B-5853

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DL00333

09/08/99

PROJECT: B-5853

CONTRACT: DL00333

See Sheet 1A For Index of Sheets

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

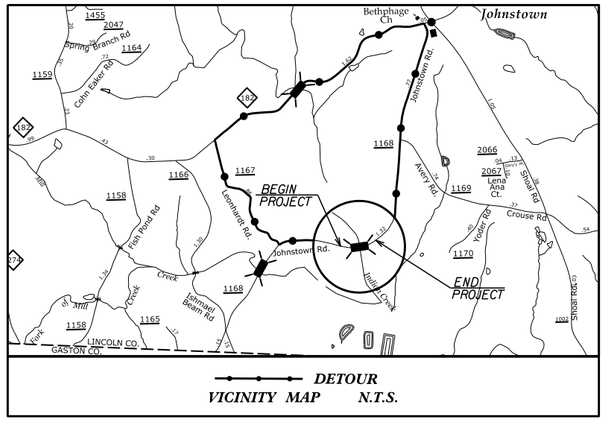
LINCOLN COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5853	1	16

WBS PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
45806.1.1	N/A	PE
45806.2.1	N/A	R/W
45806.3.1	N/A	CONSTRUCTION

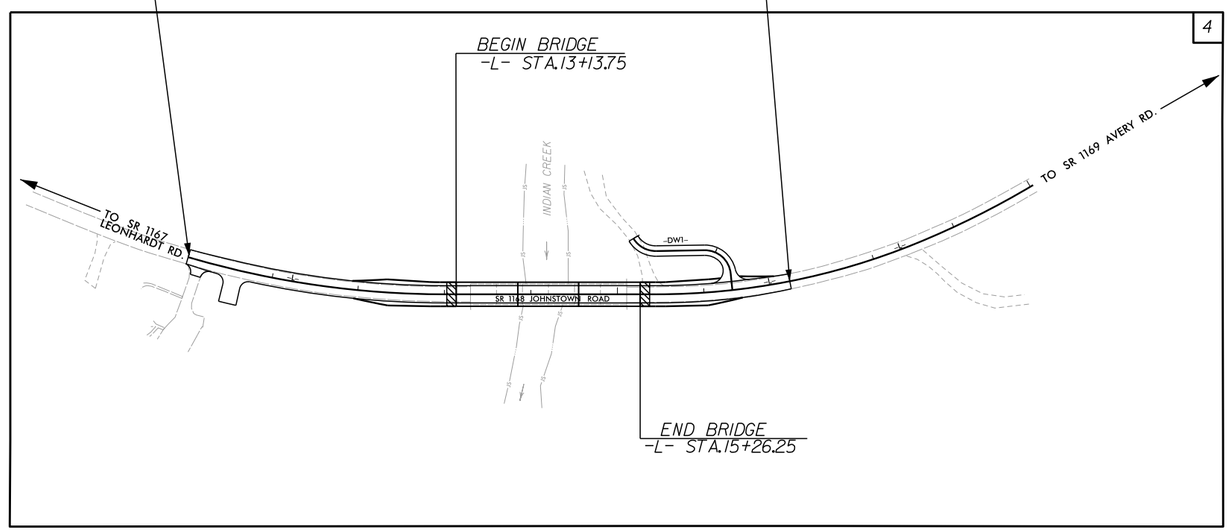
LOCATION: REPLACE BRIDGE NO. 71 ON SR 1168 (JOHNSTOWN ROAD) OVER INDIAN CREEK

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE



BEGIN PROJECT B-5853
-L- STA.10+00.00

END PROJECT B-5853
-L- STA.17+00.00



NAD 83/2011

100% PLANS SUBMITTAL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

PLANS 50 25 0 50 100

PROFILE (HORIZONTAL) 50 25 0 50 100

PROFILE (VERTICAL) 10 5 0 10 20

DESIGN DATA

ADT 2016 = 500
ADT 2040 = 600
K = 9 %
D = 60 %
T = 22 % *
V = 50 MPH
* TTST = 2% DUAL 20%
FUNC CLASS = LOCAL
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-5853 = 0.093 MILES

LENGTH STRUCTURE TIP PROJECT B-5853 = 0.040 MILES

TOTAL LENGTH TIP PROJECT B-5853 = 0.133 MILES

Prepared In the Office of:

PARRISH & PARTNERS

6701 CARMEL RD
SUITE 210
CHARLOTTE, NC 28226

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: 04/10/2023

LETTING DATE: 09/24/2024

JOSHUA WHITE, PE
NCDOT CONTACT

ADAM PARRISH, PE
PROJECT ENGINEER

GARRETT ELLER, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

DocuSigned by: Kevin Higgins 8/28/2024

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 035700 KEVIN P. HIGGINS

SIGNATURE: *P.E.*

ROADWAY DESIGN ENGINEER

Signed by: Garrett Eller 8/28/2024

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 056365 GARRETT R. ELLER

SIGNATURE: *P.E.*

STATE OF NORTH CAROLINA * DEPARTMENT OF TRANSPORTATION *

8/28/2024
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PROJECT REFERENCE NO.	SHEET NO.
B-5853	1A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 056365 ENGINEER CHARLES R. ELLER

Signed by: Charles R. Eller 8/28/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PARRISH & PARTNERS
6701 CARMEL RD
SUITE 210
CHARLOTTE, NC 28226

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2A	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2C-1 THRU 2C- (NOT INCLUDED)	SPECIAL DETAILS
2D-1	DRAINAGE DETAILS
3B-1	ROADWAY SUMMARIES
3D-1	DRAINAGE SUMMARIES
3G-1	GEOTECH SUMMARY SHEET
4 THRU 5	PLAN AND PROFILE SHEET
RW01 THRU RW04	R/W PLAN SHEETS
TMP-1 THRU TMP-4	TRAFFIC MANAGEMENT PLANS
PMP-1 THRU PMP-2	PAVEMENT MARKING PLANS
EC-1 THRU EC-9	EROSION CONTROL PLANS
UO-1 THRU UO-2	UTILITIES BY OTHERS PLANS
X-1A THRU X-1B	CROSS-SECTION INDEX & SUMMARY SHEET
X-1 THRU X-5	CROSS-SECTIONS
S-1 THRU S-20	STRUCTURE PLANS

GENERAL NOTES:

2024 SPECIFICATIONS
EFFECTIVE: 01-16-2024
REVISED:

GRADING AND SURFACING OR RESURFACING AND WIDENING:

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

CLEARING:

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

DRIVEWAYS:

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

STREET TURNOUT:

STREET RETURNS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 848.04 USING THE RADII NOTED ON PLANS.

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.

SUBSURFACE PLANS:

NO SUBSURFACE PLANS ARE AVAILABLE ON THIS PROJECT. THE CONTRACTOR SHOULD MAKE HIS OWN INVESTIGATION AS TO THE SUBSURFACE CONDITIONS.

END BENTS:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE REMC and AT&T. AT&T STATED

THE PROJECT DOES NOT IMPACT THEIR FACILITIES.

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

RIGHT-OF-WAY MARKERS:

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

EFF. 01-16-2024
REV.

2024 ROADWAY ENGLISH STANDARD DRAWINGS

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

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.02	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 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
840.00	Concrete Base Pad for Drainage Structures
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.46	Traffic Bearing Precast Drainage Structure
846.04	Drop Inlet Installation in Shoulder Berm Gutter
848.02	Driveway Turnout - Radius Type
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.02	Guide for Rip Rap at Pipe Outlets

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12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
B-5853	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)
- Computed Property Corner
- Existing Concrete Monument (ECM)
- Parcel/Sequence Number
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary
- Proposed Wetland Boundary
- Existing Endangered Animal Boundary
- Existing Endangered Plant Boundary
- Existing Historic Property Boundary
- Known Contamination Area: Soil
- Potential Contamination Area: Soil
- Known Contamination Area: Water
- Potential Contamination Area: Water
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

- Standard Gauge — 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
- Existing Control of Access Line
- Proposed Control of Access Line
- Proposed ROW and CA Line
- Existing Easement Line
- Proposed Temporary Construction Easement
- Proposed Temporary Drainage Easement — 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
- Proposed Slope Stakes Fill
- Proposed Curb Ramp — CR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

- Head and End Wall — CONC HW
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB — CB
- Paved Ditch Gutter
- Storm Sewer Manhole
- 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
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole
- H–Frame Pole
- U/G Power Line Test Hole (SUE – LOS A)*
- U/G Power Line (SUE – LOS B)*
- U/G Power Line (SUE – LOS C)*
- U/G Power Line (SUE – LOS D)*

TELEPHONE:

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

WATER:

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

SANITARY SEWER:

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

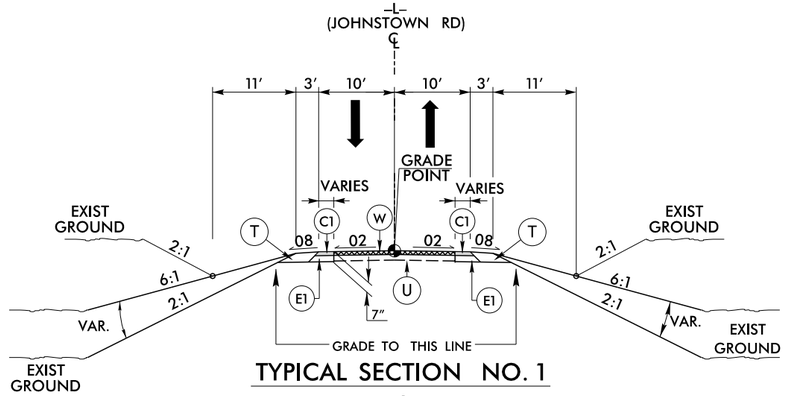
MISCELLANEOUS:

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

6/2/99

PAVEMENT SCHEDULE

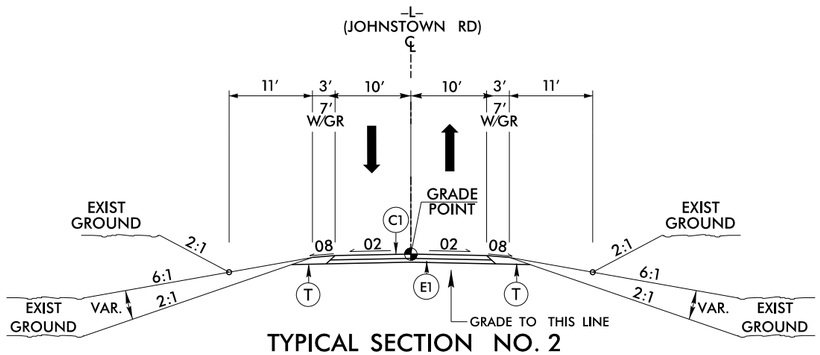
C1	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF THE TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1.5″ OR GREATER THAN 2″ IN DEPTH.
E1	PROP. APPROX. 4″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3″ OR GREATER THAN 5.5″ IN DEPTH.
R1	SHOULDER BERM GUTTER
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL)



TYPICAL SECTION NO. 1

–L–

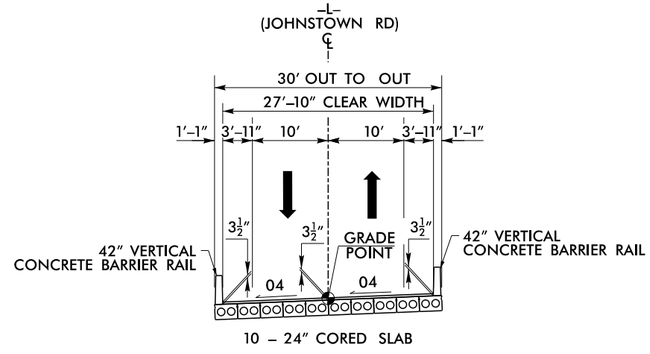
STA. 10+00.00 TO 11+50.00
STA. 16+00.00 TO 17+00.00



TYPICAL SECTION NO. 2

–L–

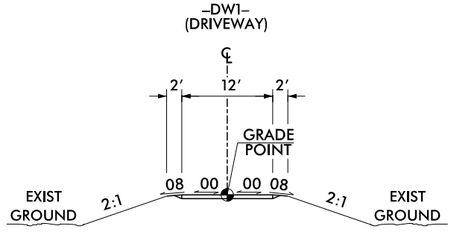
STA. 11+50.00 TO 13+13.75
STA. 15+26.25 TO 16+00.00



TYPICAL SECTION NO. 3

–L– BRIDGE

STA. 13+13.75 TO 15+26.25



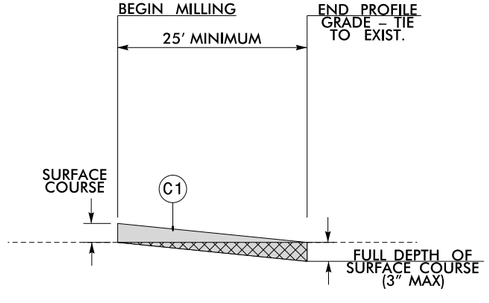
TYPICAL SECTION NO. 4

–DW1–

STA. 10+00.00 TO 11+40.87

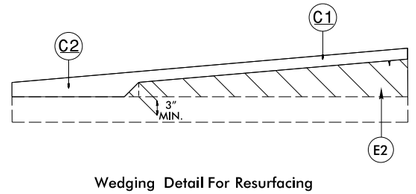
FOR SOIL DRIVEWAYS USE 6″ ABC FROM EDGE OF PAVEMENT TO R/W LIMITS.

FOR CONCRETE DRIVES USE 6″ JOINTED CONC.



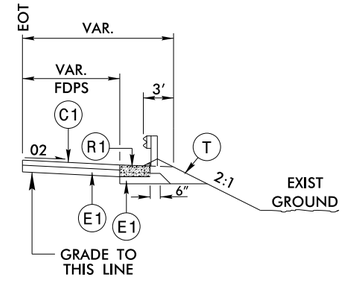
DETAIL 1

INCIDENTAL MILLING DETAIL
SEE PROFILE FOR LIMITS



Wedging Detail For Resurfacing

DETAIL 2



DETAIL NO. 3

SHOULDER BERM GUTTER

SEE PLANS FOR LOCATIONS.
USE WITH –L– TYPICAL SECTION

PROJECT REFERENCE NO.	SHEET NO.
B–5853	2A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 056365 ENGINEER CARROLL R. ELLER

6/28/2024

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 038176 ENGINEER STUART M. HANG

6/28/2024

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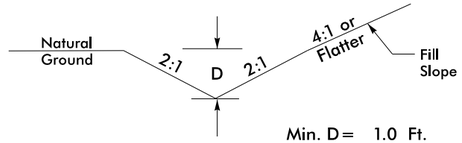
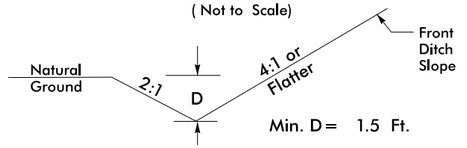
DITCH DETAILS

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



FROM STA. 10+29 TO STA. 10+35 –L– RT

DETAIL A
SPECIAL CUT DITCH
(Not to Scale)



FROM STA. 10+75 TO STA. 11+25 –L– LT

PROJECT REFERENCE NO.	SHEET NO.
B-5853	2D-1
RW SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 056365 ENGINEER CARRIE R. GARRETT

Carrie R. Garrett
8/28/2024

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 035700 ENGINEER KEVIN P. HIGGINS

Kevin Higgins
8/28/2024

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PARRISH & PARTNERS
6701 CARMEL RD
SUITE 210
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5/28/99

COMPUTED BY: G. ELLER DATE: 04/01/2024
CHECKED BY: C. ROGERS DATE: 04/01/2024

PROJECT NO.	SHEET NO.
B-5853	3B-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GUARDRAIL SUMMARY

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

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

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL WIDTH	FLARE LENGTH		W		ANCHORS						IMPACT ATTENUATOR TYPE 350		SINGLE FACED CONCRETE BARRIER	REMOVE EXISTING GUARDRAIL	REMOVE & STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	Type III	B-77	GREU, TL-3	CAT-1	AT-1	ANCHOR DEDUCTION	G	NG				
-L-	12+34.39	13+14.75	RT	81.25			13.14.75		4	7	50		1		1		1			TYPE III: 4 @ 18.75'=75'						
-L-	12+31.57	13+14.75	LT	81.25				13.14.75	4	7		50		1	1		1			GREU TYPE TL-3: 4 @50' = 200'						
-L-	15+25.25	16+03.76	RT	81.25				15+25.25	4	7		50		1	1		1			TOTAL: 275'						
-L-	15+25.25	16+05.93	LT	81.25			15+25.25		4	7	50		1		1		1									
			SUBTOTAL	325																						
			ANCHOR DEDUCTION	275																						
			TOTAL	50																						
			SAY	50																						

SHOULDER BERM GUTTER

LOCATION	SIDE	BEG. STA.	END STA.	LENGTH
-L-	LT	12+89.00	13+03.00	14.0
-L-	LT	15+37.00	15+51.00	14.0
			TOTAL	28.0
			SAY	30

REMOVAL OF EXISTING ASPHALT PAVEMENT

(FILL IN THE BLANK FOR 'ASPHALT' OR 'CONCRETE'PAVEMENT)

LINE	STATION	STATION	LOCATION	LENGTH OR AREA	WIDTH	SQUARE YARDS
-L-	11+50	13+30	LT/RT	3080.00		342.22
-L-	15+10	16+00	LT/RT	1584.00		176.00
					TOTAL	518.22
					SAY	520

SUMMARY OF EARTHWORK

STATION	STATION	EXCAVATION TOTAL UNCLASS.	EMBANKMENT Embank. + %	BORROW	WASTE TOTAL
-L- 10+00.00	-L- 13+13.75	38	774	736	
-L- 15+26.25	-L- 17+00.00	6	288	282	
-DW1- 10+00.00	-DW1- 11+40.87	6	267	261	
SUBTOTAL		50	1,329	1,279	
Est. Shoulder Material			70	70	
Loss due to Clearing and Grubbing		50		-50	
Earth waste to repl. bor.					
PROJECT	TOTALS	100	1,399	1,299	
Est. 5% for repl. Topsoil				65	
on borrow pits					
GRAND	TOTALS	100	1,399	1,363	
SAY		100	1,400	1,370	

EST. GEOTEXTILE FOR SOIL STABILIZATION = 500 SY
EST. GEOTEXTILE FOR EMBANKMENT STABILIZATION = 200 SY
EST. CLASS IV SUBGRADE STABILIZATION = 200 TON
EST. UNDERCUT EXCAVATION = 450 CY
EST. SHALLOW UNDERCUT = 100 CY
EST. SELECT GRANULAR MATERIAL = 200 CY

NOTE: Earthwork quantities are calculated by the Roadway Design Unit. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

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

8/27/2024
B-5853_QUANTITIES_SHEET.dgn
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LKEVINH3

COMPUTED BY:	K. HIGGINS	DATE:	12/6/2023
CHECKED BY:		DATE:	

PROJECT NO.	SHEET NO
B-5853	3D-1

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

LINE & STATION SIZE THICKNESS OR GAUGE	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, CAAP, HDPE, PVC, or PP PIPE) 12	15	18	24	30	36	42	48	C. S. PIPE 12 .064	15 .064	18 .064	24 .064	30 .079
L 15+47	14 LT	0400		802.7																
		0400	0401		798.5	797.2														
L 12+93	14 LT	0402		802.8																
		0402	0403		798.0	796.9														
L 15+20	60 LT	0404																		
L 10+57	23 RT																			
L 10+57	26 RT	0405																		
SHEET TOTALS																				
PROJECT TOTALS																				

LINE & STATION	FROM	TO	R. C. PIPE CLASS III 12	15	18	24	30	R. C. PIPE CLASS IV 12	15	18	24	30	R. C. PIPE CLASS V 12	15	18	24	30	STRUCTURAL PLATE PIPE 60	66	72	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G
L 15+47	0400																										1						
	0400	0401		24																													
L 12+93	0402																										1						
	0402	0403		20																													
L 15+20	0404																						32										
L 10+57																																	
L 10+57	0405			40																													
SHEET TOTALS				84																			32				2						
PROJECT TOTALS				84																			32				2						

LINE & STATION	FROM	TO	D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	ANGLED VANE GRATES AND FRAMES STD. 840.33	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	T.B.D.I. FOR STEEL GRATES STD. 840.36	STEEL FRAME WITH TWO GRATES STD. 840.37	15" C.S. ELBOW	18" C.S. ELBOW	MODIFIED CONC. FLUME	PREFORMED SCOUR HOLE (PER EACH)	PIPE REMOVAL LIN. FT.	REMARKS
L 15+47	0400																		1						1								
	0400	0401																															
L 12+93	0402																		1						1								
	0402	0403																															
L 15+20	0404																															27	
L 10+57																																24	
L 10+57	0405																																
SHEET TOTALS																			2						2							51	
PROJECT TOTALS																			2						2							51	

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

COMPUTED BY: J. Daily DATE: 5/13/2024	
CHECKED BY: L. Campos DATE: 5/17/2024	

(2-3-23)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
B-5853	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			ASU (1)	12	100	200	300		
			TOTAL CY/TONS/SY:		100	200**	300**	0	0

*ASU(1/2) = Aggregate Subgrade (Type 1 or 2)
*AST = Aggregate Stabilization
**Total tons of "Class IV Subgrade Stabilization" and total square yards of "Geotextile for 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

REVISIONS

DRIVEWAY AND 15" RCP-III ADDED, 10+50 RT
DITCH REVISED, 10+50 RT

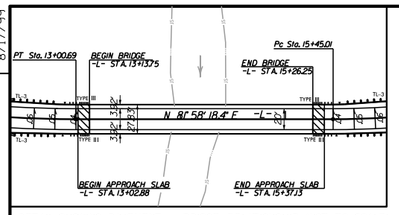
PROJECT REFERENCE NO.	SHEET NO.
B-5853	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 056365 ENGINEER CARROLL R. ELLER — Carroll Eller — 8/28/2024

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 035700 ENGINEER KEVIN P. HIGGINS — Kevin Higgins — 8/28/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/2011



DETAIL SHOWING PAVEMENT - BRIDGE RELATIONSHIP (NOT TO SCALE)

APPROACH SLAB

SKEW ANGLE=90° 00' 00"

-L-

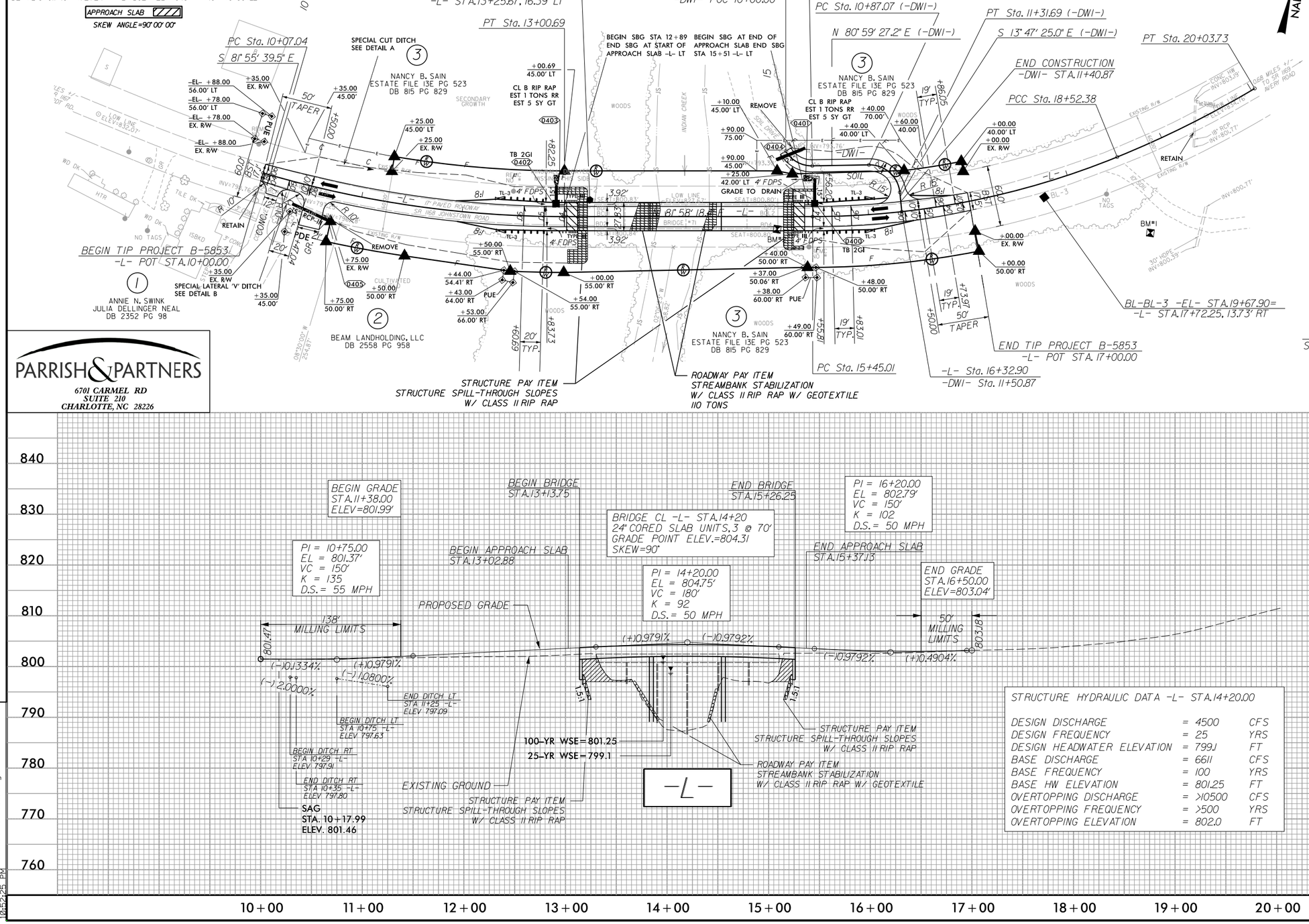
PI Sta 11+54.84
Δ = 16° 06' 01.9" (LT)
D = 5° 28' 58.3"
L = 293.65'
T = 147.80'
R = 1,045.00'
e = 0.06 FT/FT
V = 50 MPH
Runoff = 120'

PI Sta 17+00.64
Δ = 22° 09' 09.0" (LT)
D = 7° 12' 25.3"
L = 307.37'
T = 155.63'
R = 795.00'
e = 0.06 FT/FT
V = 45 MPH
Runoff = 114'

-DWI-

PI Sta 10+17.25
Δ = 59° 48' 20.7" (LT)
D = 190° 59' 09.4"
L = 31.31'
T = 17.25'
R = 30.00'
V = 15 MPH

PI Sta 11+14.67
Δ = 85° 13' 07.8" (RT)
D = 190° 59' 09.4"
L = 44.62'
T = 27.60'
R = 30.00'
V = 15 MPH



NOTES:
SEE SHEET 5 FOR DWI PROFILE

STRUCTURE HYDRAULIC DATA -L- STA. 14+20.00

DESIGN DISCHARGE	= 4500	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HEADWATER ELEVATION	= 799.1	FT
BASE DISCHARGE	= 6611	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 801.25	FT
OVERTOPPING DISCHARGE	= >10500	CFS
OVERTOPPING FREQUENCY	= >500	YRS
OVERTOPPING ELEVATION	= 802.0	FT

PARRISH & PARTNERS
6701 CARMEL RD
SUITE 210
CHARLOTTE, NC 28226

8/27/2024
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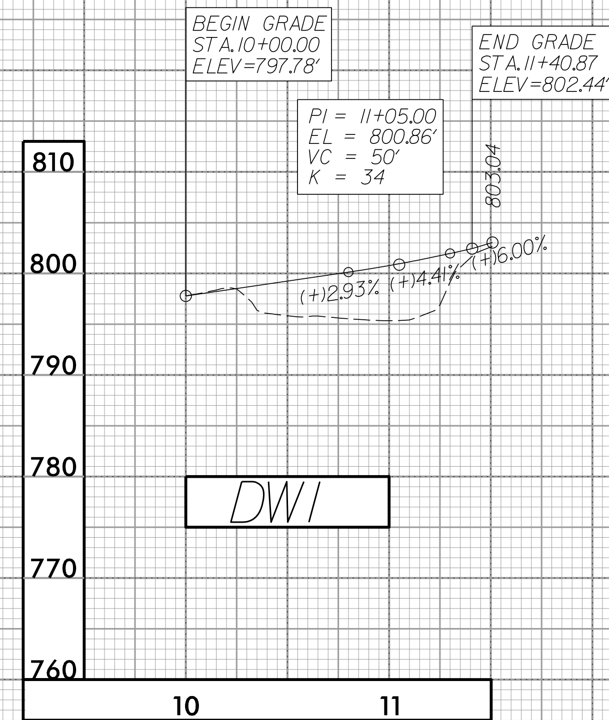
PROJECT REFERENCE NO.	SHEET NO.
B-5853	5

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 056365 ENGINEER GARRETT R. ELLER 8/28/2024	NORTH CAROLINA PROFESSIONAL SEAL 035700 ENGINEER KEVIN R. HIGGINS 8/28/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PARRISH & PARTNERS
6701 CARMEL RD
SUITE 210
CHARLOTTE, NC 28226



5/2023

TIP PROJECT: B-5853

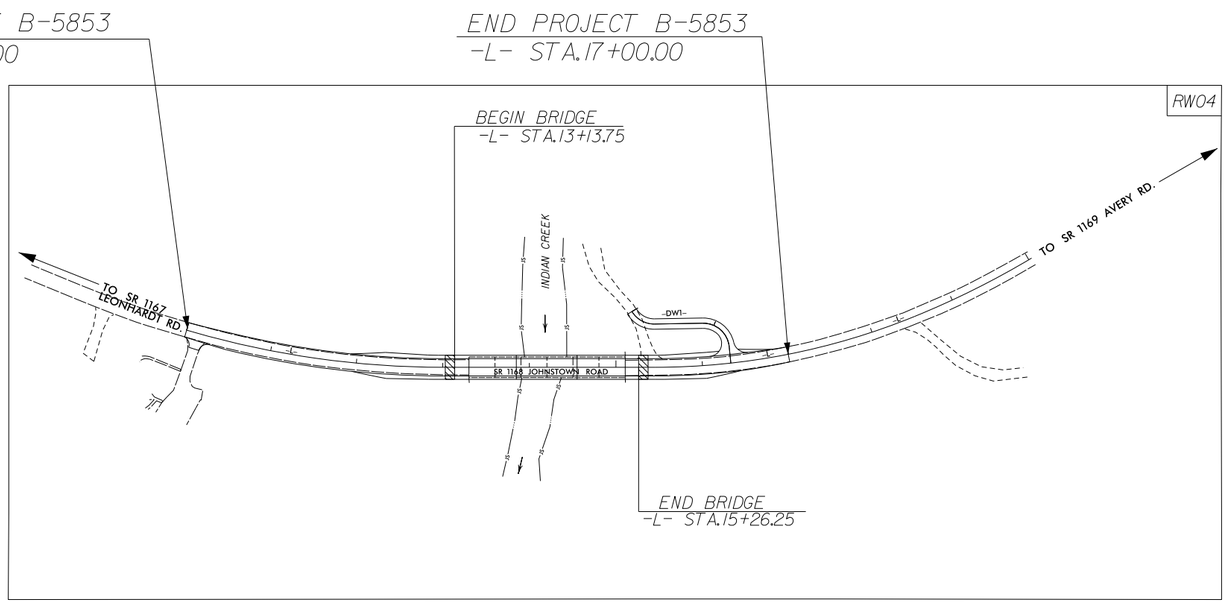
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5853	RW01	5

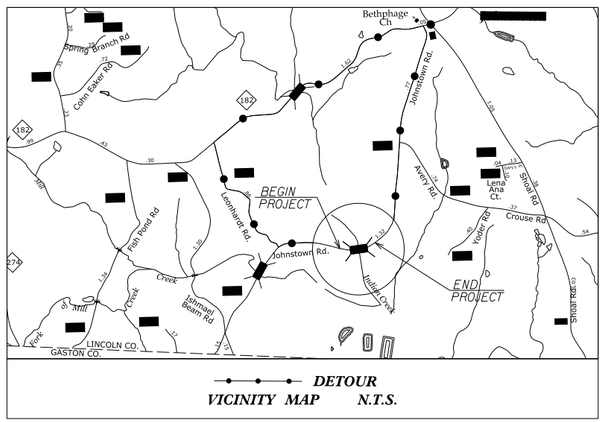
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

LINCOLN COUNTY

NAD 83/2011





DETOUR

VICINITY MAP N.T.S.

