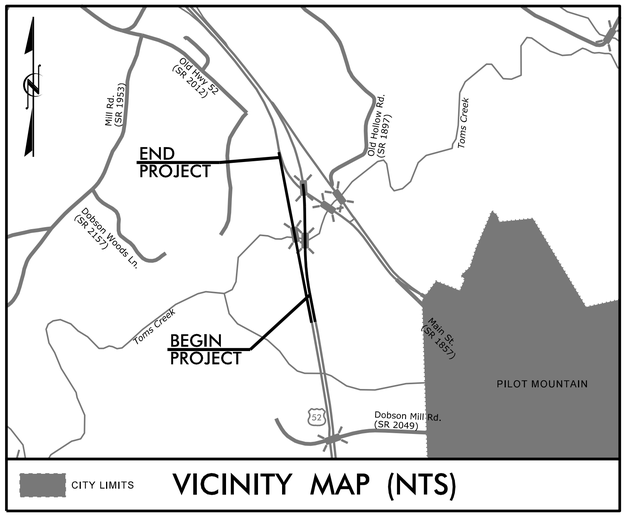
09/08/99

# TIP PROJECT: B–5527

# CONTRACT: C204208




VICINITY MAP (NTS)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

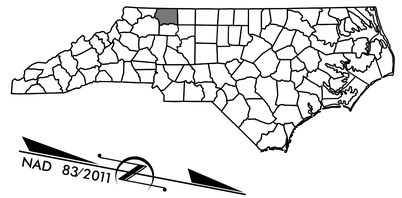
# SURRY COUNTY

| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| N.C. | B–5527 | | |

| STATE PROJ. NO. | F. A. PROJ. NO. | DESCRIPTION |
|---|---|---|
| 55027.1.FS1 | BRSTP–0052(49) | PE |
| 55027.2.1 | N/A | ROW |
| 55027.2.1 | N/A | UTIL |
| 55027.3.1 | N/A | CONST |

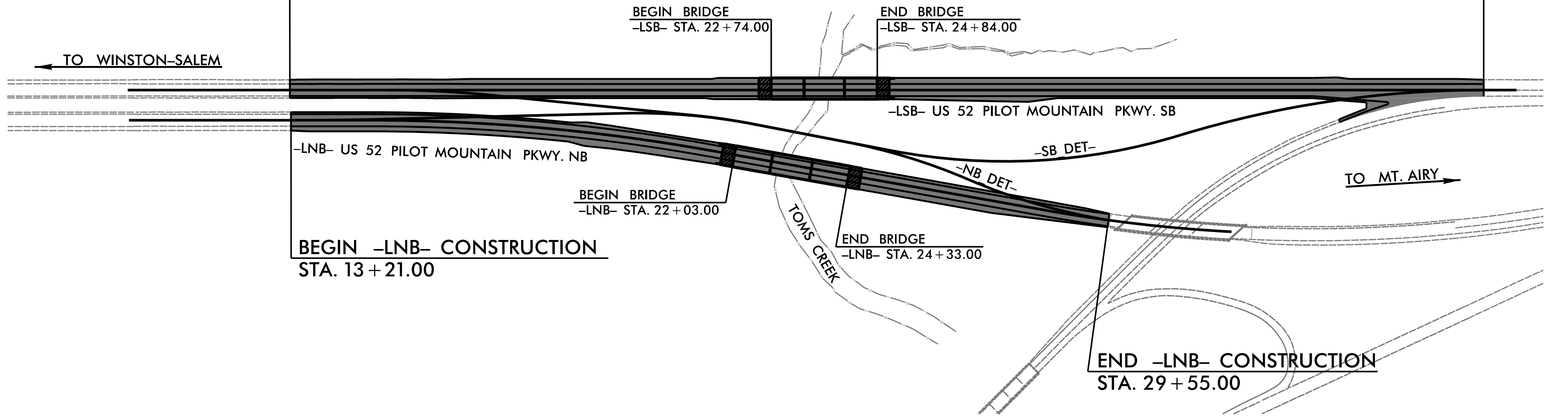
***LOCATION: BRIDGES 122 AND 126 OVER TOMS CREEK ON US 52 NB AND SB***

***TYPE OF WORK: GRADING, DRAINAGE, PAVING, & STRUCTURES***




END TIP PROJECT B–5527
END –LSB– CONSTRUCTION
STA. 36+85.00

BEGIN TIP PROJECT B–5527
END –LSB– CONSTRUCTION
STA. 13+21.00




BEGIN –LNB– CONSTRUCTION
STA. 13+21.00

END –LNB– CONSTRUCTION
STA. 29+55.00

# STRUCTURES

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

***DESIGN DATA***

ADT 2020 = 30,670
ADT 2045 = 39,000
K = 9 %
D = 50 %
T = 19 % *
V = 70 MPH
* TTST = 13% DUAL = 6%
TIER = STATEWIDE
FUNC CLASS = INTERSTATE

***PROJECT LENGTH***

LENGTH ROADWAY TIP PROJECT B–5527 = 0.408 MI.
LENGTH STRUCTURE TIP PROJECT B–5527 = 0.040 MI.
TOTAL LENGTH TIP PROJECT B–5527 = 0.448 MI.

NOTE: –LSB– ALIGNMENT USED TO DETERMINE LENGTH OF PROJECT.

AMT
*Prepared for the North Carolina Department of Transportation in the Office of:*
A. MORTON THOMAS AND ASSOCIATES, INC.
900 RIDGEFIELD DRIVE, SUITE 325•RALEIGH, NC 27609
(919) 855-9989•NC LICENSE NO. F-1049
WWW.AMTENGINEERING.COM

*2024 STANDARD SPECIFICATIONS*

***RIGHT OF WAY DATE:***
JUNE 15, 2023

***LETTING DATE:***
APRIL 16, 2024

***STRUCTURES ENGINEER***

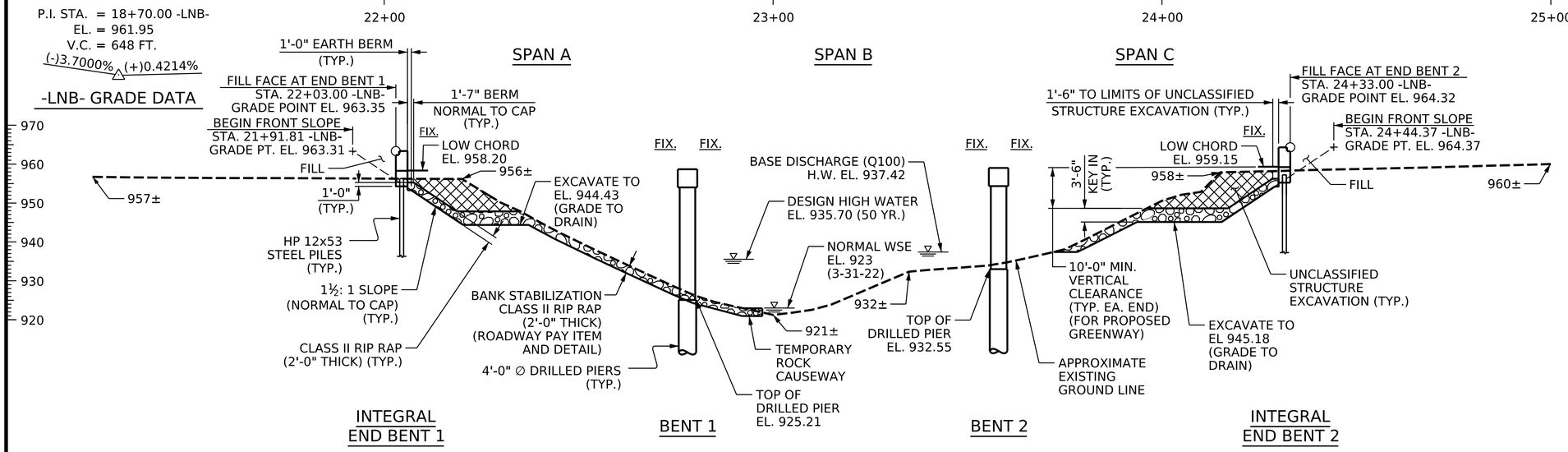
NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A. LEBLANC
2/2/2024

DocuSigned by: Marc A. LeBlanc C146F00A82F4412...
***SIGNATURE:*** P.E.

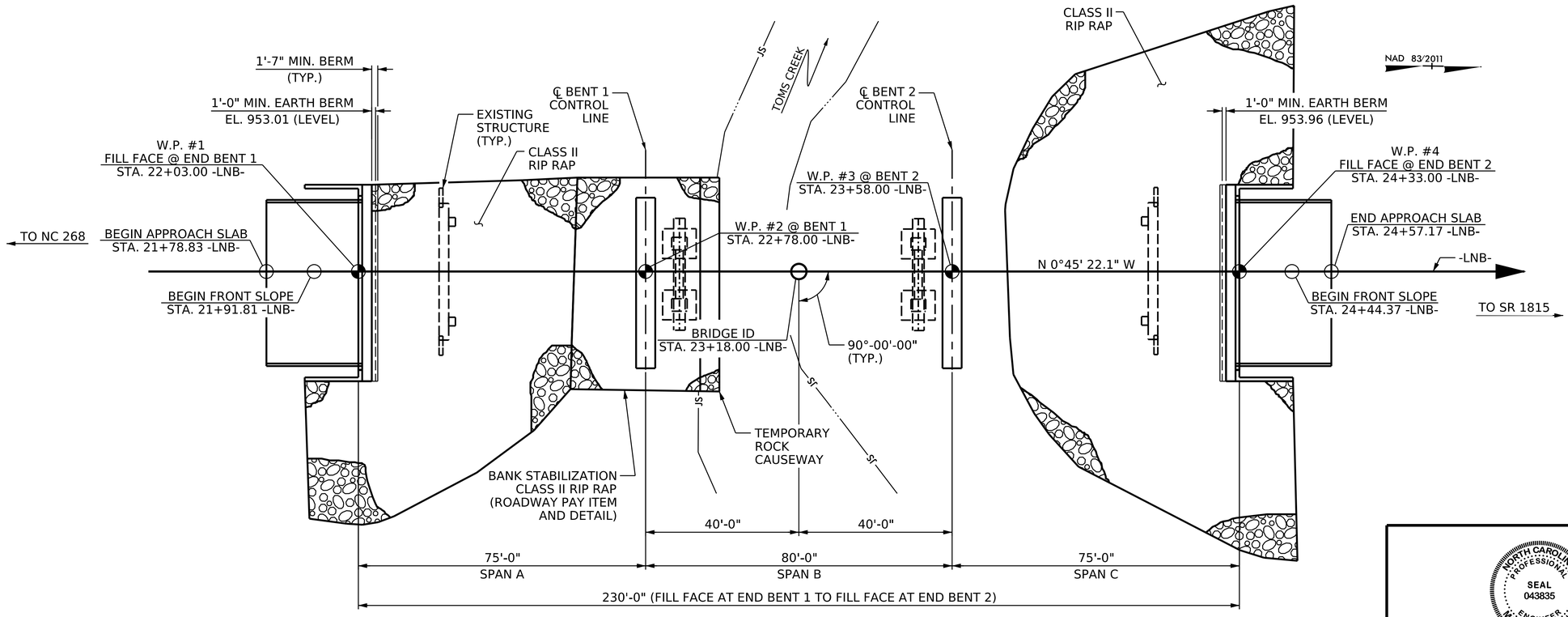
STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

2/1/2024
X:\Raleigh\14-783.005D - B-5527 CE Update\05-CAD\B5527\Structures\DGN's\Final_B5527_Str_tsh.dgn
tbolinsky

F.A. PROJECT NO. BRSTP-0052(49)




## SECTION ALONG -LNB-




## PLAN ALONG -LNB-

(FOR CLARITY, PILES & COLUMNS ARE NOT SHOWN IN PLAN VIEW)

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+18.00 -LNB-

SHEET 1 OF 4 REPLACES BRIDGE NO. 850122

DRAWN BY : HRB DATE : 12/22

CHECKED BY : MAL DATE : 12/22

DESIGN ENGINEER OF RECORD: MAL DATE : 6/23

9/29/2023
X:\Raleigh\114-783.005D - B-5527 CE Update\05-CAD\B5527\Structures\DGN's\Final\401_001_B-5527_SMU_GD_S1-1.dgn
hbollinsky

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARCA LEBLANC

10/3/2023

DocuSigned by: Marc A. LeBlanc

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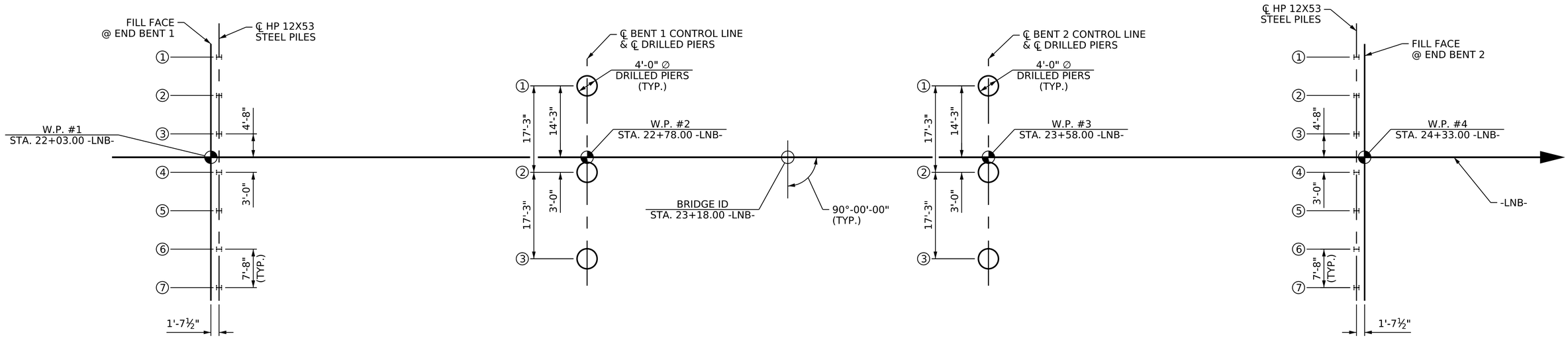
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

# GENERAL DRAWING

FOR BRIDGE ON US 52 NB OVER TOMS CREEK BETWEEN SR 1815 AND NC 268

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-1 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

NAD 83/2011




INTEGRAL
END BENT 1

BENT 1

BENT 2

INTEGRAL
END BENT 2

## FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES AND DRILLED PIERS ARE
SHOWN TO THE PILE AND DRILLED PIER CENTERLINES

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+18.00 -LNB-

SHEET 2 OF 4

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A. LEBLANC

10/3/2023

DocuSigned by: Marc A. LeBlanc

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**GENERAL DRAWING**

FOR BRIDGE ON US 52 NB
OVER TOMS CREEK BETWEEN
SR 1815 AND NC 268

A. MORTON THOMAS AND ASSOCIATES, INC.
900 RIDGEFIELD DRIVE, SUITE 325 • RALEIGH, NC 27609
(919) 855-9989 • NC LICENSE NO. F-1049
WWW.AMTENGINEERING.COM

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-2 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

DRAWN BY : HRB DATE : 5/23
CHECKED BY : MAL DATE : 5/23
DESIGN ENGINEER OF RECORD: MAL DATE : 6/23

9/29/2023
X:\Raleigh\114-783.005D - B-5527 CE Update\05-CAD\B5527\Structures\DGN's\Final\401_003_B-5527_SMU_GD_S1-2.dgn
hbollinsky

## SUMMARY OF PILE INFORMATION/INSTALLATION

(Blank entries indicate item is not applicable to structure)

| End Bent/ Bent No, Pile(s) #(-#) (e.g., "Bent 1, Piles 1-5") | Factored Resistance per Pile TONS | Pile Cut-Off (Top of Pile) Elevation FT | Estimated Pile Length per Pile FT | Scour Critical Elevation FT | Driven Piles | | | Predrilling for Piles* | | | Drilled-In Piles | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Min Pile Tip (Tip No Higher Than) Elev FT | Required Driving Resistance (RDR)** per Pile TONS | Total Pile Redrives Quantity EACH | Predrilling Length per Pile Lin FT | Predrilling Elevation (Elev Not To Predrill Below) FT | Maximum Predrilling Dia INCHES | Pile Excavation (Bottom of Hole) Elev FT | Pile Exc Not In Soil per Pile Lin FT | Pile Exc In Soil per Pile Lin FT |
| End Bent 1, Piles 1-3 | 120 | See Structure Plans | 15 | | | 200 | | | | | 944.0 | 4.4 | 5.6 |
| End Bent 1, Piles 4-7 | 120 | | 40 | | | 200 | | | | | | | |
| End Bent 2, Piles 1-7 | 120 | | 30 | | | 200 | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

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

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

## SUMMARY OF PDA/PILE ORDER LENGTHS

(Blank entries indicate item is not applicable to structure)

| Pile Driving Analyzer (PDA) | | | | Pile Order Lengths | |
|---|---|---|---|---|---|
| End Bent/ Bent No | PDA Testing Required? YES or MAYBE | PDA Test Pile Length FT | Total PDA Testing Quantity EACH | End Bent/ Bent No(s) | Pile Order Length Basis* EST or PDA |
| | | | 1 | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

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

## PILE DESIGN INFORMATION

(Blank entries indicate item is not applicable to structure)

| End Bent/ Bent No, Pile(s) #(-#) (e.g., "Bent 1, Piles 1-5") | Factored Axial Load per Pile TONS | Factored Downdrag Load per Pile TONS | Factored Dead Load* per Pile TONS | Dynamic Resistance Factor | Nominal Downdrag Resistance per Pile TONS | Nominal Scour Resistance per Pile TONS | Scour Resistance Factor (Default = 1.00) |
|---|---|---|---|---|---|---|---|
| End Bent 1, Piles 1-7 | 120 | | | 0.60 | | | 1.00 |
| End Bent 2, Piles 1-7 | 120 | | | 0.60 | | | 1.00 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

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

## SUMMARY OF PILE ACCESSORIES

(Blank entries indicate item is not applicable to structure)

| End Bent/ Bent No, Pile(s) #(-#) (e.g., "Bent 1, Piles 1-5") | Pipe Pile Plates Required? YES or MAYBE | Steel Pile Points | | | Steel Pile Tips Required? YES |
|---|---|---|---|---|---|
| | | Pipe Pile Cutting Shoes Required? YES | Pipe Pile Conical Points Required? YES | H-Pile Points Required? YES | |
| End Bent 1, Piles 4-7 | | | | YES | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| TOTAL QTY: | | | | 4 | |

## SUMMARY OF DRILLED PIER INFORMATION/INSTALLATION

(Blank entries indicate item is not applicable to structure)

| End Bent/ Bent No, Pier(s) #(-#) (e.g., "Bent 1, Piers 1-3") | Factored Resistance per Pier TONS | Minimum Pier Tip (Tip No Higher Than) Elevation FT | Required Tip Resistance per Pier TSF | Scour Critical Elevation FT | Minimum Drilled Pier Penetration Into Rock per Pier Lin FT | Drilled Pier Length* per Pier Lin FT | Drilled Pier Length Not In Soil* per Pier Lin FT | Drilled Pier Length In Soil* per Pier Lin FT | Permanent Steel Casing Required? YES or MAYBE | Permanent Steel Casing Tip Elevation (Elev Not To Extend Casing Below) FT | Permanent Steel Casing Length** per Pier Lin FT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Bent 1, Piers 1-2 | 426 | 904.0 | 20 | 913 | 10.0 | 21.2 | | | YES | 915.5 | 9.7 |
| Bent 1, Pier 3 | 426 | 907.0 | 20 | 916 | 10.0 | 18.2 | | | YES | 918.6 | 6.6 |
| Bent 2, Piers 1-3 | 428 | 912.0 | 20 | 922 | 10.0 | 20.6 | | | YES | 922.0 | 10.6 |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| TOTAL QTY: | | | | | | 122.4 | | | | | 57.8 |
| | | | | | | | | | | | |

*Drilled Pier Length, Drilled Pier Length Not in Soil and Drilled Pier Length in Soil represent estimated drilled pier quantities and are measured and paid for as either "48" Dia. Drilled Piers" or "48" Dia. Drilled Piers Not in Soil" and "48" Dia. Drilled Piers in Soil" in accordance with Article 411-7 of the *NCDOT Standard Specifications*.

**Permanent Steel Casing Length equals the difference between the ground line or top of drilled pier elevation, whichever is higher, and the permanent casing tip elevation and is measured and paid for as "Permanent Steel Casting for 48" Dia. Drilled Pier" in accordance with Article 411-7 of the *NCDOT Standard Specifications*.

## SUMMARY OF DRILLED PIER TESTING

(Blank entries indicate item is not applicable to structure)

| End Bent/ Bent No, Pier(s) #(-#) (e.g., "Bent 1, Piers 1-3") | Standard Penetration Test (SPT) Required? YES or MAYBE | Crosshole Sonic Logging (CSL) Required?* YES or MAYBE | Total CSL Tube Length (For All Tubes) per Pier Lin FT | Shaft Inspection Device (SID) Required? YES or MAYBE | Pile Integrity Test (PIT) Required? MAYBE |
|---|---|---|---|---|---|
| Bent 1, Piers 1-2 | | MAYBE | 90.8 | | |
| Bent 1, Pier 3 | | MAYBE | 78.8 | | |
| Bent 2, Piers 1-3 | | MAYBE | 88.4 | | |
| | | | | | |
| | | | | | |
| | | | | | |
| TOTAL QTY: | | 1 | 525.6 | | |
| | | | | | |

*CSL Tubes are required if CSL Testing is or may be required. The number of CSL Tubes per drilled pier is equal to one tube per foot of design pier diameter with at least 4 tubes per pier. The length of each CSL Tube is equal to the drilled pier length plus 1.5 ft.

PROJECT NO. B-5527

Surry COUNTY

STATION: 23+18.00 -LNB-



NOTES:

1. The Pile and Drilled Pier Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer Shiping Yang, #031361 on
2. Total Pile Driving Equipment Setup quantity (not shown in Pile Foundation Tables) equals the number of driven piles, i.e., the number of piles with a Required Driving Resistance.
3. The Engineer will determine the need for PDA Testing, Pipe Pile Plates, Permanent Steel Casing, SPTs, CSL Testing, SID Inspections and PITs when these items may be required.
4. For Piles, see Piles Provision section 450 of the standard specifications.
5. For Drilled Piers, see Section 411 of the Standard Specifications.
6. Fill the bottom 3 ft of holes for pile excavation at End Bent No. 1 with concrete and the rest of holes with class II or III select material that meets Section 1016 of the Standard Specifications.
7. Observe a 2 months waiting period after constructing the embankment, end bent and reinforced bridge approach fill, if applicable, before beginning approach slab construction at End Bent Nos. 1 and 2. For bridge waiting periods, see roadway plans and Section 235 of the Standard Specifications.

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A. LEBLANC

10/3/2023

DocuSigned by: Marc A. LeBlanc C149F09AB2F4412...

SIGNATURE DATE

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

# PILE AND DRILLED PIER FOUNDATION TABLES

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

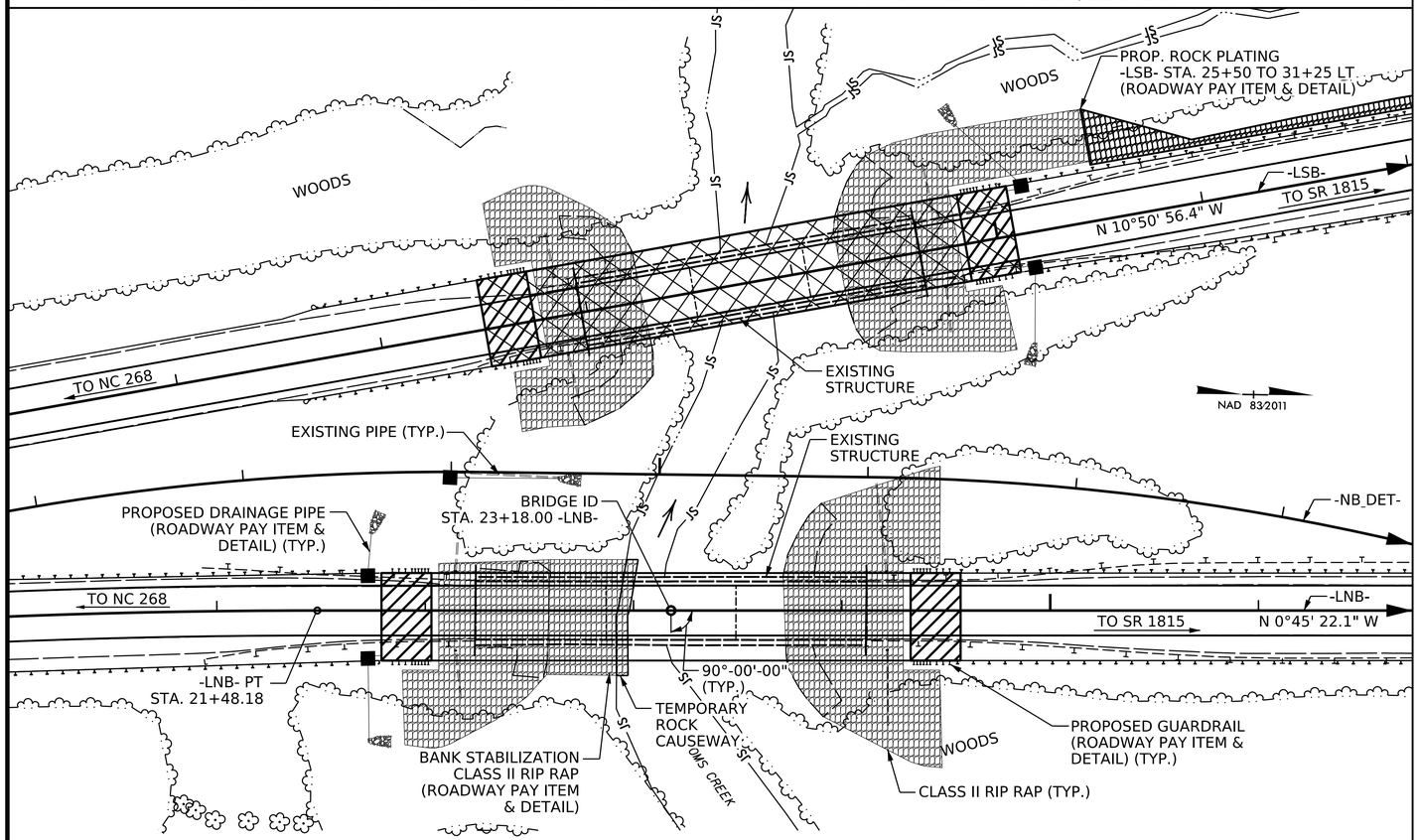
REVISIONS

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

SHEET NO. S1-3

TOTAL SHEETS 32

BENCH MARK #2: RAILROAD SPIKE SET IN 11 INCH BIRCH 320.55' RIGHT OF STA. 25+17.94 -LNB-, EL. 941.57'




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

LOCATION SKETCH

## NOTES

ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

PRESTRESSED CONCRETE DECK PANELS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.

REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3OF THE STANDARD SPECIFICATIONS.

NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 23 FT LEFT AND 30 FT RIGHT AT END BENT 1 AND 30 FT EACH SIDE OF CENTERLINE ROADWAY AT END BENT 2 AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

THE BRIDGE RAILS ON THE TEMPORARY STRUCTURE SHALL BE DESIGNED FOR THE AASHTO LRFD TEST LEVEL 3 (TL-3) CRASH TEST CRITERIA. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURE, SEE SPECIAL PROVISIONS.

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

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

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

THE CONTRACTOR WILL BE REQUIRED TO CONSTRUCT, MAINTAIN AND AFTERWARDS REMOVE THE TEMPORARY ACCESS AT STATION 23+18.00 -LNB- FOR USE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE.

FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF THE TEMPORARY ACCESS, SEE SPECIAL PROVISIONS.

## HYDRAULIC DATA

| | |
|---|---|
| DESIGN DISCHARGE | = 5,100 CFS |
| FREQUENCY OF DESIGN FLOOD | = 50 YRS |
| DESIGN HIGH WATER ELEVATION | = 935.7 |
| DRAINAGE AREA | = 29.7 SQ. MI. |
| BASE DISCHARGE (Q100) | = 6,209 CFS |
| BASE HIGH WATER ELEVATION | = 937.42 |

## OVERTOPPING FLOOD DATA

| | |
|---|---|
| OVERTOPPING DISCHARGE | = 53,960 CFS |
| FREQUENCY OF OVERTOPPING FLOOD | = 500 YRS+ |
| OVERTOPPING FLOOD ELEVATION | = 963.2 |

OVERTOPPING AT SAG STA. 21+27 -LNB-

## TOTAL BILL OF MATERIALS

| | CONSTRUCTION, MAINTENANCE & REMOVAL OF TEMPORARY ACCESS @ STA. 23+18.00 -LNB- | REMOVAL OF EXISTING STRUCTURE @ STA. 23+18.00 -LNB- | ASBESTOS ASSESSMENT | 4'-0" DIA. DRILLED PIERS | PERMANENT STEEL CASING FOR 4'-0" DIA. DRILLED PIER | DYNAMIC PILE TESTING | CSL TESTING | UNCLASSIFIED STRUCTURE EXCAVATION @ STA. 23+18.00 -LNB- | REINFORCED CONCRETE DECK SLAB | GROOVING BRIDGE FLOORS | CLASS A CONCRETE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | LUMP SUM | LUMP SUM | LUMP SUM | LIN. FT. | LIN. FT. | EACH | EACH | LUMP SUM | SQ. FT. | SQ. FT. | CU. YDS. |
| SUPERSTRUCTURE | | | | | | | | | 10,332 | 10,842 | |
| END BENT 1 | | | | | | | | | | | 35.9 |
| BENT 1 | | | | 60.6 | 26.0 | | | | | | 59.7 |
| BENT 2 | | | | 61.8 | 31.8 | | | | | | 52.3 |
| END BENT 2 | | | | | | | | | | | 35.9 |
| TOTAL | LUMP SUM | LUMP SUM | LUMP SUM | 122.4 | 57.8 | 1 | 1 | LUMP SUM | 10,332 | 10,842 | 183.8 |

| | BRIDGE APPROACH SLABS | REINFORCING STEEL | SPIRAL COLUMN REINFORCING STEEL | 45" PRESTRESSED CONCRETE GIRDERS | | PILE EXCAVATION IN SOIL | PILE EXCAVATION NOT IN SOIL | PILE DRIVING EQUIPMENT SETUP FOR HP12X53 STEEL | HP 12X53 STEEL PILES | | STEEL PILE POINTS | CONCRETE BARRIER RAIL | RIP RAP CLASS II (2'-0" THICK) | GEOTEXTILE FOR DRAINAGE | ELASTOMERIC BEARINGS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LUMP SUM | LBS. | LBS. | NO. | LIN. FT. | LIN. FT. | LIN. FT. | EACH | NO. | LIN. FT. | EACH | LIN. FT. | TONS | SQ. YDS. | LUMP SUM |
| SUPERSTRUCTURE | | | | 15 | 1,137.1 | | | | | | | 456.7 | | | |
| END BENT 1 | | 5,241 | | | | 16.8 | 13.2 | 7 | 7 | 205 | 4 | | 763 | 848 | |
| BENT 1 | | 14,896 | 3,839 | | | | | | | | | | | | |
| BENT 2 | | 13,874 | 3,329 | | | | | | | | | | | | |
| END BENT 2 | | 5,241 | | | | | | 7 | 7 | 210 | | | 904 | 1,005 | |
| TOTAL | LUMP SUM | 39,252 | 7,168 | 15 | 1,137.1 | 16.8 | 13.2 | 14 | 14 | 415 | 4 | 456.7 | 1,667 | 1,853 | LUMP SUM |

DRAWN BY : HRB DATE : 12/22
CHECKED BY : MAL DATE : 12/22
DESIGN ENGINEER OF RECORD: MAL DATE : 6/23

2/21/2024
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hbollinsky

PROJECT NO. B-5527
SURRY COUNTY
STATION: 23+18.00 -LNB-

SHEET 4 OF 4

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A. LEBLANC
2/21/2024
DocuSigned by: Marc A. LeBlanc C145F09AB2F4412...

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

# GENERAL DRAWING

FOR BRIDGE ON US 52 NB OVER TOMS CREEK BETWEEN SR 1815 AND NC 268

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-4 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

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

| LEVEL | | VEHICLE | WEIGHT (W) (TONS) | CONTROLLING LOAD RATING (#) | MINIMUM RATING FACTORS (RF) | TONS = W x RF | STRENGTH I LIMIT STATE | | | | | | | | | | | SERVICE III LIMIT STATE | | | | | | | COMMENT NUMBER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | LIVE-LOAD FACTORS($\gamma_{LL}$) | MOMENT | | | | | SHEAR | | | | | LIVE-LOAD FACTORS($\gamma_{LL}$) | MOMENT | | | | | | |
| | | | | | | | | 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) | | DISTRIBUTION FACTORS (DF) | RATING FACTOR | SPAN | GIRDER LOCATION | DISTANCE FROM LEFT END OF SPAN (ft) | |
| DESIGN LOAD | | HL-93 (INVENTORY) | N/A | 1 | 1.01 | -- | 1.75 | 0.76 | 1.29 | B | I | 39.17 | 0.96 | 1.39 | B | I | 31.20 | 0.80 | 0.76 | 1.01 | B | I | 39.17 | -- |
| | | HL-93 (OPERATING) | N/A | | 1.67 | -- | 1.35 | 0.76 | 1.67 | B | I | 39.17 | 0.96 | 2.50 | B | I | 47.13 | N/A | -- | -- | -- | -- | -- | -- |
| | | HS-20 (INVENTORY) | 36.000 | 2 | 1.34 | 48.240 | 1.75 | 0.76 | 1.71 | B | I | 39.17 | 0.96 | 2.13 | B | I | 31.20 | 0.80 | 0.76 | 1.34 | B | I | 39.17 | -- |
| | | HS-20 (OPERATING) | 36.000 | | 2.22 | 79.920 | 1.35 | 0.76 | 2.22 | B | I | 39.17 | 0.96 | 3.33 | B | I | 23.23 | N/A | -- | -- | -- | -- | -- | -- |
| LEGAL LOAD | SINGLE VEHICLE (SV) | SNSH | 13.500 | | 3.09 | 41.715 | 1.40 | 0.76 | 4.92 | B | I | 39.17 | 0.96 | 7.68 | B | I | 23.23 | 0.80 | 0.76 | 3.09 | B | I | 39.17 | -- |
| | | SNGARBS2 | 20.000 | | 2.28 | 45.600 | 1.40 | 0.76 | 3.63 | B | I | 39.17 | 0.96 | 5.47 | B | I | 23.23 | 0.80 | 0.76 | 2.28 | B | I | 39.17 | -- |
| | | SNAGRIS2 | 22.000 | | 2.15 | 47.300 | 1.40 | 0.76 | 3.43 | B | I | 39.17 | 0.96 | 5.09 | B | I | 23.23 | 0.80 | 0.76 | 2.15 | B | I | 39.17 | -- |
| | | SNCOTTS3 | 27.250 | | 1.54 | 41.965 | 1.40 | 0.76 | 2.45 | B | I | 39.17 | 0.96 | 3.67 | B | I | 23.23 | 0.80 | 0.76 | 1.54 | B | I | 39.17 | -- |
| | | SNAGGRS4 | 34.925 | | 1.27 | 44.355 | 1.40 | 0.76 | 2.03 | B | I | 39.17 | 0.96 | 3.27 | B | I | 23.23 | 0.80 | 0.76 | 1.27 | B | I | 39.17 | -- |
| | | SNS5A | 35.550 | | 1.25 | 44.438 | 1.40 | 0.76 | 1.99 | B | I | 39.17 | 0.96 | 3.27 | B | I | 23.23 | 0.80 | 0.76 | 1.25 | B | I | 39.17 | -- |
| | | SNS6A | 39.950 | | 1.14 | 45.543 | 1.40 | 0.76 | 1.82 | B | I | 39.17 | 0.96 | 3.06 | B | I | 23.23 | 0.80 | 0.76 | 1.14 | B | I | 39.17 | -- |
| | | SNS7B | 42.000 | | 1.09 | 45.780 | 1.40 | 0.76 | 1.73 | B | I | 39.17 | 0.96 | 2.96 | B | I | 23.23 | 0.80 | 0.76 | 1.09 | B | I | 39.17 | -- |
| | TRUCK TRACTOR SEMI-TRAILER (TTST) | TNAGRIT3 | 33.000 | | 1.39 | 45.870 | 1.40 | 0.76 | 2.22 | B | I | 39.17 | 0.96 | 3.85 | B | I | 23.23 | 0.80 | 0.76 | 1.39 | B | I | 39.17 | -- |
| | | TNT4A | 33.075 | | 1.40 | 46.305 | 1.40 | 0.76 | 2.22 | B | I | 39.17 | 0.96 | 3.37 | B | I | 23.23 | 0.80 | 0.76 | 1.40 | B | I | 39.17 | -- |
| | | TNT6A | 41.600 | | 1.14 | 47.424 | 1.40 | 0.76 | 1.81 | B | I | 39.17 | 0.96 | 3.14 | B | I | 23.23 | 0.80 | 0.76 | 1.14 | B | I | 39.17 | -- |
| | | TNT7A | 42.000 | | 1.14 | 47.880 | 1.40 | 0.76 | 1.82 | B | I | 39.17 | 0.96 | 3.00 | B | I | 23.23 | 0.80 | 0.76 | 1.14 | B | I | 39.17 | -- |
| | | TNT7B | 42.000 | | 1.18 | 49.560 | 1.40 | 0.76 | 1.87 | B | I | 39.17 | 0.96 | 2.87 | B | I | 23.23 | 0.80 | 0.76 | 1.18 | B | I | 39.17 | -- |
| | | TNAGRIT4 | 43.000 | | 1.12 | 48.160 | 1.40 | 0.76 | 1.79 | B | I | 39.17 | 0.96 | 2.46 | B | I | 31.20 | 0.80 | 0.76 | 1.12 | B | I | 39.17 | -- |
| | | TNAGT5A | 45.000 | | 1.06 | 47.700 | 1.40 | 0.76 | 1.69 | B | I | 39.17 | 0.96 | 2.55 | B | I | 31.20 | 0.80 | 0.76 | 1.06 | B | I | 39.17 | -- |
| | | TNAGT5B | 45.000 | 3 | 1.05 | 47.250 | 1.40 | 0.76 | 1.67 | B | I | 39.17 | 0.96 | 2.23 | B | I | 31.20 | 0.80 | 0.76 | 1.05 | B | I | 39.17 | -- |
| EMERGENCY VEHICLE (EV) | | EV2 | 28.750 | | 1.61 | 46.288 | 1.30 | 0.76 | 2.76 | B | I | 39.17 | 0.96 | 4.01 | B | I | 23.23 | 0.80 | 0.76 | 1.61 | B | I | 39.17 | -- |
| | | EV3 | 43.000 | 4 | 1.06 | 45.580 | 1.30 | 0.76 | 1.81 | B | I | 39.17 | 0.96 | 2.72 | B | I | 47.13 | 0.80 | 0.76 | 1.06 | B | I | 39.17 | -- |

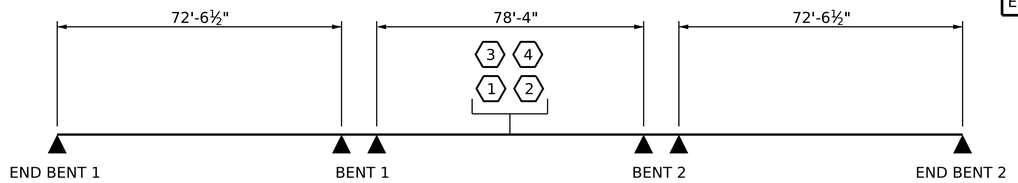
## TABLE OF SECTION RESISTANCES

| | | ℄ BRG. | 0.1L | 0.2L | 0.3L | 0.4L | 0.5L | 0.6L | 0.7L | 0.8L | 0.9L | ℄ BRG. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| INTERIOR GIRDER (I) SPAN B | Φ Vn (KIPS) | 503.3 | 557.9 | 432.6 | 211.3 | 148.9 | 150.8 | 148.9 | 211.3 | 432.6 | 557.9 | 503.3 |
| | Φ Mn (KIPS-FT) | --- | 3863.5 | 5422.3 | 5829.6 | 5903.0 | 5903.0 | 5903.0 | 5829.6 | 5422.3 | 3863.5 | --- |

## SECTION PROPERTIES

| | | SPAN B - INTERIOR | |
|---|---|---|---|
| | UNITS | NON-COMPOSITE | COMPOSITE |
| HEIGHT | IN | 45.0 | 53.75 |
| AREA | $IN^2$ | 559.50 | 1405.70 |
| Ixx | $IN^4$ | 125390 | 416096 |
| Ycg | IN | 20.27 | 37.79 |
| SELF WT. | PLF | 583 | 1668 |
| EFF. WIDTH | IN | --- | 119 |

SECTION PROPERTIES PROVIDED AT MIDSPAN




## LRFR SUMMARY

## LOAD FACTORS:

| DESIGN LOAD RATING FACTORS | LIMIT STATE | $\gamma_{DC}$ | $\gamma_{DW}$ |
|---|---|---|---|
| | STRENGTH I | 1.25 | 1.50 |
| | SERVICE III | 1.00 | 1.00 |

## NOTES:

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

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

## COMMENTS:

1. TRANSFORMING ALL PRESTRESSING TENDONS.
2. GIRDERS DESIGNED AS SIMPLE SPANS FOR FLEXURE.
3. FACTORED SHEAR AND MOMENT CAPACITIES PROVIDED FOR STRENGTH I LIMIT STATE. SECTION PROPERTIES PROVIDED FOR SERVICE III LIMIT STATE.
4. GIRDERS LOAD RATED AS SIMPLE SPANS.

## (#) CONTROLLING LOAD RATING

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

## GIRDER LOCATION

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

PROJECT NO. B-5527
SURRY COUNTY
STATION: 23+18.00 -LNB-

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A. LEBLANC
10/3/2023
DocuSigned by: Marc A. LeBlanc
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
# LRFR SUMMARY FOR PRESTRESSED CONCRETE GIRDERS (NON-INTERSTATE TRAFFIC)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-5 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

STD. NO. LRFR1

| | | | |
|---|---|---|---|
| ASSEMBLED BY : | LDL | DATE : | 9/23 |
| CHECKED BY : | MAL | DATE : | 9/23 |
| DRAWN BY : MAA 1/08 | REV. 11/12/08RR | | MAA/GM |
| CHECKED BY : GM/DI 2/08 | REV. 10/1/11 | | MAA/GM |
| | REV. 04/23 | | BNB/AAI |

10/2/2023
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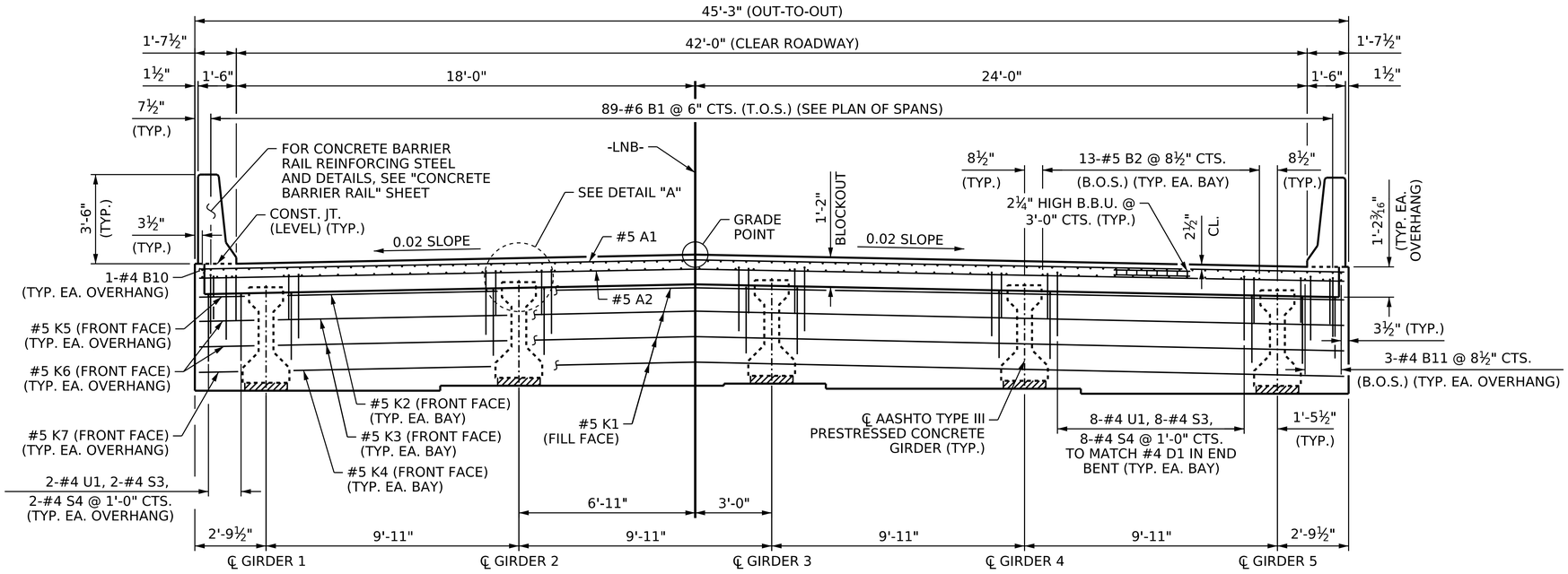
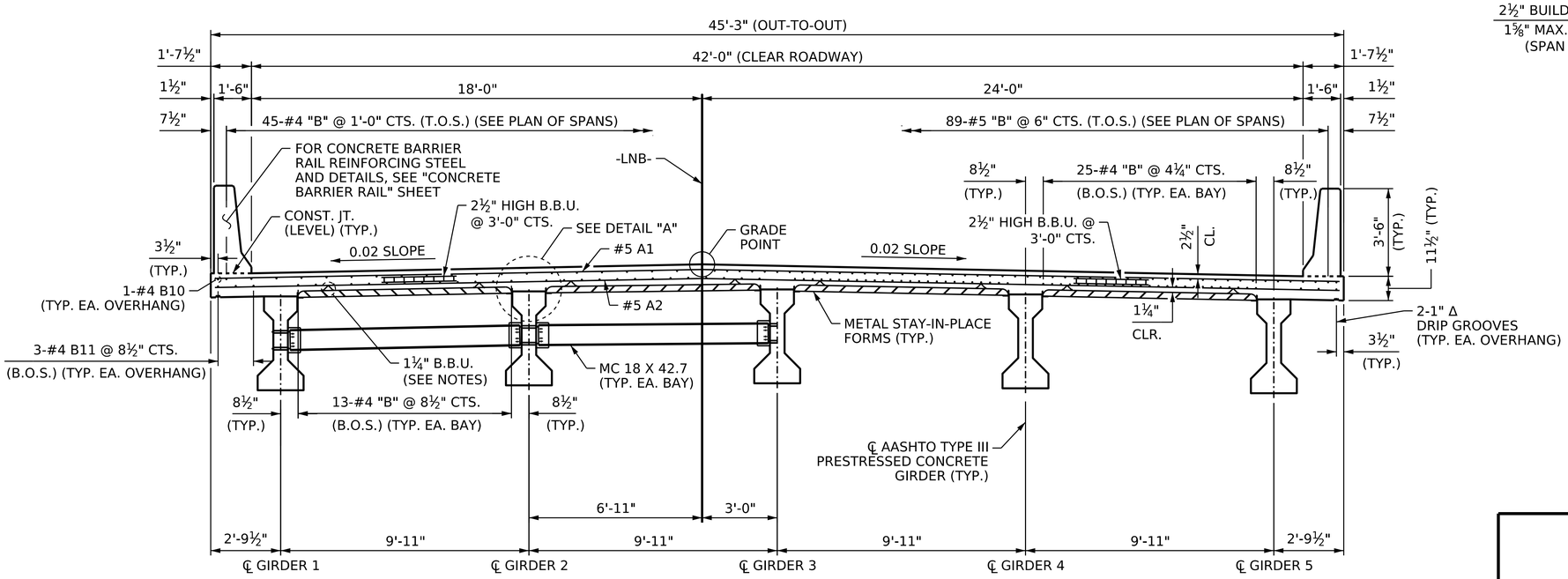
llewandowski




## TYPICAL SECTION AT INTEGRAL END BENTS




## HALF SECTION AT INTERMEDIATE DIAPHRAGM

## HALF SECTION AT LINK SLAB

## TYPICAL SECTION

### NOTES

PROVIDE 1¼" HIGH BEAM BOLSTER UPPERS AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF THE "A" BARS. WHEN USING REMOVEABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK @ 4'-0" CTS. WITH A HEIGHT TO PROVIDE 2½" CLEAR DISTANCE ABOVE FORMS.

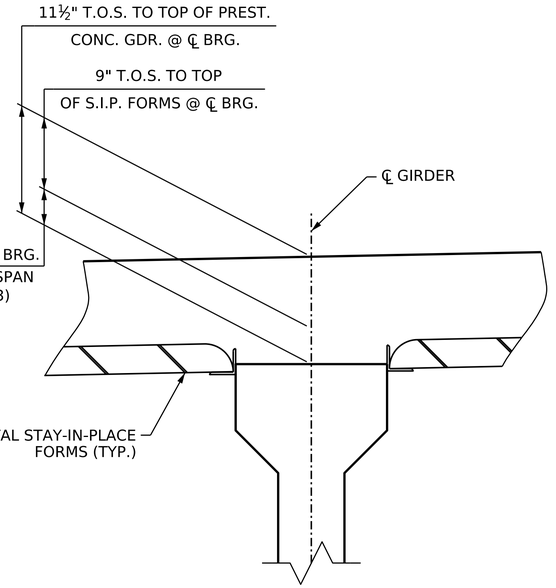
LONGITUDINAL REINFORCING STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

CONCRETE BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL DECK SLAB CONCRETE IN THAT UNIT HAS BEEN CAST AND HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

T.O.S. = TOP OF SLAB

B.O.S. = BOTTOM OF SLAB




## DETAIL "A"

* BASED ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATIONS

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+18.00 -LNB-

SHEET 1 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A LEBLANC

10/3/2023

DocuSigned by: Marc A. LeBlanc

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DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

**TYPICAL SECTION**

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-6 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

DRAWN BY : LDL DATE : 12/22
CHECKED BY : MAL DATE : 12/22
DESIGN ENGINEER OF RECORD: MAL DATE : 6/23

10/27/2023
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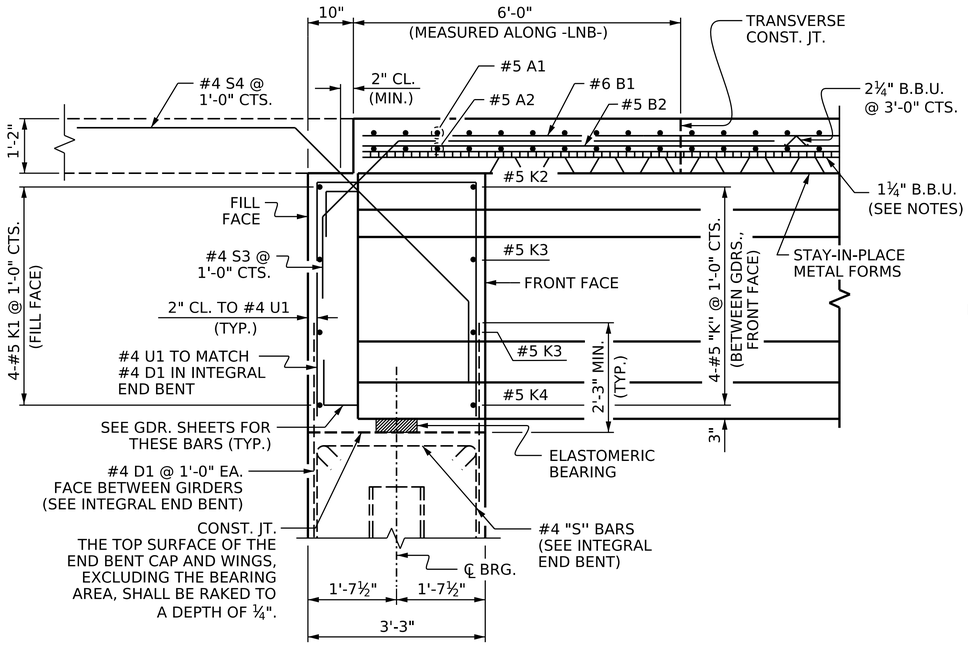
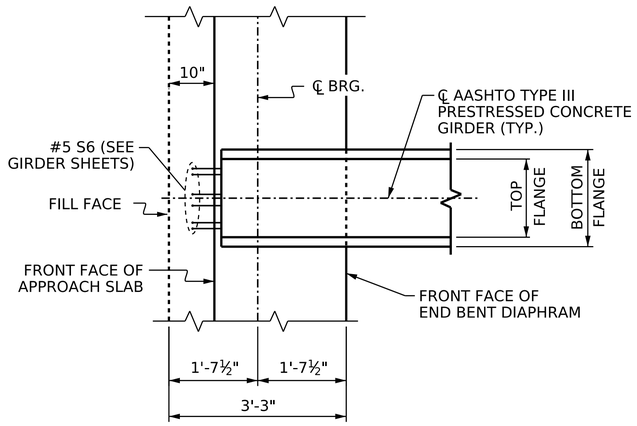
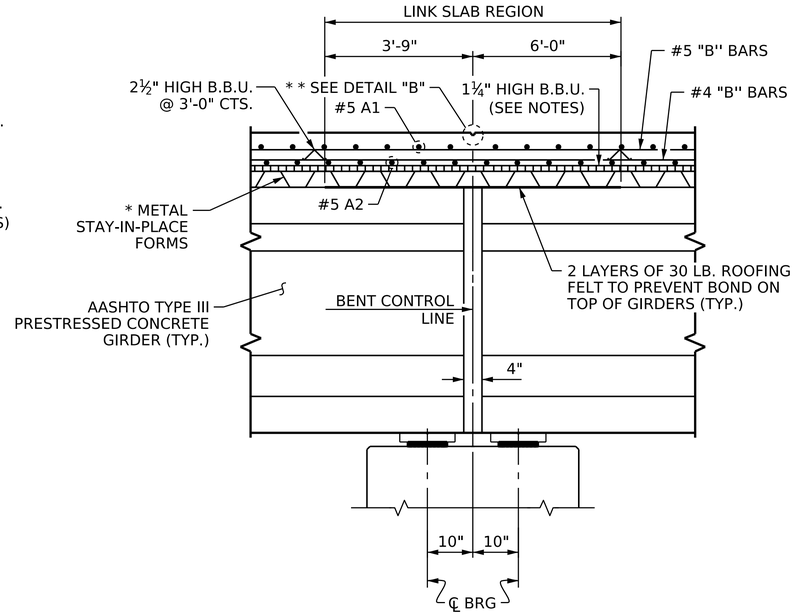
lewandowski




## SECTION THROUGH INTEGRAL END BENT




## PLAN OF GIRDER AT INTEGRAL END BENT

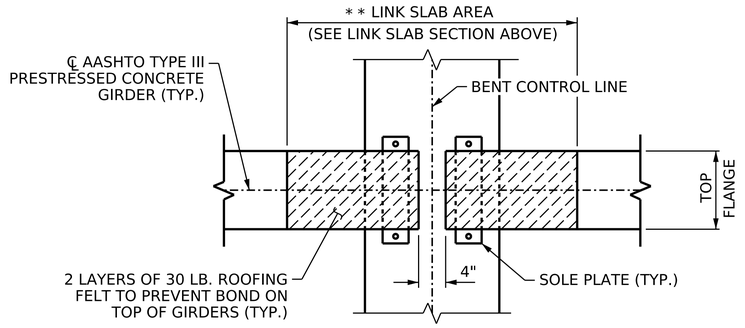



## SECTION AT BENT LINK SLAB

SECTION AT BENT 1 SHOWN. SECTION AT BENT 2 SIMILAR BY ROTATION.

