09/08/09

STATE PROJECT: DF18203.2010800

CONTRACT: DC00471

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

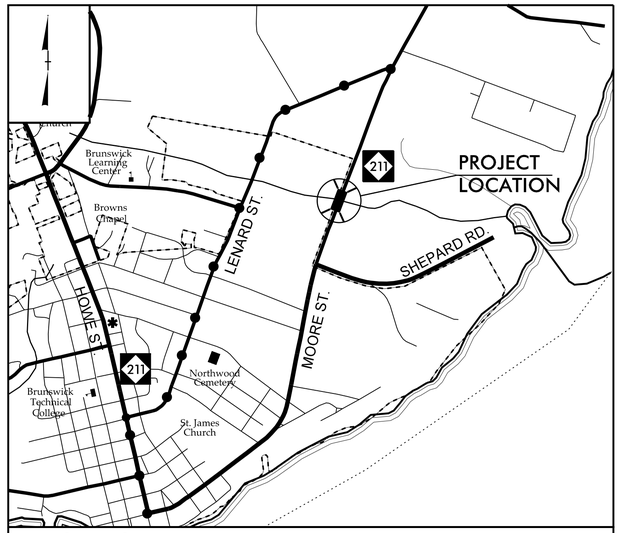
BRUNSWICK COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	DF18203.2010800	1	

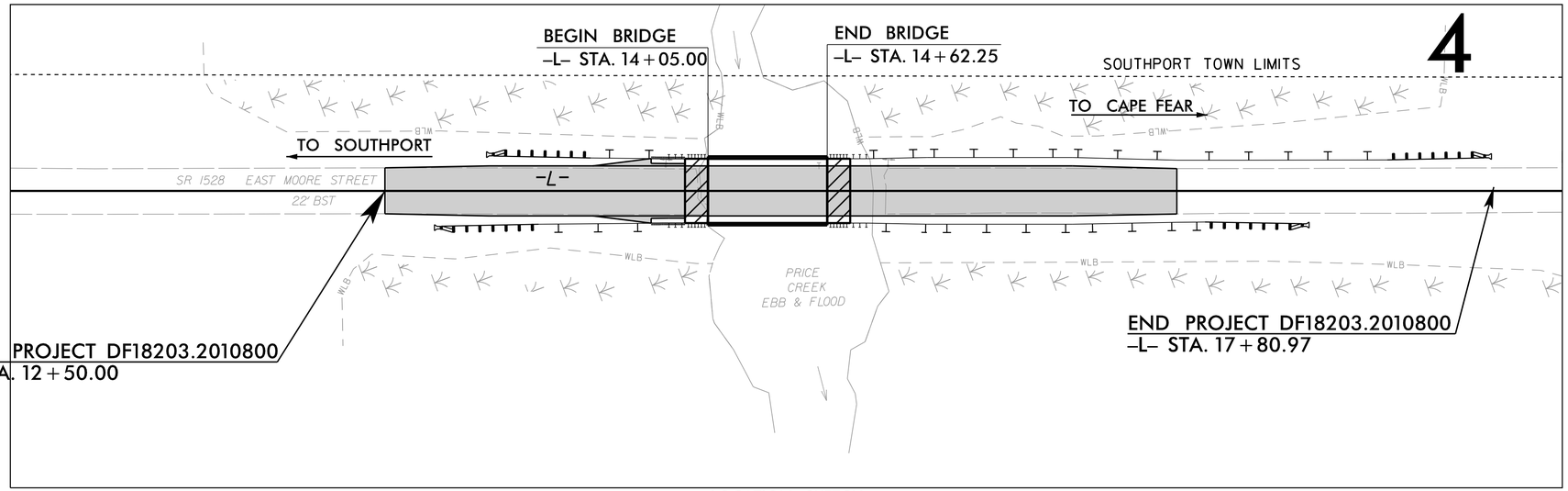
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION

LOCATION: ***SR 1528 (E. MOORE STREET) OVER PRICE CREEK NORTH OF NC 211***

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



NAD 83/
NA 2011



LOCATION SKETCH
NOT TO SCALE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2024 = 758
ADT 2045 = 1,000
T = 8 %
V = 50 MPH

*TTST = 2% DUAL = 6%

FUNC CLASS = RURAL LOCAL

PROJECT LENGTH

LENGTH ROADWAY PROJECT DF18203.2010800	=	0.090 MILES
LENGTH STRUCTURES PROJECT DF18203.2010800	=	0.011 MILES
TOTAL LENGTH PROJECT DF18203.2010800	=	0.101 MILES

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
N/A

LETTING DATE:
NOVEMBER 7, 2024

PHILLIP ROGERS, P.E.
PROJECT ENGINEER

CASEY HARRIS, P.E.
PROJECT DESIGN ENGINEER

DEREK PIELECH, P.E.
NCDOT CONTACT

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 030656 ENGINEER JAMES R. RU

P.E.

SIGNATURE: 10/22/2024

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 040386 ENGINEER CASEY E. HARRIS

P.E.

SIGNATURE: 10/22/2024

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

10/22/2024
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8:00:23 AM

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
DF18203.2010800	1A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 040286 ENGINEER CASEY E HARRIS

10/28/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

INDEX OF SHEETS

2024 ROADWAY STANDARD DRAWINGS

EFF. 01-16-2024
REV.

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

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Modified Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
275.01	Rock Plating
DIVISION 4 - MAJOR STRUCTURES	
423.01	Bridge Approach Fills - Type 1 Approach Fill for Bridge Abutment
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
846.01	Concrete Curb, Gutter and Curb & Gutter
862.01	Guardrail Placement (Use Details in Lieu of Standards for Sheets 4, 6, 12, and 14 of 15)
862.02	Guardrail Installation
862.03	Structure Anchor Units (Use Detail in Lieu of Standard for Sheet 8 of 9)

GENERAL NOTES

EFFECTIVE: 01-16-2024
REVISED:

GRADE LINE:
GRADING AND SURFACING:

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

CLEARING:

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

SUPERELEVATION:

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

SHOULDER CONSTRUCTION:

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

GUARDRAIL:

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

TEMPORARY SHORING:

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

END BENTS:

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

REVISIONS

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9/10/2021

PROJECT REFERENCE NO.	SHEET NO.
DF18203.2010800	1B

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY & PROJECT CONTROL:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

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

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

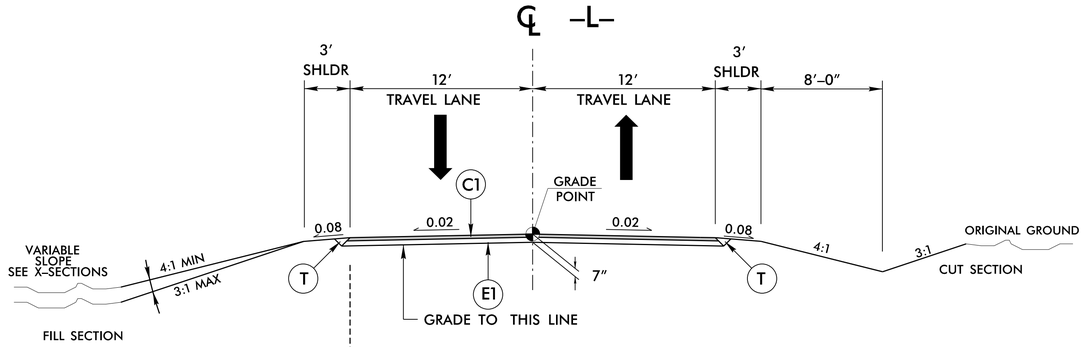
MISCELLANEOUS:

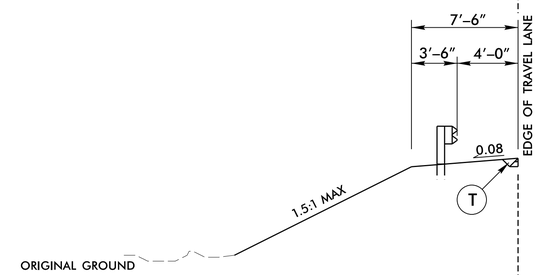
- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line (SUE – LOS B)* — ?UTL
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. — UST
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- Abandoned According to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

FINAL PAVEMENT SCHEDULE

C1	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS PER SQ. YARD IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS PER SQ. YARD PER 1″ DEPTH TO BE PLACED IN LAYERS NOT TO EXCEED 1½″ IN DEPTH.
E1	PROP. APPROX. 4″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS PER SQ. YARD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS PER SQ. YARD PER 1″ DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 3″ OR GREATER THAN 5½″ IN DEPTH.
R	SHOULDER BERM GUTTER
T	EARTH MATERIAL

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

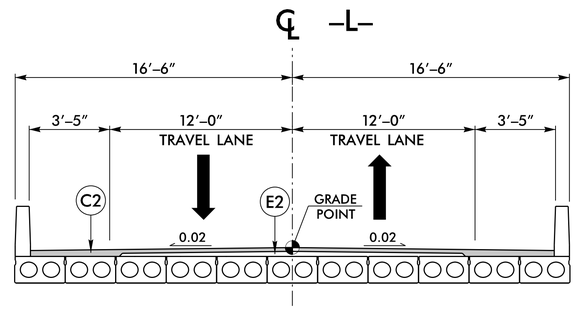




NOTE: SEE RSD 275.01 FOR ROCK PLATING DETAIL

TYPICAL SECTION NO. 1

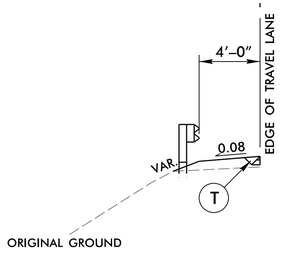
LINE	FROM STATION	TO STATION
–L–	12+50.00	14+05.00 (BEGIN BRIDGE)
–L–	14+62.25 (END BRIDGE)	16+30.00



TYPICAL SECTION NO. 2

33′ CORED SLAB BRIDGE

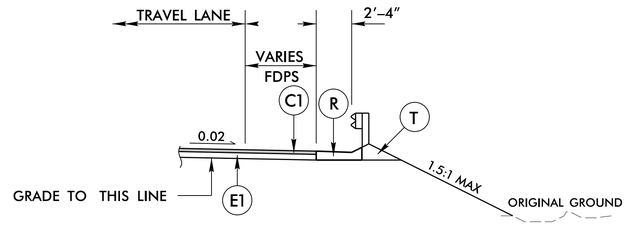
LINE	FROM STATION	TO STATION
–L–	14+05.00 (BEGIN BRIDGE)	14+62.25 (END BRIDGE)



NOTE: SEE RSD 862.01 SHEET 11 FOR DETAIL

LINE	FROM STATION	TO STATION
–L–	12+99 LT	13+50 LT
–L–	12+74 RT	13+70 RT
–L–	16+57 LT	17+81 LT
–L–	15+12 RT	16+06 RT

SBG DETAIL



SEE PLANS AND CROSS SECTIONS FOR LIMITS AND SLOPES

NOTE: SEE RSD 275.01 FOR ROCK PLATING DETAIL

PROJECT REFERENCE NO.	SHEET NO.
DF18203.2010800	2A–1

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 040286 ENGINEER CASEY E. HARRIS
10/22/2024

PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 039622 ENGINEER DEREK R. YIELDING
10/22/2024

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HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

REVISIONS

10/18/2024
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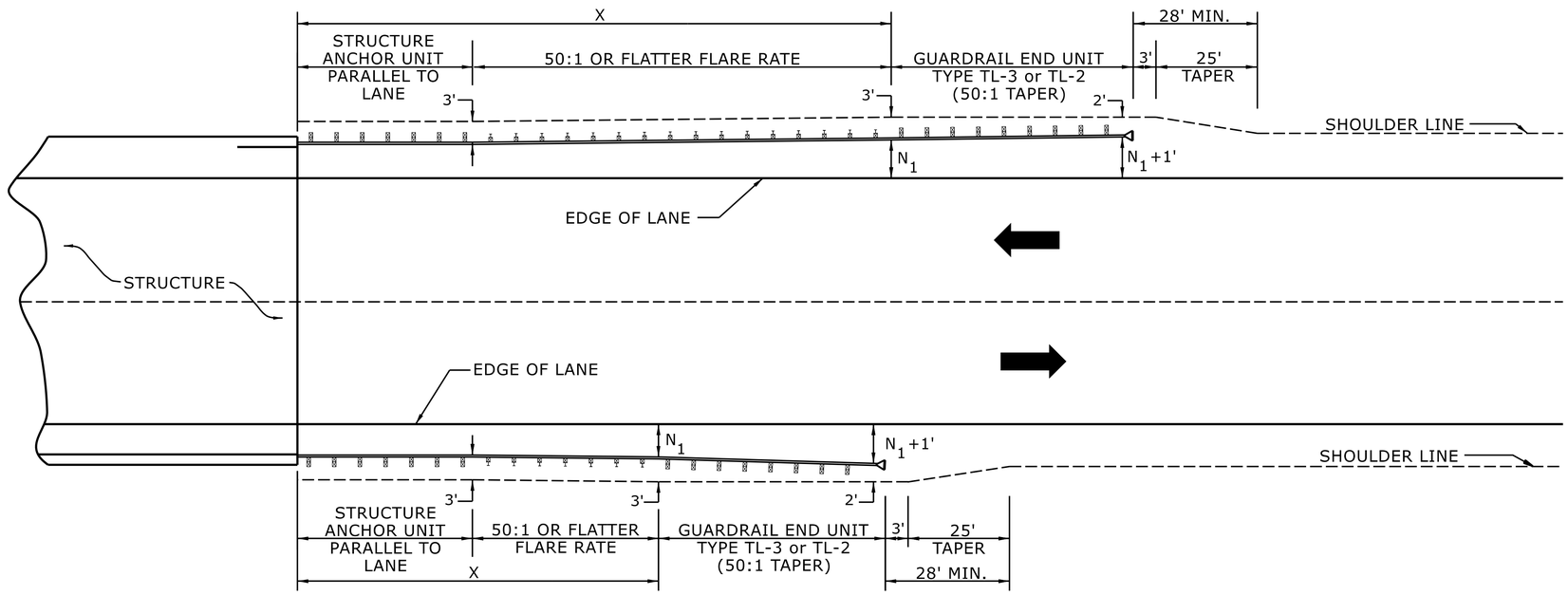
PROJECT REFERENCE NO.	SHEET NO.
DF18203.2010800	2C-1



USE FLARE RATE AS THE CONTROL IF THE "N_1" DISTANCE IS NOT OBTAINED.
("N_1" IS BASED ON SHOULDER WIDTHS IN THE ROADWAY DESIGN MANUAL)

SEE STD. 862.03 FOR STRUCTURE ANCHOR UNITS

FOR POSTED SPEEDS ≥ 45MPH USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45MPH USE GREU TYPE TL-2

GUARDRAIL LENGTH OF NEED (X) IS CALCULATED BASED ON THE AASHTO ROADSIDE DESIGN GUIDE.

LENGTHS AND OFFSETS FOR PROPOSED GUARDRAIL AT TWO LANE - TWO WAY LOCATIONS

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 4 OF 15

862D01

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033144 NICOLE M. HACKLER

10/22/2024

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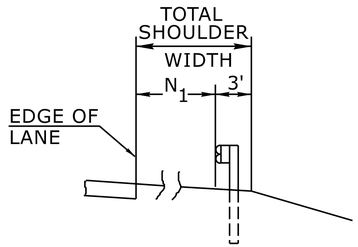
CONTRACTS STANDARDS
AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

SEE TITLE BLOCK

ORIGINAL BY: S.CALHOUN DATE: 7-25-2024
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

PROJECT REFERENCE NO.	SHEET NO.
DF18203.2010800	2C-2



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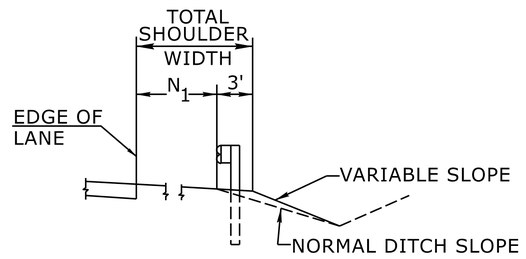
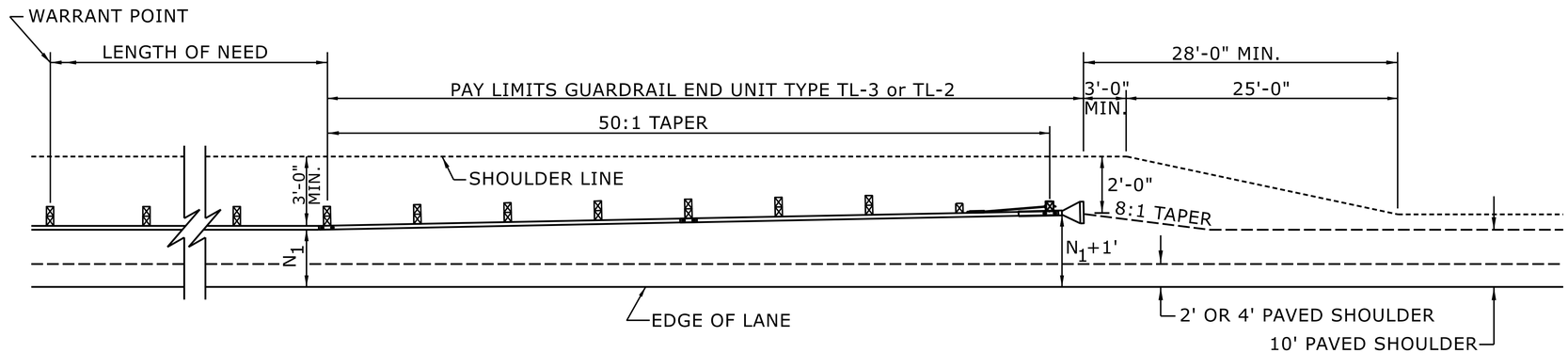


CUT SECTION

"N_1"= DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL WHERE GUARDRAIL IS PARALLEL TO LANE.



FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2

DETAIL OF BEGINNING OF GUARDRAIL IN CUT OR FILL SECTION

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 6 OF 15

862D01

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033144 NICOLE M. HACKLER
10/22/2024

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

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ORIGINAL BY: S.CALHOUN DATE: 7-25-2024
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:

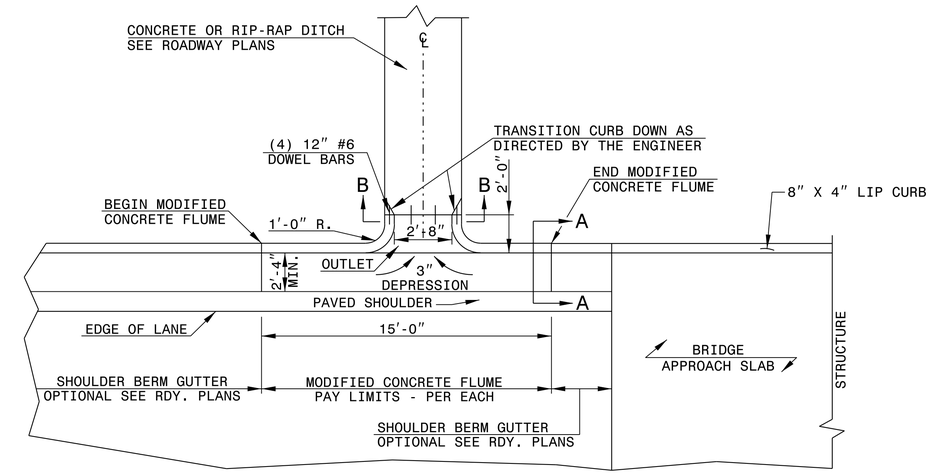
PROJECT REFERENCE NO.	SHEET NO.
DF18203.2010800	2C-3

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

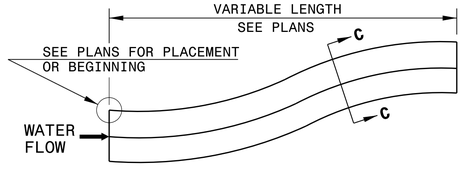
ENGLISH DETAIL DRAWING FOR

MODIFIED CONCRETE FLUME

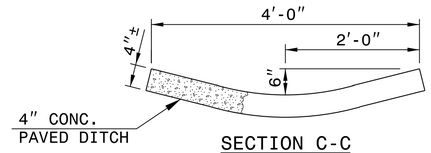
WITH CONCRETE OR RIP-RAP DITCH



PLAN VIEW



DOWNGRADE OR SAG



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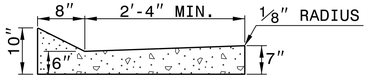

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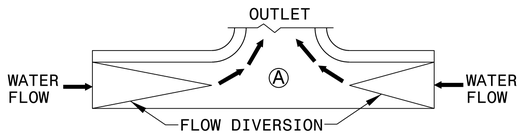
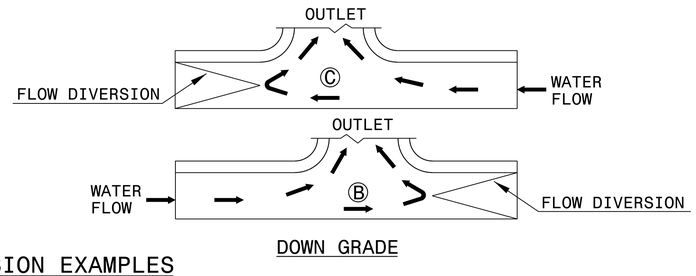
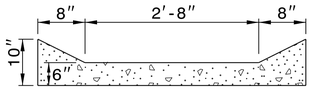


SAG

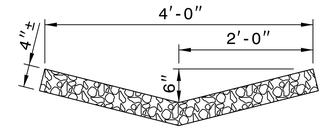


DOWN GRADE

FLOW DIVERSION EXAMPLES



SECTION B-B



RIP-RAP LINED DITCH

NOTES:

- CONSTRUCT MODIFIED CONCRETE FLUME AND SHOULDER BERM GUTTER IN ACCORDANCE WITH THIS DETAIL.
- CONSTRUCT CONCRETE DITCH IN ACCORDANCE WITH STD. DWG. NO. 850.01.
- CONSTRUCT RIP RAP LINED DITCH IN ACCORDANCE WITH THIS DETAIL, IF CALLED FOR IN PLANS.
- CONCRETE OR RIP RAP LINED DITCH SHALL BE THE TYPE AND LENGTH SPECIFIED BY THE ROADWAY PLANS. THE DITCH SHALL TERMINATE AS SHOWN ON THE PLANS. IF NO TERMINATION IS INDICATED PLACE RIP-RAP AT THE END OF THE DITCH AS INDICATED BY STD. DWG. 876.02 FOR AN 18″ PIPE. TRANSITIONS FROM THE DITCH TO TERMINATION SHALL BE AS DIRECTED BY THE ENGINEER.
- MODIFICATIONS SHALL BE AS DICTATED BY SITE CONDITIONS AND DIRECTED BY THE ENGINEER.

SHEET 1 OF 1
MODFLMDTCH

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

ENGLISH DETAIL DRAWING FOR
MODIFIED CONCRETE FLUME
WITH CONCRETE OR RIP-RAP DITCH

SHEET 1 OF 1
MODFLMDTCH

10/23/2024

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

SEE PLATE FOR TITLE

ORIGINAL BY: E.E. Ward DATE: Apr. 2002
MODIFIED BY: J.S. Howerton DATE: October 2017
CHECKED BY: _____ DATE: _____
FILE SPEC.: w:details\stand\modifiedflume.dgn

PROJECT REFERENCE NO.	SHEET NO.
DF18203.2010800	2G-1

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 030788 ENGINEER PU ZHANG

Paul Zhang — SIGNATURE — 10/22/2024 — DATE

ENGINEER

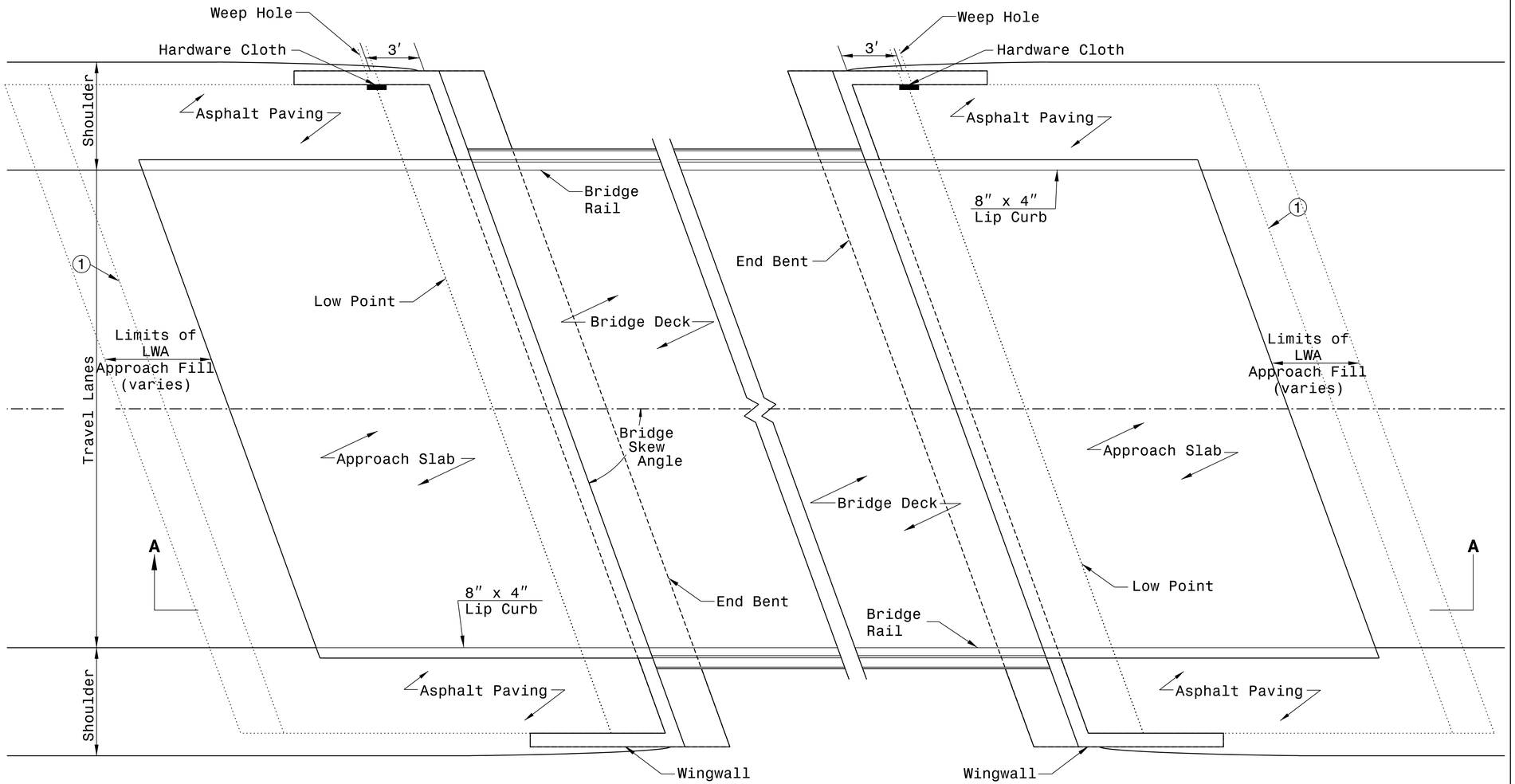
SIGNATURE — DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MODIFIED BRIDGE APPROACH FILLS

LIGHTWEIGHT AGGREGATE APPROACH FILL FOR BRIDGE ABUTMENT

① Extend Lightweight Aggregate Fill anywhere roadway excavation is required with a min. of 10′ beyond the approach slab.