GRAPHIC SCALE

50 25 0 50 100

PLANS

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B5853-1" WITH NAD 83/NSRS 2011 STATE PLANE GRID COORDINATES OF NORTHING: 618,866.738(ft) EASTING: 1,292,815.977(ft) ELEVATION: 805.92(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99975271
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B5853-1" TO -L- STATION 10+00.00 IS S 79°06'50.6" E 326.14(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

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:	*LETTING DATE:*
4/28/2023	*9/24/2023*

PROFESSIONAL LAND SURVEYOR

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

DocuSigned by: Matthew Connell EBD36F11473E475...

5/1/2023

SIGNATURE: ***Date:***

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION ·

01-MAY-2023 09:03
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mcornwell AT MCORNWELLLAPTOP

10/21

REVISIONS

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO.	SHEET NO.
B-5853	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

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 Project Control was performed under my supervision from an actual GPS survey made under my supervision and the following Information was used to perform the survey:

Class of survey: ***AA***
Type of GPS field procedure: RTN
Dates of survey: March 13, 2016
Datum/Epoch: NAD83/2011
Published/Fixed-control use: N/A
Localized around: B5853-1
Northing: 618866.738
Easting: 1292815.977
Combined grid factor: 0.99975271
Geoid model: GEOID12A
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 March 18, 2016, 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 10/18/2021.

DocuSigned by:
Matthew Cornwell
EBD36F11473E475...
Professional Land Surveyor L-4775

EXISTING ALIGNMENT

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	618846.831	1292945.188							
LINE			S 75°45'19.2" E	72.88					
PC	618828.899	1293015.823							
CURVE			S 81°20'47.9" E	222.14	11°10'57.4"(LT)	05°01'33.4"	222.50	111.60	1140.00
PCC	618795.476	1293235.439							
CURVE			N 87°31'00.9" E	201.96	11°05'25.0"(LT)	05°28'58.3"	202.27	101.45	1045.00
PT	618804.226	1293437.206							
LINE			N 81°58'18.4" E	243.01					
PC	618838.164	1293677.832							
CURVE			N 70°53'43.9" E	305.46	22°09'09.0"(LT)	07°12'25.3"	307.37	155.63	795.00
PCC	618938.140	1293966.471							
CURVE			N 55°29'00.1" E	151.21	08°40'18.6"(LT)	05°43'46.5"	151.35	75.82	1000.00
PT	619023.821	1294091.060							