* METAL STAY-IN-PLACE FORMS SHALL NOT BE WELDED TO THE GIRDER FLANGES IN THE REGION OF THE LINK SLAB.

* * A 1½" DEEP,⅜" WIDE CONTRACTION JOINT AT BENT CONTROL LINE SHALL BE SAWN WITHIN 24 HOURS OF POURING THE DECK. THE JOINT SHALL BE FILLED WITH JOINT SEALER MATERIAL. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.

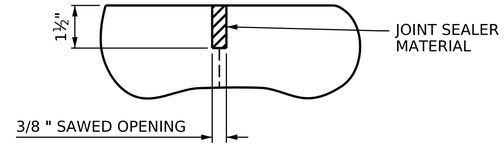



## PLAN OF LINK SLAB

* * THE TOP OF THE GIRDER IN THE REGION OF THE LINK SLAB SHALL BE SMOOTH (NOT RAKED) AND FREE OF STIRRUPS, ANCHORS STUDS, DECK FORMWORK ATTACHMENTS, AND OVERHANG FALSEWORK/FORMWORK ATTACHMENTS.

NOTE

FOR NOTES SEE SHEET 1 OF 2.




## DETAIL "B"

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+18.00 -LNB-

SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A. LEBLANC

10/3/2023

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# TYPICAL SECTION DETAILS

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-7 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

| | | | |
|---|---|---|---|
| DRAWN BY : | LDL | DATE : | 12/22 |
| CHECKED BY : | MAL | DATE : | 12/22 |
| DESIGN ENGINEER OF RECORD: | MAL | DATE : | 6/23 |

10/2/2023
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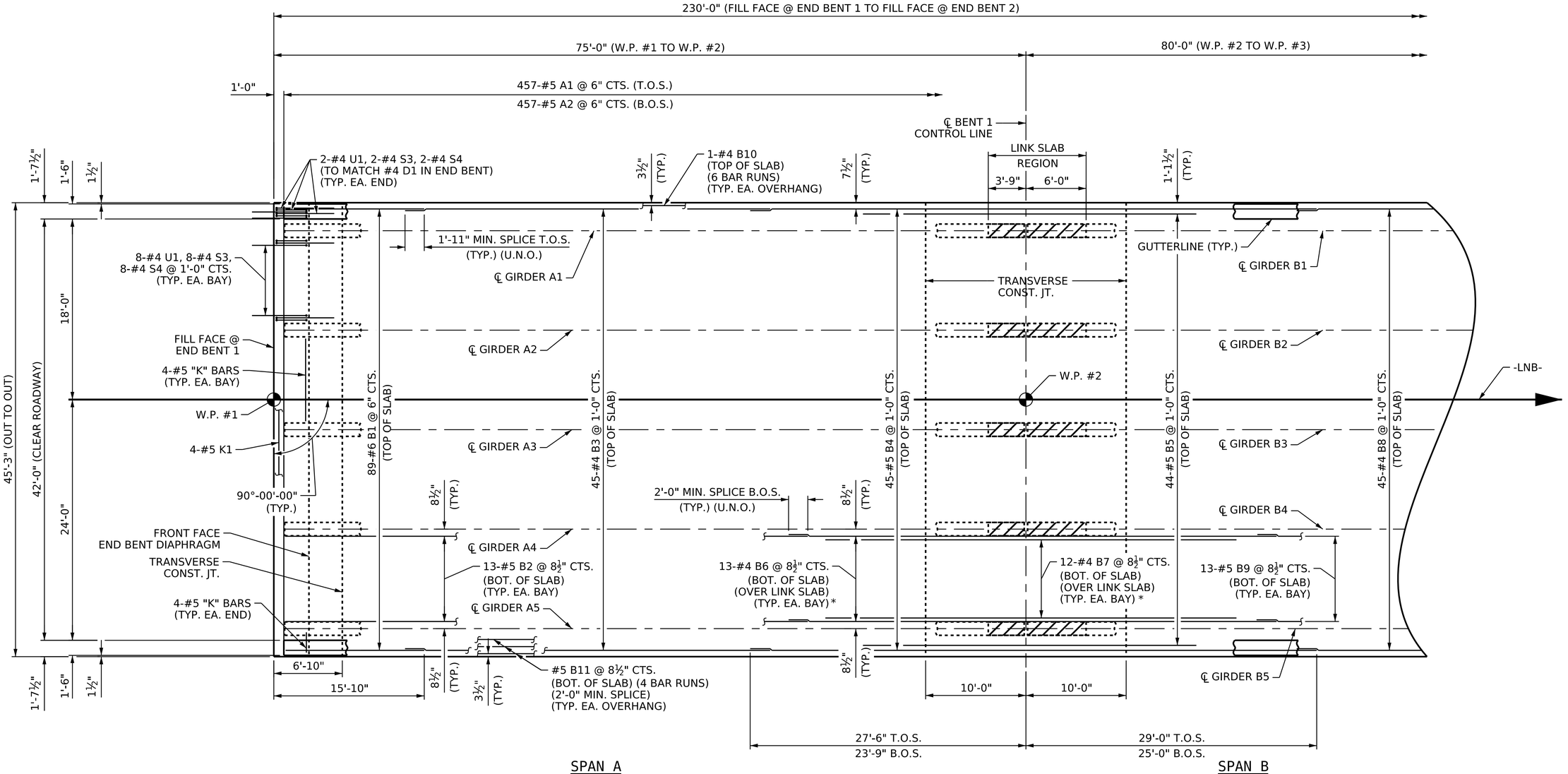



## PLAN OF SPAN A AND PART PLAN OF SPAN B

## NOTES

FOR SPLICE LENGTHS NOT SHOWN, REFER TO MINIMUM SPLICE LENGTH TABLE ON "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.

FOR END BENT DIAPHRAGM BARS, SEE "TYPICAL SECTION DETAILS" SHEET.

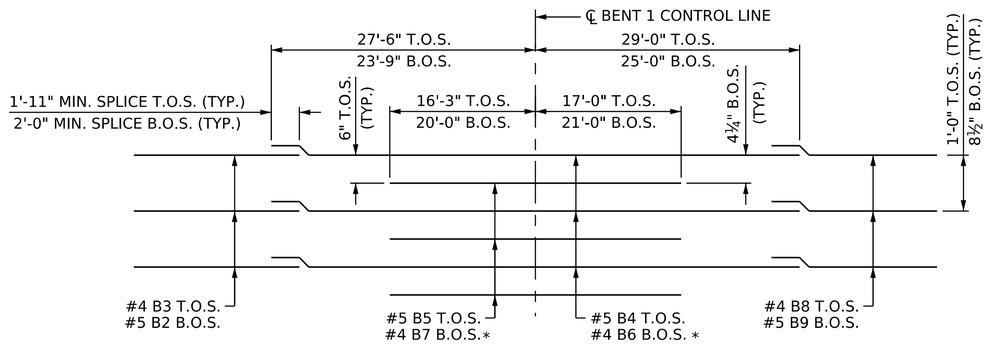
STEEL INTERMEDIATE DIAPHRAGMS NOT SHOWN FOR CLARITY. FOR LOCATIONS, SEE "FRAMING PLAN" SHEET.

FOR POURING SEQUENCE, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.

FOR BARRIER RAIL REINFORCING STEEL, SEE "CONCRETE BARRIER RAIL" SHEET.

T.O.S. = TOP OF SLAB

B.O.S. = BOTTOM OF SLAB




## TOP AND BOTTOM OF SLAB REINFORCING STEEL LAYOUT

* (2 BAR RUNS) (1'-11" MIN. SPLICE) (SPLICE NOT SHOWN)

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+18.00 -LNB-

SHEET 1 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A. LEBLANC

10/3/2023

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**PLAN OF SPAN A AND PART PLAN OF SPAN B**

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-8 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

DRAWN BY : LDL DATE : 12/22
CHECKED BY : MAL DATE : 12/22
DESIGN ENGINEER OF RECORD: MAL DATE : 6/23

10/2/2023
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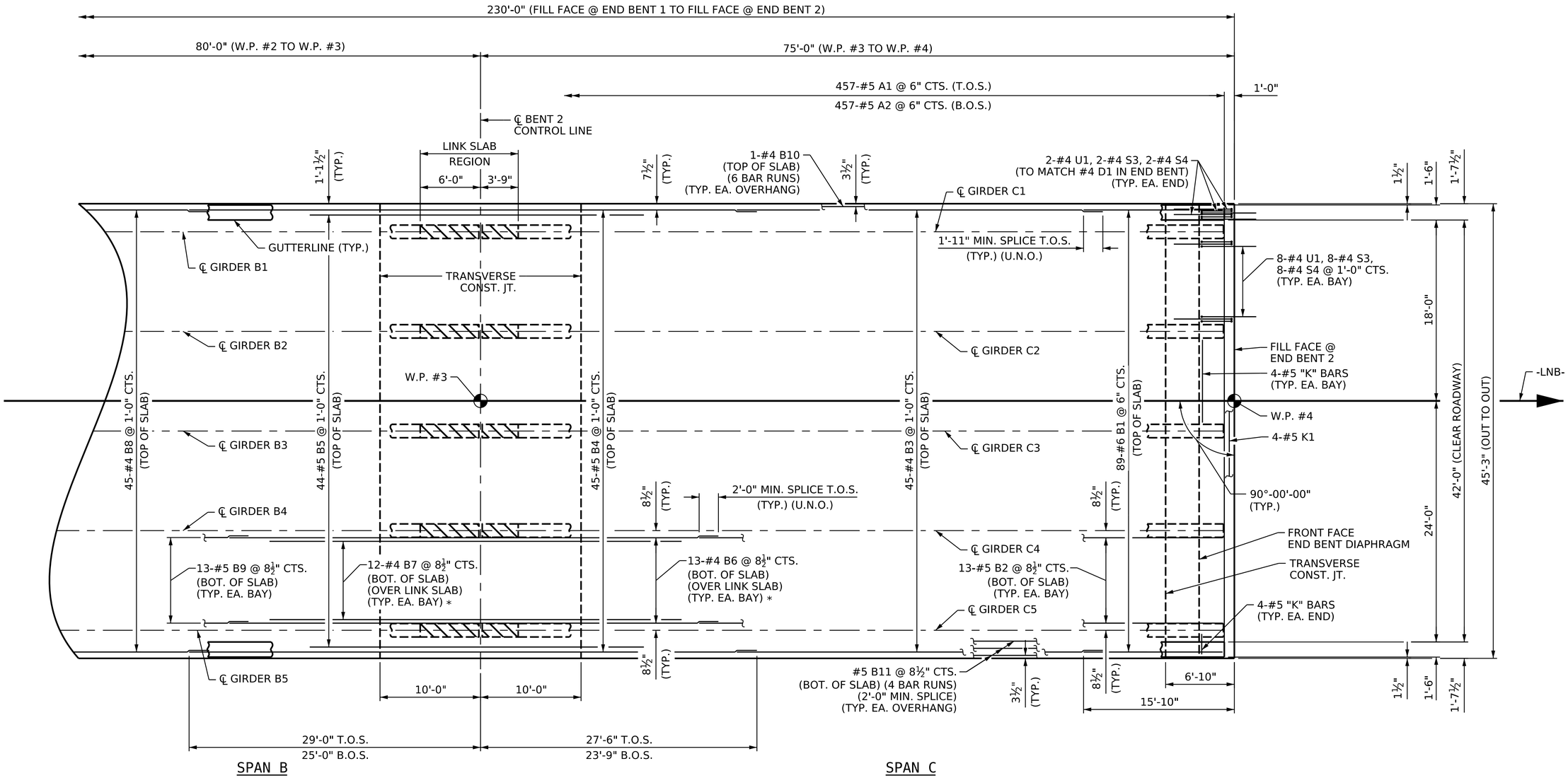



## PART PLAN OF SPAN B AND PLAN OF SPAN C

* (2 BAR RUNS) (1'-11" MIN. SPLICE) (SPLICE NOT SHOWN)

### NOTES

FOR SPLICE LENGTHS NOT SHOWN, REFER TO MINIMUM SPLICE LENGTH TABLE ON "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.

FOR END BENT DIAPHRAGM BARS, SEE "TYPICAL SECTION DETAILS" SHEET.

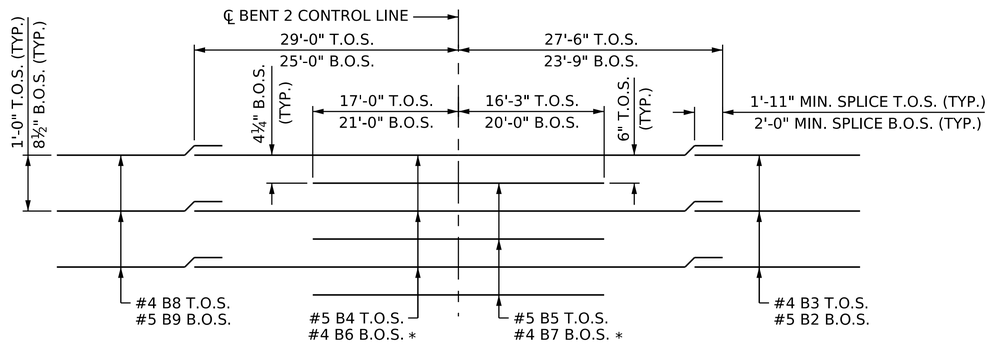
STEEL INTERMEDIATE DIAPHRAGMS NOT SHOWN FOR CLARITY. FOR LOCATIONS, SEE "FRAMING PLAN" SHEET.

FOR POURING SEQUENCE, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.

FOR BARRIER RAIL REINFORCING STEEL, SEE "CONCRETE BARRIER RAIL" SHEET.

T.O.S. = TOP OF SLAB

B.O.S. = BOTTOM OF SLAB




## TOP AND BOTTOM OF SLAB REINFORCING STEEL LAYOUT

PROJECT NO. B-5527
SURRY COUNTY
STATION: 23+18.00 -LNB-
SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A. LEBLANC
10/3/2023
DocuSigned by: Marc A. LeBlanc
C1A9E09A82F4412...

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**PART PLAN OF SPAN B AND PLAN OF SPAN C**

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-9 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

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DESIGN ENGINEER OF RECORD: MAL DATE : 6/23

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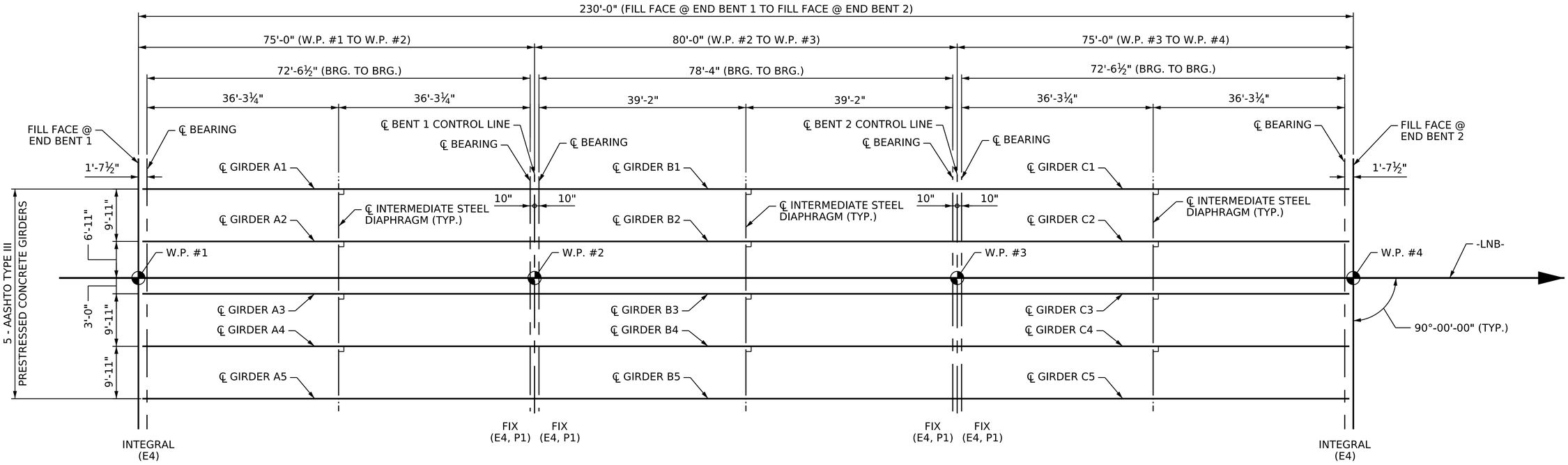
ilewandowski

## NOTES:

FOR STEEL DIAPHRAGMS DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE III PRESTRESSED CONCRETE GIRDERS" SHEET.

FOR END BENT DIAPHRAGM DETAILS, SEE TYPICAL SECTION AND PLAN OF SPAN SHEETS.




# FRAMING PLAN

CONCRETE END BENT DIAPHRAGMS
NOT SHOWN FOR CLARITY

PROJECT NO. B-5527
SURRY COUNTY
STATION: 23+18.00 -LNB-

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A. LEBLANC
10/3/2023
DocuSigned by: Marc A. LeBlanc

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

A. MORTON THOMAS AND ASSOCIATES, INC.
900 RIDGEFIELD DRIVE, SUITE 325 • RALEIGH, NC 27609
(919) 855-9985 • NC LICENSE NO. F-1049
WWW.AMTENGINEERING.COM

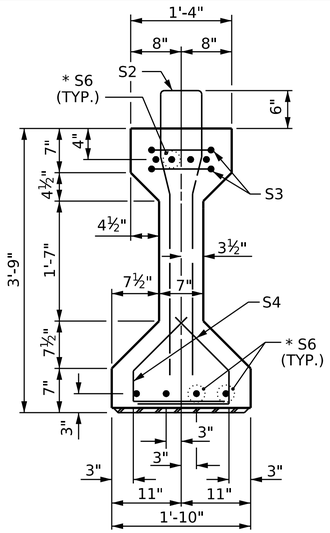
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

**FRAMING PLAN**

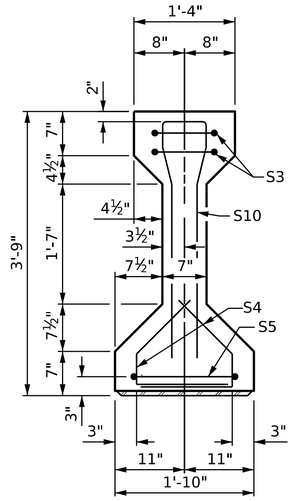
| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-10 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

DRAWN BY : LDL DATE : 12/22
CHECKED BY : MAL DATE : 12/22
DESIGN ENGINEER OF RECORD: MAL DATE : 6/23

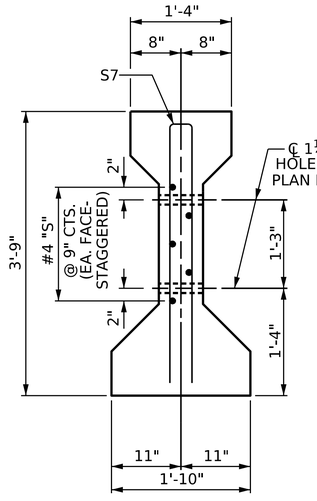
10/2/2023
X:\Raleigh\114-783.005D - B-5527 CE Update\05-CAD\B5527\Structures\DGN's\Final\401_019_B-5527_SMU_FP_S1-10.dgn
llewandowski




## SECTION A-A




## SECTION B-B

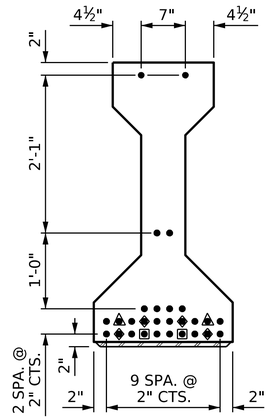



## SECTION C-C

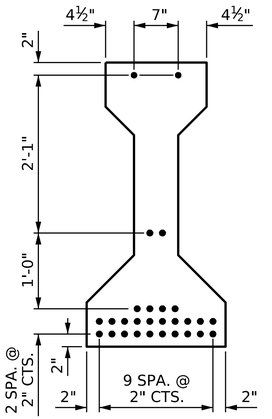
(S1 BARS NOT SHOWN)

### DEBONDING LEGEND

- FULLY BONDED STRANDS
- STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 14'-0" FROM END OF GIRDER

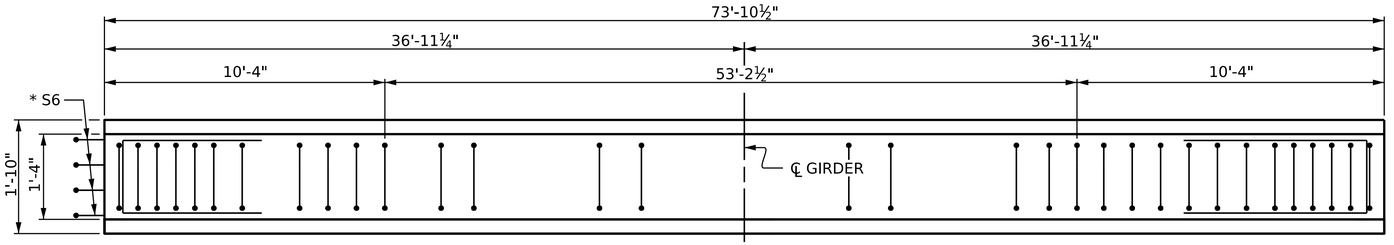



AT END OF GIRDER

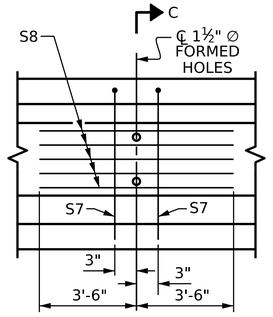



AT ℄ OF GIRDER

## 0.6" ⌀ LOW RELAXATION STRAND LAYOUT

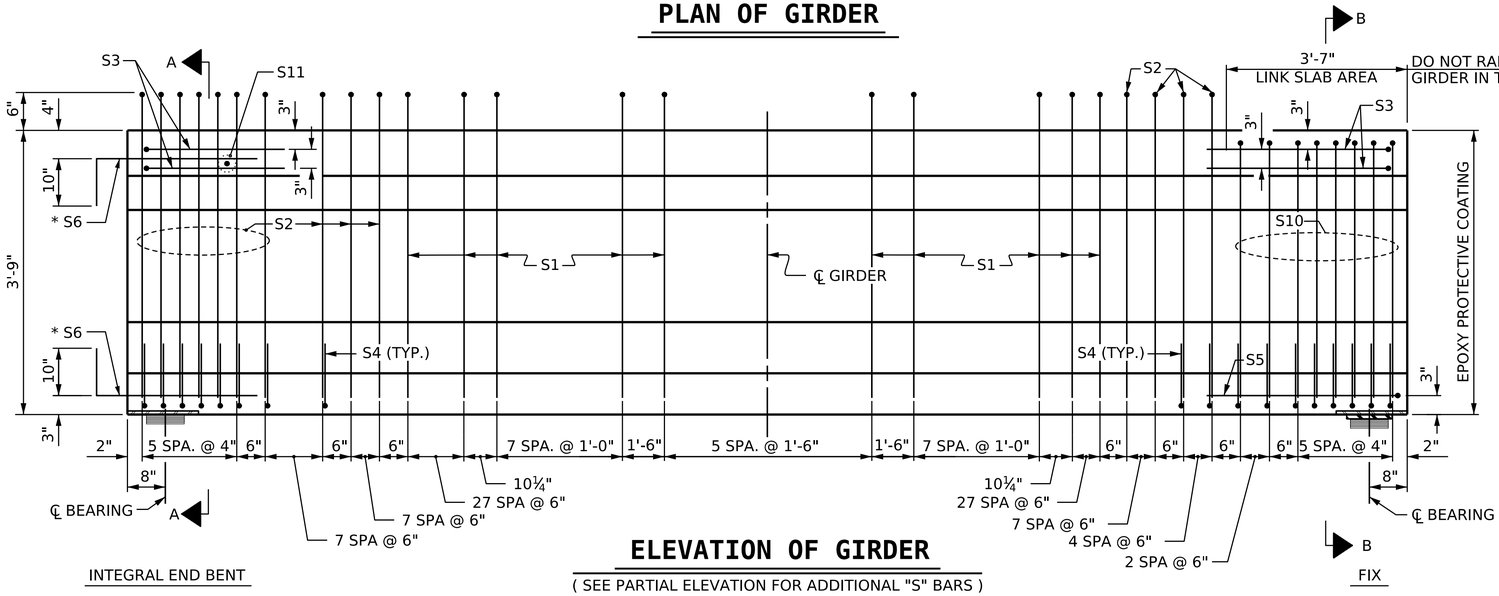



## PLAN OF GIRDER




## PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1 THRU 5




## ELEVATION OF GIRDER

( SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS )

### 0.6"⌀ L.R. GRADE 270 STRANDS

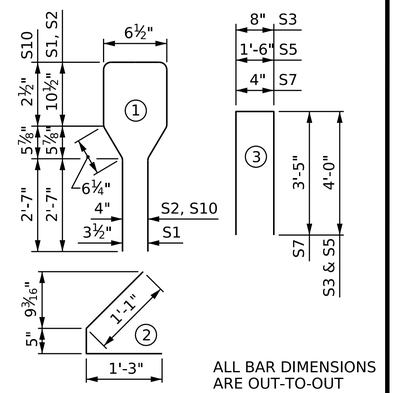
| AREA (SQUARE INCHES) | ULTIMATE STRENGTH (LBS. PER STRAND) | APPLIED PRESTRESS (LBS. PER STRAND) |
|---|---|---|
| 0.217 | 58,600 | 43,950 |

### REINFORCING STEEL FOR ONE GIRDER

| BAR | NUMBER | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| S1 | 78 | #4 | 1 | 8'-6" | 443 |
| S2 | 35 | #6 | 1 | 8'-6" | 447 |
| S3 | 4 | #4 | 3 | 8'-8" | 23 |
| S4 | 56 | #4 | 2 | 2'-9" | 103 |
| S5 | 1 | #4 | 3 | 9'-6" | 6 |
| * S6 | 8 | #5 | STR | 3'-8" | 31 |
| S7 | 2 | #5 | 3 | 7'-2" | 15 |
| S8 | 5 | #4 | STR | 7'-0" | 23 |
| S10 | 9 | #6 | 1 | 7'-2" | 97 |
| S11 | 1 | #3 | STR | 1'-0" | 1 |

* NOTE: S6 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

### BAR TYPES




ALL BAR DIMENSIONS ARE OUT-TO-OUT

### QUANTITIES FOR ONE GIRDER

| REINFORCING STEEL | 7500 PSI CONCRETE | 0.6" ∅ L. R. STRANDS |
|---|---|---|
| LB. | C.Y. | No. |
| 1189 | 10.6 | 28 |

### GIRDERS REQUIRED

| NUMBER | LENGTH | TOTAL LENGTH |
|---|---|---|
| 5 | 73'-10½" | 369'-4½" |

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+18.00 -LNB-

SHEET 1 OF 4

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARCA LEBLANC

10/3/2023

DocuSigned by: Marc A. LeBlanc

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

# AASHTO TYPE III PRESTRESSED CONCRETE GIRDER - LINK SLAB SPAN A

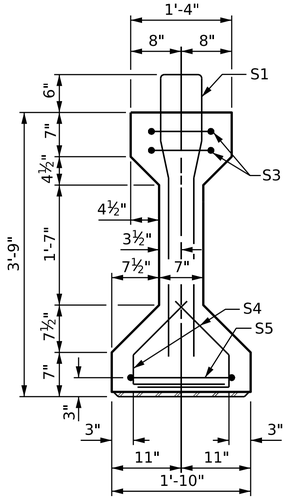
A. MORTON THOMAS AND ASSOCIATES, INC.
900 RIDGEFIELD DRIVE, SUITE 325 • RALEIGH, NC 27609
(919) 855-9989 • NC LICENSE NO. F-1049
WWW.AMTENGINEERING.COM

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-11 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

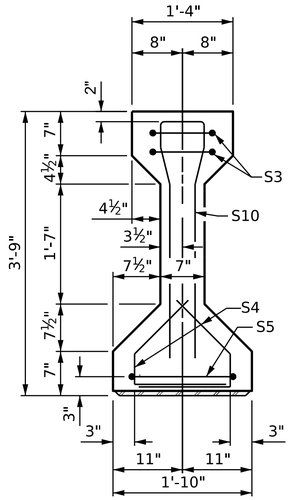
| | | | |
|---|---|---|---|
| ASSEMBLED BY : | LDL | DATE : | 8/22 |
| CHECKED BY : | MAL | DATE : | 8/22 |
| DRAWN BY : | BNB | 09/21 | |
| CHECKED BY : | AAI | 09/21 | |

10/27/2023
X:\Raleigh\114-783.005D - B-5527 CE Update\05-CAD\B5527\Structures\DGN's\Final\401_021_B-5527_SMU_G1_S1-11.dgn
llewandowski

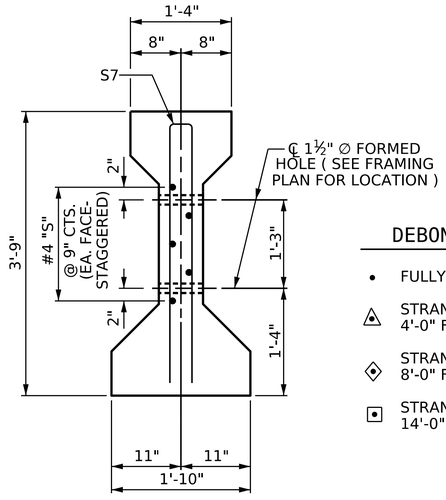
STD. NO. PCG5 (SHT. 1)




## SECTION A-A




## SECTION B-B

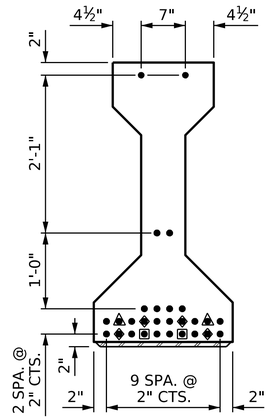



## SECTION C-C

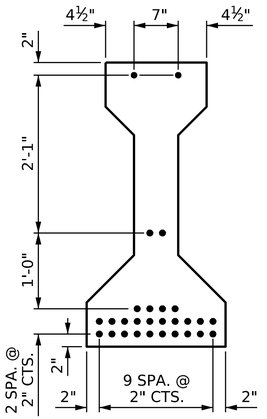
(S1 BARS NOT SHOWN)

### DEBONDING LEGEND

- FULLY BONDED STRANDS
- STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 14'-0" FROM END OF GIRDER

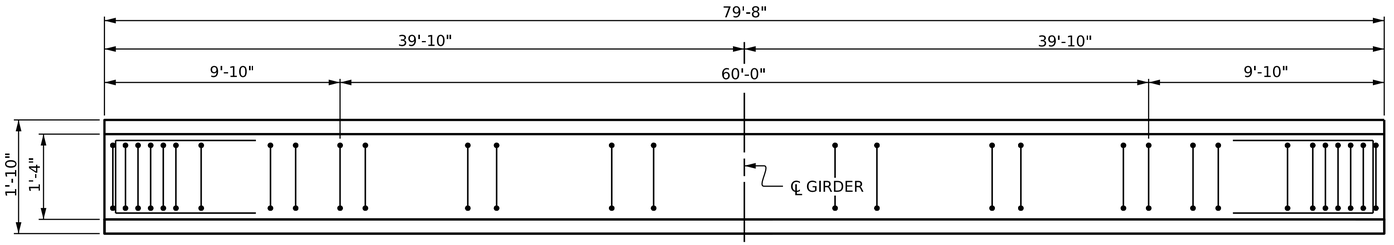



AT END OF GIRDER

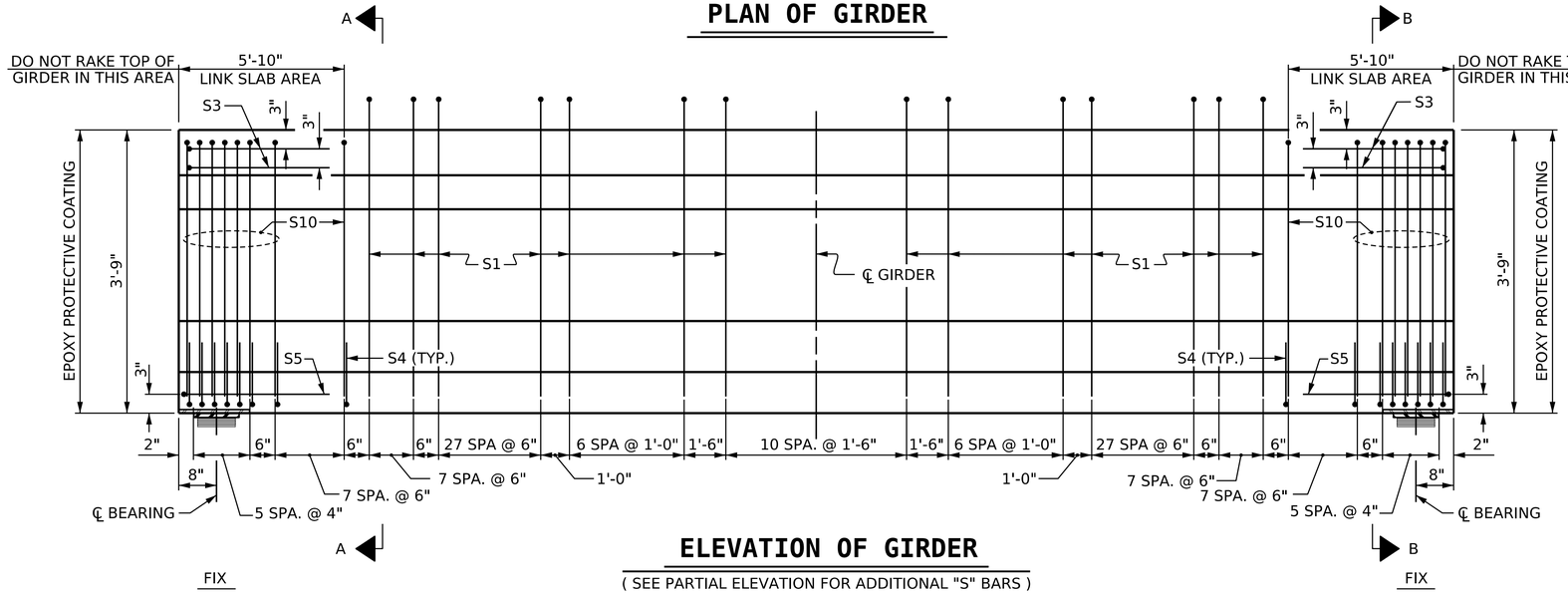



AT ℄ OF GIRDER

## 0.6" ⌀ LOW RELAXATION STRAND LAYOUT

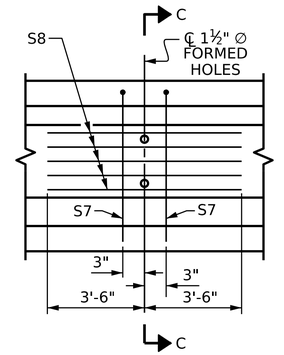



## PLAN OF GIRDER




## ELEVATION OF GIRDER

( SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS )




## PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1 THRU 5

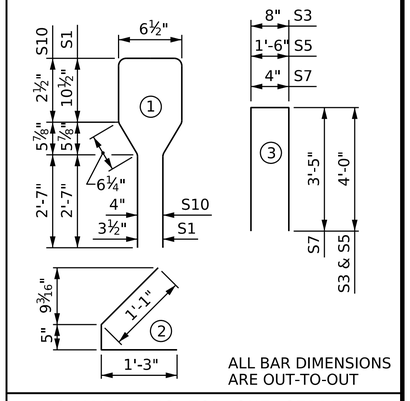
### 0.6"⌀ L.R. GRADE 270 STRANDS

| AREA (SQUARE INCHES) | ULTIMATE STRENGTH (LBS. PER STRAND) | APPLIED PRESTRESS (LBS. PER STRAND) |
|---|---|---|
| 0.217 | 58,600 | 43,950 |

### REINFORCING STEEL FOR ONE GIRDER

| BAR | NUMBER | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| S1 | 97 | #4 | 1 | 8'-6" | 551 |
| S3 | 4 | #4 | 3 | 8'-8" | 23 |
| S4 | 56 | #4 | 2 | 2'-9" | 103 |
| S5 | 2 | #4 | 3 | 9'-6" | 13 |
| S7 | 2 | #5 | 3 | 7'-2" | 15 |
| S8 | 5 | #4 | STR | 7'-0" | 23 |
| S10 | 28 | #6 | 1 | 7'-2" | 301 |

### BAR TYPES




ALL BAR DIMENSIONS ARE OUT-TO-OUT

### QUANTITIES FOR ONE GIRDER

| REINFORCING STEEL | 7500 PSI CONCRETE | 0.6" ∅ L. R. STRANDS |
|---|---|---|
| LB. | C.Y. | No. |
| 1029 | 11.5 | 28 |

| GIRDERS REQUIRED | | |
|---|---|---|
| NUMBER | LENGTH | TOTAL LENGTH |
| 5 | 79'-8" | 398'-4" |

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+18.00 -LNB-

SHEET 2 OF 4

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARCA LEBLANC

10/3/2023

DocuSigned by: Marc A. LeBlanc

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

A. MORTON THOMAS AND ASSOCIATES, INC.
900 RIDGEFIELD DRIVE, SUITE 325 • RALEIGH, NC 27609
(919) 855-9989 • NC LICENSE NO. F-1049
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

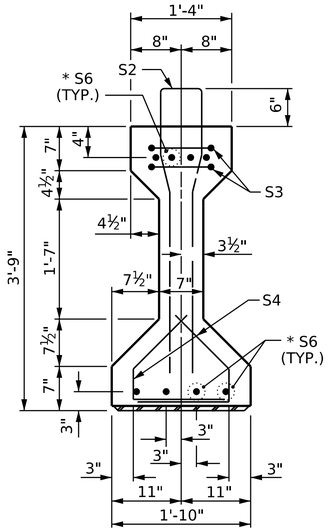
# AASHTO TYPE III PRESTRESSED CONCRETE GIRDER - LINK SLAB SPAN B

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-12 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

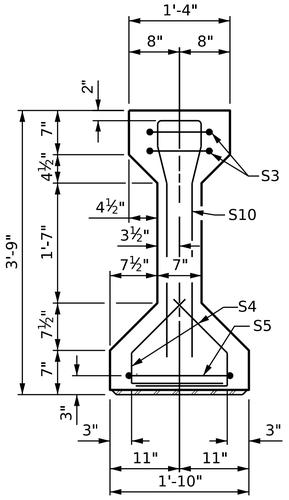
| | | | |
|---|---|---|---|
| ASSEMBLED BY : | LDL | DATE : | 8/22 |
| CHECKED BY : | MAL | DATE : | 8/22 |
| DRAWN BY : | BNB | 09/21 | |
| CHECKED BY : | AAI | 09/21 | |

10/27/2023
X:\Raleigh\114-783.005D - B-5527 CE Update\05-CAD\B5527\Structures\DGN's\Final\401_023_B-5527_SMU_G2_S1-12.dgn
llewandowski

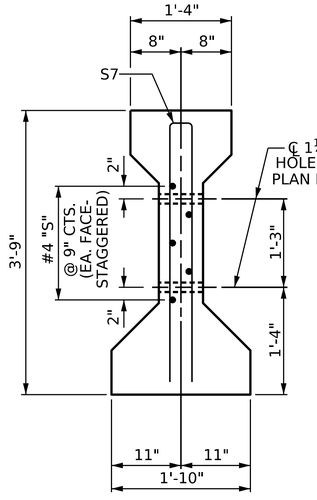
STD. NO. PCG5 (SHT. 1)




## SECTION A-A




## SECTION B-B

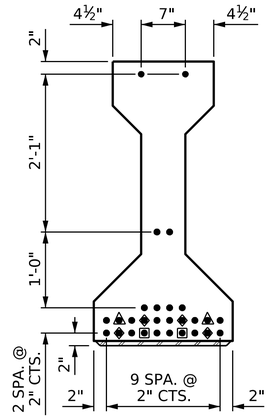



## SECTION C-C

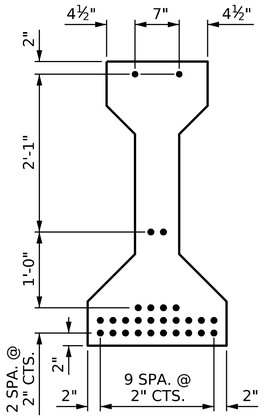
(S1 BARS NOT SHOWN)

### DEBONDING LEGEND

- FULLY BONDED STRANDS
- STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 14'-0" FROM END OF GIRDER

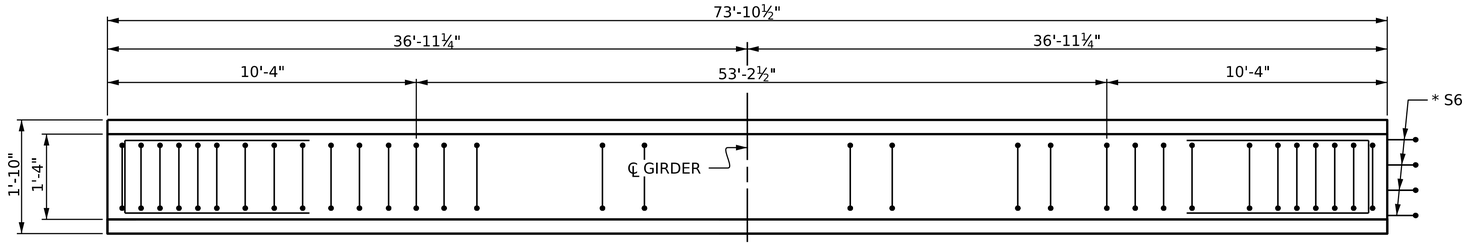



AT END OF GIRDER

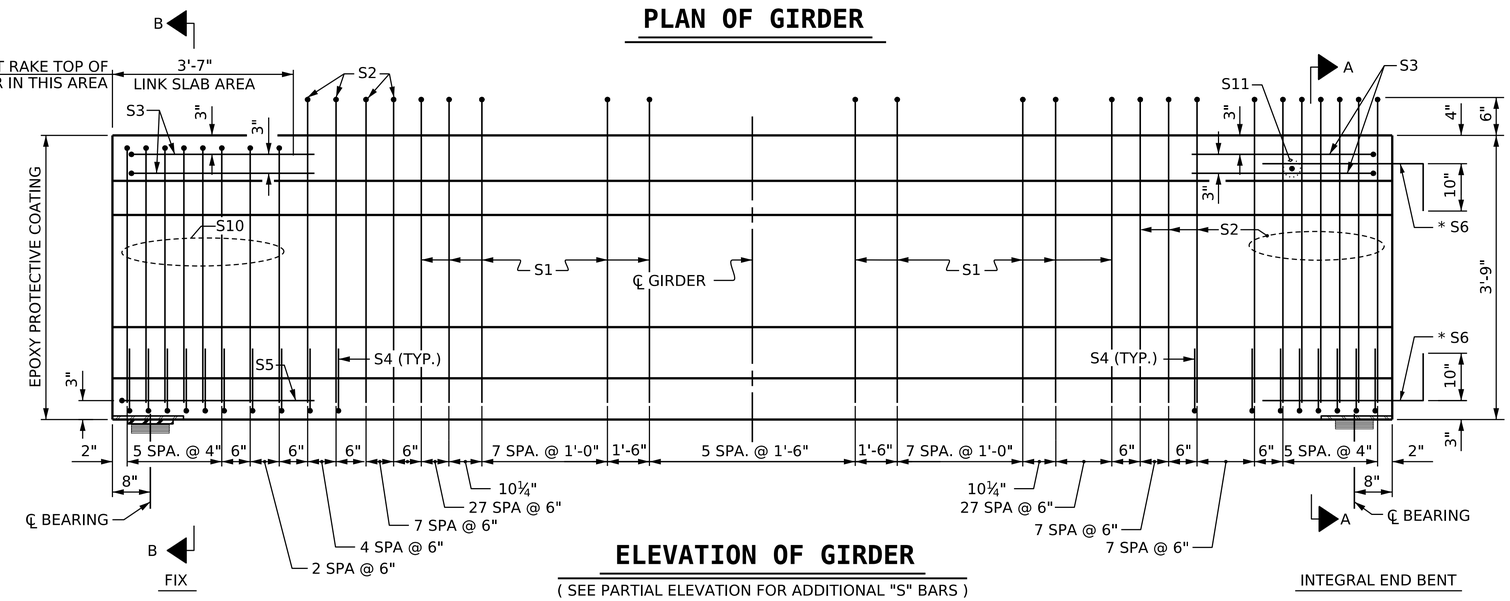



AT ℄ OF GIRDER

## 0.6" ⌀ LOW RELAXATION STRAND LAYOUT

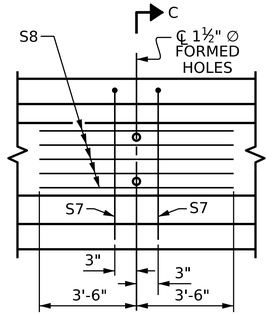



## PLAN OF GIRDER




## ELEVATION OF GIRDER

( SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS )




## PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1 THRU 5

### 0.6"∅ L.R. GRADE 270 STRANDS

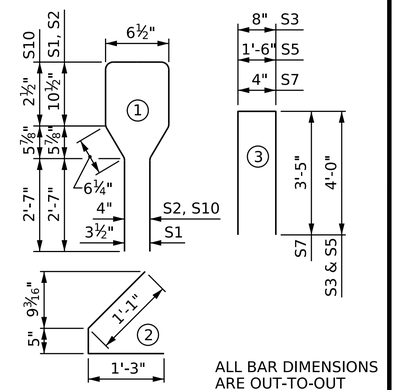
| AREA (SQUARE INCHES) | ULTIMATE STRENGTH (LBS. PER STRAND) | APPLIED PRESTRESS (LBS. PER STRAND) |
|---|---|---|
| 0.217 | 58,600 | 43,950 |

### REINFORCING STEEL FOR ONE GIRDER

| BAR | NUMBER | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| S1 | 78 | #4 | 1 | 8'-6" | 443 |
| S2 | 35 | #6 | 1 | 8'-6" | 447 |
| S3 | 4 | #4 | 3 | 8'-8" | 23 |
| S4 | 56 | #4 | 2 | 2'-9" | 103 |
| S5 | 1 | #4 | 3 | 9'-6" | 6 |
| * S6 | 8 | #5 | STR | 3'-8" | 31 |
| S7 | 2 | #5 | 3 | 7'-2" | 15 |
| S8 | 5 | #4 | STR | 7'-0" | 23 |
| S10 | 9 | #6 | 1 | 7'-2" | 97 |
| S11 | 1 | #3 | STR | 1'-0" | 1 |

* NOTE: S6 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

### BAR TYPES




ALL BAR DIMENSIONS ARE OUT-TO-OUT

### QUANTITIES FOR ONE GIRDER

| REINFORCING STEEL | 7500 PSI CONCRETE | 0.6" ∅ L. R. STRANDS |
|---|---|---|
| LB. | C.Y. | No. |
| 1189 | 10.6 | 28 |

### GIRDERS REQUIRED

| NUMBER | LENGTH | TOTAL LENGTH |
|---|---|---|
| 5 | 73'-10½" | 369'-4½" |

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+18.00 -LNB-

SHEET 3 OF 4

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A LEBLANC

10/3/2023

DocuSigned by: Marc A. LeBlanc

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

A. MORTON THOMAS AND ASSOCIATES, INC.
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WWW.AMTENGINEERING.COM

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

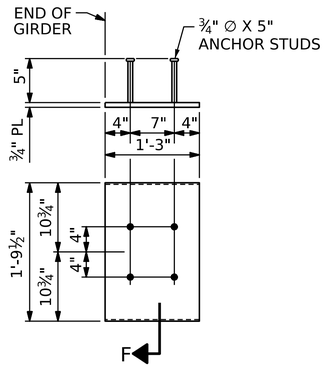
# AASHTO TYPE III PRESTRESSED CONCRETE GIRDER - LINK SLAB SPAN C

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-13 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

| | | | |
|---|---|---|---|
| ASSEMBLED BY : | LDL | DATE : | 8/22 |
| CHECKED BY : | MAL | DATE : | 8/22 |
| DRAWN BY : | BNB | 09/21 | |
| CHECKED BY : | AAI | 09/21 | |

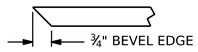
10/27/2023
X:\Raleigh\114-783.005D - B-5527 CE Update\05-CAD\B5527\Structures\DGN's\Final\401_025_B-5527_SMU_G3_S1-13.dgn
lewandowski

STD. NO. PCG5 (SHT. 1)




## EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE III GIRDER

(2 REQ'D PER GIRDER)




## SECTION "F"

(SEE NOTES)

## 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 SHALL BE GRADE 60.

APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES INDICATED IN ELEVATION VIEW.

EMBEDDED PLATE "B-1" SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

AT ENDS OF GIRDERS TO BE EMBEDDED IN CONCRETE DIAPHRAMS OR END WALLS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER ENDS. OTHERWISE, PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6,000 PSI.

DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4" AND LINK SLAB AREAS AS INDICATED, SHALL BE RAKED TO A DEPTH OF ¼".

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+18.00 -LNB-

SHEET 4 OF 4

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A. LEBLANC

10/3/2023

DocuSigned by: Marc A. LeBlanc

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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900 RIDGEFIELD DRIVE, SUITE 325 • RALEIGH, NC 27609
(919) 855-9989 • NC LICENSE NO. F-1049
WWW.AMTENGINEERING.COM

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

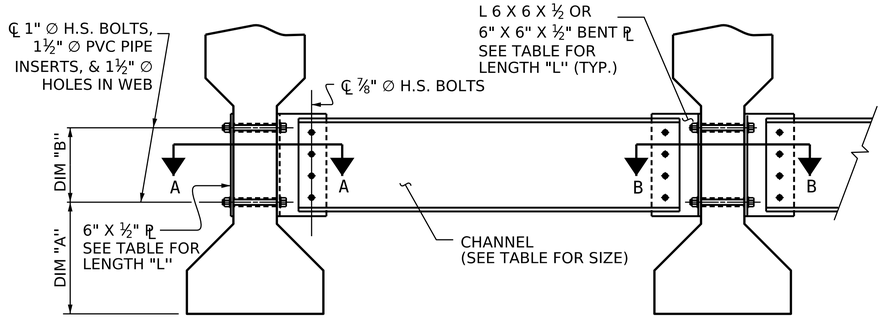
# PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-14 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

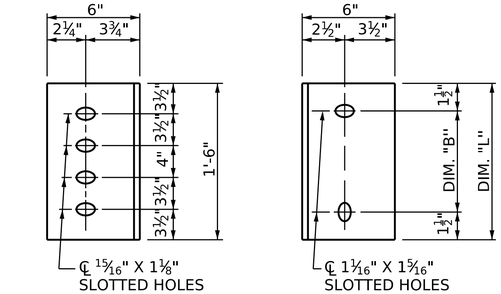
STD. NO. PCG9

| | | | |
|---|---|---|---|
| ASSEMBLED BY : | LDL | DATE : | 8/22 |
| CHECKED BY : | MAL | DATE : | 8/22 |
| DRAWN BY : ELR | 11/91 | REV. 1/15 | MAA/TMG |
| CHECKED BY : GRP | 11/91 | REV. 2/15 | MAA/TMG |
| | | REV. 12/17 | MAA/THC |

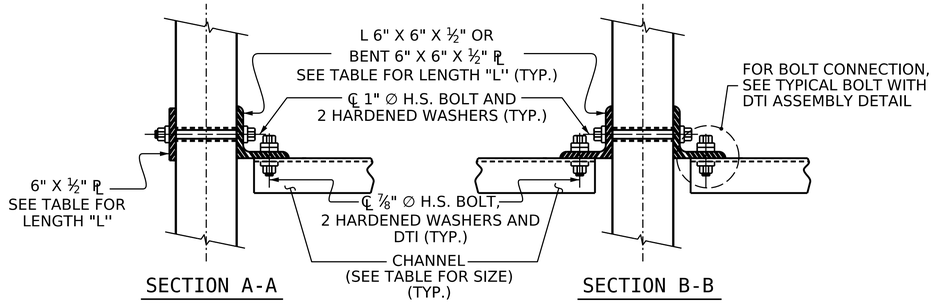
10/2/2023
X:\Raleigh\114-783.005D - B-5527 CE Update\05-CAD\B5527\Structures\DGN's\Final\401_027_B-5527_SMU_G4_S1-14.dgn
llewandowski




## PART SECTION AT INTERMEDIATE DIAPHRAGM




## CONNECTOR PLATE DETAILS




## CONNECTION DETAILS

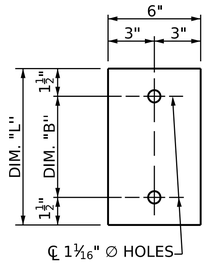
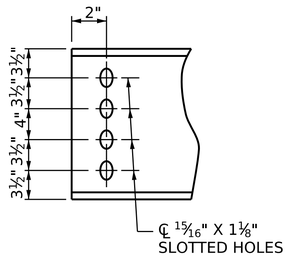
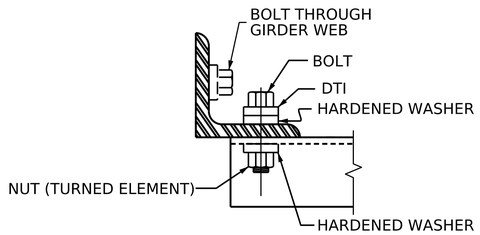



PLATE DETAILS




CHANNEL END




## BOLT WITH DTI ASSEMBLY DETAIL

## STRUCTURAL STEEL NOTES

ALL INTERMEDIATE DIAPHRAGM STEEL AND CONNECTOR PLATES SHALL BE AASHTO M270 GRADE 50 OR APPROVED EQUAL.

