TIP PROJECT: U-5806

CONTRACT: C203994

K:\RDT_Structures_Bridge\NCDOT\036388 - U-5806 Final Design\Cad\Dgn\000_U-5806_INDEX.dgn

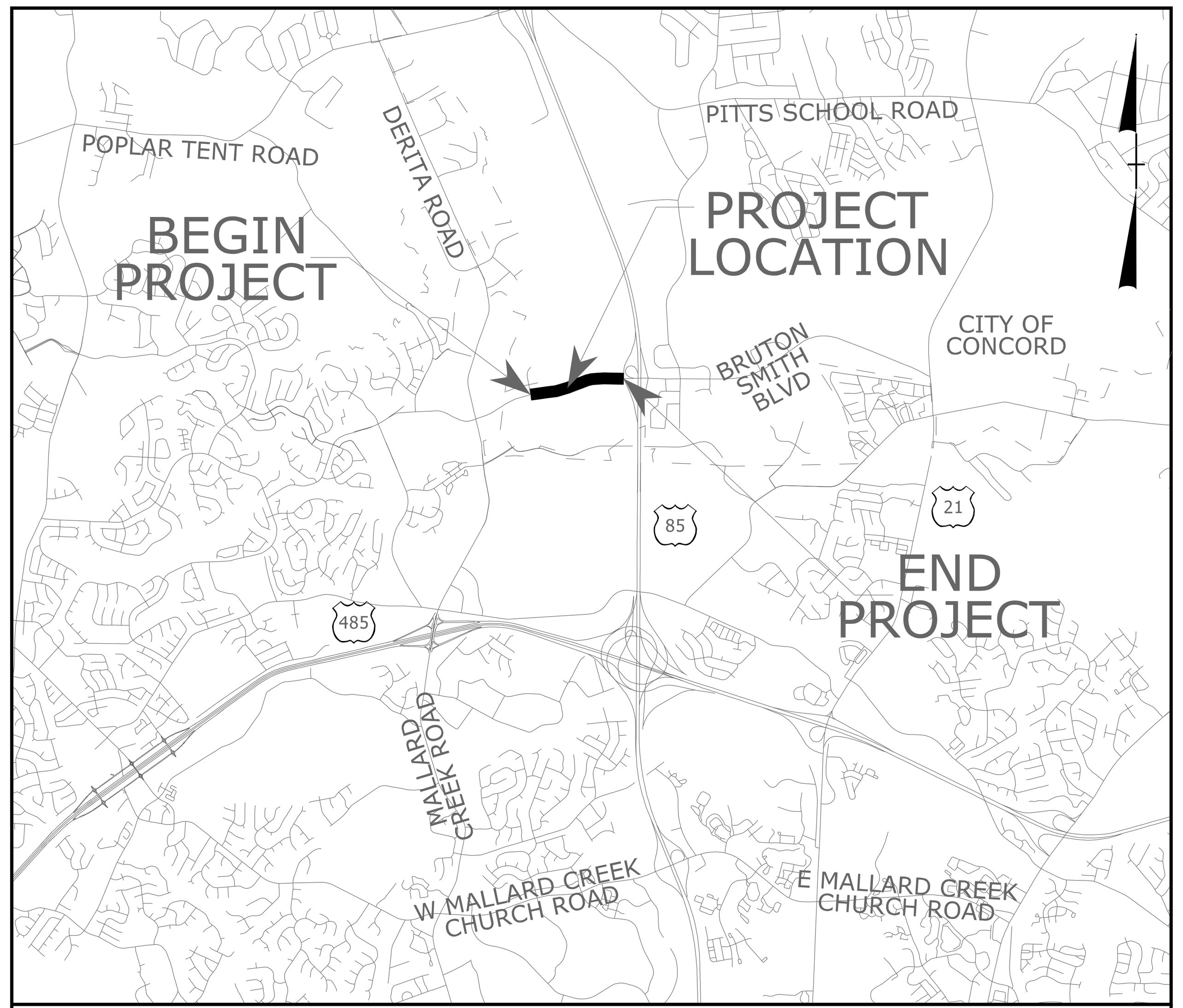
10/25/2017

| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| N.C. | U-5806 | | |

| STATE PROJ. NO. | F.A. PROJ. NO. | DESCRIPTION |
|---|---|---|
| 44378.1.D1 | N/A | P.E. |
| 44378.2.1 | N/A | R/W |
| 44378.2.2 | N/A | UTILITIES |
| 44378.3.1 | N/A | CONSTRUCTION |

# STATE OF NORTH CAROLINA
# DIVISION OF HIGHWAYS

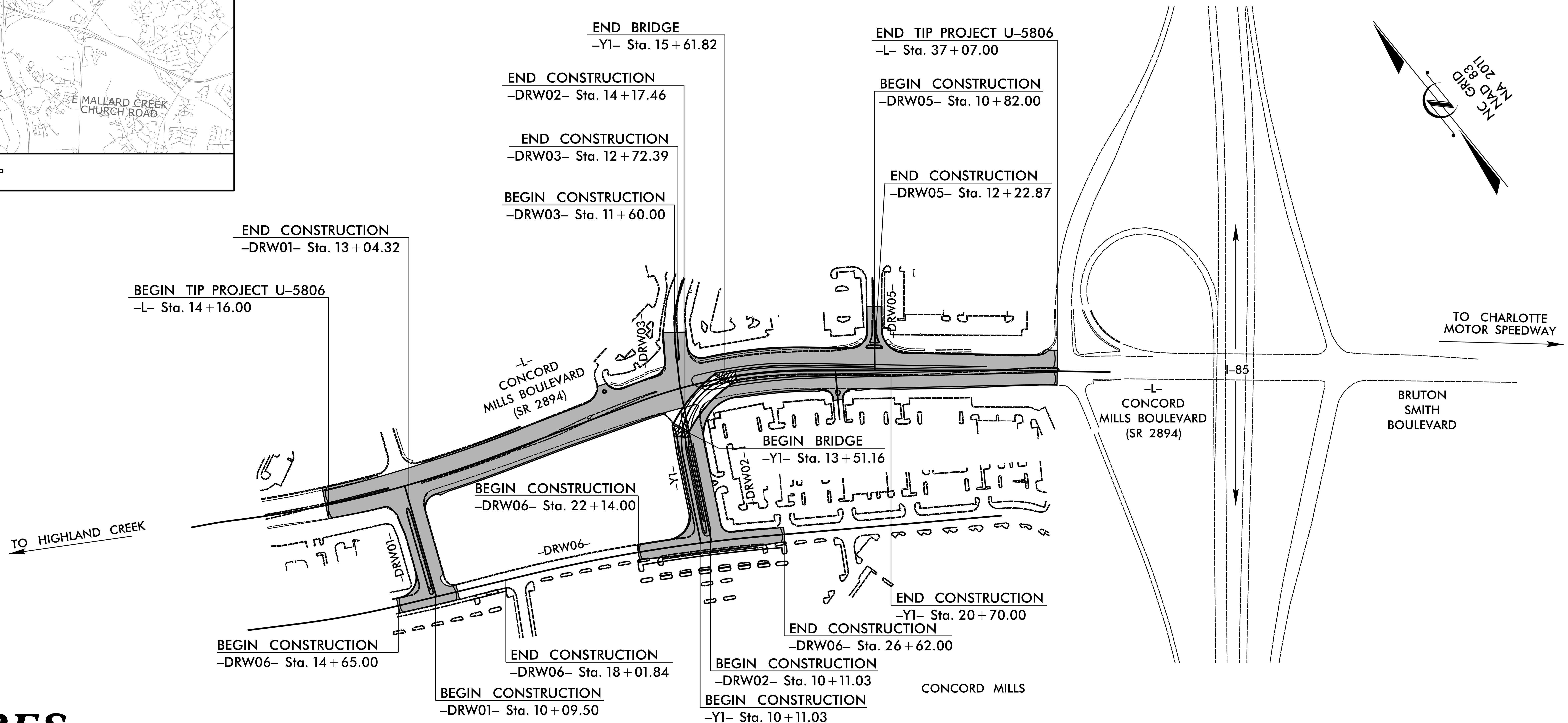
# CABARRUS COUNTY




VICINITY MAP

**LOCATION:** INTERSECTION OF SR 2894 (CONCORD MILLS BOULEVARD) AND ENTRANCE NO.1 (KINGS GRANT PAVILION)

**TYPE OF WORK:** GRADING, DRAINAGE, PAVING, SIGNALS, RETAINING WALLS AND STRUCTURE




# STRUCTURES

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

**DESIGN DATA**

| | | |
|---|---|---|
| ADT 2017 | = | 63800 VPD |
| ADT 2040 | = | 80700 VPD |
| K | = | 8% |
| D | = | 55% |
| T | = | 3%* |
| V | = | 50 MPH |

FUNCTIONAL CLASSIFICATION: URBAN MAJOR COLLECTOR

* 1% TTST 2% DUAL REGIONAL TIER

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT U-5806 = 0.434 MILES

PLANS PREPARED FOR THE NCDOT BY:

Kimley»Horn

© 2017 421 Fayetteville Street, Suite 600 Raleigh, North Carolina 27601 NC License #F-0102

2012 STANDARD SPECIFICATIONS

LETTING DATE:

DECEMBER 19, 2017


SECTION ALONG -Y1-

SECTION AT END BENTS ARE AT RIGHT ANGLES

HORIZONTAL CURVE DATA -Y1-

P.I. STA. 14+89.77 -Y1-
Δ = 93°11'39.2" (RT)
D = 27°56'57.0"
L = 333.44'
T = 216.76'
R = 205.00'


PLAN

FOOTINGS NOT SHOWN IN PLAN VIEW FOR CLARITY.

BRIDGE WORK LINE IS CONCENTRIC TO GIRDERS AND EDGE OF DECK (EXCEPT AT ENDS OF BRIDGE).

PROJECT NO. U-5806
CABARRUS COUNTY
STATION: 15+75.56 -Y1-
27+06.95 -L-

SHEET 1 OF 4 BRIDGE NO. 406

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033752 SETH A. DENNEY
DocuSigned by: Seth A. Denney
E8EB154CC9ED410...
10/23/2017

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040769 ANDREW L. PHILLIPS
DocuSigned by: Andrew L. Phillips
2B869ABAD4004D3...
10/23/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR FLYOVER BRIDGE FROM CONCORD MILLS BLVD TO ENTRANCE OF CONCORD MILLS (KINGS GRANT PAVILION)

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102

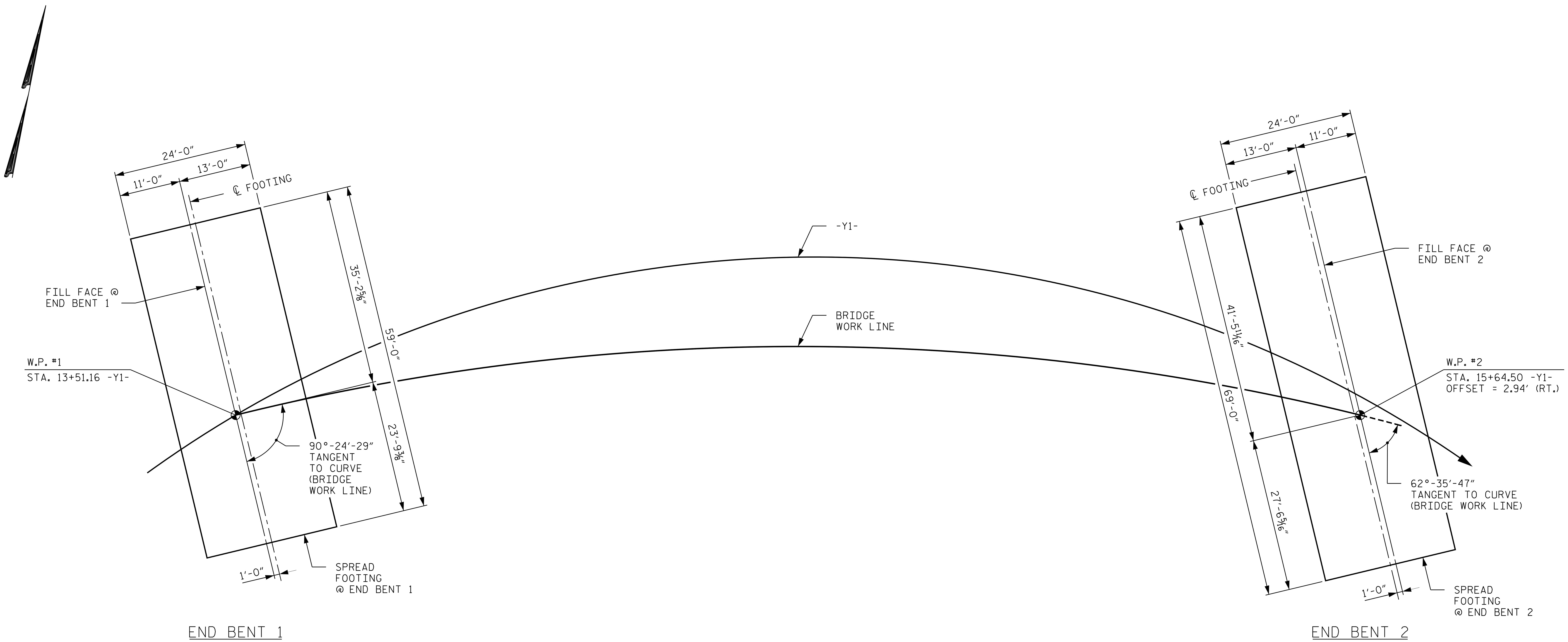


| REVISIONS | | | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | | NO. | BY: | DATE: | | S-1 |
| 1 | | | | 3 | | | | TOTAL SHEETS |
| 2 | | | | 4 | | | | 50 |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY: D. D. LOWERY DATE: 10/17
CHECKED BY: A. L. PHILLIPS DATE: 10/17
DESIGN ENGINEER OF RECORD: S.A. DENNEY DATE: 10/17

10/23/2017 K:\RDI_Structures_Bridge\NC\011036388 - U-5806 Final Design\Cad\Dgn\001_U-5806_GD01.dgn




## FOUNDATION LAYOUT

## FOUNDATION NOTES:

THE SPREAD FOOTING AT END BENTS NOS. 1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 10.0 TSF. CHECK FIELD CONDITIONS FOR THE REQUIRED RESISTANCE OF 23 TSF JUST BEFORE PLACING CONCRETE.

FOR BLASTING ADJACENT TO HIGHWAY STRUCTURES, SEE ARTICLE 410-9 OF THE STANDARD SPECIFICATIONS.

ESTIMATE 175 CUBIC YARDS OF ROCK EXCAVATION FOR END BENT NO. 1 FOUNDATION AND 300 CUBIC YARDS OF ROCK EXCAVATION FOR END BENT NO. 2 FOUNDATION.

AT THE CONTRACTOR'S OPTION, BLASTING FOR END BENT NOS. 1 AND 2 FOUNDATIONS CAN OCCUR DURING PHASE I.

PROJECT NO. U-5806
CABARRUS COUNTY
STATION: 15+75.56 -Y1-
27+06.95 -L-
SHEET 2 OF 4

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033752 SETH A. DENNEY
DocuSigned by: Seth A. Denney
E8EB154C09ED410...
10/23/2017

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040769 ANDREW L. PHILLIPS
DocuSigned by: Andrew L. Phillips
2B869ABAD4004D3...
10/23/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR FLYOVER BRIDGE FROM CONCORD MILLS BLVD TO ENTRANCE OF CONCORD MILLS (KINGS GRANT PAVILION)

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102

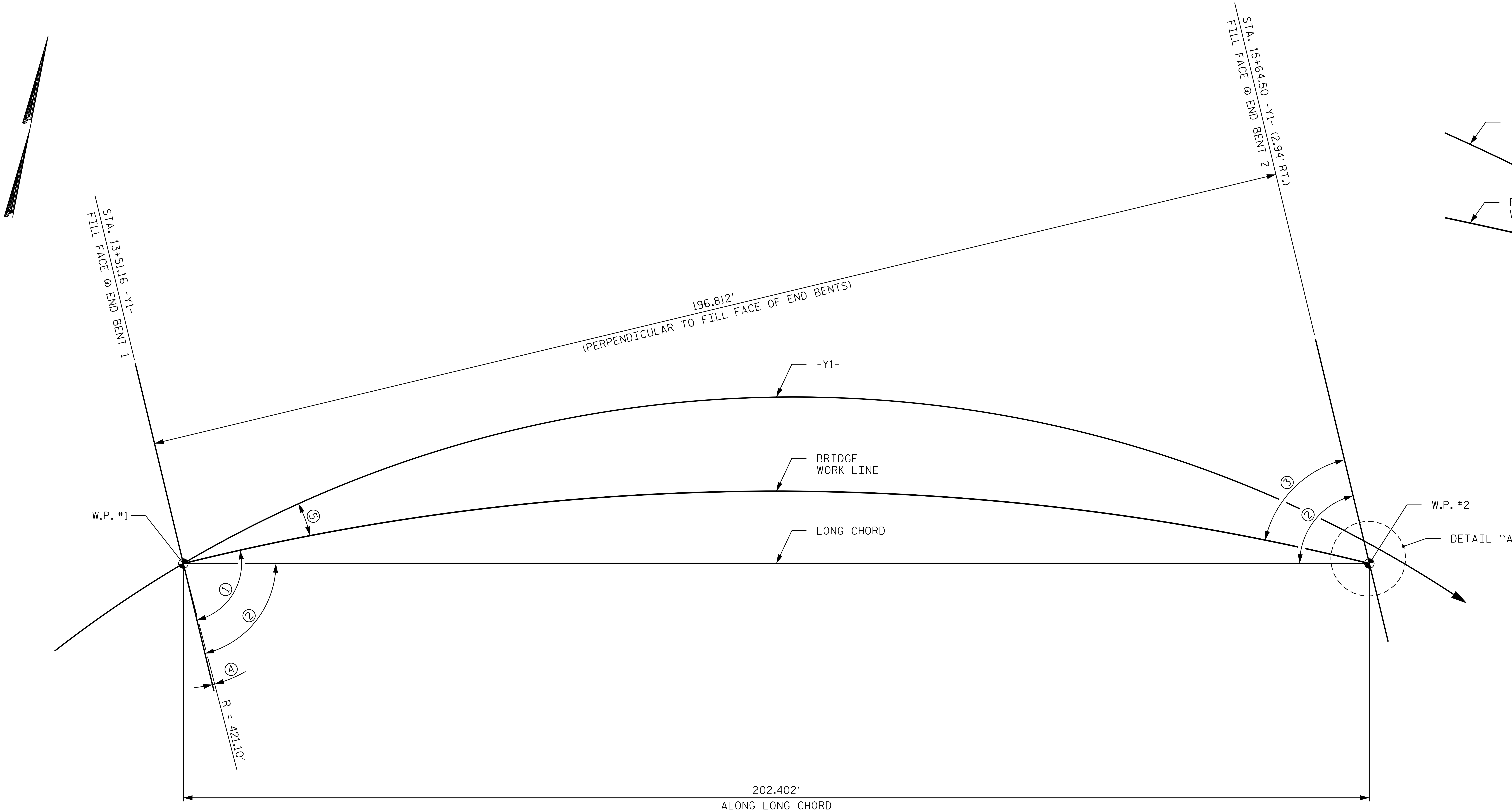


DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-2 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 50 |

| | |
|---|---|
| DRAWN BY: D. D. LOWERY | DATE: 10/17 |
| CHECKED BY: A. L. PHILLIPS | DATE: 10/17 |
| DESIGN ENGINEER OF RECORD: S.A. DENNEY | DATE: 10/17 |

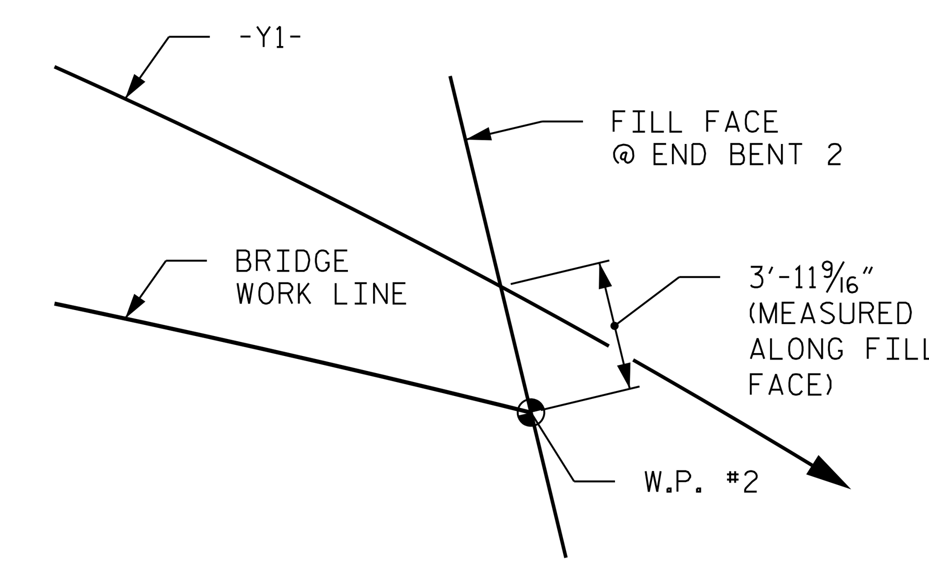
10/23/2017 K:\RDT_Structures_Bridge\NC\011035388 - U-5806 Final Design\Cad\Dgn\002_U-5806_FL01.dgn




# LONG CHORD LAYOUT

END BENTS ARE PARALLEL

ALL STATIONS, ANGLES AND DIMENSIONS SHOWN ARE WITH RESPECT TO THE BRIDGE WORK LINE, UNLESS NOTED OTHERWISE




DETAIL "A"

| TABLE OF ANGLES | |
|---|---|
| No. | ANGLE |
| 1 | 90°-24'-29" (TANGENT TO CURVE) |
| 2 | 76°-30'-08" |
| 3 | 62°-35'-47" (TANGENT TO CURVE) |
| 4 | 00°-24'-29" |
| 5 | 16°-37'-46" (TANGENT TO CURVES) (MEASURED AT W.P. #1) |

## HORIZONTAL CURVE DATA -Y1-

P.I. STA. 14+89.77 -Y1-
$\Delta$ = 93°11'39.2" (RT)
D = 27°56'57.0"
L = 333.44'
T = 216.76'
R = 205.00'

PROJECT NO. U-5806
CABARRUS COUNTY
STATION: 15+75.56 -Y1-
27+06.95 -L-

SHEET 3 OF 4

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033752 SETH A. DENNEY
DocuSigned by: Seth A. Denney
E8EB154CC9ED410...
10/23/2017

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040769 ANDREW L. PHILLIPS
DocuSigned by: Andrew L. Phillips
2B869ABAD4004D3...
10/23/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

# GENERAL DRAWING

FOR FLYOVER BRIDGE FROM CONCORD MILLS BLVD TO ENTRANCE OF CONCORD MILLS (KINGS GRANT PAVILION)

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102



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

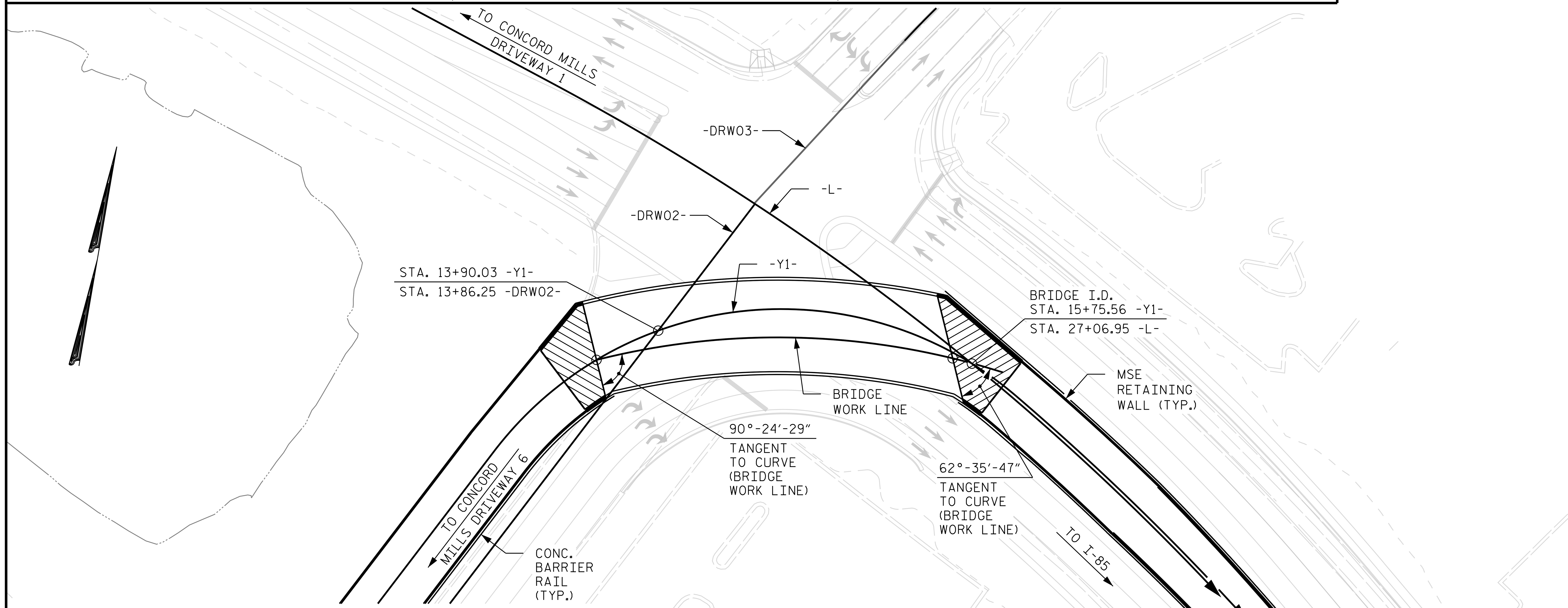
SHEET NO. S-3
TOTAL SHEETS 50

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

| | |
|---|---|
| DRAWN BY: D. D. LOWERY | DATE: 10/17 |
| CHECKED BY: A. L. PHILLIPS | DATE: 10/17 |
| DESIGN ENGINEER OF RECORD: S. A. DENNEY | DATE: 10/17 |

10/23/2017 K:\RDI_Structures_Bridge\NC\011036388 - U-5806 FinalDesign\Cad\Dgn\003_U-5806_LCL01.dgn

BENCH MARK: SURVEY POINT BY5-404, 74.39' LT STA. 26+83.69 -L-, EL. 644.32'




FOR UTILITIES INFORMATION, SEE UTILITIES PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

## TOTAL BILL OF MATERIAL

| | FOUNDATION EXCAVATION FOR END BENT | REINFORCED CONCRETE DECK SLAB (SAND-LIGHT WEIGHT CONC.) | GROOVING BRIDGE FLOORS | CLASS A CONCRETE | BRIDGE APPROACH SLABS | REINFORCING STEEL | APPROX. 1,073,598 LBS. STRUCTURAL STEEL * | CONCRETE BARRIER RAIL | DISC BEARINGS | EXPANSION JOINT SEALS | ELECTRICAL CONDUIT SYSTEM FOR SIGNALS | CONCRETE BARRIER RAIL WITH MOMENT SLAB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LUMP SUM | SQ. FT. | SQ. FT. | CU. YDS. | LUMP SUM | LBS. | LUMP SUM | LIN. FT. | LUMP SUM | LUMP SUM | LUMP SUM | LIN. FT. |
| SUPERSTRUCTURE | | 11,151 | 12,228 | | LUMP SUM | | LUMP SUM | 405.0 | LUMP SUM | LUMP SUM | LUMP SUM | |
| END BENT NO. 1 | LUMP SUM | | | 494.7 | | 66,592 | | | | | | 616.6 |
| END BENT NO. 2 | LUMP SUM | | | 589.1 | | 77,882 | | | | | | 971.6 |
| TOTAL | LUMP SUM | 11,151 | 12,228 | 1083.8 | LUMP SUM | 144,474 | LUMP SUM | 405.0 | LUMP SUM | LUMP SUM | LUMP SUM | 1,588.2 |

## NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR MASS CONCRETE AT END BENT NOS. 1 AND 2, SEE SPECIAL PROVISIONS.

THE ELEVATIONS AND CLEARANCES SHOWN ON THE PLANS AT THE POINTS 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 TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.

FOR MAINTENANCE AND PROTECTION OF THE 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.

THE TOP AND BOTTOM FLANGES IN THE MIDDLE SECTION (SEGMENT 2) OF SPAN A SHALL BE AASHTO M270 GRADE 70W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-8 OF THE STANDARD SPECIFICATIONS.

ALL OTHER STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-8 OF THE STANDARD SPECIFICATIONS.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

THE DECK CONCRETE IN SPAN A AND ALL BARRIER RAILS SHALL BE SAND-LIGHTWEIGHT CONCRETE. FOR SAND-LIGHTWEIGHT CONCRETE, SEE SPECIAL PROVISIONS.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

THE SAND LIGHTWEIGHT 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.

* APPROXIMATE STRUCTURAL STEEL WEIGHT PAY ITEM INCLUDES ALL STRUCTURAL STEEL FOR THE SIGNAL SUPPORT BRACKETS.

