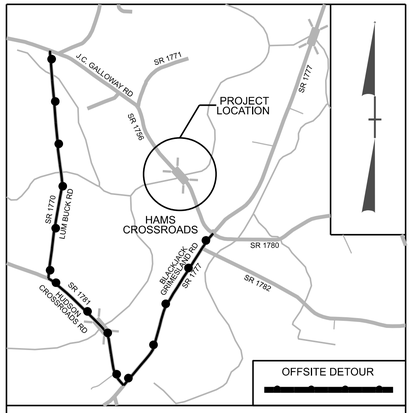
09/08/99

PROJECT: BP2.R004.1

CONTRACT: DB00623

See Sheet 1A For Index of Sheets



VICINITY MAP (NTS)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PITT COUNTY

LOCATION: *BRIDGE NO. 730006 ON SR 1756 (J.C. GALLOWAY RD) OVER COW SWAMP*

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

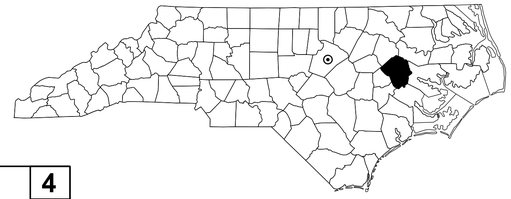
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP2.R004.1	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
BP2.R004.1		PE
BP2.R004.2		RW, UTILITIES
BP2.R004.3		CONSTRUCTION

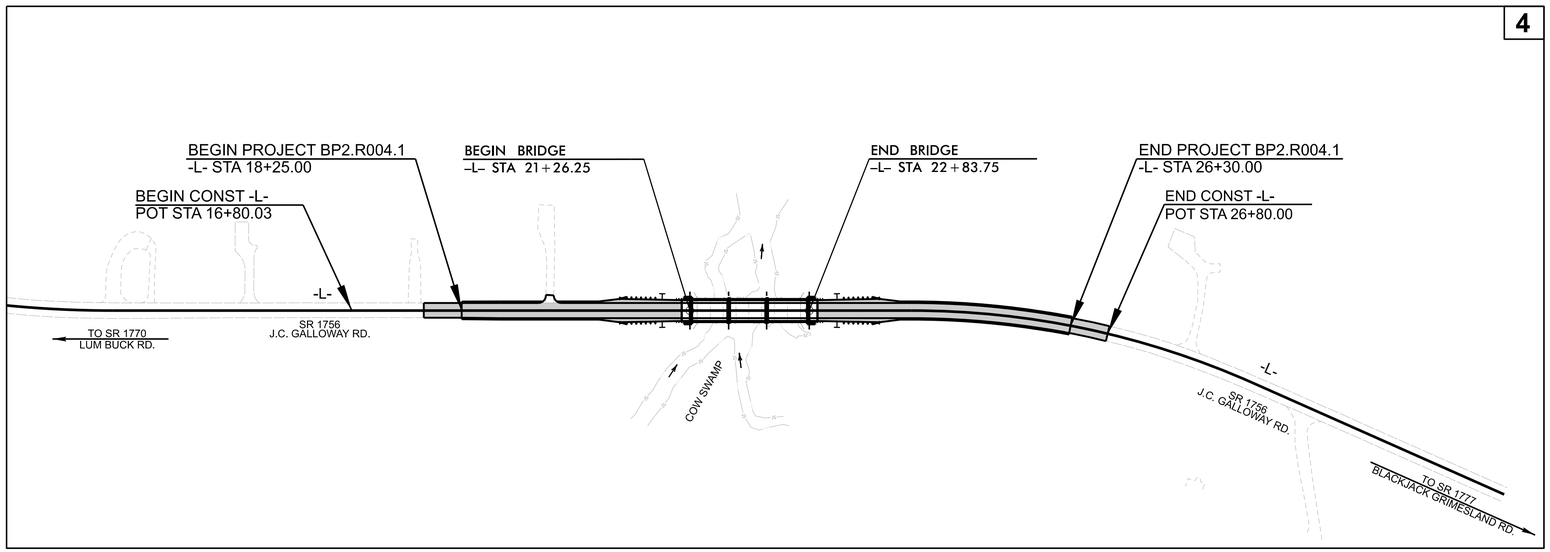
STAGE 4 PLANS

(4RD1) FINAL PLANS

Plans Developed with OpenRoads



4



NAD 83/2011

GRAPHIC SCALES

40 20 0 40 80
PLANS

50 25 0 40 80
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2020 = 750
ADT 2043 = -
K = N/A %
D = N/A %
T = 6 % *
V = 60 MPH
* TTST = 3% DUAL = 3%
FUNC CLASS =
RURAL LOCAL
SUB-REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY PROJECT BP2.R004.1 = 0.122 MILES
LENGTH OF STRUCTURES PROJECT BP2.R004.1 = 0.030 MILES
TOTAL LENGTH PROJECT BP2.R004.1 = 0.152 MILES

NCDOT Contact: CASEY WHITLEY, PE, PLS

Prepared in the Office of: 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: MAR 15, 2023

LETTING DATE: JUNE 11, 2025

JACOB H. DUKE, P.E.
PROJECT ENGINEER

ALLEN J. MCSWAIN
PROJECT DESIGNER

HYDRAULICS ENGINEER
4/30/2025
NORTH CAROLINA PROFESSIONAL SEAL 057747 ENGINEER JOHN MCNULTY
Signed by: John McNulty
SIGNATURE: *P.E.*

ROADWAY DESIGN ENGINEER
4/30/2025
NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H. DUKE
Signed by: Jacob H Duke
SIGNATURE: *P.E.*

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

5/26/20

INDEX OF SHEETS

GENERAL NOTES: *2024 SPECIFICATIONS*
EFFECTIVE: January 2024
REVISED:

GRADING AND SURFACING:

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

CLEARING:

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

SUPERELEVATION:

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

SHOULDER CONSTRUCTION:

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

SUBSURFACE DRAINS:

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

DRIVEWAYS:

DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.02 USING 3 FOOT RADII OR RADII AS SHOWN ON THE PLANS. LOCATIONS OF DRIVES WILL BE AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

GUARDRAIL:

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

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

Greenville Utilities Commission

Eastern Pines Water Corp

RIGHT-OF-WAY MARKERS:

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

EFF. January 2024
REV.

2024 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
310.02	Parallel Pipe End Section - Precast Concrete Section for 15" to 24" Pipe
DIVISION 4 - MAJOR STRUCTURES	
423.01	Bridge Approach Fills - Type I Approach Fill for Bridge Abutment
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
815.02	Subsurface Drain
840.00	Concrete Base Pad for Drainage Structures
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet - for Double Frame and Grates
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.02	Guide for Rip Rap at Pipe Outlets

BP2.R004.1
4RD1 | 1A

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
PITT COUNTY

HIGHWAY DIVISION 2

ROADWAY DESIGN ENGINEER

Signed by: Jacob Duke

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043777 ENGINEER JACOB H. DUKE

4/16/2024

HYDRAULICS ENGINEER

Signed by: Jason McNulty

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 057747 ENGINEER JASON MCNULTY

4/16/2024

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

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin (EIP)
- Computed Property Corner
- Existing Concrete Monument (ECM)
- Parcel / Sequence Number
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary
- Proposed Wetland Boundary
- Existing Endangered Animal Boundary
- Existing Endangered Plant Boundary
- Existing Historic Property Boundary
- Known Contamination Area: Soil
- Potential Contamination Area: Soil
- Known Contamination Area: Water
- Potential Contamination Area: Water
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign
- Well
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

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

RAILROADS:

- Standard Gauge
- RR Signal Milepost
- Switch
- RR Abandoned
- RR Dismantled

RIGHT OF WAY & PROJECT CONTROL:

- Primary Horiz Control Point
- Primary Horiz and Vert Control Point
- Secondary Horiz and Vert Control Point
- Vertical Benchmark
- Existing Right of Way Monument
- Proposed Right of Way Monument (Rebar and Cap)
- Proposed Right of Way Monument (Concrete)
- Existing Permanent Easement Monument
- Proposed Permanent Easement Monument (Rebar and Cap)
- Existing C/A Monument
- Proposed C/A Monument (Rebar and Cap)
- Proposed C/A Monument (Concrete)
- Existing Right of Way Line
- Proposed Right of Way Line
- Existing Control of Access Line
- Proposed Control of Access Line
- Proposed ROW and CA Line
- Existing Easement Line
- Proposed Temporary Construction Easement
- Proposed Temporary Drainage Easement
- Proposed Permanent Drainage Easement
- Proposed Permanent Drainage/Utility Easement
- Proposed Permanent Utility Easement
- Proposed Temporary Utility Easement
- Proposed Aerial Utility Easement

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

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

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

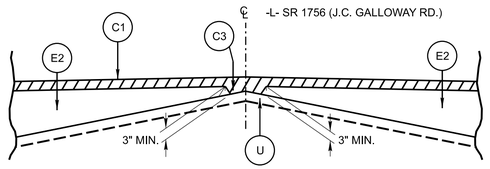
- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box
- Utility Unknown U/G Line (SUE - LOS B)*
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc.
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- Abandoned According to Utility Records —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

5/26/20

PAVEMENT SCHEDULE	
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.
J1	PROP. APPROX. 8" AGGREGATE BASE COURSE.
R1	SHOULDER BERM GUTTER
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	MILLING BITUMINOUS PAVEMENT (SEE MILLING DETAIL)
W	WEDGING (SEE WEDGING DETAIL).

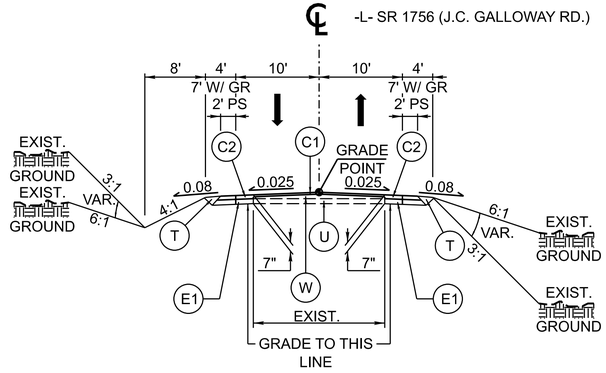
NOTE: PAVEMENT EDGE SLOPES AND TRENCH SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

INSET A



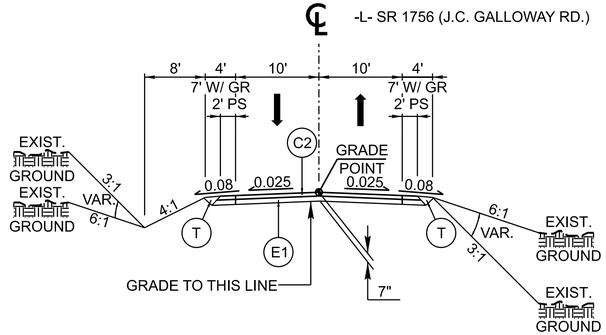
DETAIL SHOWING METHOD OF WEDGING

USE INSET A IN CONJUNCTION WITH TYPICAL NO. 1



TYPICAL SECTION NO. 1

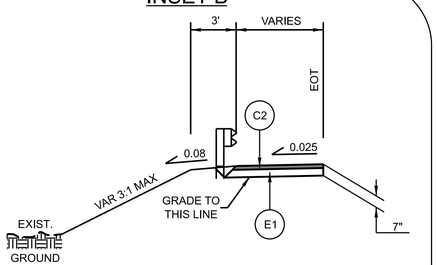
-L- STA. 18+25.00 TO STA. 20+75.39
-L- STA. 22+32.89 TO STA. 26+30.00



TYPICAL SECTION NO. 2

-L- STA. 20+75.39 TO STA. 21+26.25 (BEGIN BRIDGE)
-L- STA. 22+83.75 (END BRIDGE) TO STA. 23+32.89

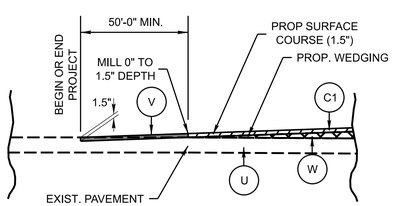
INSET B



GUARDRAIL DETAIL

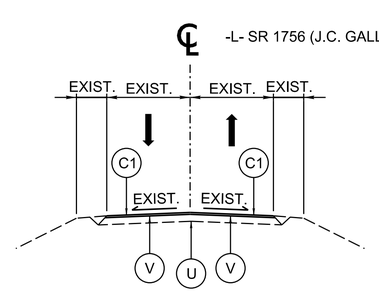
USE INSET B IN CONJUNCTION WITH TYPICAL NO. 1 AND 2
-L- RT STA. 20+33.63 TO 21+26.25
-L- LT STA. 20+33.63 TO 21+26.25
-L- RT STA. 22+83.75 TO 23+76.37
-L- LT STA. 22+83.75 TO 23+76.37

INSET C



INCIDENTAL MILLING
AND RESURFACING DETAIL

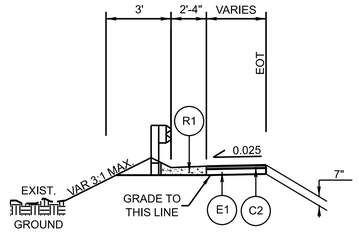
-L- STA. 18+25.00 TO STA. 18+75.00
-L- STA. 25+80.00 TO STA. 26+30.00



TYPICAL SECTION NO. 3

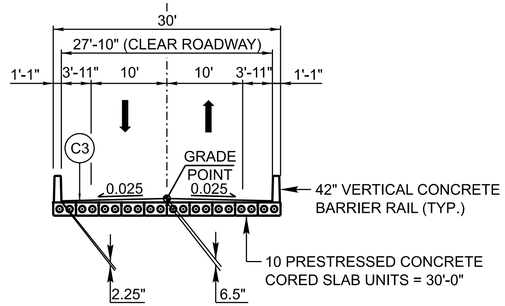
-L- STA. 17+75.00 TO STA. 18+25.00
-L- STA. 26+30.00 TO STA. 26+80.00

INSET D



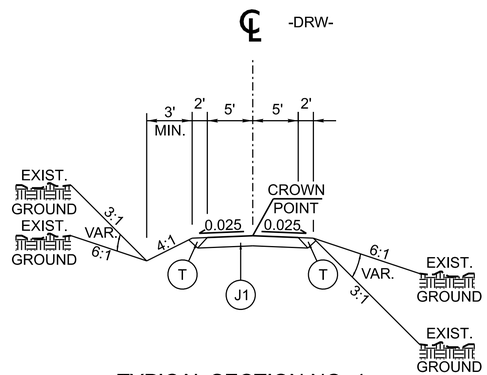
SHOULDER BERM GUTTER DETAIL
USE INSET C

USE INSET C IN CONJUNCTION WITH TYPICAL NO. 2
-L- STA. 20+79.00 TO 21+15.37 (RT)
-L- STA. 20+99.00 TO 21+15.37 (LT)
-L- STA. 22+94.62 TO 23+08.00 (RT)
-L- STA. 22+94.62 TO 23+08.00 (LT)



BRIDGE TYPICAL SECTION

-L- STA. 21+26.25 (BEGIN BRIDGE) TO STA. 22+83.75 (END BRIDGE)



TYPICAL SECTION NO. 4

DRW AT -L- STA. 17+00.00 LT
DRW AT -L- STA. 19+50.00 LT

REVISIONS

1. DESIGN REV. 05/31/2023 - Adjusted all side slopes to 3:1 Maximum.

BP2.R004.1
4RD1 | 2A-1

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
PITT COUNTY

HIGHWAY DIVISION 2

ROADWAY DESIGN ENGINEER
Signed by: Jason Yates
NORTH CAROLINA PROFESSIONAL
SEAL 043777 ENGINEER
JACOB H. DUKE
4/16/2024

HYDRAULICS ENGINEER
Signed by: John McNulty
NORTH CAROLINA PROFESSIONAL
SEAL 057747 ENGINEER
JOHN MCNULTY
4/16/2024

PREPARED BY

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

5/26/20

SUMMARY OF EARTHWORK

IN CUBIC YARDS

Station	Station	Uncl. Excav.	Embank. +%	Borrow	Waste
-L- 18+25.00	-L- 21+26 .25	67	243	176	
Bridge					
-L- 22+83.75	-L- 26+30.00	37	216	179	
PROJECT TOTALS:		104	459	355	
Waste in Lieu of Borrow					
Replace Topsoil on Borrow Pit (5%)				18	
GRAND TOTALS:		104	459	373	
SAY:		**110**		**380**	

NOTE:

APPROXIMATE QUANTITIES ONLY. UNCLASIFIED 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.

SHOULDER BERM GUTTER SUMMARY

IN LINEAR FEET

LINE	STATION	STATION	LENGTH
-L- (RT)	20+78.93	21+15.36	36.43
-L- (LT)	20+99.42	21+15.36	15.94
-L- (RT)	22+94.63	23+08.78	14.15
-L- (LT)	22+94.63	23+08.76	14.13
		TOTAL:	80.65
		SAY:	**81**

RIGHT OF WAY AREA DATA

PARCEL NO.	PROPERTY OWNER NAMES	TOTAL ACREAGE	AREA TAKEN	AREA REMAINING	R/W	CONST. EASE.	DRAIN. UTIL. EASE.	PERM. DRAIN. EASE.	TEMP. UTIL. EASE.	PERM. UTIL. EASE.
1	GEORGE SUTTON LIFE ESTATE									
2	ANDRE GOMEZ HERNANDEZ					0.0176				
3	LEON RAYMOND HARDEE, JR.					0.0335		0.0064		
4	GRIMES BUILT CONSTRUCTION, LLC					0.0765		0.0074		
5	LINDA IPOCK HARDEE LIVING TRUST C/O LEON RAYMOND HARDEE					0.0541		0.0060		
6	KENSIL JOHN EVANS					0.0723		0.0073		

PAVEMENT REMOVAL SUMMARY

IN SQUARE YARDS

SURVEY LINE	Station	Station	LOCATION LT/RT/CL	ASPHALT REMOVAL	ASPHALT BREAKUP	CONCRETE REMOVAL	CONCRETE BREAKUP
-L-	20+75.39	21+26.25	CL	135.63			
-L-	22+83.75	23+32.89	CL	131.04			
		TOTAL:		266.67			
		SAY:		**270.00**			

GUARDRAIL SUMMARY

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

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

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH STRAIGHT	LENGTH SHOP CURVED	LENGTH DOUBLE FACED	WARRANT POINT APPROACH END	WARRANT POINT TRAILING END	"N" DIST. FROM	TOTAL SHOUL WIDTH	FLARE LENGTH APPROACH END	FLARE LENGTH TRAILING END	W APPROACH END	W TRAILING END	ANCHORS XI MOD	ANCHORS XI	ANCHORS GREU TL-3	ANCHORS M-350	ANCHORS TYPE III	ANCHORS CAT-1	ANCHORS VI MOD	ANCHORS BIC	ANCHORS AT-1	ADDITIONAL GUARDRAIL POSTS	IMPACT ATTENUATOR G	IMPACT ATTENUATOR NG	SINGLE FACED CONCRETE	REMOVE EXISTING GUARDRAIL	REMOVE & STOCKPILE EXISTING	REMARKS
-L-	20+32.50	21+26.25	LT	93.75				21+26.25	3'-11"	6'-11"		75		1			1		1											
-L-	20+32.50	21+26.25	RT	93.75			21+26.25		3'-11"	6'-11"	75		1				1		1											
-L-	22+83.75	23+77.50	LT	93.75			22+83.75		3'-11"	6'-11"	75		1				1		1											
-L-	22+83.75	23+77.50	RT	93.75				22+83.75	3'-11"	6'-11"		75		1			1		1											
			SUBTOTAL:	375.00													4		4					5							
		Less GREU TL-3 @ 50' Each		200																										
		Less Type III @ 18.75 Each		75																										
			PROJECT TOTALS:	100.00													4		4					5							
			SAY:	100.00													4		4					5							

REVISIONS

BP2.R004.1
4RD1 | 3B-1

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
PITT COUNTY

HIGHWAY DIVISION 2

PREPARED BY

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

5/26/20

BP2.R004.1

4RD1 | 3D-1

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
PITT COUNTY

HIGHWAY DIVISION 2

PREPARED BY

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

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

1

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

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

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO.		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC)											C.S. PIPE								R.C. PIPE CLASS III								R.C. PIPE CLASS IV								24 " R.C. PIPE (CLASS V)	***" RC PIPE CULVERTS, CONTRACTOR DESIGN	***" RC PIPE CULVERTS, CONTRACTOR DESIGN	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	REINFORCED ENDWALLS STD. 838.01 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE)		QUANTITIES FOR DRAINAGE STRUCTURES	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B')		C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03			CONCRETE TRANSITIONAL SECTION		T.B.D.I STD 840.35	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD 840.29		DRAINAGE PIPE ELBOWS 15"			CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71		CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
SIZE								12"	15"	18"	24"	30"	36"	42"	48"					12"	15"	18"	24"	30"	36"	42"	48"	12"	15"	18"	24"	30"	36"	42"	48"	12"	15"	18"	24"	30"	36"	42"	48"						CU. YARDS			LIN. FT. A	LIN. FT. B		TYPE OF GRATE															
THICKNESS OR GAUGE		FROM	TO													DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	.064	.064	.064	.064	.079	.079	.109	.109																						R.C.P.	C.S.P.	PER EACH (0' THRU 5.0')	5.0' THRU 10.0'	10.0' AND ABOVE		E	F	G	DROP INLET	CATCH BASIN											
21+03 -L-	12.96 LT	401		25.9																																															1									1	1		2							
	12.96 LT	401	402		22.4	19.4			24							X																																																						
20+83 -L-	12.95 RT	403		25.7																																															1									1	1		2							
	12.95 RT	403	404		22.2	20.4			24							X																																																						
23+05 -L-	12.89 LT	405		25.8																																															1									1	1		2							
	12.89 LT	405	406		23.0	20.2			20							X																																																						
23+05 -L-	12.89 RT	407		25.8																																															1									1	1		2							
	12.89 RT	407	408		23.0	18.8			24							X																																																						
SHEET TOTALS									92																																										4									4	4		8							

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

5/26/20

COMPUTED BY: Tyler C. Bottoms DATE: 3/23/2022
CHECKED BY: Thein Tun Zan DATE: 5/1/2023

(2-3-23)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
BP2.R004.1 (SF-730006)	3G-1

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

BP2.R004.1
4RD1 | 3G-1

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
PITT COUNTY

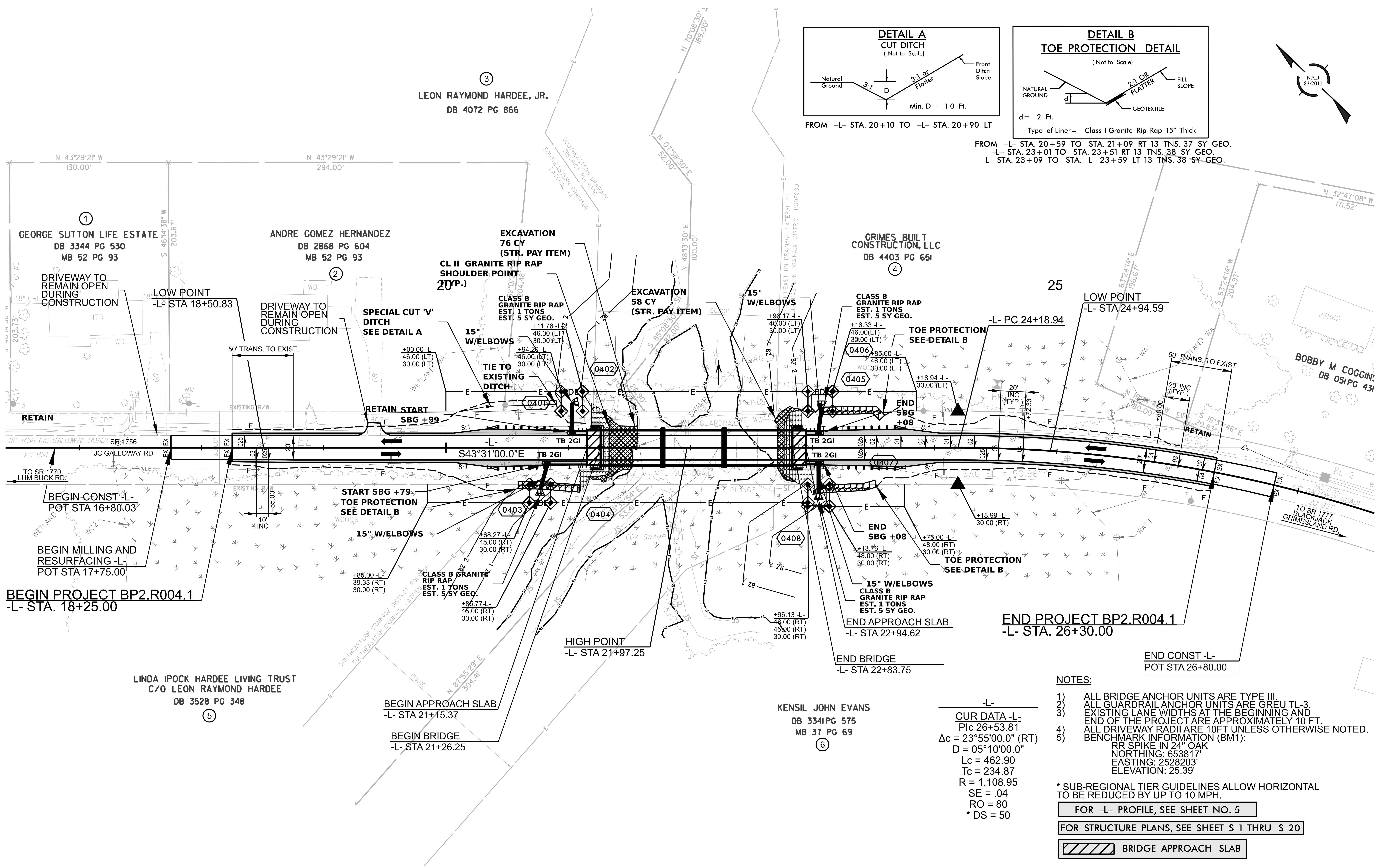
HIGHWAY DIVISION 2

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



-L-

CUR DATA -L-
PIc 26+53.81
Δc = 23°55'00.0" (RT)
D = 05°10'00.0"
Lc = 462.90
Tc = 234.87
R = 1,108.95
SE = .04
RO = 80
* DS = 50

NOTES:

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) ALL DRIVEWAY RADII ARE 10FT UNLESS OTHERWISE NOTED.
5) BENCHMARK INFORMATION (BM1):
   RR SPIKE IN 24" OAK
   NORTHING: 653817'
   EASTING: 2528203'
   ELEVATION: 25.39'

* SUB-REGIONAL TIER GUIDELINES ALLOW HORIZONTAL TO BE REDUCED BY UP TO 10 MPH.

FOR -L- PROFILE, SEE SHEET NO. 5

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

BRIDGE APPROACH SLAB

BP2.R004.1

4RD1 | 04

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
PITT COUNTY

HIGHWAY DIVISION 2

ROADWAY DESIGN ENGINEER
4/30/2025
NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H. DUKE
Signed by: Jacob H Duke

HYDRAULICS ENGINEER
4/30/2025
NORTH CAROLINA PROFESSIONAL SEAL 057747 ENGINEER JOHN MCNULTY
Signed by: John McNulty

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

BP2.R004.1	
4RDI	05

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
PITT COUNTY

HIGHWAY DIVISION 2

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H. DUKE

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 057747 ENGINEER JOHN MCNULTY

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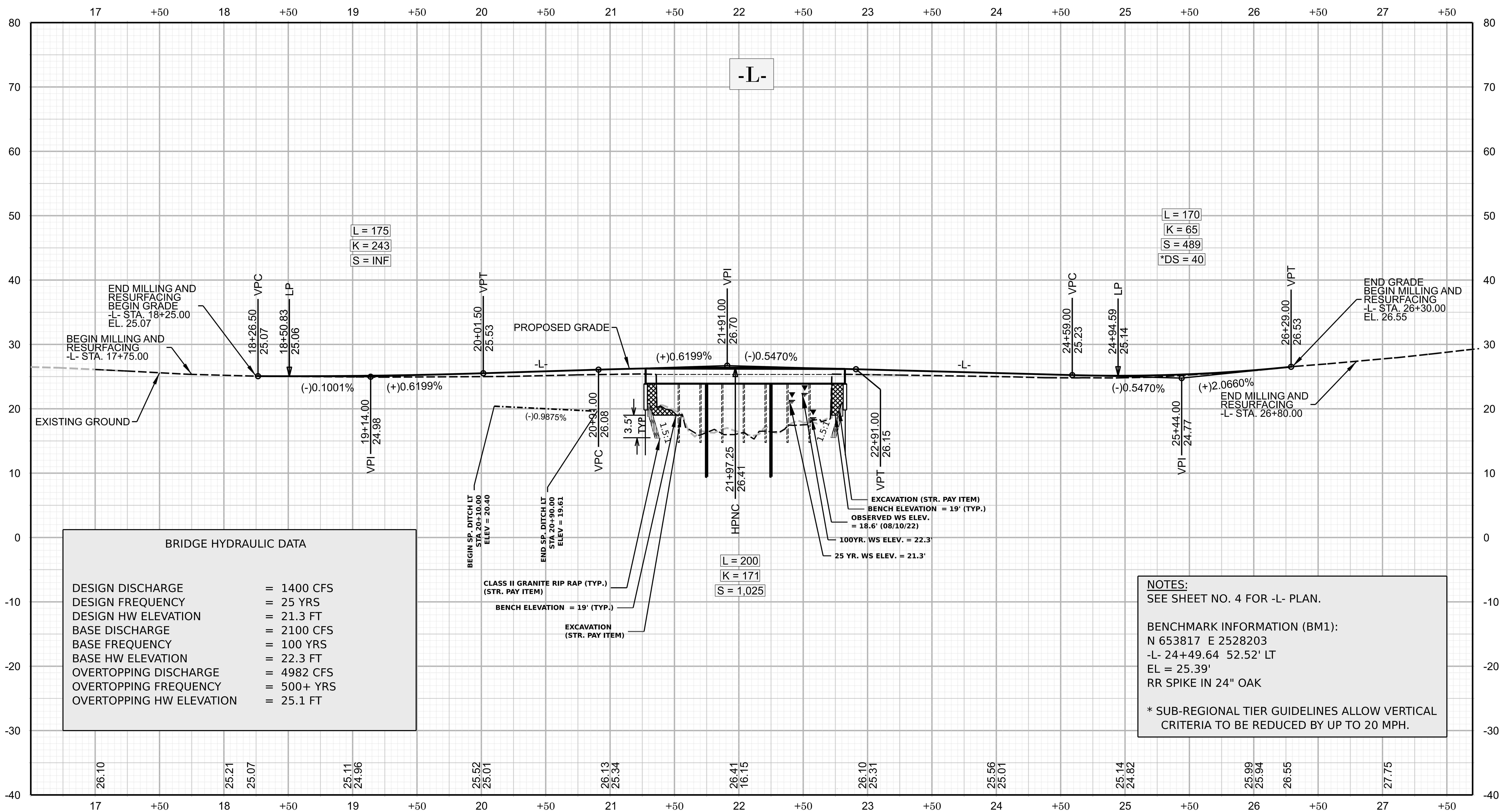


BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	1400 CFS
DESIGN FREQUENCY	=	25 YRS
DESIGN HW ELEVATION	=	21.3 FT
BASE DISCHARGE	=	2100 CFS
BASE FREQUENCY	=	100 YRS
BASE HW ELEVATION	=	22.3 FT
OVERTOPPING DISCHARGE	=	4982 CFS
OVERTOPPING FREQUENCY	=	500+ YRS
OVERTOPPING HW ELEVATION	=	25.1 FT

NOTES:
SEE SHEET NO. 4 FOR -L- PLAN.

BENCHMARK INFORMATION (BM1):
N 653817 E 2528203
-L- 24+49.64 52.52' LT
EL = 25.39'
RR SPIKE IN 24" OAK

* SUB-REGIONAL TIER GUIDELINES ALLOW VERTICAL CRITERIA TO BE REDUCED BY UP TO 20 MPH.

REVISIONS

09/08/99

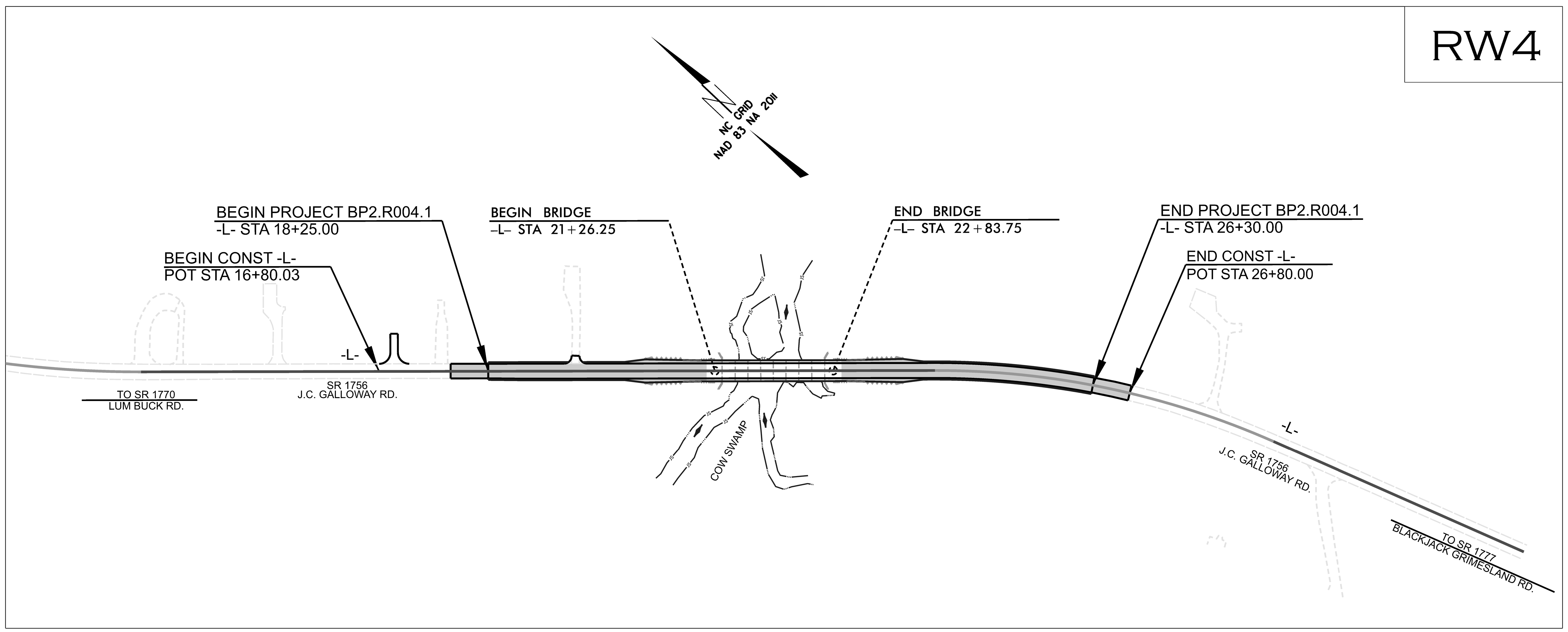
TIP PROJECT: BP2.R004

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP2.R004	RW01	6

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

PITT COUNTY



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100

PLANS

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT B5615 GPS-2
WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF
NORTHING: 654655.960 EASTING: 2527315.059
ELEVATION: 28.60'
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9998889730
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

Prepared in the Office of:

Division 2
Location and Surveys

2708 Neuse Blvd
Office No.7
New Bern, NC 28562

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: *MARCH 15, 2023*

LETTING DATE: *FEBRUARY 2, 2029*

PROFESSIONAL LAND SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-5082 LAND SURVEYOR JAMES C. GREEN III

DocuSigned by:
SIGNATURE: 03/12/2025 *DATE:*

5/26/20

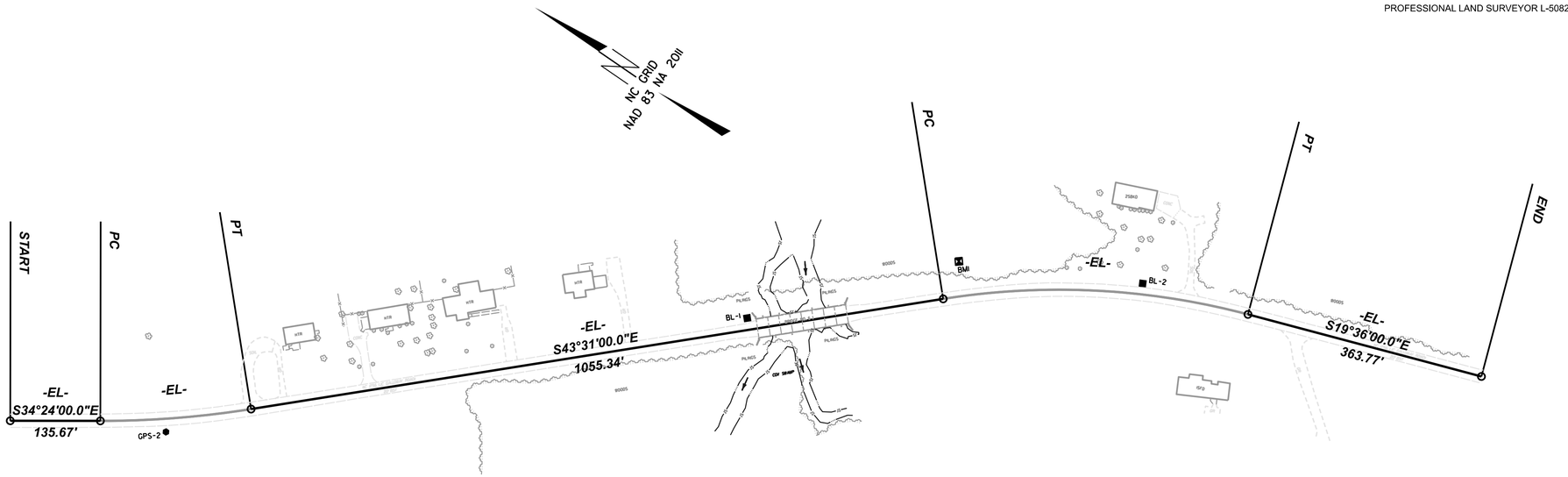
SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

EXISTING ALIGNMENT NAME: EL									
POINT	NORTHING	EASTING	BEARING	DIST	DELTA	D	L	T	R
START	654858.737	2527196.196							
LINE			S34°24'00"E	135.674					
PC	654746.791	2527272.847							
CURVE					09°07'00" Left	04°00'00"	227.917	114.199	1432.394
PT	654569.749	2527415.999							
LINE			S43°31'00"E	1055.345					
PC	653804.440	2528142.673							
CURVE					23°55'00" Right	05°10'00"	462.903	234.872	1108.951
PT	653412.854	2528383.186							
LINE			S19°36'00"E	363.772					
END	653070.160	2528505.214							

Control				
POINT	DESC	NORTH	EAST	ELEVATION
BL-1	4020	654031.390	2527951.756	24.78'
BL-2	4020	653569.845	2528331.753	28.02'
GPS-1	4017	655679.641	2526751.316	35.42'
GPS-2	4017	654655.960	2527315.059	28.60'

BENCHMARK TABLE				
BENCHMARK	NORTHING	EASTING	ELEVATION	DESCRIPTION
BM1	653816.981	2528202.576	25.39'	RR SPIKE SET IN 24" OAK



50 25 0 50 100
PLANS 1"=50'

I, JAMES C. GREEN, III, 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: JANUARY 2017
DATUM/EPOCH: NAD 83/NA 2011
PUBLISHED/FIXED-CONTROL USE: N/A
LOCALIZED AROUND: GPS-2
NORTHING: 654655.960
EASTING: 2527315.059
COMBINED GRID FACTOR: 0.9998889730
GEOID MODEL: G12NC
UNITS: US SURVEY FOOT

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 JANUARY 2017, AND ALL COORDINATES ARE BASED ON NAD 83/NA 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 28 DAY OF AUGUST, 2023.

