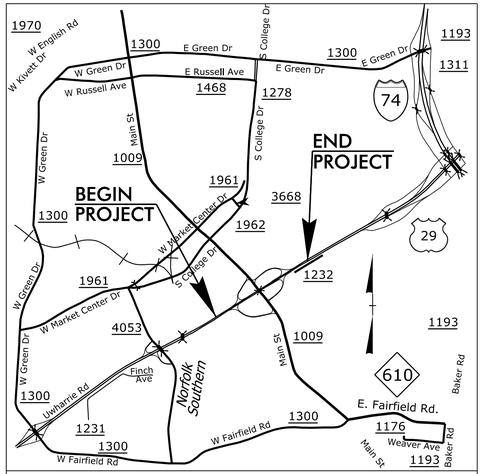
09/08/99

**TIP PROJECT: U-5896 / B-5353**

**CONTRACT: C204150**




VICINITY MAP

# STATE OF NORTH CAROLINA
# DIVISION OF HIGHWAYS

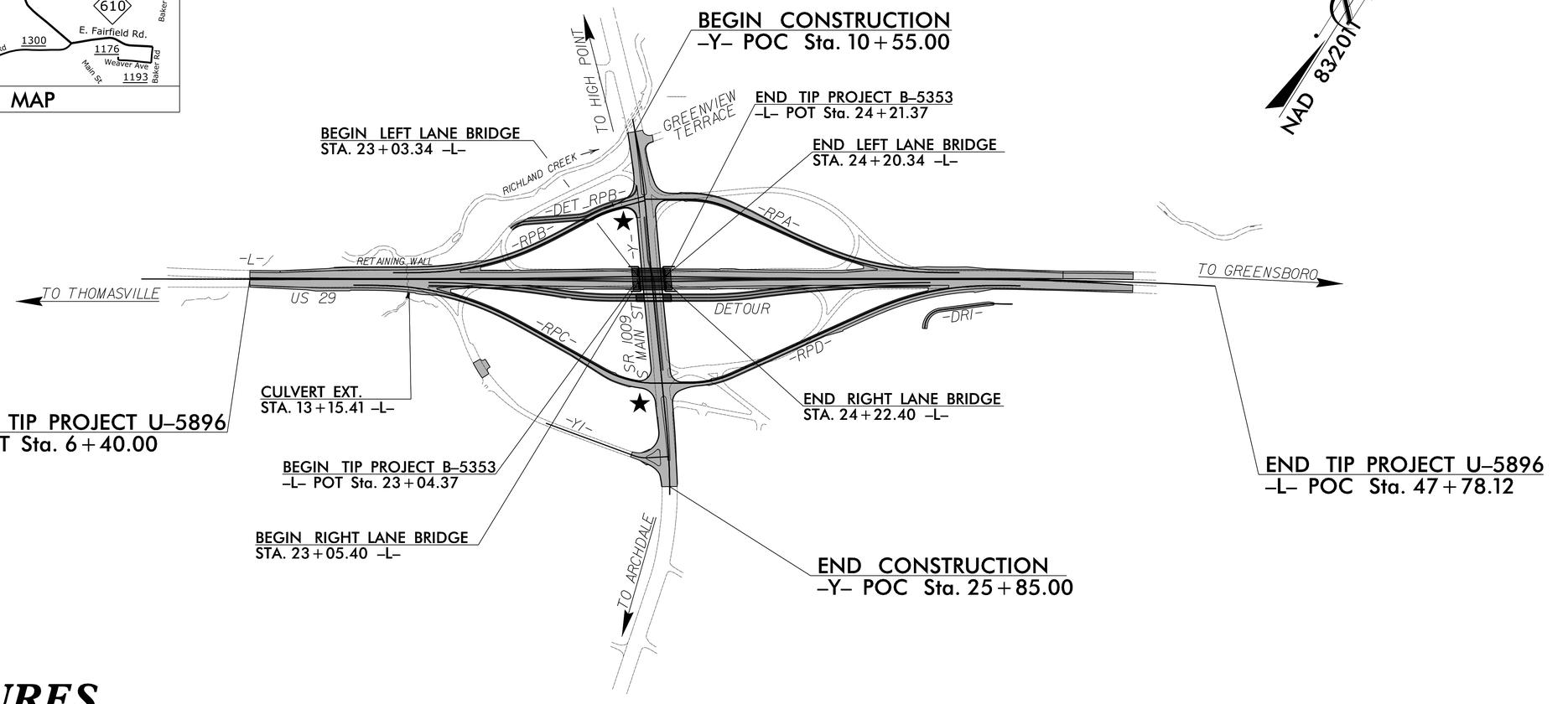
# *GUILFORD COUNTY*

| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| N.C. | U-5896/B-5353 | 1 | |

| STATE PROJ. NO. | F. A. PROJ. NO. | DESCRIPTION |
|---|---|---|
| 44674.1.2 | | PE (U-5896) |
| 46067.1.1 | BRNHS-0029(56) | PE (B-5353) |
| 44674.2.1 | | R/W & UTIL. (U-5896) |
| 46067.2.1 | | R/W & UTIL. (B-5353) |
| 44674.3.1 | | CONST. (U-5896/B-5353) |
| | | |
| | | |
| | | |

***LOCATION: INTERCHANGE AT US 29 AND SR 1009 (S MAIN STREET) IN HIGH POINT***

***TYPE OF WORK: GRADING, PAVING, DRAINAGE, STRUCTURE, CULVERT, RETAINING WALL, & SIGNALS***




# *STRUCTURES*

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

***GRAPHIC SCALES***

PLANS: 50 0 50 100

PROFILE (HORIZONTAL): 50 0 50 100

PROFILE (VERTICAL): 20 0 10 20

***DESIGN DATA***

ADT 2022 = 38,540
ADT 2040 = 42,700
K = 10 %
D = 60 %
T = 9 % *
V = 60 MPH
* TTST = 4% DUAL = 5%
FUNC CLASS = FREEWAY
STATEWIDE TIER

***PROJECT LENGTH***

| | | | |
|---|---|---|---|
| LENGTH OF ROADWAY TIP PROJECT U-5896 | = | 0.762 | MI |
| LENGTH OF STRUCTURE TIP PROJECT B-5353 | = | 0.022 | MI |
| TOTAL LENGTH TIP PROJECTS U-5896 & B-5353 | = | 0.784 | MI |

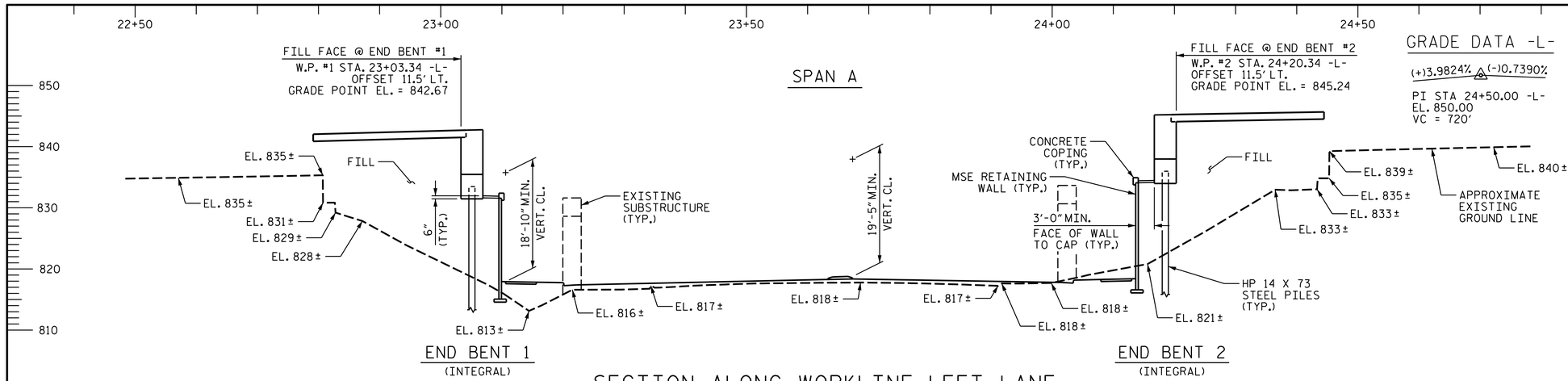

PLANS PREPARED FOR THE NCDOT BY:
MOTT MACDONALD
7621 Purfoy Road, Suite 115
Fuquay-Varina, NC 27526
(919) 552-2253
(919) 552-2254 (Fax)
www.mottmac.com/americas
LICENSE NO. F-0669


*2018 STANDARD SPECIFICATIONS*

***LETTING DATE:***
FEBRUARY 15, 2022

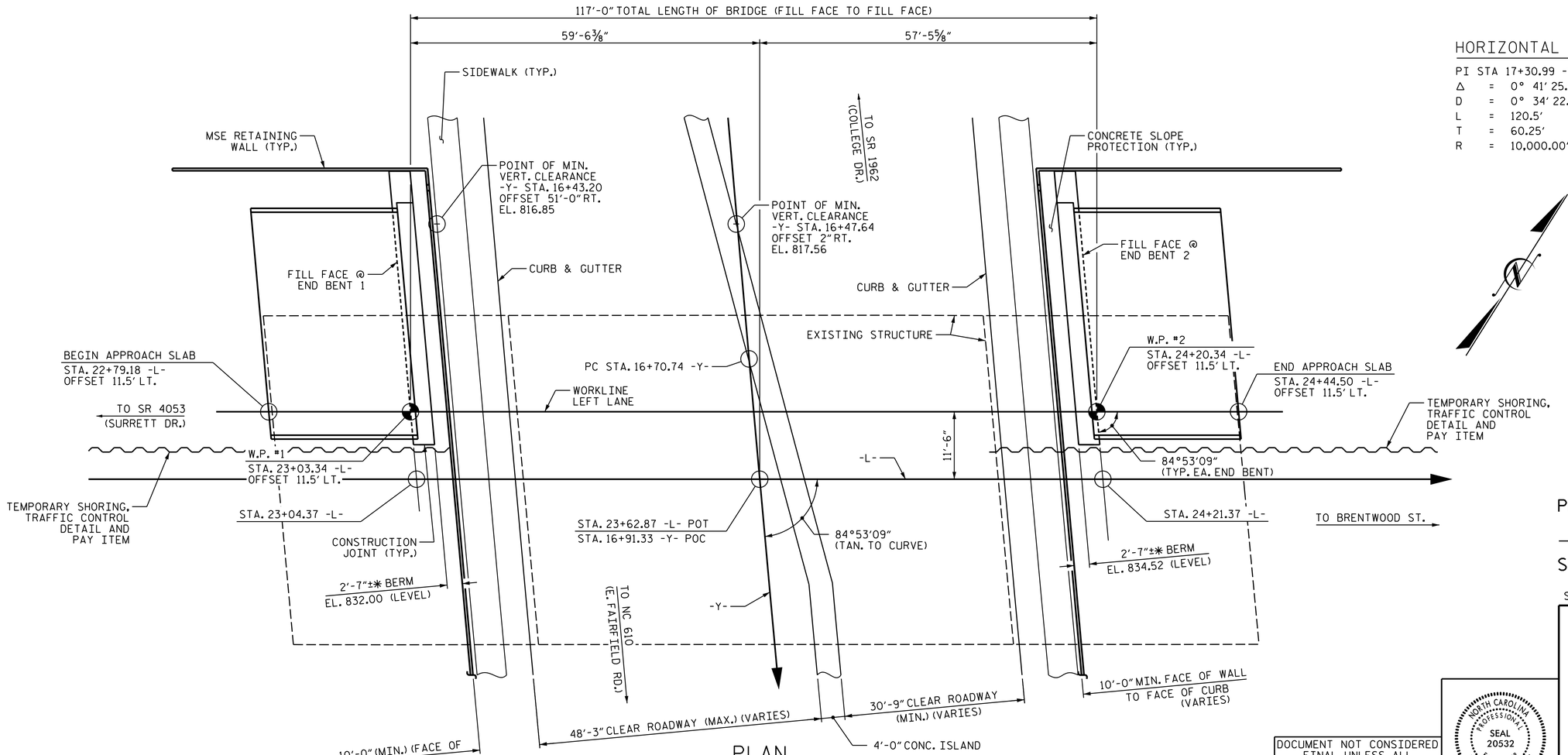
STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

$$DATE$$
1/12/2022
G:\386695_2017_NCDOT_BridgeDesign_LSA\Proj\B-5353\Structures\Plans\400_B5353_TSH.dgn
default




## SECTION ALONG WORKLINE LEFT LANE

SECTIONS AT END BENTS ARE TAKEN AT RIGHT ANGLES




## PLAN

PILES NOT SHOWN FOR CLARITY

*BERM WIDTH IS DEPENDENT ON FINAL MSE RETAINING WALL DESIGN

## HORIZONTAL CURVE DATA -Y-

PI STA 17+30.99 -Y-
Δ = 0° 41' 25.5" (LT)
D = 0° 34' 22.6"
L = 120.5'
T = 60.25'
R = 10,000.00'

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L- POT
16+91.33 -Y- POC

SHEET 1 OF 3 REPLACES BRIDGE #400147

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

# GENERAL DRAWING

BRIDGE ON US 29, US 70 OVER S. MAIN ST. (SR 1009) BETWEEN SR 4053 AND BRENTWOOD ST. (LEFT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-1 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 26 |

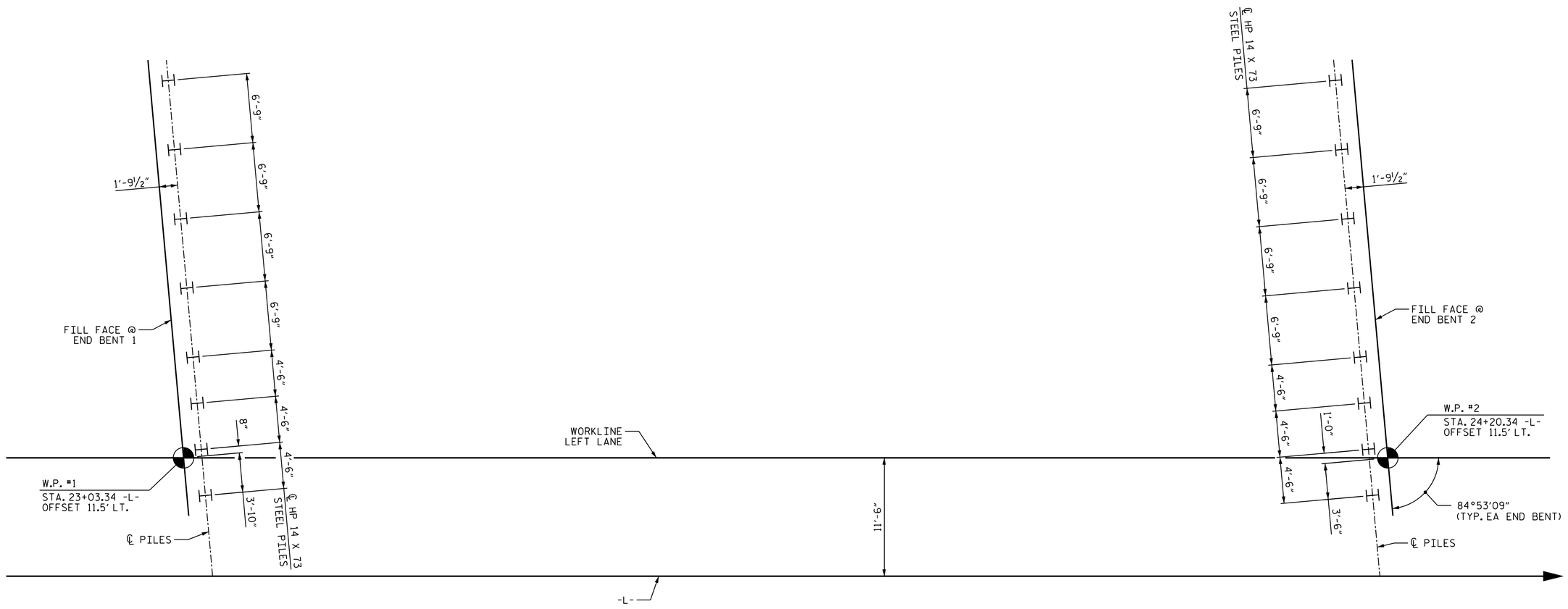
DRAWN BY: J. T. WILLIAMS DATE: 3-2020
CHECKED BY: J. E. MONDOLFI DATE: 5-2020
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 5-2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:
MOTT MACDONALD
PO Box 700
Fuquay-Varina, NC 27526
(919) 552-2253
www.mottmac.com
LICENSE NO. F-0669

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI

w:\157077 R:\Structures\Plans\Left Lane\B-5353_SMU_GDI_400147.dgn 12/2/2021 10:58:30 AM




END BENT 1

END BENT 2

## FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO PILE CENTERLINE

ORIENT PILES AS SHOWN

## NOTES:

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT 1 AND END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 130 TONS PER PILE.

DRIVE PILES AT END BENT 1 AND END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 220 TONS PER PILE.

STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT 1 AND END BENT 2. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 40,000 TO 50,000 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT END BENT 1 AND END BENT 2. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(d)(2) OF THE STANDARD SPECIFICATIONS.

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

# GENERAL DRAWING

BRIDGE ON US 29, US 70 OVER S. MAIN ST. (SR 1009) BETWEEN SR 4053 AND BRENTWOOD ST. (LEFT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-2 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 26 |

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PLANS PREPARED BY:
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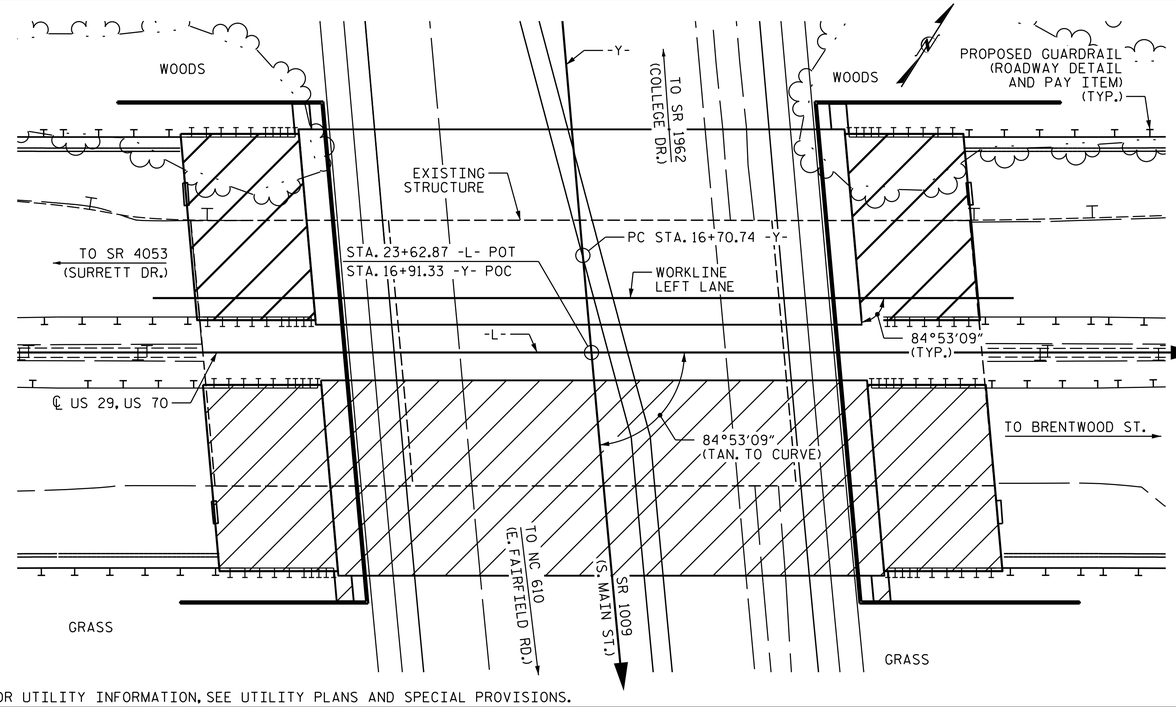
PO Box 700
Fuquay-Varina, NC 27526
(919) 552-2253
www.mottmac.com
LICENSE NO. F-0669

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI

DRAWN BY: J. T. WILLIAMS DATE: 10-2020
CHECKED BY: J. E. MONDOLFI DATE: 10-2020
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 11-2020

w:\57077 R:\Structures\Plans\Left Lane\B-5353_SMU_FL_400147.dgn 12/2/2021 10:58:32 AM

BM3: MAG NAIL IN CURB, -BY- STA. 23+04.76, 179.0' LT., ELEV.= 835.99




FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

## LOCATION SKETCH

## NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE 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.

THE ELEVATION AND CLEARANCE SHOWN ON THE PLANS AT THE POINT OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATIONS ON THE EXISTING PAVEMENT AND CHECK THE CLEARANCE. REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.

FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.

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.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE @ STA. 23+62.87 -L-".

THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLES 1024-5 AND 1024-6 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.

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

THE CONTRACTOR WILL BE REQUIRED TO CONSTRUCT, MAINTAIN AND AFTERWARDS REMOVE A TEMPORARY STRUCTURE AT STATION 16+74.54 -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.

AFTER SERVING AS A TEMPORARY STRUCTURE THE EXISTING STRUCTURE CONSISTING OF 3 SPANS: 1 @ 43', 1 @ 81', & 1 @ 43'; 52'-7" CLEAR ROADWAY WIDTH AND REINFORCED CONCRETE DECK ON 8 LINES OF STEEL W 36 X 150 CONTINUOUS I-BEAMS; END BENTS WITH REINFORCED CONCRETE CAPS ON TIMBER PILES AND INTERIOR BENTS ON SPREAD FOOTINGS, LOCATED AT THE PROPOSED STRUCTURE SITE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. 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.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

FOR ARCHITECTURAL CONCRETE SURFACE TREATMENT, SEE SPECIAL PROVISIONS.

FOR APPLICATION OF BRIDGE COATING, SEE SPECIAL PROVISIONS.

FOR LIMITS OF SUPERSTRUCTURE BRIDGE COATING AND ARCHITECTURAL CONCRETE SURFACE TREATMENT, SEE "TYPICAL SECTION DETAILS", SHEET 2 OF 2.

## TOTAL BILL OF MATERIAL

| | CONSTRUCTION, MAINTENANCE, & REMOVAL OF TEMP STRUCTURE | REMOVAL OF EXISTING STRUCTURE | ASBESTOS ASSESSMENT | REINFORCED CONCRETE DECK SLAB | GROOVING BRIDGE FLOORS | CLASS A CONCRETE | BRIDGE APPROACH SLABS | REINFORCING STEEL | MODIFIED 63" PRESTRESSED CONCRETE GIRDERS | | PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 STEEL PILES | HP 14 X 73 STEEL PILES | | STEEL PILE POINTS | CONCRETE BARRIER RAIL | ARCHITECTURAL CONCRETE SURFACE TREATMENT | APPLICATION OF BRIDGE COATING | 4" SLOPE PROTECTION | ELASTOMERIC BEARINGS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LUMP SUM | LUMP SUM | LUMP SUM | SQ. FT. | SQ. FT. | CU. YDS. | LUMP SUM | LBS. | NO. | LIN. FT. | EA. | NO. | LIN. FT. | EA. | LIN. FT. | SQ. FT. | SQ. FT. | SQ. YDS. | LUMP SUM |
| SUPERSTRUCTURE | | | LUMP SUM | 4,757 | 5,741 | | | | 5 | 573.96 | | | | | 230.65 | 327 | 2939 | | LUMP SUM |
| END BENT 1 | | | | | | 26.7 | | 3,310 | | | 8 | 8 | 240 | 8 | | | | 14 | |
| END BENT 2 | | | | | | 26.6 | | 3,305 | | | 8 | 8 | 200 | 8 | | | | 14 | |
| TOTAL | LUMP SUM | LUMP SUM | LUMP SUM | 4,757 | 5,741 | 53.3 | LUMP SUM | 6,615 | 5 | 573.96 | 16 | 16 | 440 | 16 | 230.65 | 327 | 2939 | 28 | LUMP SUM |

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

# GENERAL DRAWING

BRIDGE ON US 29, US 70 OVER S. MAIN ST. (SR 1009) BETWEEN SR 4053 AND BRENTWOOD ST. (LEFT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-3 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 26 |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:
MOTT MACDONALD
PO Box 700
Fuquay-Varina, NC 27526
(919) 552-2253
www.mottmac.com
LICENSE NO. F-0669

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20532 JAMES E. MONDOLFI

DRAWN BY: J. T. WILLIAMS DATE: 10-2020
CHECKED BY: J. E. MONDOLFI DATE: 10-2020
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 11-2020

w:\57077
R:\Structures\Plans\Left Lane\B-5353_SMU_GD3_400147.dgn
12/2/2021 10:58:34 AM

# 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 × RF | STRENGTH I LIMIT STATE | | | | | | | | | | | SERVICE III LIMIT STATE | | | | | | COMMENT NUMBER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | MOMENT | | | | | SHEAR | | | | | | MOMENT | | | | | | |
| | | | | | | | LIVE-LOAD FACTORS ($\gamma_{LL}$) | DISTRIBUTION FACTORS (DF) | RATING FACTOR | SPAN | GIRDER LOCATION | DISTANCE FROM LEFT END OF SPAN (ft) | DISTRIBUTION FACTORS (DF) | RATING FACTOR | SPAN | GIRDER LOCATION | DISTANCE FROM LEFT END OF SPAN (ft) | LIVE-LOAD FACTORS ($\gamma_{LL}$) | DISTRIBUTION FACTORS (DF) | RATING FACTOR | SPAN | GIRDER LOCATION | DISTANCE FROM LEFT END OF SPAN (ft) | |
| DESIGN LOAD RATING | | HL-93 (INVENTORY) | N/A | (1) | 1.20 | -- | 1.75 | .776 | 1.26 | A | E | 56.7 | .873 | 1.28 | A | I | 10.8 | 0.80 | .776 | 1.20 | A | E | 56.7 | |
| | | HL-93 (OPERATING) | N/A | | 1.63 | -- | 1.35 | .776 | 1.63 | A | E | 56.7 | .873 | 1.69 | A | I | 10.8 | N/A | -- | -- | -- | -- | -- | |
| | | HS-20 (INVENTORY) | 36.000 | (2) | 1.73 | 62.280 | 1.75 | .776 | 1.81 | A | E | 56.7 | .873 | 1.80 | A | I | 10.8 | 0.80 | .776 | 1.73 | A | E | 56.7 | |
| | | HS-20 (OPERATING) | 36.000 | | 2.35 | 84.600 | 1.35 | .776 | 2.35 | A | E | 56.7 | .873 | 2.37 | A | I | 10.8 | N/A | -- | -- | -- | -- | -- | |
| LEGAL LOAD RATING | SINGLE VEHICLE (SV) | SNSH | 13.500 | | 4.18 | 56.430 | 1.40 | .776 | 5.47 | A | E | 56.7 | .873 | 5.88 | A | I | 10.8 | 0.80 | .776 | 4.18 | A | E | 56.7 | |
| | | SNGARBS2 | 20.000 | | 3.00 | 60.00 | 1.40 | .776 | 3.92 | A | E | 56.7 | .873 | 4.06 | A | I | 10.8 | 0.80 | .776 | 3.00 | A | E | 56.7 | |
| | | SNAGRIS2 | 22.000 | | 2.79 | 61.380 | 1.40 | .776 | 3.65 | A | E | 56.7 | .873 | 3.73 | A | I | 10.8 | 0.80 | .776 | 2.79 | A | E | 56.7 | |
| | | SNCOTTS3 | 27.250 | | 2.08 | 56.680 | 1.40 | .776 | 2.72 | A | E | 56.7 | .873 | 2.86 | A | I | 10.8 | 0.80 | .776 | 2.08 | A | E | 56.7 | |
| | | SNAGGRS4 | 34.925 | | 1.69 | 59.023 | 1.40 | .776 | 2.21 | A | E | 56.7 | .873 | 2.29 | A | I | 10.8 | 0.80 | .776 | 1.69 | A | E | 56.7 | |
| | | SNS5A | 35.550 | | 1.66 | 59.013 | 1.40 | .776 | 2.17 | A | E | 56.7 | .873 | 2.30 | A | I | 10.8 | 0.80 | .776 | 1.66 | A | E | 56.7 | |
| | | SNS6A | 39.950 | | 1.50 | 59.925 | 1.40 | .776 | 1.96 | A | E | 56.7 | .873 | 2.06 | A | I | 10.8 | 0.80 | .776 | 1.50 | A | E | 56.7 | |
| | | SNS7B | 42.000 | | 1.43 | 60.060 | 1.40 | .776 | 1.87 | A | E | 56.7 | .873 | 2.00 | A | I | 10.8 | 0.80 | .776 | 1.43 | A | E | 56.7 | |
| | TRUCK TRACTOR SEMI-TRAILER (TTST) | TNAGRIT3 | 33.000 | | 1.82 | 60.060 | 1.40 | .776 | 2.39 | A | E | 56.7 | .873 | 2.50 | A | I | 10.8 | 0.80 | .776 | 1.82 | A | E | 56.7 | |
| | | TNT4A | 33.075 | | 1.83 | 60.527 | 1.40 | .776 | 2.39 | A | E | 56.7 | .873 | 2.45 | A | I | 10.8 | 0.80 | .776 | 1.83 | A | E | 56.7 | |
| | | TNT6A | 41.600 | | 1.48 | 61.568 | 1.40 | .776 | 1.93 | A | E | 56.7 | .873 | 2.08 | A | I | 10.8 | 0.80 | .776 | 1.48 | A | E | 56.7 | |
| | | TNT7A | 42.000 | | 1.48 | 62.160 | 1.40 | .776 | 1.93 | A | E | 56.7 | .873 | 2.05 | A | I | 10.8 | 0.80 | .776 | 1.48 | A | E | 56.7 | |
| | | TNT7B | 42.000 | | 1.51 | 63.420 | 1.40 | .776 | 1.97 | A | E | 56.7 | .873 | 1.97 | A | I | 10.8 | 0.80 | .776 | 1.51 | A | E | 56.7 | |
| | | TNAGRIT4 | 43.000 | | 1.45 | 62.350 | 1.40 | .776 | 1.90 | A | E | 56.7 | .873 | 1.91 | A | I | 10.8 | 0.80 | .776 | 1.45 | A | E | 56.7 | |
| | | TNAGT5A | 45.000 | | 1.37 | 61.650 | 1.40 | .776 | 1.80 | A | E | 56.7 | .873 | 1.86 | A | I | 10.8 | 0.80 | .776 | 1.37 | A | E | 56.7 | |
| | | TNAGT5B | 45.000 | (3) | 1.36 | 61.200 | 1.40 | .776 | 1.78 | A | E | 56.7 | .873 | 1.81 | A | I | 10.8 | 0.80 | .776 | 1.36 | A | E | 56.7 | |

## 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.
2.
3.
4.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

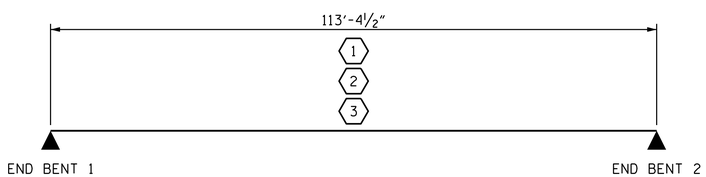
(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

I - INTERIOR GIRDER
E - EXTERIOR GIRDER




LRFR SUMMARY

PROJECT NO. B-5353
GUILFORD COUNTY
STATION: 23+62.87 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

LRFR SUMMARY FOR PRESTRESSED CONCRETE GIRDERS
(NON-INTERSTATE TRAFFIC)
(LEFT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-4 |
| 1 | | | 3 | | | TOTAL SHEETS |
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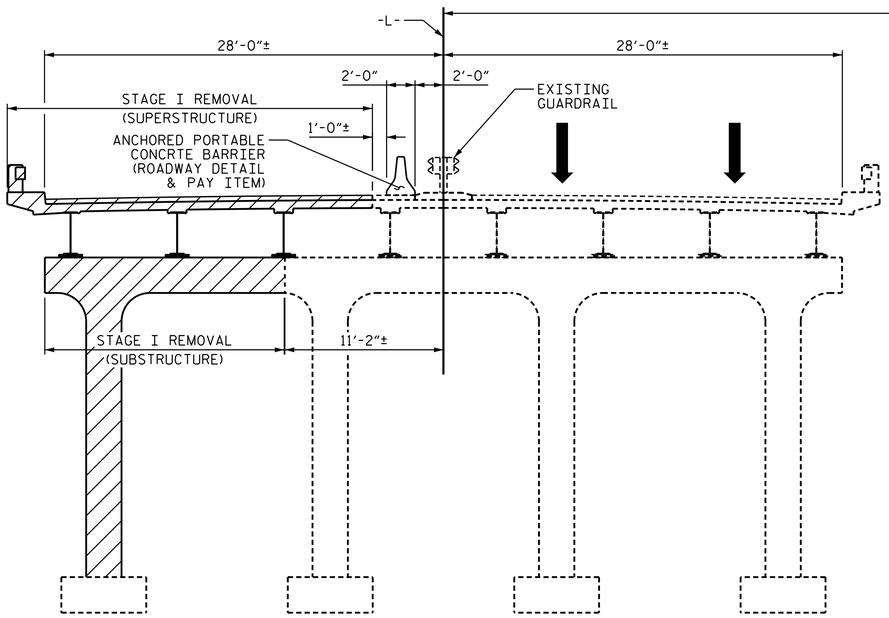
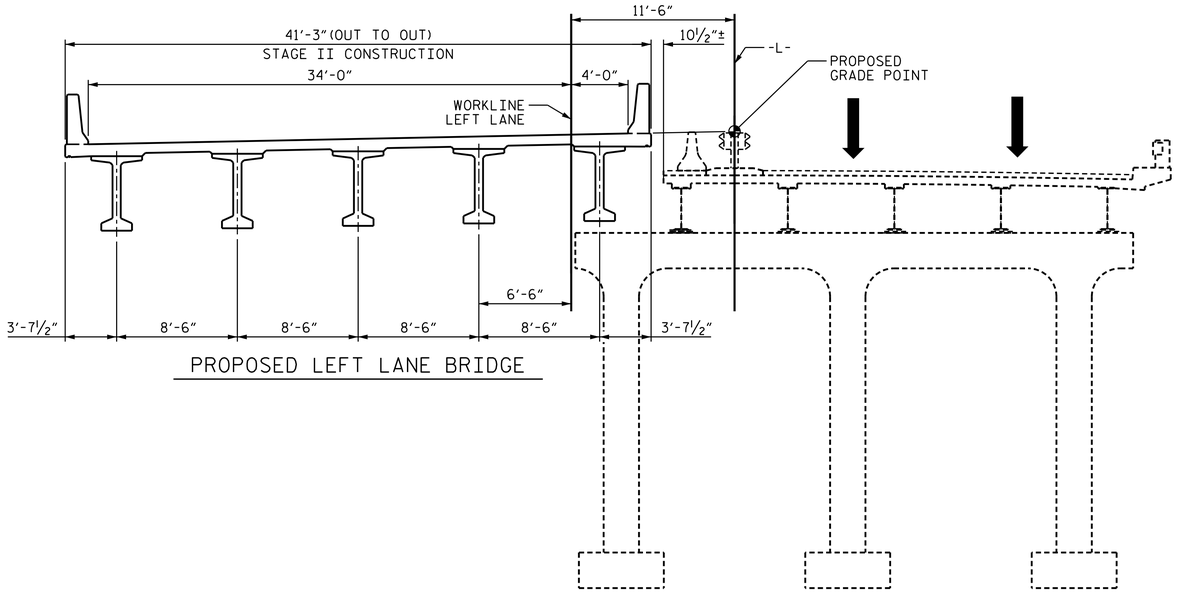
12/2/2021 10:58:36 AM




EXISTING STRUCTURE

## STAGE I DETOUR & REMOVAL

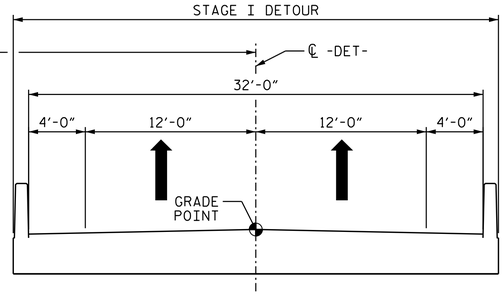
CONSTRUCT DETOUR BRIDGE. SHIFT NORTHBOUND TRAFFIC TO DETOUR BRIDGE AND SOUTHBOUND TRAFFIC TO RIGHT SIDE OF EXISTING BRIDGE. REMOVE LEFT SIDE PORTION OF EXISTING STRUCTURE AS INDICATED.



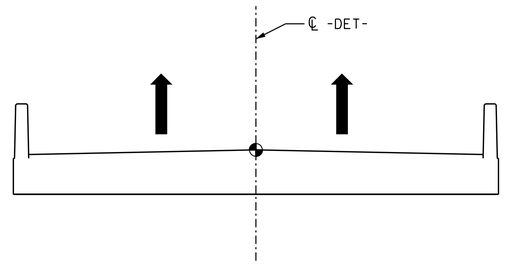

PROPOSED LEFT LANE BRIDGE

## STAGE II CONSTRUCTION

CONSTRUCT STAGE II LEFT LANE BRIDGE
(SHOWN AT EXISTING INTERIOR BENT)




DETOUR BRIDGE




DETOUR BRIDGE

## NOTES:

THE EXISTING STRUCTURE SHALL BE REMOVED IN ACCORDANCE WITH THESE PLANS, THE STANDARD SPECIFICATIONS AND AS DIRECTED BY THE ENGINEER.

1. PARTIAL REMOVAL OF THE EXISTING STRUCTURE SHALL BE DONE AS INDICATED IN THE STAGE I DETOUR AND REMOVAL SKETCH.

2. THE EXISTING SUBSTRUCTURE SHALL BE PARTIALLY REMOVED TO THE LIMITS SHOWN AND AS NECESSARY TO FACILITATE STAGE IA CONSTRUCTION OR AS DIRECTED BY THE ENGINEER.

