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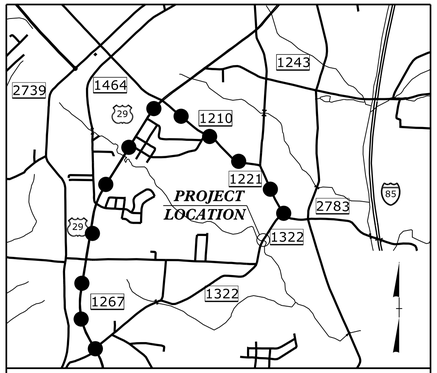
09/08/99

WBS PROJECT: BP9–R004

CONTRACT: DI00348

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



DETOUR

VICINITY MAP N.T.S.

100% PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

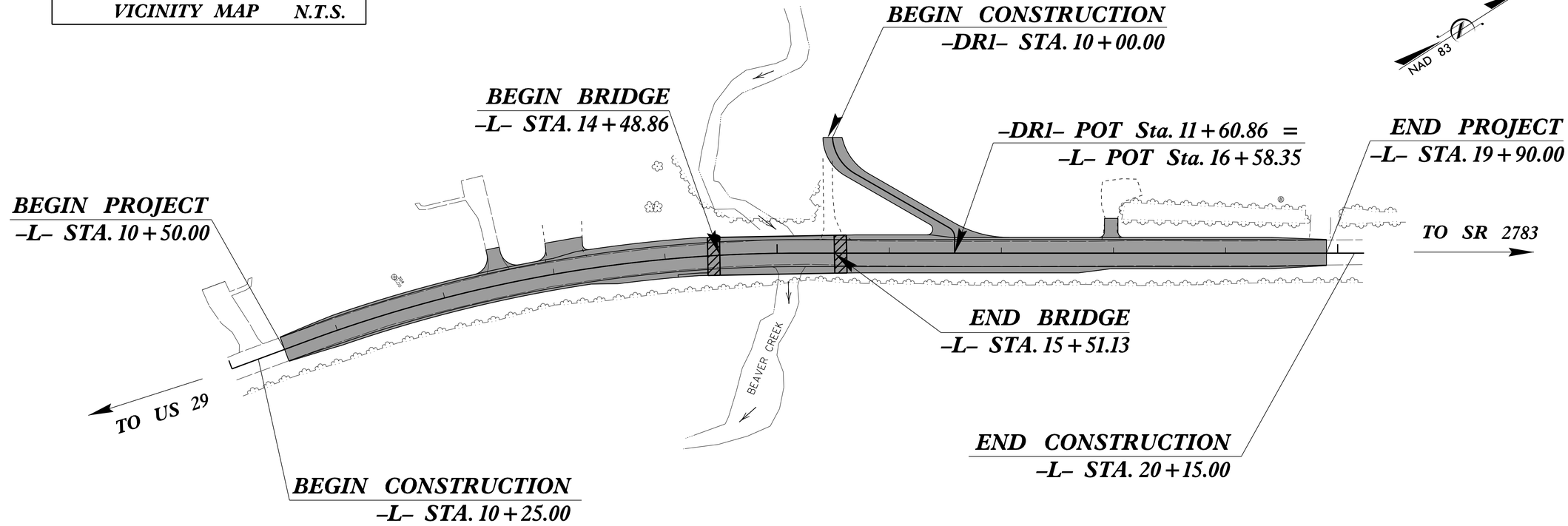
ROWAN COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP9–R004	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
BP9–R004.1	N/A	PE
BP9–R004.2	N/A	ROW, UTL.
BP9–R004.3	N/A	CONST.

LOCATION: BRIDGE NO. 790235 OVER BEAVER CREEK ON SR 1322 (EBENEZER ROAD)

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE (BRIDGE)



THERE IS NO CONTROL OF ACCESS ON THIS PROJECT.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2020 = 850

V = 45 MPH

FUNC CLASS =
MAJOR COLLECTOR
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY = 0.159

LENGTH STRUCTURE = 0.019

TOTAL LENGTH = 0.178

PREPARED IN THE OFFICE OF:

RS&H

1520 SOUTH BOULEVARD, SUITE 200
CHARLOTTE, NC 28203
NC FIRM LICENSE No: F-0493

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
SEPTEMBER 27, 2022

LETTING DATE:
NOVEMBER 13, 2024

DREW MORROW, PE
PROJECT ENGINEER

JUSTIN GERASIMOU, EI
PROJECT DESIGN ENGINEER

JEREMY KEATON, PE, PLS
NCDOT CONTACT

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 049764 ENGINEER ALEXANDER R. VINSON

8/29/2024

DocuSigned by: Alexander R. Vinson E790C5A47B6942E...

P.E.

SIGNATURE:

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039222 ENGINEER DREW D. MORROW

8/29/2024

DocuSigned by: Drew D. Morrow 6038A43B2D9743B...

P.E.

SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
BP9-R004	1A

ROADWAY DESIGN ENGINEER

8/12/2024

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RS&H
1520 SOUTH BOULEVARD, SUITE 200
CHARLOTTE, NC 28203
NC FIRM LICENSE No: F-0493

INDEX OF SHEETS

GENERAL NOTES

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

GRADE LINE:
GRADING AND SURFACING:

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

CLEARING:

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

DRIVEWAYS:

DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.02 USING 3 FOOT RADII OR RADII AS SHOWN ON THE PLANS. LOCATIONS OF DRIVES WILL BE AS SHOWN ON THE PLANS OR AS 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 DUKE ENERGY, CHARTER WINDSTREAM

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

RIGHT-OF-WAY MARKERS:

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

STANDARD DRAWINGS

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 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
815.02	Subsurface Drain
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
846.04	Drop Inlet Installation in Shoulder Berm Gutter
848.02	Driveway Turnout - Radius Type
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.
BP9-R004	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 — Vlneyard

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.

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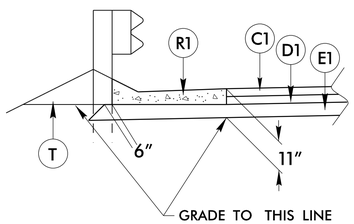
6/2/99

PAVEMENT SCHEDULE

(FINAL PAVEMENT SCHEDULE)

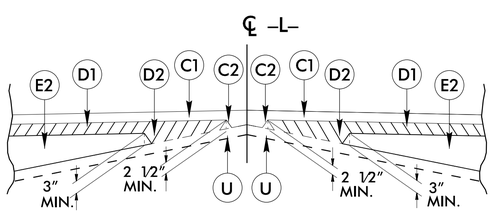
C1	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1″ DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 1″ IN DEPTH 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. APPROX. 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.
R1	SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL)

NOTE: ALL PAVEMENT SLOPES ARE 1:1 UNLESS NOTED OTHERWISE



SHOULDER BERM GUTTER DETAIL

–L– STA. 14+10.22 TO –L– STA. 14+37.18 RT



STANDARD WEDGING DETAIL

BRIDGE NO. 790235

PROJECT REFERENCE NO.	SHEET NO.
BP9-R004	2A-1

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039222 ENGINEER DREW D. MORROW

8/12/2024

PAVEMENT DESIGN ENGINEER

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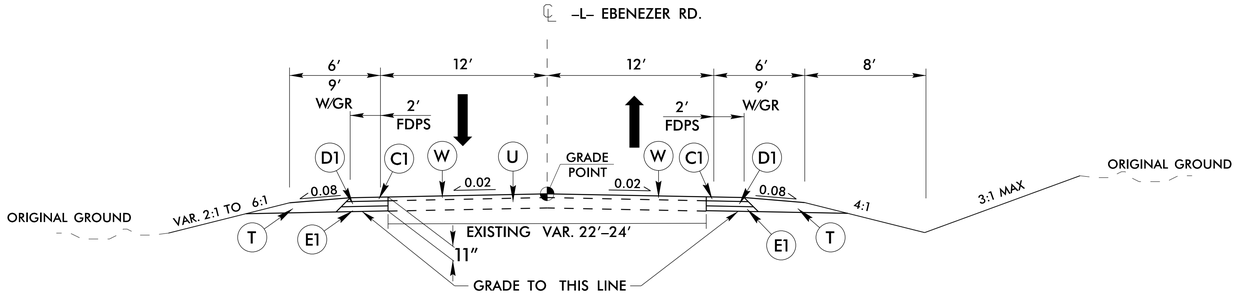

TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1

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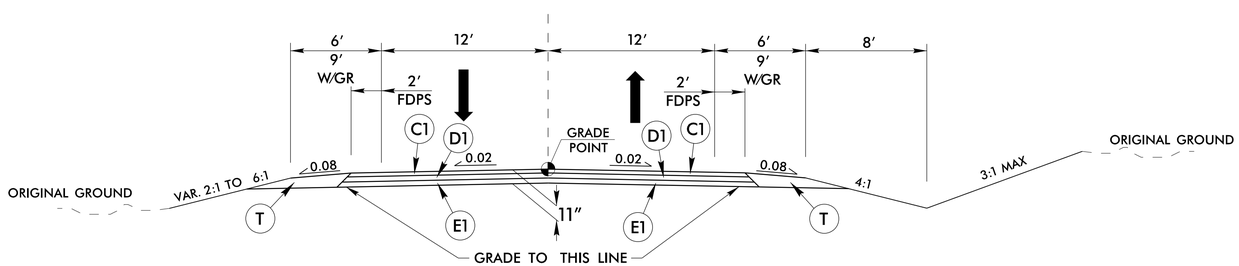
–L– STA. 17+00.00 TO –L– STA. 19+90.00



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2

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–L– STA. 15+51.13 TO –L– STA. 17+00.00

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PAVEMENT SCHEDULE

(FINAL PAVEMENT SCHEDULE)

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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.
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J1	PROP. 8″ AGGREGATE BASE COURSE.
R1	SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL)

NOTE: ALL PAVEMENT SLOPES ARE 1:1 UNLESS NOTED OTHERWISE

BRIDGE NO. 790235

PROJECT REFERENCE NO.	SHEET NO.
BP9-R004	2A-2

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 039222 DREW D MORROW

8/29/2024

PAVEMENT DESIGN ENGINEER

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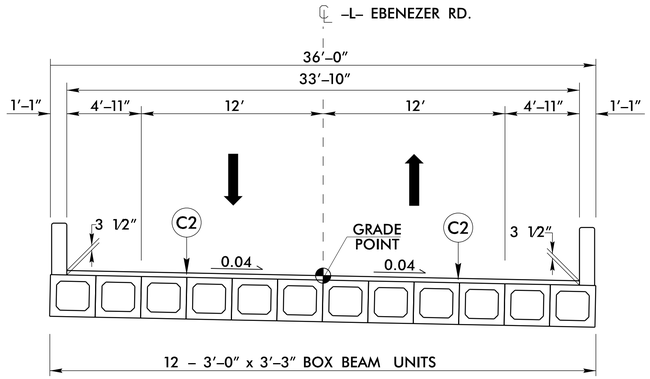
1520 SOUTH BOULEVARD, SUITE 200
CHARLOTTE, NC 28203
NC FIRM LICENSE No: F-0493



TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3

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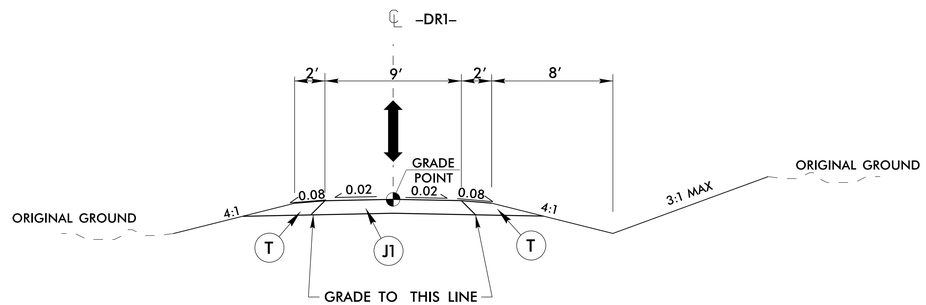

TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4

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12/06/07

COMPUTED BY: SGK DATE: 8/2/2024
CHECKED BY: DDM DATE: 8/2/2024

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
BP9-R004	3B-1

SUMMARY OF EARTHWORK

STATION	STATION	UNCL. EXCAV.	EMBANK. +%	BORROW	WASTE
-L- 10+50.00	-L- 14+48.86 (BR)	178	818	640	
-L- 15+51.13 (BR)	-L- 19+90.00	234	1,307	1,073	
-DR1- 10+00.00	-DR1- 11+46.86	72	122	50	
PROJECT TOTALS:		484	2,247	1,763	
EST. 5% TO REPLACE SOIL IN BORROW PIT				88	
GRAND TOTALS:		484		1,851	
SAY:		510		1,950	

NOTE: EARTHWORK QUANTITIES ARE CALCULATED BY THE ROADWAY DESIGNER. THESE EARTHWORK QUANTITIES ARE BASED IN PART ON SUBSURFACE DATA PROVIDED BY THE GEOTECHNICAL ENGINEERING UNIT

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

EST. SHALLOW UNDERCUT = 100 CUBIC YARDS CONTINGENCY
CLASS IV SUBGRADE STABILIZATION = 200 TONS CONTINGENCY
UNDERCUT EXCAVATION = 450 CUBIC YARDS CONTINGENCY
SELECT GRANULAR MATERIAL = 400 CUBIC YARDS CONTINGENCY

PAVEMENT REMOVAL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD^2
-L-	13+50.00	13+75.00	CL	59.94
-L-	16+75.00	17+00.00	CL	62.19
			TOTAL:	122.13
			SAY:	130

PAVEMENT BREAKING SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD^2
-L-	13+75.00	14+91.68	CL	282.02
-L-	15+30.77	16+75.00	CL	357.92
			TOTAL:	639.94
			SAY:	670

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LENGTH
-L-	14+10.22	14+37.18	26.96
		TOTAL:	26.96
		SAY:	30.00

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

STATION	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (CSP, CAAP, HDPE, or PVC) 12"	15"	18"	24"	30"	36"	42"	48"
-L- 14+23	16 RT	0401		711.00											
		0401	0402		708.25	705.97			12						
-L- 12+51	25 LT	0403			715.96	714.82									
-L- 18+10	CL	0404			725.35	722.90									
-DR1- 10+32	CL	0405			702.00	701.90									
-L- 16+64	13 LT														
-L- 13+13	25 LT	0406			713.68	711.64									
						TOTALS			12						

STATION	C.S. PIPE (UNLESS NOTED OTHRWISE) 12" .064	15" .064	18" .064	24" .064	24"	30" .079	30"	36" .079	36"	42" .109	42"	48" .109	48"
-L- 14+23													
-L- 12+51													
-L- 18+10													
-DR1- 10+32													
-L- 16+64													
-L- 13+13													
TOTALS													

STATION	CLASS V R.C. PIPE (UNLESS OTHERWISE NOTED) 12"	15"	18"	24"	30"	36"	42"	48"	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	C.S.P.
-L- 14+23													
-L- 12+51									28				
-L- 18+10			56										
-DR1- 10+32		28											
-L- 16+64													
-L- 13+13									48				
TOTALS		28	56						76				

STATION	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- 14+23	1						
-L- 12+51							
-L- 18+10							
-DR1- 10+32							
-L- 16+64							
-L- 13+13							
TOTALS	1						

STATION	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME & GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATE STD. 840.22	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	T.B.G.D.I. STD. 840.35	15" CORR. STEEL ELBOW	FRAMES AND NARROW SLOT FLAT GRATES STD. 840.29	CONC. COLLARS CL. "B" C.Y. STD 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN.FT.	15" DRAINAGE PIPE ELBOWS	REMARKS
-L- 14+23										1		1					
																2	
-L- 12+51															40		REMOVE APPROX. 40 LF OF EXIST. 15" CMP
-L- 18+10															37		REMOVE APPROX. 37 LF OF EXIST. 18" RCP
-DR1- 10+32															14		REMOVE APPROX. 14 LF OF EXIST. 12" RCP
-L- 16+64															17		REMOVE APPROX. 17 LF OF EXIST. 18" RCP
-L- 13+13															37		REMOVE APPROX. 37 LF OF EXIST. 15" HDPE
TOTALS										1		1			145	2	

ABBREVIATIONS

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

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

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH STRAIGHT	SHOP CURVED	DOUBLE FACED	WARRANT POINT APPROACH END	TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH APPROACH END	TRAILING END	W APPROACH END	TRAILING END	ANCHORS TL-3	TYPE III	IMPACT ATTENUATOR TYPE 350 EA	G	NG	SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
-L-	13+32.28	14+49.44 (BR)	LT	118.75				14+05.00	4.76	7.76		50.00′		1′	1	1							GUARDRAIL LENGTH REDUCED FOR DRIVEWAY
-L-	13+54.34	14+48.20 (BR)	RT	93.75			14+48.20 (BR)		5.02	8.02	50.00′		1′		1	1							
-L-	15+50.84 (BR)	16+30.91	LT	81.25			15+50.84 (BR)		4.28	7.28	50.00′		1′		1	1							GUARDRAIL LENGTH REDUCED FOR DRIVEWAY
-L-	15+51.46 (BR)	17+69.02	RT	218.75				16+16.00	5.55	8.55		50.00′		1′	1	1							
			SUBTOTALS	512.50																			
			ANCHOR DEDUCTION	275																			
			TOTAL	237.50																			
			SAY	250																			

ANCHOR DEDUCTION
TYPE TL-3: 4 @ 50′ = 200′
TYPE III: 4 @ 18.75′ = 75′
GRAND TOTAL = 275′
ADDITIONAL GUARDRAIL POSTS = 5

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Docusign Envelope ID: 0A19D6E1-64D3-4115-A7CC-CE37056BA959

COMPUTED BY: __ C.R. Lavender 5/22/2023	
CHECKED BY: ___ S.C. Clark 5/22/2023	

(2-3-23)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
BP9.R004.1 (SF790235)	3G-1

SUMMARY OF SUBSURFACE DRAINAGE

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
CONTINGENCY				UD	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 Subgrade Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY					100	200	300		
			TOTAL CY/TONS/SY:		100	200**	300**	0	0

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

Docusign Envelope ID: 6EFF28BE-F6B1-4374-9151-F03B3F037B42

8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
BP9-R004	4
R/W SHEET NO.	

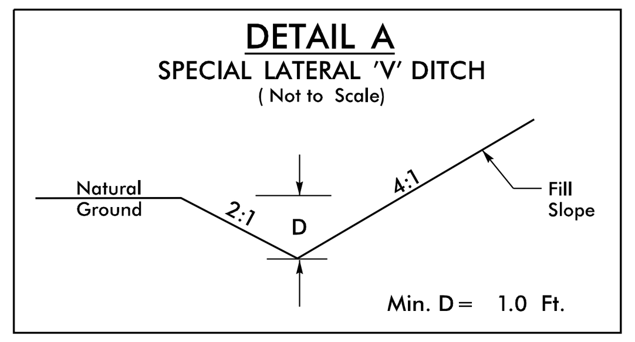
ROADWAY DESIGN ENGINEER — Docusigned by: Drew D. Morrow — SEAL 039222 — 8/29/2024

HYDRAULICS ENGINEER — Docusigned by: Alexander R. Vinson — SEAL 049764 — 8/29/2024

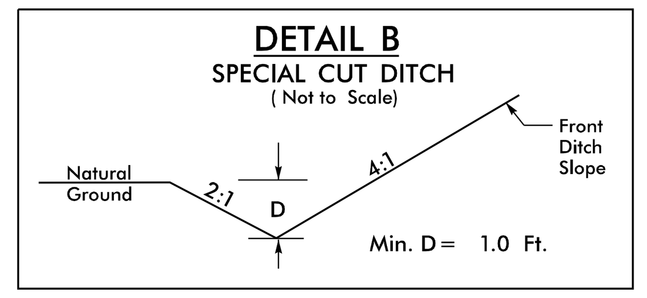
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H 1520 SOUTH BOULEVARD, SUITE 200 CHARLOTTE, NC 28203 NC FIRM LICENSE No: F-0493

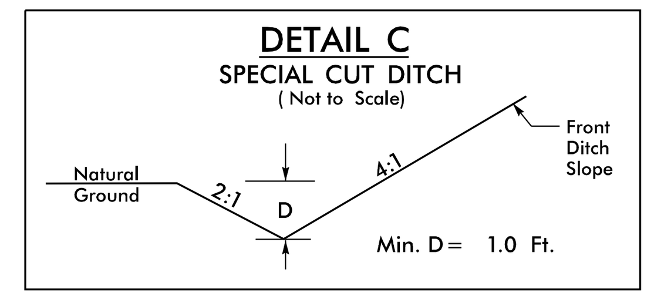
BRIDGE NO. 790235



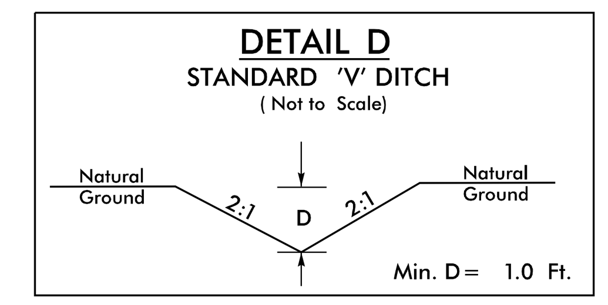
FROM -L- STA. 10+50 TO STA. 13+73 LT
FROM -L- STA. 12+25 TO STA. 14+41 RT
FROM -L- STA. 16+72 TO STA. 17+67 RT
FROM -L- STA. 18+50 TO STA. 19+90 RT
FROM -L- STA. 18+50 TO STA. 19+71 LT



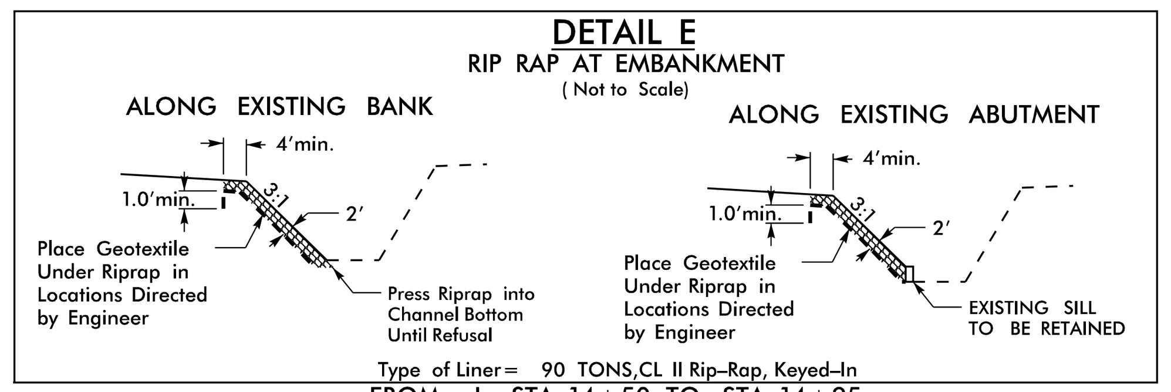
FROM -L- STA. 16+61 TO STA. 17+73 LT
FROM -L- STA. 18+10 TO STA. 18+50 LT



FROM -DR1- STA. 10+32 TO STA. 11+36 LT



-DR1- STA. 10+32 RT
L=32'; SLOPE=0.64%; DDE=20 CY

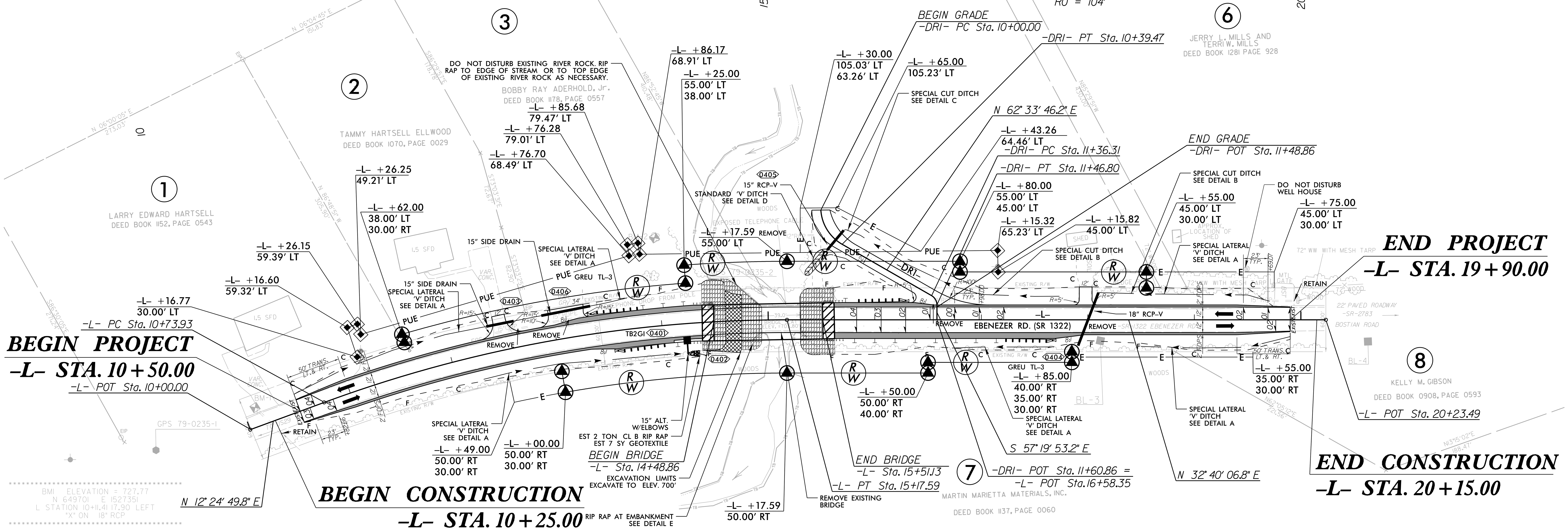


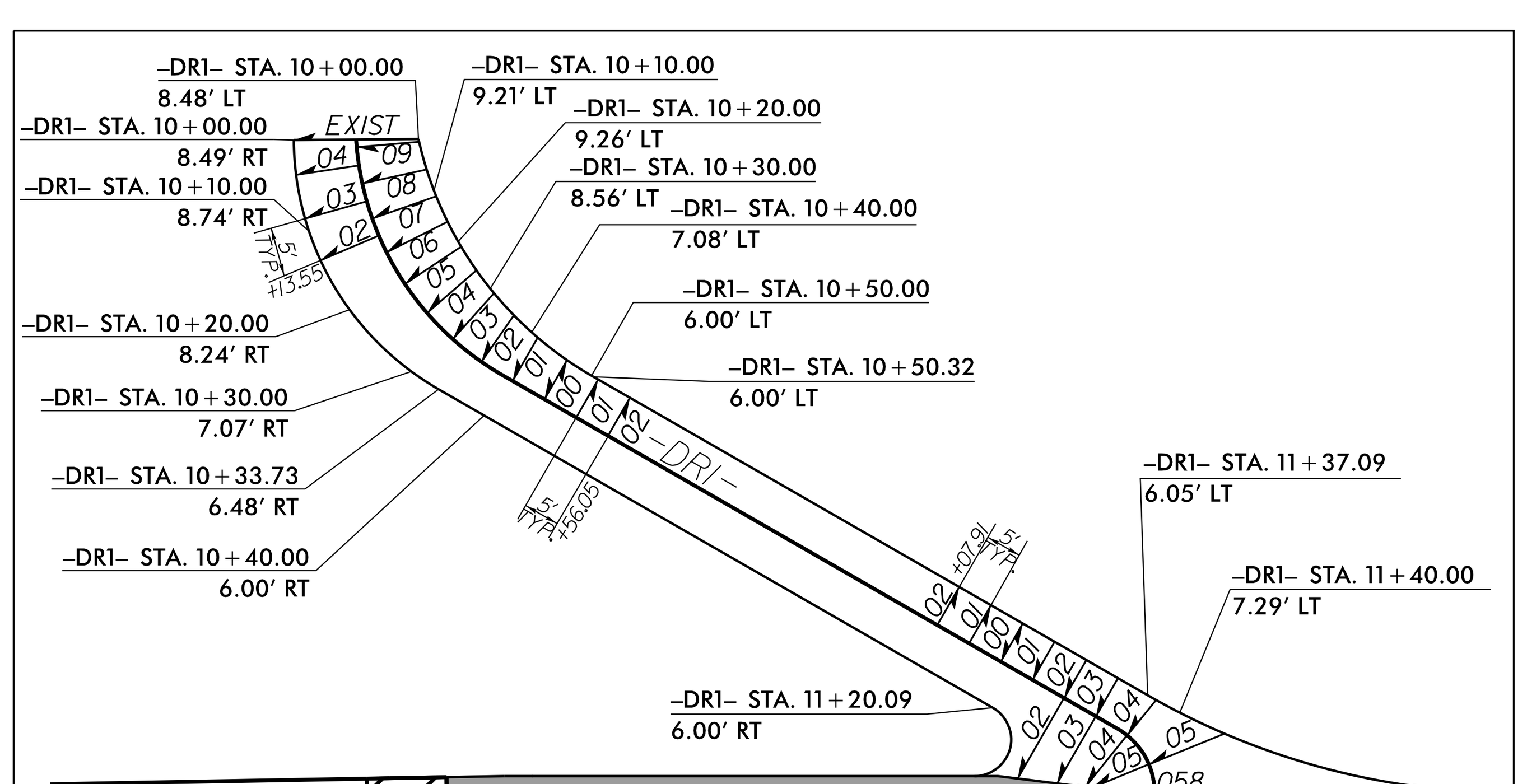
FROM -L- STA. 14+50 TO STA. 14+95
OR AS DIRECTED BY THE ENGINEER

