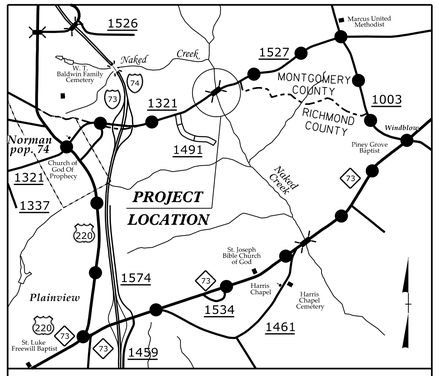
09/08/99

PROJECT: BP8–R016

CONTRACT:

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



VICINITY MAP

OFFSITE DETOUR

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

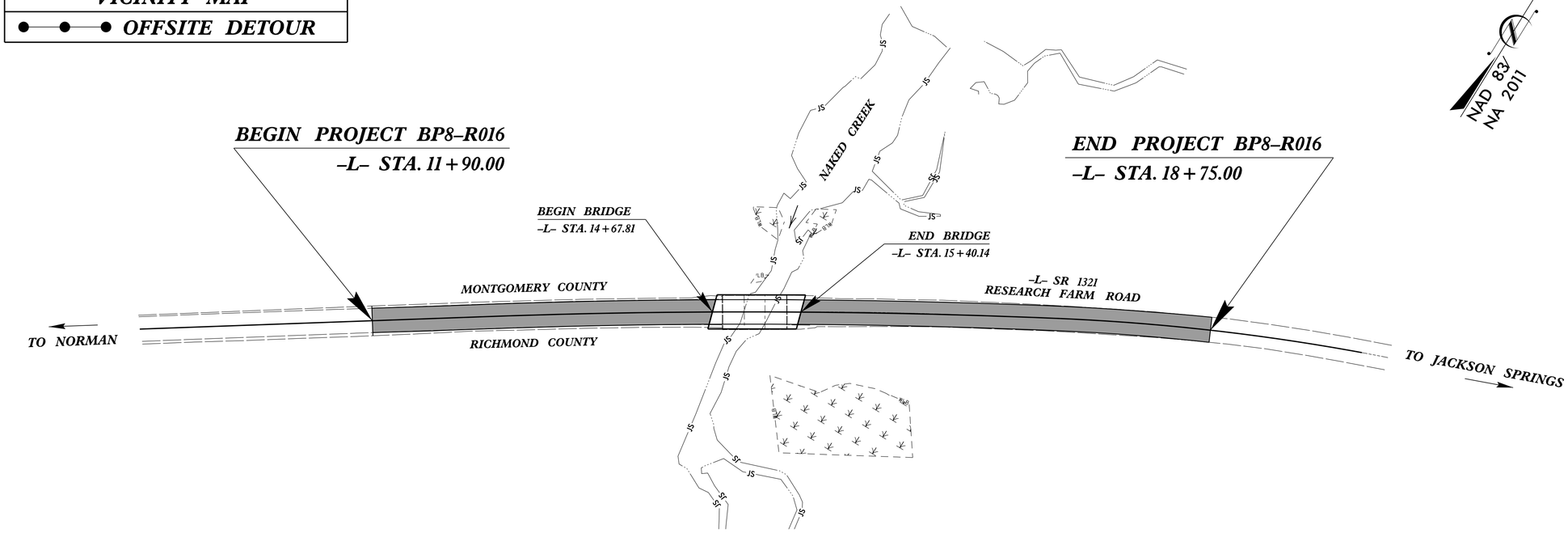
RICHMOND AND MONTGOMERY COUNTIES

LOCATION: BRIDGE NO. 142 OVER NAKED CREEK ON SR 1321 (RESEARCH FARM ROAD)

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP8–R016	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
BP8.R016.1	N/A	PE
BP8.R016.2	N/A	RW
BP8.R016.3	N/A	CONST



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

PLANS: 50 25 0 50 100

PROFILE (HORIZONTAL): 50 25 0 50 100

PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

ADT 2015 = 490
T = 6 % *
V = 55 MPH

FUNC CLASS = LOCAL
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY PROJECT BP8–R016 = 0.116 MILES
LENGTH STRUCTURE PROJECT BP8–R016 = 0.014 MILES

TOTAL LENGTH PROJECT BP8–R016 = 0.130 MILES

Prepared for NCDOT Division 8 in the Office of:
Mead&Hunt
111 E. Hargett Street, Suite 300
Raleigh, North Carolina 27601
919-714-8670 | meadhunt.com
NC License No. F-1235

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JUNE 27, 2023

LETTING DATE: OCTOBER 22, 2024

RICK DECOLA, PE
PROJECT ENGINEER

JACK HOBSON, PE
PROJECT MANAGER

TIM WELCH, PE
NCDOT CONTACT

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 48622 ENGINEER BRAD T. SMITH

DocuSigned by: Brad Smith 82A7B752B237403...
SIGNATURE: *P.E.* 8/22/2024

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 034381 ENGINEER RICHARD J. DECOLA

DocuSigned by: R J DeCola EF1546DF7D4F4A4...
SIGNATURE: *P.E.* 8/22/2024

STATE OF NORTH CAROLINA * DEPARTMENT OF TRANSPORTATION *

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REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
BP8-R016	1A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 034381 ENGINEER RICHARD J. DECOLA

Docusigned by: R J DeCola EF1545DF704F4A4... 8/22/2024

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INDEX OF SHEETS

GENERAL NOTES:

2024 SPECIFICATIONS
EFFECTIVE: 01-16-2024
REVISED:

GRADING AND SURFACING:

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

CLEARING:

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

SUPERELEVATION:

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

SHOULDER CONSTRUCTION:

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

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 PEE DEE EMC AND RIVERSTREET NETWORKS.

RIGHT-OF-WAY MARKERS:

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

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	
200.03	Method of Clearing - Method III
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	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
815.02	Subsurface Drain
840.00	Concrete Base Pad for Drainage Structures
840.22	Frames and Wide Slot Sag 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
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.02	Guide for Rip Rap at Pipe Outlets

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9/10/2021

PROJECT REFERENCE NO.	SHEET NO.
BP8-R016	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) — EIP
- Computed Property Corner
- Existing Concrete Monument (ECM) — 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.

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
BP8-R016	2A-1

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 034381 ENGINEER RICHARD J DECOLA

DocuSigned by: R J DeCola FF154FDE7DAE4A4 8/22/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Mead&Hunt
111 E. Hargett Street, Suite 300
Raleigh, North Carolina 27601
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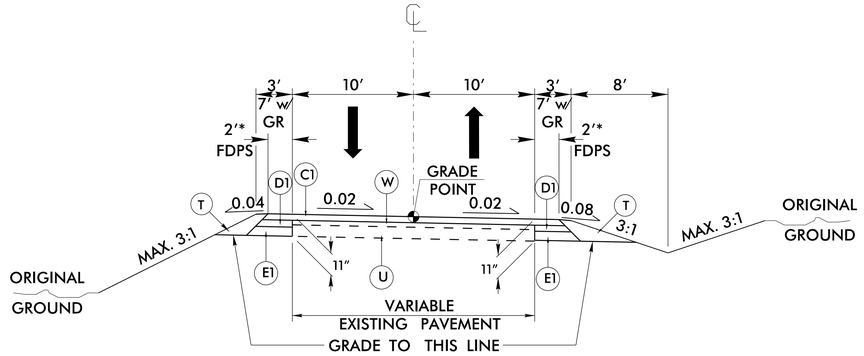
PAVEMENT SCHEDULE

C1	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1″ IN DEPTH OR GREATER THAN 1½″ IN DEPTH.
D1	PROP. APPROX. 4″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 2½″ IN DEPTH OR GREATER THAN 4″ IN DEPTH.
E1	PROP. APPROX. 4″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3″ IN DEPTH OR GREATER THAN 5½″ IN DEPTH.
R	CONCRETE SHOULDER BERM GUTTER
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	INCIDENTAL MILLING
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL).

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



TYPICAL SECTION NO. 1

* 2′ PAVED SHOULDER USED TO MATCH EXISTING CONDITIONS

USE TYPICAL SECTION NO. 1

–L– STA. 11+90.00 TO –L– STA. 14+15.00
–L– STA. 15+95.00 TO –L– STA. 18+75.00

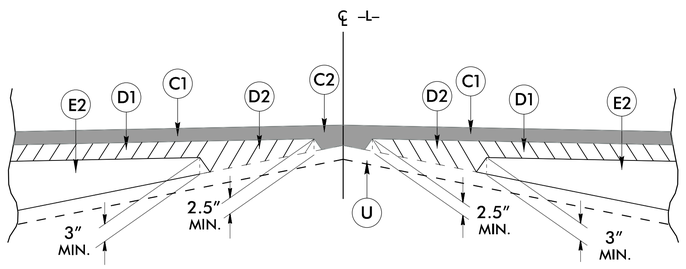
** USE 2:1 SIDE SLOPES W/RIP RAP ADJACENT TO APPROACH SLABS (SEE PLANS)

TYPICAL SECTION NO. 2

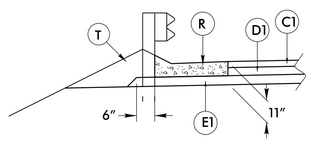
* VARIABLE OFFSET TO GUARDRAIL (SEE PLANS – TANGENT STRUCTURE ON CURVED ROADWAY)

USE TYPICAL SECTION NO. 2

–L– STA. 14+15.00 TO –L– STA. 14+67.81 (BEGIN BRIDGE)
–L– STA. 15+40.14 (END BRIDGE) TO –L– STA. 15+95.00



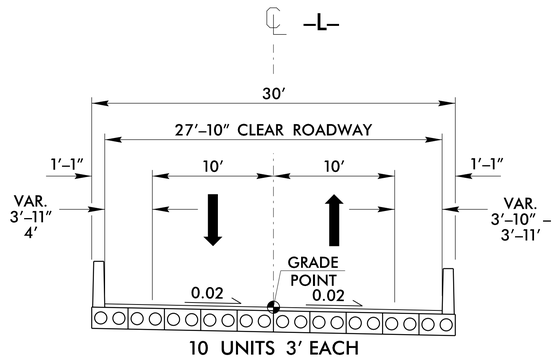
WEDGING DETAIL



SHOULDER BERM GUTTER DETAIL

USE DETAIL

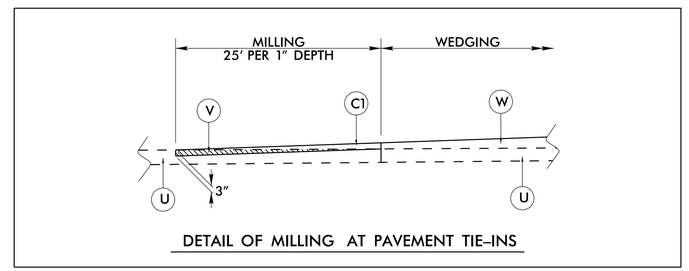
–L– STA. 14+37.00 RT TO –L– STA. 14+53.79 RT
–L– STA. 14+45.00 LT TO –L– STA. 14+60.82 LT
–L– STA. 15+47.36 RT TO –L– STA. 15+63.00 RT
–L– STA. 15+54.00 LT TO –L– STA. 15+70.00 LT



10 UNITS 3′ EACH

TYPICAL SECTION NO. 3

NOTE: SEE STRUCTURE PLANS FOR PAVEMENT DEPTH



DETAIL OF MILLING AT PAVEMENT TIE–INS

USE TYPICAL SECTION NO. 3

–L– STA. 14+67.81 (BEGIN BRIDGE) TO STA. 15+40.14 (END BRIDGE)

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COMPUTED BY: S. R. SANGHANI	DATE: 2/23/2023
CHECKED BY: R. J. DECOLA	DATE: 7/22/2024

PROJECT NO.	SHEET NO.
BP8-R016	3B-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PAVEMENT REMOVAL SUMMARY

IN SQUARE YARDS

SURVEY LINE	Station	Station	LOCATION LT/RT/CL	ASPHALT REMOVAL	ASPHALT BREAKUP	CONCRETE REMOVAL	CONCRETE BREAKUP
-L-	14+15.00	14+76.03	CL	165.22			
-L-	15+28.78	15+95.00	CL	179.78			
		TOTAL:		345.00			
		SAY:		350			

SHOULDER BERM GUTTER SUMMARY

(IN LINEAR FEET)

LINE	Station	Station	LENGTH
-L- LT	14+45.00	14+60.82	15.82
-L- RT	14+37.00	14+53.79	16.79
-L- LT	15+54.00	15+70.00	16.00
-L- RT	15+47.36	15+63.00	15.64
		TOTAL:	64.25
		SAY:	70

SUMMARY OF EARTHWORK

(IN CUBIC YARDS)

STATION	STATION	UNCLASSIFIED EXCAVATION	UNDERCUT EXCAVATION	EMBANK. +%	BORROW	WASTE
SUMMARY NO. 1						
-L- STA. 11+90.00	-L- STA.14+67.81	46		98	52	
SUMMARY NO. 1 TOTAL		46		98	52	
SUMMARY NO. 2						
-L- STA. 15+40.41	-L- STA. 18+75.00	30		25		5
SUMMARY 2 TOTAL		30		25		5
TOTAL:		76		123	52	5
WASTE IN LIEU OF BORROW					-5	-5
PROJECT TOTALS:		76		123	47	
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT					2	
GRAND TOTALS:		76		123	49	
SAY:		100			75	
EST. UNDERCUT = 250 CY (CONTINGENCY)						
EST. SELECT GRANULAR MATERIAL = 200 CY (CONTINGENCY)						

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

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

"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

GUARDRAIL SUMMARY

G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL WIDTH	FLARE LENGTH		W		ANCHORS			SINGLE FACED CONCRETE BARRIER	REMOVE EXISTING GUARDRAIL	REMOVE & STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	Type III	B-77	GREU, TL-3				
-L-	13+77.88	14+71.63	LT	93.75				14+71.63	Min. 4.00'	Min. 7.00'					1		1				
-L-	13+70.26	14+64.01	RT	93.75			14+64.01		Min. 3.75'	Min. 6.75'					1		1				Variable offset to guardrail is due to the tangent bridge on a curved roadway.
-L-	15+43.79	16+37.54	LT	93.75			15+43.79		Min. 4.00'	Min. 7.00'					1		1				
-L-	15+36.50	16+30.25	RT	93.75				15+36.50	Min. 3.75'	Min. 6.75'					1		1				
			SUBTOTAL	375.00																	
LESS DEDUCTIONS FOR ANCHOR UNITS		GREU TL-3: 4 @ 50'		-200																	
		TYPE III: 4 @ 18.75'		-75																	
			PROJECT TOTAL	100.00																	
			SAY	100											4		4				
ADDITIONAL GUARDRAIL POSTS = 5 EA.																					

COMPUTED BY: S. R. SANGHANI DATE: 2/23/2023

CHECKED BY: R. J. DECOLA DATE: 7/22/2024

PROJECT NO.	SHEET NO.
BP8-R016	3D-1

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.

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

STATION	LOCATION (LT, RT, OR CL)'	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL
-L- STA. 13+31	LT	402					
-L- STA. 15+58	RT	400		460.9			
	RT	400	401		455.9	452.0	
SHEET TOTALS							

STATION	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) 12"	15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE
-L- STA. 13+31		28										X
-L- STA. 15+58												
		40										X
SHEET TOTALS		68										

STATION	C.S. PIPE 12" (.064)	15" (.064)	18" (.064)	24" (.064)	30" (.079)	36" (.079)	42" (.109)	48" (.109)
-L- STA. 13+31								
-L- STA. 15+58								
SHEET TOTALS								

STATION	R.C. PIPE CLASS III 12"	15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS IV 12"	15"	18"	24"	30"	36"	42"	48"
-L- STA. 13+31																
-L- STA. 15+58																
SHEET TOTALS																

STATION	** " R.C. PIPE (CLASS V)	***" RC PIPE CULVERTS, CONTRACTOR DESIGN	***" RC PIPE CULVERTS, CONTRACTOR DESIGN	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G
-L- STA. 13+31														
-L- STA. 15+58								1						
SHEET TOTALS								1						

STATION	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME WITH TWO GRATES 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 TWO GRATES STD. 840.20	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	J.B. STD. 840.31 OR 840.32	T.B.D.I. STD. 840.35 OR STD. 840.46				DRAINAGE PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
-L- STA. 13+31																					
-L- STA. 15+58								1					1								
SHEET TOTALS								1					1								

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.)	(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

COMPUTED BY: BRETT SMITH, PG DATE: 11/28/22
CHECKED BY: D. DEWEY, PE DATE: 11/28/22

PROJECT NO.	SHEET NO.
BP8-R016	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 AGGREGATE SUBGRADE/STABILIZATION

LINE	Station	Station	Aggregate Type* ASU(1/2)/ AST	Aggregate Thickness INCHES [8" for ASU(2)]	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Soil Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY			ASU (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 Soil Stabilization" are only the estimated quantities for ASU(1/2)/AST and may only represent a portion of the subgrade stabilization and geotextile quantities shown in the Item Sheets of the Proposal.

8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
BP8-R016	4

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 034381 ENGINEER RICHARD T. DEVOL

Docusigned by: R T Devol EF15460EF704F44A... 8/22/2024

HYDRAULICS ENGINEER

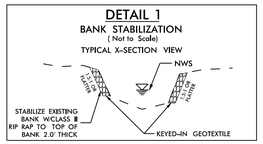
NORTH CAROLINA PROFESSIONAL SEAL 48622 ENGINEER BRADLEY T. SMITH

Docusigned by: Brad Smith 82A78752B237403... 8/22/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

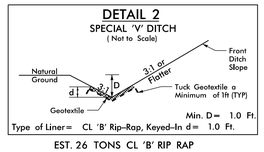
Mead&Hunt
111 E. Hargett Street, Suite 300
Raleigh, North Carolina 27601
919-714-8670 | meadhunt.com
NC License No. F-1235

DETAIL 1
BANK STABILIZATION
(Not to Scale)
TYPICAL X-SECTION VIEW



EST. 54 TONS CL II RIP RAP
EST. 63 SY GF
-L- STA. 14+90 +/-
-L- STA. 15+20 +/-

DETAIL 2
SPECIAL 'V' DITCH
(Not to Scale)



Type of Liner= CL 'B' Rip-Rap, Keyed-In d= 1.0 Ft.

EST. 26 TONS CL 'B' RIP RAP
EST. 60 SY GF
FROM STA. 13+75 TO STA. 14+40 -L- LT

-L- CURVE DATA

PI Sta 15+17.94	PI Sta 18+76.20
Δ = 4° 30' 36.0" (RT)	Δ = 7° 58' 06.4" (RT)
D = 0° 57' 46.6"	D = 3° 12' 47.0"
L = 468.35'	L = 248.00'
T = 234.30'	T = 124.20'
R = 5,950.00'	R = 1,783.22'
SE = RC	SE = 0.03

NAD 83/2011

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 400	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 454.1	FT
BASE DISCHARGE	= 530	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 454.5	FT
OVERTOPPING DISCHARGE	= 700+	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 460.5	FT
DATE OF SURVEY	= 8/4/2022	
W.S. ELEVATION AT DATE OF SURVEY	= 450.9	FT

22-AUG-2024 10:24
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17842.rd

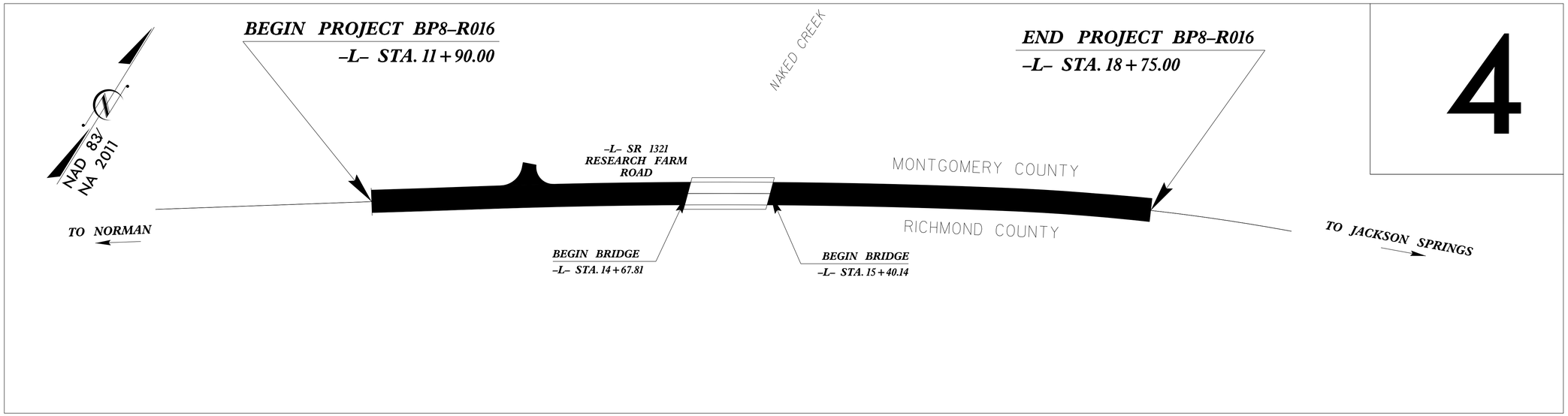
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP8.R016	RW01	6

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

RICHMOND AND MONTGOMERY COUNTIES

TIP PROJECT: BP8.R016



4

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 "760142-1"
WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF
NORTHING: 519620.155(ft) EASTING: 1789902.563(ft)
ELEVATION: 562.128(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT
(GROUND TO GRID) IS: 0.9998514223
THE N.C. LAMBERT GRID BEARING AND
LOCALIZED HORIZONTAL GROUND DISTANCE FROM
"760142-1" TO -L- STATION 10+00.00 IS
N 57-52'25.92" E 1,198.484(ft)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88 (GEOID 12B)

Prepared in the Office of:

Wadelynn GEOSPATIAL

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:	*LETTING DATE:*
06/27/2023	*10/22/2024*

PROFESSIONAL LAND SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-5060 LAND SURVEYOR RICHARD A. MITCHELL

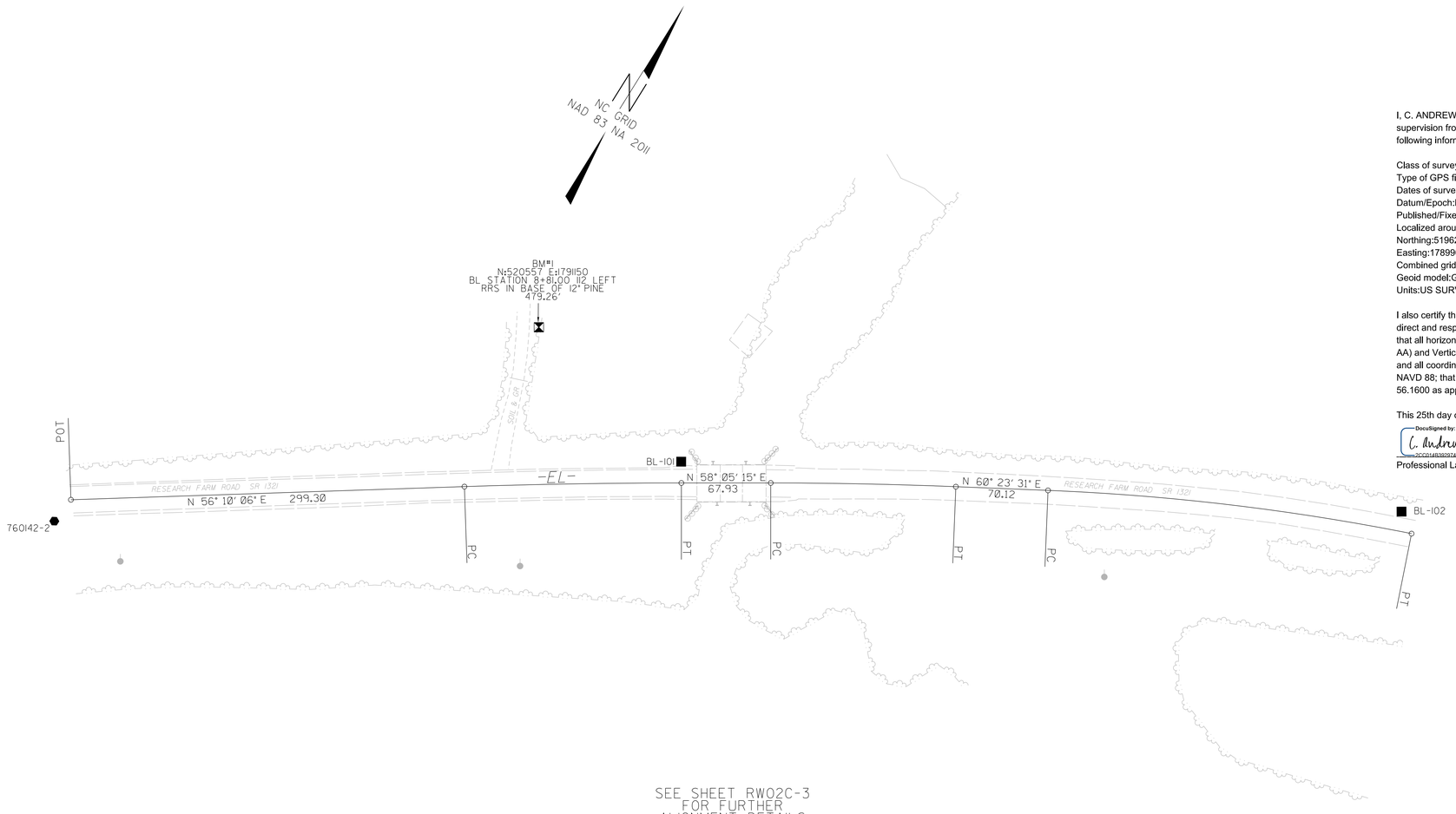
DocuSigned by: Richard Mitchell 6A77E97C41B14EC...
08/01/2023
SIGNATURE: *Date:*

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION ·

6/2/99

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION



SEE SHEET RW02C-3
FOR FURTHER
ALIGNMENT DETAILS

PROJECT REFERENCE NO.	SHEET NO.
BP8.R016.1	RW02C-1

Location and Surveys

NV5 ENGINEERS & CONSULTANTS, INC.
3300 REGENCY PARKWAY, SUITE 100
CARY, NC 27518
P: 919.851.1912 www.NV5.com
NC License # F-1103
formerly CALYX Engineers & Consultants

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-3281 LAND SURVEYOR ANDREW HEATH

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

I, C. ANDREW HEATH, JR., PLS, certify that the Project Control was performed under my supervision from an actual GPS survey made under my supervision and the following information was used to perform the survey:

Class of survey: ***AA***
Type of GPS field procedure: RTN
Dates of survey: 02/28/22
Datum/Epoch:NAD 83/2011
Published/Fixed-control use: N/A
Localized around: 760142-1
Northing:519620.155
Easting:1789902.563
Combined grid factor:0.9998514223
Geoid model:GEOID 12B
Units:US SURVEY FEET

I also certify that the Baseline Control for this project was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:20,000 (Class AA) and Vertical accuracy to Class A. Field work was performed on FEBRUARY 28, 2022 and all coordinates are based on NAD 83/2011 and all elevations are based on NAVD 88; that this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 25th day of March, 2022.