_____
PROFESSIONAL LAND SURVEYOR L-5082

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 INFORMATINO REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

BP2.R004

R/W | RW02C-1

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PROFESSIONAL LAND SURVEYOR

SEAL L-5082 JAMES C. GREEN III

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES ARE COMPLETED

2018 STANDARD SPECIFICATIONS

TIP PROJECT: BP2.R004

PITT

PREPARED BY

LOCATION AND SURVEYS UNIT

PREPARED BY

DIVISION 2
LOCATION AND SURVEYS UNIT

2807 NEUSE BLVE
OFFICE No.7
NEW BERN, NC 28562

5/26/20

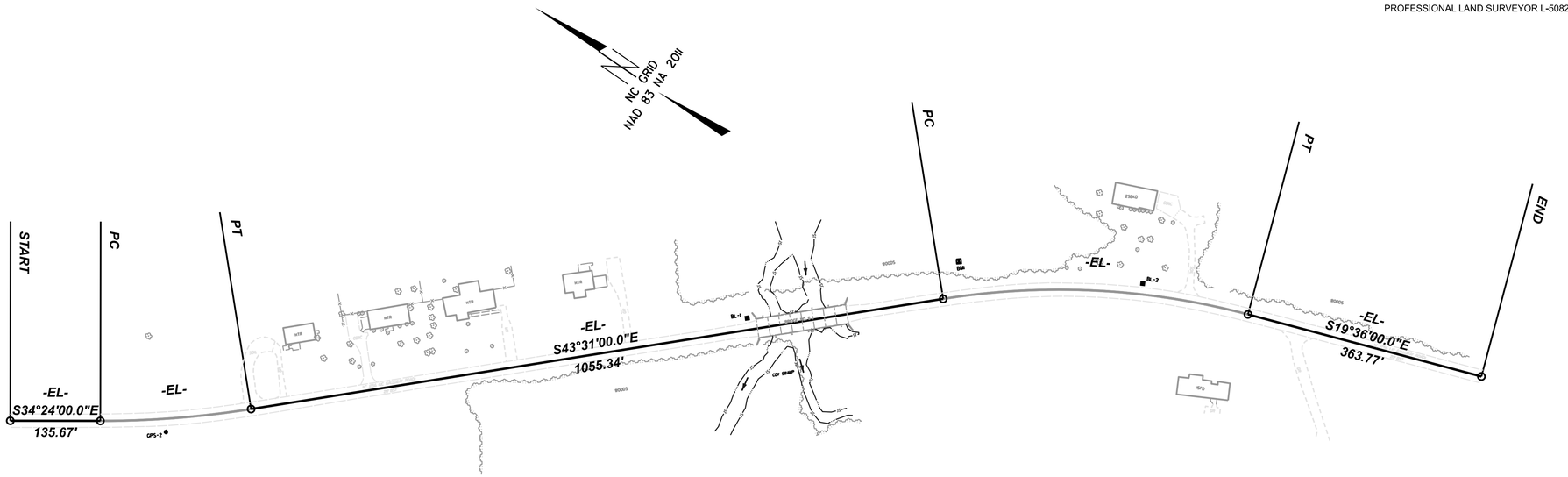
SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROPOSED ALIGNMENT NAME:L									
POINT	NORTHING	EASTING	BEARING	DIST	DELTA	D	L	T	R
START	654858.737	2527196.196							
LINE			S34°24'00"E	135.674					
PC	654746.791	2527272.847							
CURVE					09°07'00" Left	04°00'00"	227.917	114.199	1432.394
PT	654569.749	2527415.999							
LINE			S43°31'00"E	1055.345					
PC	653804.440	2528142.673							
CURVE					23°55'00" Right	05°10'00"	462.903	234.872	1108.951
PT	653412.854	2528383.186							
LINE			S19°36'00"E	363.772					
END	653070.160	2528505.214							

XX				
POINT	DESC	NORTH	EAST	ELEVATION
GPS-1	4017	654031.390	2527951.756	35.42'
GPS-2	4017	653569.845	2528331.753	28.60'
BL-1	4020	655679.641	2526751.316	24.78'
BL-2	4020	654655.960	2527315.059	28.02'

BENCHMARK TABLE				
BENCHMARK	NORTHING	EASTING	ELEVATION	DESCRIPTION
BM1	653816.981	2528202.576	25.39'	RR SPIKE SET IN 24" OAK



I, JAMES C. GREEN, III, 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: JANUARY 2017
DATUM/EPOCH: NAD 83/NA 2011
PUBLISHED/FIXED-CONTROL USE: N/A
LOCALIZED AROUND: GPS-2
NORTHING: 654655.960
EASTING: 2527315.059
COMBINED GRID FACTOR: 0.9998889730
GEOID MODEL: G12NC
UNITS: US SURVEY FOOT

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 JANUARY 2017, AND ALL COORDINATES ARE BASED ON NAD 83/NA 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 28 DAY OF AUGUST, 2023.

_____
PROFESSIONAL LAND SURVEYOR L-5082

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 INFORMATINO REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

BP2.R004

R/W | RW02C-1

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PROFESSIONAL LAND SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-5082 LAND SURVEYOR JAMES C. GREEN III

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES ARE COMPLETED

2018 STANDARD SPECIFICATIONS

TIP PROJECT: BP2.R004

PITT

PREPARED BY

LOCATION AND SURVEYS UNIT

PREPARED BY

DIVISION 2
LOCATION AND SURVEYS UNIT

2807 NEUSE BLVE
OFFICE No.7
NEW BERN, NC 28562

5/26/20

PROPOSED ALIGNMENT CONTROL SHEET

PROPOSED ALIGNMENT NAME:L									
POINT	NORTHING	EASTING	BEARING	DIST	DELTA	D	L	T	R
START	654858.737	2527196.196							
LINE			S34°24'00"E	135.674					
PC	654746.791	2527272.847							
CURVE					09°07'00" Left	04°00'00"	227.917	114.199	1432.394
PT	654569.749	2527415.999							
LINE			S43°31'00"E	1055.345					
PC	653804.440	2528142.673							
CURVE					23°55'00" Right	05°10'00"	462.903	234.872	1108.951
PT	653412.854	2528383.186							
LINE			S19°36'00"E	363.772					
END	653070.160	2528505.214							

I, JAMES C. GREEN,III, 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 15 DAY OF AUGUST, 2023.

_____

PROFESSIONAL LAND SURVEYOR L-5082

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 INFORMATINO REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

BP2.R004

R/W | 020-1

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PROFESSIONAL LAND SURVEYOR

SEAL L-5082 JAMES C. GREEN III

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES ARE COMPLETED

2018 STANDARD SPECIFICATIONS

TIP PROJECT: BP2.R004

County: PITT

PREPARED BY

LOCATION AND SURVEYS UNIT

PREPARED BY

DIVISION 2
LOCATION AND SURVEYS UNIT
2807 NEUSE BLVD
NEW BERN, NC 28562

5/26/20

RIGHT OF WAY CONTROL SHEET

PERMANENT ROW MARKER IRON PIN AND CAP: -L-			
STATION	OFFSET	NORTH	EAST
24+18.94	30.000	653783.783	2528120.918
24+18.94	-30.000	653825.097	2528164.429

PERMANENT EASEMENT MARKER IRON PIN AND CAP: -L-			
STATION	OFFSET	NORTH	EAST
20+68.27	45.000	654027.747	2527868.586
20+68.27	30.000	654038.075	2527879.464
20+85.77	45.000	654015.056	2527880.636
20+85.77	30.000	654025.385	2527891.513
20+94.26	-46.001	654071.563	2527952.470
20+94.26	-30.000	654060.546	2527940.866
21+11.76	-30.000	654047.855	2527952.916
21+11.76	-46.001	654058.873	2527964.520
22+96.13	48.000	653860.444	2528023.306 NOT SET (UNDER WATER)
22+96.13	45.000	653862.510	2528025.481 NOT SET (UNDER WATER)_
22+96.13	30.000	653872.838	2528036.359 NOT SET (UNDER WATER)
22+96.17	-46.001	653925.138	2528091.503
22+96.17	-30.000	653914.120	2528079.900
23+13.76	30.000	653860.057	2528048.495 NOT SET (UNDER WATER)
23+13.76	48.000	653847.663	2528035.442 NOT SET (UNDER WATER)
23+16.33	-46.001	653910.524	2528105.379
23+16.33	-29.955	653899.475	2528093.744

I , JAMES C. GREEN, III , CERTIFY THAT THE RIGHT OF WAY AND PERMANENT EASEMENT MONUMENTATION FOR THIS PROJECT SHOWN HEREIN WAS COMPLETED UNDER MY DIRECT AND RESPONSIBLE CHARGE FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION; THAT ALL HORIZONTAL CLOSURES HAD A MINIMUM RATIO OF PRECISION OF 1:10,000 (CLASS A). FIELD WORK WAS PERFORMED ON AUGUST 7th, 2023, AND ALL COORDINATES ARE BASED ON NAD83/2011; THAT THIS SURVEY WAS PERFORMED TO MEET THE REQUIREMENTS OF 21NCAC 56.1600 AS APPLICABLE.

THIS 15th DAY OF AUGUST, 2023.

_____

PROFESSIONAL LAND SURVEYOR L-5082

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.

BP2.R004

R/W | 03E-1

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PROFESSIONAL LAND SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-5082 LAND SURVEYOR JAMES C. GREEN

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES ARE COMPLETED

2018 STANDARD SPECIFICATIONS

TIP PROJECT: BP2.R004

County: PITT

PREPARED BY

LOCATION AND SURVEYS UNIT

PREPARED BY

DIVISION 2
LOCATION AND SURVEYS UNIT
NEW BERN, NC 28562

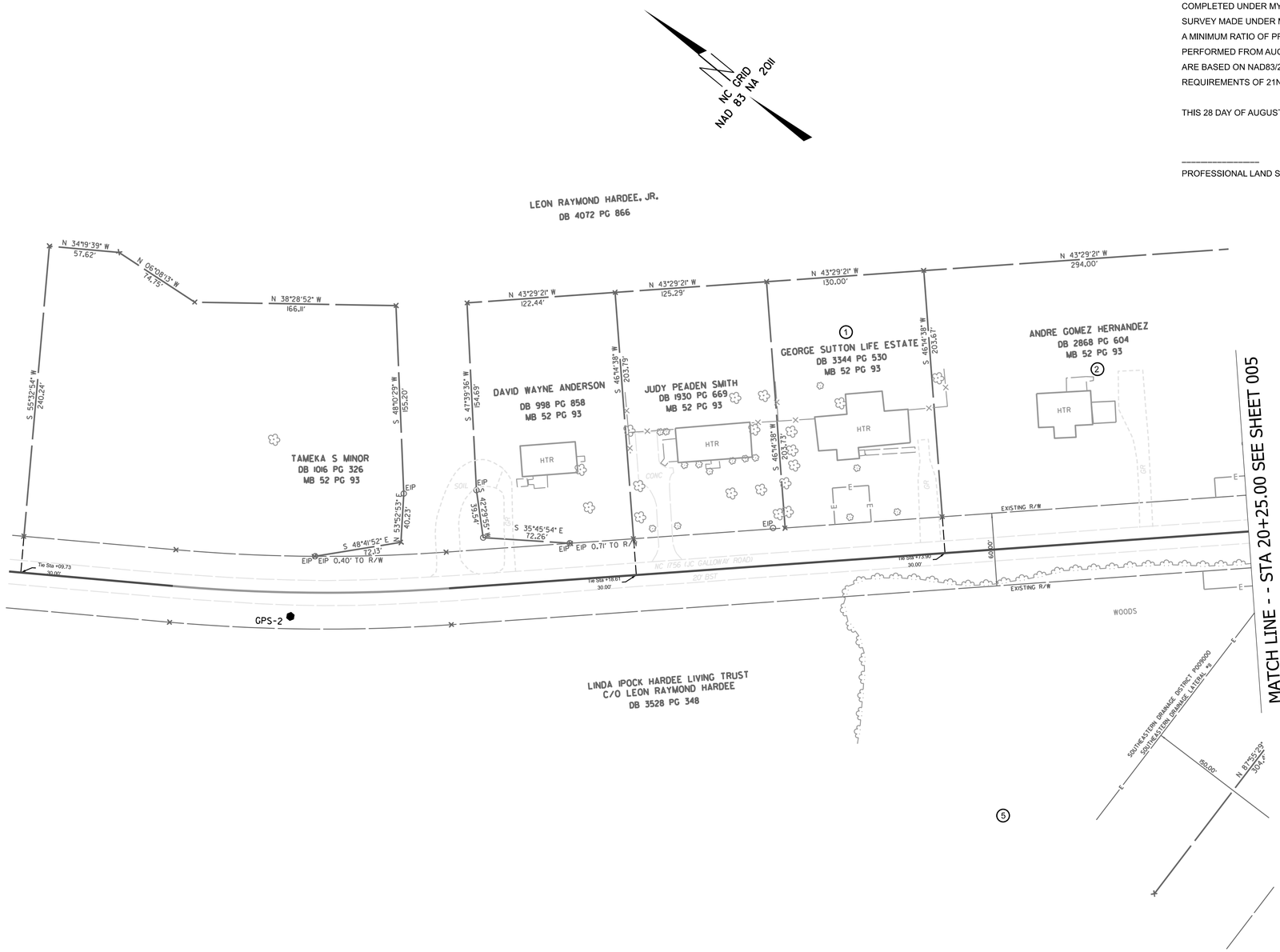
5/26/20

I , JAMES C. GREEN,III , 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 AUGUST 7, 2023 TO AUGUST 8, 2023, AND ALL COORDINATES ARE BASED ON NAD83/2011; THAT THIS SURVEY WAS PERFORMED TO MEET THE REQUIREMENTS OF 21NCAC 56.1600 AS APPLICABLE.

THIS 28 DAY OF AUGUST, 2023.

_____

PROFESSIONAL LAND SURVEYOR L-5082



50 25 0 50 100

PLANS 1"=50'

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 INFORMATINO REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

BP2.R004

R/W | RW04

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PROFESSIONAL LAND SURVEYOR

SEAL L-5082 JAMES C. GREEN III

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES ARE COMPLETED

2018 STANDARD SPECIFICATIONS

TIP PROJECT: *BP2.R004*

County: PITT

PREPARED BY

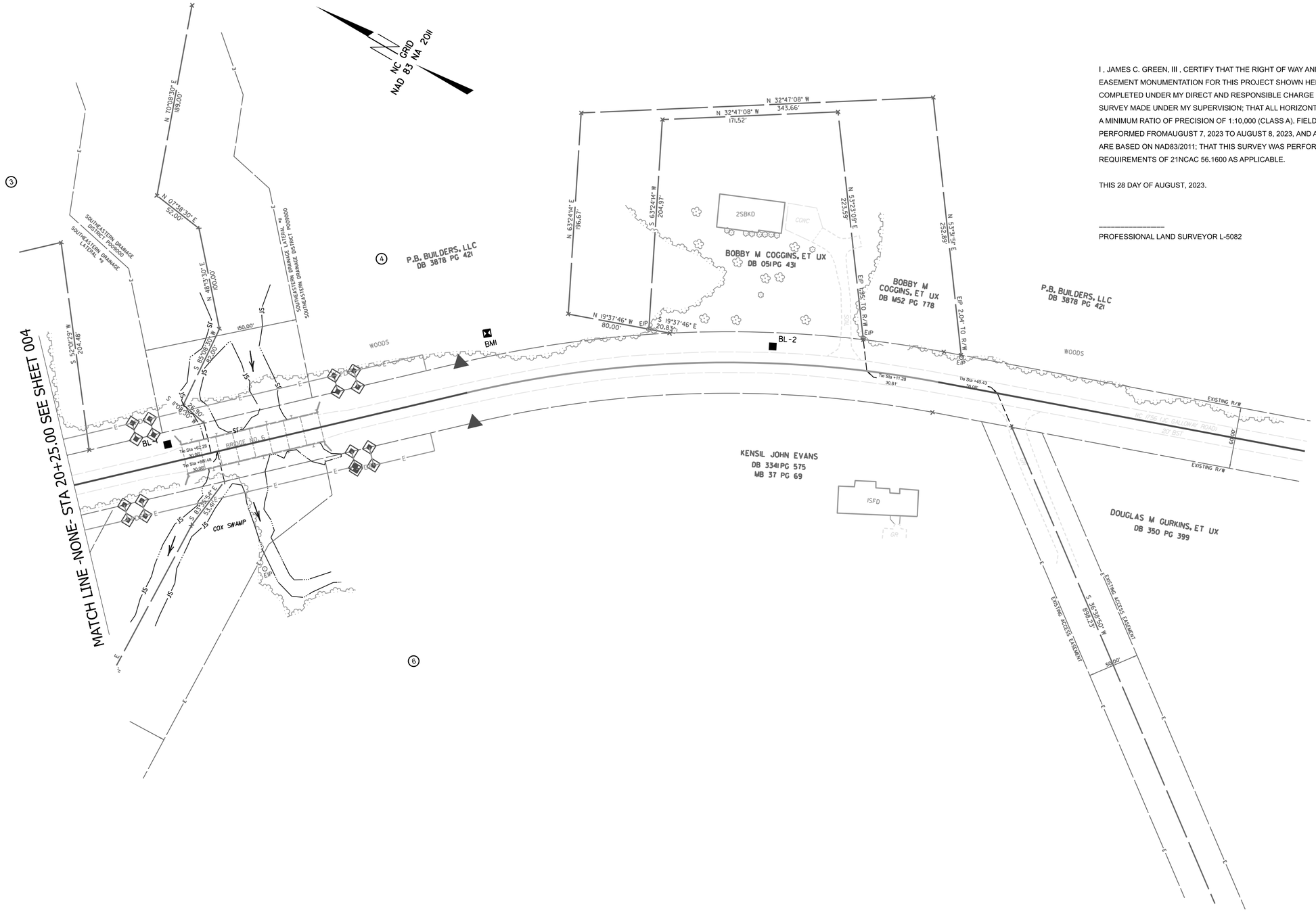
LOCATION AND SURVEYS UNIT

PREPARED BY

DIVISION 2
LOCATION AND SURVEYS UNIT

2807 NEUSE BLVD
OFFICE No.7
NEW BERN, NC 28562

5/26/20



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BP2.R004
R/W RW04

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PROFESSIONAL LAND SURVEYOR
NORTH CAROLINA PROFESSIONAL SEAL L-5082 LAND SURVEYOR JAMES C. GREEN III

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES ARE COMPLETED

2018 STANDARD SPECIFICATIONS

TIP PROJECT: BP2.R004
County: PITT

PREPARED BY

LOCATION AND SURVEYS UNIT

PREPARED BY

DIVISION 2
LOCATION AND SURVEYS UNIT
2807 NEUSE BLVD
OFFICE No.7
NEW BERN, NC 28562

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP2.R004	EC-1	

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

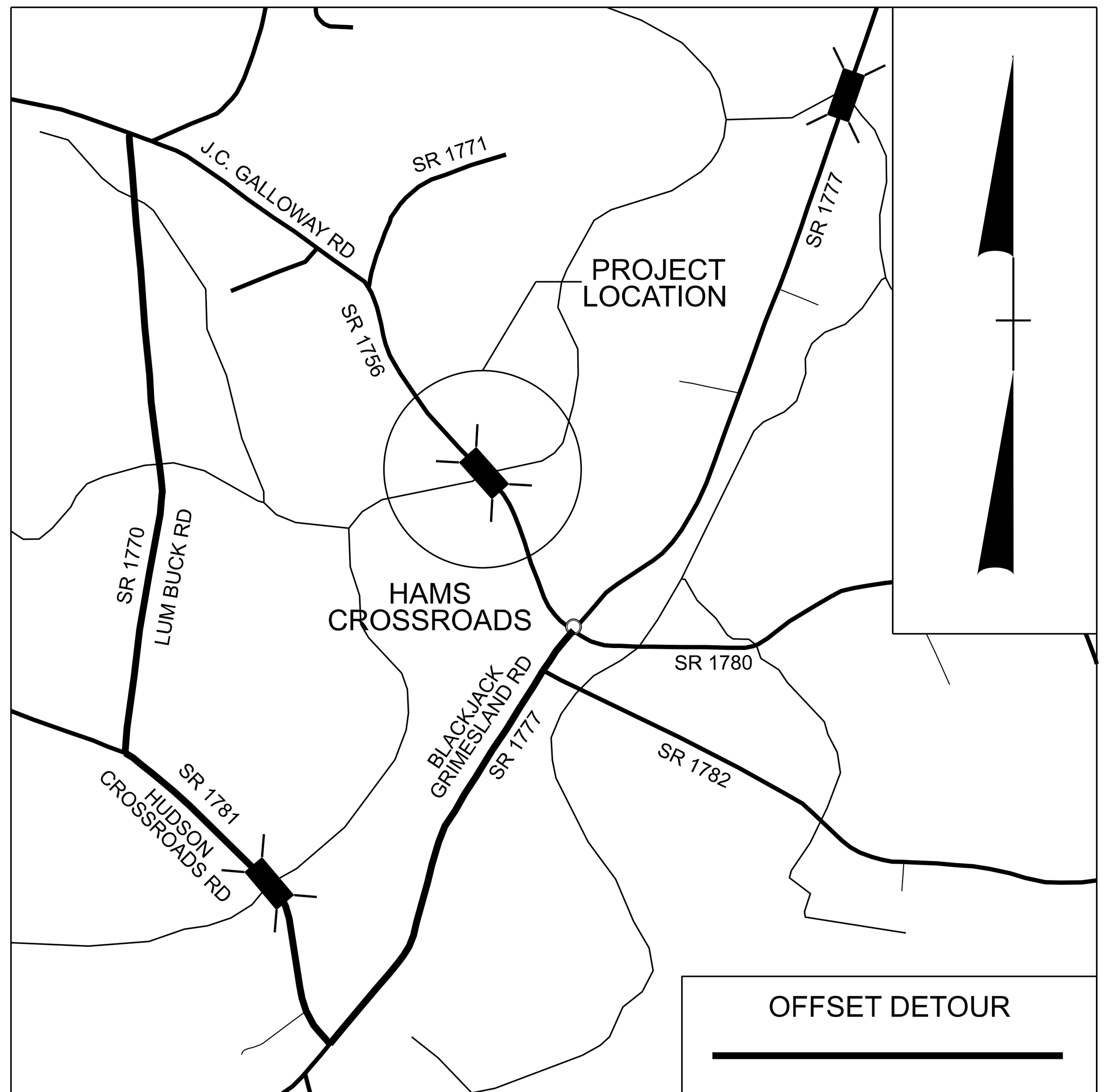
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

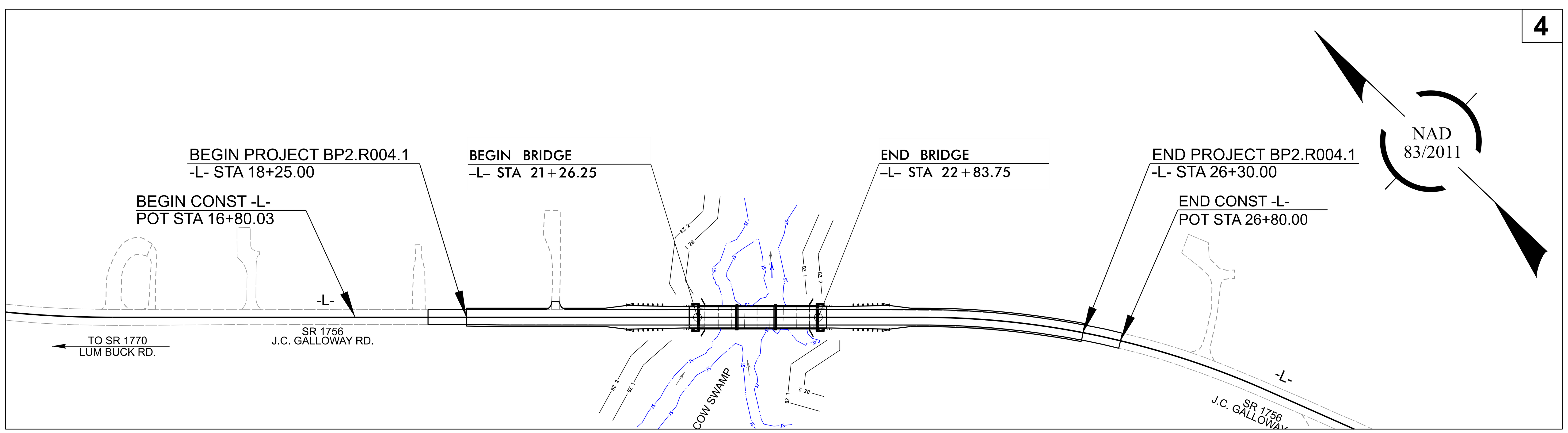
PITT COUNTY

LOCATION: BRIDGE NO. 730006 ON SR 1756 (J.C. GALLOWAY RD) OVER COW SWAMP

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE



VICINITY MAP (NTS)



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

ENVIRONMENTALLY SENSITIVE AREA(S) EXIST ON THIS PROJECT

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

GRAPHIC SCALE

50 25 0 40 100

PLANS

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE APPLICABLE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT 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 Fayetteville St.,
Suite 1500
Raleigh, NC 27601
(919)882-7839

Designed by:

JOHN MCNULTY, EI — ***4263***

NAME — LEVEL III CERTIFICATION NO.

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 2024 and the latest revison thereto are applicable to this project and by reference hereby are considered a part of these plans.

PROJECT REFERENCE NO.	SHEET NO.
BP2.R004	EC-2
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

EROSION & SEDIMENT CONTROL LEGEND

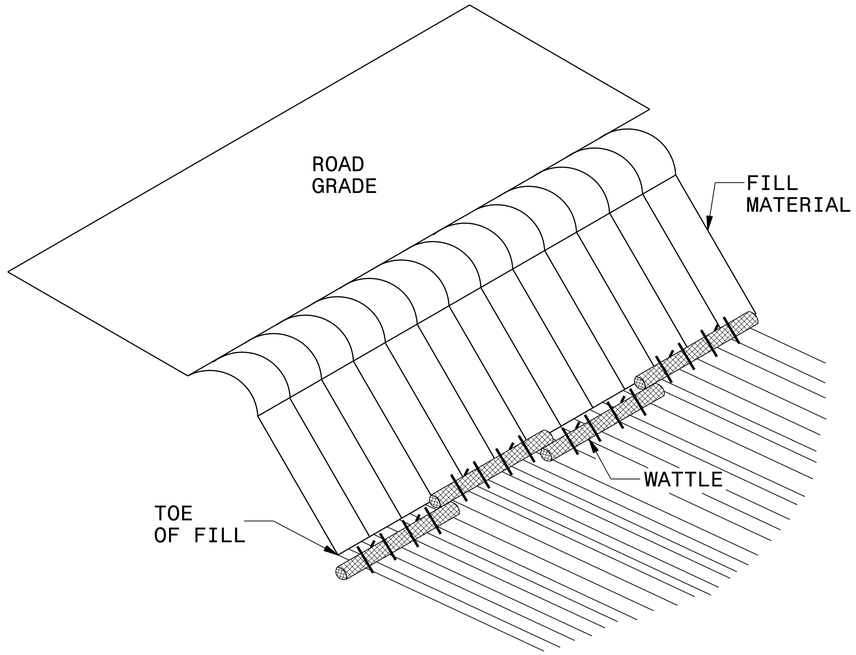
Std. #	Description	Symbol
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
1630.02	Silt Basin Type B	
1630.03	Temporary Silt Ditch	TSD
1630.04	Stilling Basin	
1630.05	Temporary Diversion	TD
1630.06	Special Stilling Basin	
1630.07	Skimmer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

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

5/26/20

PROJECT REFERENCE NO.	SHEET NO.
BP2.R004	EC-2A
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.

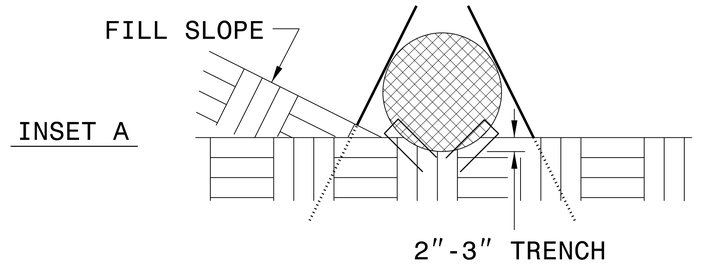
USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

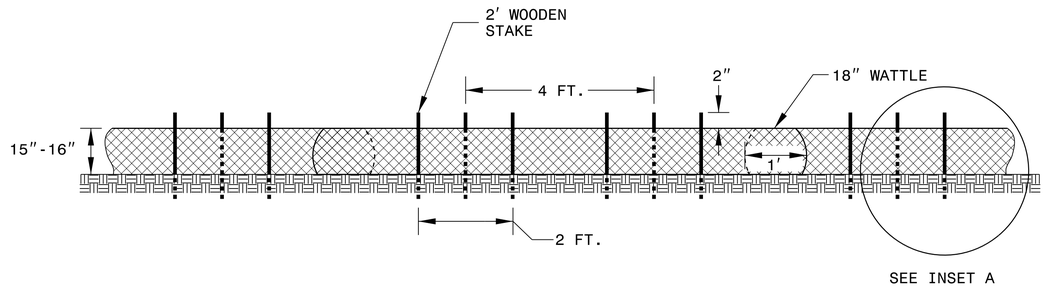
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO GROUND.

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

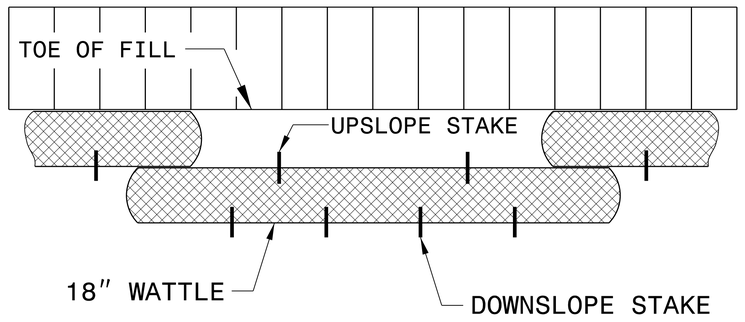
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

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





FRONT VIEW

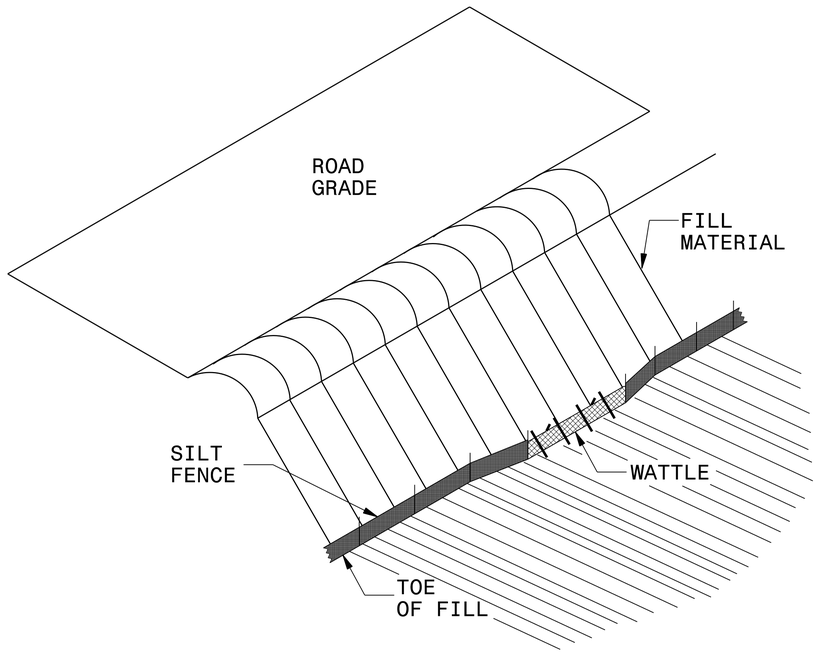


TOP VIEW

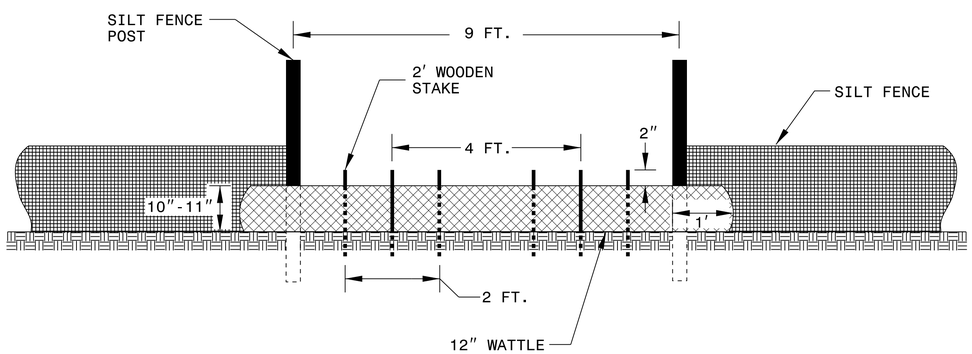
5/26/20

PROJECT REFERENCE NO.	SHEET NO.
BP2.R004	EC-2B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SILT FENCE COIR FIBER WATTLE BREAK DETAIL



ISOMETRIC VIEW



VIEW FROM SLOPE

NOTES:

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

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

DO NOT PLACE WATTLE ON TOE OF SLOPE.

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

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

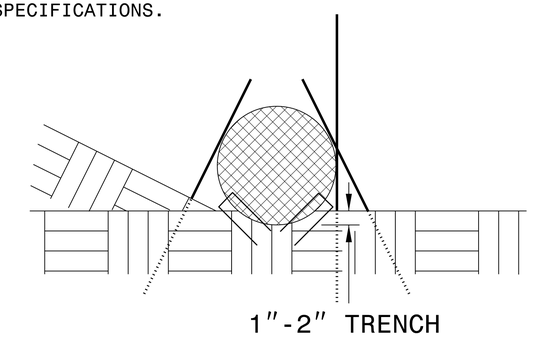
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

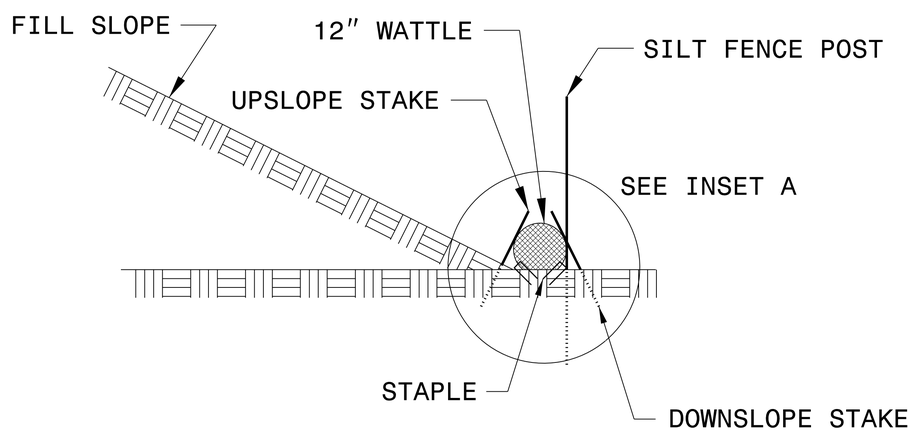
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

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

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

INSET A

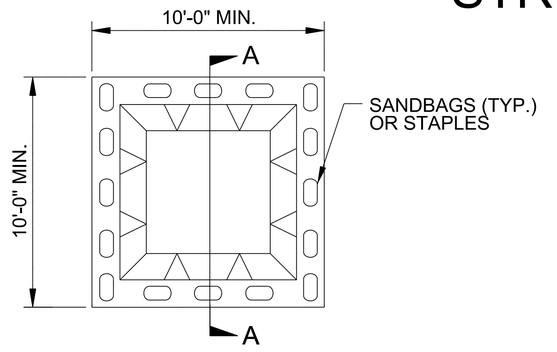




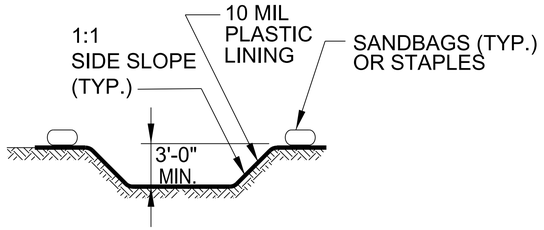
SIDE VIEW

PROJECT REFERENCE NO.	SHEET NO.
BP2.R004	EC-2C
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

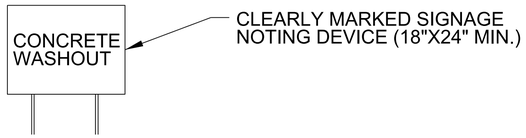
ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER



PLAN



SECTION A-A



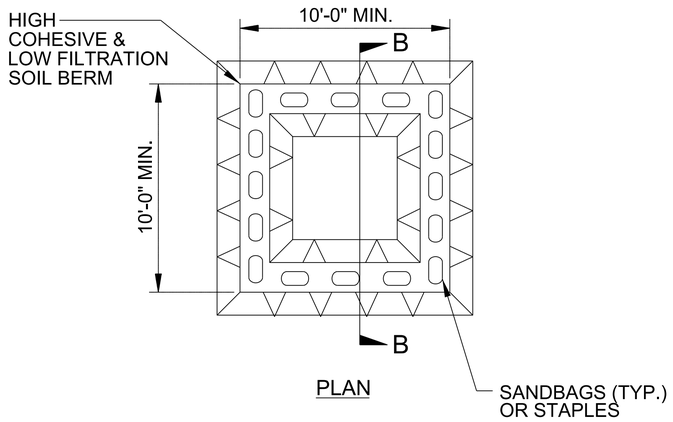
NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

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

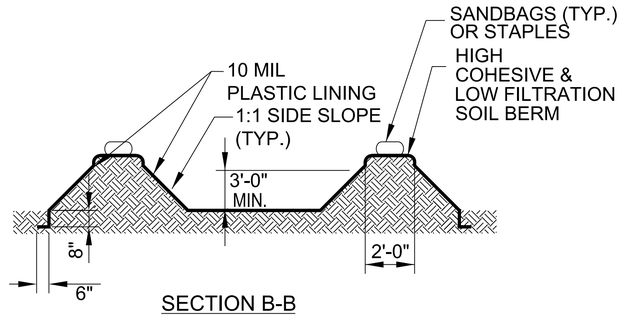
3.CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARY MARKED WITH SIGNAGE NOTING DEVICE.