CARE SHALL BE TAKEN DURING THE PARTIAL REMOVAL TO AVOID DAMAGING THE REMAINING EXISTING STRUCTURE SERVING AS A TEMPORARY STRUCTURE. DAMAGE TO THE REMAINING EXISTING STRUCTURE SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE DEPARTMENT. THE METHOD OF REPAIR SHALL BE SUBJECT TO APPROVAL BY THE ENGINEER.

ALL WORK, MATERIALS, EQUIPMENT AND INCIDENTALS REQUIRED FOR THE REMOVAL AND DISPOSAL OF THE EXISTING BRIDGE SHALL BE INCLUDED IN THE UNIT CONTRACT BID FOR "REMOVAL OF EXISTING STRUCTURE".

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

# CONSTRUCTION SEQUENCE

(LEFT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-5 |
| 1 | | | 3 | | | TOTAL SHEETS |
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www.mottmac.com
LICENSE NO. F-0669

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI

DRAWN BY: J. T. WILLIAMS DATE: 3-2019
CHECKED BY: J. E. MONDOLFI DATE: 10-2019
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 11-2019

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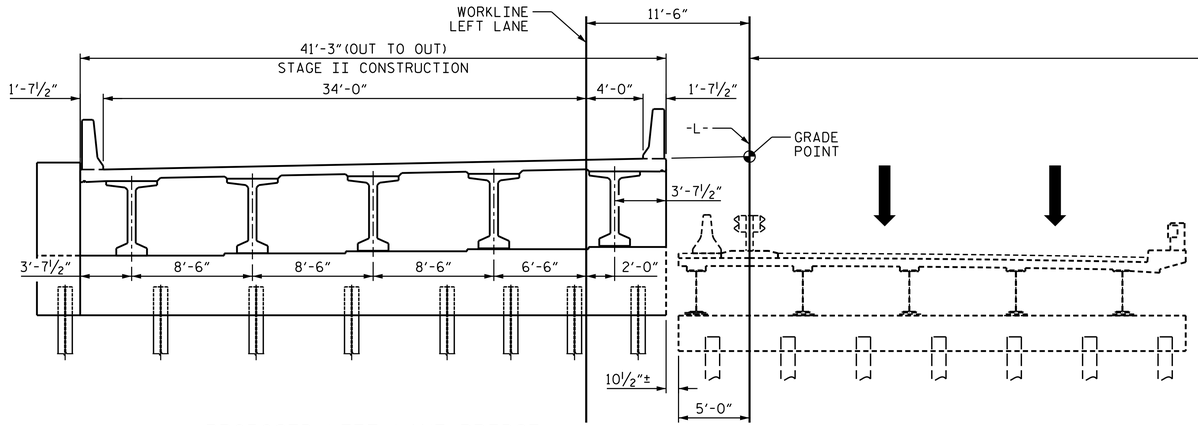
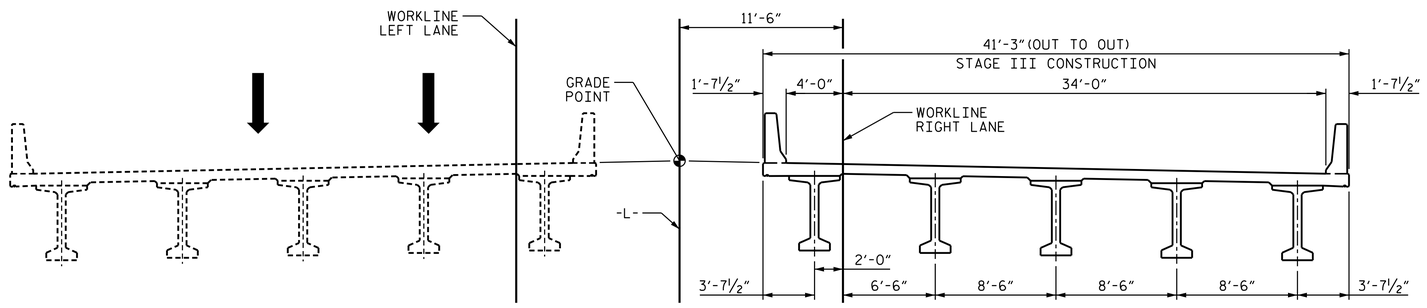



PROPOSED LEFT LANE BRIDGE

DETOUR BRIDGE

## STAGE II CONSTRUCTION

CONSTRUCT STAGE II LEFT LANE BRIDGE
(SHOWN AT EXISTING END BENT)



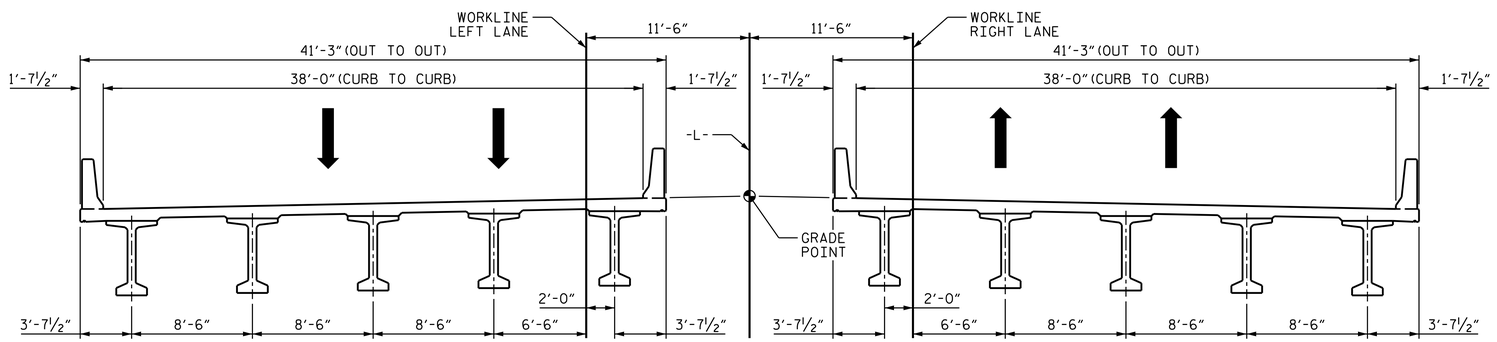

PROPOSED LEFT LANE BRIDGE

PROPOSED RIGHT LANE BRIDGE

DETOUR BRIDGE

## STAGE III CONSTRUCTION

SHIFT SOUTHBOUND TRAFFIC TO COMPLETED LEFT LANE BRIDGE
AND CONSTRUCT STAGE III RIGHT LANE BRIDGE.




PROPOSED LEFT LANE BRIDGE

PROPOSED RIGHT LANE BRIDGE

## FINAL

SHIFT NORTHBOUND TRAFFIC TO COMPLETED RIGHT LANE
BRIDGE AND REMOVE DETOUR BRIDGE.

PROJECT NO. B-5353
GUILFORD COUNTY
STATION: 23+62.87 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

# CONSTRUCTION SEQUENCE

(LEFT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
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DRAWN BY: J. T. WILLIAMS DATE: 3-2019
CHECKED BY: J. E. MONDOLFI DATE: 10-2019
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 11-2019

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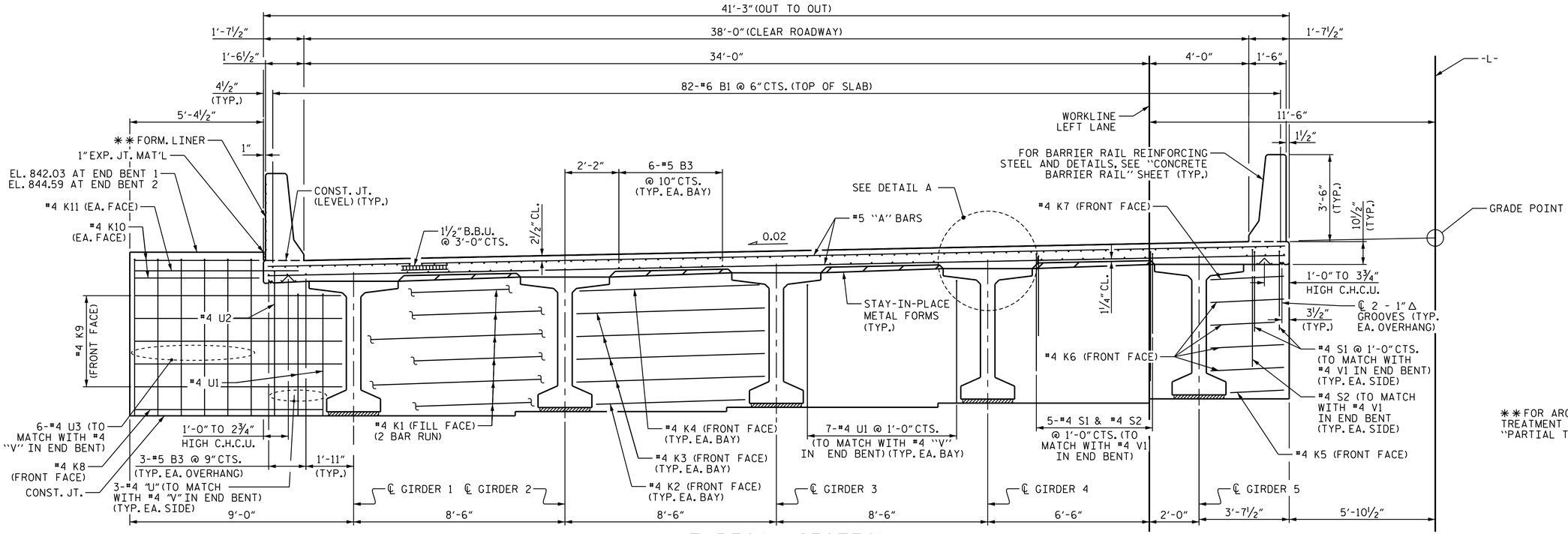
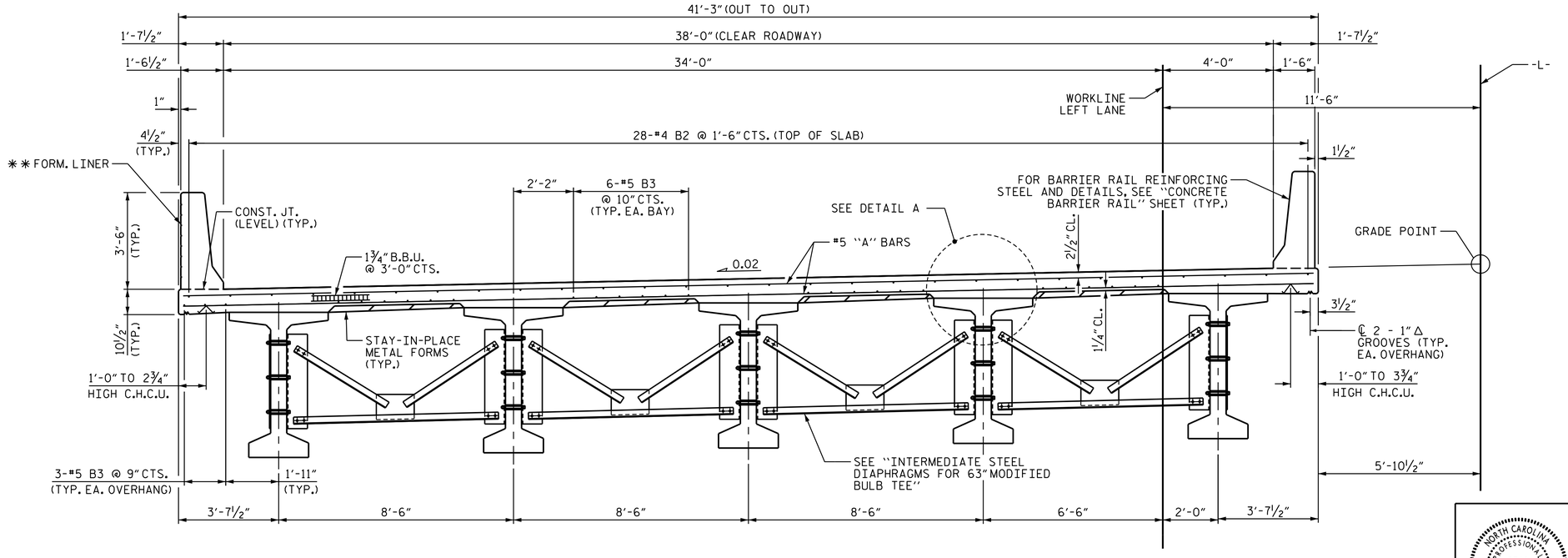



## TYPICAL SECTION

(SHOWING INTEGRAL END BENT)

** FOR ARCHITECTURAL CONCRETE SURFACE TREATMENT AND BRIDGE COATING, SEE "PARTIAL TYPICAL SECTION" SHEET 2 OF 2.




## TYPICAL SECTION

(SHOWING INTERMEDIATE DIAPHRAGMS)

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

(LEFT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-7 |
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CHECKED BY: J. E. MONDOLFI DATE: 1-2020
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 1-2020

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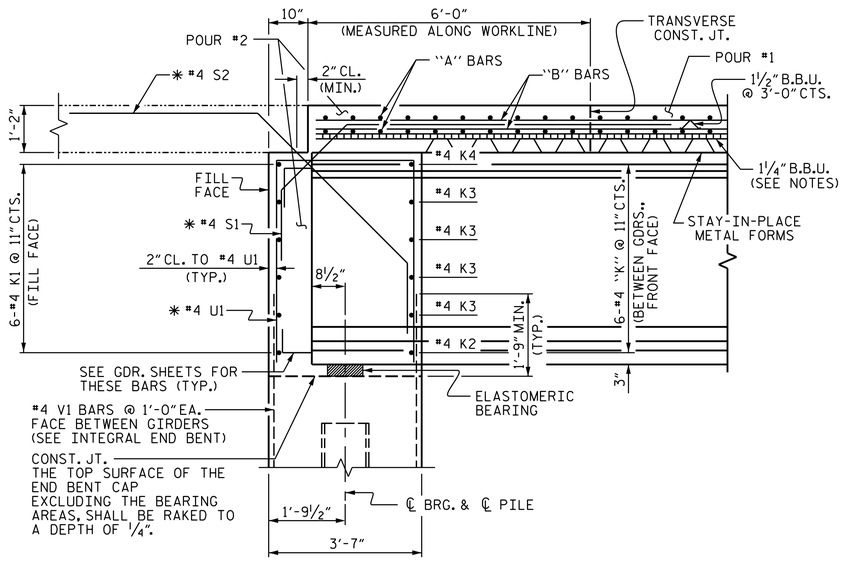
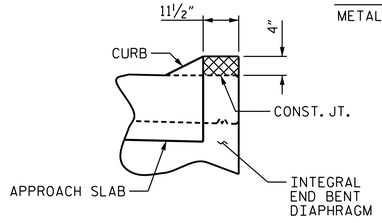


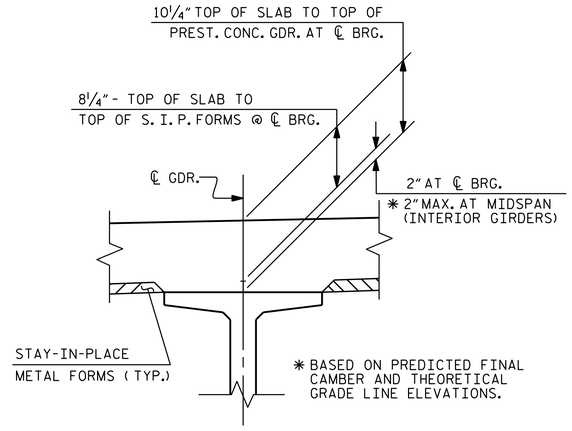

## SECTION THRU INTEGRAL END BENT

* TO MATCH #4 V1 BARS IN INTEGRAL END BENT




## RT. SIDE ELEVATION VIEW

FOR PLAN VIEW, SEE "PLAN OF SPAN A"




## DETAIL A

## NOTES:

PROVIDE 1¼" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2½" ABOVE THE TOP OF THE REMOVABLE FORM.

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

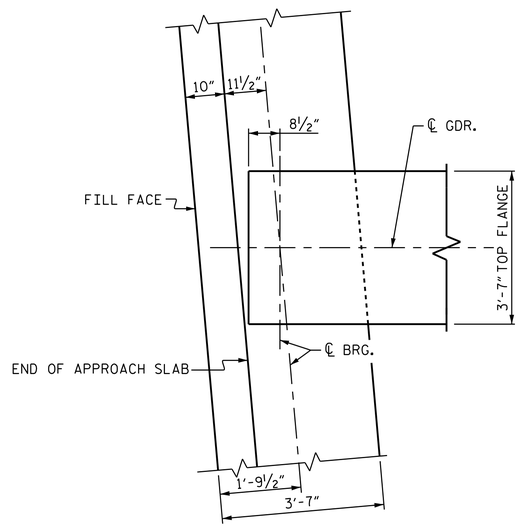
PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

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

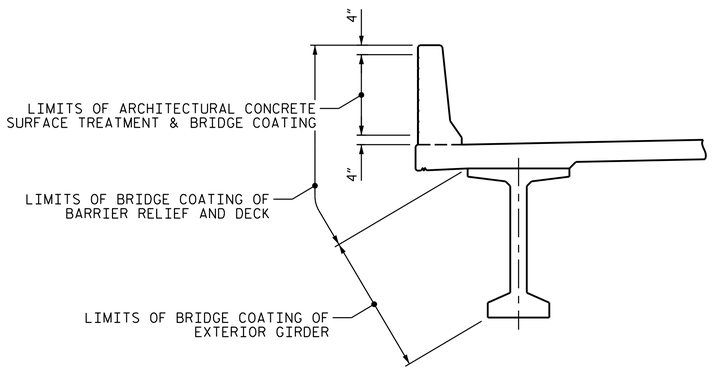
| ARCHITECTURAL CONCRETE SURFACE TREATMENT | | |
|---|---|---|
| TEXTURE: | | 327 S.F. |
| BRIDGE COATING | | |
| STAIN: | SURFACE TREATMENT COATING | 327 S.F. |
| STAIN: | BARRIER, BARRIER RELIEF AND DECK | 1075 S.F. |
| STAIN: | EXTERIOR GIRDER | 1537 S.F. |
| TOTAL: | | 2939 S.F. |

## BLOCKOUT DETAILS IN END BENT DIAPHRAGM

CONCRETE SHALL BE POURED IN THE CROSS-HATCHED AREA TO MATCH THE TOP OF CURB. UNLESS OTHERWISE DIRECTED BY THE ENGINEER




## PLAN OF GIRDER AT INTEGRAL END BENT




## PARTIAL TYPICAL SECTION

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

# TYPICAL SECTION DETAILS

(LEFT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-8 |
| 1 | | | 3 | | | TOTAL SHEETS |
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DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 1-2020

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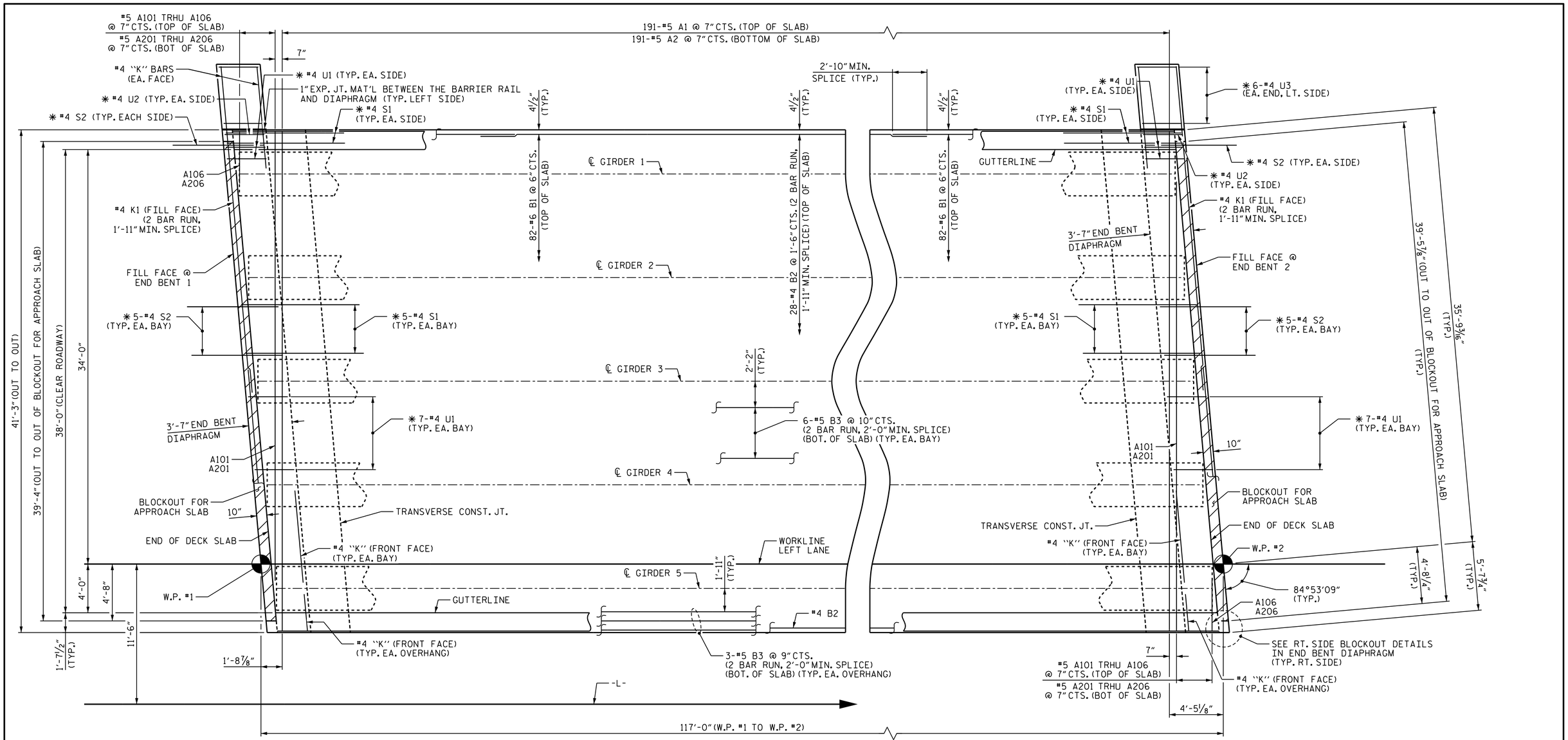
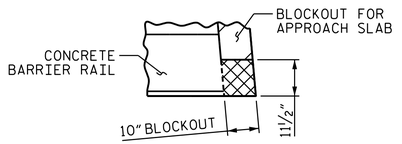



* (TO MATCH WITH V1 IN END BENT)




RT. SIDE PLAN VIEW

FOR ELEVATION VIEW, SEE TYPICAL SECTION SHEET 2 OF 2

# PLAN OF SPAN A

## BLOCKOUT DETAILS IN END BENT DIAPHRAGM

CONCRETE SHALL BE POURED IN THE CROSS-HATCHED AREA TO MATCH THE TOP OF CURB. UNLESS OTHERWISE DIRECTED BY THE ENGINEER

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

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DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 1-2020

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN A

(LEFT LANE)

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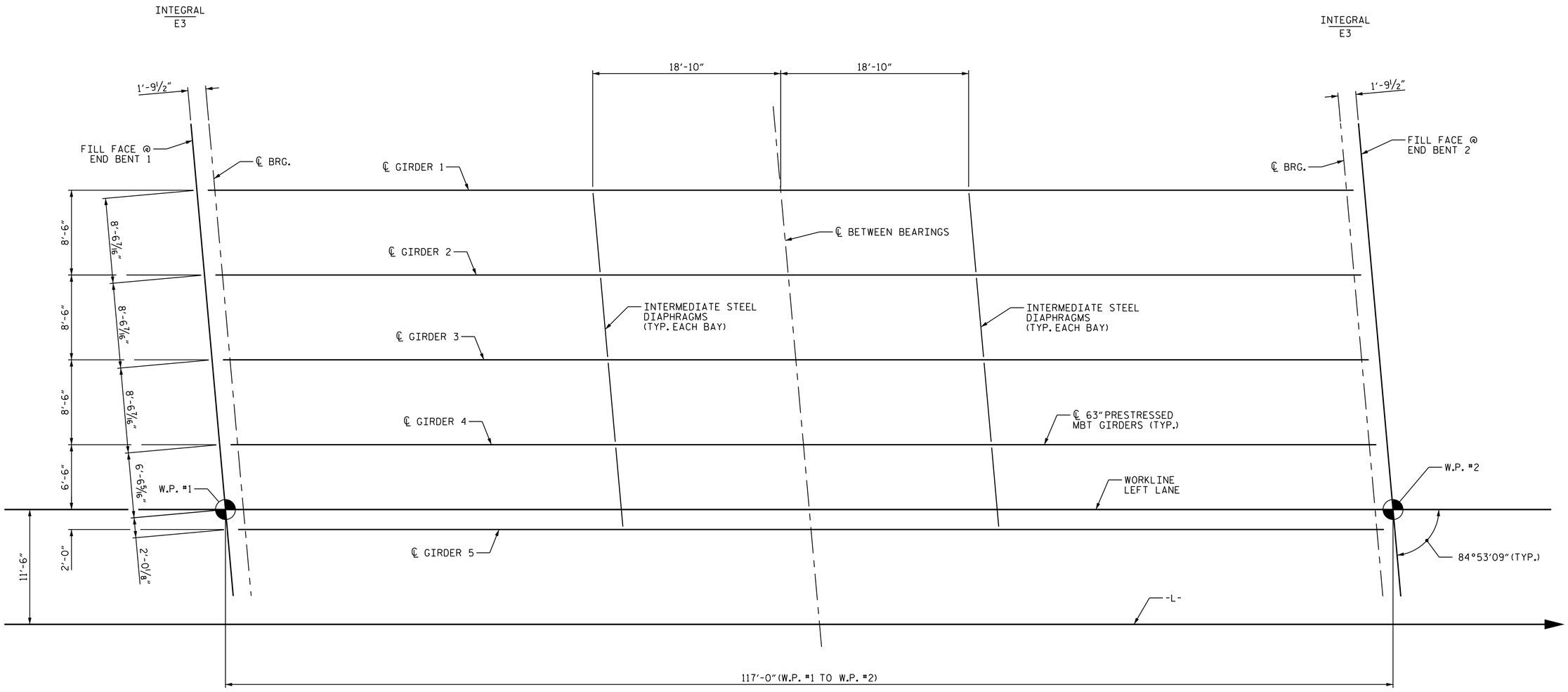


SPAN A

# FRAMING PLAN

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN

(LEFT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
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CHECKED BY: J. E. MONDOLFI DATE: 12-2019
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 12-2019

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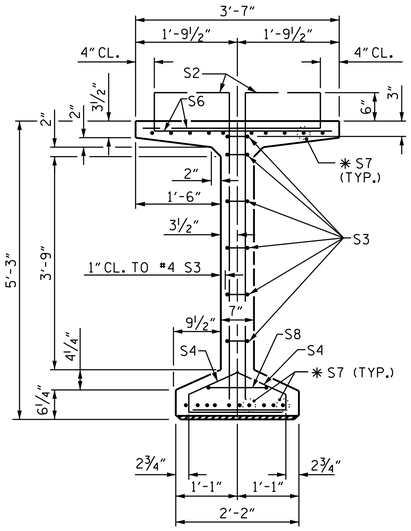
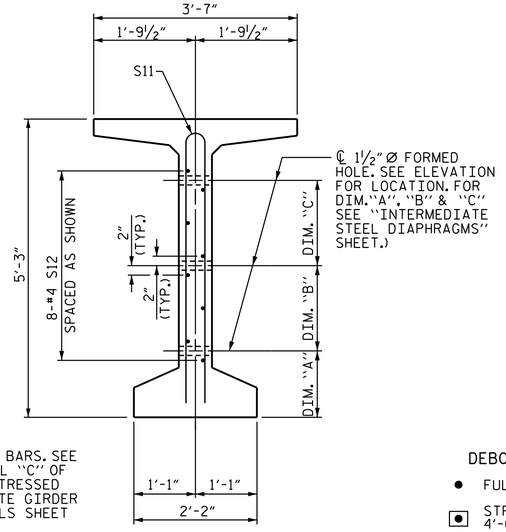



SECTION A-A



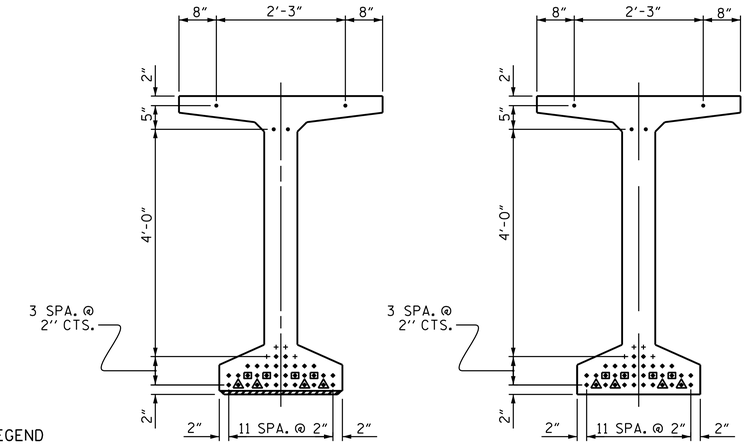

✱ FOR S7 BARS. SEE DETAIL "C" OF PRESTRESSED CONCRETE GIRDER DETAILS SHEET

SECTION C-C

(S1, S6 AND S9 BARS NOT SHOWN)

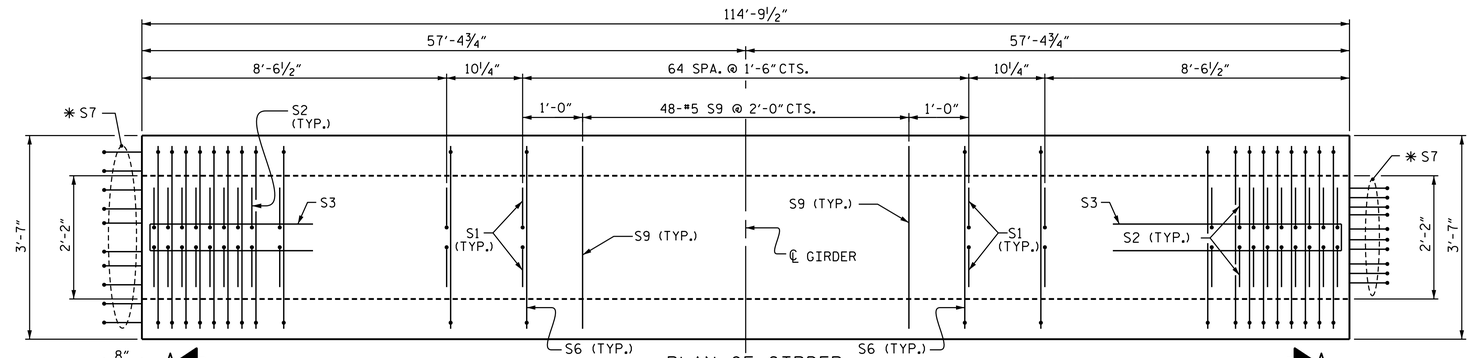
DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ⊡ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ⧋ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER

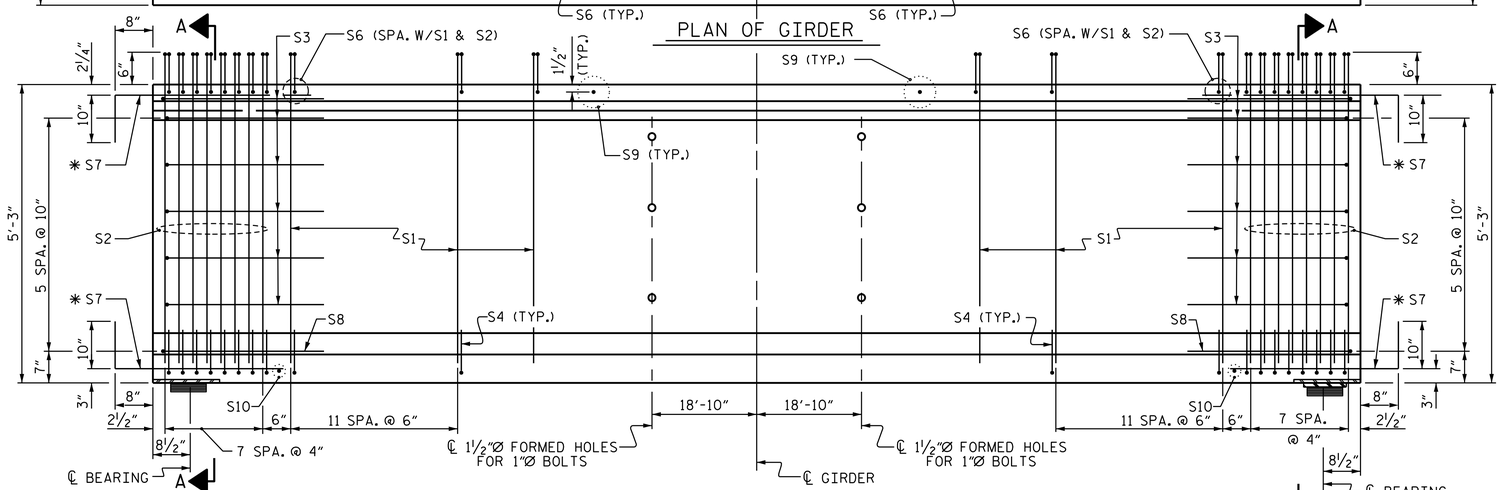



0.6" Ø LOW RELAXATION STRAND LAYOUT

(38 STRANDS, ALL STRAIGHT, 8 DEBONDED STRANDS)




PLAN OF GIRDER




INTEGRAL END BENT

ELEVATION OF GIRDER

INTEGRAL END BENT

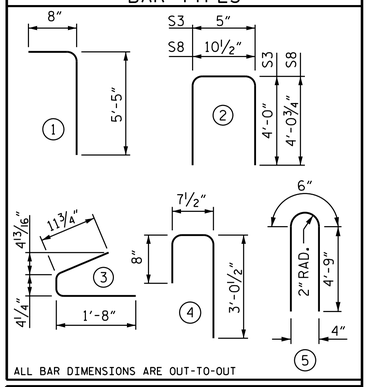
| 0.6" Ø L. R. GRADE 270 STRANDS | | |
|---|---|---|
| AREA (SQUARE INCHES) | ULTIMATE STRENGTH (LBS. PER STRAND) | APPLIED PRESTRESS (LBS. PER STRAND) |
| 0.217 | 58,600 | 43,950 |

REINFORCING STEEL FOR ONE GDR

| BAR | NUMBER | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| S1 | 178 | #4 | 1 | 6'-1" | 723 |
| S2 | 32 | #5 | 1 | 6'-1" | 203 |
| S3 | 12 | #4 | 2 | 8'-5" | 67 |
| S4 | 80 | #4 | 3 | 3'-0" | 160 |
| S6 | 210 | #5 | 4 | 4'-4" | 949 |
| ✱S7 | 40 | #5 | STR | 3'-8" | 153 |
| S8 | 2 | #5 | 2 | 9'-0" | 19 |
| S9 | 48 | #5 | STR | 3'-3" | 163 |
| S10 | 2 | #3 | STR | 1'-10" | 1 |
| S11 | 8 | #5 | 5 | 10'-0" | 83 |
| S12 | 16 | #4 | STR | 8'-0" | 86 |

✱ NOTE: S7 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 | 9000 PSI CONCRETE | 0.6" Ø L.R. STRANDS |
|---|---|---|---|
| | LB. | C.Y. | No. |
| GIRDER | 2607 | 22.8 | 38 |

GIRDERS REQUIRED

| NUMBER | LENGTH | TOTAL LENGTH |
|---|---|---|
| 5 | 114'-9½" | 573.96' |

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

63" PRESTRESSED CONCRETE MODIFIED BULB TEE SPAN A

(LEFT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-11 |
| 1 | | | 3 | | | TOTAL SHEETS |
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DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 1-2020

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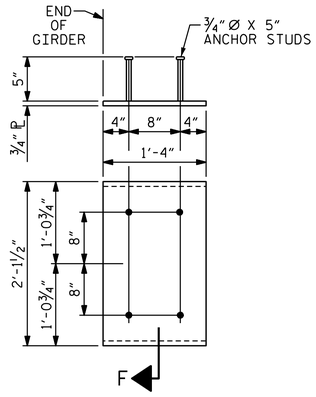
## DEAD LOAD DEFLECTION TABLE FOR GIRDERS

| | SPAN A | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | EXTERIOR GIRDER | | | | | | | | | | | | | | | | | | | | |
| FOURTIETH POINTS | 0 | .025 | .05 | .075 | .10 | .125 | .15 | .175 | .20 | .225 | .25 | .275 | .30 | .325 | .35 | .375 | .40 | .425 | .45 | .475 | .50 |
| CAMBER | 0.000 | 0.022 | 0.044 | 0.066 | 0.087 | 0.108 | 0.128 | 0.147 | 0.164 | 0.183 | 0.199 | 0.213 | 0.227 | 0.239 | 0.249 | 0.258 | 0.265 | 0.271 | 0.275 | 0.278 | 0.279 |
| ✳ DEFLECTION DUE D.L. | 0.000 | -0.013 | -0.026 | -0.039 | -0.049 | -0.064 | -0.076 | -0.087 | -0.096 | -0.108 | -0.118 | -0.126 | -0.133 | -0.141 | -0.148 | -0.153 | -0.157 | -0.161 | -0.163 | -0.165 | -0.165 |
| FINAL | 0 | 1/8" | 3/16" | 5/16" | 7/16" | 1/2" | 5/8" | 3/4" | 13/16" | 7/8" | 1" | 1 1/16" | 1 1/8" | 1 3/16" | 1 3/16" | 1 1/4" | 1 5/16" | 1 5/16" | 1 3/8" | 1 3/8" | 1 3/8" |
| | | | | | | | | | | | | | | | | | | | | | |
| FOURTIETH POINTS | .525 | .55 | .575 | .60 | .625 | .65 | .675 | .70 | .725 | .75 | .775 | .80 | .825 | .85 | .875 | .90 | .925 | .95 | .975 | 0 | |
| CAMBER | 0.278 | 0.275 | 0.271 | 0.265 | 0.258 | 0.249 | 0.239 | 0.227 | 0.213 | 0.199 | 0.183 | 0.164 | 0.147 | 0.128 | 0.108 | 0.087 | 0.066 | 0.044 | 0.022 | 0.000 | |
| ✳ DEFLECTION DUE D.L. | -0.165 | -0.163 | -0.161 | -0.157 | -0.153 | -0.148 | -0.141 | -0.133 | -0.126 | -0.118 | -0.108 | -0.096 | -0.087 | -0.076 | -0.064 | -0.049 | -0.039 | -0.026 | -0.013 | 0.000 | |
| FINAL | 1 3/8" | 1 3/8" | 1 5/16" | 1 5/16" | 1 1/4" | 1 3/16" | 1 3/16" | 1 1/8" | 1 1/16" | 1" | 7/8" | 13/16" | 3/4" | 5/8" | 1/2" | 7/16" | 5/16" | 3/16" | 1/8" | 0.000 | |
| | INTERIOR GIRDER | | | | | | | | | | | | | | | | | | | | |
| FOURTIETH POINTS | 0 | .025 | .05 | .075 | .10 | .125 | .15 | .175 | .20 | .225 | .25 | .275 | .30 | .325 | .35 | .375 | .40 | .425 | .45 | .475 | .50 |
| CAMBER | 0.000 | 0.022 | 0.044 | 0.066 | 0.087 | 0.108 | 0.128 | 0.147 | 0.164 | 0.183 | 0.199 | 0.213 | 0.227 | 0.239 | 0.249 | 0.258 | 0.265 | 0.271 | 0.275 | 0.278 | 0.279 |
| ✳ DEFLECTION DUE D.L. | 0.000 | -0.014 | -0.028 | -0.041 | -0.052 | -0.067 | -0.080 | -0.092 | -0.101 | -0.114 | -0.124 | -0.133 | -0.140 | -0.148 | -0.155 | -0.161 | -0.165 | -0.169 | -0.171 | -0.173 | -0.173 |
| FINAL | 0 | 1/8" | 3/16" | 5/16" | 7/16" | 1/2" | 9/16" | 11/16" | 3/4" | 13/16" | 7/8" | 15/16" | 1 1/16" | 1 1/16" | 1 1/8" | 1 3/16" | 1 3/16" | 1 1/4" | 1 1/4" | 1 1/4" | 1 1/4" |
| | | | | | | | | | | | | | | | | | | | | | |
| FOURTIETH POINTS | .525 | .55 | .575 | .60 | .625 | .65 | .675 | .70 | .725 | .75 | .775 | .80 | .825 | .85 | .875 | .90 | .925 | .95 | .975 | 0 | |
| CAMBER | 0.278 | 0.275 | 0.271 | 0.265 | 0.258 | 0.249 | 0.239 | 0.227 | 0.213 | 0.199 | 0.183 | 0.164 | 0.147 | 0.128 | 0.108 | 0.087 | 0.066 | 0.044 | 0.022 | 0.000 | |
| ✳ DEFLECTION DUE D.L. | -0.173 | -0.171 | -0.169 | -0.165 | -0.161 | -0.155 | -0.148 | -0.140 | -0.133 | -0.124 | -0.114 | -0.101 | -0.092 | -0.080 | -0.067 | -0.052 | -0.041 | -0.028 | -0.014 | 0.000 | |
| FINAL | 1 1/4" | 1 1/4" | 1 1/4" | 1 3/16" | 1 3/16" | 1 1/8" | 1 1/16" | 1 1/16" | 15/16" | 7/8" | 13/16" | 3/4" | 11/16" | 9/16" | 1/2" | 7/16" | 5/16" | 3/16" | 1/8" | 0 | |

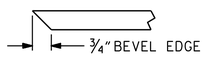
✳ INCLUDES FUTURE WEARING SURFACE

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).