TENSION ON THE ASTM A325 BOLTS THROUGH THE CHANNEL MEMBER SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

TENSION ON THE ASTM A449 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL ¼ TURN.

THE PLATES, BENT PLATES, CHANNELS, AND ANGLES SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

FOR METALLIZATION, APPLY A THERMAL SPRAYED COATING WITH A SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE DEPARTMENTS THERMAL SPRAYED COATINGS (METALLIZATION) PROGRAM, THERMAL SPRAYED COATINGS SPECIAL PROVISION AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

GALVANIZE THE HIGH STRENGTH BOLTS, NUTS, WASHERS AND DIRECT TENSION INDICATORS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

USE AN ASTM F436 HARDENED WASHER WITH STANDARD AND SLOTTED HOLES UNDER EACH BOLT HEAD AND NUT.

FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST ¼" PROJECTION BEYOND THE NUT.

INTERMEDIATE DIAPHRAGM ASSEMBLY SHALL COMPLY WITH SECTION 1072 OF THE STANDARD SPECIFICATIONS.

SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

IN THE EXTERIOR BAYS, PLACE TEMPORARY STRUTS BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED.

THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.

## TABLE

| GIRDER TYPE | CHANNEL SIZE | DIM "A" | DIM "B" | DIM "L" |
|---|---|---|---|---|
| III | MC 18 x 42.7 | 1'-4" | 1'-3" | 1'-6" |

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+18.00 -LNB-

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A. LEBLANC

10/3/2023

DocuSigned by: Marc A. LeBlanc

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

# INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE III PRESTRESSED CONCRETE GIRDERS

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-15 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

DRAWN BY : LDL DATE : 8/22
CHECKED BY : MAL DATE : 8/22
DESIGN ENGINEER OF RECORD: MAL DATE : 8/22

10/2/2023
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llewandowski

# DEAD LOAD DEFLECTION TABLE FOR GIRDERS

| 0.6" ⌀ LOW RELAXATION | SPANS A AND C<br>GIRDERS 1 AND 5 (EXTERIOR) | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TWENTIETH POINTS | 0 | 0.05 | 0.10 | 0.15 | 0.20 | 0.25 | 0.30 | 0.35 | 0.40 | 0.45 | 0.50 | 0.55 | 0.60 | 0.65 | 0.70 | 0.75 | 0.80 | 0.85 | 0.90 | 0.95 | 0 |
| CAMBER (GIRDER ALONE IN PLACE) ↑ | 0.000 | 0.030 | 0.059 | 0.086 | 0.110 | 0.133 | 0.152 | 0.167 | 0.178 | 0.185 | 0.187 | 0.185 | 0.178 | 0.167 | 0.152 | 0.133 | 0.111 | 0.086 | 0.059 | 0.030 | 0.000 |
| * DEFLECTION DUE TO SUPERIMPOSED D.L. ↓ | 0.000 | 0.014 | 0.028 | 0.042 | 0.054 | 0.065 | 0.074 | 0.081 | 0.086 | 0.090 | 0.091 | 0.090 | 0.086 | 0.081 | 0.074 | 0.065 | 0.054 | 0.042 | 0.028 | 0.014 | 0.000 |
| FINAL CAMBER ↑ | 0" | 3/16" | 3/8" | 1/2" | 11/16" | 13/16" | 15/16" | 1" | 1 1/8" | 1 1/8" | 1 1/8" | 1 1/8" | 1 1/8" | 1" | 15/16" | 13/16" | 11/16" | 1/2" | 3/8" | 3/16" | 0" |

| 0.6" ⌀ LOW RELAXATION | SPANS A AND C<br>GIRDERS 2 AND 4 (INTERIOR) | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TWENTIETH POINTS | 0 | 0.05 | 0.10 | 0.15 | 0.20 | 0.25 | 0.30 | 0.35 | 0.40 | 0.45 | 0.50 | 0.55 | 0.60 | 0.65 | 0.70 | 0.75 | 0.80 | 0.85 | 0.90 | 0.95 | 0 |
| CAMBER (GIRDER ALONE IN PLACE) ↑ | 0.000 | 0.030 | 0.059 | 0.086 | 0.110 | 0.133 | 0.152 | 0.167 | 0.178 | 0.185 | 0.187 | 0.185 | 0.178 | 0.167 | 0.152 | 0.133 | 0.111 | 0.086 | 0.059 | 0.030 | 0.000 |
| * DEFLECTION DUE TO SUPERIMPOSED D.L. ↓ | 0.000 | 0.017 | 0.034 | 0.051 | 0.065 | 0.078 | 0.089 | 0.098 | 0.105 | 0.109 | 0.110 | 0.109 | 0.105 | 0.098 | 0.089 | 0.078 | 0.065 | 0.051 | 0.034 | 0.017 | 0.000 |
| FINAL CAMBER ↑ | 0" | 1/8" | 5/16" | 7/16" | 9/16" | 11/16" | 3/4" | 13/16" | 7/8" | 15/16" | 15/16" | 15/16" | 7/8" | 13/16" | 3/4" | 11/16" | 9/16" | 7/16" | 5/16" | 1/8" | 0" |

| 0.6" ⌀ LOW RELAXATION | SPANS A AND C<br>GIRDER 3 (INTERIOR) | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TWENTIETH POINTS | 0 | 0.05 | 0.10 | 0.15 | 0.20 | 0.25 | 0.30 | 0.35 | 0.40 | 0.45 | 0.50 | 0.55 | 0.60 | 0.65 | 0.70 | 0.75 | 0.80 | 0.85 | 0.90 | 0.95 | 0 |
| CAMBER (GIRDER ALONE IN PLACE) ↑ | 0.000 | 0.030 | 0.059 | 0.086 | 0.110 | 0.133 | 0.152 | 0.167 | 0.178 | 0.185 | 0.187 | 0.185 | 0.178 | 0.167 | 0.152 | 0.133 | 0.111 | 0.086 | 0.059 | 0.030 | 0.000 |
| * DEFLECTION DUE TO SUPERIMPOSED D.L. ↓ | 0.000 | 0.018 | 0.035 | 0.051 | 0.066 | 0.079 | 0.091 | 0.100 | 0.106 | 0.110 | 0.112 | 0.110 | 0.106 | 0.100 | 0.091 | 0.079 | 0.066 | 0.051 | 0.035 | 0.018 | 0.000 |
| FINAL CAMBER ↑ | 0" | 1/8" | 5/16" | 7/16" | 1/2" | 5/8" | 3/4" | 13/16" | 7/8" | 7/8" | 7/8" | 7/8" | 7/8" | 13/16" | 3/4" | 5/8" | 9/16" | 7/16" | 5/16" | 1/8" | 0" |

| 0.6" ⌀ LOW RELAXATION | SPAN B<br>GIRDERS 1 AND 5 (EXTERIOR) | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TWENTIETH POINTS | 0 | 0.05 | 0.10 | 0.15 | 0.20 | 0.25 | 0.30 | 0.35 | 0.40 | 0.45 | 0.50 | 0.55 | 0.60 | 0.65 | 0.70 | 0.75 | 0.80 | 0.85 | 0.90 | 0.95 | 0 |
| CAMBER (GIRDER ALONE IN PLACE) ↑ | 0.000 | 0.032 | 0.064 | 0.094 | 0.120 | 0.145 | 0.166 | 0.182 | 0.194 | 0.201 | 0.204 | 0.201 | 0.194 | 0.182 | 0.166 | 0.145 | 0.121 | 0.094 | 0.064 | 0.032 | 0.000 |
| * DEFLECTION DUE TO SUPERIMPOSED D.L. ↓ | 0.000 | 0.020 | 0.039 | 0.056 | 0.072 | 0.087 | 0.100 | 0.110 | 0.117 | 0.121 | 0.123 | 0.121 | 0.117 | 0.110 | 0.100 | 0.087 | 0.072 | 0.056 | 0.039 | 0.020 | 0.000 |
| FINAL CAMBER ↑ | 0" | 1/8" | 5/16" | 7/16" | 9/16" | 11/16" | 13/16" | 7/8" | 15/16" | 15/16" | 1" | 15/16" | 15/16" | 7/8" | 13/16" | 11/16" | 9/16" | 7/16" | 5/16" | 1/8" | 0" |

| 0.6" ⌀ LOW RELAXATION | SPAN B<br>GIRDERS 2 AND 4 (INTERIOR) | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TWENTIETH POINTS | 0 | 0.05 | 0.10 | 0.15 | 0.20 | 0.25 | 0.30 | 0.35 | 0.40 | 0.45 | 0.50 | 0.55 | 0.60 | 0.65 | 0.70 | 0.75 | 0.80 | 0.85 | 0.90 | 0.95 | 0 |
| CAMBER (GIRDER ALONE IN PLACE) ↑ | 0.000 | 0.032 | 0.064 | 0.094 | 0.120 | 0.145 | 0.166 | 0.182 | 0.194 | 0.201 | 0.204 | 0.201 | 0.194 | 0.182 | 0.166 | 0.145 | 0.121 | 0.094 | 0.064 | 0.032 | 0.000 |
| * DEFLECTION DUE TO SUPERIMPOSED D.L. ↓ | 0.000 | 0.024 | 0.047 | 0.068 | 0.088 | 0.106 | 0.121 | 0.133 | 0.142 | 0.147 | 0.149 | 0.147 | 0.142 | 0.133 | 0.121 | 0.106 | 0.088 | 0.068 | 0.047 | 0.024 | 0.000 |
| FINAL CAMBER ↑ | 0" | 1/8" | 3/16" | 5/16" | 3/8" | 7/16" | 9/16" | 9/16" | 5/8" | 5/8" | 11/16" | 5/8" | 5/8" | 9/16" | 9/16" | 7/16" | 3/8" | 5/16" | 3/16" | 1/8" | 0" |

| 0.6" ⌀ LOW RELAXATION | SPAN B<br>GIRDER 3 (INTERIOR) | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TWENTIETH POINTS | 0 | 0.05 | 0.10 | 0.15 | 0.20 | 0.25 | 0.30 | 0.35 | 0.40 | 0.45 | 0.50 | 0.55 | 0.60 | 0.65 | 0.70 | 0.75 | 0.80 | 0.85 | 0.90 | 0.95 | 0 |
| CAMBER (GIRDER ALONE IN PLACE) ↑ | 0.000 | 0.032 | 0.064 | 0.094 | 0.120 | 0.145 | 0.166 | 0.182 | 0.194 | 0.201 | 0.204 | 0.201 | 0.194 | 0.182 | 0.166 | 0.145 | 0.121 | 0.094 | 0.064 | 0.032 | 0.000 |
| * DEFLECTION DUE TO SUPERIMPOSED D.L. ↓ | 0.000 | 0.024 | 0.047 | 0.069 | 0.089 | 0.108 | 0.123 | 0.135 | 0.144 | 0.149 | 0.151 | 0.149 | 0.144 | 0.135 | 0.123 | 0.108 | 0.089 | 0.069 | 0.047 | 0.024 | 0.000 |
| FINAL CAMBER ↑ | 0" | 1/8" | 3/16" | 5/16" | 3/8" | 7/16" | 1/2" | 9/16" | 5/8" | 5/8" | 5/8" | 5/8" | 5/8" | 9/16" | 1/2" | 7/16" | 3/8" | 5/16" | 3/16" | 1/8" | 0" |

* INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD.
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTIONAL FORM).

PROJECT NO. B-5527
SURRY COUNTY
STATION: 23+18.00 -LNB-

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A. LEBLANC
10/3/2023
DocuSigned by: Marc A. LeBlanc
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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

**DEAD LOAD DEFLECTION TABLES**

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-16 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

DRAWN BY : LDL DATE : 12/22
CHECKED BY : MAL DATE : 12/22
DESIGN ENGINEER OF RECORD: MAL DATE : 6/23

10/2/2023
X:\Raleigh\114-783.005D - B-5527 CE Update\05-CAD\B5527\Structures\DGN's\Final\401_031_B-5527_SMU_DL_S1-16.dgn
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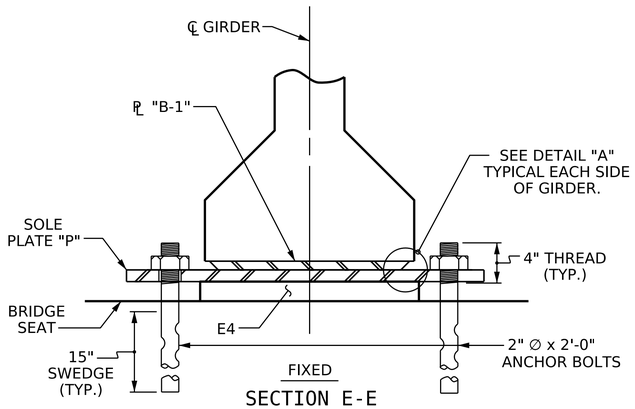
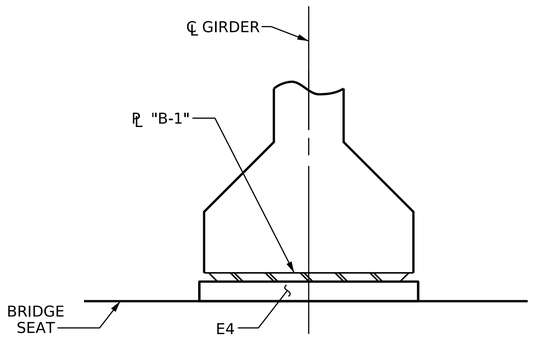


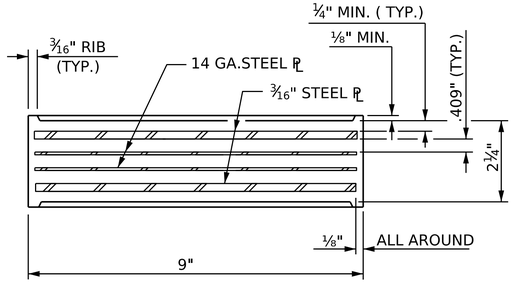

FIXED

SECTION E-E

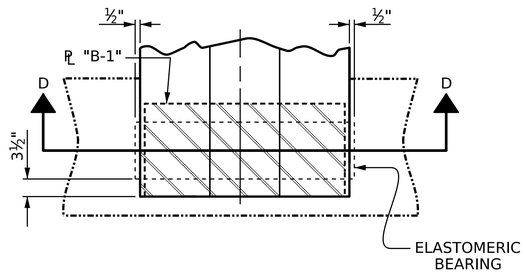



INTEGRAL

SECTION D-D

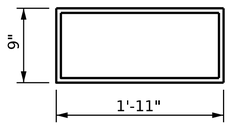



TYPICAL SECTION OF ELASTOMERIC BEARINGS




PLAN VIEW AT END BENTS

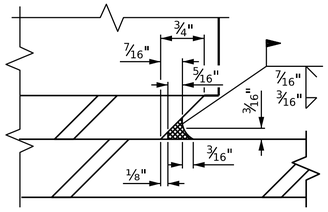
NOTE: BOTTOM FLANGE SHOWN, TOP FLANGE NOT SHOWN FOR CLARITY.



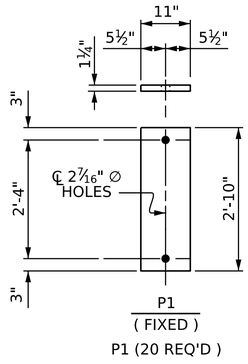

E4 ( 30 REQ'D )

PLAN VIEW OF ELASTOMERIC BEARING

## TYPE V




DETAIL "A"




P1 (20 REQ'D )

## SOLE PLATE DETAILS ( "P" )

# NOTES

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF ½ TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

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

PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE PORTION OF THE EMBEDDED PLATE AND SOLE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

WHEN WELDING THE SOLE PLATE TO THE EMBEDDED PLATE IN THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE SOLE PLATE DOES NOT EXCEED 300°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.

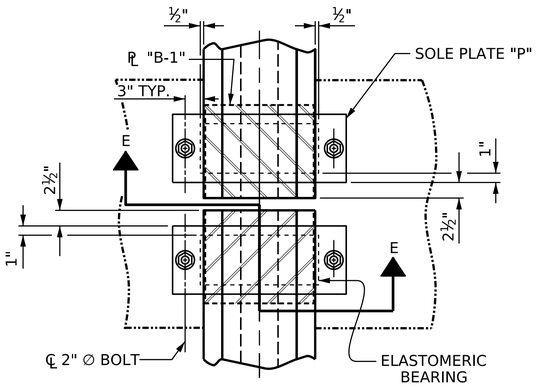
SOLE PLATE "P", BOLTS, NUTS, AND WASHERS SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLT, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.




TYPICAL PLAN

(SHOWING CONTINUOUS BENT)

| MAXIMUM ALLOWABLE SERVICE LOADS | |
|---|---|
| D.L.+L.L. (NO IMPACT) | |
| TYPE V | 365 k |

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+18.00 -LNB-

| | | | | | |
|---|---|---|---|---|---|
| ASSEMBLED BY : | LDL | | DATE : | 8/22 | |
| CHECKED BY : | MAL | | DATE : | 8/22 | |
| DRAWN BY : WJH | 8/89 | REV. 1/15 | | MAA/TMG | |
| CHECKED BY : CRK | 8/89 | REV. 12/17 | | MAA/TMG | |
| | | REV. 10/21 | | BNB/AAI | |

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A. LEBLANC

2/2/2024

DocuSigned by: Marc A. LeBlanc C149F09AB2F4412...

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DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

# ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-17 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

STD. NO. EB4

2/1/2024
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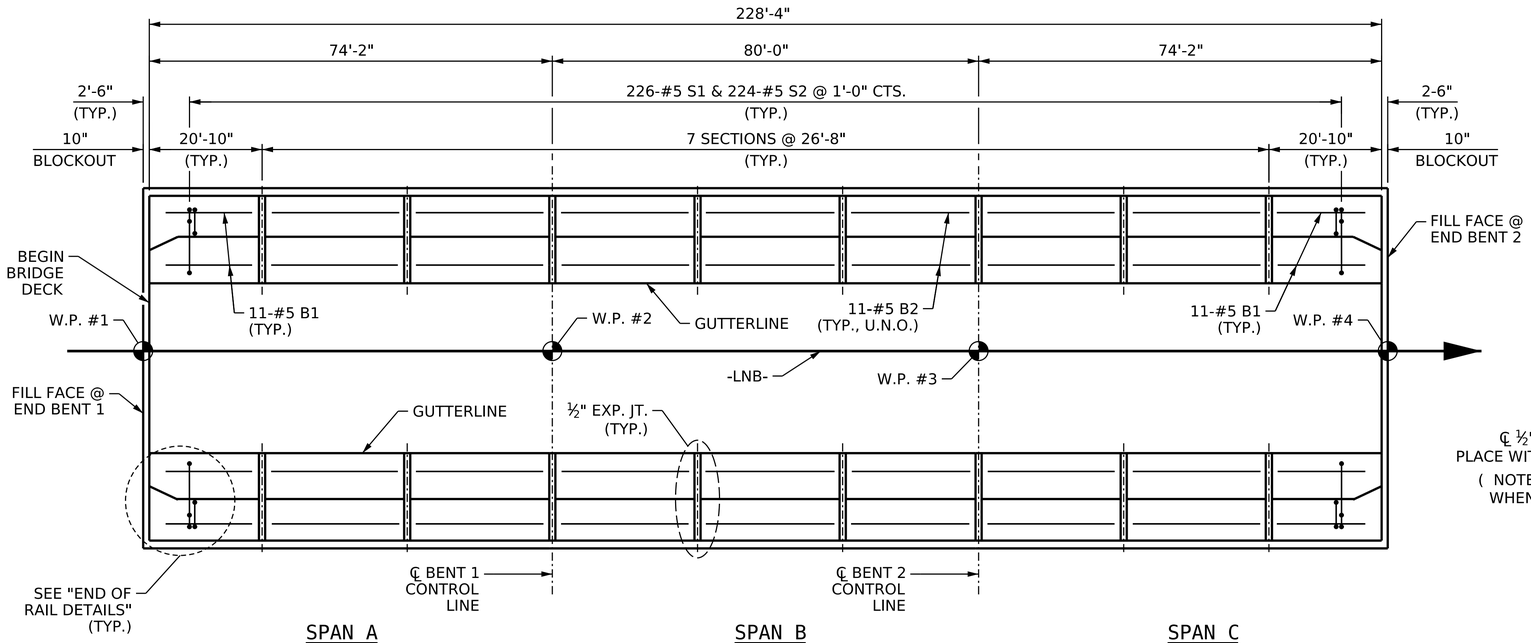
hbollinsky




## PLAN OF CONCRETE BARRIER RAIL

## NOTES

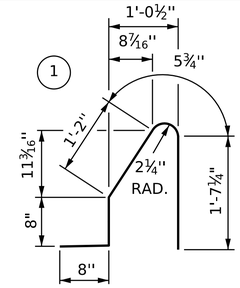
THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

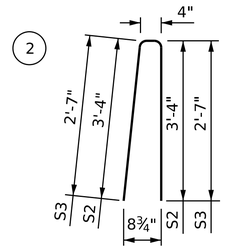
WHEN FOAM JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF BARRIER RAIL.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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. THE 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.

## BAR TYPES



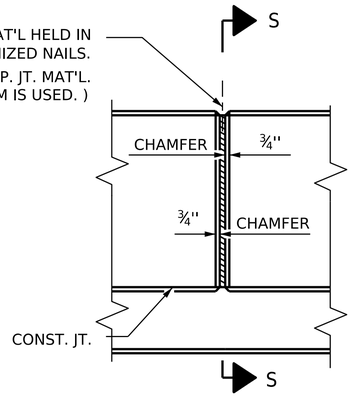




ALL BAR DIMENSIONS ARE OUT TO OUT

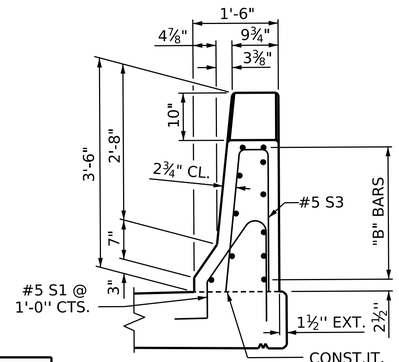
## BILL OF MATERIAL

FOR CONCRETE BARRIER ONLY

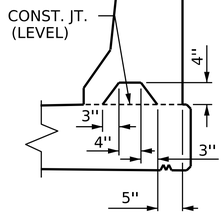
| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| * B1 | 44 | #5 | STR | 20'-6" | 941 |
| * B2 | 154 | #5 | STR | 26'-4" | 4230 |
| * S1 | 460 | #5 | 1 | 4'-7" | 2199 |
| * S2 | 452 | #5 | 2 | 7'-0" | 3300 |
| * S3 | 8 | #5 | 2 | 5'-6" | 46 |
| * EPOXY COATED REINFORCING STEEL | | | | | 10,716 LBS. |
| CLASS AA CONCRETE | | | | | 61.9 CU. YDS. |
| CONCRETE BARRIER RAIL | | | | | 456.7 LIN. FT. |




ELEVATION AT EXPANSION JOINTS

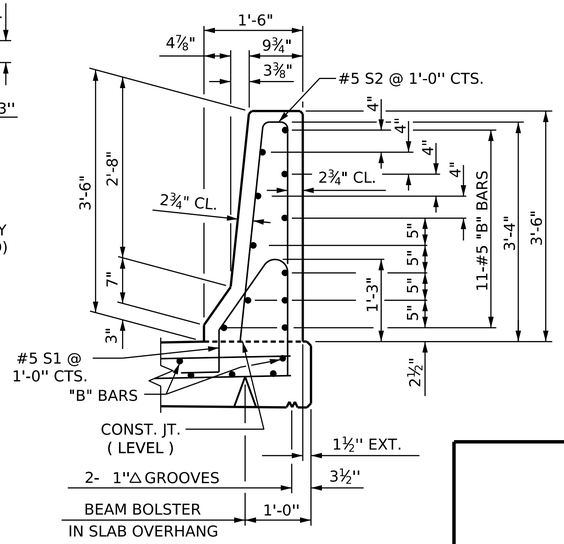



END VIEW

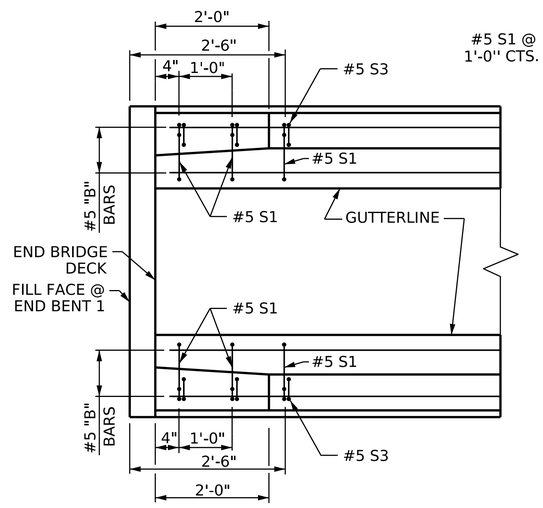



SECTION S-S

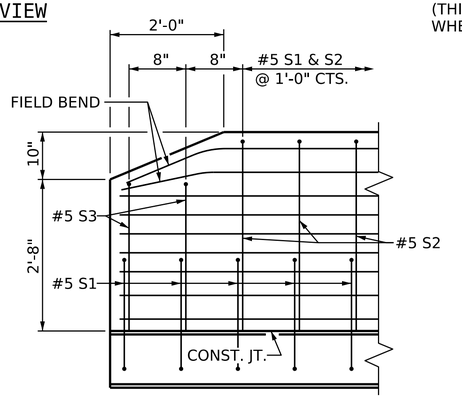
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)




SECTION THRU CONCRETE RAILS




PLAN




SIDE VIEW

## END OF RAIL DETAILS

## BARRIER RAIL DETAILS

| | | | |
|---|---|---|---|
| ASSEMBLED BY : | HRB | DATE : | 12/22 |
| CHECKED BY : | MAL | DATE : | 1/23 |
| DRAWN BY : ARB | 5/87 | REV. 7/12 | MAA/GM |
| CHECKED BY : SJD | 9/87 | REV. 6/13 | MAA/GM |
| | | REV. 12/17 | MAA/THC |

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A. LEBLANC
10/3/2023
DocuSigned by: Marc A. LeBlanc
C146E09ABF2E4412...

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STANDARD

# CONCRETE BARRIER RAIL

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-18 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

PROJECT NO. B-5527
SURRY COUNTY
STATION: 23+18.00 -LNB-

STD. NO. CBR1

9/29/2023
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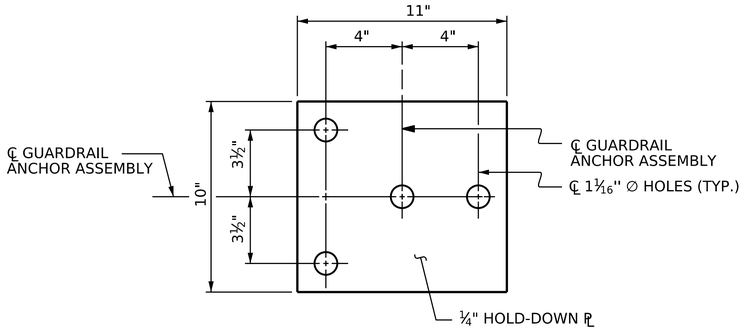
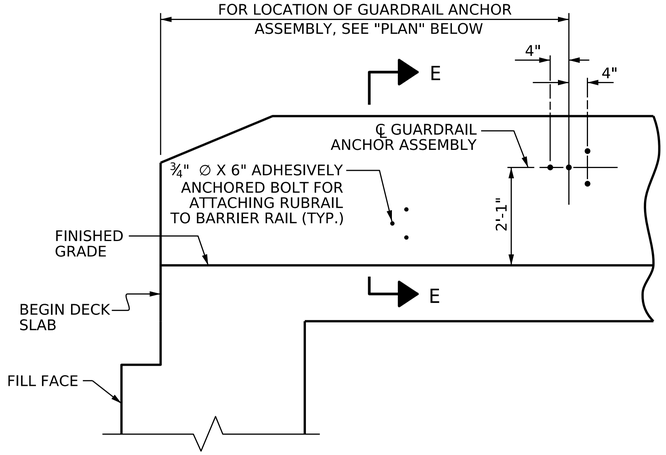
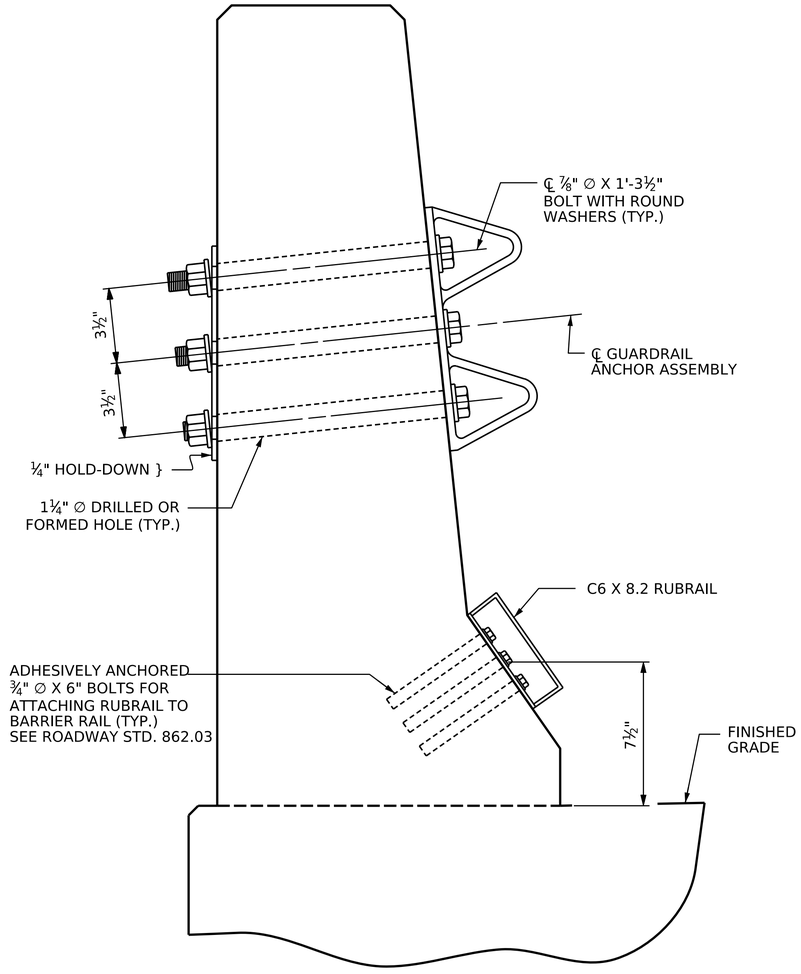
hbollnsky




PLAN

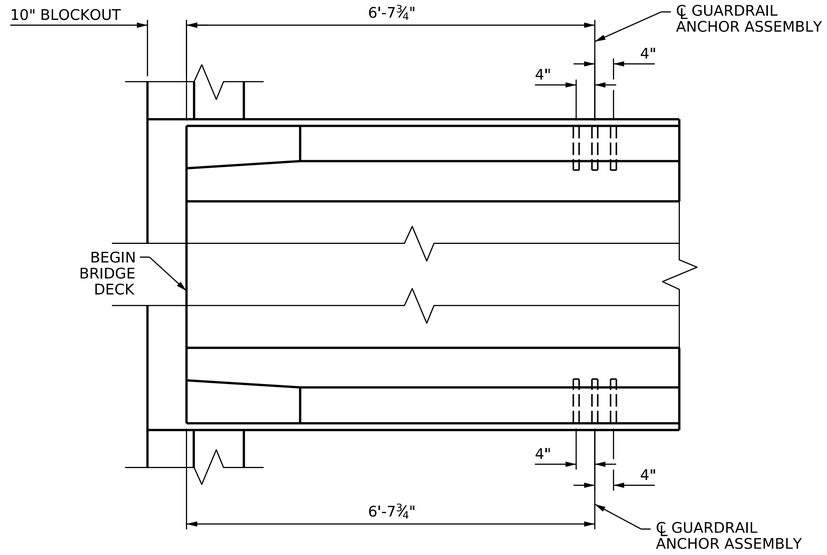



ELEVATION




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 4 - ⅞'' ∅ BOLTS WITH NUTS AND WASHERS, RUBRAIL, AND ADHESIVELY ANCHORED BOLTS.

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'' ∅ 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.)

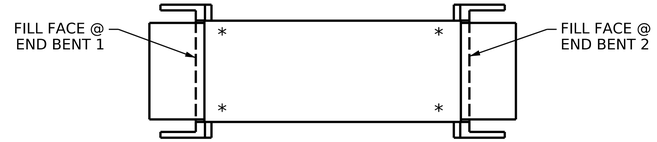
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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 CONCRETE BARRIER RAIL.

THE 1¼'' ∅ 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.

THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE ¾" ∅ X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE ¾" ∅ BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.




## SKETCH SHOWING POINTS OF ATTACHMENT

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+18.00 -LNB-

| | | | |
|---|---|---|---|
| ASSEMBLED BY : | HRB | DATE : | 12/22 |
| CHECKED BY : | MAL | DATE : | 1/23 |
| DRAWN BY : TLA | 5/06 | REV. 7/12 | MAA/GM |
| CHECKED BY : GM | 5/06 | REV. 6/13 | MAA/GM |
| | | REV. 12/17 | MAA/THC |

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A. LEBLANC

10/3/2023

DocuSigned by: Marc A. LeBlanc C146F09AB2F4412...

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# GUARDRAIL ANCHORAGE DETAILS FOR CONCRETE BARRIER RAIL

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-19 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

STD. NO. GRA2

9/29/2023
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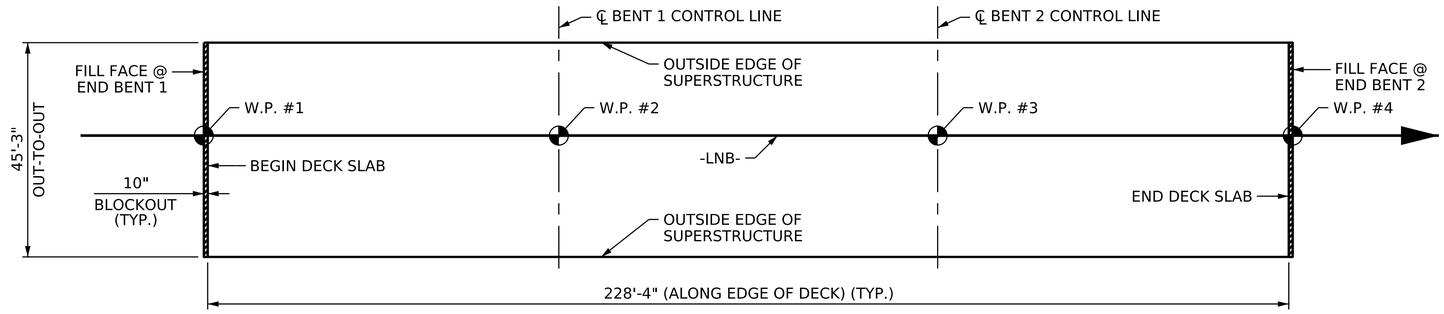
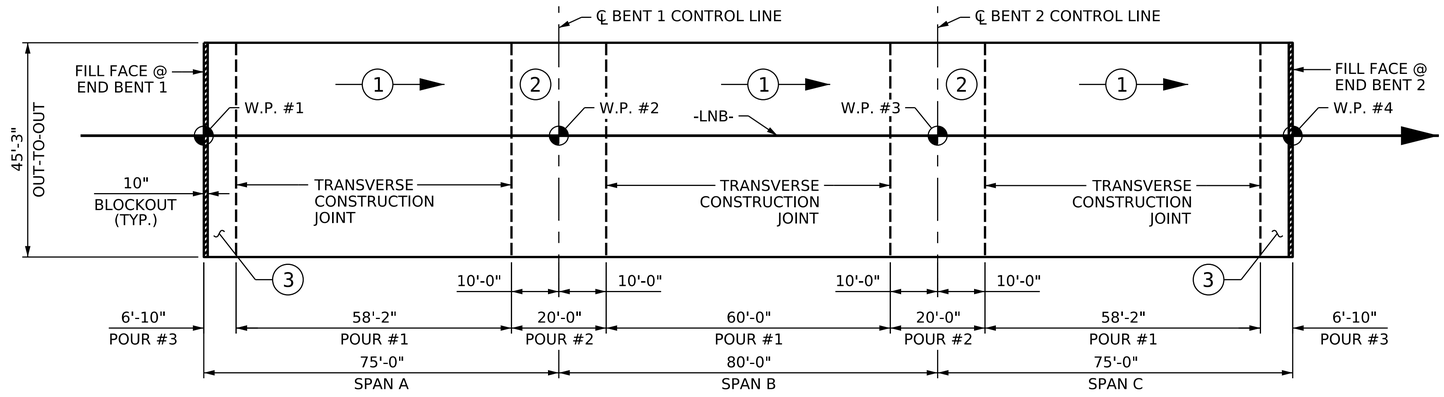



## LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB

## (SQ. FT. = 10,332)

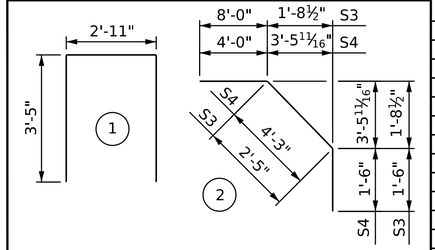



## POURING SEQUENCE

POUR (2) CAN NOT BE STARTED UNTIL BOTH ADJACENT (1) POURS REACH A MINIMUM OF 3000 PSI.

= INDICATES DIRECTION OF POUR

### BAR TYPES



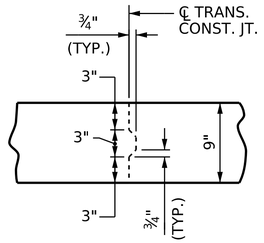

ALL BAR DIMENSIONS ARE OUT TO OUT

### REINFORCING BAR SCHEDULE

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| * A1 | 457 | #5 | STR | 44'-11" | 21410 |
| A2 | 457 | #5 | STR | 44'-11" | 21410 |
| | | | | | |
| * B1 | 178 | #6 | STR | 13'-11" | 3721 |
| B2 | 104 | #5 | STR | 52'-5" | 5686 |
| * B3 | 90 | #4 | STR | 36'-4" | 2184 |
| * B4 | 90 | #5 | STR | 56'-6" | 5304 |
| * B5 | 88 | #5 | STR | 33'-3" | 3052 |
| B6 | 208 | #4 | STR | 25'-5" | 3532 |
| B7 | 192 | #4 | STR | 21'-6" | 2758 |
| * B8 | 45 | #4 | STR | 25'-10" | 777 |
| B9 | 52 | #5 | STR | 34'-0" | 1844 |
| * B10 | 12 | #4 | STR | 39'-8" | 318 |
| B11 | 24 | #5 | STR | 58'-6" | 1464 |
| | | | | | |
| K1 | 8 | #5 | STR | 44'-11" | 375 |
| K2 | 8 | #5 | STR | 8'-1" | 67 |
| K3 | 16 | #5 | STR | 8'-10" | 147 |
| K4 | 8 | #5 | STR | 7'-7" | 63 |
| K5 | 4 | #5 | STR | 1'-10" | 7 |
| K6 | 8 | #5 | STR | 2'-3" | 18 |
| K7 | 4 | #5 | STR | 1'-7" | 6 |
| | | | | | |
| S3 | 72 | #4 | 2 | 11'-11" | 573 |
| S4 | 72 | #4 | 2 | 9'-9" | 469 |
| | | | | | |
| U1 | 72 | #4 | 1 | 9'-9" | 469 |
| | | | | | |
| REINFORCING STEEL | | | | 38,888 | LBS. |
| * EPOXY COATED REINFORCING STEEL | | | | 36,766 | LBS. |
| CLASS AA CONCRETE | | | | 373.7 | CU. YDS. |

### SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

| BAR SIZE | SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL | | APPROACH SLABS | | PARAPET AND BARRIER RAIL |
|---|---|---|---|---|---|
| | EPOXY COATED | UNCOATED | EPOXY COATED | UNCOATED | |
| #4 | 1'-11" | 1'-7" | 1'-11" | 1'-7" | 2'-6" |
| #5 | 2'-5" | 2'-0" | 2'-5" | 2'-0" | 3'-1" |
| #6 | 2'-10" | 2'-5" | 3'-7" | 2'-5" | 3'-8" |
| #7 | 4'-2" | 2'-9" | | | |
| #8 | 4'-9" | 3'-2" | | | |




### GROOVING BRIDGE FLOORS

| | |
|---|---|
| APPROACH SLABS | 1,950 SQ. FT. |
| BRIDGE DECK | 8,892 SQ. FT. |
| TOTAL | 10,842 SQ. FT. |

## TRANSVERSE CONSTRUCTION JOINT DETAIL

REINFORCING STEEL IN SLAB NOT SHOWN.
LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THROUGH JOINT.

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+18.00 -LNB-

### SUPERSTRUCTURE BILL OF MATERIAL

| CLASS "AA" CONCRETE | | REINFORCING STEEL | EPOXY COATED REINFORCING STEEL |
|---|---|---|---|
| POUR NO. | CU. YDS. | LBS. | LBS. |
| 1 | 254.2 | | |
| 2 | 57.2 | | |
| 3 | 62.3 | | |
| TOTAL | 373.7 | 38,888 LBS. | 36,766 LBS. |

* * QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A. LEBLANC

10/3/2023

DocuSigned by: Marc A. LeBlanc

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SUPERSTRUCTURE

## BILL OF MATERIAL

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-20 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

DRAWN BY : LDL DATE : 12/22
CHECKED BY : MAL DATE : 12/22
DESIGN ENGINEER OF RECORD: MAL DATE : 6/23

10/27/2023
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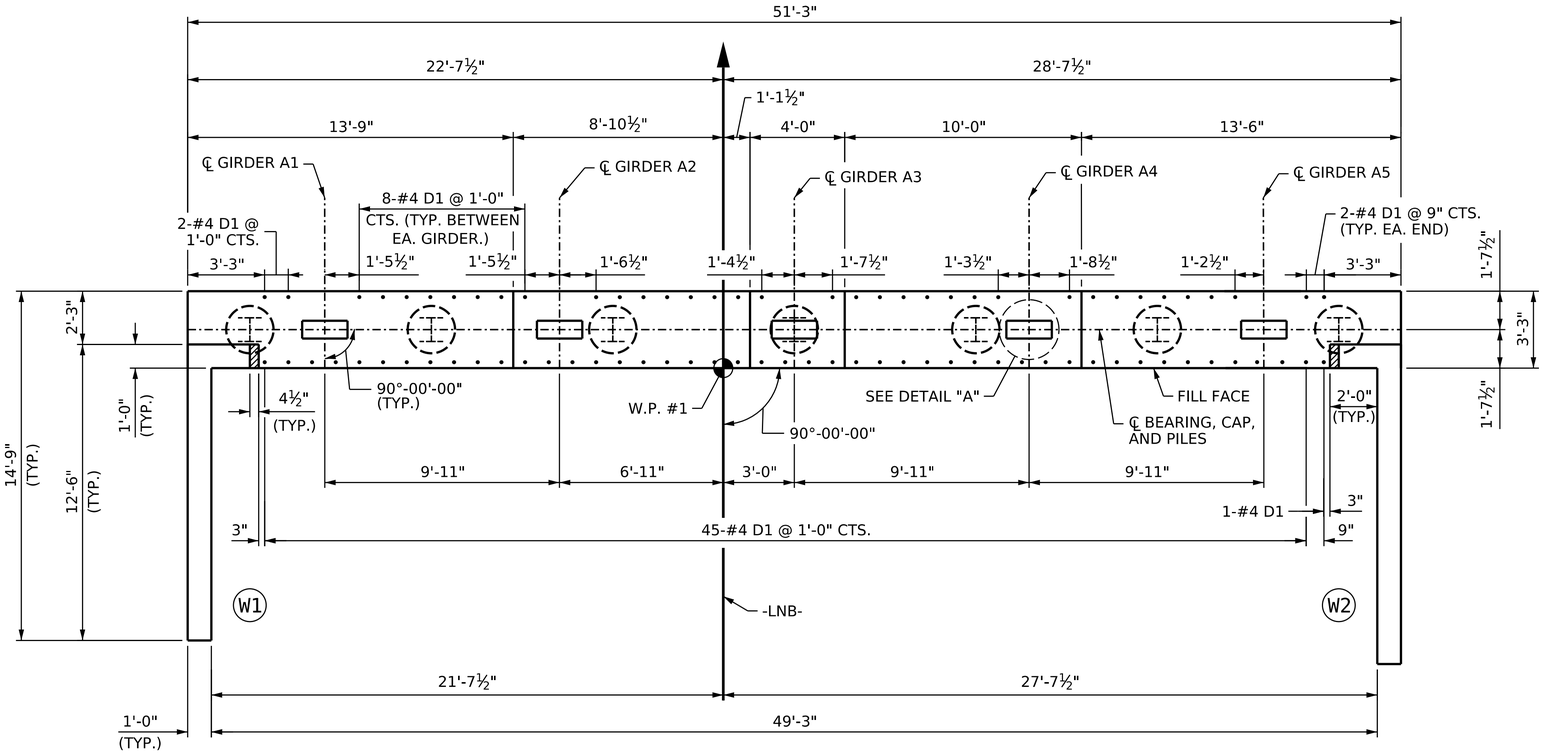
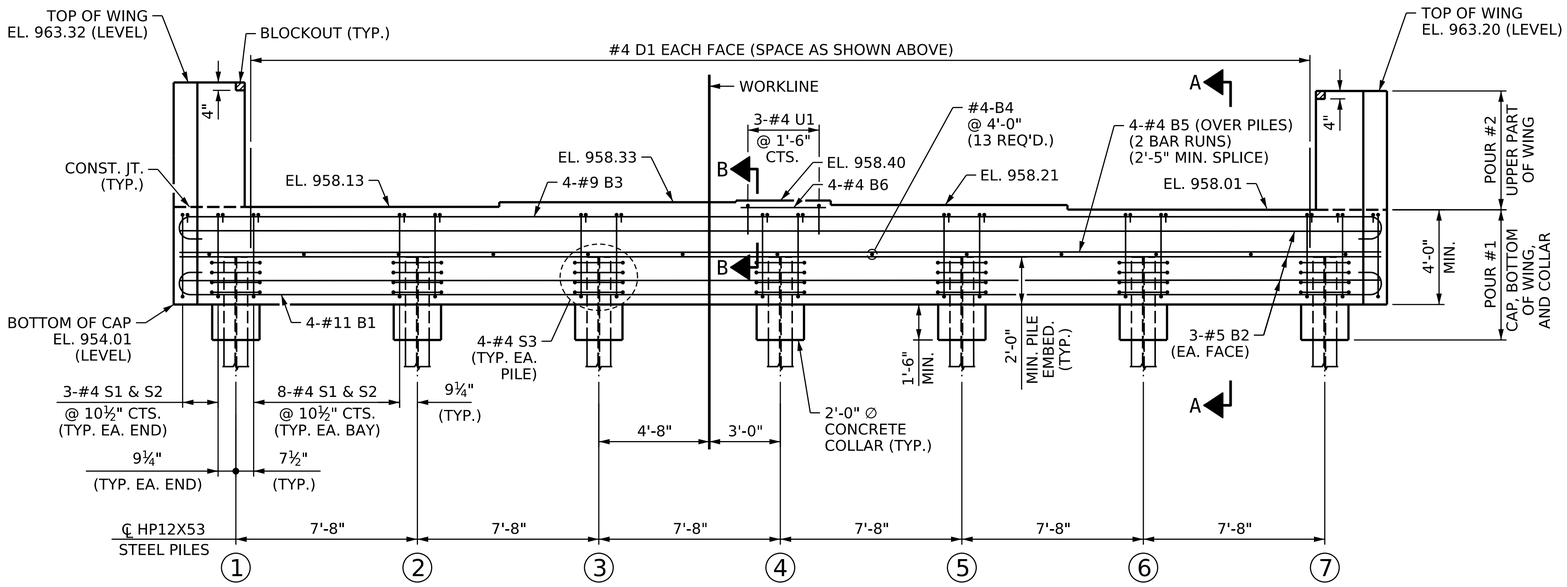



## PLAN




## ELEVATION

## NOTES

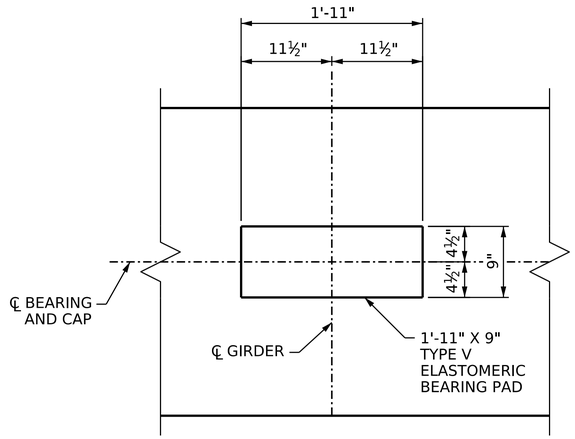
FOR SECTION A-A AND PARTIAL SECTION B-B, SEE SHEET 3 OF 3.

#4 D1 STIRRUP BARS MAY BE SHIFTED SLIGHTLY TO AVOID STIRRUPS IN CAP AND STEPS IN CAP.

SEE SUPERSTRUCTURE SHEETS FOR UPPER PART OF INTEGRAL END BENT DETAILS.

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

THE TOP SURFACE OF THE END BENT CAP AND WINGS, EXCLUDING THE BEARING AREA AND EXPOSED AREA OUTSIDE OF CONCRETE DIAPHRAGM, SHALL BE RAKED TO A DEPTH OF ¼".