BENCHMARKS

```
****************************************
BM1       ELEVATION = 803.07
N 618869      E 1294009
BL STATION 15+91.00
S 79°25'24.8" E    DIST 110.09
RR SPIKE IN 18" SYCAMORE
****************************************

****************************************
BM2       ELEVATION = 803.12
N 618821      E 1293645
BL STATION 13+28.00 30 RIGHT
TBM1 PAINT DOT ON WHEELGUARD
****************************************
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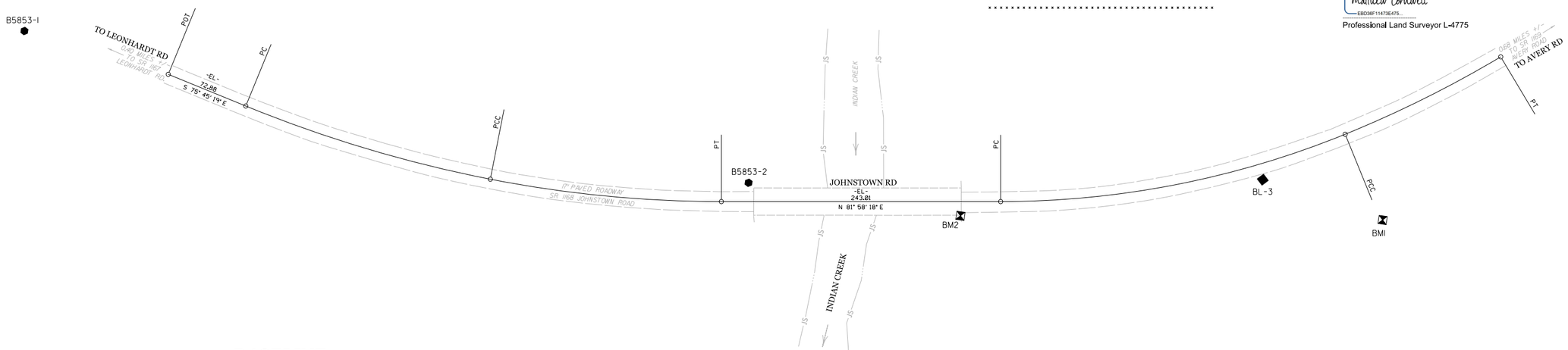
NC GRID
NAD 83 NA 2011



BASELINE

BL

POINT	DESC.	NORTH	EAST	ELEVATION
1	B5853-1	618866.7380	1292815.9770	805.92
2	B5853-2	618823.7630	1293458.3550	801.45
3	BL-3	618888.9072	1293900.9663	803.40

NOTES:

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

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

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mcornwell AT MCORNWELLLAPTOP

5/2023

REVISIONS

PROPOSED ALIGNMENT CONTROL SHEET

EL

TYPE	STATION	NORTH	EAST
POT	10+00.00	618846.8311	1292945.1885
PC	10+72.88	618828.8992	1293015.8229
PCC	12+95.37	618795.4762	1293235.4389
PT	14+97.64	618804.2258	1293437.2058
PC	17+40.65	618838.1644	1293677.8316
PCC	20+48.03	618938.1400	1293966.4709
PT	21+99.38	619023.8211	1294091.0601

L

TYPE	STATION	NORTH	EAST
POT	10+00.00	618805.1442	1293136.2522
PC	10+07.04	618804.1556	1293143.2225
PT	13+00.69	618804.0430	1293435.9097
PC	15+45.01	618838.1644	1293677.8316
PCC	18+52.38	618938.1400	1293966.4709
PT	20+03.73	619023.8211	1294091.0601

DW1

TYPE	STATION	NORTH	EAST
PC	10+00.00	618898.2677	1293642.5900
PT	10+31.31	618887.6000	1293670.5349
PC	10+87.07	618896.3309	1293725.6028
PT	11+31.69	618873.8520	1293759.4358
POT	11+50.87	618855.2209	1293764.0087

PROJECT REFERENCE NO.	SHEET NO.
B-5853	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...

5/1/2023

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 5/1/2023

DocuSigned by:
Matthew Cornwell
EBD36F11473E475...

Professional Land Surveyor L-4775

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.

01-MAY-2023 09:04
S:\Surveyors\Projects\ncdot\B-5853\2023 RW Staking\MTC\b5853_ls_rw02d-1.dgn
mcornwell AT MCORNWELL-LAPTOP

5/2023

REVISIONS

RIGHT OF WAY & PERMANENT EASEMENT CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
B-5853	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...

5/1/2023

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 3/27/2023, and all coordinates are based on NAD83/2011. That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 5/1/2023

DocuSigned by:
Matthew Cornwell
EBD36F11473E475...

Professional Land Surveyor L-4775

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
L	10+75.00	29.72	618767.1731	1293208.5197
L	10+75.00	50.00	618746.9502	1293206.9828
L	11+25.00	-30.22	618824.4192	1293261.5460
L	11+25.00	-45.00	618839.1936	1293261.9599
L	11+50.00	50.00	618743.8105	1293285.4917
L	12+50.00	55.00	618743.4139	1293390.5935
L	13+00.00	55.00	618749.4805	1293442.8692
L	13+00.69	-45.00	618848.6020	1293429.6250
L	15+10.00	-45.00	618877.8340	1293636.8811
L	15+25.00	-42.00	618876.9584	1293652.1531
L	15+40.00	50.00	618787.9549	1293679.8549
L	16+40.00	-40.00	618895.6718	1293760.6086
L	17+00.00	50.00	618827.3675	1293844.6721
L	17+00.00	-30.00	618902.9183	1293818.3648
L	17+00.00	-40.00	618912.3621	1293815.0764
L	17+00.00	30.00	618846.2552	1293838.0953

ROW MARKER PERMANENT EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST	
L	10+35.00	50.00	618750.9255	1293165.2604	60D NAIL SET IN TREE ROOT
L	10+35.00	29.67	618771.1232	1293167.5757	
L	12+43.00	64.00	618733.7968	1293384.0170	
L	12+44.00	54.41	618743.4378	1293384.2523	
L	12+53.00	66.00	618732.7564	1293394.7755	
L	12+54.00	55.00	618743.8071	1293394.7856	
L	15+37.00	50.06	618787.4739	1293676.8931	
L	15+38.00	60.00	618777.7736	1293679.2711	
L	15+48.00	50.00	618789.1047	1293687.9641	
L	15+49.00	60.00	618779.3626	1293690.4600	

ROW MARKER PERMANENT EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
EL	11+78.00	-56.00	618863.0797	1293127.4860
EL	11+78.00	-30.00	618837.3970	1293123.4361
EL	11+88.00	-56.00	618861.6397	1293136.8851
EL	11+88.00	-30.00	618835.9226	1293133.0606

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 3/27/2023.

01-MAY-2023 09:05
C:\Users\mcornwell\gists\ncdot\B-5853\2023 RW Staking\MTC\b5853_ls_rw03e-1.dgn
mcornwell AT MCORNWELL-LAPTOP

PROJECT REFERENCE NO.	SHEET NO.
B-5853	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 EBD36F11473E475...

5/1/2023

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 3/27/2023, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

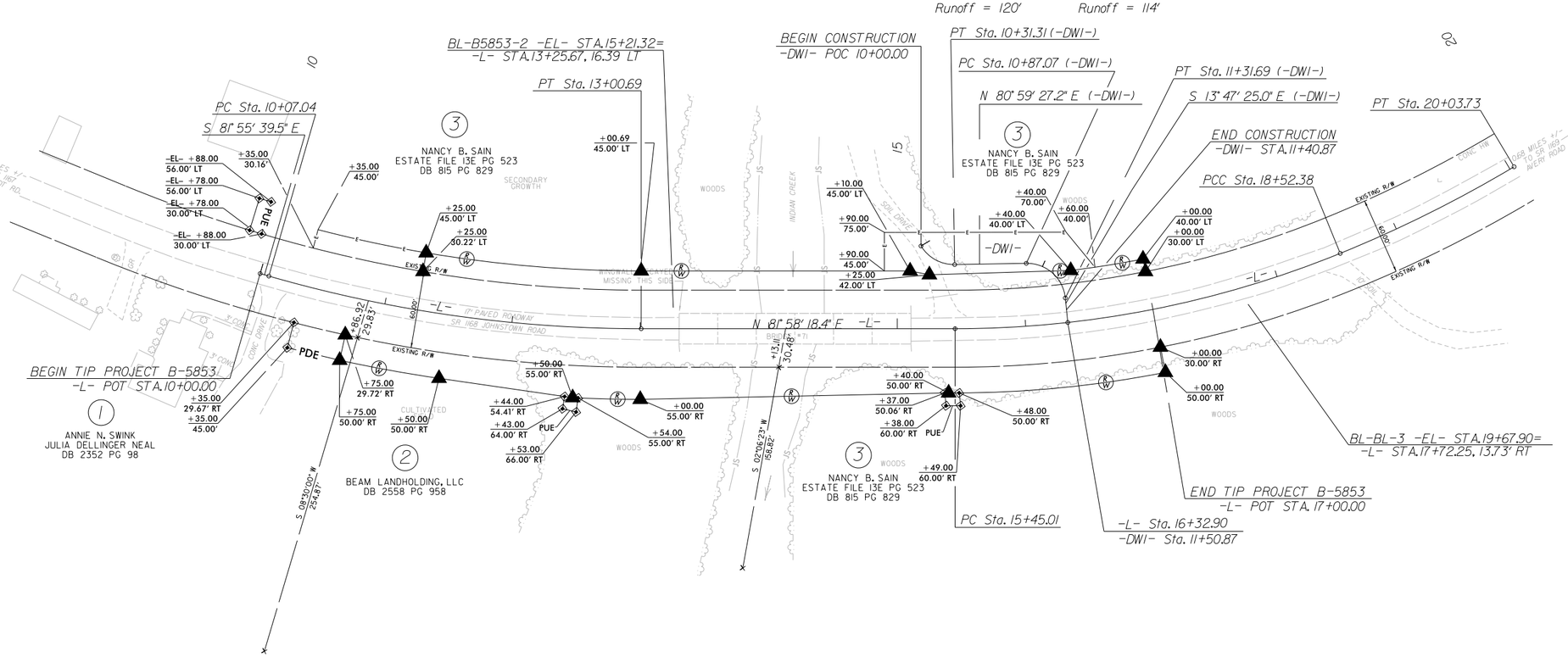
This 5/1/2023

DocuSigned by: Matthew Cornwell EBD36F11473E475...

Professional Land Surveyor L-4775

NAD 83/2011

-L-		-DWI-	
PI Sta 11+54.84	PI Sta 17+00.64	PI Sta 10+17.25	PI Sta 11+14.67
△ = 16° 06' 01.9" (LT)	△ = 22° 09' 09.0" (LT)	△ = 59° 48' 20.7" (LT)	△ = 85° 13' 07.8" (RT)
D = 5° 28' 58.3"	D = 7° 12' 25.3"	D = 190° 59' 09.4"	D = 190° 59' 09.4"
L = 293.65'	L = 307.37'	L = 31.31'	L = 44.62'
T = 147.80'	T = 155.63'	T = 17.25'	T = 27.60'
R = 1,045.00'	R = 795.00'	R = 30.00'	R = 30.00'
e = 0.06 FT/FT	e = 0.06 FT/FT	V = 15 MPH	V = 15 MPH
V = 50 MPH	V = 45 MPH		
Runoff = 120'	Runoff = 114'		



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 3/27/2023.

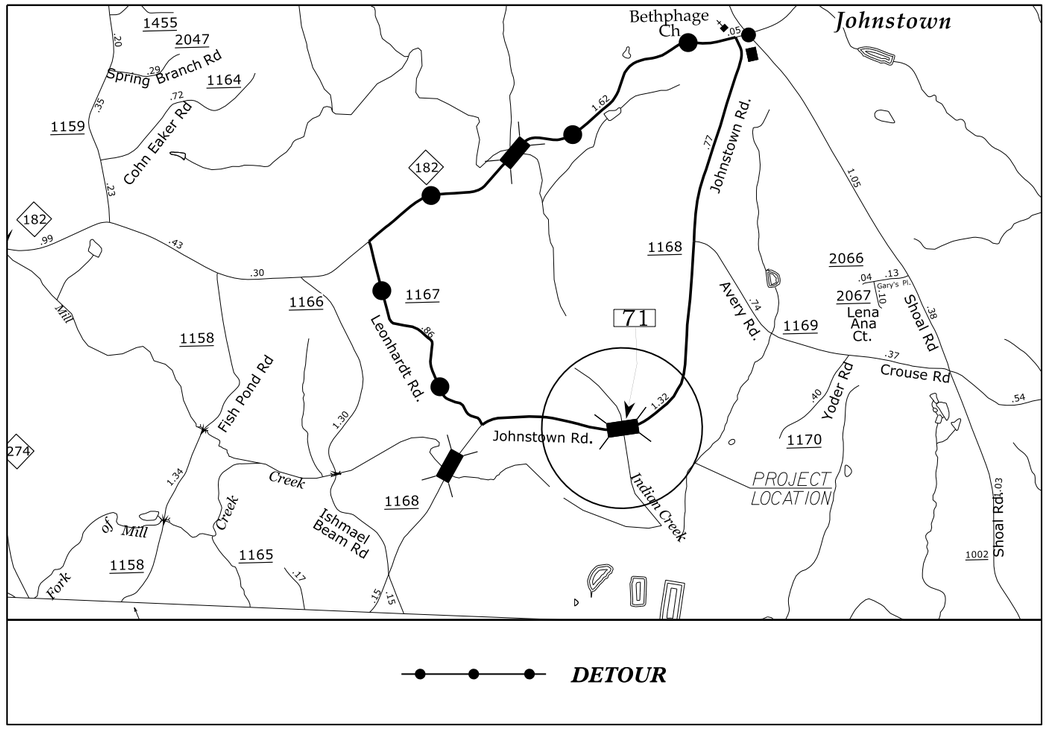
REVISIONS 5/2023

01-MAY-2023 09:06
S:\Surveyor Projects\ncdot\B-5853\2023 RW Staking\MTC\b5853_1s_rw04.dgn
mcornwell AT MCORNWELL-LAPTOP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

LINCOLN COUNTY



DETOUR

LOCATION: REPLACE BRIDGE NO. 71 ON SR 1168 (JOHNSTOWN ROAD) OVER INDIAN CREEK

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

PLANS PREPARED BY:

GARRETT ELLER, PE

NCDOT CONTACTS:

JOSHUA WHITE, PE
PROJECT ENGINEER

PROJECT DESIGN ENGINEER

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

INDEX OF SHEETS

SHEET NO.	TITLE
TMP-1	TITLE SHEET, VICINITY MAP, AND INDEX OF SHEETS
TMP-1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, AND LEGEND
TMP-1B	TRANSPORTATION OPERATIONS PLAN: (MANAGEMENT STRATEGIES, GENERAL NOTES, AND LOCAL NOTES)
TMP-2	CLOSURE AND OFFSITE DETOUR
TMP-3	SIGN AND DEVICE LEGEND
TMP-4	SPECIAL SIGN DESIGN(S)

SHEET NO.
TMP-1

B-5853

TIP PROJECT:

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PARRISH & PARTNERS

APPROVED: _____

DATE: _____

Signed by: Garrett Eller
BC79D682EBAA46A...
SEAL
8/28/2024

NORTH CAROLINA PROFESSIONAL SEAL 056365 ENGINEER GARRETT R. ELLER

8/27/2024
PW:\\parrish-pw.bentley.com:parrish-pw\Documents\Surface Transportation\B-5853\Project Design\Traffic Control\B-5853_TMP1.dgn
User:GEller

PROJ. REFERENCE NO.	SHEET NO.
B-5853	TMP-1A

ROADWAY STANDARD DRAWINGS

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

STD. NO.	TITLE
1101.03	TEMPORARY ROAD CLOSURES
1110.01	STATIONARY WORK ZONE SIGNS
1145.01	BARRICADES
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO LANE AND MULTI-LANE ROADWAYS
1205.12	PAVEMENT MARKINGS - BRIDGES
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION
1264.01	OBJECT MARKERS - TYPES
1264.02	OBJECT MARKERS - INSTALLATION

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
- USER DEFINED (IF NEEDED)
- USER DEFINED (IF NEEDED)

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

PARRISH & PARTNERS

APPROVED: _____

DATE: _____

Signed by: Garrett Eller
8C75D882EBAA46A...
8/28/2024

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 056365 ENGINEER GARRETT R. ELLER

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

PROJ. REFERENCE NO.	SHEET NO.
B-5853	TMP-1B

MANAGEMENT STRATEGIES

OFF-SITE DETOURS / USE OF ALTERNATIVE ROUTES

THE OFF-SITE DETOUR WILL INCLUDE LEONHARDT RD (SR 1167) AND NC 182

PHASING

STEP 1. USING ROADWAY STANDARD DRAWINGS 1101.03, SHEET 1 AND TMP-2 INSTALL OFFSITE DETOUR SIGNS AND TRAFFIC CONTROL DEVICES AND CLOSE JOHNSTOWN RD (SR 1168) TO THROUGH TRAFFIC.

STEP 2. COMPLETE THE FOLLOW WITHIN THE ROAD CLOSURE:

A) REMOVE EXISTING BRIDGE AND ANY SIGNS WITHIN PROJECT LIMITS

B) CONSTRUCT THE PROPOSED BRIDGE AND ROADWAY APPROACHES INCLUDING THE FINAL LAYER OF SURFACE COURSE AND FINAL PAVEMENT MARKINGS

STEP 3. REMOVE ALL TRAFFIC CONTROL DEVICES AND DETOUR SIGNS AN OPEN JOHNSTOWN RD (SR 1168) TO THROUGH TRAFFIC.

GENERAL NOTES / LOCAL NOTES

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

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

TRAFFIC PATTERN ALTERATIONS

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

SIGNING

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

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

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

COVER OR REMOVE ALL SIGNS REQUIRED FOR THE OFF-SITE DETOUR WHEN THE DETOUR IS NOT IN OPERATION.

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

TRAFFIC CONTROL DEVICES

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

PAVEMENT MARKINGS

F) INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE

AS FOLLOWS:

ROAD NAME	MARKING	MARKER
JOHNSTOWN RD.	PAINT	NONE
BRIDGE	PAINT	NONE

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

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

I) UNLESS OTHERWISE SPECIFIED, HEATED-IN-PLACE THERMOPLASTIC MAY BE USED IN LIEU OF EXTRUDED THERMOPLASTIC FOR STOP BARS, SYMBOLS, CHARACTERS AND DIAGONALS. IF HEATED-IN-PLACE IS USED, IT SHALL BE PAID FOR USING THE EXTRUDED THERMOPLASTIC PAY ITEM.

PARRISH & PARTNERS

APPROVED: _____

DATE: _____

Signed by: Garrett Eller
8/28/2024

SEAL
056365
NORTH CAROLINA PROFESSIONAL ENGINEER GARRETT R. ELLER
SEAL

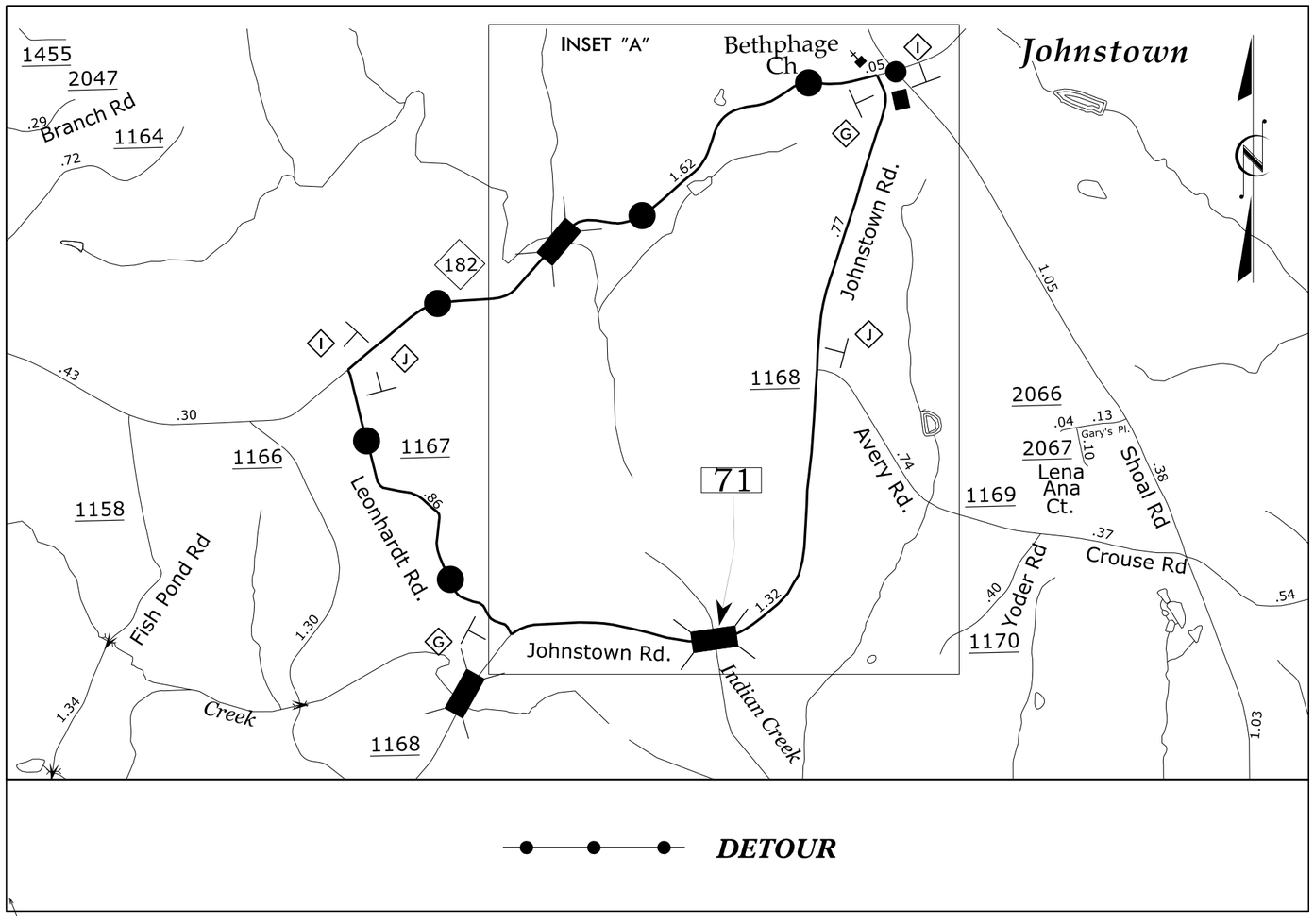
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

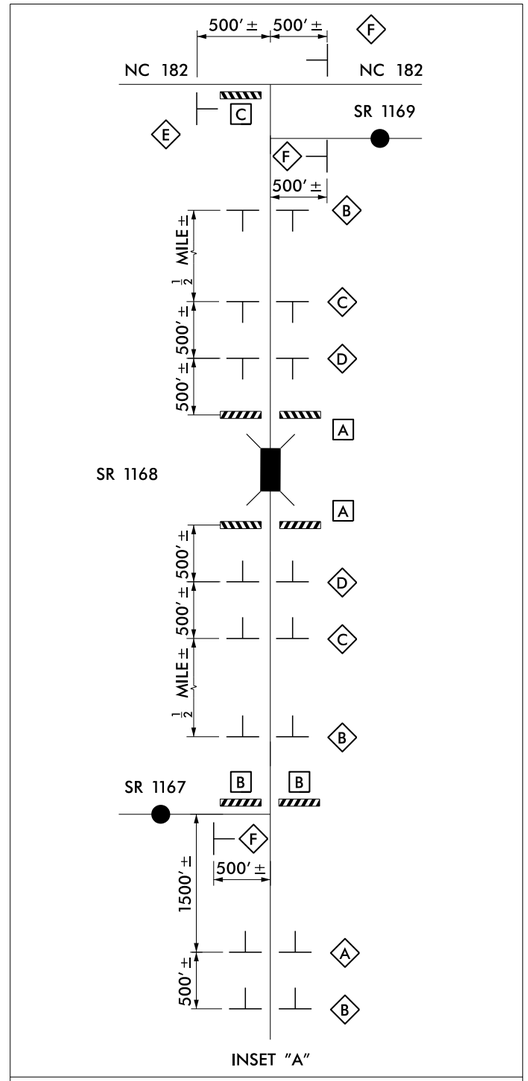
TRANSPORTATION OPERATIONS PLAN

8/27/2024
P:\\parrish-pw.bentley.com:parrish-pw\Documents\Surface Transportation\B-5853\Project Design\Traffic Control\B-5853_TMP1B.dgn
User:GEller

PROJ. REFERENCE NO.	SHEET NO.
B-5853	TMP-2



LOCATION: REPLACE BRIDGE NO. 71 ON SR 1168 (JOHNSTOWN ROAD) OVER INDIAN CREEK



REFER TO ROADWAY STANDARD DRAWING 1101.03, SHEET 1 OF 9 FOR APPLICABLE NOTES.

APPROVED: _____

DATE: _____

SEAL

Signed by: Garrett Eller
8C790B82EBAA46A...
8/28/2024

NORTH CAROLINA PROFESSIONAL SEAL 056365 ENGINEER GARRETT R. ELLER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

PARRISH & PARTNERS

8/27/2024
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User:dEller

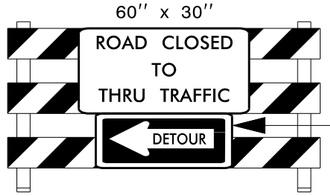
PROJ. REFERENCE NO.	SHEET NO.
B-5853	TMP-3

R11-2
48″ x 30″

TYPE III BARRICADE

A

R11-4
60″ x 30″

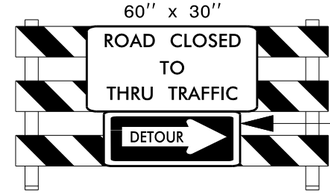


M4-10L
48″ x 18″

TYPE III BARRICADE

B

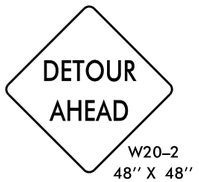
R11-4
60″ x 30″



M4-10R
48″ x 18″

TYPE III BARRICADE

C



W20–2
48″ X 48″

A

W20–3
48″ X 48″

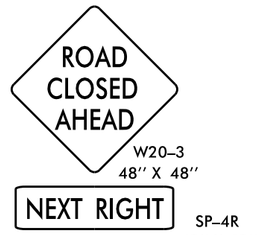
B

W20–3
48″ X 48″

C

W20–3
48″ X 48″

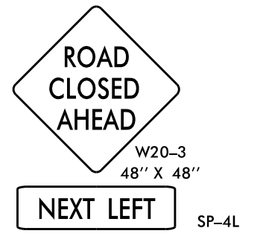
D



W20–3
48″ X 48″

SP–4R
42″ X 12″

E



W20–3
48″ X 48″

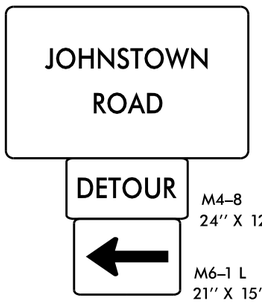
SP–4L
42″ X 12″

F

M4–8 A
24″ X 18″

G

SSD 48″ X 30″