DocuSigned by:
C. Andrew Heath Jr.
2CC0148530927472...
Professional Land Surveyor L-3281

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.

24-MAR-2022 14:35
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scott.cranford AT NCCAR-CRANS100

6/2/99

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO.	SHEET NO.
BP8.R016.1	RW02C-2

Location and Surveys

NV5

NV5 ENGINEERS & CONSULTANTS, INC.
3300 REGENCY PARKWAY, SUITE 100
CARY, NC 27518
P: 919.851.1912 www.NV5.com
NC License # F-1103
formerly CALYX Engineers & Consultants

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-3281 LAND SURVEYOR ANDREW HEATH

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BL

POINT	DESC.	NORTH	EAST	ELEVATION
2	GPS-2	520237.0120	1790915.3970	494.51
101	BL-101	520527.3400	1791295.9910	463.15
102	BL-102	520784.5770	1791780.9410	472.39

****
BM1 ELEVATION - 479.26
N 520557 E 1791150
BL STATION 8+81.00 112 LEFT
RR SPIKE IN BASE OF 12" PINE
****

I, C. ANDREW HEATH, JR., PLS, certify that the Project Control was performed under my supervision from an actual GPS survey made under my supervision and the following information was used to perform the survey:

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Datum/Epoch:NAD 83/2011
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Localized around: 760142-1
Northing:519620.155
Easting:1789902.563
Combined grid factor:0.9998514223
Geoid model:GEOID 12B
Units:US SURVEY FEET

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This 25th day of March, 2022.

DocuSigned by:
C. Andrew Heath Jr.
2CC014B3929747F...

Professional Land Surveyor L-3281

NOTES:

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24-MAR-2022 14:38
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scott.crawford AT NCCAR-CRANS10D

6/2/99

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO.	SHEET NO.
BP8.R016.1	RW02C-3

Location and Surveys

NV5

NV5 ENGINEERS & CONSULTANTS, INC.
3300 REGENCY PARKWAY, SUITE 100
CARY, NC 27518
P: 919.851.1912 www.NV5.com
NC License # F-1103
formerly CALYX Engineers & Consultants

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-3281 LAND SURVEYOR ANDREW HEATH

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	520257.491	1790917.535							
LINE			N 56°10'05.6" E	299.30					
PC	520424.129	1791166.157							
CURVE			N 57°07'40.1" E	164.96	01°55'09.0"(RT)	01°09'48.1"	164.97	82.49	4925.00
PT	520513.663	1791304.704							
LINE			N 58°05'14.6" E	67.93					
PC	520549.574	1791362.369							
CURVE			N 59°14'23.0" E	140.77	02°18'16.7"(RT)	01°38'13.3"	140.78	70.40	3500.00
PT	520621.572	1791483.337							
LINE			N 60°23'31.3" E	70.12					
PC	520656.217	1791544.303							
CURVE			N 64°52'03.8" E	278.31	08°57'05.0"(RT)	03°12'47.0"	278.59	139.58	1783.22
PT	520774.418	1791796.266							

I, C. ANDREW HEATH, JR., PLS, certify that the Project Control was performed under my supervision from an actual GPS survey made under my supervision and the following information was used to perform the survey:

Class of survey: ***AA***
Type of GPS field procedure: RTN
Dates of survey: 02/28/22
Datum/Epoch:NAD 83/2011
Published/Fixed-control use: N/A
Localized around: 760142-1
Northing:519620.155
Easting:1789902.563
Combined grid factor:0.9998514223
Geoid model:GEOID 12B
Units:US SURVEY FEET

I also certify that the Baseline Control for this project was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:20,000 (Class AA) and Vertical accuracy to Class A. Field work was performed on FEBRUARY 28, 2022 and all coordinates are based on NAD 83/2011 and all elevations are based on NAVD 88; that this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 25th day of March, 2022.

DocuSigned by:
C. Andrew Heath Jr.
2CC014B3929247F...

Professional Land Surveyor L-3281

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.

24-MAR-2022 14:40
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scott.crawford AT NCCAR-CRANS10D

6/2/99

REVISIONS

$$$$SYSTIME$$$$
$$$$TIME$$$$
$$$$DGN$$$$
$$$$USERNAME$$$$

PROPOSED ALIGNMENT CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
BP8.R016	RW02D-1

Location and Surveys

Wadelynn GEOSPATIAL

NORTH CAROLINA PROFESSIONAL SEAL L-5060 LAND SURVEYOR RICHARD A MITCHELL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

I, Richard A. Mitchell, 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 01 day of August, 2023.

DocuSigned by:
Richard Mitchell
6A77E97C41B14EC...
08/01/2023

Professional Land Surveyor L-5060

L

TYPE	STATION	NORTH	EAST
POT	10+00.00	520257.4910	1790917.5350
PC	12+83.65	520415.4142	1791153.1551
PCC	17+52.00	520660.5980	1791552.0579
PT	20+00.00	520766.6448	1791776.0214

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.

6/2/99

REVISIONS

04-AUG-2023 09:03
User:rmitchell
Rich AT WADELYNNGEO-01

C:\Users\rmitchell\Dropbox\Wadelynn_Geo\NCDOT_Dropbox\Conventional Surveys\BP8-016_con_wad Div 8 Richmond\Delivery\bp8-016_ls_rw02e1_230801.dgn

RIGHT OF WAY CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
BP8.R016	RW03E1

Location and Surveys

Wadelynn GEOSPATIAL

NORTH CAROLINA PROFESSIONAL SEAL L-5060 LAND SURVEYOR RICHARD A MITCHELL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	13+50.00	-45.00	520489.7051	1791183.8407
L	13+50.00	-30.11	520477.2439	1791191.9929
L	13+50.00	46.93	520412.7718	1791234.1708
L	13+50.00	29.89	520427.0339	1791224.8405
L	16+50.00	-45.00	520648.7393	1791440.8529
L	16+50.00	-30.31	520636.0583	1791448.2643
L	16+50.00	29.69	520584.2559	1791478.5400
L	16+50.00	51.63	520565.3111	1791489.6122

I , Richard A. Mitchell, PLS , 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 July 24 to July 27 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 1st day of August, 2023.

DocuSigned by:
Richard Mitchell
6A7E97C41B14EC...
08/01/2023

Professional Land Surveyor L-5060

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	15+45.00	65.00	520500.5783	1791407.1621
L	15+45.00	51.69	520511.9455	1791400.2466
L	15+70.00	65.00	520513.3856	1791428.3137
L	15+70.00	51.85	520524.6518	1791421.5244

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 JULY 24 TO JULY 27 2023 .

PROJECT REFERENCE NO.	SHEET NO.
BP8.R016	RW04

Location and Surveys

Wadelynn GEOSPATIAL

NORTH CAROLINA PROFESSIONAL LAND SURVEYOR SEAL L-5060 RICHARD A MITCHELL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

I , Richard A. Mitchell, PLS , 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 July 24th to July 27th 2023 and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

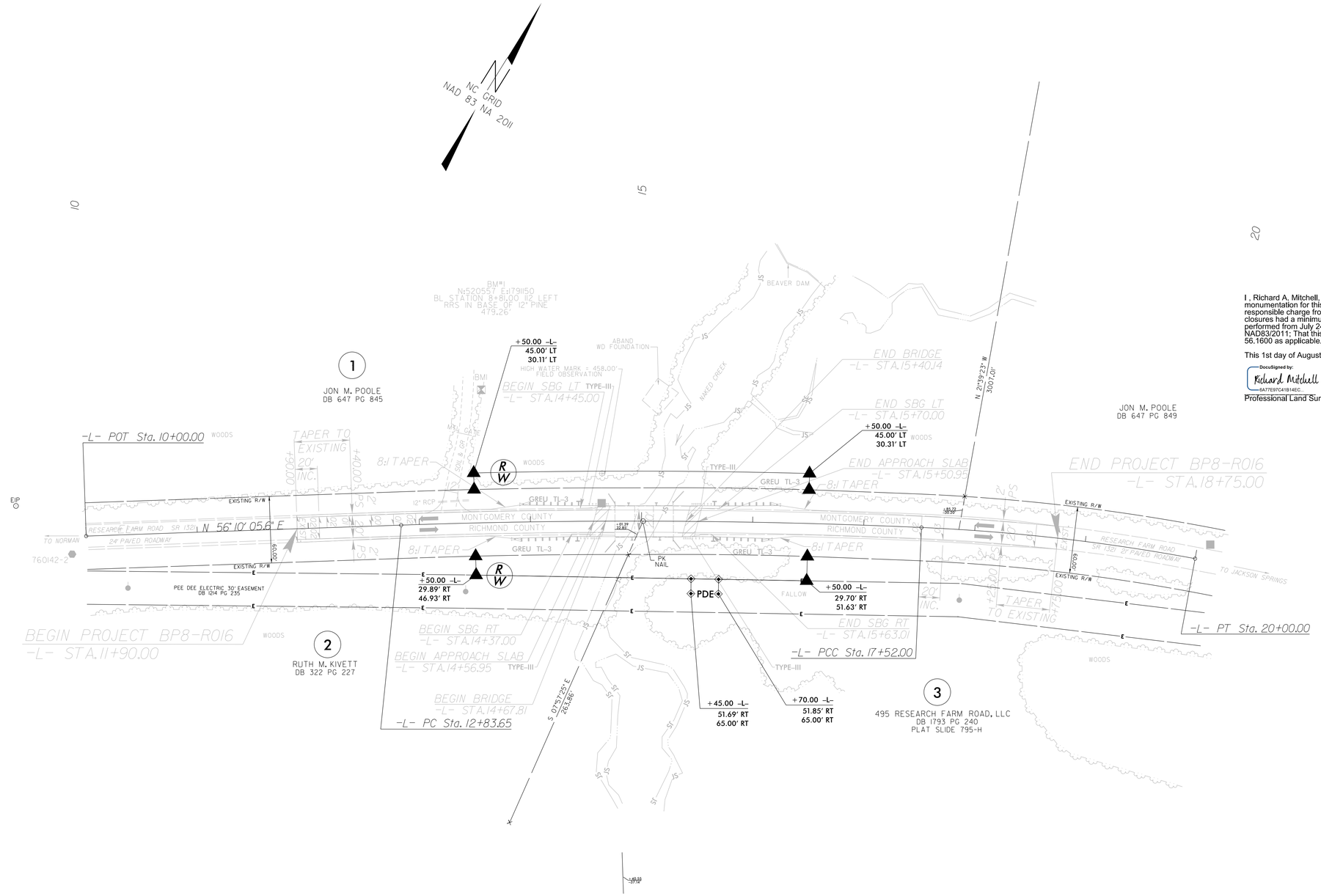
This 1st day of August, 2023.

DocuSigned by: Richard Mitchell 08/01/2023
6A77E97C4181 4EC...

Professional Land Surveyor L-5060

REVISIONS

6/2/99



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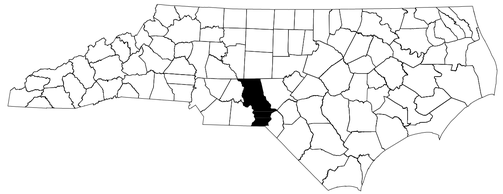
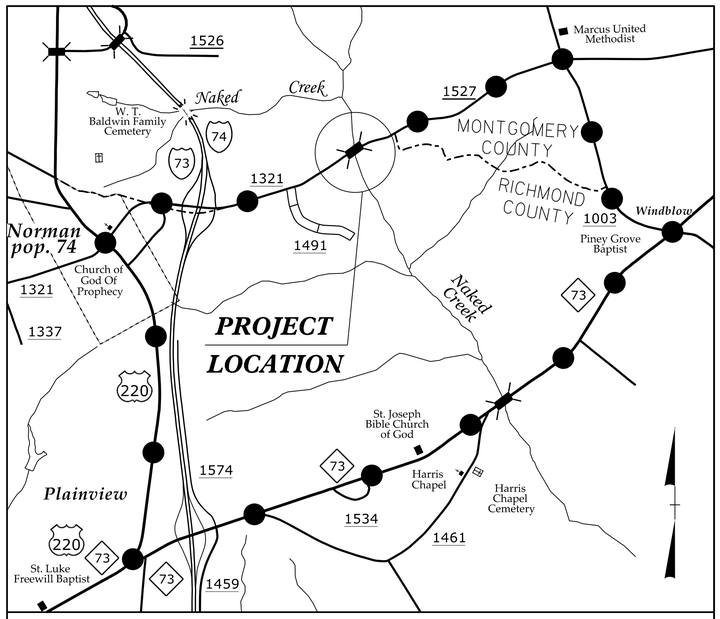
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

RICHMOND AND MONTGOMERY COUNTIES





VICINITY MAP

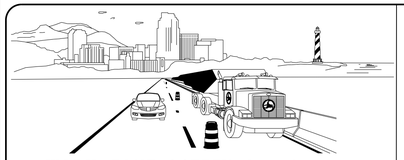
OFFSITE DETOUR

INDEX OF SHEETS

SHEET NO.
TMP-1

BP8-R016

TIP PROJECT:



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

PLANS PREPARED BY:
RICK DECOLA, PE
PROJECT ENGINEER

NCDOT CONTACTS:
TIM WELCH, PE
BRIDGE PROGRAM MANAGER

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:
Mead&Hunt
111 E. Hargett Street, Suite 300
Raleigh, North Carolina 27601
919-714-8670 | meadhunt.com
NC License No. F-1235

APPROVED: DocuSigned by: R J DeCola EF1546DF704F4A4...
DATE: 8/22/2024
SEAL

NORTH CAROLINA PROFESSIONAL SEAL 034381 ENGINEER RICHARD J DECOLA

PROJ. REFERENCE NO.	SHEET NO.
BP8-R016	TMP-1A

PLANS PREPARED BY:

Mead&Hunt

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Raleigh, North Carolina 27601
919-714-8670 | meadhunt.com
NC License No. F-1235

ROADWAY STANDARD DRAWINGS

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

STD. NO.	TITLE
1101.01	WORK ZONE 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
1145.01	BARRICADES

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- TEMP. SHORING (LOCATION PURPOSES ONLY)
- WORK AREA
- REMOVAL
- STRUCTURE EXCAVATION
- INCIDENTAL STONE

SIGNALS

EXISTING PROPOSED TEMPORARY

PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

TRAFFIC CONTROL DEVICES

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

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

PAVEMENT MARKERS

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

PAVEMENT MARKING SYMBOLS

PAVEMENT MARKING SYMBOLS

APPROVED: DocuSigned by: R J DeCola EF1546DF704F4A4...

DATE: 8/22/2024

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 034381 ENGINEER RICHARD J. DECOLA

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

ROADWAY STANDARD DRAWINGS & LEGEND

7/22/2024
R:\Work Zone Traffic Control\BP8-R016_TC_TMP_0Ld.dgn
User:784rid

PROJ. REFERENCE NO.	SHEET NO.
BP8-R016	TMP-2

PLANS PREPARED BY:

Mead&Hunt

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Raleigh, North Carolina 27601
919-714-8670 | meadhunt.com
NC License No. F-1235

LOCAL NOTES

NOTIFY RICHMOND COUNTY PUBLIC SCHOOLS (910-582-5860) AT LEAST 30 DAYS PRIOR TO CLOSURE.

NOTIFY RICHMOND COUNTY EMERGENCY SERVICES (910-997-8238) AT LEAST 30 DAYS PRIOR TO CLOSURE.

NOTIFY MONTGOMERY COUNTY PUBLIC SCHOOLS (910-576-6511) AT LEAST 30 DAYS PRIOR TO CLOSURE.

NOTIFY MONTGOMERY COUNTY EMERGENCY SERVICES (910-572-1347) AT LEAST 30 DAYS PRIOR TO CLOSURE.

MANAGEMENT STRATEGIES

DURING CONSTRUCTION OF PROPOSED BRIDGE NO. 142, SR 1321 (RESEARCH FARM ROAD) WILL BE CLOSED AND TRAFFIC WILL BE MAINTAINED VIA AN OFF-SITE DETOUR.

LOCAL ACCESS TO ALL RESIDENCES AND BUSINESSES WILL BE MAINTAINED BETWEEN CLOSURE POINTS AT ALL TIMES DURING CONSTRUCTION.

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.

TRAFFIC PATTERN ALTERATIONS

A) NOTIFY THE ENGINEER 30 DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

B) 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 MANAGEMENT PLANS.

C) 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.

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

TRAFFIC CONTROL DEVICES

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

PAVEMENT MARKINGS AND MARKERS

F) INSTALL PAVEMENT MARKINGS ON THE FINAL SURFACE AS SHOWN IN THE FINAL PAVEMENT MARKING PLAN.

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

TEMPORARY TRAFFIC CONTROL PHASING

STEP 1: USING RSD NO. 1101.03 (SHEET 1 OF 9) AND SHEET TMP-4, INSTALL DETOUR SIGNS, PLACE TYPE III BARRICADES TO CLOSE SR 1321 (RESEARCH FARM ROAD) TO ALL TRAFFIC, AND DETOUR TRAFFIC OFF-SITE.

STEP 2: AWAY FROM TRAFFIC, COMPLETE THE FOLLOWING:
1) REMOVE EXISTING STRUCTURE (BRIDGE NO. 142) AND CONSTRUCT PROPOSED STRUCTURE INCLUDING ROADWAY APPROACHES, DRAINAGE, AND GUARDRAIL. (SEE ROADWAY AND STRUCTURE PLANS)
2) CONSTRUCT PROPOSED ROADWAY UP TO AND INCLUDING FINAL LAYER OF SURFACE COURSE ON SR 1321 (RESEARCH FARM ROAD). (SEE ROADWAY PLANS)
3) PLACE FINAL PAVEMENT MARKINGS AND TIE INTO EXISTING PAVEMENT MARKINGS. (SEE PAVEMENT MARKING PLANS)

STEP 3: REMOVE ALL TRAFFIC CONTROL DEVICES AND ALL DETOUR SIGNING, AND OPEN SR 1321 (RESEARCH FARM RD) TO PROPOSED TRAFFIC PATTERN.

APPROVED: DocuSigned by: R J DeCola EF1568DF704F4A4...

DATE: 8/22/2024

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 034381 ENGINEER RICHARD J. DECOLA

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

TRANSPORTATION OPERATIONS PLAN

7/22/2024
R:\Work Zone Traffic Control\BP8-R016_TC_TMP_02.dgn
User:l784rld

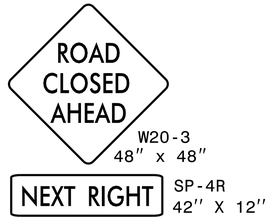
PROJ. REFERENCE NO.	SHEET NO.
BP8-R016	TMP-3

PLANS PREPARED BY:

Mead&Hunt

111 E. Hargett Street, Suite 300
Raleigh, North Carolina 27601
919-714-8670 | meadhunt.com
NC License No. F-1235

A



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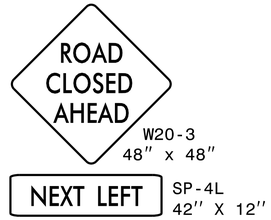

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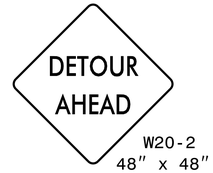

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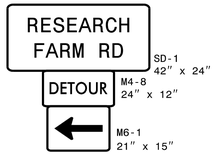

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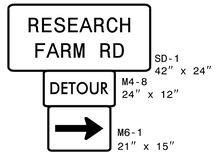

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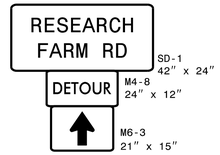

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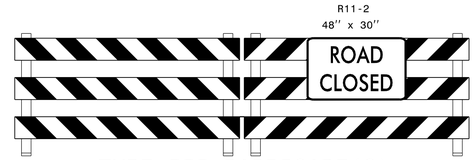

TYPE III BARRICADE(S)

K

TYPE III BARRICADE

L

TYPE III BARRICADE

M

TYPE III BARRICADE

N

SIGN NUMBER: SD-1
TYPE: D
QUANTITY: SEE PLANS

SIGN WIDTH: 3′-6″
HEIGHT: 2′-0″
TOTAL AREA: 7.0 Sq.Ft.

BORDER TYPE: INSET
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: 0.080″ (2.0 mm) ALUMINUM

USE NOTES: 1,2

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

DESIGN BY: E.L.LACEY
PROJECT ID: BP8-R016

CHECKED BY: R.J.DECOLA
LOCATION: SR 1321 (RESEARCH FARM ROAD)

July 22, 2024
DIV: 8

Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter spacings are to start of next letter

																										Series/Size Text Length
	R	E	S	E	A	R	C	H						27.5												C 2000
	7.4	11	14.2	17.8	20.8	24.7	28.3	32.1																		27.5
	F	A	R	M		R	D																			C 2000
	8.5	11.4	15.3	18.9	22.2	27.2	30.9							25.2												25.2

FILENAME: BP8-R016_TC_TMP_03

NORTH CAROLINA D.O.T. SIGN DETAIL

APPROVED: DocuSigned by: R J DeCola EF1540DF704F4A4...