## DETAIL "A"

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+18.00 -LNB-

SHEET 1 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARCA LEBLANC

10/3/2023

DocuSigned by: Marc A. LeBlanc

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

# INTEGRAL END BENT NO. 1

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| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-21 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

DRAWN BY : HRB DATE : 12/22
CHECKED BY : MAL DATE : 12/22
DESIGN ENGINEER OF RECORD: MAL DATE : 6/23

9/29/2023
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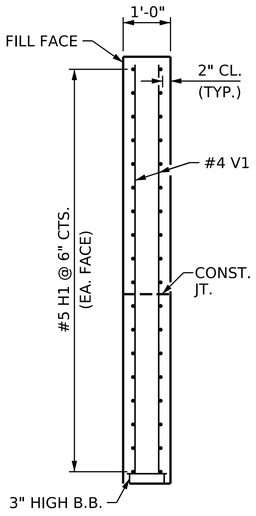
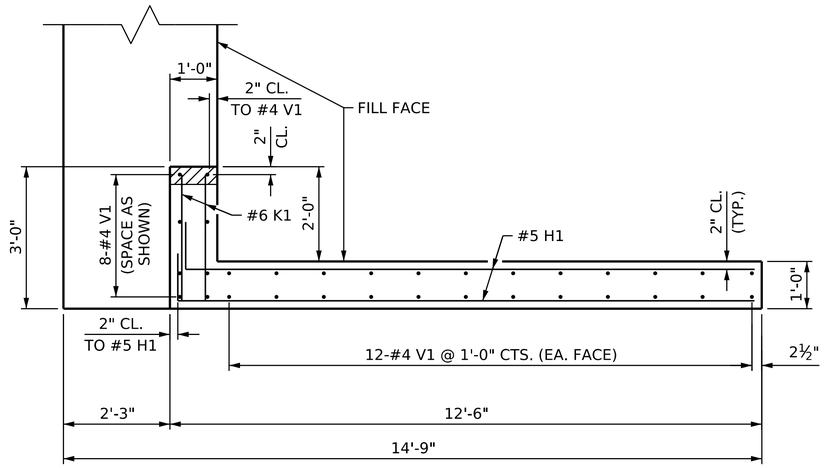
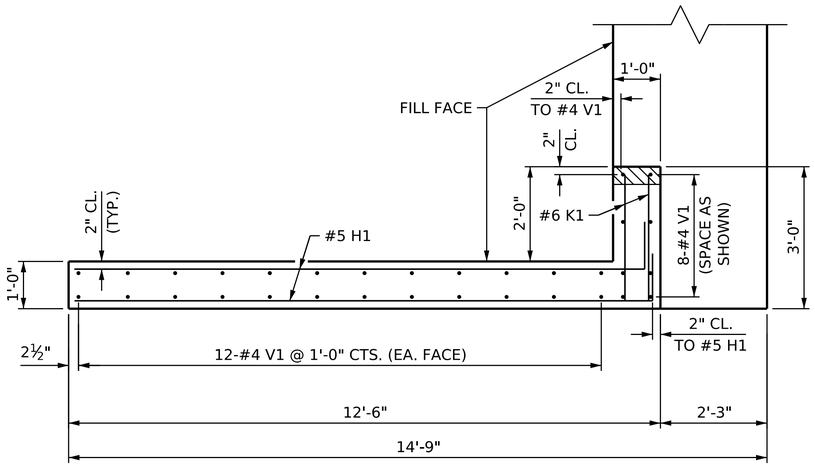
hbollinsky



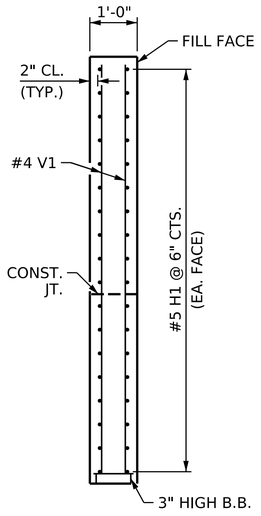

## SECTION C-C




## PLAN OF WING - W1




## PLAN OF WING - W2




## SECTION D-D

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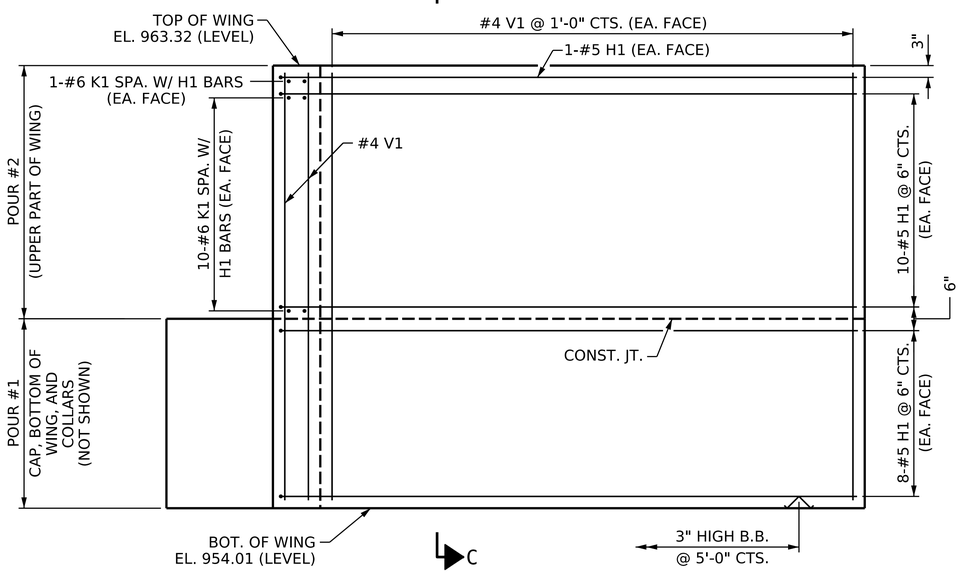
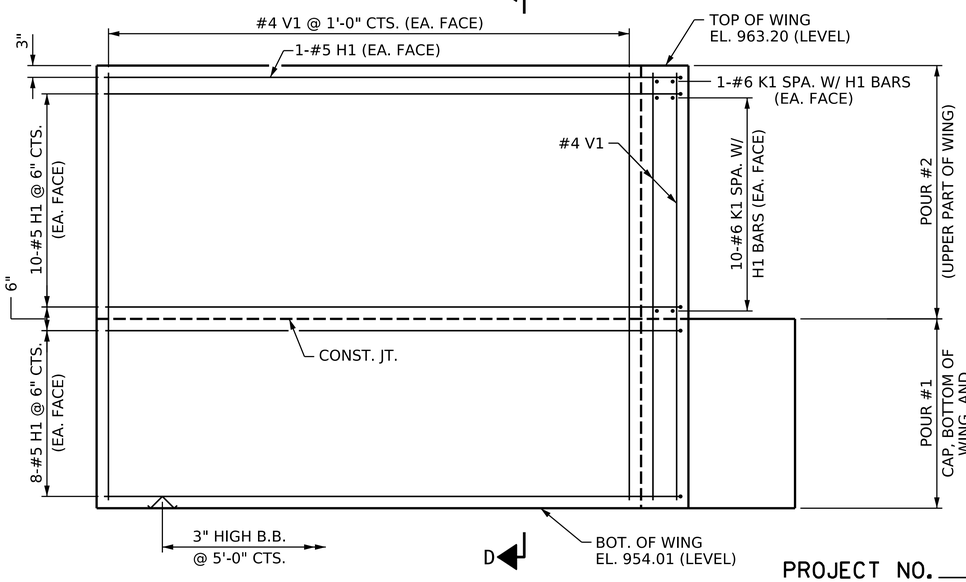



C

## ELEVATION OF WING - W1

D




D

## ELEVATION OF WING - W2

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+18.00 -LNB-

SHEET 2 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A. LEBLANC

10/3/2023

DocuSigned by: Marc A. LeBlanc

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STATE OF NORTH CAROLINA
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RALEIGH
SUBSTRUCTURE

# INTEGRAL END BENT NO. 1

A. MORTON THOMAS AND ASSOCIATES, INC.
900 RIDGEFIELD DRIVE, SUITE 325 • RALEIGH, NC 27609
(919) 855-9989 • NC LICENSE NO. F-1049
WWW.AMTENGINEERING.COM

| REVISIONS | | | | | | SHEET NO. |
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| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

DRAWN BY : HRB DATE : 12/22
CHECKED BY : MAL DATE : 12/22
DESIGN ENGINEER OF RECORD: MAL DATE : 6/23

9/29/2023
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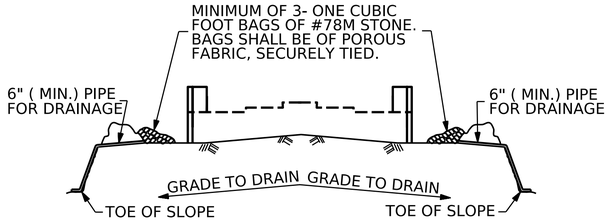
hbollinsky

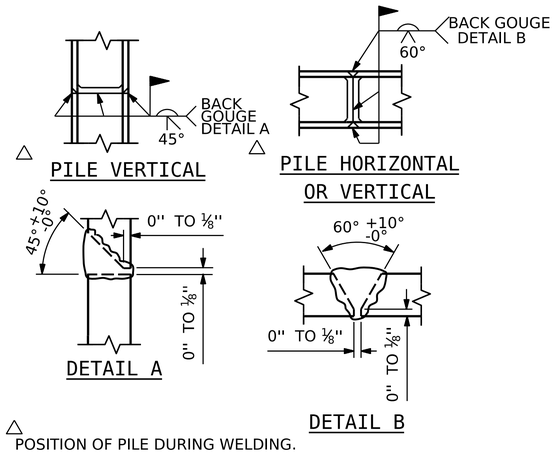



BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

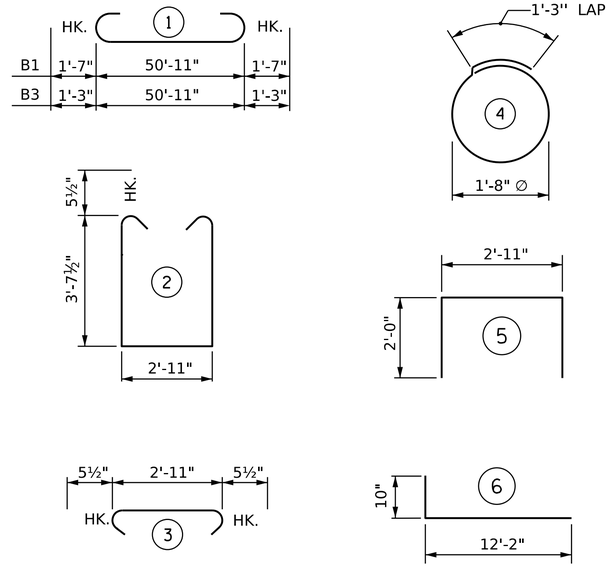
## TEMPORARY DRAINAGE AT END BENT




△ POSITION OF PILE DURING WELDING.

## PILE SPLICE DETAILS

## BAR TYPES




ALL BAR DIMENSIONS ARE OUT TO OUT.

## BILL OF MATERIAL

### END BENT NO. 1

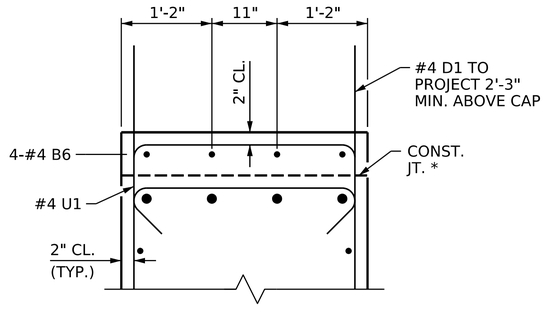
| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| B1 | 4 | #11 | 1 | 54'-1" | 1149 |
| B2 | 6 | #5 | STR | 50'-11" | 319 |
| B3 | 4 | #9 | 1 | 53'-5" | 726 |
| B4 | 13 | #4 | STR | 2'-11" | 25 |
| B5 | 8 | #4 | STR | 26'-8" | 143 |
| B6 | 4 | #4 | STR | 3'-8" | 10 |
| | | | | | |
| D1 | 82 | #4 | STR | 4'-3" | 233 |
| | | | | | |
| H1 | 76 | #5 | 6 | 13'-0" | 1030 |
| | | | | | |
| K1 | 44 | #6 | STR | 2'-8" | 176 |
| | | | | | |
| S1 | 54 | #4 | 2 | 11'-1" | 400 |
| S2 | 54 | #4 | 3 | 3'-10" | 138 |
| S3 | 28 | #4 | 4 | 6'-6" | 122 |
| | | | | | |
| U1 | 3 | #4 | 5 | 6'-11" | 14 |
| | | | | | |
| V1 | 64 | #4 | STR | 8'-10" | 378 |
| V2 | 64 | #4 | STR | 8'-10" | 378 |

| | |
|---|---|
| REINFORCING STEEL | 5241 LBS. |
| CLASS A CONCRETE | |
| POUR #1 COLLARS, CAP, AND BOTTOM OF WINGS | 30.3 CY |
| POUR #2 UPPER PART OF WINGS | 5.6 CY |
| TOTAL CLASS A CONCRETE | 35.9 CY |




## SECTION A-A

* THE TOP SURFACE OF THE END BENT CAP AND WINGS, EXCLUDING THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF ¼"




## PARTIAL SECTION B-B

* THE TOP SURFACE OF THE END BENT CAP AND WINGS, EXCLUDING THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF ¼"

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+18.00 -LNB-

SHEET 3 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARCA LEBLANC

10/3/2023

DocuSigned by: Marc A. LeBlanc

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

# INTEGRAL END BENT NO. 1 DETAILS

A. MORTON THOMAS AND ASSOCIATES, INC.
900 RIDGEFIELD DRIVE, SUITE 325 • RALEIGH, NC 27609
(919) 855-9989 • NC LICENSE NO. F-1049
WWW.AMTENGINEERING.COM

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| 2 | | | 4 | | | 32 |

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DESIGN ENGINEER OF RECORD: MAL DATE : 6/23

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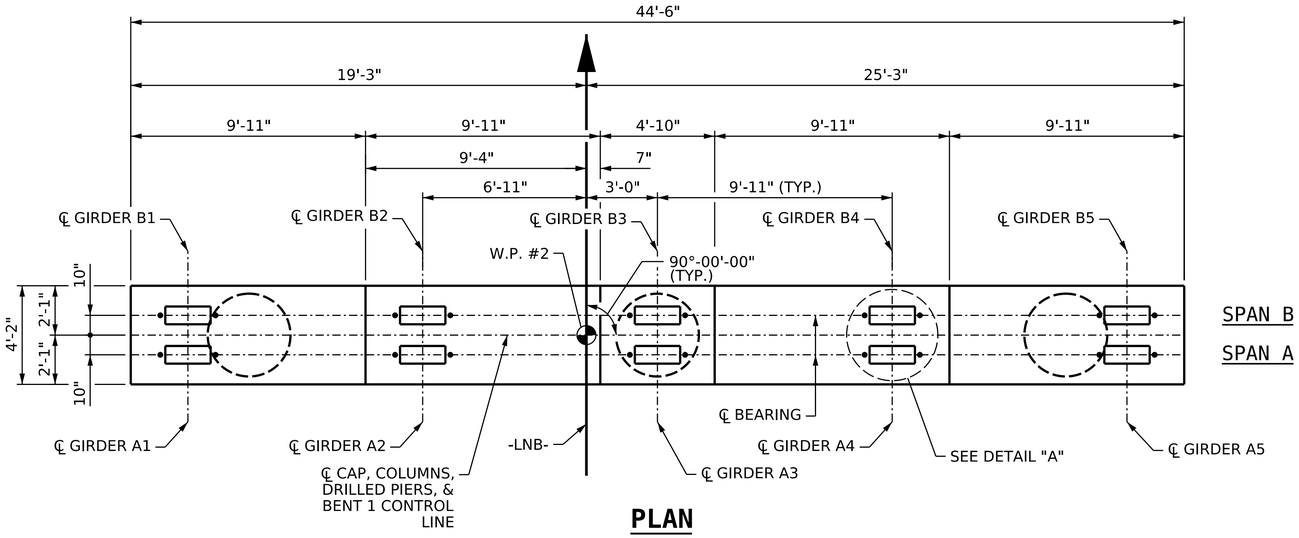
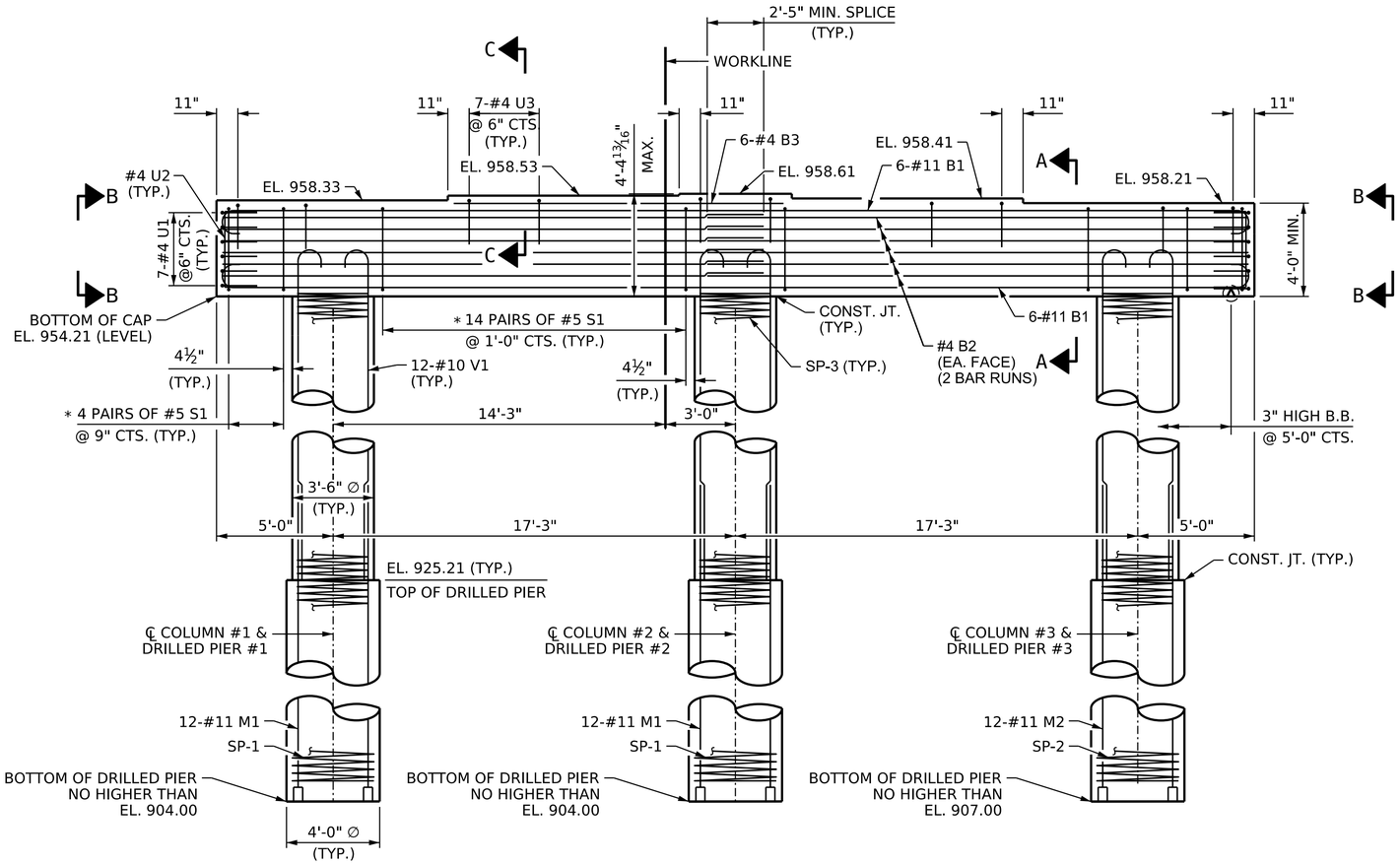
hbollinsky




## PLAN




## ELEVATION

## NOTES

FOR SECTION CUTS AND VIEWS, SEE SHEET 2 OF 2.

FOR REINFORCING BILL OF MATERIAL, SEE SHEET 2 OF 2.

STIRRUPS AND U3 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO AVOID ANCHOR BOLTS.

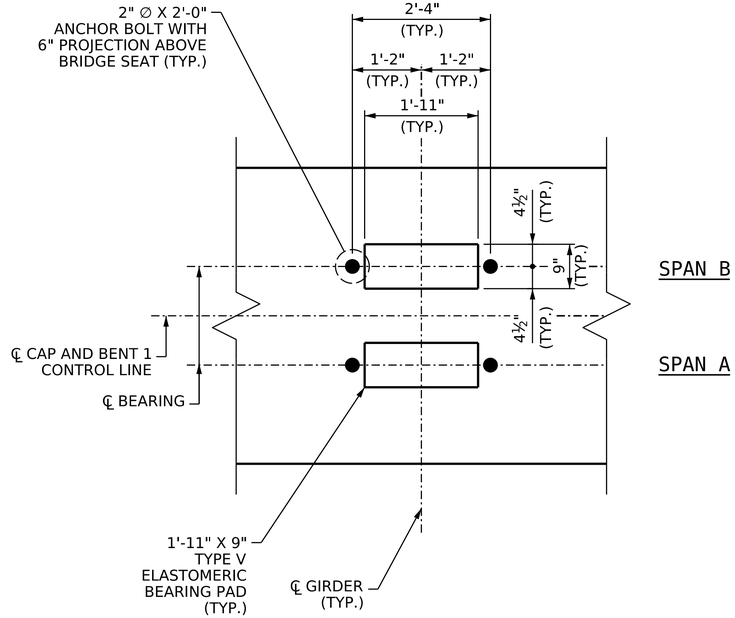
* INVERT ALTERNATE #5 S1 STIRRUP PAIRS.

HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".

THE CONTRACTORS ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FOOT BELOW THE GROUND LINE.




## DETAIL "A"

DIMENSIONS ARE TYPICAL FOR EACH GIRDER

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+18.00 -LNB-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
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RALEIGH
SUBSTRUCTURE

**BENT NO. 1**

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARCA LEBLANC — 10/3/2023
DocuSigned by: Marc A. LeBlanc

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| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

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|---|---|---|
| DRAWN BY : | GD | DATE : 12/22 |
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| DESIGN ENGINEER OF RECORD: | MAL | DATE : 6/23 |

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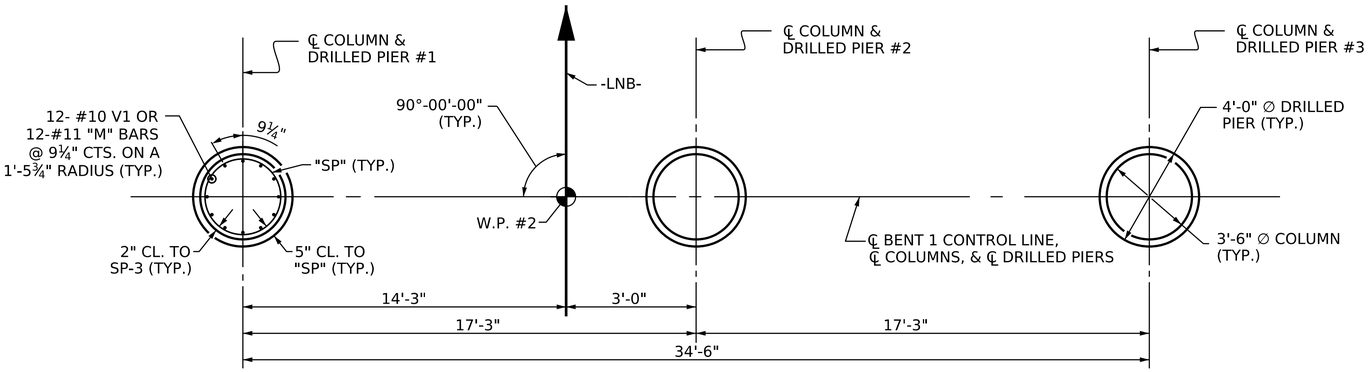
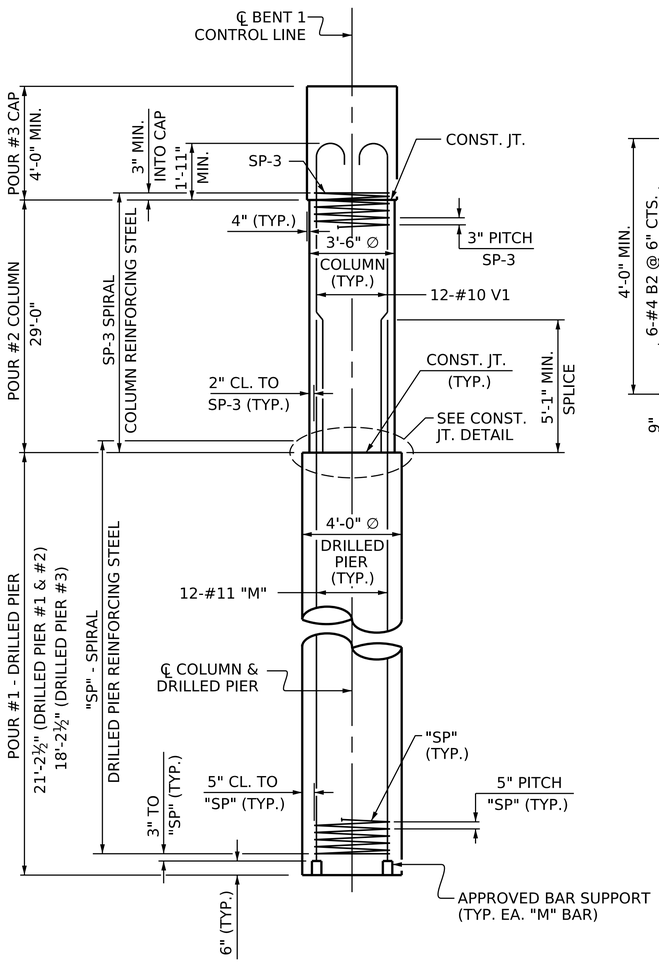
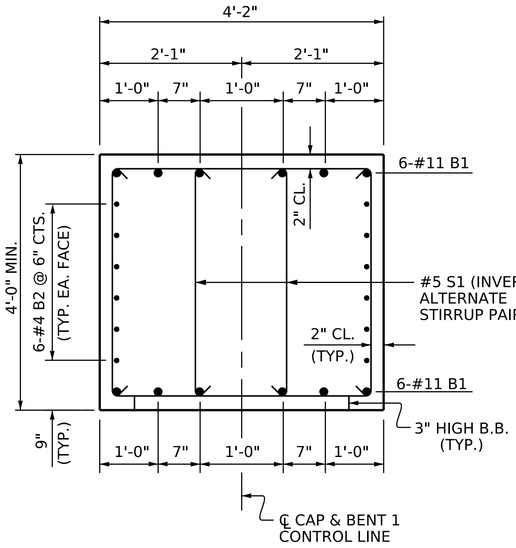


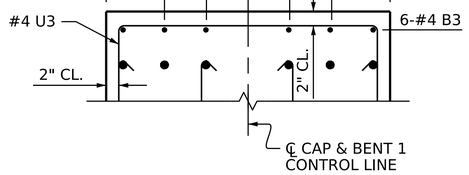

## PLAN OF DRILLED PIERS AND COLUMNS



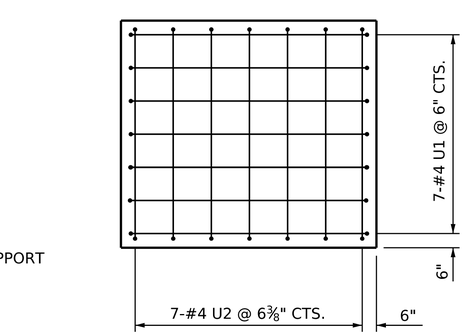

## END ELEVATION



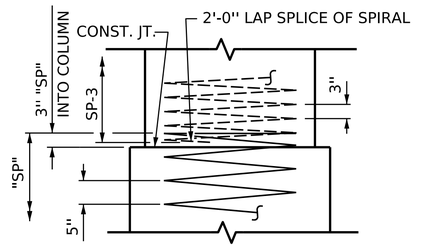

## SECTION A-A




## PARTIAL SECTION C-C

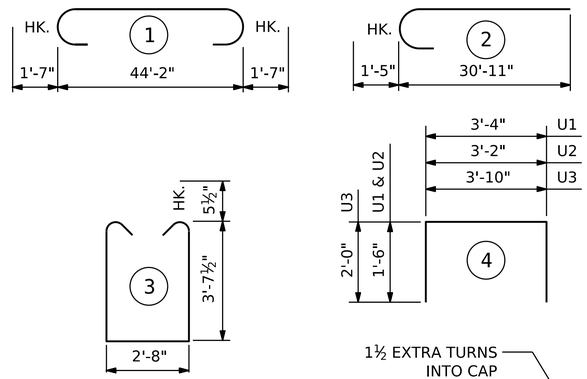



## VIEW B-B




## CONSTRUCTION JOINT DETAIL

## BAR TYPES




ALL BAR DIMENSIONS ARE OUT TO OUT.

## BILL OF MATERIAL

### BENT NO. 1

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| B1 | 12 | #11 | 1 | 47'-4" | 3,018 |
| B2 | 24 | #4 | STR | 23'-4" | 374 |
| B3 | 6 | #4 | STR | 14'-3" | 57 |
| | | | | | |
| M1 | 24 | #11 | STR | 28'-10" | 3,677 |
| M2 | 12 | #11 | STR | 25'-10" | 1,647 |
| | | | | | |
| S1 | 72 | #5 | 3 | 10'-10" | 814 |
| | | | | | |
| U1 | 14 | #4 | 4 | 6'-4" | 59 |
| U2 | 14 | #4 | 4 | 6'-2" | 58 |
| U3 | 35 | #4 | 4 | 7'-10" | 183 |
| | | | | | |
| V1 | 36 | #10 | 2 | 32'-4" | 5,009 |
| | | | | | |
| REINFORCING STEEL (FOR BENT 1) | | | | | 14,896 LBS. |
| | | | | | |
| SP-1 | 2 | * | 6 | 504'-5" | 1,052 |
| SP-2 | 1 | * | 6 | 435'-10" | 455 |
| SP-3 | 3 | ** | 5 | 1,163'-9" | 2,332 |
| | | | | | |
| SPIRAL COLUMN REINFORCING STEEL (FOR BENT 1) | | | | | 3,839 LBS. |

** THE SP-3 SPIRAL REINFORCING STEEL SHALL BE W20 OR D20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

* THE "SP" SPIRAL REINFORCING STEEL SHALL BE W31 OR D31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

CLASS A CONCRETE BREAKDOWN FOR BENT 1

| | |
|---|---|
| POUR #2 (COLUMNS) | 31.0 CY |
| POUR #3 (CAP) | 28.7 CY |
| TOTAL CLASS A CONCRETE | 59.7 CY |

DRILLED PIERS: (FOR BENT 1)

| | |
|---|---|
| DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS) | 28.2 CY |

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+18.00 -LNB-

SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A. LEBLANC

10/3/2023

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RALEIGH
SUBSTRUCTURE

# BENT NO. 1 DETAILS

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CHECKED BY : KAR DATE : 12/22
DESIGN ENGINEER OF RECORD: MAL DATE : 6/23

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| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

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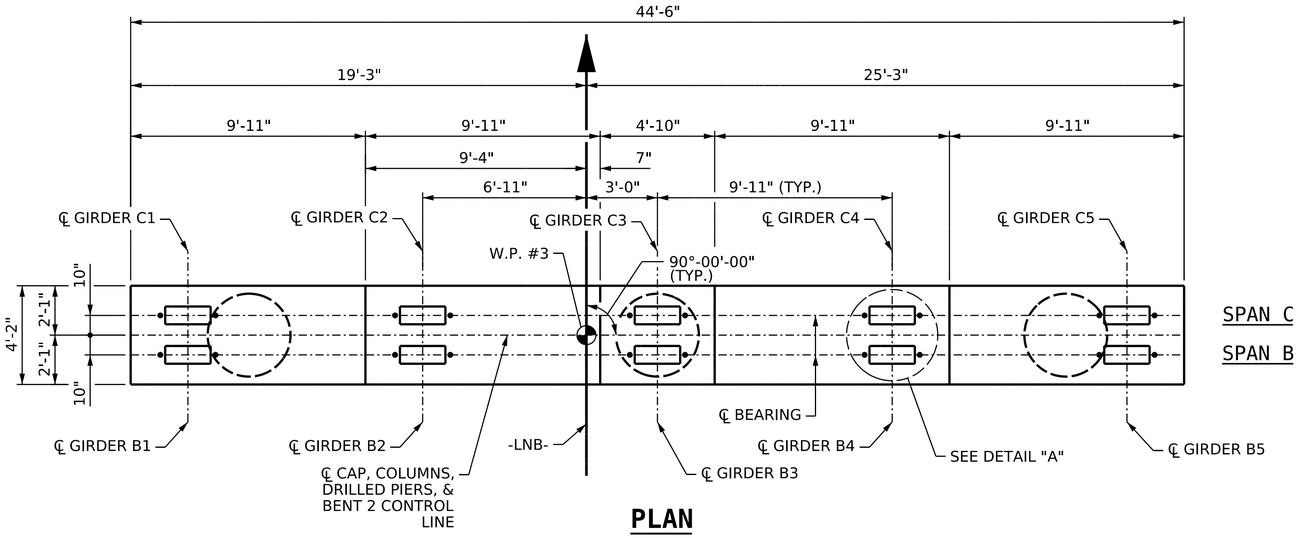
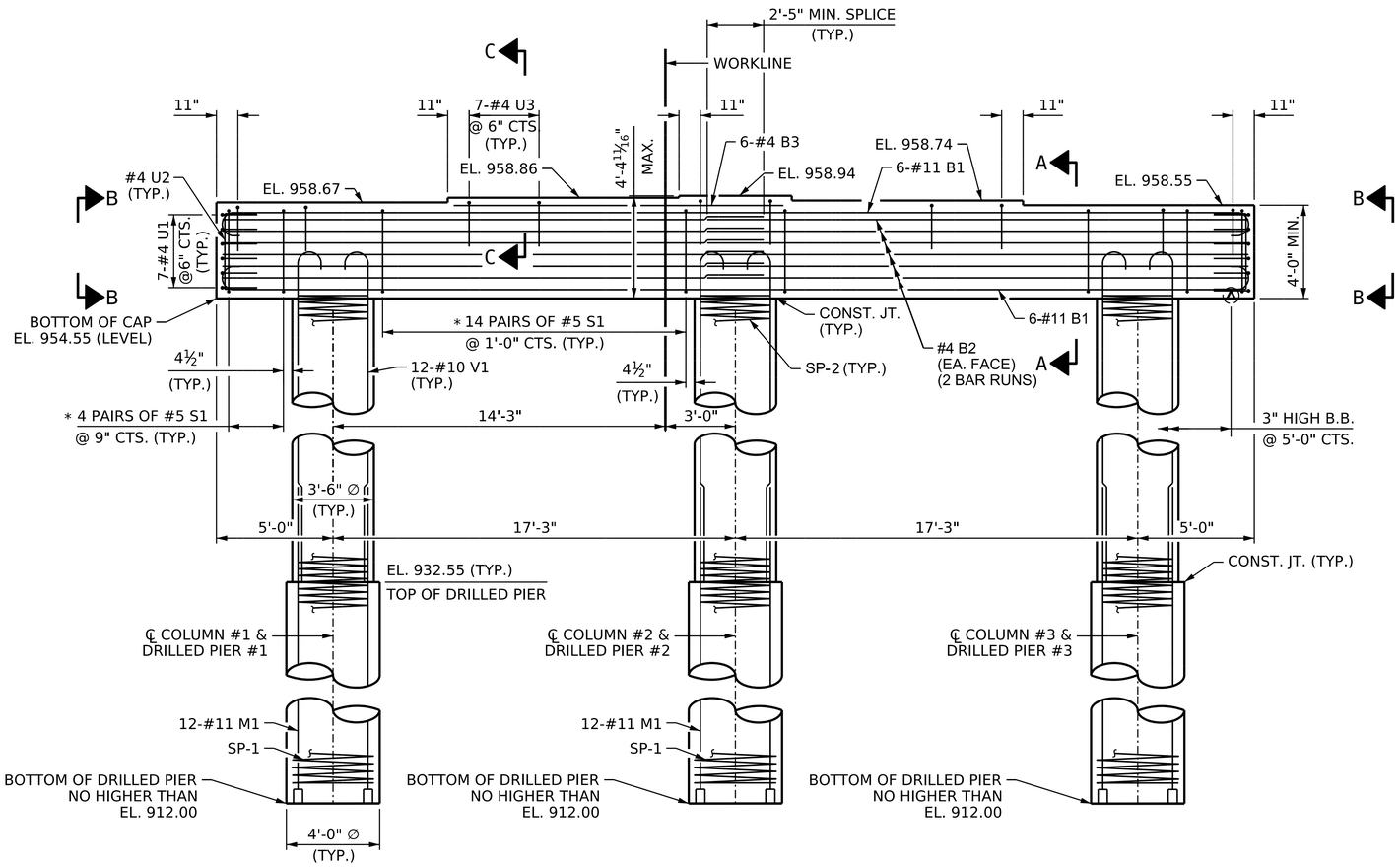



## PLAN




## ELEVATION

## NOTES

FOR SECTION CUTS AND VIEWS, SEE SHEET 2 OF 2.

FOR REINFORCING BILL OF MATERIAL, SEE SHEET 2 OF 2.

STIRRUPS AND U3 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO AVOID ANCHOR BOLTS.

* INVERT ALTERNATE #5 S1 STIRRUP PAIRS.

HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".

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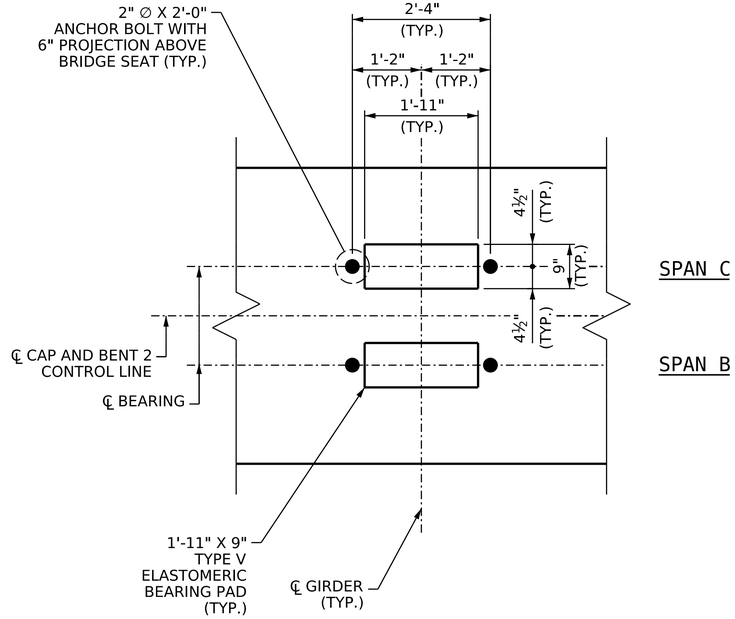


## DETAIL "A"

DIMENSIONS ARE TYPICAL FOR EACH GIRDER

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+18.00 -LNB-

SHEET 1 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARCA LEBLANC

10/3/2023

DocuSigned by: Marc A. LeBlanc

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RALEIGH
SUBSTRUCTURE

**BENT NO. 2**

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900 RIDGEFIELD DRIVE, SUITE 325 • RALEIGH, NC 27609
(919) 855-9989 • NC LICENSE NO. F-1049
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| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

| | | |
|---|---|---|
| DRAWN BY : | GD | DATE : 12/22 |
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| DESIGN ENGINEER OF RECORD: | MAL | DATE : 6/23 |

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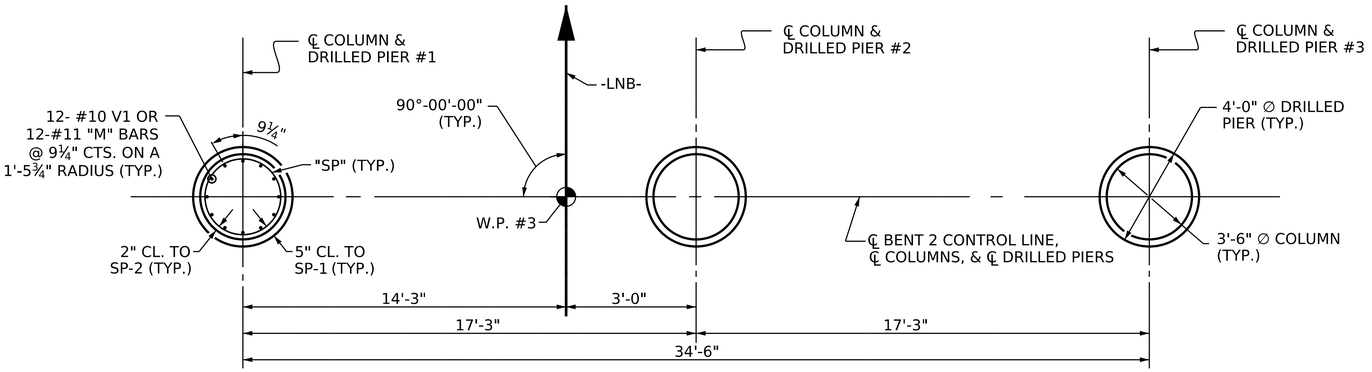
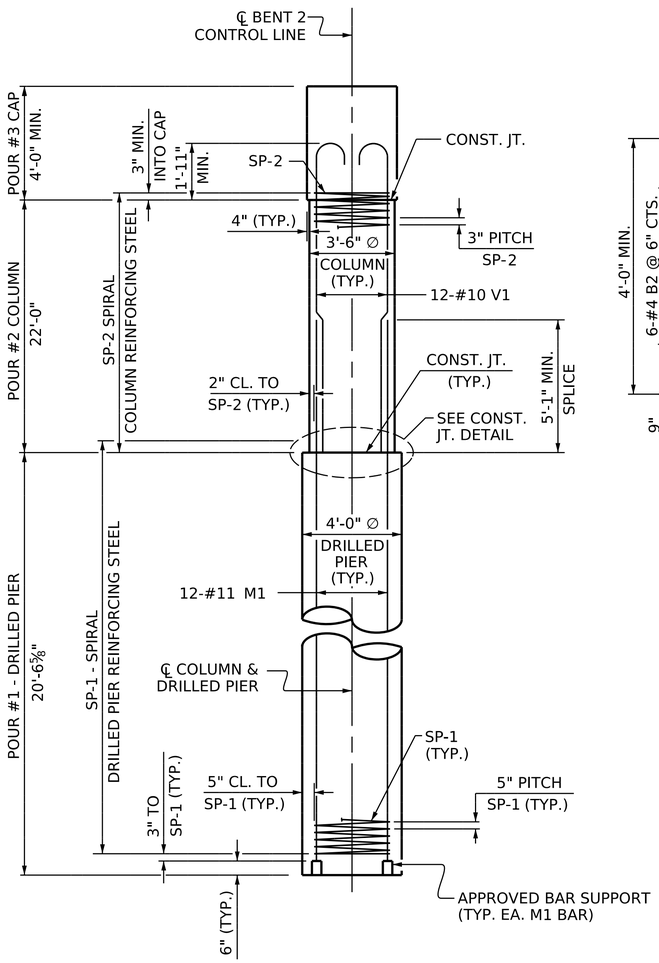
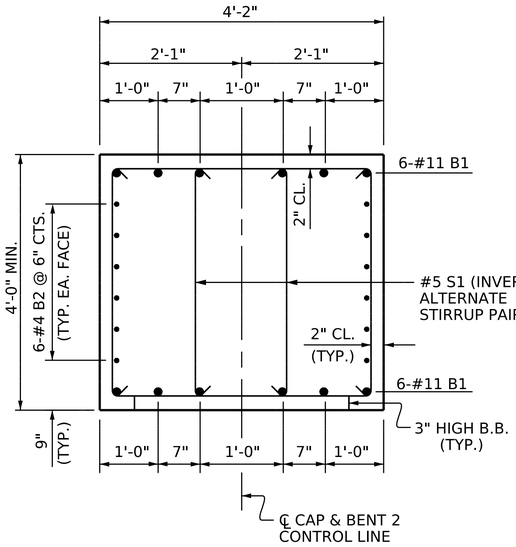


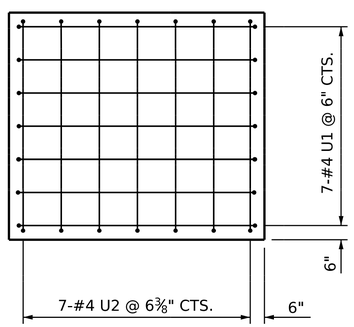

## PLAN OF DRILLED PIERS AND COLUMNS



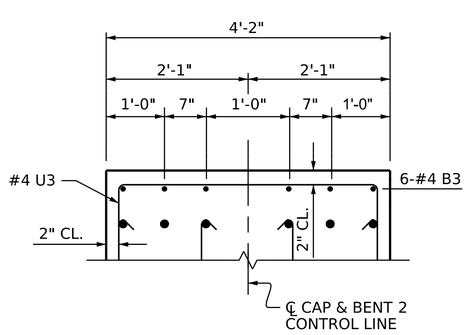

## END ELEVATION



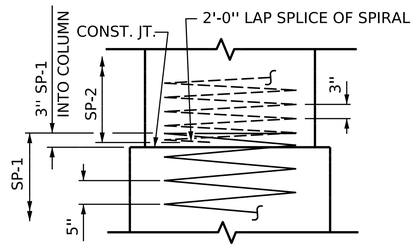

## SECTION A-A




## VIEW B-B

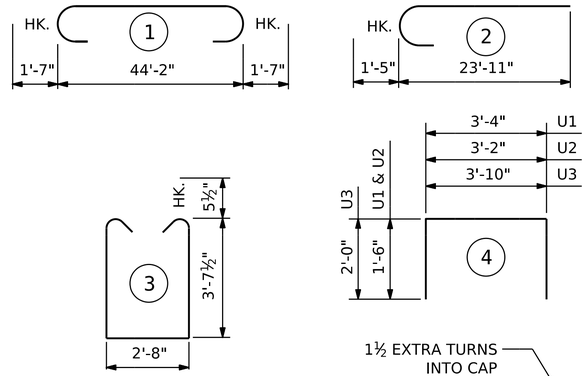



## PARTIAL SECTION C-C




## CONSTRUCTION JOINT DETAIL

## BAR TYPES




ALL BAR DIMENSIONS ARE OUT TO OUT.

## BILL OF MATERIAL

### BENT NO. 2

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| B1 | 12 | #11 | 1 | 47'-4" | 3,018 |
| B2 | 24 | #4 | STR | 23'-4" | 374 |
| B3 | 6 | #4 | STR | 14'-3" | 57 |
| | | | | | |
| M1 | 36 | #11 | STR | 28'-2" | 5,387 |
| | | | | | |
| S1 | 72 | #5 | 3 | 10'-10" | 814 |
| | | | | | |
| U1 | 14 | #4 | 4 | 6'-4" | 59 |
| U2 | 14 | #4 | 4 | 6'-2" | 58 |
| U3 | 35 | #4 | 4 | 7'-10" | 183 |
| | | | | | |
| V1 | 36 | #10 | 2 | 25'-4" | 3,924 |
| | | | | | |
| | | | | | |

REINFORCING STEEL (FOR BENT 2) 13,874 LBS.

| | | | | | |
|---|---|---|---|---|---|
| SP-1 | 3 | * | 6 | 494'-7" | 1,548 |
| SP-2 | 3 | ** | 5 | 888'-10" | 1,781 |

SPIRAL COLUMN REINFORCING STEEL (FOR BENT 2) 3,329 LBS.

** THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

CLASS A CONCRETE BREAKDOWN FOR BENT 2

| | |
|---|---|
| POUR #2 (COLUMNS) | 23.5 CY |
| POUR #3 (CAP) | 28.7 CY |
| TOTAL CLASS A CONCRETE | 52.3 CY |

DRILLED PIERS: (FOR BENT 2)

| | |
|---|---|
| DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS) | 28.7 CY |

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+18.00 -LNB-

SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A. LEBLANC

10/3/2023

DocuSigned by: Marc A. LeBlanc C145E00A8F2F4412...

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DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

# BENT NO. 2 DETAILS

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CHECKED BY : KAR DATE : 12/22
DESIGN ENGINEER OF RECORD: MAL DATE : 6/23

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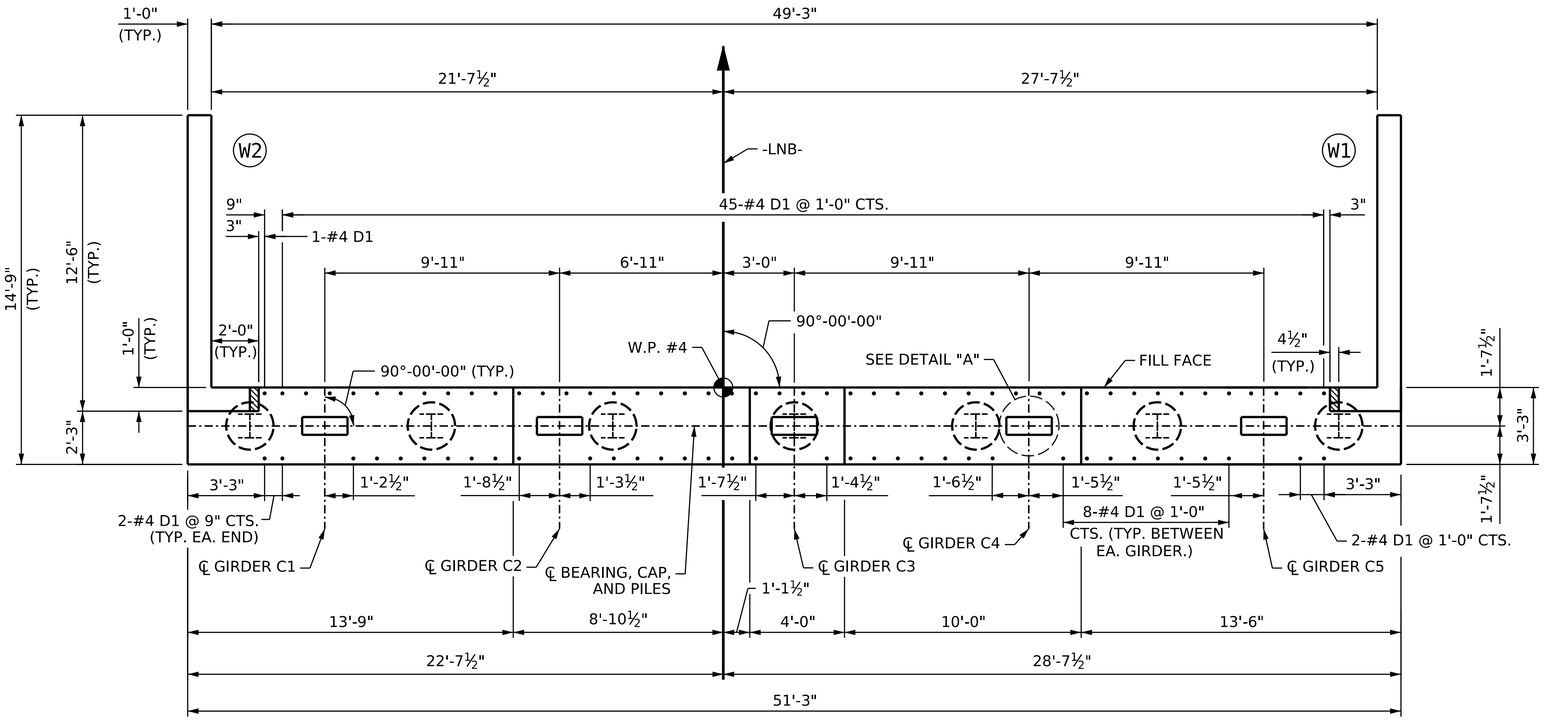
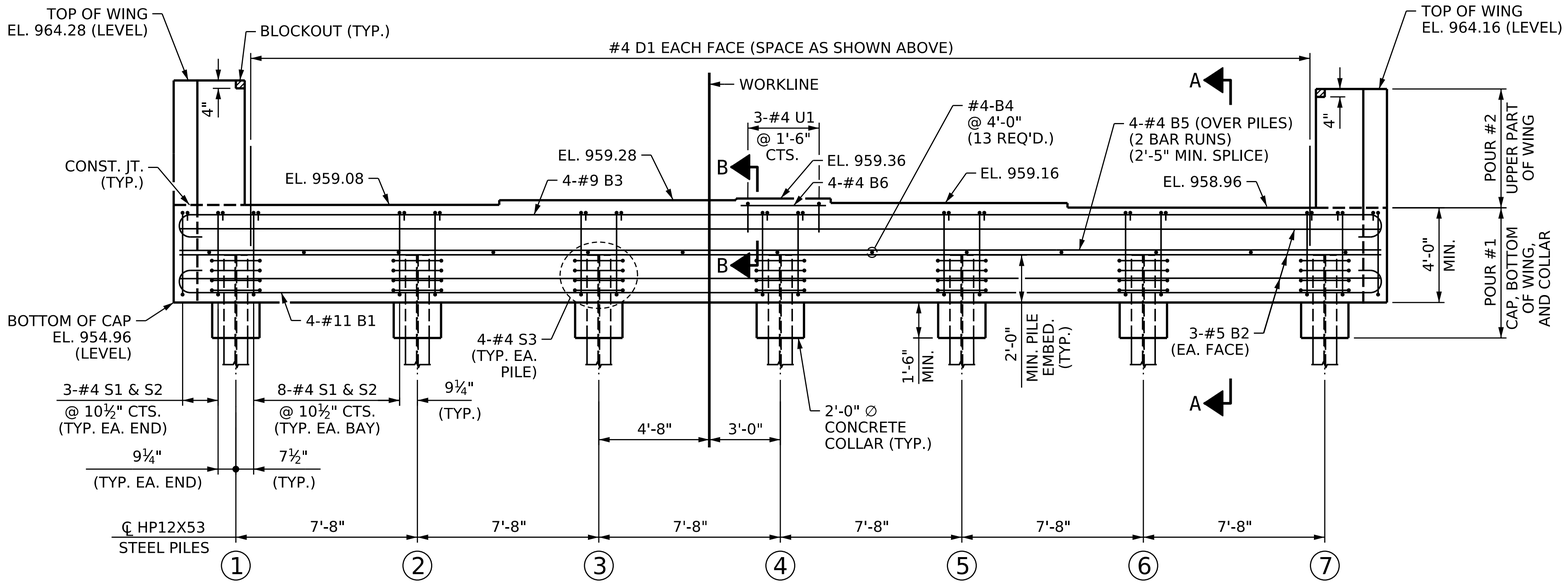



## PLAN




## ELEVATION

## NOTES

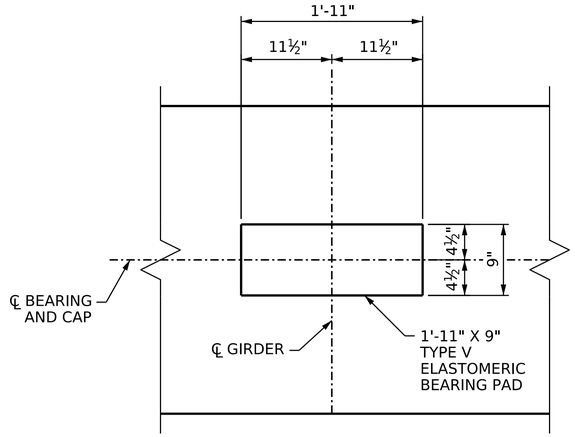
FOR SECTION A-A AND PARTIAL SECTION B-B, SEE SHEET 3 OF 3.

#4 D1 STIRRUP BARS MAY BE SHIFTED SLIGHTLY TO AVOID STIRRUPS IN CAP AND STEPS IN CAP.

SEE SUPERSTRUCTURE SHEETS FOR UPPER PART OF INTEGRAL END BENT DETAILS.

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

THE TOP SURFACE OF THE END BENT CAP AND WINGS, EXCLUDING THE BEARING AREA AND EXPOSED AREA OUTSIDE OF CONCRETE DIAPHRAGM, SHALL BE RAKED TO A DEPTH OF ¼".