PLAN VIEW
APPROACH SLAB

PREPARED BY: S. KABRA	DATE: 10/22/24
REVIEWED BY: PU ZHANG	DATE: 10/22/24

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

BRIDGE ON SR 1528 (E. MOORE ST) OVER PRICE CREEK BETWEEN NC 211 AND SR 1527

REVISIONS

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

PROJECT REFERENCE NO.	SHEET NO.
DF18203.2010800	2G-2

GEOTECHNICAL ENGINEER

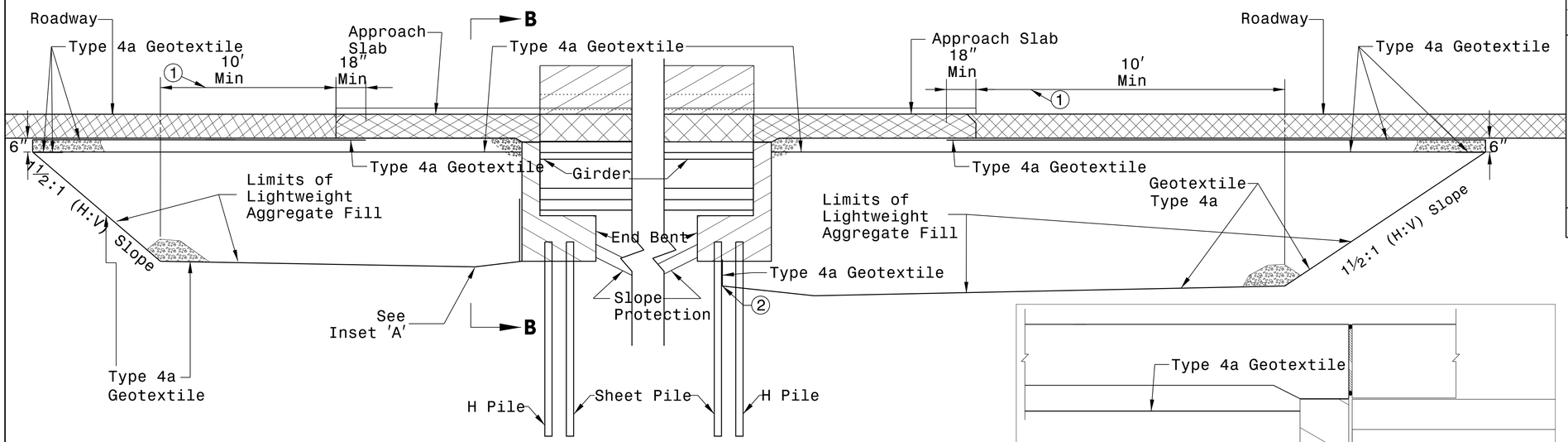
NORTH CAROLINA PROFESSIONAL SEAL 030788 ENGINEER PU ZHANG

Paul Zhang — SIGNATURE — 10/22/2024 — DATE

ENGINEER

SIGNATURE — DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



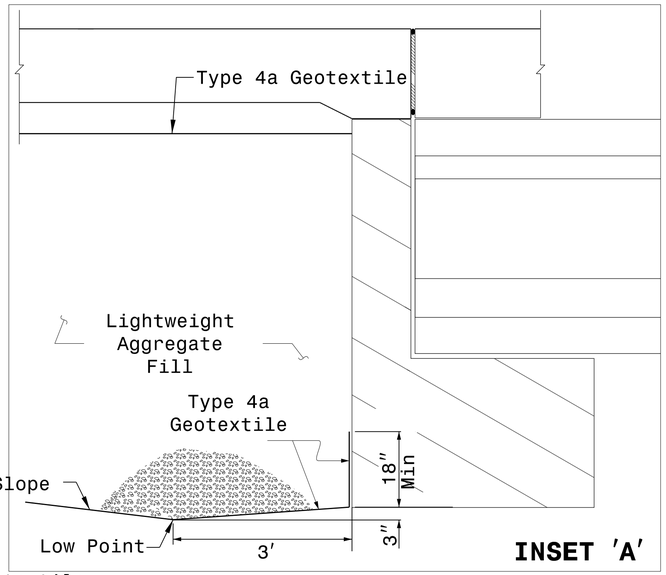
SECTION A-A
(Girder bridge shown, Cored Slabs and Box Beams similar)

① Extend Lightweight Aggregate Fill anywhere roadway excavation is required with a min. of 10′ beyond the approach slab.

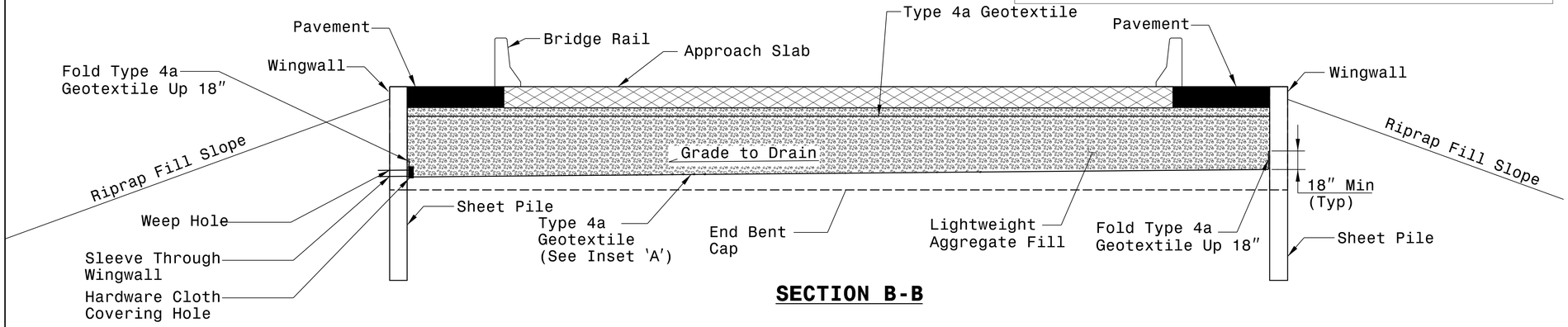
② Use the Lightweight Aggregate Fill on End Bent 2 Above Elevation 1.7′. Don't Use Select Fill.

③ Wrap the Lightweight Aggregate Fill in Type 4a Geotextile for Area Outside Sheet Pile Wall Limit at End Bent 1.

Estimated Lightweight Aggregate Fill = 1,400 Tons



INSET 'A'



SECTION B-B

MODIFIED BRIDGE APPROACH FILLS
LIGHTWEIGHT AGGREGATE APPROACH FILL FOR BRIDGE ABUTMENT

PREPARED BY: S. KABRA	DATE: 10/22/24
REVIEWED BY: PU ZHANG	DATE: 10/22/24

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

BRIDGE ON SR 1528 (E. MOORE ST) OVER PRICE CREEK BETWEEN NC 211 AND SR 1527

REVISIONS

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

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St. Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK

IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	EMBANK. + %	BORROW	WASTE
–L– STA. 12 + 50.00 TO STA. 14 + 05.00 (BEGIN BRIDGE)	64	150	86	0
SUBTOTAL	64	150	86	0
–L– STA. 14 + 62.25 (END BRIDGE) TO STA. 17 + 80.97	56	396	340	0
SUBTOTAL	56	396	340	0
TOTAL	120	546	426	0
MATERIAL FOR SHOULDER CONSTRUCTION				
LOSS DUE TO CLEARING & GRUBBING				
ROCK WASTE TO REPLACE BORROW				
ADJUST FOR ROCK WASTE				
WASTE IN LIEU OF BORROW				
PROJECT TOTAL	120	546	426	0
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT			21	
GRAND TOTAL	120	546	447	
SAY	150		500	

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

ESTIMATED UNDERCUT = 400 CY
ESTIMATED GEOTEXTILE FOR SOIL STABILIZATION = 200 SY
ESTIMATED SELECT GRANULAR MATERIAL, CLASS III = 200 CY

SUMMARY OF SHOULDER BERM & GUTTER

IN FEET

	LOCATION	SIDE	BEGIN STATION	END STATION	LENGTH
	–L–	LT	13 + 78	13 + 94	16
	–L–	RT	13 + 78	13 + 94	16
				TOTAL	32
				SAY	40

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

GUARDRAIL SUMMARY

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 GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	XI MOD	AT–1	GREU, TL–3	TYPE III	B–77	CAT–1	B–77 SHOP CURVED	XIII	XI	EA	G	NG				
–L–	12 + 74	14 + 05 (BR)	RT	131.25			13 + 70	14 + 05	4′	4′	112.5′		1.58′				1	1												8′ GUARDRAIL POSTS
–L–	12 + 99	14 + 05 (BR)	LT	106.25			12 + 50	14 + 05	4′	4′	87.5′		1.35′				1	1												8′ GUARDRAIL POSTS
–L–	14 + 62 (BR)	16 + 93	RT	231.25			14 + 62	16 + 00	4′	4′	29′	50′	.58′	1′			1	1												8′ GUARDRAIL POSTS
–L–	14 + 62 (BR)	17 + 81	LT	318.75			14 + 62	16 + 57	4′	4′	29′	50′	.58′	1′			1	1												8′ GUARDRAIL POSTS
		SUBTOTAL		787.50																										
		GREU, TL–3 @ 50′X4		–200																										
		TYPE III @ 18.75′X4		–75																										
		TOTAL		512.50													4	4												
		SAY		525			5 ADDITIONAL GUARDRAIL POSTS																								

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_50.plt PENTABLE: NCDOT_pshpfl.tbl
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PROJECT REFERENCE NO.	SHEET NO.
DF18203.2010800	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 040286 ENGINEER CASEY E. HARRIS
10/22/2024

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 054986 ENGINEER JAMES R. RICE
10/22/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

8/17/99

REVISIONS

BEGIN APPROACH SLAB
–L– STA. 13+94.13

END APPROACH SLAB
–L– STA. 14+73.13

TYPE–III
12' LANE
12' LANE
.02
TYPE–III
TYPE–III
TYPE–III

BEGIN BRIDGE
–L– STA. 14+05.00

END BRIDGE
–L– STA. 14+62.25

SKETCH SHOWING ROADWAY IN RELATION TO STRUCTURE

NAD 83/2011

–L– POT Sta. 10+00.00

–L– POT Sta. 18+48.47

S 20°37'02" W
370.09'

N 73°05'34" W
264.70'

N 73°05'34" W
179.44'

N 73°05'34" W
65.99'

RYAN KINIRY
AND WIFE
MARITZA MANRIQUE-KINIRY
DB 4409 PG 615
MB 19 PG 337

HARBOR OAKS PROPERTY
OWNERS ASSOCIATION, INC
DB 2603 PG 341
MB 19 PG 337
MB 21PG 107

TURTLEWOOD AT SOUTHPORT
PROPERTY OWNERS ASSOCIATION, INC
DB 3048 PG 912
MB 32 PG 9

CITY OF
SOUTHPORT
DB 2776 PG 1237
MB 32 PG 9

LINDA DIANE HIRSCH
AND SPOUSE
JOSEPH J. HIRSCH, III
DB 5222 PG 883
MB 32 PG 9

TURTLEWOOD AT SOUTHPORT
PROPERTY OWNERS ASSOCIATION, INC
DB 3048 PG 912
MB 32 PG 9

N 10°46'07" E
28.53'

N 27°07'01" W
60.67'

N 20°25'50" E
61.79'

S 76°50'15" W
10.08'

N 01°55'47" W
45.55'

N 65°27'57" W
37.04'

72" CHL 358N

LIFT STATION

PUMP STATION SIGNAL

SALT MARSH

CLASS II RIP RAP UP TO RDWY SHOULDER (1.5:1 ALONG WALL) (FILL VOIDS WITH CLASS B) (BEG. +50 LT & +70 RT)

50' TAPER LT & RT

USE 8' POSTS

SHEET PILE WALL (END +97 LT & RT)

USE 8' POSTS

BEG ROCK PLATING 15+74 LT

50' TAPER LT & RT

END ROCK PLATING 16+57 LT

EXISTING R/W

GPS-2

SR 1528 EAST MOORE STREET

22' BST

WOODS

GREU TL-3

TYPE-III

N 20°29'06.9" E

–L–

8:1

GREU TL-3

SBG +76 (LT & RT)

CONCRETE FLUMES EXTEND 5.0' BEYOND SHEET PILE WALLS (OUTLET +82 LT & RT)

SHEET PILE WALL (BEG +88 LT & RT)

EXCAVATION AND DEBRIS REMOVAL. REMOVE CULVERT AND ROADWAY MATERIAL WITHIN STREAM INSIDE R/W AS DIRECTED BY ENGINEER.(DO NOT REMOVE NATIVE MATERIAL)

CLASS II RIP RAP SLOPING ABUTMENT (1.5:1 NORMAL TO PILE WALL) (FILL VOIDS WITH CLASS B)

END PAVING STA. +30

END ROCK PLATING 16+00 RT

CLASS II RIP RAP UP TO RDWY SHOULDER (1.5:1 ALONG WALL) (FILL VOIDS WITH CLASS B) (END +22 LT & +12 RT)

BEGIN PROJECT DF18203.2010800
–L– STA. 12+50.00

END PROJECT DF18203.2010800
–L– STA. 17+80.97

BM1 ELEVATION = 5.68
N 69467 E 2301768
BL STATION 19+52 16' RIGHT
MAG SPIKE IN 18" PINE

BM2 ELEVATION = 16.85
N 70179 E 2302032
BL STATION 27+10 16' RIGHT
MAG SPIKE IN 18" TRIPLE OAK

BM-2

BF-2

PI = 13+40.00
EL = 10.58'
K = 97
VC = 150'

BEGIN GRADE
–L– STA. 12+50.00
EL. = 11.50'

BEGIN BRIDGE
–L– STA. 14+05.00

END BRIDGE
–L– STA. 14+62.25

END GRADE
–L– STA. 16+30.00
EL. = 12.11'

BRIDGE ℄ STA. 14+33.5 –L–
1 SPAN, 21" CORED SLAB, 1@55'
W/4.0' DEEP CAPS, SKEW 90
GP ELEV. = 11.02

FEMA 100YR BACKWATER
WS ELEV. = 9.0'

EXISTING GROUND

PROPOSED ROADWAY PROFILE

(–)11.0180%

(+)10.5260%

100 YR FEMA WS ELEV. = 4.53'

100 YR USGS WS ELEV. = 4.6'

25 YR USGS WS ELEV. = 4.5'

REMOVE EXISTING CULVERT

MHHW = 1.7'*

CLASS II RIP RAP SLOPE 1.5:1 (2 FT. THICK) (NORMAL TO CAP) (TYP.)

EXCAVATION AND DEBRIS REMOVAL. REMOVE CULVERT AND ROADWAY MATERIAL WITHIN STREAM INSIDE R/W AS DIRECTED BY ENGINEER. (DO NOT REMOVE NATIVE MATERIAL)

FILL SCOUR HOLE

NATURAL STREAM BED ELEV = –3.5

NOTE: ALLOW UPSTREAM CHANNEL TO NATURALLY FILL ON TOP OF RIP RAP ALONG UPSTREAM BRIDGE FACE

CLASS II RIP RAP ALONG UPSTREAM BRIDGE FACE (PLACE RIP RAP UP TO 2.0' BELOW NATURAL BED UP TO ELEV = –5.5)

STORM SCOUR LIMITS ALONG UPSTREAM BRIDGE FACE (FILL SCOUR HOLE) (APPROX SCOUR ELEV = –13')

HYDRAULIC DATA

DESIGN DISCHARGE (USGS)	= 780 C.F.S.
FREQUENCY OF DESIGN FLOOD	= 25 YRS.
DESIGN HIGH WATER ELEVATION	= 4.5
DRAINAGE AREA	= 1.13 SQ. MI.
BASIC DISCHARGE Q100 (USGS)	= 930 C.F.S.
BASIC HIGH WATER ELEVATION	= 4.6

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 4,500 C.F.S.
FREQUENCY OF OVERTOPPING FLOOD	= >500 YRS.
OVERTOPPING FLOOD ELEVATION	= 10.8*

*ROADWAY SAG –L– 13+65

–L–

50 40 30 20 10 0 –10 –20 –30 –40

10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00

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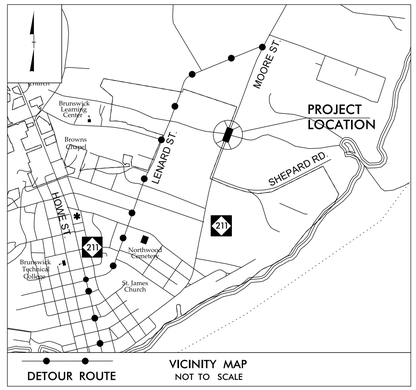
09/08/99

TIP PROJECT: DF18203.2010800

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	DF18203.2010800	RW01	04

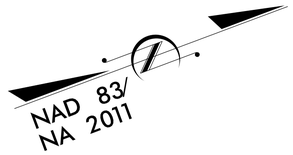


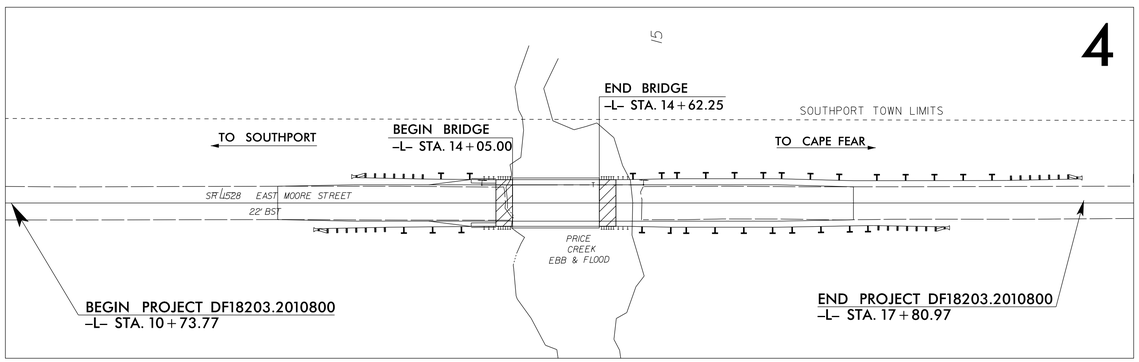
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

BRUNSWICK COUNTY

LOCATION: SR 1528 (E. MOORE STREET) OVER PRICE CREEK NORTH OF NC 211





GRAPHIC SCALE
FOR RW04 SHEET ONLY

50 25 0 50 100
PLANS

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "GPS-2" WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF NORTHING: 69023.1582(ft) EASTING: 2301550.3653(ft) ELEVATION: 14.758(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.0001390365 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "GPS-2" TO -L- STATION 10+00.00 IS N 24-47'40.1" E 206.63(ft) ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

Prepared in the Office of:

LOCATION AND SURVEYS UNIT
5310 BARBADOS BLVD., SUITE 102
CASTLE HAYNE, NORTH CAROLINA 28409

PROFESSIONAL LAND SURVEYOR

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

10/24/2024
SIGNATURE: *Date:*

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:	*LETTING DATE:*
N/A	*NOVEMBER 7, 2024*

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

24-OCT-2024 13:05
S:\Units\Div03\Projects\BRIDGE\Brunswick\Culvert over Price's Creek\Working\Control Sheets\DF18203.2010800_ls_rw01.dgn
mjduval AT LS-328725L

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

NC GRID NAD 83 NA 2011

PROJECT REFERENCE NO.	SHEET NO.
DF18203.2010800	RW02C-1

Location and Surveys

LOCATION AND SURVEYS UNIT
5310 BARBADOS BLVD., SUITE 102
CASTLE HAYNE, NORTH CAROLINA 28409

PROJECT SURVEYOR

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

I, Christopher J. Sawyer, PLS, certify that the 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: OCTOBER 17, 2024
Datum/Epoch: NAD 83/ NA 2011
Published/Fixed-control use: N/A FOR RTN
Localized around: GPS-2
Northing: 69023.1582
Easting: 2301550.3653
Combined grid factor: 1.0001390365
Geoid model: G18NC
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 on October 17, 2024 , and all coordinates are based on NAD 83/ NA2011 and all elevations are based on NAVD 88; that this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 24th day of October, 2024.

Christopher J. Sawyer

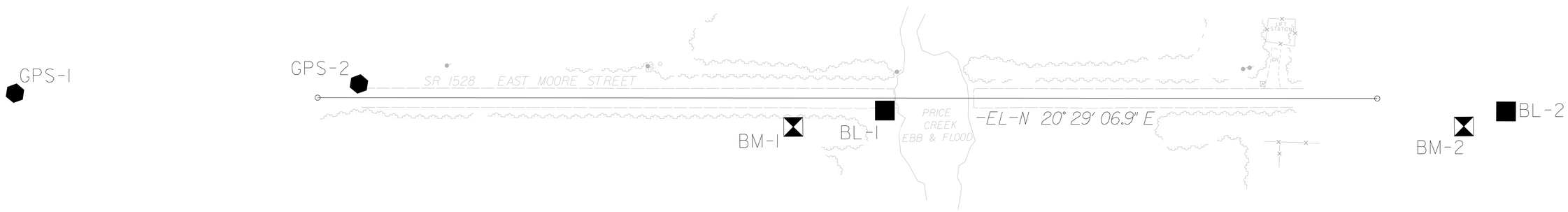
Professional Land Surveyor L-4526

EL

POINT	N	E	BEARING	DIST
POT	68973.896	2301548.536		
LINE			N 20°29'06.9" E	1200.00
POT	70098.011	2301968.496		

BL

POINT	DESC.	NORTH	EAST	ELEVATION
GPS1	GPS PK	68116.7486	2301239.9631	21.72
GPS2	GPS CAP & REBAR	69023.1582	2301550.3653	14.76
BL1	TRV CAP & REBAR	69570.6660	2301786.4780	9.28
BL2	TRV CAP & REBAR	70229.5280	2302033.1220	15.57




```
**********************************************
BM1       ELEVATION = 5.68
N 69467       E 2301768
MAG SPIKE IN 18" PINE
**********************************************
**********************************************
BM2       ELEVATION = 16.85
N 70179       E 2302032
MAG SPIKE IN 18" TRIPLE OAK
**********************************************
```

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.

6/2/99

REVISIONS

PROPOSED ALIGNMENT CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
DF18203.2010800	RW02D-1

Location and Surveys

LOCATION AND SURVEYS UNIT
5310 BARBADOS BLVD., SUITE 102
CASTLE HAYNE, NORTH CAROLINA 28409

PROJECT SURVEYOR

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

This 24th day of October, 2024.

Christopher J. Sawyer

Professional Land Surveyor L-4526

L

TYPE	STATION	NORTH	EAST
POT	10+00.00	69210.7450	2301637.0206
POT	18+48.47	70005.5602	2301933.9568

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.