-L- CURVE DATA
PI Sta 12+98.10
Δ = 20° 15' 17.0" (RT)
D = 4° 33' 55.4"
L = 443.66'
T = 224.17'
R = 1,255.00'
SE = 04
RO = 104'

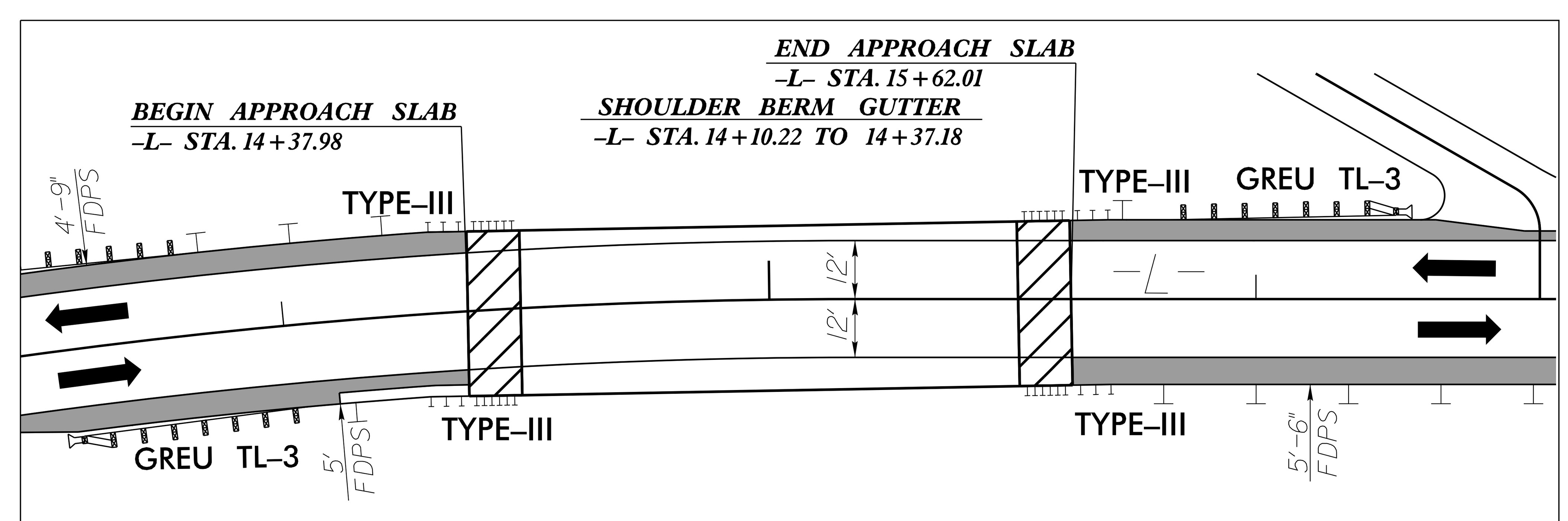
-DRI- CURVE DATA

PI Sta 10+21.51	PI Sta 11+42.09
Δ = 56° 32' 23.7" (LT)	Δ = 60° 06' 20.6" (RT)
D = 143° 14' 22.0"	D = 572° 57' 28.1"
L = 39.47'	L = 10.49'
T = 21.51'	T = 5.79'
R = 40.00'	R = 10.00'





CURVE WIDENING AND CROSS SLOPE DETAIL FOR -DRI- N.T.S.



BRIDGE SKETCH SHOWING BRIDGE/PAVEMENT RELATIONSHIP N.T.S.

(hatched)	BRIDGE APPROACH SLAB
FOR -L- PROFILE SEE SHEET 5	
FOR -DRI- PROFILE SEE SHEET 5	
FOR STRUCTURE PLANS, SEE SHEET S-1 THRU S-16	

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PROJECT REFERENCE NO.	SHEET NO.
BP9-R004	5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 039222, 8/12/2024	SEAL 049764, 8/12/2024

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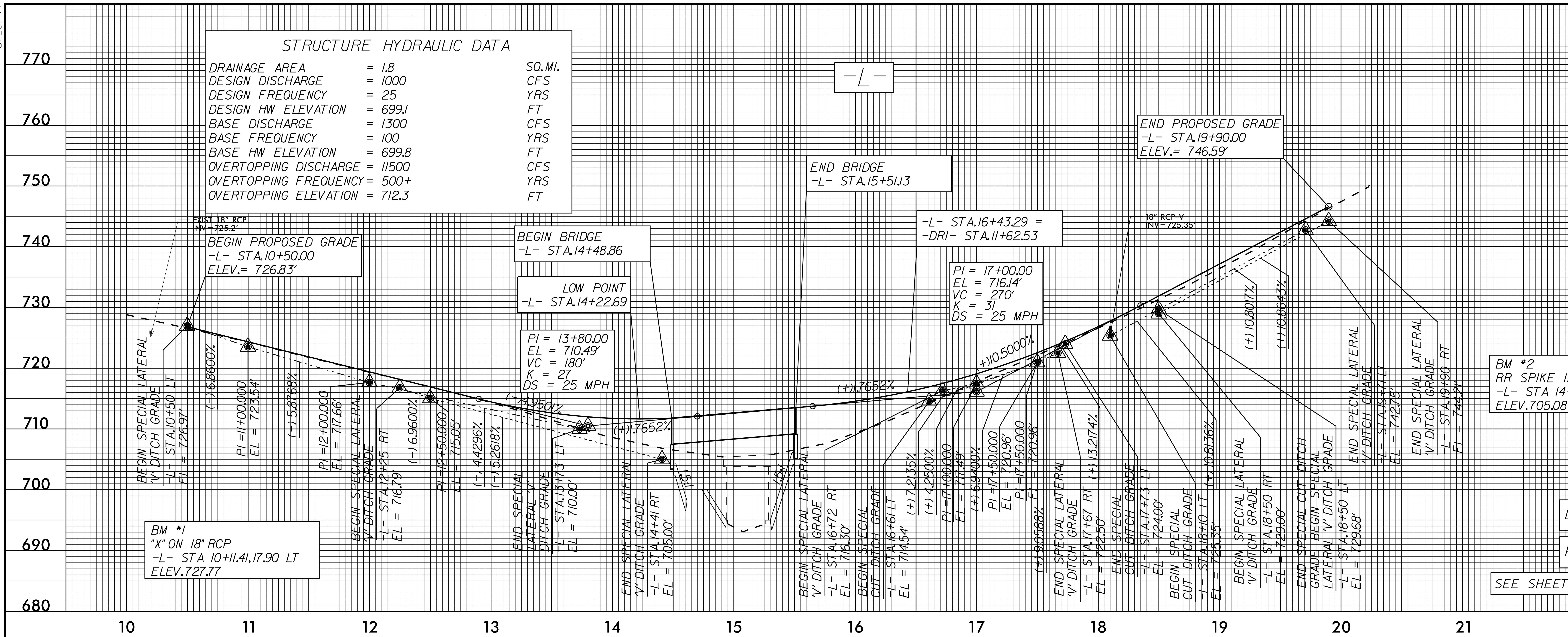
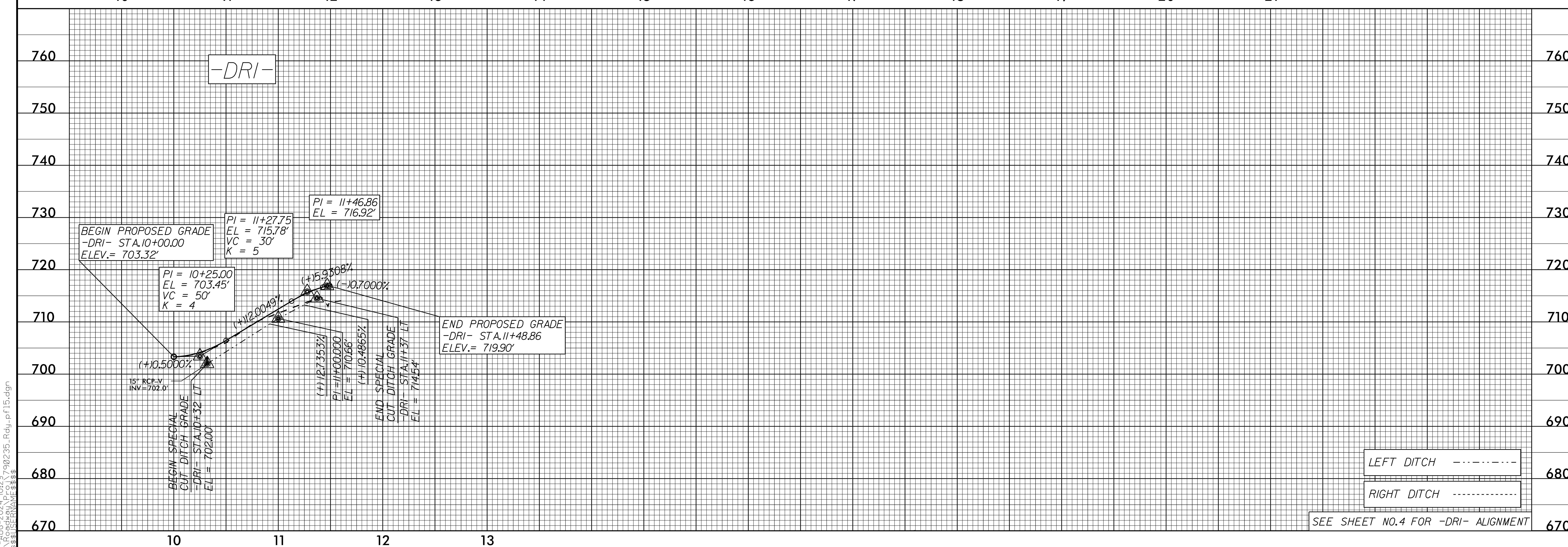
1520 SOUTH BOULEVARD, SUITE 200
CHARLOTTE, NC 28203
NC FIRM LICENSE No: F-0493





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STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP9-R004	RW01	05

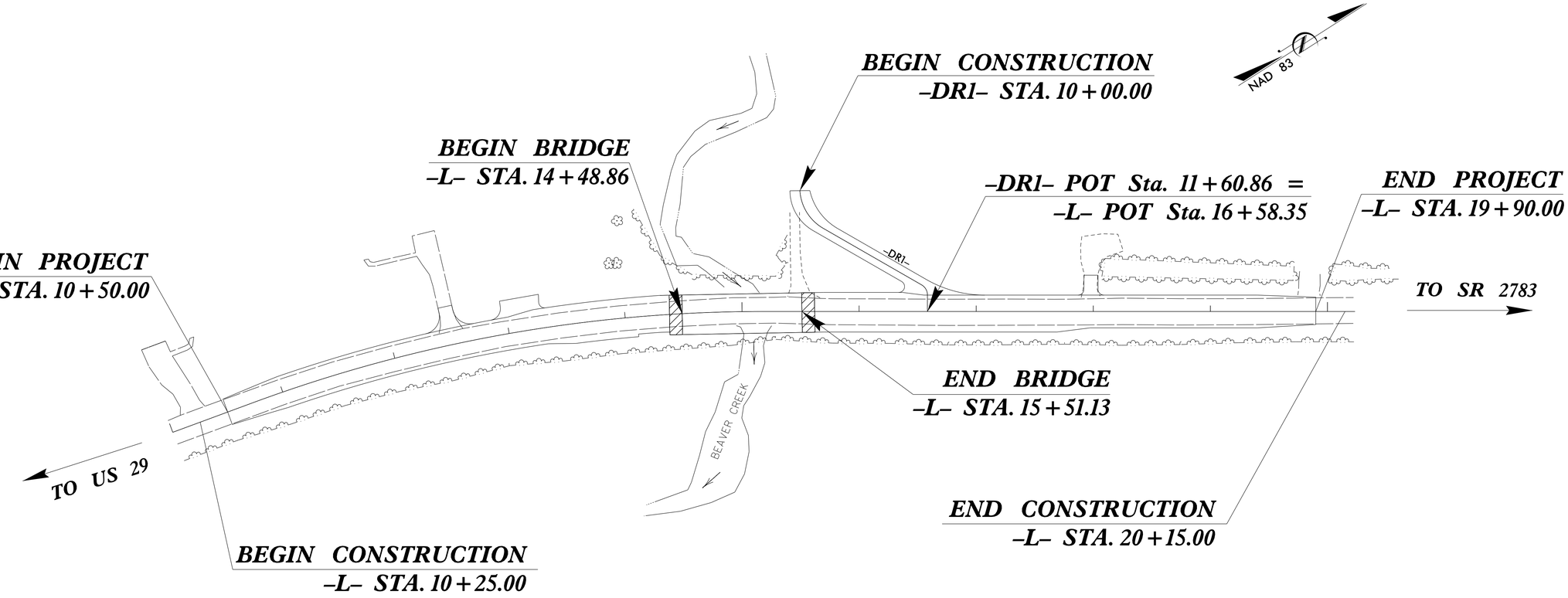
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

ROWAN COUNTY

TIP PROJECT: BP9–R004

09/08/99



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 "79-0235-2"
WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF
NORTHING: 650,112.524(ft) EASTING: 1,527,500.977(ft)
ELEVATION: 706.01(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT
(GROUND TO GRID) IS: 0.999855150
THE N.C. LAMBERT GRID BEARING AND
LOCALIZED HORIZONTAL GROUND DISTANCE FROM
"GPS 79-0235-2" TO -L- STATION 10+00.00 IS
S 17°35'00.74" W 447.87(ft)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

Prepared In the Office of:

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:	*LETTING DATE:*
09/27/2022	*11/13/2024*

PROFESSIONAL LAND SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-3877 LAND SURVEYOR MICHAEL L. MOTSINGER

DocuSigned by:
Michael L Motsinger
SIGNATURE OF SEAL AFFIXER

08/08/2024
Date:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

08-AUG-2024 13:31
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mmotsinger AT LS-3286/IL

6/2/99

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

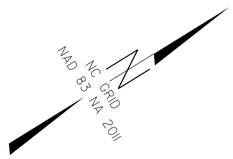
PROJECT REFERENCE NO.	SHEET NO.
BP9.R004	RW02C-1

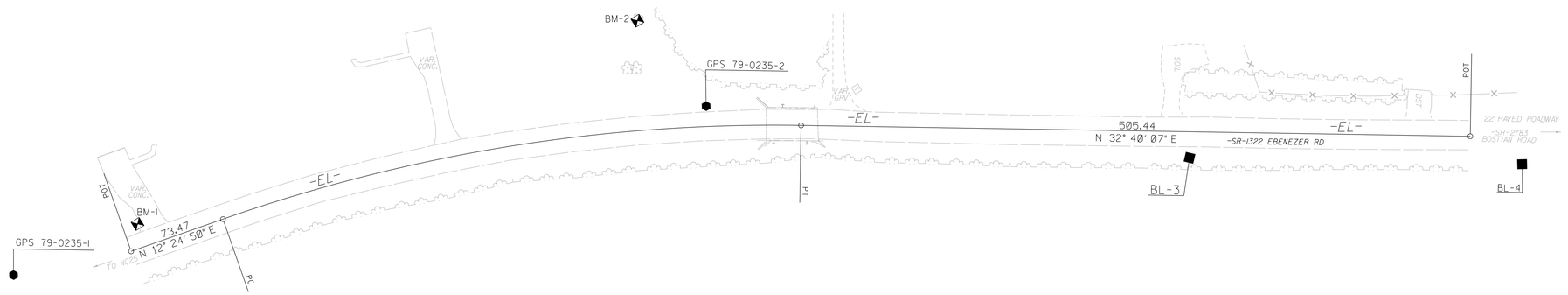
Location and Surveys

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-3877 LAND SURVEYOR MICHAEL L. MOTSINGER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





I, Michael L. Motsinger, PLS, certify that the Project Control was [performed/verified] under my supervision from an actual GPS survey made under my supervision and the following information was used to perform the survey:

Class of survey: ***AA***
Type of GPS field procedure: RTN
Dates of survey: 5-5-2017
Datum/Epoch: NAD 83 / 2011
Published/Fixed-control use: [Project Control if applicable, N/A for RTN]
Localized around: GPS-2
Northing: 650112.524
Easting: 1527500.977
Combined grid factor:0.999985513
Geoid model: NC12B
Units: English

I also certify that the Baseline Control for this project was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:20,000 (Class AA) and Vertical accuracy to Class A. Field work was performed from June 1, 2017 to June 30, 2017 , and all coordinates are based on NAD 83/2011 and all elevations are based on NAVD 88; that this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 13 th day of September, 2023.

DocuSigned by:
Michael L Motsinger
FDB8FE70E23C40E...

Professional Land Surveyor L-3877

NORTH CAROLINA PROFESSIONAL SEAL L-3877 LAND SURVEYOR MICHAEL L. MOTSINGER

SEE SHEET RW02C-2
FOR FURTHER
ALIGNMENT DETAILS

NOTES:

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

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mmotsinger AT LS-32867IL

6/2/99

REVISIONS

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

BL

POINT	DESC.	NORTH	EAST	ELEVATION
1	GPS 79-0235-1	649600.6420	1527334.1870	732.16
2	GPS 79-0235-2	650112.5240	1527500.9770	706.01
3	BL-3 (RESET)	650402.4110	1527726.0520	726.75
4	BL-4	650613.5140	1527862.2880	754.51

```
****************************************
BM1       ELEVATION = 727.77
N 649701       E 1527351
BL STATION 06+00  15 LEFT
"X" ON  18" RCP
****************************************
****************************************
BM2       ELEVATION = 705.08
N 650102       E 1527419
BL STATION 10+03  75 LEFT
RAILROAD SPIKE IN AN 18"POPLAR TREE
****************************************
```

PROJECT REFERENCE NO.	SHEET NO.
BP9.R004	RW02C-2

Location and Surveys

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-3877 LAND SURVEYOR MICHAEL L. MOTSINGER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

I, Michael L. Motsinger, PLS, certify that the Project Control was [performed/verified] under my supervision from an actual GPS survey made under my supervision and the following information was used to perform the survey:

Class of survey: ***AA***
Type of GPS field procedure: RTN
Dates of survey: 5-5-2017
Datum/Epoch: NAD 83 / 2011
Published/Fixed-control use: [Project Control if applicable, N/A for RTN]
Localized around: GPS-2
Northing: 650112.524
Easting: 1527500.977
Combined grid factor:0.999985513
Geoid model: NC12B
Units: English

I also certify that the Baseline Control for this project was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:20,000 (Class AA) and Vertical accuracy to Class A. Field work was performed from June 1, 2017 to June 30, 2017 , and all coordinates are based on NAD 83/2011 and all elevations are based on NAVD 88; that this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 8 th day of August, 2024.

DocuSigned by:
Michael L Motsinger
F0B6FE79E23C40E...
Professional Land Surveyor L-3877

NORTH CAROLINA PROFESSIONAL SEAL L-3877 LAND SURVEYOR MICHAEL L. MOTSINGER

SURVEY CONTROL

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

EL

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	649685.574	1527365.675							
LINE			N 12°24'49.8" E	73.47					
PC	649757.330	1527381.470							
CURVE			N 22°32'28.3" E	442.26	20°15'17.0"(RT)	04°33'21.8"	444.57	224.63	1257.58
PT	650165.800	1527551.008							
LINE			N 32°40'06.8" E	505.44					
POT	650591.281	1527823.832							

PROPOSED ALIGNMENT

L

TYPE	STATION	NORTH	EAST
POT	10+00.00	649685.5740	1527365.6755
PC	10+73.93	649757.7801	1527381.5693
PT	15+17.59	650165.4130	1527550.7598
POT	20+23.49	650591.2806	1527823.8320

DR1

TYPE	STATION	NORTH	EAST
PC	10+00.00	650247.8808	1527481.0664
PT	10+39.47	650247.3301	1527518.9525
PC	11+36.31	650291.9492	1527604.8951
PT	11+46.80	650291.4921	1527614.9006
POT	11+60.86	650283.9025	1527626.7369

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.

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mmotsinger AT LS-32867IL

6/2/99

REVISIONS

RIGHT OF WAY CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
BP9.R004	RW03E-1

Location and Surveys

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-3877 LAND SURVEYOR MICHAEL L. MOTSINGER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

I , Michael L. Motsinger , 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 October 20, 2022 to October 21, 2022, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 13 th day of September, 2023.

DocuSigned by:
Michael L. Motsinger
F0B8FE79E23C40E...

Professional Land Surveyor L-3877

NORTH CAROLINA PROFESSIONAL SEAL L-3877 LAND SURVEYOR MICHAEL L. MOTSINGER

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	11+62.00	-38.00	649853.8029	1527367.0542
L	11+62.00	-30.00	649851.5395	1527374.7273
L	13+00.00	30.00	649961.4091	1527477.4046
L	13+00.00	50.00	649953.6798	1527495.8507
L	14+25.00	-55.00	650111.8910	1527455.3385
L	14+25.00	-38.00	650103.7946	1527470.2867
L	15+17.59	-55.00	650195.0996	1527504.4596
L	15+17.59	50.00	650138.4229	1527592.8495
L	16+50.00	40.00	650255.2844	1527655.9034
L	16+50.00	50.00	650249.8866	1527664.3215
L	16+80.00	-45.00	650326.4197	1527600.5431
L	16+80.00	-55.00	650331.8175	1527592.1251
L	17+85.00	30.00	650374.3261	1527720.3554
L	17+85.00	40.00	650368.9283	1527728.7735
L	18+55.00	-45.00	650473.7360	1527695.0043
L	18+55.00	-30.00	650465.6393	1527707.6314

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	11+16.60	-59.32	649813.9979	1527333.9814
L	11+16.77	-30.00	649806.8939	1527362.4283
L	11+26.15	-59.39	649823.6951	1527336.4313
L	11+26.25	-49.21	649821.1955	1527346.3002
L	13+76.28	-79.01	650077.3220	1527410.4522
L	13+76.70	-68.49	650073.0718	1527420.0857
L	13+85.68	-79.47	650086.4756	1527414.4887
L	13+86.17	-68.91	650082.2016	1527424.1591
L	17+15.32	-65.23	650367.0721	1527602.5783
L	17+15.82	-45.00	650356.5733	1527619.8780

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 _____ TO _____ .

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mmotsinger AT LS-32867IL

PROJECT REFERENCE NO.	SHEET NO.
BP9.R004	RW04

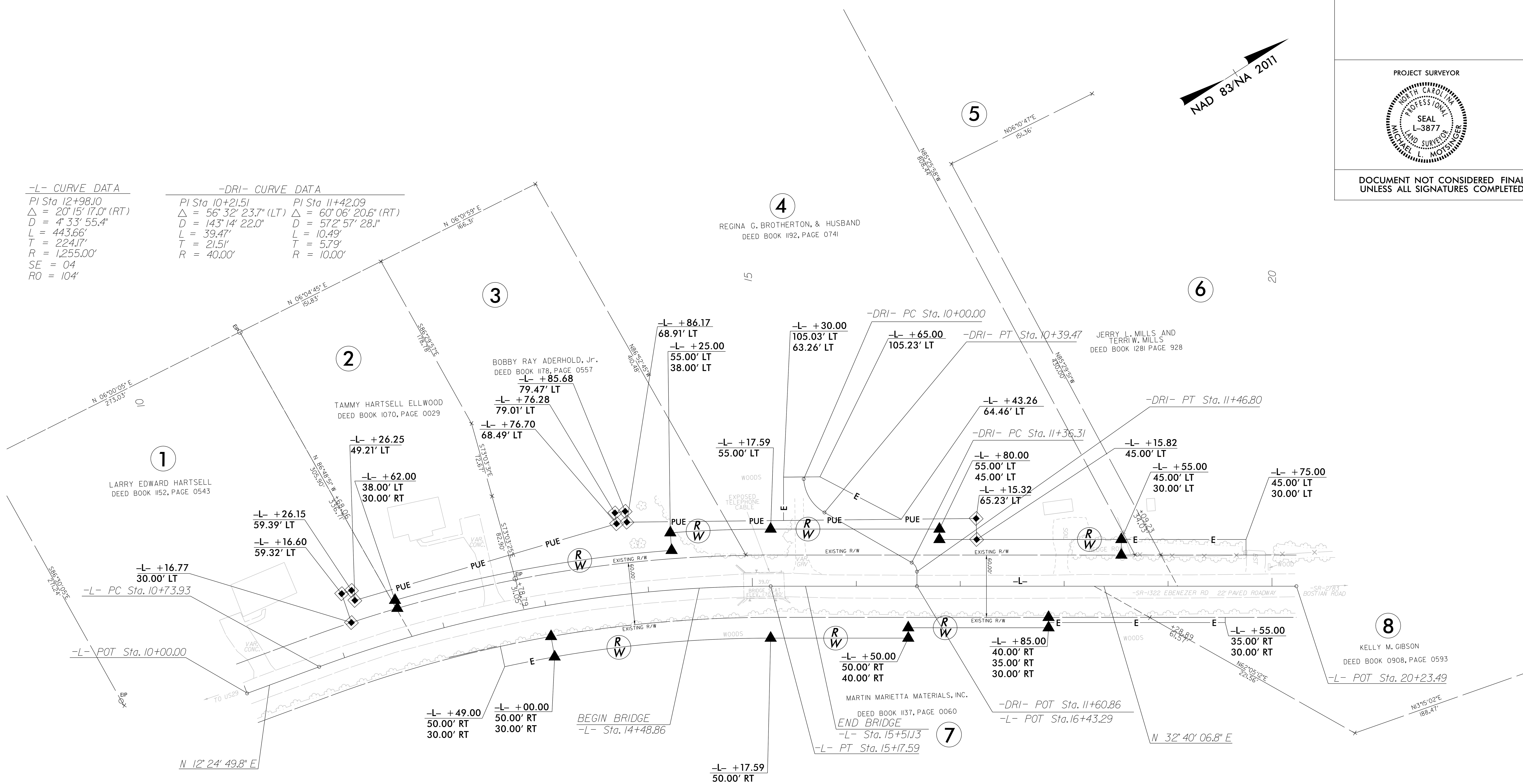
Location and Surveys

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-3877 LAND SURVEYOR MICHAEL L. MOTSINGER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS



I, Michael L. Motsinger, 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 October 20, 2022 to October 21, 2022, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 8 th day of August, 2024.

