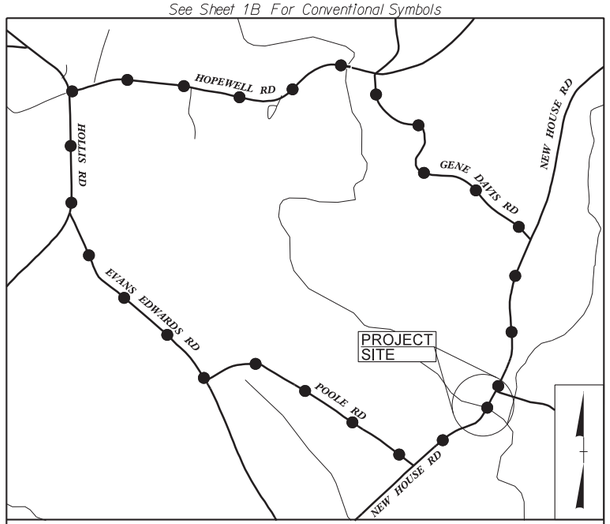
09/08/99

TIP PROJECT: BP13.R002

CONTRACT: DM00406

FINAL PLAN SUBMITTAL

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



VICINITY MAP

OFF–SITE DETOUR

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

RUTHERFORD COUNTY

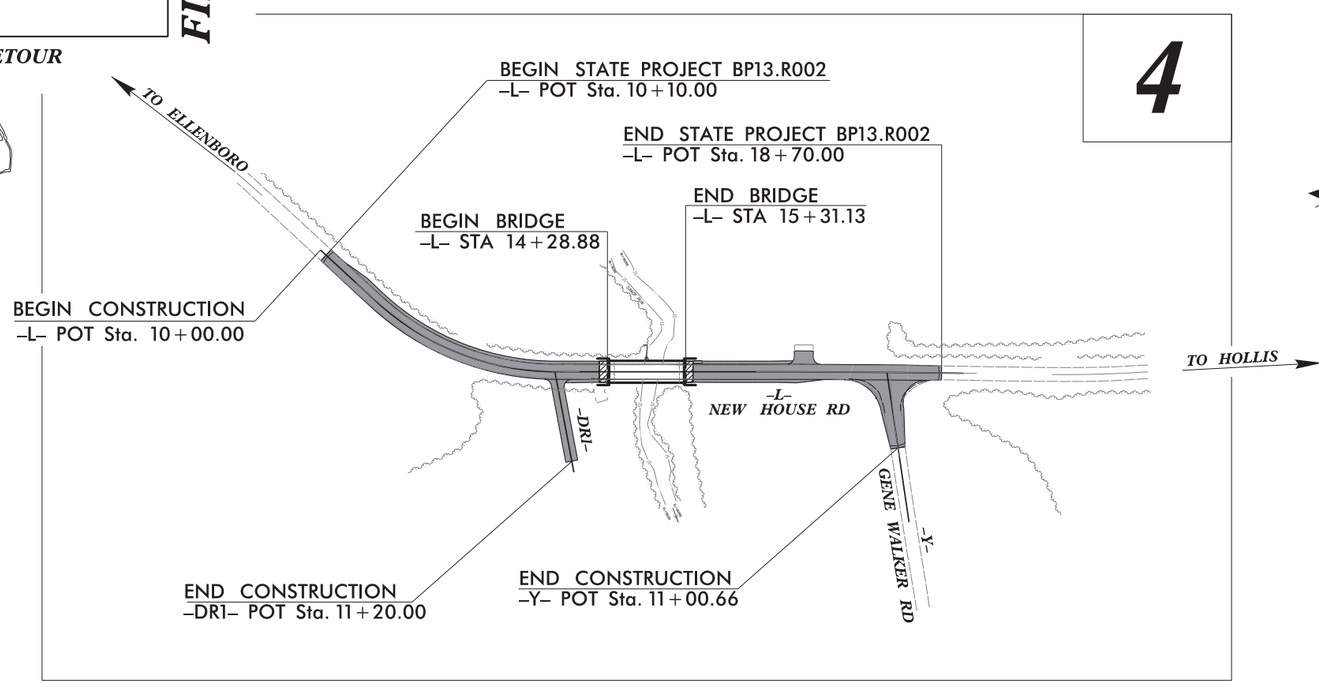
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP13.R002	1	

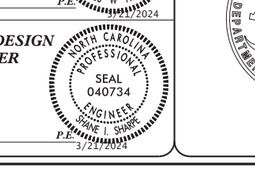
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
BP13.R002.1	N/A	P.E.
BP13.R002.2	N/A	R/W & UTIL.
BP13.R002.3	N/A	CONSTRUCTION

LOCATION: REPLACE BRIDGE NO. 090 OVER SANDY RUN ON SR 1762 (NEW HOUSE RD)

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

4

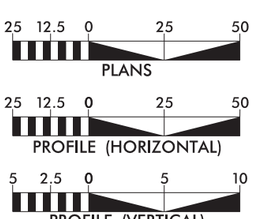




NOTE: DESIGN EXCEPTION REQUIRED
FOR DESIGN SPEED OF 35MPH

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES



DESIGN DATA

ADT 2019 = 650
V = 35 MPH
FUNC CLASS = LOCAL
SUB REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT BP13.R002 = 0.144 Miles
LENGTH OF STRUCTURE TIP PROJECT BP13.R002 = 0.019 Miles
TOTAL LENGTH OF TIP PROJECT BP13.R002 = 0.163 Miles

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

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: FEBRUARY 2, 2023

LETTING DATE: JUNE 19, 2024

SHANE I. SHARPE, PE
PROJECT ENGINEER

DREW DAACK, EIT
PROJECT DESIGN ENGINEER

NCDOT CONTACT: EDDIE DOUGLAS
DIVISION 13 BRIDGE PROGRAM MANAGER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032312 ENGINEER CHARLES W HEANEY

DocuSigned by: Heafner Charles
SIGNATURE: P.E. 3/21/2024

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 040734 ENGINEER SHANE I SHARPE

DocuSigned by: Shane I Sharpe
SIGNATURE: P.E. 3/21/2024

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

8:47:24 AM
800090_R01_TSH-01.dgn
3/21/2024

ROADWAY DESIGN ENGINEER
3/8/2024
NORTH CAROLINA PROFESSIONAL SEAL 040734 ENGINEER SHANE L. SHARPE

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

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

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.

EFF. 01–16–2024
REV.

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 Superelevation – 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
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

9/10/2021

PROJECT REFERENCE NO.	SHEET NO.
BP13-R002	1B

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
- 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 (S)
- Well (W)
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

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

RAILROADS:

- Standard Gauge (CSX TRANSPORTATION)
- RR Signal Milepost (MILEPOST 35)
- Switch (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 (RW)
- Existing Control of Access Line (CA)
- Proposed Control of Access Line (CA)
- Proposed ROW and CA Line (RW CA)
- 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 (Vineyard)

EXISTING STRUCTURES:

MAJOR:

- Bridge, Tunnel or Box Culvert (CONC)
- Bridge Wing Wall, Head Wall and End Wall (CONC WW)

MINOR:

- Head and End Wall (CONC HW)
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB (CB)
- Paved Ditch Gutter
- Storm Sewer Manhole (S)
- Storm Sewer (S)

UTILITIES:

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

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole (P)
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole (HH)
- 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 (T)
- Telephone Pedestal (T)
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole (HH)
- U/G Telephone Test Hole (SUE – LOS A)*
- U/G Telephone Cable (SUE – LOS B)* (T)
- U/G Telephone Cable (SUE – LOS C)* (T)
- U/G Telephone Cable (SUE – LOS D)* (T)
- U/G Telephone Conduit (SUE – LOS B)* (TC)
- U/G Telephone Conduit (SUE – LOS C)* (TC)
- U/G Telephone Conduit (SUE – LOS D)* (TC)
- U/G Fiber Optics Cable (SUE – LOS B)* (T FO)
- U/G Fiber Optics Cable (SUE – LOS C)* (T FO)
- U/G Fiber Optics Cable (SUE – LOS D)* (T FO)

WATER:

- Water Manhole (W)
- Water Meter
- Water Valve
- Water Hydrant
- U/G Water Line Test Hole (SUE – LOS A)*
- U/G Water Line (SUE – LOS B)* (W)
- U/G Water Line (SUE – LOS C)* (W)
- U/G Water Line (SUE – LOS D)* (W)
- Above Ground Water Line (A/G Water)

TV:

- TV Pedestal (C)
- TV Tower
- U/G TV Cable Hand Hole (HH)
- 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 (S)
- 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.)

PROJECT REFERENCE NO.	SHEET NO.
BP13.R002	2A-1
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER 3/8/2024 — SEAL 040734, NORTH CAROLINA PROFESSIONAL ENGINEER, SHANE I. SHARPE — DocuSigned by: Shane I Sharpe 63EDE17E6E7A4AB...

PAVEMENT DESIGN ENGINEER 3/11/2024 — SEAL 044590, NORTH CAROLINA PROFESSIONAL ENGINEER, ANDREW D. WARGO — DocuSigned by: Andrew D. Wargo, PE, PhD 2D2C959DCBCA49E...

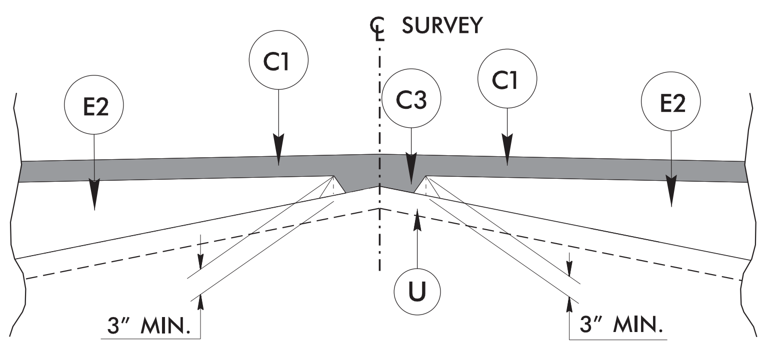
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

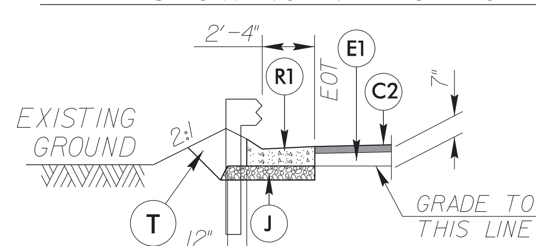
PAVEMENT SCHEDULE
(FINAL PAVEMENT DESIGN)

C1	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C2	PROP. APPROX. 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 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" TO BE PLACED IN LAYERS NOT LESS THAN 3.0" OR GREATER THAN 5.5" IN DEPTH.
J	PROP. 6" AGGREGATE BASE COURSE.
R1	SHOULDER BERM GUTTER
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	WEDGING (SEE WEDGING DETAIL).

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.
SEE STRUCTURE PLANS FOR BRIDGE CONSTRUCTION

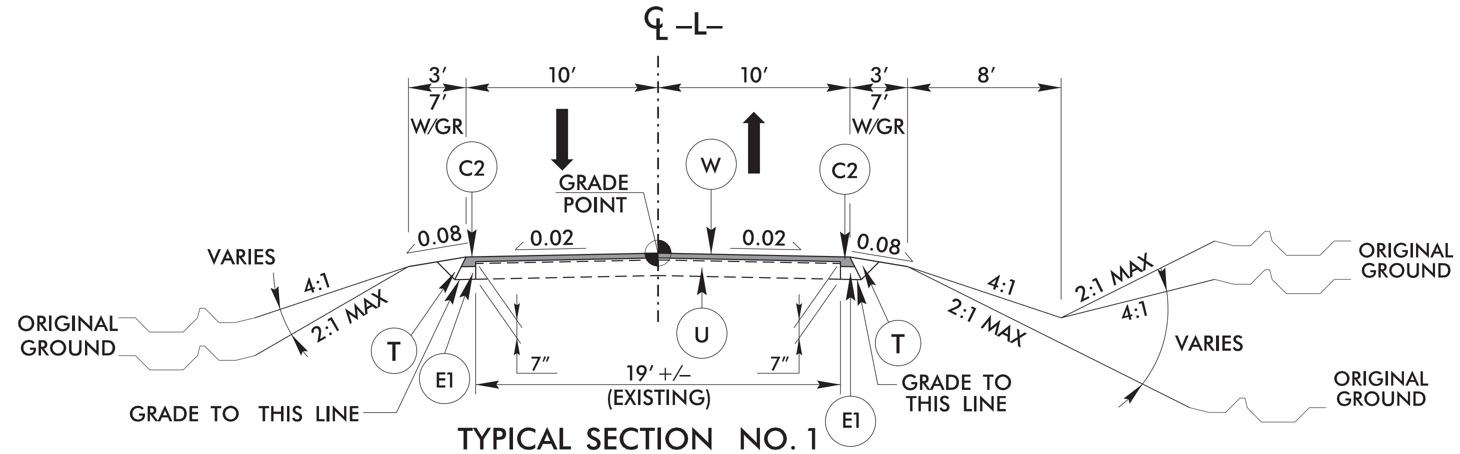


DETAIL SHOWING METHOD OF WEDGING



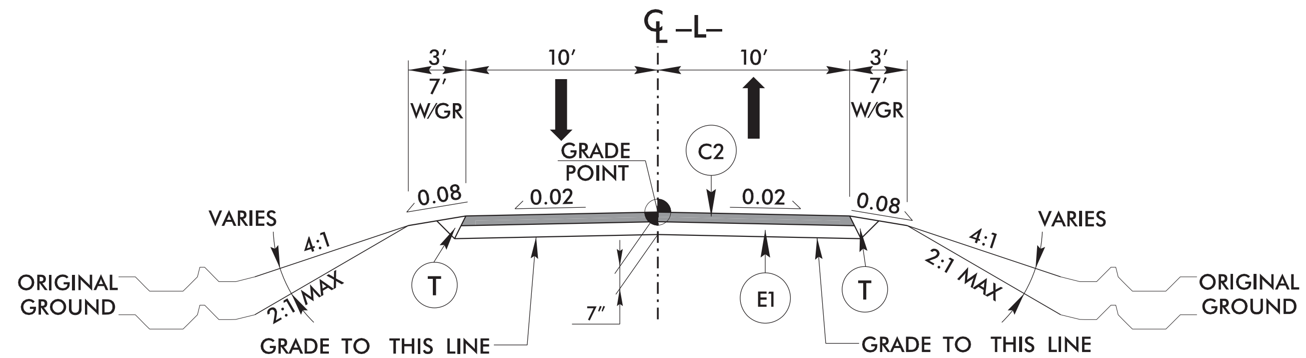
SHOULDER BERM GUTTER DETAIL

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 2
-L- STA 15+42.00 TO STA 15+54.00 (LT)



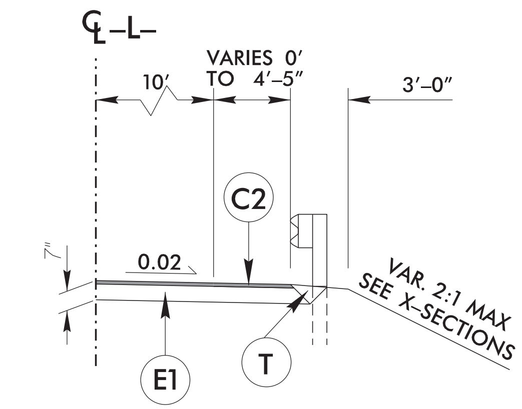
TYPICAL SECTION NO. 1

-L- STA 10+10.00 TO STA 13+40.00
-L- STA 16+85.00 TO STA 18+70.00



TYPICAL SECTION NO. 2

-L- STA 13+40.00 TO 14+28.88 (BEG. BRIDGE)
-L- STA 15+31.13 (END BRIDGE) TO STA 16+85.00

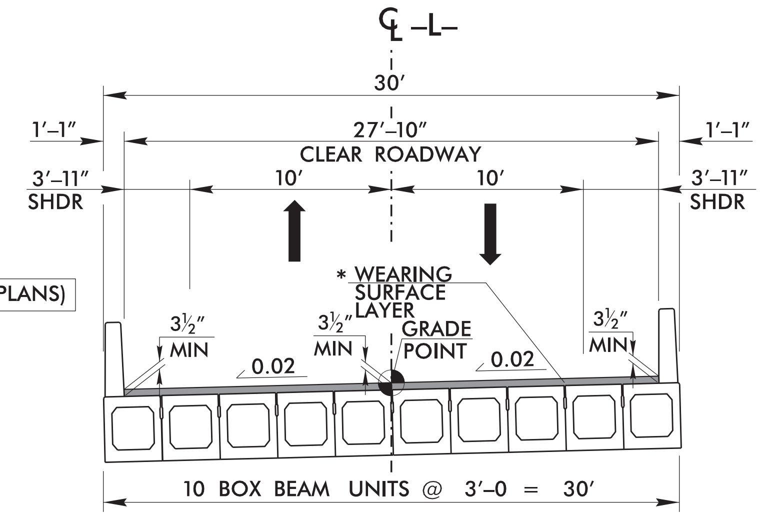


DETAIL

GUARDRAIL

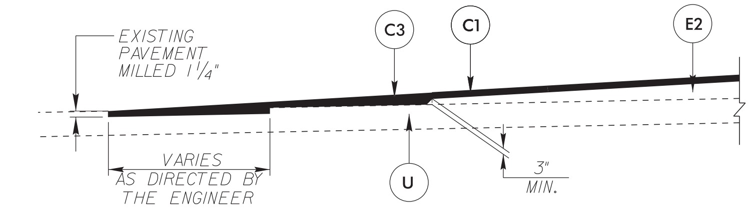
-L- STA 10+68.21 TO STA 14+30.71 (LT)
-L- STA 13+80.71 TO STA 14+30.71 (RT)
-L- STA 15+54.00 TO STA 16+66.80 (LT)
-L- STA 15+29.30 TO STA 16+79.30 (RT)

* (SEE STRUCTURE PLANS)



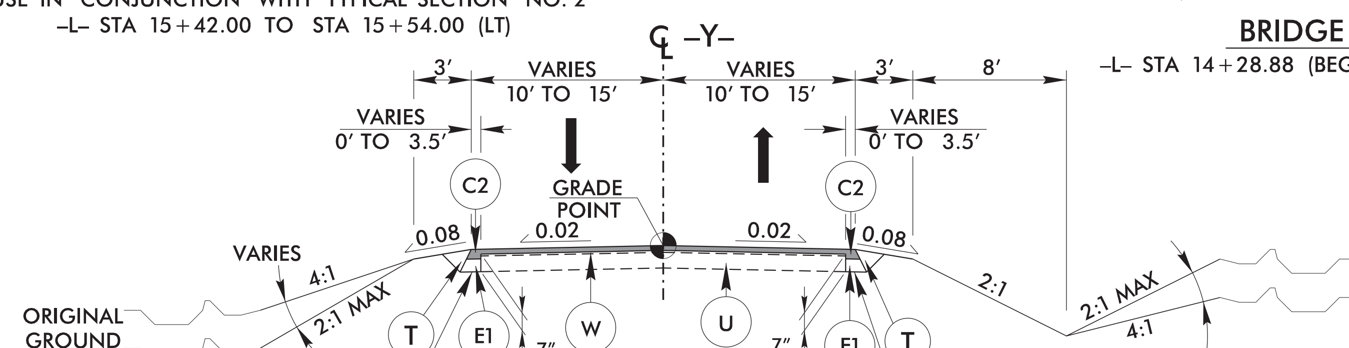
BRIDGE TYPICAL SECTION NO. 3

-L- STA 14+28.88 (BEGIN BRIDGE) TO STA 15+31.13 (END BRIDGE)



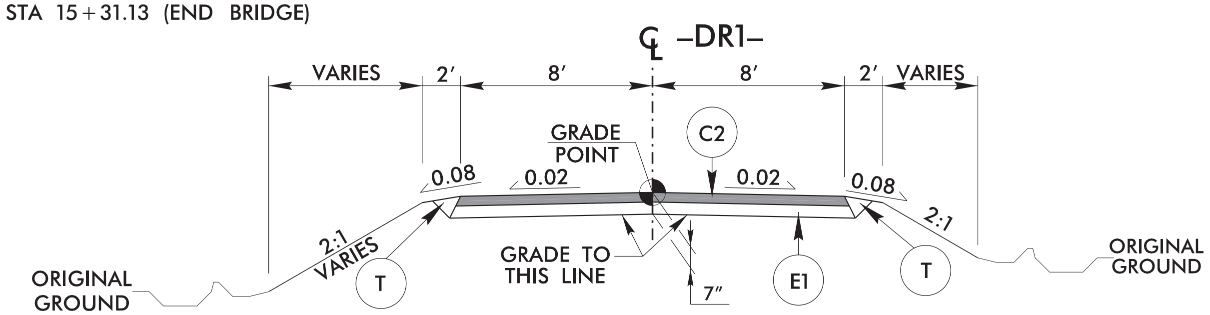
MILLING DETAIL FOR PROFILE CONNECTIONS

TYING PROPOSED PAVEMENTS TO EXISTING PAVEMENTS



TYPICAL SECTION NO. 4

-Y- STA 10+10.12 TO STA 11+00.66



TYPICAL SECTION NO. 5

-DR1- STA 10+10.18 TO 11+20.00

REVISIONS

8/17/99

12/06/07

COMPUTED BY: DTD	DATE: 11/30/2022
CHECKED BY: EM	DATE: 11/16/2023

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
BP13.R002	3B-1

434 Fayetteville Street Suite 1500
Raleigh, NC 27601 - 919.836.4040
www.wspgroup.com
LICENSE NO. F-0891

SUMMARY OF EARTHWORK

STATION	STATION	UNCL. EXCAV.	EMBANK. +%	BORROW	WASTE
–L– 10+10.00	–L– 14+28.88	140	684	544	
–DR1– 10+10.18	–DR1– 11+35.04	267	20		247
SUBTOTALS:		407	704	544	247
–L– 15+31.13	–L– 18+70.00	68	785	717	
–Y– 10+10.12	–Y– 11+00.66	16	8		8
SUBTOTALS:		84	793	717	8
PROJECT TOTALS:		491	1,497	1,261	255
WASTE IN LIEU OF BORROW				–255	–255
EST. 5% TO REPLACE TOP SOIL				50	
GRAND TOTALS:		491	1,497	1,056	
SAY:		500		1,100	

NOTE: EARTHWORK QUANTITIES ARE CALCULATED BY THE ROADWAY DESIGNER.

APPROXIMATE QUANTITIES ONLY. UNCLASSIFIED EXCAVATION, BORROW EXCAVATION, FINE GRADING, CLEARING AND GRUBBING, 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

SURVEY LINE	STATION	STATION	LENGTH
L (LT)	15+42.00	15+54.00	12
TOTAL:			12
SAY:			12

PAVEMENT REMOVAL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD^2
L	13+40	14+38	CL	207.98
L	15+24	16+85	CL	321.32
Y	10+18	10+36	LT	13.31
TOTAL:				542.61
SAY:				550

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48" & UNDER)

STATION	LOCATION (LT,RT, OR CL)	STRUCTURE NO.		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC)								C.S. PIPE (UNLESS NOTED OTHRWISE)													CLASS III R.C. PIPE (UNLESS OTHERWISE NOTED)							
SIZE								12"	15"	18"	24"	30"	36"	42"	48"	12"	15"	18"	24"		30"		36"		42"		48"		12"	15"	18"	24"	30"	36"	42"	48"
THICKNESS OR GAUGE		FROM	TO													.064	.064	.064	.064		.079		.079		.109		.109									
–L– 15+58	12 LT	0405		871.8																																
		0405	0404		869.1	865.0											20																			
–L– 12+39	CL	0403			872.4	868.8																										52				
–L– 13+63	20 RT	0402								28																										
–L– 16+90	20 LT	0401								36																										
TOTAL:										64							20															52				

STATION	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS.		QUANTITIES FOR DRAINAGE STRUCTURES * TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B')	LIN. *FT.		C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE				D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME & GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATE STD. 840.22	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	J.B. STD. 840.31 OR 840.32	T.B.D.I. STD. 840.35						15" C.S. ELBOW	CONC. COLLARS CL. "B" C.Y. STD 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN.FT.	REMARKS
				R.C.P.	C.S.P.	PER EACH (0' THRU 5.0')	A 5.0' THRU 10.0'	B 10.0' AND ABOVE		E	F	G																							
–L– 15+58						1																	1		1										
																															2				
–L– 12+39																																			
–L– 13+63																																		24	DRIVEWAY PIPE
–L– 16+90																																		29	DRIVEWAY PIPE
TOTAL:						1																	1		1						2			53	

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
G.D.I. (N.S.)	GRATED DROP INLET (NARROW SLOT)
J.B.	JUNCTION BOX
M.H.	MANHOLE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX

"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

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS									IMPACT ATTENUATOR TYPE 350			SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	TYPE III	GREU TL-2								EA	G	NG				
–L–	10+68.21	14+30.71	LT	362.5'				11+60.00	4'	7'		25'		0.5'	1	1														
–L–	13+80.71	14+30.71	RT	50'			14+30.71		4'	7'	25'		0.5'		1	1														
–L–	15+29.30	16+66.80	LT	137.5'			16+66.80		4'	7'	25'		0.5'		1	1														
–L–	15+29.30	16+79.30	RT	150'				16+00.00	4'	7'		25'		0.5'	1	1														
SUBTOTAL				700'																										
	LESS ANCHORS DEDUCTIONS																													
		GREU TL-2	4 @ 25'	–100'																										
		TYPE III	4 @ 18.75'	–75'																										
			TOTAL	525'																										
			SAY	525'																										
							ADDITIONAL GUARDRAIL POSTS = 5								4	4														

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3/7/2024

COMPUTED BY: D. MATT MULLEN PE DATE: 4.28.23
CHECKED BY: SHIPING YANG, PE DATE: 4.28.2023

(2-3-23)

PROJECT NO.	SHEET NO.
BP13.R002	3G-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF SUBSURFACE DRAINAGE

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

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

SUMMARY OF GEOTEXTILE FOR SUBGRADE STABILIZATION

LINE	Station	Station	Geotextile for Subgrade Stabilization SY
CONTINGENCY			200
		TOTAL SY:	200*

*Total square yards of "Geotextile for Subgrade Stabilization" is only the estimated quantity for subgrades and may only represent a portion of the geotextile 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 Subgrade Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY			ASU(1)	12	100	200	300		
			TOTAL CY/TONS/SY:		100	200**	300**	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 Subgrade 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.

8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
BP13.R002	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER 3/8/2024 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040734 SHANE I. SHARPE — DocuSigned by: Shane I Sharpe

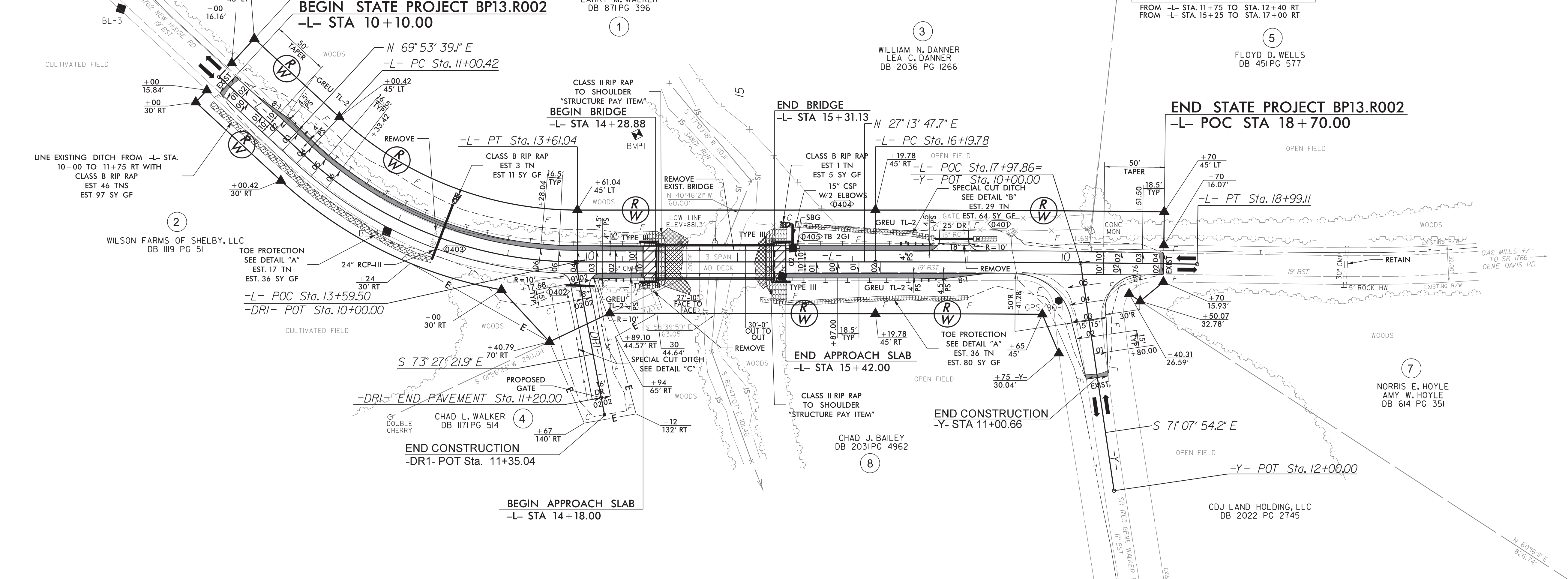
HYDRAULICS ENGINEER 3/8/2024 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032312 CHARLES W HEAFNER — DocuSigned by: Heafner Charles

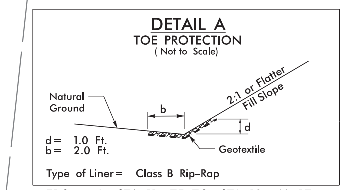
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:

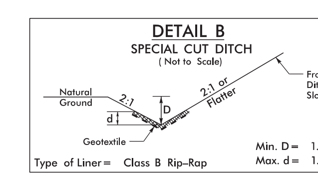
WSP USA
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
FAX: 1.919.836.4099
LICENSE NO. F-0165

-L-	-L-
PI Sta 12+37.11	PI Sta 17+59.45
△ = 42° 39' 51.4" (LT)	△ = 0° 48' 00.8" (RT)
D = 16° 22' 12.8"	D = 0° 17' 11.3"
L = 260.62'	L = 279.33'
T = 136.69'	T = 139.67'
R = 350.00'	R = 20,000.00'
e = 6%	e = NC
Ro = 99'	Ds = 45 MPH
Ds = 35 MPH **	

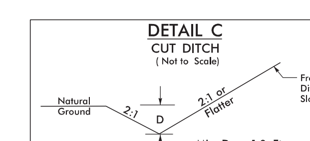

NAD 83/2011
-L- POT Sta. 10+00.00
BEGIN CONSTRUCTION
BEGIN STATE PROJECT BP13.R002
-L- STA 10+10.00
N 69° 53' 39.1" E
-L- PC Sta. 11+00.42
LARRY M. WALKER
DB 871 PG 396
WILLIAM N. DANNER
LEA C. DANNER
DB 2036 PG 1266
FLOYD D. WELLS
DB 451 PG 577
CLASS II RIP RAP
TO SHOULDER
"STRUCTURE PAY ITEM"
BEGIN BRIDGE
-L- STA 14+28.88
END BRIDGE
-L- STA 15+31.13
N 27° 13' 47.7" E
-L- PC Sta. 16+19.78
END STATE PROJECT BP13.R002
-L- POC STA 18+70.00
-L- PT Sta. 13+61.04
CLASS B RIP RAP
EST 3 TN
EST 11 SY GF
LINE EXISTING DITCH FROM -L- STA. 10+00 TO 11+75 RT WITH CLASS B RIP RAP
EST 46 TNS
EST 97 SY GF
WILSON FARMS OF SHELBY, LLC
DB 1119 PG 51
TOE PROTECTION
SEE DETAIL "A"
EST. 17 TN
EST. 36 SY GF
24" RCP-III
-L- POC Sta. 13+59.50
-DR1- POT Sta. 10+00.00
CULTIVATED FIELD
WOODS
REMOVE
REMOVE EXIST. BRIDGE
LOW LINE ELEV=881.3'
CLASS B RIP RAP
EST 1 TN
EST 5 SY GF
15" CSP W/2 ELBOWS
-L- POC Sta. 17+97.86=
-Y- POT Sta. 10+00.00
SPECIAL CUT DITCH
SEE DETAIL "B"
EST. 29 TN
EST. 64 SY GF
-L- PT Sta. 18+99.11
RETAIN
OPEN FIELD
S 73° 27' 21.9" E
PROPOSED GATE
-DR1- END PAVEMENT Sta. 11+20.00
CHAD L. WALKER
DB 1171 PG 514
END CONSTRUCTION
-DR1- POT Sta. 11+35.04
SPECIAL CUT DITCH
SEE DETAIL "C"
END APPROACH SLAB
-L- STA 15+42.00
TOE PROTECTION
SEE DETAIL "A"
EST. 36 TN
EST. 80 SY GF
END CONSTRUCTION
-Y- STA 11+00.66
S 71° 07' 54.2" E
CLASS II RIP RAP
TO SHOULDER
"STRUCTURE PAY ITEM"
CHAD J. BAILEY
DB 2031 PG 4962
NORRIS E. HOYLE
AMY W. HOYLE
DB 614 PG 351
-Y- POT Sta. 12+00.00
CDJ LAND HOLDING, LLC
DB 2022 PG 2745
BEGIN APPROACH SLAB
-L- STA 14+18.00
SR 1763 GENE WALKER RD
0.50 MILES +/- TO CLEVELAND CO. LINE
0.42 MILES +/- TO SR 1766 GENE DAVIS RD
SR 1762 NEW HOUSE RD
BL-3
BY-6
BM#1
DOUBLE CHERRY
EIP



FROM -L- STA. 11+75 TO STA. 12+40 RT
FROM -L- STA. 15+25 TO STA. 17+00 RT



FROM STA. 15+50 TO STA. 17+25 LT



FROM -DR1- STA. 10+25 TO STA. 11+20 RT
FROM -DR1- STA. 10+25 TO STA. 10+75 LT

**NOTE: DESIGN EXCEPTION IS REQUIRED

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R002_RDY_PSH-04
3/7/2024

PROJECT REFERENCE NO.	SHEET NO.
BP13.R002	5

ROADWAY DESIGN ENGINEER 3/8/2024 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040734 SHANE I. SHARPE — DocuSigned by: Shane I Sharpe 83EDE17E6E7A4AB...