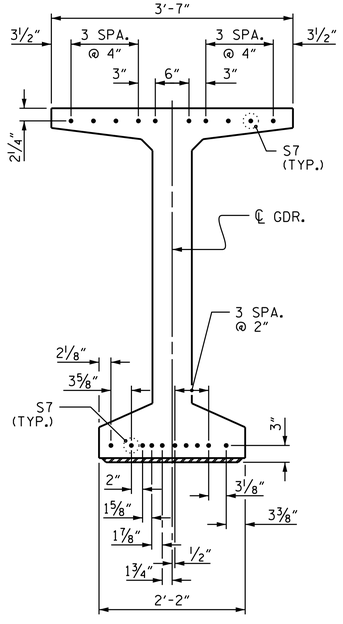

## EMBEDDED PLATE "B-1" DETAILS
## 63" MODIFIED BULB TEES

(2 REQ'D PER GIRDER)




## SECTION "F"

(SEE NOTES)




## DETAIL "C"

## 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.

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 DIAPHRAGMS 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.

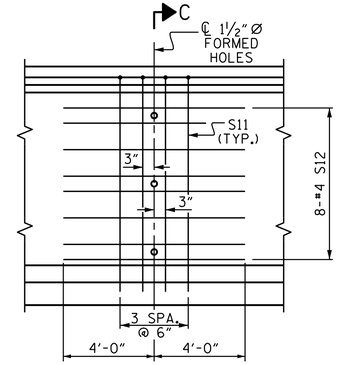
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 7000 PSI.

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", SHALL BE RAKED TO A DEPTH OF 1/4".

A 2" x 2" CHAMFER IS ALLOWED AT THE INTERSECTION OF THE WEB AND THE BOTTOM FLANGE OF THE 63" MODIFIED BULB TEES.

THE CONTRACTOR HAS THE OPTION TO PROVIDE, AT NO ADDITIONAL COST TO THE DEPARTMENT, 2 ADDITIONAL STRANDS AT THE TOP OF THE GIRDER TO FACILITATE TYING OF THE REINFORCING STEEL. THESE STRANDS SHALL BE PULLED TO A LOAD OF 4500 lbs.




## PARTIAL ELEVATION

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

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

# PRESTRESSED CONCRETE GIRDER DETAILS

(LEFT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-12 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 26 |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:
MOTT MACDONALD
PO Box 700
Fuquay-Varina, NC 27526
(919) 552-2253
www.mottmac.com
LICENSE NO. F-0669

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI

| | | | |
|---|---|---|---|
| DRAWN BY: | M. L. MARLEY | DATE: | 1-2020 |
| CHECKED BY: | J. E. MONDOLFI | DATE: | 1-2020 |
| DESIGN ENGINEER OF RECORD: | J. E. MONDOLFI | DATE: | 1-2020 |

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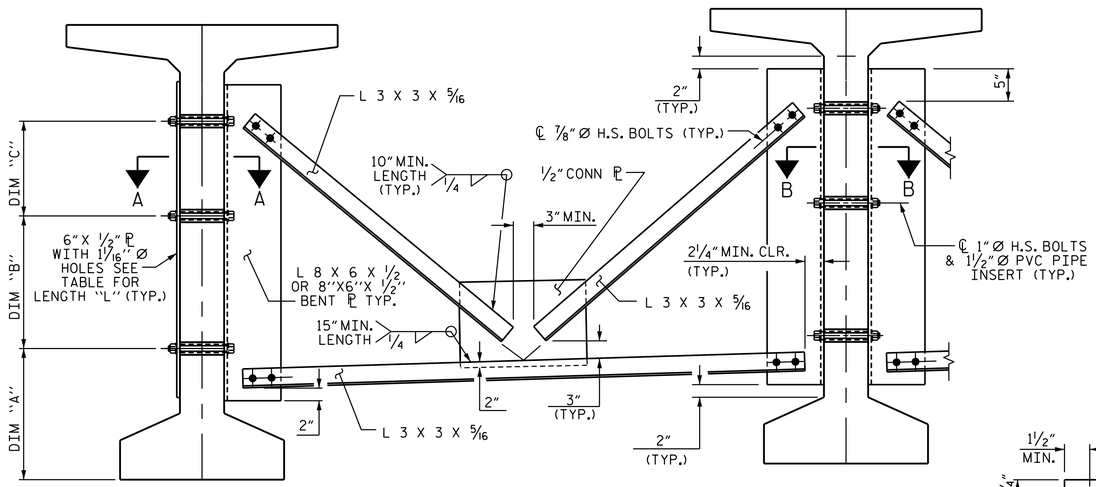
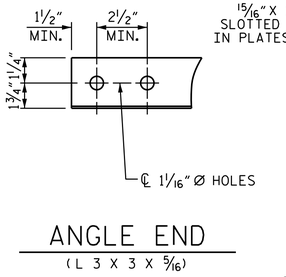
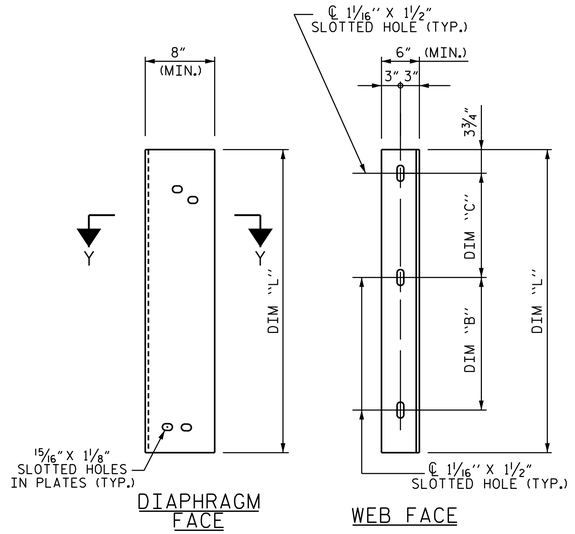
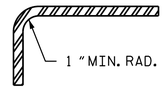



PART SECTION AT INTERMEDIATE DIAPHRAGM




ANGLE END
(L 3 X 3 X 5/16)




SECTION Y-Y

CONNECTOR PLATE 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 ANGLE 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 1/4 TURN.

THE PLATES, BENT PLATES, 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 1/4" PROJECTION BEYOND THE NUT.

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

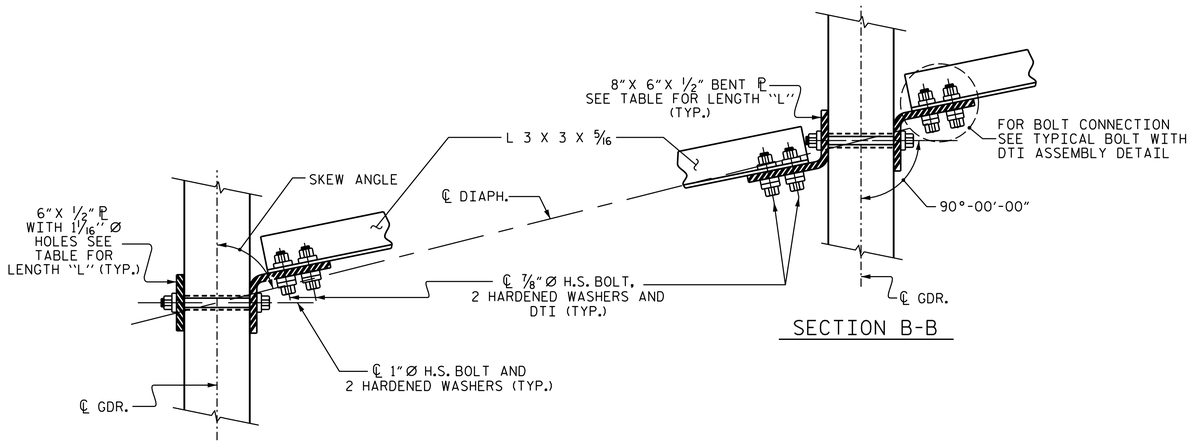
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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

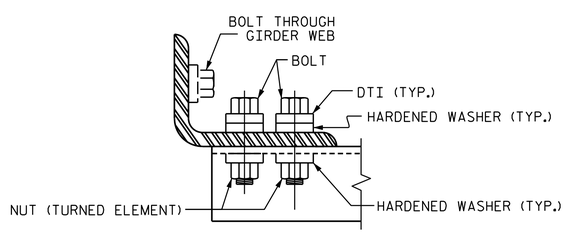
| GIRDER TYPE | DIM "A" | DIM "B" | DIM "C" | DIM "L" |
|---|---|---|---|---|
| 63" BULB TEE | 1'-6" | 1'-7" | 1'-3" | 3'-5" |




SECTION B-B

SECTION A-A

CONNECTION DETAILS




BOLT WITH DTI ASSEMBLY DETAIL

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

INTERMEDIATE STEEL DIAPHRAGMS FOR 63" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS (LEFT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-13 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 26 |

DRAWN BY: M. L. MARLEY DATE: 12-2019
CHECKED BY: J. E. MONDOLFI DATE: 12-2019
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 12-2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:
MOTT MACDONALD
PO Box 700
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(919) 552-2253
www.mottmac.com
LICENSE NO. F-0669

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI

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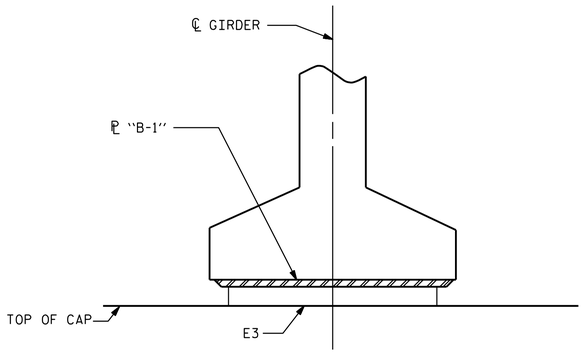
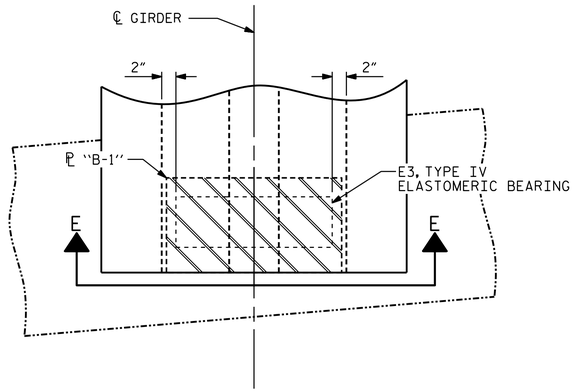
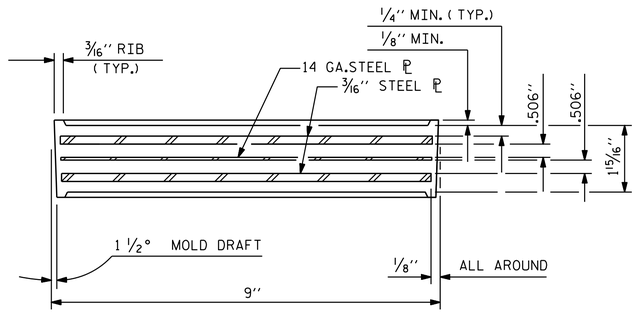



INTEGRAL

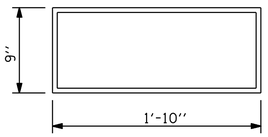
SECTION E-E




TYPICAL PLAN @ END BENT




TYPICAL SECTION OF ELASTOMERIC BEARINGS




E3 ( 10 REQ'D )

PLAN VIEW OF ELASTOMERIC BEARING

TYPE IV

## NOTES

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

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

| MAXIMUM ALLOWABLE SERVICE LOADS | |
|---|---|
| D.L.+L.L. (NO IMPACT) | |
| TYPE IV | 225 k |

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

# ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE (LEFT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-14 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 26 |

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PLANS PREPARED BY:
MOTT MACDONALD
PO Box 700
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(919) 552-2253
www.mottmac.com
LICENSE NO. F-0669

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI

| | | |
|---|---|---|
| DRAWN BY: | M. L. MARLEY | DATE: 1-2020 |
| CHECKED BY: | J. E. MONDOLFI | DATE: 1-2020 |
| DESIGN ENGINEER OF RECORD: | J. E. MONDOLFI | DATE: 1-2020 |

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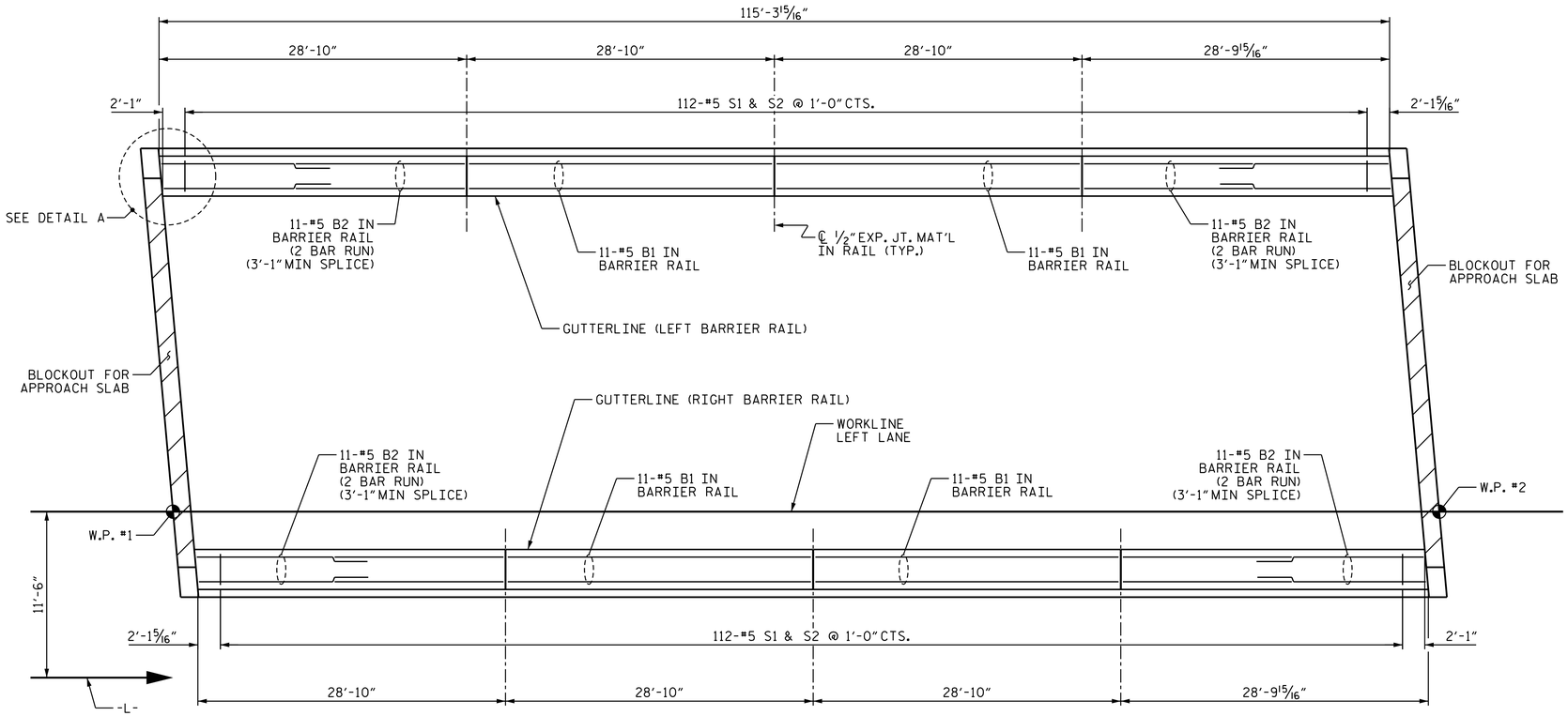



## PLAN OF BARRIER RAIL

## BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| ✳ B1 | 44 | #5 | STR | 28'-5" | 1304 |
| ✳ B2 | 88 | #5 | STR | 15'-10" | 1453 |
| | | | | | |
| ✳ S1 | 232 | #5 | 1 | 4'-6" | 1089 |
| ✳ S2 | 224 | #5 | 2 | 7'-0" | 1635 |
| ✳ S3 | 8 | #5 | 2 | 5'-6" | 46 |

✳ EPOXY COATED REINFORCING STEEL 5,527 LBS.

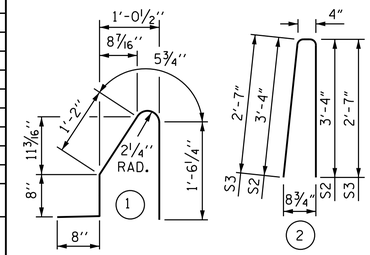
CLASS AA CONCRETE BREAKDOWN

LT. BARRIER 16.3 CU. YDS.
RT. BARRIER 15.7 CU YDS.

TOTAL CLASS AA CONCRETE 32.0 CU. YDS.

CONCRETE BARRIER RAIL 230.65 LIN. FT.

## BAR TYPES




ALL BAR DIMENSIONS ARE OUT TO OUT

## NOTES

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

GROOVED CONTRACTION JOINTS, 1/2" 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.

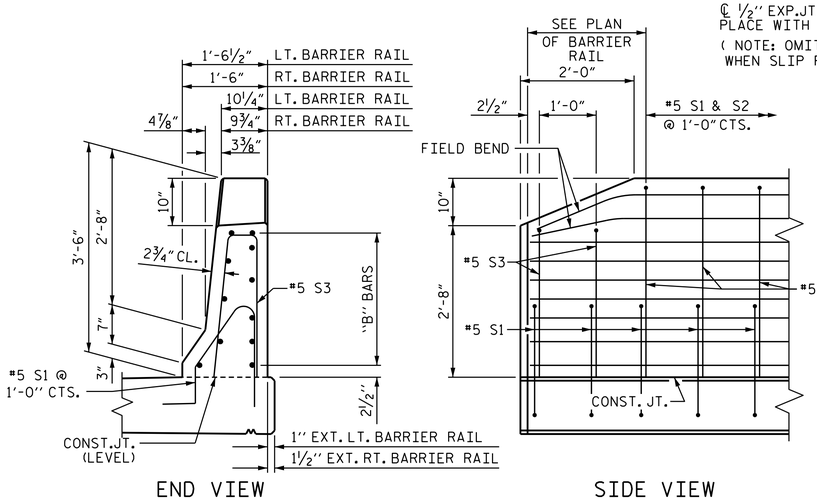
FOR ARCHITECTURAL CONCRETE SURFACE TREATMENT AND BRIDGE COATING, SEE "TYPICAL SECTION DETAILS" SHEET.

THE COST FOR FORM LINERS REQUIRED FOR SURFACE FINISH ARE INCLUDED IN THE S.F. COST FOR ARCH. CONC. SURFACE TREATMENT.



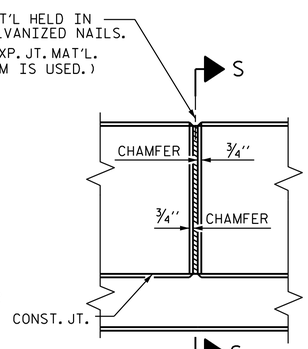

## DETAIL A

ALL CORNERS SIMILAR

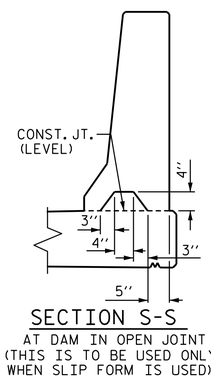



END VIEW SIDE VIEW

## END OF RAIL DETAILS

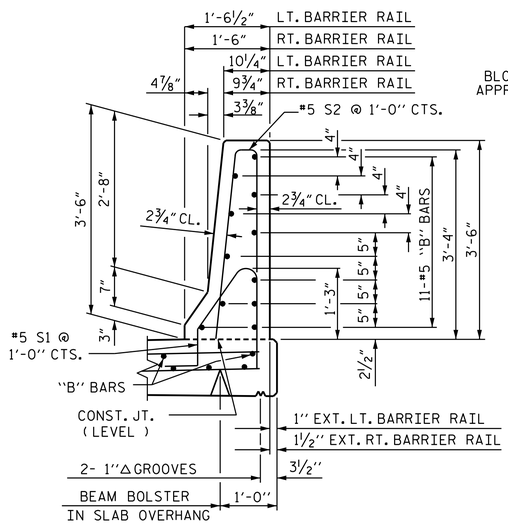



ELEVATION AT EXPANSION JOINTS




SECTION S-S

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




SECTION THRU RAIL

## BARRIER RAIL DETAILS

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

# CONCRETE BARRIER RAIL

(LEFT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-15 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 26 |

DRAWN BY: J. T. WILLIAMS DATE: 1-2020
CHECKED BY: J. E. MONDOLFI DATE: 1-2020
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 1-2020

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PLANS PREPARED BY:
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LICENSE NO. F-0669

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20532 JAMES E. MONDOLFI

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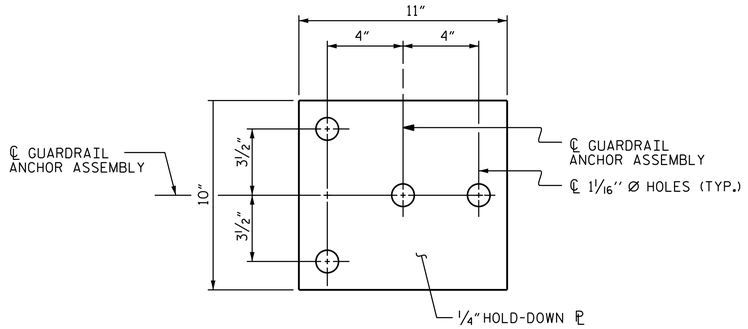
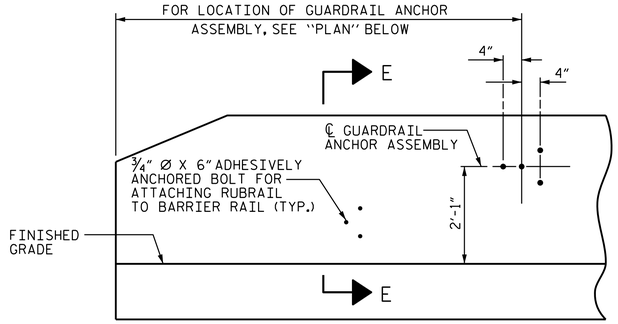
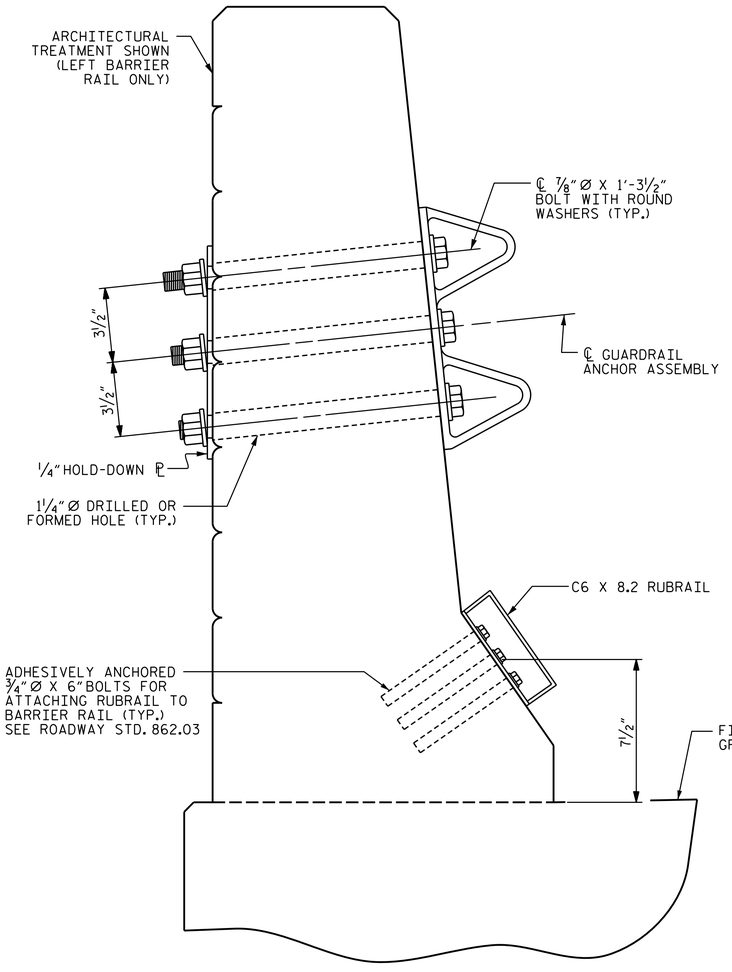



PLAN

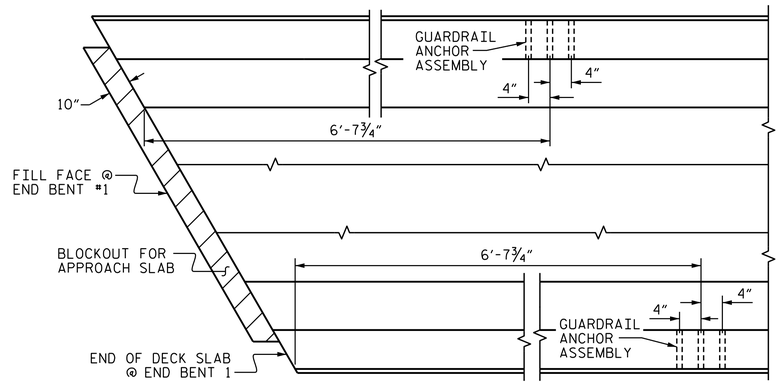



ELEVATION




SECTION E-E

## GUARDRAIL ANCHOR ASSEMBLY DETAILS




PLAN

## LOCATION OF ANCHORS FOR GUARDRAIL

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

## NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD-DOWN PLATE AND 4 - 7/8" Ø 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 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

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

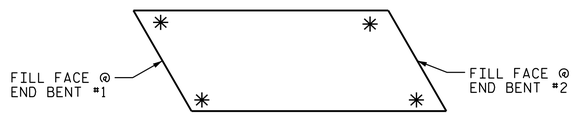
AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.

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

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

THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø 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.

PAINT HOLD-DOWN PLATE AND EXPOSED ENDS OF ANCHOR BOLTS, NUTS AND WASHERS TO MATCH COATING ON THE LEFT BARRIER RAIL. SEE SPECIAL PROVISIONS.




## SKETCH SHOWING POINTS OF ATTACHMENTS

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

# GUARDRAIL ANCHORAGE FOR BARRIER RAIL

(LEFT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-16 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 26 |

DRAWN BY: M. L. MARLEY DATE: 11-2019
CHECKED BY: J. E. MONDOLFI DATE: 4-2020
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 4-2020

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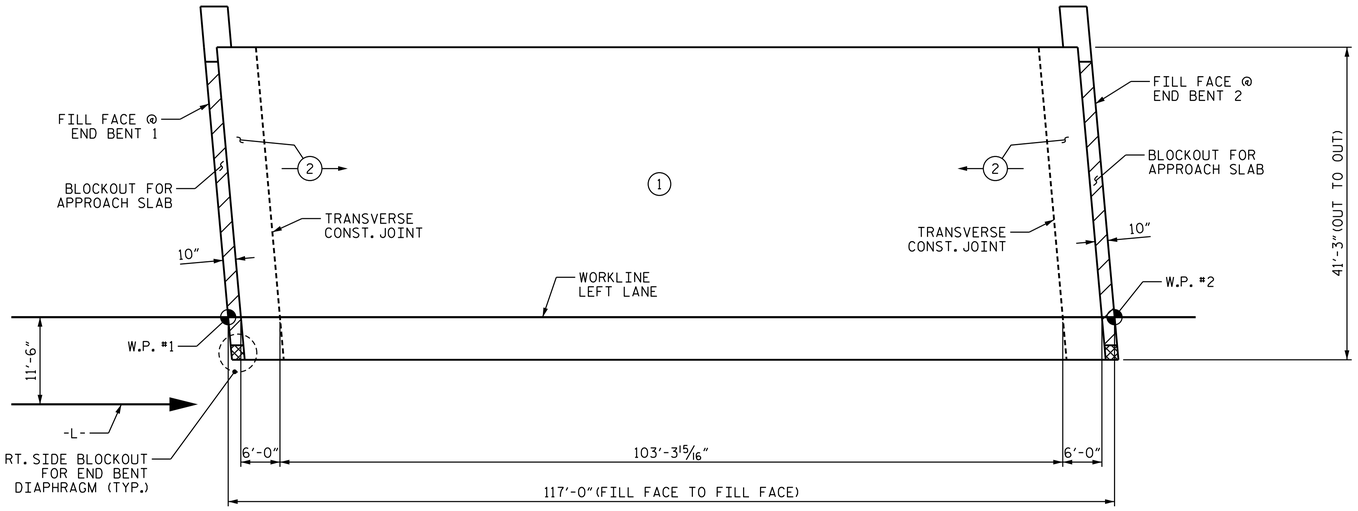
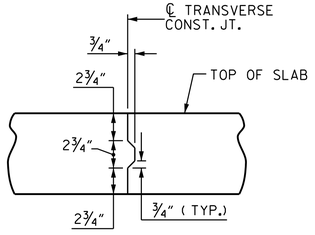



## POURING SEQUENCE AND LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB

( 4,757 SF )

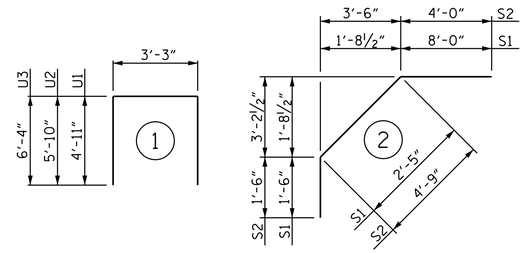
←(#)— = INDICATES POUR NUMBER AND DIRECTION OF POUR




## TRANSVERSE CONSTRUCTION JOINT DETAIL

NOTE: REINFORCING STEEL IN SLAB NOT SHOWN. LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THRU JOINT

## BAR TYPES




ALL BAR DIMENSIONS ARE OUT TO OUT

## 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 | 1,704 | SQ.FT. |
| BRIDGE DECK | 4,037 | SQ.FT. |
| TOTAL | 5,741 | SQ.FT. |

## SUPERSTRUCTURE BILL OF MATERIAL

| | CLASS AA CONCRETE | REINFORCING STEEL | EPOXY COATED REINFORCING STEEL |
|---|---|---|---|
| | ( CU. YDS. ) | ( LBS. ) | ( LBS. ) |
| SPAN | A | 13,550 | 16,191 |
| POUR 1 | 130.9 | | |
| POUR 2 | 78.7 | | |
| | | | |
| | | | |
| TOTALS** | 209.6 | 13,550 | 16,191 |

**QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

## BILL OF MATERIAL

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| *A1 | 191 | #5 | STR | 40'-11" | 8151 |
| A2 | 191 | #5 | STR | 40'-11" | 8151 |
| *A101 | 2 | #5 | STR | 36'-10" | 77 |
| *A102 | 2 | #5 | STR | 30'-4" | 63 |
| *A103 | 2 | #5 | STR | 23'-9" | 50 |
| *A104 | 2 | #5 | STR | 17'-3" | 36 |
| *A105 | 2 | #5 | STR | 10'-9" | 22 |
| *A106 | 2 | #5 | STR | 4'-3" | 9 |
| A201 | 2 | #5 | STR | 36'-10" | 77 |
| A202 | 2 | #5 | STR | 30'-4" | 63 |
| A203 | 2 | #5 | STR | 23'-9" | 50 |
| A204 | 2 | #5 | STR | 17'-3" | 36 |
| A205 | 2 | #5 | STR | 10'-9" | 22 |
| A206 | 2 | #5 | STR | 4'-3" | 9 |
| | | | | | |
| *B1 | 164 | #6 | STR | 23'-0" | 5666 |
| *B2 | 56 | #4 | STR | 38'-4" | 1434 |
| B3 | 60 | #5 | STR | 58'-6" | 3661 |
| | | | | | |
| K1 | 24 | #4 | STR | 24'-3" | 389 |
| K2 | 8 | #4 | STR | 6'-0" | 32 |
| K3 | 32 | #4 | STR | 7'-7" | 162 |
| K4 | 8 | #4 | STR | 7'-3" | 39 |
| K5 | 2 | #4 | STR | 2'-2" | 3 |
| K6 | 8 | #4 | STR | 3'-0" | 16 |
| K7 | 2 | #4 | STR | 1'-6" | 2 |
| K8 | 2 | #4 | STR | 7'-7" | 10 |
| K9 | 10 | #4 | STR | 8'-5" | 56 |
| K10 | 8 | #4 | STR | 5'-0" | 27 |
| K11 | 4 | #4 | STR | 6'-8" | 18 |
| | | | | | |
| *S1 | 48 | #4 | 2 | 11'-11" | 382 |
| *S2 | 44 | #4 | 2 | 10'-3" | 301 |
| | | | | | |
| U1 | 64 | #4 | 1 | 13'-1" | 559 |
| U2 | 4 | #4 | 1 | 14'-11" | 40 |
| U3 | 12 | #4 | 1 | 15'-11" | 128 |
| | | | | | |
| REINFORCING STEEL | | | | LBS. | 13,550 |
| *EPOXY COATED REINFORCING STEEL | | | | LBS. | 16,191 |

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

DRAWN BY: J. T. WILLIAMS DATE: 1-2020

CHECKED BY: J. E. MONDOLFI DATE: 1-2020

DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 1-2020

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PLANS PREPARED BY:


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LICENSE NO. F-0669


NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20532 JAMES E. MONDOLFI

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

# SUPERSTRUCTURE BILL OF MATERIAL

(LEFT LANE)