BELOW GRADE WASHOUT STRUCTURE

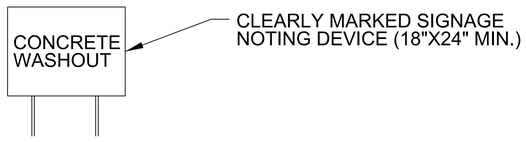
NOT TO SCALE



PLAN



SECTION B-B



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ABOVE GRADE WASHOUT STRUCTURE

NOT TO SCALE

5/26/20

PROJECT REFERENCE NO.	SHEET NO.
BP2.R004	EC-3A
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

SITE DESCRIPTION	STABILIZATION TIME	TIMEFRAME EXCEPTIONS
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES 3:1 TO 4:1	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH WITH SLOPES STEEPER THAN 4:1. 7 DAYS FOR PERIMETER DIKES, SWALES, DITCHES PERIMETER SLOPES, AND HQW ZONES
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	7 DAYS FOR PERIMETER DIKES, SWALES, DITCHES PERIMETER SLOPES, AND HQW ZONES

5/26/20

PROJECT REFERENCE NO.	SHEET NO.
BP2.R004	EC-3B

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION SUMMARY SHEET

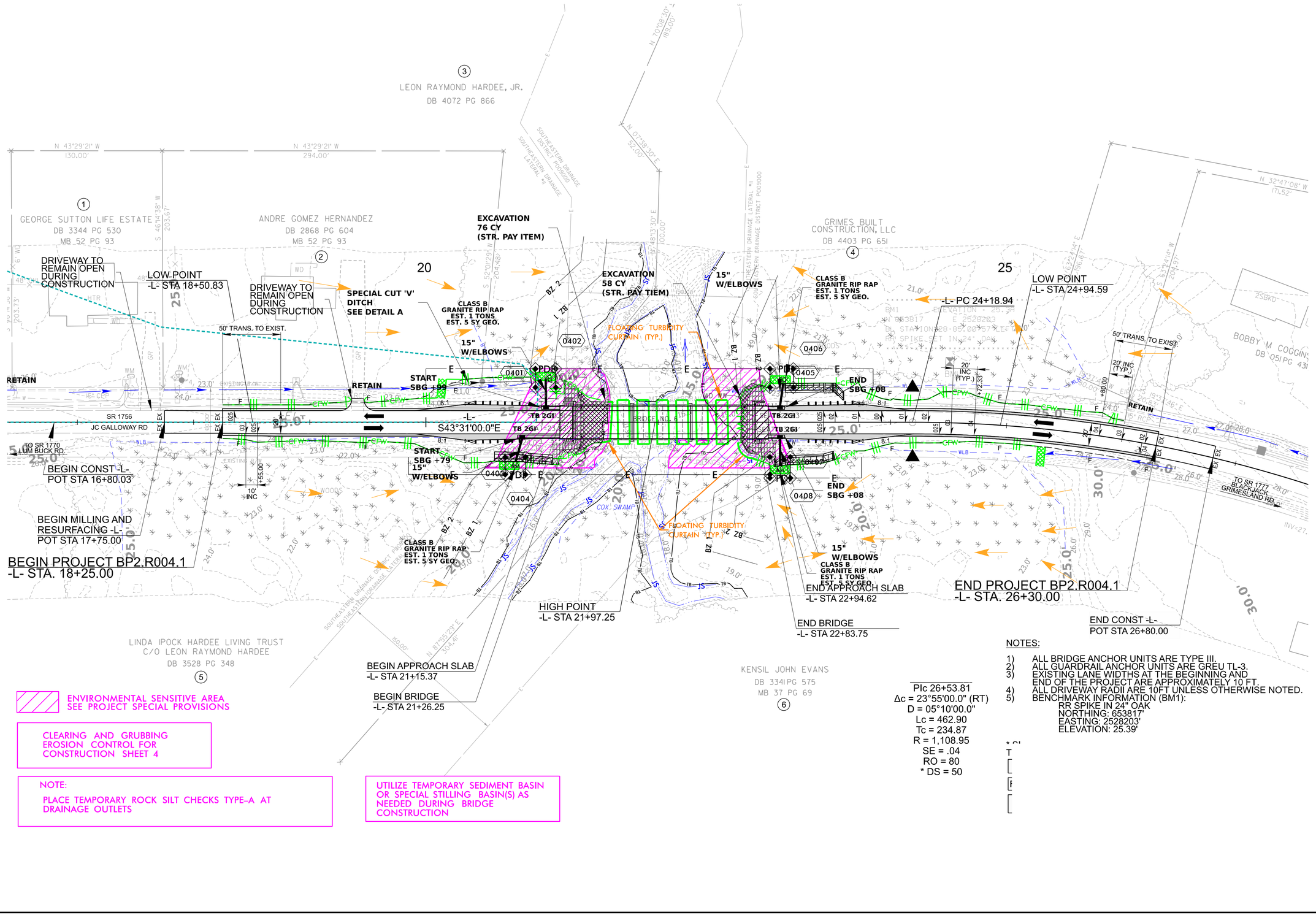
PERMANENT SOIL REINFORCEMNT MAT

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4					
				SUBTOTAL	0
				ADDITIONAL PSRM TO BE INSTALLED	0
				TOTAL	0
				SAY	0

MATTING FOR EROSION CONTROL (STRAW)

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	L	20+10	20+90	LT	185
				SUBTOTAL STRAW MATTING	185
				MISCELLANEOUS MATTING TO BE INSTALLED	2000
				TOTAL	2185
				SAY	2185

5/26/20



ENVIRONMENTAL SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 4

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

UTILIZE TEMPORARY SEDIMENT BASIN OR SPECIAL STILLING BASIN(S) AS NEEDED DURING BRIDGE CONSTRUCTION

NOTES:

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) ALL DRIVEWAY RADII ARE 10FT UNLESS OTHERWISE NOTED.
5) BENCHMARK INFORMATION (BM1):
   RR SPIKE IN 24" OAK
   NORTHING: 653817'
   EASTING: 2528203'
   ELEVATION: 25.39'

BP2.R004.1
EC-4/CONST. 4

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
PITT COUNTY

HIGHWAY DIVISION 2

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

BP2.R004.1

EC-5/CONST. 4

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
PITT COUNTY

HIGHWAY DIVISION 2

PREPARED BY

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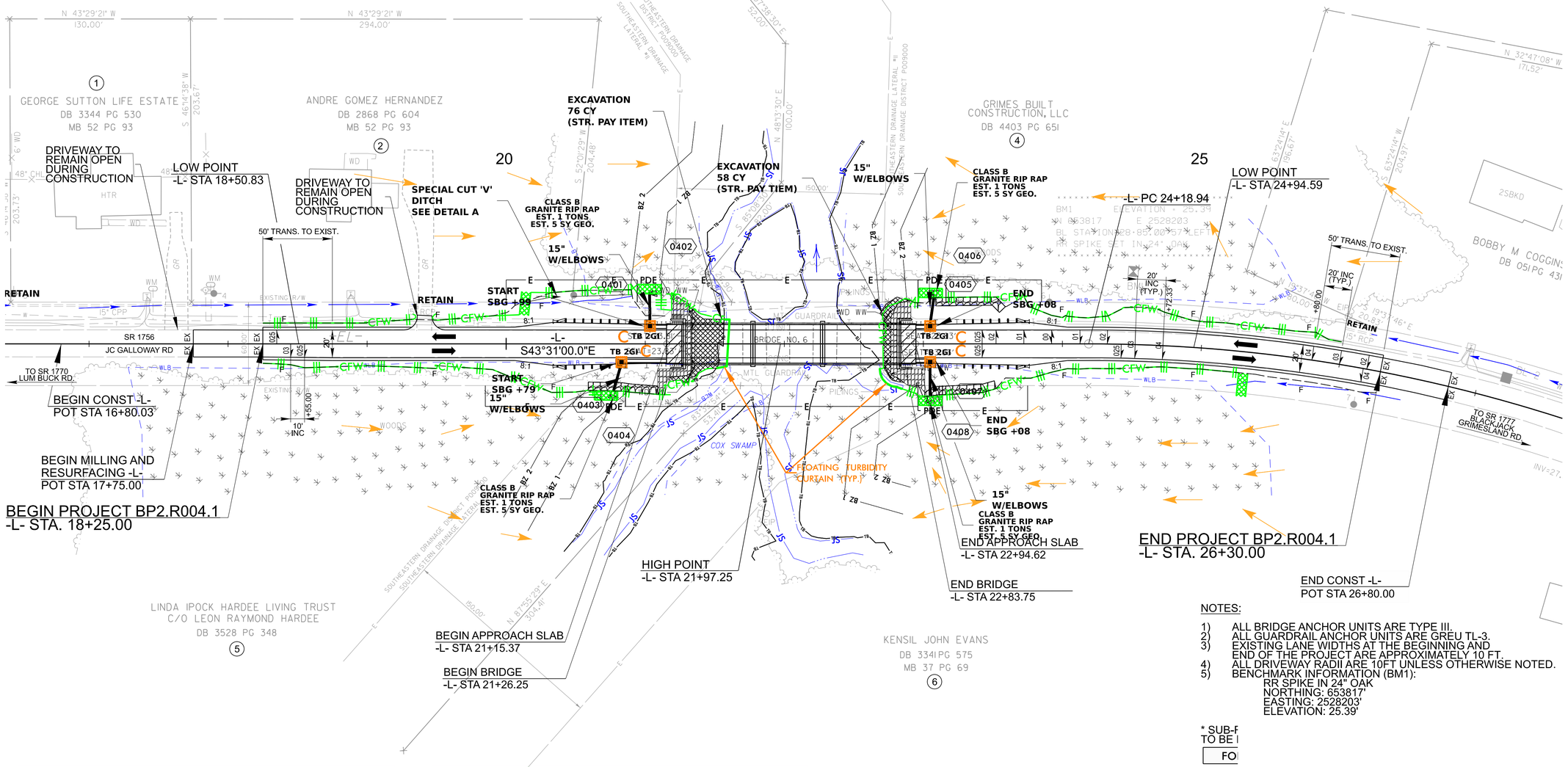
REVISIONS



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   NORTHING: 653817'
   EASTING: 2528203'
   ELEVATION: 25.39'

* SUB-F
TO BE I

FO

FOR S

NOTE:

PLACE TEMPORARY ROCK SILT CHECKS TYPE-A AT DRAINAGE OUTLETS

Place PSRM for Erosion Control on Slope as Work Allows.

-L-

20+00 TO 21+14 LT
20+00 TO 21+14 RT
22+93 TO 23+76 LT
22+93 TO 23+76 RT

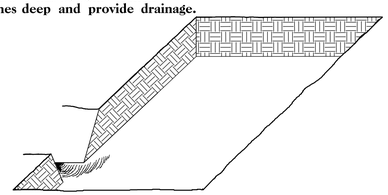
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP2.R004	RF–1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	

PLANTING DETAILS

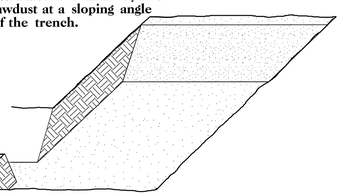
SEEDLING / LINER 3AREROOT PLANTING DETAIL

HEALING IN

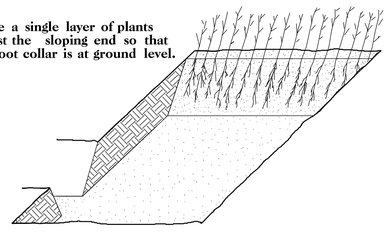
1. Locate a healing–in site in a shady, well protected area.
2. Excavate a flat bottom trench 12 inches deep and provide drainage.



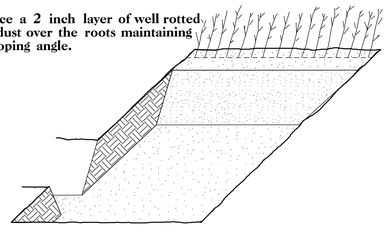
3. 3ackfill the trench with 2 inches well rotted sawdust. Place a 2 inch layer of well rotted sawdust at a sloping angle at one end of the trench.



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

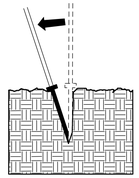


5. Place a 2 inch layer of well rotted sawdust over the roots maintaining a sloping angle.

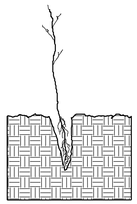


6. Repeat layers of plants and sawdust as necessary and water thoroughly.

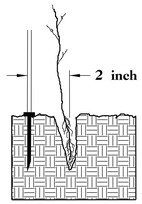
DI33LE PLANTING METHOD
USING THE K3C PLANTING 3AR



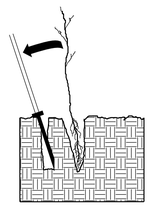
1. Insert planting bar as shown and pull handle toward planter.



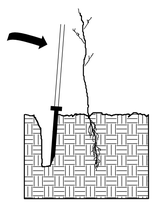
2. Remove planting bar and place seedling at correct depth.



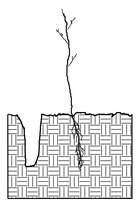
3. Insert planting bar 2 inches toward planter from seedling.



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



5. Push handle forward firming soil at top.



6. Leave compaction hole open. Water thoroughly.

PLANTING NOTES:

PLANTING 3AG
During planting, seedlings shall be kept in a moist canvas bag or similar container to prevent the root systems from drying.

K3C PLANTING 3AR
Planting bar shall have a blade with a triangular cross section, and shall be 12 inches long, 4 inches wide and 1 inch thick at center.

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

REFORESTATION

☐ TREE REFORESTATION SHALL 3E PLANTED 6 FT. TO 10 FT. ON CENTER, RANDOM SPACING, AVERAGING 8 FT. ON CENTER, APPROXIMATELY 680 PLANTS PER ACRE.

REFORESTATION

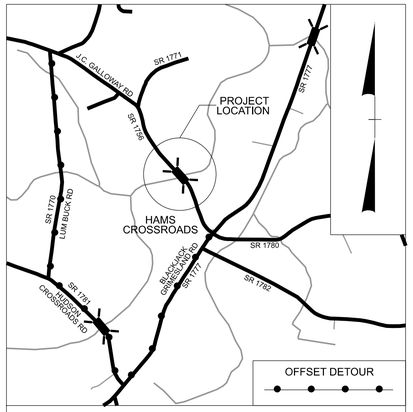
MIXTURE, TYPE, SIZE, AND FURNISH SHALL CONFORM TO THE FOLLOWING:

25% LIRIODENDRON TULIPIFERA	TULIP POPLAR	12 in – 18 in 3R
25% PLATANUS OCCIDENTALIS	AMERICAN SYCAMORE	12 in – 18 in 3R
25% FRAXINUS PENNSYLVANICA	GREEN ASH	12 in – 18 in 3R
25% 3ETULA NIGRA	RIVER 3IRCH	12 in – 18 in 3R

REFORESTATION DETAIL SHEET

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

PROJECT: BP2.R004.1



VICINITY MAP (NTS)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PITT COUNTY

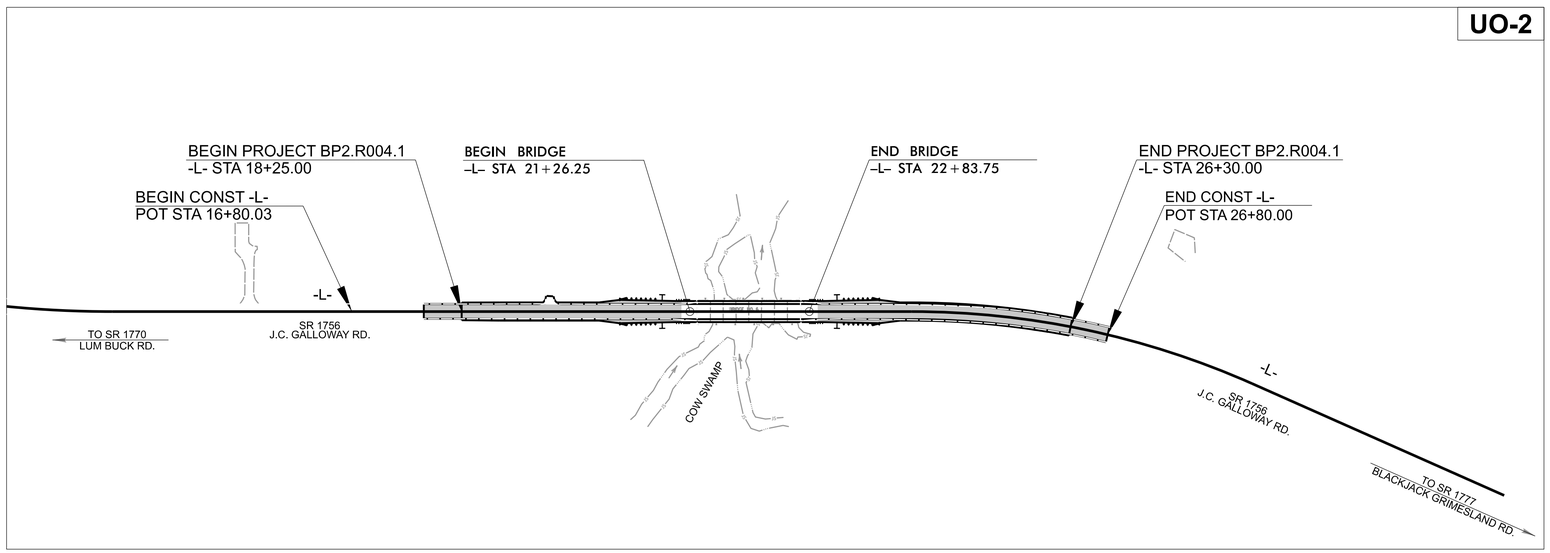
LOCATION: *BRIDGE NO. 730006 ON SR 1756*
(J.C. GALLOWAY RD) OVER COW SWAMP
TYPE OF WORK: *UTILITIES BY OTHERS*

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP2.R004.1	UO-1	2

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.

NAD 83/2011

UO-2



GRAPHIC SCALES

40 20 0 40 80
PLANS

INDEX OF SHEETS

SHEET:	DESCRIPTION:
UO–1	TITLE SHEET
UO–2	UBO PLAN SHEET

UTILTITY OWNERS WITH CONFLICTS

(A) COMMUNICATIONS: BRIGHTSPEED
(B) ELECTRICITY: GREENVILLE UTILITIES COMMISSION

KCA KISINGER CAMPO & ASSOCIATES

PREPARED IN THE OFFICE OF
NC FIRM LICENSE NO: C–1506
301 FAYETTVILLE ST. SUITE 1500
RALEIGH, NC 27601
PHONE (919)882–7839

SCOTT BETZ, PE — CONSULTANT CONTACT #1
REBECCA HILL — CONSULTANT CONTACT #2
CHRISTIAN SHUPING — CONSULTANT CONTACT #3

DIVISION OF HIGHWAYS
UTILITIES UNIT
209 S. GLENBURNIE ROAD
NEW BERN, NC 28560
PHONE (252) 649–6509

DAVID KRAMER — UTILITIES ENGINEER

UTILITY BY OTHERS

BP2.R004.1	
UO	2

THIS SHEET CORRESPONDS TO RDY-04

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
PITT COUNTY

UTILITIES UNIT

UTILITY BY OTHERS
PLANS ONLY

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

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

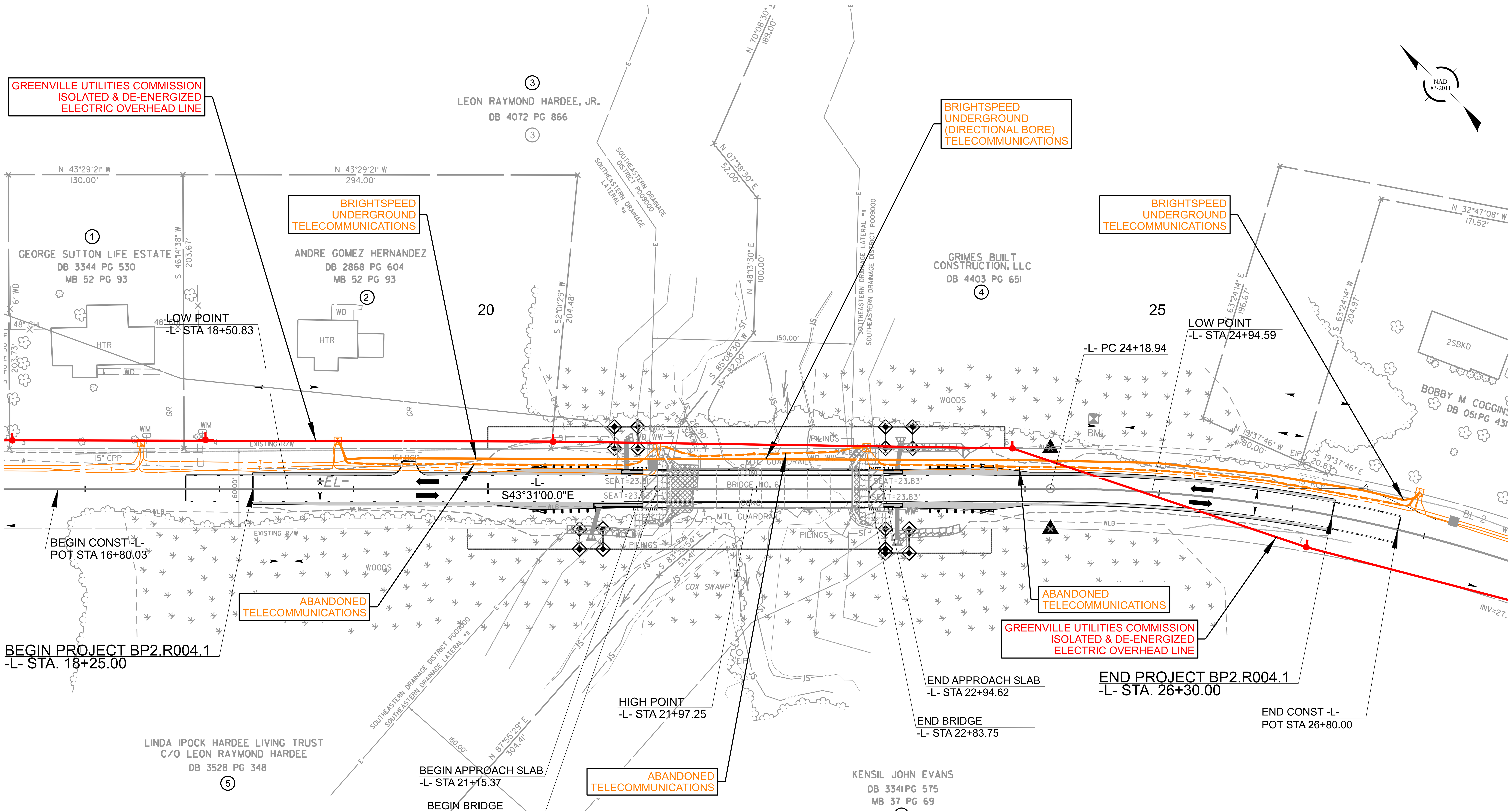
DESIGNED BY:	CAS
DRAWN BY:	CAS
CHECKED BY:	SAB
APPROVED BY:	
REVISED:	

PREPARED BY:

KISINGER CAMPO & ASSOCIATES

NC FIRM LICENSE NO: C-1506
301 FAYETTEVILLE STREET,
SUITE 1500
RALEIGH, NC 27601
(919) 882-7839

REVISIONS



GREENVILLE UTILITIES COMMISSION
ISOLATED & DE-ENERGIZED
ELECTRIC OVERHEAD LINE
LEON RAYMOND HARDEE, JR.
DB 4072 PG 866
N 43°29'21" W
130.00'
N 43°29'21" W
294.00'
BRIGHTSPEED
UNDERGROUND
TELECOMMUNICATIONS
GEORGE SUTTON LIFE ESTATE
DB 3344 PG 530
MB 52 PG 93
ANDRE GOMEZ HERNANDEZ
DB 2868 PG 604
MB 52 PG 93
LOW POINT
-L- STA 18+50.83
20
BRIGHTSPEED
UNDERGROUND
(DIRECTIONAL BORE)
TELECOMMUNICATIONS
GRIMES BUILT
CONSTRUCTION, LLC
DB 4403 PG 651
25
LOW POINT
-L- STA 24+94.59
-L- PC 24+18.94
BOBBY M COGGINS
DB 051 PG 431
NAD 83/2011
-L-
S43°31'00.0"E
BRIDGE NO. 6
PILINGS
WOODS
COX SWAMP
BEGIN CONST -L-
POT STA 16+80.03
ABANDONED
TELECOMMUNICATIONS
BEGIN PROJECT BP2.R004.1
-L- STA. 18+25.00
END APPROACH SLAB
-L- STA 22+94.62
END BRIDGE
-L- STA 22+83.75
END PROJECT BP2.R004.1
-L- STA. 26+30.00
END CONST -L-
POT STA 26+80.00
HIGH POINT
-L- STA 21+97.25
BEGIN APPROACH SLAB
-L- STA 21+15.37
BEGIN BRIDGE
-L- STA 21+26.25
LINDA IPOCK HARDEE LIVING TRUST
C/O LEON RAYMOND HARDEE
DB 3528 PG 348
KENSIL JOHN EVANS
DB 3341 PG 575
MB 37 PG 69
SOUTHEASTERN DRAINAGE DISTRICT P009000

CONTACT:
BRIGHTSPEED
- RYAN MESIMER - (980) 376-1539

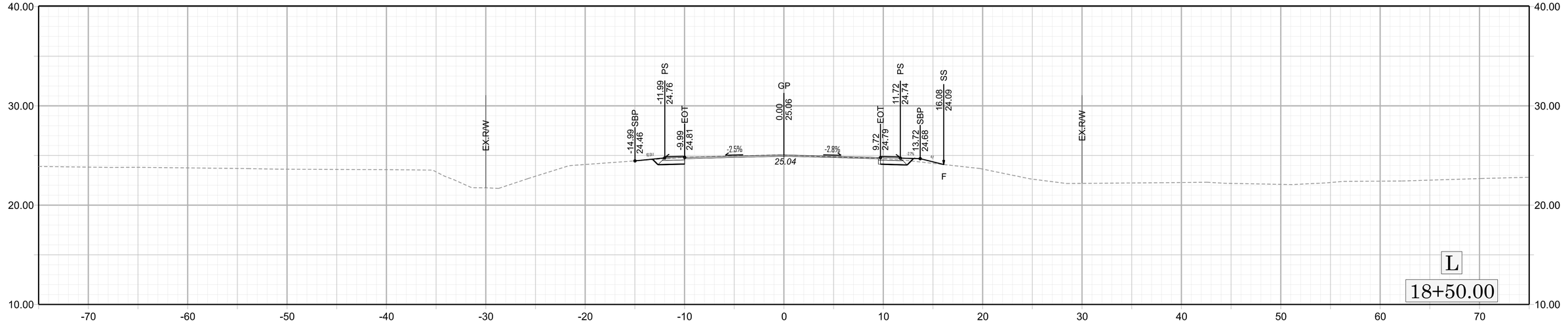
CONTACT:
GREENVILLE UTILITIES COMMISION
- JACOB BARNES - (252) 329-2155

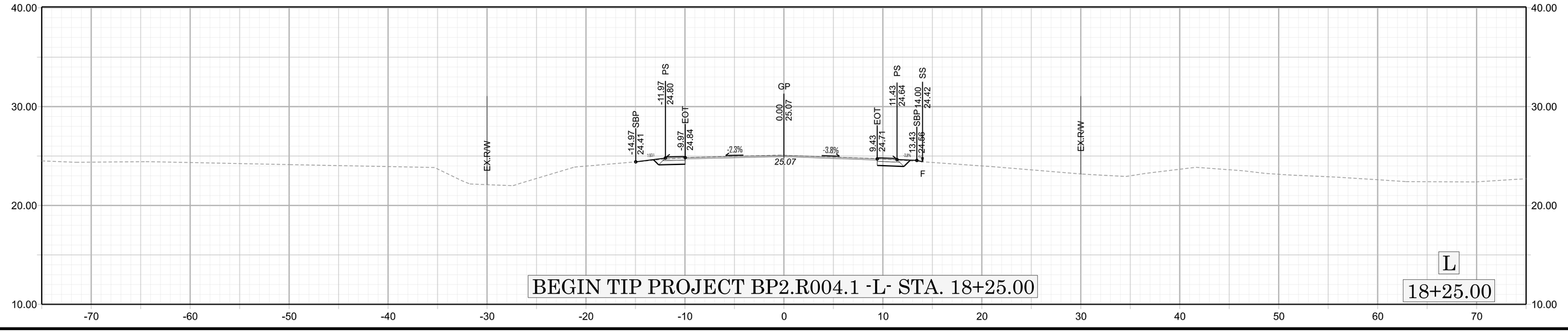
DE-ENERGIZATION TIMELINE
GREENVILLE UTILITIES COMMISION WILL NEED A (4) WEEK NOTICE TO ORDER AND SCHEDULE ISOLATION AND DE-ENERGIZATION OF OVERHEAD ELECTRIC LINES

5/26/20

0 5 10

BP2.R004.1
X I 01



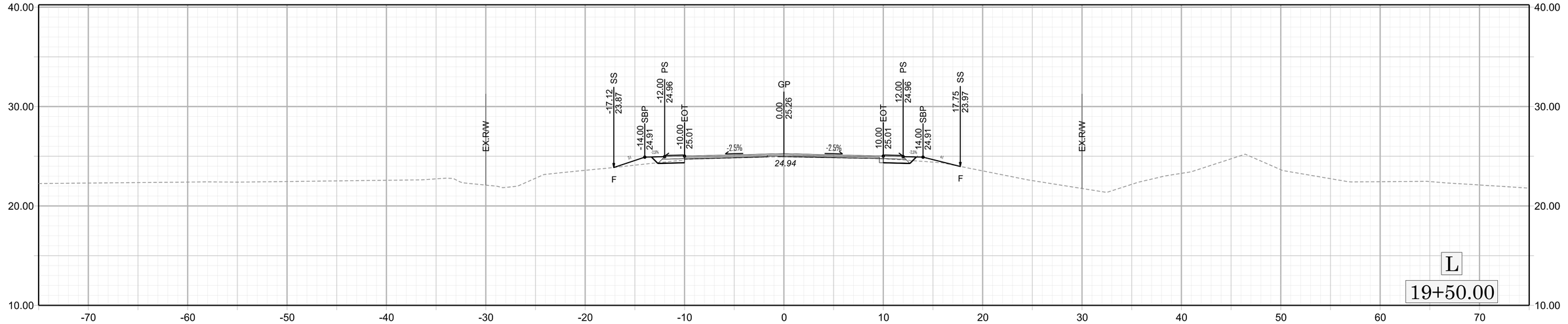


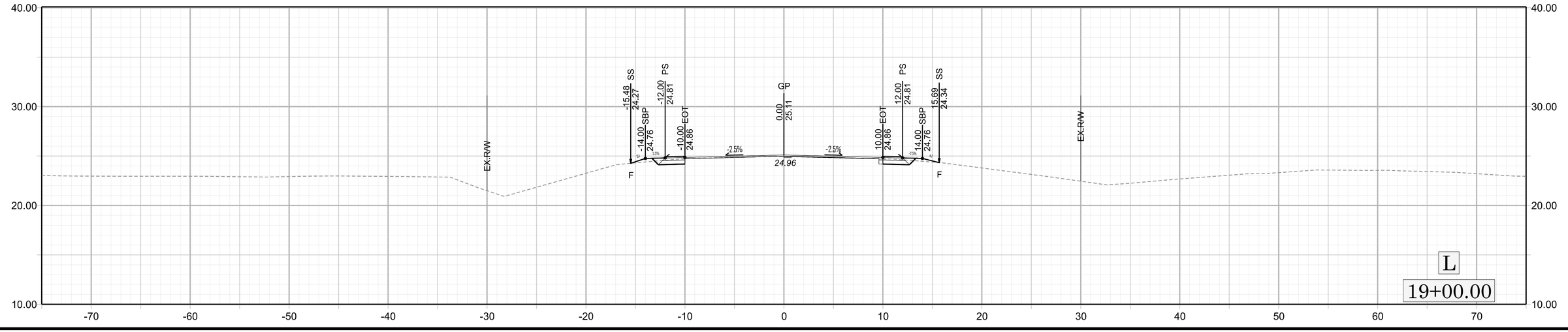
BEGIN TIP PROJECT BP2.R004.1 -L- STA. 18+25.00