DATE: 8/22/2024

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 034381 ENGINEER RICHARD J. DECOLA

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SPECIAL SIGN DESIGN & DETOUR SIGNING

8/17/2024
R:\Work_Zone Traffic Control\BP8-R016_TC_TMP_03.dgn
User:l784rld

PROJ. REFERENCE NO.	SHEET NO.
BP8-R016	TMP-4

PLANS PREPARED BY:

Mead&Hunt

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Raleigh, North Carolina 27601
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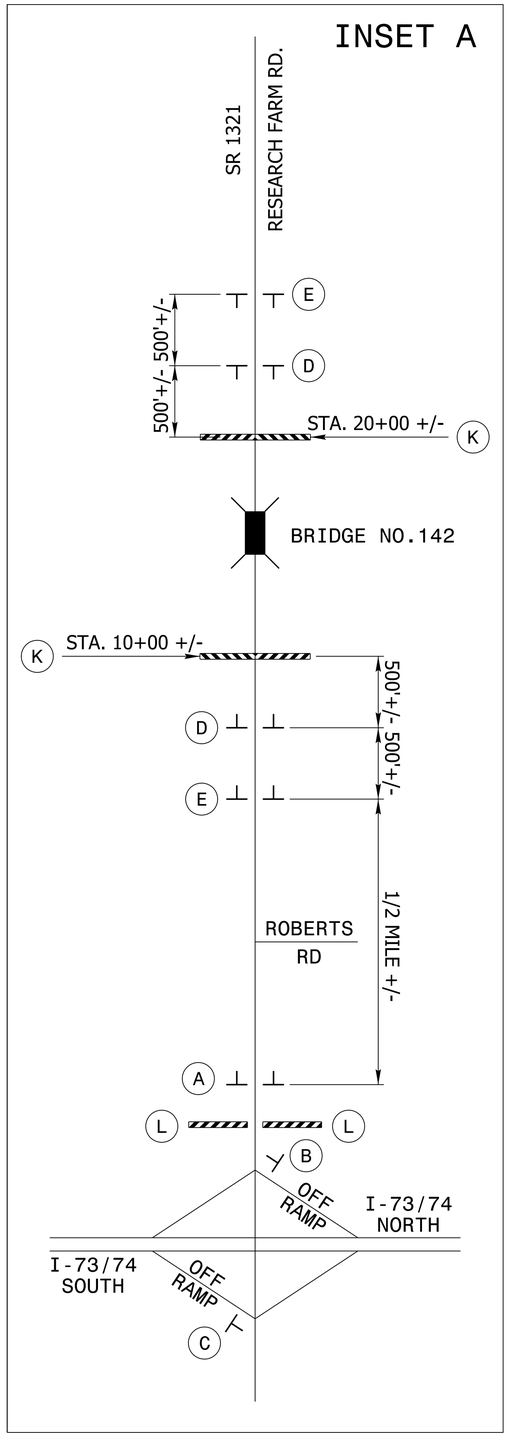
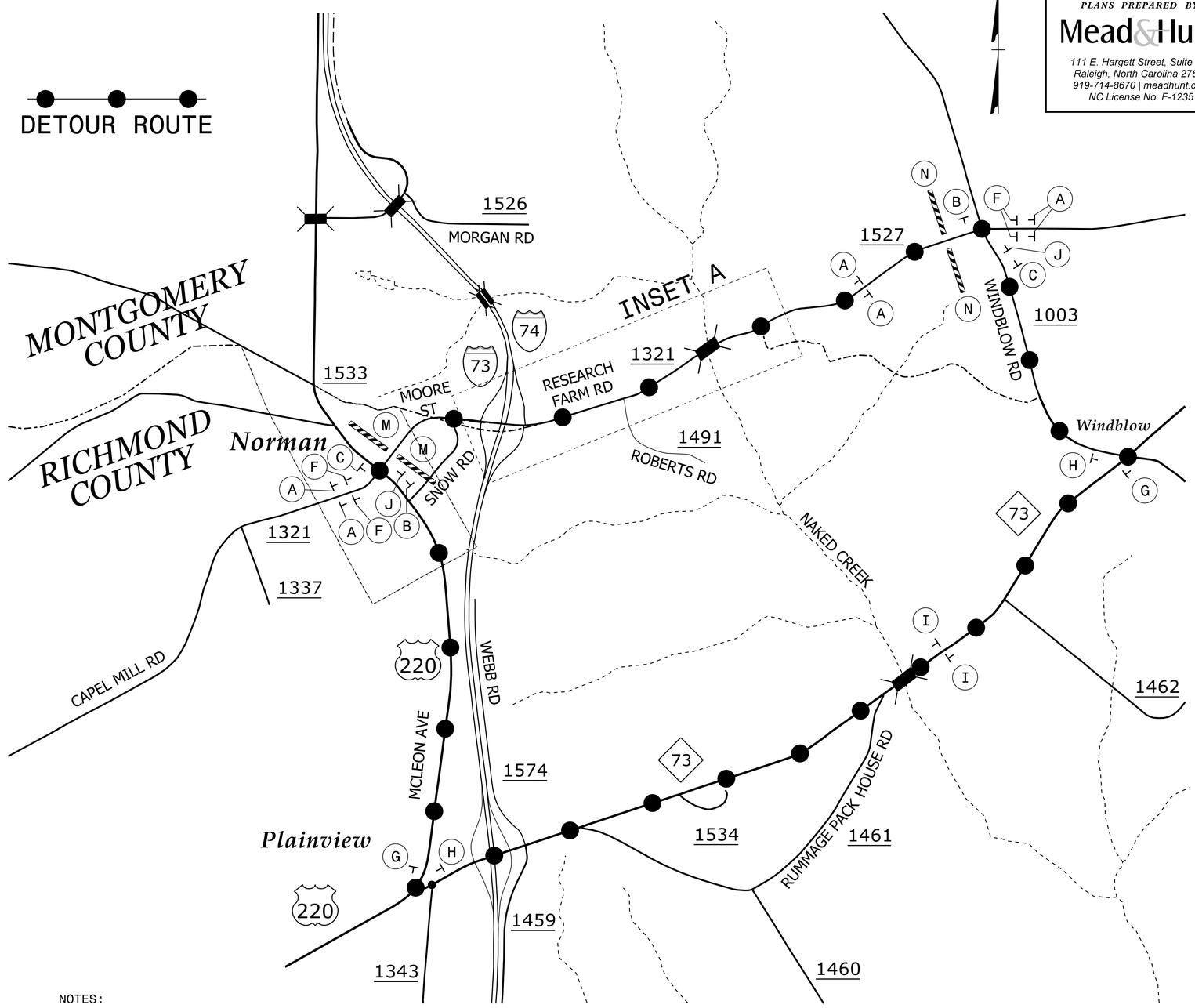
NC License No. F-1235





NOTES:

- ALL DETOUR SIGN LOCATIONS ARE APPROXIMATE.
- ALL DETOUR SIGNS ARE BLACK ON ORANGE UNLESS OTHERWISE NOTED.
- * SEE ROADWAY STANDARD DRAWING NO. 1101.03, SHEET 1 OF 9, FOR WORK ZONE SIGN DISTANCES.

APPROVED: DocuSigned by: R J DeCola EF1540DF704F4A4...

DATE: 8/22/2024

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 034381 ENGINEER RICHARD J DECOLA

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

OFF-SITE DETOUR

7/22/2024
R:\Work_Zone Traffic Control\BP8-R016_TC_TMP_04.dgn
User:tl784rjd

T.I.P.: BP8–R016

CONTRACT: –

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING PLAN
RICHMOND AND MONTGOMERY COUNTIES
LOCATION: BRIDGE NO. 142 OVER NAKED CREEK ON SR 1321 (RESEARCH FARM ROAD)

TIP NO.	SHEET NO.
BP8-R016	PMP-1

APPROVED: DocuSigned by: R J DeCola EF1540DF704F4AA...

DATE: 8/22/2024

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 034381 ENGINEER RICHARD J. DECOLA

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GENERAL NOTES

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

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

ROAD NAME	MARKING	MARKER
-L- SR 1321	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.

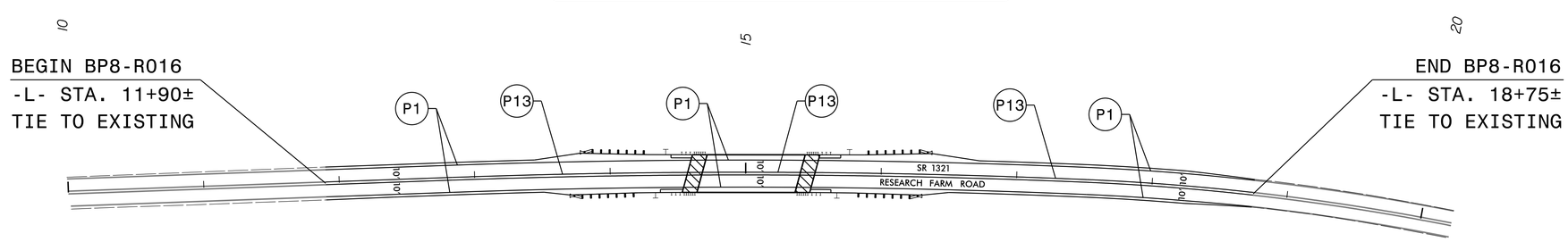
D) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS.

ROADWAY STANDARD DRAWING

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

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

PAVEMENT MARKING DETAIL



PAVEMENT MARKING SCHEDULE

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

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION ·

PLAN PREPARED FOR NCDOT BY:

RICK DECOLA, PE — PROJECT ENGINEER

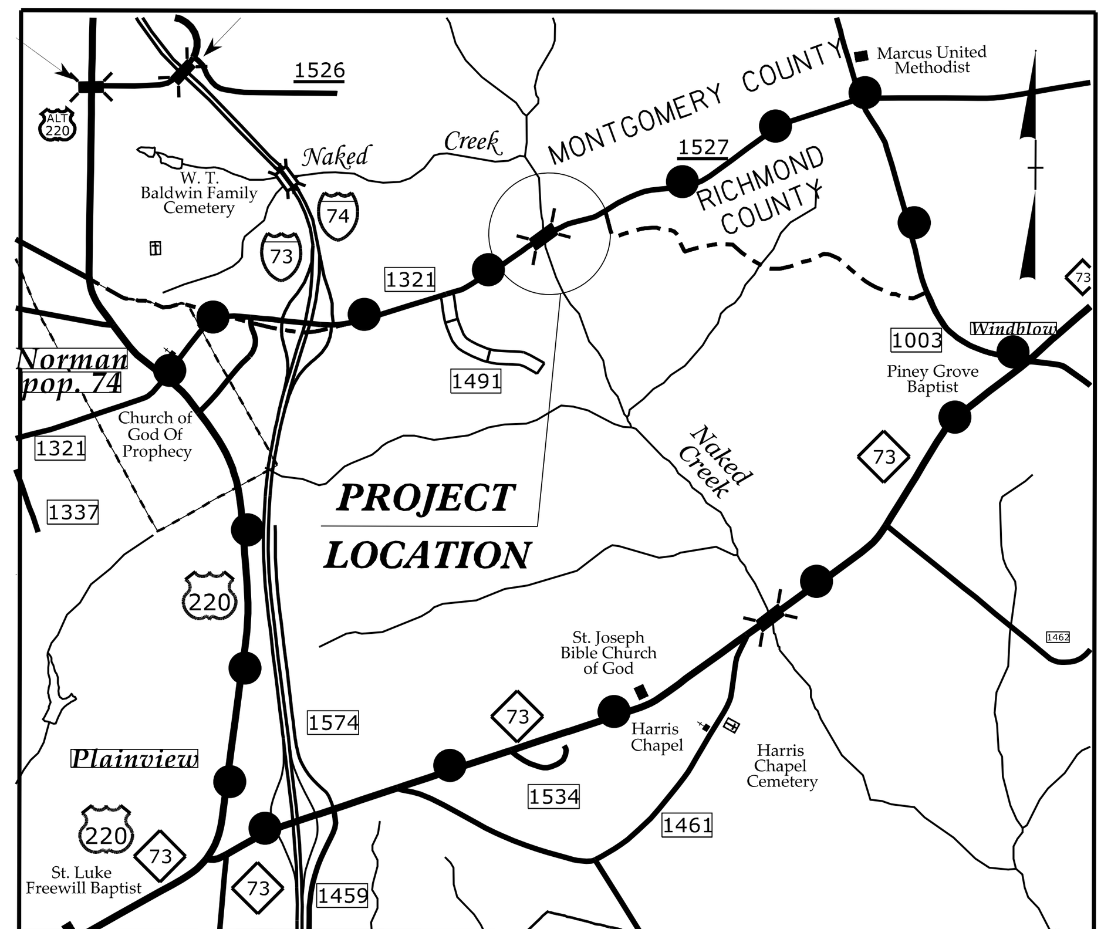
TIM WELCH, PE — NCDOT CONTACT

Mead&Hunt

111 E. Hargett Street, Suite 300
Raleigh, North Carolina 27601
919-714-8670 | meadhunt.com
NC License No. F-1235

08/17/24
H:\Signing and Delineation\Pavement Marking\Design\BP8R016_Sgn_PMP.dgn
User:TSAF

TIP PROJECT: BP8-R016



VICINITY MAP

OFFSITE DETOUR

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP8-R016	EC-1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED HIGHWAY EROSION CONTROL

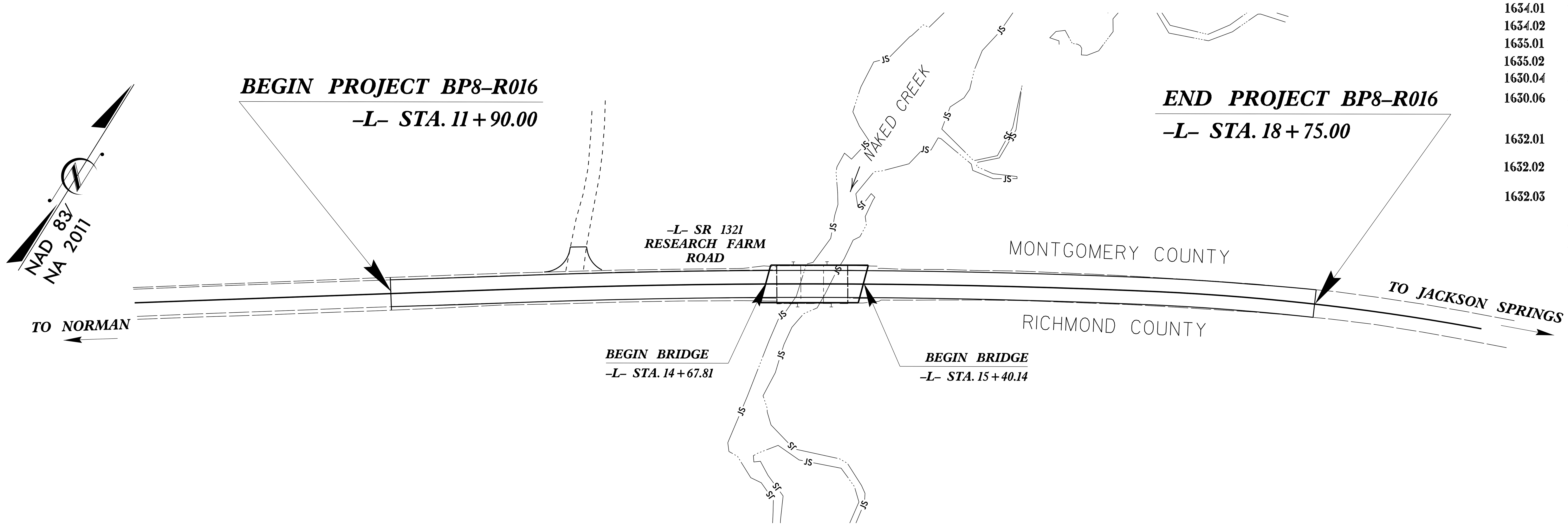
RICHMOND AND MONTGOMERY COUNTIES

LOCATION: BRIDGE NO. 142 OVER NAKED CREEK ON SR 1321 (RESEARCH FARM ROAD)

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

EROSION AND SEDIMENT CONTROL MEASURES

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



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

THIS PROJECT HAS BEEN DESIGNED TO SENSITIVE WATERSHED STANDARDS.

ENVIRONMENTALLY SENSITIVE AREA(S) EXIST ON THIS PROJECT

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

HIGH QUALITY WATER(S) EXIST ON THIS PROJECT

High Quality Water Zone(s) Exist From Sta. 11+90 -L- to Sta. 18+75 -L-

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

GRAPHIC SCALE

50 25 0 50 100

PLANS

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG 010000 GENERAL STORMWATER CONSTRUCTION PERMIT ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY DIVISION OF ENERGY, MINERAL, AND LAND RESOURCES.

Reviewed In the Office of:

ROADSIDE ENVIRONMENTAL FIELD OPERATIONS FOR DIVISIONS 7 & 8

1530 South 7th Street
Sanford, NC 27330

2024 STANDARD SPECIFICATIONS

Reviewed by:

JOSH YOUNG

NAME

Prepared In the Office of:

Mead&Hunt

111 E. Hargett Street, Suite 300
Raleigh, North Carolina 27601
919-714-8670 | meadhunt.com
NC License No. F-1235

Designed by:

BRAD SMITH, PE — 3520

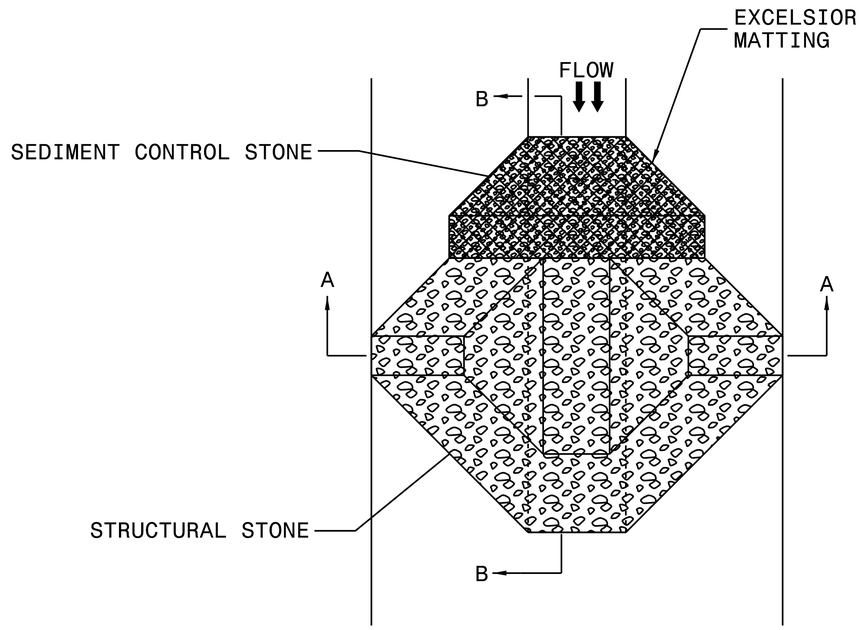
NAME — LEVEL III CERTIFICATION NO.

Roadway Standard Drawings

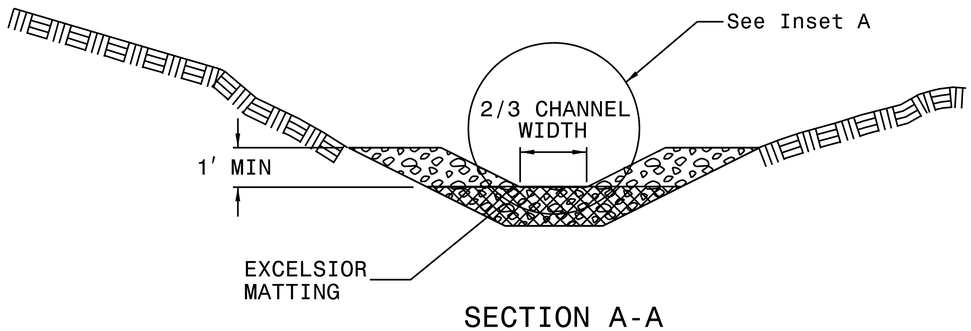
The "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2024 and the latest revision thereto are applicable to this project and by reference hereby are considered a part of these plans.

PROJECT REFERENCE NO.	SHEET NO.
BP8-R016	EC-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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



PLAN



SECTION A-A

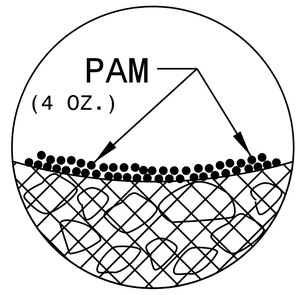
NOTES:

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

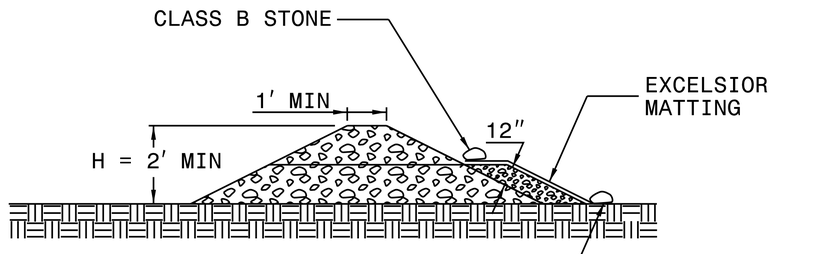
USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

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

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



INSET A

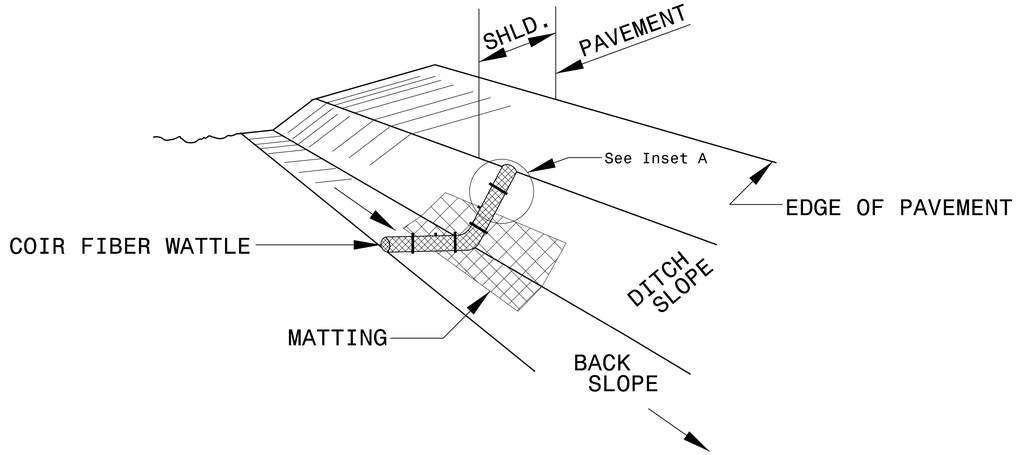


SECTION B-B

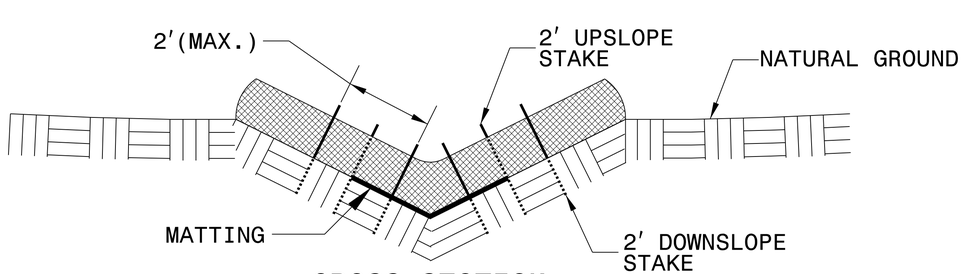
NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
BP8-R016	EC-2A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

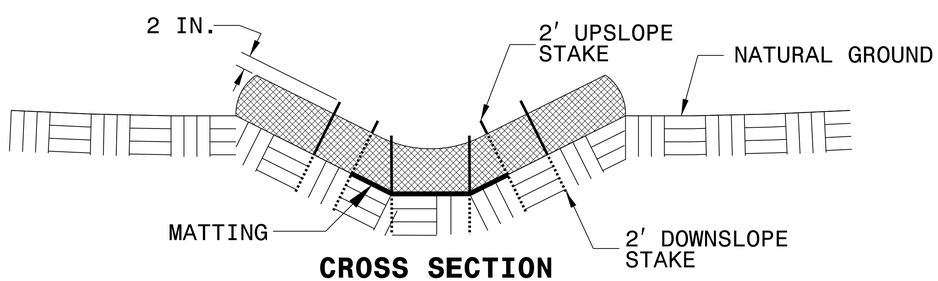
COIR FIBER WATTLE DETAIL



ISOMETRIC VIEW



CROSS SECTION VEE DITCH



CROSS SECTION TRAPEZOIDAL DITCH

NOTES:

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

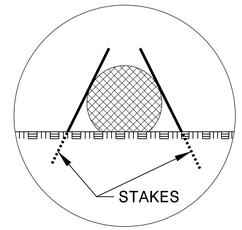
ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.