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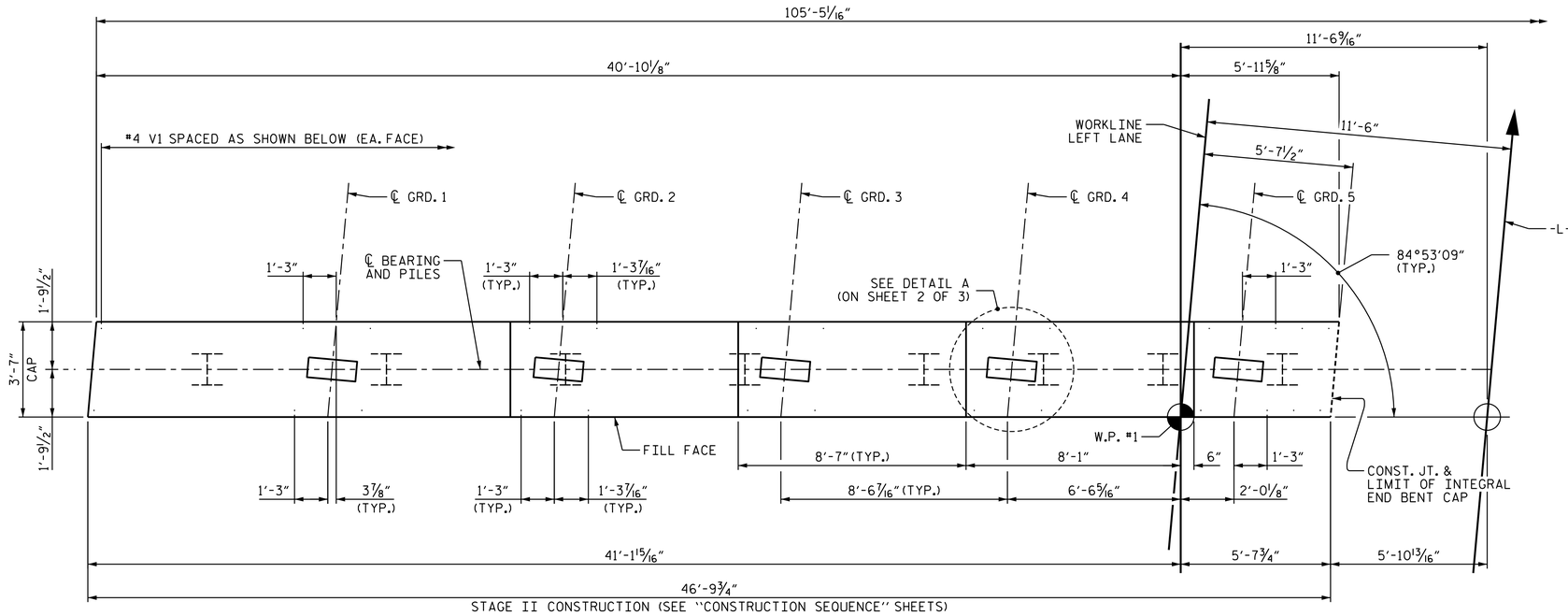
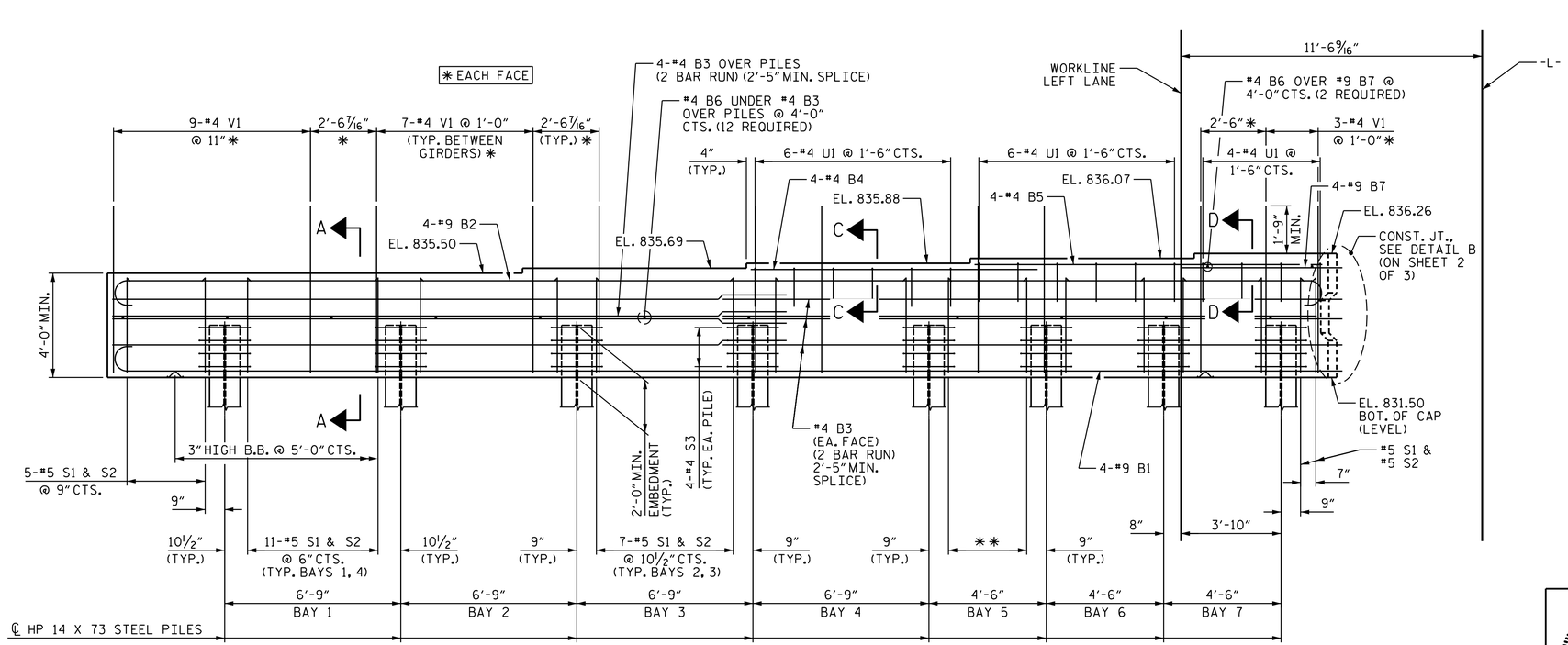



## PLAN




## ELEVATION

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1
(INTEGRAL)

(LEFT LANE)

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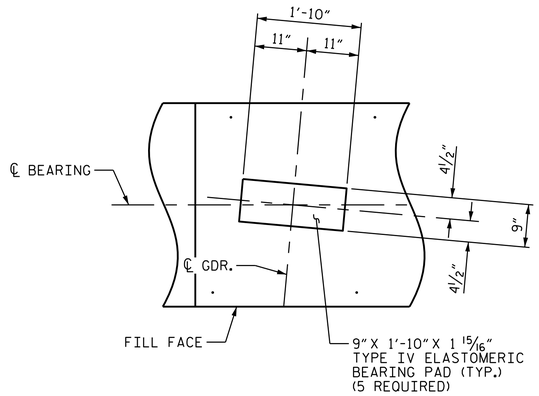
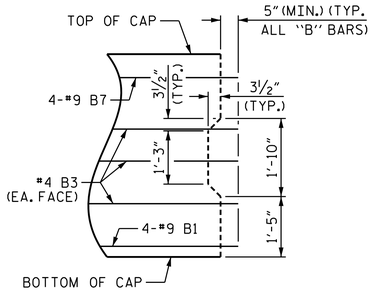



DETAIL A




DETAIL B

## NOTES:

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

#5 S1, #5 S2, AND #4 U1 BARS MAY BE SHIFTED SLIGHTLY TO CLEAR #4 V1.

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

THE TOP SURFACE OF THE END BENT CAP, EXCLUDING THE BEARING AREAS SHALL BE RAKED TO A DEPTH OF 1/4".

THE END BENT IS DETAILED TO FIT WITH MSE WALL COPING DETAIL A AS SHOWN ON THE SLOPE PROTECTION DETAIL SHEET. COORDINATE WITH THE MSE WALL FABRICATOR FOR COPING DETAIL TO BE USED. CONTRACTOR SHALL VERIFY REQUIRED LENGTH BASED ON FINAL LOCATION OF MSE WALL. BAR LENGTHS AND BAR POSITIONS SHALL BE ADJUSTED TO FIT.

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1
(INTEGRAL)

(LEFT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-19 |
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DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 4-2020

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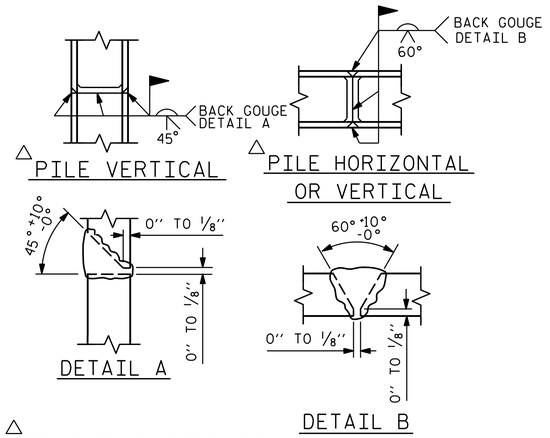
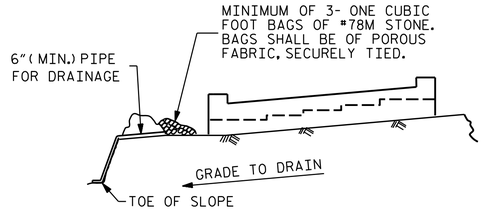



## PILE SPLICE DETAILS



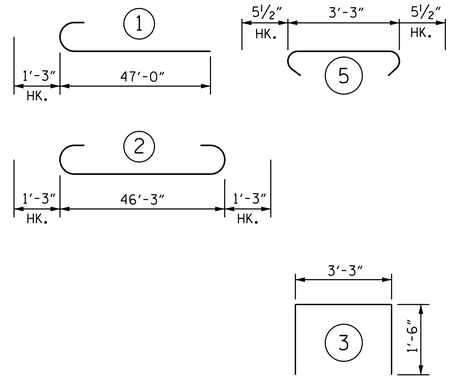

BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

## BAR TYPES




ALL DIMENSIONS ARE OUT TO OUT

## BILL OF MATERIAL

END BENT 1

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| B1 | 4 | #9 | 1 | 48'-3" | 656 |
| B2 | 4 | #9 | 2 | 48'-9" | 663 |
| B3 | 20 | #4 | STR | 24'-9" | 331 |
| B4 | 4 | #4 | STR. | 11'-0" | 29 |
| B5 | 4 | #4 | STR. | 13'-4" | 36 |
| B6 | 14 | #4 | STR. | 3'-3" | 30 |
| B7 | 4 | #9 | STR. | 6'-1" | 83 |
| | | | | | |
| S1 | 56 | #5 | 4 | 11'-5" | 667 |
| S2 | 56 | #5 | 5 | 4'-2" | 243 |
| S3 | 32 | #4 | 6 | 7'-7" | 162 |
| | | | | | |
| U1 | 16 | #4 | 3 | 6'-3" | 67 |
| | | | | | |
| V1 | 80 | #4 | STR | 6'-5" | 343 |

REINFORCING STEEL = 3,310 LBS.

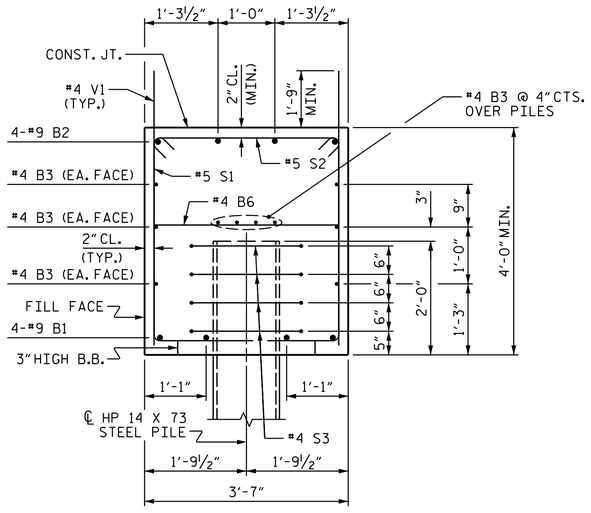
CLASS A CONCRETE BREAKDOWN

POUR #1 CAP 26.7 C.Y.

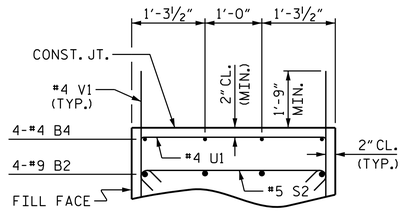
TOTAL CLASS A CONCRETE 26.7 C.Y.

HP 14 X 73 STEEL PILES:
NO. 8 240 LIN. FT.
STEEL PILE POINTS 8 EA.

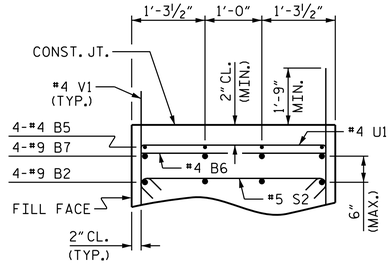
PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 STEEL PILES NO. 8




## SECTION A-A




## SECTION C-C




## SECTION D-D

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PROJECT NO. B-5353
GUILFORD COUNTY
STATION: 23+62.87 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1
(INTEGRAL)

(LEFT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
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CHECKED BY: J. E. MONDOLFI DATE: 4-2020
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 4-2020

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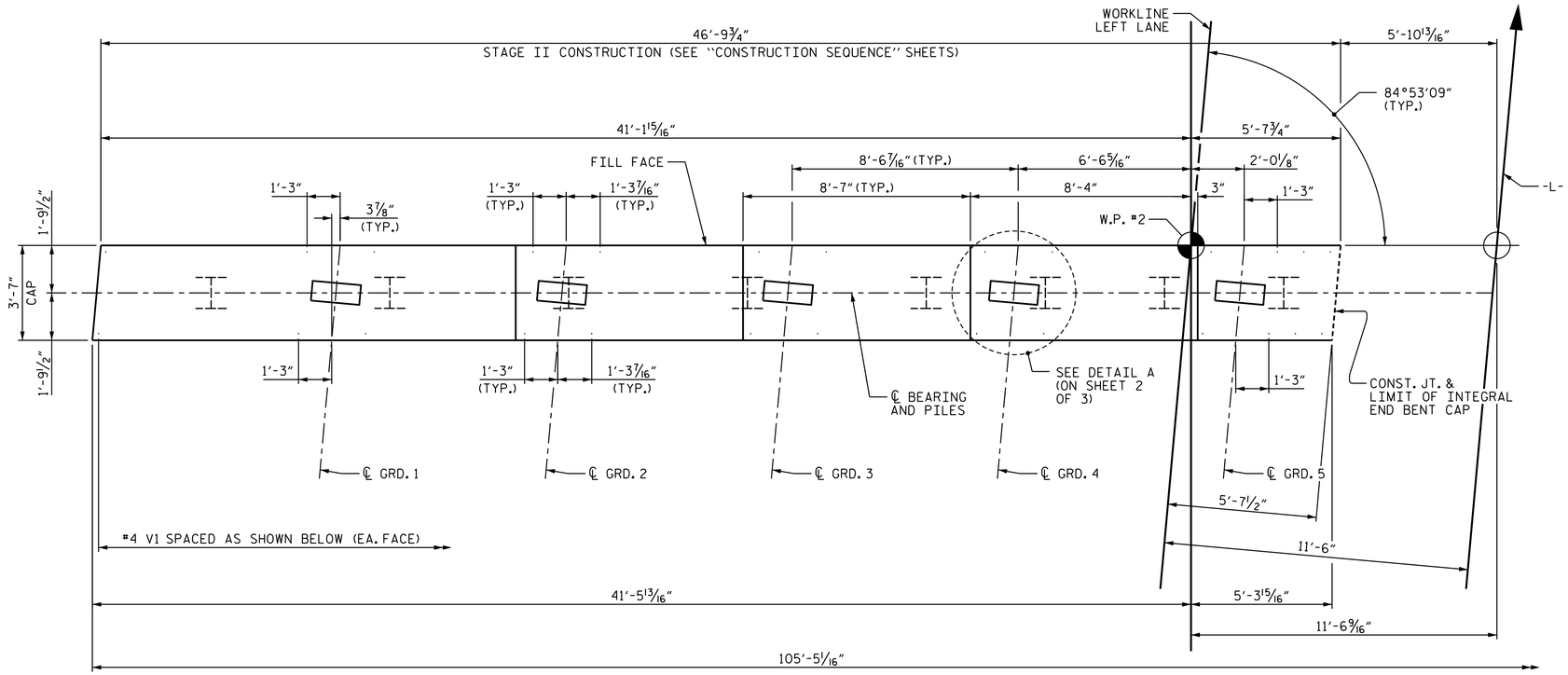
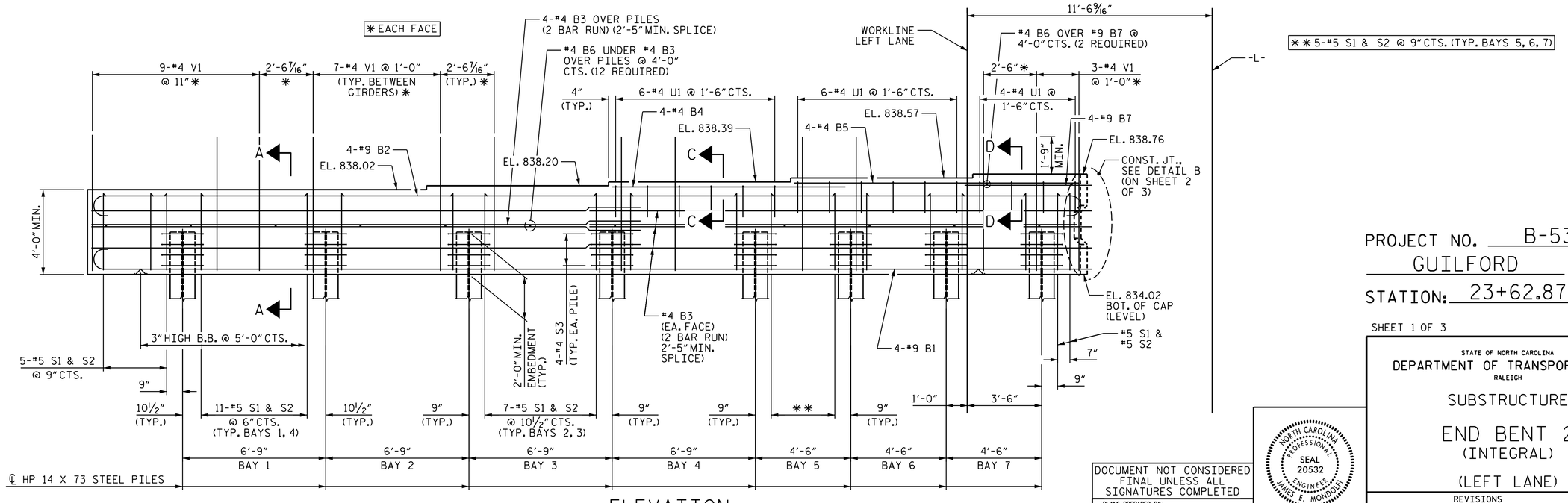



PLAN




ELEVATION

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2
(INTEGRAL)

(LEFT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-21 |
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(919) 552-2253
www.mottmac.com
LICENSE NO. F-0669

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20532 JAMES E. MONDOLFI

| | | |
|---|---|---|
| DRAWN BY: | J. T. WILLIAMS | DATE: 4-2020 |
| CHECKED BY: | J. E. MONDOLFI | DATE: 4-2020 |
| DESIGN ENGINEER OF RECORD: | J. E. MONDOLFI | DATE: 4-2020 |

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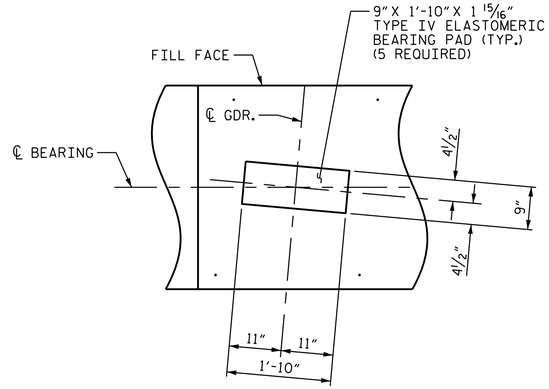
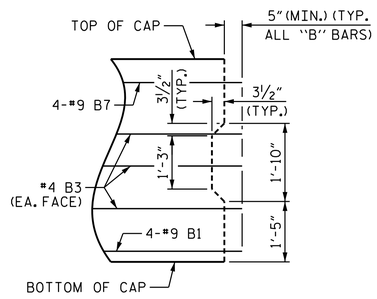



DETAIL A




DETAIL B

## NOTES:

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

#5 S1, #5 S2, AND #4 U1 BARS MAY BE SHIFTED SLIGHTLY TO CLEAR #4 V1.

FOR PILE SPLICE DETAILS, SEE "END BENT DETAILS", SHEET 3 OF 3.

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

THE END BENT IS DETAILED TO FIT WITH MSE WALL COPING DETAIL A AS SHOWN ON THE SLOPE PROTECTION DETAIL SHEET. COORDINATE WITH THE MSE WALL FABRICATOR FOR COPING DETAIL TO BE USED. CONTRACTOR SHALL VERIFY REQUIRED LENGTH BASED ON FINAL LOCATION OF MSE WALL. BAR LENGTHS AND BAR POSITIONS SHALL BE ADJUSTED TO FIT.

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2
(INTEGRAL)

(LEFT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-22 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 26 |

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20532 JAMES E. MONDOLFI

DRAWN BY: J. T. WILLIAMS DATE: 4-2020
CHECKED BY: J. E. MONDOLFI DATE: 4-2020
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 4-2020

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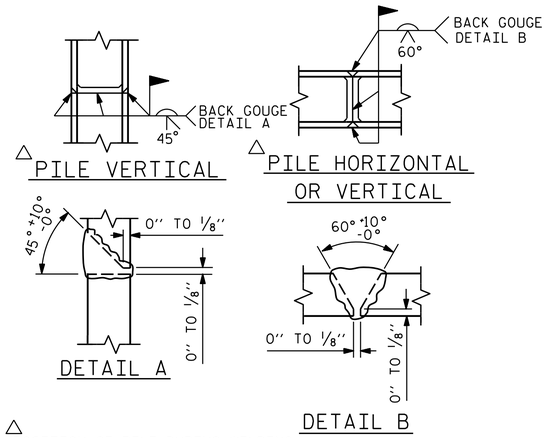
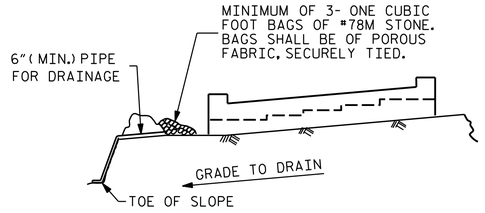
12/2/2021 10:59:04 AM




## PILE SPLICE DETAILS



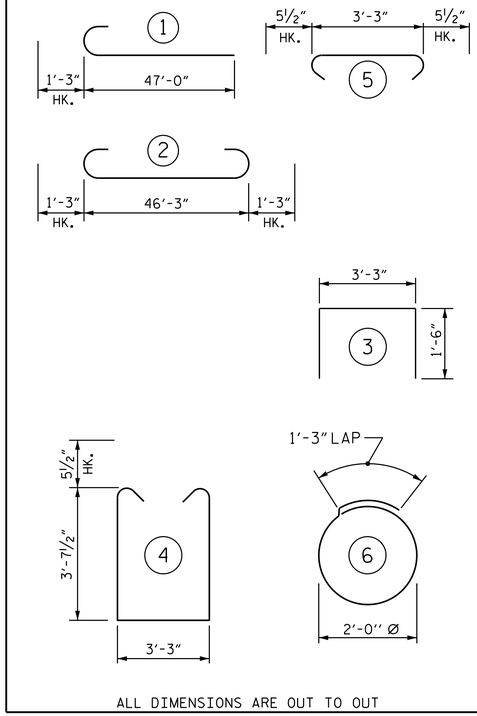

BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

## BAR TYPES




ALL DIMENSIONS ARE OUT TO OUT

## BILL OF MATERIAL

END BENT 2

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| B1 | 4 | #9 | 1 | 48'-3" | 656 |
| B2 | 4 | #9 | 2 | 48'-9" | 663 |
| B3 | 20 | #4 | STR | 24'-9" | 331 |
| B4 | 4 | #4 | STR. | 11'-0" | 29 |
| B5 | 4 | #4 | STR. | 13'-4" | 36 |
| B6 | 14 | #4 | STR. | 3'-3" | 30 |
| B7 | 4 | #9 | STR. | 6'-1" | 83 |
| | | | | | |
| S1 | 56 | #5 | 4 | 11'-5" | 667 |
| S2 | 56 | #5 | 5 | 4'-2" | 243 |
| S3 | 32 | #4 | 6 | 7'-7" | 162 |
| | | | | | |
| U1 | 16 | #4 | 3 | 6'-3" | 67 |
| | | | | | |
| V1 | 80 | #4 | STR | 6'-4" | 338 |

REINFORCING STEEL = 3,305 LBS.

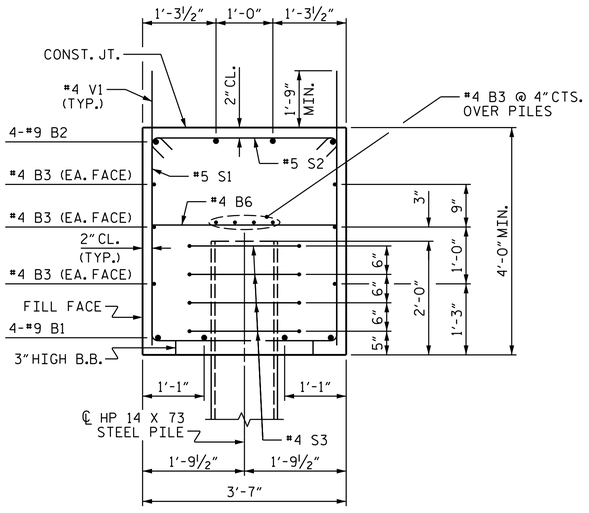
CLASS A CONCRETE BREAKDOWN

POUR #1 CAP 26.6 C.Y.

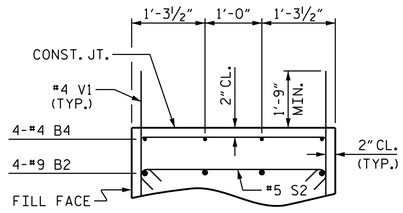
TOTAL CLASS A CONCRETE 26.6 C.Y.

HP 14 X 73 STEEL PILES:
NO. 8 200 LIN. FT.
STEEL PILE POINTS 8 EA.

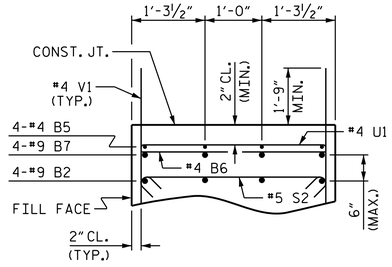
PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 STEEL PILES NO. 8




## SECTION A-A




## SECTION C-C




## SECTION D-D

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2
(INTEGRAL)

(LEFT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-23 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 26 |

DRAWN BY: J. T. WILLIAMS DATE: 4-2020
CHECKED BY: J. E. MONDOLFI DATE: 4-2020
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 4-2020

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LICENSE NO. F-0669

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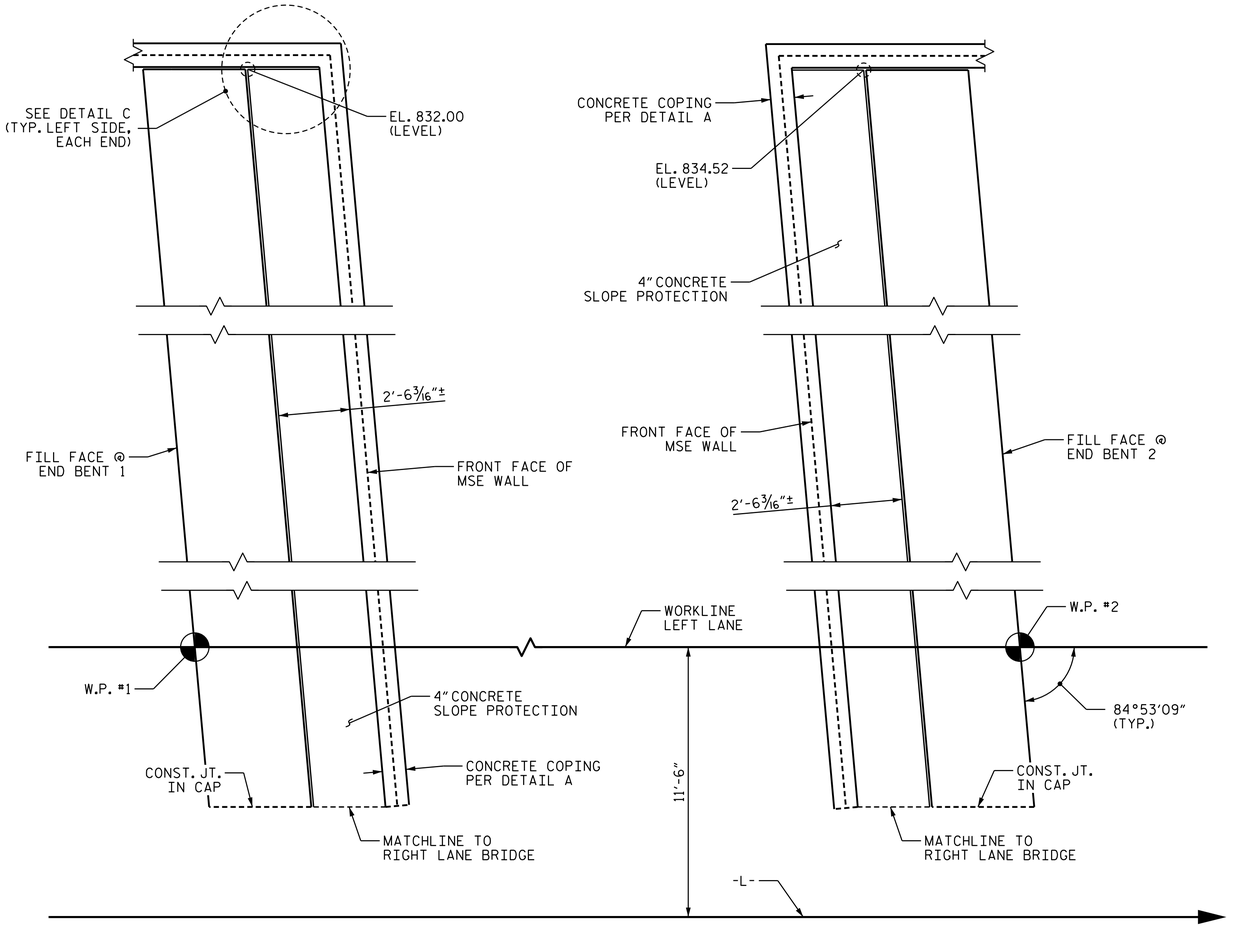



## PLAN

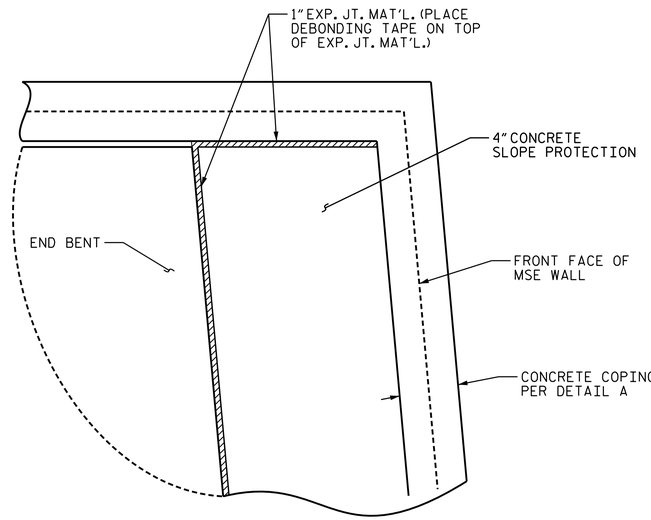
ELEVATIONS SHOWN ARE AT TOP OF
SLOPE PROTECTION AT FACE OF END BENT

## NOTES:

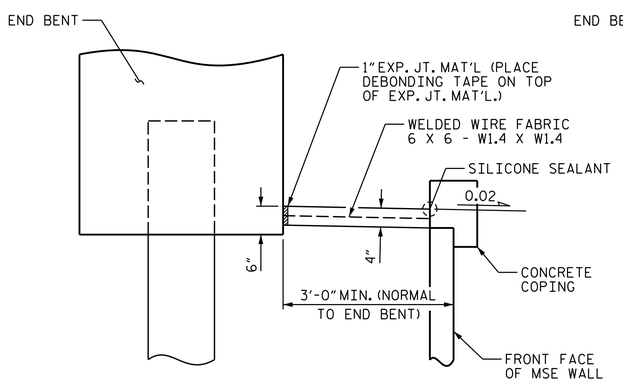
SLOPE PROTECTION SHALL CONSIST OF 4'' POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS ''B''. THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4. THE COST OF THE WELDED WIRE FABRIC SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

THE SLOPE PROTECTION IS DETAILED TO FIT WITH THE MSE WALL COPING DETAIL A. IF MSE WALL COPING DETAIL B IS USED, SLOPE PROTECTION SHALL BE ADJUSTED TO FIT. COORDINATE WITH THE MSE WALL FABRICATOR FOR ACTUAL WALL THICKNESS AND COPING TO BE USED. ADJUST SLOPE PROTECTION QUANTITIES AS NECESSARY TO FIT COPING USED.

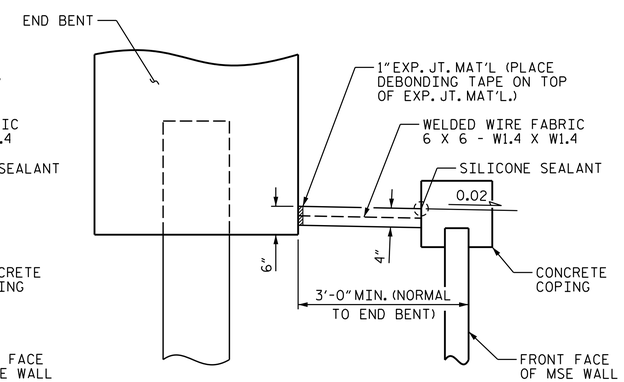
| BRIDGE @ 23+62.87 -L- | 4 INCH SLOPE PROTECTION | WELDED WIRE FABRIC |
|---|---|---|
| | SQUARE YARDS | APPROX. L.F. |
| END BENT 1 | 14 | 47 |
| END BENT 2 | 14 | 47 |




DETAIL C




DETAIL A




DETAIL B

## COPING DETAILS

THE CONTRACTOR HAS THE OPTION OF USING COPING IN DETAILS A OR B, SEE MSE END BENT WALLS TYPICAL SECTION

PROJECT NO. B-5353
GUILFORD COUNTY
STATION: 23+62.87 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

# CONCRETE SLOPE PROTECTION

(LEFT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-24 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 26 |

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CHECKED BY: J. E. MONDOLFI DATE: 4-2020
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 4-2020

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NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI

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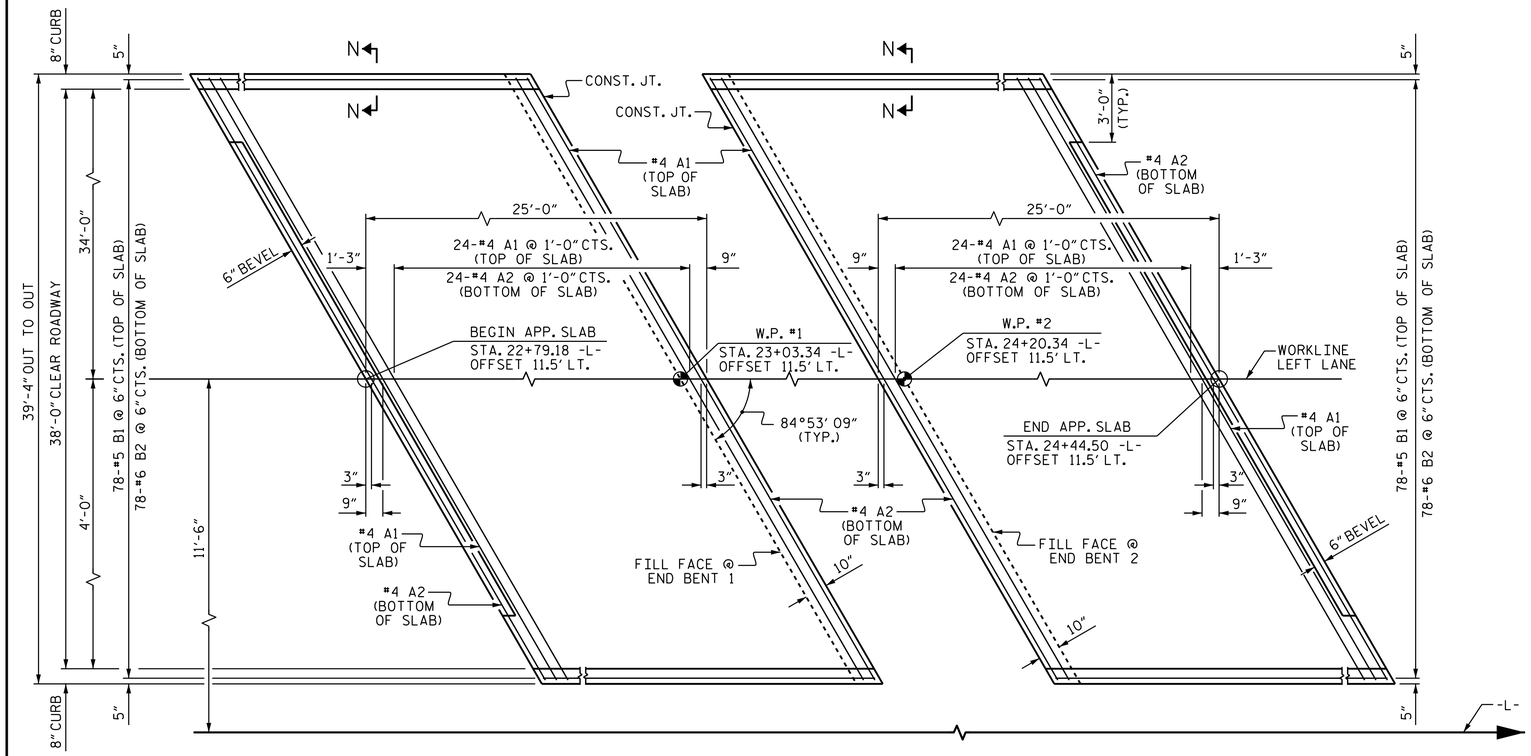
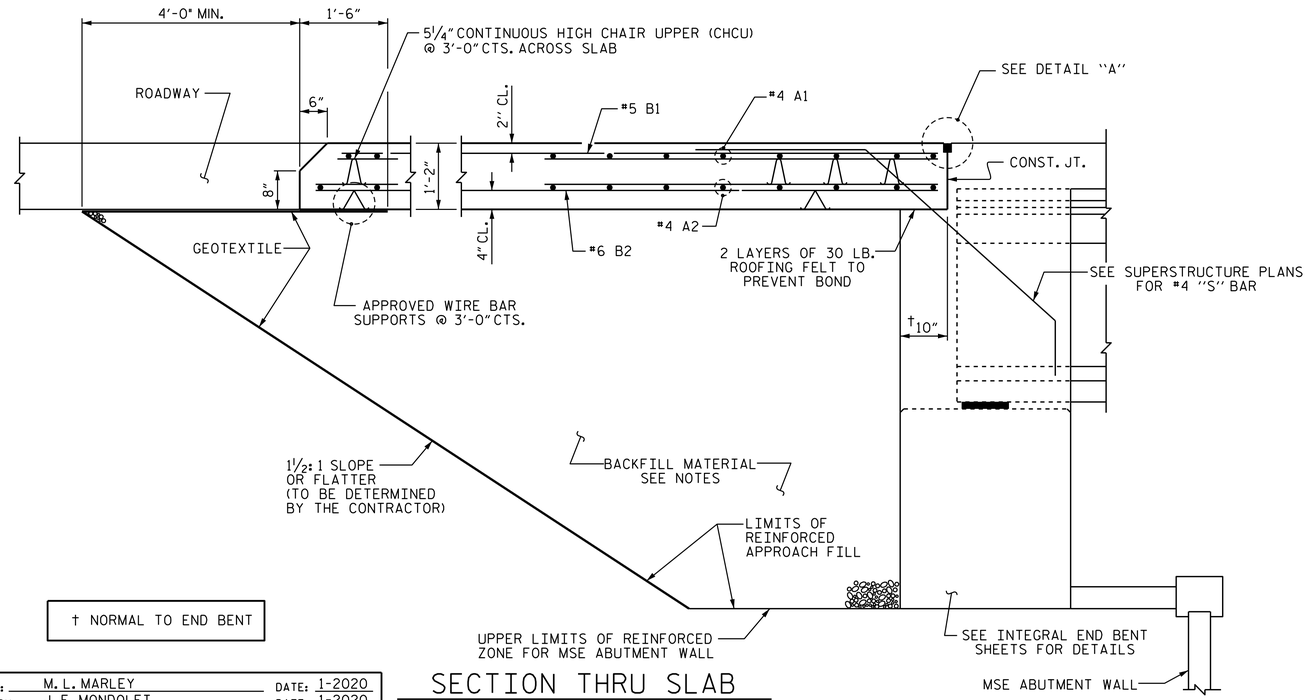



PLAN @ END BENT 1 PLAN @ END BENT 2

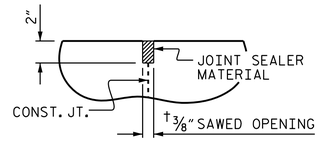
DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



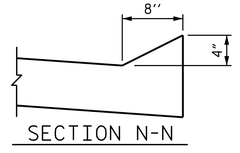

† NORMAL TO END BENT

SECTION THRU SLAB

(TYPE III - REINFORCED APPROACH FILL)




DETAIL "A"




SECTION N-N

## NOTES

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

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, MSE WALL REINFORCEMENT AND BACKFILL, SEE ROADWAY PLANS.