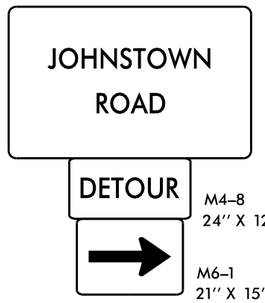


M4–8
24″ X 12″

M6–1 L
21″ X 15″

I

SSD 48″ X 30″



M4–8
24″ X 12″

M6–1
21″ X 15″

J

APPROVED: _____

DATE: _____

Signed by: Garrett Eller
8/28/2024

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 056365 ENGINEER GARRETT R. ELLER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

PARRISH & PARTNERS

8/27/2024
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User:GEller

PROJ. REFERENCE NO.	SHEET NO.
B-5853	TMP-4

SIGN NUMBER: name
TYPE: STATIONARY
QUANTITY: SEE PLANS

SIGN WIDTH: 4'-0"
HEIGHT: 2'-6"
TOTAL AREA: 10.0 Sq.Ft.

BORDER TYPE: INSET
RECESS: 0"
WIDTH: 0.75"
RADII: 2.25"

NO. Z BARS:
LENGTH:

BACKG COLOR: Fluorescent Orange
COPY COLOR: White

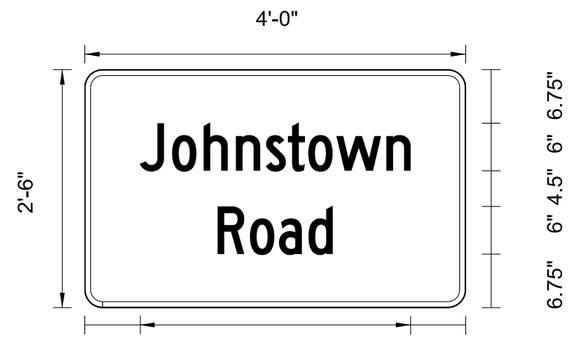
SYMBOL	X	Y	WID	HT

MAT'L: 0.080" (2.0 mm) ALUMINUM

USE NOTES: 1,2

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

DESIGN BY: CH
PROJECT ID: B-5853
CHECKED BY: CR
LOCATION: OFFSITE DETOUR
Jul 23, 2021
DIV: 12



Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter locations are panel edge to lower left corner

																									Series/Size Text Length
	J	o	h	n	s	t	o	w	n																C 2000
	6.9	11	15	19.1	22.8	25.6	28.2	31.7	38																34.1
	R	o	a	d																					C 2000
	16.7	20.8	24.5	28.2																					14.5

FILENAME: B-5853_TMP4

NORTH CAROLINA D.O.T. SIGN DETAIL

APPROVED: _____

DATE: _____

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 056365 ENGINEER GARRETT R. ELLER

Signed by: Garrett Eller
8/28/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SPECIAL SIGN DESIGN

8/27/2024
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User:GEller

T.I.P.: B-5853

CONTRACT: DL00333

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING PLAN

LINCOLN COUNTY

LOCATION: REPLACE BRIDGE NO. 71 ON SR 1168 (JOHNSTOWN ROAD) OVER INDIAN CREEK

TIP NO.	SHEET NO.
B-5853	PMP-1

APPROVED: _____

DATE: _____

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 056365 ENGINEER GARRETT R. ELLER

Signed by: Garrett Eller

8/28/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ROADWAY STANDARD DRAWING

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

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

GENERAL NOTES

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

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

ROAD NAME	MARKING	MARKER
JOHNSTOWN RD.	PAINT	NONE

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

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

D) 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.

INDEX

PLAN PREPARED BY: PARRISH AND PARTNERS

ADAM PARRISH, PE SIGNING & DELINEATION PROJECT ENGINEER

GARRETT ELLER, PE SIGNING & DELINEATION PROJECT DESIGN ENGINEER

PARRISH & PARTNERS
6701 CARMEL RD
SUITE 210
CHARLOTTE, NC 28226

8/27/2024
\B-5853_RDY_PM.SHT1
11:05:04 PM

TIP NO.	SHEET NO.
B-5853	PMP-2

APPROVED: _____

DATE: _____

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 056365 ENGINEER GARRETT R. ELLER

Signed by: Garrett Eller
9C790582EBAA46A...
8/28/2024

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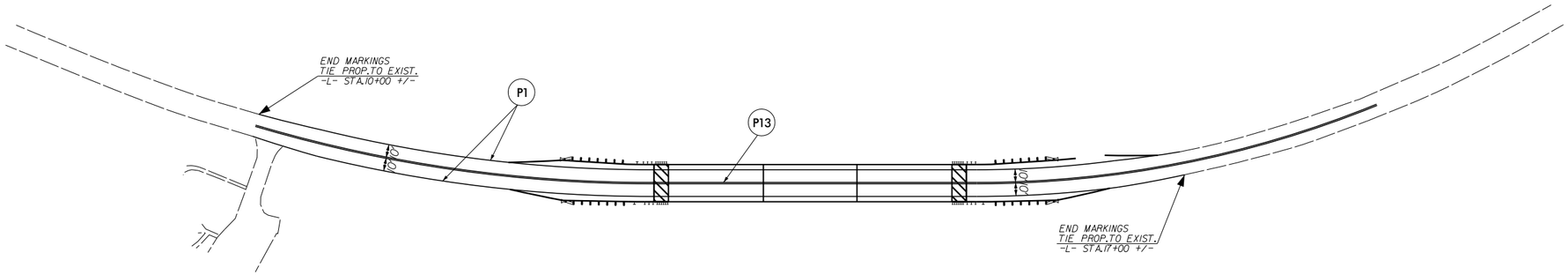
PARRISH & PARTNERS
6701 CARMEL RD
SUITE 210
CHARLOTTE, NC 28226

NAD 83/2011



PAVEMENT MARKING SCHEDULE

SYMBOL	DESCRIPTION
P1	WHITE EDGELINE (PAINT, 4″)
P13	YELLOW DOUBLE CENTER (PAINT, 4″)

PAVEMENT MARKING QUANTITIES

P1 (2 COATS) = 2800 LF

P13 (2 COATS) = 2800 LF

8/27/2024
B-5853_RDY_PM_SHT2
11:06:31 PM

PAVEMENT MARKING DETAIL

TIP PROJECT: B-5853

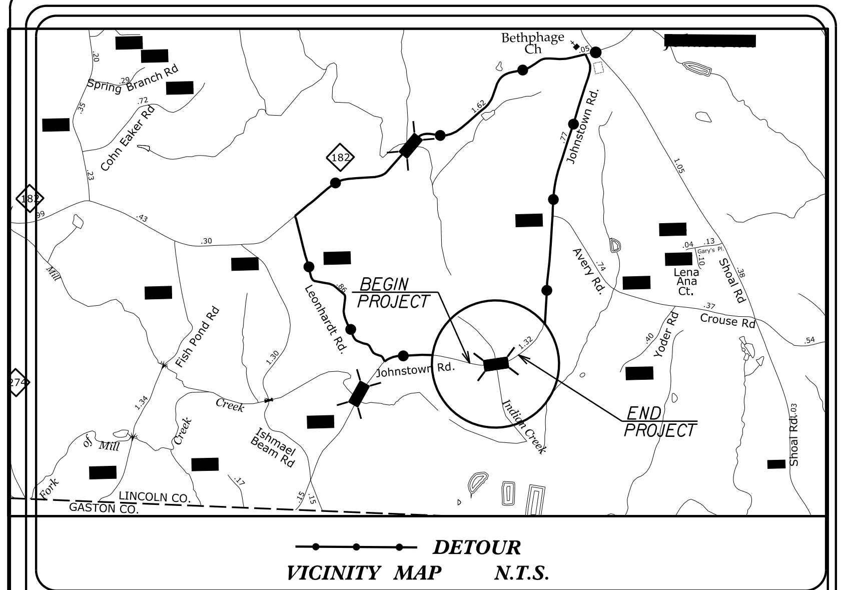
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5853	EC-1	7

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
45806.1	N/A	P.E.
45806.2	N/A	R/W, UTL
45806.3	N/A	CONSTRUCTION

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

LINCOLN COUNTY



VICINITY MAP
NOT TO SCALE

LOCATION: REPLACE BRIDGE NO. 71 ON SR 1168 (JOHNSTOWN ROAD) OVER INDIAN CREEK

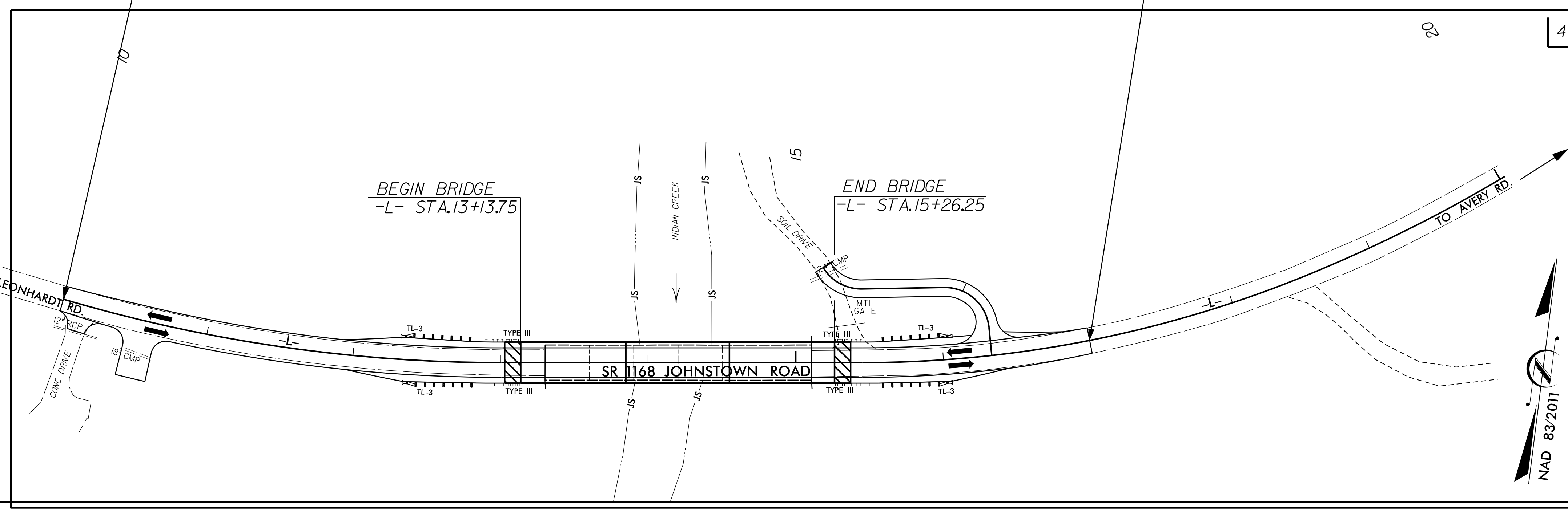
TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURE

ENVIRONMENTALLY SENSITIVE AREA(S) EXIST ON THIS PROJECT

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

BEGIN TIP PROJECT B-5853
-L- STA.10+00.00

END TIP PROJECT B-5853
-L- STA.17+00.00



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 PROJECT
to Sta. END PROJECT
Refer To E. C. Special Provisions for Special Considerations.

GRAPHIC SCALE

50 25 0 50 100
PLANS

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

PARRISH&PARTNERS

Prepared In the Office of:

PARRISH AND PARTNERS
6701 CARMEL RD
SUITE 210
CHARLOTTE, NC 28226

Designed by:

KEVIN HIGGINS, PE — 4000
NAME — LEVEL III CERTIFICATION NO.

Roadway Standard Drawings

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

PROJECT REFERENCE NO.	SHEET NO.
B-5853	EC-02

PARRISH & PARTNERS
6701 CARMEL ROAD
SUITE 210
CHARLOTTE, NC 28226

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

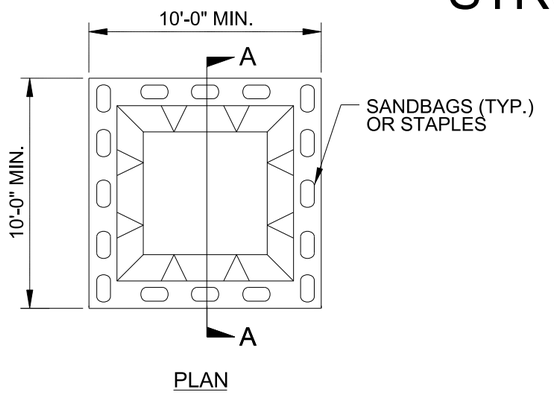
EROSION & SEDIMENT CONTROL LEGEND

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

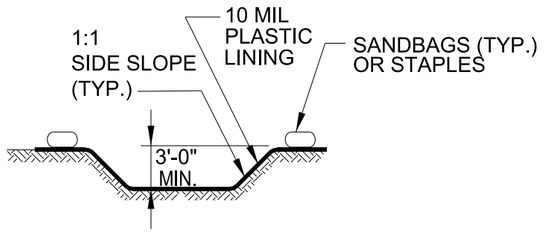
Std. #	Description	Symbol
1633.01	Temporary Rock Silt Check Type A	
1633.02	Temporary Rock Silt Check Type B	
1633.03	Temporary Rock Silt Check Type A with Excelsior Matting and Flocculant	
1634.01	Temporary Rock Sediment Dam Type A	
1634.02	Temporary Rock Sediment Dam Type B	
1635.01	Rock Pipe Inlet 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.
B-5853	EC-02A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

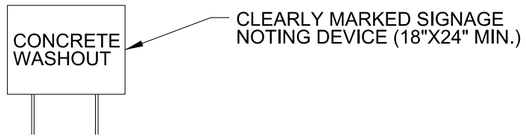
ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER



PLAN



SECTION A-A



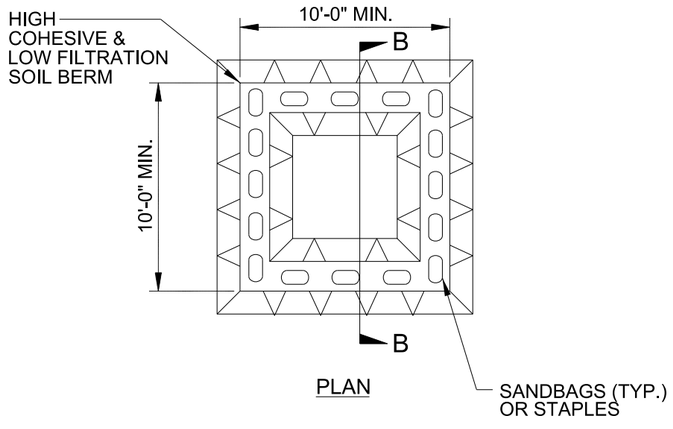
NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

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

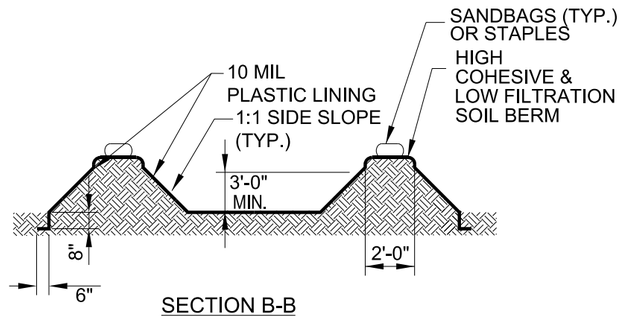
3.CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARY MARKED WITH SIGNAGE NOTING DEVICE.

BELOW GRADE WASHOUT STRUCTURE

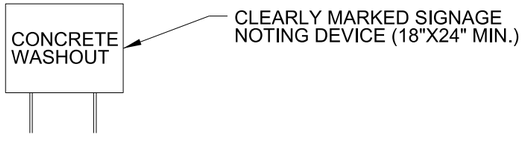
NOT TO SCALE



PLAN



SECTION B-B



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.
B-5853	EC-3
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION SUMMARY SHEET

MATTING FOR EROSION CONTROL

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
STRAW					
4	L	10+75	11+25	LT	60
4	L	10+40	10+70	RT	25
			STRAW SUBTOTAL		85
			MATTING SUBTOTAL		85
MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER					3500
				TOTAL	3585
				SAY	3600

RIPRAP CL B FOR EROSION CONTROL

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (TONS)
			SUBTOTAL		
MISCELLANEOUS RIPRAP TO BE INSTALLED AS DIRECTED BY THE ENGINEER					
				TOTAL	
				SAY	

PERMANENT SOIL REINFORCEMENT MAT

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

PROJECT REFERENCE NO.	SHEET NO.
B-5853	EC-3A

PARRISH & PARTNERS
6701 CARMEL ROAD
SUITE 210
CHARLOTTE, NC 28226

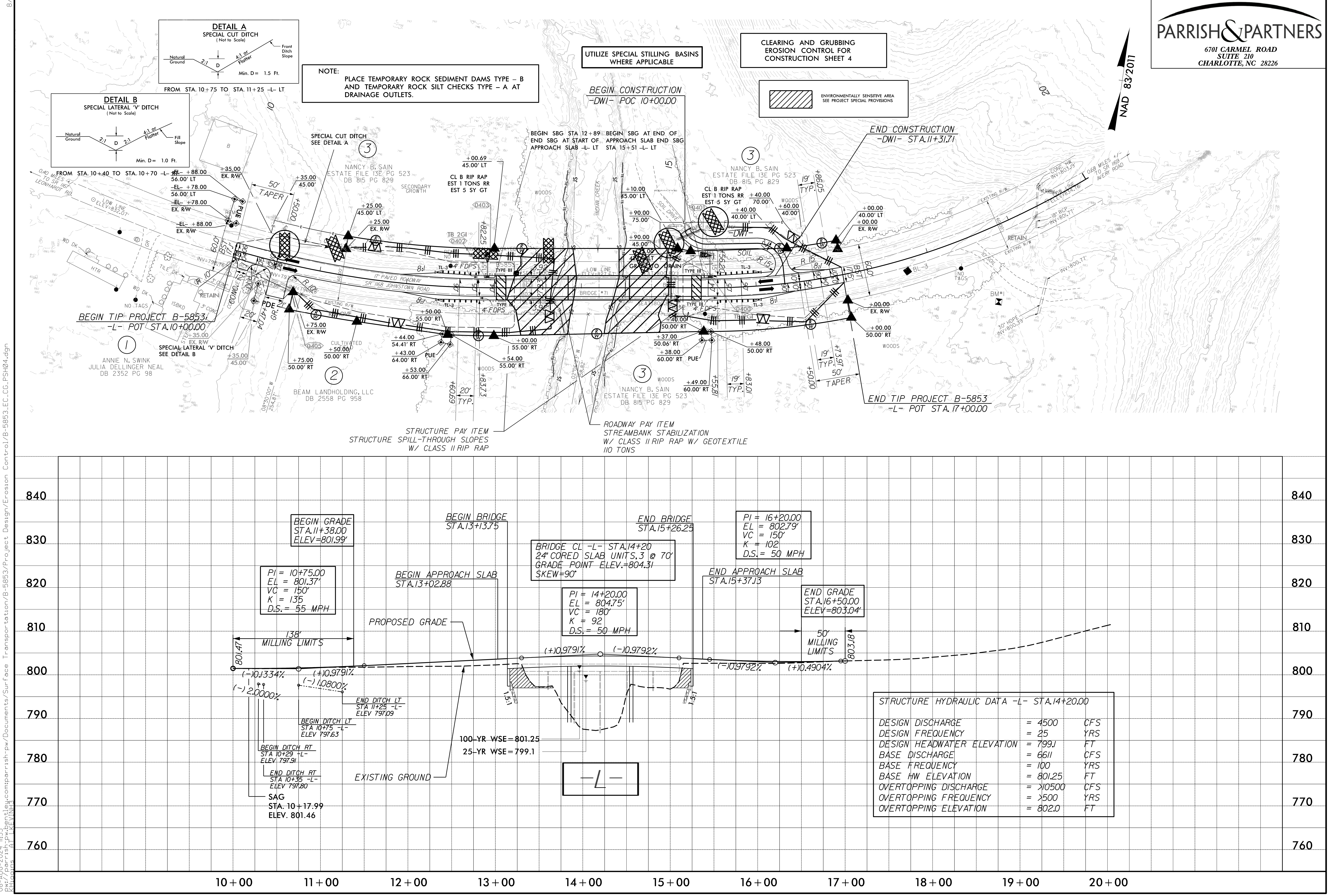
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

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

PROJECT REFERENCE NO.	SHEET NO.
B-5853	EC-04/CONST.4

PARRISH & PARTNERS
6701 CARMEL ROAD
SUITE 210
CHARLOTTE, NC 28226

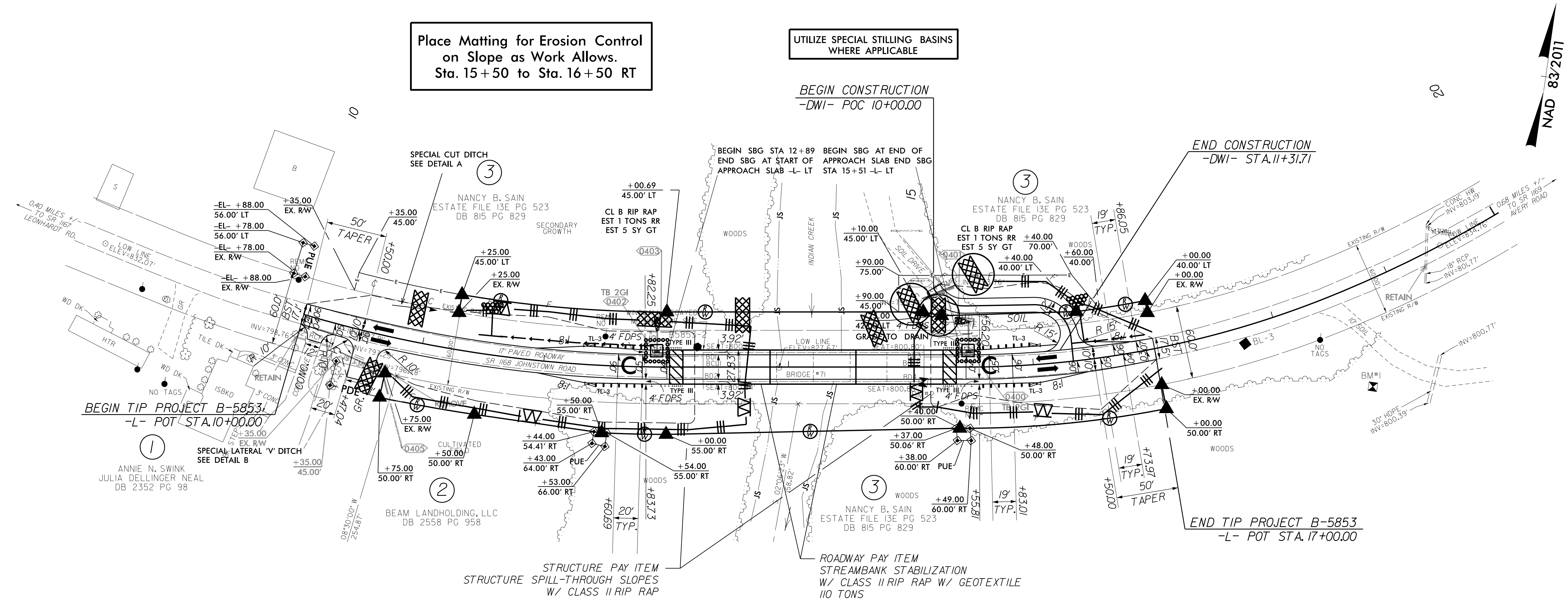

DETAIL A
SPECIAL CUT DITCH
(Not to Scale)
Min. D= 1.5 Ft.
FROM STA. 10+75 TO STA. 11+25 -L- LT
DETAIL B
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Min. D= 1.0 Ft.
FROM STA. 10+40 TO STA. 10+70 -L- RT
NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE – B AND TEMPORARY ROCK SILT CHECKS TYPE – A AT DRAINAGE OUTLETS.
UTILIZE SPECIAL STILLING BASINS WHERE APPLICABLE
CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 4
ENVIRONMENTALLY SENSITIVE AREA SEE PROJECT SPECIAL PROVISIONS
NAD 83/2011
BEGIN CONSTRUCTION -DW1- POC 10+00.00
END CONSTRUCTION -DW1- STA.11+31.71
BEGIN SBG STA 12+89 END SBG AT START OF APPROACH SLAB -L- LT
BEGIN SBG AT END OF APPROACH SLAB END SBG STA 15+51 -L- LT
SPECIAL CUT DITCH SEE DETAIL A
NANCY B. SAIN ESTATE FILE 13E PG 523 DB 815 PG 829
ANNIE N. SWINK JULIA DELLINGER NEAL DB 2352 PG 98
BEAM LANDHOLDING, LLC DB 2558 PG 958
BEGIN TIP PROJECT B-5853 -L- POT STA.10+00.00
END TIP PROJECT B-5853 -L- POT STA.17+00.00
SPECIAL LATERAL 'V' DITCH SEE DETAIL B
CL B RIP RAP EST 1 TONS RR EST 5 SY GT
STRUCTURE PAY ITEM STRUCTURE SPILL-THROUGH SLOPES W/ CLASS II RIP RAP
ROADWAY PAY ITEM STREAMBANK STABILIZATION W/ CLASS II RIP RAP W/ GEOTEXTILE 110 TONS
SR 1168 JOHNSTOWN ROAD
BEGIN GRADE STA.11+38.00 ELEV=801.99'
PI = 10+75.00 EL = 801.37' VC = 150' K = 135 D.S.= 55 MPH
BEGIN BRIDGE STA.13+13.75
BEGIN APPROACH SLAB STA.13+02.88
BRIDGE CL -L- STA.14+20 24" CORED SLAB UNITS,3 @ 70' GRADE POINT ELEV.=804.31 SKEW=90°
PI = 14+20.00 EL = 804.75' VC = 180' K = 92 D.S.= 50 MPH
END BRIDGE STA.15+26.25
END APPROACH SLAB STA.15+37.13
PI = 16+20.00 EL = 802.79' VC = 150' K = 102 D.S.= 50 MPH
END GRADE STA.16+50.00 ELEV=803.04'
138' MILLING LIMITS
50' MILLING LIMITS
PROPOSED GRADE
EXISTING GROUND
100-YR WSE=801.25
25-YR WSE=799.1
SAG STA. 10+17.99 ELEV. 801.46
-L-

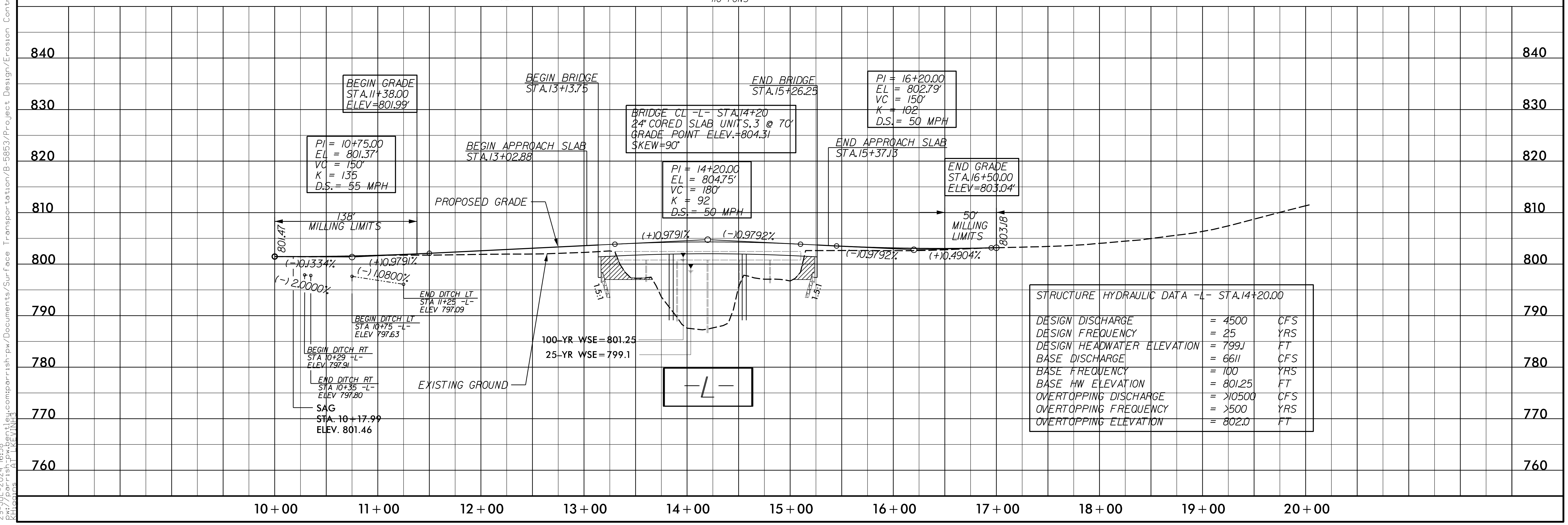
STRUCTURE HYDRAULIC DATA -L- STA.14+20.00			
DESIGN DISCHARGE	=	4500	CFS
DESIGN FREQUENCY	=	25	YRS
DESIGN HEADWATER ELEVATION	=	799.1	FT
BASE DISCHARGE	=	6611	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	801.25	FT
OVERTOPPING DISCHARGE	=	>10500	CFS
OVERTOPPING FREQUENCY	=	>500	YRS
OVERTOPPING ELEVATION	=	802.0	FT

PROJECT REFERENCE NO.	SHEET NO.
B-5853	EC-05/CONST.4

PARRISH & PARTNERS
6701 CARMEL ROAD
SUITE 210
CHARLOTTE, NC 28226

8/17/99


Place Matting for Erosion Control on Slope as Work Allows. Sta. 15+50 to Sta. 16+50 RT
UTILIZE SPECIAL STILLING BASINS WHERE APPLICABLE
BEGIN CONSTRUCTION -DWI- POC 10+00.00
END CONSTRUCTION -DWI- STA.11+31.71
NAD 83/2011
SPECIAL CUT DITCH SEE DETAIL A
NANCY B. SAIN ESTATE FILE 13E PG 523 DB 815 PG 829
BEGIN SBG STA 12+89 END SBG AT START OF APPROACH SLAB -L- LT
BEGIN SBG AT END OF APPROACH SLAB END SBG STA 15+51 -L- LT
CL B RIP RAP EST 1 TONS RR EST 5 SY GT
SECONDARY GROWTH
WOODS
INDIAN CREEK
SR 1168 JOHNSTOWN ROAD
17' PAVED ROADWAY
BRIDGE #71
LOW LINE
BEGIN TIP PROJECT B-5853 -L- POT STA.10+00.00
END TIP PROJECT B-5853 -L- POT STA. 17+00.00
ANNIE N. SWINK JULIA DELLINGER NEAL DB 2352 PG 98
BEAM LANDHOLDING, LLC DB 2558 PG 958
NANCY B. SAIN ESTATE FILE 13E PG 523 DB 815 PG 829
SPECIAL LATERAL 'V' DITCH SEE DETAIL B
STRUCTURE PAY ITEM STRUCTURE SPILL-THROUGH SLOPES W/ CLASS II RIP RAP
ROADWAY PAY ITEM STREAMBANK STABILIZATION W/ CLASS II RIP RAP W/ GEOTEXTILE 110 TONS
0.40 MILES +/- TO SR 1167 LEONHARDT RD.
0.48 MILES +/- TO SR 1169 AVERY ROAD
50' TAPER
19' TYP.
20' TYP.
BM#1
NO TAGS
RETAIN
CULTIVATED


840
830
820
810
800
790
780
770
760
BEGIN GRADE STA.11+38.00 ELEV=801.99'
PI = 10+75.00 EL = 801.37' VC = 150' K = 135 D.S.= 55 MPH
BEGIN BRIDGE STA.13+13.75
BEGIN APPROACH SLAB STA.13+02.88
BRIDGE CL -L- STA.14+20 24" CORED SLAB UNITS,3 @ 70' GRADE POINT ELEV.=804.31 SKEW=90°
PI = 14+20.00 EL = 804.75' VC = 180' K = 92 D.S.= 50 MPH
END BRIDGE STA.15+26.25
END APPROACH SLAB STA.15+37.13
PI = 16+20.00 EL = 802.79' VC = 150' K = 102 D.S.= 50 MPH