DocuSigned by: Michael L. Motsinger FDB6FE70E23C40E...

Professional Land Surveyor L-3877

NORTH CAROLINA PROFESSIONAL SEAL L-3877 LAND SURVEYOR MICHAEL L. MOTSINGER

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 _____ TO _____ .

6/2/99

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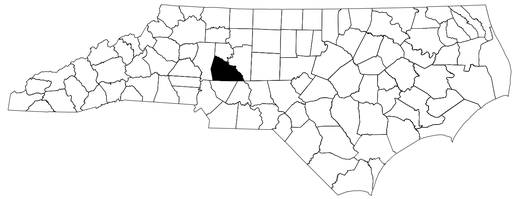
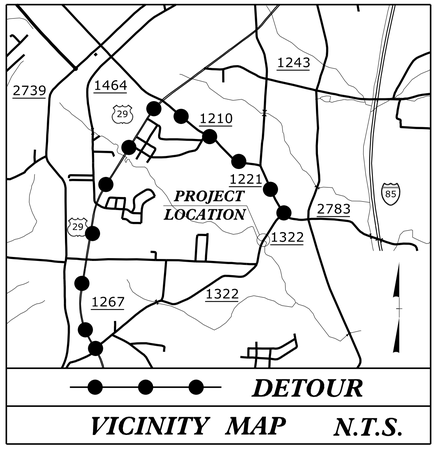
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

ROWAN COUNTY

LOCATION: BRIDGE NO. 790235 OVER BEAVER CREEK ON SR 1322 (EBENEZER ROAD)





DETOUR

VICINITY MAP N.T.S.

100% PLANS

INDEX OF SHEETS

SHEET NO.
TMP-1

BP9-R004

WBS PROJECT:

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

PLANS PREPARED BY:

DREW D. MORROW, P.E.
PROJECT ENGINEER

NIKI E. AVGERINOS, P.E.
PROJECT DESIGN ENGINEER

NCDOT CONTACTS:

KEN THORNEWELL, P.E.

JUSTIN BEAVER, P.E.

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

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RS&H
NC FIRM LICENSE No: F-0493
8521 SIX FORKS ROAD, SUITE 400
RALEIGH, NC 27615

APPROVED: DocuSigned by: Drew D. Morrow 8038A43B2D97438...

DATE: 8/12/2024

NORTH CAROLINA PROFESSIONAL SEAL 039222 ENGINEER DREW D. MORROW

7/30/2024
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PROJ. REFERENCE NO.	SHEET NO.
BP9-R004	TMP-1A

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
1110.02	PORTABLE WORK ZONE SIGNS
1130.01	DRUM
1145.01	BARRICADES - TYPE III
1150.01	FLAGGERS

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
- CONTINUED CONSTRUCTION

SIGNALS

EXISTING | PROPOSED | TEMPORARY (TEMP)

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

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8521 SIX FORKS ROAD, SUITE 400
RALEIGH, NC 27615

APPROVED: DocuSigned by: Drew D. Morrow 6038A43B2D9743B...

DATE: 8/12/2024

NORTH CAROLINA PROFESSIONAL SEAL 039222 ENGINEER DREW D. MORROW

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

ROADWAY STANDARD DRAWINGS & LEGEND

7/30/2024
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PROJ. REFERENCE NO.	SHEET NO.
BP9-R004	TMP-1B

MANAGEMENT STRATEGIES

PHASE I:

CLOSE SR 1322 (EBENEZER RD.) TO TRAFFIC AND DETOUR TRAFFIC OFF-SITE

WITH TRAFFIC DETOURED, BEGIN CONSTRUCTION OF THE PROPOSED STRUCTURE ALONG -L- SR 1322 (EBENEZER RD.)

USING LANE CLOSURES AND WEDGING, AND WHILE MAINTAINING DRIVEWAY ACCESS, CONSTRUCT -L- (LT) AND -DR1-

PHASE II:

WITH TRAFFIC DETOURED, COMPLETE CONSTRUCTION OF THE PROPOSED STRUCTURE ALONG -L- SR 1322 (EBENEZER RD.)

USING LANE CLOSURES AND WEDGING, AND WHILE MAINTAINING DRIVEWAY ACCESS, COMPLETE CONSTRUCTION OF -L- (RT)

GENERAL NOTES

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS, AND ROADWAY DETAILS ARE NOT ATTAINABLE TO MEET FIELD CONDITIONS OR RESULT IN DUPLICATE OR UNDESIRED OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.

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

LANE AND SHOULDER CLOSURE REQUIREMENTS

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

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

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

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

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

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

F) PROVIDE TRAFFIC CONTROL FOR APPROPRIATE LANE CLOSURES FOR SURVEYING DONE BY THE DEPARTMENT.

PAVEMENT EDGE DROP OFF REQUIREMENTS

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

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

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

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

H) DO NOT EXCEED A DIFFERENCE OF 2 INCHES IN ELEVATION BETWEEN OPEN LANES OF TRAFFIC FOR NOMINAL LIFTS OF 1.5 INCHES. INSTALL ADVANCE WARNING "UNEVEN LANES" SIGNS (W8-11) 500 FT IN ADVANCE AND A MINIMUM OF EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

TRAFFIC PATTERN ALTERATIONS

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

SIGNING

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

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

   AND

   PROVIDE SIGNING REQUIRED FOR THE OFF-SITE DETOUR ROUTE AS SHOWN IN THE TRAFFIC CONTROL PLANS.

L) 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.

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

N) INSTALL BLACK ON ORANGE "DIP" SIGNS (W8-2) AND/OR "BUMP" SIGNS (W8-1) 500 FT IN ADVANCE OF THE UNEVEN AREA, OR AS DIRECTED BY THE ENGINEER.

TRAFFIC CONTROL DEVICES

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

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

PAVEMENT MARKINGS AND MARKERS

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

ROAD NAME	MARKING	MARKER
EBENEZER RD.	PAINT	N/A

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

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

RS&H
NC FIRM LICENSE No: F-0493
8521 SIX FORKS ROAD, SUITE 400
RALEIGH, NC 27615

APPROVED: DocuSigned by: Drew D. Morrow 8038A43B2D9743B...
DATE: 8/12/2024

NORTH CAROLINA PROFESSIONAL SEAL 039222 ENGINEER DREW D. MORROW

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TRANSPORTATION OPERATIONS PLAN

7/30/2024
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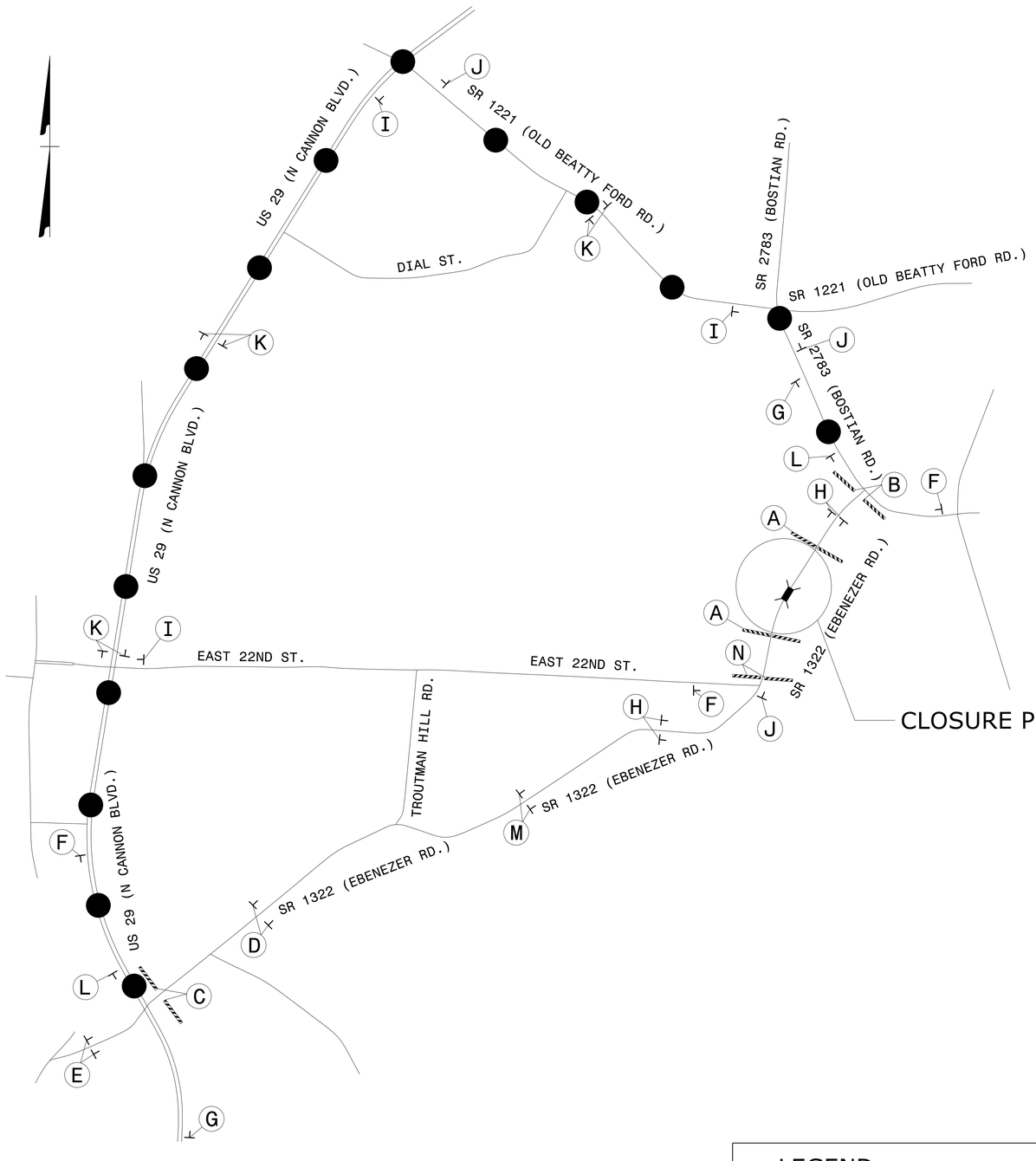
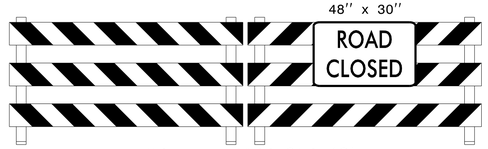
BP9-R004	TMP-2



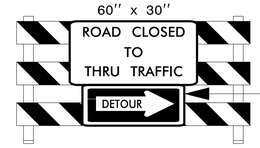
R11-2
48″ x 30″



TYPE III BARRICADE(S)

A

R11-4
60″ x 30″



M4-10R
48″ x 18″

TYPE III BARRICADE

B

R11-3
60″ x 30″

M4-10L
48″ x 18″

TYPE III BARRICADE

C

W20-3
48″ X 48″

D

W20-2
48″ X 48″

E

W20-3
48″ X 48″

NEXT LEFT SP-4L
42″ X 12″

F

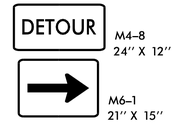
W20-3
48″ X 48″

NEXT RIGHT SP-4R
42″ X 12″

G

W20-3
48″ X 48″

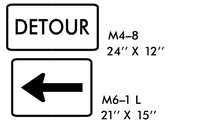
H



M4-8
24″ X 12″

M6-1
21″ X 15″

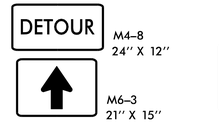
I



M4-8
24″ X 12″

M6-1 L
21″ X 15″

J



M4-8
24″ X 12″

M6-3
21″ X 15″

K

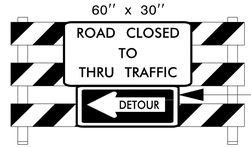
M4-8 A
24″ X 18″

L

W20-3
48″ X 48″

M

R11-4
60″ x 30″



M4-10L
48″ x 18″

TYPE III BARRICADE

N

LEGEND

DETOUR ROUTE

RS&H
NC FIRM LICENSE No: F-0493
8521 SIX FORKS ROAD, SUITE 400
RALEIGH, NC 27615

APPROVED: DocuSigned by: Drew D. Morrow 6038A43B2D97438...

DATE: 8/29/2024

NORTH CAROLINA PROFESSIONAL SEAL 039222 ENGINEER DREW D. MORROW

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DETOUR

8/29/2024
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PROJ. REFERENCE NO.	SHEET NO.
BP9-R004	TMP-3

PHASING

NOTES:

'RSD' REFERS TO NCDOT ROADWAY STANDARD DRAWINGS

COMPLETE ANY PROPOSED OR TEMPORARY WIDENING IN SUCH A MATTER THAT PONDING OF WATTER WILL NOT OCCUR IN THE TRAVEL LANE.

ALL PROPOSED ASPHALT ROADWAY CONSTRUCTION IS UP TO BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COURSE UNLESS OTHERWISE NOTED.

PHASE I STEP 1

USING RSD 1101.01 (SHEET 3 OF 3), PLACE ALL ADVANCED WARNING SIGNS ALONG -L- SR 1322 (EBENEZER RD.).

USING RSD 1101.03 (SHEET 1 OF 9), INSTALL DETOUR ROUTE SIGNING TO CLOSE SR 1322 (EBENEZER RD.).

PHASE I STEP 2

USING ROAD CLOSURES AND AN OFF-SITE DETOUR WITH RSD 1101.03 (SHEET 1 OF 9) ALONG US 29 (N. CANNON BLVD.), SR 1221 (OLD BEATTY FORD RD.) AND SR 2783 (BOSTIAN RD.), BEGIN CONSTRUCTION OF THE PROPOSED STRUCTURE ALONG -L- SR 1322 (EBENEZER RD.) (SEE DETOUR SHEET TMP-2).

-L- STA 13+30± TO -L- STA 16+25±

USING RSD 1101.02 (SHEET 1 OF 19), LANE CLOSURES, WEDGING, AND WHILE MAINTAINING DRIVEWAY ACCESS, CONSTRUCT -L- SR 1322 (EBENEZER RD.) AND -DR1-.

-L- STA 10+25± (LT) TO -L- STA 13+30± (LT)
-L- STA 16+25± (LT) TO -L- STA 20+15± (LT)

PHASE II

USING ROAD CLOSURES AND AN OFF-SITE DETOUR WITH RSD 1101.03 (SHEET 1 OF 9) ALONG US 29 (N. CANNON BLVD.), SR 1221 (OLD BEATTY FORD RD.) AND SR 2783 (BOSTIAN RD.), COMPLETE CONSTRUCTION OF THE PROPOSED STRUCTURE ALONG -L- SR 1322 (EBENEZER RD.) (SEE DETOUR SHEET TMP-2).

-L- STA 13+30± TO -L- STA 16+25±

USING RSD 1101.02 (SHEET 1 OF 19), LANE CLOSURES, WEDGING, AND WHILE MAINTAINING DRIVEWAY ACCESS, COMPLETE CONSTRUCTION OF -L- SR 1322 (EBENEZER RD.).

-L- STA 10+25± (RT) TO -L- STA 13+30± (RT)
-L- STA 16+25± (RT) TO -L- STA 20+15± (RT)

PHASE III

USING RSD 1101.02 (SHEET 1 OF 19) PLACE THE FINAL LAYER OF SURFACE COURSE AND FINAL MARKINGS ALONG -L- SR 1322 (EBENEZER RD.) AND PLACE ALL TRAFFIC IN THE FINAL TRAFFIC PATTERN. REMOVE ALL TRAFFIC CONTROL DEVICES FROM THE PROJECT LIMITS.

RS&H
NC FIRM LICENSE No: F-0493
8521 SIX FORKS ROAD, SUITE 400
RALEIGH, NC 27615

APPROVED: DocuSigned by: Drew D. Morrow 6038A4382D97438...
DATE: 8/12/2024

NORTH CAROLINA PROFESSIONAL SEAL 039222 ENGINEER DREW D. MORROW

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TEMPORARY TRAFFIC CONTROL PHASING

7/30/2024
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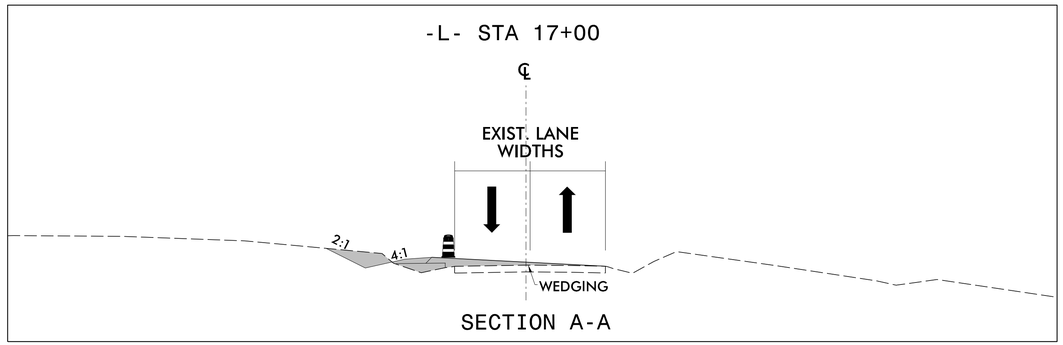
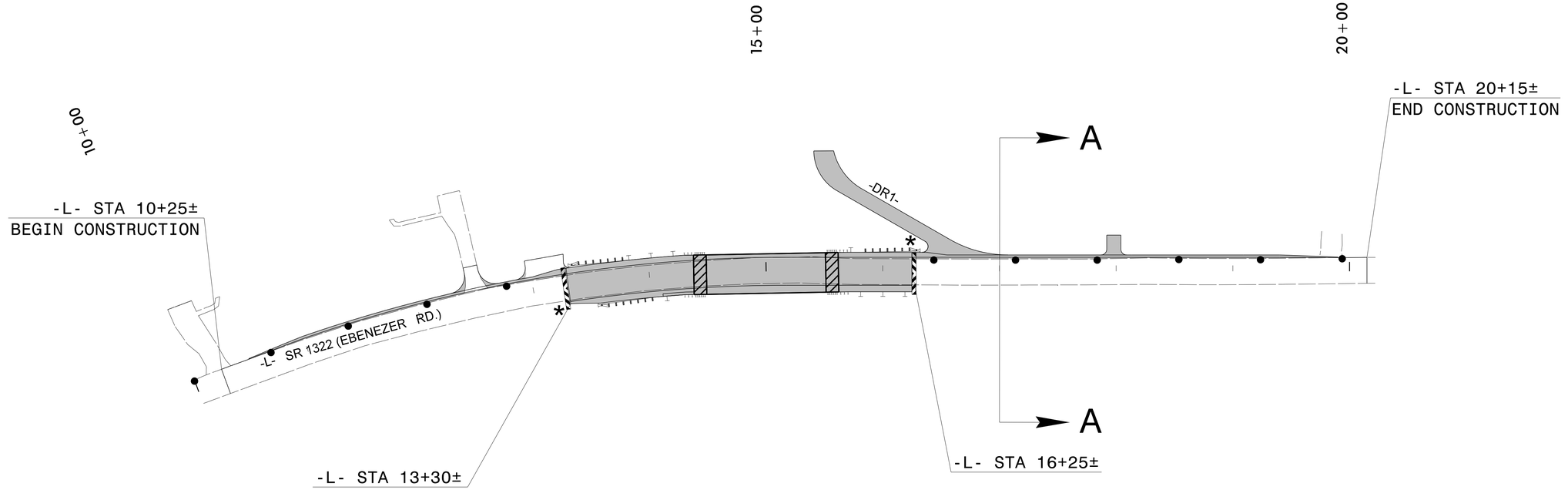
PROJ. REFERENCE NO.	SHEET NO.
BP9-R004	TMP-4



NAD 83/NA 2011



*NOTE: SEE TMP-2 FOR DETOUR ROUTE AND SIGNING

RS&H
NC FIRM LICENSE No: F-0493
8521 SIX FORKS ROAD, SUITE 400
RALEIGH, NC 27615

APPROVED: Docusigned by: Drew D. Morrow 6038A43B2D9743B...
DATE: 8/12/2024

NORTH CAROLINA PROFESSIONAL SEAL 039222 ENGINEER DREW D MORROW

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

PHASE I DETAIL

7/30/2024
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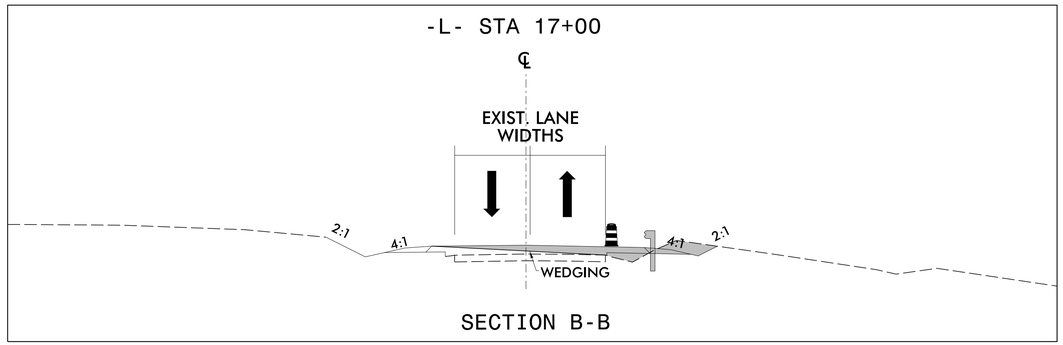
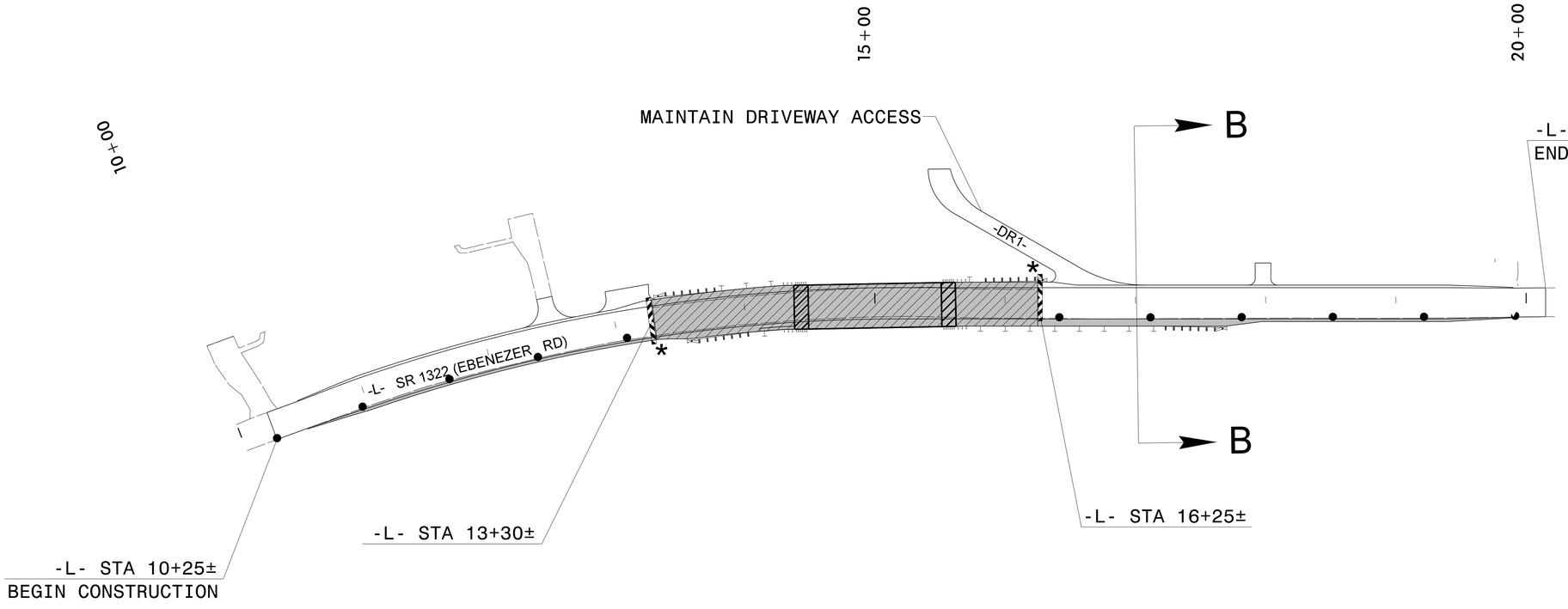
PROJ. REFERENCE NO.	SHEET NO.
BP9-R004	TMP-5



SECTION B-B

NAD 83/NA 2011



RS&H
NC FIRM LICENSE No: F-0493
8521 SIX FORKS ROAD, SUITE 400
RALEIGH, NC 27615

*NOTE: SEE TMP-2 FOR DETOUR ROUTE AND SIGNING

APPROVED: DocuSigned by: Drew D. Morrow 6038A43B2D9743B...

DATE: 8/12/2024

NORTH CAROLINA PROFESSIONAL SEAL 039222 ENGINEER DREW D. MORROW

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

PHASE II DETAIL

7/30/2024
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CONTRACT: WBS PROJECT: BP9-R004

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING PLAN

ROWAN COUNTY

LOCATION: BRIDGE NO. 790235 OVER BEAVER CREEK ON SR 1322 (EBENEZER ROAD)

TIP NO.	SHEET NO.
BP9-R004	PMP-1

APPROVED: DocuSigned by: Drew D. Morrow 603BA43B2D9743B...

DATE: 9/24/2024

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 039222 ENGINEER DREW D. MORROW

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

INDEX

ROADWAY STANDARD DRAWING

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

STD. NO.	TITLE
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTILANE ROADWAYS
1205.12	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

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
EBENEZER RD.	THERMOPLASTIC	N/A

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

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

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

E) REMOVE ALL RESIDUE AND SURFACE LAITANCE BY ACCEPTABLE METHODS ON CONCRETE BRIDGE DECKS PRIOR TO PLACING POLYUREA PAVEMENT MARKING MATERIAL.

