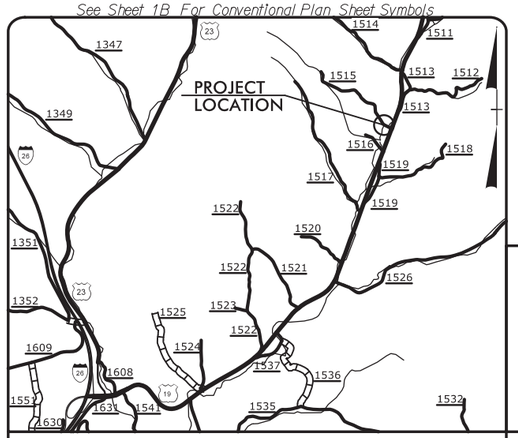
09/08/99

PROJECT: BP13–R020

CONTRACT: DM00431

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



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

MADISON COUNTY

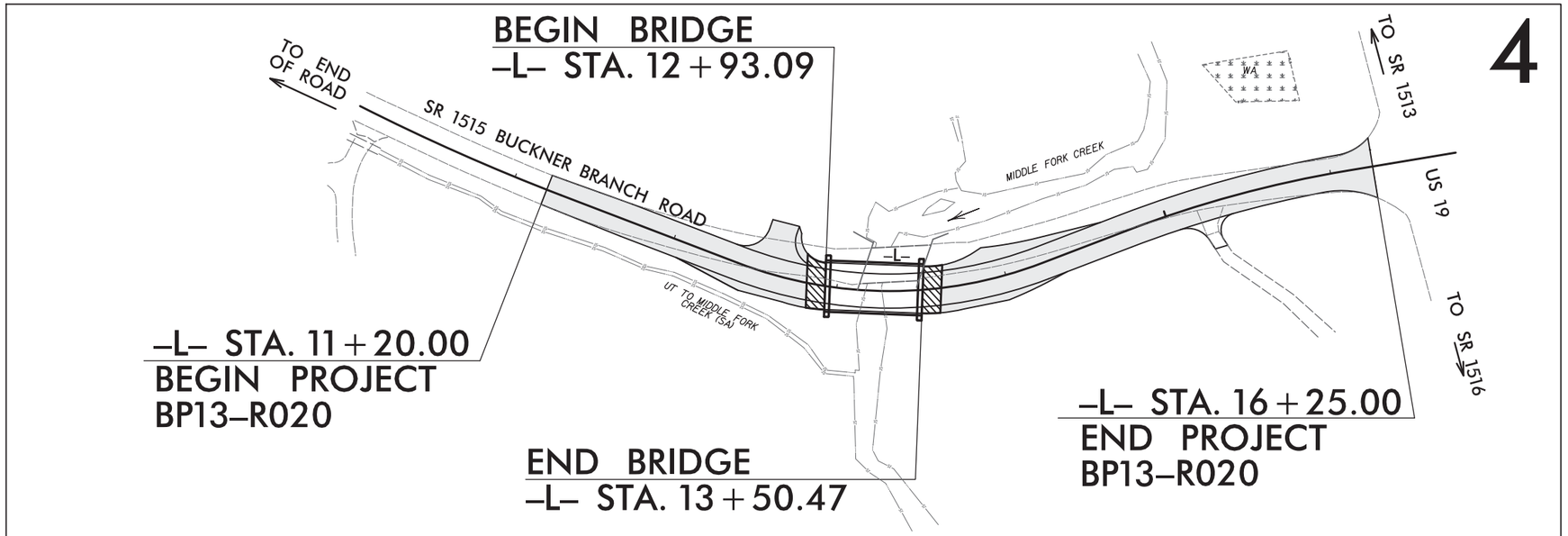
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP13–R020	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
BP13.R020.1	N/A	PE
BP13.R020.2	N/A	R/W & UTIL.
BP13.R020.3	N/A	CONST.

LOCATION: BRIDGE #560036 OVER MIDDLE FORK CREEK ON SR 1515 (BUCKNER BRANCH RD.)

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

NAD 83/2011



4

DESIGN EXCEPTION REQUIRED FOR DESIGN SPEED

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

PLANS: 20 10 0 20 40

PROFILE (HORIZONTAL): 20 10 0 20 40

PROFILE (VERTICAL): 4 2 0 4 8

DESIGN DATA

ADT 2024 = 150
T = 6 % *
V = 20 MPH
* TTST = 3% DUAL = 3%

FUNC CLASS = LOCAL, RURAL

SUB–REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY PROJECT #BP13–R020	= 0.085 MILES
LENGTH STRUCTURE PROJECT #BP13–R020	= 0.011 MILES
TOTAL LENGTH PROJECT #BP13–R020	= 0.096 MILES

NCDOT CONTACT: JOEL M DAVIS

PLANS PREPARED BY:

TGS ENGINEERS
201 W. WARREN ST.
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

PLANS PREPARED FOR:

NORTH CAROLINA DEPARTMENT OF TRANSPORATION
DIVISION 13
20 OLD 74
Asheville, NC 28813

RIGHT OF WAY DATE:
OCTOBER 31, 2023

LETTING DATE:
OCTOBER 1, 2025

2024 STANDARD SPECIFICATIONS

JIMMY L. TERRY, PE
PROJECT ENGINEER

AUSTIN R. TURNER, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

6/20/2024

NORTH CAROLINA PROFESSIONAL SEAL 038697 ENGINEER DAVID B. PETTY

DocuSigned by: David B. Petty P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

6/20/2024

NORTH CAROLINA PROFESSIONAL SEAL 35018 ENGINEER JIMMY L. TERRY

DocuSigned by: Jimmy Terry P.E.
SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

6/13/2024
X:\NCDOT\Division 13 Madison 2019\Madison 36\Roadway\Proj\Madison 36_Rdy_tsh.dgn
User:smelvin

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
BP13-R020	1A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 35018 JIMMY L. TERRY

6/20/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

INDEX OF SHEETS

GENERAL NOTES

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

GRADE LINE:
GRADING AND SURFACING:

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

CLEARING:

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

SUPERELEVATION:

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

SHOULDER CONSTRUCTION:

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

SIDE ROADS:

THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.

SUBSURFACE DRAINS:

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

GUARDRAIL:

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

TEMPORARY SHORING:

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC NOT SHOWN ON THE PLANS WILL BE PAID FOR AT THE CONTRACT PRICE FOR "TEMPORARY SHORING".

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.

RIGHT-OF-WAY MARKERS:

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

STANDARD DRAWINGS

EFF. 01-16-2024
REV.

2024 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Contracts Standards and Development Unit - N. C. Department of Transportation - Raleigh, N. C., Dated January 16, 2024 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 4 - MAJOR STRUCTURES	
423.01	Bridge Approach Fills - Type 1 Approach Fill for Bridge Abutment
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
815.02	Subsurface Drain
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.01	Rip Rap in Channels and Ditches
876.02	Guide for Rip Rap at Pipe Outlets

9/10/2021

PROJECT REFERENCE NO.	SHEET NO.
BP13-R020	1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS
CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin (EIP) — EIP
- Computed Property Corner
- Existing Concrete Monument (ECM) — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB
- Existing Historic Property Boundary — HPB
- Known Contamination Area: Soil — S
- Potential Contamination Area: Soil — S
- Known Contamination Area: Water — W
- Potential Contamination Area: Water — W
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY & PROJECT CONTROL:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

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

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

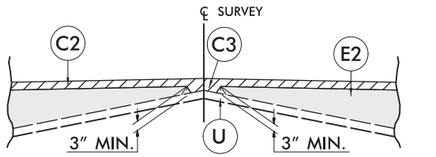
MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line (SUE – LOS B)* — 2UTL
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. — UST
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

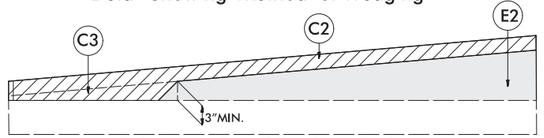
6/2/99

FINAL PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1¼" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD.
C2	PROP. APPROX. 2 ½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1" OR GREATER THAN 1 ½"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. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	INCIDENTAL MILLING (SEE MILLING DETAILS THIS SHEET)
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAILS THIS SHEET)

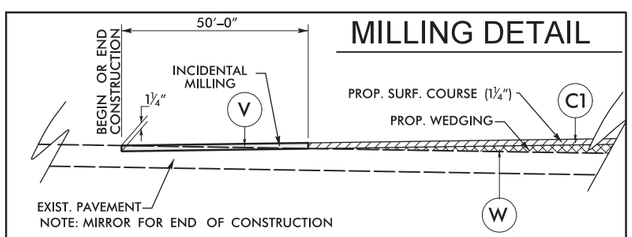
PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE SHOWN.



Detail Showing Method of Wedging



Wedging Detail For Resurfacing

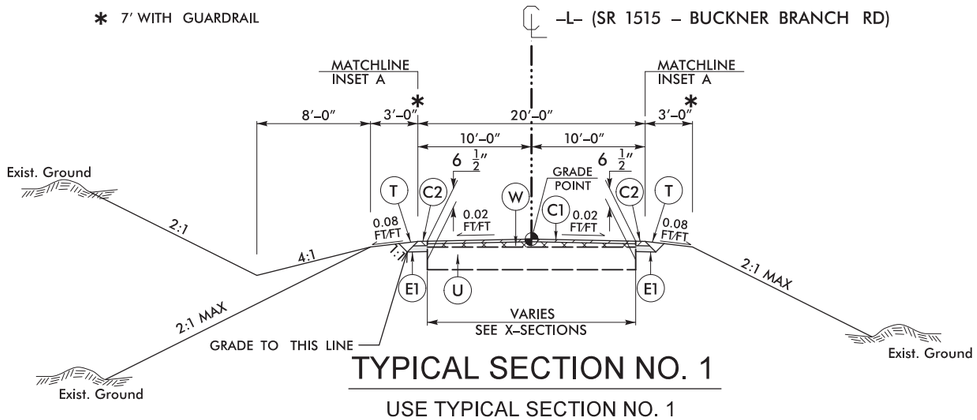


MILLING DETAIL

USE MILLING DETAIL AS FOLLOWS:

MILLING AND RESURFACING:
-L- STA. 11+20.00 TO -L- STA. 11+70.00
-L- STA. 15+75.00 TO -L- STA. 16+25.00

✱ 7' WITH GUARDRAIL



TYPICAL SECTION NO. 1

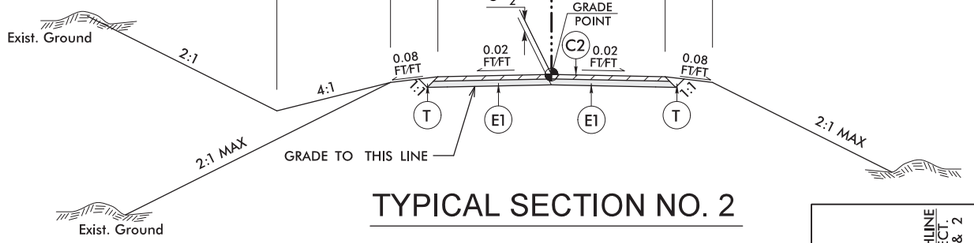
USE TYPICAL SECTION NO. 1

-L- STA. 11+70.00 TO -L- STA. 12+50.00
-L- STA. 14+25.00 TO -L- STA. 15+94.10 RT
-L- STA. 14+25.00 TO -L- STA. 16+05.96 LT

NOTE: TRANSITION BETWEEN EXISTING AND TYP. SECT. NO.1 AS FOLLOWS:

-L- STA. 11+20.00 TO -L- STA. 11+70.00
-L- STA 15+94.10 TO -L- STA. 16+25.00 RT
-L- STA 16+05.96 TO -L STA . 16+25.00 LT

✱ 7' WITH GUARDRAIL

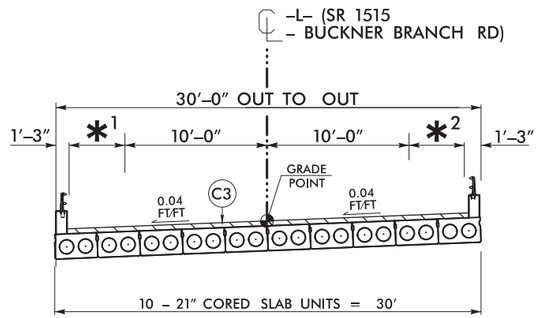


TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2

-L- STA. 12+50.00 TO -L- STA. 12+93.09 (BEGIN BRIDGE)
-L- STA. 13+50.47 (END BRIDGE) TO -L- STA. 14+25.00

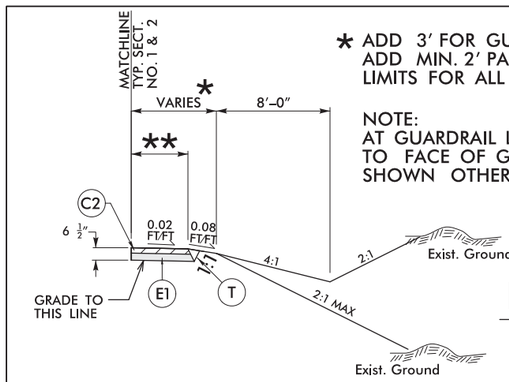
✱1 VAR. 4'–0" TO 5'–5"
✱2 VAR. 3'–6" TO 2'–1"



TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3

-L- STA. 12+93.09 TO -L- STA. 13+50.47



✱ ADD 3' FOR GUARDRAIL LOCATIONS ADD MIN. 2' PAST PAVED SHOULDERS LIMITS FOR ALL OTHER LOCATIONS

NOTE:
AT GUARDRAIL LOCATIONS PAVE TO FACE OF GUARDRAIL UNLESS SHOWN OTHERWISE ON PLANS.

INSET A

USE INSET A

✱✱ FDPS WIDTH	
0'–0" TO 2'–4"	–L– STA. 12+69.93 LT TO –L– STA. 12+79.25 LT (BEGIN APPROACH SLAB)
0'–0" TO 9'–2"	–L– STA. 13+63.69 LT (END APPROACH SLAB) TO –L– STA. 14+63.12 LT
0'–0" TO 5'–3½"	–L– STA. 12+05.12 RT TO –L– STA. 12+84.29 RT (BEGIN APPROACH SLAB)
0'–0" TO 4'–7"	–L– STA. 13+59.27 RT (END APPROACH SLAB) TO –L– STA. 14+34.49 RT

MADISON COUNTY
BRIDGE #560036

PROJECT REFERENCE NO.	SHEET NO.
BP13-R020	2A-1

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 35018 ENGINEER JIMMY L. TERRY
6/20/2024

PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 044590 ENGINEER ANDREW D. WARGO
6/20/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST.
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

6/13/2024
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User:melvin

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
BP13-R020	2C-1

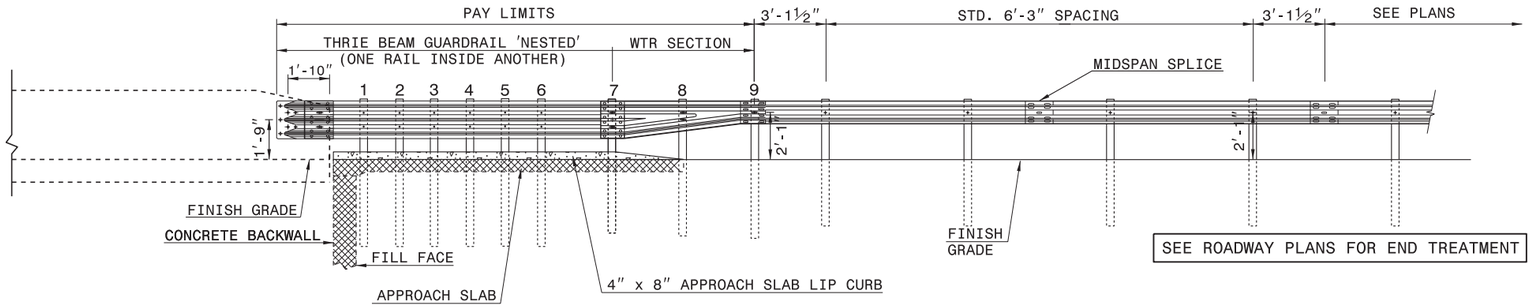
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR

TYPE III - SHOP CURVED STRUCTURE ANCHOR UNIT

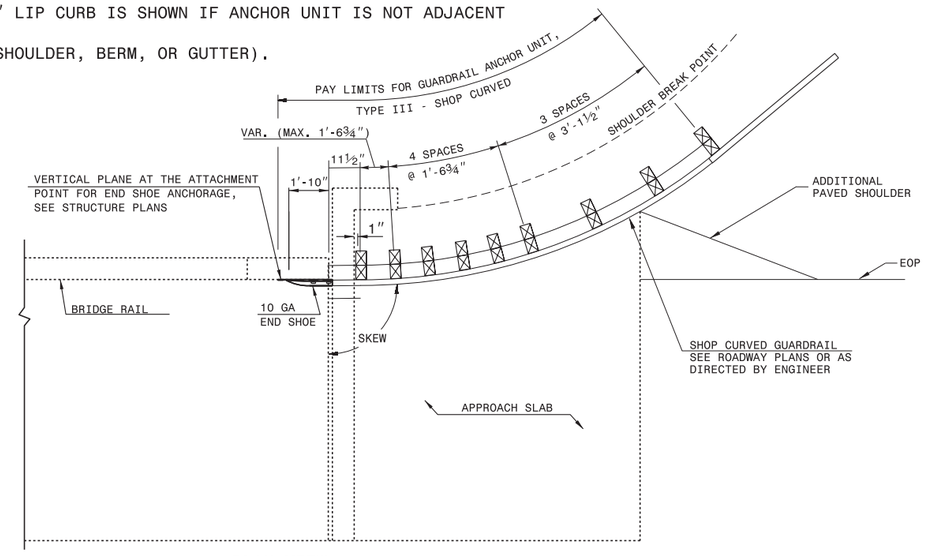
SHEET 1 OF 1

TYPE III SC



ELEVATION

NOTE:
 **POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
 *THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT.
 -SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.
 -MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
 -USE NO STEEL POSTS WITHIN THE GUARDRAIL ANCHOR UNIT LIMITS.
 -LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
 -SEE STANDARD 862.03 SHEET 4 FOR POST SECTIONS 1 THRU 9.



PLAN VIEW

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

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

ENGLISH DETAIL DRAWING FOR

TYPE III - SHOP CURVED STRUCTURE ANCHOR UNIT

SHEET 1 OF 1

TYPE III SC

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 33144 NICOLE W. HACKLER

6/20/2024

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

SEE PLATE FOR TITLE

ORIGINAL BY: E.E.Ward DATE: 4-4-02
MODIFIED BY: T.S.Spell DATE: 2-01-18
CHECKED BY: DATE:
FILE SPEC.: \jhowerton\guardrail\31inguardrail\typeiiisc.dgn

01-FEB-2018 09:49
S:\Contracts\Special Details\jhowerton\Guardrail\31 inch Guardrail\type_iii_sc.dgn
jhowerton
AT CSD-292595

COMPUTED BY: SGM	DATE: 4/10/2024
CHECKED BY: JLT	DATE: 4/12/2021

PROJECT NO.	SHEET NO.
BP13-R020	3B-1

STATE OF NORTH CAROLINA

SUMMARY OF EARTHWORK

IN CUBIC YARDS

Station	Station	Uncl. Excav.	Embank. +%	Borrow	Waste
-L- 11+20.00	-L- 12+93.09	19	236	217	
SUB-TOTAL #1:		19	236	217	
BRIDGE					
-L- 13+50.47	-L- 16+25.00	28	419	391	
SUB-TOTAL #2:		28	419	391	
TOTAL:		47	655	608	
PROJECT TOTALS:		47	655	608	
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT				30	
GRAND TOTALS:		47	655	638	
SAY		**100**		**700**	

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

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

EST. DDE = 135 CUBIC YARDS

EST. SHALLOW UNDERCUT = 100 CUBIC YARDS

EST. SELECT GRANULAR MATERIAL = 400 CUBIC YARDS
PER GEOTECH RECOMMENDATION, ESTIMATED 400 CUBIC YARDS OF UNDERCUT TO BE USED IN THE DISCRETION OF THE RESIDENT ENGINEER.

PAVEMENT REMOVAL SUMMARY

IN SQUARE YARDS

SURVEY LINE	Station	Station	LOCATION LT/RT/CL	ASPHALT REMOVAL	ASPHALT BREAKUP	CONCRETE REMOVAL	CONCRETE BREAKUP
-L-	11+70	12+50	LT	29.44			
-L-	12+50	13+15	CL	131.27			
-L-	13+55	14+25	CL	132.65			
-L-	14+25	15+79	LT	114.18			
			TOTAL	407.54			
			SAY	**410**			

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

GUARDRAIL SUMMARY

IN FEET

LINE	BEG. STA.	END STA.	LOC.	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHLDR WIDTH	FLAIR LENGTH		W		ANCHORS					IMP. ATTEN. TYPE TL-2			REMOVE EXISTING GUARDRAIL	REMOVE & RESET EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPR. END	TRAIL. END			APPR. END	TRAIL. END	APPR. END	TRAIL. END	AT-1	TYPE III SC	TL-2			EA	G	NG			
-L-	12+44.58	12+94.58	RT	25.00	25.00		12+94.58		3.7'	6.7'	25'		0.5'			1	1								R=90'
-L-	12+72.45	12+91.43	LT		31.25			12+91.43							1	1									R=15'
-L-	13+48.97	13+98.97	RT	25.00	25.00		13+48.97		3.7'	6.7'	25'		0.5'			1	1								R=90'
-L-	13+52.13	13+89.63	LT		37.50			13+52.13							1	1									R=50'
-L-	15+65.88	16+25.00	RT	25.00	31.25				4'	7'	25'		0.5'				1								
-L-	15+77.64	16+25.00	LT	25.00	25.00				4'	7'		25'		0.5'			1								
		SUB-TOTALS		100.00	175.00										2	4	4								
	LESS ANCHOR DEDUCTIONS																								
	TYPE III SC	4 @ 18.75 ft			75																				
	AT-1	2 @ 6.25 ft			12.5																				
	TL-2	4 @ 25 ft		100.00																					
	ANCHOR TOTALS			100.00	87.5																				
		GRAND-TOTALS		**0.00**	**87.50**										**2**	**4**	**4**								
		SAY			**112.50**										**2**	**4**	**4**								

ADDITIONAL GUARDRAIL POSTS = 5 EA

TEMPORARY GUARDRAIL SUMMARY

LINE	BEG. STA.	END STA.	LOC.	STRAIGHT	SHOP CURVED	DOUBLE FACED	WARRANT POINT APPR. END	WARRANT POINT TRAIL. END	"N" DIST. FROM E.O.L.	TOTAL SHLDR WIDTH	FLAIR LENGTH APPR. END	FLAIR LENGTH TRAIL. END	W APPR. END	W TRAIL. END	AT-1	TYPE III SC	TL-2			EA	G	NG	REMOVE EXISTING GUARDRAIL	REMOVE & RESET EXISTING GUARDRAIL	REMARKS
-L-	12+54.00	14+04.00	150.00								25'	25'	0.5'	0.5'				2							TEMPORARY ANCHOR UNIT
-L-	12+54.00	14+04.00	150.00								25'	25'	0.5'	0.5'				2							TEMPORARY ANCHOR UNIT
		SUB-TOTALS	300.00															4							
	LESS ANCHOR DEDUCTIONS																								
	TL-2	4 @ 25 ft	100																						
	ANCHOR TOTALS																								
		GRAND-TOTALS	**200.00**															**4**							
		SAY	**200**															**4**							

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.
See "Standard Specifications For Roads and Structures, Section 300-5".

COMPUTED BY: Zachary Richard, PE DATE: 3/21/2024
CHECKED BY: David Petty, PE DATE: 3/21/2024

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

STATION SIZE THICKNESS OR GAUGE	LOCATION (LT, RT, OR CL)'	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) 12"	15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	C.S. PIPE 12"	15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS III 12"	15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS IV 12"	15"	18"	24"	30"	36"	42"	48"	** " R.C. PIPE (CLASS V)	***" RC PIPE CULVERTS, CONTRACTOR DESIGN	***" RC PIPE CULVERTS, CONTRACTOR DESIGN	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	ENDWALLS STD.838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	REINFORCED ENDWALLS	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN	D.I. STD. 840.14 OR STD. 840.15	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	T.B.D.I STD. 840.35	FRAME AND NARROW FLAT GRATE STD. 840.29					PIPE CLEAN OIT EA		CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
L 12+61	29 LT	0401							32																																																															21	REMOVE 15" HDPE
L 15+27	20 RT	0402							28																																																															21	REMOVE 15" HDPE
TOTALS									**60**																																																															**42**	

ABBREVIATIONS

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

COMPUTED BY: REK DATE: 3/21/2023
CHECKED BY: DMB DATE: 3/21/2023

(2-3-23)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
BP13-R020	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

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

LINE	Station	Station	Aggregate Type* ASU(1/2)/ AST	Aggregate Thickness INCHES [8" for ASU(2)]	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Subgrade Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY			1	12	100	200	300		
			TOTAL CY/TONS/SY:		100	200**	300**	0	0

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

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
BP13-R020	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — SEAL 35018, JIMMY L. TERRY, 6/20/2024

HYDRAULICS ENGINEER — SEAL 038697, DAVID B. PETTY, 6/20/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

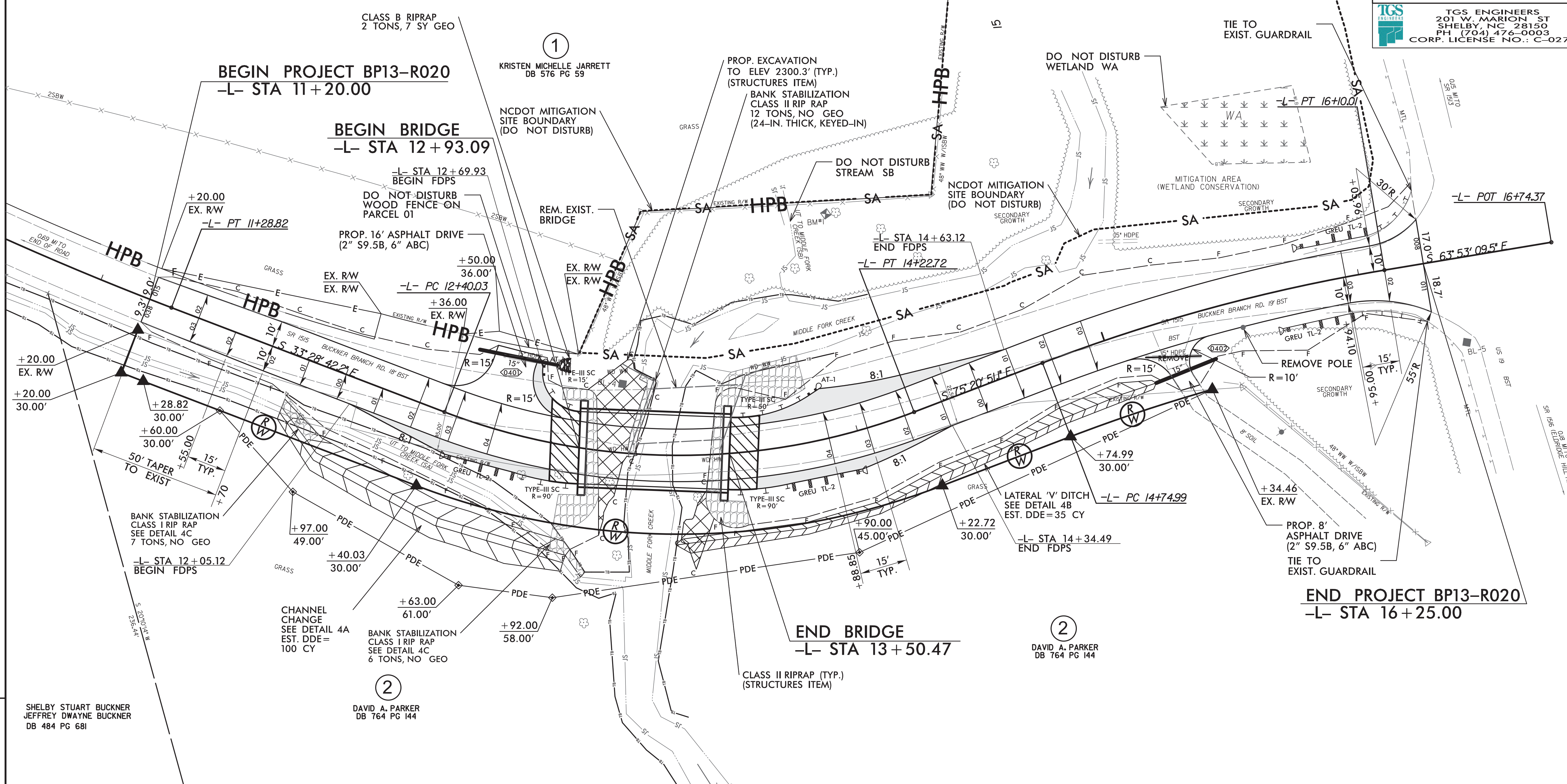
TGS ENGINEERS
201 W. MARION ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

MADISON COUNTY
BRIDGE #560036

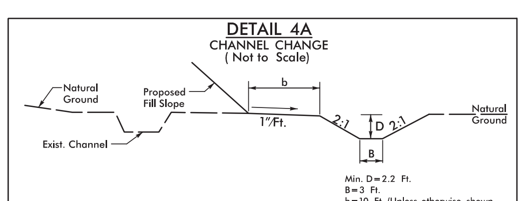
-L- CURVE DATA

PI Sta 10+64.47	PI Sta 13+35.67	PI Sta 15+42.73
△ = 5° 55' 41.5" (LT)	△ = 41° 52' 08.9" (LT)	△ = 11° 27' 41.6" (RT)
D = 4° 36' 07.5"	D = 22° 55' 05.9"	D = 8° 29' 17.7"
L = 128.82'	L = 182.69'	L = 135.03'
T = 64.47'	T = 95.64'	T = 67.74'
R = 1,245.00'	R = 250.00'	R = 675.00'
	SE = 0.04	SE = 0.03
	DS = 30 MPH	DS = 25 MPH

REVISIONS

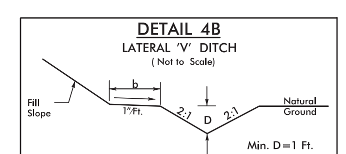


NAD 83/2011
BEGIN PROJECT BP13-R020
-L- STA 11+20.00
BEGIN BRIDGE
-L- STA 12+93.09
END BRIDGE
-L- STA 13+50.47
END PROJECT BP13-R020
-L- STA 16+25.00
CLASS B RIPRAP
2 TONS, 7 SY GEO
KRISTEN MICHELLE JARRETT
DB 576 PG 59
PROP. EXCAVATION
TO ELEV 2300.3' (TYP.)
(STRUCTURES ITEM)
BANK STABILIZATION
CLASS II RIP RAP
12 TONS, NO GEO
(24-IN. THICK, KEYED-IN)
NCDOT MITIGATION
SITE BOUNDARY
(DO NOT DISTURB)
-L- STA 12+69.93
BEGIN FDPS
DO NOT DISTURB
WOOD FENCE ON
PARCEL 01
PROP. 16' ASPHALT DRIVE
(2" S9.5B, 6" ABC)
REM. EXIST. BRIDGE
DO NOT DISTURB
STREAM SB
DO NOT DISTURB
WETLAND WA
TIE TO
EXIST. GUARDRAIL
-L- PT 16+10.01
MITIGATION AREA
(WETLAND CONSERVATION)
-L- POT 16+74.37
S 63° 53' 09.5" E
-L- STA 14+63.12
END FDPS
-L- PT 14+22.72
-L- PT 11+28.82
-L- PC 12+40.03
S 33° 28' 42.2" E
S 75° 20' 51.1" E
BUCKNER BRANCH RD. 18' BST
SR 1515 BUCKNER BRANCH RD. 19' BST
MIDDLE FORK CREEK
UT TO MIDDLE FORK CREEK (SA)
REMOVE POLE
R=10'
SECONDARY GROWTH
BANK STABILIZATION
CLASS I RIP RAP
SEE DETAIL 4C
7 TONS, NO GEO
-L- STA 12+05.12
BEGIN FDPS
CHANNEL CHANGE
SEE DETAIL 4A
EST. DDE= 100 CY
BANK STABILIZATION
CLASS I RIP RAP
SEE DETAIL 4C
6 TONS, NO GEO
CLASS II RIPRAP (TYP.)
(STRUCTURES ITEM)
LATERAL 'V' DITCH
SEE DETAIL 4B
EST. DDE=35 CY
-L- STA 14+34.49
END FDPS
-L- PC 14+74.99
PROP. 8' ASPHALT DRIVE
(2" S9.5B, 6" ABC)
TIE TO
EXIST. GUARDRAIL
50' TAPER TO EXIST
SHELBY STUART BUCKNER
JEFFREY DWAYNE BUCKNER
DB 484 PG 681
DAVID A. PARKER
DB 764 PG 144
GRASS
HPB
SA
PDE

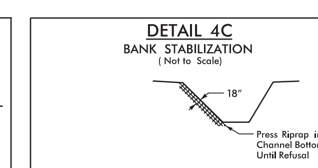


FROM -L- STA. 11+82 TO STA. 12+94 RT

FOR STRUCTURE PLANS, SEE SHEET S-1 THRU S-32



FROM -L- STA. 13+30 TO STA. 15+14 RT



FROM -L- STA. 11+82 TO STA. 11+98 RT
AND -L- STA. 12+88 TO STA. 13+01 RT

FOR -L- PROFILE SEE SHEET 5

6/13/2024
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5/14/99

PROJECT REFERENCE NO.	SHEET NO.
BP13-R020	5

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 35018 ENGINEER JIMMY L. TERRY

6/20/2024

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 038697 ENGINEER DAVID B. PETTY

6/20/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-L-

BEGIN GRADE
-L- STA 11+20.00
EL.2,306.41

PI = 11+85.00
EL = 2,304.62'
VC = 130'
K = 33
DS = 25 MPH

LOW CHORD AT C/L

LOW SIDE LOW CHORD

EXISTING BRIDGE TO BE REMOVED

PROPOSED GRADE

EXISTING GRADE AT -L-

PI = 13+26.00
EL = 2,306.32'
VC = 125'
K = 63
DS = 45 MPH

BEGIN BRIDGE
-L- STA 12+93.09

END BRIDGE
-L- STA 13+50.47

PI = 15+30.00
EL = 2,304.70'
VC = 120'
K = 7
DS < 15 MPH

END GRADE
-L- STA 16+25.00
EL.2,319.10

PI = 16+10.00
EL = 2,317.29'
VC = 30'
K = 8
DS = 20 MPH

(-)2.7538%
(+)1.2057%
(+)1.2057%
(-)0.7941%
(-)0.7941%
(+)5.3755%
(+)5.3755%
(+)12.0667%

(-) 2.3%

LOW POINT
-L- STA 12+70.42
EL 2,305.17

1.5:1 NORMAL SLOPE
W/CLASS II RIP RAP (TYP.)
(STRUCTURES ITEM)

1.5:1

1.5:1

CLASS II RIP RAP
KEY-IN 3.5' (TYP.)

(+) 0.3%

LOW POINT
-L- STA 14+75.76
EL 2,305.5

(+) 3.2%

END CHANNEL CHANGE
-L- STA 12+94 RT
EL=2297.3

BEGIN CHANNEL CHANGE
-L- STA 11+82 RT
EL=2300.2

PROP EXCAVATION
TO ELEV 2300.3' (TYP.)
(STRUCTURES ITEM)

BEGIN LATERAL 'V' DITCH
-L- STA 13+30 RT
EL=2299.6

NWS=2298'

VPI LATERAL 'V' DITCH
-L- STA 14+50 RT
EL=2300.0

END LATERAL 'V' DITCH
-L- STA 15+14 RT
EL=2302.0

FOR -L- PLAN SEE SHEET 4

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 1300	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 2304.1	FT
BASE DISCHARGE	= 2120	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 2305.8	FT
OVERTOPPING DISCHARGE	= 1800	CFS
OVERTOPPING FREQUENCY	= 50+	YRS
OVERTOPPING ELEVATION	= 2305.18*	FT

* OCCURS AT -L- STA 12+00 @ CL

DATE OF SURVEY = FEB 2022

W.S. ELEVATION AT DATE OF SURVEY = 2298.0 FT

2,322 2,318 2,314 2,310 2,306 2,302 2,298 2,294 2,290

11 12 13 14 15 16

6/13/2024
K:\NCDOT\Division 13 Madison 2019\Madison 36\Roadway\Proj\Madison 36_Rdy_pf1.dgn
User:amelvin

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP13-R020	RW01	5

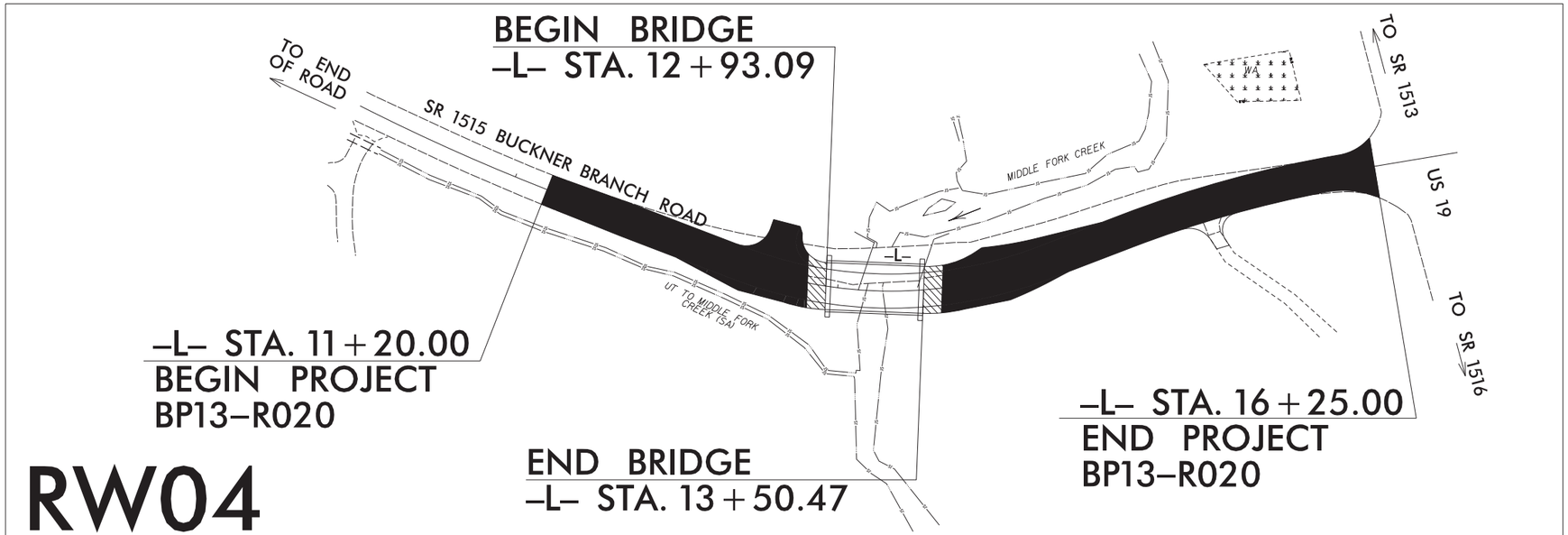
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

MADISON COUNTY

PROJECT: BP13-R020

NAD 83/2011



GRAPHIC SCALE

50 25 0 50 100
PLANS

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "BUCKNER" WITH NAD 83/NSRS 2011 STATE PLANE GRID COORDINATES OF NORTHING: 789,371.000(ft) EASTING: 968,333.100(ft) ELEVATION: 2,310.41(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99982475
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "BUCKNER" TO -L- STATION 10+00.00 IS N 4°57'42.9" W 1,274.299(ft)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

Prepared in the Office of:

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

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:	*LETTING DATE:*
10/31/2023	*10/1/2025*

PROFESSIONAL LAND SURVEYOR

DocuSigned by: Matthew Cornwell EBD36F11473E475 4/15/2024

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

SIGNATURE: *Date:*

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

15-APR-2024 11:39
S:\Surveyors\projects\LIB_560036\2023 RW Staking\AS SUBMITTED 240415\560036_ls_rw01.dgn
mcornwell AT MCORNWELLLAPTOP

4/2024

3/2022

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO.	SHEET NO.
BP13-R020	RW02C-1

Location and Surveys

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

PROJECT SURVEYOR

DocuSigned by: Matthew Cornwell

3/23/2022

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

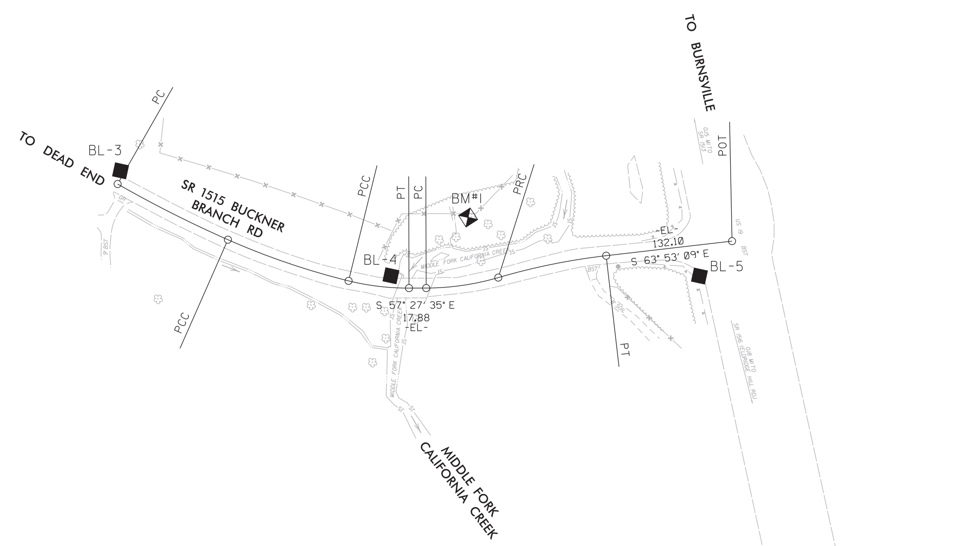
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

N
NC GRID
NAD 83 NA 2011

EXISTING HORIZONTAL ALIGNMENT

EL

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
PC	790640.523	968222.881							
CURVE			S 30°30′51.4" E	128.76	05°55′41.5"(LT)	04°36′07.5"	128.82	64.47	1245.00
PCC	790529.597	968288.259							
CURVE			S 38°27′42.1" E	132.90	09°57′59.7"(LT)	07°29′22.7"	133.07	66.70	765.00
PCC	790425.530	968370.924							
CURVE			S 50°27′08.3" E	63.44	14°00′52.8"(LT)	22°02′12.6"	63.60	31.96	260.00
PT	790385.138	968419.841							
LINE			S 57°27′34.7" E	17.88					
PC	790375.520	968434.914							
CURVE			S 65°32′50.6" E	75.97	16°10′31.9"(LT)	21°13′14.4"	76.23	38.37	270.00
PCC	790344.072	968504.072							
CURVE			S 68°45′38.0" E	114.72	09°44′57.1"(RT)	08°29′17.7"	114.85	57.57	675.00
PT	790302.514	968610.996							
LINE			S 63°53′09.5" E	132.10					
POT	790244.370	968729.610							



I, Matthew T. Cornwell, 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: N/A
Dates of survey: January 30, 2022
Datum/Epoch: NAD83/2011
Published/Fixed-control use: NCGS "BUCKNER"
Localized around: NCGS "BUCKNER"
Northing: 789371.000
Easting: 968333.100
Combined grid factor: 0.99982475
Geoid model: Geoid18
Units: US Survey Feet

I also certify that the Baseline Control for this project was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:20,000 (Class AA) and Vertical accuracy to Class A. Field work was performed from February 8, 2022 to February 16, 2022 , and all coordinates are based on NAD 83/2011 and all elevations are based on NAVD 88; that this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 3/23/2022

DocuSigned by: Matthew Cornwell

Professional Land Surveyor L-4775

BASELINE

BL

POINT	DESC.	NORTH	EAST	ELEVATION
3	BL-3	790650.4244	968232.8285	2310.48
4	BL-4	790406.1049	968410.8787	2304.46
5	BL-5	790232.0850	968681.2990	2319.74
2	NCGS BUCKNER	789371.0000	968333.1000	2310.41
1	NCGS MAD 22	786032.6430	967231.9810	2254.29

BENCHMARK

BM1 ELEVATION = 2303.80
N 790414 E 968511
BL STATION 8+83.00 61 LEFT
RR SPIKE IN BASE OF 12" DOUBLE TRUNK WALNUT

NOTES:

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

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

8/2023

REVISIONS

PROPOSED ALIGNMENT CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
BP13-R020	RW02D-1

Location and Surveys

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

PROJECT SURVEYOR

DocuSigned by:
Matthew Cornwell
EBD36F11473E475...

