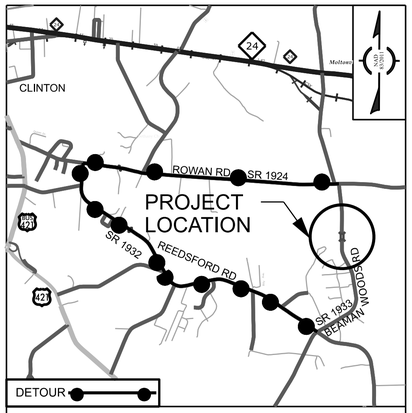
09/08/99

PROJECT: BP3.R003.1

CONTRACT: DC00403

See Sheet 1A For Index of Sheets



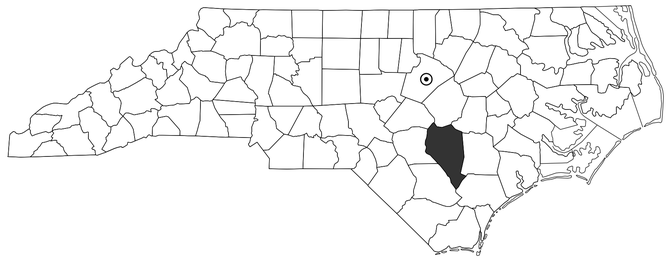
VICINITY MAP (NTS)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SAMPSON COUNTY

LOCATION: *BRIDGE NO. 810003 ON SR 1933 (BEAMAN WOODS RD.) OVER ROWAN BRANCH*

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



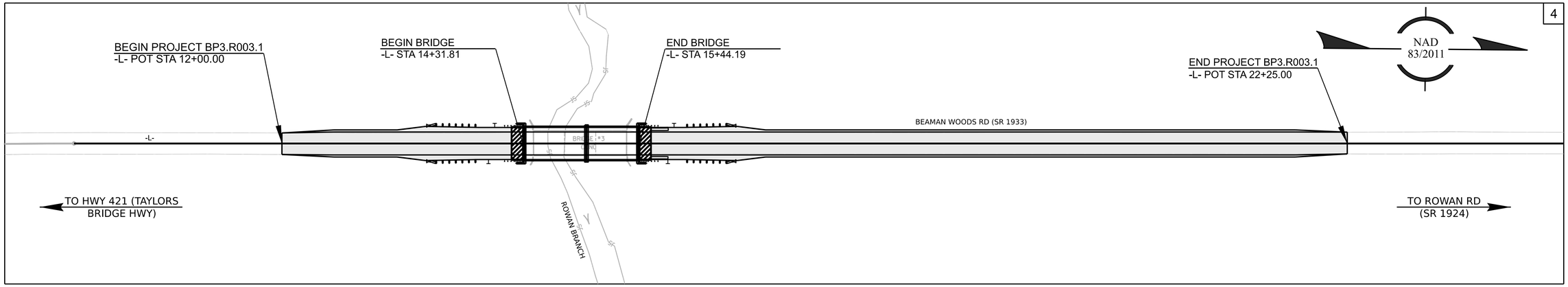
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP3.R003.1	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
BP3.R003.1		PE
BP3.R003.2		RW, UTILITIES
BP3.R003.3		CONSTRUCTION

(FORMERLY B-4815)

Stage 4 Plans (4RD1)

Plans Developed with OpenRoads (ORD)



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

PLANS: 50 25 0 50 100

PROFILE (HORIZONTAL): 50 25 0 50 100

PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

ADT 2022 = 1,730
ADT 2042 = 3,550
K = N/A %
D = N/A %
T = 6 % *
V = 60 MPH
* TTST =3% DUAL 3%
FUNC CLASS = LOCAL
SUB-REGIONAL TIER

PROJECT LENGTH

LENGTHS FOR TIP PROJECT BP3.R003.1

LENGTH ROADWAY	=	0.173 MILES
LENGTH STRUCTURES	=	0.021 MILES
TOTAL LENGTH	=	0.194 MILES

NCDOT Contact: DEREK PIELECH

Prepared in the Office of: KCA KISINGER CAMPO & ASSOCIATES

NC FIRM LICENSE No: C-1506
301 Fayettville St., Suite 1500
Raleigh, NC 27601
(919)882-7839

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: 2/3/2022

LETTING DATE: 07/21/2022

JACOB H. DUKE, P.E.
PROJECT ENGINEER

ALLEN J. MCSWAIN
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

6/14/2022

NORTH CAROLINA PROFESSIONAL SEAL 049338 ENGINEER ERIK P AADLAND

DocuSigned by: Erik P. Aadland
P.E.
SIGNATURE

ROADWAY DESIGN ENGINEER

6/14/2022

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE

DocuSigned by: Jacob H Duke
P.E.
SIGNATURE

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

5/26/20

INDEX OF SHEETS

GENERAL NOTES: 2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018
REVISED:

GRADE LINE:
GRADING AND SURFACING OR RESURFACING AND WIDENING:

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

CLEARING:

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

SUBSURFACE DRAINS:

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

GUARDRAIL:

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

TEMPORARY SHORING:

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

END BENTS:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE

Century Link, Duke Energy, and Sampson County Public Works

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

RIGHT-OF-WAY MARKERS:

ALL RIGHT-OF-WAY MARKERS AND PERMANENT EASEMENT MARKERS ON THIS PROJECT SHALL BE PLACED BY L&S. THE CONTRACT SURVEYOR WILL BE RESPONSIBLE FOR RESETTING ANY POINTS DISTRUBED BY CONSTRUCTION.

EFF. 01-16-2018
REV.

2018 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January, 2018 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
DIVISION 4 - MAJOR STRUCTURES	
422.02	Bridge Approach Fills - Type II Modiefied Approach Fill
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
815.02	Subsurface Drain
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.02	Guide for Rip Rap at Pipe Outlets

BP3.R003.1
4RD1 | 1A

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
SAMPSON COUNTY

HIGHWAY DIVISION 3

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ROADWAY DESIGN ENGINEER

DocuSigned by: Jacob H Duke
05300E3E4E8E4...

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE

5/31/2022

HYDRAULICS ENGINEER

DocuSigned by: Erik Madland
ABABE5F5785E4...

NORTH CAROLINA PROFESSIONAL SEAL 049338 ENGINEER ERIK P MADLAND

5/31/2022

PREPARED BY

KCA
KISINGER CAMPO & ASSOCIATES
NC FIRM LICENSE No: C-1506
301 Fayetteville Street, Suite 1500
Raleigh, NC 27601
(919)882-7839

REVISIONS

5/26/20

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale

**S.U.E. = Subsurface Utility Engineering*

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 — $
- Well — W
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

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

RAILROADS:

- Standard Gauge — CSX TRANSPORTATION
- RR Signal Milepost — MILEPOST 35
- Switch — SWITCH
- RR Abandoned
- RR Dismantled

RIGHT OF WAY & PROJECT CONTROL:

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

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Curb Ramp — CR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard — Vineyard

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

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

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole — HH
- H–Frame Pole
- U/G Power Line Test Hole (SUE – LOS A)*
- U/G Power Line (SUE – LOS B)* — P
- U/G Power Line (SUE – LOS C)* — P
- U/G Power Line (SUE – LOS D)* — P

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

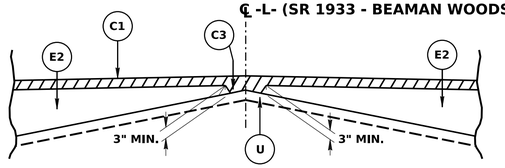
5/26/20

PAVEMENT SCHEDULE

A	VARIABLE DEPTH CONCRETE WEARING SURFACE. SEE STRUCTURE PLANS.
C1	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF THE TWO LAYERS.
C3	PROP. VARIABLE DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110.0 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 1" OR TO EXCEED 1.5" IN DEPTH.
E1	PROP. APPROX. 4.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS PER SQ. YD.
E2	PROP. VARIABLE DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114.0 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 3" OR GREATER THAN 5.5" IN DEPTH.
R1	SHOULDER BERM GUTTER.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	INCIDENTAL MILLING.
W	WEDGING (SEE WEDGING DETAIL).

NOTE: PAVEMENT TRENCH SECTIONS AND EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE

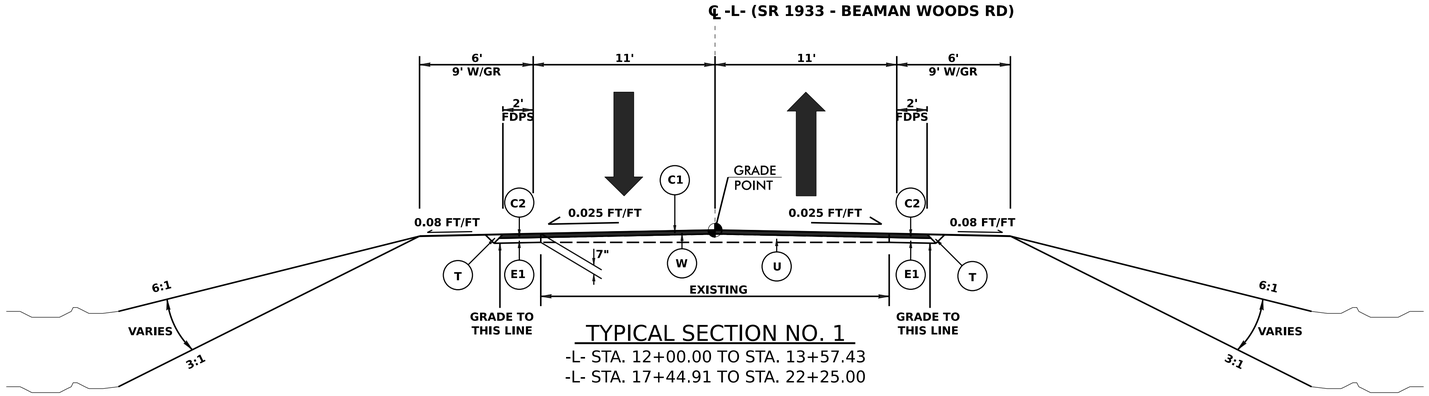
INSET A



DETAIL SHOWING METHOD OF WEDGING

USE INSET A

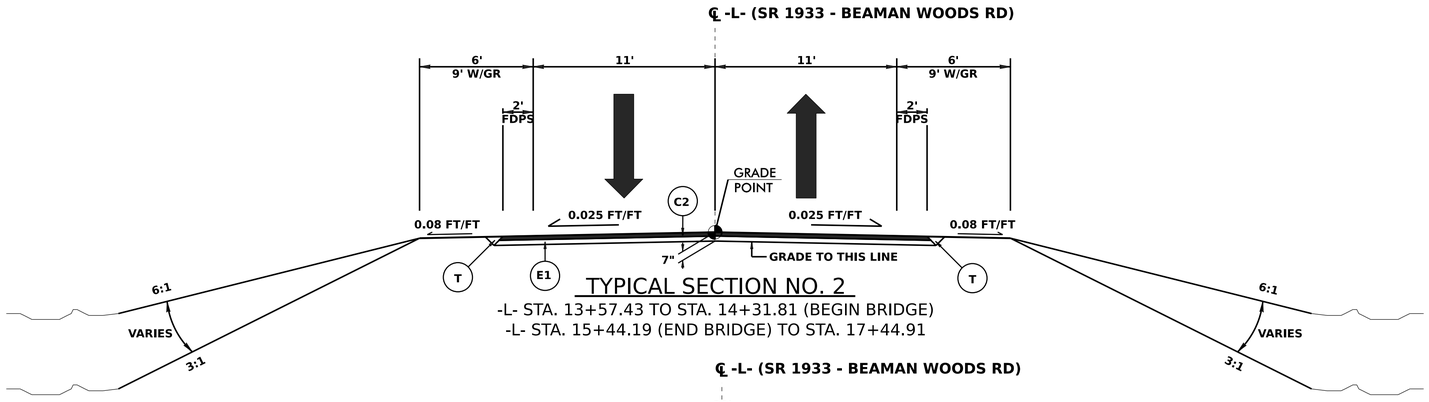
USE INSET A IN CONJUNCTION WITH TYPICAL SECTION NO. 1



TYPICAL SECTION NO. 1

-L- STA. 12+00.00 TO STA. 13+57.43

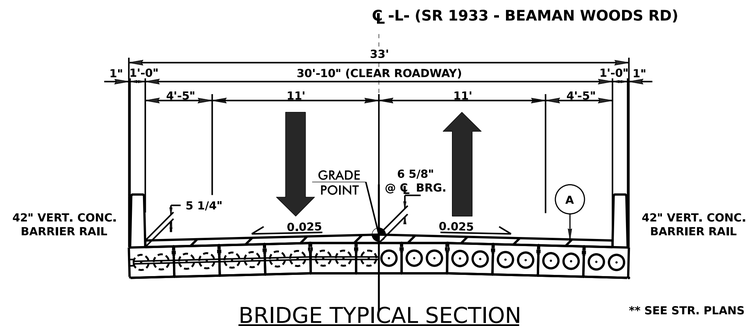
-L- STA. 17+44.91 TO STA. 22+25.00



TYPICAL SECTION NO. 2

-L- STA. 13+57.43 TO STA. 14+31.81 (BEGIN BRIDGE)

-L- STA. 15+44.19 (END BRIDGE) TO STA. 17+44.91



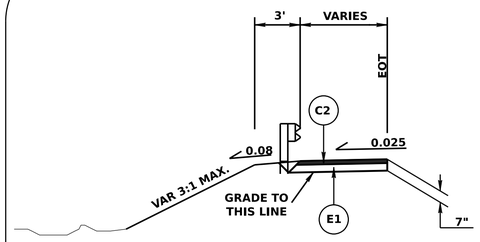
** SEE STR. PLANS

BRIDGE TYPICAL SECTION

-L- STA. 14+31.81 (BEGIN BRIDGE) TO

-L- STA. 15+44.19 (END BRIDGE)

INSET B



GUARDRAIL DETAIL

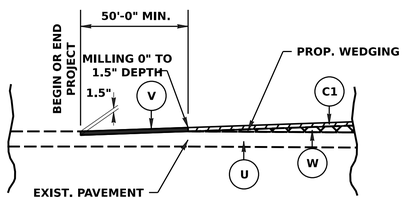
USE INSET B

USE INSET B IN CONJUNCTION WITH TYPICAL NO. 1 AND 2

-L- STA. 13+38.06 TO 14+31.81 (BEGIN BRIDGE)

-L- 15+44.19 (END BRIDGE) TO 16+37.94

INSET C



INCIDENTAL

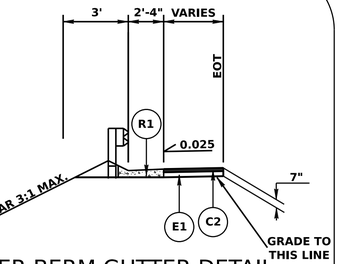
MILLING AND RESURFACING DETAIL

USE INSET C

-L- STA. 12+00.00 TO 12+50.00

-L- STA. 21+75.00 TO 22+25.00

INSET D



SHOULDER BERM GUTTER DETAIL

USE INSET D

-L- STA. 15+55.06 TO 15+72.00 LT/RT

BP3.R003.1

4RDI | 2A-1

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
SAMPSON COUNTY

HIGHWAY DIVISION 3

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ROADWAY DESIGN ENGINEER

DocuSigned by:
Jacob Duke
295B3D5A4E3F4E8...

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043777 ENGINEER JACOB H DUKE

5/27/2022

PREPARED BY

KCA
KISINGER CAMPO & ASSOCIATES
NC FIRM LICENSE No: C-1506
301 Fayetteville Street,
Suite 1500
Raleigh, NC 27601
(919)882-7839

REVISIONS

5/26/20

PROJECT REFERENCE NO.	SHEET NO.

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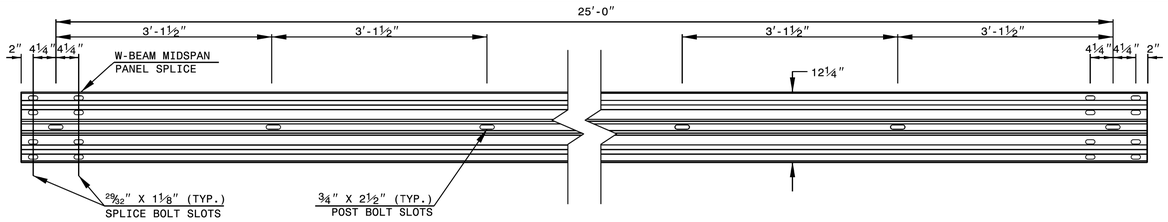
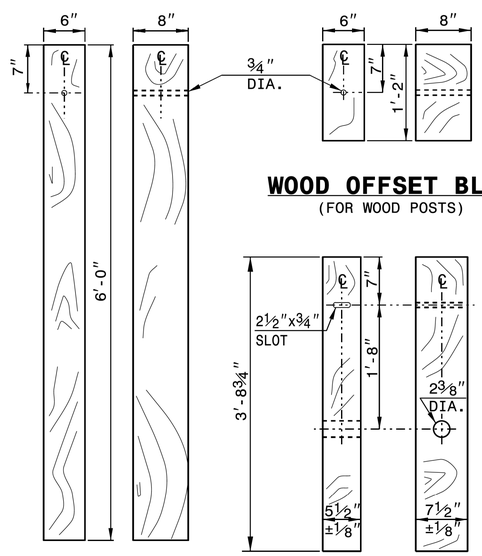
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02



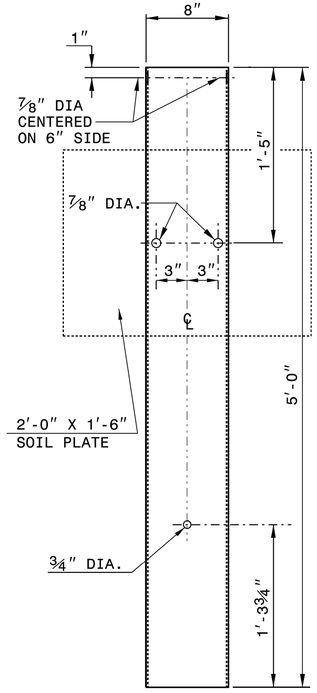
STANDARD W-BEAM GUARDRAIL



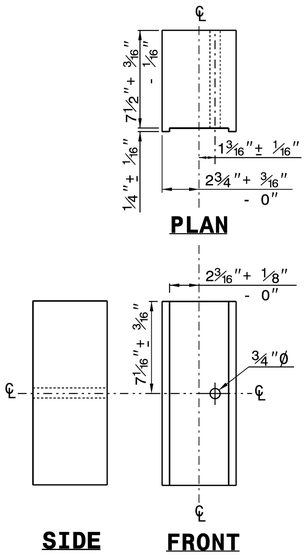
STANDARD LINE POST

WOOD OFFSET BLOCK
(FOR WOOD POSTS)

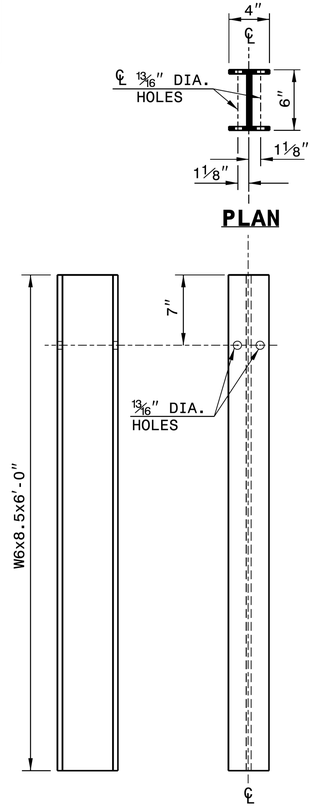
SHORT WOOD BREAKAWAY POST



STEEL TUBE
TS 6"x8"x0.1875"



ROUTED OFFSET BLOCK



"W6" STEEL POST

SYSTEM PARTS

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02

DocuSigned by: Ken Davenport
5/27/2022

NORTH CAROLINA PROFESSIONAL SEAL 022071 ENGINEER KENNETH DAVENPORT

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

SEE TITLE BLOCK

ORIGINAL BY: J.HOWERTON DATE: 3-7-2018
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:

BP3.R003.1
4RD1 | 2C-1

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
SAMPSON COUNTY

HIGHWAY DIVISION 3

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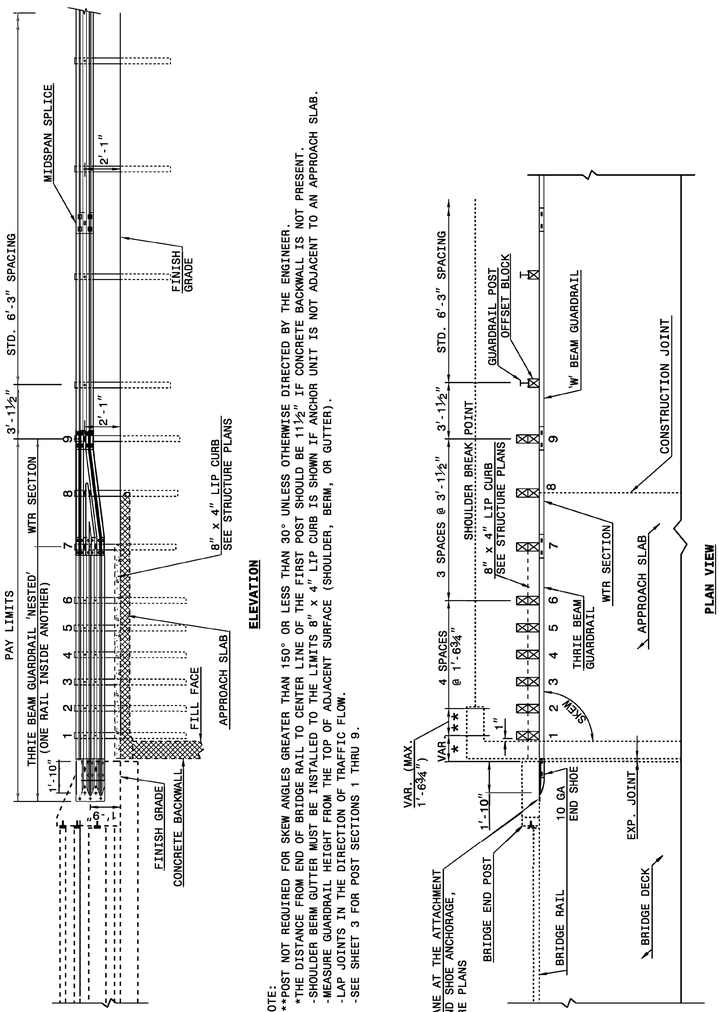
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III
FOR ATTACHMENT TO RAIL ON BRIDGE

SHEET 1 OF 7
862D03



ELEVATION

PLAN VIEW

NOTE:
**POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT.
-SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.
-MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
-LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
-SEE SHEET 3 FOR POST SECTIONS 1 THRU 9.

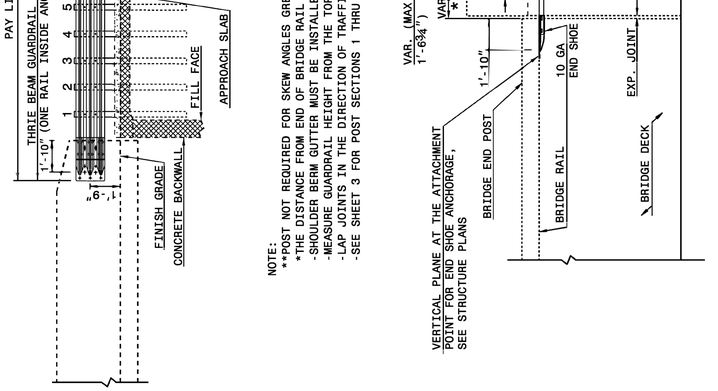
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	ROADWAY DETAIL DRAWING FOR **STRUCTURE ANCHOR UNITS** GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE	SHEET 1 OF 7 862D03

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

ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO
RAIL ON BRIDGE - SUB REGIONAL TIER

SHEET 2 OF 7
862D03



ELEVATION

PLAN VIEW

NOTE:
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-SEE SHEET 3 FOR POST SECTIONS 1 THRU 9.

GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	ROADWAY DETAIL DRAWING FOR **STRUCTURE ANCHOR UNITS** GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER	SHEET 2 OF 7 862D03

BP3.R003.1
4RD1 | 2C-2

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
SAMPSON COUNTY

HIGHWAY DIVISION 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PREPARED BY

KCA
KISINGER CAMPO & ASSOCIATES

NC FIRM LICENSE No: C-1506
301 Fayetteville Street,
Suite 1500
Raleigh, NC 27601
(919)882-7839

DocuSigned by:
Ron Davis
F81B6038A47B4B3...

5/27/2022

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

SEE TITLE BLOCK

ORIGINAL BY: J HOWERTON DATE: 06-22-12
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

COMPUTED BY: JMD DATE: 8/21
CHECKED BY: JHD DATE: 8/21

5/26/20

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4RD1 | 3B-1

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
SAMPSON COUNTY

HIGHWAY DIVISION 3

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STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK
IN CUBIC YARDS

Station	Station	Uncl. Excav.	Embank. +%	Borrow	Waste
-L- 12+00.00	-L- 14+31.81	234	180		54
-L- 15+44.19	-L- 22+25.00	287	681	394	
PROJECT TOTALS:		521	861	394	54
Waste in Lieu of Borrow				-54	
Replace Topsoil on Borrow Pit (5%)				17	
GRAND TOTALS:		521	861	357	
SAY:		**530**		**360**	

NOTE:

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

ALL EARTHWORK QUANTITIES WERE DERIVED FROM ORD QUANTITIES BY NAMED BOUNDARY REPORT(S) AS DESCRIBED IN THE ORD QUICKSTART TRAINING.

PAVEMENT REMOVAL SUMMARY
IN SQUARE YARDS

SURVEY LINE	Station	Station	LOCATION LT/RT/CL	ASPHALT REMOVAL	ASPHALT BREAKUP	CONCRETE REMOVAL	CONCRETE BREAKUP
-L-	13+57.43	14+42.04	LT/RT/CL	200.12			
-L-	15+31.60	17+44.91	LT/RT/CL	488.70			
		TOTAL:		688.82			
		SAY:		**690**			

SHOULDER BERM GUTTER SUMMARY
IN LINEAR FEET

LINE	Station	Station	LENGTH
-L- LT	15+55.06	15+72.00	16.94
-L- RT	15+55.06	15+72.00	16.94
		TOTAL:	33.88
		SAY:	**40**

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL

GUARDRAIL SUMMARY

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

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL WIDTH	FLARE LENGTH		W		ANCHORS								ADDITIONAL GUARDRAIL POSTS	IMPACT ATTENUATOR TYPE 350		SINGLE FACED CONCRETE BARRIER	REMOVE EXISTING GUARDRAIL	REMOVE & STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	XI MOD	XI	GREU TL-3	M-350	TYPE III	CAT-1	VI MOD	BIC		G	NG				
-L-	13+38.06	14+31.81	LT	93.75				14+31.81	4.417	7.417		50		1			1		1									
-L-	13+38.06	14+31.81	RT	93.75			14+31.81		4.417	7.417	50		1				1		1									
-L-	15+44.19	16+37.94	LT	93.75			15+44.19		4.417	7.417		50		1			1		1									
-L-	15+44.19	16+37.94	RT	93.75				15+44.19	4.417	7.417	50		1				1		1									
			SUBTOTAL:	375													4		4				5						
		Less GREU TL-3 @ 50' Each		200																								
		Less Type III @ 18.75 Each		75																								
		PROJECT TOTALS:		100													4		4				5						
			SAY	**100**													**4**		**4**				**5**						

REVISIONS

5/26/20

COMPUTED BY: JRM DATE: 12/21
CHECKED BY: EPA DATE: 12/21

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BP3.R003.1

4RD1 | 3D-1

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
SAMPSON COUNTY

HIGHWAY DIVISION 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PREPARED BY
KCA
KISINGER CAMPO & ASSOCIATES
NC FIRM LICENSE No: C-1506
301 Fayetteville Street,
Suite 1500
Raleigh, NC 27601
(919)882-7839

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

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

STATION / SIZE / THICKNESS OR GAUGE	LOCATION (LT, RT, OR CL)'	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) 12"	15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE
15+66	11 LT	401		94.2															
	11 LT	401	402		91.5	90.0			16										
15+66	11 RT	403		94.2															
	11 RT	403	404		91.5	90.0			16										
SHEET TOTALS									32										

STATION	C.S. PIPE 12" (.064)	15" (.064)	18" (.064)	24" (.064)	30" (.079)	36" (.079)	42" (.109)	48" (.109)	R.C. PIPE CLASS III 12"	15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS IV 12"	15"	18"	24"	30"	36"	42"	48"
15+66																								
15+66																								
SHEET TOTALS																								

STATION	** " R.C. PIPE (CLASS V)	**** RC PIPE CULVERTS, CONTRACTOR DESIGN	**** RC PIPE CULVERTS, CONTRACTOR DESIGN	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL. 'B') LIN. FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN
15+66								1								
15+66								1								
SHEET TOTALS								2								

STATION	T.B.D.I. STD. 840.35	G.D.I (N.S. FLAT) FRAME W/ 2 GRATES STD 840.29	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. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32					DRAINAGE PIPE ELBOWS NO. 15"	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
15+66	1	1																	
															2				
15+66	1	1																	
															2				
SHEET TOTALS	2	2													4				

ABBREVIATIONS

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

REVISIONS

COMPUTED BY: Tyler C. Bottoms DATE: 02/22/22
CHECKED BY: Jinyoung Park DATE: 03/31/22

5/26/20

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF SUBSURFACE DRAINAGE

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

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

BP3.R003.1
4RDI | 3G-1

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
SAMPSON COUNTY

HIGHWAY DIVISION 3

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PREPARED BY

KCA
KISINGER CAMPO & ASSOCIATES
NC FIRM LICENSE No: C-1506
301 Fayetteville Street,
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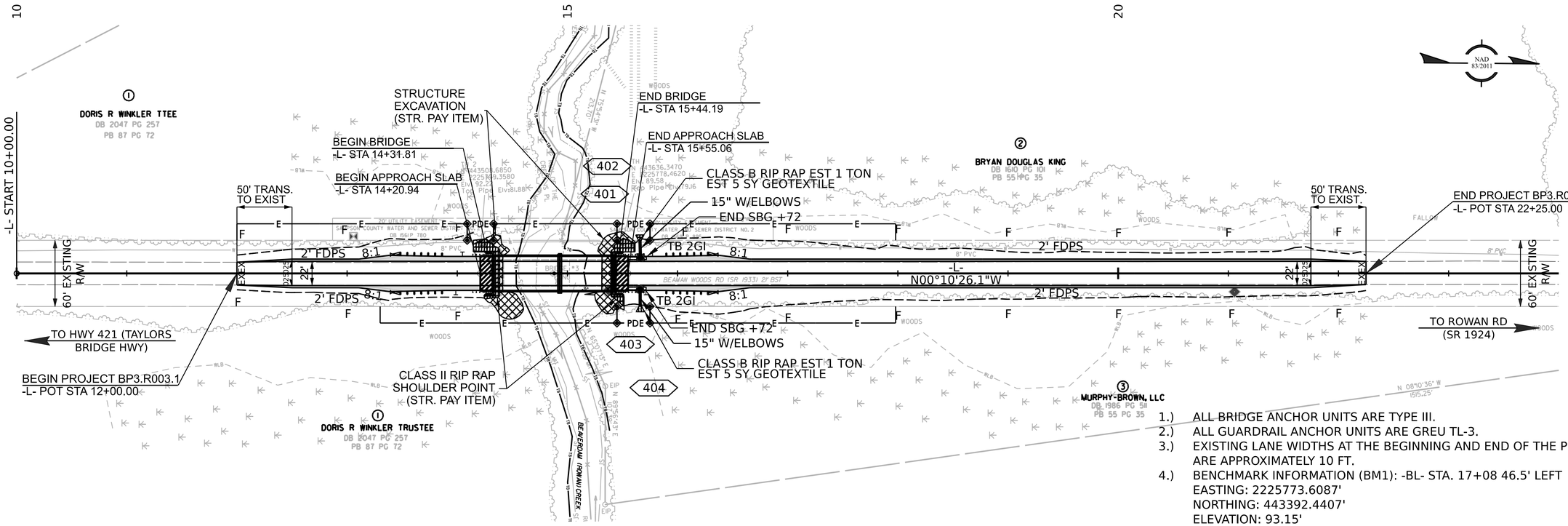
Raleigh, NC 27601
(919)882-7839

REVISIONS

5/26/20



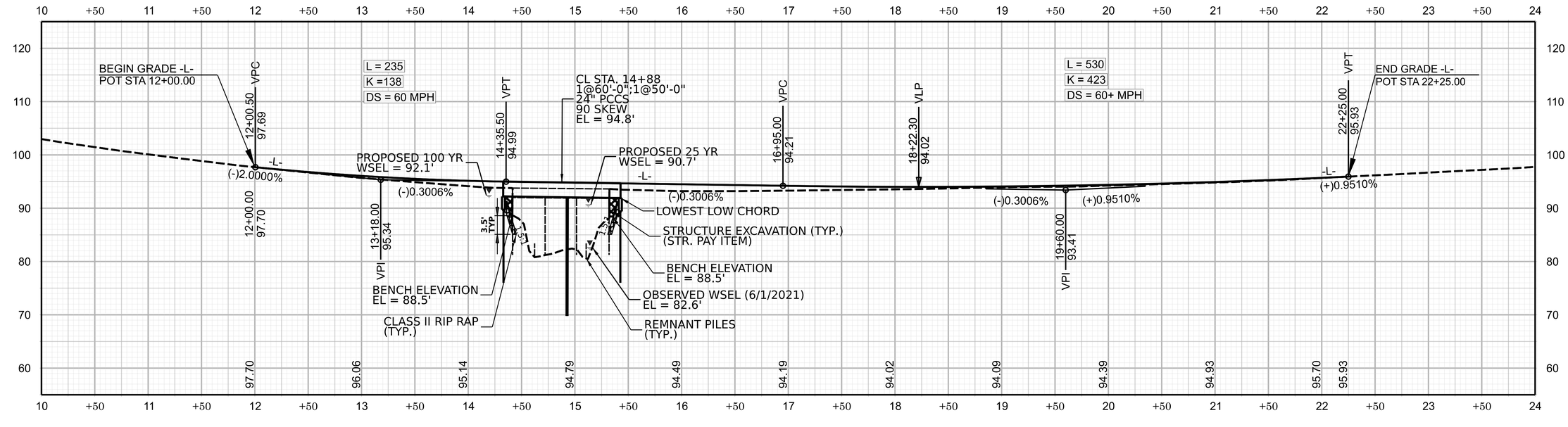
1.) ALL BRIDGE ANCHOR UNITS ARE TYPE III.
2.) ALL GUARDRAIL ANCHOR UNITS ARE GREU TL-3.
3.) EXISTING LANE WIDTHS AT THE BEGINNING AND END OF THE PROJECT ARE APPROXIMATELY 10 FT.
4.) BENCHMARK INFORMATION (BM1): -BL- STA. 17+08 46.5' LEFT
EASTING: 2225773.6087'
NORTHING: 443392.4407'
ELEVATION: 93.15'
RAIL ROAD SPIKE IN THE BASE OF 12" BIRCH TREE
5.) REFER TO SHEET 4A FOR R/W AND EASEMENT MONUMENT PLACEMENT.