PAVEMENT MARKING SCHEDULE

T1	WHITE EDGELINE	THERMOPLASTIC (4")
T13	YELLOW DOUBLE CENTER	THERMOPLASTIC (4")

N.C.D.O.T. CONTACT INFORMATION

J. NAVARRETE — *SIGNING & DELINEATION PROJECT DESIGN ENGINEER*

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION

PLAN PREPARED BY: *RS&H*

DREW MORROW, P.E. — PROJECT ENGINEER

NIKI AVGERINOS, P.E. — PROJECT DESIGNER

RS&H
8521 SIX FORKS ROAD, SUITE 400
RALEIGH, NC 27615
NC FIRM LICENSE No: F-0493

9/24/2024
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TIP NO.	SHEET NO.
BP9-R004	PMP-2

APPROVED: DocuSigned by: Drew D. Morrow 6038A43B2D9743B...

DATE: 8/29/2024

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 039222 ENGINEER DREW D. MORROW

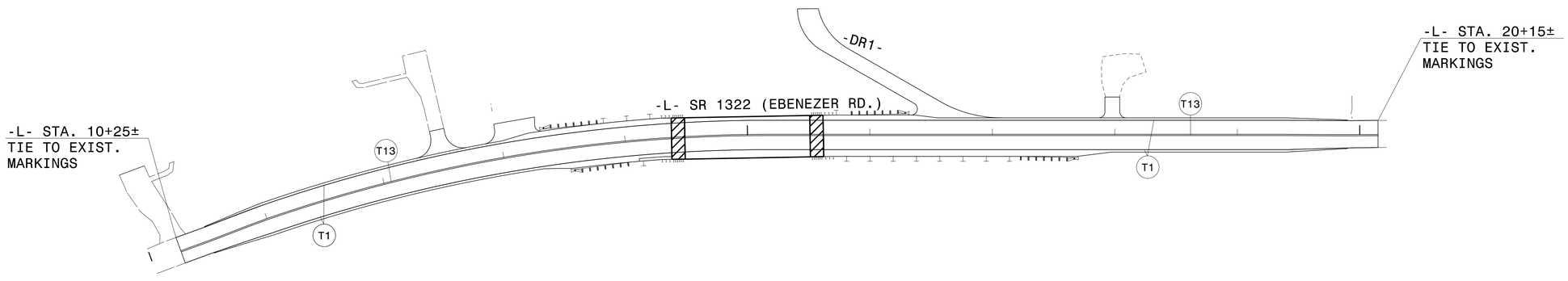
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/NA 2011

10

15

20



RS&H

NC FIRM LICENSE No: F-0493
8521 SIX FORKS ROAD, SUITE 400
RALEIGH, NC 27615

PAVEMENT MARKING DETAIL

8/27/2024
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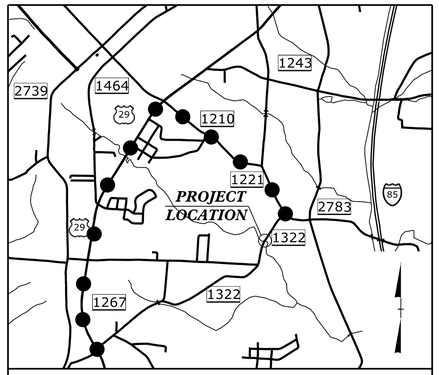
Docusign Envelope ID: 6EFF28BE-F6B1-4374-9151-F03B3F037B42

WBS PROJECT: BP9–R004

CONTRACT: DI00348



VICINITY MAP N.T.S.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

ROWAN COUNTY

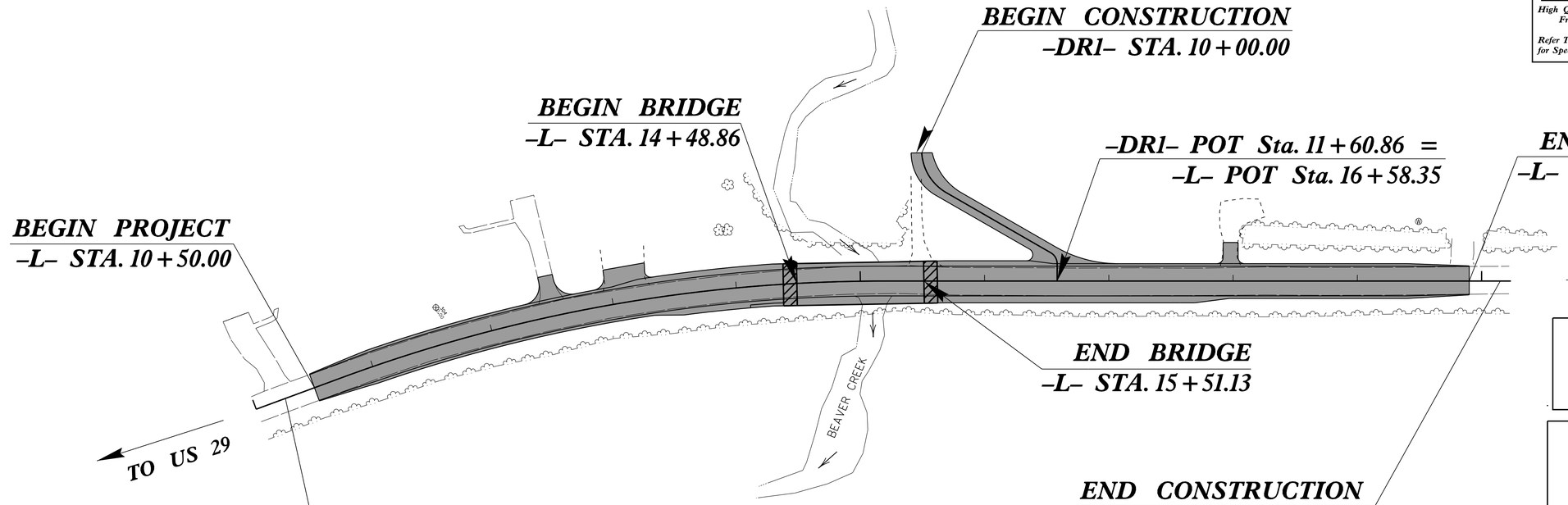
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP9–R004	EC-1	8

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
BP9–R004.1	N/A	PE
BP9–R004.2	N/A	ROW, UTL.
BP9–R004.3	N/A	CONST.

NAD 83

LOCATION: BRIDGE NO. 790235 OVER BEAVER CREEK ON SR 1322 (EBENEZER ROAD)

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE (BRIDGE)



HIGH QUALITY WATER(S) EXIST ON THIS PROJECT

High Quality Water Zone(s) Exist
From Sta. 10+50.00
to Sta. 19+90.00
Refer To E. C. Special Provisions for Special Considerations.

THIS PROJECT HAS BEEN DESIGNED TO SENSITIVE WATERSHED STANDARDS.

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

ENVIRONMENTALLY SENSITIVE AREA(S) EXIST ON THIS PROJECT

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 APPLICABLE REGULATIONS SET FORTH BY THE NCG–010000 GENERAL CONSTRUCTION PERMIT AND ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY DIVISION OF WATER RESOURCES.

RS&H

Prepared In the Office of:

RS&H

1520 SOUTH BOULEVARD, SUITE 200
CHARLOTTE, NC 28203
NC FIRM LICENSE NO: F–0493

Designed by:

ALEXANDER VINSON *3909*
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.

27-AUG-2024 14:43
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$$$$USERNAME$$$$

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PROJECT REFERENCE NO.	SHEET NO.
BP9-R004	EC-02

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

EROSION & SEDIMENT CONTROL LEGEND

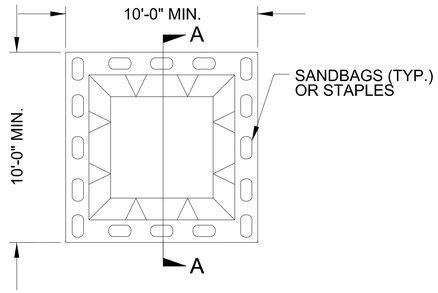
Std. #	Description	Symbol
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
1630.02	Silt Basin Type B	
1630.03	Temporary Silt Ditch	TSD
1630.04	Stilling Basin	
1630.05	Temporary Diversion	TD
1630.06	Special Stilling Basin	
1630.07	Skimmer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

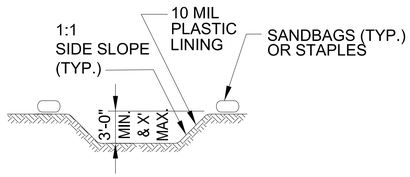
Std. #	Description	Symbol
1633.01	Temporary Rock Silt Check Type A	
1633.02	Temporary Rock Silt Check Type B	
1633.03	Temporary Rock Silt Check Type A with Excelsior Matting and Flocculant	
1634.01	Temporary Rock Sediment Dam Type A	
1634.02	Temporary Rock Sediment Dam Type B	
1635.01	Rock Pipe Inlet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

Docusign Envelope ID: 0A19D6E1-64D3-4115-A7CC-CE37056BA959

PROJECT REFERENCE NO.	SHEET NO.
BP9-R004	EC-2A

ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER





SECTION A-A

PLAN

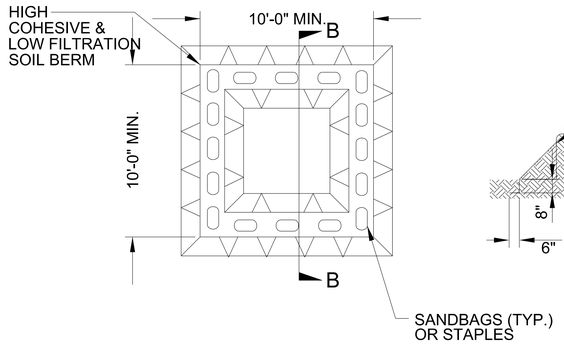
NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

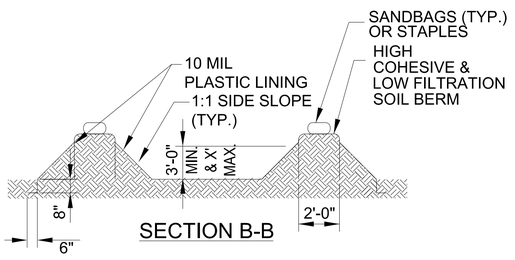
2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY.

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

BELOW GRADE WASHOUT STRUCTURE

NOT TO SCALE





SECTION B-B

PLAN

NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM 12 INCHES OF FREEBOARD.

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

ABOVE GRADE WASHOUT STRUCTURE

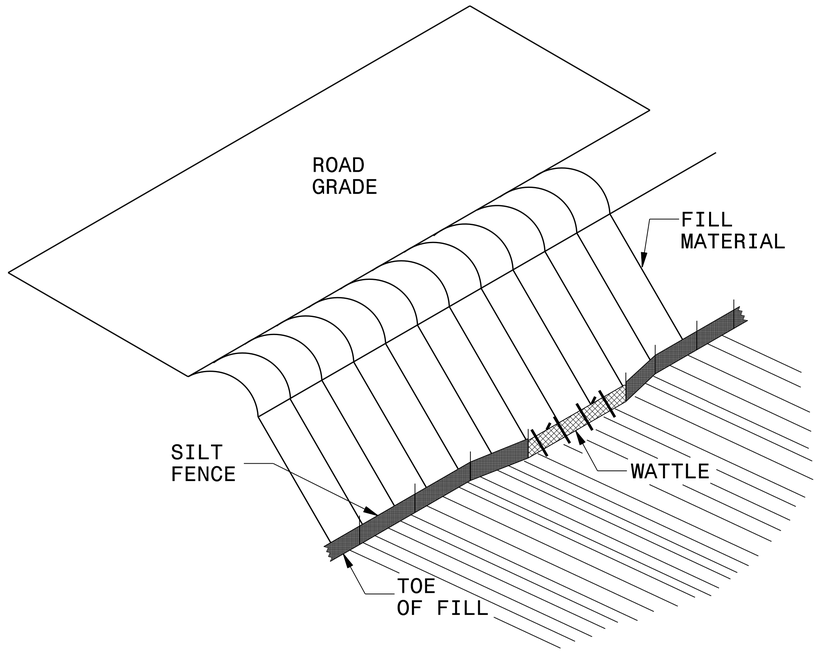
NOT TO SCALE

NOT TO SCALE

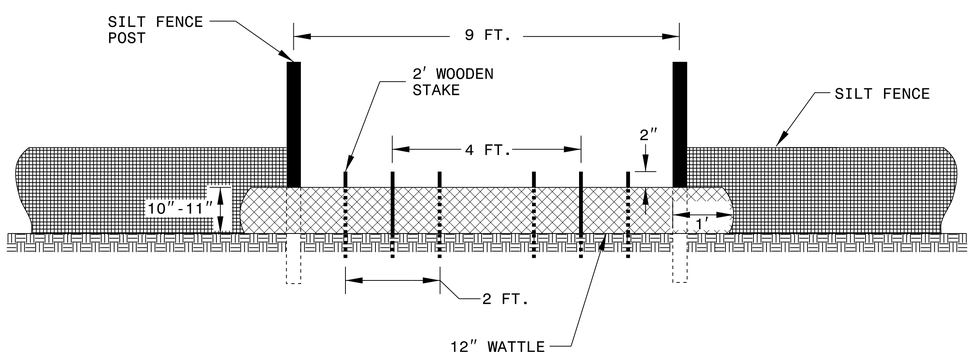
Docusign Envelope ID: 0A19D6E1-64D3-4115-A7CC-CE37056BA959

PROJECT REFERENCE NO.	SHEET NO.
BP9-R004	EC-2B

SILT FENCE COIR FIBER WATTLE BREAK DETAIL



ISOMETRIC VIEW



VIEW FROM SLOPE

NOTES:

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE AND LENGTH OF 10 FT.

EXCAVATE A 1 TO 2 INCH TRENCH FOR WATTLE TO BE PLACED.

DO NOT PLACE WATTLE ON TOE OF SLOPE.

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

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

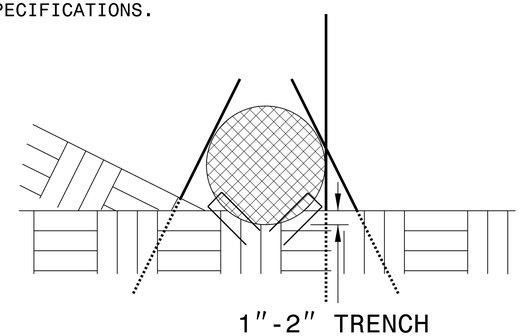
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

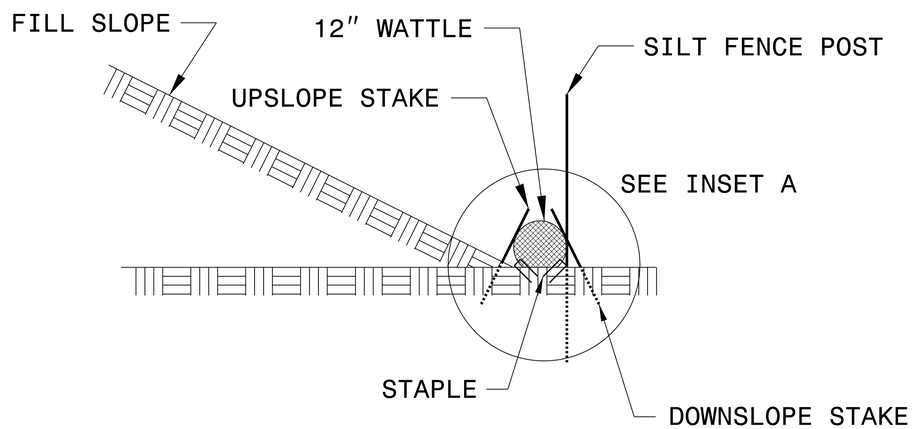
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

WATTLE INSTALLATION CAN BE ON OUTSIDE OF THE SILT FENCE AS DIRECTED.

INSTALL TEMPORARY SILT FENCE IN ACCORDANCE WITH SECTION 1605 OF THE STANDARD SPECIFICATIONS.

INSET A





SIDE VIEW

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PROJECT REFERENCE NO.	SHEET NO.
BP9-R004	EC-3

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION SUMMARY SHEET

STRAW MATTING FOR EROSION CONTROL

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	-L-	12+50	14+41	RT	180
4	-L-	16+72	17+67	RT	80
4	-DR1-	10+32	10+75	RT	30
4	-DR1-	10+32	10+32	RT	30
			SUBTOTAL		320

EXCELSIOR MATTING FOR EROSION CONTROL

4	-L-	10+50	13+73	LT	315
4	-L-	12+25	12+50	RT	20
4	-L-	18+50	19+50	RT	110
4	-L-	16+61	17+50	RT	70
	EXCELSIOR MATTING SUBTOTAL				515
	STRAW MATTING SUBTOTAL				320
MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER					10710
				TOTAL	11545

TYPE 1 PERMANENT SOIL REINFORCEMENT MATTING

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	-DR1-	10+32	11+37	LT	85
4	-L-	17+50	17+73	LT	20
4	-L-	17+91	19+71	LT	200
				TOTAL	305

Docusign Envelope ID: 0A19D6E1-64D3-4115-A7CC-CE37056BA959

PROJECT REFERENCE NO.	SHEET NO.
BP9-R004	EC-3A

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

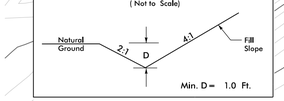
PROJECT REFERENCE NO.	SHEET NO.
BP9-R004	EC-4/CONST.4

BRIDGE NO. 790235

RS&H
1520 SOUTH BOULEVARD, SUITE 200
CHARLOTTE, NC 28203
NC FIRM LICENSE No: F-0493

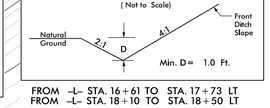
REVISIONS 8/17/99

DETAIL A
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



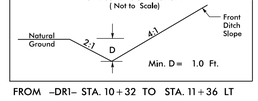
FROM –L– STA. 10+50 TO STA. 13+73 LT
FROM –L– STA. 12+25 TO STA. 14+41 RT
FROM –L– STA. 16+72 TO STA. 17+67 RT
FROM –L– STA. 18+50 TO STA. 19+90 RT
FROM –L– STA. 18+50 TO STA. 19+71 LT

DETAIL B
SPECIAL CUT DITCH
(Not to Scale)



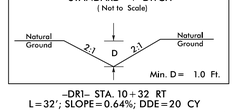
FROM –L– STA. 16+61 TO STA. 17+73 LT
FROM –L– STA. 18+10 TO STA. 18+50 LT

DETAIL C
SPECIAL CUT DITCH
(Not to Scale)



FROM –DRI– STA. 10+32 TO STA. 11+36 LT

DETAIL D
STANDARD 'V' DITCH
(Not to Scale)



–DRI– STA. 10+32 RT
L=32'; SLOPE=0.64%; DDE=20 CY

–L– CURVE DATA
PI Sta 12+98.10
△ = 20° 15' 17.0" (RT)
D = 4° 33' 55.4"
L = 443.66'
T = 224.17'
R = 1,255.00'
SE = 04
RO = 104'

–DRI– CURVE DATA
PI Sta 10+21.51
△ = 56° 32' 23.7" (LT)
D = 143° 14' 22.0"
L = 39.47'
T = 21.51'
R = 40.00'

PI Sta 11+42.09
△ = 60° 06' 20.6" (RT)
D = 572° 57' 28.1"
L = 10.49'
T = 5.79'
R = 10.00'

BM2 ELEVATION = 705.08
N 650102 E 1521419
BL STATION 16+25.00
STATION 14+00.34 82.76 LEFT
Rail road Spike in an 18" Poplar Tree

BMI ELEVATION = 731.77
N 649701 E 1521351
L STATION 10+11.41 17.90 LEFT
Y-ON 18" REP

1 LARRY EDWARD HARTSELL
DEED BOOK 1152, PAGE 0543

2 TAMMY HARTSELL ELLWOOD
DEED BOOK 1070, PAGE 0029

3 BOBBY RAY ADERHOLD, Jr.
DEED BOOK 1178, PAGE 0557

4 REGINA G. BROTHERTON, & HUSBAND
DEED BOOK 1192, PAGE 0741

5 , BROTHERTON, & HUSBAND
D BOOK 1192, PAGE 0741

6 JERRY L. MILLS AND
TERRI W. MILLS
DEED BOOK 1281 PAGE 928

7 MARTIN MARIETTA MATERIALS, INC.
DEED BOOK 1137, PAGE 0060

8 KELLY M. GIBSON
DEED BOOK 0908, PAGE 0593

NAD 83/NA 2011

–L– PC Sta. 10+73.93
BEGIN PROJECT
–L– STA. 10+50.00
–L– POT Sta. 10+00.00

BEGIN CONSTRUCTION
–L– STA. 10+25.00

BEGIN GRADE
–DRI– PC Sta. 10+00.00

–DRI– PT Sta. 10+39.47

N 62° 33' 46.2" E

–DRI– PC Sta. 11+36.31
–DRI– PT Sta. 11+46.80

END GRADE
–DRI– POT Sta. 11+48.86

BEGIN BRIDGE
–L– Sta. 14+48.86

END BRIDGE
–L– Sta. 15+51.13

–L– PT Sta. 15+17.59

–DRI– POT Sta. 11+60.86 =
–L– POT Sta. 16+58.35

S 57° 19' 53.2" E

N 32° 40' 06.8" E

N 12° 24' 49.8" E

END PROJECT
–L– STA. 19+90.00

END CONSTRUCTION
–L– STA. 20+15.00

SPECIAL CUT DITCH SEE DETAIL C
SPECIAL CUT DITCH SEE DETAIL B
SPECIAL LATERAL 'V' DITCH SEE DETAIL A
STANDARD 'V' DITCH SEE DETAIL D
15" SIDE DRAIN
15" RCP-V
18" RCP-V
15" ALT. W/ELBOWS
EST 2 TON CL B RIP RAP
EST 7 SY GEOTEXTILE
EXCAVATION LIMITS EXCAVATE TO ELEV. 700'
REMOVE EXISTING BRIDGE
IMPERVIOUS DIKE
EXPOSED TELEPHONE CABLE
REMOVE
RETAIN
PUE
EBENEZER RD. (SR 1322)
22' PAVED ROADWAY -SR-2278-
BOSTIAN ROAD
BRIDGE APPROACH SLAB

NOTE:
UTILIZE IMPERVIOUS DIKES DURING BRIDGE REMOVAL WHERE APPLICABLE.

NOTE:
STABILIZE PROPOSED EXCAVATION LIMITS WITH COIR FIBER MATTING AND NATIVE SEED UPON COMPLETION OF THE EXCAVATION. THIS INCLUDES THE AREA UNDER THE PROPOSED BRIDGE AT –L– 14+60 +/–.

NOTES: ANY DEVIATION FROM OPTIONS GIVEN WILL REQUIRE PRIOR APPROVAL BY ENGINEER.

ADDITIONAL EROSION CONTROL DEVICES MAY NEED TO BE INSTALLED AS DIRECTED BY THE ENGINEER.

CLEARING AND GRUBBING
EROSION CONTROL FOR CONSTRUCTION SHEET 4

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

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

ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS

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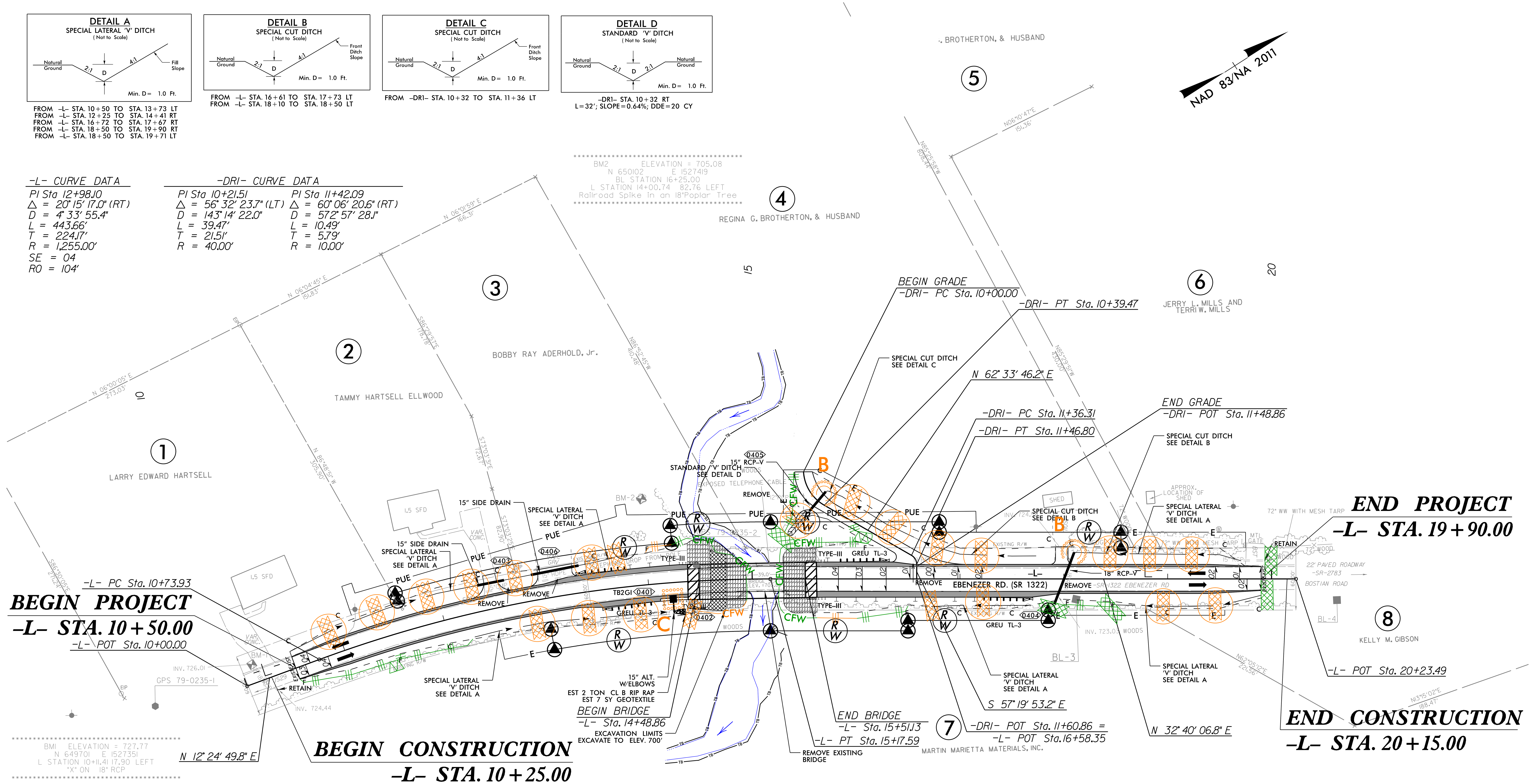
PROJECT REFERENCE NO.	SHEET NO.
BP9-R004	EC-5/CONST.4

RS&H
1520 SOUTH BOULEVARD, SUITE 200
CHARLOTTE, NC 28203
NC FIRM LICENSE No: F-0493

BRIDGE NO. 790235



-L- CURVE DATA

PI Sta 12+98.10
Δ = 20° 15' 17.0" (RT)
D = 4° 33' 55.4"
L = 443.66'
T = 224.17'
R = 1,255.00'
SE = .04
RO = 104'

-DRI- CURVE DATA

PI Sta 10+21.51	PI Sta 11+42.09
Δ = 56° 32' 23.7" (LT)	Δ = 60° 06' 20.6" (RT)
D = 143° 14' 22.0"	D = 572° 57' 28.1"
L = 39.47'	L = 10.49'
T = 21.51'	T = 5.79'
R = 40.00'	R = 10.00'

BM2 ELEVATION = 705.08
N 650102 E 1527419
BL STATION 16+25.00
L STATION 14+00.74 82.76 LEFT
Railroad Spike In an 18"Poplar Tree

BM1 ELEVATION = 727.77
N 649701 E 1527351
L STATION 10+11.41 17.90 LEFT
"X" ON 18" RCP

NOTE:
UTILIZE IMPERVIOUS DIKES DURING BRIDGE REMOVAL WHERE APPLICABLE.