8/25/2023

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

This 8/25/2023

DocuSigned by:
Matthew Cornwell
EBD36F11473E475...

Professional Land Surveyor L-4775

L

TYPE	STATION	NORTH	EAST
PC	10+00.00	790640.5231	968222.8811
PT	11+28.82	790529.5973	968288.2587
PC	12+40.03	790436.8348	968349.6066
PT	14+22.72	790332.8709	968494.8911
PC	14+74.99	790319.6494	968545.4593
PT	16+10.01	790272.6977	968671.8217
POT	16+74.37	790244.3699	968729.6099

NOTES:

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

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

25 AUG 2023 07:22
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mcornwell AT MCORNWELL LAPTOP

8/2023

REVISIONS

RIGHT OF WAY & PERMANENT EASEMENT CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
BP13-R020	RW03E-1

Location and Surveys

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

PROJECT SURVEYOR

DocuSigned by:
Matthew Cornwell
EBD36F11473E475...

8/25/2023

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

I, Matthew T. Cornwell, certify that the right of way and permanent easement monumentation for this project shown herein was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:10,000 (Class A). Field work was performed from 8/7/2023 to 8/9/2023, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 8/25/2023

DocuSigned by:
Matthew Cornwell
EBD36F11473E475...

Professional Land Surveyor L-4775

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
L	11+20.00	12.50	790530.1465	968272.9470
L	11+20.00	30.00	790520.5967	968258.2823
L	11+28.82	30.00	790513.0486	968263.2359
L	12+40.03	30.00	790420.2861	968324.5837
L	14+22.72	30.00	790303.8466	968487.3025
L	14+74.99	30.00	790290.6251	968537.8706
L	15+34.46	30.00	790273.8483	968592.1462

ROW MARKER PERMANENT EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
L	11+60.00	30.00	790487.0382	968280.4377
L	11+97.00	49.00	790445.6959	968284.9999
L	12+63.00	61.00	790380.1084	968315.5617
L	12+92.00	58.00	790355.4773	968341.8254
L	13+90.00	45.00	790301.5131	968446.9011

NOTES:

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2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
3. RIGHT OF WAY MONUMENTATION ESTABLISHED 8/7/2023 TO 8/9/2023.

25-AUG-2023 07:27
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mcornwell
AT MCORNWELL LAPTOP

PROJECT REFERENCE NO.	SHEET NO.
BP13-R020	RW04

Location and Surveys

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

PROJECT SURVEYOR

DocuSigned by: Matthew Cornwell

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

4/15/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-L- CURVE DATA

PI Sta 10+64.47	PI Sta 13+35.67	PI Sta 15+42.73
Δ = 5° 55' 41.5" (LT)	Δ = 41° 52' 08.9" (LT)	Δ = 11° 27' 41.6" (RT)
D = 4° 36' 07.5"	D = 22° 55' 05.9"	D = 8° 29' 17.7"
L = 128.82'	L = 182.69'	L = 135.03'
T = 64.47'	T = 95.64'	T = 67.74'
R = 1,245.00'	R = 250.00'	R = 675.00'
	SE = 0.04	SE = 0.03
	DS = 30 MPH	DS = 25 MPH

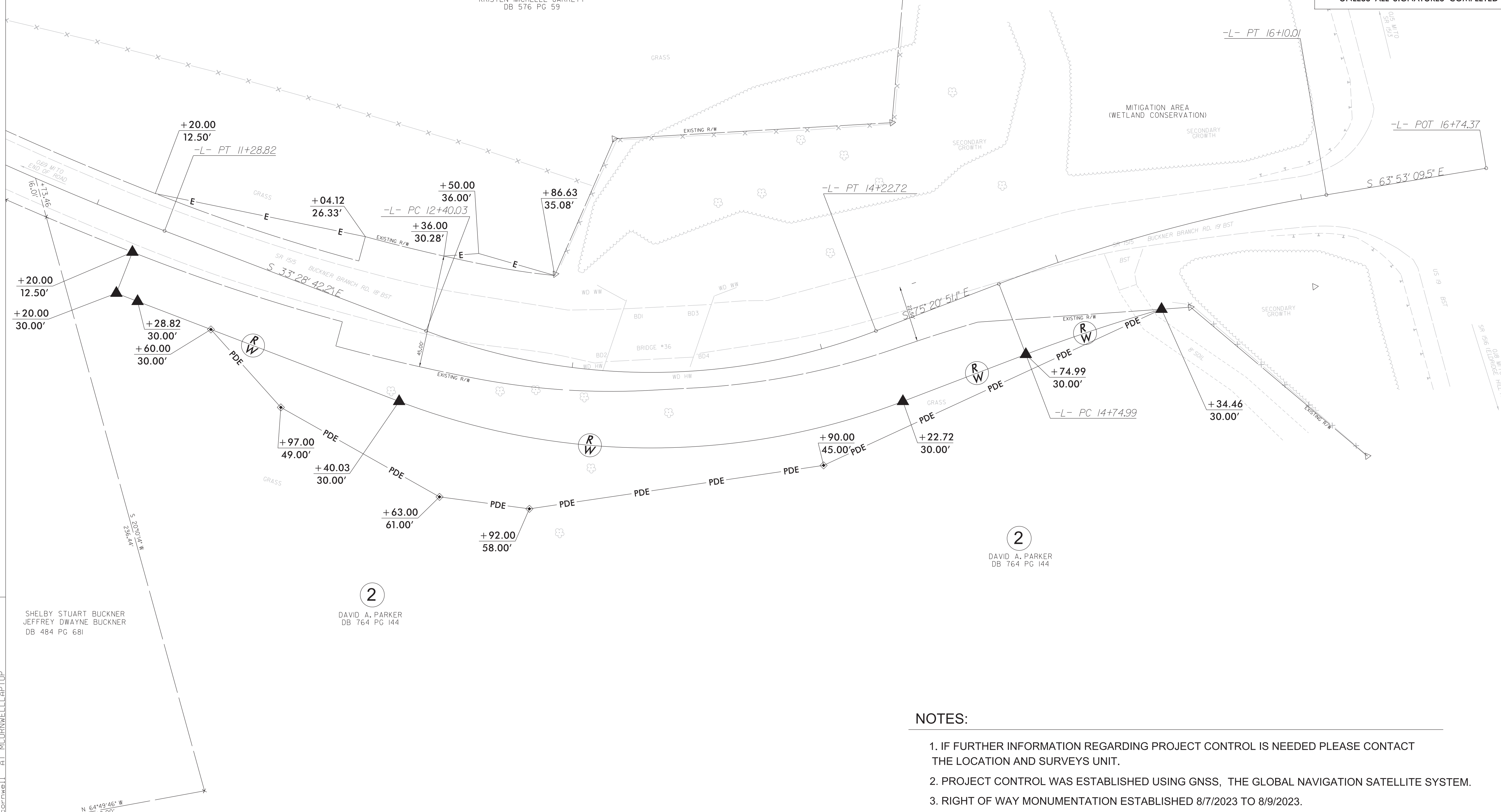
I, Matthew T. Cornwell, certify that the right of way and permanent easement monumentation for this project shown herein was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:10,000 (Class A). Field work was performed from 8/7/2023 to 8/9/2023, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 4/15/2024

DocuSigned by: Matthew Cornwell

Professional Land Surveyor L-4775

NAD 83/2011



REVISIONS

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mcornwell AT MCORNWELLLAPTOP

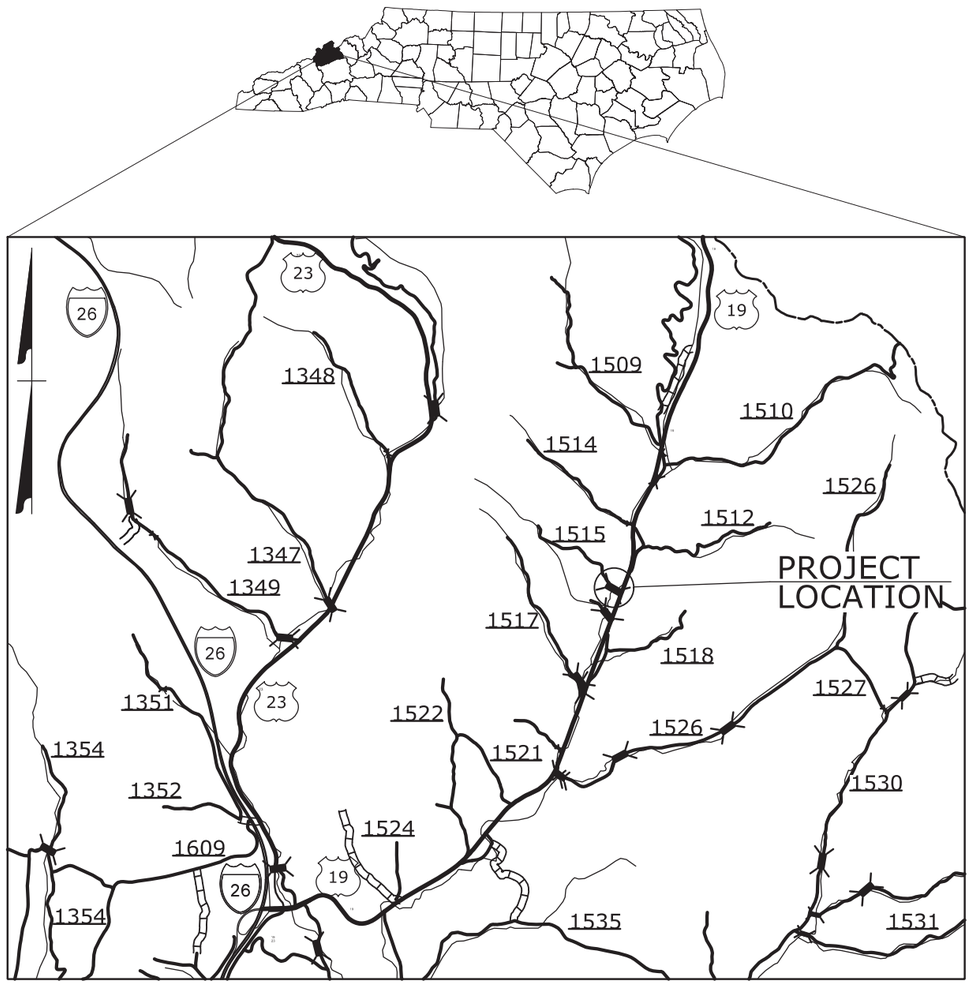
NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
3. RIGHT OF WAY MONUMENTATION ESTABLISHED 8/7/2023 TO 8/9/2023.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

MADISON COUNTY



VICINITY MAP

INDEX OF SHEETS

SHEET NO.
TMP-1

PROJECT: BP13-R020

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

PLAN PREPARED FOR N.C.D.O.T. BY:

TGS ENGINEERS
201 W. MARION ST. STE. 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

DON PARKER, PE

SANDRA MELVIN

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

APPROVED: DocuSigned by: Don A. Parker

DATE: 6/20/2024

NORTH CAROLINA PROFESSIONAL SEAL 043251 ENGINEER DON A. PARKER

6/13/2024
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User:smelvin

ROADWAY STANDARD DRAWINGS

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

STD. NO.	TITLE
1101.01	WORK ZONE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.03	TEMPORARY ROAD CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1130.01	DRUMS
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGING DEVICES
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO LANE AND MULTILANE ROADWAYS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.12	PAVEMENT MARKINGS - BRIDGES
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

MADISON COUNTY
BRIDGE #560036

PROJ. REFERENCE NO.	SHEET NO.
BP13-R020	TMP-1A

TGS ENGINEERS
201 W. MARION ST., STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- TEMP. SHORING (LOCATION PURPOSES ONLY)
- WORK AREA
- REMOVAL
- WEDGING EXISTING PAVEMENT
- MILLING EXISTING PAVEMENT

SIGNALS

EXISTING · PROPOSED · TEMPORARY · PORTABLE

PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

TRAFFIC CONTROL DEVICES

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

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

PAVEMENT MARKERS

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

PAVEMENT MARKING SYMBOLS

PAVEMENT MARKING SYMBOLS

TEMPORARY PAVEMENT MARKING

SYMBOL	DESCRIPTION
	PAVEMENT MARKINGS
PAINT (4")	
P1	(4") WHITE EDGELINE
P13	(4") YELLOW DOUBLE CENTER
PAINT (24")	
P61	(24") WHITE STOPBAR

APPROVED: Don A. Parker (DocuSigned by)
DATE: 6/20/2024

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 043251 ENGINEER DON A. PARKER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

ROADWAY STANDARD DRAWINGS & LEGEND

6/13/2024
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User:smelvin

MADISON COUNTY
BRIDGE #560036

PROJ. REFERENCE NO.	SHEET NO.
BP13-R020	TMP-1B

TGS ENGINEERS
201 W. MARION ST., STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

GENERAL NOTES

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

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

LANE AND SHOULDER CLOSURE REQUIREMENTS

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

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

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

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

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

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

PAVEMENT EDGE DROP OFF REQUIREMENTS

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

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

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

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

G) DO NOT EXCEED A DIFFERENCE OF 2 INCHES IN ELEVATION BETWEEN OPEN LANES OF TRAFFIC FOR NOMINAL LIFTS OF 1.5 INCHES. INSTALL ADVANCE WARNING "UNEVEN LANES" SIGNS (W8-11) 200 FT IN ADVANCE AND A MINIMUM OF EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

TRAFFIC PATTERN ALTERATIONS

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

SIGNING

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

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

K) COVER OR REMOVE ALL SIGNS AND DEVICES REQUIRED TO CLOSE THE ROAD WHEN ROAD CLOSURE IS NOT IN OPERATION.

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

M) INSTALL BLACK ON ORANGE "DIP" SIGNS (W8-2) AND/OR "BUMP" SIGNS (W8-1) 200 FT IN ADVANCE OF THE UNEVEN AREA, OR AS DIRECTED BY THE ENGINEER.

TRAFFIC CONTROL DEVICES

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

PAVEMENT MARKINGS AND MARKERS

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

ROAD NAME	MARKING	MARKER
BUCKNER BRANCH RD (-L-)	PAINT	NONE

P) INSTALL PAVEMENT MARKINGS ON THE FINAL SURFACE.

Q) PLACE ONE APPLICATION OF PAINT FOR TEMPORARY TRAFFIC PATTERNS. PLACE A SECOND APPLICATION OF PAINT SIX (6) MONTHS AFTER THE INITIAL APPLICATION AND EVERY SIX MONTHS AS DIRECTED BY THE ENGINEER.

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

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

MANAGEMENT STRATEGIES

PROPOSED SR 1515 (BUCKNER BRANCH RD) WILL BE CONSTRUCTED USING A COMBINATION OF DEVICES INCLUDING A PORTABLE TRAFFIC SIGNAL SYSTEM, TEMPORARY LANE CLOSURES UTILIZING FLAGGERS, ONE-LANE TWO-WAY TRAFFIC PATTERN, AND STAGED BRIDGE CONSTRUCTION.

APPROVED: Don A. Parker
75DB9E90ADEF440...
DATE: 6/20/2024
SEAL

NORTH CAROLINA PROFESSIONAL SEAL 043251 ENGINEER DON A. PARKER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

TRANSPORTATION OPERATIONS PLAN

6/13/2024
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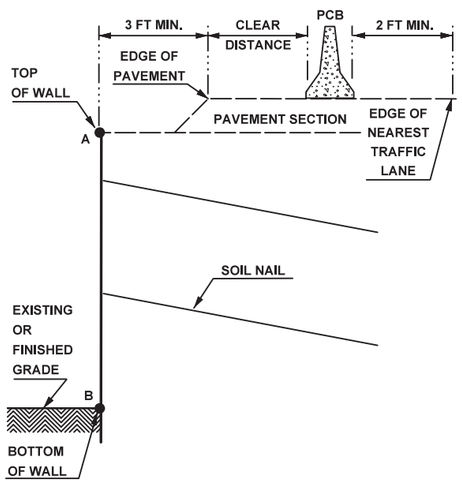
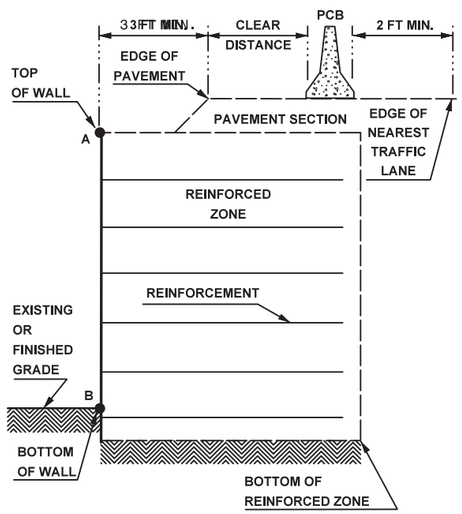
User:smelvin

PROJ. REFERENCE NO.	SHEET NO.
BP13-R020	TMP-2

TEMPORARY SOIL NAIL WALL



TEMPORARY MSE WALL



NOTE: WALL OR SHORING HEIGHT = A-B

TEMPORARY SHORING

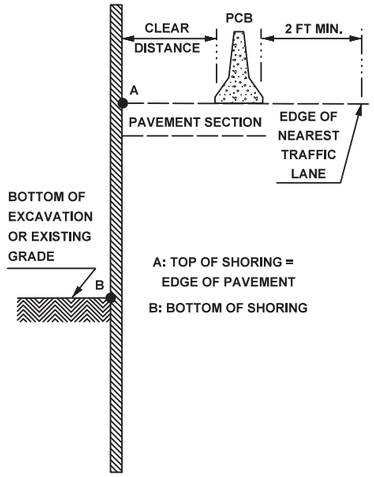


FIGURE A

NOTES

1- REFER TO THE TRAFFIC CONTROL PLANS FOR TEMPORARY SHORING LOCATIONS AND NOTES.

2- REFER TO THE "TEMPORARY SHORING" STANDARD PROVISION FOR INFORMATION ABOUT TEMPORARY SHORING AND PORTABLE CONCRETE BARRIER (PCB).

3- PCB IS REQUIRED IF TEMPORARY SHORING/WALL IS LOCATED WITHIN THE CLEAR ZONE IN ACCORDANCE WITH THE AASHTO ROADSIDE DESIGN GUIDE. DO NOT PLACE BARRIER DIRECTLY ON ANY SURFACE OTHER THAN ASPHALT OR CONCRETE. (CONTACT NCDOT PAVEMENT MANAGEMENT FOR APPLICABLE PAVEMENT DESIGN).

4- BASED ON THE CLEAR DISTANCE, OFFSET, DESIGN SPEED AND PAVEMENT TYPE, CHOOSE AN UNANCHORED OR ANCHORED PCB FROM THE TABLE SHOWN IN FIGURE B. CLEAR DISTANCE IS DEFINED AS SHOWN IN FIGURE A AND OFFSET IS DEFINED AS SHOWN IN FIGURE B.

5- AT THE CONTRACTOR'S OPTION OR IF THE MINIMUM REQUIRED CLEAR DISTANCE IS NOT AVAILABLE, SET PCB NEXT TO AND UP AGAINST THE TRAFFIC SIDE OF THE TEMPORARY SHORING/WALLS EXCEPT FOR BARRIER ABOVE TEMPORARY WALLS. PCB WITH THE MINIMUM REQUIRED CLEAR DISTANCE IS REQUIRED ABOVE TEMPORARY WALLS.

6- USE NCDOT PORTABLE CONCRETE BARRIER (PCB) IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1170.01 AND SECTION 1170 OF THE STANDARD SPECIFICATIONS.

7- SET PCB WITH A MINIMUM HORIZONTAL DISTANCE OF 2 FT BETWEEN THE FRONT FACE OF THE BARRIER AND THE EDGE OF THE NEAREST TRAFFIC LANE AS SHOWN IN FIGURE A UNLESS OTHERWISE SHOWN IN THE PLANS OR APPROVED BY THE ENGINEER.

8- FOR PCB ABOVE AND BEHIND TEMPORARY WALLS, PROVIDE A MINIMUM DISTANCE OF 3 FT BETWEEN THE EDGE OF PAVEMENT AND THE WALL FACE AS SHOWN IN FIGURE A. IF THIS MINIMUM REQUIRED DISTANCE IS NOT AVAILABLE, CONTACT THE ENGINEER.

9- TABLE SHOWN IN FIGURE B IS BASED ON NCDOT RESEARCH PROJECT NO. 2005-010 WITH VEHICLE TYPE USED FOR NCHRP 350 CRASH TESTS.

MINIMUM REQUIRED CLEAR DISTANCE, inches

Barrier Type	Pavement Type	Offset * ft	Design Speed, mph					
			<30	31-40	41-50	51-60	61-70	71-80
Unanchored PCB	Asphalt	<8	24	26	29	32	36	40
		8-14	26	28	31	35	38	42
		14-20	27	29	34	36	39	43
		20-26	28	31	35	38	40	44
		26-32	29	32	36	39	42	45
		32-38	30	34	38	41	43	46
		38-44	31	34	41	43	45	48
		44-50	31	35	41	43	46	49
		50-56	32	36	42	44	47	50
		>56	32	36	42	45	47	51
	Concrete	<8	17	18	21	22	25	26
		8-14	19	20	23	25	26	29
		14-20	22	22	24	26	28	31
		20-26	23	24	26	27	30	34
		26-32	24	25	27	28	32	35
		32-38	24	26	27	30	33	36
		38-44	25	26	28	30	34	37
		44-50	26	26	28	32	35	37
		50-56	26	26	28	32	35	38
		>56	26	27	29	32	36	38
Anchored PCB	Asphalt	All Offsets	24 for All Design Speeds					
Anchored PCB	Concrete (including bridge approach slabs)	All Offsets	12 for All Design Speeds					

* See Figure Below

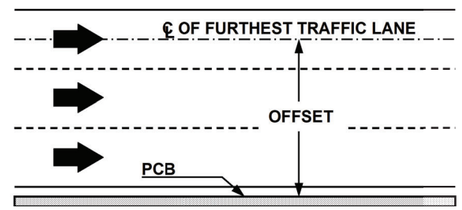


FIGURE B

APPROVED: Don A. Parker
DATE: 6/20/2024
SEAL

NORTH CAROLINA PROFESSIONAL SEAL 043251 ENGINEER DON A PARKER

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

PORTABLE CONCRETE BARRIER AT TEMPORARY SHORING LOCATIONS

6/13/2024
X:\NCDOT\Division 13 Madison 2019\Madison 36\Traffic\TrafficControl\TCP\Madison 36_TC_TMP_02 (PCB at Temporary Shoring Locations).dgn
User:smelvin

TEMPORARY SHORING DATA

PROJ. REFERENCE NO.	SHEET NO.
BP13-R020	TMP-2A

Shoring Location No. 1 (CUT SHORING):

FOR TEMPORARY SHORING AND POSITIVE PROTECTION FOR TEMPORARY SHORING, SEE PLANS AND TEMPORARY SHORING PROVISION.

TEMPORARY SHORING IS REQUIRED FOR THE STRUCTURE CONSTRUCTION FROM -L- STATION 12+78, 5.0 FT LT TO -L- STATION 12+98, 7.5 FT LT.

DO NOT USE STANDARD TEMPORARY SHORING FOR TEMPORARY SHORING FROM -L- STATION 12+78, 5.0 FT LT TO -L- STATION 12+98, 7.5 FT LT. CONTRACTOR DESIGNED SHORING IS REQUIRED. SEE TEMPORARY SHORING SPECIAL PROVISION.

BEFORE BEGINNING TEMPORARY SHORING DESIGN OR CONSTRUCTION, SURVEY EXISTING GROUND ELEVATIONS IN THE VICINITY OF SHORING LOCATIONS TO DETERMINE ACTUAL SHORING HEIGHTS.

DESIGN TEMPORARY SHORING FROM -L- STATION 12+80, 2.75 FT LT TO -L- STATION 12+95, 5.0 FT LT, FOR THE FOLLOWING ASSUMED SOIL PARAMETERS:

ABOVE ELEVATION 2295 FT
UNIT WEIGHT (γ) = 120 LB/CF
FRICTION ANGLE (ϕ) = 28 DEGREES
COHESION (c) = 0 LB/SF
GROUNDWATER ELEVATION = 2298 ft

ELEVATION 2295 TO ELEVATION 2273 FT
UNIT WEIGHT (γ) = 120 LB/CF
FRICTION ANGLE (ϕ) = 34 DEGREES
COHESION (c) = 0 LB/SF

ELEVATION 2273 TO ELEVATION 2267 FT
UNIT WEIGHT (γ) = 125 LB/CF
FRICTION ANGLE (ϕ) = 36 DEGREES
COHESION (c) = 0 LB/SF

BELOW ELEVATION 2267
UNIT WEIGHT (γ) = 135 LB/CF
FRICTION ANGLE (ϕ) = 38 DEGREES
COHESION (c) = 500 LB/SF

LIMITED SUBSURFACE INFORMATION IS AVAILABLE IN THE VICINITY OF TEMPORARY SHORING FROM -L- STATION 12+78, 5.0 FT LT TO -L- STATION 12+98, 7.5 FT LT. THE INFORMATION PROVIDED FOR TEMPORARY SHORING DESIGN WAS ASSUMED AND MAY NOT BE APPLICABLE TO THE ACTUAL SITE CONDITIONS ENCOUNTERED DURING CONSTRUCTION.

DRIVEN PILING FOR TEMPORARY SHORING FROM -L- STATION 12+78, 5.0 FT LT TO -L- STATION 12+98, 7.5 FT LT MAY NOT PENETRATE BELOW ELEVATION 2267 FT DUE TO OBSTRUCTIONS, VERY DENSE OR HARD SOIL, BOULDERS OR WEATHERED OR HARD ROCK.

DO NOT USE A TEMPORARY WALL FOR TEMPORARY SHORING FROM -L- STATION 12+78, 5.0 FT LT TO -L- STATION 12+98, 7.5 FT LT.

Shoring Location No. 2 (CUT SHORING):

FOR TEMPORARY SHORING AND POSITIVE PROTECTION FOR TEMPORARY SHORING, SEE PLANS AND TEMPORARY SHORING PROVISION.

TEMPORARY SHORING IS REQUIRED FOR THE STRUCTURE CONSTRUCTION FROM -L- STATION 13+47, 8.0 FT LT TO -L- STATION 13+65, 5.5 FT LT.

DO NOT USE STANDARD TEMPORARY SHORING FOR TEMPORARY SHORING FROM -L- STATION 13+47, 8.0 FT LT TO -L- STATION 13+65, 5.5 FT LT. CONTRACTOR DESIGNED SHORING IS REQUIRED. SEE TEMPORARY SHORING SPECIAL PROVISION.

BEFORE BEGINNING TEMPORARY SHORING DESIGN OR CONSTRUCTION, SURVEY EXISTING GROUND ELEVATIONS IN THE VICINITY OF SHORING LOCATIONS TO DETERMINE ACTUAL SHORING HEIGHTS.

DESIGN TEMPORARY SHORING FROM -L- STATION 13+47, 8.0 FT LT TO -L- STATION 13+65, 5.5 FT LT, FOR THE FOLLOWING ASSUMED SOIL PARAMETERS:

ABOVE ELEVATION 2292 FT
UNIT WEIGHT (γ) = 120 LB/CF
FRICTION ANGLE (ϕ) = 28 DEGREES
COHESION (c) = 0 LB/SF
GROUNDWATER ELEVATION = 2298 ft

ELEVATION 2292 TO ELEVATION 2282 FT
UNIT WEIGHT (γ) = 125 LB/CF
FRICTION ANGLE (ϕ) = 36 DEGREES
COHESION (c) = 0 LB/SF

BELOW ELEVATION 2282
UNIT WEIGHT (γ) = 135 LB/CF
FRICTION ANGLE (ϕ) = 38 DEGREES
COHESION (c) = 500 LB/SF

LIMITED SUBSURFACE INFORMATION IS AVAILABLE IN THE VICINITY OF TEMPORARY SHORING FROM -L- STATION 13+47, 8.0 FT LT TO -L- STATION 13+65, 5.5 FT LT. THE INFORMATION PROVIDED FOR TEMPORARY SHORING DESIGN WAS ASSUMED AND MAY NOT BE APPLICABLE TO THE ACTUAL SITE CONDITIONS ENCOUNTERED DURING CONSTRUCTION.

DRIVEN PILING FOR TEMPORARY SHORING FROM -L- STATION 13+47, 8.0 FT LT TO -L- STATION 13+65, 5.5 FT LT MAY NOT PENETRATE BELOW ELEVATION 2282 FT DUE TO OBSTRUCTIONS, VERY DENSE OR HARD SOIL, BOULDERS OR WEATHERED OR HARD ROCK.

DO NOT USE A TEMPORARY WALL FOR TEMPCRARY SHORING FROM -L- STATION 13+47, 8.0 FT LT TO -L- STATION 13+65, 5.5 FT LT.

APPROVED: Digitally signed by Matthew Brewer 3861290A4C1452

DATE: 6/19/2024

NORTH CAROLINA PROFESSIONAL SEAL 041986 ENGINEER D. MATTHEW BREWER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

TEMPORARY SHORING DATA

6/13/2024
X:\NCDOT\Division 13 Madison 2019\Madison 36\Traffic\TrafficControl\TCP\Madison 36_TC_TMP_02A(TEMP SHORING DATA).dgn
User:smelvin

MADISON COUNTY
BRIDGE #560036

PROJ. REFERENCE NO.	SHEET NO.
BP13-R020	TMP-2B

TGS ENGINEERS
201 W. MARION ST. STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

PHASING

NOTE : UNLESS OTHERWISE NOTED ACCESS TO LOCAL DRIVES MUST BE MAINTAINED AT ALL TIME.

PHASE I

STEP 1

PLACE ALL ADVANCED WORK ZONE WARNING SIGNS IN ACCORDANCE WITH NCDOT RDWY. STD. 1101.01, SHT 3 OF 3.

STEP 2 (TMP-3)

USING TEMPORARY LANE CLOSURES AND FLAGGERS IN ACCORDANCE WITH RDWY. STD. 1101.02, SHT 1 OF 19 INSTALL TEMPORARY PORTABLE TRAFFIC SIGNALS INCLUDING THE APPROPRIATE SIGNAGE AS SHOWN ON PLANS. ACTIVATE THE SIGNAL.

CLOSE THE EXISTING SR 1515 EASTBOUND LANE AND SHIFT ALL TRAFFIC INTO A ONE-LANE TWO-WAY PATTERN ONTO THE WESTBOUND LANE.

INSTALL TEMPORARY GUARDRAIL ONTO THE EXISTING BRIDGE AND REMOVE A SECTION OF THE EXISTING BRIDGE AS SHOWN ON PLANS. (SEE STRUCTURE PLANS).

STEP 3 (TMP-3)
PLACE TEMPORARY SHORING NO. 1 AND NO.2

CONSTRUCT THE FIRST SECTION OF THE PROPOSED STRUCTURE FROM -L- STA 12+93.09 TO -L- STA. 13+50.47.

PERFORM WORK TO CONSTRUCT APPROACHES AND TIE-INS UP TO THE EXISTING EDGE OF PAVEMENT IN THE WORK AREA AS SHOWN ON TMP-3,BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COURSE.

INSTALL TEMPORARY GUARDRAIL ONTO THE NEW STRUCTURE AS SHOWN ON PLANS.

PLACE TEMPORARY PAVEMENT MARKINGS AS SHOWN ON PLANS.

PLACE AND COVER SIGNAGE IN ACCORDANCE TO RDWY STD. 1101.03 SHT 3 OF 9.

PHASE II

STEP 1 (TMP-4)

WEDGE EXISTING PAVEMENT AS NEEDED TO CREATE A SMOOTH TRANSITION BETWEEN EXISTING AND NEW PAVEMENT.

USING DRUMS AND BARRICADES CLOSE EXISTING SR 1515 AND SHIFT TRAFFIC ONTO THE NEW STRUCTURE IN A ONE-LANE TWO-WAY PATTERN. PLACE TEMPORARY PAVEMENT MARKINGS AS NEEDED.

WITH TRAFFIC SHIFTED REMOVE THE REMAINING SECTION OF THE EXISTING BRIDGE.

STEP 2 (TMP-4)

CONSTRUCT THE SECOND SECTION OF THE PROPOSED STRUCTURE FROM -L- STA 12+93.09 TO -L- STA. 13+50.47.

CONSTRUCT THE FOLLOWING UP TO BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COURSE AS SHOWN ON PLANS:
-L- STA. 11+80± TO -L- STA. 12+93.09 (BEGIN BRIDGE)
-L- STA. 13+50.47 (END BRIDGE) TO -L- STA 14+55±

PHASE III

STEP 1 (TMP-5)

DEACTIVATE THE PORTABLE TRAFFIC SIGNAL SYSTEM AND SHIFT TRAFFIC ONTO THE NEW STRUCTURE IN A TWO-WAY TWO-LANE PATTERN.

REMOVE AND /OR COVER ALL SIGNAGE, PAVEMENT MARKINGS AND OTHER TRAFFIC CONTROL DEVIVES USED IN CONJUNCTION WITH THE PRIOR ONE-LANE TWO-WAY PATTERN.

USING TEMPORARY LANE CLOSURES AND FLAGGERS IN ACCORDANCE WITH NCDOT RDWY STD. 1101.02, SHT 1 OF 19 PLACE TEMPORARY PAVEMENT MARKINGS AS SHOWN ON PLAN FROM -L- STA. 11+70± TO -L- STA. 16+25±.

USING TEMPORARY LANE CLOSURES AND FLAGGERS IN ACCORDANCE WITH NCDOT RDWY STD. 1101.02, SHT 1 OF 19 PERFORM THE FOLLOWING:

WEDGE EXISTING PAVEMENT AS SHOWN ON PLANS UP TO BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COURSE FROM -L- STA. 11+51± TO -L- STA. 12+48±, AND FROM -L- STA. 14+27± TO -L- STA. 15+94±.

MILL EXISTING PAVEMENT FROM -L- STA 11+20± TO -L- STA 11+51±, AND FROM -L- STA. 15+94± TO 16+25±.

REPLACE TEMPORARY PAVEMENT MARKINGS AS NEEDED.

STEP 2 (TMP-5)

USING TEMPORARY LANE CLOSURES AND FLAGGERS IN ACCORDANCE WITH NCDOT RDWY STD. 1101.02, SHT 1 OF 19 PLACE FINAL LAYER OF SURFACE COURSE FROM -L- STA. 11+20± TO -L- STA. 16+25±.

USING TEMPORARY LANE CLOSURES AND FLAGGERS IN ACCORDANCE WITH NCDOT RDWY STD. 1101.02, SHT 1 OF 19 PLACE FINAL PAVEMENT MARKINGS AS SHOWN IN PAVEMENT MARKING PLANS.

REMOVE ALL TRAFFIC CONTROL DEVICES.

APPROVED: Don A. Parker
DATE: 6/20/2024

NORTH CAROLINA PROFESSIONAL SEAL 043251 ENGINEER DON A. PARKER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

TEMPORARY TRAFFIC CONTROL PHASING

6/13/2024
X:\NCDOT\Division 13 Madison 2019\Madison 36\Traffic\TrafficControl\TCP\Madison 36_TC_TMP_02B(Phasing).dgn
User:smelvin

PHASE I, STEP 2

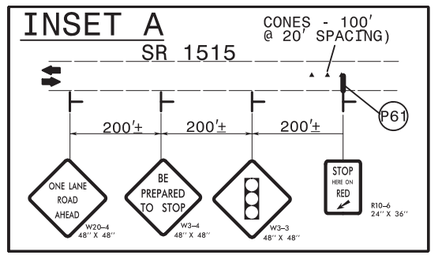
SEE TMP-1A FOR TEMPORARY PAVEMENT SCHEDULE

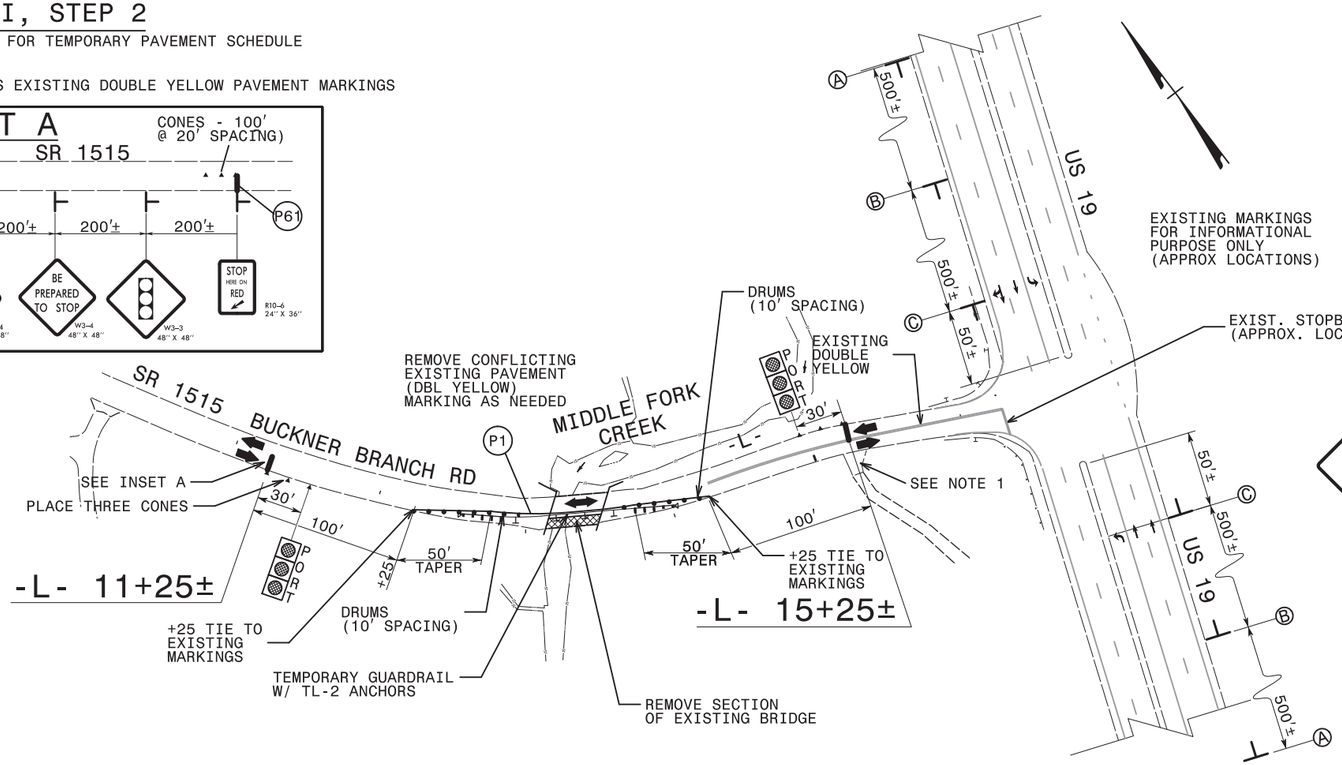
(X) DENOTES EXISTING DOUBLE YELLOW PAVEMENT MARKINGS

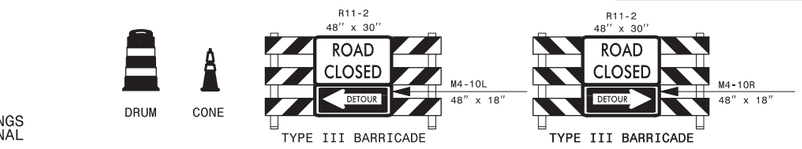
MADISON COUNTY
BRIDGE #560036

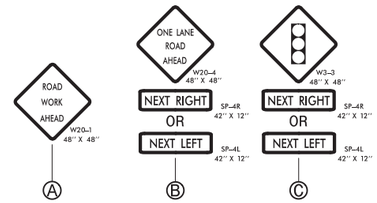
PROJ. REFERENCE NO.	SHEET NO.
BP13-R020	TMP-3

TGS ENGINEERS
201 W. MARION ST. STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275









PHASE I, STEP 3

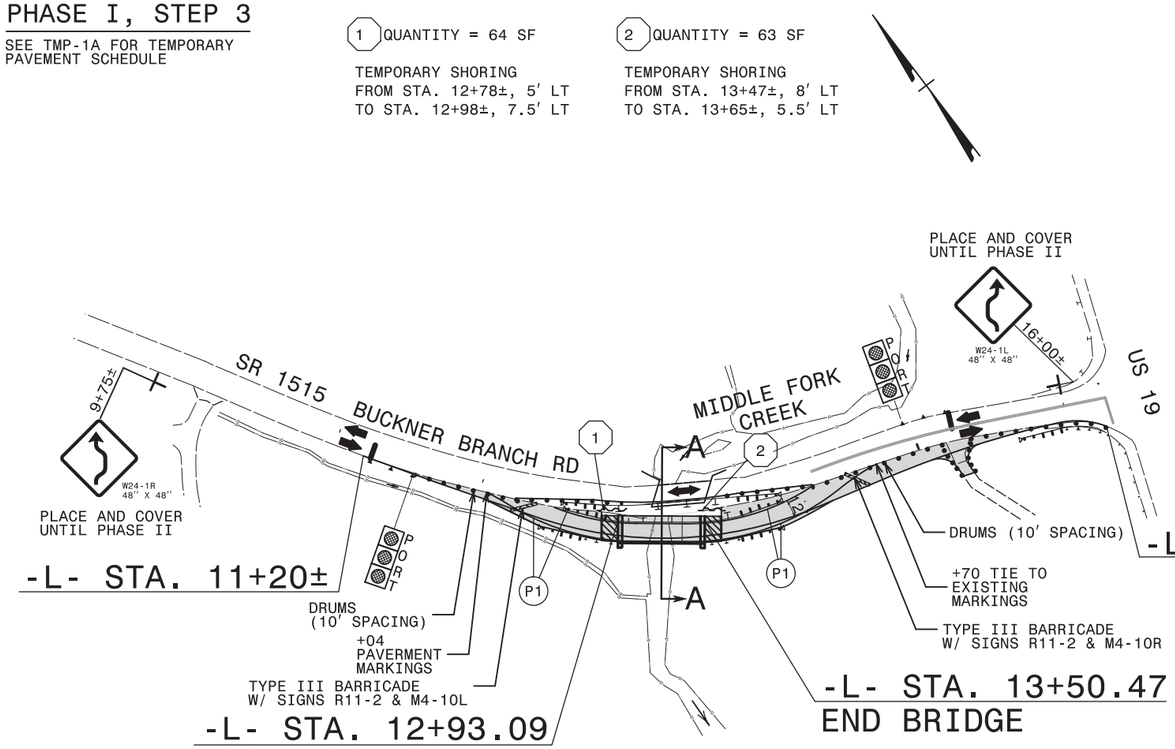
SEE TMP-1A FOR TEMPORARY PAVEMENT SCHEDULE