23-OCT-2024 14:17
$$USER:\Projects\BRIDGE\Brunswick\Culvert over Price's Creek\Working\Control Sheets\DF18203.2010800_LS_rw02d-1_241023.dgn
mduval AT LS-328725

PROJECT REFERENCE NO.	SHEET NO.
DF18203.2010800	RW04

Location and Surveys

LOCATION AND SURVEYS UNIT
5310 BARBADOS BLVD., SUITE 102
CASTLE HAYNE, NORTH CAROLINA 284029

PROJECT SURVEYOR

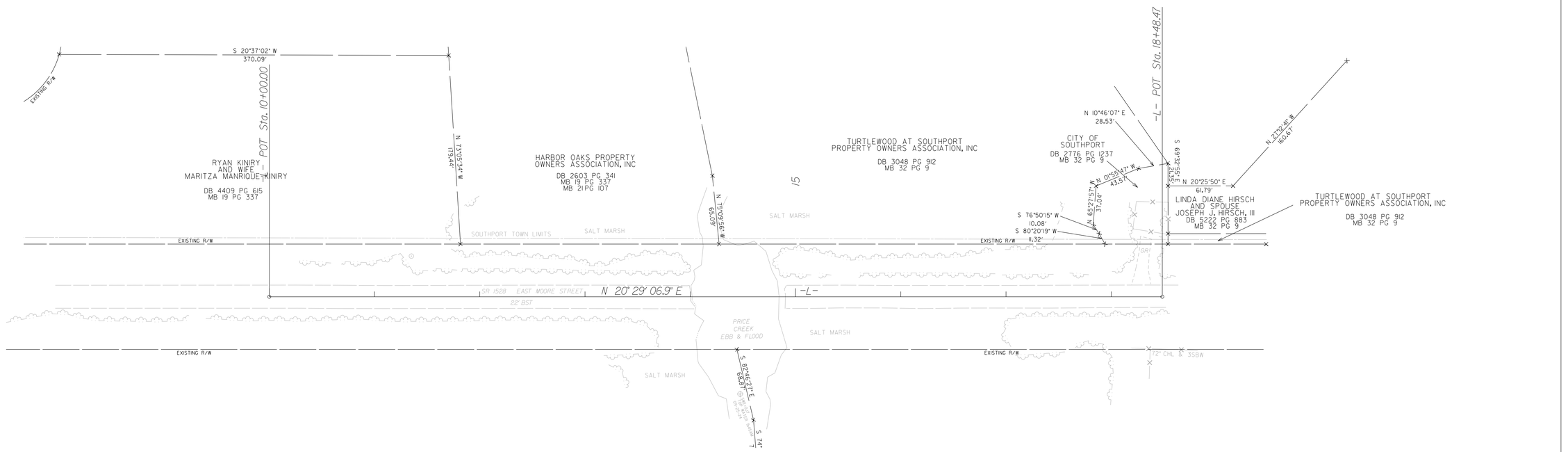
NORTH CAROLINA PROFESSIONAL LAND SURVEYOR SEAL L-4526 CHRISTOPHER J. SAWYER

10/24/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/NA 2011

NO RIGHT-OF-WAY WAS PURCHASED ON THIS PROJECT EXISTING R/W IS 100'.



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. NO RIGHT-OF-WAY WAS PURCHASED FOR THIS PROJECT.

REVISIONS

6/2/99

24-OCT-2024 15:55
S:\Units\Projects\BRIDGE\Brunswick\Culvert over Price's Creek\Working\Control Sheets\DF18203.2010800_ls_rw04_241023.dgn
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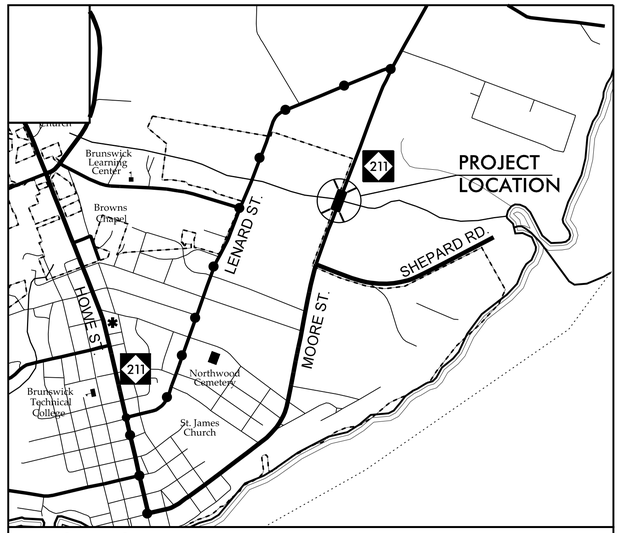
CONTRACT:DC00471 STATE PROJECT:WBS DF18203.2010800



VICINITY MAP
NOT TO SCALE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

BRUNSWICK COUNTY

LOCATION: SR 1528 (E. MOORE STREET) OVER PRICE CREEK NORTH OF NC 211

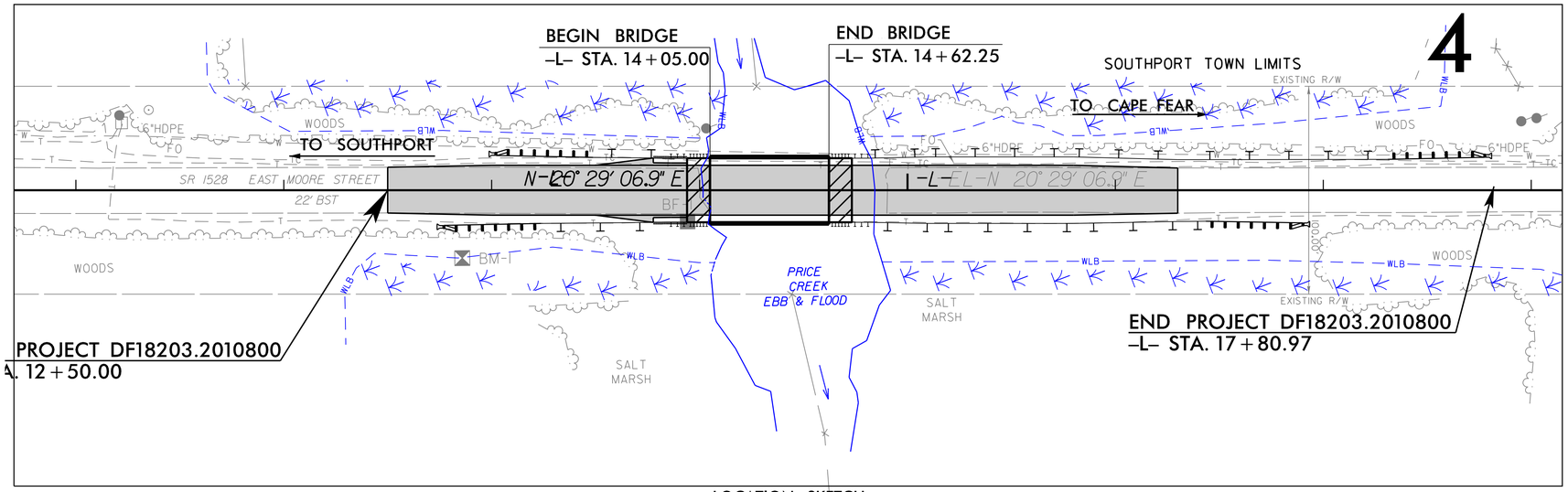
TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURE

NAD 83/
NA 2011

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	DF18203.2010800	EC-1	

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

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



LOCATION SKETCH
NOT TO SCALE

THE OUTSIDE BUFFER, WETLAND, OR WATER BOUNDARY SHALL BE CLEARLY MARKED BY HIGHLY VISIBLE FENCING (ORANGE SAFETY FENCE).

GRAPHIC SCALE

50 25 0 50 100
PLANS

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

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

Prepared in the Office of:

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

2024 STANDARD SPECIFICATIONS

Designed by:

David R. Wagner II, PE *4286*
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.

10/28/2024
$$$$USERNAME$$$$
$$$$FILENAME$$$$ St-EC_TSH.dgn

PROJECT REFERENCE NO.	SHEET NO.
DF18203.2010800	EC-02
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

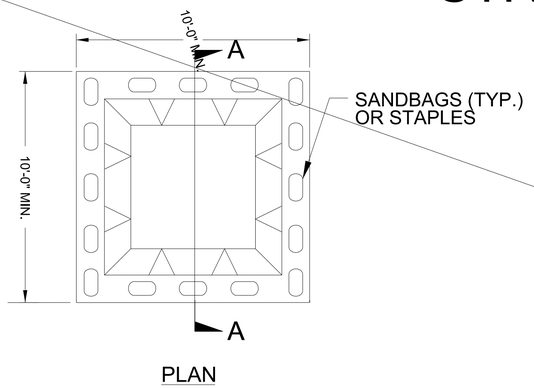
EROSION & SEDIMENT CONTROL LEGEND

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

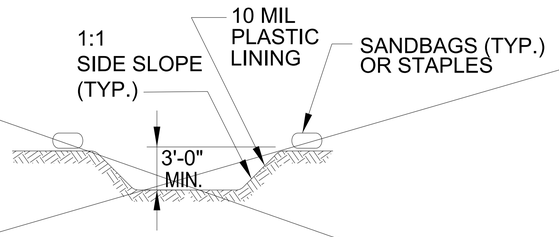
Std. #	Description	Symbol
1633.01	Temporary Rock Silt Check Type A	
1633.02	Temporary Rock Silt Check Type B	
1633.03	Temporary Rock Silt Check Type A with Excelsior Matting and Flocculant	
1634.01	Temporary Rock Sediment Dam Type A	
1634.02	Temporary Rock Sediment Dam Type B	
1635.01	Rock Pipe Inlet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

PROJECT REFERENCE NO.	SHEET NO.
DF18203.20I0800	EC-02A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

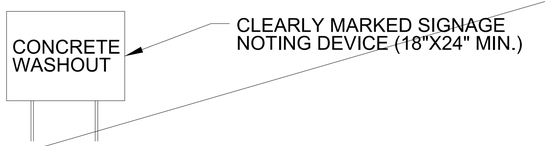
ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER



PLAN



SECTION A-A



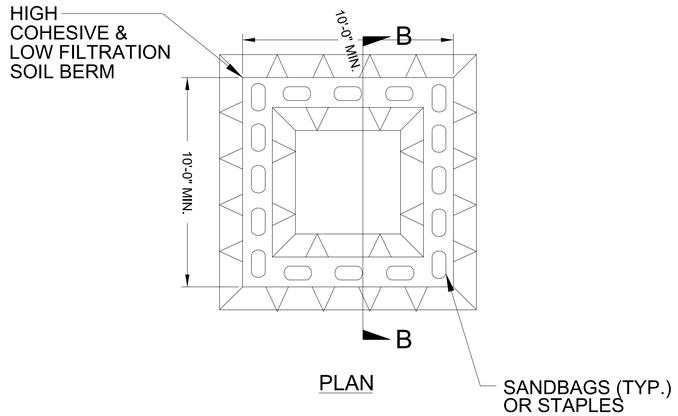
NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

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

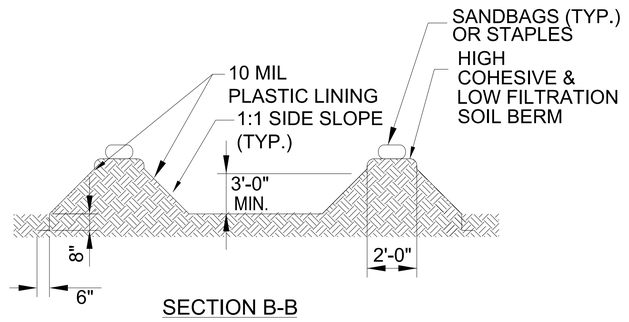
3.CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARY MARKED WITH SIGNAGE NOTING DEVICE.

BELOW GRADE WASHOUT STRUCTURE

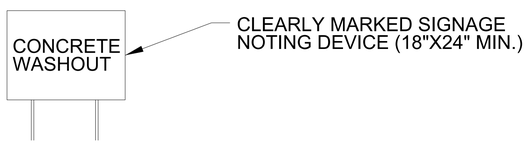
NOT TO SCALE



PLAN



SECTION B-B



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.

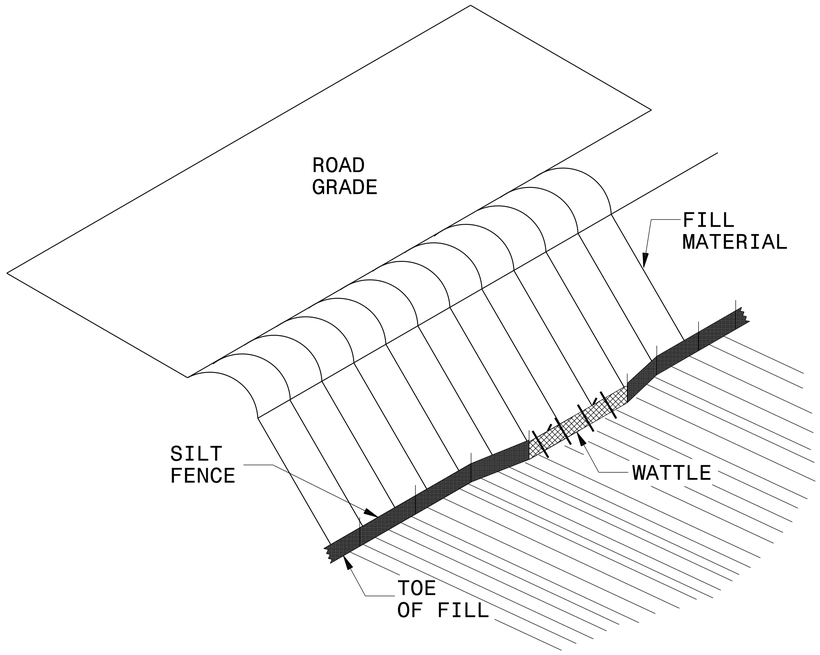
3.CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARY MARKED WITH SIGNAGE NOTING DEVICE.

ABOVE GRADE WASHOUT STRUCTURE

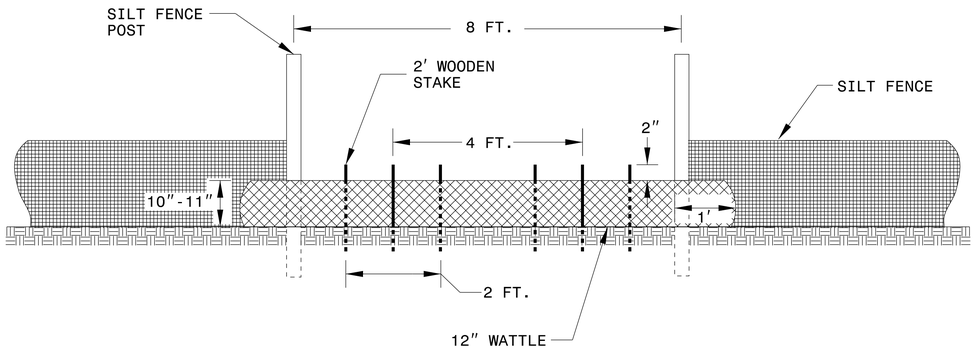
NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
DF18203.2010800	EC-2B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SILT FENCE COIR FIBER WATTLE BREAK DETAIL



ISOMETRIC VIEW



VIEW FROM SLOPE

NOTES:

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

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

DO NOT PLACE WATTLE ON TOE OF SLOPE.

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

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

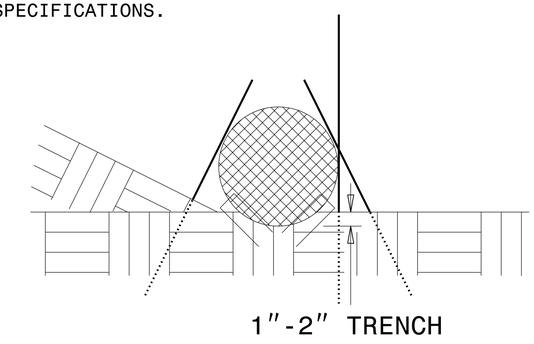
PROVIDE STAPLES MADE OF 11 GUAGE STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 6″ IN LENGTH.

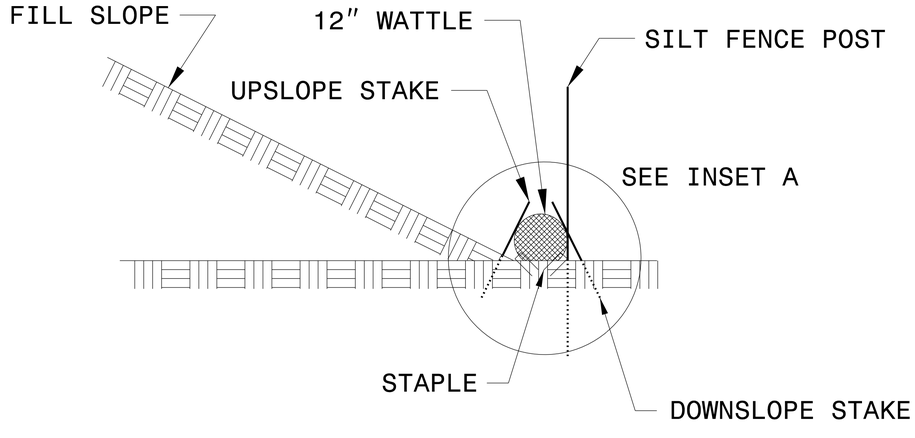
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

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

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

INSET A

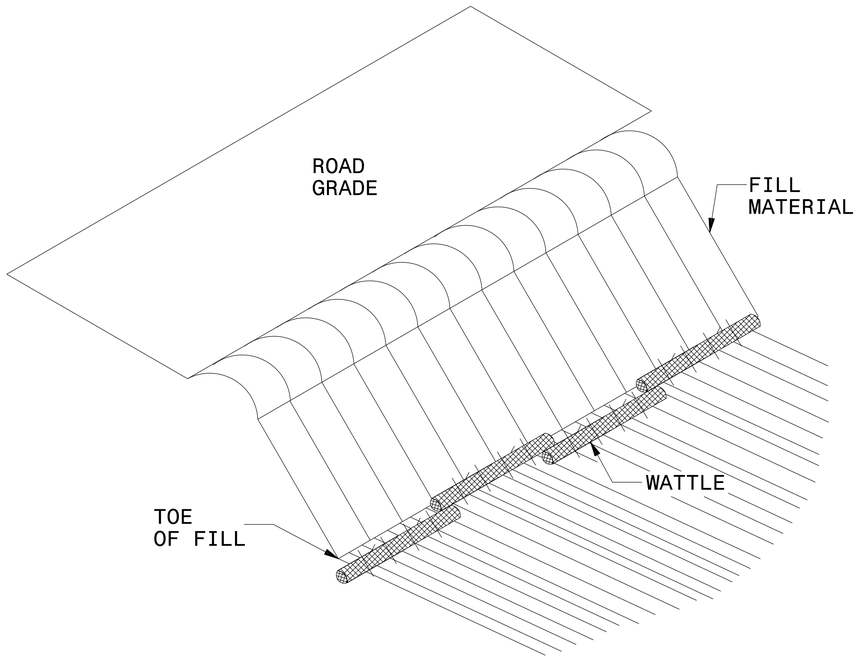




SIDE VIEW

PROJECT REFERENCE NO.	SHEET NO.
DF18203.2010800	EC-2C
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

COIR FIBER WATTLE BARRIER DETAIL



ISOMETRIC VIEW

NOTES:

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

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

DO NOT PLACE WATTLES ON TOE OF SLOPE.

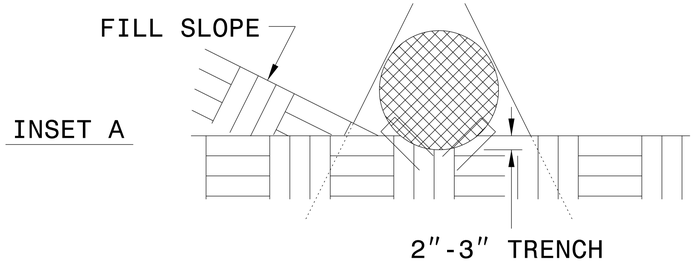
USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

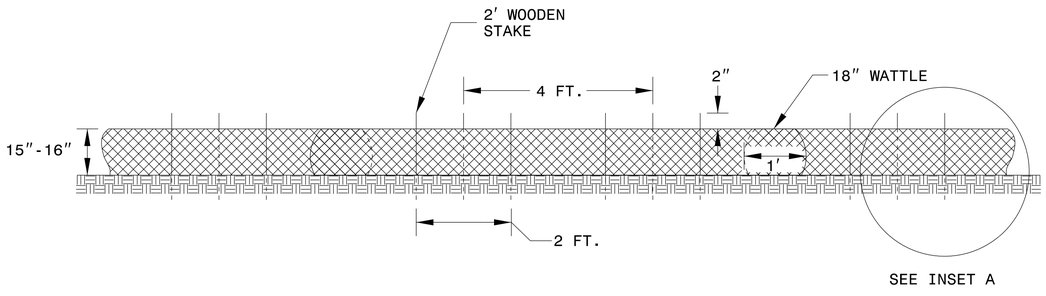
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO GROUND.

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

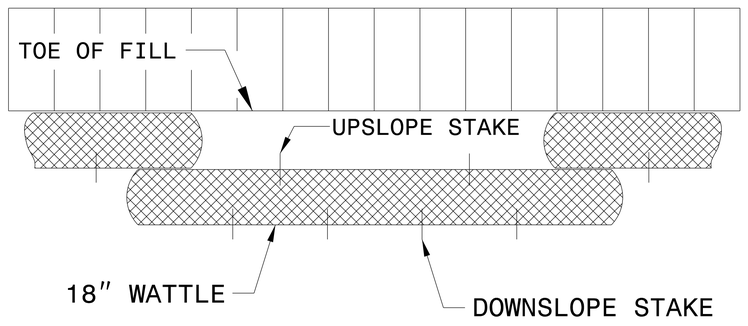
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

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





FRONT VIEW



TOP VIEW

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
DF18203.2010800	EC-3

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION SUMMARY SHEET

COIR FIBER MATTING FOR SLOPE

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	-L-	13+00	13+75	LT	275
4	-L-	13+00	13+75	RT	275
4	-L-	15+00	16+25	LT	450
4	-L-	15+00	16+25	RT	450
	MATTING FOR SLOPES SUBTOTAL				1450 SY
	MISCELLANEOUS AS DIRECTED BY ENGINEER				550 SY
				TOTAL	2000 SY

MATTING FOR DITCHES

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
	NOTE: NO DITCH MATTING ANTICIPATED ON THIS PROJECT				

PROJECT REFERENCE NO.	SHEET NO.
DF18203.2010800	EC-3A
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

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

PROJECT REFERENCE NO.	SHEET NO.
DF18203.2010800	EC-04/CONST.04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

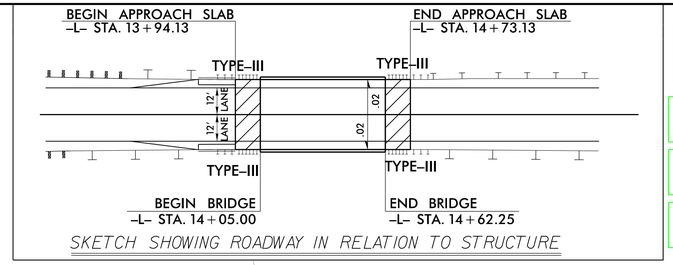
NAD 83/2011

CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 4

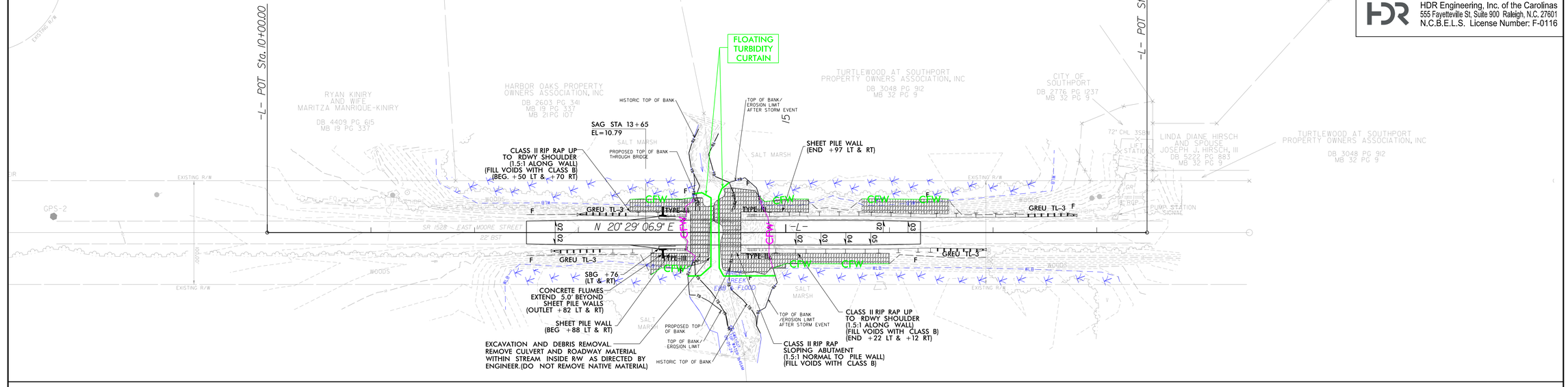
NOTE: UTILIZE SPECIAL STILLING BASIN(S) (SILT BAGS) AS NEEDED DURING BRIDGE CONSTRUCTION

NOTE: UTILIZE A COMBINATION OF SILT FENCE AND COIR FIBER WATTLES AS DIRECTED BY ENGINEER.

NOTE: USE COIR FIBER PRODUCTS ONLY. NO POLYMER PRODUCTS ARE TO BE USED WITHIN PROJECT LIMITS.