PROJECT NO. U-5806

CABARRUS COUNTY

STATION: 15+75.56 -Y1-
27+06.95 -L-

SHEET 4 OF 4

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033752 SETH A. DENNEY

DocuSigned by: Seth A. Denney 10/23/2017

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040769 ANDREW L. PHILLIPS

DocuSigned by: Andrew L. Phillips 10/23/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

# GENERAL DRAWING

FOR FLYOVER BRIDGE FROM CONCORD MILLS BLVD TO ENTRANCE OF CONCORD MILLS (KINGS GRANT PAVILION)

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

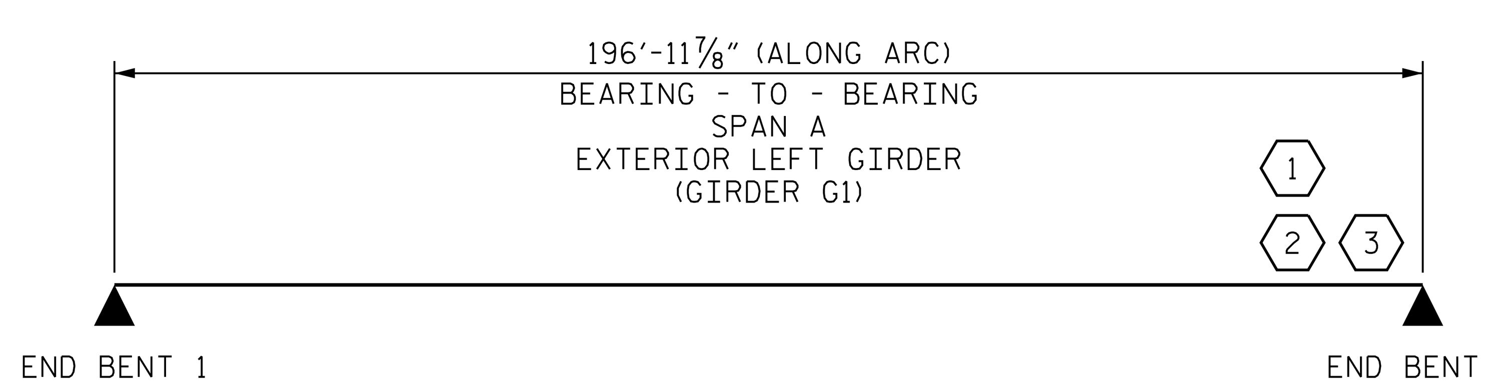
| REVISIONS | | | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | | | S-4 |
| 1 | | | 3 | | | | | TOTAL SHEETS |
| 2 | | | 4 | | | | | 50 |

DRAWN BY: D. D. LOWERY DATE: 10/17
CHECKED BY: A. L. PHILLIPS DATE: 10/17
DESIGN ENGINEER OF RECORD: S.A. DENNEY DATE: 10/17

10/23/2017 K:\RDI_Structures_Bridge\NC\011036388 - U-5806 FinalDesign\Cad\Dgn\004_U-5806_LS01.dgn

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

| LEVEL | | VEHICLE | WEIGHT (W) (TONS) | CONTROLLING LOAD RATING (#) | MINIMUM RATING FACTORS (RF) | TONS = W x RF | STRENGTH I LIMIT STATE | | | | | | | | | | | SERVICE II 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 | 0.797 | 1.44 | A | EL | 48.75 | 0.677 | 1.20 | A | EL | 194.99 | 1.30 | 0.797 | 2.24 | A | EL | 48.75 | -- |
| | | HL-93 (OPERATING) | N/A | · | 1.55 | -- | 1.35 | 0.797 | 1.87 | A | EL | 48.75 | 0.677 | 1.55 | A | EL | 194.99 | 1.00 | 0.797 | 2.91 | A | EL | 48.75 | -- |
| | | HS-20 (INVENTORY) | 36.00 | 2 | 2.01 | 72.36 | 1.75 | 0.797 | 2.46 | A | EL | 48.75 | 0.677 | 2.01 | A | EL | 194.99 | 1.30 | 0.797 | 3.82 | A | EL | 48.75 | -- |
| | | HS-20 (OPERATING) | 36.00 | · | 2.61 | 93.96 | 1.35 | 0.797 | 3.19 | A | EL | 48.75 | 0.677 | 2.61 | A | EL | 194.99 | 1.00 | 0.797 | 4.96 | A | EL | 48.75 | -- |
| LEGAL LOAD RATING | SINGLE VEHICLE (SV) | SNSH | 13.500 | · | 6.38 | 86.13 | 1.40 | 0.797 | 8.08 | A | EL | 48.75 | 0.956 | 6.38 | A | EL | 196.98 | 1.30 | 0.797 | 8.70 | A | EL | 48.75 | -- |
| | | SNGARBS2 | 20.000 | · | 4.44 | 88.80 | 1.40 | 0.797 | 5.46 | A | EL | 48.75 | 0.956 | 4.44 | A | EL | 196.98 | 1.30 | 0.797 | 5.88 | A | EL | 48.75 | -- |
| | | SNAGRIS2 | 22.000 | · | 4.08 | 89.76 | 1.40 | 0.797 | 4.96 | A | EL | 48.75 | 0.677 | 4.08 | A | EL | 194.99 | 1.30 | 0.797 | 5.35 | A | EL | 48.75 | -- |
| | | SNCOTTS3 | 27.250 | · | 3.17 | 86.38 | 1.40 | 0.797 | 4.01 | A | EL | 48.75 | 0.956 | 3.17 | A | EL | 196.98 | 1.30 | 0.797 | 4.32 | A | EL | 48.75 | -- |
| | | SNAGGRS4 | 34.925 | · | 2.57 | 89.76 | 1.40 | 0.797 | 3.16 | A | EL | 48.75 | 0.956 | 2.57 | A | EL | 196.98 | 1.30 | 0.797 | 3.41 | A | EL | 48.75 | -- |
| | | SNS5A | 35.550 | · | 2.54 | 90.30 | 1.40 | 0.797 | 3.11 | A | EL | 48.75 | 0.677 | 2.54 | A | EL | 194.99 | 1.30 | 0.797 | 3.35 | A | EL | 48.75 | -- |
| | | SNS6A | 39.950 | · | 2.25 | 89.89 | 1.40 | 0.797 | 2.79 | A | EL | 48.75 | 0.797 | 2.25 | A | EL | 196.98 | 1.30 | 0.797 | 3.00 | A | EL | 48.75 | -- |
| | | SNS7B | 42.000 | · | 2.13 | 89.46 | 1.40 | 0.797 | 2.65 | A | EL | 48.75 | 0.797 | 2.13 | A | EL | 196.98 | 1.30 | 0.797 | 2.86 | A | EL | 48.75 | -- |
| | TRUCK TRACTOR SEMI-TRAILER (TTST) | TNAGRIT3 | 33.000 | · | 2.74 | 90.42 | 1.40 | 0.797 | 3.39 | A | EL | 48.75 | 0.677 | 2.74 | A | EL | 194.99 | 1.30 | 0.797 | 3.66 | A | EL | 48.75 | -- |
| | | TNT4A | 33.075 | · | 2.73 | 90.29 | 1.40 | 0.797 | 3.37 | A | EL | 48.75 | 0.677 | 2.73 | A | EL | 194.99 | 1.30 | 0.797 | 3.63 | A | EL | 48.75 | -- |
| | | TNT6A | 41.600 | · | 2.18 | 90.69 | 1.40 | 0.797 | 2.70 | A | EL | 48.75 | 0.797 | 2.18 | A | EL | 196.98 | 1.30 | 0.797 | 2.90 | A | EL | 48.75 | -- |
| | | TNT7A | 42.000 | · | 2.16 | 90.72 | 1.40 | 0.797 | 2.67 | A | EL | 48.75 | 0.797 | 2.16 | A | EL | 196.98 | 1.30 | 0.797 | 2.88 | A | EL | 48.75 | -- |
| | | TNT7B | 42.000 | · | 2.18 | 91.56 | 1.40 | 0.797 | 2.69 | A | EL | 48.75 | 0.677 | 2.18 | A | EL | 194.99 | 1.30 | 0.797 | 2.89 | A | EL | 48.75 | -- |
| | | TNAGRIT4 | 43.000 | · | 2.11 | 90.73 | 1.40 | 0.797 | 2.60 | A | EL | 48.75 | 0.677 | 2.11 | A | EL | 194.99 | 1.30 | 0.797 | 2.80 | A | EL | 48.75 | -- |
| | | TNAGT5A | 45.000 | · | 2.02 | 90.90 | 1.40 | 0.797 | 2.49 | A | EL | 48.75 | 0.677 | 2.02 | A | EL | 194.99 | 1.30 | 0.797 | 2.68 | A | EL | 48.75 | -- |
| | | TNAGT5B | 45.000 | 3 | 2.01 | 90.45 | 1.40 | 0.797 | 2.47 | A | EL | 48.75 | 0.797 | 2.01 | A | EL | 196.98 | 1.30 | 0.797 | 2.66 | A | EL | 48.75 | -- |
| FATIGUE | | HL-93 (INVENTORY) | $\gamma_{LL}$=0.75 | · | | | | | | | | | | | | | | | | | | | | |




## LRFR SUMMARY

## LOAD FACTORS:

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

## NOTES:

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

ALLOWABLE STRESS FOR SERVICE II LIMIT STATE ARE AS REQUIRED FOR DESIGN.

## COMMENTS:

1. ANALYSIS METHOD: FINITE ELEMENT MODEL ON GRILLAGE.
2. FATIGUE RATING IS NOT REQUIRED OR REPORTED SINCE GIRDERS DO NOT INCLUDE FATIGUE-PRONE DETAILS.

## (#) 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
EL - EXTERIOR LEFT GIRDER
ER - EXTERIOR RIGHT GIRDER

PROJECT NO. U-5806
CABARRUS COUNTY
STATION: 15+75.56 -Y1-
27+06.95 -L-

NORTH CAROLINA PROFESSIONAL SEAL 033752 ENGINEER SETH A. DENNEY
DocuSigned by: Seth A. Denney
E8EB154CC9ED410...
10/23/2017

NORTH CAROLINA PROFESSIONAL SEAL 040769 ENGINEER ANDREW L. PHILLIPS
DocuSigned by: Andrew L. Phillips
2B869ABAD4004D3...
10/23/2017

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102



**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

LRFR SUMMARY FOR STEEL GIRDERS
(NON-INTERSTATE TRAFFIC)

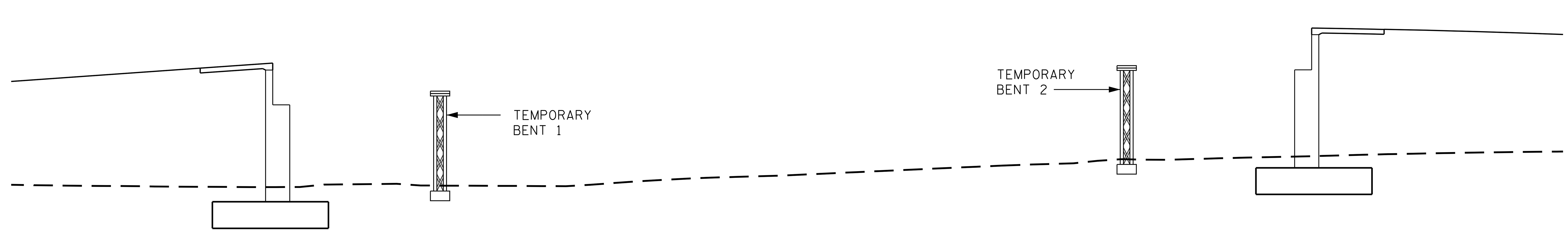
| REVISIONS | | | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | | NO. | BY: | DATE: | | S-5 |
| 1 | | | | 3 | | | | TOTAL SHEETS |
| 2 | | | | 4 | | | | 50 |

| | | | |
|---|---|---|---|
| ASSEMBLED BY : D.D. LOWERY | DATE : 10/17 | | |
| CHECKED BY : A.L. PHILLIPS | DATE : 10/17 | | |
| DRAWN BY : MAA 1/08 | | REV. 11/12/08RR | MAA/GM |
| CHECKED BY : GM/DI 2/08 | | REV. 10/1/11 | MAA/GM |

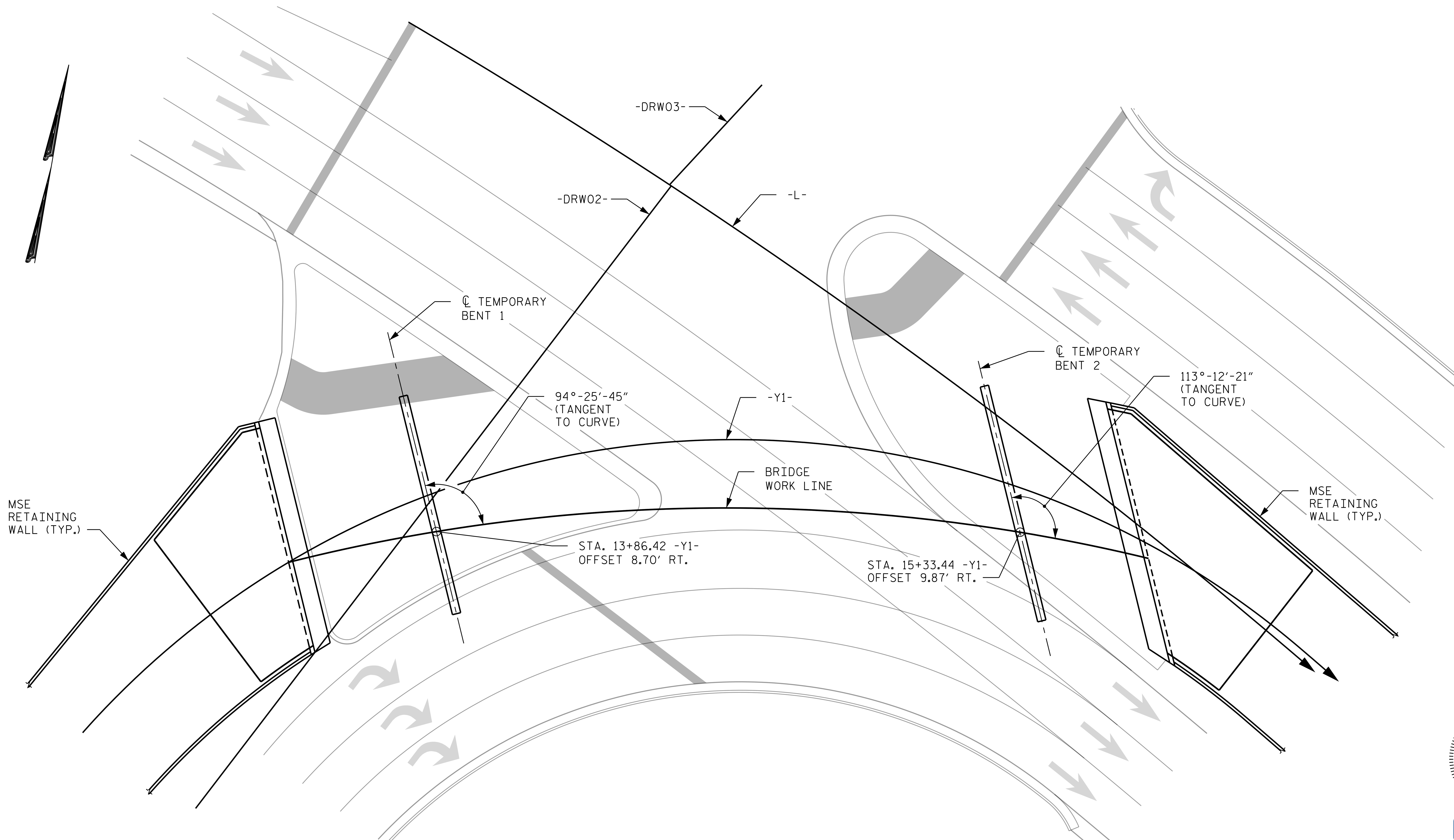
10/23/2017 K:\RDI_Structures_Bridge\NC\011036388 - U-5806 Final Design\Cad\Dgn\005_U-5806_RFR01.dgn

STD. NO. LRFR3

SPAN A




SECTION ALONG BRIDGE WORK LINE - STAGE 1




PLAN - STAGE 1

FOOTINGS NOT SHOWN IN PLAN VIEW FOR CLARITY
TEMPORARY BENTS ARE PARALLEL TO END BENTS

## ERECTION NOTES:

ERECTION OF GIRDERS SHALL BE COORDINATED WITH TRAFFIC PHASING REQUIREMENTS. SEE TRAFFIC CONTROL PLANS.

ERECT A MINIMUM OF TWO GIRDERS AT A TIME WITH ALL DIAPHRAGMS/ CROSSFRAMES BETWEEN THE GIRDERS IN PLACE AND THE BOLTS TIGHTENED PRIOR TO RELEASING THE GIRDERS.

ERECT EACH SUBSEQUENT PAIR OF GIRDERS WITH DIAPHRAGMS/CROSSFRAMES CONNECTING TO THE ADJACENT PREVIOUSLY ERECTED GIRDER AND TIGHTEN ALL BOLTS BEFORE RELEASING.

INSTALL LATERAL BRACING AFTER ERECTING THE EXTERIOR GIRDER AND THE ADJACENT INTERIOR GIRDER AND ASSOCIATED DIAPHRAGMS/CROSSFRAMES.

DIAPHRAGMS/CROSSFRAMES AND CONNECTIONS SHALL BE DETAILED FOR NO-LOAD FIT (NLF). HOLDING CRANE(S) WILL BE REQUIRED FOR DIAPHRAGM INSTALLATION DURING ERECTION OF THE SEGMENT 2 GIRDERS (SECTIONS 3A, 3B, & 3C).

THE STRUCTURAL STEEL SHALL REMAIN SUPPORTED DURING ERECTION IN ITS CAMBERED POSITION. TEMPORARY BENTS AS SHOWN SHALL BE USED.

TEMPORARY BENTS SHALL REMAIN IN PLACE UNTIL ALL DIAPHRAGMS/ CROSSFRAMES ARE IN PLACE, ALL HIGH STRENGTH BOLTS ARE TIGHTENED, AND THE SAND-LIGHTWEIGHT CONCRETE DECK IS POURED AND ACHIEVES THE REQUIRED 28-DAY COMPRESSIVE STRENGTH.

TEMPORARY BENTS SHALL PROVIDE BEARING AT CONNECTOR PLATE LOCATIONS. WHEN CONNECTOR PLATES ARE USED AS TEMPORARY BEARING STIFFENERS, DIAPHRAGMS MUST BE ATTACHED.

THE CONTRACTOR'S ERECTION PLANS SHALL INCLUDE A METHOD OF TEMPORARY BENT REMOVAL THAT WILL UNIFORMLY TRANSFER THE STRUCTURAL STEEL AND SLAB WEIGHT TO THE DIAPHRAGMS/CROSSFRAMES.

PLANS FOR TEMPORARY BENT ERECTION AND REMOVAL SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.

THE CONTRACTOR IS RESPONSIBLE FOR DESIGNING THE TEMPORARY BENTS. THE DESIGN SHALL BE COMPLETED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NORTH CAROLINA. THE CONTRACTOR SHALL SUBMIT SIGNED AND SEALED WORKING DRAWINGS AND CALCULATIONS FOR APPROVAL BY THE ENGINEER.

DURING GIRDER ERECTION, THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING TEMPORARY LATERAL BRACING AND OTHER MEANS OF SUPPORT, AS REQUIRED, TO ENSURE STABILITY OF THE GIRDERS. TEMPORARY HOLD DOWNS FOR UPLIFT DURING GIRDER ERECTION AND DECK/BARRIER RAIL POURING ARE REQUIRED AT THE END BENTS.

THE CONTRACTOR MAY SUBMIT AN ALTERNATE ERECTION METHOD TO THE ENGINEER FOR REVIEW AND APPROVAL.

FOR TEMPORARY BENTS, SEE SPECIAL PROVISIONS.

NO SEPARATE MEASUREMENT OR PAYMENT WILL BE MADE FOR PROVIDING THE TEMPORARY BENTS, TEMPORARY LATERAL BRACING, AND OTHER MEANS OF SUPPORT. THE COST FOR ALL MATERIALS, EQUIPMENT, TOOLS, AND LABOR NECESSARY TO PROVIDE THE TEMPORARY SUPPORTS SHALL BE CONSIDERED INCIDENTAL TO THE LUMP SUM BID PRICE FOR STRUCTURAL STEEL.

## STAGE 1

1. CONSTRUCT MSE WALLS, END BENTS, APPROACH SLABS AND ERECT TEMPORARY BENTS.

PROJECT NO. U-5806
CABARRUS COUNTY
STATION: 15+75.56 -Y1-
27+06.95 -L-
SHEET 1 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 033752 ENGINEER SETH A. DENNEY
DocuSigned by: Seth A. Denney
E8EB154CC9ED410...
10/23/2017

NORTH CAROLINA PROFESSIONAL SEAL 040769 ENGINEER ANDREW L. PHILLIPS
DocuSigned by: Andrew L. Phillips
2B869ABAD4004D3...
10/23/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GIRDER ERECTION DETAILS
STAGE 1

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102

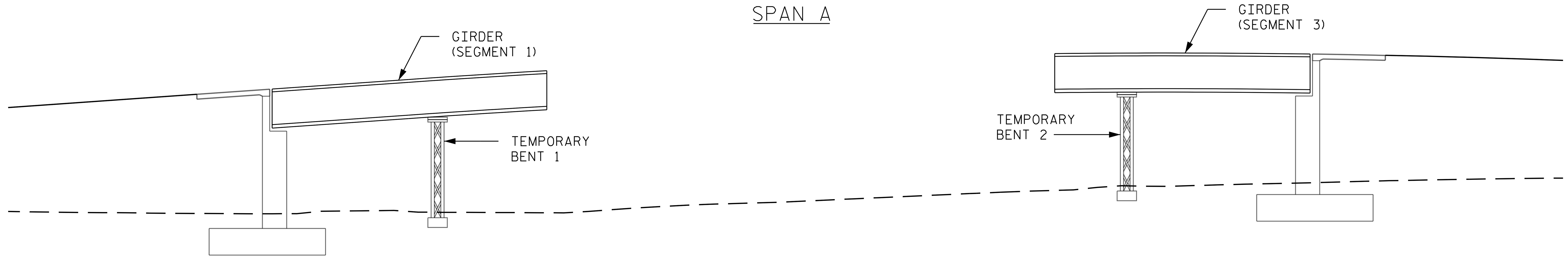


| REVISIONS | | | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | | | S-6 |
| 1 | | | 3 | | | | | TOTAL SHEETS |
| 2 | | | 4 | | | | | 50 |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

| | |
|---|---|
| DRAWN BY: D. D. LOWERY | DATE: 10/17 |
| CHECKED BY: A. L. PHILLIPS | DATE: 10/17 |
| DESIGN ENGINEER OF RECORD: S.A. DENNEY | DATE: 10/17 |

10/23/2017 K:\RDI_Structures_Bridge\NC\011036388 -U-5806_FinalDesign\Cad\Dgn\006_U-5806_CS01.dgn



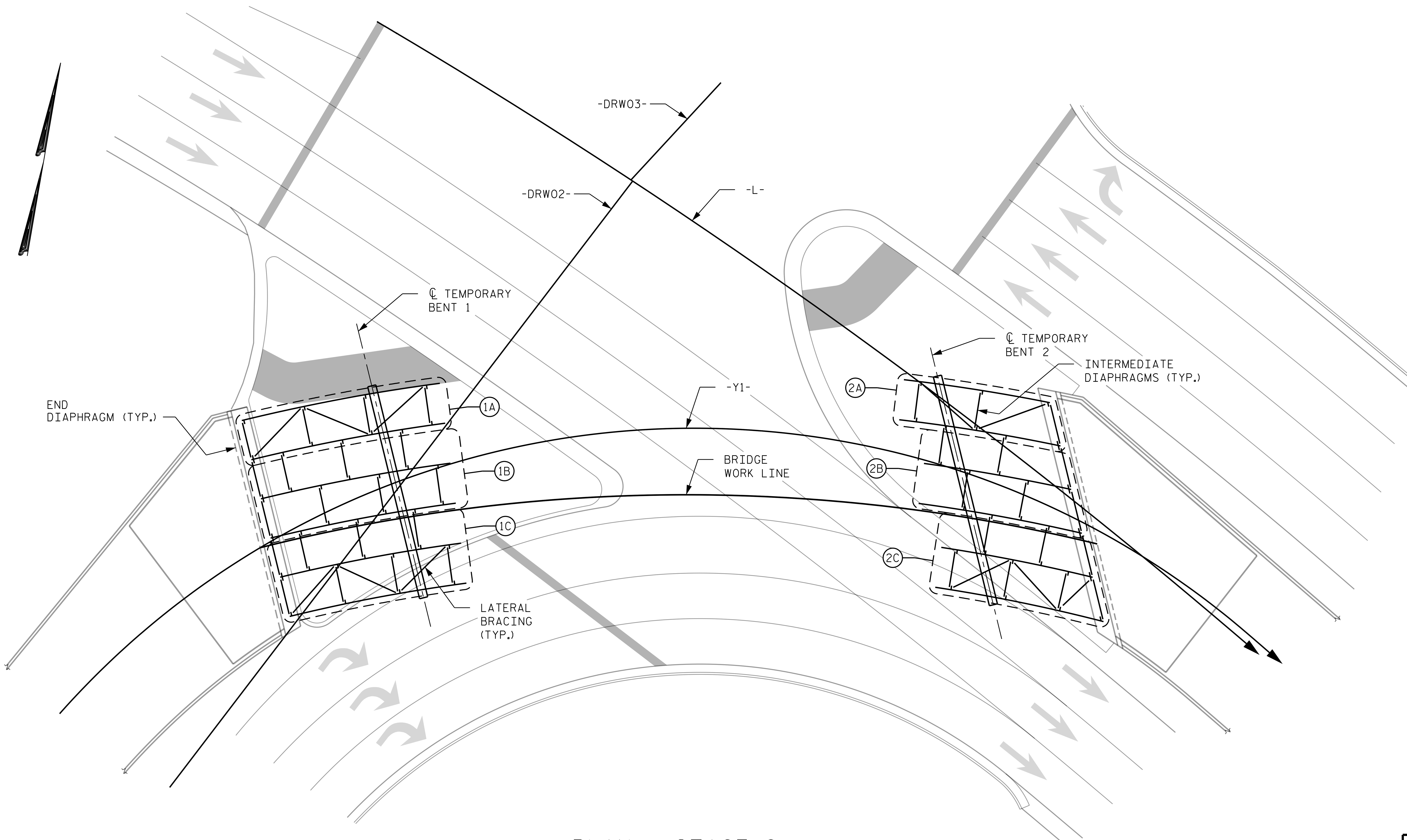

SECTION ALONG BRIDGE WORK LINE - STAGE 2

## ERECTION NOTES:

FOR ERECTION NOTES, SEE "GIRDER ERECTION DETAILS, STAGE I" SHEET.

## STAGE 2

1. BEGINNING ON THE OUTSIDE OF THE CURVE, ERECT THE FIRST TWO GIRDERS OF SEGMENT 1 (SECTION 1A). GIRDERS SHALL BE ERECTED WITH ALL INTERMEDIATE DIAPHRAGMS IN PLACE, CONNECTED, AND ALL BOLTS TIGHTENED.
2. INSTALL LATERAL BRACING BETWEEN THE EXTERIOR AND INTERIOR GIRDERS.
3. ERECT THE NEXT TWO GIRDERS OF SEGMENT 1 (SECTION 1B). GIRDERS SHALL BE ERECTED WITH ALL INTERMEDIATE DIAPHRAGMS IN PLACE & CONNECTED. PRIOR TO RELEASING CRANES, INSTALL & CONNECT THE INTERMEDIATE DIAPHRAGMS BETWEEN SECTIONS 1A & 1B.
4. ERECT THE REMAINING GIRDERS IN SEGMENT 1 AND THE GIRDERS IN SEGMENT 3 USING THE SAME METHOD.




PLAN - STAGE 2

FOOTINGS NOT SHOWN IN PLAN VIEW FOR CLARITY

PROJECT NO. U-5806
CABARRUS COUNTY
STATION: 15+75.56 -Y1-
27+06.95 -L-

SHEET 2 OF 3

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033752 SETH A. DENNEY
DocuSigned by: Seth A. Denney
E8EB154CC9ED410...
10/23/2017

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040769 ANDREW L. PHILLIPS
DocuSigned by: Andrew L. Phillips
2B869ABAD4004D3...
10/23/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GIRDER ERECTION DETAILS
STAGE 2

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102

This document, together with the concepts and designs presented herein, as an instrument of services, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adoption by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



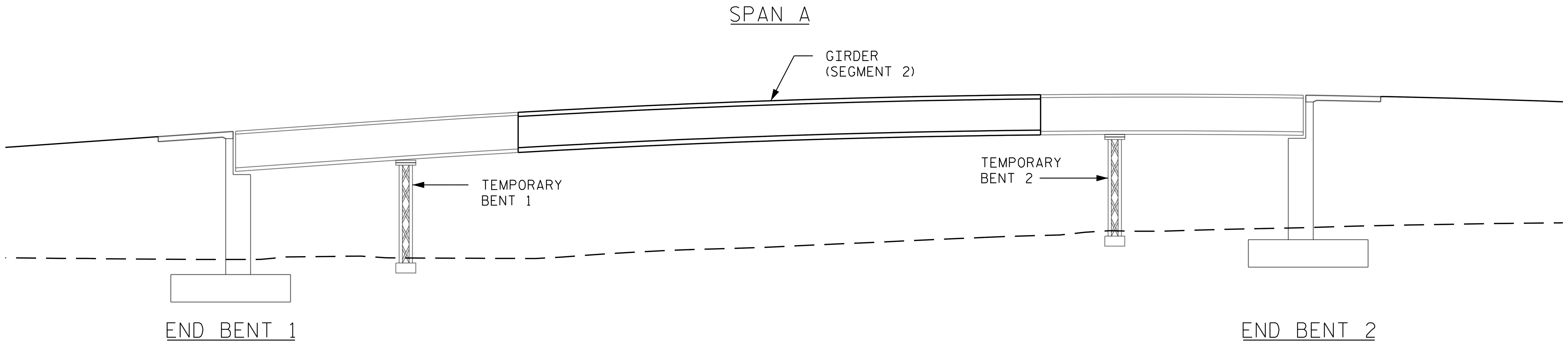
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

| | |
|---|---|
| SHEET NO. | S-7 |
| TOTAL SHEETS | 50 |

| | |
|---|---|
| DRAWN BY: D.D.LOWERY | DATE: 10/17 |
| CHECKED BY: A.L.PHILLIPS | DATE: 10/17 |
| DESIGN ENGINEER OF RECORD: S.A.DENNEY | DATE: 10/17 |

10/23/2017 K:\RDI_Structures_Bridge\NC\011036388 -U-5806 FinalDesign\Cad\Dgn\007_U-5806_CS02.dgn



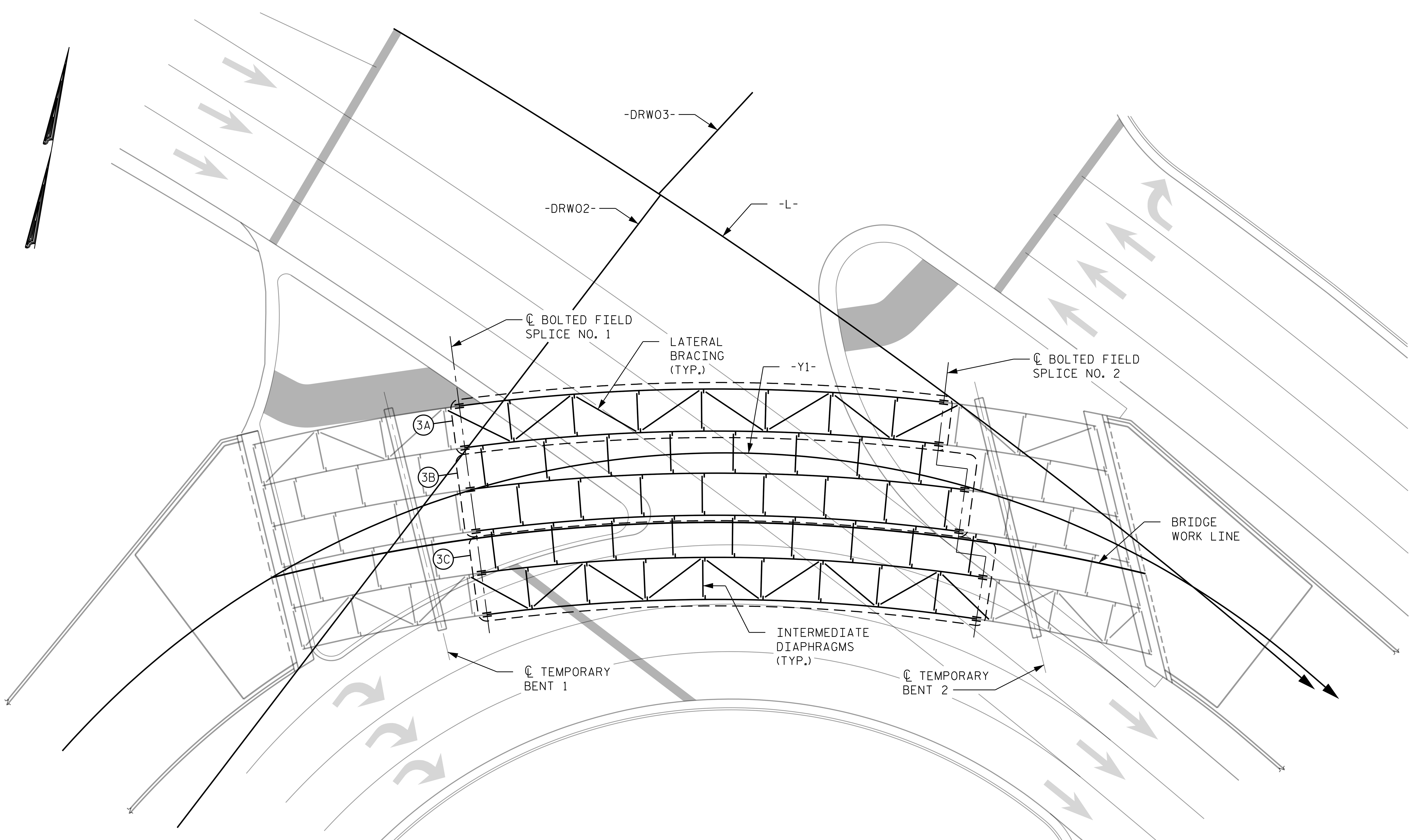

SECTION ALONG BRIDGE WORK LINE - STAGE 3

## ERECTION NOTES:

FOR ERECTION NOTES, SEE "GIRDER ERECTION DETAILS STAGE I" SHEET.