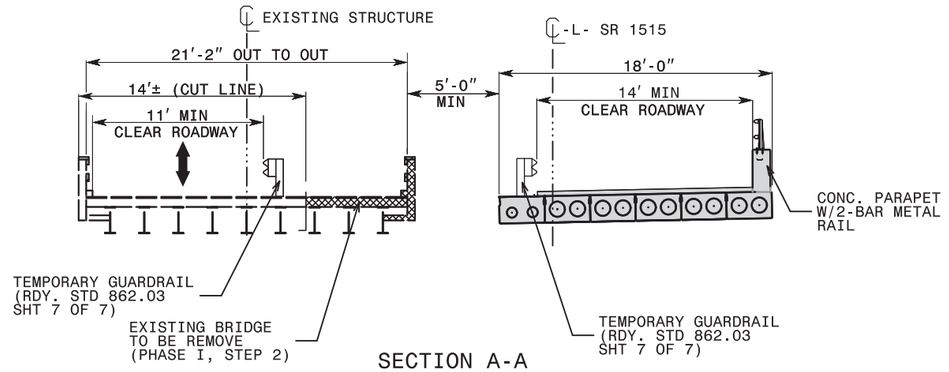
(1) QUANTITY = 64 SF

TEMPORARY SHORING
FROM STA. 12+78±, 5' LT
TO STA. 12+98±, 7.5' LT

(2) QUANTITY = 63 SF

TEMPORARY SHORING
FROM STA. 13+47±, 8' LT
TO STA. 13+65±, 5.5' LT





SECTION A-A
-L-STA 13+22±
NTS

APPROVED: Don A. Parker
DATE: 6/20/2024
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 043251 ENGINEER DON A. PARKER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

TEMPORARY TRAFFIC CONTROL PHASE I DETAIL

6/13/2024
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User:smelvin

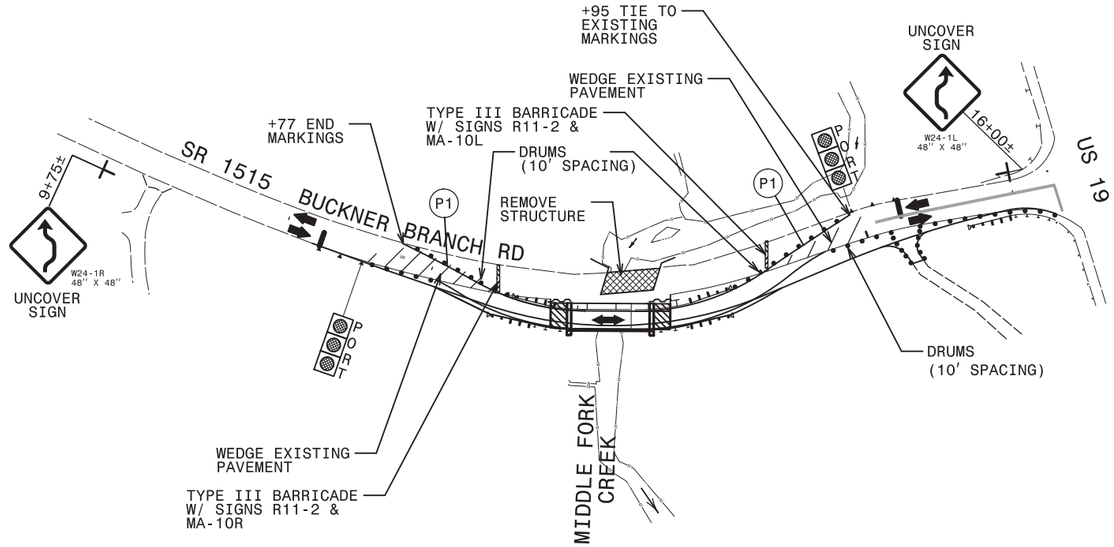
MADISON COUNTY
BRIDGE #560036

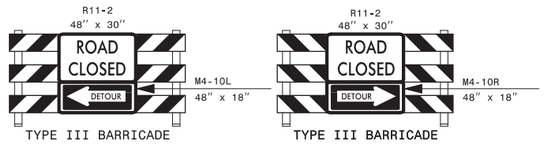
PROJ. REFERENCE NO.	SHEET NO.
BP13-R020	TMP-4

TGS ENGINEERS
201 W. MARION ST. STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

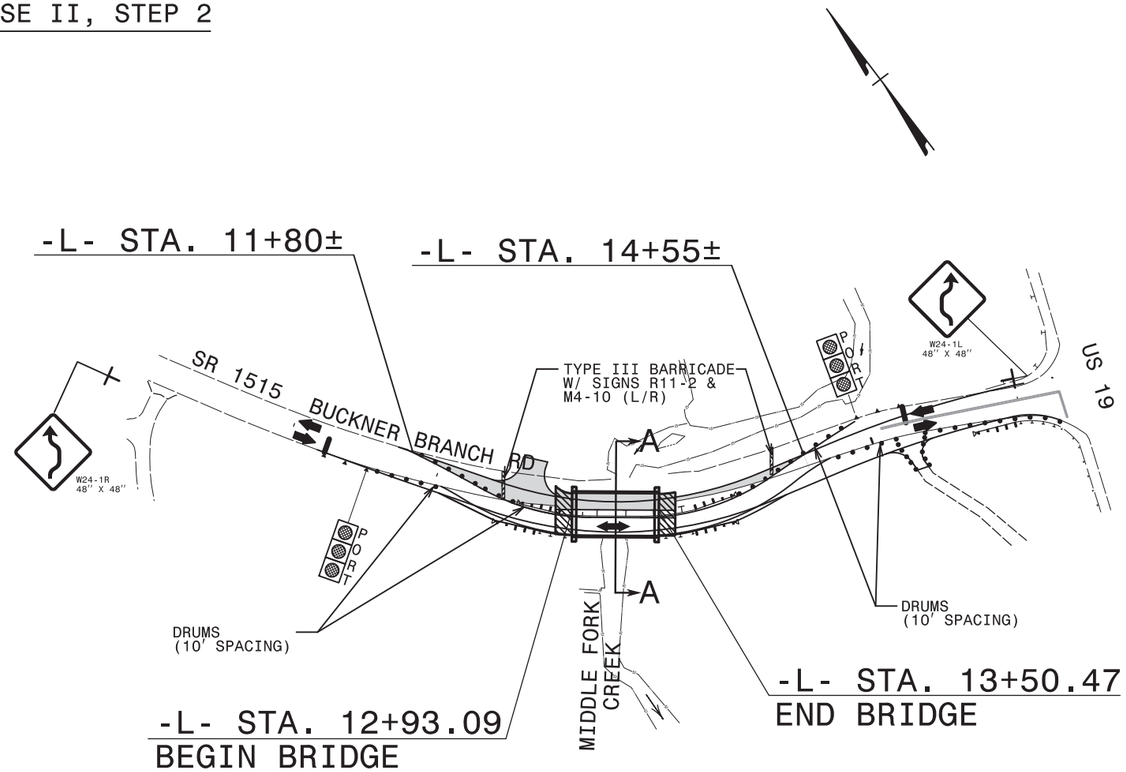
PHASE II, STEP 1

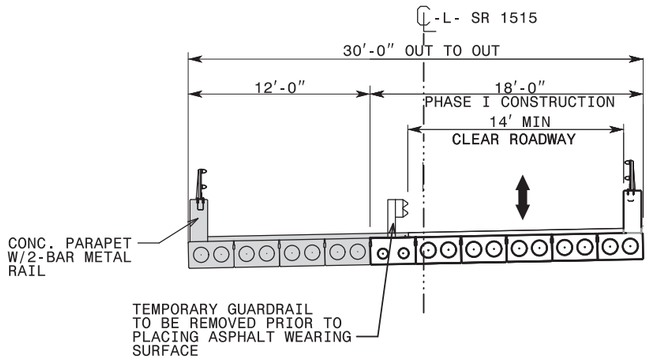
SEE TMP-1A FOR PAVEMENT MARKING SCHEDULE





PHASE II, STEP 2





SECTION A-A
-L-STA 13+22±
NTS

APPROVED: Don A. Parker (Docusigned by 75DB9E9CADEF44C)
DATE: 6/20/2024
SEAL

NORTH CAROLINA PROFESSIONAL SEAL 043251 ENGINEER DON A. PARKER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

TEMPORARY TRAFFIC CONTROL PHASE II DETAIL

6/13/2024
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User:smelvin

MADISON COUNTY
BRIDGE #560036

PROJ. REFERENCE NO.	SHEET NO.
BP13-R020	TMP-5

TGS ENGINEERS
201 W. MARION ST. STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

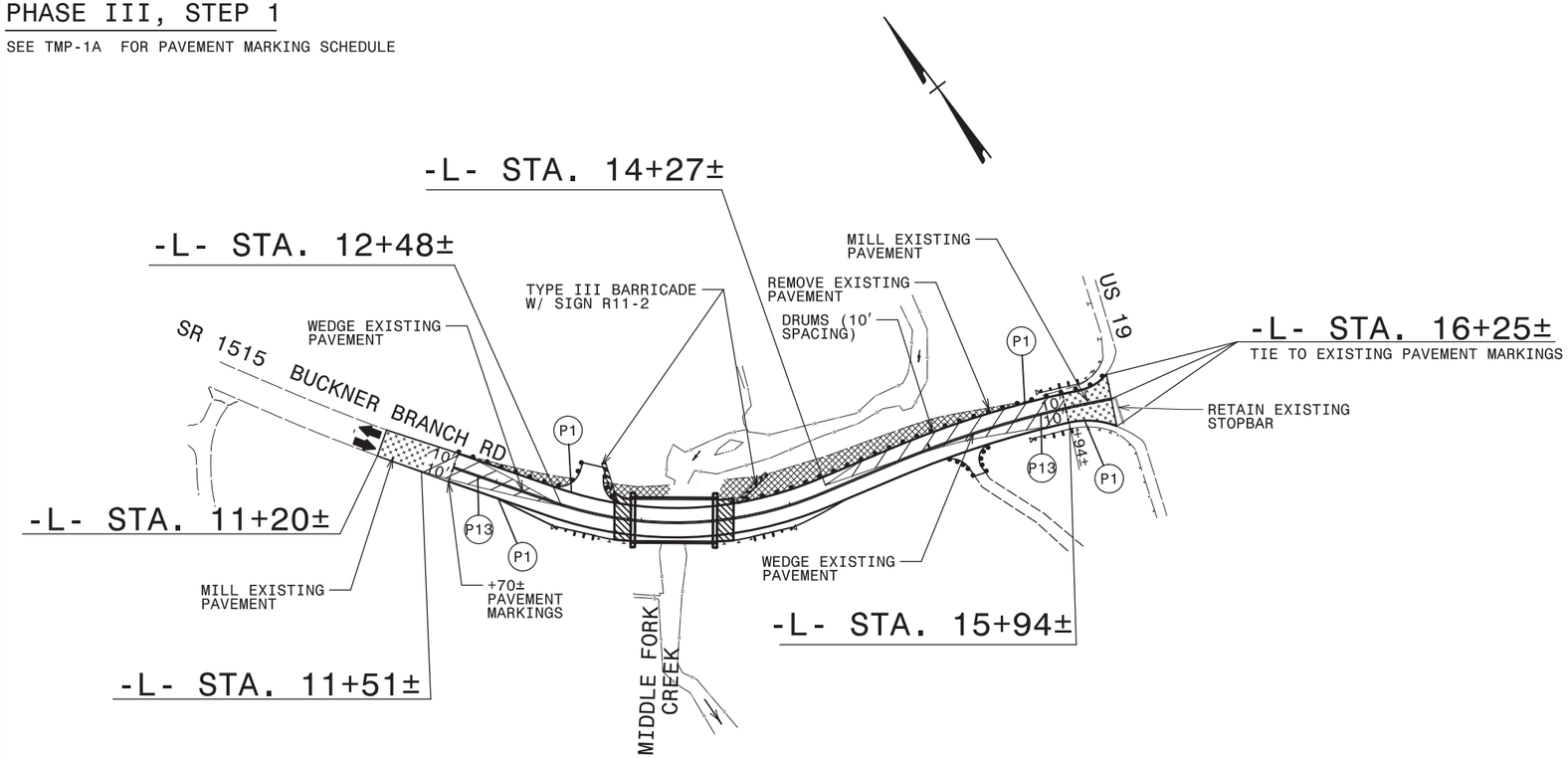
R11-2
48" x 30"

TYPE III BARRICADE

DRUM

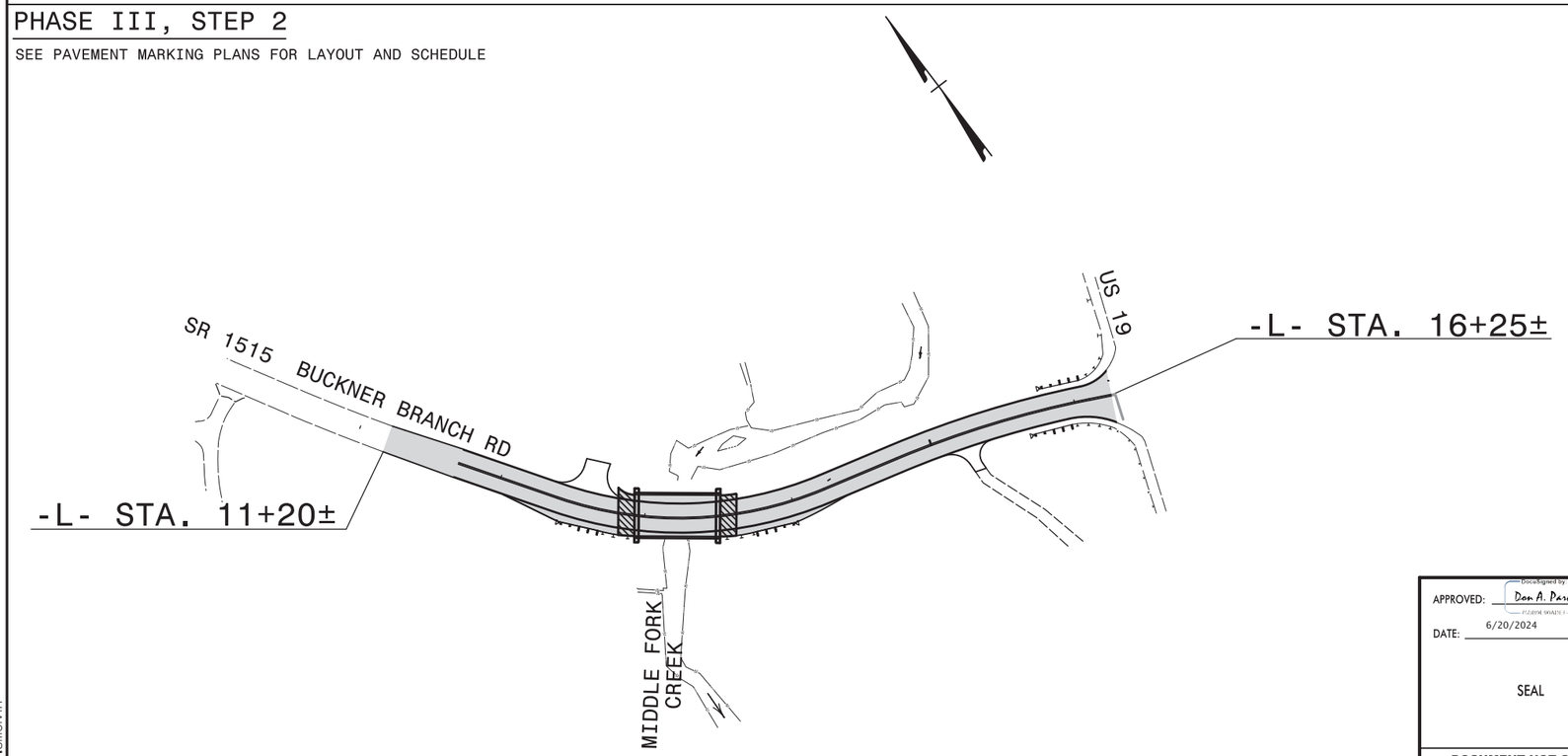
PHASE III, STEP 1

SEE TMP-1A FOR PAVEMENT MARKING SCHEDULE



PHASE III, STEP 2

SEE PAVEMENT MARKING PLANS FOR LAYOUT AND SCHEDULE



APPROVED: DocuSigned by: Don A. Parker
DATE: 6/20/2024
SEAL

NORTH CAROLINA PROFESSIONAL SEAL 043251 ENGINEER DON A. PARKER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

TEMPORARY TRAFFIC CONTROL PHASE III DETAIL

6/13/2024
X:\NCDOT\Division 13 Madison 2019\Madison 36\Traffic\TrafficControl\TCP\Madison 36_TC_TMP_05 (PH03).dgn
User:smelvin

PROJECT: BP13-R020

PROJECT NO.	SHEET NO.
BP13-R020	PMP-1

APPROVED: Don A. Parker

DATE: 6/20/2024

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 043251 ENGINEER DON A. PARKER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING PLAN

MADISON COUNTY

LOCATION: BRIDGE #560036 OVER MIDDLE FORK CREEK ON SR 1515 (BUCKNER BRANCH)

ROADWAY STANDARD DRAWING

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

STD. NO.	TITLE
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTILANE ROADWAYS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.12	PAVEMENT MARKINGS - BRIDGES

GENERAL NOTES

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

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

ROAD NAME	MARKING	MARKER
BUCKNER BRANCH RD (-L-)	PAINT	NONE

B) PLACE TWO APPLICATIONS OF PAINT PAVEMENT MARKINGS ON THE FINAL WEARING SURFACE. PLACE THE SECOND APPLICATION OF PAINT UPON SUFFICIENT DRYING TIME OF THE FIRST.

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

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

INDEX

FINAL PAVEMENT MARKING SCHEDULE

SYMBOL	DESCRIPTION
PAVEMENT MARKINGS	
PAINT (4")	
P1	(4") WHITE EDGELINE
P13	(4") YELLOW DOUBLE CENTER

PLAN PREPARED FOR N.C.D.O.T. BY:

TGS ENGINEERS
201 W. MARION ST. STE. 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

DON PARKER, PE — PROJECT ENGINEER

SANDRA MELVIN — DESIGN TECHNICIAN

MADISON COUNTY
BRIDGE #560036

TIP NO.	SHEET NO.
BP13-R020	PMP-2

APPROVED: Don A. Parker

DATE: 6/20/2024

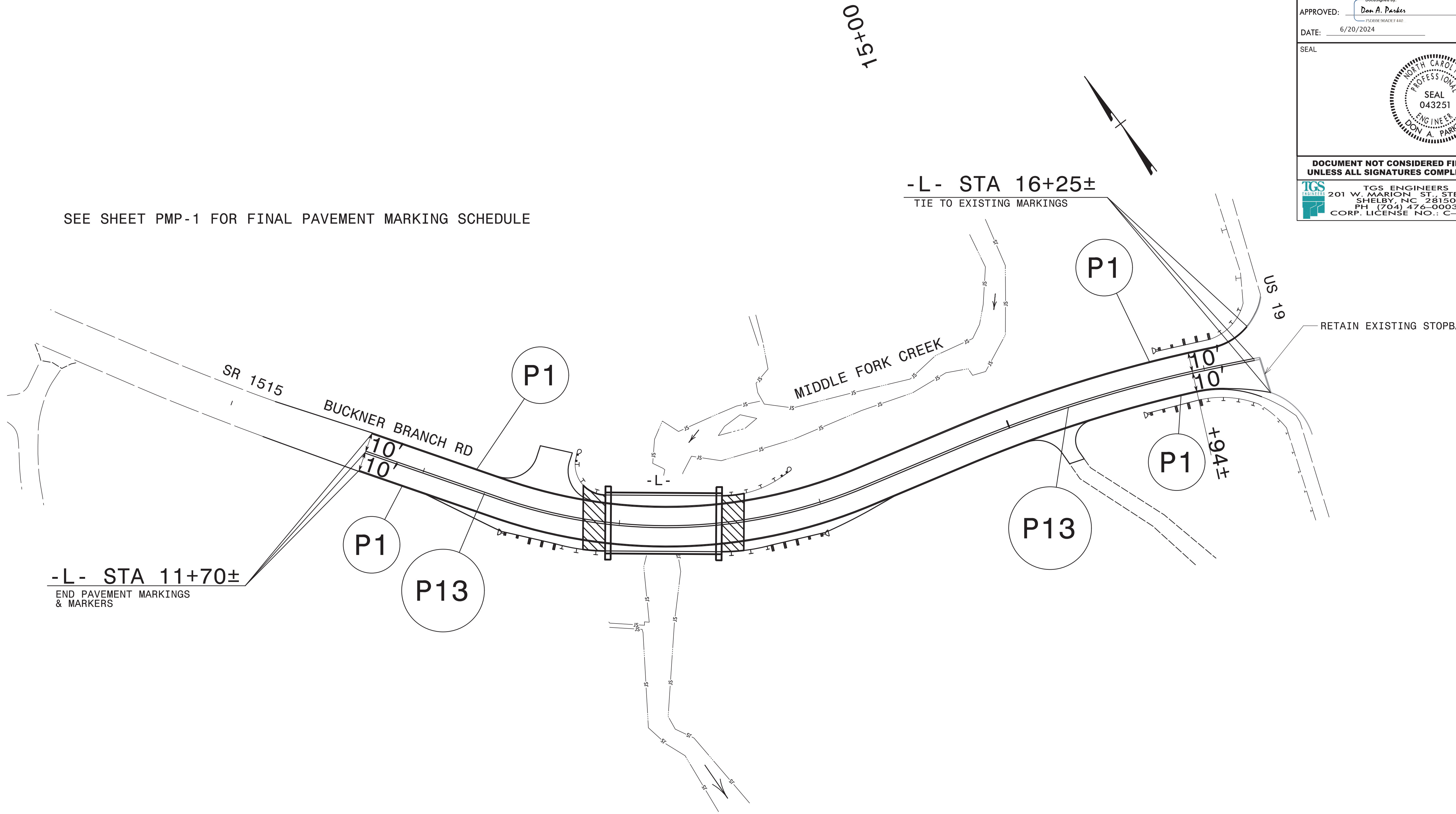
SEAL

NORTH CAROLINA PROFESSIONAL SEAL 043251 ENGINEER DON A. PARKER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST., STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

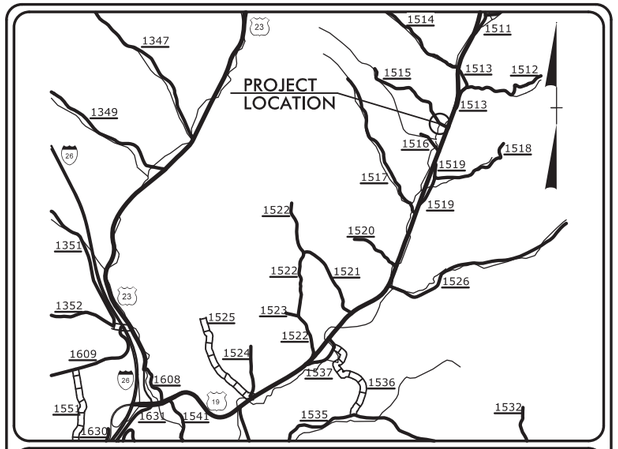
SEE SHEET PMP-1 FOR FINAL PAVEMENT MARKING SCHEDULE



PAVEMENT MARKING DETAIL

PROJECT: BP13–R020

CONTRACT: DM00431



VICINITY MAP
NOT TO SCALE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

MADISON COUNTY

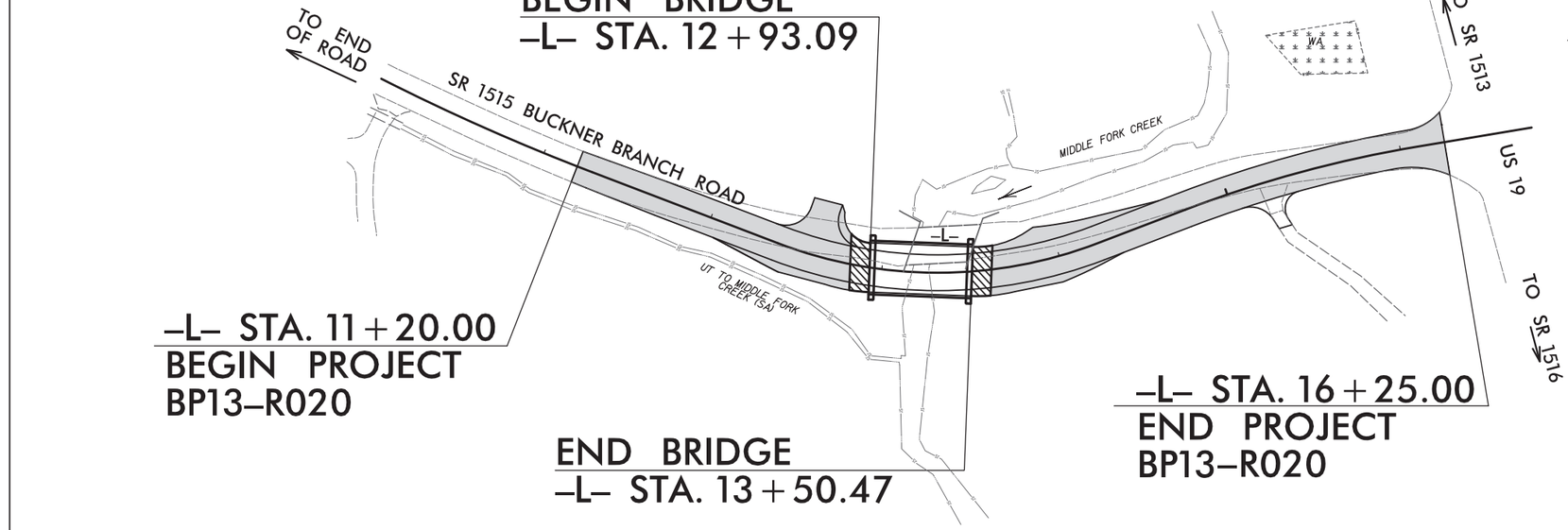
LOCATION: BRIDGE NO. 560036 OVER MIDDLE FORK CREEK ON SR 1515 (BUCKNER BRANCH ROAD)

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP13-R020	EC-1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
BP13.R020.1	N/A	PE
BP13.R020.2	N/A	R/W & UTIL
BP13.R020.3	N/A	CONST

NAD 83/2011



4

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

THIS PROJECT HAS BEEN DESIGNED TO SENSITIVE WATERSHED STANDARDS.

HIGH QUALITY WATER(S) EXIST ON THIS PROJECT

High Quality Water Zone(s) Exist
From Sta. Begin
to Sta. End
Refer To E. C. Special Provisions for Special Considerations.

GRAPHIC SCALE

50 25 0 50 100
PLANS

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE APPLICABLE REGULATIONS SET FORTH BY THE NCG–010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE APRIL 1, 2024 AND ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY DIVISION OF WATER RESOURCES.

TGS ENGINEERS

Prepared In the Office of:
TGS ENGINEERS
201 W. MARION ST–STE 200
SHELBY, NC 28150

Designed by:
Andrew H. Cochrane, PE *3015*
NAME *LEVEL III CERTIFICATION NO.*

Roadway Standard Drawings

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

PROJECT REFERENCE NO.	SHEET NO.
BP13-R020	EC-02
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

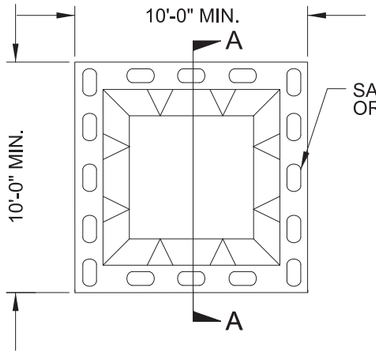
EROSION & SEDIMENT CONTROL LEGEND

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

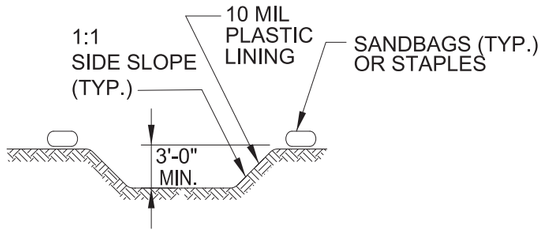
Std. #	Description	Symbol
1633.01	Temporary Rock Silt Check Type A	
1633.02	Temporary Rock Silt Check Type B	
1633.03	Temporary Rock Silt Check Type A with Excelsior Matting and Flocculant	
1634.01	Temporary Rock Sediment Dam Type A	
1634.02	Temporary Rock Sediment Dam Type B	
1635.01	Rock Pipe Inlet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

PROJECT REFERENCE NO.	SHEET NO.
BPI3-R020	EC-2A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER



PLAN



SECTION A-A

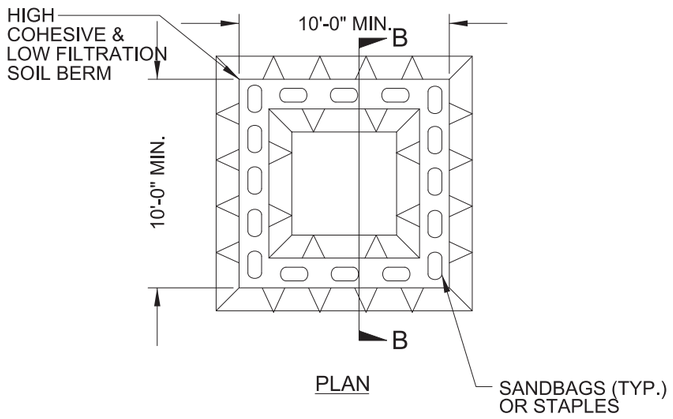
NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

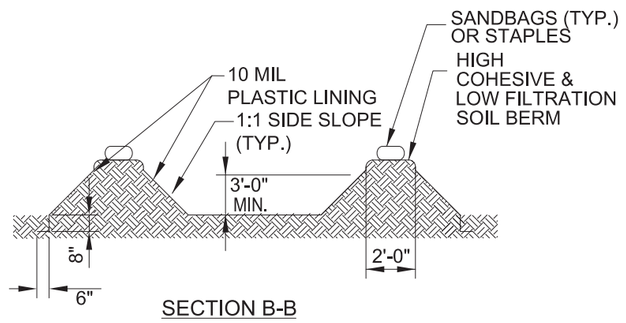
2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM 12 INCHES OF FREEBOARD.

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

BELOW GRADE WASHOUT STRUCTURE

NOT TO SCALE





SECTION B-B

NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

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

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

ABOVE GRADE WASHOUT STRUCTURE

NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
BP13-R020	EC-3
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION SUMMARY SHEET

SLOPE STRAW MATTING FOR EROSION CONTROL

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	L	12+00	13+00	RT	174
4	L	13+50	15+00	RT	224
	SLOPE MATTING SUBTOTAL				398

DITCHLINE EXCELSIOR MATTING FOR EROSION CONTROL

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
					NONE
	SLOPE STRAW MATTING SUBTOTAL				398
	DITCHLINE STRAW MATTING SUBTOTAL				110
	DITCHLINE EXCELSIOR MATTING SUBTOTAL				0
	MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER				6,397
				TOTAL	6,905
				SAY	6,905

DITCHLINE STRAW MATTING FOR EROSION CONTROL

4	L	13+30	15+14	RT	110
	DITCHLINE MATTING SUBTOTAL				110

DITCHLINE COIR FIBER MATTING FOR EC

4	L	11+82	12+94	RT	195
	DITCHLINE COIR FIBER MATTING SUBTOTAL				195
			MISCELLANEOUS COIR FIBER MATTING		175
				TOTAL	370
				SAY	370

PROJECT REFERENCE NO.	SHEET NO.
BP13-R020	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

ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS

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

CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 4

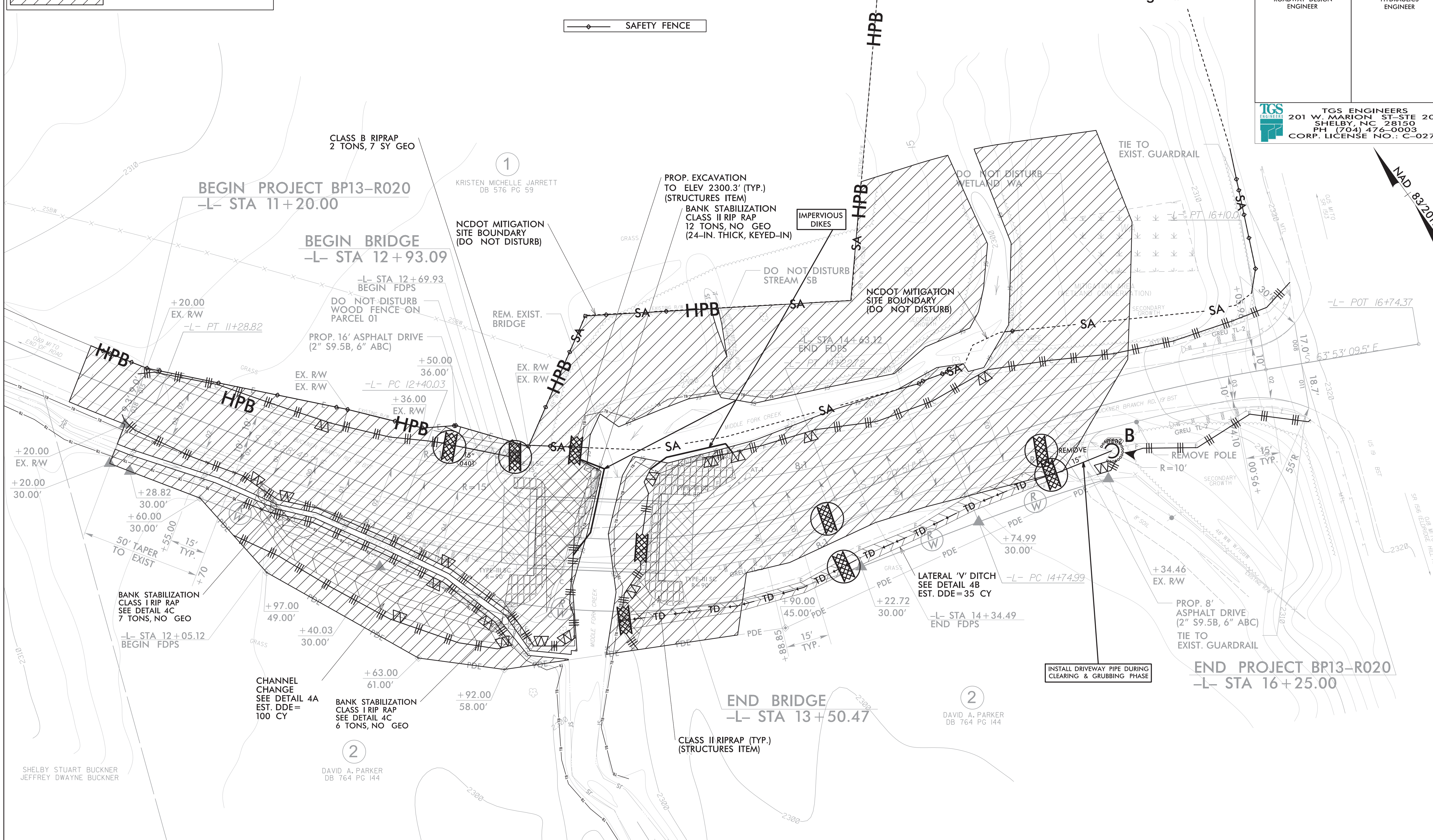
NOTE: UTILIZE TEMPORARY SEDIMENT BASIN OR SPECIAL STILLING BASIN(S) AS STILLING BASIN WHERE APPLICABLE.

SAFETY FENCE

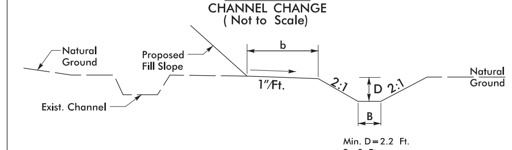
Madison County
Bridge #560036

PROJECT REFERENCE NO.	SHEET NO.
BP13-R020	EC-04/CONST.4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

TGS ENGINEERS
201 W. MARION ST-STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275


NAD 83/2011
BEGIN PROJECT BP13-R020
-L- STA 11+20.00
BEGIN BRIDGE
-L- STA 12+93.09
CLASS B RIPRAP
2 TONS, 7 SY GEO
KRISTEN MICHELLE JARRETT
DB 576 PG 59
NCDOT MITIGATION SITE BOUNDARY (DO NOT DISTURB)
PROP. EXCAVATION TO ELEV 2300.3' (TYP.) (STRUCTURES ITEM)
BANK STABILIZATION CLASS II RIP RAP 12 TONS, NO GEO (24-IN. THICK, KEYED-IN)
IMPERVIOUS DIKES
DO NOT DISTURB WETLAND WA
TIE TO EXIST. GUARDRAIL
DO NOT DISTURB STREAM SB
NCDOT MITIGATION SITE BOUNDARY (DO NOT DISTURB)
-L- STA 12+69.93 BEGIN FDPS
DO NOT DISTURB WOOD FENCE ON PARCEL 01
PROP. 16' ASPHALT DRIVE (2" S9.5B, 6" ABC)
REM. EXIST. BRIDGE
-L- PT 11+28.82
-L- PC 12+40.03
-L- STA 14+63.12 END FDPS
-L- PT 16+10.0
-L- POT 16+74.37
REMOVE POLE
REMOVE 15"
R=10'
BANK STABILIZATION CLASS I RIP RAP SEE DETAIL 4C 7 TONS, NO GEO
-L- STA 12+05.12 BEGIN FDPS
50' TAPER TO EXIST
CHANNEL CHANGE SEE DETAIL 4A EST. DDE= 100 CY
BANK STABILIZATION CLASS I RIP RAP SEE DETAIL 4C 6 TONS, NO GEO
LATERAL 'V' DITCH SEE DETAIL 4B EST. DDE=35 CY
-L- PC 14+74.99
-L- STA 14+34.49 END FDPS
PROP. 8' ASPHALT DRIVE (2" S9.5B, 6" ABC)
TIE TO EXIST. GUARDRAIL
INSTALL DRIVEWAY PIPE DURING CLEARING & GRUBBING PHASE
END PROJECT BP13-R020
-L- STA 16+25.00
END BRIDGE
-L- STA 13+50.47
CLASS II RIPRAP (TYP.) (STRUCTURES ITEM)
DAVID A. PARKER
DB 764 PG 144
SHELBY STUART BUCKNER
JEFFREY DWAYNE BUCKNER
MIDDLE FORK CREEK

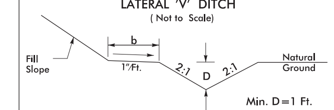
DETAIL 4A
CHANNEL CHANGE
(Not to Scale)



Type of Liner= No liner

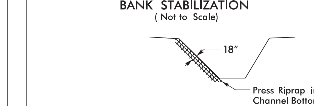
FROM -L- STA. 11+82 TO STA. 12+94 RT

DETAIL 4B
LATERAL 'V' DITCH
(Not to Scale)



FROM -L- STA. 13+30 TO STA. 15+14 RT

DETAIL 4C
BANK STABILIZATION
(Not to Scale)



Type of Liner= CL I Rip-Rap, Keyed-In

FROM -L- STA. 11+82 TO STA. 11+98 RT
AND -L- STA. 12+88 TO STA. 13+01 RT

Madison County Bridge #560036

PROJECT REFERENCE NO.	SHEET NO.
BP13-R020	EC-05/CONST.4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

TGS ENGINEERS
201 W. MARION ST-STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

NAD 83/2011

0.04 ACRE STREAMBANK REFORESTATION. SEE RF-1, RF-2 AND PROJECT SPECIAL PROVISIONS

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

SAFETY FENCE

Place Matting for Erosion Control on Slopes Adjacent to Permitted Wetlands as Work Allows.

PLACE COIR FIBER MATTING ON EXPOSED SOIL UNDER BRIDGE WHICH WILL NOT BE PLATED WITH STONE.