HYDRAULICS ENGINEER 3/8/2024 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032312 CHARLES W HEAFNER — DocuSigned by: Heafner Charles 56932E85C450464...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

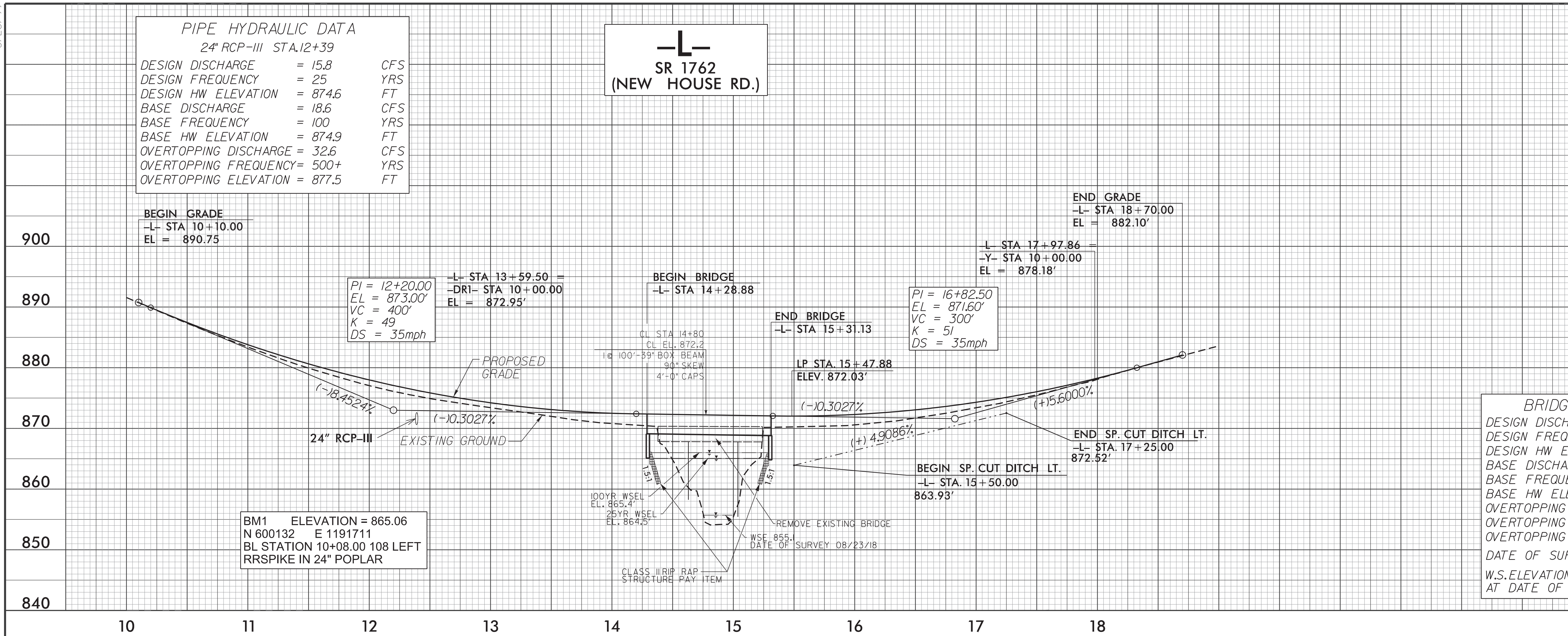
PIPE HYDRAULIC DATA

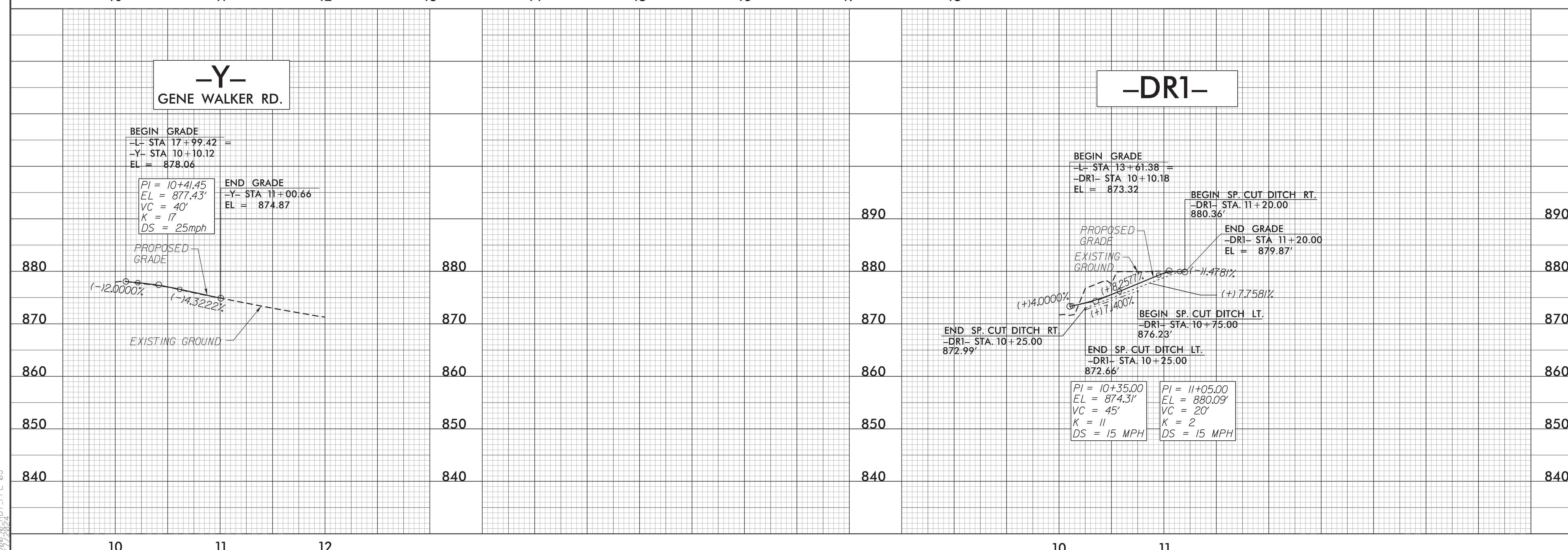
24" RCP-III STA.12+39

DESIGN DISCHARGE	= 15.8	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 874.6	FT
BASE DISCHARGE	= 18.6	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 874.9	FT
OVERTOPPING DISCHARGE	= 32.6	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 877.5	FT

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 1700	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 864.5	FT
BASE DISCHARGE	= 2400	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 865.4	FT
OVERTOPPING DISCHARGE	= 9800	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 872.18	FT
DATE OF SURVEY	= 8/18	
W.S. ELEVATION AT DATE OF SURVEY	= 855.1	FT


-L-
SR 1762
(NEW HOUSE RD.)
BEGIN GRADE
-L- STA 10+10.00
EL = 890.75
PI = 12+20.00
EL = 873.00'
VC = 400'
K = 49
DS = 35mph
-L- STA 13+59.50 =
-DR1- STA 10+00.00
EL = 872.95'
BEGIN BRIDGE
-L- STA 14+28.88
END BRIDGE
-L- STA 15+31.13
CL STA 14+80
CL EL. 872.2
1@ 100'-39" BOX BEAM
90° SKEW
4'-0" CAPS
LP STA. 15+47.88
ELEV. 872.03'
PI = 16+82.50
EL = 871.60'
VC = 300'
K = 51
DS = 35mph
-L- STA 17+97.86 =
-Y- STA 10+00.00
EL = 878.18'
END GRADE
-L- STA 18+70.00
EL = 882.10'
PROPOSED GRADE
EXISTING GROUND
(-)18.4524%
(-)0.3027%
(-)0.3027%
(+)4.9086%
(+)5.6000%
24" RCP-III
1.5:1
100YR WSEL EL. 865.4'
25YR WSEL EL. 864.5'
REMOVE EXISTING BRIDGE
WSE 855.1
DATE OF SURVEY 08/23/18
CLASS II RIP RAP
STRUCTURE PAY ITEM
BEGIN SP. CUT DITCH LT.
-L- STA. 15+50.00
863.93'
END SP. CUT DITCH LT.
-L- STA. 17+25.00
872.52'
BM1 ELEVATION = 865.06
N 600132 E 1191711
BL STATION 10+08.00 108 LEFT
RRSPIKE IN 24" POPLAR
900
890
880
870
860
850
840
10
11
12
13
14
15
16
17
18


-Y-
GENE WALKER RD.
BEGIN GRADE
-L- STA 17+99.42 =
-Y- STA 10+10.12
EL = 878.06
PI = 10+41.45
EL = 877.43'
VC = 40'
K = 17
DS = 25mph
END GRADE
-Y- STA 11+00.66
EL = 874.87
PROPOSED GRADE
EXISTING GROUND
(-)2.0000%
(-)4.3222%
-DR1-
BEGIN GRADE
-L- STA 13+61.38 =
-DR1- STA 10+10.18
EL = 873.32
BEGIN SP. CUT DITCH RT.
-DR1- STA. 11+20.00
880.36'
END GRADE
-DR1- STA 11+20.00
EL = 879.87'
PROPOSED GRADE
EXISTING GROUND
(+)4.0000%
(+)8.2577%
(+)7.1400%
(-)1.4781%
(+)7.7581%
END SP. CUT DITCH RT.
-DR1- STA. 10+25.00
872.99'
BEGIN SP. CUT DITCH LT.
-DR1- STA. 10+75.00
876.23'
END SP. CUT DITCH LT.
-DR1- STA. 10+25.00
872.66'
PI = 10+35.00
EL = 874.31'
VC = 45'
K = 11
DS = 15 MPH
PI = 11+05.00
EL = 880.09'
VC = 20'
K = 2
DS = 15 MPH
890
880
870
860
850
840
10
11
12

3/2023

TIP PROJECT: BP13.R002

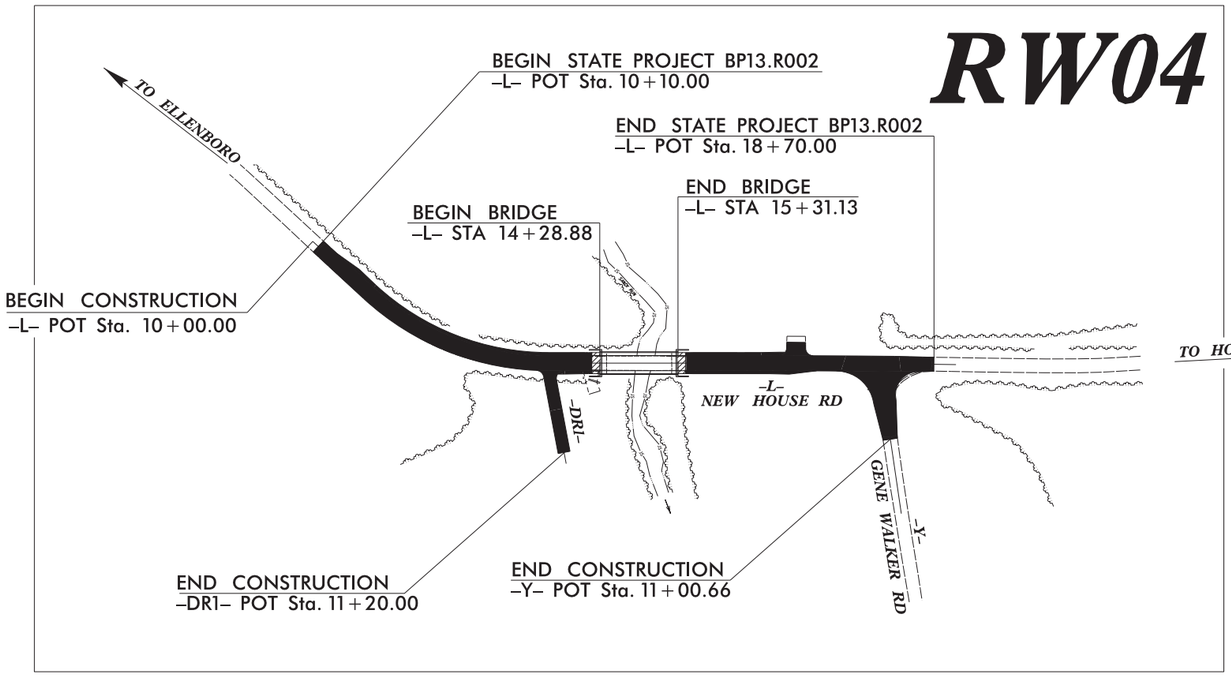
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP13.R002	RW01	5

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

RUTHERFORD COUNTY

RW04



NAD 83/2011

GRAPHIC SCALE

50 25 0 50 100
PLANS

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "GPS 90-1" WITH NAD 83/NSRS 2011 STATE PLANE GRID COORDINATES OF NORTHING: 600,391.143(ft) EASTING: 1,192,006.603(ft) ELEVATION: 875.00(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99983699
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "GPS 90-1" TO -L- STATION 10+00.00 IS S 42°09'38.9" W 754.467(ft)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

Prepared in the Office of:

TGS ENGINEERS
201 WEST MARION STREET
SUITE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:	*LETTING DATE:*
2/2/2023	*6/19/2024*

PROFESSIONAL LAND SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-4775 LAND SURVEYOR MATTHEW T CORNWELL

DocuSigned by: Matthew Cornwell EBD36F11473E475...

3/21/2024

SIGNATURE: *Date:*

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

21-MAR-2024 14:52
S:\Surveyors\projects\LIB_800090\2023 RW Staking\as-submitted_24032I\800090_ls_rw01.dgn
mcornwell AT MCORNWELLLAPTOP

11/27/18

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO.	SHEET NO.
17BP.13.R.178	RW02C-1
Location and Surveys	

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

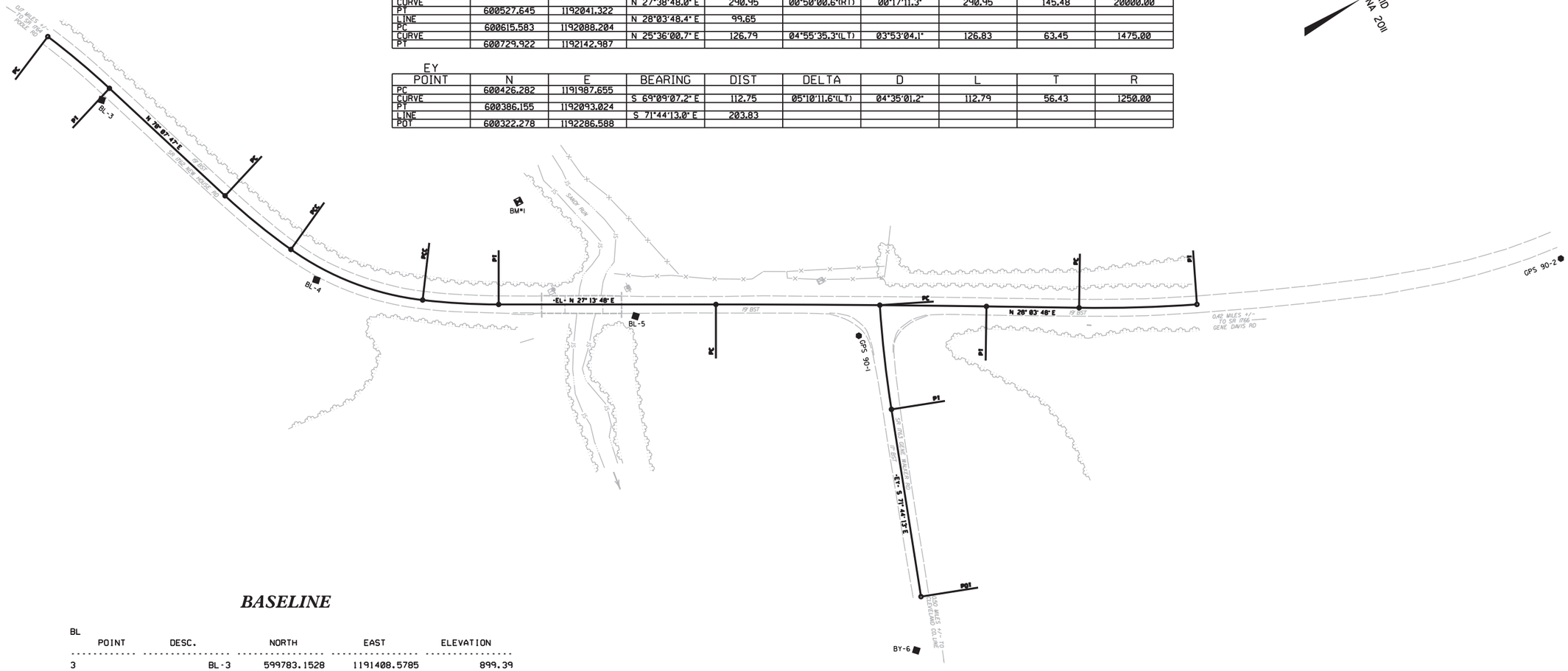
EXISTING CENTERLINE ALIGNMENTS

EL

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
PC	599762.838	1191321.477							
CURVE			N 67°14'47.7" E	86.51	05°45'58.1"(RT)	06°39'44.3"	86.55	43.31	860.00
PT	599796.298	1191401.257							
LINE			N 70°07'46.7" E	169.78					
PC	599854.005	1191560.929							
CURVE			N 66°23'23.5" E	91.32	07°28'46.4"(LT)	08°11'06.4"	91.38	45.75	700.00
PCC	599890.577	1191644.600							
CURVE			N 48°14'45.6" E	151.74	28°48'29.6"(LT)	18°47'07.8"	153.35	78.33	305.00
PCC	599991.628	1191757.802							
CURVE			N 30°32'09.2" E	81.89	06°36'43.1"(LT)	08°04'11.4"	81.93	41.01	710.00
PT	600062.160	1191799.408							
LINE			N 27°13'47.7" E	233.65					
PC	600269.917	1191906.317							
CURVE			N 27°38'48.0" E	290.95	00°50'00.6"(RT)	00°17'11.3"	290.95	145.48	20000.00
PT	600527.645	1192041.322							
LINE			N 28°03'48.4" E	99.65					
PC	600615.583	1192088.204							
CURVE			N 25°36'00.7" E	126.79	04°55'35.3"(LT)	03°53'04.1"	126.83	63.45	1475.00
PT	600729.922	1192142.987							

EY

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
PC	600426.282	1191987.655							
CURVE			S 69°09'07.2" E	112.75	05°10'11.6"(LT)	04°35'01.2"	112.79	56.43	1250.00
PT	600386.155	1192093.024							
LINE			S 71°44'13.0" E	203.83					
POT	600322.278	1192286.588							



BASELINE

BL

POINT	DESC.	NORTH	EAST	ELEVATION
3	BL-3	599783.1528	1191408.5785	899.39
4	BL-4	599899.8640	1191686.2823	877.47
5	BL-5	600187.2724	1191877.9791	868.85
1	GPS 90-1	600391.1430	1192006.6030	875.00
2	GPS 90-2	601100.4450	1192278.2040	914.19

BY

POINT	DESC.	NORTH	EAST	ELEVATION
EQ1	GPS 90-1	600391.1430	1192006.6030	875.00
6	BY-6	600291.3125	1192335.6437	868.35

BENCHMARKS

BM1 ELEVATION - 865.06
N 600132 E 1191711
BL STATION 10+08.00 108 LEFT
RRSPIKE IN 24" POPLAR

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.

27-NOV-2018 14:45
C:\Users\mcornwell.TGSE\Desktop\800090\FOR REVIEW\800090_ls_rw02c-1.dgn
mcornwell AT MCORNWELLLAPTOP

3/2023

REVISIONS

PROPOSED ALIGNMENT CONTROL SHEET

L

TYPE	STATION	NORTH	EAST
POT	10+00.00	599831.8836	1191500.1941
PC	11+00.42	599866.4043	1191594.4966
PT	13+61.04	600034.9283	1191785.3946
PC	16+19.78	600264.9929	1191903.7836
PT	18+99.11	600512.4654	1192033.3243

Y

TYPE	STATION	NORTH	EAST
POT	10+00.00	600422.9688	1191985.9681
POT	12+00.00	600358.2901	1192175.2210

DR1

TYPE	STATION	NORTH	EAST
POT	10+00.00	600033.5548	1191784.6839
POT	11+20.00	599999.3855	1191899.7137

PROJECT REFERENCE NO.	SHEET NO.
BP13.R002	RW02D-1

Location and Surveys

TGS ENGINEERS
201 WEST MARION STREET
SUITE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

PROJECT SURVEYOR

DocuSigned by:
Matthew Cornwell
EBD36F1147 3E475...

3/30/2023

NORTH CAROLINA PROFESSIONAL SEAL L-4775 LAND SURVEYOR MATTHEW T. CORNWELL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

This 3/30/2023

DocuSigned by:
Matthew Cornwell
EBD36F1147 3E475...

Professional Land Surveyor L-4775

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

2. THE PROPOSED ALIGNMENT CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

30-MAR-2023 09:14
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mcornwell AT MCORNWELL_LAPTOP

3/2023

REVISIONS

RIGHT OF WAY CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
BP13.R002	RW03E-1

Location and Surveys

TGS ENGINEERS
201 WEST MARION STREET
SUITE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

PROJECT SURVEYOR

DocuSigned by:
Matthew Cornwell
EBD9BF1147BE475...

3/30/2023

NORTH CAROLINA PROFESSIONAL SEAL L-4775 LAND SURVEYOR MATTHEW T. CORNWELL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

I, Matthew T. Cornwell, certify that the right of way and permanent easement monumentation for this project shown herein was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:10,000 (Class A). Field work was performed from 3/22/2023 to 3/24/2023, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 3/30/2023

DocuSigned by:
Matthew Cornwell
EBD9BF1147BE475...

Professional Land Surveyor L-4775

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST	
L	10+00.00	-16.16	599847.0597	1191494.6387	
L	10+00.00	-45.00	599874.1413	1191484.7251	
L	10+00.00	15.84	599817.0096	1191505.6389	
L	10+00.00	30.00	599803.7119	1191510.5067	
L	11+00.42	30.00	599838.2325	1191604.8093	
L	11+00.42	-45.00	599908.6620	1191579.0276	
L	13+00.00	30.00	599965.2066	1191776.7720	
L	13+40.79	70.00	599981.6259	1191835.8998	
L	13+61.04	-45.00	600055.5186	1191745.3816	
L	13+89.10	44.57	600039.4834	1191837.8593	REBAR SET (NO CAP)
L	16+19.78	-45.00	600285.5832	1191863.7706	
L	16+19.78	45.00	600244.4025	1191943.7966	
L	17+65.00	45.00	600372.9946	1192010.5605	
L	18+70.00	-45.00	600507.8482	1191979.9104	
L	18+70.00	-16.07	600494.2895	1192005.4680	
L	18+70.00	15.93	600479.2927	1192033.7362	

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y	10+50.00	-30.74	600435.8886	1192043.2229
Y	10+75.00	30.04	600370.2889	1192047.2233

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 3/22/2023 TO 3/24/2023.

30-MAR-2023 09:17
$$Surveys\Projects\LIB\2023\800090.RW\MTC\800090_ls_rw03e-1.dgn
mcornwell $$ MCORNWELLLAPTOP

PROJECT REFERENCE NO.	SHEET NO.
BP13.R002	RW04

Location and Surveys

TGS ENGINEERS
201 WEST MARION STREET
SUITE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

PROJECT SURVEYOR

DocuSigned by: Matthew Cornwell EBD38F1147 3E475...

NORTH CAROLINA PROFESSIONAL SEAL L-4775 LAND SURVEYOR MATTHEW T. CORNWELL

4/5/2023

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

I, Matthew T. Cornwell, certify that the right of way and permanent easement monumentation for this project shown herein was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:10,000 (Class A). Field work was performed from 3/22/2023 to 3/24/2023, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

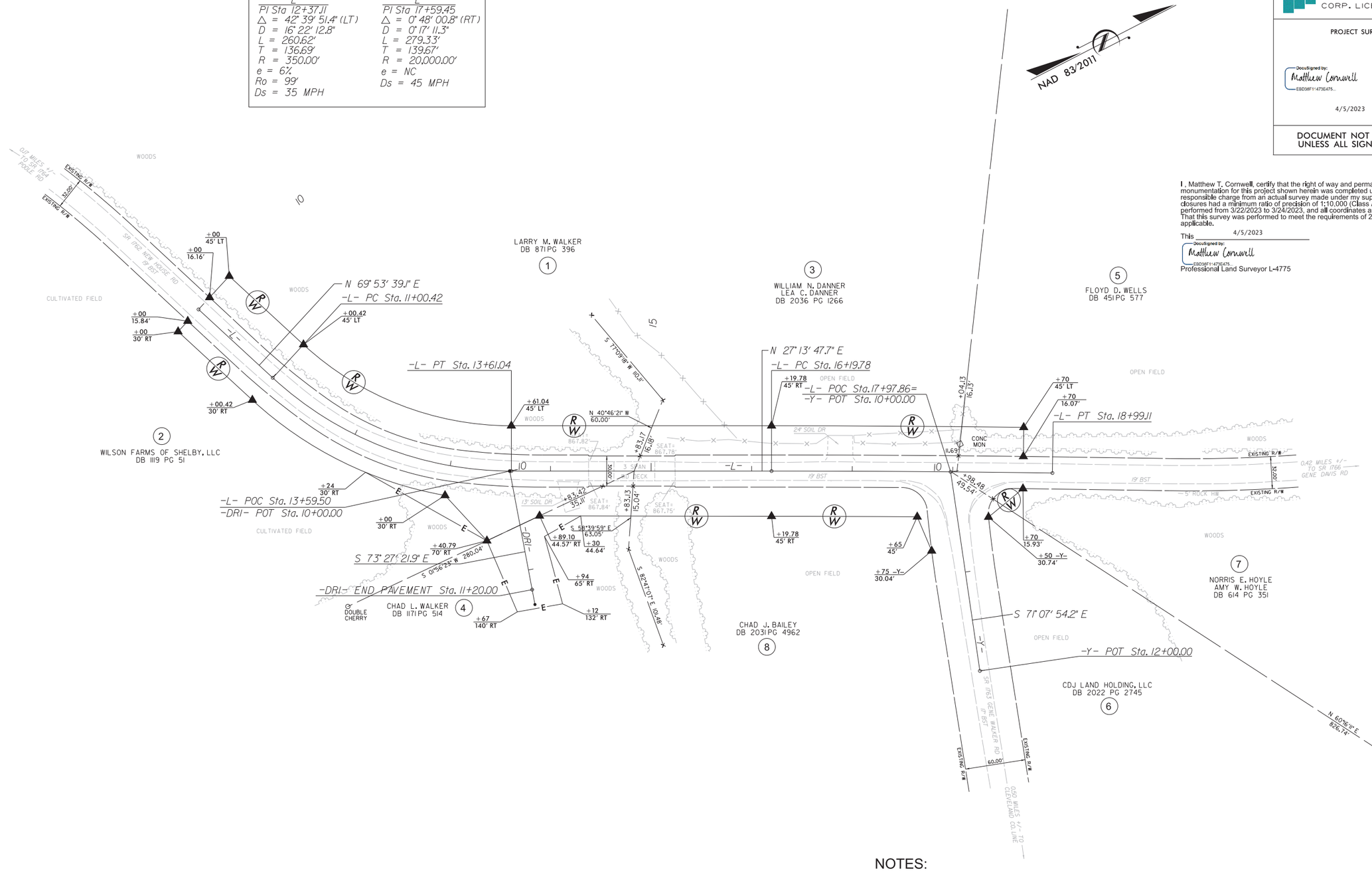
This 4/5/2023

DocuSigned by: Matthew Cornwell EBD38F1147 3E475...

Professional Land Surveyor L-4775

-L-	-L-
PI Sta 12+37.11	PI Sta 17+59.45
△ = 42° 39' 51.4" (LT)	△ = 0° 48' 00.8" (RT)
D = 16° 22' 12.8"	D = 0° 17' 11.3"
L = 260.62'	L = 279.33'
T = 136.69'	T = 139.67'
R = 350.00'	R = 20,000.00'
e = 6%	e = NC
Ro = 99'	Ds = 45 MPH
Ds = 35 MPH	

NAD 83/2011



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 3/22/2023 TO 3/24/2023.