END GRADE STA.16+50.00 ELEV=803.04'
138' MILLING LIMITS
50' MILLING LIMITS
PROPOSED GRADE
EXISTING GROUND
(+)0.9791%
(-)0.9792%
(-)0.1334%
(+)0.9791%
(-)1.0800%
(-)2.0000%
(-)0.9792%
(+)0.4904%
801.47
803.18
END DITCH LT STA 11+25 -L- ELEV 797.09
BEGIN DITCH LT STA 10+75 -L- ELEV 797.63
BEGIN DITCH RT STA 10+29 -L- ELEV 797.91
END DITCH RT STA 10+35 -L- ELEV 797.80
SAG STA. 10+17.99 ELEV. 801.46
100-YR WSE=801.25
25-YR WSE=799.1
-L-
10+00
11+00
12+00
13+00
14+00
15+00
16+00
17+00
18+00
19+00
20+00

STRUCTURE HYDRAULIC DATA -L- STA.14+20.00

DESIGN DISCHARGE	= 4500	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HEADWATER ELEVATION	= 799.1	FT
BASE DISCHARGE	= 6611	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 801.25	FT
OVERTOPPING DISCHARGE	= >10500	CFS
OVERTOPPING FREQUENCY	= >500	YRS
OVERTOPPING ELEVATION	= 802.0	FT

29-JUL-2024 16:58
Pw:\\parrish-pw.bentley.com:parrish-pw/Documents/Surface Transportation/B-5853/Project Design/Erosion Control/B-5853_EC_FINAL_PSH04.dgn

05/22/23

PROJECT: B-5853

T.I.P. NO.	SHEET NO.
B-5853	UO-1

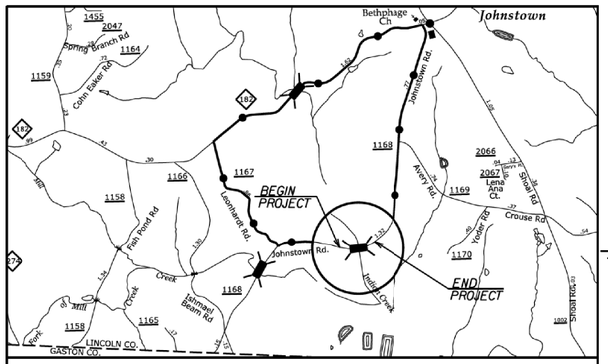
NOTE:
ALL UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS.
NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR UTILITY WORK SHOWN ON THIS SHEET.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES BY OTHERS PLANS
LINCOLN COUNTY

LOCATION: REPLACE BRIDGE NO. 71 ON SR 1168 (JOHNSTOWN ROAD) OVER INDIAN CREEK

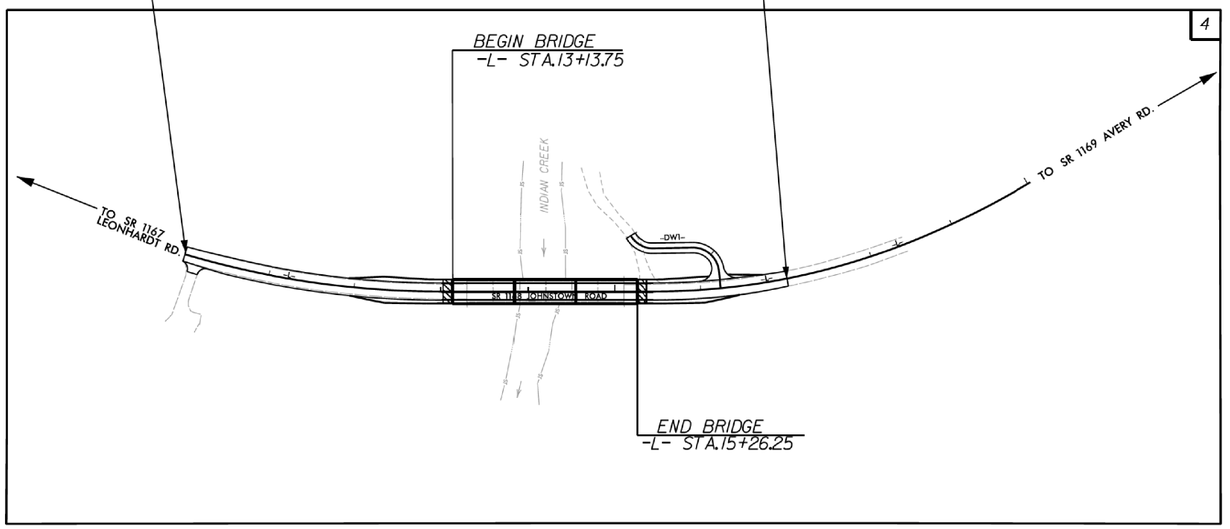
TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE



DETOUR
VICINITY MAP N.T.S.

BEGIN PROJECT B-5853
-L- STA.10+00.00

END PROJECT B-5853
-L- STA.17+00.00



NAD 83/2011

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

INDEX OF SHEETS

SHEET NO.:	*DESCRIPTION:*
UO-1	*TITLE SHEET*
UO-2	*UBO PLAN SHEET*

UTILITY OWNERS WITH CONFLICTS

(A) POWER - REMC

UCC
Utility Coordination Consultants
P.O.Box 450
Mineral Springs, NC 28108
704-844-9093

JOSH WHITE, PE — *UTILITY PROJECT MANAGER*
PROJECT UTILITY COORDINATOR
JIM CARLSON — *PROJECT UTILITY XXXX*

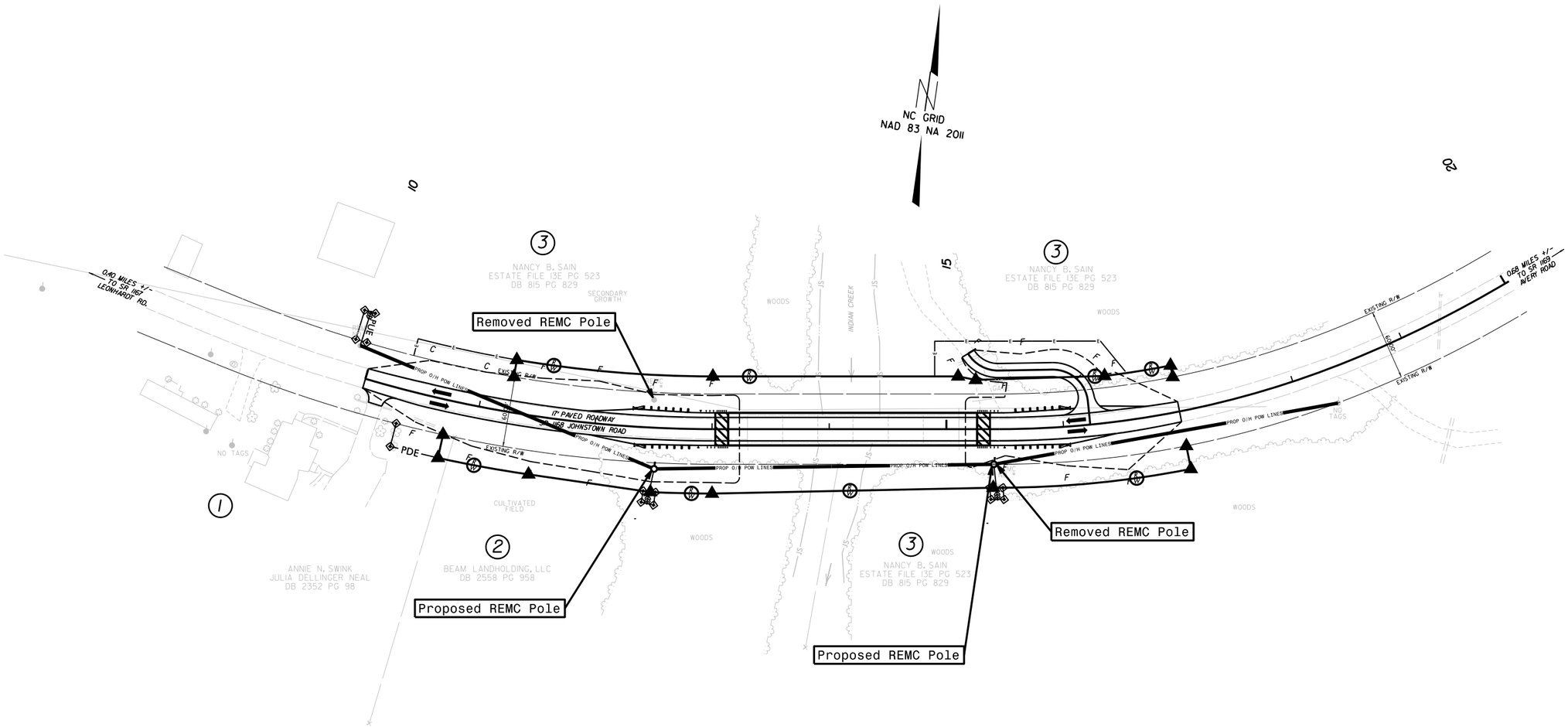
DIVISION OF HIGHWAYS
DIVISION 12
1710 E. MARION ST.
SHELBY, NC 28151

WARREN ANDERSON — *DIVISION CONTACT #1*
DIVISION CONTACT #2
DIVISION CONTACT #3
DIVISION CONTACT #4

PROJECT REFERENCE NO.	SHEET NO.
B-5853	U0-2
THIS SHEET CORRESPONDS TO RDY SHEET 4	

UTILITIES BY OTHERS

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



UCC
Utility Coordination Consultants
P.O.Box 450
Mineral Springs, NC 28108
704-844-9093
DSS

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-5853	X-1A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 056365 ENGINEER GARRETT R. ELLER

8/28/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PARRISH & PARTNERS
6701 CARMEL RD
SUITE 210
CHARLOTTE, NC 28226

CROSS SECTION INDEX OF SHEETS

ALIGNMENT	SHEET NO.	SHEET SUBTOTALS
-L-	X1 - X4	4
-DW1-	X5	1
TOTAL CROSS SECTION SHEETS		5

8/27/2024 ...\B-5853_XS Index_SHEET.dgn 10:52:39 PM

5/28/99

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJ. REFERENCE NO.	SHEET NO.
B-5853	X-1B

Approximate quantities only. Unclassified Excavation, Shoulder Borrow, Fine Grading, Clearing and Grubbing, Breaking of Existing Pavement and Removal of Existing Pavement will be paid for at the lump sum price for "Grading".

CROSS-SECTION SUMMARY

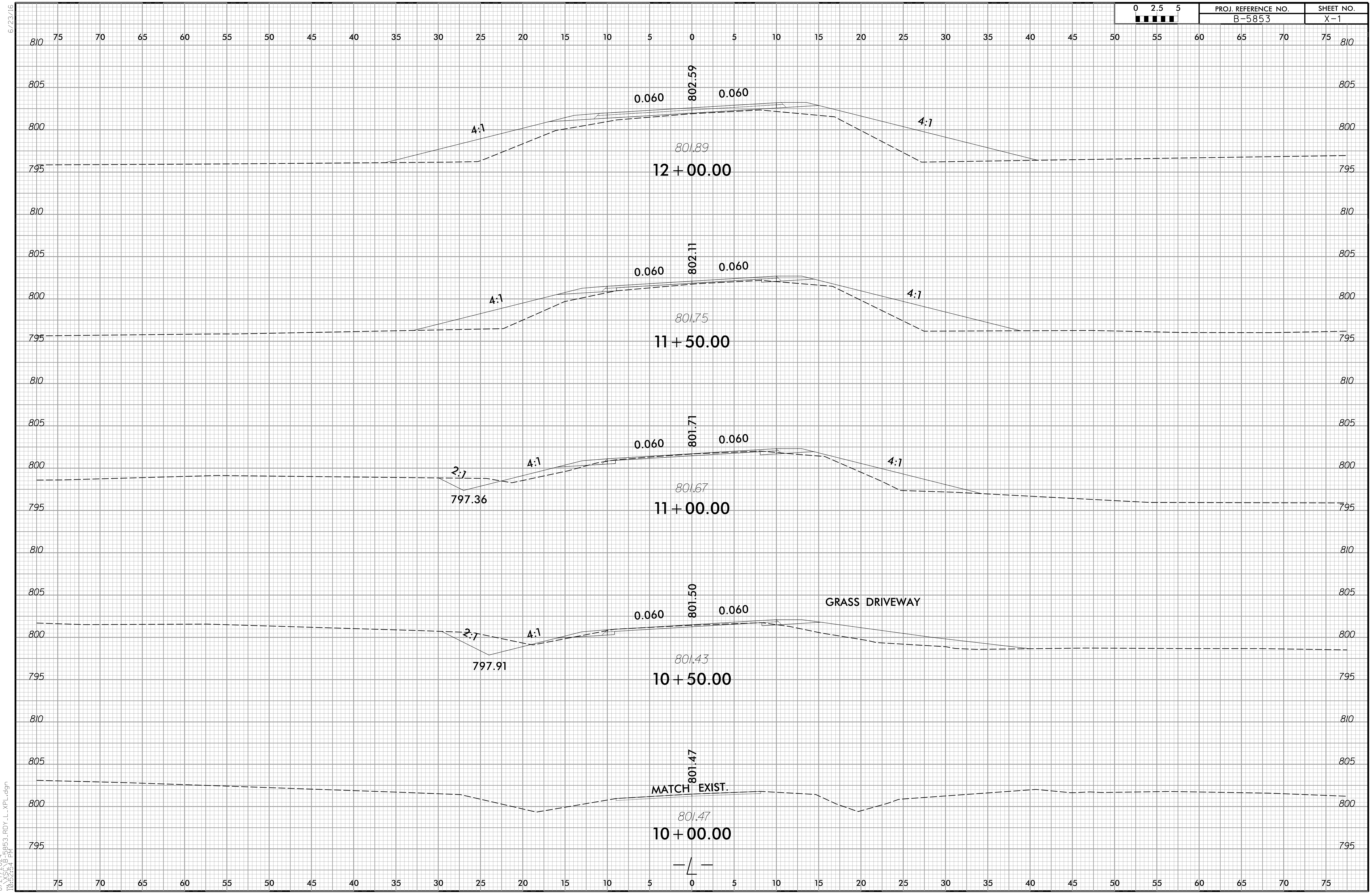
NOTE: EMBANKMENT COLUMN DOES NOT INCLUDE BACKFILL FOR UNDERCUT

Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
10+50.00	0	0
11+00.00	24	30
11+50.00	8	80
12+00.00	4	139
12+50.00	2	193
13+00.00	0	231

Station DW1	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
10+00.00	0	0
10+50.00	6	60
11+00.00	0	172

Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
15+50.00	0	0
16+00.00	2	100
16+50.00	4	150

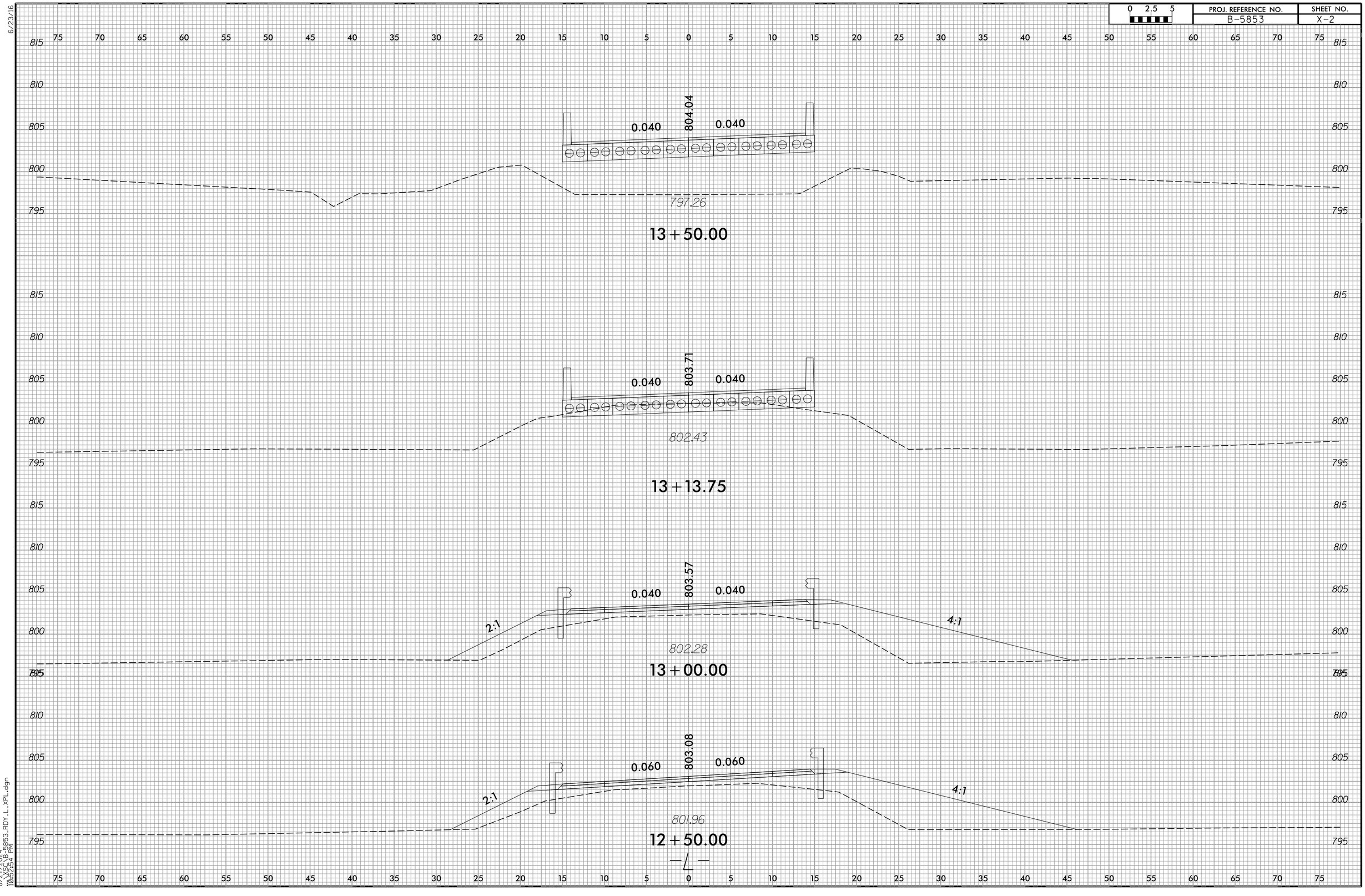
PROJ. REFERENCE NO.	SHEET NO.
B-5853	X-1



6/23/16

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
B-5853	X-2



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0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-5853	X-3

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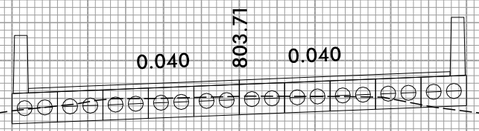
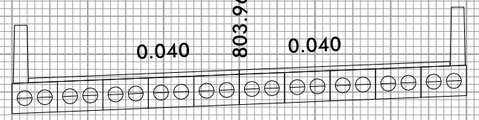
810 805 800 795



802.63

15+26.25

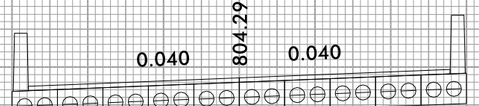


796.73

15+00.00

795.62

14+50.00



790 785

787.58

14+00.00

—L—

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0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
B-5853	X-4

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

815 810 805 800 795

803.18

MATCH EXIST.

803.18

17+00.00

803.04

0.060 0.053

4:1 4:1

802.78

16+50.00

803.13

0.060 0.060

4:1 2:1

802.62

16+00.00

803.48

0.043 0.043

4:1 2:1

802.64

15+50.00

790

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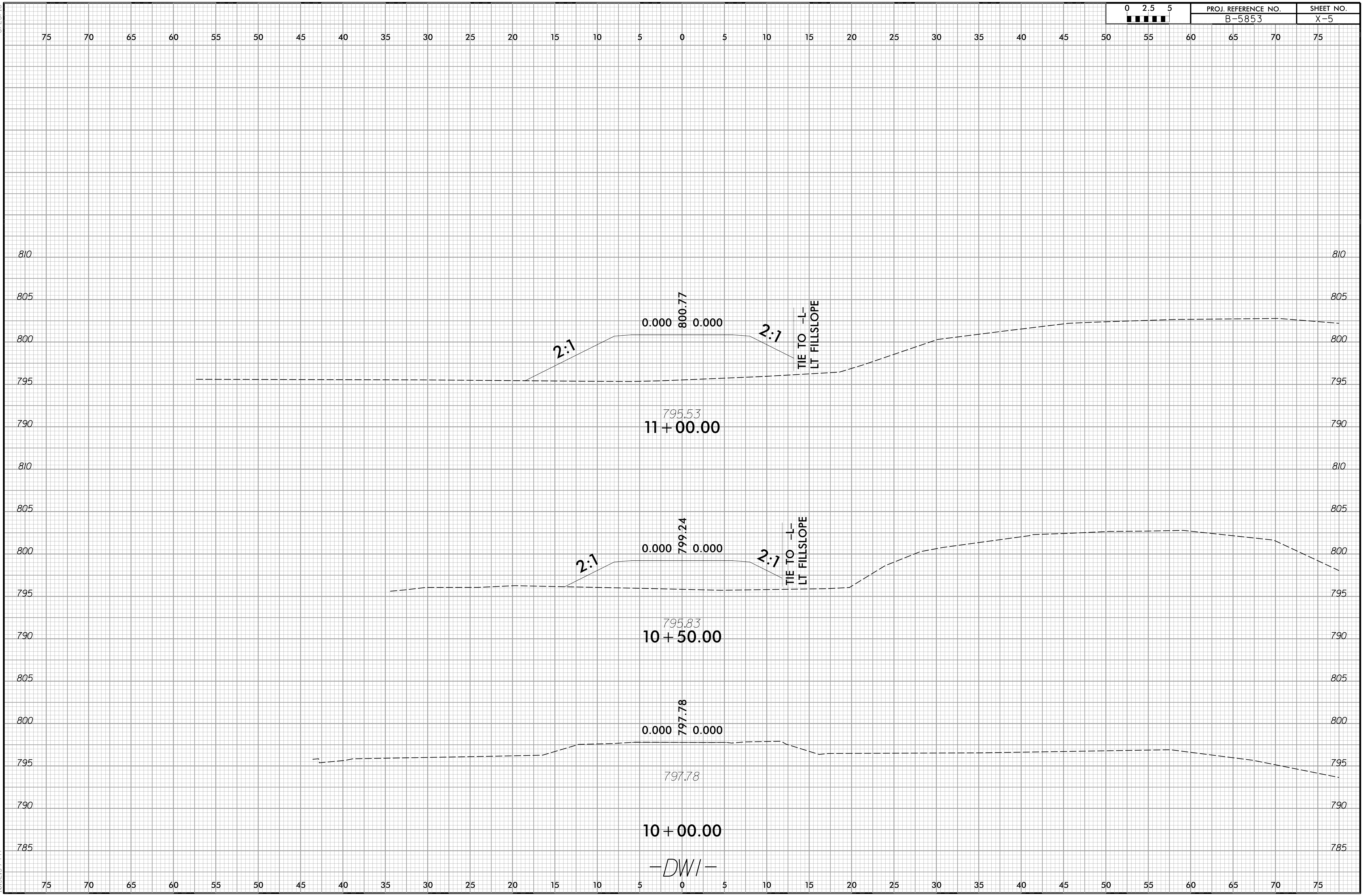
PROJ. REFERENCE NO.	SHEET NO.
B-5853	X-5



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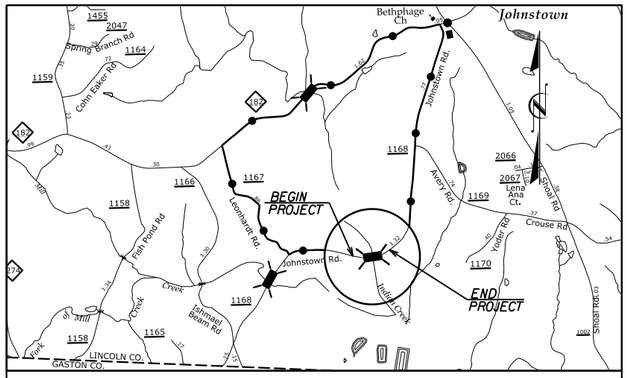
TIP PROJECT: B–5853

CONTRACT: DL00333



DETOUR

VICINITY MAP N.T.S.

STATE OF NORTH CAROLINA

DIVISION OF HIGHWAYS

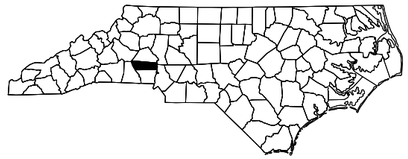
LINCOLN COUNTY

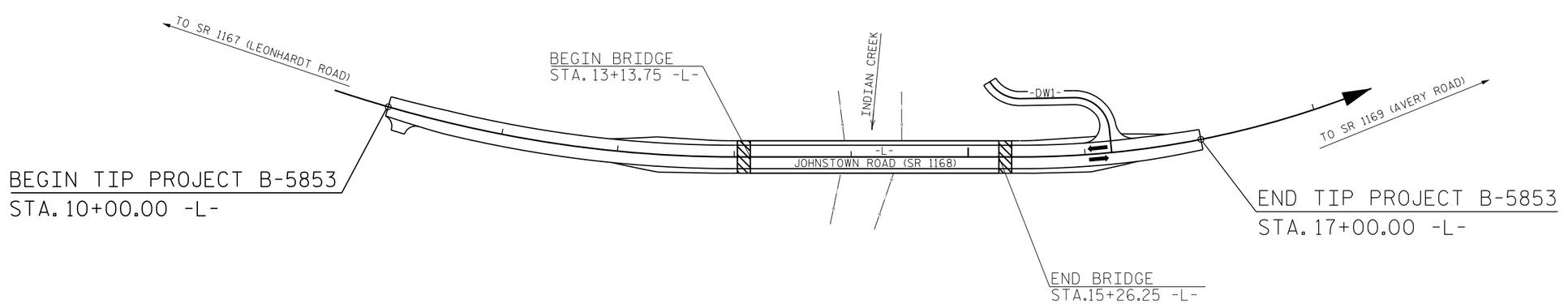
LOCATION: REPLACE BRIDGE No. 71 ON SR 1168 (JOHNSTOWN ROAD) OVER INDIAN CREEK

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B–5853		

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
45806.1.1	N/A	P.E.
45806.2.1	N/A	ROW/UTIL.
45806.3.1	N/A	CONST.





STRUCTURES

DESIGN DATA

ADT 2016 = 500
ADT 2040 = 600
K = 9%
D = 60%
T = 22% *
V = 50 MPH
* (TTST 2%, DUAL 20%)
FUNC CLASS = LOCAL
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B–5853 = 0.093 MILES
LENGTH STRUCTURE TIP PROJECT B–5853 = 0.040 MILES

TOTAL LENGTH TIP PROJECT B–5853 = 0.133 MILES

Prepared By:
PARRISH & PARTNERS
220 Horizon Dr.
Suite 100
RALEIGH, N.C. 27615

2024 STANDARD SPECIFICATIONS

LETTING DATE :

SEPTEMBER 24, 2024

Prepared For:
DIVISION OF HIGHWAYS
STRUCTURES MANAGEMENT UNIT
1000 BIRCH RIDGE DR.
RALEIGH, N.C. 27610

ADAM PARRISH, PE
PROJECT ENGINEER

WAEL ARAFAT, PE
PROJECT DESIGN ENGINEER

13+00 13+50 14+00 14+50 15+00 15+50

(+)0.9791% (-)0.9792%

PI = 14+20.00
EL = 804.75'
VC = 180'

GRADE DATA -L-

BEGIN FRONT SLOPE
STA. 13+06.57 -L-
GRADE PT. EL. = 803.64

FILL FACE @ END BENT 1
STA. 13+13.75 -L-
GRADE PT. EL. = 803.71

820 810 800 790 780

EL. 802.0±

FIX.

LOW CHORD
EL. 800.84

EL. 802.0±

EL. 797.0±

EL. 797.0±

EXISTING SUBSTRUCTURE (TYP.)

SPAN A

SPAN B

FIX. FIX.

NORMAL
WATER SURFACE
EL. 789.7

EL. 799.1
(025)

EL. 801.25
(Q100)

EXISTING SUBSTRUCTURE
(TYP.)

SPAN C

FIX. FIX.

EL. 798.0±

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

FILL FACE @ END BENT 2
STA. 15+26.25 -L-
GRADE PT. EL. = 803.71

BEGIN FRONT SLOPE
STA. 15+33.43 -L-
GRADE PT. EL. = 803.64

LOW CHORD
EL. 800.84

EL. 803.0±

EL. 798.0±

FIX.

EL. 803.0±

3'-6" TYP.

EXCAVATE TO EL. 797.0±
GRADE TO DRAIN (TYP.)

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

1½:1 SLOPE
NORMAL TO CAP
(TYP. EXCEPT
WHERE NOTED)

EL. 794.0±

TEMP. ROCK CAUSEWAY
EL. 791.7 (MIN.)

1.5:1

EL. 797.0±

EL. 797.0±

2'-0" TYP.

HP 12X53
STEEL PILES (TYP.)

CLASS II RIP RAP (TYP.)

EL. 788.0±

EL. 789.0±

EL. 787.0±

APPROX. NATURAL
GROUND

24X0.5
GALVANIZED STEEL
PIPE PILES (TYP.)

END BENT 1

STREAMBANK STABILIZATION
2'-0" THICK CLASS II RIP RAP W/
GEOTEXTILE (ROADWAY PAY ITEM)

BENT 1

STREAMBANK STABILIZATION
2'-0" THICK CLASS II RIP RAP W/
GEOTEXTILE (ROADWAY PAY ITEM)

BENT 2

END BENT 2

UNCLASSIFIED STRUCTURE
EXCAVATION

SECTION ALONG -L-

I HEAR BY CERTIFY
THESE PLANS
ARE THE
AS-BUILT PLANS

EXISTING
SUBSTRUCTURE

5'-0"

CLASS B
RIP RAP

1'-0"

1.5:1

CLASS II
RIP RAP

30" RCP CLASS V

SECTION A-A

NAD 83/2011

1'-0" MIN.
EARTH BERM
EL. 795.63 LT.
EL. 797.07 RT.

FILL FACE @
END BENT 1

W.P. #1
STA. 13+13.75 -L-

TO SR 1167

W.P. #2
STA 13+84.94 -L-

1'-0"
TYP.

TEMP. ROCK
CAUSEWAY

1.5:1

5'-0" TYP.

5'-0" 5'-0"

48'-0"

-L-

A A

1.5:1

1.5:1

BEGIN FRONT SLOPE
STA. 13+06.57 -L-

BEGIN APPROACH SLAB
STA. 13+02.88 -L-

STREAMBANK STABILIZATION
2'-0" THICK CLASS II RIP RAP W/
GEOTEXTILE (ROADWAY PAY ITEM)

INDIAN CREEK

30" RCP
CLASS V

BRIDGE I.D.
STA 14+20.00 -L-

BENT 1 CONTROL LINE

BENT 2 CONTROL LINE

35'-0¾" 35'-0¾"

71'-2¼" 70'-1½" 71'-2¼"

212'-6" (FILL FACE TO FILL FACE)

STREAMBANK STABILIZATION
2'-0" THICK CLASS II RIP RAP W/
GEOTEXTILE (ROADWAY PAY ITEM)

W.P. #3
STA 14+55.06 -L-

90°-00'-00"
(TYP.)

EXISTING
STRUCTURE

1'-0" MIN.
EARTH BERM
EL. 795.63 LT.
EL. 797.07 RT.

BEGIN FRONT SLOPE
STA. 15+33.43 -L-

END APPROACH SLAB
STA. 15+37.13 -L-

TO SR 1169

W.P. #4
STA 15+26.25 -L-

FILL FACE @
END BENT 2

CLASS II RIP RAP (TYP.)

PLAN

PILES NOT SHOWN FOR CLARITY

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT

Docusigned by:
Wael Arafat
7B07F1ACBA8A4A2...
8/12/2024

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FINAL UNLESS ALL
SIGNATURES COMPLETED

PARRISH&PARTNERS

Parrish and Partners of North Carolina, PLLC
220 Horizon Dr. Suite 100
Raleigh, NC 27615

NC License #P-1212

PROJECT NO. B-5853

LINCOLN COUNTY

STATION: 14+20.00 -L-

SHEET 1 OF 4 REPLACES BRIDGE #540071

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER INDIAN CREEK
ON SR 1168 (JOHNSTOWN ROAD)
BETWEEN SR 1167 AND SR 1169

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

DRAWN BY :	G.C. MORRIS	DATE : 05-24
CHECKED BY :	W.S. ARAFAT	DATE : 06-24
DESIGN ENGINEER OF RECORD:	O. PUIGCERVER	DATE : 05-24

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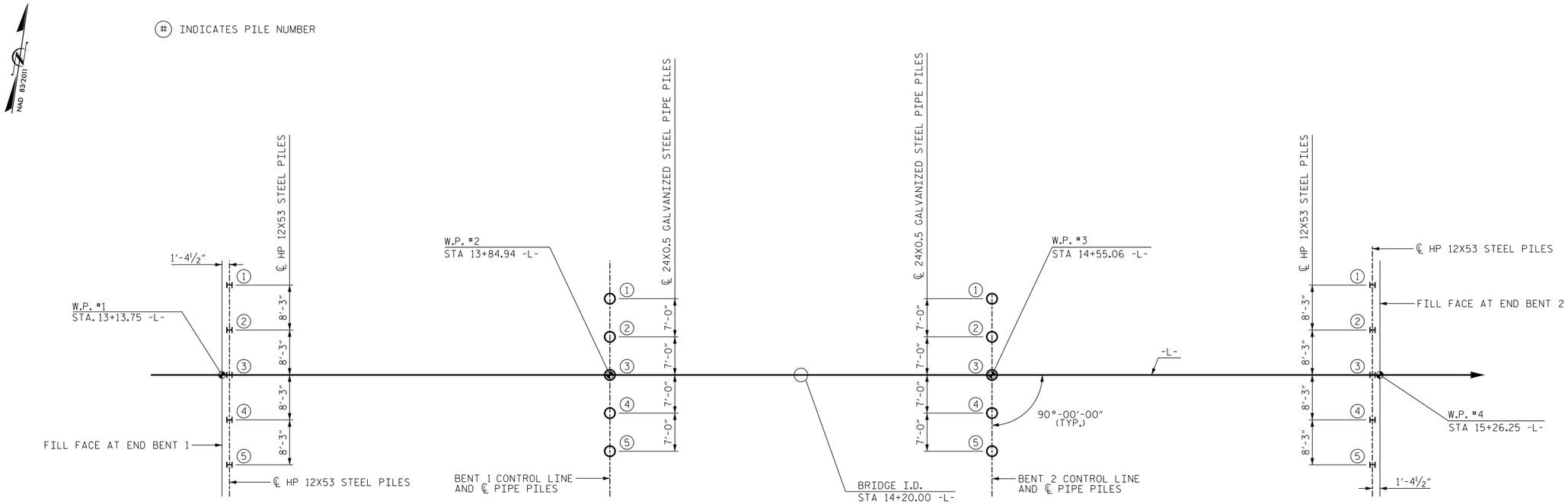

END BENT 1 | BENT 1 | BENT 2 | END BENT 2

FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO PILE CENTERLINE.

NOTES:

1 FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

2 IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 60 TO 70 FT-KIPS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT BENT No. 1 AND BENT No. 2. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.

SPECIAL NOTES:

3. DRIVE PIPE PILES AT BENT No. 2 TO A MINIMUM TIP ELEVATION OF 755.4 FEET AND WITH A MINIMUM OF 1.5 FEET OF PENETRATION INTO WEATHERED ROCK.

4. IF PILES AT BENT No. 2 DO NOT MEET THE MINIMUM TIP ELEVATION AND THE MINIMUM PENETRATION INTO WEATHERED ROCK REQUIREMENTS, DRILL PILES AT BENT No. 2 WITH A MINIMUM 5 FEET PENETRATION INTO HARD ROCK.

5. IF PILES ARE DRILLED IN AT BENT No. 2, FILL HOLES FOR PILE EXCAVATION AT BENT No. 2 WITH CONCRETE.

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT
DocuSigned by: Wael Arafat 7807F1ACBA854A2...
8/12/2024

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PARRISH & PARTNERS
Parrish and Partners of North Carolina, PLLC
220 Horizon Dr. Suite 100
Raleigh, NC 27615
NC License #P-1212

PROJECT NO. B-5853
LINCOLN COUNTY
STATION: 14+20.00 -L-
SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER INDIAN CREEK
ON SR 1168 (JOHNSTOWN ROAD)
BETWEEN SR 1167 AND SR 1169

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

DRAWN BY : G.C. MORRIS DATE : 05-24
CHECKED BY : W.S. ARAFAT DATE : 06-24
DESIGN ENGINEER OF RECORD: O. PUIGCERVER DATE : 05-24