CLASS B RIPRAP
2 TONS, 7 SY GEO

BEGIN PROJECT BP13-R020
-L- STA 11+20.00

BEGIN BRIDGE
-L- STA 12+93.09

KRISTEN MICHELLE JARRETT
DB 576 PG 59

NCDOT MITIGATION SITE BOUNDARY (DO NOT DISTURB)

PROP. EXCAVATION TO ELEV 2300.3' (TYP.) (STRUCTURES ITEM)

BANK STABILIZATION CLASS II RIP RAP 12 TONS, NO GEO (24-IN. THICK, KEYED-IN)

-L- STA 12+69.93
BEGIN FDPS

DO NOT DISTURB WOOD FENCE ON PARCEL 01

PROP. 16' ASPHALT DRIVE (2" S9.5B, 6" ABC)

REM. EXIST. BRIDGE

DO NOT DISTURB STREAM SB

DO NOT DISTURB WETLAND WA

TIE TO EXIST. GUARDRAIL

MITIGATION AREA (WETLAND CONSERVATION)

-L- STA 14+63.12
END FDPS

-L- PT 14+22.72

-L- PT 16+10.0

-L- POT 16+74.37

-L- PT 11+28.82

-L- PC 12+40.03

SR 1515 BUCKNER BRANCH RD. 19' BST

MIDDLE FORK CREEK

REMOVE POLE

BANK STABILIZATION CLASS I RIP RAP SEE DETAIL 4C 7 TONS, NO GEO

-L- STA 12+05.12
BEGIN FDPS

CHANNEL CHANGE SEE DETAIL 4A EST. DDE= 100 CY

BANK STABILIZATION CLASS I RIP RAP SEE DETAIL 4C 6 TONS, NO GEO

LATERAL 'V' DITCH SEE DETAIL 4B EST. DDE=35 CY

-L- PC 14+74.99

-L- STA 14+34.49
END FDPS

PROP. 8' ASPHALT DRIVE (2" S9.5B, 6" ABC)

TIE TO EXIST. GUARDRAIL

END PROJECT BP13-R020
-L- STA 16+25.00

END BRIDGE
-L- STA 13+50.47

CLASS II RIPRAP (TYP.) (STRUCTURES ITEM)

2 DAVID A. PARKER DB 764 PG 144

SHELBY STUART BUCKNER
JEFFREY DWAYNE BUCKNER

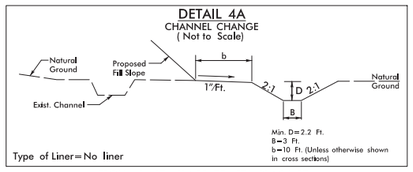
INSTALL COIR FIBER MATTING IN THE PROPOSED DITCH LINE -L- STA 11+82 TO 12+94 RT EST. 195 SY

INSTALL STRAW MATTING IN THE PROPOSED DITCH LINE -L- STA 13+30 TO 15+14 RT EST. 110 SY

Place Straw Matting for Erosion Control on Slope as Work Allows. -L- Sta. 12+00 to 13+00 RT EST. 174 SY

Place Straw Matting for Erosion Control on Slope as Work Allows. -L- Sta. 13+50 to 15+00 RT EST. 224 SY

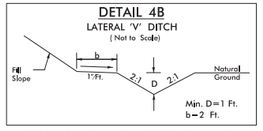
DETAIL 4A
CHANNEL CHANGE
(Not to Scale)



Type of Liner=No liner

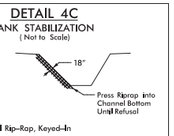
FROM -L- STA. 11+82 TO STA. 12+94 RT

DETAIL 4B
LATERAL 'V' DITCH
(Not to Scale)



FROM -L- STA. 13+30 TO STA. 15+14 RT

DETAIL 4C
BANK STABILIZATION
(Not to Scale)



Type of Liner= CL I Rip-Rap, Keyed-In

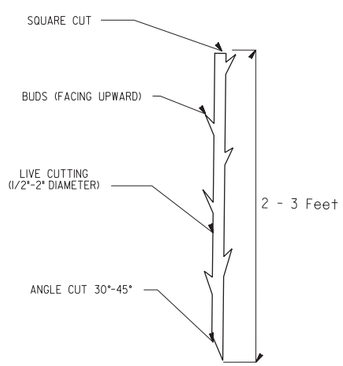
FROM -L- STA. 11+82 TO STA. 11+98 RT
AND -L- STA. 12+88 TO STA. 13+01 RT

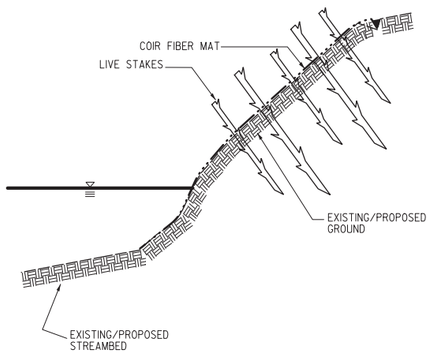
PROJECT REFERENCE NO.	SHEET NO.
BP13-R020	RF-1
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PLANTING DETAILS

LIVE STAKES PLANTING DETAIL

LIVE STAKE

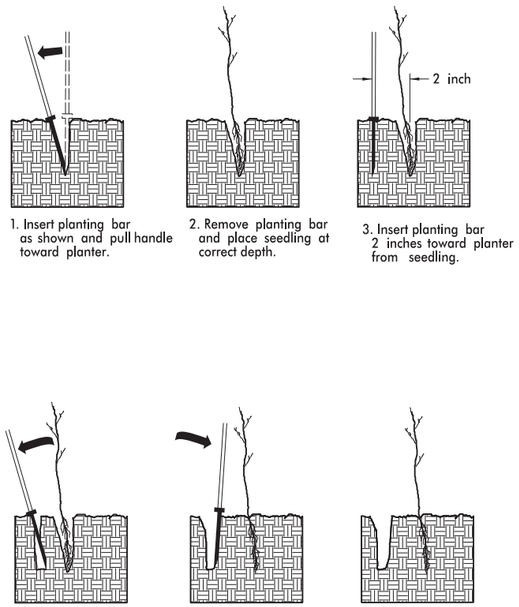




BANK STABILIZATION WITH LIVE STAKES

NOTE:
LIVE STAKES SHALL BE SPACED APPROXIMATELY 4 FEET ON CENTER
LIVE STAKES SHALL BE DRIVEN UNTIL APPROXIMATELY 3/4 OF LIVE STAKE IS WITHIN GROUND

BAREROOT PLANTING DETAIL
DIBBLE PLANTING METHOD
USING THE KBC PLANTING BAR



1. Insert planting bar as shown and pull handle toward planter.
2. Remove planting bar and place seedling at correct depth.
3. Insert planting bar 2 inches toward planter from seedling.
4. Pull handle of bar toward planter, firming soil at bottom.
5. Push handle forward firming soil at top.
6. Leave compaction hole open. Water thoroughly.

PLANTING NOTES:

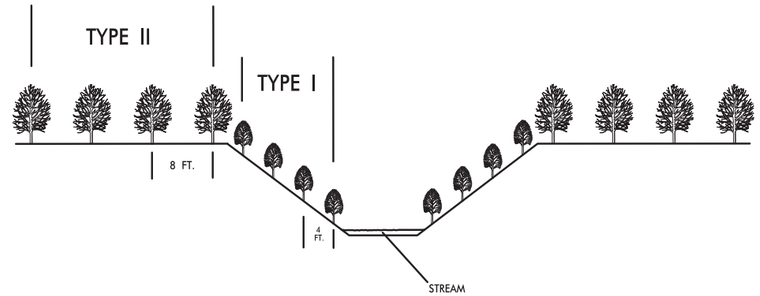
PLANTING BAG
During planting, seedlings shall be kept in a moist canvas bag or similar container to prevent the root systems from drying.

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

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

- ☐ TYPE 1 STREAMBANK REFORESTATION SHALL BE PLANTED 3 FT. TO 5 FT. ON CENTER, RANDOM SPACING, AVERAGING 4 FT. ON CENTER, APPROXIMATELY 2724 PLANTS PER ACRE.
- ☐ TYPE 2 STREAMBANK REFORESTATION SHALL BE PLANTED 6 FT. TO 10 FT. ON CENTER, RANDOM SPACING, AVERAGING 8 FT. ON CENTER, APPROXIMATELY 680 PLANTS PER ACRE.
- ☐ NOTE: TYPE 1 AND TYPE 2 STREAMBANK REFORESTATION SHALL BE PAID FOR AS "STREAMBANK REFORESTATION"

STREAMBANK REFORESTATION TYPICAL



STREAMBANK REFORESTATION

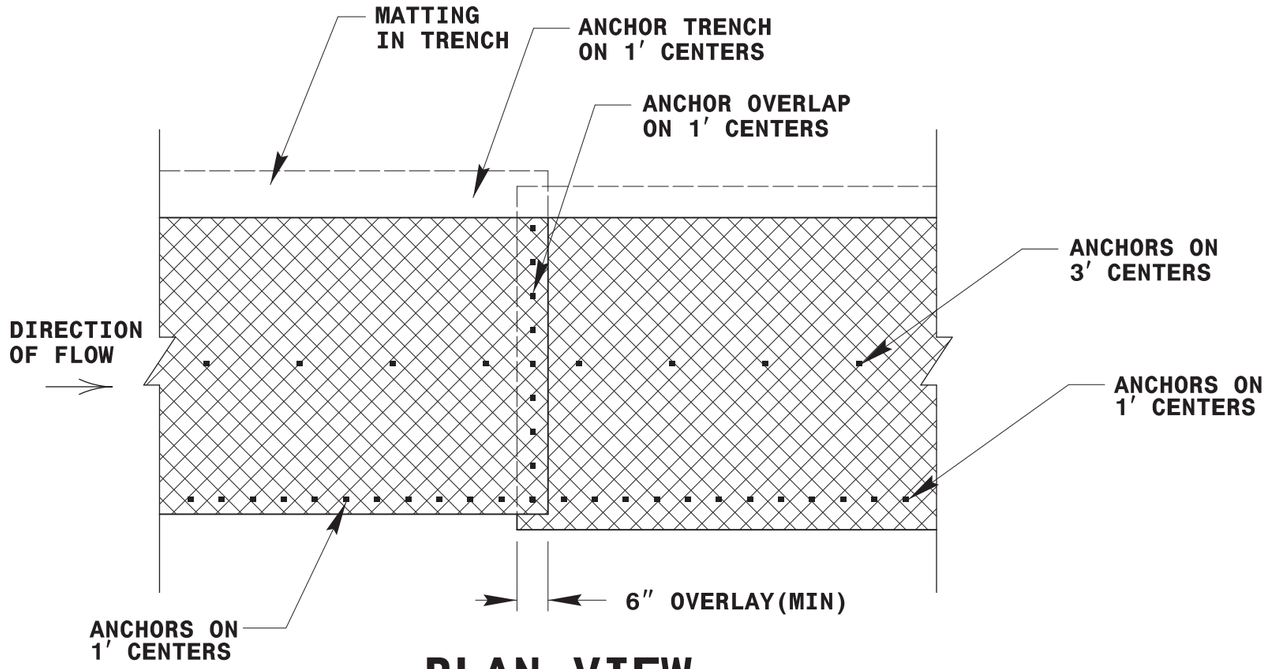
MIXTURE, TYPE, SIZE, AND FURNISH SHALL CONFORM TO THE FOLLOWING:

TYPE 1			
50%	SALIX NIGRA	BLACK WILLOW	2 ft – 3 ft LIVE STAKES
50%	CORNUS AMOMUM	SILKY DOGWOOD	2 ft – 3 ft LIVE STAKES
TYPE 2			
25%	LIRIODENDRON TULIPIFERA	TULIP POPLAR	12 in – 18 in BR
25%	PLATANUS OCCIDENTALIS	SYCAMORE	12 in – 18 in BR
25%	BETULA NIGRA	RIVER BIRCH	12 in – 18 in BR
25%	NYSSA SYLVATICA	BLACK GUM	12 in – 18 in BR

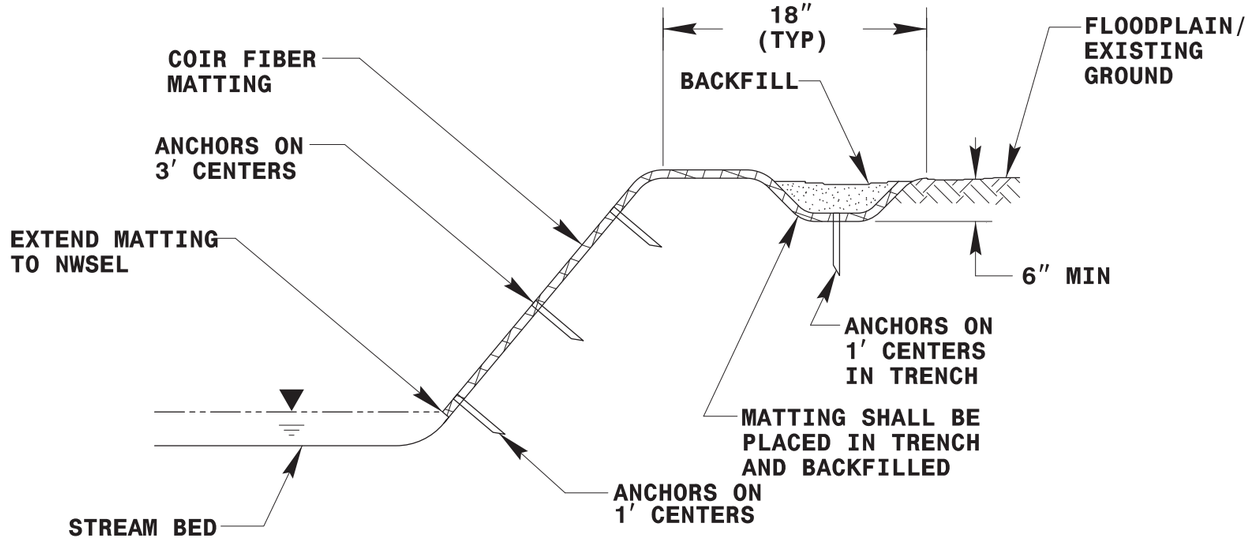
☐ SEE PLAN SHEETS FOR AREAS TO BE PLANTED

STREAMBANK REFORESTATION
DETAIL SHEET 1 OF 2
N.C.D.O.T. – ROADSIDE ENVIRONMENTAL UNIT

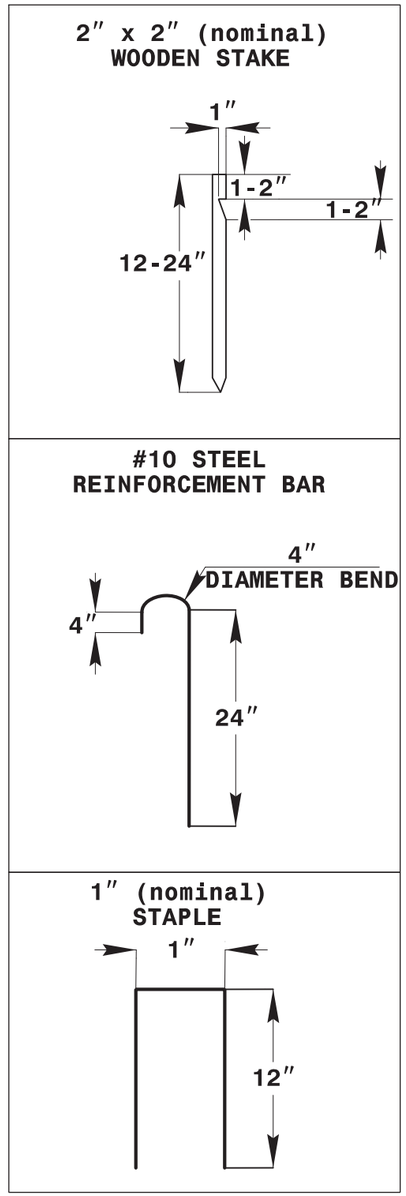
PROJECT REFERENCE NO.	SHEET NO.
BP13-R020	RF-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



PLAN VIEW



TYPICAL CROSS SECTION



ANCHOR OPTIONS

COIR FIBER MATTING DETAIL

NOT TO SCALE

STREAMBANK REFORESTATION

DETAIL SHEET 2 OF 2

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

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
APPROVED: Renee B. Roach, PE
DATE: 06/21/2024

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 024921 RENEE B. ROACH

INCOMPLETE PLANS
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

SIGNING PLAN
MADISON COUNTY

LOCATION: BRIDGE #560036 OVER MIDDLE FORK CREEK ON SR 1515 (BUCKNER BRANCH RD)

ROADWAY STANDARD DRAWING

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

STD. NO.	TITLE
904.10	ORIENTATION OF GROUND MOUNTED SIGNS
904.50	MOUNTING OF TYPE `D', `E' AND `F' SIGNS ON `U' CHANNEL POSTS

GENERAL NOTES

. SIGNS FURNISHED BY STATE

. CONFIRM IN WRITING AT LEAST 4 MONTHS IN ADVANCE, THE ACTUAL DATE THE DEPARTMENT FURNISHED SIGNS WILL BE REQUIRED.

. IF REMOVAL OR RELOCATION OF SIGNS ON PRIVATE STREET (NON-STATE MAINTAINED) IS REQUIRED DUE TO CONSTRUCTION, THE CONTRACTOR SHALL INFORM THE ENGINEER. THE WORK WILL BE COMPLETED BY OTHERS.

. WHEN NOT STATIONED OR DIMENSIONED ON PLANS, ALL 'E' AND 'F' SIGNS SHALL BE FIELD LOCATED BY THE ENGINEER

. ALL EXISTING SIGNS ON "U" CHANNEL POST WITHIN THE PROJECT LIMITS SHALL BE REMOVED AND DISPOSED OF UNLESS OTHERWISE NOTED ON PLANS.

. WHEN EXISTING SIGNS ARE REMOVED AND INSTALLED ON NEW SUPPORTS, THE RE-ERECTION SHALL IMMEDIATELY FOLLOW THE REMOVAL.

. THE BACKGROUND FOR TYPE E & F SIGNS SHALL BE TYPE C REFLECTIVE SHEETING.

. SEE ROADWAY PLANS FOR GUARD/GUIDE RAIL DETAILS.

SUMMARY OF QUANTITIES

ITEM NO. DESC. NO.	ITEM NO. SECT. NO.	ITEM DESCRIPTION	QUANTITY	UNIT
4072000000	903	SUPPORTS, 3 LB STEEL U-CHANNEL	130	L.F.
4102000000	904	SIGN ERECTION, TYPE E	7	EA.
4155000000	907	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	9	EA.

INDEX

PLAN PREPARED BY: N.C.D.O.T. SIGNING AND DELINEATION UNIT

Kelvin Jordan — SIGNING & DELINEATION REGIONAL ENGINEER
Walter Johnson — SIGNING & DELINEATION PROJECT DESIGN ENGINEER

T.I.P.: BP13-R020

5/26/20

(401) QUANTITY REQ'D 1

36" X 36"
W14-2

ONE "U" POST PER SIGN

(406) QUANTITY REQ'D 1

36" X 36"
R1-1

ONE "U" POST PER SIGN

(402) QUANTITY REQ'D 2

18" X 18"
W13-1P

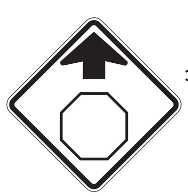
MOUNT BELOW SIGNS 403,405
IN 2 INSTALLATIONS

(403) QUANTITY REQ'D 1

36" X 36"
W1-2R

ONE "U" POST PER SIGN

(404) QUANTITY REQ'D 1



36" X 36"
W3-1

ONE "U" POST PER SIGN

(405) QUANTITY REQ'D 1

36" X 36"
W1-2L

ONE "U" POST PER SIGN

BP13-R020

SIGN 002

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

APPROVED: DocuSigned by: Renee B. Roach, PE
3EB4360BD316431...

DATE: 06/21/2024

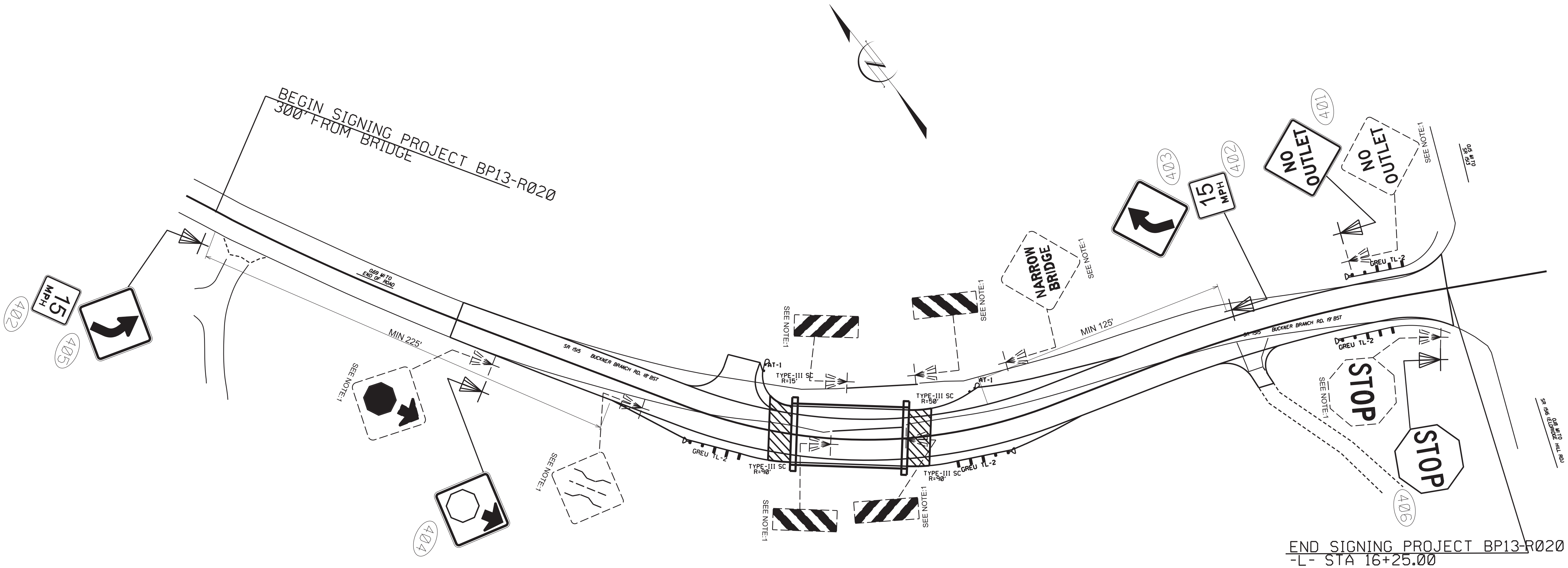
SEAL:

NORTH CAROLINA PROFESSIONAL SEAL 024921 ENGINEER RENEE B. ROACH

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

5/26/20



BP13-R020

SIGN | 003

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

APPROVED: Renee B. Roach, PE

DATE: 06/21/2024

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 024921 ENGINEER RENEE B. ROACH

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NOTES

1. DISPOSAL OF SIGN SYSTEM, U-CHANNEL

PROJ. REFERENCE NO.	SHEET NO.
BP13-R020	X-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

NOTE: EMBANKMENT DOES NOT COLUMN INCLUDES BACKFILL FOR UNDERCUT

CROSS-SECTION SUMMARY

Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
11+20.00	0	0
11+25.00	0	0
11+50.00	1	0
11+75.00	2	0
12+00.00	2	6
12+25.00	1	23
12+60.00	8	78
12+75.00	4	45
12+93.09	1	53

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

Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
13+50.47	0	0
13+75.00	4	88
14+00.00	4	85
14+25.00	2	70
14+50.00	0	46
14+75.00	1	26
15+00.00	3	14
15+25.00	7	5
15+50.00	5	6
15+75.00	1	12
16+00.00	1	8
16+25.00	0	4

6/23/16

0 5 10

PROJ. REFERENCE NO.	SHEET NO.
BP13-R020	X-2

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

2310 2305 2300 2295

3:1 0.040 0.040 2:1 S.S. 2298.80
S.S. 2304.74
2304.47
12+75.00
2:1 2:1
INV. 2297.80

2310 2305 2300 2295

6.5% 0.040 0.040 2:1 S.S. 2300.51
PROP. ASPHALT DRIVE
2304.33
12+60.00
2:1 2:1
INV. 2298.20

2310 2305 2300 2295

EXTEND SHOULDER 0.020 0.017 2:1 S.S. 2300.67
S.S. 2304.20
2304.46
12+25.00
2:1 2:1
INV. 2299.10

2310 2305 2300 2295

EXTEND SHOULDER 0.020 0.000 2:1 S.S. 2300.53
S.S. 2304.46
2304.82
12+00.00
2:1 2:1
INV. 2299.70

2310 2305 2300 2295

EXTEND SHOULDER 0.020 0.017 4:1 S.S. 2304.75
S.S. 2304.72
2305.12
11+75.00

2315 2310 2305 2300

EXTEND SHOULDER 0.020 0.023 4:1 S.S. 2305.16
S.S. 2305.12
2305.58
11+50.00

2315 2310 2305 2300

4:1 0.016 0.034 S.S. 2305.90
S.S. 2305.97
2306.24
11+25.00

2310 2305 2300

2306.40
11+20.00

BEGIN PROJECT BP13-R020
-L- STA 11+20.00

2315 2310 2305 2300

2307.05
11+00.00
-L-

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

6/9/2024
X:\NCDOT\Division 13 Madison 2019\Madison 36\Roadway\XSC\Madison 36_Rdy_xpl.dgn
User:smelvin

6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	BP13-R020	X-3

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

2315 2310 2305 2300 2295

EXTEND SHOULDER
0.017 0.017
S.S. 2304.82
2304.71
2:1 S.S. 2303.13
2:1 2:1
INV. 2300.80
14+75.00

2310 2305 2300 2295

EXTEND SHOULDER
0.001 0.001
S.S. 2304.62
2304.07
2:1 S.S. 2301.26
2:1 2:1
INV. 2300.00
14+50.00

2310 2305 2300 2315

EXTEND SHOULDER
0.016 0.016
S.S. 2304.23
2303.77
2:1 S.S. 2301.60
2:1 2:1
INV. 2299.93
14+25.00

2310 2305 2300 2295

EXTEND SHOULDER
0.033 0.033
S.S. 2304.27
2303.08
2:1 S.S. 2301.20
2:1 2:1
INV. 2299.85
14+00.00

2310 2305 2300 2295

3:1
0.040 0.040
S.S. 2305.53
2303.60
2:1 S.S. 2301.03
2:1 2:1
INV. 2299.77
13+75.00

END BRIDGE –L– STA 13+50.47

2310 2305 2300 2295

0.040 0.040
2303.12
2:1 S.S. 2301.53
2:1 2:1
INV. 2299.70
13+50.00

2310 2305 2300 2295 2290

0.040 0.040
2297.27
13+25.00

2310 2305 2300 2295

0.040 0.040
2304.79
13+00.00

BEGIN BRIDGE –L– STA 12+93.09

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

6/19/2024
K:\NCDOT\Division 13 Madison 2019\Madison 36\Roadway\XSC\Madison 36_Rdy_xs1.dgn
User:smelvin

6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	BP13-R020	X-4

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

END PROJECT BP13-R020
-L- STA 16+25.00

2325 2320 2315 2310 2305 2300 2295

2319.09

16+25.00

2320 2315 2310 2305 2300

2:1 | 0.027 | 0.027 | 4:1

S.S. 2313.99

2315.47

S.S. 2315.05

16+00.00

2315 2310 2305 2300

5.3:1 | 0.030 | 0.030 | 4:1 | 2:1

S.S. 2311.40

2311.81

S.S. 2307.51

15+75.00

2315 2310 2305 2300

5.3:1 | 0.030 | 0.030 | 2.5:1

S.S. 2308.38

2308.60

S.S. 2306.06

15+50.00

2315 2310 2305 2300

EXTEND SHOULDER

S.S. 2306.76 | 0.030 | 0.030 | 9% | 16.4%

2306.50

PROP. ASPHALT DRIVE

15+25.00

2315 2310 2305 2300

EXTEND SHOULDER

S.S. 2305.37 | 0.030 | 0.030 | 2:1 | S.S. 2304.01

2305.44

2:1 | 2:1

INV. 2301.60

15+00.00

-L-

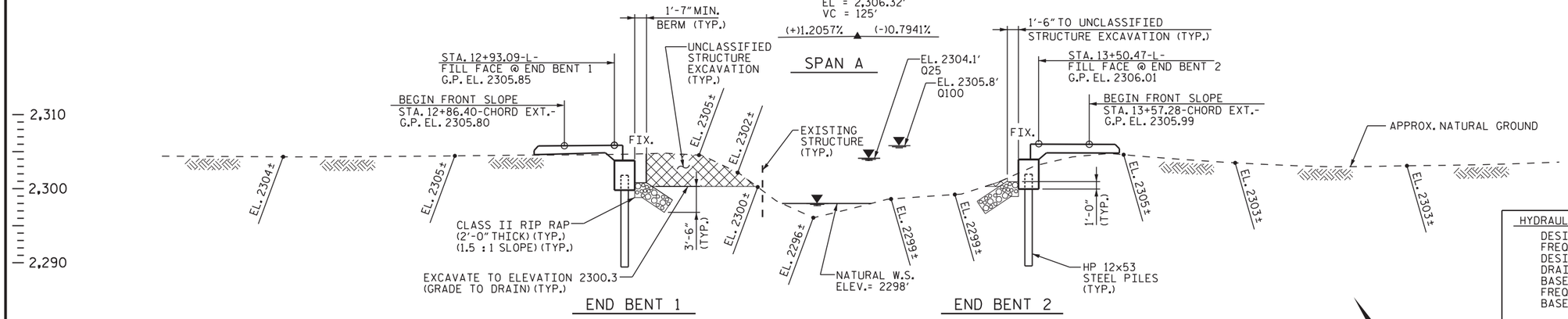
2315 2310 2305 2300 2295

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

6/9/2024
X:\NCDOT\Division 13 Madison 2019\Madison 36\Roadway\XSC\Madison 36_Rdy_xpl.dgn
User:smelvin

VERTICAL CURVE DATA

PI = 13+26.00
EL = 2,306.32'
VC = 125'
(+)1.2057% (-)0.7941%



I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS.

SEAL

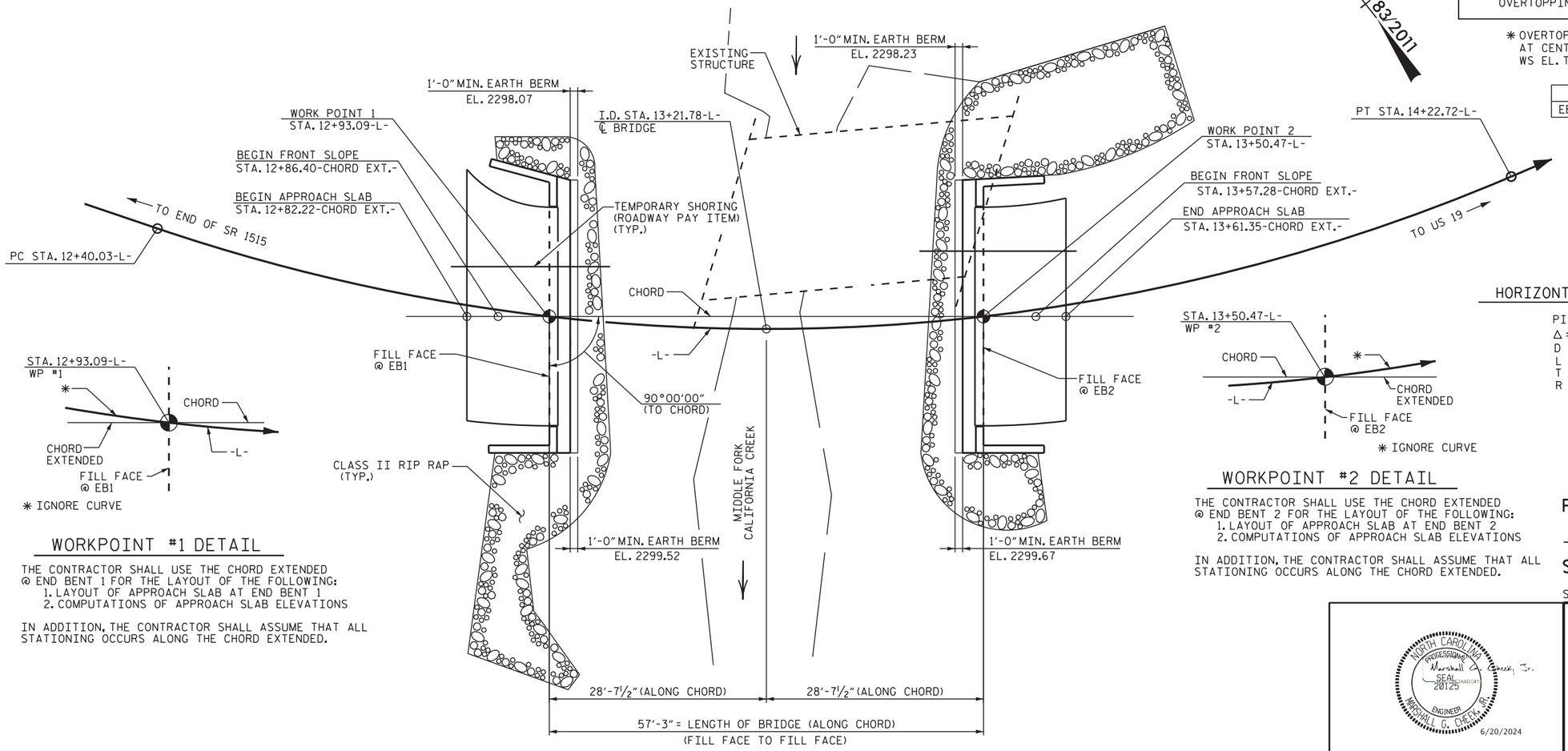
HYDRAULIC DATA:	
DESIGN DISCHARGE	1300 CFS
FREQUENCY OF DESIGN DISCHARGE	25 YRS.
DESIGN HIGH WATER ELEVATION	2304.1'
DRAINAGE AREA	5.3 SQ. MI.
BASE DISCHARGE (Q100)	2120 CFS
FREQUENCY OF BASE DISCHARGE	100 YRS.
BASE HIGH WATER ELEVATION	2305.8'
OVERTOPPING FLOOD DATA:	
OVERTOPPING DISCHARGE	1800 CFS
FREQUENCY OF OVERTOPPING FLOOD	50+ YRS.
OVERTOPPING FLOOD ELEVATION	2305.18' *

* OVERTOPPING OCCURS @ STA. 12+00-L- AT CENTERLINE OF PAVEMENT. WS EL. TAKEN @ RIVER STATION 25161

NAD 83/2011

LOW CHORD ELEVATION	
EB1 2303.28' LT.	EB2 2303.43' LT.

SECTION ALONG -L-



PLAN

PILES NOT SHOWN IN PLAN VIEW FOR CLARITY.

* IGNORE CURVE

WORKPOINT #1 DETAIL

THE CONTRACTOR SHALL USE THE CHORD EXTENDED @ END BENT 1 FOR THE LAYOUT OF THE FOLLOWING:
1. LAYOUT OF APPROACH SLAB AT END BENT 1
2. COMPUTATIONS OF APPROACH SLAB ELEVATIONS

IN ADDITION, THE CONTRACTOR SHALL ASSUME THAT ALL STATIONING OCCURS ALONG THE CHORD EXTENDED.

* IGNORE CURVE

WORKPOINT #2 DETAIL

THE CONTRACTOR SHALL USE THE CHORD EXTENDED @ END BENT 2 FOR THE LAYOUT OF THE FOLLOWING:
1. LAYOUT OF APPROACH SLAB AT END BENT 2
2. COMPUTATIONS OF APPROACH SLAB ELEVATIONS

IN ADDITION, THE CONTRACTOR SHALL ASSUME THAT ALL STATIONING OCCURS ALONG THE CHORD EXTENDED.

HORIZONTAL CURVE DATA -L-

PI = 13+35.67
Δ = 41°-52'-08.9" (LT.)
D = 22°-55'-05.9"
L = 182.69'
T = 95.64'
R = 250.00'

PROJECT NO. BP13-R020
MADISON COUNTY
STATION: 13+21.78-L-

SHEET 1 OF 5 REPLACES BRIDGE NO. 560036

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20125 Marshall G. Cheek, Jr. 6/20/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

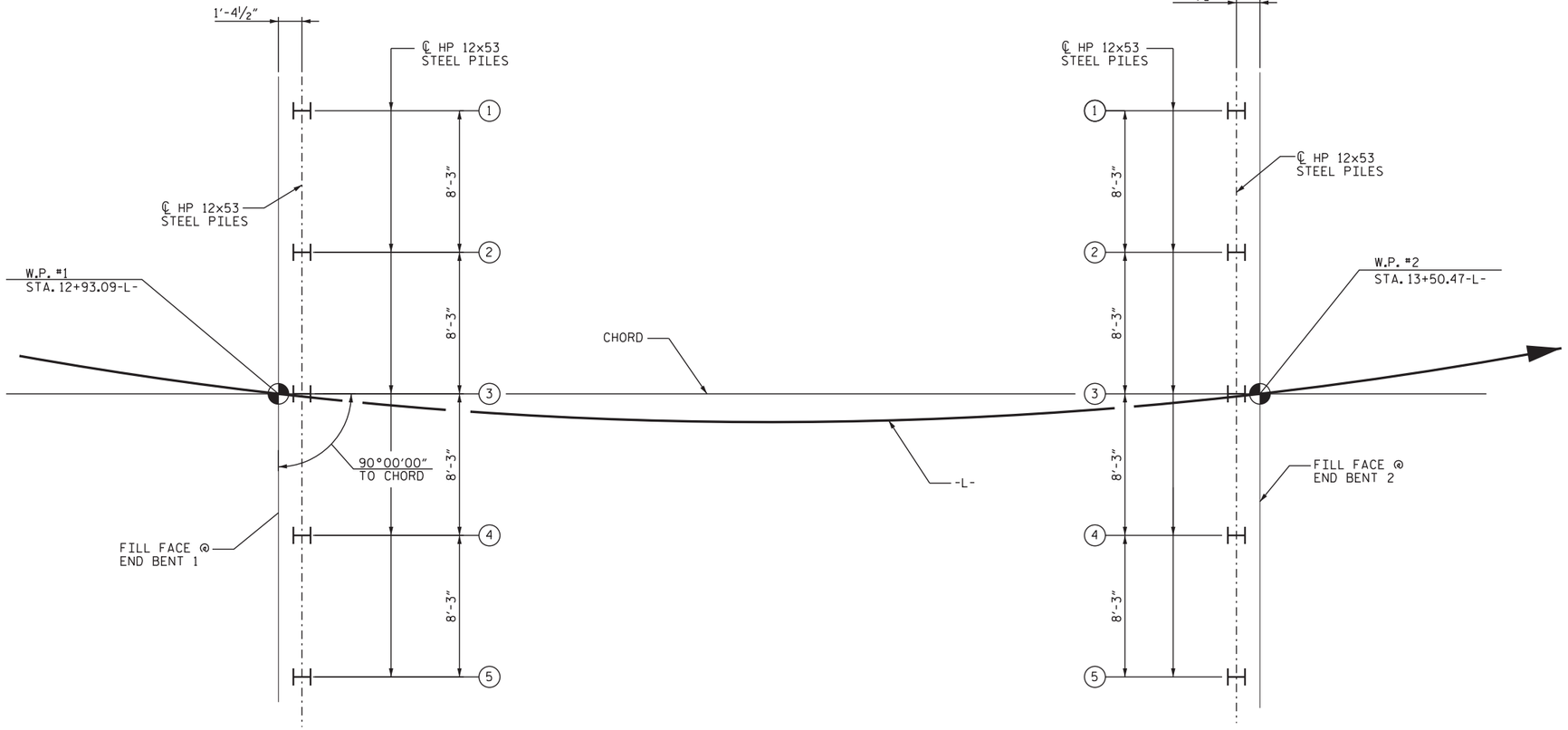
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER MIDDLE FORK CALIFORNIA CREEK ON SR 1515 BETWEEN END OF SR 1515 AND US 19

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			32

DRAWN BY :	NMW	DATE :	1/23
CHECKED BY :	MGC	DATE :	7/23
DESIGN ENGINEER OF RECORD :	MGC	DATE :	7/23



END BENT 1

END BENT 2

FOUNDATION LAYOUT PLAN

ALL END BENT PILES ARE HP12x53 STEEL PILES.
DIMENSIONS LOCATING PILES ARE SHOWN TO THE CENTERLINE OF PILES. ORIENT PILES AS SHOWN.

PROJECT NO. BP13-R020

MADISON COUNTY

STATION: 13+21.78-L-

SHEET 2 OF 5

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20125 MARSHALL G. CHEEK, JR. ENGINEER

Marshall G. Cheek, Jr.

6/20/2024

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

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER MIDDLE FORK CALIFORNIA CREEK
ON SR 1515 BETWEEN
END OF SR 1515 AND US HWY 19

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			32

DRAWN BY :	NMW	DATE :	2/23
CHECKED BY :	MGC	DATE :	7/23
DESIGN ENGINEER OF RECORD :	MGC	DATE :	7/23

SUMMARY OF PILE INFORMATION/INSTALLATION

(BLANK ENTRIES INDICATE ITEM IS NOT APPLICABLE TO STRUCTURE)

End Bent/ Bent No. Pile(s) #-# (e.g., "Bent 1, Piles 1-5")	Factored Resistance per Pile TONS	Pile Cut-Off (Top of Pile) Elevation FT	Estimated Pile Length per Pile FT	Scour Critical Elevation FT	Driven Piles			Predrilling For Piles *			Drilled-in-Piles		
					Min. Pile Tip (Tip No Higher Than) Elev. FT	Required Driving Resistance (RDR)** per Pile TONS	Total Pile Redrives Quantity EACH	Predrilling Length per Pile LIN FT	Predrilling Elevation (Elev Not To Predrill Below) FT	Maximum Predrilling Dia INCHES	Pile Excavation (Bottom of Hole) Elev FT	Pile Exc Not In Soil per Pile LIN FT	Pile Exc In Soil per Pile LIN FT
End Bent 1, Piles 1-2	85	SEE END BENT SHEETS	40			145							
End Bent 1, Piles 3-5	85		45			145							
End Bent 2, Piles 1-3	85		25			145							
End Bent 2, Piles 4-5	85		20			145							

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

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

PILE DESIGN INFORMATION

(BLANK ENTRIES INDICATE ITEM IS NOT APPLICABLE TO STRUCTURE)

End Bent/ Bent No. Pile(s) #-# (e.g., "Bent 1, Piles 1-5")	Factored Axial Load per Pile TONS	Factored Downdrag Load per Pile TONS	Factored Dead Load * per Pile TONS	Dynamic Resistance Factor	Nominal Downdrag Resistance per Pile TONS	Nominal Scour Resistance per Pile TONS	Scour Resistance Factor (Default = 1.00)
End Bent 1, Piles 1-5	85			0.60			1.00
End Bent 2, Piles 1-5	85			0.60			1.00

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

NOTES:

1. The Pile Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (Robert E. Kral, 042642) on 4/20/2023.
2. Total Pile Driving Equipment Setup quantity (not shown in Pile Foundation Tables) equals the number of driven piles, ie., the number of piles with a Required Driving Resistance.
3. The Engineer will determine the need for Dynamic Pile Testing when DPTs may be required.
4. For Piles, see Section 450 ot the Standard Specifications.
5. It has been estimated that a hammer with a equivalent rated energy in the range of 30,000 to 40,000 ft-lbs per blow will be required to drive piles at End Bent 1 and End Bent 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.

SUMMARY OF DPT / PILE ORDER LENGTHS

(BLANK ENTRIES INDICATE ITEM IS NOT APPLICABLE TO STRUCTURE)

Dynamic Pile Testing (DPT)				Pile Order Lengths	
End Bent/ Bent No.	DPT Required? YES or MAYBE	DPT Test Pile Length FT	Total DPT Quantity EACH	End Bent/ Bent No(s)	Pile Order Length Basis * EST or DPT
End Bent 1	MAYBE	50	1		
End Bent 2	MAYBE	30			

* 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 Dynamic Pile Testing, the first end bent/bent no. listed for each group is the representive end bent/bent with the DPT.