SKETCH SHOWING ROADWAY IN RELATION TO STRUCTURE



REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
DF18203.2010800	EC-05/CONST.04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St. Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

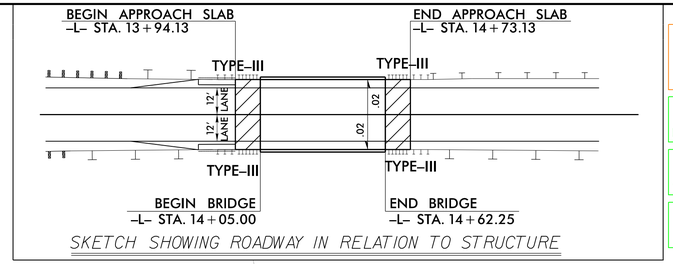
NAD 83/2011

NOTE:
UTILIZE COIR FIBER MATTING ADJACENT TO WETLANDS/JURISDICTIONAL AREAS, AND AS DIRECTED.

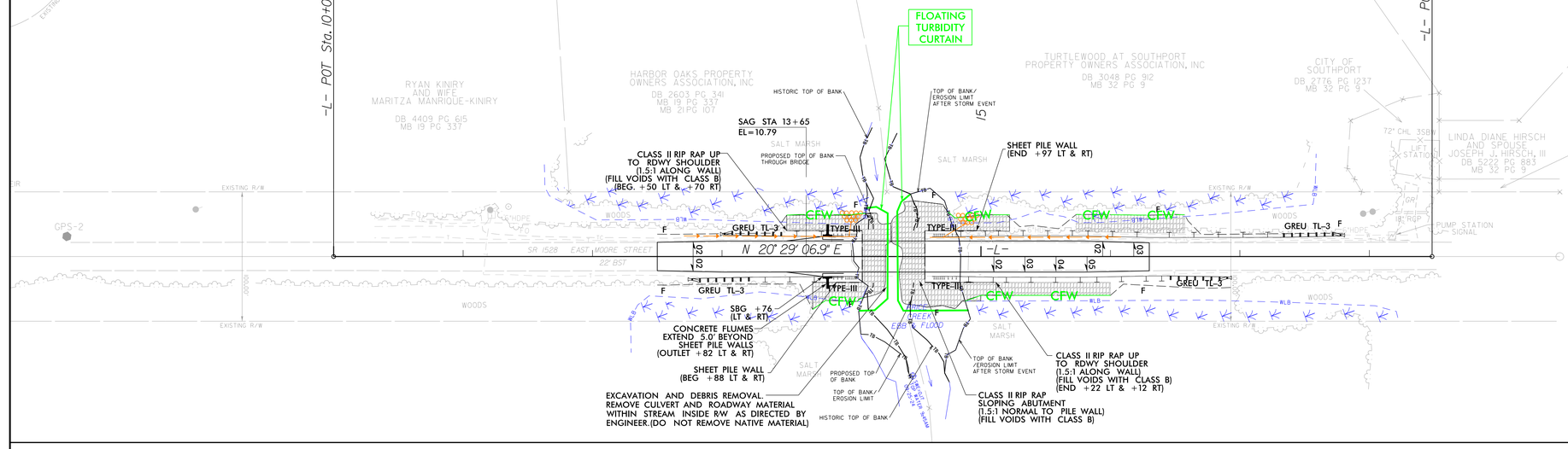
NOTE: UTILIZE SPECIAL STILLING BASIN(S) (SILT BAGS) AS NEEDED DURING BRIDGE CONSTRUCTION

NOTE: UTILIZE A COMBINATION OF SILT FENCE AND COIR FIBER WATTLES AS DIRECTED BY ENGINEER.

NOTE: USE COIR FIBER PRODUCTS ONLY. NO POLYMER PRODUCTS ARE TO BE USED WITHIN PROJECT LIMITS.



SKETCH SHOWING ROADWAY IN RELATION TO STRUCTURE



REVISIONS

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DF18203.2010800

CONTRACT: DC00471

PROJECT NO.	SHEET NO.
DF18203.2010800	S&PMP-1

APPROVED: Michael T. Rzepka

DATE: 10/24/2024

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 15876 ENGINEER MICHAEL T. RZEPKA

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

SIGNING & PAVEMENT MARKING PLAN

BRUNSWICK COUNTY

LOCATION: SR 1528 (E. MOORE STREET) OVER PRICE CREEK NORTH OF NC 211

INDEX

ROADWAY STANDARD DRAWING

THE FOLLOWING ROADWAY STANDARDS AS APPEAR 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
903.10	GROUND MOUNTED SIGN SUPPORTS
903.20	WOOD SIGN SUPPORTS
904.10	ORIENTATION OF GROUND MOUNTED SIGNS
904.50	MOUNTING OF TYPE 'D', 'E' AND 'F' SIGNS ON 'U' CHANNEL POSTS
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTI-LANE ROADWAYS
1205.12	PAVEMENT MARKINGS - BRIDGES
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

GENERAL NOTES

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
-L- (MOORE ST.)	THERMOPLASTIC	POLYCARBONATE H-SHAPED SNOWPLOWABLE

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

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

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

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

SUMMARY OF QUANTITIES

ITEM NO.		ITEM DESCRIPTION	QUANTITY	UNIT
DESC. NO.	SECT. NO.			
4025000000	901	CONTRACTOR FURNISHED, TYPE E SIGN	12	S.F.
4072000000	903	SUPPORTS, 3 LB STEEL U-CHANNEL	28	L.F.
4102000000	904	SIGN ERECTION, TYPE E	2	EA.
4685000000	1205	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)	2550	L.F.
4895000000	SP	GENERIC PAVEMENT MARKING ITEM (SNOWPLOWABLE MARKER ALTERNATIVE)	23	EA.

PLAN SUBMITTED TO: N.C.D.O.T. SIGNING AND DELINEATION UNIT

_____ SIGNING & DELINEATION STANDARDS ENGINEER

_____ SIGNING & DELINEATION PROJECT DESIGN ENGINEER

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION ·

PLAN PREPARED BY: HDR ENGINEERING, INC. OF THE CAROLINAS

MIKE RZEPKA, P.E. SIGNING & DELINEATION PROJECT DESIGN ENGINEER

CHRIS HARNDEN SIGNING & DELINEATION PROJECT DESIGN TECHNICIAN

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

PLOT DRIVER: NCDOT_pdf_color_eng_50.plt PENTABLE: NCDOT_PMP.tbl
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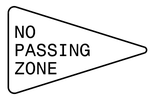
401 QUANTITY REQ'D _2_



48 X 48 X 36
W14-3

ONE "U" POST PER SIGN

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

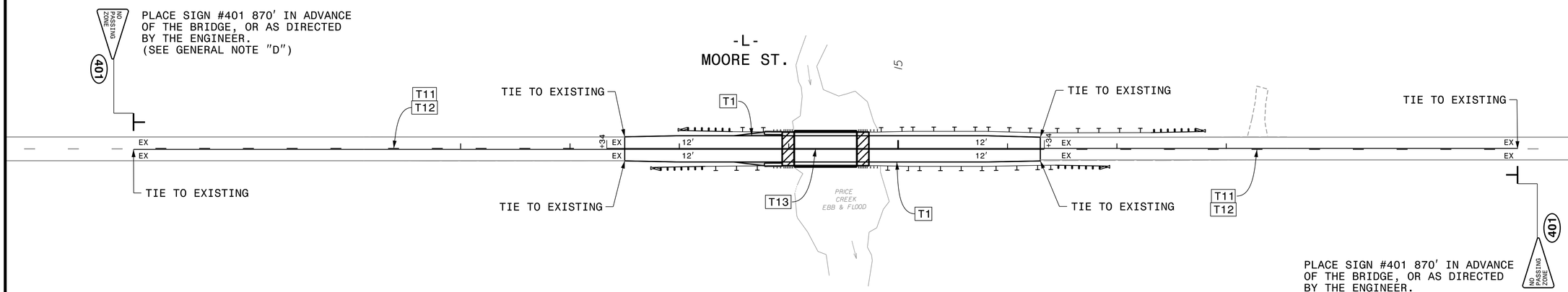
PROJECT NO.	SHEET NO.
DF18203.2010800	S&PMP-2

APPROVED: Michael T. Rzepka

DATE: 10/24/2024

SEAL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



T1	THERMOPLASTIC 4" WHITE EDGELINE (90 MIL)
T11	THERMOPLASTIC 4" YELLOW SINGLE CENTER (90 MIL)
T12	THERMOPLASTIC 4" 10'-30'/SP. YELLOW SKIP (90 MIL)
T13	THERMOPLASTIC 4" YELLOW DOUBLE CENTER (90 MIL)
ME	POLYCARBONATE H-SHAPED SNOWPLOWABLE MARKER - YELLOW & YELLOW

SIGNING & PAVEMENT MARKING PLAN

PLOT DRIVER: NCDOT_pdf_color_eng_50.plt PENTABLE: NCDOT_PMP.tbl
USER: CHARNDEN DATE: 10/24/2024 TIME: 10:13:22 AM
FILE: pw:\\pwhdruseas01:HDR_US_East_01\Documents\332\10004048\10355921\6.0_CAD_BIM\6.2_WIP\6.2.1 E Moore St Emergency Bridge\Traffic\Pavement Marking\MooreStCR_PMP_PMP02.dgn

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJ. REFERENCE NO.	SHEET NO.
DF18203.2010800	X-0

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

CROSS-SECTION SUMMARY

NOTE: EMBANKMENT COLUMN DOES NOT INCLUDE BACKFILL FOR UNDERCUT

Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
12+50.00	0	0
13+00.00	26	5
13+50.00	23	24
14+00.00	14	79
14+05.00	1	12

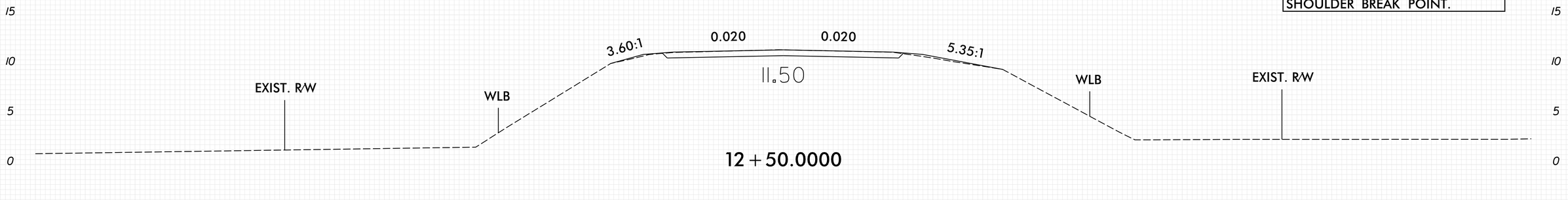
Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
14+62.25	0	0
15+00.00	3	88
15+50.00	13	75
16+00.00	21	67
16+30.00	14	45
16+50.00	5	18
17+00.00	0	21
17+50.00	0	2
17+80.97	0	1

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	DF18203.2010800	X-1

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

NOTE: WHERE ROCK PLATING IS NOT PROPOSED, SHOULDER FILL SHOULD TIE TO EXISTING SHOULDER BREAK POINT.



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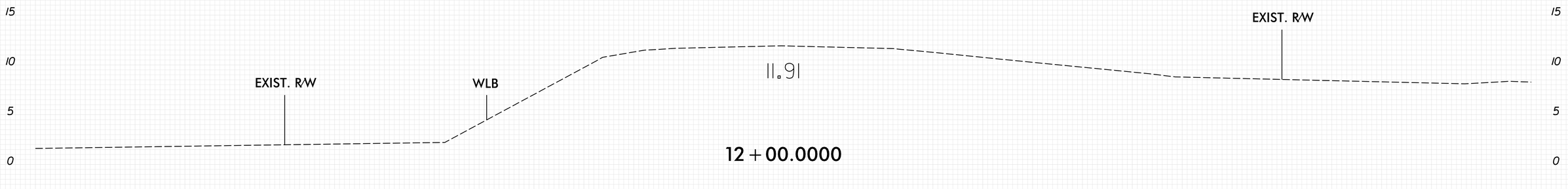

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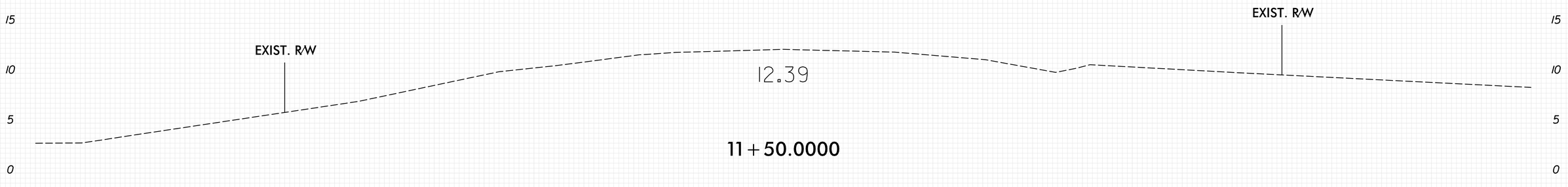

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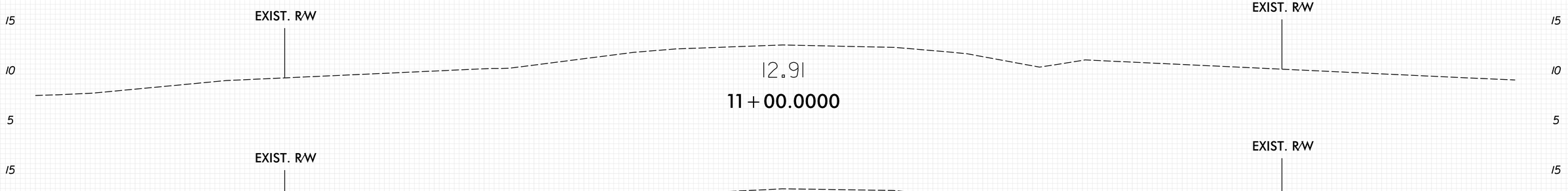

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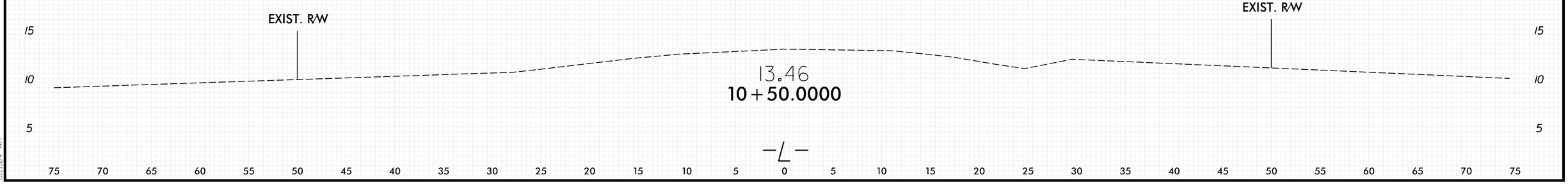

10 + 50.0000

—L—

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10/22/2024
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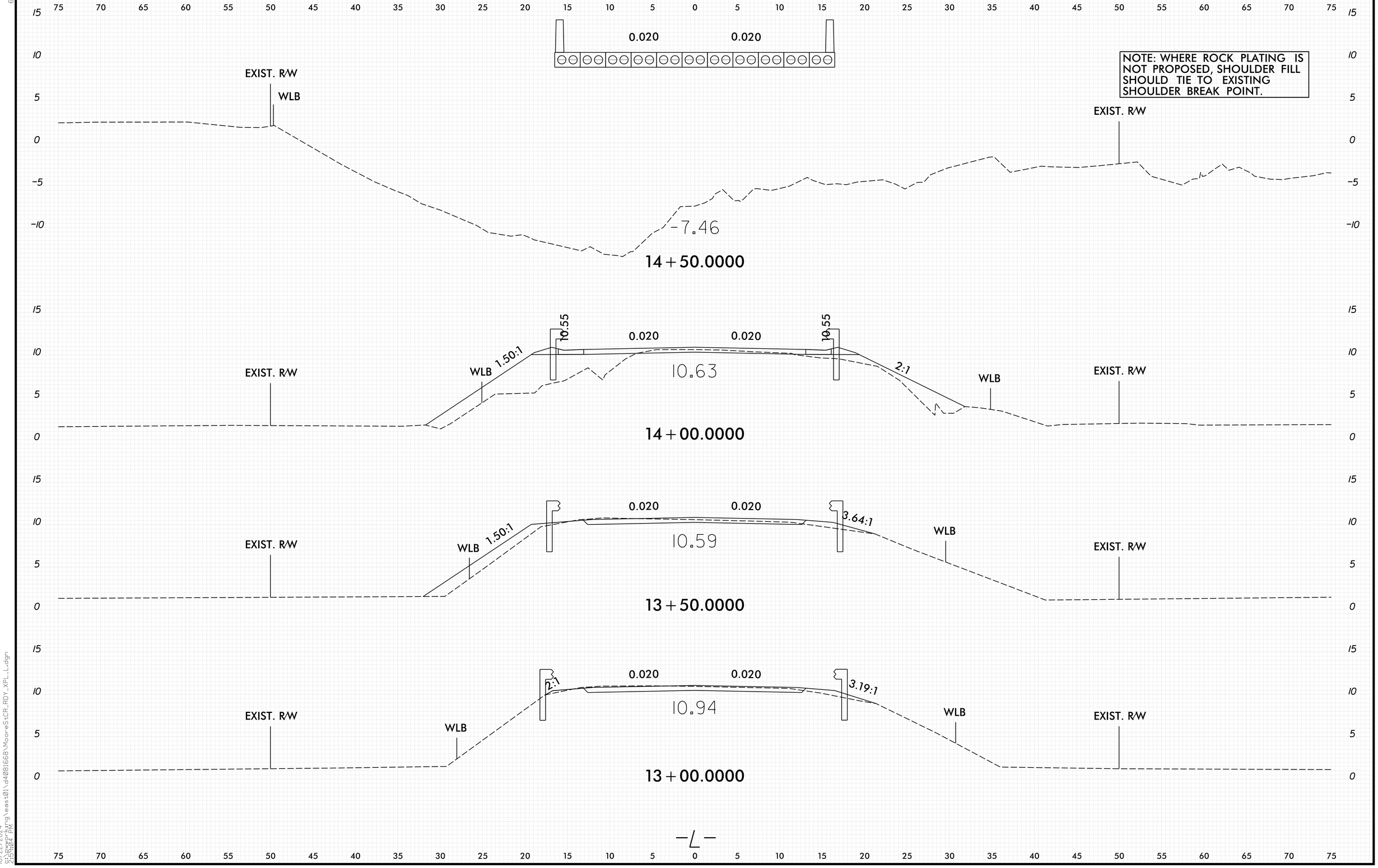
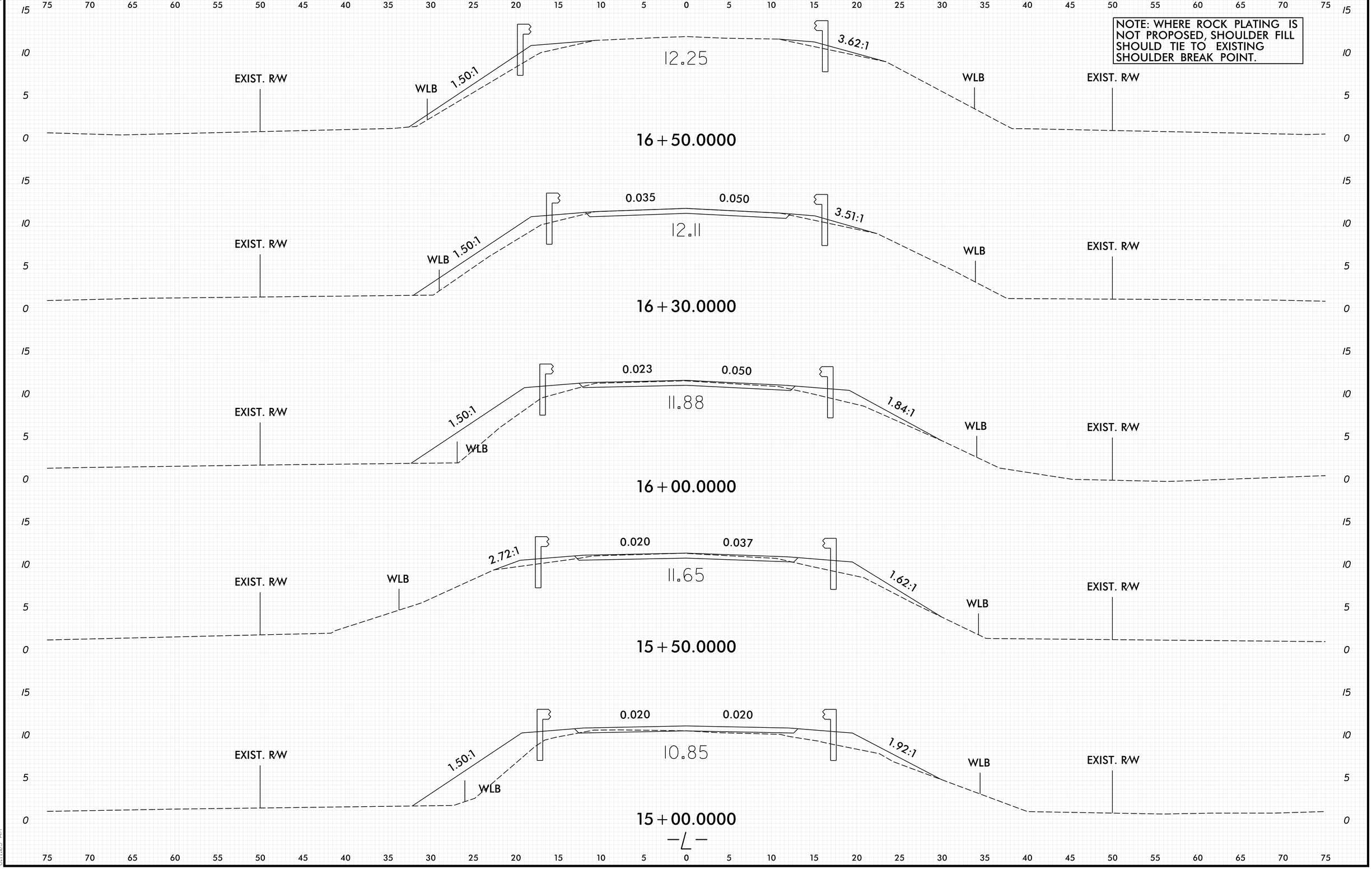


6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	DF18203.2010800	X-3

NOTE: WHERE ROCK PLATING IS NOT PROPOSED, SHOULDER FILL SHOULD TIE TO EXISTING SHOULDER BREAK POINT.



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0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
DF18203.2010800	X-4

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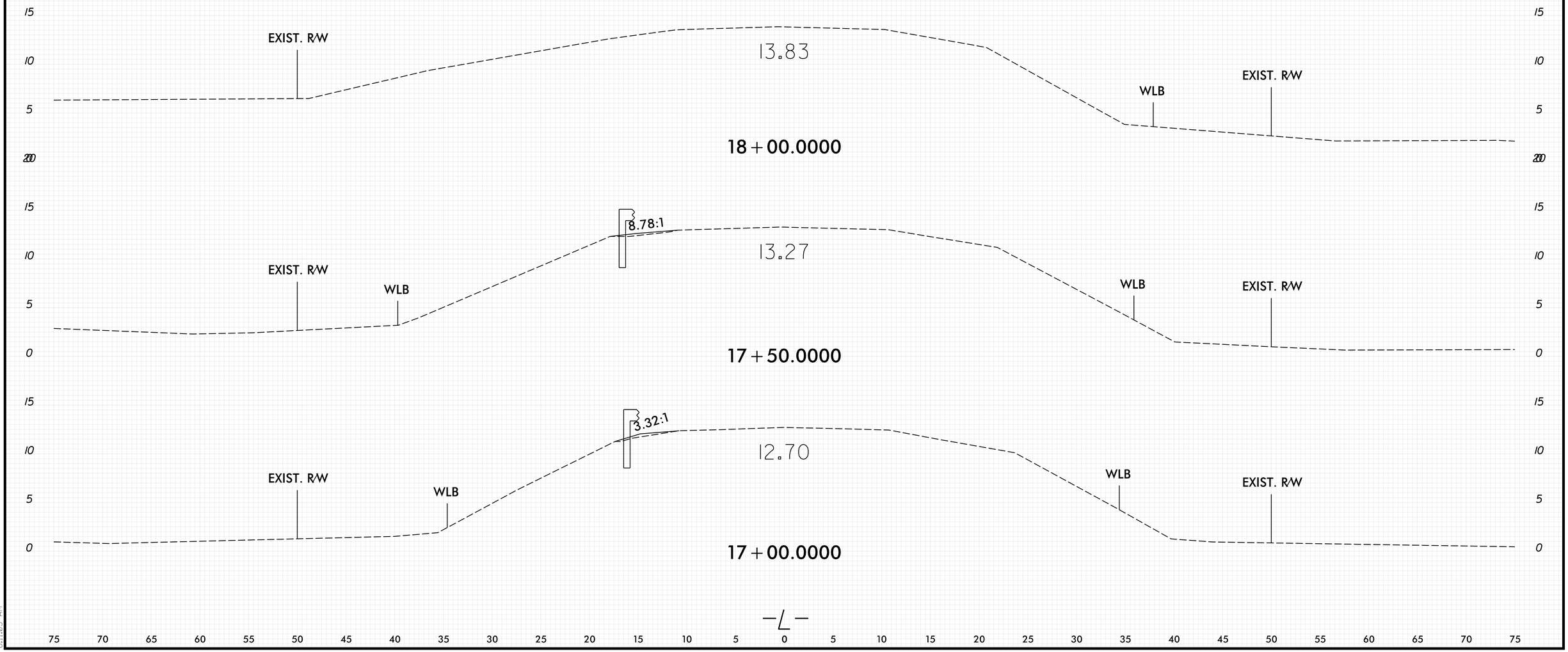
NOTE: WHERE ROCK PLATING IS NOT PROPOSED, SHOULDER FILL SHOULD TIE TO EXISTING SHOULDER BREAK POINT.