-L- SR 1933 (BEAMAN WOODS RD)

FOR STRUCTURE PLANS, SEE SHEET S-1 THRU S-20

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE = 1200 CFS	BASE DISCHARGE = 2083 CFS	OVERTOPPING DISCHARGE = 4300 FCS
DESIGN FREQUENCY = 25 YRS	BASE FREQUENCY = 100 YRS	OVERTOPPING FREQUENCY = 500+ YRS
DESIGN HW ELEVATION = 90.7 FT	BASE HW ELEVATION = 92.1 FT	OVERTOPPING HW ELEVATION = 94.0 FT

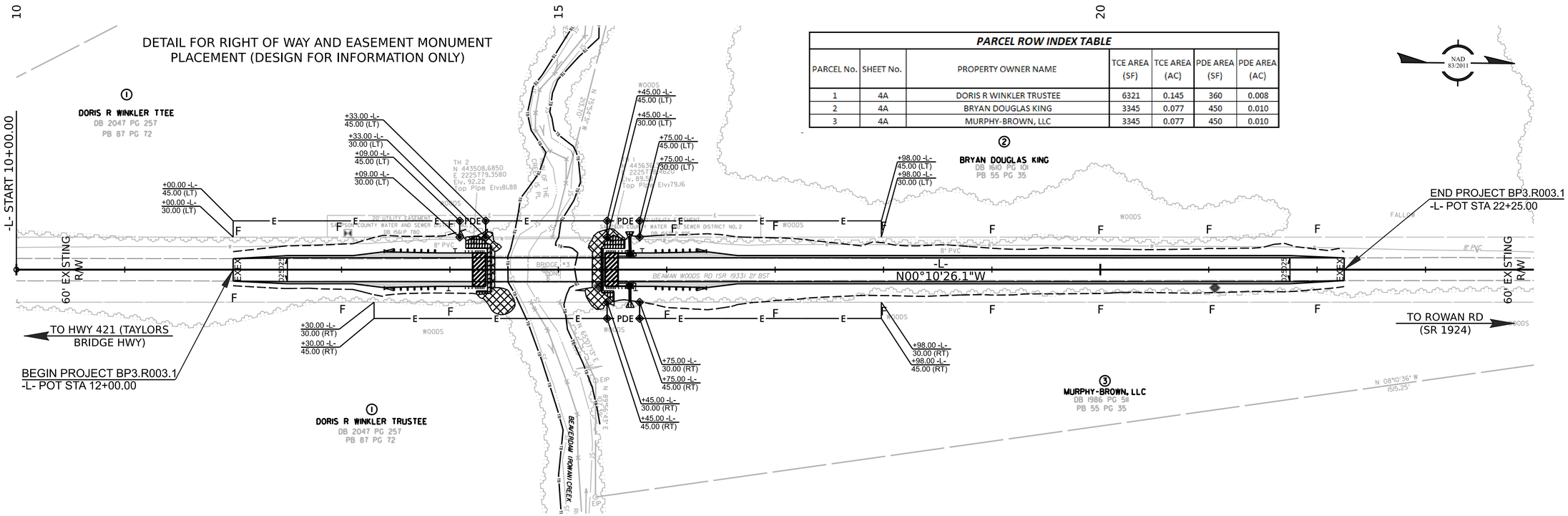


BP3.R003.1
4RDI | 4
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
SAMPSON COUNTY
HIGHWAY DIVISION 3
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
ROADWAY DESIGN ENGINEER
DocuSigned by:
NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE
5/27/2022
HYDRAULICS ENGINEER
DocuSigned by:
NORTH CAROLINA PROFESSIONAL SEAL 049338 ENGINEER ERIK P MADLAND
5/27/2022
PREPARED BY
KCA
KISINGER CAMPO & ASSOCIATES
NC FIRM LICENSE No: C-1506
301 Fayetteville Street, Suite 1500
Raleigh, NC 27601
(919)882-7839

REVISIONS

5/26/20

DETAIL FOR RIGHT OF WAY AND EASEMENT MONUMENT PLACEMENT (DESIGN FOR INFORMATION ONLY)



PARCEL ROW INDEX TABLE

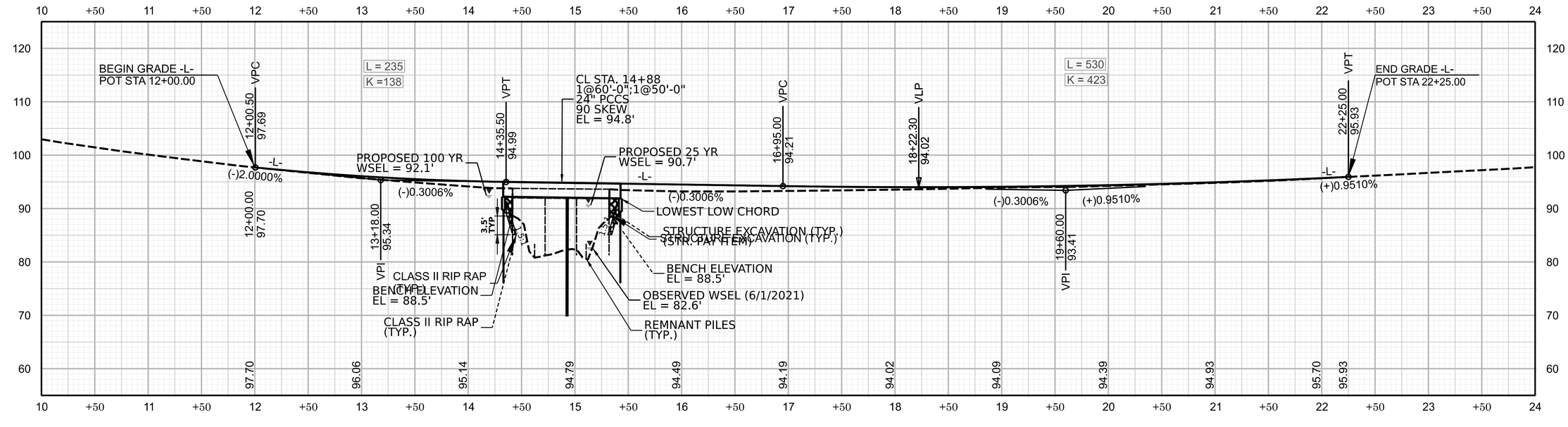
PARCEL No.	SHEET No.	PROPERTY OWNER NAME	TCE AREA (SF)	TCE AREA (AC)	PDE AREA (SF)	PDE AREA (AC)
1	4A	DORIS R WINKLER TRUSTEE	6321	0.145	360	0.008
2	4A	BRYAN DOUGLAS KING	3345	0.077	450	0.010
3	4A	MURPHY-BROWN, LLC	3345	0.077	450	0.010

-L- SR 1933 (BEAMAN WOODS RD)

FOR STRUCTURE PLANS, SEE SHEET S-1 THRU S-20

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE = 1200 CFS	BASE DISCHARGE = 2083 CFS	OVERTOPPING DISCHARGE = 4300 FCS
DESIGN FREQUENCY = 25 YRS	BASE FREQUENCY = 100 YRS	OVERTOPPING FREQUENCY = 500+ YRS
DESIGN HW ELEVATION = 90.7 FT	BASE HW ELEVATION = 92.1 FT	OVERTOPPING HW ELEVATION = 94.0 FT



REVISIONS

BP3.R003.1
4RDI | 4A

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
SAMPSON COUNTY

HIGHWAY DIVISION 3

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ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE
5/27/2022

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 049338 ENGINEER ERIK P AADLAND
5/27/2022

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Raleigh, NC 27601
(919)882-7839

09/08/99

TIP PROJECT: BP3.R003

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP3.R003	RW01	5

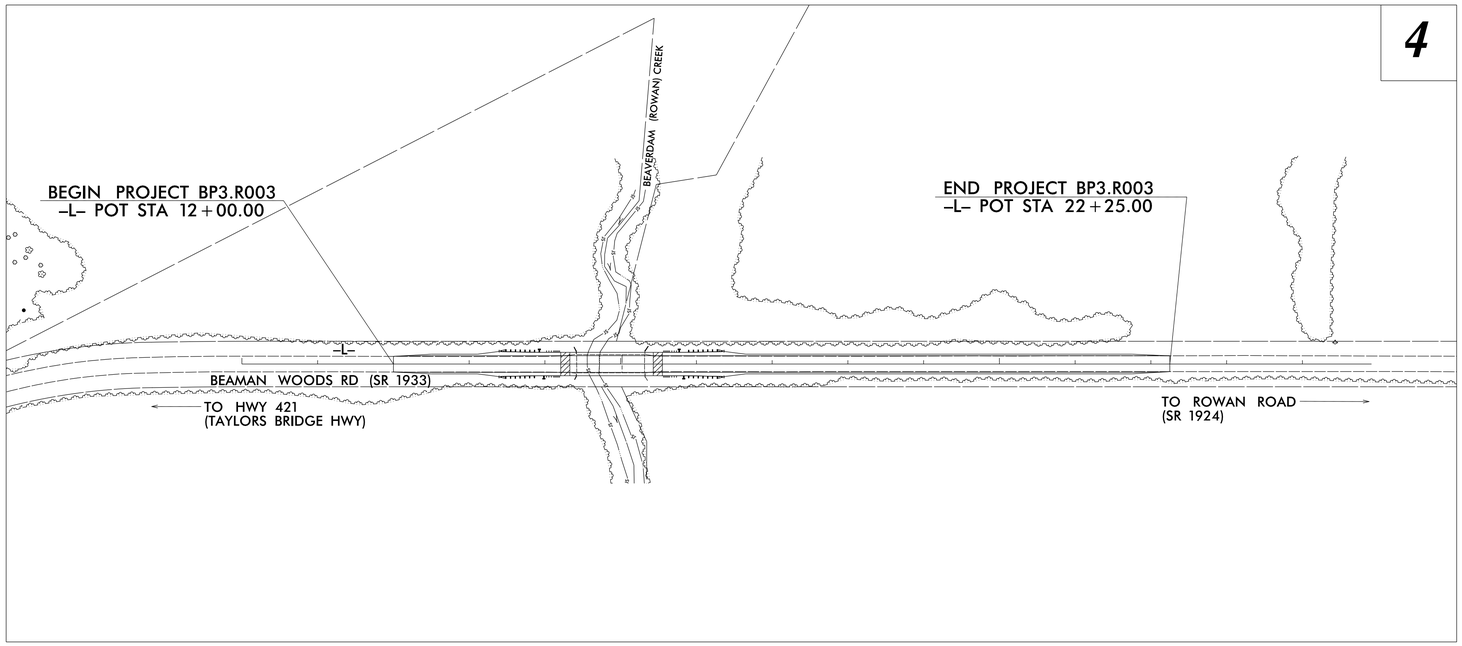
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

NAD 83/2011

SAMPSON COUNTY

BRIDGE NO. 3 ON SR 1933 (BEAMAN WOODS ROAD) OVER ROWAN BRANCH



GRAPHIC SCALE
FOR RW04 ONLY

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 NCGS FOR MONUMENT "B4815-2" WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF NORTHING: 445,403.911(ft) EASTING: 2,225,743.524(ft) ELEVATION: 110.26(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.0001150620
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4815-2" TO -L- STATION 10+00.00 IS S 02-29'51.4" X 2712.665(ft)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD88

Prepared in the Office of:

LOCATION AND SURVEYS UNIT
DIVISION 3
5310 BARBADOS BLVD, SUITE 102
CASTLE HAYNE, NORTH CAROLINA 28429

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:	*LETTING DATE:*
FEBRUARY 3, 2022	*JULY 21, 2022*

PROFESSIONAL LAND SURVEYOR

NORTH CAROLINA PROFESSIONAL LAND SURVEYOR SEAL L-4526 CHRISTOPHER J. SAWYER

DocuSigned by: Christopher Sawyer E1D21467 06/20/2022

SIGNATURE: *Date:*

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

20-JUN-2022 13:43
S:\Units\Div03\Projects\BRIDGE\Sampson\B4815-0003\Working\150 Series Set\BP3.R003_LS_rw01.dgn
mjduval AT LS-299896

6/2/99

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

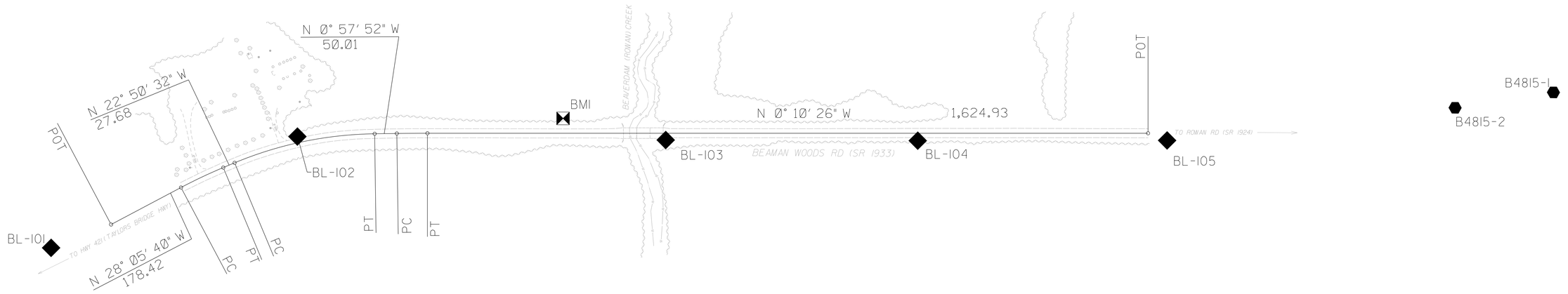
NAD 83 NA 2011 NC GRID

EL

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	442374.032	2226016.195							
LINE			N 28°05'39.9" W	178.42					
PC	442531.431	2225932.171							
CURVE			N 25°28'06.1" W	105.38	05°15'07.7"(RT)	04°58'56.1"	105.42	52.75	1150.00
PT	442626.571	2225886.856							
LINE			N 22°50'32.2" W	27.68					
PC	442652.081	2225876.111							
CURVE			N 11°54'11.9" W	322.60	21°52'40.5"(RT)	06°44'26.4"	324.57	164.28	850.00
PT	442967.742	2225809.572							
LINE			N 00°57'51.7" W	50.01					
PC	443017.741	2225808.730							
CURVE			N 00°34'08.9" W	68.98	00°47'25.6"(RT)	01°08'45.3"	68.98	34.49	5000.00
PT	443086.716	2225808.045							
LINE			N 00°10'26.1" W	1624.93					
POT	444711.642	2225803.112							

BL

POINT	DESC.	NORTH	EAST	ELEVATION
BL-101	TRV CAP AND REBAR	442238.8831	2226069.1733	131.66
BL-102	TRV CAP AND REBAR	442793.5041	2225816.2848	114.48
BL-103	TRV CAP AND REBAR	443624.0421	2225821.5487	93.19
BL-104	TRV CAP AND REBAR	444192.3821	2225821.3171	93.81
BL-105	TRV CAP AND REBAR	444754.6539	2225819.0648	100.82
B4815-2	GPS CAP AND REBAR	445403.9110	2225743.5240	110.26
B4815-1	GPS CAP AND REBAR	446420.0050	2225648.3020	127.35



****

BM1 ELEVATION = 93.15

N 443392 E 2225774

RAIL ROAD SPIKE IN THE BASE OF A 12"BIRCH TREE

****

I, Christopher J. Sawyer, PLS, certify that the Project Control was 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: April, 2021
Datum/Epoch: NAVD88
Published/Fixed-control use: N/A FOR RTN
Localized around: B4815-2
Northing:445403.911
Easting:2225743.524
Combined grid factor:1.0001150620
Geoid model:G12NC
Units: US SURVEY FEET

I also certify that the Baseline Control for this project was verified 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 April, 2021 , 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 20th day of June, 2022.

DocuSigned by:
Christopher J Sawyer
07000C821D2D4EF...

Professional Land Surveyor L-4526

PROJECT REFERENCE NO.	SHEET NO.
BP3.R003	RW02C-1

Location and Surveys

LOCATION AND SURVEYS UNIT
DIVISION 3
5310 BARBADOS BLVD, SUITE 102
CASTLE HAYNE, NORTH CAROLINA 28429

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-4526 LAND SURVEYOR CHRISTOPHER J. SAWYER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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.

20-JUN-2022 13:01
H:\Simpson\B4815-2003\Working\150 Series Set\cs\BP3.R003_LS_rw02c-1.dgn
cjsawyer AT LS-29904

6/2/99

REVISIONS

PROPOSED ALIGNMENT CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
BP3.R003	RW02D-1

Location and Surveys

LOCATION AND SURVEYS UNIT
DIVISION 3
5310 BARBADOS BLVD, SUITE 102
CASTLE HAYNE, NORTH CAROLINA 28429

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-4526 LAND SURVEYOR CHRISTOPHER J. SAWYER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

This 20th day of June, 2022.

DocuSigned by:
Christopher Sawyer
97D5CB2E1D21467...

Professional Land Surveyor L-4526

L

TYPE	STATION	NORTH	EAST
POT	10+00.00	443086.7161	2225808.0448
POT	26+24.93	444711.6422	2225803.1124

NOTES:

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

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

20-JUN-2022 13:25
R:\Surveys\BP3_0003\Working\150 Series Sets\ls\BP3.R003.LS_rw02d-1.dgn
$user: AT LS 29904

6/2/99

REVISIONS

RIGHT OF WAY CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
BP3.R003	RW03D-1

Location and Surveys

LOCATION AND SURVEYS UNIT
DIVISION 3
5310 BARBADOS BLVD, SUITE 102
CASTLE HAYNE, NORTH CAROLINA 28429

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-4526 LAND SURVEYOR CHRISTOPHER J. SAWYER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

I , Christopher J. Sawyer , 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 April, 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 20th day of June, 2022.

DocuSigned by:
Christopher Sawyer
9206CB5E1D214E7...

Professional Land Surveyor L-4526

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	10+00.00	-30.00	443086.6250	2225778.0449
L	10+00.00	30.00	443086.8072	2225838.0446
L	22+25.00	-30.00	444311.6194	2225774.3265
L	22+25.00	30.00	444311.8015	2225834.3262

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	14+09.00	-30.00	443495.6232	2225776.8034
L	14+09.00	-45.00	443495.5776	2225761.8035
L	14+33.00	-45.00	443519.5775	2225761.7306
L	14+33.00	-30.00	443519.6230	2225776.7306
L	15+45.00	-30.00	443631.6225	2225776.3906
L	15+45.00	-45.00	443631.5770	2225761.3907
L	15+75.00	-45.00	443661.5769	2225761.2996
L	15+75.00	-30.00	443661.6224	2225776.2995
L	15+45.00	30.00	443631.8047	2225836.3903
L	15+45.00	45.00	443631.8502	2225851.3903
L	15+75.00	45.00	443661.8500	2225851.2992
L	15+75.00	30.00	443661.8045	2225836.2993

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 APRIL, 2022 .

20-JUN-2022 13:07
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csawyer AT LS_29904

6/2/99

REVISIONS

NAD 83 NA 2011 NC GRID

I , Christopher J. Sawyer, PLS , certify that the right of way and permanent easement monumentation for this project shown herein was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:10,000 (Class A). Field work was performed from April, 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 20th day of June, 2022.

DocuSigned by:
Christopher J. Sawyer
9700CB2EF0214B7...

Professional Land Surveyor L-4526

PROJECT REFERENCE NO.	SHEET NO.
BP3.R003	RW04

Location and Surveys

LOCATION AND SURVEYS UNIT
DIVISION 3
5310 BARBADOS BLVD, SUITE 102
CASTLE HAYNE, NORTH CAROLINA 28429

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-4526 LAND SURVEYOR CHRISTOPHER J. SAWYER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BEGIN PROJECT BP3.R003
–L– POT STA 12+00.00

END PROJECT BP3.R003
–L– POT STA 22+25.00

POT Sta. 10+00.00

JAMES W LUCAS
DB 1193 PG 786

DORIS R WINKLER TTEE
DB 2047 PG 257
PB 87 PG 72

BRYAN DOUGLAS KING
DB 1610 PG 101
PB 55 PG 35

MURPHY-BROWN, LLC
DB 1986 PG 511
PB 55 PG 35

DORIS R WINKLER TRUSTEE
DB 2047 PG 257
PB 87 PG 72

MURPHY-BROWN, LLC
DB 1986 PG 511
PB 55 PG 35

BEAMAN WOODS RD (SR 1933)

TO HWY 421
(TAYLORS BRIDGE HWY)

TO ROWAN ROAD
(SR 1924)

BEAVERDAM (ROWAN) CREEK

RUN OF THE CREEK IS PL

20' UTILITY EASEMENT
SAMPSON COUNTY WATER AND SEWER DISTRICT NO. 2
DB 1561P 780

20' UTILITY EASEMENT
SAMPSON COUNTY WATER AND SEWER DISTRICT NO. 2
DB 1569 P 895

BRIDGE #3
CONC

BM1

BL 103

BL 104

N 6°32'24" W
271.09'

N 09°05'15" W
80.19'

N 15°54'51" W
232.70'

N 0°10'26.1" W

N 65°07'13" E
193.53'

CB N 89°56'43" E
2307.10.39'

N 08°10'36" W
1515.25'

–L– STA 14+33.00
30.00' LT
45.00' LT

–L– STA 14+09.00
30.00' LT
45.00' LT

–L– STA 12+00.00
30.00' LT
45.00' LT

–L– STA 10+00.00
30.00' LT

–L– STA 15+45.00
30.00' LT
45.00' LT

–L– STA 15+75.00
30.00' LT
45.00' LT

–L– STA 17+98.00
30.00' LT
45.00' LT

–L– STA 22+25.00
30.00' LT

–L– STA 13+30.00
30.00' RT
45.00' RT

–L– STA 10+00.00
30.00' RT

–L– STA 15+75.00
30.00' RT
45.00' RT

–L– STA 15+45.00
30.00' RT
45.00' RT

–L– STA 17+98.00
30.00' RT
45.00' RT

–L–STA 22+25.00
30.00' RT

NOTES:

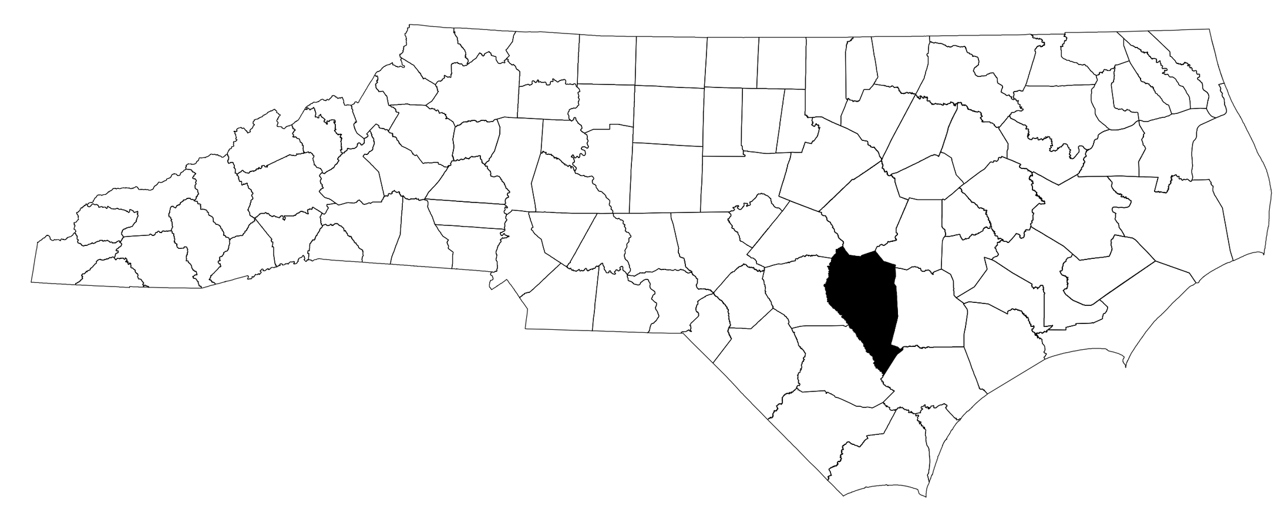
1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
3. RIGHT OF WAY MONUMENTATION ESTABLISHED APRIL, 2022.

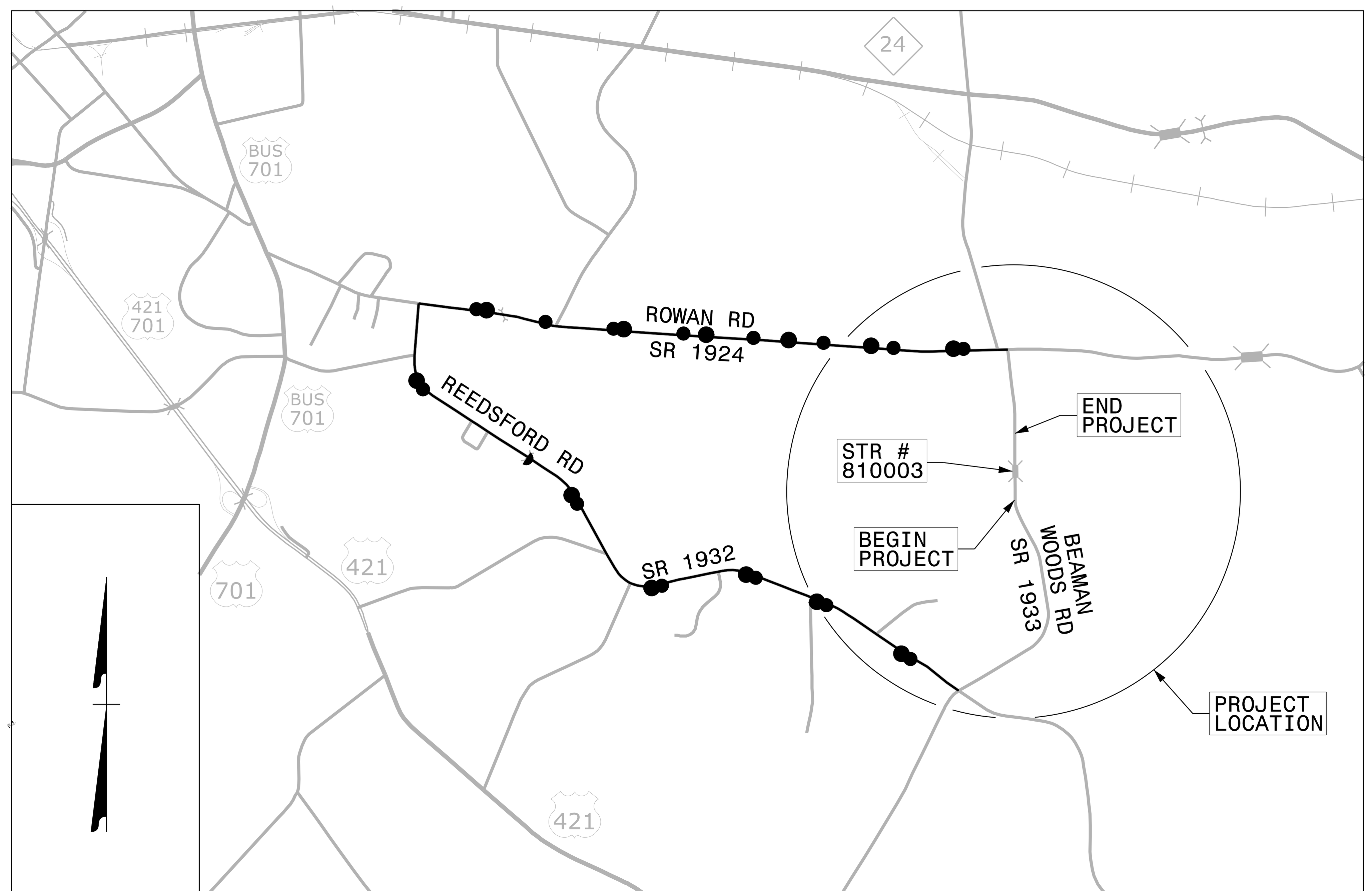
20-JUN-2022 13:40
K:\Projects\6385-0003\Working\150 Series Set\es\BP3.R003_LS_rw04.dgn
cjsawyer
AT LS 299004

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

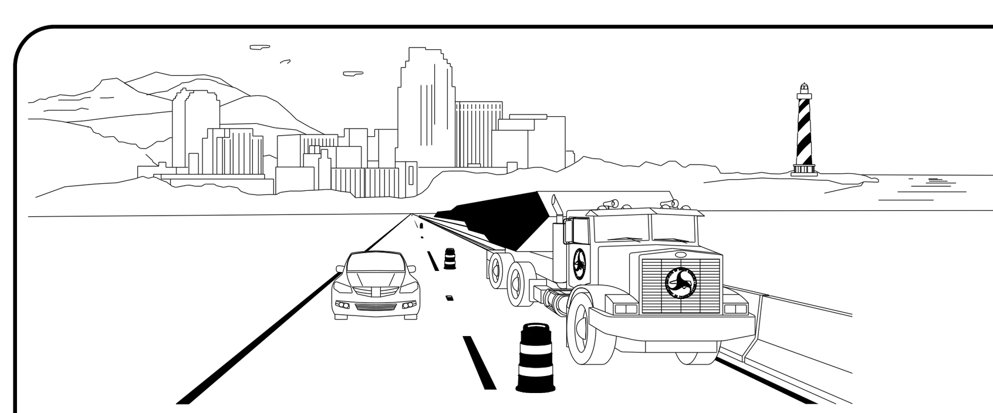
TRANSPORTATION MANAGEMENT PLAN

SAMPSON COUNTY





VICINITY MAP | OFFSITE DETOUR ROUTE



PLANS PREPARED BY:

Jacob H. Duke, P.E.
WZTC PROJECT ENGINEER

Allen J. McSwain
WZTC PROJECT DESIGN ENGINEER

NCDOT CONTACTS:

Kenneth C. Thornewell, P.E.
PROJECT ENGINEER

Spencer B. Jennings
PROJECT DESIGN ENGINEER

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

INDEX OF SHEETS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

KCA
KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
(919) 882-7839
NC FIRM LICENSE: C-1506

APPROVED: DocuSigned by: Jacob Duke 29530C8054E94D9...

DATE: 5/3/2022

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H. DUKE

SHEET NO. TMP-1

TIP PROJECT: BP3.R003.1

5/3/2022
BP3.R003.1_TC_TMP_01.dgn
User:jdebone

PROJ. REFERENCE NO.	SHEET NO.
BP3.R003.1	TMP-1A

KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
(919) 882-7839
NC FIRM LICENSE: C-1506

LEGEND

GENERAL

NORTH ARROW

TRAFFIC CONTROL DEVICES

BARRICADE (TYPE III)

TEMPORARY SIGNING

STATIONARY SIGN

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2018 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
1101.03	TEMPORARY ROAD CLOSURES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1145.01	BARRICADES
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO LANE AND MULT-ILANE ROADWAYS
1205.12	PAVEMENT MARKINGS - BRIDGES
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

GENERAL NOTES

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

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

TRAFFIC PATTERN ALTERATIONS

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

SIGNING

B) 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.

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

PROVIDE SIGNING REQUIRED FOR THE OFFSITE DETOUR ROUTE AS SHOWN IN THE TRAFFIC CONTROL PLANS.

D) 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 OFFSITE DETOUR WHEN THE DETOUR IS NOT IN OPERATION.

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

TRAFFIC CONTROL DEVICES

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

PHASING NOTES

PHASE 1

STEP 1: PRIOR TO ANY CONSTRUCTION OPERATIONS, PLACE AND COVER OFFSITE DETOUR SIGNS AND DEVICES FOR BEAMAN WOODS RD (SR 1933), REEDSFORD RD (SR 1932), AND ROWAN RD (SR 1924) AS SHOWN ON TMP-3. PLACE ADVANCE WARNING SIGNS PER RSD 1101.01 (SHEET 3 OF 3).

STEP 2: USING THE OFFSITE DETOUR, AS SHOWN ON TMP-3, UNCOVER DETOUR SIGNS, CLOSE -L- (BEAMAN WOODS RD/SR 1933) TO TRAFFIC AND CONSTRUCT PROPOSED BRIDGE AND ROADWAY UP TO AND INCLUDING THE FINAL LAYER OF SURFACE COURSE PER ROADWAY AND STRUCTURE PLANS.

STEP 3: UPON COMPLETION OF BRIDGE AND ROADWAY CONSTRUCTION, PLACE FINAL PAVEMENT MARKINGS AND MARKERS PER PAVEMENT MARKING PLANS. REMOVE ALL SIGNS AND DEVICES AND OPEN -L- (BEAMAN WOODS RD/SR 1933) TO TRAFFIC.

APPROVED: DocuSigned by: Jacob Duke 29530C8054E9484...

DATE: 5/3/2022

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

LEGEND, ROADWAY STANDARD DRAWINGS, GENERAL NOTES, AND PHASING NOTES

5/3/2022
BP3_R003_1_TC_TMP_01A.dgn
User:idebone

PROJ. REFERENCE NO.	SHEET NO.
BP3.R003.1	TMP-2

SIGN NUMBER: S-1
TYPE: D
QUANTITY: 6

SIGN WIDTH: 3′-0″
HEIGHT: 2′-0″
TOTAL AREA: 6.0 Sq. Ft.

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

NO. Z BARS:
LENGTH:

BACKG COLOR: ORANGE
COPY COLOR: BLACK

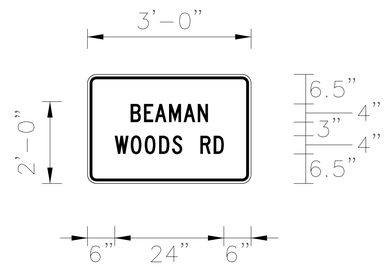
SYMBOL	X	Y	WID	HT

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

USE NOTES:

1. Legend and border(except those that are colored black) shall be direct applied Grade C sheeting.
2. Background shall be Grade A, B, or C reflective sheeting.
3. Shields; A, B, and C type arrows shall be on 0.032″ (0.8mm) aluminum with Grade C reflective sheeting and demountable.
4. Bottom panel shall be yellow Grade C sheeting. Legend shall be direct applied black non-reflective sheeting. Arrow shall be on 0.032″ aluminum, black non-reflective sheeting and demountable. Yellow panel is:

DESIGN BY: A. MCSWAIN
PROJECT ID: BP3.R003.1
CHECKED BY: J. DUKE
LOCATION: SAMPSON COUNTY
July 7, 2021
DIV: 3



Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter locations are panel edge to lower left corner

																										Series/Size Text Length
	B	E	A	M	A	N																				C 2000 17.0
	9.5	12.4	14.8	17.9	21.1	24.3																				
	W	O	O	D	S		R	D																		C 2000 24.0
	6.0	9.5	12.6	15.8	18.6	20.8	24.8	27.8																		

FILENAME: BP3.R003.1_TC_SIGN DESIGN

NORTH CAROLINA D.O.T. SIGN DETAIL

APPROVED: DocuSigned by: Jacob Duke 29530C8054E94DF...
DATE: 5/3/2022
SEAL

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

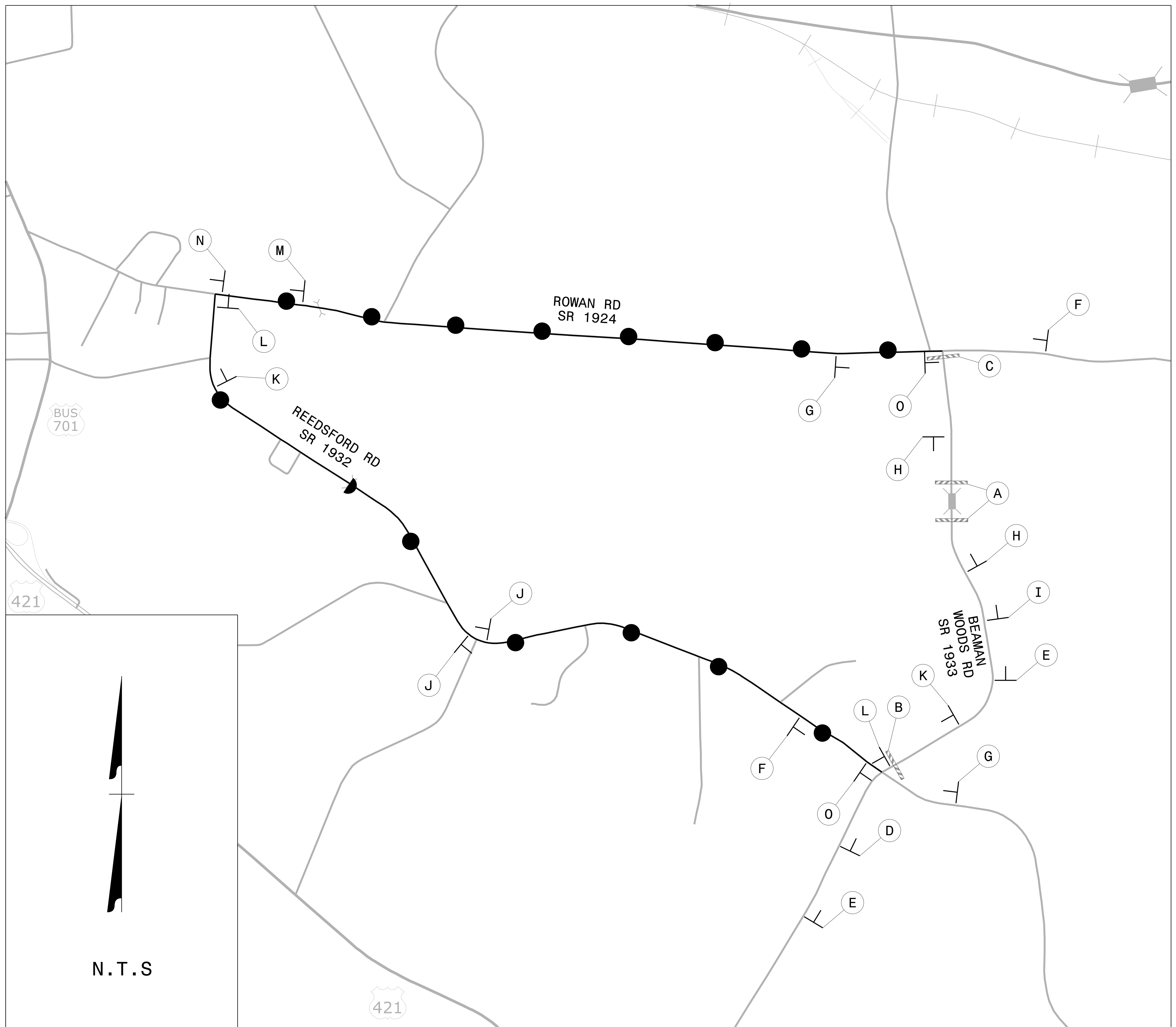
DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

SIGN DESIGN

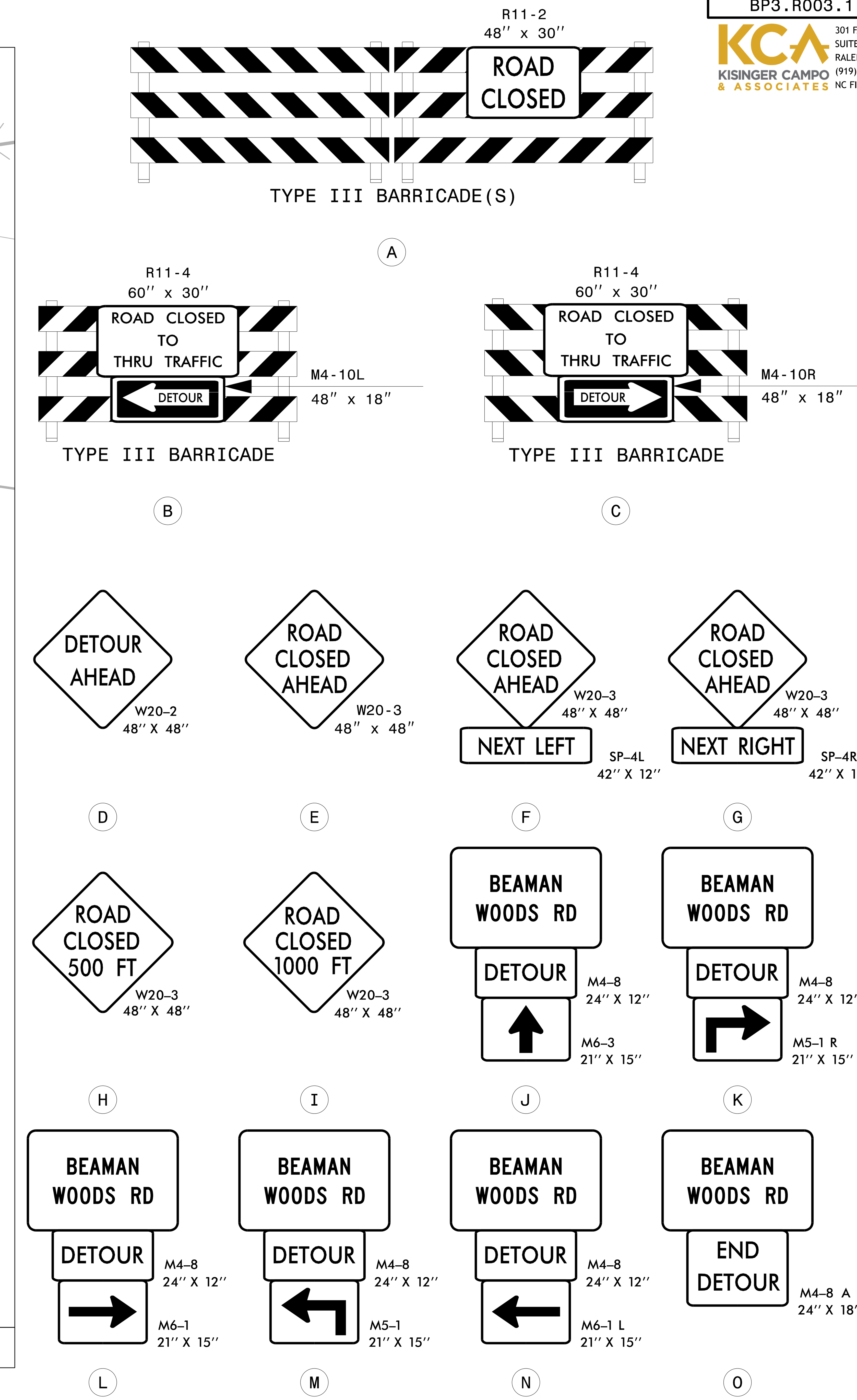
5/3/2022
BP3.R003.1_TC_TMP_02.dgn
User:jdeLone

PROJ. REFERENCE NO.	SHEET NO.
BP3.R003.1	TMP-3

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
(919) 882-7839
NC FIRM LICENSE: C-1506



OFFSITE DETOUR ROUTE:



DETOUR DESCRIPTION:

BEAMAN WOODS ROAD (SR 1933) TO REEDSFORD ROAD (SR 1932)
TO ROWAN ROAD (SR 1924) BACK TO BEAMAN WOODS ROAD (SR 1933).