SUMMARY OF PILE ACCESSORIES

(BLANK ENTRIES INDICATE ITEM IS NOT APPLICABLE TO STRUCTURE)

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

PROJECT NO. BP13-R020

MADISON COUNTY

STATION: 13+21.78-L-

SHEET 3 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

6/20/2024

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TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

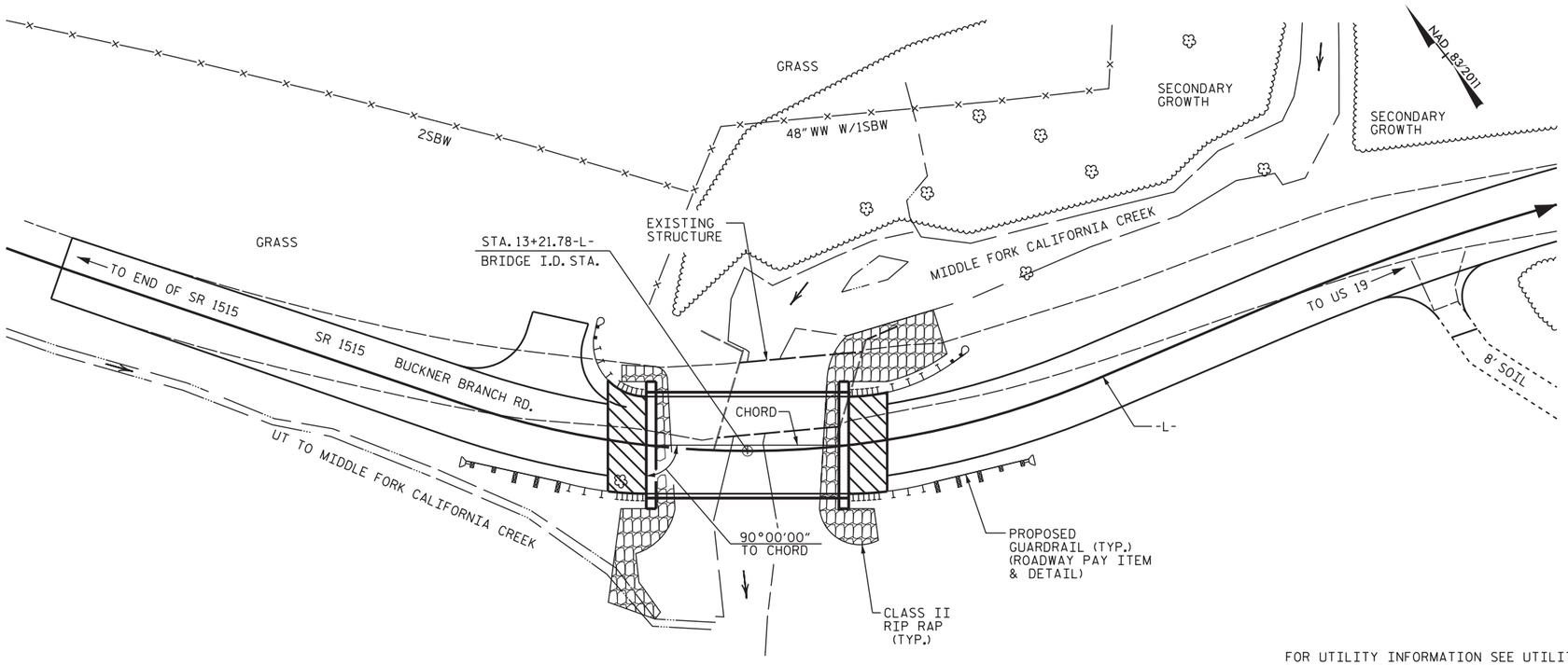
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PILE FOUNDATION TABLES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			32

DRAWN BY :	NMW	DATE : 2/23
CHECKED BY :	MGC	DATE : 4/23

BENCH MARK #1: RR SPIKE IN BASE OF 12" DOUBLE TRUNK WALNUT; 82.0' LT. OF STA. 14+16.08-L-; ELEV. = 2303.80'



FOR UTILITY INFORMATION SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

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 STANDARD NOTES SHEET.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET S-1 SHALL BE EXCAVATED FOR THE DISTANCE OF 35 FT. (LT) AND 35 FT (RT) @ END BENT 1 AND 25 FT. (LT.) AND 45 FT. (RT.) @ END BENT 2 EACH SIDE OF THE CENTERLINE OF THE BRIDGE 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 SINGLE SPAN STRUCTURE (1 @ 35'-2") ON A TIMBER FLOOR ON STEEL I-BEAMS WITH A CLEAR ROADWAY WIDTH OF 20'-4" AND 2 ½" ASPHALT WEARING SURFACE AND A SUBSTRUCTURE CONSISTING OF VERTICAL TIMBER ABUTMENTS AND LOCATED AT THE SITE OF THE PROPOSED BRIDGE, SHALL BE REMOVED. FOR REMOVAL OF EXISTING STRUCTURE, SEE SPECIAL PROVISIONS.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

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

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

ASPHALT WEARING SURFACE IS INCLUDED IN ROADWAY QUANTITIES ON ROADWAY PLANS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR ASBESTOS ASSESMENT, SEE SPECIAL PROVISIONS.

TEMPORARY SHORING WILL BE REQUIRED AS-SHOWN ON THE PLAN VIEW, SHEET 1 OF 5.

FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.

DRAWN BY :	NMW	DATE :	2/23
CHECKED BY :	MGC	DATE :	7/23
DESIGN ENGINEER OF RECORD :	MGC	DATE :	7/23

PROJECT NO. BP13-R020

MADISON COUNTY

STATION: 13+21.78-L-

SHEET 4 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 040047 ENGINEER Marshall G. Chen, Jr.

6/20/2024

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TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER MIDDLE FORK CALIFORNIA CREEK ON SR 1515 BETWEEN END OF SR 1515 AND US 19

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			32

TOTAL BILL OF MATERIAL

ITEM	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESSMENT	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS "A" CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12 x 53 STEEL PILES	HP 12x53 STEEL PILES		STEEL PILE POINTS	DYNAMIC PILE TESTING	TWO BAR METAL RAIL	1'-2" x 2'-8¾" CONCRETE PARAPET	RIP RAP, CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" x 1'-9" PRESTRESSED CONCRETE CORED SLABS	
	LUMP SUM	LUMP SUM	LUMP SUM	C.Y.	LUMP SUM	LBS.		NO.	LIN. FT.	EA.	EA.	LIN. FT.	LIN. FT.	TONS	S.Y.	LUMP SUM	NO.	LIN. FT.
SUPERSTRUCTURE												95.00	110.00				10	550.00
END BENT 1			LUMP SUM	20.3		2461	5	5	215	5				115	130			
END BENT 2			LUMP SUM	20.2		2442	5	5	115	5				120	135			
TOTALS	LUMP SUM	LUMP SUM	LUMP SUM	40.5	LUMP SUM	4903	10	10	330	10	1	95.00	110.00	235	265	LUMP SUM	10	550.00

PROJECT NO. BP13-R020

MADISON COUNTY

STATION: 13+21.78-L-

SHEET 5 OF 5

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20125 MARSHALL G. CHEEK, JR.

6/20/2024

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TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

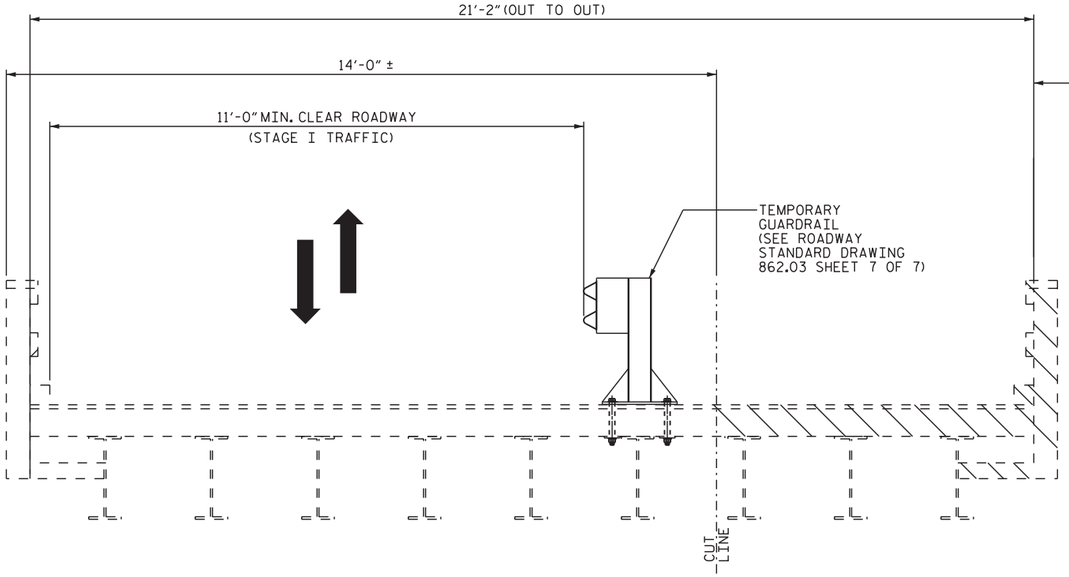
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

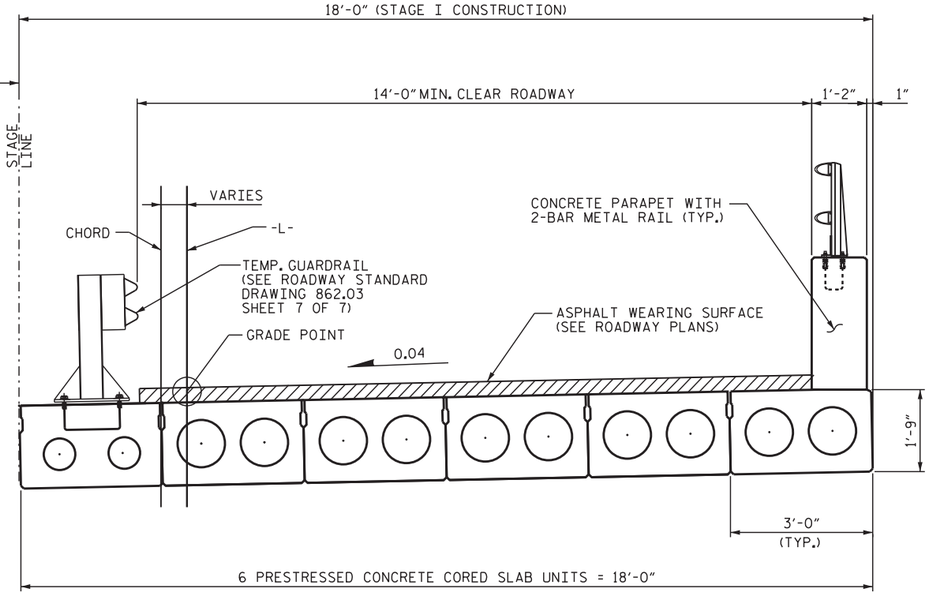
GENERAL DRAWING

FOR BRIDGE OVER MIDDLE FORK CALIFORNIA CREEK
ON SR 1515 BETWEEN
END OF SR 1515 AND US HWY 19

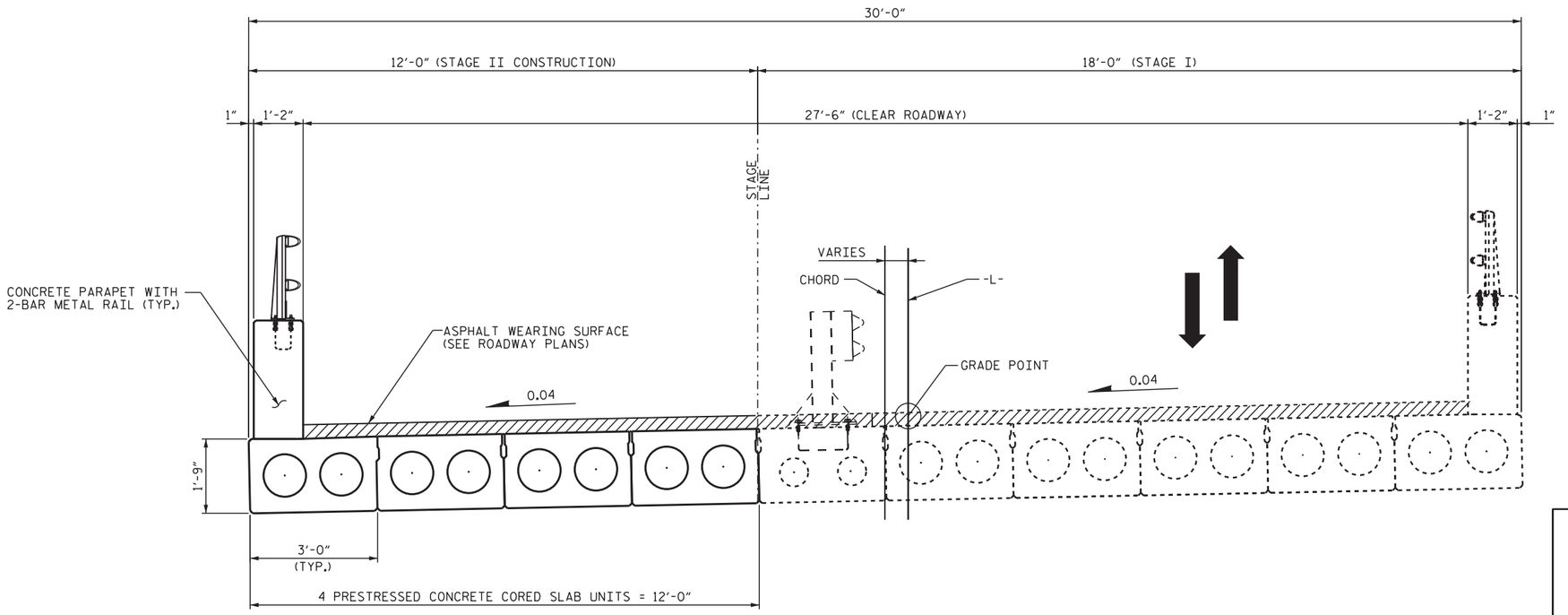
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			32

DRAWN BY :	NMW	DATE :	2/23
CHECKED BY :	MGC	DATE :	7/23
DESIGN ENGINEER OF RECORD :	MGC	DATE :	7/23





STAGE I



STAGE II

= TWO WAY TRAFFIC

STAGING SEQUENCE

PROJECT NO. BP13-R020

MADISON COUNTY

STATION: 13+21.78-L-

DRAWN BY :	NMW	DATE :	2/23
CHECKED BY :	MGC	DATE :	7/23
DESIGN ENGINEER OF RECORD :	MGC	DATE :	7/23

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.
6/20/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONSTRUCTION STAGING

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			32

8/26/21

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	γ DC	γ DW
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

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

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

COMMENTS:

1.

2.

3.

4.

 # CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

2 DESIGN LOAD RATING (HS-20)

3 LEGAL LOAD RATING **

4 EMERGENCY VEHICLE LOAD RATING **

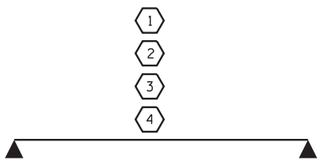
** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

I - INTERIOR GIRDER

EL - EXTERIOR LEFT GIRDER

ER- EXTERIOR RIGHT GIRDER



LRFR SUMMARY

FOR SPAN " A "

PROJECT NO. BP13-R020

MADISON COUNTY

STATION: 13+21.78 -L-

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

6/20/2024

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TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

LRFR SUMMARY FOR 55' CORED SLAB UNIT 90° SKEW

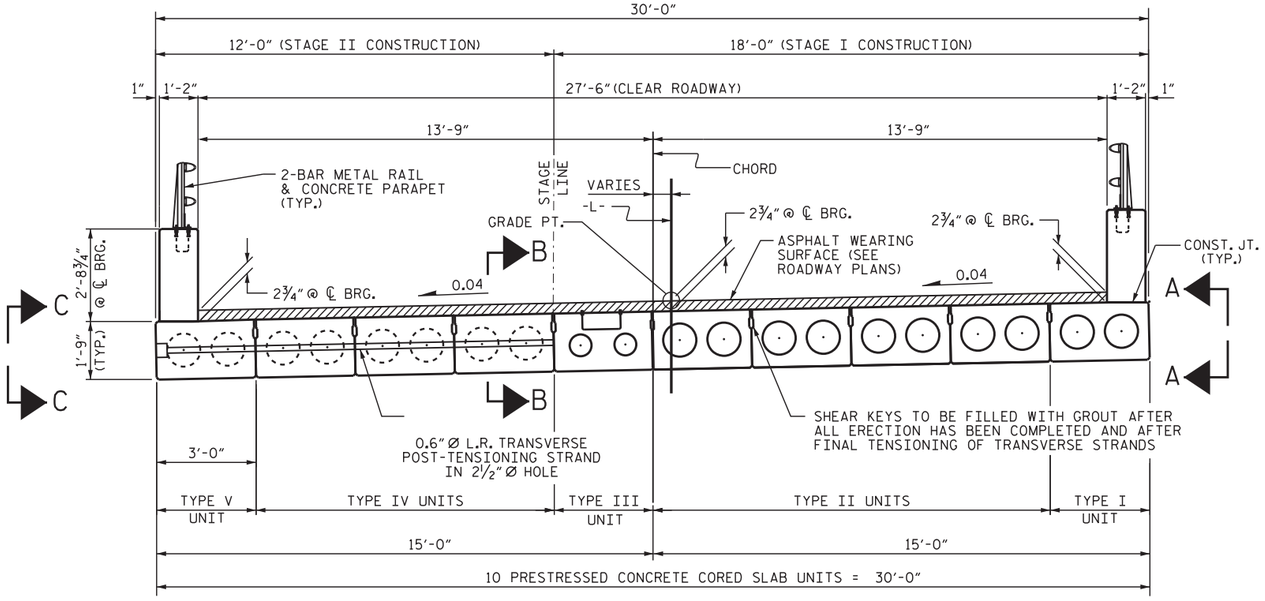
(NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			32

ASSEMBLED BY:	ZCS	DATE :	6/23
CHECKED BY :	MGC	DATE :	7/23
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

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

STD. NO. 21LRFR1_90S_55L

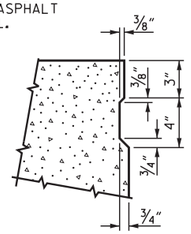


HALF SECTION AT INTERMEDIATE DIAPHRAGMS

HALF SECTION THROUGH VOIDS

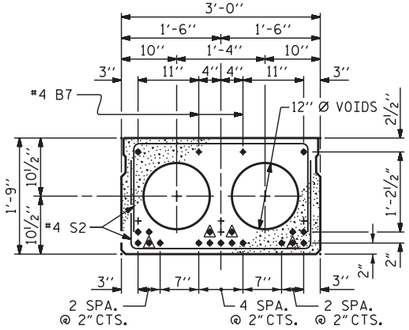
TYPICAL SECTION

* - THE MAXIMUM PARAPET HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE PARAPET AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE PARAPET FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR PARAPET HEIGHT DETAILS AND ASPHALT THICKNESS SEE THE "PARAPET SECTION FOR TWO BAR METAL RAIL" DETAIL.



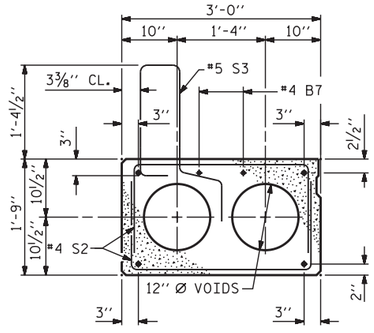
SHEAR KEY DETAIL

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



INTERIOR SLAB SECTION (55' UNIT) (TYPE II & IV)

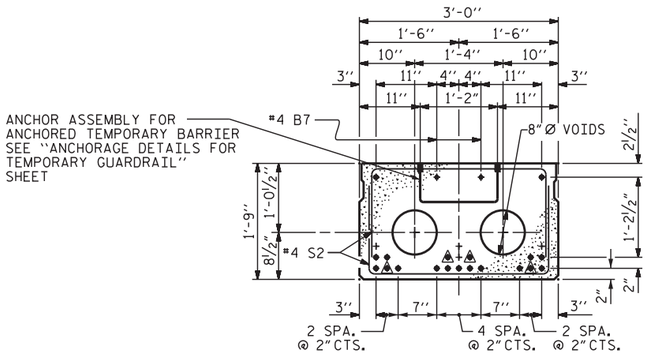
(19 STRANDS REQUIRED)



EXTERIOR SLAB SECTION (55' UNIT) (TYPE I & V)

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

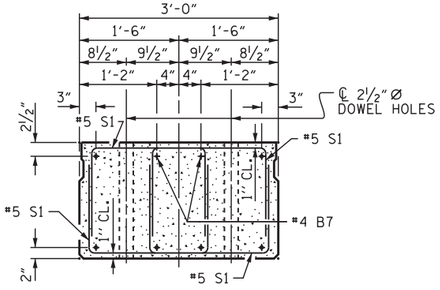
0.6" Ø LOW RELAXATION STRAND LAYOUT



INTERIOR SLAB SECTION (55' UNIT) (TYPE III)

(19 STRANDS REQUIRED)

0.6" Ø LOW RELAXATION STRAND LAYOUT

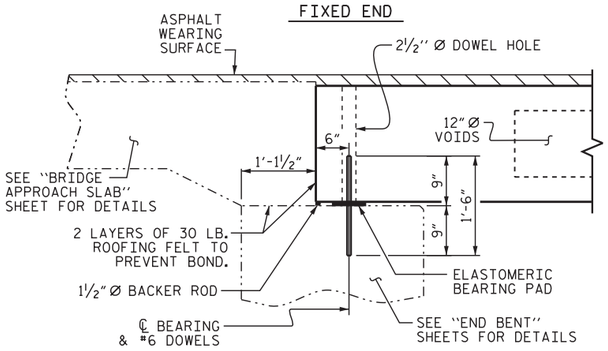


END ELEVATION

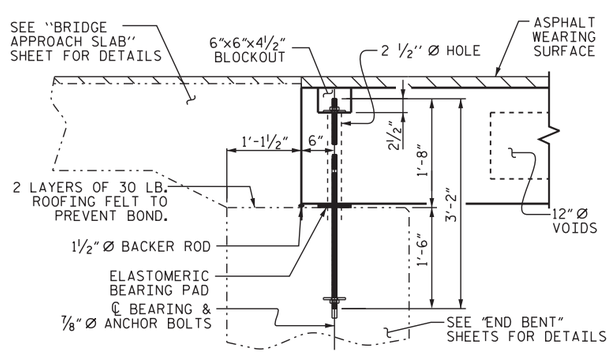
SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES. (STRAND LAYOUT NOT SHOWN.) INTERIOR SLAB UNIT SHOWN-EXTERIOR SLAB UNIT SIMILAR EXCEPT SHEAR KEY LOCATION.

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

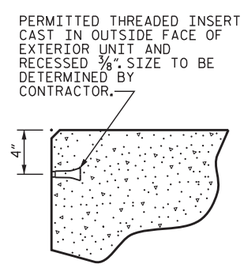


SECTION AT END BENT



SECTION AT END BENT FOR EXTERIOR CORED SLAB UNITS

FOR "BLOCKOUT DETAIL FOR ANCHOR BOLTS", SEE SHEETS 3 & 4 OF 8.



THREADED INSERT DETAIL

PROJECT NO. BP13-R020

MADISON COUNTY

STATION: 13+21.78-L-

SHEET 1 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

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

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20125 MARSHALL G. CHEEK, JR. ENGINEER

6/20/2024

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TGS ENGINEERS
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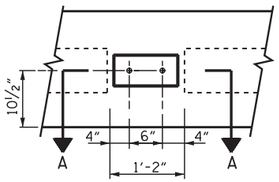
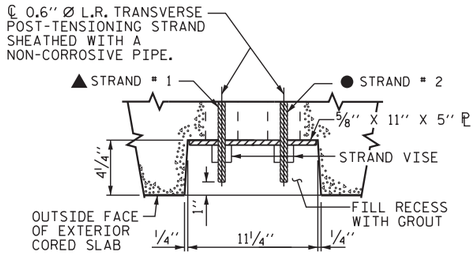
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			32

DRAWN BY :	NMW	DATE :	2/23
CHECKED BY :	MGC	DATE :	7/23
DESIGN ENGINEER OF RECORD :	MGC	DATE :	7/23

STD. NO. 21"PCS2_30_90S



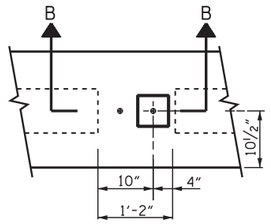
ELEVATION VIEW



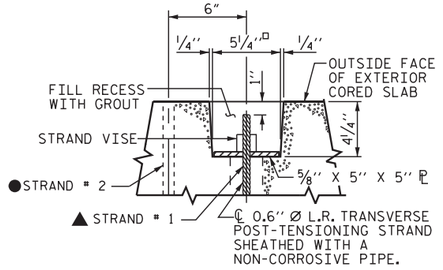
SECTION A-A

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

(TYPE I UNIT)



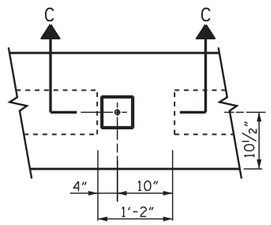
ELEVATION VIEW



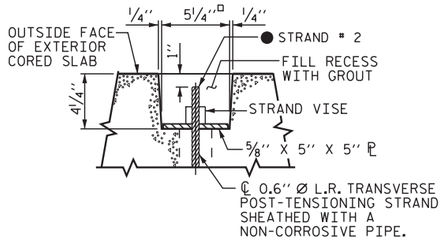
SECTION B-B

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

(TYPE III UNIT)



ELEVATION VIEW



SECTION C-C

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

(TYPE V UNIT)

▲ STRAND # 1 GOES THRU 6 CORED SLAB UNITS
(TO BE TENSIONED DURING STAGE I CONSTRUCTION)

● STRAND # 2 GOES THRU ALL 10 CORED SLAB UNITS
(TO BE TENSIONED DURING STAGE II CONSTRUCTION)

PROJECT NO. BP13-R020

MADISON COUNTY

STATION: 13+21.78-L-

DRAWN BY :	NMW	DATE :	2/23
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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20125 MARSHALL G. CHEEK, JR. ENGINEER
Marshall G. Cheek, Jr.
6/20/2024

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TGS ENGINEERS
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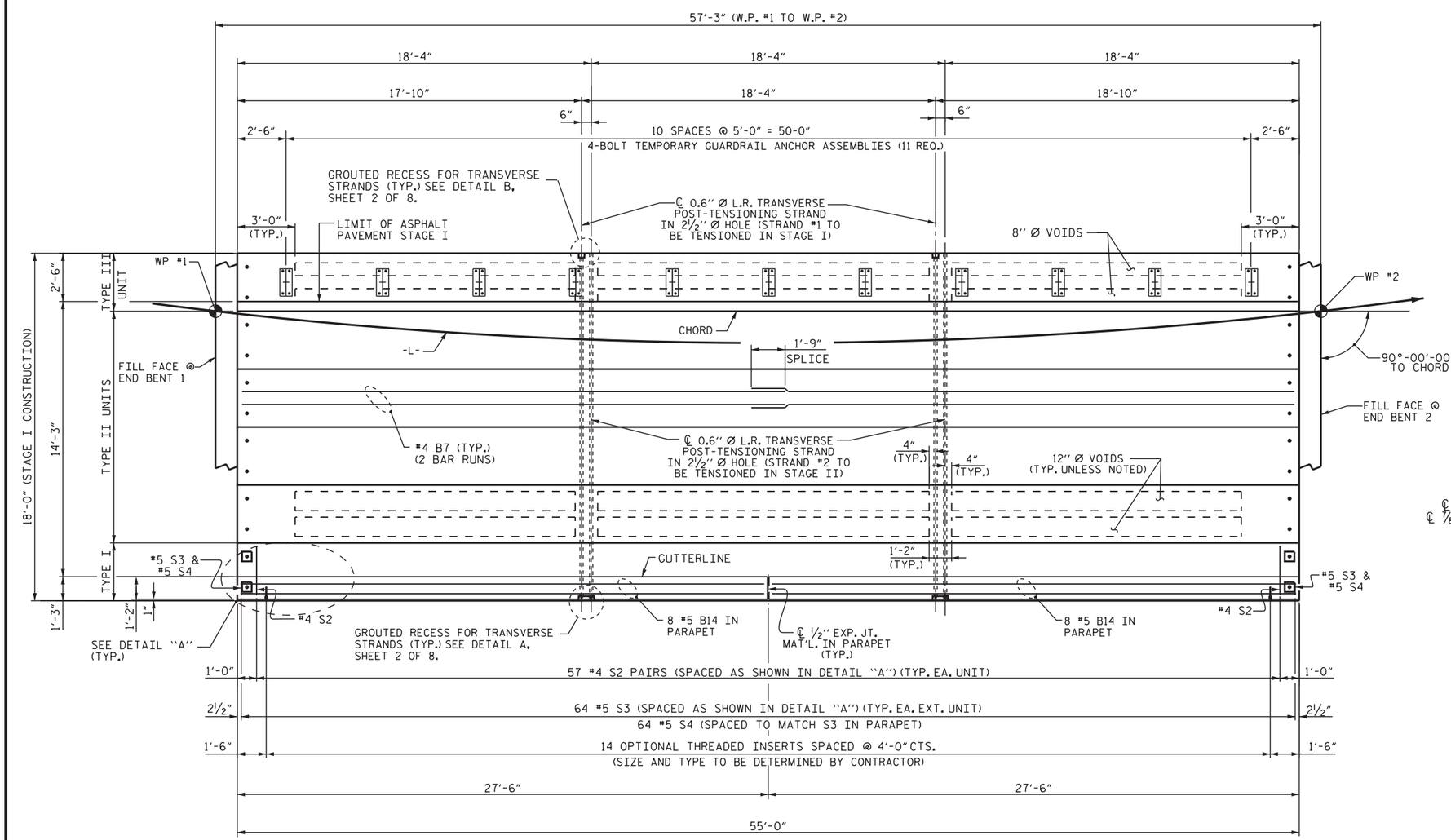
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

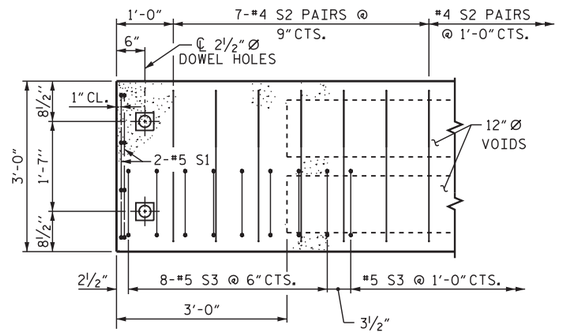
SUPERSTRUCTURE

PRESTRESSED CONCRETE CORED SLAB DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			32



PLAN OF SPAN A - STAGE I



DETAIL "A"

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

NOTES

TYPE I UNIT SHALL BE ANCHORED WITH ⅞" Ø ANCHOR BOLTS.

THE 2½" ANCHOR BOLT HOLES SHALL BE FILLED WITH NON-SHRINK GROUT. SEE GROUT FOR STRUCTURES SPECIAL PROVISION.

ANCHOR BOLTS SHALL BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF ½ TURN.

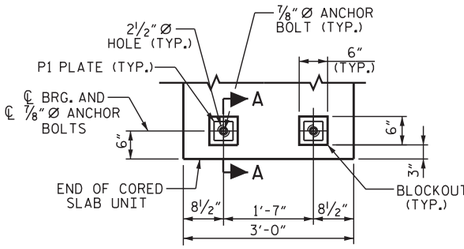
ANCHOR BOLT BLOCKOUTS SHALL BE FILLED WITH NON-SHRINK GROUT AFTER TIGHTENING OF THE ANCHOR BOLTS AND PRIOR TO PLACEMENT OF ASPHALT WEARING SURFACE.

THE VERTICAL FACES OF THE ANCHOR BOLT BLOCKOUTS SHALL BE FINISHED WITH A ROUGHENED SURFACE.

HOLD DOWN PLATES, ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

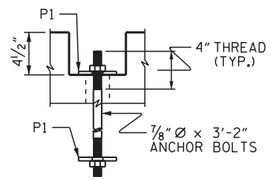
PAYMENT FOR HOLD DOWN PLATES, ANCHOR BOLTS, NUTS AND WASHERS SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. PLATES SHALL MEET THE REQUIREMENTS OF AASHTO M293. BOLTS, NUTS AND PLATES SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLT, NUTS AND PLATES. SHOP INSPECTION IS REQUIRED.

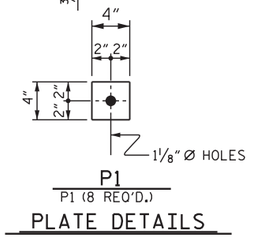


TYPICAL PLAN

TYPICAL EACH END



SECTION A-A



P1

P1 (8 REQ'D.)

PLATE DETAILS

BLOCKOUT DETAIL FOR ANCHOR BOLTS

FOR TYPE I UNIT

PROJECT NO. BP13-R020

MADISON COUNTY

STATION: 13+21.78-L-

SHEET 3 OF 8

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20125 Marshall G. Cheek, Jr. ENGINEERING MARSHALL G. CHEEK, JR.

6/20/2024

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CORP. LICENSE NO.: C-0275

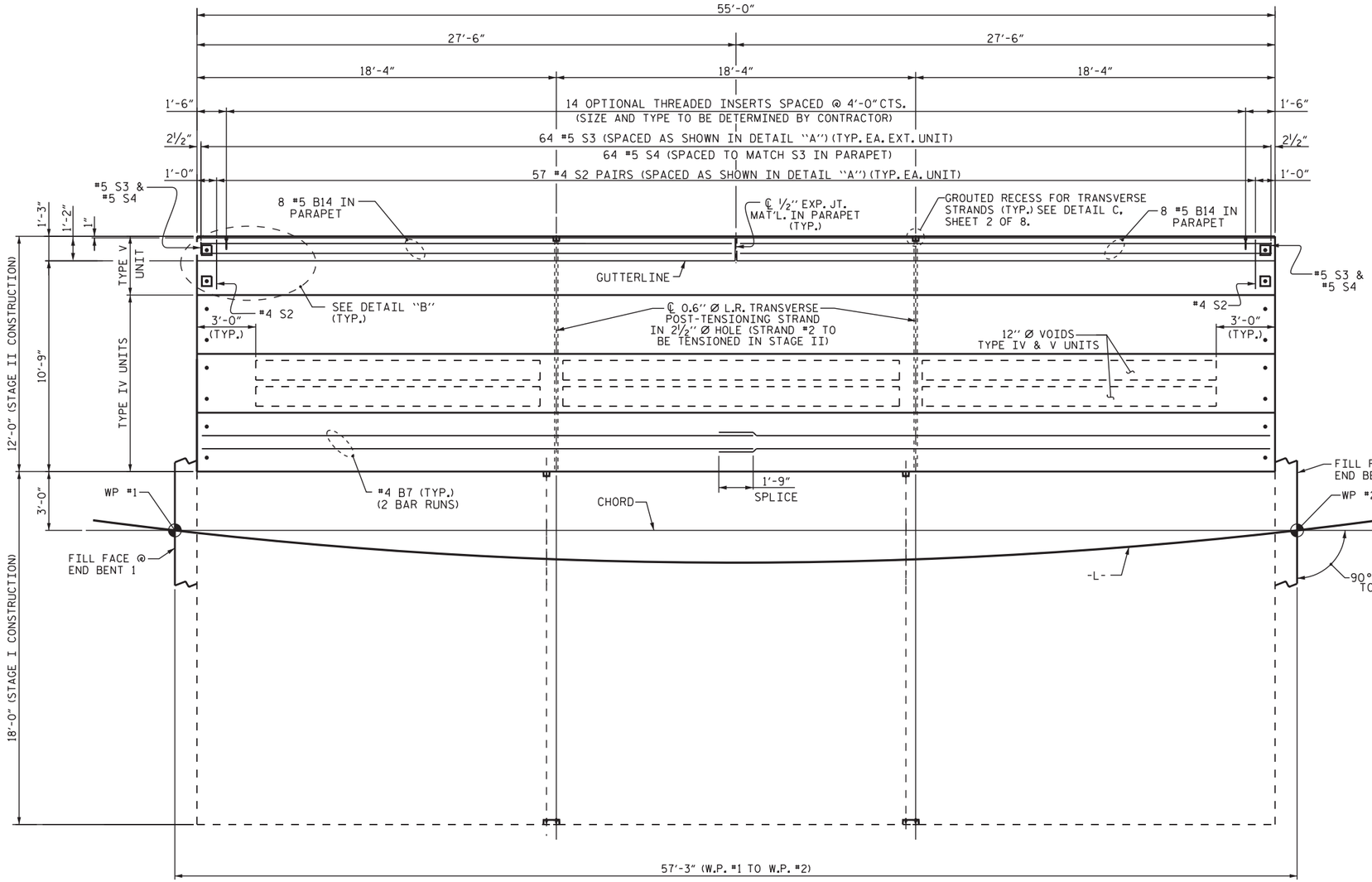
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

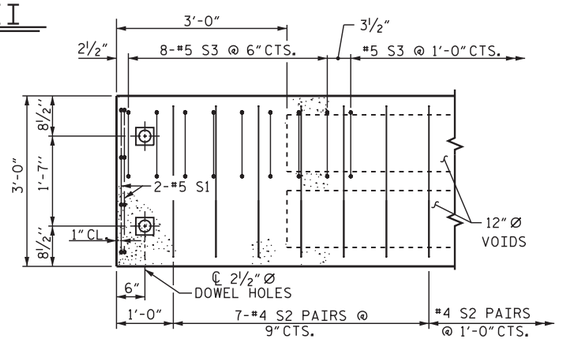
PLAN OF SPAN A
STAGE I

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			32

DRAWN BY :	NMW	DATE : 2/23
CHECKED BY :	MGC	DATE : 7/23
DESIGN ENGINEER OF RECORD : MGC		DATE : 7/23



PLAN OF SPAN A - STAGE II



DETAIL "B"

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

NOTES

TYPE V UNIT SHALL BE ANCHORED WITH ⅞" Ø ANCHOR BOLTS.

THE 2½" ANCHOR BOLT HOLES SHALL BE FILLED WITH NON-SHRINK GROUT. SEE GROUT FOR STRUCTURES SPECIAL PROVISION.

ANCHOR BOLTS SHALL BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF ½ TURN.

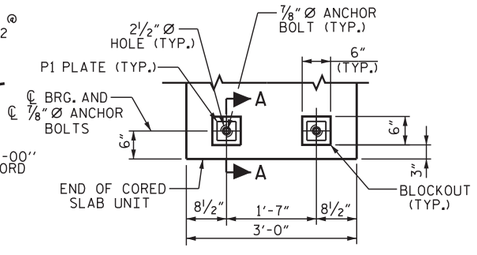
ANCHOR BOLT BLOCKOUTS SHALL BE FILLED WITH NON-SHRINK GROUT AFTER TIGHTENING OF THE ANCHOR BOLTS AND PRIOR TO PLACEMENT OF ASPHALT WEARING SURFACE.

THE VERTICAL FACES OF THE ANCHOR BOLT BLOCKOUTS SHALL BE FINISHED WITH A ROUGHENED SURFACE.

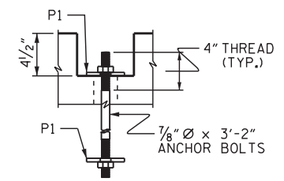
HOLD DOWN PLATES, ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

PAYMENT FOR HOLD DOWN PLATES, ANCHOR BOLTS, NUTS AND WASHERS SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

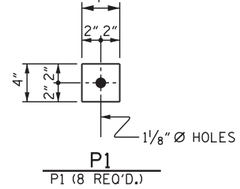
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. PLATES SHALL MEET THE REQUIREMENTS OF AASHTO M293. BOLTS, NUTS AND PLATES SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLT, NUTS AND PLATES. SHOP INSPECTION IS REQUIRED.



TYPICAL PLAN
TYPICAL EACH END



SECTION A-A



P1
P1 (8 REQ'D.)

PLATE DETAILS

BLOCKOUT DETAIL FOR ANCHOR BOLTS
FOR TYPE V UNIT

PROJECT NO. BP13-R020
MADISON COUNTY
STATION: 13+21.78-L-
SHEET 4 OF 8

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20125 MARSHALL G. CHEEK, JR. ENGINEER
Marshall G. Cheek, Jr.
6/20/2024

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TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN A
STAGE II

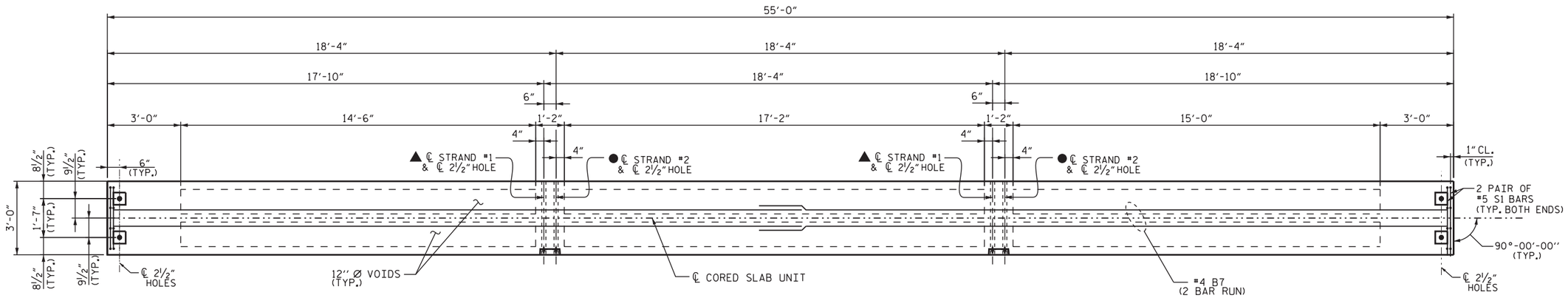
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			32

DRAWN BY :	NMW	DATE : 2/23
CHECKED BY :	MGC	DATE : 7/23
DESIGN ENGINEER OF RECORD :	MGC	DATE : 7/23

NOTES

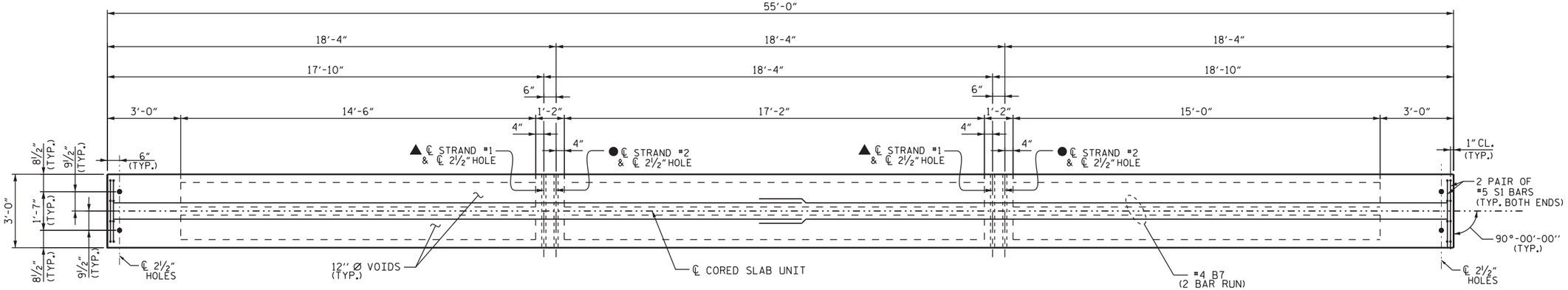
- ▲ STRAND # 1 GOES THRU 6 CORED SLAB UNITS (TO BE TENSIONED DURING STAGE I CONSTRUCTION)
- ● STRAND # 2 GOES THRU ALL 10 CORED SLAB UNITS (TO BE TENSIONED DURING STAGE II CONSTRUCTION)

FOR GROUTED RECESS, SEE SHEET 2 OF 8



PLAN - SPAN A - TYPE I UNIT - STAGE I

NOTE: SEE PLAN OF SPAN A STAGE I FOR SPACING OF THE "S" BARS AND THREADED INSERTS FOR "BLOCKOUT DETAIL FOR ANCHOR BOLTS "SEE SHEET 3 OF 8.



PLAN - SPAN A - TYPE II UNIT - STAGE I

NOTE: SEE PLAN OF SPAN A STAGE I FOR SPACING OF THE "S" BARS

PROJECT NO. BP13-R020

MADISON COUNTY

STATION: 13+21.78-L-

SHEET 5 OF 8

DRAWN BY :	NMW	DATE :	2/23		
CHECKED BY :	MGC	DATE :	7/23		
DESIGN ENGINEER OF RECORD :	MGC	DATE :	7/23		

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER — Marshall G. Chetty, Jr.