## DETAIL "A"

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+18.00 -LNB-

SHEET 1 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARCA LEBLANC

10/3/2023

DocuSigned by: Marc A. LeBlanc

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# INTEGRAL END BENT NO. 2

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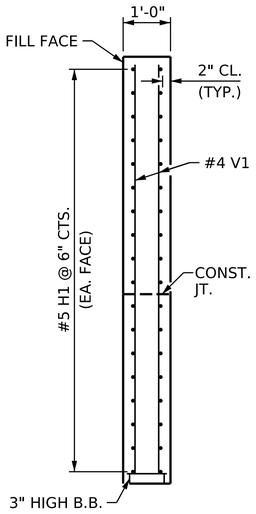
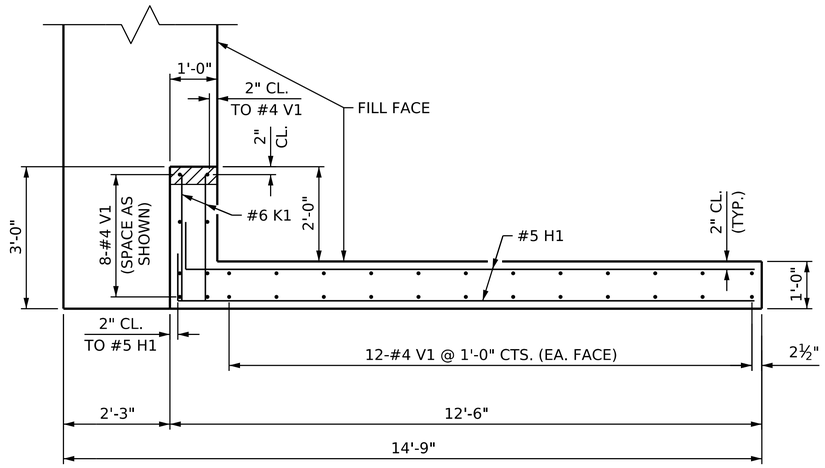
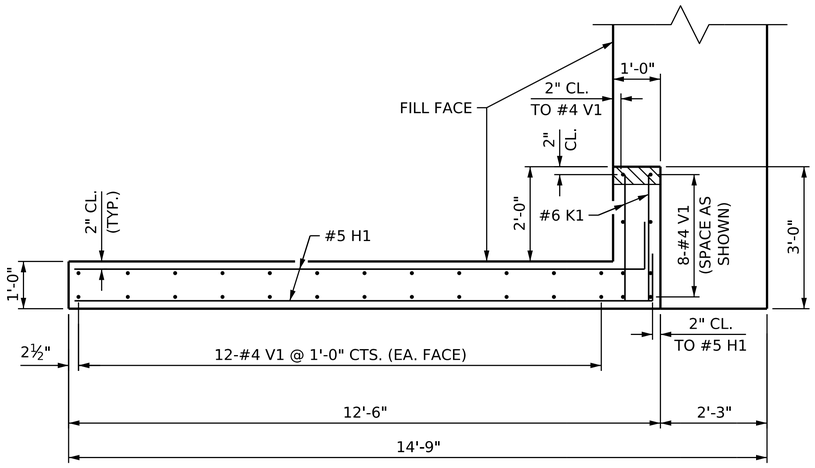
hbollinsky



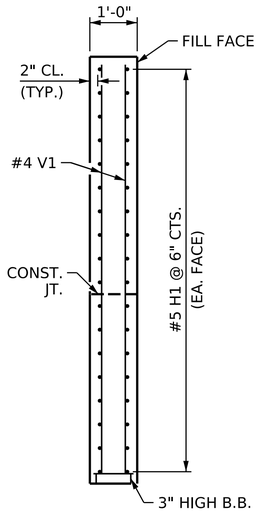

## SECTION C-C




## PLAN OF WING - W1

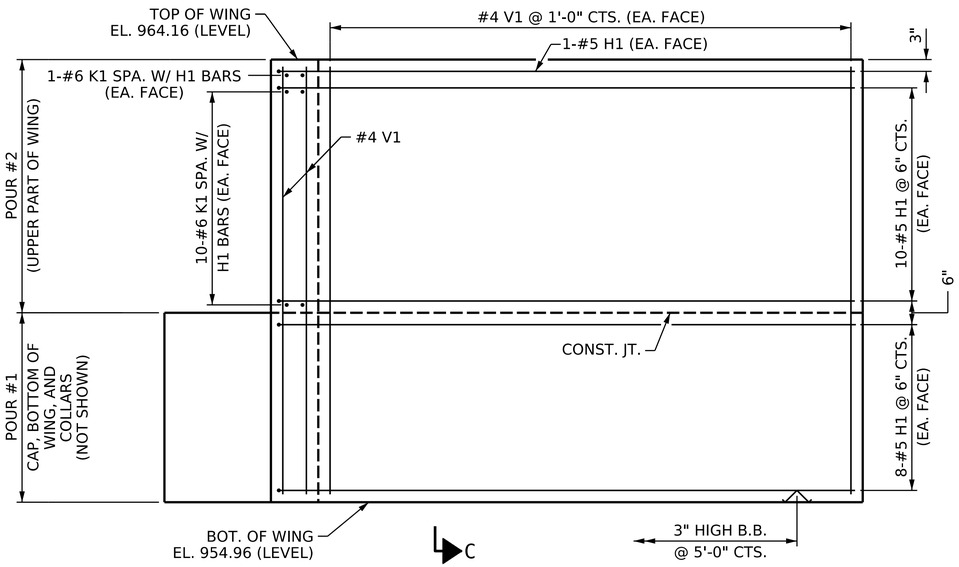



## PLAN OF WING - W2



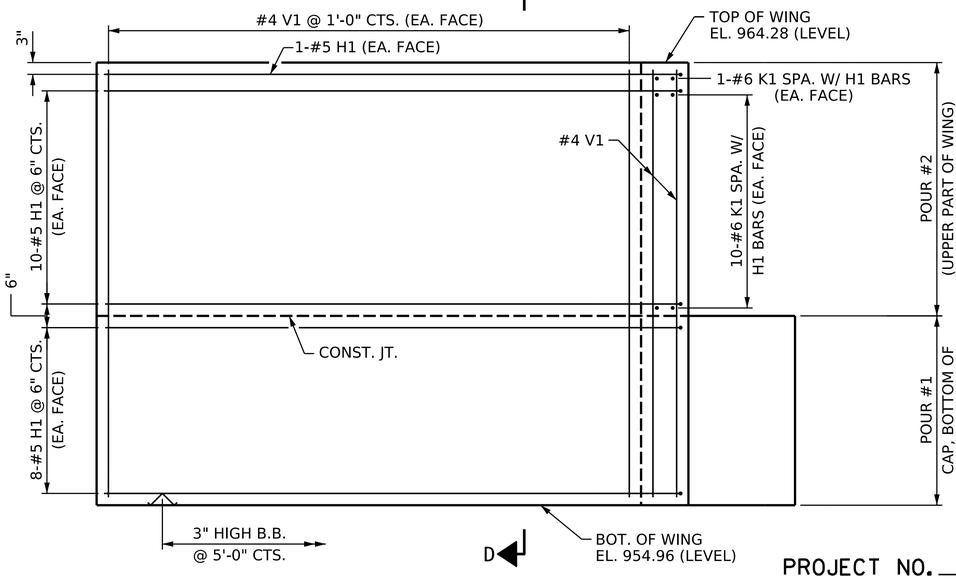

## SECTION D-D

C




## ELEVATION OF WING - W1

D




## ELEVATION OF WING - W2

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+18.00 -LNB-

SHEET 2 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARCA LEBLANC

10/3/2023

DocuSigned by: Marc A. LeBlanc

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# INTEGRAL END BENT NO. 2

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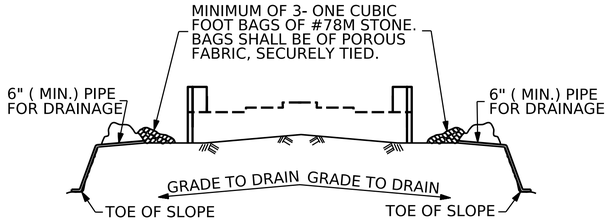
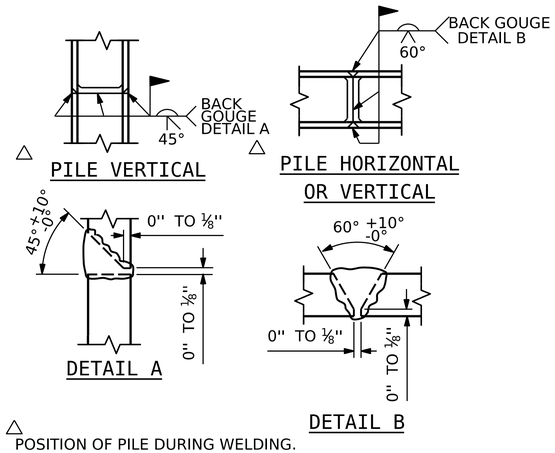



BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

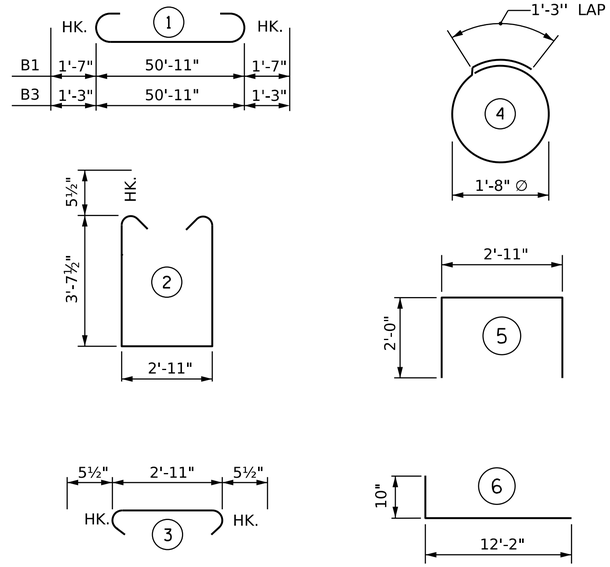
## TEMPORARY DRAINAGE AT END BENT




△ POSITION OF PILE DURING WELDING.

## PILE SPLICE DETAILS

## BAR TYPES




ALL BAR DIMENSIONS ARE OUT TO OUT.

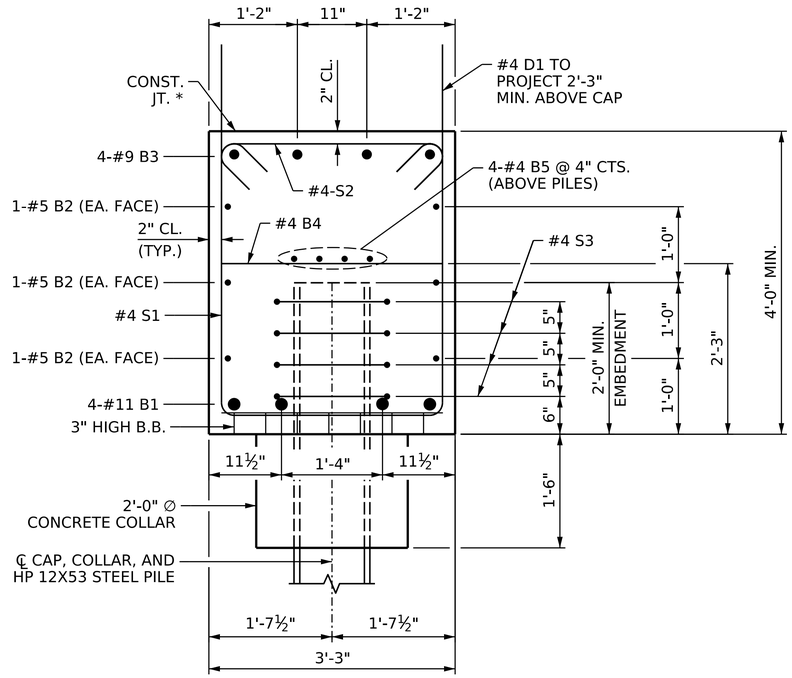
## BILL OF MATERIAL
### END BENT NO. 2

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| B1 | 4 | #11 | 1 | 54'-1" | 1149 |
| B2 | 6 | #5 | STR | 50'-11" | 319 |
| B3 | 4 | #9 | 1 | 53'-5" | 726 |
| B4 | 13 | #4 | STR | 2'-11" | 25 |
| B5 | 8 | #4 | STR | 26'-8" | 143 |
| B6 | 4 | #4 | STR | 3'-8" | 10 |
| | | | | | |
| D1 | 82 | #4 | STR | 4'-3" | 233 |
| | | | | | |
| H1 | 76 | #5 | 6 | 13'-0" | 1030 |
| | | | | | |
| K1 | 44 | #6 | STR | 2'-8" | 176 |
| | | | | | |
| S1 | 54 | #4 | 2 | 11'-1" | 400 |
| S2 | 54 | #4 | 3 | 3'-10" | 138 |
| S3 | 28 | #4 | 4 | 6'-6" | 122 |
| | | | | | |
| U1 | 3 | #4 | 5 | 6'-11" | 14 |
| | | | | | |
| V1 | 64 | #4 | STR | 8'-10" | 378 |
| V2 | 64 | #4 | STR | 8'-10" | 378 |

REINFORCING STEEL 5241 LBS.

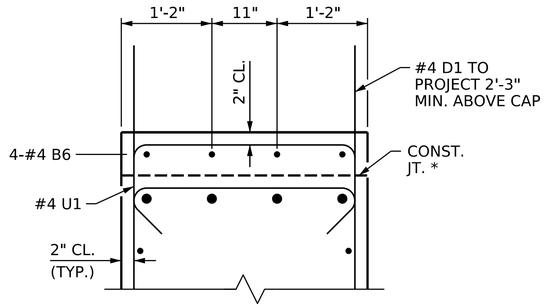
CLASS A CONCRETE
- POUR #1
  - COLLARS, CAP, AND BOTTOM OF WINGS 30.3 CY
- POUR #2
  - UPPER PART OF WINGS 5.6 CY

TOTAL CLASS A CONCRETE 35.9 CY




## SECTION A-A

* THE TOP SURFACE OF THE END BENT CAP AND WINGS, EXCLUDING THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF ¼"




## PARTIAL SECTION B-B

* THE TOP SURFACE OF THE END BENT CAP AND WINGS, EXCLUDING THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF ¼"

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+18.00 -LNB-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
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# INTEGRAL END BENT NO. 2 DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARCA LEBLANC

10/3/2023

DocuSigned by: Marc A. LeBlanc

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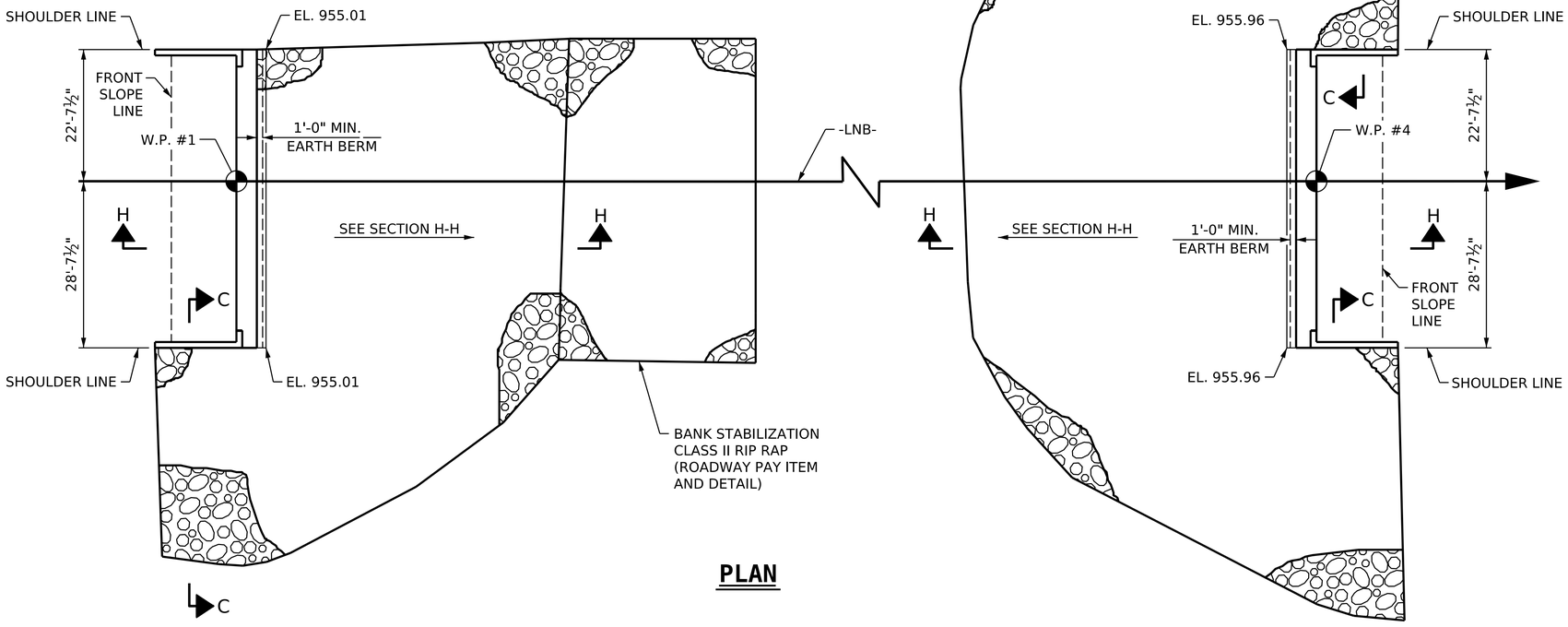


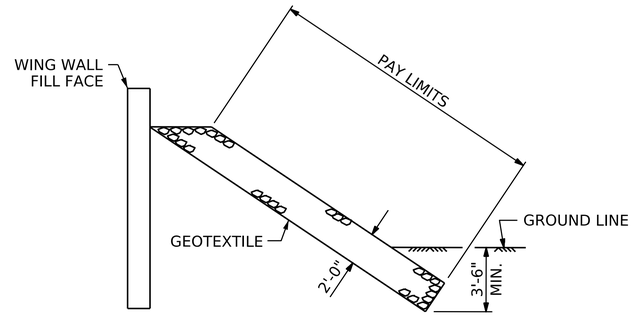

**PLAN**

## NOTE

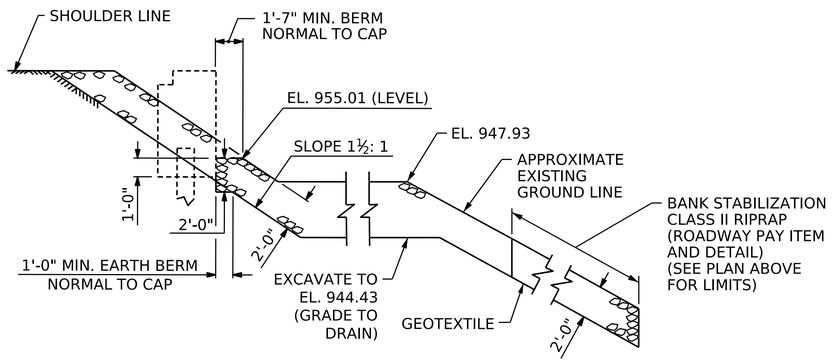
FOR BERM WIDTH DIMENSIONS AND OTHER RIP RAP DETAILS, SEE GENERAL DRAWING.

## ESTIMATED QUANTITIES

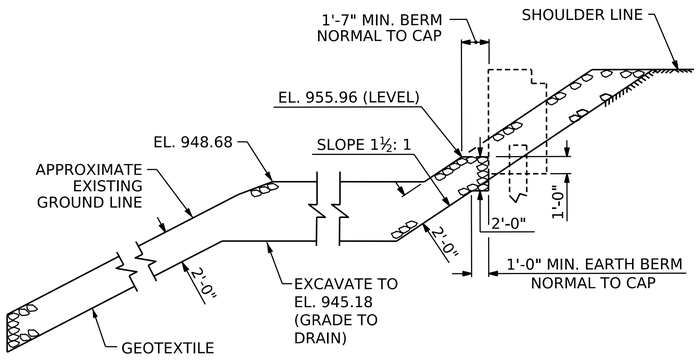
| BRIDGE @ STA. 23+18.00 -LNB- | RIP RAP CLASS II (2'-0" THICK) | GEOTEXTILE FOR DRAINAGE |
|---|---|---|
| | TONS | SQUARE YARDS |
| END BENT 1 | 763 | 848 |
| END BENT 2 | 904 | 1,005 |




SECTION C-C




SECTION H-H
END BENT 1




SECTION H-H
END BENT 2

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+18.00 -LNB-

STATE OF NORTH CAROLINA
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RALEIGH

# RIP RAP DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A. LEBLANC

10/3/2023

DocuSigned by: Marc A. LeBlanc C145E00A8725A412

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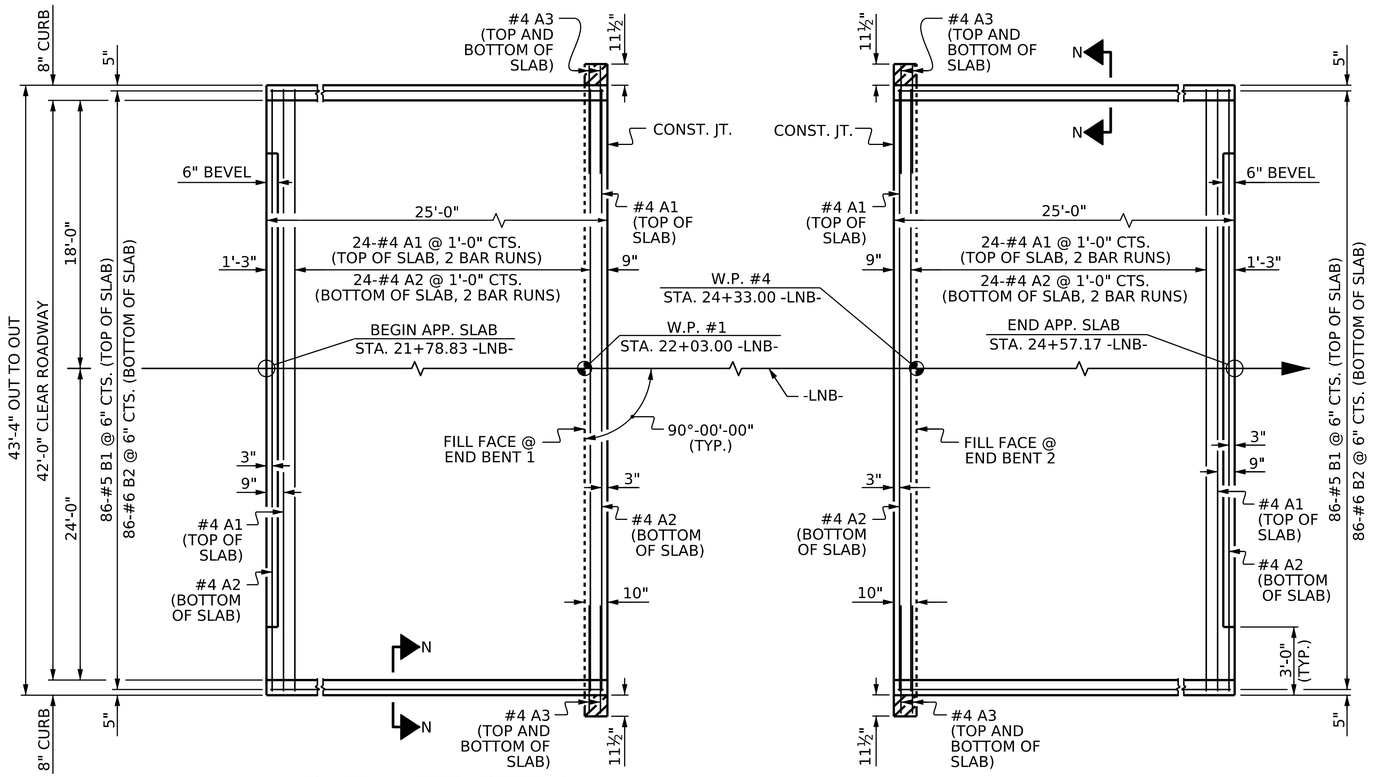


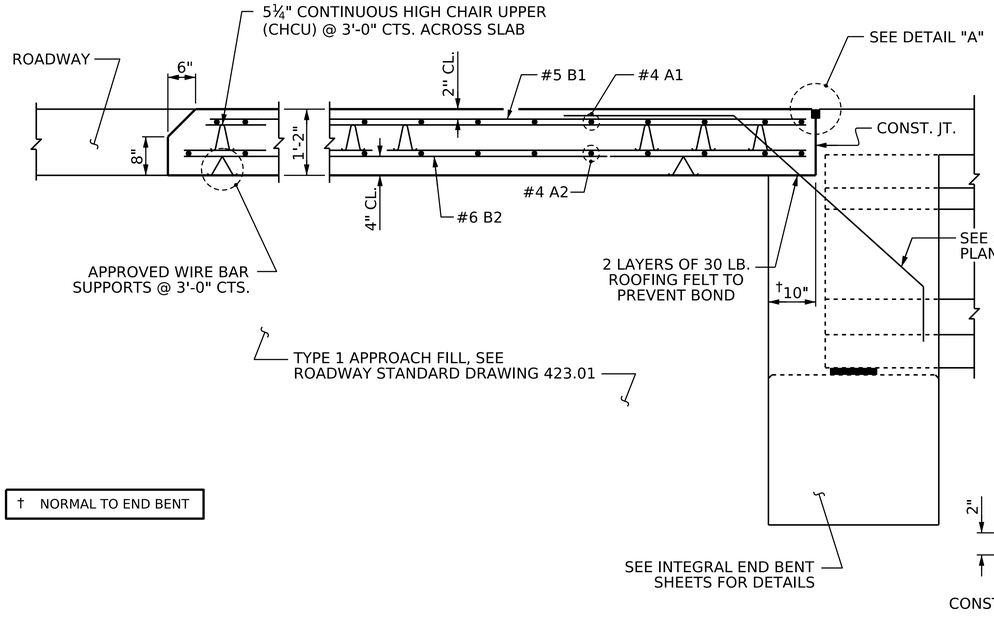

## PLAN @ END BENT 1




## PLAN @ END BENT 2

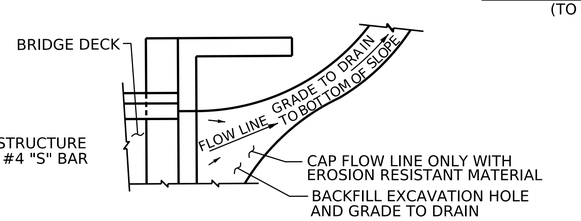
DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

▨ CONCRETE TO BE FILLED IN DURING CONSTRUCTION OF APPROACH SLABS



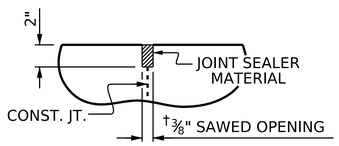

† NORMAL TO END BENT

## SECTION THRU SLAB

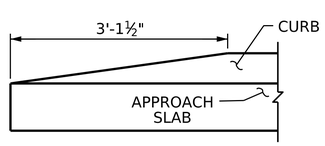



NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

## TEMPORARY DRAINAGE DETAIL




## DETAIL "A"




## END OF CURB WITHOUT SHOULDER BERM GUTTER

## NOTES

FOR BRIDGE APPROACH FILL, SEE ROADWAY PLANS.

APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.

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.

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

AT THE CONTRACTORS OPTION, "TYPE 1A - ALTERNATE APPROACH FILL" (ROADWAY APPROACH STD. 423.02) MAY BE CONSTRUCTED AT NO ADDITIONAL COST TO THE DEPARTMENT IN LIEU OF "TYPE 1 - APPROACH FILL".

## BILL OF MATERIAL

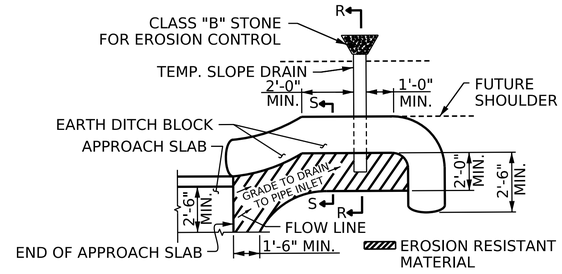
### FOR ONE APPROACH SLAB (2 REQ'D)

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| ✳ A1 | 52 | #4 | STR | 22'-6" | 782 |
| A2 | 52 | #4 | STR | 22'-6" | 782 |
| ✳ A3 | 8 | #4 | STR | 3'-0" | 16 |
| | | | | | |
| ✳ B1 | 86 | #5 | STR | 24'-0" | 2153 |
| B2 | 86 | #6 | STR | 24'-6" | 3165 |

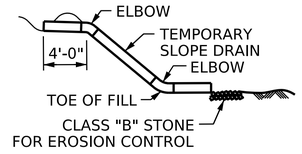
| | |
|---|---|
| REINFORCING STEEL | 3,947 LBS. |
| ✳ EPOXY COATED REINFORCING STEEL | 2,951 LBS. |
| CLASS AA CONCRETE | 47.0 C. Y. |

## SPLICE LENGTHS

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

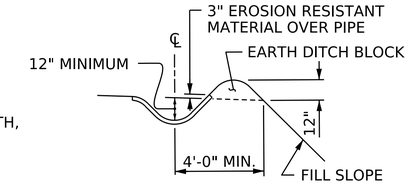



## PLAN VIEW




## SECTION R-R

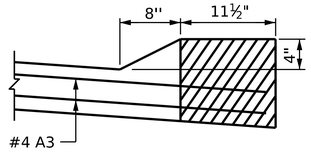
NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

OTHER REINFORCEMENT NOT SHOWN FOR CLARITY

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+18.00 -LNB-

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A. LEBLANC

10/3/2023

DocuSigned by: Marc A. LeBlanc C1A8E09AB2F4412...

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

# BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT WITH FLEXIBLE PAVEMENT

| | | | |
|---|---|---|---|
| ASSEMBLED BY : | HRB | DATE : | 12/22 |
| CHECKED BY : | MAL | DATE : | 1/23 |
| DRAWN BY : TLA | 10/05 | REV. 12/17 | MAA/THC |
| CHECKED BY : GM | 5/06 | REV. 06/19 | BNB/THC |
| | | REV. 07/23 | BNB/SNM |

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900 RIDGEFIELD DRIVE, SUITE 325 • RALEIGH, NC 27609
(919) 855-9989 • NC LICENSE NO. F-1049
WWW.AMTENGINEERING.COM

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-32 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

9/29/2023
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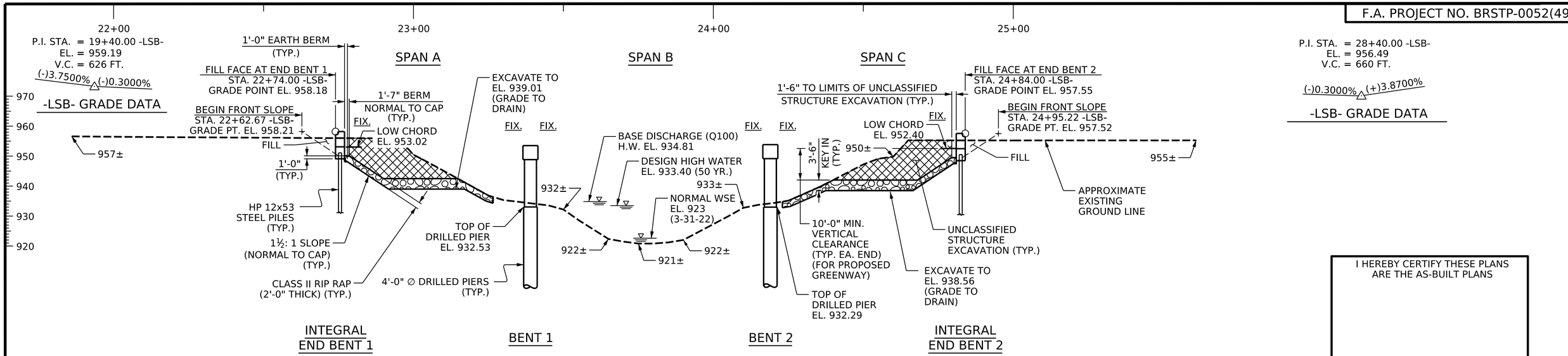
hbollinsky

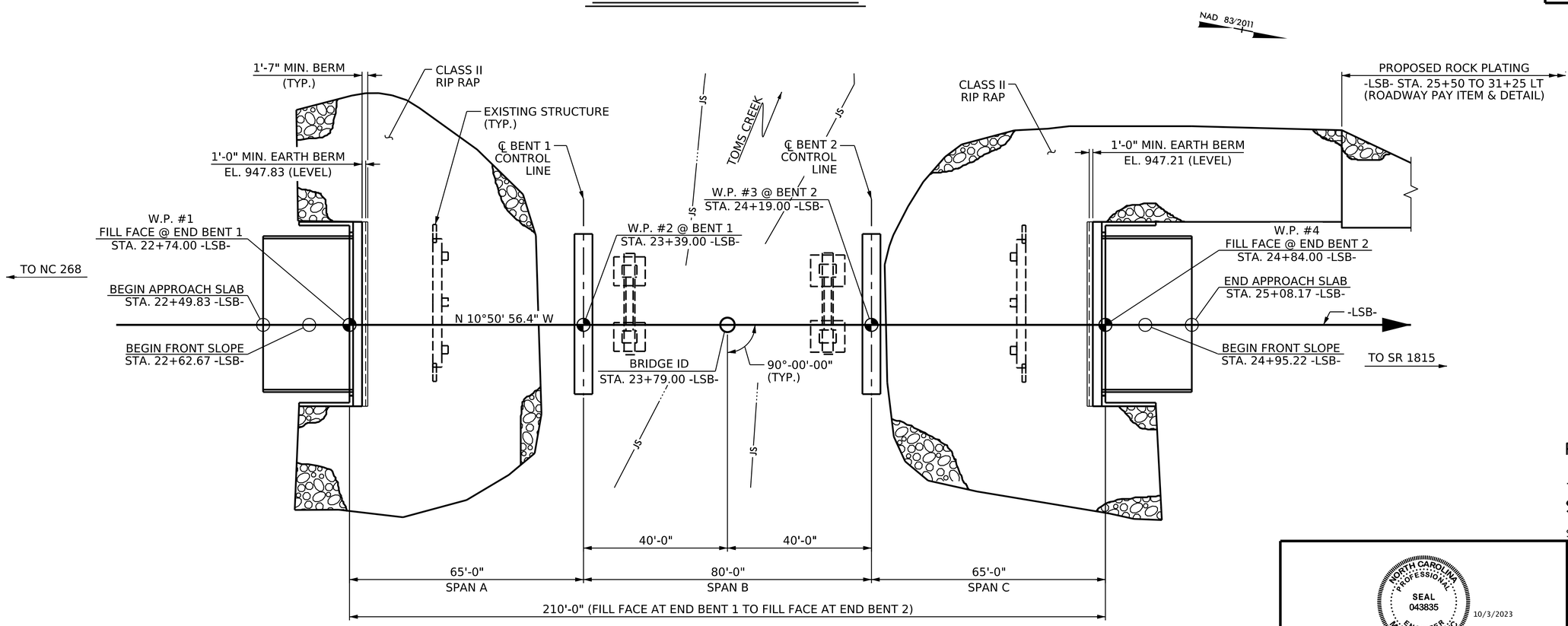
STD. NO. BAS5 (SHT 1)

F.A. PROJECT NO. BRSTP-0052(49)




## SECTION ALONG -LSB-

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS




## PLAN ALONG -LSB-

(FOR CLARITY, PILES & COLUMNS ARE NOT SHOWN IN PLAN VIEW)

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+79.00 -LSB-

SHEET 1 OF 4 REPLACES BRIDGE NO. 850126

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A. LEBLANC

10/3/2023

DocuSigned by: Marc A. LeBlanc

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RALEIGH

# GENERAL DRAWING

FOR BRIDGE ON US 52 SB OVER TOMS CREEK BETWEEN SR 1815 AND NC 268

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| NO. | BY: | DATE: | NO. | BY: | DATE: | S2-1 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

DRAWN BY : HRB DATE : 12/22
CHECKED BY : MAL DATE : 12/22
DESIGN ENGINEER OF RECORD: MAL DATE : 6/23

9/29/2023
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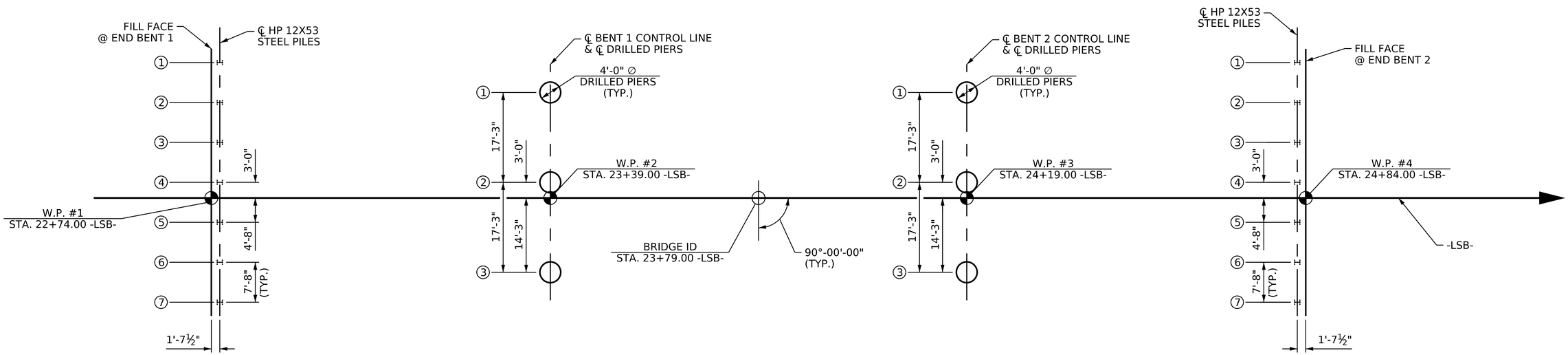
hbollinsky

NAD 83/2011




INTEGRAL
END BENT 1

BENT 1

BENT 2

INTEGRAL
END BENT 2

# FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES AND DRILLED PIERS ARE SHOWN TO THE PILE AND DRILLED PIER CENTERLINES

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+79.00 -LSB-

SHEET 2 OF 4

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A. LEBLANC

10/3/2023

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Marc A. LeBlanc
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

## GENERAL DRAWING

FOR BRIDGE ON US 52 SB
OVER TOMS CREEK BETWEEN
SR 1815 AND NC 268

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900 RIDGEFIELD DRIVE, SUITE 325 • RALEIGH, NC 27609
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| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

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CHECKED BY : MAL DATE : 5/23
DESIGN ENGINEER OF RECORD: MAL DATE : 6/23

9/29/2023
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hbollinsky

## SUMMARY OF PILE INFORMATION/INSTALLATION

(Blank entries indicate item is not applicable to structure)

| End Bent/ Bent No, Pile(s) #(-#) (e.g., "Bent 1, Piles 1-5") | Factored Resistance per Pile TONS | Pile Cut-Off (Top of Pile) Elevation FT | Estimated Pile Length per Pile FT | Scour Critical Elevation FT | Driven Piles | | | Predrilling for Piles* | | | Drilled-In Piles | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Min Pile Tip (Tip No Higher Than) Elev FT | Required Driving Resistance (RDR)** per Pile TONS | Total Pile Redrives Quantity EACH | Predrilling Length per Pile Lin FT | Predrilling Elevation (Elev Not To Predrill Below) FT | Maximum Predrilling Dia INCHES | Pile Excavation (Bottom of Hole) Elev FT | Pile Exc Not In Soil per Pile Lin FT | Pile Exc In Soil per Pile Lin FT |
| End Bent 1, Piles 1-5 | 115 | See Structure Plans | 20 | | | 192 | | | | | | | |
| End Bent 1, Piles 6-7 | 115 | | 15 | | | 192 | | | | | 939.0 | 4.6 | 5.4 |
| End Bent 2, Piles 1-3 | 115 | | 35 | | | 192 | | | | | | | |
| End Bent 2, Piles 4-7 | 115 | | 40 | | | 192 | | | | | | | |
| | | | | | | | | | | | | | |

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

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

## PILE DESIGN INFORMATION

(Blank entries indicate item is not applicable to structure)

| End Bent/ Bent No, Pile(s) #(-#) (e.g., "Bent 1, Piles 1-5") | Factored Axial Load per Pile TONS | Factored Downdrag Load per Pile TONS | Factored Dead Load* per Pile TONS | Dynamic Resistance Factor | Nominal Downdrag Resistance per Pile TONS | Nominal Scour Resistance per Pile TONS | Scour Resistance Factor (Default = 1.00) |
|---|---|---|---|---|---|---|---|
| End Bent 1, Piles 1-7 | 115 | | | 0.60 | | | 1.00 |
| End Bent 2, Piles 1-7 | 115 | | | 0.60 | | | 1.00 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

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

## SUMMARY OF DRILLED PIER INFORMATION/INSTALLATION

(Blank entries indicate item is not applicable to structure)

| End Bent/ Bent No, Pier(s) #(-#) (e.g., "Bent 1, Piers 1-3") | Factored Resistance per Pier TONS | Minimum Pier Tip (Tip No Higher Than) Elevation FT | Required Tip Resistance per Pier TSF | Scour Critical Elevation FT | Minimum Drilled Pier Penetration Into Rock per Pier Lin FT | Drilled Pier Length* per Pier Lin FT | Drilled Pier Length Not In Soil* per Pier Lin FT | Drilled Pier Length In Soil* per Pier Lin FT | Permanent Steel Casing Required? YES or MAYBE | Permanent Steel Casing Tip Elevation (Elev Not To Extend Casing Below) FT | Permanent Steel Casing Length** per Pier Lin FT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Bent 1, Piers 1-3 | 403 | 909.0 | 20 | 918 | 10.0 | 23.5 | | | YES | 919.0 | 13.5 |
| Bent 2, Piers 1-3 | 404 | 910.0 | 20 | 919 | 10.0 | 22.3 | | | YES | 921.0 | 11.3 |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| TOTAL QTY: | | | | | | 137.4 | | | | | 74.4 |
| | | | | | | | | | | | |

*Drilled Pier Length, Drilled Pier Length Not in Soil and Drilled Pier Length in Soil represent estimated drilled pier quantities and are measured and paid for as either "48" Dia. Drilled Piers" or "48" Dia. Drilled Piers Not in Soil" and "48" Dia. Drilled Piers in Soil" in accordance with Article 411-7 of the *NCDOT Standard Specifications*.

**Permanent Steel Casing Length equals the difference between the ground line or top of drilled pier elevation, whichever is higher, and the permanent casing tip elevation and is measured and paid for as "Permanent Steel Casting for 48" Dia. Drilled Pier" in accordance with Article 411-7 of the *NCDOT Standard Specifications*.

## SUMMARY OF PDA/PILE ORDER LENGTHS

(Blank entries indicate item is not applicable to structure)

| Pile Driving Analyzer (PDA) | | | | Pile Order Lengths | |
|---|---|---|---|---|---|
| End Bent/ Bent No | PDA Testing Required? YES or MAYBE | PDA Test Pile Length FT | Total PDA Testing Quantity EACH | End Bent/ Bent No(s) | Pile Order Length Basis* EST or PDA |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

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

## SUMMARY OF PILE ACCESSORIES

(Blank entries indicate item is not applicable to structure)

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

## SUMMARY OF DRILLED PIER TESTING

(Blank entries indicate item is not applicable to structure)

| End Bent/ Bent No, Pier(s) #(-#) (e.g., "Bent 1, Piers 1-3") | Standard Penetration Test (SPT) Required? YES or MAYBE | Crosshole Sonic Logging (CSL) Required?* YES or MAYBE | Total CSL Tube Length (For All Tubes) per Pier Lin FT | Shaft Inspection Device (SID) Required? YES or MAYBE | Pile Integrity Test (PIT) Required? MAYBE |
|---|---|---|---|---|---|
| Bent 1, Piers 1-3 | | MAYBE | 100.0 | | |
| Bent 2, Piers 1-3 | | MAYBE | 95.2 | | |
| | | | | | |
| | | | | | |
| | | | | | |
| TOTAL QTY: | | 1 | 585.6 | | |
| | | | | | |

*CSL Tubes are required if CSL Testing is or may be required. The number of CSL Tubes per drilled pier is equal to one tube per foot of design pier diameter with at least 4 tubes per pier. The length of each CSL Tube is equal to the drilled pier length plus 1.5 ft.

NOTES:

1. The Pile and Drilled Pier Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer Shiping Yang, #031361 on
2. Total Pile Driving Equipment Setup quantity (not shown in Pile Foundation Tables) equals the number of driven piles, i.e., the number of piles with a Required Driving Resistance.
3. The Engineer will determine the need for PDA Testing, Pipe Pile Plates, Permanent Steel Casing, SPTs, CSL Testing, SID Inspections and PITs when these items may be required.
4. For Piles, see Piles Provision section 450 of the standard specifications.
5. For Drilled Piers, see Section 411 of the Standard Specifications.
6. Fill the bottom 3 ft of holes for pile excavation at End Bent No. 1 with concrete and the rest of holes with class II or III select material that meets Section 1016 of the Standard Specifications.
7. Observe a 2 months waiting period after constructing the embankment, end bent and reinforced bridge approach fill, if applicable, before beginning approach slab construction at End Bent Nos. 1 and 2. For bridge waiting periods, see roadway plans and Section 235 of the Standard Specifications.

PROJECT NO. B-5527

Surry COUNTY

STATION: 23+79.00 -LSB-



NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A. LEBLANC

10/3/2023

DocuSigned by: Marc A. LeBlanc C149F09AB2F4412...

SIGNATURE DATE

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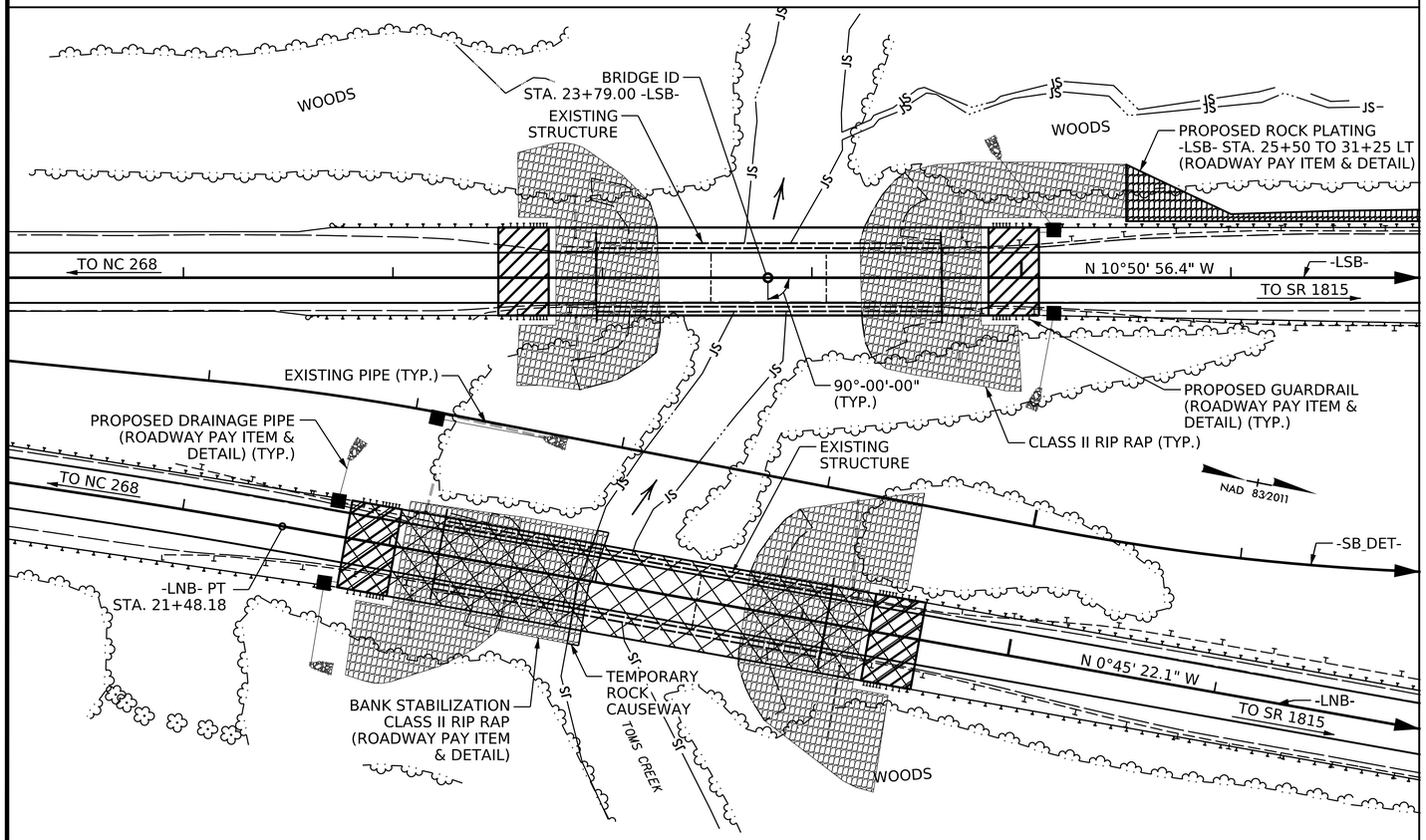
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

# PILE AND DRILLED PIER FOUNDATION TABLES

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S2-3 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

BENCH MARK #2: RAILROAD SPIKE SET IN 11 INCH BIRCH 499.06' RIGHT OF STA. 24+55.07 -LSB-, EL. 941.57'




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

LOCATION SKETCH

## NOTES

ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

PRESTRESSED CONCRETE DECK PANELS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.

REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.

NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 30 FT EACH SIDE OF CENTERLINE ROADWAY AT END BENT 1 AND END BENT 2 AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

THE CONTRACTOR WILL BE REQUIRED TO CONSTRUCT, MAINTAIN AND AFTERWARDS REMOVE A TEMPORARY STRUCTURE AT STATION 18+12 -SB_DET- FOR USE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURE, SEE SPECIAL PROVISIONS.

THE BRIDGE RAILS ON THE TEMPORARY STRUCTURE SHALL BE DESIGNED FOR THE AASHTO LRFD TEST LEVEL 3 (TL-3) CRASH TEST CRITERIA. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURE, SEE SPECIAL PROVISIONS.