NOTES:

1. TRAFFIC CONTROL DEVICES (A) THRU (O) SHALL BE INSTALLED PER ENGINEER'S INSTRUCTIONS.
2. ALL SIGNAGE IS SPACED AT 500 FOOT INTERVALS UNLESS OTHERWISE NOTED.
3. USE THIS SHEET IN CONJUNCTION WITH RSD 1101.01 SHEET 3 OF 3.

APPROVED: DocuSigned by: Jacob Duke 29530C8054E54D9

DATE: 5/3/2022

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H. DUKE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

OFFSITE DETOUR

T.I.P.: BP3.R003.1

TIP NO.	SHEET NO.
BP3.R003.1	PMP-1

APPROVED: DocuSigned by: Jacob Duke 29530C8054F94D9...
DATE: 2/7/2022

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING PLAN
SAMPSON COUNTY

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 2018 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
1205.03	PAVEMENT MARKINGS - EXIT AND ENTRANCE RAMPS
1205.12	PAVEMENT MARKINGS - BRIDGES
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY
1253.01	RAISED PAVEMENT MARKERS - SNOWPLOWABLE
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
SR 1933	THERMOPLASTIC	RAISED
(BEAMAN WOODS RD)	POLYUREA	RAISED

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

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

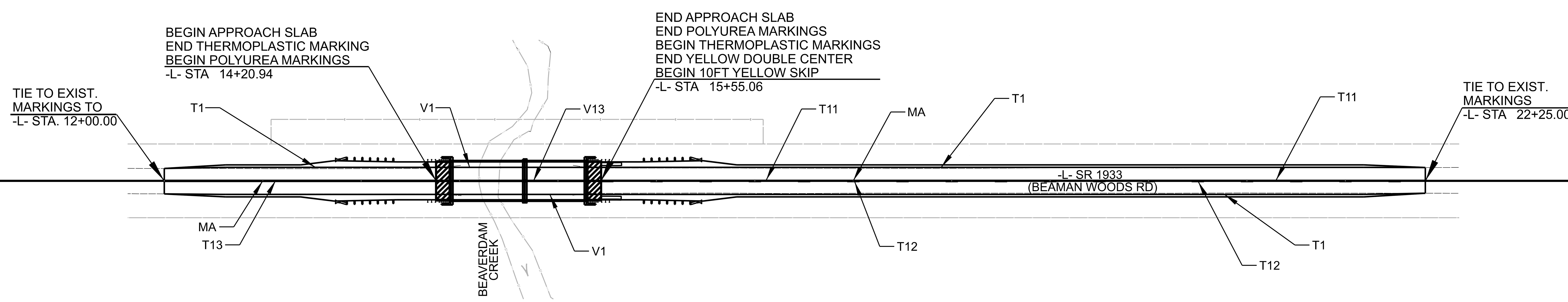
D) PASSING ZONES WILL BE DETERMINED IN THE FIELD AND MUST BE APPROVED BY THE ENGINEER.

PAVEMENT MARKING SCHEDULE

SYMBOL	DESCRIPTION	QUANTITY
THERMOPLASTIC		
T1	WHITE EDGELINE (4", 90 MIL)	1782 LF
T11	YELLOW SINGLE CENTER (4", 90 MIL)	670 LF
T12	10 FT. YELLOW SKIP (4", 90 MIL)	168 LF
T13	YELLOW DOUBLE CENTER (4", 90 MIL)	442 LF
MA	PERMANENT RAISED PAVEMENT MARKERS	13 EA

PAVEMENT MARKING SCHEDULE CONTINUED

SYMBOL	DESCRIPTION	QUANTITY
POLYUREA		
V1	WHITE EDGELINE (4", 20 MIL)	268 LF
V13	YELLOW DOUBLE CENTER (4", 20 MIL)	268 LF



PLAN SUBMITTED TO:

AYMAN I. ALQUDWAH, P.E. – SIGNING AND DELINEATION REGIONAL ENGINEER

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

PLAN PREPARED BY: KISINGER CAMPO & ASSOCIATES

JACOB H. DUKE, PE PROJECT ENGINEER

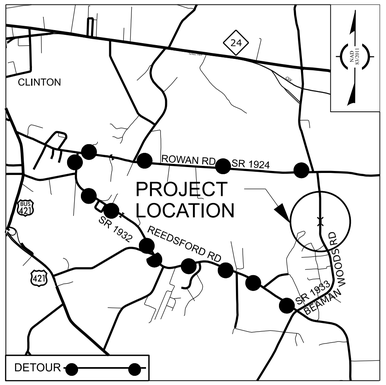
ALLEN J. MCSWAIN PROJECT DESIGNER

KCA KISINGER CAMPO & ASSOCIATES

NC FIRM LICENSE No: C-1506
301 Fayetteville St.,
Suite 1500
Raleigh, NC 27601
(919)882-7839

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

TIP PROJECT: BP3.R003.1



VICINITY MAP (NTS)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

SAMPSON COUNTY

LOCATION: *BRIDGE NO. 810003 ON SR 1933 (BEAMAN WOODS RD.) OVER BEAVERDAM CREEK*

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

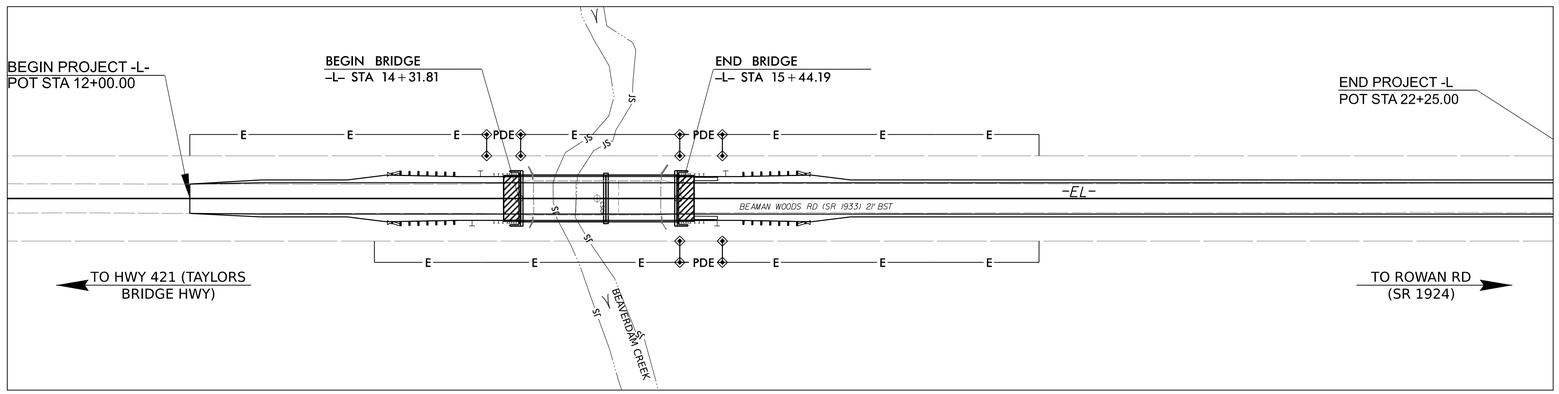
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP3.R003.1	EC-1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
BP3.R003.1		PE
BP3.R003.1		R/W, UTILITIES
BP3.R003.1		CONSTRUCTION

EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	TSD
1630.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
1630.02	Silt Basin Type B	
1633.01	Temporary Rock Silt Check Type-A	
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	
1633.02	Temporary Rock Silt Check Type-B	
	Wattle / Coir Fiber Wattle	RW CFW
	Wattle / Coir Fiber Wattle with Polyacrylamide (PAM)	
1634.01	Temporary Rock Sediment Dam Type-A	
1634.02	Temporary Rock Sediment Dam Type-B	
1635.01	Rock Pipe Inlet Sediment Trap Type-A	
1635.02	Rock Pipe Inlet Sediment Trap Type-B	
1630.04	Stilling Basin	
1630.06	Special Stilling Basin	
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C
	Skimmer Basin	
	Tiered Skimmer Basin	
	Infiltration Basin	

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



GRAPHIC SCALE

50 25 0 50 100

PLANS

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

Prepared in the Office of:

KCA KISINGER CAMPO & ASSOCIATES

NC FIRM LICENSE No: C-1506
301 Fayettville St.,
Suite 1500
Raleigh, NC 27601
(919)882-7839

Designed by:

NAME	*LEVEL III CERTIFICATION NO.*
JOHN MCNULTY	*4263*

Roadway Standard Drawings

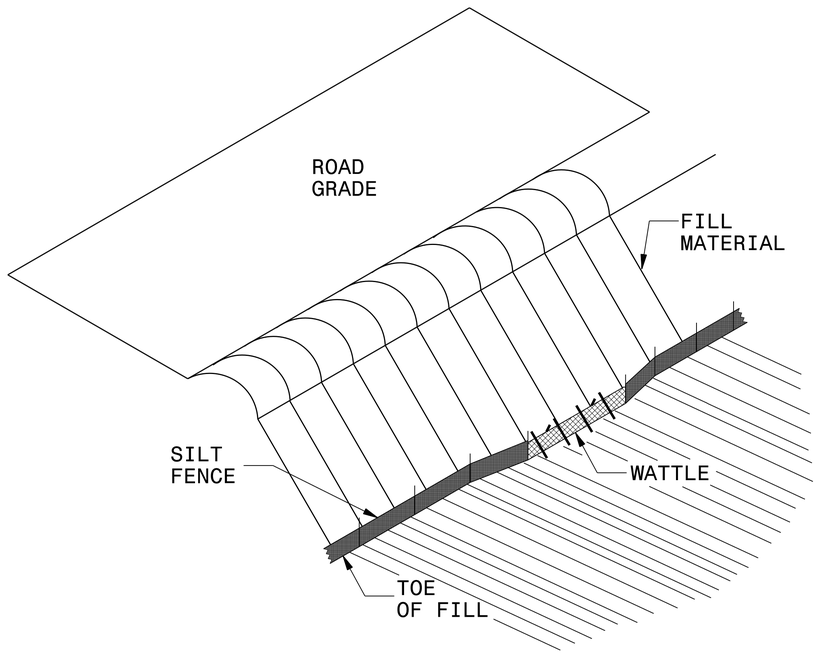
The following roadway english standards as appear in "Roadway Standard Drawings"– Roadway Design Unit – N. C. Department of Transportation – Raleigh, N. C., dated January 2012 and the latest revison thereto are applicable to this project and by reference hereby are considered a part of these plans.

1604.01	Railroad Erosion Control Detail	1632.01	Rock Inlet Sediment Trap Type A
1605.01	Temporary Silt Fence	1632.02	Rock Inlet Sediment Trap Type B
1606.01	Special Sediment Control Fence	1632.03	Rock Inlet Sediment Trap Type C
1607.01	Gravel Construction Entrance	1633.01	Temporary Rock Silt Check Type A
1622.01	Temporary Berms and Slope Drains	1633.02	Temporary Rock Silt Check Type B
1630.01	Riser Basin	1634.01	Temporary Rock Sediment Dam Type A
1630.02	Silt Basin Type B	1634.02	Temporary Rock Sediment Dam Type B
1630.03	Temporary Silt Ditch	1635.01	Rock Pipe Inlet Sediment Trap Type A
1630.04	Stilling Basin	1635.02	Rock Pipe Inlet Sediment Trap Type B
1630.05	Temporary Diversion	1640.01	Coir Fiber Baffle
1630.06	Special Stilling Basin	1645.01	Temporary Stream Crossing
1631.01	Matting Installation		

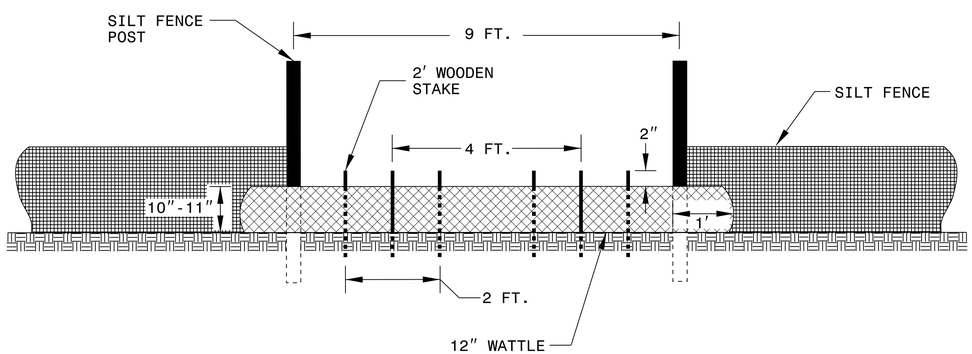
5/26/20

SILT FENCE COIR FIBER WATTLE BREAK DETAIL

PROJECT REFERENCE NO.	SHEET NO.
BP3.R003.1	EC-2A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



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.

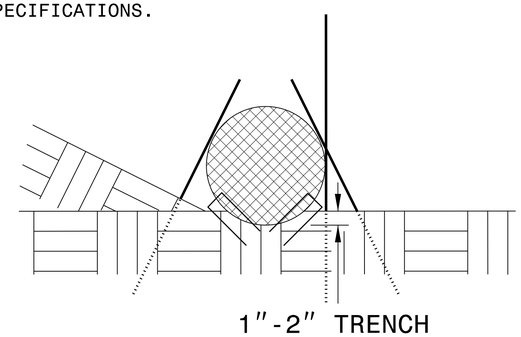
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

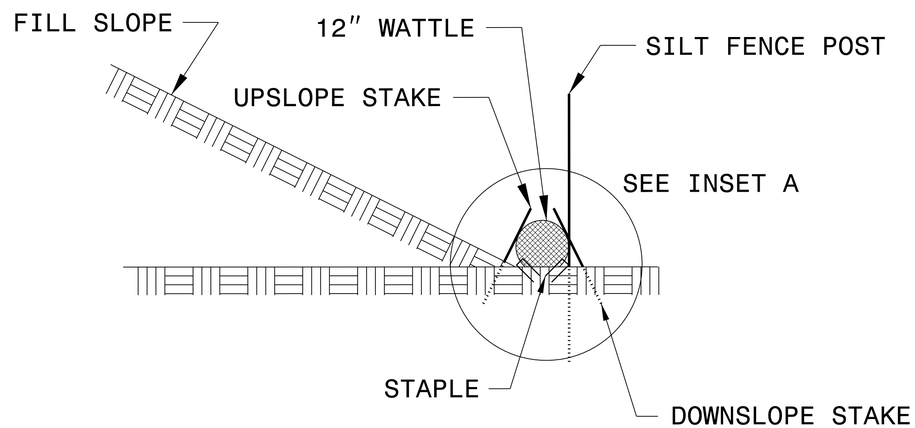
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

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



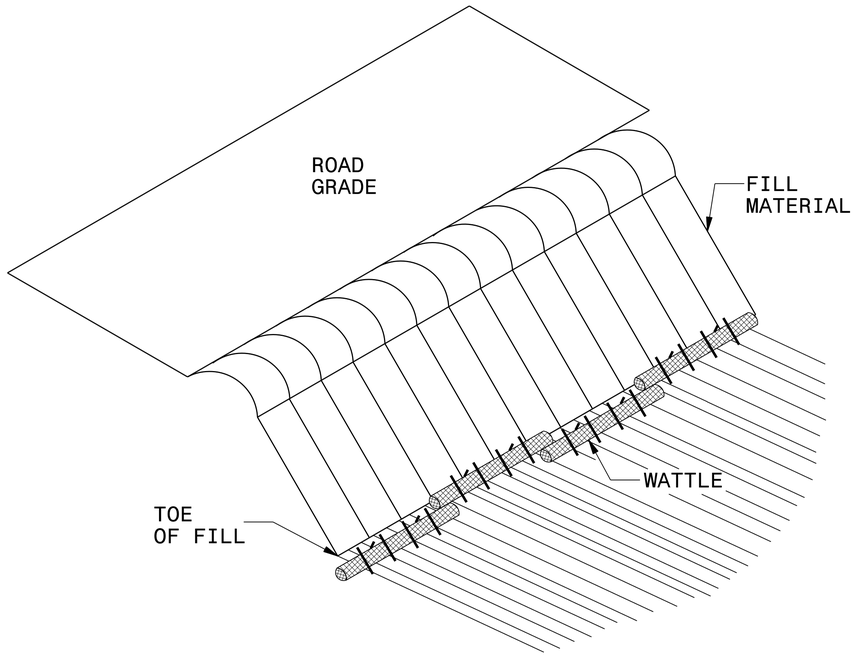


SIDE VIEW

5/26/20

PROJECT REFERENCE NO.	SHEET NO.
BP3.R003.1	EC-2B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

COIR FIBER WATTLE BARRIER DETAIL



ISOMETRIC VIEW

NOTES:

USE MINIMUM 18 IN. NOMINAL DIAMETER COIR FIBER (COCONUT) WATTLE AND LENGTH OF 10 FT.

EXCAVATE A 2 TO 3 INCH TRENCH FOR WATTLE TO BE PLACED.

DO NOT PLACE WATTLES ON TOE OF SLOPE.

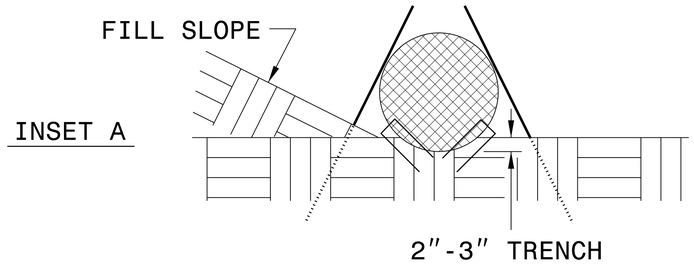
USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

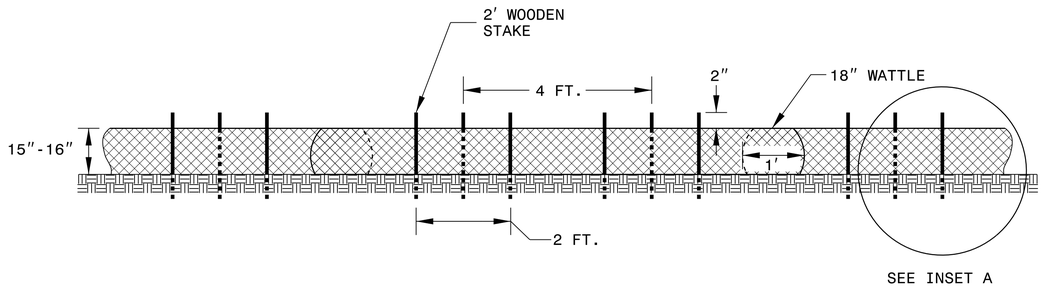
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO GROUND.

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

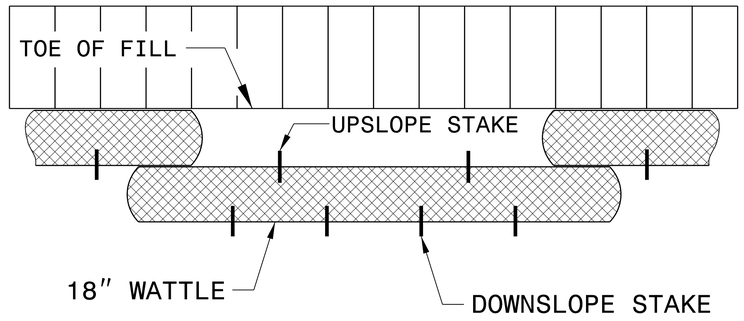
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

FOR BREAKS ALONG LARGE SLOPES, USE MAXIMUM SPACING OF 25 FT.





FRONT VIEW



TOP VIEW

5/26/20

PROJECT REFERENCE NO.	SHEET NO.
BP3.R003.I	EC-3A
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION SUMMARY SHEET

MATTING FOR EROSION CONTROL

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
				SUBTOTAL	0
MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER					1250
				TOTAL	1250
				SAY	1250

PERMANENT SOIL REINFORCEMENT MATTING

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

5/26/20

PROJECT REFERENCE NO.	SHEET NO.
BP3.R003J	EC-3B

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 OR FLATTER	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH.
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	NONE, EXCEPT FOR PERIMETERS AND HQW ZONES.

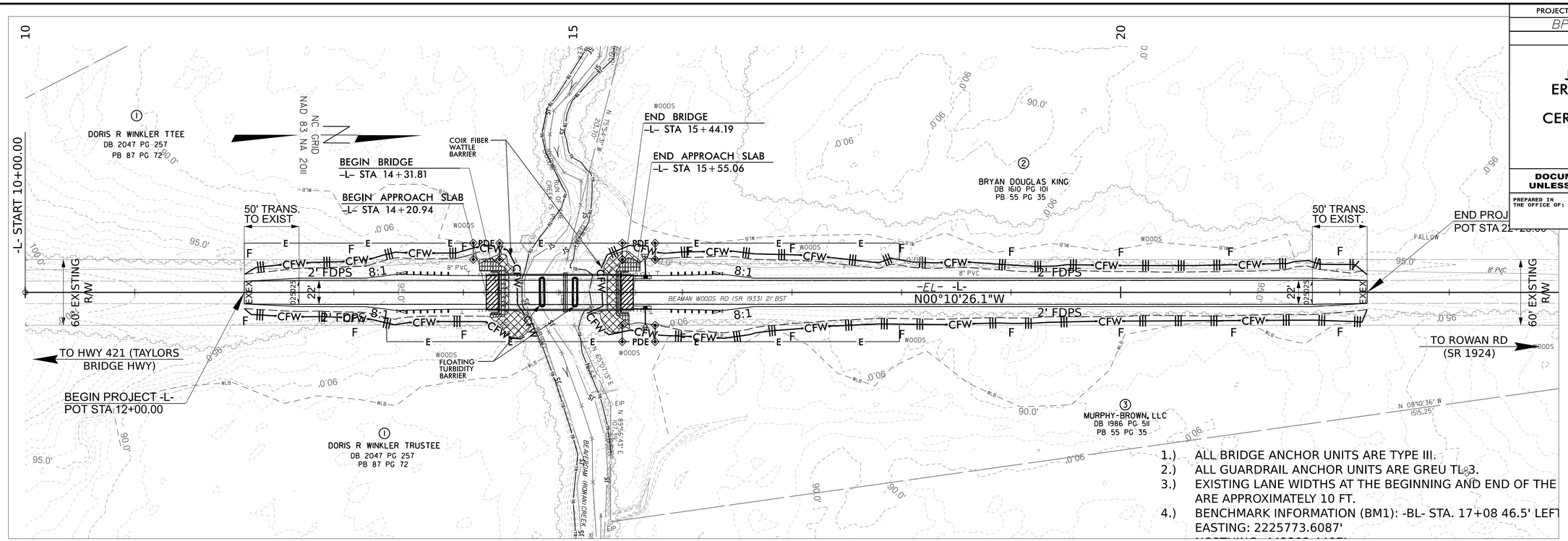
5/26/20

PROJECT REFERENCE NO.	SHEET NO.
BP3.R003.1	EC-4/CONST.4
R/W SHEET NO.	

JOHN MCNULTY EROSION CONTROL LEVEL III CERTIFICATION #4263

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PREPARED IN THE OFFICE OF:
KCA KISINGER CAMPO & ASSOCIATES
NC FIRM LICENSE No: C-1506
301 Fayetteville St., Suite 1500
Raleigh, NC 27601
(910)802-7839



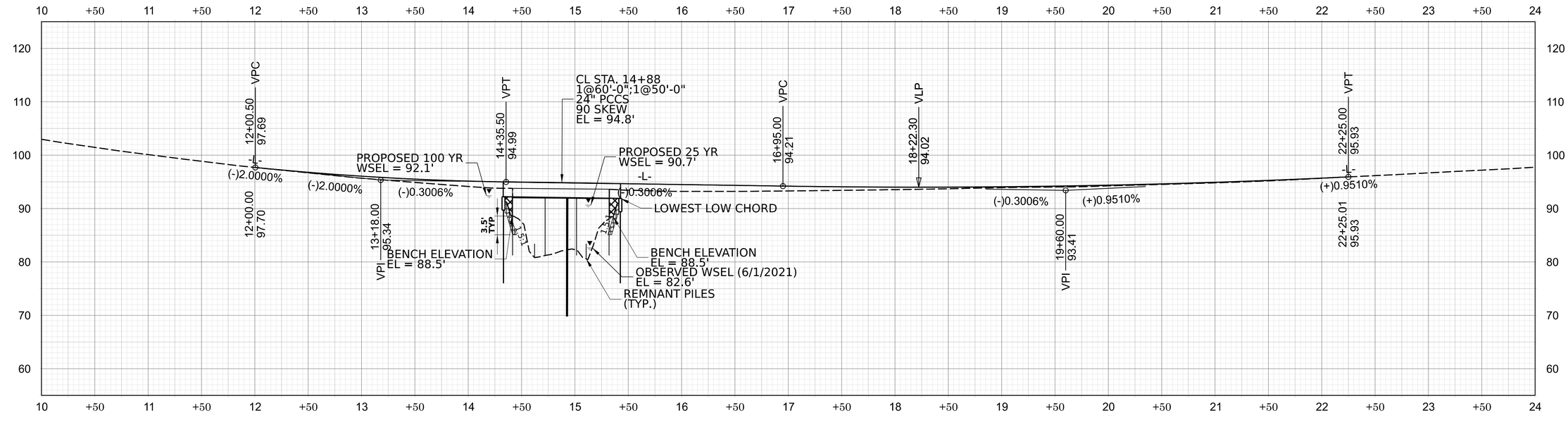
1.) ALL BRIDGE ANCHOR UNITS ARE TYPE III.
2.) ALL GUARDRAIL ANCHOR UNITS ARE GREU TL-3.
3.) EXISTING LANE WIDTHS AT THE BEGINNING AND END OF THE ARE APPROXIMATELY 10 FT.
4.) BENCHMARK INFORMATION (BM1): -BL- STA. 17+08 46.5' LEFT
EASTING: 2225773.6087'

CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 4

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

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE = 1200 CFS	BASE DISCHARGE = 2083 CFS	OVERTOPPING DISCHARGE = 4300 FCS
DESIGN FREQUENCY = 25 YRS	BASE FREQUENCY = 100 YRS	OVERTOPPING FREQUENCY = 500+ YRS
DESIGN HW ELEVATION = 90.7 FT	BASE HW ELEVATION = 92.1 FT	OVERTOPPING HW ELEVATION = 94.0 FT



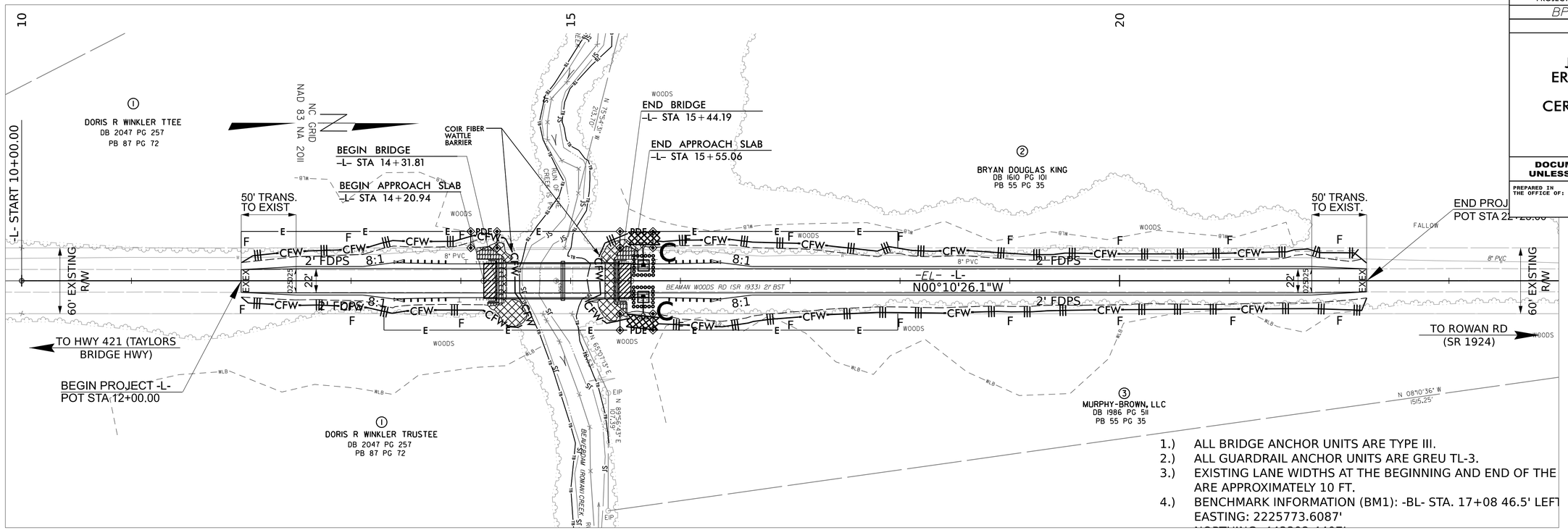
5/26/20

PROJECT REFERENCE NO.	SHEET NO.
BP3.R003.1	EC-4/CONST.5
R/W SHEET NO.	

JOHN MCNULTY EROSION CONTROL LEVEL III CERTIFICATION #4263

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PREPARED IN THE OFFICE OF:
KCA KISINGER CAMPO & ASSOCIATES
NC FIRM LICENSE No: C-1506
301 Fayetteville St., Suite 1500
Raleigh, NC 27601
(919)802-7839



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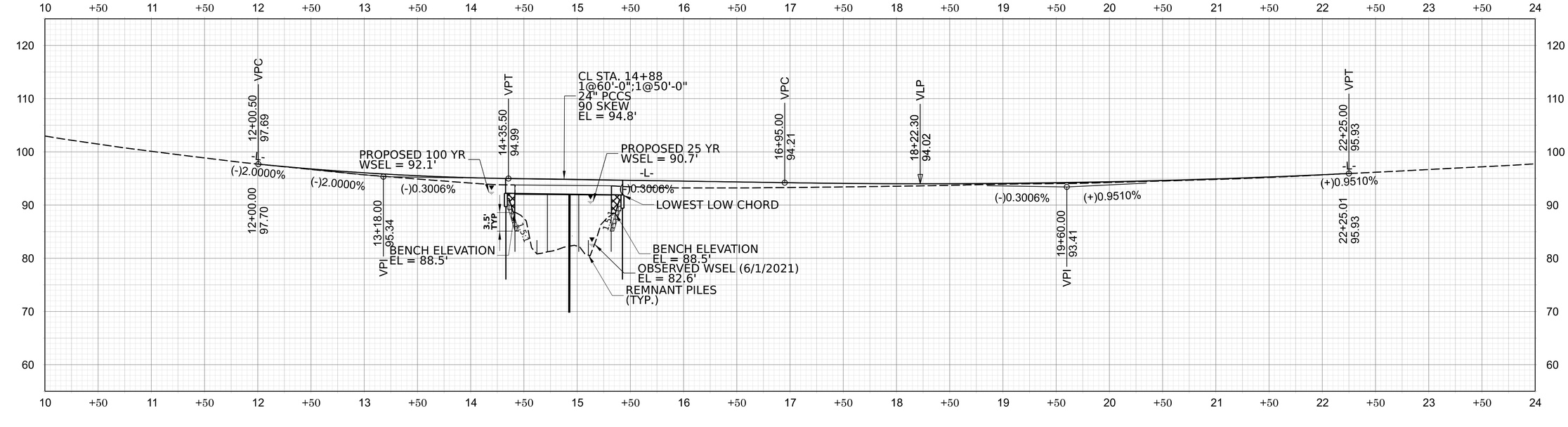
NOTE:
PLACE TEMPORARY ROCK SILT CHECKS TYPE –A AT DRAINAGE OUTLETS

BRIDGE HYDRAULIC DATA

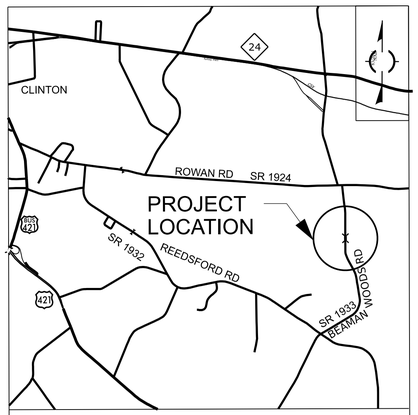
DESIGN DISCHARGE = 1200 CFS	BASE DISCHARGE = 2083 CFS	OVERTOPPING DISCHARGE = 4300 FCS
DESIGN FREQUENCY = 25 YRS	BASE FREQUENCY = 100 YRS	OVERTOPPING FREQUENCY = 500+ YRS
DESIGN HW ELEVATION = 90.7 FT	BASE HW ELEVATION = 92.1 FT	OVERTOPPING HW ELEVATION = 94.0 FT



09/08/99

TIP PROJECT: BP3.R003.1

See Sheet 1A For Index of Sheets



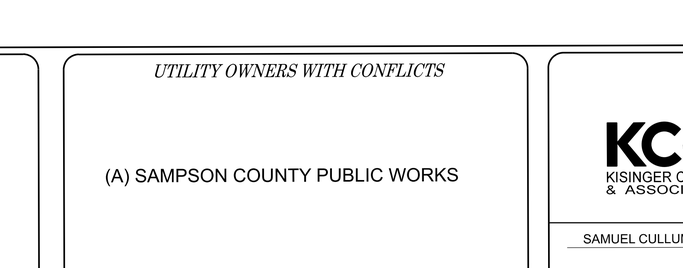
VICINITY MAP (NTS)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITY CONSTRUCTION PLANS
SAMPSON COUNTY

LOCATION: *BRIDGE NO. 810003 ON SR 1933 (BEAMAN WOODS RD.) OVER ROWAN BRANCH*

TYPE OF WORK: *UTILITY CONSTRUCTION*



T.I.P. NO.	SHEET NO.
BP3.R003.1	UC–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.

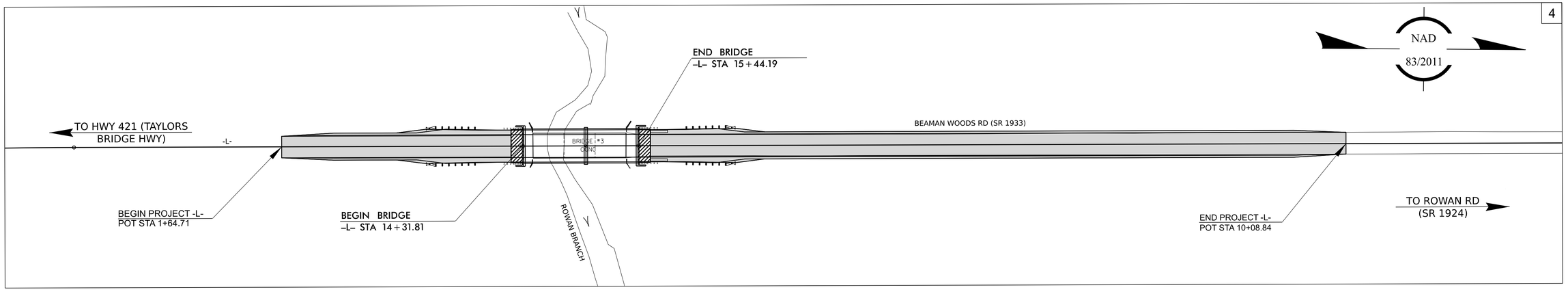
Stage 4 Plans (4UT3)

Plans Developed with OpenRoads (ORD)

NOTE TO REVIEWER:

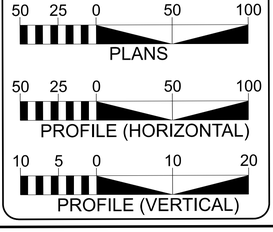
PRINT STYLE AND PSET DEVELOPMENT IS STILL IN PROGRESS BY NCDOT FOR ORD DEVELOPED SHEETS AND CROSS SECTIONS. PLOTTING IN THIS SET IS ACCOMPLISHED USING NCDOT'S DEVELOPMENTAL STANDARDS FOR PLAN-ELEVATION AND CROSS SECTION SHEETS. ALL OTHER SHEETS UTILIZE THE ORD PRINT SYTLE.

THE CROSS SECTION SUMMARY SHEET HAS BEEN REMOVED FROM THIS PLAN SET. THE SUMMARY OF EARTHWORK QUANTITIES ARE SHOWN ON SHEET 3B-1 AND ALL EARTHWORK QUANTITY CALCULATIONS SHALL BE PROVIDED VIA A VOLUMETRIC ORD REPORT AS A SUPPORTING DOCUMENT.