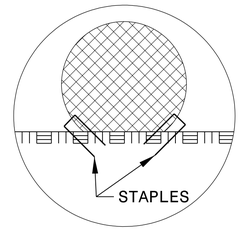
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

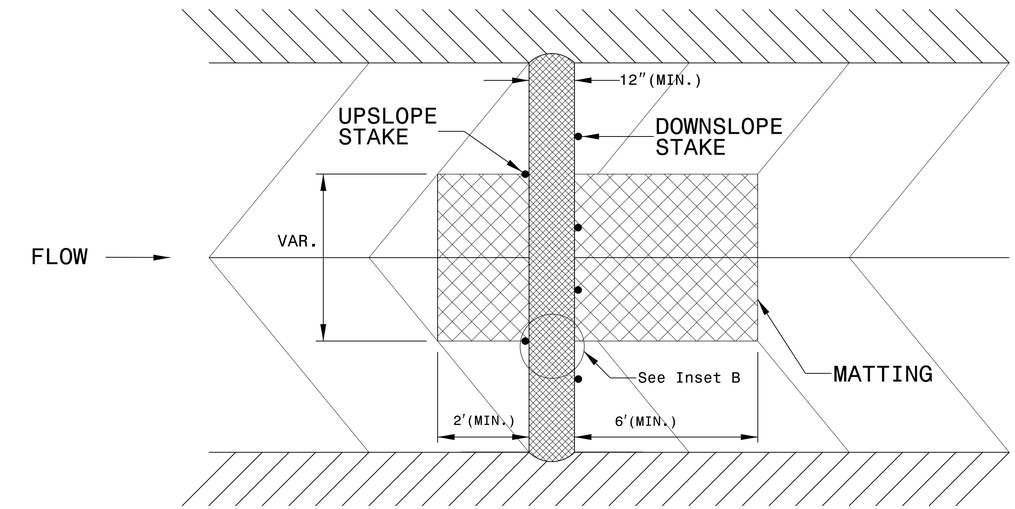
INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.



INSET A



INSET B



TOP VIEW

PROJECT REFERENCE NO.	SHEET NO.
BP8-R016	EC-3
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

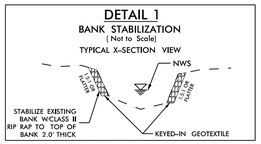
SOIL STABILIZATION TIMEFRAMES

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 TO 4:1	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH WITH SLOPES STEEPER THAN 4:1. 7 DAYS FOR PERIMETER DIKES, SWALES, DITCHES PERIMETER SLOPES, AND HQW ZONES
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	7 DAYS FOR PERIMETER DIKES, SWALES, DITCHES PERIMETER SLOPES, AND HQW ZONES

PROJECT REFERENCE NO.	SHEET NO.
BP8-R016	EC-04/CONST.04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

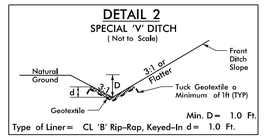
CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 04

DETAIL 1
BANK STABILIZATION
(Not to Scale)



EST. 54 TONS CL II RIP RAP
EST. 63 SY GF
-L- STA. 14+90 +/-
-L- STA. 15+20 +/-

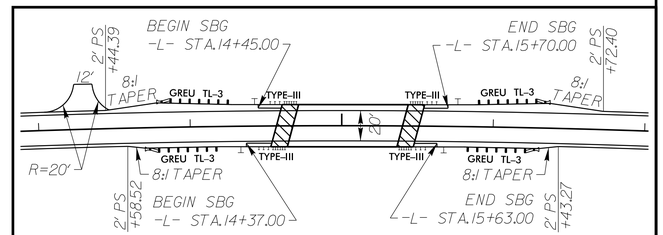
DETAIL 2
SPECIAL 'V' DITCH
(Not to Scale)

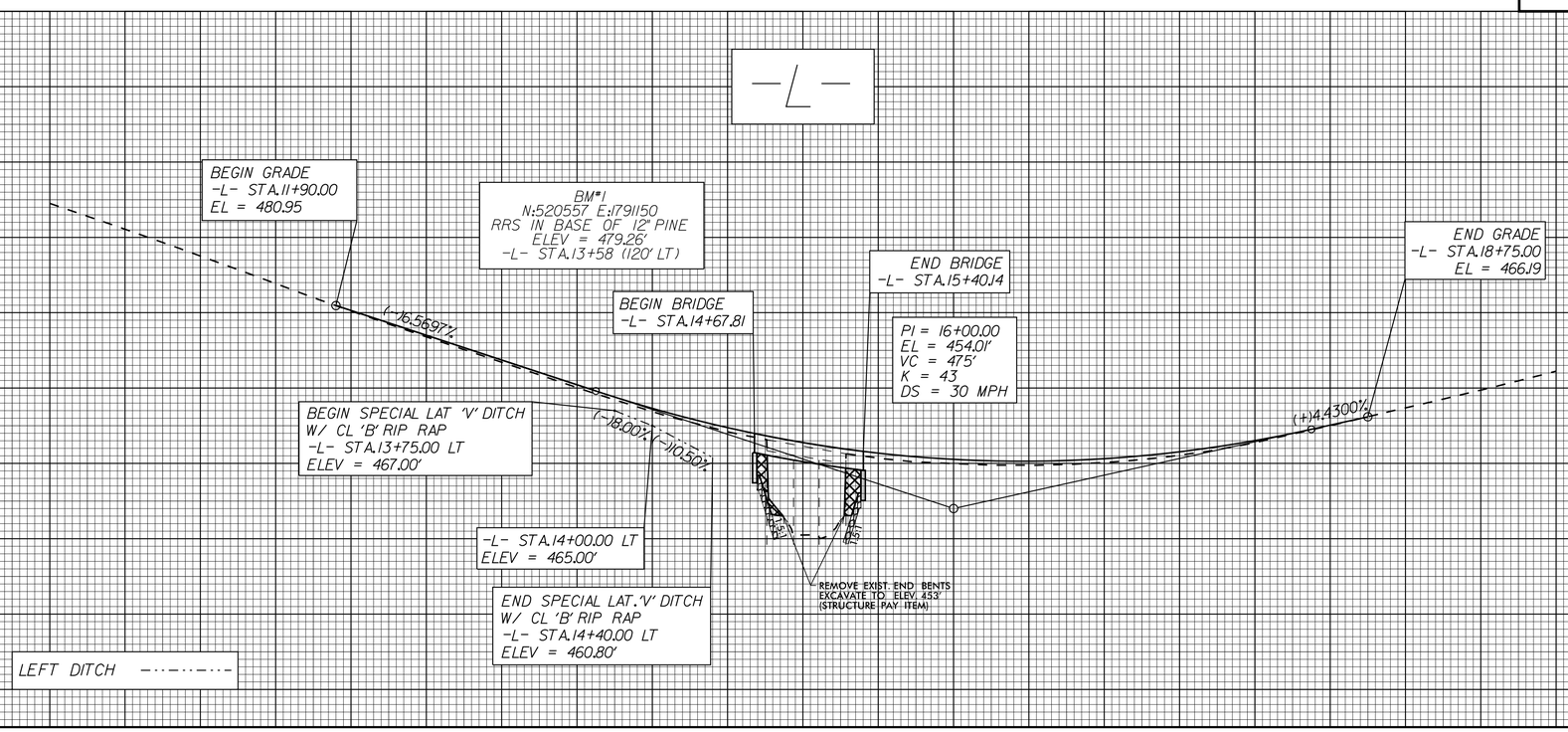


EST. 26 TONS CL 'B' RIP RAP
EST. 60 SY GF
FROM STA. 13+75 TO STA. 14+40 -L- LT

NOTE:
PLACE TEMPORARY ROCK SILT CHECKS TYPE - A AT DRAINAGE OUTLETS.

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





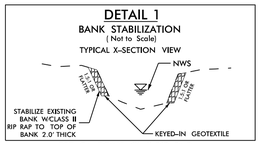
BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 400	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 454.1	FT
BASE DISCHARGE	= 530	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 454.5	FT
OVERTOPPING DISCHARGE	= 700+	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 460.5	FT
DATE OF SURVEY	= 8/4/2022	
W.S.ELEVATION AT DATE OF SURVEY	= 450.9	FT

PROJECT REFERENCE NO.	SHEET NO.
BP8-R016	EC-05/CONST.04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

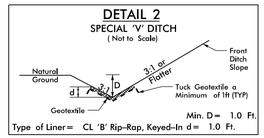
FINAL GRADE
EROSION CONTROL FOR
CONSTRUCTION SHEET 04

DETAIL 1
BANK STABILIZATION
(Not to Scale)



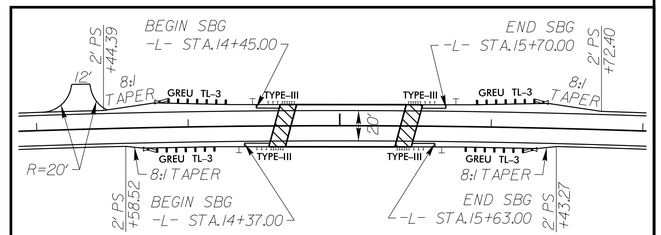
EST. 54 TONS CL II RIP RAP
EST. 63 SY GF
-L- STA. 14+90 +/-
-L- STA. 15+20 +/-

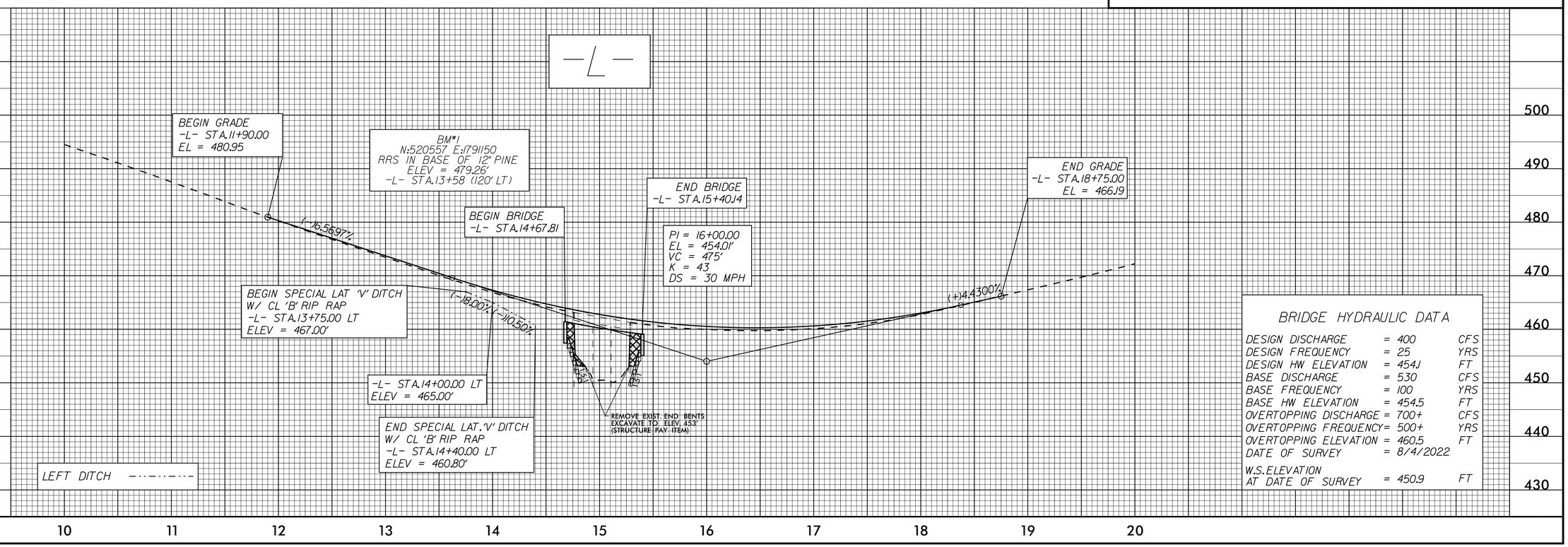
DETAIL 2
SPECIAL 'V' DITCH
(Not to Scale)



EST. 26 TONS CL 'B' RIP RAP
EST. 60 SY GF
FROM STA. 13+75 TO STA. 14+40 -L- LT

Place Matting for Erosion Control on 2:1 Slopes As Work Allows





BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 400	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 454.1	FT
BASE DISCHARGE	= 530	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 454.5	FT
OVERTOPPING DISCHARGE	= 700+	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 460.5	FT
DATE OF SURVEY	= 8/4/2022	
W.S.ELEVATION AT DATE OF SURVEY	= 450.9	FT

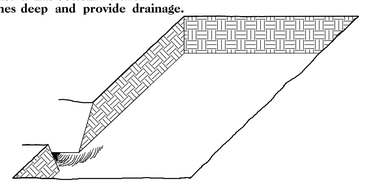
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP8-R016	RF-1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	

PLANTING DETAILS

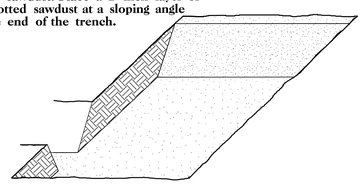
SEEDLING / LINER BAREROOT PLANTING DETAIL

HEALING IN

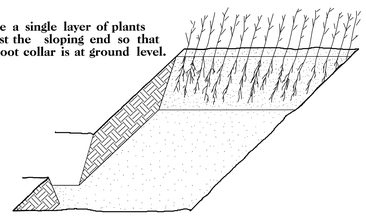
1. Locate a healing-in site in a shady, well protected area.
2. Excavate a flat bottom trench 12 inches deep and provide drainage.



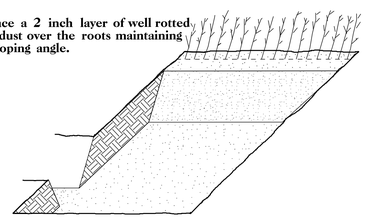
3. Backfill the trench with 2 inches well rotted sawdust. Place a 2 inch layer of well rotted sawdust at a sloping angle at one end of the trench.



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

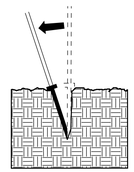


5. Place a 2 inch layer of well rotted sawdust over the roots maintaining a sloping angle.

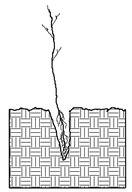


6. Repeat layers of plants and sawdust as necessary and water thoroughly.

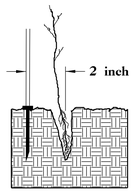
DIBBLE PLANTING METHOD
USING THE KBC PLANTING BAR



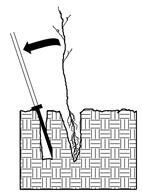
1. Insert planting bar as shown and pull handle toward planter.



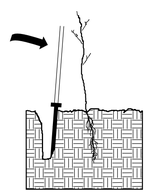
2. Remove planting bar and place seedling at correct depth.



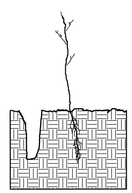
3. Insert planting bar 2 inches toward planter from seedling.



4. Pull handle of bar toward planter, firming soil at bottom.



5. Push handle forward firming soil at top.



6. Leave compaction hole open. Water thoroughly.

PLANTING NOTES:

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

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

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

REFORESTATION

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

REFORESTATION

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

25% LIRIODENDRON TULIPIFERA	TULIP POPLAR	12 in – 18 in BR
25% PLATANUS OCCIDENTALIS	AMERICAN SYCAMORE	12 in – 18 in BR
25% FRAXINUS PENNSYLVANICA	BLACK GUM	12 in – 18 in BR
25% BETULA NIGRA	RIVER BIRCH	12 in – 18 in BR

REFORESTATION DETAIL SHEET

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

T.I.P.: BP8–R016

CONTRACT: –

TIP NO.	SHEET NO.
BP8-R016	SIGN-1

APPROVED: DocuSigned by: R J DeCola EF1540DF704F4A4...

DATE: 8/22/2024

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 034381 ENGINEER RICHARD J. DECOLA

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

SIGNING PLAN

RICHMOND AND MONTGOMERY COUNTIES

LOCATION: BRIDGE NO. 142 OVER NAKED CREEK ON SR 1321 (RESEARCH FARM ROAD)

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
904.50	MOUNTING OF TYPE 'D', 'E' AND 'F' SIGNS ON 'U' CHANNEL POSTS

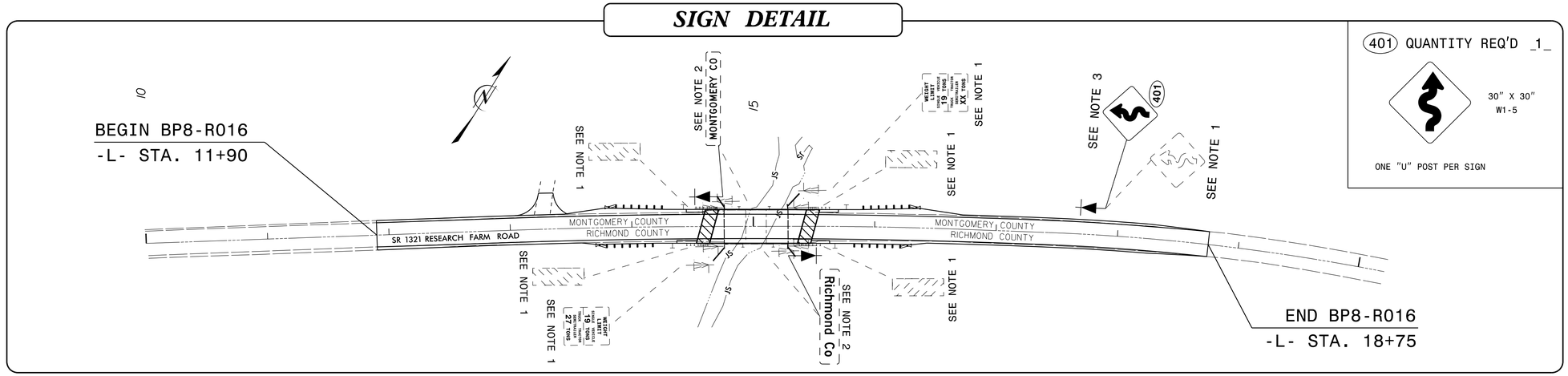
SUMMARY OF QUANTITIES

ITEM NO. DESC. NO.	ITEM NO. SECT. NO.	ITEM DESCRIPTION	QUANTITY	UNIT
4072000000	903	SUPPORTS, 3-LB STEEL U-CHANNEL	12	L.F.
4102000000	904	SIGN ERECTION, TYPE E	1	EA.
4116100000	904	SIGN ERECTION, RELOCATE TYPE D	2	EA.
4155000000	907	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	7	EA.

GENERAL NOTES

. SIGNS FURNISHED BY STATE
. CONFIRM IN WRITING AT LEAST 4 MONTHS IN ADVANCE, THE ACTUAL DATE THE DEPARTMENT FURNISHED SIGNS WILL BE REQUIRED.
. ALL TYPE 'D' SIGNS SHALL BE MOUNTED ON TWO U-CHANNEL POSTS UNLESS OTHERWISE INDICATED ON THE PLANS.
. 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.
. THE BACKGROUND FOR TYPE E & F SIGNS SHALL BE TYPE C REFLECTIVE SHEETING.
. SEE ROADWAY PLANS FOR GUARD/GUIDE RAIL DETAILS.
. SIGNING PLANS DO NOT INCLUDE TEMPORARY CONSTRUCTION SIGNING. SEE TRAFFIC CONTROL PLANS

SIGN DETAIL



PROJECT NOTES

1 DISPOSAL OF SIGN SYSTEM, U-CHANNEL
2 SIGN ERECTION, RELOCATE SIGN TYPE D
3 SIGN ERECTION, TYPE D, E AND F

PLAN PREPARED FOR NCDOT BY:	
RICK DECOLA, PE	PROJECT ENGINEER
TIM WELCH, PE	NCDOT CONTACT

Mead&Hunt
111 E. Hargett Street, Suite 300
Raleigh, North Carolina 27601
919-714-8670 | meadhunt.com
NC License No. F-1235

07/22/24
R:\Signing and Delineation\Signing\Design\BP8R016_Sgn_SGN.dgn
User:RDecola

PROJ. REFERENCE NO.	SHEET NO.
BP8-R016	X-1

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".