5/26/20

0 5 10

BP2.R004.1
X | 02

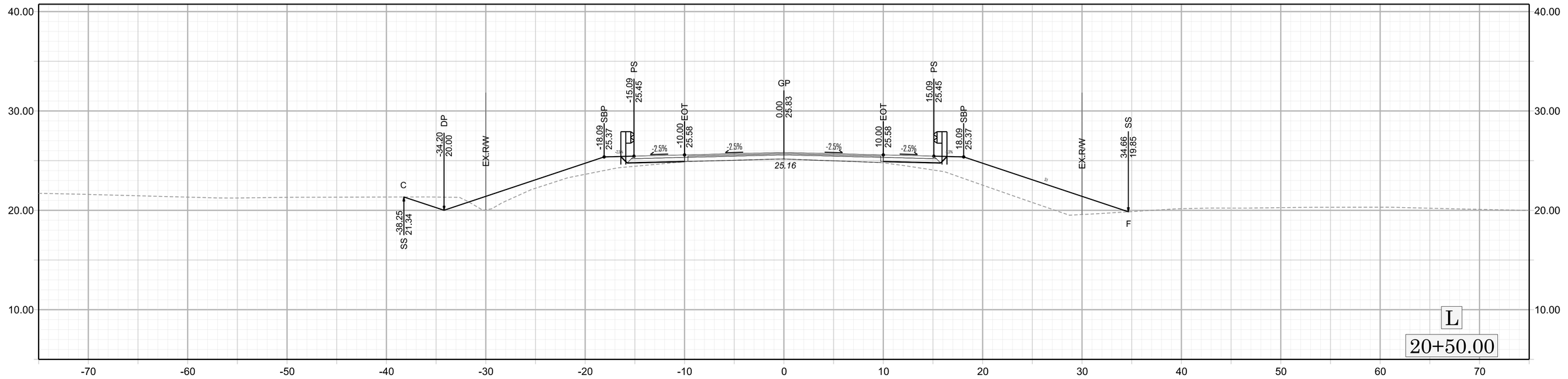


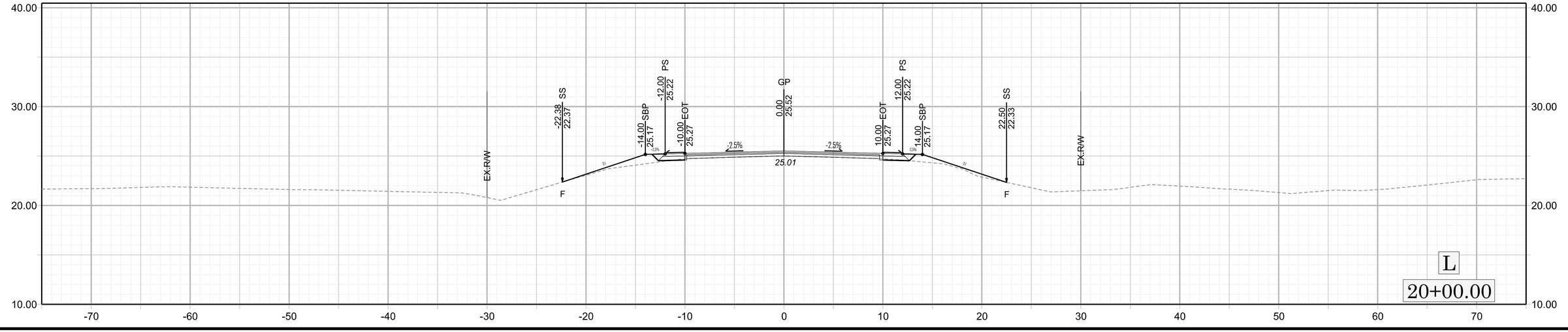


5/26/20

0 5 10

BP2.R004.1
X | 03

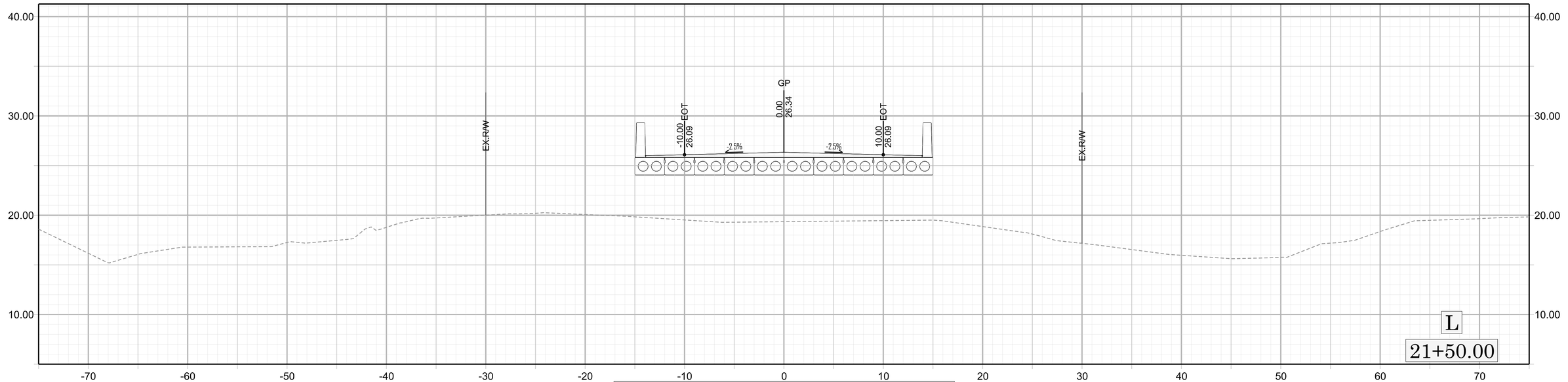




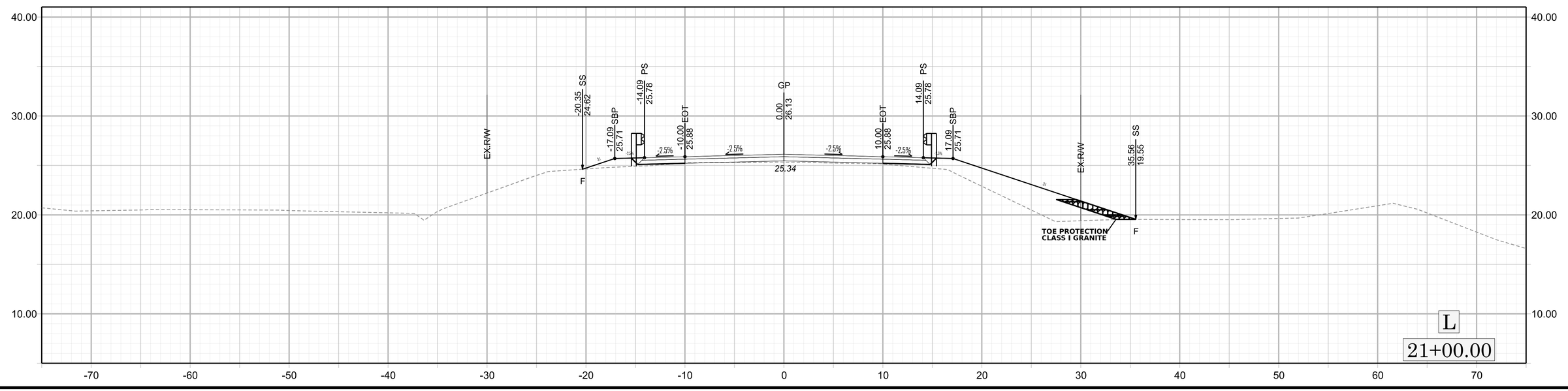
5/26/20

0 5 10

BP2.R004.1
X | 04



BEGIN BRIDGE -L- STA. 21+26.25

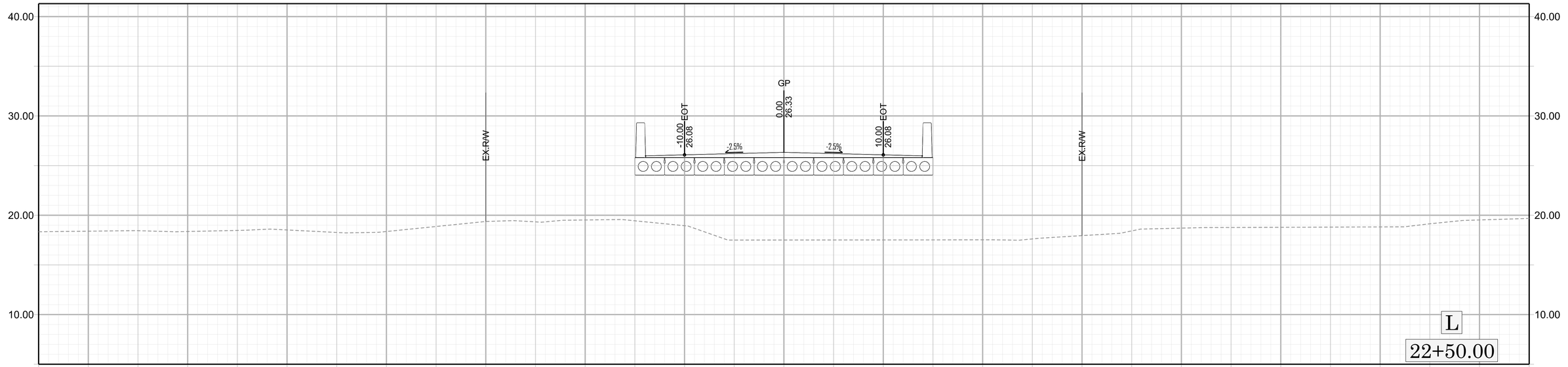


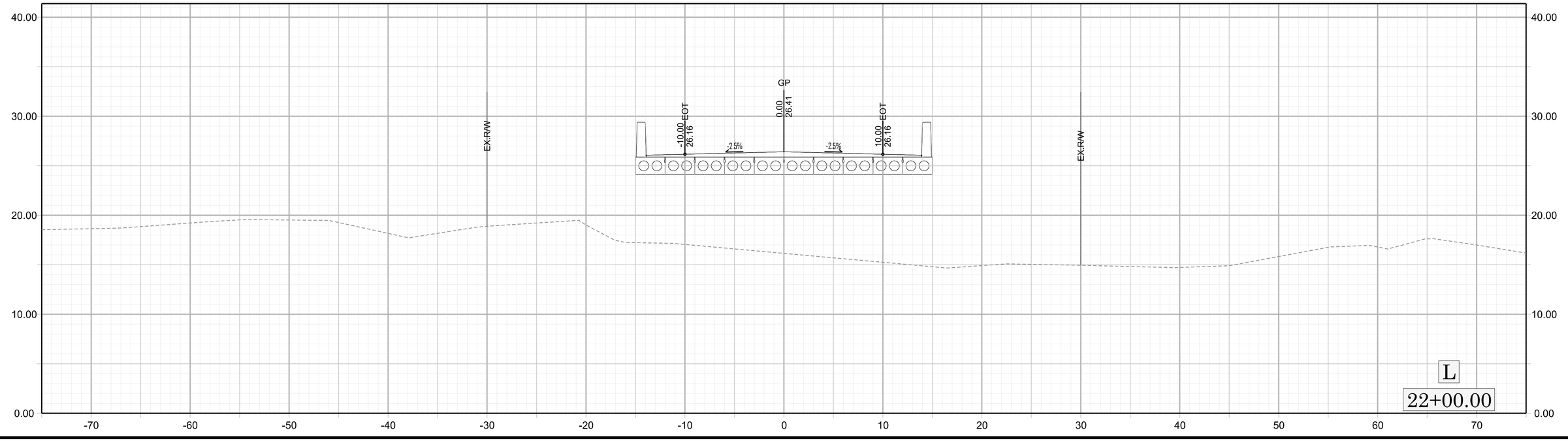
5/26/20

0 5 10

BP2.R004.1
X | 05

END BRIDGE -L- STA. 22+83.75

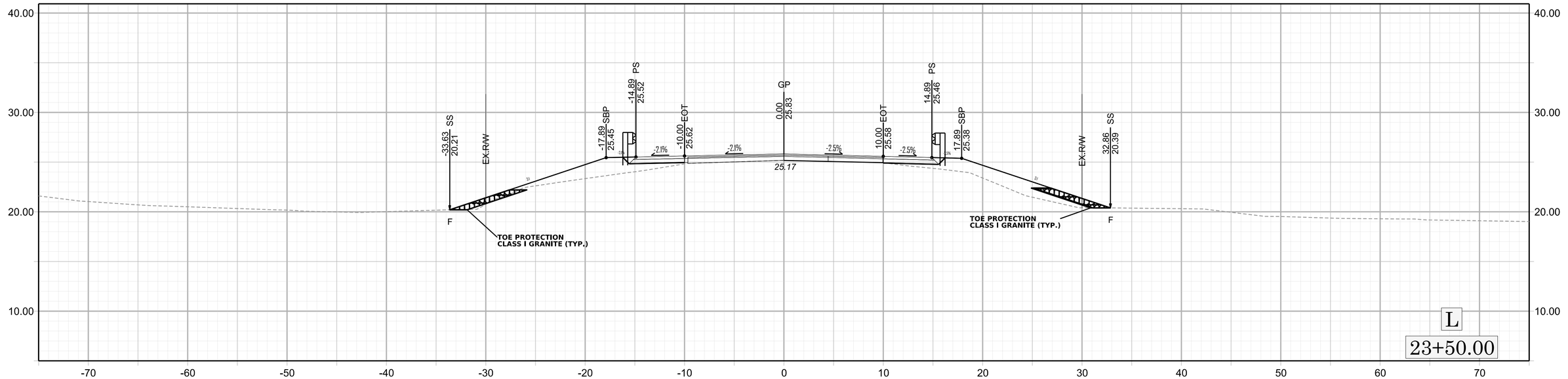


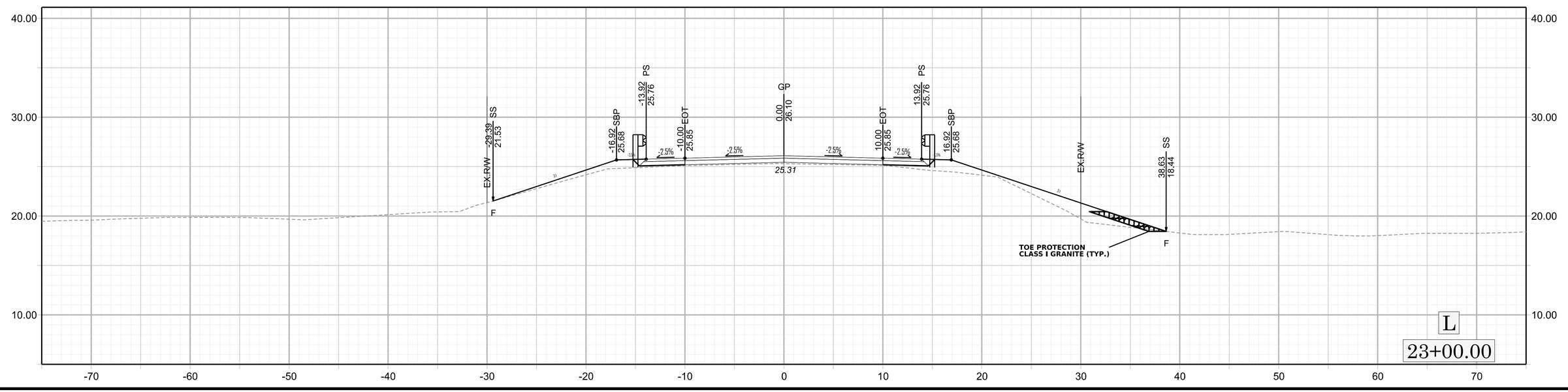


5/26/20

0 5 10

BP2.R004.1
X | 06

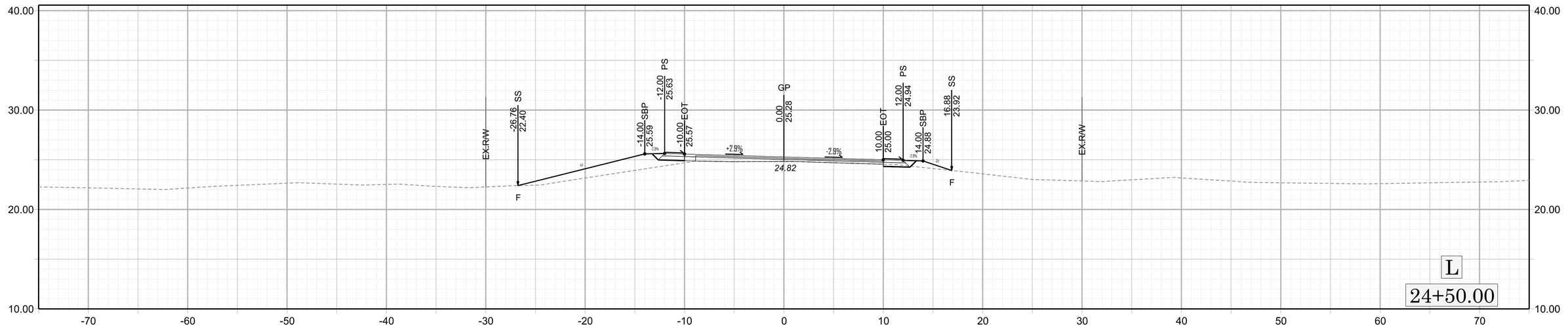


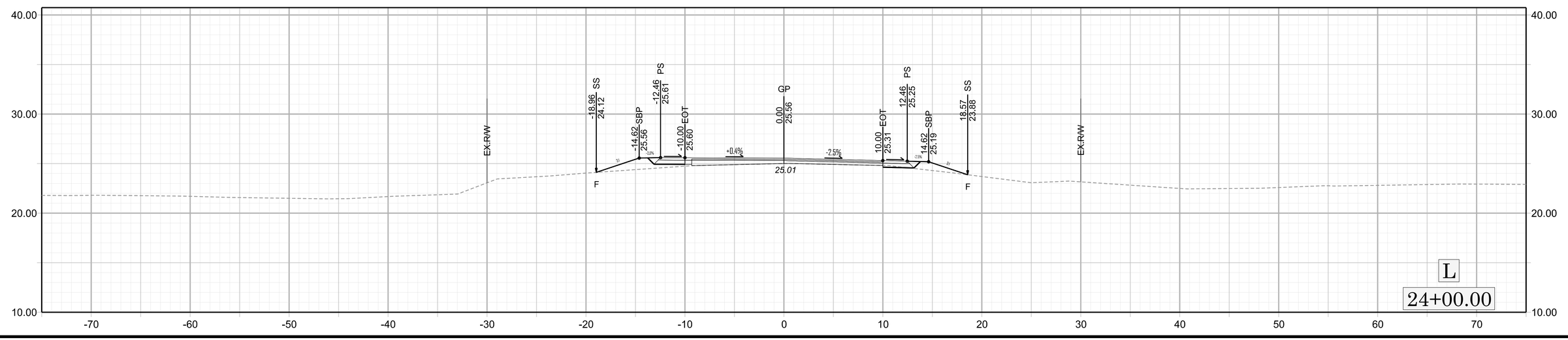


5/26/20

0 5 10

BP2.R004.1
X 07

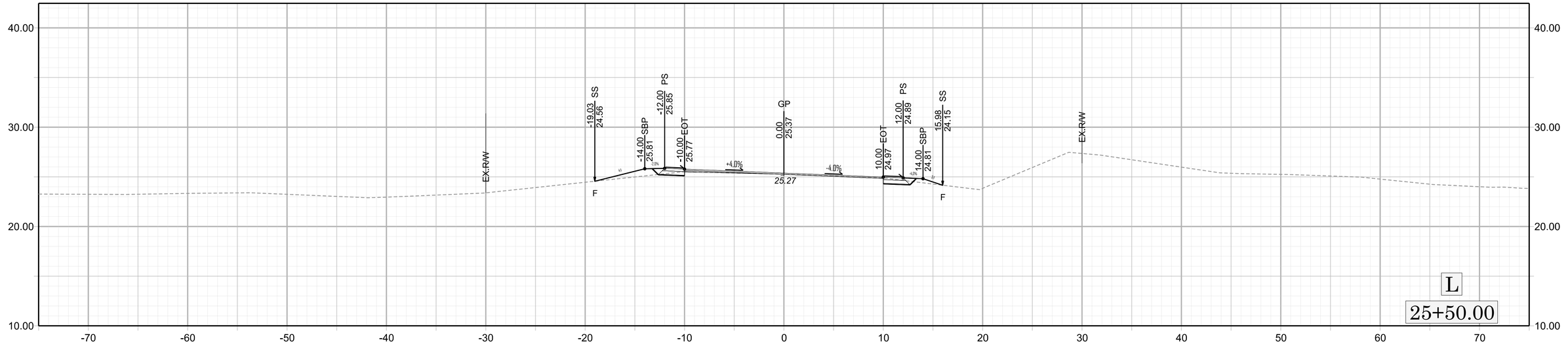


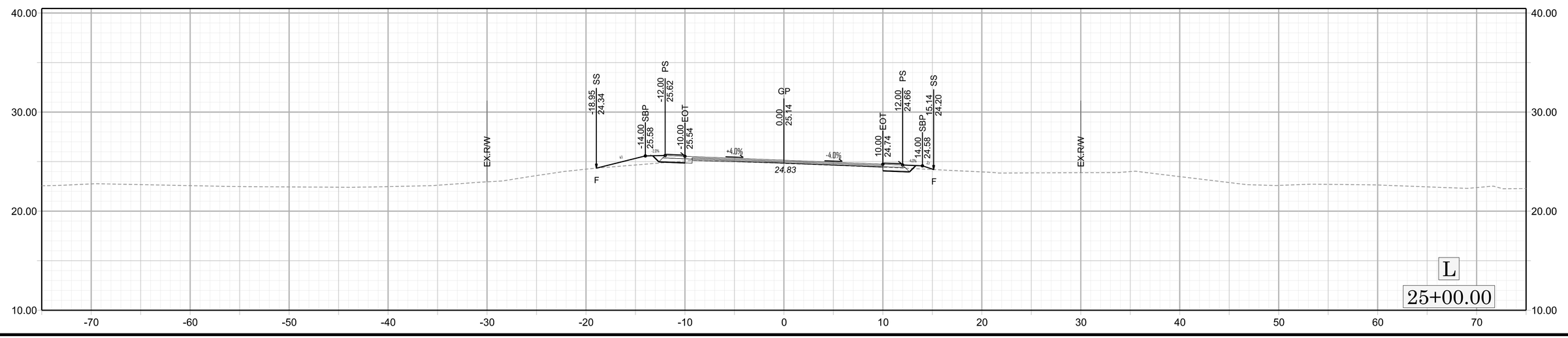


5/26/20

0 5 10

BP2.R004.1
X | 08



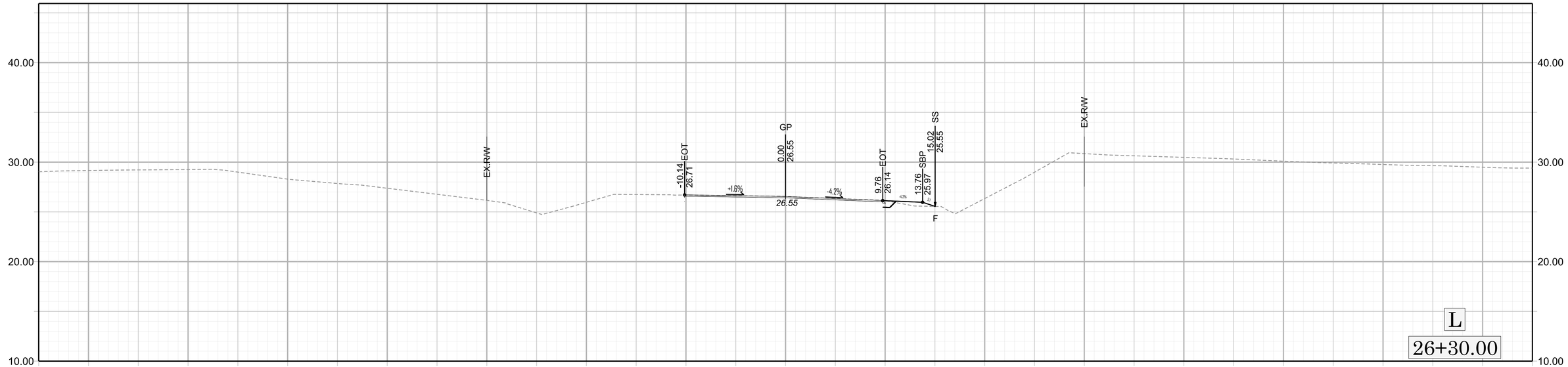


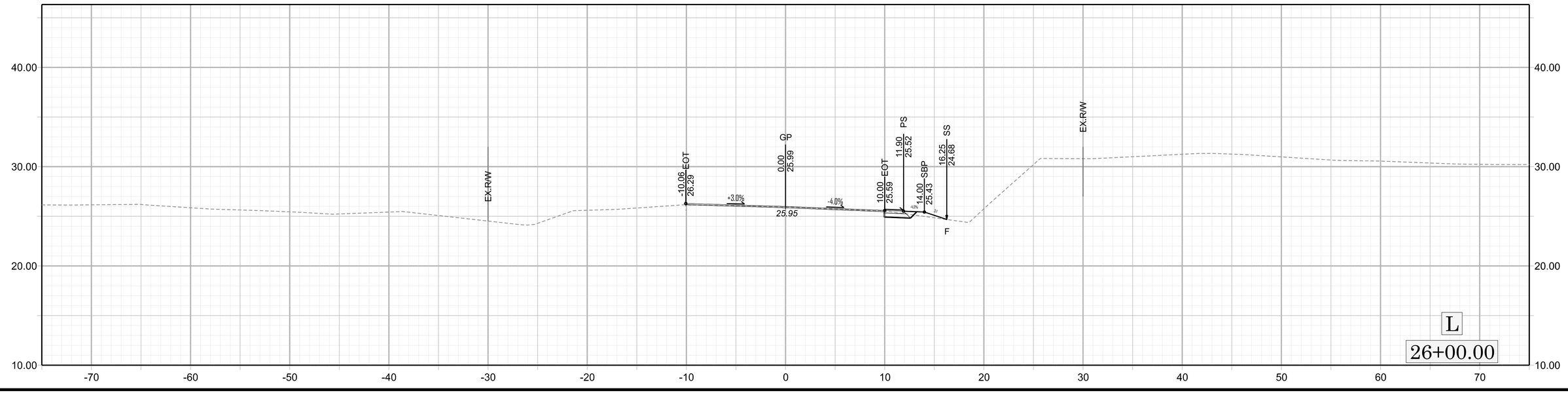
5/26/20

0 5 10

BP2.R004.1
X | 09

END TIP PROJECT BP2.R004.1 -L- STA. 26+30.00

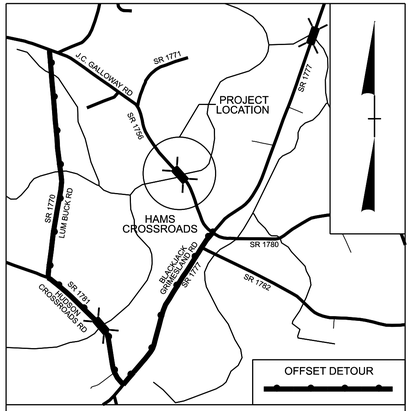




PROJECT: BP2.R004.1

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP2.R004.1	1	20

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
BP2.R004.1	–	P.E.
BP2.R004.3	–	CONST.



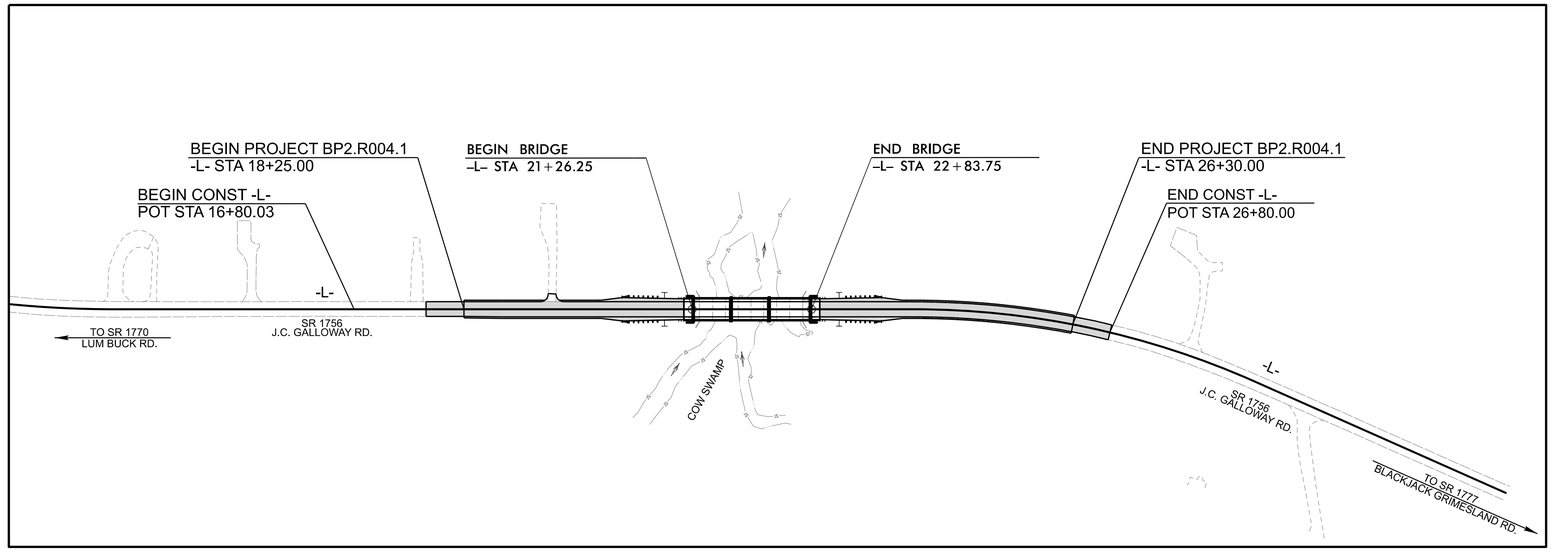
VICINITY MAP (NTS)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PITT COUNTY

LOCATION: BRIDGE NO. 730006 ON SR 1756 (J.C. GALLOWAY RD.) OVER COW SWAMP

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



NAD 83/2011

STRUCTURES

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DESIGN DATA

ADT (2020) = 750
ADT (2043) = –
K = N/A %
D = N/A %
T = 6 % *
V = 60 MPH
* (TTST = 3%, DUAL = 3 %)

FUNC CLASS = RURAL LOCAL

SUB–REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY PROJECT BP2.R004.1 = 0.122 MILES
LENGTH STRUCTURE PROJECT BP2.R004.1 = 0.030 MILES

TOTAL LENGTH PROJECT BP2.R004.1 = 0.152 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

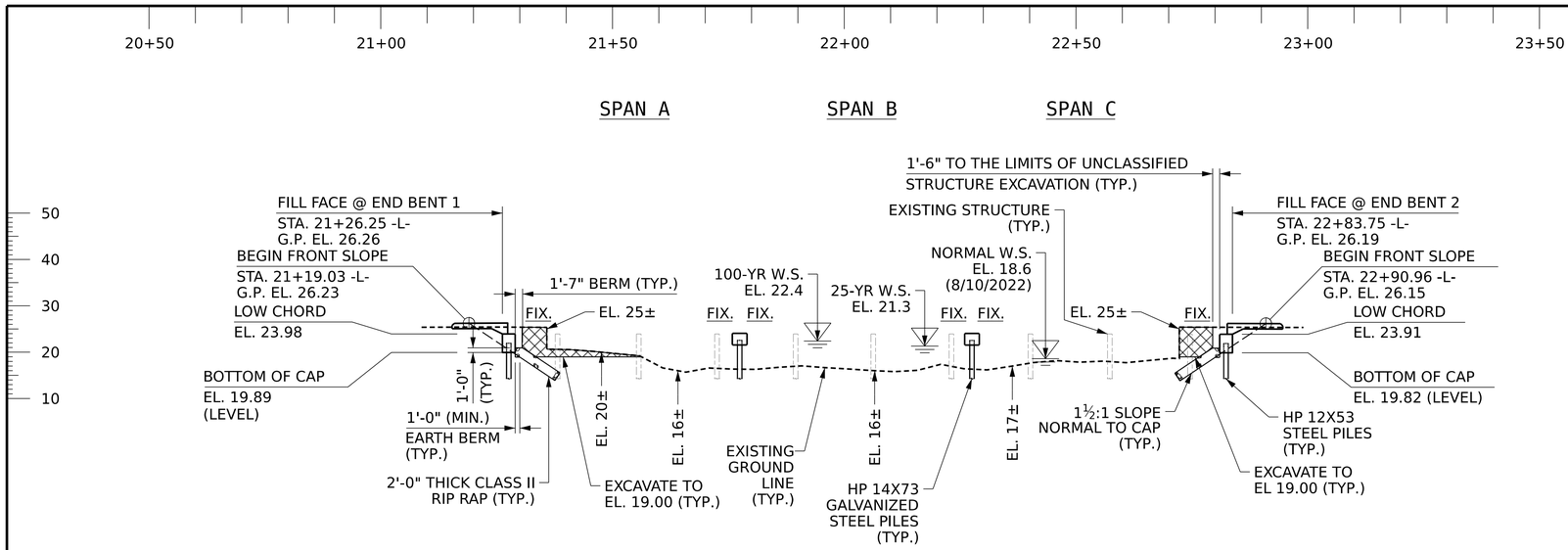
2018 STANDARD SPECIFICATIONS

LETTING DATE :

SEE ROADWAY PLANS

SCOTT A. BETZ, PE
PROJECT ENGINEER

DIEGO A. AGUIRRE, PE
PROJECT DESIGN ENGINEER



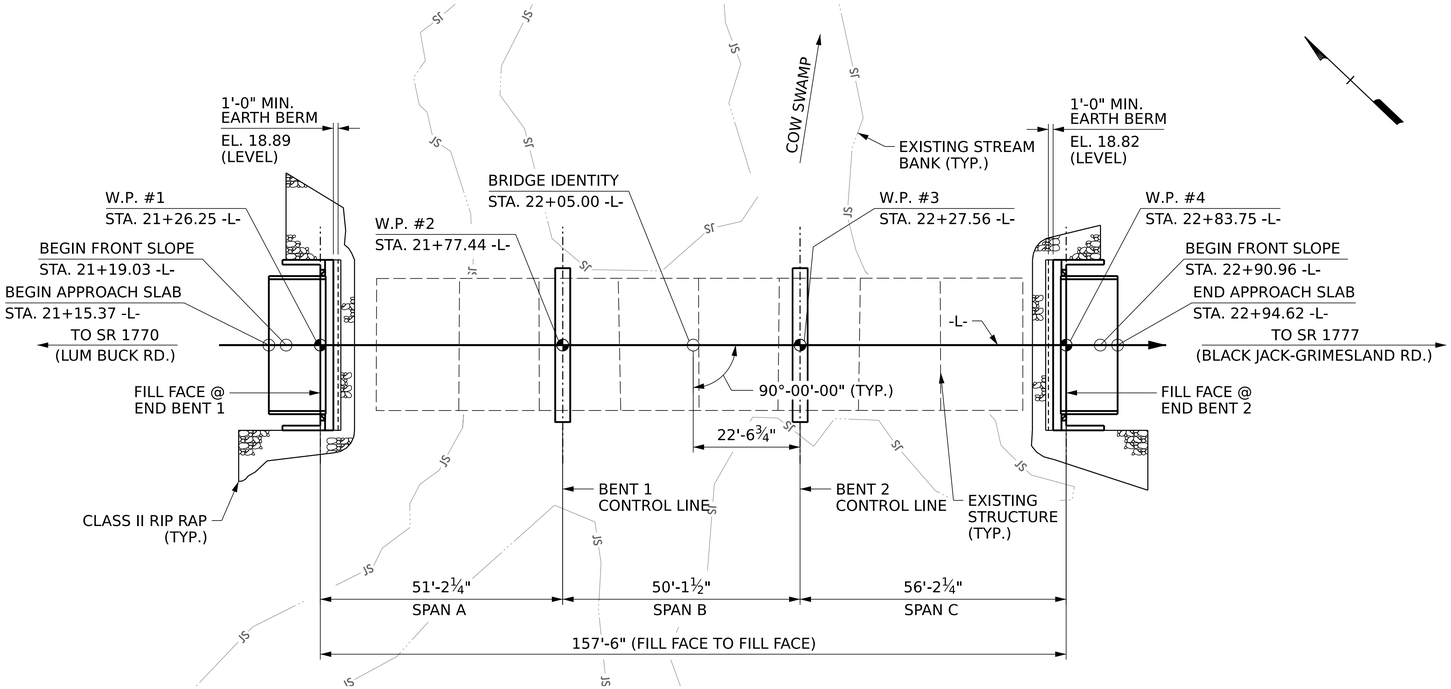
SECTION ALONG -L-

SECTIONS AT END BENTS AND BENTS ARE @ RIGHT ANGLES

VERTICAL CURVE DATA

PI = 21+91.00 -L-
EL. = 26.70
VC = 200'

UNCLASSIFIED STRUCTURE EXCAVATION



PLAN

(PILES NOT SHOWN FOR CLARITY)

I HEREBY CERTIFY THESE PLANS
ARE THE AS-BUILT PLANS

PROJECT NO. BP2.R004.1

PITT COUNTY

STATION: 22+05.00 -L-

SHEET 1 OF 2 REPLACES BRIDGE NO. 730006

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE ON SR 1756
(J. C. GALLOWAY RD.) OVER
COW SWAMP BETWEEN SR 1771
(PARAMORE RD.) AND SR 1777
(BLACK JACK-GRIMESLAND RD.)

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

Signed by: F9DF1280241648C...

NORTH CAROLINA PROFESSIONAL SEAL 054452 ENGINEER SCOTT A BETZ

4/16/2025

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

DRAWN BY : SCOTT A. BETZ DATE : 07/2023
CHECKED BY : LAURA E. SUTTON DATE : 07/2023
DESIGN ENGINEER OF RECORD: SCOTT A. BETZ DATE : 07/2023

4/1/2025
401_005_BP2.R004.1_SMU_GD01_S-1_730006.dgn
sbetz

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")	Number of Piles per Line	Factored Resistance per Pile KIPS	Pile Cut-Off (Top of Pile) Elevation FT	Estimated Pile Length per Pile FT	Scour Critical Elevation FT	Driven Piles			Predrilling for Piles **			Drilled-In Piles		
						Minimum Pile Tip (Tip No Higher Than) Elevation FT	Required Driving Resistance (RDR)* per pile KIPS	Pile Redrives Quantity EACH	Predrilling Length per Pile LIN FT	Predrilling Elevation (Elevation Not To Predrill Below) FT	Maximum Predrilling Diameter INCHES	Pile Excavation (Bottom of Hole) Elevation FT	Pile Excavation Not In Soil per Pile LIN FT	Pile Excavation In Soil per Pile LIN FT
End Bent 1 (Piles 1-5)	5	170	21.89	65			290	2						
Bent 1 (Piles 1-7)	7	240	22.52	70	7.00	-15.00	410	4						
Bent 2 (Piles 1-7)	7	240	22.51	70	7.00	-15.00	410	4						
End Bent 2 (Piles 1-5)	5	170	21.82	65			290	2						
TOTAL QUANTITY:								12						

$$^{*}RDR = \frac{Factored\ Resistance + Factored\ Drag\ Load + Factored\ Dead\ Load}{Dynamic\ Resistance\ Factor} + Nominal\ Drag\ Load\ Resistance + Nominal\ Resistance\ from\ Scourable\ Material$$

** 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.

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 KIPS	Factored Drag Load per Pile KIPS	Factored Dead Load * per Pile KIPS	Dynamic Resistance Factor	Nominal Drag Resistance per Pile KIPS	Nominal Scour Resistance per Pile KIPS
End Bent 1 (Piles 1-5)	162			0.60		
Bent 1 (Piles 1-7)	236			0.60		8
Bent 2 (Piles 1-7)	236			0.60		4
End Bent 2 (Piles 1-5)	170			0.60		

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

SUMMARY OF DPT/PILE ORDER LENGTHS

(Blank entries indicate item is not applicable to structure)

Dynamic Pile Testing (DPT)		
End Bent / Bent No (e.g., "Bent 1 - Bent 3")	DPT Test Pile Length FT	DPT Testing Quantity EACH
End Bent 1 (Piles 1-5)	70	1
Bent 1 (Piles 1-7)	75	
Bent 2 (Piles 1-7)	75	
End Bent 2 (Piles 1-5)	70	
TOTAL QUANTITY:		1

Pile Order Lengths for Concrete Piles	
End Bent / Bent No (e.g., "Bent 1 - Bent 3")	Pile Order Length Basis* EST or DPT

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

PROJECT NO. BP2.R004.1 (SF-730006)

PITT COUNTY

STATION: 22+05.00 -L-

NOTES:

1. The Pile Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (Thein Tun Zan, #030943) on 03-26-2025.
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 may adjust the quantity for DPT Testing and Pipe Pile Plates when necessary.
4. For Piles, see Section 450 of the Standard Specifications.
5. It has been estimated that a hammer with an equivalent rated energy in the range of 30,000 FT-LBS per blow to 60,000 FT-LBS per blow will be required to drive piles at End Bent No. 1, Bent No. 1, Bent No. 2, and End Bent No. 2. This estimated energy range does not release the contractor from providing driving equipment in accordance with Subarticle 450-3(D)(2) of the standard specifications.

NORTH CAROLINA PROFESSIONAL SEAL 054452 ENGINEER SCOTT A BETZ

Signed by: F9DF1280241648C 4/16/2025

SIGNATURE DATE

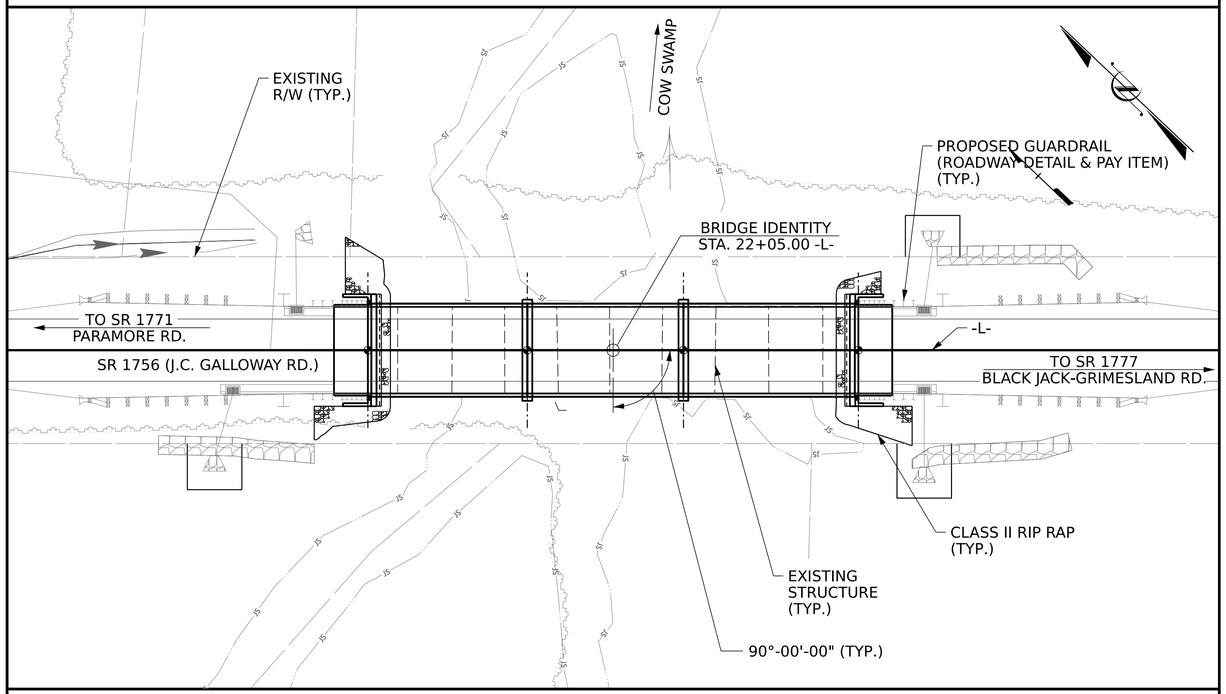
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PILE FOUNDATION TABLES

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

BM INFO: BM1, RR SPIKE SET IN 24" OAK, STA. 24+49.64 -L-, 52.52 LT.
EL. 25.39, NORTHING: 653817 EASTING: 2528203



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 LOCATED IN SEISMIC ZONE 1.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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 30 FT. 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 8 SPANS: 1 @ 17'-6", 3 @ 17'-0", 1 @ 17'-2", 1 @ 16'-8", 1 @ 17'-0" AND 1 @ 17'-7", CONSISTING OF A REINFORCED CONCRETE DECK ON TIMBER JOISTS WITH A CLEAR ROADWAY OF 28'-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 AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

FOR ASBESTOS ASSESSMENT, SEE SPECIAL PROVISIONS.

THE SCOUR CRITICAL ELEVATION FOR BENTS 1 AND 2 IS ELEVATION 7FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

PAVEMENT ALONG THE TRANSVERSE CENTERLINE OF ALL CAPS SHALL BE SAW CUT TO A DEPTH OF 3/4" ±, CLEANED, AND FILLED WITH AN APPROVED ASPHALT SEALANT IN ACCORDANCE WITH SECTION 1028 OF THE STANDARD SPECIFICATIONS. PAYMENT FOR THIS WORK SHALL BE INCIDENTAL TO THE CONTRACT UNIT PRICE FOR VARIOUS PAY ITEMS.