## STAGE 3

1. BEGINNING ON THE OUTSIDE OF THE CURVE, ERECT THE FIRST TWO GIRDERS OF SEGMENT 2 (SECTION 3A). GIRDERS SHALL BE ERECTED WITH ALL INTERMEDIATE DIAPHRAGMS IN PLACE & CONNECTED.
2. INSTALL LATERAL BRACING BETWEEN THE EXTERIOR AND INTERIOR GIRDER.
3. ERECT THE NEXT TWO GIRDERS OF SEGMENT 2 (SECTION 3B). GIRDERS SHALL BE ERECTED WITH ALL INTERMEDIATE DIAPHRAGMS IN PLACE & CONNECTED. PRIOR TO RELEASING CRANES, INSTALL & CONNECT THE INTERMEDIATE DIAPHRAGMS BETWEEN SECTIONS 3A & 3B. HOLDING CRANE(S) WILL BE REQUIRED FOR INTERMEDIATE DIAPHRAGM INSTALLATION BETWEEN SECTIONS 3A & 3B AS WELL AS SECTIONS 3B & 3C.
4. ERECT THE REMAINING GIRDERS IN SEGMENT 2 USING THE SAME METHOD.
5. FORM AND POUR DECK AS SHOWN IN DECK POUR SEQUENCE.
6. REMOVE TEMPORARY BENTS AFTER ALL DECK CONCRETE HAS REACHED THE REQUIRED 28 DAY COMPRESSIVE STRENGTH.




PLAN - STAGE 3

FOOTINGS NOT SHOWN IN PLAN VIEW FOR CLARITY

PROJECT NO. U-5806

CABARRUS COUNTY

STATION: 15+75.56 -Y1-
27+06.95 -L-

SHEET 3 OF 3

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033752 SETH A. DENNEY
DocuSigned by: Seth A. Denney
E8EB154CC9ED410...
10/23/2017

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040769 ANDREW L. PHILLIPS
DocuSigned by: Andrew L. Phillips
2B869ABAD4004D3...
10/23/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GIRDER ERECTION DETAILS

STAGE 3

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102



**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

| REVISIONS | | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | | S-8 |
| 1 | | | 3 | | | | TOTAL SHEETS |
| 2 | | | 4 | | | | 50 |

DRAWN BY: D.D.LOWERY DATE: 10/17
CHECKED BY: A.L.PHILLIPS DATE: 10/17
DESIGN ENGINEER OF RECORD: S.A.DENNEY DATE: 10/17

10/23/2017 K:\RDI_Structures_Bridge\NC\011036388 -U-5806 FinalDesign\Cad\Dgn\008_U-5806_CS03.dgn

## DECK POUR SEQUENCING DEAD LOAD DEFLECTION TABLE FOR GIRDER 1

| THIRTIETH POINTS | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEFLECTION DUE TO DECK POUR #1 ✳ | 0.000 | -0.006 | -0.010 | -0.010 | -0.004 | 0.004 | 0.049 | 0.096 | 0.141 | 0.192 | 0.241 | 0.285 | 0.323 | 0.352 | 0.373 | 0.382 | 0.381 | 0.368 | 0.345 | 0.312 | 0.272 | 0.227 | 0.178 | 0.128 | 0.079 | 0.037 | 0.001 | -0.008 | -0.012 | -0.010 | 0.000 |
| DEFLECTION DUE TO DECK POUR #2 ✳ | 0.000 | -0.006 | -0.010 | -0.010 | -0.004 | 0.004 | 0.049 | 0.095 | 0.140 | 0.191 | 0.239 | 0.283 | 0.320 | 0.349 | 0.369 | 0.378 | 0.377 | 0.364 | 0.340 | 0.308 | 0.269 | 0.223 | 0.175 | 0.125 | 0.077 | 0.036 | 0.001 | -0.005 | -0.008 | -0.007 | 0.000 |
| DEFLECTION DUE TO DECK POUR #3 | 0.000 | -0.020 | -0.030 | -0.031 | -0.016 | 0.007 | 0.101 | 0.201 | 0.306 | 0.418 | 0.525 | 0.623 | 0.707 | 0.772 | 0.818 | 0.840 | 0.839 | 0.810 | 0.760 | 0.689 | 0.602 | 0.502 | 0.394 | 0.283 | 0.176 | 0.082 | 0.002 | -0.018 | -0.025 | -0.021 | 0.000 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DEFLECTION DUE TO REMOVAL OF TEMPORARY BENTS ✳✳ | 0.000 | 1.200 | 2.384 | 3.554 | 4.697 | 5.807 | 6.852 | 7.845 | 8.747 | 9.557 | 10.269 | 10.873 | 11.361 | 11.726 | 11.963 | 12.068 | 12.039 | 11.854 | 11.537 | 11.091 | 10.521 | 9.835 | 9.041 | 8.148 | 7.167 | 6.102 | 4.970 | 3.786 | 2.557 | 1.303 | 0.000 |

## DECK POUR SEQUENCING DEAD LOAD DEFLECTION TABLE FOR GIRDER 2

| THIRTIETH POINTS | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEFLECTION DUE TO DECK POUR #1 ✳ | 0.000 | -0.004 | -0.006 | -0.006 | -0.001 | 0.004 | 0.048 | 0.093 | 0.135 | 0.182 | 0.228 | 0.268 | 0.302 | 0.329 | 0.346 | 0.355 | 0.354 | 0.343 | 0.323 | 0.295 | 0.258 | 0.216 | 0.170 | 0.123 | 0.079 | 0.037 | 0.001 | -0.006 | -0.009 | -0.008 | 0.000 |
| DEFLECTION DUE TO DECK POUR #2 ✳ | 0.000 | -0.004 | -0.006 | -0.006 | -0.001 | 0.004 | 0.048 | 0.092 | 0.135 | 0.181 | 0.226 | 0.266 | 0.300 | 0.327 | 0.344 | 0.353 | 0.352 | 0.341 | 0.321 | 0.293 | 0.256 | 0.214 | 0.169 | 0.122 | 0.079 | 0.038 | 0.002 | -0.002 | -0.004 | -0.004 | 0.000 |
| DEFLECTION DUE TO DECK POUR #3 | 0.000 | -0.016 | -0.024 | -0.025 | -0.011 | 0.007 | 0.099 | 0.195 | 0.294 | 0.399 | 0.500 | 0.590 | 0.667 | 0.727 | 0.767 | 0.787 | 0.785 | 0.762 | 0.718 | 0.656 | 0.575 | 0.482 | 0.380 | 0.275 | 0.175 | 0.082 | 0.003 | -0.012 | -0.020 | -0.017 | 0.000 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DEFLECTION DUE TO REMOVAL OF TEMPORARY BENTS ✳✳ | 0.000 | 1.044 | 2.064 | 3.064 | 4.033 | 4.968 | 5.841 | 6.666 | 7.404 | 8.075 | 8.660 | 9.140 | 9.523 | 9.797 | 9.964 | 10.019 | 9.961 | 9.793 | 9.513 | 9.130 | 8.631 | 8.039 | 7.358 | 6.601 | 5.790 | 4.906 | 3.978 | 3.017 | 2.031 | 1.032 | 0.000 |

## DECK POUR SEQUENCING DEAD LOAD DEFLECTION TABLE FOR GIRDER 3

| THIRTIETH POINTS | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEFLECTION DUE TO DECK POUR #1 ✳ | 0.000 | -0.002 | -0.003 | -0.003 | 0.001 | 0.004 | 0.041 | 0.076 | 0.108 | 0.145 | 0.180 | 0.212 | 0.239 | 0.260 | 0.273 | 0.280 | 0.278 | 0.270 | 0.254 | 0.231 | 0.203 | 0.170 | 0.135 | 0.098 | 0.061 | 0.030 | 0.002 | -0.004 | -0.007 | -0.006 | 0.000 |
| DEFLECTION DUE TO DECK POUR #2 ✳ | 0.000 | -0.002 | -0.003 | -0.003 | 0.001 | 0.004 | 0.041 | 0.076 | 0.108 | 0.145 | 0.180 | 0.212 | 0.239 | 0.259 | 0.273 | 0.279 | 0.278 | 0.269 | 0.253 | 0.231 | 0.203 | 0.170 | 0.135 | 0.098 | 0.063 | 0.032 | 0.003 | 0.000 | -0.002 | -0.002 | 0.000 |
| DEFLECTION DUE TO DECK POUR #3 | 0.000 | -0.014 | -0.022 | -0.022 | -0.010 | 0.008 | 0.095 | 0.181 | 0.270 | 0.365 | 0.455 | 0.538 | 0.608 | 0.662 | 0.697 | 0.715 | 0.712 | 0.690 | 0.649 | 0.591 | 0.519 | 0.436 | 0.344 | 0.250 | 0.158 | 0.076 | 0.005 | -0.010 | -0.017 | -0.015 | 0.000 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DEFLECTION DUE TO REMOVAL OF TEMPORARY BENTS ✳✳ | 0.000 | 0.889 | 1.753 | 2.593 | 3.402 | 4.175 | 4.897 | 5.579 | 6.178 | 6.723 | 7.194 | 7.588 | 7.893 | 8.107 | 8.224 | 8.252 | 8.186 | 8.029 | 7.783 | 7.452 | 7.039 | 6.550 | 5.992 | 5.374 | 4.701 | 3.981 | 3.227 | 2.446 | 1.647 | 0.837 | 0.000 |

✳ THE DEFLECTIONS CAUSED BY THE EXPANSION JOINT CLOSURE POUR (POUR #4), ARE INCLUDED IN THE VALUES SHOWN FOR POURS #1 & #2.

✳✳ TEMPORARY BENTS ARE NOT TO BE REMOVED UNTIL ALL DECK CONCRETE HAS REACHED THE SPECIFIED 28-DAY COMPRESSIVE STRENGTH. THIS VALUE DOES NOT ACCOUNT FOR ANY ADDITIONAL DEFLECTION CAUSED BY COMPOSITE DEAD LOAD.

## NOTES:

ALL DECK POURS INCLUDE THE WEIGHT OF GIRDERS, ALL OTHER STRUCTURAL STEEL COMPONENTS, SAND-LIGHTWEIGHT CONCRETE SLAB, BUILD-UP, STAY-IN-PLACE METAL FORMS, AND ADDITIONAL UNIFORM CONSTRUCTION LOAD (10 PSF).

THIRTIETH POINTS SHOWN ARE MEASURED ALONG ℄ GIRDER AND ARE GIVEN BETWEEN ℄ BEARINGS.

ALL VALUES ARE SHOWN IN INCHES.

FOR POUR SEQUENCE, SEE "SUPERSTRUCTURE BILL OF MATERIALS" SHEET 2 OF 2.

FOR ADDITIONAL INFORMATION REGARDING GIRDER ERECTION AND CONSTRUCTION SEQUENCING, SEE "GIRDER ERECTION DETAILS" SHEETS.

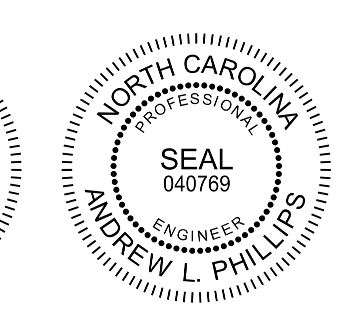
K:\RDT_Structures_Bridge\NC\011035388 - U-5806 Final Design\Cad\Dgn\009_U-5806_CS-DL01.dgn

10/23/2017

DRAWN BY: D. D. LOWERY DATE: 10/17
CHECKED BY: A. L. PHILLIPS DATE: 10/17
DESIGN ENGINEER OF RECORD: S.A. DENNEY DATE: 10/17

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**


DocuSigned by:
Seth A. Denney
E8EB154C09ED410...
10/23/2017




DocuSigned by:
Andrew L. Phillips
2B8B9ABAD4004D3...
10/23/2017

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102



PROJECT NO. U-5806
CABARRUS COUNTY
STATION: 15+75.56 -Y1-
27+06.95 -L-
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTIONS DUE TO SLAB POURS

| REVISIONS | | | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | | NO. | BY: | DATE: | | S-9 |
| 1 | | | | 3 | | | | TOTAL SHEETS |
| 2 | | | | 4 | | | | 50 |

## DECK POUR SEQUENCING DEAD LOAD DEFLECTION TABLE FOR GIRDER 4

| THIRTIETH POINTS | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEFLECTION DUE TO DECK POUR #1 ✱ | 0.000 | -0.005 | -0.007 | -0.007 | -0.002 | 0.006 | 0.053 | 0.101 | 0.151 | 0.203 | 0.253 | 0.298 | 0.336 | 0.366 | 0.386 | 0.395 | 0.394 | 0.381 | 0.357 | 0.324 | 0.283 | 0.236 | 0.185 | 0.133 | 0.083 | 0.037 | -0.001 | -0.008 | -0.011 | -0.009 | 0.000 |
| DEFLECTION DUE TO DECK POUR #2 ✱ | 0.000 | -0.005 | -0.007 | -0.008 | -0.002 | 0.006 | 0.053 | 0.101 | 0.151 | 0.203 | 0.254 | 0.299 | 0.337 | 0.367 | 0.388 | 0.397 | 0.396 | 0.383 | 0.360 | 0.327 | 0.286 | 0.239 | 0.188 | 0.135 | 0.086 | 0.039 | 0.000 | -0.005 | -0.007 | -0.006 | 0.000 |
| DEFLECTION DUE TO DECK POUR #3 | 0.000 | -0.017 | -0.026 | -0.027 | -0.013 | 0.010 | 0.106 | 0.205 | 0.313 | 0.423 | 0.528 | 0.624 | 0.705 | 0.768 | 0.811 | 0.831 | 0.829 | 0.802 | 0.753 | 0.684 | 0.598 | 0.499 | 0.391 | 0.281 | 0.175 | 0.078 | -0.001 | -0.018 | -0.024 | -0.019 | 0.000 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DEFLECTION DUE TO REMOVAL OF TEMPORARY BENTS ✱✱ | 0.000 | 0.749 | 1.470 | 2.172 | 2.846 | 3.493 | 4.096 | 4.664 | 5.166 | 5.622 | 6.015 | 6.340 | 6.594 | 6.771 | 6.872 | 6.892 | 6.835 | 6.696 | 6.479 | 6.187 | 5.830 | 5.408 | 4.931 | 4.410 | 3.847 | 3.247 | 2.620 | 1.978 | 1.327 | 0.671 | 0.000 |

## DECK POUR SEQUENCING DEAD LOAD DEFLECTION TABLE FOR GIRDER 5

| THIRTIETH POINTS | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEFLECTION DUE TO DECK POUR #1 ✱ | 0.000 | -0.001 | -0.001 | -0.002 | 0.001 | 0.005 | 0.036 | 0.065 | 0.096 | 0.128 | 0.159 | 0.186 | 0.210 | 0.228 | 0.240 | 0.245 | 0.244 | 0.236 | 0.222 | 0.202 | 0.177 | 0.148 | 0.116 | 0.084 | 0.052 | 0.024 | 0.002 | -0.005 | -0.007 | -0.006 | 0.000 |
| DEFLECTION DUE TO DECK POUR #2 ✱ | 0.000 | -0.001 | -0.002 | -0.002 | 0.001 | 0.005 | 0.036 | 0.066 | 0.097 | 0.130 | 0.161 | 0.189 | 0.213 | 0.232 | 0.244 | 0.250 | 0.250 | 0.242 | 0.228 | 0.208 | 0.183 | 0.154 | 0.122 | 0.089 | 0.057 | 0.028 | 0.004 | -0.002 | -0.003 | -0.002 | 0.000 |
| DEFLECTION DUE TO DECK POUR #3 | 0.000 | -0.013 | -0.020 | -0.021 | -0.010 | 0.010 | 0.087 | 0.166 | 0.252 | 0.339 | 0.423 | 0.498 | 0.561 | 0.610 | 0.643 | 0.658 | 0.654 | 0.633 | 0.594 | 0.540 | 0.472 | 0.394 | 0.310 | 0.223 | 0.138 | 0.064 | 0.005 | -0.014 | -0.019 | -0.015 | 0.000 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DEFLECTION DUE TO REMOVAL OF TEMPORARY BENTS ✱✱ | 0.000 | 0.605 | 1.185 | 1.741 | 2.272 | 2.772 | 3.242 | 3.678 | 4.066 | 4.413 | 4.711 | 4.955 | 5.144 | 5.274 | 5.345 | 5.357 | 5.308 | 5.201 | 5.035 | 4.815 | 4.542 | 4.222 | 3.859 | 3.455 | 3.017 | 2.554 | 2.068 | 1.564 | 1.052 | 0.533 | 0.000 |

## DECK POUR SEQUENCING DEAD LOAD DEFLECTION TABLE FOR GIRDER 6

| THIRTIETH POINTS | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEFLECTION DUE TO DECK POUR #1 ✱ | 0.000 | -0.002 | -0.003 | -0.004 | 0.000 | 0.007 | 0.040 | 0.073 | 0.111 | 0.148 | 0.183 | 0.215 | 0.241 | 0.262 | 0.275 | 0.280 | 0.278 | 0.268 | 0.251 | 0.227 | 0.198 | 0.164 | 0.128 | 0.091 | 0.059 | 0.026 | 0.000 | -0.005 | -0.007 | -0.005 | 0.000 |
| DEFLECTION DUE TO DECK POUR #2 ✱ | 0.000 | -0.002 | -0.003 | -0.004 | 0.000 | 0.007 | 0.040 | 0.074 | 0.112 | 0.151 | 0.187 | 0.219 | 0.247 | 0.268 | 0.282 | 0.288 | 0.286 | 0.277 | 0.260 | 0.236 | 0.207 | 0.173 | 0.137 | 0.099 | 0.065 | 0.030 | 0.001 | -0.003 | -0.004 | -0.003 | 0.000 |
| DEFLECTION DUE TO DECK POUR #3 | 0.000 | -0.012 | -0.018 | -0.019 | -0.009 | 0.013 | 0.084 | 0.160 | 0.243 | 0.327 | 0.406 | 0.477 | 0.536 | 0.582 | 0.611 | 0.624 | 0.620 | 0.599 | 0.561 | 0.508 | 0.443 | 0.369 | 0.289 | 0.207 | 0.130 | 0.058 | 0.001 | -0.012 | -0.015 | -0.011 | 0.000 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DEFLECTION DUE TO REMOVAL OF TEMPORARY BENTS ✱✱ | 0.000 | 0.454 | 0.882 | 1.292 | 1.680 | 2.049 | 2.395 | 2.717 | 3.007 | 3.268 | 3.490 | 3.676 | 3.820 | 3.924 | 3.983 | 4.000 | 3.971 | 3.901 | 3.787 | 3.633 | 3.438 | 3.207 | 2.944 | 2.651 | 2.332 | 1.984 | 1.616 | 1.231 | 0.831 | 0.422 | 0.000 |

✱ THE DEFLECTIONS CAUSED BY THE EXPANSION JOINT CLOSURE POUR (POUR #4), ARE INCLUDED IN THE VALUES SHOWN FOR POURS #1 & #2.

✱✱ TEMPORARY BENTS ARE NOT TO BE REMOVED UNTIL ALL DECK CONCRETE HAS REACHED THE SPECIFIED 28-DAY COMPRESSIVE STRENGTH. THIS VALUE DOES NOT ACCOUNT FOR ANY ADDITIONAL DEFLECTION CAUSED BY COMPOSITE DEAD LOAD.

## NOTES:

ALL DECK POURS INCLUDE THE WEIGHT OF GIRDERS, ALL OTHER STRUCTURAL STEEL COMPONENTS, SAND-LIGHTWEIGHT CONCRETE SLAB, BUILD-UP, STAY-IN-PLACE METAL FORMS, AND ADDITIONAL UNIFORM CONSTRUCTION LOAD (10 PSF).

THIRTIETH POINTS SHOWN ARE MEASURED ALONG ℄ GIRDER AND ARE GIVEN BETWEEN ℄ BEARINGS.

ALL VALUES ARE SHOWN IN INCHES.

FOR POUR SEQUENCE, SEE "SUPERSTRUCTURE BILL OF MATERIALS" SHEET 2 OF 2.

FOR ADDITIONAL INFORMATION REGARDING GIRDER ERECTION AND CONSTRUCTION SEQUENCING, SEE "GIRDER ERECTION DETAILS" SHEETS.

10/23/2017 K:\RDT_Structures_Bridge\NC\011036388 - U-5806 Final Design\Cad\Dgn\010_U-5806_CS-DL02.dgn

DRAWN BY: D. D. LOWERY DATE: 10/17
CHECKED BY: A. L. PHILLIPS DATE: 10/17
DESIGN ENGINEER OF RECORD: S.A. DENNEY DATE: 10/17

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

NORTH CAROLINA PROFESSIONAL SEAL 033752 ENGINEER SETH A. DENNEY
DocuSigned by: Seth A. Denney
E8EB154CC9ED410...
10/23/2017

NORTH CAROLINA PROFESSIONAL SEAL 040769 ENGINEER ANDREW L. PHILLIPS
DocuSigned by: Andrew L. Phillips
2B869ABAD4004D3...
10/23/2017

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102



PROJECT NO. U-5806
CABARRUS COUNTY
STATION: 15+75.56 -Y1-
27+06.95 -L-
SHEET 2 OF 2

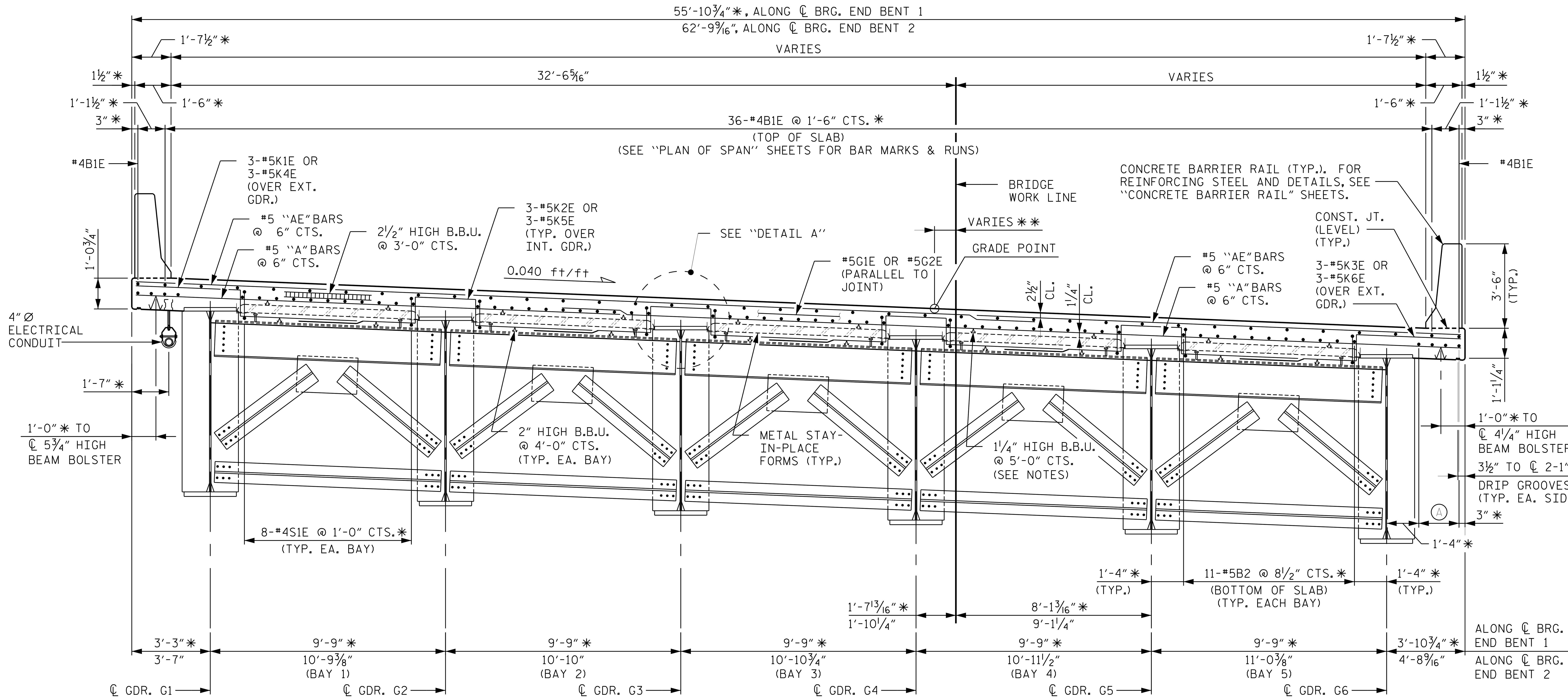
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

# DEAD LOAD DEFLECTIONS DUE TO SLAB POURS

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

SHEET NO. S-10
TOTAL SHEETS 50




TYPICAL SECTION AT END BENT DIAPHRAGMS

# TYPICAL SECTION

*RADIAL DIMENSIONS

** 10⅝" (RADIAL DIMENSION) ALONG ℄ BRG. END BENT 1
5'-0¹¹⁄₁₆" ALONG ℄ BRG. END BENT 2

Ⓐ 4-#5B2 @ EQ. SPA. (TYP. EA. OVERHANG)

## NOTES:

PROVIDE 1¼" HIGH BEAM BOLSTERS UPPER AT 5'-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.) @ 5'-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.

FOR MORE INFORMATION REGARDING THE DIAPHRAGMS SEE "STRUCTURAL STEEL DETAILS" SHEETS.

BARRIER RAIL SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE HAS BEEN CAST AND REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI. FOR MORE INFORMATION SEE CONSTRUCTION SEQUENCE.

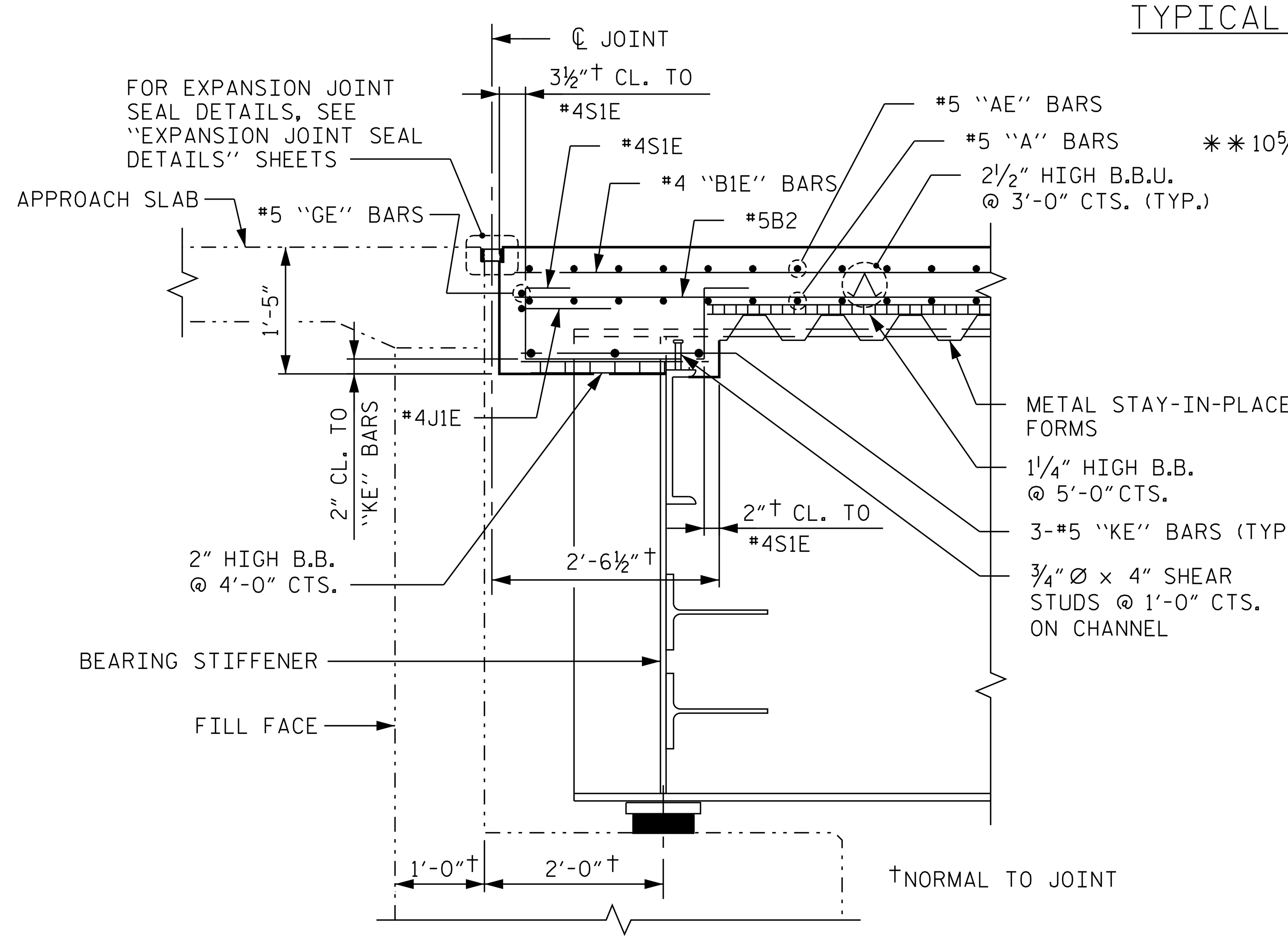
REINFORCING STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR EXPANSION JOINT COMPONENTS.

THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN METAL STAY-IN-PLACE FORM SUPPORTS OR FORMS AND GIRDER STIFFENERS OR CONNECTOR PLATES. THE PROPOSAL SHALL BE INDICATED, AS APPROPRIATE, ON EITHER THE STEEL WORKING DRAWINGS OR THE METAL STAY-IN-PLACE FORM WORKING DRAWING.

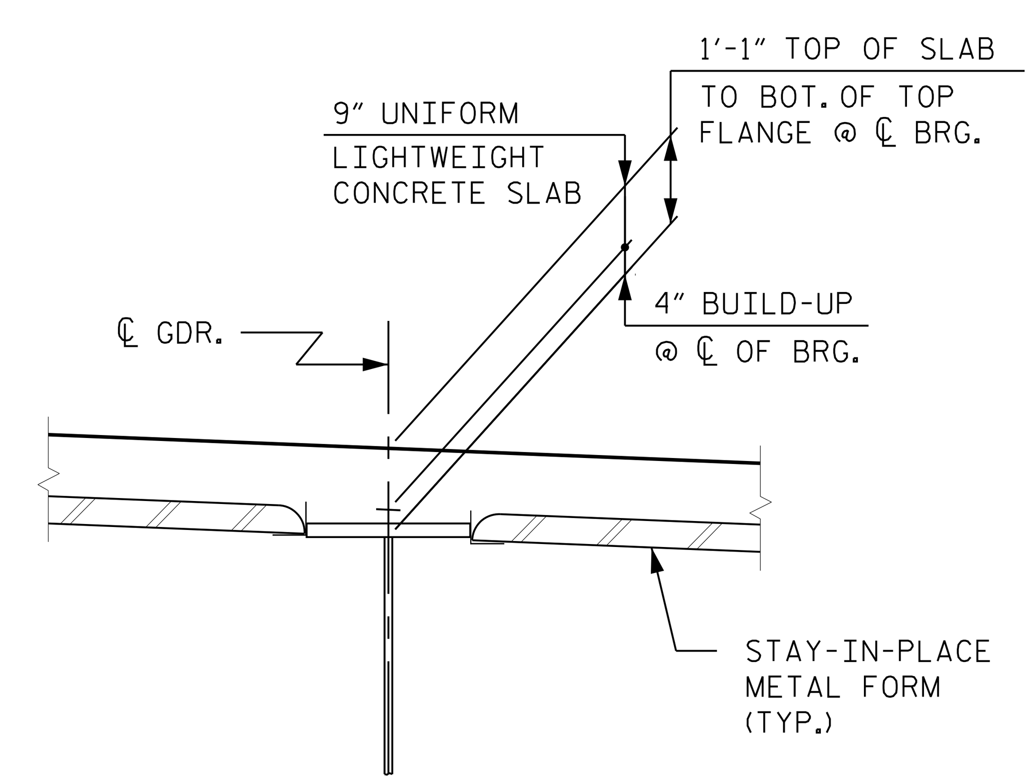
THE CONTRACTOR SHALL ADJUST THE GIRDER BUILD-UPS AS NECESSARY TO INCORPORATE A MAXIMUM PERMISSIBLE VARIATION IN DISC BEARING DEPTH OF 2". SEE SPECIAL PROVISION FOR DISC BEARINGS.