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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 No. 1	97		75			165							
Bent No. 1	202	See Substructure Plans	65	776	748.9	350						5.0	50.0
Bent No. 2	204		55	780	755.4	350						5.0	45.0
End Bent No. 2	97		40			165							

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

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

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 No. 1	97			0.60			
Bent No. 1	202			0.60		4	1.00
Bent No. 2	204			0.60		6	1.00
End Bent No. 2	97			0.60			

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

SUMMARY OF PILE ACCESSORIES

(Blank entries indicate item is not applicable to structure)

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

NOTES:

1. The Pile Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (Thomas J. Daily and 045672) on 06-05-2024.
2. Total Pile Driving Equipment Setup quantity (not shown in Pile Foundation Tables) equals the number of driven piles, i.e., the number of piles with a Required Driving Resistance.

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT

DocuSigned by: Wael Arafat 7807F1ACBA854A2...

8/12/2024

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PARRISH & PARTNERS

Parrish and Partners of North Carolina, PLLC
220 Horizon Dr. Suite 100
Raleigh, NC 27615

NC License #P-1212

PROJECT NO. B-5853

LINCOLN COUNTY

STATION: 14+20.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER INDIAN CREEK ON SR 1168 (JOHNSTOWN ROAD) BETWEEN SR 1167 AND SR 1169

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

DRAWN BY :	G.C. MORRIS	DATE : 05-24
CHECKED BY :	W.S. ARAFAT	DATE : 06-24
DESIGN ENGINEER OF RECORD:	O. PUIGCERVER	DATE : 05-24

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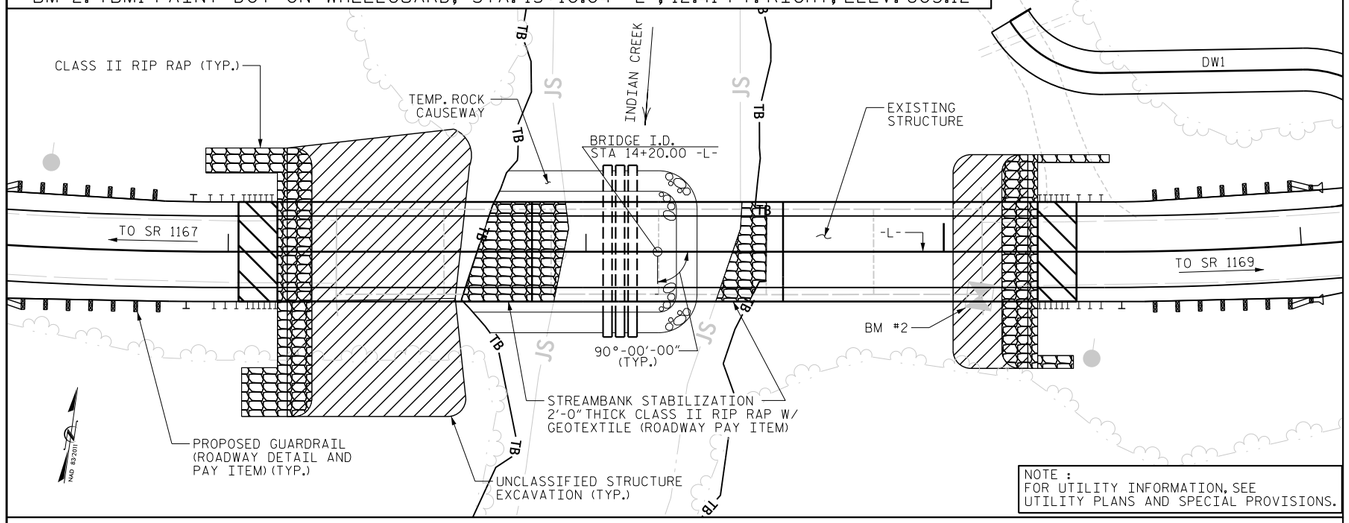
BM#2: TBM1 PAINT DOT ON WHEELGUARD, STA. 15+10.04 -L-, 12.41 FT. RIGHT, ELEV. 803.12



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

LOCATION SKETCH

HYDRAULIC DATA

DESIGN DISCHARGE	4500 CFS
FREQUENCY OF DESIGN FLOOD	25 YRS.
DESIGN HIGH WATER ELEVATION	799.1 FT.
DRAINAGE AREA	32.8 SQ. MILES
BASE DISCHARGE (Q100)	6611 CFS
BASE HIGH WATER ELEVATION	801.25 FT

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	10500 CFS
FREQUENCY OF OVERTOPPING FLOOD	500+ YRS
OVERTOPPING FLOOD ELEVATION	802.0 FT.

TOTAL BILL OF MATERIAL

	CONSTRUCTION MAINTENANCE & REMOVAL OF TEMP. ACCESS	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESSMENT	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES
	LUMP SUM	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	EACH
SUPERSTRUCTURE								LUMP SUM		
END BENT 1							20.2		2453	5
BENT 1				250	25		14.5		2327	
BENT 2				225	25		14.5		2327	
END BENT 2							20.2		2453	5
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	475	50	LUMP SUM	69.4	LUMP SUM	9560	10

TOTAL BILL OF MATERIAL

	PILE DRIVING EQUIPMENT SETUP FOR 24x0.5 GALVANIZED STEEL PILES	HP 12x53 STEEL PILES		PP 24X0.5 GALVANIZED STEEL PILES		STEEL PILE POINTS	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLAB	
	EACH	No.	LIN. FT.	No.	LIN. FT.	EACH	LIN. FT.	TON	SY	LUMP SUM	No.	LIN. FT.
SUPERSTRUCTURE							420.75			LUMP SUM	30	2100
END BENT 1		5	375					112	125			
BENT 1	5			5	325	5						
BENT 2	5			5	275	5						
END BENT 2		5	200					75	83			
TOTAL	10	10	575	10	600	10	420.75	187	208	LUMP SUM	30	2100

DRAWN BY : G.C. MORRIS DATE : 05-24
CHECKED BY : W.S. ARAFAT DATE : 06-24
DESIGN ENGINEER OF RECORD: O. PUIGCERVER DATE : 05-24

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 14+20.00 -L-.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF APPROXIMATELY 35' LEFT AND 47' RIGHT OF CENTERLINE ROADWAY AT END BENT 1 AND 28' LEFT AND 33' RIGHT OF CENTERLINE ROADWAY AT END BENT 2 AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

THE EXISTING STRUCTURE CONSISTING OF 6 SPANS (30'-3" EACH) OF PRECAST PRESTRESSED CONCRETE CHANNELS TOPPED WITH 2" ASPHALT WEARING SURFACE WITH 24' CLEAR ROADWAY WIDTH ON PPC CAPS ON TIMBER PILES AND TIMBER BULKHEADS AT END BENTS AND INTERIOR BENTS AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, THE LOAD LIMIT MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT. FOR REMOVAL OF EXISTING STRUCTURE AT STA 14+20.00 -L-, 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 THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

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

THE SCOUR CRITICAL ELEVATIONS FOR BENTS No. 1 & No. 2 ARE ELEVATIONS 776.0 AND 780.0 RESPECTIVELY. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

FOR INTERIOR BENTS No. 1 AND No. 2, ONLY PARTIAL GALVANIZING OF THE PILES IS REQUIRED. SEE INTERIOR BENT SHEETS FOR REQUIRED GALVANIZED LENGTHS. PAYMENT FOR PARTIALLY GALVANIZED PILES WILL BE MADE UNDER THE CONTRACT UNIT PRICE FOR GALVANIZED STEEL PILES.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

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

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT ONLY ONE TEMPORARY CAUSEWAY IS PERMITTED WITHIN THE STREAM AT ANY TIME, AND ANY SINGLE CAUSEWAY SHOULD NOT BLOCK MORE THAN 50% OF THE CHANNEL FLOW THROUGH THE CHANNEL.

CAUSEWAY IN THE INDIAN CREEK IS ANTICIPATED TO REMOVE EXISTING BRIDGE AND CONSTRUCT THE PROPOSED BRIDGE. FOR CAUSEWAY REQUIREMENTS, SEE PERMIT DRAWINGS.

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT
DocuSigned by: Wael Arafat 7B07F1ACBA854A2...
8/12/2024

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NC License #P-1212

PROJECT NO. B-5853
LINCOLN COUNTY
STATION: 14+20.00 -L-
SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER INDIAN CREEK ON SR 1168 (JOHNSTOWN ROAD) BETWEEN SR 1167 AND SR 1169

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

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

LOAD TYPE		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR					MOMENT						
							LIVE-LOAD FACTORS (γLL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γLL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD		HL-93 (INVENTORY)	N/A	(1)	1.006	--	1.75	0.273	1.03	70′	EL	34.5	0.507	1.32	70′	EL	6.9	0.80	0.273	**1.01**	70′	EL	**34.5**	
		HL-93 (OPERATING)	N/A	--	1.341	--	1.35	0.273	1.34	70′	EL	34.5	0.507	1.72	70′	EL	6.9	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	(2)	1.306	47.02	1.75	0.273	1.34	70′	EL	34.5	0.507	1.65	70′	EL	6.9	0.80	0.273	**1.31**	70′	EL	**34.5**	
		HS-20 (OPERATING)	36.000	--	1.74	62.64	1.35	0.273	1.74	70′	EL	34.5	0.507	2.14	70′	EL	6.9	N/A	--	--	--	--	--	
LEGAL LOAD	SINGLE VEHICLE (SV)	SNSH	13.500	--	2.917	39.379	1.4	0.273	3.75	70′	EL	34.5	0.507	4.87	70′	EL	6.9	0.80	0.273	2.92	70′	EL	34.5	
		SNGARBS2	20.000	--	2.187	43.741	1.4	0.273	2.81	70′	EL	34.5	0.507	3.47	70′	EL	6.9	0.80	0.273	2.19	70′	EL	34.5	
		SNAGRIS2	22.000	--	2.077	45.69	1.4	0.273	2.67	70′	EL	34.5	0.507	3.23	70′	EL	6.9	0.80	0.273	2.08	70′	EL	34.5	
		SNCOTTS3	27.250	--	1.452	39.565	1.4	0.273	1.87	70′	EL	34.5	0.507	2.43	70′	EL	6.9	0.80	0.273	1.45	70′	EL	34.5	
		SNAGGRS4	34.925	--	1.218	42.554	1.4	0.273	1.57	70′	EL	34.5	0.507	2.03	70′	EL	6.9	0.80	0.273	1.22	70′	EL	34.5	
		SNS5A	35.550	--	1.191	42.346	1.4	0.273	1.53	70′	EL	34.5	0.507	2.06	70′	EL	6.9	0.80	0.273	1.19	70′	EL	34.5	
		SNS6A	39.950	--	1.095	43.747	1.4	0.273	1.41	70′	EL	34.5	0.507	1.88	70′	EL	6.9	0.80	0.273	1.10	70′	EL	34.5	
		SNS7B	42.000	--	1.043	43.801	1.4	0.273	1.34	70′	EL	34.5	0.507	1.85	70′	EL	6.9	0.80	0.273	1.04	70′	EL	34.5	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000	--	1.336	44.087	1.4	0.273	1.72	70′	EL	34.5	0.507	2.23	70′	EL	6.9	0.80	0.273	1.34	70′	EL	34.5	
		TNT4A	33.075	--	1.342	44.401	1.4	0.273	1.72	70′	EL	34.5	0.507	2.17	70′	EL	6.9	0.80	0.273	1.34	70′	EL	34.5	
		TNT6A	41.600	--	1.1	45.746	1.4	0.273	1.41	70′	EL	34.5	0.507	1.98	70′	EL	6.9	0.80	0.273	1.10	70′	EL	34.5	
		TNT7A	42.000	--	1.106	46.462	1.4	0.273	1.42	70′	EL	34.5	0.507	1.94	70′	EL	6.9	0.80	0.273	1.11	70′	EL	34.5	
		TNT7B	42.000	--	1.147	48.18	1.4	0.273	1.47	70′	EL	34.5	0.507	1.8	70′	EL	6.9	0.80	0.273	1.15	70′	EL	34.5	
		TNAGRIT4	43.000	--	1.089	46.838	1.4	0.273	1.4	70′	EL	34.5	0.507	1.74	70′	EL	6.9	0.80	0.273	1.09	70′	EL	34.5	
		TNAGT5A	45.000	--	1.026	46.175	1.4	0.273	1.32	70′	EL	34.5	0.507	1.74	70′	EL	6.9	0.80	0.273	1.03	70′	EL	34.5	
		TNAGT5B	45.000	(3)	1.013	45.579	1.4	0.273	1.3	70′	EL	34.5	0.507	1.66	70′	EL	6.9	0.80	0.273	**1.01**	70′	EL	**34.5**	
EMERGENCY VEHICLE (EV)		EV2	28.750		1.816	52.212	1.3	0.273	2.11	70′	EL	34.5	0.507	2.59	70′	EL	6.9	0.80	0.273	1.82	70′	EL	34.5	
		EV3	43.000	(4)	1.188	51.068	1.3	0.273	1.38	70′	EL	34.5	0.507	1.75	70′	EL	6.9	0.80	0.273	**1.19**	70′	EL	**34.5**	

LOAD FACTORS:

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

NOTES:

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

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

COMMENTS:

1.
2.
3.
4.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

(2) DESIGN LOAD RATING (HS-20)

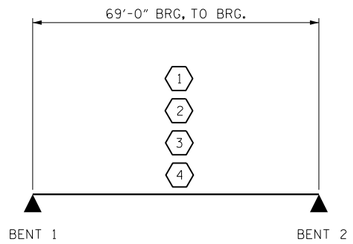
(3) LEGAL LOAD RATING **

(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

SPAN "B" SHOWN, SPANS A & C ARE SIMILIAR.

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT

DocuSigned by: Wael Arafat 7807F1ACBAB54A2...

8/12/2024

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PARRISH & PARTNERS

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NC License #P-1212

PROJECT NO. B-5853

LINCOLN COUNTY

STATION: 14+20.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

LRFR SUMMARY FOR 70′ CORED SLAB UNIT 90° SKEW

(NON-INTERSTATE TRAFFIC)

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

ASSEMBLED BY :	G.C. MORRIS	DATE :	05-24
CHECKED BY :	O. PUIGCERVER	DATE :	05-24
DRAWN BY :	CVC		6/10
CHECKED BY :	DNS		6/10

STD. NO. 24LRFR1_90S_70L

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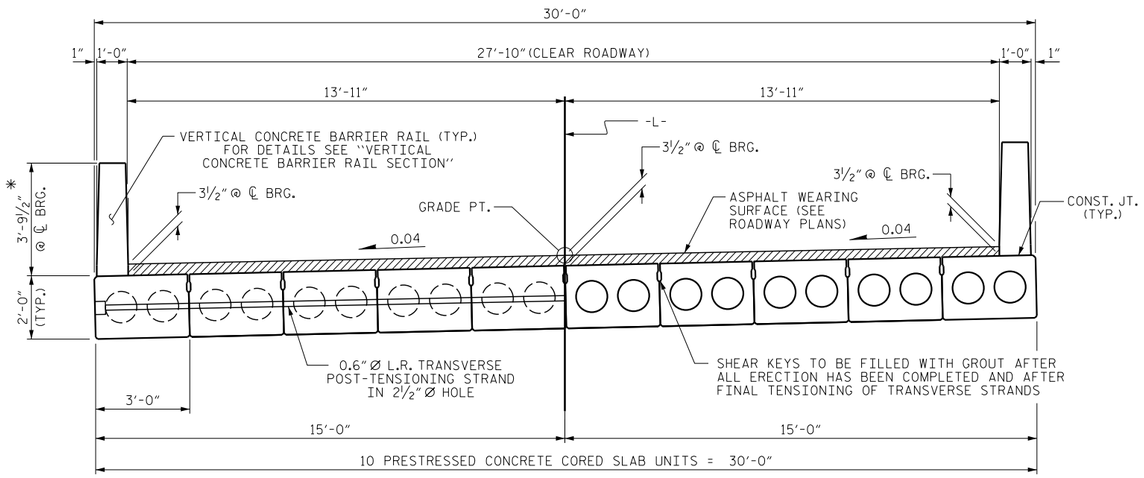
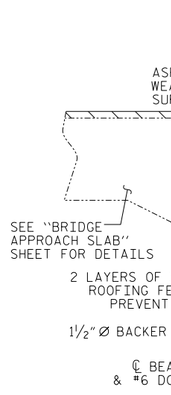


HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

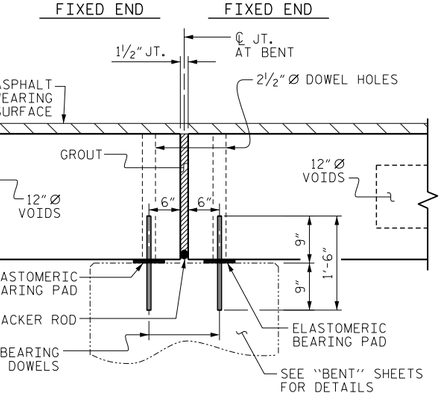
HALF SECTION
THROUGH VOIDS

TYPICAL SECTION

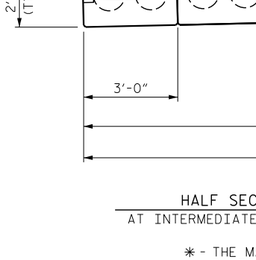
* - THE MAXIMUM BARRIER RAIL HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE BARRIER RAIL AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE BARRIER RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR RAIL HEIGHT DETAILS AND ASPHALT THICKNESS, SEE THE "VERTICAL CONCRETE BARRIER RAIL SECTION" DETAIL.



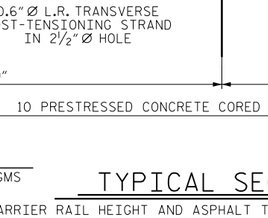
SECTION AT END BENT



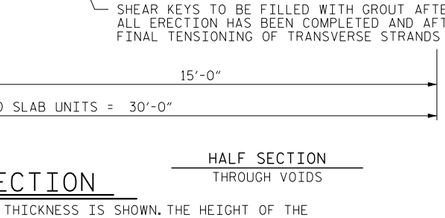
SECTION AT BENT



THREADED INSERT DETAIL

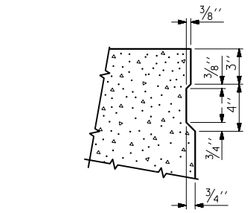


ELEVATION VIEW



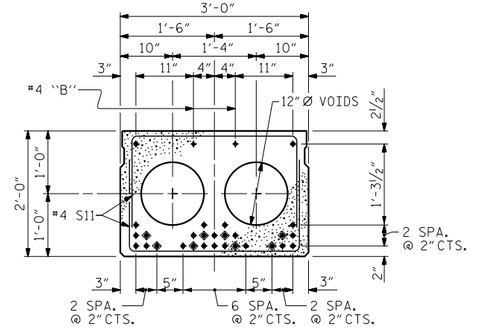
SECTION B-B

GROUTED RECESS AT END OF POST-TENSIONED STRAND CORED SLABS



SHEAR KEY DETAIL

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



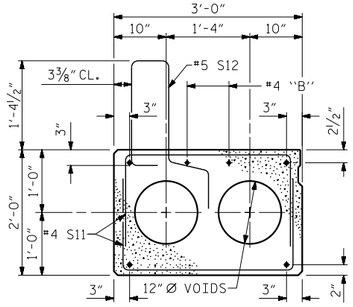
INTERIOR SLAB SECTION (70' UNIT)

(28 STRANDS REQUIRED)

0.6'' Ø LOW RELAXATION STRAND LAYOUT

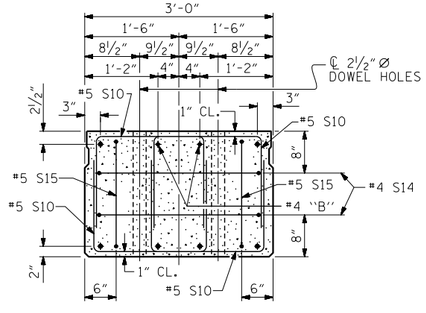
◈ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 12'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