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

BACKFILL MATERIAL SHALL BE THE SAME MATERIAL USED IN THE MSE REINFORCED ZONE.

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL.

AREA BETWEEN THE MSE WALL 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.

## BILL OF MATERIAL

FOR ONE APPROACH SLAB (2 REQ'D)

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| ✱ A1 | 26 | #4 | STR | 39'-1" | 679 |
| A2 | 26 | #4 | STR | 39'-1" | 679 |
| | | | | | |
| ✱ B1 | 78 | #5 | STR | 24'-3" | 1973 |
| B2 | 78 | #6 | STR | 24'-7" | 2880 |
| | | | | | |
| REINFORCING STEEL | | | | LBS. | 3559 |
| ✱ EPOXY COATED REINFORCING STEEL | | | | LBS. | 2652 |
| | | | | | |
| CLASS AA CONCRETE | | | | C.Y. | 42.5 |

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

# BRIDGE APPROACH SLAB

FOR INTEGTAL ABUTMENT WITH FLEXIBLE PAVEMENT (LEFT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-25 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 26 |

DRAWN BY: M. L. MARLEY DATE: 1-2020
CHECKED BY: J. E. MONDOLFI DATE: 1-2020
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 1-2020

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PLANS PREPARED BY:
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LICENSE NO. F-0669

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E MONDOLFI

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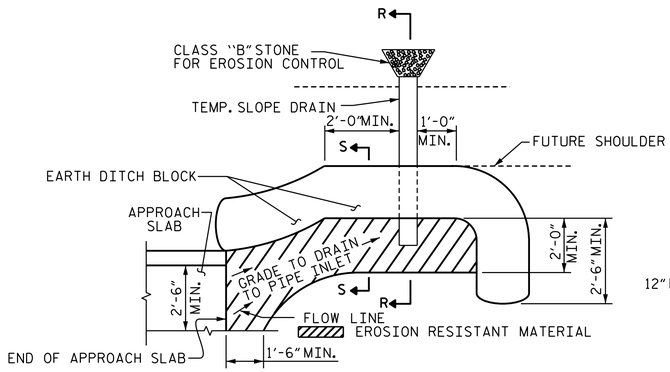
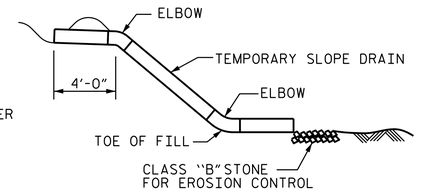
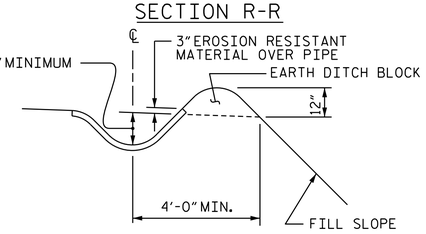



NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

PLAN VIEW



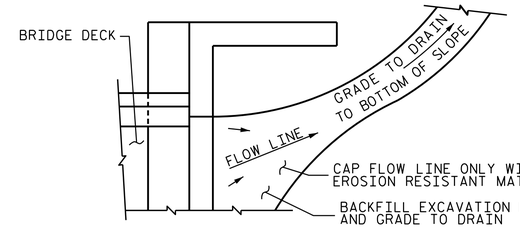

SECTION R-R




SECTION S-S

# TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)




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

TEMPORARY DRAINAGE DETAIL

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

## BRIDGE APPROACH SLAB DETAILS

(LEFT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S1-26 |
| 1 | | | 3 | | | TOTAL SHEETS |
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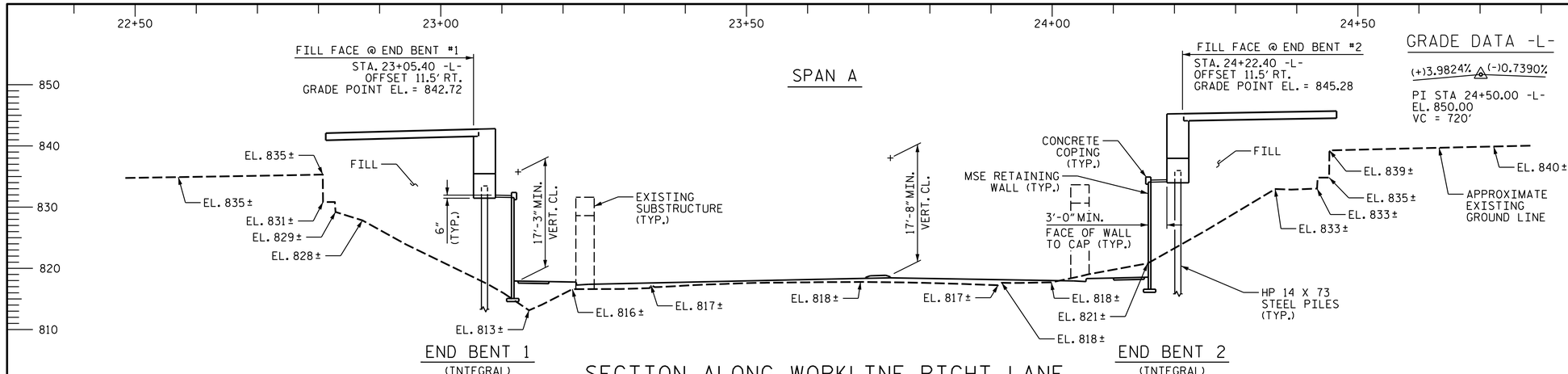
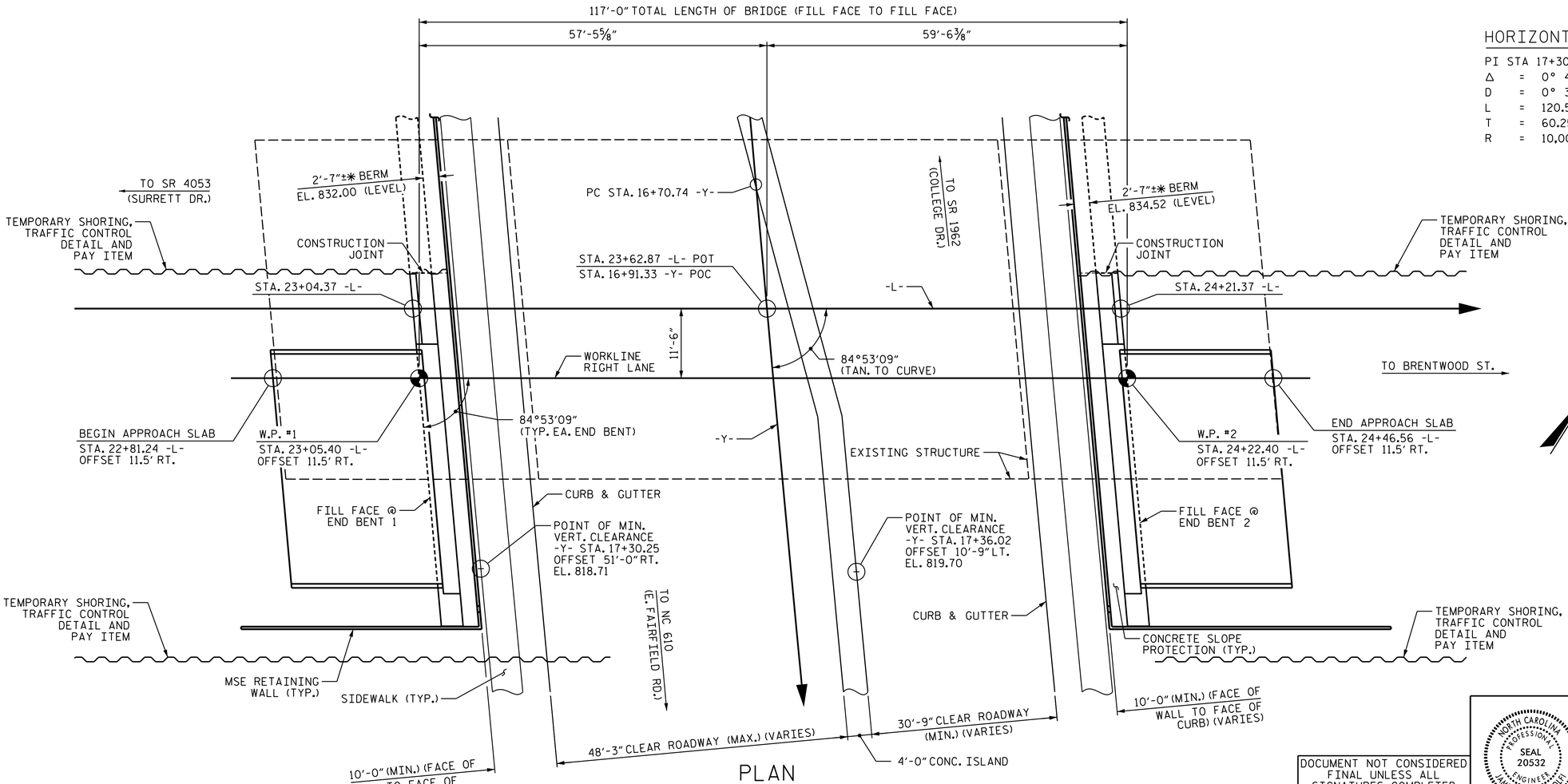



## SECTION ALONG WORKLINE RIGHT LANE

SECTIONS AT END BENTS ARE TAKEN AT RIGHT ANGLES




## PLAN

PILES NOT SHOWN FOR CLARITY

*BERM WIDTH IS DEPENDENT ON FINAL MSE RETAINING WALL DESIGN

## HORIZONTAL CURVE DATA -Y-

PI STA 17+30.99 -Y-
Δ = 0° 41' 25.5"(LT)
D = 0° 34' 22.6"
L = 120.5'
T = 60.25'
R = 10,000.00'

PROJECT NO. B-5353
GUILFORD COUNTY
STATION: 23+62.87 -L- POT
16+91.33 -Y- POC
SHEET 1 OF 3 BRIDGE #401289

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

# GENERAL DRAWING

BRIDGE ON US 29, US 70 OVER S. MAIN ST. (SR 1009) BETWEEN SR 4053 AND BRENTWOOD ST. (RIGHT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S2-1 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 24 |

DRAWN BY: J. T. WILLIAMS DATE: 3-2020
CHECKED BY: J. E. MONDOLFI DATE: 5-2020
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 5-2020

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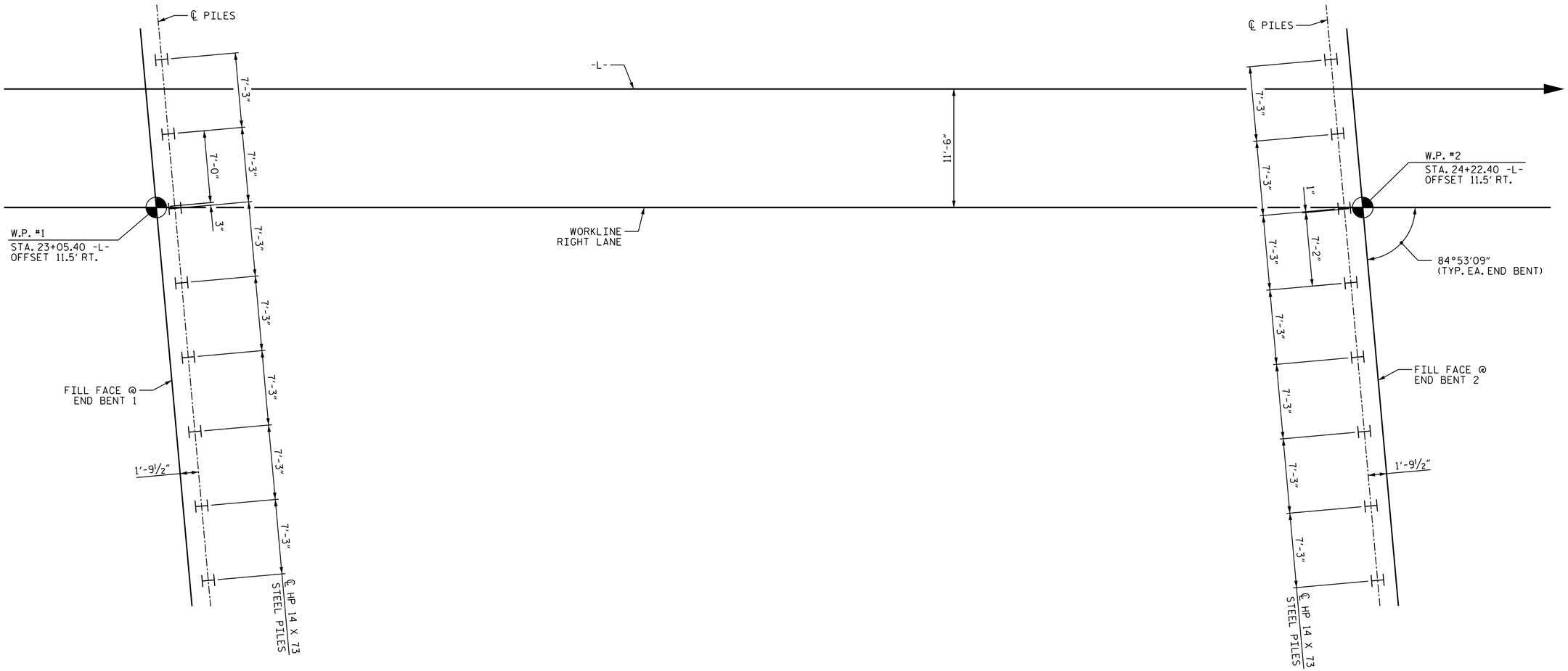


END BENT 1

END BENT 2

## FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO PILE CENTERLINE

ORIENT PILES AS SHOWN

## NOTES:

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT 1 AND END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 130 TONS PER PILE.

DRIVE PILES AT END BENT 1 AND END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 220 TONS PER PILE.

STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT 1 AND END BENT 2. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 40,000 TO 50,000 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT END BENT 1 AND END BENT 2. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON US 29, US 70 OVER S. MAIN ST. (SR 1009) BETWEEN SR 4053 AND BRENTWOOD ST. (RIGHT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S2-2 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 24 |

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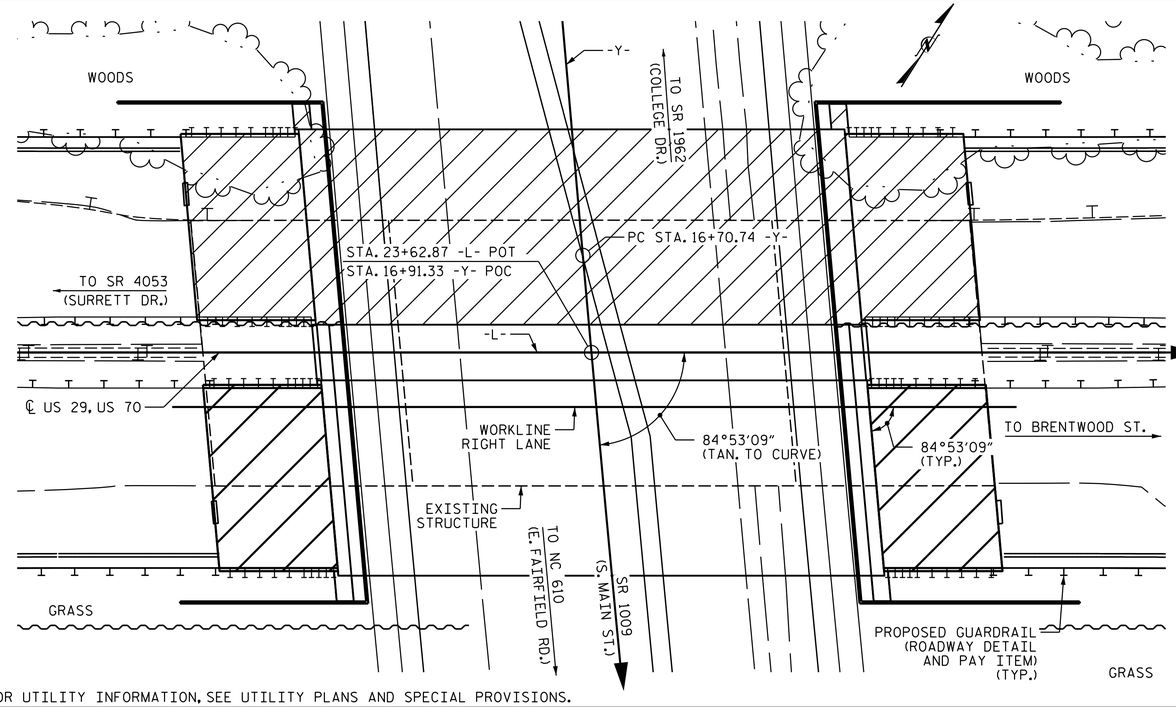
PLANS PREPARED BY:
MOTT MACDONALD
PO Box 700
Fuquay-Varina, NC 27526
(919) 552-2253
www.mottmac.com
LICENSE NO. F-0669

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI

DRAWN BY: J. T. WILLIAMS DATE: 10-2020
CHECKED BY: J. E. MONDOLFI DATE: 10-2020
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 12-2020

w1157077
R:\Structures\Plans\Right Lane\B-5353_SMU_FL_401289.dgn
12/2/2021 10:59:58 AM

BM3: MAG NAIL IN CURB, -BY- STA. 23+04.76, 179.0' LT., ELEV.= 835.99




FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

## NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE 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.

THE ELEVATION AND CLEARANCE SHOWN ON THE PLANS AT THE POINT OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATIONS ON THE EXISTING PAVEMENT AND CHECK THE CLEARANCE. REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.

FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.

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.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE @ STA. 23+62.87 -L-".

THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLES 1024-5 AND 1024-6 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.

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

THE CONTRACTOR WILL BE REQUIRED TO CONSTRUCT, MAINTAIN AND AFTERWARDS REMOVE A TEMPORARY STRUCTURE AT STATION 16+74.54 -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.

AFTER SERVING AS A TEMPORARY STRUCTURE THE EXISTING STRUCTURE CONSISTING OF 3 SPANS: 1 @ 43', 1 @ 81', & 1 @ 43'; 52'-7" CLEAR ROADWAY WIDTH AND REINFORCED CONCRETE DECK ON 8 LINES OF STEEL W 36 X 150 CONTINUOUS I-BEAMS; END BENTS WITH REINFORCED CONCRETE CAPS ON TIMBER PILES AND INTERIOR BENTS ON SPREAD FOOTINGS, LOCATED AT THE PROPOSED STRUCTURE SITE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. 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.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

FOR ARCHITECTURAL CONCRETE SURFACE TREATMENT, SEE SPECIAL PROVISIONS.

FOR APPLICATION OF BRIDGE COATING, SEE SPECIAL PROVISIONS.

FOR LIMITS OF SUPERSTRUCTURE BRIDGE COATING AND ARCHITECTURAL CONCRETE SURFACE TREATMENT, SEE "TYPICAL SECTION DETAILS", SHEET 2 OF 2.

## TOTAL BILL OF MATERIAL

| | REINFORCED CONCRETE DECK SLAB | GROOVING BRIDGE FLOORS | CLASS A CONCRETE | BRIDGE APPROACH SLABS | REINFORCING STEEL | MODIFIED 63" PRESTRESSED CONCRETE GIRDERS | | PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 STEEL PILES | HP 14 X 73 STEEL PILES | | STEEL PILE POINTS | CONCRETE BARRIER RAIL | ARCHITECTURAL CONCRETE SURFACE TREATMENT | APPLICATION OF BRIDGE COATING | 4" SLOPE PROTECTION | ELASTOMERIC BEARINGS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SQ. FT. | SQ. FT. | CU. YDS. | LUMP SUM | LBS. | NO. | LIN. FT. | EA. | NO. | LIN. FT. | EA. | LIN. FT. | SQ. FT. | SQ. FT. | SQ. YDS. | LUMP SUM |
| SUPERSTRUCTURE | 4,757 | 5,741 | | | | 5 | 573.96 | | | | | 230.65 | 327 | 2,939 | | LUMP SUM |
| END BENT 1 | | | 37.8 | | 4,482 | | | 8 | 8 | 240 | 8 | | | | 17 | |
| END BENT 2 | | | 37.5 | | 4,482 | | | 8 | 8 | 200 | 8 | | | | 17 | |
| TOTAL | 4,757 | 5,741 | 75.3 | LUMP SUM | 8,964 | 5 | 573.96 | 16 | 16 | 440 | 16 | 230.65 | 327 | 2,939 | 34 | LUMP SUM |

NOTE:

FOR CONSTRUCTION, MAINTENANCE, & REMOVAL OF TEMP STRUCTURE, REMOVAL OF EXISTING STRUCTURE, AND ASBESTOS ASSESSMENT, SEE GENERAL DRAWING SHEET 3 OF 3 OF LEFT LANE.

DRAWN BY: J. T. WILLIAMS DATE: 10-2020
CHECKED BY: J. E. MONDOLFI DATE: 10-2020
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 10-2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:
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LICENSE NO. F-0669

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI

PROJECT NO. B-5353
GUILFORD COUNTY
STATION: 23+62.87 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON US 29, US 70 OVER S. MAIN ST. (SR 1009) BETWEEN SR 4053 AND BRENTWOOD ST. (RIGHT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S2-3 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 24 |

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# 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 × RF | STRENGTH I LIMIT STATE | | | | | | | | | | | SERVICE III LIMIT STATE | | | | | | COMMENT NUMBER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | MOMENT | | | | | SHEAR | | | | | | MOMENT | | | | | | |
| | | | | | | | LIVE-LOAD FACTORS ($\gamma_{LL}$) | DISTRIBUTION FACTORS (DF) | RATING FACTOR | SPAN | GIRDER LOCATION | DISTANCE FROM LEFT END OF SPAN (ft) | DISTRIBUTION FACTORS (DF) | RATING FACTOR | SPAN | GIRDER LOCATION | DISTANCE FROM LEFT END OF SPAN (ft) | LIVE-LOAD FACTORS ($\gamma_{LL}$) | DISTRIBUTION FACTORS (DF) | RATING FACTOR | SPAN | GIRDER LOCATION | DISTANCE FROM LEFT END OF SPAN (ft) | |
| DESIGN LOAD RATING | | HL-93 (INVENTORY) | N/A | ⟨1⟩ | 1.20 | -- | 1.75 | .776 | 1.26 | A | E | 56.7 | .873 | 1.28 | A | I | 10.8 | 0.80 | .776 | 1.20 | A | E | 56.7 | |
| | | HL-93 (OPERATING) | N/A | | 1.63 | -- | 1.35 | .776 | 1.63 | A | E | 56.7 | .873 | 1.69 | A | I | 10.8 | N/A | -- | -- | -- | -- | -- | |
| | | HS-20 (INVENTORY) | 36.000 | ⟨2⟩ | 1.73 | 62.280 | 1.75 | .776 | 1.81 | A | E | 56.7 | .873 | 1.80 | A | I | 10.8 | 0.80 | .776 | 1.73 | A | E | 56.7 | |
| | | HS-20 (OPERATING) | 36.000 | | 2.35 | 84.600 | 1.35 | .776 | 2.35 | A | E | 56.7 | .873 | 2.37 | A | I | 10.8 | N/A | -- | -- | -- | -- | -- | |
| LEGAL LOAD RATING | SINGLE VEHICLE (SV) | SNSH | 13.500 | | 4.18 | 56.430 | 1.40 | .776 | 5.47 | A | E | 56.7 | .873 | 5.88 | A | I | 10.8 | 0.80 | .776 | 4.18 | A | E | 56.7 | |
| | | SNGARBS2 | 20.000 | | 3.00 | 60.000 | 1.40 | .776 | 3.92 | A | E | 56.7 | .873 | 4.06 | A | I | 10.8 | 0.80 | .776 | 3.00 | A | E | 56.7 | |
| | | SNAGRIS2 | 22.000 | | 2.79 | 61.380 | 1.40 | .776 | 3.65 | A | E | 56.7 | .873 | 3.73 | A | I | 10.8 | 0.80 | .776 | 2.79 | A | E | 56.7 | |
| | | SNCOTTS3 | 27.250 | | 2.08 | 56.680 | 1.40 | .776 | 2.72 | A | E | 56.7 | .873 | 2.86 | A | I | 10.8 | 0.80 | .776 | 2.08 | A | E | 56.7 | |
| | | SNAGGRS4 | 34.925 | | 1.69 | 59.023 | 1.40 | .776 | 2.21 | A | E | 56.7 | .873 | 2.29 | A | I | 10.8 | 0.80 | .776 | 1.69 | A | E | 56.7 | |
| | | SNS5A | 35.550 | | 1.66 | 59.013 | 1.40 | .776 | 2.17 | A | E | 56.7 | .873 | 2.30 | A | I | 10.8 | 0.80 | .776 | 1.66 | A | E | 56.7 | |
| | | SNS6A | 39.950 | | 1.50 | 59.925 | 1.40 | .776 | 1.96 | A | E | 56.7 | .873 | 2.06 | A | I | 10.8 | 0.80 | .776 | 1.50 | A | E | 56.7 | |
| | | SNS7B | 42.000 | | 1.43 | 60.060 | 1.40 | .776 | 1.87 | A | E | 56.7 | .873 | 2.00 | A | I | 10.8 | 0.80 | .776 | 1.43 | A | E | 56.7 | |
| | TRUCK TRACTOR SEMI-TRAILER (TTST) | TNAGRIT3 | 33.000 | | 1.82 | 60.060 | 1.40 | .776 | 2.39 | A | E | 56.7 | .873 | 2.50 | A | I | 10.8 | 0.80 | .776 | 1.82 | A | E | 56.7 | |
| | | TNT4A | 33.075 | | 1.83 | 60.527 | 1.40 | .776 | 2.39 | A | E | 56.7 | .873 | 2.45 | A | I | 10.8 | 0.80 | .776 | 1.83 | A | E | 56.7 | |
| | | TNT6A | 41.600 | | 1.48 | 61.568 | 1.40 | .776 | 1.93 | A | E | 56.7 | .873 | 2.08 | A | I | 10.8 | 0.80 | .776 | 1.48 | A | E | 56.7 | |
| | | TNT7A | 42.000 | | 1.48 | 62.160 | 1.40 | .776 | 1.93 | A | E | 56.7 | .873 | 2.05 | A | I | 10.8 | 0.80 | .776 | 1.48 | A | E | 56.7 | |
| | | TNT7B | 42.000 | | 1.51 | 63.420 | 1.40 | .776 | 1.97 | A | E | 56.7 | .873 | 1.97 | A | I | 10.8 | 0.80 | .776 | 1.51 | A | E | 56.7 | |
| | | TNAGRIT4 | 43.000 | | 1.45 | 62.350 | 1.40 | .776 | 1.90 | A | E | 56.7 | .873 | 1.91 | A | I | 10.8 | 0.80 | .776 | 1.45 | A | E | 56.7 | |
| | | TNAGT5A | 45.000 | | 1.37 | 61.650 | 1.40 | .776 | 1.80 | A | E | 56.7 | .873 | 1.86 | A | I | 10.8 | 0.80 | .776 | 1.37 | A | E | 56.7 | |
| | | TNAGT5B | 45.000 | ⟨3⟩ | 1.36 | 61.200 | 1.40 | .776 | 1.78 | A | E | 56.7 | .873 | 1.81 | A | I | 10.8 | 0.80 | .776 | 1.36 | A | E | 56.7 | |

## 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.
2.
3.
4.

⟨#⟩ CONTROLLING LOAD RATING

⟨1⟩ DESIGN LOAD RATING (HL-93)

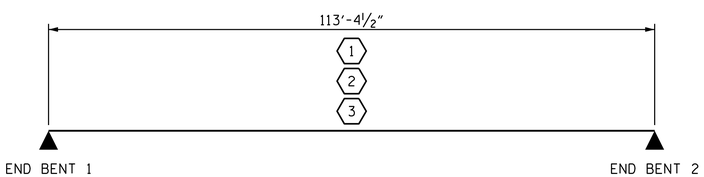
⟨2⟩ DESIGN LOAD RATING (HS-20)

⟨3⟩ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

I - INTERIOR GIRDER
E - EXTERIOR GIRDER




LRFR SUMMARY

PROJECT NO. B-5353
GUILFORD COUNTY
STATION: 23+62.87 -L-

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED


PLANS PREPARED BY:
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PO Box 700
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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20532 JAMES E. MONDOLFI

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

LRFR SUMMARY FOR PRESTRESSED CONCRETE GIRDERS
(NON-INTERSTATE TRAFFIC)
(RIGHT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S2-4 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 24 |

DRAWN BY: J. T. WILLIAMS DATE: 3-2020
CHECKED BY: J. E. MONDOLFI DATE: 4-2020
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 4-2020

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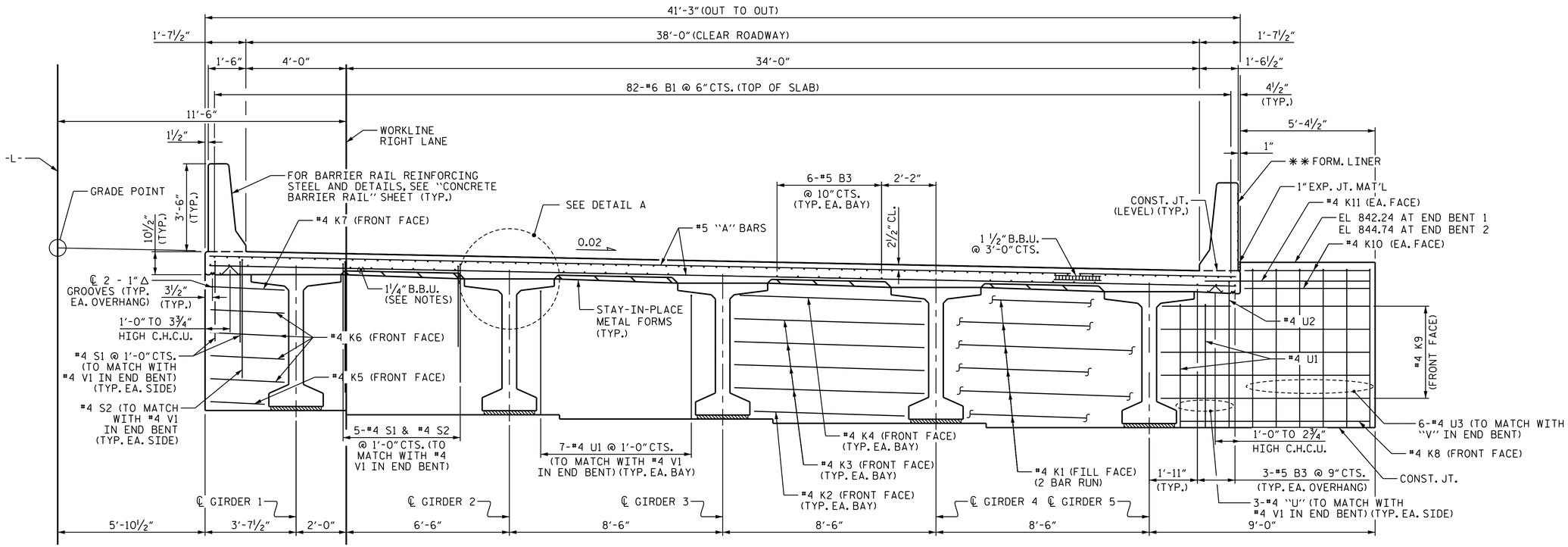
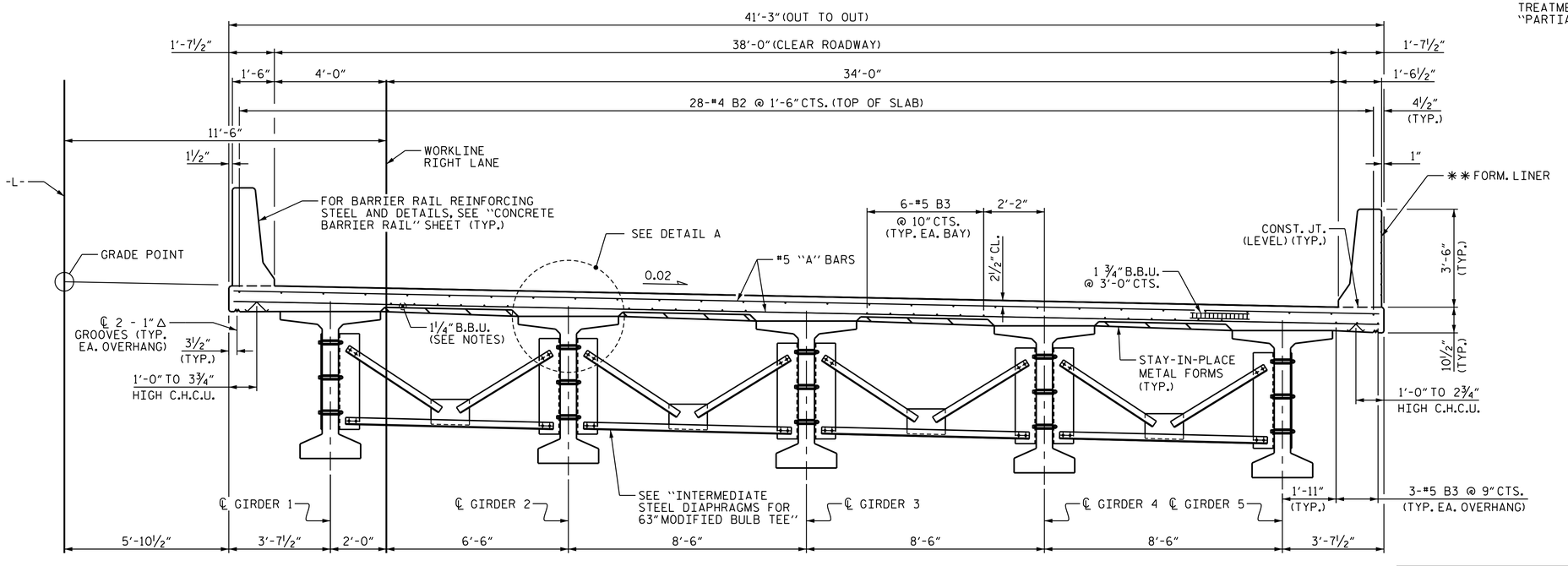
12/2/2021




## TYPICAL SECTION

(SHOWING INTEGRAL END BENT)

** FOR ARCHITECTURAL CONCRETE SURFACE TREATMENT AND BRIDGE COATING, SEE "PARTIAL TYPICAL SECTION" SHEET 2 OF 2.




## TYPICAL SECTION

(SHOWING INTERMEDIATE DIAPHRAGMS)

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

(RIGHT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S2-5 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 24 |

DRAWN BY: J. T. WILLIAMS DATE: 3-2020
CHECKED BY: J. E. MONDOLFI DATE: 4-2020
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 4-2020

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PLANS PREPARED BY:
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NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI

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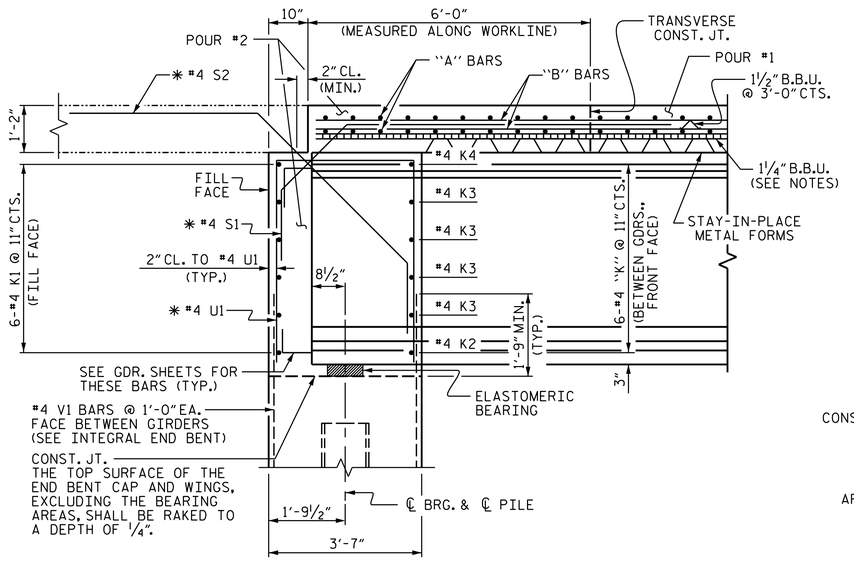
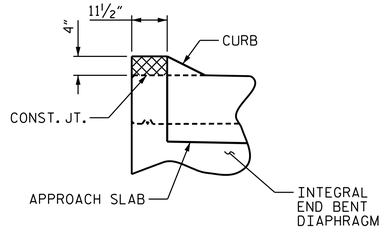



## SECTION THRU INTEGRAL END BENT

✱ TO MATCH #4 V1 BARS IN INTEGRAL END BENT

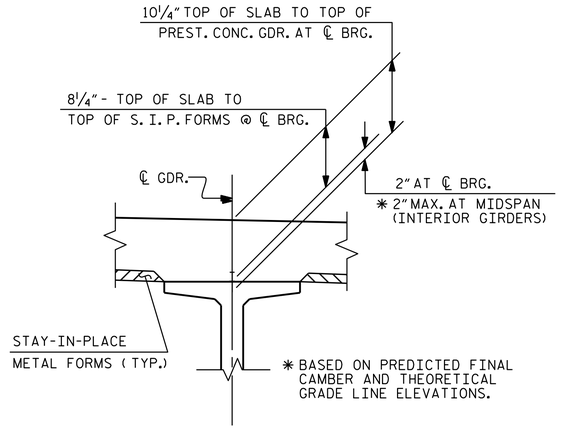



## LT. SIDE ELEVATION VIEW

FOR PLAN VIEW, SEE "PLAN OF SPAN A"

## BLOCKOUT DETAILS IN END BENT DIAPHRAGM

CONCRETE SHALL BE POURED IN THE CROSS-HATCHED AREA TO MATCH THE TOP OF CURB. UNLESS OTHERWISE DIRECTED BY THE ENGINEER




## DETAIL A

## NOTES:

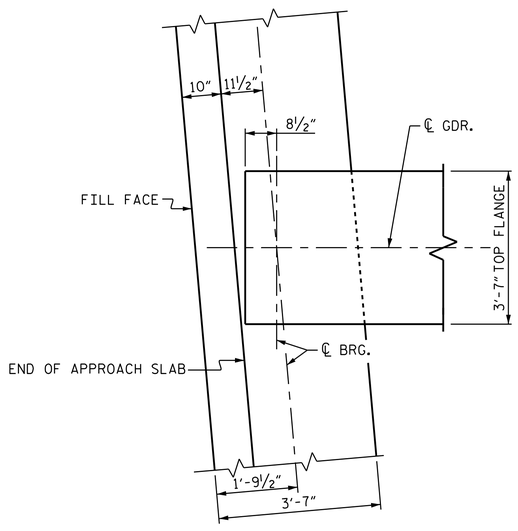
PROVIDE 1¼" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2½" ABOVE THE TOP OF THE REMOVABLE FORM.