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

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

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

## HYDRAULIC DATA

| | |
|---|---|
| DESIGN DISCHARGE | = 5,100 CFS |
| FREQUENCY OF DESIGN FLOOD | = 50 YRS |
| DESIGN HIGH WATER ELEVATION | = 933.4 |
| DRAINAGE AREA | = 29.7 SQ. MI. |
| BASE DISCHARGE (Q100) | = 6,209 CFS |
| BASE HIGH WATER ELEVATION | = 934.81 |

## OVERTOPPING FLOOD DATA

| | |
|---|---|
| OVERTOPPING DISCHARGE | = 50,400 CFS |
| FREQUENCY OF OVERTOPPING FLOOD | = 500 YRS+ |
| OVERTOPPING FLOOD ELEVATION | = 957.4 |

OVERTOPPING AT SAG STA. 25+57 -LSB-

## TOTAL BILL OF MATERIALS

| | CONSTRUCTION, MAINTENANCE & REMOVAL OF TEMPORARY STRUCTURE @ STA. 18+12 -SB_DET- | REMOVAL OF EXISTING STRUCTURE @ STA. 23+79.00 -LSB- | ASBESTOS ASSESSMENT | 4'-0" DIA. DRILLED PIERS | PERMANENT STEEL CASING FOR 4'-0" DIA. DRILLED PIER | CSL TESTING | UNCLASSIFIED STRUCTURE EXCAVATION @ STA. 23+79.00 -LSB- | REINFORCED CONCRETE DECK SLAB | GROOVING BRIDGE FLOORS | CLASS A CONCRETE |
|---|---|---|---|---|---|---|---|---|---|---|
| | LUMP SUM | LUMP SUM | LUMP SUM | LIN. FT. | LIN. FT. | EACH | LUMP SUM | SQ. FT. | SQ. FT. | CU. YDS. |
| SUPERSTRUCTURE | | | | | | | | 9,427 | 10,062 | |
| END BENT 1 | | | | | | | | | | 35.9 |
| BENT 1 | | | | 70.5 | 40.5 | | | | | 45.8 |
| BENT 2 | | | | 66.9 | 33.9 | | | | | 45.8 |
| END BENT 2 | | | | | | | | | | 35.9 |
| TOTAL | LUMP SUM | LUMP SUM | LUMP SUM | 137.4 | 74.4 | 1 | LUMP SUM | 9,427 | 10,062 | 163.4 |

| | BRIDGE APPROACH SLABS | REINFORCING STEEL | SPIRAL COLUMN REINFORCING STEEL | 45" PRESTRESSED CONCRETE GIRDERS | | PILE EXCAVATION IN SOIL | PILE EXCAVATION NOT IN SOIL | PILE DRIVING EQUIPMENT SETUP FOR HP12X53 STEEL | HP 12X53 STEEL PILES | | STEEL PILE POINTS | CONCRETE BARRIER RAIL | RIP RAP CLASS II (2'-0" THICK) | GEOTEXTILE FOR DRAINAGE | ELASTOMERIC BEARINGS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LUMP SUM | LBS. | LBS. | NO. | LIN. FT. | LIN. FT. | LIN. FT. | EACH | NO. | LIN. FT. | EACH | LIN. FT. | TONS | SQ. YDS. | LUMP SUM |
| SUPERSTRUCTURE | | | | 15 | 1,037.1 | | | | | | | 416.7 | | | |
| END BENT 1 | | 5,241 | | | | 10.8 | 9.2 | 7 | 7 | 130 | 5 | | 724 | 805 | |
| BENT 1 | | 13,519 | 3,071 | | | | | | | | | | | | |
| BENT 2 | | 13,280 | 2,979 | | | | | | | | | | | | |
| END BENT 2 | | 5,241 | | | | | | 7 | 7 | 265 | | | 929 | 1,033 | |
| TOTAL | LUMP SUM | 37,281 | 6,050 | 15 | 1,037.1 | 10.8 | 9.2 | 14 | 14 | 395 | 5 | 416.7 | 1,653 | 1,838 | LUMP SUM |

DRAWN BY : HRB DATE : 12/22
CHECKED BY : MAL DATE : 12/22
DESIGN ENGINEER OF RECORD: MAL DATE : 6/23

2/1/2024
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hbolinsky

PROJECT NO. B-5527
SURRY COUNTY
STATION: 23+79.00 -LSB-

SHEET 4 OF 4

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2/2/2024
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A. MORTON THOMAS AND ASSOCIATES, INC.
900 RIDGEFIELD DRIVE, SUITE 325 • RALEIGH, NC 27609
(919) 855-9989 • NC LICENSE NO. F-1049
WWW.AMTENGINEERING.COM

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

# GENERAL DRAWING

FOR BRIDGE ON US 52 SB OVER TOMS CREEK BETWEEN SR 1815 AND NC 268

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S2-4 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

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

| LEVEL | | VEHICLE | WEIGHT (W) (TONS) | CONTROLLING LOAD RATING (#) | MINIMUM RATING FACTORS (RF) | TONS = W x RF | STRENGTH I LIMIT STATE | | | | | | | | | | | SERVICE III LIMIT STATE | | | | | | | COMMENT NUMBER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | LIVE-LOAD FACTORS($\gamma_{LL}$) | MOMENT | | | | | SHEAR | | | | | LIVE-LOAD FACTORS($\gamma_{LL}$) | MOMENT | | | | | | |
| | | | | | | | | 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) | | DISTRIBUTION FACTORS (DF) | RATING FACTOR | SPAN | GIRDER LOCATION | DISTANCE FROM LEFT END OF SPAN (ft) | |
| DESIGN LOAD | | HL-93 (INVENTORY) | N/A | 1 | 1.01 | -- | 1.75 | 0.76 | 1.29 | B | I | 39.17 | 0.96 | 1.39 | B | I | 31.20 | 0.80 | 0.76 | 1.01 | B | I | 39.17 | -- |
| | | HL-93 (OPERATING) | N/A | | 1.67 | -- | 1.35 | 0.76 | 1.67 | B | I | 39.17 | 0.96 | 2.50 | B | I | 47.13 | N/A | -- | -- | -- | -- | -- | -- |
| | | HS-20 (INVENTORY) | 36.000 | 2 | 1.34 | 48.240 | 1.75 | 0.76 | 1.71 | B | I | 39.17 | 0.96 | 2.13 | B | I | 31.20 | 0.80 | 0.76 | 1.34 | B | I | 39.17 | -- |
| | | HS-20 (OPERATING) | 36.000 | | 2.22 | 79.920 | 1.35 | 0.76 | 2.22 | B | I | 39.17 | 0.96 | 3.33 | B | I | 23.23 | N/A | -- | -- | -- | -- | -- | -- |
| LEGAL LOAD | SINGLE VEHICLE (SV) | SNSH | 13.500 | | 3.09 | 41.715 | 1.40 | 0.76 | 4.92 | B | I | 39.17 | 0.96 | 7.68 | B | I | 23.23 | 0.80 | 0.76 | 3.09 | B | I | 39.17 | -- |
| | | SNGARBS2 | 20.000 | | 2.28 | 45.600 | 1.40 | 0.76 | 3.63 | B | I | 39.17 | 0.96 | 5.47 | B | I | 23.23 | 0.80 | 0.76 | 2.28 | B | I | 39.17 | -- |
| | | SNAGRIS2 | 22.000 | | 2.15 | 47.300 | 1.40 | 0.76 | 3.43 | B | I | 39.17 | 0.96 | 5.09 | B | I | 23.23 | 0.80 | 0.76 | 2.15 | B | I | 39.17 | -- |
| | | SNCOTTS3 | 27.250 | | 1.54 | 41.965 | 1.40 | 0.76 | 2.45 | B | I | 39.17 | 0.96 | 3.67 | B | I | 23.23 | 0.80 | 0.76 | 1.54 | B | I | 39.17 | -- |
| | | SNAGGRS4 | 34.925 | | 1.27 | 44.355 | 1.40 | 0.76 | 2.03 | B | I | 39.17 | 0.96 | 3.27 | B | I | 23.23 | 0.80 | 0.76 | 1.27 | B | I | 39.17 | -- |
| | | SNS5A | 35.550 | | 1.25 | 44.438 | 1.40 | 0.76 | 1.99 | B | I | 39.17 | 0.96 | 3.27 | B | I | 23.23 | 0.80 | 0.76 | 1.25 | B | I | 39.17 | -- |
| | | SNS6A | 39.950 | | 1.14 | 45.543 | 1.40 | 0.76 | 1.82 | B | I | 39.17 | 0.96 | 3.06 | B | I | 23.23 | 0.80 | 0.76 | 1.14 | B | I | 39.17 | -- |
| | | SNS7B | 42.000 | | 1.09 | 45.780 | 1.40 | 0.76 | 1.73 | B | I | 39.17 | 0.96 | 2.96 | B | I | 23.23 | 0.80 | 0.76 | 1.09 | B | I | 39.17 | -- |
| | TRUCK TRACTOR SEMI-TRAILER (TTST) | TNAGRIT3 | 33.000 | | 1.39 | 45.870 | 1.40 | 0.76 | 2.22 | B | I | 39.17 | 0.96 | 3.85 | B | I | 23.23 | 0.80 | 0.76 | 1.39 | B | I | 39.17 | -- |
| | | TNT4A | 33.075 | | 1.40 | 46.305 | 1.40 | 0.76 | 2.22 | B | I | 39.17 | 0.96 | 3.37 | B | I | 23.23 | 0.80 | 0.76 | 1.40 | B | I | 39.17 | -- |
| | | TNT6A | 41.600 | | 1.14 | 47.424 | 1.40 | 0.76 | 1.81 | B | I | 39.17 | 0.96 | 3.14 | B | I | 23.23 | 0.80 | 0.76 | 1.14 | B | I | 39.17 | -- |
| | | TNT7A | 42.000 | | 1.14 | 47.880 | 1.40 | 0.76 | 1.82 | B | I | 39.17 | 0.96 | 3.00 | B | I | 23.23 | 0.80 | 0.76 | 1.14 | B | I | 39.17 | -- |
| | | TNT7B | 42.000 | | 1.18 | 49.560 | 1.40 | 0.76 | 1.87 | B | I | 39.17 | 0.96 | 2.87 | B | I | 23.23 | 0.80 | 0.76 | 1.18 | B | I | 39.17 | -- |
| | | TNAGRIT4 | 43.000 | | 1.12 | 48.160 | 1.40 | 0.76 | 1.79 | B | I | 39.17 | 0.96 | 2.46 | B | I | 31.20 | 0.80 | 0.76 | 1.12 | B | I | 39.17 | -- |
| | | TNAGT5A | 45.000 | | 1.06 | 47.700 | 1.40 | 0.76 | 1.69 | B | I | 39.17 | 0.96 | 2.55 | B | I | 31.20 | 0.80 | 0.76 | 1.06 | B | I | 39.17 | -- |
| | | TNAGT5B | 45.000 | 3 | 1.05 | 47.250 | 1.40 | 0.76 | 1.67 | B | I | 39.17 | 0.96 | 2.23 | B | I | 31.20 | 0.80 | 0.76 | 1.05 | B | I | 39.17 | -- |
| EMERGENCY VEHICLE (EV) | | EV2 | 28.750 | | 1.61 | 46.288 | 1.30 | 0.76 | 2.76 | B | I | 39.17 | 0.96 | 4.01 | B | I | 23.23 | 0.80 | 0.76 | 1.61 | B | I | 39.17 | -- |
| | | EV3 | 43.000 | 4 | 1.06 | 45.580 | 1.30 | 0.76 | 1.81 | B | I | 39.17 | 0.96 | 2.72 | B | I | 47.13 | 0.80 | 0.76 | 1.06 | B | I | 39.17 | -- |

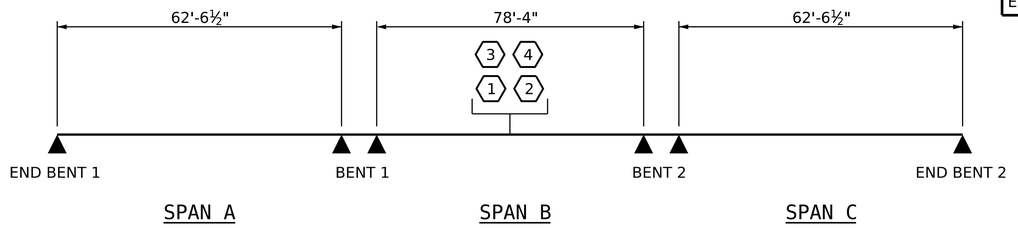
## TABLE OF SECTION RESISTANCES

| | | ℄ BRG. | 0.1L | 0.2L | 0.3L | 0.4L | 0.5L | 0.6L | 0.7L | 0.8L | 0.9L | ℄ BRG. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| INTERIOR GIRDER (I) SPAN B | Φ Vn (KIPS) | 503.3 | 557.9 | 432.6 | 211.3 | 148.9 | 150.8 | 148.9 | 211.3 | 432.6 | 557.9 | 503.3 |
| | Φ Mn (KIPS-FT) | --- | 3863.5 | 5422.3 | 5829.6 | 5903.0 | 5903.0 | 5903.0 | 5829.6 | 5422.3 | 3863.5 | --- |

## SECTION PROPERTIES

| | | SPAN B - INTERIOR | |
|---|---|---|---|
| | UNITS | NON-COMPOSITE | COMPOSITE |
| HEIGHT | IN | 45.0 | 53.75 |
| AREA | $IN^2$ | 559.50 | 1405.70 |
| Ixx | $IN^4$ | 125390 | 416096 |
| Ycg | IN | 20.27 | 37.79 |
| SELF WT. | PLF | 583 | 1668 |
| EFF. WIDTH | IN | --- | 119 |

SECTION PROPERTIES PROVIDED AT MIDSPAN




## LRFR SUMMARY

## LOAD FACTORS:

| DESIGN LOAD RATING FACTORS | LIMIT STATE | $\gamma_{DC}$ | $\gamma_{DW}$ |
|---|---|---|---|
| | STRENGTH I | 1.25 | 1.50 |
| | SERVICE III | 1.00 | 1.00 |

## NOTES:

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

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

## COMMENTS:

1. TRANSFORMING ALL PRESTRESSING TENDONS.
2. GIRDERS DESIGNED AS SIMPLE SPANS FOR FLEXURE.
3. FACTORED SHEAR AND MOMENT CAPACITIES PROVIDED FOR STRENGTH I LIMIT STATE. SECTION PROPERTIES PROVIDED FOR SERVICE III LIMIT STATE.
4. GIRDERS LOAD RATED AS SIMPLE SPANS.

## (#) CONTROLLING LOAD RATING

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

## GIRDER LOCATION

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

PROJECT NO. B-5527
SURRY COUNTY
STATION: 23+79.00 -LSB-

| | | | |
|---|---|---|---|
| ASSEMBLED BY : | LDL | DATE : | 9/23 |
| CHECKED BY : | MAL | DATE : | 9/23 |
| DRAWN BY : MAA 1/08 | REV. 11/12/08RR | | MAA/GM |
| CHECKED BY : GM/DI 2/08 | REV. 10/1/11 | | MAA/GM |
| | REV. 04/23 | | BNB/AAI |

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A. LEBLANC
10/3/2023
DocuSigned by: Marc A. LeBlanc
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
# LRFR SUMMARY FOR PRESTRESSED CONCRETE GIRDERS (NON-INTERSTATE TRAFFIC)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S2-5 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

STD. NO. LRFR1

10/2/2023
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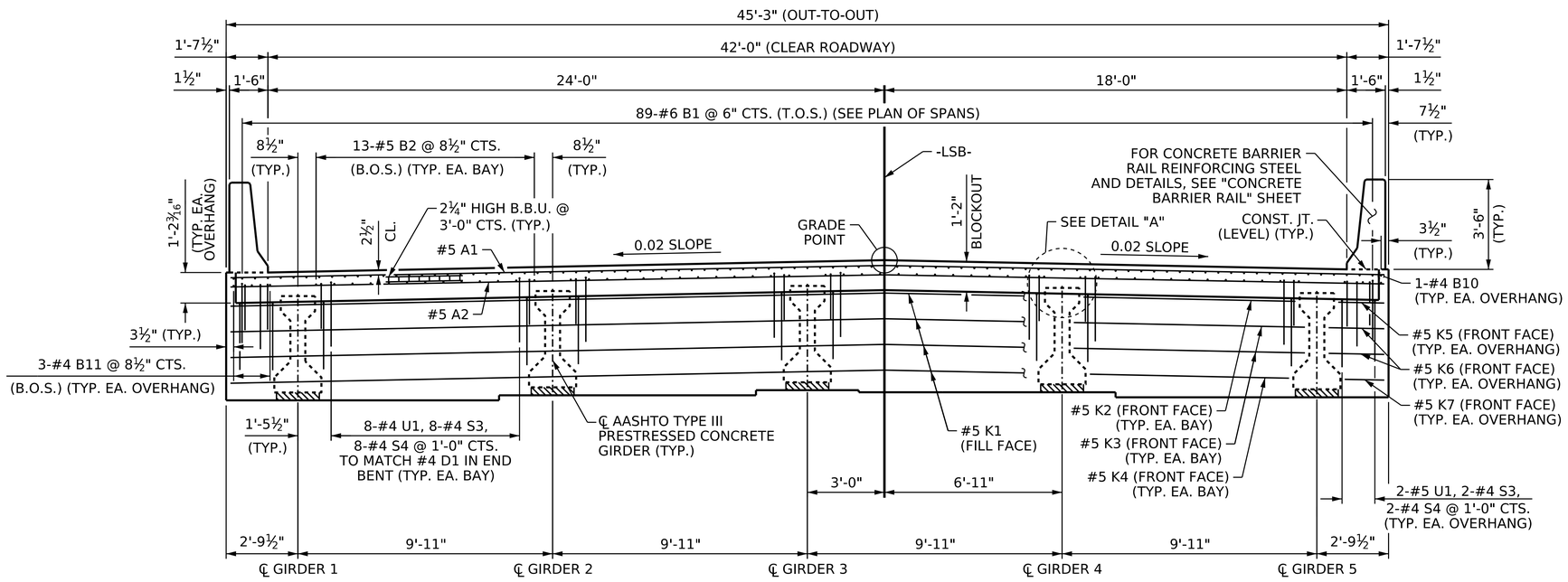
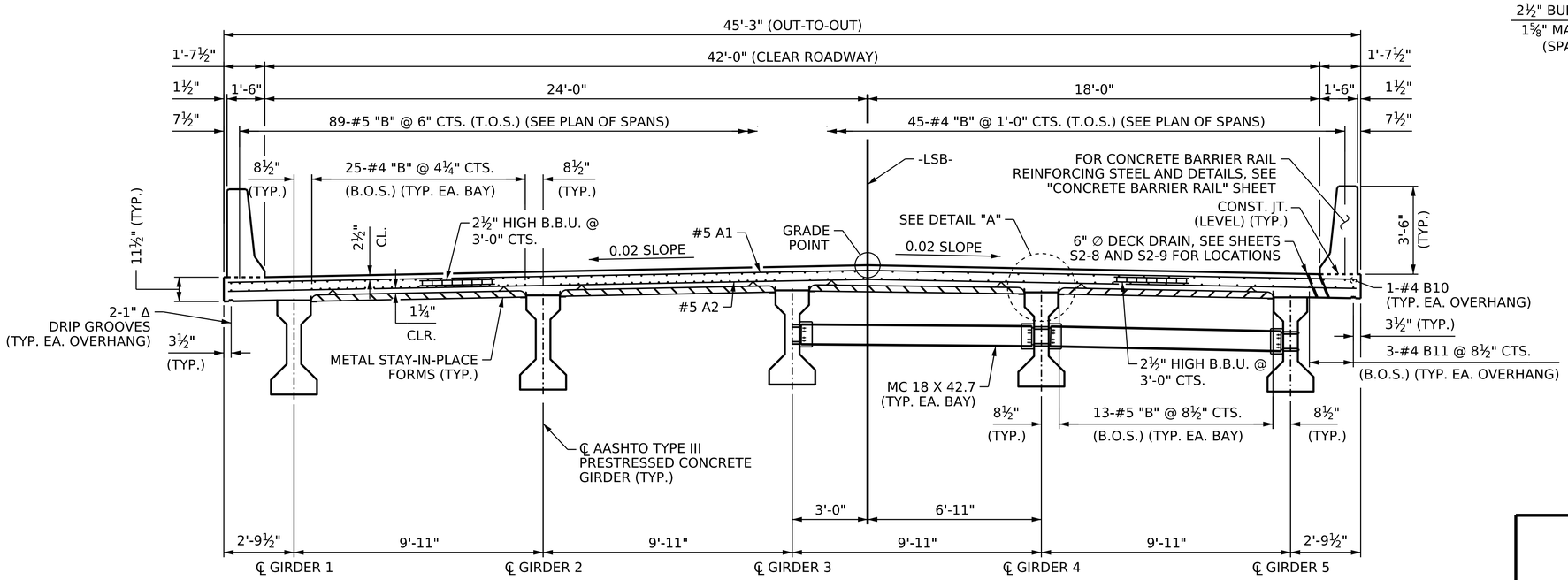
llewandowski




## TYPICAL SECTION AT INTEGRAL END BENTS




## HALF SECTION AT LINK SLAB

## HALF SECTION AT INTERMEDIATE DIAPHRAGM

## TYPICAL SECTION

### NOTES

PROVIDE 1¼" HIGH BEAM BOLSTER UPPERS AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF THE "A" BARS. WHEN USING REMOVEABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK @ 4'-0" CTS. WITH A HEIGHT TO PROVIDE 2½" CLEAR DISTANCE ABOVE FORMS.

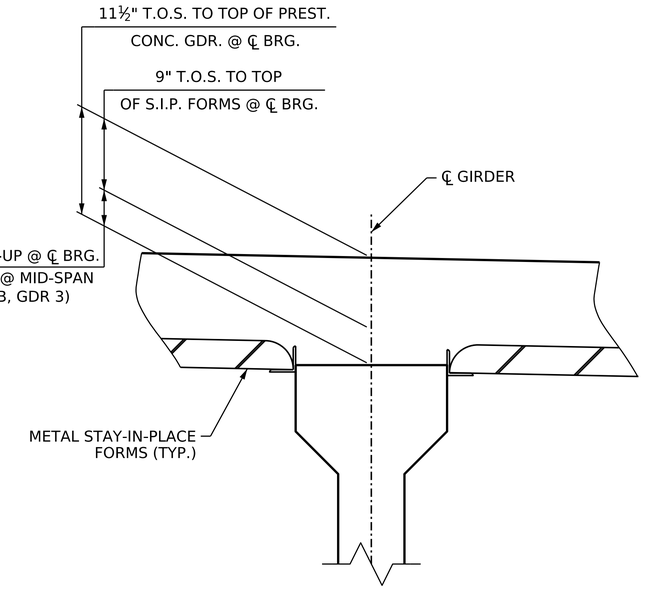
LONGITUDINAL REINFORCING STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

CONCRETE BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL DECK SLAB CONCRETE IN THAT UNIT HAS BEEN CAST AND HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

T.O.S. = TOP OF SLAB

B.O.S. = BOTTOM OF SLAB




## DETAIL "A"

* BASED ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATIONS

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+79.00 -LSB-

SHEET 1 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A LEBLANC

10/3/2023

DocuSigned by: Marc A. LeBlanc

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**TYPICAL SECTION**

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S2-6 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

DRAWN BY : LDL DATE : 12/22
CHECKED BY : MAL DATE : 12/22
DESIGN ENGINEER OF RECORD: MAL DATE : 6/23

10/27/2023
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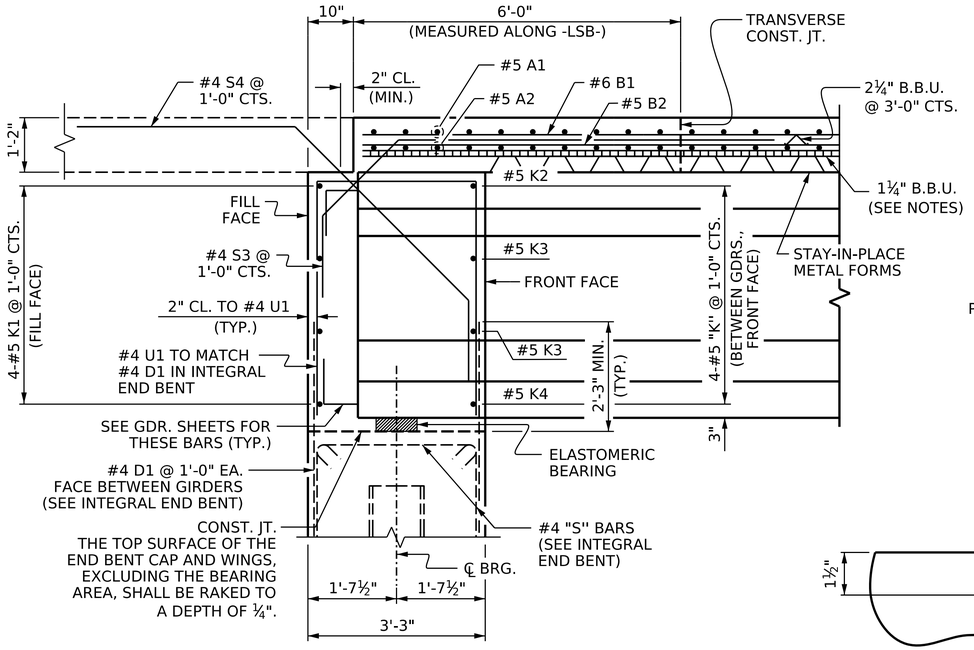
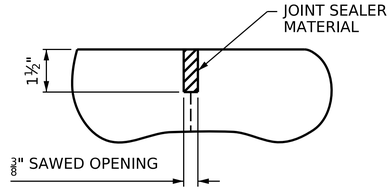
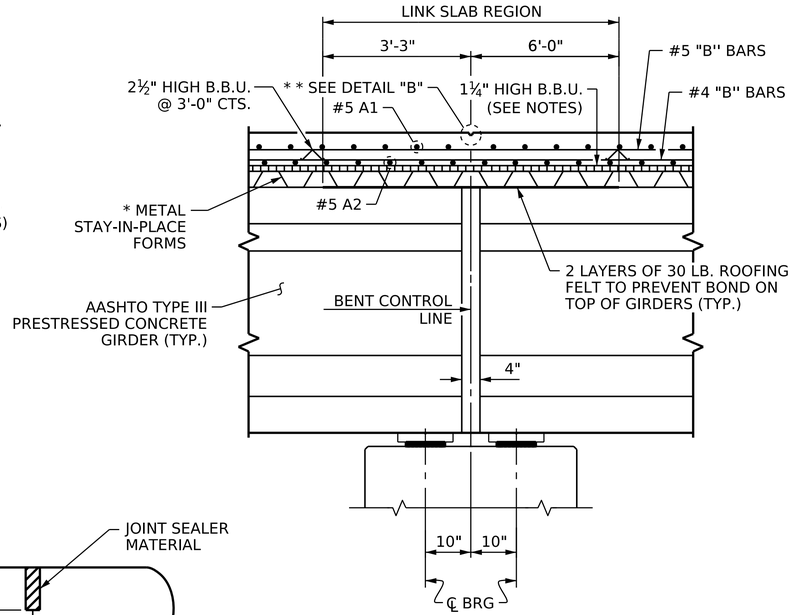



## SECTION THROUGH INTEGRAL END BENT




## DETAIL "B"

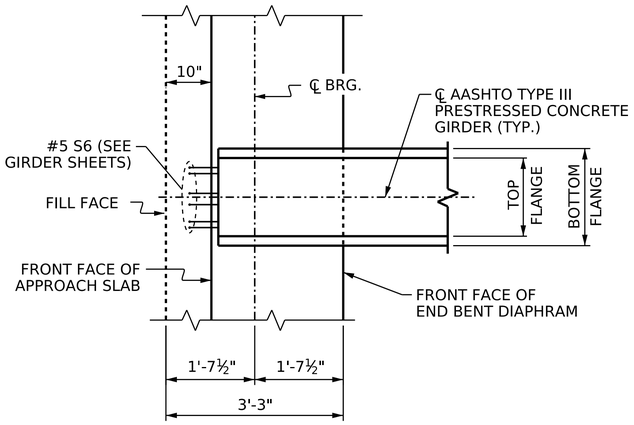



## SECTION AT BENT LINK SLAB

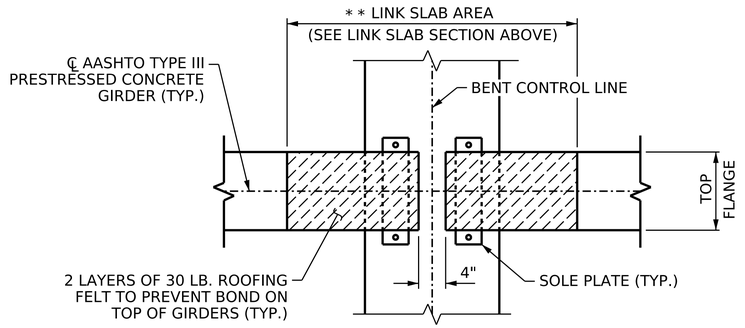
SECTION AT BENT 1 SHOWN. SECTION AT BENT 2 SIMILAR BY ROTATION.

* METAL STAY-IN-PLACE FORMS SHALL NOT BE WELDED TO THE GIRDER FLANGES IN THE REGION OF THE LINK SLAB.

* * A 1½" DEEP, ⅜" WIDE CONTRACTION JOINT AT BENT CONTROL LINE SHALL BE SAWN WITHIN 24 HOURS OF POURING THE DECK. THE JOINT SHALL BE FILLED WITH JOINT SEALER MATERIAL. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.




## PLAN OF GIRDER AT INTEGRAL END BENT

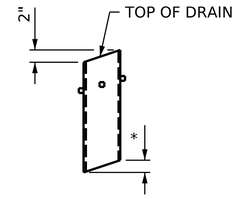



## PLAN OF LINK SLAB

* * THE TOP OF THE GIRDER IN THE REGION OF THE LINK SLAB SHALL BE SMOOTH (NOT RAKED) AND FREE OF STIRRUPS, ANCHORS STUDS, DECK FORMWORK ATTACHMENTS, AND OVERHANG FALSEWORK/FORMWORK ATTACHMENTS.

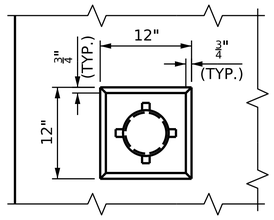
NOTE

FOR NOTES SEE SHEET 1 OF 2.

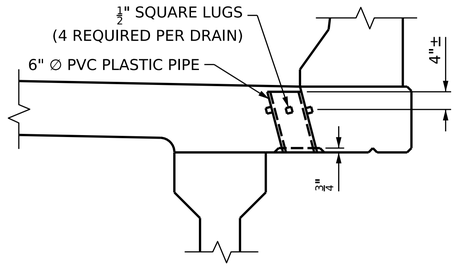



* TO BE SET TO MATCH SLOPE OF BOTTOM OF OVERHANG (8 DRAINS REQUIRED)

## PIPE DETAIL




## PLAN OF RECESS




## ELEVATION

NOTES: TOP OF FLOOR DRAIN TO BE SET ⅜" BELOW SURFACE OF SLAB.

4 - ½" SQUARE LUGS TO BE GLUED TO THE PVC PLASTIC PIPE AT EQUAL SPACES AROUND THE PIPE DRAIN APPROXIMATELY 4" FROM THE TOP OF THE PIPE.

THE 6" ~ PVC PLASTIC PIPE AND FITTINGS SHALL BE SCHEDULE 40 AND CONFORM TO ASTM D1785.

## DECK DRAIN DETAILS

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+79.00 -LSB-

SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A LEBLANC

10/3/2023

DocuSigned by: Marc A. LeBlanc

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# TYPICAL SECTION DETAILS

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S2-7 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

| | | | |
|---|---|---|---|
| DRAWN BY : | LDL | DATE : | 12/22 |
| CHECKED BY : | MAL | DATE : | 12/22 |
| DESIGN ENGINEER OF RECORD: | MAL | DATE : | 6/23 |

10/27/2023
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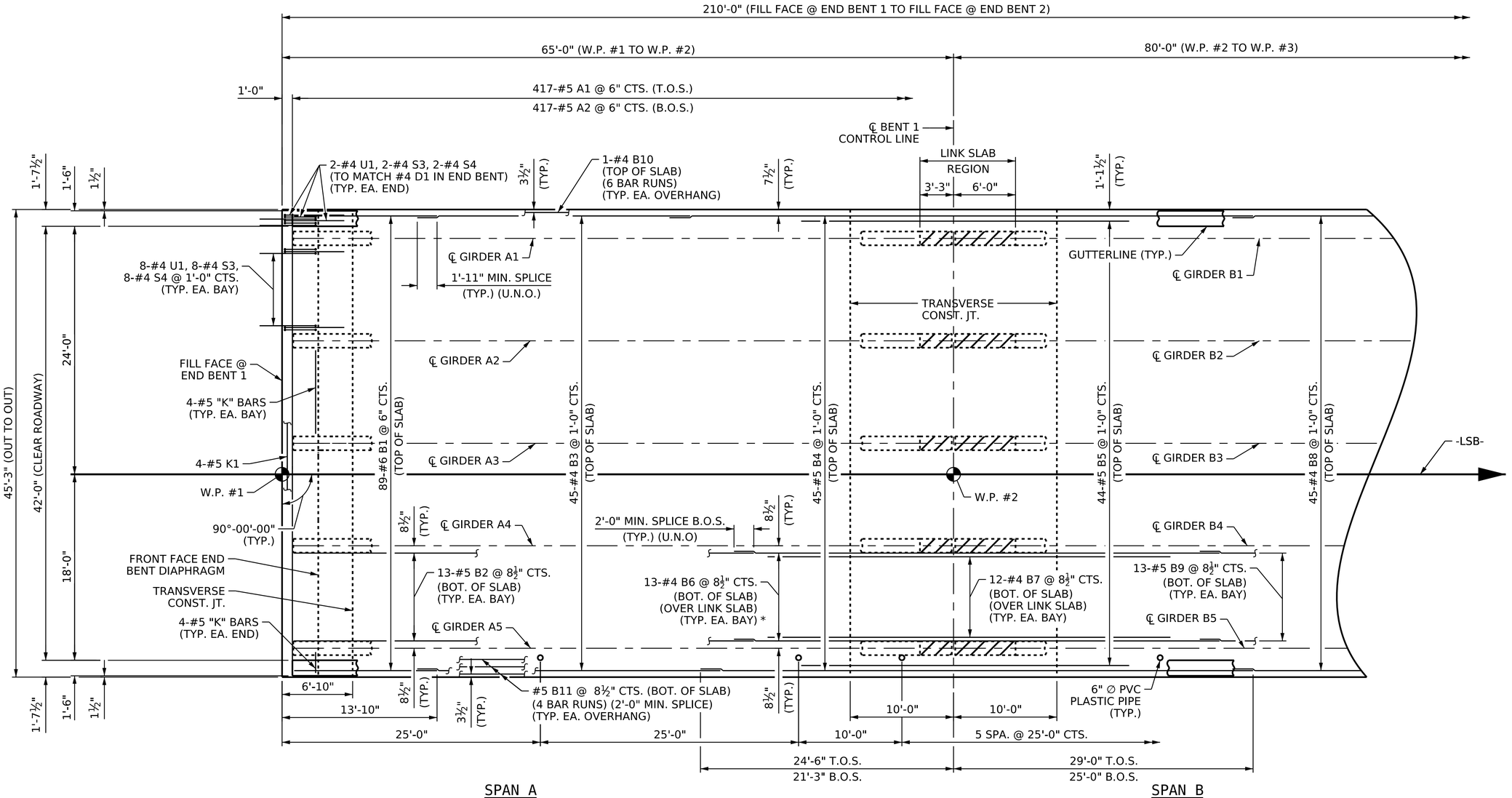



## PLAN OF SPAN A AND PART PLAN OF SPAN B

## NOTES

FOR SPLICE LENGTHS NOT SHOWN, REFER TO MINIMUM SPLICE LENGTH TABLE ON "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.

FOR END BENT DIAPHRAGM BARS, SEE "TYPICAL SECTION DETAILS" SHEET.

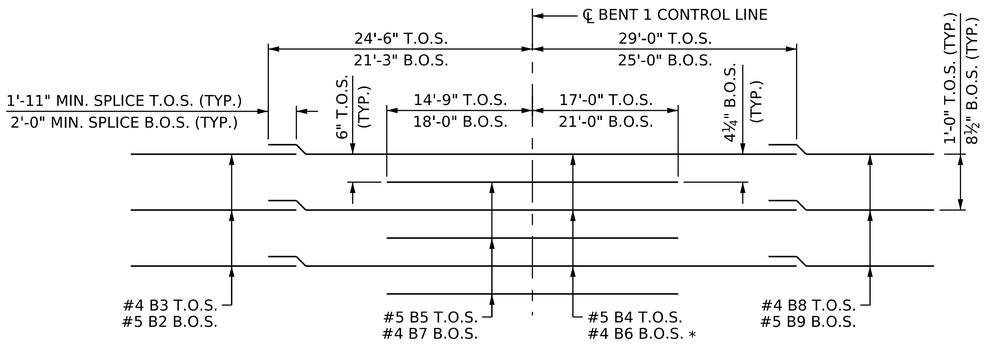
STEEL INTERMEDIATE DIAPHRAGMS NOT SHOWN FOR CLARITY. FOR LOCATIONS, SEE "FRAMING PLAN" SHEET.

FOR POURING SEQUENCE, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.

FOR BARRIER RAIL REINFORCING STEEL, SEE "CONCRETE BARRIER RAIL" SHEET.

T.O.S. = TOP OF SLAB

B.O.S. = BOTTOM OF SLAB




## TOP AND BOTTOM OF SLAB REINFORCING STEEL LAYOUT

* (2 BAR RUNS) (1'-11" MIN. SPLICE) (SPLICE NOT SHOWN)

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+79.00 -LSB-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

**PLAN OF SPAN A AND PART PLAN OF SPAN B**

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A. LEBLANC
10/3/2023
DocuSigned by: Marc A. LeBlanc C145E00A8F2F4A12

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| REVISIONS | | | | | | SHEET NO. |
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| NO. | BY: | DATE: | NO. | BY: | DATE: | S2-8 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

DRAWN BY : LDL DATE : 12/22
CHECKED BY : MAL DATE : 12/22
DESIGN ENGINEER OF RECORD: MAL DATE : 6/23

10/2/2023
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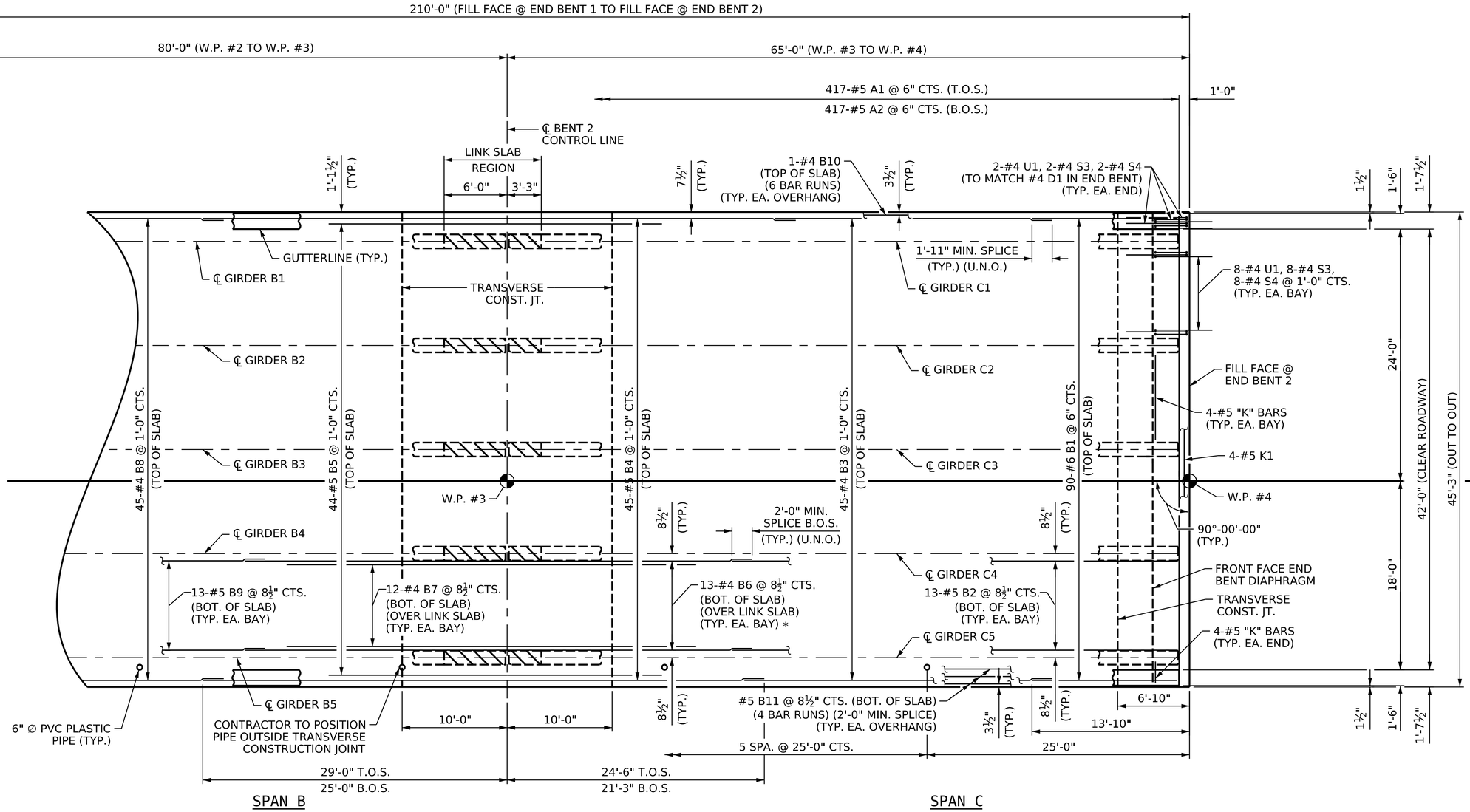



## PART PLAN OF SPAN B AND PLAN OF SPAN C

## NOTES

FOR SPLICE LENGTHS NOT SHOWN, REFER TO MINIMUM SPLICE LENGTH TABLE ON "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.

FOR END BENT DIAPHRAGM BARS, SEE "TYPICAL SECTION DETAILS" SHEET.

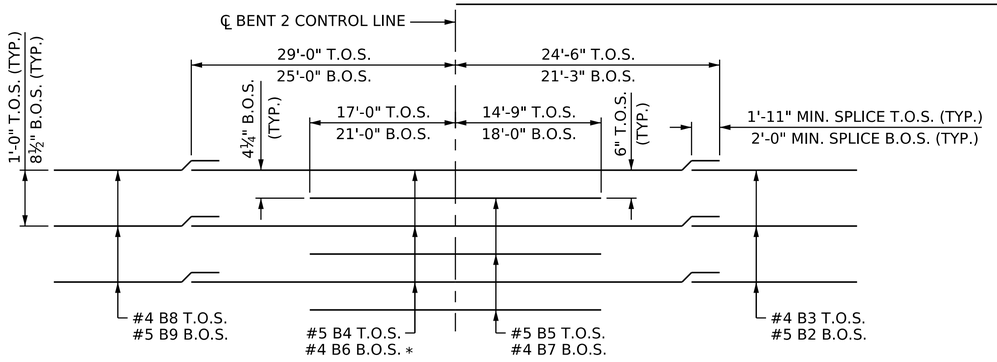
STEEL INTERMEDIATE DIAPHRAGMS NOT SHOWN FOR CLARITY. FOR LOCATIONS, SEE "FRAMING PLAN" SHEET.

FOR POURING SEQUENCE, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.

FOR BARRIER RAIL REINFORCING STEEL, SEE "CONCRETE BARRIER RAIL" SHEET.

T.O.S. = TOP OF SLAB

B.O.S. = BOTTOM OF SLAB




## TOP AND BOTTOM OF SLAB REINFORCING STEEL LAYOUT

* (2 BAR RUNS) (1'-11" MIN. SPLICE) (SPLICE NOT SHOWN)

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+79.00 -LSB-

SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A. LEBLANC

10/3/2023

DocuSigned by: Marc A. LeBlanc

C1A9E09A8F2E412...

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

# PART PLAN OF SPAN B AND PLAN OF SPAN C

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S2-9 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

DRAWN BY : LDL DATE : 12/22
CHECKED BY : MAL DATE : 12/22
DESIGN ENGINEER OF RECORD: MAL DATE : 6/23

10/2/2023
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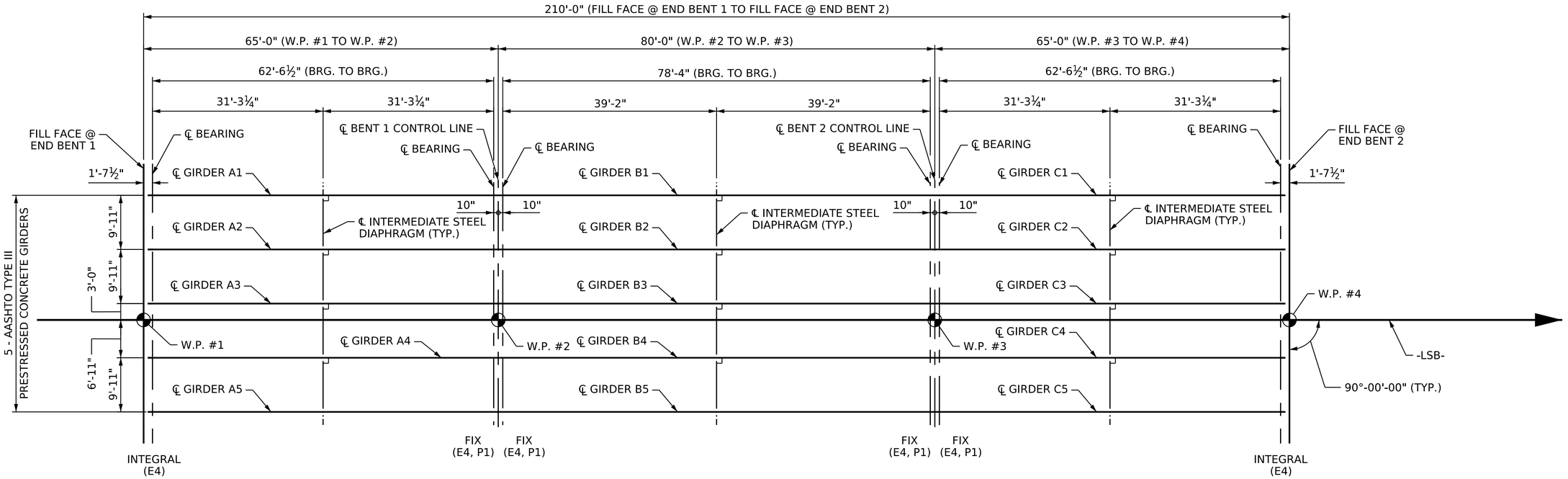
ilewandowski

## NOTES:

FOR STEEL DIAPHRAGMS DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE III PRESTRESSED CONCRETE GIRDERS" SHEET.

FOR END BENT DIAPHRAGM DETAILS, SEE TYPICAL SECTION AND PLAN OF SPAN SHEETS.




SPAN A SPAN B SPAN C

## FRAMING PLAN

CONCRETE END BENT DIAPHRAGMS
NOT SHOWN FOR CLARITY

PROJECT NO. B-5527
SURRY COUNTY
STATION: 23+79.00 -LSB-

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A LEBLANC
10/3/2023
DocuSigned by: Marc A. LeBlanc

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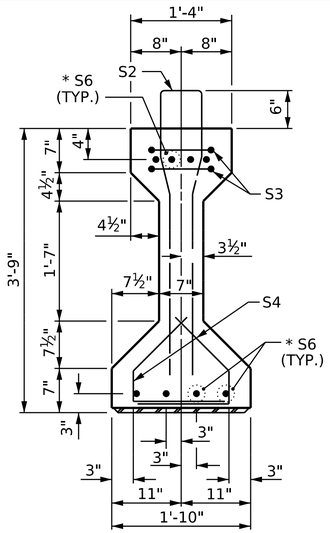
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

**FRAMING PLAN**

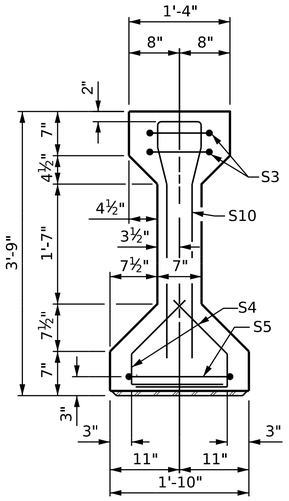
| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S2-10 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

DRAWN BY : LDL DATE : 12/22
CHECKED BY : MAL DATE : 12/22
DESIGN ENGINEER OF RECORD: MAL DATE : 6/23

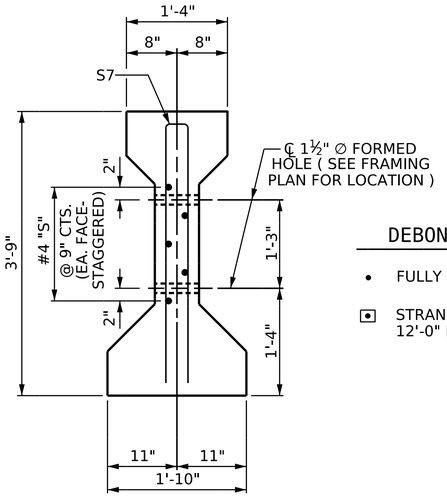
10/27/2023
X:\Raleigh\114-783.005D - B-5527 CE Update\05-CAD\B5527\Structures\DGN's\Final\402_019_B-5527_SMU_FP_S2-10.dgn
llewandowski




## SECTION A-A




## SECTION B-B

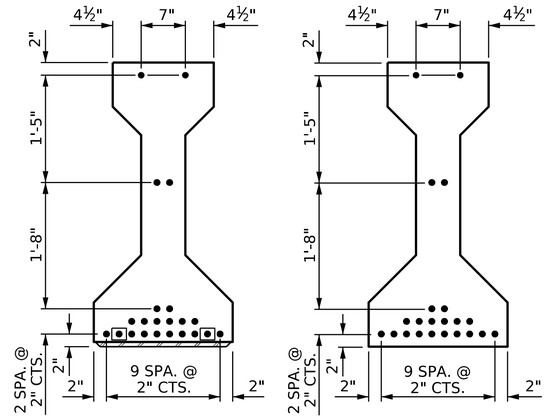



## SECTION C-C

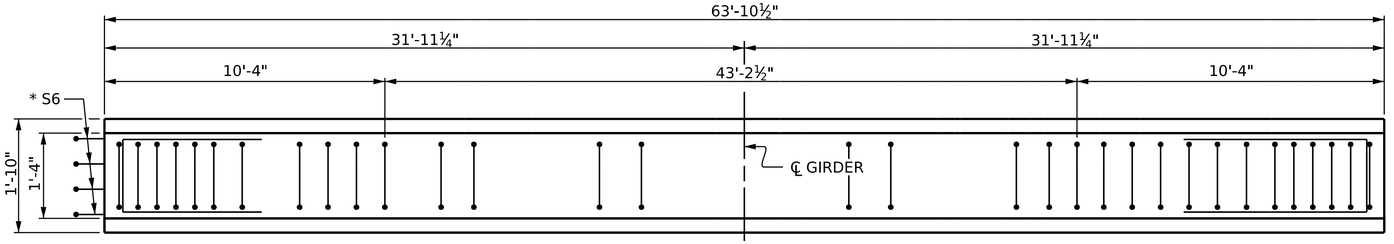
(S1 BARS NOT SHOWN)

### DEBONDING LEGEND

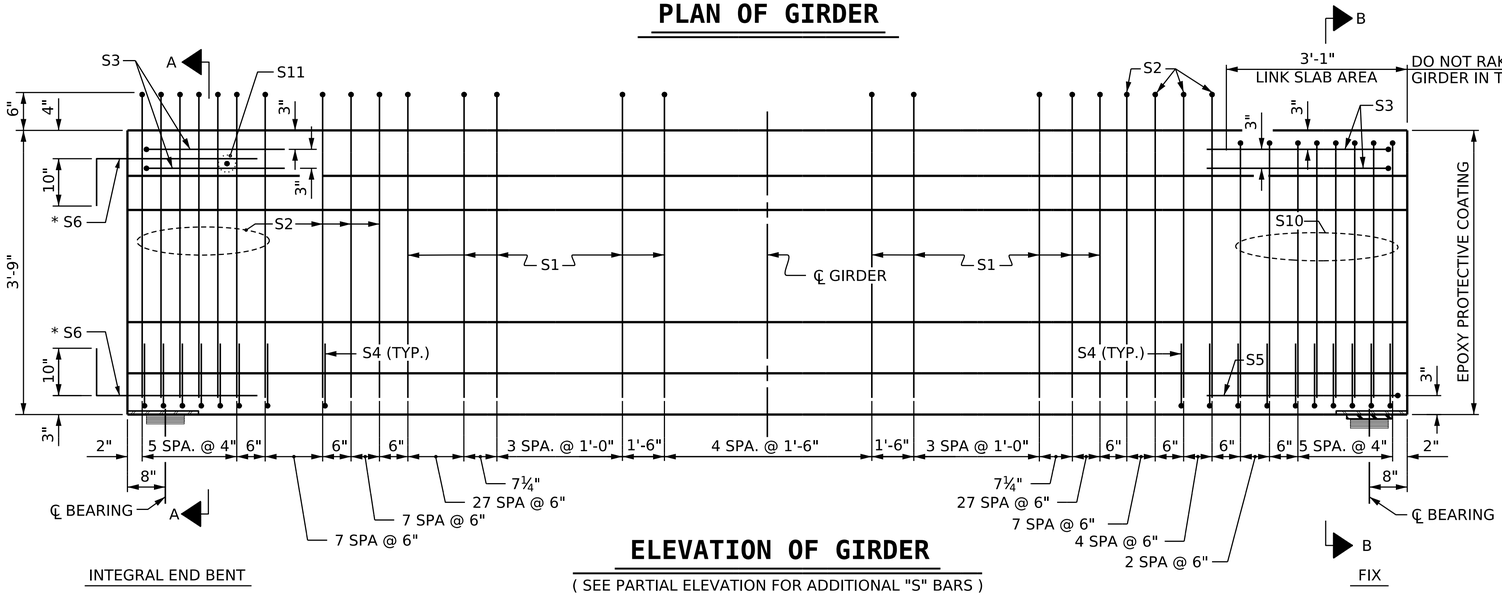
- • FULLY BONDED STRANDS
- ⊡ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER




## 0.6" ⌀ LOW RELAXATION STRAND LAYOUT

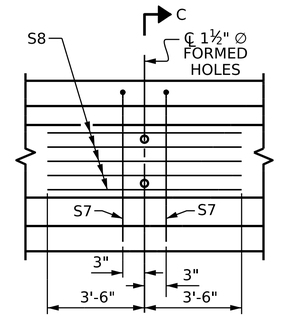



## PLAN OF GIRDER




## ELEVATION OF GIRDER

( SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS )




## PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1 THRU 5

### 0.6"⌀ L.R. GRADE 270 STRANDS

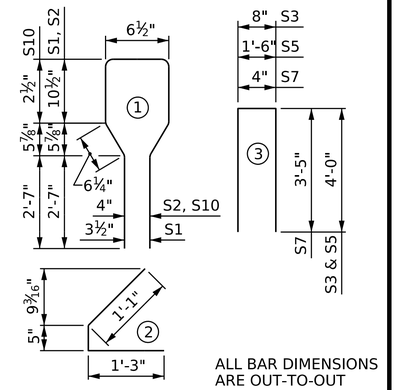
| AREA (SQUARE INCHES) | ULTIMATE STRENGTH (LBS. PER STRAND) | APPLIED PRESTRESS (LBS. PER STRAND) |
|---|---|---|
| 0.217 | 58,600 | 43,950 |

### REINFORCING STEEL FOR ONE GIRDER

| BAR | NUMBER | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| S1 | 69 | #4 | 1 | 8'-6" | 392 |
| S2 | 36 | #6 | 1 | 8'-6" | 460 |
| S3 | 4 | #4 | 3 | 8'-8" | 23 |
| S4 | 56 | #4 | 2 | 2'-9" | 103 |
| S5 | 1 | #4 | 3 | 9'-6" | 6 |
| * S6 | 8 | #5 | STR | 3'-8" | 31 |
| S7 | 2 | #5 | 3 | 7'-2" | 15 |
| S8 | 5 | #4 | STR | 7'-0" | 23 |
| S10 | 8 | #6 | 1 | 7'-2" | 86 |
| S11 | 1 | #3 | STR | 1'-0" | 1 |

* NOTE: S6 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

### BAR TYPES




ALL BAR DIMENSIONS ARE OUT-TO-OUT

### QUANTITIES FOR ONE GIRDER

| REINFORCING STEEL | 6000 PSI CONCRETE | 0.6" ∅ L. R. STRANDS |
|---|---|---|
| LB. | C.Y. | No. |
| 1140 | 9.19 | 22 |

### GIRDERS REQUIRED

| NUMBER | LENGTH | TOTAL LENGTH |
|---|---|---|
| 5 | 63'-10½" | 319'-4½" |

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+79.00 -LSB-

SHEET 1 OF 4

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARCA LEBLANC

10/3/2023

DocuSigned by: Marc A. LeBlanc

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

# AASHTO TYPE III PRESTRESSED CONCRETE GIRDER - LINK SLAB SPAN A

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| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S2-11 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

| | | | |
|---|---|---|---|
| ASSEMBLED BY : | LDL | DATE : | 8/22 |
| CHECKED BY : | MAL | DATE : | 8/22 |
| DRAWN BY : | BNB | 09/21 | |
| CHECKED BY : | AAI | 09/21 | |

10/27/2023
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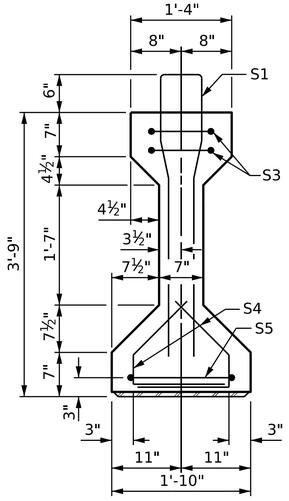
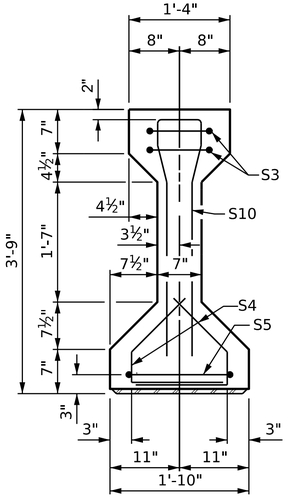
llewandowski

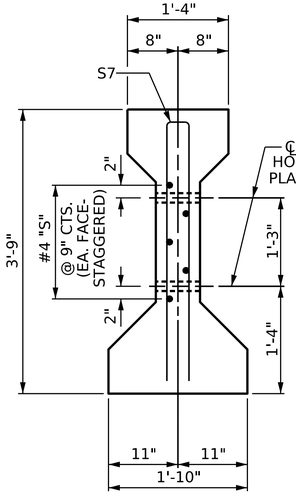
STD. NO. PCG5 (SHT. 1)




## SECTION A-A




## SECTION B-B

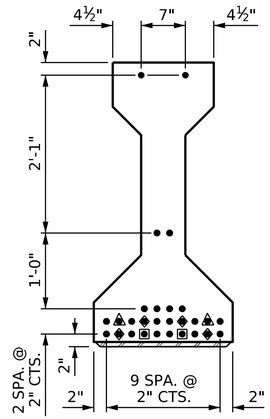



## SECTION C-C

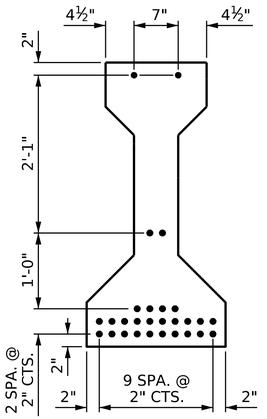
(S1 BARS NOT SHOWN)

### DEBONDING LEGEND

- FULLY BONDED STRANDS
- STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 14'-0" FROM END OF GIRDER




AT END OF GIRDER




AT ℄ OF GIRDER

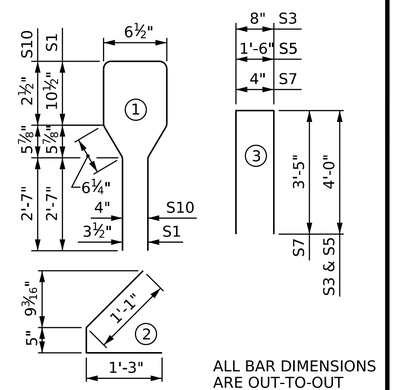
## 0.6" ⌀ LOW RELAXATION STRAND LAYOUT

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

### REINFORCING STEEL FOR ONE GIRDER

| BAR | NUMBER | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| S1 | 97 | #4 | 1 | 8'-6" | 551 |
| S3 | 4 | #4 | 3 | 8'-8" | 23 |
| S4 | 56 | #4 | 2 | 2'-9" | 103 |
| S5 | 2 | #4 | 3 | 9'-6" | 13 |
| S7 | 2 | #5 | 3 | 7'-2" | 15 |
| S8 | 5 | #4 | STR | 7'-0" | 23 |
| S10 | 28 | #6 | 1 | 7'-2" | 301 |