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES



INDEX OF SHEETS

UTILITY OWNERS WITH CONFLICTS

(A) SAMPSON COUNTY PUBLIC WORKS

PREPARED IN THE OFFICE OF:

KCA KISINGER CAMPO & ASSOCIATES

NC FIRM LICENSE No: C-1506
301 Fayettville St.,
Suite 1500
Raleigh, NC 27601
(919)882-7839

SAMUEL CULLUM P.E.	UTILITY PROJECT MANAGER
STEPHEN CHAMBERS	PROJECT UTILITY COORDINATOR

DIVISION OF HIGHWAYS
DIVISION 3
5501 BARBADOS BLVD.
CASTLE HAYNE, NC 28429
PHONE - (252) 598-5100
FAX - (910) 675-0143

ROY (CHRIS) SUTTON	UTILITIES COORDINATOR
LONNY SLEEPER	UTILITIES ENGINNER
-	UTILITIES REGIONAL ENGINEER
-	UTILITIES COORDINATOR

10/06/21

UTILITY CONSTRUCTION

BP3.R003.1

4UT3 | 2

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

UTILITY DESIGN UNIT

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES PLAN SHEET SYMBOLS

EXISTING UTILITIES SYMBOLS

PROPOSED WATER SYMBOLS

- Water Line (Sized as Shown) — 12" WL
- 11¼ Degree Bend
- 22½ Degree Bend
- 45 Degree Bend
- 90 Degree Bend
- Plug
- Tee
- Cross
- Reducer
- Gate Valve — GV
- Butterfly Valve — BV
- Tapping Valve — TGV
- Line Stop — LS
- Line Stop with Bypass — LS/BP
- Blow Off — BO
- Fire Hydrant — PFH
- Relocate Fire Hydrant — REH
- Remove Fire Hydrant — REM FH
- Water Meter — PWM
- Relocate Water Meter — RWM
- Remove Water Meter — REM WM
- Water Pump Station — PS(W)
- RPZ Backflow Preventer — PRPZ
- DCV Backflow Preventer — PRFP
- Relocate RPZ Backflow Preventer — RRPZ
- Relocate DCV Backflow Preventer — RRFP

PROPOSED SEWER SYMBOLS

- Gravity Sewer Line (Sized as Shown) — 12" SS
- Force Main Sewer Line (Sized as Shown) — 12" FSS
- Manhole (Sized per Note)
- Sewer Pump Station — PS(SS)

PROPOSED MISCELLANOUS UTILITIES SYMBOLS

- Power Pole
- Telephone Pole
- Joint Use Pole
- Telephone Pedestal — TEL PED
- Utility Line by Others (Type as Shown) — PROP O/H POW LINES
- Trenchless Installation — 12" TL INSTALL
- Encasement by Open Cut — 12" TL INSTALL
- Encasement — 12" TL INSTALL

- Power Pole
- Telephone Pole
- Joint Use Pole
- Utility Pole
- Utility Pole with Base
- H-Frame Pole
- Power Transmission Line Tower
- Water Manhole
- Power Manhole
- Telephone Manhole
- Sanitary Sewer Manhole
- Hand Hole for Cable
- Power Transformer
- Telephone Pedestal
- CATV Pedestal
- Gas Valve
- Gas Meter
- Located Miscellaneous Utility Object
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

- Thrust Block
- Air Release Valve — AR
- Utility Vault — UV
- Concrete Pier — CP
- Steel Pier — SP
- Plan Note — NOTE
- Pay Item Note — PAY ITEM

- *Underground Power Line
- *Underground Telephone Cable
- *Underground Telephone Conduit
- *Underground Fiber Optics Telephone Cable
- *Underground TV Cable
- *Underground Fiber Optics TV Cable
- *Underground Gas Pipeline
- Aboveground Gas Pipeline — A/G Gas
- *Underground Water Line
- Aboveground Water Line — A/G Water
- *Underground Gravity Sanitary Sewer Line — ss
- Aboveground Gravity Sanitary Sewer Line — A/G Sanitary Sewer
- *Underground SS Forced Main Line
- Underground Unknown Utility Line
- SUE Test Hole
- Water Meter
- Water Valve
- Fire Hydrant
- Sanitary Sewer Cleanout

*For Existing Utilities

- Utility Line Drawn from Record (Type as Shown)
- Designated Utility Line (Type as Shown)

REVISIONS

UTILITY CONSTRUCTION

GENERAL NOTES:

1. THE PROPOSED UTILITY CONSTRUCTION SHALL MEET THE APPLICABLE REQUIREMENTS OF THE NC DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2018.

2. THE EXISTING UTILITIES BELONG TO SAMPSON COUNTY PUBLIC WORKS, LINWOOD REYNOLDS (910) 214-4309, UTILITY SUPERVISOR OF SAMPSON COUNTY PUBLIC WORKS, WILL SERVE AS THE UTILITY OWNER CONTACT.

PROJECT SPECIFIC NOTES:

1. PROPOSED 8" GATE VALVE TO BE INSTALLED ON THE SOUTHWEST SIDE OF THE STRUCTURE.

2. IN ADVANCE OF BEGINNING UTILITY WORK, SOFT DIGS SHALL BE PERFORMED BY THE CONTRACTOR TO VERIFY ACTUAL WATER LINE DEPTH AND LOCATION AT PROPOSED TIE-IN LOCATIONS.

3. AFTER INSTALLING THE VALVE, CONTRACTOR TO ENSURE VALVE TO PIPE CONNECTIONS ARE SECURE BEFORE PRESSURIZING WATER LINE.

4. LINWOOD REYNOLDS, DIRECTOR OF SAMPSON COUNTY PUBLIC WORKS, WILL SERVE AS THE UTILITY OWNER CONTACT ON THIS PROJECT. CONTRACTOR, AS REQUIRED BY STANDARD SPECIFICATION SECTION 1500-2, SHALL CONTACT HIM AT (910) 592-0188

5. SAMPSON COUNTY PUBLIC WORKS SHALL BE CONTACTED 48 HOURS BEFORE DISRUPTION OF SERVICE OF THE EXISTING WATER LINE TO GIVE THEM TIME TO MANIPULATE VALVES TO ENSURE WATER SERVICE IS MAINTAINED ON EACH SIDE OF THE BRIDGE.

6. NO INTERRUPTION TO EXISTING SERVICE SHALL TAKE PLACE UNTIL ALL CUSTOMERS HAVE BEEN NOTIFIED A MINIMUM OF 48 HOURS IN ADVANCE. NOTICE OF INTERRUPTION SHALL BE PREPARED BY THE PUBLIC WORKS OFFICE ON OFFICIAL LETTERHEAD. DISTRIBUTION TO EACH CUSTOMER SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR UNDER THE DIRECTION OF THE PUBLIC WORKS OFFICE.

7. SAMPSON COUNTY PUBLIC WORKS CAN ADJUST EXACT LOCATION WITH THE ENGINEER AND CONTRACTOR AS NEEDED.

8. WHEN CONSTRUCTION IS SCHEDULED WITHIN THE VICINITY OF THE WATERLINE, AT THE DIRECTION OF THE ENGINEER, THE WATERLINE IS TO BE SHUT OFF AT THE BEGINNING OF THE WORKDAY AND TURNED ON AT THE END OF THE WORKDAY. IF THERE IS NO WORK TO BE DONE IN THE VICINITY OF THE WATERLINE ON THE SOUTHERN END OF THE BRIDGE, THE WATERLINE IS TO REMAIN ON FOR THE WORKDAY.

BP3.R003.1

4UT3 | 3

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

UTILITY DESIGN UNIT

UTILITY CONSTRUCTION
PLANS ONLY

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043571 ENGINEER SAMUEL L CULLUM

6/28/2022

DESIGNED BY:	SLCh
DRAWN BY:	SLCh
CHECKED BY:	SLCu
APPROVED BY:	
REVISED:	

UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
FAX:(919)250-4151

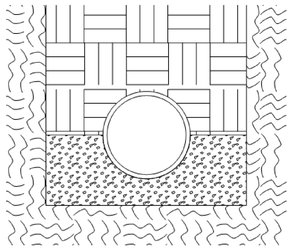
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PREPARED BY
KCA
KISINGER CAMPO & ASSOCIATES
NC FIRM LICENSE No: C-1506
301 Fayetteville Street,
Suite 1500
Raleigh, NC 27601
(919)882-7839

REVISIONS

PROJECT TYPICAL DETAILS

PIPE BEDDING DETAIL
(FOR OPEN CUT)

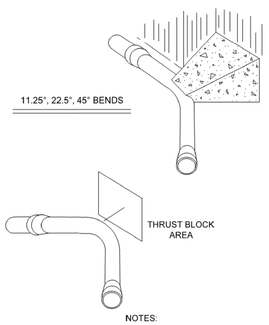


PIPE BEDDED IN SAND, GRAVEL OR CRUSHED STONE TO A DEPTH OF ½ PIPE DIAMETER, 4" MINIMUM UNDER PIPE. TRENCH BACKFILLED IN LOOSE 6" LAYERS COMPACTED TO TOP OF TRENCH USING LOCAL EXCAVATED MATERIAL, IF APPROVED BY THE ENGINEER, OR SELECT MATERIAL. ALL MATERIAL SHALL BE FREE OF ROCKS, FOREIGN MATERIAL, AND FROZEN EARTH. COMPACTION SHALL BE TO APPROX. 95% DENSITY IN ACCORDANCE WITH AASHTO T-99 AS MODIFIED BY THE DEPARTMENT OF TRANSPORTATION.

MAXIMUM TRENCH WIDTH AT TOP OF PIPE

NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)	NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)
4	28	20	44
6	30	24	48
8	32	30	54
10	34	36	60
12	36	42	66
14	38	48	72
16	40	54	78
18	42		

THRUST BLOCKING



NOTES:

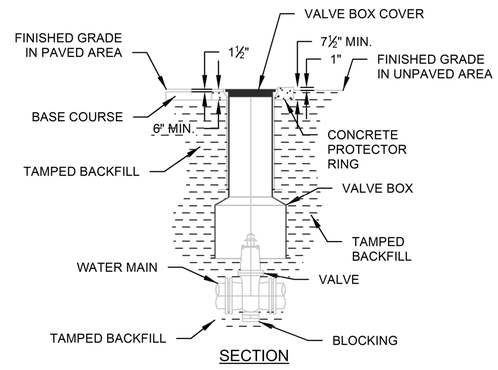
1. CONCRETE SHALL BE 3000 PSI
2. CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT FITTINGS.
3. ALL BENDS AND INTERSECTIONS SHALL HAVE CONCRETE THRUST BLOCKING.

6 INCH DIAMETER PIPE CONCRETE THRUST BLOCKS

BEND ANGLE	CONCRETE [CY]	AREA [SF]	HEIGHT [FT]	WIDTH [FT]	DEPTH [FT]
11.25°	0.1	1.2	1.2	1.2	1.0
22.5°	0.2	2.5	1.6	1.6	1.5
45°	0.4	4.8	2.2	2.2	2.0

FOR USE IN PAVED AREAS

FOR USE IN UNPAVED AREAS



SECTION

NOTES:
1. D.I.P. MAY BE USED FOR VALVE BOX EXTENSIONS.
2. VALVE BOX SHOULD NOT CONTACT WATER MAIN OR VALVE.
3. CONCRETE PROTECTOR RING SHALL BE USED IN ALL UNPAVED AREAS.
4. ALL MATERIALS USED IN THE POTABLE WATER SYSTEM MUST BE NSF61 AND NSF372 CERTIFIED AND MEET THE LATEST FEDERAL SAFE DRINKING WATER ACT REQUIREMENTS.

VALVE AND VALVE BOX INSTALLATION

NOT TO SCALE

BP3.R003.1

4UT3 | 3A

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

UTILITY DESIGN UNIT

UTILITY CONSTRUCTION PLANS ONLY

DocuSigned by:
SAMUEL L CULLUM
BC07E2CCE7E2...

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043571 SAMUEL L CULLUM

6/28/2022

DESIGNED BY:	SLCh
DRAWN BY:	SLCh
CHECKED BY:	SLCu
APPROVED BY:	
REVISED:	

UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
FAX:(919)250-4151

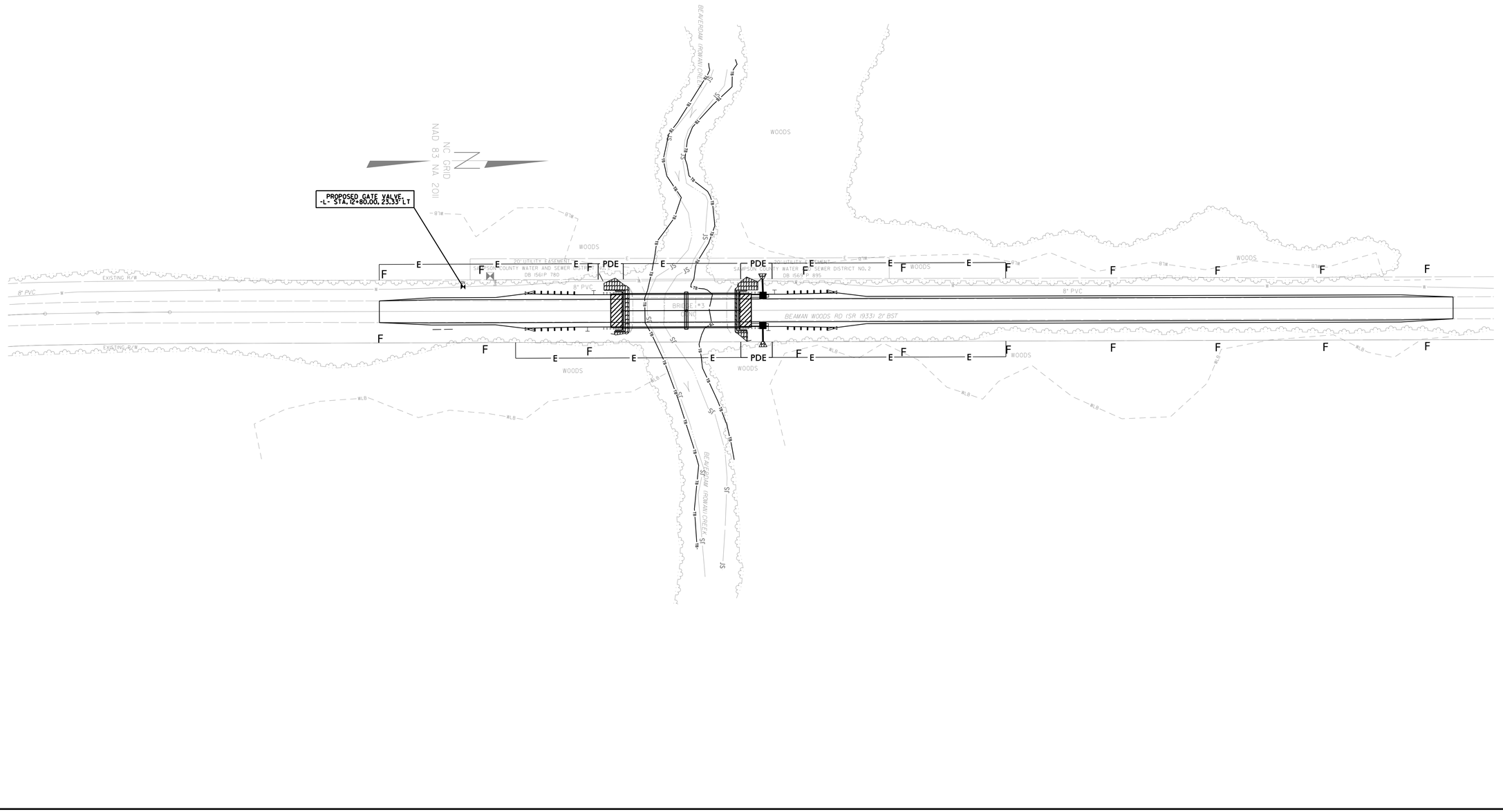
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PREPARED BY

KCA
KISINGER CAMPO & ASSOCIATES
NC FIRM LICENSE No: C-1506
301 Fayetteville Street,
Suite 1500
Raleigh, NC 27601
(919)882-7839

REVISIONS

UTILITY CONSTRUCTION



BP3.R003.1

4UT3	UC-4

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

UTILITY DESIGN UNIT

UTILITY CONSTRUCTION
PLANS ONLY

DocuSigned by:
Samuel Culbreth
19A97099E3A4F8...

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULBRETH

6/28/2022

DESIGNED BY:	SLCh
DRAWN BY:	SLCh
CHECKED BY:	SLCu
APPROVED BY:	
REVISED:	

UTILITIES ENGINEERING SEC.
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REVISIONS

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0 5 10

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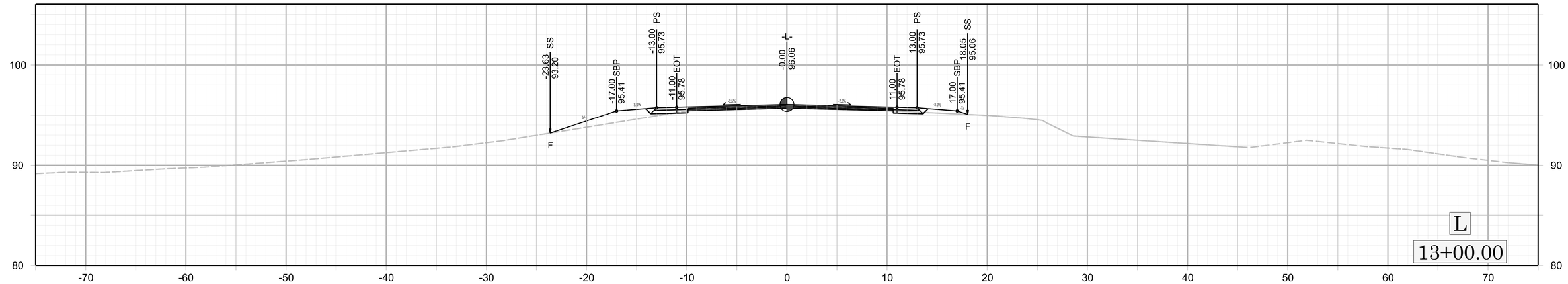
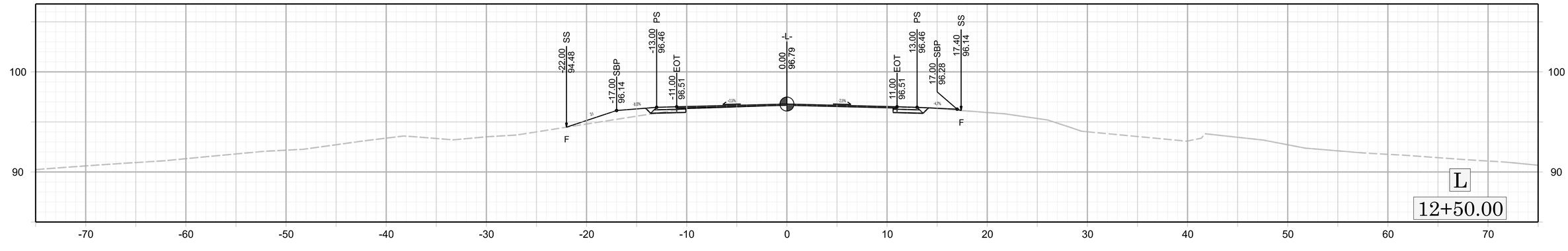
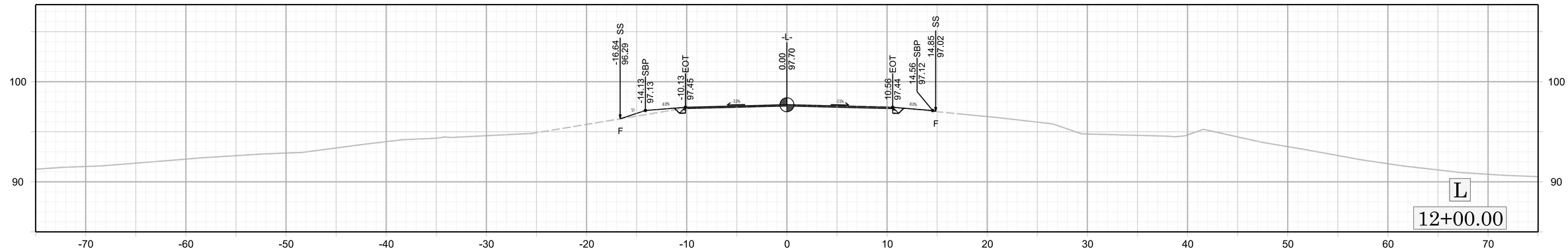
X 1







BEGIN PROJECT -L- STA. 12+00.00

5/26/20

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BP3.R003.1
X 2

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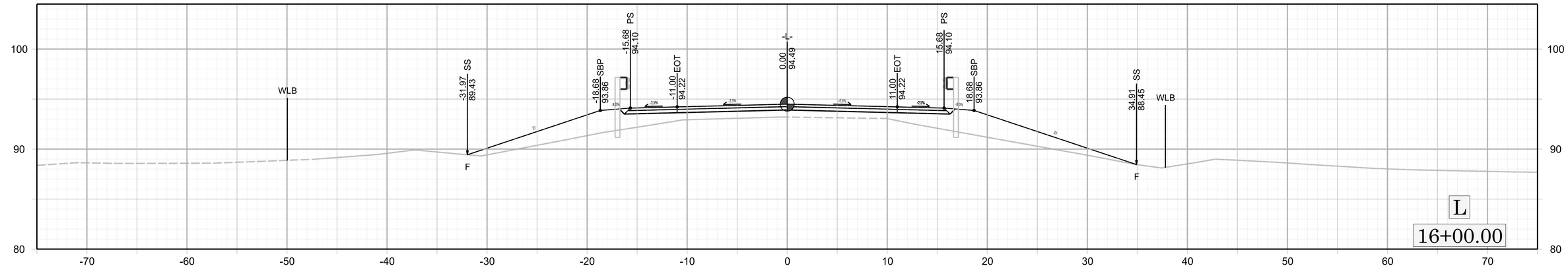
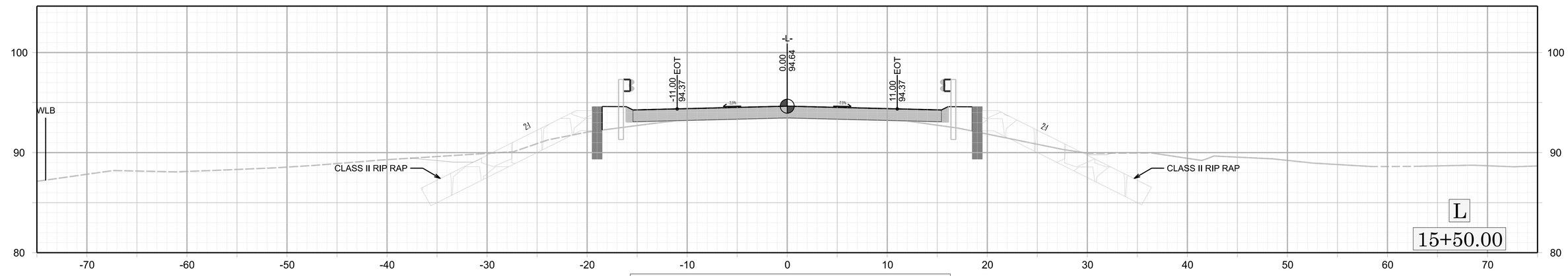
0 5 10

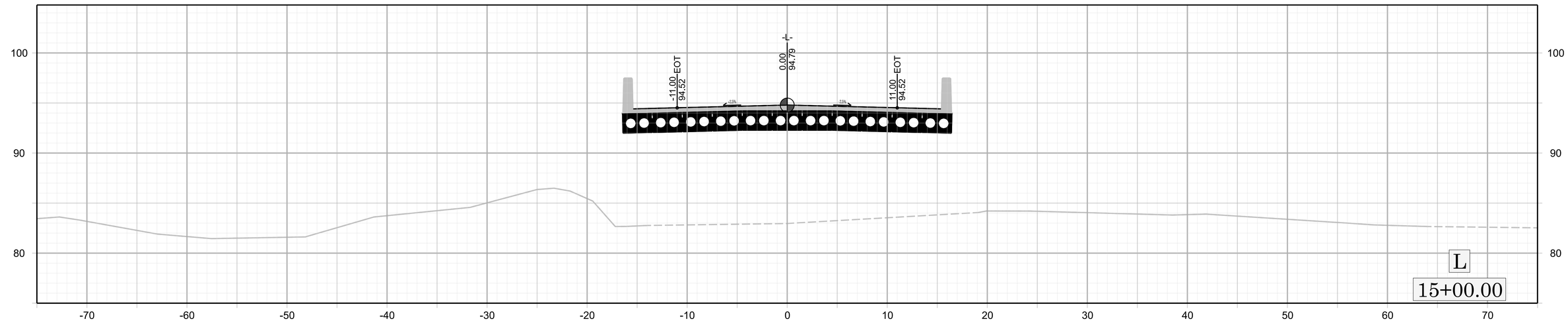
BP3.R003.1

X 3





END BRIDGE -L- STA. 15+44.19



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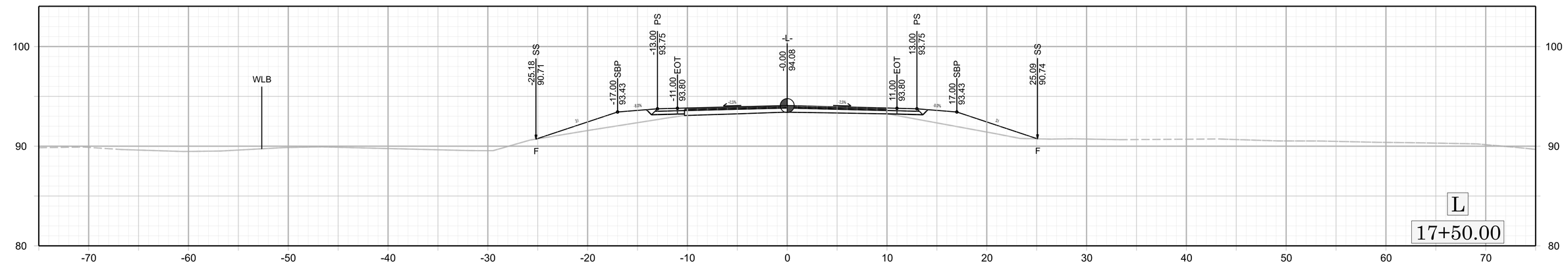
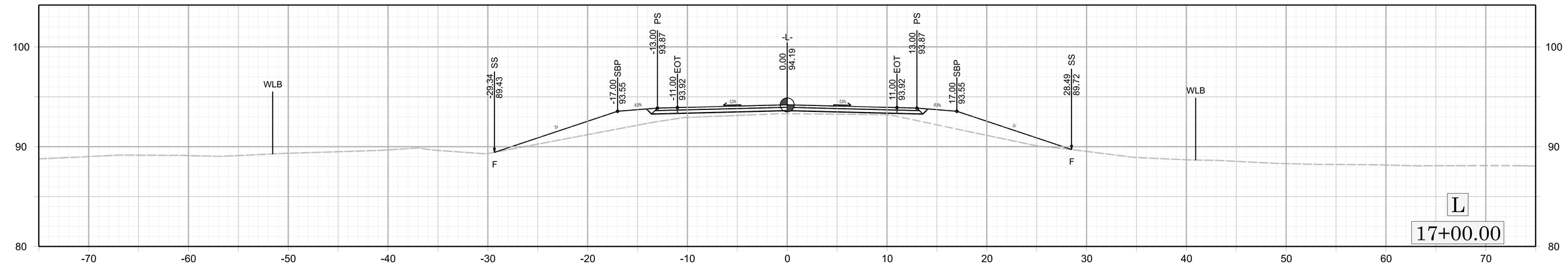
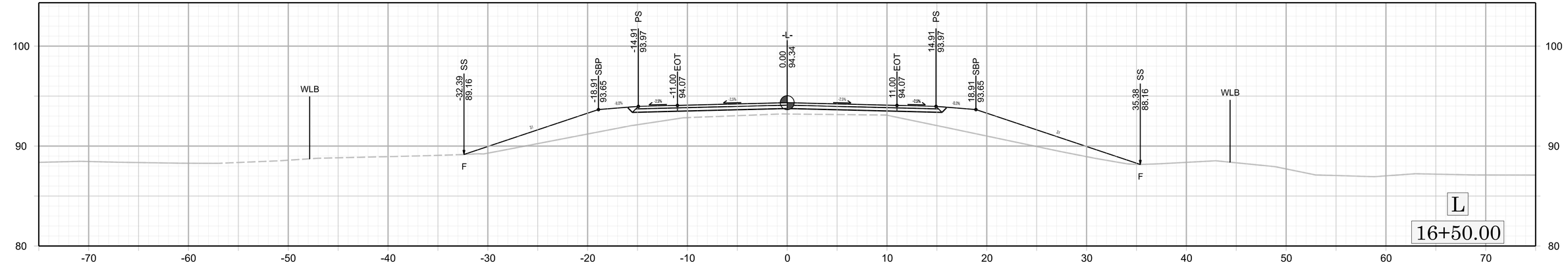
BP3.R003.1

X | 4







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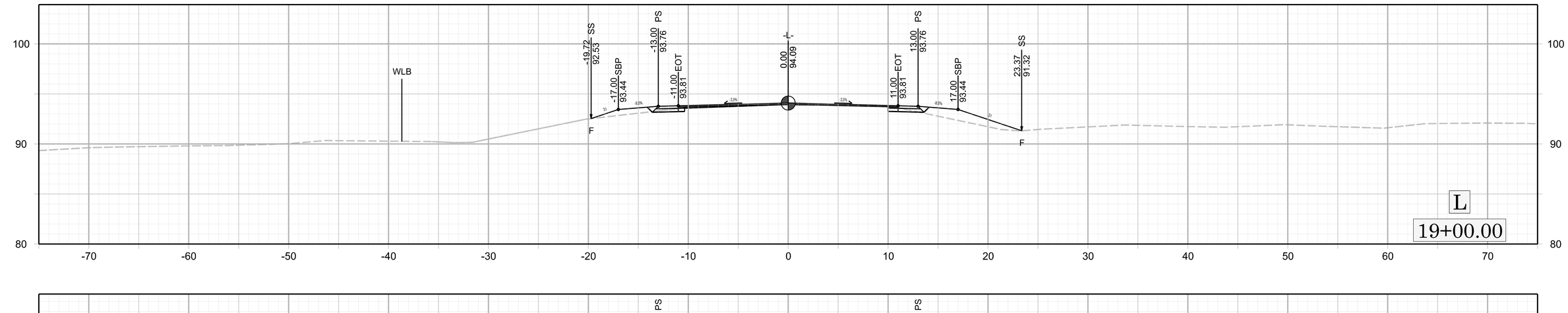

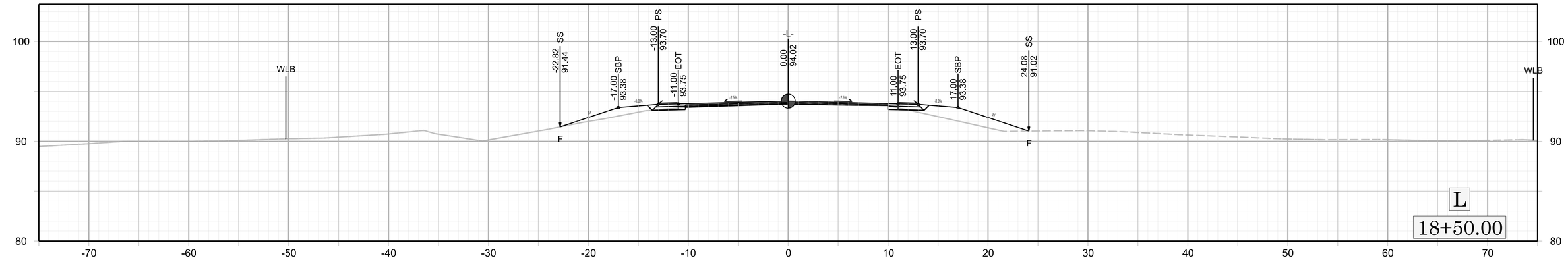

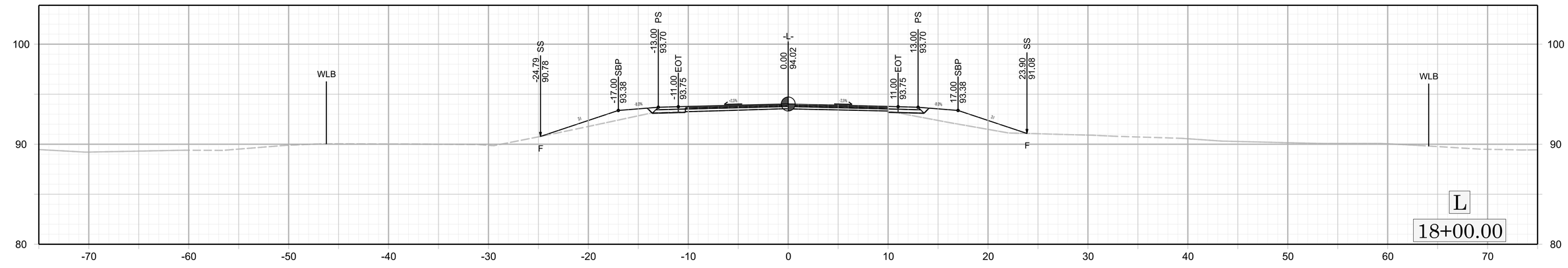

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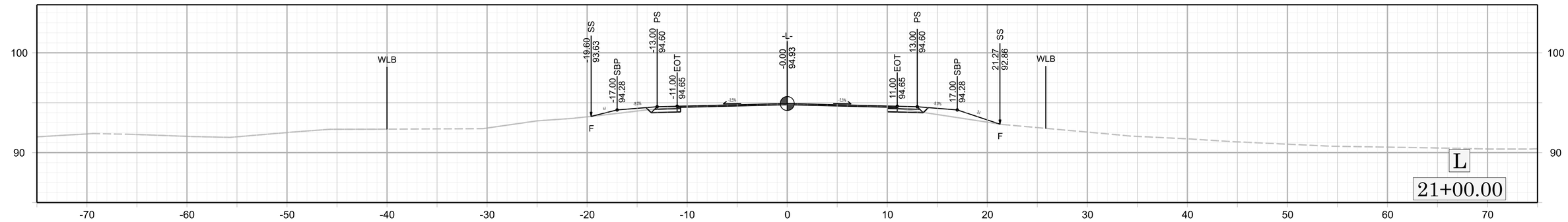
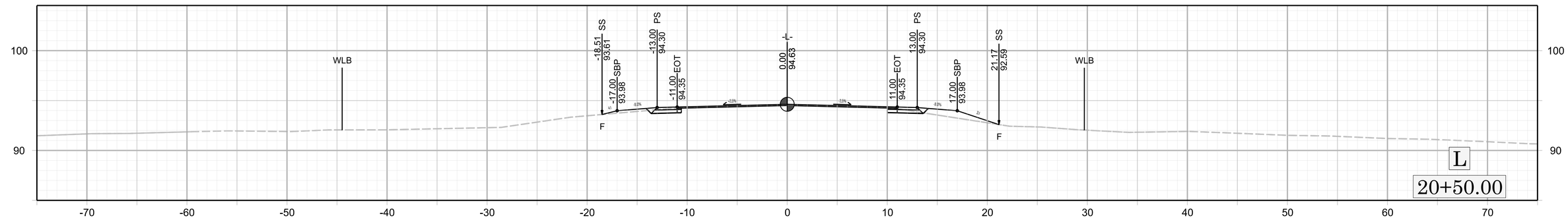
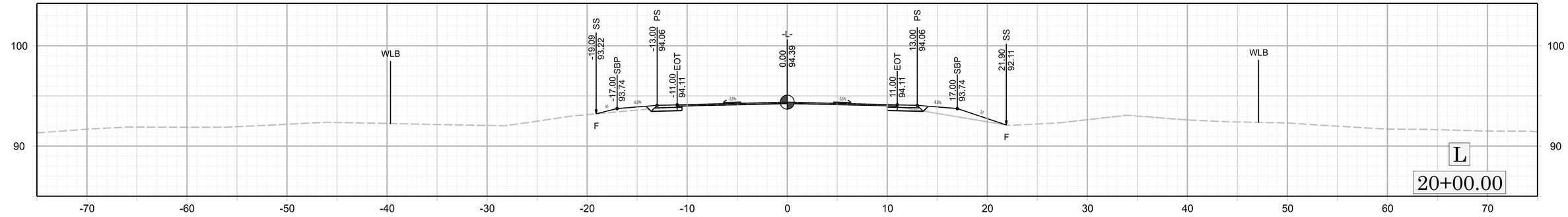
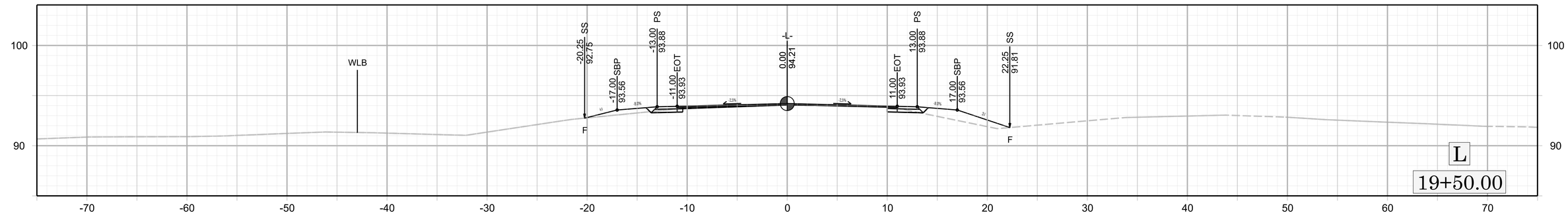
X 6









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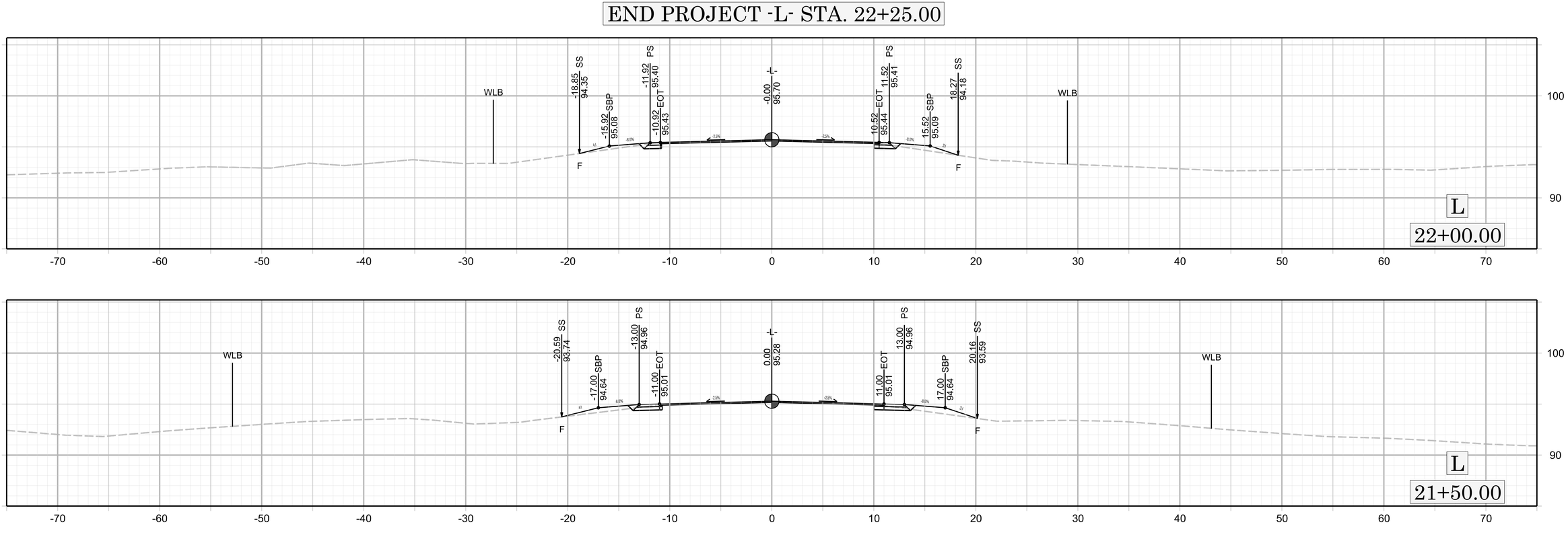
BP3.R003.1
X 7

END PROJECT -L- STA. 22+25.00



TIP PROJECT: BP3.R003.1

STATE OF NORTH CAROLINA

DIVISION OF HIGHWAYS

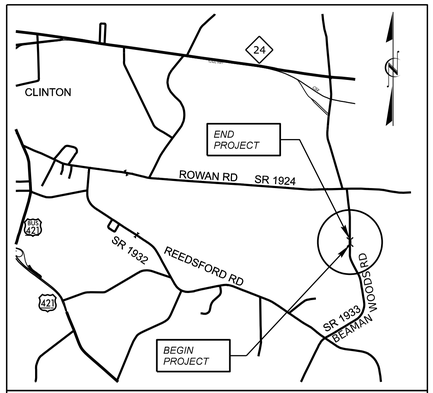
SAMPSON COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP3.R003.1	1	

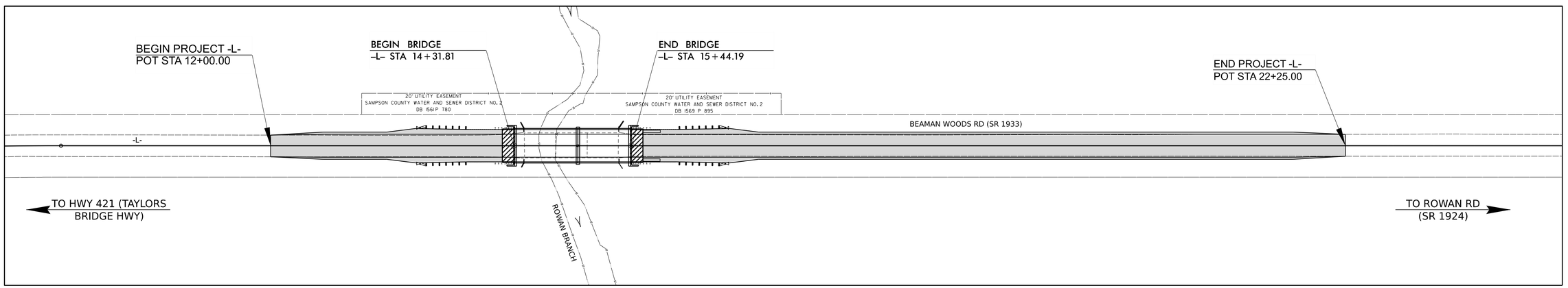
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
BP3.R003.1	–	P.E.
BP3.R003.3	–	CONST.