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

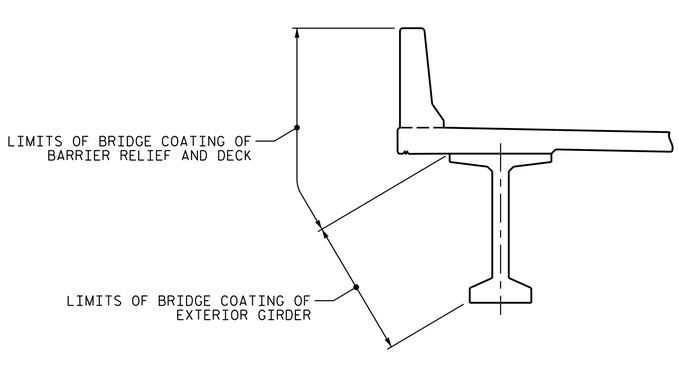
PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

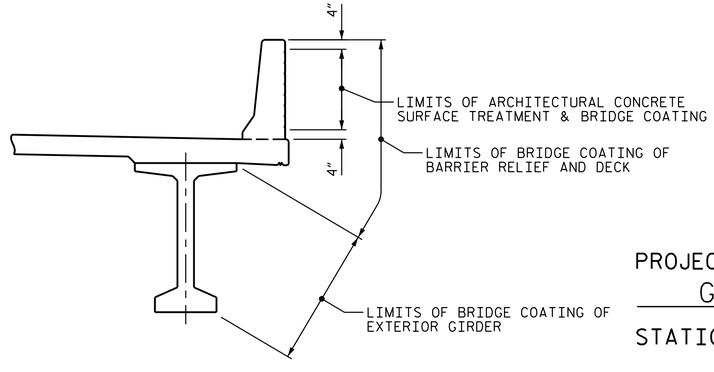
BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

| ARCHITECTURAL CONCRETE SURFACE TREATMENT | |
|---|---|
| TEXTURE: | 327 S.F. |
| **BRIDGE COATING** | |
| STAIN: SURFACE TREATMENT COATING | 327 S.F. |
| STAIN: BARRIER, BARRIER RELIEF AND DECK | 1075 S.F. |
| STAIN: EXTERIOR GIRDER | 1537 S.F. |
| TOTAL: | 2939 S.F. |




## PLAN OF GIRDER AT INTEGRAL END BENT




## PARTIAL TYPICAL SECTION

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

# TYPICAL SECTION DETAILS

(RIGHT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S2-6 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 24 |

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PLANS PREPARED BY:
MOTT MACDONALD
PO Box 700
Fuquay-Varina, NC 27526
(919) 552-2253
www.mottmac.com
LICENSE NO. F-0669

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI

| | | | |
|---|---|---|---|
| DRAWN BY: | J. T. WILLIAMS | DATE: | 3-2020 |
| CHECKED BY: | J. E. MONDOLFI | DATE: | 4-2020 |
| DESIGN ENGINEER OF RECORD: | J. E. MONDOLFI | DATE: | 4-2020 |

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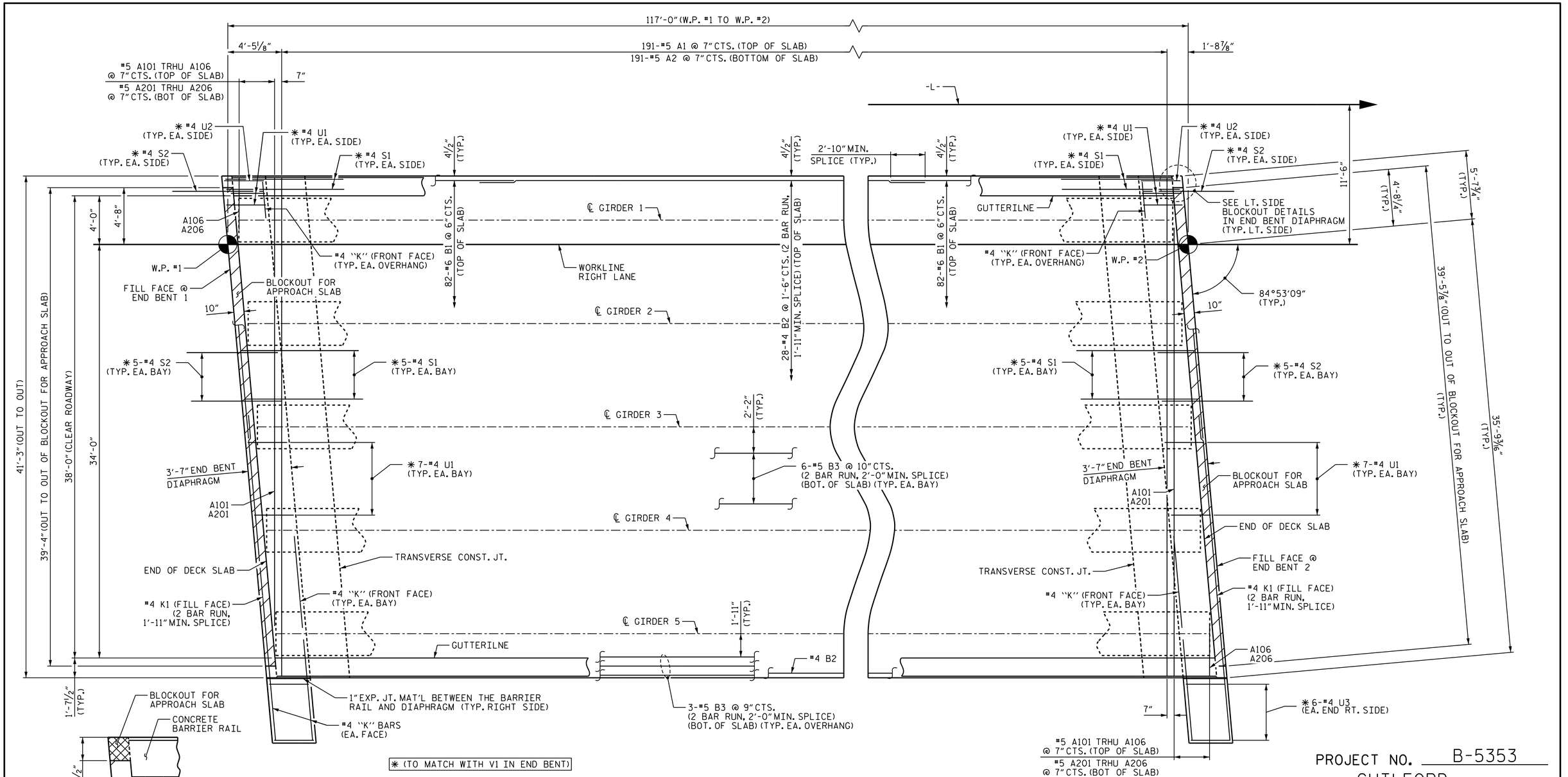


* (TO MATCH WITH V1 IN END BENT)

## LT. SIDE PLAN VIEW

FOR ELEVATION VIEW, SEE TYPICAL SECTION SHEET 2 OF 2

## PLAN OF SPAN A

## BLOCKOUT DETAILS IN END BENT DIAPHRAGM

CONCRETE SHALL BE POURED IN THE CROSS-HATCHED AREA TO MATCH THE TOP OF CURB. UNLESS OTHERWISE DIRECTED BY THE ENGINEER

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

| | | | |
|---|---|---|---|
| DRAWN BY: | J. T. WILLIAMS | DATE: | 4-2020 |
| CHECKED BY: | J. E. MONDOLFI | DATE: | 4-2020 |
| DESIGN ENGINEER OF RECORD: | J. E. MONDOLFI | DATE: | 4-2020 |

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20532 JAMES E. MONDOLFI

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN A

(RIGHT LANE)

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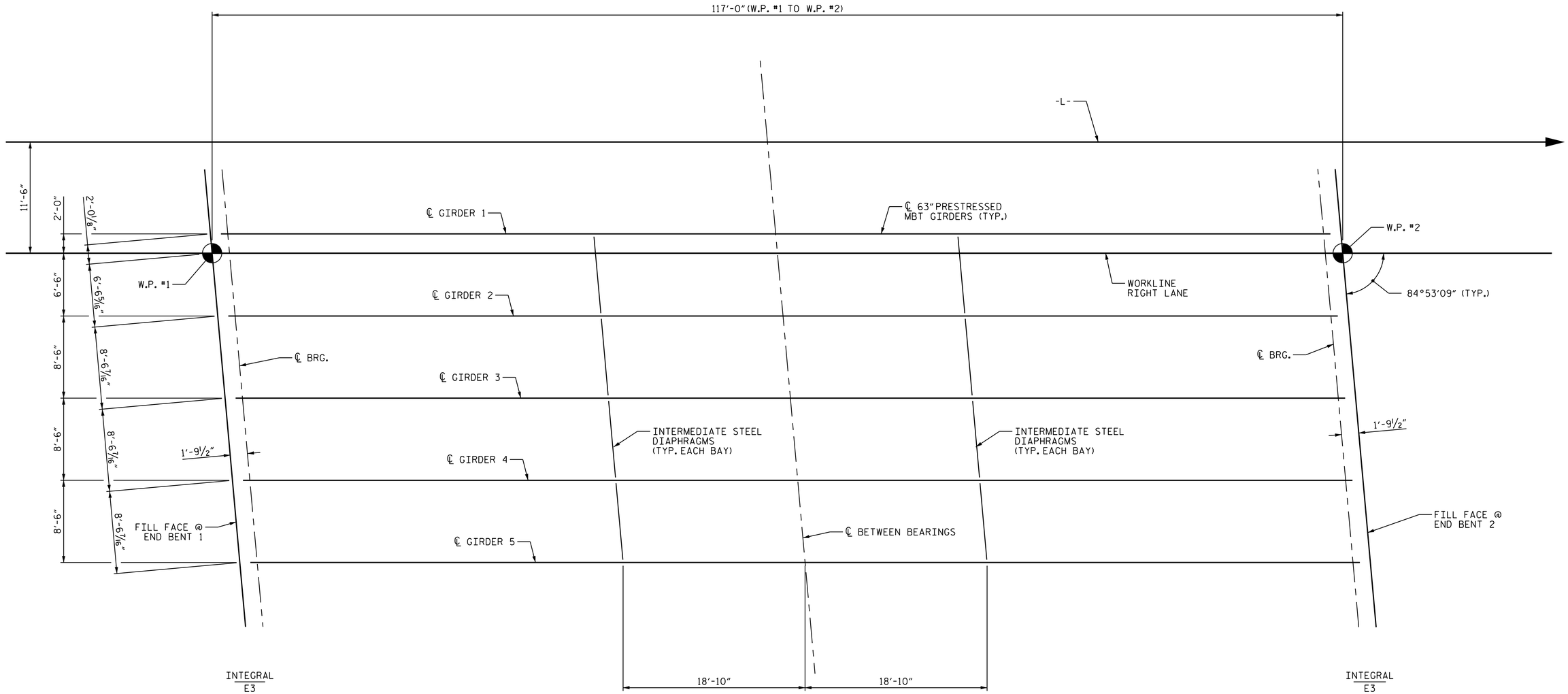


SPAN A

# FRAMING PLAN

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN

(RIGHT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
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DRAWN BY: J. T. WILLIAMS DATE: 4-2020
CHECKED BY: J. E. MONDOLFI DATE: 4-2020
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 4-2020

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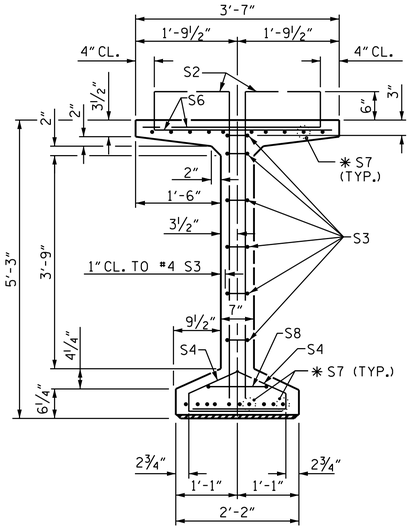
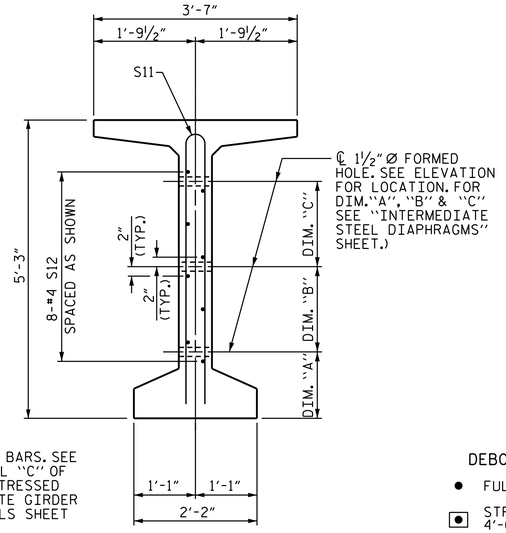



SECTION A-A



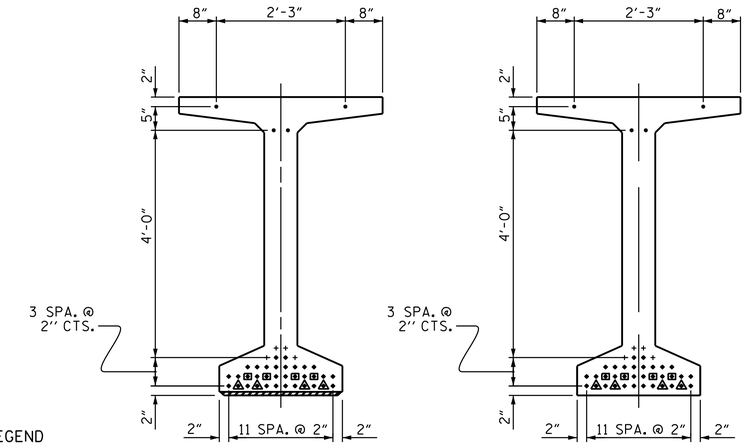

✱ FOR S7 BARS. SEE DETAIL "C" OF PRESTRESSED CONCRETE GIRDER DETAILS SHEET

SECTION C-C

(S1, S6 AND S9 BARS NOT SHOWN)

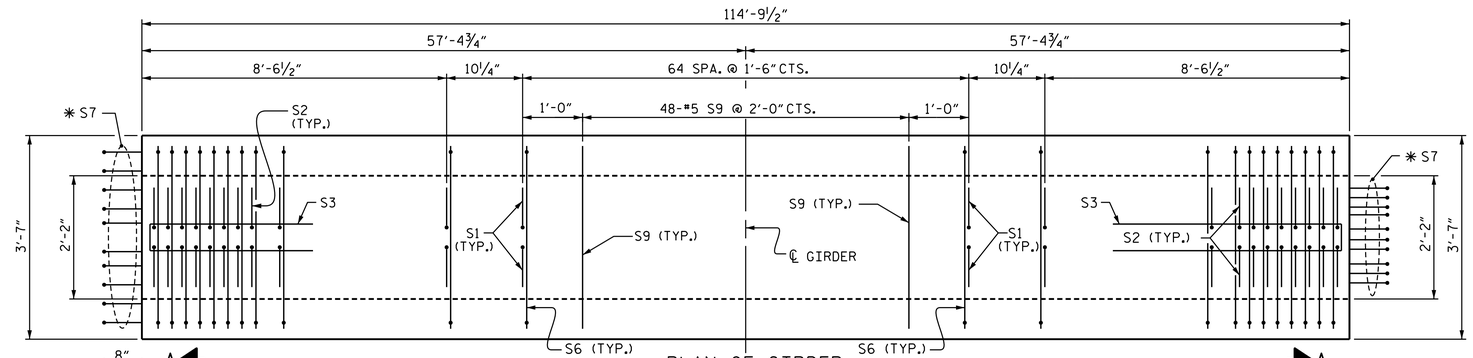
DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ⊡ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ⧋ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER

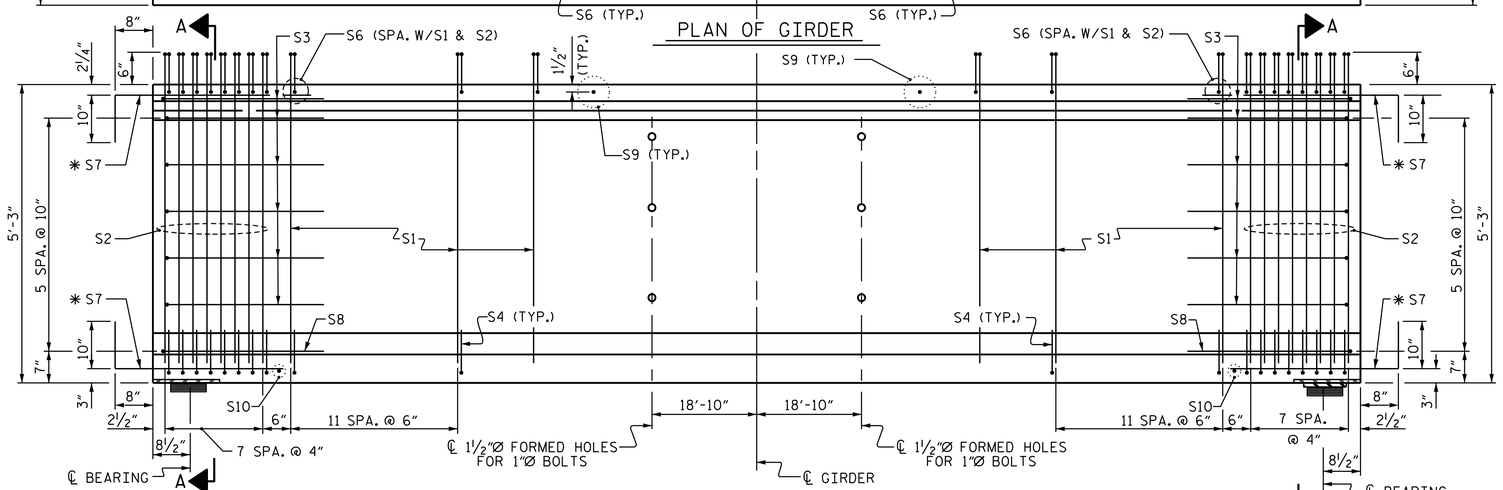



0.6" Ø LOW RELAXATION STRAND LAYOUT

(38 STRANDS, ALL STRAIGHT, 8 DEBONDED STRANDS)




PLAN OF GIRDER




INTEGRAL END BENT

ELEVATION OF GIRDER

INTEGRAL END BENT

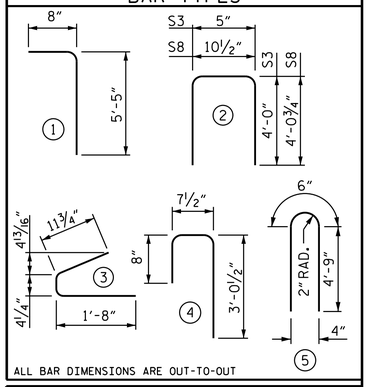
| 0.6" Ø L. R. GRADE 270 STRANDS | | |
|---|---|---|
| AREA (SQUARE INCHES) | ULTIMATE STRENGTH (LBS. PER STRAND) | APPLIED PRESTRESS (LBS. PER STRAND) |
| 0.217 | 58,600 | 43,950 |

REINFORCING STEEL FOR ONE GDR

| BAR | NUMBER | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| S1 | 178 | #4 | 1 | 6'-1" | 723 |
| S2 | 32 | #5 | 1 | 6'-1" | 203 |
| S3 | 12 | #4 | 2 | 8'-5" | 67 |
| S4 | 80 | #4 | 3 | 3'-0" | 160 |
| S6 | 210 | #5 | 4 | 4'-4" | 949 |
| ✱S7 | 40 | #5 | STR | 3'-8" | 153 |
| S8 | 2 | #5 | 2 | 9'-0" | 19 |
| S9 | 48 | #5 | STR | 3'-3" | 163 |
| S10 | 2 | #3 | STR | 1'-10" | 1 |
| S11 | 8 | #5 | 5 | 10'-0" | 83 |
| S12 | 16 | #4 | STR | 8'-0" | 86 |

✱ NOTE: S7 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 | 9000 PSI CONCRETE | 0.6" Ø L.R. STRANDS |
|---|---|---|---|
| | LB. | C.Y. | No. |
| GIRDER | 2607 | 22.8 | 38 |

GIRDERS REQUIRED

| NUMBER | LENGTH | TOTAL LENGTH |
|---|---|---|
| 5 | 114'-9½" | 573.96' |

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

63" PRESTRESSED CONCRETE MODIFIED BULB TEE SPAN A

(RIGHT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S2-9 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 24 |

DRAWN BY: M. L. MARLEY DATE: 1-2020
CHECKED BY: J. E. MONDOLFI DATE: 1-2020
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 1-2020

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PLANS PREPARED BY:
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NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI

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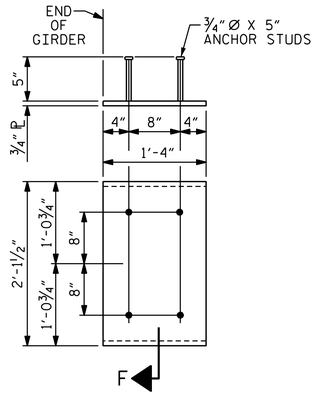
## DEAD LOAD DEFLECTION TABLE FOR GIRDERS

| | SPAN A | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | EXTERIOR GIRDER | | | | | | | | | | | | | | | | | | | | |
| FOURTIETH POINTS | 0 | .025 | .05 | .075 | .10 | .125 | .15 | .175 | .20 | .225 | .25 | .275 | .30 | .325 | .35 | .375 | .40 | .425 | .45 | .475 | .50 |
| CAMBER | 0.000 | 0.022 | 0.044 | 0.066 | 0.087 | 0.108 | 0.128 | 0.147 | 0.164 | 0.183 | 0.199 | 0.213 | 0.227 | 0.239 | 0.249 | 0.258 | 0.265 | 0.271 | 0.275 | 0.278 | 0.279 |
| ✳ DEFLECTION DUE D.L. | 0.000 | -0.013 | -0.026 | -0.039 | -0.049 | -0.064 | -0.076 | -0.087 | -0.096 | -0.108 | -0.118 | -0.126 | -0.133 | -0.141 | -0.148 | -0.153 | -0.157 | -0.161 | -0.163 | -0.165 | -0.165 |
| FINAL | 0 | 1/8" | 3/16" | 5/16" | 7/16" | 1/2" | 5/8" | 3/4" | 13/16" | 7/8" | 1" | 1 1/16" | 1 1/8" | 1 3/16" | 1 3/16" | 1 1/4" | 1 5/16" | 1 5/16" | 1 3/8" | 1 3/8" | 1 3/8" |
| | | | | | | | | | | | | | | | | | | | | | |
| FOURTIETH POINTS | .525 | .55 | .575 | .60 | .625 | .65 | .675 | .70 | .725 | .75 | .775 | .80 | .825 | .85 | .875 | .90 | .925 | .95 | .975 | 0 | |
| CAMBER | 0.278 | 0.275 | 0.271 | 0.265 | 0.258 | 0.249 | 0.239 | 0.227 | 0.213 | 0.199 | 0.183 | 0.164 | 0.147 | 0.128 | 0.108 | 0.087 | 0.066 | 0.044 | 0.022 | 0.000 | |
| ✳ DEFLECTION DUE D.L. | -0.165 | -0.163 | -0.161 | -0.157 | -0.153 | -0.148 | -0.141 | -0.133 | -0.126 | -0.118 | -0.108 | -0.096 | -0.087 | -0.076 | -0.064 | -0.049 | -0.039 | -0.026 | -0.013 | 0.000 | |
| FINAL | 1 3/8" | 1 3/8" | 1 5/16" | 1 5/16" | 1 1/4" | 1 3/16" | 1 3/16" | 1 1/8" | 1 1/16" | 1" | 7/8" | 13/16" | 3/4" | 5/8" | 1/2" | 7/16" | 5/16" | 3/16" | 1/8" | 0.000 | |
| | INTERIOR GIRDER | | | | | | | | | | | | | | | | | | | | |
| FOURTIETH POINTS | 0 | .025 | .05 | .075 | .10 | .125 | .15 | .175 | .20 | .225 | .25 | .275 | .30 | .325 | .35 | .375 | .40 | .425 | .45 | .475 | .50 |
| CAMBER | 0.000 | 0.022 | 0.044 | 0.066 | 0.087 | 0.108 | 0.128 | 0.147 | 0.164 | 0.183 | 0.199 | 0.213 | 0.227 | 0.239 | 0.249 | 0.258 | 0.265 | 0.271 | 0.275 | 0.278 | 0.279 |
| ✳ DEFLECTION DUE D.L. | 0.000 | -0.014 | -0.028 | -0.041 | -0.052 | -0.067 | -0.080 | -0.092 | -0.101 | -0.114 | -0.124 | -0.133 | -0.140 | -0.148 | -0.155 | -0.161 | -0.165 | -0.169 | -0.171 | -0.173 | -0.173 |
| FINAL | 0 | 1/8" | 3/16" | 5/16" | 7/16" | 1/2" | 9/16" | 11/16" | 3/4" | 13/16" | 7/8" | 15/16" | 1 1/16" | 1 1/16" | 1 1/8" | 1 3/16" | 1 3/16" | 1 1/4" | 1 1/4" | 1 1/4" | 1 1/4" |
| | | | | | | | | | | | | | | | | | | | | | |
| FOURTIETH POINTS | .525 | .55 | .575 | .60 | .625 | .65 | .675 | .70 | .725 | .75 | .775 | .80 | .825 | .85 | .875 | .90 | .925 | .95 | .975 | 0 | |
| CAMBER | 0.278 | 0.275 | 0.271 | 0.265 | 0.258 | 0.249 | 0.239 | 0.227 | 0.213 | 0.199 | 0.183 | 0.164 | 0.147 | 0.128 | 0.108 | 0.087 | 0.066 | 0.044 | 0.022 | 0.000 | |
| ✳ DEFLECTION DUE D.L. | -0.173 | -0.171 | -0.169 | -0.165 | -0.161 | -0.155 | -0.148 | -0.140 | -0.133 | -0.124 | -0.114 | -0.101 | -0.092 | -0.080 | -0.067 | -0.052 | -0.041 | -0.028 | -0.014 | 0.000 | |
| FINAL | 1 1/4" | 1 1/4" | 1 1/4" | 1 3/16" | 1 3/16" | 1 1/8" | 1 1/16" | 1 1/16" | 15/16" | 7/8" | 13/16" | 3/4" | 11/16" | 9/16" | 1/2" | 7/16" | 5/16" | 3/16" | 1/8" | 0 | |

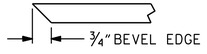
✳ INCLUDES FUTURE WEARING SURFACE

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).



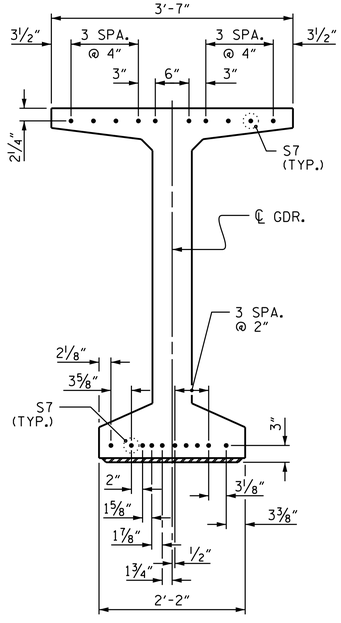

## EMBEDDED PLATE "B-1" DETAILS
## 63" MODIFIED BULB TEES

(2 REQ'D PER GIRDER)




## SECTION "F"

(SEE NOTES)




## DETAIL "C"

## 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.

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 DIAPHRAGMS 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.

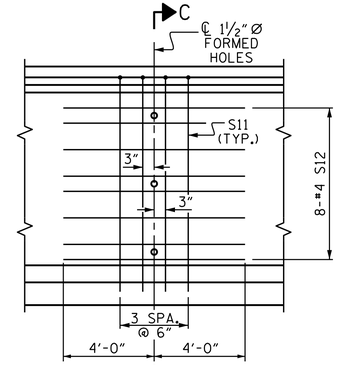
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 7000 PSI.

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", SHALL BE RAKED TO A DEPTH OF 1/4".

A 2" x 2" CHAMFER IS ALLOWED AT THE INTERSECTION OF THE WEB AND THE BOTTOM FLANGE OF THE 63" MODIFIED BULB TEES.

THE CONTRACTOR HAS THE OPTION TO PROVIDE, AT NO ADDITIONAL COST TO THE DEPARTMENT, 2 ADDITIONAL STRANDS AT THE TOP OF THE GIRDER TO FACILITATE TYING OF THE REINFORCING STEEL. THESE STRANDS SHALL BE PULLED TO A LOAD OF 4500 lbs.




## PARTIAL ELEVATION

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

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

# PRESTRESSED CONCRETE GIRDER DETAILS

(RIGHT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S2-10 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 24 |

DRAWN BY: M. L. MARLEY DATE: 1-2020
CHECKED BY: J. E. MONDOLFI DATE: 1-2020
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 1-2020

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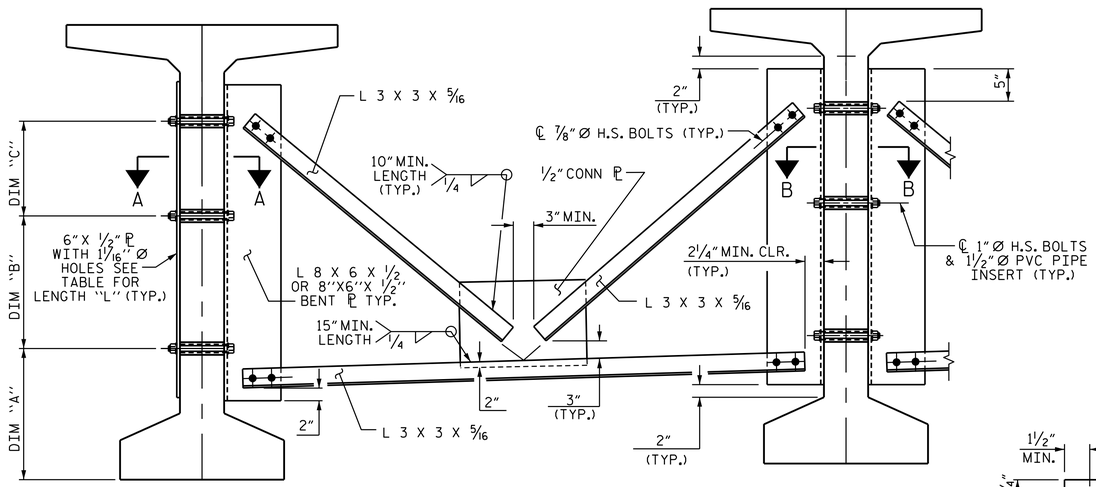
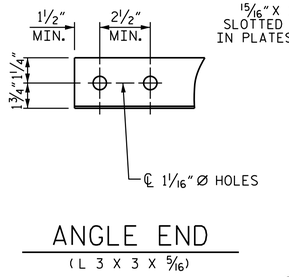
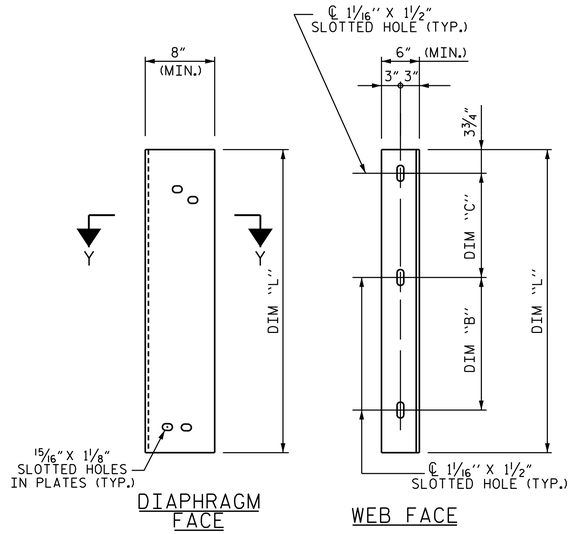
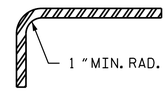



PART SECTION AT INTERMEDIATE DIAPHRAGM




ANGLE END
(L 3 X 3 X 5/16)




SECTION Y-Y

CONNECTOR PLATE 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 ANGLE 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 1/4 TURN.

THE PLATES, BENT PLATES, 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 1/4" PROJECTION BEYOND THE NUT.