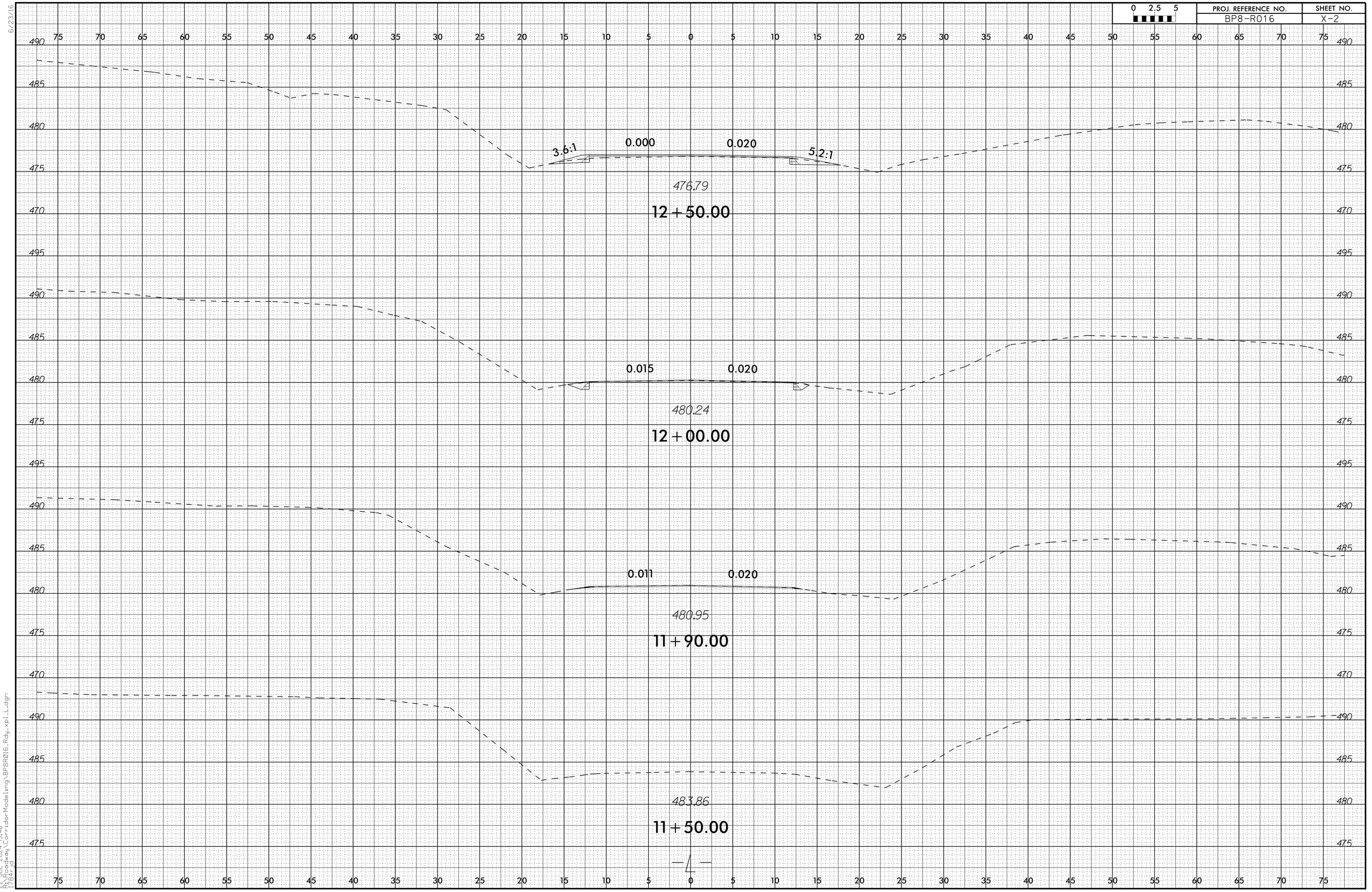
NOTE: EMBANKMENT COLUMN DOES NOT INCLUDE BACKFILL FOR UNDERCUT

Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
11+90.00	0	0
12+00.00	1	0
12+50.00	6	0
13+00.00	6	11
13+50.00	4	13
14+00.00	7	11
14+50.00	12	35
14+67.81	10	12

Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
15+40.14	0	0
15+50.00	5	2
16+00.00	6	10
16+50.00	2	6
17+00.00	2	3
17+50.00	3	0
18+00.00	5	0
18+50.00	6	0
18+75.00	1	0

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	BP8-R016	X-2

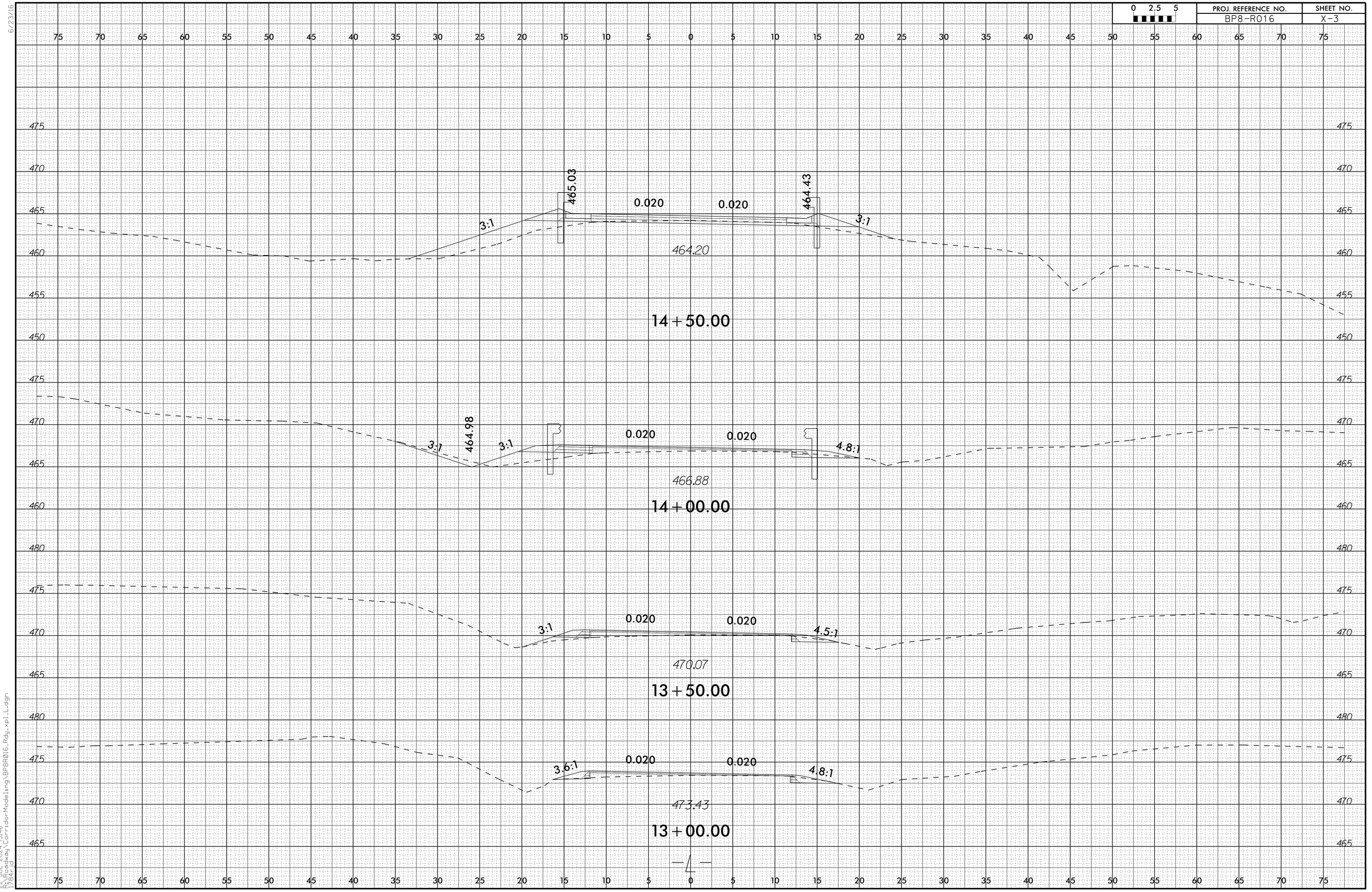


—4—

22-JUL-2024 13:46
R:\Roadway Corridor Modeling\BP8R016_Rdy_xpl_L.dgn
1784rjd

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	BP8-R016	X-3



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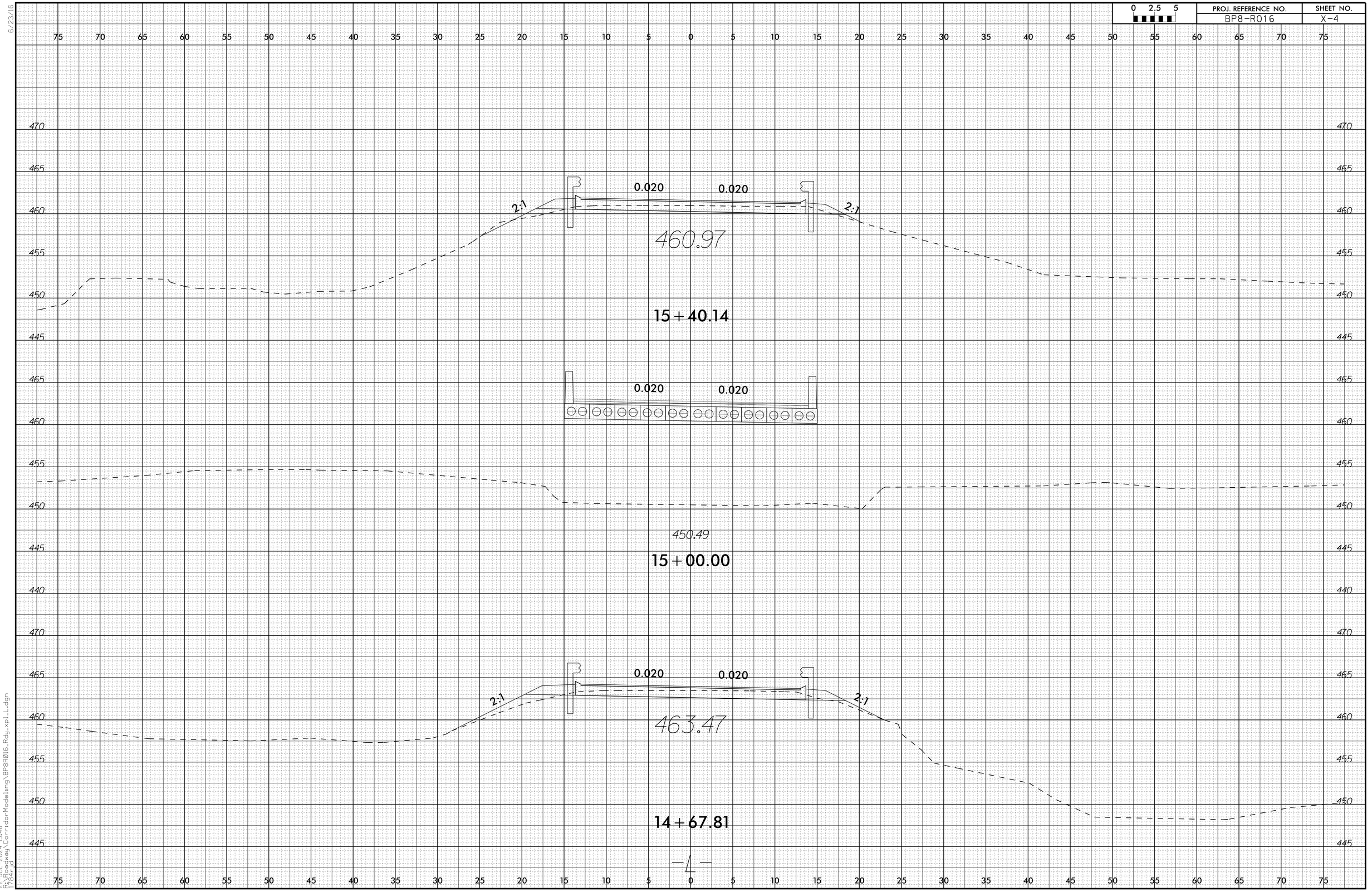
1784rid

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	BP8-R016	X-4



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17841rd

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	BP8-R016	X-5

3:1 0.020 0.020 3:1

461.09

17+50.00

3:1 0.020 0.020 3:1

460.13

17+00.00

3:1 0.020 0.020 3:1

459.76

16+50.00

3:1 0.020 0.020 3:1

459.98

16+00.00

2.6:1 461.65 0.020 0.020 461.04 3.4:1

460.71

15+50.00

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	BP8-R016	X-6

467.38

19+00.00

0.022 0.038

466.19

18+75.00

3:1 0.030 0.030 3:1

465.01

18+50.00

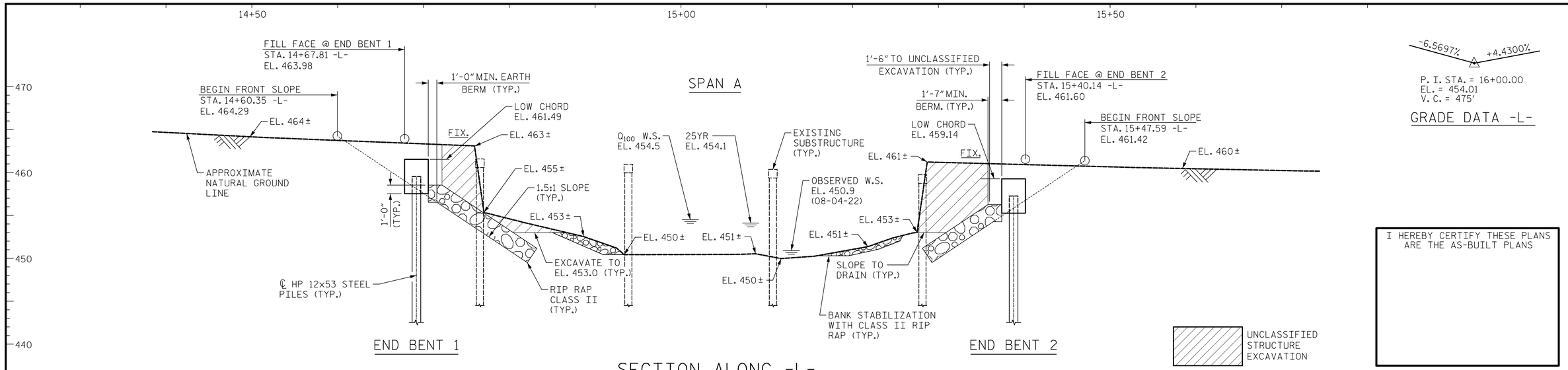
3:1 0.030 0.030 3:1

462.75

18+00.00

—4—

22-JUL-2024 13:46
R:\Roadway Corridor Modeling\BP8R016_Rdy_xpl1_L.dgn
17841rid



SECTION ALONG -L-

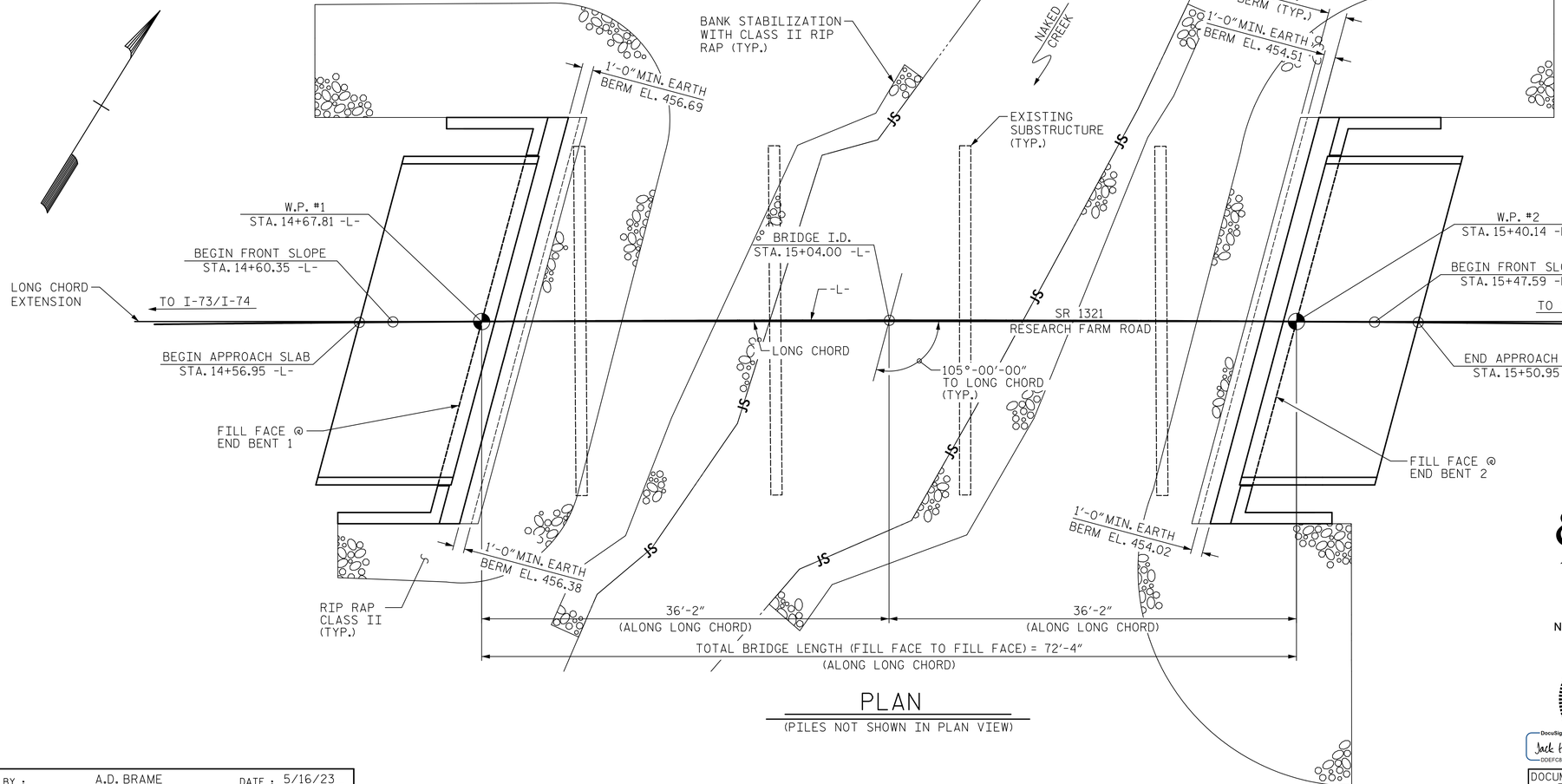
(SECTIONS AT END BENTS ARE AT RIGHT ANGLES)

-6.5697% +4.4300%

P. I. STA. = 16+00.00
EL. = 454.01
V. C. = 475'

GRADE DATA -L-

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS



PLAN

(PILES NOT SHOWN IN PLAN VIEW)

HORIZONTAL CURVE DATA -L-

P.I. STA. = 15+17.94 -L-
Δ = 4°-30'-36.0" (RT)
D = 0°-57'-46.6"
L = 468.35'
T = 234.30'
R = 5950.00'

DRAWN BY : A.D. BRAME DATE : 5/16/23
CHECKED BY : C.C. CAMPBELL DATE : 5/19/23
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 7/22/24

Mead & Hunt
111 E. Hargett Street
Suite 300
Raleigh, NC 27601
919-714-8670
meadhunt.com
NC License No. F-1235

NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson DDEFC8B1D45F4D6... 7/22/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. BP8.R016.1
RICHMOND/MONTGOMERY COUNTY
STATION: 15+04.00 -L-

SHEET 1 OF 4 REPLACES BRIDGE NO. 760142

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER NAKED CREEK ON SR 1321 BETWEEN I-73/I-74 & SR 1003

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-01
1			3			TOTAL SHEETS
2			4			14

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 1 PILES 1-2	97	See Structural Plans	20			170							
END BENT 1 PILES 3-5			25			170							
END BENT 2 PILES 1-2			20			170							
END BENT 2 PILES 3-5			25			170							

*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 DYNAMIC PILE TESTING/PILE ORDER LENGTHS

(Blank entries indicate item is not applicable to structure)

Dynamic Pile Testing				Pile Order Lengths	
End Bent/ Bent No	Dynamic Pile Testing Required? YES or MAYBE	Dynamic Pile Testing Test Pile Length FT	Total Dynamic Pile Testing Quantity EACH	End Bent/ Bent No(s)	Pile Order Length Basis* EST or PDA
END BENT 1 PILES 1-2	MAYBE	20	2		
END BENT 1 PILES 3-5	MAYBE	25			
END BENT 2 PILES 1-2	MAYBE	20			
END BENT 2 PILES 3-5	MAYBE	25			

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

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 1	97	0	0	0.60	0	0	1.00
END BENT 2	97	0	0	0.60	0	0	1.00

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

SUMMARY OF PILE ACCESSORIES

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pile(s) #(-#) (e.g., "Bent 1, Piles 1-5")	Pipe Pile Plates Required? YES or MAYBE	Steel Pile Points			Steel Pile Tips Required? YES
		Pipe Pile Cutting Shoes Required? YES	Pipe Pile Conical Points Required? YES	H-Pile Points Required? YES	
END BENT 1, PILES 1-5				YES	
END BENT 2, PILES 1-5				YES	
TOTAL QTY:	0	0	0	10	0

PROJECT NO. BP8.R016.1

RICHMOND/MONTGOMERY COUNTY

STATION: 15+04.00 -L-

NOTES:

1. The Pile Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (Mariano M. Cruz and 052760) on 04-18-2023.
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. For piles, see Piles Provisions and Section 450 of the Standard Specifications.
5. It has been estimated that a hammer with an equivalent rated energy in the range of 40 to 45 ft-kips per blow will be required to drive piles at End Bent No. 1 and at End Bent No. 2. This estimated energy range does not release the contractor from providing equipment in accordance with the pile provision.

NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson 8/22/2024
SIGNATURE DATE

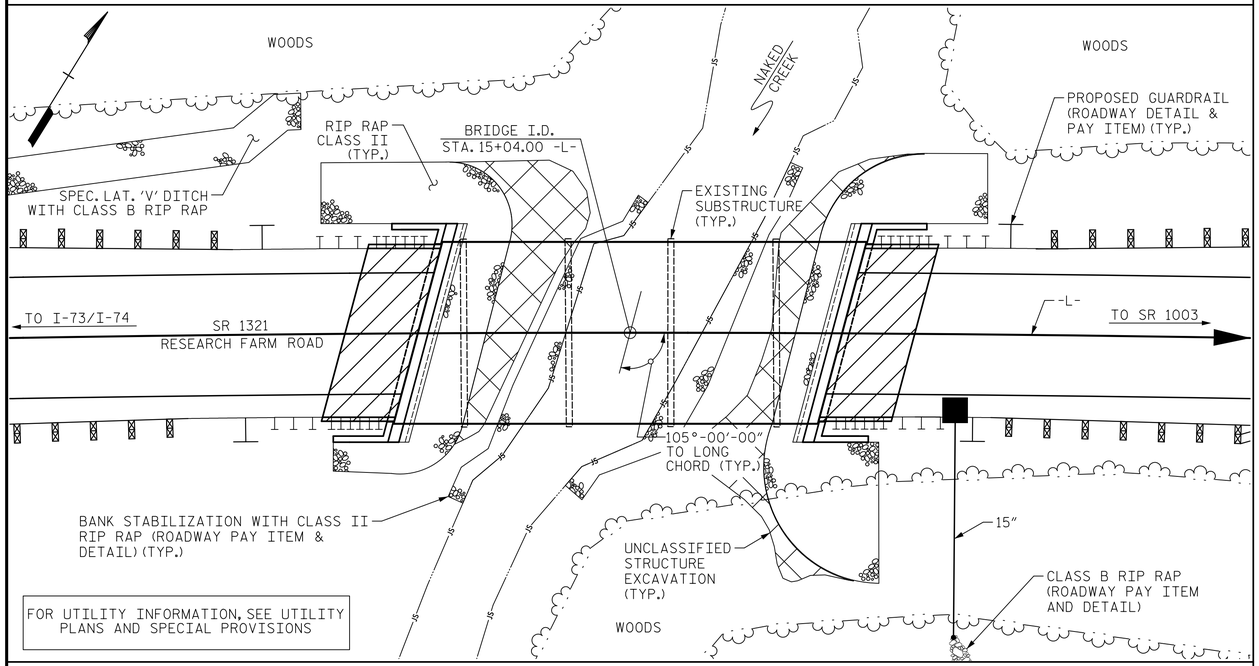
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PILE FOUNDATION TABLES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-02
1			3			TOTAL SHEETS
2			4			14

BM #1: R/R SPIKE IN 12"PINE, 119.71' LT. OF STA. 13+58.44 -L- EL. 479.26



LOCATION SKETCH

NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 15+04.00 -L-."

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

THE EXISTING STRUCTURE CONSISTING OF 3 SPANS @ 17'-10", 17'-1", AND 17'-11" OF REINFORCED CONCRETE DECKING ON TIMBER JOISTS 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. 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 IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18 - EVALUATING SCOUR AT BRIDGES."

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

FOR ASBESTOS ASSESSMENT, SEE SPECIAL PROVISIONS.

