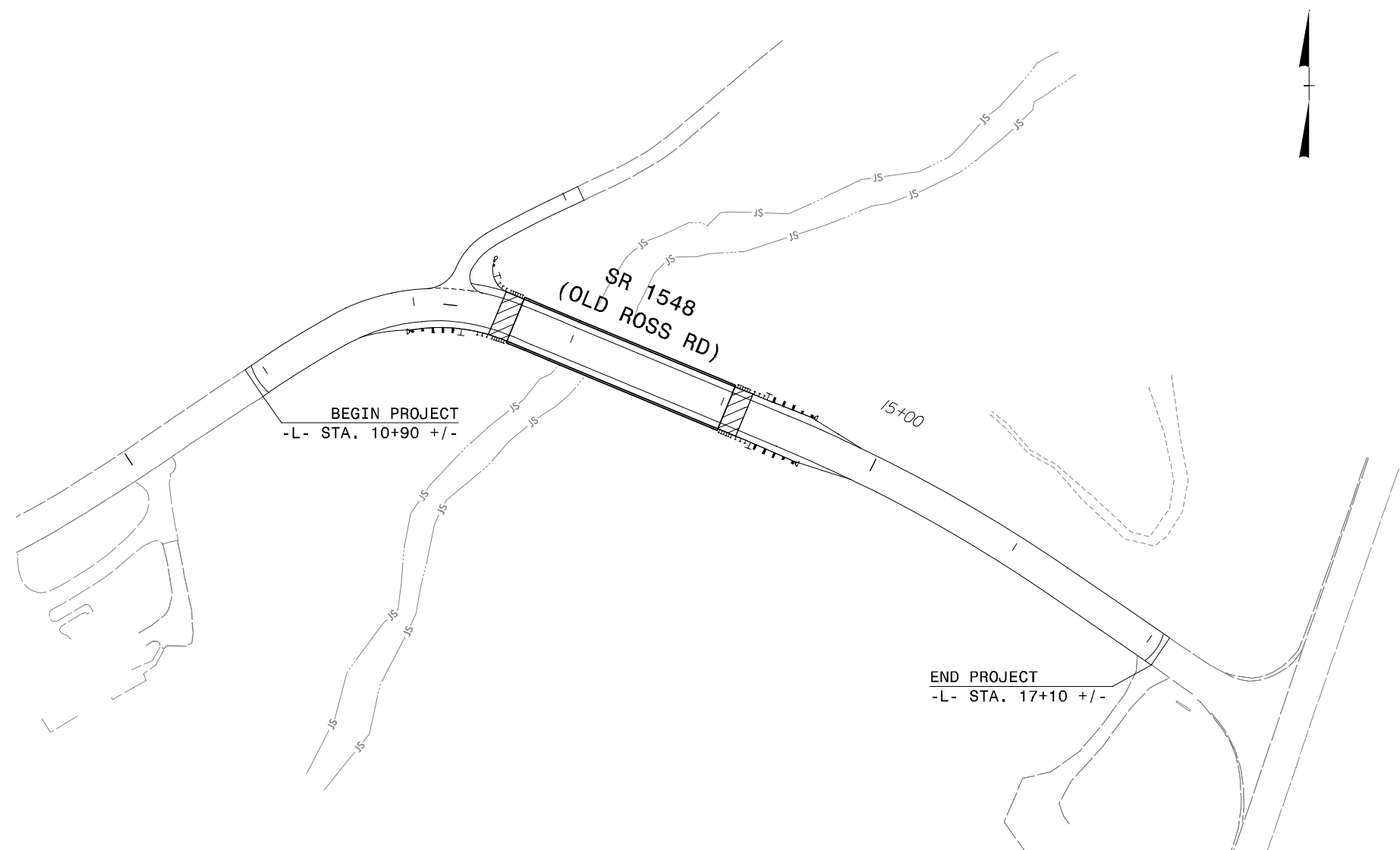
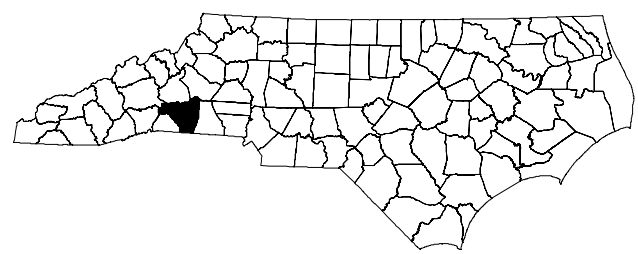
NOTES:

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 03/09/2023 .

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

RUTHERFORD COUNTY

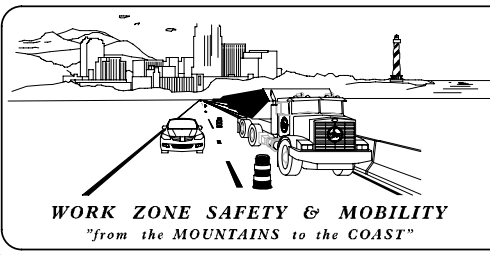


SHEET NO.
TMP-01

INDEX OF SHEETS

<u>SHEET NO.</u>	<u>TITLE</u>
TMP-01	TITLE SHEET, VICINITY MAP AND INDEX OF SHEETS
TMP-02	ROADWAY STANDARD DRAWINGS AND LEGEND
TMP-02A	SIGN DESIGN
TMP-03	GENERAL NOTES AND WRITTEN PHASING
TMP-04	OFFSITE DETOUR ROUTE SIGNING

10/2/2023
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PLANS PREPARED BY:

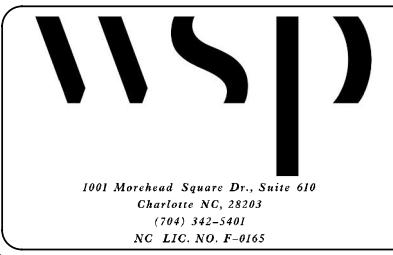
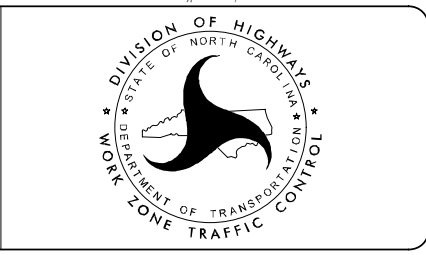
DERRICK DOHM, EI

RICHARD ODYSKI, PE

NCDOT CONTACTS:

ZACHARY CLARK, PE
PROJECT ENGINEER

KARMEN DAIS, PE
PROJECT DESIGN ENGINEER



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

APPROVED: *Richard Odyski*
DATE: 1/25/2024

PROJECT: BPI3.R032




ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - 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:

<u>STD. NO.</u>	<u>TITLE</u>
1101.01	WORK ZONE ADVANCE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.03	TEMPORARY ROAD CLOSURES
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	FLAGGERS
1180.01	SKINNY DRUMS











LEGEND

GENERAL




-  DIRECTION OF TRAFFIC FLOW
-  DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
-  NORTH ARROW
- PROPOSED PVMT.

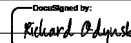
 WORK AREA

TRAFFIC CONTROL DEVICES

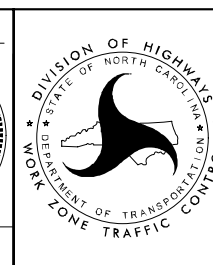
-  BARRICADE (TYPE III)
-  CONE
-  DRUM  SKINNY DRUM
-  TEMPORARY CRASH CUSHION
-  FLASHING ARROW BOARD
-  FLAGGER
-  LAW ENFORCEMENT
-  TRUCK MOUNTED ATTENUATOR (TMA)
-  CHANGEABLE MESSAGE SIGN

TEMPORARY SIGNING

-  PORTABLE SIGN
-  STATIONARY SIGN
-  STATIONARY OR PORTABLE SIGN

APPROVED: 
DocuSigned by:
Richard Adamski
8F7E8A8A8F8E8E
 DATE: 1/25/2024

NORTH CAROLINA
PROFESSIONAL
SEAL
037467
ENGINEER
RICHARD A. ADAMSKI



TRANSPORTATION
MANAGEMENT PLANS
ROADWAY STANDARD
DRAWINGS & LEGEND

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

<p>SIGN NUMBER: SP-01 TYPE: GROUND QUANTITY: 1 SIGN WIDTH: 3'-0" HEIGHT: 1'-0" TOTAL AREA: 3.0 Sq.Ft. BORDER TYPE: FLUSH RECESS: 0.47" WIDTH: 0.63" RADIUS: 1.5" NO. Z BARS: LENGTH:</p>	<p>BACKG COLOR: Fluorescent Orange COPY COLOR: Black</p> <table border="1" style="width: 100%; text-align: center; font-size: 8px;"> <tr> <th>SYMBOL</th> <th>X</th> <th>Y</th> <th>WID</th> <th>HT</th> </tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>	SYMBOL	X	Y	WID	HT																										<p>DESIGN BY: DAD PROJECT ID: R.032</p> <p>CHECKED BY: RAO DIV: 13</p> <p style="text-align: right;">Apr 13, 2022</p>	<div style="text-align: center;"> <p>3'-0"</p> <p>1'-0"</p> <p>2.05" 31.9" 2.05"</p> </div>
SYMBOL	X	Y	WID	HT																													

- USE NOTES:**
1. Legend and border shall be direct applied black non-reflective sheeting.
 2. Background shall be NC Grade B fluorescent orange retroreflective sheeting.
 3. To be mounted with Detour signing.

Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter	O	L	D	R	O	S	S	R	D	Series/Size	Text Length				
O	2	3.2	2.6	2.2	4	2.8	3	2.7	2.2	4	2.9	2.2	2	C 2000	31.9

Letter spacings are to start of next letter

FILENAME: detour_sign NORTH CAROLINA D.O.T. SIGN DETAIL

<p>APPROVED: </p> <p>DATE: 1/25/2024</p>			<p style="font-size: 12px; font-weight: bold;">TRANSPORTATION MANAGEMENT PLANS SIGN DESIGN</p>
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

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.

WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO A DIVIDED FACILITY AND WITHIN 10 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.
- 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) 500 FT IN ADVANCE AND A MINIMUM OF EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

TRAFFIC PATTERN ALTERATIONS

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

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) PROVIDE SIGNING AND DEVICES REQUIRED TO CLOSE THE ROAD ACCORDING TO THE ROADWAY STANDARD DRAWINGS AND TRAFFIC CONTROL PLANS.

PROVIDE SIGNING REQUIRED FOR THE OFF-SITE DETOUR ROUTE AS SHOWN IN THE TRAFFIC CONTROL PLANS.
- K) COVER OR REMOVE ALL SIGNS AND DEVICES REQUIRED TO CLOSE THE ROAD WHEN ROAD CLOSURE IS NOT IN OPERATION.

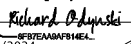
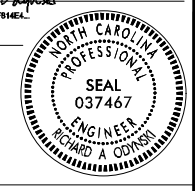
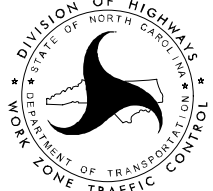
COVER OR REMOVE ALL SIGNS REQUIRED FOR THE OFF-SITE DETOUR WHEN THE DETOUR IS NOT IN OPERATION.
- L) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

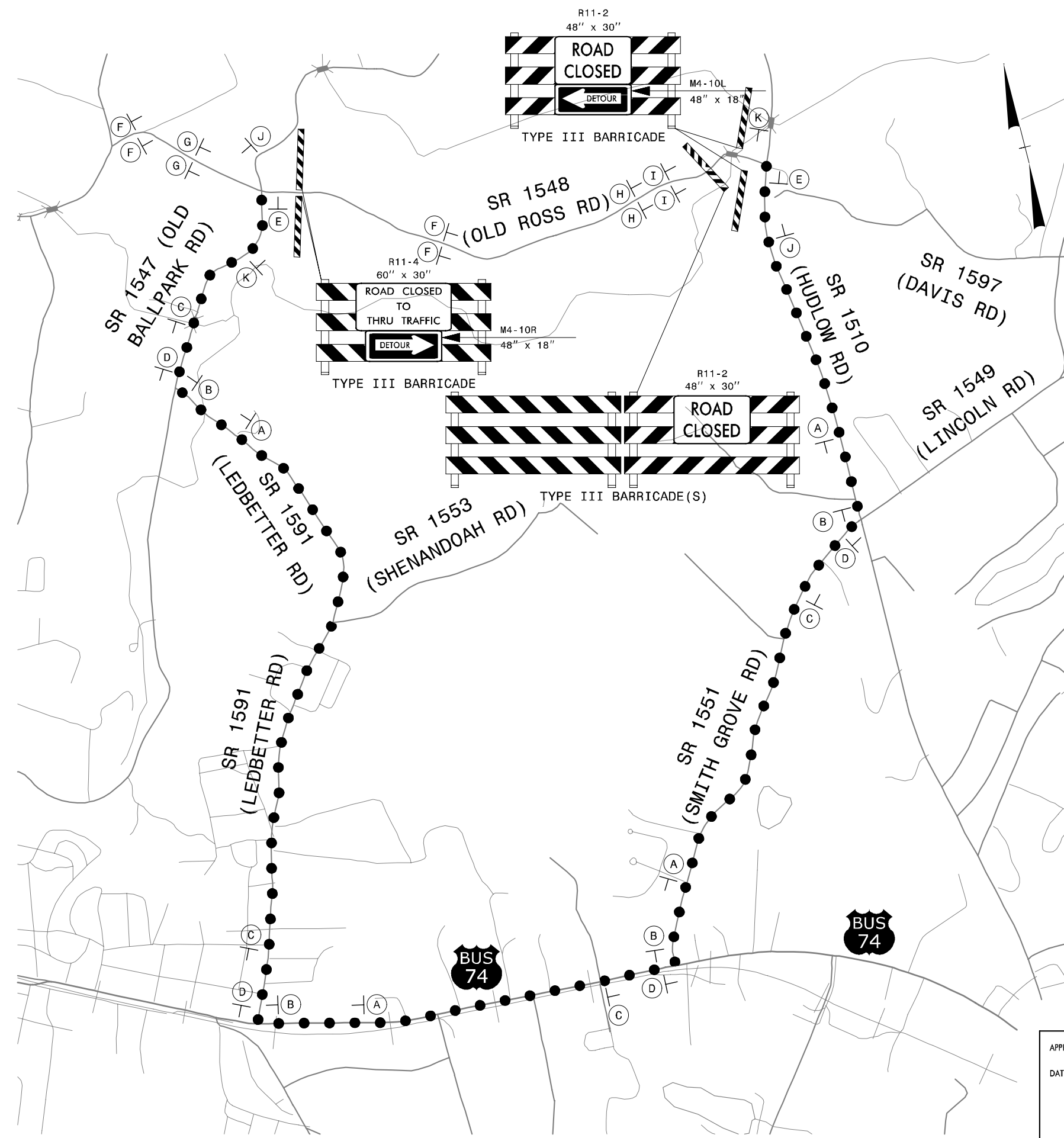
TRAFFIC CONTROL DEVICES

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

PHASING NOTES

- STEP 1: INSTALL WORK ZONE ADVANCE WARNING SIGNS ON OLD ROSS RD. ACCORDING TO ROADWAY STANDARD DRAWING NO. 1101.01 WHERE WORK WILL BE OCCURRING NO MORE THAN THREE DAYS PRIOR TO BEGINNING CONSTRUCTION.
- STEP 2: USING ROADWAY STANDARD DRAWING NO. 1101.03, SHEETS 1 AND 2 OF 9, AND SHEET TMP-04, INSTALL ROAD CLOSURE AND DETOUR SIGNS FOR OLD ROSS RD. COVER SIGNS UNTIL DETOUR IS READY FOR OPERATION.
- STEP 3: WHEN DETOUR IS READY UNCOVER SIGNS AND CLOSE OLD ROSS RD. CONSTRUCT STRUCTURE AND ROADWAY IMPROVEMENTS INCLUDING FINAL ASPHALT OVERLAY AND PAVEMENT MARKINGS ALONG OLD ROSS RD.
- STEP 4: REMOVE ROAD CLOSURE DEVICES AND SIGNS ONCE CONSTRUCTION IS COMPLETE. OPEN OLD ROSS RD. TO TRAFFIC.

APPROVED:  DATE: 1/25/2024			TRANSPORTATION MANAGEMENT PLANS GENERAL NOTES AND WRITTEN PHASING
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			



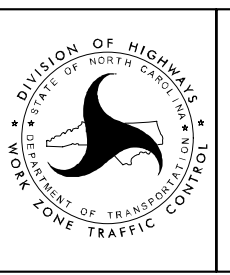
OLD ROSS RD SP-01 36" X 12"	OLD ROSS RD SP-01 36" X 12"	OLD ROSS RD SP-01 36" X 12"	OLD ROSS RD SP-01 36" X 12"
DETOUR M4-R 24" X 12"	DETOUR M4-R 24" X 12"	DETOUR M4-R 24" X 12"	DETOUR M4-R 24" X 12"
→ M5-1 21" X 15"	→ M6-1 21" X 15"	← M5-1 L 21" X 15"	← M6-1 L 21" X 15"
(A)	(B)	(C)	(D)
END DETOUR M4-B A 24" X 18"	ROAD CLOSED AHEAD W20-3 48" X 48"	DETOUR AHEAD W20-2 48" X 48"	ROAD CLOSED 1000 FT W20-3 48" X 48"
(E)	(F)	(G)	(H)
ROAD CLOSED 500 FT W20-3 48" X 48"	ROAD CLOSED AHEAD W20-3 48" X 48"	ROAD CLOSED AHEAD W20-3 48" X 48"	
(I)	NEXT LEFT SP-4L 42" X 12"	NEXT RIGHT SP-4R 42" X 12"	
	(J)	(K)	

NOTE: COORDINATE WITH THE ENGINEER TO FIELD LOCATE SIGNS AS NEEDED.



APPROVED: *Richard A. Conroy*
DATE: 1/25/2024

SEAL
037467
ENGINEER
RICHARD A. CONROY

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

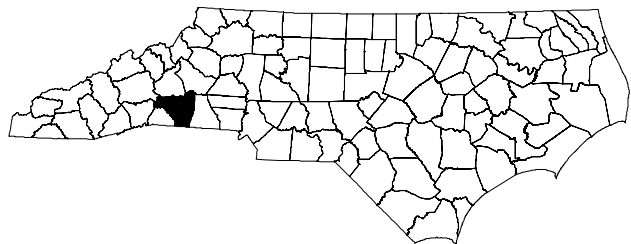


TRANSPORTATION
MANAGEMENT PLANS
OFFSITE DETOUR
ROUTE SIGNING

TIP NO. BP13.R032	SHEET NO. PMP - 1
APPROVED: 	
DATE: 3/11/2024	
SEAL 	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING PLANS
RUTHERFORD COUNTY



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
ALL	PAINT	NONE
BRIDGE	PAINT	NONE

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

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

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

E) PASSING ZONES WILL BE DETERMINED IN THE FIELD AND MUST BE APPROVED BY THE ENGINEER.

F) SEE ROADWAY PLANS FOR GUARD/GUIDE RAIL DETAILS.

INDEX

SHEET NO.	DESCRIPTION
PMP-1	TITLE SHEET, INDEX, GENERAL NOTES & ROADWAY STANDARD DRAWINGS
PMP-2	PROPOSED PAVEMENT MARKING PLAN SHEET

ROADWAY STANDARD DRAWING

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 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
1205.12	PAVEMENT MARKINGS - BRIDGES
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

CONTRACT:

3/11/2024 10:51:42 AM \\bususer\dms37789\800159_pmp_tsh.dgn


CONTRACT: DM00362 PROJECT: BP13.R032



WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
NC LIC. NO. F-0165

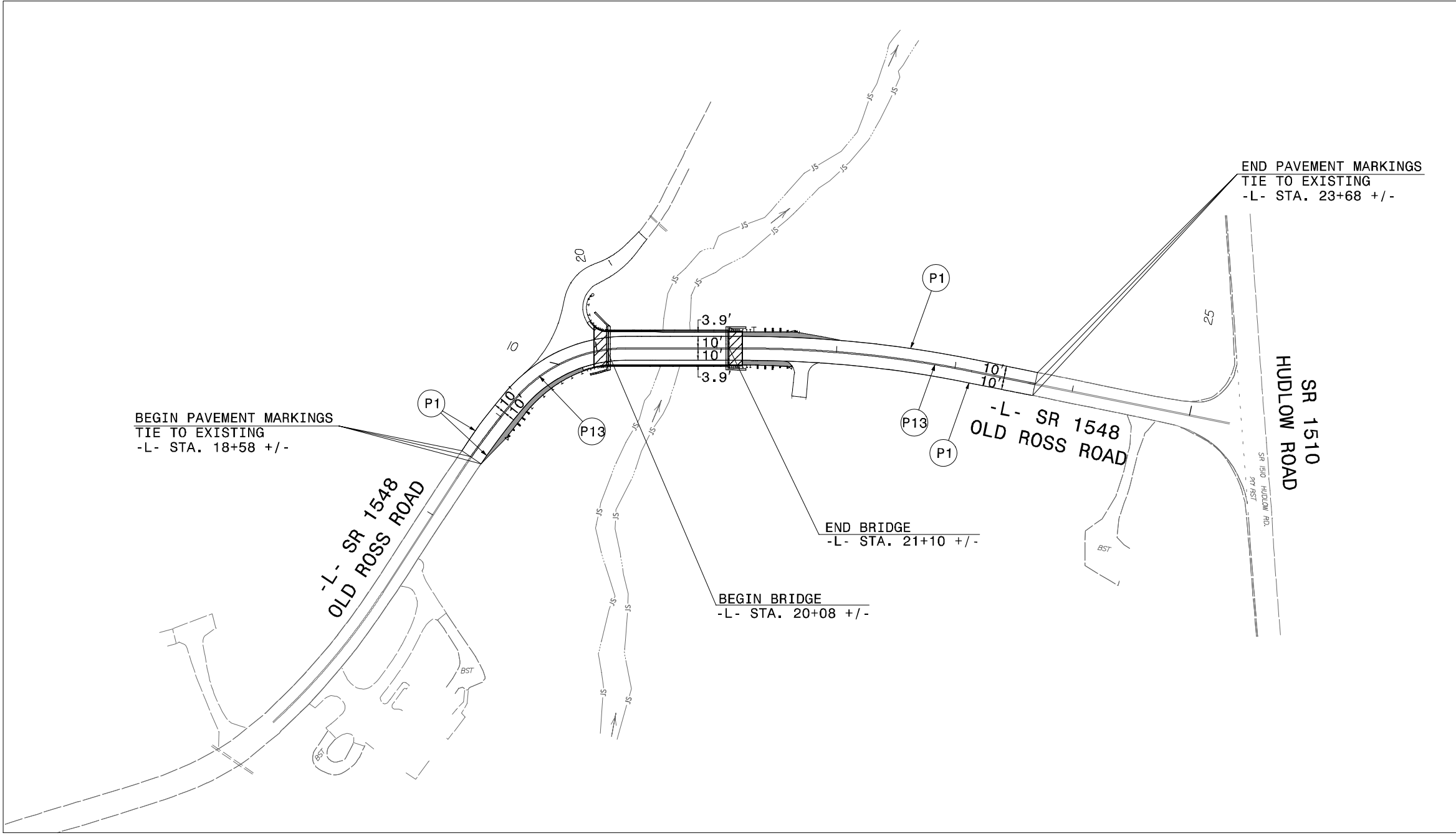
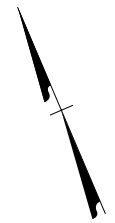
PLAN PREPARED BY:

ERIC W BOWMAN, PE SR. TRANSPORTATION DESIGNER
SAYMA AFREEN TRANSPORTATION DESIGNER

TIP NO. BP13.R032	SHEET NO. PMP-02
APPROVED: _____	
DATE: _____	
SEAL	1/29/2024
	
Documented by: <i>Eric W. Bowman</i> <small>DATE: 1/29/2024</small>	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

PAVEMENT MARKING SCHEDULE
TIP PROJECT # BP13.R032

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

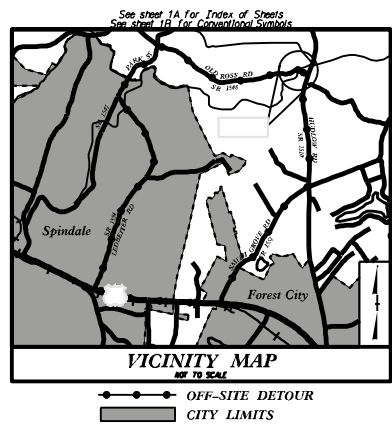


1/29/2024
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 USEB04421

**PAVEMENT MARKING
PLAN SHEET**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP13.R032	EC-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	

TIP PROJECT: BP13.R032

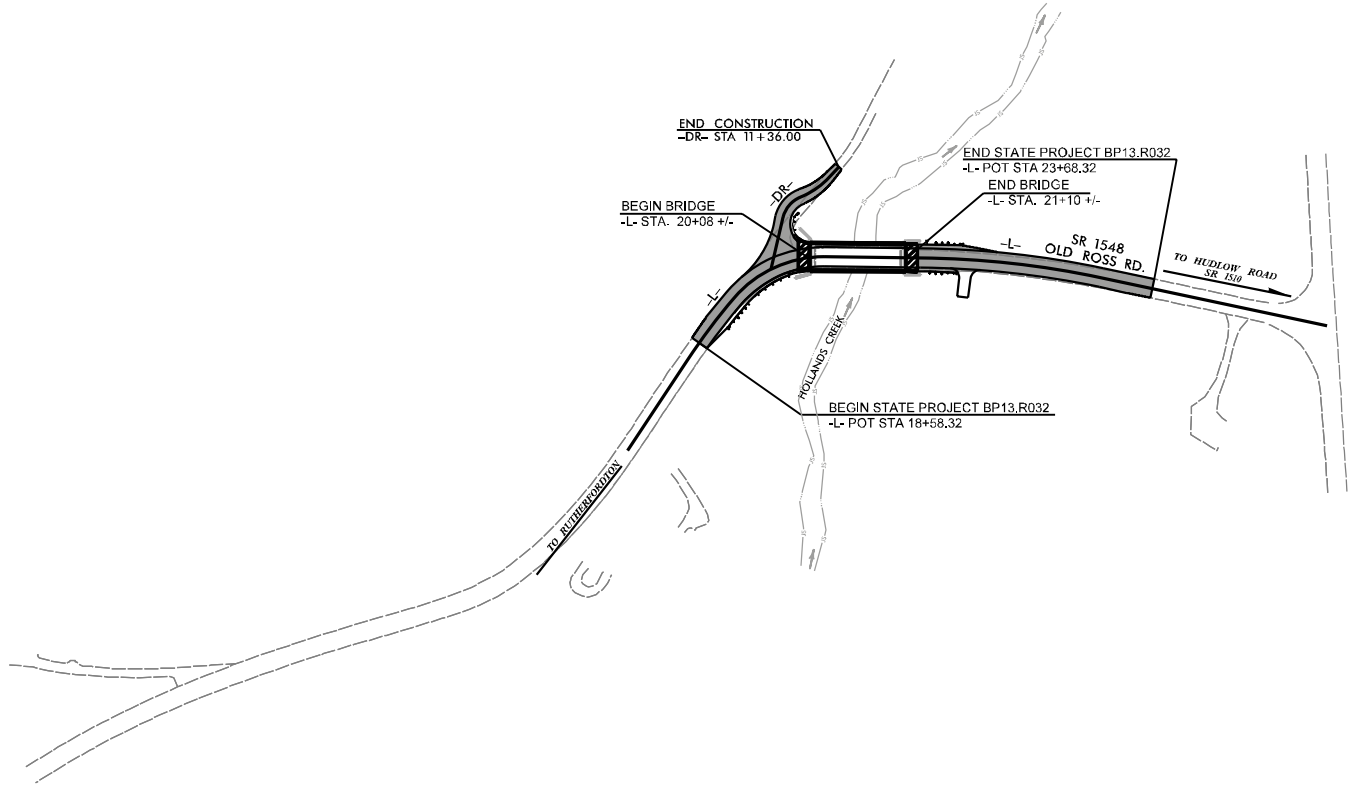


STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

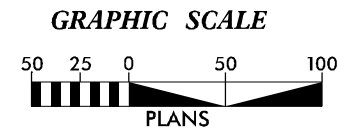
RUTHERFORD COUNTY

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

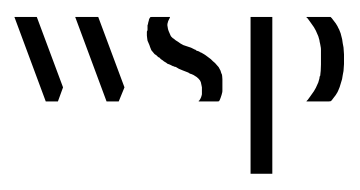
REPLACE BRIDGE NO. 159 OVER HOLLAND CREEK
LOCATION: ON SR 1548 (OLD ROSS RD)
TYPE OF WORK: GRADING, PAVING, DRAINAGE, & STRUCTURE



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



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



Prepared in the Office of:

WSP

WSP USA
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
FAX: 1.919.836.4099
LICENSE NO. F-0165

Designed by:

James Owen Britt 4228
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.