6/20/2024

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RALEIGH

SUPERSTRUCTURE

3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLAB UNIT DETAILS STAGE I

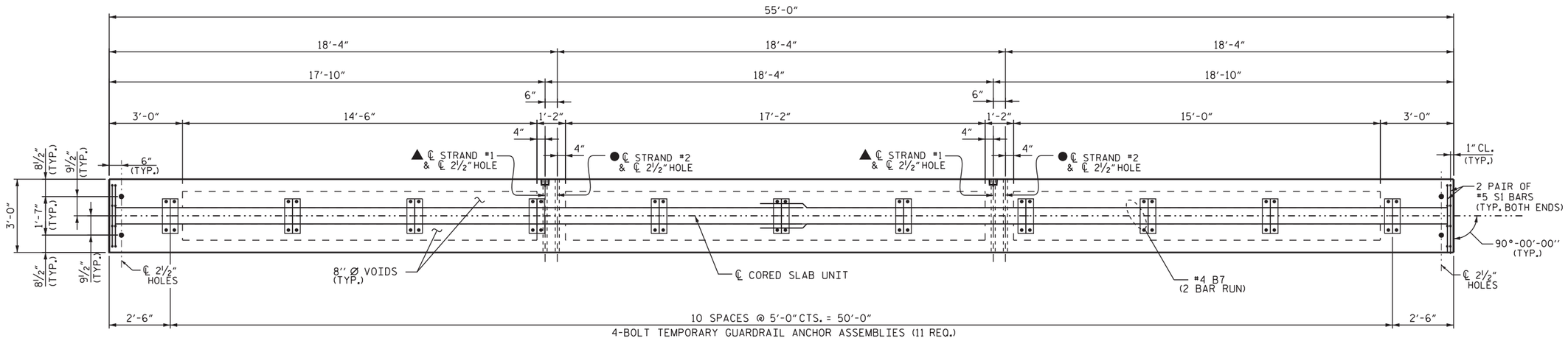
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			32

NOTES

▲ STRAND # 1 GOES THRU 5 CORED SLAB UNITS
(TO BE TENSIONED DURING STAGE I CONSTRUCTION)

● STRAND # 2 GOES THRU ALL 9 CORED SLAB UNITS
(TO BE TENSIONED DURING STAGE II CONSTRUCTION)

FOR GROUTED RECESS, SEE SHEET 2 OF 8



PLAN - SPAN A - TYPE III UNIT - STAGE I

NOTE: SEE PLAN OF SPAN A STAGE I FOR SPACING OF THE "S" BARS FOR TEMPORARY GUARDRAIL ANCHOR ASSEMBLIES. SEE "ANCHORAGE DETAILS FOR TEMPORARY GUARDRAIL" SHEET.

PROJECT NO. BP13-R020

MADISON COUNTY

STATION: 13+21.78-L-

SHEET 6 OF 8

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20125 MARSHALL G. CHEEK, JR.

6/20/2024

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STATE OF NORTH CAROLINA
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RALEIGH

SUPERSTRUCTURE

3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLAB UNIT DETAILS STAGE I

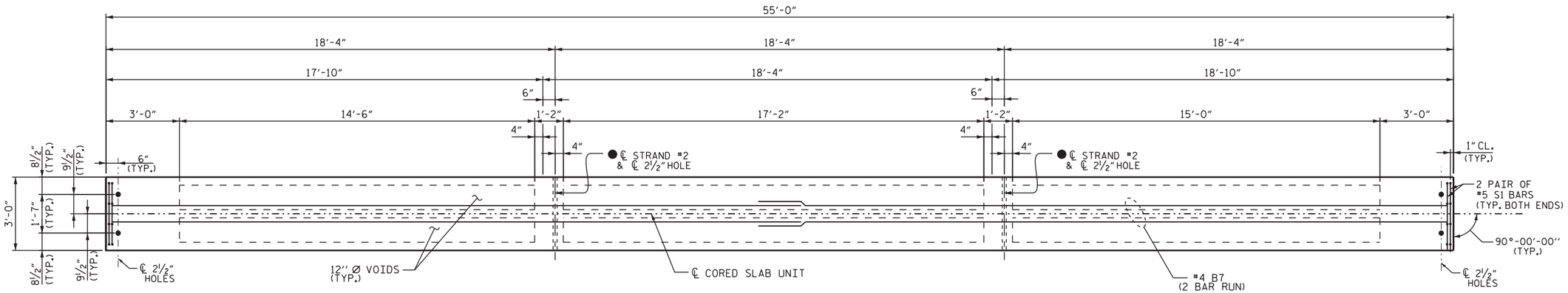
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			32

DRAWN BY :	NMW	DATE :	2/23
CHECKED BY :	MGC	DATE :	7/23
DESIGN ENGINEER OF RECORD :	MGC	DATE :	7/23

NOTES

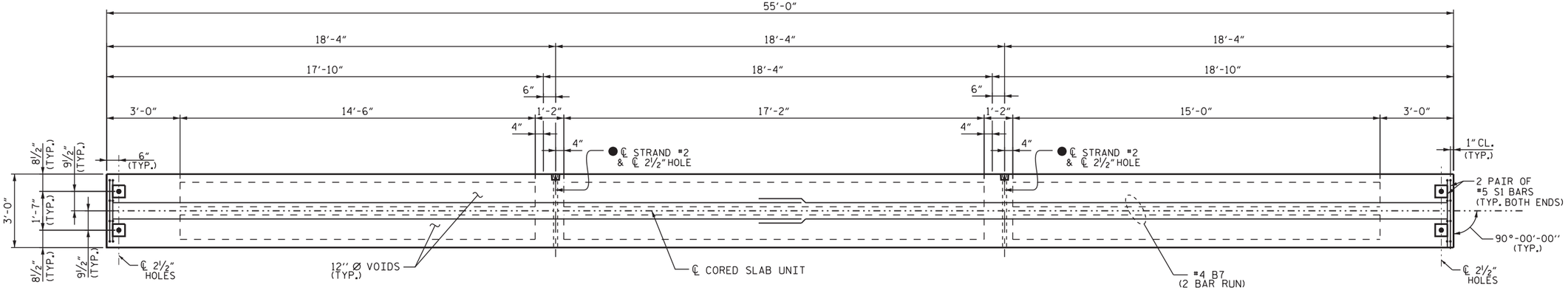
● STRAND # 2 GOES THRU ALL 10 CORED SLAB UNITS (TO BE TENSIONED DURING STAGE II CONSTRUCTION)

FOR GROUTED RECESS, SEE SHEET 2 OF 8



PLAN - SPAN A - TYPE IV UNIT - STAGE II

NOTE: SEE PLAN OF SPAN A STAGE II FOR SPACING OF THE "S" BARS
FOR "BLOCKOUT DETAIL FOR ANCHOR BOLTS "SEE SHEET 3 OF 8.



PLAN - SPAN A - TYPE V UNIT - STAGE II

NOTE: SEE PLAN OF SPAN A STAGE II FOR SPACING OF THE "S" BARS AND THREADED INSERTS
FOR "BLOCKOUT DETAIL FOR ANCHOR BOLTS "SEE SHEET 3 OF 8.

PROJECT NO. BP13-R020

MADISON COUNTY

STATION: 13+21.78-L-

SHEET 7 OF 8

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

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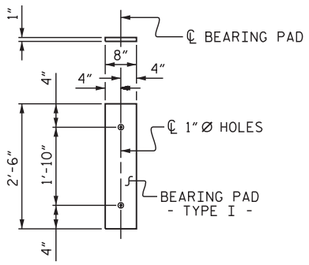
SUPERSTRUCTURE

3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLAB UNIT DETAILS STAGE II

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			32

DRAWN BY :	NMW	DATE :	2/23
CHECKED BY :	MGC	DATE :	7/23
DESIGN ENGINEER OF RECORD :	MGC	DATE :	7/23



FIXED END
(TYPE I - 20 REQ'D)

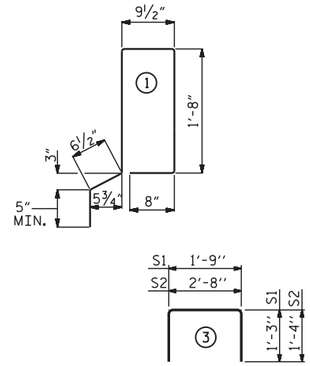
ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 50 DUROMETER HARDNESS.

CORED SLABS REQUIRED SPAN A

		NUMBER	LENGTH	TOTAL LENGTH
STAGE I	TYPE I	1	55'-0"	55'-0"
	TYPE II	4	55'-0"	220'-0"
	TYPE III	1	55'-0"	55'-0"
	STAGE I TOTAL	6		330'-0"
STAGE II	TYPE IV	3	55'-0"	165'-0"
	TYPE V	1	55'-0"	55'-0"
	STAGE II TOTAL	4		220'-0"
	TOTAL	10		550'-0"

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

NOTES

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

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

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

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

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

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

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.

BILL OF MATERIAL FOR ONE CORED SLAB UNIT

				TYPE I UNIT		TYPE II UNIT		TYPE III UNIT		TYPE IV UNIT		TYPE V UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT
B7	4	#4	STR	28'-3"	75	28'-3"	75	28'-3"	75	28'-3"	75	28'-3"	75
S1	8	#5	3	4'-3"	35	4'-3"	35	4'-3"	35	4'-3"	35	4'-3"	35
S2	114	#4	3	5'-4"	406	5'-4"	406	5'-4"	406	5'-4"	406	5'-4"	406
✳ S3	64	#5	1	5'-9"	384							5'-9"	384
REINFORCING STEEL LBS.					516		516		516		516		516
✳EPOXY COATED REINFORCING STEEL LBS.					384								384
6500 P.S.I. CONCRETE CU. YDS.					7.9		7.9		9.4		7.9		7.9
0.6"Ø L.R. STRANDS No.					19		19		19		19		19

GUTTERLINE ASPHALT THICKNESS & PARAPET HEIGHT

	ASPHALT OVERLAY THICKNESS @ MID-SPAN	PARAPET HEIGHT @ MID-SPAN
55' UNITS	1⅝"	2'-7⅝"

DEAD LOAD DEFLECTION AND CAMBER

	3'-0" x 1'-9"
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" ↑

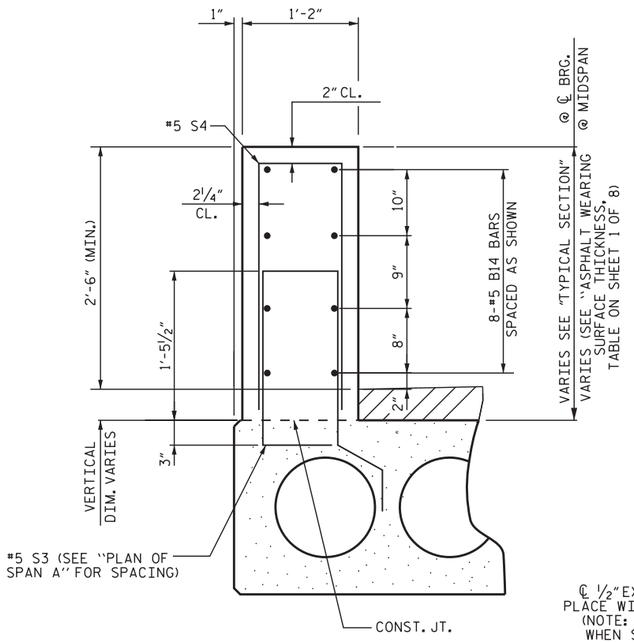
✳✳ INCLUDES FUTURE WEARING SURFACE

CONCRETE RELEASE STRENGTH

UNIT	PSI
55' UNITS	4900

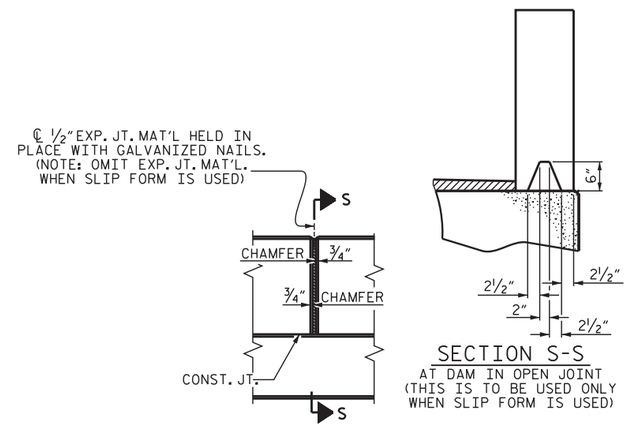
GRADE 270 STRANDS

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



PARAPET SECTION FOR TWO BAR METAL RAIL

QUANTITIES FOR THE #5 S4 AND #5 B14 BARS ARE INCLUDED WITH THE END POST BILL OF MATERIAL.

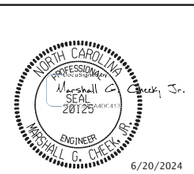


SECTION S-S
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)

ELEVATION AT EXPANSION JOINTS

PROJECT NO. BP13-R020
MADISON COUNTY
STATION: 13+21.78-L-

SHEET 8 OF 8



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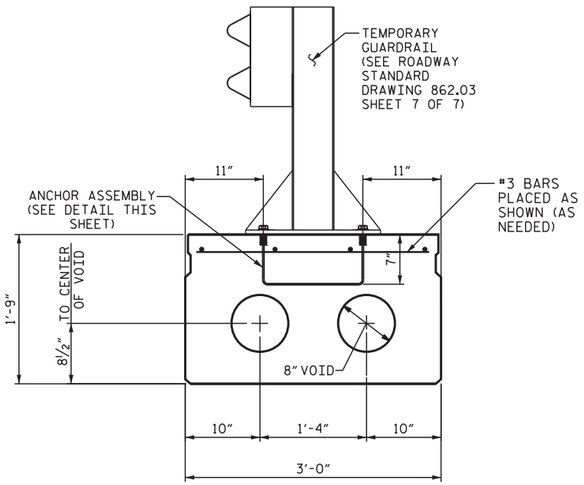
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLAB UNIT 120° SKEW

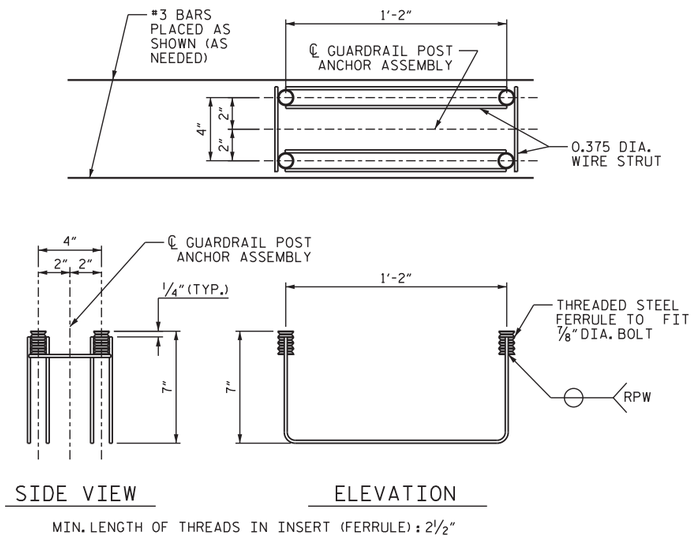
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			32

DRAWN BY :	NMW	DATE : 2/23
CHECKED BY :	MGC	DATE : 7/23
DESIGN ENGINEER OF RECORD :	MGC	DATE : 7/23



SECTION OF ANCHOR ASSEMBLY LOCATION

(TYPE III UNIT OF STAGE I)



SIDE VIEW ELEVATION

MIN. LENGTH OF THREADS IN INSERT (FERRULE) : 2½"

TEMPORARY GUARDRAIL ANCHOR ASSEMBLY

(11 ASSEMBLIES REQUIRED IN THE TYPE III CORED SLAB UNIT)
(4 ASSEMBLIES REQUIRED IN THE APPROACH SLABS)

NOTES FOR TEMPORARY GUARDRAIL

THE ANCHOR ASSEMBLY FOR TEMPORARY GUARDRAIL SHALL CONSIST OF THE FOLLOWING :

A) FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2½".

B) 2-⅞" DIA x 5" ANCHOR BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. ANCHOR BOLTS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATIVE FOR THE ⅞" DIA. x 5" GALVANIZED ANCHOR BOLTS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

C) WIRE STRUT SHOWN IN THE ANCHOR ASSEMBLY DETAIL ARE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI.

ANCHOR ASSEMBLY WITH BOLTS SHALL BE ASSEMBLED IN THE SHOP. BOLT THREADS MAY BE RECUT AS NECESSARY TO INSURE FIT.

THE COST OF THE ANCHOR ASSEMBLY COMPLETE IN PLACE, SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR "3'-0" x 1'-9" PRESTRESSED CONCRETE CORED SLABS".

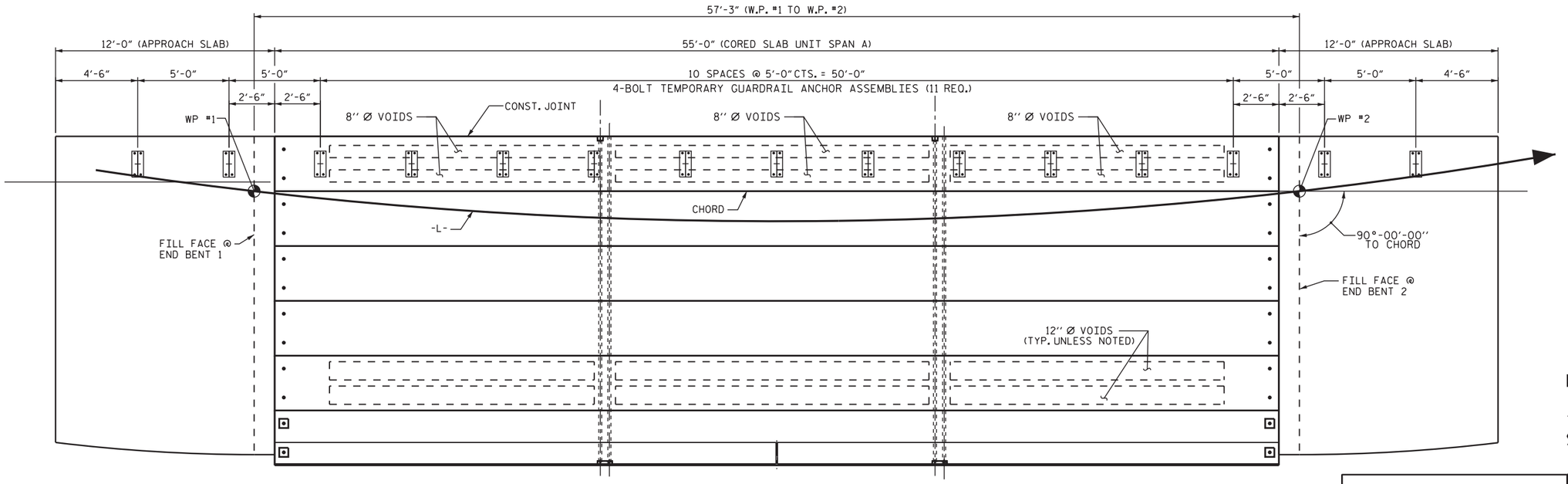
FERRULES TO BE PLUGGED DURING CASTING OF THE CORED SLAB UNITS AS RECOMMMENDED BY THE MANUFACTURER.

AT THE CONTRACTOR'S OPTION, FERRULES WITH OPEN OR CLOSED ENDS MAY BE USED.

PAYMENT FOR ANCHORED TEMPORARY GUARDRAIL ARE INCLUDED IN TRAFFIC CONTROL.

PLUG FERRULES WITH GROUT UPON REMOVAL OF TEMPORARY GUARDRAIL BOLTS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.



RAIL POST SPACING FOR TEMPORARY GUARDRAIL - STAGE I

PROJECT NO. BP13-R020

MADISON COUNTY

STATION: 13+21.78-L-

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20125 MARSHALL G. CHEEK, JR.

6/20/2024

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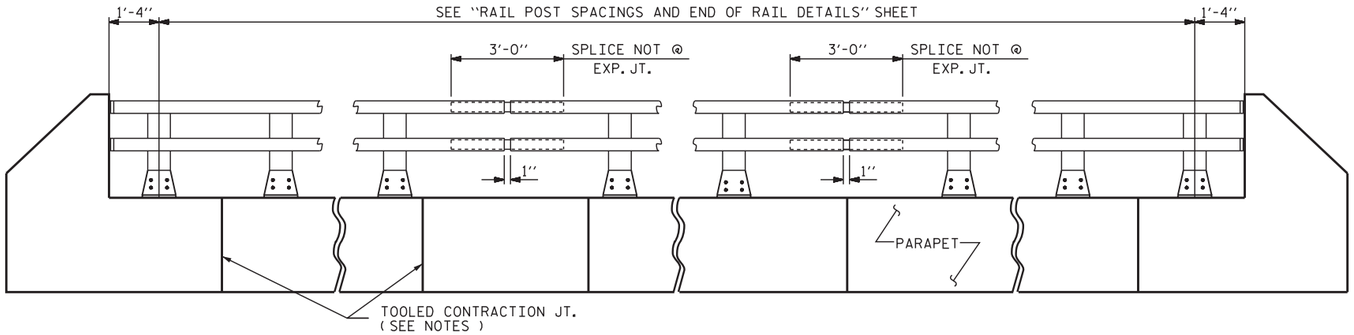
DEPARTMENT OF TRANSPORTATION
RALEIGH

ANCHORAGE DETAILS FOR TEMPORARY GUARDRAIL

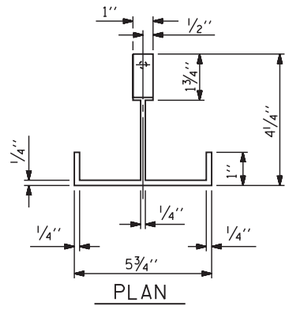
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			32

DRAWN BY :	NMW	DATE :	2/23
CHECKED BY :	MGC	DATE :	7/23
DESIGN ENGINEER OF RECORD :	MGC	DATE :	7/23

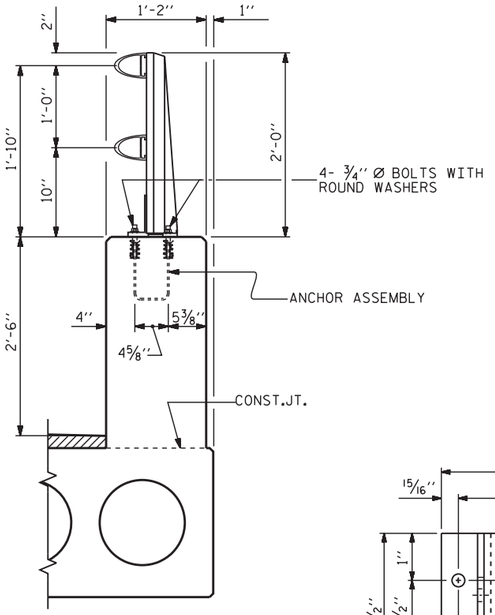


ELEVATION

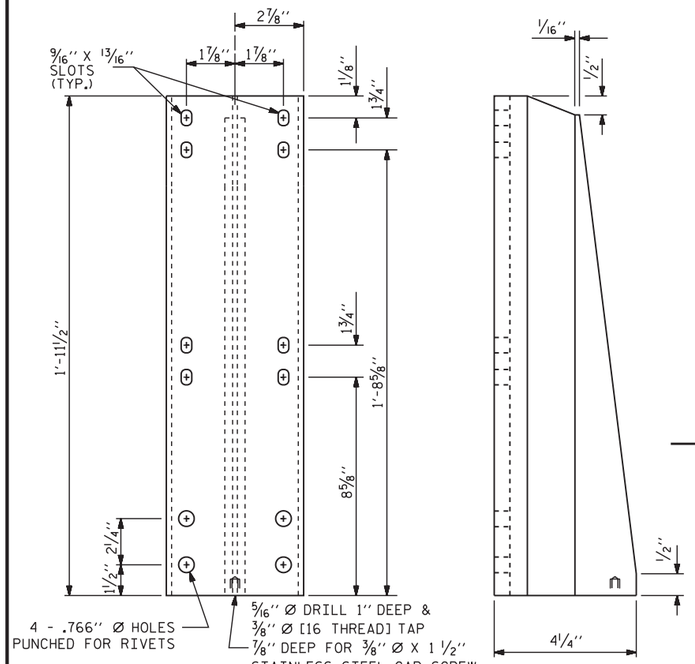
NOTE : FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR2.



PLAN

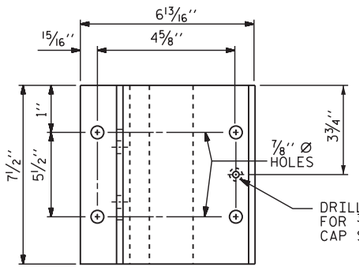


SECTION THRU PARAPET AND RAIL

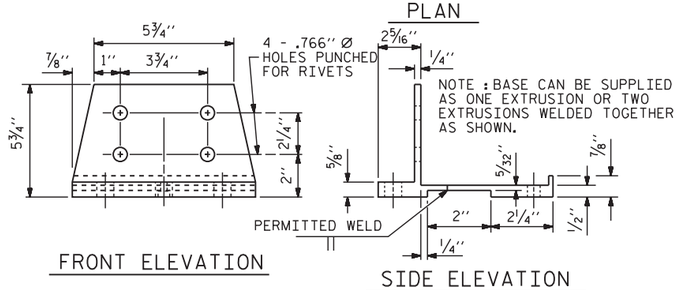


FRONT ELEVATION SIDE ELEVATION

DETAILS OF POST

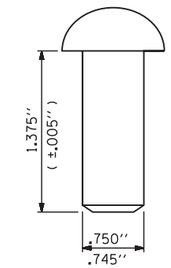


PLAN



FRONT ELEVATION SIDE ELEVATION

POST BASE DETAILS



RIVET DETAIL

NOTES

AT THE CONTRACTOR'S OPTION, METAL RAIL MAY BE EITHER ALUMINUM OR GALVANIZED STEEL IN ACCORDANCE WITH THE REQUIREMENTS OF THE GENERAL NOTES AND THE FOLLOWING SPECIFICATIONS FOR THE ALTERNATE MATERIALS; HOWEVER, THE CONTRACTOR WILL BE REQUIRED TO USE THE SAME RAIL MATERIAL ON ALL STRUCTURES ON THE PROJECT FOR WHICH METAL RAIL IS DESIGNATED.

UNLESS OTHERWISE REQUIRED IN THE CONTRACT DOCUMENTS, THE CONTRACTOR HAS THE OPTION TO USE AN ALTERNATE TO THE 2 BAR METAL RAIL. THE ALTERNATE RAIL SHALL MEET THE REQUIREMENTS OF THE AASHTO LRFDBRIDGE DESIGN SPECIFICATIONS AND MUST BE LISTED ON THE DEPARTMENT'S APPROVED PRODUCTS LIST (APL) UNDER "2 BAR METAL RAIL ALTERNATE". ADJUSTMENTS TO THE CONCRETE PARAPET WILL NOT BE ALLOWED.

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B-221 ALLOY 6061-T6.

MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING.

THE BASE OF RAIL POSTS, OR ANY OTHER ALUMINUM SURFACE IN CONTACT WITH CONCRETE SHALL BE THOROUGHLY COATED WITH AN ALUMINUM IMPREGNATED CAULKING COMPOUND OF APPROVED QUALITY.

MATERIAL FOR SHIMS TO BE ASTM B209 ALLOY 6061-T6.

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

POST, POST BASES, RAILS, EXPANSION BARS AND CLAMP BARS: ASTM A36 GRADE 36 STRUCTURAL STEEL - GALVANIZED TO ASTM A123.

RIVETS: RIVETS SHALL MEET THE REQUIREMENTS OF ASTM A502 FOR GRADE 1 RIVETS.

THE CUT ENDS OF GALVANIZED STEEL RAILING, AFTER GRINDING SMOOTH SHALL BE GIVEN TWO COATS OF ZINC RICH PAINT MEETING THE REQUIREMENTS OF FEDERAL SPECIFICATION MIL-P-26915 USAF TYPE 1, OR OF FEDERAL SPECIFICATIONS TT-P-641.

SHIMS: SHIMS SHALL MEET THE REQUIREMENTS OF ASTM A1011 FOR GRADE 36, 40, 45 OR ASTM A1008 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123.

RAIL CAPS: RAIL CAPS SHALL MEET THE REQUIREMENTS OF ASTM A1011 FOR GRADE 36, 40, 45 OR ASTM A1008 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123.

GENERAL NOTES

RAILING SHALL BE CONTINUOUS FROM END POST TO END POST OF BRIDGE. EACH JOINT IN RAIL LENGTH SHALL BE SPLICED AS DETAILED. PANEL LENGTHS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS.

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE STANDARD NO. BMR2.

CAP SCREWS SHALL BE ASTM F593 ALLOY 305 STAINLESS STEEL. WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

CERTIFIED MILL REPORTS ARE REQUIRED FOR RAILS AND POSTS. SHOP INSPECTION IS NOT REQUIRED.

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

METHOD OF MEASUREMENT FOR METAL RAILS: FOR LENGTH OF METAL RAILS TO BE PAID FOR, SEE THE STANDARD SPECIFICATIONS.

CURVED RAIL USAGE: WHERE RAILS ARE TO BE USED ON BRIDGES ON HORIZONTAL AND/OR VERTICAL CURVATURE THE CONTRACTOR MAY, AT HIS OPTION, HAVE THE REQUIRED CURVATURE IN THE RAIL FORMED IN THE SHOP OR IN THE FIELD. IN EITHER EVENT, THE RAIL SHALL CONFORM WITHOUT BUCKLING OR KINKING TO THE REQUIRED CURVATURE IN A UNIFORM MANNER ACCEPTABLE TO THE ENGINEER.

TO INSURE FUTURE IDENTIFICATION OF THE FABRICATOR, A PERMANENT IDENTIFYING MARK SHALL BE PLACED ON EACH POST. THE METHOD OF MARKING AND LOCATION SHALL BE SUCH THAT IT DOES NOT DETRACT FROM THE APPEARANCE OF THE POST, BUT REMAINS VISIBLE AFTER RAIL PLACEMENT.

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

ALLOY 6351-T5 MAY BE SUBSTITUTED FOR ALLOY 6061-T6 WHERE APPLICABLE.

MINOR VARIATIONS IN DETAILS OF METAL RAIL WILL BE CONSIDERED. DETAILS OF SUCH VARIATIONS, IF DESIRED, SHALL BE SUBMITTED FOR APPROVAL.

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

PAY LENGTH = 95.00 LIN. FT.

PROJECT NO. BP13-R020

MADISON COUNTY

STATION: 13+21.78-L-

SHEET 1 OF 2

ASSEMBLED BY :	NMW	DATE :	2/24
CHECKED BY :	MGC	DATE :	2/24
DRAWN BY : EEM 6/94	REV. 6/13		MAA/GM
CHECKED BY : RGW 6/94	REV. 12/17		MAA/THC
	REV. 10/23		BNB/SNM

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20125 MARSHALL G. CHEEK, JR.

6/20/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

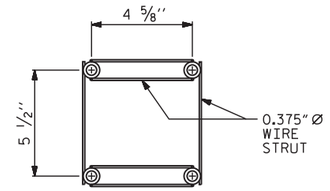
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

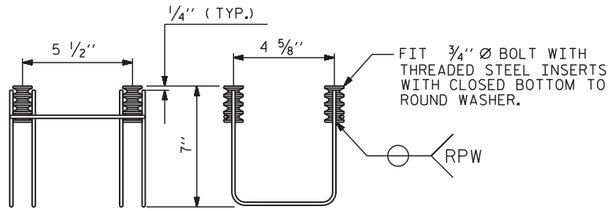
2 BAR METAL RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			32

STD. NO. BMR3



PLAN



SIDE VIEW ELEVATION

4-BOLT METAL RAIL ANCHOR ASSEMBLY

(20 ASSEMBLIES REQUIRED)

NOTES

STRUCTURAL CONCRETE ANCHOR ASSEMBLY

THE STRUCTURAL CONCRETE ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS :

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2'' FOR 3/4'' FERRULES.

B. 4 - 3/4'' Ø X 2 1/2'' BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4'' Ø X 2 1/2'' GALVANIZED BOLTS 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.

C. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16'' Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

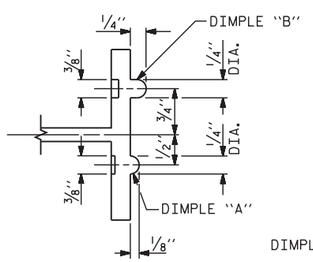
D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF ASTM A123.

E. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.

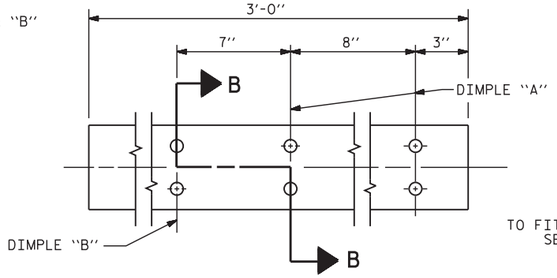
F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE METAL RAIL ANCHOR ASSEMBLY. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE THE STANDARD SPECIFICATIONS.

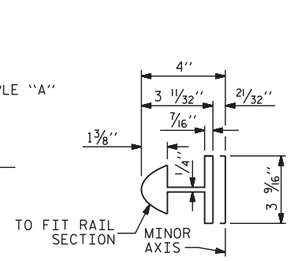
WHEN ADHESIVELY ANCHORED ANCHOR BOLTS ARE USED, BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. NUTS SHALL MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.



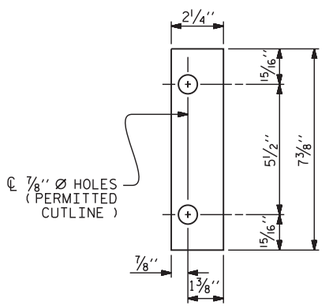
SECTION B - B



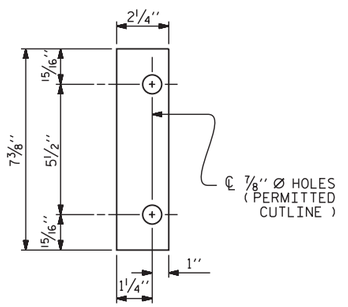
EXPANSION BAR DETAILS



BAR SECTION



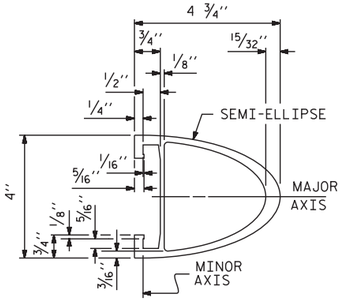
FRONT PLATE



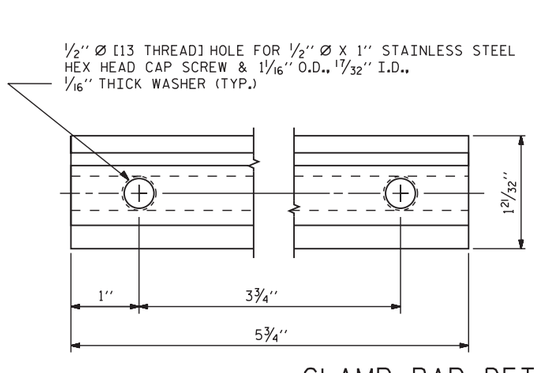
REAR PLATE

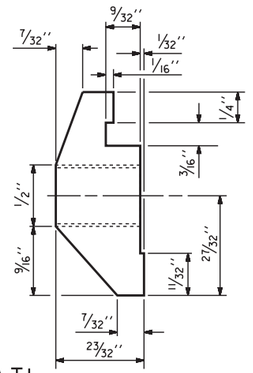
SHIM DETAILS

NOTE :
SHIMS MAY BE CUT ALONG PERMITTED CUTLINE OR SLOTTED TO EDGE OF PLATE TO FACILITATE PLACEMENT.



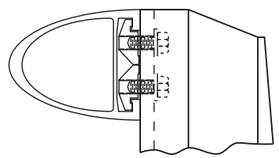
RAIL SECTION



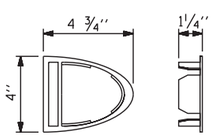


CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY



RAIL CAP

PROJECT NO. BP13-R020

MADISON COUNTY

STATION: 13+21.78-L-

SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER Marshall G. Cheek, Jr.
6/20/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

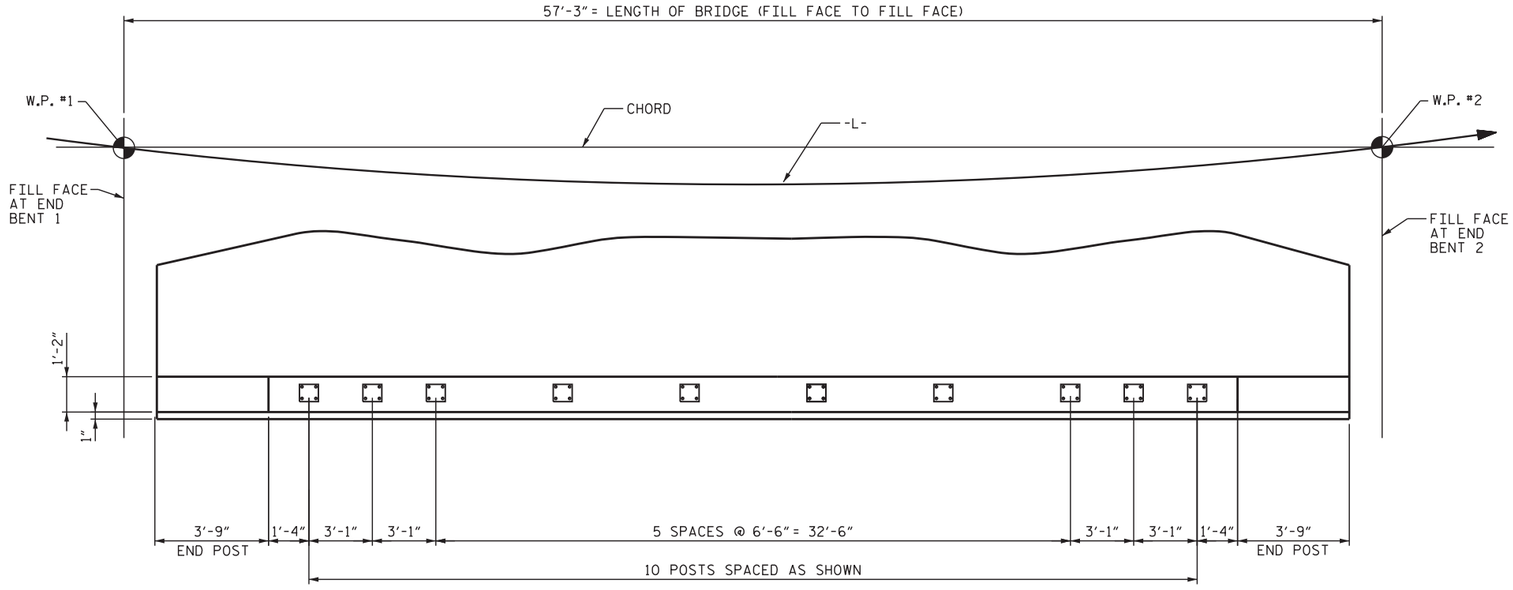
2 BAR METAL RAIL

ASSEMBLED BY : NMW	DATE : 2/24
CHECKED BY : MGC	DATE : 2/24
DRAWN BY : EEM 6/94	REV. 10/11 MAA/GM
CHECKED BY : RGW 6/94	REV. 12/17 MAA/THC
	REV. 10/23 BNB/SNM

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

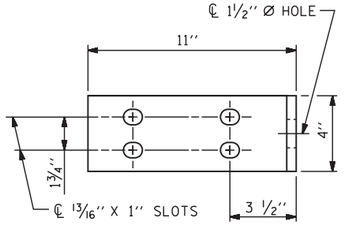
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			32

STD. NO. BMR4

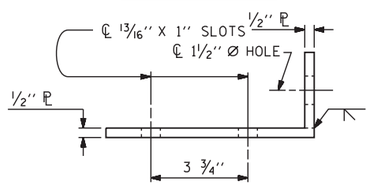


PLAN OF RAIL POST SPACINGS

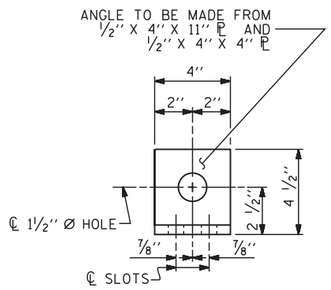
RIGHT SIDE SHOWN, LEFT SIDE SIMILAR



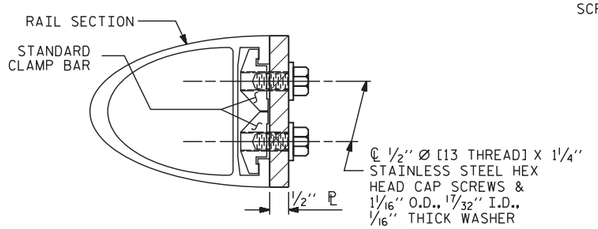
ELEVATION



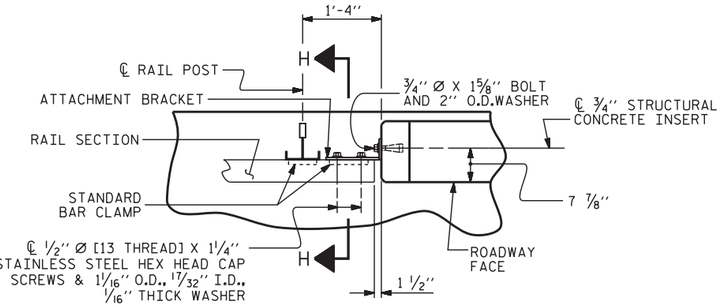
TOP VIEW



END VIEW (FIX AND EXP.)



SECTION H-H (FIX)



PLAN - RAIL AND END POST

FIXED

DETAILS FOR ATTACHING METAL RAIL TO END POST

NOTES

STRUCTURAL CONCRETE INSERT

THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1½".

B. 1 - ¾" Ø X 1⅝" BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE ¾" Ø X 1⅝" GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

C. WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

NOTES

METAL RAIL TO END POST CONNECTION

THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:

A. ½" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.

B. ¾" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A ¾"Ø X 1⅝" BOLT WITH 2" O.D. WASHER IN PLACE. THE ¾"Ø X 1⅝" BOLT SHALL HAVE N. C. THREADS.

C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F.

D. STANDARD CLAMP BARS (SEE METAL RAIL SHEET).

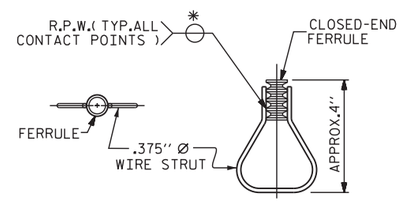
E. ½" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 1 OR 2 BAR METAL RAILS.

THE ¾" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

THE COST OF THE ¾" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE ½" PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE ¾" Ø X 1⅝" BOLT WITH WASHER SHALL BE REPLACED WITH A ¾"Ø X 6½" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE ¾" Ø X 1⅝" BOLT SHALL APPLY TO THE ¾"Ø X 6 ½" BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

*EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.