LOCATION: BRIDGE NO. 810003 ON SR 1933 (BEAMAN WOODS RD.) OVER ROWAN BRANCH

TYPE OF WORK: GRADING DRAINAGE, PAVING, AND STRUCTURE



VICINITY MAP N.T.S.



STRUCTURES

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DESIGN DATA

ADT (2022) = 1,730
ADT (2042) = 3,550
K = N/A %
D = ## %
T = 6 % **
* V = 60 MPH
** (TTST 3 %, DUAL 3 %)

FUNC CLASS = LOCAL

SUB-REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT BP3.R003.1 = 0.173 MILES
LENGTH STRUCTURE TIP PROJECT BP3.R003.1 = 0.021 MILES

TOTAL LENGTH TIP PROJECT BP3.R003.1 = 0.194 MILES

Prepared in the Office of:

KCA KISINGER CAMPO & ASSOCIATES

301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

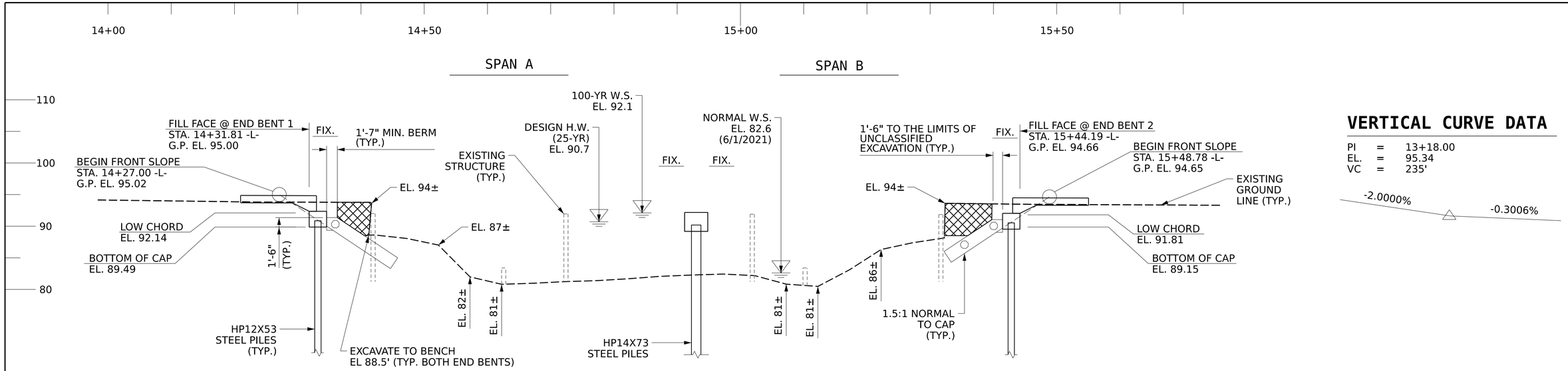
2018 STANDARD SPECIFICATIONS

LETTING DATE :

SEE ROADWAY PLANS

JACOB H. DUKE, PE
PROJECT ENGINEER

DIEGO A. AGUIRRE, PhD, PE
PROJECT DESIGN ENGINEER



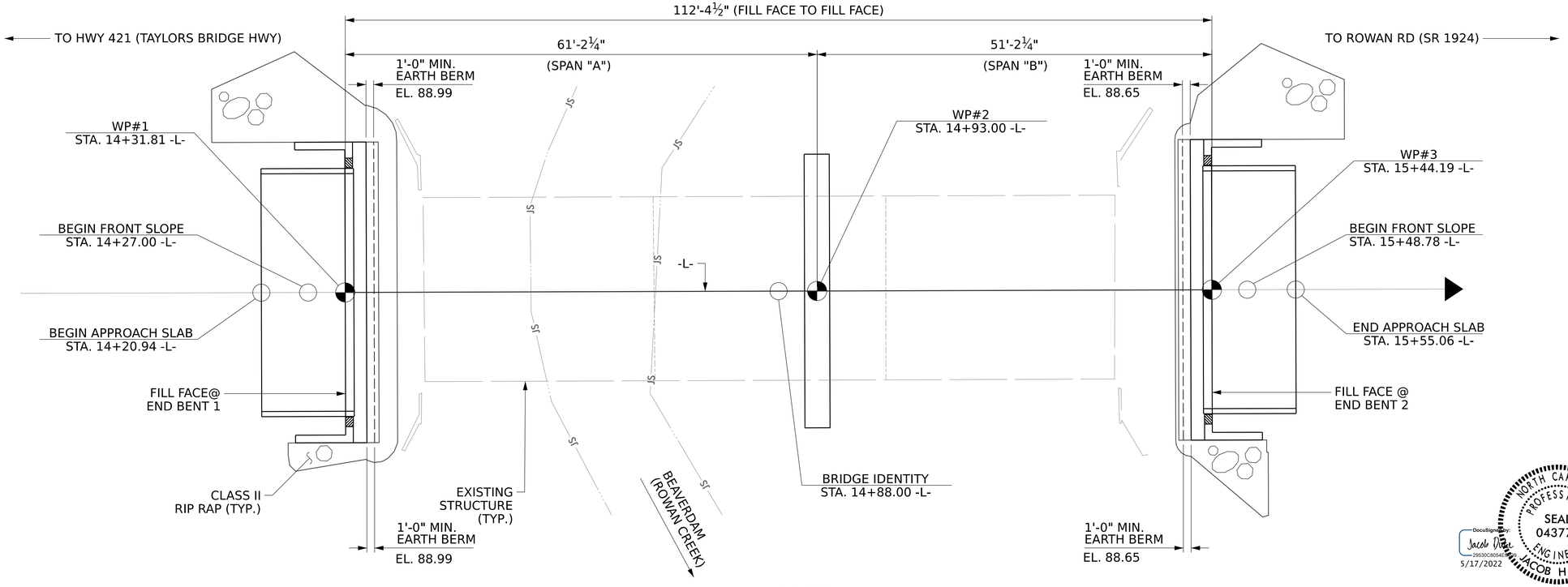
SECTION ALONG -L-

VERTICAL CURVE DATA

PI = 13+18.00
EL. = 95.34
VC = 235'

-2.0000% -0.3006%

UNCLASSIFIED STRUCTURE EXCAVATION



PLAN

(PILES NOT SHOWN FOR CLARITY)

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. BP3.R003.1

SAMPSON COUNTY

STATION: 14+88.00 -L-

SHEET 1 OF 2 REPLACES BRIDGE NO. 810003

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H. DUKE

DocuSigned by: Jacob Duke 29530C80545E4...
5/17/2022

KCA KISINGER CAMPO & ASSOCIATES

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RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 1933 (BEAMAN WOODS RD.) OVER ROWAN BRANCH BETWEEN REEDSFORD RD (SR 1932 AND ROWAN RD (SR 1924)

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

DRAWN BY : DIEGO A. AGUIRRE DATE : 03/2022
CHECKED BY : JACOB H. DUKE DATE : 03/2022
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 03/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

5/17/2022
BP3.R003.1_SMU_GD01_810003.dgn
daguirre

SUMMARY OF PILE INFORMATION/INSTALLATION

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pile(s) #-# (e.g., "Bent 1, Piles 1-5")	Factored Resistance per Pile TONS	Pile Cut-Off (Top of Pile) Elevation FT	Estimated Pile Lenth per Pile FT	Scour Critical Elevation FT	Driven Piles			Predrilling for Piles*			Drilled-In Piles		
					Min Pile Tip (Tip No Higher Than) Elev FT	Required Driving Resistance (RDR)** per Pile TONS	Total Pile Redrives Quantity EACH	Predrilling Length per Pile Lin FT	Predrilling Elevation (Elev Not To Predrill Below) FT	Maximum Predrilling Dia INCHES	Pile Excavation (Bottom of Hole) Elev FT	Pile Exc Not In Soil per Pile Lin FT	Pile Exc In Soil per Pile Lin FT
End Bent 1, Piles 1-7	74	90.49	50			125	11						
Bent 1, Piles 1-8	118	90.35	65	69.8	54.0	205							
End Bent 2, Piles 1-7	67	90.15	50			115							

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

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

SUMMARY OF PDA/PILE ORDER LENGTHS

(Blank entries indicate item is not applicable to structure)

Pile Driving Analyzer (PDA)				Pile Order Lengths	
End Bent/ Bent No	PDA Testing Required? YES or MAYBE	PDA Test Pile Length FT	Total PDA Testing Quantity EACH	End Bent/ Bent No(s)	Pile Order Length Basis* EST or PDA
End Bent 1, Piles 1-7	MAYBE	55	1		
Bent 1, Piles 1-8	MAYBE	70			
End Bent 2, Piles 1-7	MAYBE	55			

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

PILE DESIGN INFORMATION

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pile(s) #-# (e.g., "Bent 1, Piles 1-5")	Factored Axial Load per Pile TONS	Factored Downdrag Load per Pile TONS	Factored Dead Load* per Pile TONS	Dynamic Resistance Factor	Nominal Downdrag Resistance per Pile TONS	Nominal Scour Resistance per Pile TONS	Scour Resistance Factor (Default = 1.00)
End Bent 1, Piles 1-7	74			0.60			
Bent 1, Piles 1-8	118			0.60		11.0	1.00
End Bent 2, Piles 1-7	67			0.60			

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

NOTES:

1. The Pile Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (Jinyoung Park, PE# 032171) on 4-1-2022.
2. Total Pile Driving Equipment Setup quantity (not shown in Pile Foundation Tables) equals the number of driven piles, i.e., the number of piles with a Required Driving Resistance.
3. The Engineer will determine the need for PDA Testing when PDAs may be required.

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE

DocuSigned by: Jacob Duke 29530C80548... 5/17/2022

KCA KISINGER CAMPO & ASSOCIATES

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PROJECT NO. BP3.R003.1

SAMPSON COUNTY

STATION: 14+88.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

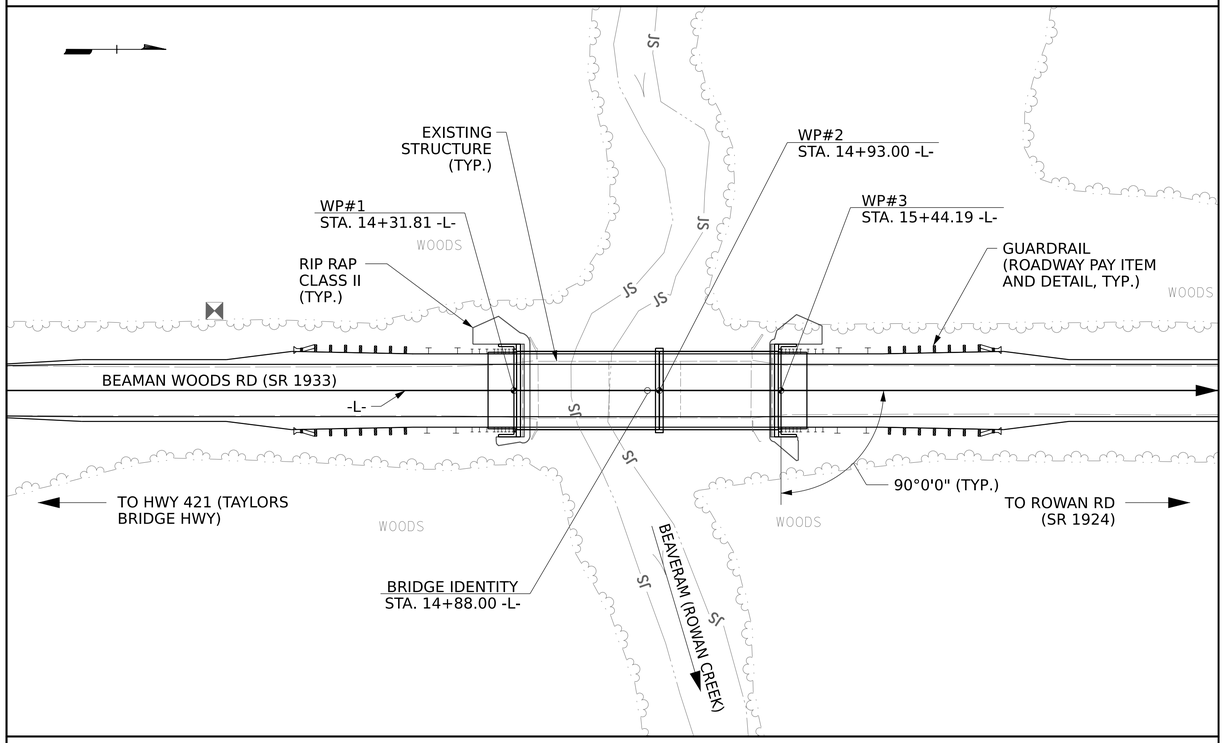
PILE FOUNDATION TABLES

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

DRAWN BY : DIEGO A. AGUIRRE DATE : 03/2022
CHECKED BY : JACOB H. DUKE DATE : 03/2022
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 03/2022

5/17/2022
BP3.R003.1_SMU_PFT01_810003.dgn
daguirre

BM#1: RAIL ROAD SPIKE IN THE BASE OF 12" BIRCH TREE; -L- STA. 13+05.83, 33.5' LT, EL. 93.15'



LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS

GENERAL 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 IN SEISMIC ZONE 1.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH ''HEC 18 - EVALUATING SCOUR AT BRIDGES''.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET S-1 SHALL BE EXCAVATED FOR A DISTANCE OF APPROXIMATELY 30FT EACH SIDE 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 CONSISTING OF THREE APPROXIMATELY 30FT SPANS CONSISTING OF A CONCRETE DECK ON PRESTRESSED CONCRETE BEAMS WITH A CLEAR ROADWAY WIDTH OF 24'-0" 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 CONVENIENCE OF THE CONTRACTOR. THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW. FOR REMOVAL OF EXISTING STRUCTURE, SEE SPECIAL PROVISIONS.

THE SCOUR CRITICAL ELEVATION FOR BENT No. 1 IS ELEVATION 69.8'. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

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

FOR CONCRETE WEARING SURFACE, SEE SPECIAL PROVISIONS.

FOR INTERIOR BENT NO. 1, ONLY PARTIAL GALVANIZING OF THE PILES IS REQUIRED. SEE INTERIOR BENT SHEETS FOR REQUIRED GALVANIZING LENGTHS. PAYMENT FOR PARTIALLY GALVANIZED PILES WILL BE MADE UNDER THE CONTRACT UNIT PRICE FOR GALVANIZED STEEL PILES.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESMENT	PDA TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	CONCRETE WEARING SURFACE	GROOVING BRIDGE FLOORS	CLASS A CONCRETE (BRIDGE)	BRIDGE APPROACH SLABS	REINFORCING STEEL (BRIDGE)	PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES	PILE DRIVING EQUIPMENT SETUP FOR HP 14X73 GALVANIZED STEEL PILES
	LUMP SUM	LUMP SUM	EA.	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	EA.	EA.
SUPERSTRUCTURE					3396	3715					
END BENT No. 1			*				15.3		2174	7	
BENT No. 1			*				11.6		2196		8
END BENT No. 2			*				15.3		2174	7	
TOTAL	LUMP SUM	LUMP SUM	1	LUMP SUM	3396	3715	42.2	LUMP SUM	6544	14	8

* SEE ''PILE FOUNDATION TABLES'' SHEET FOR QUANTITIES.

TOTAL BILL OF MATERIAL CONT'D

	HP 12X53 STEEL PILES		HP 14X73 GALVANIZED STEEL PILES		PILE REDRIVES	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0") THICK	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 2-0" PRESTRESSED CONCRETE CORED SLAB	
	No.	LIN. FT.	No.	LIN. FT.	EA.	LIN. FT.	TONS.	SQ. YDS.	LUMP SUM	No.	LIN. FT.
SUPERSTRUCTURE						220.5			LUMP SUM	22	1210
END BENT No. 1	7	350			*		99.9	140.8			
BENT No. 1			8	520	*						
END BENT No. 2	7	350			*		106.8	148.9			
TOTAL	14	700	8	520	11	220.5	206.7	289.7	LUMP SUM	22	1210

* SEE ''PILE FOUNDATION TABLES'' SHEET FOR QUANTITIES.

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	4300 CFS
FREQUENCY OF OVERTOPPING FLOOD	500 + YRS.
OVERTOPPING FLOOD ELEVATION	94.0'
SAG STA.	18+22.30 -L-

HYDRAULIC DATA

DESIGN DISCHARGE	1200 CFS
FREQUENCY OF DESIGN FLOOD	25 YRS.
DESIGN HIGH WATER ELEVATION	90.7 FT.
DRAINAGE AREA	13.2 SQ. MI.
BASE DISCHARGE (Q100)	2083 CFS
BASE HIGH WATER ELEVATION	92.1'

PROJECT NO. BP3.R003.1

SAMPSON COUNTY

STATION: 14+88.00 -L-

SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE

DocuSigned by: Jacob Duke 29530C8054E8...

6/2/2022

KCA KISINGER CAMPO & ASSOCIATES

301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE ON SR 1933 (BEAMAN WOODS RD.) OVER ROWAN BRANCH BETWEEN REEDSFORD RD (SR 1932 AND ROWAN RD (SR 1924)

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

DRAWN BY : DIEGO A. AGUIRRE DATE : 03/2022
CHECKED BY : JACOB H. DUKE DATE : 03/2022
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 03/2022

6/2/2022
BP3_R003_1_SMU_GD02_810003.dgn
daguirre

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	2.073	--	1.75	0.28	3.04	60'	EL	24.5	0.534	2.07	60'	EL	2.45	0.80	0.28	2.85	60'	EL	24.5	
		HL-93(Opr)	N/A	--	2.687	--	1.35	0.28	3.93	60'	EL	24.5	0.534	2.69	60'	EL	2.45	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	2	2.479	89.25	1.75	0.28	3.76	60'	EL	24.5	0.534	2.48	60'	EL	2.45	0.80	0.28	3.52	60'	EL	24.5	
		HS-20(Opr)	36.000	--	3.214	115.694	1.35	0.28	4.88	60'	EL	24.5	0.534	3.21	60'	EL	2.45	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SV	SNSH	13.500	--	6.997	94.455	1.4	0.28	9.57	60'	EL	24.5	0.534	7	60'	EL	2.45	0.80	0.28	7.20	60'	EL	24.5	
		SNGARBS2	20.000	--	5.091	101.826	1.4	0.28	7.56	60'	EL	24.5	0.534	5.09	60'	EL	2.45	0.80	0.28	5.65	60'	EL	24.5	
		SNAGRIS2	22.000	--	4.772	104.98	1.4	0.28	7.26	60'	EL	19.6	0.534	4.77	60'	EL	2.45	0.80	0.28	5.45	60'	EL	19.6	
		SNC0TTS3	27.250	--	3.505	95.499	1.4	0.28	4.78	60'	EL	24.5	0.534	3.5	60'	EL	2.45	0.80	0.28	3.59	60'	EL	24.5	
		SNAGGRS4	34.925	--	2.991	104.445	1.4	0.28	4.15	60'	EL	24.5	0.534	2.99	60'	EL	2.45	0.80	0.28	3.12	60'	EL	24.5	
		SNS5A	35.550	--	3.044	108.209	1.4	0.28	4.05	60'	EL	24.5	0.534	3.07	60'	EL	2.45	0.80	0.28	3.04	60'	EL	24.5	
		SNS6A	39.950	--	2.84	113.453	1.4	0.28	3.79	60'	EL	24.5	0.534	2.84	60'	EL	2.45	0.80	0.28	2.85	60'	EL	24.5	
		SNS7B	42.000	--	2.712	113.918	1.4	0.28	3.61	60'	EL	24.5	0.534	2.84	60'	EL	2.45	0.80	0.28	2.71	60'	EL	24.5	
	TTST	TNAGRIT3	33.000	--	3.351	110.572	1.4	0.28	4.64	60'	EL	24.5	0.534	3.35	60'	EL	2.45	0.80	0.28	3.49	60'	EL	24.5	
		TNT4A	33.075	--	3.228	106.768	1.4	0.28	4.68	60'	EL	24.5	0.534	3.23	60'	EL	2.45	0.80	0.28	3.52	60'	EL	24.5	
		TNT6A	41.600	--	2.93	121.871	1.4	0.28	3.9	60'	EL	24.5	0.534	3.1	60'	EL	2.45	0.80	0.28	2.93	60'	EL	24.5	
		TNT7A	42.000	--	2.892	121.477	1.4	0.28	3.96	60'	EL	24.5	0.534	2.89	60'	EL	2.45	0.80	0.28	2.97	60'	EL	24.5	
		TNT7B	42.000	--	2.736	114.922	1.4	0.28	4.12	60'	EL	24.5	0.534	2.74	60'	EL	2.45	0.80	0.28	3.08	60'	EL	24.5	
		TNAGRIT4	43.000	--	2.637	113.381	1.4	0.28	3.91	60'	EL	24.5	0.534	2.64	60'	EL	2.45	0.80	0.28	2.94	60'	EL	24.5	
		TNAGT5A	45.000	--	2.676	120.405	1.4	0.28	3.66	60'	EL	24.5	0.534	2.68	60'	EL	2.45	0.80	0.28	2.75	60'	EL	24.5	
		TNAGT5B	45.000	3	2.502	112.57	1.4	0.28	3.58	60'	EL	24.5	0.534	2.5	60'	EL	2.45	0.80	0.28	2.69	60'	EL	24.5	

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.

⟨#⟩ CONTROLLING LOAD RATING
⟨1⟩ DESIGN LOAD RATING (HL-93)
⟨2⟩ DESIGN LOAD RATING (HS-20)
⟨3⟩ LEGAL LOAD RATING **
** SEE CHART FOR VEHICLE TYPE
GIRDER LOCATION
I - INTERIOR GIRDER
EL - EXTERIOR LEFT GIRDER
ER - EXTERIOR RIGHT GIRDER

LRFR SUMMARY

FOR SPAN 'A'

ASSEMBLED BY :	DAA	DATE : 03/2022
CHECKED BY :	FLF	DATE : 03/2022
DRAWN BY : CVC	6/10	
CHECKED BY : DNS	6/10	

DRAWN BY :	DIEGO A. AGUIRRE	DATE : 03/2022
CHECKED BY :	JACOB H. DUKE	DATE : 03/2022
DESIGN ENGINEER OF RECORD:	JACOB H. DUKE	DATE : 03/2022

5/17/2022
BP3.R003.1_SMU_LRFR01_810003.dgn
dagulrre

DocuSigned by: Jacob Duke 29530C80541...
5/17/2022

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. BP3.R003.1

SAMPSON COUNTY

STATION: 14+88.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
LRFR SUMMARY FOR 60' CORED SLAB UNIT 90° SKEW
(NON-INTERSTATE TRAFFIC)

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

STD. NO. 24LRFR1_90S_60L (TOP DOWN)

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	2.053	--	1.75	0.276	2.26	50′	EL	29.5	0.52	2.05	50′	EL	5.9	0.80	0.276	2.22	50′	EL	29.5	
		HL-93(Opr)	N/A	--	2.661	--	1.35	0.276	2.93	50′	EL	29.5	0.52	2.66	50′	EL	5.9	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	2	2.47	88.93	1.75	0.276	2.86	50′	EL	29.5	0.52	2.47	50′	EL	5.9	0.80	0.276	2.81	50′	EL	29.5	
		HS-20(Opr)	36.000	--	3.202	115.279	1.35	0.276	3.71	50′	EL	29.5	0.52	3.2	50′	EL	5.9	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SV	SNSH	13.500	--	6.053	81.711	1.4	0.276	7.7	50′	EL	29.5	0.52	7.14	50′	EL	5.9	0.80	0.276	6.05	50′	EL	29.5	
		SNGARBS2	20.000	--	4.634	92.672	1.4	0.276	5.89	50′	EL	29.5	0.52	5.14	50′	EL	5.9	0.80	0.276	4.63	50′	EL	29.5	
		SNAGRIS2	22.000	--	4.43	97.466	1.4	0.276	5.65	50′	EL	29.5	0.52	4.8	50′	EL	5.9	0.80	0.276	4.43	50′	EL	29.5	
		SNCOTTS3	27.250	--	3.015	82.171	1.4	0.276	3.84	50′	EL	29.5	0.52	3.57	50′	EL	5.9	0.80	0.276	3.02	50′	EL	29.5	
		SNAGGRS4	34.925	--	2.567	89.643	1.4	0.276	3.27	50′	EL	29.5	0.52	3.01	50′	EL	5.9	0.80	0.276	2.57	50′	EL	29.5	
		SNS5A	35.550	--	2.507	89.116	1.4	0.276	3.19	50′	EL	29.5	0.52	3.07	50′	EL	5.9	0.80	0.276	2.51	50′	EL	29.5	
		SNS6A	39.950	--	2.32	92.685	1.4	0.276	2.95	50′	EL	29.5	0.52	2.82	50′	EL	5.9	0.80	0.276	2.32	50′	EL	29.5	
		SNS7B	42.000	--	2.21	92.825	1.4	0.276	2.81	50′	EL	29.5	0.52	2.8	50′	EL	5.9	0.80	0.276	2.21	50′	EL	29.5	
	TTST	TNAGRIT3	33.000	--	2.835	93.559	1.4	0.276	3.61	50′	EL	29.5	0.52	3.34	50′	EL	5.9	0.80	0.276	2.84	50′	EL	29.5	
		TNT4A	33.075	--	2.853	94.369	1.4	0.276	3.63	50′	EL	29.5	0.52	3.24	50′	EL	5.9	0.80	0.276	2.85	50′	EL	29.5	
		TNT6A	41.600	--	2.352	97.863	1.4	0.276	2.99	50′	EL	29.5	0.52	3.03	50′	EL	5.9	0.80	0.276	2.35	50′	EL	29.5	
		TNT7A	42.000	--	2.375	99.744	1.4	0.276	3.02	50′	EL	29.5	0.52	2.89	50′	EL	5.9	0.80	0.276	2.37	50′	EL	29.5	
		TNT7B	42.000	--	2.475	103.971	1.4	0.276	3.16	50′	EL	29.5	0.52	2.71	50′	EL	5.9	0.80	0.276	2.48	50′	EL	29.5	
		TNAGRIT4	43.000	--	2.343	100.737	1.4	0.276	2.98	50′	EL	29.5	0.52	2.62	50′	EL	5.9	0.80	0.276	2.34	50′	EL	29.5	
		TNAGT5A	45.000	--	2.2	98.988	1.4	0.276	2.8	50′	EL	29.5	0.52	2.63	50′	EL	5.9	0.80	0.276	2.20	50′	EL	29.5	
		TNAGT5B	45.000	3	2.165	97.428	1.4	0.276	2.75	50′	EL	29.5	0.52	2.49	50′	EL	5.9	0.80	0.276	2.17	50′	EL	29.5	

LOAD FACTORS:

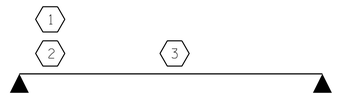
	LIMIT STATE	γ_{DC}	γ_{DW}
DESIGN LOAD RATING FACTORS	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

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

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

(#) CONTROLLING LOAD RATING
(1) DESIGN LOAD RATING (HL-93)
(2) DESIGN LOAD RATING (HS-20)
(3) LEGAL LOAD RATING **
** SEE CHART FOR VEHICLE TYPE
GIRDER LOCATION
I - INTERIOR GIRDER
EL - EXTERIOR LEFT GIRDER
ER - EXTERIOR RIGHT GIRDER



LRFR SUMMARY

FOR SPAN 'B'

ASSEMBLED BY :	DAA	DATE : 03/2022
CHECKED BY :	FLF	DATE : 03/2022
DRAWN BY : CVC	6/10	
CHECKED BY : DNS	6/10	
DRAWN BY :	DIEGO A. AGUIRRE	DATE : 03/2022
CHECKED BY :	JACOB H. DUKE	DATE : 03/2022
DESIGN ENGINEER OF RECORD:	JACOB H. DUKE	DATE : 03/2022

5/17/2022
BP3.R003.1_SMU_LRFR02_810003.dgn
daguirre

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE

DocuSigned by: Jacob Duke 29530C80548...
5/17/2022

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. BP3.R003.1

SAMPSON COUNTY

STATION: 14+88.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

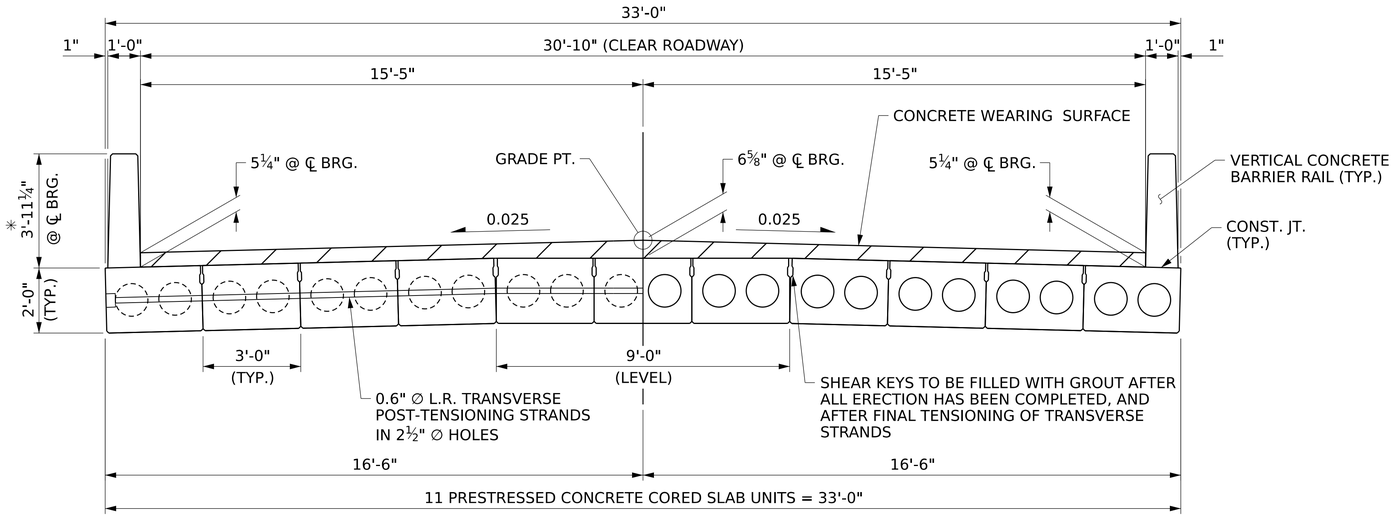
STANDARD

LRFR SUMMARY FOR 50′ CORED SLAB UNIT 90° SKEW

(NON-INTERSTATE TRAFFIC)

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

STD. NO. 24LRFR1_90S_50L (TOP DOWN)

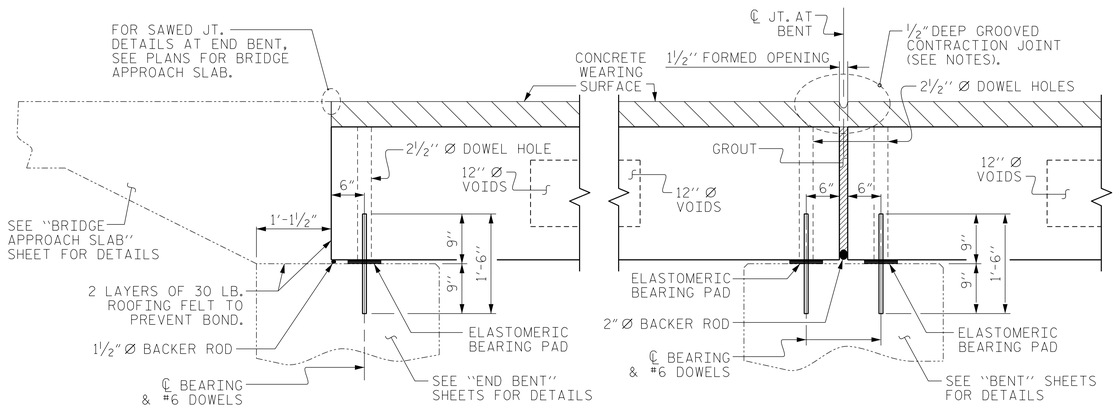


HALF SECTION AT INTERMEDIATE DIAPHRAGMS

HALF SECTION THROUGH VOIDS

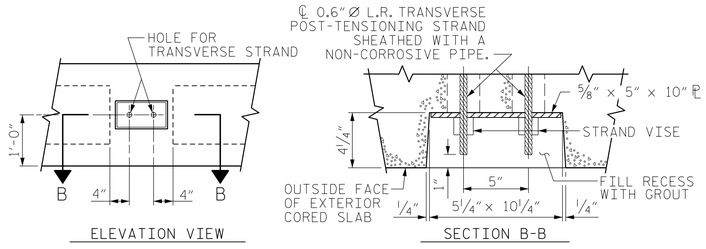
TYPICAL SECTION

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



SECTION AT END BENT

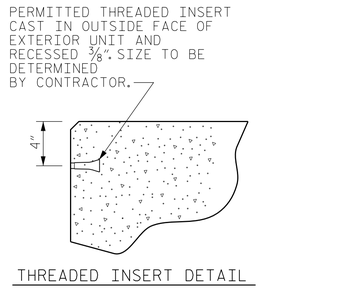
SECTION AT BENT



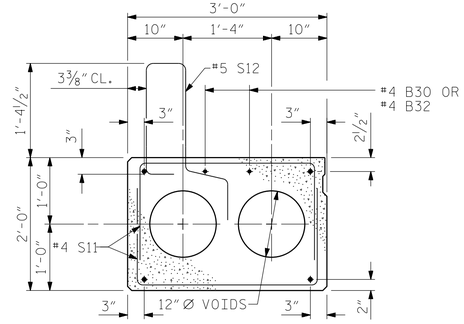
ELEVATION VIEW

SECTION B-B

GROUTED RECESS AT END OF POST-TENSIONED STRAND CORED SLABS

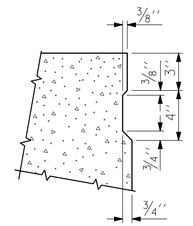


THREADED INSERT DETAIL



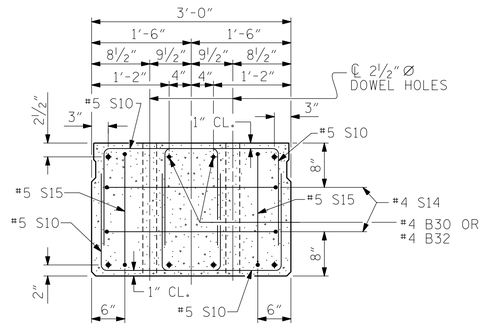
EXTERIOR SLAB SECTION

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



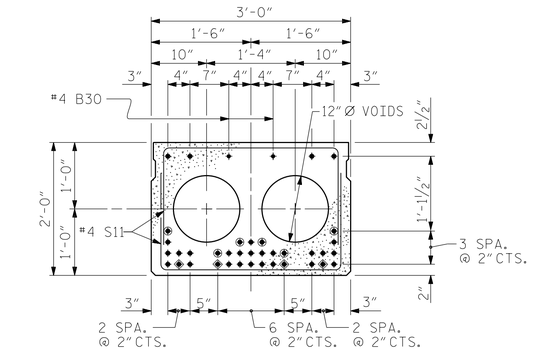
SHEAR KEY DETAIL

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



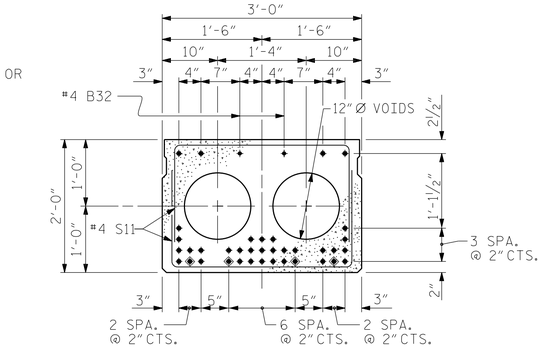
END ELEVATION

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



INTERIOR SLAB SECTION (50' UNIT)