11/10/2023 11:00:00 AM C:\Users\jowbri\OneDrive\Documents\BP13.R032\EC-01.TSH.dgn

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

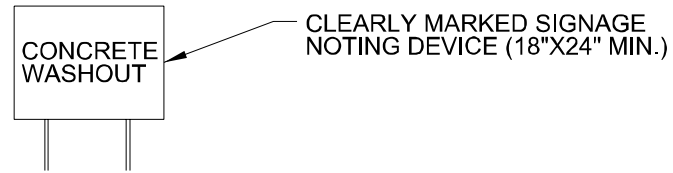
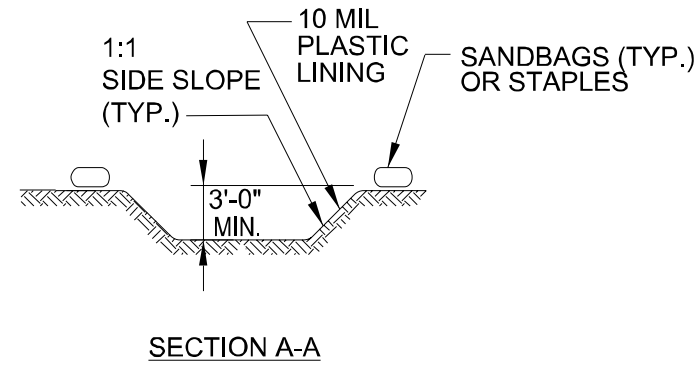
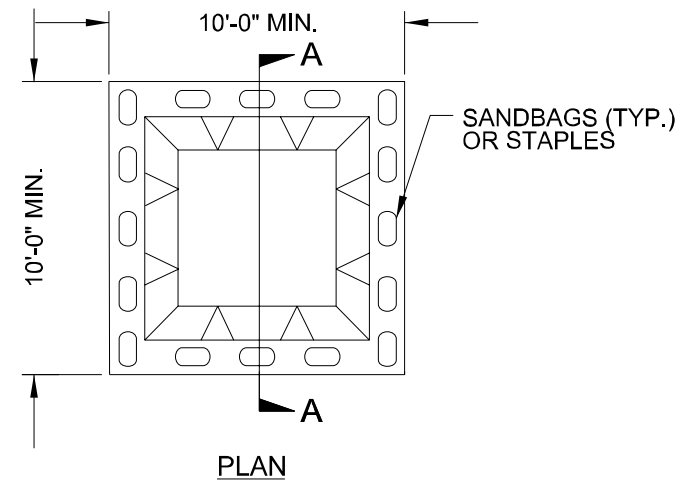
PROJECT REFERENCE NO.	SHEET NO.
BP13.R032	EC-2
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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				

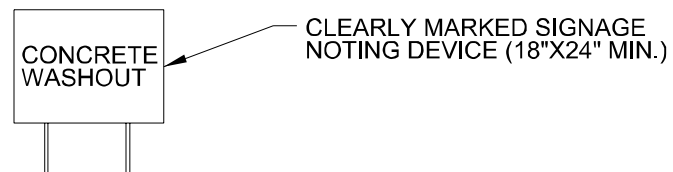
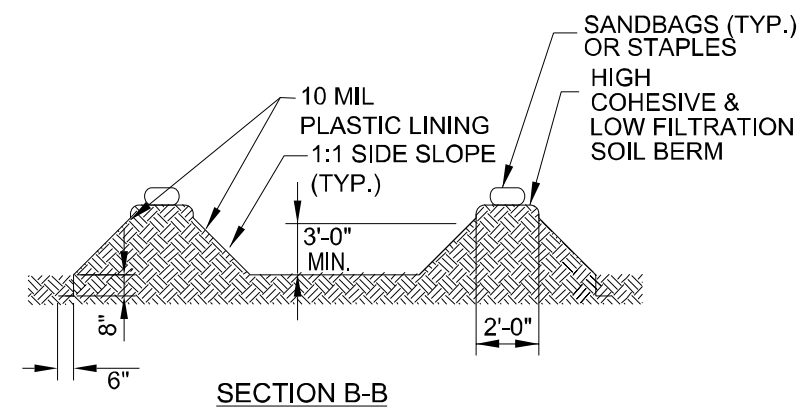
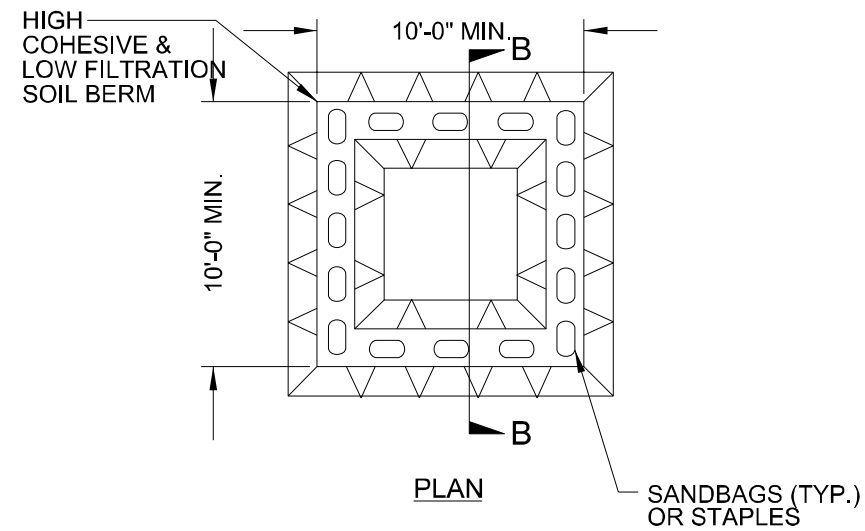
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R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER



BELOW GRADE WASHOUT STRUCTURE
NOT TO SCALE

- NOTES:**
1. ACTUAL LOCATION DETERMINED IN FIELD
 2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM 12 INCHES OF FREEBOARD.
 3. CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARLY MARKED WITH SIGNAGE NOTING DEVICE.



ABOVE GRADE WASHOUT STRUCTURE
NOT TO SCALE

- NOTES:**
1. ACTUAL LOCATION DETERMINED IN FIELD
 2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM 12 INCHES OF FREEBOARD.
 3. CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARLY MARKED WITH SIGNAGE NOTING DEVICE.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

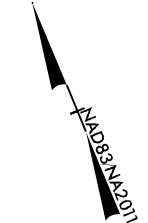
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R/W SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

<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.

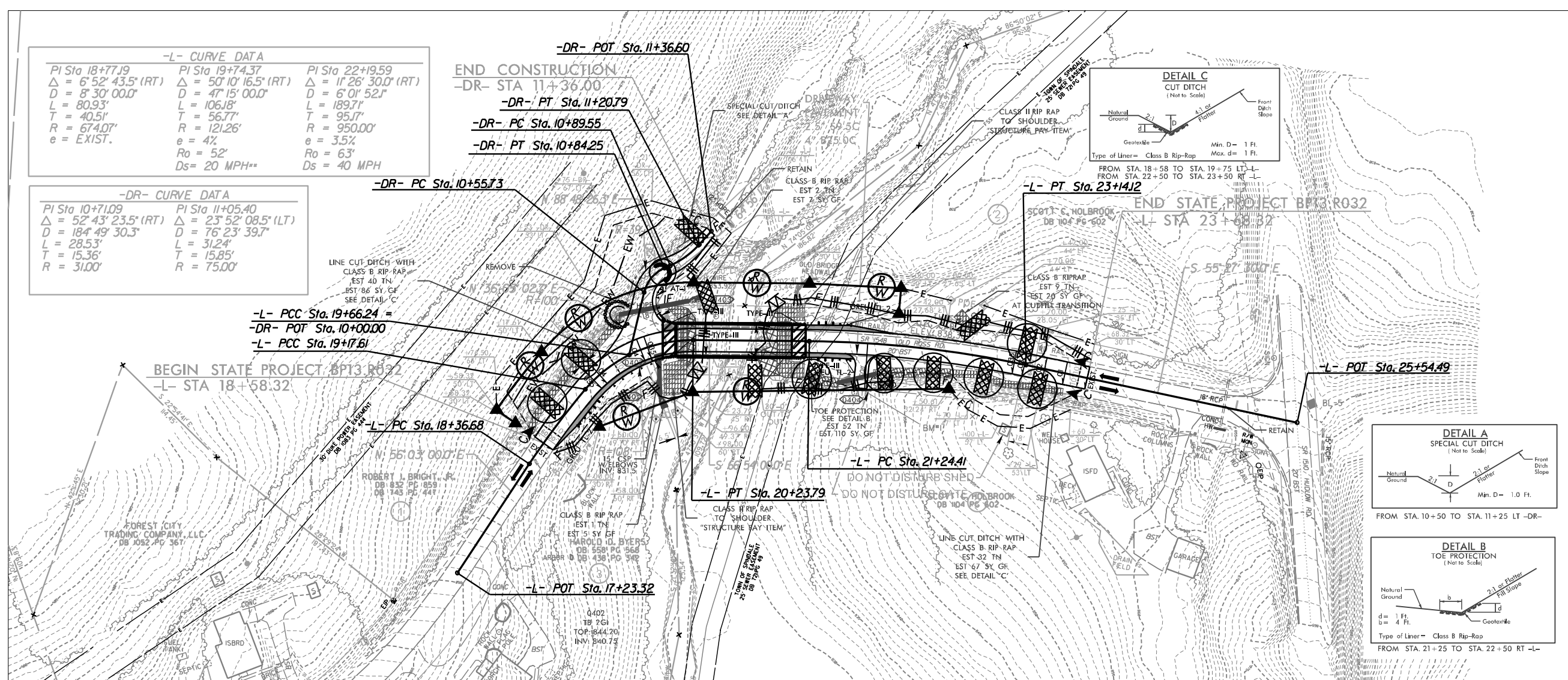
PROJECT REFERENCE NO.	SHEET NO.
BP13.R032	EC-4-/CONST.A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

EROSION CONTROL PLAN

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 4

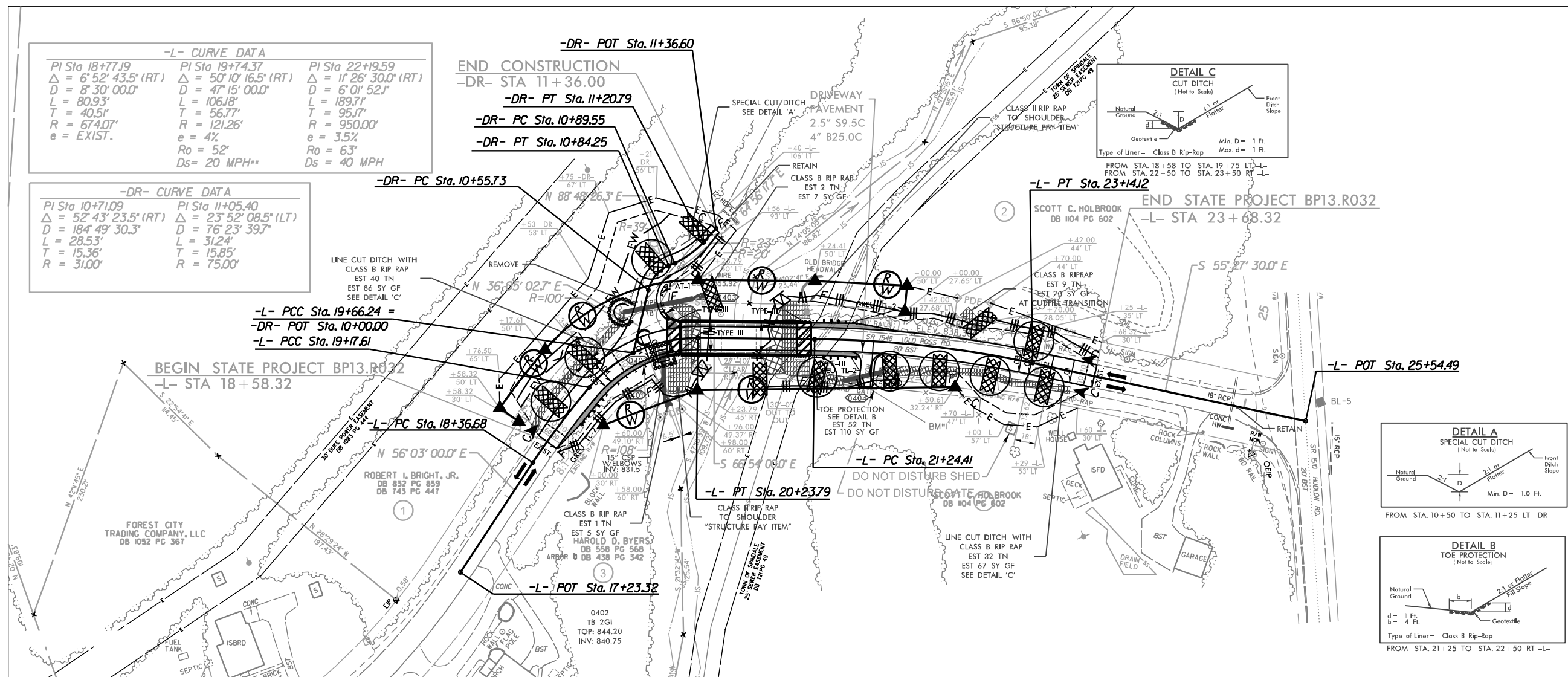
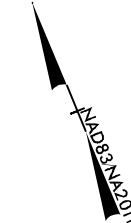


PAVEMENT REMOVAL
PAVED SHOULDER



PROJECT REFERENCE NO. BP13.R032	SHEET NO. EC-5/CONST.5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

EROSION CONTROL PLAN

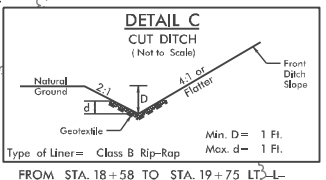
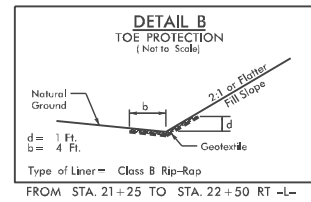
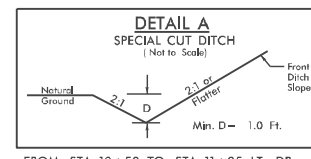


-L- CURVE DATA

PI Sta 18+77.79	PI Sta 19+74.37	PI Sta 22+19.59
$\Delta = 6^{\circ} 52' 43.5''$ (RT)	$\Delta = 50^{\circ} 10' 16.5''$ (RT)	$\Delta = 1^{\circ} 26' 30.0''$ (RT)
$D = 8^{\circ} 30' 00.0''$	$D = 47^{\circ} 15' 00.0''$	$D = 6^{\circ} 01' 52.1''$
$L = 80.93'$	$L = 106.18'$	$L = 189.71'$
$T = 40.51'$	$T = 56.77'$	$T = 95.17'$
$R = 674.07'$	$R = 121.26'$	$R = 950.00'$
$e = EXIST.$	$e = 4\%$	$e = 3.5\%$
	$R_o = 52'$	$R_o = 63'$
	$D_s = 20$ MPH**	$D_s = 40$ MPH

-DR- CURVE DATA

PI Sta 10+71.09	PI Sta 11+05.40
$\Delta = 52^{\circ} 43' 23.5''$ (RT)	$\Delta = 23^{\circ} 52' 08.5''$ (LT)
$D = 184^{\circ} 49' 30.3''$	$D = 76^{\circ} 23' 39.7''$
$L = 28.53'$	$L = 31.24'$
$T = 15.36'$	$T = 15.85'$
$R = 31.00'$	$R = 75.00'$



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

SIGNING PLAN RUTHERFORD COUNTY

LOCATION: REPLACE BRIDGE NO. 159 OVER HOLLANDS CREEK
ON SR 1548 (OLD ROSS RD)

ROADWAY STANDARD DRAWING

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

STD. NO.	TITLE
904.10	ORIENTATION OF GROUND MOUNTED SIGNS
904.20	SECONDARY SIGN MOUNTING
904.50	MOUNTING OF TYPE 'D', 'E' AND 'F' SIGNS ON 'U' CHANNEL POSTS

SUMMARY OF QUANTITIES

ITEM NO.		ITEM DESCRIPTION	QUANTITY	UNIT
DESC. NO.	SECT. NO.			
4072000000	903	SUPPORTS, 3 LB STEEL U-CHANNEL	182	L.F.
4102000000	904	SIGN ERECTION, TYPE E	13	EA.
4155000000	907	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	9	EA.

GENERAL NOTES

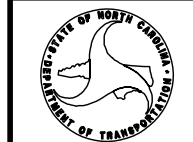
- . SIGNS FURNISHED BY STATE
- . CONFIRM IN WRITING AT LEAST 4 MONTHS IN ADVANCE, THE ACTUAL DATE THE DEPARTMENT FURNISHED SIGNS WILL BE REQUIRED.
- . ALL TYPE 'D' SIGNS SHALL BE MOUNTED ON TWO U-CHANNEL POSTS UNLESS OTHERWISE INDICATED ON THE PLANS.
- . IF REMOVAL OR RELOCATION OF SIGNS ON PRIVATE STREET (NON-STATE MAINTAINED) IS REQUIRED DUE TO CONSTRUCTION, THE CONTRACTOR SHALL INFORM THE ENGINEER. THE WORK WILL BE COMPLETED BY OTHERS.
- . WHEN NOT STATIONED OR DIMENSIONED ON PLANS, ALL 'E' AND 'F' SIGNS SHALL BE FIELD LOCATED BY THE ENGINEER
- . ALL EXISTING SIGNS ON "U" CHANNEL POST WITHIN THE PROJECT LIMITS SHALL BE REMOVED AND DISPOSED OF UNLESS OTHERWISE NOTED ON PLANS.
- . WHEN EXISTING SIGNS ARE REMOVED AND INSTALLED ON NEW SUPPORTS, THE RE-ERECTION SHALL IMMEDIATELY FOLLOW THE REMOVAL.
- . THE BACKGROUND FOR TYPE E & F SIGNS SHALL BE TYPE C REFLECTIVE SHEETING.
- . DO NOT BEGIN FABRICATION FOR TYPES A & B SIGNS MOUNTED ON OVERHEAD STRUCTURES OR STEEL SUPPORTS UNTIL "S" DIMENSIONS HAVE BEEN FIELD VERIFIED.
- . SEE ROADWAY PLANS FOR GUARD/GUIDE RAIL DETAILS.

INDEX

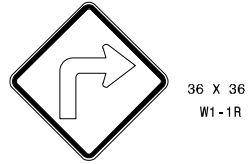
SHEET NO.	DESCRIPTION
SIGN-1	TITLE SHEET
SIGN-2	E SHEET
SIGN-3	SIGNING PLAN SHEET

PLAN PREPARED BY: N.C.D.O.T. SIGNING AND DELINEATION UNIT

Kelvin Jordan _____ SIGNING & DELINEATION REGIONAL ENGINEER
 Ashley Matthews, PE _____ SIGNING & DELINEATION PROJECT DESIGN ENGINEER



401 QUANTITY REQ'D 1



ONE "U" POST PER SIGN

406 QUANTITY REQ'D 1



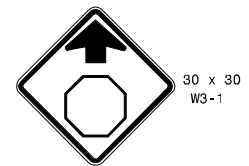
TWO "U" POSTS PER SIGN

402 QUANTITY REQ'D 2



MOUNT BELOW SIGNS 401 & 408
IN 2 INSTALLATIONS

407 QUANTITY REQ'D 1



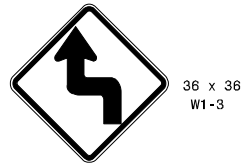
ONE "U" POST PER SIGN

403 QUANTITY REQ'D 2



ONE "U" POST PER SIGN

408 QUANTITY REQ'D 1



ONE "U" POST PER SIGN

404 QUANTITY REQ'D 2



ONE "U" POST PER SIGN

409 QUANTITY REQ'D 1



ONE "U" POST PER SIGN

405 QUANTITY REQ'D 1

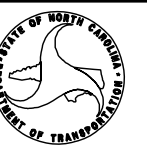
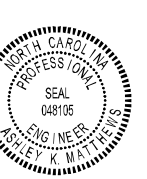


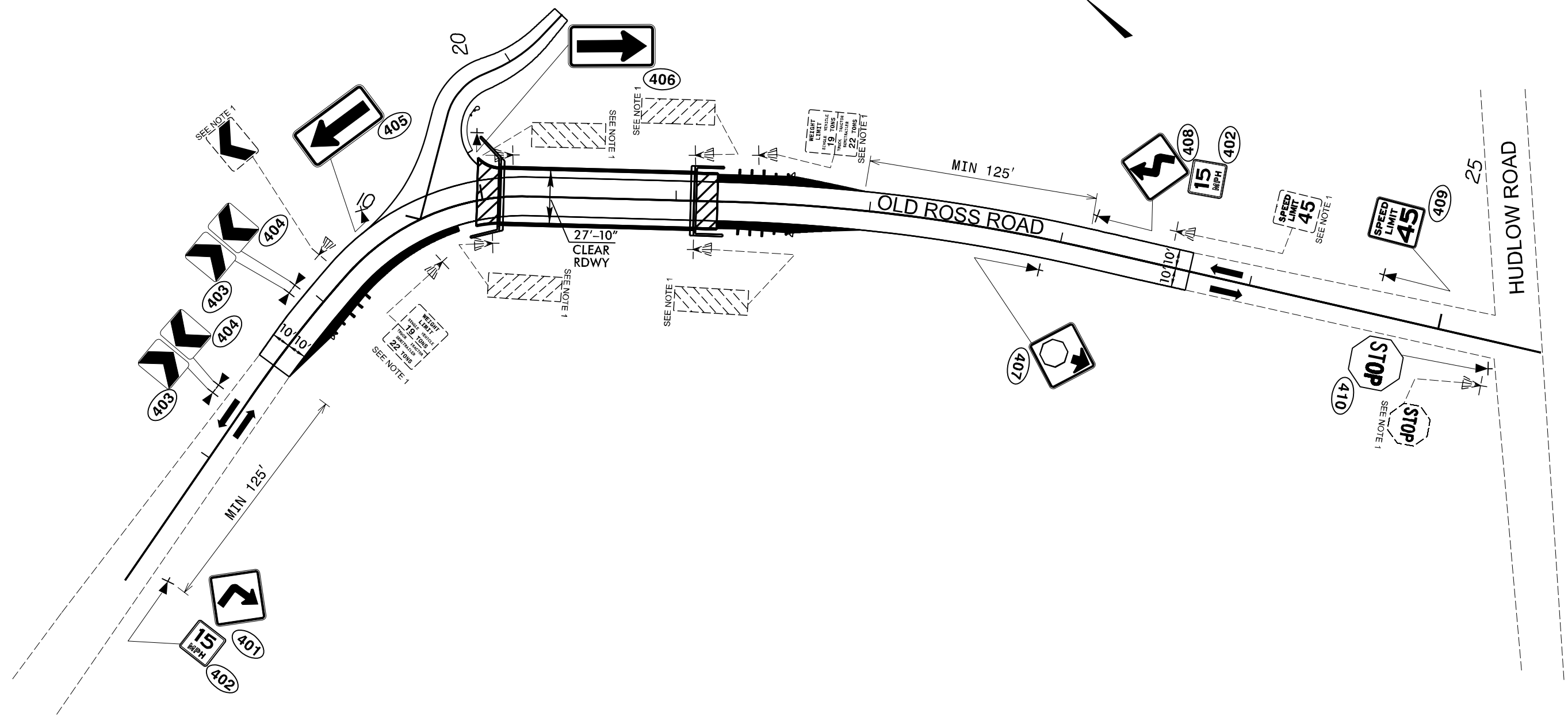
TWO "U" POSTS PER SIGN

410 QUANTITY REQ'D 1



ONE "U" POST PER SIGN





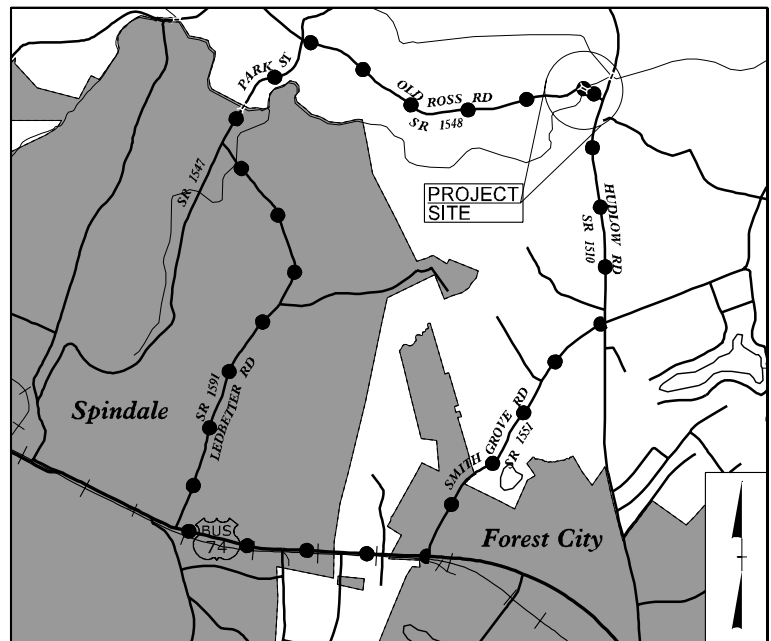
PROJECT NOTES

1 DISPOSAL OF SIGN SYSTEM, U-CHANNEL

09/08/99

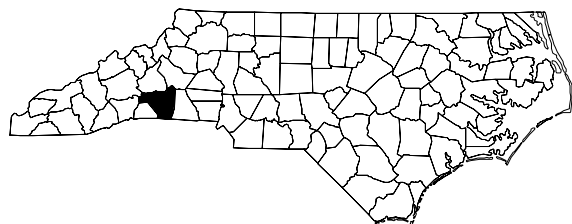
TIP PROJECT: BP13.R032

CONTRACT: DM00362



VICINITY MAP
NOT TO SCALE

●●● OFF-SITE DETOUR
■ CITY LIMITS



R/W PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

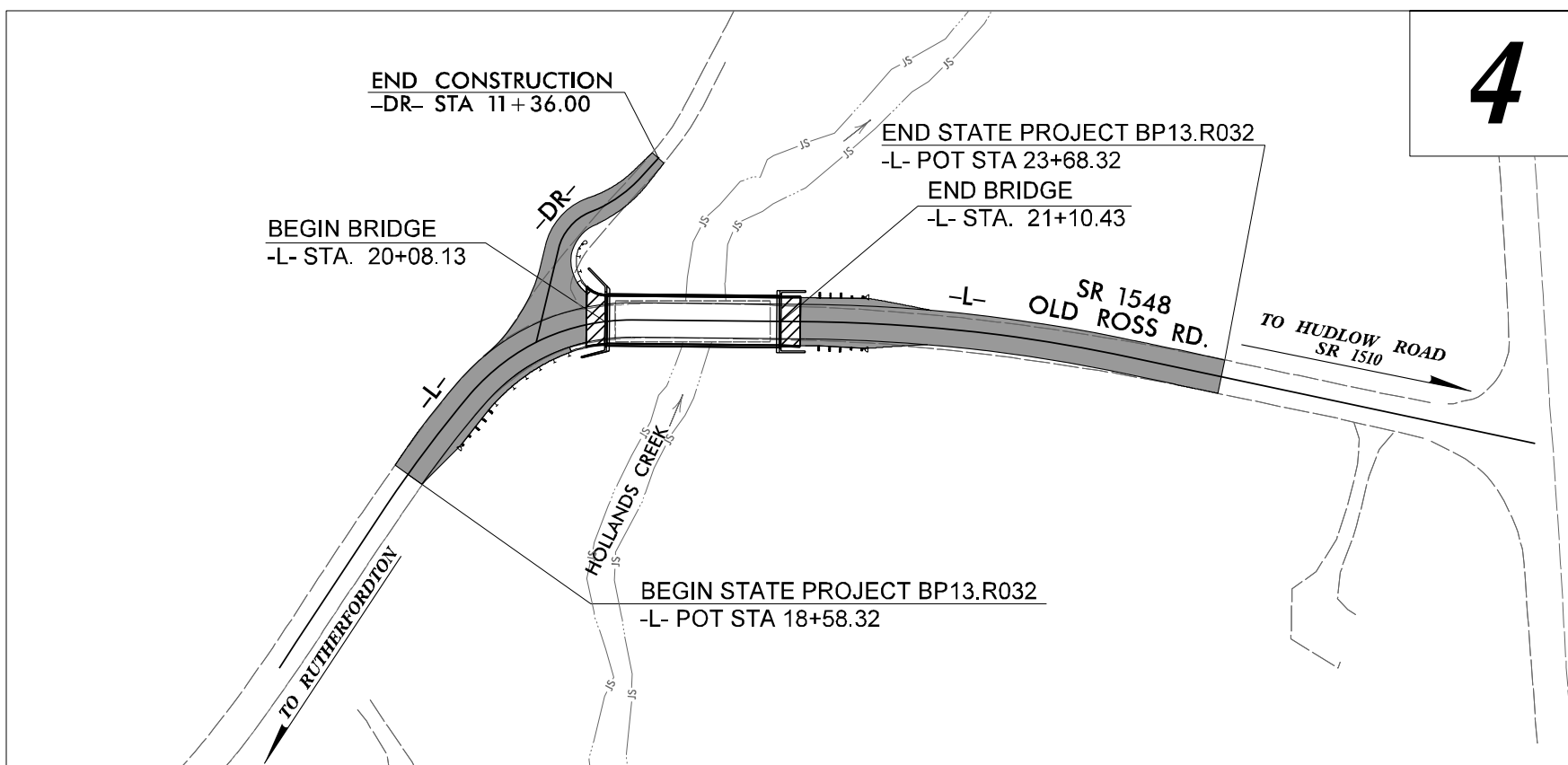
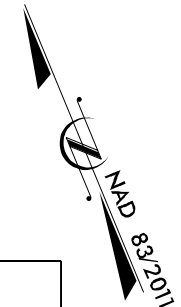
UTILITIES BY OTHERS PLANS
RUTHERFORD COUNTY

LOCATION: REPLACE BRIDGE NO. 159 OVER HOLLAND CREEK
ON SR 1548 (OLD ROSS RD)

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

T.I.P. NO.	SHEET NO.
BP13.R032	UO-1

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



GRAPHIC SCALES



INDEX OF SHEETS

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

UTILITY OWNERS WITH CONFLICTS

(A) COMMUNICATION - AT&T

PREPARED IN THE OFFICE OF:



WSP USA
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
FAX: 1.919.836.4099
LICENSE NO. F-0165

ROGER WORTHINGTON, PE UTILITY PROJECT MANAGER
BRANDT BROUGHTON, PE PROJECT UTILITY COORDINATOR



DIVISION OF HIGHWAYS
UTILITIES UNIT
1555 MAIL SERVICES CENTER
RALEIGH, NC 27699-1555
PHONE (919) 707-6690
FAX (919) 250-4151

R. KEITH RADCLIFF DIVISION SENIOR UTILITY COORDINATOR
JOHN D. METCALF DIVISION UTILITY COORDINATOR

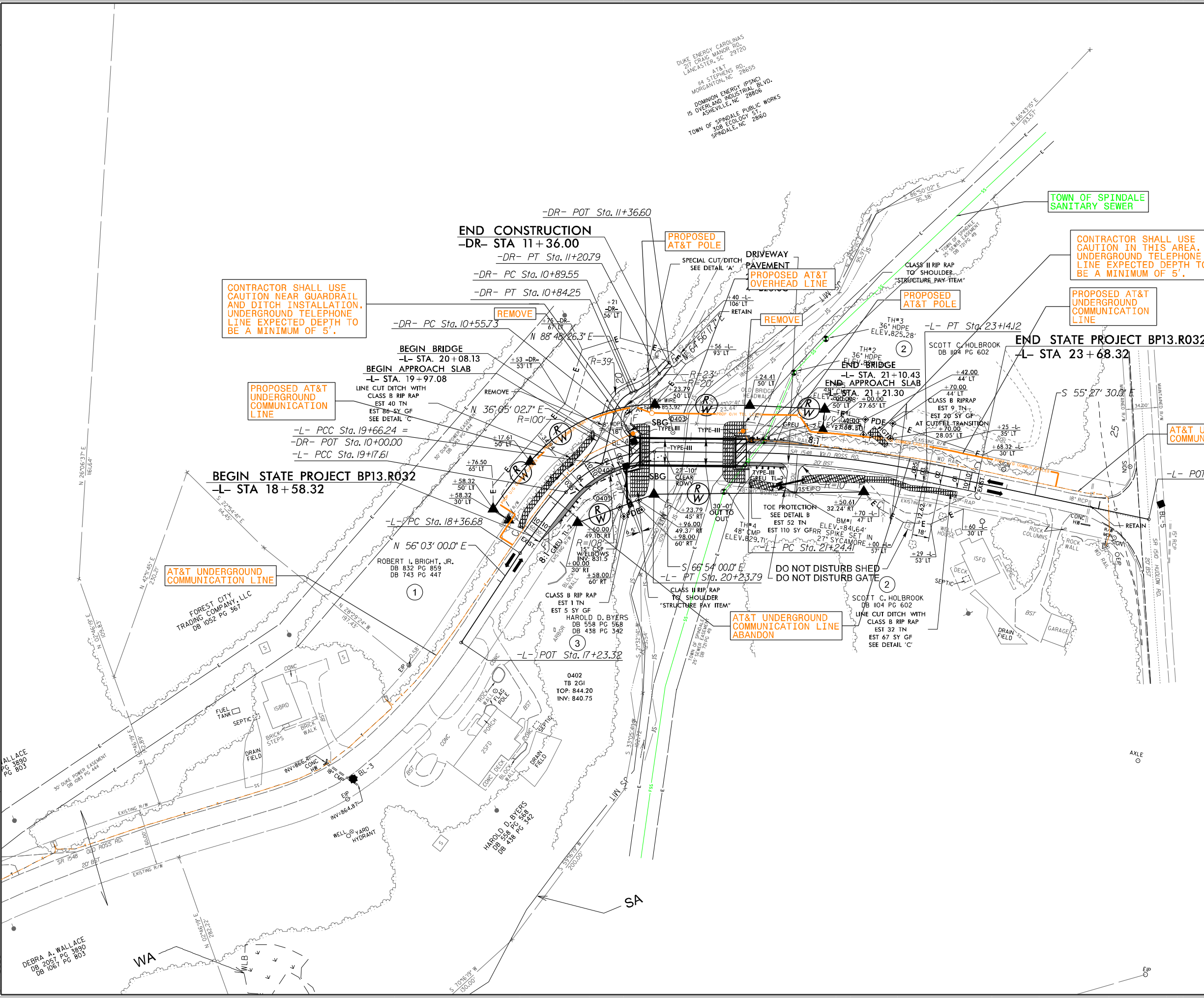
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3/20/2023

UTILITIES BY OTHERS

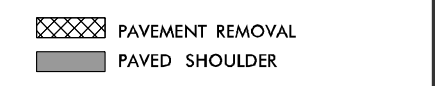
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 ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR PROPOSED UTILITY WORK SHOWN ON THIS SHEET.