APPLY AN APPROVED EPOXY PROTECTIVE COATING TO THE TOPS OF ALL CAPS AND TO THE EXTERIOR FACES OF ALL EXTERIOR CORED SLAB UNITS. PAYMENT FOR THIS WORK SHALL BE INCIDENTAL TO OTHER PAY ITEMS IN THE CONTRACT AND NO SEPARATE PAYEMENT WILL BE MADE FOR THIS WORK.

USE A TYPE 4A FLEXIBLE AND MOISTURE INSENSITIVE EPOXY COATING IN ACCORDANCE WITH SECTION 1081 OF THE STANDARD SPECIFICATIONS. PROVIDE A TYPE 3 MATERIAL CERTIFICATION IN ACCORDANCE WITH ARTICLE 106-3 SHOWING THAT THE EPOXY MEETS TYPE 4A REQUIREMENTS.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESSMENT	DYNAMIC PILE TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	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	CU. YDS.	LUMP SUM	LBS.	EA.	EA.
SUPERSTRUCTURE									
END BENT 1			*		20.0		2,449	5	
BENT 1			*		9.8		1,932		7
BENT 2			*		9.8		1,932		7
END BENT 2			*		20.0		2,449	5	
TOTAL	LUMP SUM	LUMP SUM	1	LUMP SUM	59.6	LUMP SUM	8,762	10	14

* SEE "PILE FOUNDATION TABLES" SHEET FOR QUANTITIES

TOTAL BILL OF MATERIAL

	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 1'-9" PRESTRESSED CONCRETE CORED SLABS	
	NO.	LIN. FT.	NO.	LIN. FT.	EA.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	NO.	LIN. FT.
SUPERSTRUCTURE						310.75			LUMP SUM	30	1,550
END BENT 1	5	325					114	233			
BENT 1			7	490							
BENT 2			7	490							
END BENT 2	5	325					127	258			
TOTAL	10	650	14	980	12	310.75	241	491	LUMP SUM	30	1,550

HYDRAULIC DATA

DESIGN DISCHARGE	1400 CFS
FREQUENCY OF DESIGN FLOOD	25 YRS.
DESIGN HIGH WATER ELEVATION	21.3 FT.
DRAINAGE AREA	18.1 SQ. MI.
BASE DISCHARGE (Q100)	2100 CFS
BASE HIGH WATER ELEVATION	22.4 FT.

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	4982 CFS
FREQUENCY OF OVERTOPPING FLOOD	500+ YRS.
OVERTOPPING FLOOD ELEVATION	25.1 FT.
SAG STA.	18+50.83 -L-

PROJECT NO. BP2.R004.1

PITT COUNTY

STATION: 22+05.00 -L-

SHEET 2 OF 2

Signed by: F9DF12802416480...

NORTH CAROLINA PROFESSIONAL SEAL 054452 ENGINEER SCOTT A BETZ

4/16/2025

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

GENERAL DRAWING
FOR BRIDGE ON SR 1756
(J. C. GALLOWAY RD.) OVER
COW SWAMP BETWEEN SR 1771
(PARAMORE RD.) AND SR 1777
(BLACKJACK GRIMESLAND RD.)

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

DRAWN BY : SCOTT A. BETZ DATE : 07/2023
CHECKED BY : LAURA E. SUTTON DATE : 07/2023
DESIGN ENGINEER OF RECORD: SCOTT A. BETZ DATE : 07/2023

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

4/1/2025
401_015_BP2.R004.1_SMU_GD02_S-3_730006.dgn
sbetz

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

LOAD TYPE		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR					MOMENT						
							LIVE-LOAD FACTORS (γLL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γLL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD		HL-93 (INVENTORY)	N/A	1	1.394	--	1.75	0.276	1.57	50'	EL	24.5	0.531	1.39	50'	EL	2.45	0.80	0.276	1.44	50'	EL	24.5	
		HL-93 (OPERATING)	N/A		1.807	--	1.35	0.276	2.03	50'	EL	24.5	0.531	1.81	50'	EL	2.45	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	2	1.667	60.007	1.75	0.276	1.95	50'	EL	24.5	0.531	1.67	50'	EL	2.45	0.80	0.276	1.79	50'	EL	24.5	
		HS-20 (OPERATING)	36.000		2.161	77.787	1.35	0.276	2.52	50'	EL	24.5	0.531	2.16	50'	EL	2.45	N/A	--	--	--	--	--	
LEGAL LOAD	SINGLE VEHICLE (SV)	SNSH	13.500		3.635	49.079	1.4	0.276	4.95	50'	EL	24.5	0.531	4.70	50'	EL	2.45	0.80	0.276	3.64	50'	EL	24.5	
		SNGARBS2	20.000		2.871	57.420	1.4	0.276	3.91	50'	EL	24.5	0.531	3.42	50'	EL	2.45	0.80	0.276	2.87	50'	EL	24.5	
		SNAGRIS2	22.000		2.778	61.109	1.4	0.276	3.78	50'	EL	19.6	0.531	3.21	50'	EL	2.45	0.80	0.276	2.78	50'	EL	24.5	
		SNCOTTS3	27.250		1.814	49.418	1.4	0.276	2.47	50'	EL	24.5	0.531	2.36	50'	EL	2.45	0.80	0.276	1.81	50'	EL	24.5	
		SNAGGRS4	34.925		1.577	55.063	1.4	0.276	2.15	50'	EL	24.5	0.531	2.01	50'	EL	2.45	0.80	0.276	1.58	50'	EL	24.5	
		SNS5A	35.550		1.537	54.657	1.4	0.276	2.09	50'	EL	24.5	0.531	2.07	50'	EL	2.45	0.80	0.276	1.54	50'	EL	24.5	
		SNS6A	39.950		1.438	57.430	1.4	0.276	1.96	50'	EL	24.5	0.531	1.91	50'	EL	2.45	0.80	0.276	1.44	50'	EL	24.5	
		SNS7B	42.000		1.370	57.540	1.4	0.276	1.87	50'	EL	24.5	0.531	1.91	50'	EL	2.45	0.80	0.276	1.37	50'	EL	24.5	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.761	58.118	1.4	0.276	2.40	50'	EL	24.5	0.531	2.25	50'	EL	2.45	0.80	0.276	1.76	50'	EL	24.5	
		TNT4A	33.075		1.777	58.759	1.4	0.276	2.42	50'	EL	24.5	0.531	2.17	50'	EL	2.45	0.80	0.276	1.78	50'	EL	24.5	
		TNT6A	41.600		1.480	61.558	1.4	0.276	2.01	50'	EL	24.5	0.531	2.08	50'	EL	2.45	0.80	0.276	1.48	50'	EL	24.5	
		TNT7A	42.000		1.502	63.087	1.4	0.276	2.05	50'	EL	24.5	0.531	1.94	50'	EL	2.45	0.80	0.276	1.50	50'	EL	24.5	
		TNT7B	42.000		1.566	65.773	1.4	0.276	2.13	50'	EL	24.5	0.531	1.84	50'	EL	2.45	0.80	0.276	1.57	50'	EL	24.5	
		TNAGRIT4	43.000		1.486	63.902	1.4	0.276	2.02	50'	EL	24.5	0.531	1.77	50'	EL	2.45	0.80	0.276	1.49	50'	EL	24.5	
		TNAGT5A	45.000		1.388	62.470	1.4	0.276	1.89	50'	EL	24.5	0.531	1.80	50'	EL	2.45	0.80	0.276	1.39	50'	EL	24.5	
		TNAGT5B	45.000	3	1.360	61.206	1.4	0.276	1.85	50'	EL	24.5	0.531	1.68	50'	EL	2.45	0.80	0.276	1.36	50'	EL	24.5	
EMERGENCY VEHICLE (EV)		EV2	28.750		2.154	61.929	1.3	0.276	2.97	50'	EL	24.5	0.531	2.50	50'	EL	5.50	0.80	0.276	2.15	50'	EL	24.5	
		EV3	43.000	4	1.392	59.852	1.3	0.276	1.92	50'	EL	24.5	0.531	1.69	50'	EL	5.50	0.80	0.276	1.39	50'	EL	24.5	

LOAD FACTORS:

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

NOTES:

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

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

COMMENTS:

1.

2.

3.

4.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING * *

(4) EMERGENCY VEHICLE LOAD RATING * *

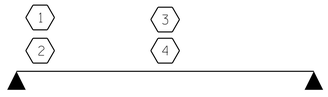
* * SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

I - INTERIOR GIRDER

EL - EXTERIOR LEFT GIRDER

ER - EXTERIOR RIGHT GIRDER



LRFR SUMMARY

FOR SPANS A & B

PROJECT NO. BP2.R004.1

PITT COUNTY

STATION: 22+05.00 -L-

Signed by: F9DF1280241640C...

NORTH CAROLINA PROFESSIONAL SEAL 054452 ENGINEER SCOTT A BETZ

4/16/2025

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

STANDARD

LRFR SUMMARY FOR 50' 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. 21LRFR1_90S_50L

DRAWN BY : MAA 1/08 | REV. 11/12/08RR MAA/GM
CHECKED BY : GM/DI 2/08 | REV. 10/1/11 MAA/GM
REV. 04/23 BNB/AAI

DRAWN BY : SCOTT A. BETZ DATE : 07/2023
CHECKED BY : LAURA E. SUTTON DATE : 07/2023
DESIGN ENGINEER OF RECORD: SCOTT A. BETZ DATE : 07/2023

4/1/2025
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sbetz

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

LOAD TYPE		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR					MOMENT						
							LIVE-LOAD FACTORS (γ LL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γ LL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD		HL-93 (INVENTORY)	N/A	1	1.055	--	1.75	0.275	1.23	55'	EL	27	0.523	1.23	55'	EL	5.4	0.80	0.275	1.05	55'	EL	27	
		HL-93 (OPERATING)	N/A		1.591	--	1.35	0.275	1.59	55'	EL	27	0.523	1.59	55'	EL	5.4	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	2	1.322	47.585	1.75	0.275	1.54	55'	EL	27	0.523	1.47	55'	EL	5.4	0.80	0.275	1.32	55'	EL	27	
		HS-20 (OPERATING)	36.000		1.900	68.396	1.35	0.275	1.99	55'	EL	27	0.523	1.90	55'	EL	5.4	N/A	--	--	--	--	--	
LEGAL LOAD	SINGLE VEHICLE (SV)	SNSH	13.500		2.776	37.476	1.4	0.275	4.04	55'	EL	27	0.523	4.17	55'	EL	5.4	0.80	0.275	2.78	55'	EL	27	
		SNGARBS2	20.000		2.155	43.095	1.4	0.275	3.14	55'	EL	27	0.523	3.02	55'	EL	5.4	0.80	0.275	2.15	55'	EL	27	
		SNAGRIS2	22.000		2.079	45.734	1.4	0.275	3.03	55'	EL	27	0.523	2.83	55'	EL	5.4	0.80	0.275	2.08	55'	EL	27	
		SNCOTTS3	27.250		1.384	37.708	1.4	0.275	2.01	55'	EL	27	0.523	2.09	55'	EL	5.4	0.80	0.275	1.38	55'	EL	27	
		SNAGGRS4	34.925		1.189	41.527	1.4	0.275	1.73	55'	EL	27	0.523	1.77	55'	EL	5.4	0.80	0.275	1.19	55'	EL	27	
		SNS5A	35.550		1.160	41.255	1.4	0.275	1.69	55'	EL	27	0.523	1.82	55'	EL	5.4	0.80	0.275	1.16	55'	EL	27	
		SNS6A	39.950		1.079	43.102	1.4	0.275	1.57	55'	EL	27	0.523	1.68	55'	EL	5.4	0.80	0.275	1.08	55'	EL	27	
		SNS7B	42.000		1.028	43.175	1.4	0.275	1.50	55'	EL	27	0.523	1.67	55'	EL	5.4	0.80	0.275	1.03	55'	EL	27	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.320	43.556	1.4	0.275	1.92	55'	EL	27	0.523	1.98	55'	EL	5.4	0.80	0.275	1.32	55'	EL	27	
		TNT4A	33.075		1.330	43.979	1.4	0.275	1.94	55'	EL	27	0.523	1.91	55'	EL	5.4	0.80	0.275	1.33	55'	EL	27	
		TNT6A	41.600		1.101	45.811	1.4	0.275	1.60	55'	EL	27	0.523	1.83	55'	EL	5.4	0.80	0.275	1.10	55'	EL	27	
		TNT7A	42.000		1.114	46.804	1.4	0.275	1.62	55'	EL	27	0.523	1.71	55'	EL	5.4	0.80	0.275	1.11	55'	EL	27	
		TNT7B	42.000		1.163	48.848	1.4	0.275	1.69	55'	EL	27	0.523	1.62	55'	EL	5.4	0.80	0.275	1.16	55'	EL	27	
		TNAGRIT4	43.000		1.101	47.330	1.4	0.275	1.60	55'	EL	27	0.523	1.56	55'	EL	5.4	0.80	0.275	1.10	55'	EL	27	
		TNAGT5A	45.000		1.031	46.405	1.4	0.275	1.50	55'	EL	27	0.523	1.58	55'	EL	5.4	0.80	0.275	1.03	55'	EL	27	
		TNAGT5B	45.000	3	1.013	45.582	1.4	0.275	1.47	55'	EL	27	0.523	1.48	55'	EL	5.4	0.80	0.275	1.01	55'	EL	27	
EMERGENCY VEHICLE (EV)		EV2	28.750		1.617	46.483	1.3	0.275	2.37	55'	EL	27	0.523	2.27	55'	EL	5.4	0.80	0.275	1.62	55'	EL	27	
		EV3	43.000	4	1.049	45.107	1.3	0.275	1.54	55'	EL	27	0.523	1.53	55'	EL	5.4	0.80	0.275	1.05	55'	EL	27	

LOAD FACTORS:

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

NOTES:

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

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

COMMENTS:

1.

2.

3.

4.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

(2) DESIGN LOAD RATING (HS-20)

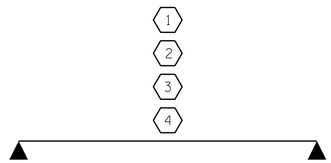
(3) LEGAL LOAD RATING * *

(4) EMERGENCY VEHICLE LOAD RATING **

* * SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

FOR SPAN C

DRAWN BY : MAA 1/08	REV. 11/12/08RR	MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/1/11	MAA/GM
	REV. 04/23	BNB/AAI
DRAWN BY : SCOTT A. BETZ	DATE : 07/2023	
CHECKED BY : LAURA E. SUTTON	DATE : 07/2023	
DESIGN ENGINEER OF RECORD: SCOTT A. BETZ	DATE : 07/2023	

4/1/2025
401.0025_BP2.R004.1_SMU_LRFR02_S-5_730006.dgn
sbetz

Signed by: F90F128024164...

NORTH CAROLINA PROFESSIONAL SEAL 054452 ENGINEER SCOTT A BETZ

4/16/2025

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. BP2.R004.1

PITT COUNTY

STATION: 22+05.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

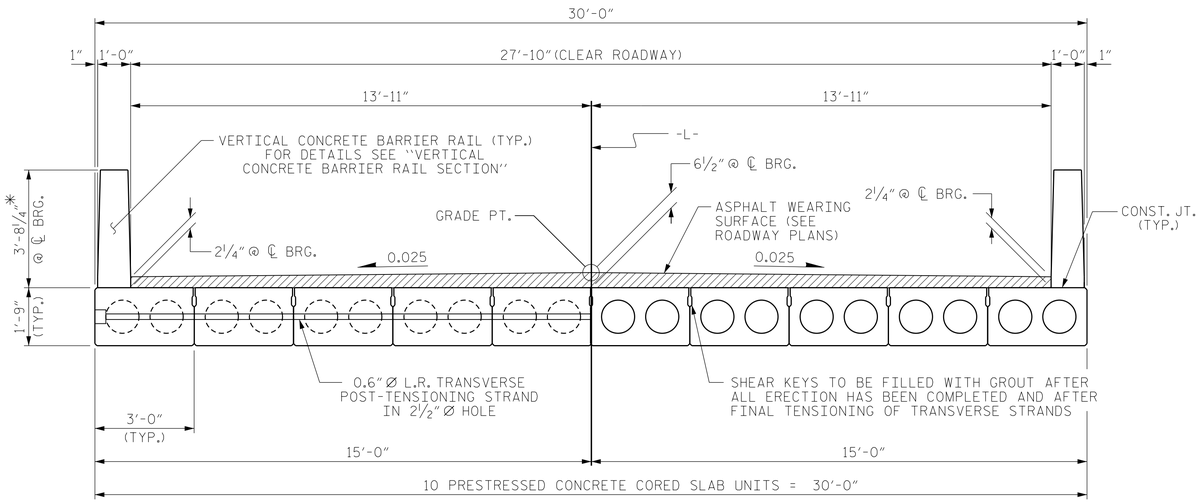
STANDARD

LRFR SUMMARY FOR 55' 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. 21LRFR1_90S_55L

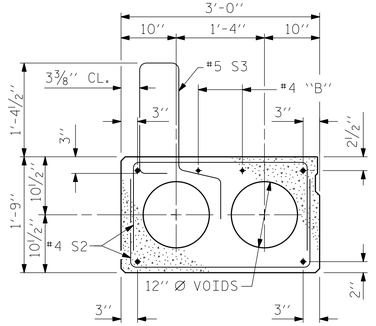


HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

HALF SECTION
THROUGH VOIDS

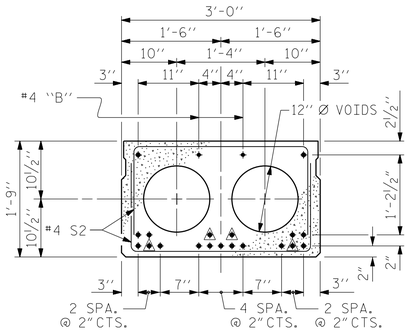
TYPICAL SECTION

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



EXT. SLAB SECTION

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



INTERIOR SLAB SECTION (50' & 55' UNIT)

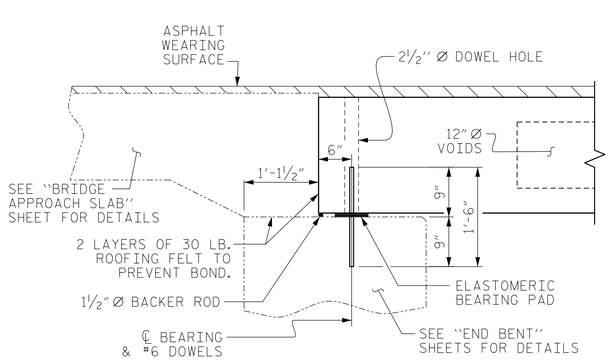
(19 STRANDS REQUIRED)

0.6" Ø LOW RELAXATION STRAND LAYOUT

△ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 6'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

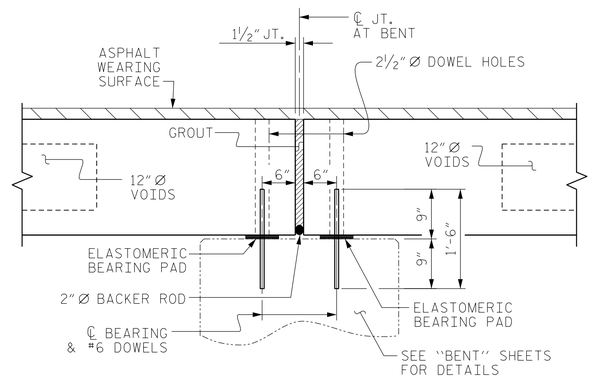
DEBONDING LEGEND

FIXED END



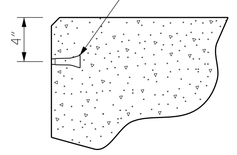
SECTION AT END BENT

FIXED END FIXED END

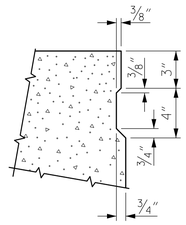


SECTION AT BENT

PERMITTED THREADED INSERT CAST IN OUTSIDE FACE OF EXTERIOR UNIT AND RECESSED ⅜". SIZE TO BE DETERMINED BY CONTRACTOR.

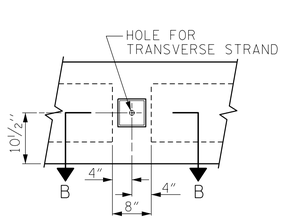


THREADED INSERT DETAIL

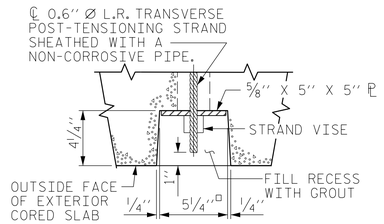


SHEAR KEY DETAIL

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

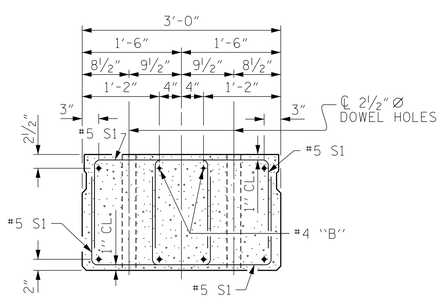


ELEVATION VIEW



SECTION B-B

GROUTED RECESS AT END OF POST-TENSIONED STRAND OF 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.

DRAWN BY : DGE	5/09	REV. 8/14	MAA/TMG
CHECKED BY : BCH	6/09	REV. 5/23	BNB/AAI

DRAWN BY :	SCOTT A. BETZ	DATE : 07/2023
CHECKED BY :	LAURA E. SUTTON	DATE : 07/2023
DESIGN ENGINEER OF RECORD:	SCOTT A. BETZ	DATE : 07/2023

4/1/2025
401.0030_BP2.R004.1_SMU_CS01_S-6_730006.DGN
sbetz

Signed by: F9DF128024164BC...

NORTH CAROLINA PROFESSIONAL SEAL 054452 ENGINEER SCOTT A BETZ

4/16/2025

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. BP2.R004.1
PITT COUNTY
STATION: 22+05.00 -L-

SHEET 1 OF 5

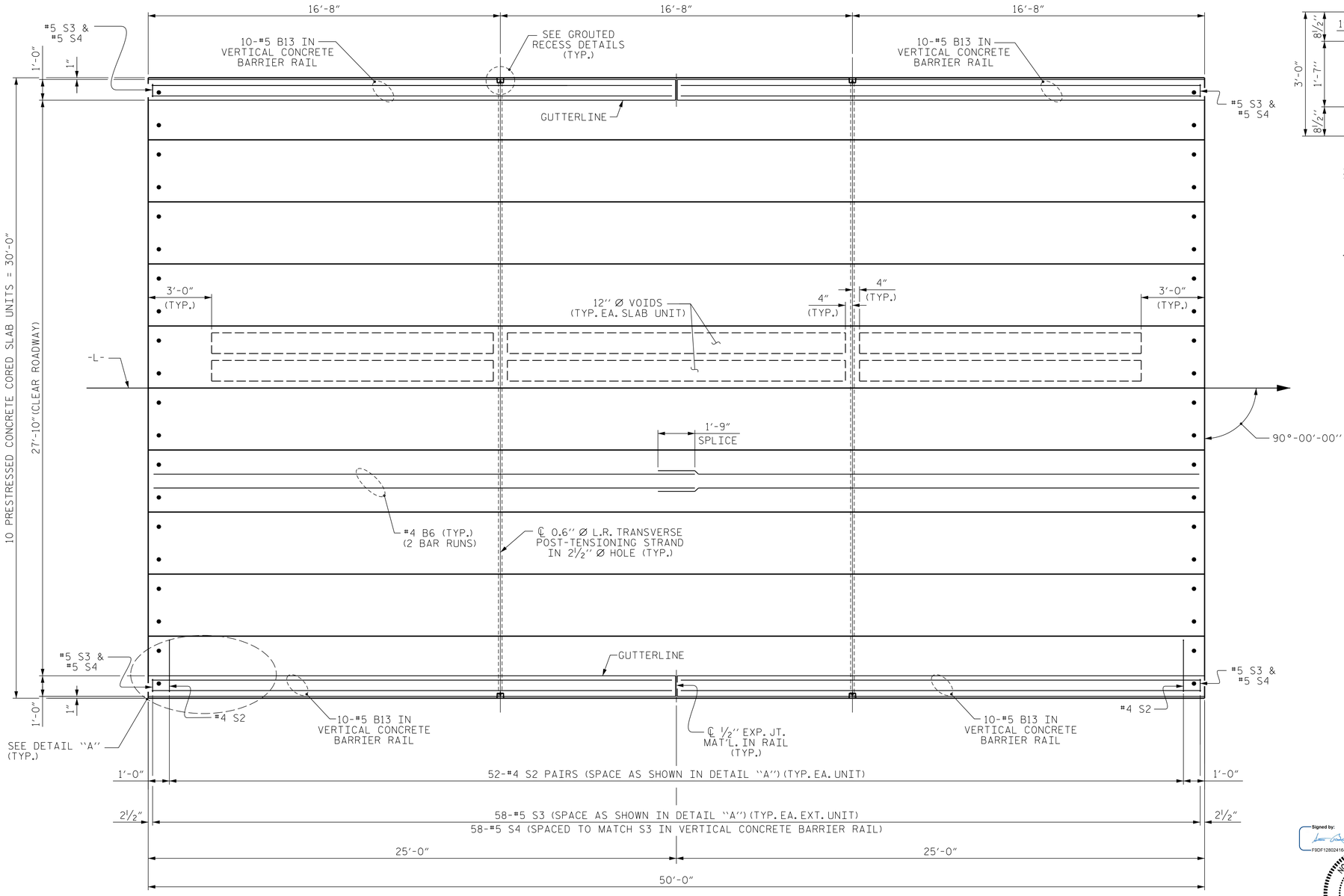
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

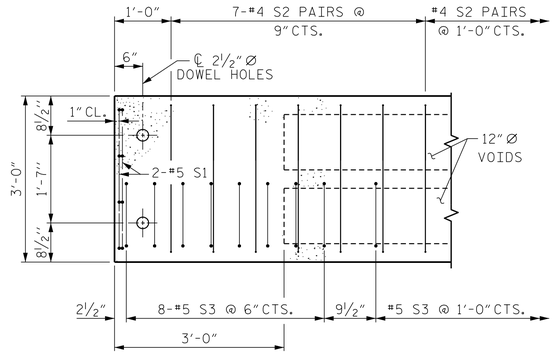
3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLAB UNIT 90° SKEW

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

STD. NO. 21" PCS2_30_90S



PLAN OF UNIT



DETAIL ″A″

(TYPICAL EACH END OF UNIT)
NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.

DRAWN BY :	DGE 3/09	REV.	12/5/11 MAA/AAC
CHECKED BY :	BCH 3/09	REV.	8/14 MAA/TMG

DRAWN BY :	SCOTT A. BETZ	DATE : 07/2023
CHECKED BY :	LAURA E. SUTTON	DATE : 07/2023
DESIGN ENGINEER OF RECORD:	SCOTT A. BETZ	DATE : 07/2023

4/1/2025
401_0035_BP2.R004.1_SMU_CS02_S-7_730006.DGN
sbetz

Signed by: F9DF12802416480...

NORTH CAROLINA PROFESSIONAL SEAL 054452 ENGINEER SCOTT A BETZ

4/16/2025

KCA KISINGER CAMPO & ASSOCIATES

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

PROJECT NO. BP2.R004.1

PITT COUNTY

STATION: 22+05.00 -L-

SHEET 2 OF 5

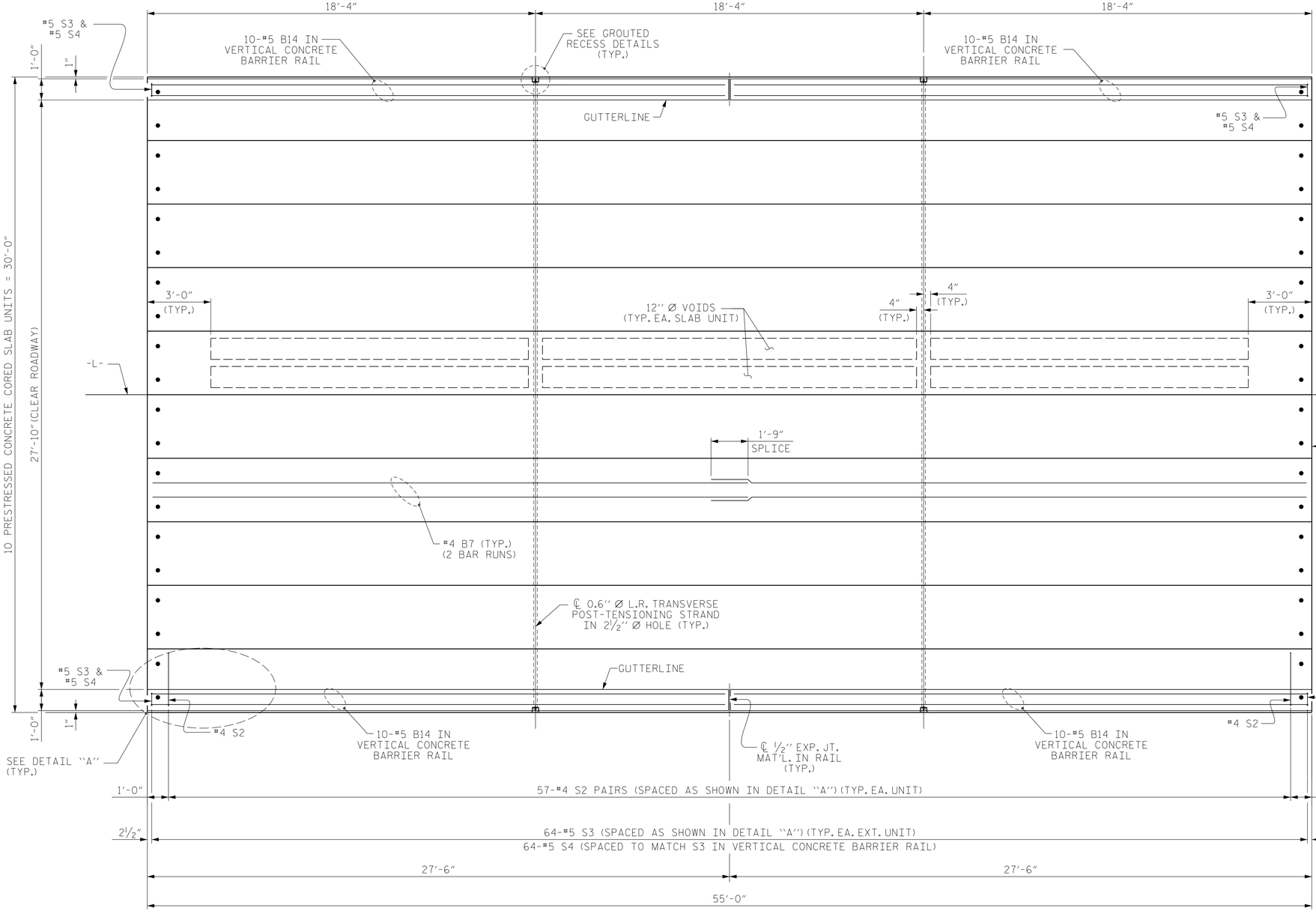
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 50′ UNIT 27′-10″ CLEAR ROADWAY 90° SKEW

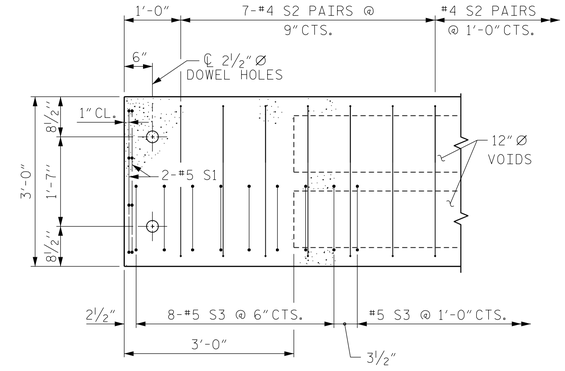
SPAN A & SPAN B

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

STD. NO. 21" PCS_30_90S_50L



PLAN OF UNIT



DETAIL "A"

(TYPICAL EACH END OF UNIT)
NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.

DRAWN BY : DGE 3/09	REV. 12/5/11 MAA/AAC	DRAWN BY : SCOTT A. BETZ	DATE : 07/2023
CHECKED BY : BCH 3/09	REV. 8/14 MAA/TMG	CHECKED BY : LAURA E. SUTTON	DATE : 07/2023
		DESIGN ENGINEER OF RECORD: SCOTT A. BETZ	DATE : 07/2023

4/1/2025
401.0040_BP2.R004.1_SMU_CS03_S-8_730006.DGN
sbetz

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Signed by: F9DF128D24164FC...

NORTH CAROLINA PROFESSIONAL SEAL 054452 ENGINEER SCOTT A BETZ

4/16/2025

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

PROJECT NO. BP2.R004.1

PITT COUNTY

STATION: 22+05.00 -L-

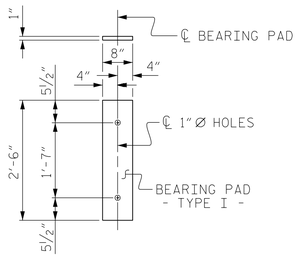
SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 55' UNIT 27'-10" CLEAR ROADWAY 90° SKEW SPAN C

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

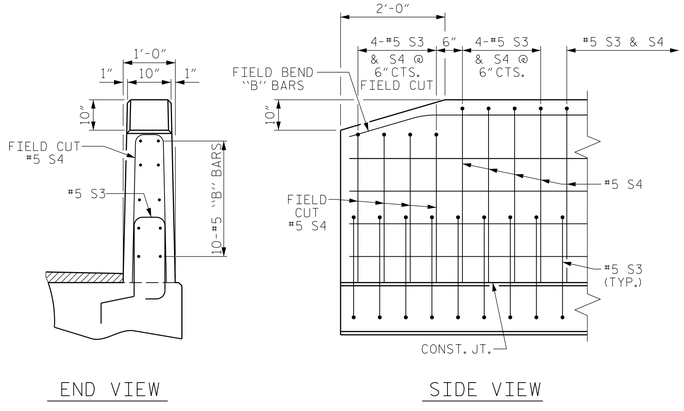
STD. NO. 21" PCS_30_90S_55L



FIXED END
(TYPE I - 60 REQ'D)

ELASTOMERIC BEARING DETAILS

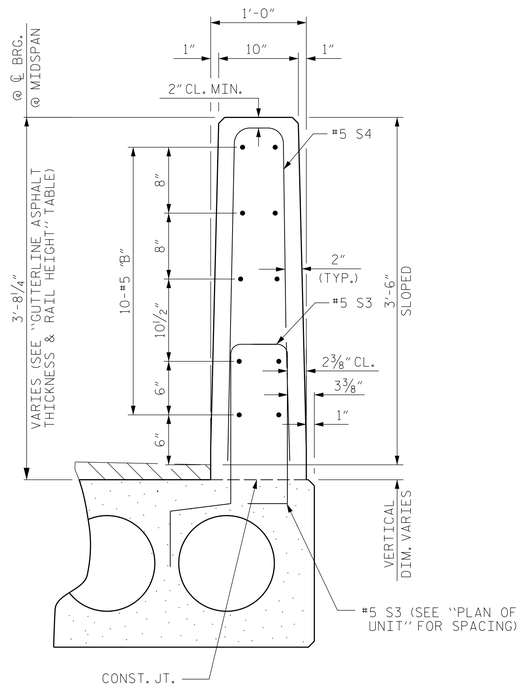
ELASTOMER IN ALL BEARINGS SHALL BE 50 DUROMETER HARDNESS.



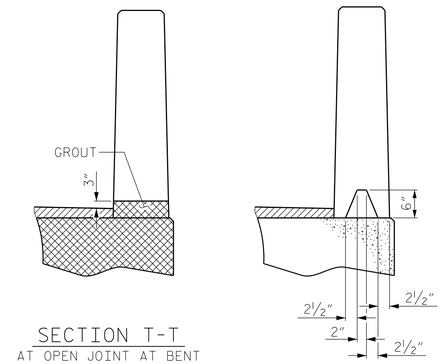
END VIEW

SIDE VIEW

END OF RAIL DETAILS

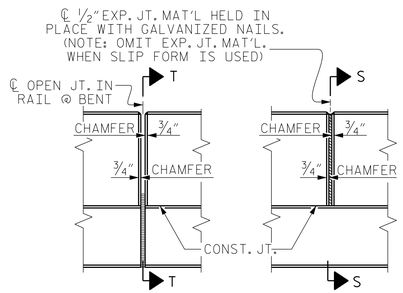


SECTION THRU RAIL



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 SECTION

CONCRETE RELEASE STRENGTH	
UNIT	PSI
50' & 55' UNITS	4900

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

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT		
	ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
50' & 55' UNITS	1⅛"	3'-7⅛"

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.

ALL REINFORCING STEEL IN THE VERTICAL CONCRETE BARRIER RAIL 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.

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.

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.

FOR BILL OF MATERIALS, BAR TYPES, AND OTHER TABLES, SEE SHEET 5 OF 5.

PROJECT NO. BP2.R004.1

PITT COUNTY

STATION: 22+05.00 -L-

SHEET 4 OF 5

Signed by: F9DF1280241640C...