14+00 14+50 15+00

(-)1.0180% (+)0.5260%

PVI STA. 13+40.00
PVI EL. = 10.58
VC = 150.00'

GRADE DATA
-L-

BEGIN BRIDGE
FILL FACE END BENT 1
STA. 14+05.00
GRADE PT. EL. 10.93

BEGIN FRONT SLOPE
STA. 14+00.22
GRADE PT. EL. 10.91

END BRIDGE
FILL FACE END BENT 2
STA. 14+62.25
GRADE PT. EL. 11.22

BEGIN FRONT SLOPE
STA. 14+67.14
GRADE PT. EL. 11.25

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

SPAN A

1'-7" BERM (TYP.)
PVT
PROPOSED
FIX.
1'-0" (TYP.)
LOW CHORD EL. 8.66
EL. 11±
EL. 6±
FILL
UNCLASSIFIED STRUCTURE EXCAVATION
BASE DISCHARGE WATER SURFACE (Q100) EL. 4.60 (USGS) (Q100) EL. 4.53 (FEMA)
UNCLASSIFIED STRUCTURE EXCAVATION
EL. 1±
NORMAL WATER SURFACE EL. 0.5± (10-20-23)
PROPOSED STREAMBED EL. -3.50
CUT
EL. 2±
EL. 2±
1 1½
1'-0" MIN. EARTH BERM (TYP.)
CLASS II RIP RAP (2'-0" THICK) (TYP.)
3'-6" (TYP.)
EL. -6±
EL. -7±
EL. -8±
FIX.
1'-0" (TYP.)
LOW CHORD EL. 8.94
FILL
EL. 2±
EL. 11±
16" SQ. PRESTRESSED CONCRETE PILES (TYP.)
PZ35 METALLIZED STEEL SHEET PILES (TYP.)
FILL
EL. -5±
APPROXIMATE EXISTING GROUND LINE
EL. -4±
EL. -7±

END BENT 1 — SECTION ALONG -L- — END BENT 2

OVERALL LENGTH OF BRIDGE (FILL FACE TO FILL FACE) = 57'-3"
28'-6"
1'-0" MIN. EARTH BERM
SHEET PILE WALL BEGIN AT STA. 13+89.25 -L- (TYP. EA. SIDE)
1'-0" MIN. EARTH BERM
SHEET PILE WALL END AT STA. 14+98.00 -L- (TYP. EA. SIDE)
21'-6" (TYP.)
TO NC HWY 211
W.P. #1 @ FILL FACE END BENT 1 STA. 14+05.00 -L-
BRIDGE ID STA. 14+33.50 -L-
N 20° 29' 06.9"E
W.P. #2 @ FILL FACE END BENT 2 STA. 14+62.25 -L-
43'-0" (TYP.)
-L-
14+00
15+00
BEGIN APPROACH SLAB STA. 13+94.13 -L-
END APPROACH SLAB STA. 14+73.13 -L-
BEGIN FRONT SLOPE STA. 14+00.22
90°00'00" (TYP.)
21'-6" (TYP.)
BEGIN FRONT SLOPE STA. 14+67.14
TO E. LEONARD ST. SR 1527
PRICE CREEK
EBB & FLOOD
EARTH BERM EL. 3.57 (LEVEL)
1'-7" BERM
EARTH BERM EL. 3.85 (LEVEL)
1'-7" BERM

PLAN

PROJECT NO. DF18203.2010800
BRUNSWICK COUNTY
STATION: 14+33.50 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 1528 (E. MOORE ST.)
OVER PRICE CREEK BETWEEN
NC HWY 211 AND SR 1527 (E. LEONARD ST.)

NORTH CAROLINA PROFESSIONAL SEAL 033723 ENGINEER CHARLES A. ABERNATHY
10/21/2024
Charles A Abernathy

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-01
1	--	--	3	--	--	TOTAL SHEETS
2	--	--	4	--	--	17

DES BY: R. JONES	DATE: 10/24	DWG BY: B. PETERSON	DATE: 10/24
DES CHK: A. ABERNATHY	DATE: 10/24	CHK BY: A. ABERNATHY	DATE: 10/24

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St. Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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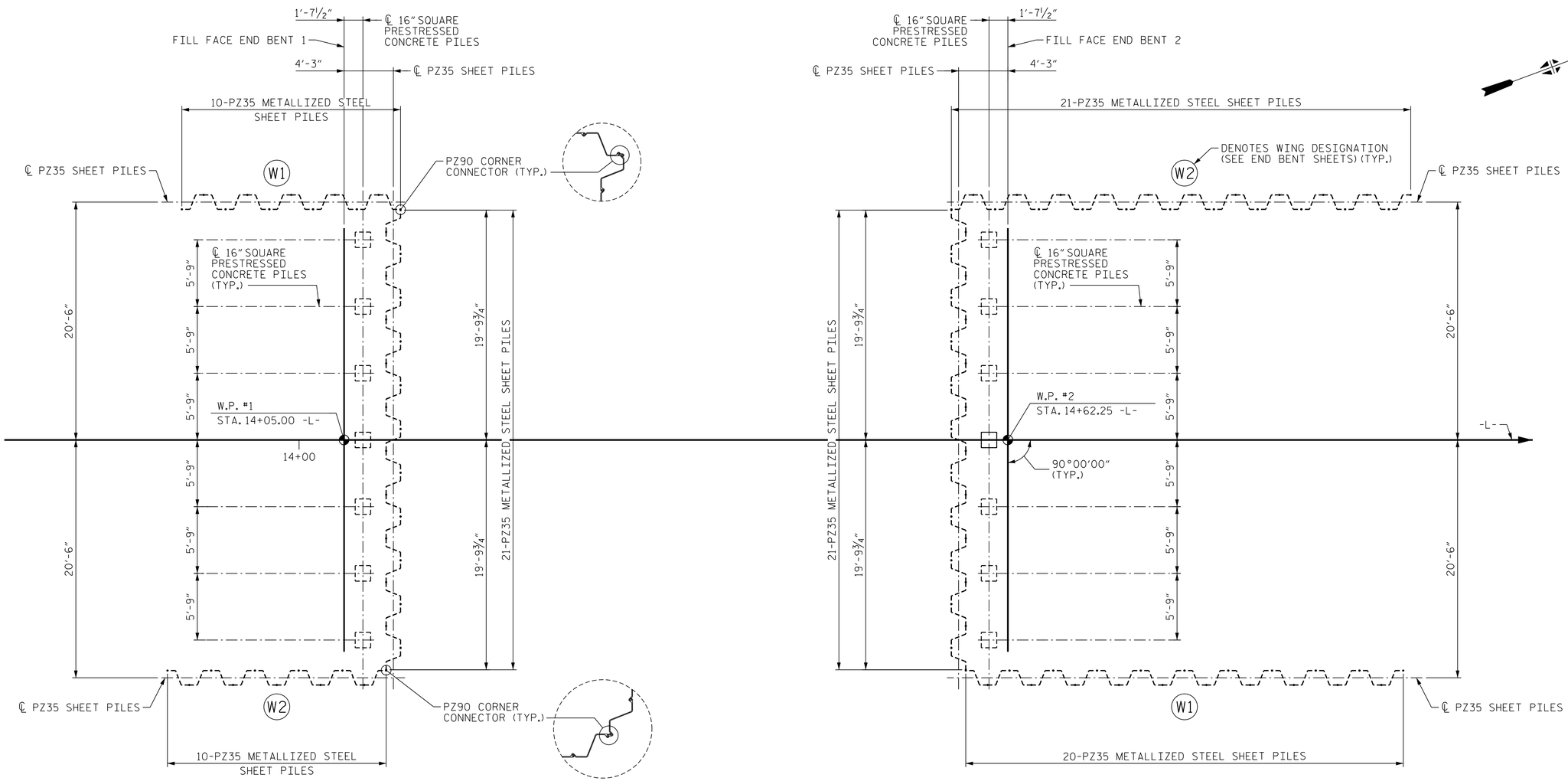

END BENT 1

END BENT 2

FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE TO THE CENTERLINE OF PILES

NOTES

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

THE CONTRACTOR MAY CHOOSE TO CONSTRUCT END BENT NO. 2 BEFORE PLACING FILL. PLACE FILL IN ACCORDANCE WITH ARTICLE 410-8 OF THE STANDARD SPECIFICATIONS.

FOR SHEET PILE RETAINING WALL, SEE SECTION 452 OF THE NCDOT STANDARD SPECIFICATIONS.

METALLIZED PZ35 SHEET PILES ARE TO BE DRIVEN IN FRONT (STREAM SIDE) OF 16" PRESTRESSED CONCRETE PILES AT END BENT NO. 1 AND NO. 2 AND ALONG WING WALLS AS SHOWN ON PLANS.

INSTALL METALLIZED PZ35 SHEET PILES AT END BENT NO. 1 AND NO. 2 TO A MINIMUM TIP ELEVATION OF -36.0 FEET.

PROJECT NO. DF18203.2010800

BRUNSWICK COUNTY

STATION: 14+33.50 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOUNDATION LAYOUT

REVISIONS						SHEET NO. S-02
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS 17
1	--	--	3	--	--	
2	--	--	4	--	--	

NORTH CAROLINA PROFESSIONAL SEAL 033723 ENGINEER CHARLES A. ABERNATHY
10/21/2024
Charles A Abernathy

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St., Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

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DES BY:	R. JONES	DATE: 10/24	DWG BY:	B. PETERSON	DATE: 10/24
DES CHK:	A. ABERNATHY	DATE: 10/24	CHK BY:	A. ABERNATHY	DATE: 10/24

SUMMARY OF PILE INFORMATION/INSTALLATION

(Blank entries indicate item is not applicable to structure)

End Bent / Bent No, Pile(s) #(-#) (e.g., "Bent 1, Piles 1-5")	Number of Piles per Line	Factored Resistance per Pile KIPS	Pile Cut-Off (Top of Pile) Elevation FT	Estimated Pile Length per Pile FT	Scour Critical Elevation FT	Driven Piles			Predrilling for Piles **			Drilled-In Piles		
						Minimum Pile Tip (Tip No Higher Than) Elevation FT	Required Driving Resistance (RDR)* per pile KIPS	Pile Redrives Quantity EACH	Predrilling Length per Pile LIN FT	Predrilling Elevation (Elevation Not To Predrill Below) FT	Maximum Predrilling Diameter INCHES	Pile Excavation (Bottom of Hole) Elevation FT	Pile Excavation Not In Soil per Pile LIN FT	Pile Excavation In Soil per Pile LIN FT
End Bent 1, Piles 1-7	7	145	6.30	45			195							
End Bent 2, Piles 1-7	7	145	6.50	45			195							
TOTAL QUANTITY:														

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

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

PILE DESIGN INFORMATION

(Blank entries indicate item is not applicable to structure)

End Bent / Bent No, Pile(s) #(-#) (e.g., "Bent 1, Piles 1-5")	Factored Axial Load per Pile KIPS	Factored Drag Load per Pile KIPS	Factored Dead Load * per Pile KIPS	Dynamic Resistance Factor	Nominal Drag Resistance per Pile KIPS	Nominal Scour Resistance per Pile KIPS
End Bent 1, Piles 1-7	145	0	0	0.75	0	0
End Bent 2, Piles 1-7	145	0	0	0.75	0	0

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

SUMMARY OF DPT/PILE ORDER LENGTHS

(Blank entries indicate item is not applicable to structure)

Dynamic Pile Testing (DPT)		
End Bent / Bent No (e.g., "Bent 1 - Bent 3")	DPT Test Pile Length FT	DPT Testing Quantity EACH
End Bent 1 - End Bent 2	45	2
TOTAL QUANTITY:		2

Pile Order Lengths for Concrete Piles	
End Bent / Bent No (e.g., "Bent 1 - Bent 3")	Pile Order Length Basis* EST or DPT
End Bent 1 - End Bent 2	DPT

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

PROJECT NO. DF18203.2010800

BRUNSWICK COUNTY

STATION: 14+33.62 -L-

NOTES:

1. The Pile Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (Saket Kabra, #053059) on 10-17-2024.
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.
3. The Engineer may adjust the quantity for DPT Testing when necessary.

NORTH CAROLINA PROFESSIONAL SEAL 033723 ENGINEER CHARLES A. ABERNATHY

Charles A Abernathy 10/21/2024

SIGNATURE DATE

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PILE FOUNDATION TABLES

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

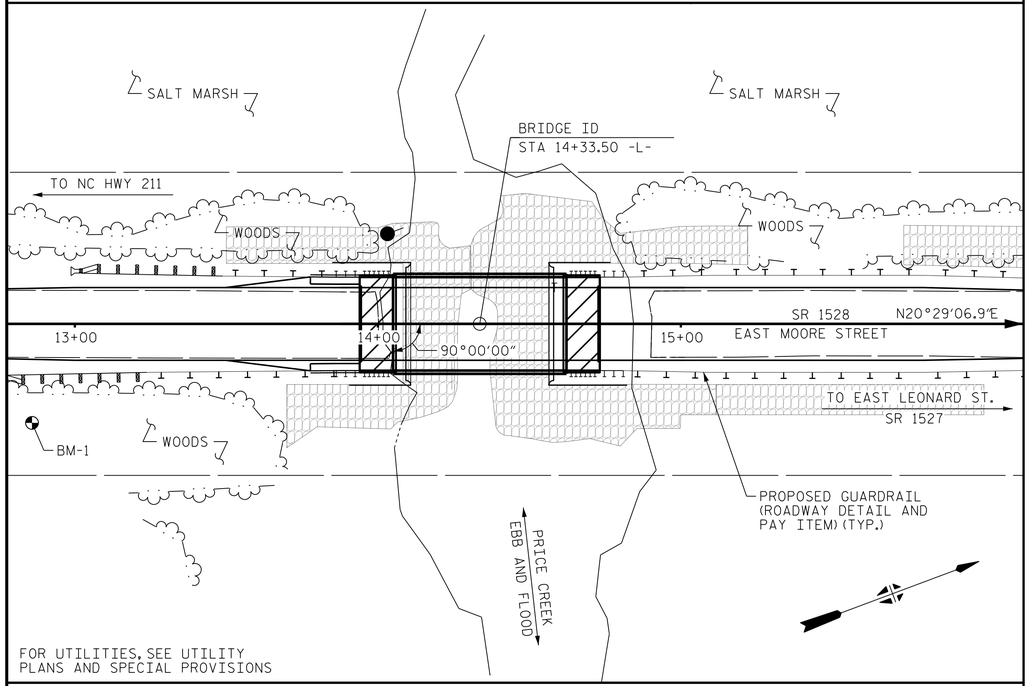
REVISIONS

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

SHEET NO. S-03

TOTAL SHEETS 17

BENCHMARK BM1 : N 69467 E 2301768, MAG SPIKE IN 18"PINE, 16' RT. -L- STATION 12+86, ELEVATION = 5.68



LOCATION SKETCH

HYDRAULIC DATA

DESIGN DISCHARGE (USGS)	= 780 C.F.S.
FREQUENCY OF DESIGN FLOOD	= 25 YRS.
DESIGN HIGH WATER ELEVATION	= 4.5
DRAINAGE AREA	= 1.13 SQ. MI.
BASIC DISCHARGE Q100 (USGS)	= 930 C.F.S.
BASIC HIGH WATER ELEVATION	= 4.6

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 4,500 C.F.S.
FREQUENCY OF OVERRTOPPING FLOOD	= >500 YRS.
OVERTOPPING FLOOD ELEVATION	= 10.8*

*ROADWAY SAG -L- 13+65

WS EL. Taken @ River Station 9258.6

SAMPLE BAR REPLACEMENT

SIZE	LENGTH
#3	6'-2"
#4	7'-4"
#5	8'-6"
#6	9'-8"
#7	10'-10"
#8	12'-0"
#9	13'-2"
#10	14'-6"
#11	15'-10"

NOTE:
SAMPLE BAR REPLACEMENT LENGTHS BASED ON 30" (SAMPLE LENGTH) PLUS TWO SPLICE LENGTHS AND f_y = 60ksi.

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.

THIS STRUCTURE CONTAINS THE NECESSARY CORROSION PROTECTION REQUIRED FOR A CORROSIVE SITE.

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

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

ALL METALIZED SURFACES SHALL RECEIVE A SEAL COATING AS SPECIFIED IN THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).

CLASS AA CONCRETE SHALL BE USED IN ALL CAST-IN-PLACE END BENT CAPS AND SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL BAR SUPPORTS USED IN THE BARRIER RAIL, END BENT CAPS AND ALL INCIDENTAL REINFORCING STEEL SHALL BE EPOXY COATED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

THE CONCRETE IN THE END BENT CAPS AND PRESTRESSED CONCRETE PILES OF END BENT NOS. 1 & 2 SHALL CONTAIN SILICA FUME. SILICA FUME SHALL BE SUBSTITUTED FOR 5% OF THE PORTLAND CEMENT BY WEIGHT. IF THE OPTION OF ARTICLE 1024-1 OF THE STANDARD SPECIFICATIONS TO PARTIALLY SUBSTITUTE CLASS F FLY ASH FOR PORTLAND CEMENT IS EXERCISED, THEN THE RATE OF FLY ASH SUBSTITUTION SHALL BE REDUCED TO 1.0 LB OF FLY ASH PER 1.0 LB OF CEMENT. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE VARIOUS PAY ITEMS.

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

THE 100YR THEORETICAL SCOUR RANGES FROM 1' TO 16' (CLEAR-WATER TO LIVE-BED). SIGNIFICANT SCOUR WAS OBSERVED AFTER THE STORM THAT WASHED OUT THE ROAD AND CULVERT. THE STORM SCOUR RANGES FROM EL. -5.0 TO EL. -13.0. IT IS RECOMMENDED TO CONSIDER THE STORM SCOUR (EL. -13.0) OR GREATER, FOR SCOUR CONSIDERATIONS THERE HAVE BEEN NO PRIOR HISTORICAL SCOUR ISSUES REPORTED BY NCDOT.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE SAMPLE BARS SHOULD COME FROM STEEL ACTUALLY USED IN THE PROJECT AND THE SAMPLE BARS SHOULD BE REPLACED BY SPLICED BARS AS SPECIFIED IN THE SAMPLE BAR REPLACEMENT CHART. PAYMENT FOR THE SAMPLE BARS AND REPLACEMENT REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 22 FT EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS AA CONCRETE	BRIDGE APPROACH SLABS	EPOXY COATED REINFORCING STEEL	PILE DRIVING EQUIPMENT SETUP FOR 16" PRESTRESSED CONCRETE PILES	16" PRESTRESSED CONCRETE PILES		DYNAMIC PILE TESTING	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" x 1'-9" PRESTRESSED CONCRETE CORED SLABS		PZ35 STEEL SHEET PILE SYSTEM
	LUMP SUM	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	EA.	NO.	LIN. FT.	EACH	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	NO.	LIN. FT.	SQ. FT.
SUPERSTRUCTURE										110.25				11	605	
END BENT 1			37.5		4824	7	7	315			242	269				3216
END BENT 2			53.1		7022	7	7	315			307	341				4896
TOTAL	LUMP SUM	LUMP SUM	90.6	LUMP SUM	11846	14	14	630	2	110.25	549	610	LUMP SUM	11	605	8112

PROJECT NO. DF18203.2010800

BRUNSWICK COUNTY

STATION: 14+33.50 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 1528 (E. MOORE ST.) OVER PRICE CREEK BETWEEN NC HWY 211 AND SR 1527 (E. LEONARD ST.)

REVISIONS						SHEET NO. S-04
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS 17
1	--	--	3	--	--	
2	--	--	4	--	--	

NORTH CAROLINA PROFESSIONAL SEAL 033723 ENGINEER CHARLES A. ABERNATHY

Charles A Abernathy 10/21/2024

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St., Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DES BY: R. JONES DATE: 10/24
DES CHK: A. ABERNATHY DATE: 10/24

DWG BY: B. PETERSON DATE: 10/24
CHK BY: A. ABERNATHY DATE: 10/24

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

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

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ DC	γ DW
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

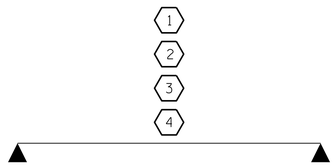
NOTES:

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

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

(#) CONTROLLING LOAD RATING
(1) DESIGN LOAD RATING (HL-93)
(2) DESIGN LOAD RATING (HS-20)
(3) LEGAL LOAD RATING * *
(4) EMERGENCY VEHICLE LOAD RATING **
* * SEE CHART FOR VEHICLE TYPE

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



LRFR SUMMARY
(FOR SPAN A)

PROJECT NO. DF18203.2010800
BRUNSWICK COUNTY
STATION: 14+33.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
LRFR SUMMARY FOR 55' CORED SLAB UNIT 90° SKEW
(NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO. S-05
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS 17
1	--	--	3	--	--	
2	--	--	4	--	--	

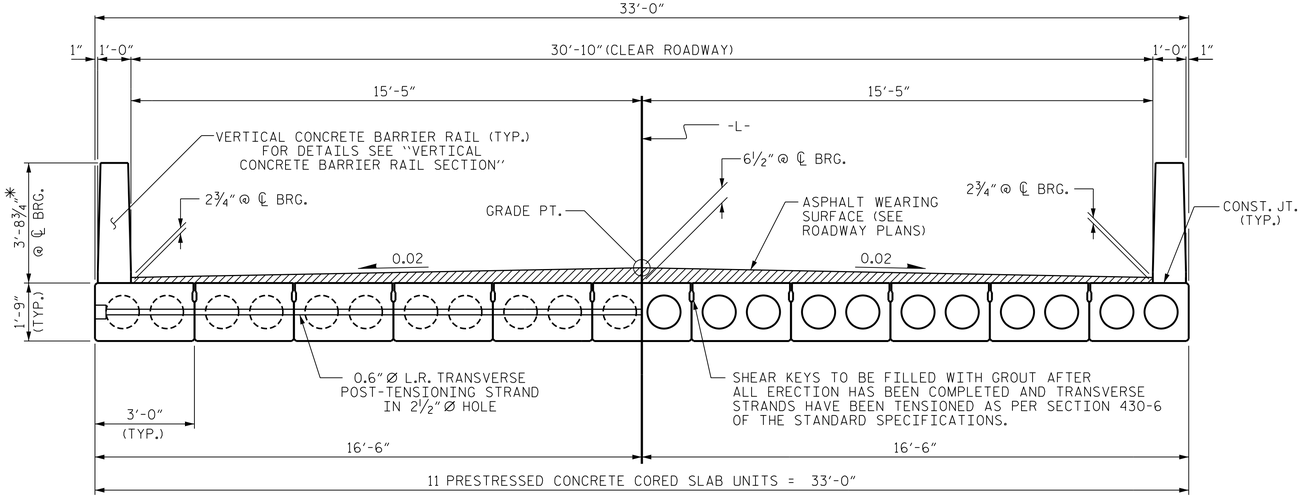
STD. NO. 21LRFR1_90S_55L

NORTH CAROLINA PROFESSIONAL SEAL 033723 ENGINEER CHARLES A. ABERNATHY
10/21/2024
Charles A Abernathy

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St., Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DES BY:	R. JONES	DATE :	10/24
DES CHK:	A. ABERNATHY	DATE :	10/24
DWG BY:	B. PETERSON	DATE :	10/24
CHK BY:	A. ABERNATHY	DATE :	10/24

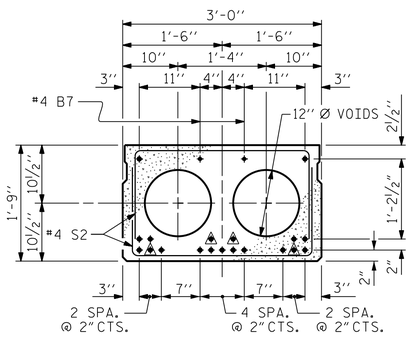


HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

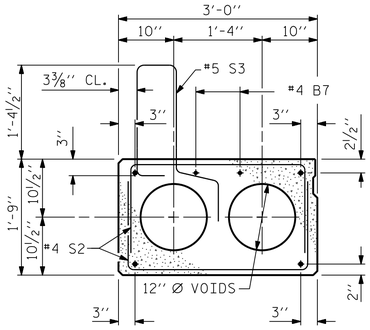
HALF SECTION
THROUGH VOIDS

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.



INTERIOR SLAB SECTION
(19 STRANDS REQUIRED)

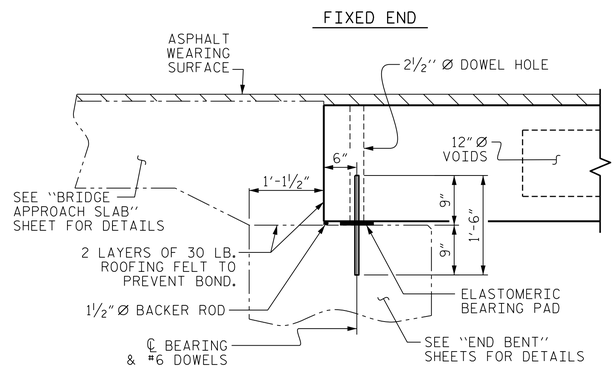


EXT. SLAB SECTION
(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION.)