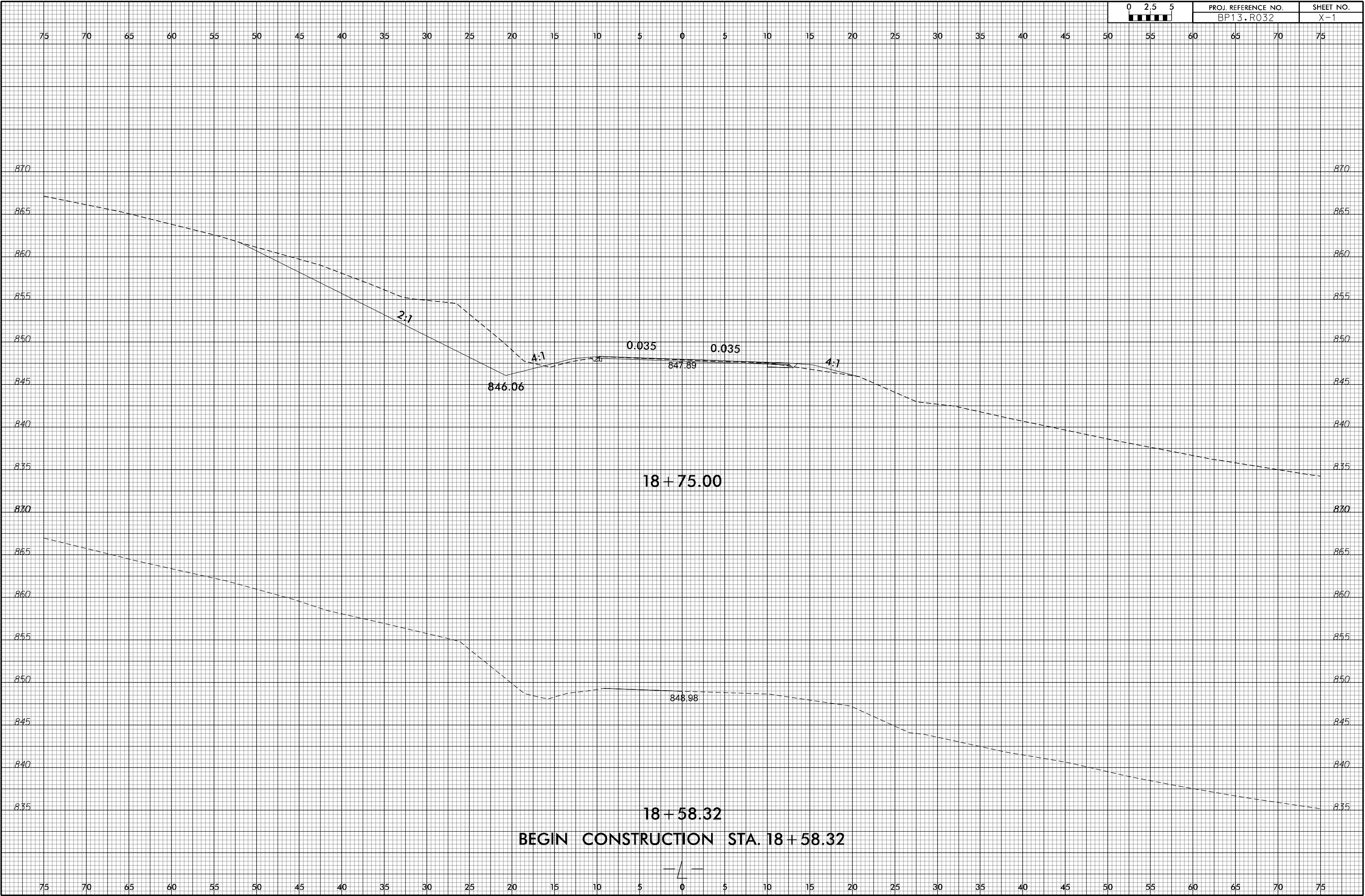


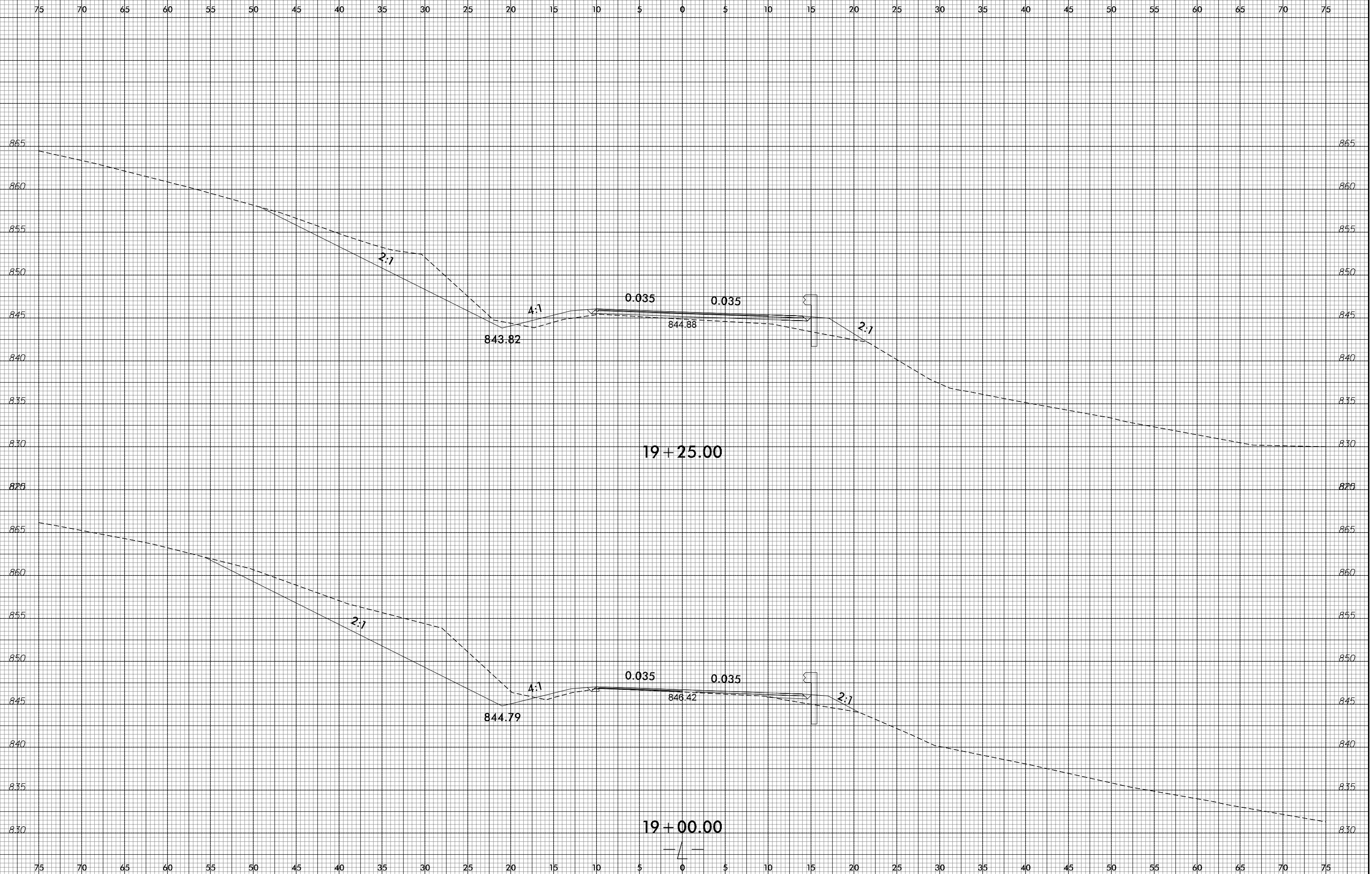
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 DEBRA A. WALLACE
 DB 2057 PG 3890
 DB 1067 PG 803

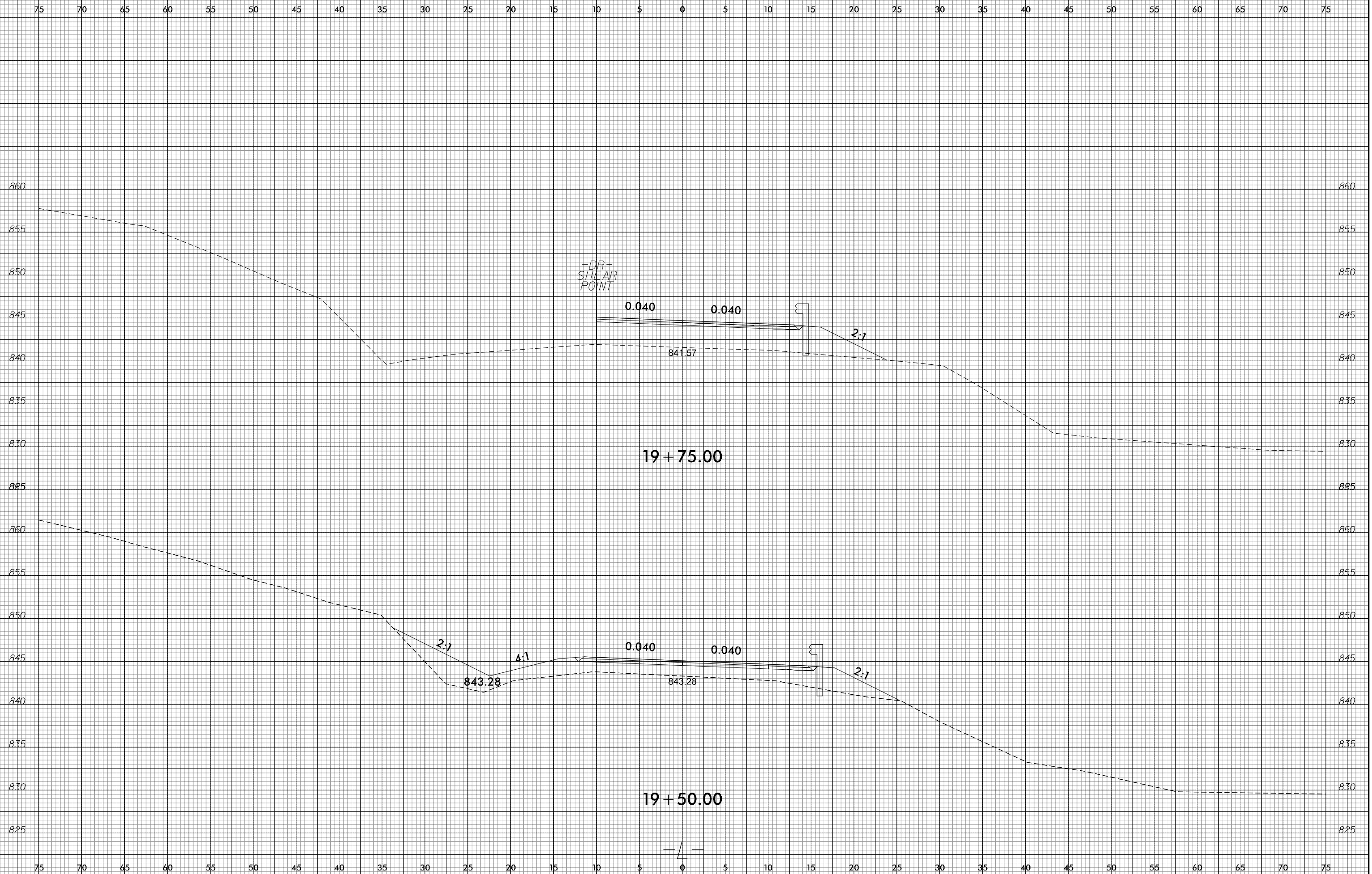


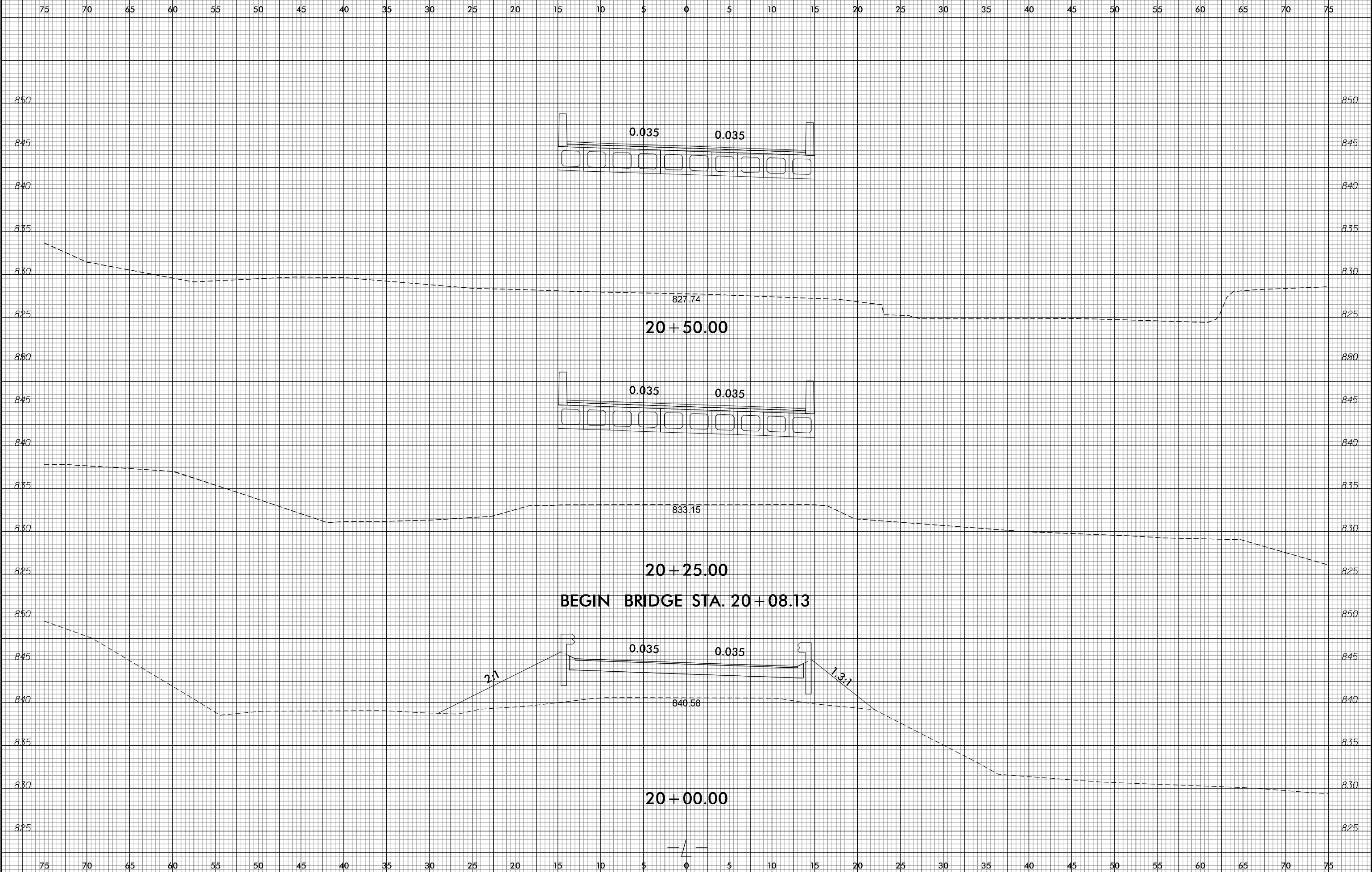
****NOTE: DESIGN EXCEPTION IS REQUIRED**

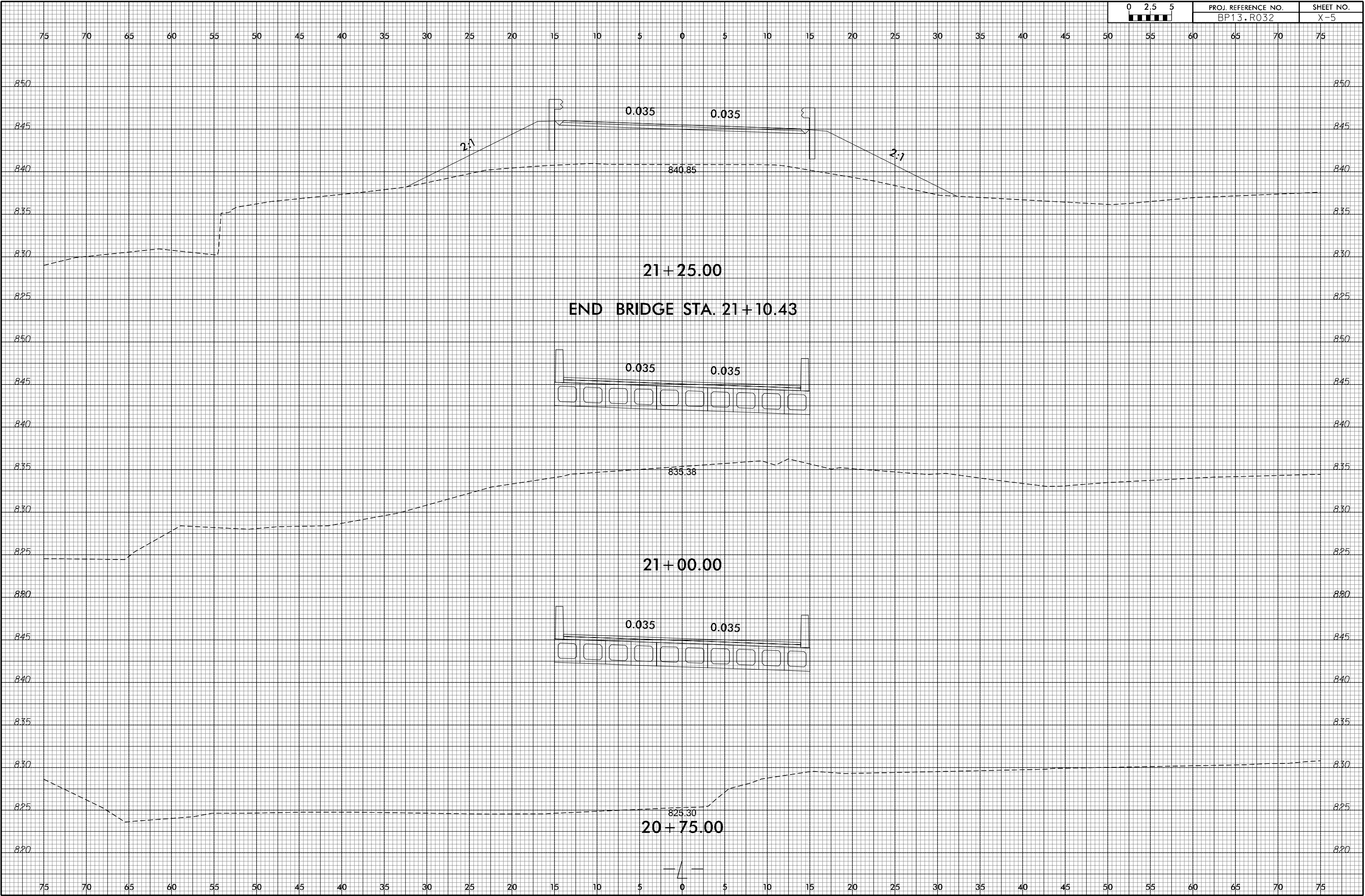


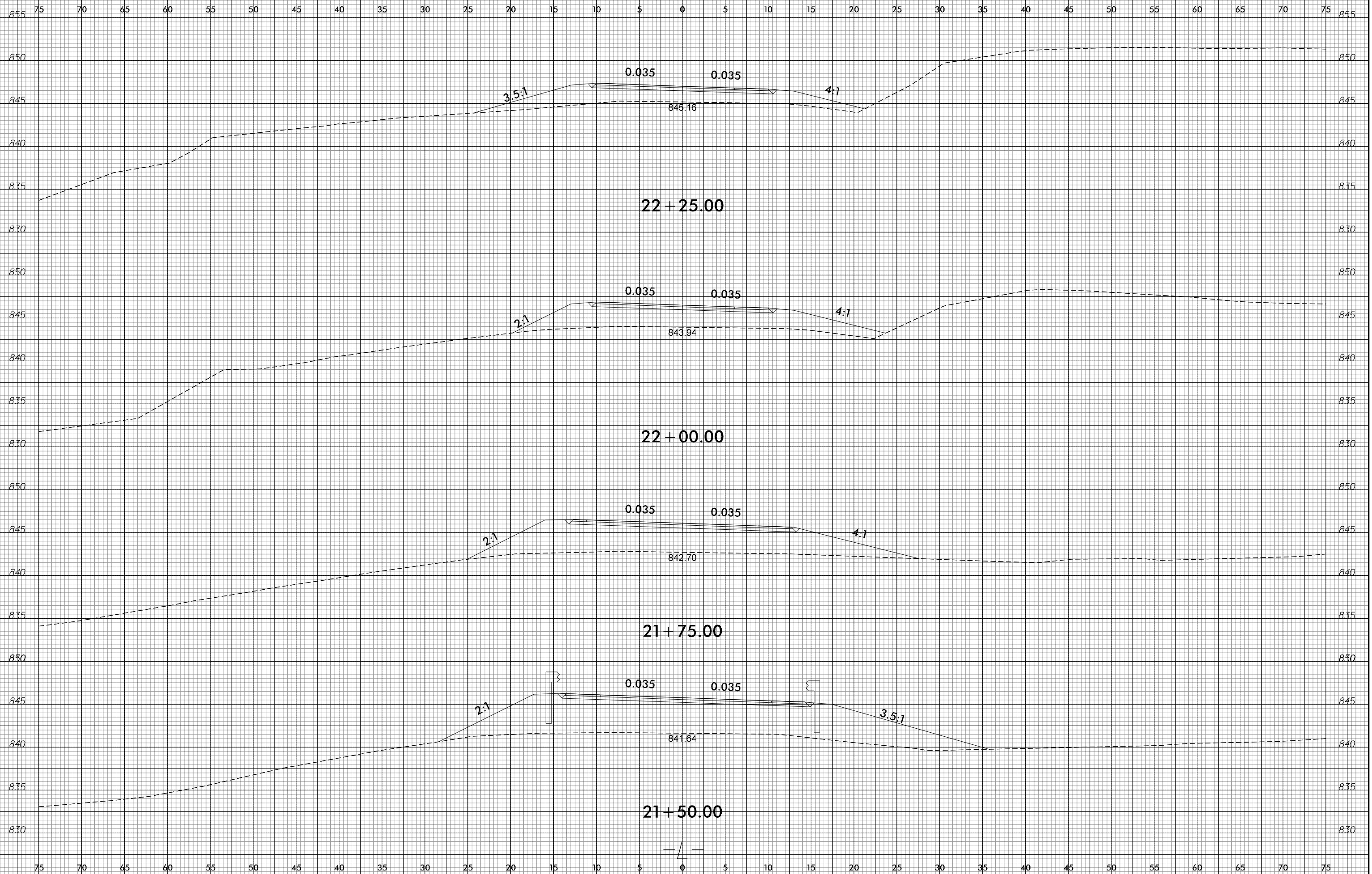










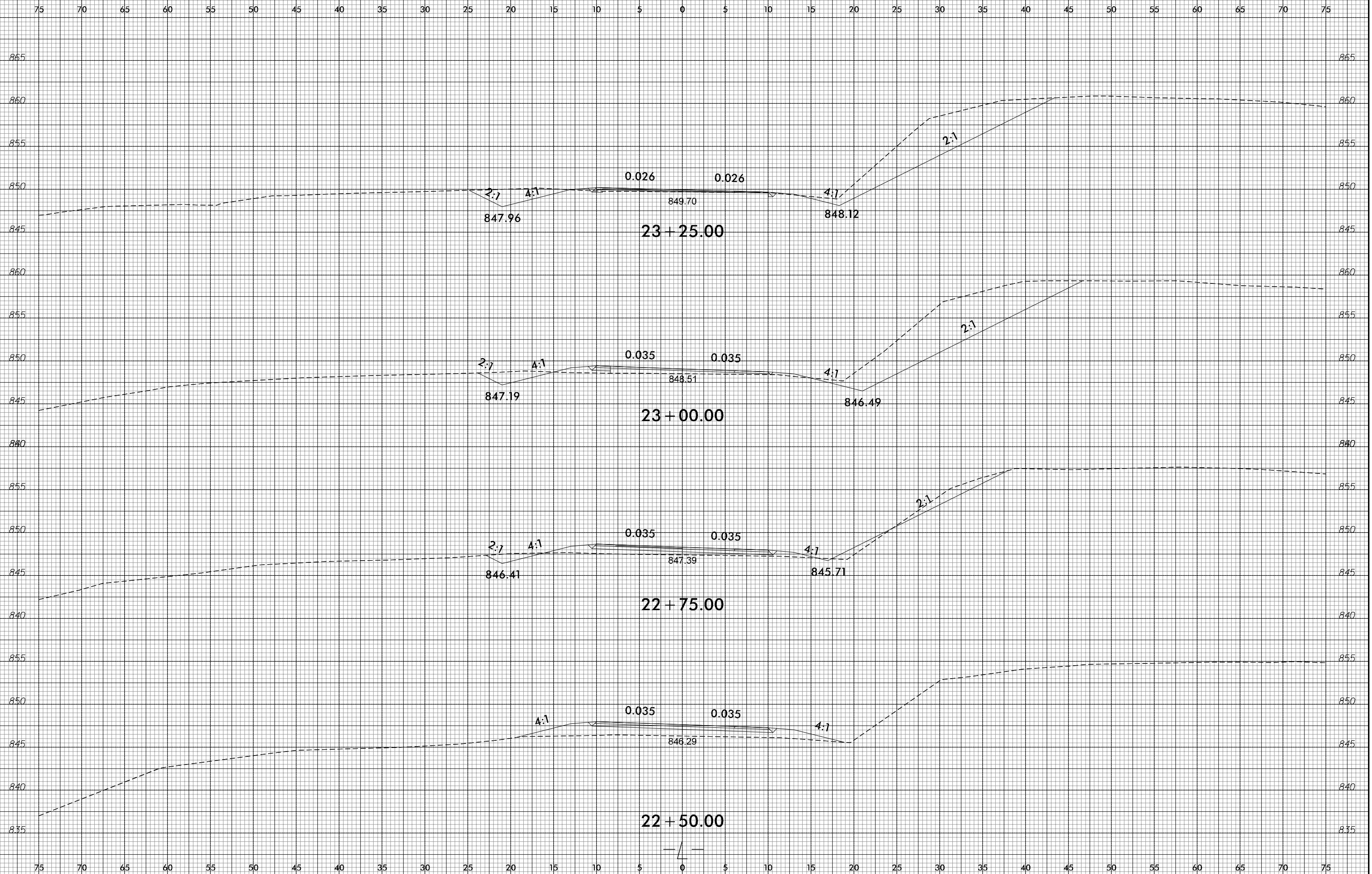


6/23/16

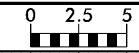


PROJ. REFERENCE NO.
BP13.R032

SHEET NO.
X-7

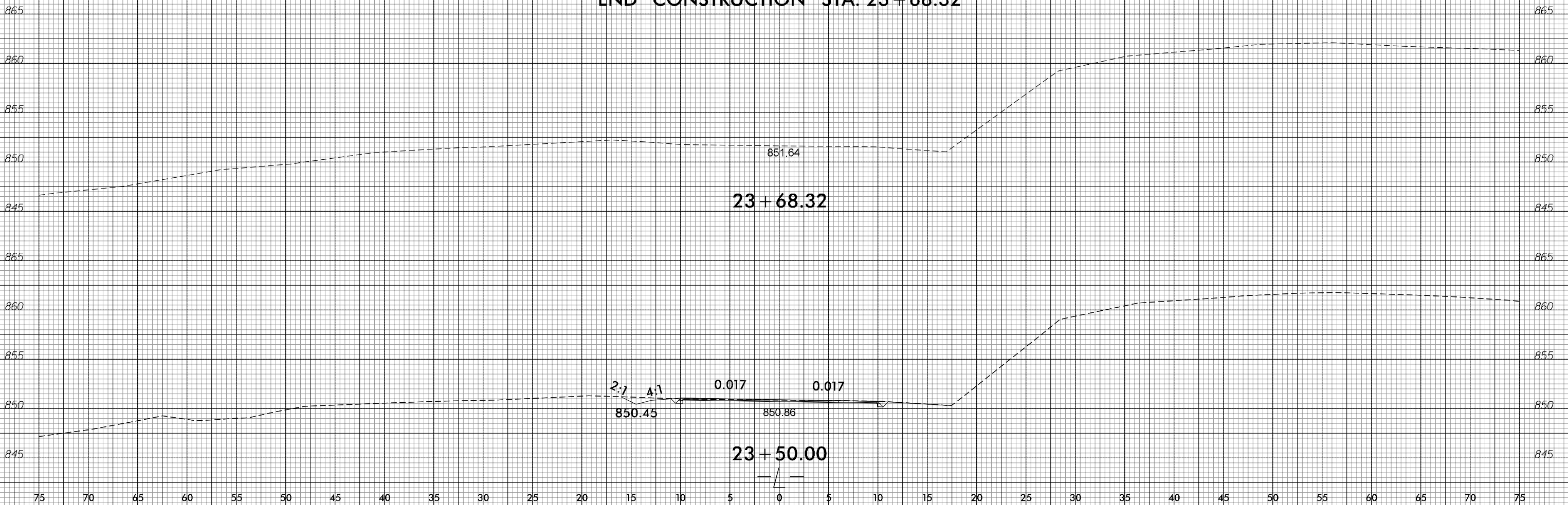


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5/22/17 2023

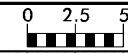


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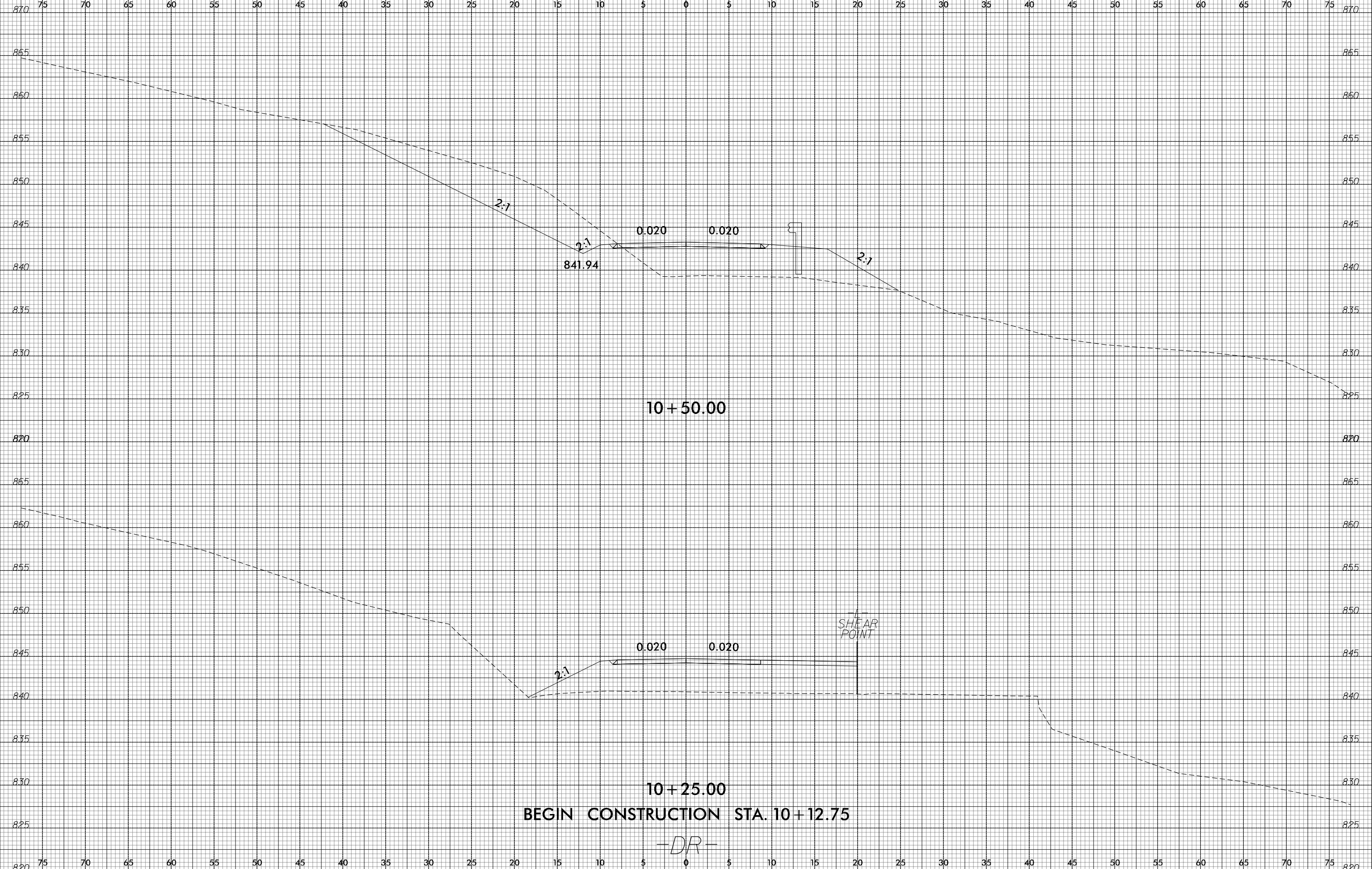
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6/23/16