ASPHALT WEARING SURFACE IS INCLUDED IN THE ROADWAY QUANTITY ON ROADWAY PLANS.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 28 ± FT LEFT AND 18 ± FT RIGHT OF CENTERLINE ROADWAY AT END BENT 1, AND 29 ± FT LEFT AND 40 ± 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.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE AT STA. 15+04.00 -L-	ASBESTOS ASSESSMENT	UNCLASSIFIED STRUCTURE EXCAVATION AT STA. 15+04.00 -L-	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES		STEEL PILE POINTS	DYNAMIC PILE TESTING	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLABS	
	LUMP SUM	LUMP SUM	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	EACH	NO.	LIN. FT.	EACH	EACH	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	NO.	LIN. FT.
SUPERSTRUCTURE					LUMP SUM							140.26			LUMP SUM	10	700.00
END BENT 1			LUMP SUM	20.7		2522	5	5	115	5			120	134			
END BENT 2			LUMP SUM	20.7		2522	5	5	115	5			134	149			
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	41.4	LUMP SUM	5044	10	10	230	10	2	140.26	254	283	LUMP SUM	10	700.00

HYDRAULIC DATA

DESIGN DISCHARGE	= 400 CFS
FREQUENCY OF DESIGN DISCHARGE	= 25 YEARS
DESIGN HIGH WATER ELEVATION	= 454.1
DRAINAGE AREA	= 9.16 SQ. MI.
BASE DISCHARGE (Q100)	= 530 CFS
BASE HIGH WATER ELEVATION	= 454.5

OVERTOPPING DATA

OVERTOPPING DISCHARGE	= 700+ CFS
FREQUENCY OF OVERTOPPING	= 500+ YEARS
✳ OVERTOPPING ELEVATION	= 460.5

✳ OVERTOPPING WOULD OCCUR AT SAG IN ROADWAY STA. 16+46 -L-

DRAWN BY : A.D. BRAME DATE : 5/16/23
CHECKED BY : C.C. CAMPBELL DATE : 5/19/23
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 7/22/24

Mead & Hunt
111 E. Hargett Street
Suite 300
Raleigh, NC 27601
919-714-8670
meadhunt.com
NC License No. F-1235

NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson DDEFC881D45F4D6... 8/22/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. BP8.R016.1
RICHMOND/MONTGOMERY COUNTY
STATION: 15+04.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER NAKED CREEK ON SR 1321 BETWEEN I-73/I-74 & SR 1003

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-03
1			3			TOTAL SHEETS
2			4			14

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 × RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR					MOMENT						
							LIVE-LOAD FACTORS (γLL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γLL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD		HL-93 (INVENTORY)	N/A	(1)	1.014	--	1.75	0.269	1.04	70′	EL	34.482	0.608	1.10	70′	EL	3.448	0.80	0.269	1.01	70′	EL	34.482	
		HL-93 (OPERATING)	N/A		1.355	--	1.35	0.269	1.35	70′	EL	34.482	0.608	1.43	70′	EL	3.448	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	(2)	1.315	47.356	1.75	0.269	1.36	70′	EL	34.482	0.608	1.38	70′	EL	3.448	0.80	0.269	1.32	70′	EL	34.482	
		HS-20 (OPERATING)	36.000		1.757	63.236	1.35	0.269	1.76	70′	EL	34.482	0.608	1.79	70′	EL	3.448	N/A	--	--	--	--	--	
LEGAL LOAD	SINGLE VEHICLE (SV)	SNSH	13.500		2.938	39.656	1.4	0.269	3.78	70′	EL	34.482	0.608	4.12	70′	EL	3.448	0.80	0.269	2.94	70′	EL	34.482	
		SNGARBS2	20.000		2.203	44.052	1.4	0.269	2.84	70′	EL	34.482	0.608	2.93	70′	EL	3.448	0.80	0.269	2.20	70′	EL	34.482	
		SNAGRIS2	22.000		2.092	46.016	1.4	0.269	2.69	70′	EL	34.482	0.608	2.72	70′	EL	3.448	0.80	0.269	2.09	70′	EL	34.482	
		SNCOTTS3	27.250		1.462	39.844	1.4	0.269	1.88	70′	EL	34.482	0.608	2.06	70′	EL	3.448	0.80	0.269	1.46	70′	EL	34.482	
		SNAGGRS4	34.925		1.227	42.856	1.4	0.269	1.58	70′	EL	34.482	0.608	1.71	70′	EL	3.448	0.80	0.269	1.23	70′	EL	34.482	
		SNS5A	35.550		1.200	42.646	1.4	0.269	1.54	70′	EL	34.482	0.608	1.73	70′	EL	3.448	0.80	0.269	1.20	70′	EL	34.482	
		SNS6A	39.950		1.103	44.058	1.4	0.269	1.42	70′	EL	34.482	0.608	1.58	70′	EL	3.448	0.80	0.269	1.10	70′	EL	34.482	
		SNS7B	42.000		1.050	44.113	1.4	0.269	1.35	70′	EL	34.482	0.608	1.55	70′	EL	3.448	0.80	0.269	1.05	70′	EL	34.482	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.345	44.401	1.4	0.269	1.73	70′	EL	34.482	0.608	1.88	70′	EL	3.448	0.80	0.269	1.35	70′	EL	34.482	
		TNT4A	33.075		1.352	44.717	1.4	0.269	1.74	70′	EL	34.482	0.608	1.83	70′	EL	3.448	0.80	0.269	1.35	70′	EL	34.482	
		TNT6A	41.600		1.108	46.073	1.4	0.269	1.43	70′	EL	34.482	0.608	1.65	70′	EL	3.448	0.80	0.269	1.11	70′	EL	34.482	
		TNT7A	42.000		1.114	46.794	1.4	0.269	1.43	70′	EL	34.482	0.608	1.62	70′	EL	3.448	0.80	0.269	1.11	70′	EL	34.482	
		TNT7B	42.000		1.155	48.526	1.4	0.269	1.49	70′	EL	34.482	0.608	1.51	70′	EL	3.448	0.80	0.269	1.16	70′	EL	34.482	
		TNAGRIT4	43.000		1.097	47.174	1.4	0.269	1.41	70′	EL	34.482	0.608	1.46	70′	EL	3.448	0.80	0.269	1.10	70′	EL	34.482	
		TNAGT5A	45.000		1.033	46.505	1.4	0.269	1.33	70′	EL	34.482	0.608	1.45	70′	EL	3.448	0.80	0.269	1.03	70′	EL	34.482	
		TNAGT5B	45.000	(3)	1.020	45.905	1.4	0.269	1.31	70′	EL	34.482	0.608	1.39	70′	EL	3.448	0.80	0.269	1.02	70′	EL	34.482	
EMERGENCY VEHICLE (EV)		EV2	28.750		1.829	52.587	1.3	0.269	2.13	70′	EL	34.482	0.608	2.20	70′	EL	3.448	0.80	0.269	1.83	70′	EL	34.482	
		EV3	43.000	(4)	1.196	51.434	1.3	0.269	1.39	70′	EL	34.482	0.608	1.48	70′	EL	3.448	0.80	0.269	1.20	70′	EL	34.482	

LOAD FACTORS:

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

NOTES:

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

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

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

(2) DESIGN LOAD RATING (HS-20)

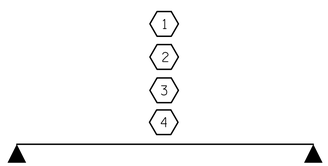
(3) LEGAL LOAD RATING **

(4) EMERGENCY VEHICLE LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY
FOR SPAN "A"

Mead &Hunt
111 E. Hargett Street
Suite 300
Raleigh, NC 27601
919-714-8670
meadhunt.com
NC License No. F-1235

NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson DOEFC861D45F4D6... 8/22/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. BP8.R016.1
RICHMOND/MONTGOMERY COUNTY
STATION: 15+04.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

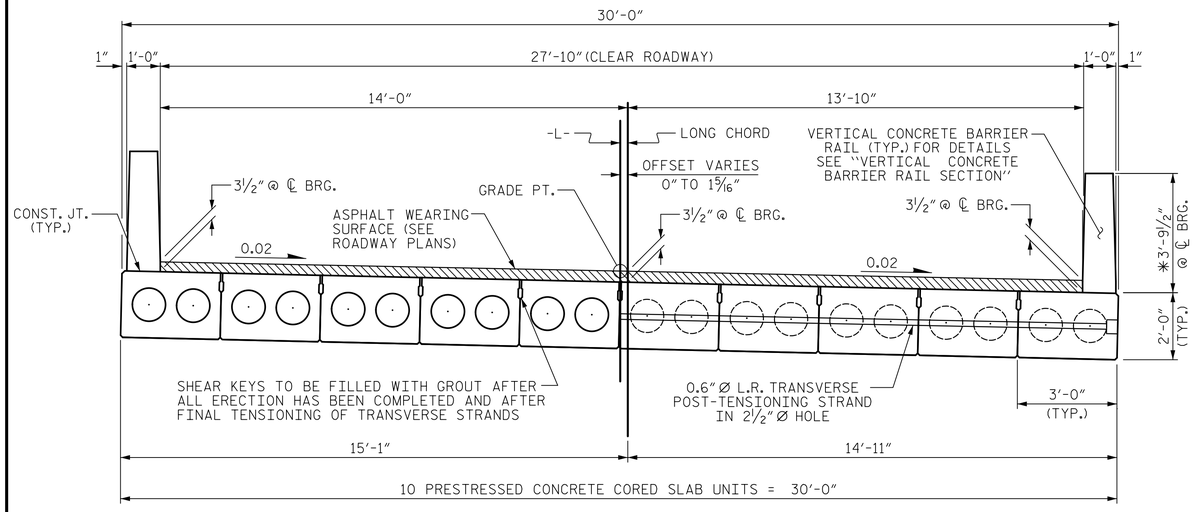
STANDARD
LRFR SUMMARY FOR 70′ CORED SLAB UNIT 105° SKEW
(NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-04
1			3			TOTAL SHEETS
2			4			14

ASSEMBLED BY : A.D. BRAME	DATE : 5/16/23
CHECKED BY : C.C. CAMPBELL	DATE : 5/19/23
DRAWN BY : CVC 6/10	REV. BY : BNB/AKP 06/23
CHECKED BY : DNS 6/10	

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$$

STD. NO. 24LRFR1_75&105S_70L



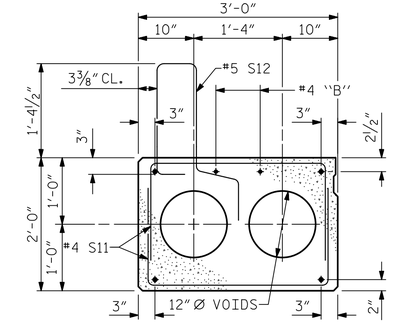
HALF SECTION THROUGH VOIDS

HALF SECTION AT INTERMEDIATE DIAPHRAGMS

TYPICAL SECTION

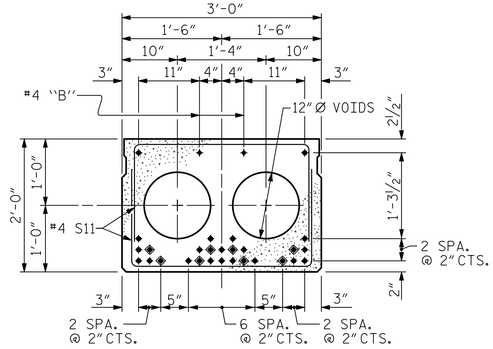
✳ - THE MAXIMUM BARRIER RAIL HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE BARRIER RAIL AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE BARRIER RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR RAIL HEIGHT DETAILS AND ASPHALT THICKNESS, SEE THE ″VERTICAL CONCRETE BARRIER RAIL SECTION″ DETAIL.

FIXED END



EXTERIOR SLAB SECTION

(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION.)



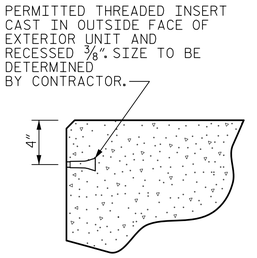
INTERIOR SLAB SECTION (70′ UNIT)

(28 STRANDS REQUIRED)

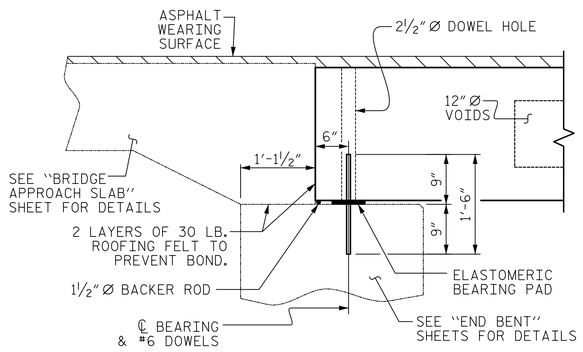
0.6″ Ø LOW RELAXATION STRAND LAYOUT

◈ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 12′-0″ FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

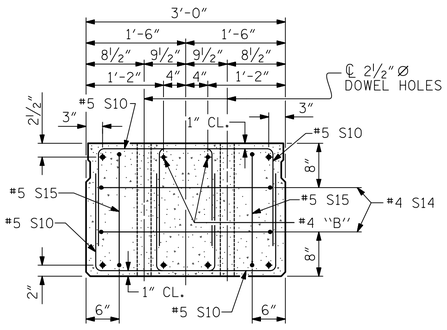
DEBONDING LEGEND



THREADED INSERT DETAIL

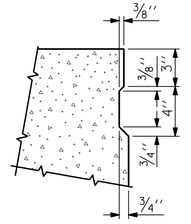


SECTION AT END BENT



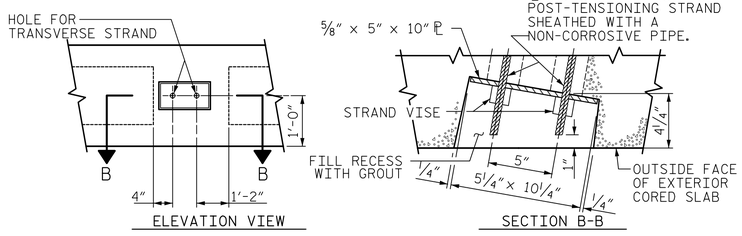
END ELEVATION

SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES. (STRAND LAYOUT NOT SHOWN.) INTERIOR SLAB UNIT SHOWN-EXTERIOR SLAB UNIT SIMILAR EXCEPT SHEAR KEY LOCATION.



SHEAR KEY DETAIL

NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR CORED SLABS.



GROUTED RECESS AT END OF POST-TENSIONED STRAND-CORED SLABS

ASSEMBLED BY : A.D. BRAME	DATE : 5/16/23		
CHECKED BY : C.C. CAMPBELL	DATE : 5/19/23		
DRAWN BY : MAA	6/10	REV. 8/14	MAA/TMG
CHECKED BY : MKT	7/10		

Mead &Hunt
111 E. Hargett Street
Suite 300
Raleigh, NC 27601
919-714-8670
meadhunt.com
NC License No. F-1235

NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson DDEFC881D45F4D6... 8/22/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. BP8.R016.1

RICHMOND/MONTGOMERY COUNTY

STATION: 15+04.00 -L-

SHEET 1 OF 3

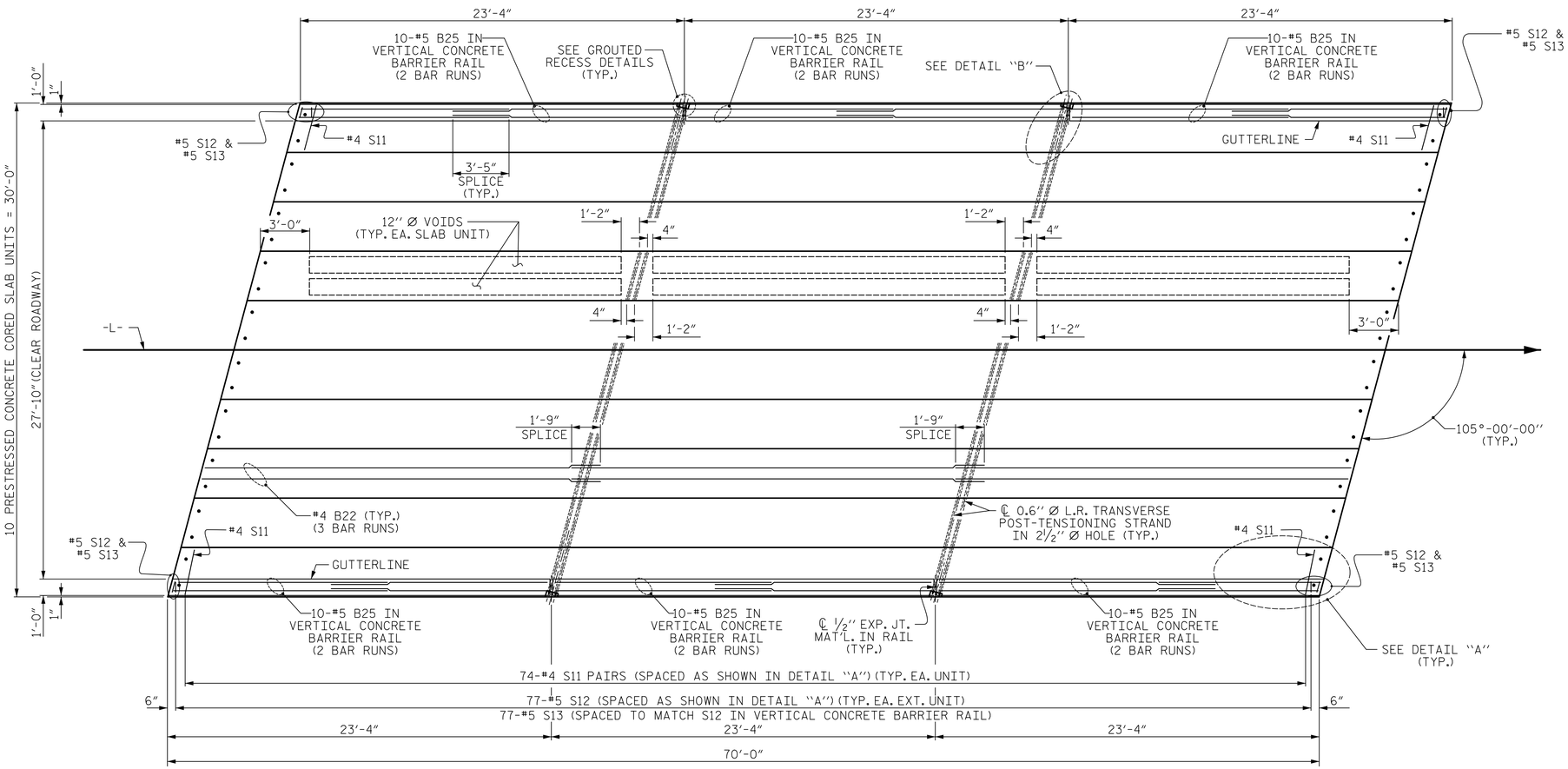
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

3′-0″ X 2′-0″ PRESTRESSED CONCRETE CORED SLAB UNIT

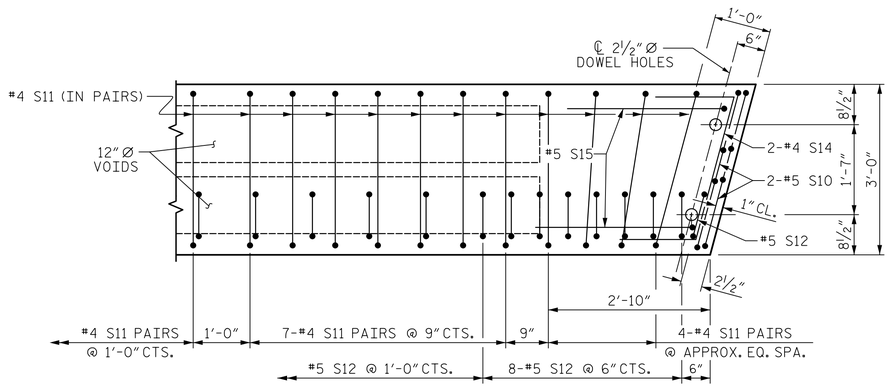
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-05
1			3			TOTAL SHEETS
2			4			14

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

STD. NO. 24PCS4_30_105S

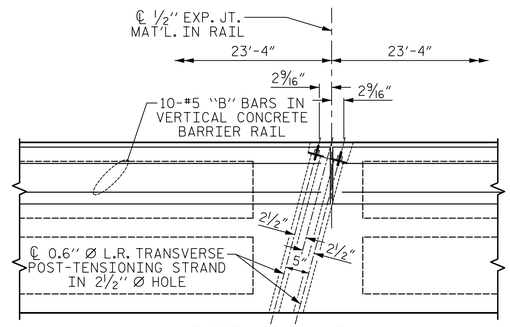


PLAN OF UNIT



DETAIL "A"

(SIMILAR EACH END OF UNIT)
NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S12 BARS.



DETAIL "B"

#4 S11 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1″CLEAR TO GROUTED RECESS AND 2½″Ø TRANSVERSE POST-TENSIONING STRAND HOLES

ASSEMBLED BY :	A.D. BRAME	DATE :	5/16/23
CHECKED BY :	C.C. CAMPBELL	DATE :	5/19/23
DRAWN BY : MAA	6/10	REV. 12/5/11	MAA/AAC
CHECKED BY : MKT	7/10	REV. 8/14	MAA/TMG

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson DDEFC8B1D45F4D6... 8/22/2024

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PROJECT NO. BP8.R016.1
RICHMOND/MONTGOMERY COUNTY
STATION: 15+04.00 -L-

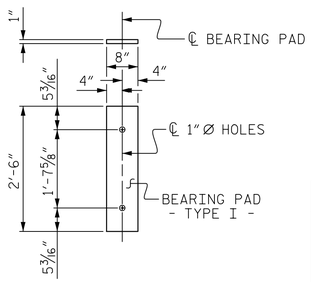
SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 70′ UNIT 27′-10″ CLEAR ROADWAY 105° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-06
1			3			TOTAL SHEETS
2			4			14

STD. NO. 24PCS_30_105S_70L



FIXED END
(TYPE I - 20 REQ'D)

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
	70' UNIT					
✳B25	120	120	#5	STR	13'-8"	1711
✳S13	158	158	#5	2	7'-2"	1181
✳EPOXY COATED REINFORCING STEEL				LBS.		2892
CLASS AA CONCRETE				CU.YDS.		18.1
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT.		140.26

CORED SLABS REQUIRED

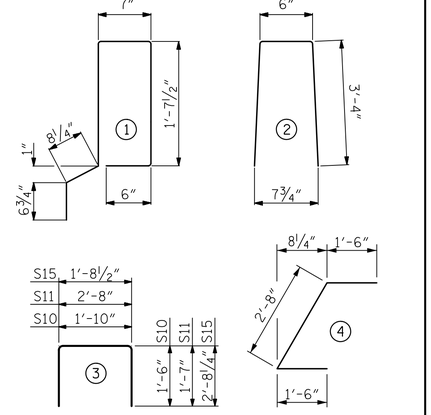
	NUMBER	LENGTH	TOTAL LENGTH
70' UNIT			
EXTERIOR C.S.	2	70'-0"	140'-0"
INTERIOR C.S.	8	70'-0"	560'-0"
TOTAL	10		700'-0"

DEAD LOAD DEFLECTION AND CAMBER

	3'-0" x 2'-0"
70' CORED SLAB UNIT	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	2¼" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD✳✳	¾" ↓
FINAL CAMBER	1½" ↑

✳✳ INCLUDES FUTURE WEARING SURFACE

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

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 CORED SLAB SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE CORED SLABS.

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

THE 2½"Ø DOWEL HOLES AT FIXED ENDS OF SLAB 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.

WHEN CORED SLABS ARE CAST, AN INTERNAL HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDEWAYS. AT LEAST SIX WEEKS PRIOR TO CASTING CORED SLABS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. IN ADDITION TO STRUCTURAL DETAILS, LOCATION AND SPACING OF THE HOLD-DOWNS SHALL BE INDICATED.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE CORED SLAB UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN THE REQUIRED STRENGTH SHOWN IN THE "CONCRETE RELEASE STRENGTH" TABLE.

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

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE CORED SLAB UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

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 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.

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

MAINTAIN A SYMMETRIC TENSION FORCE BETWEEN EACH PAIR OF TRANSVERSE POST TENSIONING STRANDS IN THE DIAPHRAGM.

THE #4 S11 STIRRUPS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO THE GROUTED RECESS.

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.

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT

	ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
70' UNITS	2"	3'-8"

BILL OF MATERIAL FOR ONE 70' CORED SLAB UNIT

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B22	6	#4	STR	24'-6"	98	24'-6"	98
S10	8	#5	3	4'-10"	40	4'-10"	40
S11	148	#4	3	5'-10"	577	5'-10"	577
✳S12	79	#5	1	5'-7"	460		
S14	4	#4	4	5'-8"	15	5'-8"	15
S15	4	#5	3	7'-1"	30	7'-1"	30
REINFORCING STEEL			LBS.		760		760
✳EPOXY COATED REINFORCING STEEL			LBS.		460		
7000 P.S.I. CONCRETE			CU. YDS.		12.0		12.0
0.6"Ø L.R. STRANDS			No.		28		28

GRADE 270 STRANDS

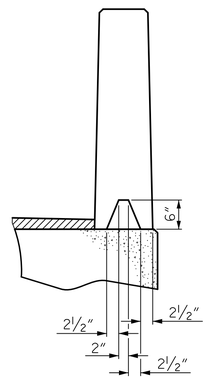
	0.6"Ø L.R.
AREA (SQUARE INCHES)	0.217
ULTIMATE STRENGTH (LBS. PER STRAND)	58,600
APPLIED PRESTRESS (LBS. PER STRAND)	43,950

CONCRETE RELEASE STRENGTH

UNIT	PSI
70' UNITS	5500

SECTION THRU RAIL

ELEVATION AT EXPANSION JOINTS



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

END VIEW

SIDE VIEW

VERTICAL CONCRETE BARRIER RAIL DETAILS

END OF RAIL DETAILS

ASSEMBLED BY :	A.D. BRAME	DATE :	5/16/23
CHECKED BY :	C.C. CAMPBELL	DATE :	5/19/23
DRAWN BY :	MAA 6/10	REV. 5/18	MAA/THC
CHECKED BY :	MKT 7/10		

Mead &Hunt
111 E. Hargett Street
Suite 300
Raleigh, NC 27601
919-714-8670
meadhunt.com
NC License No. F-1235

NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson DOEFC881D45F4D6... 8/22/2024

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PROJECT NO. BP8.R016.1

RICHMOND/MONTGOMERY COUNTY

STATION: 15+04.00 -L-

SHEET 3 OF 3

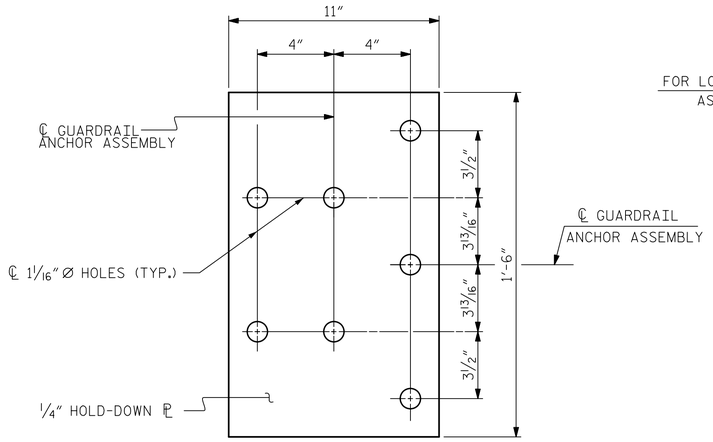
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLAB UNIT

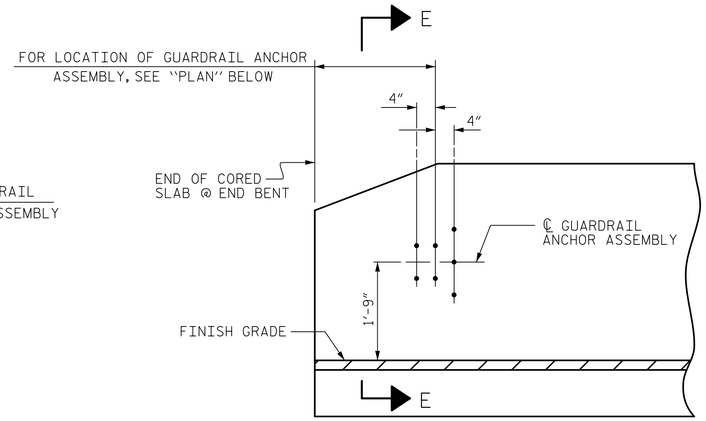
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-07
1			3			TOTAL SHEETS
2			4			14

STD. NO. 24PCS3_30_75&105S

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$



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.)