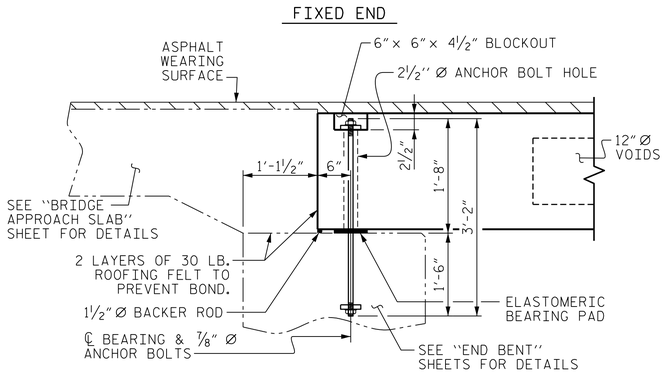
0.6" Ø LOW RELAXATION STRAND LAYOUT

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

DEBONDING LEGEND



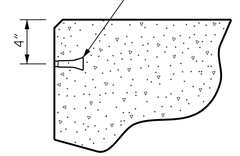
SECTION AT END BENT FOR INTERIOR CORED SLAB UNITS



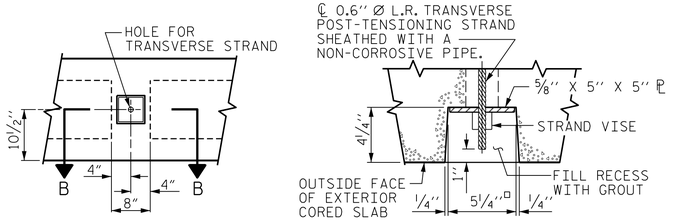
SECTION AT END BENT FOR EXTERIOR CORED SLAB UNITS

FOR "BLOCKOUT DETAIL FOR ANCHOR BOLTS", SEE SHEET 2 OF 3.

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



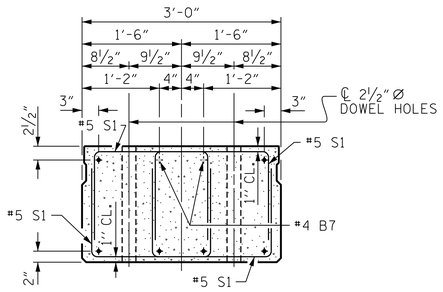
THREADED INSERT DETAIL



ELEVATION VIEW

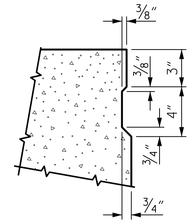
SECTION B-B

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



END ELEVATION

SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES. (STRAND LAYOUT NOT SHOWN.) INTERIOR SLAB UNIT SHOWN-EXTERIOR SLAB UNIT SIMILAR EXCEPT SHEAR KEY LOCATION AND 6" X 6" X 4½" BLOCKOUTS.



SHEAR KEY DETAIL

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

PROJECT NO. DF18203.2010800

BRUNSWICK COUNTY

STATION: 14+33.50 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 1'-9" PRESTR. CONC. CORED SLAB UNIT 90° SKEW TYP SECTION

NORTH CAROLINA PROFESSIONAL SEAL 033723 ENGINEER CHARLES A. ABERNATHY
10/21/2024
Charles A Abernathy

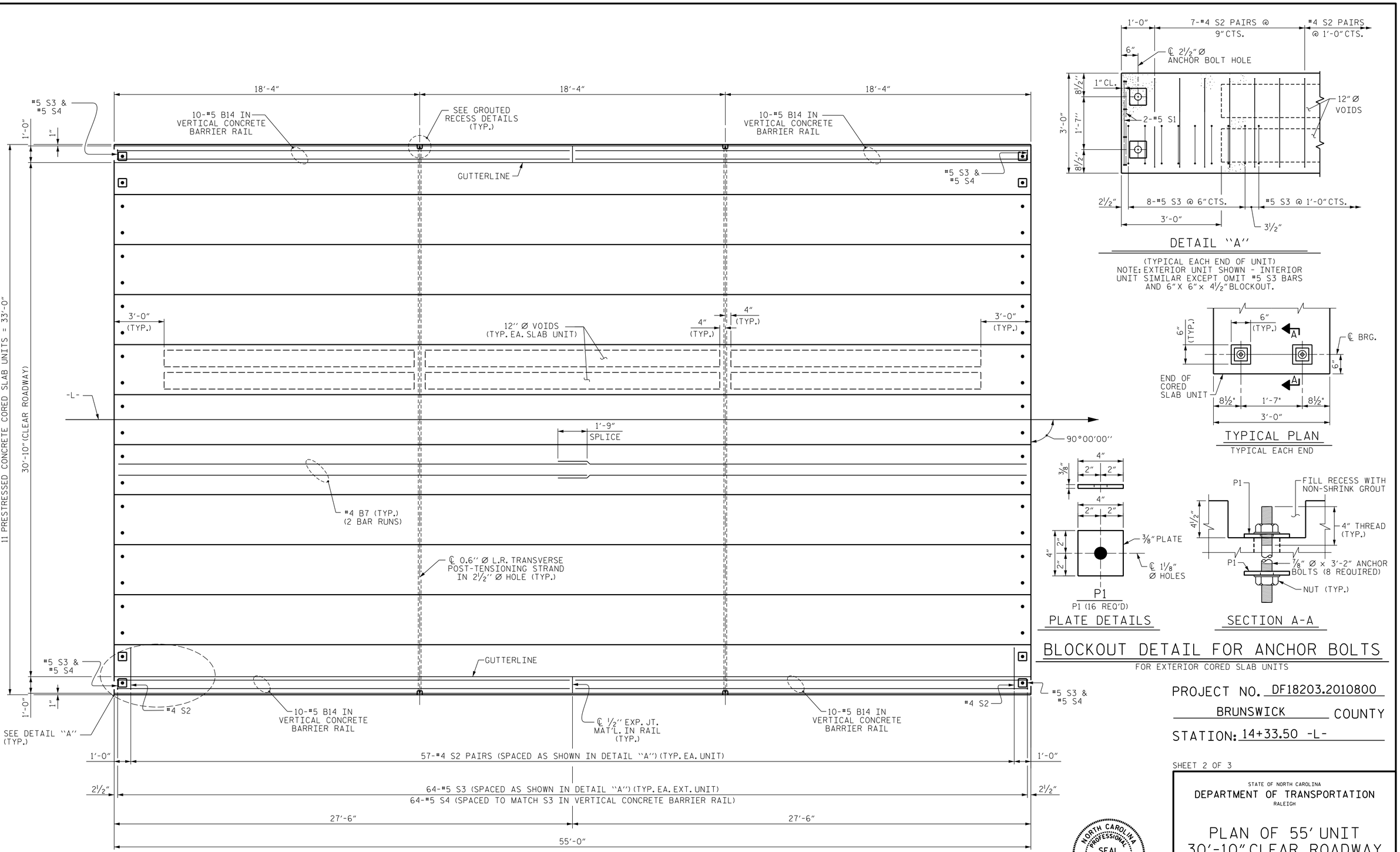
REVISIONS						SHEET NO. S-06
NO.	BY:	DATE:	NO.	BY:	DATE:	
1	--	--	3	--	--	TOTAL SHEETS 17
2	--	--	4	--	--	

DES BY:	R. JONES	DATE :	10/24
DES CHK:	A. ABERNATHY	DATE :	10/24
DWG BY:	B. PETERSON	DATE :	10/24
CHK BY:	A. ABERNATHY	DATE :	10/24

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St. Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLOT DRIVER: NCDOT STRUCTURES DEFAULT PLOTTER.plt PENTABLE: NCDOT STRUCTURES DEFAULT PEN.tbl
USER: DCHAPMAN DATE: 10/21/2024 TIME: 4:35:27 PM
FILE: ...\401_025_DF18203_2010800_SMU_TS_006_090xxx.dgn



PLAN OF UNIT

DETAIL ″A″

(TYPICAL EACH END OF UNIT)
NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS AND 6″ X 6″ × 4½″ BLOCKOUT.

TYPICAL PLAN

TYPICAL EACH END

PLATE DETAILS

SECTION A-A

BLOCKOUT DETAIL FOR ANCHOR BOLTS

FOR EXTERIOR CORED SLAB UNITS

PROJECT NO. DF18203.2010800

BRUNSWICK COUNTY

STATION: 14+33.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 55′ UNIT
30′-10″ CLEAR ROADWAY
90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-07
1	--	--	3	--	--	TOTAL SHEETS
2	--	--	4	--	--	17

NORTH CAROLINA PROFESSIONAL SEAL 033723 ENGINEER CHARLES A. ABERNATHY
Charles A Abernathy 10/21/2024

DES BY: R. JONES	DATE: 10/24	DWG BY: B. PETERSON	DATE: 10/24
DES CHK: A. ABERNATHY	DATE: 10/24	CHK BY: A. ABERNATHY	DATE: 10/24

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St., Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

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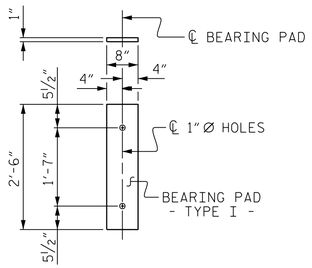
STD. NO. 21″PCS_33_90S_55L



FIXED END
(TYPE I - 22 REQ'D)

ELASTOMERIC BEARING DETAILS

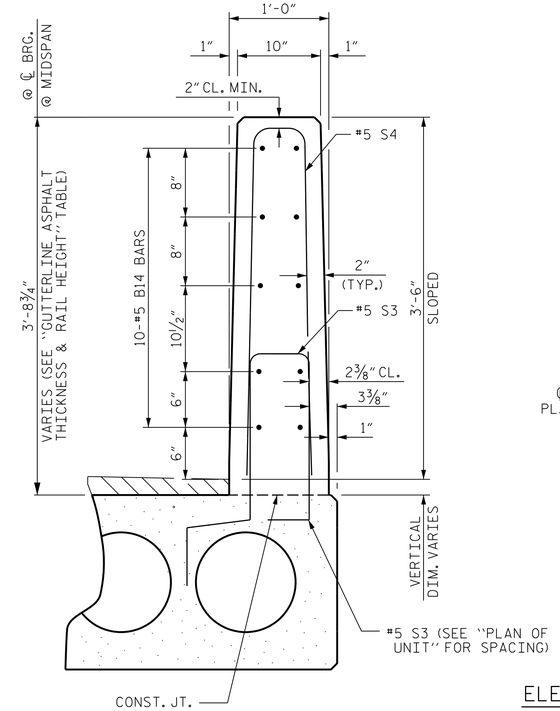
ELASTOMER IN ALL BEARINGS SHALL BE 50 DUROMETER HARDNESS.

HOLD-DOWN ANCHOR BOLT NOTES

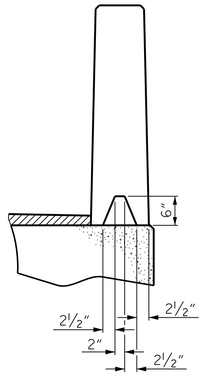
AT ALL ENDS OF EXTERIOR CORED SLAB SECTIONS WITH HOLD-DOWN ANCHOR BOLTS, NUTS FOR ANCHOR BOLTS SHALL BE FINGER-TIGHTENED AND THEN BACKED OFF ½ TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

THE 2½"Ø DOWEL HOLES AT ENDS OF EXTERIOR CORED SLAB SECTIONS WITH HOLD-DOWN ANCHOR BOLTS SHALL BE FILLED WITH NON-SHRINK GROUT TO THE BOTTOM OF THE ANCHOR BOLT BLOCKOUT PRIOR TO INSTALLING THE ANCHOR PLATES, WASHERS, AND NUTS.

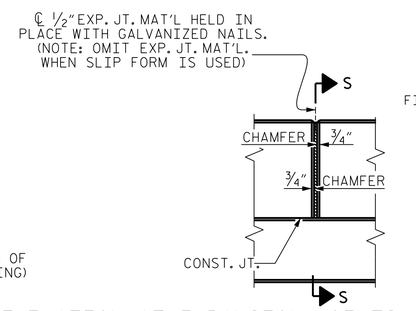
THE ANCHOR BOLT BLOCKOUTS IN EXTERIOR CORED SLAB SECTIONS SHALL BE FILLED WITH NON-SHRINK GROUT PRIOR TO PLACEMENT OF THE WEARING SURFACE.



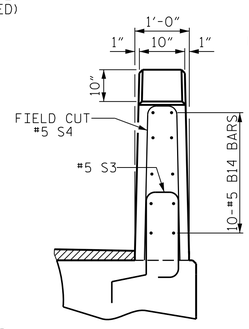
VERTICAL CONCRETE BARRIER RAIL SECTION



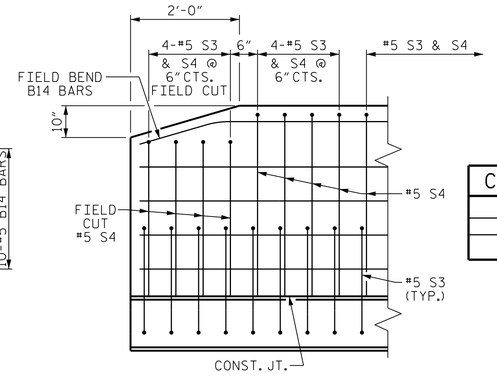
SECTION S-S
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)



ELEVATION AT EXPANSION JOINTS



END VIEW



SIDE VIEW

END OF RAIL DETAILS

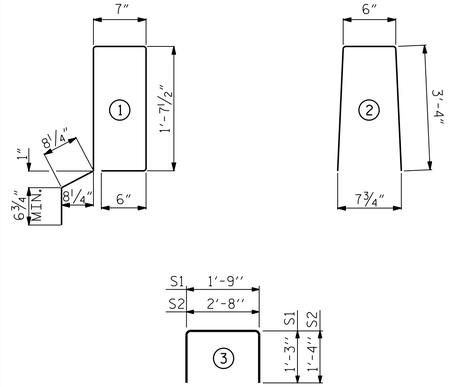
BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

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

BILL OF MATERIAL FOR ONE 55' CORED SLAB UNIT

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

CORED SLABS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
55' UNIT			
EXTERIOR C.S.	2	55'-0"	110'-0"
INTERIOR C.S.	9	55'-0"	495'-0"
TOTAL	11		605'-0"

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT

	ASPHALT OVERLAY THICKNESS	RAIL HEIGHT
	@ MID-SPAN	@ MID-SPAN
55' UNIT	1⅝"	3'-7⅝"

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

DEAD LOAD DEFLECTION AND CAMBER

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

✳✳ INCLUDES FUTURE WEARING SURFACE

CONCRETE RELEASE STRENGTH

UNIT	PSI
55' UNIT	4900

NOTES

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

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

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

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

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

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

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

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

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

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

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

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

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

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

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

PRESTRESSED CONCRETE CORED SLAB UNITS ARE DESIGNED FOR 0 PSI TENSION IN THE PRECOMPRESSED TENSILE ZONE UNDER ALL LOADING CONDITIONS.

PRESTRESSED CONCRETE CORED SLAB UNITS SHALL CONTAIN CALCLIUM NITRITE CORROSION INHIBITOR IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

PROJECT NO. DF18203.2010800

BRUNSWICK COUNTY

STATION: 14+33.50 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 1'-9" PRESTR. CONC. CORED SLAB UNIT 90° SKEW DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 033723 ENGINEER CHARLES A. ABERNATHY
10/21/2024
Charles A Abernathy

REVISIONS						SHEET NO. S-08
NO.	BY:	DATE:	NO.	BY:	DATE:	
1	--	--	3	--	--	TOTAL SHEETS 17
2	--	--	4	--	--	

DES BY:	R. JONES	DATE :	10/24
DES CHK:	A. ABERNATHY	DATE :	10/24
DWG BY:	B. PETERSON	DATE :	10/24
CHK BY:	A. ABERNATHY	DATE :	10/24

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555 Fayetteville St., Suite 900 Raleigh, N.C. 27601
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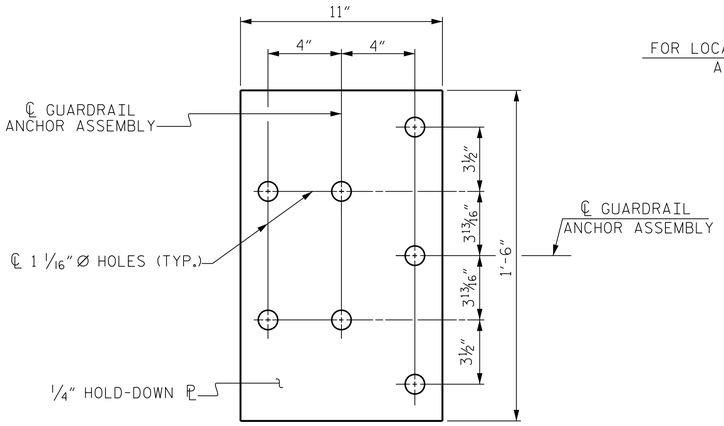
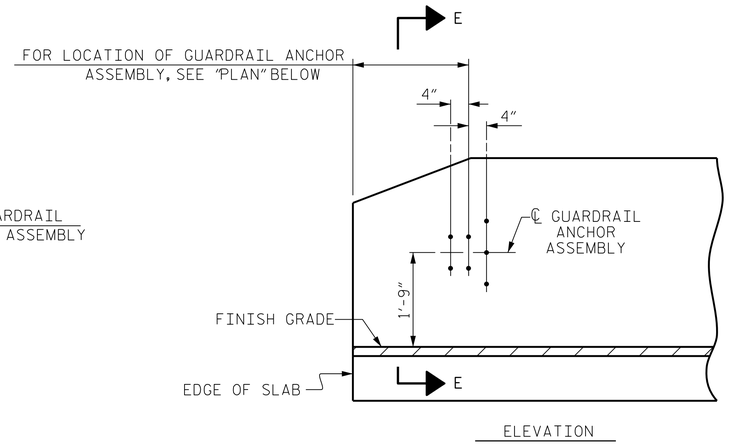
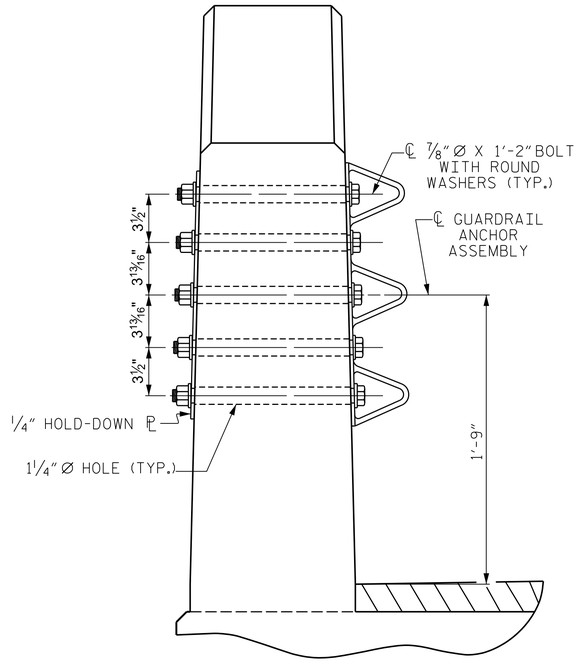


PLAN

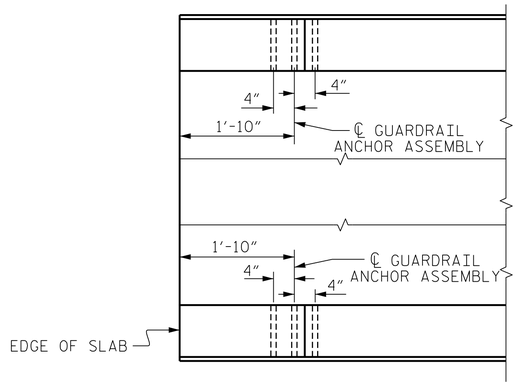


ELEVATION



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 ¼" HOLD DOWN PLATE AND 7 - ⅞" 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 ⅞" 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 ¼" 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

PROJECT NO. DF18203.2010800

BRUNSWICK COUNTY

STATION: 14+33.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GUARDRAIL ANCHORAGE DETAILS FOR VERTICAL CONCRETE BARRIER RAIL

NORTH CAROLINA PROFESSIONAL SEAL 033723 ENGINEER CHARLES A. ABERNATHY
10/21/2024
Charles A Abernathy

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-09
1	--	--	3	--	--	TOTAL SHEETS
2	--	--	4	--	--	17

DES BY: R. JONES	DATE: 10/24	DWG BY: B. PETERSON	DATE: 10/24
DES CHK: A. ABERNATHY	DATE: 10/24	CHK BY: A. ABERNATHY	DATE: 10/24

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555 Fayetteville St., Suite 900 Raleigh, N.C. 27601
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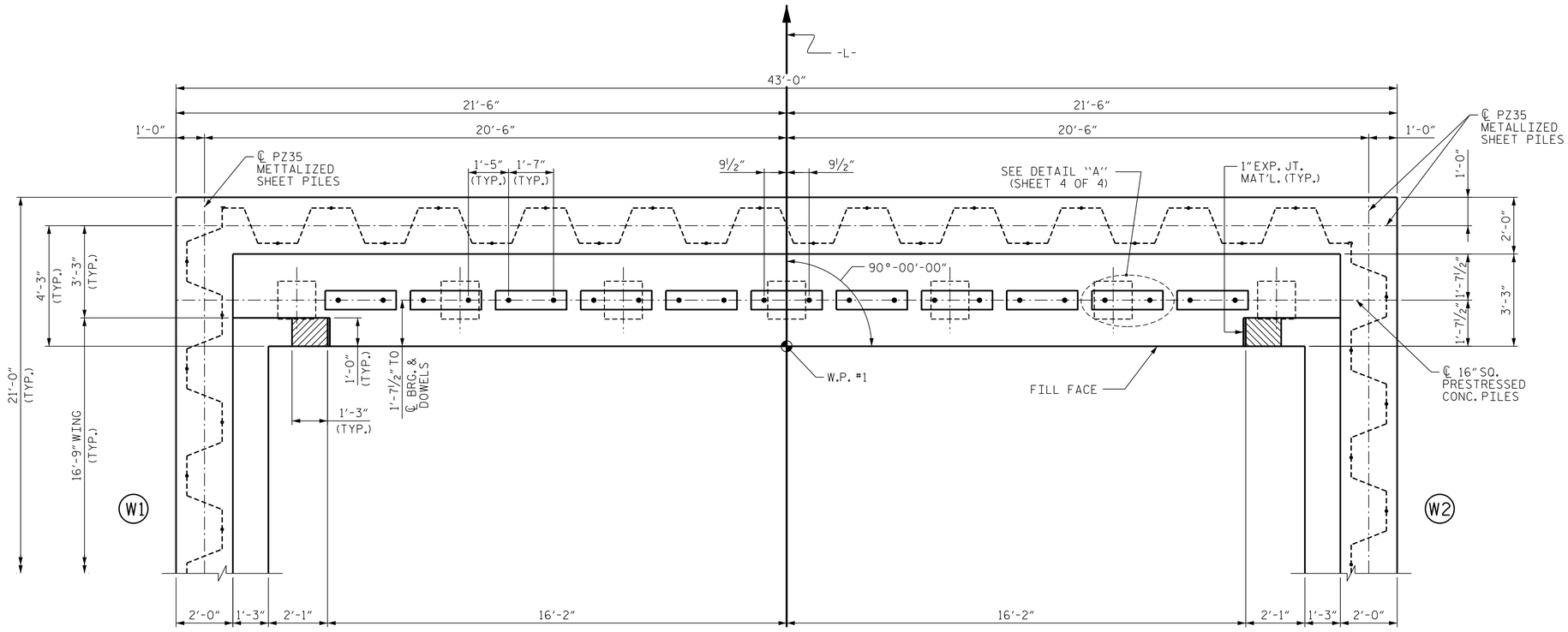
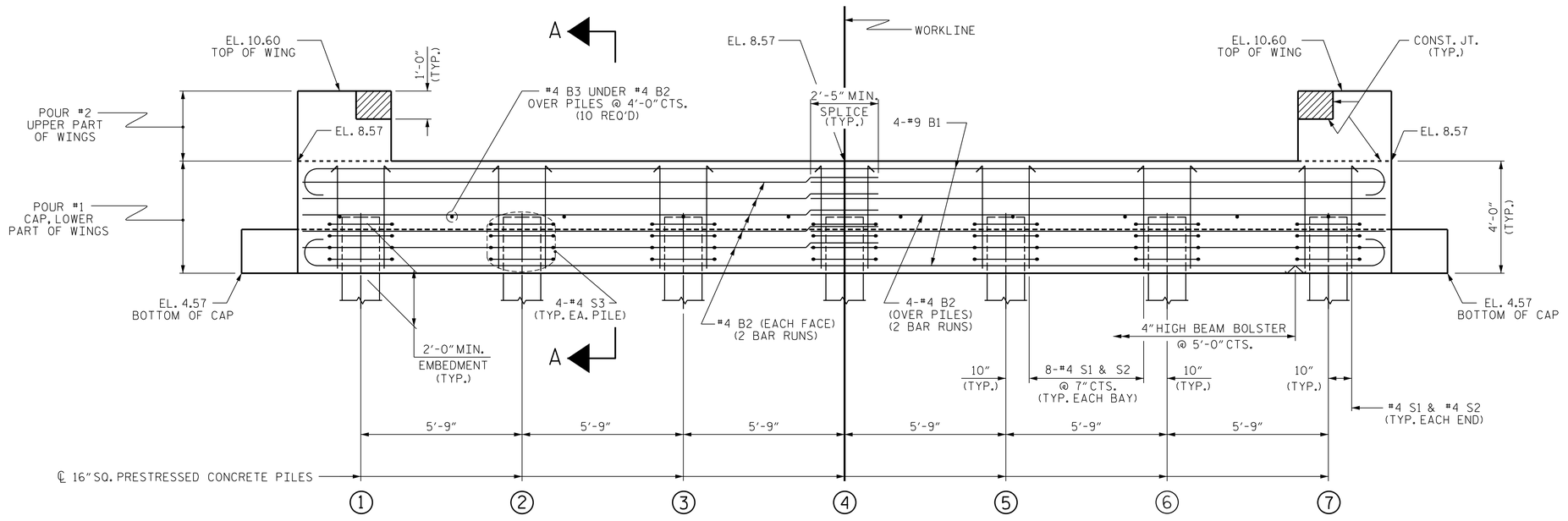


PLAN



ELEVATION

WINGS, SHEET PILES AND COPING NOT SHOWN FOR CLARITY.
FOR COPING REINFORCING SEE SECTION A-A.
FOR SECTION A-A, SEE SHEET 4 OF 4.