THE CONTRACTOR SHALL ENSURE THE STABILITY OF THE GIRDER WEB DURING CONSTRUCTION BASED ON THE OVERHANG SUPPORT SYSTEM USED.

FOR 4"Ø ELECTRICAL CONDUIT DETAILS, SEE "ELECTRICAL CONDUIT SYSTEM FOR SIGNALS" SHEET.




SECTION THRU END BENT DIAPHRAGM




DETAIL "A"
(TYP. @ EA. GDR.)

PROJECT NO. U-5806
CABARRUS COUNTY
STATION: 15+75.56 -Y1-
27+06.95 -L-

SHEET 1 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 033752 ENGINEER SETH A. DENNEY
DocuSigned by: Seth A. Denney
E8EB154CC9E0410...
10/23/2017

NORTH CAROLINA PROFESSIONAL SEAL 040769 ENGINEER ANDREW L. PHILLIPS
DocuSigned by: Andrew L. Phillips
2B869ABAD4004D3...
10/23/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102



**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

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

SHEET NO. S-11
TOTAL SHEETS 50

| | |
|---|---|
| DRAWN BY: D. D. LOWERY | DATE: 10/17 |
| CHECKED BY: A. L. PHILLIPS | DATE: 10/17 |
| DESIGN ENGINEER OF RECORD: S. A. DENNEY | DATE: 10/17 |

10/23/2017 K:\RDT_Structures_Bridge\NC\011036388 -U-5806 FinalDesign\Cad\Dgn\011_U-5806_TS01.dgn

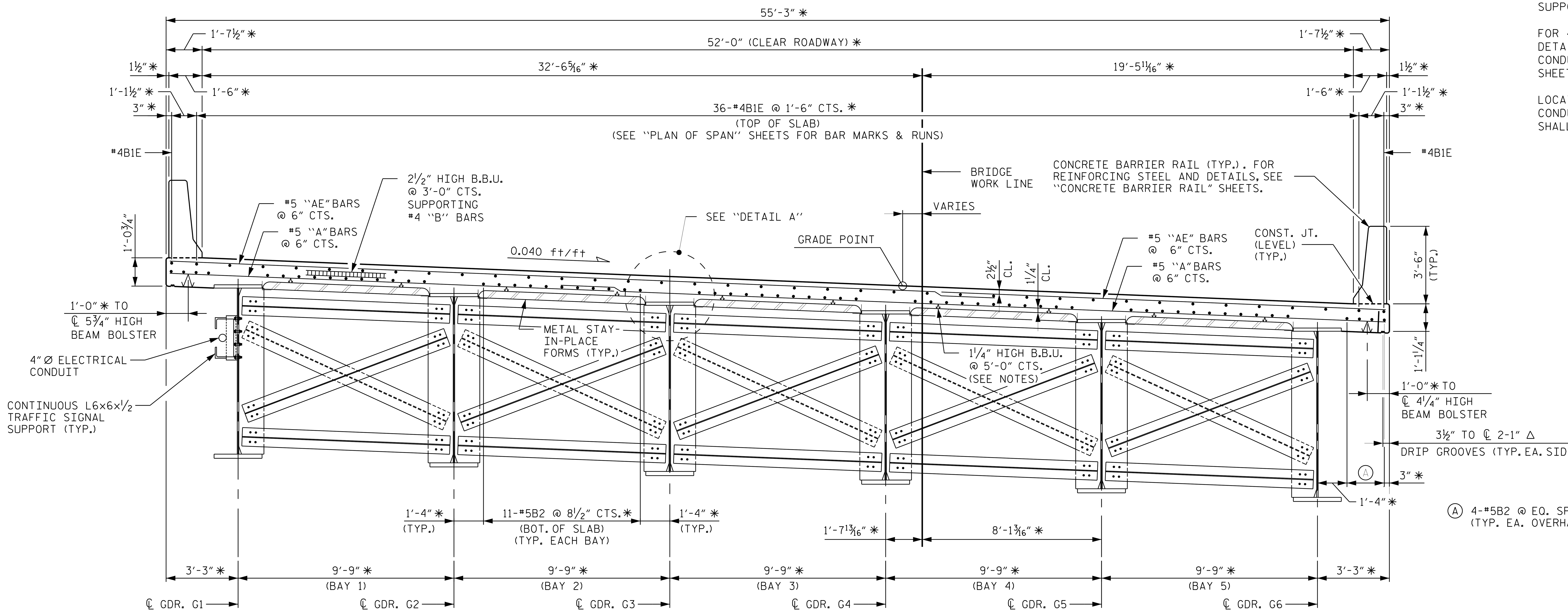
NOTES:

FOR NOTES, SEE SHEET 1 OF 2.

FOR TRAFFIC SIGNAL SUPPORT LOCATIONS AND ADDITIONAL DETAILS, SEE "TRAFFIC SIGNAL SUPPORT DETAILS" SHEET.

FOR 4"Ø ELECTRICAL CONDUIT DETAILS, SEE "ELECTRICAL CONDUIT SYSTEM FOR SIGNALS" SHEET.

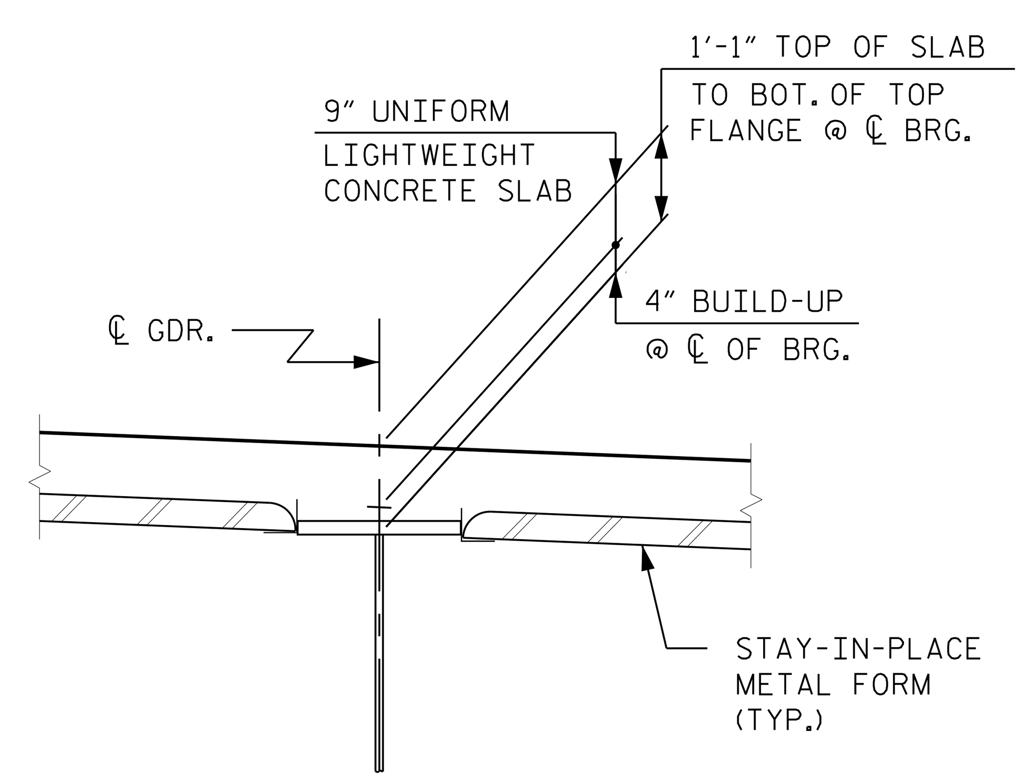
LOCATION OF 4"Ø ELECTRICAL CONDUIT IS NOT EXACT AND SHALL BE FIELD VERIFIED.




TYPICAL SECTION AT INTERMEDIATE DIAPHRAGMS

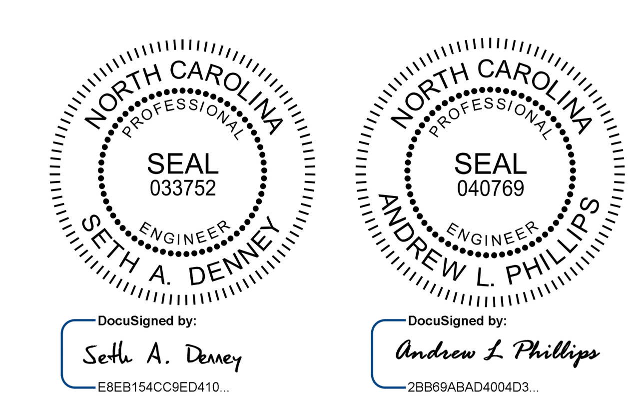
## TYPICAL SECTION

✱ RADIAL DIMENSIONS




DETAIL "A"

(TYP. @ EA. GDR.)




PROJECT NO. U-5806

CABARRUS COUNTY

STATION: 15+75.56 -Y1-
27+06.95 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102



DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

| REVISIONS | | | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | | | S-12 |
| 1 | | | 3 | | | | | TOTAL SHEETS |
| 2 | | | 4 | | | | | 50 |

| | |
|---|---|
| DRAWN BY: D. D. LOWERY | DATE: 10/17 |
| CHECKED BY: A. L. PHILLIPS | DATE: 10/17 |
| DESIGN ENGINEER OF RECORD: S.A. DENNEY | DATE: 10/17 |


## NOTES:

FOR POUR SEQUENCE AND LOCATION OF CONSTRUCTION JOINT, SEE SUPERSTRUCTURE "BILL OF MATERIAL" SHEET 2 OF 2.

#5 "AE" AND "A" BARS TO BE PLACED PERPENDICULAR TO LONG CHORD.

#4 "JE" BARS TO BE PLACED AS SPECIFIED ON THE "EXPANSION JOINT SEAL DETAIL" SHEET.

FOR REINFORCING STEEL AND DETAILS IN CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEETS.

FOR DETAILS A, B, C, AND, D, SEE "PLAN OF SPAN" SHEET 2 OF 2.

## PLAN OF SPAN

* DENOTES RADIAL DIMENSIONS

PROJECT NO. U-5806

CABARRUS COUNTY

STATION: 15+75.56 -Y1-
27+06.95 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033752 SETH A. DENNEY
DocuSigned by: Seth A. Denney
E8EB154C09E0410...
10/23/2017

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040769 ANDREW L. PHILLIPS
DocuSigned by: Andrew L. Phillips
2BB69ABAD4004D3...
10/23/2017

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102



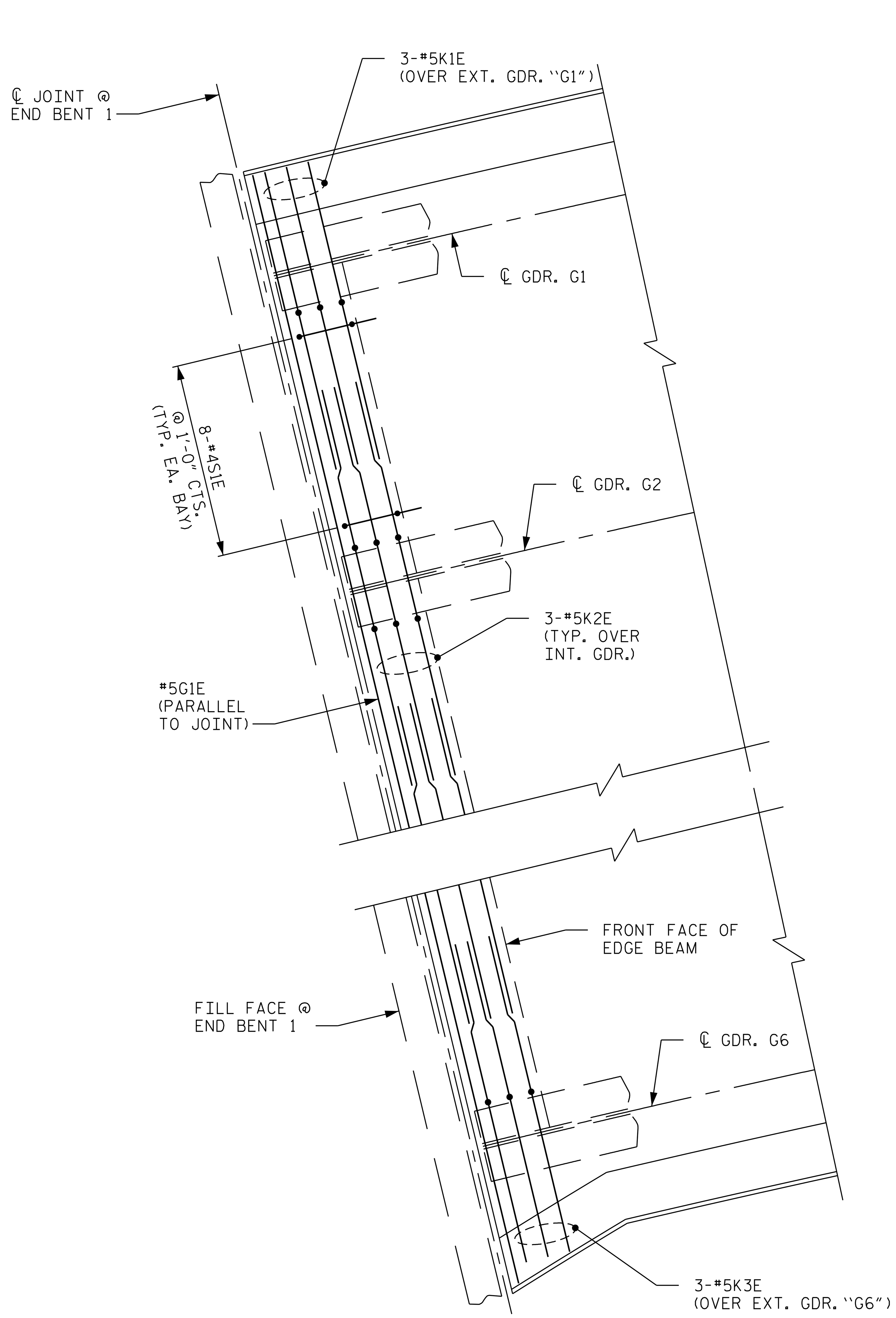
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

| DRAWN BY: D. D. LOWERY | DATE: 10/17 |
|---|---|
| CHECKED BY: A. L. PHILLIPS | DATE: 10/17 |
| DESIGN ENGINEER OF RECORD: S.A. DENNEY | DATE: 10/17 |

REVISIONS

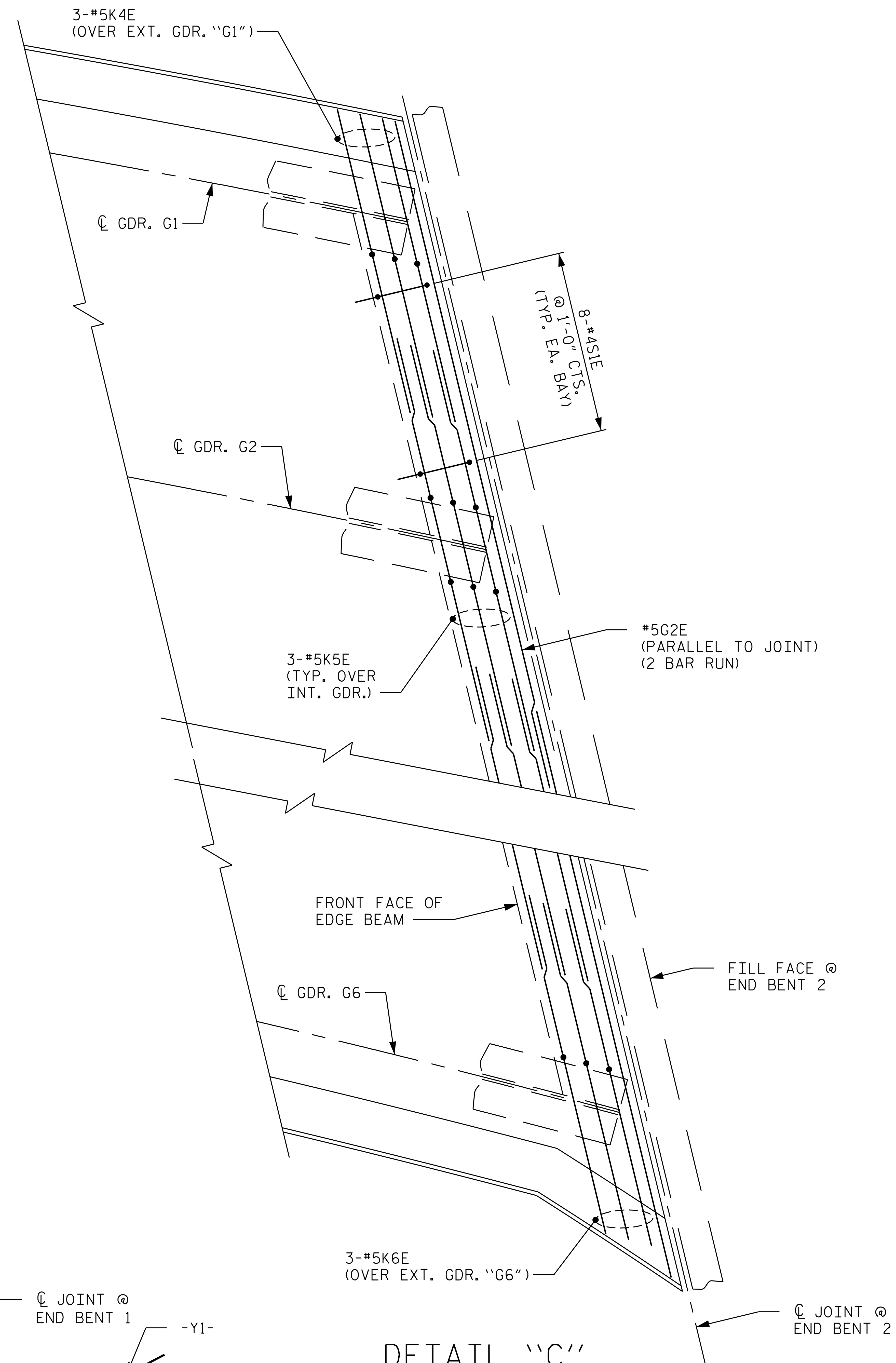
| NO. | BY: | DATE: | NO. | BY: | DATE: |
|---|---|---|---|---|---|
| 1 | | | 3 | | |
| 2 | | | 4 | | |

SHEET NO. S-13
TOTAL SHEETS 50



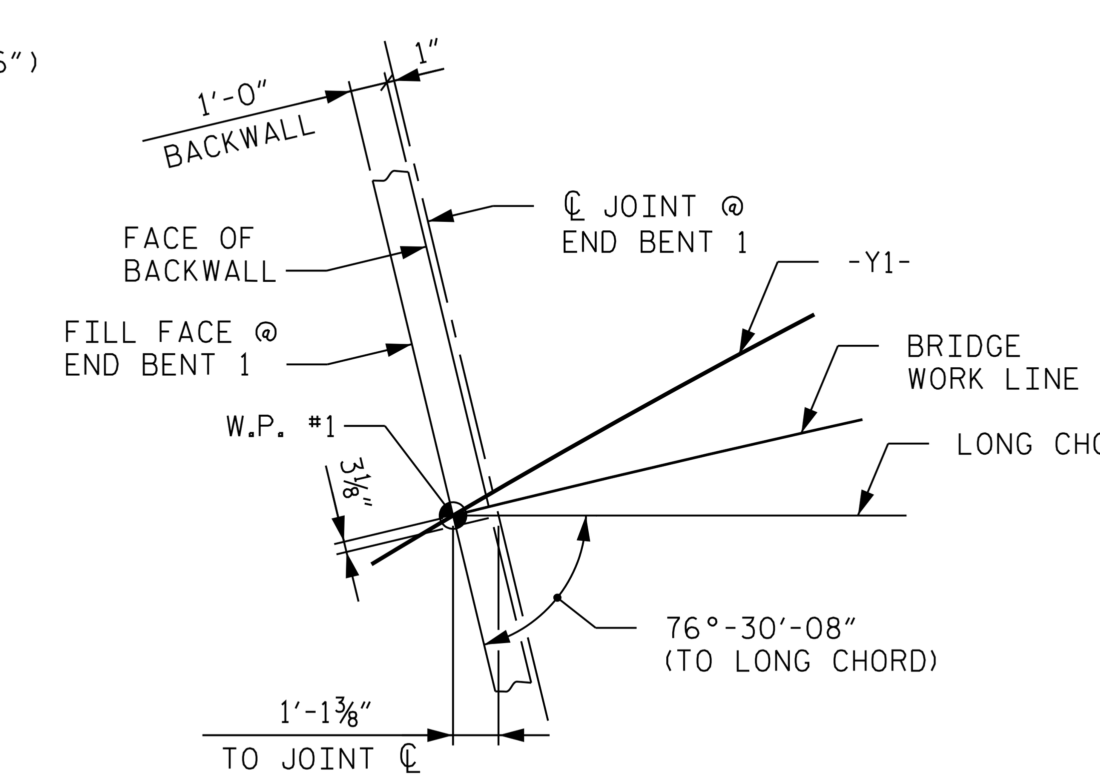

DETAIL "A"

DECK REINFORCING NOT SHOWN
FOR CLARITY

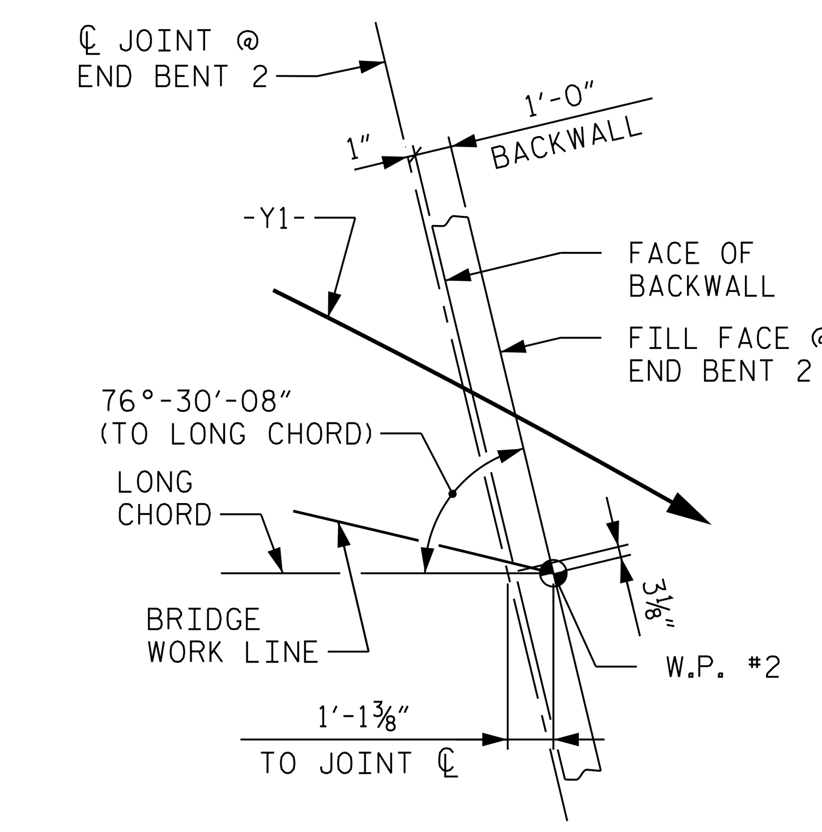



DETAIL "C"

DECK REINFORCING NOT SHOWN
FOR CLARITY




DETAIL "B"




DETAIL "D"

PROJECT NO. U-5806
CABARRUS COUNTY
STATION: 15+75.56 -Y1-
27+06.95 -L-
SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 033752 ENGINEER SETH A. DENNEY
DocuSigned by: Seth A. Denney
E8EB154C09ED410...
10/23/2017

NORTH CAROLINA PROFESSIONAL SEAL 040769 ENGINEER ANDREW L. PHILLIPS
DocuSigned by: Andrew L. Phillips
2B869ABAD4004D3...
10/23/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102

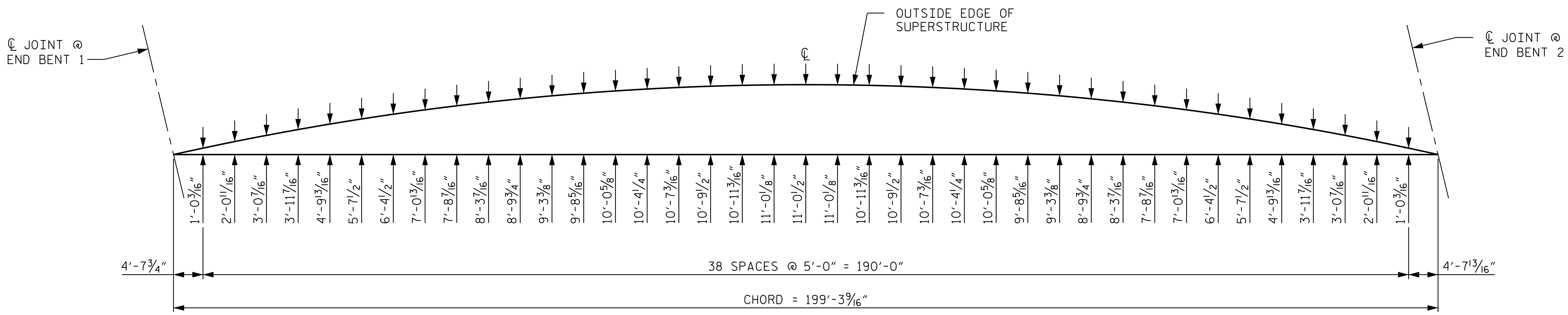


DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

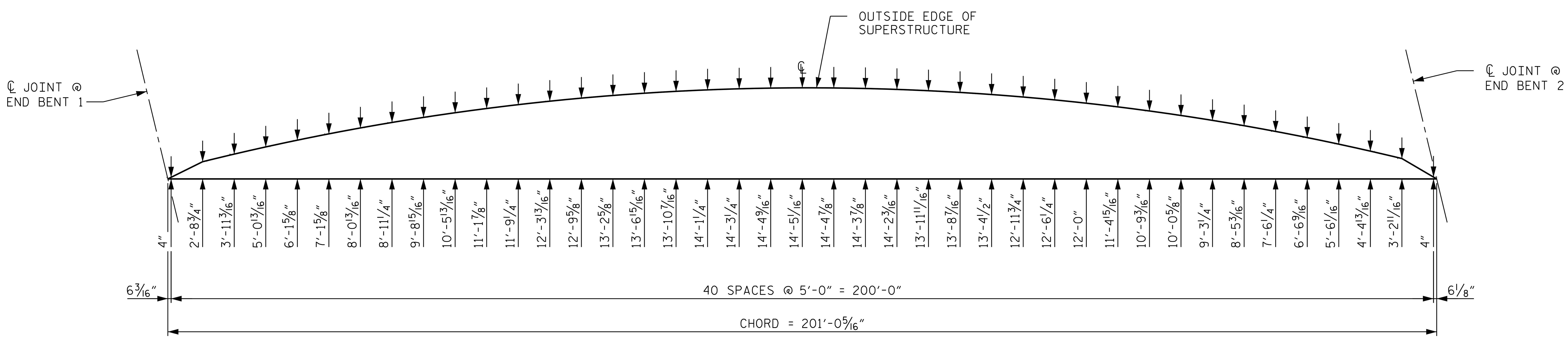
| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-14 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 50 |

DRAWN BY: D.D.LOWERY DATE: 10/17
CHECKED BY: A.L.PHILLIPS DATE: 10/17
DESIGN ENGINEER OF RECORD: S.A.DENNEY DATE: 10/17

10/23/2017 K:\RDI_Structures_Bridge\NC\011036388 - U-5806 FinalDesign\Cad\Dgn\014_U-5806_S02.dgn




LEFT SIDE




RIGHT SIDE

# ARC OFFSETS - SPAN A

PROJECT NO. U-5806

CABARRUS COUNTY

STATION: 15+75.56 -Y1-
27+06.95 -L-

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033752 SETH A. DENNEY
DocuSigned by: Seth A. Denney
E8EB154C09ED410...
10/23/2017

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040769 ANDREW L. PHILLIPS
DocuSigned by: Andrew L. Phillips
2B869ABAD4004D3...
10/23/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

ARC OFFSETS

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102



**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-15 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 50 |

| | |
|---|---|
| DRAWN BY: D.D.LOWERY | DATE: 10/17 |
| CHECKED BY: A.L.PHILLIPS | DATE: 10/17 |
| DESIGN ENGINEER OF RECORD: S.A.DENNEY | DATE: 10/17 |

10/23/2017 K:\RDT_Structures_Bridge\NC\011035388 - U-5806 FinalDesign\Cad\Dgn\015_U-5806_AR001.dgn


# FRAMING PLAN

✱ DENOTES RADIAL DIMENSIONS
+ GIRDER DIMENSIONS ALONG FILL FACE OF END BENT 1 ARE EQUAL TO THE RADIAL DIMENSIONS
ALL HORIZONTAL DIMENSIONS SHOWN ARE ALONG ℄ GIRDER, U.N.O.

## NOTES:

SEE "STRUCTURAL STEEL DETAIL" SHEET 3 OF 5 FOR STRUCTURAL STEEL NOTES.

FOR LOCATION OF SUPPORT BRACKETS AND TIE PLATES RELATING TO TRAFFIC SIGNAL SUPPORT, SEE "TRAFFIC SIGNAL SUPPORT DETAILS" SHEET.

| GIRDER SEGMENT LENGTHS | | | |
|---|---|---|---|
| GIRDER | S1 | S2 | S3 |
| G1 | 48′-9″ | 112′-6″ | 35′-8 7/8″ |
| G2 | 47′-8 3/8″ | 110′-0 7/8″ | 39′-6 1/4″ |
| G3 | 46′-7 3/4″ | 114′-9 7/8″ | 36′-1 3/4″ |
| G4 | 45′-7 1/8″ | 112′-2 13/16″ | 40′-1 11/16″ |
| G5 | 44′-6 1/2″ | 116′-6″ | 37′-3 11/16″ |
| G6 | 43′-5 7/8″ | 113′-9″ | 41′-6 1/4″ |

| GIRDER | ANGLE "A" (TANGENT TO CURVE) | ANGLE "B" (TANGENT TO CURVE) |
|---|---|---|
| G1 | 90°-22′-49″ | 64°-36′-34″ |
| G2 | 90°-23′-19″ | 64°-00′-30″ |
| G3 | 90°-23′-51″ | 63°-22′-37″ |
| G4 | 90°-24′-24″ | 62°-42′-45″ |
| G5 | 90°-24′-58″ | 62°-00′-45″ |
| G6 | 90°-25′-35″ | 61°-16′-26″ |

| ANGLES | |
|---|---|
| 1 | 90°-24′-29″ (TANGENT TO CURVE BRIDGE WORK LINE) |
| 2 | 62°-35′-47″ (TANGENT TO CURVE BRIDGE WORK LINE) |

PROJECT NO. U-5806
CABARRUS COUNTY
STATION: 15+75.56 -Y1-
27+06.95 -L-

NORTH CAROLINA PROFESSIONAL SEAL 033752 ENGINEER SETH A. DENNEY
DocuSigned by: Seth A. Denney
E8EB154CC9ED410...
10/23/2017

NORTH CAROLINA PROFESSIONAL SEAL 040769 ENGINEER ANDREW L. PHILLIPS
DocuSigned by: Andrew L. Phillips
2B869ABAD4004D3...
10/23/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102



**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

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

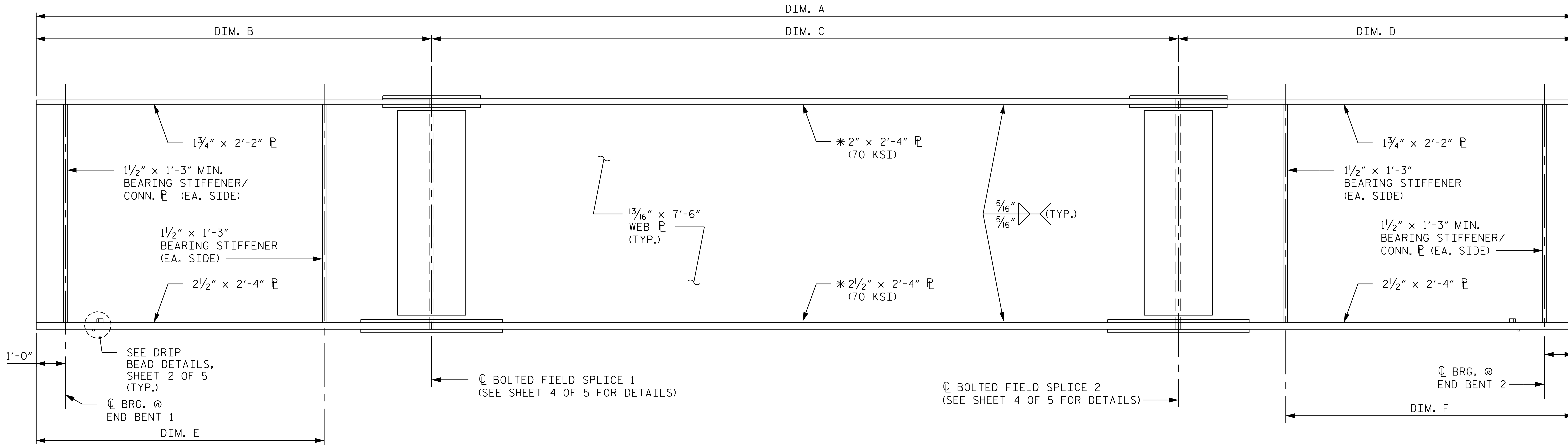
SHEET NO. S-16
TOTAL SHEETS 50

DRAWN BY: D. D. LOWERY DATE: 10/17
CHECKED BY: A. L. PHILLIPS DATE: 10/17
DESIGN ENGINEER OF RECORD: S.A. DENNEY DATE: 10/17

NOTES:

FOR STRUCTURAL STEEL NOTES, SEE SHEET 3 OF 5.