PROJ. REFERENCE NO. BP13.R032	SHEET NO. X-9
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841.94

0.020 0.020

SHEAR POINT

0.020 0.020

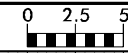
10+25.00

BEGIN CONSTRUCTION STA. 10+12.75

-DR-

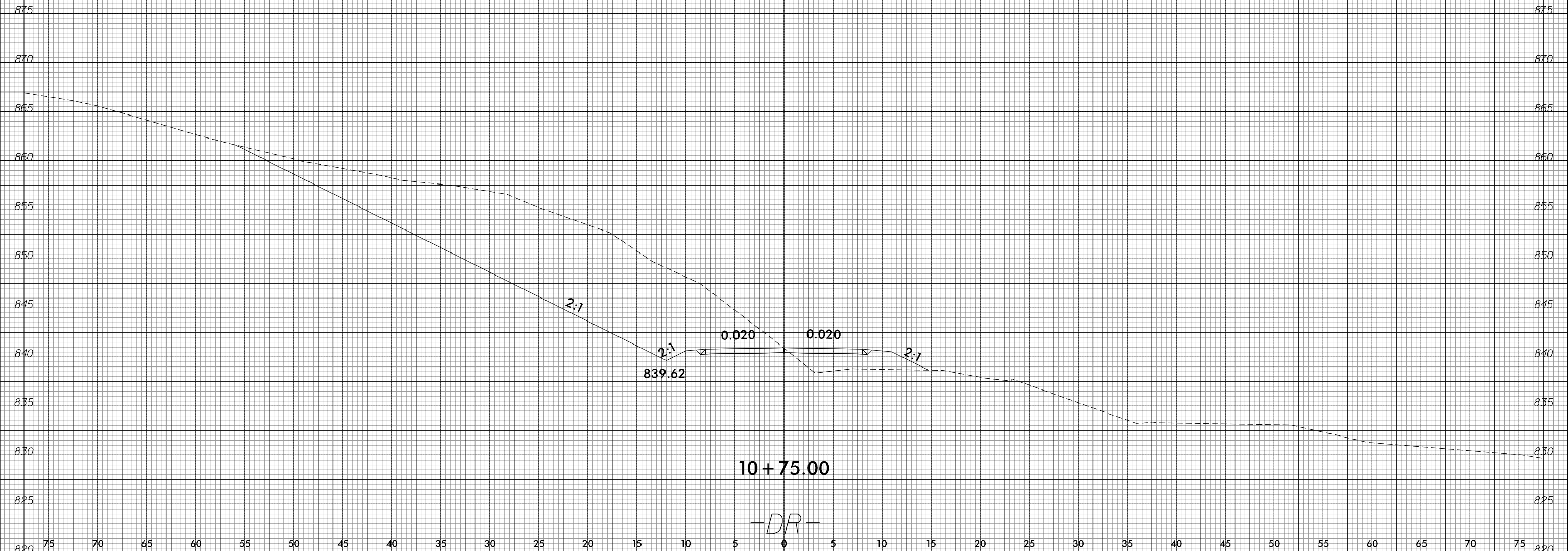
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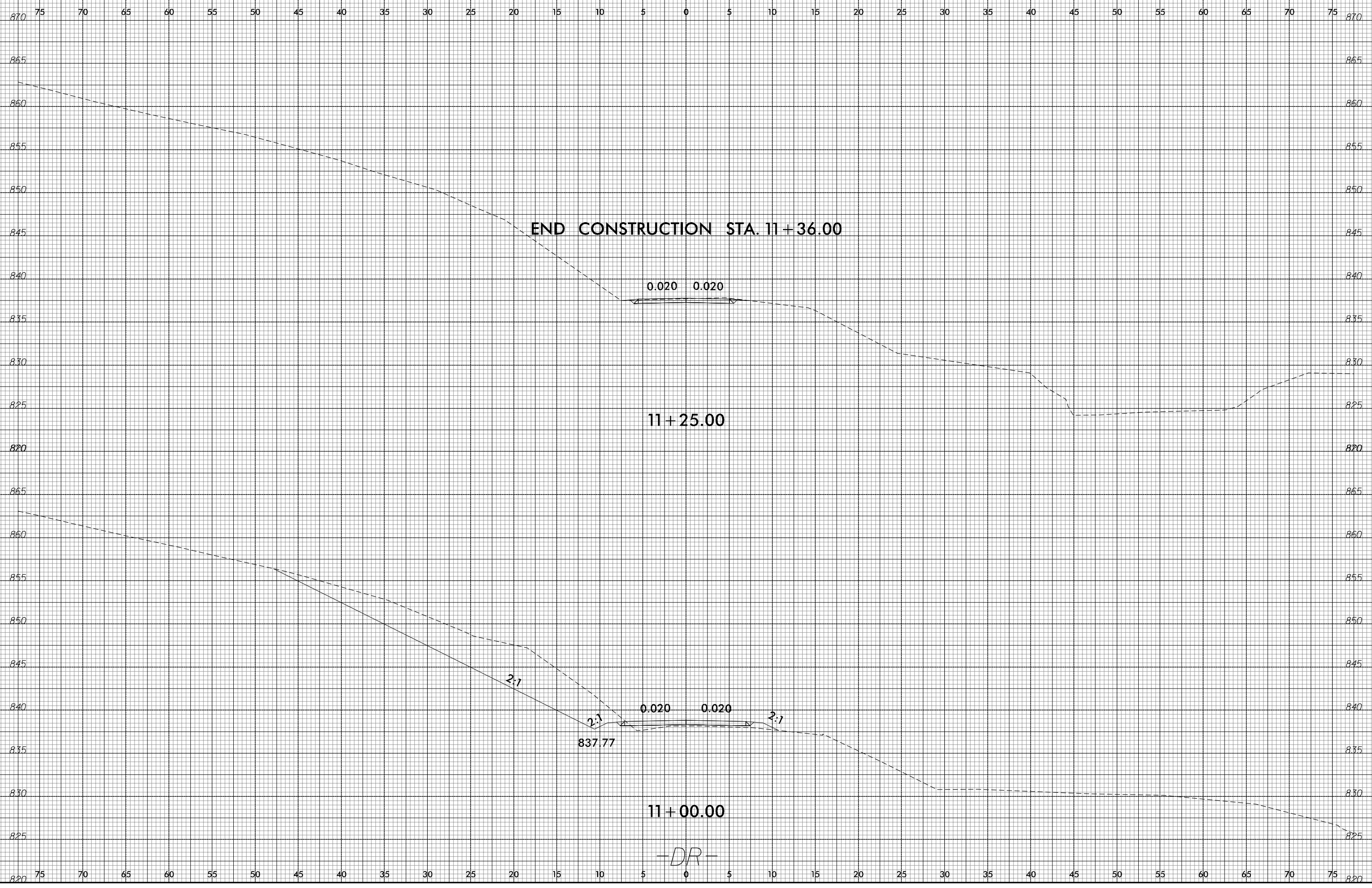


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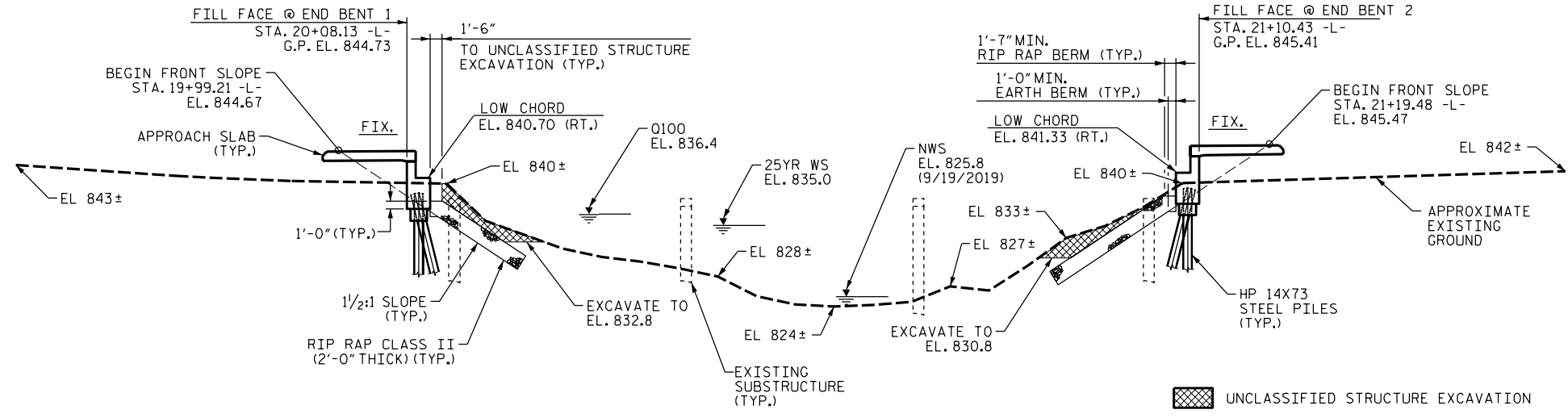


+50 20+00 +50 21+00 +50

(-).6.2777% Δ (+).0.6696%
 PI STA = 19+34.00 -L-
 EL = 844.23
 VC = 140'
 GRADE DATA -L-

(+).0.6696% Δ (+).4.1277%
 PI STA = 22+38.00 -L-
 EL = 846.26
 VC = 245'
 GRADE DATA -L-

SPAN A



HYDRAULIC DATA

DESIGN DISCHARGE	2100 CFS
FREQUENCY OF DESIGN FLOOD	25 YRS.
DESIGN HIGH WATER ELEVATION	835.0
DRAINAGE AREA	9.6 SQ.MI.
BASE DISCHARGE (Q100)	3000 CFS
BASE HIGH WATER ELEVATION	836.4

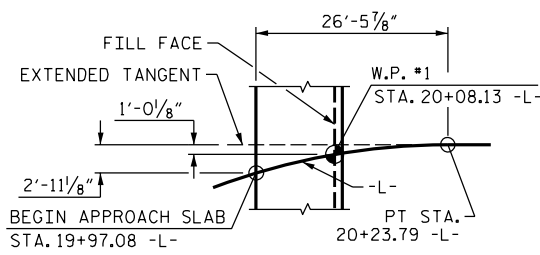
OVERTOPPING FLOOD DATA

OVERTOPPING FLOOD DISCHARGE	12000 CFS
FREQUENCY OF OVERTOPPING FLOOD	500+ YRS.
OVERTOPPING FLOOD ELEVATION	845.1
@ STA. 19+91.00 -L-	

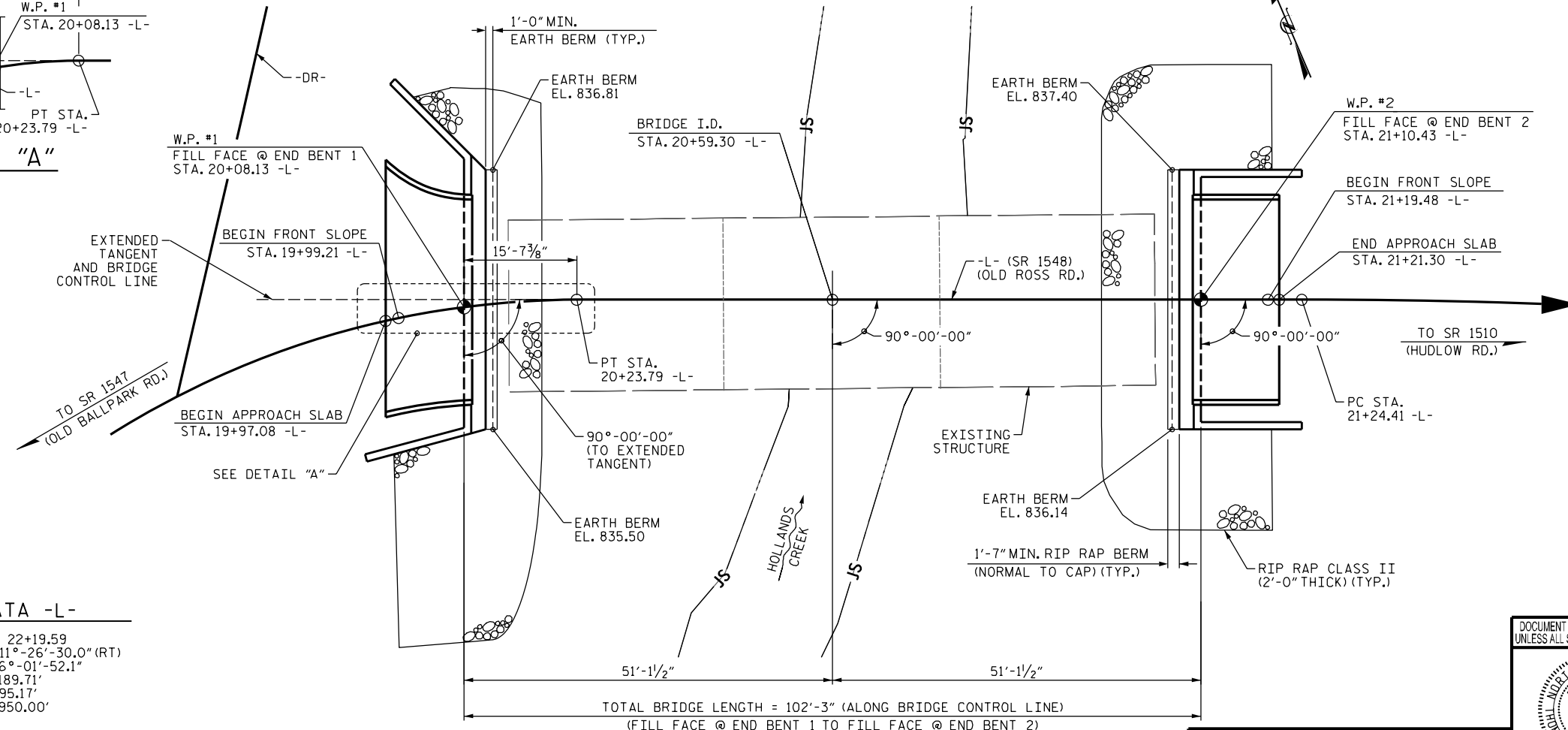
END BENT 1

END BENT 2

SECTION ALONG BRIDGE CONTROL LINE



DETAIL "A"



PLAN

(FOR CLARITY, PILES ARE NOT SHOWN IN PLAN VIEW)

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. BP13.R032
 RUTHERFORD COUNTY
 STATION: 20+59.30 -L-

SHEET 1 OF 4 REPLACES BRIDGE NO. 800159

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING
 FOR BRIDGE OVER HOLLANDS CREEK
 ON SR 1548 (OLD ROSS RD)
 BETWEEN SR 1547 & SR 1510

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			20

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

1/29/2024

wsp
 WSP USA Inc.
 454 FAYETTEVILLE STREET
 SUITE 1500
 RALEIGH, NC 27601
 TEL: 1.919.836.4040
 LICENSE NO. P-0165

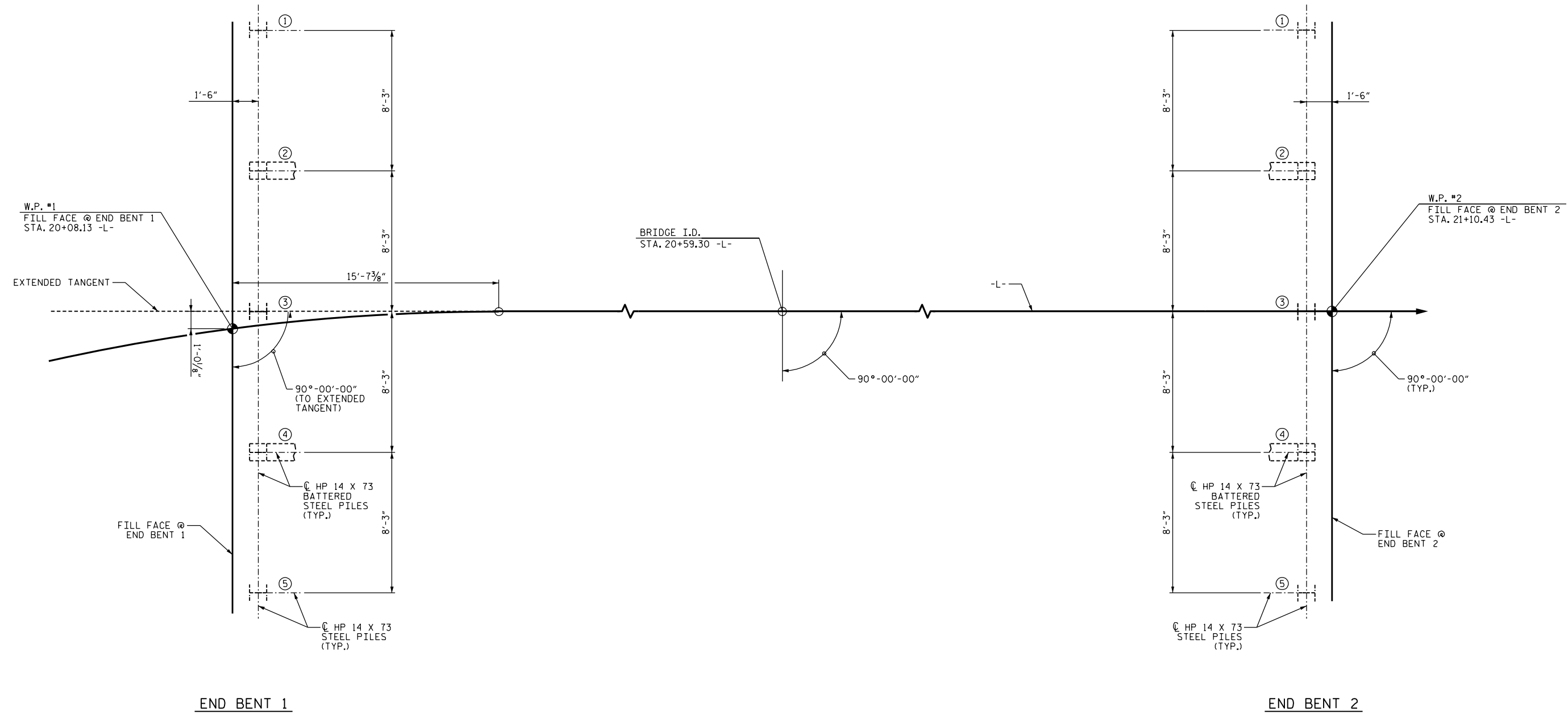
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DESIGNED BY: T. KIRSCHBAUM DATE: OCT 2022
 DRAWN BY: T. KIRSCHBAUM DATE: OCT 2022
 CHECKED BY: E. LAWES DATE: FEB 2023
 DESIGN ENGINEER OF RECORD: T. KIRSCHBAUM DATE: OCT 2023

HORIZ. CURVE DATA -L-

PI = 19+74.37	PI = 22+19.59
Δ = 50°-10'-16.5" (RT)	Δ = 11°-26'-30.0" (RT)
D = 47°-15'-00.0"	D = 6°-01'-52.1"
L = 106.18'	L = 189.71'
T = 56.77'	T = 95.17'
R = 121.26'	R = 950.00'

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FOUNDATION LAYOUT
 (DIMENSIONS LOCATING END BENT PILES
 ARE SHOWN TO THE CENTERLINE OF PILES)

NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
 PILES AT END BENTS No. 1 AND No. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 141 TONS PER PILE.
 DRIVE PILES AT END BENTS No. 1 AND No. 2 TO A REQUIRED DRIVING RESISTANCE OF 235 TONS PER PILE.

PROJECT NO. BP13.R032
RUTHERFORD COUNTY
 STATION: 20+59.30 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE OVER HOLLANDS CREEK
 ON SR 1548 (OLD ROSS RD)
 BETWEEN SR 1547 & SR 1510

DESIGNED BY: T. KIRSCHBAUM DATE: OCT 2022
 DRAWN BY: T. KIRSCHBAUM DATE: OCT 2022
 CHECKED BY: E. LAWES DATE: FEB 2023
 DESIGN ENGINEER OF RECORD: T. KIRSCHBAUM DATE: OCT 2023

wsp
 WSP USA Inc.
 454 FAYETTEVILLE STREET
 SUITE 1500
 RALEIGH, NC 27601
 TEL: 1.919.836.4040
 LICENSE NO. F-0165

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
 PROFESSIONAL SEAL
 042638
 ENGINEER
 T. KIRSCHBAUM

1/29/2024

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			20

SUMMARY OF PILE INFORMATION/INSTALLATION

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pile(s) #(-#) (e.g., "Bent 1, Piles 1-5")	Factored Resistance per Pile TONS	Pile Cut-Off (Top of Pile) Elevation FT	Estimated Pile Length per Pile FT	Scour Critical Elevation FT	Driven Piles			Predrilling for Piles*			Drilled-In Piles		
					Min Pile Tip (Tip No Higher Than) Elev FT	Required Driving Resistance (RDR)** per Pile TONS	Total Pile Redrives Quantity EACH	Predrilling Length per Pile Lin FT	Predrilling Elevation (Elev Not To Predrill Below) FT	Maximum Predrilling Dia INCHES	Pile Excavation (Bottom of Hole) Elev FT	Pile Exc Not In Soil per Pile Lin FT	Pile Exc In Soil per Pile Lin FT
End Bent No. 1, Piles 1-5	141	See Structure	25	NA		235							
End Bent No. 2, Piles 1-5	141	Drawings	25	NA		235							

*Predrilling for Piles is required for end bents/bents with a predrilling length and at the Contractor's option for end bents/bents with predrilling information but no predrilling length.

**RDR = $\frac{\text{Factored Resistance} + \text{Factored Downdrag Load} + \text{Factored Dead Load}}{\text{Dynamic Resistance Factor}} + \frac{\text{Nominal Downdrag Resistance} + \text{Nominal Scour Resistance}}{\text{Scour Resistance Factor}}$

SUMMARY OF PDA/PILE ORDER LENGTHS

(Blank entries indicate item is not applicable to structure)

Pile Driving Analyzer (PDA)				Pile Order Lengths	
End Bent/ Bent No	PDA Testing Required? YES or MAYBE	PDA Test Pile Length FT	Total PDA Testing Quantity EACH	End Bent/ Bent No(s)	Pile Order Length Basis* EST or PDA
			1		

*EST = Pile order lengths from estimated pile lengths; PDA = Pile order lengths based on PDA testing. For groups of end bents/bents with pile order lengths based on PDA testing, the first end bent/bent no. listed for each group is the representative end bent/bent with the PDA.

PILE DESIGN INFORMATION

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pile(s) #(-#) (e.g., "Bent 1, Piles 1-5")	Factored Axial Load per Pile TONS	Factored Downdrag Load per Pile TONS	Factored Dead Load* per Pile TONS	Dynamic Resistance Factor	Nominal Downdrag Resistance per Pile TONS	Nominal Scour Resistance per Pile TONS	Scour Resistance Factor (Default = 1.00)
End Bent No. 1, Piles 1-5	139			0.60			1.00
End Bent No. 2, Piles 1-5	139			0.60			1.00
							1.00
							1.00

*Factored Dead Load is factored weight of pile above the ground line.

SUMMARY OF PILE ACCESSORIES

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pile(s) #(-#) (e.g., "Bent 1, Piles 1-5")	Pipe Pile Plates Required? YES or MAYBE	Steel Pile Points			Steel Pile Tips Required? YES
		Pipe Pile Cutting Shoes Required? YES	Pipe Pile Conical Points Required? YES	H-Pile Points Required? YES	
End Bent No. 1				YES	
End Bent No. 2				YES	
TOTAL QTY:				10	

NOTES:


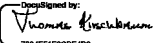
- The Pile Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer Shiping Yang, #031361 on 2/7/2023.
- Total Pile Driving Equipment Setup quantity (not shown in Pile Foundation Tables) equals the number of driven piles, i.e., the number of piles with a Required Driving Resistance.
- The Engineer will determine the need for PDA Testing and Pipe Pile Plates when PDAs or plates may be required.
- Any reference to "PDA Testing" shall be presumed to be updated to "Dynamic Pile Testing" per the updated 2024 Standard Provision.