REVISIONS

3/2023

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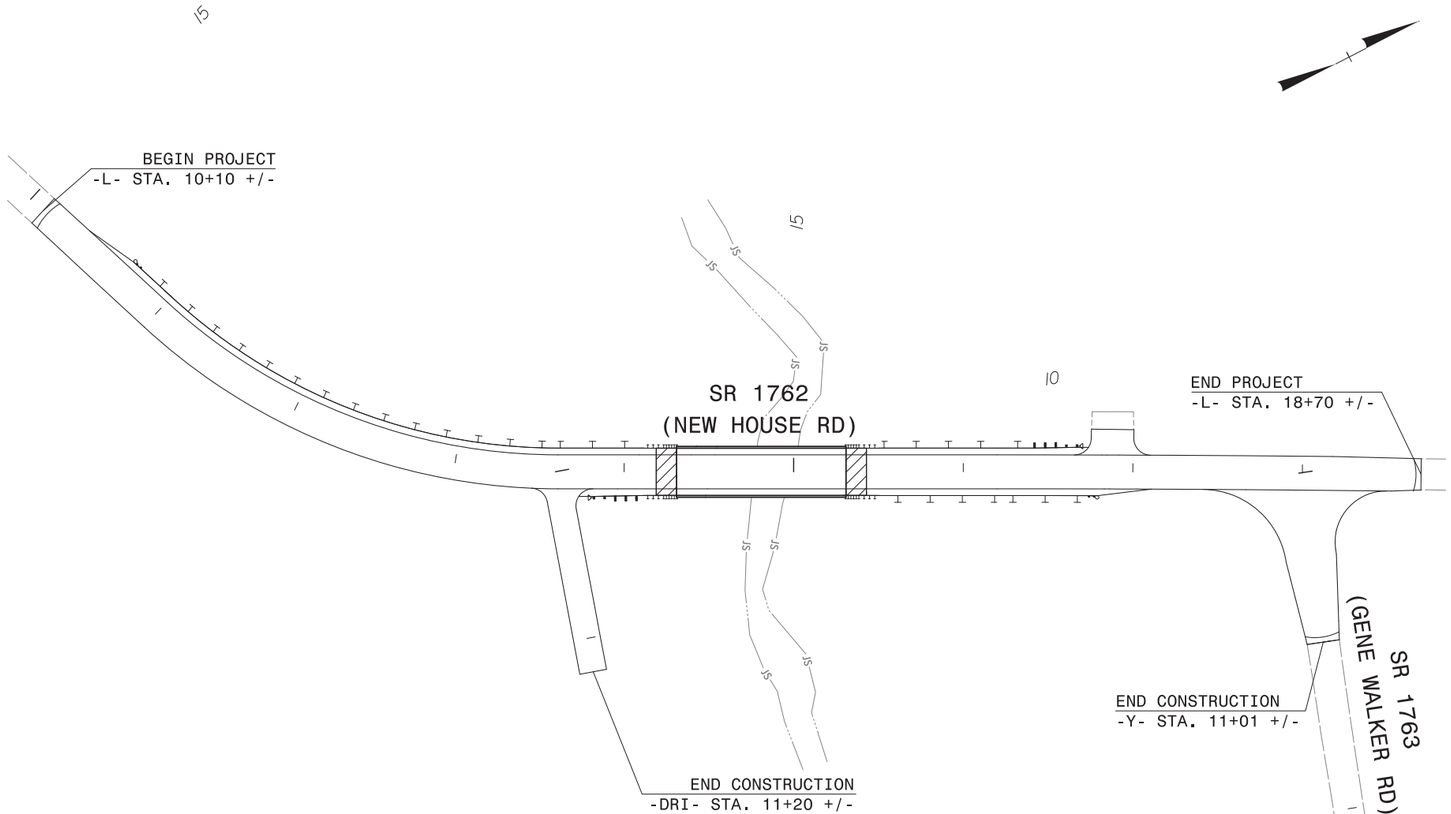
mcornwell AT MCORNWELLLAPTOP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

RUTHERFORD COUNTY



INDEX OF SHEETS

SHEET NO.	TITLE
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

SHEET NO.
TMP-01

PROJECT: BP13.R002

WORK ZONE SAFETY & MOBILITY
"from the MOUNTAINS to the COAST"

PLANS PREPARED BY:

DERRICK DOHM, EI

RICHARD ODYNSKI, PE

NCDOT CONTACTS:

ZACHARY CLARK, PE
PROJECT ENGINEER

KARMEN DAIS, PE
PROJECT DESIGN ENGINEER

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

WSP
1001 Morehead Square Dr., Suite 610
Charlotte NC, 28203
(704) 342-5401
NC LIC. NO. F-0165

APPROVED: DocuSigned by: Richard Odynski 8FB7EAA9AF514E4...

DATE: 3/8/2024

NORTH CAROLINA PROFESSIONAL SEAL 037467 ENGINEER RICHARD A ODYNSKI

12/14/2023
T:\NCDOT_Divi3_LIBR\Rutherford_090\Rutherford090_TMP-01.dgn
dohmd

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:

STD. NO.	TITLE
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	DRUM
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGING DEVICES
1180.01	SKINNY-DRUM

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: Richard Odynski
DATE: 3/8/2024

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 037467 RICHARD A. ODYNSKI

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

TRANSPORTATION MANAGEMENT PLANS
ROADWAY STANDARD DRAWINGS & LEGEND

PROJ. REFERENCE NO.	SHEET NO.
BP13.R005	TMP-02A

SIGN NUMBER: SP-01
TYPE: GROUND
QUANTITY: 1

SIGN WIDTH: 3′-6″
HEIGHT: 1′-0″
TOTAL AREA: 3.5 Sq.Ft.

BORDER TYPE: FLUSH
RECESS: 0.47″
WIDTH: 0.63″
RADII: 1.5″

NO. Z BARS:
LENGTH:

BACKG COLOR: Fluorescent Orange
COPY COLOR: Black

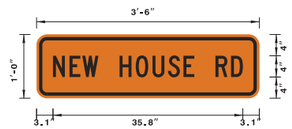
SYMBOL	X	Y	WID	HT

MAT'L: 0.063″ (1.6 mm) ALUMINUM
0.080″ (2.0 mm) ALUMINUM
0.125″ (3.2 mm) ALUMINUM

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.

DESIGN BY: DAD
PROJECT ID: R.005
CHECKED BY: RAO
DIV: 13
Apr 18, 2022



Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter spacings are to start of next letter

		N	E	W		H	O	U	S	E		R	D													Series/Size Text Length
	3.1	3.1	2.4	3	4	3	3.2	2.9	2.9	2	4	2.9	2.2	3.1												C 2000
																										35.8

FILENAME: detour_sign

NORTH CAROLINA D.O.T. SIGN DETAIL

APPROVED: DocuSigned by: Richard Odjenski 5FB7EAA9AF814E4...
DATE: 3/8/2024

NORTH CAROLINA PROFESSIONAL SEAL 037467 ENGINEER RICHARD A ODJENSKI

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

TRANSPORTATION MANAGEMENT PLANS
SIGN DESIGN

GENERAL NOTES

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS, AND ROADWAY DETAILS ARE NOT ATTAINABLE TO MEET FIELD CONDITIONS OR RESULT IN DUPLICATE OR UNDESIRED OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.
THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT EXCEPT WHEN OTHERWISE NOTED IN THE PLAN OR DIRECTED BY THE ENGINEER.

LANE AND SHOULDER CLOSURE REQUIREMENTS

A) REMOVE LANE CLOSURE DEVICES FROM THE LANE WHEN WORK IS NOT BEING PERFORMED BEHIND THE LANE CLOSURE OR WHEN A LANE CLOSURE IS NO LONGER NEEDED OR AS DIRECTED BY THE ENGINEER.

B) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 15 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN SHOULDER USING ROADWAY STANDARD DRAWING NO. 1101.04 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL OR A LANE CLOSURE IS INSTALLED.

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

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 NEW HOUSE 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 NEW HOUSE RD. COVER SIGNS UNTIL DETOUR IS READY FOR OPERATION.

STEP 3: WHEN DETOUR IS READY UNCOVER SIGNS AND CLOSE NEW HOUSE RD. CONSTRUCT STRUCTURE AND ROADWAY IMPROVEMENTS INCLUDING FINAL ASPHALT OVERLAY AND PAVEMENT MARKINGS ALONG NEW HOUSE RD. USING ROADWAY STANDARD DRAWING NO. 1101.02, SHEET 1 OF 14, INSTALL MILL AND OVERLAY AND PAVEMENT MARKINGS ALONG GENE WALKER RD.

STEP 4: REMOVE ROAD CLOSURE DEVICES AND SIGNS ONCE CONSTRUCTION IS COMPLETE. OPEN NEW HOUSE RD. TO TRAFFIC.

APPROVED: DocuSigned by: Richard Odynski
8FB7EAA9AF614E4...
DATE: 3/8/2024

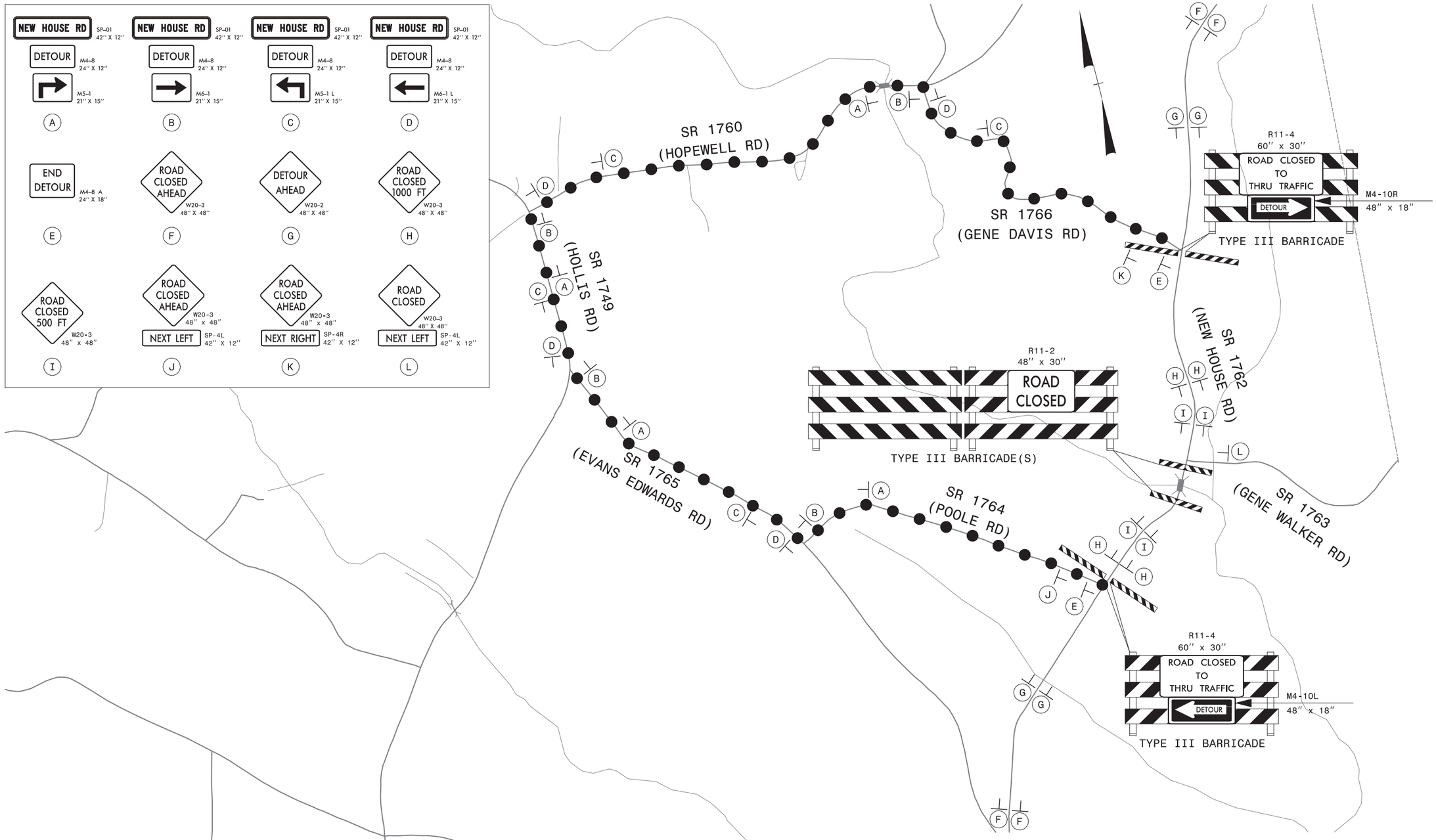
NORTH CAROLINA PROFESSIONAL SEAL 037467 ENGINEER RICHARD A ODYNSKI

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

TRANSPORTATION MANAGEMENT PLANS GENERAL NOTES AND WRITTEN PHASING

PROJ. REFERENCE NO.	SHEET NO.
BP13.R002	TMP-04



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

APPROVED: DocuSigned by: Richard Odgenski 5FB7EAA8AF814E4...

DATE: 3/8/2024

NORTH CAROLINA PROFESSIONAL SEAL 037467 ENGINEER RICHARD A ODGENSKI

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

TRANSPORTATION MANAGEMENT PLANS OFFSITE DETOUR ROUTE SIGNING

CONTRACT: DM000406 PROJECT: BP13.R002

TIP NO.	SHEET NO.
BP13.R002	PMP-1

APPROVED: DocuSigned by: Eric W Bowman DADA2D3C69024F...

DATE: 3/6/2024

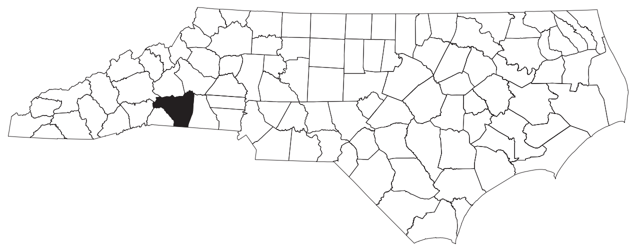
SEAL

NORTH CAROLINA PROFESSIONAL SEAL 043754 ENGINEER ERIC W. BOWMAN

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

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
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
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

WSP

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 — TRANSPORATION DESIGNER

3/6/2024 c:\pms\2\lbususer\dms38456\8000090_pmp_tsh.dgn USEB0442I

TIP NO.	SHEET NO.
BP13.R002	PMP-02

APPROVED: Eric W Bowman (DocuSigned by: DADA2D3C6B0246F...)

DATE: 3/6/2024

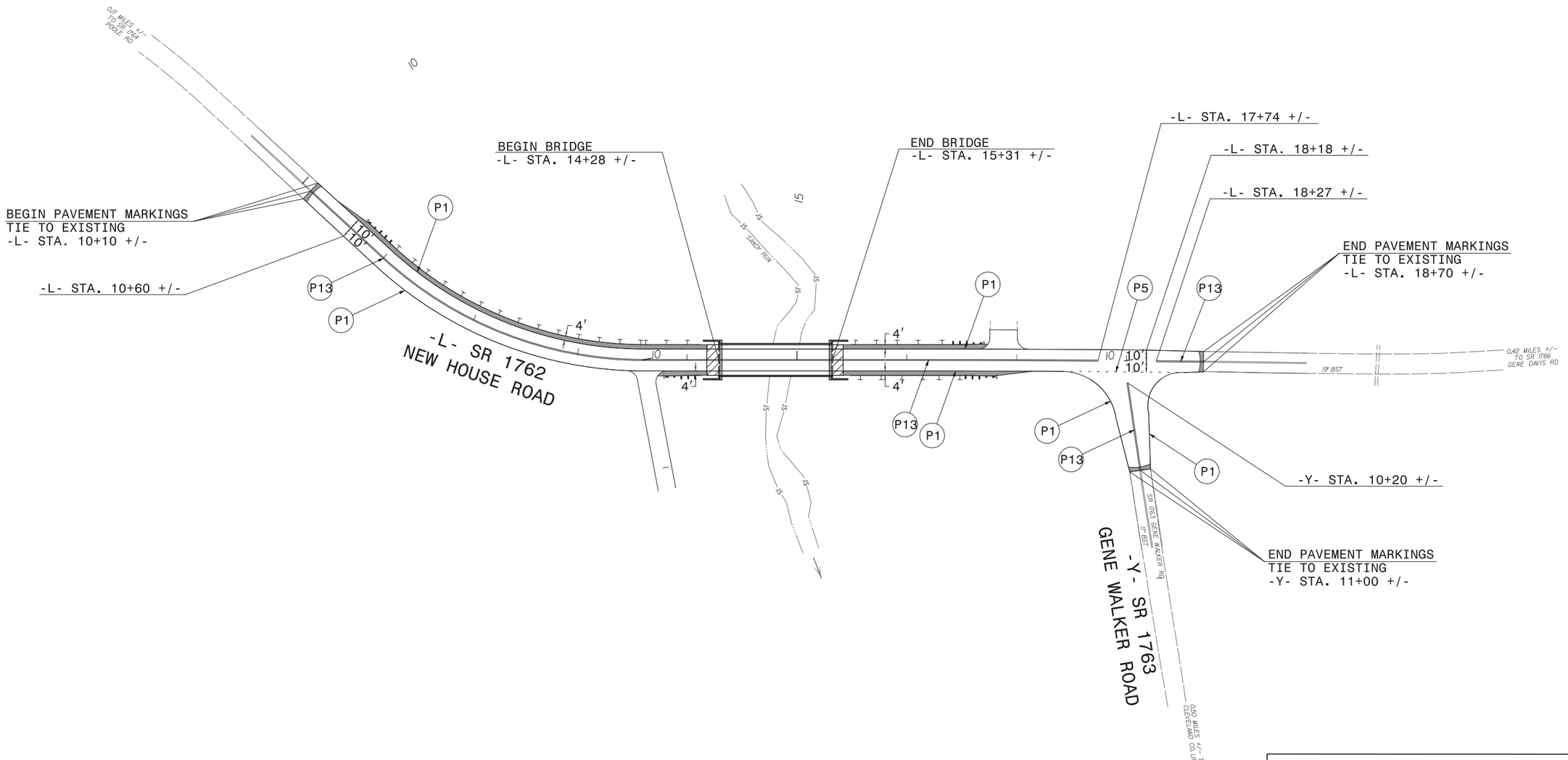
SEAL

NORTH CAROLINA PROFESSIONAL SEAL 043754 ENGINEER ERIC W. BOWMAN

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT MARKING SCHEDULE
TIP PROJECT # BP13.R002

SYMBOL	DESCRIPTION
	PAINT (4")
P1	WHITE EDGELINE
P5	2FT. – 6FT./SP WHITE MINISKIP
P13	YELLOW DOUBLE CENTER



PAVEMENT MARKING PLAN SHEET

12/15/2023
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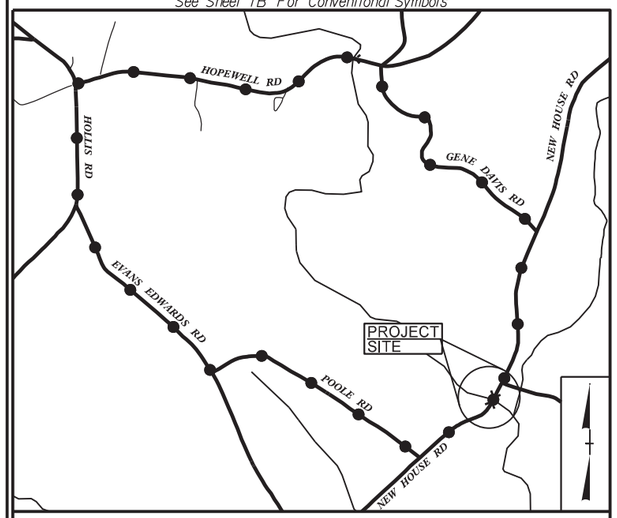
TIP PROJECT: BP13.R002

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



VICINITY MAP

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP13.R002	EC-1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
BP13.R002.1	N/A	P.E.
BP13.R002.2	N/A	R/W & UTIL.

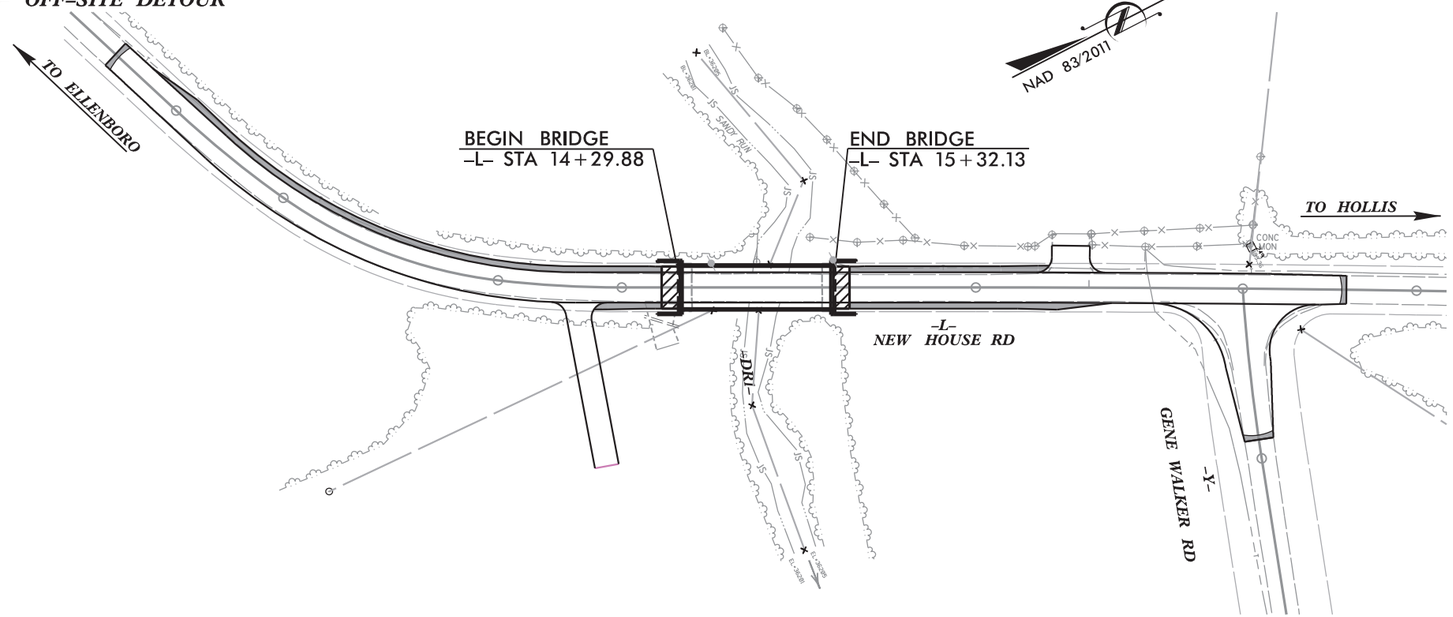
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
RUTHERFORD COUNTY

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

LOCATION: REPLACE BRIDGE NO. 090 OVER SANDY RUN ON SR 1762 (NEW HOUSE RD)

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

OFF–SITE DETOUR



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

GRAPHIC SCALE

50 25 0 50 100

PLANS

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 USA
1001 MOREHEAD SQUARE DRIVE
SUITE 610
CHARLOTTE, NC 28203
TEL: 1.704.342.5401

LICENSE NO. F–0165

Designed by:

James Owen Britt, P.E. *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 revison thereto are applicable to this project and by reference hereby are considered a part of these plans.

PROJECT REFERENCE NO.	SHEET NO.
BP13.R002	EC-2
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

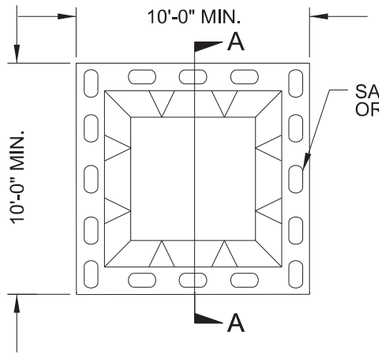
EROSION & SEDIMENT CONTROL LEGEND

Std. #	Description	Symbol
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
1630.02	Silt Basin Type B	
1630.03	Temporary Silt Ditch	TSD
1630.04	Stilling Basin	
1630.05	Temporary Diversion	TD
1630.06	Special Stilling Basin	
1630.07	Skimmer Basin	
1630.08	Tiered Skimmer Basin	
1630.09	Earthen Dam with Skimmer	
	Infiltration Basin	
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C

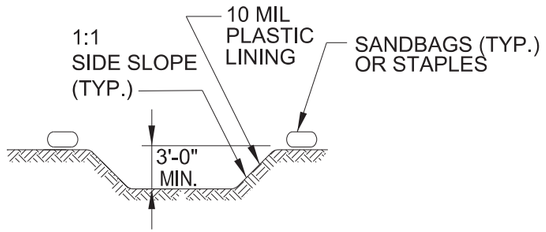
Std. #	Description	Symbol
1633.01	Temporary Rock Silt Check Type A	
1633.02	Temporary Rock Silt Check Type B	
1633.03	Temporary Rock Silt Check Type A with Excelsior Matting and Flocculant	
1634.01	Temporary Rock Sediment Dam Type A	
1634.02	Temporary Rock Sediment Dam Type B	
1635.01	Rock Pipe Inlet Sediment Trap Type A	A
1635.02	Rock Pipe Inlet Sediment Trap Type B	B
1636.01	Excelsior Wattle Check	
1636.01	Excelsior Wattle Check with Flocculant	
1636.01	Coir Fiber Wattle Check	
1636.01	Coir Fiber Wattle Check with Flocculant	
1636.02	Silt Fence Excelsior Wattle Break	EW
	Silt Fence Coir Fiber Wattle Break	CFW
1636.03	Excelsior Wattle Barrier	EW EW EW
1636.03	Coir Fiber Wattle Barrier	CFW CFW CFW

PROJECT REFERENCE NO.	SHEET NO.
BPI3.R002	EC-2A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER



PLAN



SECTION A-A

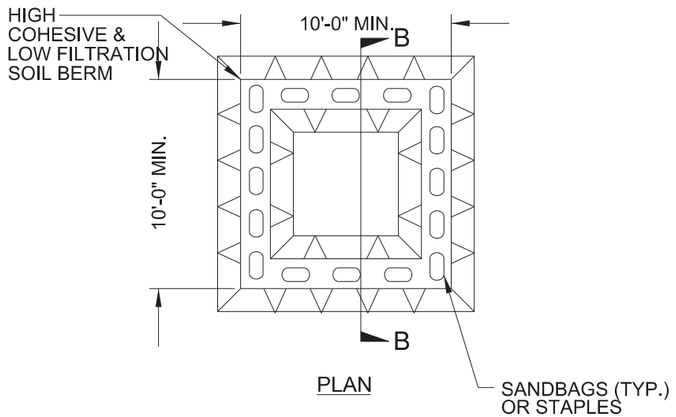
NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

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.

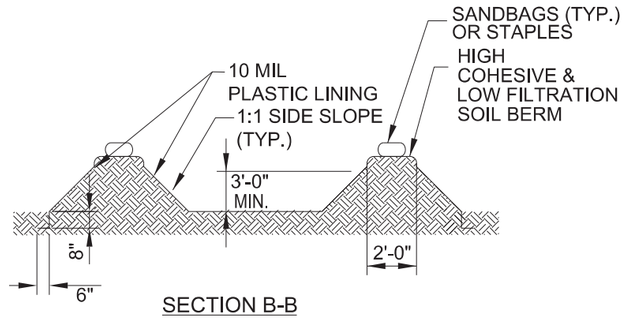
3.CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARY MARKED WITH SIGNAGE NOTING DEVICE.

BELOW GRADE WASHOUT STRUCTURE

NOT TO SCALE



PLAN



SECTION B-B

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 CLEARY MARKED WITH SIGNAGE NOTING DEVICE.

ABOVE GRADE WASHOUT STRUCTURE

NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
BP13.R002	EC-3
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SOIL STABILIZATION TIMEFRAMES

SITE DESCRIPTION	STABILIZATION TIME	TIMEFRAME EXCEPTIONS
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.

REVISIONS

8/17/99

3/25/2024
c:\pms\...\busuer\d0152316\800090_EC-03.dgn
PARSONS_BRINCKERHOFF

PROJECT REFERENCE NO.	SHEET NO.
BP13.R002	EC-3A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION SUMMARY SHEET

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

REVISIONS

MATTING FOR EROSION CONTROL

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
EC-4	-L-	12+75	14+75	RT	155-STRAW
EC-4	-L-	15+50	18+50	LT	235-EXCELSIOR
EC-4	-DR1-	10+25	10+75	LT	40-STRAW
EC-4	-DR1-	10+25	11+20	RT	80-STRAW
				SUBTOTAL	510
MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER					2000
				TOTAL	2510
				SAY	2510

MATTING FOR EROSION CONTROL

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)

PROJECT REFERENCE NO.	SHEET NO.
BP13.R002	EC-4/CONST.4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PLANS PREPARED BY:

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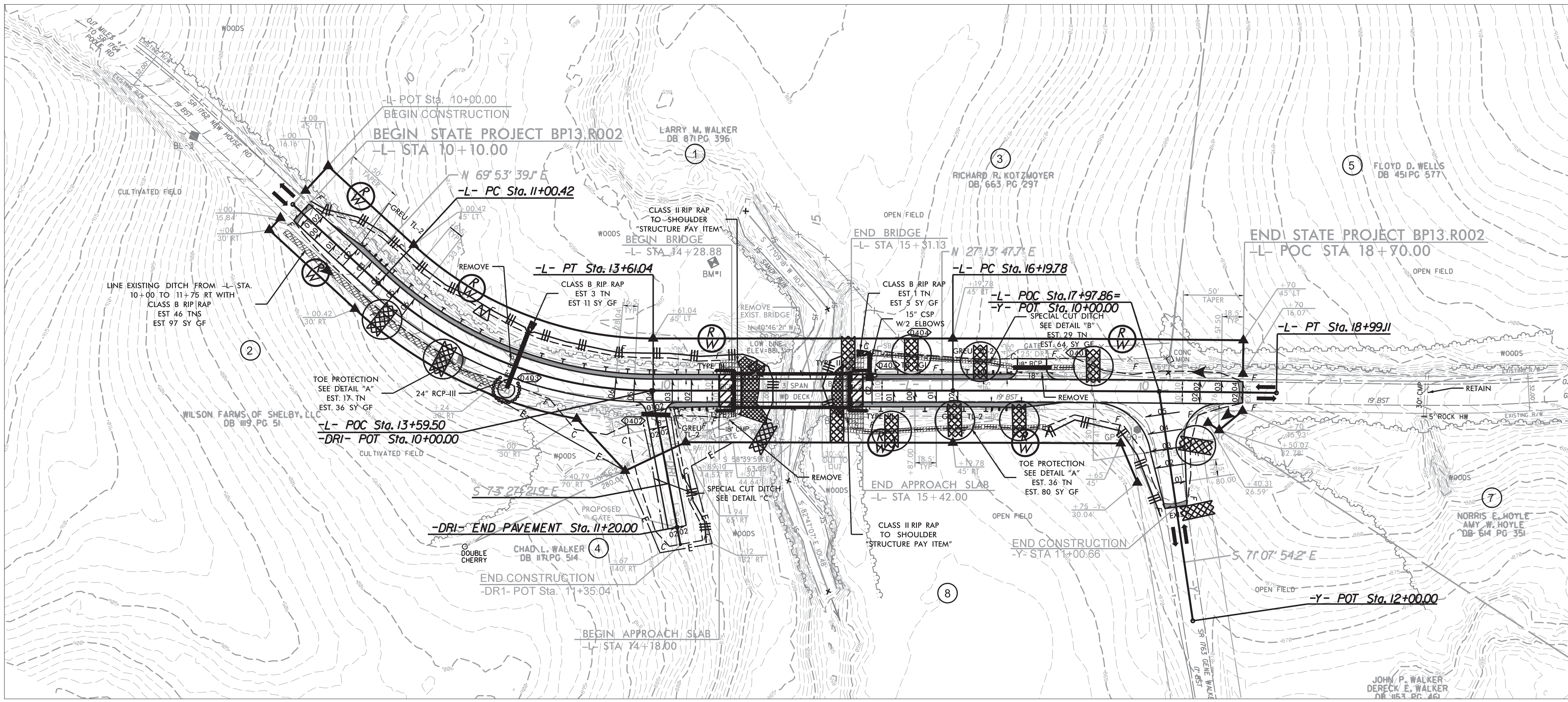
RALEIGH, NC 27601
TEL: 1.919.836.4040
FAX: 1.919.836.4099
LICENSE NO. F-0165

EROSION CONTROL PLAN

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 4



NOTE:
PERIMETER EROSION CONTROL MEASURES SHALL BE INSTALLED DURING CLEARING AND GRUBBING PHASE.