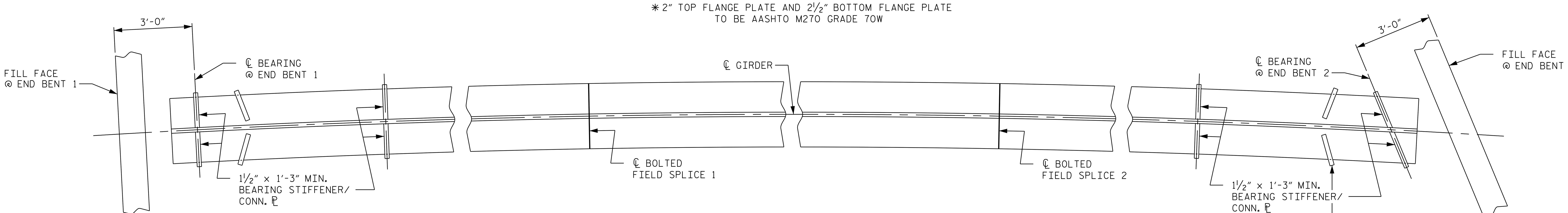
DIM. E & F ARE TO THE BEARING STIFFENERS PROVIDED AT THE LOCATION OF THE TEMPORARY SUPPORTS.




## PLATE GIRDER ELEVATION

SEE GIRDER TABLE (ALL DIMENSIONS ARE ALONG ARC AT ℄ GIRDER)
SHEAR STUDS NOT SHOWN, SEE SHEET 2 OF 5 FOR SHEAR STUD LOCATIONS

✱2" TOP FLANGE PLATE AND 2½" BOTTOM FLANGE PLATE TO BE AASHTO M270 GRADE 70W




## BOTTOM FLANGE DETAIL

GIRDER TABLE

| GIRDER | RADIUS | DIM. A | DIM. B | DIM. C | DIM. D | DIM. E ✱✱ | DIM. F ✱✱ |
|---|---|---|---|---|---|---|---|
| G1 | 452'-0" | 198'-11⅞" | 49'-9" | 112'-6" | 36'-8⅞" | 33'-6 9/16" | 28'-1 1/16" |
| G2 | 442'-3" | 199'-3½" | 48'-8⅜" | 110'-0⅞" | 40'-6¼" | 33'-6 9/16" | 28'-2 7/16" |
| G3 | 432'-6" | 199'-7⅜" | 47'-7¾" | 114'-9⅞" | 37'-1¾" | 33'-6⅝" | 28'-3⅞" |
| G4 | 422'-9" | 199'-11⅝" | 46'-7⅛" | 112'-2 13/16" | 41'-1 11/16" | 33'-6⅝" | 28'-5 7/16" |
| G5 | 413'-0" | 200'-4 3/16" | 45'-6½" | 116'-6" | 38'-3 11/16" | 33'-6⅝" | 28'-7 3/16" |
| G6 | 403'-3" | 200'-9⅛" | 44'-5⅞" | 113'-9" | 42'-6¼" | 33'-6 11/16" | 28'-9 1/16" |

✱✱ LOCATION OF BEARING STIFFENERS FOR TEMPORARY BENTS SHALL BE ADJUSTED IF ACTUAL LOCATION OF TEMPORARY BENTS ARE DIFFERENT THAN INDICATED.

PROJECT NO. U-5806
CABARRUS COUNTY
STATION: 15+75.56 -Y1-
27+06.95 -L-

SHEET 1 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 033752 ENGINEER SETH A. DENNEY
DocuSigned by: Seth A. Denney
E8EB154C0E0410...
10/23/2017

NORTH CAROLINA PROFESSIONAL SEAL 040769 ENGINEER ANDREW L. PHILLIPS
DocuSigned by: Andrew L. Phillips
2B869ABAD4004D3...
10/23/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102

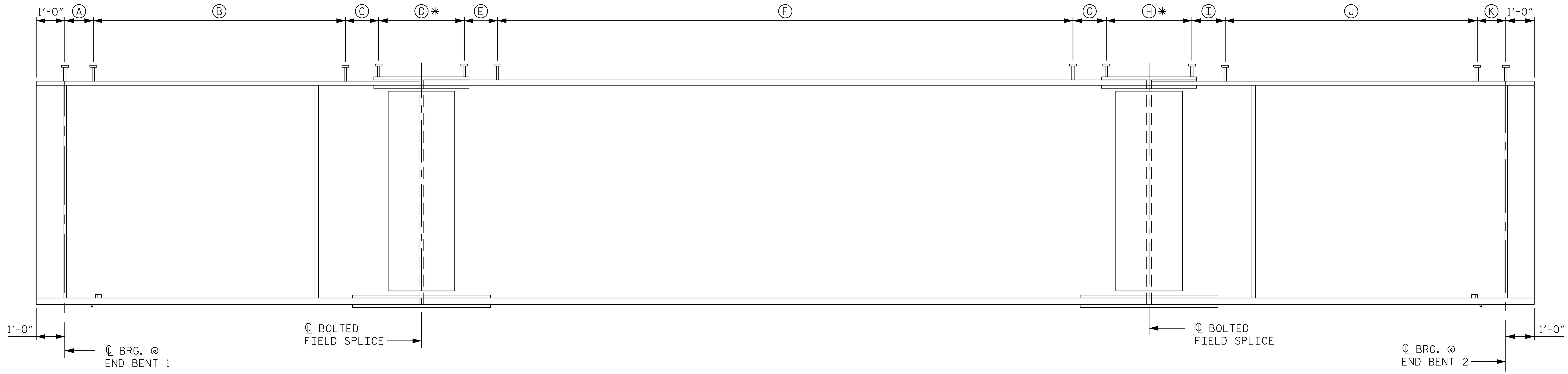


DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SHEET NO. S-17
TOTAL SHEETS 50

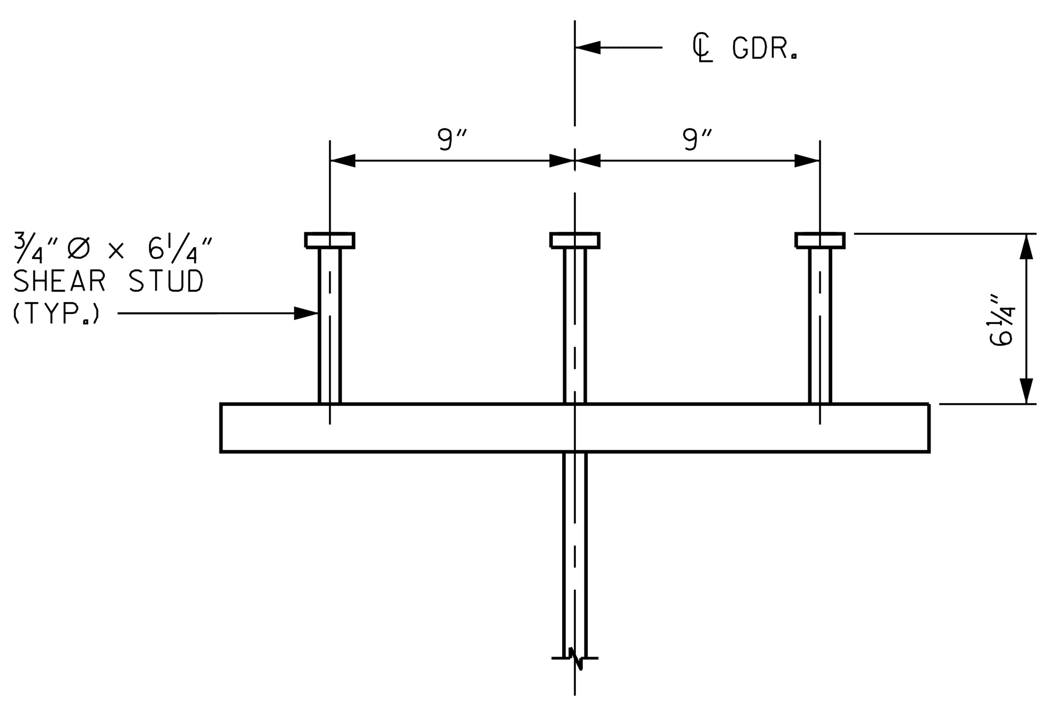
DRAWN BY: D.D.LOWERY DATE: 10/17
CHECKED BY: A.L.PHILLIPS DATE: 10/17
DESIGN ENGINEER OF RECORD: S.A.DENNEY DATE: 10/17




✱ FOR SPACING OF SHEAR STUDS, SEE BOLTED FIELD SPLICE, SHEET 4 OF 5.

## SHEAR STUD LOCATIONS FOR GIRDERS

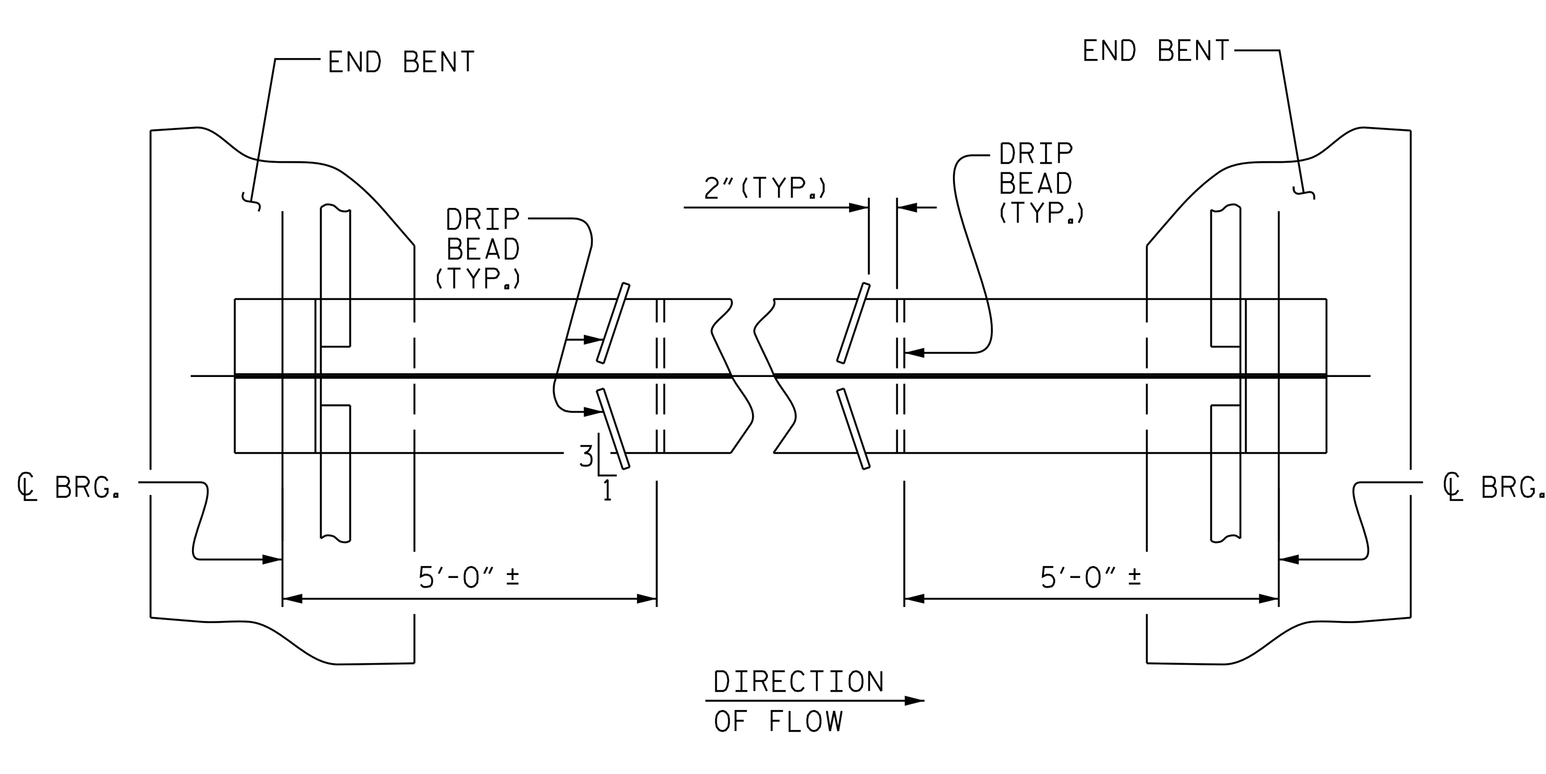
(ALL DIMENSIONS ARE ALONG ARC)



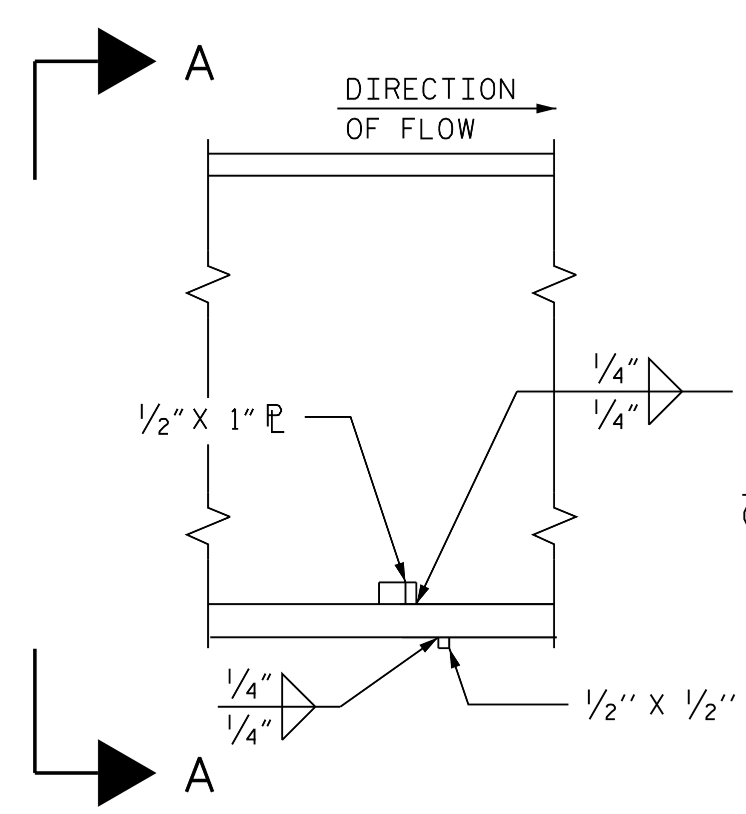

## SHEAR STUD DETAILS

(TYP. EA. GIRDER)

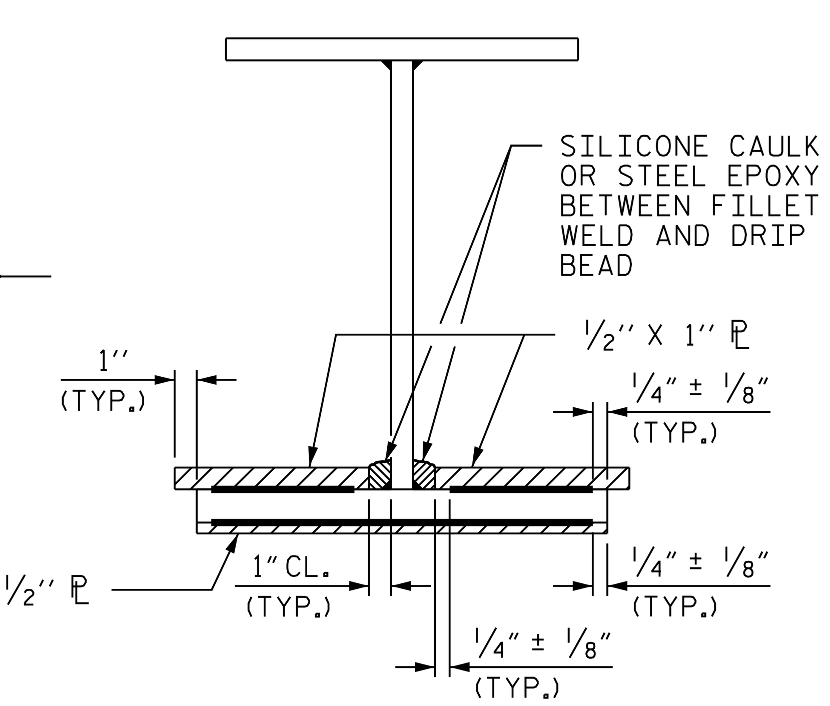
| SHEAR STUD SPACING | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| GIRDER | A | B | C | D ✱ | E | F | G | H ✱ | I | J | K |
| G1 | 1'-0" | 45 SPA. @ 1'-0" | 6" | 4 SPA. @ 1'-1½" | 10½" | 85 SPA. @ 1'-3" | 10½" | 4 SPA. @ 1'-1½" | 5⅞" | 32 SPA. @ 1'-0" | 1'-0" |
| G2 | 1'-0" | 44 SPA. @ 1'-0" | 5⅜" | 4 SPA. @ 1'-1½" | 10 15/16" | 83 SPA. @ 1'-3" | 10 15/16" | 4 SPA. @ 1'-1½" | 9¼" | 36 SPA. @ 1'-0" | 6" |
| G3 | 1'-0" | 43 SPA. @ 1'-0" | 4¾" | 4 SPA. @ 1'-1½" | 9 7/16" | 87 SPA. @ 1'-3" | 9 7/16" | 4 SPA. @ 1'-1½" | 10¾" | 32 SPA. @ 1'-0" | 1'-0" |
| G4 | 1'-0" | 42 SPA. @ 1'-0" | 4⅛" | 4 SPA. @ 1'-1½" | 8⅞" | 85 SPA. @ 1'-3" | 8 15/16" | 4 SPA. @ 1'-1½" | 10 11/16" | 36 SPA. @ 1'-0" | 1'-0" |
| G5 | 6" | 41 SPA. @ 1'-0" | 9½" | 4 SPA. @ 1'-1½" | 1'-0" | 88 SPA. @ 1'-3" | 1'-0" | 4 SPA. @ 1'-1½" | 6 11/16" | 34 SPA. @ 1'-0" | 6" |
| G6 | 6" | 40 SPA. @ 1'-0" | 8⅞" | 4 SPA. @ 1'-1½" | 10½" | 86 SPA. @ 1'-3" | 10½" | 4 SPA. @ 1'-1½" | 9¼" | 38 SPA. @ 1'-0" | 6" |




PART PLAN - BOTTOM FLANGE




SECTION




VIEW A-A

## DRIP BEAD DETAILS

PROJECT NO. U-5806

CABARRUS COUNTY

STATION: 15+75.56 -Y1-
27+06.95 -L-

SHEET 2 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 033752 ENGINEER SETH A. DENNEY
DocuSigned by: Seth A. Denney
E8EB154CC9ED410...
10/23/2017

NORTH CAROLINA PROFESSIONAL SEAL 040769 ENGINEER ANDREW L. PHILLIPS
DocuSigned by: Andrew L. Phillips
2B869ABAD40403...
10/23/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102

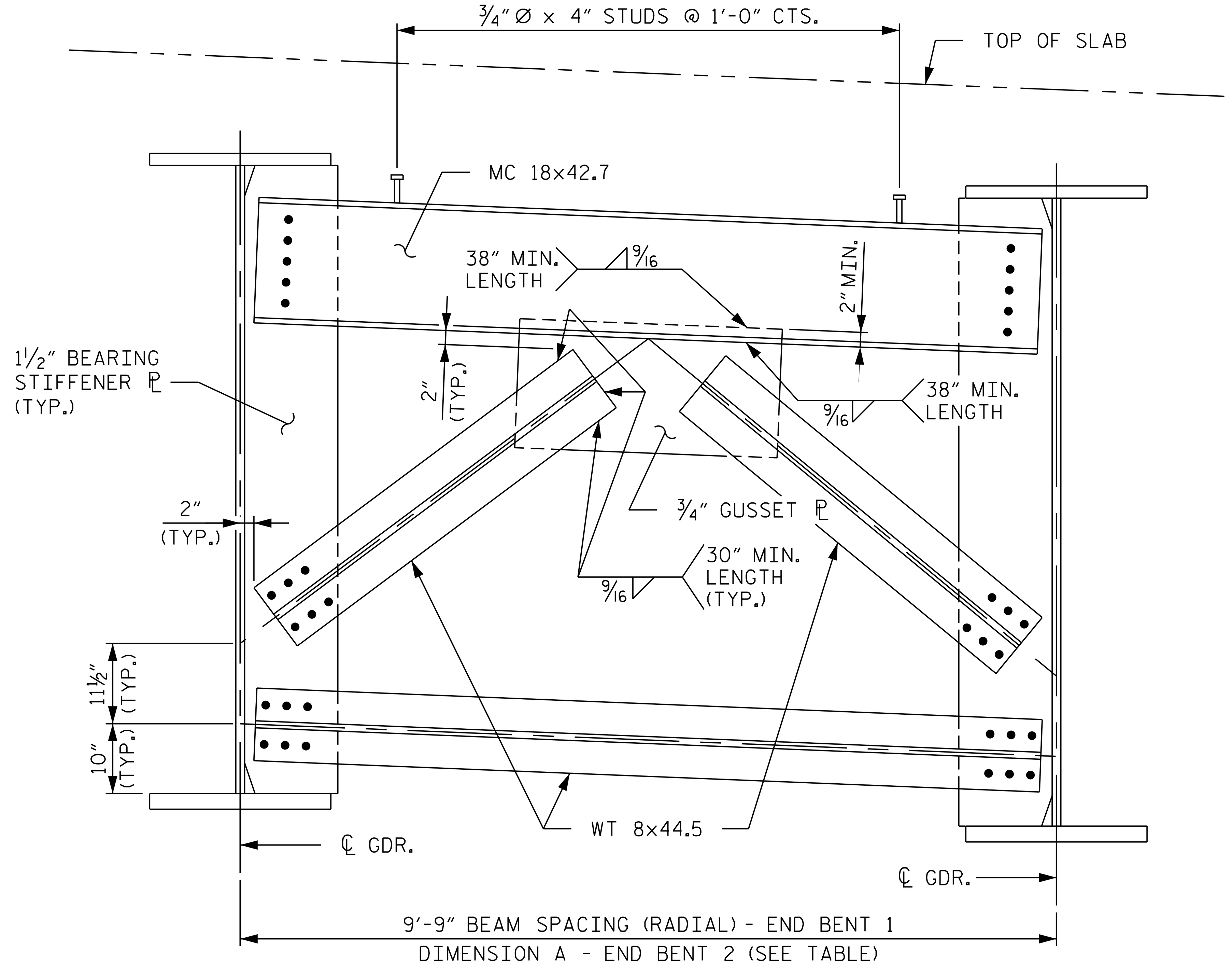


**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

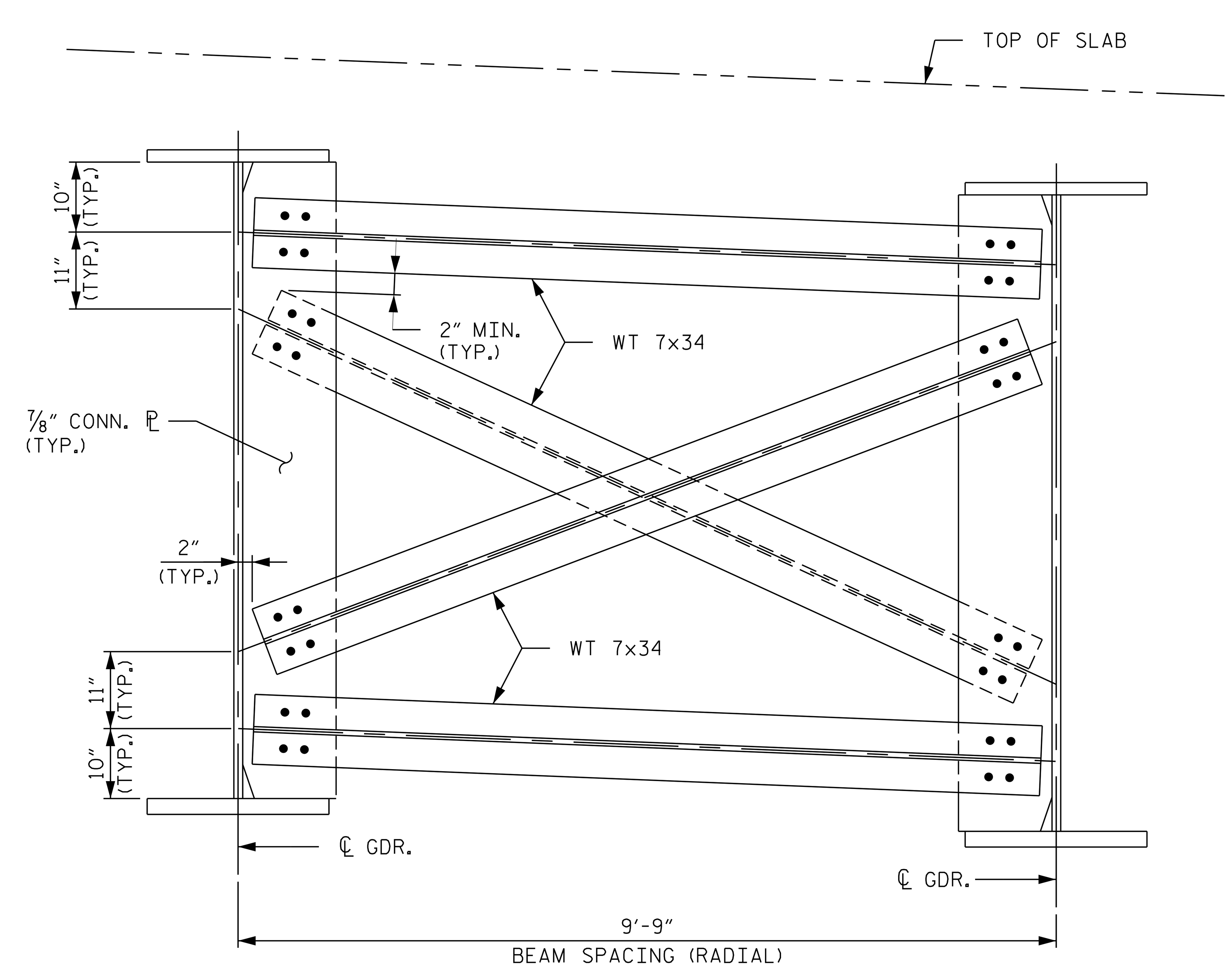
| REVISIONS | | | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | | NO. | BY: | DATE: | | S-18 |
| 1 | | | | 3 | | | | TOTAL SHEETS |
| 2 | | | | 4 | | | | 50 |

DRAWN BY: D. D. LOWERY DATE: 10/17
CHECKED BY: A. L. PHILLIPS DATE: 10/17
DESIGN ENGINEER OF RECORD: S.A. DENNEY DATE: 10/17

10/23/2017 K:\RDI_Structures_Bridge\NC\011036388 - U-5806 FinalDesign\Cad\Dgn\018_U-5806_SD02.dgn




TYPICAL END BENT DIAPHRAGM




TYPICAL INTERMEDIATE DIAPHRAGM

# STRUCTURAL STEEL NOTES

THE TOP AND BOTTOM FLANGES IN THE MIDDLE SECTION (SEGMENT 2) OF SPAN A SHALL BE AASHTO M270 GRADE 70W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-8 OF THE STANDARD SPECIFICATIONS.

ALL OTHER STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-8 OF THE STANDARD SPECIFICATIONS.

ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL, UNLESS OTHERWISE NOTED.

ALL FIELD CONNECTIONS TO BE 1" DIA. HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.

BEARING STIFFENERS ARE TO BE PLACED NORMAL TO THE WEB OF THE GIRDERS AND SHALL BE PLUMB, EXCEPT AT END BENT 2. SEE "CONNECTION PLATE DETAILS @ END BENT 2 END".

A CHARPY V-NOTCH TEST IS REQUIRED FOR WEB PLATES, WEB SPLICE PLATES, BOTTOM FLANGE PLATES, AND BOTTOM FLANGE SPLICE PLATES. A CHARPY V-NOTCH TEST IS REQUIRED FOR TOP FLANGE PLATES WITHIN 36 FEET OF THE ENDS OF GIRDERS. CHARPY V-NOTCH TESTS SHALL BE IN ACCORDANCE WITH ARTICLE 1072-7 OF THE STANDARD SPECIFICATIONS.

NO WELDING OF FORMS OR FALSEWORK TO THE TOP FLANGE WILL BE PERMITTED WITHIN 36 FEET OF THE ENDS OF GIRDER.

PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION. KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES. KEEP 6" MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.

STUDS ON GIRDERS MAY BE SHIFTED UP TO 1" IF NECESSARY TO CLEAR FLANGE SPLICE WELD.

TENSION ON THE ASTM A325 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-8 OF THE STANDARD SPECIFICATIONS.

END OF GIRDERS SHALL BE PLUMB IN THE FINAL CONDITION.

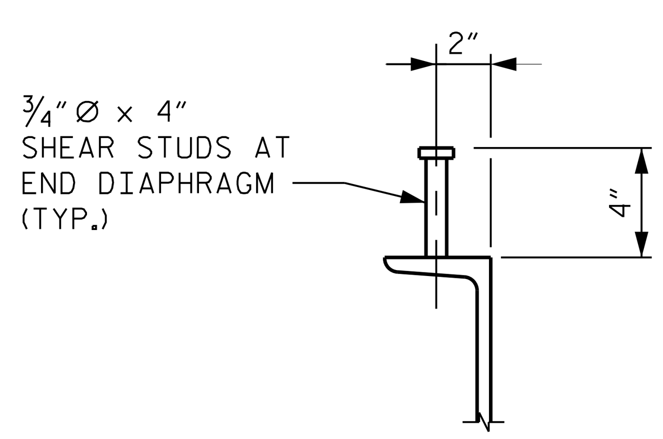
FABRICATORS SHALL DETAIL DIAPHRAGM MEMBERS AND CONNECTIONS FOR NO-LOAD FIT (NLF).

DIMENSIONS ARE HORIZONTAL DIMENSIONS ALONG THE CENTER LINE OF GIRDER NO CORRECTIONS HAVE BEEN MADE TO ADJUST FOR THE DISTANCE ALONG THE GRADE.

BEARING STIFFENER MAY REQUIRE COPING IF WIDER THAN BOTTOM FLANGE.