(31 STRANDS REQUIRED)



INTERIOR SLAB SECTION (60' UNIT)

(37 STRANDS REQUIRED)

0.6'' ∅ LOW RELAXATION STRAND LAYOUT

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

◉ OPTIONAL FULL LENGTH DEBONDED STRANDS. THESE STRANDS ARE NOT REQUIRED. IF THE FABRICATOR CHOOSES TO INCLUDE THESE STRANDS IN THE CORED SLAB UNIT, THE STRANDS SHALL BE DEBONDED FOR THE FULL LENGTH OF THE UNIT AT NO ADDITIONAL COST. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

DEBONDING LEGEND

PROJECT NO. BP3.R003.1

SAMPSON COUNTY

STATION: 14+88.00 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

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

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H. DUKE

DocuSigned by: Jacob Duke 29530C8054...
5/17/2022

KCA KISINGER CAMPO & ASSOCIATES

301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

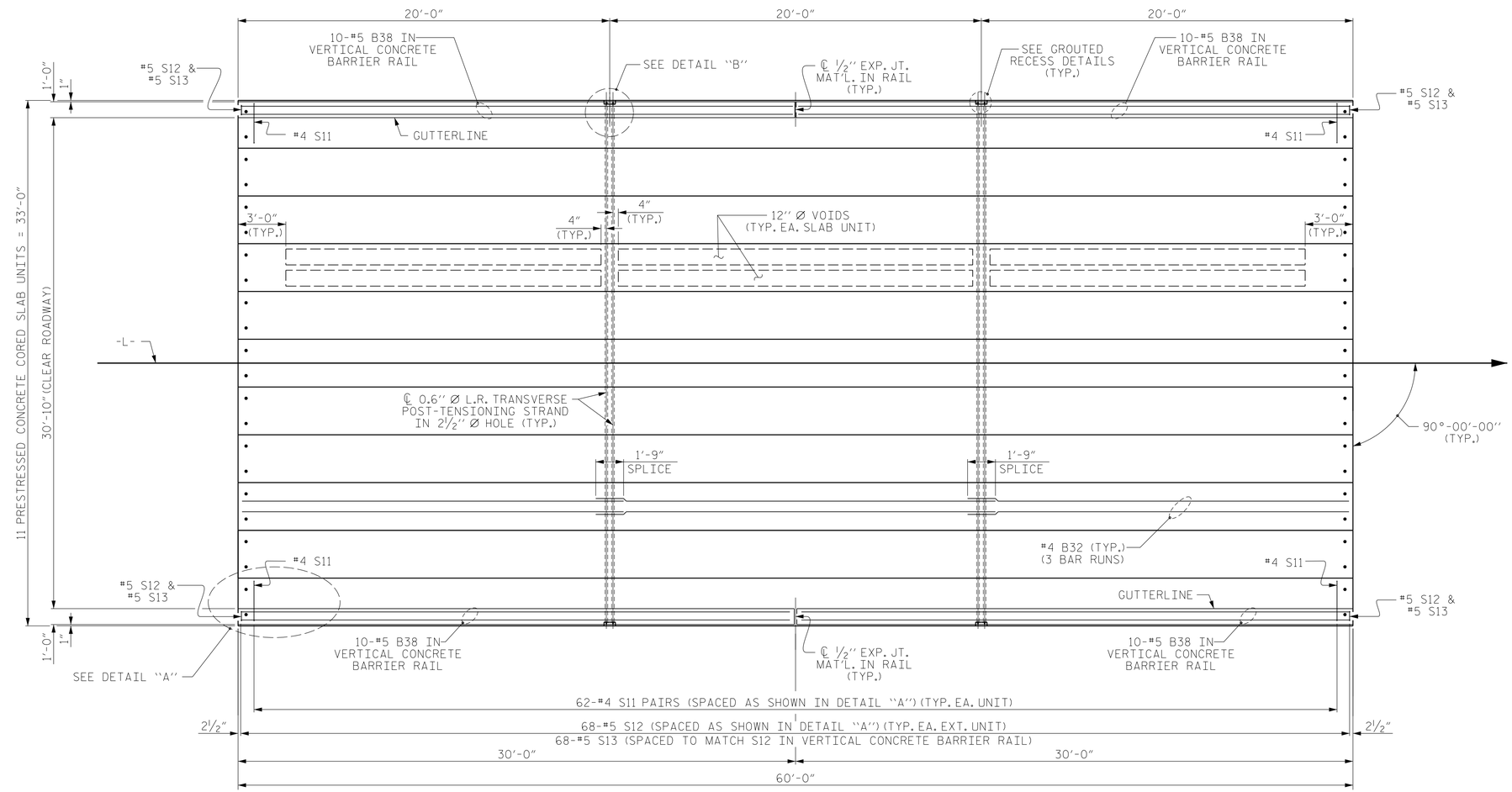
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

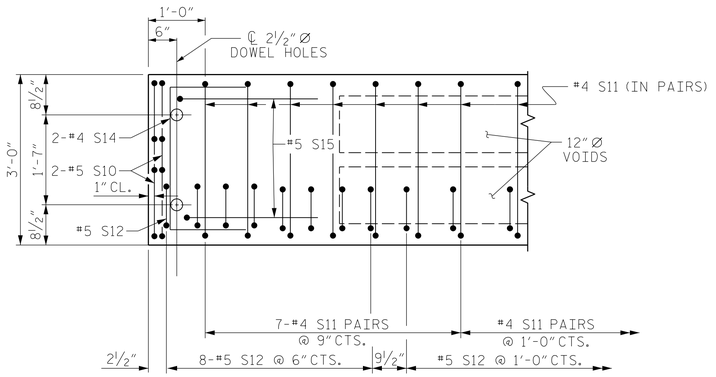
DRAWN BY : MAA 7/10	REV. 9/14 MAA/TMG		
CHECKED BY : MKT 8/10			
DRAWN BY : DIEGO A. AGUIRRE	DATE : 03/2022		
CHECKED BY : JACOB H. DUKE	DATE : 03/2022		
DESIGN ENGINEER OF RECORD: JACOB H. DUKE	DATE : 03/2022		

5/17/2022
BP3.R003.1_SMU_CS01_810003.dgn
daguirre

STD. NO. 24PCS4_33_90S (TOP DOWN)

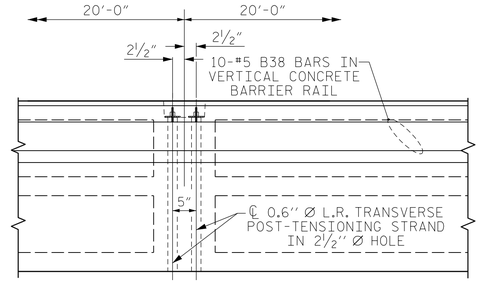


PLAN OF UNIT



DETAIL "A"

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



DETAIL "B"

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

ASSEMBLED BY :	DAA	DATE :	3/2022
CHECKED BY :	FLF	DATE :	3/2022
DRAWN BY : MAA	7/10	REV. 12/5/11	MAA/AAC
CHECKED BY : MKT	8/10	REV. 8/14	MAA/TMG
DRAWN BY :	DIEGO A. AGUIRRE	DATE :	03/2022
CHECKED BY :	JACOB H. DUKE	DATE :	03/2022
DESIGN ENGINEER OF RECORD:	JACOB H. DUKE	DATE :	03/2022

5/17/2022
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daguirre

DocuSigned by: Jacob Duke 29530C8054E8...
5/17/2022

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H. DUKE

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

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PROJECT NO. BP3.R003.1
SAMPSON COUNTY
STATION: 14+88.00 -L-

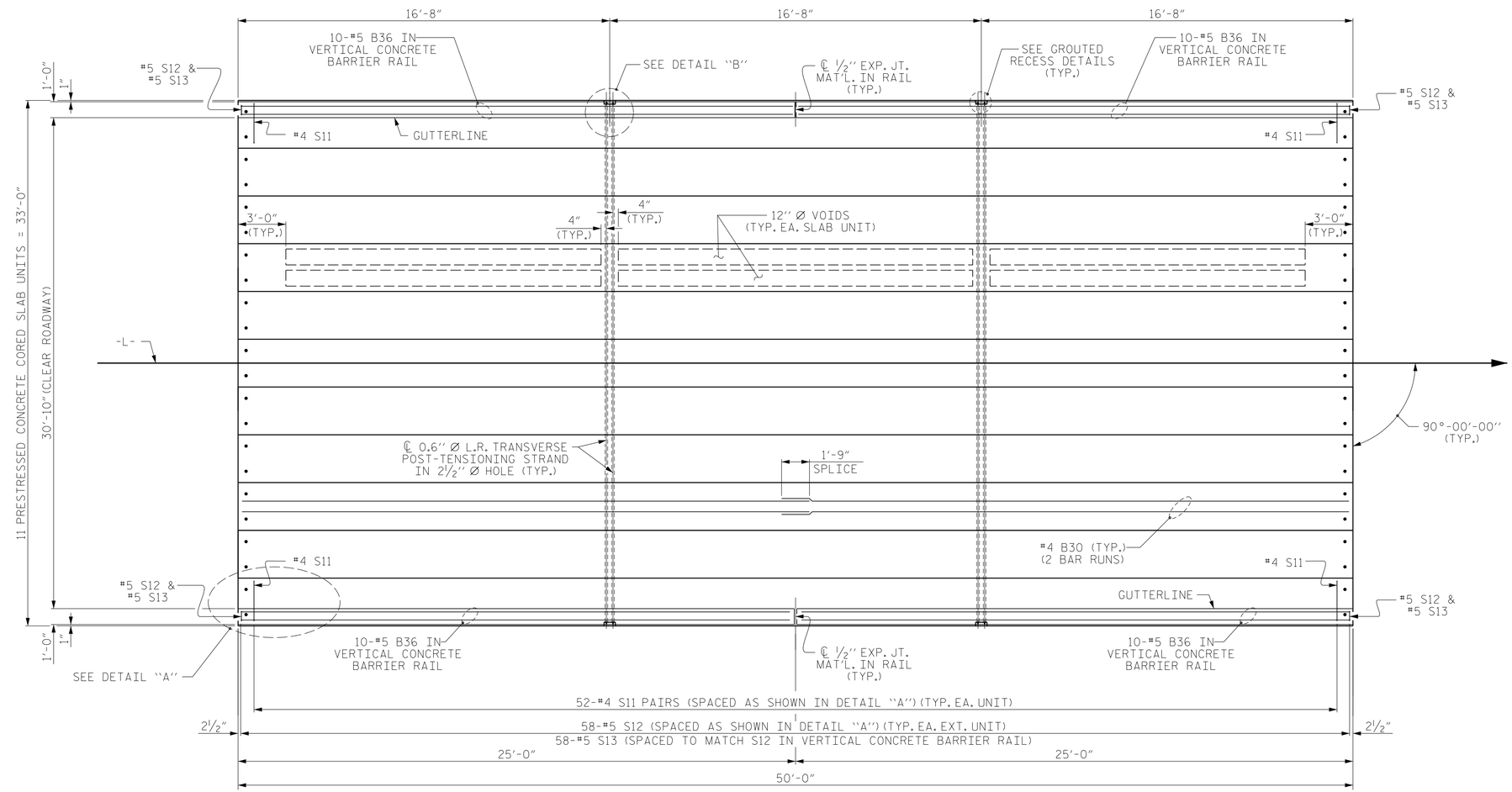
SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

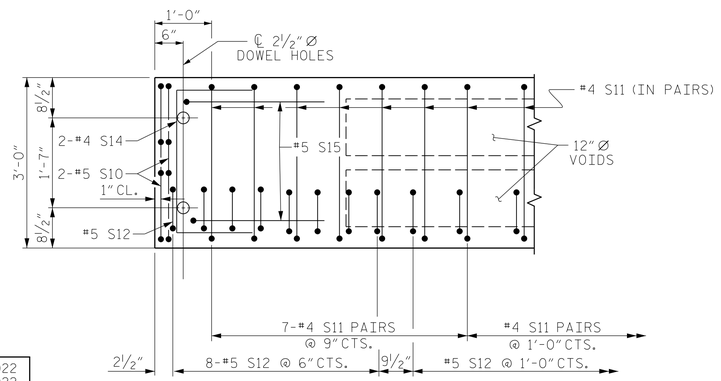
PLAN OF 60' UNIT
30'-10" CLEAR ROADWAY
90° SKEW
SPAN 'A'

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

STD. NO. 24PCS_33_90S_60L (TOP DOWN)

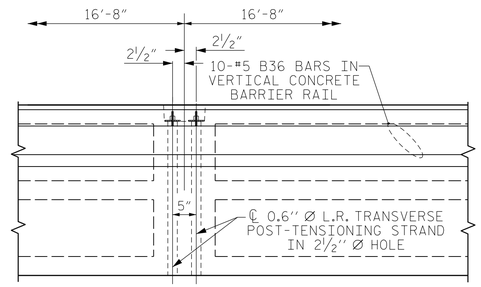


PLAN OF UNIT



DETAIL "A"

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



DETAIL "B"

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

ASSEMBLED BY :	DAA	DATE :	3/2022
CHECKED BY :	FLF	DATE :	3/2022
DRAWN BY : MAA 7/10	REV. 12/5/11		MAA/AAC
CHECKED BY : MKT 8/10	REV. 8/14		MAA/TMG
DRAWN BY : DIEGO A. AGUIRRE		DATE :	03/2022
CHECKED BY : JACOB H. DUKE		DATE :	03/2022
DESIGN ENGINEER OF RECORD: JACOB H. DUKE		DATE :	03/2022

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KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

DocuSigned by: Jacob Duke 29530C8054E4...
5/17/2022

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H. DUKE

PROJECT NO. BP3.R003.1
SAMPSON COUNTY
STATION: 14+88.00 -L-

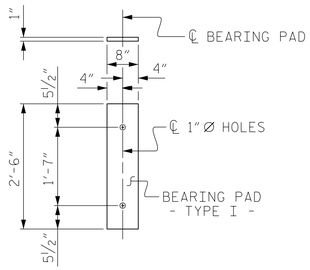
SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 50' UNIT
30'-10" CLEAR ROADWAY
90° SKEW
SPAN 'B'

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			20

STD. NO. 24PCS_33_90S_50L (TOP DOWN)



FIXED END
(TYPE I - 22 REQ'D)

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

DEAD LOAD DEFLECTION AND CAMBER	
	3'-0" x 2'-0"
60' CORED SLAB UNIT	0.6"Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	2¼" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	⅜" ↓
FINAL CAMBER	1⅞" ↑

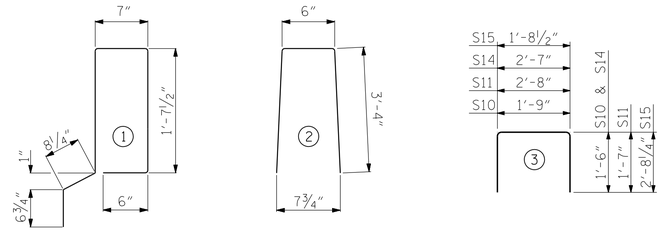
** INCLUDES WEARING SURFACE

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

CONCRETE RELEASE STRENGTH	
UNIT	PSI
60' UNITS	7200

CORED SLABS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
60' UNIT			
EXTERIOR C.S.	2	60'-0"	120'-0"
INTERIOR C.S.	9	60'-0"	540'-0"
TOTAL	11		660'-0"

BAR TYPES

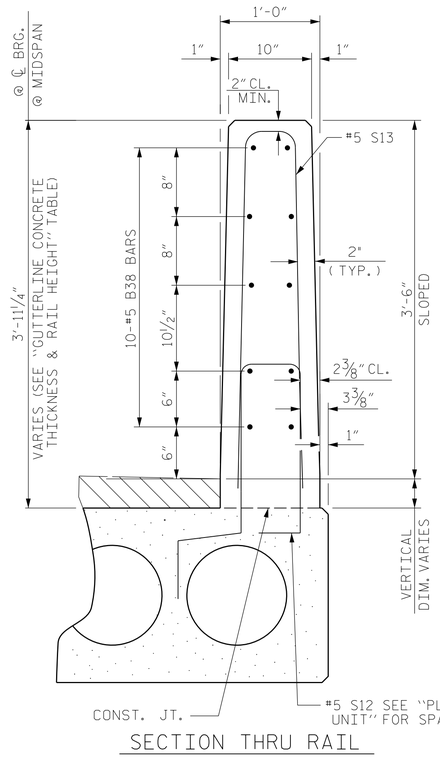


ALL BAR DIMENSIONS ARE OUT TO OUT

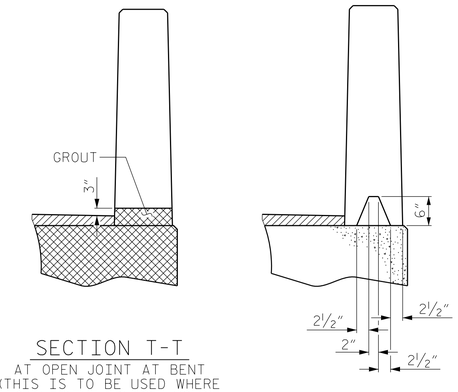
BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL						
BAR	BARS PER PAIR OF EXTERIOR UNITS 60' UNIT	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B38	40	40	#5	STR	29'-7"	1234
✳S13	136	136	#5	2	7'-2"	1017
✳EPOXY COATED REINFORCING STEEL				LBS.		2251
CLASS AA CONCRETE				CU.YDS.		15.6
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT.		120.25

BILL OF MATERIAL FOR ONE 60' CORED SLAB UNIT							
				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B32	6	#4	STR	21'-2"	85	21'-2"	85
S10	8	#5	3	4'-9"	40	4'-9"	40
S11	124	#4	3	5'-10"	483	5'-10"	483
✳S12	68	#5	1	5'-7"	396		
S14	4	#4	3	5'-7"	15	5'-7"	15
S15	4	#5	3	7'-1"	30	7'-1"	30
REINFORCING STEEL		LBS.			653		653
✳EPOXY COATED REINFORCING STEEL		LBS.			396		
9500 P.S.I. CONCRETE		CU. YDS.			10.3		10.3
0.6"Ø L.R. STRANDS		No.			37		37

GUTTERLINE CONCRETE THICKNESS & RAIL HEIGHT		
	CONCRETE OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
60' UNITS	3⅜"	3'-9⅜"

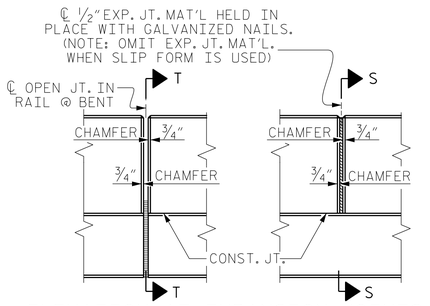


SECTION THRU RAIL



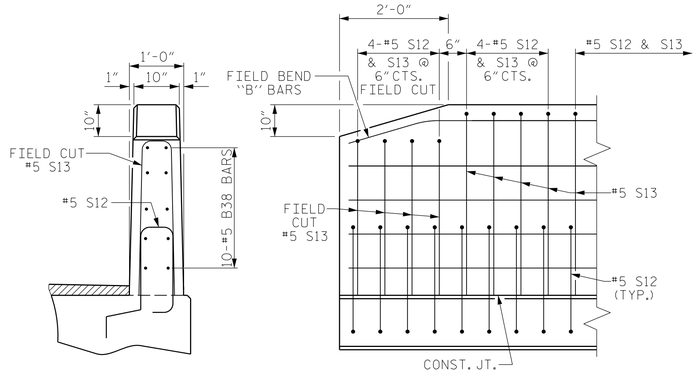
SECTION T-T
AT OPEN JOINT AT BENT
(THIS IS TO BE USED WHERE FOAM JOINT IS NOT USED)

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



END VIEW SIDE VIEW

END OF RAIL DETAILS

NOTES

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

ALL REINFORCING STEEL CAST WITH THE CORED SLAB SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE CORED SLABS.

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

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

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

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

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

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

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

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

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

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

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

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

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

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

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

PROJECT NO. BP3.R003.1

SAMPSON COUNTY

STATION: 14+88.00 -L-

SHEET 4 OF 5

DocuSigned by: Jacob Duke 29630C80545E4...
5/17/2022

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			20

DRAWN BY : MAA 6/10	REV. 5/18 MAA/THC	
CHECKED BY : MKT 8/10		
DRAWN BY : DIEGO A. AGUIRRE	DATE : 03/2022	
CHECKED BY : JACOB H. DUKE	DATE : 03/2022	
DESIGN ENGINEER OF RECORD: JACOB H. DUKE	DATE : 03/2022	

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BP3.R003.1_SMU_CS04_810003.dgn
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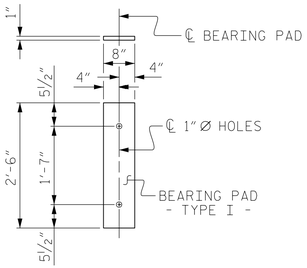
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STD. NO. 24PCS3_33_90S (TOP DOWN)



FIXED END
(TYPE I - 22 REQ'D)

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

DEAD LOAD DEFLECTION AND CAMBER	
	3'-0" x 2'-0"
50' CORED SLAB UNIT	0.6"Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	1½" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	⅛" ↓
FINAL CAMBER	1⅜" ↑

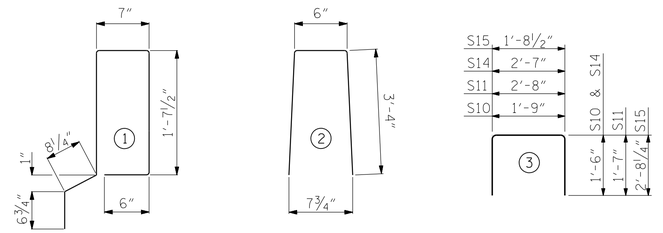
** INCLUDES WEARING SURFACE

CORED SLABS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
50' UNIT			
EXTERIOR C.S.	2	50'-0"	100'-0"
INTERIOR C.S.	9	50'-0"	450'-0"
TOTAL	11		550'-0"

CONCRETE RELEASE STRENGTH
UNIT / PSI
50' UNITS / 6200

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

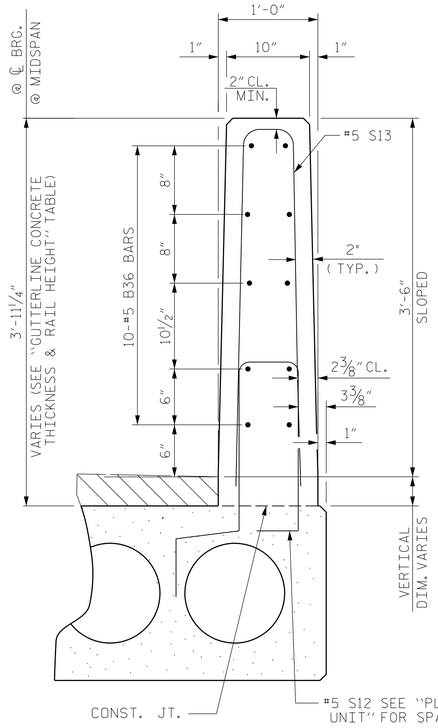
BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
	50' UNIT					
*B36	40	40	#5	STR	24'-7"	1026
*S13	116	116	#5	2	7'-2"	867
*EPOXY COATED REINFORCING STEEL				LBS.		1893
CLASS AA CONCRETE				CU.YDS.		13.0
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT.		100.25

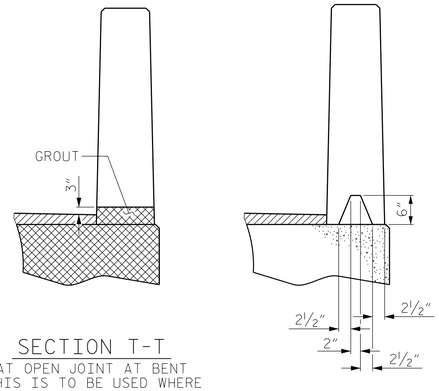
BILL OF MATERIAL FOR ONE 50' CORED SLAB UNIT

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B30	4	#4	STR	25'-9"	69	25'-9"	69
S10	8	#5	3	4'-9"	40	4'-9"	40
S11	104	#4	3	5'-10"	405	5'-10"	405
*S12	58	#5	1	5'-7"	338		
S14	4	#4	3	5'-7"	15	5'-7"	15
S15	4	#5	3	7'-1"	30	7'-1"	30
REINFORCING STEEL		LBS.			559		559
*EPOXY COATED REINFORCING STEEL		LBS.			338		
8500 P.S.I. CONCRETE		CU. YDS.			8.6		8.6
0.6"Ø L.R. STRANDS		No.			31		31

GUTTERLINE CONCRETE THICKNESS & RAIL HEIGHT		
	CONCRETE OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
50' UNITS	3⅛"	3'-9⅞"

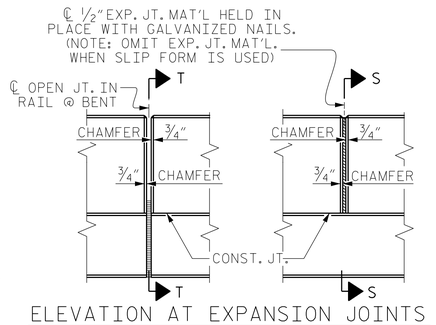


SECTION THRU RAIL



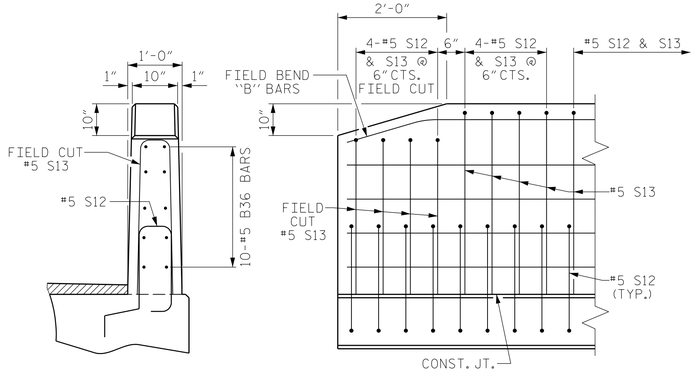
SECTION T-T
AT OPEN JOINT AT BENT
(THIS IS TO BE USED WHERE FOAM JOINT IS NOT USED)

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



END VIEW SIDE VIEW

END OF RAIL DETAILS

NOTES

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

ALL REINFORCING STEEL CAST WITH THE CORED SLAB SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE CORED SLABS.

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

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

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

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

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

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

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

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

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

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

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

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

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

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

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

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SHEET 5 OF 5

STATE OF NORTH CAROLINA
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RALEIGH

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

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE
DocuSigned by: Jacob Duke 2953C0B2B4E... 5/17/2022

KCA KISINGER CAMPO & ASSOCIATES
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RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

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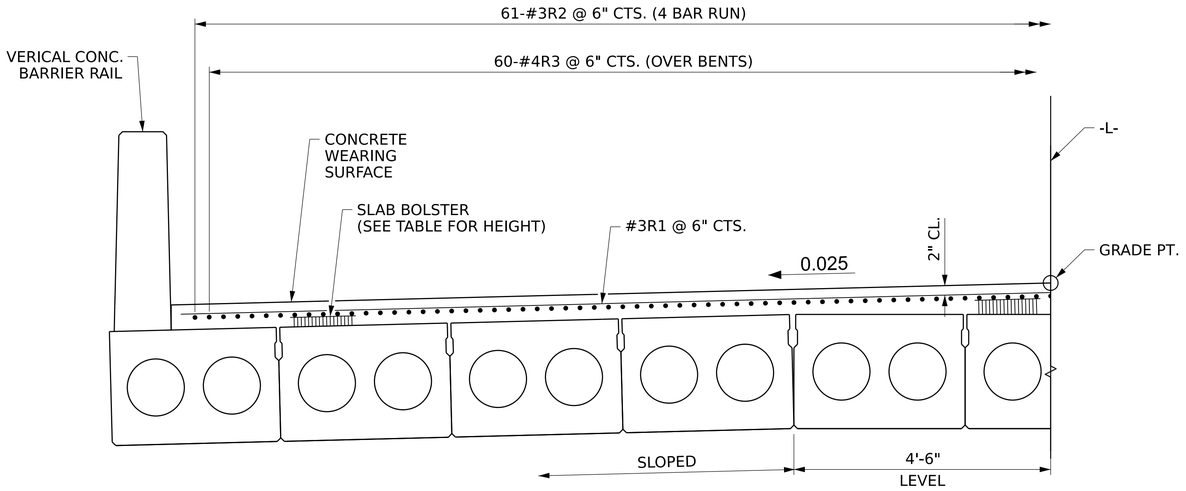
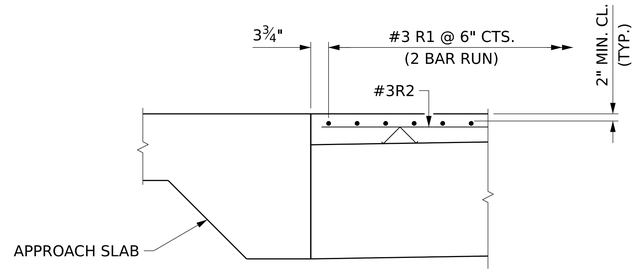
STD. NO. 24PCS3_33_90S (TOP DOWN)



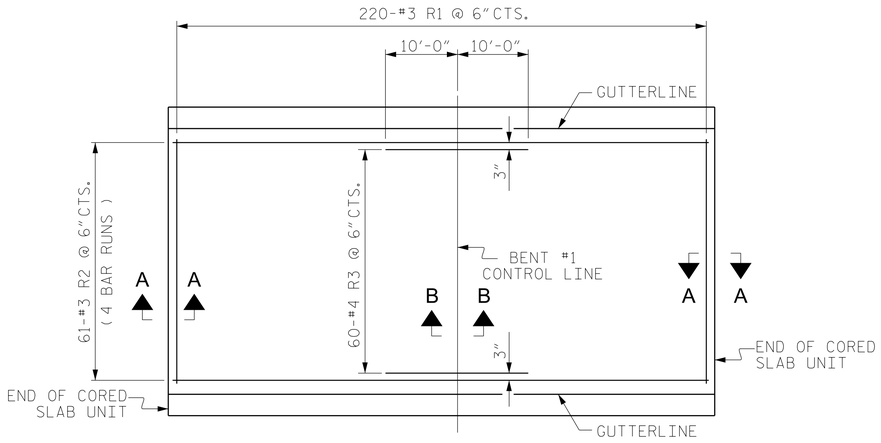
PARTIAL SECTION - REINFORCING STEEL

(SECTION IS SYMMETRIC ABOUT -L-)

NOTE: SLAB BOLSTER HEIGHTS BASED ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATION, AND VARY BETWEEN ℄ BEARING AND MID-SPAN FOR ALL SPANS

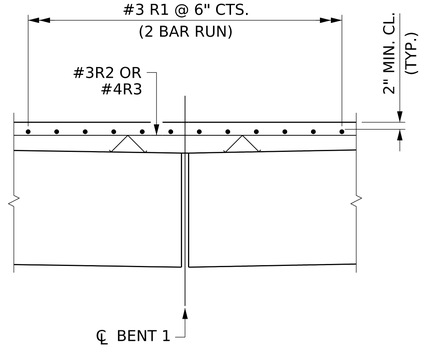


SECTION A-A



PLAN SHOWING CONCRETE WEARING SURFACE REINFORCING STEEL

(NOT TO SCALE)



SECTION B-B

BILL OF MATERIAL

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
*R1	220	#3	STR	16'-0"	1324
*R2	61	#3	STR	27'-9"	637
*R3	60	#4	STR	20'-0"	802

* EPOXY COATED REINFORCING STEEL	LBS.	2763
CONCRETE WEARING SURFACE	SQ.FT.	3396

GROOVING BRIDGE FLOOR QUANTITY

	AREA (SQ.FT.)
BRIDGE DECK	3056
APPROACH SLABS	659
TOTAL	3715

SPLICE LENGTH CHART

BAR SIZE	EPOXY COATED
#3	1'-3"

SLAB BOLSTER HEIGHT

SPAN	AT ℄ BEARINGS		AT ℄ BEARINGS	
	GUTTERS	GRADE PT.	GUTTERS	GRADE PT.
A	2½"	3¾"	**	2"
B	2½"	3¾"	1"	2½"

** USE #5 BARS

NOTES:

1. ALL REINFORCING FOR THE CONCRETE WEARING SURFACE SHALL BE EPOXY COATED.
2. PLACEMENT OF THE CONCRETE WEARING SURFACE SHALL OCCUR AFTER CASTING THE VERTICAL CONCRETE BARRIER RAILS.
3. THE COST OF THE REINFORCING STEEL CAST WITH THE CONCRETE WEARING SURFACE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONCRETE WEARING SURFACE.
4. FOR CONCRETE WEARING SURFACE, SEE SPECIAL PROVISIONS.

PROJECT NO. BP3.R003.1

SAMPSON COUNTY

STATION: 14+88.00 -L-

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE

DocuSigned by: Jacob Duke 29530CB0485...