### BAR TYPES

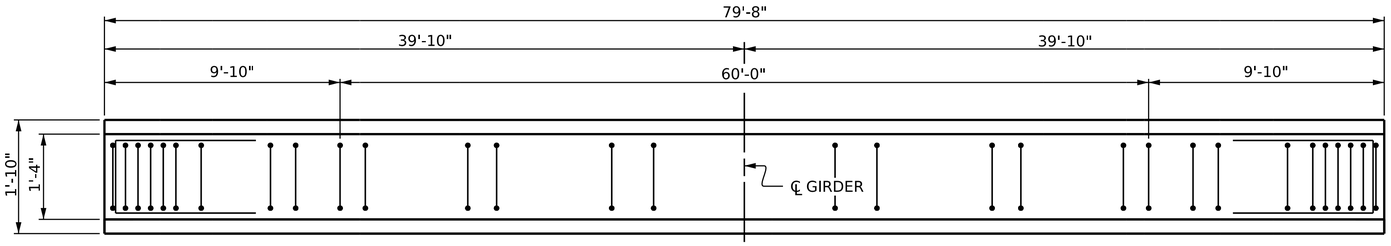



ALL BAR DIMENSIONS ARE OUT-TO-OUT

### QUANTITIES FOR ONE GIRDER

| REINFORCING STEEL | 7500 PSI CONCRETE | 0.6" ∅ L. R. STRANDS |
|---|---|---|
| LB. | C.Y. | No. |
| 1029 | 11.5 | 28 |

| GIRDERS REQUIRED | | |
|---|---|---|
| NUMBER | LENGTH | TOTAL LENGTH |
| 5 | 79'-8" | 398'-4" |

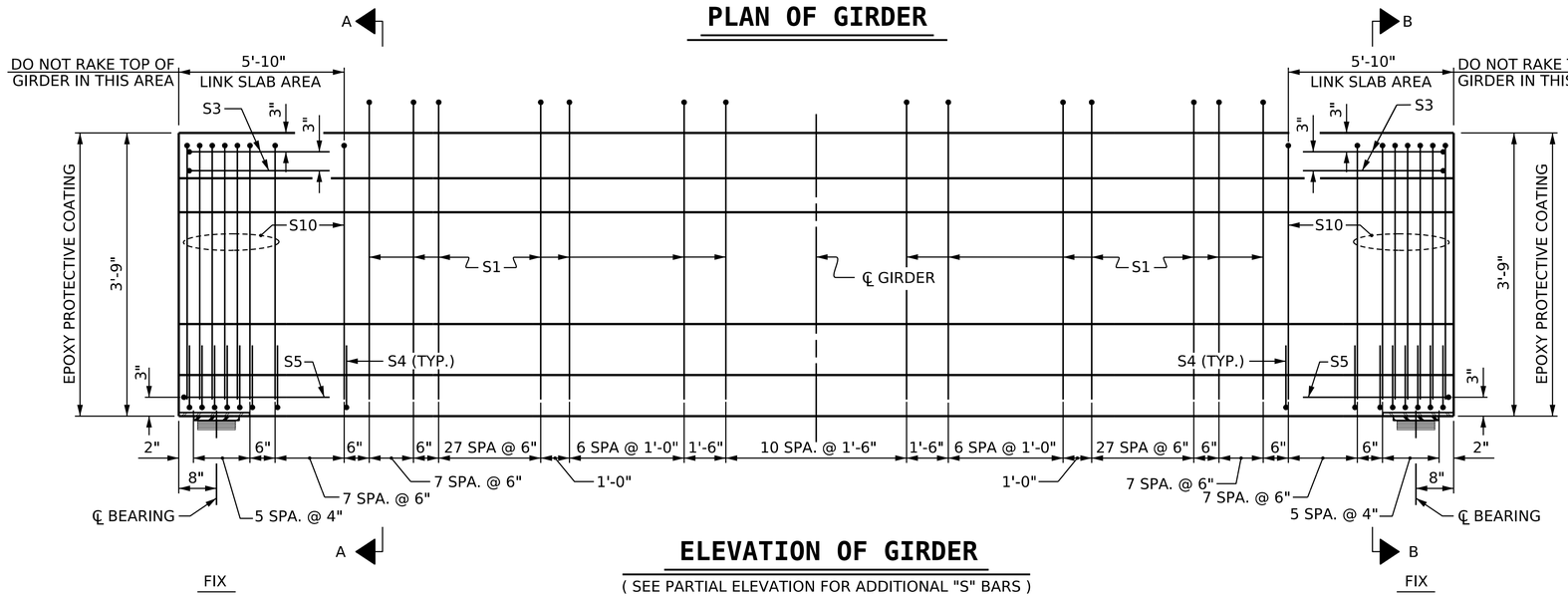



## PLAN OF GIRDER




## PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1 THRU 5




## ELEVATION OF GIRDER

( SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS )

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+79.00 -LSB-

SHEET 2 OF 4

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARCA LEBLANC

10/3/2023

DocuSigned by: Marc A. LeBlanc

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

# AASHTO TYPE III PRESTRESSED CONCRETE GIRDER - LINK SLAB SPAN B

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S2-12 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

| | | | |
|---|---|---|---|
| ASSEMBLED BY : | LDL | DATE : | 8/22 |
| CHECKED BY : | MAL | DATE : | 8/22 |
| DRAWN BY : | BNB | 09/21 | |
| CHECKED BY : | AAI | 09/21 | |

10/27/2023
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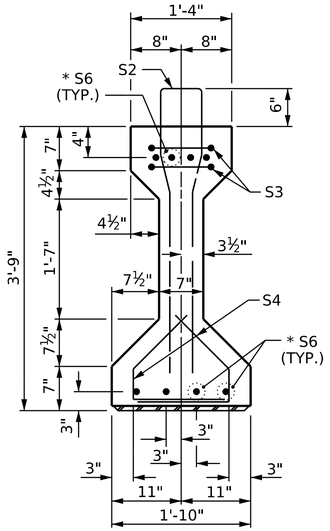
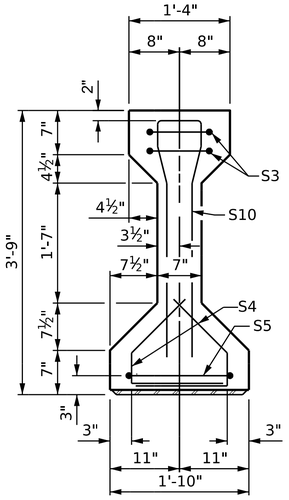
llewandowski

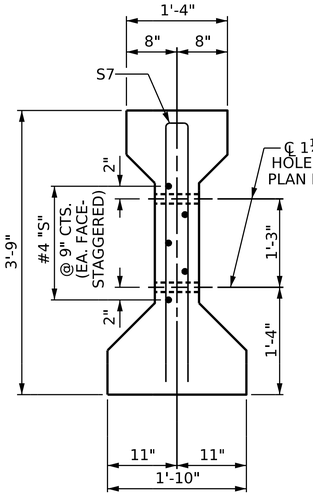
STD. NO. PCG5 (SHT. 1)




## SECTION A-A




## SECTION B-B

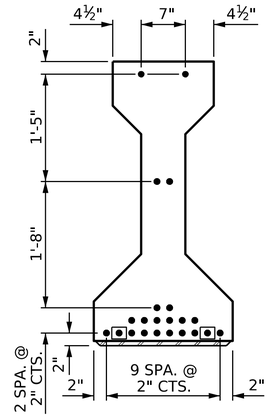



## SECTION C-C

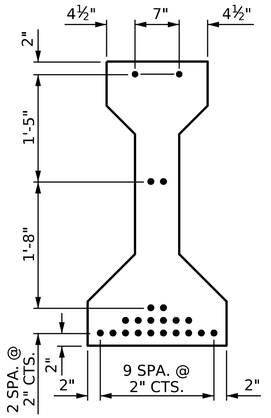
(S1 BARS NOT SHOWN)

### DEBONDING LEGEND

- • FULLY BONDED STRANDS
- ⊡ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER

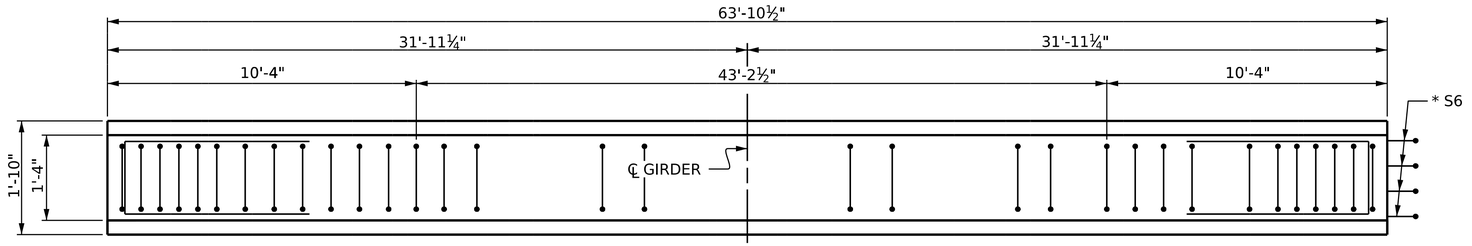



AT END OF GIRDER

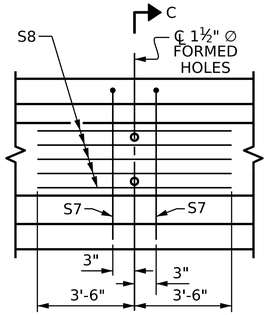



AT ℄ OF GIRDER

## 0.6" ⌀ LOW RELAXATION STRAND LAYOUT

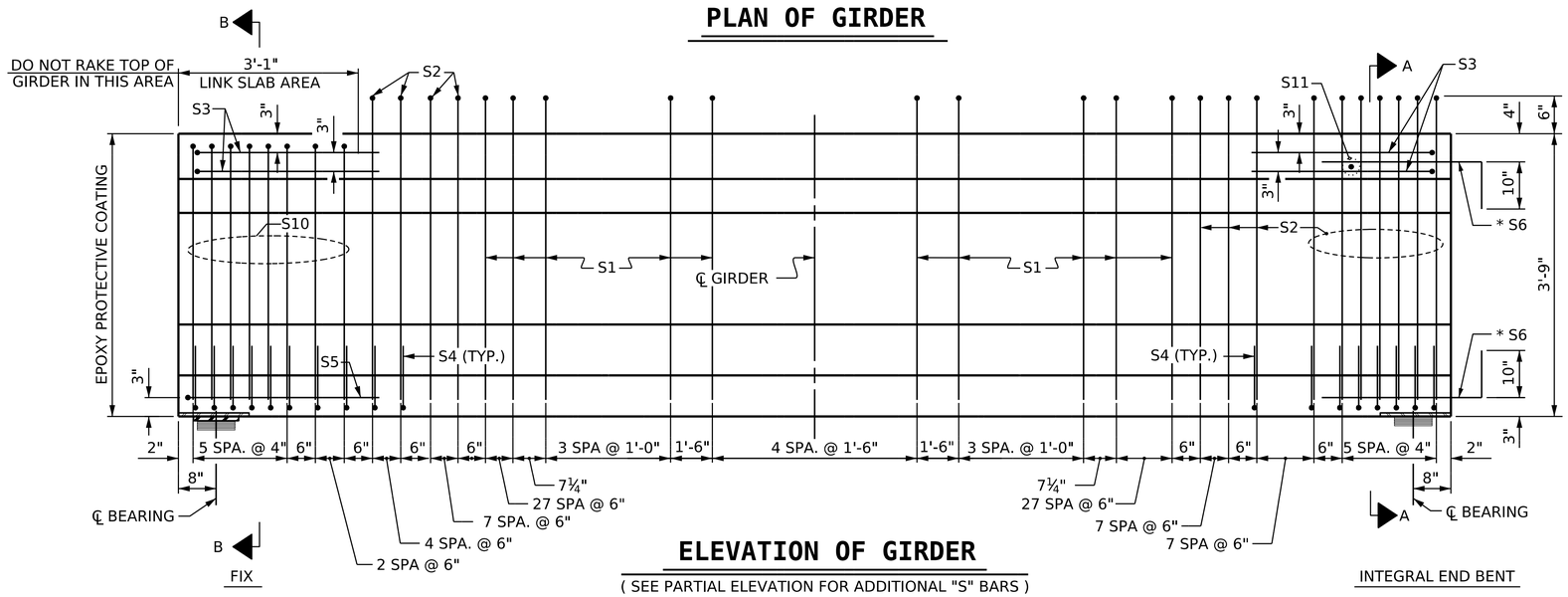



## PLAN OF GIRDER




## PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1 THRU 5




## ELEVATION OF GIRDER

( SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS )

INTEGRAL END BENT

### 0.6"⌀ L.R. GRADE 270 STRANDS

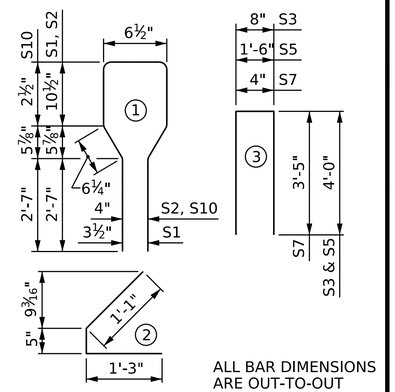
| AREA (SQUARE INCHES) | ULTIMATE STRENGTH (LBS. PER STRAND) | APPLIED PRESTRESS (LBS. PER STRAND) |
|---|---|---|
| 0.217 | 58,600 | 43,950 |

### REINFORCING STEEL FOR ONE GIRDER

| BAR | NUMBER | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| S1 | 69 | #4 | 1 | 8'-6" | 392 |
| S2 | 36 | #6 | 1 | 8'-6" | 460 |
| S3 | 4 | #4 | 3 | 8'-8" | 23 |
| S4 | 56 | #4 | 2 | 2'-9" | 103 |
| S5 | 1 | #4 | 3 | 9'-6" | 6 |
| * S6 | 8 | #5 | STR | 3'-8" | 31 |
| S7 | 2 | #5 | 3 | 7'-2" | 15 |
| S8 | 5 | #4 | STR | 7'-0" | 23 |
| S10 | 8 | #6 | 1 | 7'-2" | 86 |
| S11 | 1 | #3 | STR | 1'-0" | 1 |

* NOTE: S6 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

### BAR TYPES




ALL BAR DIMENSIONS ARE OUT-TO-OUT

### QUANTITIES FOR ONE GIRDER

| REINFORCING STEEL | 6000 PSI CONCRETE | 0.6" ∅ L. R. STRANDS |
|---|---|---|
| LB. | C.Y. | No. |
| 1140 | 9.19 | 22 |

### GIRDERS REQUIRED

| NUMBER | LENGTH | TOTAL LENGTH |
|---|---|---|
| 5 | 63'-10½" | 319'-4½" |

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+79.00 -LSB-

SHEET 3 OF 4

| | | | |
|---|---|---|---|
| ASSEMBLED BY : | LDL | DATE : | 8/22 |
| CHECKED BY : | MAL | DATE : | 8/22 |
| DRAWN BY : | BNB | 09/21 | |
| CHECKED BY : | AAI | 09/21 | |

10/27/2023
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NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A LEBLANC

10/3/2023

DocuSigned by: Marc A. LeBlanc

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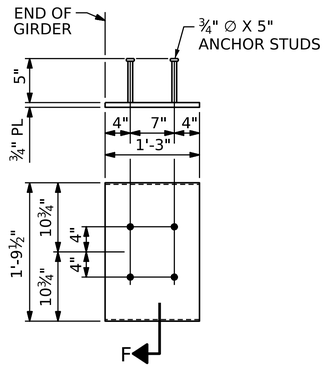
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

# AASHTO TYPE III PRESTRESSED CONCRETE GIRDER - LINK SLAB SPAN C

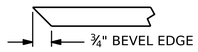
| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S2-13 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

STD. NO. PCG5 (SHT. 1)




## EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE III GIRDER

(2 REQ'D PER GIRDER)




## SECTION "F"

(SEE NOTES)

## 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 SHALL BE GRADE 60.

APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES INDICATED IN ELEVATION VIEW.

EMBEDDED PLATE "B-1" SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

AT ENDS OF GIRDERS TO BE EMBEDDED IN CONCRETE DIAPHRAMS OR END WALLS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER ENDS. OTHERWISE, PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4,500 PSI (SPANS A & C) AND 6,000 PSI (SPAN B).

DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4" AND LINK SLAB AREAS AS INDICATED, SHALL BE RAKED TO A DEPTH OF ¼".

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+79.00 -LSB-

SHEET 4 OF 4

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A. LEBLANC

10/3/2023

DocuSigned by: Marc A. LeBlanc

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

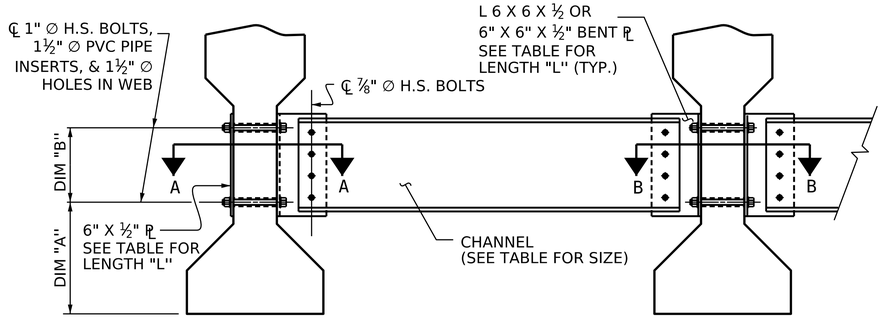
# PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S2-14 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

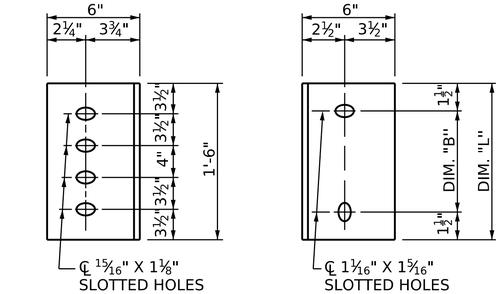
| | | | |
|---|---|---|---|
| ASSEMBLED BY : | LDL | DATE : | 8/22 |
| CHECKED BY : | MAL | DATE : | 8/22 |
| DRAWN BY : ELR | 11/91 | REV. 1/15 | MAA/TMG |
| CHECKED BY : GRP | 11/91 | REV. 2/15 | MAA/TMG |
| | | REV. 12/17 | MAA/THC |

10/2/2023
X:\Raleigh\114-783.005D - B-5527 CE Update\05-CAD\B5527\Structures\DGN's\Final\402_027_B-5527_SMU_G4_S2-14.dgn
llewandowski

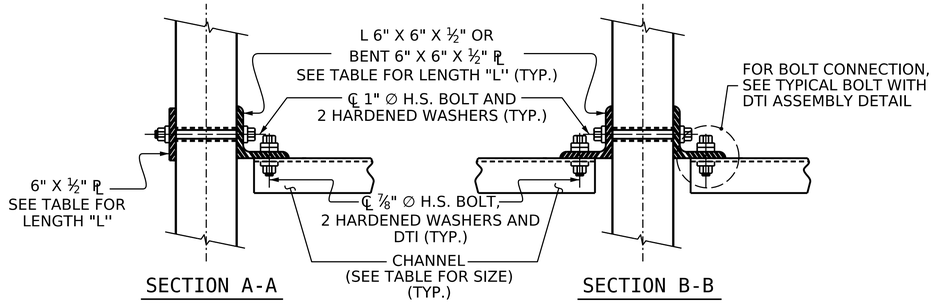
STD. NO. PCG9




## PART SECTION AT INTERMEDIATE DIAPHRAGM




## CONNECTOR PLATE DETAILS




## CONNECTION DETAILS

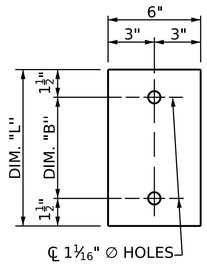
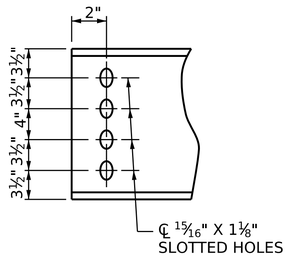
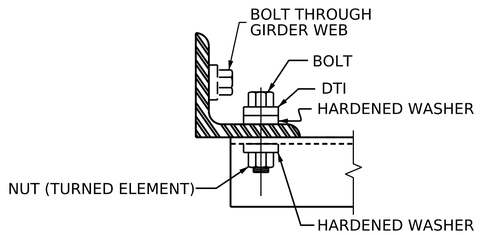



PLATE DETAILS




CHANNEL END




## BOLT WITH DTI ASSEMBLY DETAIL

## STRUCTURAL STEEL NOTES

ALL INTERMEDIATE DIAPHRAGM STEEL AND CONNECTOR PLATES SHALL BE AASHTO M270 GRADE 50 OR APPROVED EQUAL.

TENSION ON THE ASTM A325 BOLTS THROUGH THE CHANNEL MEMBER SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

TENSION ON THE ASTM A449 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL ¼ TURN.

THE PLATES, BENT PLATES, CHANNELS, AND ANGLES SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

FOR METALLIZATION, APPLY A THERMAL SPRAYED COATING WITH A SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE DEPARTMENTS THERMAL SPRAYED COATINGS (METALLIZATION) PROGRAM, THERMAL SPRAYED COATINGS SPECIAL PROVISION AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

GALVANIZE THE HIGH STRENGTH BOLTS, NUTS, WASHERS AND DIRECT TENSION INDICATORS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

USE AN ASTM F436 HARDENED WASHER WITH STANDARD AND SLOTTED HOLES UNDER EACH BOLT HEAD AND NUT.

FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST ¼" PROJECTION BEYOND THE NUT.

INTERMEDIATE DIAPHRAGM ASSEMBLY SHALL COMPLY WITH SECTION 1072 OF THE STANDARD SPECIFICATIONS.

SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

IN THE EXTERIOR BAYS, PLACE TEMPORARY STRUTS BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED.

THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.

## TABLE

| GIRDER TYPE | CHANNEL SIZE | DIM "A" | DIM "B" | DIM "L" |
|---|---|---|---|---|
| III | MC 18 x 42.7 | 1'-4" | 1'-3" | 1'-6" |

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+79.00 -LSB-

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A. LEBLANC

10/3/2023

DocuSigned by: Marc A. LeBlanc

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

# INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE III PRESTRESSED CONCRETE GIRDERS

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S2-15 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

DRAWN BY : LDL DATE : 8/22
CHECKED BY : MAL DATE : 8/22
DESIGN ENGINEER OF RECORD: MAL DATE : 8/22

10/2/2023
X:\Raleigh\114-783.005D - B-5527 CE Update\05-CAD\B5527\Structures\DGN's\Final\402_029_B-5527_SMU_DIA_S2-15.dgn
llewandowski

# DEAD LOAD DEFLECTION TABLE FOR GIRDERS

| 0.6" ⌀ LOW RELAXATION | SPANS A AND C<br>GIRDERS 1 AND 5 (EXTERIOR) | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TWENTIETH POINTS | 0 | 0.05 | 0.10 | 0.15 | 0.20 | 0.25 | 0.30 | 0.35 | 0.40 | 0.45 | 0.50 | 0.55 | 0.60 | 0.65 | 0.70 | 0.75 | 0.80 | 0.85 | 0.90 | 0.95 | 0 |
| CAMBER (GIRDER ALONE IN PLACE) ↑ | 0.000 | 0.018 | 0.036 | 0.052 | 0.067 | 0.081 | 0.092 | 0.101 | 0.108 | 0.112 | 0.113 | 0.112 | 0.108 | 0.101 | 0.092 | 0.081 | 0.067 | 0.052 | 0.036 | 0.018 | 0.000 |
| * DEFLECTION DUE TO SUPERIMPOSED D.L. ↓ | 0.000 | 0.009 | 0.017 | 0.025 | 0.032 | 0.039 | 0.045 | 0.049 | 0.052 | 0.054 | 0.055 | 0.054 | 0.052 | 0.049 | 0.045 | 0.039 | 0.032 | 0.025 | 0.017 | 0.009 | 0.000 |
| FINAL CAMBER ↑ | 0" | 1/8" | 1/4" | 5/16" | 7/16" | 1/2" | 9/16" | 5/8" | 11/16" | 11/16" | 11/16" | 11/16" | 11/16" | 5/8" | 9/16" | 1/2" | 7/16" | 5/16" | 1/4" | 1/8" | 0" |

| 0.6" ⌀ LOW RELAXATION | SPANS A AND C<br>GIRDERS 2 AND 4 (INTERIOR) | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TWENTIETH POINTS | 0 | 0.05 | 0.10 | 0.15 | 0.20 | 0.25 | 0.30 | 0.35 | 0.40 | 0.45 | 0.50 | 0.55 | 0.60 | 0.65 | 0.70 | 0.75 | 0.80 | 0.85 | 0.90 | 0.95 | 0 |
| CAMBER (GIRDER ALONE IN PLACE) ↑ | 0.000 | 0.018 | 0.036 | 0.052 | 0.067 | 0.081 | 0.092 | 0.101 | 0.108 | 0.112 | 0.113 | 0.112 | 0.108 | 0.101 | 0.092 | 0.081 | 0.067 | 0.052 | 0.036 | 0.018 | 0.000 |
| * DEFLECTION DUE TO SUPERIMPOSED D.L. ↓ | 0.000 | 0.011 | 0.021 | 0.031 | 0.039 | 0.047 | 0.054 | 0.059 | 0.063 | 0.066 | 0.066 | 0.066 | 0.063 | 0.059 | 0.054 | 0.047 | 0.039 | 0.031 | 0.021 | 0.011 | 0.000 |
| FINAL CAMBER ↑ | 0" | 1/16" | 3/16" | 1/4" | 5/16" | 3/8" | 7/16" | 1/2" | 9/16" | 9/16" | 9/16" | 9/16" | 9/16" | 1/2" | 7/16" | 3/8" | 5/16" | 1/4" | 3/16" | 1/16" | 0" |

| 0.6" ⌀ LOW RELAXATION | SPANS A AND C<br>GIRDER 3 (INTERIOR) | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TWENTIETH POINTS | 0 | 0.05 | 0.10 | 0.15 | 0.20 | 0.25 | 0.30 | 0.35 | 0.40 | 0.45 | 0.50 | 0.55 | 0.60 | 0.65 | 0.70 | 0.75 | 0.80 | 0.85 | 0.90 | 0.95 | 0 |
| CAMBER (GIRDER ALONE IN PLACE) ↑ | 0.000 | 0.018 | 0.036 | 0.052 | 0.067 | 0.081 | 0.092 | 0.101 | 0.108 | 0.112 | 0.113 | 0.112 | 0.108 | 0.101 | 0.092 | 0.081 | 0.067 | 0.052 | 0.036 | 0.018 | 0.000 |
| * DEFLECTION DUE TO SUPERIMPOSED D.L. ↓ | 0.000 | 0.011 | 0.021 | 0.031 | 0.040 | 0.048 | 0.055 | 0.061 | 0.065 | 0.067 | 0.068 | 0.067 | 0.065 | 0.061 | 0.055 | 0.048 | 0.040 | 0.031 | 0.021 | 0.011 | 0.000 |
| FINAL CAMBER ↑ | 0" | 1/16" | 3/16" | 1/4" | 5/16" | 3/8" | 7/16" | 1/2" | 1/2" | 9/16" | 9/16" | 9/16" | 1/2" | 1/2" | 7/16" | 3/8" | 5/16" | 1/4" | 3/16" | 1/16" | 0" |

| 0.6" ⌀ LOW RELAXATION | SPAN B<br>GIRDERS 1 AND 5 (EXTERIOR) | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TWENTIETH POINTS | 0 | 0.05 | 0.10 | 0.15 | 0.20 | 0.25 | 0.30 | 0.35 | 0.40 | 0.45 | 0.50 | 0.55 | 0.60 | 0.65 | 0.70 | 0.75 | 0.80 | 0.85 | 0.90 | 0.95 | 0 |
| CAMBER (GIRDER ALONE IN PLACE) ↑ | 0.000 | 0.032 | 0.064 | 0.094 | 0.120 | 0.145 | 0.166 | 0.182 | 0.194 | 0.201 | 0.204 | 0.201 | 0.194 | 0.182 | 0.166 | 0.145 | 0.121 | 0.094 | 0.064 | 0.032 | 0.000 |
| * DEFLECTION DUE TO SUPERIMPOSED D.L. ↓ | 0.000 | 0.020 | 0.039 | 0.056 | 0.072 | 0.087 | 0.100 | 0.110 | 0.117 | 0.121 | 0.123 | 0.121 | 0.117 | 0.110 | 0.100 | 0.087 | 0.072 | 0.056 | 0.039 | 0.020 | 0.000 |
| FINAL CAMBER ↑ | 0" | 1/8" | 5/16" | 7/16" | 9/16" | 11/16" | 13/16" | 7/8" | 15/16" | 15/16" | 1" | 15/16" | 15/16" | 7/8" | 13/16" | 11/16" | 9/16" | 7/16" | 5/16" | 1/8" | 0" |

| 0.6" ⌀ LOW RELAXATION | SPAN B<br>GIRDERS 2 AND 4 (INTERIOR) | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TWENTIETH POINTS | 0 | 0.05 | 0.10 | 0.15 | 0.20 | 0.25 | 0.30 | 0.35 | 0.40 | 0.45 | 0.50 | 0.55 | 0.60 | 0.65 | 0.70 | 0.75 | 0.80 | 0.85 | 0.90 | 0.95 | 0 |
| CAMBER (GIRDER ALONE IN PLACE) ↑ | 0.000 | 0.032 | 0.064 | 0.094 | 0.120 | 0.145 | 0.166 | 0.182 | 0.194 | 0.201 | 0.204 | 0.201 | 0.194 | 0.182 | 0.166 | 0.145 | 0.121 | 0.094 | 0.064 | 0.032 | 0.000 |
| * DEFLECTION DUE TO SUPERIMPOSED D.L. ↓ | 0.000 | 0.024 | 0.047 | 0.068 | 0.088 | 0.106 | 0.121 | 0.133 | 0.142 | 0.147 | 0.149 | 0.147 | 0.142 | 0.133 | 0.121 | 0.106 | 0.088 | 0.068 | 0.047 | 0.024 | 0.000 |
| FINAL CAMBER ↑ | 0" | 1/8" | 3/16" | 5/16" | 3/8" | 7/16" | 9/16" | 9/16" | 5/8" | 5/8" | 11/16" | 5/8" | 5/8" | 9/16" | 9/16" | 7/16" | 3/8" | 5/16" | 3/16" | 1/8" | 0" |

| 0.6" ⌀ LOW RELAXATION | SPAN B<br>GIRDER 3 (INTERIOR) | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TWENTIETH POINTS | 0 | 0.05 | 0.10 | 0.15 | 0.20 | 0.25 | 0.30 | 0.35 | 0.40 | 0.45 | 0.50 | 0.55 | 0.60 | 0.65 | 0.70 | 0.75 | 0.80 | 0.85 | 0.90 | 0.95 | 0 |
| CAMBER (GIRDER ALONE IN PLACE) ↑ | 0.000 | 0.032 | 0.064 | 0.094 | 0.120 | 0.145 | 0.166 | 0.182 | 0.194 | 0.201 | 0.204 | 0.201 | 0.194 | 0.182 | 0.166 | 0.145 | 0.121 | 0.094 | 0.064 | 0.032 | 0.000 |
| * DEFLECTION DUE TO SUPERIMPOSED D.L. ↓ | 0.000 | 0.024 | 0.047 | 0.069 | 0.089 | 0.108 | 0.123 | 0.135 | 0.144 | 0.149 | 0.151 | 0.149 | 0.144 | 0.135 | 0.123 | 0.108 | 0.089 | 0.069 | 0.047 | 0.024 | 0.000 |
| FINAL CAMBER ↑ | 0" | 1/8" | 3/16" | 5/16" | 3/8" | 7/16" | 1/2" | 9/16" | 5/8" | 5/8" | 5/8" | 5/8" | 5/8" | 9/16" | 1/2" | 7/16" | 3/8" | 5/16" | 3/16" | 1/8" | 0" |

* INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD.
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTIONAL FORM).

PROJECT NO. B-5527
SURRY COUNTY
STATION: 23+79.00 -LSB-

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A. LEBLANC
10/3/2023
DocuSigned by: Marc A. LeBlanc C145E00A8F2E4A12...

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

## DEAD LOAD DEFLECTION TABLES

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S2-16 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

DRAWN BY : LDL DATE : 12/22
CHECKED BY : MAL DATE : 12/22
DESIGN ENGINEER OF RECORD: MAL DATE : 6/23

10/2/2023
X:\Raleigh\114-783.005D - B-5527 CE Update\05-CAD\B5527\Structures\DGN's\Final\402_031_B-5527_SMU_DL_S2-16.dgn
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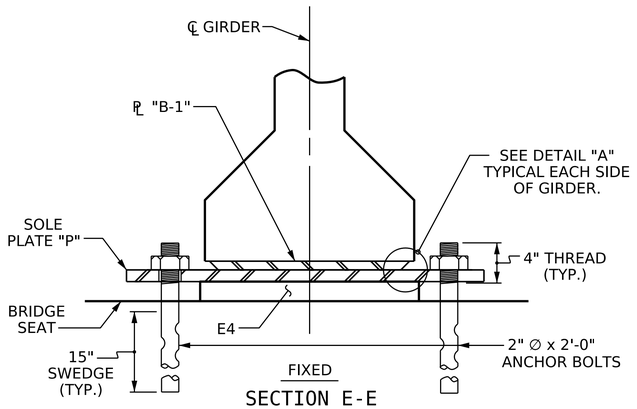
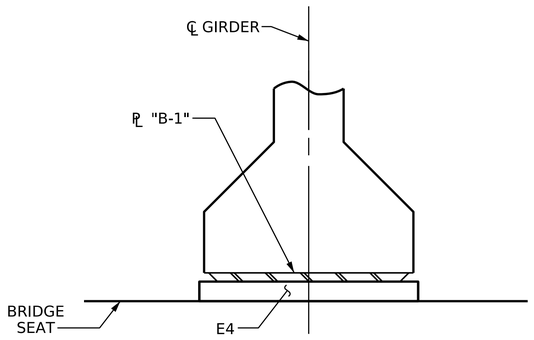


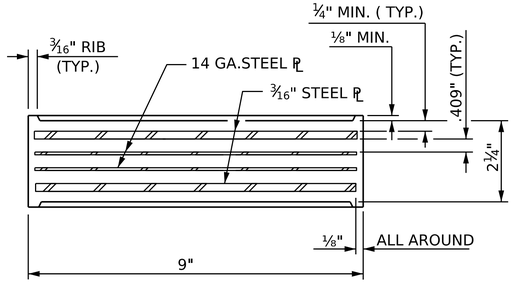

FIXED

SECTION E-E

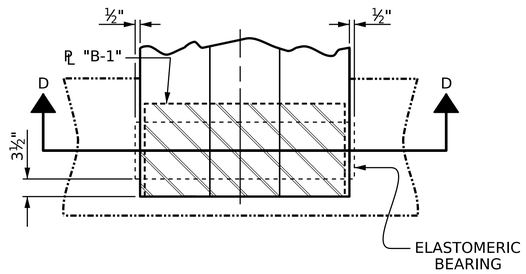



INTEGRAL

SECTION D-D

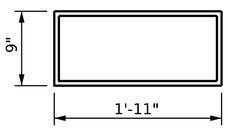



TYPICAL SECTION OF ELASTOMERIC BEARINGS




PLAN VIEW AT END BENTS

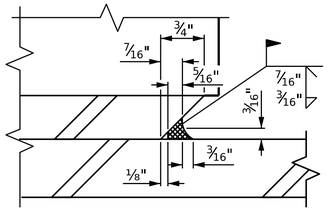
NOTE: BOTTOM FLANGE SHOWN, TOP FLANGE NOT SHOWN FOR CLARITY.



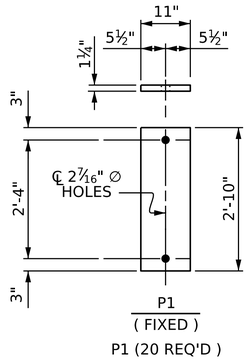

E4 ( 30 REQ'D )

PLAN VIEW OF ELASTOMERIC BEARING

## TYPE V




DETAIL "A"




P1 (20 REQ'D )

## SOLE PLATE DETAILS ( "P" )

# NOTES

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF ½ TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

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

PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE PORTION OF THE EMBEDDED PLATE AND SOLE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

WHEN WELDING THE SOLE PLATE TO THE EMBEDDED PLATE IN THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE SOLE PLATE DOES NOT EXCEED 300°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.

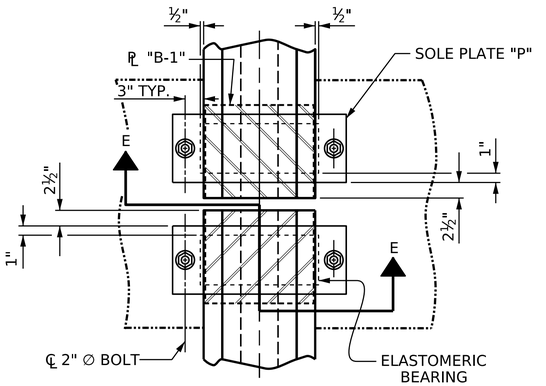
SOLE PLATE "P", BOLTS, NUTS, AND WASHERS SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLT, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.




TYPICAL PLAN

(SHOWING CONTINUOUS BENT)

| MAXIMUM ALLOWABLE SERVICE LOADS | |
|---|---|
| D.L.+L.L. (NO IMPACT) | |
| TYPE V | 365 k |

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+79.00 -LSB-

| | | | | | |
|---|---|---|---|---|---|
| ASSEMBLED BY : | LDL | DATE : | 8/22 | | |
| CHECKED BY : | MAL | DATE : | 8/22 | | |
| DRAWN BY : WJH | 8/89 | REV. 1/15 | | MAA/TMG | |
| CHECKED BY : CRK | 8/89 | REV. 12/17 | | MAA/TMG | |
| | | REV. 10/21 | | BNB/AAI | |

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A. LEBLANC

2/2/2024

DocuSigned by: Marc A. LeBlanc C149F09ABI2F4412...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

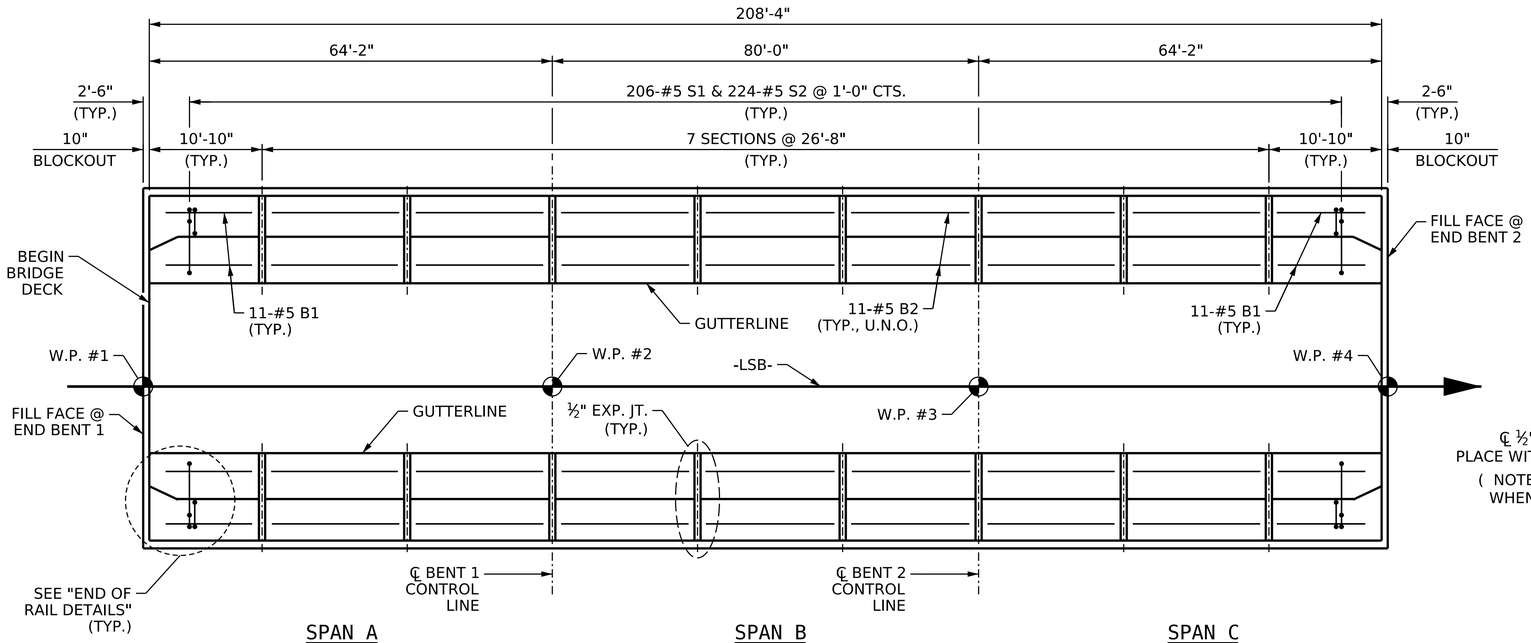
# ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S2-17 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

STD. NO. EB4

2/1/2024
X:\Raleigh\114-783.005D - B-5527 CE Update\05-CAD\B5527\Structures\DGN's\Final\402_033_B-5527_SMU_BG_S2-17.dgn
hbollinsky




# PLAN OF CONCRETE BARRIER RAIL

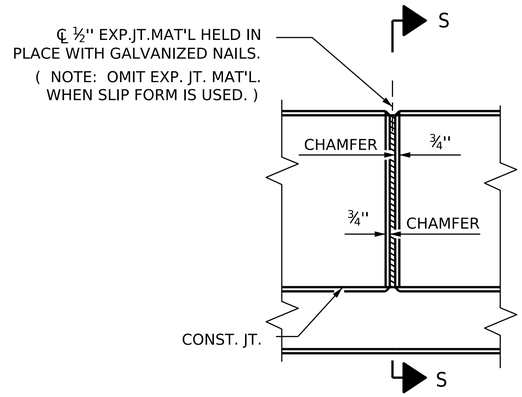
## NOTES

THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

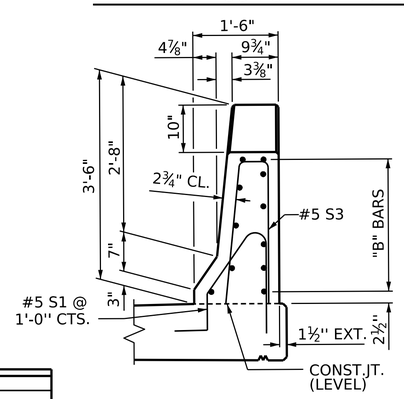
WHEN FOAM JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF BARRIER RAIL.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

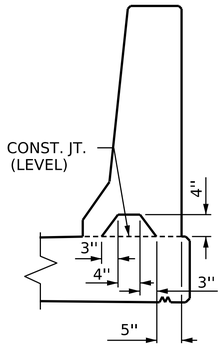
GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED 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.




ELEVATION AT EXPANSION JOINTS

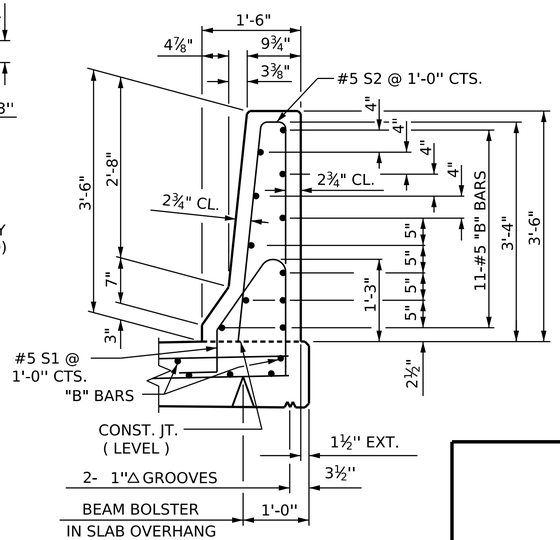



END VIEW

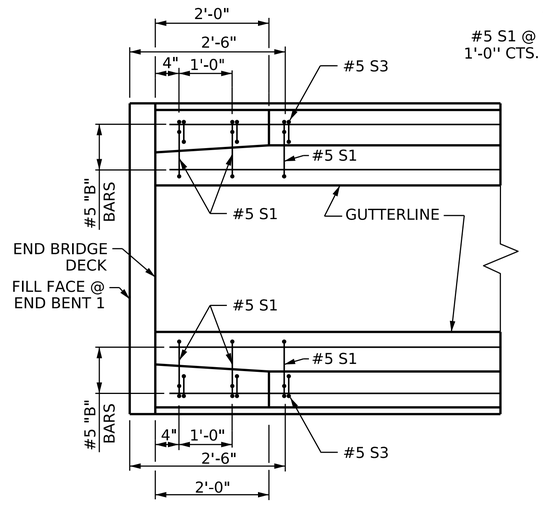



SECTION S-S

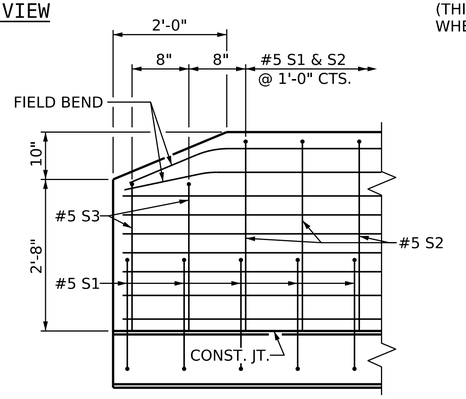
AT DAM IN OPEN JOINT (THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)




SECTION THRU CONCRETE RAILS




PLAN

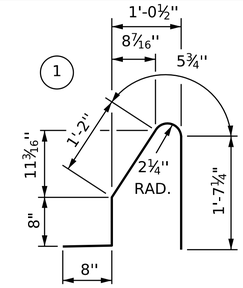


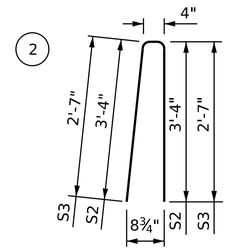

SIDE VIEW

# END OF RAIL DETAILS

# BARRIER RAIL DETAILS

## BAR TYPES




ALL BAR DIMENSIONS ARE OUT TO OUT

## BILL OF MATERIAL

FOR CONCRETE BARRIER ONLY

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| * B1 | 44 | #5 | STR | 10'-6" | 482 |
| * B2 | 154 | #5 | STR | 26'-4" | 4230 |
| * S1 | 420 | #5 | 1 | 4'-7" | 2008 |
| * S2 | 412 | #5 | 2 | 7'-0" | 3008 |
| * S3 | 8 | #5 | 2 | 5'-6" | 46 |

| | |
|---|---|
| * EPOXY COATED REINFORCING STEEL | 9,774 LBS. |
| CLASS AA CONCRETE | 56.5 CU. YDS. |
| CONCRETE BARRIER RAIL | 416.7 LIN. FT. |

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+79.00 -LSB-

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A. LEBLANC

10/3/2023

DocuSigned by: Marc A. LeBlanc C146E09ABF2E4412...

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DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

# CONCRETE BARRIER RAIL

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S2-18 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

| | | | |
|---|---|---|---|
| ASSEMBLED BY : | HRB | DATE : | 12/22 |
| CHECKED BY : | MAL | DATE : | 1/23 |
| DRAWN BY : ARB 5/87 | REV. 7/12 | | MAA/GM |
| CHECKED BY : SJD 9/87 | REV. 6/13 | | MAA/GM |
| | REV. 12/17 | | MAA/THC |

9/29/2023
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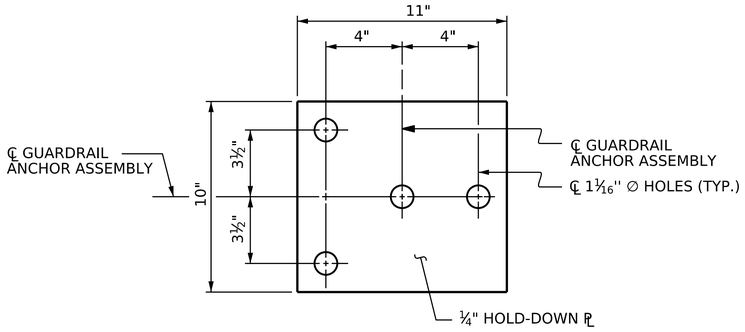
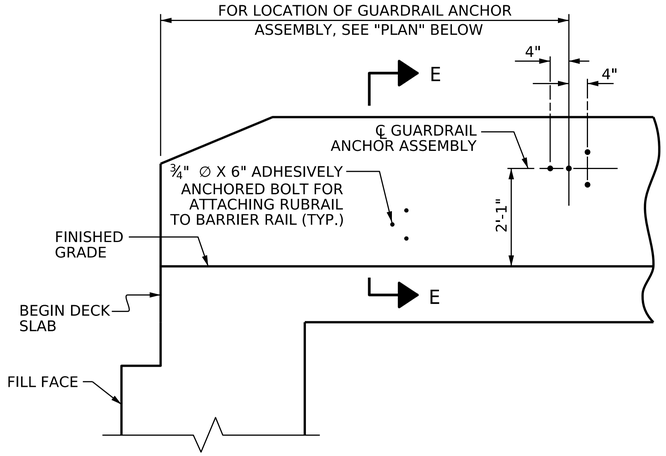
hbolinsky

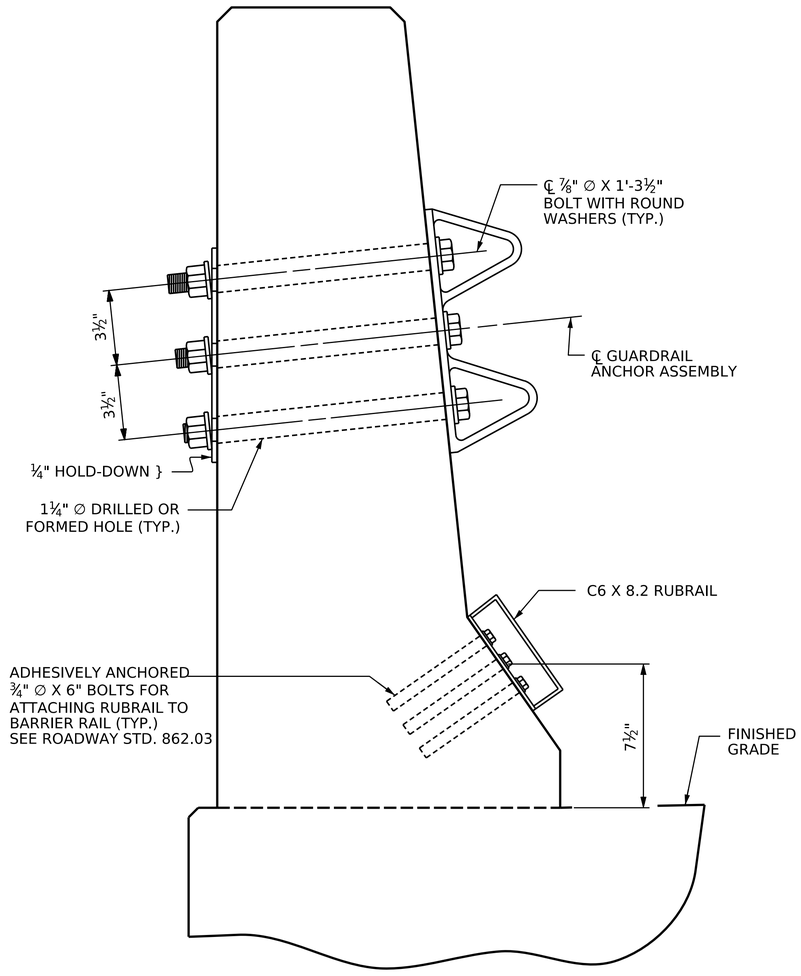
STD. NO. CBR1




PLAN

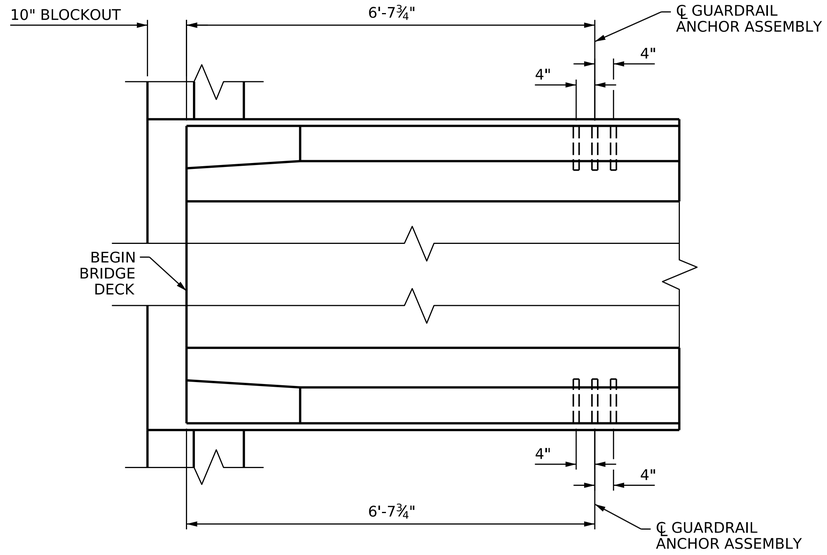



ELEVATION




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 4 - ⅞'' ∅ BOLTS WITH NUTS AND WASHERS, RUBRAIL, AND ADHESIVELY ANCHORED BOLTS.

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'' ∅ 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.)

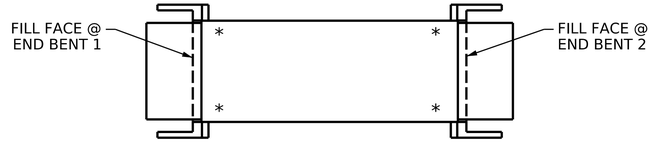
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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 CONCRETE BARRIER RAIL.

THE 1¼'' ∅ 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.

THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE ¾" ∅ X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE ¾" ∅ BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.