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

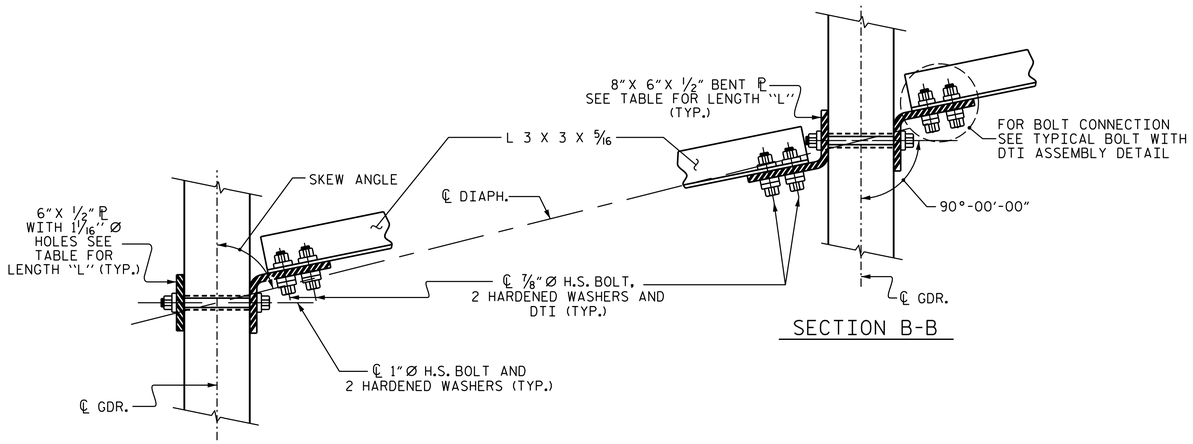
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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

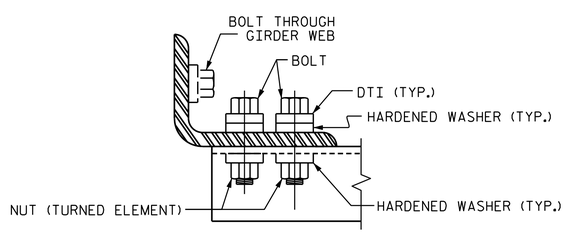
| GIRDER TYPE | DIM "A" | DIM "B" | DIM "C" | DIM "L" |
|---|---|---|---|---|
| 63" BULB TEE | 1'-6" | 1'-7" | 1'-3" | 3'-5" |




SECTION B-B

SECTION A-A

CONNECTION DETAILS




BOLT WITH DTI ASSEMBLY DETAIL

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

INTERMEDIATE STEEL DIAPHRAGMS FOR 63" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS (RIGHT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S2-11 |
| 1 | | | 3 | | | TOTAL SHEETS |
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PLANS PREPARED BY:
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Fuquay-Varina, NC 27526
(919) 552-2253
www.mottmac.com
LICENSE NO. F-0669

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI

DRAWN BY: M. L. MARLEY DATE: 12-2019
CHECKED BY: J. E. MONDOLFI DATE: 12-2019
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 12-2019

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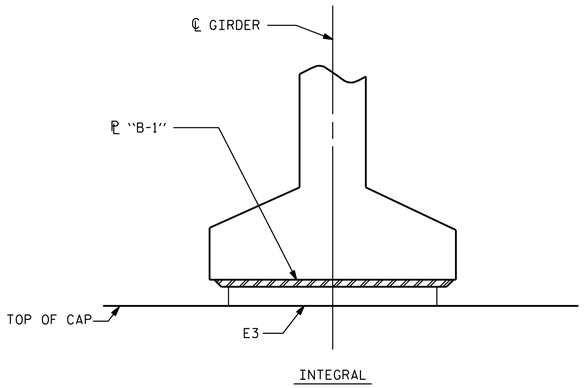
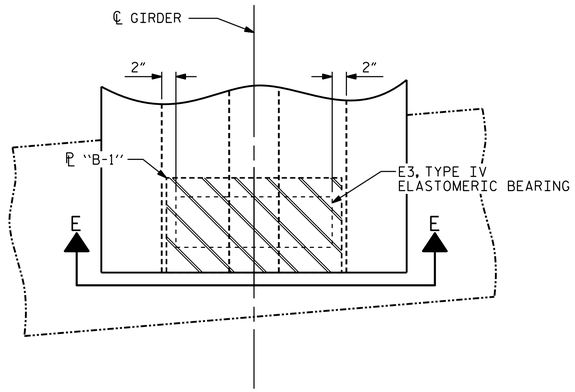
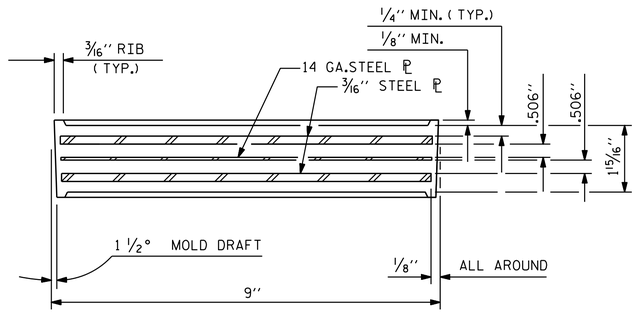



INTEGRAL

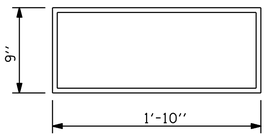
SECTION E-E




TYPICAL PLAN @ END BENT




TYPICAL SECTION OF ELASTOMERIC BEARINGS




E3 ( 10 REQ'D )

PLAN VIEW OF ELASTOMERIC BEARING

TYPE IV

## NOTES

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

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

| MAXIMUM ALLOWABLE SERVICE LOADS | |
|---|---|
| D.L.+L.L. (NO IMPACT) | |
| TYPE IV | 225 k |

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

# ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE (RIGHT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S2-12 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 24 |

DRAWN BY: M. L. MARLEY DATE: 1-2020
CHECKED BY: J. E. MONDOLFI DATE: 1-2020
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 1-2020

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NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI

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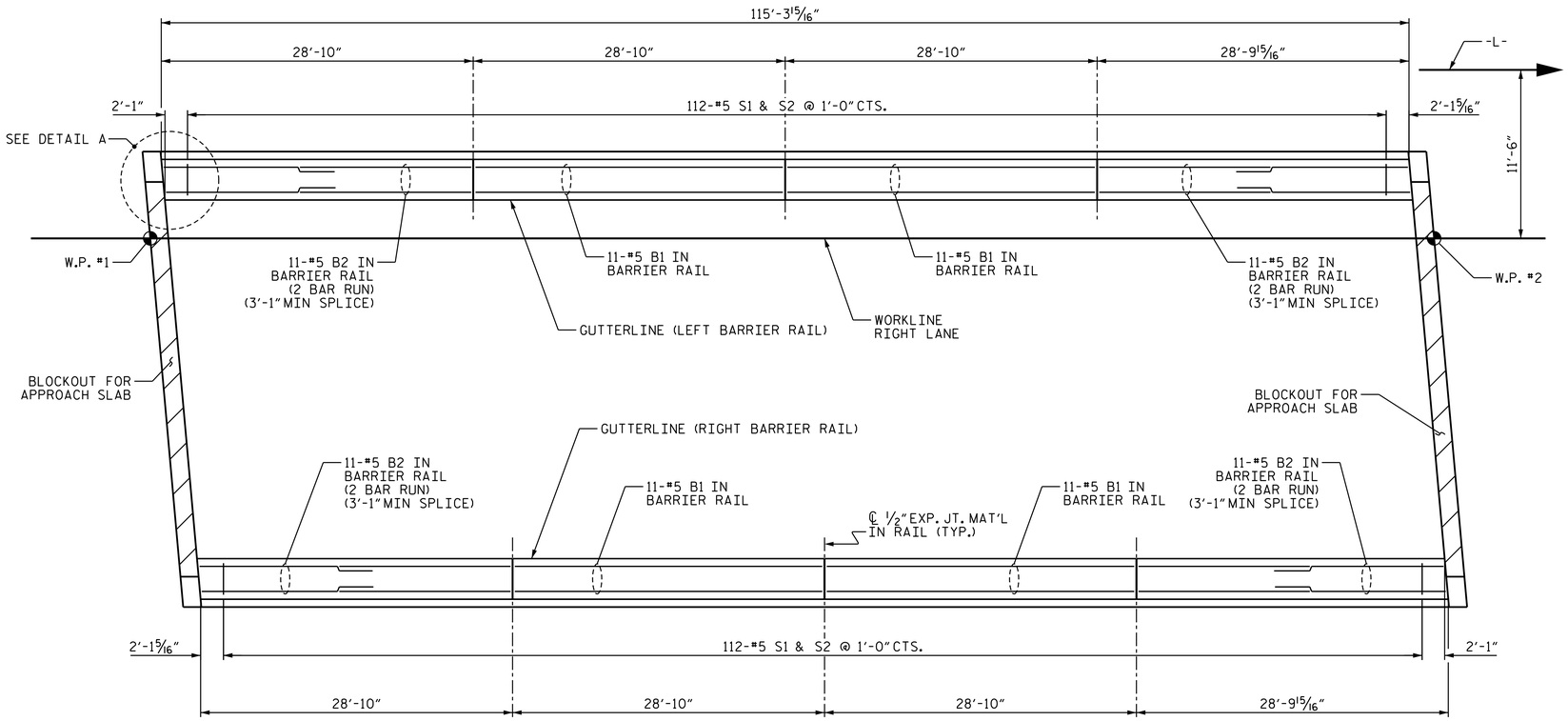



## PLAN OF BARRIER RAIL

## BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| ✳ B1 | 44 | #5 | STR | 28'-5" | 1304 |
| ✳ B2 | 88 | #5 | STR | 15'-10" | 1453 |
| | | | | | |
| ✳ S1 | 232 | #5 | 1 | 4'-6" | 1089 |
| ✳ S2 | 224 | #5 | 2 | 7'-0" | 1635 |
| ✳ S3 | 8 | #5 | 2 | 5'-6" | 46 |
| | | | | | |
| | | | | | |

✳ EPOXY COATED REINFORCING STEEL 5,527 LBS.

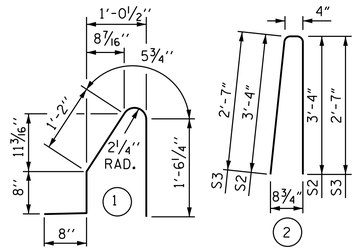
CLASS AA CONCRETE BREAKDOWN

LT. BARRIER 15.7 CU. YDS.
RT. BARRIER 16.3 CU YDS.

TOTAL CLASS AA CONCRETE 32.0 CU. YDS.

CONCRETE BARRIER RAIL 230.65 LIN. FT.

## BAR TYPES




ALL BAR DIMENSIONS ARE OUT TO OUT

## NOTES

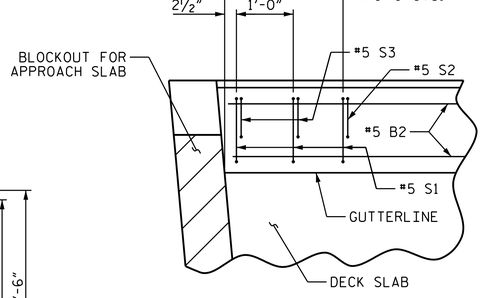
THE BARRIER RAIL SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

GROOVED CONTRACTION JOINTS, 1/2" 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.

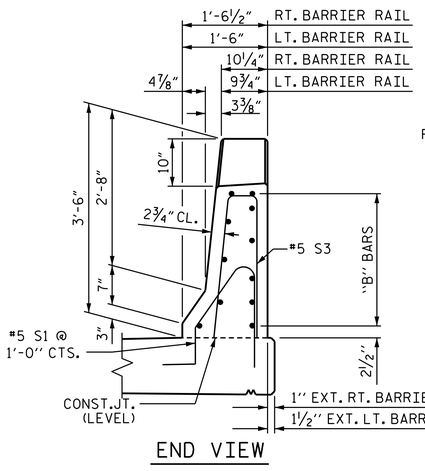
FOR ARCHITECTURAL CONCRETE SURFACE TREATMENT AND BRIDGE COATING, SEE "TYPICAL SECTION DETAILS" SHEET.

THE COST FOR FORM LINERS REQUIRED FOR SURFACE FINISH ARE INCLUDED IN THE S.F. COST FOR ARCH. CONC. SURFACE TREATMENT.

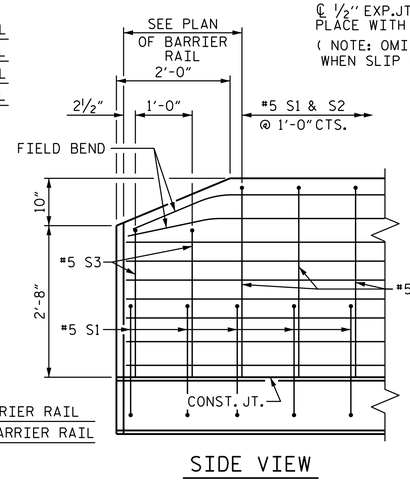



## DETAIL A

ALL CORNERS SIMILAR

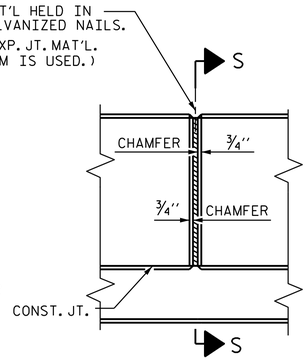



END VIEW

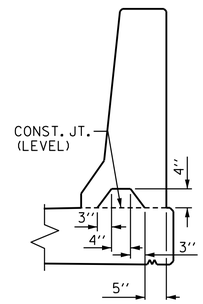



SIDE VIEW

## END OF RAIL DETAILS

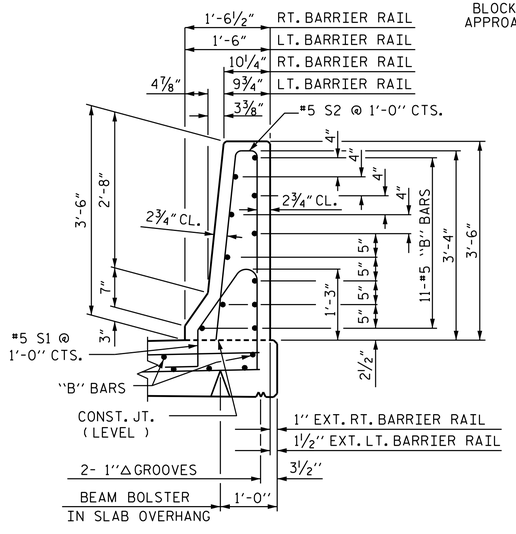



ELEVATION AT EXPANSION JOINTS




SECTION S-S

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




SECTION THRU RAIL

## BARRIER RAIL DETAILS

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

# CONCRETE BARRIER RAIL

(RIGHT LANE)

DRAWN BY: J. T. WILLIAMS DATE: 4-2020
CHECKED BY: J. E. MONDOLFI DATE: 4-2020
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 4-2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:
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(919) 552-2253
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NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI

| REVISIONS | | | | | | SHEET NO. |
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| 1 | | | 3 | | | TOTAL SHEETS |
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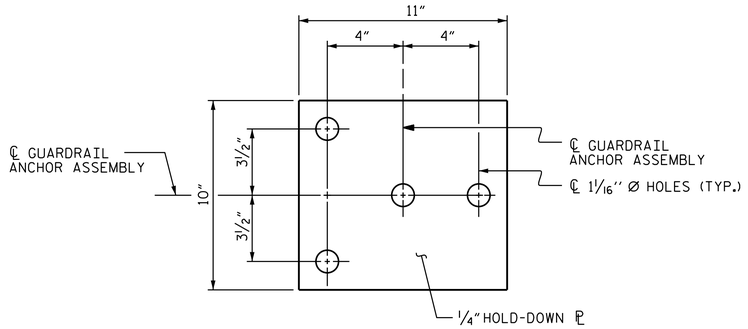
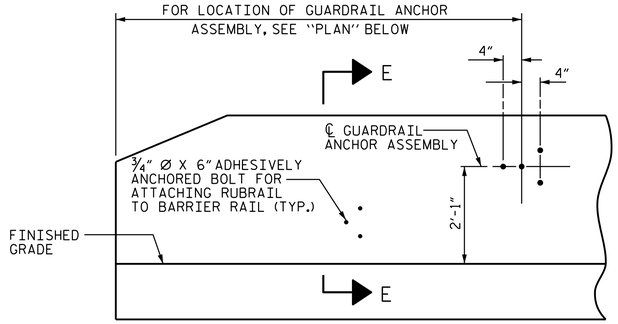
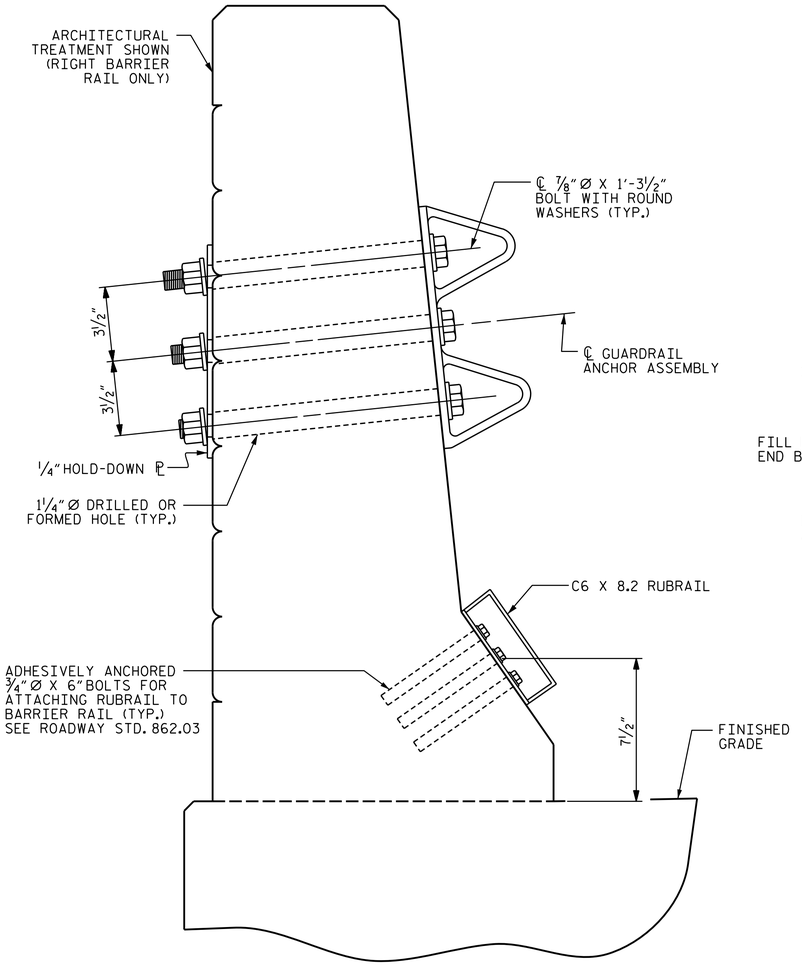



PLAN

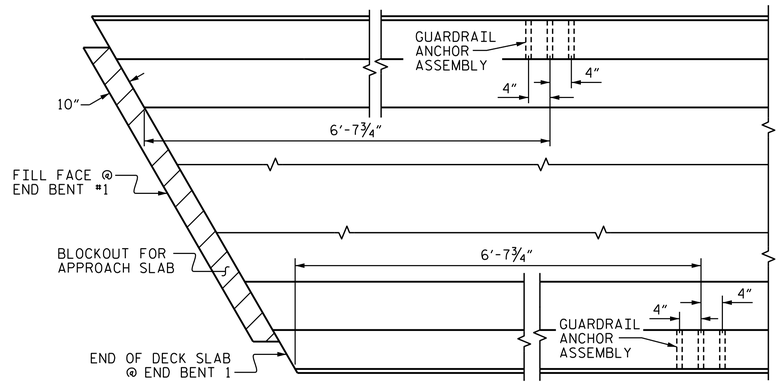



ELEVATION




SECTION E-E

## GUARDRAIL ANCHOR ASSEMBLY DETAILS




PLAN

## LOCATION OF ANCHORS FOR GUARDRAIL

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

## NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD-DOWN PLATE AND 4 - 7/8" Ø 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 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

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

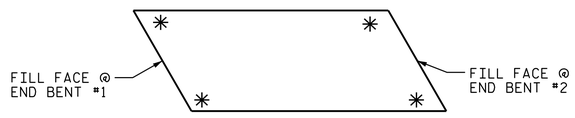
AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.

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

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

THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø 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.

PAINT HOLD-DOWN PLATE AND EXPOSED ENDS OF ANCHOR BOLTS, NUTS AND WASHERS TO MATCH COATING ON THE RIGHT BARRIER RAIL. SEE SPECIAL PROVISIONS.




## SKETCH SHOWING POINTS OF ATTACHMENTS

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

# GUARDRAIL ANCHORAGE FOR BARRIER RAIL

(RIGHT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S2-14 |
| 1 | | | 3 | | | TOTAL SHEETS |
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DRAWN BY: M. L. MARLEY DATE: 4-2020
CHECKED BY: J. E. MONDOLFI DATE: 4-2020
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 4-2020

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NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI

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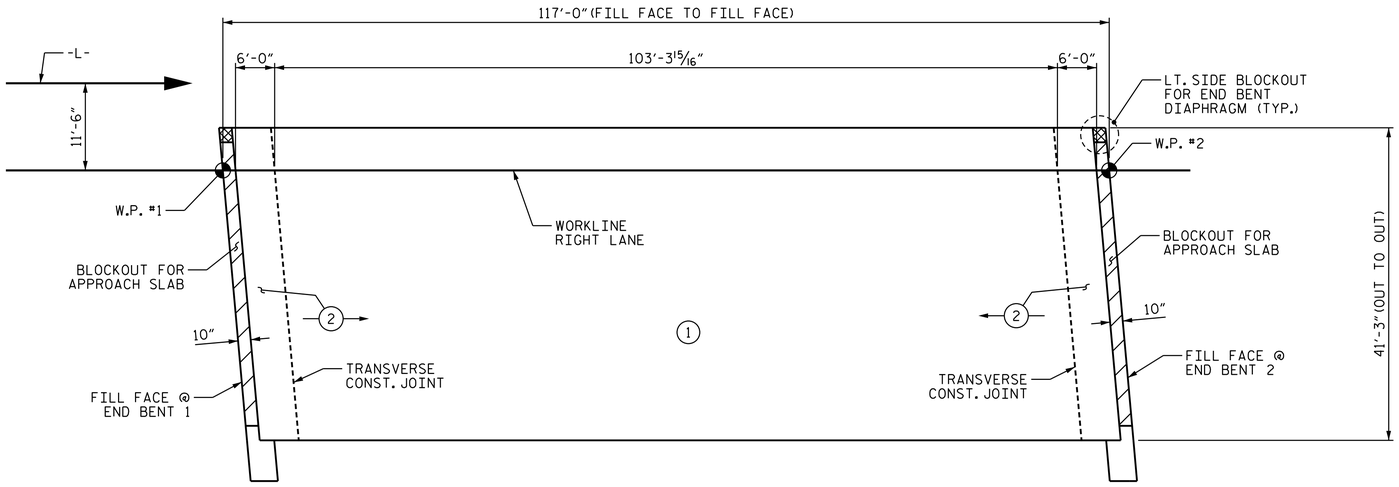
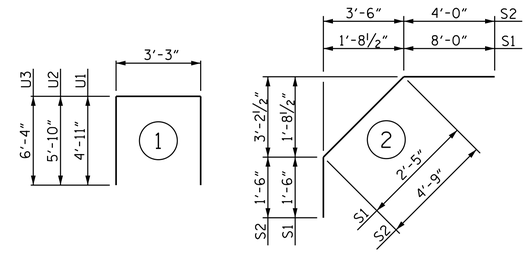



## POURING SEQUENCE AND LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB

( 4,757 SF )

←(#)— = INDICATES POUR NUMBER AND DIRECTION OF POUR

## BAR TYPES




ALL BAR DIMENSIONS ARE OUT TO OUT

## BILL OF MATERIAL

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| ✱A1 | 191 | #5 | STR | 40'-11" | 8151 |
| A2 | 191 | #5 | STR | 40'-11" | 8151 |
| ✱A101 | 2 | #5 | STR | 36'-10" | 77 |
| ✱A102 | 2 | #5 | STR | 30'-4" | 63 |
| ✱A103 | 2 | #5 | STR | 23'-9" | 50 |
| ✱A104 | 2 | #5 | STR | 17'-3" | 36 |
| ✱A105 | 2 | #5 | STR | 10'-9" | 22 |
| ✱A106 | 2 | #5 | STR | 4'-3" | 9 |
| A201 | 2 | #5 | STR | 36'-10" | 77 |
| A202 | 2 | #5 | STR | 30'-4" | 63 |
| A203 | 2 | #5 | STR | 23'-9" | 50 |
| A204 | 2 | #5 | STR | 17'-3" | 36 |
| A205 | 2 | #5 | STR | 10'-9" | 22 |
| A206 | 2 | #5 | STR | 4'-3" | 9 |
| | | | | | |
| ✱B1 | 164 | #6 | STR | 23'-0" | 5666 |
| ✱B2 | 56 | #4 | STR | 38'-4" | 1434 |
| B3 | 60 | #5 | STR | 58'-6" | 3661 |
| | | | | | |
| K1 | 24 | #4 | STR | 24'-3" | 389 |
| K2 | 8 | #4 | STR | 6'-0" | 32 |
| K3 | 32 | #4 | STR | 7'-7" | 162 |
| K4 | 8 | #4 | STR | 7'-3" | 39 |
| K5 | 2 | #4 | STR | 2'-2" | 3 |
| K6 | 8 | #4 | STR | 3'-0" | 16 |
| K7 | 2 | #4 | STR | 1'-6" | 2 |
| K8 | 2 | #4 | STR | 7'-6" | 10 |
| K9 | 10 | #4 | STR | 8'-4" | 56 |
| K10 | 8 | #4 | STR | 5'-0" | 27 |
| K11 | 4 | #4 | STR | 6'-7" | 18 |
| | | | | | |
| ✱S1 | 48 | #4 | 2 | 11'-11" | 382 |
| ✱S2 | 44 | #4 | 2 | 10'-3" | 301 |
| | | | | | |
| U1 | 64 | #4 | 1 | 13'-1" | 559 |
| U2 | 4 | #4 | 1 | 14'-11" | 40 |
| U3 | 12 | #4 | 1 | 15'-11" | 128 |
| | | | | | |
| REINFORCING STEEL | | | | LBS. | 13,550 |
| ✱EPOXY COATED REINFORCING STEEL | | | | LBS. | 16,191 |

## 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" | | | |

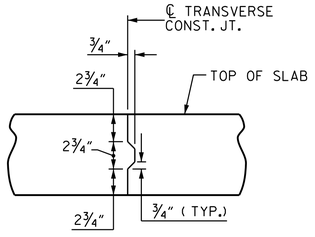
## SUPERSTRUCTURE BILL OF MATERIAL

| | CLASS AA CONCRETE | REINFORCING STEEL | EPOXY COATED REINFORCING STEEL |
|---|---|---|---|
| | ( CU. YDS. ) | ( LBS. ) | ( LBS. ) |
| SPAN | A | 13,550 | 16,191 |
| POUR 1 | 130.9 | | |
| POUR 2 | 78.7 | | |
| | | | |
| | | | |
| TOTALS✱✱ | 209.6 | 13,550 | 16,191 |

✱✱QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

## GROOVING BRIDGE FLOORS

| | | |
|---|---|---|
| APPROACH SLABS | 1,704 | SQ.FT. |
| BRIDGE DECK | 4,037 | SQ.FT. |
| TOTAL | 5,741 | SQ.FT. |




## TRANSVERSE CONSTRUCTION JOINT DETAIL

NOTE: REINFORCING STEEL IN SLAB NOT SHOWN. LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THRU JOINT

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

# SUPERSTRUCTURE BILL OF MATERIAL

(RIGHT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S2-15 |
| 1 | | | 3 | | | TOTAL SHEETS |
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DRAWN BY: J. T. WILLIAMS DATE: 4-2020
CHECKED BY: J. E. MONDOLFI DATE: 4-2020
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 4-2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:
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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20532 JAMES E. MONDOLFI

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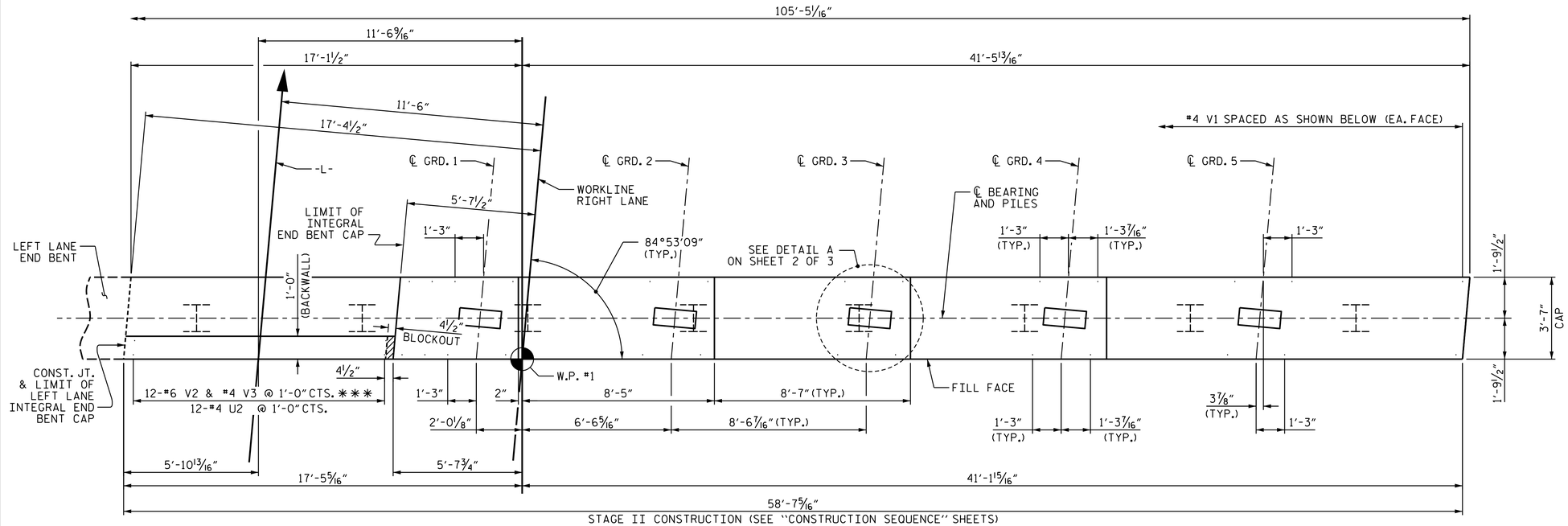


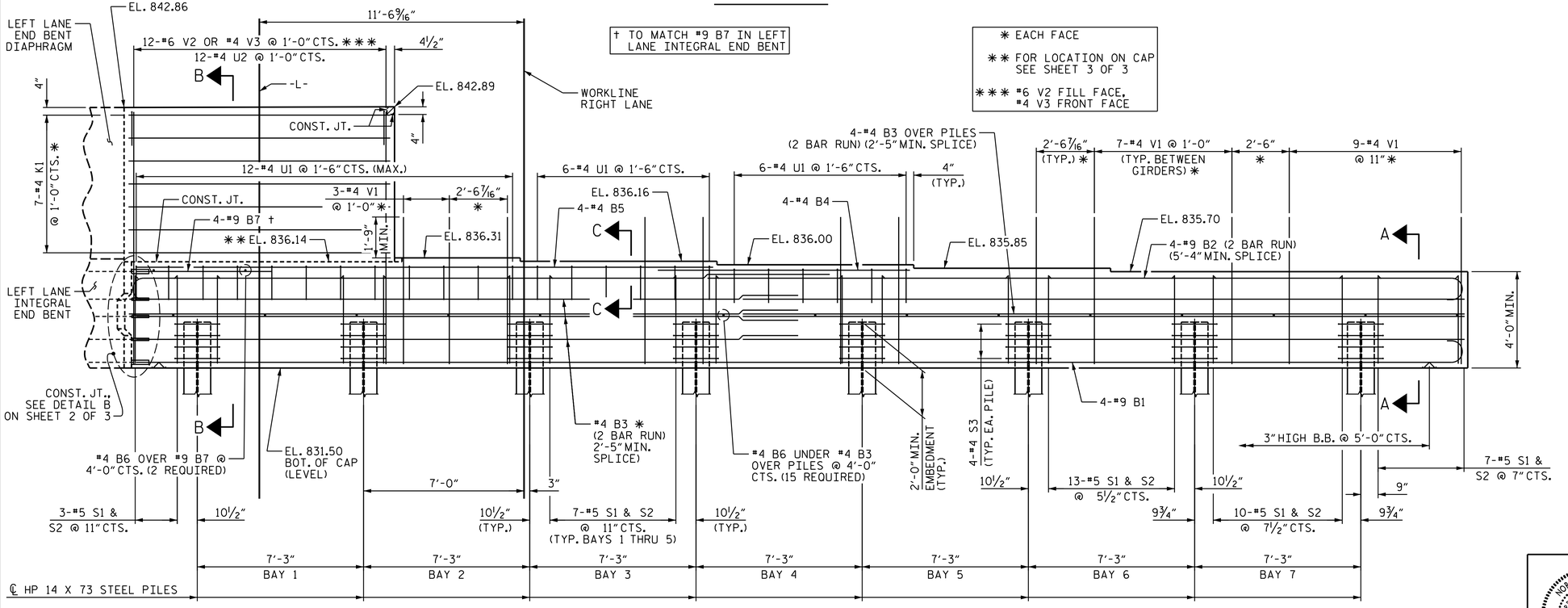

## PLAN

† TO MATCH #9 B7 IN LEFT LANE INTEGRAL END BENT

* EACH FACE

** FOR LOCATION ON CAP SEE SHEET 3 OF 3

*** #6 V2 FILL FACE, #4 V3 FRONT FACE




## ELEVATION

DRAWN BY: J. T. WILLIAMS DATE: 4-2020
CHECKED BY: J. E. MONDOLFI DATE: 5-2020
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 5-2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:
MOTT MACDONALD
PO Box 700
Fuquay-Varina, NC 27526
(919) 552-2253
www.mottmac.com
LICENSE NO. F-0669

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E MONDOLFI

PROJECT NO. B-5353
GUILFORD COUNTY
STATION: 23+62.87 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1
(INTEGRAL)

(RIGHT LANE)

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

SHEET NO. S2-16
TOTAL SHEETS 24

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## NOTES:

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

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

#5 S1, #5 S2, AND #4 U1 BARS MAY BE SHIFTED SLIGHTLY TO CLEAR #4 V1, #6 V2, AND #4 V3.

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

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

THE TOP SURFACE OF THE END BENT CAP, EXCLUDING THE BEARING AREAS, AND THE AREA BETWEEN THE LIMIT OF INTEGRAL END BENT CAP AND THE CONSTRUCTION JOINT SHALL BE RAKED TO A DEPTH OF 1/4".

THE TOP SURFACE AREA BETWEEN THE LIMIT OF INTEGRAL END BENT CAP AND THE CONSTRUCTION JOINT SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

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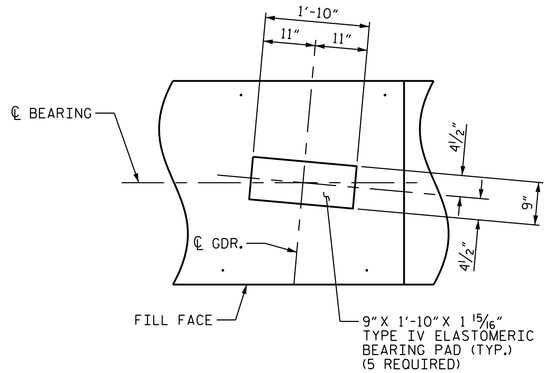
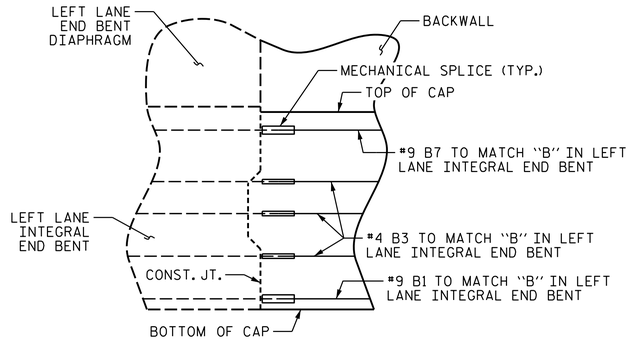
THE END BENT IS DETAILED TO FIT WITH MSE WALL COPING DETAIL A AS SHOWN ON THE SLOPE PROTECTION DETAIL SHEET. COORDINATE WITH THE MSE WALL FABRICATOR FOR COPING DETAIL TO BE USED. CONTRACTOR SHALL VERIFY REQUIRED LENGTH OF WING WALL BASED ON FINAL LOCATION OF MSE WALL. BAR LENGTHS AND BAR POSITIONS SHALL BE ADJUSTED TO FIT.




DETAIL A




DETAIL B

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1
(INTEGRAL)

(RIGHT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S2-17 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 24 |

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CHECKED BY: J. E. MONDOLFI DATE: 5-2020
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 5-2020

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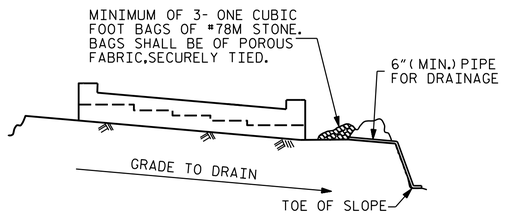


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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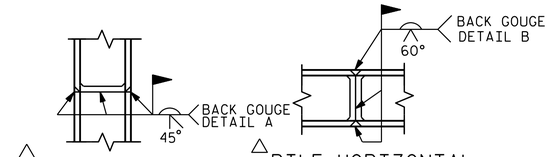
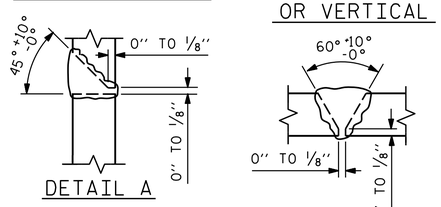
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

## TEMPORARY DRAINAGE AT END BENT



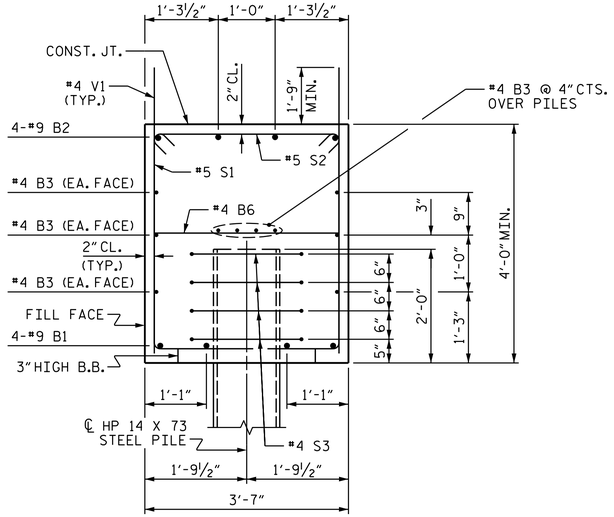

△ PILE VERTICAL

△ PILE HORIZONTAL OR VERTICAL

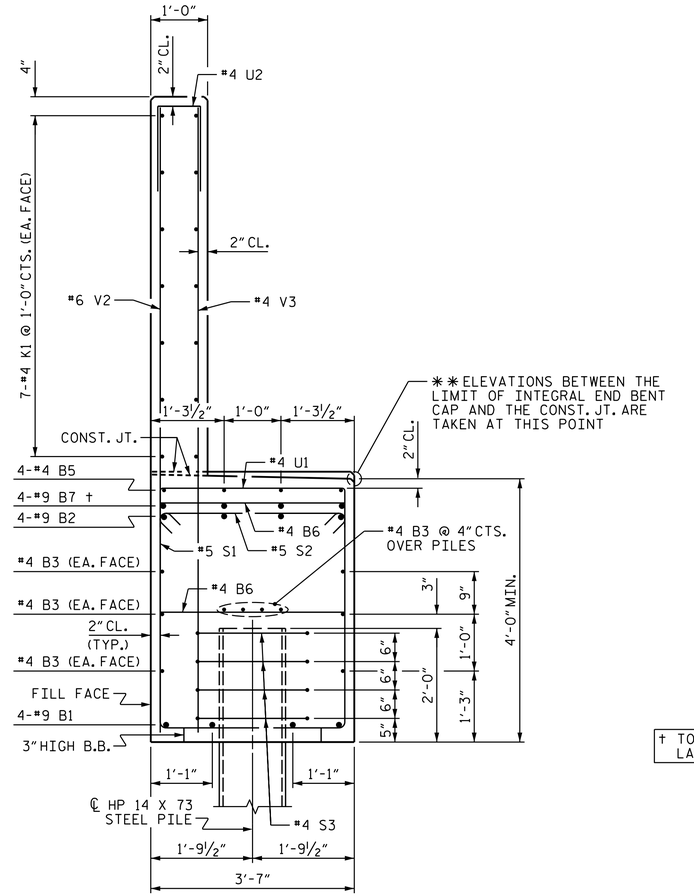



△ POSITION OF PILE DURING WELDING.