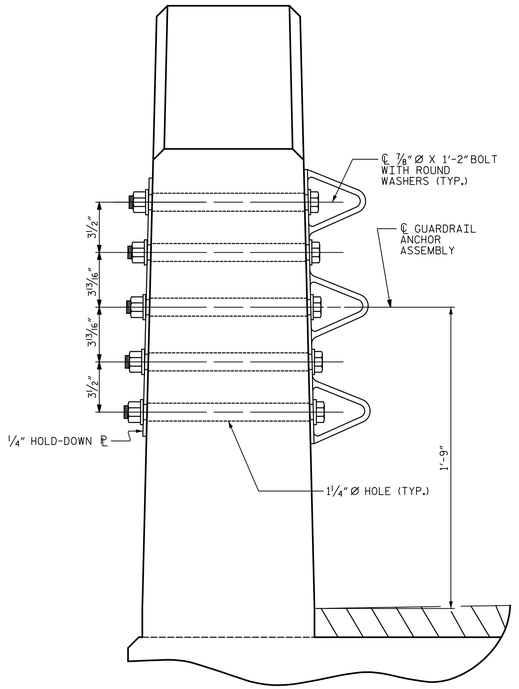
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.

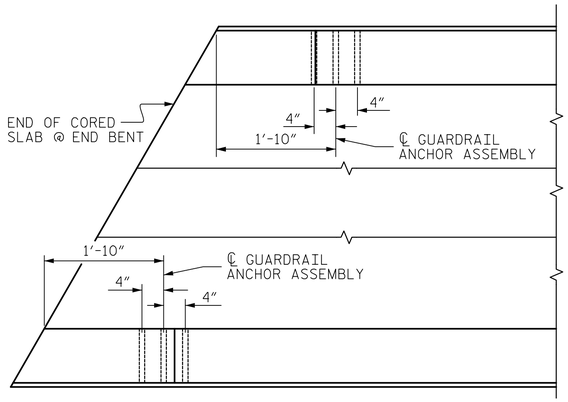
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

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.

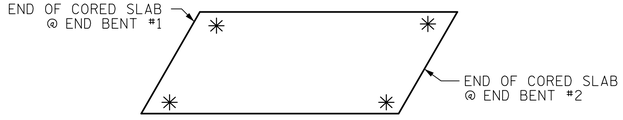


SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN



SKETCH SHOWING POINTS OF ATTACHMENT

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

LOCATION OF ANCHORS FOR GUARDRAIL

ASSEMBLED BY : A.D. BRAME	DATE : 5/16/23
CHECKED BY : C.C. CAMPBELL	DATE : 5/19/23
DRAWN BY : MAA 5/10	REV. 1/15 MAA/TMG
CHECKED BY : GM 5/10	REV. 12/17 MAA/THC
	REV. 5/18 MAA/THC

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson DDEFC8B1D45F4D6... 8/22/2024

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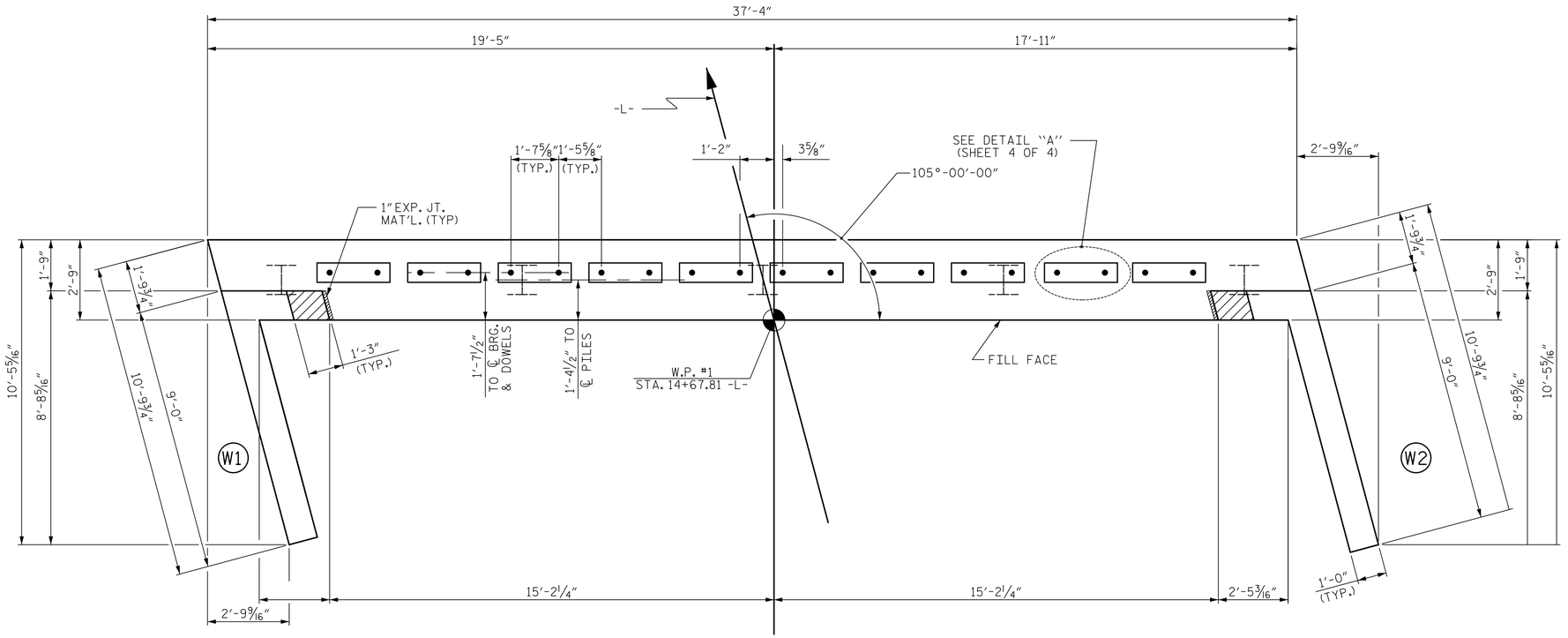
PROJECT NO. BP8.R016.1
RICHMOND/MONTGOMERY COUNTY
STATION: 15+04.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

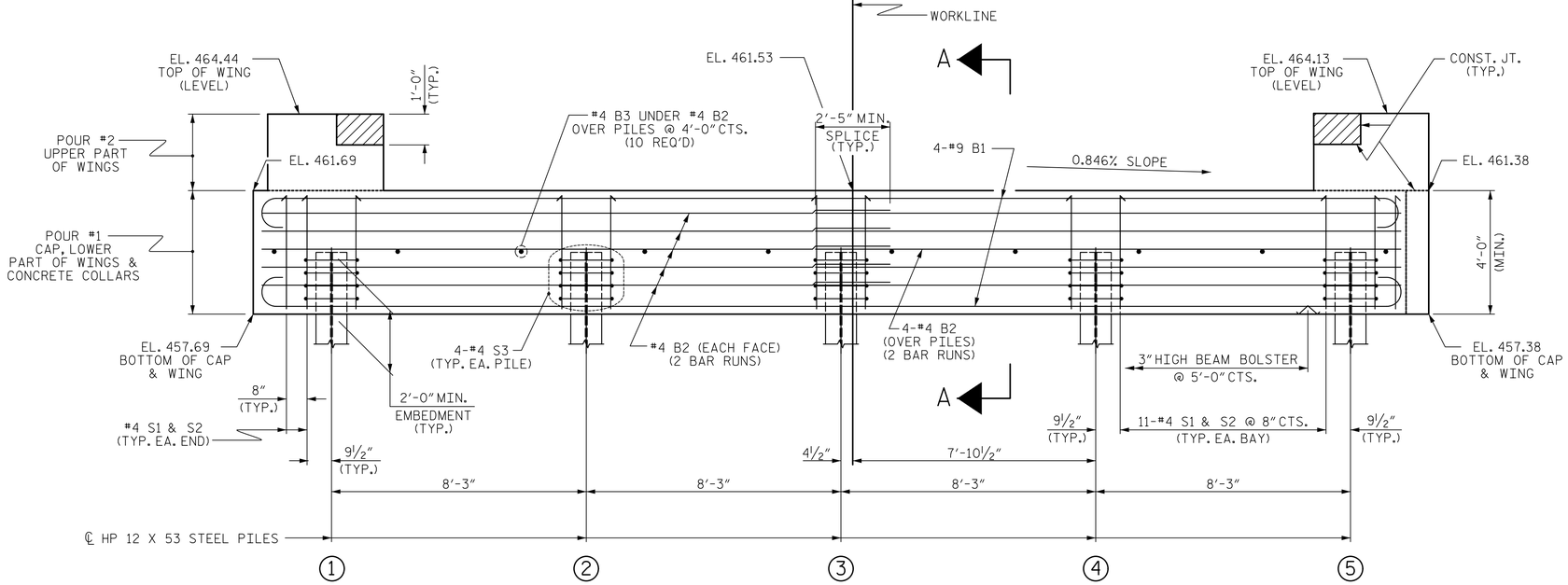
STANDARD
GUARDRAIL ANCHORAGE DETAILS FOR VERTICAL CONCRETE BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-08
1			3			TOTAL SHEETS
2			4			14

(SHT 1a) STD. NO. GRA3



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.

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	459.68
②	459.61
③	459.54
④	459.47
⑤	459.40

ASSEMBLED BY : A.D. BRAME	DATE : 5/16/23		
CHECKED BY : C.C. CAMPBELL	DATE : 5/19/23		
DRAWN BY : WJH 12/11	REV. 4/15	MAA/TMG	
CHECKED BY : AAC 12/11			

$$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

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RICHMOND/MONTGOMERY COUNTY
STATION: 15+04.00 -L-

SHEET 1 OF 4

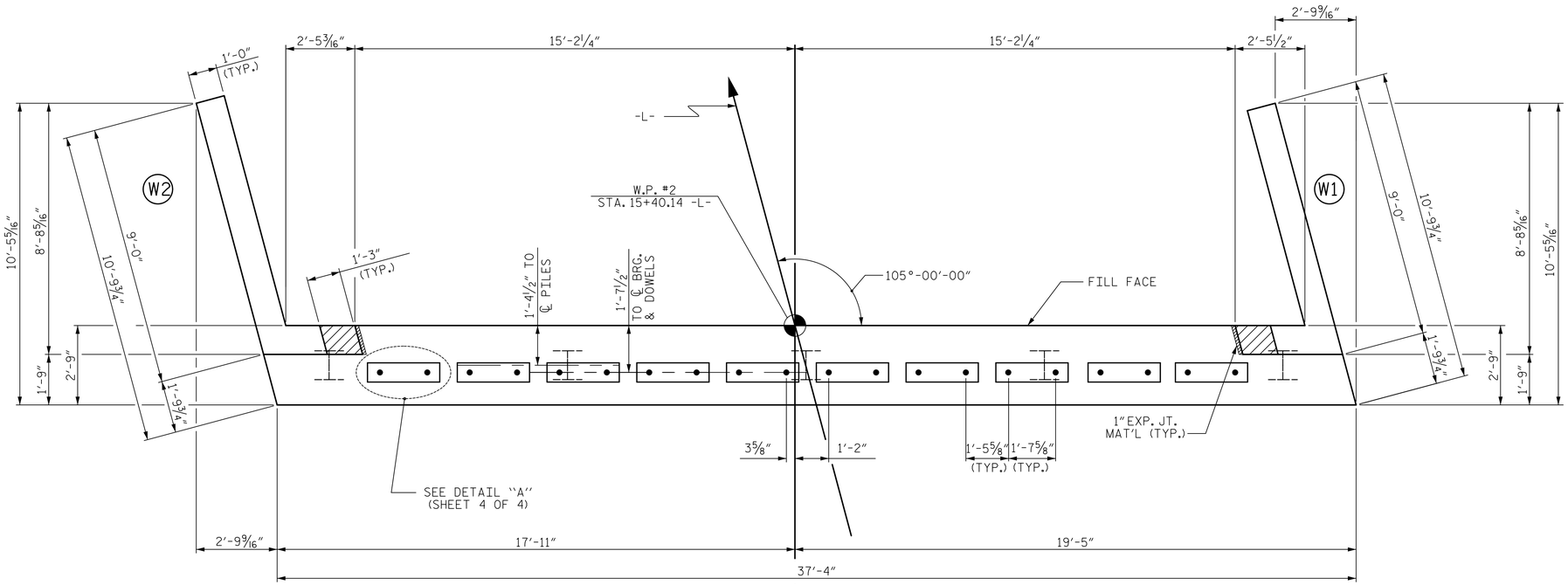
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

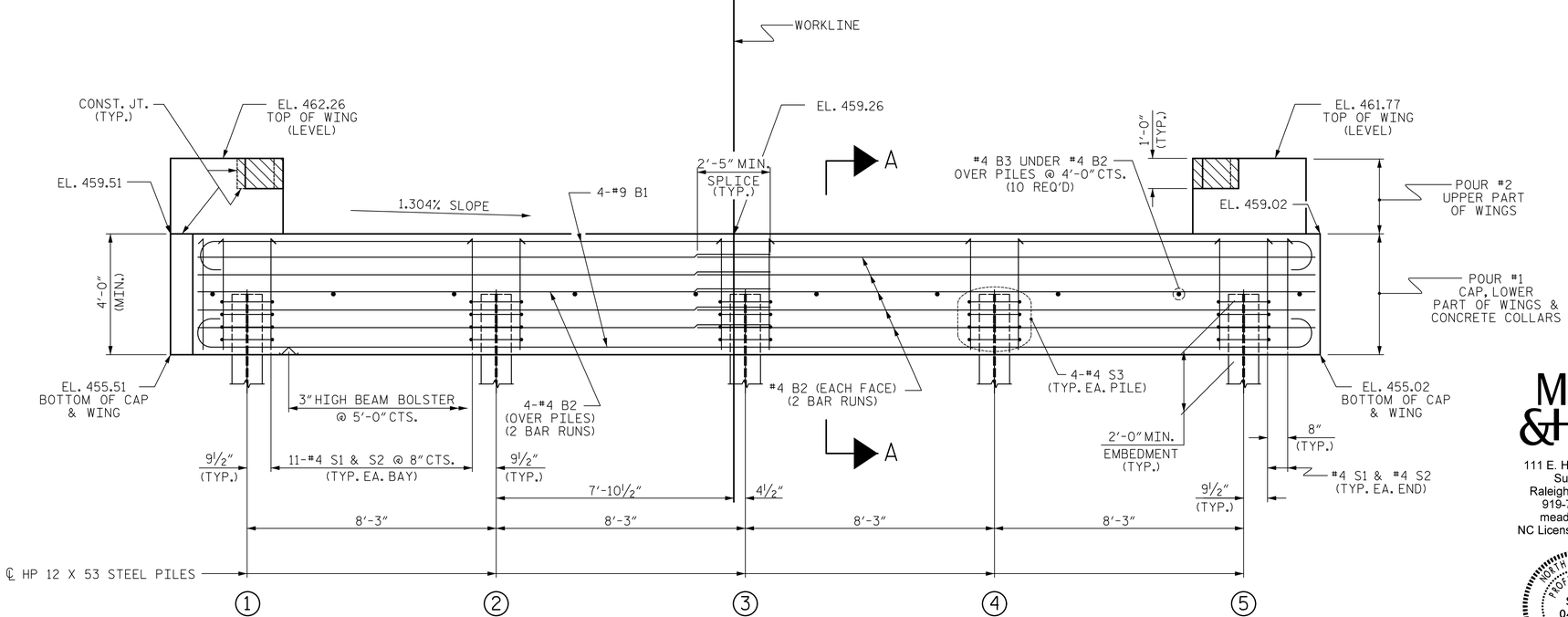
END BENT No. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-09
1			3			TOTAL SHEETS
2			4			14

STD. NO. EB_30_105S4



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.

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	457.49
2	457.38
3	457.28
4	457.17
5	457.06

ASSEMBLED BY : A.D. BRAME	DATE : 5/16/23		
CHECKED BY : C.C. CAMPBELL	DATE : 5/19/23		
DRAWN BY : WJH 12/11	REV. 4/15	MAA/TMG	
CHECKED BY : AAC 12/11			

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043177 JOHN S. HOBSON

DocuSigned by: Jack Hobson 8/22/2024

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PROJECT NO. BP8.R016.1
RICHMOND/MONTGOMERY COUNTY
STATION: 15+04.00 -L-

SHEET 2 OF 4

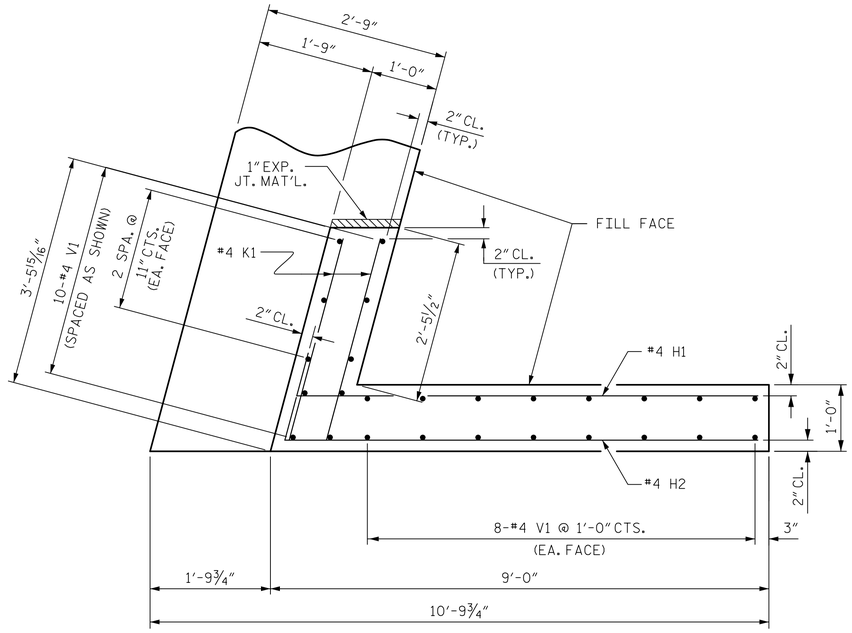
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

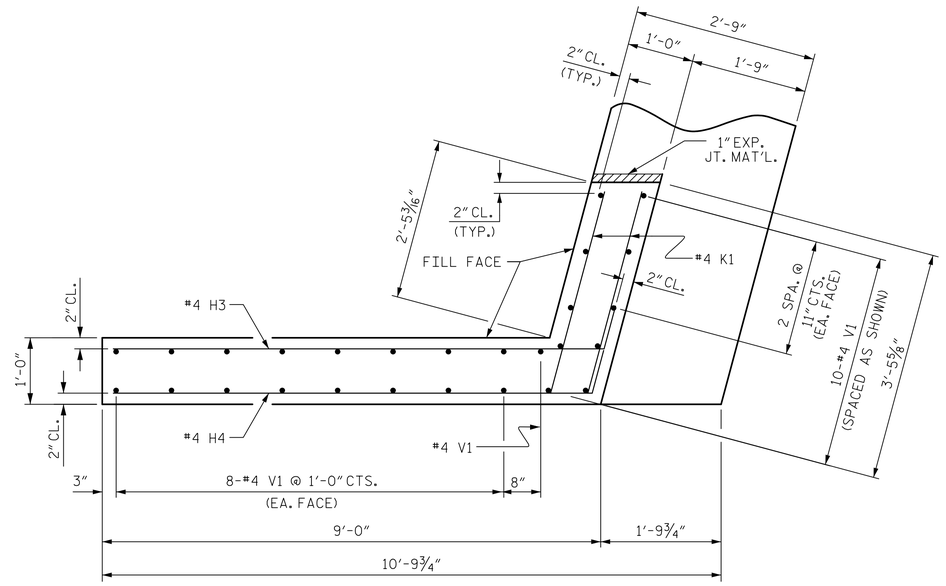
END BENT No. 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			14

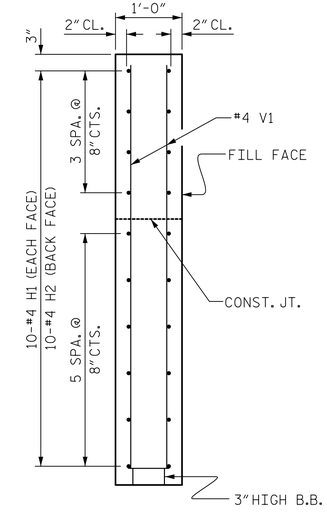
STD. NO. EB_30_105S4



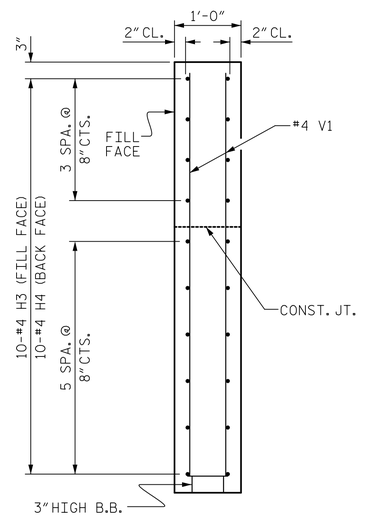
PLAN OF WING (W1)



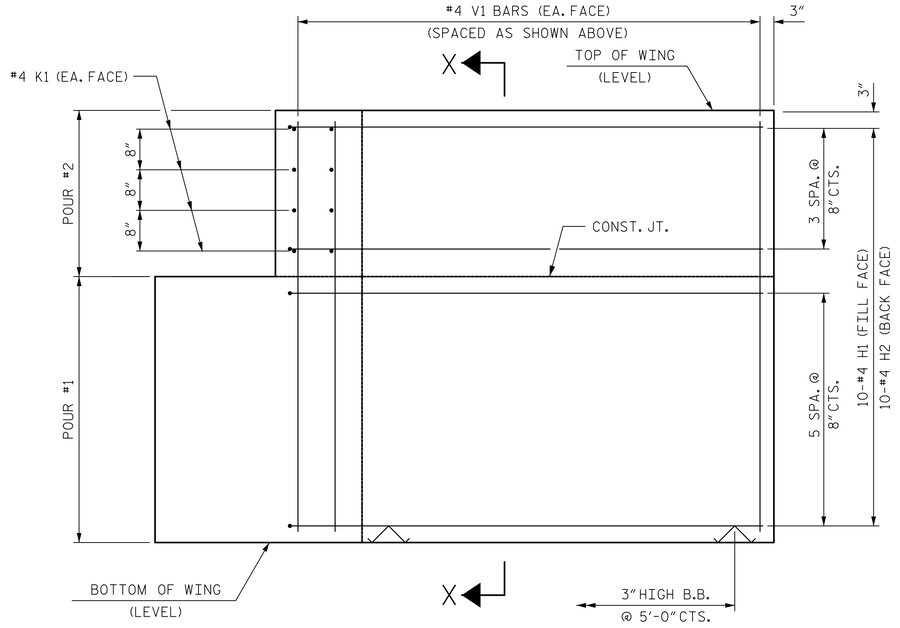
PLAN OF WING (W2)