PROJECT NO. BP13.R032.1

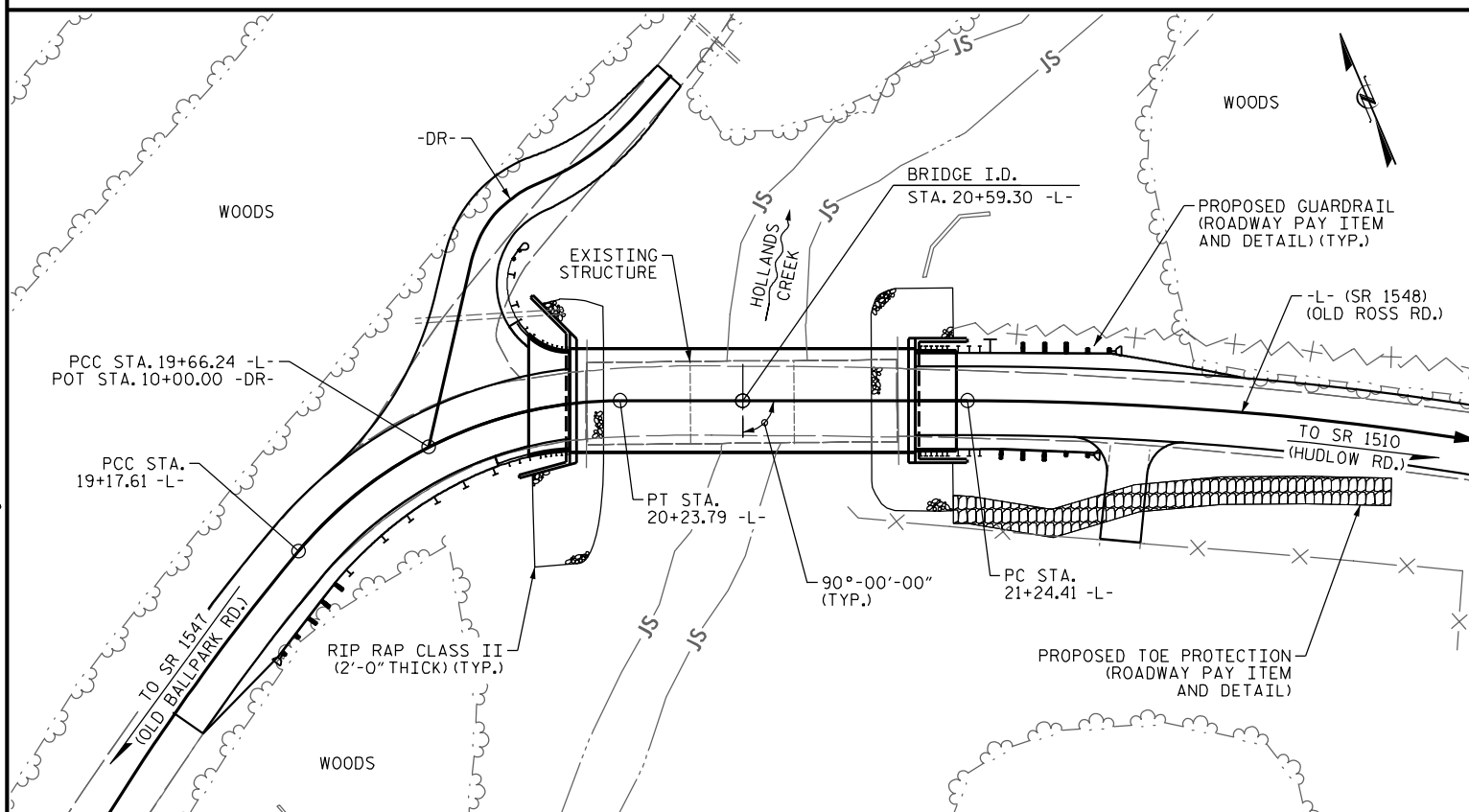
Rutherford COUNTY

STATION: 20+59 -L-

SHEET 3 OF 4 Bridge #159

 Designated by:  1/29/2024 SIGNATURE DATE	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH		PILE FOUNDATION TABLES	SHEET NO. S-3
	REVISIONS			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	NO. BY: DATE:	NO. BY: DATE:	NO. BY: DATE:	NO. BY: DATE:
	1 2	3 4		

BM #1: STA. 21+58.97 -L-, OFFSET 34.01' RT, ELEV. 841.64', RAILROAD SPIKE SET IN 27" SYCAMORE



LOCATION SKETCH
FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

NOTES

- ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
- THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
- THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- THE EXISTING PAVEMENT WITHIN THE AREA OF THE END BENT PILES SHALL BE REMOVED AND THE ROADBED SCARIFIED TO A MINIMUM DEPTH OF 2'-0".
- INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE".
- THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET S-1 SHALL BE EXCAVATED FOR A DISTANCE OF 28 FT. (LEFT) AND 24 FT. (RIGHT) OF CENTERLINE ROADWAY AT END BENT NO. 1 AND 31 FT. (LEFT) AND 31 FT. (RIGHT) OF CENTERLINE ROADWAY AT END BENT NO. 2 AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.
- THE EXISTING STRUCTURE CONSISTING OF THREE SPANS, TWO AT 30'-3" AND ONE AT 30'-0"; PRECAST PRESTRESSED CONCRETE CORED SLABS; 23'-11" CLEAR ROADWAY WIDTH WITH ASPHALT WEARING SURFACE ON END BENT AND INTERIOR BENT PILE CAPS AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.
- THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.
- REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.
- THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC-18 - EVALUATING SCOUR AT BRIDGES."
- ASPHALT WEARING SURFACE IS INCLUDED IN THE ROADWAY QUANTITY ON ROADWAY PLANS.
- FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.
- FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE @ STA. 20+59.30 -L-	ASBESTOS ASSESSMENT	DYNAMIC PILE TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS @ STA. 20+59.30 -L-	REINFORCING STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 14 x 73 STEEL PILES	HP 14 X 73 STEEL PILES	STEEL PILE POINTS	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 3'-3" PRESTRESSED CONCRETE BOX BEAMS		
	LUMP SUM	LUMP SUM	EACH	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	No.	No.	LIN. FT.	EA.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	No.	LIN. FT.
SUPERSTRUCTURE																	
END BENT 1				LUMP SUM	30.1	LUMP SUM	4,750	5	5	125	5	170	190		LUMP SUM	10	1,000
END BENT 2				LUMP SUM	29.1	LUMP SUM	4,404	5	5	125	5	180	200				
TOTAL	LUMP SUM	LUMP SUM	2	LUMP SUM	59.2	LUMP SUM	9,154	10	10	250	10	200.0	390	390	LUMP SUM	10	1,000

PROJECT NO. BP13.R032
RUTHERFORD COUNTY
 STATION: 20+59.30 -L-

SHEET 4 OF 4

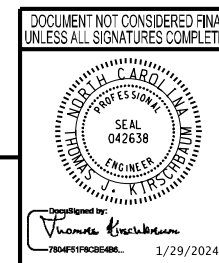
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE OVER HOLLANDS CREEK
 ON SR 1548 (OLD ROSS RD)
 BETWEEN SR 1547 & SR 1510

REVISIONS

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

SHEET NO.
S-4
 TOTAL SHEETS
20



DESIGNED BY: T. KIRSCHBAUM DATE: OCT 2022
 DRAWN BY: T. KIRSCHBAUM DATE: OCT 2022
 CHECKED BY: E. LAWES DATE: FEB 2023
 DESIGN ENGINEER OF RECORD: T. KIRSCHBAUM DATE: OCT 2023

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LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS

LOAD TYPE	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE								SERVICE III LIMIT STATE								COMMENT NUMBER		
						MOMENT				SHEAR				MOMENT										
						LIVE-LOAD FACTORS (γLL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γLL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION		DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD	HL-93 (INVENTORY)	N/A	①	1.035	--	1.75	0.272	1.26	100'	EL	49.25	0.489	1.34	100'	EL	4.925	0.80	0.272	1.04	100'	EL	49.25		
	HL-93 (OPERATING)	N/A		1.633	--	1.35	0.272	1.63	100'	EL	49.25	0.489	1.73	100'	EL	4.925	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	②	1.440	51.840	1.75	0.272	1.75	100'	EL	49.25	0.489	1.81	100'	EL	4.925	0.80	0.272	1.44	100'	EL	49.25		
	HS-20 (OPERATING)	36.000		2.271	81.756	1.35	0.272	2.27	100'	EL	49.25	0.489	2.35	100'	EL	4.925	N/A	--	--	--	--	--		
LEGAL LOAD	SINGLE VEHICLE (SV)	SNSH		3.413	46.079	1.4	0.272	5.19	100'	EL	49.25	0.489	5.59	100'	EL	4.925	0.80	0.272	3.41	100'	EL	49.25		
		SNGARBS2	20.000		2.473	49.452	1.4	0.272	3.76	100'	EL	49.25	0.489	3.91	100'	EL	4.925	0.80	0.272	2.47	100'	EL	49.25	
		SNAGRIS2	22.000		2.313	50.885	1.4	0.272	3.52	100'	EL	49.25	0.489	3.60	100'	EL	4.925	0.80	0.272	2.31	100'	EL	49.25	
		SNCOTTS3	27.250		1.696	46.228	1.4	0.272	2.58	100'	EL	49.25	0.489	2.78	100'	EL	4.925	0.80	0.272	1.70	100'	EL	49.25	
		SNAGGRS4	34.925		1.390	48.556	1.4	0.272	2.11	100'	EL	49.25	0.489	2.26	100'	EL	4.925	0.80	0.272	1.39	100'	EL	49.25	
		SNS5A	35.550		1.361	48.398	1.4	0.272	2.07	100'	EL	49.25	0.489	2.27	100'	EL	4.925	0.80	0.272	1.36	100'	EL	49.25	
		SNS6A	39.950		1.238	49.456	1.4	0.272	1.88	100'	EL	49.25	0.489	2.05	100'	EL	4.925	0.80	0.272	1.24	100'	EL	49.25	
	SNS7B	42.000		1.178	49.496	1.4	0.272	1.79	100'	EL	49.25	0.489	2.00	100'	EL	4.925	0.80	0.272	1.18	100'	EL	49.25		
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.506	49.709	1.4	0.272	2.29	100'	EL	49.25	0.489	2.46	100'	EL	4.925	0.80	0.272	1.51	100'	EL	49.25	
		TNT4A	33.075		1.510	49.942	1.4	0.272	2.30	100'	EL	49.25	0.489	2.41	100'	EL	4.925	0.80	0.272	1.51	100'	EL	49.25	
		TNT6A	41.600		1.224	50.926	1.4	0.272	1.86	100'	EL	49.25	0.489	2.09	100'	EL	4.925	0.80	0.272	1.22	100'	EL	49.25	
		TNT7A	42.000		1.225	51.442	1.4	0.272	1.86	100'	EL	49.25	0.489	2.05	100'	EL	4.925	0.80	0.272	1.22	100'	EL	49.25	
		TNT7B	42.000		1.254	52.657	1.4	0.272	1.91	100'	EL	49.25	0.489	1.96	100'	EL	4.925	0.80	0.272	1.25	100'	EL	49.25	
		TNAGRIT4	43.000		1.203	51.711	1.4	0.272	1.83	100'	EL	49.25	0.489	1.91	100'	EL	4.925	0.80	0.272	1.20	100'	EL	49.25	
TNAGT5A		45.000		1.139	51.236	1.4	0.272	1.73	100'	EL	49.25	0.489	1.87	100'	EL	4.925	0.80	0.272	1.14	100'	EL	49.25		
TNAGT5B	45.000		③	1.129	50.805	1.4	0.272	1.72	100'	EL	49.25	0.489	1.82	100'	EL	4.925	0.80	0.272	1.13	100'	EL	49.25		
EMERGENCY VEHICLE (EV)	EV2	28.750		2.129	61.213	1.3	0.272	2.87	100'	EL	49.25	0.489	3.06	100'	EL	4.925	0.80	0.272	2.13	100'	EL	49.25		
	EV3	43.000		④	1.403	60.325	1.3	0.272	1.89	100'	EL	49.25	0.489	2.06	100'	EL	4.925	0.80	0.272	1.40	100'	EL	49.25	

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γDC	γDW
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

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

CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

② DESIGN LOAD RATING (HS-20)

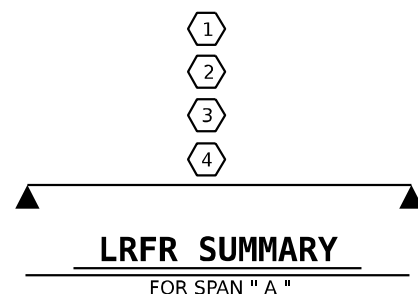
③ LEGAL LOAD RATING **

④ EMERGENCY VEHICLE LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

I - INTERIOR GIRDER
EL - EXTERIOR LEFT GIRDER
ER - EXTERIOR RIGHT GIRDER



PROJECT NO. BP13.R032
RUTHERFORD COUNTY
 STATION: 20+59.30 -L-

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ASSEMBLED BY: T.KIRSCHBAUM DATE: OCT 2022
 CHECKED BY: E.LAWES DATE: FEB 2023
 DESIGN ENGINEER OF RECORD: T.KIRSCHBAUM DATE: OCT 2023

DRAWN BY: TMG II/II
 CHECKED BY: AAC II/II

REV. 06/23 AKP/AAI

wsp

WSP USA Inc.
 434 FAYETTEVILLE STREET
 SUITE 1500
 RALEIGH, NC 27601
 TEL: 1.919.836.4040
 LICENSE NO. F-0165

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

DESIGNED BY: Thomas Kirschbaum
 DATE: 1/29/2024

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
**LRFR SUMMARY FOR
 100' BOX BEAM UNIT
 90° SKEW**
 (NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-5
2			4			TOTAL SHEETS 20

STD. NO. 39LRFR1_90S_100L

NOTES

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL REINFORCING STEEL CAST WITH THE BOX BEAM SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE BOX BEAMS.

FLAME CUTTING OF THE TRANSVERSE POST-TENSIONING STRAND IS NOT ALLOWED.

RECESSES FOR TRANSVERSE STRANDS SHALL BE GROUTED AFTER THE TENSIONING OF THE STRANDS.

THE 2 1/2" Ø DOWEL HOLES AT FIXED ENDS OF BOX BEAM SECTIONS SHALL BE FILLED WITH NON-SHRINK GROUT.

THE BACKER RODS SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE BOX BEAM UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 5,500 PSI.

ALL REINFORCING STEEL IN VERTICAL CONCRETE BARRIER RAILS SHALL BE EPOXY COATED.

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE BOX BEAM UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO BOX BEAM UNIT ENDS.

VERTICAL GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A VERTICAL CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

THE LOCATION OF THE VOID DRAINS MAY BE SHIFTED SLIGHTLY WHERE NECESSARY TO CLEAR PRESTRESSING STRANDS OR TRANSVERSE REINFORCING STEEL.

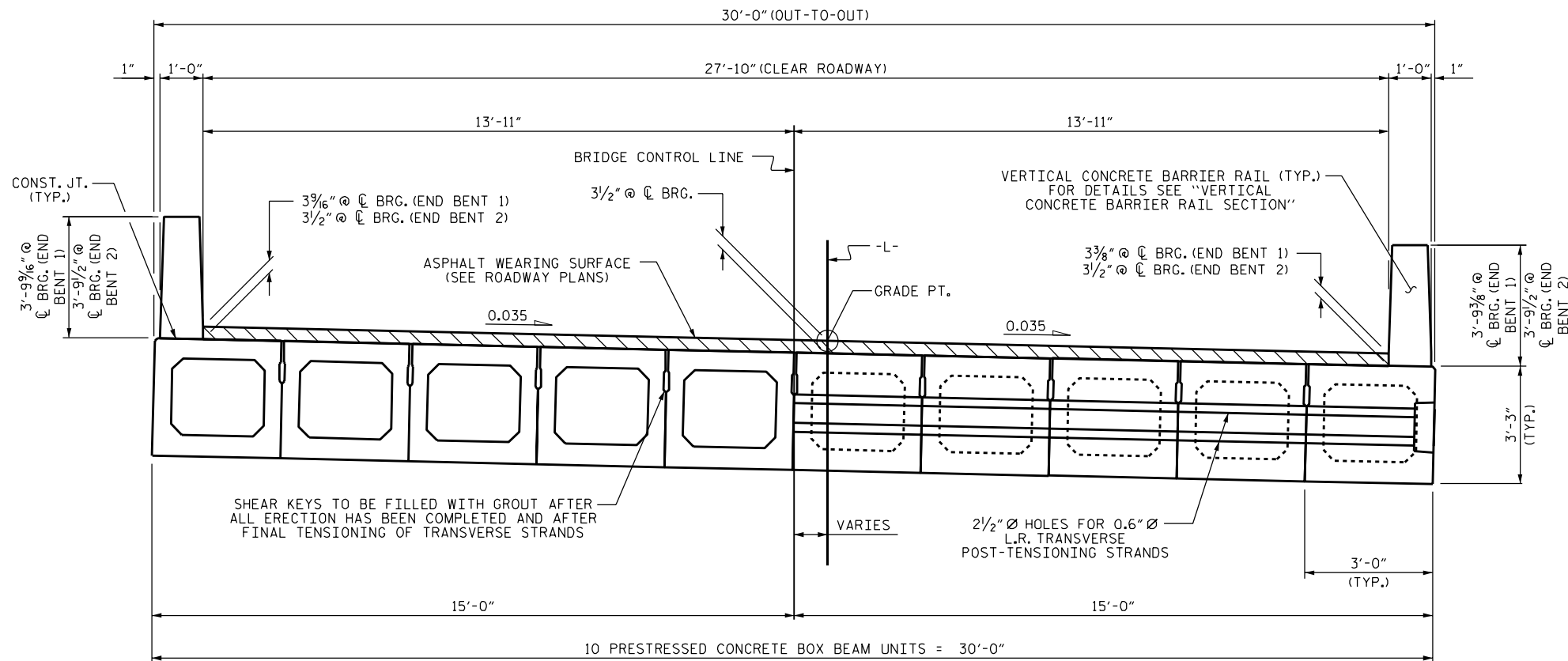
FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE PERMITTED THREADED INSERTS ARE DETAILED AS AN OPTION FOR THE CONTRACTOR TO ATTACH FALSEWORK AND FORMWORK DURING CONSTRUCTION.

THE PERMITTED THREADED INSERTS IN THE EXTERIOR UNITS SHALL BE SIZED BY THE CONTRACTOR, SPACED AT 4'-0" CENTERS AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS. STAINLESS STEEL THREADED INSERTS MAY BE USED AS AN ALTERNATE.

THE PERMITTED THREADED INSERTS SHALL BE GROUTED BY THE CONTRACTOR IMMEDIATELY FOLLOWING REMOVAL OF THE FALSEWORK.

THE COST OF THE PERMITTED THREADED INSERTS SHALL BE INCLUDED IN THE PRICE BID FOR THE PRECAST UNITS.



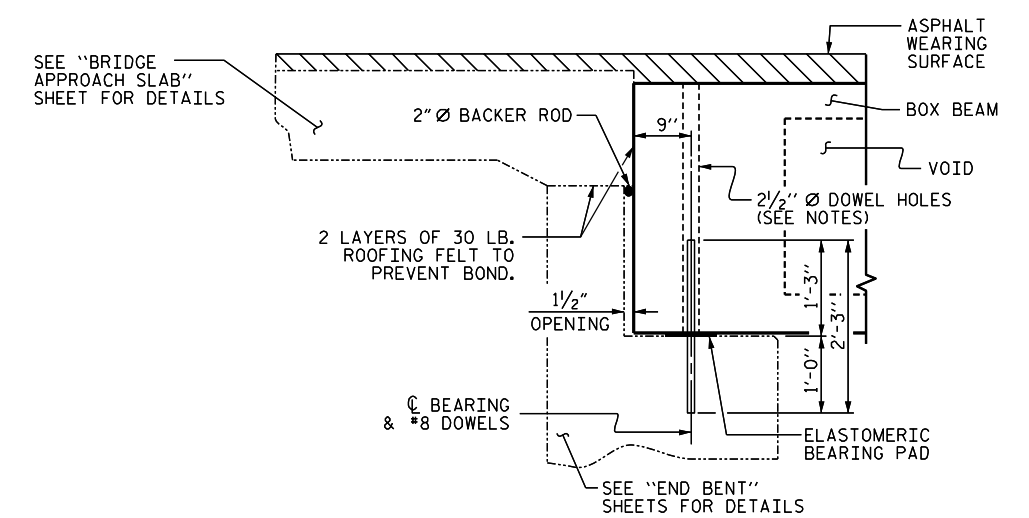
HALF SECTION THROUGH VOIDS

HALF SECTION AT INTERMEDIATE DIAPHRAGMS

TYPICAL SECTION

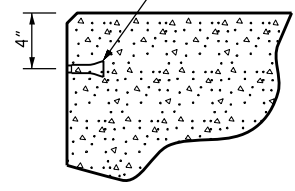
THE MAXIMUM BARRIER RAIL HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE BARRIER RAIL AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE BARRIER RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR RAIL HEIGHT DETAILS AND ASPHALT THICKNESS, SEE THE "VERTICAL CONCRETE BARRIER RAIL SECTION" DETAIL.

FIXED END



SECTION AT END BENT

PERMITTED THREADED INSERT CAST IN OUTSIDE FACE OF EXTERIOR UNIT AND RECESSED 3/8" SIZE TO BE DETERMINED BY CONTRACTOR.



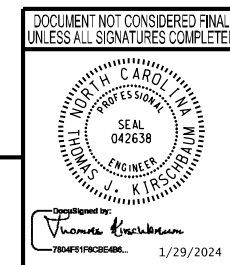
THREADED INSERT DETAIL

PROJECT NO. BP13.R032
RUTHERFORD COUNTY
 STATION: 20+59.30 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 3'-0" X 3'-3"
 PRESTRESSED CONCRETE
 BOX BEAM UNIT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			20



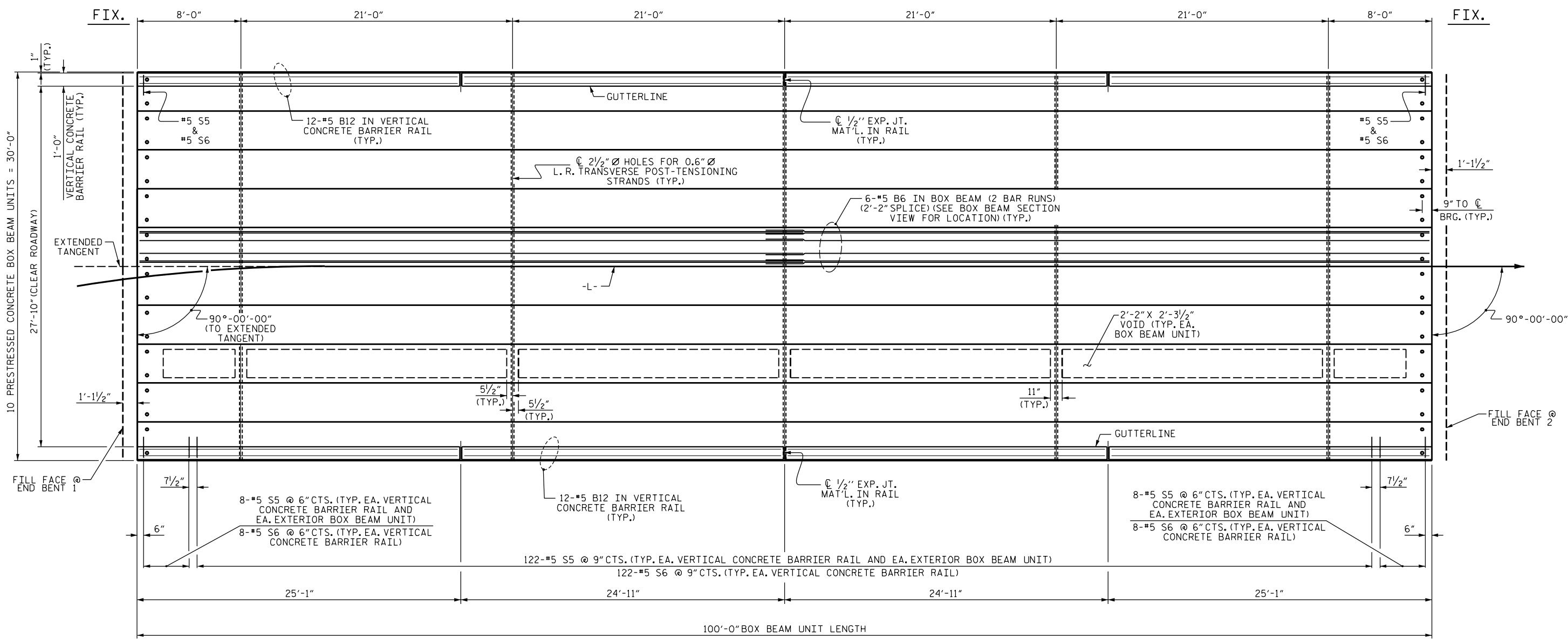
wsp
 WSP USA Inc.
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10/9/2023
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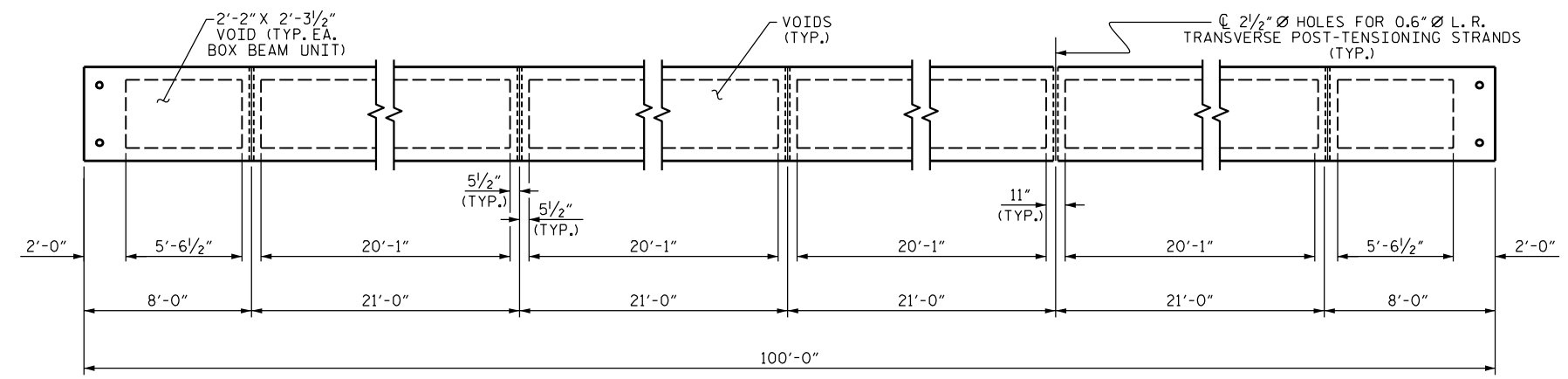
ASSEMBLED BY: T.KIRSCHBAUM	DATE: OCT 2022	DRAWN BY: DGE	8/11	REV. 10/15	MAA/TMG
CHECKED BY: E.LAWES	DATE: FEB 2023	CHECKED BY: TMG	11/11		
DESIGN ENGINEER OF RECORD: T.KIRSCHBAUM	DATE: OCT 2023				

STD. NO. 39PCBB1_30

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PLAN OF UNIT

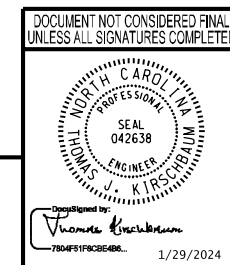


DIAPHRAGM AND VOID LAYOUT

PROJECT NO. BP13.R032
RUTHERFORD COUNTY
 STATION: 20+59.30 -L-
 SHEET 2 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

PLAN OF 100' UNIT
 27'-10" CLEAR ROADWAY
 90° SKEW



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			20

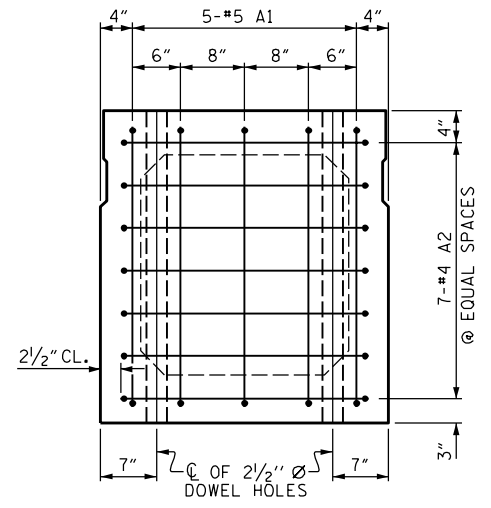
wsp

WSP USA Inc.
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ASSEMBLED BY: T.KIRSCHBAUM	DATE: OCT 2022	DRAWN BY: DGE	8/10	REV. 8/14	MAA/TMG
CHECKED BY: E.LAWES	DATE: FEB 2023	CHECKED BY: TMG	11/11		
DESIGN ENGINEER OF RECORD: T.KIRSCHBAUM	DATE: OCT 2023				

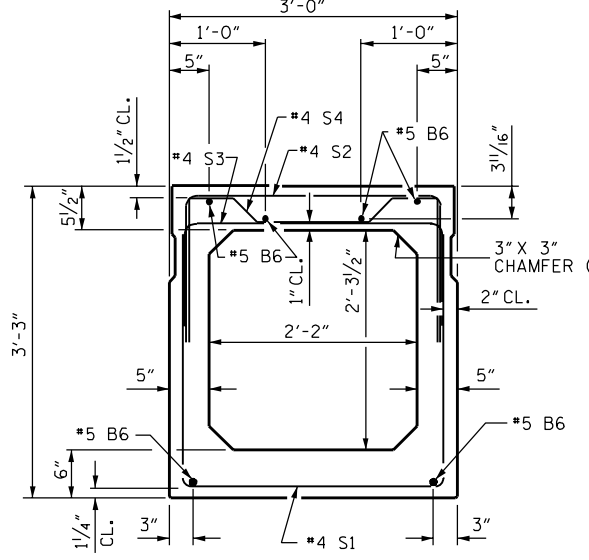
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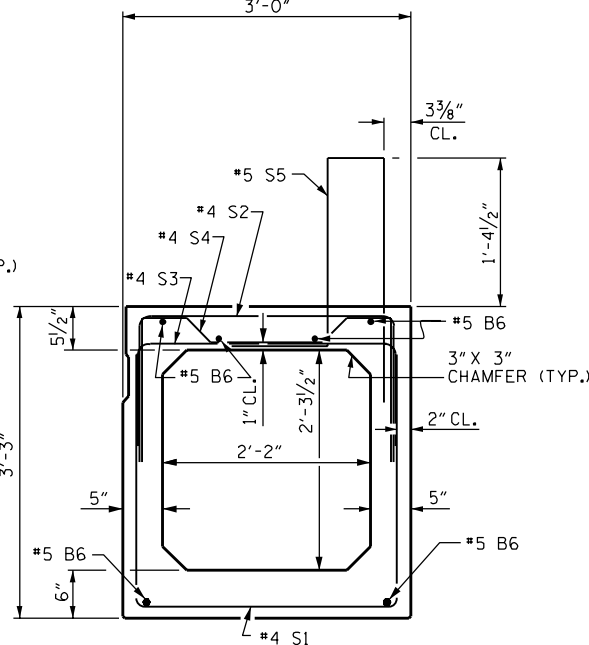
END ELEVATION

SHOWING PLACEMENT OF #5 & #4 "A" BARS AND LOCATION OF DOWEL HOLES. (INTERIOR BOX BEAM SECTION SHOWN-EXTERIOR SECTION SIMILAR EXCEPT SHEAR KEY LOCATION, STRAND LAYOUT NOT SHOWN.)



INTERIOR BOX BEAM SECTION

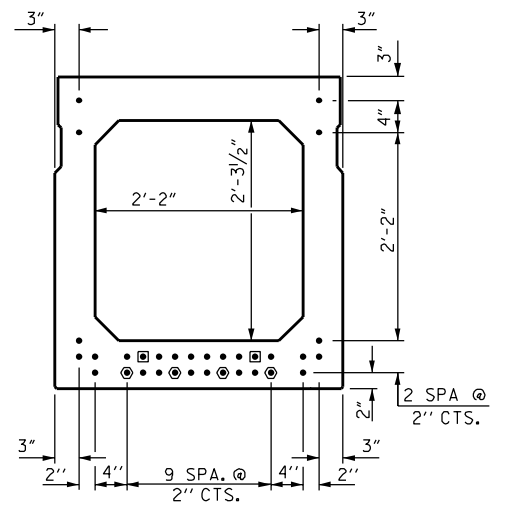
(STRAND LAYOUT NOT SHOWN)



EXTERIOR BOX BEAM SECTION

(STRAND LAYOUT NOT SHOWN)

0.6" Ø LOW RELAXATION STRAND LAYOUT



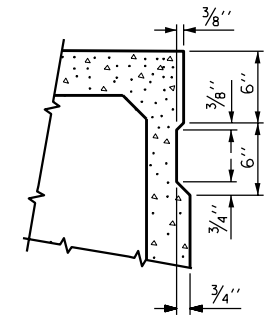
TYPICAL STRAND LOCATION

(32 STRANDS REQUIRED)

DEBONDING LEGEND

- FULLY BONDED STRANDS
- ◻ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ◻ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER

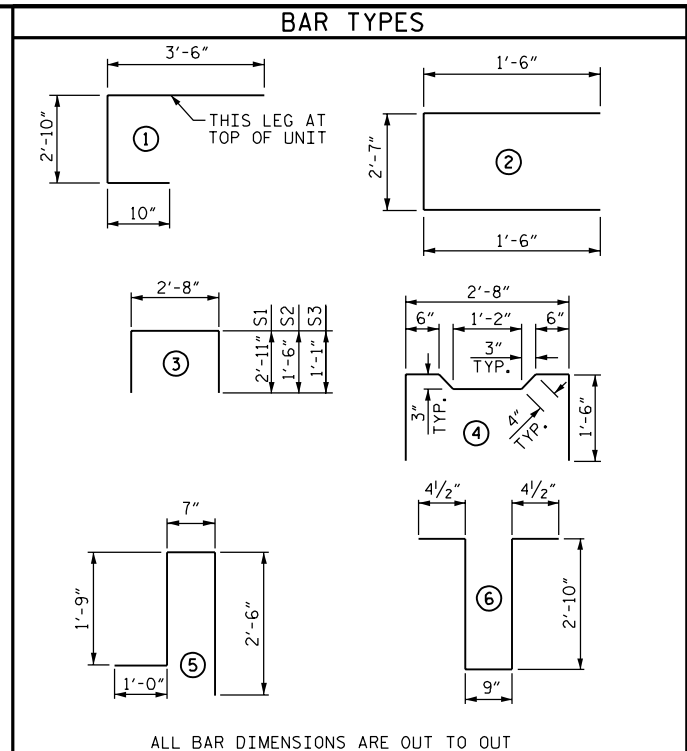
BOND SHALL BE BROKEN ON STRANDS AS SHOWN FOR THE SPECIFIED LENGTH FROM EACH END OF THE BOX BEAM. SEE STANDARD SPECIFICATIONS ARTICLE 1078-7.