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

NAD 83/2011

REVISIONS

8/17/99

3/25/2024

PROJECT REFERENCE NO.	SHEET NO.
BP13.R002	EC-5/CONST.4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

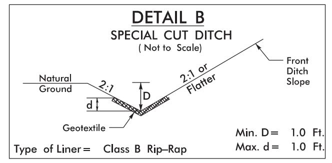
PLANS PREPARED BY:

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

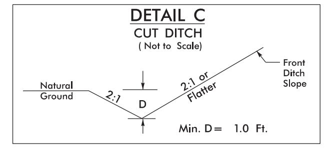
REVISIONS

8/17/99

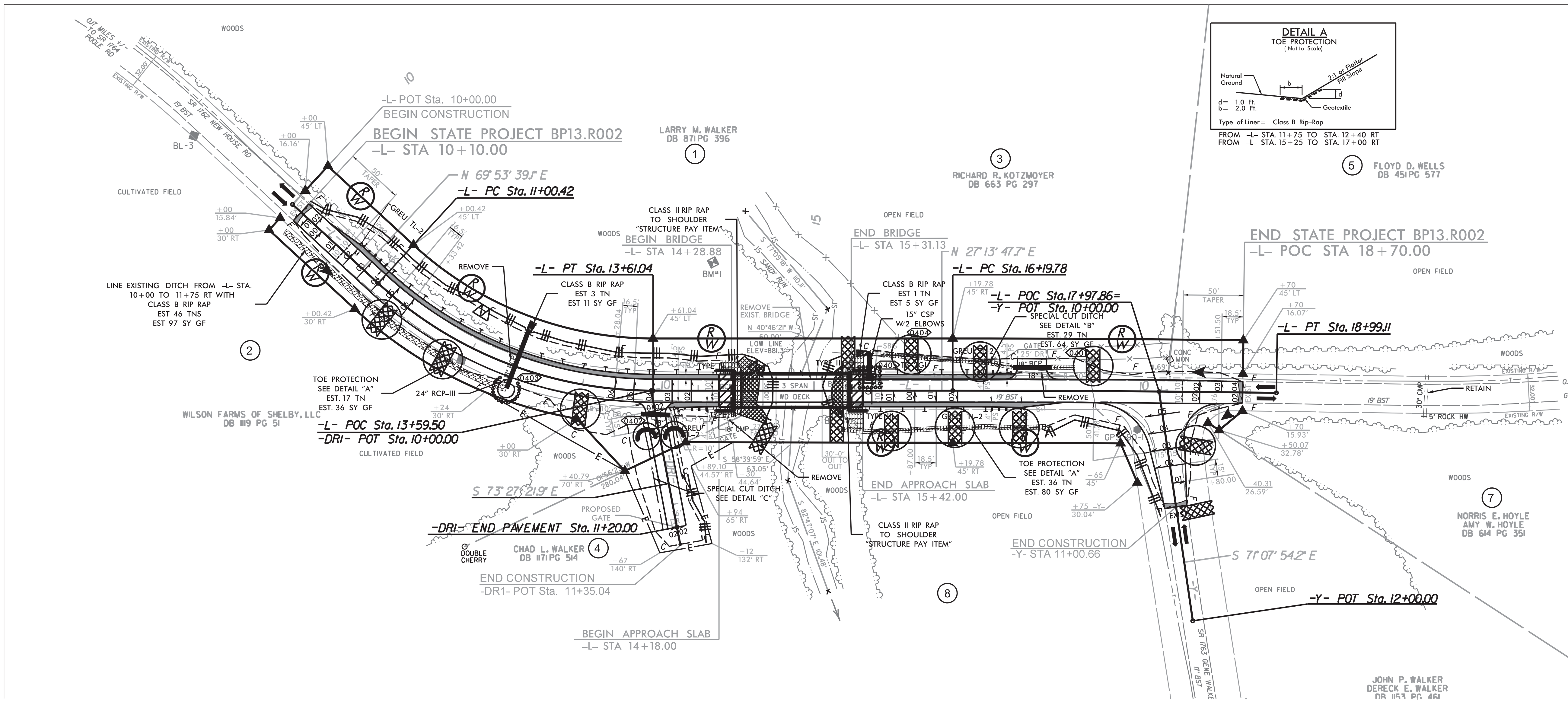
EROSION CONTROL PLAN

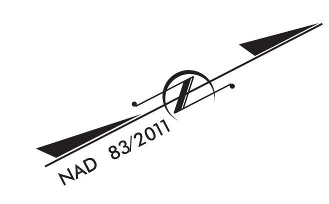


FROM STA. 15+50 TO STA. 17+25 LT



FROM -DR1- STA. 10+25 TO STA. 11+20 RT
FROM -DR1- STA. 10+25 TO STA. 10+75 LT





5/26/20

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

SIGNING PLAN
RUTHERFORD COUNTY

LOCATION: REPLACE BRIDGE NO. 090 OVER SANDY RUN
ON SR 1762 (NEW HOUSE 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

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 TW0 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.

SUMMARY OF QUANTITIES

ITEM NO.		ITEM DESCRIPTION	QUANTITY	UNIT
DESC. NO.	SECT. NO.			
4072000000	903	SUPPORTS, 3 LB STEEL U-CHANNEL	155	L.F.
4102000000	904	SIGN ERECTION, TYPE E	14	EA.
4155000000	907	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	10	EA.

INDEX

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

BP13.R002
SIGN | 001

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

APPROVED: DocuSigned by: Ashley Matthews 40171AA18C834CD...

DATE: 3/5/2024 | 10:33 AM EST

SEAL:

NORTH CAROLINA PROFESSIONAL SEAL 048105 ENGINEER ASHLEY K. MATTHEWS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION ·

T.I.P.: BP13.R002

5/26/20

(401) QUANTITY REQ'D 1

36 X 36
W1-2

ONE "U" POST PER SIGN

(406) QUANTITY REQ'D 1

36 X 36
W1-3

ONE "U" POST PER SIGN

(402) QUANTITY REQ'D 2

18 X 18
W13-1P

MOUNT BELOW SIGN 401 & 406
IN 2 INSTALLATIONS

(407) QUANTITY REQ'D 1

36 X 36
R1-1

ONE "U" POST PER SIGN

(403) QUANTITY REQ'D 4

18 X 24
W1-8L

ONE "U" POST PER SIGN

(404) QUANTITY REQ'D 4

18 X 24
W1-8R

ONE "U" POST PER SIGN

(405) QUANTITY REQ'D 1

24 X 30
R2-1

ONE "U" POST PER SIGN

BP13.R002

SIGN 002

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

APPROVED DocuSigned by: Ashley Matthews 40171AB1BC834CD...

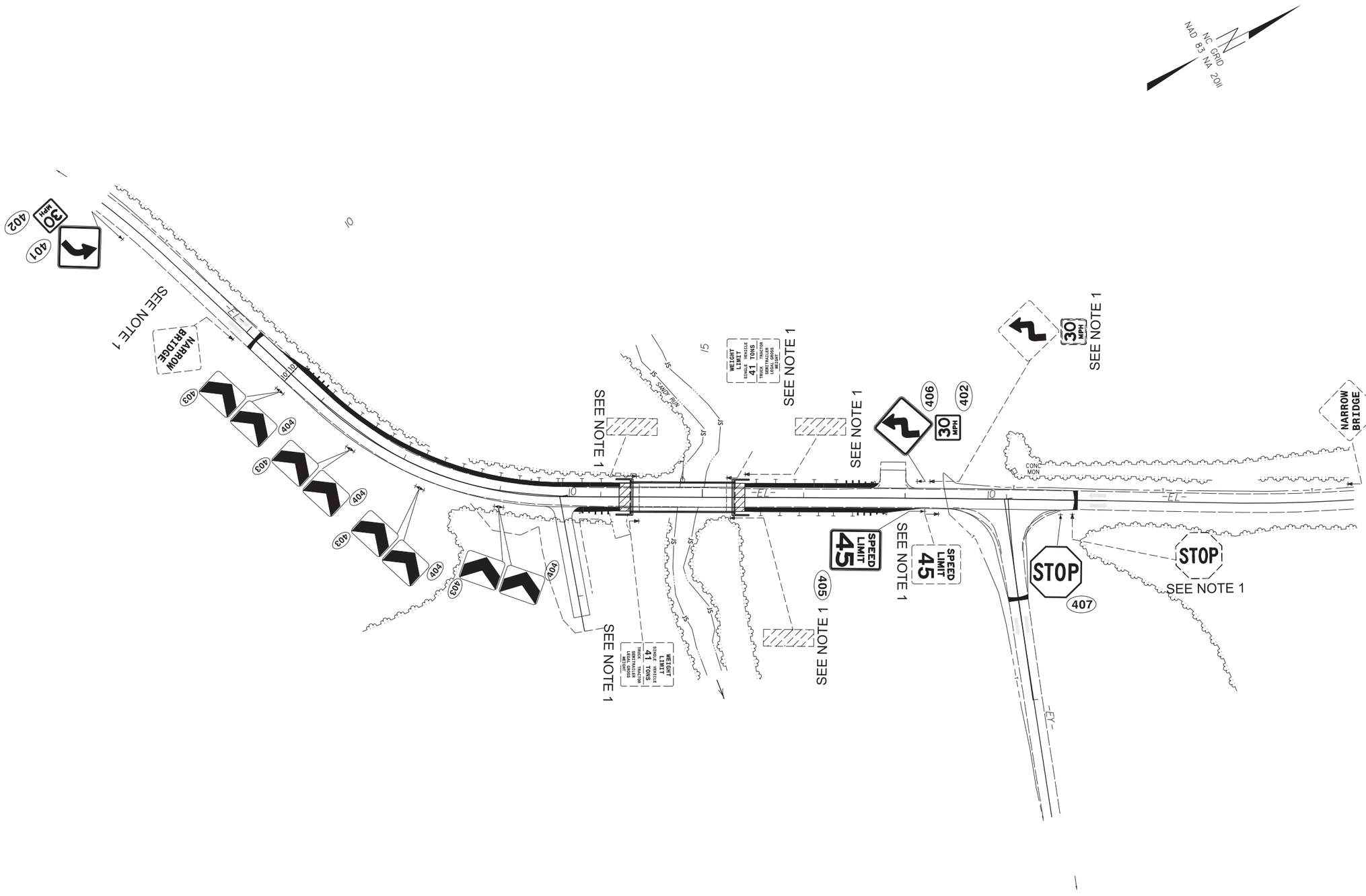
DATE 3/5/2024 | 10:33 AM EST

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 048105 ENGINEER ASHLEY K. MATTHEWS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION ·



PROJECT NOTES

1 DISPOSAL OF SIGN SYSTEM, U-CHANNEL

SIGNING PLAN SHEET

BP13.R002

SIGN	003

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

APPROVED: DocuSigned by: Ashley Matthews 40171AA1BC834CD...

1/24/2024 | 9:22 AM EST

SEAL:

NORTH CAROLINA PROFESSIONAL SEAL 048105 ENGINEER ASHLEY K. MATTHEWS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

09/08/09

TIP PROJECT: BP13.R002

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

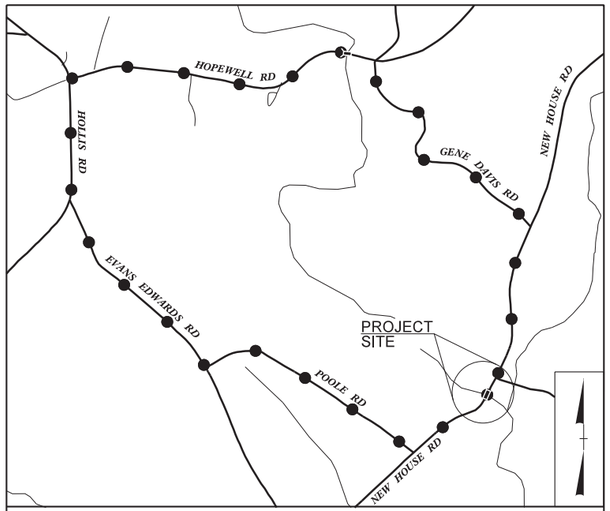
T.I.P. NO.	SHEET NO.
BP13.R002	UO–1

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

UTILITIES BY OTHERS PLANS
RUTHERFORD COUNTY

LOCATION: REPLACE BRIDGE NO. 090 OVER SANDY RUN ON SR 1762 (NEW HOUSE RD)

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

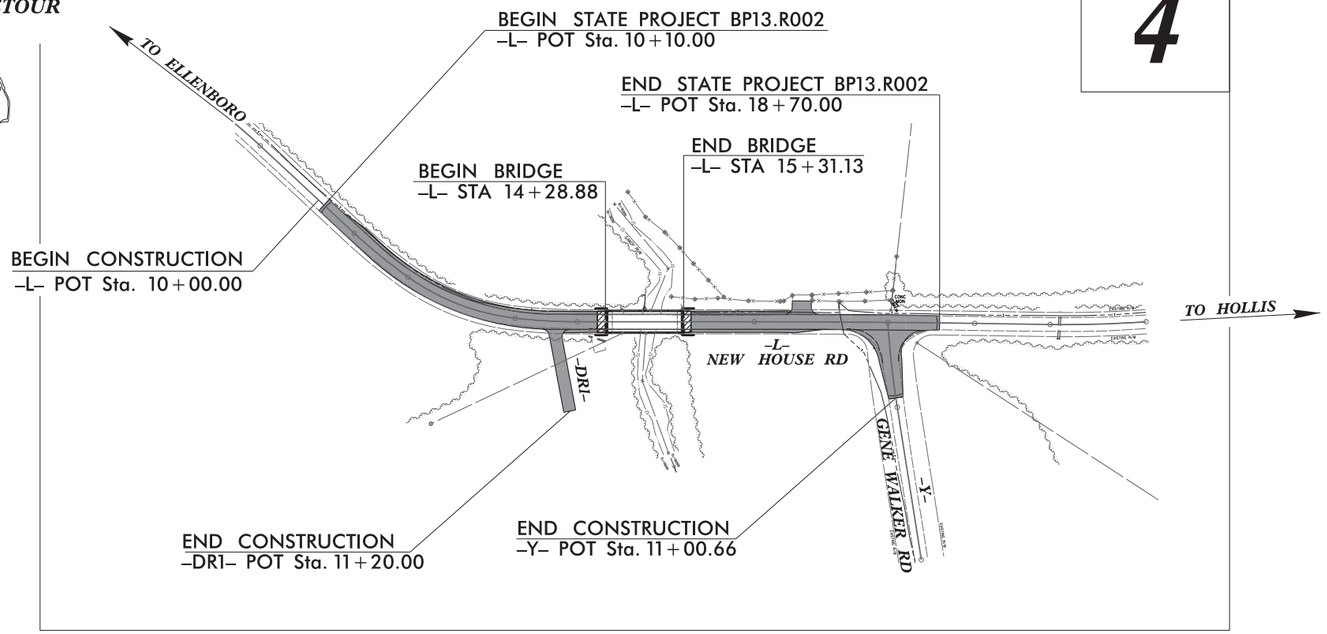


VICINITY MAP

OFF–SITE DETOUR

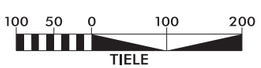
NAD 83/2011

4



CONTRACT:

GRAPHIC SCALES



INDEX OF SHEETS

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*

1:54:18 PM
800090_RDY_TSH-01.dgn
5/22/2023

PROJECT REFERENCE NO.	SHEET NO.
BP13.R002	UO-2

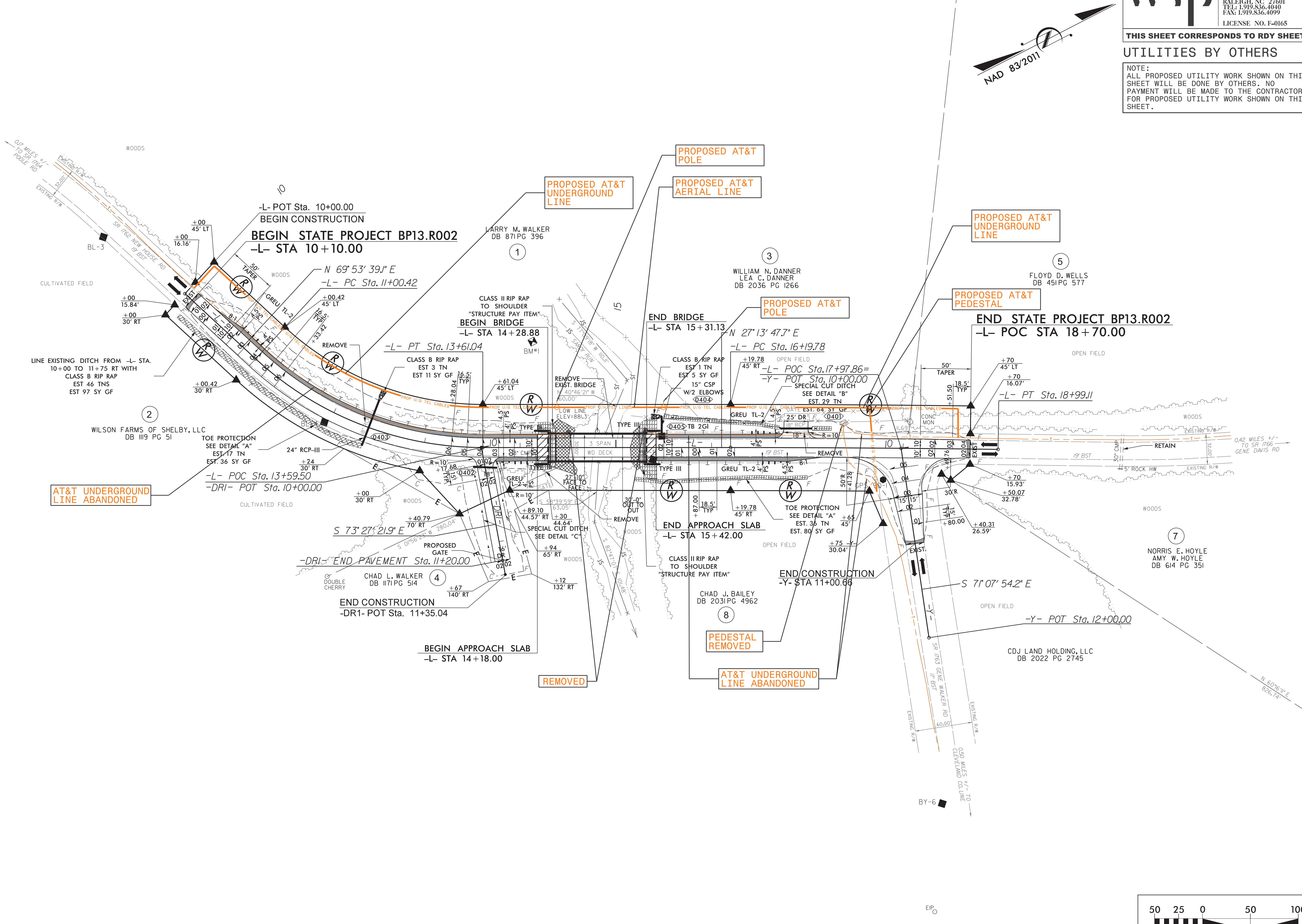
PLANS PREPARED BY:

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

THIS SHEET CORRESPONDS TO RDY SHEET 4

UTILITIES BY OTHERS

NOTE:
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.



NAD 83/2011
-L- POT Sta. 10+00.00
BEGIN CONSTRUCTION
BEGIN STATE PROJECT BP13.R002
-L- STA 10+10.00
N 69° 53' 39.1" E
-L- PC Sta. 11+00.42
PROPOSED AT&T UNDERGROUND LINE
PROPOSED AT&T POLE
PROPOSED AT&T AERIAL LINE
LARRY M. WALKER
DB 871 PG 396
WILLIAM N. DANNER
LEA C. DANNER
DB 2036 PG 1266
PROPOSED AT&T POLE
FLOYD D. WELLS
DB 451 PG 577
PROPOSED AT&T UNDERGROUND LINE
PROPOSED AT&T PEDESTAL
END STATE PROJECT BP13.R002
-L- POC STA 18+70.00
BEGIN BRIDGE
-L- STA 14+28.88
END BRIDGE
-L- STA 15+31.13
-L- PT Sta. 13+61.04
N 27° 13' 47.7" E
-L- PC Sta. 16+19.78
-L- POC Sta. 17+97.86=
-Y- POT Sta. 10+00.00
-L- PT Sta. 18+99.11
LINE EXISTING DITCH FROM -L- STA. 10+00 TO 11+75 RT WITH CLASS B RIP RAP EST 46 TNS EST 97 SY GF
WILSON FARMS OF SHELBY, LLC
DB 1119 PG 51
TOE PROTECTION SEE DETAIL "A" EST 17 TN EST 36 SY GF
AT&T UNDERGROUND LINE ABANDONED
-L- POC Sta. 13+59.50
-DR1- POT Sta. 10+00.00
S 73° 27' 21.9" E
-DR1- END PAVEMENT Sta. 11+20.00
CHAD L. WALKER
DB 1171 PG 514
END CONSTRUCTION
-DR1- POT Sta. 11+35.04
BEGIN APPROACH SLAB
-L- STA 14+18.00
REMOVED
END APPROACH SLAB
-L- STA 15+42.00
CHAD J. BAILEY
DB 2031 PG 4962
PEDESTAL REMOVED
AT&T UNDERGROUND LINE ABANDONED
END CONSTRUCTION
-Y- STA 11+00.66
S 71° 07' 54.2" E
-Y- POT Sta. 12+00.00
CDJ LAND HOLDING, LLC
DB 2022 PG 2745
NORRIS E. HOYLE
AMY W. HOYLE
DB 614 PG 351

50 25 0 50 100

PLANS

**NOTE: DESIGN EXCEPTION IS REQUIRED

REVISIONS

PROJ. REFERENCE NO.	SHEET NO.
BP13.R002	X-1A

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CROSS-SECTION SUMMARY

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

NOTE: EMBANKMENT COLUMN INCLUDES BACKFILL FOR UNDERCUT

Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
10+10.00		0
10+25.00		0
10+50.00		5
10+75.00		16
11+00.00		31
11+25.00		39
11+50.00		38
11+75.00		38
12+00.00		46
12+25.00		53
12+50.00		50
12+75.00		40
13+00.00		30
13+25.00		23
13+50.00		25
13+75.00		36
14+00.00		58
14+25.00		60
14+28.88		7

Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
15+31.13		0
15+50.00		99
15+75.00		124
16+00.00		113
16+25.00		102
16+50.00		90
16+75.00		74
17+00.00		38
17+25.00		16
17+50.00		11
17+75.00		2
18+00.00		2
18+25.00		3
18+50.00		2
18+70.00		7

Station Y	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
10+10.00		0
10+25.00		4
10+50.00		3
10+75.00		0
11+00.00		0

Station DR1	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
10+10.18		0
10+25.00		0

Station DR1	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
10+50.00		0
10+75.00		0
11+00.00		3
11+20.00		7
11+35.04		7

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	BP13.R002	X-1

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

895 890 885 880 875 870

0.025 0.025 3:1

885.31

2:1

10+75.00

0.020 0.009 3:1

887.32

2:1

10+50.00

2:1 0.020 0.006 3:1

889.43

10+25.00
BEGIN PROJECT 10+10.00
BEGIN CONSTRUCTION 10+00.00

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

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80000 RDY_XPL_L
1/29/2024

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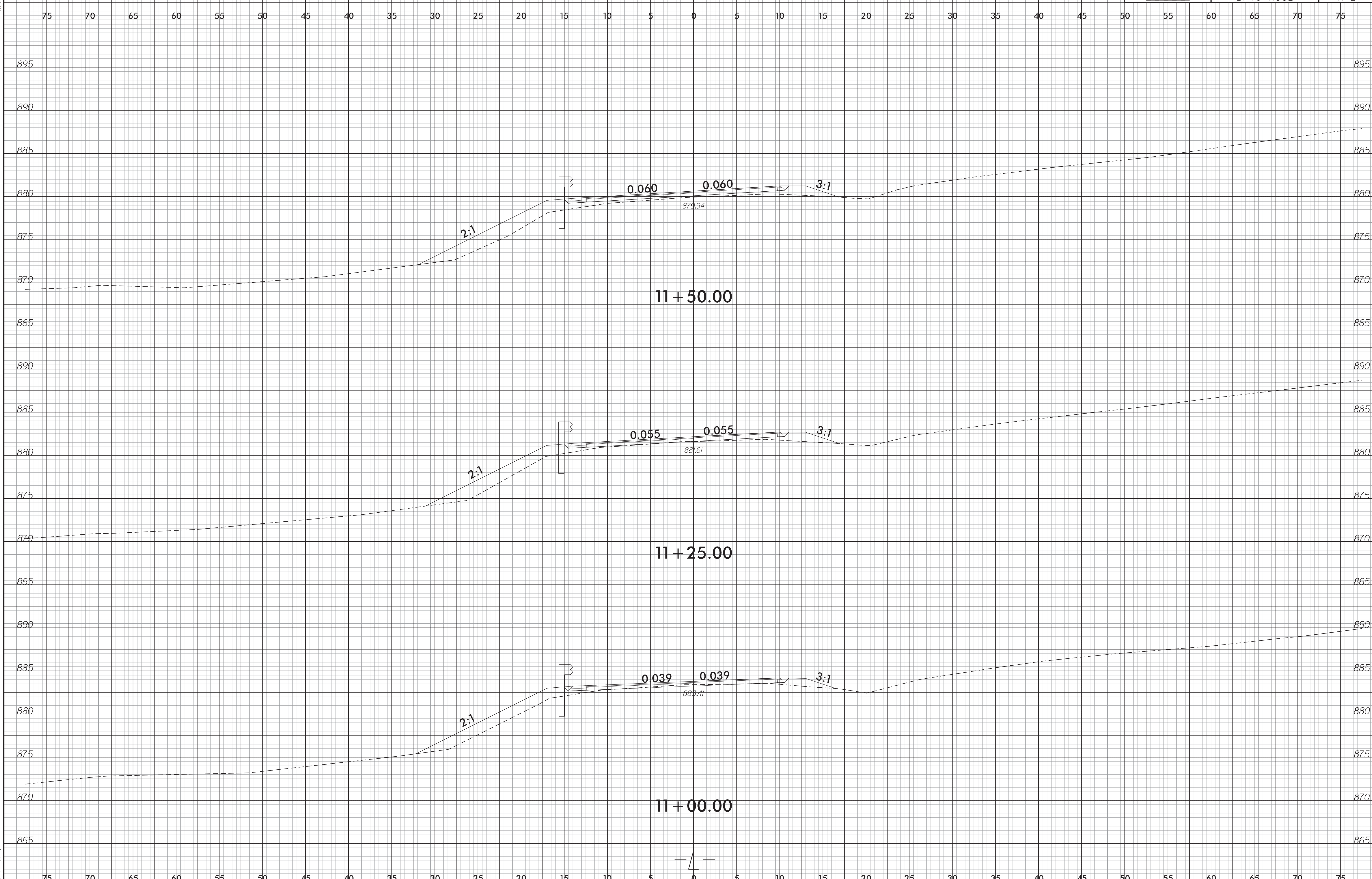
BP13.R002	X-2



6/23/16

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1/29/2024

6/23/16

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	BP13.R002	X-3

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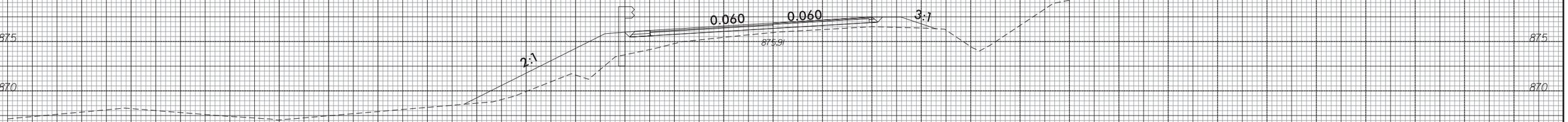
890 885 880 875 870 865



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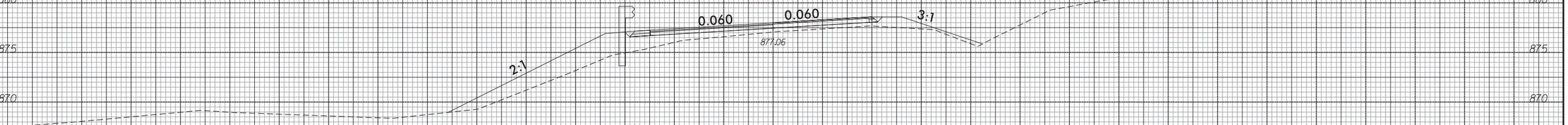

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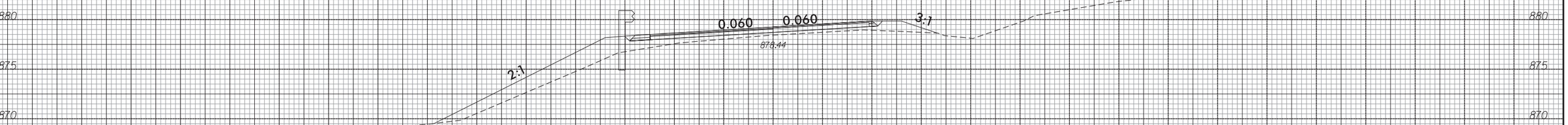