NOTE:
STABILIZE PROPOSED EXCAVATION LIMITS WITH COIR FIBER MATTING AND NATIVE SEED UPON COMPLETION OF THE EXCAVATION. THIS INCLUDES THE AREA UNDER THE PROPOSED BRIDGE AT -L- 14+60+/-.

NOTES: ANY DEVIATION FROM OPTIONS GIVEN WILL REQUIRE PRIOR APPROVAL BY ENGINEER.

ADDITIONAL EROSION CONTROL DEVICES MAY NEED TO BE INSTALLED AS DIRECTED BY THE ENGINEER.

SBG FROM STA. 14+11.25 TO STA. 14+37.17 -L- RT

PLACE MATTING FOR EROSION CONTROL ON SLOPES AS WORK ALLOWS.

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

BRIDGE APPROACH SLAB

REVISIONS

8/17/99

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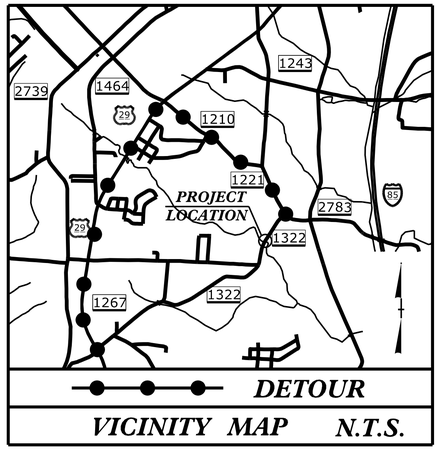
09/08/99

TIP PROJECT: BP9–R004



VICINITY MAP N.T.S.

100% PLANS

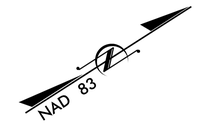
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES BY OTHERS PLANS
ROWAN COUNTY

LOCATION: BRIDGE NO. 790235 OVER BEAVER CREEK
ON SR 1322 (EBENEZER ROAD)
TYPE OF WORK: POWER (DISTRIBUTION) & COMMUNICATIONS

T.I.P. NO.	SHEET NO.
BP9.R004	UO–1

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



GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

INDEX OF SHEETS

UTILITY OWNERS WITH CONFLICTS

(A) POWER (DISTRIBUTION) – DUKE ENERGY
(B) COMMUNICATIONS – CHARTER
(C) COMMUNICATIONS – WINDSTREAM

PREPARED IN THE OFFICE OF:

SAM™
2641 Sumner Boulevard
Suite 116
Raleigh, NC 27616
(919) 878–7466

PAT JONES — *UTILITY PROJECT MANAGER*
WILL PACE — *PROJECT UTILITY COORDINATOR*

DIVISION OF HIGHWAYS
DIVISION 9
375 SILAS CREEK PARKWAY
WINSTON-SALEM, NC 27127
PHONE (336) 761–2004

JOSHUA MCMAHAN — *DIVISION UTILITY ENGINEER*
LOU PORTER — *DIVISION UTILITY COORDINATOR*

8/6/2024
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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
BP9-R004	U0-2
THIS SHEET CORRESPONDS TO RDY- · 4	

UTILITIES BY OTHERS

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

NAD 83/NA 2011

BM2 ELEVATION = 705.08
N 650102 E 1527419
BL STATION 16+25.00
L STATION 14+00.74 82.76 LEFT
Railroad Spike in an 18"Poplar Tree

1 LARRY EDWARD HARTSELL
DEED BOOK 1152, PAGE 0543

2 TAMMY HARTSELL ELLWOOD
DEED BOOK 1070, PAGE 0029

3 BOBBY RAY ADERHOLD, Jr.
DEED BOOK 1178, PAGE 0557

4 REGINA G. BROTHERTON, & HUSBAND
DEED BOOK 1192, PAGE 0741

5 REGINA G. BROTHERTON, & HUSBAND
DEED BOOK 1192, PAGE 0741

6 JERRY L. MILLS AND TERRY W. MILLS
DEED BOOK 1281 PAGE 928

7 MARTIN MARIETTA MATERIALS, INC.
DEED BOOK 1137, PAGE 0060

8 KELLY M. GIBSON
DEED BOOK 0908, PAGE 0593

-L- +26.25 49.21' LT
-L- +26.15 59.39' LT
-L- +16.60 59.32' LT
-L- +16.77 30.00' LT
-L- +76.28 79.01' LT
-L- +76.70 68.49' LT
-L- +85.68 79.47' LT
-L- +86.17 68.91' LT
-L- +15.32 65.23' LT
-L- +15.82 45.00' LT

DUKE/CHARTER O/H
DUKE/CHARTER O/H
WINDSTREAM U/G
WINDSTREAM PED TIE TO EXISTING

PROP O/H POR & CATV LINES
PROP U/G TEL CABLES
ABANDONED
REM
ABANDONED
REM

BEGIN PROJECT
-L- STA. 10+50.00

BEGIN CONSTRUCTION
-L- STA. 10+25.00

END PROJECT
-L- STA. 19+90.00

END CONSTRUCTION
-L- STA. 20+15.00

BM1 ELEVATION = 727.77
N 649701 E 1527351
L STATION 10+11.41 17.90 LEFT
"X" ON 18" RCP

EBENEZER RD. (SR 1322)
BL-3

8/5/2024
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RS&H NC FIRM LICENSE No: F-0493
1520 SOUTH BOULEVARD, SUITE 200
CHARLOTTE, NC 28203

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
BP9-R004	X-1	X-6

CROSS SECTION INDEX

ALIGNMENT	SHEET NUMBERS
-L-	X-2 THRU X-5
-DRI-	X-6

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CROSS-SECTION SUMMARY

PROJ. REFERENCE NO.	SHEET NO.
BP9.R004	X-1A

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

Earthwork quantities are calculated by the roadway designer. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

'NOTE: EMBANKMENT COLUMN DOES NOT INCLUDE BACKFILL FOR UNDERCUT

Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
10+50.00	0	0
11+00.00	8	0
11+50.00	16	1
12+00.00	31	1
12+50.00	39	1
13+00.00	30	5
13+50.00	25	31
14+00.00	20	150
14+48.86	9	493

Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
15+51.13	0	0
16+00.00	0	627
16+50.00	0	307
17+00.00	24	90
17+50.00	59	11
18+00.00	44	0
18+50.00	25	8
19+00.00	31	20
19+50.00	35	20
19+90.00	16	6

Station DR1	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
10+00.00	0	0
10+50.00	25	0
11+00.00	36	4
11+46.86	11	98

RS&H
1520 SOUTH BOULEVARD, SUITE 200
CHARLOTTE, NC 28203
NC FIRM LICENSE No: F-0493

0 5 10

PROJ. REFERENCE NO.	SHEET NO.
BP9-R004	X-2

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

730
720
710

2:1 4:1 0.040 0.040 50:1
717.66 719.34

12+00.00

730
720
710

2:1 4:1 0.040 0.040 2:1
720.60 721.79

11+50.00

730
720
710

2:1 4:1 0.040 0.040 2:1
723.54 724.32

11+00.00

740
730
720

0.046 0.026
726.58

10+50.00

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

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RS&H 1520 SOUTH BOULEVARD, SUITE 200 CHARLOTTE, NC 28203 NC FIRM LICENSE No: F-0493	0 5 10	PROJ. REFERENCE NO.	SHEET NO.
		BP9-R004	X-3

6/23/16

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RS&H
1520 SOUTH BOULEVARD, SUITE 200
CHARLOTTE, NC 28203
NC FIRM LICENSE No: F-0493

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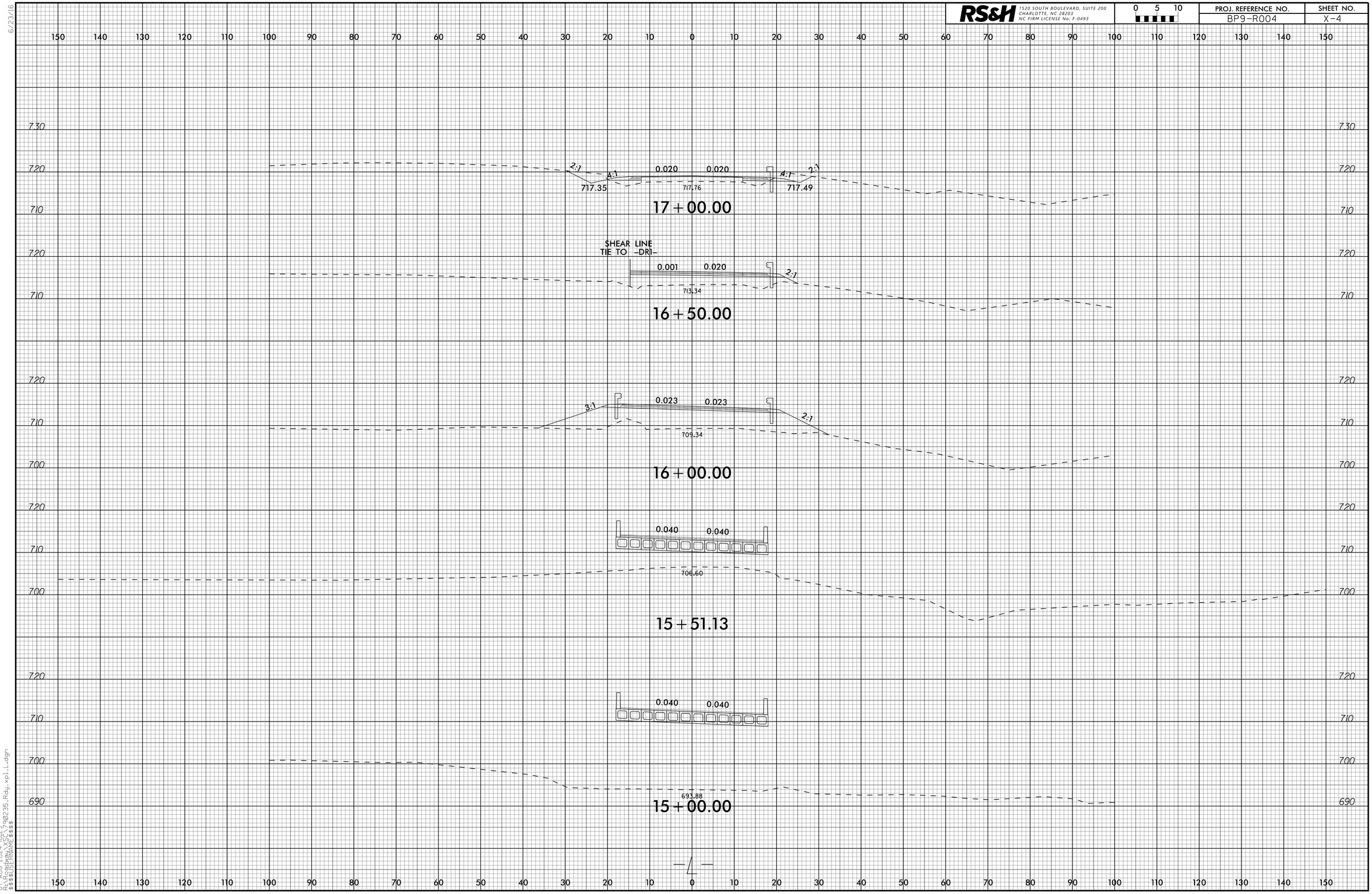
PROJ. REFERENCE NO.	SHEET NO.
BP9-R004	X-4



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RS&H
1520 SOUTH BOULEVARD, SUITE 200
CHARLOTTE, NC 28203
NC FIRM LICENSE No: F-0493

0 5 10

PROJ. REFERENCE NO.	SHEET NO.
BP9-R004	X-5

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

750
740

0.001 0.014
746.34
19+90.00

750
740

0.018 0.020
2:1 4:1 4:1 2:1
740.48 739.86
19+50.00

740
730

0.020 0.020
2:1 4:1 4:1 2:1
735.08 734.43
19+00.00

740
730

0.020 0.020
2:1 4:1 3:1
729.68
18+50.00

730
720

16% 8% 2% 0.020 0.020 6:1
726.60
18+00.00

730
720

2:1 4:1 0.020 0.020 4:1 2:1
720.96 720.96
17+50.00

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

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RS&H 1520 SOUTH BOULEVARD, SUITE 200 CHARLOTTE, NC 28203 NC FIRM LICENSE No: F-0493	0 5 10	PROJ. REFERENCE NO.	SHEET NO.
		BP9-R004	X-6

6/23/16

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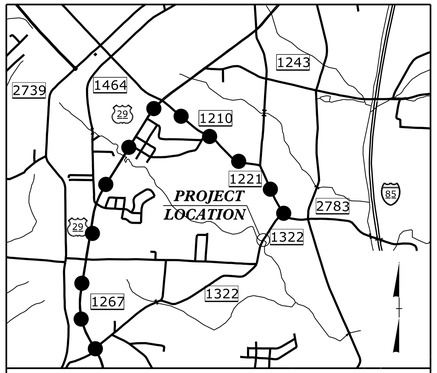
09/08/99

WBS PROJECT: BP9–R004

CONTRACT: DI00348

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



DETOUR

VICINITY MAP N.T.S.

100% PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

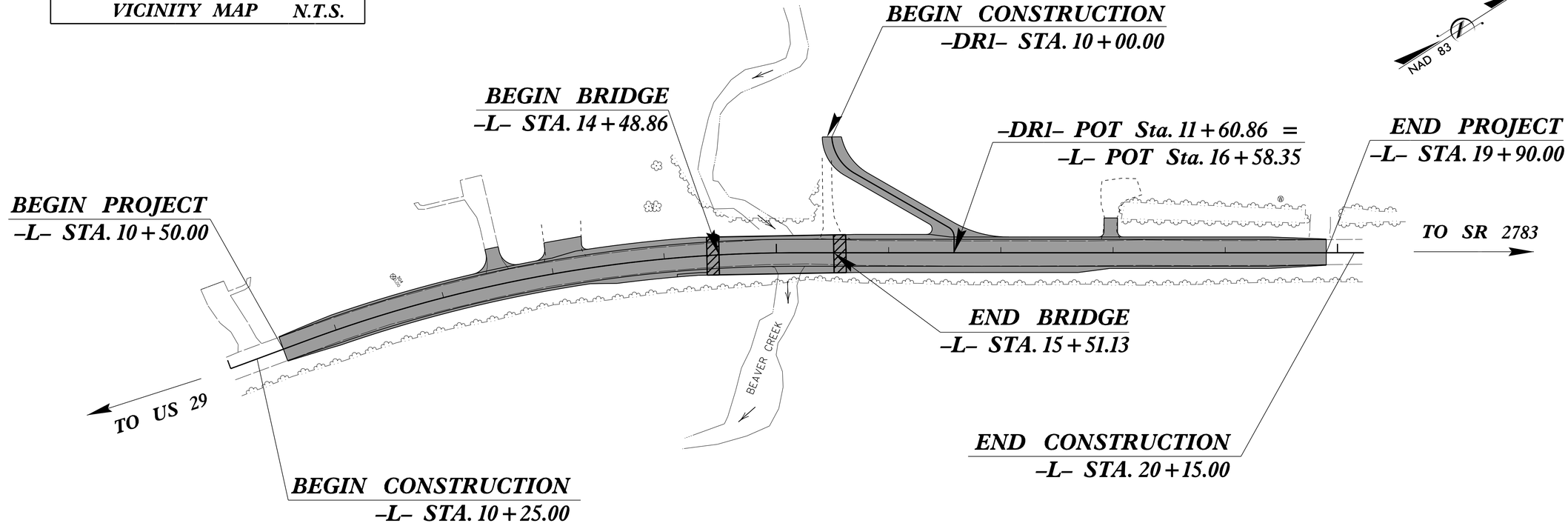
ROWAN COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP9–R004	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
BP9–R004.1	N/A	PE
BP9–R004.2	N/A	ROW, UTL.
BP9–R004.3	N/A	CONST.

LOCATION: BRIDGE NO. 790235 OVER BEAVER CREEK ON SR 1322 (EBENEZER ROAD)

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE (BRIDGE)



STRUCTURE

THERE IS NO CONTROL OF ACCESS ON THIS PROJECT.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DESIGN DATA

ADT 2020 = 850

V = 45 MPH

FUNC CLASS =
MAJOR COLLECTOR
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY = 0.159

LENGTH STRUCTURE = 0.019

TOTAL LENGTH = 0.178

PREPARED IN THE OFFICE OF:

RS&H

1520 SOUTH BOULEVARD, SUITE 200
CHARLOTTE, NC 28203
NC FIRM LICENSE No: F-0493

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
SEPTEMBER 27, 2022

LETTING DATE:
NOVEMBER 13, 2024

DREW MORROW, PE
PROJECT ENGINEER

JUSTIN GERASIMOU, EI
PROJECT DESIGN ENGINEER

JEREMY KEATON, PE, PLS
NCDOT CONTACT

STRUCTURAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 052672 ENGINEER MATTHEW R KEEVER

8/29/2024

DocuSigned by:
14D29587255514F4...

SIGNATURE: *P.E.*

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

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14+00 14+50 15+00 15+50 16+00

720 710 700 690

FIX.

SPAN A

FIX.

FILL FACE @ END BENT NO. 1
STA. 14+48.86 -L-
GRADE PT. EL. = 711.79

BEGIN FRONT SLOPE
STA. 14+39.46 -L-
GRADE PT. EL. = 711.71

1'-6" TO UNCLASSIFIED STRUCTURE EXCAVATION (TYP.)

LOW CHORD EL. 707.56

-4.9501% +1.7652%
P.I. = 13+80.00
EL. = 710.49
VC = 180'
GRADE DATA -L-

EL. 707.0±

1'-0" (TYP.)

9⅝" DIA. MICROPILES (TYP.)

1.5:1 SLOPE NORMAL TO CAP

CLASS II RIP RAP

** CLASS II RIP RAP (ROADWAY DETAIL AND PAY ITEM) (SEE ROADWAY PLANS)

EL. 700.00

3'-6" MIN.

REMOVE EXISTING ABUTMENT AND LAY BACK BANK AT 3:1 SLOPE

RETAIN EXISTING SILL (TYP.)

EL. 694.0±

EL. 693.0±

END BENT NO. 1

FEMA (Q100) ELEV. = 700.49

NWS ELEV. = 694.10± DATE OF SURVEY: 09/17/2019

EL. 705.0±

BASE DISCHARGE (Q100) H.W. ELEV. = 699.80

DESIGN DISCHARGE (Q25) H.W. ELEV. = 699.10

1'-7" BERM NORMAL TO CAP (TYP.)

FILL FACE @ END BENT NO. 2
STA. 15+51.13 -L-
GRADE PT. EL. = 713.51

BEGIN FRONT SLOPE
STA. 15+60.53 -L-
GRADE PT. EL. = 713.68

LOW CHORD EL. 709.24

EL. 706.0±

1'-0" (TYP.)

1'-0" MIN. EARTH BERM (TYP.)

EL. 707.0±

APPROXIMATE EXISTING GROUND LINE

REMOVE EXISTING ABUTMENT AND LAY BACK BANK AT 1.5:1 SLOPE

CLASS II RIP RAP

EXISTING SUBSTRUCTURE (TYP.)

EL. 694.0±

2'-0" (TYP.)

END BENT NO. 2

+1.7652% +10.5000%
P.I. = 17+00.00
EL. = 716.14
VC = 270'
GRADE DATA -L-

SECTION ALONG -L-

UNCLASSIFIED STRUCTURE EXCAVATION
(SECTIONS AT END BENTS ARE AT RIGHT ANGLES)

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

102'-3" (ALONG CHORD)
FILL FACE @ END BENT NO. 1 TO FILL FACE @ END BENT NO. 2

51'-1½" (ALONG CHORD)

51'-1½" (ALONG CHORD)

NAD 83/NA 2001

1'-0" MIN. EARTH BERM
EL. 703.99

CLASS II RIP RAP

BEAVER CREEK

1'-7" BERM (TYP.)

1'-0" MIN. EARTH BERM
EL. 705.65

CLASS II RIP RAP

W.P. #2
FILL FACE @ END BENT NO. 2
STA. 15+51.13 -L-

BEGIN FRONT SLOPE
STA. 15+60.53 -L-

END APPROACH SLOPE
STA. 15+62.01 -L-

BEGIN FRONT SLOPE
STA. 14+39.46 -L-

BEGIN APPROACH SLOPE
STA. 14+37.98 -L-

TO US 29

-L-

9 13/16"

SR 1322
EBENEZER ROAD

EXTENDED CHORD (TYP.)

TO SR 2783
BOSTIAN RD.

CHORD

BRIDGE I.D.
STA. 15+00.00 -L-

PT STA. 15+17.59 -L-

W.P. #1
FILL FACE @ END BENT NO. 1
STA. 14+48.86 -L-

EXISTING STRUCTURE

CLASS II RIP RAP (ROADWAY DETAIL AND PAY ITEM) (SEE ROADWAY PLANS)

1'-0" MIN. EARTH BERM
EL. 702.29

1'-0" MIN. EARTH BERM
EL. 703.98

① 90°-00'-00" (TO CHORD) (TYP.)
② 92°-05'-00" (TANGENT TO CURVE)
③ 89°-45'-38" (TANGENT TO CURVE)
④ 90°-15'-04" (RADIAL TO CHORD)
⑤ 88°-56'-45"

PLAN ALONG -L-
PILES NOT SHOWN FOR CLARITY

HORIZONTAL CURVE DATA -L-

P.I. STA. = 12+98.10
Δ = 20°-15'-17.0" (RT.)
D = 04°-33'-55.4"
L = 443.66'
T = 224.17'
R = 1,255.00'
S.E. = 0.04

PROJECT NO. BP9-R004
ROWAN COUNTY
STATION: 15+00.00 -L-

SHEET 1 OF 2 REPLACES BRIDGE 790235

NORTH CAROLINA PROFESSIONAL SEAL 052672 ENGINEER MATTHEW R. ACOSTA
Docusigned by:
8/12/2024

RS&H
RS&H Architects-Engineers-Planners, Inc.
8521 Six Forks Road, Suite 400
Raleigh, NC 27615
919-926-4100 FAX 919-846-9080
www.rsandh.com
North Carolina License Nos. 50073 * F-0493 * C-28

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE ON SR 1322 OVER BEAVER CREEK BETWEEN US 29 AND SR 2783

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			16

DRAWN BY : NSC DATE : 08/2022
CHECKED BY : MRA DATE : 09/2022
DESIGN ENGINEER OF RECORD: MRA DATE : 07/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

7/24/2024
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AcostaM

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SUMMARY OF MICROPILE INFORMATION/INSTALLATION

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pile(s) #-# (e.g., "Bent 1, Piles 1-5")	Minimum Micropile Casing Size	Factored Vertical Resistance per Pile TONS	Estimated Micropile Length FT	Minimum Reinforcing Casing Penetration Into Rock per Pile Lin FT	Scour Critical Elevation FT	No Reinforcing Casing Joints Between Elevations FT - FT	Galvanizing Exposed Reinforcing Casing Required?
End Bent No. 1 Piles 1-4	9-5/8" O.D. w/ 0.5 Wall	120	20	10.0			
End Bent No. 1 Piles 5-7	9-5/8" O.D. w/ 0.5 Wall	120	30	10.0			
End Bent No. 2 Piles 1-4	9-5/8" O.D. w/ 0.5 Wall	120	20	10.0			
End Bent No. 2 Piles 5-7	9-5/8" O.D. w/ 0.5 Wall	120	25	10.0			

NOTES

1. The Micropile and Spread Footing Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer Michael H. Stephens, P.E., License No. 028893 on 12-15-2022.