NOTES

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

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

THE CONCRETE IN THE END BENT CAPS SHALL CONTAIN SILICA FUME. SILICA FUME SHALL BE SUBSTITUED FOR 5% OF THE PORTLAND CEMENT BY WEIGHT. IF THE OPTION OF ARTICLE 1024-1 OF THE STANDARD SPECIFICATIONS TO PARTIALLY SUBSTITUTE CLASS F FLY ASH FOR PORTLAND CEMENT IS EXERCISED, THE THE RATE OF FLY ASH SUBSTITUTION SHALL BE REDUCED TO 1.0 LB OF FLY ASH PER 1.0 LB. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE VARIOUS PAY ITEMS.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. ANCHOR PLATES, WASHERS, AND NUTS SHALL MEET THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS. ANCHOR BOLTS, ANCHOR PLATES, WASHERS, AND NUTS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

NO SEPARATE PAYMENT SHALL BE MADE FOR THE ANCHOR BOLTS, ANCHOR PLATES, WASHERS, AND NUTS. THE COST OF THE MATERIAL AND INSTALLATION SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

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

SHEET PILES SHALL BE METALLIZED.

FOR SHEET PILE WALL AND WING DETAILS, SEE SHEET 3 OF 4.

PROJECT NO. DF18203.2010800

BRUNSWICK COUNTY

STATION: 14+33.50 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE END BENT NO. 1

REVISIONS						SHEET NO. S-10
NO.	BY:	DATE:	NO.	BY:	DATE:	
1	--	--	3	--	--	TOTAL SHEETS 17
2	--	--	4	--	--	

NORTH CAROLINA PROFESSIONAL SEAL 033723 ENGINEER CHARLES A. ABERNATHY

Charles A Abernathy 10/21/2024

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DES BY:	R. JONES	DATE :	10/24
DES CHK:	A. ABERNATHY	DATE :	10/24
DWG BY:	B. PETERSON	DATE :	10/24
CHK BY:	A. ABERNATHY	DATE :	10/24

PLOT DRIVER: NCDOT STRUCTURES DEFAULT PLOTTER.plt PENTABLE: NCDOT STRUCTURES DEFAULT PEN.tbl
USER: DCHAPMAN DATE: 10/21/2024 TIME: 4:35:44 PM
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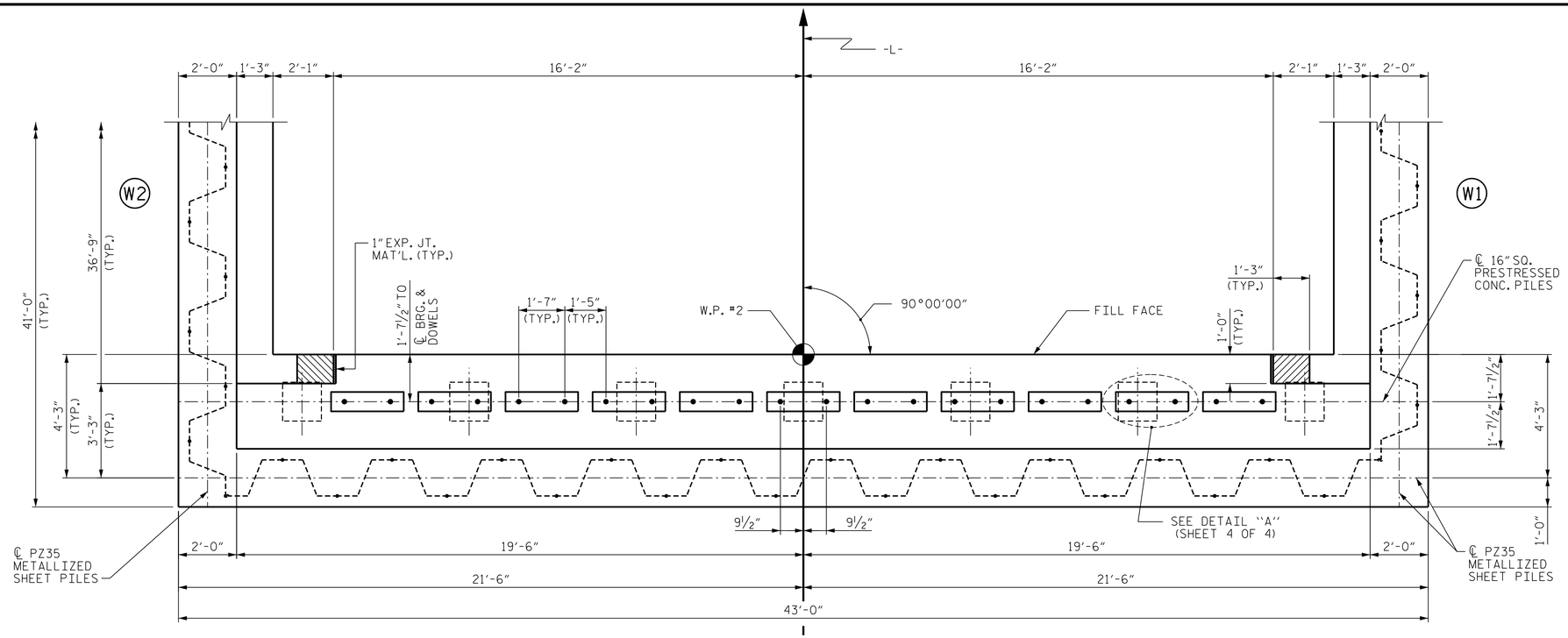
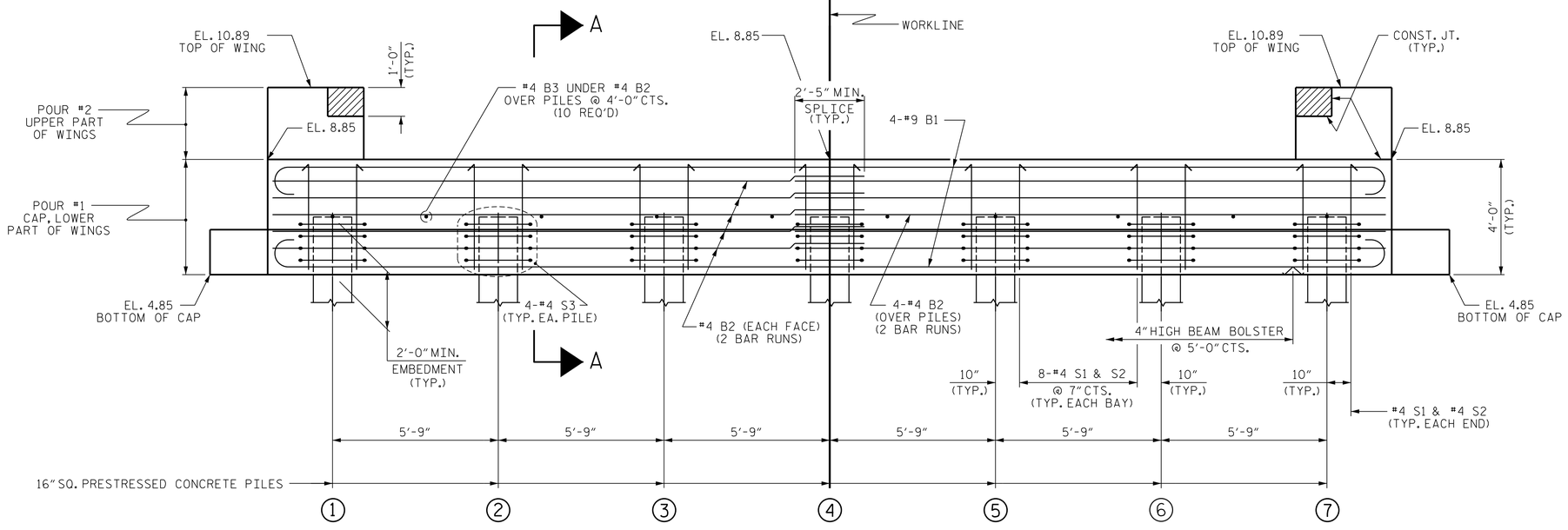


PLAN



ELEVATION

WINGS, SHEET PILES AND COPING NOT SHOWN FOR CLARITY.
FOR COPING REINFORCING SEE SECTION A-A.
FOR SECTION A-A, SEE SHEET 4 OF 4.

NOTES

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

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

THE CONCRETE IN THE END BENT CAPS SHALL CONTAIN SILICA FUME. SILICA FUME SHALL BE SUBSTITUED FOR 5% OF THE PORTLAND CEMENT BY WEIGHT. IF THE OPTION OF ARTICLE 1024-1 OF THE STANDARD SPECIFICATIONS TO PARTIALLY SUBSTITUTE CLASS F FLY ASH FOR PORTLAND CEMENT IS EXERCISED, THE THE RATE OF FLY ASH SUBSTITUTION SHALL BE REDUCED TO 1.0 LB OF FLY ASH PER 1.0 LB. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE VARIOUS PAY ITEMS.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. ANCHOR PLATES, WASHERS, AND NUTS SHALL MEET THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS. ANCHOR BOLTS, ANCHOR PLATES, WASHERS, AND NUTS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

NO SEPARATE PAYMENT SHALL BE MADE FOR THE ANCHOR BOLTS, ANCHOR PLATES, WASHERS, AND NUTS. THE COST OF THE MATERIAL AND INSTALLATION SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

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

SHEET PILES SHALL BE METALLIZED.

FOR SHEET PILE WALL AND WING DETAILS, SEE SHEET 3 OF 4.

PROJECT NO. DF18203.2010800

BRUNSWICK COUNTY

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SHEET 2 OF 4

STATE OF NORTH CAROLINA
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RALEIGH

SUBSTRUCTURE END BENT NO. 2

REVISIONS						SHEET NO. S-11
NO.	BY:	DATE:	NO.	BY:	DATE:	
1	--	--	3	--	--	TOTAL SHEETS 17
2	--	--	4	--	--	

DES BY: R. JONES	DATE: 10/24	DWG BY: B. PETERSON	DATE: 10/24
DES CHK: A. ABERNATHY	DATE: 10/24	CHK BY: A. ABERNATHY	DATE: 10/24

NORTH CAROLINA PROFESSIONAL SEAL 033723 ENGINEER CHARLES A. ABERNATHY

10/21/2024

Charles A Abernathy

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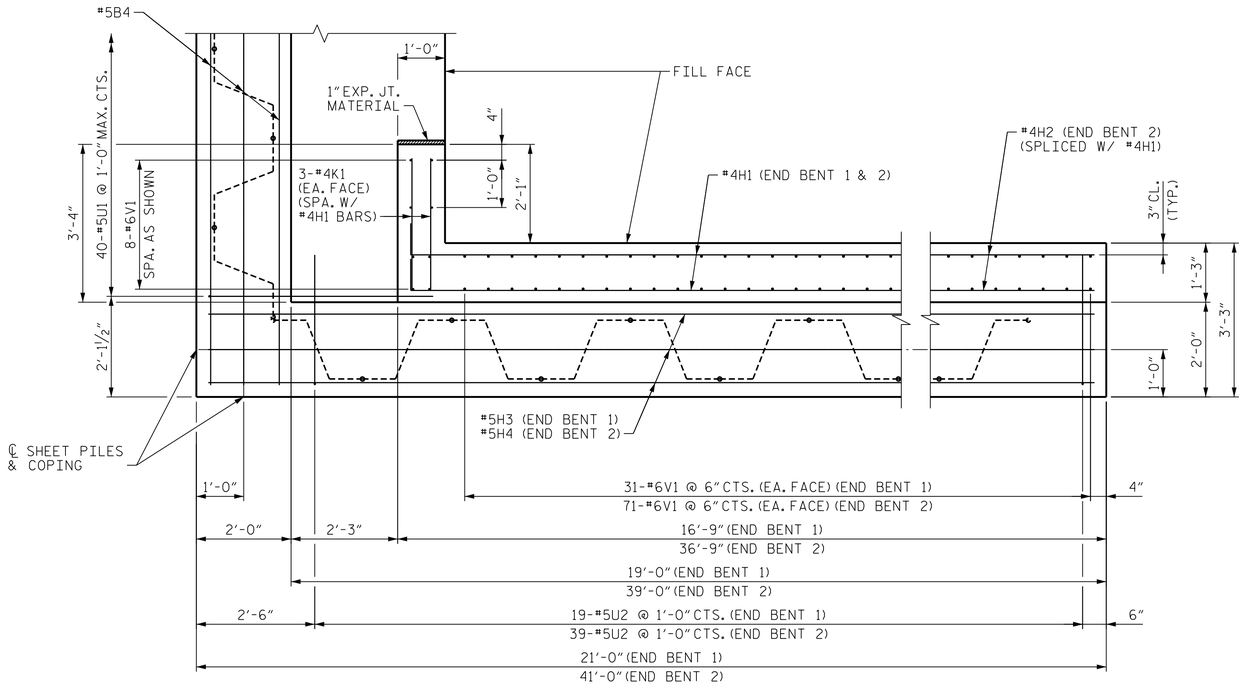
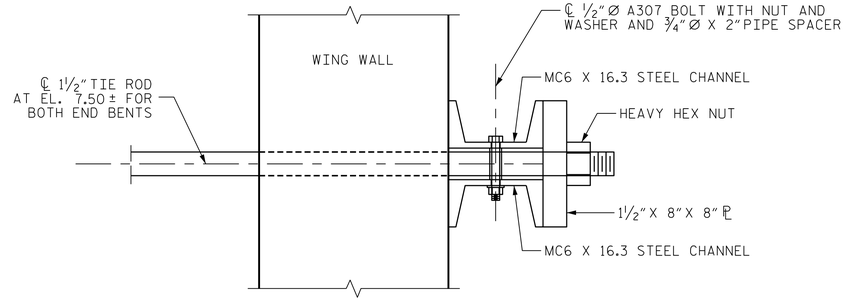
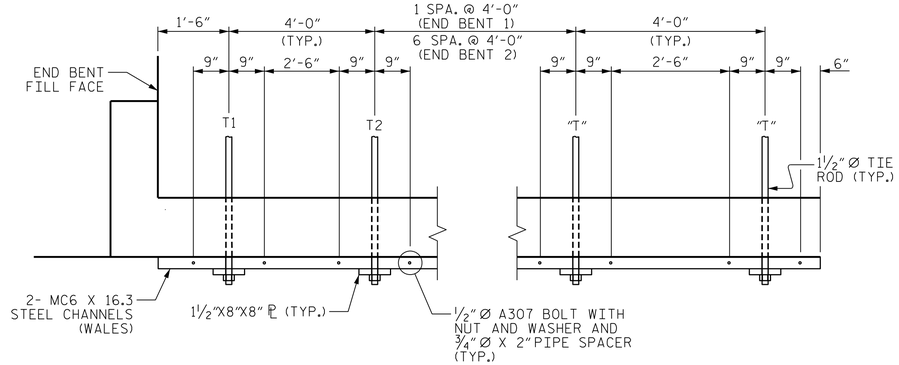


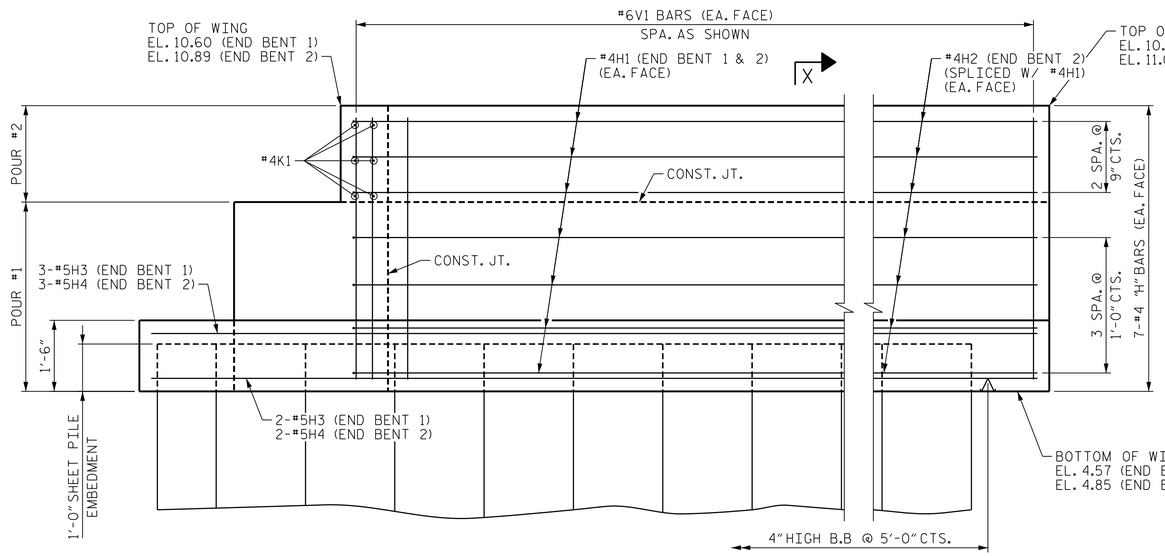
PLAN - WING W1

WING W1 SHOWN, WING W2 SIMILAR



DETAIL "D"



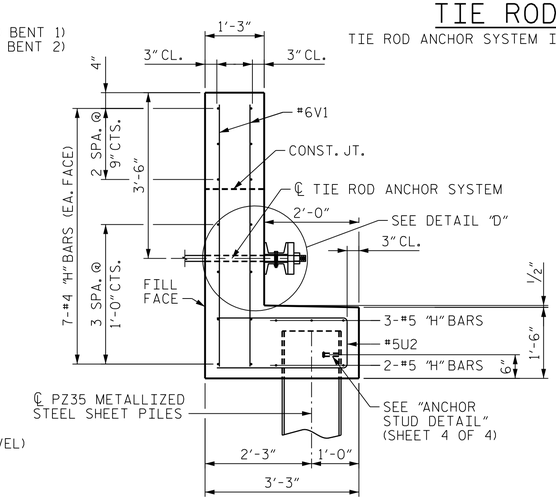


ELEVATION - WING W1

WING W1 SHOWN, WING W2 SIMILAR

TIE ROD ANCHOR SYSTEM

TIE ROD ANCHOR SYSTEM IS INCIDENTAL TO PZ35 SHEET PILE SYSTEM



SECTION X-X

DRILL 2" Ø MAX. HOLE IN SHEET PILE FOR #5U2, #5H3 & #5H4 BARS.

PROJECT NO. DF18203.2010800

BRUNSWICK COUNTY

STATION: 14+33.50 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
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RALEIGH

SUBSTRUCTURE STEEL SHEET PILE WING DETAILS

REVISIONS						SHEET NO. S-12
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS 17
1	--	--	3	--	--	
2	--	--	4	--	--	

NORTH CAROLINA PROFESSIONAL SEAL 033723 ENGINEER CHARLES A. ABERNATHY

Charles A Abernathy 10/21/2024

DES BY:	R. JONES	DATE :	10/24
DES CHK:	A. ABERNATHY	DATE :	10/24
DWG BY:	B. PETERSON	DATE :	10/24
CHK BY:	A. ABERNATHY	DATE :	10/24

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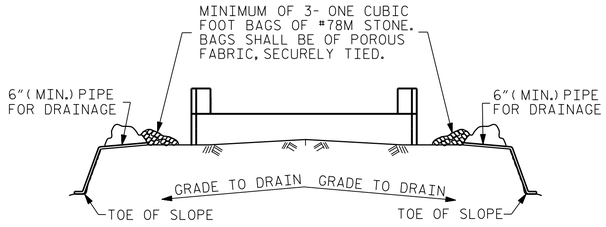
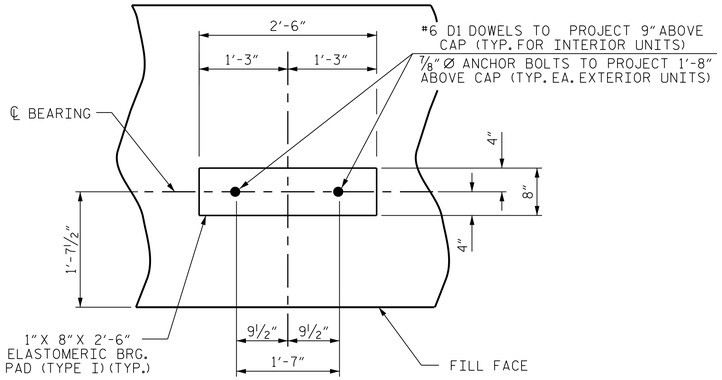


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

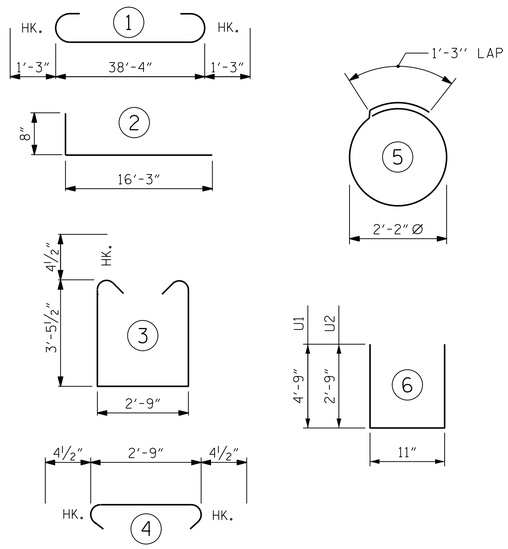
TEMPORARY DRAINAGE AT END BENT



DETAIL "A"

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

END BENT No. 1	END BENT No. 2
PZ35 STEEL SHEET PILE SYSTEM SQ. FT.: 3216	PZ35 STEEL SHEET PILE SYSTEM SQ. FT.: 4896

BILL OF MATERIAL

FOR ONE END BENT

	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
END BT. 1	B1	8	#9	1	40'-10"	1111
	B2	28	#4	STR	20'-6"	384
	B3	10	#4	STR	2'-9"	19
	B4	6	#5	STR	42'-6"	266
	D1	18	#6	STR	1'-6"	41
	K1	12	#4	STR	2'-10"	23
	S1	50	#4	3	10'-5"	349
	S2	50	#4	4	3'-6"	118
	S3	28	#4	5	8'-1"	152
	V1	140	#6	STR	5'-5"	1140
	H1	28	#4	2	16'-11"	317
	H3	10	#5	STR	20'-6"	214
	U1	40	#5	6	10'-5"	435
	U2	38	#5	6	6'-5"	255
END BT. 2	V1	300	#6	STR	5'-5"	2441
	H1	28	#4	2	16'-11"	317
	H2	28	#4	STR	22'-5"	420
	H4	10	#5	STR	40'-6"	423
	U1	40	#5	6	10'-5"	435
	U2	78	#5	6	6'-5"	523

EPOXY COATED REINFORCING STEEL
END BENT 1 4824 LBS.
END BENT 2 7022 LBS.

CLASS AA CONCRETE BREAKDOWN
END BENT 1

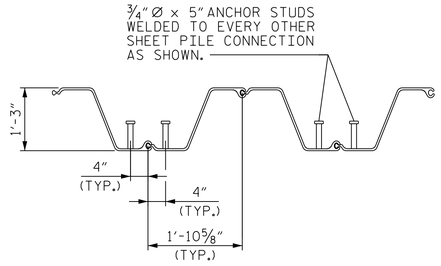
POUR #1	CAP, LOWER PART OF WINGS & COPING	34.1 C.Y.
POUR #2	UPPER PART OF WINGS	3.4 C.Y.
TOTAL CLASS AA CONCRETE		37.5 C.Y.

CLASS AA CONCRETE BREAKDOWN
END BENT 2

POUR #1	CAP, LOWER PART OF WINGS & COPING	46.0 C.Y.
POUR #2	UPPER PART OF WINGS	7.1 C.Y.
TOTAL CLASS AA CONCRETE		53.1 C.Y.

SECTION A-A

DRILL 2" Ø MAX. HOLE IN SHEET PILES FOR #5 B4 AND #5 U1 BARS.
#5 U1 BARS MAY BE SHIFTED AS NECESSARY TO CLEAR 16" PRESTRESSED CONCRETE PILES.