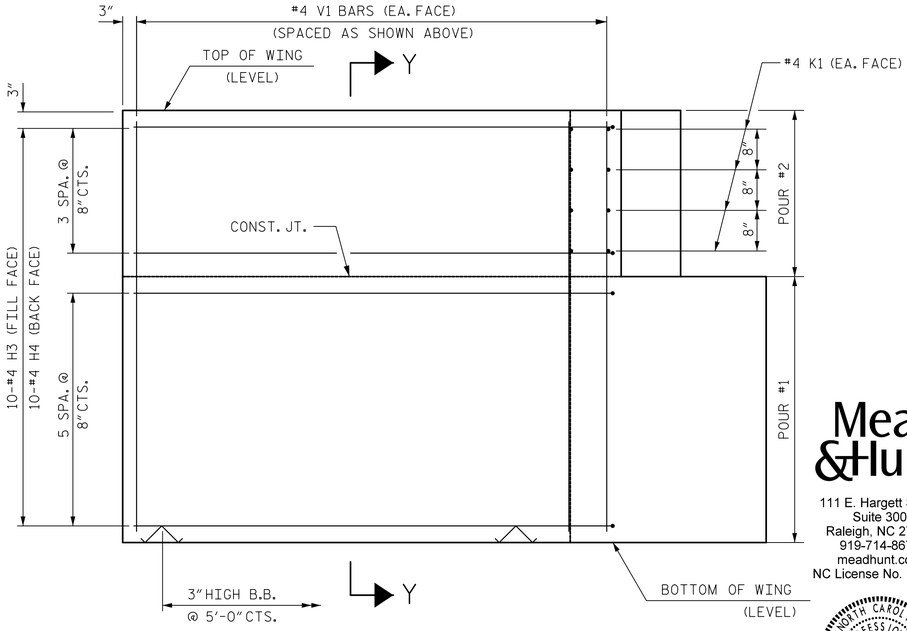
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

WING DETAILS

ASSEMBLED BY : A.D. BRAME	DATE : 5/16/23		
CHECKED BY : C.C. CAMPBELL	DATE : 5/19/23		
DRAWN BY : WJH 12/11	REV. 4/15	MAA/TMG	
CHECKED BY : AAC 12/11			

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

Mead &Hunt
111 E. Hargett Street
Suite 300
Raleigh, NC 27601
919-714-8670
meadhunt.com
NC License No. F-1235

NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HORSON
DocuSigned by: Jack Horson DDEFC8B1D45F4D6...
8/22/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. BP8.R016.1
RICHMOND/MONTGOMERY COUNTY
STATION: 15+04.00 -L-

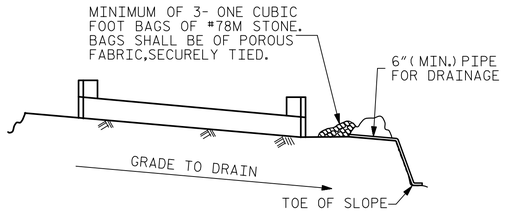
SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

END BENT WING DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			14

STD. NO. EB_30_105S4

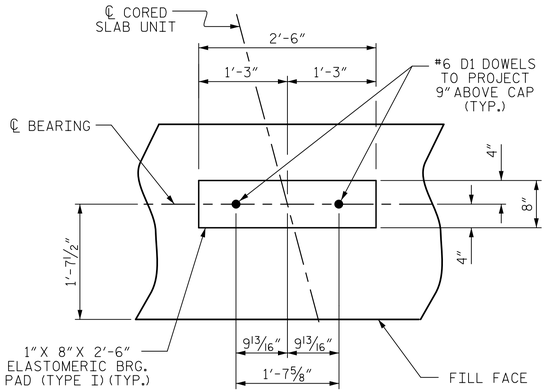


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

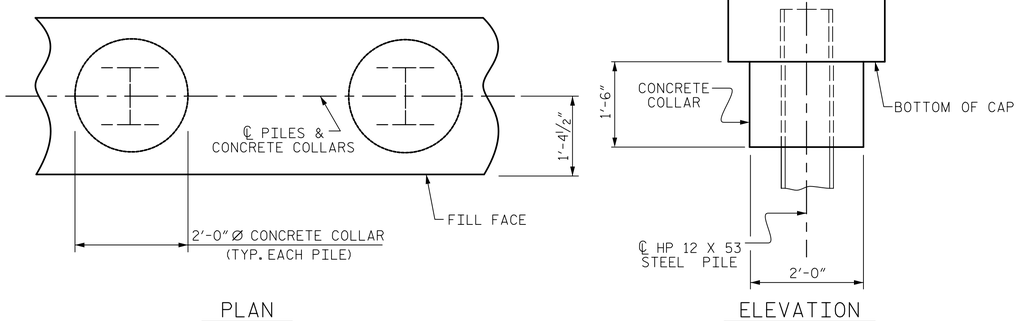
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



DETAIL "A"

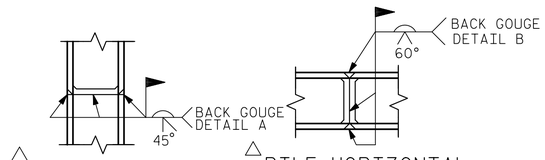
(END BENT No.1 SHOWN, END BENT No.2 SIMILAR BY ROTATION)



PLAN ELEVATION

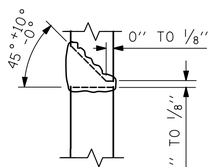
CORROSION PROTECTION FOR STEEL PILES DETAIL

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

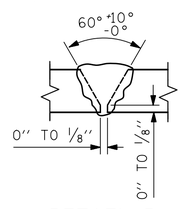


△ PILE VERTICAL

△ PILE HORIZONTAL OR VERTICAL



DETAIL A

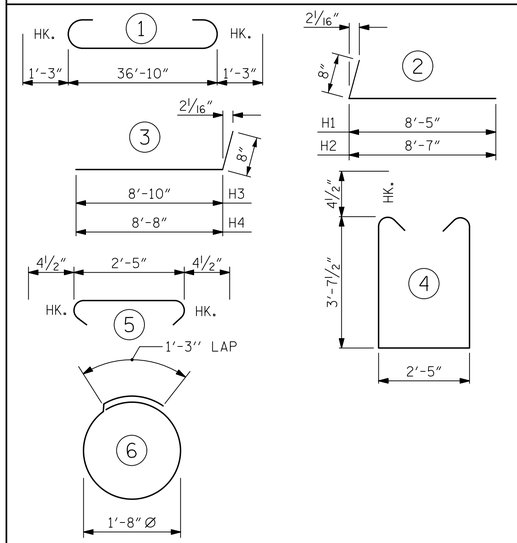


DETAIL B

△ 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	39'-4"	1070
B2	28	#4	STR	19'-9"	369
B3	10	#4	STR	2'-5"	16
D1	20	#6	STR	1'-6"	45
H1	10	#4	2	9'-1"	61
H2	10	#4	2	9'-3"	62
H3	10	#4	3	9'-6"	63
H4	10	#4	3	9'-4"	62
K1	16	#4	STR	3'-1"	33
S1	48	#4	4	10'-5"	334
S2	48	#4	5	3'-2"	102
S3	20	#4	6	6'-6"	87
V1	53	#4	STR	6'-2"	218

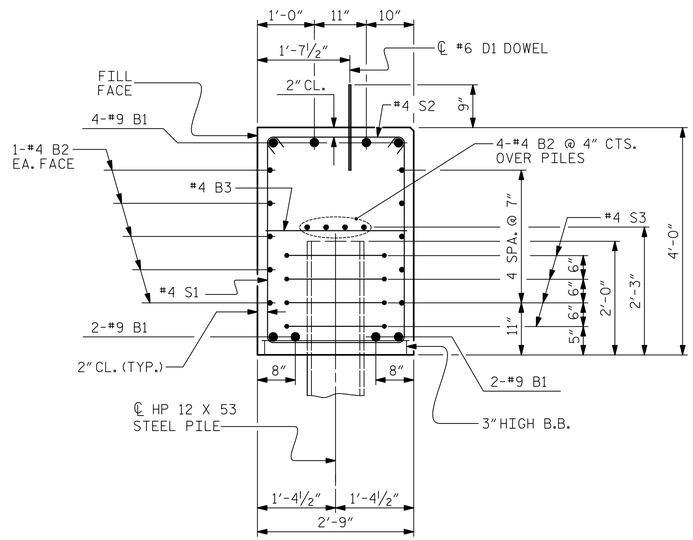
REINFORCING STEEL (FOR ONE END BENT) 2522 LBS.

CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)

POUR #1 CAP, LOWER PART OF WINGS & COLLARS 18.4 C.Y.

POUR #2 UPPER PART OF WINGS 2.3 C.Y.

TOTAL CLASS A CONCRETE 20.7 C.Y.



SECTION A-A

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

Mead &Hunt
111 E. Hargett Street
Suite 300
Raleigh, NC 27601
919-714-8670
meadhunt.com
NC License No. F-1235

NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson DDEFC8B1D45F4D6... 9/22/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. BP8.R016.1

RICHMOND/MONTGOMERY COUNTY

STATION: 15+04.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

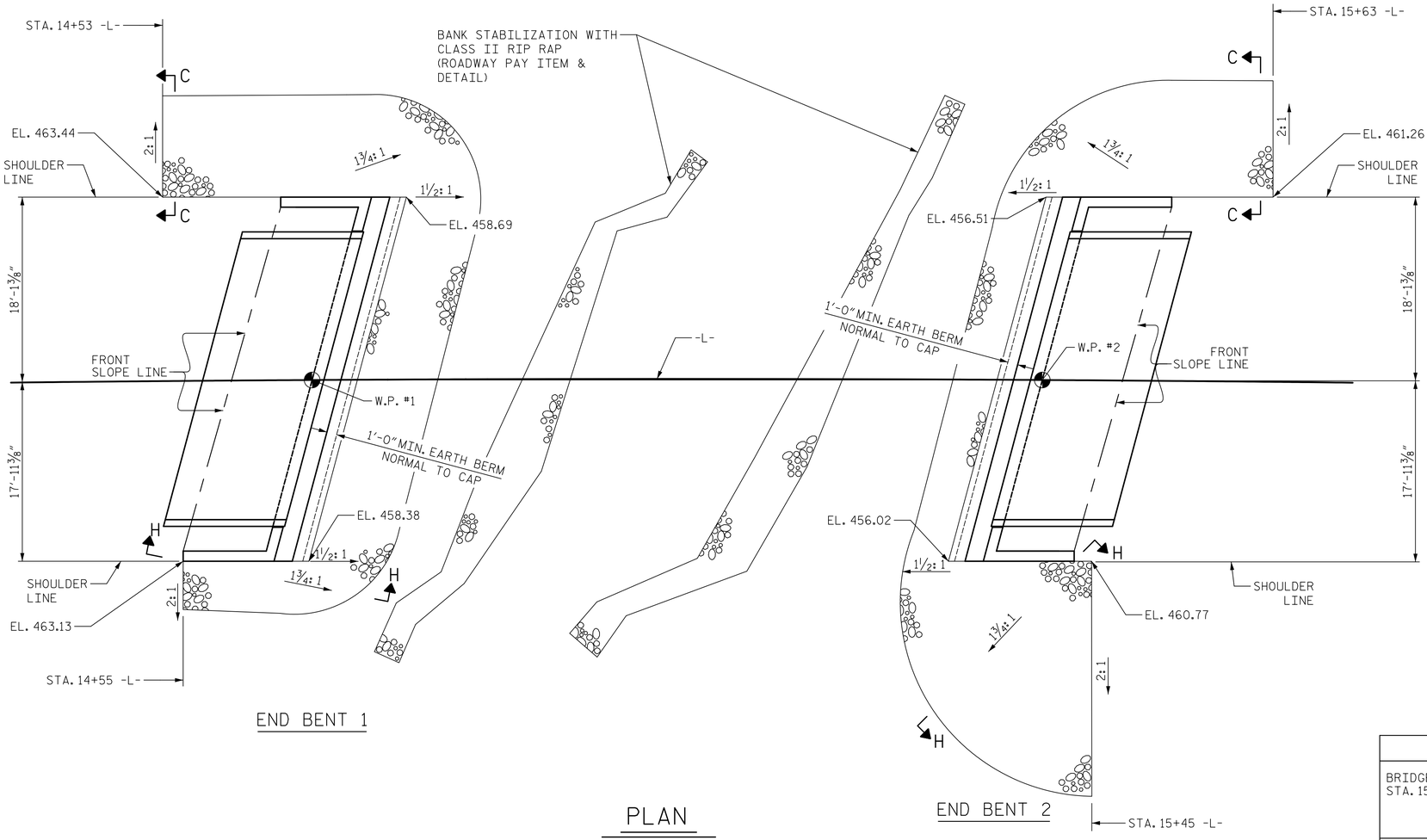
END BENT No.1 & 2 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			14

ASSEMBLED BY : A.D. BRAME	DATE : 5/16/23	
CHECKED BY : C.C. CAMPBELL	DATE : 5/19/23	
DRAWN BY : WJH 12/11	REV. 4/17	MAA/THC
CHECKED BY : AAC 12/11		

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

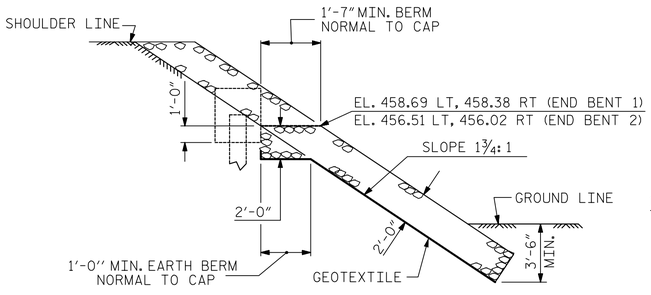
STD. NO. EB_30_105S4



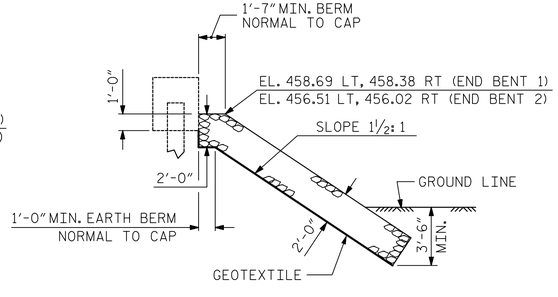
NOTES :

FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.

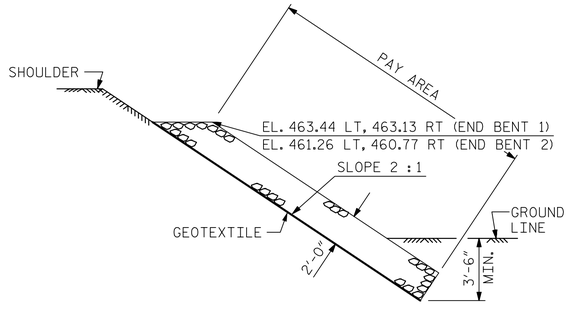
ESTIMATED QUANTITIES		
BRIDGE @ STA. 15+04.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	120	134
END BENT 2	134	149



SECTION H-H



℄ SECTION
BERM RIP RAPPED



SECTION C-C

Mead &Hunt
111 E. Hargett Street
Suite 300
Raleigh, NC 27601
919-714-8670
meadhunt.com
NC License No. F-1235

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043177 JOHN S HOBSON

DocuSigned by: Jack Hobson DDEFC8B1D45F4D6... 8/22/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. BP8.R016.1

RICHMOND/MONTGOMERY COUNTY

STATION: 15+04.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

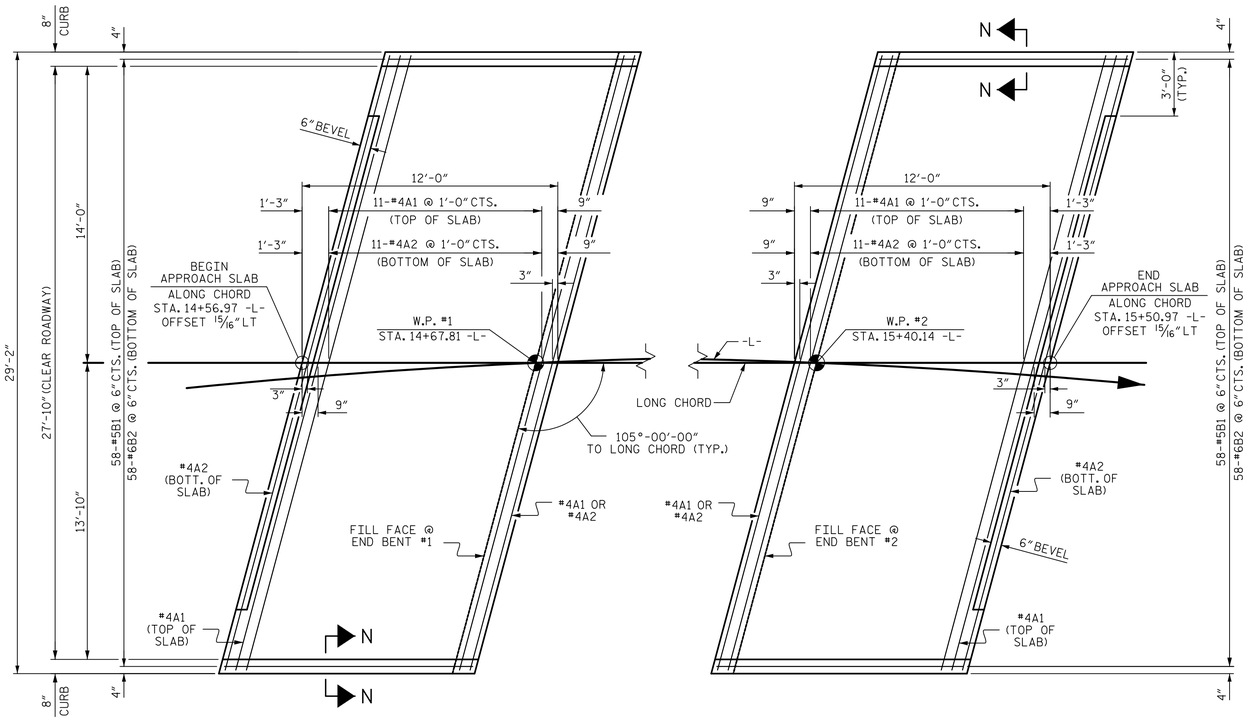
STANDARD

RIP RAP DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			14

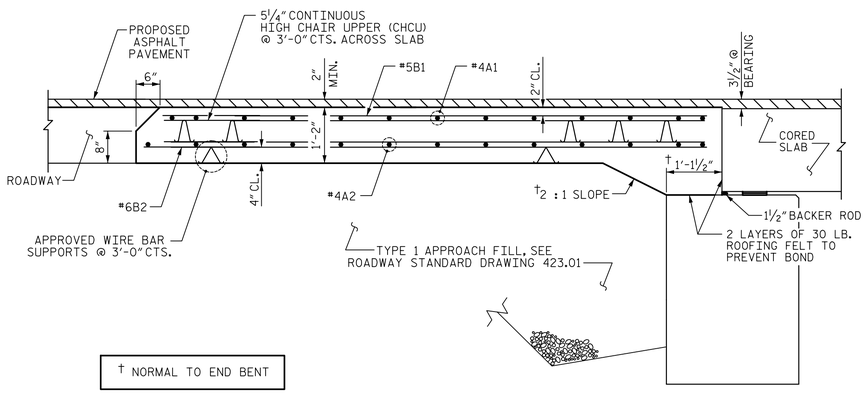
ASSEMBLED BY : A.D. BRAME	DATE : 5/16/23	
CHECKED BY : C.C. CAMPBELL	DATE : 5/19/23	
DRAWN BY : REK 1/84	REV. 10/1/11	MAA/GM
CHECKED BY : RDU 1/84	REV. 12/21/11	MAA/GM
	REV. 12/17	MAA/THC

STD. NO. RR1 (Sht 3)



PLAN @ END BENT #1 PLAN @ END BENT #2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



SECTION THRU SLAB

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.

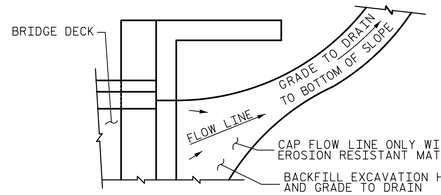
BILL OF MATERIAL

APPROACH SLAB AT EB #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	13	#4	STR	29'-10"	259
A2	13	#4	STR	29'-10"	259
✱ B1	58	#5	STR	11'-1"	670
B2	58	#6	STR	11'-7"	1009
REINFORCING STEEL				LBS.	1268
✱ EPOXY COATED REINFORCING STEEL				LBS.	929
CLASS AA CONCRETE				C.Y.	17.7

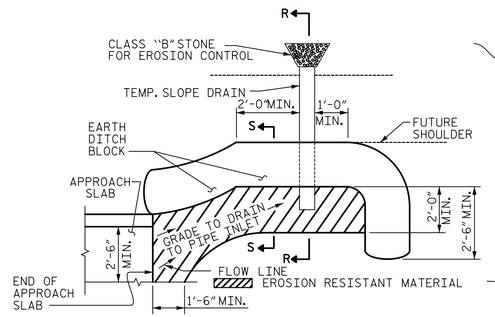
APPROACH SLAB AT EB #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	13	#4	STR	29'-10"	259
A2	13	#4	STR	29'-10"	259
✱ B1	58	#5	STR	11'-1"	670
B2	58	#6	STR	11'-7"	1009
REINFORCING STEEL				LBS.	1268
✱ EPOXY COATED REINFORCING STEEL				LBS.	929
CLASS AA CONCRETE				C.Y.	17.7



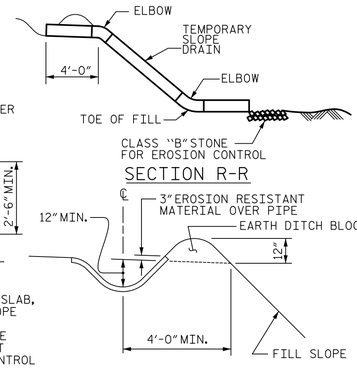
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT 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

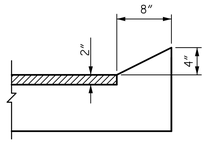


SECTION R-R

SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



SECTION N-N

CURB DETAILS

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

Mead &Hunt
111 E. Hargett Street
Suite 300
Raleigh, NC 27601
919-714-8670
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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON
DocuSigned by: Jack Hobson DOEFC881D45F4D6...
8/22/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. BP8.R016.1
RICHMOND/MONTGOMERY COUNTY
STATION: 15+04.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD BRIDGE APPROACH SLAB FOR PRESTRESSED CONCRETE CORED SLAB UNIT (SUB-REGIONAL TIER) 105° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			14

ASSEMBLED BY : A.D. BRAME	DATE : 5/16/23	
CHECKED BY : C.C. CAMPBELL	DATE : 5/19/23	
DRAWN BY : KMM 3-08	REV. 06-19	MAA/THC
CHECKED BY : GM 3-08	REV. 08/19	BNB/THC
	REV. 07/23	BNB/SNM

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$$

STD. NO. BAS6

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 ¾" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1½" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A ¼" 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 ¼" 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 ⅞" Ø SHEAR STUDS FOR THE ¾" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - ⅞" Ø STUDS FOR 4 - ¾" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF ⅞" Ø STUDS ALONG THE BEAM AS SHOWN FOR ¾" Ø STUDS BASED ON THE RATIO OF 3 - ⅞"Ø STUDS FOR 4 - ¾" 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 ⅝" 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 ⅜" 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.