5/17/2022

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NC FIRM LICENSE: C-1506

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONCRETE WEARING SURFACE DETAILS

30'-10" CLEAR ROADWAY - 90° SKEW

REVISIONS						SHEET NO.
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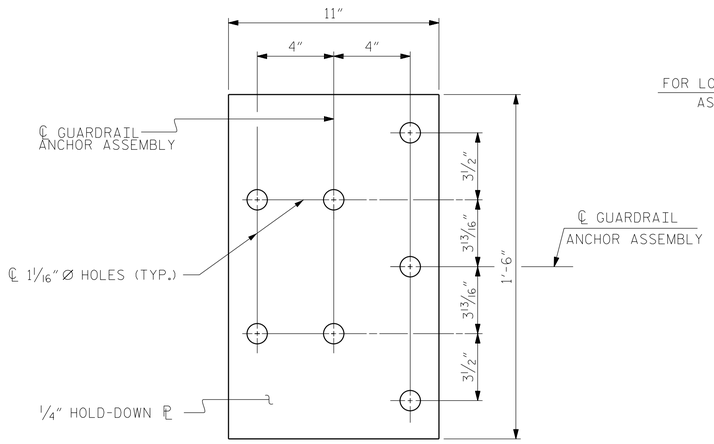
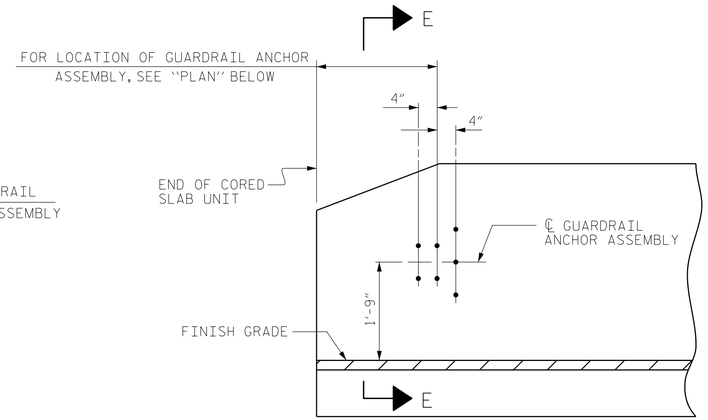


PLAN



ELEVATION

NOTES

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

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

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

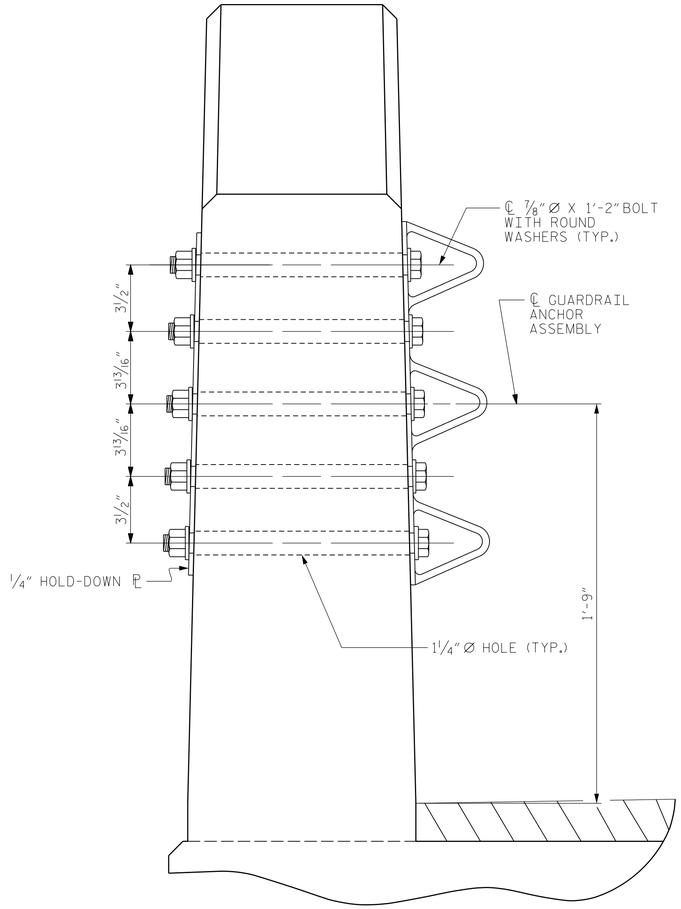
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

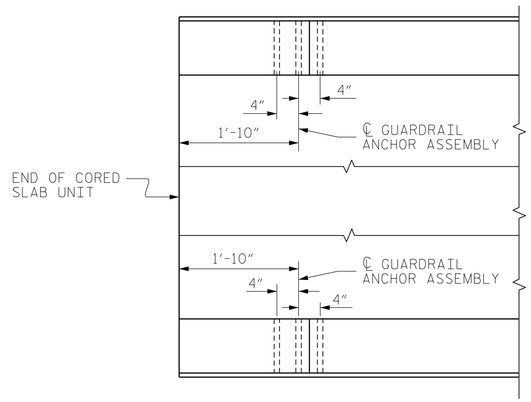
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

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



SECTION E-E

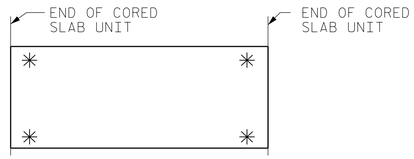
GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

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



SKETCH SHOWING POINTS OF ATTACHMENT

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. BP3.R003.1

SAMPSON COUNTY

STATION: 14+88.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
GUARDRAIL ANCHORAGE DETAILS FOR VERTICAL CONCRETE BARRIER RAIL

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1			3			TOTAL SHEETS
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NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE

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	REV. 5/18	MAA/THC

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(SHT 1) STD. NO. GRA3

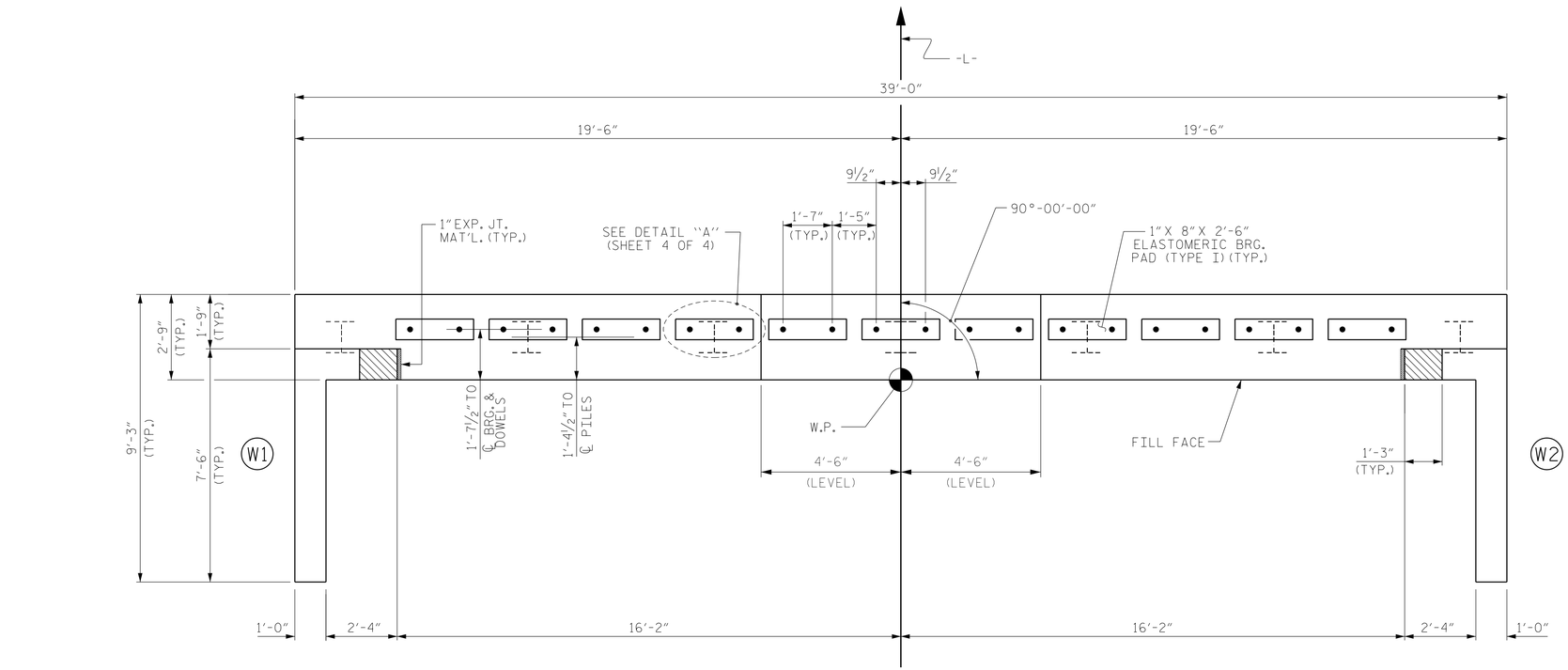
NOTES

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

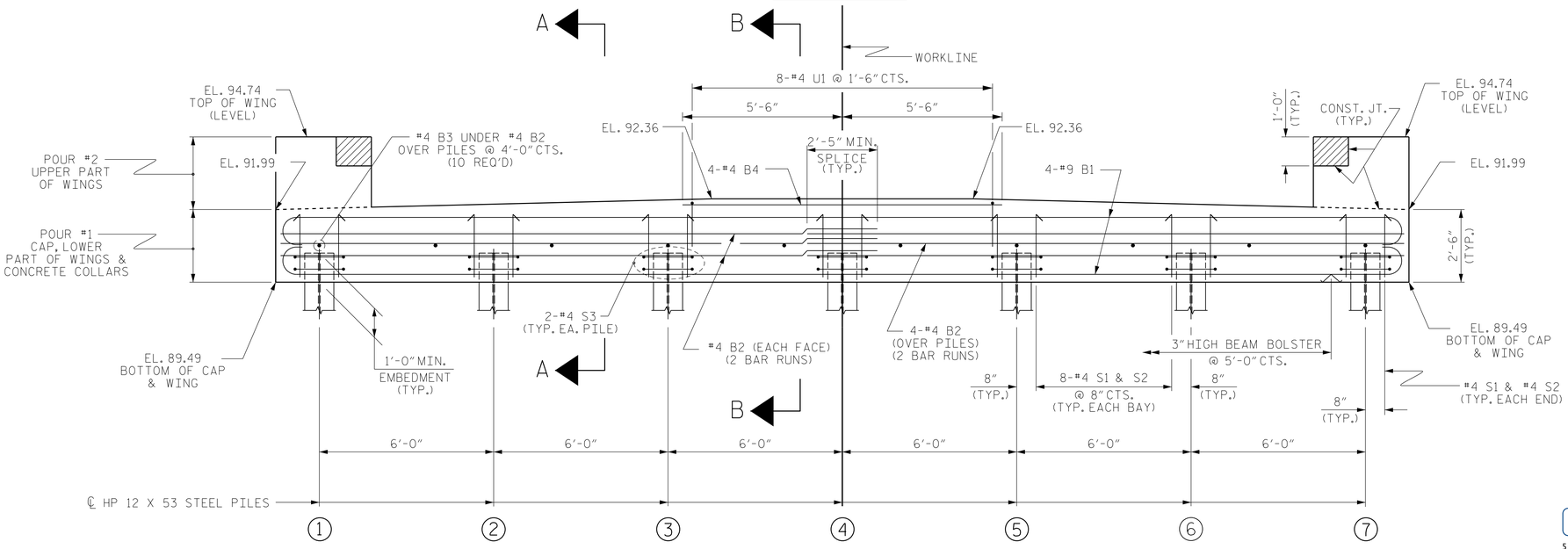
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.



PLAN



ELEVATION

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

PROJECT NO. BP3.R003.1
SAMPSON COUNTY
STATION: 14+88.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 1

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE
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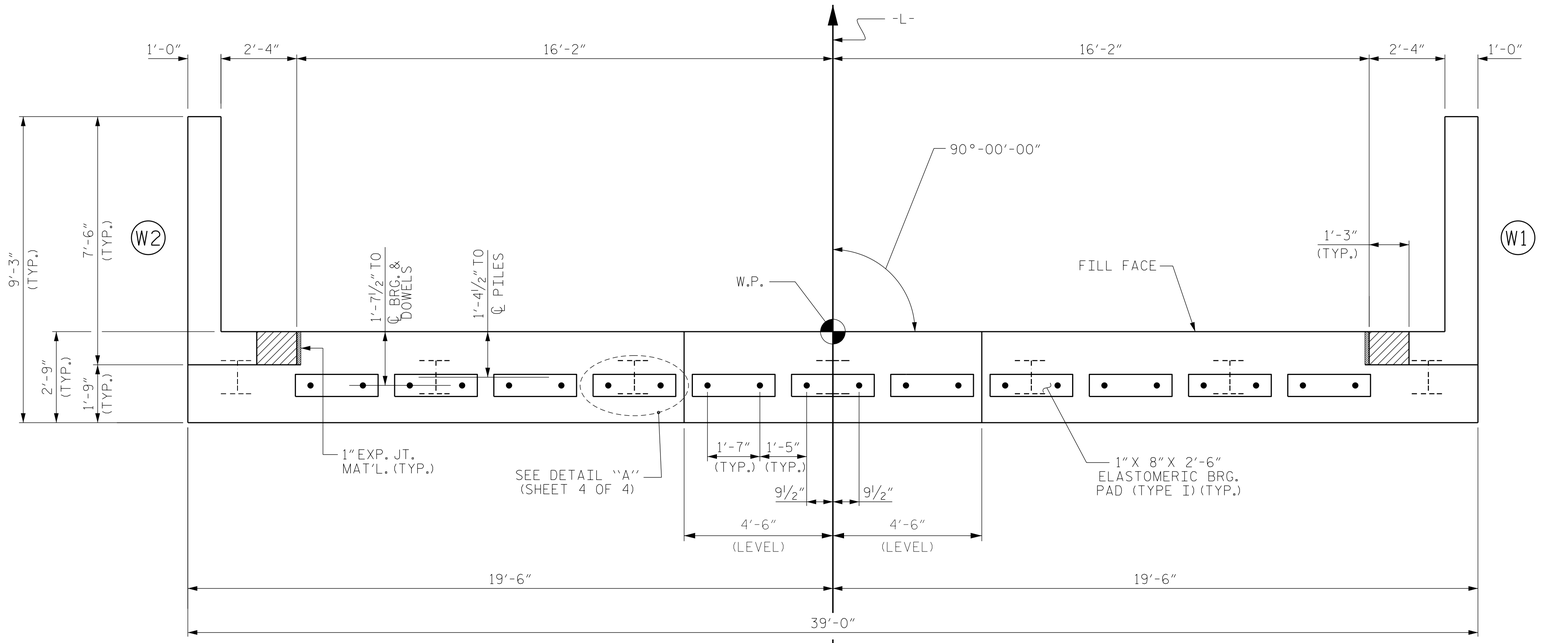
NOTES

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

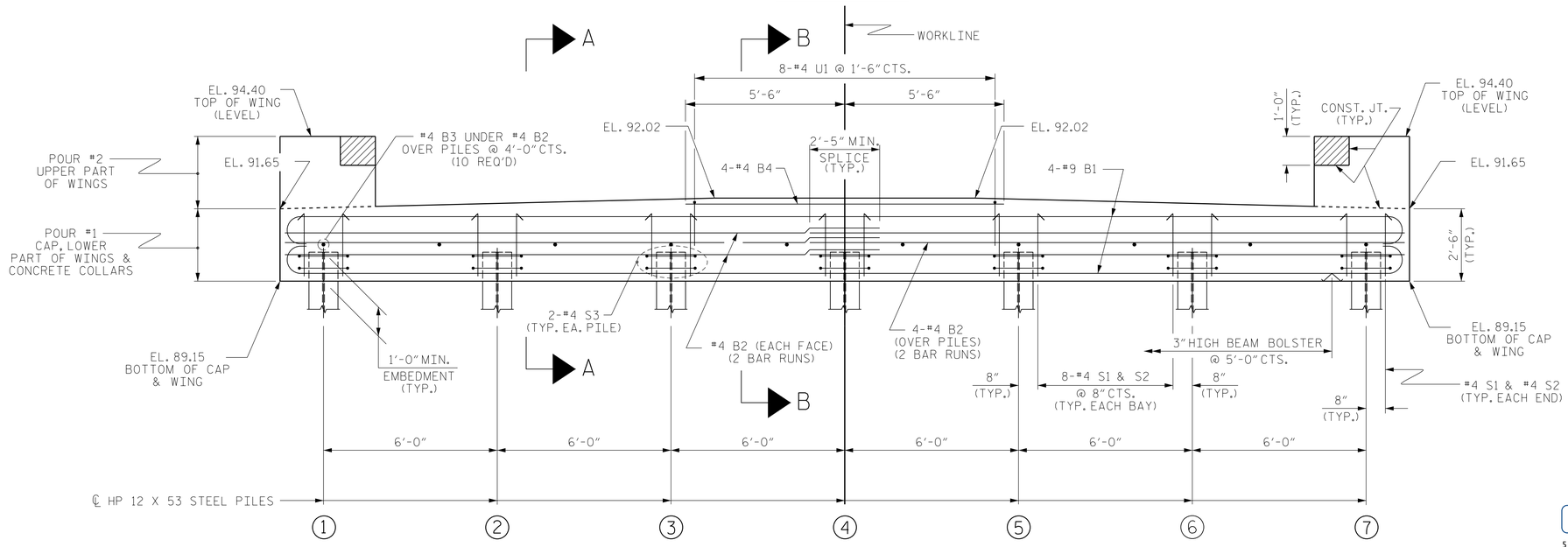
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.



PLAN



ELEVATION

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

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5/17/2022

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SHEET 2 OF 4

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SUBSTRUCTURE

END BENT No. 2

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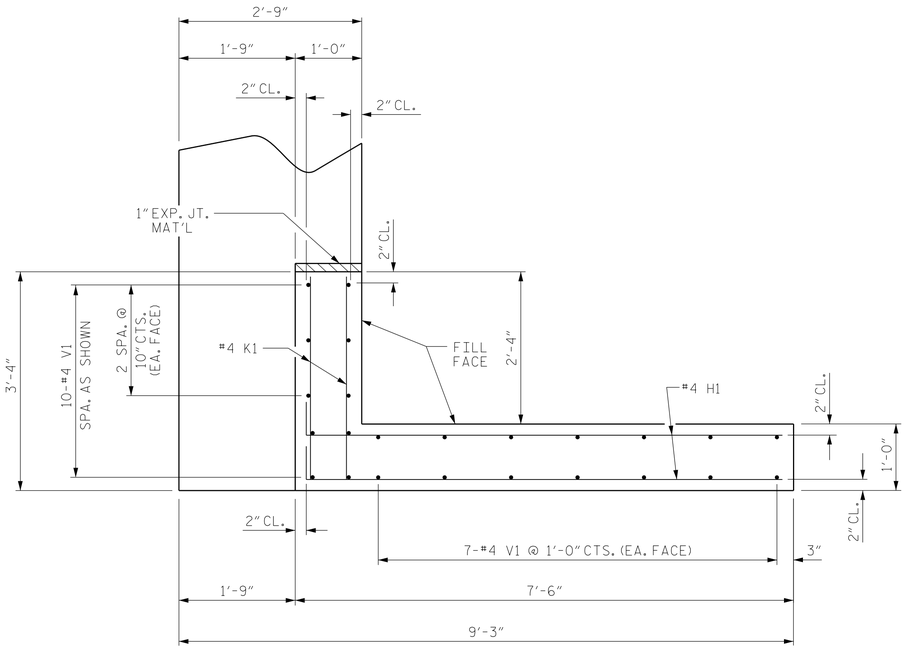
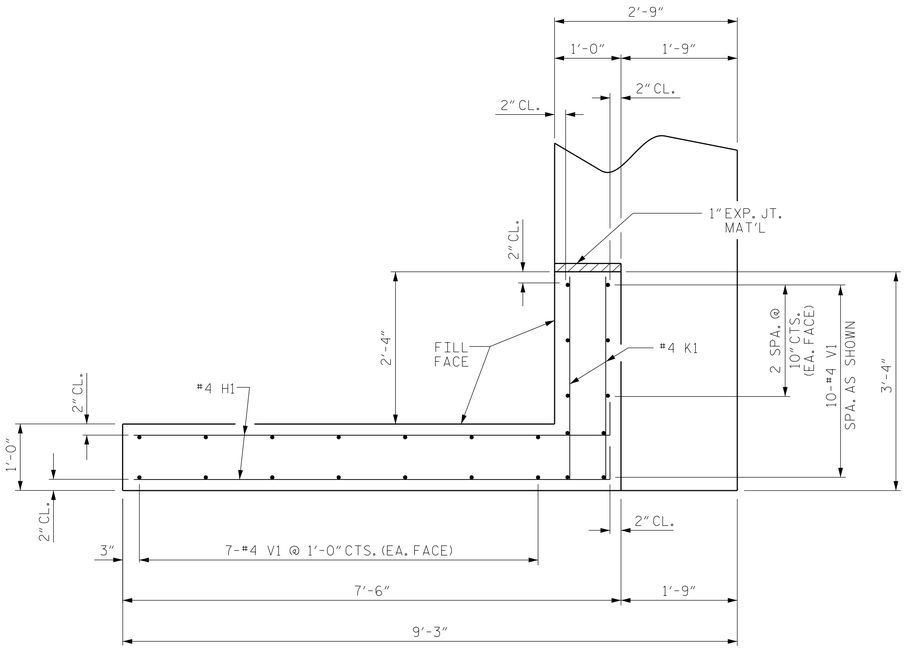
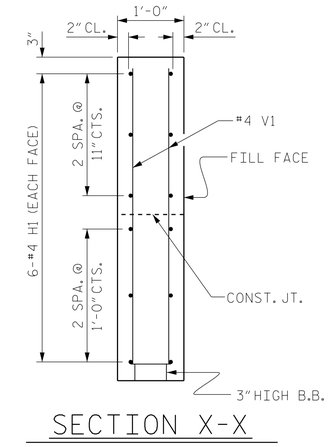


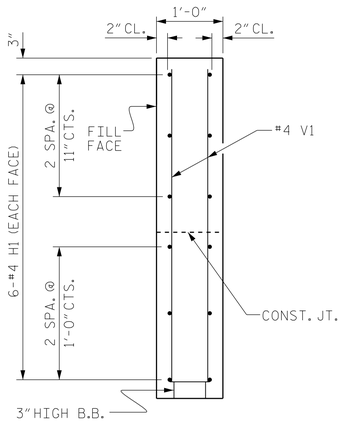
PLAN OF WING (W1)



PLAN OF WING (W2)



SECTION X-X



SECTION Y-Y

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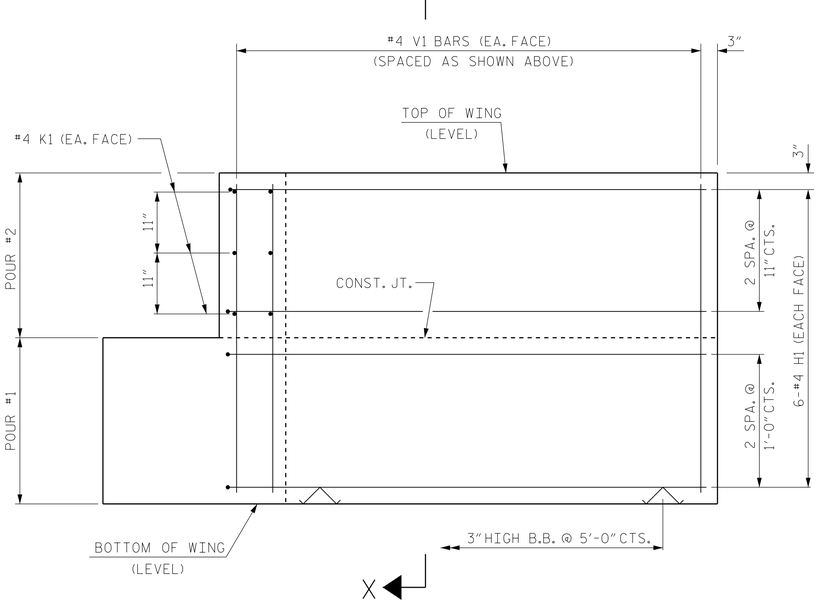

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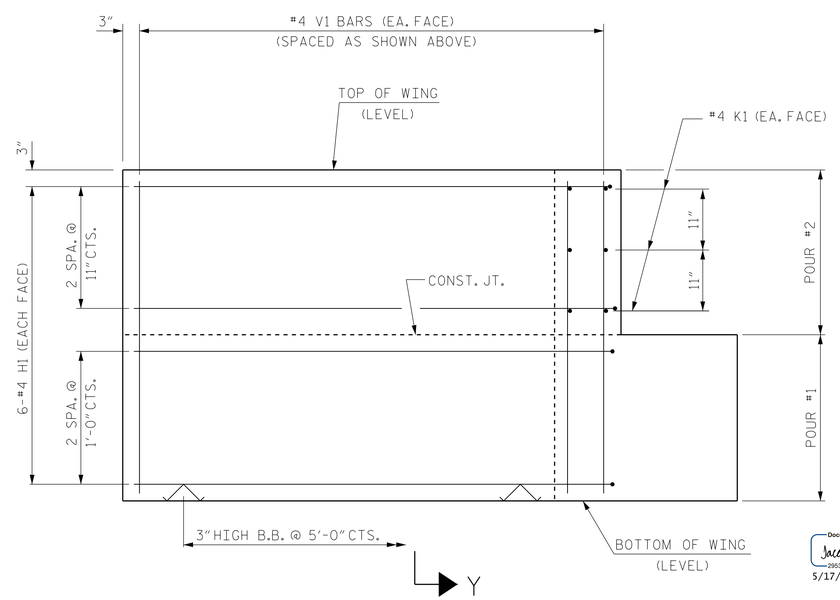
ELEVATION OF WING (W1)

Y



Y

ELEVATION OF WING (W2)

WING DETAILS

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5/17/2022

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SAMPSON COUNTY
STATION: 14+88.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT
WING DETAILS

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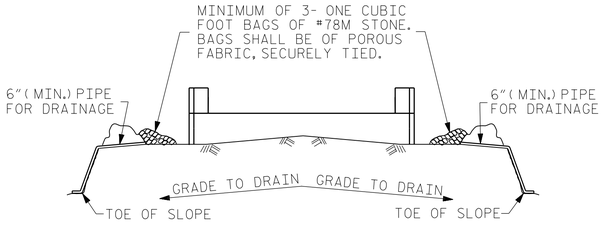
1			3			TOTAL SHEETS
2			4			20

STD. NO. EB_33_90S

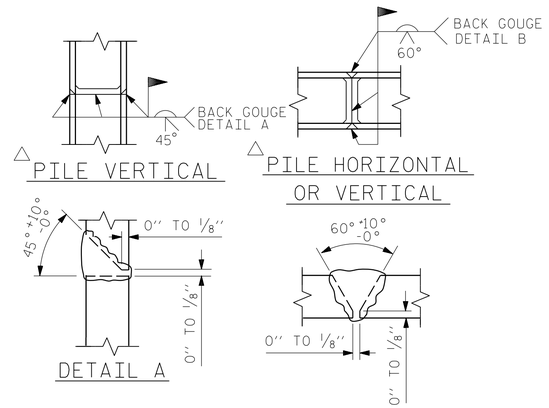


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

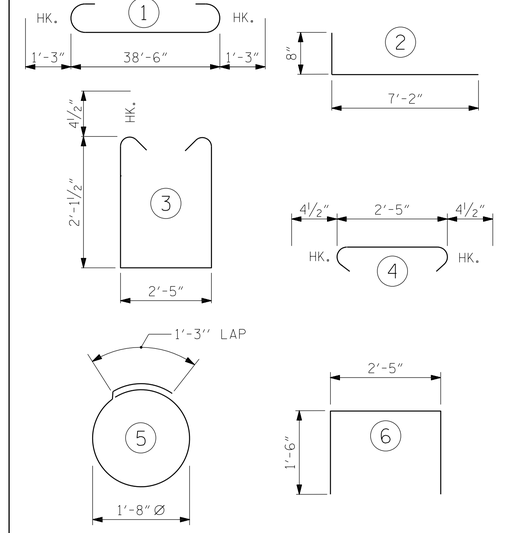
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL
FOR ONE END BENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	41'-0"	1115
B2	16	#4	STR	20'-7"	220
B3	10	#4	STR	2'-5"	16
B4	4	#4	STR	11'-0"	30
D1	22	#6	STR	1'-6"	50
H1	24	#4	2	7'-10"	126
K1	12	#4	STR	2'-11"	23
S1	50	#4	3	7'-5"	248
S2	50	#4	4	3'-2"	106
S3	14	#4	5	6'-6"	61
U1	8	#4	6	5'-5"	29
V1	48	#4	STR	4'-8"	150

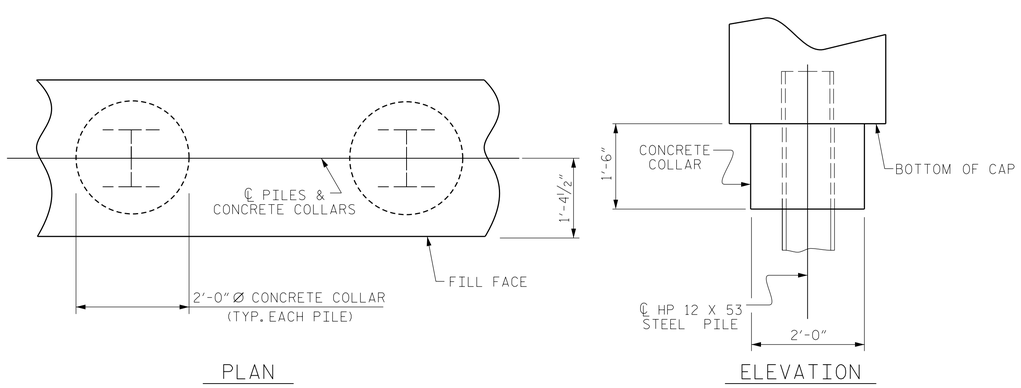
REINFORCING STEEL (FOR ONE END BENT) 2174 LBS.

CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)

POUR #1 CAP, LOWER PART OF WINGS & COLLARS 13.3 C.Y.

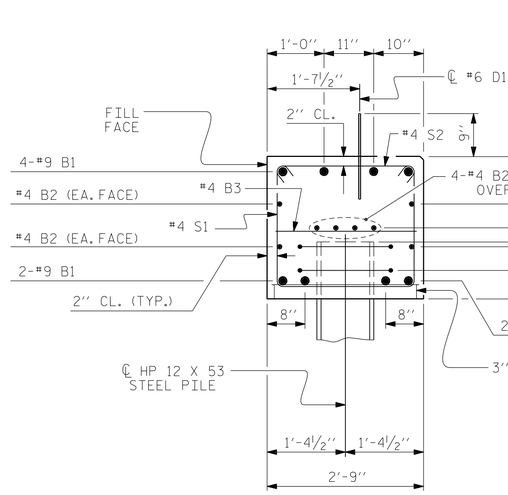
POUR #2 UPPER PART OF WINGS 2.0 C.Y.

TOTAL CLASS A CONCRETE 15.3 C.Y.



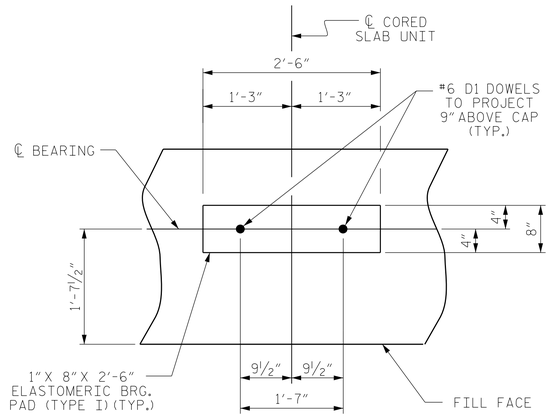
CORROSION PROTECTION FOR STEEL PILES DETAIL

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



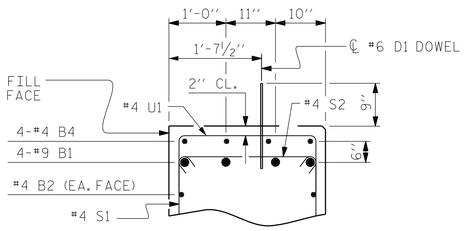
SECTION A-A

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



DETAIL "A"

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



PARTIAL SECTION B-B

DocuSigned by: Jacob Duke 5/17/2022

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

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PROJECT NO. BP3.R003.1
SAMPSON COUNTY
STATION: 14+88.00 -L-
SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 1 & 2 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			20

DRAWN BY : DGE 12/09	REV. 4/17 MAA/THC		
CHECKED BY : MKT 01/10			
DRAWN BY :	DIEGO A. AGUIRRE	DATE :	03/2022
CHECKED BY :	JACOB H. DUKE	DATE :	03/2022
DESIGN ENGINEER OF RECORD:	JACOB H. DUKE	DATE :	03/2022

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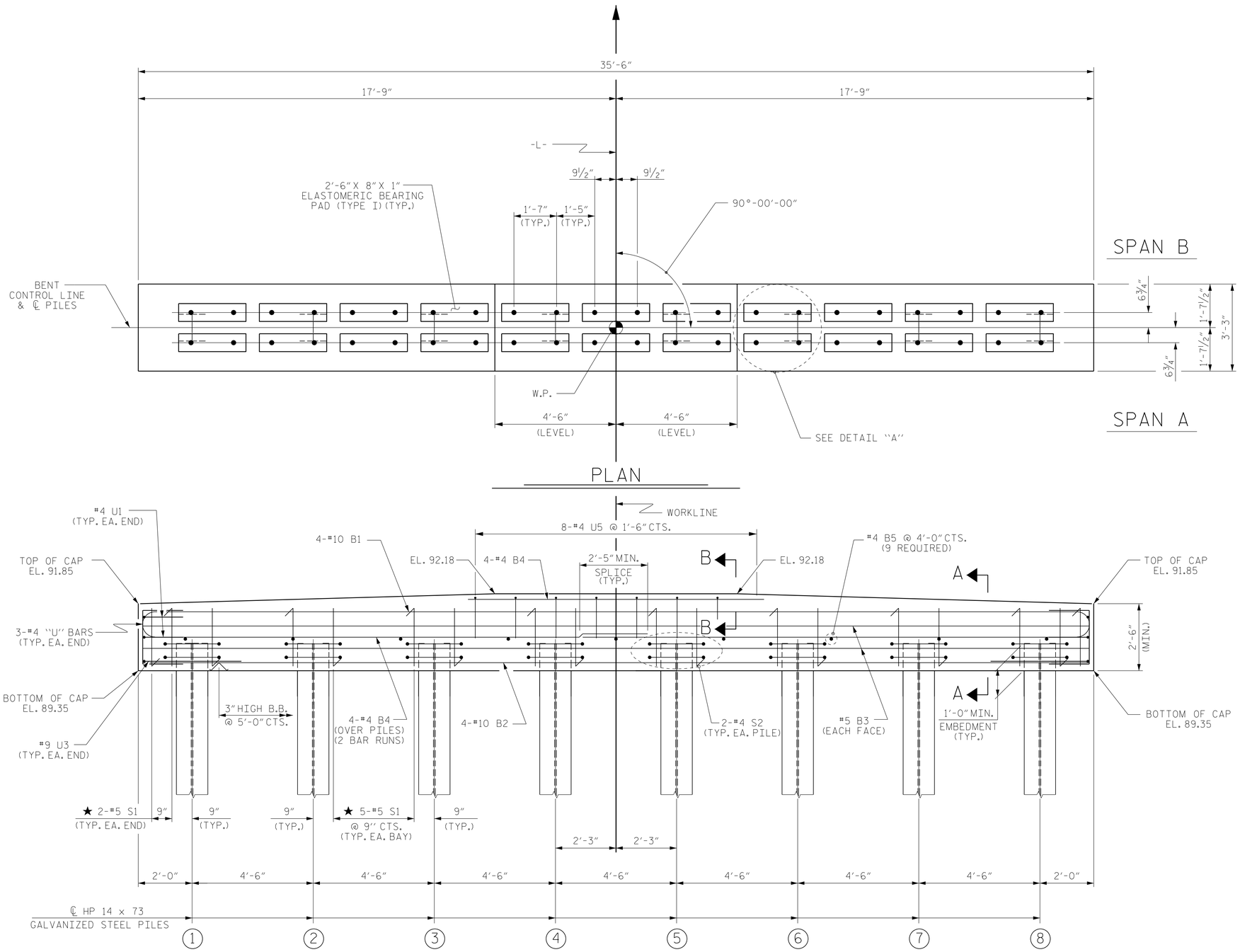
STD. NO. EB_33_90S



ELEVATION

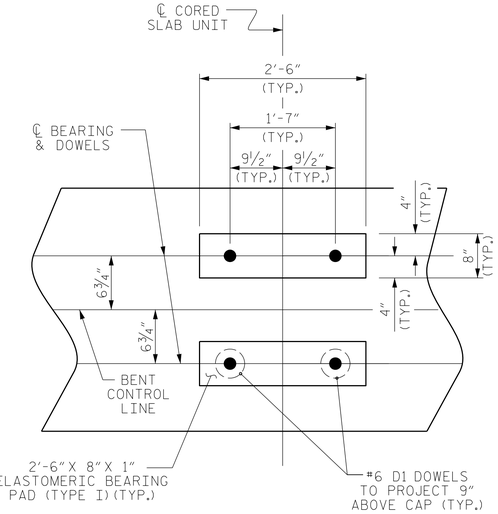
FOR SECTION A-A, SEE SHEET 2 OF 2

NOTES

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

★ INVERT ALTERNATE STIRRUPS.

GALVANIZE THE TOP OF EACH INTERIOR BENT PILE A MINIMUM OF 30 FEET. GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.



DETAIL "A"

(DIMENSIONS ARE TYPICAL EACH BEARING)

PROJECT NO. BP3.R003.1

SAMPSON COUNTY

STATION: 14+88.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT No. 1

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE

DocuSigned by: Jacob Duke 295D3CB0A4F0...
5/17/2022

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

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1			3			TOTAL SHEETS
2			4			20

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CHECKED BY : MKT 05/10		CHECKED BY :	JACOB H. DUKE DATE : 03/2022
		DESIGN ENGINEER OF RECORD:	JACOB H. DUKE DATE : 03/2022

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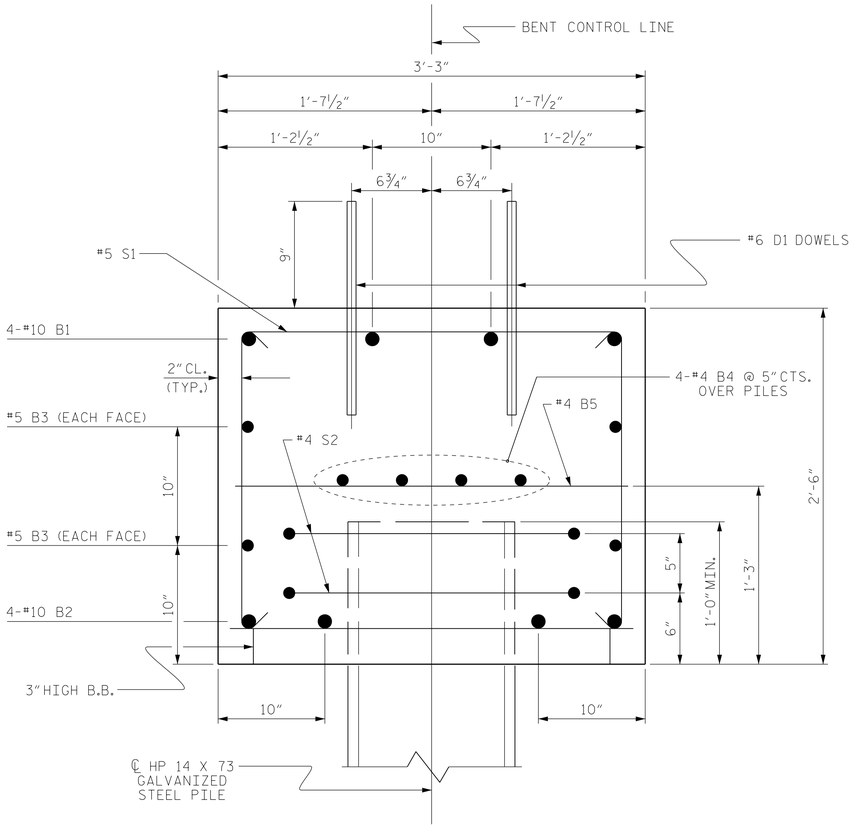
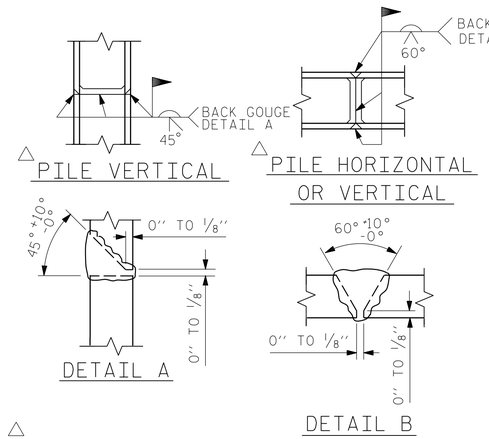
STD. NO. 14"HP_BT_33_90S_<60'

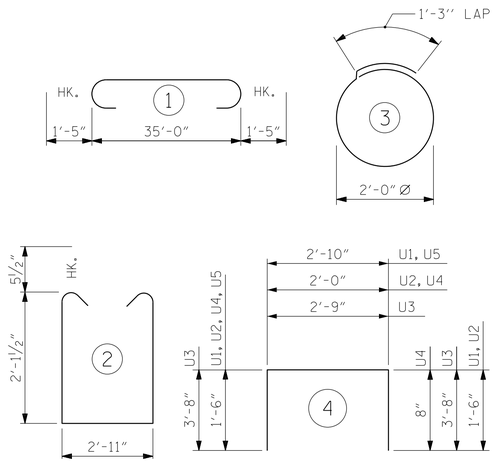


SECTION A-A



PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

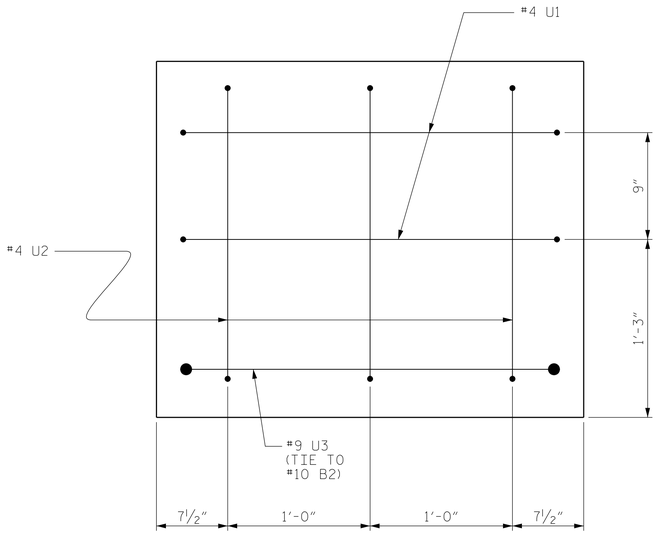
BILL OF MATERIAL
FOR ONE BENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	37'-10"	651
B2	4	#10	STR	35'-2"	605
B3	4	#5	STR	35'-2"	147
B4	8	#4	STR	18'-10"	101
B5	9	#4	STR	2'-11"	18
B6	4	#4	STR	11'-2"	30
D1	44	#6	STR	1'-6"	99
S1	39	#5	2	8'-1"	329
S2	16	#4	3	7'-7"	81
U1	4	#4	4	5'-10"	16
U2	4	#4	4	5'-0"	13
U3	2	#9	4	10'-1"	69
U4	2	#4	4	4'-2"	6
U5	8	#4	4	5'-10"	32

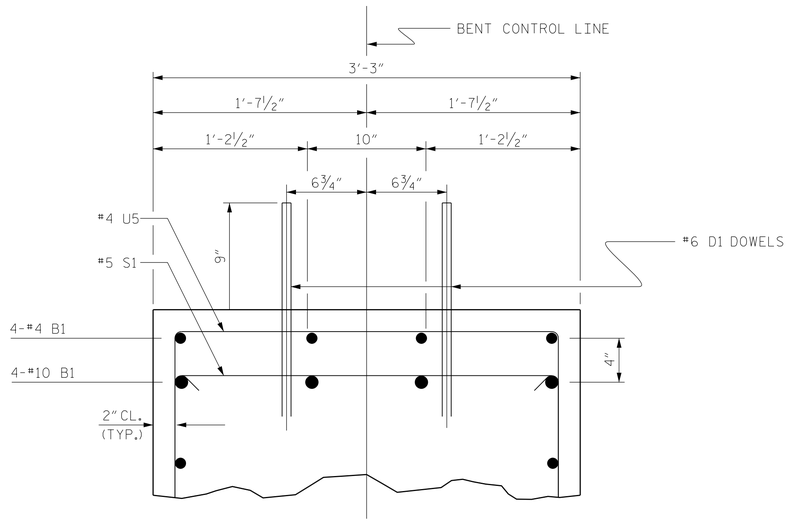
REINFORCING STEEL (FOR ONE BENT) 2196 LBS

CLASS A CONCRETE BREAKDOWN (FOR ONE BENT)

TOTAL CLASS A CONCRETE 11.6 C.Y.