SHEAR KEY DETAIL

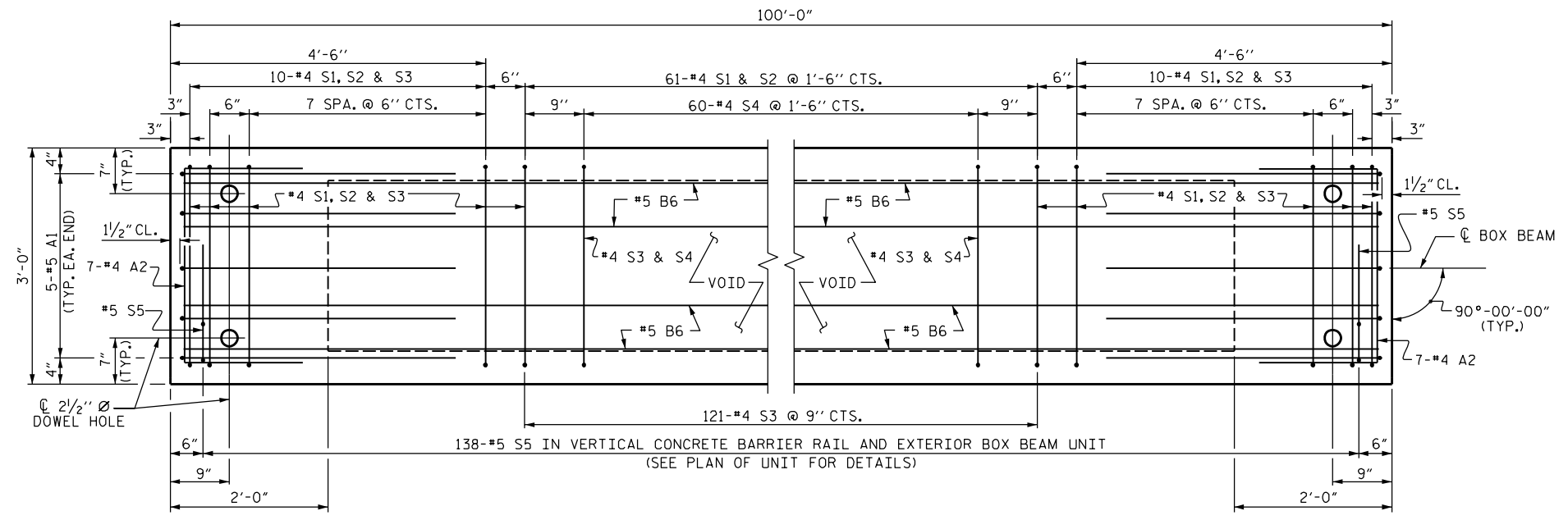
NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR BOX BEAMS.

GRADE 270 STRANDS	
0.6" Ø L.R.	
AREA (SQUARE INCHES)	0.217
ULTIMATE STRENGTH (LBS. PER STRAND)	58,600
APPLIED PRESTRESS (LBS. PER STRAND)	43,950



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR ONE BOX BEAM SECTION							
BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT LENGTH	EXTERIOR UNIT WEIGHT	INTERIOR UNIT LENGTH	INTERIOR UNIT WEIGHT
A1	10	#5	1	7'-2"	75	7'-2"	75
A2	44	#4	2	5'-7"	164	5'-7"	164
B6	12	#5	STR	50'-11"	637	50'-11"	637
K1	15	#4	6	7'-2"	72	7'-2"	72
K2	10	#4	STR	2'-7"	17	2'-7"	17
S1	81	#4	3	8'-6"	460	8'-6"	460
S2	81	#4	3	5'-8"	307	5'-8"	307
S3	141	#4	3	4'-10"	455	4'-10"	455
S4	60	#4	4	5'-10"	234	5'-10"	234
* S5	138	#5	5	5'-10"	840	--	--
REINFORCING STEEL				2421	LBS.	2421	LBS.
* EPOXY COATED REINF. STEEL				840	LBS.		
7500 P.S.I. CONCRETE				19.6	CU. YDS.	19.4	CU. YDS.
0.6" Ø L.R. STRANDS				No. 32		No. 32	



PLAN OF BOX BEAM

EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S5 BARS. FOR LOCATION OF DIAPHRAGMS, SEE "PLAN OF UNIT". FOR THREADED INSERTS, SEE "THREADED INSERT DETAIL". FOR REINFORCING STEEL IN DIAPHRAGMS, SEE "DOUBLE DIAPHRAGM DETAILS".

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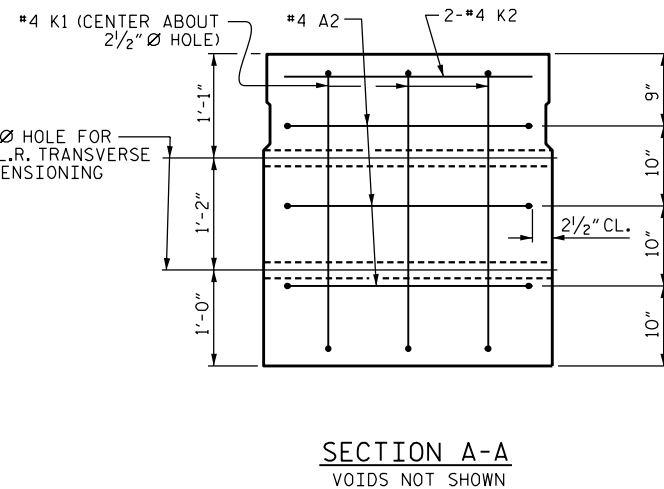
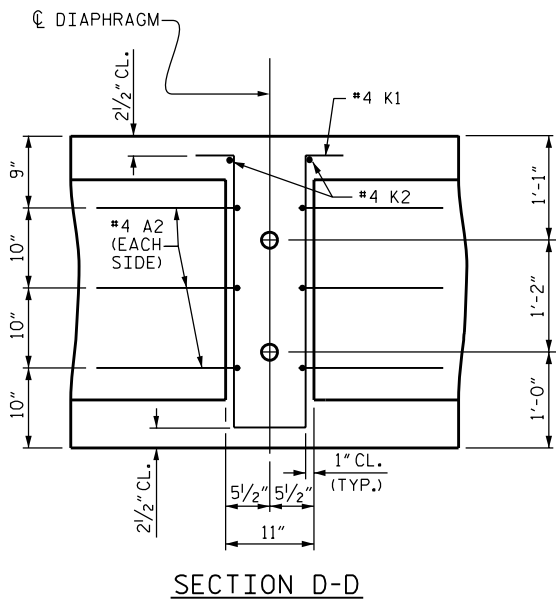
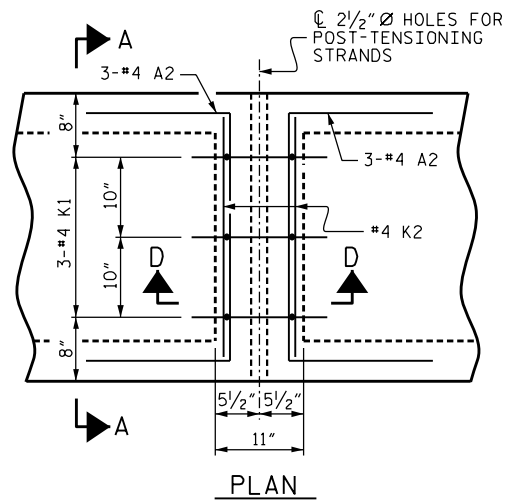
PROJECT NO. BP13.R032
RUTHERFORD COUNTY
 STATION: 20+59.30 -L-
 SHEET 3 OF 5

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

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 3'-0" X 3'-3"
 PRESTRESSED CONCRETE
 BOX BEAM UNIT

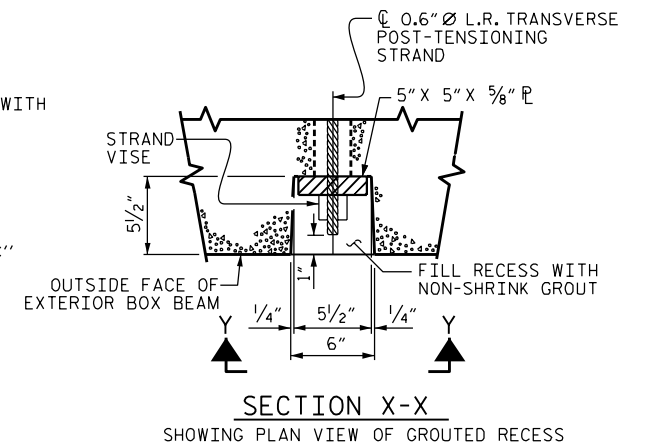
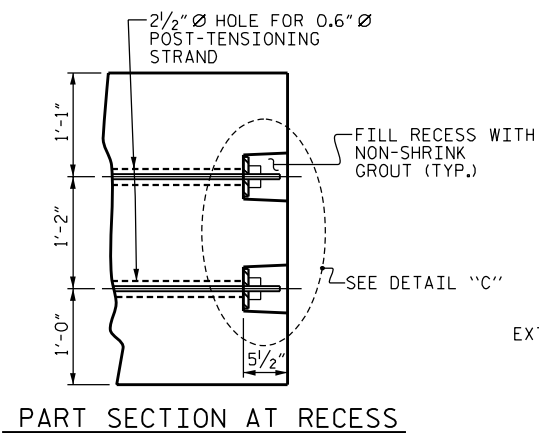
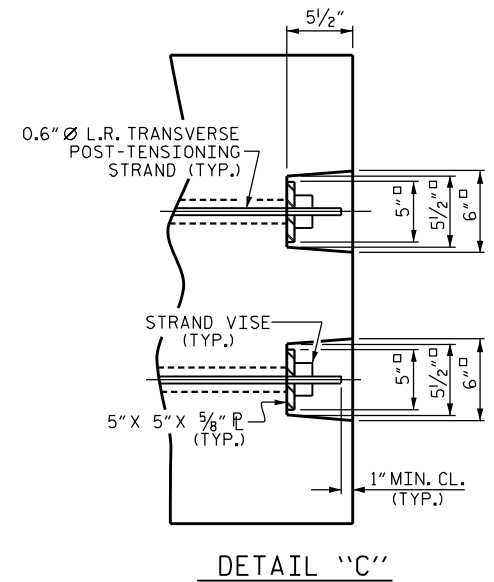
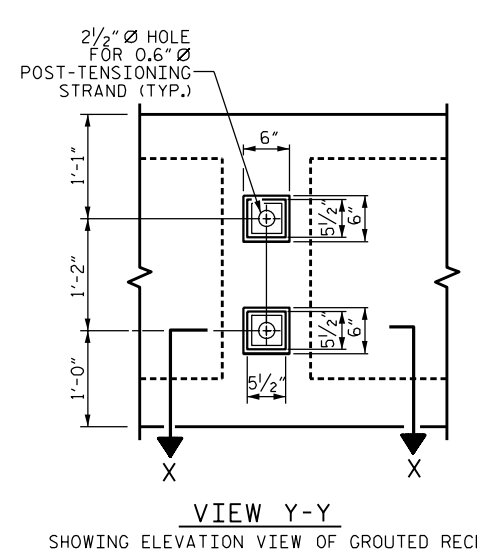
TOTAL SHEETS: 20

STD. NO. 39PCBB6-90S-100L



DOUBLE DIAPHRAGM DETAILS

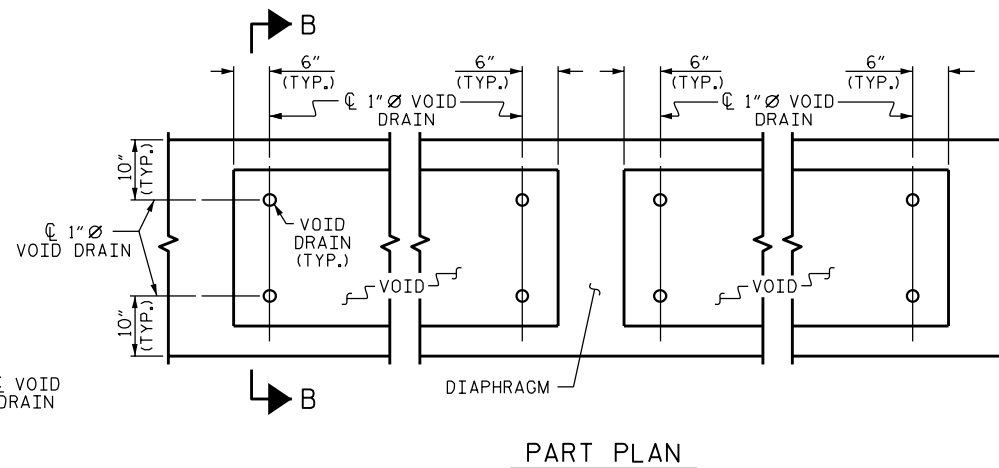
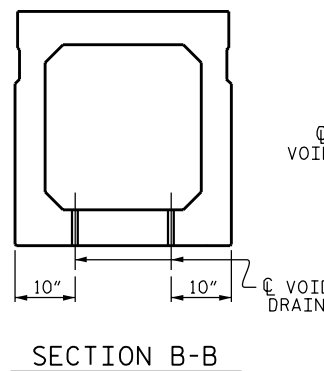
*4 "S" BARS NOT SHOWN. *4 "S" BARS MAY BE SHIFTED SLIGHTLY TO CLEAR 2 1/2" Ø HOLE.



GRouted RECESS DETAIL AT END OF POST-TENSIONED STRANDS OF EXTERIOR BOX BEAM

DEAD LOAD DEFLECTION AND CAMBER	
100' BOX BEAM UNIT	3'-0" x 3'-3"
CAMBER (SLAB ALONE IN PLACE)	0.6" Ø L.R. STRAND
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	2" ↑
FINAL CAMBER	7/8" ↓
	1 1/8" ↑

** INCLUDES FUTURE WEARING SURFACE

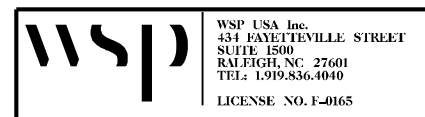
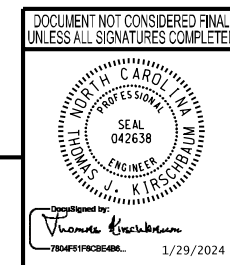


VOID DRAIN DETAILS

(DIMENSIONS SHOWN ARE TYPICAL FOR EACH VOID)

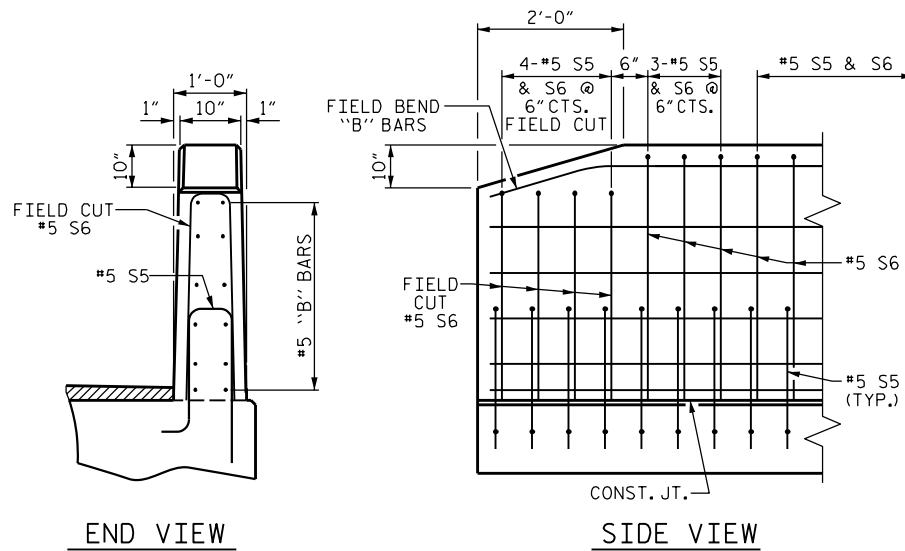
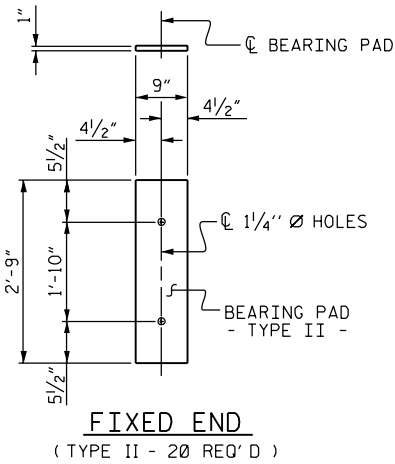
PROJECT NO. BP13.R032
RUTHERFORD COUNTY
 STATION: 20+59.30 -L-
 SHEET 4 OF 5

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH STANDARD					
3'-0" X 3'-3" PRESTRESSED CONCRETE BOX BEAM UNIT					
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-9
					TOTAL SHEETS 20

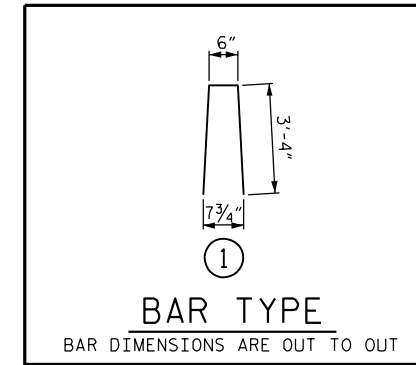


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STD.NO.39PCBB7_90S



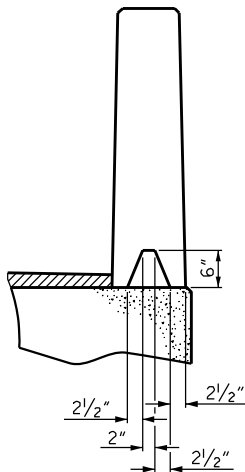
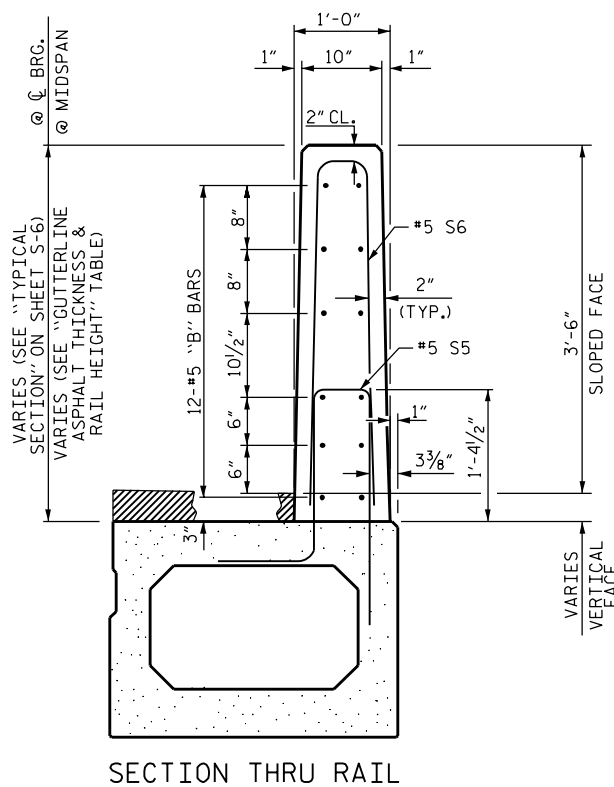
BOX BEAM UNITS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR B.B.	2	100'-0"	200'-0"
INTERIOR B.B.	8	100'-0"	800'-0"
TOTAL	10		1000'-0"



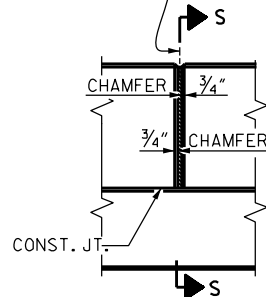
ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

END OF RAIL DETAILS



1/2" EXP. JT. MAT'L HELD IN PLACE WITH GALVANIZED NAILS.
(NOTE: OMIT EXP. JT. MAT'L WHEN SLIP FORM IS USED)



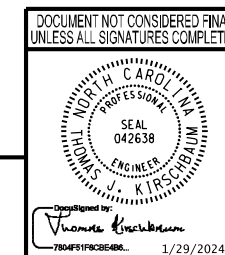
BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL					
BAR	BARS PER PAIR OF EXTERIOR UNITS 100' UNIT	SIZE	TYPE	LENGTH	WEIGHT
*B12	96	#5	STR	24'-7"	2461
*S6	276	#5	1	7'-2"	2063
*EPOXY COATED REINFORCING STEEL				LBS.	4524
CLASS AA CONCRETE				CU.YDS.	25.9
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT.	200.0

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT		
	ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
100' UNITS	2 3/8"	3'-8 3/8"

PROJECT NO. BP13.R032
RUTHERFORD COUNTY
 STATION: 20+59.30 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 3'-0" X 3'-3"
 PRESTRESSED CONCRETE
 BOX BEAM UNIT



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-10
2			4			TOTAL SHEETS 20

STD. NO. 39PCBB8_90S

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ASSEMBLED BY: T.KIRSCHBAUM	DATE: OCT 2022	DRAWN BY: DCE	10/11	REV. 5/18	MAA/THC
CHECKED BY: E.LAWES	DATE: FEB 2023	CHECKED BY: TMG	11/11		
DESIGN ENGINEER OF RECORD: T.KIRSCHBAUM	DATE: OCT 2023				

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 7 - 7/8" Ø BOLTS WITH NUTS AND WASHERS.

THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

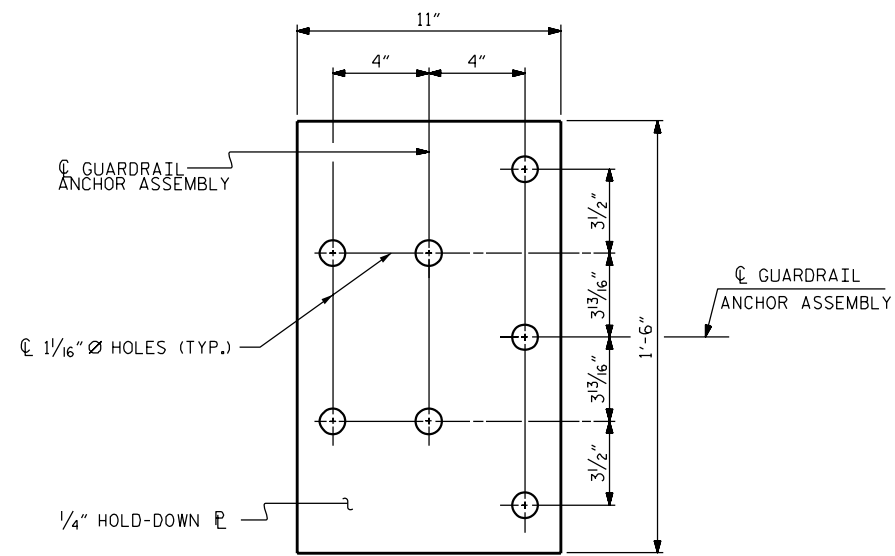
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR VERTICAL CONCRETE BARRIER RAIL.

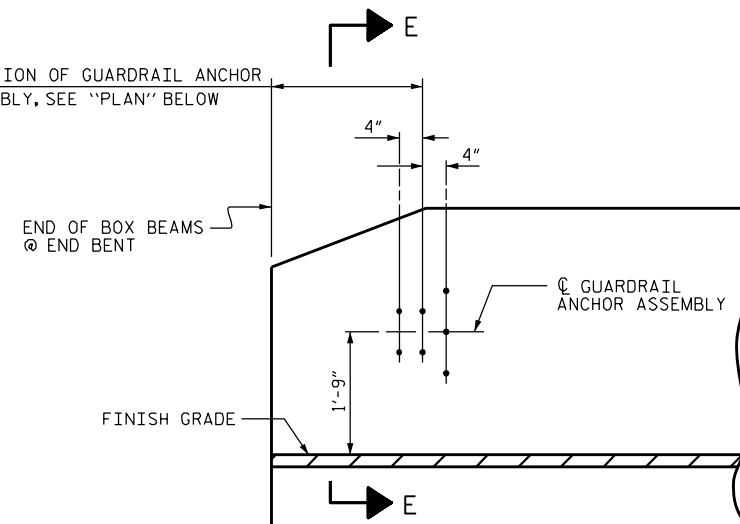
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

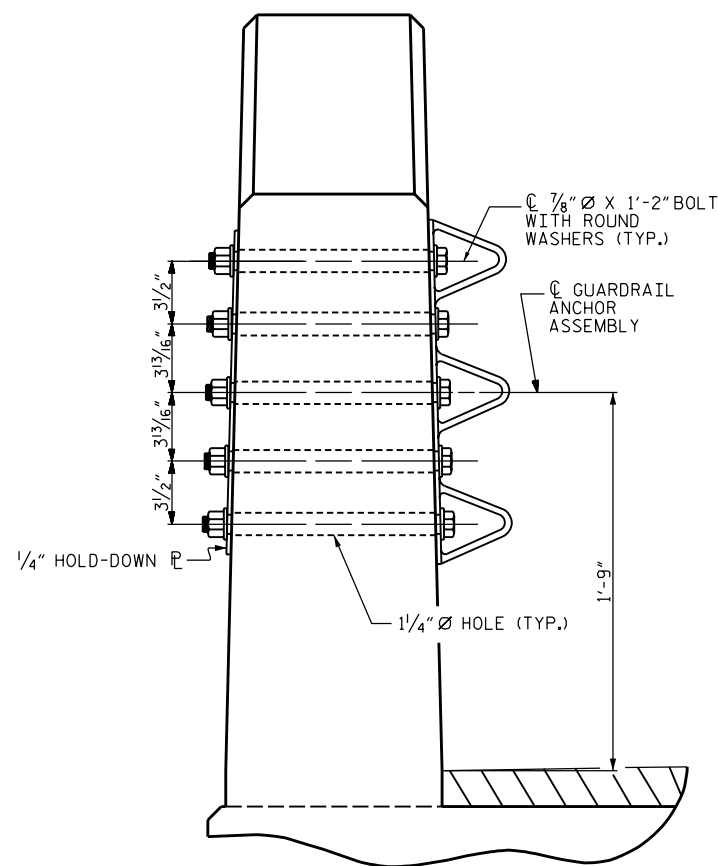


PLAN

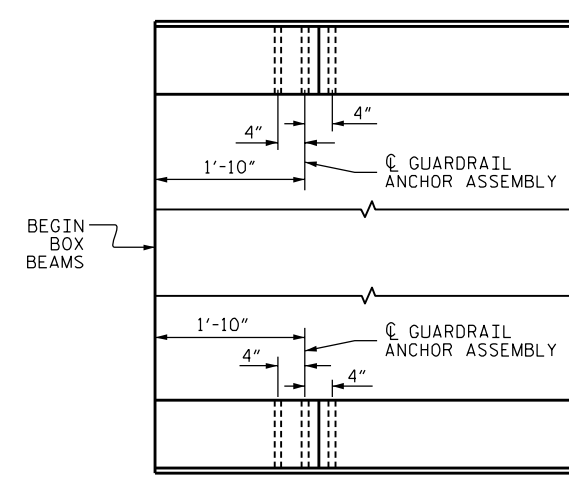
FOR LOCATION OF GUARDRAIL ANCHOR ASSEMBLY, SEE "PLAN" BELOW



ELEVATION



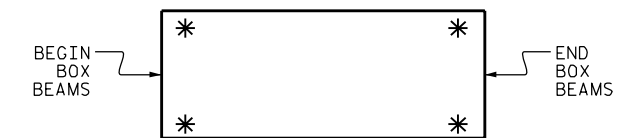
SECTION E-E
GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT #1 SHOWN, END BENT #2 SIMILAR.