PROJECT NO. BP13-R020

MADISON COUNTY

STATION: 13+21.78-L-

ASSEMBLED BY : NMW	DATE : 2/23	REV. 5/1/06	TLA/GM
CHECKED BY : MGC	DATE : 7/23	REV. 10/1/11	MAA/GM
DRAWN BY : FCJ 1/88		REV. 12/17	MAA/THC
CHECKED BY : CRK 3/89			

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

6/20/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

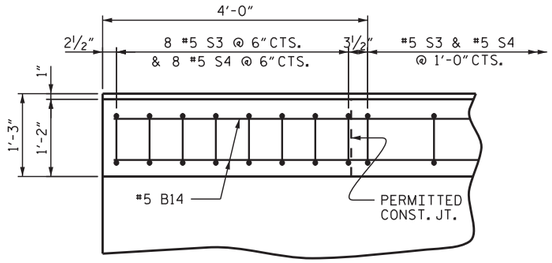
TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

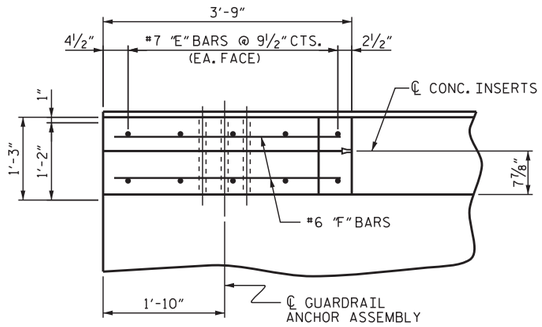
RAIL POST SPACINGS AND END OF RAIL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			32

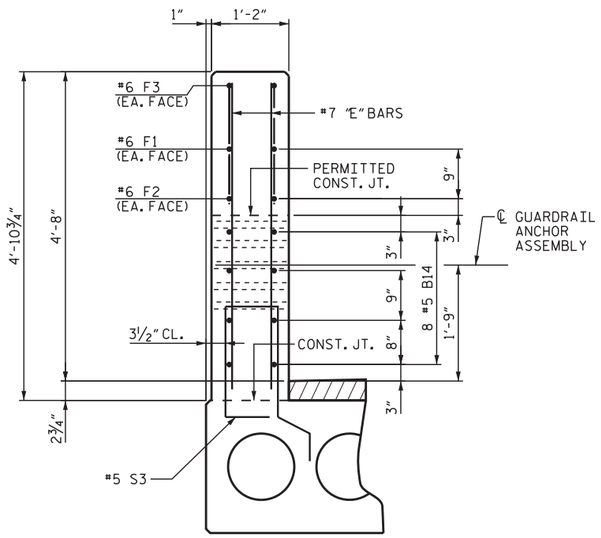
STD. NO. BMR2



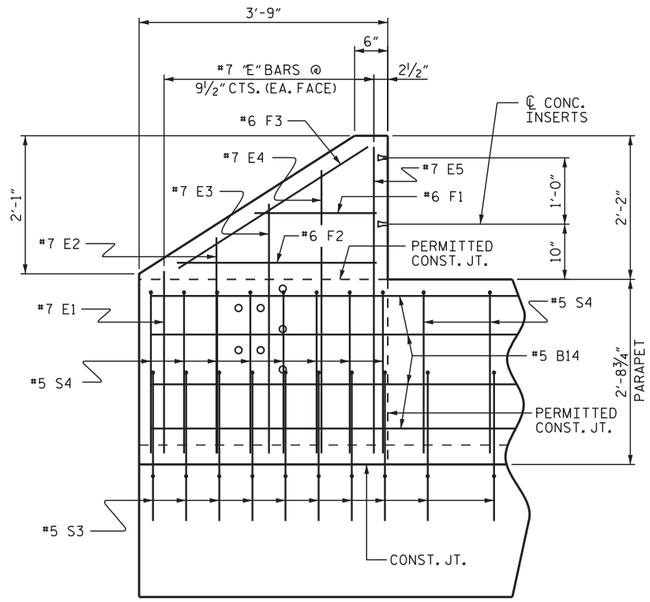
PLAN OF PARAPET



PLAN OF END POST



END VIEW

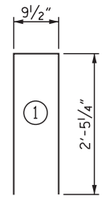


ELEVATION

PARAPET AND END POST FOR TWO BAR METAL RAIL

END BENT 1 SHOWN; END BENT 2 SIMILAR

BAR TYPES



BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL FOR PARAPETS @ SPAN A & FOUR END POSTS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B14	32	#5	STR.	27'-1"	904
✳E1	8	#7	STR.	2'-9"	45
✳E2	8	#7	STR.	3'-3"	53
✳E3	8	#7	STR.	3'-9"	61
✳E4	8	#7	STR.	4'-3"	69
✳E5	8	#7	STR.	4'-7"	75
✳F1	8	#6	STR.	1'-10"	22
✳F2	8	#6	STR.	3'-0"	36
✳F3	8	#6	STR.	3'-4"	40
✳S4	128	#5	1	5'-8"	757
✳EPOXY COATED REINFORCING STEEL					2,062 LBS.
CLASS "AA" CONCRETE					13.8 C.Y.
1'-2" x 2'-8¾" CONCRETE PARAPET					110.00 L.F.

NOTES:

QUANTITIES FOR THE #5 S3 BARS ARE SHOWN IN THE CORED SLAB BILL OF MATERIAL.

PROJECT NO. BP13-R020

MADISON COUNTY

STATION: 13+21.78-L-

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 2025 MARSHALL G. CHEEK, JR. ENGINEER

Marshall G. Cheek, Jr.

6/20/2024

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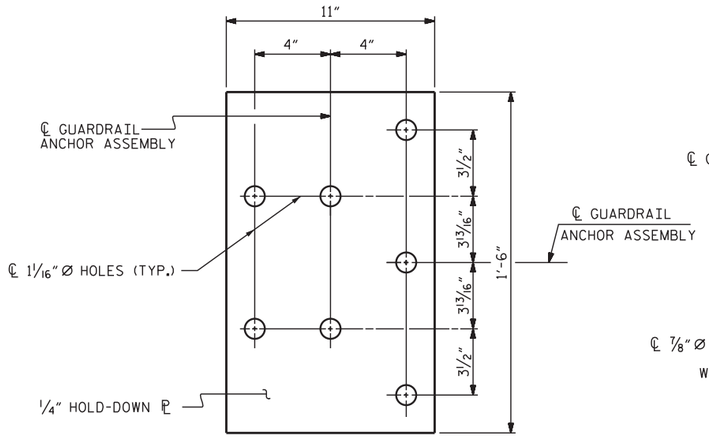
TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

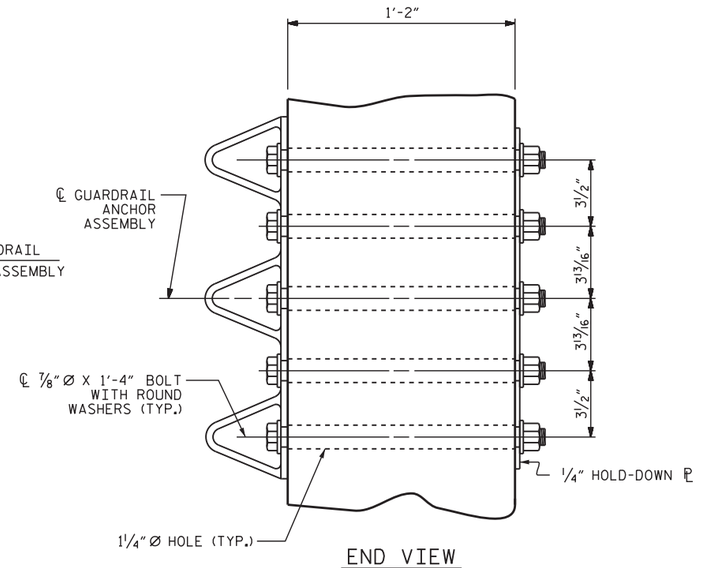
END POST DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			32

DRAWN BY :	NMW	DATE :	2/23
CHECKED BY :	MGC	DATE :	7/23
DESIGN ENGINEER OF RECORD :	MGC	DATE :	7/23



PLAN



END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS

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 THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

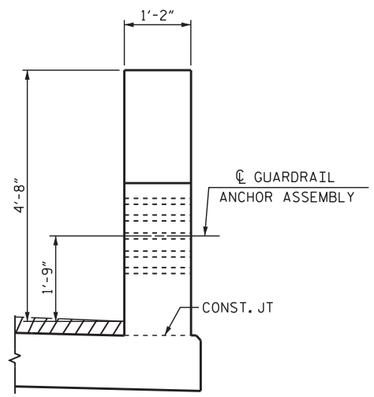
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

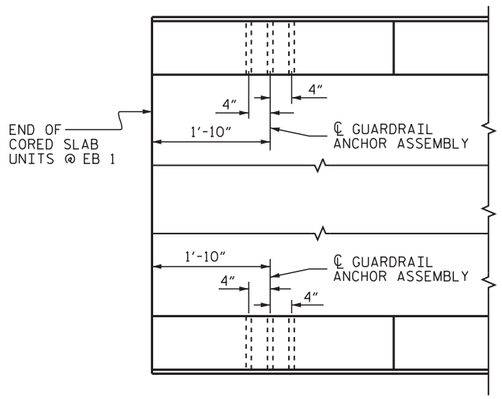
THE 1 1/4'' Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT



END VIEW
(TWO BAR METAL RAIL)



PLAN

LOCATION OF GUARDRAIL ANCHOR AT END POST

(END BENT 1 SHOWN, END BENT 2 SIMILAR)

PROJECT NO. BP13-R020
MADISON COUNTY
STATION: 13+21.78-L-

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.
Marshall G. Cheek, Jr.
6/20/2024

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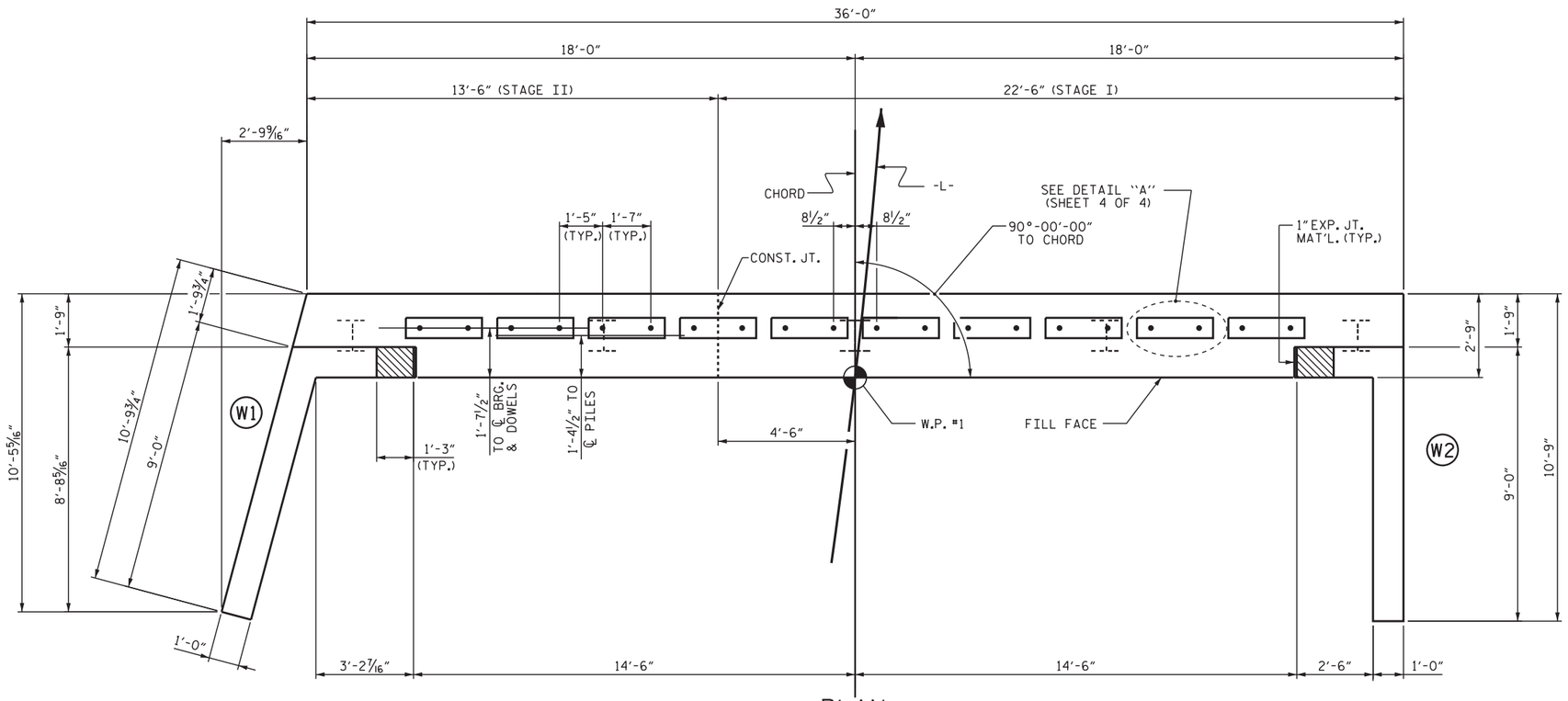
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS

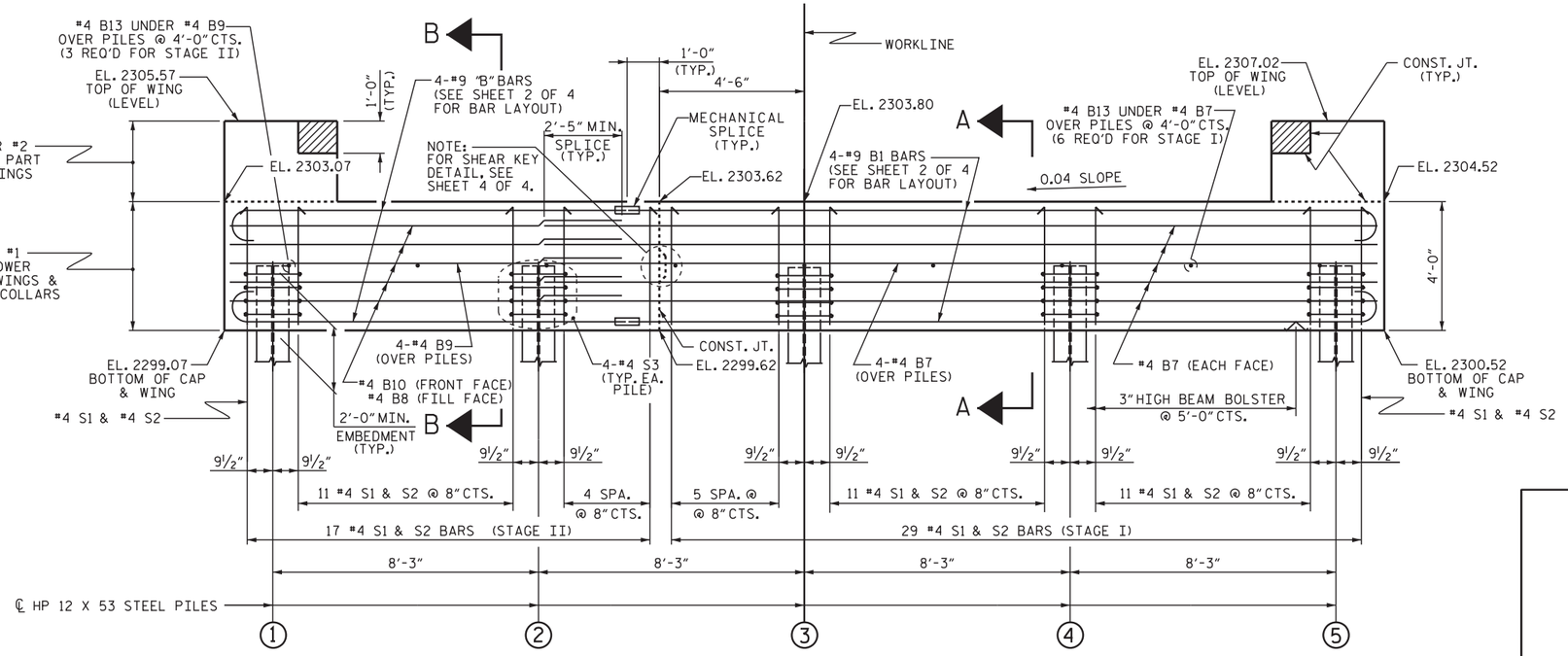
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			32

ASSEMBLED BY : NMW		DATE : 3/23	
CHECKED BY : MGC		DATE : 4/23	
DRAWN BY : MAA 5/10	REV. 1/15	MAA/TMG	
CHECKED BY : GM 5/10	REV. 12/17	MAA/THC	
	REV. 5/18	MAA/THC	

(SHT 2) STD. NO. GRA3



PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A AND B-B, SEE SHEET 2 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 OR ANCHOR BOLTS.

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

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

TOP OF PILE ELEVATIONS	
1	2301.16
2	2301.49
3	2301.82
4	2302.15
5	2302.48

PROJECT NO. BP13-R020

MADISON COUNTY

STATION: 13+21.78-L-

SHEET 1 OF 4

DRAWN BY :	NMW	DATE :	3/23
CHECKED BY :	MGC	DATE :	7/23
DESIGN ENGINEER OF RECORD :	MGC	DATE :	7/23

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20125 MARSHALL G. CHEEK, JR.

6/20/2024

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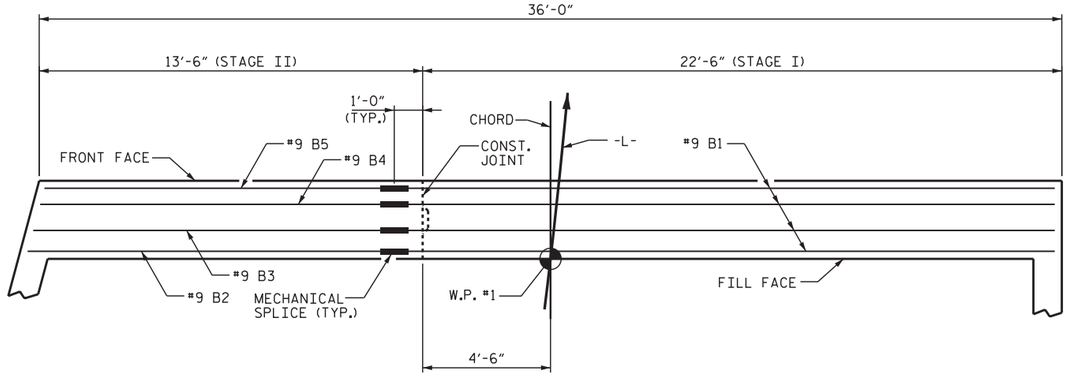
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

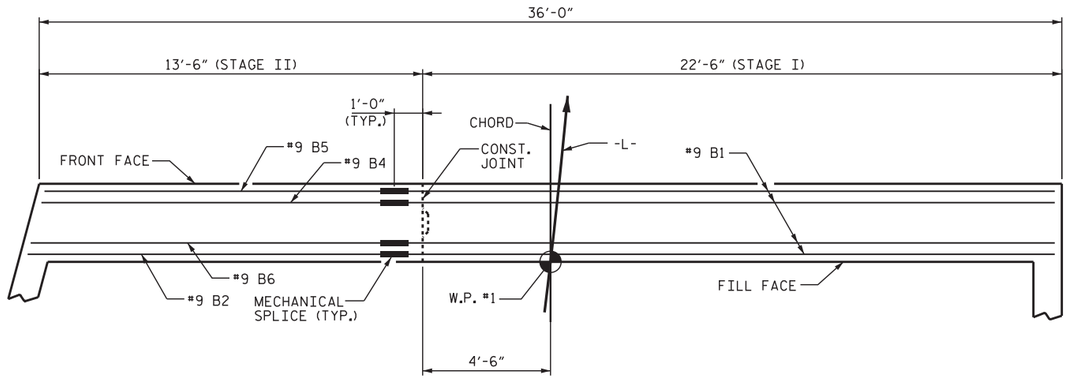
SUBSTRUCTURE

END BENT 1

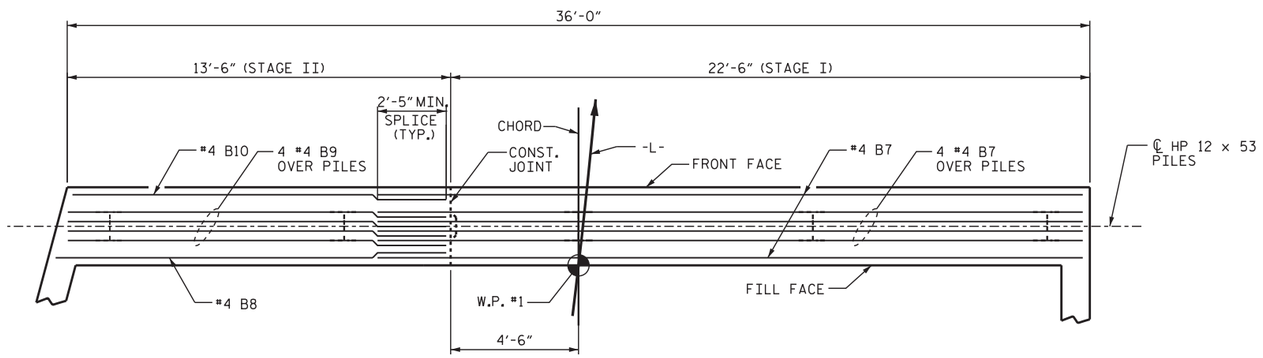
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			32



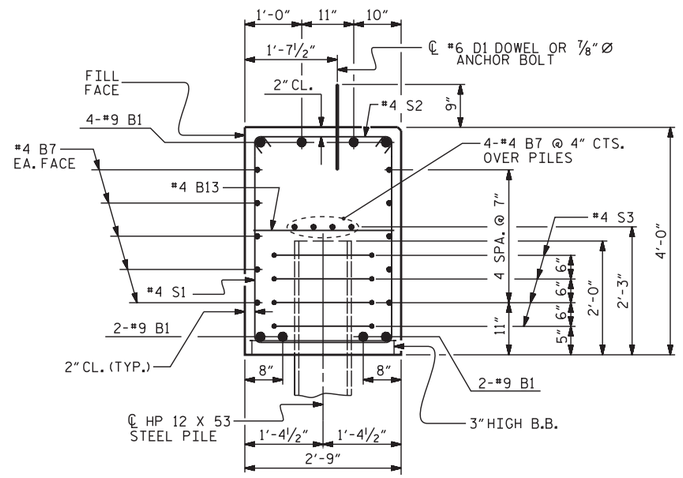
#9 "B" BARS - TOP OF CAP



#9 "B" BARS - BOTTOM OF CAP

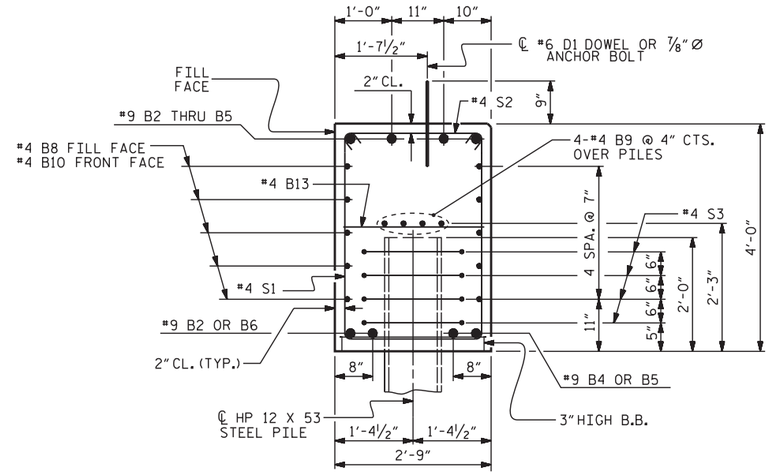


#4 "B" BARS - FACES OF CAP AND OVER TOP OF PILES



SECTION A-A

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



SECTION B-B

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

PROJECT NO. BP13-R020

MADISON COUNTY

STATION: 13+21.78-L-

SHEET 2 OF 4

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CREEK, JR.

6/20/2024

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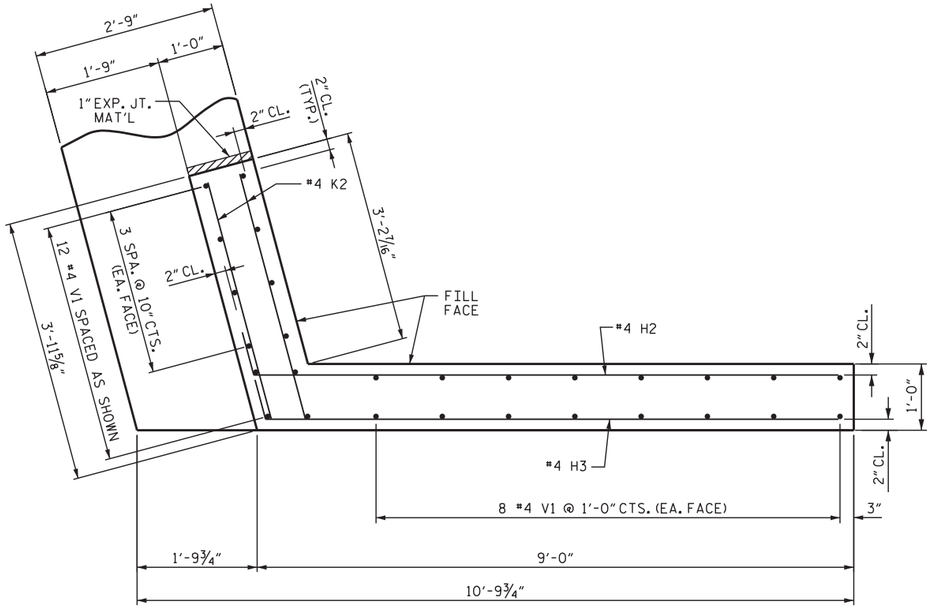
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

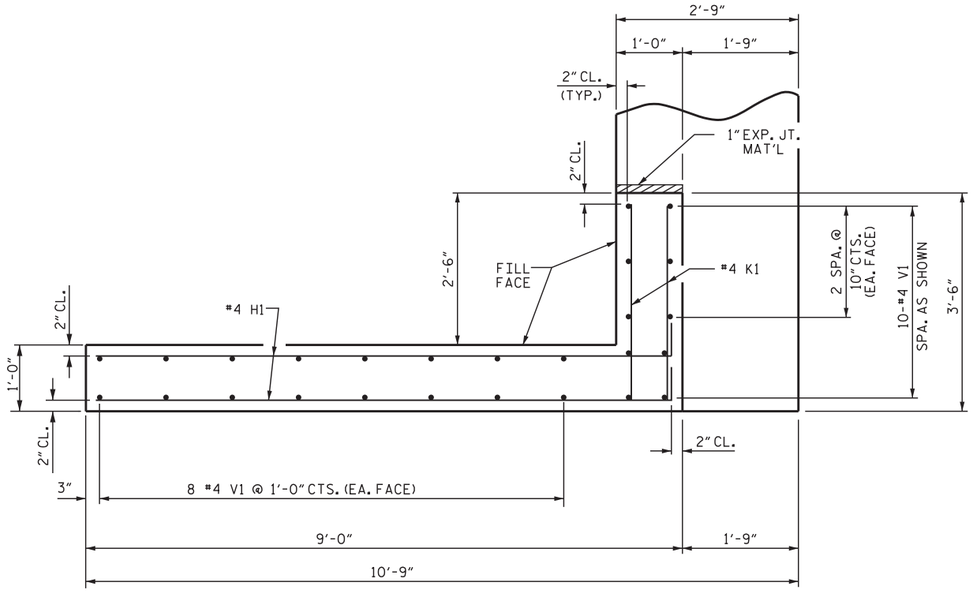
END BENT 1 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			32

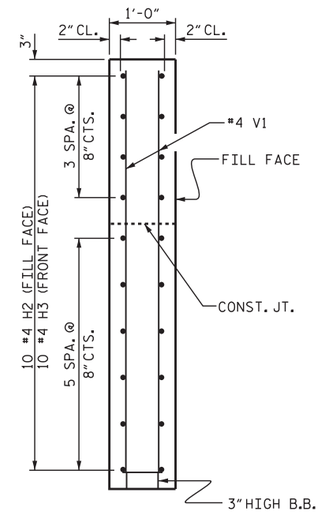
DRAWN BY :	NMW	DATE : 3/23
CHECKED BY :	MGC	DATE : 7/23
DESIGN ENGINEER OF RECORD :	MGC	DATE : 7/23



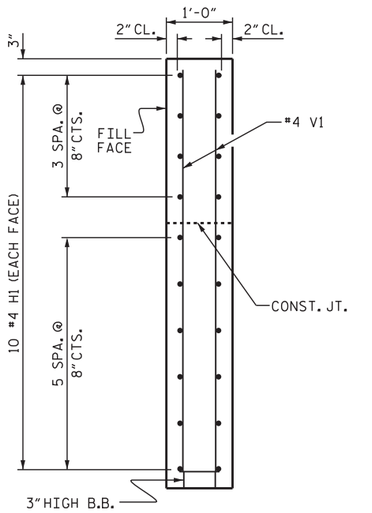
PLAN OF WING (W1)



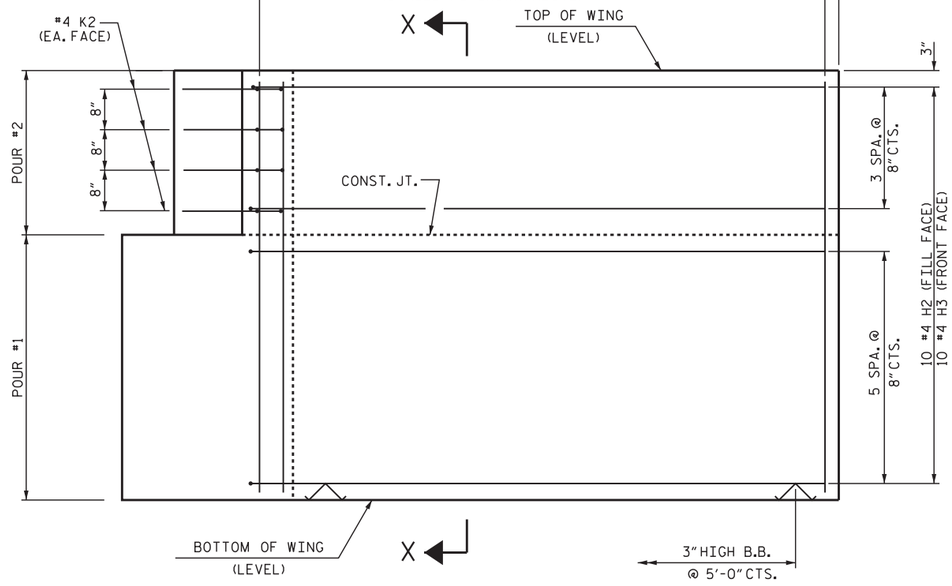
PLAN OF WING (W2)



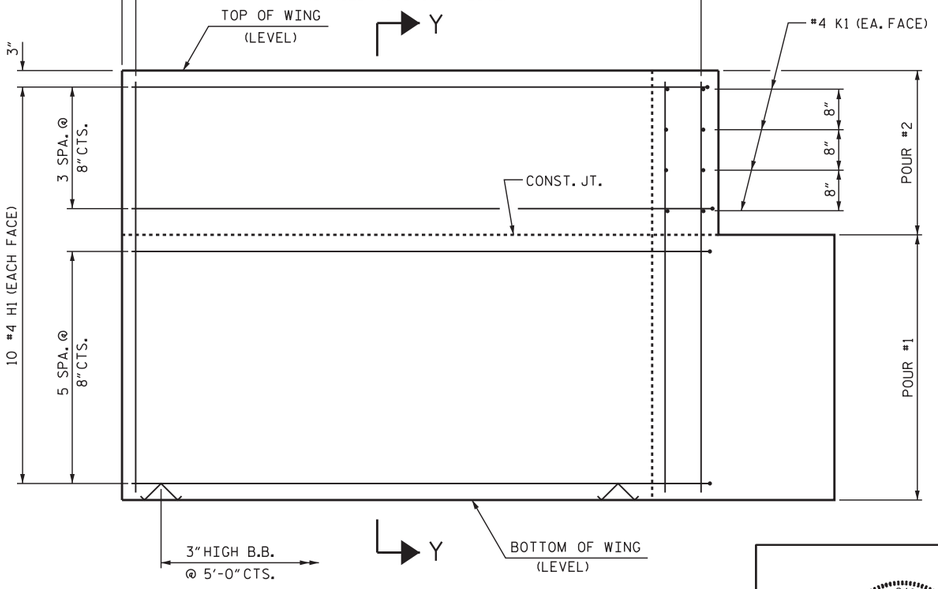
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

WING DETAILS

PROJECT NO. BP13-R020

MADISON COUNTY

STATION: 13+21.78-L-

SHEET 3 OF 4

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

6/20/2024

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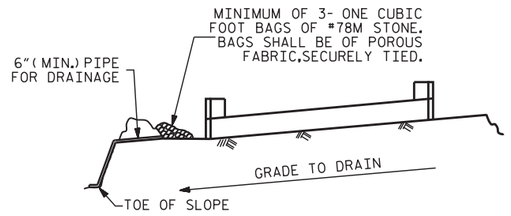
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1
WING DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			32

DRAWN BY :	NMW	DATE :	3/23
CHECKED BY :	MGC	DATE :	7/23
DESIGN ENGINEER OF RECORD :	MGC	DATE :	7/23

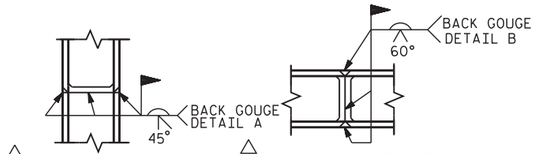


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

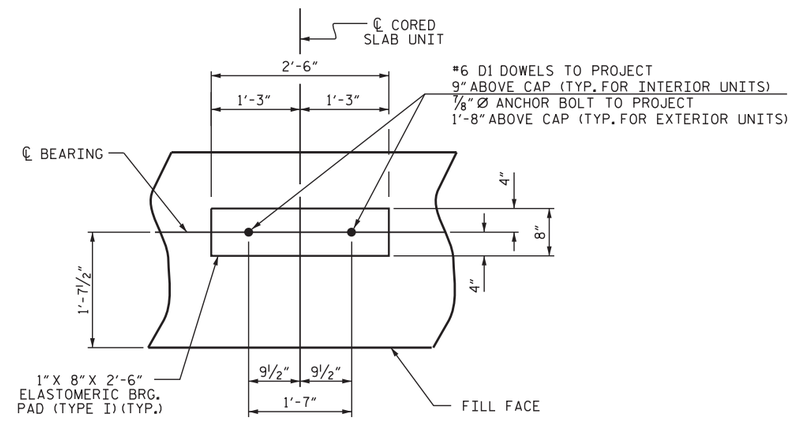
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

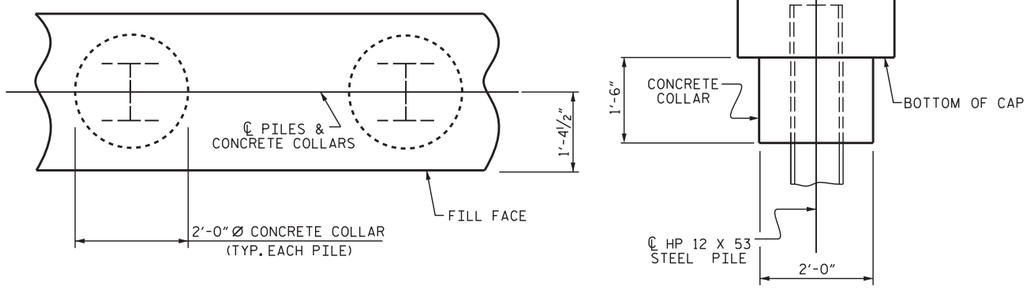


△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



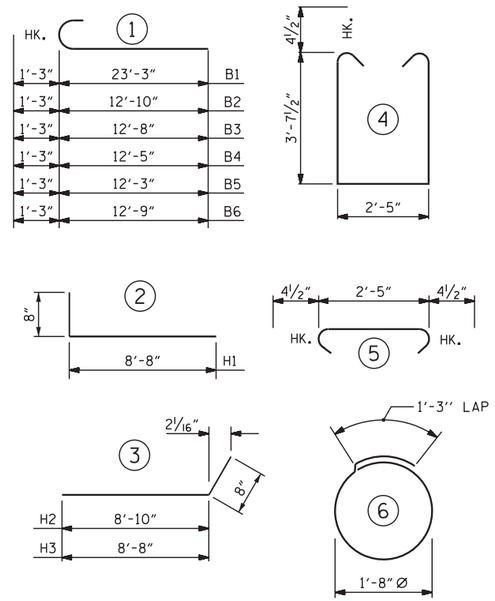
DETAIL ''A''



PLAN ELEVATION

CORROSION PROTECTION FOR STEEL PILES DETAIL

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL - END BENT 1

(STAGE I)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	24'-6"	666
B7	14	#4	STR	24'-9"	231
B13	6	#4	STR	2'-5"	10
D1	11	#6	STR	1'-6"	25
H1	20	#4	2	9'-4"	125
K1	8	#4	STR	3'-2"	17
S1	29	#4	4	10'-5"	202
S2	29	#4	5	3'-2"	61
S3	12	#4	6	6'-6"	52
V1	26	#4	STR	6'-2"	107

REINFORCING STEEL 1496 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1	CAP, LOWER PART OF WINGS & COLLARS	10.9 C.Y.
POUR #2	UPPER PART OF WINGS	1.1 C.Y.
TOTAL CLASS A CONCRETE		12.0 C.Y.

(STAGE II)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B2	2	#9	1	14'-1"	96
B3	1	#9	1	13'-11"	47
B4	2	#9	1	13'-8"	93
B5	2	#9	1	13'-6"	92
B6	1	#9	1	14'-0"	48
B8	5	#4	STR	13'-9"	46
B9	4	#4	STR	13'-3"	35
B10	5	#4	STR	13'-1"	44
B13	3	#4	STR	2'-5"	5
D1	5	#6	STR	1'-6"	11
H2	10	#4	3	9'-6"	63
H3	10	#4	3	9'-4"	62
K2	8	#4	STR	3'-7"	19
S1	17	#4	4	10'-5"	118
S2	17	#4	5	3'-2"	36
S3	8	#4	6	6'-6"	35
V1	28	#4	STR	6'-2"	115

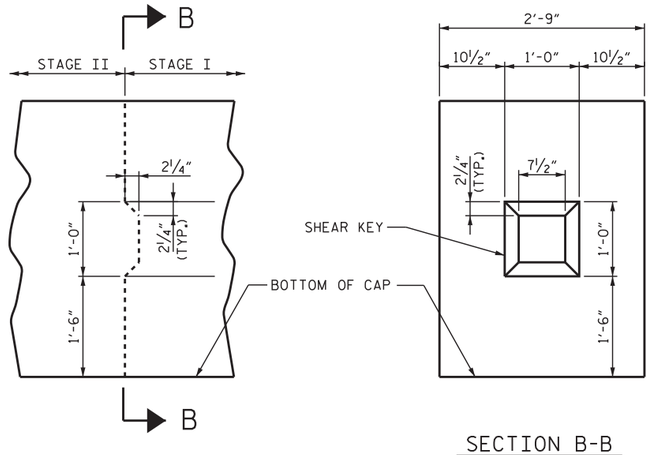
REINFORCING STEEL 965 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1	CAP, LOWER PART OF WINGS & COLLARS	7.2 C.Y.
POUR #2	UPPER PART OF WINGS	1.1 C.Y.
TOTAL CLASS A CONCRETE		8.3 C.Y.

TOTAL QUANTITIES

REINFORCING STEEL	2461 LBS.
CLASS A CONCRETE BREAKDOWN	20.3 CY



SECTION B-B

SHEAR KEY DETAIL

PROJECT NO. BP13-R020

MADISON COUNTY

STATION: 13+21.78-L-

SHEET 4 OF 4

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20125 Marshall G. Cheek, Jr. ENGINEER
MARSHALL G. CHEEK, JR.

6/20/2024

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TGS ENGINEERS
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CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			32

DRAWN BY :	NMW	DATE :	3/23
CHECKED BY :	MGC	DATE :	7/23
DESIGN ENGINEER OF RECORD :	MGC	DATE :	7/23

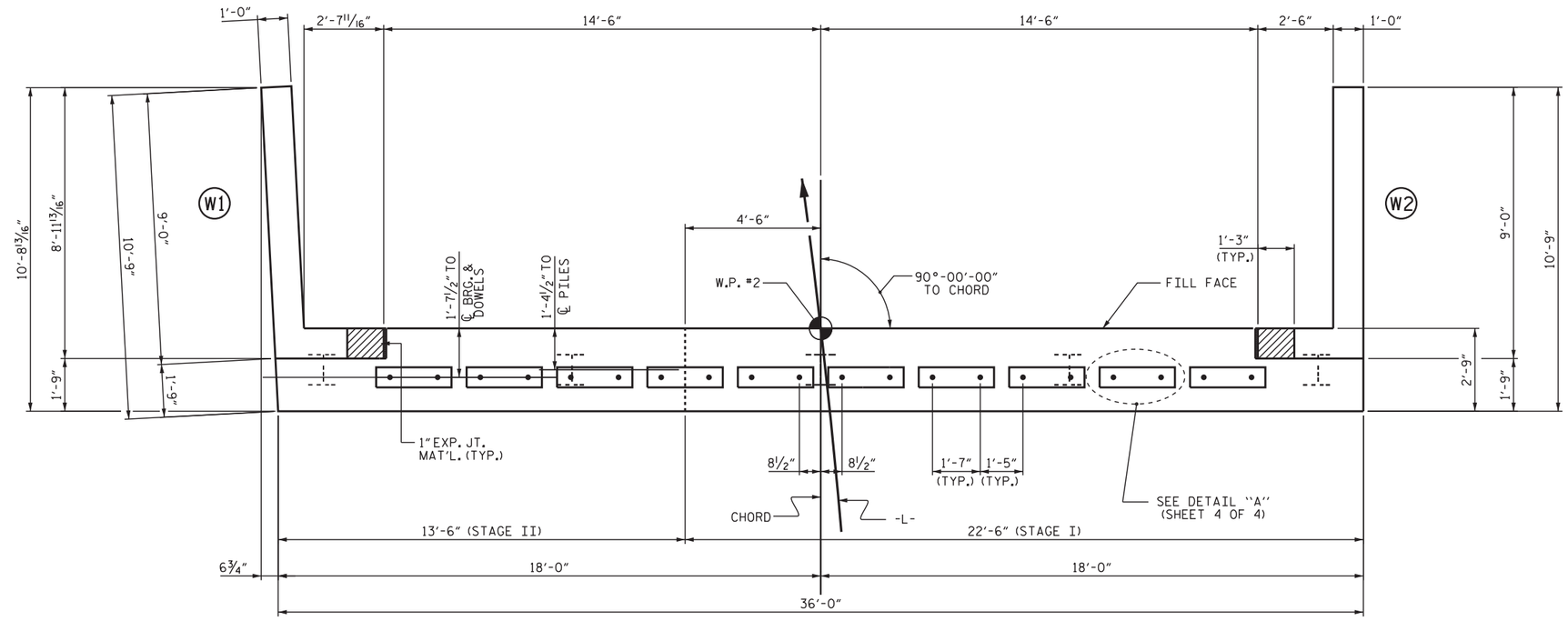
NOTES

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

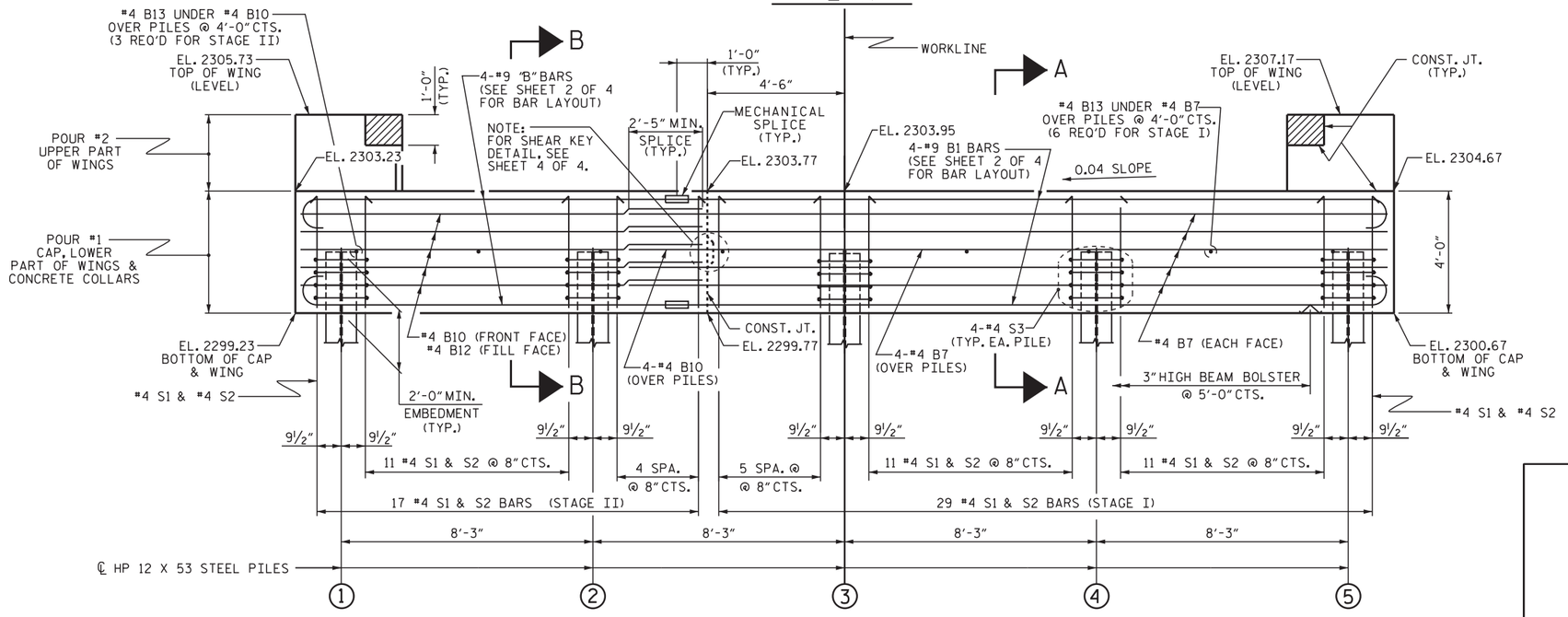
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE PARAPET IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.



PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A AND B-B, SEE SHEET 2 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.

TOP OF PILE ELEVATIONS

1	2301.31
2	2301.64
3	2301.97
4	2302.30
5	2302.63

PROJECT NO. BP13-R020

MADISON COUNTY

STATION: 13+21.78-L-

SHEET 1 OF 4

DRAWN BY : NMW DATE : 3/23
CHECKED BY : MGC DATE : 7/23
DESIGN ENGINEER OF RECORD : MGC DATE : 7/23

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20125 MARSHALL G. CHEEK, JR.
6/20/2024

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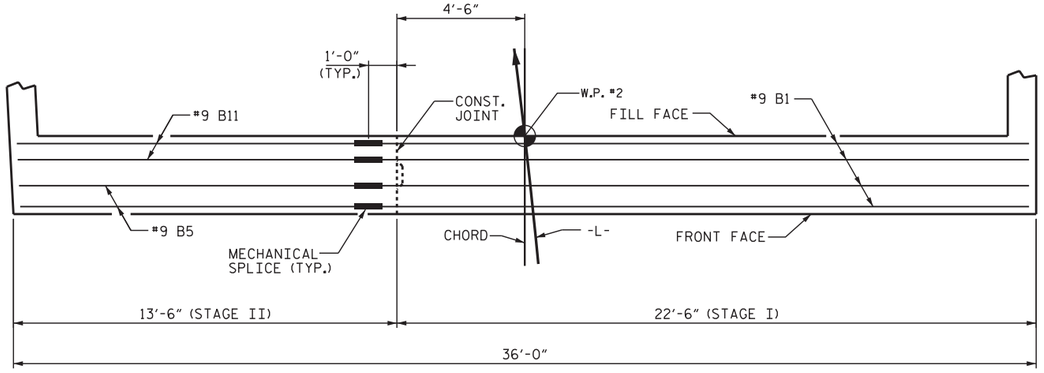
RALEIGH

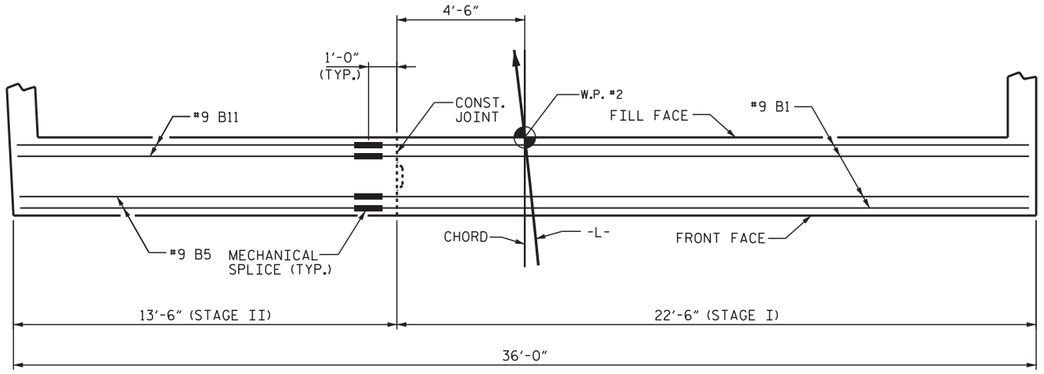
SUBSTRUCTURE

END BENT 2

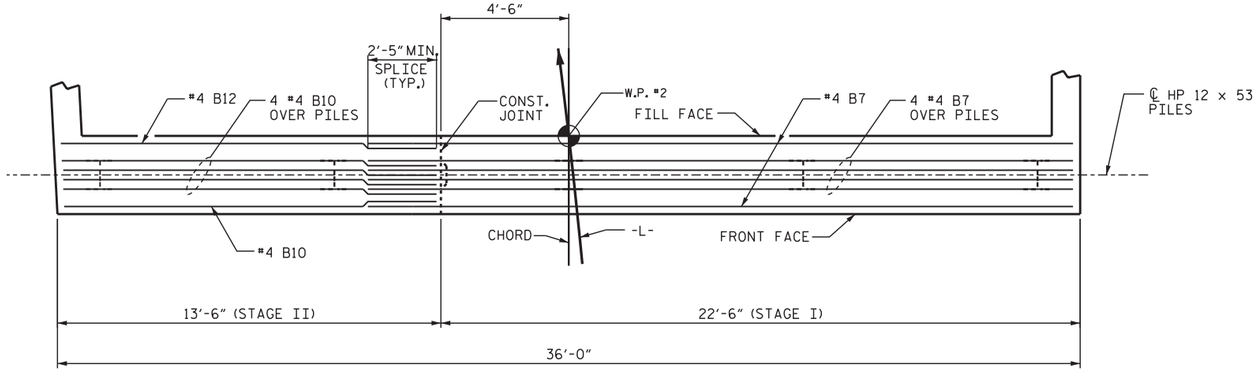
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			32



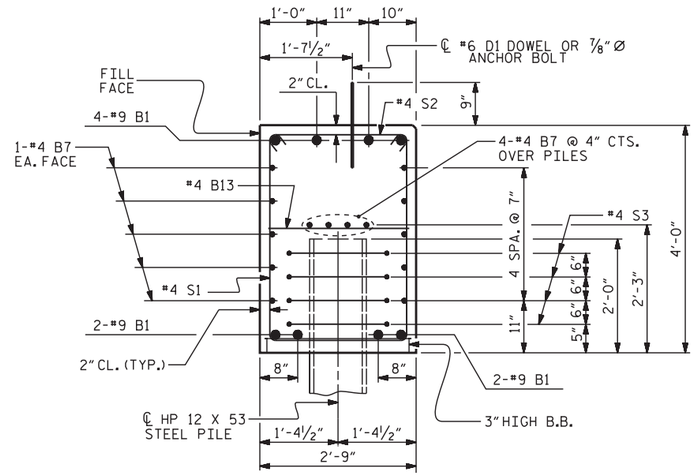
#9 "B" BARS - TOP OF CAP



#9 "B" BARS - BOTTOM OF CAP

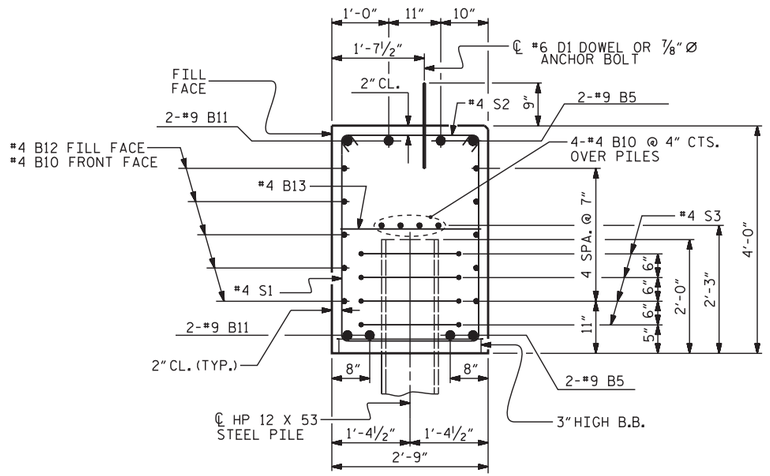


#4 "B" BARS - FACES OF CAP AND OVER TOP OF PILES



SECTION A-A

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



SECTION B-B

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

PROJECT NO. BP13-R020

MADISON COUNTY

STATION: 13+21.78-L-

SHEET 2 OF 4

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20125 MARSHALL G. CHEEK, JR. ENGINEER
Marshall G. Cheek, Jr.
6/20/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

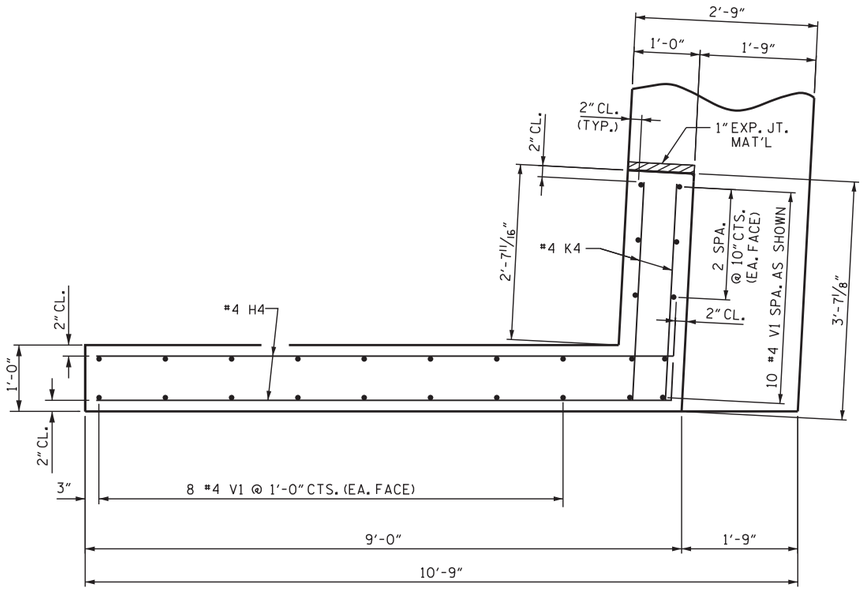
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

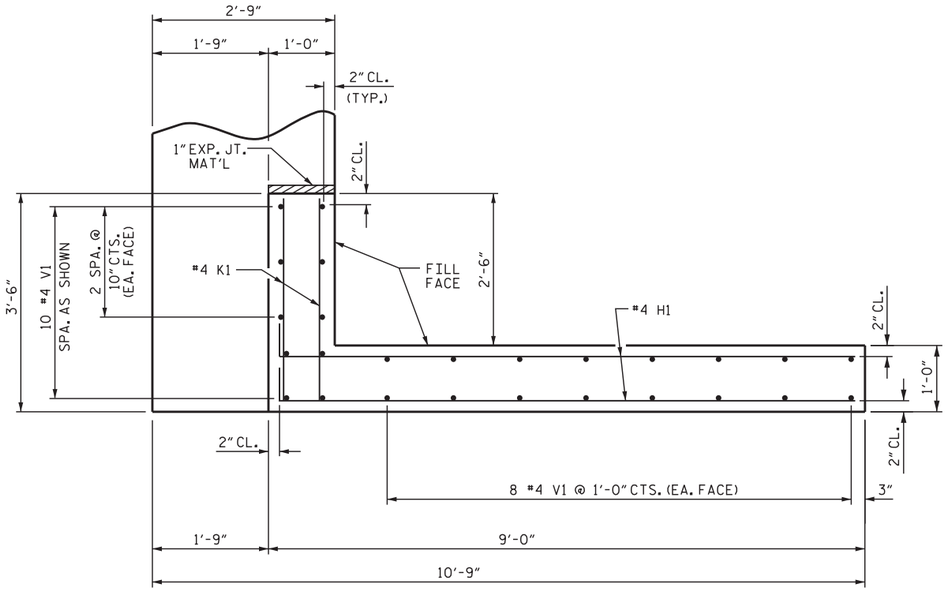
END BENT 2 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			32

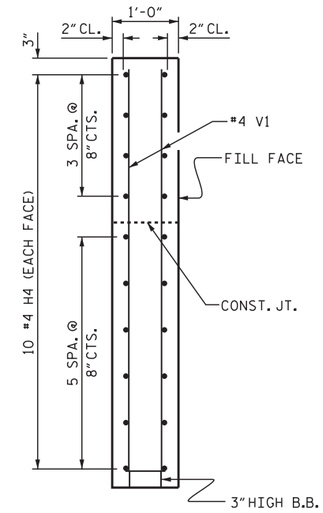
DRAWN BY :	NMW	DATE :	3/23
CHECKED BY :	MGC	DATE :	7/23
DESIGN ENGINEER OF RECORD :	MGC	DATE :	7/23



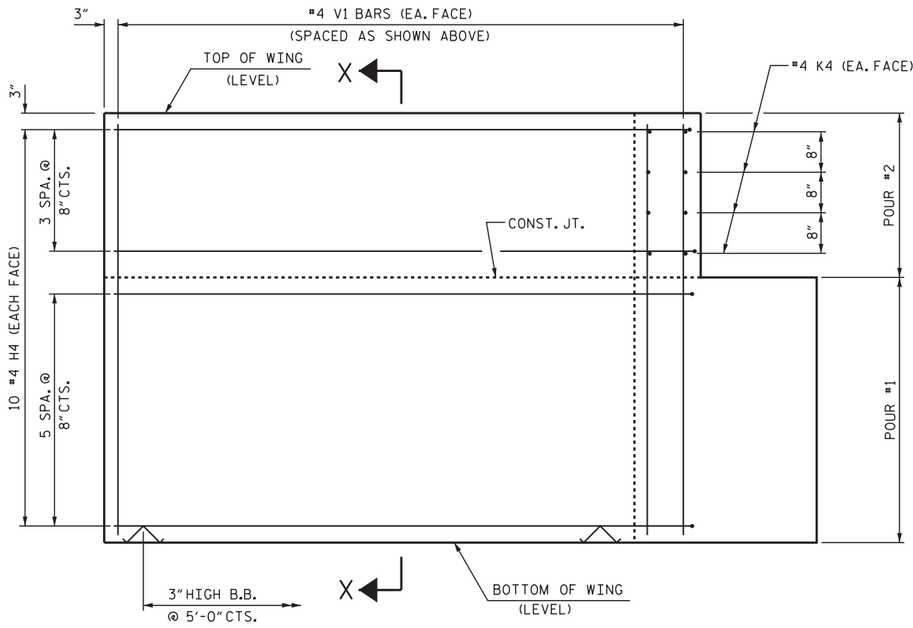
PLAN OF WING (W1)



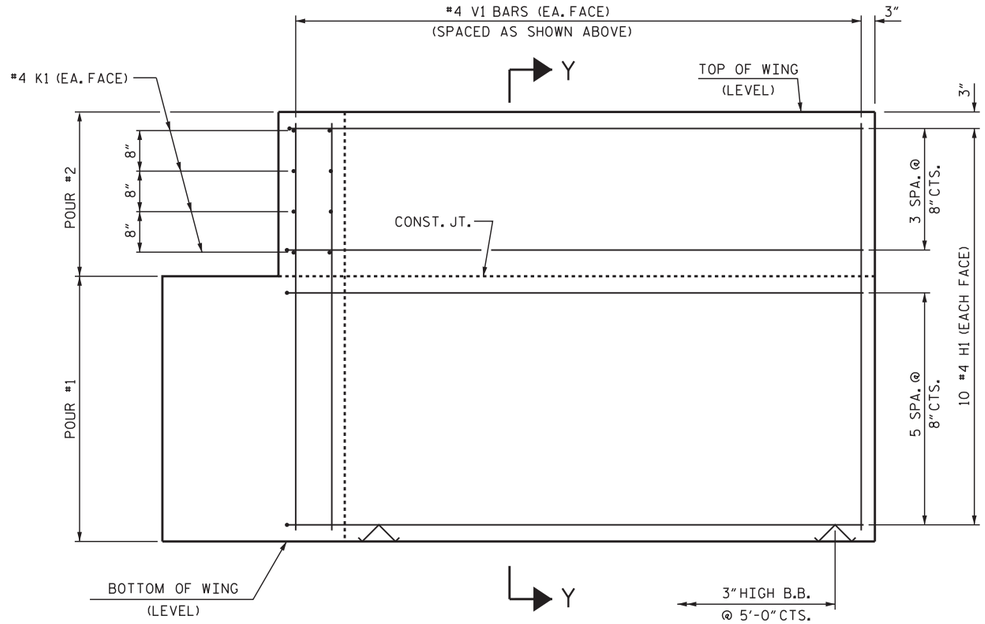
PLAN OF WING (W2)



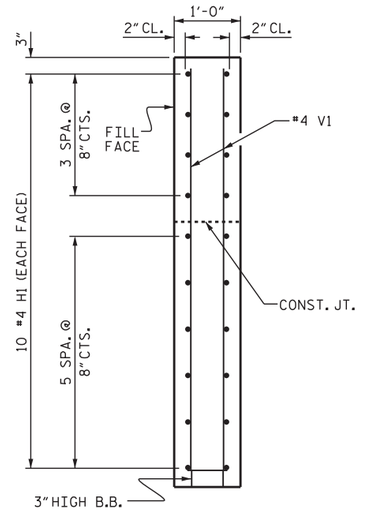
SECTION X-X



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)



SECTION Y-Y

WING DETAILS

DRAWN BY :	NMW	DATE :	3/23
CHECKED BY :	MGC	DATE :	7/23
DESIGN ENGINEER OF RECORD :	MGC	DATE :	7/23

NORTH CAROLINA PROFESSIONAL SEAL 28125 ENGINEER MARSHALL G. CHEEK, JR.
Marshall G. Cheek, Jr.
6/20/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

PROJECT NO. BP13-R020
MADISON COUNTY
STATION: 13+21.78-L-

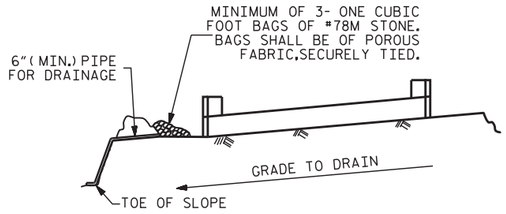
SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2 WING DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS
2			4			32

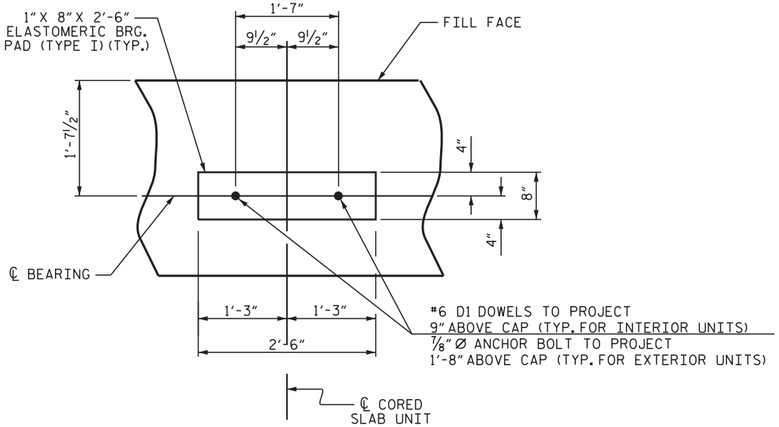


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

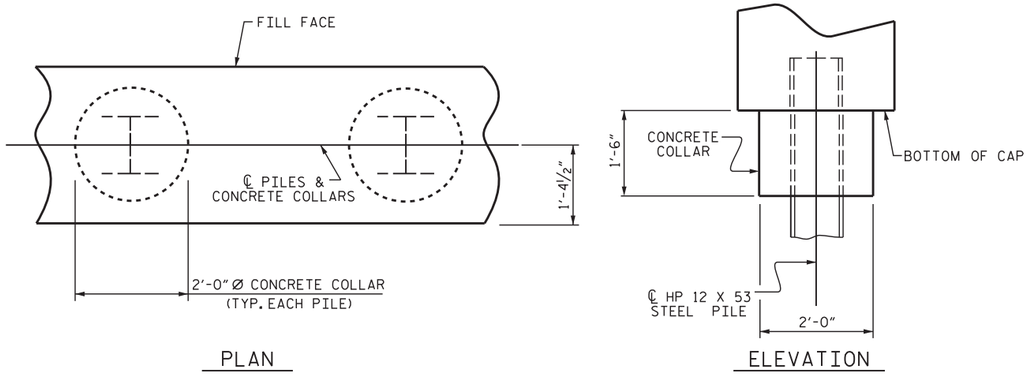
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

TEMPORARY DRAINAGE AT END BENT

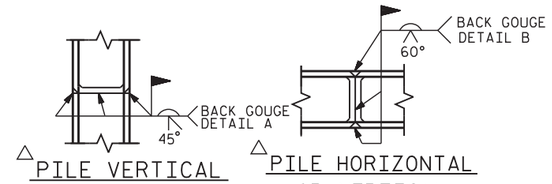


DETAIL "A"



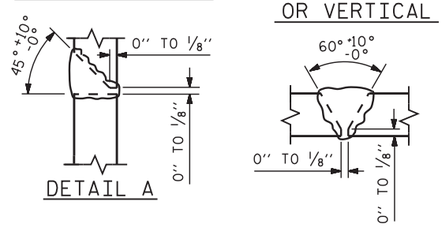
PLAN ELEVATION

CORROSION PROTECTION FOR STEEL PILES DETAIL



△ PILE VERTICAL

△ PILE HORIZONTAL OR VERTICAL

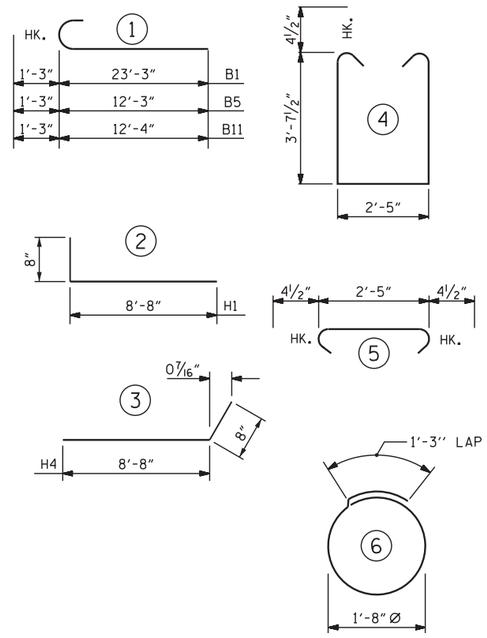


DETAIL A DETAIL B

△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL - END BENT 2

(STAGE I)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	24'-6"	666
B7	14	#4	STR	24'-9"	231
B13	6	#4	STR	2'-5"	10
D1	11	#6	STR	1'-6"	25
H1	20	#4	2	9'-4"	125
K1	8	#4	STR	3'-2"	17
S1	29	#4	4	10'-5"	202
S2	29	#4	5	3'-2"	61
S3	12	#4	6	6'-6"	52
V1	26	#4	STR	6'-2"	107

REINFORCING STEEL 1496 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1	CAP, LOWER PART OF WINGS & COLLARS	10.9 C.Y.
POUR #2	UPPER PART OF WINGS	1.1 C.Y.
TOTAL CLASS A CONCRETE		12.0 C.Y.

(STAGE II)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B5	4	#9	1	13'-6"	184
B10	9	#4	STR	13'-1"	79
B11	4	#9	1	13'-7"	185
B12	5	#4	STR	13'-3"	44
B13	3	#4	STR	2'-5"	5
D1	5	#6	STR	1'-6"	11
H4	20	#4	3	9'-4"	125
K4	8	#4	STR	3'-3"	17
S1	17	#4	4	10'-5"	118
S2	17	#4	5	3'-2"	36
S3	8	#4	6	6'-6"	35
V1	26	#4	STR	6'-2"	107

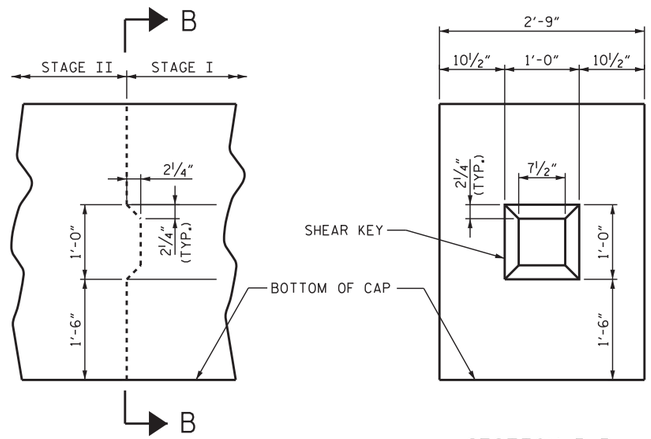
REINFORCING STEEL 946 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1	CAP, LOWER PART OF WINGS & COLLARS	7.1 C.Y.
POUR #2	UPPER PART OF WINGS	1.1 C.Y.
TOTAL CLASS A CONCRETE		8.2 C.Y.

TOTAL QUANTITIES

REINFORCING STEEL	2442 LBS.
CLASS A CONCRETE BREAKDOWN	20.2 CY



SECTION B-B

SHEAR KEY DETAIL

PROJECT NO. BP13-R020

MADISON COUNTY

STATION: 13+21.78-L-

SHEET 4 OF 4

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20125 Marshall G. Cheek, Jr. MARSHALL G. CHEEK, JR. ENGINEER

6/20/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

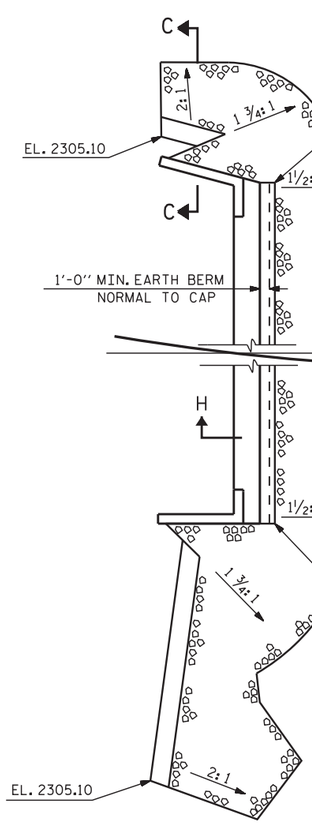
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

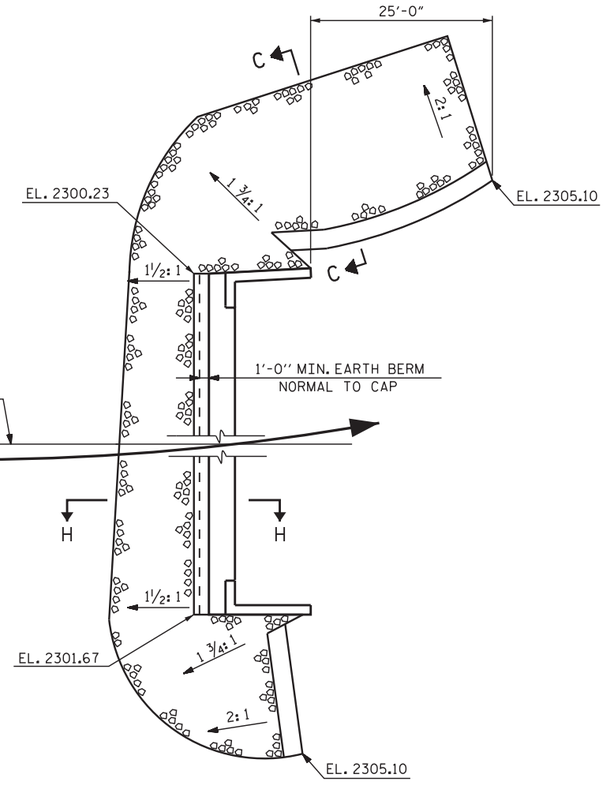
END BENT 2 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			32

DRAWN BY :	NMW	DATE :	3/23
CHECKED BY :	MGC	DATE :	7/23
DESIGN ENGINEER OF RECORD :	MGC	DATE :	7/23



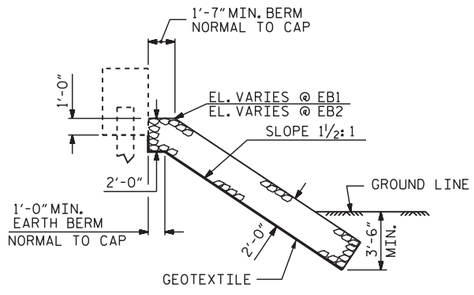
END BENT 1



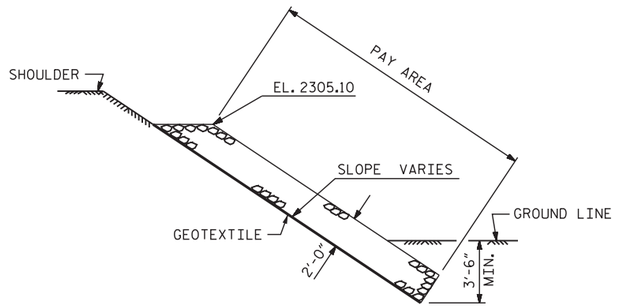
END BENT 2

ESTIMATED QUANTITIES		
BRIDGE @ STA. 13+21.78-L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	115	130
END BENT 2	120	135

RIP RAP



SECTION H-H



SECTION C-C

PROJECT NO. BP13-R020

MADISON COUNTY

STATION: 13+21.78-L-

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20125 MARSHALL G. CREEK, JR. — Marshall G. Creek, Jr.

6/20/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

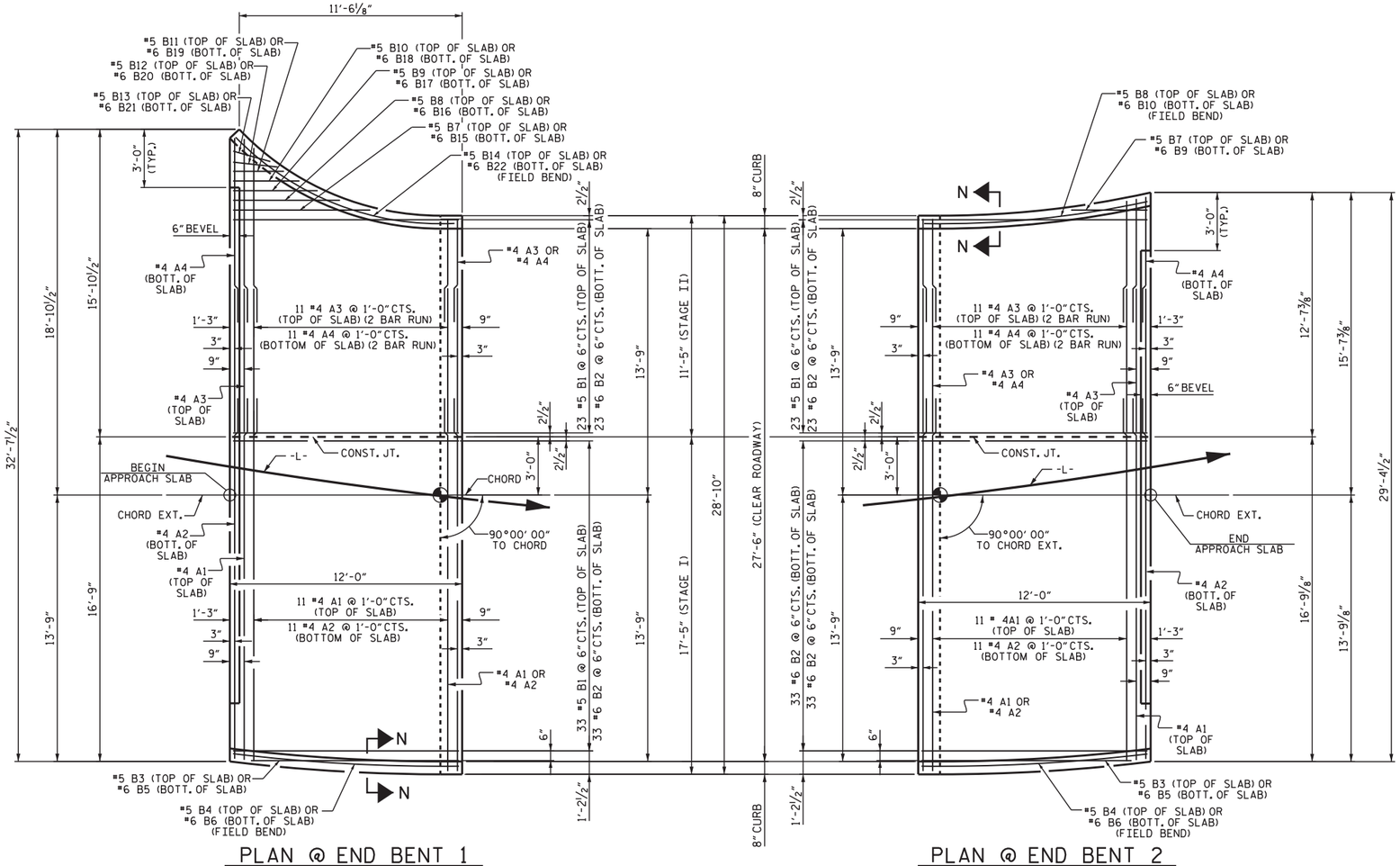
STANDARD

RIP RAP DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30
1			3			TOTAL SHEETS
2			4			32

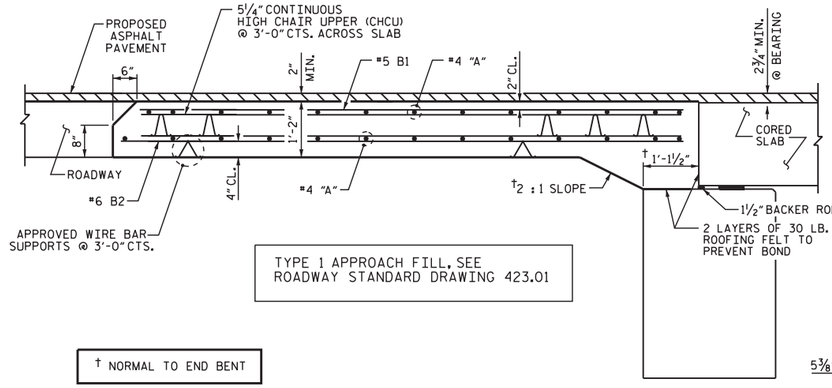
DRAWN BY :	NMW	DATE : 3/23
CHECKED BY :	MGC	DATE : 7/23
DESIGN ENGINEER OF RECORD :	MGC	DATE : 7/23

STD. NO. RR1



PLAN @ END BENT 1

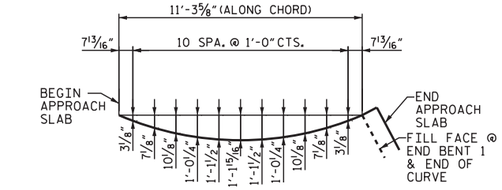
PLAN @ END BENT 2



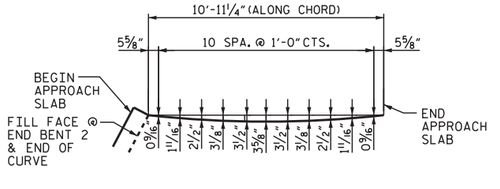
TYPE 1 APPROACH FILL. SEE ROADWAY STANDARD DRAWING 423.01

† NORMAL TO END BENT

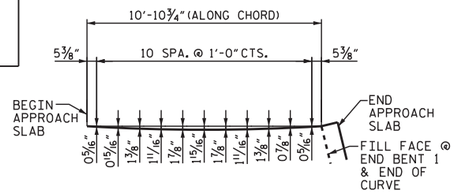
SECTION THRU SLAB



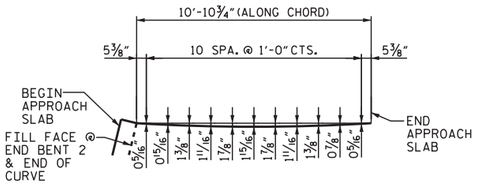
ARC OFFSETS - LEFT SIDE @ EB1



ARC OFFSETS - LEFT SIDE @ EB2



ARC OFFSETS - RIGHT SIDE @ EB1



ARC OFFSETS - RIGHT SIDE @ EB2

BILL OF MATERIAL

APPROACH SLAB AT EB 1 STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	13	#4	STR	19'-2"	166
A2	13	#4	STR	18'-10"	164
* B1	33	#5	STR	11'-1"	381
B2	33	#6	STR	11'-7"	574
* B3	1	#5	STR	10'-8"	11
* B4	1	#5	STR	11'-7"	12
B5	1	#6	STR	10'-8"	16
B6	1	#6	STR	11'-7"	17
REINFORCING STEEL				LBS.	771
* EPOXY COATED REINFORCING STEEL				LBS.	570
CLASS AA CONCRETE				C. Y.	9.6

APPROACH SLAB AT EB 2 STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	13	#4	STR	19'-2"	166
A2	13	#4	STR	18'-10"	164
* B1	33	#5	STR	11'-1"	381
B2	33	#6	STR	11'-7"	574
* B3	1	#5	STR	10'-10"	11
* B4	1	#5	STR	11'-8"	12
B5	1	#6	STR	10'-10"	16
B6	1	#6	STR	11'-8"	18
REINFORCING STEEL				LBS.	772
* EPOXY COATED REINFORCING STEEL				LBS.	570
CLASS AA CONCRETE				C. Y.	9.6

APPROACH SLAB AT EB 1 STAGE II

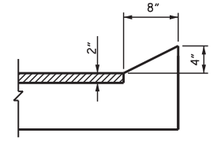
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A3	26	#4	STR	8'-8"	151
A4	26	#4	STR	8'-6"	148
* B1	23	#5	STR	11'-1"	266
B2	23	#6	STR	11'-7"	400
* B7	1	#5	STR	6'-7"	7
* B8	1	#5	STR	5'-0"	5
* B9	1	#5	STR	3'-10"	4
* B10	1	#5	STR	3'-5"	4
* B11	1	#5	STR	2'-7"	3
* B12	1	#5	STR	2'-3"	2
* B13	1	#5	STR	2'-0"	2
* B14	1	#5	STR	12'-6"	13
B15	1	#6	STR	7'-1"	11
B16	1	#6	STR	5'-6"	8
B17	1	#6	STR	4'-4"	7
B18	1	#6	STR	3'-5"	5
B19	1	#6	STR	2'-7"	4
B20	1	#6	STR	2'-3"	3
B21	1	#6	STR	2'-0"	3
B22	1	#6	STR	12'-6"	19
REINFORCING STEEL				LBS.	608
* EPOXY COATED REINFORCING STEEL				LBS.	457
CLASS AA CONCRETE				C. Y.	7.7

APPROACH SLAB AT EB 2 STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A3	26	#4	STR	7'-2"	124
A4	26	#4	STR	7'-0"	122
* B1	23	#5	STR	11'-1"	266
B2	23	#6	STR	11'-7"	400
* B7	1	#5	STR	3'-11"	4
* B8	1	#5	STR	11'-7"	12
B9	1	#6	STR	3'-11"	6
B10	1	#6	STR	11'-7"	17
REINFORCING STEEL				LBS.	545
* EPOXY COATED REINFORCING STEEL				LBS.	406
CLASS AA CONCRETE				C. Y.	6.8

SPLICE LENGTHS

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



SECTION N-N

CURB DETAILS

PROJECT NO. BP13-R020

MADISON COUNTY

STATION: 13+21.78-L-

SHEET 1 OF 2

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20125 Marshall G. Cheek, Jr. ENGINEER

6/20/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

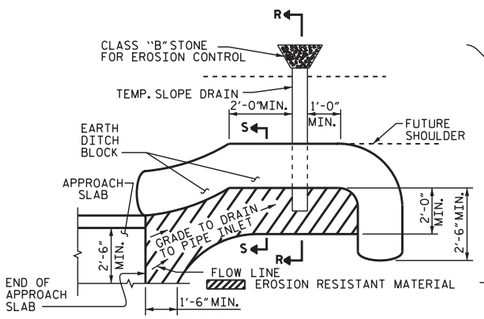
TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

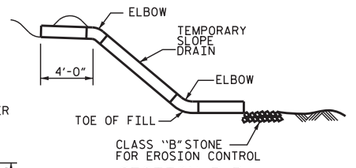
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS
2			4			32

DRAWN BY :	NMW	DATE : 3/23
CHECKED BY :	MGC	DATE : 7/23
DESIGN ENGINEER OF RECORD :	MGC	DATE : 7/23

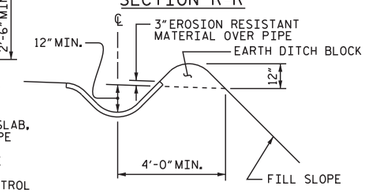


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

PLAN VIEW



SECTION R-R



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

NOTES

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

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

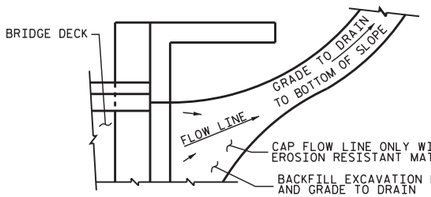
SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

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

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

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.



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

TEMPORARY DRAINAGE DETAIL

PROJECT NO. BP13-R020

MADISON COUNTY

STATION: 13+21.78-L-

SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20125 MARSHALL G. CHEEK, JR. — Marshall G. Cheek, Jr.

6/20/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS
2			4			32

DRAWN BY :	NMW	DATE :	3/23
CHECKED BY :	MGC	DATE :	4/23

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

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

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

CONCRETE:

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

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED ¾" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1½" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A ¼" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A ¼" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE ⅞" ∅ SHEAR STUDS FOR THE ¾" ∅ STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - ⅞" ∅ STUDS FOR 4 - ¾" ∅ STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF ⅞" ∅ STUDS ALONG THE BEAM AS SHOWN FOR ¾" ∅ STUDS BASED ON THE RATIO OF 3 - ⅞"∅ STUDS FOR 4 - ¾" ∅ 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.