NORTH CAROLINA PROFESSIONAL SEAL 054452 ENGINEER SCOTT A BETZ

4/16/2025

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 1'-9" PRESTRESSED CONCRETE CORED SLAB UNIT

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

DRAWN BY : DGE 5/09 CHECKED BY : BCH 6/09	REV. 5/18 MAA/THC	
DRAWN BY : SCOTT A. BETZ	DATE :	07/2023
CHECKED BY : LAURA E. SUTTON	DATE :	07/2023
DESIGN ENGINEER OF RECORD: SCOTT A. BETZ	DATE :	07/2023

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

4/1/2025
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sbetz

STD. NO. 21" PCS3_30_90S

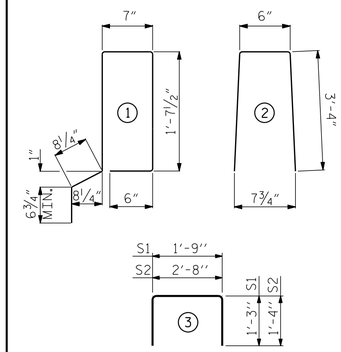
CORED SLABS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
50' UNIT			
EXTERIOR C.S.	4	50'-0"	200'-0"
INTERIOR C.S.	16	50'-0"	800'-0"
TOTAL	20		1000'-0"

CORED SLABS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
55' UNIT			
EXTERIOR C.S.	2	55'-0"	110'-0"
INTERIOR C.S.	8	55'-0"	440'-0"
TOTAL	10		550'-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	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
	50' UNIT					
✳B13	40	80	#5	STR	24'-7"	2051
✳ S4	116	232	#5	2	7'-2"	1734
✳EPOXY COATED REINFORCING STEEL				LBS.		3785
CLASS AA CONCRETE				CU.YDS.		25.6
TOTAL VERTICAL CONCRETE BARRIER RAIL				LIN.FT.		200.50

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
	55' UNIT					
✳B14	40	40	#5	STR	27'-1"	1130
✳ S4	128	128	#5	2	7'-2"	957
✳EPOXY COATED REINFORCING STEEL				LBS.		2087
CLASS AA CONCRETE				CU.YDS.		14.1
TOTAL VERTICAL CONCRETE BARRIER RAIL				LIN.FT.		110.25

DEAD LOAD DEFLECTION AND CAMBER

	3'-0" x 1'-9"
50' & 55' CORED SLAB UNIT	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	1½" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD✳✳	⅜" ↓
FINAL CAMBER	1⅛" ↑

✳✳ INCLUDES FUTURE WEARING SURFACE

BILL OF MATERIAL FOR ONE 50' CORED SLAB UNIT

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B6	4	#4	STR	25'-9"	69	25'-9"	69
S1	8	#5	3	4'-3"	35	4'-3"	35
S2	104	#4	3	5'-4"	371	5'-4"	371
✳ S3	58	#5	1	5'-7"	338		
REINFORCING STEEL		LBS.			475		475
✳EPOXY COATED REINFORCING STEEL		LBS.			338		
6500 P.S.I. CONCRETE		CU. YDS.			7.2		7.1
0.6" Ø L.R. STRANDS		No.			19		19

BILL OF MATERIAL FOR ONE 55' CORED SLAB UNIT

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B7	4	#4	STR	28'-3"	75	28'-3"	75
S1	8	#5	3	4'-3"	35	4'-3"	35
S2	114	#4	3	5'-4"	406	5'-4"	406
✳ S3	64	#5	1	5'-7"	373		
REINFORCING STEEL		LBS.			516		516
✳EPOXY COATED REINFORCING STEEL		LBS.			373		
6500 P.S.I. CONCRETE		CU. YDS.			7.9		7.8
0.6" Ø L.R. STRANDS		No.			19		19

TABLES FOR 50' UNITS
SPANS A & B

TABLE FOR 55' UNIT
SPAN C

DRAWN BY : DGE 5/09
CHECKED BY : BCH 6/09
REV. 1/15 MAA/THC

DRAWN BY : SCOTT A. BETZ DATE : 07/2023
CHECKED BY : LAURA E. SUTTON DATE : 07/2023
DESIGN ENGINEER OF RECORD: SCOTT A. BETZ DATE : 07/2023

4/1/2025
401_0050_BP2.R004.1_SMU_CS05_S-10_730006.DGN
sbetz

Signed by:
F9DF12802416480...

NORTH CAROLINA PROFESSIONAL SEAL 054452 ENGINEER SCOTT A BETZ

4/16/2025

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. BP2.R004.1
PITT COUNTY
STATION: 22+05.00 -L-
SHEET 5 OF 5

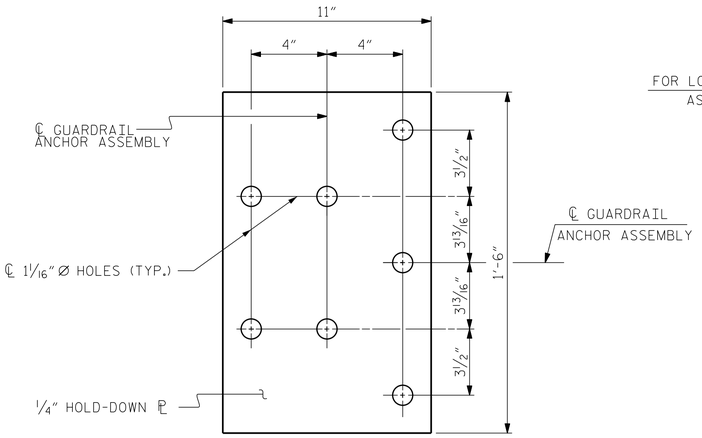
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

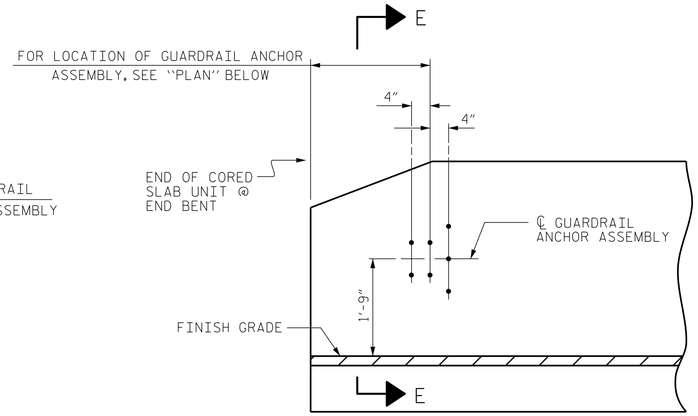
3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLAB UNIT 90° SKEW

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

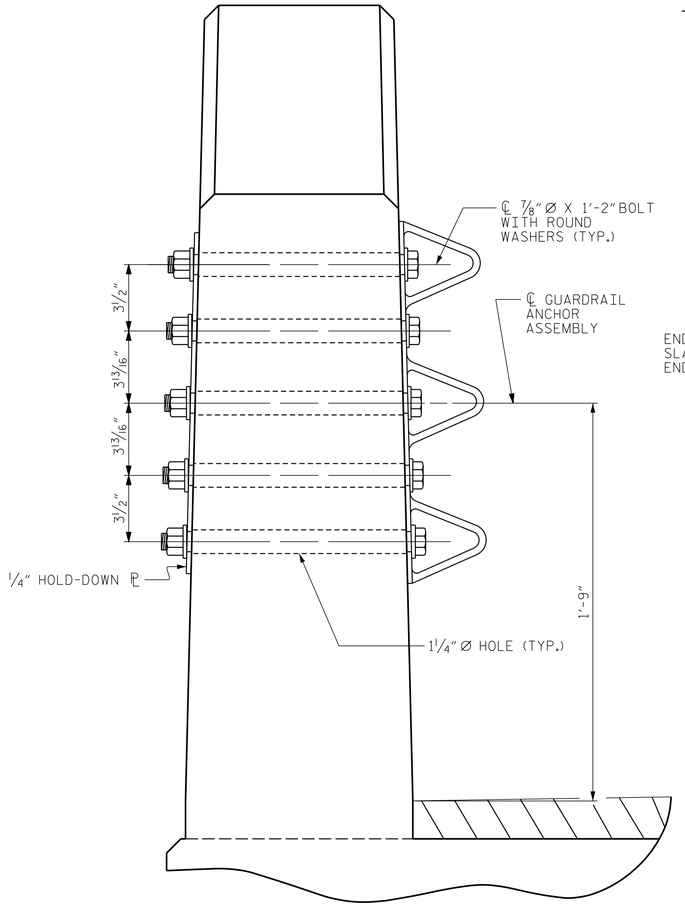
STD. NO. 21" BOM INFO_90_30S



PLAN

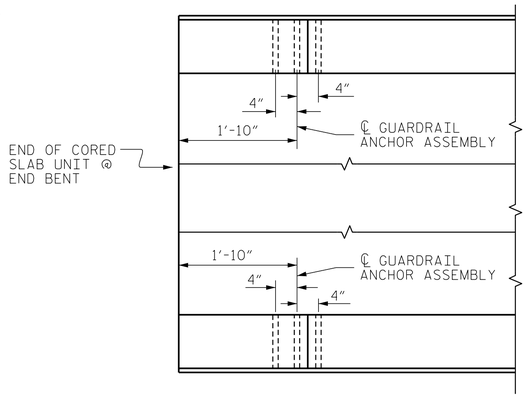


ELEVATION



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

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

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.)

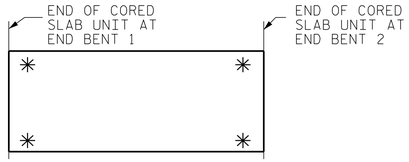
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.



SKETCH SHOWING POINTS OF ATTACHMENT

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

DRAWN BY : MAA 5/10	REV. 1/15	MAA/TMG
CHECKED BY : GM 5/10	REV. 12/17	MAA/THC
	REV. 5/18	MAA/THC

DRAWN BY : SCOTT A. BETZ DATE : 07/2023
CHECKED BY : LAURA E. SUTTON DATE : 07/2023
DESIGN ENGINEER OF RECORD: SCOTT A. BETZ DATE : 07/2023

4/1/2025
401.0055_BP2.R004.1_SMU_GR_S-11_730006.DGN
sbetz

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Signed by: F90F128024164...

SEAL 054452 NORTH CAROLINA PROFESSIONAL ENGINEER SCOTT A BETZ

4/16/2025

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

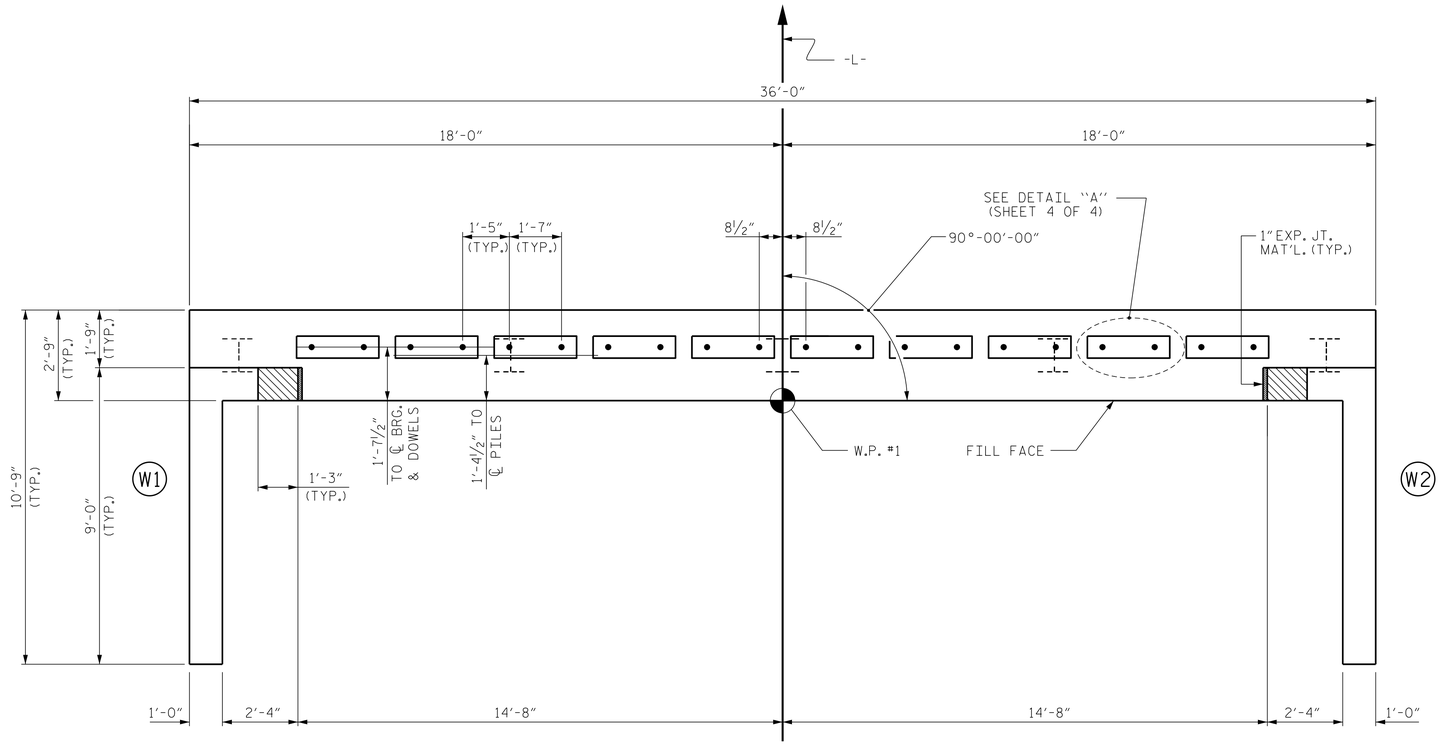
PROJECT NO. BP2.R004.1
PITT COUNTY
STATION: 22+05.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

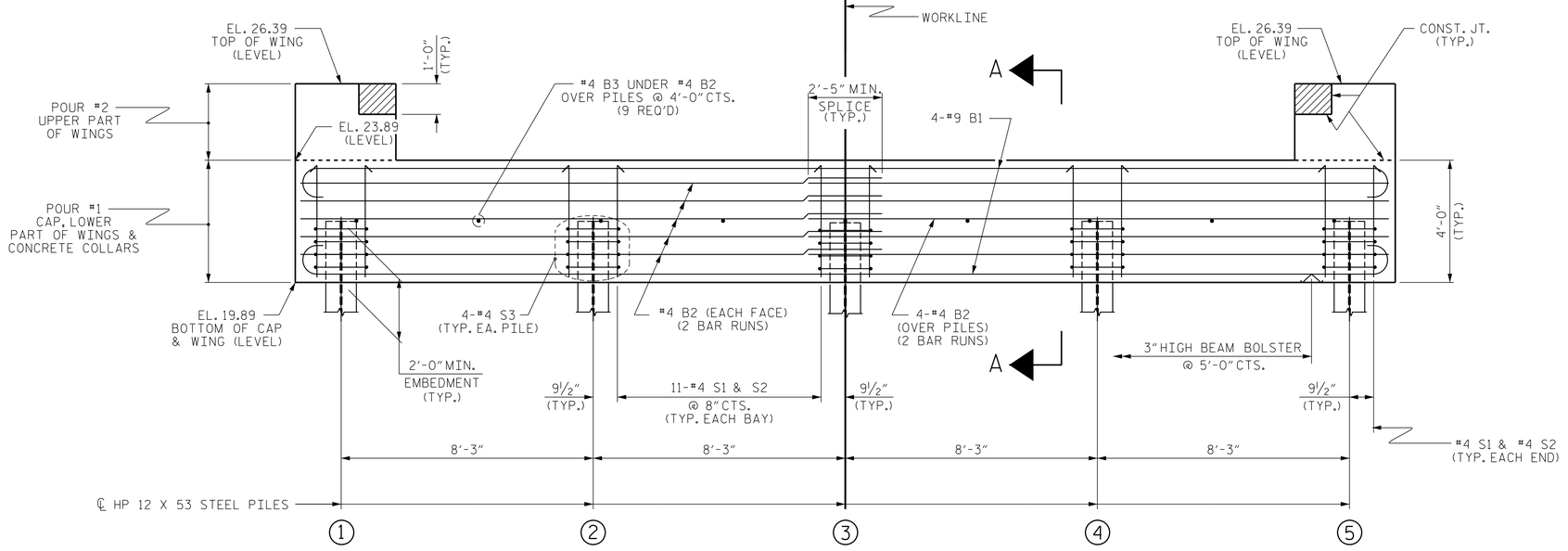
STANDARD
GUARDRAIL ANCHORAGE DETAILS FOR VERTICAL CONCRETE BARRIER RAIL

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

STD. GRA3 SHT. 1



PLAN



ELEVATION

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

NOTES

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

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

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

INSTALL THE 6"Ø DRAIN PIPE THROUGH THE WINGWALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS. SEE ROADWAY PLANS. REINFORCING STEEL IN THE WINGWALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

PROJECT NO. BP2.R004.1

PITT COUNTY

STATION: 22+05.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

DRAWN BY : WJH 12/11	REV. 4/15 MAA/TMG
CHECKED BY : AAC 12/11	

DRAWN BY : SCOTT A. BETZ DATE : 07/2023
CHECKED BY : LAURA E. SUTTON DATE : 07/2023
DESIGN ENGINEER OF RECORD: SCOTT A. BETZ DATE : 07/2023

4/16/2025
401_0060_BP2.R004.1_SMU_EB01_S-12_730006.DGN
sbetz

Signed by: F9DF12802416480...

NORTH CAROLINA PROFESSIONAL SEAL 054452 ENGINEER SCOTT A BETZ

4/16/2025

KCA KISINGER CAMPO & ASSOCIATES
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NC FIRM LICENSE: C-1506

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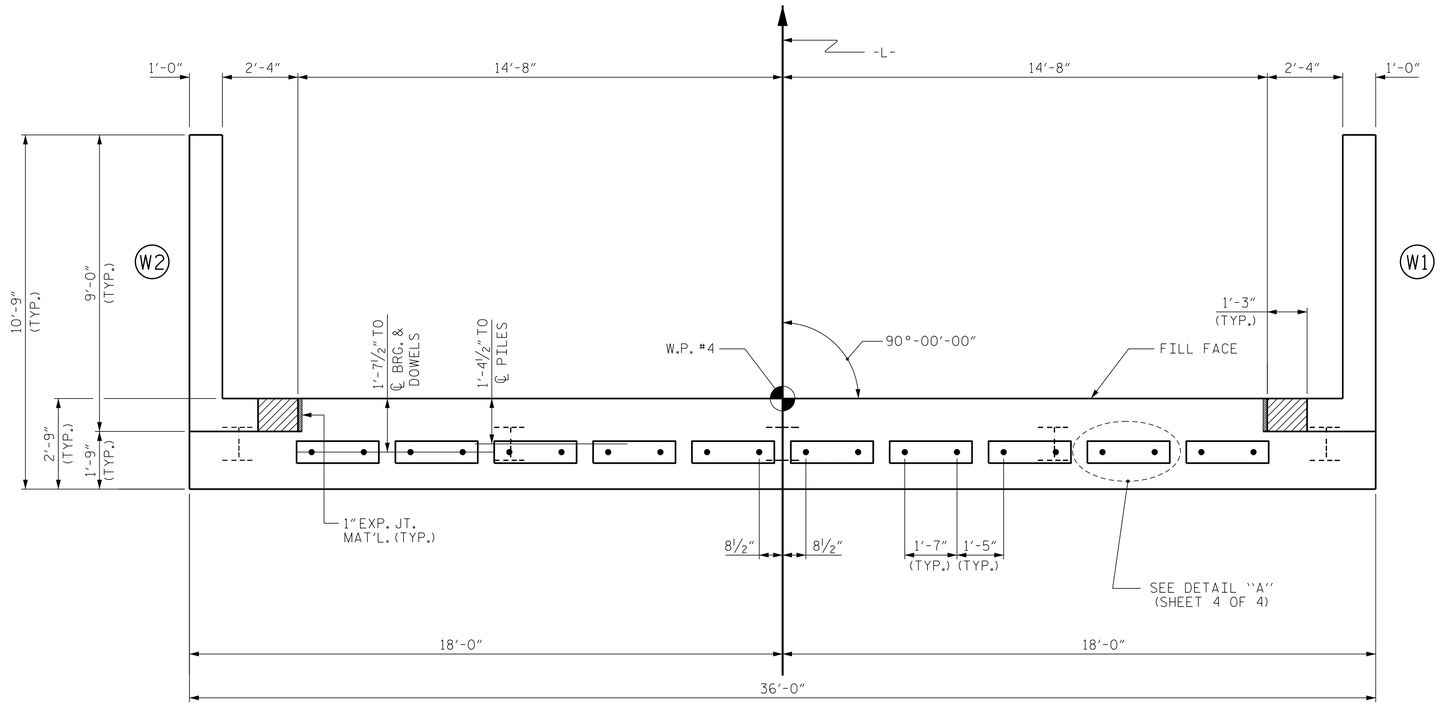
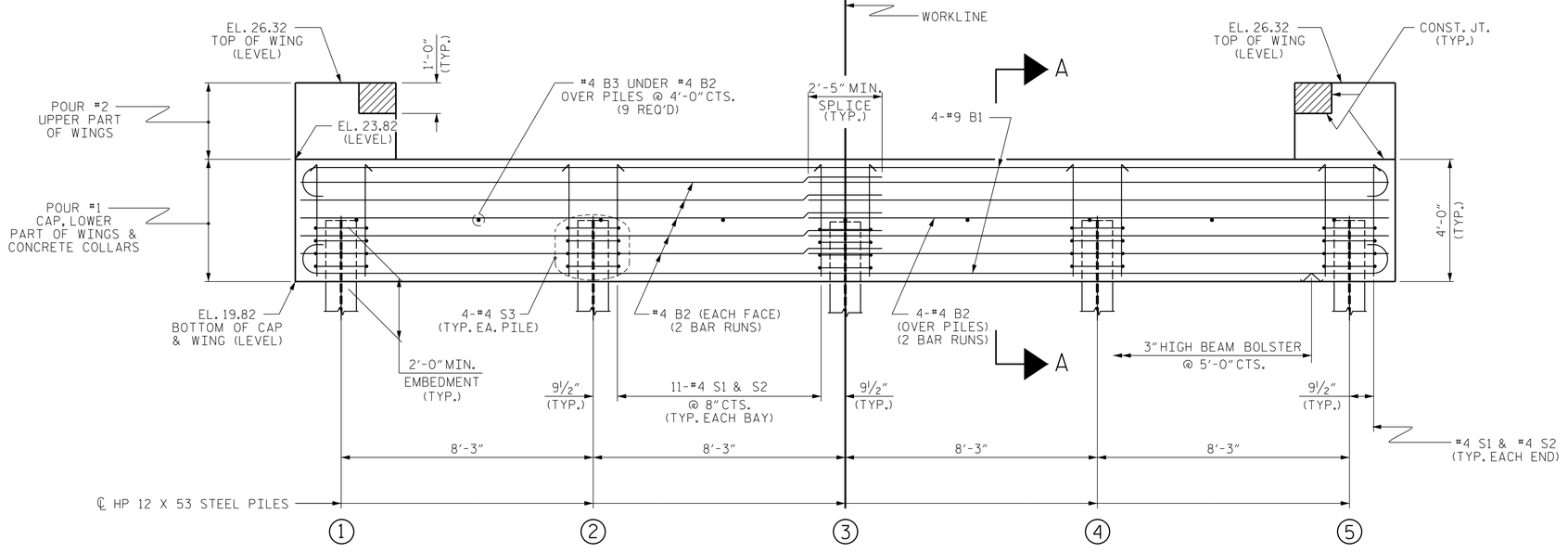
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			20

STD. NO. EB_30_90S4



PLAN



ELEVATION

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

NOTES

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

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

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

INSTALL THE 6" Ø DRAIN PIPE THROUGH THE WINGWALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS. SEE ROADWAY PLANS. REINFORCING STEEL IN THE WINGWALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

DRAWN BY : WJH 12/11	REV. 4/15 MAA/TMG	
CHECKED BY : AAC 12/11		
DRAWN BY : SCOTT A. BETZ	DATE : 07/2023	
CHECKED BY : LAURA E. SUTTON	DATE : 07/2023	
DESIGN ENGINEER OF RECORD: SCOTT A. BETZ	DATE : 07/2023	

4/16/2025
401_0065_BP2.R004.1_SMU_EB02_S-13_730006.DGN
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NORTH CAROLINA PROFESSIONAL SEAL 054452 ENGINEER SCOTT A. BETZ

4/16/2025

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PROJECT NO. BP2.R004.1
PITT COUNTY
STATION: 22+05.00 -L-
SHEET 2 OF 4

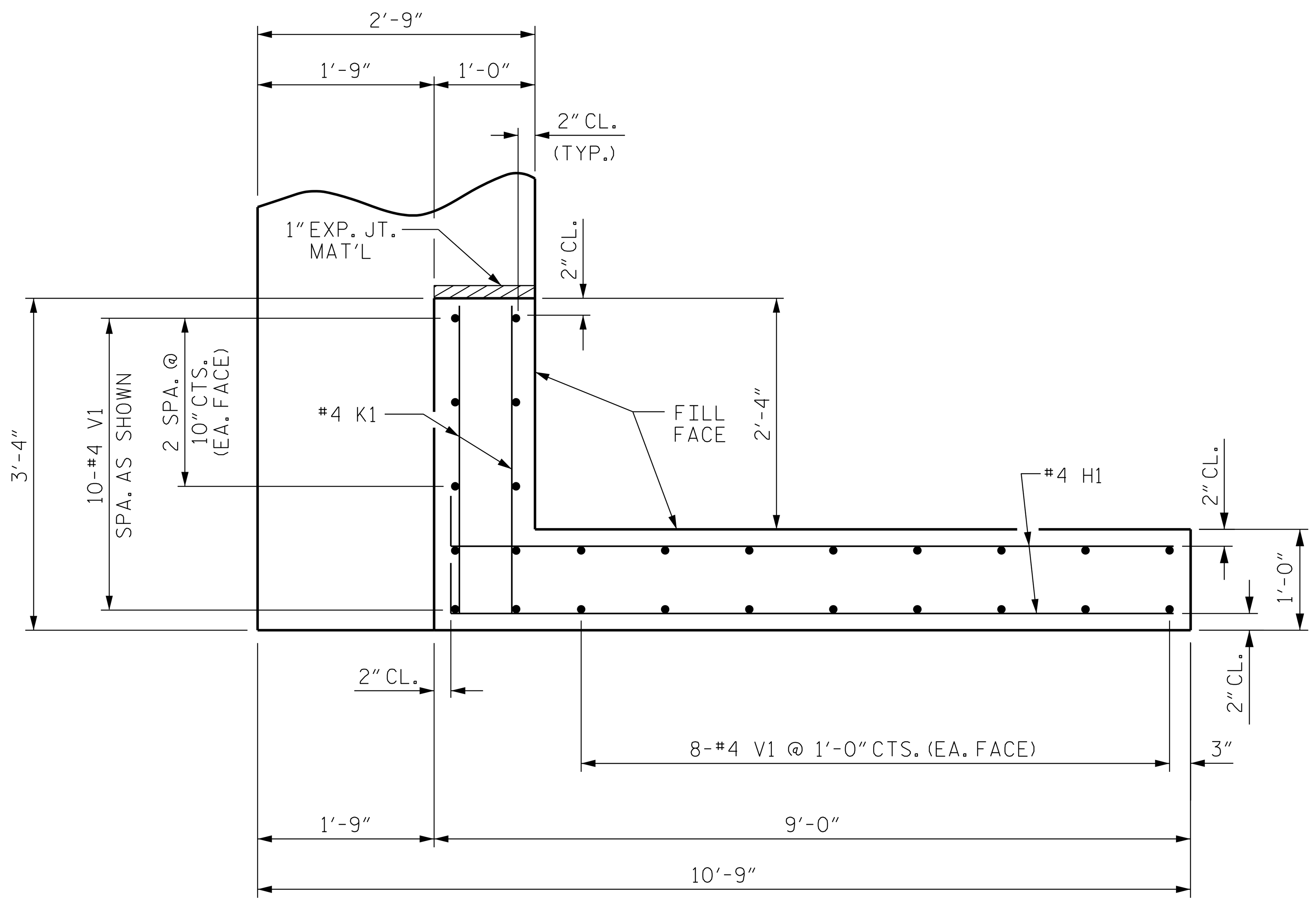
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

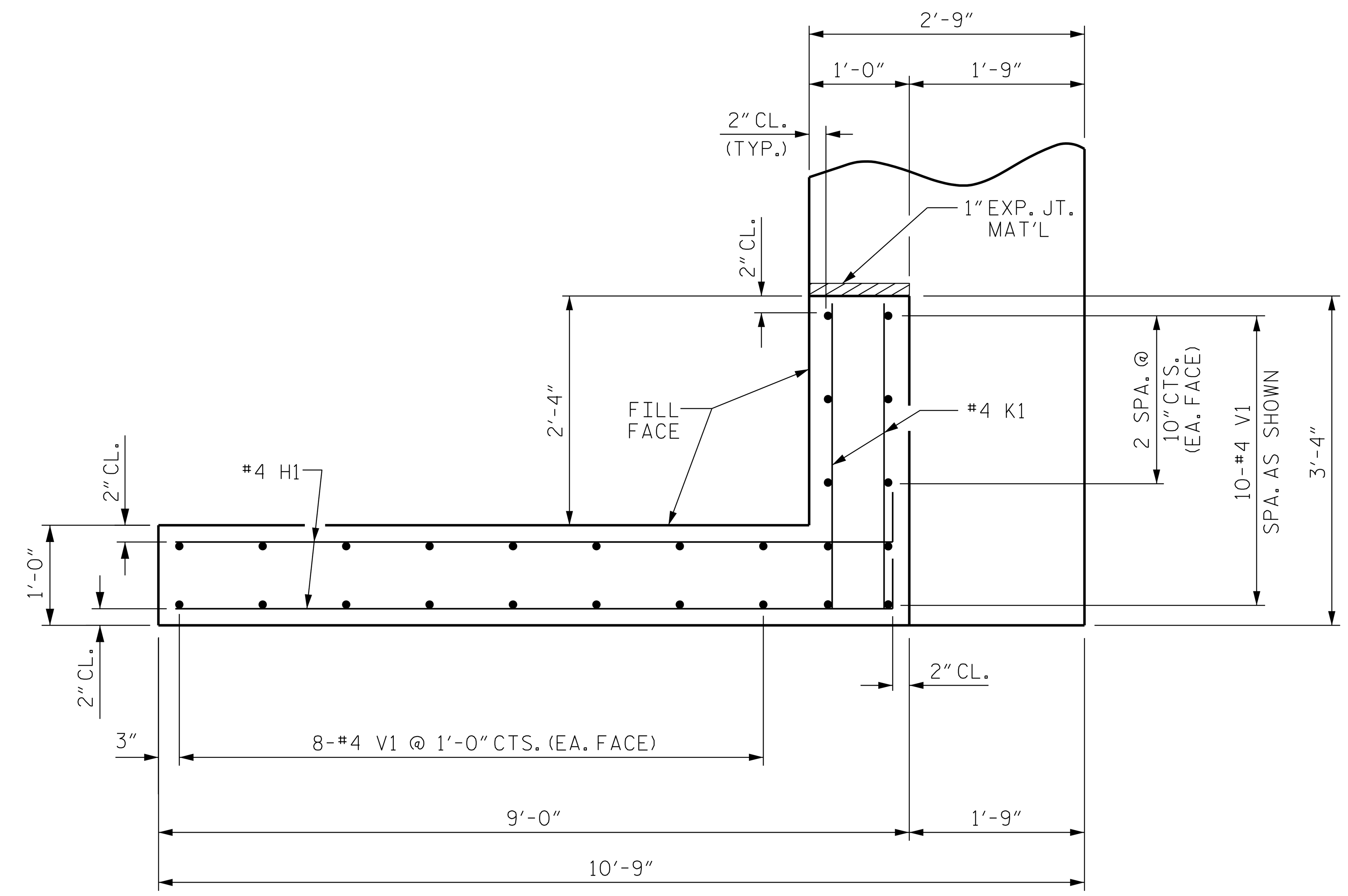
END BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			20

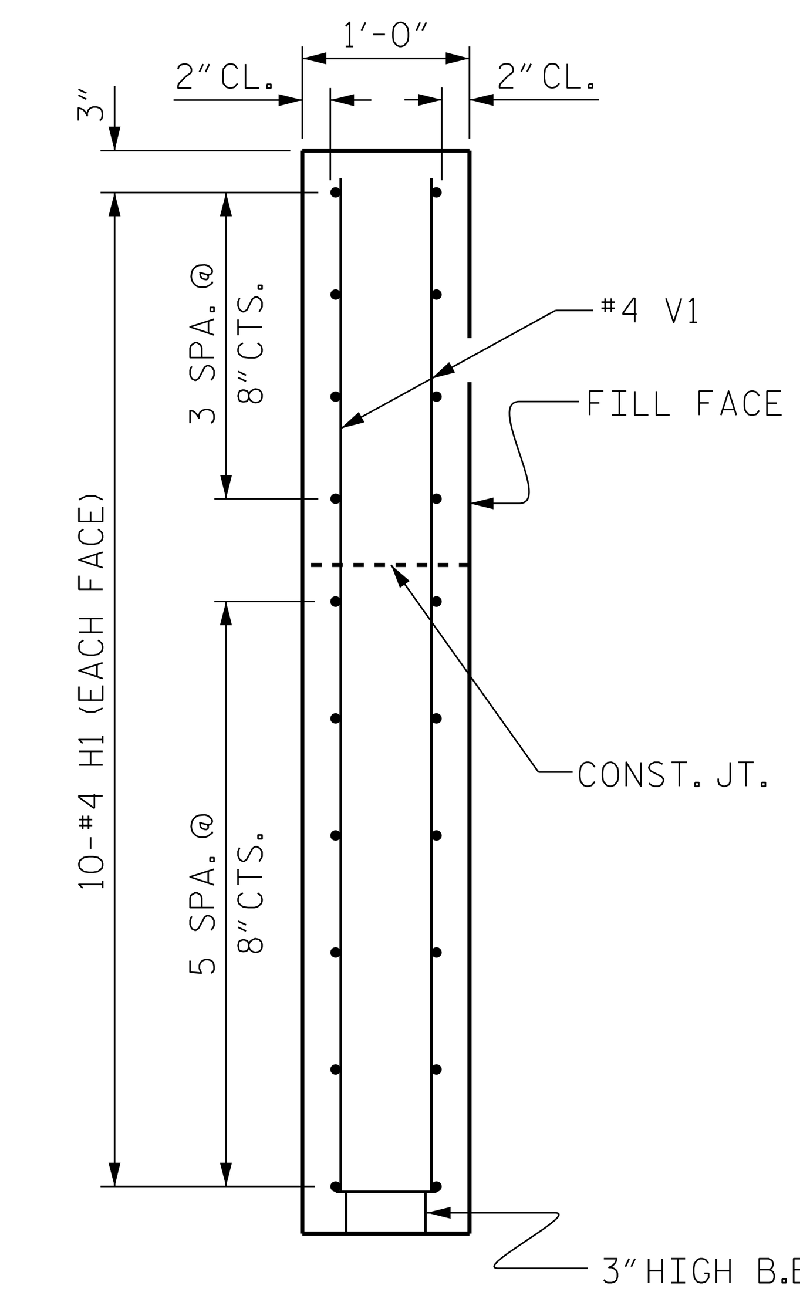
STD. NO. EB_30_90S4



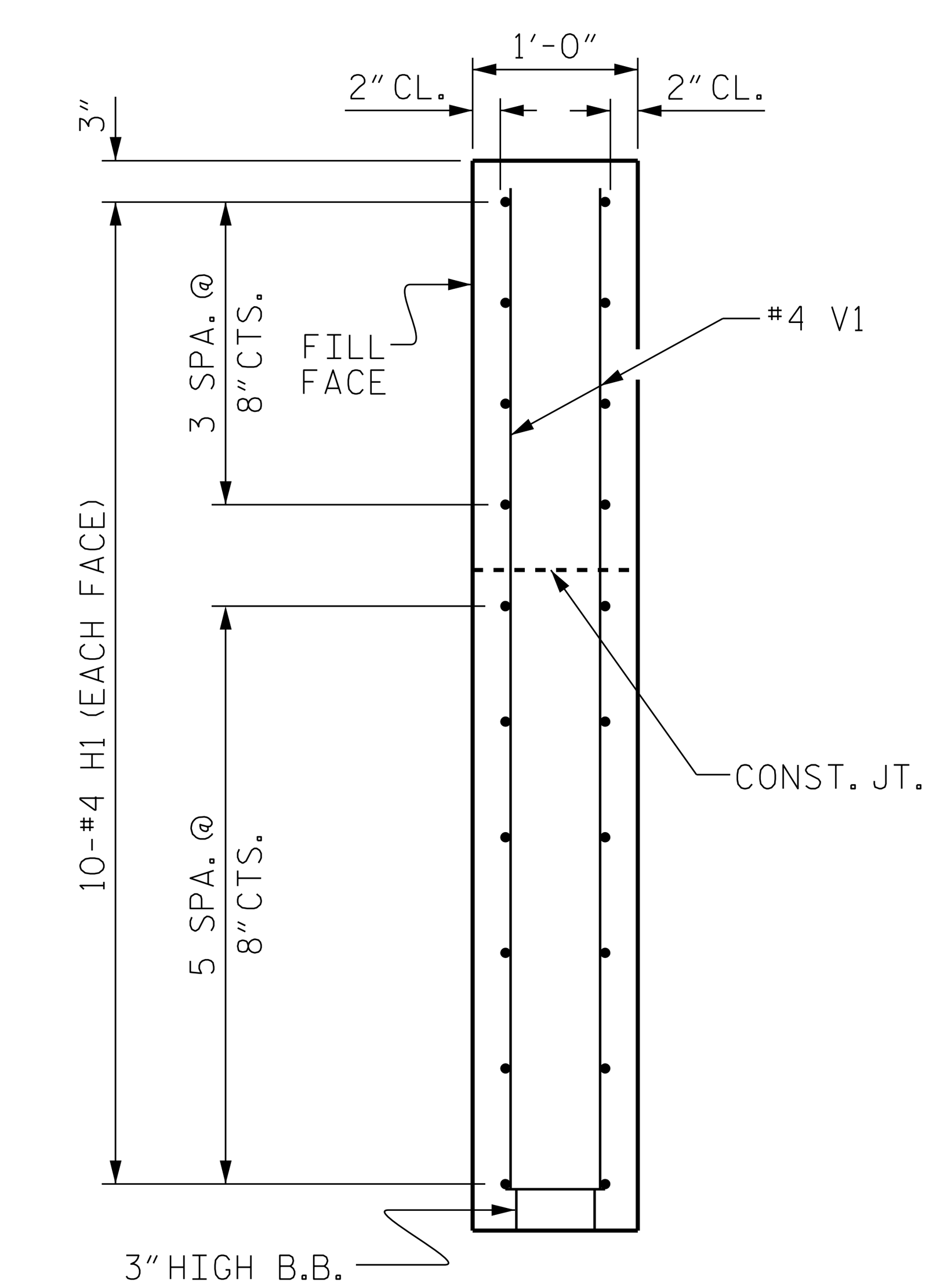
PLAN OF WING (W1)