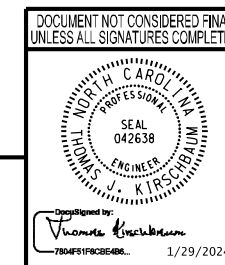
SKETCH SHOWING POINTS OF ATTACHMENT

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. BP13.R032
RUTHERFORD COUNTY
STATION: 20+59.30 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
GUARDRAIL ANCHORAGE
DETAILS FOR
VERTICAL CONCRETE
BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			20

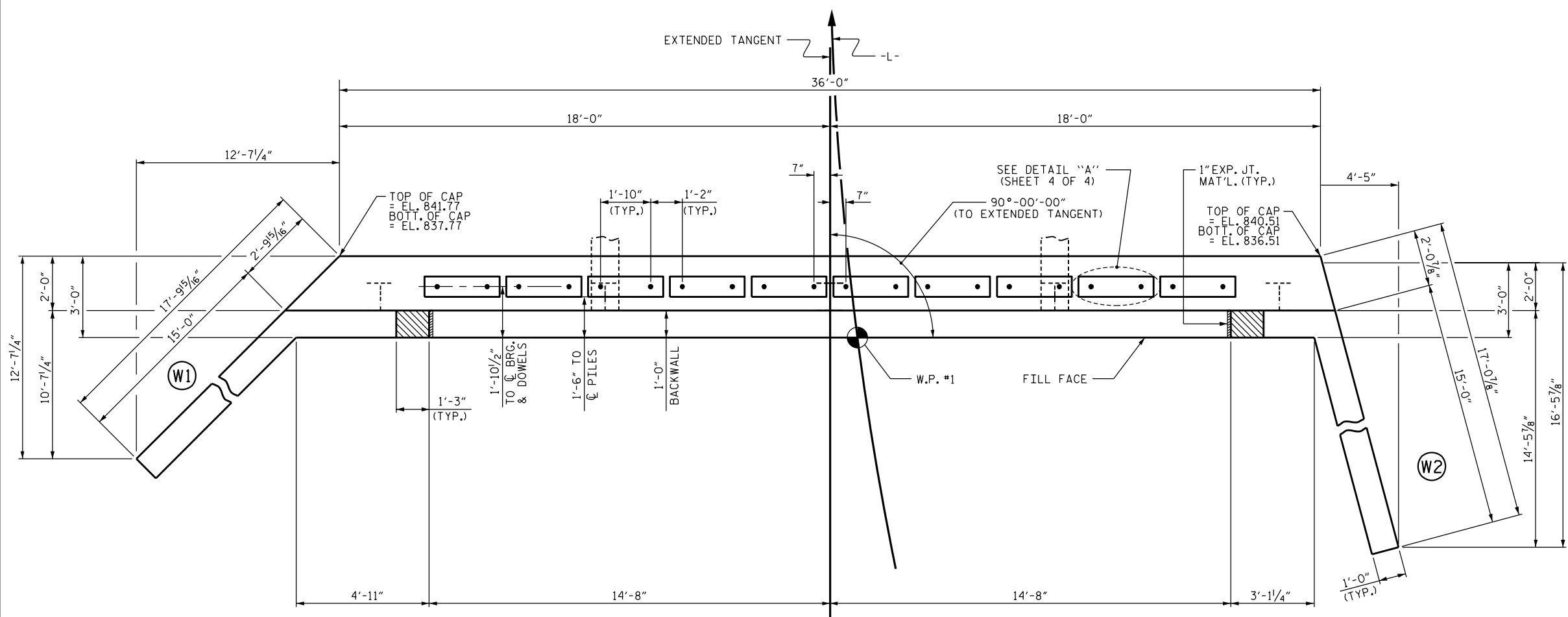


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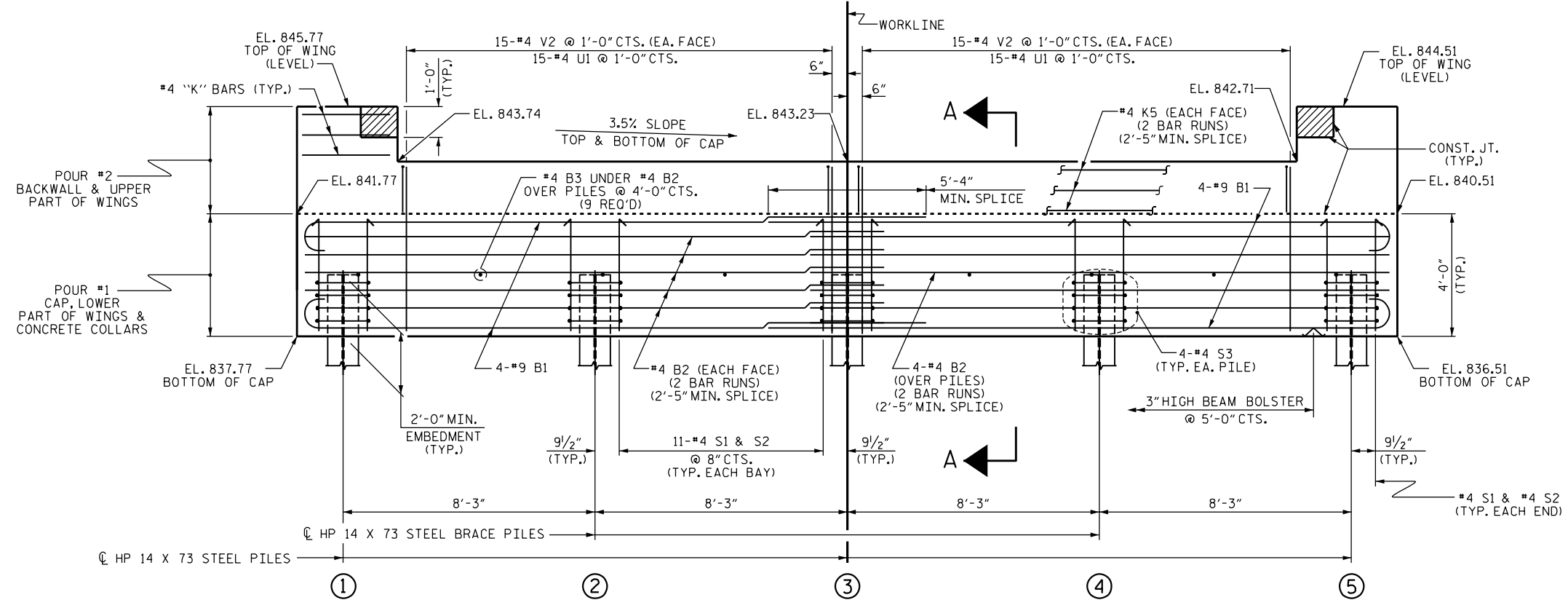
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ASSEMBLED BY: T.KIRSCHBAUM	DATE: OCT 2022	DRAWN BY: MAA	5/10	REV. 1/15	MAA/TMG
CHECKED BY: E.LAWES	DATE: FEB 2023	CHECKED BY: GM	5/10	REV. 12/17	MAA/THC
DESIGN ENGINEER OF RECORD: T.KIRSCHBAUM	DATE: OCT 2023			REV. 5/18	MAA/THC

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PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
 FOR SECTION A-A, SEE SHEET 4 OF 4.
 CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
 SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

NOTES

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.
- THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.
- FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.
- FOR WING DETAILS, SEE SHEET 2 OF 3.

TOP OF PILE ELEVATIONS	
①	839.72
②	839.43
③	839.14
④	838.85
⑤	838.56

PROJECT NO. BP13.R032
RUTHERFORD COUNTY
 STATION: 20+59.30 -L-
 SHEET 1 OF 3

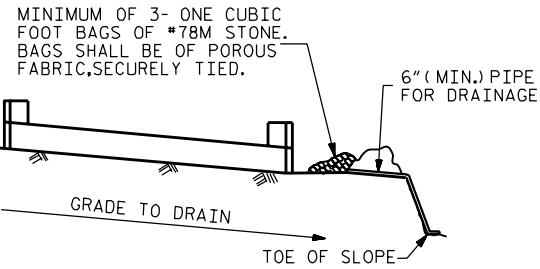
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT No. 1					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-12					
TOTAL SHEETS 20					

DRAWN BY: WJH 12/11 REV. 4/15 MAA/TMG
 CHECKED BY: AAC 12/11
 ASSEMBLED BY: T.KIRSCHBAUM DATE: OCT 2022
 CHECKED BY: E.LAWES DATE: FEB 2023
 DESIGN ENGINEER
 OF RECORD: T.KIRSCHBAUM DATE: OCT 2023

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 RALEIGH, NC 27601
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1/29/2024

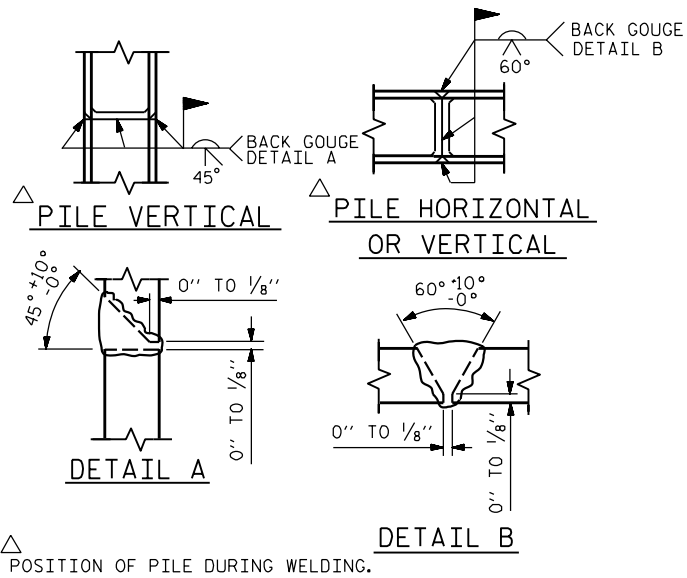


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

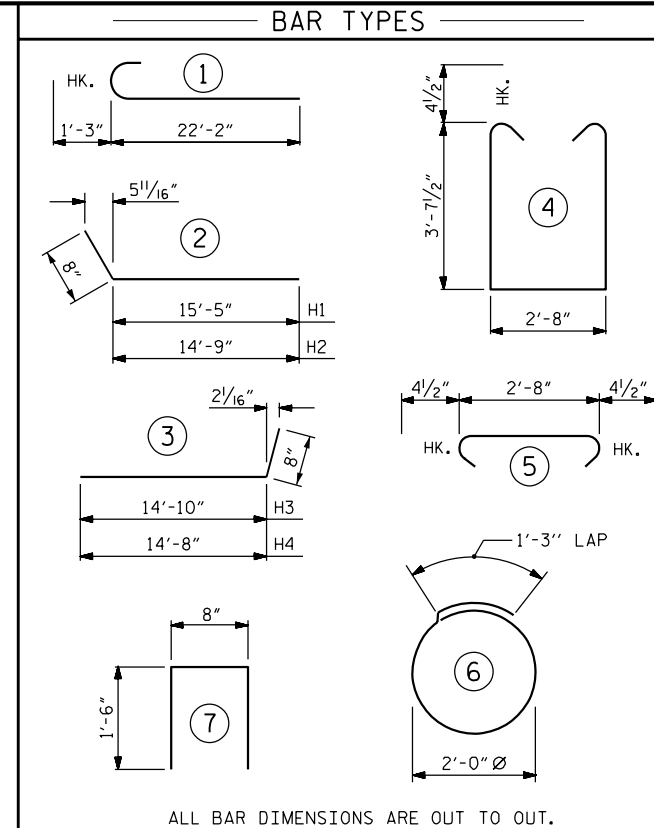
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

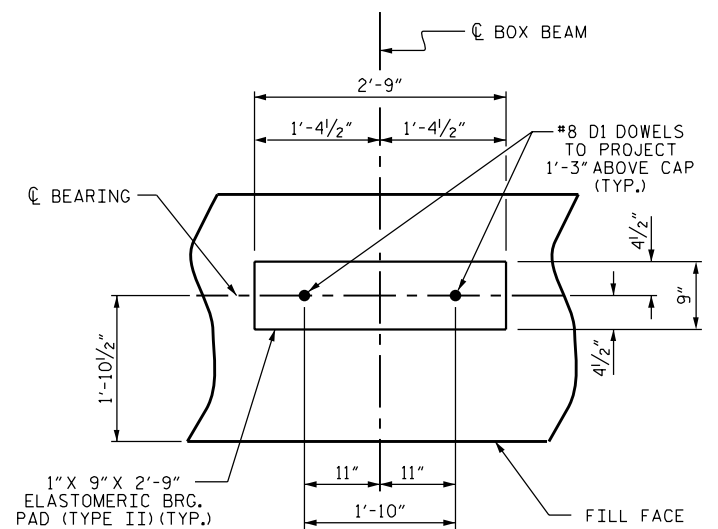
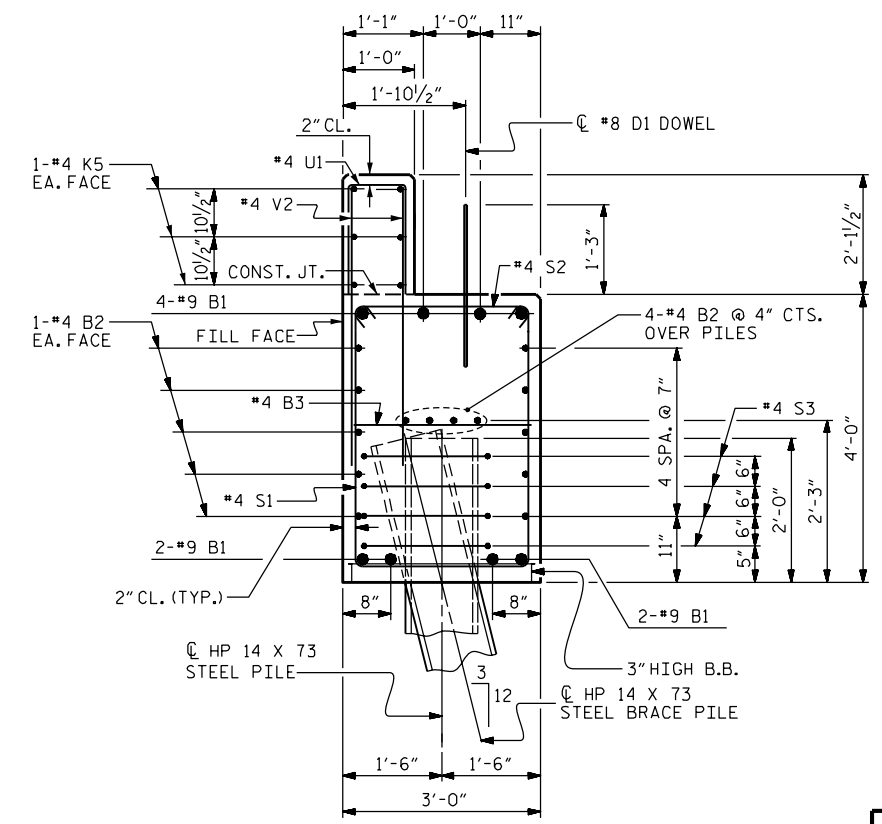
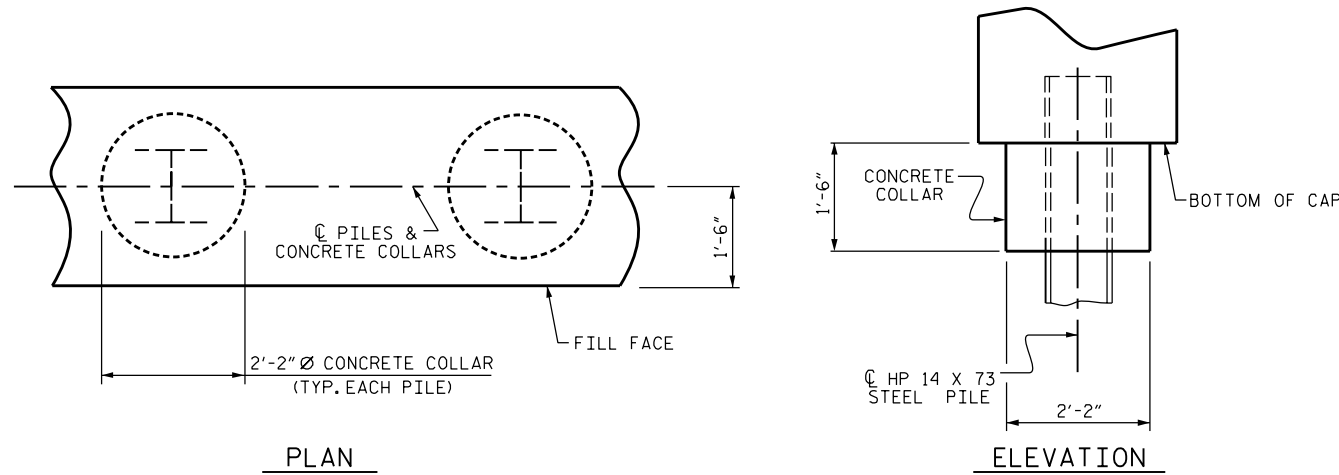
TEMPORARY DRAINAGE AT END BENT



PILE SPLICE DETAILS



BILL OF MATERIAL FOR END BENT 1					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	#9	1	23'-5"	1274	
B2	#4	STR	20'-8"	387	
B3	#4	STR	2'-8"	16	
D1	#8	STR	2'-3"	120	
H1	#6	2	16'-1"	387	
H2	#6	2	15'-5"	370	
H3	#6	3	15'-6"	372	
H4	#6	3	15'-4"	368	
K1	#4	STR	5'-1"	10	
K2	#4	STR	5'-9"	12	
K3	#4	STR	3'-9"	8	
K4	#4	STR	3'-6"	7	
K5	#4	STR	20'-10"	167	
S1	#4	4	10'-8"	328	
S2	#4	5	3'-5"	105	
S3	#4	6	7'-7"	101	
U1	#4	7	3'-8"	73	
V1	#4	STR	7'-8"	415	
V2	#4	STR	5'-9"	230	



REINFORCING STEEL	4750 LBS.
CLASS A CONCRETE BREAKDOWN	
POUR #1 CAP, LOWER PART OF WINGS & COLLARS	22.0 C.Y.
POUR #2 BACKWALL & UPPER PART OF WINGS	8.1 C.Y.
TOTAL CLASS A CONCRETE	30.1 C.Y.
END BENT No. 1	
HP 14 X 73 STEEL PILES	
NO: 5	LIN. FT. = 125
PILE DRIVING EQUIPMENT	
SETUP FOR	
HP 14 X 73 STEEL PILES	NO: 5

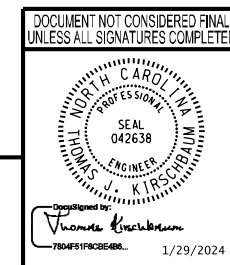
PROJECT NO. BP13.R032

RUTHERFORD COUNTY

STATION: 20+59.30 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA					
DEPARTMENT OF TRANSPORTATION					
RALEIGH					
SUBSTRUCTURE					
END BENT No. 1					
DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-14
TOTAL SHEETS					20

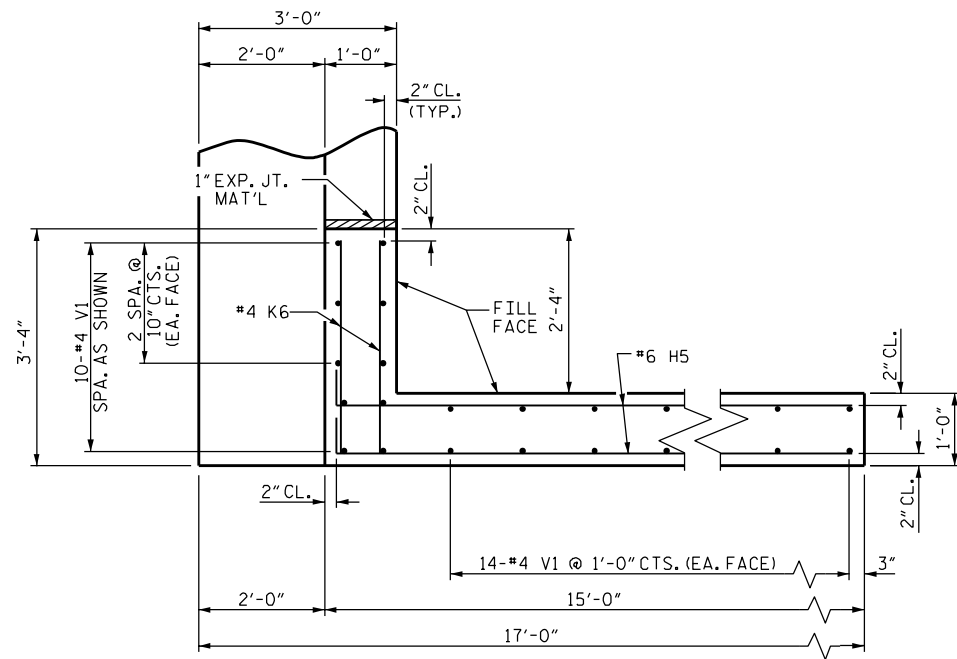


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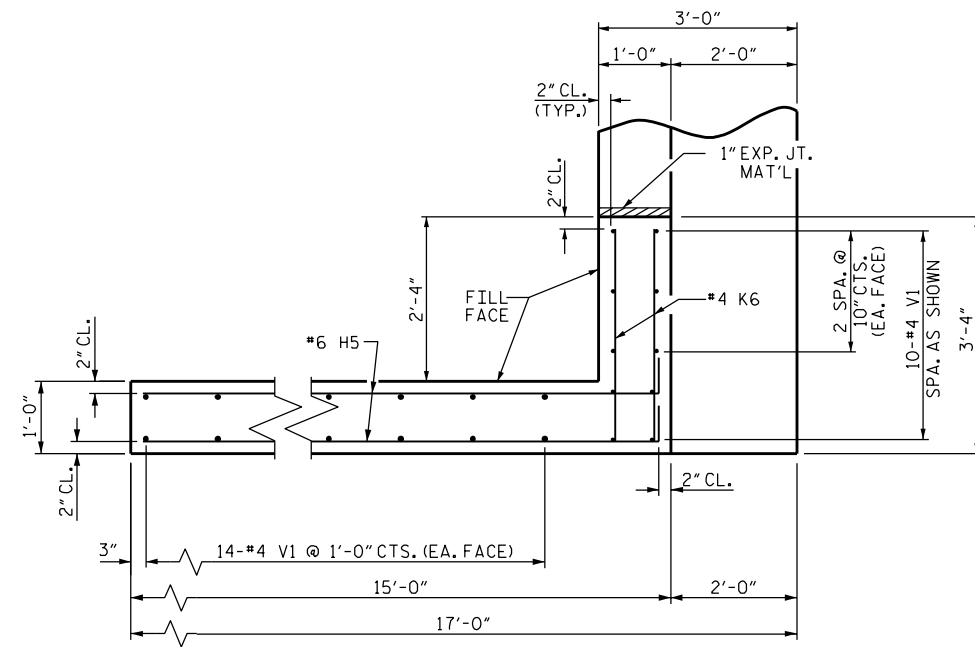
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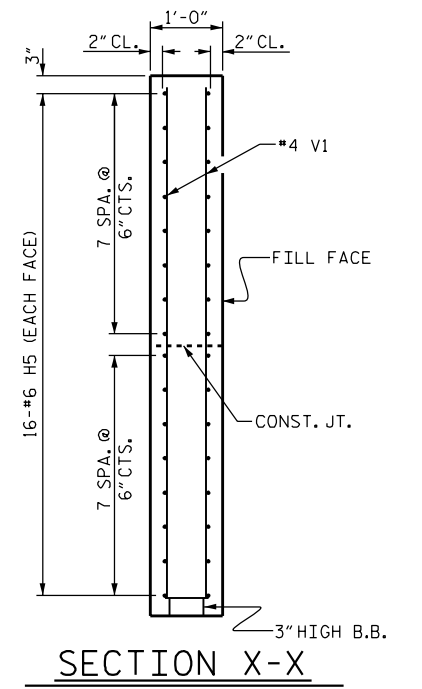
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CHECKED BY :	AAC	12/11		
ASSEMBLED BY :	T.KIRSCHBAUM	DATE : OCT 2022		
CHECKED BY :	E.LAWES	DATE : FEB 2023		
DESIGN ENGINEER	T.KIRSCHBAUM	DATE : OCT 2023		
OF RECORD :				



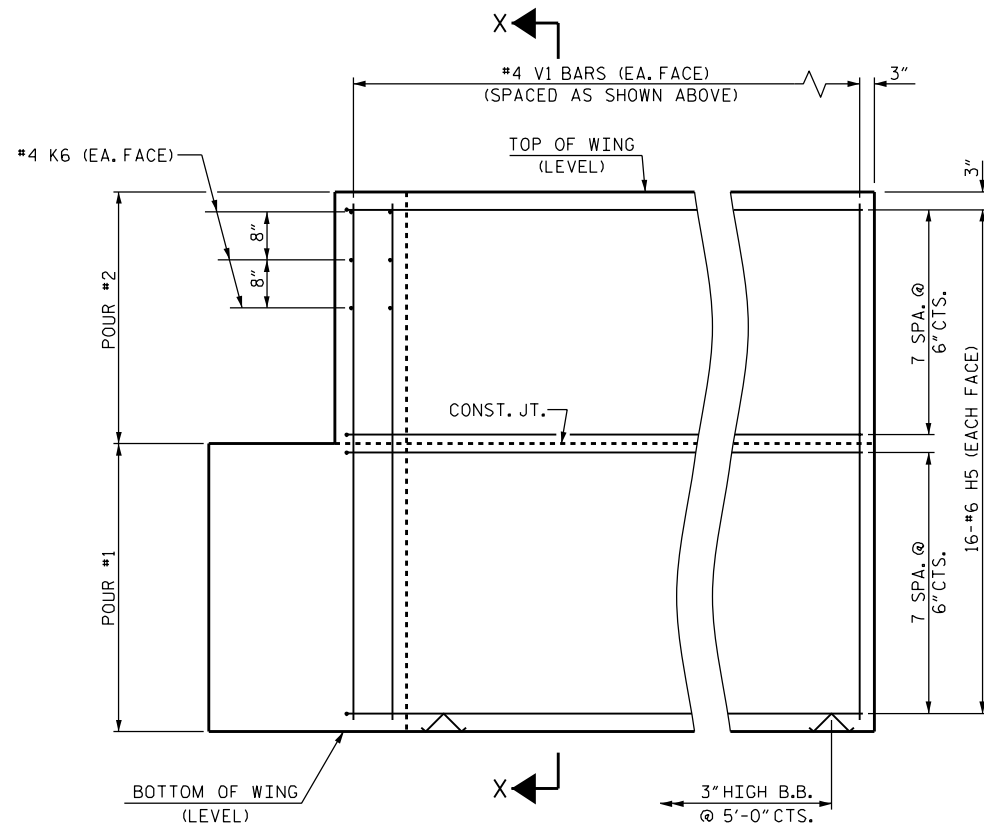
PLAN OF WING (W3)



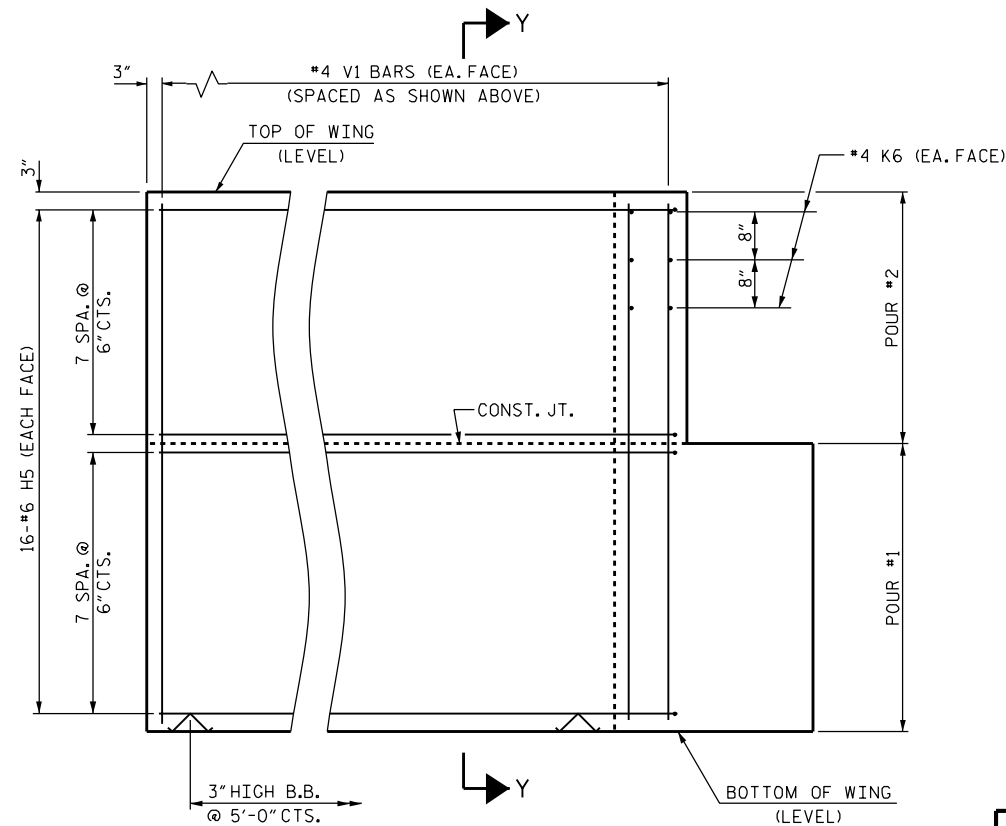
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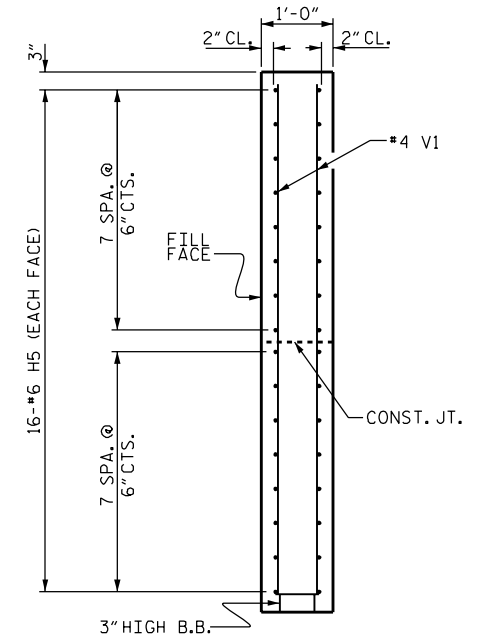
SECTION X-X



ELEVATION OF WING (W3)



ELEVATION OF WING (W4)



SECTION Y-Y

PROJECT NO. BP13.R032
RUTHERFORD COUNTY
 STATION: 20+59.30 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT No. 2
 WING DETAILS

DOCUMENT NOT CONSIDERED FINAL
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1			3		
2			4		

SHEET NO.