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6/23/16

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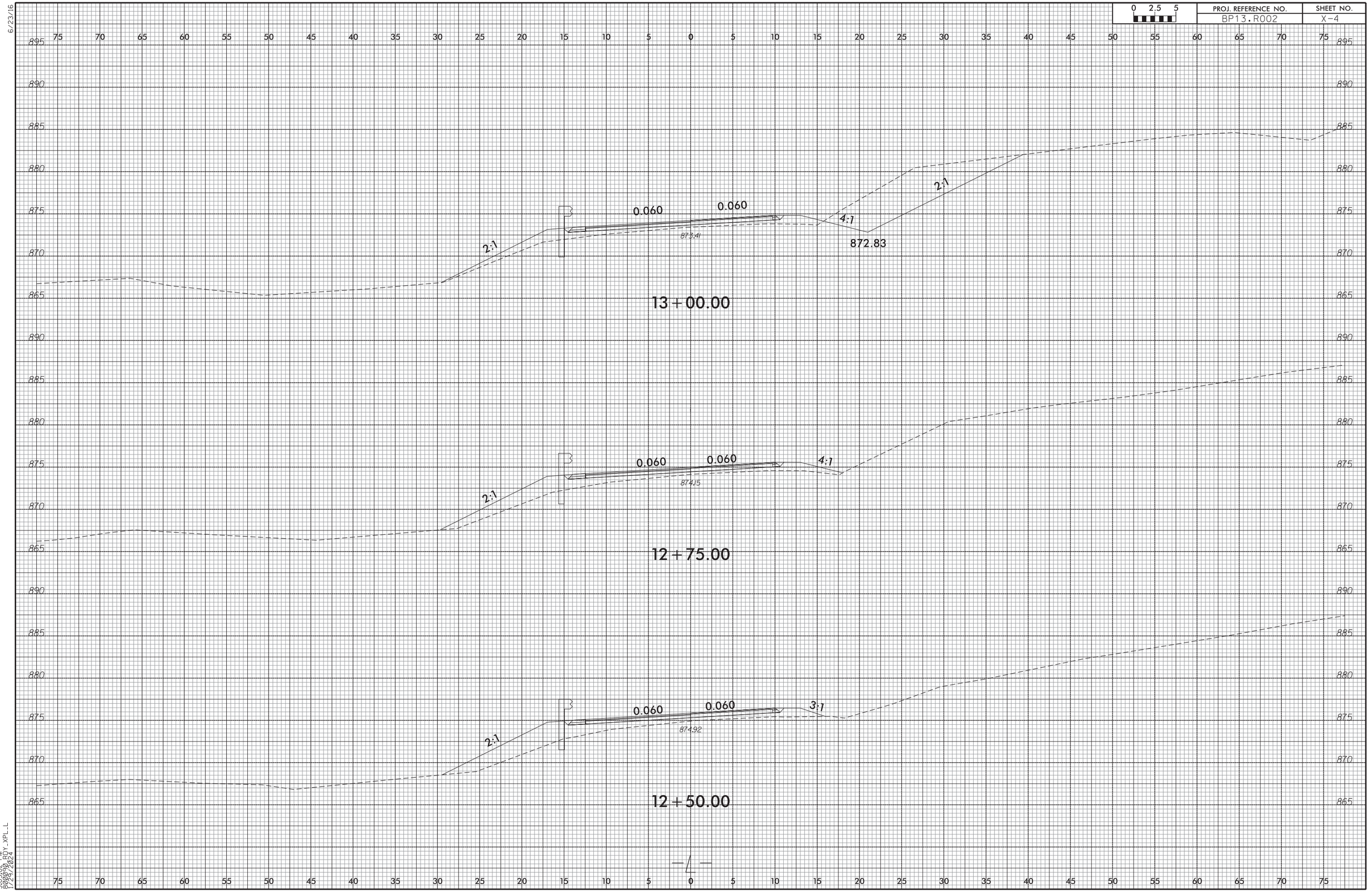

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1/24/2024

6/23/16

0 2.5 5

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BP13.R002	X-5

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885 880 875 870 865 860

-DR1-
SHEAR LINE

0.032 0.032

2:1

871.27

13+75.00

-DR1-
SHEAR LINE

0.047 0.047

2:1

871.98

13+50.00

0.060 0.060

2:1

4:1

2:1

872.71

872.20

13+25.00

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7/29/2024

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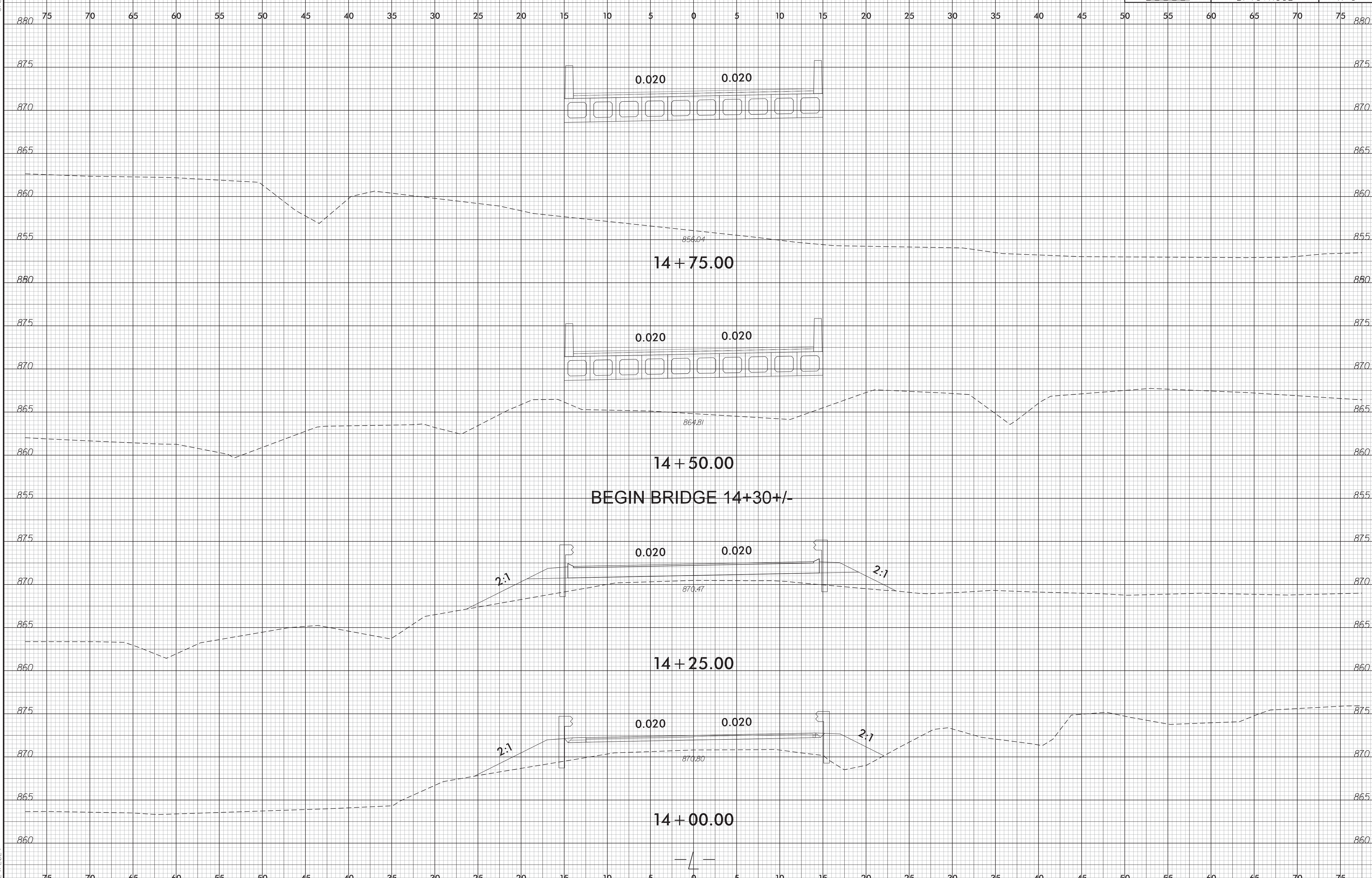

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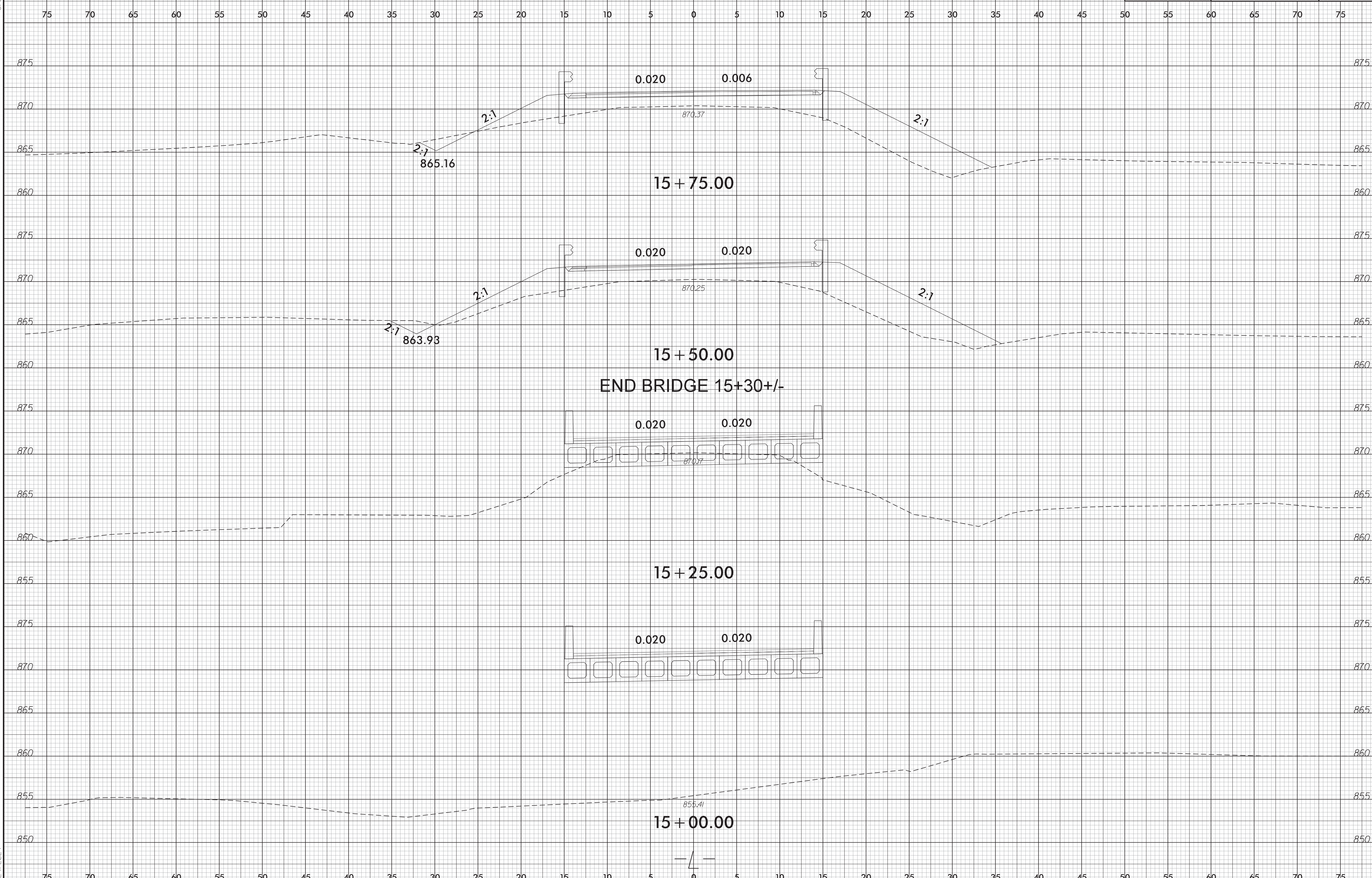

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6/23/16

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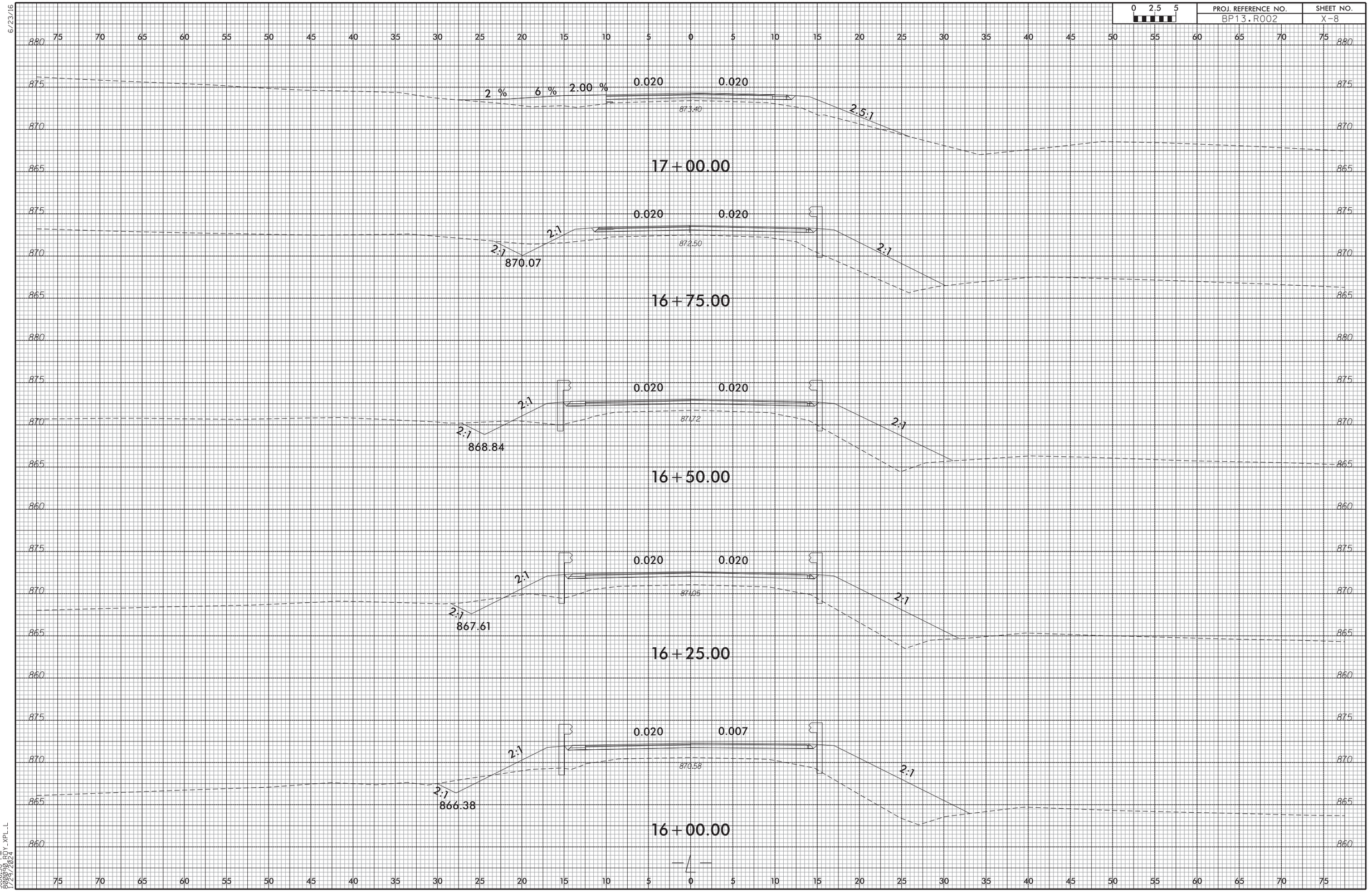

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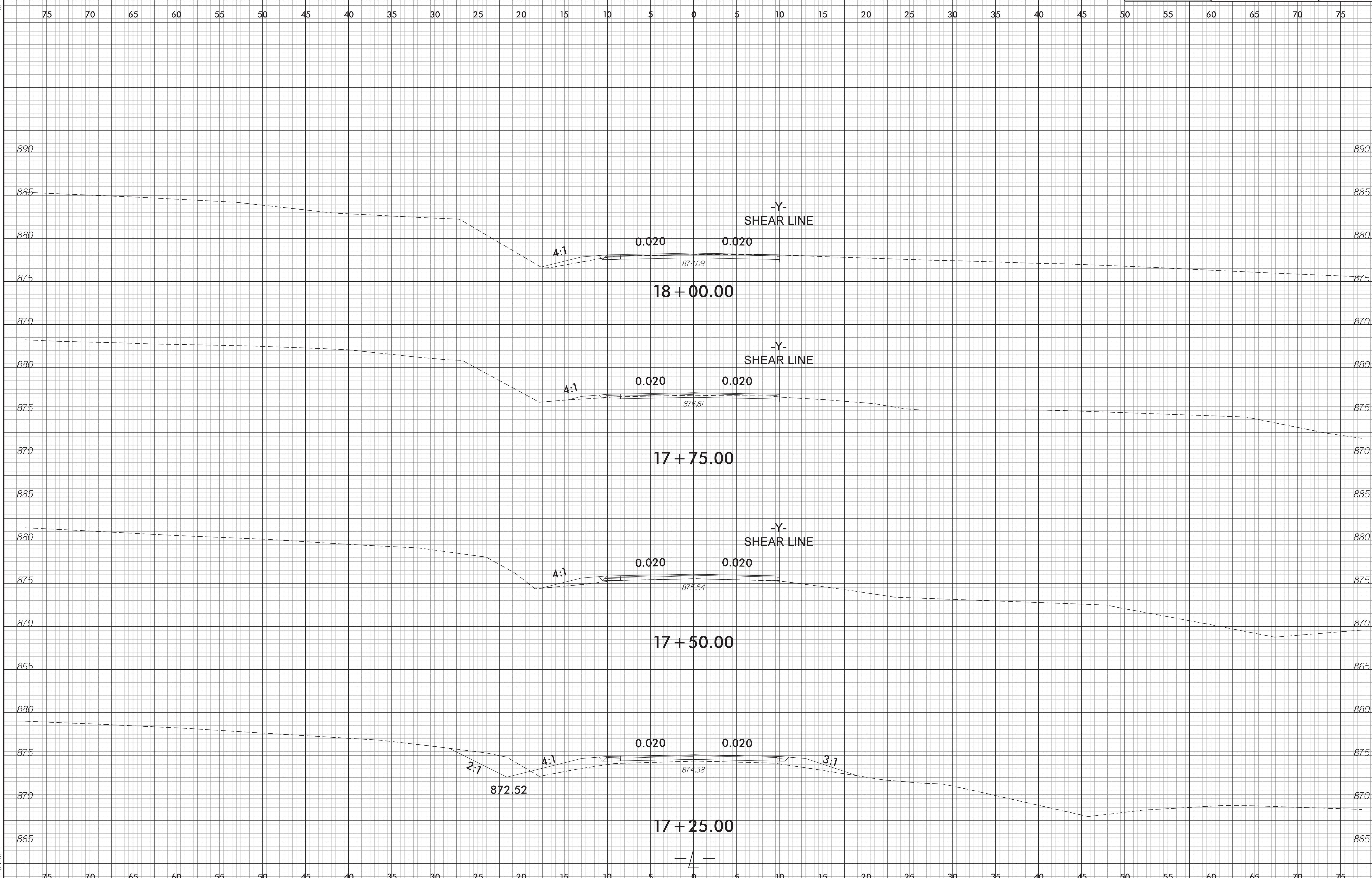

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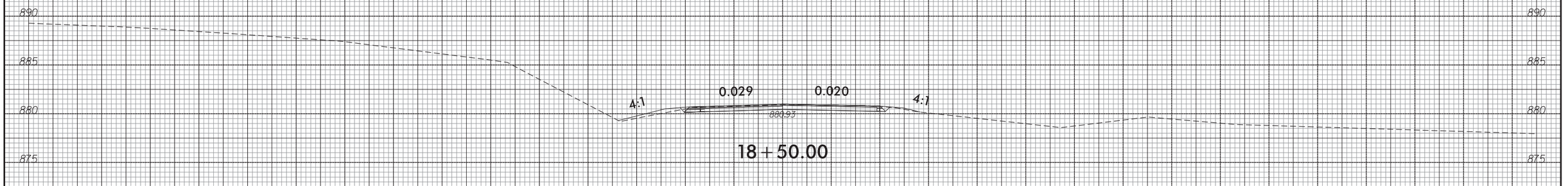
END PROJECT 18+70.00



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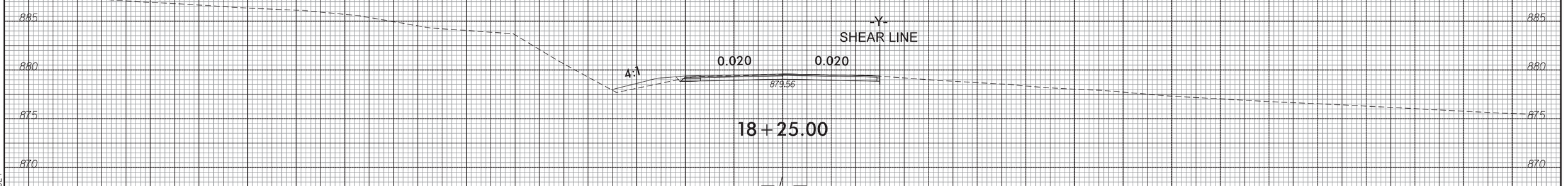

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7/29/2024

6/23/16

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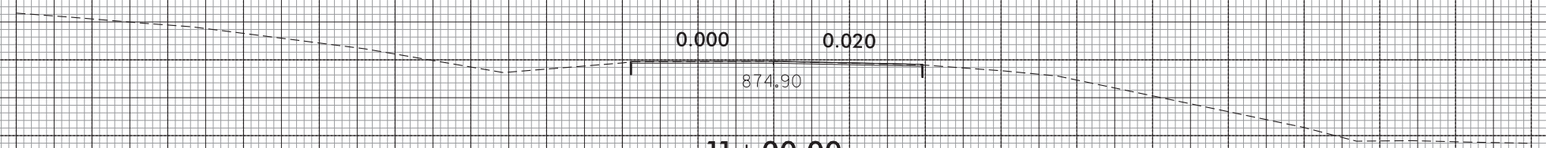
END CONSTRUCTION
11+00.66



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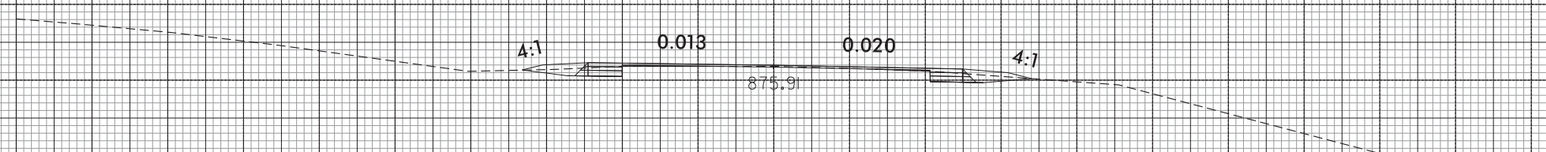

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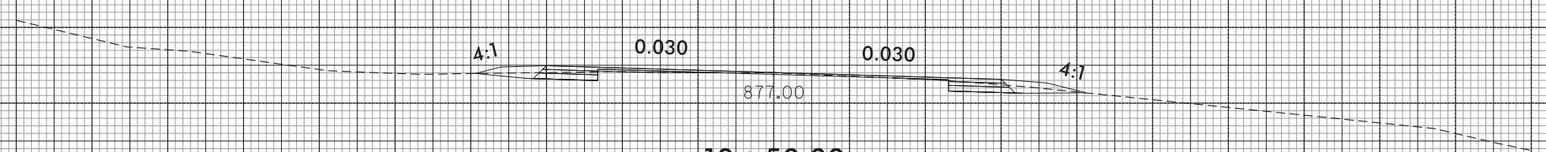

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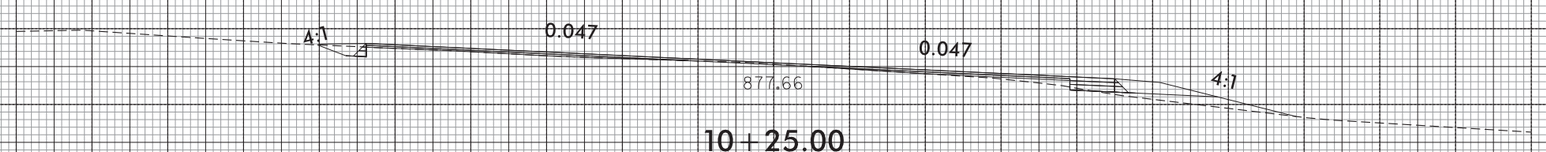

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BEGIN CONSTRUCTION
10+10.12

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7/29/2024

0 2.5 5

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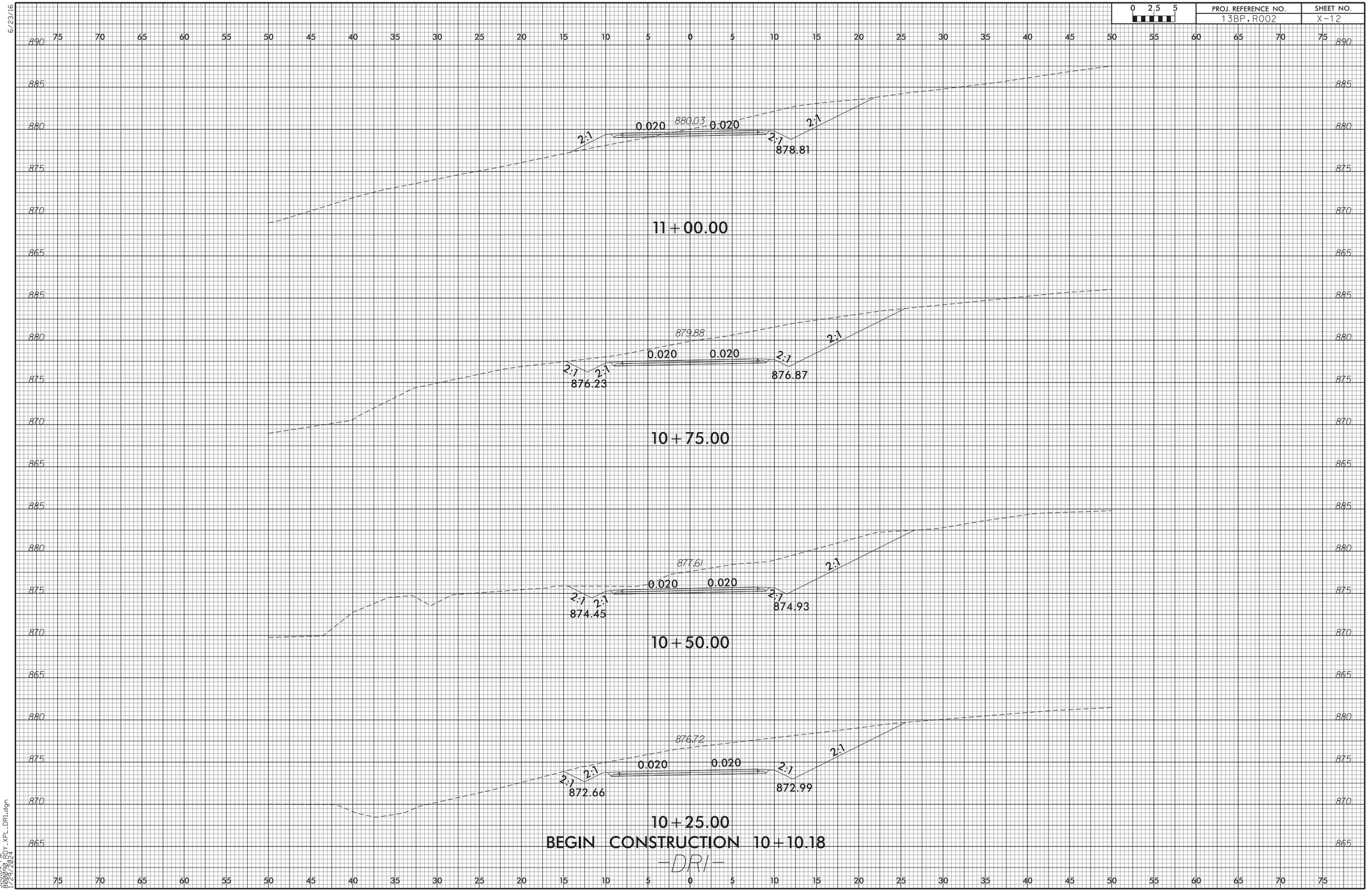

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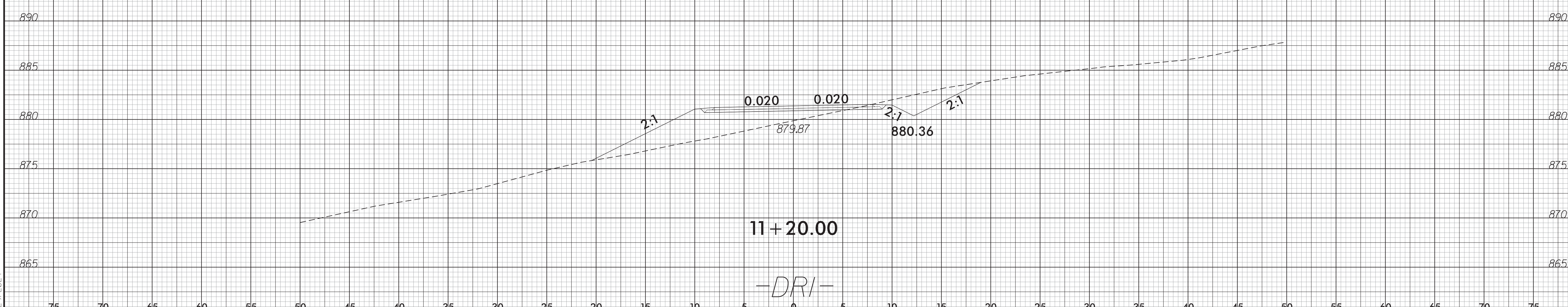

11+20.00

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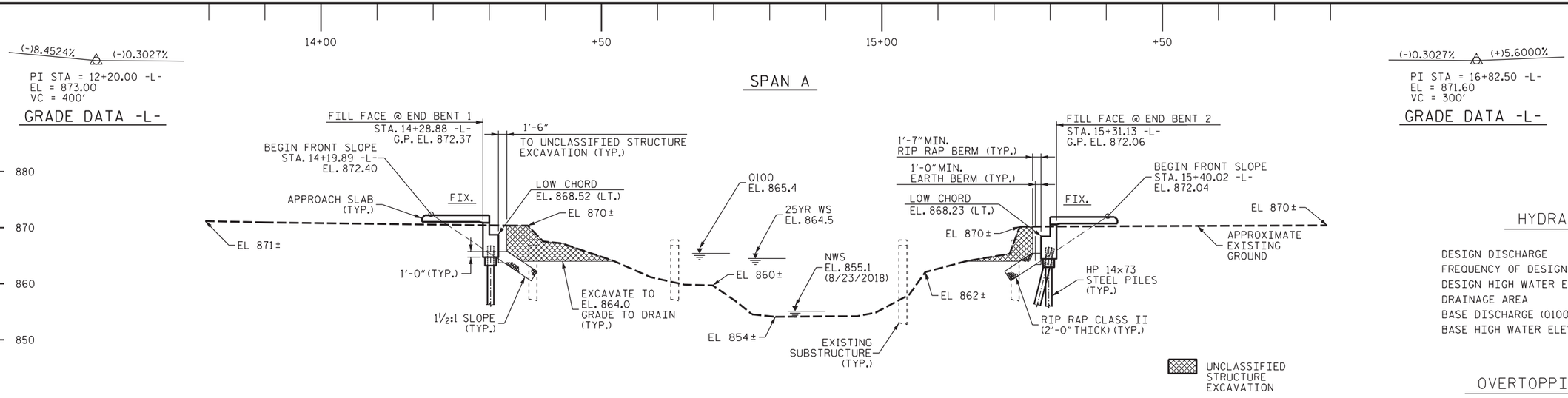