PROJECT NO. BP9-R004

Rowan COUNTY

STATION: 15+00 -L-

Bridge No. 235

NORTH CAROLINA PROFESSIONAL SEAL 052672 ENGINEER MATTHEW T. ACUFF

DocuSigned by: SIGNATURE 8/12/2024 DATE

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

MICROPILE FOUNDATION TABLES

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

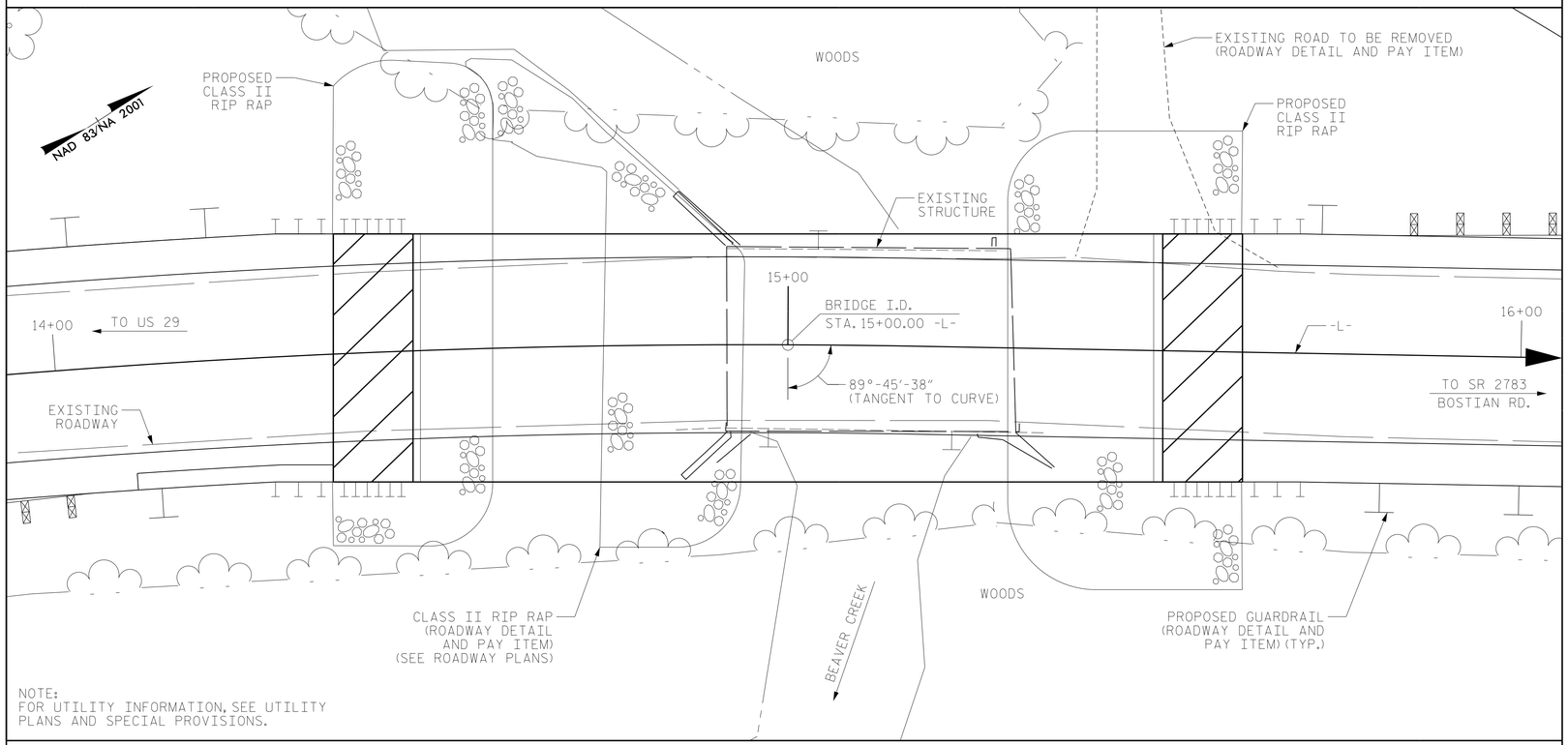
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S-2

TOTAL SHEETS 16

Docusign Envelope ID: 71CED346-88E0-4861-8BA7-E4503877B497

BENCH MARK #2 - RAILROAD SPIKE IN 18"DIA. POPLAR TREE, 83.00' LT. OF STA. 14+01.00 -L-, EL. 705.08'



NOTE:
FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

HYDRAULIC DATA

DESIGN DISCHARGE	= 1000 CFS
FREQUENCY OF DESIGN FLOOD	= 25 YRS
DESIGN HIGH WATER ELEVATION	= 699.1'
DRAINAGE AREA	= 1.80 SQ. MI.
BASE DISCHARGE (Q100)	= 1300 CFS
BASE HIGH WATER ELEVATION	= 699.8'

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 11500 CFS
FREQUENCY OF OVERTOPPING FLOOD	= 500+ YRS
* OVERTOPPING FLOOD ELEVATION	= 712.3'

* SAG @ STA. 14+22.69 -L-

TOTAL BILL OF MATERIALS

	REMOVAL OF EXISTING STRUCTURE @ STA. 15+00.00 -L-	ASBESTOS ASSESSMENT	UNCLASSIFIED STRUCTURE EXCAVATION @ STA. 15+00.00 -L-	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	9⅝"DIA. MICROPILES	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 3'-3" PRESTRESSED CONCRETE BOX BEAMS	
	LUMP SUM	LUMP SUM	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	EACH	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	NO.	LIN. FT.
SUPERSTRUCTURE								200.0				12	1,200
END BENT NO. 1				29.2		4,830	7		120	130			
END BENT NO. 2				29.2		4,830	7		200	220			
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	58.4	LUMP SUM	9,660	14	200.0	320	350	LUMP SUM	12	1,200

NOTES

ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET 1 OF 2 SHALL BE EXCAVATED FOR A DISTANCE OF 28 FT LEFT AND 30 FT RIGHT FOR END BENT NO. 1 AND 30 FT LEFT AND 33 FT RIGHT FOR END BENT NO. 2 OF THE CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

THE EXISTING STRUCTURE CONSISTS OF 1 SPAN @ 36'-8" WITH STEEL PLANK DECK ON STEEL I-BEAMS WITH A CLEAR ROADWAY OF 24'-1" ON RUBBLE MASONRY WITH CONCRETE SEATS AT END BENT NO. 1 AND NO. 2 LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED 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 CONDITION AT THE PROJECT SITE.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PREFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM THE COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO THE HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STA. 15+00.00 -L-".

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

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

FOUNDATION NOTES

FOR MICROPILES, SEE MICROPILES PROVISION.

2 BATTERED MICROPILES ARE REQUIRED AT EACH END BENT. SEE END BENT SHEETS FOR BATTERED PILE LOCATIONS.

OVERBURDEN DRILLING SYSTEM THAT ADVANCES THE DRILL STRING AND CASING SIMULTANEOUSLY IS REQUIRED FOR ALL MICROPILES.

MICROPILE LOAD TESTING IS NOT REQUIRED.

MICROPILE ESTIMATED LENGTHS ARE BASED ON NCDOT GEOTECHNICAL DESIGN ASSUMPTION AND IS FOR INFORMATION PURPOSES ONLY. CONTRACTOR TO VERIFY MICROPILE LENGTHS FOR ESTIMATING PURPOSES.

PROJECT NO. BP9-R004

ROWAN COUNTY

STATION: 15+00.00 -L-

SHEET 2 OF 2

DRAWN BY : NSC DATE : 08/2022
CHECKED BY : MRA DATE : 09/2022
DESIGN ENGINEER OF RECORD: MRA DATE : 07/2024

10/16/2024
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AcostaM

NORTH CAROLINA PROFESSIONAL SEAL 052672 ENGINEER MATTHEW R. ACOSTA
10/17/2024

RS&H

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North Carolina License Nos. 50073 * F-0493 * C-28

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 1322
OVER BEAVER CREEK BETWEEN
US 29 AND SR 2783

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			16

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE											SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR						MOMENT						
							LIVELOAD FACTORS	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)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93(Inv)	N/A	(1)	1.035	--	1.75	0.272	1.26	100'	EL	49.25	0.489	1.34	100'	EL	4.925	0.80	0.272	1.04	100'	EL	49.25	
		HL-93(Opr)	N/A	--	1.633	--	1.35	0.272	1.63	100'	EL	49.25	0.489	1.73	100'	EL	4.925	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	(2)	1.440	51.84	1.75	0.272	1.75	100'	EL	49.25	0.489	1.81	100'	EL	4.925	0.80	0.272	1.44	100'	EL	49.25	
		HS-20(Opr)	36.000	--	2.271	81.756	1.35	0.272	2.27	100'	EL	49.25	0.489	2.35	100'	EL	4.925	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.413	46.079	1.4	0.272	5.19	100'	EL	49.25	0.489	5.59	100'	EL	4.925	0.80	0.272	3.41	100'	EL	49.25	
		SNGARBS2	20.000	--	2.473	49.452	1.4	0.272	3.76	100'	EL	49.25	0.489	3.91	100'	EL	4.925	0.80	0.272	2.47	100'	EL	49.25	
		SNAGRIS2	22.000	--	2.313	50.885	1.4	0.272	3.52	100'	EL	49.25	0.489	3.60	100'	EL	4.925	0.80	0.272	2.31	100'	EL	49.25	
		SNCOTTS3	27.250	--	1.696	46.228	1.4	0.272	2.58	100'	EL	49.25	0.489	2.78	100'	EL	4.925	0.80	0.272	1.70	100'	EL	49.25	
		SNAGGRS4	34.925	--	1.390	48.556	1.4	0.272	2.11	100'	EL	49.25	0.489	2.26	100'	EL	4.925	0.80	0.272	1.39	100'	EL	49.25	
		SNS5A	35.550	--	1.361	48.398	1.4	0.272	2.07	100'	EL	49.25	0.489	2.27	100'	EL	4.925	0.80	0.272	1.36	100'	EL	49.25	
		SNS6A	39.950	--	1.238	49.456	1.4	0.272	1.88	100'	EL	49.25	0.489	2.05	100'	EL	4.925	0.80	0.272	1.24	100'	EL	49.25	
		SNS7B	42.000	--	1.178	49.496	1.4	0.272	1.79	100'	EL	49.25	0.489	2.00	100'	EL	4.925	0.80	0.272	1.18	100'	EL	49.25	
	TTST	TNAGRIT3	33.000	--	1.506	49.709	1.4	0.272	2.29	100'	EL	49.25	0.489	2.46	100'	EL	4.925	0.80	0.272	1.51	100'	EL	49.25	
		TNT4A	33.075	--	1.510	49.942	1.4	0.272	2.3	100'	EL	49.25	0.489	2.41	100'	EL	4.925	0.80	0.272	1.51	100'	EL	49.25	
		TNT6A	41.600	--	1.224	50.926	1.4	0.272	1.86	100'	EL	49.25	0.489	2.09	100'	EL	4.925	0.80	0.272	1.22	100'	EL	49.25	
		TNT7A	42.000	--	1.225	51.442	1.4	0.272	1.86	100'	EL	49.25	0.489	2.05	100'	EL	4.925	0.80	0.272	1.22	100'	EL	49.25	
		TNT7B	42.000	--	1.254	52.657	1.4	0.272	1.91	100'	EL	49.25	0.489	1.96	100'	EL	4.925	0.80	0.272	1.25	100'	EL	49.25	
		TNAGRIT4	43.000	--	1.203	51.711	1.4	0.272	1.83	100'	EL	49.25	0.489	1.91	100'	EL	4.925	0.80	0.272	1.20	100'	EL	49.25	
		TNAGT5A	45.000	--	1.139	51.236	1.4	0.272	1.73	100'	EL	49.25	0.489	1.87	100'	EL	4.925	0.80	0.272	1.14	100'	EL	49.25	
		TNAGT5B	45.000	(3)	1.129	50.805	1.4	0.272	1.72	100'	EL	49.25	0.489	1.82	100'	EL	4.925	0.80	0.272	1.13	100'	EL	49.25	
EMERGENCY VEHICLE (EV)		EV2	28.750	--	2.129	61.213	1.3	0.272	2.87	100'	EL	49.25	0.489	3.06	100'	EL	4.925	0.80	0.272	2.13	100'	EL	49.25	
		EV3	43.000	(4)	1.403	60.325	1.3	0.272	1.89	100'	EL	49.25	0.489	2.06	100'	EL	4.925	0.80	0.272	1.40	100'	EL	49.25	

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ_{DC}	γ_{DW}
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

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

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

COMMENTS:

1.
2.
3.
4.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

(2) DESIGN LOAD RATING (HS-20)

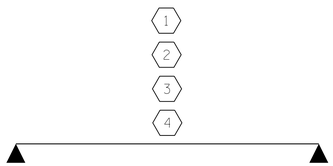
(3) LEGAL LOAD RATING **

(4) EMERGENCY VEHICLE LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. BP9-R004

ROWAN COUNTY

STATION: 15+00.00 -L-

ASSEMBLED BY : NSC DATE : 09/2023
CHECKED BY : MRA DATE : 09/2023
DRAWN BY : TMG II/II
CHECKED BY : AAC II/II
REV. 06/23 AKP/AAI

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NORTH CAROLINA PROFESSIONAL SEAL 052672 ENGINEER MATTHEW R. ACOSTA
8/12/2024

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North Carolina License Nos. 50073 * F-0493 * C-28

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			16

STD. NO. 39LRFR1_90S_100L

7/24/2024
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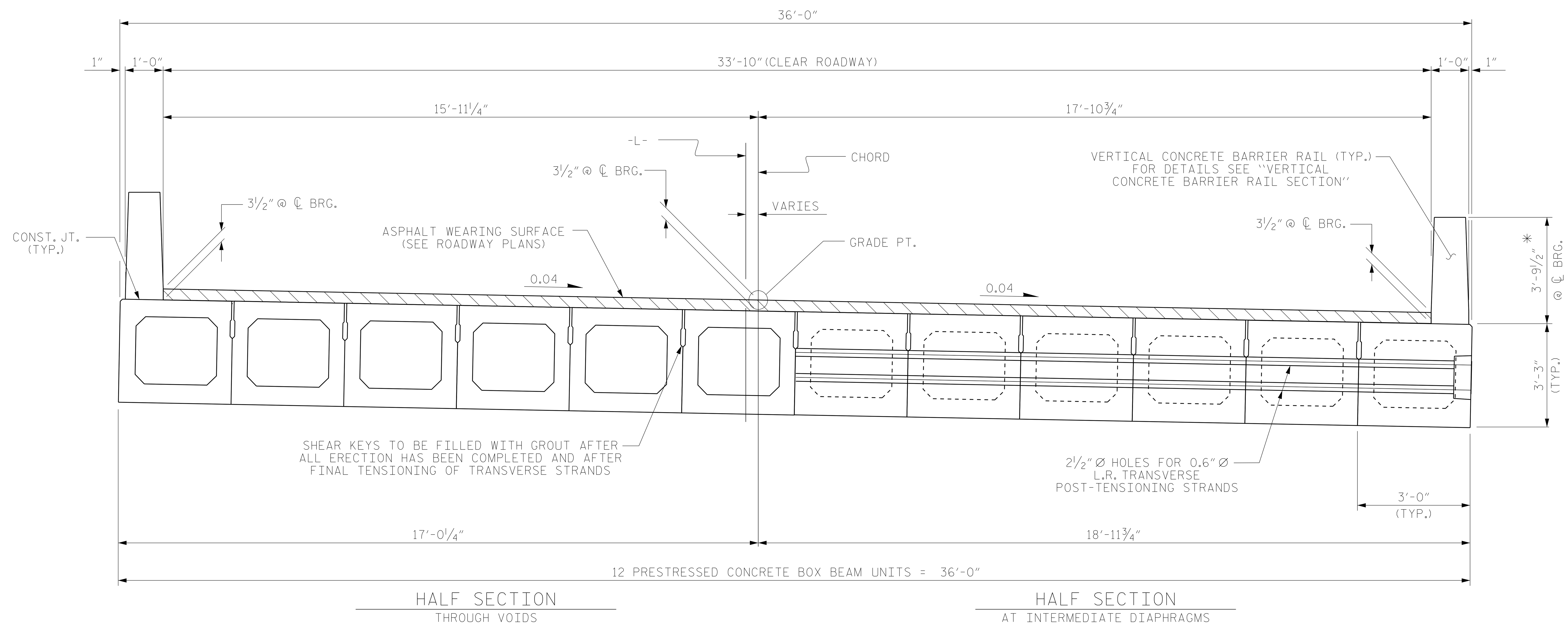
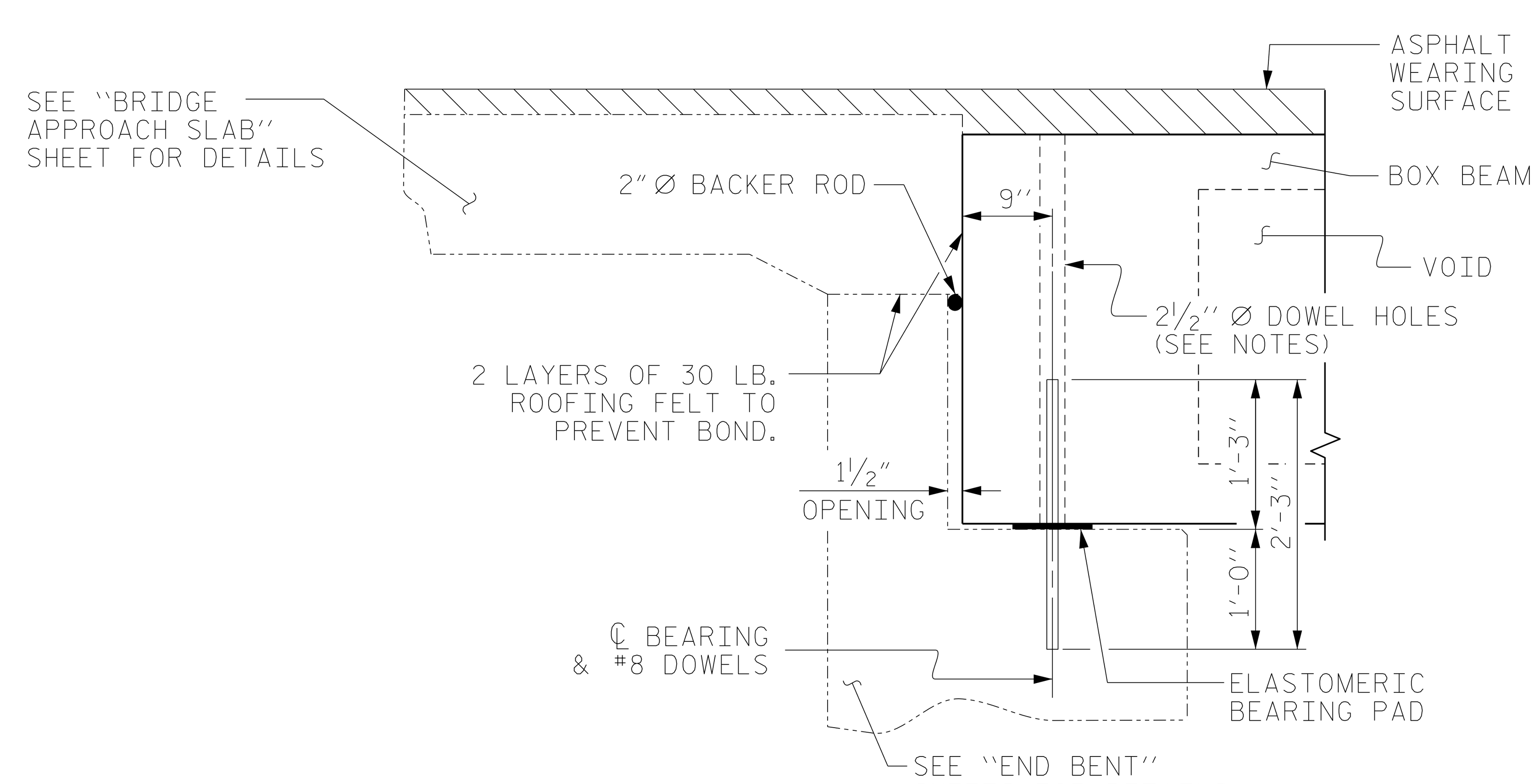
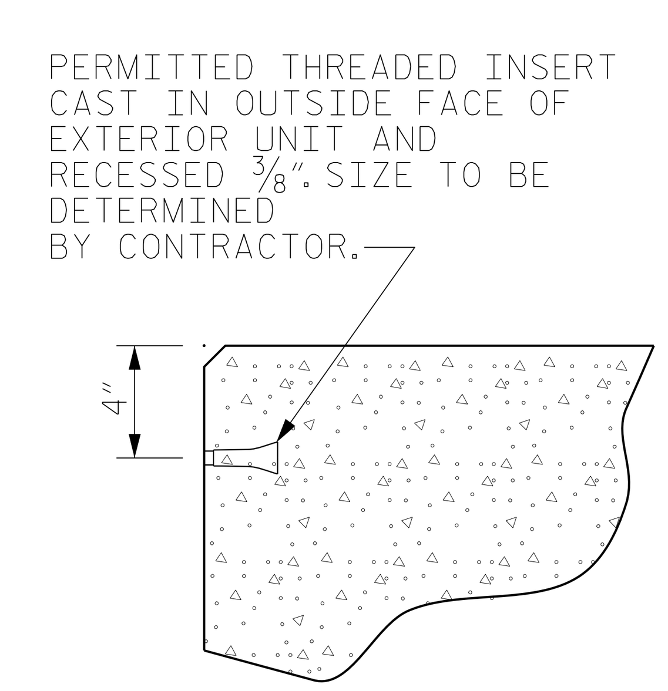


TYPICAL SECTION

* 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.



SECTION AT END BENT



THREADED INSERT DETAIL

NOTES

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

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

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

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

THE 2½" Ø DOWEL HOLES AT FIXED ENDS OF BOX BEAM SECTIONS SHALL BE FILLED WITH NON-SHRINK GROUT.

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

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

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

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

APPLY EPOXY PROTECTIVE COATING TO BOX BEAM UNIT ENDS.

VERTICAL GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A VERTICAL CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

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

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

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

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

PROJECT NO. BP9-R004

ROWAN COUNTY

STATION: 15+00.00 -L-

SHEET 1 OF 5

SEAL 052672 — NORTH CAROLINA PROFESSIONAL ENGINEER — MATTHEW R. ACOSTA

8/12/2024

RS&H

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North Carolina License Nos. 50073 * F-0493 * C-28

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ASSEMBLED BY : NSC	DATE : 08/2022		
CHECKED BY : MRA	DATE : 09/2022		
DRAWN BY : DGE 8/11	REV. 10/15	MAA/TMG	
CHECKED BY : TMG 11/11			

STD. NO. 39PCBB1_36

7/24/2024
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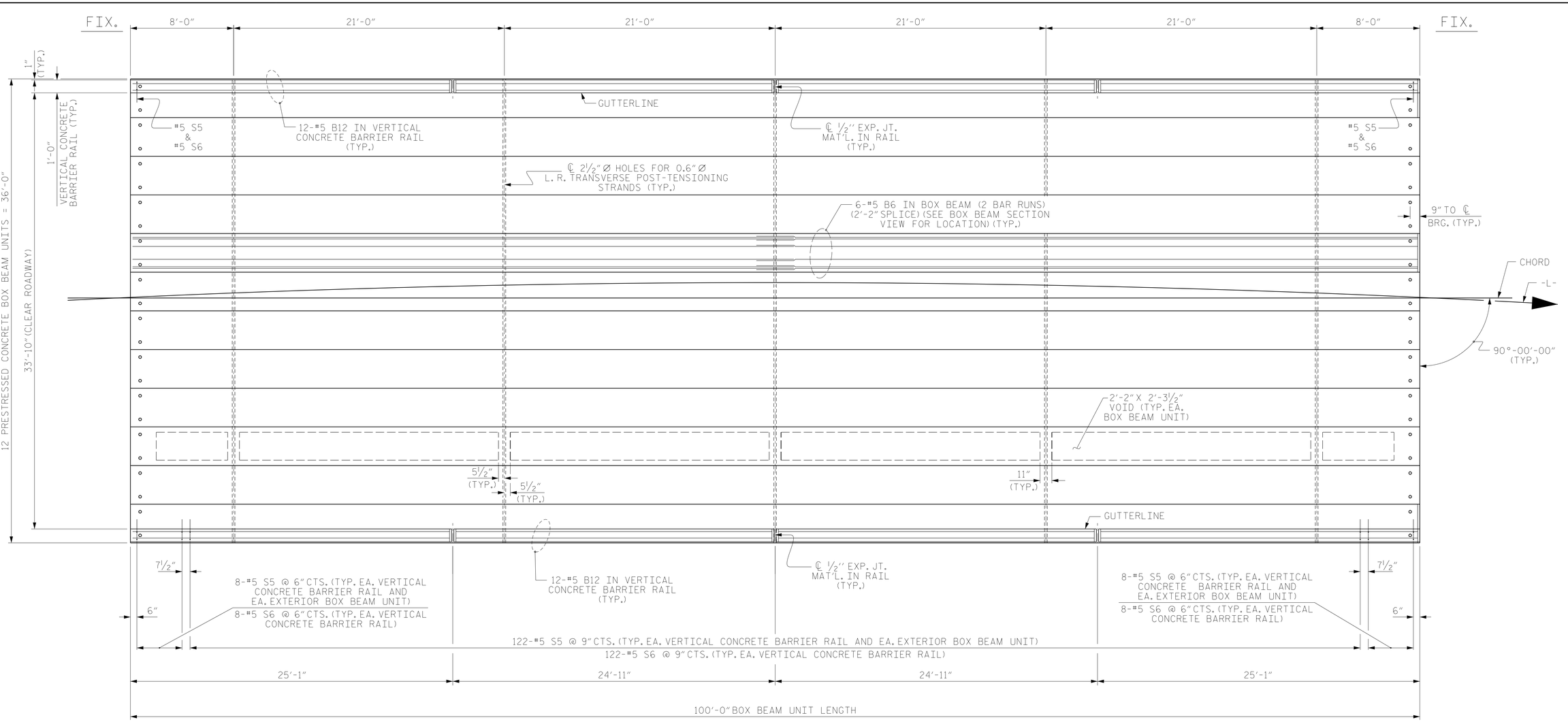
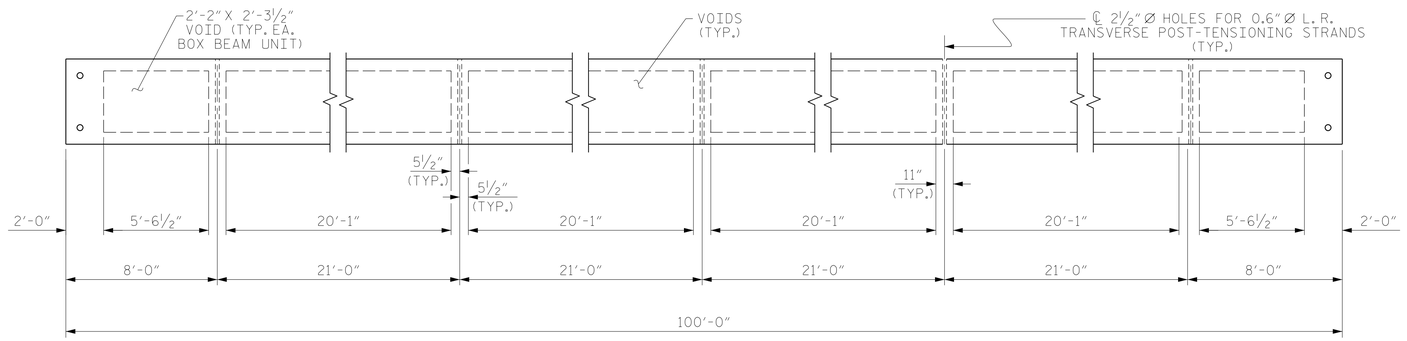


PLAN OF UNIT



DIAPHRAGM AND VOID LAYOUT

PROJECT NO. BP9-R004

ROWAN COUNTY

STATION: 15+00.00 -L-

SHEET 2 OF 5

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 052672 ENGINEER MATTHEW R. ACOSTA

8/12/2024

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

PLAN OF 100' UNIT 33'-10" CLEAR ROADWAY 90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			16

ASSEMBLED BY : NSC DATE : 08/2022
CHECKED BY : MRA DATE : 09/2022

DRAWN BY : DGE 8/10
CHECKED BY : TMG 11/11

REV. 8/14 MAA/TMG

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7/24/2024
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AcostaM

STD.NO.39PCBB_36_90S_100L

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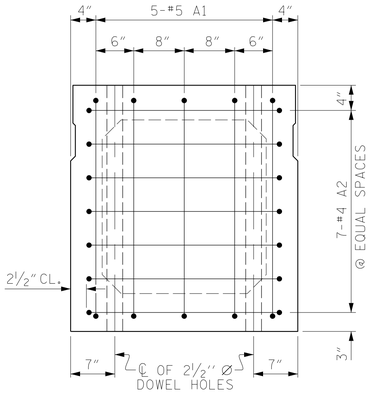
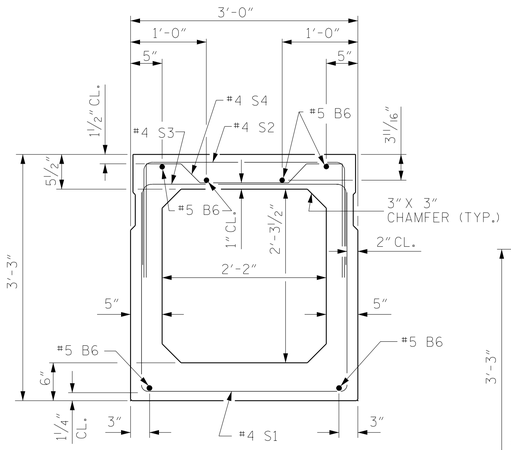