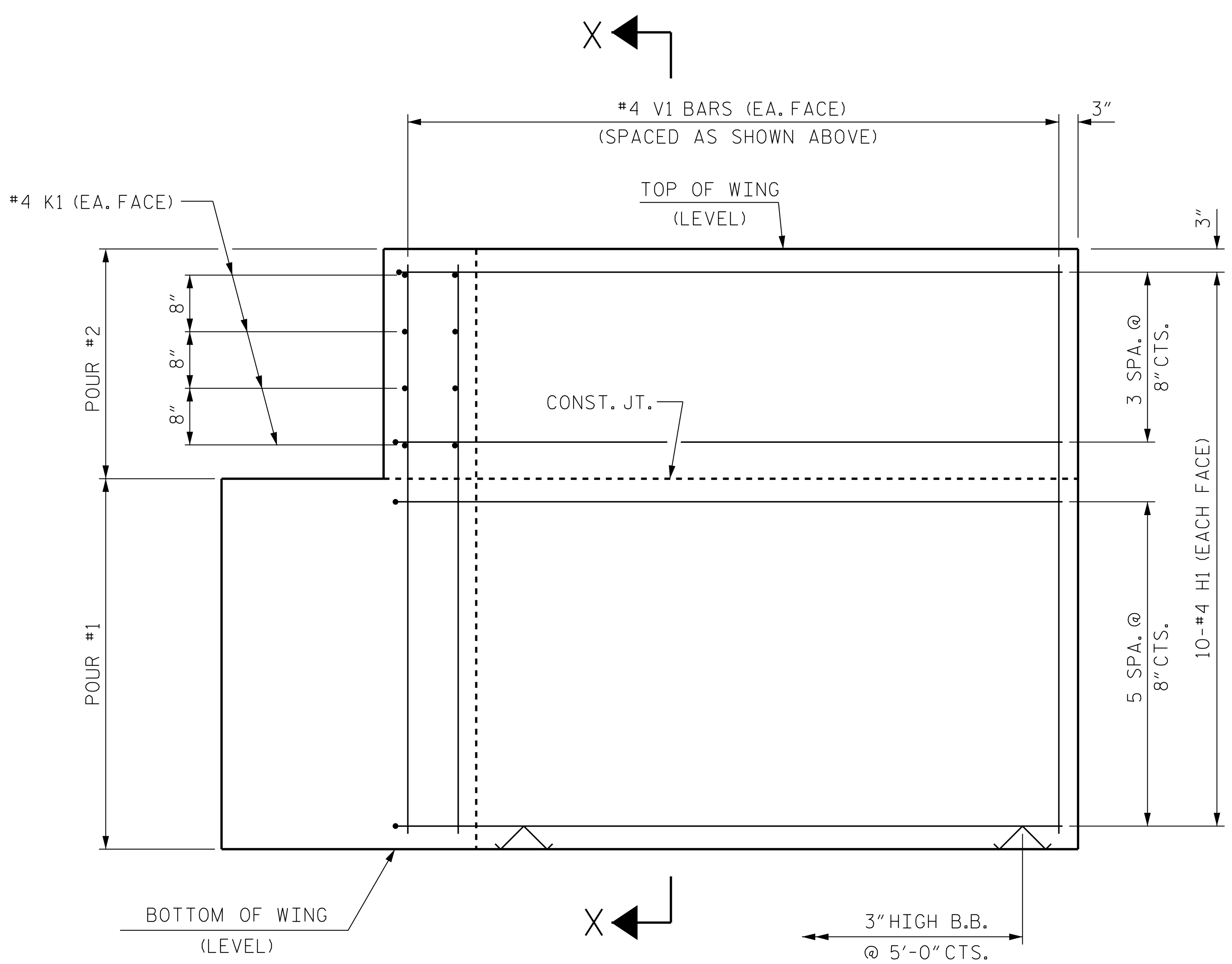
PLAN OF WING (W2)



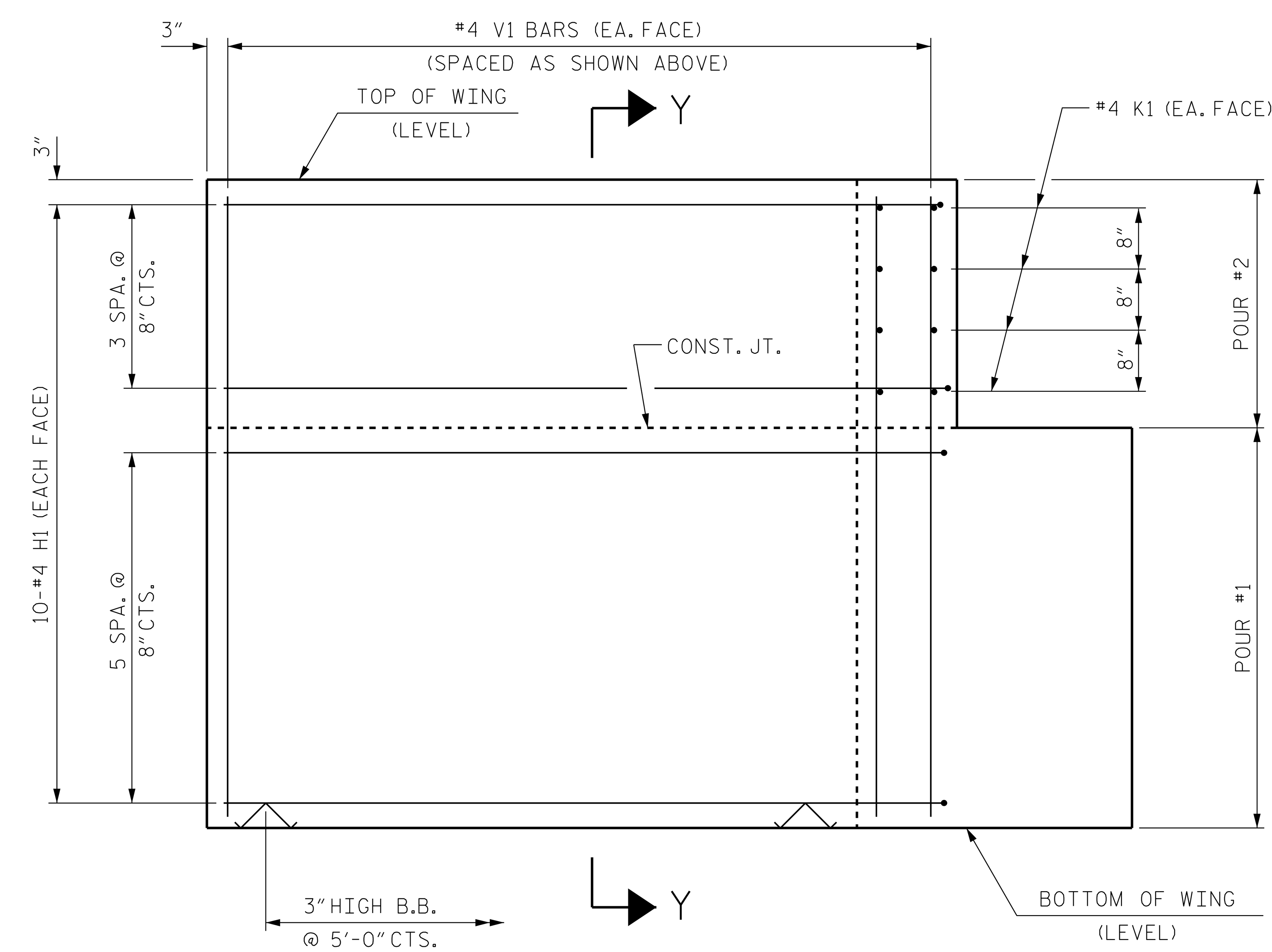
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

WING DETAILS

PROJECT NO. BP2.R004.1

PITT COUNTY

STATION: 22+05.00 -L-

SHEET 3 OF 4

Signed by: F9DF128024168C...

SEAL 054452 — NORTH CAROLINA PROFESSIONAL ENGINEER — SCOTT A. BETZ

4/16/2025

KCA KISINGER CAMPO & ASSOCIATES

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NC FIRM LICENSE: C-1506

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT
WING DETAILS

DRAWN BY : WJH 12/11	REV. 4/15 MAA/TMG
CHECKED BY : AAC 12/11	

DRAWN BY :	SCOTT A. BETZ	DATE : 07/2023
CHECKED BY :	LAURA E. SUTTON	DATE : 07/2023
DESIGN ENGINEER OF RECORD:	SCOTT A. BETZ	DATE : 07/2023

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

SHEET NO. S-14
TOTAL SHEETS 20

STD. NO. EB_30_90S4

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401_0070_BP2.R004.1_SMU_EB03_S-14_730006.DGN
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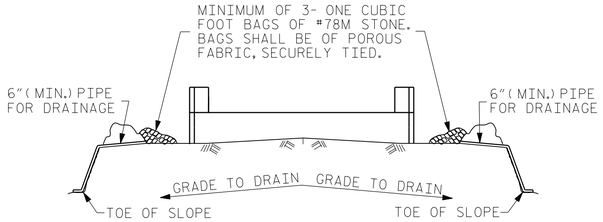
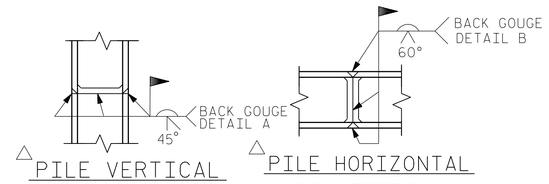


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

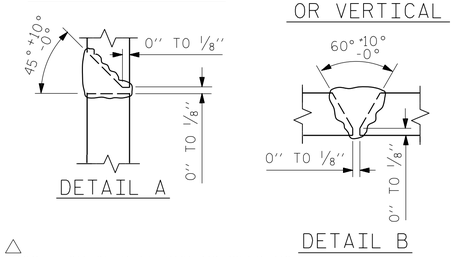
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



△ PILE VERTICAL

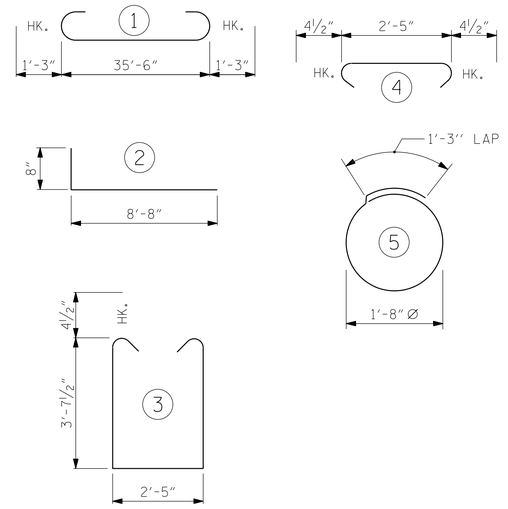
△ PILE HORIZONTAL OR VERTICAL



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL
FOR ONE END BENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	38'-0"	1034
B2	28	#4	STR	19'-1"	357
B3	9	#4	STR	2'-5"	15
D1	20	#6	STR	1'-6"	45
H1	40	#4	2	9'-4"	249
K1	16	#4	STR	2'-11"	31
S1	46	#4	3	10'-5"	320
S2	46	#4	4	3'-2"	97
S3	20	#4	5	6'-6"	87
V1	52	#4	STR	6'-2"	214

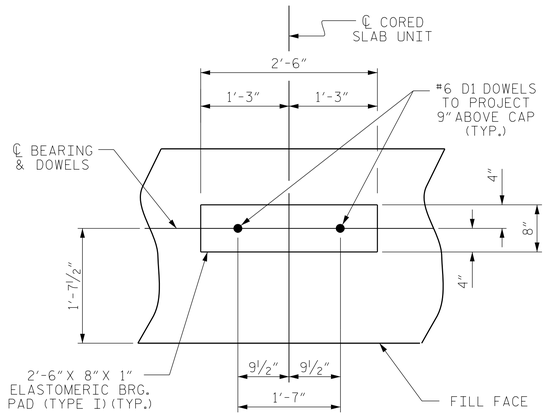
REINFORCING STEEL (FOR ONE END BENT) 2449 LBS.

CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)

POUR #1 CAP, LOWER PART OF WINGS & COLLARS 17.9 C.Y.

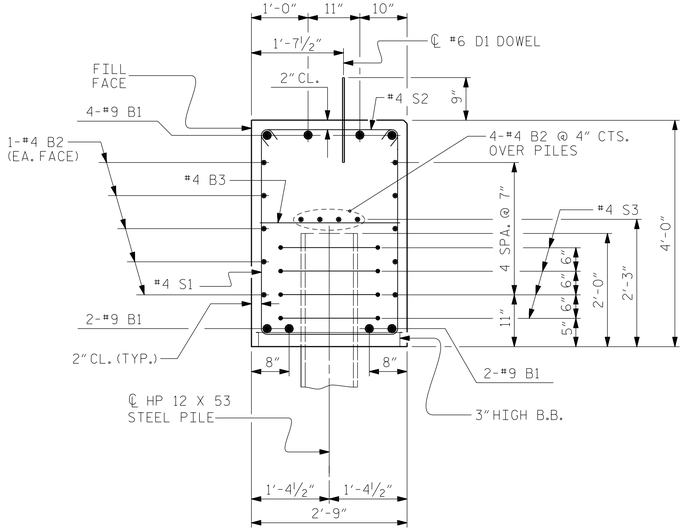
POUR #2 UPPER PART OF WINGS 2.1 C.Y.

TOTAL CLASS A CONCRETE 20.0 C.Y.



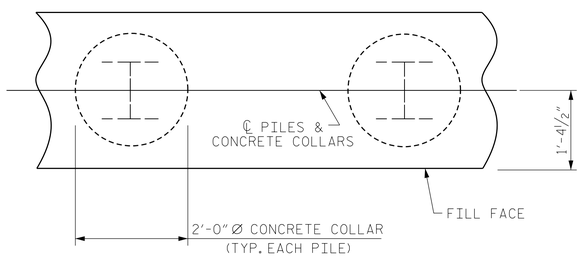
DETAIL "A"

(END BENT 1 SHOWN, END BENT 2 SIMILAR BY ROTATION)

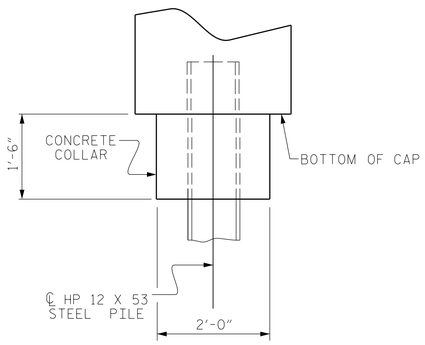


SECTION A-A

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



PLAN



ELEVATION

CORROSION PROTECTION FOR STEEL PILES DETAIL

(END BENT 1 SHOWN, END BENT 2 SIMILAR BY ROTATION)

DRAWN BY : WJH 12/11
CHECKED BY : AAC 12/11
REV. 4/17 MAA/THC

DRAWN BY : SCOTT A. BETZ DATE : 07/2023
CHECKED BY : LAURA E. SUTTON DATE : 07/2023
DESIGN ENGINEER OF RECORD: SCOTT A. BETZ DATE : 07/2023

4/1/2025
401_0075_BP2_R004_1_SMU_EB04_S-15_T30006.DGN
SDETZ

Signed by: F90F1280241646...

NORTH CAROLINA PROFESSIONAL SEAL 054452 ENGINEER SCOTT A. BETZ

4/16/2025

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

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PROJECT NO. BP2.R004.1
PITT COUNTY
STATION: 22+05.00 -L-

SHEET 4 OF 4

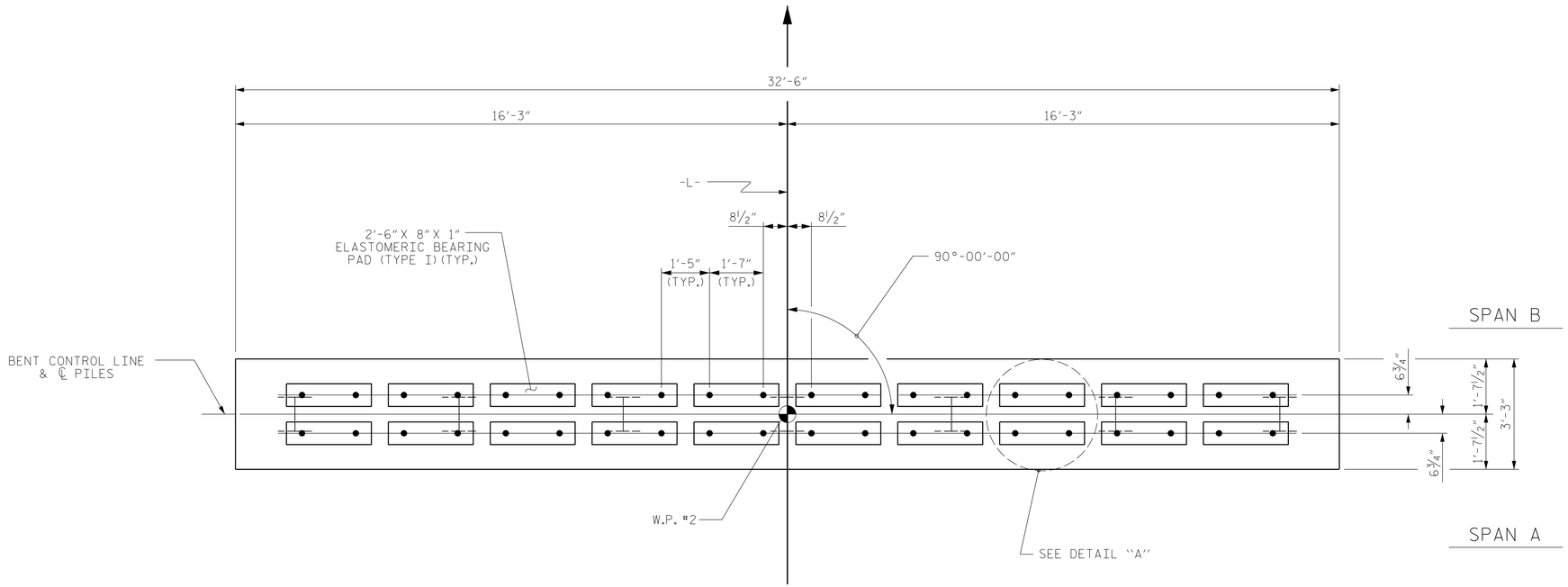
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

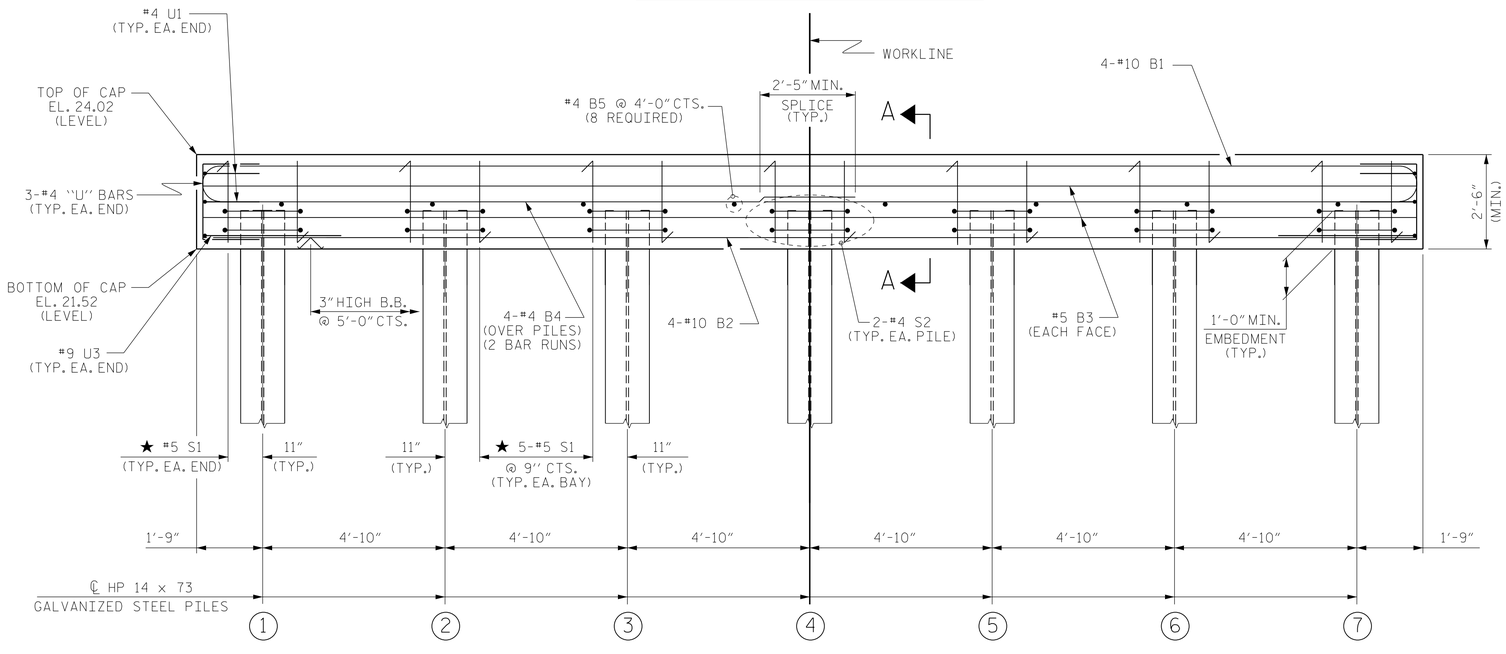
END BENT 1 & 2 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			20

STD. NO. EB_30_90S4



PLAN



ELEVATION

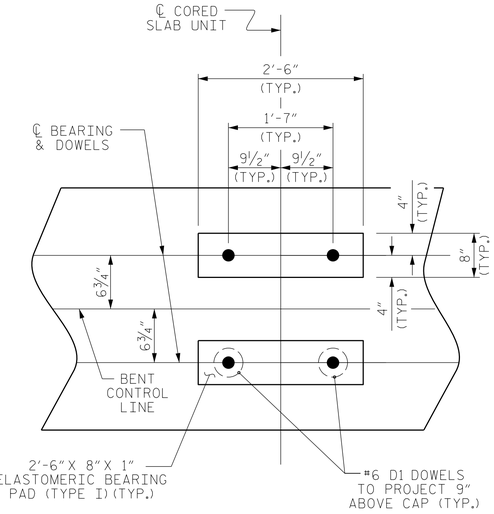
FOR SECTION A-A, SEE SHEET 3 OF 3

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 25'-0". GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.



DETAIL "A"

(DIMENSIONS ARE TYPICAL EACH BEARING)

PROJECT NO. BP2.R004.1

PITT COUNTY

STATION: 22+05.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

Signed by: F9DF1280241640...

NORTH CAROLINA PROFESSIONAL SEAL 054452 ENGINEER SCOTT A BETZ

4/16/2025

KCA KISINGER CAMPO & ASSOCIATES

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

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

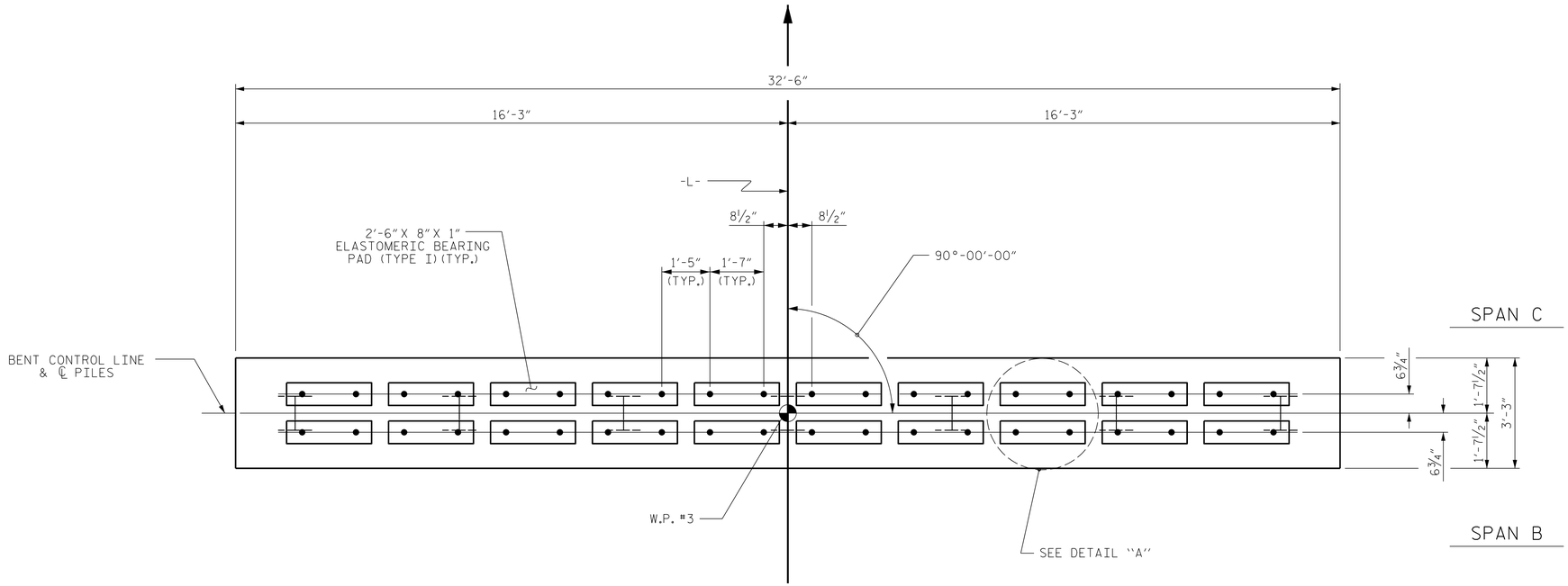
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

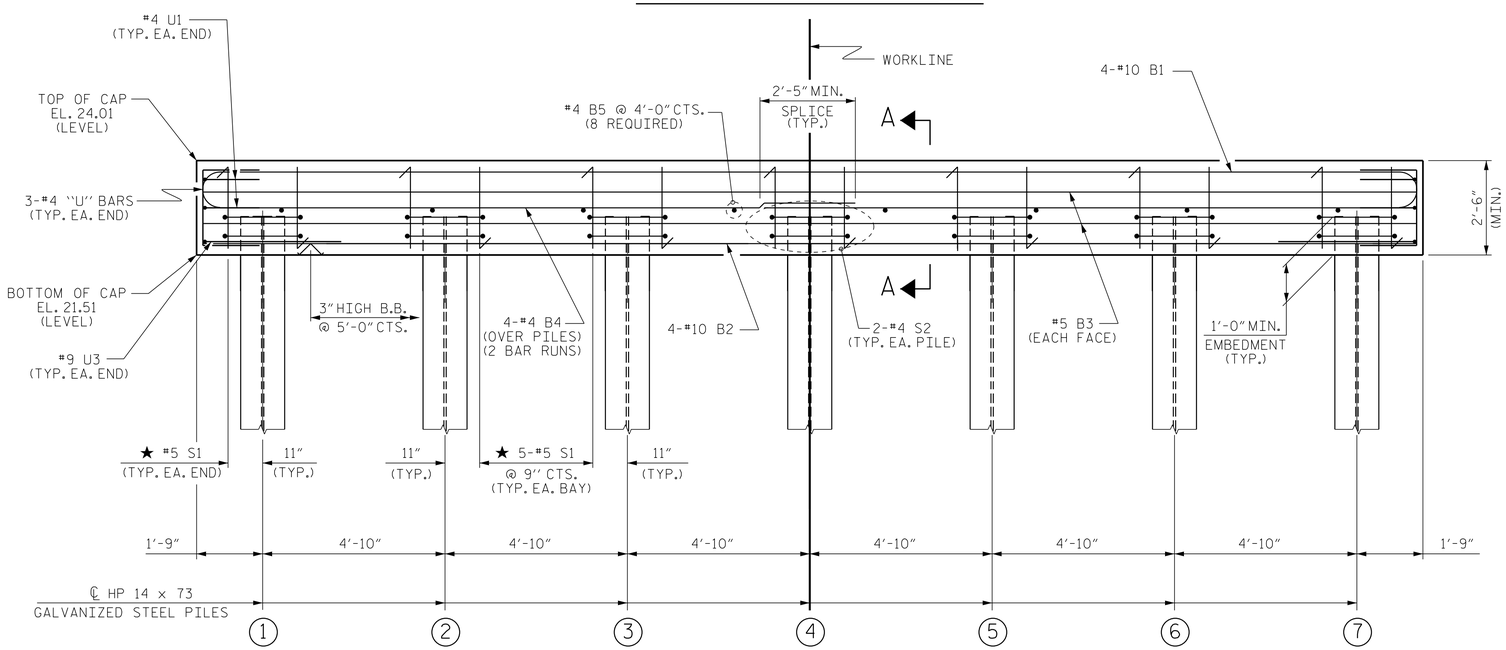
DRAWN BY : SCOTT A. BETZ DATE : 07/2023
CHECKED BY : LAURA E. SUTTON DATE : 07/2023
DESIGN ENGINEER OF RECORD: SCOTT A. BETZ DATE : 07/2023

4/1/2025
401_0080_BP2.R004.1_SMU_B01_S-16_730006.DGN
sbetz

STD. NO. 14" HP_BT_30_90S_<60'



PLAN



ELEVATION

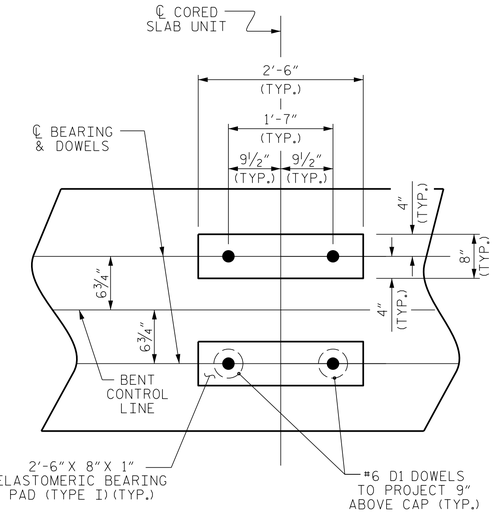
FOR SECTION A-A, SEE SHEET 3 OF 3

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 25'-0". GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.



DETAIL "A"

(DIMENSIONS ARE TYPICAL EACH BEARING)

PROJECT NO. BP2.R004.1

PITT COUNTY

STATION: 22+05.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 2

Signed by: F90F128024164...

NORTH CAROLINA PROFESSIONAL SEAL 054452 ENGINEER SCOTT A. BETZ

4/16/2025

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

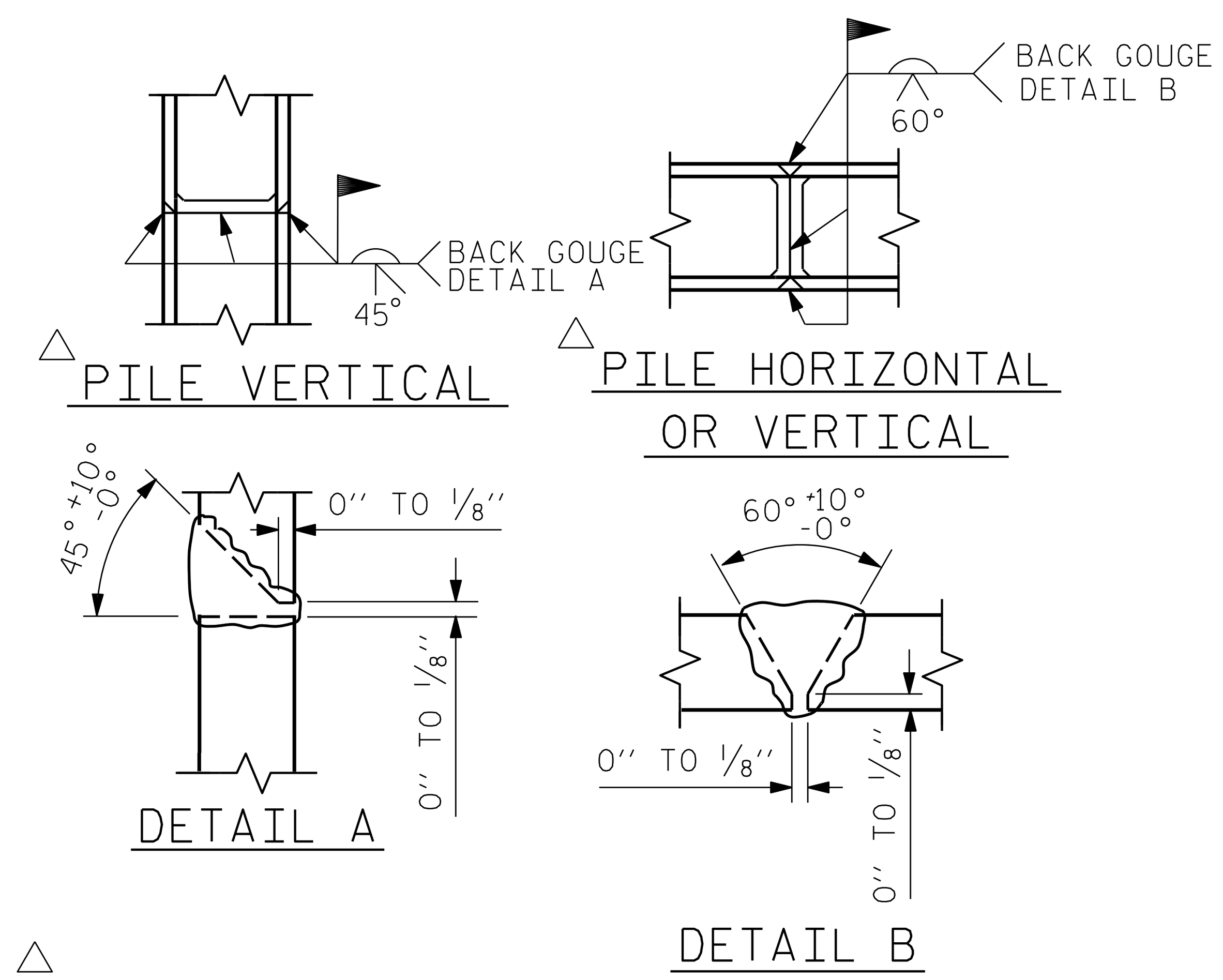
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			20

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

DRAWN BY : SCOTT A. BETZ DATE : 07/2023
CHECKED BY : LAURA E. SUTTON DATE : 07/2023
DESIGN ENGINEER OF RECORD: SCOTT A. BETZ DATE : 07/2023

4/1/2025
401_0085_BP2.R004.1_SMU_B02_S-17_730006.DGN
sbetz

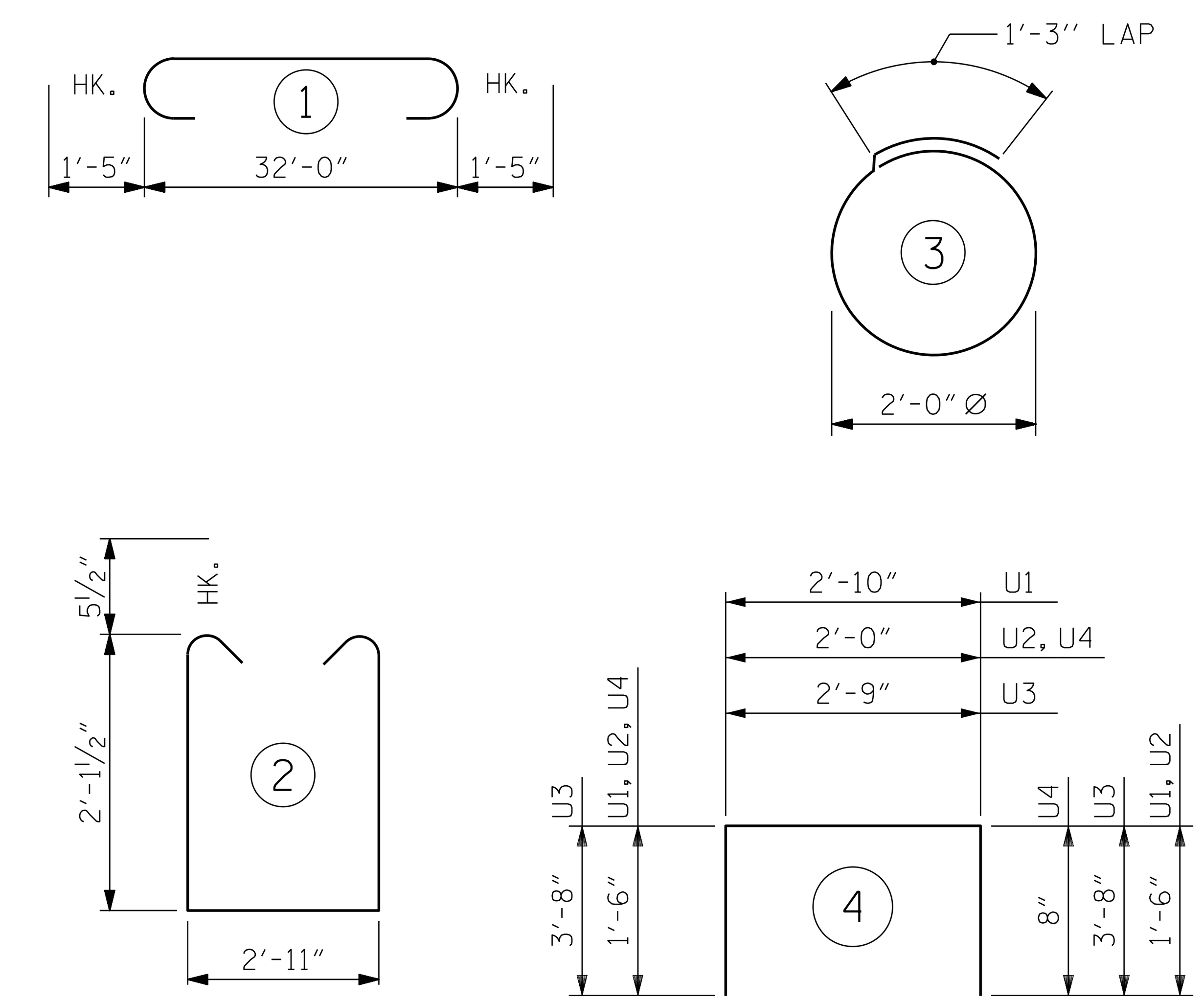
STD. NO. 14" HP_BT_30_90S_<60'



POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

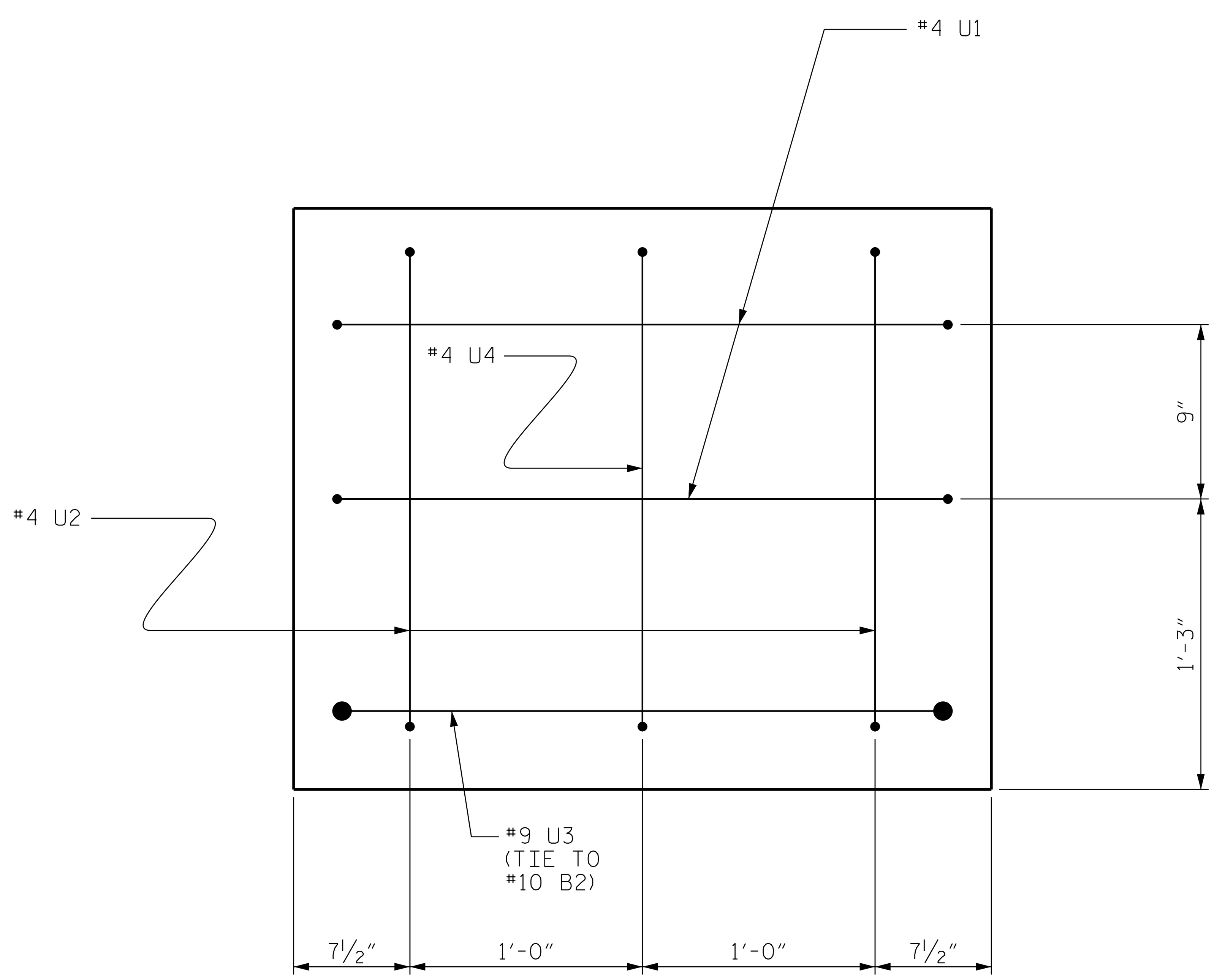
FOR ONE BENT (2 REQ'D.)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	34'-10"	600
B2	4	#10	STR	32'-2"	554
B3	4	#5	STR	32'-2"	134
B4	8	#4	STR	17'-4"	93
B5	8	#4	STR	2'-11"	16
D1	40	#6	STR	1'-6"	90
S1	32	#5	2	8'-1"	270
S2	14	#4	3	7'-7"	71
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

REINFORCING STEEL (FOR ONE BENT) 1932 LBS

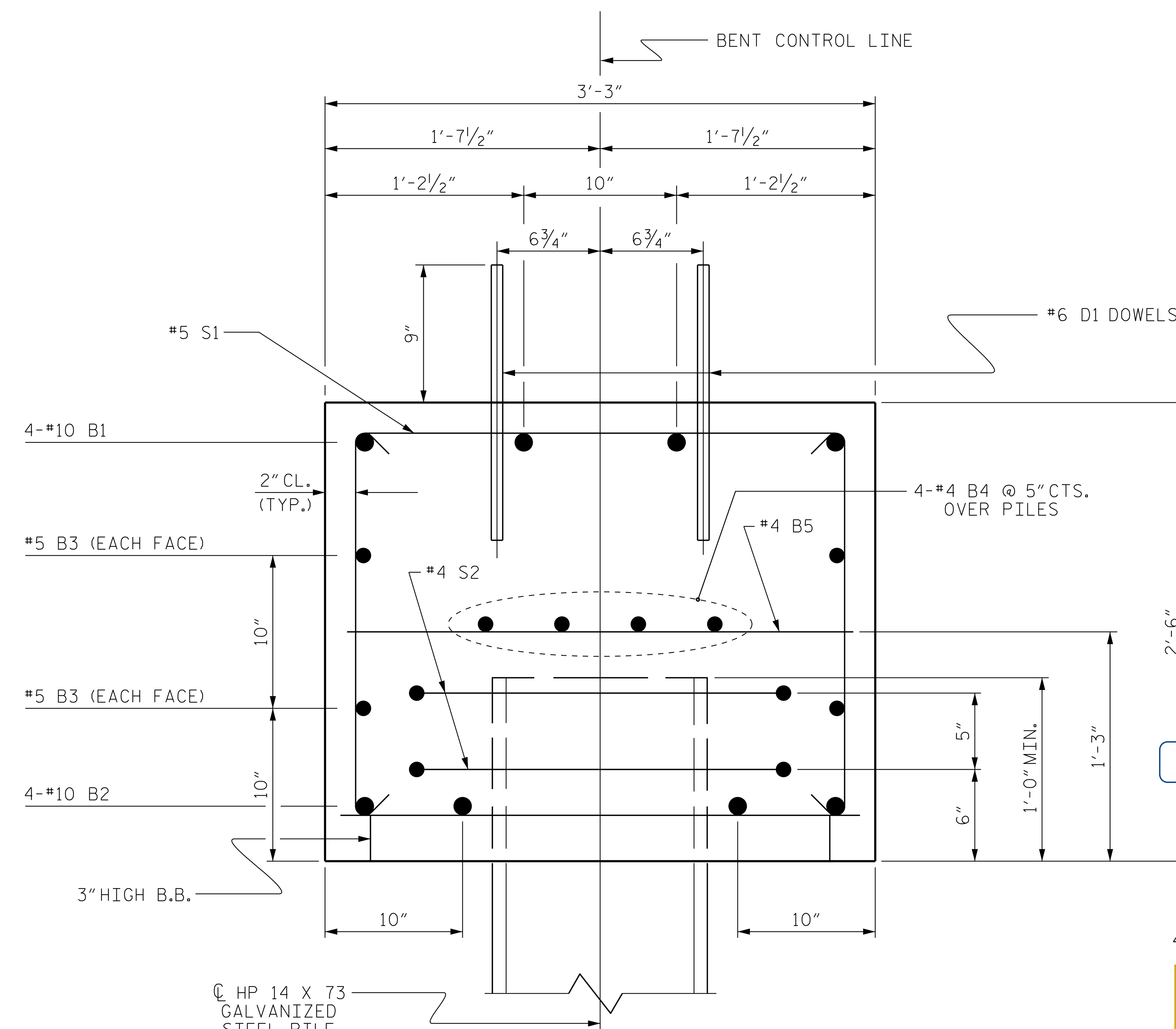
CLASS A CONCRETE BREAKDOWN (FOR ONE BENT)

TOTAL CLASS A CONCRETE 9.8 C.Y.