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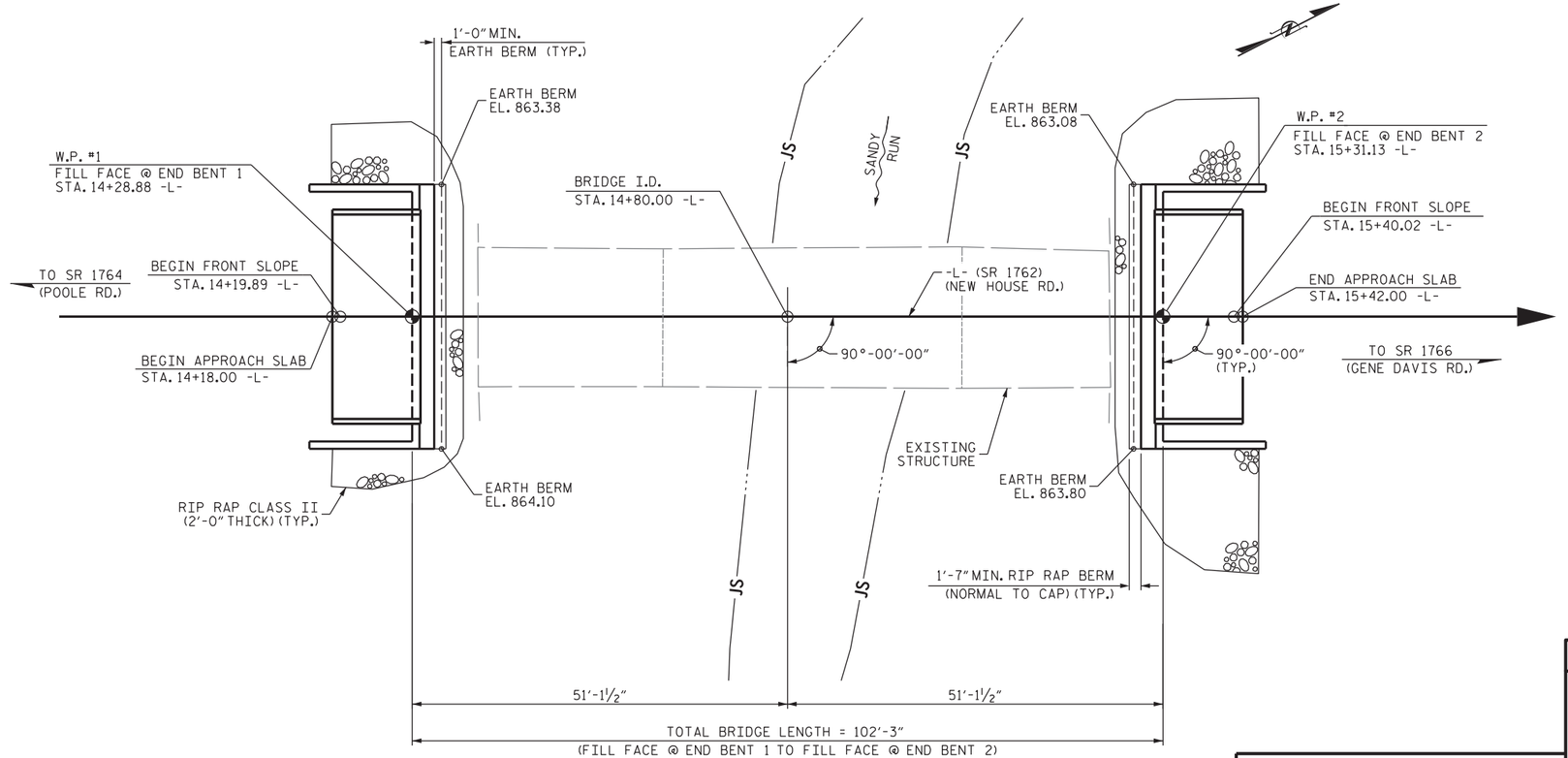

PLAN

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

HYDRAULIC DATA

DESIGN DISCHARGE	1700 CFS
FREQUENCY OF DESIGN FLOOD	25 YRS.
DESIGN HIGH WATER ELEVATION	864.5
DRAINAGE AREA	6.9 SQ.MI.
BASE DISCHARGE (Q100)	2400 CFS
BASE HIGH WATER ELEVATION	865.4

OVERTOPPING FLOOD DATA

OVERTOPPING FLOOD DISCHARGE	9800 CFS
FREQUENCY OF OVERTOPPING FLOOD	500+ YRS.
OVERTOPPING FLOOD ELEVATION @ STA. 15+48.00 -L-	872.2

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. BP13.R002

RUTHERFORD COUNTY

STATION: 14+80.00 -L-

SHEET 1 OF 4 REPLACES BRIDGE NO. 800090

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

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

NORTH CAROLINA PROFESSIONAL SEAL 042638 ENGINEER THOMAS J. KIRSCHBAUM

Docusigned by: Thomas Kirschbaum 7304F51F8CBE486... 3/6/2024

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER SANDY RUN
ON SR 1762 (NEW HOUSE RD.)
BETWEEN SR 1764 & SR 1763

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

3/6/2024
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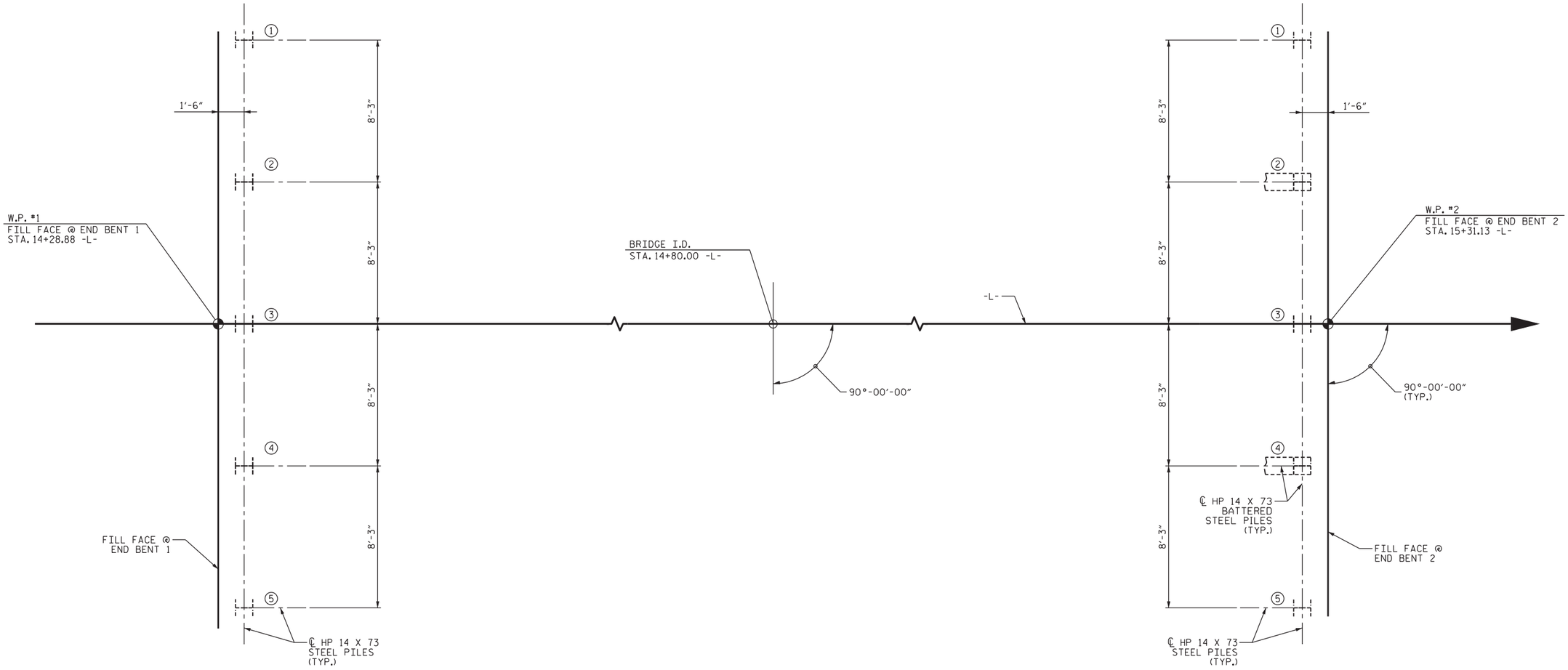

END BENT 1

END BENT 2

FOUNDATION LAYOUT

(END BENTS ARE PARALLEL)

NOTES

FOR SUMMARY OF PILE AND DRILLED PIER INFORMATION, SEE SHEET 3 OF 4.

PROJECT NO. BP13.R002

RUTHERFORD COUNTY

STATION: 14+80.00 -L-

SHEET 2 OF 4

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

WSP USA Inc.
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LICENSE NO. F-0165

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NORTH CAROLINA PROFESSIONAL SEAL 042638 ENGINEER THOMAS J. KIRSCHBAUM

DocuSigned by: Thomas Kirschbaum 7804F51F8CBE486... 3/6/2024

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER SANDY RUN
ON SR 1762 (NEW HOUSE RD.)
BETWEEN SR 1764 & SR 1763

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

3/6/2024
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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 Drawings	15	NA		N/A					854.7	5.0	5.0
End Bent No. 2, Piles 1-5	141		20	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.

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

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

*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

*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	
TOTAL QTY:					

FOUNDATION NOTES:

1. For Piles, see Piles Provision and Section 450 of the Standard Specifications.
2. Fill holes for pile excavation at End Bent No. 1 with concrete.

NOTES:

1. 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. 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.
3. The Engineer will determine the need for PDA Testing and Pipe Pile Plates when PDAs or plates may be required.
4. Any reference to "PDA Testing" shall be presumed to be updated to "Dynamic Pile Testing" per the updated 2024 Standard Provision.

PROJECT NO. BP13.R002

Rutherford COUNTY

STATION: 14+80 -L-

SHEET 3 OF 4

NORTH CAROLINA PROFESSIONAL SEAL 042638 ENGINEER THOMAS J. KIRSCHBAUM

DocuSigned by: Thomas Kirschbaum 7304F51F8CBE49B...

3/6/2024

SIGNATURE DATE

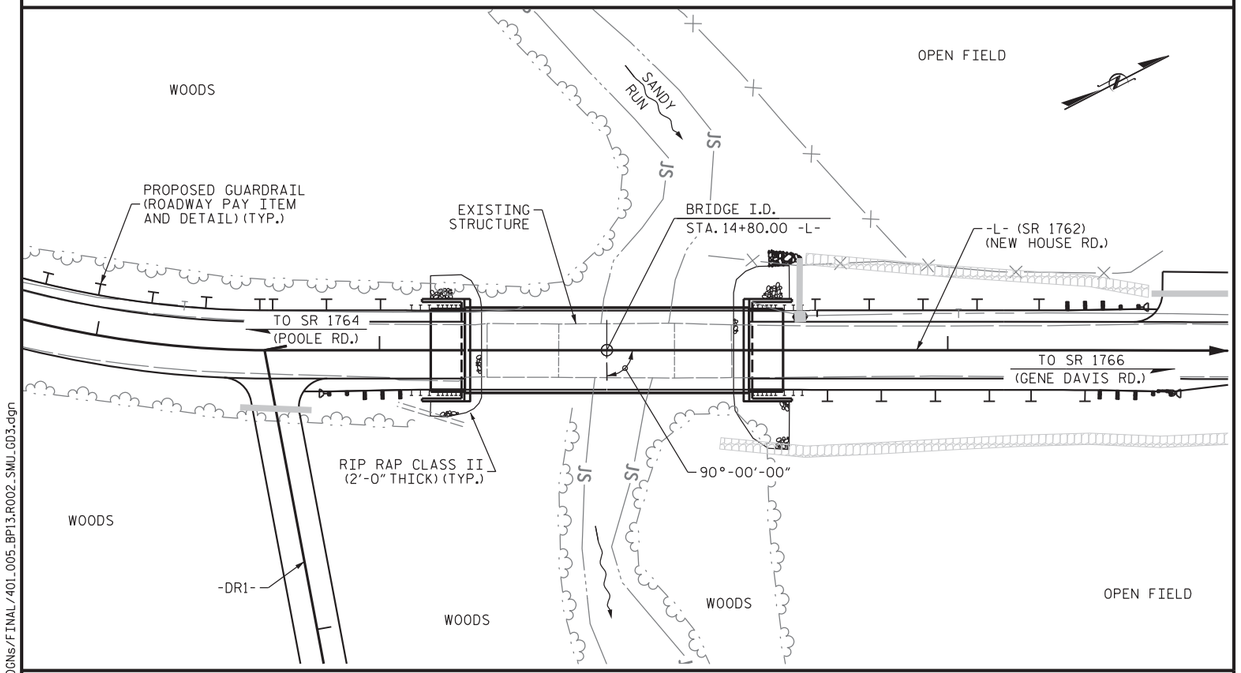
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PILE FOUNDATION TABLES

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

BM #1: STA. 14+12.92 -L-, OFFSET 110.65' LT, ELEV. 865.06', RAILROAD SPIKE IN 24" POPLAR



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 29.5 FT (LEFT) AND 28.5 FT (RIGHT) OF CENTERLINE ROADWAY AT END BENT 1 AND 22.5 FT (LEFT) AND 23.5 FT (RIGHT) OF CENTERLINE ROADWAY AT END BENT 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, ONE AT 25'-9", ONE AT 40'-2" AND ONE AT 20'-7", STEEL I-BEAM GIRDERS; 19'-9" 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. 14+80.00 -L-	ASBESTOS ASSESSMENT	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS @ STA. 14+80.00 -L-	REINFORCING STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 14 x 73 STEEL PILES	HP 14 X 73 STEEL PILES		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	LIN. FT.	LIN. FT.	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	No.	No.	LIN. FT.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	No.	LIN. FT.
SUPERSTRUCTURE							LUMP SUM					200.0			LUMP SUM	10	1,000
END BENT 1			25.0	25.0	LUMP SUM	28.6		4,404		5	75.0		68	75			
END BENT 2					LUMP SUM	28.6		4,404	5	5	100.0		102	113			
TOTAL	LUMP SUM	LUMP SUM	25.0	25.0	LUMP SUM	57.2	LUMP SUM	8,808	5	10	175.0	200.0	170	188	LUMP SUM	10	1,000

PROJECT NO. BP13.R002

RUTHERFORD COUNTY

STATION: 14+80.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER SANDY RUN
ON SR 1762 (NEW HOUSE RD.)
BETWEEN SR 1764 & SR 1763

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

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

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
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NORTH CAROLINA PROFESSIONAL SEAL 042638 ENGINEER THOMAS J. KIRSCHBAUM

DocuSigned by: Thomas Kirschbaum 7804F51F8CBE4B6... 3/6/2024

3/6/2024
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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 (γ LL)	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 (γ LL)	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	13.500		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	γ DC	γ DW
	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

(1)
(2)
(3)
(4)

LRFR SUMMARY

FOR SPAN " A "

PROJECT NO. BP13.R002

RUTHERFORD COUNTY

STATION: 14+80.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

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

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NORTH CAROLINA PROFESSIONAL SEAL 042638 ENGINEER THOMAS J. KIRSCHBAUM

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1			3			TOTAL SHEETS
2			4			17

STD. NO. 39LRFR1_90S_100L

ASSEMBLED BY: T.KIRSCHBAUM DATE : JUN 2023
CHECKED BY: E.LAWES DATE : JUN 2023
DESIGN ENGINEER OF RECORD: T.KIRSCHBAUM DATE : JUN 2023

DRAWN BY : TMG 11/11
CHECKED BY : AAC 11/11

REV. 06/23 AKP/AAI

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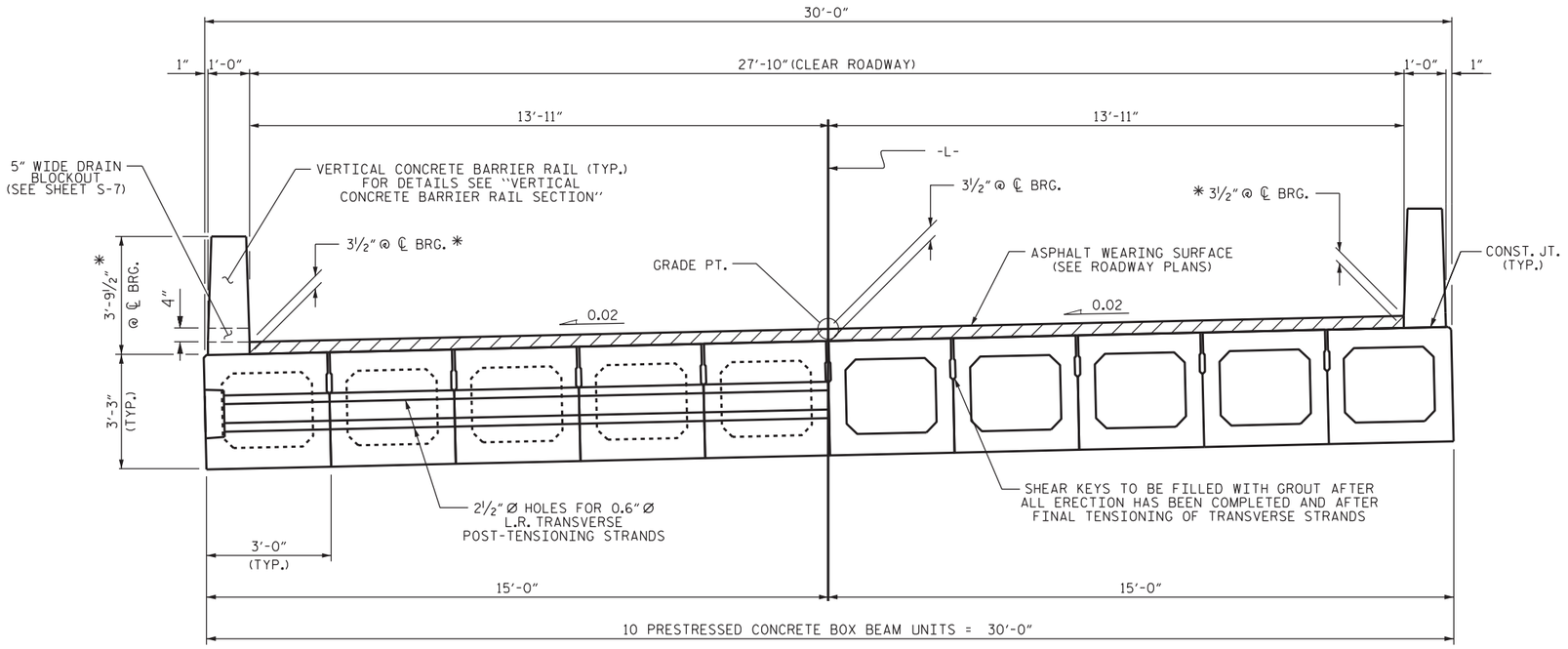


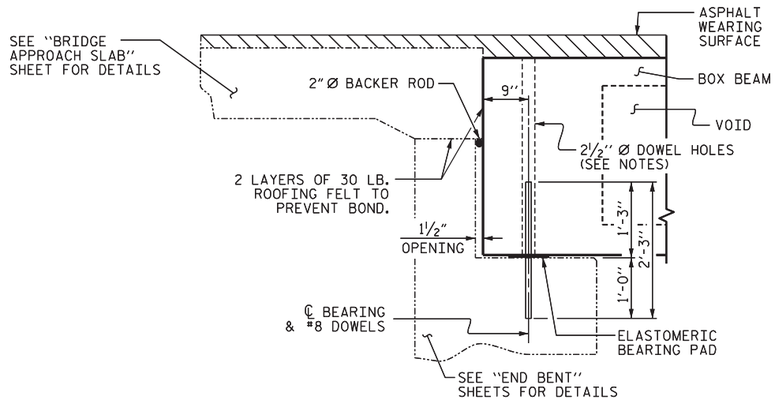
HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

HALF SECTION
THROUGH VOIDS

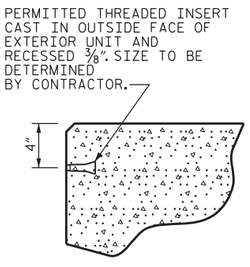
TYPICAL SECTION

* 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



THREADED INSERT DETAIL

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 2½" 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, ½" 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.

THE DRAIN OPENING AT THE GUTTERLINE SHALL BE 4" X 5". THE HEIGHT OF THE BLOCKOUT IN THE CONCRETE PARAPET SHALL EXTEND FROM THE TOP OF THE BOX BEAM UNIT TO THE TOP OF THE DRAIN OPENING.

APPLY EPOXY PROTECTIVE COATING TO EXTERIOR FACE OF THE EXTERIOR BOX BEAM UNITS THAT REQUIRE DRAINS IN THE VERTICAL CONCRETE BARRIER RAIL.

PROJECT NO. BP13.R002
RUTHERFORD COUNTY
STATION: 14+80.00 -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			17

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NORTH CAROLINA PROFESSIONAL SEAL 042638 ENGINEER THOMAS J. KIRSCHBAUM

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CHECKED BY: E.LAWES	DATE : JUN 2023	CHECKED BY : TMG 11/11	
DESIGN ENGINEER OF RECORD: T.KIRSCHBAUM	DATE : JUN 2023		

STD. NO. 39PCBB1_30

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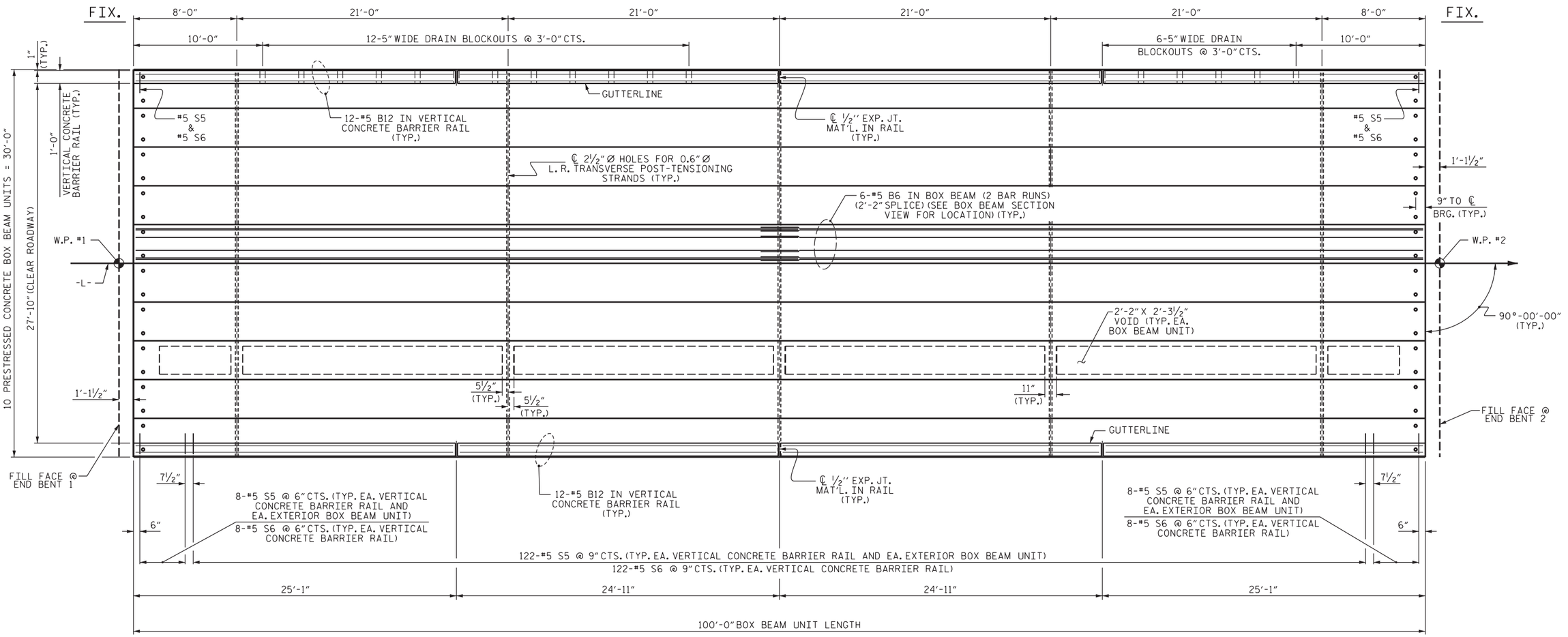
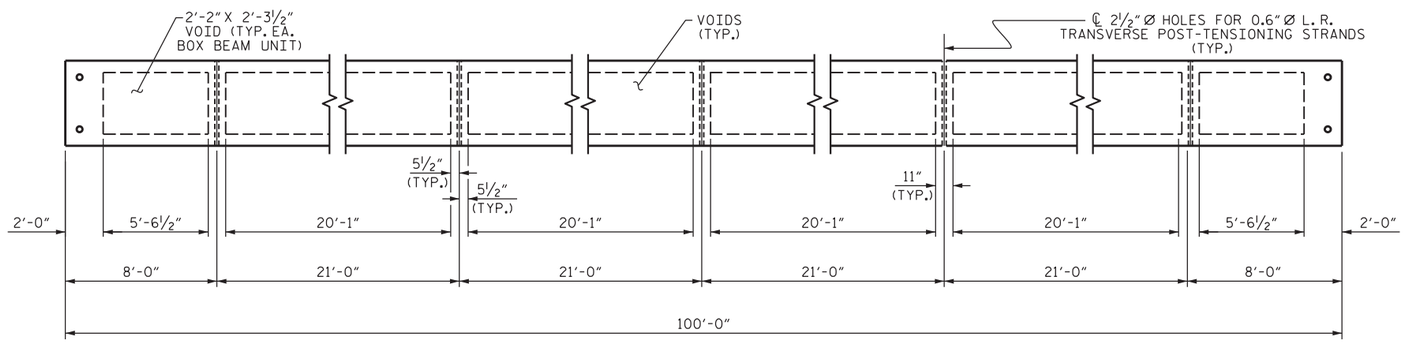


PLAN OF UNIT



DIAPHRAGM AND VOID LAYOUT

PROJECT NO. BP13.R002
RUTHERFORD COUNTY
STATION: 14+80.00 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

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CHECKED BY: E.LAWES DATE : JUN 2023
DESIGN ENGINEER OF RECORD: T.KIRSCHBAUM DATE : JUN 2023

DRAWN BY : DGE 8/10
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REV. 8/14 MAA/TMG

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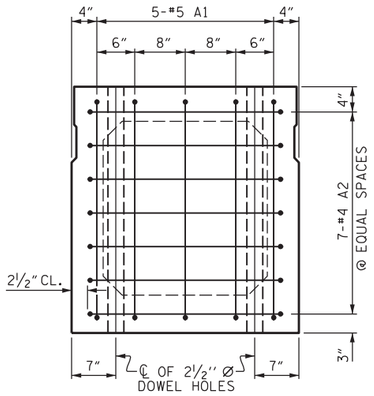
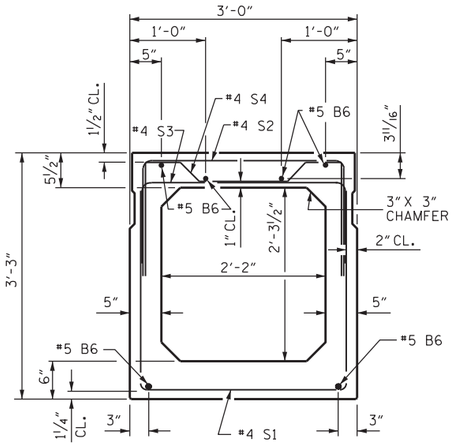


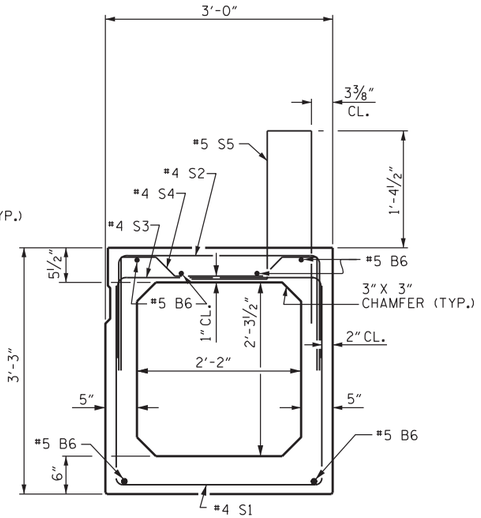
END ELEVATION

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.)



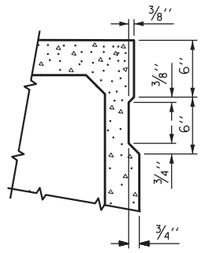
INTERIOR BOX BEAM SECTION

(STRAND LAYOUT NOT SHOWN)



EXTERIOR BOX BEAM SECTION

(STRAND LAYOUT NOT SHOWN)

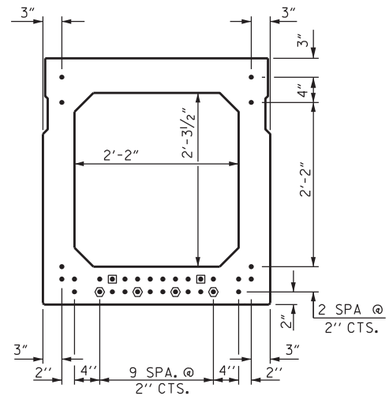


SHEAR KEY DETAIL

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

0.6" Ø LOW RELAXATION STRAND LAYOUT



TYPICAL STRAND LOCATION

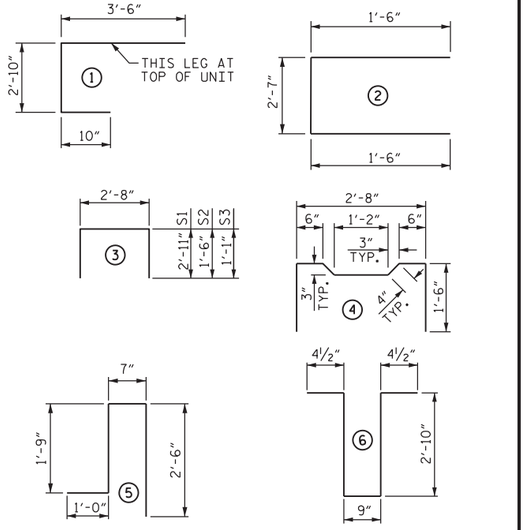
(32 STRANDS REQUIRED)

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.