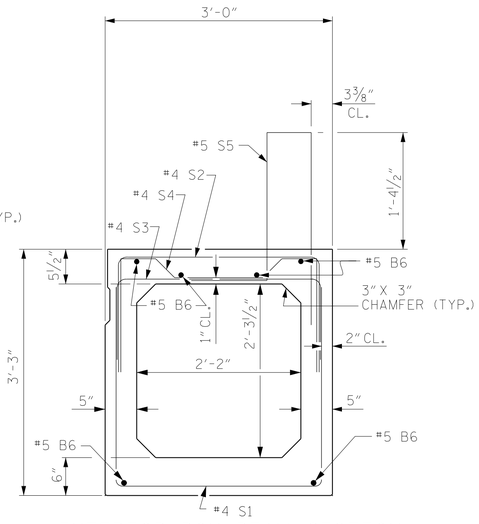
END ELEVATION

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



INTERIOR BOX BEAM SECTION

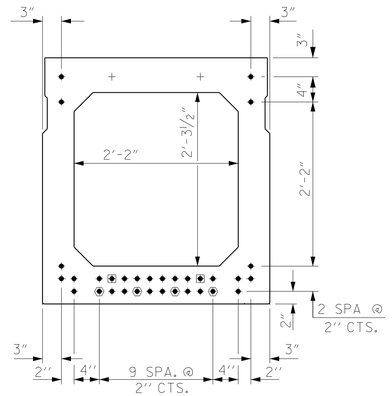
(STRAND LAYOUT NOT SHOWN)



EXTERIOR BOX BEAM SECTION

(STRAND LAYOUT NOT SHOWN)

0.6" Ø LOW RELAXATION STRAND LAYOUT



TYPICAL STRAND LOCATION

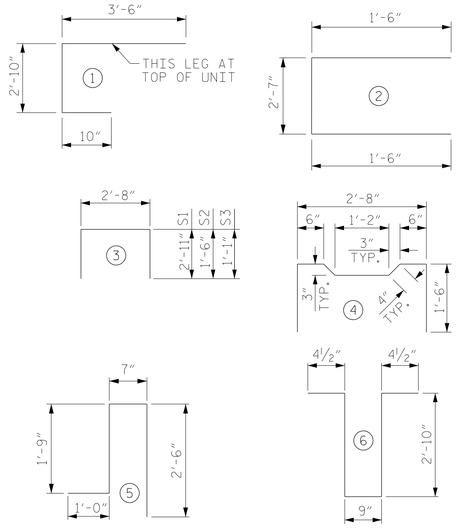
(32 STRANDS REQUIRED)

DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ◘ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ⬢ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER

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

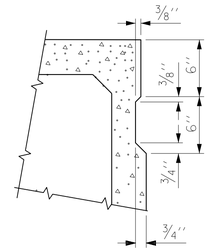
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR ONE BOX BEAM SECTION

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

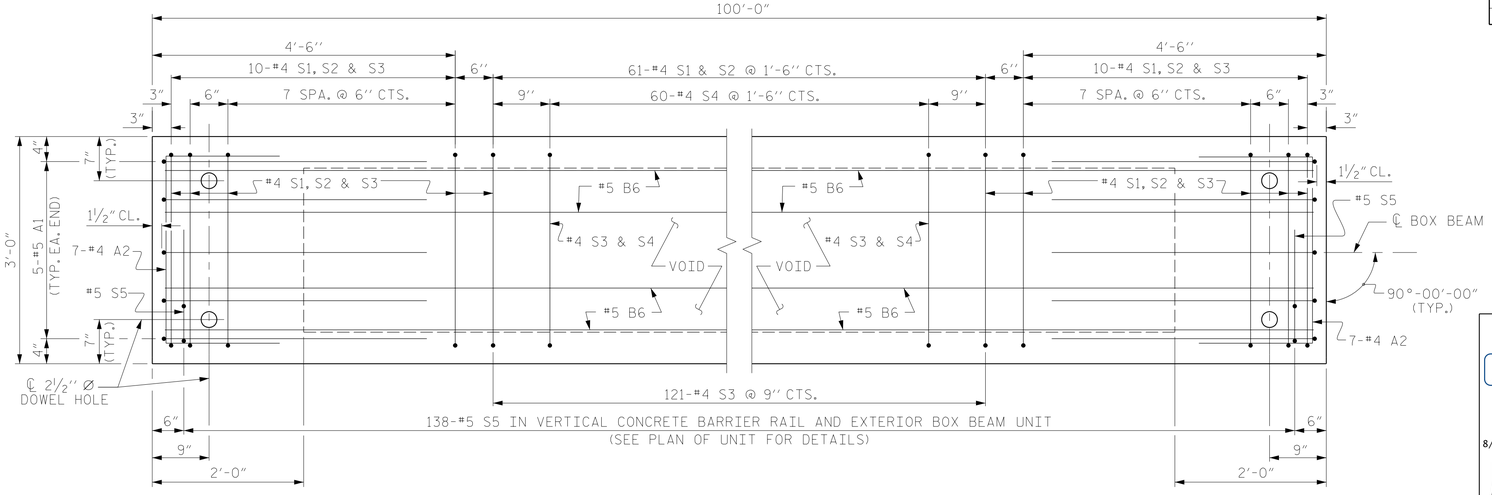


SHEAR KEY DETAIL

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

GRADE 270 STRANDS

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



PLAN OF BOX BEAM

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

PROJECT NO. BP9-R004
ROWAN COUNTY
STATION: 15+00.00 -L-

SHEET 3 OF 5

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DRAWN BY : DGE II/II	REV. 9/14 MAA/TMG
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

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

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			16

STD. NO. 39PCBB6_90S_100L

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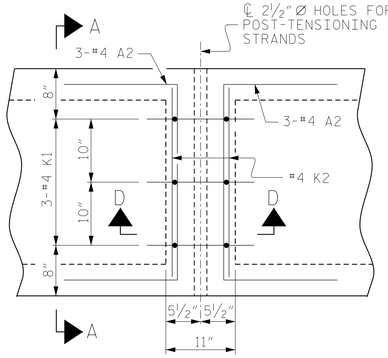
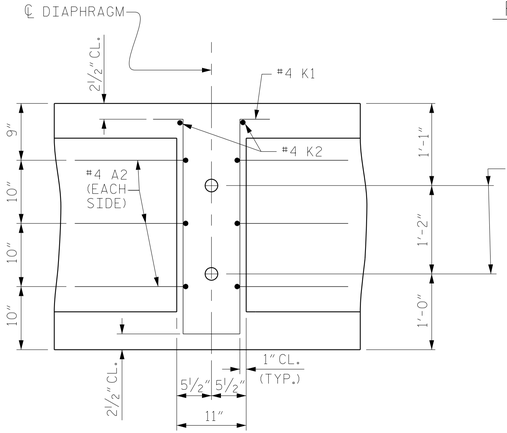
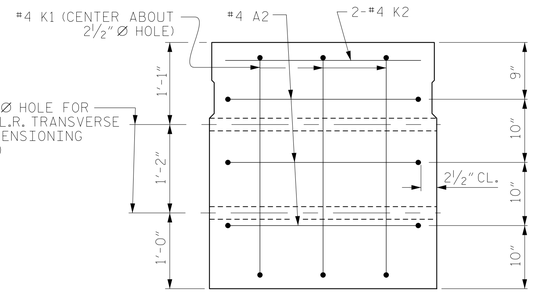


PLAN



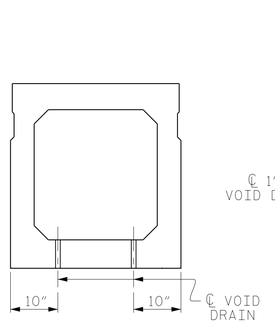
SECTION D-D



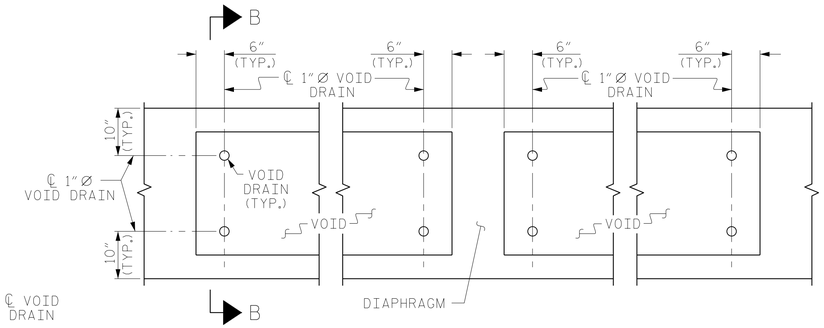
SECTION A-A
VOIDS NOT SHOWN

DOUBLE DIAPHRAGM DETAILS

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



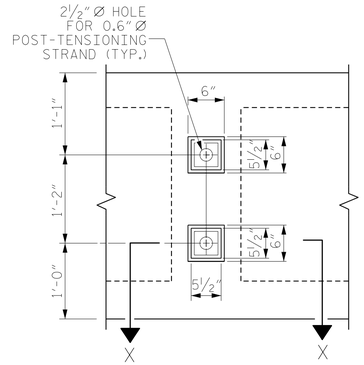
SECTION B-B



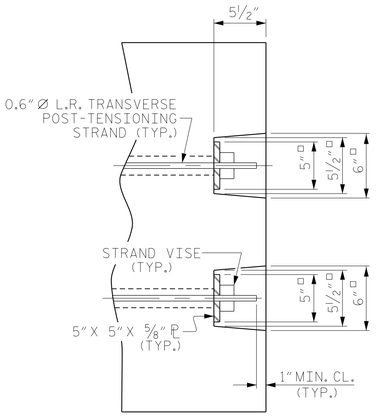
PART PLAN

VOID DRAIN DETAILS

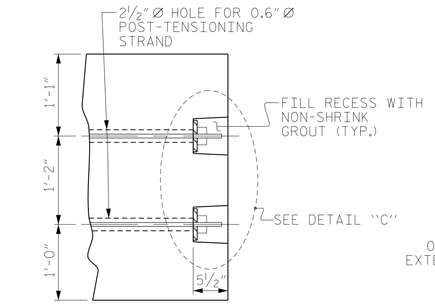
(DIMENSIONS SHOWN ARE TYPICAL FOR EACH VOID)



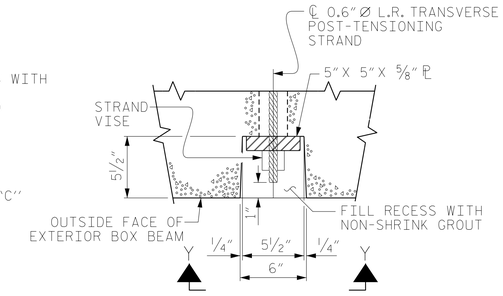
VIEW Y-Y
SHOWING ELEVATION VIEW OF GROUTED RECESS



DETAIL "C"



PART SECTION AT RECESS



SECTION X-X
SHOWING PLAN VIEW OF GROUTED RECESS

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

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

** INCLUDES FUTURE WEARING SURFACE

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SHEET 4 OF 5

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RALEIGH

STANDARD

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

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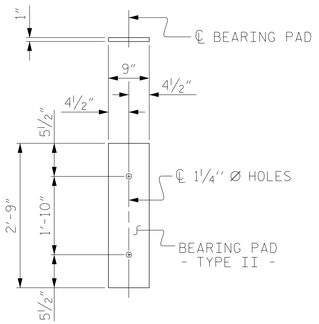
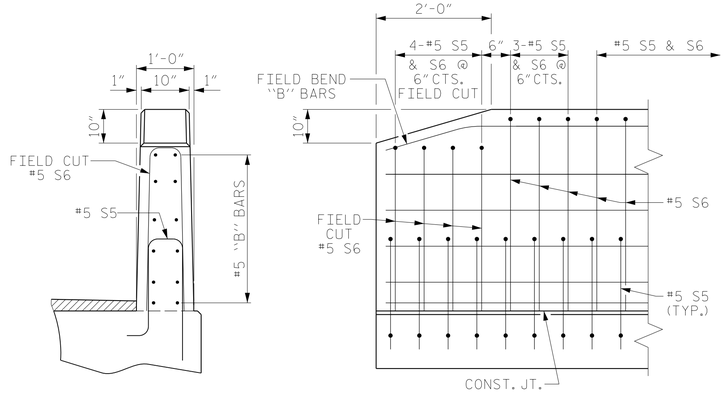


FIXED END

(TYPE II - 24 REQ'D)

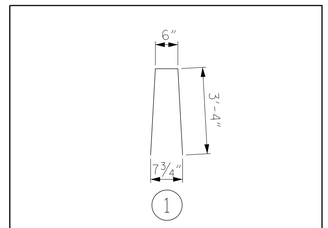


END VIEW SIDE VIEW

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

END OF RAIL DETAILS



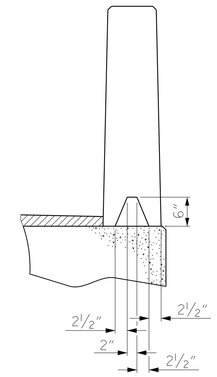
BAR TYPE

BAR DIMENSIONS ARE OUT TO OUT

BOX BEAM UNITS REQUIRED

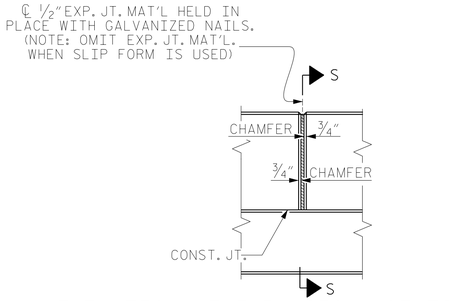
	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR B.B.	2	100'-0"	200'-0"
INTERIOR B.B.	10	100'-0"	1000'-0"
TOTAL	12	———	1200'-0"

SECTION THRU RAIL



SECTION S-S

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



ELEVATION AT EXPANSION JOINTS

VERTICAL CONCRETE BARRIER RAIL DETAILS

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

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

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT

36' NC AND SE	ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
100' UNITS	2⅜"	3'-8⅜"

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ROWAN COUNTY

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SHEET 5 OF 5

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RALEIGH

STANDARD

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

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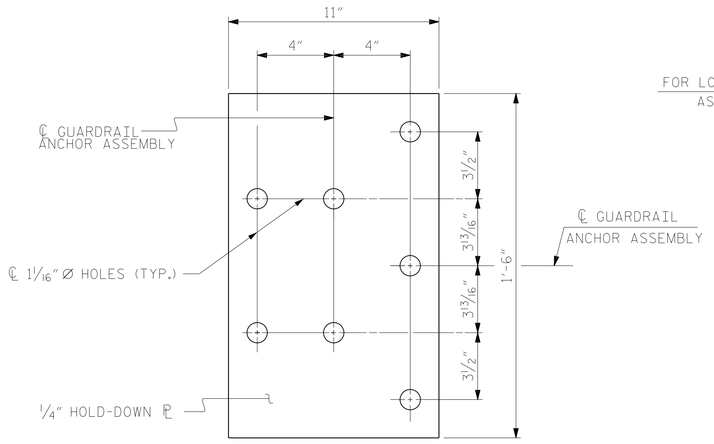
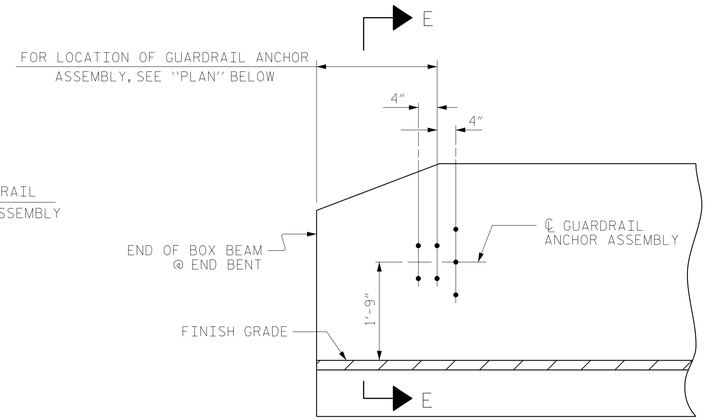


PLAN



ELEVATION

NOTES

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

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

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

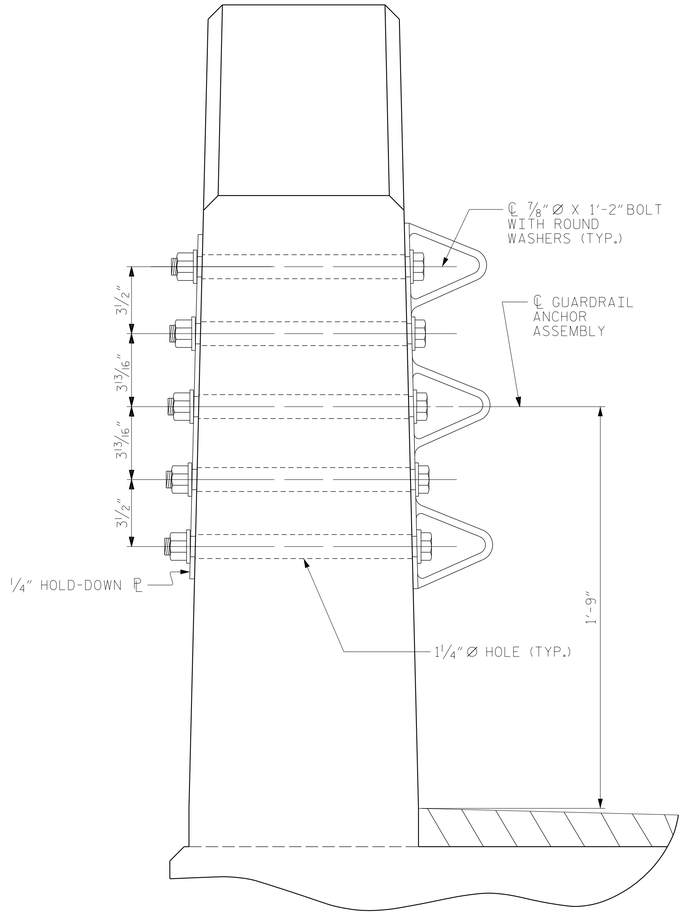
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

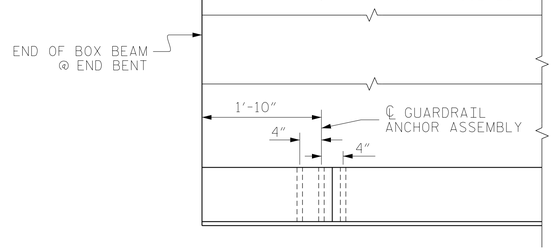
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

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



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

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

SKETCH SHOWING POINTS OF ATTACHMENT

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

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ROWAN COUNTY

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CHECKED BY : GM 5/10	REV. 12/17	MAA/THC	
	REV. 5/18	MAA/THC	

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
GUARDRAIL ANCHORAGE DETAILS FOR VERTICAL CONCRETE BARRIER RAIL

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			16

(SHT 1) STD. NO. GRA3

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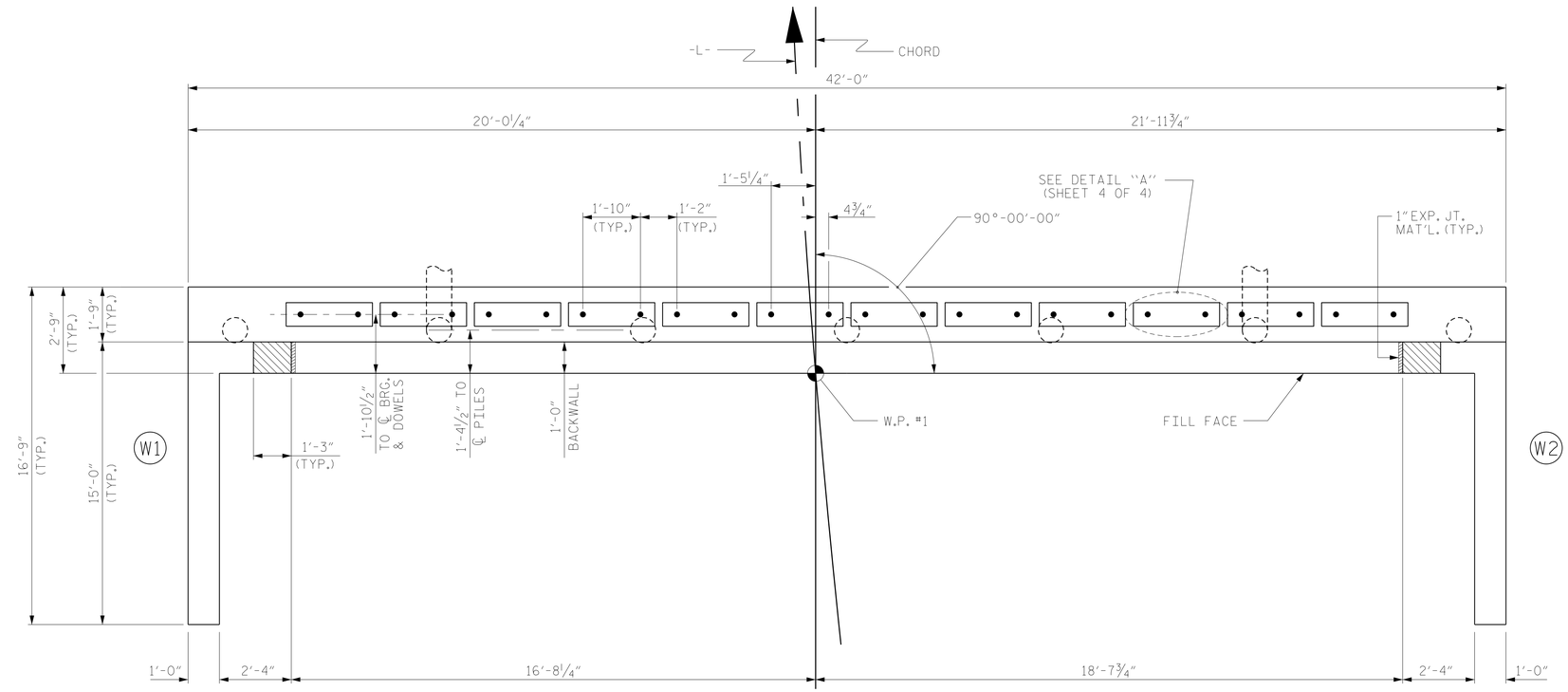
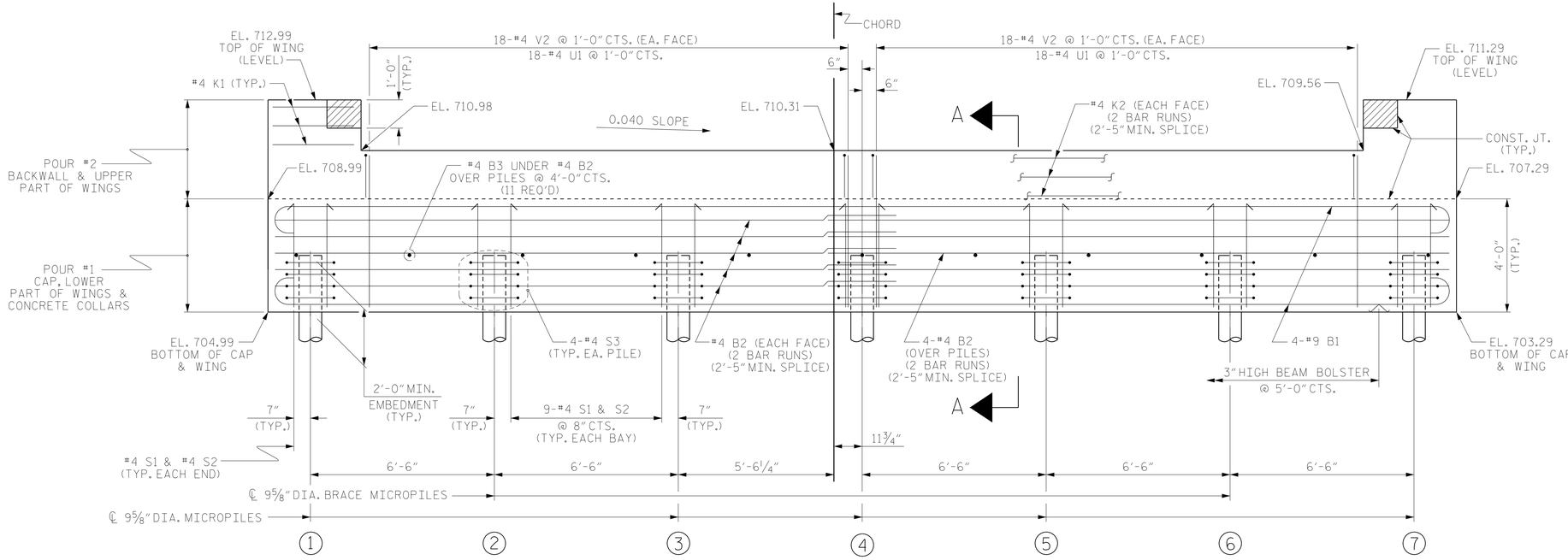


PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 4 OF 4.

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

FOR MICROPILES, SEE "MICROPILE FOUNDATION TABLES" SHEET.