ANCHOR STUD DETAIL

PROJECT NO. DF18203.2010800

BRUNSWICK COUNTY

STATION: 14+33.50 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE END BENT NO. 1 & 2 DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 033723 ENGINEER CHARLES A. ABERNATHY
Charles A Abernathy 10/21/2024

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St., Suite 900 Raleigh, N.C. 27601
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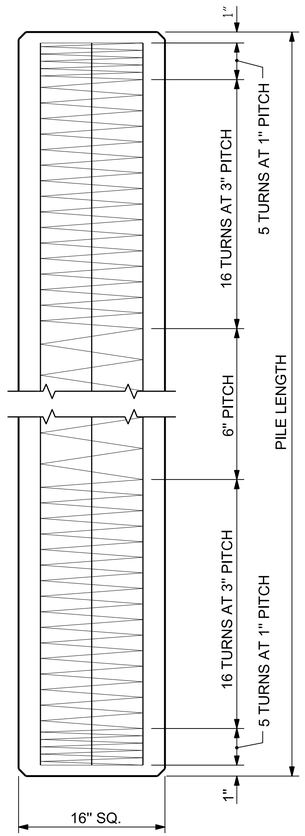
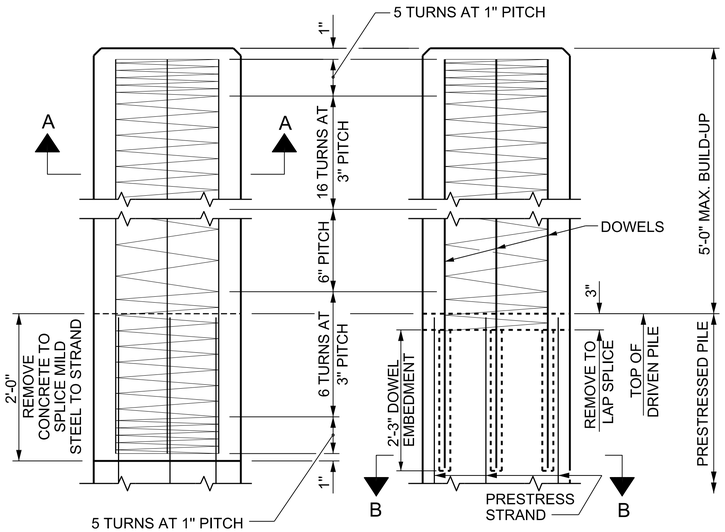
2	--	--	4	--	--

SHEET NO. S-13
TOTAL SHEETS 17

DES BY:	R. JONES	DATE :	10/24
DES CHK:	A. ABERNATHY	DATE :	10/24
DWG BY:	B. PETERSON	DATE :	10/24
CHK BY:	A. ABERNATHY	DATE :	10/24

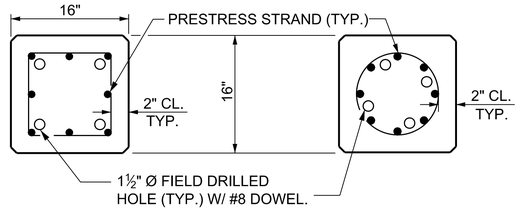


ELEVATION



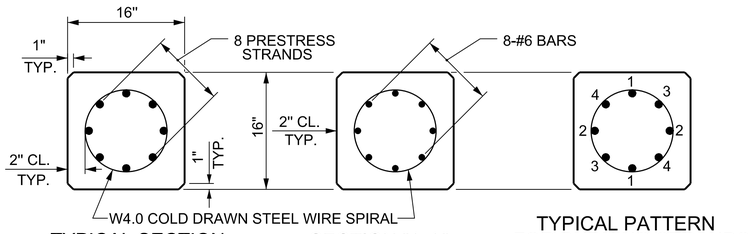
BUILD-UP AND SPIRAL REINFORCING

OPTIONAL BUILD-UP WITH DOWELS



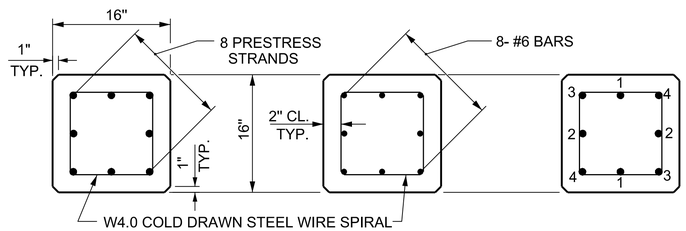
SECTION "B-B"

(AT THE CONTRACTOR'S OPTION, PILE BUILD-UP MAY BE CONSTRUCTED WITH DOWELS.)



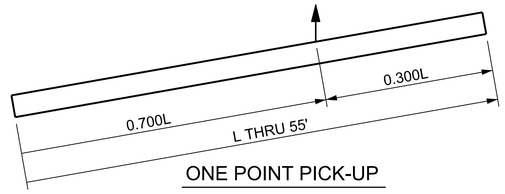
TYPICAL SECTION | SECTION "A-A" | TYPICAL PATTERN FOR BURNING STRANDS

0.6"Ø GRADE 270 L.R. PRESTRESS STRANDS

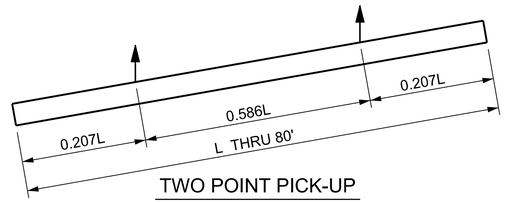


TYPICAL SECTION | SECTION "A-A" | TYPICAL PATTERN FOR BURNING STRANDS

0.6"Ø GRADE 270 L.R. PRESTRESS STRANDS



ONE POINT PICK-UP



TWO POINT PICK-UP

PICK-UP POINTS

QUANTITIES FOR ONE 16" PRESTRESSED PILE

LENGTH	CONCRETE CU. YDS.	PILE WT. TONS	ONE POINT PICK-UP 0.300L	ONE POINT PICK-UP 0.700L	TWO POINT PICK-UP 0.207L	TWO POINT PICK-UP 0.586L
25'-0"	1.63	3.31	7'-6"	17'-6"	5'-2"	14'-8"
30'-0"	1.96	3.97	9'-0"	21'-0"	6'-2½"	17'-7"
35'-0"	2.29	4.63	10'-6"	24'-6"	7'-3"	20'-6"
40'-0"	2.61	5.29	12'-0"	28'-0"	8'-3½"	23'-5"
45'-0"	2.94	5.95	13'-6"	31'-6"	9'-4"	26'-4"
50'-0"	3.27	6.61	15'-0"	35'-0"	10'-4"	29'-4"
55'-0"	3.59	7.28	16'-6"	38'-6"	11'-4½"	32'-3"
60'-0"	3.92	7.94			12'-5"	35'-2"
65'-0"	4.25	8.60			13'-5½"	38'-1"
70'-0"	4.57	9.26			14'-6"	41'-0"
75'-0"	4.90	9.92			15'-6½"	43'-11"
80'-0"	5.23	10.58			16'-7"	46'-10"

NOTES

PRESTRESSED CONCRETE STRENGTH :f'c = 7,500 PSI

BUILD-UP CONCRETE STRENGTH :f'c = 7,500 PSI

STRAND DATA:

SIZE	GRADE	AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS FORCE
0.6"	270 L.R.	0.217	58,600# PER STRAND	43,940# PER STRAND

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW-RELAXATION GRADE 270 STRANDS CONFORMING TO AASHTO M203. STRAND SAMPLING REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

THE SLIP-FORM METHOD OF CASTING PILES WILL NOT BE PERMITTED. TRANSFER THE LOAD FROM THE ANCHORAGES TO THE PILE AFTER THE CONCRETE HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI.

IF STRAND STRESS IS RELIEVED BY BURNING, THE STRANDS SHALL BE BURNED IN OPPOSITE PAIRS AS INDICATED IN THE TYPICAL PATTERN SHOWN. FOR ANY NUMBER OF STRANDS, BURN IN OPPOSITE PAIRS AND SYMMETRICALLY ABOUT BOTH THE VERTICAL AND HORIZONTAL AXES. STRANDS 1-1 SHALL BE BURNED BEFORE 2-2, ETC. NOT MORE THAN 4 STRANDS, SAY 3-3 AND 4-4, MAY BE BURNED AT ANY ONE SECTION BEFORE THESE SAME PAIRS OF STRANDS ARE BURNED AT BOTH ENDS OF THE BED AND BETWEEN EACH PAIR OF PILES IN THE BED.

PROPOSED DEVICES FOR LIFTING PILES, RECESS DETAILS, AND PATCHING MATERIAL SHALL BE DETAILED IN SHOP DRAWINGS. AFTER ATTACHMENTS HAVE BEEN REMOVED, OPENINGS SHALL BE REPAIRED SUCH THAT THE APPEARANCE OF THE PILE IS UNIFORM.

WHERE CAST-IN-PLACE LIFTING DEVICES ARE NOT USED, PICK-UP POINTS ARE TO BE INDICATED WITH A 2" WIDE BLACK MARK.

DRIVE PILES USING A METHOD APPROVED BY THE ENGINEER, WHEREBY THE HEAD OF THE PILE IS NOT DAMAGED.

DRIVING OF THE BUILT-UP PILE WILL NOT BE PERMITTED UNTIL THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF 5,000 PSI AND UNTIL A PERIOD OF SEVEN DAYS HAS ELAPSED SINCE CASTING OF THE BUILD-UP.

THE WATER/CEMENT RATIO FOR CONCRETE PILES SHALL NOT EXCEED 0.40.

PRESTRESSED CONCRETE PILES SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

THE CONCRETE IN THE PRESTRESSED CONCRETE PILES SHALL CONTAIN SILICA FUME. SILICA FUME SHALL BE SUBSTITUTED FOR 5% OF THE PORTLAND CEMENT BY WEIGHT. IF THE OPTION OF ARTICLE 1024-1 OF THE STANDARD SPECIFICATIONS TO PARTIALLY SUBSTITUTE CLASS F FLY ASH FOR PORTLAND CEMENT IS EXERCISED, THE RATE OF FLY ASH SUBSTITUTION SHALL BE REDUCED TO 1.0 LB OF FLY ASH PER 1.0 LB. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE VARIOUS PAY ITEMS.

DOWEL INSTALLATION FOR OPTIONAL BUILD-UP

GROUT COMPRESSIVE STRENGTH: f'c= 5,000 PSI

BEFORE DRILLING DOWEL HOLES, REMOVE THE UPPER 3" OF CONCRETE FROM THE TOP OF THE PILE WITHOUT DAMAGE TO THE REINFORCING STEEL. THE REMOVAL PLANE SHOULD BE NORMAL TO THE EDGE OF THE PILE.

DOWEL HOLES SHALL BE POSITIONED TO MAINTAIN ½" CLEAR TO ALL EXISTING PRESTRESSING STRANDS IN THE CONCRETE PILE.

FIELD DRILLED HOLES SHALL BE CLEAN AND FREE OF ANY OBSTRUCTIONS BEFORE GROUTING OF DOWELS. DOWEL BARS SHALL BE INSTALLED AND GROUTED WITH AN APPROVED NON-SHRINK GROUT.

THE SPIRAL REINFORCING IN ALL BUILD-UPS SHALL BE W4.0 COLD DRAWN WIRE WHICH SHALL BE SECURED TO THE LONGITUDINAL REINFORCEMENT TO MAINTAIN PITCH.

THE SPIRAL REINFORCING IN THE BUILD-UP AND THE PRESTRESSED CONCRETE PILE SHALL BE SPLICED BY OVERLAPPING A MIN. OF ONE TURN.

PROJECT NO. DF18203.2010800

BRUNSWICK COUNTY

STATION: 14+33.50 -L-

NORTH CAROLINA PROFESSIONAL SEAL 033723 ENGINEER CHARLES A. ABERNATHY

Charles A Abernathy 10/21/2024

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St., Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

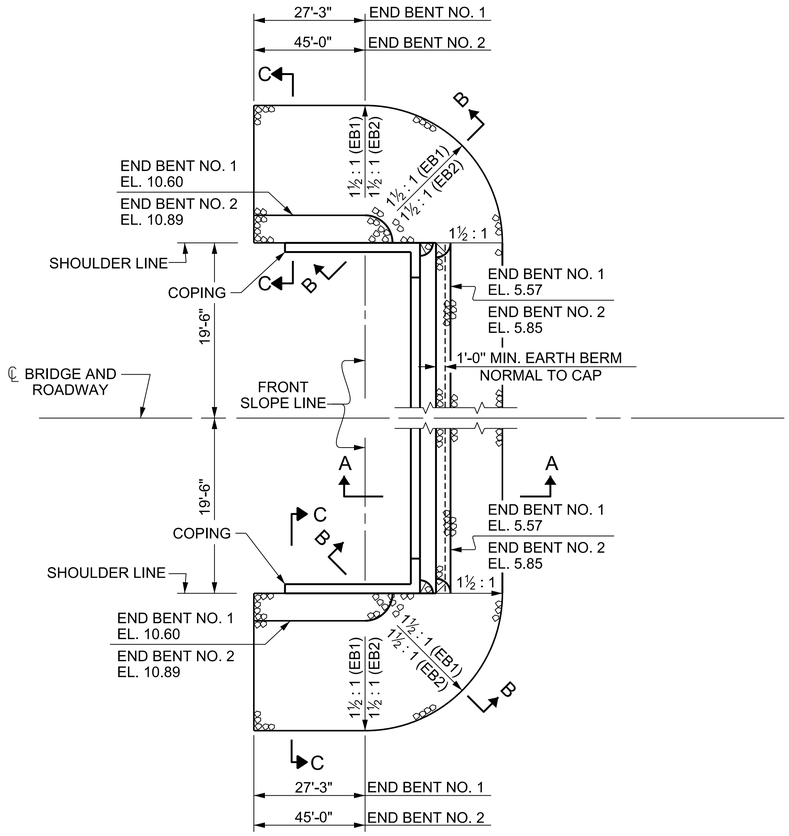
16" PRESTRESSED CONCRETE PILE

REVISIONS						SHEET NO. S-14
NO.	BY:	DATE:	NO.	BY:	DATE:	
1	--	--	3	--	--	TOTAL SHEETS 17
2	--	--	4	--	--	

DES BY: R. JONES DATE : 10/24
DES CHK: A. ABERNATHY DATE : 10/24

DWG BY: B. PETERSON DATE : 10/24
CHK BY: A. ABERNATHY DATE : 10/24

STD. NO. PCP2

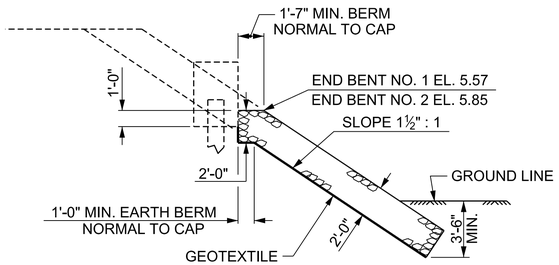


SHOULDER RIP RAP IS HIGHER THAN BERM RIP RAP

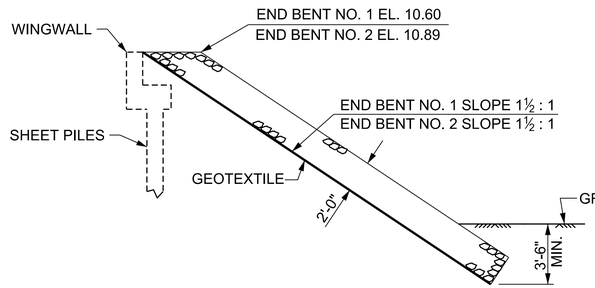
NOTES :

FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.

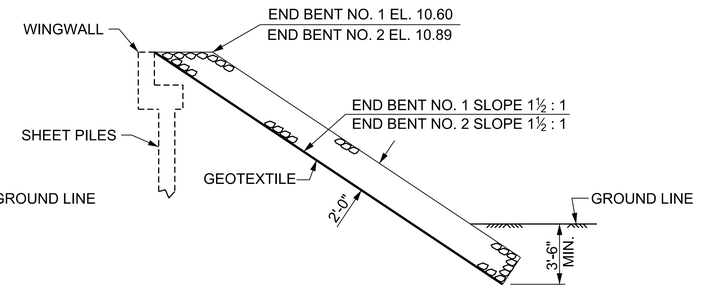
ESTIMATED QUANTITIES		
BRIDGE @ STA. 14+33.50 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	242	269
END BENT 2	307	341



SECTION A-A



SECTION B-B



SECTION C-C

PROJECT NO. DF18203.2010800

BRUNSWICK COUNTY

STATION: 14+33.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RIP RAP DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 033723 ENGINEER CHARLES A. ABERNATHY

Charles A Abernathy 10/21/2024

REVISIONS						SHEET NO. S-15
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS 17
1	--	--	3	--	--	
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DES BY: R. JONES	DATE : 10/24	DWG BY: B. PETERSON	DATE : 10/24
DES CHK: A. ABERNATHY	DATE : 10/24	CHK BY: A. ABERNATHY	DATE : 10/24

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St., Suite 900 Raleigh, N.C. 27601
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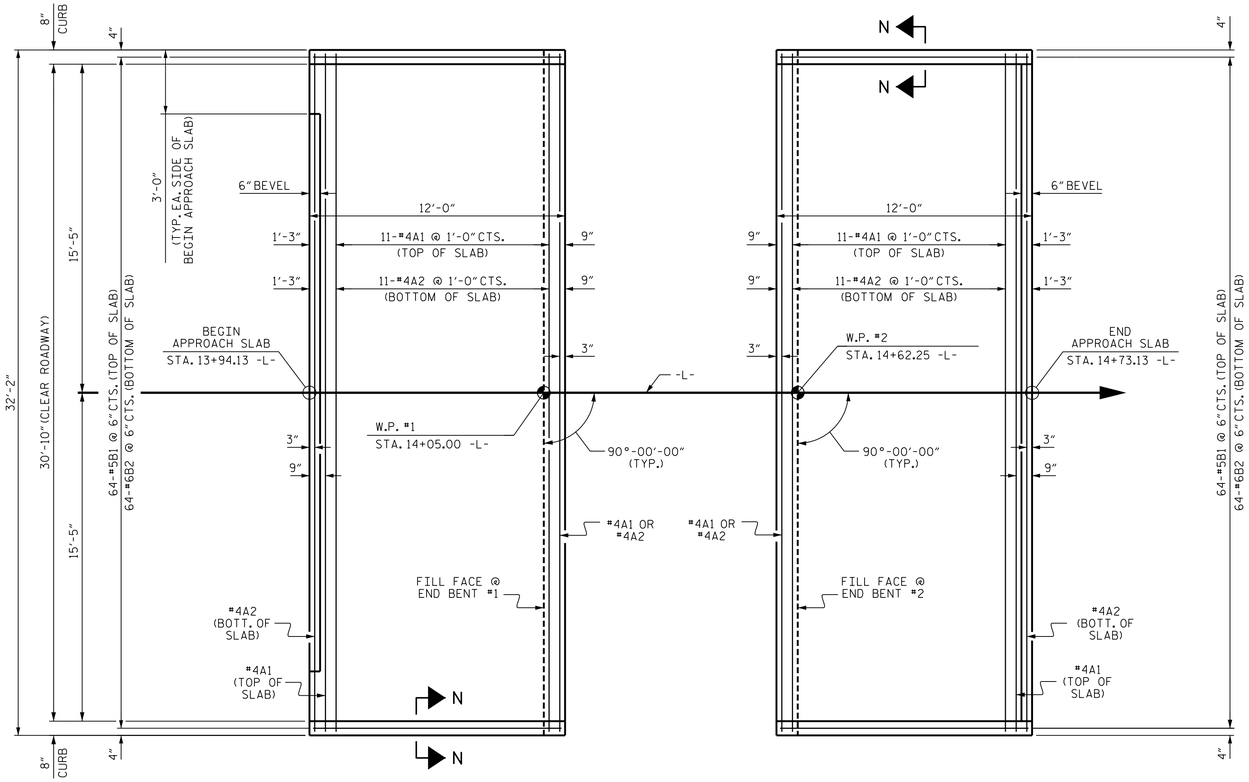
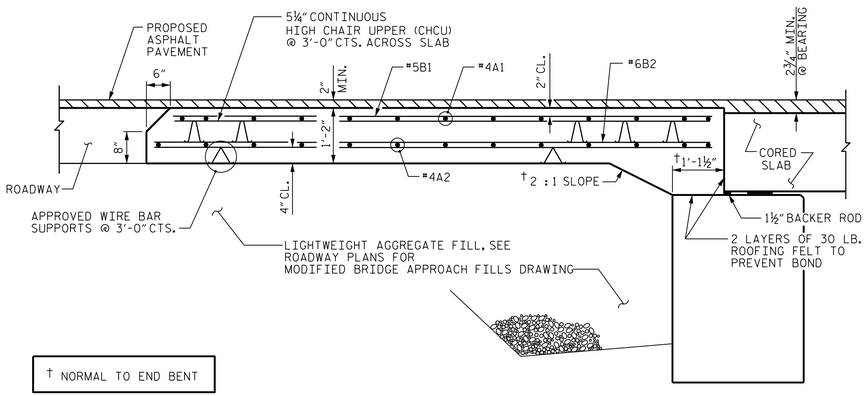


PLAN @ END BENT #1

PLAN @ END BENT #2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



SECTION THRU SLAB

NOTES

FOR BRIDGE APPROACH FILL, SEE ROADWAY PLANS.

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

APPROACH SLAB GROOVING IS NOT REQUIRED.

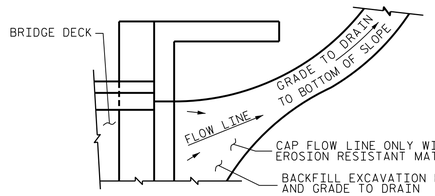
BILL OF MATERIAL

APPROACH SLAB AT EB #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	13	#4	STR	31'-10"	276
A2	13	#4	STR	31'-10"	276
✱ B1	64	#5	STR	11'-2"	745
B2	64	#6	STR	11'-8"	1121
REINFORCING STEEL				LBS.	1397
✱ EPOXY COATED REINFORCING STEEL				LBS.	1021
CLASS AA CONCRETE				C.Y.	18.4

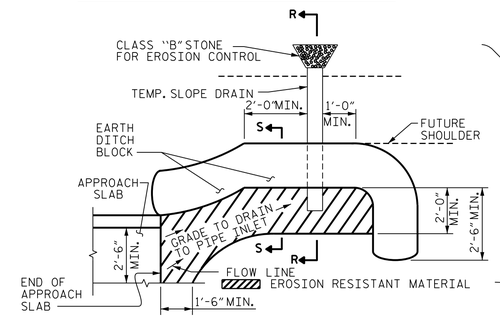
APPROACH SLAB AT EB #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	13	#4	STR	31'-10"	276
A2	13	#4	STR	31'-10"	276
✱ B1	64	#5	STR	11'-2"	745
B2	64	#6	STR	11'-8"	1121
REINFORCING STEEL				LBS.	1397
✱ EPOXY COATED REINFORCING STEEL				LBS.	1021
CLASS AA CONCRETE				C.Y.	18.4



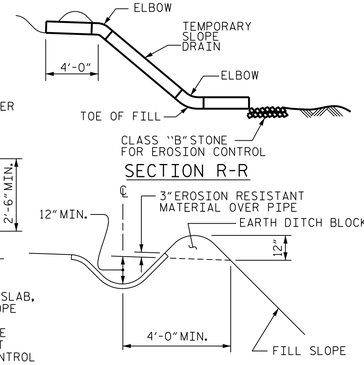
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL



PLAN VIEW

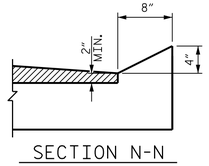
NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 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 S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



SECTION N-N

CURB DETAILS

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

PROJECT NO. DF18203.2010800

BRUNSWICK COUNTY

STATION: 14+33.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR PRESTR. CONC. CORED SLAB UNIT

REVISIONS						SHEET NO. S-16
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS 17
1	--	--	3	--	--	
2	--	--	4	--	--	

NORTH CAROLINA PROFESSIONAL SEAL 033723 ENGINEER CHARLES A. ABERNATHY

Charles A Abernathy 10/21/2024

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DES BY:	R. JONES	DATE :	10/24	DWG BY:	B. PETERSON	DATE :	10/24
DES CHK:	A. ABERNATHY	DATE :	10/24	CHK BY:	A. ABERNATHY	DATE :	10/24

STD. NO. BAS_33_90S

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

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

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

CONCRETE:

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

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED ¾" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1½" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A ¼" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A ½" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE ⅞" Ø SHEAR STUDS FOR THE ¾" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - ⅞" Ø STUDS FOR 4 - ¾" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF ⅞" Ø STUDS ALONG THE BEAM AS SHOWN FOR ¾" Ø STUDS BASED ON THE RATIO OF 3 - ⅞"Ø STUDS FOR 4 - ¾" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

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

PROJECT NO. DF18203.2010800

BRUNSWICK COUNTY

STATION: 14+33.50 -L-

NORTH CAROLINA PROFESSIONAL SEAL 033723 ENGINEER CHARLES A. ABERNATHY

Charles A Abernathy 10/21/2024

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD NOTES

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PLOT DRIVER: NCDOT STRUCTURES DEFAULT PLOTTER.pltPENTABLE: NCDOT STRUCTURES DEFAULT PEN.tbl
USER: DCHAPMAN DATE: 10/21/2024 TIME: 4:36:14 PM
FILE: ...\401_080_DF18203.2010800_SMU_SN_017_090xxx.dgn