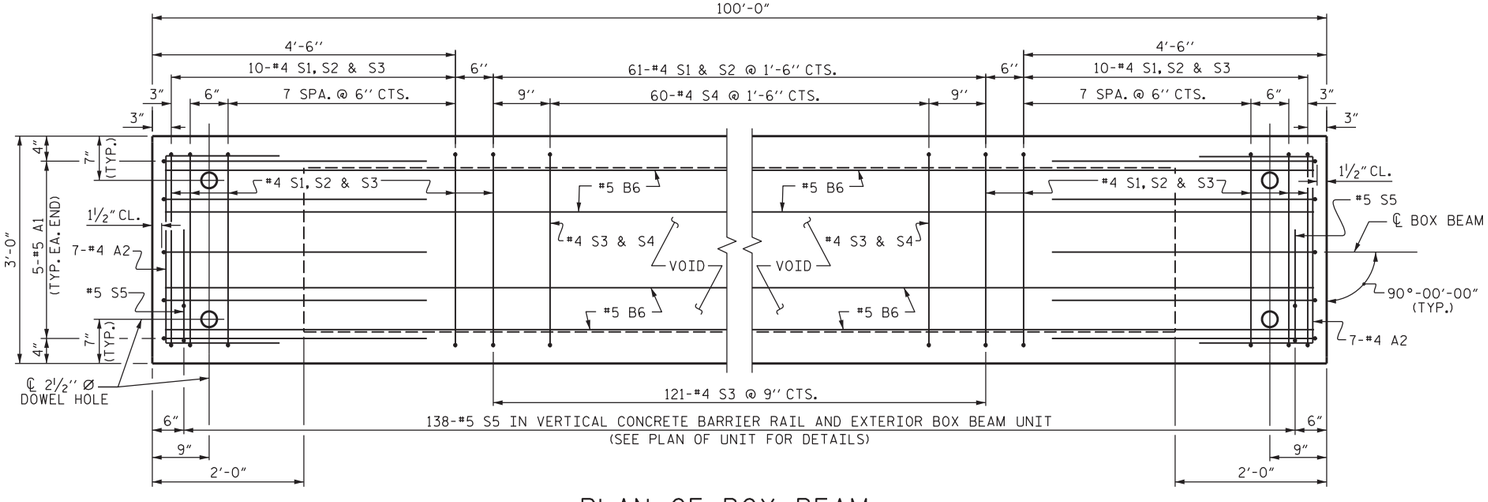
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR ONE BOX BEAM SECTION

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	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".

PROJECT NO. BP13.R002
RUTHERFORD COUNTY
STATION: 14+80.00 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

3'-0" X 3'-3" PRESTRESSED CONCRETE BOX BEAM UNIT

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NORTH CAROLINA PROFESSIONAL SEAL 042638 ENGINEER THOMAS M. KIRSCHBAUM

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1			3			TOTAL SHEETS
2			4			17

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CHECKED BY:	E.LAWES	DATE : JUN 2023
DESIGN ENGINEER OF RECORD:	T.KIRSCHBAUM	DATE : JUN 2023

DRAWN BY : DGE II/II
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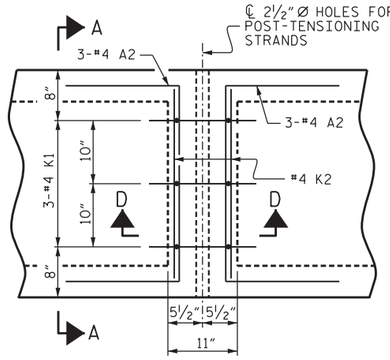
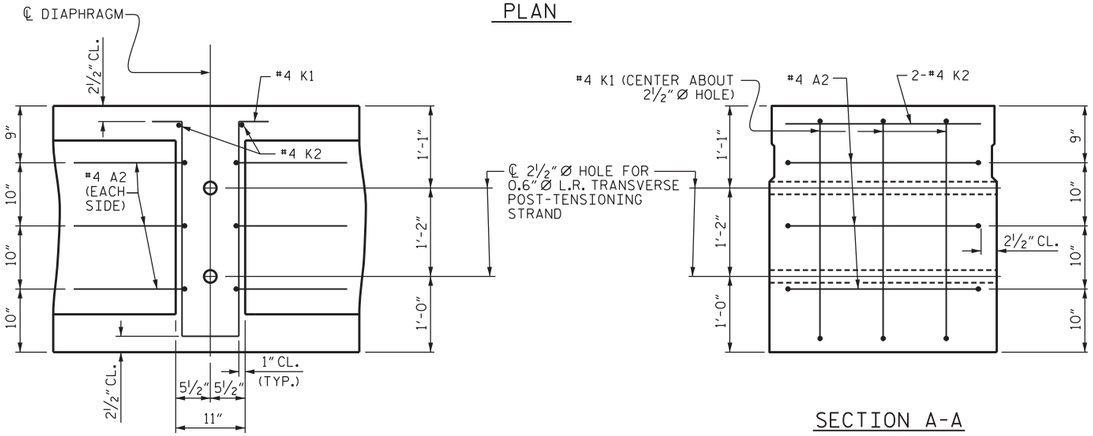


PLAN



SECTION D-D

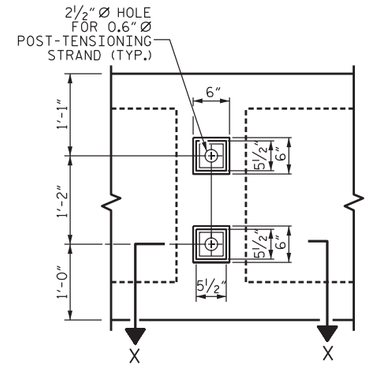
SECTION A-A
VOIDS NOT SHOWN

DOUBLE DIAPHRAGM DETAILS

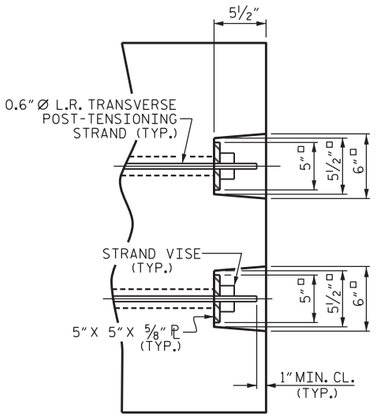
#4 "S" BARS NOT SHOWN. #4 "S" BARS MAY BE SHIFTED SLIGHTLY TO CLEAR 2½" Ø HOLE.

DEAD LOAD DEFLECTION AND CAMBER	
	3'-0" x 3'-3"
100' BOX BEAM UNIT	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	2" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	⅞" ↓
FINAL CAMBER	1⅛" ↑

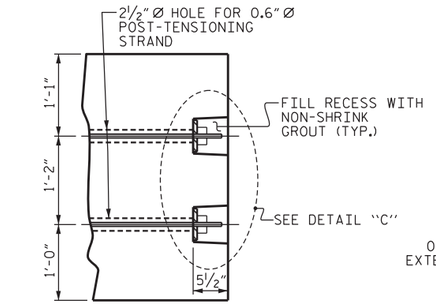
** INCLUDES FUTURE WEARING SURFACE



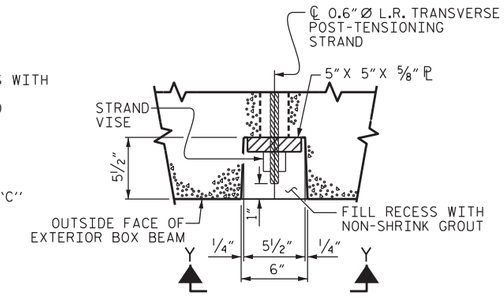
VIEW Y-Y
SHOWING ELEVATION VIEW OF GROUTED RECESS



DETAIL "C"

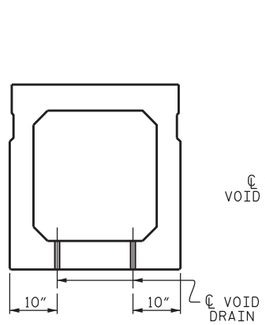


PART SECTION AT RECESS

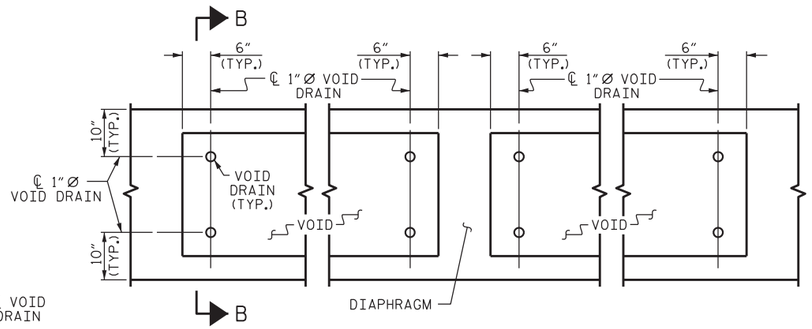


SECTION X-X
SHOWING PLAN VIEW OF GROUTED RECESS

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



SECTION B-B



PART PLAN

VOID DRAIN DETAILS

(DIMENSIONS SHOWN ARE TYPICAL FOR EACH VOID)

PROJECT NO. BP13.R002
RUTHERFORD COUNTY
STATION: 14+80.00 -L-
SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

3'-0" X 3'-3" PRESTRESSED CONCRETE BOX BEAM UNIT

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 042638 ENGINEER THOMAS J. KIRSCHBAUM

DocuSigned by: Thomas Kirschbaum 7804F51F8CBE4B6... 3/6/2024

WSP USA Inc.
434 FAYETTEVILLE STREET
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LICENSE NO. F-0165

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
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ASSEMBLED BY: T.KIRSCHBAUM DATE : JUN 2023
CHECKED BY: E.LAWES DATE : JUN 2023
DESIGN ENGINEER OF RECORD: T.KIRSCHBAUM DATE : JUN 2023

DRAWN BY : DGE 11/11
CHECKED BY : TMG 11/11

REV. 8/14 MAA/TMG

STD.NO.39PCBB7_90S

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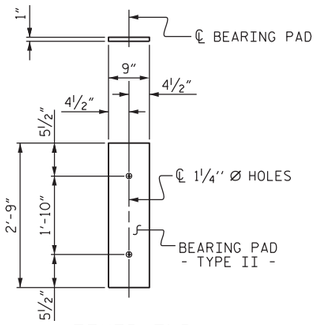
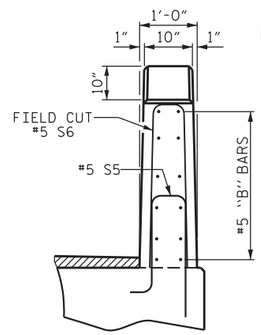


FIXED END

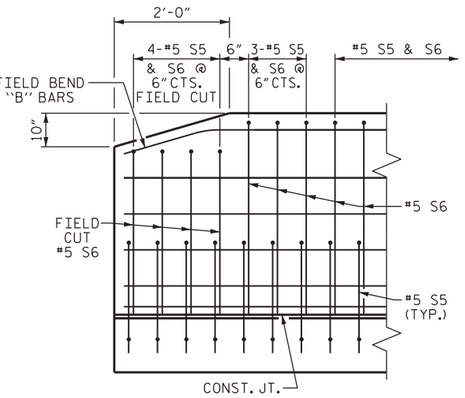
(TYPE II - 20 REQ'D)

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.



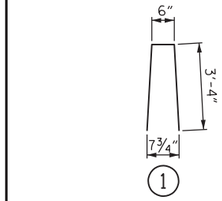
END VIEW



SIDE VIEW

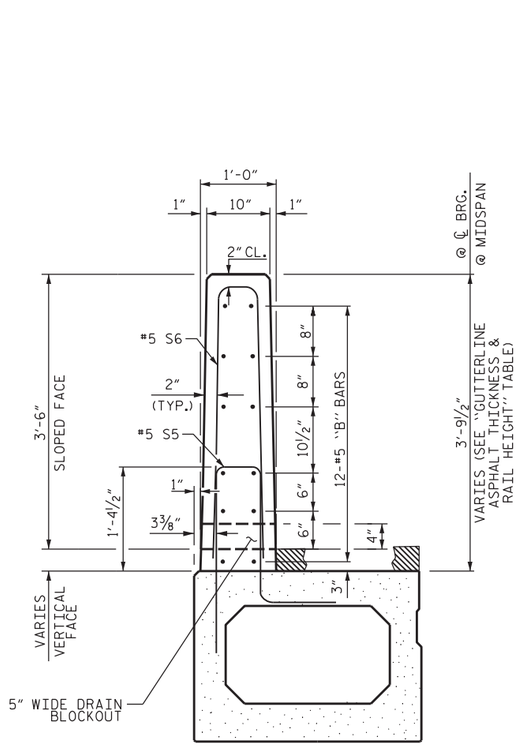
END OF RAIL DETAILS

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"

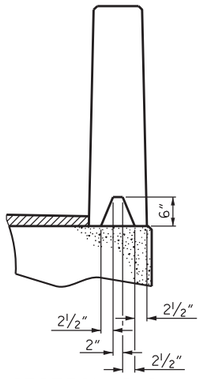


BAR TYPE

BAR DIMENSIONS ARE OUT TO OUT

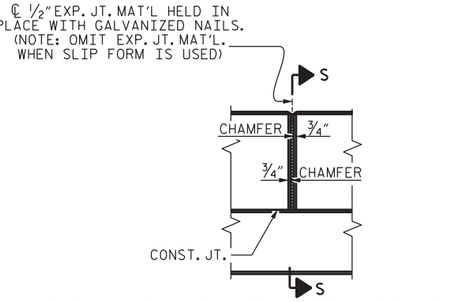


SECTION THRU RAIL



SECTION S-S

AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)



ELEVATION AT EXPANSION JOINTS

VERTICAL CONCRETE BARRIER RAIL DETAILS

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	2⅜"	3'-8⅜"

PROJECT NO. BP13.R002

RUTHERFORD COUNTY

STATION: 14+80.00 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

3'-0" X 3'-3" PRESTRESSED CONCRETE BOX BEAM UNIT

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042638 THOMAS J. KIRSCHBAUM

Docusigned by: Thomas Kirschbaum 7304F51F8CBE4B6... 3/6/2024

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LICENSE NO. F-0165

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ASSEMBLED BY:	T.KIRSCHBAUM	DATE :	JUN 2023
CHECKED BY:	E.LAWES	DATE :	JUN 2023
DESIGN ENGINEER OF RECORD:	T.KIRSCHBAUM	DATE :	JUN 2023

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CHECKED BY : TMG 11/11

REV. 5/18 MAA/THC

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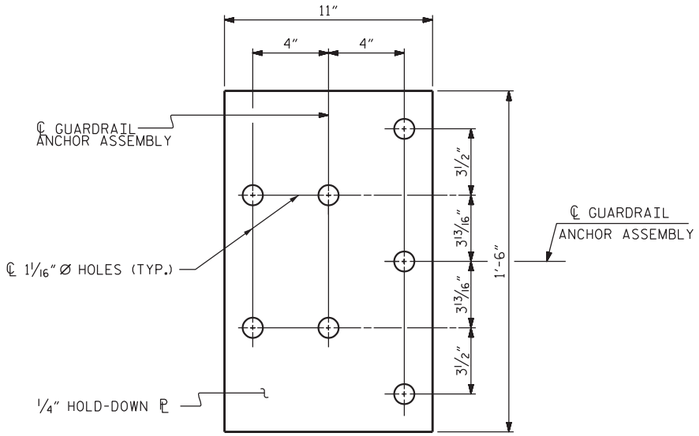
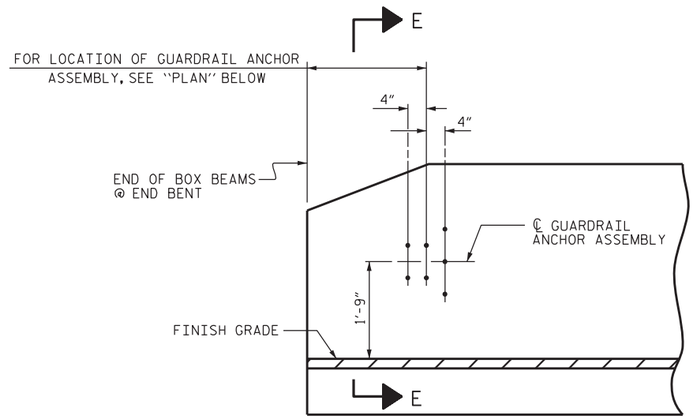


PLAN



ELEVATION

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.)

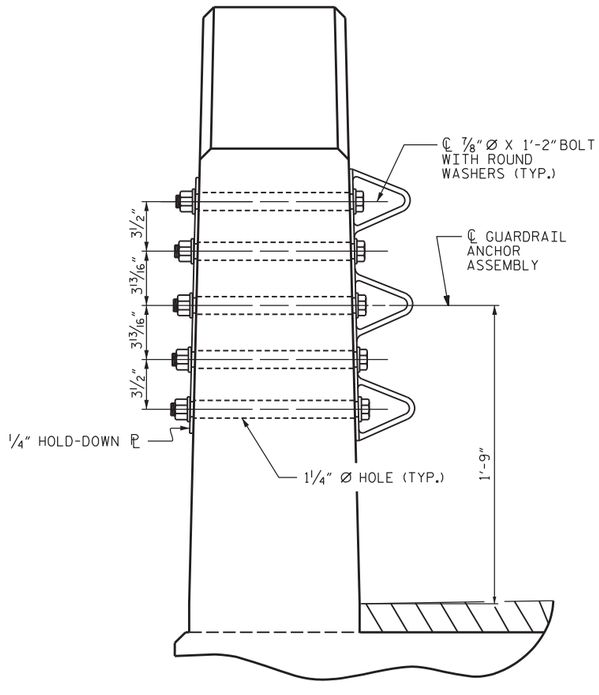
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.

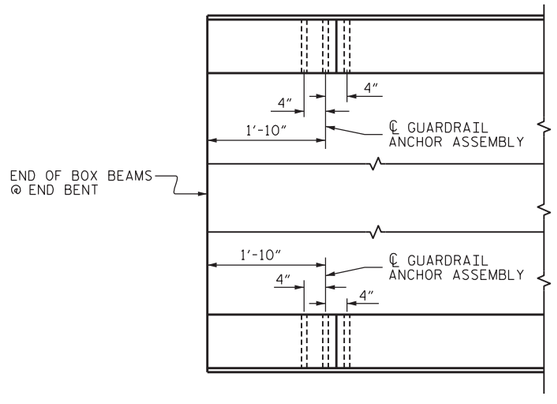
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

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.



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.R002

RUTHERFORD COUNTY

STATION: 14+80.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE DETAILS FOR VERTICAL CONCRETE BARRIER RAIL

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NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
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2			4			17

STD. NO. GRA3

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NORTH CAROLINA PROFESSIONAL SEAL 042638 ENGINEER THOMAS K KIRSCHBAUM

Docusigned by: Thomas Kirschbaum 7304F51F8CBE486...

3/6/2024

WSP USA Inc.
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RALEIGH, NC 27601
TEL: 1.919.836.4040

LICENSE NO. F-0165

ASSEMBLED BY:	T.KIRSCHBAUM	DATE :	JUN 2023
CHECKED BY:	E.LAWES	DATE :	JUN 2023
DESIGN ENGINEER OF RECORD:	T.KIRSCHBAUM	DATE :	JUN 2023

DRAWN BY :	MAA	5/10
CHECKED BY :	GM	5/10

REV.	1/15	MAA/TMG
REV.	12/17	MAA/THC
REV.	5/18	MAA/THC

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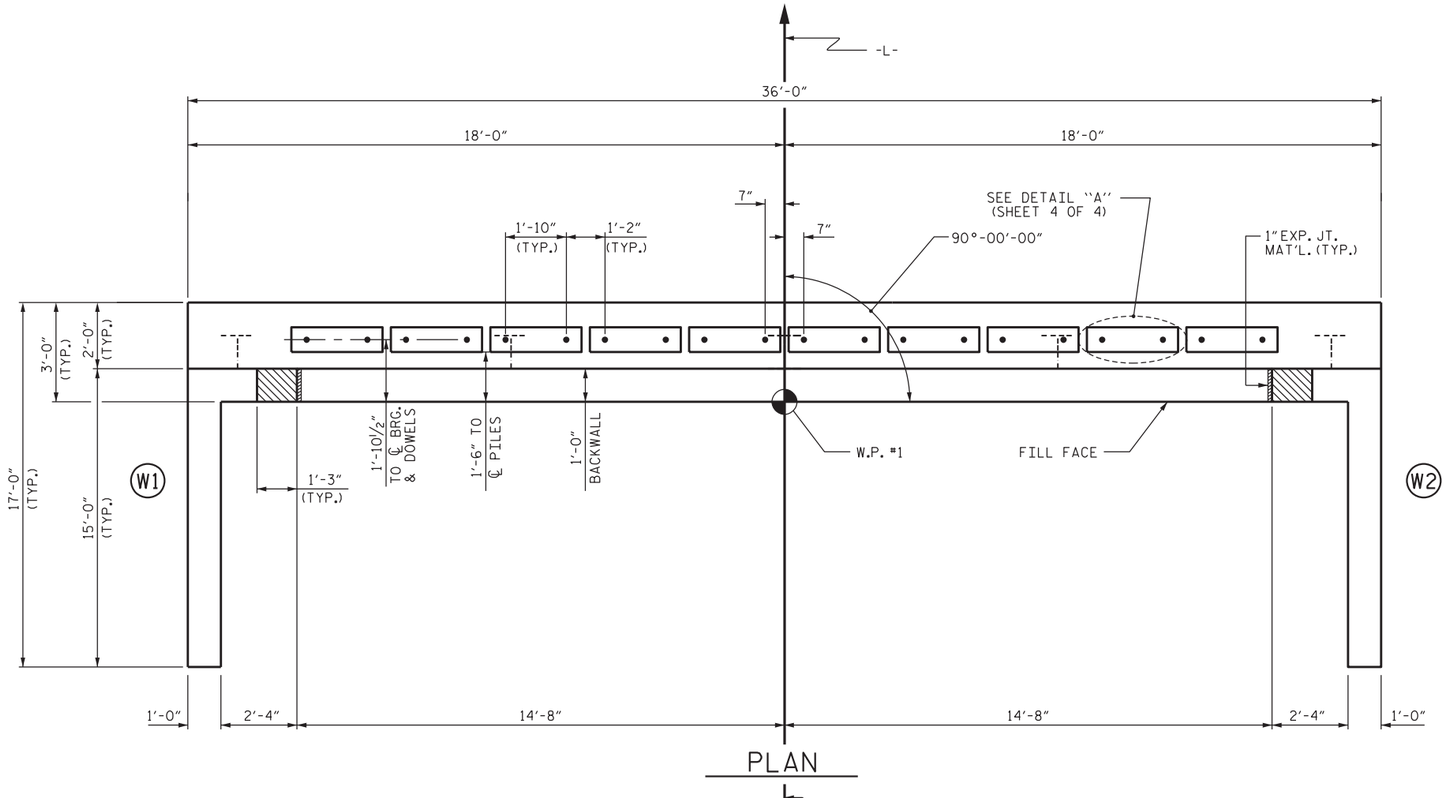
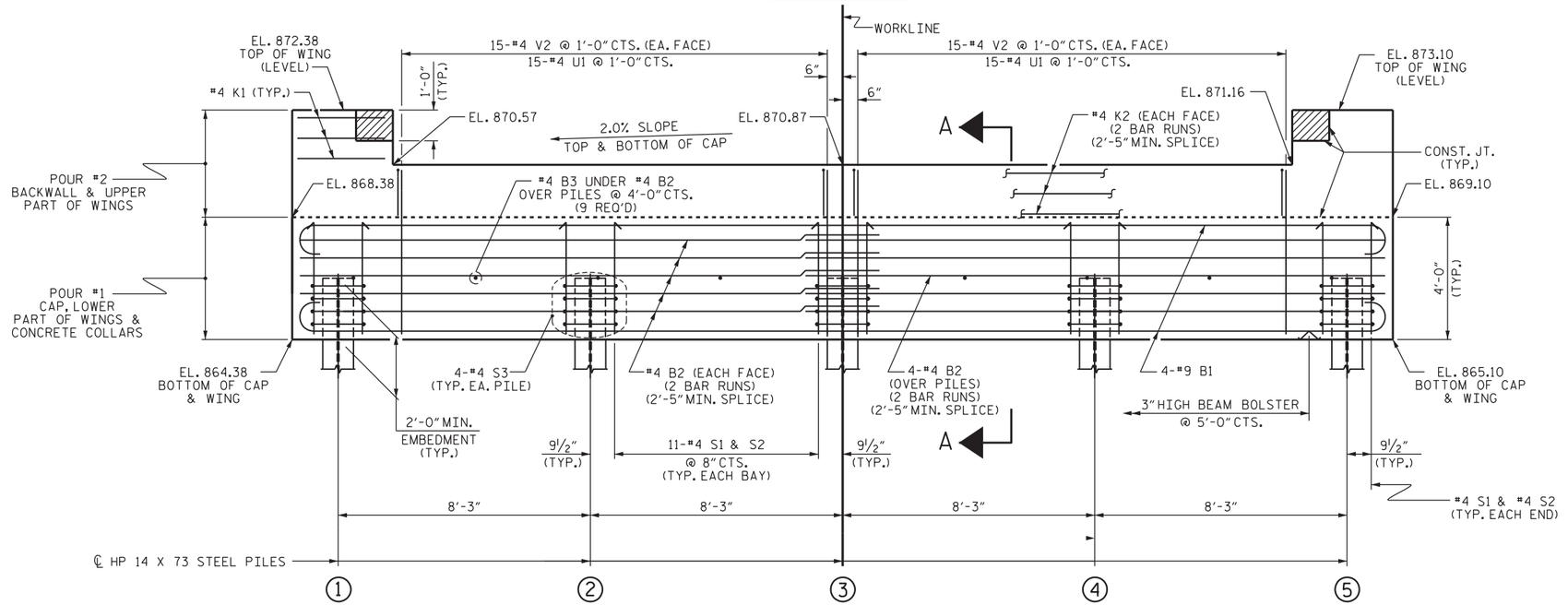


PLAN



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 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

TOP OF PILE ELEVATIONS	
①	866.41
②	866.57
③	866.74
④	866.90
⑤	867.07

PROJECT NO. BP13.R002
RUTHERFORD COUNTY
STATION: 14+80.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
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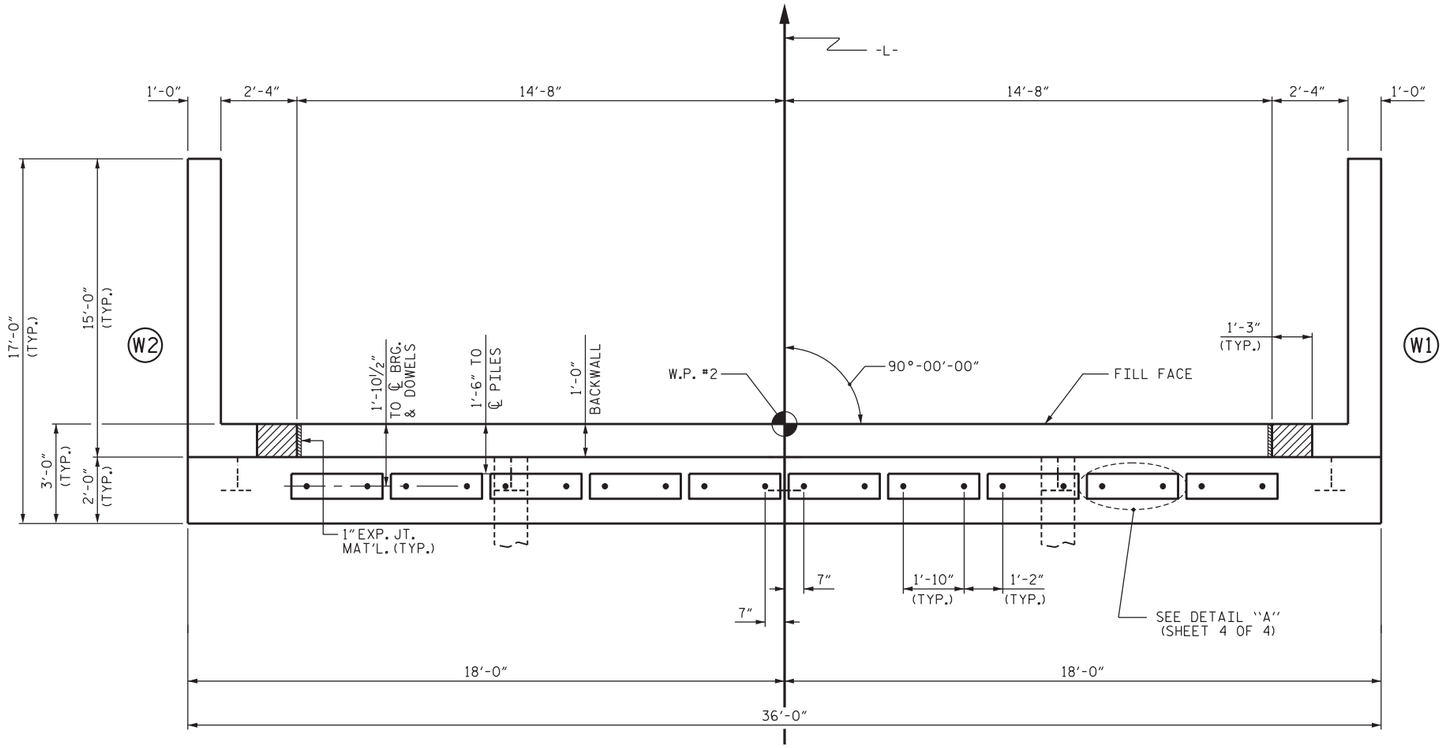
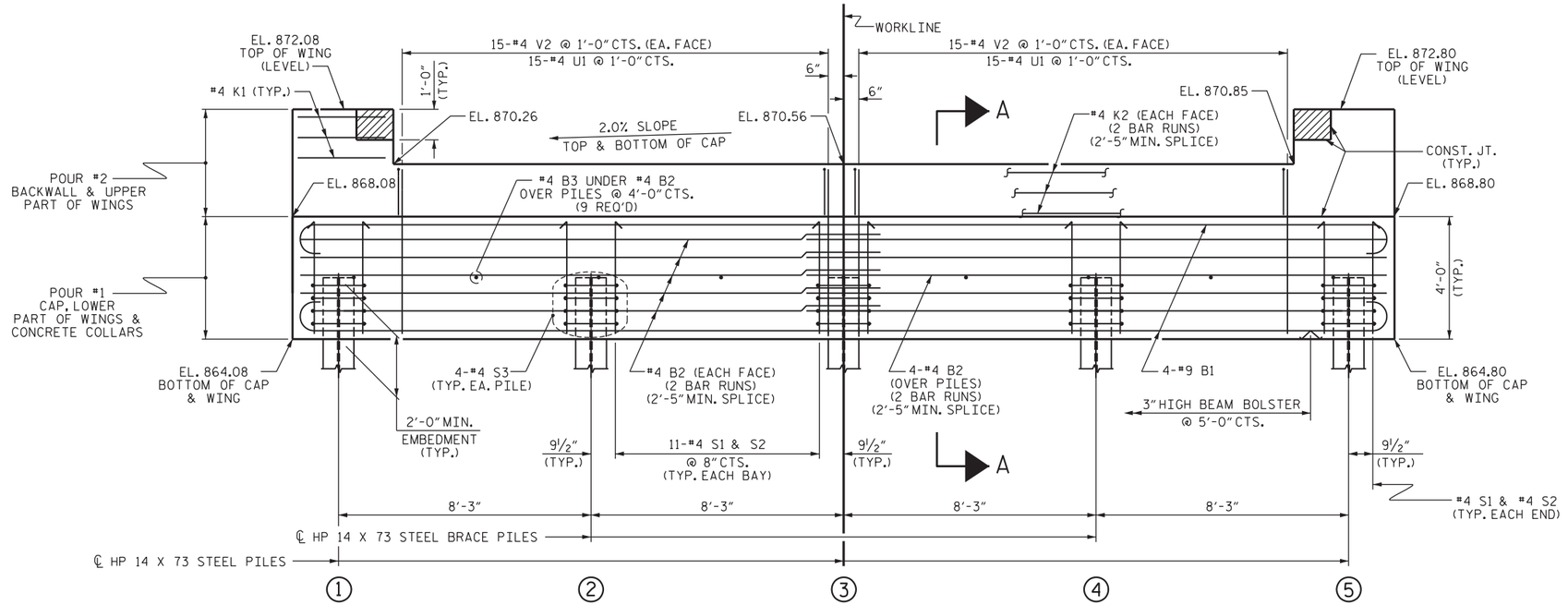