TOP OF PILE ELEVATIONS

1	706.93
2	706.67
3	706.40
4	706.14
5	705.88
6	705.62
7	705.35

PROJECT NO. BP9-R004
ROWAN COUNTY
STATION: 15+00.00 -L-

SHEET 1 OF 4

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CHECKED BY : AAC 12/11	

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8/12/2024

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STATE OF NORTH CAROLINA
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RALEIGH

SUBSTRUCTURE

END BENT NO. 1

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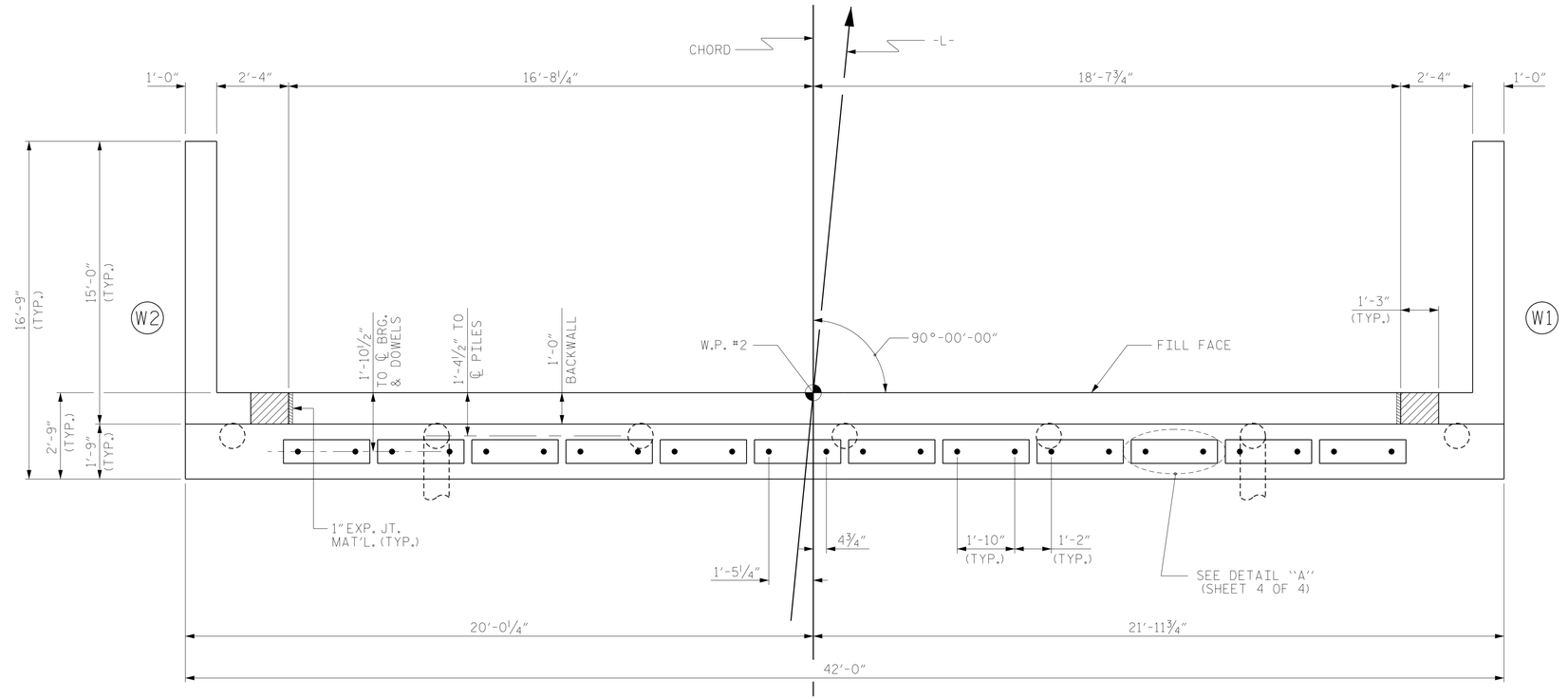
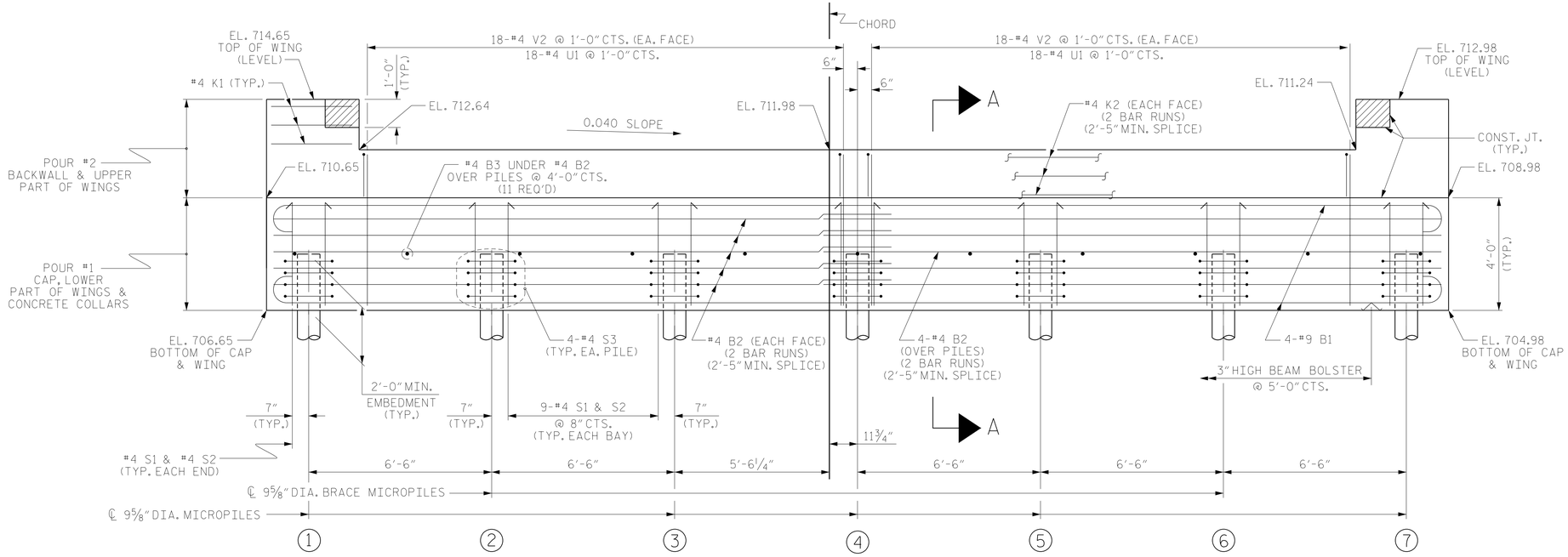


PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 4 OF 4.

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

FOR MICROPILES, SEE "MICROPILE FOUNDATION TABLES" SHEET.

TOP OF PILE ELEVATIONS

1	708.59
2	708.33
3	708.07
4	707.81
5	707.55
6	707.30
7	707.04

PROJECT NO. BP9-R004

ROWAN COUNTY

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SHEET 2 OF 4

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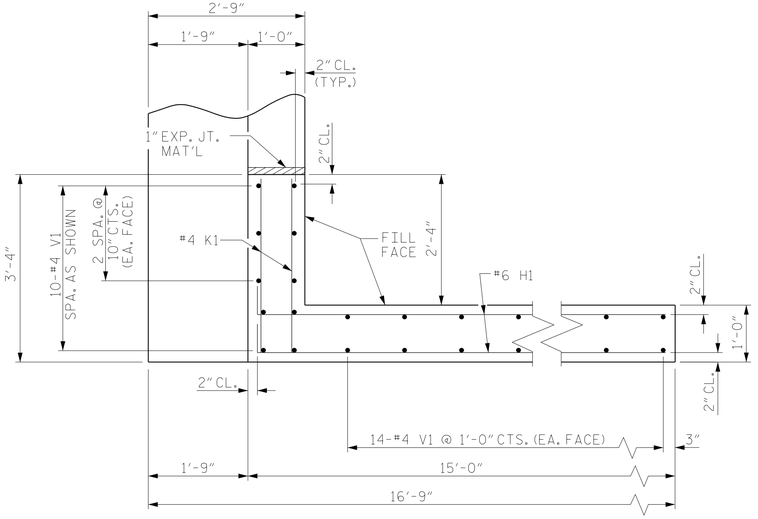
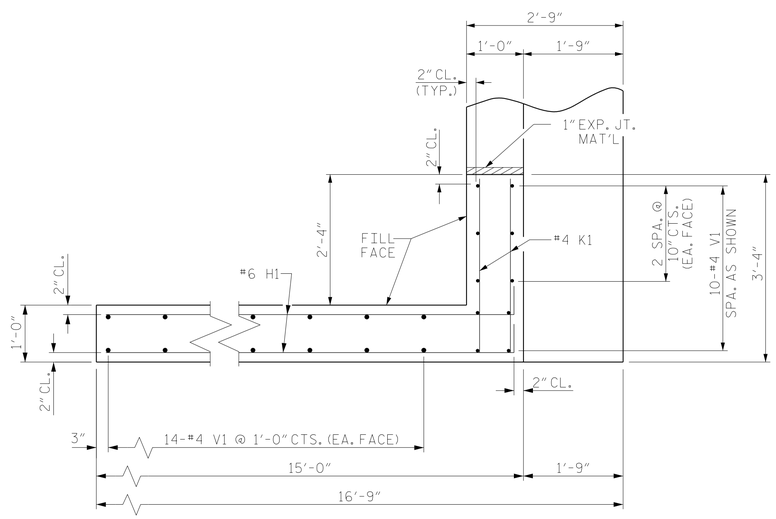
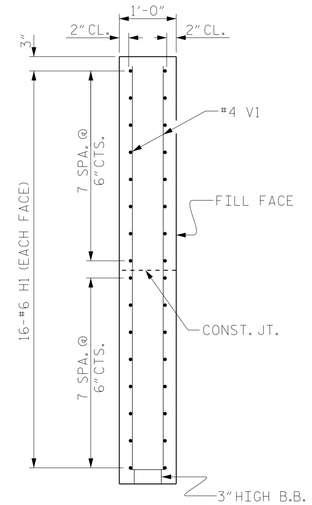


PLAN OF WING (W1)



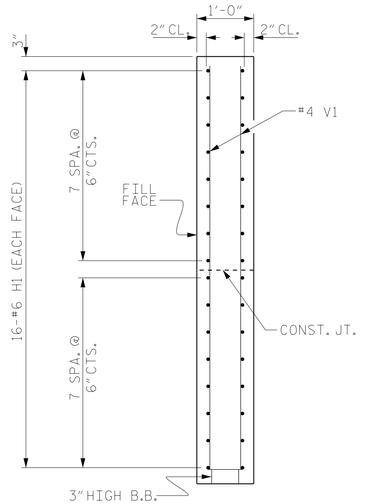
PLAN OF WING (W2)



SECTION X-X

ELEVATION OF WING (W1)

ELEVATION OF WING (W2)



SECTION Y-Y

WING DETAILS

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SHEET 3 OF 4

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SUBSTRUCTURE

END BENT
WING DETAILS

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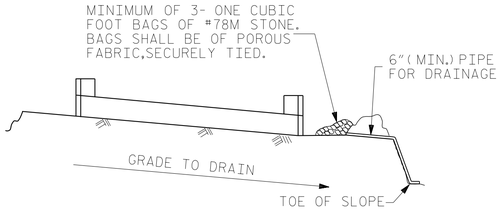
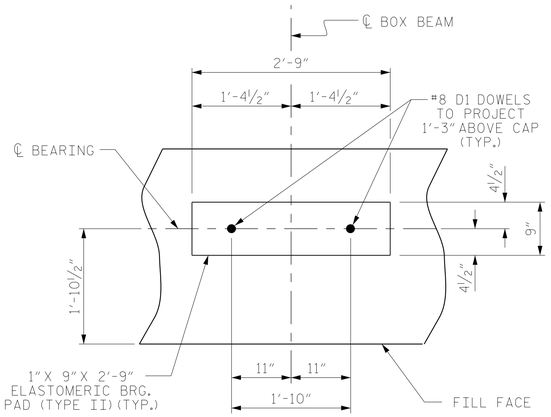


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

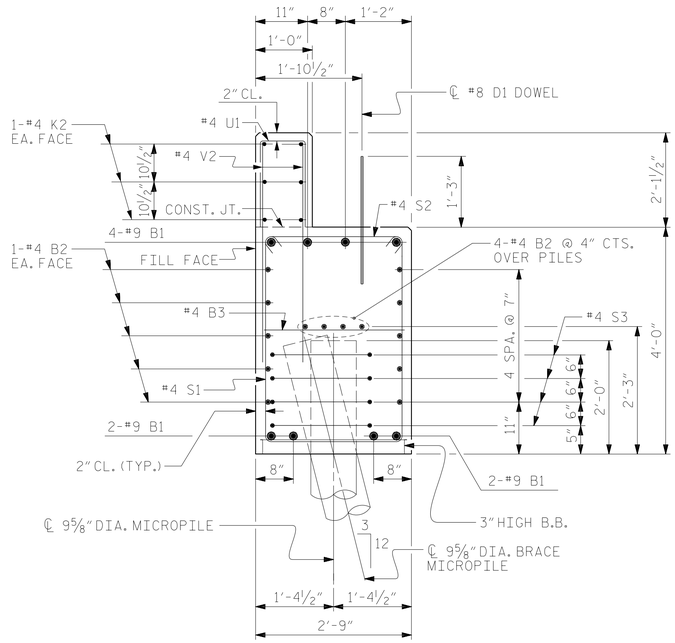
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



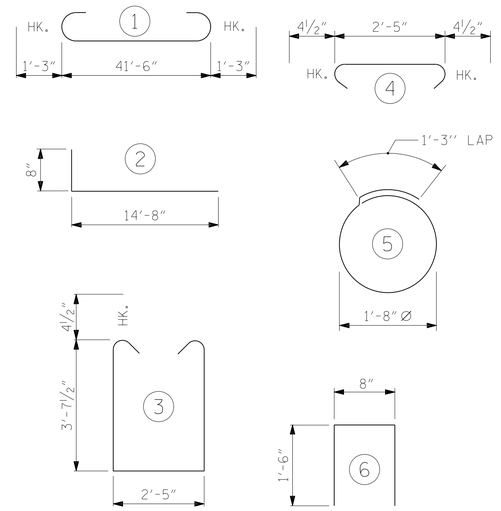
DETAIL "A"

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



SECTION A-A

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	44'-0"	1197
B2	28	#4	STR	22'-1"	413
B3	11	#4	STR	2'-5"	18
D1	24	#8	STR	2'-3"	144
H1	64	#6	2	15'-4"	1474
K1	12	#4	STR	2'-11"	23
K2	12	#4	STR	22'-1"	177
S1	56	#4	3	10'-5"	390
S2	56	#4	4	3'-2"	118
S3	28	#4	5	6'-6"	122
U1	36	#4	6	3'-8"	88
V1	76	#4	STR	7'-8"	389
V2	72	#4	STR	5'-9"	277

REINFORCING STEEL (FOR ONE END BENT) 4830 LBS.

CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)

POUR #1 CAP & LOWER PART OF WINGS 21.3 C.Y.

POUR #2 BACKWALL & UPPER PART OF WINGS 7.9 C.Y.

TOTAL CLASS A CONCRETE 29.2 C.Y.

PROJECT NO. BP9-R004

ROWAN COUNTY

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SHEET 4 OF 4

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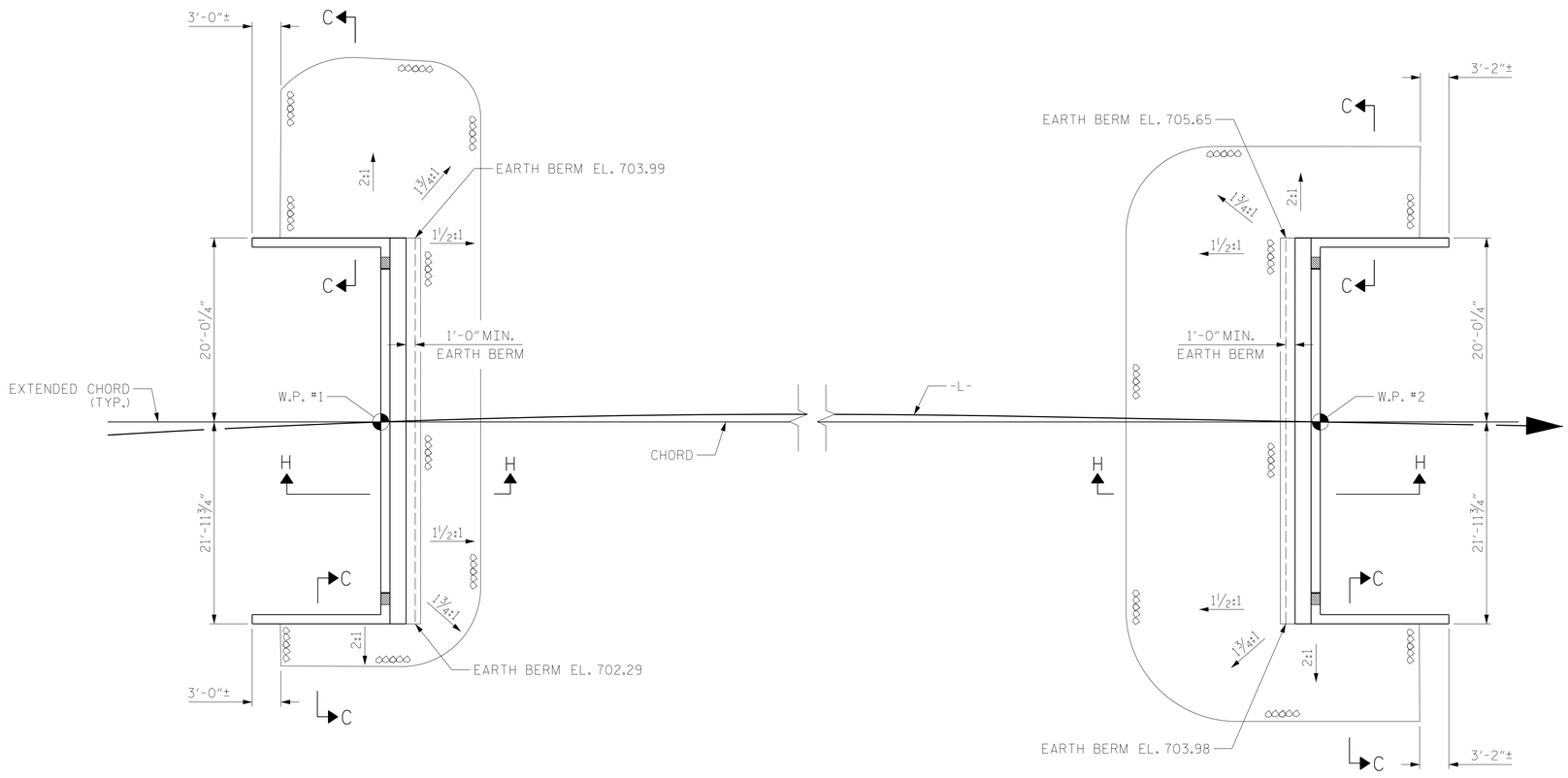
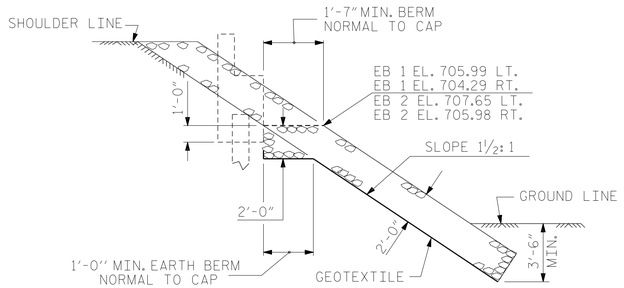


NOTES :

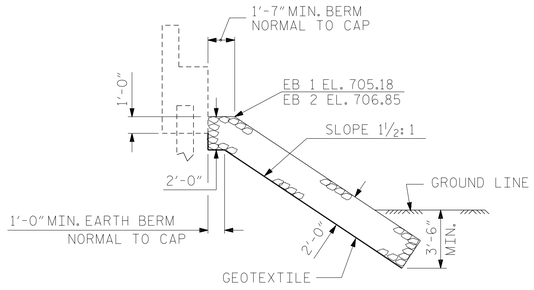
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.

ESTIMATED QUANTITIES		
BRIDGE @ STA. 15+00.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	120	130
END BENT 2	200	220

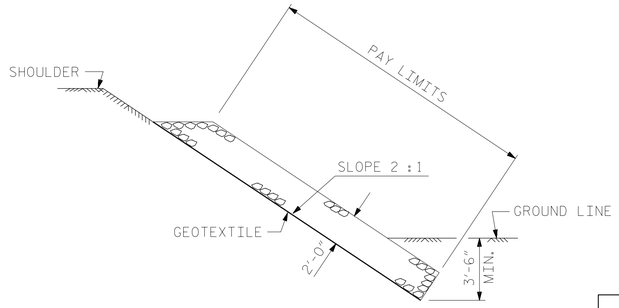
PLAN OF RIP RAP



SECTION H-H



℄ SECTION
BERM RIP RAPPED



SECTION C-C

PROJECT NO. BP9-R004

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RIP RAP DETAILS

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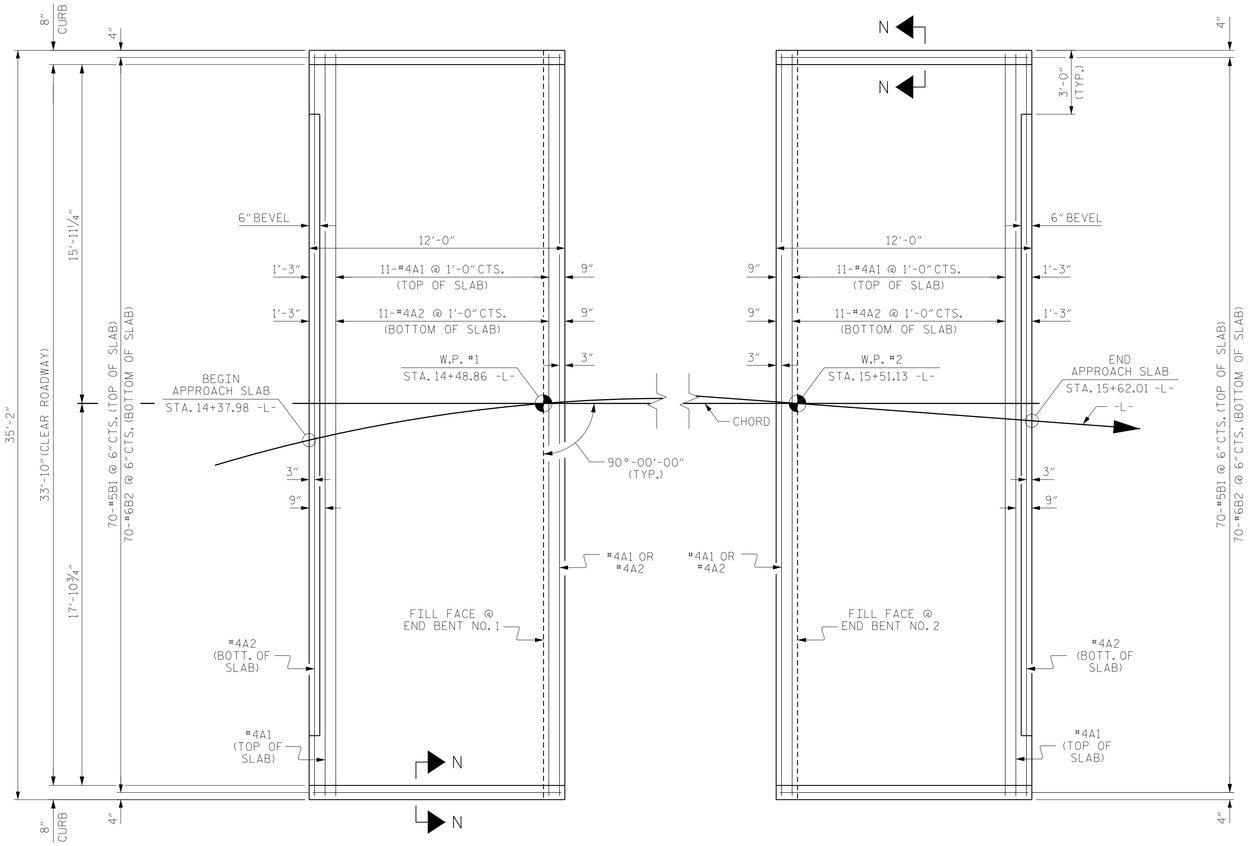
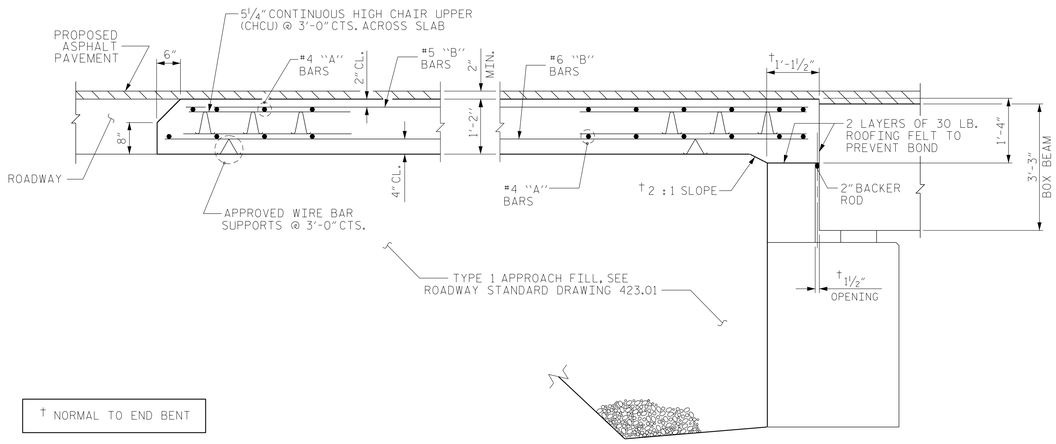


PLAN @ END BENT NO. 1

PLAN @ END BENT NO. 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



† NORMAL TO END BENT

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 NO. 1

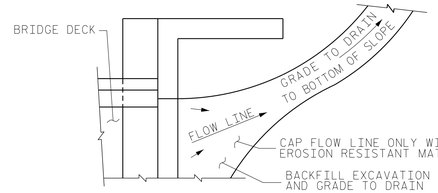
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	13	#4	STR	34'-10"	302
A2	13	#4	STR	34'-10"	302
* B1	70	#5	STR	11'-2"	815
B2	70	#6	STR	11'-8"	1227

REINFORCING STEEL	LBS.	1529
* EPOXY COATED REINFORCING STEEL	LBS.	1117
CLASS AA CONCRETE	C. Y.	18.6

APPROACH SLAB AT EB NO. 2

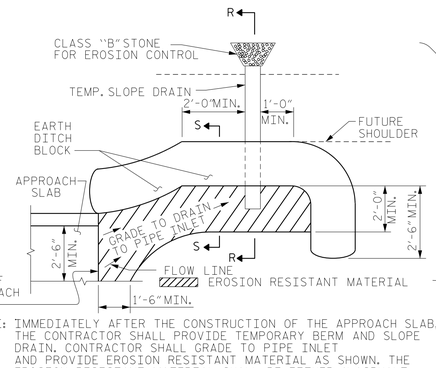
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	13	#4	STR	34'-10"	302
A2	13	#4	STR	34'-10"	302
* B1	70	#5	STR	11'-2"	815
B2	70	#6	STR	11'-8"	1227

REINFORCING STEEL	LBS.	1529
* EPOXY COATED REINFORCING STEEL	LBS.	1117
CLASS AA CONCRETE	C. Y.	18.6



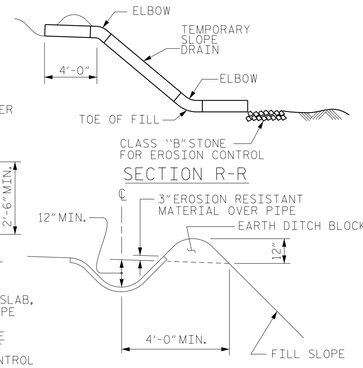
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL



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

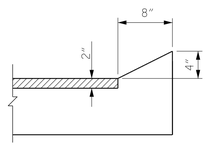
PLAN VIEW



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



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"

PROJECT NO. BP9-R004

ROWAN COUNTY

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BRIDGE APPROACH SLAB FOR PRESTRESSED CONCRETE BOX BEAM UNIT (SUB-REGIONAL TIER) 90° SKEW

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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 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16" 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.