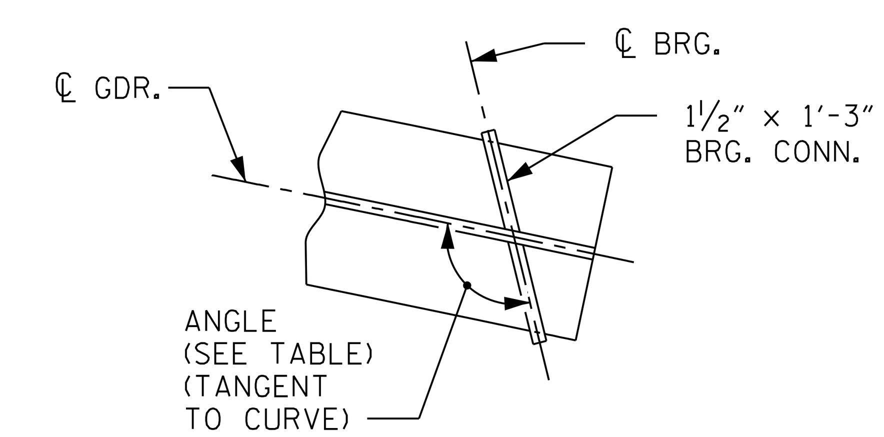
DIMENSION A - END DIAPHRAGM (MEASURED ALONG ℄ OF BEARING)

| | | |
|---|---|---|
| BAY 1 | G1 - G2 | 10'-9 3/8" |
| BAY 2 | G2- G3 | 10'-10" |
| BAY 3 | G3 - G4 | 10'-10 3/4" |
| BAY 4 | G4 - G5 | 10'-11 1/2" |
| BAY 5 | G5 - G6 | 11'-0 3/8" |



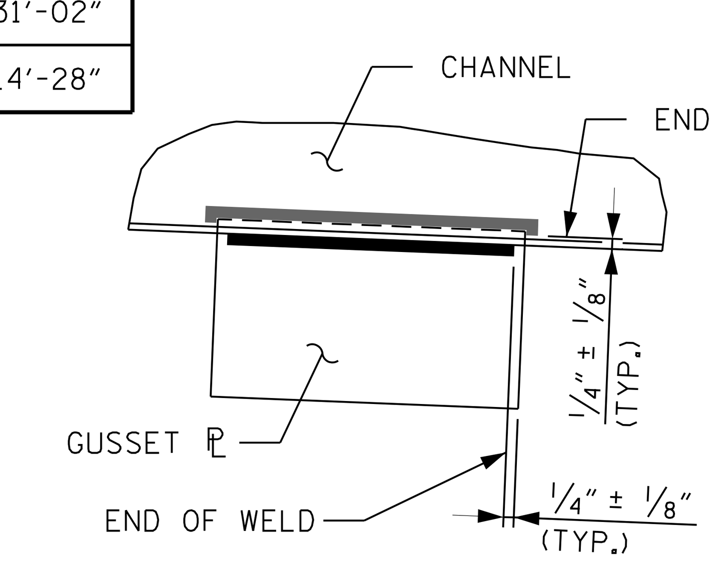

SHEAR STUD DETAIL

NOTE: TOP OF SHEAR STUD SHALL HAVE AT LEAST 2 1/2" COVER AND PENETRATE AT LEAST 3" ABOVE BOTTOM OF EDGE BEAM.

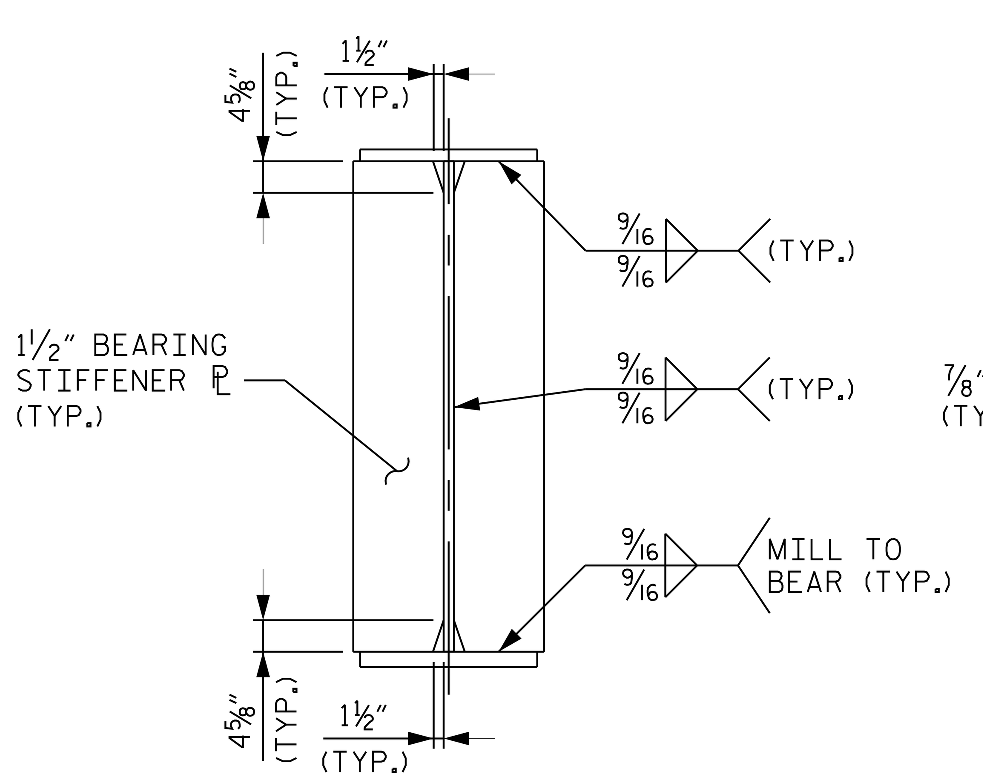



| GIRDER | ANGLE |
|---|---|
| G1 | 114°-58'-13" |
| G2 | 115°-33'-36" |
| G3 | 116°-10'-46" |
| G4 | 116°-49'-51" |
| G5 | 117°-31'-02" |
| G6 | 118°-14'-28" |

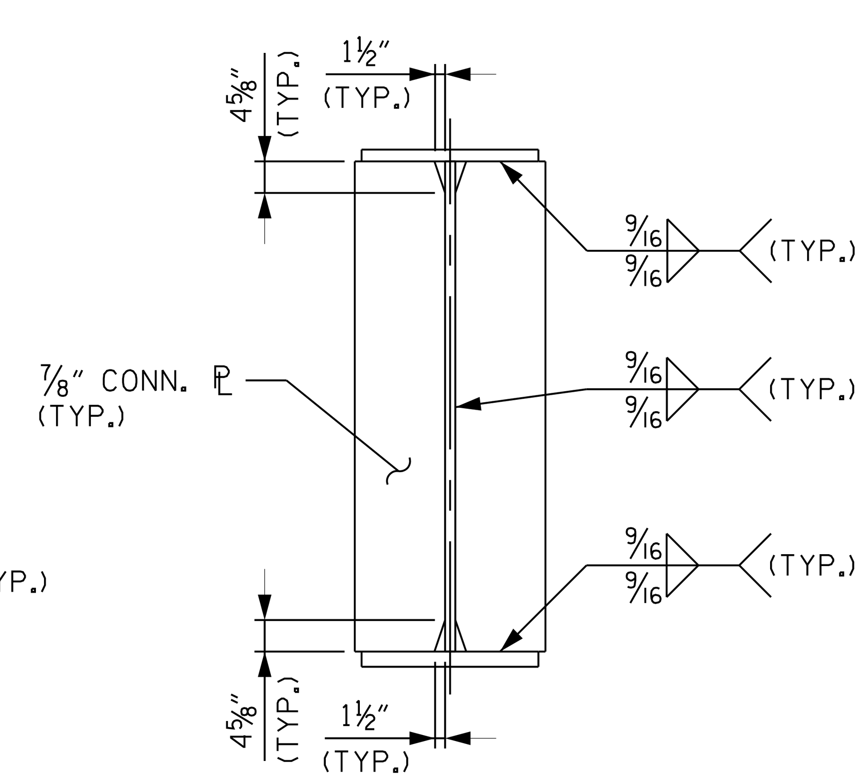
CONNECTION PLATE DETAILS @ END BENT 2 END



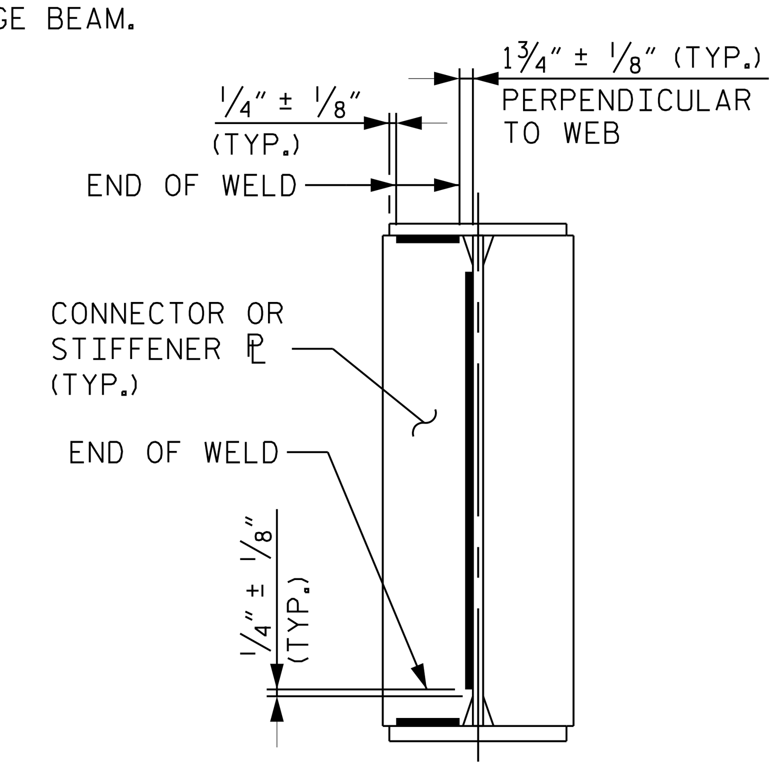

TYPICAL GUSSET PLATE CONNECTION



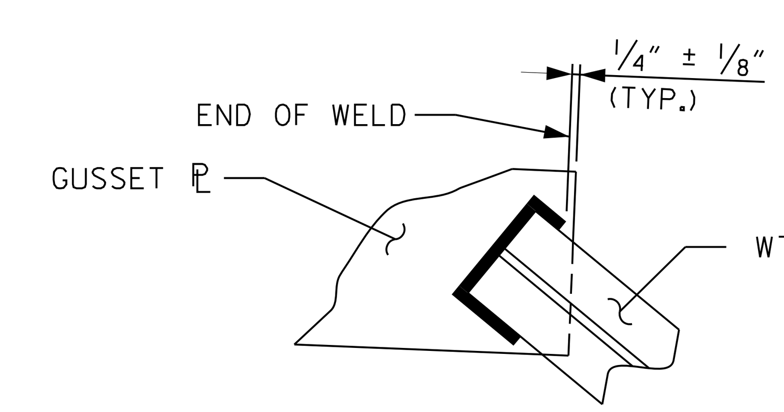

BEARING STIFFENER




INTERMEDIATE DIAPHRAGM CONNECTOR PLATE DETAIL



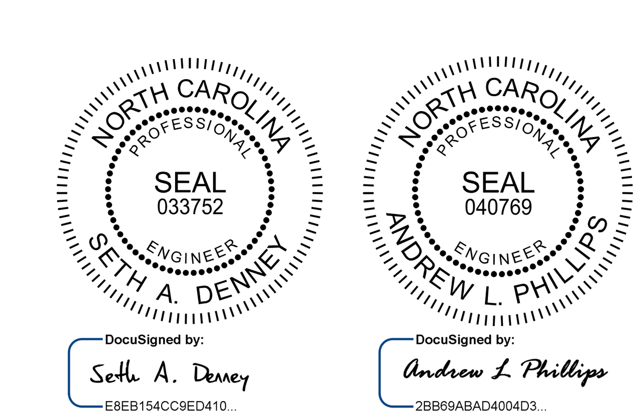

TYPICAL WELD TERMINATION DETAIL




TYPICAL "TEE" TO GUSSET PLATE CONNECTION

PROJECT NO. U-5806
CABARRUS COUNTY
STATION: 15+75.56 -Y1-
27+06.95 -L-

SHEET 3 OF 5




STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102



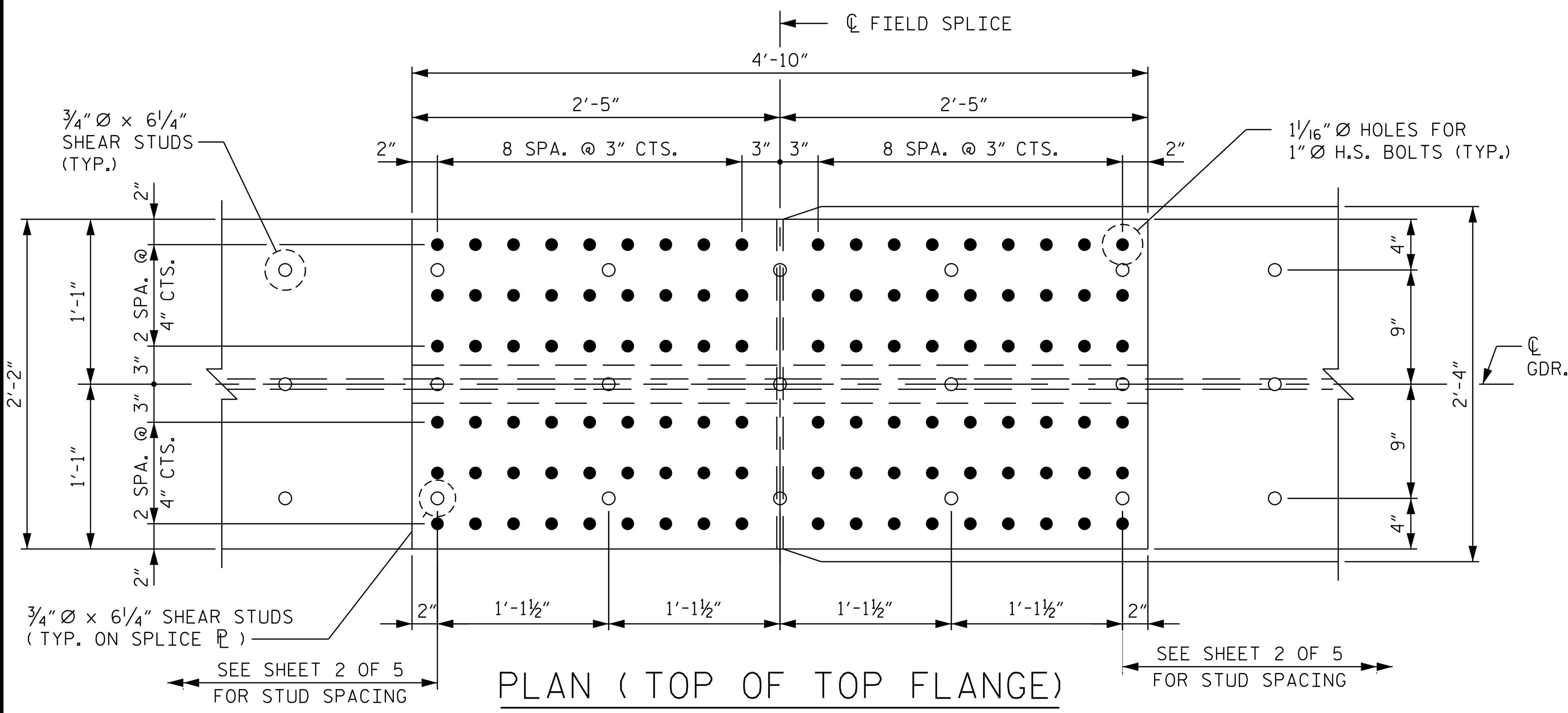
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

| | | | | | |
|---|---|---|---|---|---|
| DRAWN BY: | D. D. LOWERY | DATE: | 10/17 | | |
| CHECKED BY: | A. L. PHILLIPS | DATE: | 10/17 | | |
| DESIGN ENGINEER OF RECORD: | S.A. DENNEY | DATE: | 10/17 | | |

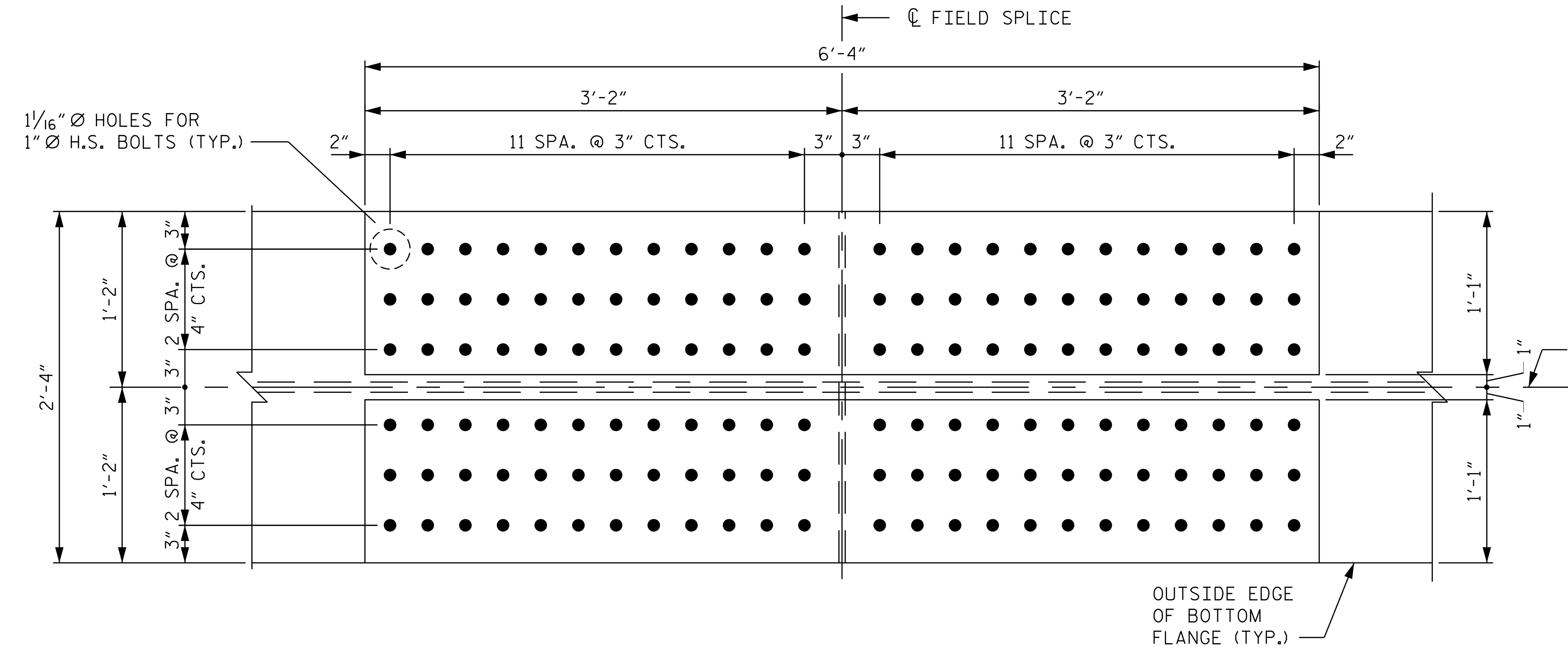
REVISIONS

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

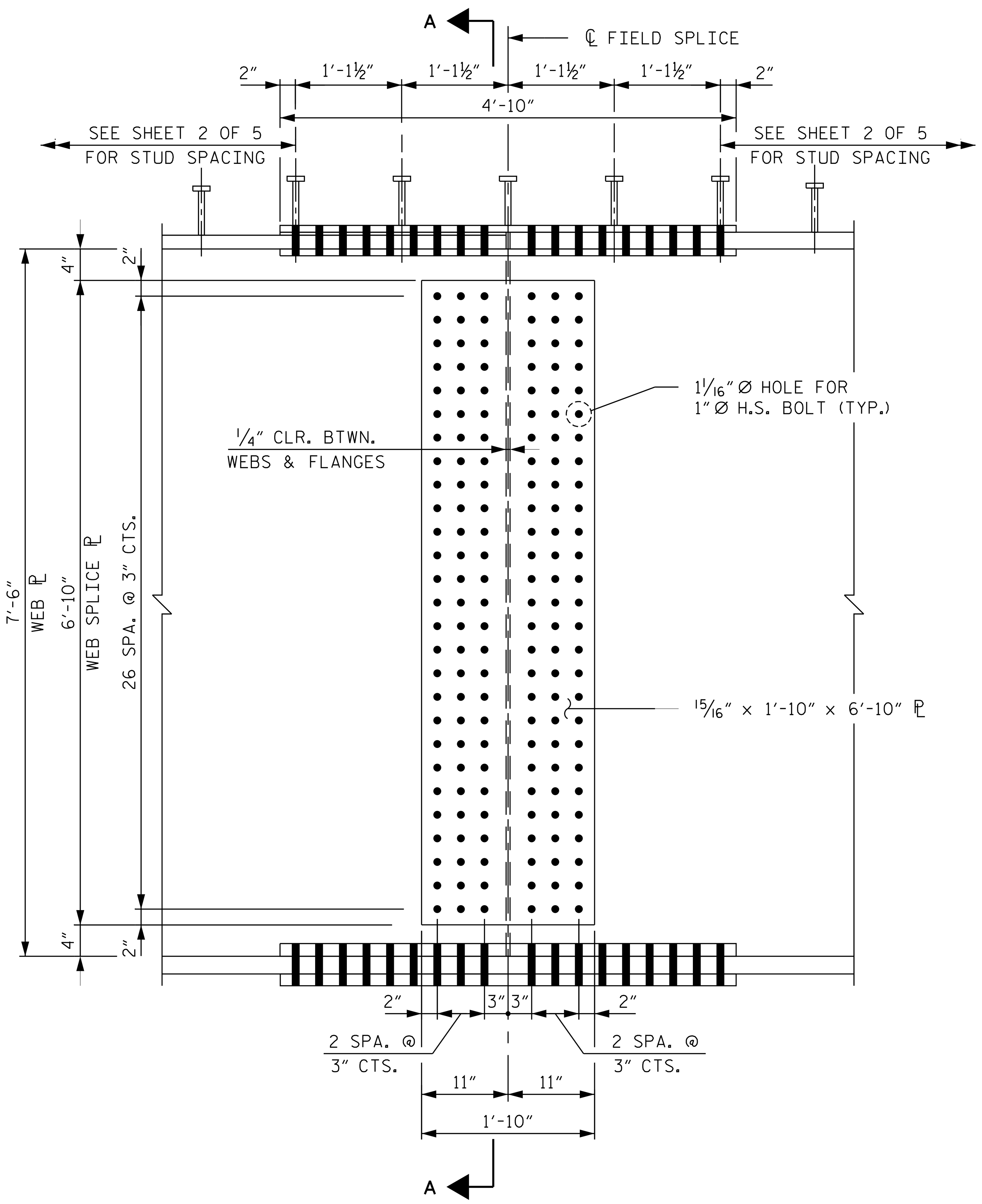
SHEET NO. S-19
TOTAL SHEETS 50



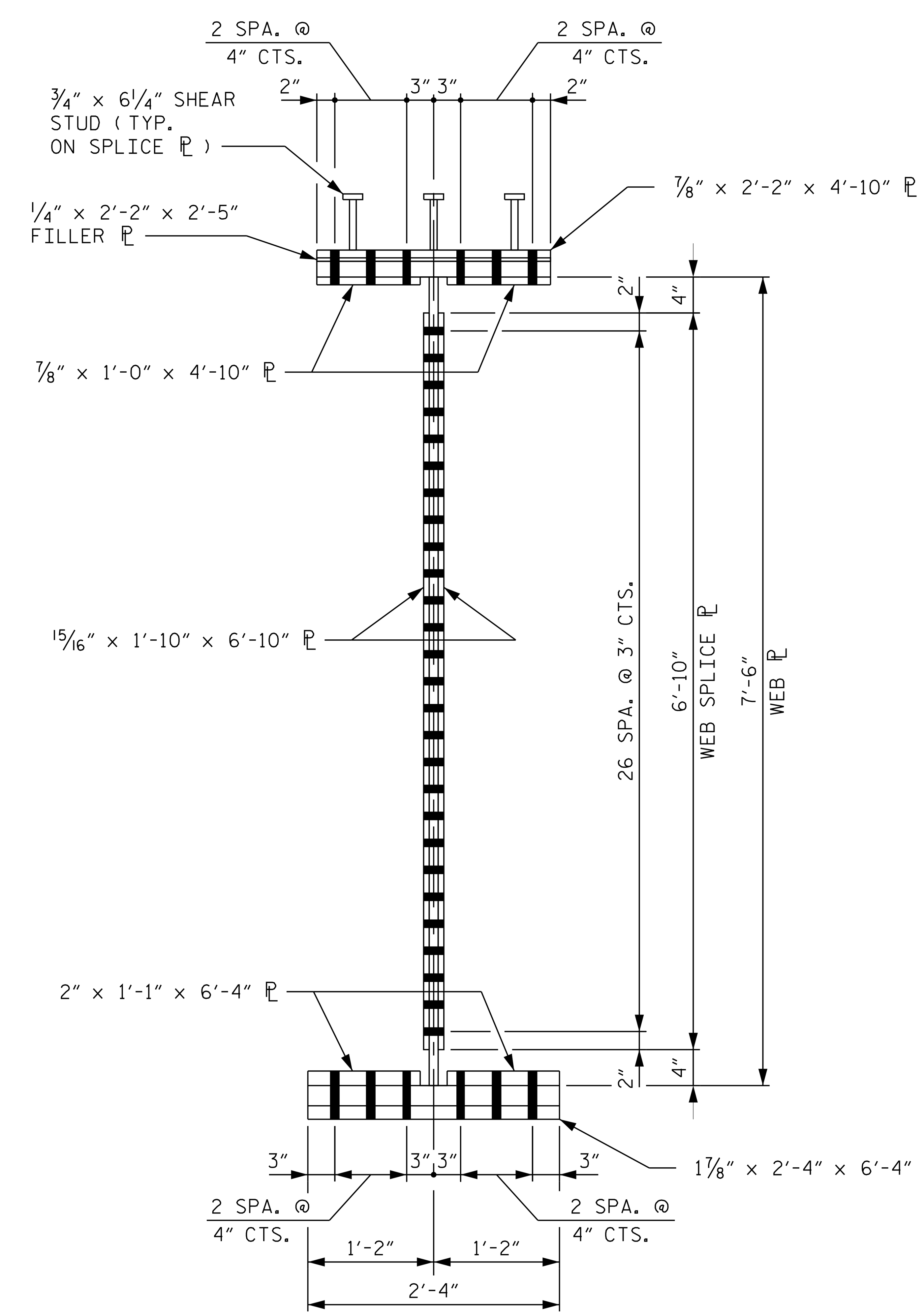

PLAN ( TOP OF TOP FLANGE)



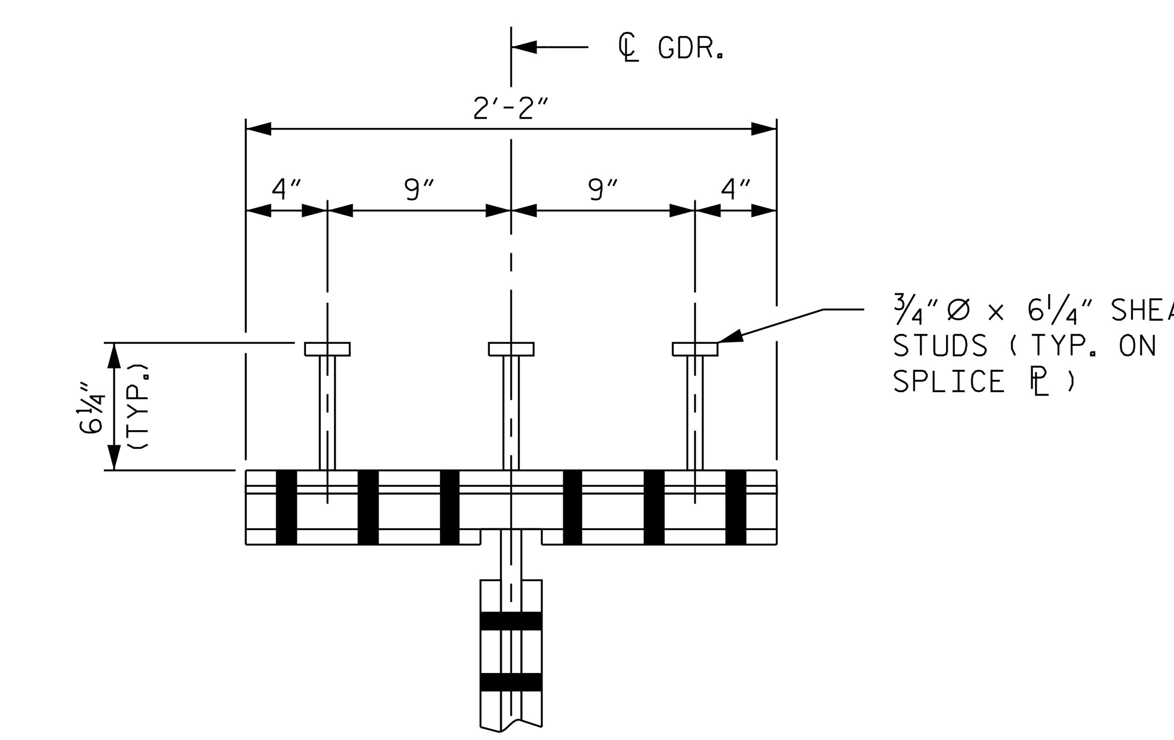

PLAN ( TOP OF BOTTOM FLANGE)




ELEVATION




SECTION A-A




SHEAR STUD DETAIL FOR TOP FLANGE SPLICE ℙ

PROJECT NO. U-5806

CABARRUS COUNTY

STATION: 15+75.56 -Y1-
27+06.95 -L-

SHEET 4 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 033752 ENGINEER SETH A. DENNEY

DocuSigned by: Seth A. Denney
E8EB154CC9ED410...
10/23/2017

NORTH CAROLINA PROFESSIONAL SEAL 040769 ENGINEER ANDREW L. PHILLIPS

DocuSigned by: Andrew L. Phillips
2B869ABAD4004D3...
10/23/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102

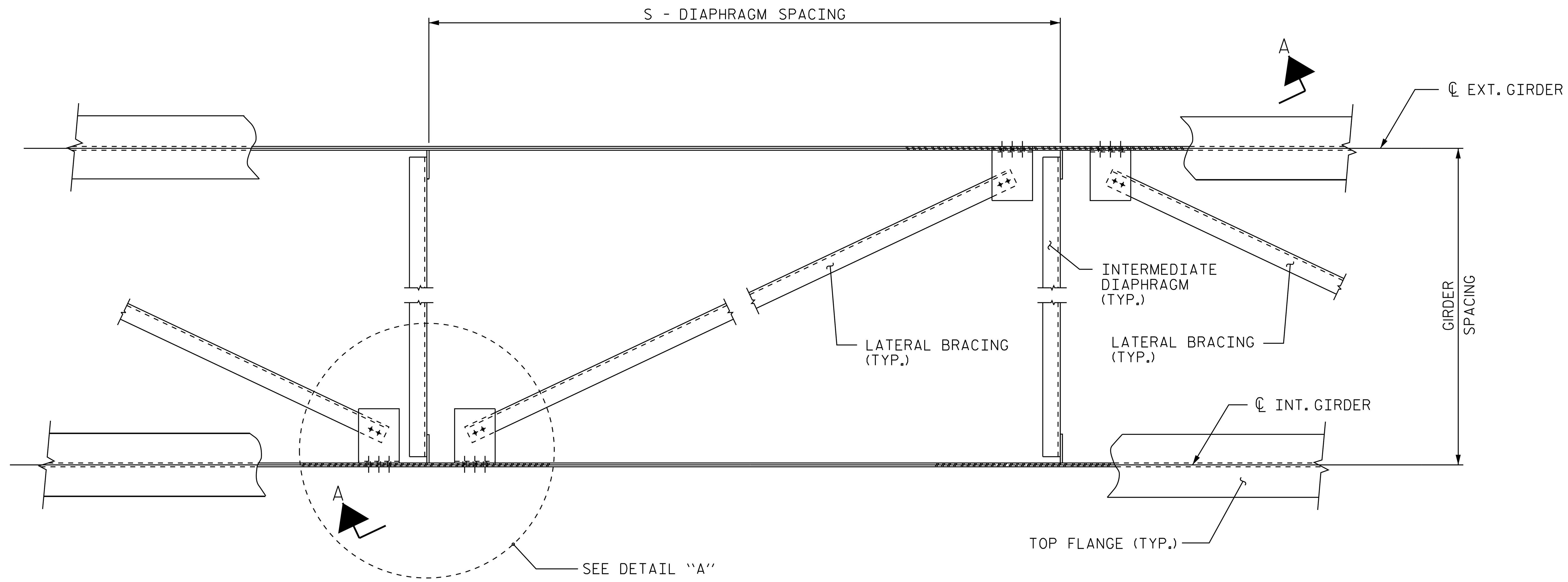


DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

| REVISIONS | | | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | | | S-20 |
| 1 | | | 3 | | | | | TOTAL SHEETS |
| 2 | | | 4 | | | | | 50 |

DRAWN BY: D.D.LOWERY DATE: 10/17
CHECKED BY: A.L.PHILLIPS DATE: 10/17
DESIGN ENGINEER OF RECORD: S.A.DENNEY DATE: 10/17

10/23/2017 K:\RDI_Structures_Bridge\NC\011036388 - U-5806_FinalDesign\Cad\Dgn\020_U-5806_S004.dgn




## PART PLAN - NEAR TOP FLANGE LATERAL BRACING

(THROUGHOUT EXTERIOR BAYS ONLY)
(TRAFFIC SIGNAL SUPPORT NOT SHOWN FOR CLARITY)

## NOTES

LATERAL BRACING ASSEMBLY SHALL COMPLY WITH SECTION 1072 OF THE STANDARD SPECIFICATIONS.