DEBONDING LEGEND



EXTERIOR SLAB SECTION

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



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.

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER MAEL S. ARAFAT
Docusigned by: Mael Arafat 7B07F1ACBA854A2...
8/12/2024

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PROJECT NO. B-5853
LINCOLN COUNTY
STATION: 14+20.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

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

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

ASSEMBLED BY : G.C. MORRIS	DATE : 05-24		
CHECKED BY : O. PUIGCERVER	DATE : 05-24		
DRAWN BY : MAA 6/10	REV. 8/14	MAA/TMG	
CHECKED BY : MKT 7/10			

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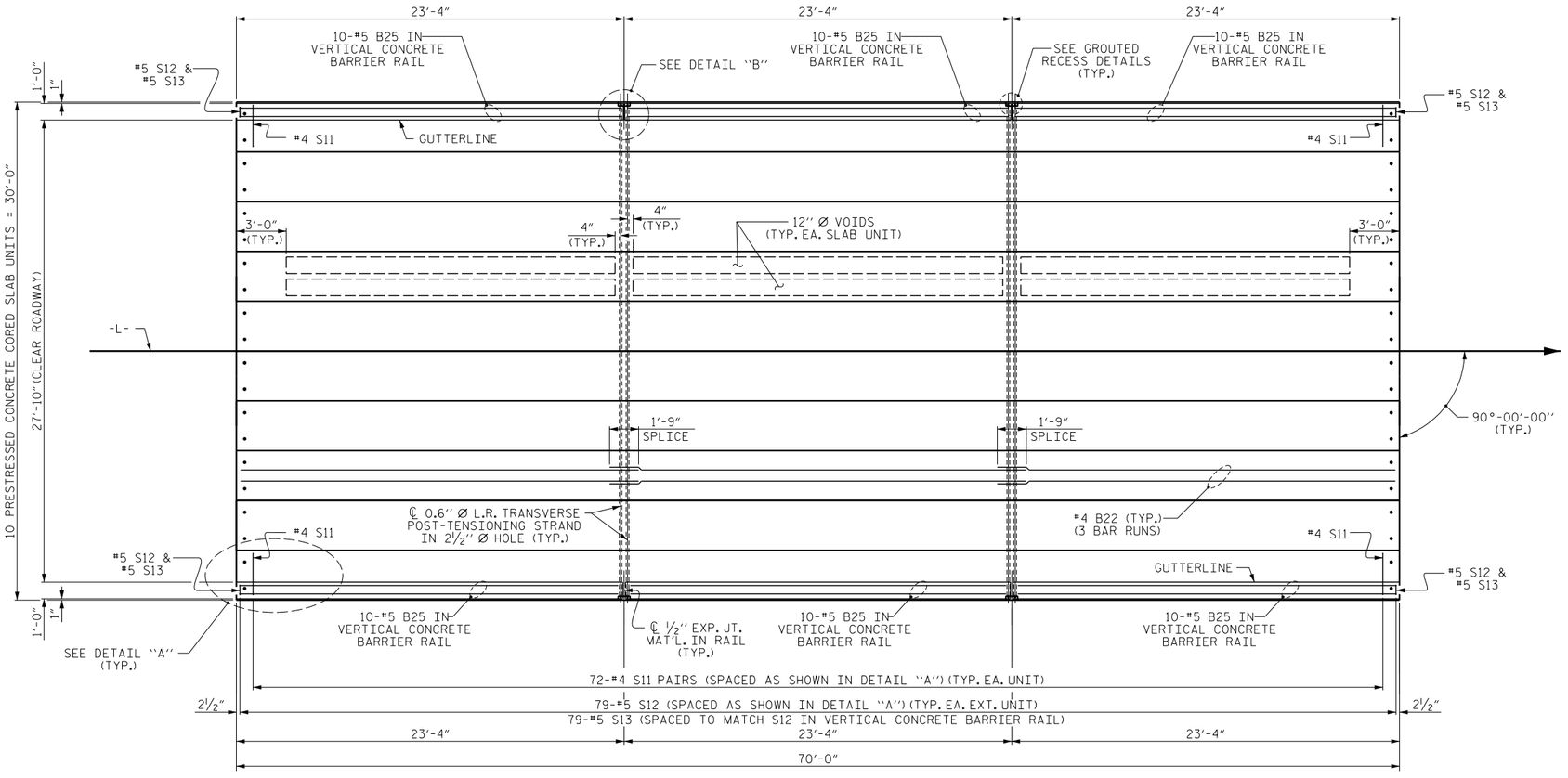
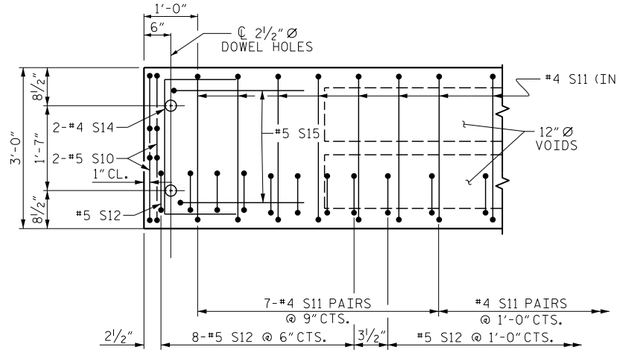
STD. NO. 24PCS4_30_90S

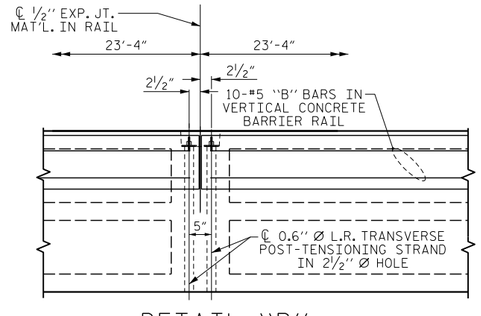


PLAN OF UNIT



DETAIL "A"

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



DETAIL "B"

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

ASSEMBLED BY :	G.C. MORRIS	DATE :	05-24		
CHECKED BY :	O. PUIGCERVER	DATE :	05-24		
DRAWN BY : MAA 6/10		REV. 12/5/11		REV. 8/14	MAA/AAC MAA/TMG
CHECKED BY : MKT 7/10					

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PROJECT NO. B-5853
LINCOLN COUNTY
STATION: 14+20.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 70' UNIT 27'-10" CLEAR ROADWAY 90° SKEW ALL SPANS

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

STD. NO. 24PCS_30_90S_70L

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT

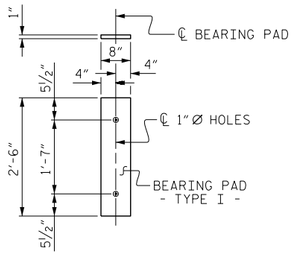
	ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
70' UNITS	2"	3'-8"

CORED SLABS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
70' UNIT			
EXTERIOR C.S.	6	70'-0"	420'-0"
INTERIOR C.S.	24	70'-0"	1680'-0"
TOTAL	30	70'-0"	2100'-0"

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

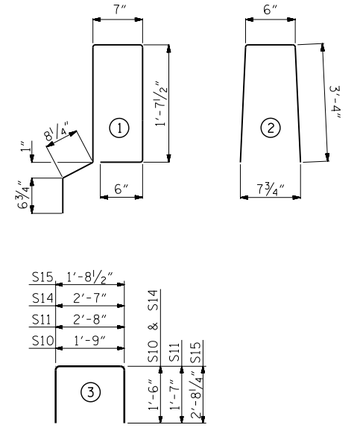


FIXED END
(TYPE I - 60 REQ'D)

BILL OF MATERIAL FOR ONE 70' CORED SLAB UNIT

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B22	6	#4	STR	24'-6"	98	24'-6"	98
S10	8	#5	3	4'-9"	40	4'-9"	40
S11	144	#4	3	5'-10"	561	5'-10"	561
✳S12	79	#5	1	5'-7"	460		
S14	4	#4	3	5'-7"	15	5'-7"	15
S15	4	#5	3	7'-1"	30	7'-1"	30
REINFORCING STEEL			LBS.		744		744
✳EPOXY COATED REINFORCING STEEL			LBS.		460		
7000 P.S.I. CONCRETE			CU. YDS.		11.8		11.8
0.6" Ø L.R. STRANDS			No.		28		28

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

NOTES

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

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

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

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

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

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

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

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

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

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

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

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

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

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

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

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

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.

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

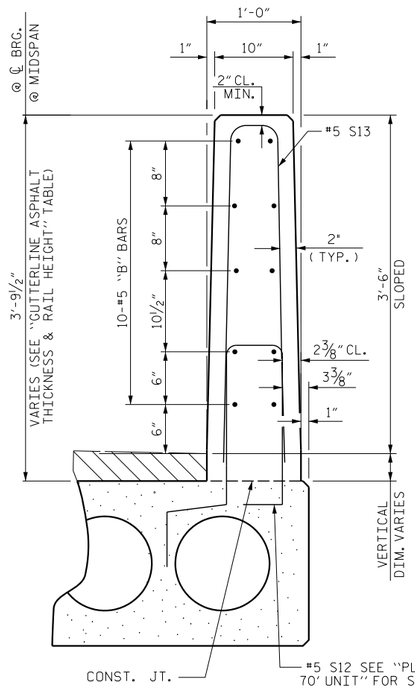
CONCRETE RELEASE STRENGTH

UNIT	PSI
70' UNITS	5500

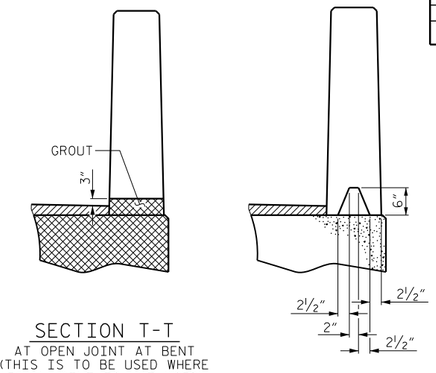
DEAD LOAD DEFLECTION AND CAMBER

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

✳✳ INCLUDES FUTURE WEARING SURFACE

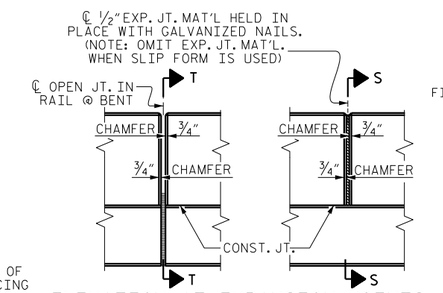


SECTION THRU RAIL



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

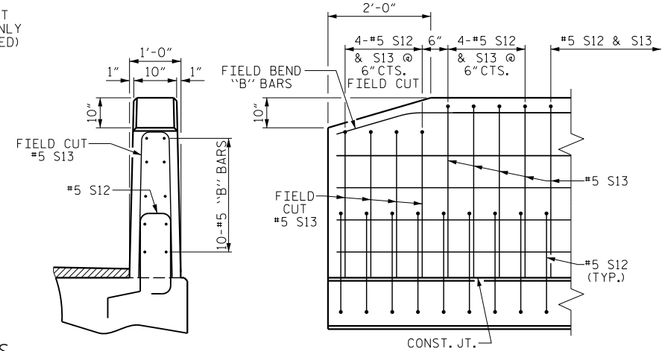
SECTION S-S
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)



ELEVATION AT EXPANSION JOINTS

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

BAR	BARS PER PAIR OF EXTERIOR UNITS 70' UNIT	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B25	60	180	#5	STR	22'-11"	4302
✳S13	158	474	#5	2	7'-2"	3543
✳EPOXY COATED REINFORCING STEEL				LBS.		7845
CLASS AA CONCRETE				CU.YDS.		54.3
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT.		420.75



END VIEW

SIDE VIEW

VERTICAL CONCRETE BARRIER RAIL DETAILS

END OF RAIL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT
Docusigned by: Wael Arafat 7807F1AC0A8A4A2...
8/12/2024

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220 Horizon Dr. Suite 100
Raleigh, NC 27615
NC License #P-1212

PROJECT NO. B-5853
LINCOLN COUNTY
STATION: 14+20.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

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

ASSEMBLED BY : G.C. MORRIS	DATE : 05-24	
CHECKED BY : O. PUIGCERVER	DATE : 05-24	
DRAWN BY : MAA 6/10	REV. 5/18	MAA/THC
CHECKED BY : MKT 7/10		

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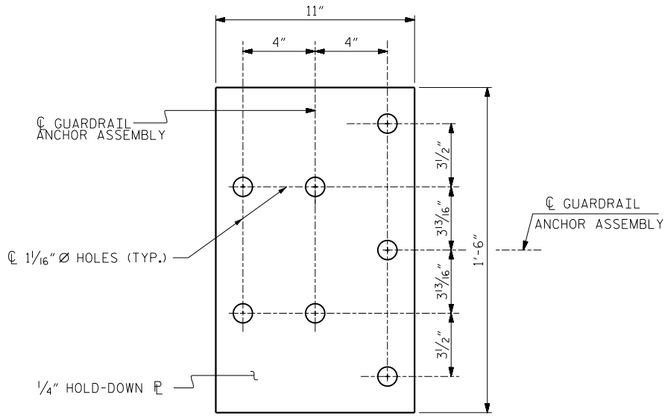
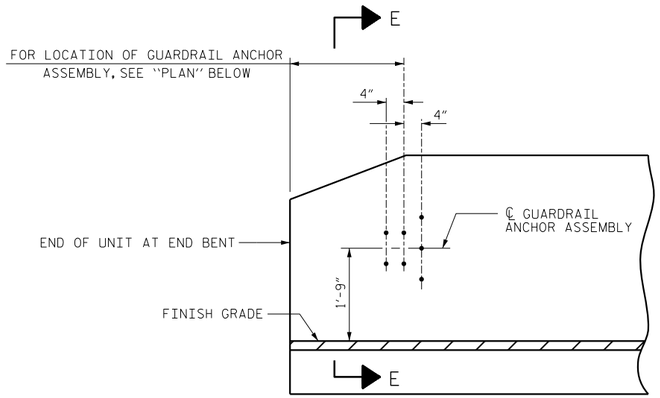
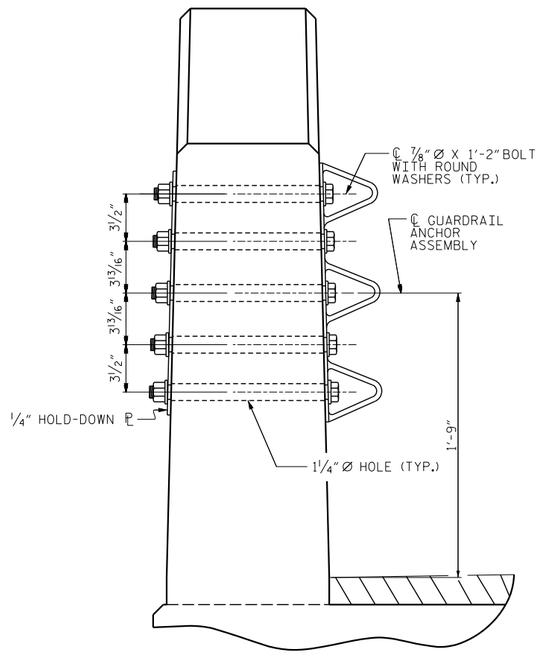
STD. NO. 24PCS3_30_90S



PLAN

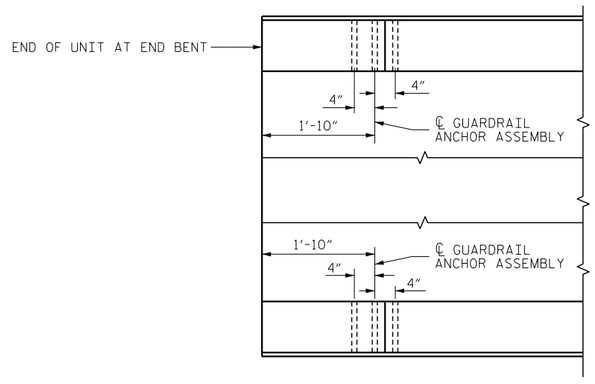


ELEVATION



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

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

NOTES

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

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

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

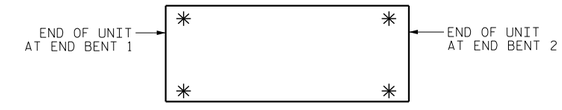
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

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

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



SKETCH SHOWING POINTS OF ATTACHMENT

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT

DocuSigned by: Wael Arafat 7B07F1ACBAB54A2...

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PROJECT NO. B-5853

LINCOLN COUNTY

STATION: 14+20.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
GUARDRAIL ANCHORAGE DETAILS
FOR VERTICAL CONCRETE BARRIER RAIL

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

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ASSEMBLED BY :	G.C. MORRIS		DATE :	05-24	
CHECKED BY :	O. PUIGCERVER		DATE :	05-24	
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	

STD. NO. GRA3

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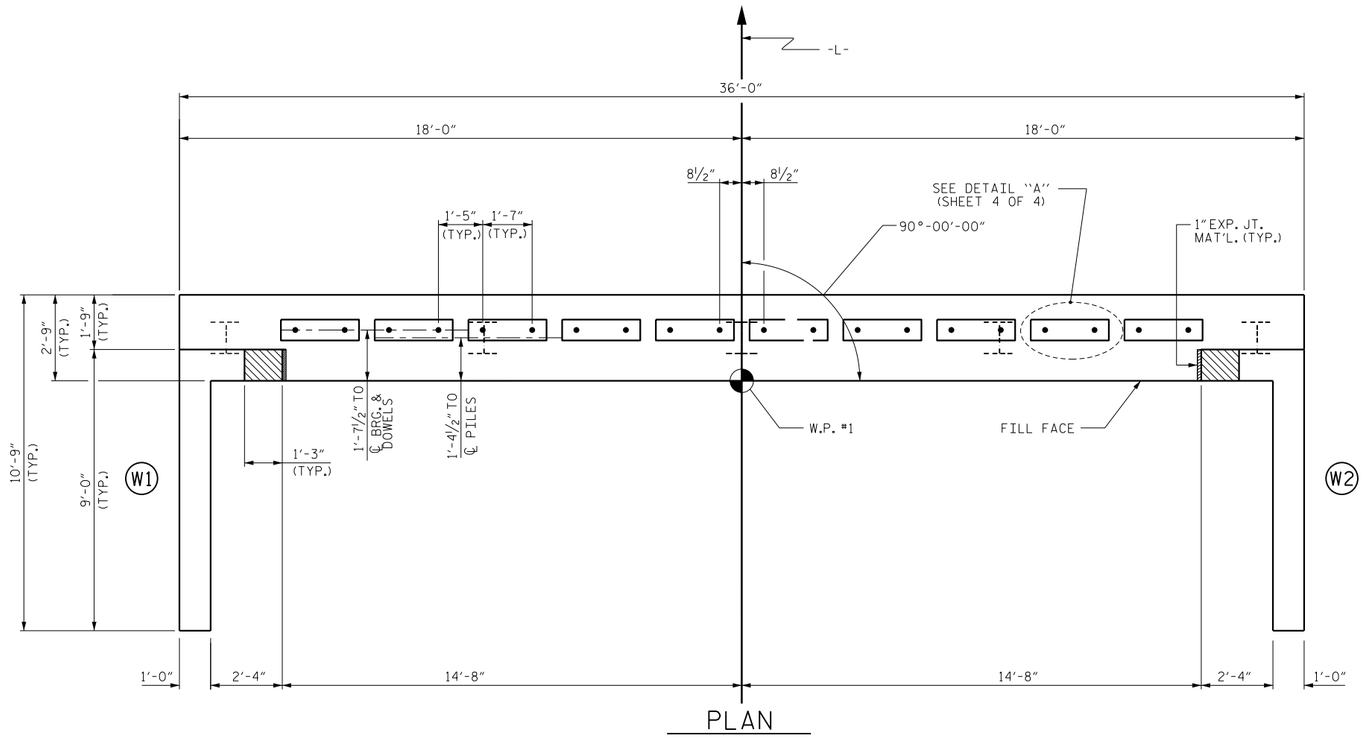
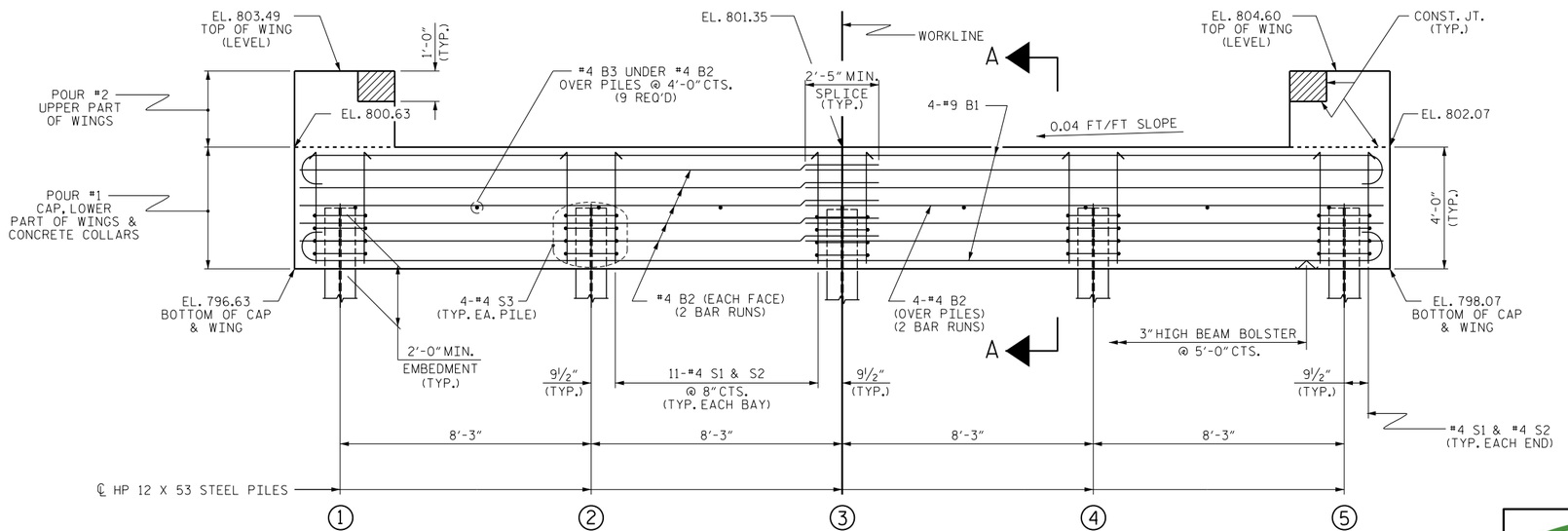


PLAN



ELEVATION

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

NOTES

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

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

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

TOP OF PILE ELEVATIONS

1	798.71
2	799.04
3	799.37
4	799.70
5	800.03

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT
DocuSigned by: Wael Arafat 7B07F1ACBA884A2...
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LINCOLN COUNTY
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SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 1

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

ASSEMBLED BY : G. MORRIS	DATE : 06-24		
CHECKED BY : O. PUIGCERVER	DATE : 06-24		
DRAWN BY : WJH 12/11	REV. 4/15	MAA/TMG	
CHECKED BY : AAC 12/11			

STD. NO. EB_30_90S4

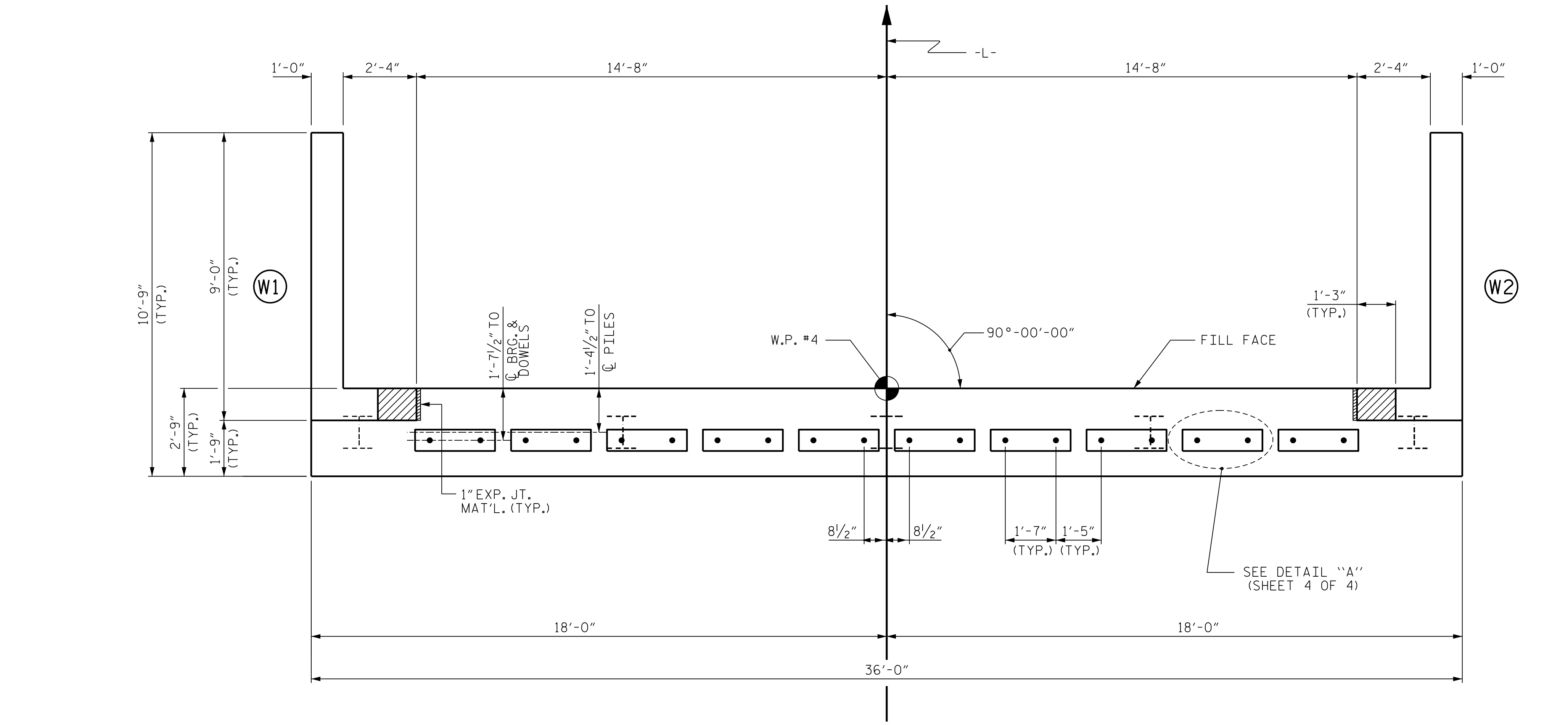
NOTES

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

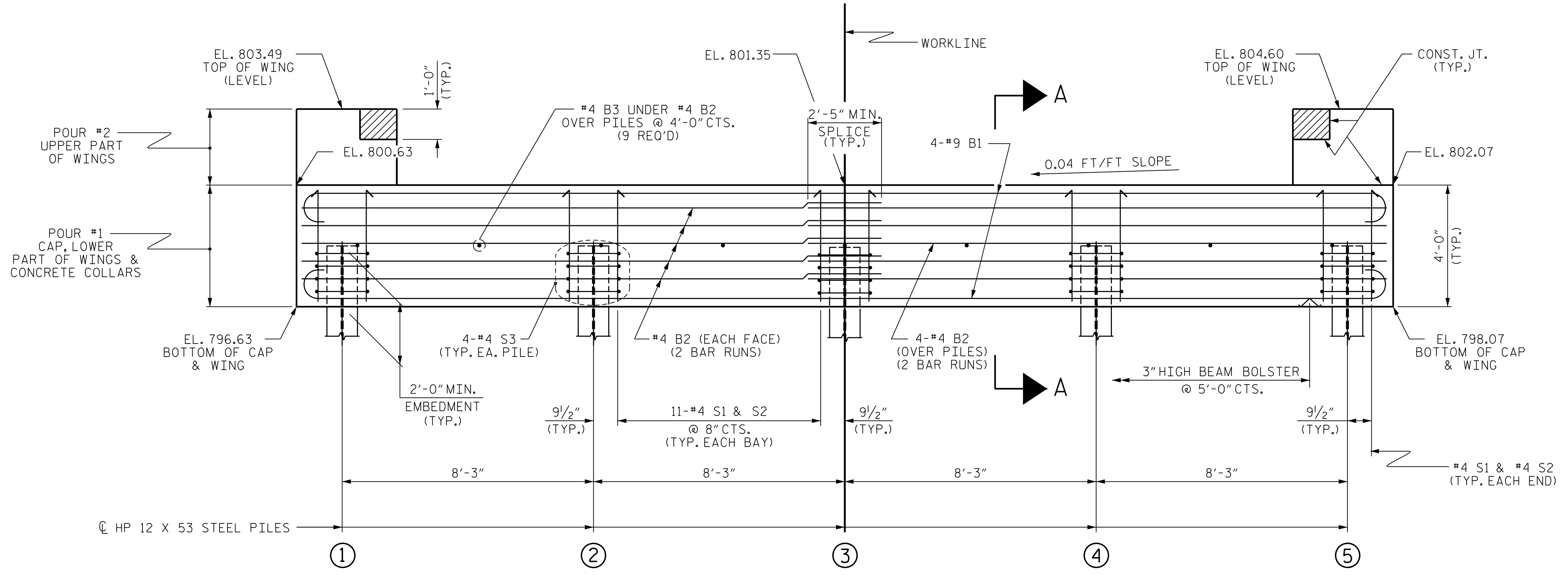
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.



PLAN



ELEVATION

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

TOP OF PILE ELEVATIONS	
1	798.71
2	799.04
3	799.37
4	799.70
5	800.03

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT
DocuSigned by: Wael Arafat
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SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

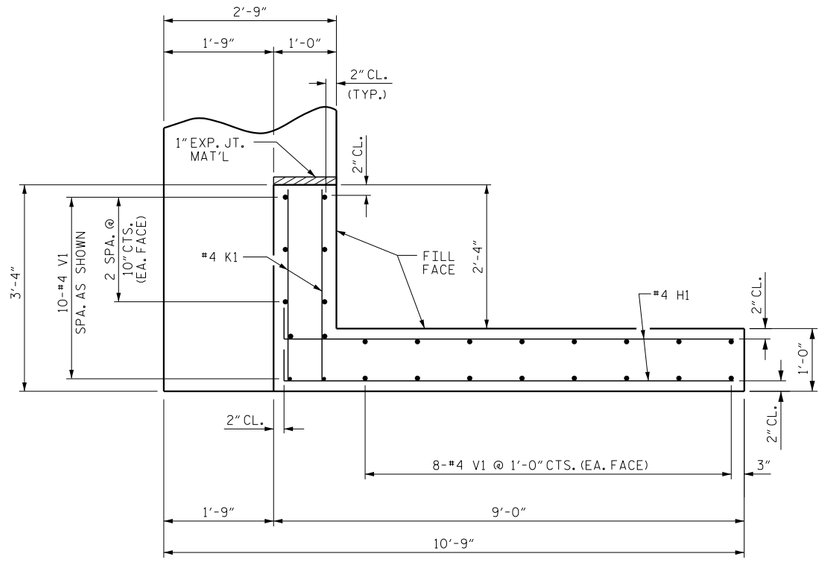
SUBSTRUCTURE

END BENT No. 2

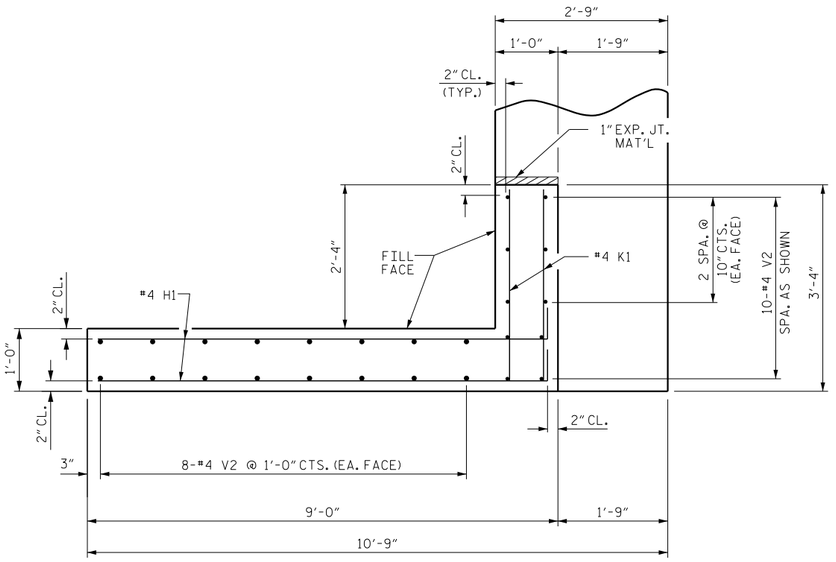
REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.	S-11
1			3			TOTAL SHEETS	20
2			4				

ASSEMBLED BY : G. MORRIS	DATE : 06-24		
CHECKED BY : O. PUIGCERVER	DATE : 06-24		
DRAWN BY : WJH 12/11		REV. 4/15	MAA/TMG
CHECKED BY : AAC 12/11			

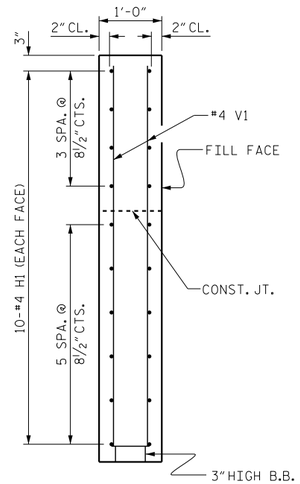
STD. NO. EB_30_90S4



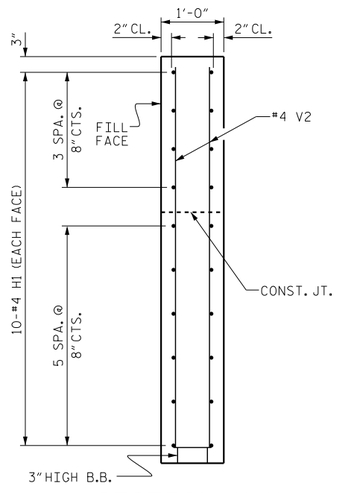
PLAN OF WING (W1)



PLAN OF WING (W2)

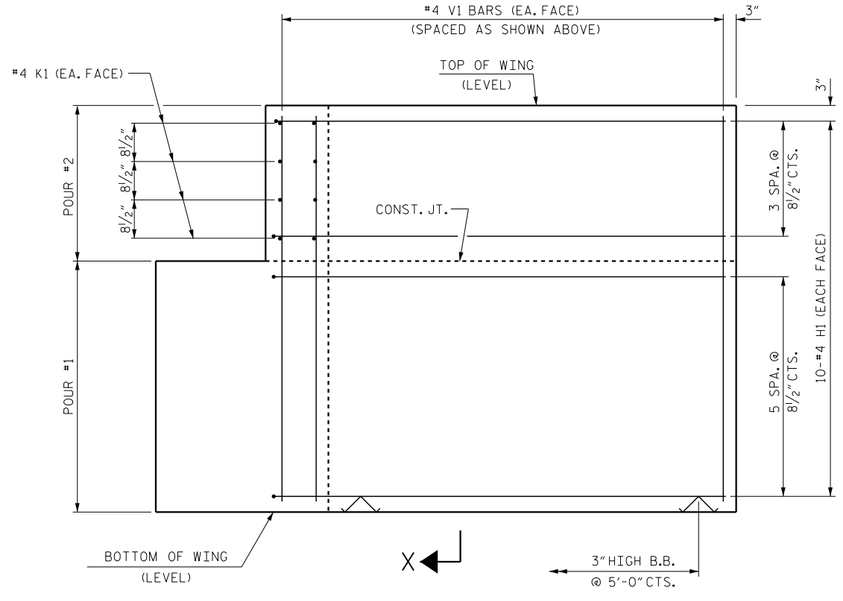


SECTION X-X

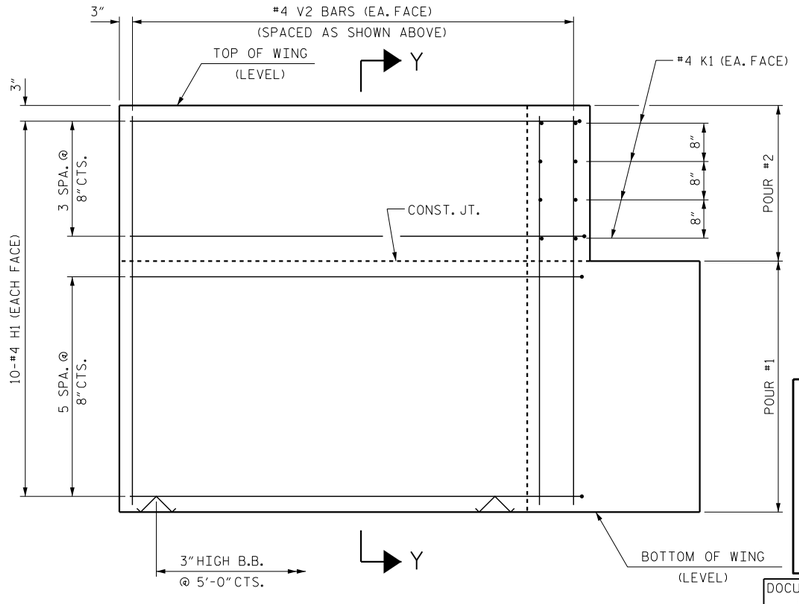


SECTION Y-Y

X



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

WING DETAILS

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SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT
WING DETAILS

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

ASSEMBLED BY : G. MORRIS	DATE : 06-24		
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DRAWN BY : WJH 12/11	REV. 4/15	MAA/TMG	
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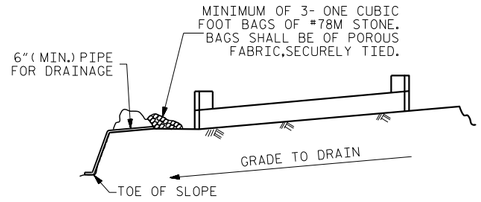
STD. NO. EB_30_90S4

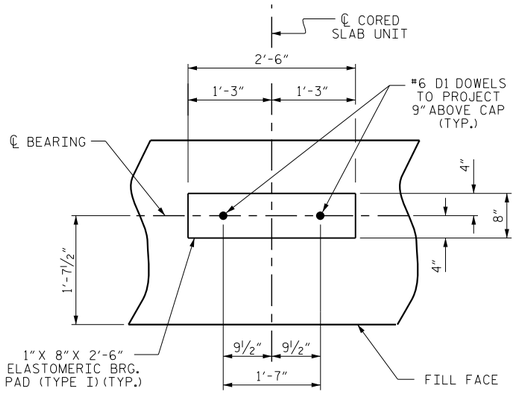


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

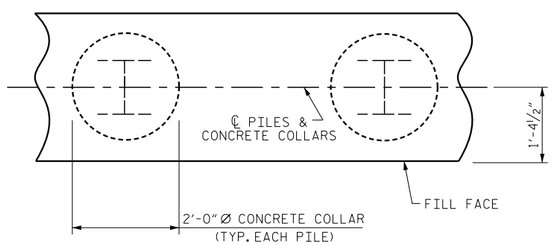
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

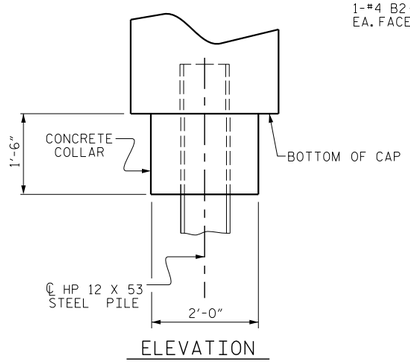


DETAIL "A"

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



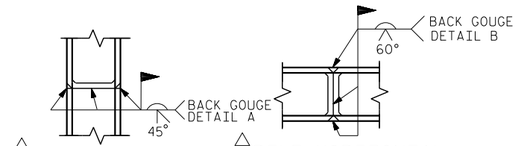
PLAN



ELEVATION

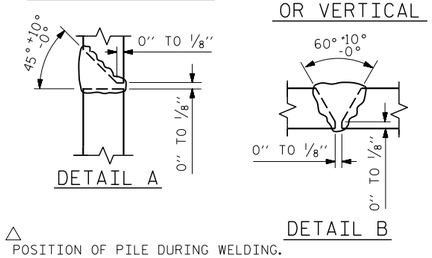
CORROSION PROTECTION FOR STEEL PILES DETAIL

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



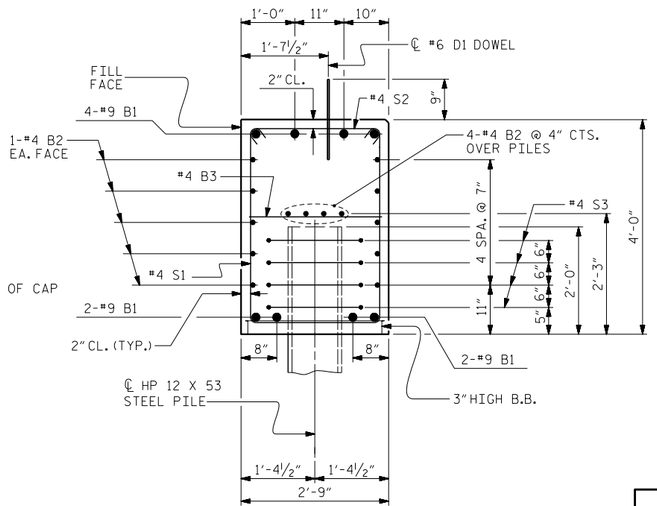
△ PILE VERTICAL

△ PILE HORIZONTAL OR VERTICAL



△ POSITION OF PILE DURING WELDING.

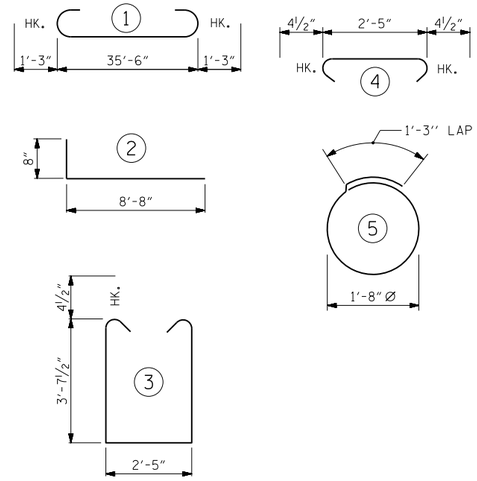
PILE SPLICE DETAILS



SECTION A-A

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

FOR ONE END BENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	38'-0"	1034
B2	28	#4	STR	19'-1"	357
B3	9	#4	STR	2'-5"	15
D1	20	#6	STR	1'-6"	45
H1	40	#4	2	9'-4"	249
K1	16	#4	STR	2'-11"	31
S1	46	#4	3	10'-5"	320
S2	46	#4	4	3'-2"	97
S3	20	#4	5	6'-6"	87
V1	26	#4	STR	6'-5"	111
V2	26	#4	STR	6'-2"	107

REINFORCING STEEL (FOR ONE END BENT) 2453 LBS.

CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)

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

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

TOTAL CLASS A CONCRETE 20.2 C.Y.

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT

DocuSigned by: Wael Arafat 7807F1ACBAB54A2...

8/12/2024

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PARRISH & PARTNERS

Parrish and Partners of North Carolina, PLLC
220 Horizon Dr. Suite 100
Raleigh, NC 27615

NC License #P-1212

PROJECT NO. B-5853

LINCOLN COUNTY

STATION: 14+20.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

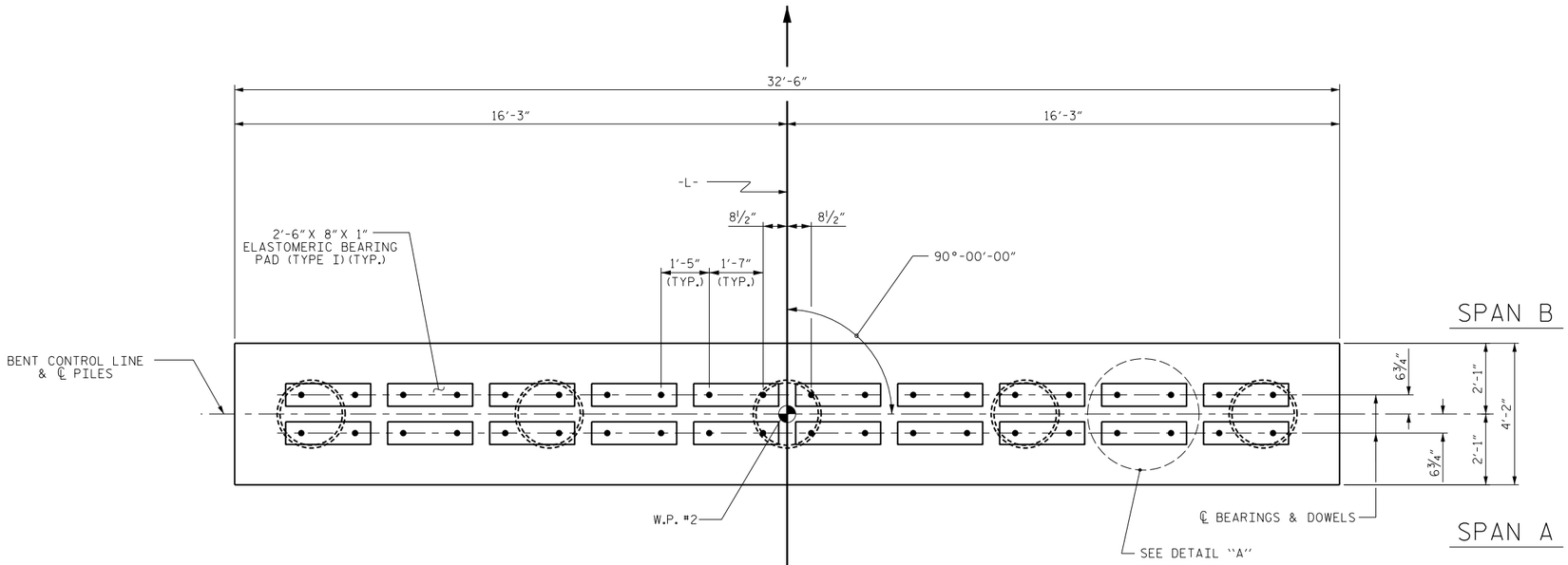
END BENT No. 1 & 2 DETAILS

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

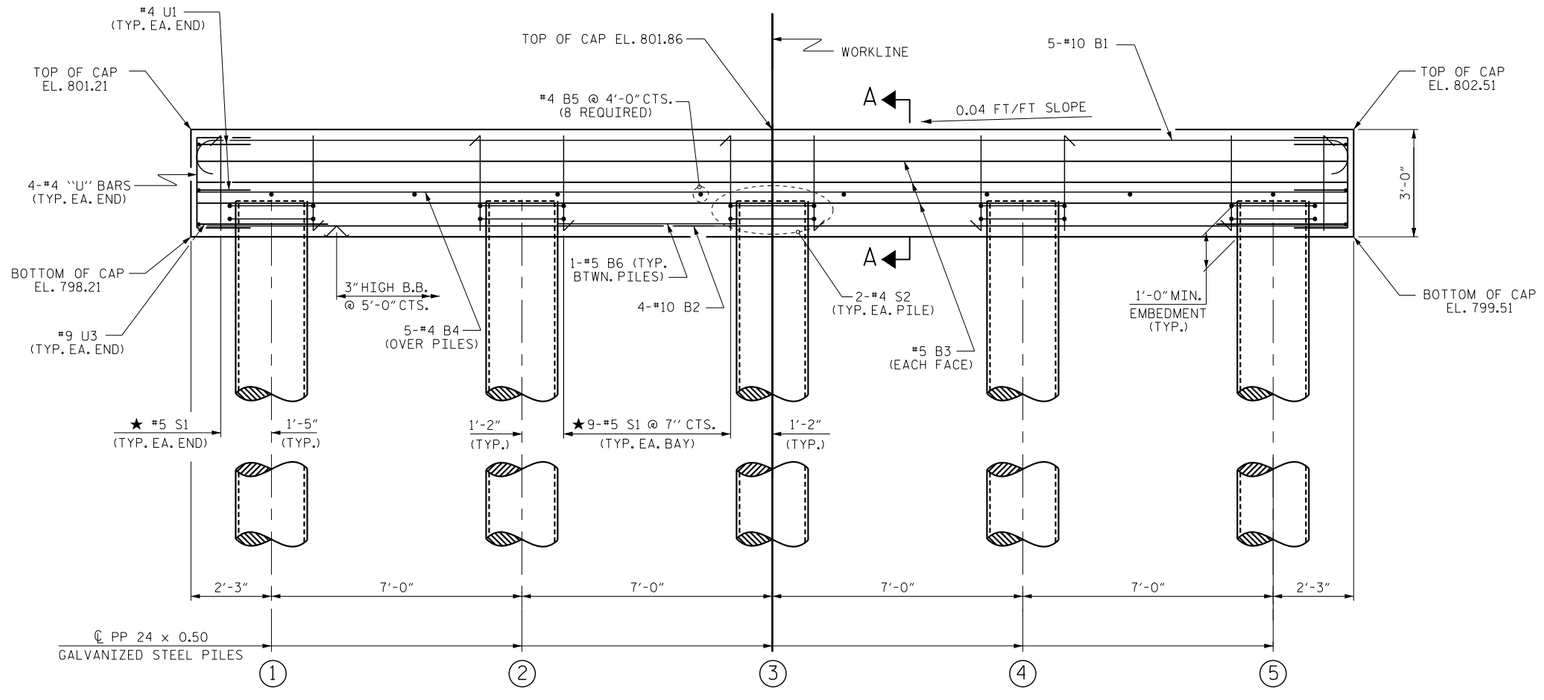
ASSEMBLED BY : G. MORRIS	DATE : 06-24		
CHECKED BY : O. PUIGCERVER	DATE : 06-24		
DRAWN BY : WJH	12/11	REV. 4/17	MAA/THC
CHECKED BY : AAC	12/11		