## PILE SPLICE DETAILS



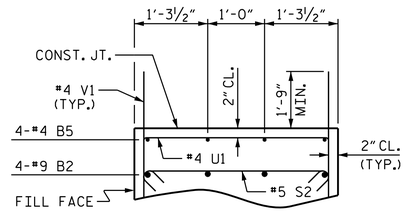

## SECTION A-A




** ELEVATIONS BETWEEN THE LIMIT OF INTEGRAL END BENT CAP AND THE CONST. JT. ARE TAKEN AT THIS POINT

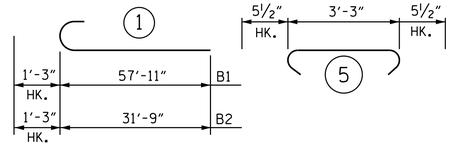
## SECTION B-B

† TO MATCH #9 B7 IN LEFT LANE INTEGRAL END BENT




## SECTION C-C

## BAR TYPES




ALL DIMENSIONS ARE OUT TO OUT

## BILL OF MATERIAL

END BENT 1

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| B1 | 4 | #9 | 1 | 59'-2" | 805 |
| B2 | 8 | #9 | 1 | 33'-0" | 898 |
| B3 | 20 | #4 | STR | 30'-3" | 404 |
| B4 | 4 | #4 | STR | 11'-0" | 29 |
| B5 | 4 | #4 | STR | 25'-2" | 67 |
| B6 | 17 | #4 | STR | 3'-3" | 37 |
| B7 | 4 | #9 | STR | 5'-11" | 80 |
| | | | | | |
| K1 | 14 | #4 | STR | 11'-5" | 107 |
| | | | | | |
| S1 | 68 | #5 | 4 | 11'-10" | 839 |
| S2 | 68 | #5 | 5 | 4'-2" | 296 |
| S3 | 32 | #4 | 7 | 7'-7" | 162 |
| | | | | | |
| U1 | 24 | #4 | 6 | 6'-3" | 100 |
| U2 | 12 | #4 | 6 | 3'-8" | 29 |
| | | | | | |
| V1 | 80 | #4 | STR | 6'-5" | 343 |
| V2 | 12 | #6 | STR | 11'-0" | 198 |
| V3 | 12 | #4 | STR | 11'-0" | 88 |

REINFORCING STEEL = 4,482 LBS.

CLASS A CONCRETE BREAKDOWN

| | |
|---|---|
| POUR #1 CAP | 34.9 C.Y. |
| POUR #2 BACKWALL | 2.9 C.Y. |
| TOTAL CLASS A CONCRETE | 37.8 C.Y. |

| | |
|---|---|
| HP 14 X 73 STEEL PILES: | |
| NO. 8 | 240 LIN. FT. |
| STEEL PILE POINTS | 8 EA. |

PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 STEEL PILES NO. 8

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1
(INTEGRAL)

(RIGHT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S2-18 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 24 |

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CHECKED BY: J. E. MONDOLFI DATE: 5-2020
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 5-2020

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58'-7 5/16"
STAGE II CONSTRUCTION (SEE "CONSTRUCTION SEQUENCE" SHEETS)
17'-5 5/16"
41'-1 5/16"
WORKLINE RIGHT LANE
84°53'09" (TYP.)
-L-
5'-10 13/16"
5'-7 3/4"
12-#6 V2 & #4 V3 @ 1'-0" CTS. ***
12-#4 U2 @ 1'-0" CTS.
2'-0 1/8"
6'-6 5/16"
8'-6 7/16" (TYP.)
4 1/2"
1'-3"
6"
8'-1"
8'-7" (TYP.)
W.P. #2
FILL FACE
1'-3" (TYP.)
1'-3 3/16" (TYP.)
3/8" (TYP.)
1'-3"
LEFT LANE END BENT
1'-0" BACKWALL
4 1/2" BLOCKOUT
1'-9 1/2"
3'-7" CAP
1'-9 1/2"
CONST. JT. & LIMIT OF LEFT LANE INTEGRAL END BENT CAP
LIMIT OF INTEGRAL END BENT CAP
1'-3"
5'-7 1/2"
SEE DETAIL A (ON SHEET 2 OF 3)
℄ BEARING AND PILES
1'-3" (TYP.)
1'-3 3/16" (TYP.)
1'-3"
℄ GRD. 1
℄ GRD. 2
℄ GRD. 3
℄ GRD. 4
℄ GRD. 5
11'-6 9/16"
11'-6"
17'-4 1/2"
#4 V1 SPACED AS SHOWN BELOW (EA. FACE)
17'-9 3/16"
40'-10 1/8"
105'-5 1/16"

# PLAN

| |
|---|
| * EACH FACE |
| ** FOR LOCATION ON CAP SEE SHEET 3 OF 3 |
| *** #6 V2 FILL FACE, #4 V3 FRONT FACE |

† TO MATCH #9 B7 IN LEFT LANE INTEGRAL END BENT

LEFT LANE END BENT DIAPHRAGM
EL. 845.43
11'-6 9/16"
12-#6 V2 OR #4 V3 @ 1'-0" CTS. ***
12-#4 U2 @ 1'-0" CTS.
4 1/2"
WORKLINE RIGHT LANE
B
-L-
EL. 845.45
4"
#4 B6 OVER #9 B7 @ 4'-0" CTS. (2 REQUIRED)
CONST. JT.
4"
7-#4 K1 @ 1'-0" CTS. *
12-#4 U1 @ 1'-6" CTS. (MAX.)
6-#4 U1 @ 1'-6" CTS.
6-#4 U1 @ 1'-6" CTS.
4" (TYP.)
4-#4 B3 OVER PILES (2 BAR RUN) (2'-5" MIN. SPLICE)
2'-6 7/16" (TYP.) *
7-#4 V1 @ 1'-0" (TYP. BETWEEN GIRDERS) *
2'-6" *
9-#4 V1 @ 11" *
CONST. JT.
3-#4 V1 @ 1'-0" *
2'-6 7/16" *
4-#9 B7 †
** EL. 838.63
1'-9" MIN.
EL. 838.79
EL. 838.63
4-#4 B5
EL. 838.47
4-#4 B4
EL. 838.32
EL. 838.16
4-#9 B2 (2 BAR RUN) (5'-4' MIN. SPLICE)
A
LEFT LANE INTEGRAL END BENT
C
4'-0" MIN.
CONST. JT., SEE DETAIL B ON SHEET 2 OF 3
4-#9 B1
A
B
#4 B3 * (2 BAR RUN) 2'-5" MIN. SPLICE)
EL. 834.02 BOT. OF CAP (LEVEL)
#4 B6 UNDER #4 B3 OVER PILES @ 4'-0" CTS. (15 REQUIRED)
2'-0" MIN. EMBEDMENT (TYP.)
4-#4 S3 (TYP. EA. PILE)
3" HIGH B.B. @ 5'-0" CTS.
7-#5 S1 & S2 @ 7 1/2" CTS.
10 1/2"
13-#5 S1 & S2 @ 5 1/2" CTS.
10 1/2"
9"
9 3/4"
10-#5 S1 & S2 @ 7 1/2" CTS.
9 3/4"
3-#5 S1 & S2 @ 11" CTS.
10 1/2"
10 1/2" (TYP.)
7-#5 S1 & S2 @ 11" CTS. (TYP. BAYS 1 THRU 5)
1"
7'-2"
10 1/2" (TYP.)
7'-3" BAY 1
7'-3" BAY 2
7'-3" BAY 3
7'-3" BAY 4
7'-3" BAY 5
7'-3" BAY 6
7'-3" BAY 7
℄ HP 14 X 73 STEEL PILES

# ELEVATION

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PROJECT NO. B-5353
GUILFORD COUNTY
STATION: 23+62.87 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2
(INTEGRAL)

(RIGHT LANE)

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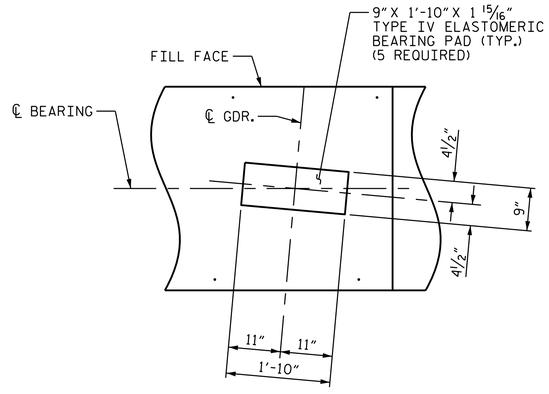
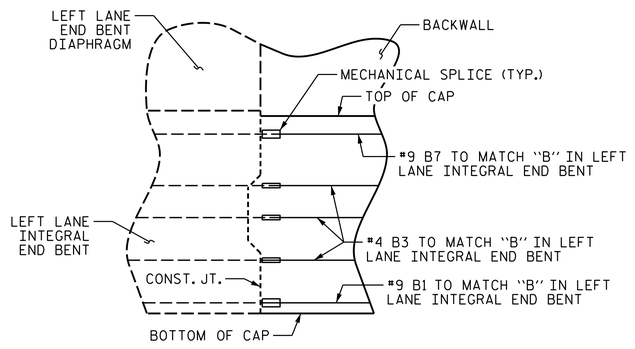



DETAIL A




DETAIL B

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2
(INTEGRAL)

(RIGHT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S2-20 |
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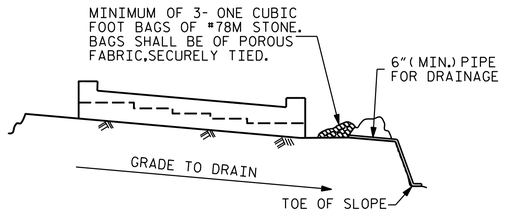


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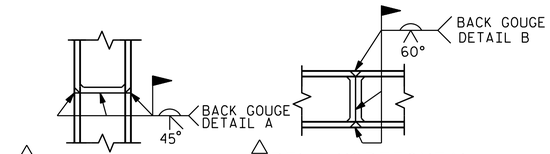
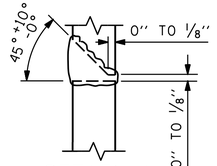
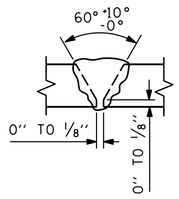



△ PILE VERTICAL

△ PILE HORIZONTAL OR VERTICAL



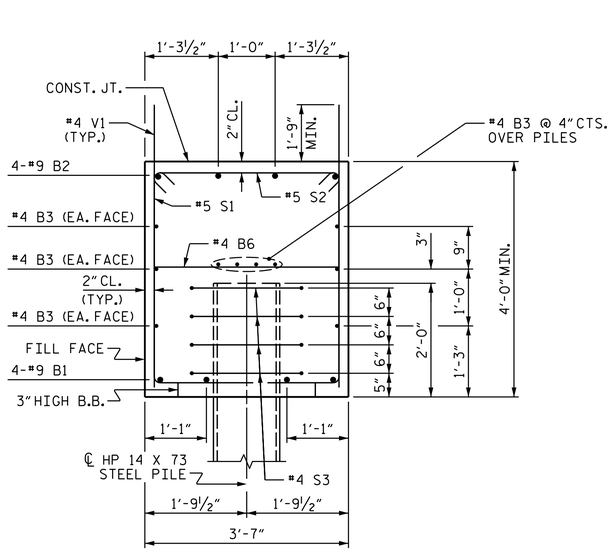

DETAIL A



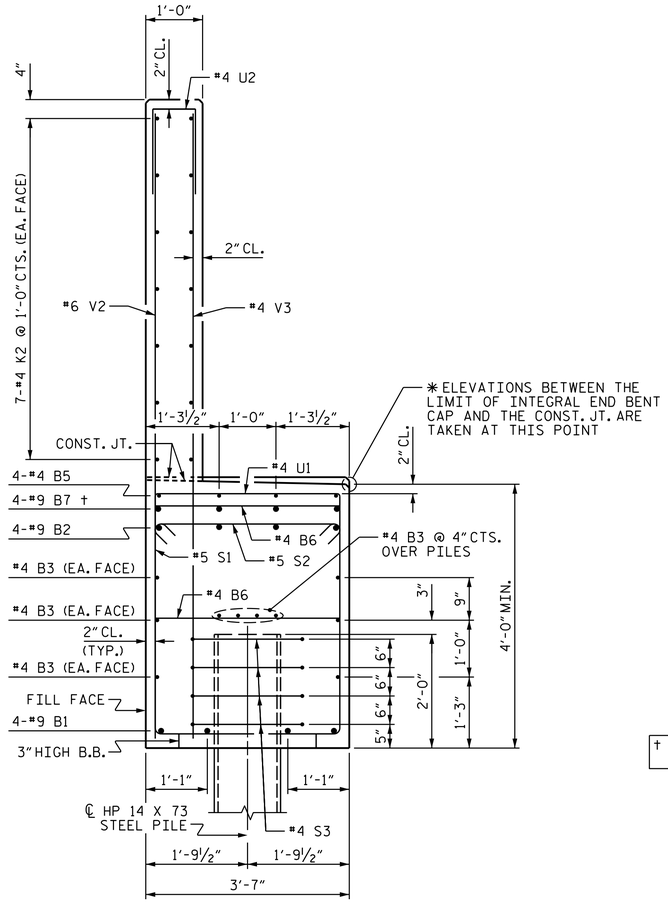

DETAIL B

△ POSITION OF PILE DURING WELDING.

## PILE SPLICE DETAILS

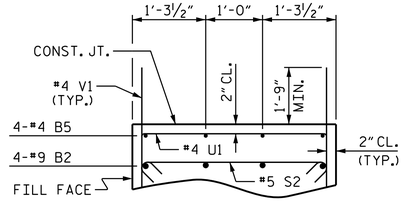



## SECTION A-A



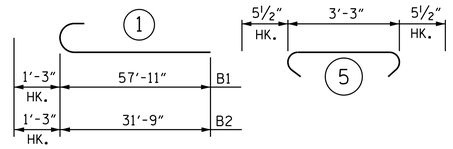

## SECTION B-B

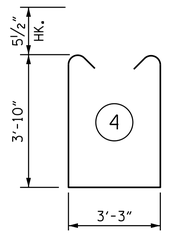
† TO MATCH #9 B7 IN LEFT LANE INTEGRAL END BENT

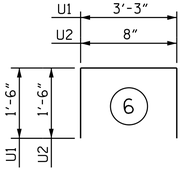


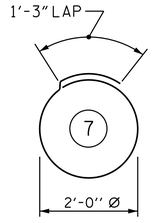

## SECTION C-C

## BAR TYPES




ALL DIMENSIONS ARE OUT TO OUT

## BILL OF MATERIAL

END BENT 2

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| B1 | 4 | #9 | 1 | 59'-2" | 805 |
| B2 | 8 | #9 | 1 | 33'-0" | 898 |
| B3 | 20 | #4 | STR | 30'-3" | 404 |
| B4 | 4 | #4 | STR | 11'-0" | 29 |
| B5 | 4 | #4 | STR | 25'-2" | 67 |
| B6 | 17 | #4 | STR | 3'-3" | 37 |
| B7 | 4 | #9 | STR | 5'-11" | 80 |
| | | | | | |
| K1 | 14 | #4 | STR | 11'-5" | 107 |
| | | | | | |
| S1 | 68 | #5 | 4 | 11'-10" | 839 |
| S2 | 68 | #5 | 5 | 4'-2" | 296 |
| S3 | 32 | #4 | 7 | 7'-7" | 162 |
| | | | | | |
| U1 | 24 | #4 | 6 | 6'-3" | 100 |
| U2 | 12 | #4 | 6 | 3'-8" | 29 |
| | | | | | |
| V1 | 80 | #4 | STR | 6'-5" | 343 |
| V2 | 12 | #6 | STR | 11'-0" | 198 |
| V3 | 12 | #4 | STR | 11'-0" | 88 |

REINFORCING STEEL = 4,482 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1 CAP 34.5 C.Y.

POUR #2 BACKWALL 3.0 C.Y.

TOTAL CLASS A CONCRETE 37.5 C.Y.

HP 14 X 73 STEEL PILES:

NO. 8 200 LIN. FT.

STEEL PILE POINTS 8 EA.

PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 STEEL PILES NO. 8

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2
(INTEGRAL)

(RIGHT LANE)

REVISIONS

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

SHEET NO. S2-21

TOTAL SHEETS 24

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PLANS PREPARED BY:
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LICENSE NO. F-0669

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20532 JAMES E. MONDOLFI

DRAWN BY: J. T. WILLIAMS DATE: 4-2020
CHECKED BY: J. E. MONDOLFI DATE: 5-2020
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 5-2020

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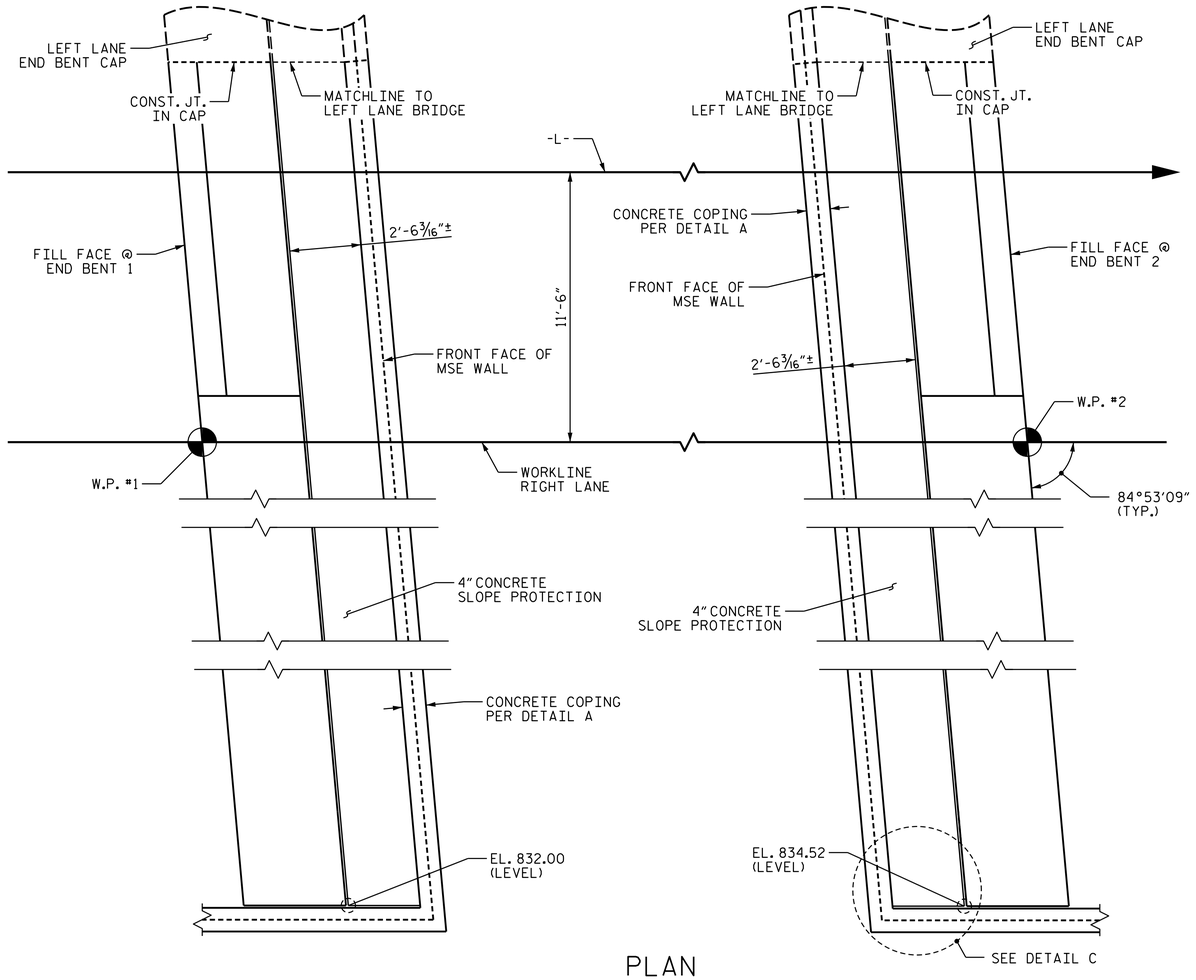



## PLAN

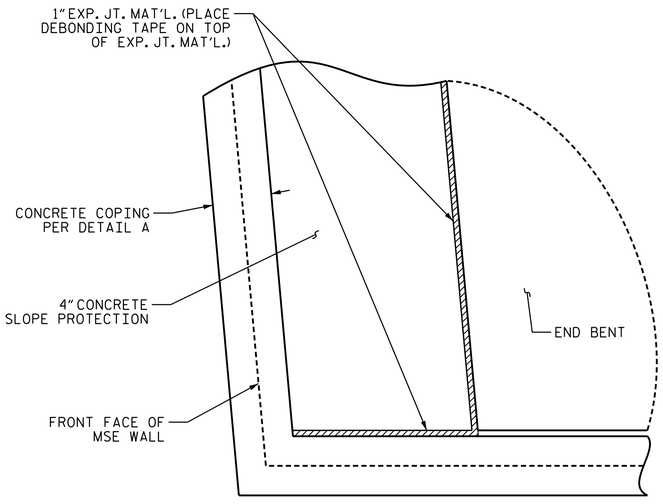
ELEVATIONS SHOWN ARE AT TOP OF
SLOPE PROTECTION AT FACE OF END BENT

## NOTES:

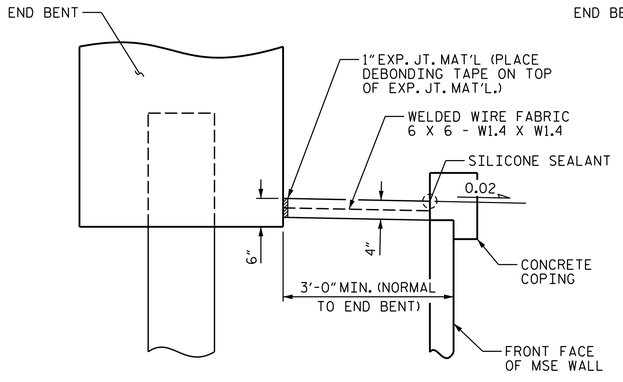
SLOPE PROTECTION SHALL CONSIST OF 4'' POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS ''B''. THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4. THE COST OF THE WELDED WIRE FABRIC SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

THE SLOPE PROTECTION IS DETAILED TO FIT WITH THE MSE WALL COPING DETAIL A. IF MSE WALL COPING DETAIL B IS USED, SLOPE PROTECTION SHALL BE ADJUSTED TO FIT. COORDINATE WITH THE MSE WALL FABRICATOR FOR ACTUAL WALL THICKNESS AND COPING TO BE USED. ADJUST SLOPE PROTECTION QUANTITIES AS NECESSARY TO FIT COPING USED.

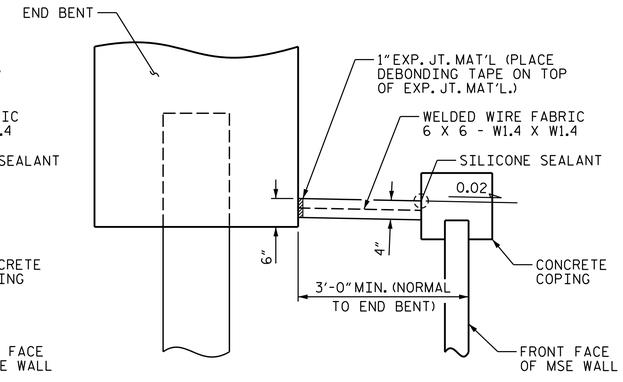
| BRIDGE @ 23+62.87 -L- | 4 INCH SLOPE PROTECTION | WELDED WIRE FABRIC |
|---|---|---|
| | SQUARE YARDS | APPROX. L.F. |
| END BENT 1 | 17 | 59 |
| END BENT 2 | 17 | 59 |




DETAIL C




DETAIL A




DETAIL B

## COPING DETAILS

THE CONTRACTOR HAS THE OPTION OF USING COPING IN DETAILS A OR B, SEE MSE END BENT WALLS TYPICAL SECTION

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

# CONCRETE SLOPE PROTECTION
(RIGHT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S2-22 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 24 |

DRAWN BY: J. T. WILLIAMS DATE: 4-2020
CHECKED BY: J. E. MONDOLFI DATE: 5-2020
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 5-2020

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PLANS PREPARED BY:
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LICENSE NO. F-0669

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20532 JAMES E. MONDOLFI

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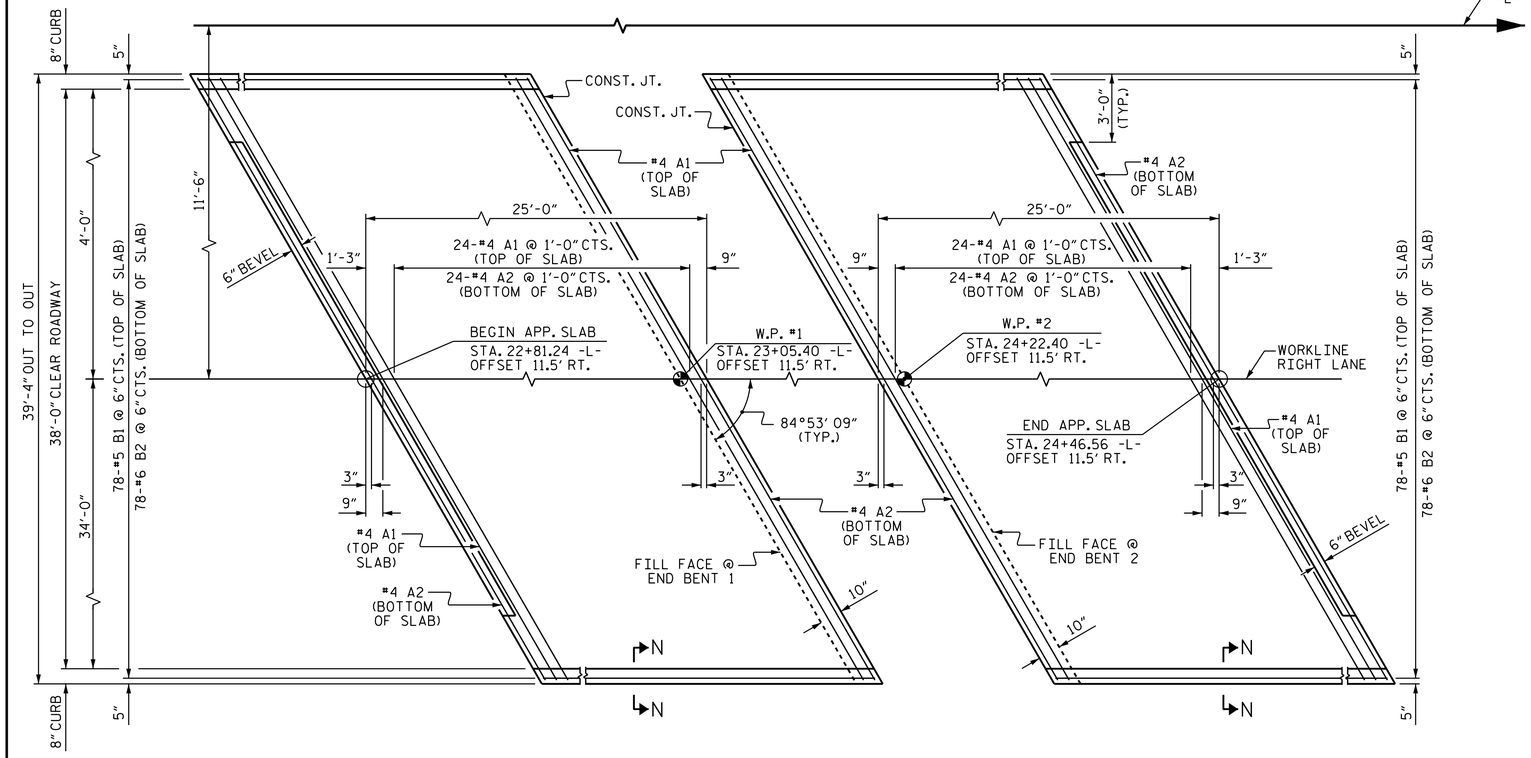
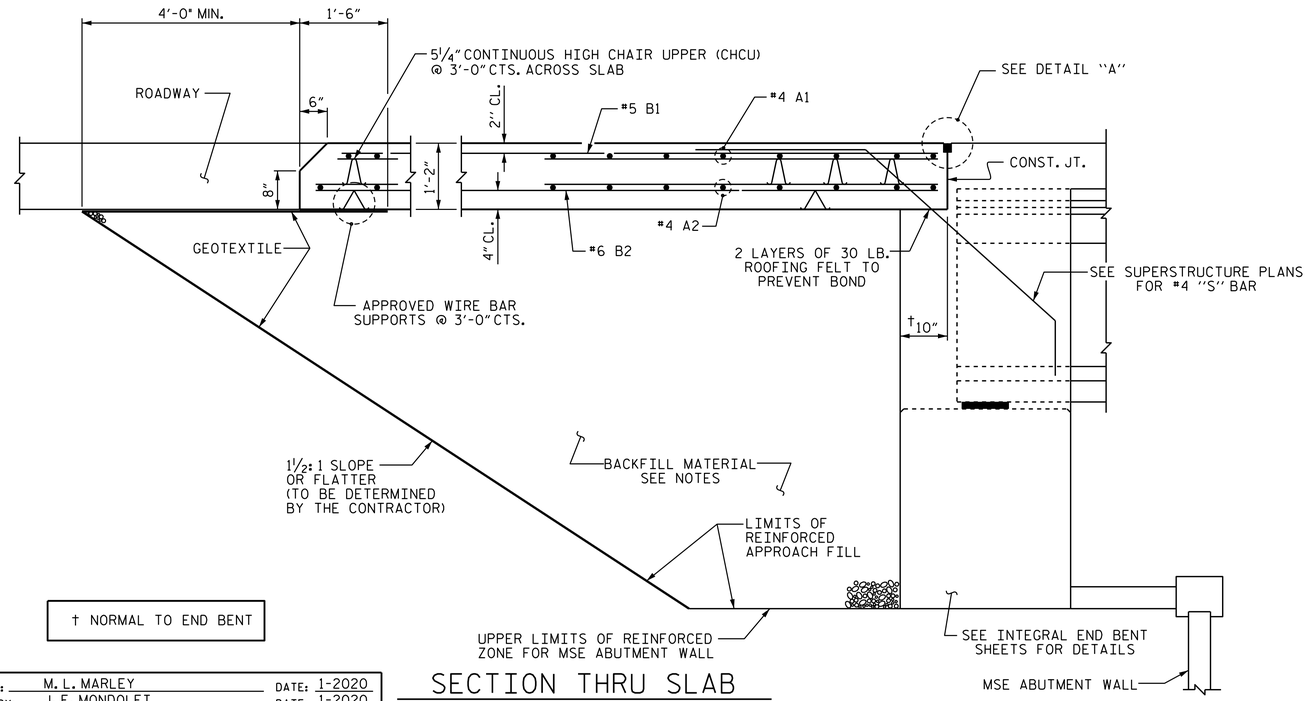



PLAN @ END BENT 1

PLAN @ END BENT 2

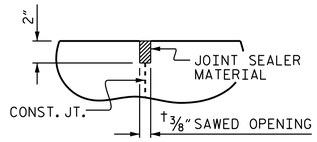
DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



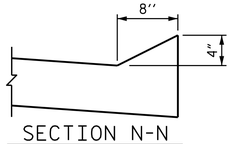

† NORMAL TO END BENT

SECTION THRU SLAB

(TYPE III - REINFORCED APPROACH FILL)




DETAIL "A"




SECTION N-N

## NOTES

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

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, MSE WALL REINFORCEMENT AND BACKFILL, SEE ROADWAY PLANS.

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

BACKFILL MATERIAL SHALL BE THE SAME MATERIAL USED IN THE MSE REINFORCED ZONE.

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL.

AREA BETWEEN THE MSE WALL 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.

## BILL OF MATERIAL

FOR ONE APPROACH SLAB (2 REQ'D)

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| * A1 | 26 | #4 | STR | 39'-1" | 679 |
| A2 | 26 | #4 | STR | 39'-1" | 679 |
| | | | | | |
| * B1 | 78 | #5 | STR | 24'-3" | 1973 |
| B2 | 78 | #6 | STR | 24'-7" | 2880 |
| | | | | | |
| REINFORCING STEEL | | | | LBS. | 3559 |
| * EPOXY COATED REINFORCING STEEL | | | | LBS. | 2652 |
| | | | | | |
| CLASS AA CONCRETE | | | | C.Y. | 42.5 |

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

# BRIDGE APPROACH SLAB

FOR INTEGTAL ABUTMENT WITH FLEXIBLE PAVEMENT (RIGHT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S2-23 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 24 |

DRAWN BY: M. L. MARLEY DATE: 1-2020
CHECKED BY: J. E. MONDOLFI DATE: 1-2020
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 1-2020

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PLANS PREPARED BY:
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(919) 552-2253
www.mottmac.com
LICENSE NO. F-0669

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E MONDOLFI

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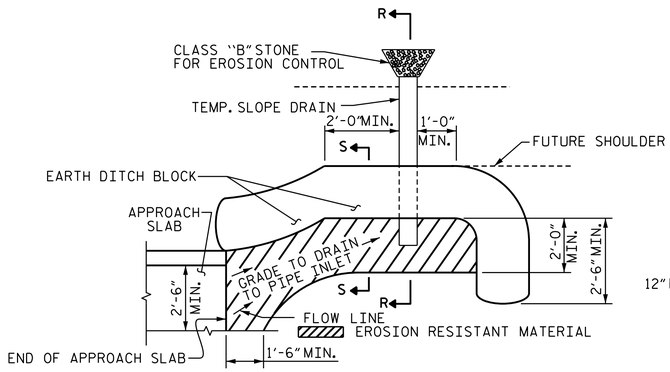
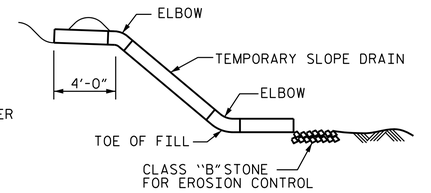
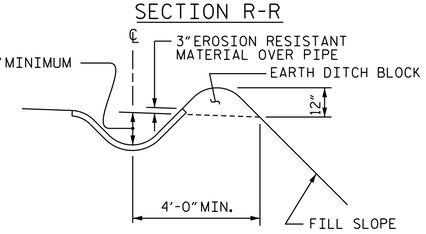



NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

PLAN VIEW



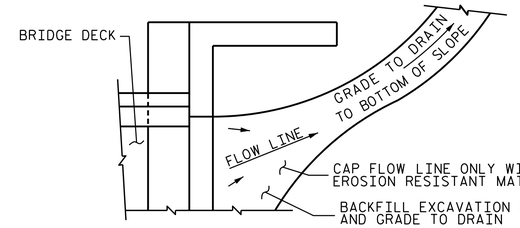

SECTION R-R




SECTION S-S

# TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)




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

TEMPORARY DRAINAGE DETAIL

PROJECT NO. B-5353

GUILFORD COUNTY

STATION: 23+62.87 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB DETAILS

(RIGHT LANE)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S2-24 |
| 1 | | | 3 | | | TOTAL SHEETS |
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NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI

DRAWN BY: M. L. MARLEY DATE: 1-2020
CHECKED BY: J. E. MONDOLFI DATE: 1-2020
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 1-2020

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# STANDARD NOTES

## DESIGN DATA:

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

## MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2018 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

## CONCRETE:

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

## CONCRETE CHAMFERS:

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

## DOWELS:

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

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

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

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

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

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

## REINFORCING STEEL:

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

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

## STRUCTURAL STEEL:

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

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

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

## HANDRAILS AND POSTS:

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

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

## SPECIAL NOTES:

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

# ENGLISH

JANUARY, 1990

REV. 6-16-95 EEM (c) RGW REV. 5-7-03 RWW (c) JTE REV. 10-1-11 MAA (c) GM
REV. 8-16-99 RWW (c) LES REV. 5-1-06 TLA (c) GM REV. 12-17 MAA (c) THC
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