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W OR APPROVED EQUAL.

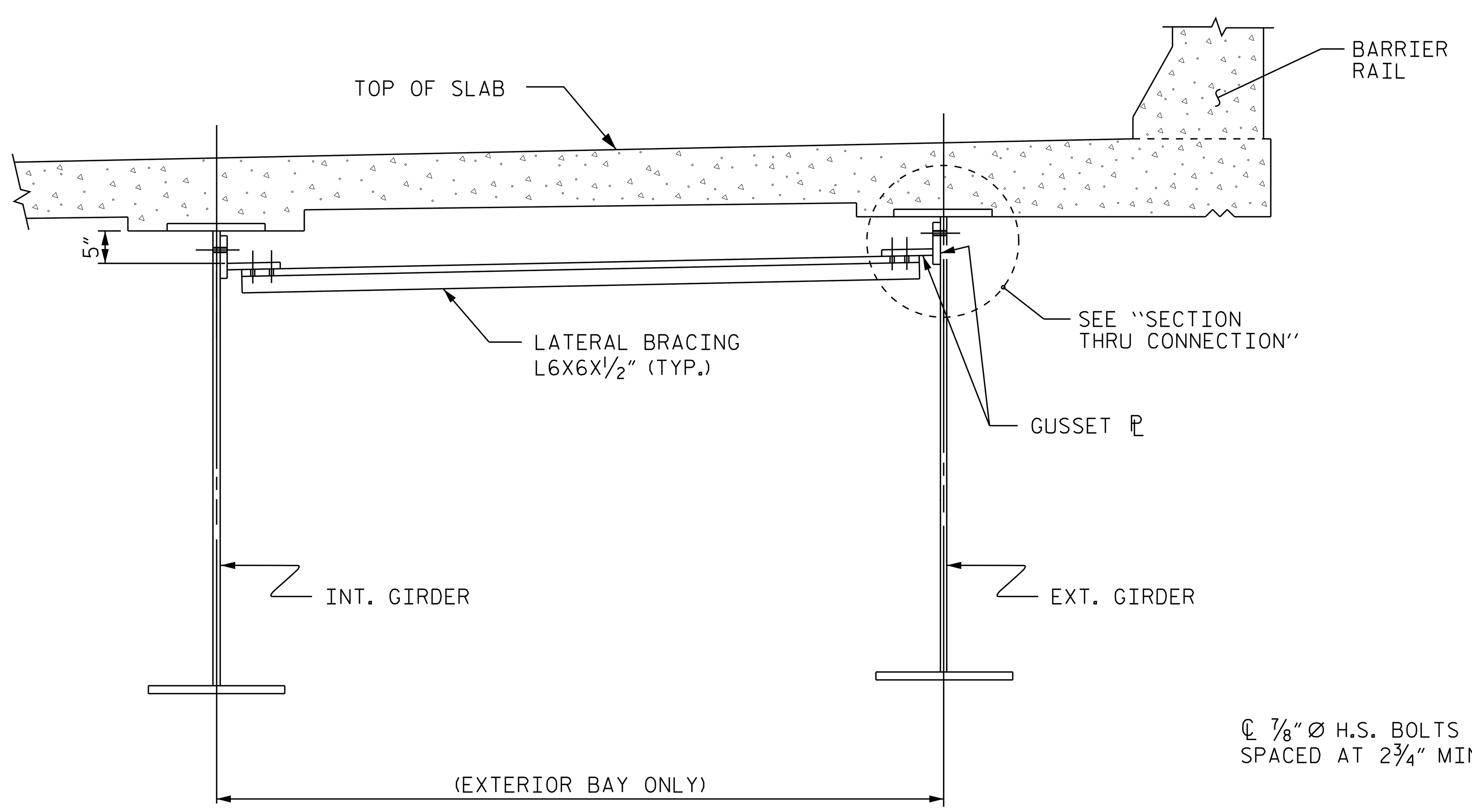
TENSION ON THE ASTM A325 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL BOLTED CONNECTIONS SHALL BE 7/8"Ø HIGH STRENGTH BOLTS.

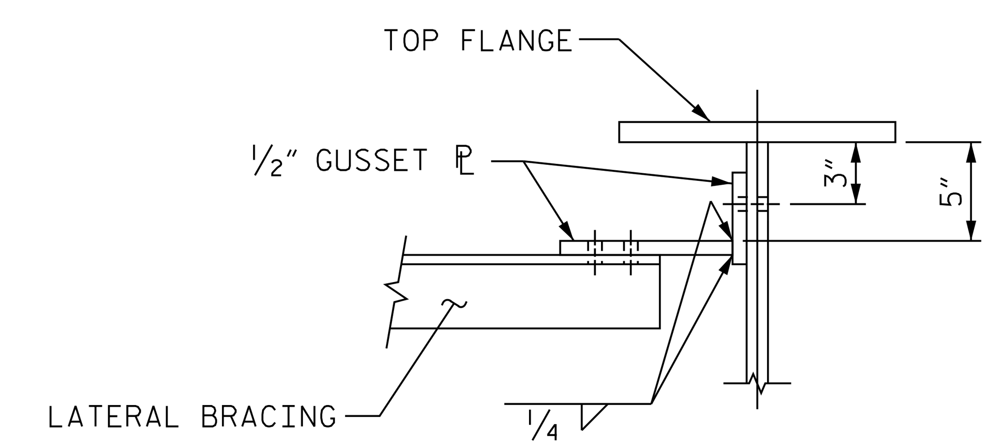
THE CONTRACTOR HAS THE OPTION TO CLIP THE PROTRUDING CORNERS OF THE GUSSET PLATES, AT NO ADDITIONAL COST TO THE DEPARTMENT.

BENT GUSSET PLATES OR ROLLED ANGLE SHAPES MAY BE SUBSTITUTED FOR THE WELDED GUSSET PLATES DETAILED IF APPROVED BY THE ENGINEER, AT NO ADDITIONAL COST TO THE DEPARTMENT.

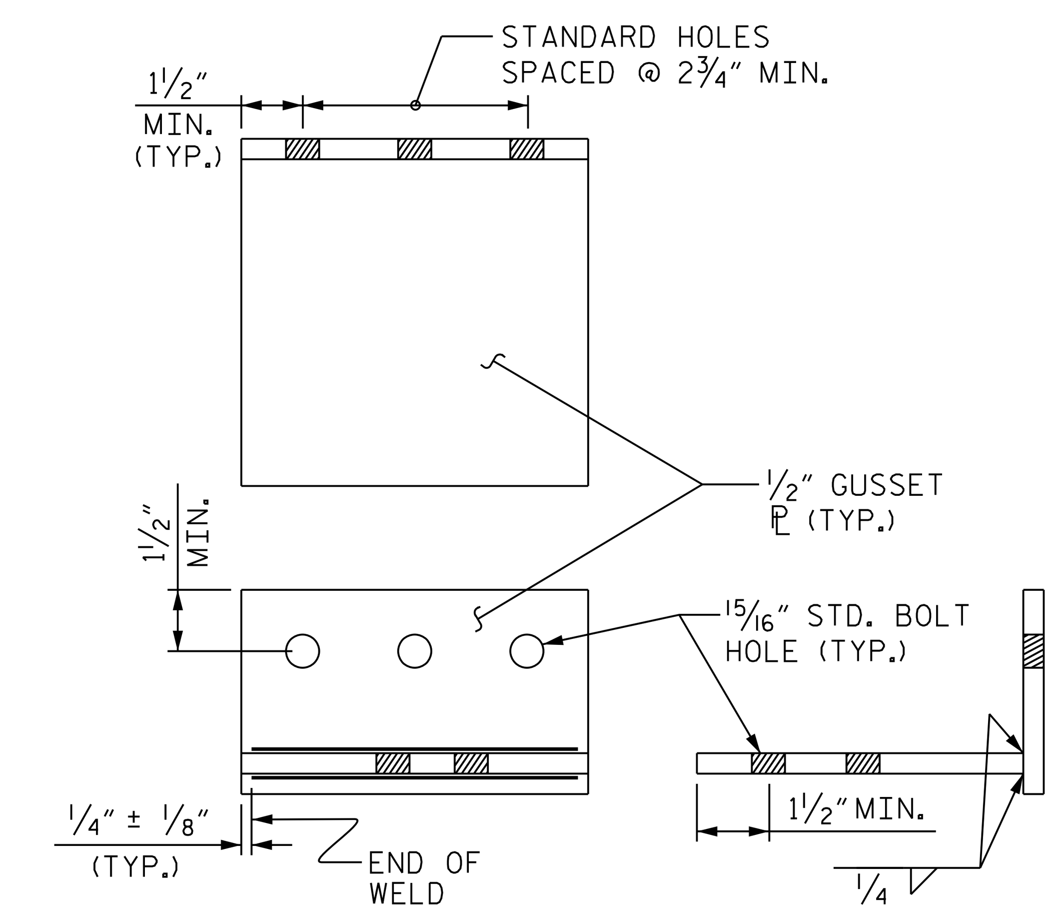
INSTALL THE LATERAL BRACING AFTER ERECTING THE EXTERIOR GIRDER AND THE ADJACENT INTERIOR GIRDER AND INSTALLING THE INTERMEDIATE DIAPHRAGMS.



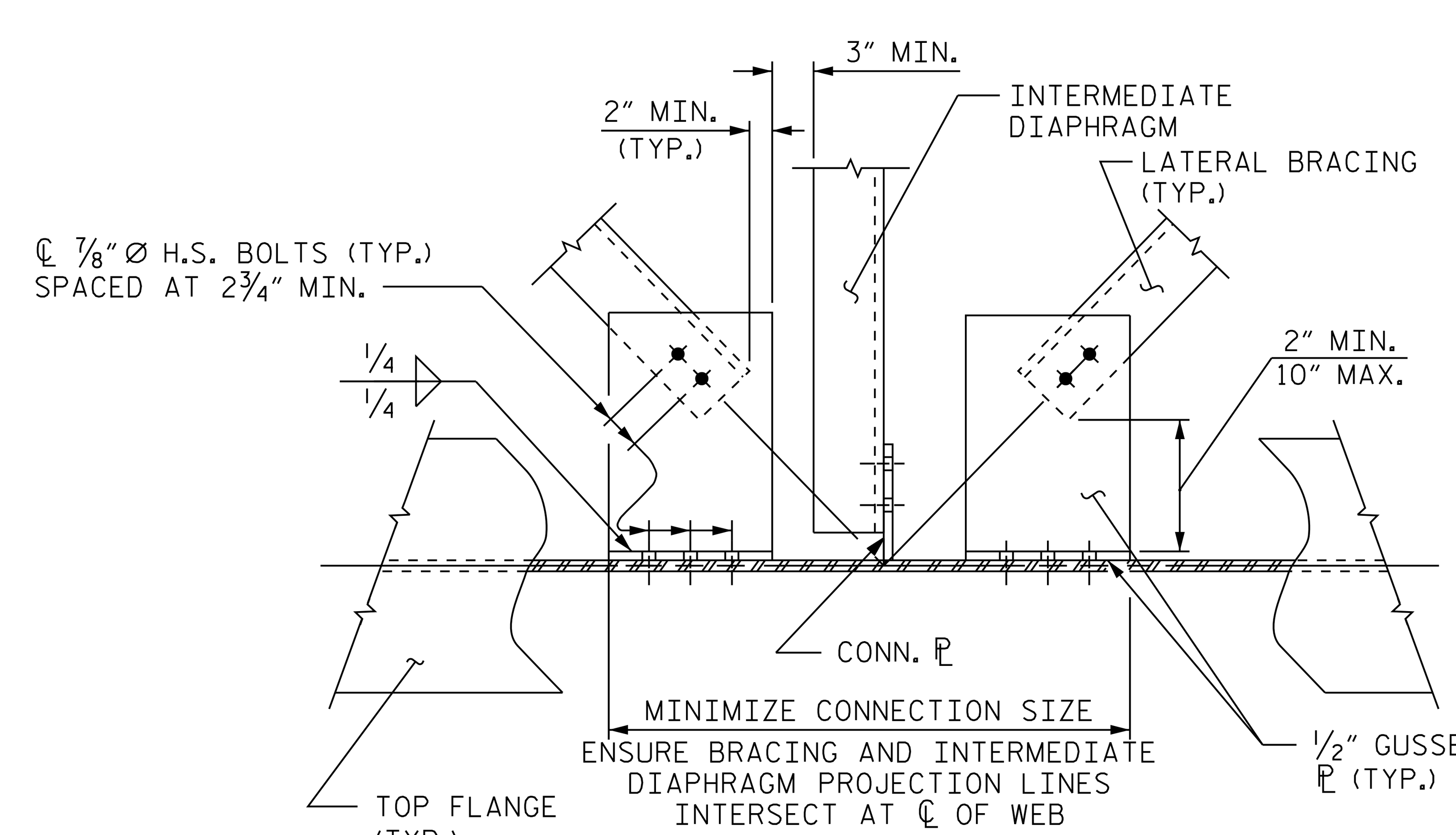

## SECTION A-A




## SECTION THRU CONNECTION




## CONNECTION DETAIL




## DETAIL "A"

PROJECT NO. U-5806
CABARRUS COUNTY
STATION: 15+75.56 -Y1-
27+06.95 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

# LATERAL BRACING

NORTH CAROLINA PROFESSIONAL SEAL 033752 ENGINEER SETH A. DENNEY
DocuSigned by: Seth A. Denney
E8EB154CC9ED410...
10/23/2017

NORTH CAROLINA PROFESSIONAL SEAL 040769 ENGINEER ANDREW L. PHILLIPS
DocuSigned by: Andrew L. Phillips
2B869ABAD40D4D3...
10/23/2017

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102

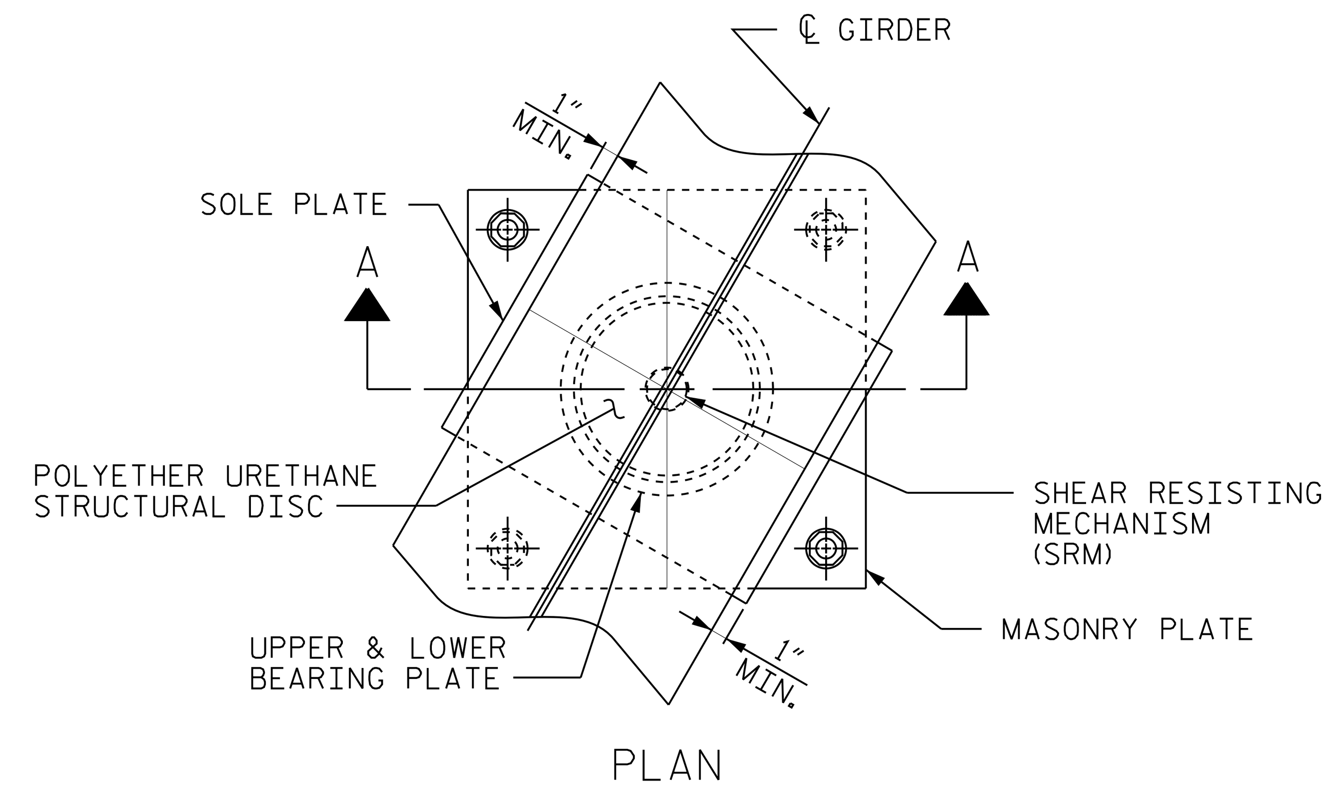


**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

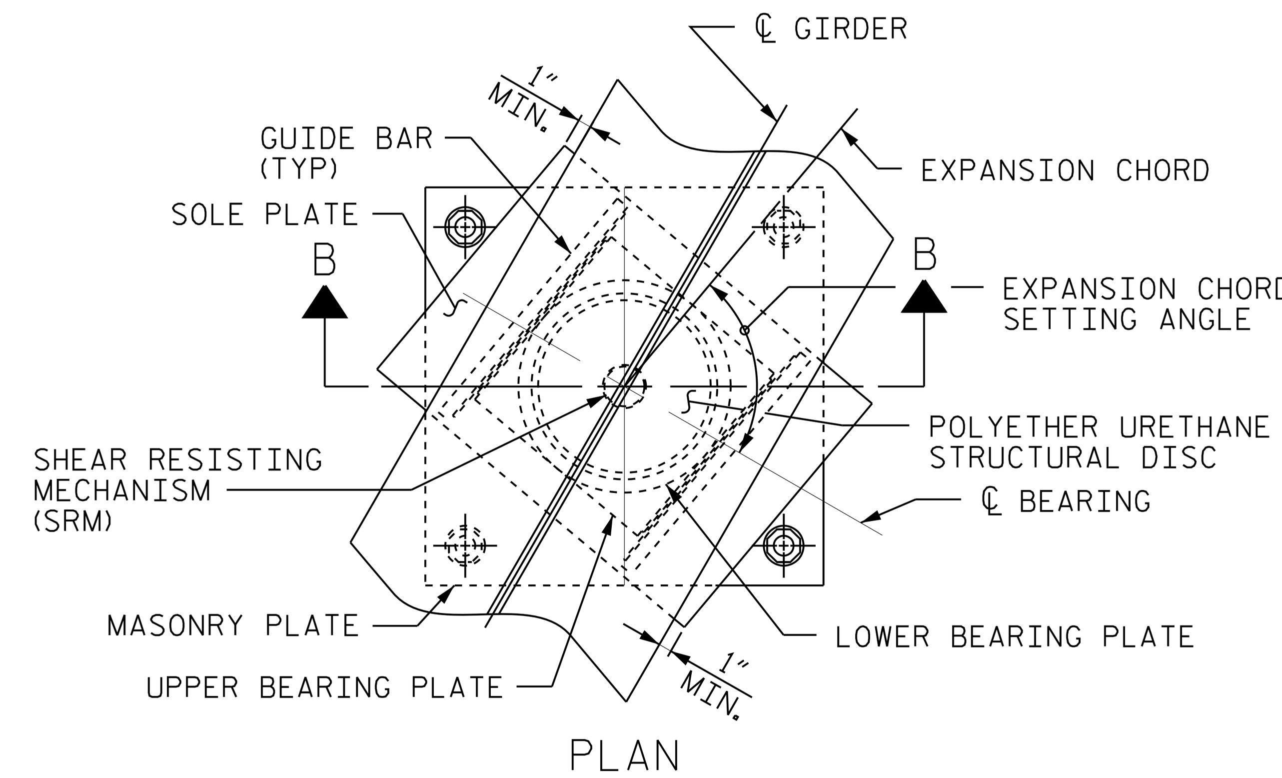
| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-21 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 50 |

| | | |
|---|---|---|
| ASSEMBLED BY : D.D. LOWERY | DATE : 10/17 | |
| CHECKED BY : A.L. PHILLIPS | DATE : 10/17 | |
| DRAWN BY : WMC 6/11 | ADDED: 10/31/11 | |
| CHECKED BY : GM 6/11 | | |

10/23/2017 K:\RDT_Structures_Bridge\NC\011036388 - U-5806_FinalDesign\Cad\Dgn\021_U-5806_LB01.dgn

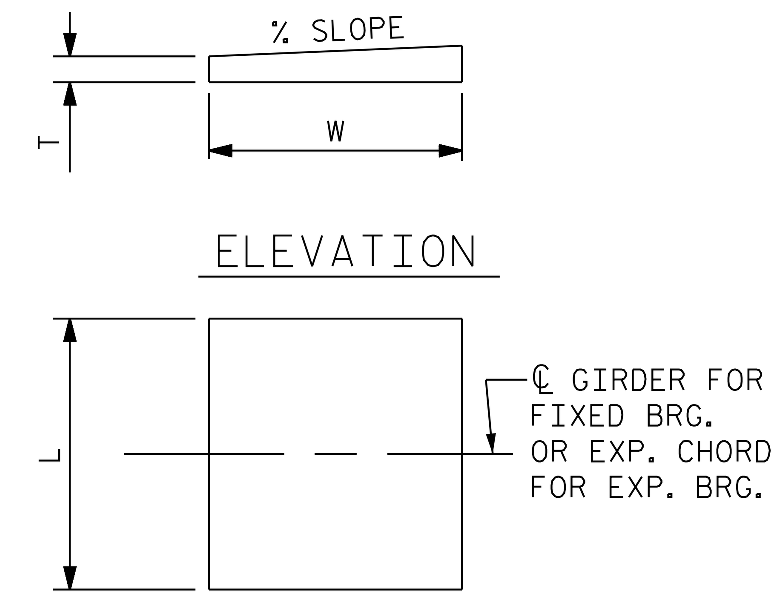



PLAN




PLAN

INCREASING STATIONS




ELEVATION

PLAN

NOTE:
DIMENSIONS "L", "W", AND "T" SHALL BE DETERMINED BY THE BEARING MANUFACTURER. SET DIMENSION "L" SUCH THAT THE MINIMUM EDGE DISTANCE TO THE GIRDER FLANGE IS 1".

SOLE PLATE DETAILS

## NOTES

FOR DISC BEARINGS, SEE SPECIAL PROVISIONS.

ALL BEARING PLATES SHALL BE AASHTO M270 GRADE 50W OR GRADE 50.

AT ALL POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS SHALL BE FINGER-TIGHTENED PLUS AN ADDITIONAL 1/4 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

WHEN WELDING THE SOLE PLATE TO THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE BEARING DOES NOT EXCEED 250°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE TFE OR URETHANE DISC.

AFTER BEARING ASSEMBLY IS IN PLACE AND ANCHOR BOLTS HAVE BEEN FINALLY POSITIONED, THEY SHALL BE GROUTED IN PLACE AS SHOWN.

THE CLOSURE PLATE, GROUT PIPE, AND STANDARD PIPE FOR THIS ASSEMBLY NEED NOT BE GALVANIZED.

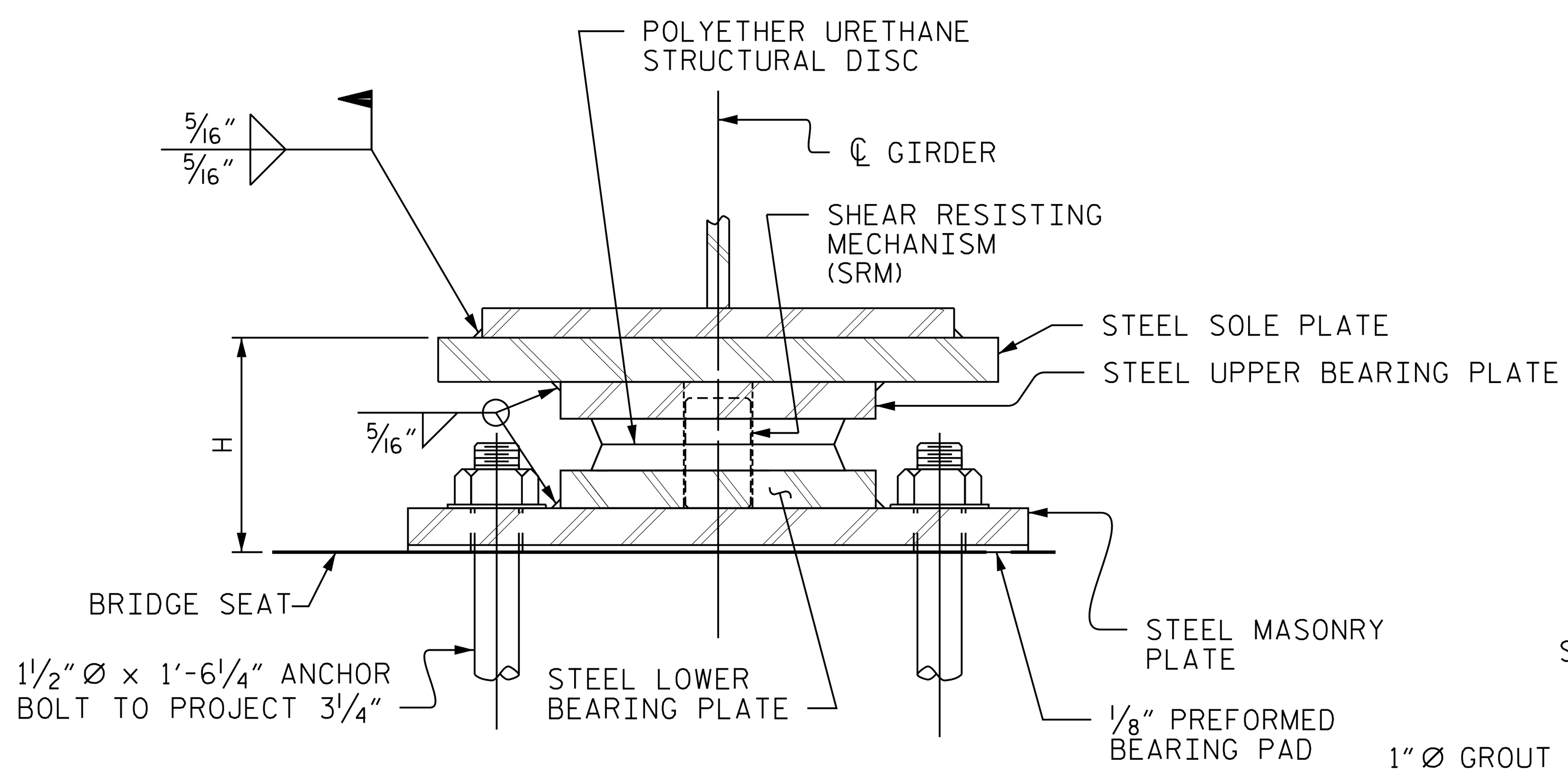
SOLE PLATES SHOULD BE WELDED TO GIRDER FLANGES AND ANCHOR BOLTS SHOULD BE GROUTED BEFORE FALSEWORK IS PLACED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

FOR ATTACHMENT OF THE STAINLESS STEEL SHEETS TO THE STEEL SOLE PLATE AND GUIDE BARS, AS WELL AS THE TOP AND SIDE PTFE SHEETS TO THE STEEL UPPER BEARING PLATE, SEE SPECIAL PROVISIONS.

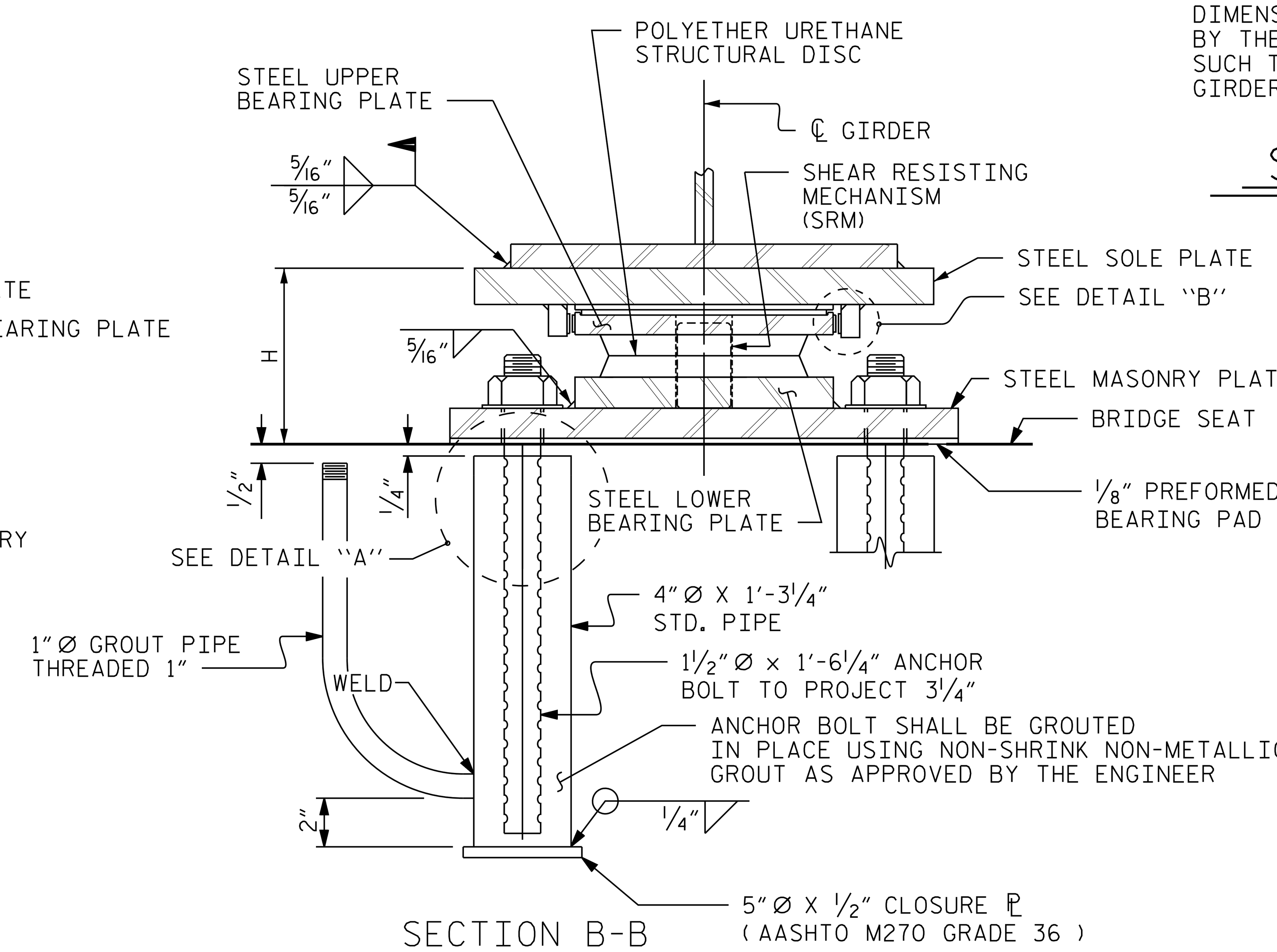
FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

THE MINIMUM ROTATIONAL CAPACITY FOR ALL BEARINGS SHALL BE 0.02 RADIANS.