PLAN



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 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

TOP OF PILE ELEVATIONS

1	866.11
2	866.27
3	866.44
4	866.60
5	866.77

PROJECT NO. BP13.R002
RUTHERFORD COUNTY
STATION: 14+80.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 2

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			17

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NORTH CAROLINA PROFESSIONAL SEAL 042638 ENGINEER THOMAS J. KIRSCHBAUM
DocuSigned by: 7804F51F8CBE486...
3/6/2024

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TEL: 1.919.836.4040
LICENSE NO. F-0165

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

STD. NO. EB_30_90S4_39BB

3/6/2024
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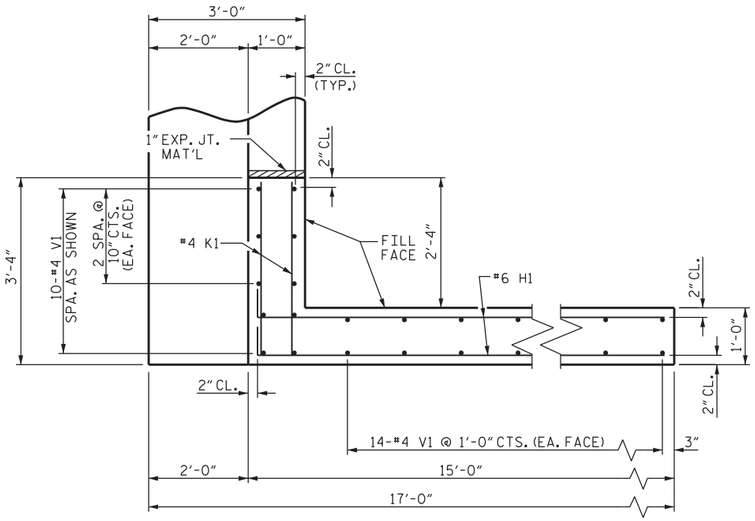
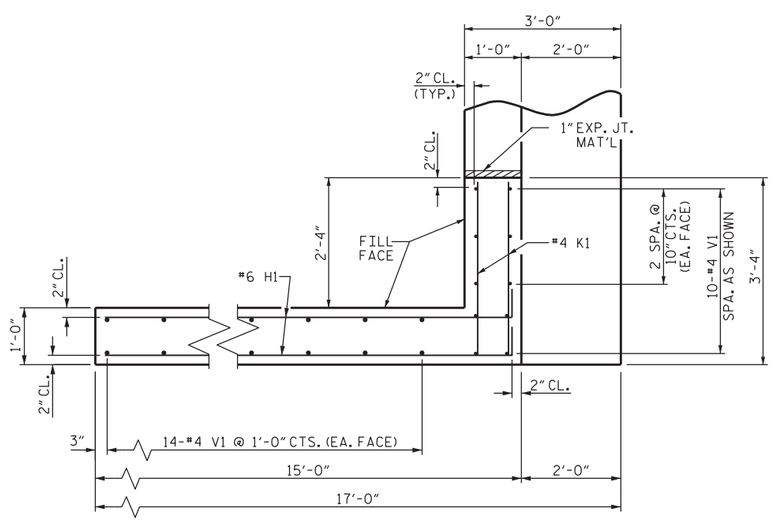
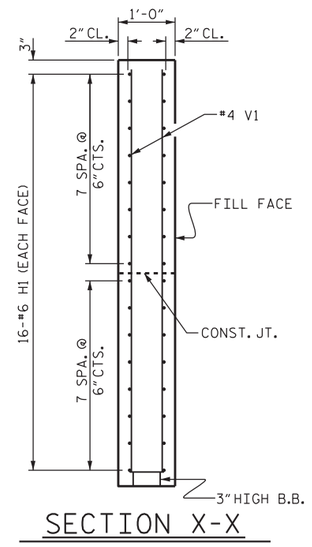


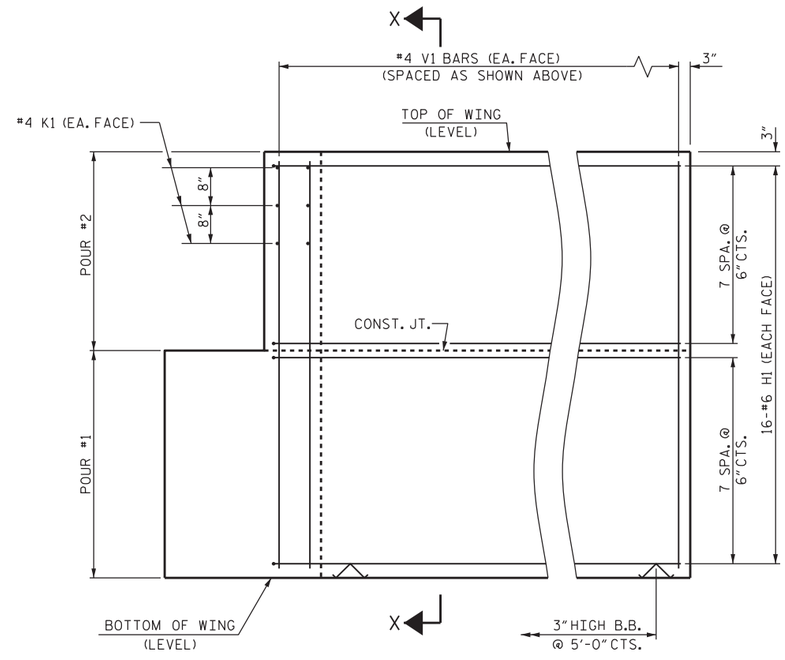
PLAN OF WING (W1)



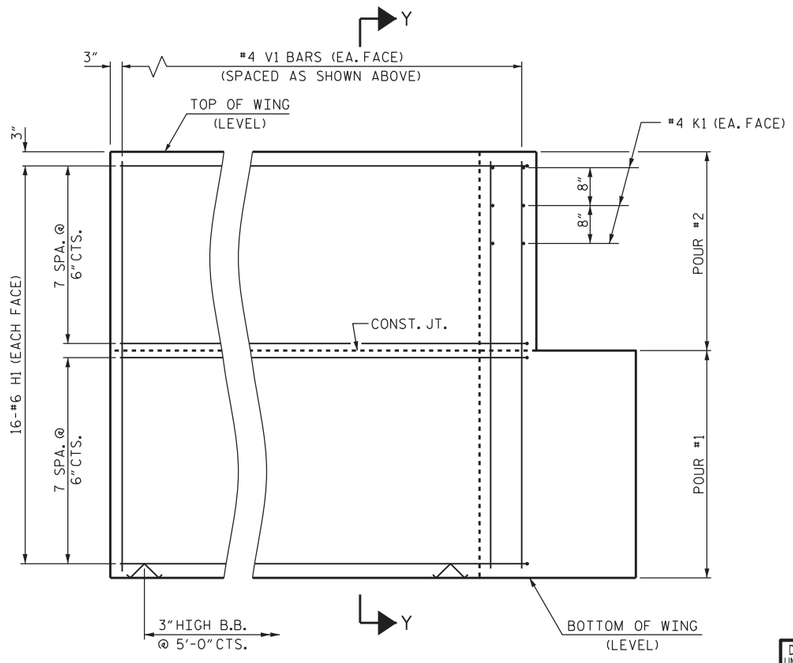
PLAN OF WING (W2)



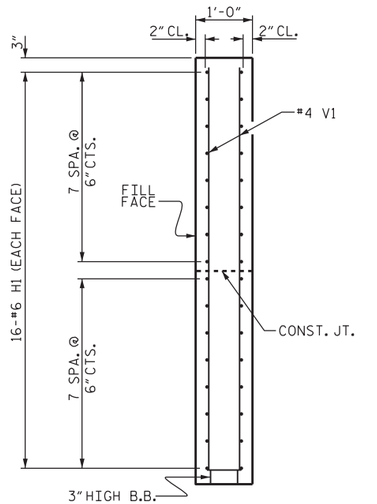
SECTION X-X



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)



SECTION Y-Y

WING DETAILS

PROJECT NO. BP13.R002

RUTHERFORD COUNTY

STATION: 14+80.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT
WING DETAILS

REVISIONS						SHEET NO.
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2			4			17

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NORTH CAROLINA PROFESSIONAL SEAL 042638 ENGINEER THOMAS J. KIRSCHBAUM

Designed by: 7804F51F8CBE486...

3/6/2024

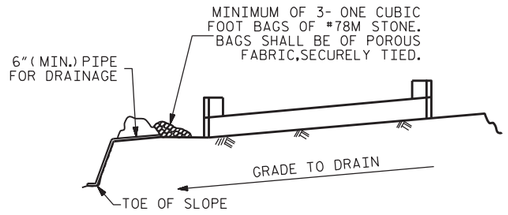
WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040

LICENSE NO. F-0165

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

STD. NO. EB_30_90S4_39BB

3/6/2024
pw://bgh-eus2-pw.bentley.com:bgh-eus2-pw-02/Documents/2042955/Technical/Division 13/800090.Rutherford/Structures/2.0 Drafting/DGNs/FINAL/401_025_BP13_R002_SMU_EB3.dgn

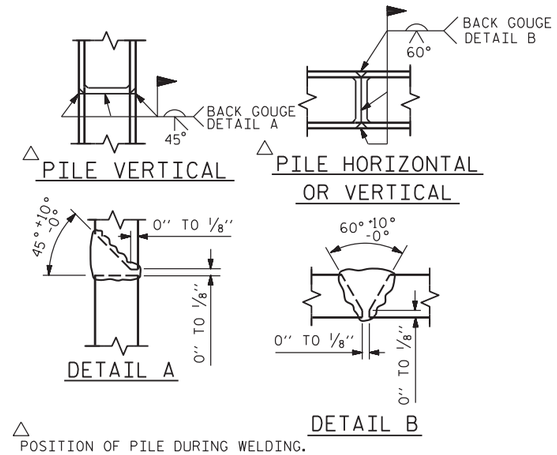


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

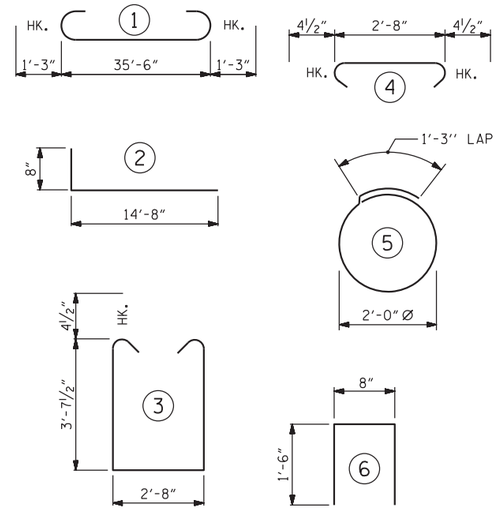
TEMPORARY DRAINAGE AT END BENT



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL
FOR ONE END BENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	38'-0"	1034
B2	28	#4	STR	19'-1"	357
B3	9	#4	STR	2'-8"	16
D1	20	#8	STR	2'-3"	120
H1	64	#6	2	15'-4"	1474
K1	12	#4	STR	2'-11"	23
K2	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 (FOR ONE END BENT) 4,404 LBS.

CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)

POUR #1 CAP, LOWER PART OF WINGS & COLLARS 21.2 C.Y.

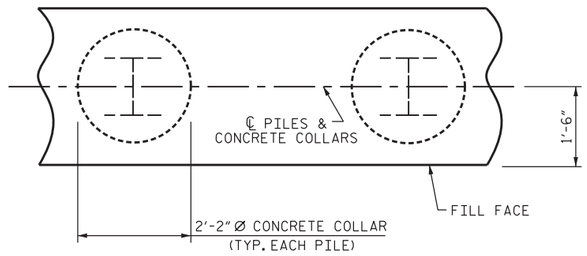
POUR #2 BACKWALL & UPPER PART OF WINGS 7.4 C.Y.

TOTAL CLASS A CONCRETE 28.6 C.Y.

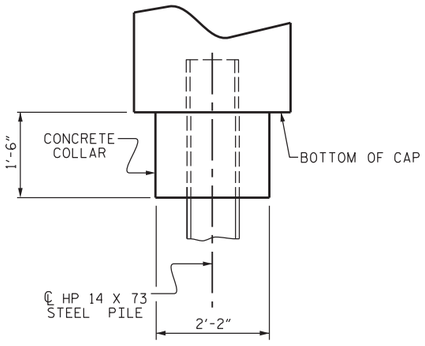
END BENT No. 1
HP 14 X 73 STEEL PILES
NO: 5 LIN. FT. = 75.0

END BENT No. 2
HP 14 X 73 STEEL PILES
NO: 5 LIN. FT. = 100.0

PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 STEEL PILES NO: 5



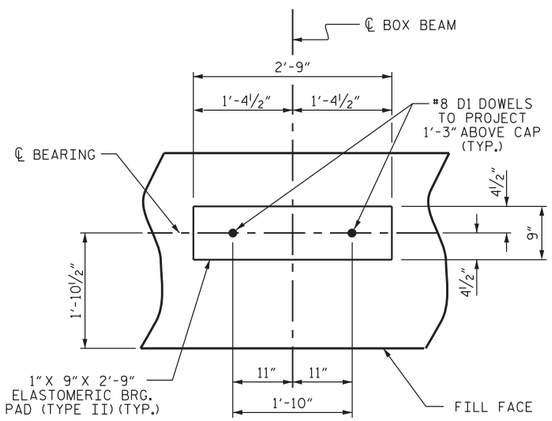
PLAN



ELEVATION

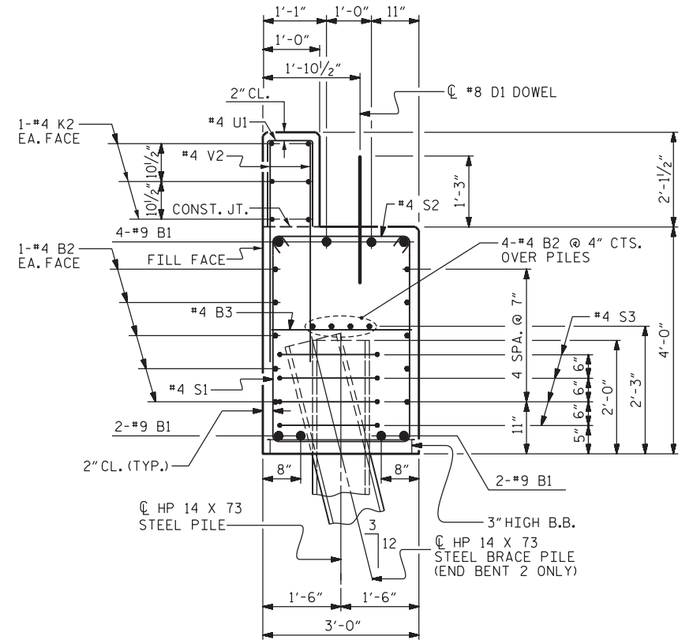
CORROSION PROTECTION FOR STEEL PILES DETAIL

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



DETAIL "A"

(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.")

PROJECT NO. BP13.R002
RUTHERFORD COUNTY
STATION: 14+80.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 1 & 2 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			17

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NORTH CAROLINA PROFESSIONAL SEAL 042638 ENGINEER THOMAS J. KIRSCHBAUM

Documents Kirschbaum 7804F51F8CBE4B6... 3/6/2024

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DESIGN ENGINEER OF RECORD: T.KIRSCHBAUM	DATE : JUN 2023		

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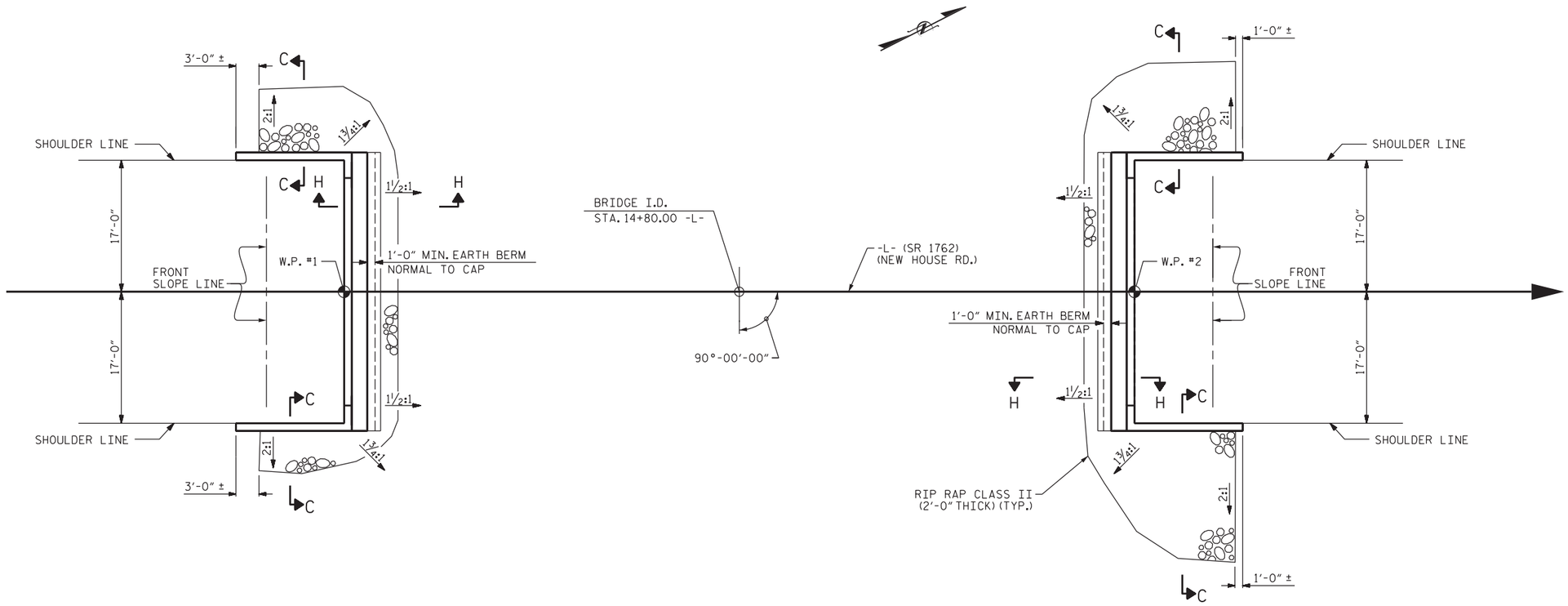
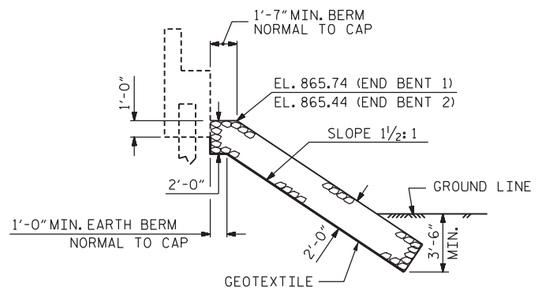
ESTIMATED QUANTITIES		
BRIDGE @ STA. 14+80.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	68	75
END BENT 2	102	113



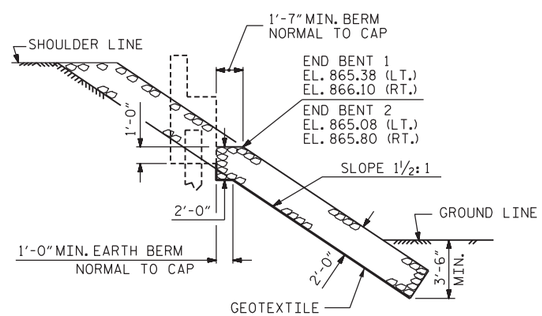
END BENT 1

PLAN

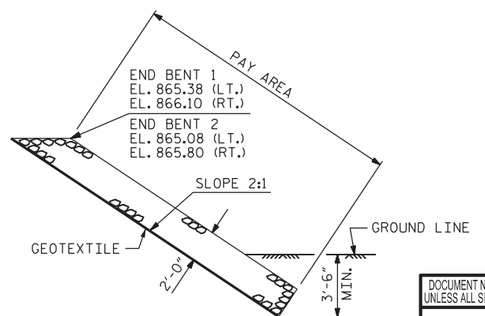
END BENT 2



℄ SECTION
BERM RIP RAPPED



SECTION H-H



SECTION C-C

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

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NORTH CAROLINA PROFESSIONAL SEAL 042638 ENGINEER THOMAS J. KIRSCHBAUM

DocuSigned by: Thomas Kirschbaum 7304F51F8CBE49B...

3/6/2024

PROJECT NO. BP13.R002
RUTHERFORD COUNTY
STATION: 14+80.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RIP RAP DETAILS

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

SHEET NO. S-16
TOTAL SHEETS 17

3/6/2024
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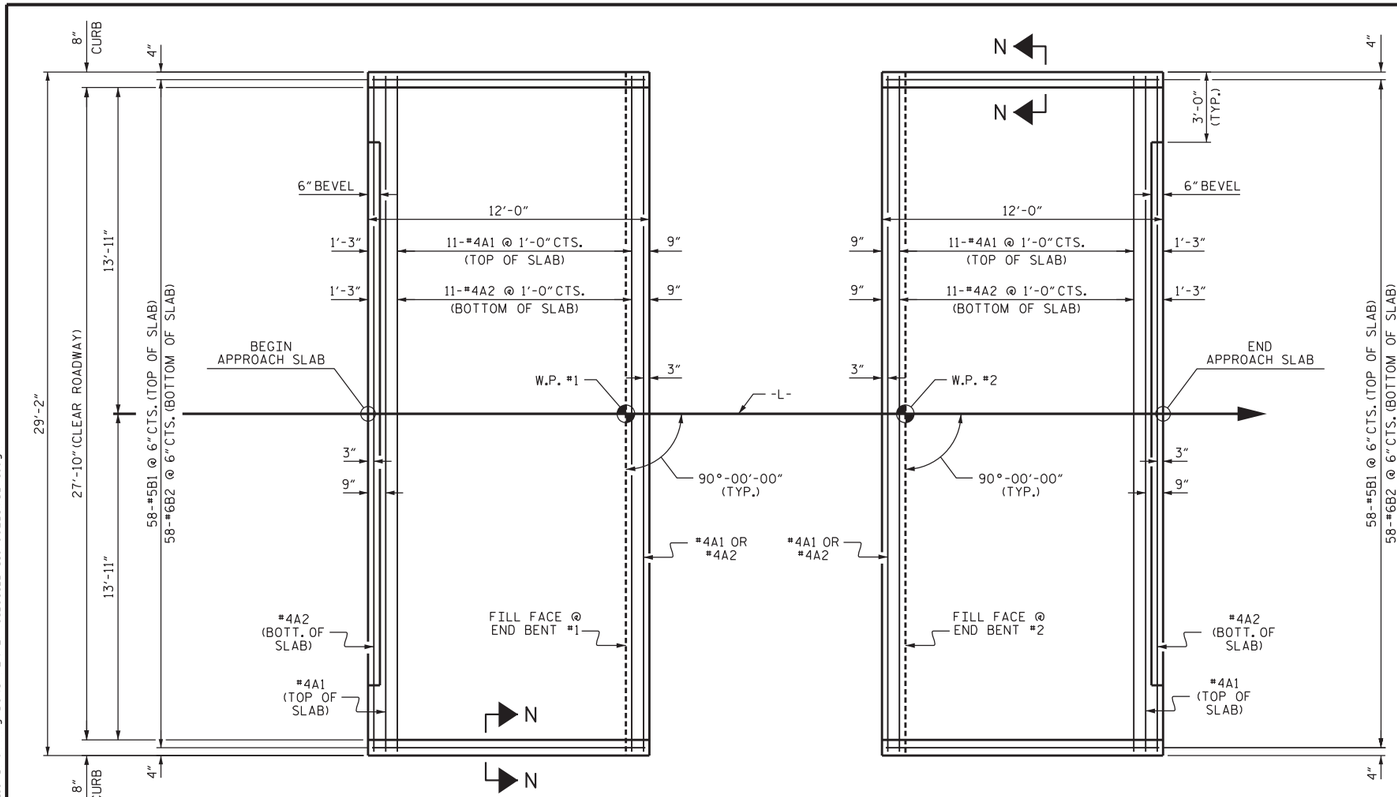
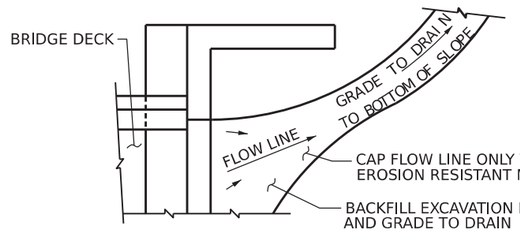


PLAN @ END BENT #1

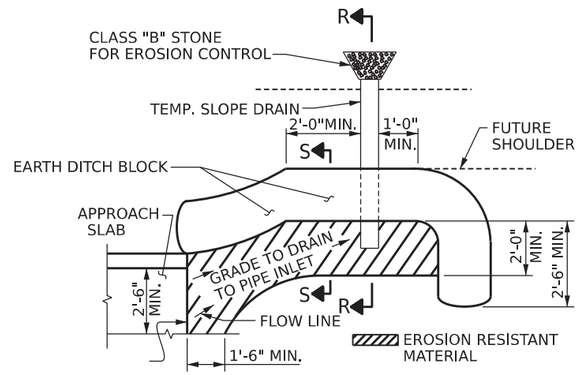
PLAN @ END BENT #2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



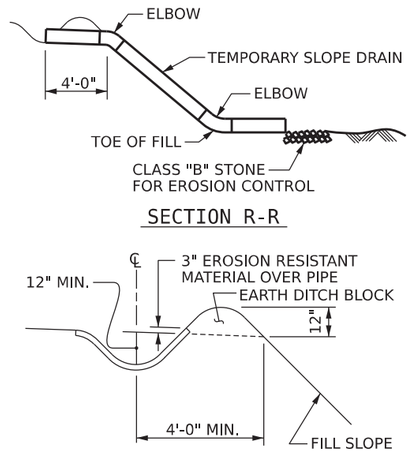
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL



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



SECTION S-S

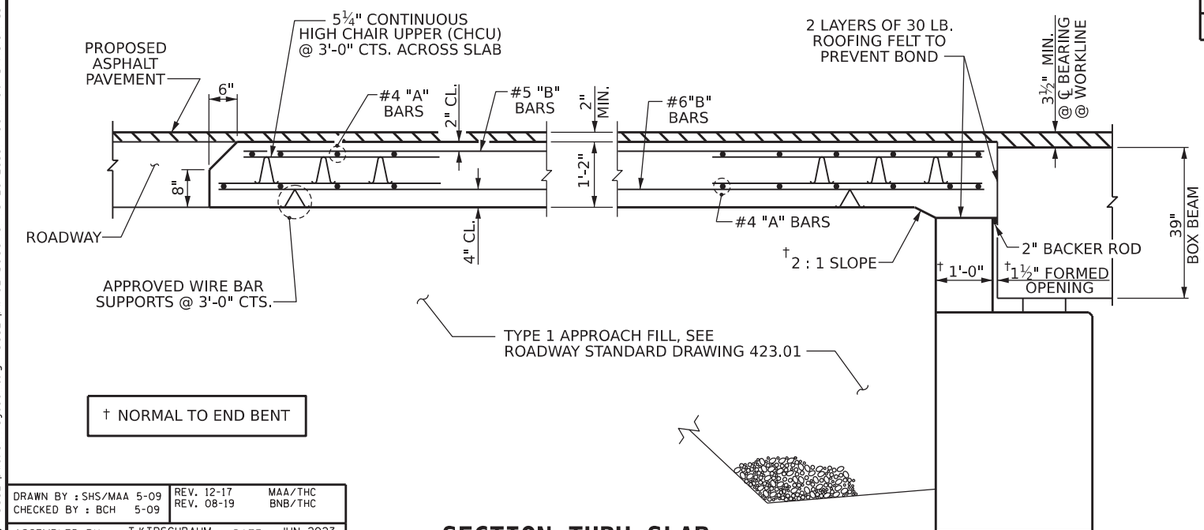
TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

BILL OF MATERIAL — APPROACH SLAB AT EB #1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	13	#4	STR	28'-10"	250
A2	13	#4	STR	28'-10"	250
✳ B1	58	#5	STR	11'-2"	676
B2	58	#6	STR	11'-8"	1016
REINFORCING STEEL				LBS.	1266
✳ EPOXY COATED REINFORCING STEEL				LBS.	926
CLASS AA CONCRETE				C.Y.	15.4

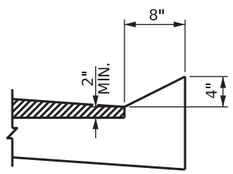
APPROACH SLAB AT EB #2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	13	#4	STR	28'-10"	250
A2	13	#4	STR	28'-10"	250
✳ B1	58	#5	STR	11'-2"	676
B2	58	#6	STR	11'-8"	1016
REINFORCING STEEL				LBS.	1266
✳ EPOXY COATED REINFORCING STEEL				LBS.	926
CLASS AA CONCRETE				C.Y.	15.4

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



† NORMAL TO END BENT

SECTION THRU SLAB



SECTION N-N

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.

PROJECT NO. BP13.R002

RUTHERFORD COUNTY

STATION: 14+80.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR PRESTRESSED CONCRETE BOX BEAM UNIT

(SUB-REGIONAL TIER)

DRAWN BY : SHS/MAA 5-09	REV. 12-17	MAA/THC
CHECKED BY : BCH 5-09	REV. 08-19	BNB/THC
ASSEMBLED BY: T.KIRSCHBAUM	DATE : JUN 2023	
CHECKED BY: E.LAWES	DATE : JUN 2023	
DESIGN ENGINEER OF RECORD: T.KIRSCHBAUM	DATE : JUN 2023	

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2			4			17

STD. NO. BAS_BB_30_90S

3/6/2024
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8/26/21

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 1$\frac{1}{2}$" 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 $\frac{7}{8}$" Ø SHEAR STUDS FOR THE $\frac{3}{4}$" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - $\frac{7}{8}$" Ø STUDS FOR 4 - $\frac{3}{4}$" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF $\frac{7}{8}$" Ø STUDS ALONG THE BEAM AS SHOWN FOR $\frac{3}{4}$" Ø STUDS BASED ON THE RATIO OF 3 - $\frac{7}{8}$"Ø STUDS FOR 4 - $\frac{3}{4}$" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST $\frac{5}{16}$" 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. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

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