END OF CAP VIEW

(TYPICAL BOTH ENDS)



SECTION A-A

PROJECT NO. BP2.R004.1

PITT COUNTY

STATION: 22+05.00 -L-

SHEET 3 OF 3

Signed by: 190F12802415490...

SEAL 054452 NORTH CAROLINA PROFESSIONAL ENGINEER SCOTT A. BETZ

4/16/2025

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

SUBSTRUCTURE

BENT 1 & 2
DETAILS

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

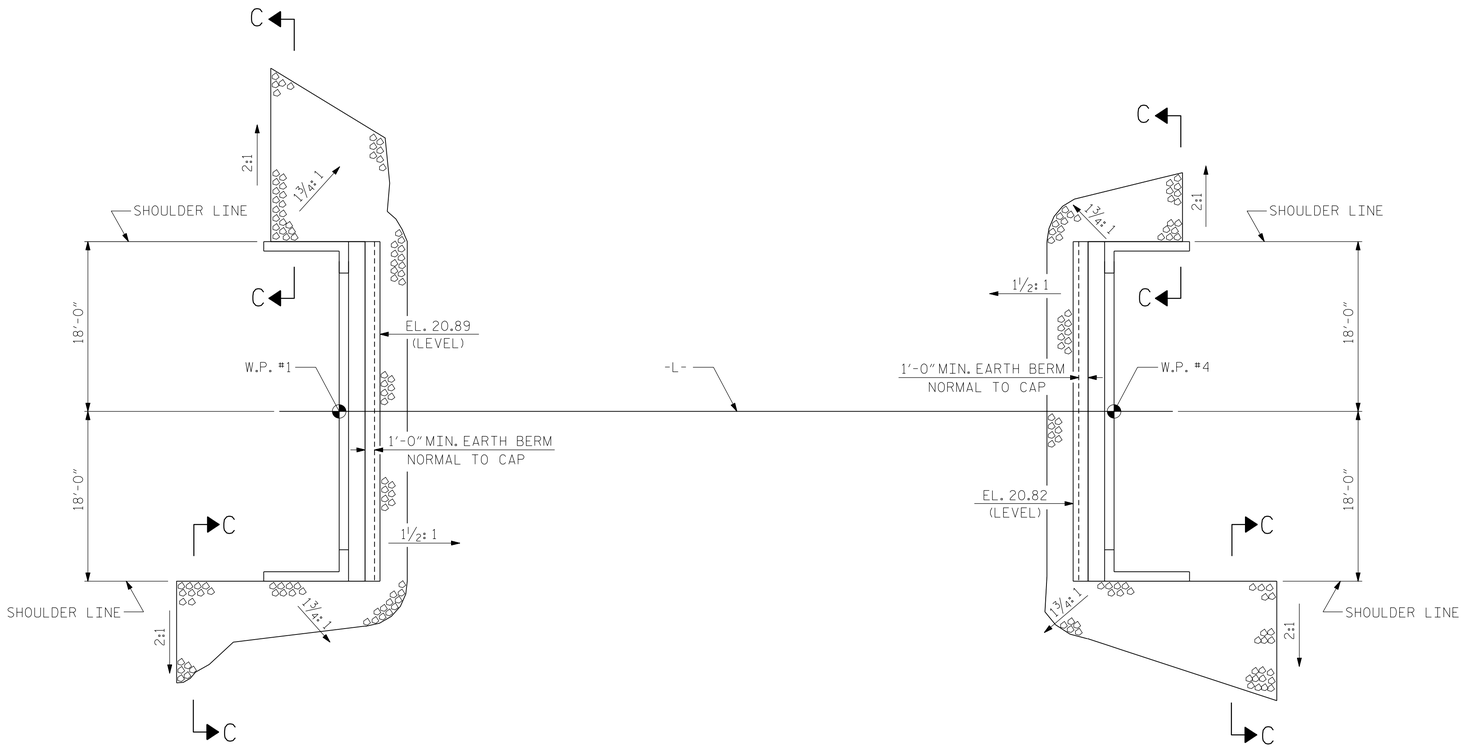
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

DRAWN BY : SCOTT A. BETZ DATE : 07/2023
CHECKED BY : LAURA E. SUTTON DATE : 07/2023
DESIGN ENGINEER OF RECORD: SCOTT A. BETZ DATE : 07/2023

4/1/2025
401_0090_BP2.R004.1_SMU_B03_S-18_730006.DGN
sbetz

STD. NO. 14" HP_BT_30_90S_<60'



@ END BENT 1

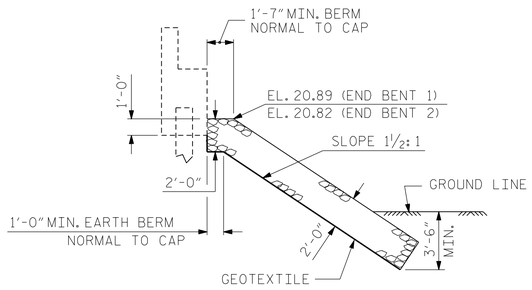
@ END BENT 2

PLAN OF RIP RAP

NOTES :

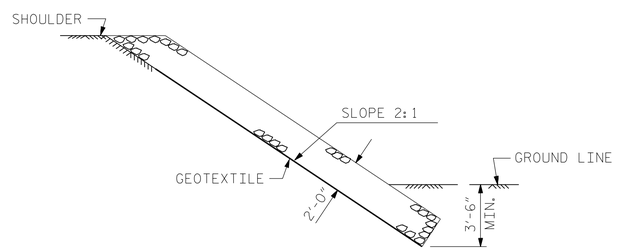
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.

ESTIMATED QUANTITIES		
BRIDGE @ STA. 22+05.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	114	233
END BENT 2	127	258



℄ SECTION

BERM RIP RAPPED



SECTION C-C

PROJECT NO. BP2.R004.1

PITT COUNTY

STATION: 22+05.00 -L-

Signed by: F90F12802416482...

NORTH CAROLINA PROFESSIONAL SEAL 054452 ENGINEER SCOTT A. BETZ

4/16/2025

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

RIP RAP DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
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 : SCOTT A. BETZ DATE : 07/2023
CHECKED BY : LAURA E. SUTTON DATE : 07/2023
DESIGN ENGINEER OF RECORD: SCOTT A. BETZ DATE : 07/2023

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

4/1/2025
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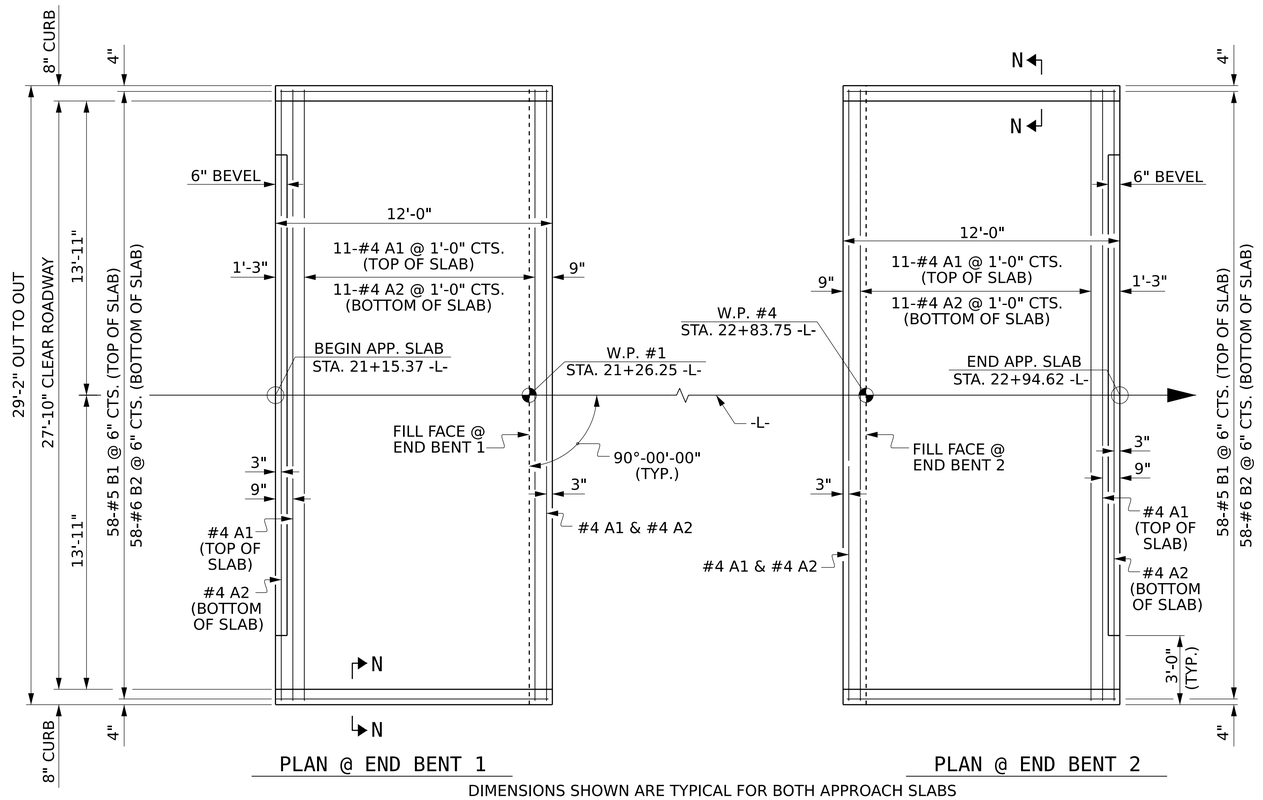
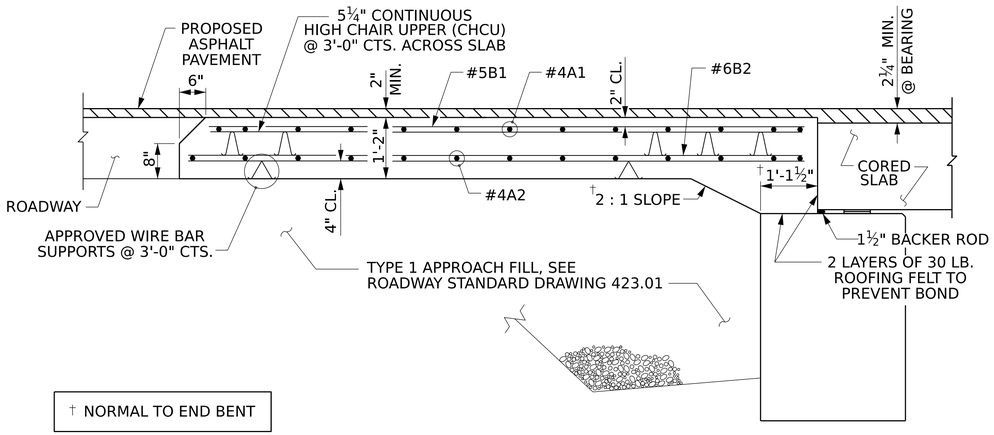
STD. NO. RR1



DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



† NORMAL TO END BENT

SECTION THRU SLAB

NOTES

FOR BRIDGE APPROACH FILL, SEE ROADWAY PLANS.

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

APPROACH SLAB GROOVING IS NOT REQUIRED.

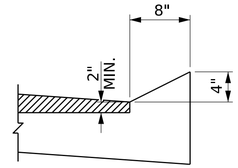
BILL OF MATERIAL

APPROACH SLAB AT EB 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	13	#4	STR	28'-10"	250
A2	13	#4	STR	28'-10"	250
*B1	58	#5	STR	11'-2"	676
B2	58	#6	STR	11'-8"	1016
REINFORCING STEEL				LBS.	1266
* EPOXY COATED REINFORCING STEEL				LBS.	926
CLASS AA CONCRETE				C. Y.	16.7

APPROACH SLAB AT EB 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	13	#4	STR	28'-10"	250
A2	13	#4	STR	28'-10"	250
*B1	58	#5	STR	11'-2"	676
B2	58	#6	STR	11'-8"	1016
REINFORCING STEEL				LBS.	1266
* EPOXY COATED REINFORCING STEEL				LBS.	926
CLASS AA CONCRETE				C. Y.	16.7



SECTION N-N

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

PROJECT NO. BP2.R004.1

PITT COUNTY

STATION: 22+05.00 -L-

Signed by: F9DF12802416480...

4/16/2025

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

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

DRAWN BY : KMM 3-08	REV. 06/19	MAA/THC
CHECKED BY : GM 3-08	REV. 08/19	BNB/THC
	REV. 07/23	BNB/SNM
DRAWN BY : SCOTT A. BETZ	DATE : 07/2023	
CHECKED BY : LAURA E. SUTTON	DATE : 07/2023	
DESIGN ENGINEER OF RECORD: SCOTT A. BETZ	DATE : 07/2023	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

4/1/2025
401_0100_BP2_R004_1_SMU_AS_S-20_730006.DGN
sbetz

STD. NO. BAS_30_90S

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2024 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED $\frac{3}{4}$" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO $1\frac{1}{2}$" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A $\frac{1}{4}$" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A $\frac{1}{4}$" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 12" INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT, ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.

ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

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

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST $\frac{5}{16}$" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

REFERENCE: SF-730006

PROJECT: BP2.R004

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	SF-730006	1	8

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

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY *PITT*

PROJECT DESCRIPTION *BRIDGE NUMBER 6 ON -L- (SR 1756) OVER COW SWAMP AT STA. 22+05*

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 PERFORM INDEPENDENT SUBSURFACE INVESTIGATIONS AND MAKE INTERPRETATIONS AS NECESSARY TO CONFIRM CONDITIONS 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

D.N. ARGENBRIGHT

S.N. ZIMARINO

T.W. MILLER

C.M. WALKER

INVESTIGATED BY *T.C BOTTOMS*

DRAWN BY *T.W. MILLER*

CHECKED BY *D.N. ARGENBRIGHT*

SUBMITTED BY *D.N. ARGENBRIGHT*

DATE *APRIL 2023*

NORTH CAROLINA LICENSED SEAL 2240 GEOLOGIST TYLER C. BOTTOMS

DocuSigned by:
Tyler Bottoms 05/10/2023
48A2D3BD08CF4A6...
SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
SF-730006	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		—	—	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: BM-1
N: 654031.3897 E: 2527951.7563
ELEVATION: 24.78 FEET

NOTES:

DATE: 8-15-14

PROJECT REFERENCE NO.	SHEET NO.
SF-730006	3

SITE PLAN

0 30 60
FEET

SKEW: 90°

21

22

23

EB1 BENT LINE

B1 BENT LINE

B2 BENT LINE

EB2 BENT LINE

TO SR 1771

EB1-A

B2-A

-L- (SR 1756)

TO SR 1777

B1-B

BRIDGE NO. 6

EB2-B

COW SWAMP

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
SF-730006	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
21+25
7'LT

B1-B
21+75
10'RT

B2-A
22+27
8' LT

EB2-B
22+86
7' RT

SURFACE WATER

VERY LOOSE TO MEDIUM DENSE GRAY AND TAN SILTY SAND, MOIST TO SATURATED (ALLUVIAL)

VERY SOFT TO SOFT GRAY SILTY CLAY WITH SHELL FRAGMENTS, WET (YORKTOWN FORMATION)

LOOSE GRAY SILTY SAND WITH PHOSPHATE AND SHELL FRAGMENTS, SATURATED (YORKTOWN FORMATION)

VERY LOOSE TO VERY DENSE BLUE, GREEN, AND GRAY SILTY SAND
WITH SHELL FRAGMENTS, SANDSTONE LAYERS, AND PHOSPHATE, SATURATED (PEEDEE FORMATION)

MEDIUM STIFF TO HARD GRAY AND GREEN SANDY SILT AND MICACEOUS SILT,
WET (PEEDEE FORMATION)

MEDIUM DENSE TO VERY DENSE TAN, GREEN, AND GRAY SILTY SAND WITH PHOSPHATE,
SATURATED (PEEDEE FORMATION)

Ⓐ PAVEMENT

Ⓑ VERY LOOSE TO LOOSE TAN SILTY SAND WITH GRAVEL, MOIST TO SATURATED (ROADWAY EMBANKMENT)

Ⓒ VERY SOFT BROWN CLAYEY MUCK, WET (ALLUVIAL)

Ⓓ MEDIUM STIFF TO HARD GRAY AND DARK GRAY SILTY AND SANDY CLAY, WITH SANDSTONE LAYERS, WET (PEEDEE FORMATION)

NOTE: PROFILE ALONG GROUNDLINE -L- DRAWN BY HAND REFERENCE THE BRIDGE SURVEY AND HYDRAULIC REPORT DATED 12/14/22

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

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

20+00 21+00 22+00 23+00 24+00

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GEOTECHNICAL BORING REPORT
BORE LOG

WBS BP2.R004.1	**TIP** SF-730006	**COUNTY** PITT	**GEOLOGIST** Miller, T. W.	
SITE DESCRIPTION BRIDGE NUMBER 6 ON -L- (SR 1756) OVER COW SWAMP				**GROUND WTR (ft)**
BORING NO. EB1-A	**STATION** 21+25	**OFFSET** 7 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 25.4 ft	**TOTAL DEPTH** 119.2 ft	**NORTHING** 654,024	**EASTING** 2,527,944	**24 HR.** 1.9
DRILL RIG/HAMMER EFF./DATE GFC0075 CME-45C 90% 11/21/2022		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Walker, C. M.	**START DATE** 04/03/23	**COMP. DATE** 04/03/23	**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)
25.4										GROUND SURFACE	0.0
24.6		0.8	10	5	4	9				**ROADWAY EMBANKMENT** PAVEMENT	0.8
21.4		4.0	2	1	2	3				TAN SILTY SAND WITH GRAVEL, MOIST TO SATURATED	
19.4		6.0								**ALLUVIAL**	
17.7		7.7	1	1	1	2				GRAY SILTY SAND WITH WOOD FRAGMENTS, SATURATED	
12.7		12.7	WOH	1	2	3					
9.4		16.0								**COASTAL PLAIN**	
7.7		17.7	1	1	1	2				GRAY SILTY CLAY WITH SHELL FRAGMENTS, WET (YORKTOWN FORMATION)	
2.7		22.7	3	1	1	2					
-0.6		26.0								GRAY SILTY SAND WITH SHELLS AND PHOSPHATE, SATURATED (YORKTOWN FORMATION)	
-2.3		27.7	3	2	2	4					
-6.6		32.0									
-7.0		32.4								GRAY AND GREEN SILTY SAND WITH PHOSPHATE, SHELL FRAGMENTS, AND VERY HARD SANDSTONE LAYERS, SATURATED (PEEDEE FORMATION)	
-7.3		32.7	7	10	5	15					
-9.1		34.5									
-9.5		34.9									
-10.8		36.2									
-11.3		36.7									
-12.3		37.7	34	37	7	44					
-13.9		39.3									
-14.5		39.9									
-17.3		42.7	4	3	30	33					
-18.8		44.2									
-19.7		45.1									
-22.0		47.4									
-22.3		47.7	10	10	90/0.3	100/0.8					
-24.4		49.8									
-27.3		52.7	14	18	32	50					
-29.1		54.5									
-30.2		55.6									
-30.7		56.1									
-31.0		56.4									
-32.3		57.7	7	5	5	10					
-33.6		59.0								DARK GRAY SILTY CLAY WITH SANDSTONE LAYERS, WET (PEEDEE FORMATION)	
-37.3		62.7	53	100/0.1		100/0.1					
-38.8		64.2									
-42.3		67.7	18	4	8	12					
-47.3		72.7	3	4	7	11					

WBS BP2.R004.1	**TIP** SF-730006	**COUNTY** PITT	**GEOLOGIST** Miller, T. W.	
SITE DESCRIPTION BRIDGE NUMBER 6 ON -L- (SR 1756) OVER COW SWAMP				**GROUND WTR (ft)**
BORING NO. EB1-A	**STATION** 21+25	**OFFSET** 7 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 25.4 ft	**TOTAL DEPTH** 119.2 ft	**NORTHING** 654,024	**EASTING** 2,527,944	**24 HR.** 1.9
DRILL RIG/HAMMER EFF./DATE GFC0075 CME-45C 90% 11/21/2022		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Walker, C. M.	**START DATE** 04/03/23	**COMP. DATE** 04/03/23	**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
-50						Match Line				
-52.3		77.7	2	3	4	7				
-57.3		82.7	4	3	5	8				
-62.3		87.7	4	3	6	9				
-67.3		92.7	4	9	13	22				
-72.3		97.7	4	4	6	10				
-77.3		102.7	5	5	8	13				
-82.3		107.7	6	7	11	18				
-87.3		112.7	29	37	63/0.4	100/0.9				
-92.3		117.7	22	29	48	77				
-50.6		76.0								GRAY SANDY SILT, WET (PEEDEE FORMATION)
-55.6		81.0								GRAY SANDY CLAY, WET (PEEDEE FORMATION)
-65.6		91.0								GRAY MICACEOUS SILT, WET (PEEDEE FORMATION)
-80.6		106.0								GREEN AND GRAY SILTY SAND WITH PHOSPHATE, SATURATED (PEEDEE FORMATION)
-93.8		119.2								Boring Terminated at Elevation -93.8 ft IN VERY DENSE SILTY SAND

GEOTECHNICAL BORING REPORT
BORE LOG

WBS BP2.R004.1	**TIP** SF-730006	**COUNTY** PITT	**GEOLOGIST** Argenbright, D. N.
SITE DESCRIPTION BRIDGE NUMBER 6 ON -L- (SR 1756) OVER COW SWAMP			**GROUND WTR (ft)**
BORING NO. B1-B	**STATION** 21+75	**OFFSET** 10 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 16.6 ft	**TOTAL DEPTH** 115.6 ft	**NORTHING** 653,975	**EASTING** 2,527,966	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE GFC0075 CME-45C 90% 11/21/2022		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic
DRILLER Walker, C. M.	**START DATE** 03/30/23	**COMP. DATE** 03/30/23	**SURFACE WATER DEPTH** 2.4ft

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)
										WATER SURFACE (03/30/23)	
	16.6	0.0	WOR	WOR	WOR	0				16.6 GROUND SURFACE	0.0
										ALLUVIAL TAN SAND WITH WOOD FRAGMENTS, SATURATED	
	11.3	5.3	4	2	2	4				10.3	6.3
										GRAY SAND, SATURATED	
	7.5	9.1	WOH	2	1	3				8.6 **COASTAL PLAIN** GRAY SILTY CLAY WITH SHELL FRAGMENTS, WET (YORKTOWN FORMATION)	8.0
	2.5	14.1	3	1	1	2					
	-2.5	19.1	2	3	5	8				-0.4 GRAY SILTY SAND, SATURATED (YORKTOWN FORMATION)	17.0
	-7.5	24.1	21	10	60/0.1	60/0.1				-8.5	25.1
	-12.5	29.1	4	6	100	100/0.5				-9.0 GRAY AND GREEN SILTY SAND WITH PHOSPHATE AND SANDSTONE LAYERS, SATURATED (PEEDEE FORMATION)	25.6
	-17.5	34.1	2	3	24	27				-11.0	27.6
	-22.5	39.1	7	9	60/0.1	60/0.1				-11.7	28.3
	-27.5	44.1	11	15	14	29				-13.5	30.1
	-32.5	49.1	25	7	8	15				-14.4	31.0
	-37.5	54.1	11	11	12	23				-20.9	37.5
	-42.5	59.1	4	4	5	9				-21.1	37.7
	-47.5	64.1	7	23	12	35				-23.5	40.1
	-52.5	69.1	2	100/0.4		100/0.4				-24.2	40.8
	-57.5	74.1	3	4	4	8				-30.7	47.3
										-31.2	47.8
										-31.9	48.5
										-32.6	49.2
										-33.8 DARK GRAY SILTY CLAY, WET (PEEDEE FORMATION)	50.4
										-53.0	69.6
										-54.2 GRAY SILT WITH SANDSTONE LAYERS, WET (PEEDEE FORMATION)	70.8
										-55.4 GRAY SANDY CLAY, WET (PEEDEE FORMATION)	72.0

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
						Match Line				GRAY SANDY CLAY, WET (PEEDEE FORMATION) *(continued)*
	-62.5	79.1	4	4	5	9				
	-67.5	84.1	5	43	27	70				-65.4 GRAY AND GREEN SILT, WET (PEEDEE FORMATION) 82.0
	-72.5	89.1	4	4	6	10				
	-77.5	94.1	4	5	6	11				
	-82.5	99.1	5	7	12	19				-80.4 GRAY AND GREEN SILTY SAND, SATURATED (PEEDEE FORMATION) 97.0
	-87.5	104.1	25	43	57	100				
	-92.5	109.1	18	27	38	65				
	-97.5	114.1	16	26	27	53				-99.0 Boring Terminated at Elevation -99.0 ft IN VERY DENSE SILTY SAND 115.6

NCDOT BORE DOUBLE SF-730006_GEO_BRDG.GPJ NC_DOT.GDT 4/11/23

GEOTECHNICAL BORING REPORT
BORE LOG

WBS BP2.R004.1	**TIP** SF-730006	**COUNTY** PITT	**GEOLOGIST** Zimarino, S. N.	
SITE DESCRIPTION BRIDGE NUMBER 6 ON -L- (SR 1756) OVER COW SWAMP				**GROUND WTR (ft)**
BORING NO. B2-A	**STATION** 22+27	**OFFSET** 8 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 15.6 ft	**TOTAL DEPTH** 114.4 ft	**NORTHING** 653,950	**EASTING** 2,528,015	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE GFC0075 CME-45C 90% 11/21/2022		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Walker, C. M.	**START DATE** 03/29/23	**COMP. DATE** 03/29/23	**SURFACE WATER DEPTH** 3.5ft	

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)
										WATER SURFACE (03/29/23)	
	15.6	0.0	WOH	WOH	1	1				GROUND SURFACE	0.0
										ALLUVIAL BROWN CLAYEY MUCK, WET	
	11.4	4.2									
			3	4	6	10				12.6	3.0
										GRAY SAND, SATURATED	
	7.7	7.9	WOH	WOH	1	1				8.6	7.0
										COASTAL PLAIN GRAY SILTY CLAY WITH SHELL FRAGMENTS, WET (YORKTOWN FORMATION)	
	2.7	12.9	2	2	2	4					
										-0.5	16.0
	-2.4	17.9	2	3	3	6				GRAY AND BLUE SILTY SAND, SATURATED (YORKTOWN FORMATION)	
										-4.7	20.2
	-7.4	22.9	2	2	2	4				-5.8	21.3
										TAN, GREEN, AND GRAY SILTY SAND WITH VERY HARD CALCAREOUS SANDSTONE LAYERS AND PHOSPHATE, SATURATED (PEEDEE FORMATION)	
	-12.4	27.9	2	2	3	5					
	-17.4	32.9	7	14	17	31					
	-22.4	37.9	8	9	65	74					
	-27.4	42.9	14	20	52	72					
	-32.4	47.9	32	11	11	22					
	-37.4	52.9	9	9	11	20				-35.5	51.0
	-42.4	57.9	27	8	12	20				GRAY SANDY CLAY, WET (PEEDEE FORMATION)	
	-47.4	62.9	5	11	15	26					
	-52.4	67.9	3	4	8	12					
	-57.4	72.9	2	4	6	10				-55.5	71.0
										GRAY CLAYEY SILT, WET (PEEDEE FORMATION)	

WBS BP2.R004.1	**TIP** SF-730006	**COUNTY** PITT	**GEOLOGIST** Zimarino, S. N.	
SITE DESCRIPTION BRIDGE NUMBER 6 ON -L- (SR 1756) OVER COW SWAMP				**GROUND WTR (ft)**
BORING NO. B2-A	**STATION** 22+27	**OFFSET** 8 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 15.6 ft	**TOTAL DEPTH** 114.4 ft	**NORTHING** 653,950	**EASTING** 2,528,015	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE GFC0075 CME-45C 90% 11/21/2022		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Walker, C. M.	**START DATE** 03/29/23	**COMP. DATE** 03/29/23	**SURFACE WATER DEPTH** 3.5ft	

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
-60						Match Line				GRAY CLAYEY SILT, WET (PEEDEE FORMATION) *(continued)*
	-62.4	77.9	3	7	15	22				
-65										
	-67.4	82.9	4	6	6	12				
-70										
	-72.4	87.9	3	5	5	10				
-75										
	-77.4	92.9	4	5	7	12				
-80										-80.5 96.0
	-82.4	97.9	4	6	8	14				TAN, GREEN AND GRAY SILTY SAND, SATURATED (PEEDEE FORMATION)
-85										
	-87.4	102.9	16	26	41	67				
-90										
	-92.4	107.9	27	30	46	76				
-95										
	-97.4	112.9	14	26	43	69				-98.9 114.4
										Boring Terminated at Elevation -98.9 ft IN VERY DENSE SILTY SAND

GEOTECHNICAL BORING REPORT
BORE LOG

WBS BP2.R004.1	**TIP** SF-730006	**COUNTY** PITT	**GEOLOGIST** Miller, T. W.	
SITE DESCRIPTION BRIDGE NUMBER 6 ON -L- (SR 1756) OVER COW SWAMP				**GROUND WTR (ft)**
BORING NO. EB2-B	**STATION** 22+86	**OFFSET** 7 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 25.3 ft	**TOTAL DEPTH** 114.3 ft	**NORTHING** 653,897	**EASTING** 2,528,045	**24 HR.** 6.7
DRILL RIG/HAMMER EFF./DATE GFC0075 CME-45C 90% 11/21/2022		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Walker, C. M.	**START DATE** 04/03/23	**COMP. DATE** 04/04/23	**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)
30										
25	24.2	1.1	5	3	4	7				25.3 0.0 GROUND SURFACE
	21.3	4.0	2	2	1	3				24.2 1.1 **ROADWAY EMBANKMENT** PAVEMENT TAN SILTY SAND, MOIST
20	17.5	7.8	3	1	2	3				19.3 6.0 **ALLUVIAL** GRAY SILTY SAND WITH WOOD FRAGMENTS, MOIST TO SATURATED
15	12.5	12.8	6	4	6	10				
10	7.5	17.8	WOH	1	2	3				9.3 16.0 **COASTAL PLAIN** BLUE AND GRAY SILTY CLAY WITH SHELL FRAGMENTS, WET (YORKTOWN FORMATION)
5	2.5	22.8	2	2	1	3				
0	-2.5	27.8	3	5	5	10				-0.7 26.0 BLUE AND GRAY SILTY SAND WITH PHOSPHATE AND SHELL FRAGMENTS, SATURATED (YORKTOWN FORMATION)
-5	-7.5	32.8	2	1	2	3				-6.4 31.7 -6.8 32.1 GREEN AND GRAY SILTY SAND WITH PHOSPHATE, SHELL FRAGMENTS, AND VERY HARD SANDSTONE LAYERS, SATURATED (PEEDEE FORMATION)
-10	-12.5	37.8	3	9	59	68				-11.8 37.1 -12.3 37.6
-15	-17.5	42.8	4	7	3	10				-19.2 44.5 -19.5 44.8 -20.9 46.2 -21.6 46.9
-20	-22.5	47.8	10	8	33	41				-24.0 49.3 -24.8 50.1
-25	-27.5	52.8	15	20	32	52				-31.2 56.5 -31.9 57.2
-30	-32.5	57.8	45	12	9	21				-33.5 58.8 DARK GRAY SILTY CLAY WITH VERY HARD SANDSTONE LAYERS, WET (PEEDEE FORMATION)
-35	-37.5	62.8	4	100/0.4		100/0.4				-38.0 63.3 -39.1 64.4
-40	-42.5	67.8	100/0.2			100/0.2				-42.5 67.8 -43.5 68.8
-45	-47.5	72.8	4	7	6	13				
-50										

WBS BP2.R004.1	**TIP** SF-730006	**COUNTY** PITT	**GEOLOGIST** Miller, T. W.	
SITE DESCRIPTION BRIDGE NUMBER 6 ON -L- (SR 1756) OVER COW SWAMP				**GROUND WTR (ft)**
BORING NO. EB2-B	**STATION** 22+86	**OFFSET** 7 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 25.3 ft	**TOTAL DEPTH** 114.3 ft	**NORTHING** 653,897	**EASTING** 2,528,045	**24 HR.** 6.7
DRILL RIG/HAMMER EFF./DATE GFC0075 CME-45C 90% 11/21/2022		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Walker, C. M.	**START DATE** 04/03/23	**COMP. DATE** 04/04/23	**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
-50						Match Line				-50.7 76.0 GRAY SANDY CLAY WITH VERY HARD SANDSTONE LAYERS, WET (PEEDEE FORMATION) -53.5 78.8 -53.9 79.2
	-52.5	77.8	9	6	94/0.3	100/0.8				
-55	-57.5	82.8	3	4	4	8				
-60	-62.5	87.8	3	3	4	7				-60.7 86.0 GREEN AND GRAY MICACEOUS SILT, WET (PEEDEE FORMATION)
-65	-67.5	92.8	4	4	7	11				
-70	-72.5	97.8	4	4	5	9				
-75	-77.5	102.8	4	5	7	12				
-80	-82.5	107.8	4	5	8	13				-80.7 106.0 GRAY AND GREEN SILTY SAND WITH PHOSPHATE, SATURATED (PEEDEE FORMATION)
-85	-87.5	112.8	19	22	32	54				-89.0 114.3 Boring Terminated at Elevation -89.0 ft IN VERY DENSE SILTY SAND

NCDOT BORE DOUBLE SF-730006_GEO_BRDG.GPJ NC_DOT.GDT 4/11/23