## SKETCH SHOWING POINTS OF ATTACHMENT

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+79.00 -LSB-

| | | | |
|---|---|---|---|
| ASSEMBLED BY : | HRB | DATE : | 12/22 |
| CHECKED BY : | MAL | DATE : | 1/23 |
| DRAWN BY : TLA | 5/06 | REV. 7/12 | MAA/GM |
| CHECKED BY : GM | 5/06 | REV. 6/13 | MAA/GM |
| | | REV. 12/17 | MAA/THC |

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A. LEBLANC

10/3/2023

DocuSigned by: Marc A. LeBlanc C146F09AB2F4412...

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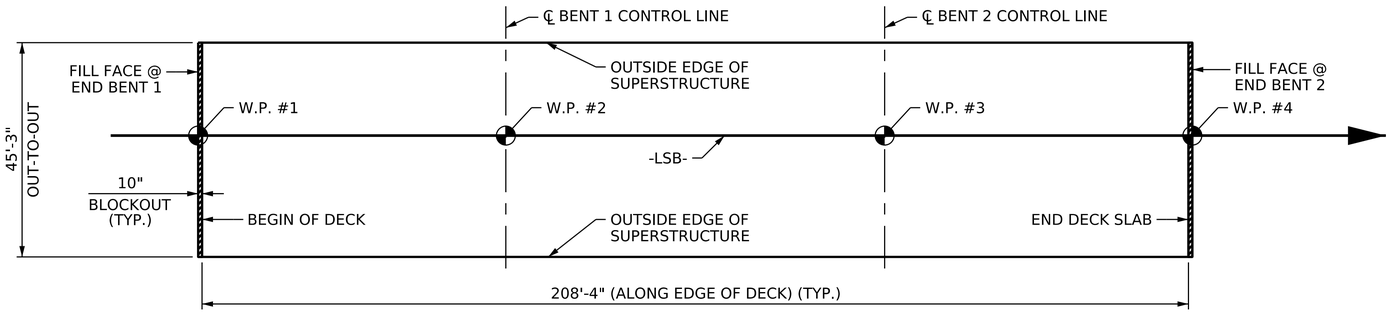
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

# GUARDRAIL ANCHORAGE DETAILS FOR CONCRETE BARRIER RAIL

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S2-19 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

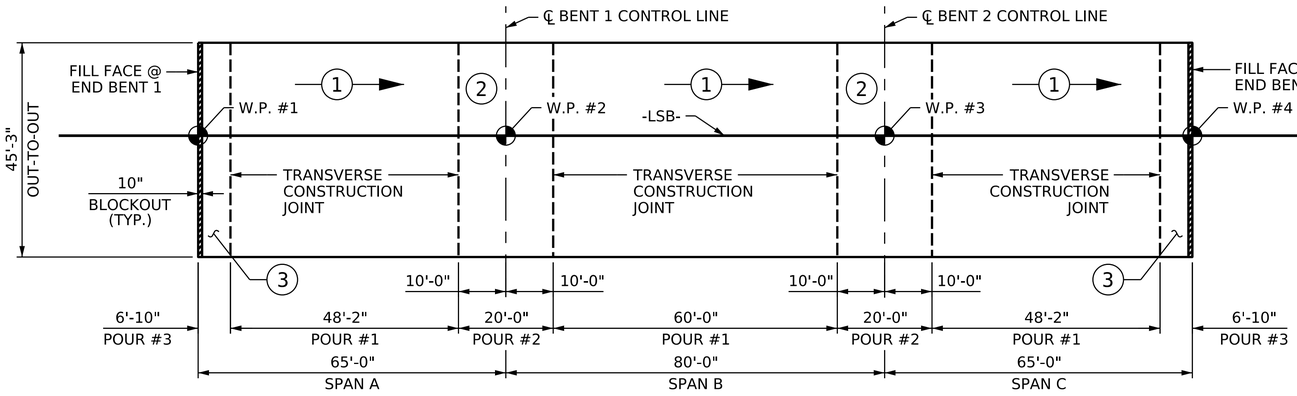
STD. NO. GRA2

9/29/2023
X:\Raleigh\114-783.005D - B-5527 CE Update\05-CAD\B5527\Structures\DGN's\Final\402_037_B-5527_SMU_GR_S2-19.dgn
hbolinsky




## LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB

## (SQ. FT. = 9,427)

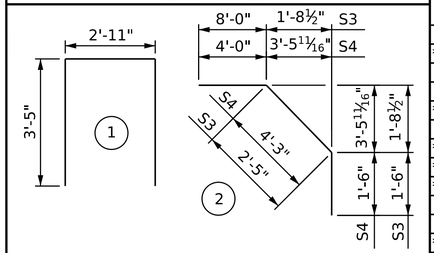



## POURING SEQUENCE

POUR (2) CAN NOT BE STARTED UNTIL BOTH ADJACENT (1) POURS REACH A MINIMUM OF 3000 PSI.

= INDICATES DIRECTION OF POUR

## BAR TYPES



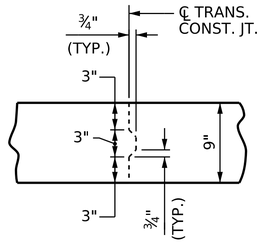

ALL BAR DIMENSIONS ARE OUT TO OUT

## REINFORCING BAR SCHEDULE

| | BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|---|
| * | A1 | 417 | #5 | STR | 44'-11" | 19536 |
| | A2 | 417 | #5 | STR | 44'-11" | 19536 |
| | | | | | | |
| * | B1 | 178 | #6 | STR | 11'-11" | 3186 |
| | B2 | 104 | #5 | STR | 44'-11" | 4872 |
| * | B3 | 90 | #4 | STR | 31'-4" | 1884 |
| * | B4 | 90 | #5 | STR | 53'-6" | 5022 |
| * | B5 | 88 | #5 | STR | 31'-9" | 2914 |
| | B6 | 208 | #4 | STR | 24'-2" | 3358 |
| | B7 | 96 | #4 | STR | 39'-0" | 2501 |
| * | B8 | 45 | #4 | STR | 25'-10" | 777 |
| | B9 | 52 | #5 | STR | 34'-0" | 1844 |
| * | B10 | 12 | #4 | STR | 36'-4" | 291 |
| | B11 | 24 | #5 | STR | 53'-6" | 1339 |
| | | | | | | |
| | K1 | 8 | #5 | STR | 44'-11" | 375 |
| | K2 | 8 | #5 | STR | 8'-1" | 67 |
| | K3 | 16 | #5 | STR | 8'-10" | 147 |
| | K4 | 8 | #5 | STR | 7'-7" | 63 |
| | K5 | 4 | #5 | STR | 1'-10" | 7 |
| | K6 | 8 | #5 | STR | 2'-3" | 18 |
| | K7 | 4 | #5 | STR | 1'-7" | 6 |
| | | | | | | |
| | S3 | 72 | #4 | 2 | 11'-11" | 573 |
| | S4 | 72 | #4 | 2 | 9'-9" | 469 |
| | | | | | | |
| | U1 | 72 | #4 | 1 | 9'-9" | 469 |
| | | | | | | |
| | REINFORCING STEEL | | | | 35,644 | LBS. |
| * | EPOXY COATED REINFORCING STEEL | | | | 33,610 | LBS. |
| | CLASS AA CONCRETE | | | | 344.8 | CU. YDS. |

## SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

| BAR SIZE | SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL | | APPROACH SLABS | | PARAPET AND BARRIER RAIL |
|---|---|---|---|---|---|
| | EPOXY COATED | UNCOATED | EPOXY COATED | UNCOATED | |
| #4 | 1'-11" | 1'-7" | 1'-11" | 1'-7" | 2'-6" |
| #5 | 2'-5" | 2'-0" | 2'-5" | 2'-0" | 3'-1" |
| #6 | 2'-10" | 2'-5" | 3'-7" | 2'-5" | 3'-8" |
| #7 | 4'-2" | 2'-9" | | | |
| #8 | 4'-9" | 3'-2" | | | |




## TRANSVERSE CONSTRUCTION JOINT DETAIL

REINFORCING STEEL IN SLAB NOT SHOWN.
LONGITUDINAL REINFORCING STEEL
SHALL BE CONTINUOUS THROUGH JOINT.

## GROOVING BRIDGE FLOORS

| | |
|---|---|
| APPROACH SLABS | 1,950 SQ. FT. |
| BRIDGE DECK | 8,112 SQ. FT. |
| TOTAL | 10,062 SQ. FT. |

## SUPERSTRUCTURE BILL OF MATERIAL

| CLASS "AA" CONCRETE | | REINFORCING STEEL | EPOXY COATED REINFORCING STEEL |
|---|---|---|---|
| POUR NO. | CU. YDS. | LBS. | LBS. |
| 1 | 225.0 | | |
| 2 | 57.5 | | |
| 3 | 62.3 | | |
| TOTAL | 344.8 | 35,644 LBS. | 33,610 LBS. |

* * QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+79.00 -LSB-

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARCIA LEBLANC

10/3/2023

DocuSigned by: Marc A. LeBlanc

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DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

# BILL OF MATERIAL

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S2-20 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 32 |

DRAWN BY : LDL DATE : 12/22
CHECKED BY : MAL DATE : 12/22
DESIGN ENGINEER OF RECORD: MAL DATE : 6/23

10/27/2023
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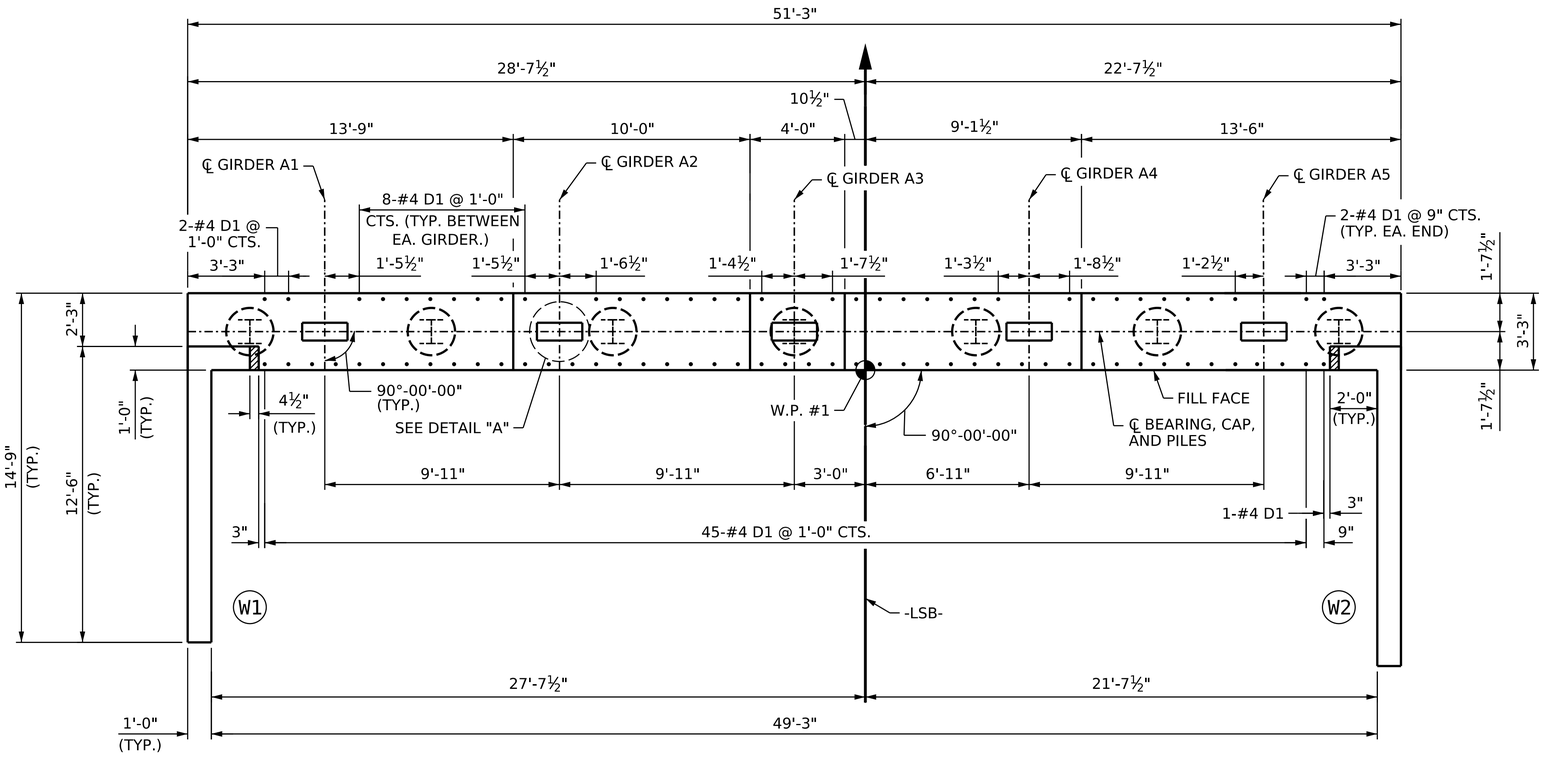



## PLAN

## NOTES

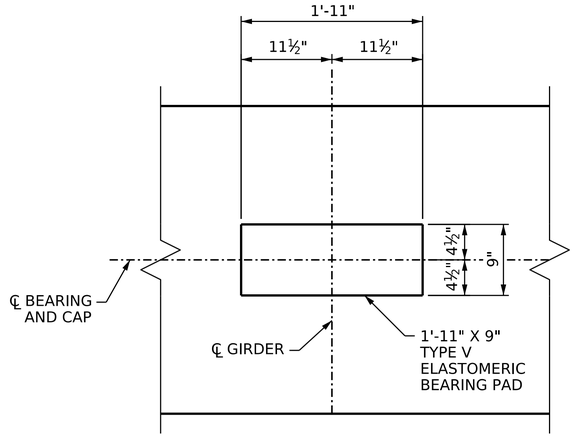
FOR SECTION A-A AND PARTIAL SECTION B-B, SEE SHEET 3 OF 3.

#4 D1 STIRRUP BARS MAY BE SHIFTED SLIGHTLY TO AVOID STIRRUPS IN CAP AND STEPS IN CAP.

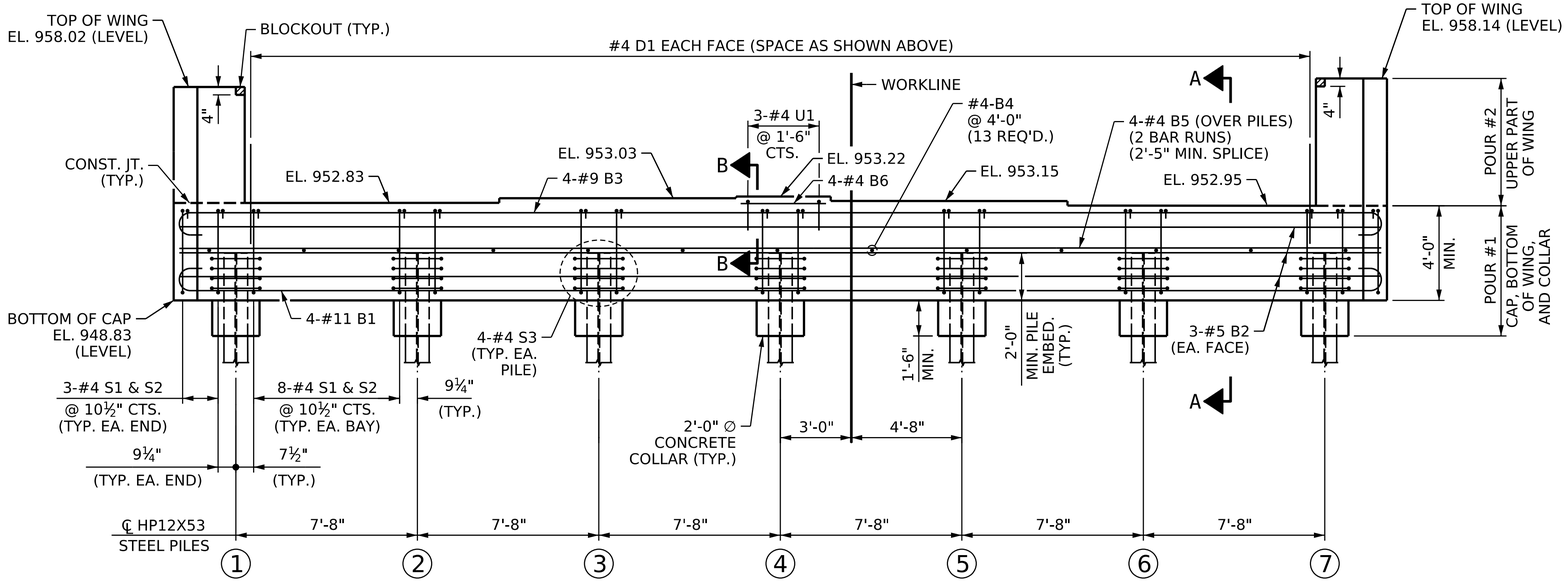
SEE SUPERSTRUCTURE SHEETS FOR UPPER PART OF INTEGRAL END BENT DETAILS.

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

THE TOP SURFACE OF THE END BENT CAP AND WINGS, EXCLUDING THE BEARING AREA AND EXPOSED AREA OUTSIDE OF CONCRETE DIAPHRAGM, SHALL BE RAKED TO A DEPTH OF ¼".




## DETAIL "A"




## ELEVATION

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+79.00 -LSB-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

# INTEGRAL END BENT NO. 1

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARCA LEBLANC

10/3/2023

DocuSigned by: Marc A. LeBlanc

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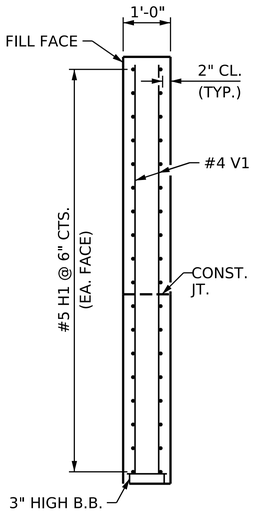
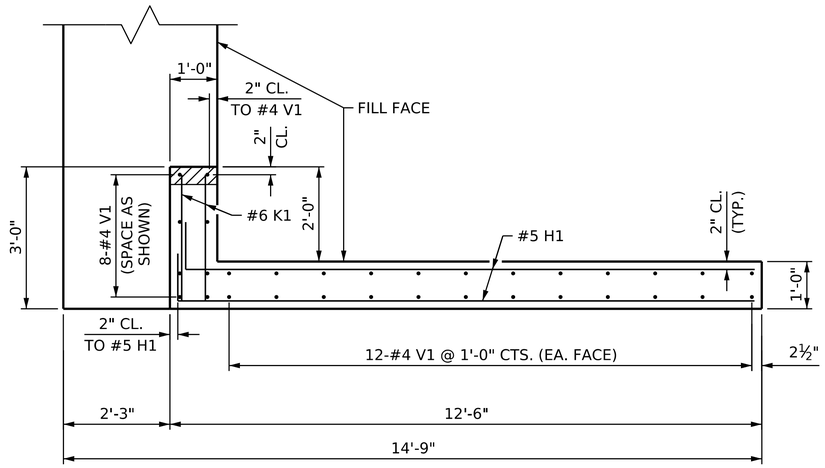
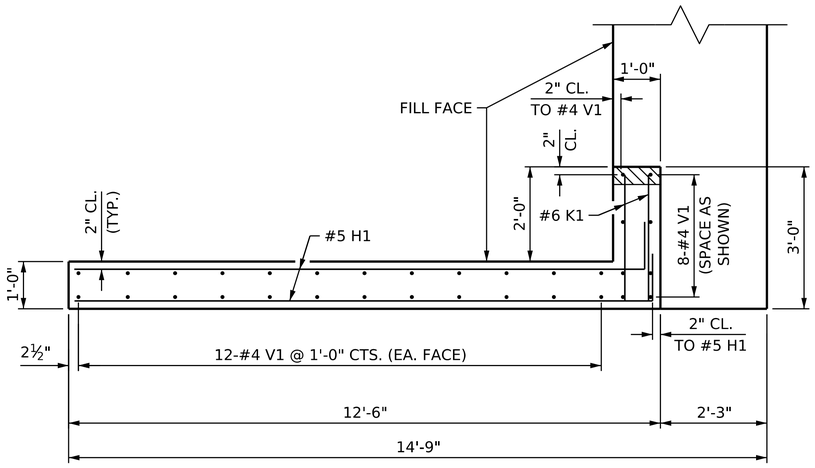


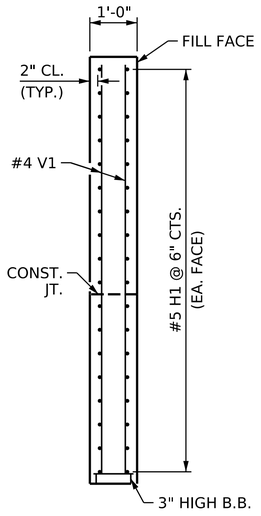

## SECTION C-C




## PLAN OF WING - W1




## PLAN OF WING - W2

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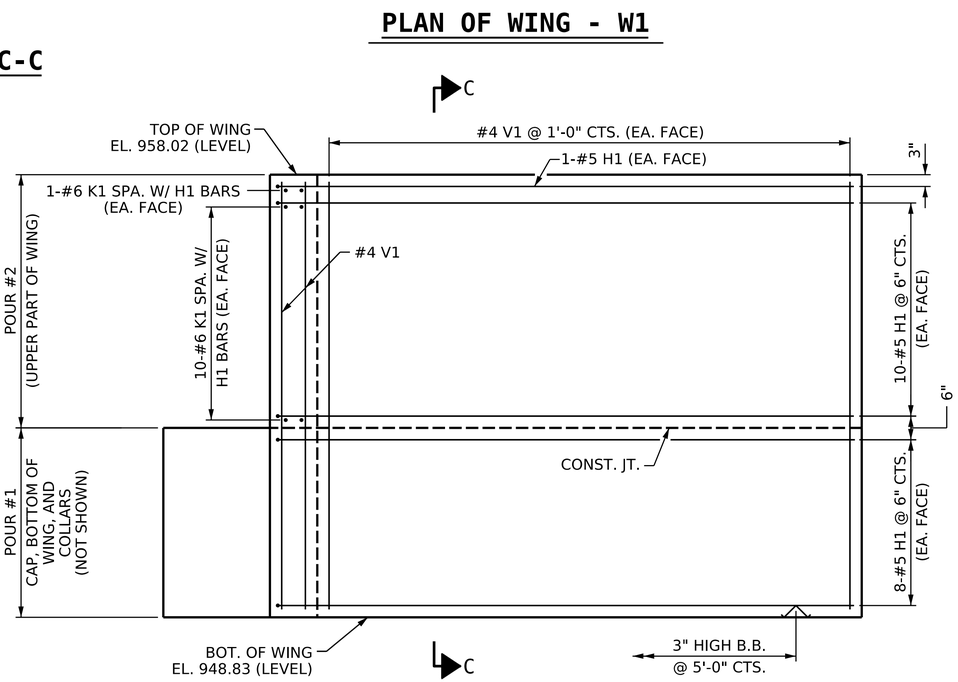
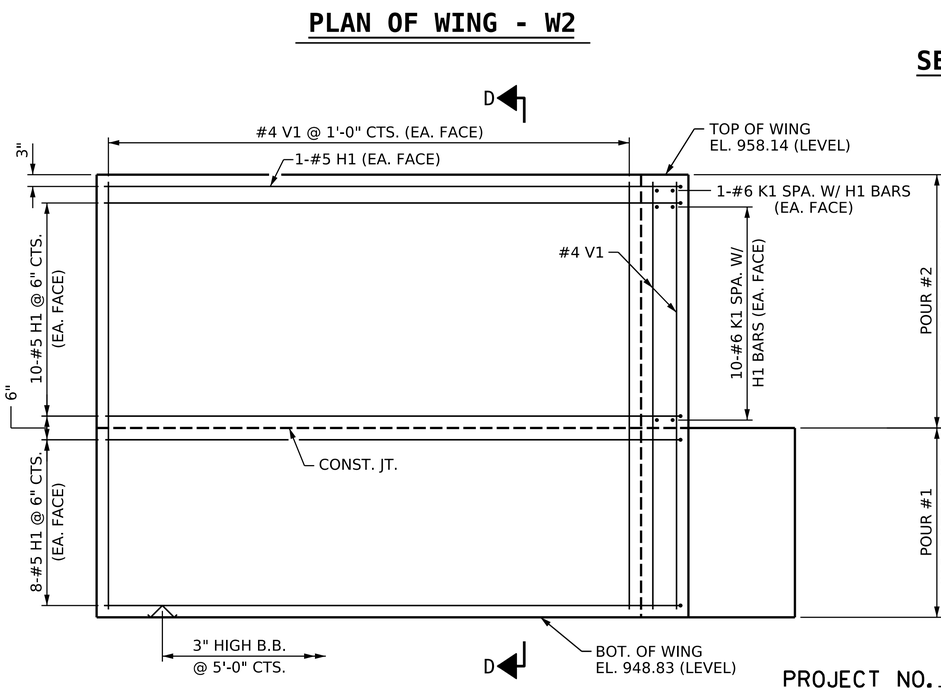



## ELEVATION OF WING - W1




## ELEVATION OF WING - W2

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+79.00 -LSB-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
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**INTEGRAL END BENT NO. 1**

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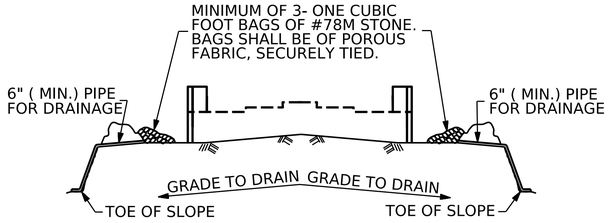
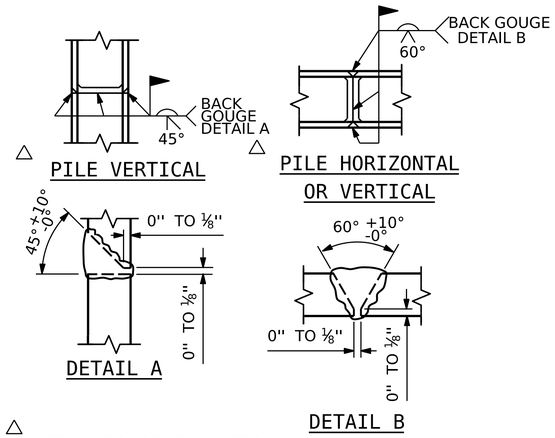



BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

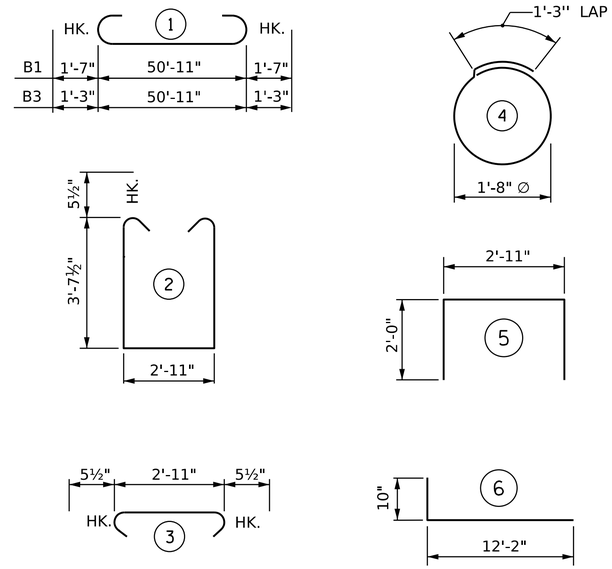
## TEMPORARY DRAINAGE AT END BENT




△ POSITION OF PILE DURING WELDING.

## PILE SPLICE DETAILS

## BAR TYPES




ALL BAR DIMENSIONS ARE OUT TO OUT.

## BILL OF MATERIAL

### END BENT NO. 1

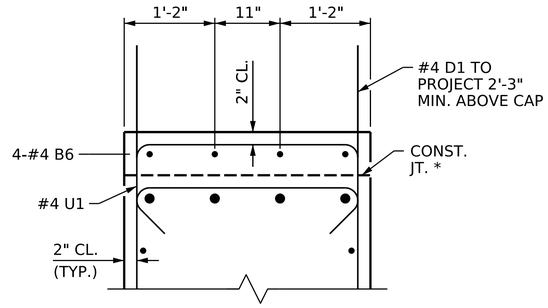
| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| B1 | 4 | #11 | 1 | 54'-1" | 1149 |
| B2 | 6 | #5 | STR | 50'-11" | 319 |
| B3 | 4 | #9 | 1 | 53'-5" | 726 |
| B4 | 13 | #4 | STR | 2'-11" | 25 |
| B5 | 8 | #4 | STR | 26'-8" | 143 |
| B6 | 4 | #4 | STR | 3'-8" | 10 |
| | | | | | |
| D1 | 82 | #4 | STR | 4'-3" | 233 |
| | | | | | |
| H1 | 76 | #5 | 6 | 13'-0" | 1030 |
| | | | | | |
| K1 | 44 | #6 | STR | 2'-8" | 176 |
| | | | | | |
| S1 | 54 | #4 | 2 | 11'-1" | 400 |
| S2 | 54 | #4 | 3 | 3'-10" | 138 |
| S3 | 28 | #4 | 4 | 6'-6" | 122 |
| | | | | | |
| U1 | 3 | #4 | 5 | 6'-11" | 14 |
| | | | | | |
| V1 | 64 | #4 | STR | 8'-10" | 378 |
| V2 | 64 | #4 | STR | 8'-10" | 378 |

| | |
|---|---|
| REINFORCING STEEL | 5241 LBS. |
| CLASS A CONCRETE | |
| POUR #1 COLLARS, CAP, AND BOTTOM OF WINGS | 30.3 CY |
| POUR #2 UPPER PART OF WINGS | 5.6 CY |
| TOTAL CLASS A CONCRETE | 35.9 CY |




## SECTION A-A

* THE TOP SURFACE OF THE END BENT CAP AND WINGS, EXCLUDING THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF ¼"




## PARTIAL SECTION B-B

* THE TOP SURFACE OF THE END BENT CAP AND WINGS, EXCLUDING THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF ¼"

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+79.00 -LSB-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
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# INTEGRAL END BENT NO. 1 DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARCA LEBLANC

10/3/2023

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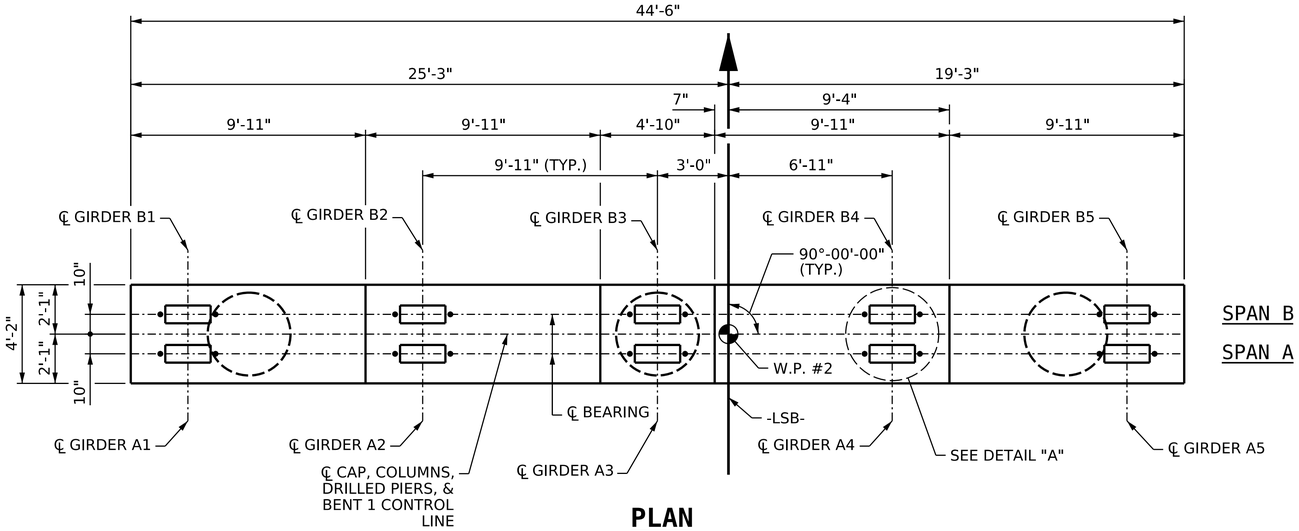
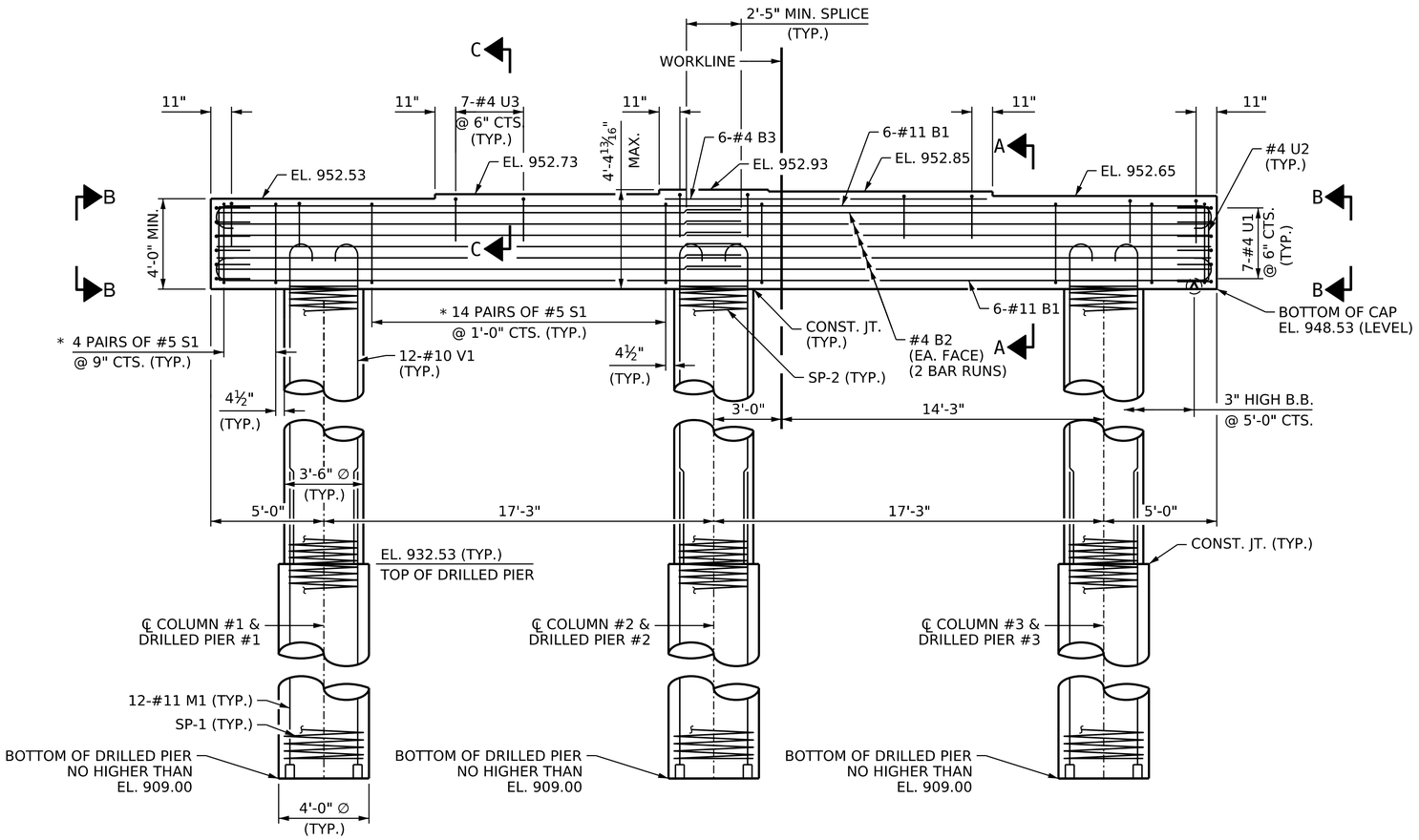



## PLAN




## ELEVATION

## NOTES

FOR SECTION CUTS AND VIEWS, SEE SHEET 2 OF 2.

FOR REINFORCING BILL OF MATERIAL, SEE SHEET 2 OF 2.

STIRRUPS AND U3 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO AVOID ANCHOR BOLTS.

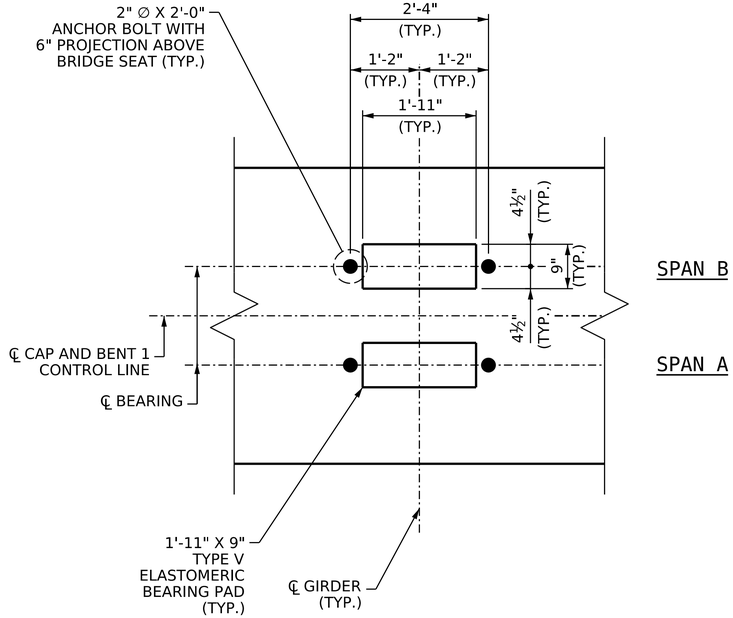
* INVERT ALTERNATE #5 S1 STIRRUP PAIRS.

HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".

THE CONTRACTORS ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FOOT BELOW THE GROUND LINE.




## DETAIL "A"

DIMENSIONS ARE TYPICAL FOR EACH GIRDER

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+79.00 -LSB-

SHEET 1 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARCA LEBLANC

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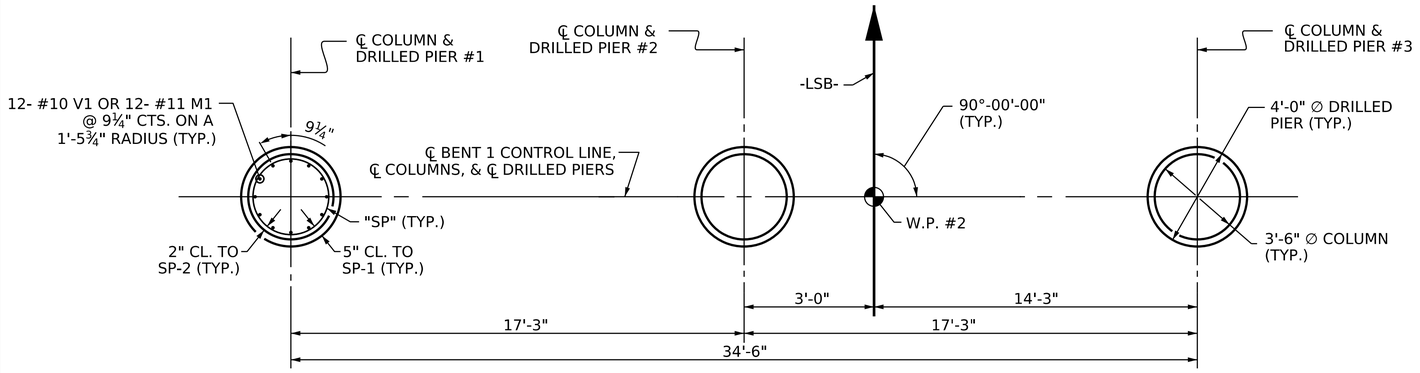
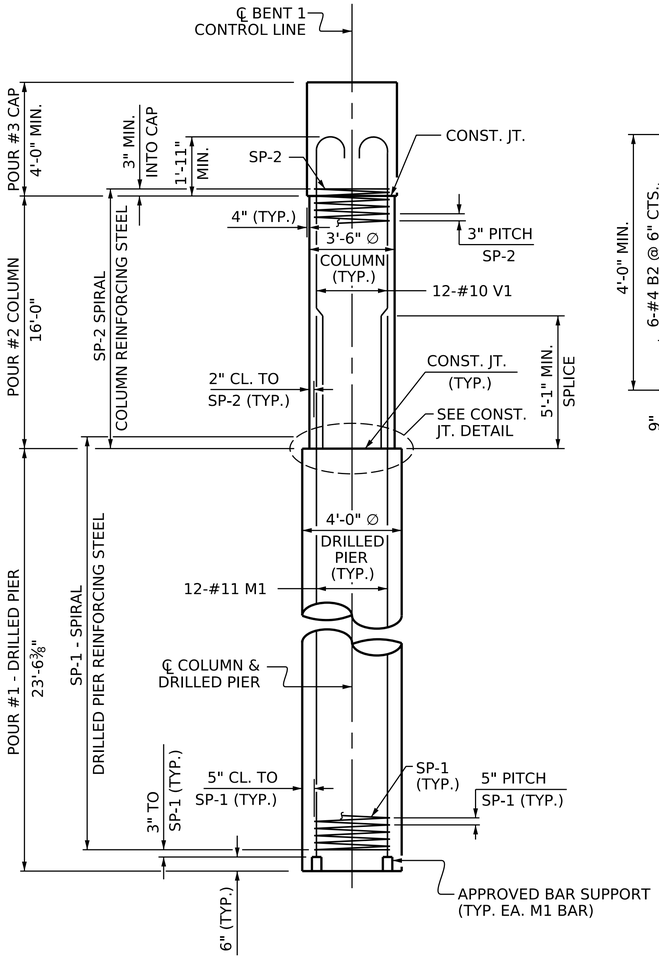
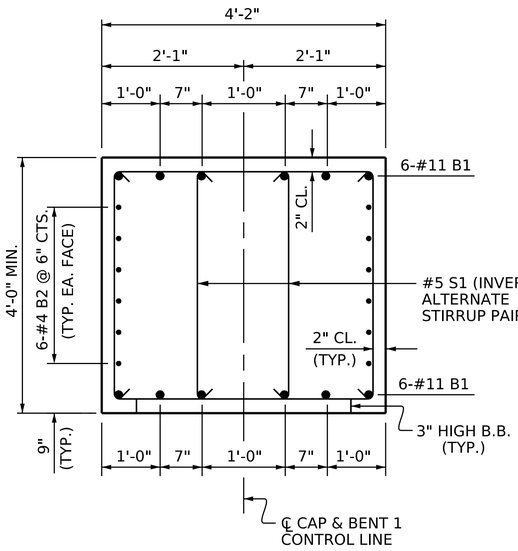


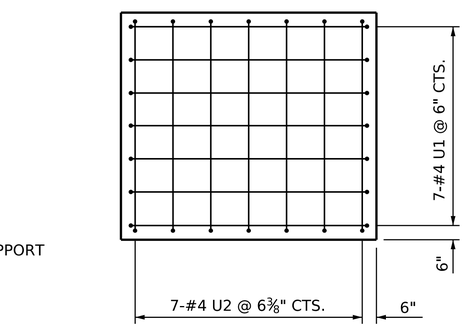

## PLAN OF DRILLED PIERS AND COLUMNS



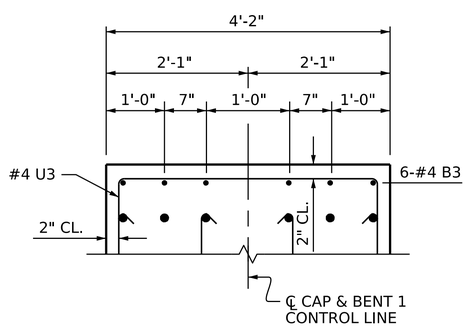

## END ELEVATION



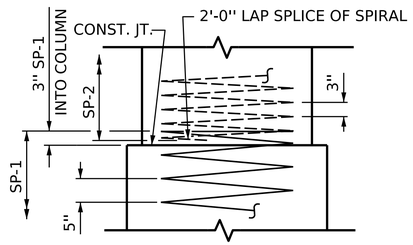

## SECTION A-A




## VIEW B-B

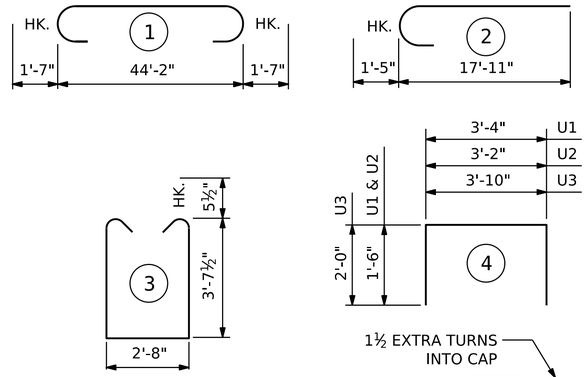



## PARTIAL SECTION C-C




## CONSTRUCTION JOINT DETAIL

## BAR TYPES




ALL BAR DIMENSIONS ARE OUT TO OUT.

## BILL OF MATERIAL

### BENT NO. 1

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| B1 | 12 | #11 | 1 | 47'-4" | 3,018 |
| B2 | 24 | #4 | STR | 23'-4" | 374 |
| B3 | 6 | #4 | STR | 14'-3" | 57 |
| | | | | | |
| M1 | 36 | #11 | STR | 31'-2" | 5,961 |
| | | | | | |
| S1 | 72 | #5 | 3 | 10'-10" | 814 |
| | | | | | |
| U1 | 14 | #4 | 4 | 6'-4" | 59 |
| U2 | 14 | #4 | 4 | 6'-2" | 58 |
| U3 | 35 | #4 | 4 | 7'-10" | 183 |
| | | | | | |
| V1 | 36 | #10 | 2 | 19'-4" | 2,995 |

| | | | | | |
|---|---|---|---|---|---|
| REINFORCING STEEL (FOR BENT 1) | | | | | 13,519 LBS. |
| SP-1 | 3 | * | 6 | 563'-2" | 1,762 |
| SP-2 | 3 | ** | 5 | 653'-1" | 1,309 |

SPIRAL COLUMN REINFORCING STEEL (FOR BENT 1) 3,071 LBS.

** THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

CLASS A CONCRETE BREAKDOWN FOR BENT 1

| | |
|---|---|
| POUR #2 (COLUMNS) | 17.1 CY |
| POUR #3 (CAP) | 28.7 CY |
| TOTAL CLASS A CONCRETE | 45.8 CY |

DRILLED PIERS: (FOR BENT 1)

| | |
|---|---|
| DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS) | 32.9 CY |

PROJECT NO. B-5527

SURRY COUNTY

STATION: 23+79.00 -LSB-

SHEET 2 OF 2

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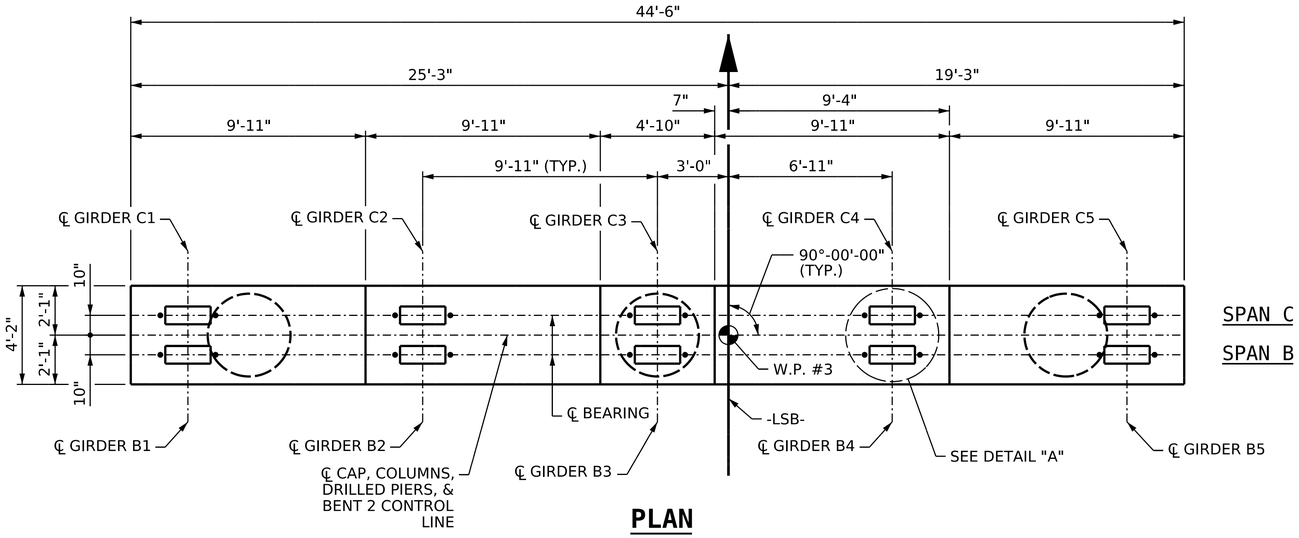
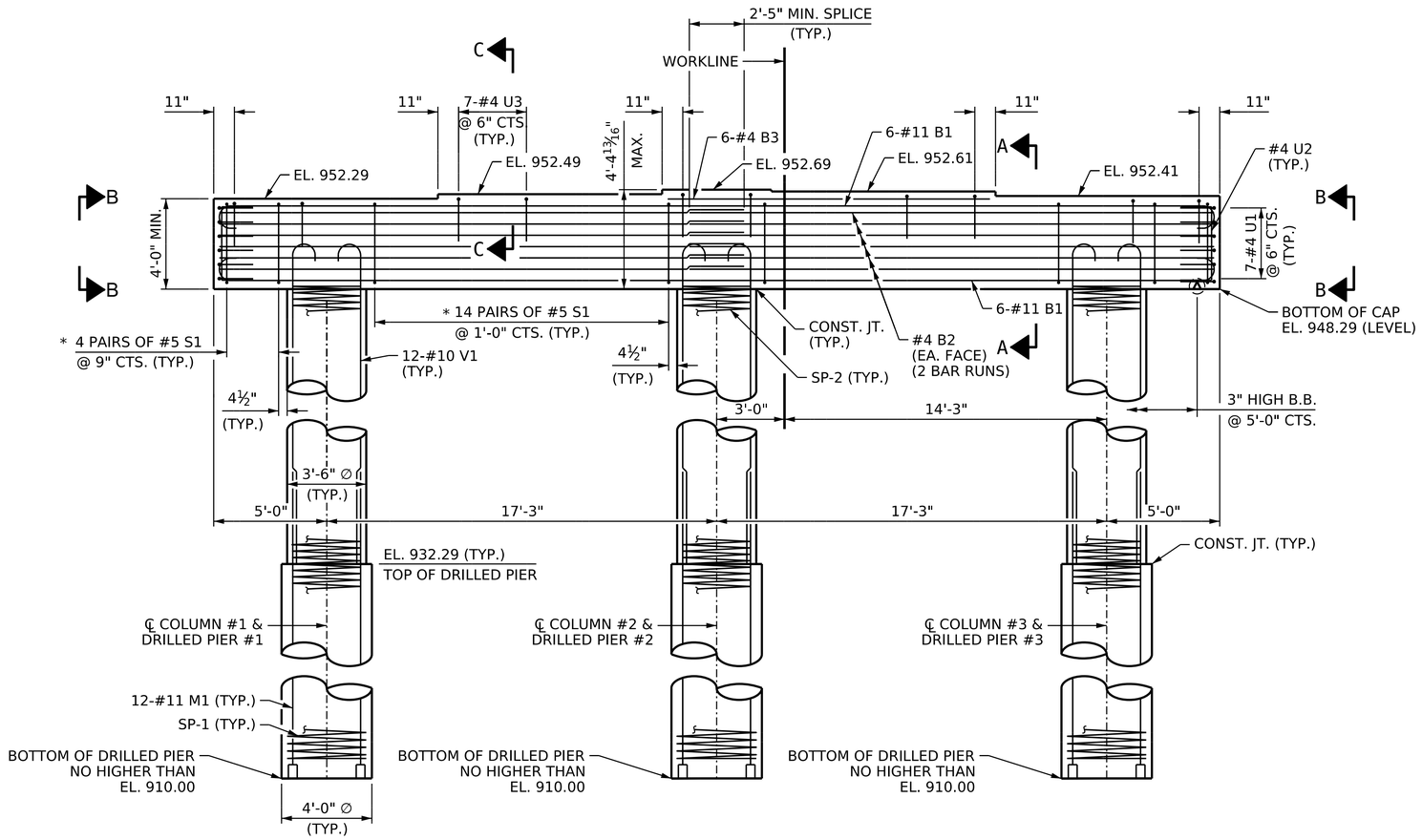



## PLAN




## ELEVATION

## NOTES

FOR SECTION CUTS AND VIEWS, SEE SHEET 2 OF 2.

FOR REINFORCING BILL OF MATERIAL, SEE SHEET 2 OF 2.

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* INVERT ALTERNATE #5 S1 STIRRUP PAIRS.

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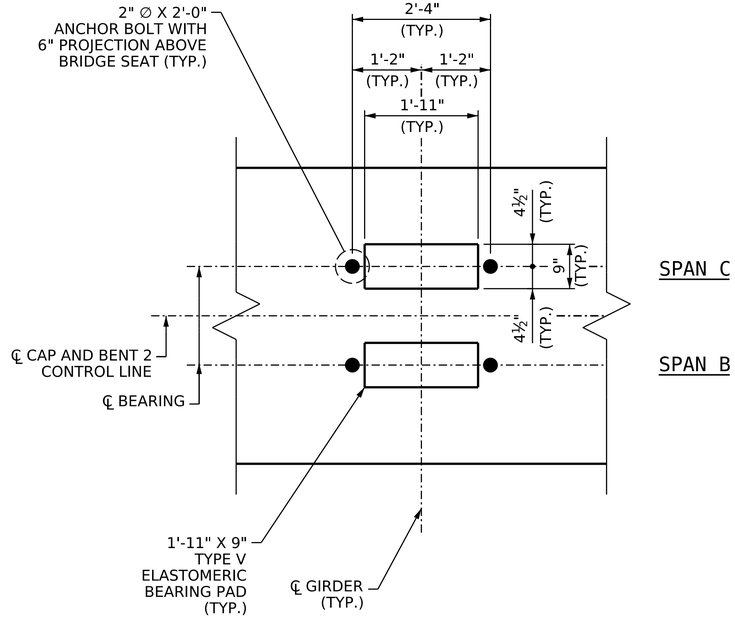


## DETAIL "A"

DIMENSIONS ARE TYPICAL FOR EACH GIRDER

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SHEET 1 OF 2

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