pw:\\parrish-pw.bentley.com:parrish-pw\Documents\Surface Transportation\B-5853\Project Design\Structures\FINAL\B5383_S13 10:56:51 AM 7/10/2024

STD. NO. EB_30_90S4



PLAN



ELEVATION

FOR SECTION A-A, SEE SHEET 2 OF 2

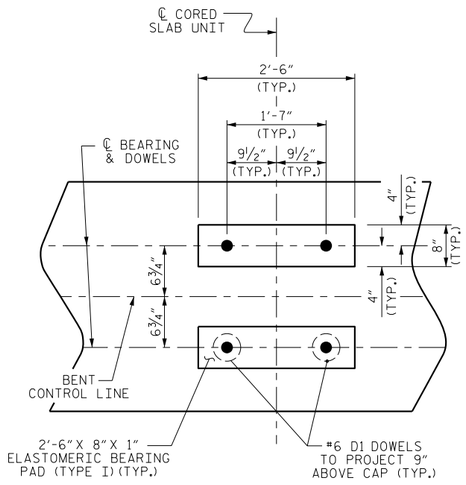
NOTES

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

★ INVERT ALTERNATE STIRRUPS.

FOR ADDITIONAL REINFORCING STEEL IN PP 24 x 0.50 GALVANIZED STEEL PILES, SEE 24" STEEL PIPE PILE SHEET.

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



DETAIL "A"

(DIMENSIONS ARE TYPICAL EACH BEARING)

TOP OF PILE ELEVATIONS	
1	799.34
2	799.62
3	799.90
4	800.18
5	800.46

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT

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8/12/2024

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PARRISH & PARTNERS

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220 Horizon Dr. Suite 100
Raleigh, NC 27615

NC License #P-1212

PROJECT NO. B-5853

LINCOLN COUNTY

STATION: 14+20.00 -L-

SHEET 1 OF 2

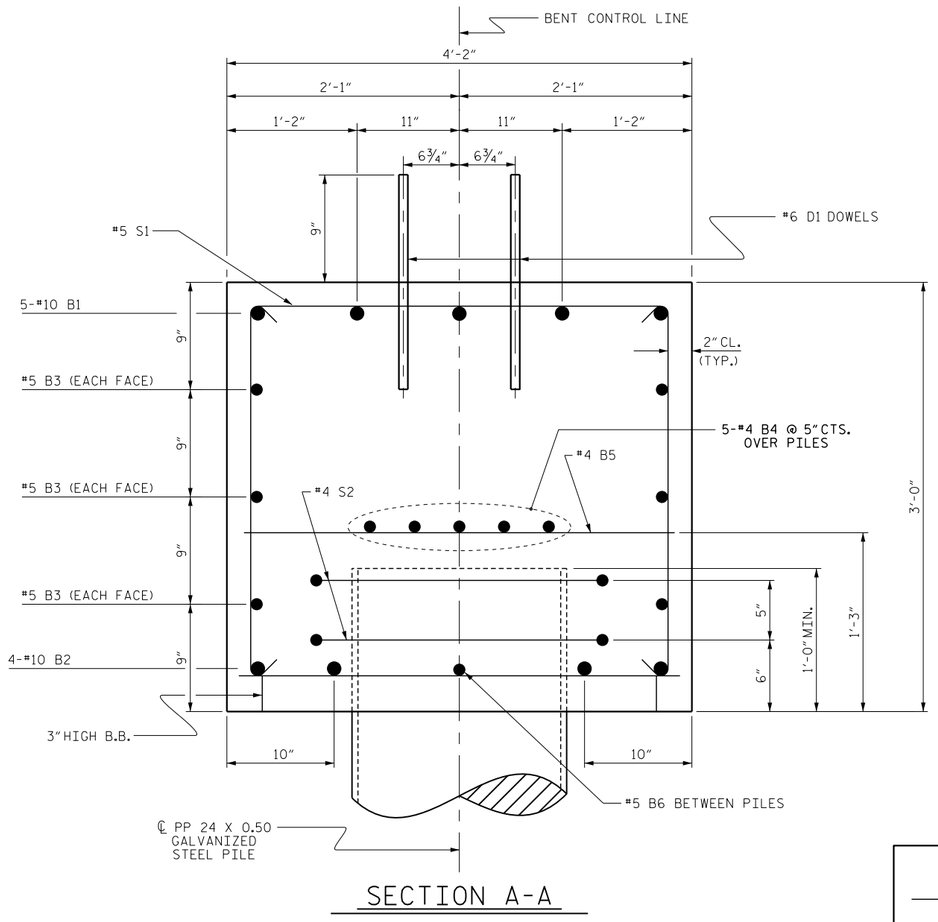
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT No. 1

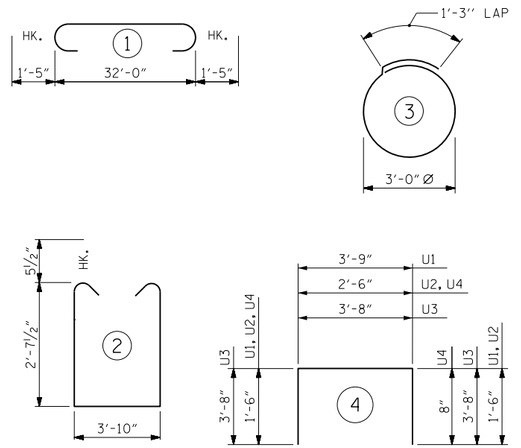
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			20

DRAWN BY :	G. MORRIS	DATE : 06-24
CHECKED BY :	W.S. ARAFAT	DATE : 06-24
DESIGN ENGINEER OF RECORD:	O. PUIGCERVER	DATE : 06-24



SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

FOR ONE BENT

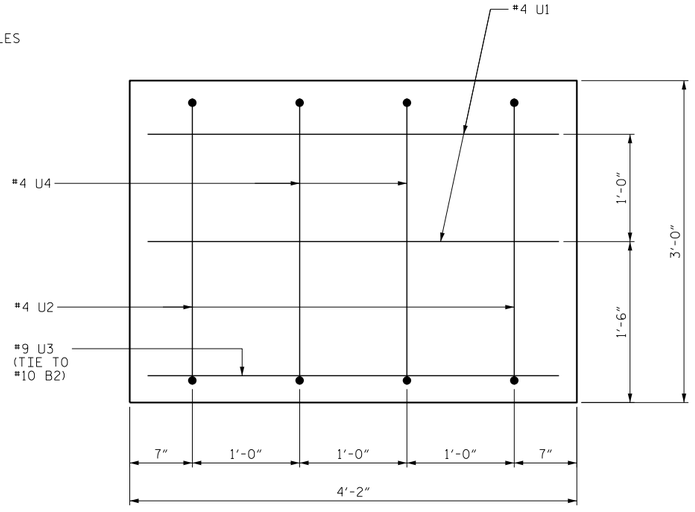
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	#10	1	34'-10"	749
B2	4	#10	STR	32'-2"	554
B3	6	#5	STR	32'-2"	201
B4	5	#4	STR	32'-2"	107
B5	8	#4	STR	3'-10"	20
B6	4	#5	STR	4'-8"	19
D1	40	#6	STR	1'-6"	90
S1	38	#5	2	10'-0"	396
S2	10	#4	3	10'-8"	71
U1	4	#4	4	6'-9"	18
U2	4	#4	4	5'-6"	15
U3	2	#9	4	11'-0"	75
U4	4	#4	4	4'-8"	12

REINFORCING STEEL (FOR ONE BENT) 2327 LBS

CLASS A CONCRETE BREAKDOWN (FOR ONE BENT)

TOTAL CLASS A CONCRETE ▲ 14.5 C.Y.

▲ CONCRETE DISPLACED BY THE PP 24 x 0.50 GALVANIZED STEEL PILES HAS BEEN DEDUCTED FROM THE CONCRETE QUANTITY.



END OF CAP VIEW

(TYPICAL BOTH ENDS)

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT
Docusigned by: Wael Arafat 7807F1AC8A854A2...
8/12/2024

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Raleigh, NC 27615
NC License #P-1212

PROJECT NO. B-5853

LINCOLN COUNTY

STATION: 14+20.00 -L-

SHEET 2 OF 2

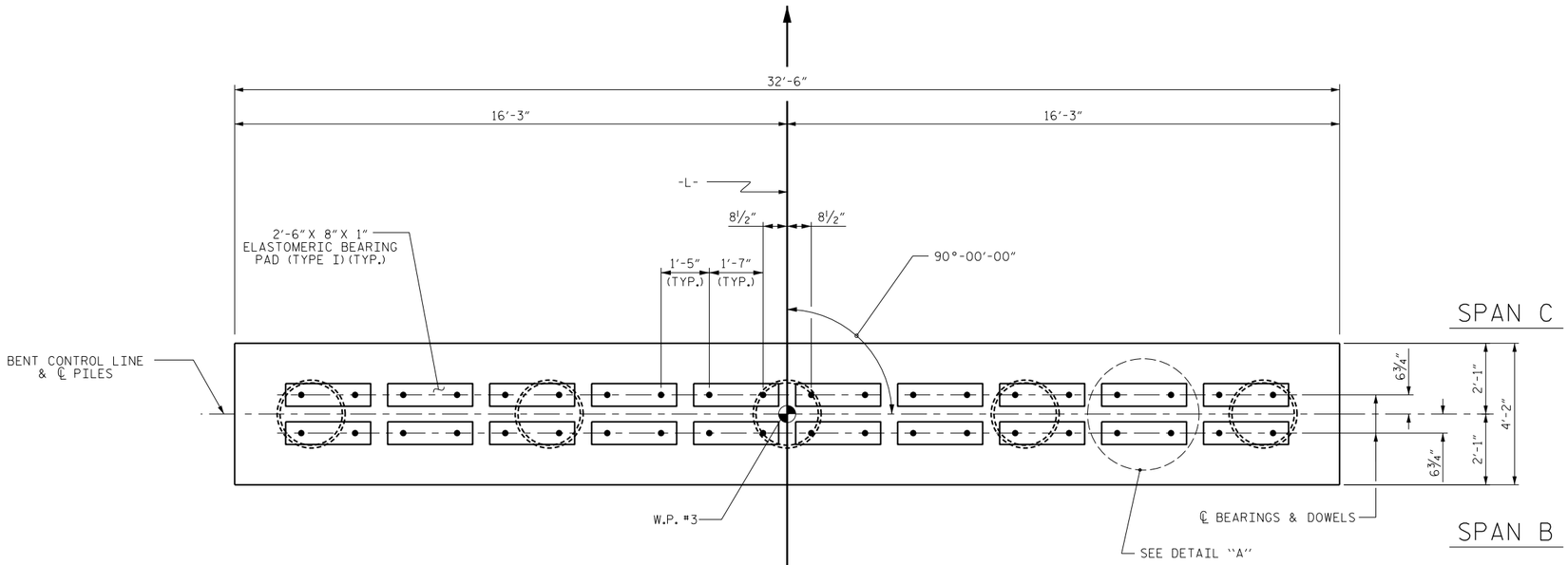
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

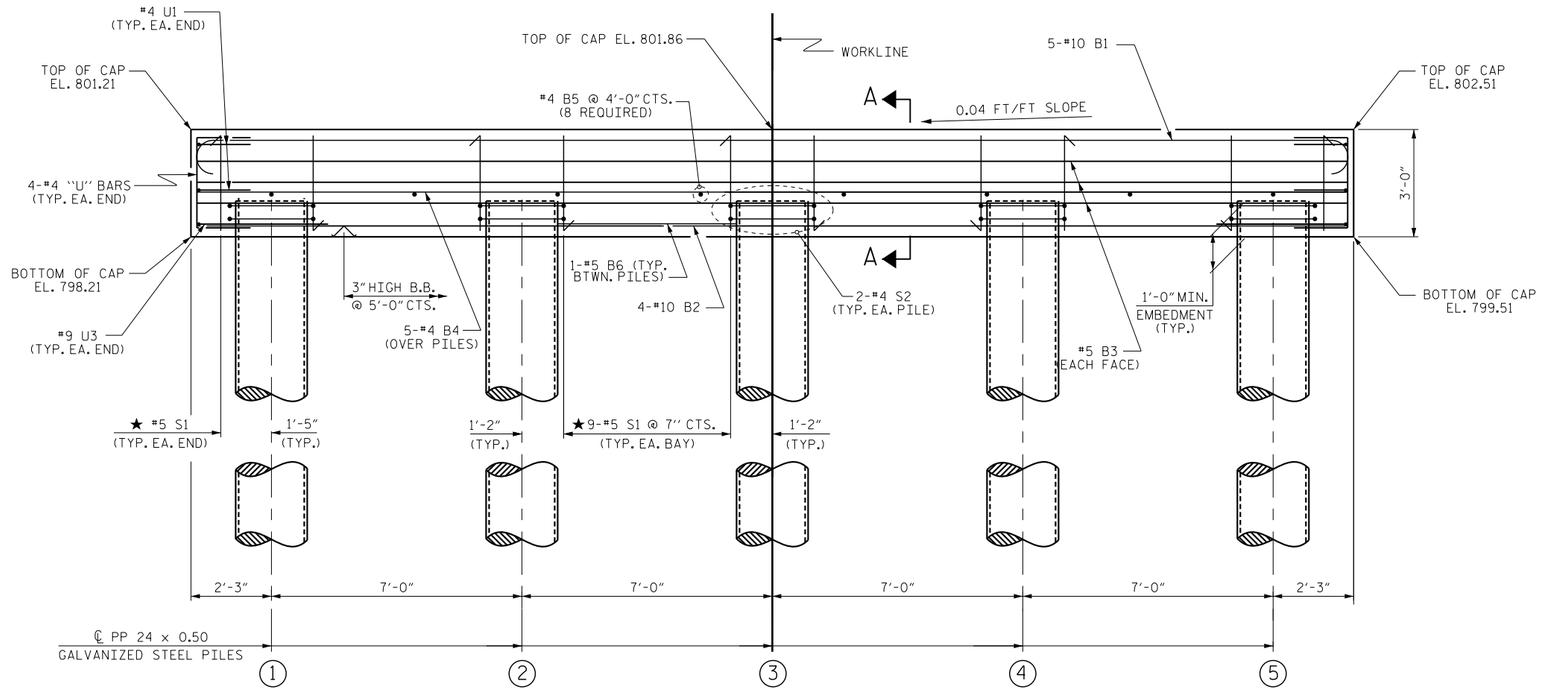
BENT No. 1

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

DRAWN BY : G. MORRIS DATE : 06-24
CHECKED BY : W.S. ARAFAT DATE : 06-24
DESIGN ENGINEER OF RECORD: O. PUIGCERVER DATE : 06-24



PLAN



ELEVATION

FOR SECTION A-A, SEE SHEET 2 OF 2

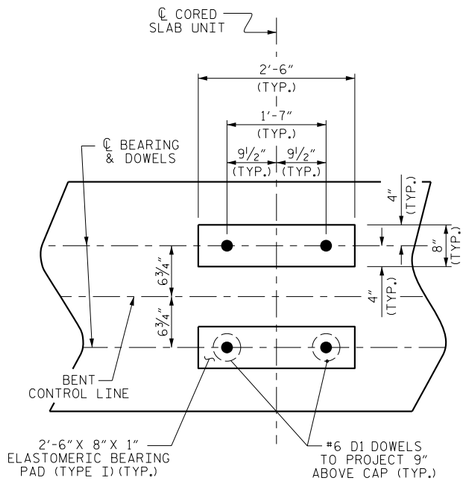
NOTES

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

★ INVERT ALTERNATE STIRRUPS.

FOR ADDITIONAL REINFORCING STEEL IN PP 24 x 0.50 GALVANIZED STEEL PILES, SEE 24" STEEL PIPE PILE SHEET.

GALVANIZE THE TOP OF EACH INTERIOR BENT PILE A MINIMUM OF 23 FEET. GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.



DETAIL "A"

(DIMENSIONS ARE TYPICAL EACH BEARING)

TOP OF PILE ELEVATIONS	
1	799.34
2	799.62
3	799.90
4	800.18
5	800.46

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT

DocuSigned by: Wael Arafat 7B0FF1ACBA854A2...

8/12/2024

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220 Horizon Dr. Suite 100
Raleigh, NC 27615

NC License #P-1212

PROJECT NO. B-5853

LINCOLN COUNTY

STATION: 14+20.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT No. 2

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

DRAWN BY :	G. MORRIS	DATE : 06-24
CHECKED BY :	W.S. ARAFAT	DATE : 06-24
DESIGN ENGINEER OF RECORD:	O. PUIGCERVER	DATE : 06-24

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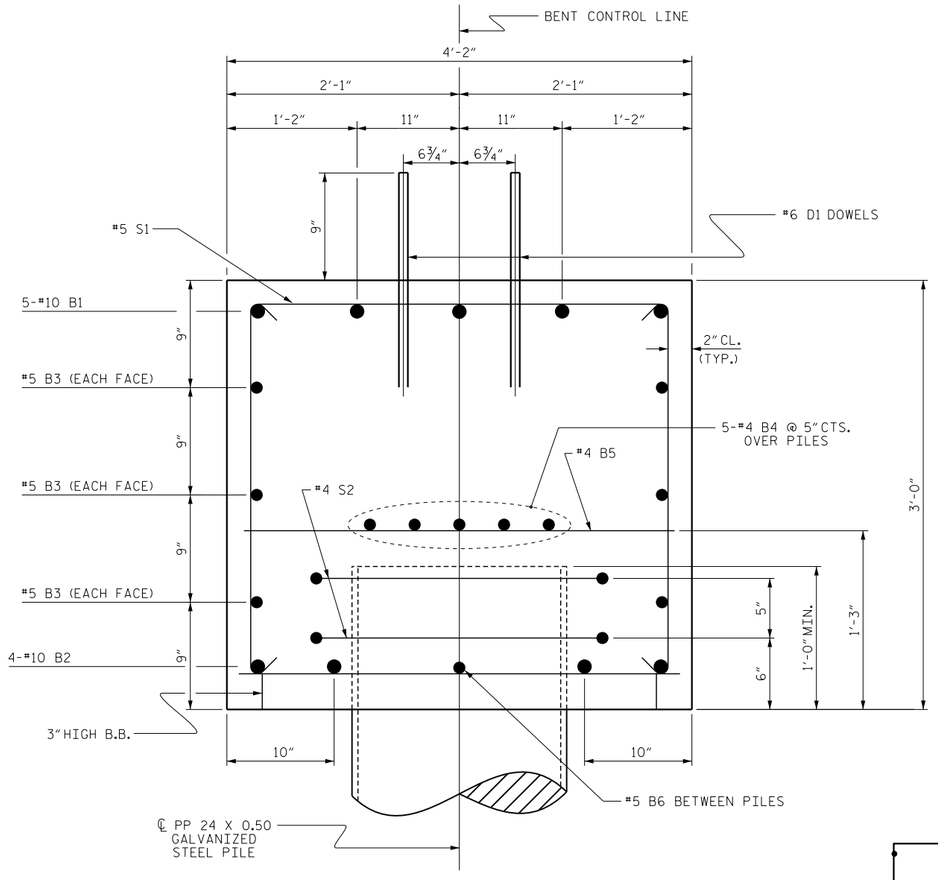
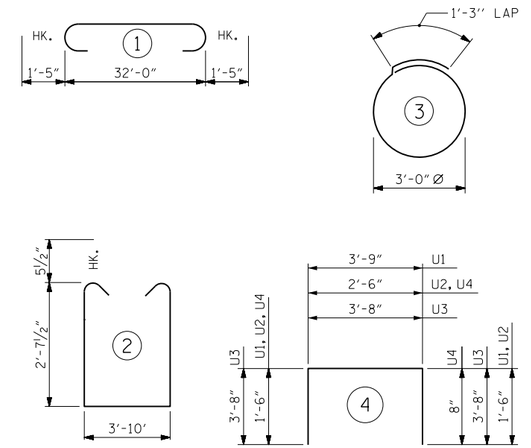


SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

FOR ONE BENT

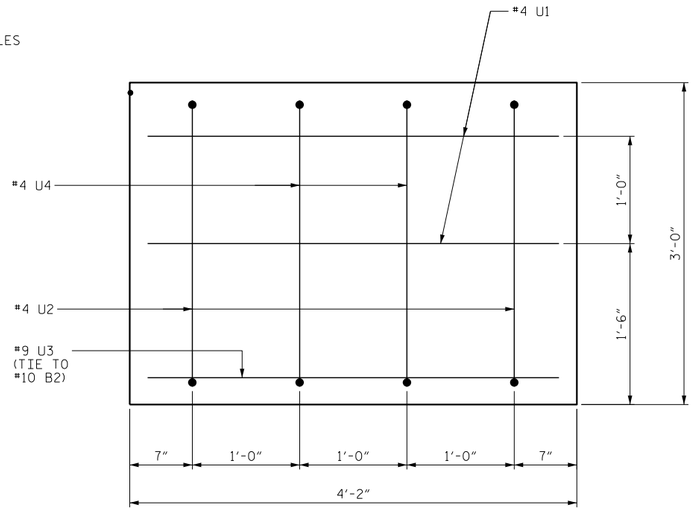
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	#10	1	34'-10"	749
B2	4	#10	STR	32'-2"	554
B3	6	#5	STR	32'-2"	201
B4	5	#4	STR	32'-2"	107
B5	8	#4	STR	3'-10"	20
B6	4	#5	STR	4'-8"	19
D1	40	#6	STR	1'-6"	90
S1	38	#5	2	10'-0"	396
S2	10	#4	3	10'-8"	71
U1	4	#4	4	6'-9"	18
U2	4	#4	4	5'-6"	15
U3	2	#9	4	11'-0"	75
U4	4	#4	4	4'-8"	12

REINFORCING STEEL (FOR ONE BENT) 2327 LBS

CLASS A CONCRETE BREAKDOWN (FOR ONE BENT)

TOTAL CLASS A CONCRETE ▲ 14.5 C.Y.

▲ CONCRETE DISPLACED BY THE PP 24 x 0.50 GALVANIZED STEEL PILES HAS BEEN DEDUCTED FROM THE CONCRETE QUANTITY.



END OF CAP VIEW

(TYPICAL BOTH ENDS)

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT
DocuSigned by: Wael Arafat 7807F1ACBAB54A2...
8/12/2024

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PROJECT NO. B-5853
LINCOLN COUNTY
STATION: 14+20.00 -L-
SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT No. 2

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

DRAWN BY : G. MORRIS DATE : 06-24
CHECKED BY : W.S. ARAFAT DATE : 06-24
DESIGN ENGINEER OF RECORD: O. PUIGCERVER DATE : 06-24

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7/17/2024
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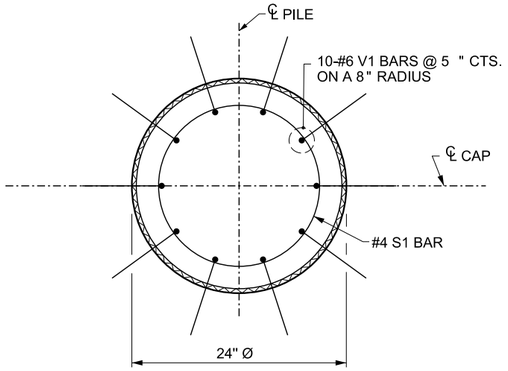
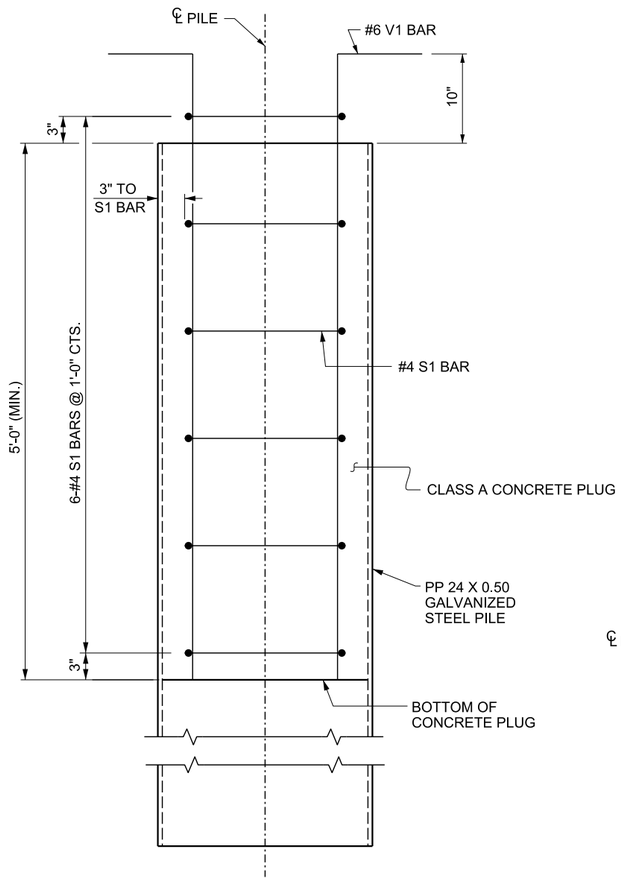


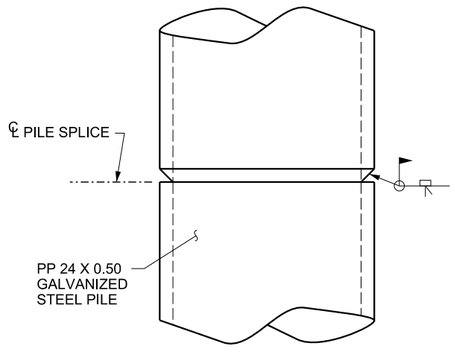
PLAN



ELEVATION

PP 24 X 0.50 GALVANIZED STEEL PILE

(OPEN END)



PIPE PILE SPLICE DETAIL

NOTES

PIPE PILES SHALL BE IN ACCORDANCE WITH SECTION 1084 OF THE STANDARD SPECIFICATIONS.

GALVANIZE STEEL PIPE PILES IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS UNLESS METALLIZING IS REQUIRED. GALVANIZING OR METALLIZING PIPE PILE PLATES IS NOT REQUIRED.

REMOVE AND REPLACE OR REPAIR TO THE SATISFACTION OF THE ENGINEER PILES THAT ARE DAMAGED, DEFORMED OR COLLAPSED DURING INSTALLATION OR DRIVING.

PILE SPLICES SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS AND AWS D1.1.

FOR OPEN END PIPE PILES, REMOVE ENOUGH SOIL AND WATER FROM INSIDE THE PILES TO CONSTRUCT THE CONCRETE PLUG WITHOUT FOULING THE CONCRETE.

FORM THE CONCRETE PLUG SUCH THAT THE REINFORCING STEEL OR CONCRETE DOES NOT MOVE AND THE CLEARANCE FROM THE REINFORCING STEEL TO THE INSIDE OF THE PILE IS MAINTAINED AFTER CONCRETE PLACEMENT. DO NOT PLACE CONCRETE IN THE BENT CAP UNTIL THE CONCRETE PLUG HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI.

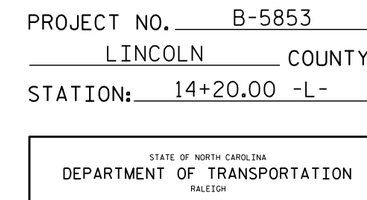
THE REINFORCING STEEL, CLASS A CONCRETE, AND GALVANIZING ARE CONSIDERED INCIDENTAL TO THE CONTRACT UNIT PRICE BID PER LINEAR FOOT FOR PP 24 X 0.50 GALVANIZED STEEL PILES.

BILL OF MATERIAL FOR ONE PP 24 X 0.50 GALVANIZED STEEL PILE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	6	#4	1	6'-0"	24
V1	10	#6	2	6'-8"	100

REINFORCING STEEL =	124 LBS
CLASS A CONCRETE	
5'-0" MINIMUM PLUG	0.5 CY

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

ASSEMBLED BY:	G.C. MORRIS		DATE :	05-24	
CHECKED BY :	O. PUIGCERVER		DATE :	06-24	
DRAWN BY :	TLA	8/05	REV. 5/1/06R		MAA/KMM
CHECKED BY :	GM	9/05	REV. 10/1/11		MAA/GM
			REV. 12/17		MAA/THC

pw:\\parrish-pwbentley.company\parrish-pw\Documents\Surface Transportation\B-5853\Project Design\Structures\FINAL\B5853_S18
7/1/2024
12:55:45 PM

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT
Docusigned by: Wael Arafat 780FF1ACBA854A2...
8/12/2024

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PARRISH & PARTNERS
Parrish and Partners of North Carolina, PLLC
220 Horizon Dr. Suite 100
Raleigh, NC 27615
NC License #P-1212

PROJECT NO. B-5853
LINCOLN COUNTY
STATION: 14+20.00 -L-

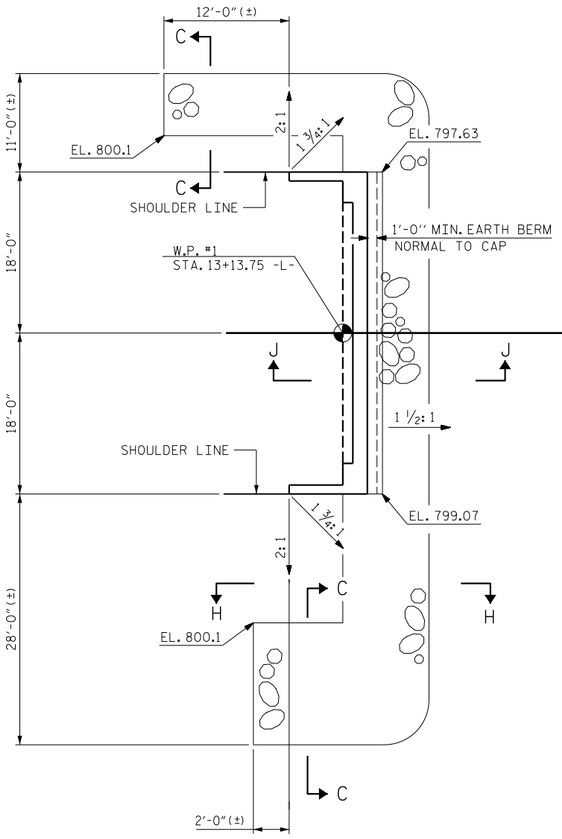
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

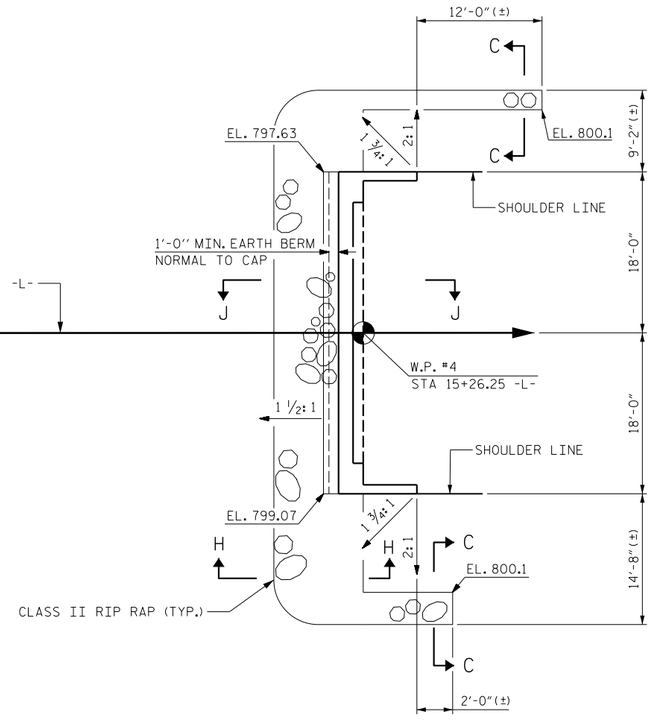
24" STEEL PIPE PILE

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

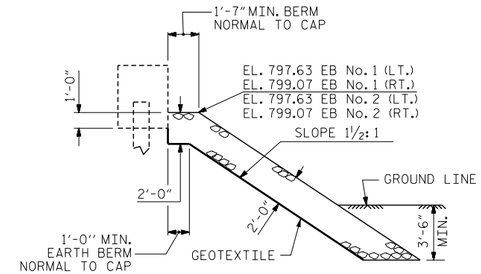
STD. NO. SPP4



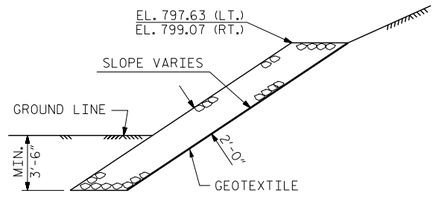
END BENT No. 1



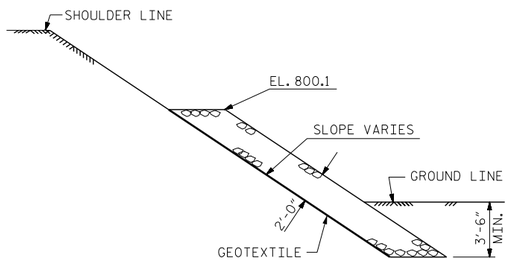
END BENT No. 2



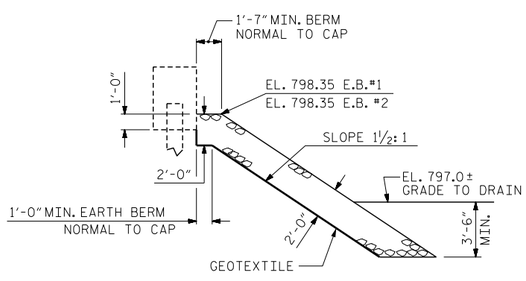
SECTION J-J



SECTION H-H



SECTION C-C



℄ SECTION BERM RIP RAPPED

ESTIMATED QUANTITIES		
BRIDGE @ STA. 14+20.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	112	125
END BENT 2	75	83
TOTAL	187	208

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT
DocuSigned by: Wael Arafat 7807F1ACBAB64A2...
8/12/2024

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PROJECT NO. B-5853
LINCOLN COUNTY
STATION: 14+20.00 -L-

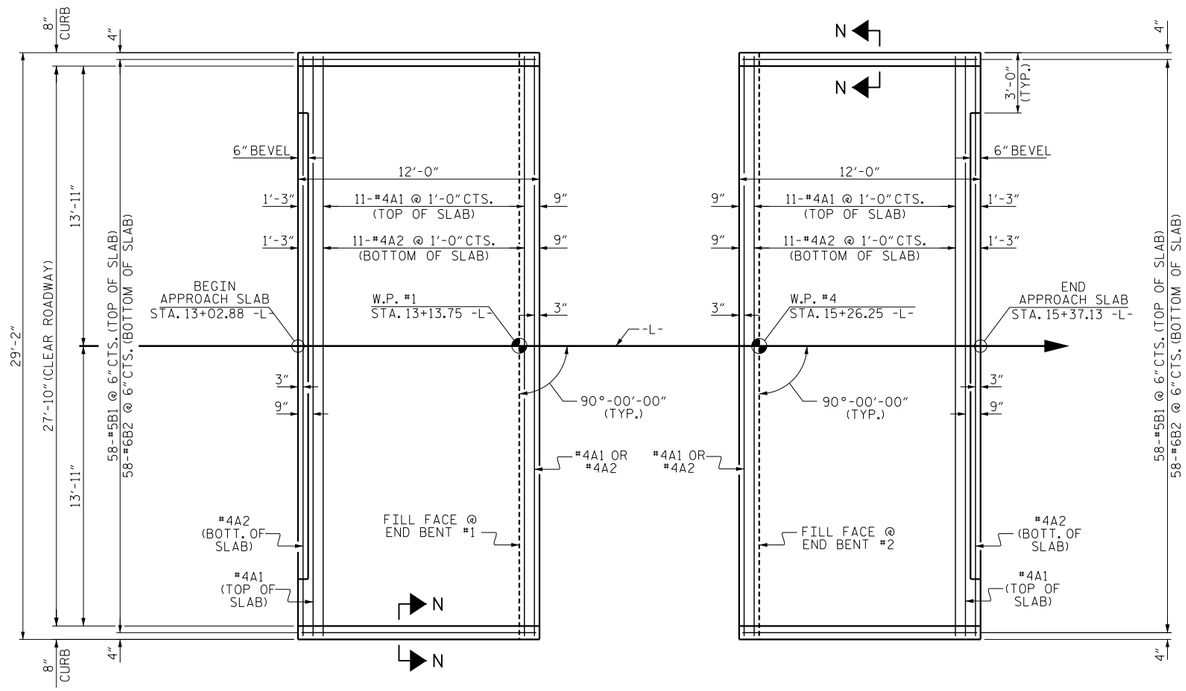
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RIP RAP DETAILS

PARRISH & PARTNERS
Parrish and Partners of North Carolina, PLLC
220 Horizon Dr. Suite 100
Raleigh, NC 27615
NC License #P-1212

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			20

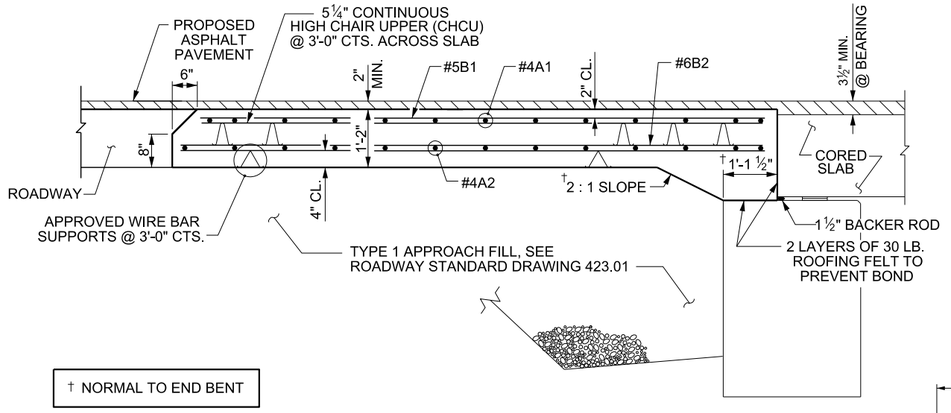
DRAWN BY : M.W. BREELAND DATE : 06-24
CHECKED BY : O. PUIGCERVER DATE : 06-24
DESIGN ENGINEER OF RECORD: O. PUIGCERVER DATE : 06-24



PLAN @ END BENT #1

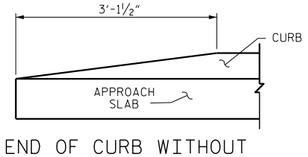
PLAN @ END BENT #2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



† NORMAL TO END BENT

SECTION THRU SLAB



END OF CURB WITHOUT SHOULDER BERM GUTTER

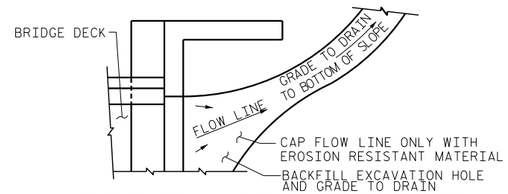
CURB DETAILS

NOTES

FOR BRIDGE APPROACH FILL, SEE ROADWAY PLANS.

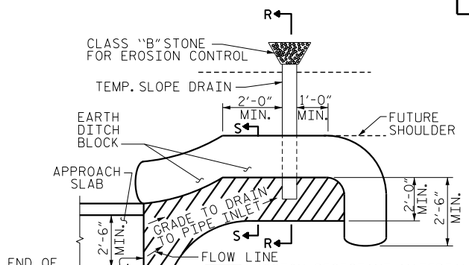
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

APPROACH SLAB GROOVING IS NOT REQUIRED.

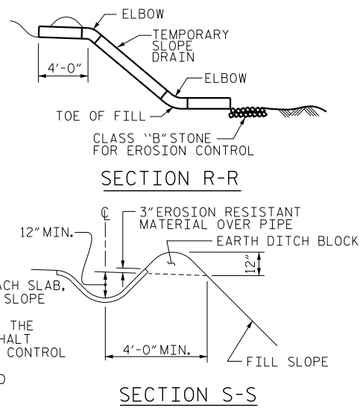


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL



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



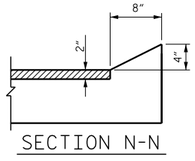
SECTION R-R

SECTION S-S

PLAN VIEW

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



SECTION N-N

CURB DETAILS

BILL OF MATERIAL

APPROACH SLAB AT EB #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	13	#4	STR	28'-10"	250
A2	13	#4	STR	28'-10"	250
✳ B1	58	#5	STR	11'-2"	676
B2	58	#6	STR	11'-8"	1016
REINFORCING STEEL				LBS.	1266
✳ EPOXY COATED REINFORCING STEEL				LBS.	926
CLASS AA CONCRETE				C.Y.	17.7

APPROACH SLAB AT EB #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	13	#4	STR	28'-10"	250
A2	13	#4	STR	28'-10"	250
✳ B1	58	#5	STR	11'-2"	676
B2	58	#6	STR	11'-8"	1016
REINFORCING STEEL				LBS.	1266
✳ EPOXY COATED REINFORCING STEEL				LBS.	926
CLASS AA CONCRETE				C.Y.	17.7

SPLICE LENGTHS

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-5853

LINCOLN COUNTY

STATION: 14+20.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

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

SHEET NO. S-20
TOTAL SHEETS 20

PARRISH & PARTNERS
Parrish and Partners of North Carolina, PLLC
220 Horizon Dr. Suite 100
Raleigh, NC 27615
NC License #P-1212

ASSEMBLED BY : G. MORRIS	DATE : 05-24		
CHECKED BY : O. PUIGCERVER	DATE : 05-24		
DRAWN BY : SHS/MAA 5-09	REV. 12-17	MAA/THC	
CHECKED BY : BCH 5-09	REV. 08-19	BNB/THC	

STD. NO. BAS_30_90S

8/26/21

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

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

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST $\frac{5}{16}$" 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.