S-16

TOTAL SHEETS

20

STD. NO. EB_30_90S4_39BB

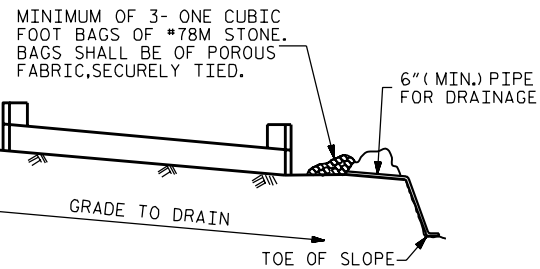
WING DETAILS



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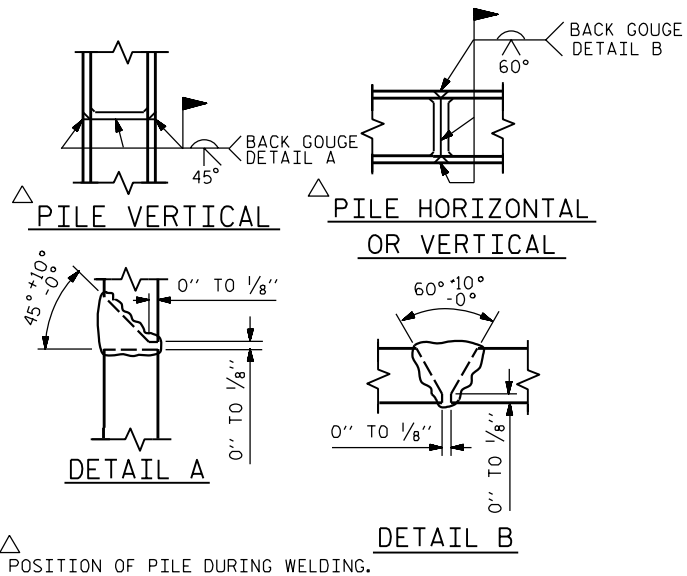


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

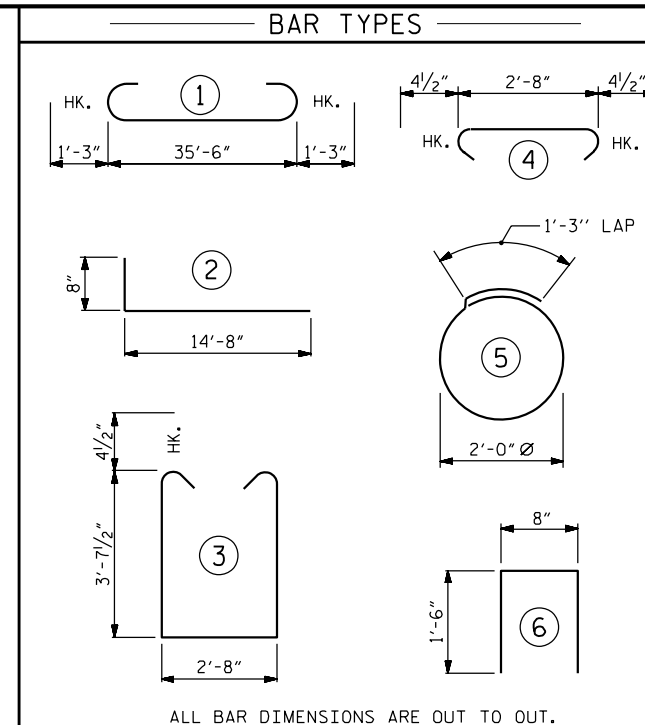
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

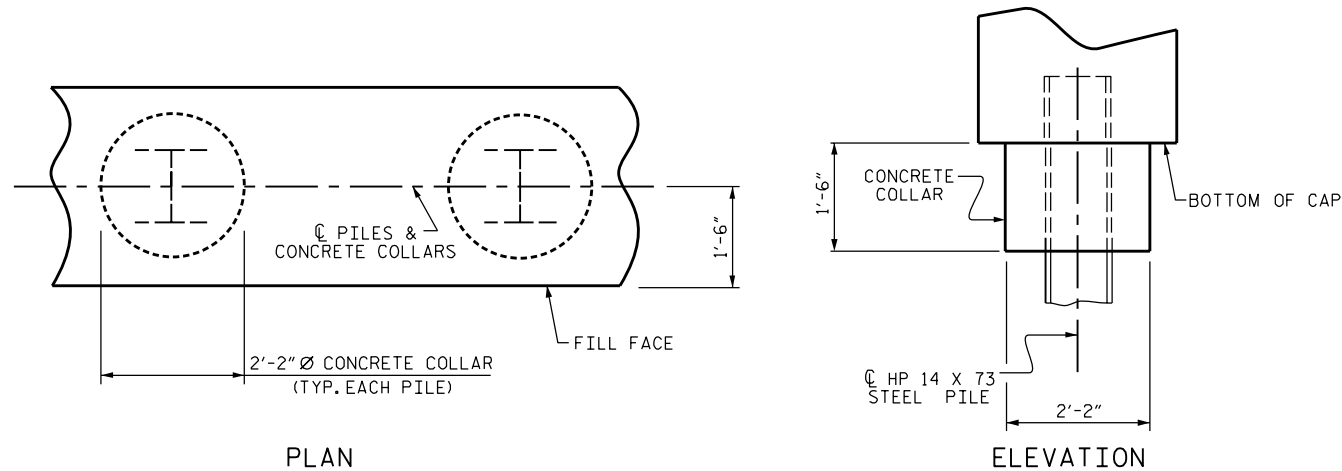


PILE SPLICE DETAILS



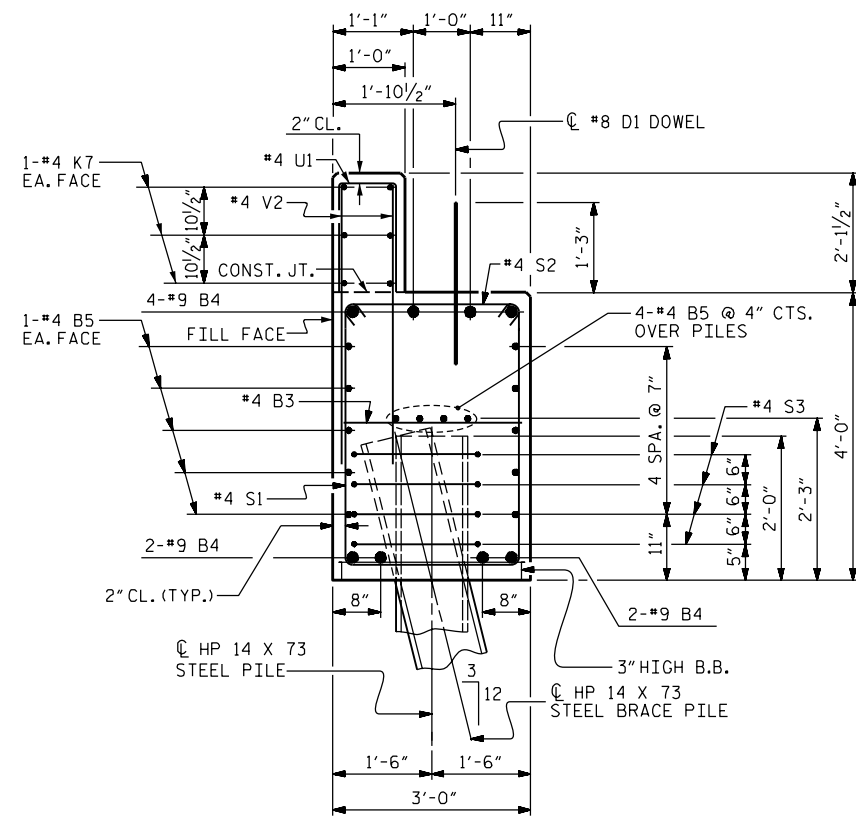
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL FOR END BENT 2						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
B3	9	#4	STR	2'-8"	16	
B4	8	#9	1	38'-0"	1034	
B5	28	#4	STR	19'-1"	357	
D1	20	#8	STR	2'-3"	120	
H5	64	#6	2	15'-4"	1474	
K6	12	#4	STR	2'-11"	23	
K7	12	#4	STR	19'-1"	153	
S1	46	#4	3	10'-8"	328	
S2	46	#4	4	3'-5"	105	
S3	20	#4	5	7'-7"	101	
U1	30	#4	6	3'-8"	73	
V1	76	#4	STR	7'-8"	389	
V2	60	#4	STR	5'-9"	230	
REINFORCING STEEL					4404 LBS.	
CLASS A CONCRETE BREAKDOWN						
POUR #1 CAP, LOWER PART OF WINGS & COLLARS					21.5 C.Y.	
POUR #2 BACKWALL & UPPER PART OF WINGS					7.6 C.Y.	
TOTAL CLASS A CONCRETE					29.1 C.Y.	
END BENT No. 2						
HP 14 X 73 STEEL PILES						
NO: 5					LIN. FT. = 125	
PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 STEEL PILES						
						NO: 5



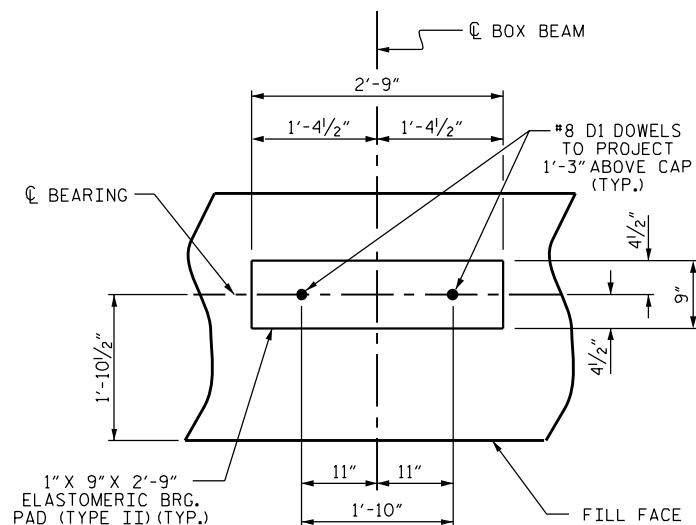
CORROSION PROTECTION FOR STEEL PILES DETAIL

(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)



SECTION A-A

(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")



DETAIL "A"

(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)

PROJECT NO. BP13.R032
RUTHERFORD COUNTY
 STATION: 20+59.30 -L-

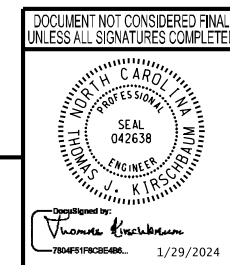
SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT No. 2
 DETAILS

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NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S-17
2			4			TOTAL SHEETS 20



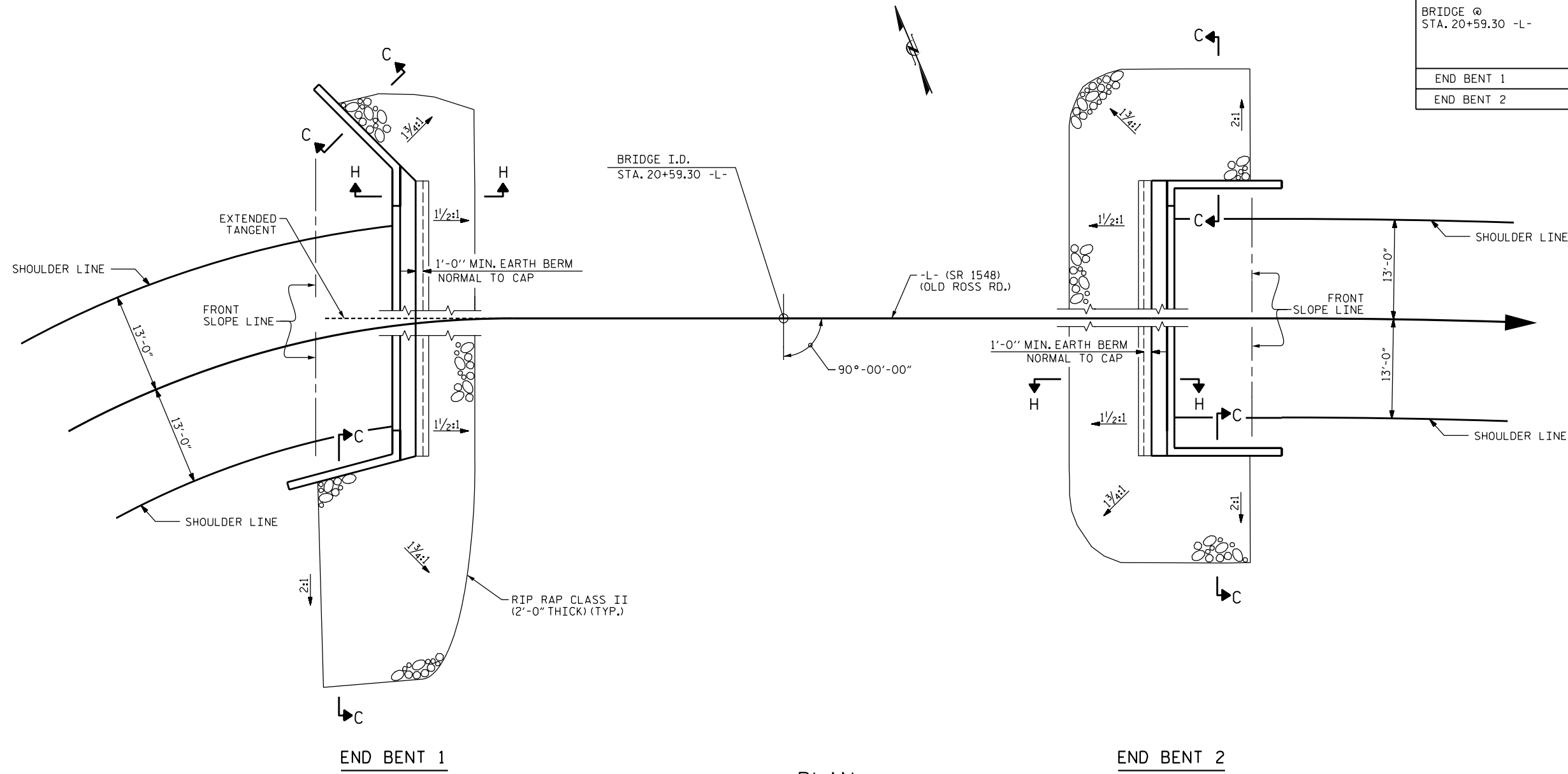
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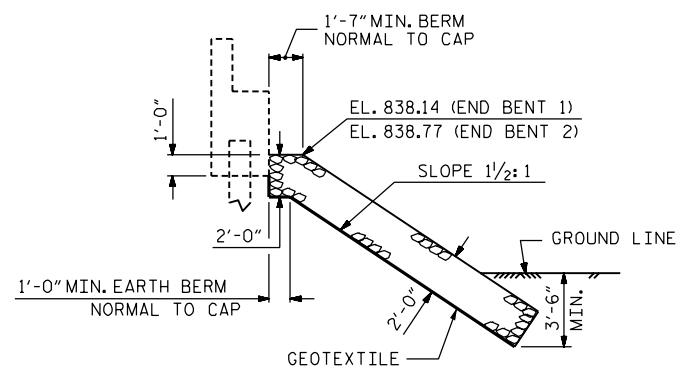
DRAWN BY: WJH	12/11	REV. 4/17	MAA/THC
CHECKED BY: AAC	12/11		
ASSEMBLED BY: T.KIRSCHBAUM	DATE: OCT 2022		
CHECKED BY: E.LAWES	DATE: FEB 2023		
DESIGN ENGINEER OF RECORD: T.KIRSCHBAUM	DATE: OCT 2023		

STD. NO. EB_30_90S4_39BB

ESTIMATED QUANTITIES		
BRIDGE @ STA. 20+59.30 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	170	190
END BENT 2	180	200

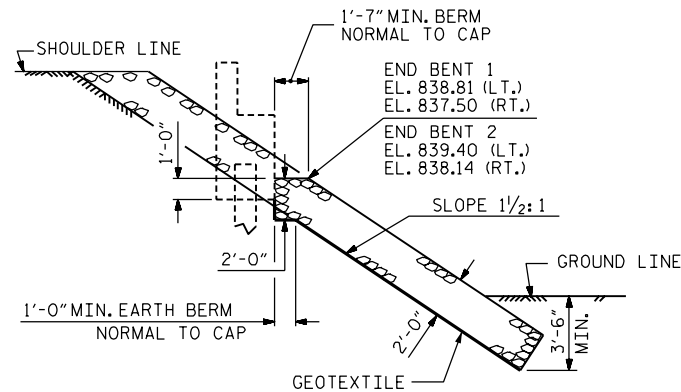


PLAN

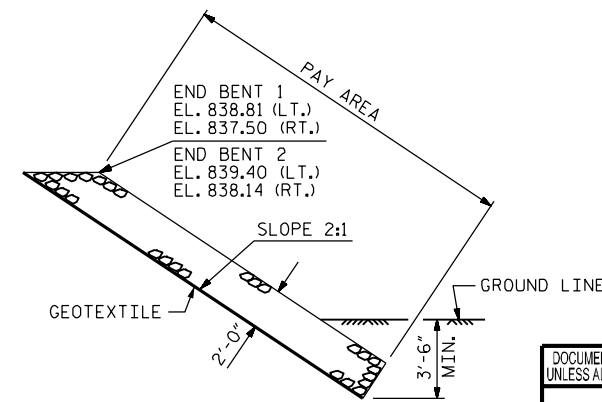


SECTION C-C

BERM RIP RAPPED



SECTION H-H



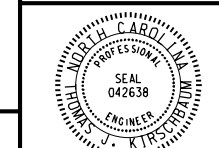
SECTION C-C

PROJECT NO. BP13.R032
RUTHERFORD COUNTY
 STATION: 20+59.30 -L-

STATE OF NORTH CAROLINA
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RIP RAP DETAILS

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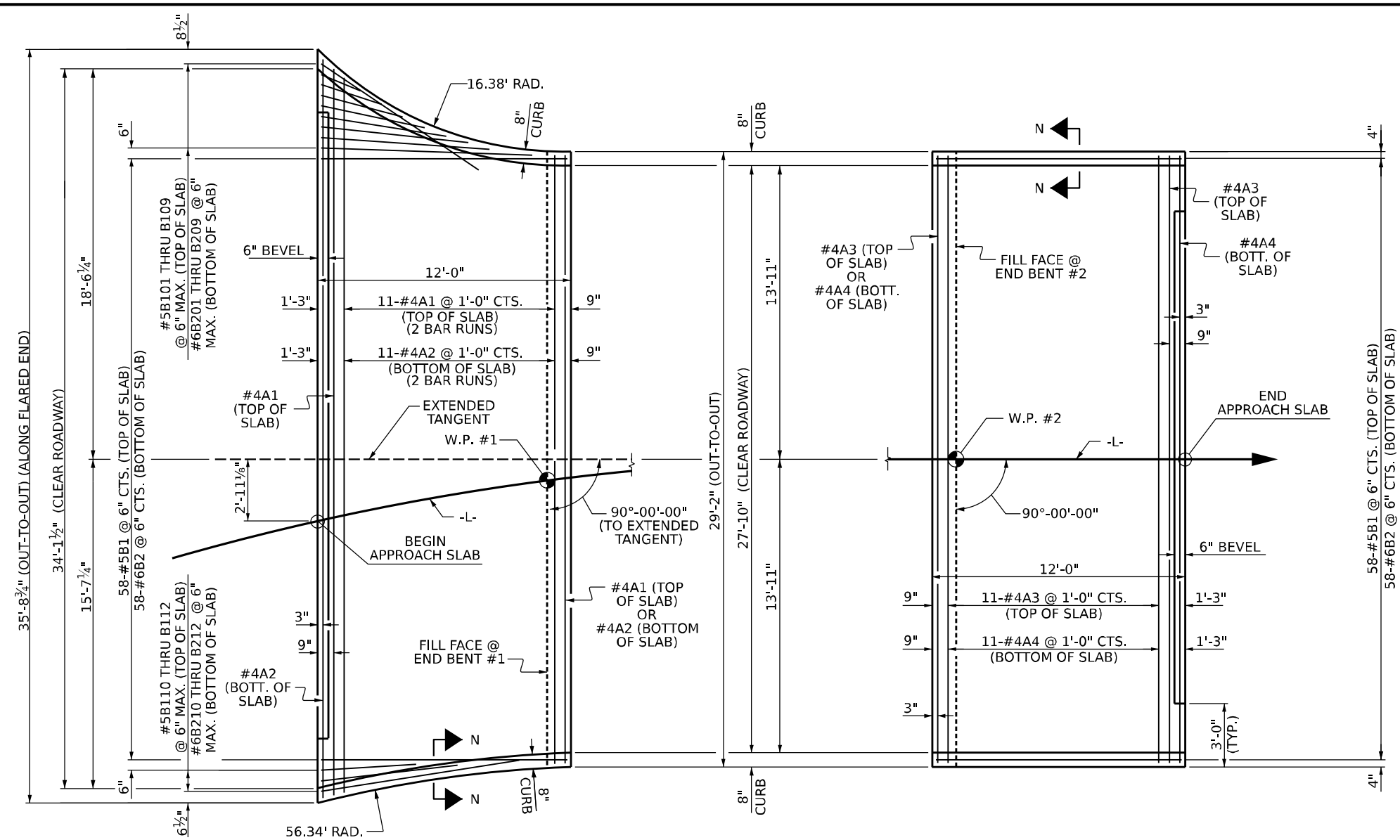


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2			4			20

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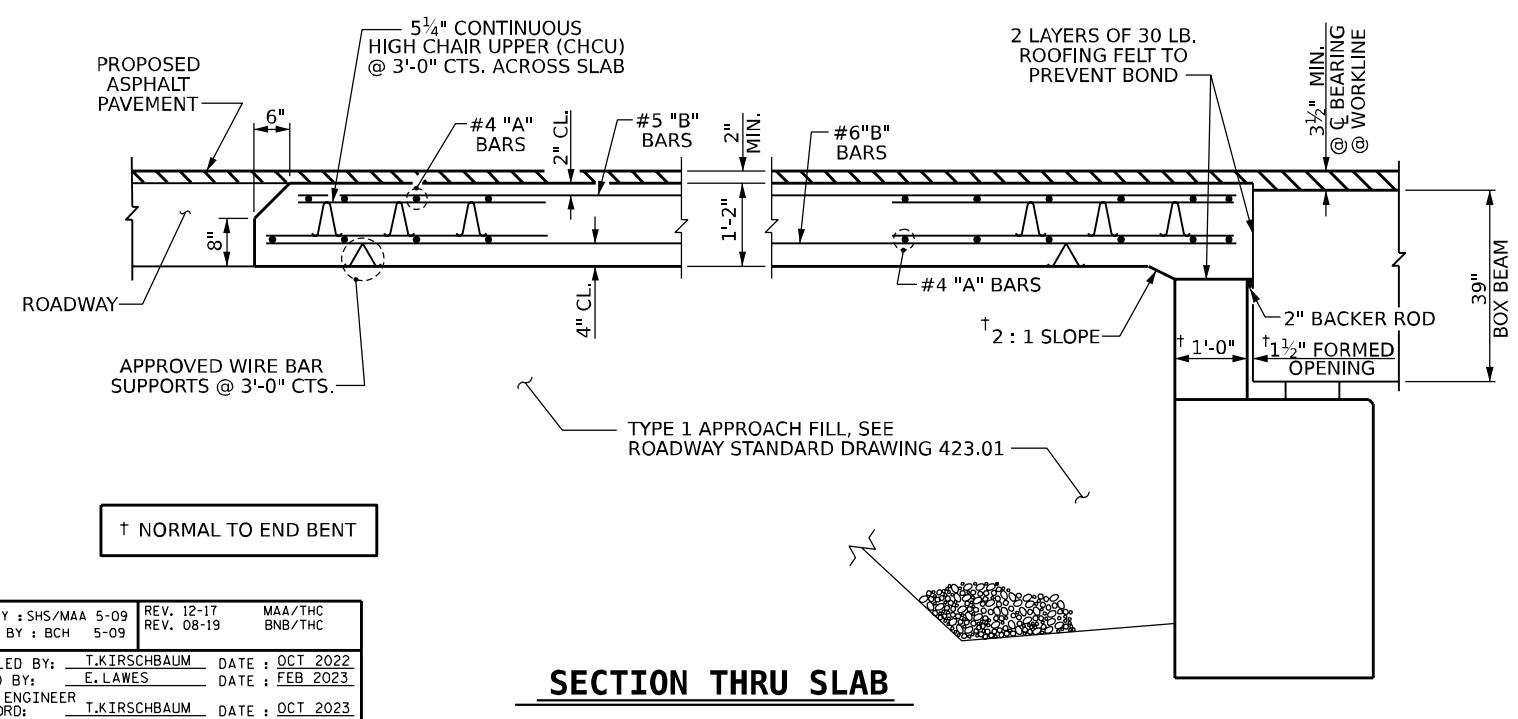
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PLAN @ END BENT 1

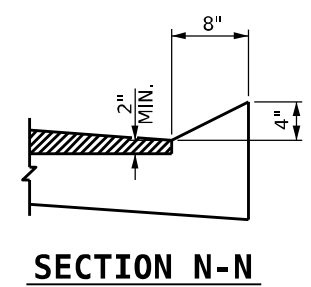
PLAN @ END BENT 2



SECTION THRU SLAB

BILL OF MATERIAL											
APPROACH SLAB AT EB 1					APPROACH SLAB AT EB 2						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	26	#4	STR	18'-3"	317	* A3	13	#4	STR	28'-10"	250
A2	26	#4	STR	18'-4"	318	A4	13	#4	STR	28'-10"	250
* B1	58	#5	STR	11'-2"	676	* B1	58	#5	STR	11'-2"	676
* B101	1	#5	STR	9'-0"	9	B2	58	#6	STR	11'-8"	1016
* B102	1	#5	STR	2'-0"	2						
* B103	1	#5	STR	3'-0"	3						
* B104	1	#5	STR	4'-0"	4	REINFORCING STEEL LBS. 1266					
* B105	1	#5	STR	5'-0"	5	* EPOXY COATED REINFORCING STEEL LBS. 926					
* B106	1	#5	STR	5'-6"	6	CLASS AA CONCRETE C. Y. 15.4					
* B107	1	#5	STR	6'-6"	7						
* B108	1	#5	STR	7'-6"	8						
* B109	1	#5	STR	9'-6"	10						
* B110	1	#5	STR	4'-6"	5						
* B111	1	#5	STR	6'-6"	7						
* B112	1	#5	STR	9'-6"	10						
B2	58	#6	STR	11'-8"	1016						
B201	1	#6	STR	9'-0"	14						
B202	1	#6	STR	2'-0"	3						
B203	1	#6	STR	3'-0"	5						
B204	1	#6	STR	4'-0"	6						
B205	1	#6	STR	5'-0"	8						
B206	1	#6	STR	6'-0"	9						
B207	1	#6	STR	7'-0"	11						
B208	1	#6	STR	8'-0"	12						
B209	1	#6	STR	10'-0"	15						
B210	1	#6	STR	4'-6"	7						
B211	1	#6	STR	6'-6"	10						
B212	1	#6	STR	9'-6"	14						
REINFORCING STEEL					LBS.	1448					
* EPOXY COATED REINFORCING STEEL					LBS.	1069					
CLASS AA CONCRETE					C. Y.	16.5					

SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	1'-11"	1'-7"
#5	2'-5"	2'-0"
#6	3'-7"	2'-5"

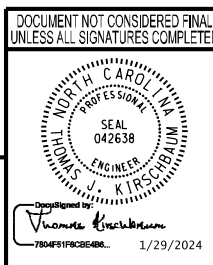


SECTION N-N

PROJECT NO. BP13.R032
RUTHERFORD COUNTY
 STATION: 20+59.30 -L-
 SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
BRIDGE APPROACH SLAB FOR PRESTRESSED CONCRETE BOX BEAM UNIT
 (SUB-REGIONAL TIER)

REVISIONS						SHEET NO.
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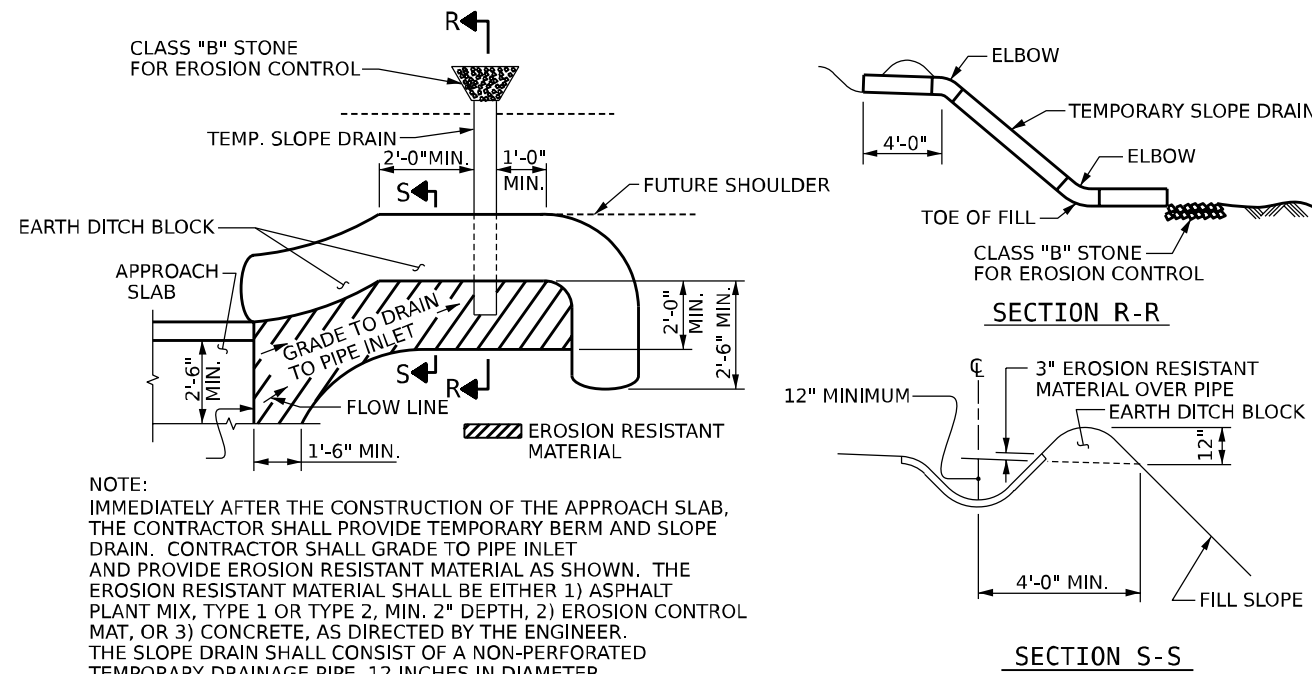
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CHECKED BY: BCH 5-09	REV. 08-19	BNB/THC
ASSEMBLED BY: T.KIRSCHBAUM	DATE: OCT 2022	
CHECKED BY: E.LAWES	DATE: FEB 2023	
DESIGN ENGINEER OF RECORD: T.KIRSCHBAUM	DATE: OCT 2023	

NOTES

FOR BRIDGE APPROACH FILL, SEE ROADWAY PLANS.

AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

APPROACH SLAB GROOVING IS NOT REQUIRED.

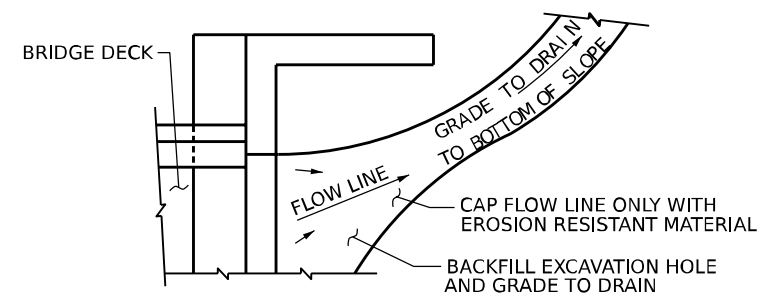


NOTE:
IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 2" DEPTH, 2) EROSION CONTROL MAT, OR 3) CONCRETE, AS DIRECTED BY THE ENGINEER. THE SLOPE DRAIN SHALL CONSIST OF A NON-PERFORATED TEMPORARY DRAINAGE PIPE, 12 INCHES IN DIAMETER.

PLAN VIEW

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT TO THE STRUCTURE. THE CONTRACTOR WILL BE REQUIRED TO REMOVE THESE MATERIALS PRIOR TO CONSTRUCTION OF THE APPROACH SLAB.

TEMPORARY DRAINAGE DETAIL

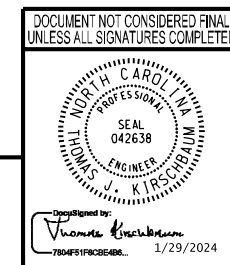
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RUTHERFORD COUNTY
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SHEET 2 OF 2

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 DEPARTMENT OF TRANSPORTATION
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 STANDARD

**BRIDGE APPROACH
 SLAB DETAILS**

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ASSEMBLED BY : T.KIRSCHBAUM	DATE : OCT 2022	
CHECKED BY : E.LAWES	DATE : FEB 2023	
DESIGN ENGINEER OF RECORD : T.KIRSCHBAUM	DATE : OCT 2023	

STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	AASHTO (CURRENT)
LIVE LOAD	SEE PLANS
IMPACT ALLOWANCE	SEE AASHTO
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 AASHTO
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 2024 "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 $\frac{3}{4}$ " WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO $\frac{1}{2}$ " RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A $\frac{1}{4}$ " 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 $\frac{1}{4}$ " 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 $\frac{7}{8}$ " \emptyset SHEAR STUDS FOR THE $\frac{3}{4}$ " \emptyset STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - $\frac{7}{8}$ " \emptyset STUDS FOR 4 - $\frac{3}{4}$ " \emptyset STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF $\frac{7}{8}$ " \emptyset STUDS ALONG THE BEAM AS SHOWN FOR $\frac{3}{4}$ " \emptyset STUDS BASED ON THE RATIO OF 3 - $\frac{7}{8}$ " \emptyset STUDS FOR 4 - $\frac{3}{4}$ " \emptyset 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 $\frac{5}{16}$ " IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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