END OF CAP VIEW
(TYPICAL BOTH ENDS)



PARTIAL SECTION B-B

PROJECT NO. BP3.R003.1

SAMPSON COUNTY

STATION: 14+88.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT No. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			20

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NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE

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NC FIRM LICENSE: C-1506

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DRAWN BY : DGE 05/10
CHECKED BY : MKT 05/10
REV. 6/17 MAA/THC

DRAWN BY : DIEGO A. AGUIRRE DATE : 03/2022
CHECKED BY : JACOB H. DUKE DATE : 03/2022
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 03/2022

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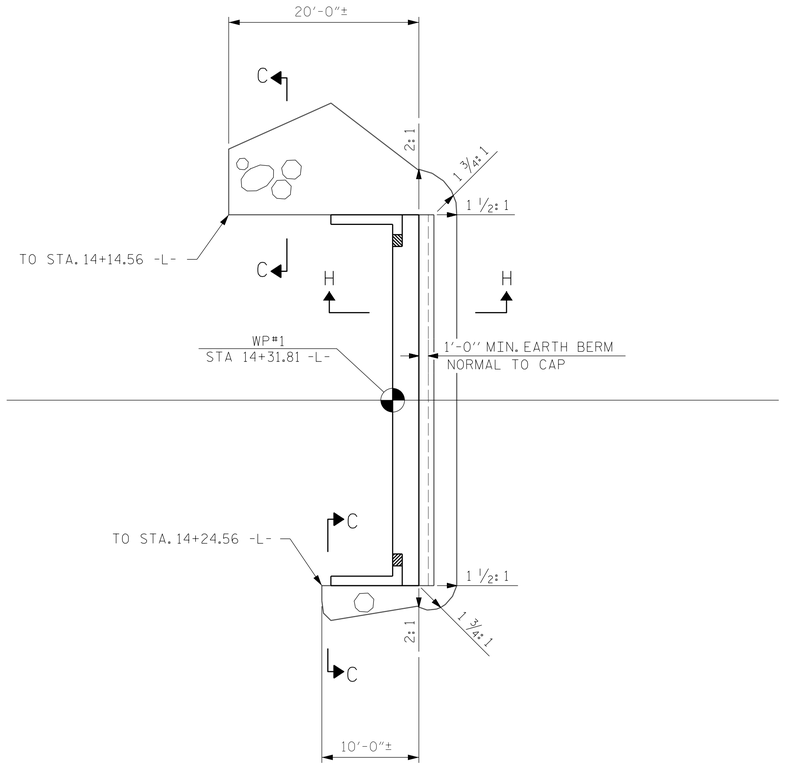
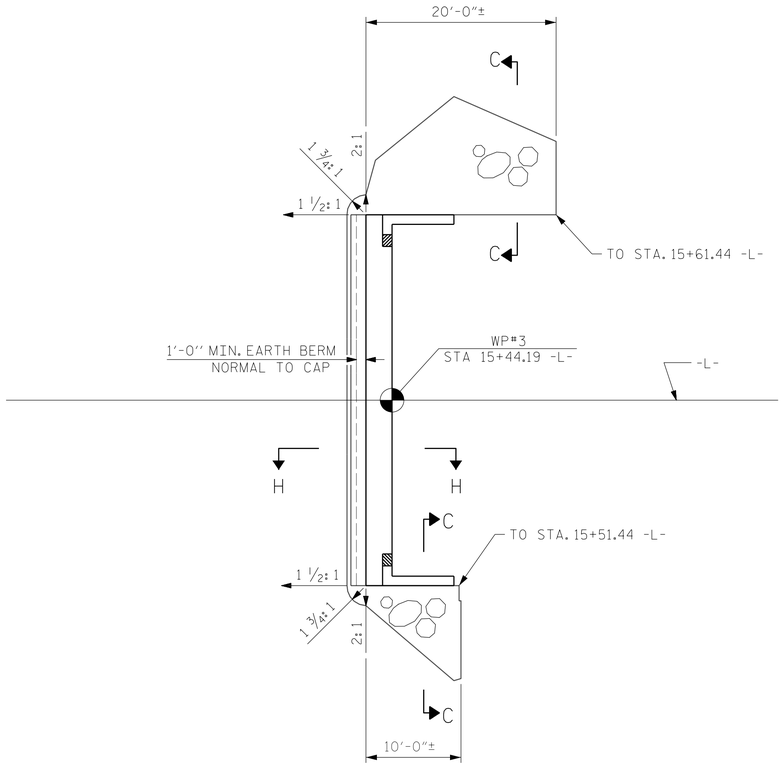
STD. NO. 14"HP_BT_33_90S_<60'



END BENT No. 1



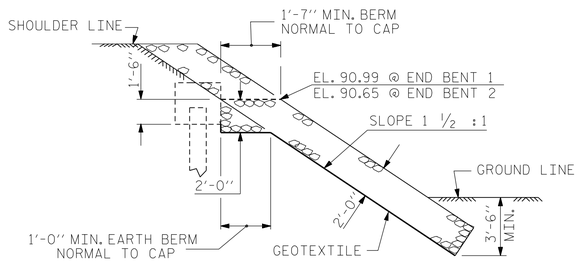
END BENT No. 2

NOTES :

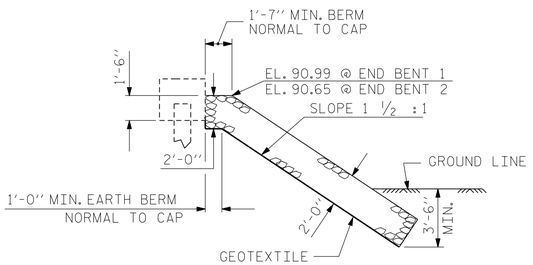
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.

PLAN VIEW

ESTIMATED QUANTITIES		
BRIDGE @ STA. 14+88.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	99.9	140.8
END BENT 2	106.8	148.9

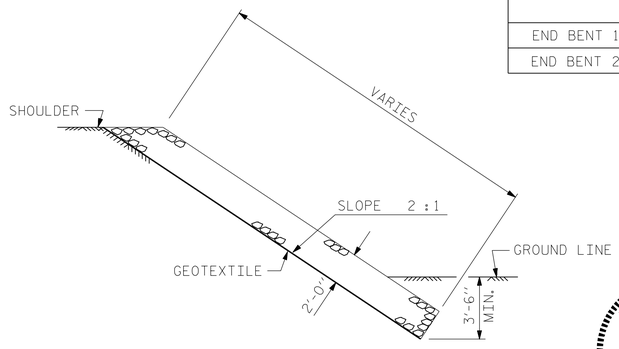


SECTION H-H



℄ SECTION

BERM RIP RAPPED



SECTION C-C

PROJECT NO. BP3.R003.1

SAMPSON COUNTY

STATION: 14+88.00 -L-

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

RALEIGH

STANDARD

RIP RAP DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H. DUKE

DocuSigned by: Jacob Duke 29530C8054E4...

5/17/2022

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NC FIRM LICENSE: C-1506

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2			4			20

DRAWN BY : REK 1/84
CHECKED BY : RDU 1/84

REV. 10/1/11 MAA/GM
REV. 12/21/11 MAA/GM
REV. 12/17 MAA/THC

DRAWN BY : DIEGO A. AGUIRRE DATE : 03/2022
CHECKED BY : JACOB H. DUKE DATE : 03/2022
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 03/2022

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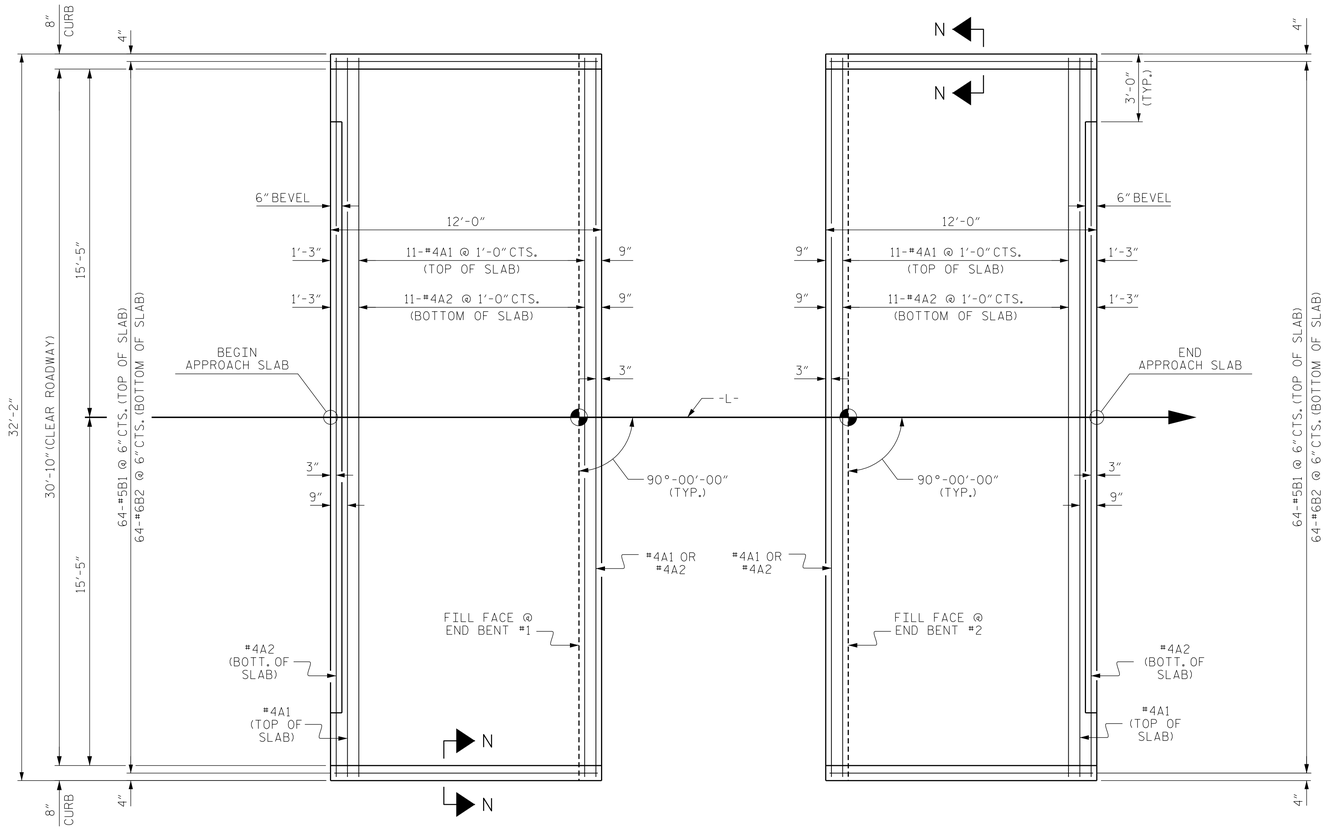
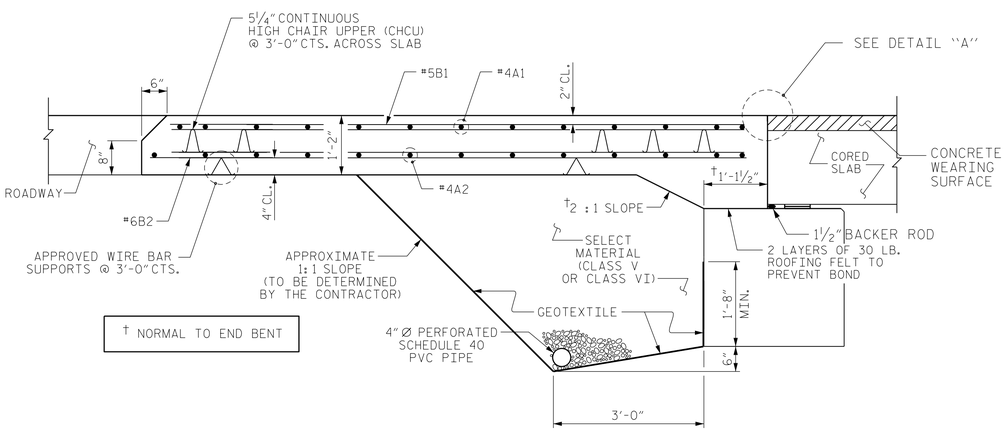
STD. NO. RR1 (Sht 2)



PLAN @ END BENT #1

PLAN @ END BENT #2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



SECTION THRU SLAB

(TYPE II - MODIFIED APPROACH FILL)

NOTES

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 4" Ø DRAINAGE PIPE, AND SELECT MATERIAL BACKFILL, SEE ROADWAY PLANS.

GEOTEXTILE SHALL BE TYPE 1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

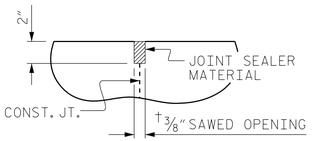
SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

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.

FOR THE 4" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

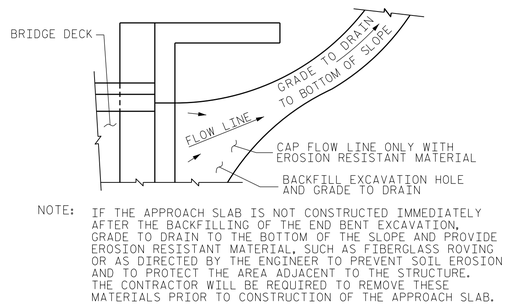
APPROACH SLABS SHALL BE POURED AFTER CONCRETE WEARING SURFACE IS POURED.

THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWED NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.



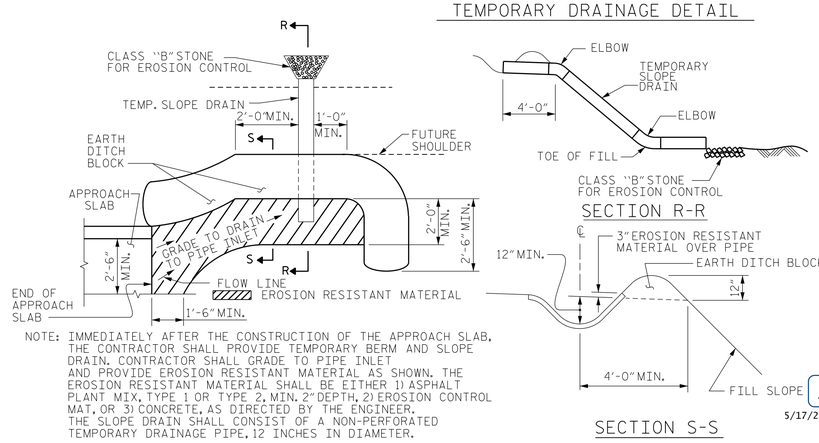
DETAIL "A"

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



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

TEMPORARY DRAINAGE DETAIL



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

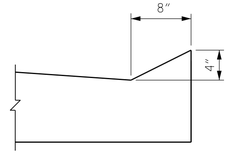
PLAN VIEW

SECTION S-S

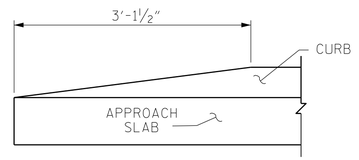
TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

BILL OF MATERIAL					
APPROACH SLAB AT EB #1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	13	#4	STR	31'-10"	276
A2	13	#4	STR	31'-10"	276
* B1	64	#5	STR	11'-2"	745
B2	64	#6	STR	11'-8"	1121
REINFORCING STEEL				LBS.	1397
* EPOXY COATED REINFORCING STEEL				LBS.	1021
CLASS AA CONCRETE				C.Y.	19.5
APPROACH SLAB AT EB #2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	13	#4	STR	31'-10"	276
A2	13	#4	STR	31'-10"	276
* B1	64	#5	STR	11'-2"	745
B2	64	#6	STR	11'-8"	1121
REINFORCING STEEL				LBS.	1397
* EPOXY COATED REINFORCING STEEL				LBS.	1021
CLASS AA CONCRETE				C.Y.	19.5



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

PROJECT NO. BP3.R003.1

SAMPSON COUNTY

STATION: 14+88.00 -L-

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE
DocuSigned by: Jacob Duke 2953...
5/17/2022

KCA KISINGER CAMPO & ASSOCIATES
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RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR PRESTRESSED CONCRETE CORED SLAB

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

DRAWN BY : DIEGO A. AGUIRRE DATE : 03/2022
CHECKED BY : JACOB H. DUKE DATE : 03/2022
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 03/2022

5/17/2022
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daguirre

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STD. NO. BAS_33_90S & STD. NO. BAS3 (MODIFIED)

STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	A.A.S.H.T.O. (CURRENT)
LIVE LOAD	SEE PLANS
IMPACT ALLOWANCE	SEE A.A.S.H.T.O.
STRESS IN EXTREME FIBER OF STRUCTURAL STEEL - AASHTO M270 GRADE 36	20,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50W	27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION - GRADE 60	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR UNTREATED EXTREME FIBER STRESS	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH	30 LBS. PER CU. FT. (MINIMUM)

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2018 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; AND CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP.

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED 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 INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

REFERENCE: SF-810003

PROJECT: BP3.R003

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	SF-810003	1	7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY *SAMPSON*

PROJECT DESCRIPTION *BRIDGE NO. 3 ON -L- (SR 1933) OVER ROWAN BRANCH AT STA. 14+88*

CONTENTS

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

NOTES:
1. THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.
2. BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

PERSONNEL

S.N. ZIMARINO

R.E. SMITH

C.M. WALKER

INVESTIGATED BY *T.C. BOTTOMS*

DRAWN BY *T.C. BOTTOMS*

CHECKED BY *D.N. ARGENBRIGHT*

SUBMITTED BY *D.N. ARGENBRIGHT*

DATE *MARCH 2022*

NORTH CAROLINA LICENSED SEAL 2240 GEOLOGIST TYLER C. BOTTOMS

DocuSigned by:
Tyler C. Bottoms
48A2D3BD08CF4A6...

04/04/2022

SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
SF-810003	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE,

VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5, A-7-6			
SYMBOL														
% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX	51 MN 10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
MATERIAL PASSING #40 LL PI	— 6 MX		— NP	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
GROUP INDEX	0		0	0		4 MX		8 MX	12 MX	16 MX	NO MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND		FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH ($TONS/FT^2$)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE	< 4 4 TO 10 10 TO 30 30 TO 50 > 50	N/A
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD	< 2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 > 30	< 0.25 0.25 TO 0.5 0.5 TO 1.0 1 TO 2 2 TO 4 > 4

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE	4	10	40	60	200	270
OPENING (MM)	4.76	2.00	0.42	0.25	0.075	0.053

BOULDER (BLDR.)	COBBLE (COB.)	GRAVEL (GR.)	COARSE SAND (CSE. SD.)	FINE SAND (F SD.)	SILT (SL.)	CLAY (CL.)

GRAIN SIZE	MM	305	75	2.0	0.25	0.05	0.005
	IN.	12	3				

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
LL — LIQUID LIMIT		
PLASTIC RANGE (PI)	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PL — PLASTIC LIMIT		
OM — OPTIMUM MOISTURE SL — SHRINKAGE LIMIT	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
NON PLASTIC	0-5	VERY LOW
SLIGHTLY PLASTIC	6-15	SLIGHT
MODERATELY PLASTIC	16-25	MEDIUM
HIGHLY PLASTIC	26 OR MORE	HIGH

COLOR

DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY), MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.

GRADATION

WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.
UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE.
GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.

ANGULARITY OF GRAINS

THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.

MINERALOGICAL COMPOSITION

MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LL < 31
MODERATELY COMPRESSIBLE	LL = 31 - 50
HIGHLY COMPRESSIBLE	LL > 50

PERCENTAGE OF MATERIAL

ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL	
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE	1 - 10%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE	10 - 20%
MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME	20 - 35%
HIGHLY ORGANIC	> 10%	> 20%	HIGHLY	35% AND ABOVE

GROUND WATER

- WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING
- STATIC WATER LEVEL AFTER 24 HOURS
- PW — PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA
- SPRING OR SEEP

MISCELLANEOUS SYMBOLS

- ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT
- INFERRED SOIL BOUNDARY
- INFERRED ROCK LINE
- ALLUVIAL SOIL BOUNDARY
- 25/025 — DIP & DIP DIRECTION OF ROCK STRUCTURES
- SPT, DPT, DMT, VST PMT — TEST BORING
- AUGER BORING
- CORE BORING
- MW — MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- CONE PENETROMETER TEST
- SOUNDING ROD
- TEST BORING WITH CORE
- SPT N-VALUE

RECOMMENDATION SYMBOLS

- UNDERCUT
- SHALLOW UNDERCUT
- UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE
- UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK
- UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL

ABBREVIATIONS

AR - AUGER REFUSAL
BT - BORING TERMINATED
CL. - CLAY
CPT - CONE PENETRATION TEST
CSE. - COARSE
DMT - DILATOMETER TEST
DPT - DYNAMIC PENETRATION TEST
e - VOID RATIO
F - FINE
FOSS. - FOSSILIFEROUS
FRAC. - FRACTURED, FRACTURES
FRAGS. - FRAGMENTS
HI. - HIGHLY
MED. - MEDIUM
MICA. - MICACEOUS
MOD. - MODERATELY
NP - NON PLASTIC
ORG. - ORGANIC
PMT - PRESSUREMETER TEST
SAP. - SAPROLITIC
SD. - SAND, SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
w - MOISTURE CONTENT
V - VERY
VST - VANE SHEAR TEST
WEA. - WEATHERED
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT

SAMPLE ABBREVIATIONS

S - BULK
SS - SPLIT SPOON
ST - SHELBY TUBE
RS - ROCK
RT - RECOMPACTED TRIAXIAL
CBR - CALIFORNIA BEARING RATIO

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [X] CME-45C
- [ ] CME-55
- [ ] CME-550
- [ ] VANE SHEAR TEST
- [ ] PORTABLE HOIST
- [ ] _____
- [ ] _____

ADVANCING TOOLS:
- [ ] CLAY BITS
- [ ] 6" CONTINUOUS FLIGHT AUGER
- [ ] 8" HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [ ] TUNG.-CARBIDE INSERTS
- [X] CASING [ ] W/ ADVANCER
- [X] TRICONE 2 15/16" STEEL TEETH
- [ ] TRICONE _____" TUNG.-CARB.
- [ ] CORE BIT
- [ ] _____

HAMMER TYPE:
- [X] AUTOMATIC [ ] MANUAL

CORE SIZE:
- [ ] -B _____ [ ] -H _____
- [ ] -N _____

HAND TOOLS:
- [ ] POST HOLE DIGGER
- [ ] HAND AUGER
- [ ] SOUNDING ROD
- [ ] VANE SHEAR TEST
- [ ] _____

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK.
ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:

WEATHERED ROCK (WR)	NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.
CRYSTALLINE ROCK (CR)	FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.
NON-CRYSTALLINE ROCK (NCR)	FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.
COASTAL PLAIN SEDIMENTARY ROCK (CP)	COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.

WEATHERING

FRESH	ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.
VERY SLIGHT (V SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.
SLIGHT (SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.
MODERATE (MOD.)	SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.
MODERATELY SEVERE (MOD. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. *IF TESTED, WOULD YIELD SPT REFUSAL*
SEVERE (SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. *IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF*
VERY SEVERE (V SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF*
COMPLETE	ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.

ROCK HARDNESS

VERY HARD	CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.
HARD	CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.
MODERATELY HARD	CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.
MEDIUM HARD	CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.
SOFT	CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.
VERY SOFT	CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.

FRACTURE SPACING

TERM	SPACING
VERY WIDE	MORE THAN 10 FEET
WIDE	3 TO 10 FEET
MODERATELY CLOSE	1 TO 3 FEET
CLOSE	0.16 TO 1 FOOT
VERY CLOSE	LESS THAN 0.16 FEET

BEDDING

TERM	THICKNESS
VERY THICKLY BEDDED	4 FEET
THICKLY BEDDED	1.5 - 4 FEET
THINLY BEDDED	0.16 - 1.5 FEET
VERY THINLY BEDDED	0.03 - 0.16 FEET
THICKLY LAMINATED	0.008 - 0.03 FEET
THINLY LAMINATED	< 0.008 FEET

INDURATION

FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.

FRIABLE	RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.
MODERATELY INDURATED	GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.
INDURATED	GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.
EXTREMELY INDURATED	SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.

TERMS AND DEFINITIONS

ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.

AQUIFER - A WATER BEARING FORMATION OR STRATA.

ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.

ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.

ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.

CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.

COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.

CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.

DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.

DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.

FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.

FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.

FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.

FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.

FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.

JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.

LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.

LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.

MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.

PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.

RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.

SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.

SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.

STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.

STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.

STRATA ROCK QUALITY DESIGNATION (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK: BL-103
N 443624.0421 E 2225821.5487
ELEVATION: 93.19 FEET

NOTES:

DATE: 8-15-14

PROJECT REFERENCE NO.	SHEET NO.
SF-810003	3

SITE PLAN

0 30 60
FEET

SKEW: 90°

13 14 15 16 17

EB1 BENT LINE

B1 BENT LINE

EB2 BENT LINE

EB1-A

B1-A

EB2-A

BRIDGE NO. 3

TO HWY 421

BEAMAN WOODS RD -L-

TO ROWAN RD.

ROWAN BRANCH

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
SF-810003	4
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROFILE THROUGH BORINGS PROJECTED ALONG -L-

V.E. = 2

EB1-A
14+20
17' LT

B1-A
14+99
7' LT

EB2-B
15+58
16' RT

LOOSE BROWN AND TAN SAND, MOIST (ROADWAY EMBANKMENT)

VERY LOOSE TO MEDIUM DENSE GRAY SAND AND SILTY SAND, MOIST TO SATURATED (UNDIVIDED COASTAL PLAIN)

SURFACE WATER 03/22

LOOSE TAN SAND, MOIST (ROADWAY EMBANKMENT)

VERY SOFT GRAY SANDY CLAY, MOIST (UNDIVIDED COASTAL PLAIN)

MEDIUM DENSE GRAY SAND AND SITLY SAND, MOIST TO SATURATED (UNDIVIDED COASTAL PLAIN)

MEDIUM DENSE GRAY SILTY SAND, SATURATED (BLACK CREEK FORMATION)

MEDIUM STIFF TO HARD GRAY SANDY SILT AND SANDY CLAY, WET (BLACK CREEK FORMATION)

MEDIUM DENSE TO VERY DENSE GRAY SAND AND SILTY SAND, SATURATED (BLACK CREEK FORMATION)

Ⓐ VERY LOOSE TAN SAND WITH WOOD FRAGMENTS, SATURATED (ALLUVIAL)

NOTE: GROUNDLINE PROFILE ALONG -L- DRAWN BY HAND REFERENCING BRIDGE SURVEY AND HYDRAULIC DESIGN REPORT DATED 11/23/2021

NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE PROFILE

120 110 100 90 80 70 60 50 40 30 20 10 0 -10

13 14 15 16 17

21-MAR-2022 12:48
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$$$$USERNAME$$$$

GEOTECHNICAL BORING REPORT
BORE LOG

WBS BP3.R003.1	**TIP** SF-810003	**COUNTY** SAMPSON	**GEOLOGIST** Zimarino, S. N.	
SITE DESCRIPTION BRIDGE NO. 3 ON -L- (SR 1933) OVER ROWAN BRANCH				**GROUND WTR (ft)**
BORING NO. EB1-A	**STATION** 14+20	**OFFSET** 17 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 92.9 ft	**TOTAL DEPTH** 94.1 ft	**NORTHING** 443,506	**EASTING** 2,225,790	**24 HR.** 8.0
DRILL RIG/HAMMER EFF./DATE GFC0075 CME-45C 87% 11/23/2021		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Walker, C. M.	**START DATE** 03/07/22	**COMP. DATE** 03/07/22	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
95											
	92.9	0.0	1	3	5	8				92.9 GROUND SURFACE	0.0
90										**ROADWAY EMBANKMENT** BROWN AND TAN SILTY SAND, MOIST	
	88.9	4.0	5	2	2	4				86.9	6.0
85	85.3	7.6	2	1	1	2				**UNDIVIDED COASTAL PLAIN** GRAY SAND AND SILTY SAND, MOIST TO SATURATED	
	80.3	12.6	7	6	6	12				81.9	11.0
80											
75	75.3	17.6	4	4	6	10				76.9	16.0
										COASTAL PLAIN GRAY SANDY SILT AND SANDY CLAY, WET (BLACK CREEK FORMATION)	
70	70.3	22.6	4	4	7	11					
65	65.3	27.6	4	5	8	13					
60	60.3	32.6	4	6	9	15					
55	55.3	37.6	6	8	9	17					
50	50.3	42.6	4	6	8	14					
45	45.3	47.6	12	12	20	32				66.9	26.0
40	40.3	52.6	6	12	25	37					
35	35.3	57.6	5	15	15	30					
30	30.3	62.6	5	10	17	27					
25	25.3	67.6	22	12	25	37					
20	20.3	72.6	31	37	50	87					
15	15.3	77.6								46.9	46.0
										41.9 GRAY SAND WITH SHELL FRAGMENTS AND LIGNITE, SATURATED	51.0

WBS BP3.R003.1	**TIP** SF-810003	**COUNTY** SAMPSON	**GEOLOGIST** Zimarino, S. N.	
SITE DESCRIPTION BRIDGE NO. 3 ON -L- (SR 1933) OVER ROWAN BRANCH				**GROUND WTR (ft)**
BORING NO. EB1-A	**STATION** 14+20	**OFFSET** 17 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 92.9 ft	**TOTAL DEPTH** 94.1 ft	**NORTHING** 443,506	**EASTING** 2,225,790	**24 HR.** 8.0
DRILL RIG/HAMMER EFF./DATE GFC0075 CME-45C 87% 11/23/2021		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Walker, C. M.	**START DATE** 03/07/22	**COMP. DATE** 03/07/22	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
15						Match Line				
			13	21	26	47				GRAY SAND WITH SHELL FRAGMENTS AND LIGNITE, SATURATED *(continued)*
10	10.3	82.6	8	31	59	90				
5	5.3	87.6	24	36	52	88				
0	0.3	92.6	14	20	29	49				-1.2 94.1 Boring Terminated at Elevation -1.2 ft In Dense Sand

GEOTECHNICAL BORING REPORT
BORE LOG

WBS BP3.R003.1	**TIP** SF-810003	**COUNTY** SAMPSON	**GEOLOGIST** Zimarino, S. N.	
SITE DESCRIPTION BRIDGE NO. 3 ON -L- (SR 1933) OVER ROWAN BRANCH				**GROUND WTR (ft)**
BORING NO. B1-A	**STATION** 14+99	**OFFSET** 7 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 84.3 ft	**TOTAL DEPTH** 89.5 ft	**NORTHING** 443,585	**EASTING** 2,225,799	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE GFC0075 CME-45C 87% 11/23/2021		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Walker, C. M.	**START DATE** 03/09/22	**COMP. DATE** 03/09/22	**SURFACE WATER DEPTH** 0.1ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft) / DEPTH (ft)
85	84.3	0.0	WOH	WOH	WOH	0				84.3 / 0.0 WATER SURFACE (03/09/22)
80	79.8	4.5	1	1	1	2				**ALLUVIAL** TAN SAND WITH WOOD FRAGMENTS, SATURATED
	76.3	8.0								78.5 / 5.8
75			2	3	4	7				77.3 / 7.0 **COASTAL PLAIN** GRAY SANDY SILT AND SANDY CLAY, WET (BLACK CREEK FORMATION)
70	71.3	13.0	4	5	6	11				
65	66.3	18.0	4	5	7	12				68.3 / 16.0
60	61.3	23.0	4	5	7	12				
55	56.3	28.0	4	6	8	14				
50	51.3	33.0	4	5	8	13				48.3 / 36.0
45	46.3	38.0	8	15	16	31				
40	41.3	43.0	9	11	14	25				
35	36.3	48.0	10	14	23	37				
30	31.3	53.0	20	21	29	50				33.3 / 51.0 GRAY SAND WITH LIGNITE, SATURATED
25	26.3	58.0	33	59	41/0.2	100/0.7				
20	21.3	63.0	50	78	22/0.1	100/0.6				
15	16.3	68.0	10	18	25	43				
10	11.3	73.0	25	44	56/0.4	100/0.9				
5	6.3	78.0	40	65	35/0.3	100/0.8				

WBS BP3.R003.1	**TIP** SF-810003	**COUNTY** SAMPSON	**GEOLOGIST** Zimarino, S. N.	
SITE DESCRIPTION BRIDGE NO. 3 ON -L- (SR 1933) OVER ROWAN BRANCH				**GROUND WTR (ft)**
BORING NO. B1-A	**STATION** 14+99	**OFFSET** 7 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 84.3 ft	**TOTAL DEPTH** 89.5 ft	**NORTHING** 443,585	**EASTING** 2,225,799	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE GFC0075 CME-45C 87% 11/23/2021		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Walker, C. M.	**START DATE** 03/09/22	**COMP. DATE** 03/09/22	**SURFACE WATER DEPTH** 0.1ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
5						Match Line				GRAY SAND WITH LIGNITE, SATURATED *(continued)*
0	1.3	83.0	16	25	36	61				
-5	-3.7	88.0	18	31	48	79				-5.2 / 89.5 Boring Terminated at Elevation -5.2 ft in Very Dense Sand

NCDOT BORE DOUBLE SF810003_GEO_BRDG.GPJ NC_DOT.GDT 3/21/22

GEOTECHNICAL BORING REPORT
BORE LOG

WBS BP3.R003.1	**TIP** SF-810003	**COUNTY** SAMPSON	**GEOLOGIST** Zimarino, S. N.	
SITE DESCRIPTION BRIDGE NO. 3 ON -L- (SR 1933) OVER ROWAN BRANCH				**GROUND WTR (ft)**
BORING NO. EB2-B	**STATION** 15+58	**OFFSET** 16 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 93.2 ft	**TOTAL DEPTH** 94.0 ft	**NORTHING** 443,644	**EASTING** 2,225,822	**24 HR.** 8.8
DRILL RIG/HAMMER EFF./DATE GFC0075 CME-45C 87% 11/23/2021		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Walker, C. M.	**START DATE** 03/08/22	**COMP. DATE** 03/08/22	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
95											
	93.2	0.0	1	2	3	5				93.2 GROUND SURFACE	0.0
90										**ROADWAY EMBANKMENT** TAN SILTY SAND, MOIST	
	89.2	4.0	WOH	WOH	WOH	0				90.2	3.0
										UNDIVIDED COASTAL PLAIN GRAY SANDY CLAY, MOIST	
85	85.7	7.5	4	4	7	11				87.2	6.0
										GRAY SILTY SAND, MOIST TO SATURATED	
80	80.7	12.5	3	4	6	10					
75	75.7	17.5	3	6	8	14				77.2	16.0
										COASTAL PLAIN GRAY SILTY SAND, SATURATED (BLACK CREEK FORMATION)	
70	70.7	22.5	5	7	7	14				72.2	21.0
										GRAY SANDY SILT AND SANDY CLAY, WET	
65	65.7	27.5	4	6	7	13				67.2	26.0
60	60.7	32.5	4	6	8	14					
55	55.7	37.5	4	6	7	13					
50	50.7	42.5	7	9	14	23				47.2	46.0
45	45.7	47.5	7	9	12	21				42.2	51.0
40	40.7	52.5	8	11	12	23					
35	35.7	57.5	6	10	15	25				37.2	56.0
30	30.7	62.5	27	36	48	84				GRAY SILTY SAND WITH LIGNITE, SATURATED	
25	25.7	67.5	30	35	45	80					
20	20.7	72.5	22	42	58/0.3	100/0.8					
15	15.7	77.5									

WBS BP3.R003.1	**TIP** SF-810003	**COUNTY** SAMPSON	**GEOLOGIST** Zimarino, S. N.	
SITE DESCRIPTION BRIDGE NO. 3 ON -L- (SR 1933) OVER ROWAN BRANCH				**GROUND WTR (ft)**
BORING NO. EB2-B	**STATION** 15+58	**OFFSET** 16 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 93.2 ft	**TOTAL DEPTH** 94.0 ft	**NORTHING** 443,644	**EASTING** 2,225,822	**24 HR.** 8.8
DRILL RIG/HAMMER EFF./DATE GFC0075 CME-45C 87% 11/23/2021		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Walker, C. M.	**START DATE** 03/08/22	**COMP. DATE** 03/08/22	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
15						Match Line				
	10.7	82.5	10	15	25	40				GRAY SILTY SAND WITH LIGNITE, SATURATED *(continued)*
10			18	22	35	57				
5	5.7	87.5	17	22	28	50				
0	0.7	92.5	15	28	50	78				-0.8 94.0
										Boring Terminated at Elevation -0.8 ft in Very Dense Sand

NCDOT BORE DOUBLE SF810003_GEO_BRDG.GPJ NC_DOT.GDT 3/21/22