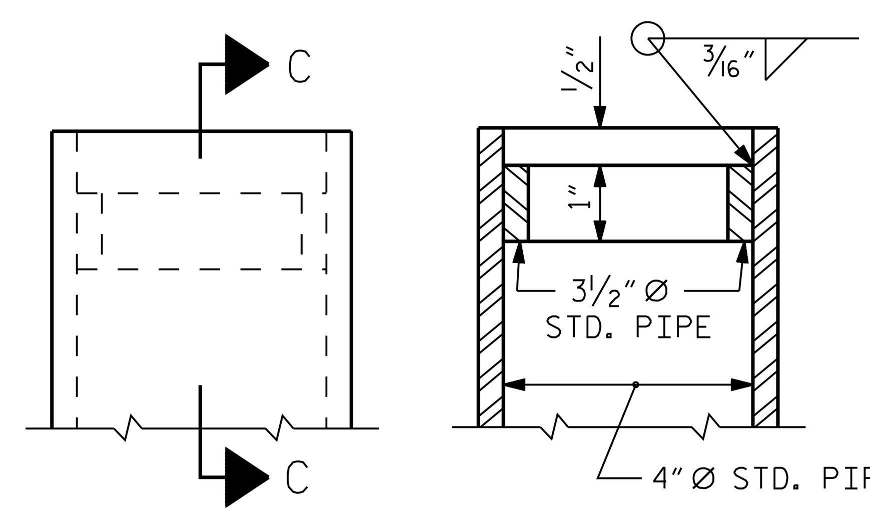

SECTION A-A

DB1, FIXED



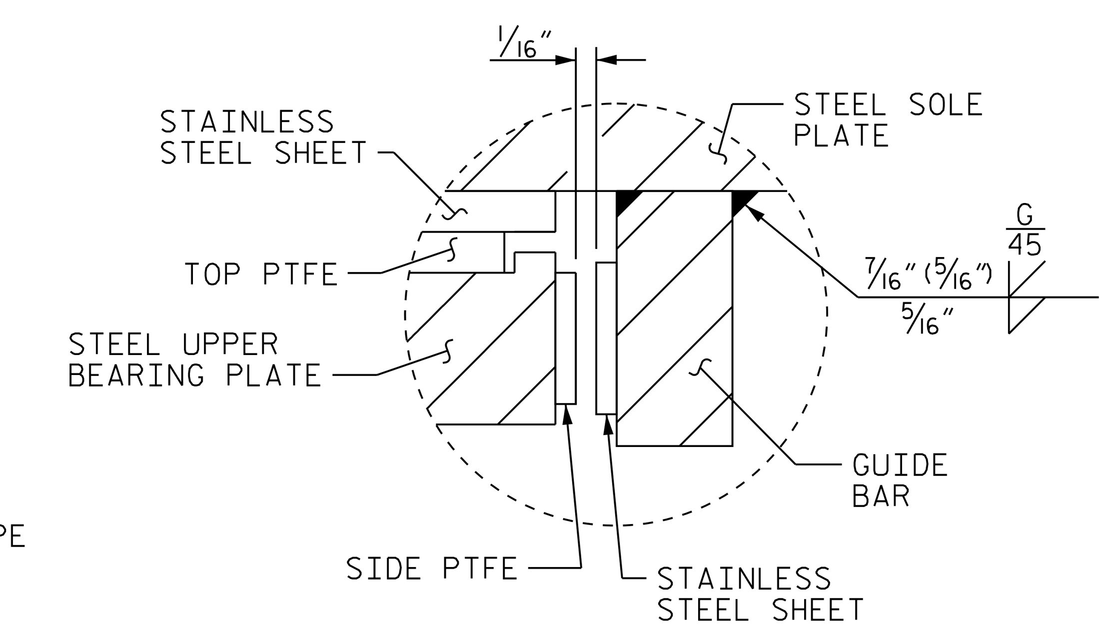

SECTION B-B

DB2, EXP.

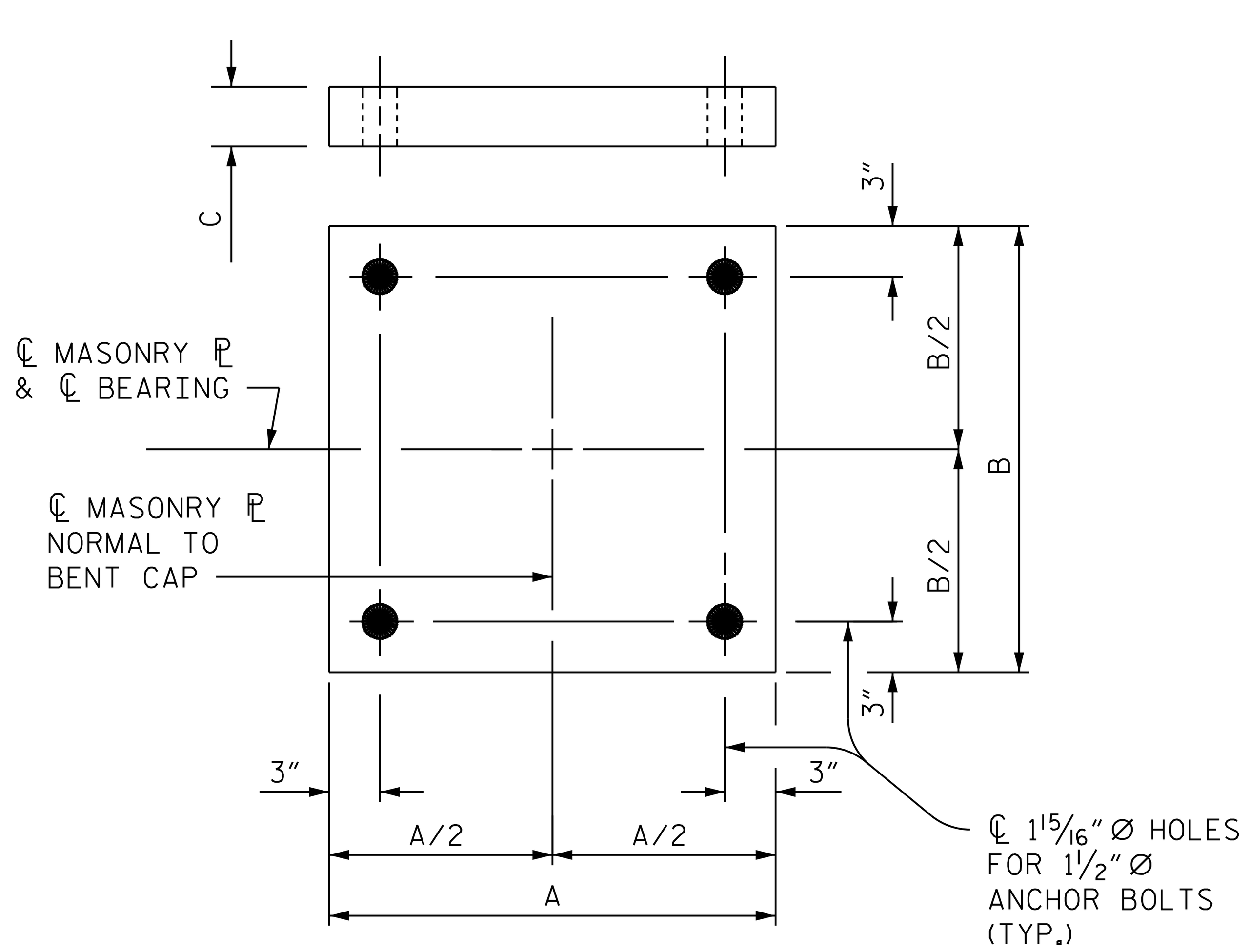



SECTION C-C

DETAIL "A"




DETAIL "B"



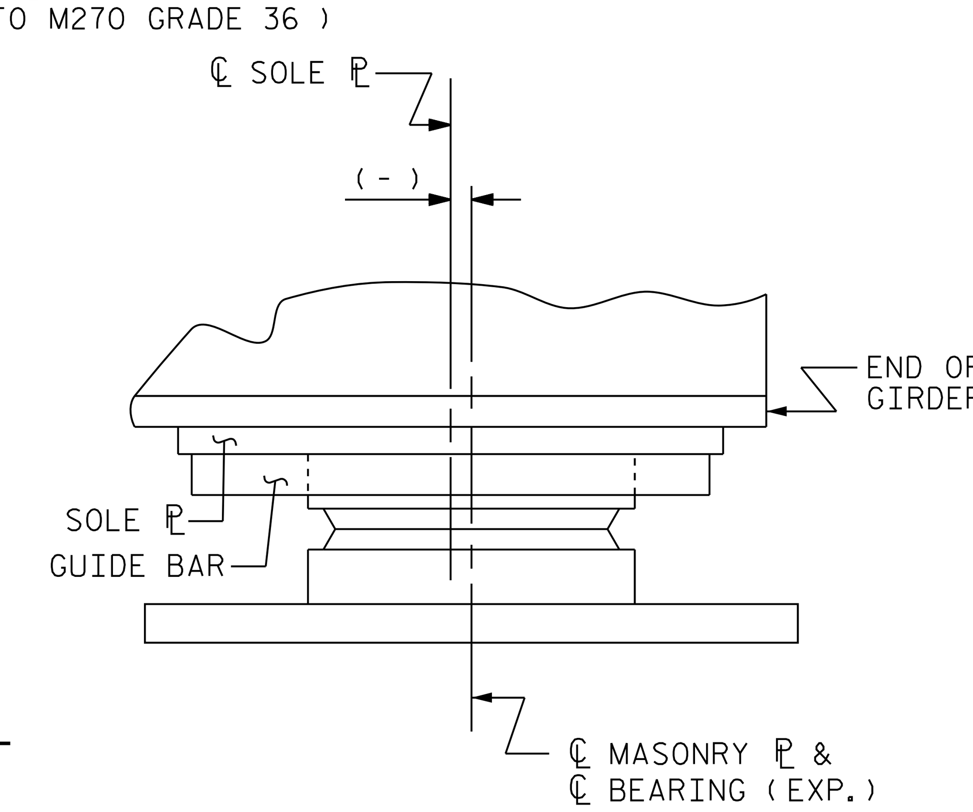

PLAN

MASONRY PLATE DETAILS

| PLATE SETTING DATA (EXPANSION DISC BEARINGS) | | | | |
|---|---|---|---|---|
| LOCATION | TEMPERATURE AT TIME OF SETTING | | | * |
| | 45° F | 60° F | 90° F | |
| END BENT 2 | -¼" | 0" | 7/16" | 1 15/16" |

* CORRECTION FOR END ROTATION DUE TO WEIGHT OF SLAB AND COMPOSITE DEAD LOAD.

TEMPERATURE SETTING DETAIL




| EXPANSION CHORD SETTING ANGLES (EXPANSION DISC BEARINGS) | |
|---|---|
| GIRDER | LOCATION |
| | END BENT 2 |
| G1 | 77°-30'-53" |
| G2 | 77°-13'-12" |
| G3 | 76°-54'-37" |
| G4 | 76°-35'-04" |
| G5 | 76°-14'-29" |
| G6 | 75°-52'-46" |

| DESIGNATIONS | | LOCATION | NUMBER OF BEARINGS | DIMENSIONS: BEARING | DIMENSIONS: MASONRY PLATE | | | DIMENSIONS: SOLE PLATE | LOADS AND MOVEMENT: UNFACTORED VERTICAL LOAD (KIPS) | | | FACTORED HORIZONTAL LOAD (KIPS) | ONE-WAY MOVEMENT (IN.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | DEAD | | LIVE | | |
| BEARINGS | MASONRY ℙ | | | H (IN.) | A (IN.) | B (IN.) | C (IN.) | TOP SLOPE (%) | DC | DW | LL+IM | | |
| DB1 (FIXED) | M1 | END BENT 1 | 6 | 9¼" | 26½" | 26½" | 1" | 6.00% | 404 | 46 | 214 | 140 | 0 |
| DB2 (EXP.) | M2 | END BENT 2 | 6 | 9¾" | 32½" | 32½" | 1" | 0 | 386 | 47 | 195 | 133 | 1½" |
| | | | | | | | | | | | | | |

PROJECT NO. U-5806
CABARRUS COUNTY
STATION: 15+75.56 -Y1- 27+06.95 -L-

SEAL 033752 NORTH CAROLINA PROFESSIONAL ENGINEER SETH A. DENNEY
DocuSigned by: Seth A. Denney
E6EB154CC9ED410...
10/23/2017

SEAL 040769 NORTH CAROLINA PROFESSIONAL ENGINEER ANDREW L. PHILLIPS
DocuSigned by: Andrew L. Phillips
2B869ABAD40040D...
10/23/2017

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

DISC BEARING DETAILS

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-22 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 50 |

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

| | | |
|---|---|---|
| ASSEMBLED BY : D.D. LOWERY | DATE : 10/17 | |
| CHECKED BY : A.L. PHILLIPS | DATE : 10/17 | |
| DRAWN BY : TMG 08/13 | | REV. |
| CHECKED BY : EKP 10/13 | | REV. REV. |

10/23/2017 K:\RDT_Structures_Bridge\NC\011036388 - U-5806 Final Design\Cad\Dgn\022_U-5806_B001.dgn

STD. NO. DB1

## DEAD LOAD DEFLECTION & CAMBER TABLE FOR GIRDER 1

| THIRTIETH POINTS | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEFLECTION DUE TO WEIGHT OF STEEL & SLAB ✱ | 0.000 | 0.100 | 0.199 | 0.296 | 0.391 | 0.484 | 0.571 | 0.654 | 0.729 | 0.796 | 0.856 | 0.906 | 0.947 | 0.977 | 0.997 | 1.006 | 1.003 | 0.988 | 0.961 | 0.924 | 0.877 | 0.820 | 0.753 | 0.679 | 0.597 | 0.508 | 0.414 | 0.315 | 0.213 | 0.109 | 0.000 |
| DEFLECTION DUE TO WEIGHT OF RAIL | 0.000 | 0.008 | 0.016 | 0.024 | 0.032 | 0.039 | 0.046 | 0.053 | 0.059 | 0.064 | 0.069 | 0.073 | 0.076 | 0.079 | 0.080 | 0.081 | 0.081 | 0.080 | 0.078 | 0.075 | 0.071 | 0.067 | 0.061 | 0.056 | 0.049 | 0.042 | 0.034 | 0.026 | 0.018 | 0.009 | 0.000 |
| TOTAL DEAD LOAD DEFLECTION | 0.000 | 0.108 | 0.215 | 0.320 | 0.423 | 0.523 | 0.617 | 0.706 | 0.788 | 0.861 | 0.925 | 0.979 | 1.023 | 1.056 | 1.077 | 1.087 | 1.084 | 1.067 | 1.039 | 0.999 | 0.948 | 0.886 | 0.815 | 0.735 | 0.646 | 0.550 | 0.448 | 0.342 | 0.231 | 0.118 | 0.000 |
| VERTICAL CURVE ORDINATE | 0.000 | 0.173 | 0.350 | 0.530 | 0.705 | 0.869 | 1.019 | 1.157 | 1.282 | 1.392 | 1.488 | 1.569 | 1.635 | 1.686 | 1.720 | 1.738 | 1.740 | 1.725 | 1.693 | 1.645 | 1.579 | 1.496 | 1.396 | 1.279 | 1.145 | 0.995 | 0.828 | 0.644 | 0.445 | 0.230 | 0.000 |
| SUPERELEVATION ORDINATE | 0.000 | -0.074 | -0.142 | -0.206 | -0.264 | -0.318 | -0.366 | -0.410 | -0.448 | -0.481 | -0.510 | -0.533 | -0.551 | -0.565 | -0.573 | -0.576 | -0.574 | -0.568 | -0.556 | -0.539 | -0.517 | -0.490 | -0.458 | -0.422 | -0.380 | -0.333 | -0.281 | -0.224 | -0.162 | -0.095 | -0.022 |
| CAMBER DUE TO DISSIPATION RESULTING FROM HEAT CURVING | 0.206 | 0.206 | 0.206 | 0.206 | 0.206 | 0.206 | 0.196 | 0.196 | 0.288 | 0.288 | 0.288 | 0.288 | 0.288 | 0.288 | 0.288 | 0.288 | 0.288 | 0.288 | 0.288 | 0.288 | 0.288 | 0.288 | 0.288 | 0.288 | 0.288 | 0.196 | 0.196 | 0.206 | 0.206 | 0.206 | 0.206 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| REQUIRED CAMBER | 0″ | 4 15/16″ | 7 9/16″ | 10 3/16″ | 12 7/8″ | 15 3/8″ | 17 5/8″ | 19 13/16″ | 22 15/16″ | 24 11/16″ | 26 5/16″ | 27 5/8″ | 28 3/4″ | 29 9/16″ | 30 1/8″ | 30 7/16″ | 30 7/16″ | 30 3/16″ | 29 9/16″ | 28 11/16″ | 27 9/16″ | 26 1/8″ | 24 1/2″ | 22 9/16″ | 20 3/8″ | 16 7/8″ | 14 5/16″ | 11 5/8″ | 8 5/8″ | 5 1/2″ | 0″ |

## DEAD LOAD DEFLECTION & CAMBER TABLE FOR GIRDER 2

| THIRTIETH POINTS | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEFLECTION DUE TO WEIGHT OF STEEL & SLAB ✱ | 0.000 | 0.087 | 0.172 | 0.255 | 0.336 | 0.414 | 0.487 | 0.556 | 0.617 | 0.673 | 0.722 | 0.762 | 0.794 | 0.816 | 0.830 | 0.835 | 0.830 | 0.816 | 0.793 | 0.761 | 0.719 | 0.670 | 0.613 | 0.550 | 0.483 | 0.409 | 0.332 | 0.251 | 0.169 | 0.086 | 0.000 |
| DEFLECTION DUE TO WEIGHT OF RAIL | 0.000 | 0.006 | 0.013 | 0.019 | 0.025 | 0.030 | 0.036 | 0.041 | 0.045 | 0.049 | 0.052 | 0.055 | 0.057 | 0.059 | 0.060 | 0.060 | 0.060 | 0.059 | 0.057 | 0.055 | 0.052 | 0.048 | 0.044 | 0.040 | 0.035 | 0.029 | 0.024 | 0.018 | 0.012 | 0.006 | 0.000 |
| TOTAL DEAD LOAD DEFLECTION | 0.000 | 0.093 | 0.185 | 0.274 | 0.361 | 0.444 | 0.522 | 0.596 | 0.662 | 0.722 | 0.774 | 0.817 | 0.851 | 0.876 | 0.890 | 0.895 | 0.890 | 0.875 | 0.850 | 0.816 | 0.771 | 0.718 | 0.657 | 0.590 | 0.517 | 0.438 | 0.355 | 0.269 | 0.181 | 0.092 | 0.000 |
| VERTICAL CURVE ORDINATE | 0.000 | 0.185 | 0.375 | 0.568 | 0.760 | 0.939 | 1.105 | 1.256 | 1.393 | 1.515 | 1.621 | 1.711 | 1.784 | 1.840 | 1.878 | 1.899 | 1.901 | 1.885 | 1.850 | 1.797 | 1.725 | 1.634 | 1.524 | 1.396 | 1.249 | 1.085 | 0.902 | 0.702 | 0.485 | 0.251 | 0.000 |
| SUPERELEVATION ORDINATE | 0.000 | -0.074 | -0.143 | -0.206 | -0.265 | -0.319 | -0.368 | -0.412 | -0.451 | -0.485 | -0.515 | -0.539 | -0.558 | -0.572 | -0.581 | -0.586 | -0.585 | -0.579 | -0.569 | -0.553 | -0.533 | -0.507 | -0.477 | -0.441 | -0.401 | -0.356 | -0.305 | -0.250 | -0.190 | -0.125 | -0.055 |
| CAMBER DUE TO DISSIPATION RESULTING FROM HEAT CURVING | 0.211 | 0.211 | 0.211 | 0.211 | 0.211 | 0.211 | 0.200 | 0.200 | 0.294 | 0.294 | 0.294 | 0.294 | 0.294 | 0.294 | 0.294 | 0.294 | 0.294 | 0.294 | 0.294 | 0.294 | 0.294 | 0.294 | 0.294 | 0.294 | 0.200 | 0.200 | 0.211 | 0.211 | 0.211 | 0.211 | 0.211 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| REQUIRED CAMBER | 0″ | 5″ | 7 1/2″ | 10 1/8″ | 12 13/16″ | 15 5/16″ | 17 1/2″ | 19 11/16″ | 22 3/4″ | 24 9/16″ | 26 1/8″ | 27 3/8″ | 28 7/16″ | 29 1/4″ | 29 3/4″ | 30″ | 30″ | 29 11/16″ | 29 1/8″ | 28 1/4″ | 27 1/16″ | 25 11/16″ | 24″ | 22 1/16″ | 18 13/16″ | 16 7/16″ | 13 15/16″ | 11 3/16″ | 8 1/4″ | 5 1/8″ | 0″ |

## DEAD LOAD DEFLECTION & CAMBER TABLE FOR GIRDER 3

| THIRTIETH POINTS | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEFLECTION DUE TO WEIGHT OF STEEL & SLAB ✱ | 0.000 | 0.074 | 0.146 | 0.216 | 0.283 | 0.348 | 0.408 | 0.465 | 0.515 | 0.560 | 0.600 | 0.632 | 0.658 | 0.676 | 0.685 | 0.688 | 0.682 | 0.669 | 0.649 | 0.621 | 0.587 | 0.546 | 0.499 | 0.448 | 0.392 | 0.332 | 0.269 | 0.204 | 0.137 | 0.070 | 0.000 |
| DEFLECTION DUE TO WEIGHT OF RAIL | 0.000 | 0.005 | 0.010 | 0.015 | 0.019 | 0.024 | 0.028 | 0.031 | 0.034 | 0.037 | 0.040 | 0.042 | 0.044 | 0.045 | 0.045 | 0.045 | 0.045 | 0.044 | 0.042 | 0.041 | 0.038 | 0.036 | 0.032 | 0.029 | 0.025 | 0.021 | 0.017 | 0.013 | 0.009 | 0.004 | 0.000 |
| TOTAL DEAD LOAD DEFLECTION | 0.000 | 0.079 | 0.156 | 0.231 | 0.303 | 0.371 | 0.436 | 0.496 | 0.549 | 0.598 | 0.639 | 0.674 | 0.701 | 0.720 | 0.731 | 0.733 | 0.727 | 0.713 | 0.691 | 0.662 | 0.625 | 0.581 | 0.532 | 0.477 | 0.417 | 0.353 | 0.286 | 0.217 | 0.146 | 0.074 | 0.000 |
| VERTICAL CURVE ORDINATE | 0.000 | 0.199 | 0.402 | 0.611 | 0.820 | 1.018 | 1.200 | 1.368 | 1.519 | 1.654 | 1.772 | 1.872 | 1.953 | 2.015 | 2.058 | 2.081 | 2.084 | 2.066 | 2.028 | 1.970 | 1.890 | 1.790 | 1.670 | 1.529 | 1.367 | 1.187 | 0.986 | 0.767 | 0.529 | 0.273 | 0.000 |
| SUPERELEVATION ORDINATE | 0.000 | -0.074 | -0.143 | -0.207 | -0.266 | -0.321 | -0.370 | -0.415 | -0.455 | -0.490 | -0.520 | -0.545 | -0.565 | -0.580 | -0.590 | -0.596 | -0.596 | -0.592 | -0.582 | -0.568 | -0.549 | -0.525 | -0.496 | -0.462 | -0.424 | -0.380 | -0.331 | -0.278 | -0.220 | -0.157 | -0.088 |
| CAMBER DUE TO DISSIPATION RESULTING FROM HEAT CURVING | 0.215 | 0.215 | 0.215 | 0.215 | 0.215 | 0.215 | 0.204 | 0.204 | 0.300 | 0.300 | 0.300 | 0.300 | 0.300 | 0.300 | 0.300 | 0.300 | 0.300 | 0.300 | 0.300 | 0.300 | 0.300 | 0.300 | 0.300 | 0.300 | 0.300 | 0.204 | 0.204 | 0.215 | 0.215 | 0.215 | 0.215 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| REQUIRED CAMBER | 0″ | 5″ | 7 9/16″ | 10 3/16″ | 12 7/8″ | 15 3/8″ | 17 5/8″ | 19 13/16″ | 23″ | 24 3/4″ | 26 5/16″ | 27 5/8″ | 28 11/16″ | 29 7/16″ | 30″ | 30 1/4″ | 30 3/16″ | 29 7/8″ | 29 1/4″ | 28 3/8″ | 27 3/16″ | 25 3/4″ | 24 1/16″ | 22 1/8″ | 19 15/16″ | 16 3/8″ | 13 3/4″ | 11 1/16″ | 8 1/16″ | 4 7/8″ | 0″ |

✱ INCLUDES ALL STRUCTURAL STEEL COMPONENTS, SLAB (SAND-LIGHTWEIGHT), BUILD-UP (SAND-LIGHTWEIGHT), & STAY-IN-PLACE METAL FORMS.

NOTES:

THIRTIETH POINTS SHOWN ARE MEASURED ALONG ℄ GIRDER AND ARE GIVEN BETWEEN ℄ BEARINGS.

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

PROJECT NO. U-5806

CABARRUS COUNTY

STATION: 15+75.56 -Y1-
27+06.95 -L-

SHEET 1 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 033752 ENGINEER SETH A. DENNEY

DocuSigned by: Seth A. Denney
E8EB154C09E0410...
10/23/2017

NORTH CAROLINA PROFESSIONAL SEAL 040769 ENGINEER ANDREW L. PHILLIPS

DocuSigned by: Andrew L. Phillips
2B869ABAD40042D...
10/23/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTIONS AND CAMBER

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

| REVISIONS | | | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | | NO. | BY: | DATE: | | S-23 |
| 1 | | | | 3 | | | | TOTAL SHEETS |
| 2 | | | | 4 | | | | 50 |

DRAWN BY: D. D. LOWERY DATE: 10/17
CHECKED BY: A. L. PHILLIPS DATE: 10/17
DESIGN ENGINEER OF RECORD: S. A. DENNEY DATE: 10/17

## DEAD LOAD DEFLECTION & CAMBER TABLE FOR GIRDER 4

| THIRTIETH POINTS | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEFLECTION DUE TO WEIGHT OF STEEL & SLAB ✳ | 0.000 | 0.062 | 0.123 | 0.181 | 0.237 | 0.291 | 0.341 | 0.389 | 0.431 | 0.468 | 0.501 | 0.528 | 0.550 | 0.564 | 0.573 | 0.574 | 0.570 | 0.558 | 0.540 | 0.516 | 0.486 | 0.451 | 0.411 | 0.368 | 0.321 | 0.271 | 0.218 | 0.165 | 0.111 | 0.056 | 0.000 |
| DEFLECTION DUE TO WEIGHT OF RAIL | 0.000 | 0.004 | 0.008 | 0.012 | 0.016 | 0.019 | 0.022 | 0.025 | 0.028 | 0.030 | 0.032 | 0.033 | 0.034 | 0.035 | 0.036 | 0.036 | 0.035 | 0.035 | 0.034 | 0.032 | 0.030 | 0.028 | 0.026 | 0.023 | 0.020 | 0.017 | 0.014 | 0.011 | 0.007 | 0.004 | 0.000 |
| TOTAL DEAD LOAD DEFLECTION | 0.000 | 0.067 | 0.131 | 0.193 | 0.253 | 0.310 | 0.364 | 0.414 | 0.458 | 0.498 | 0.533 | 0.562 | 0.584 | 0.600 | 0.608 | 0.610 | 0.605 | 0.593 | 0.573 | 0.548 | 0.516 | 0.479 | 0.437 | 0.391 | 0.341 | 0.288 | 0.232 | 0.175 | 0.118 | 0.059 | 0.000 |
| VERTICAL CURVE ORDINATE | 0.000 | 0.214 | 0.434 | 0.659 | 0.888 | 1.106 | 1.309 | 1.495 | 1.663 | 1.813 | 1.944 | 2.056 | 2.146 | 2.216 | 2.264 | 2.290 | 2.293 | 2.274 | 2.232 | 2.167 | 2.079 | 1.968 | 1.835 | 1.679 | 1.501 | 1.301 | 1.081 | 0.840 | 0.579 | 0.299 | 0.000 |
| SUPERELEVATION ORDINATE | 0.000 | -0.074 | -0.143 | -0.208 | -0.268 | -0.323 | -0.373 | -0.418 | -0.458 | -0.494 | -0.525 | -0.551 | -0.572 | -0.588 | -0.600 | -0.606 | -0.608 | -0.605 | -0.597 | -0.584 | -0.566 | -0.544 | -0.516 | -0.484 | -0.447 | -0.405 | -0.359 | -0.307 | -0.251 | -0.190 | -0.124 |
| CAMBER DUE TO DISSIPATION RESULTING FROM HEAT CURVING | 0.219 | 0.219 | 0.219 | 0.219 | 0.219 | 0.219 | 0.208 | 0.306 | 0.306 | 0.306 | 0.306 | 0.306 | 0.306 | 0.306 | 0.306 | 0.306 | 0.306 | 0.306 | 0.306 | 0.306 | 0.306 | 0.306 | 0.306 | 0.306 | 0.208 | 0.208 | 0.219 | 0.219 | 0.219 | 0.219 | 0.219 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| REQUIRED CAMBER | 2 5/8″ | 5 1/8″ | 7 11/16″ | 10 3/8″ | 13 1/8″ | 15 3/4″ | 18 1/8″ | 21 9/16″ | 23 5/8″ | 25 1/2″ | 27 1/8″ | 28 1/2″ | 29 9/16″ | 30 3/8″ | 30 15/16″ | 31 3/16″ | 31 3/16″ | 30 13/16″ | 30 3/16″ | 29 1/4″ | 28″ | 26 1/2″ | 24 3/4″ | 22 11/16″ | 19 1/4″ | 16 11/16″ | 14 1/16″ | 11 1/8″ | 8″ | 4 5/8″ | 0″ |

## DEAD LOAD DEFLECTION & CAMBER TABLE FOR GIRDER 5

| THIRTIETH POINTS | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEFLECTION DUE TO WEIGHT OF STEEL & SLAB ✳ | 0.000 | 0.050 | 0.099 | 0.145 | 0.189 | 0.231 | 0.270 | 0.306 | 0.339 | 0.368 | 0.393 | 0.413 | 0.429 | 0.440 | 0.445 | 0.446 | 0.442 | 0.433 | 0.420 | 0.401 | 0.379 | 0.352 | 0.322 | 0.288 | 0.251 | 0.213 | 0.172 | 0.130 | 0.088 | 0.044 | 0.000 |
| DEFLECTION DUE TO WEIGHT OF RAIL | 0.000 | 0.004 | 0.007 | 0.010 | 0.013 | 0.016 | 0.019 | 0.021 | 0.023 | 0.025 | 0.027 | 0.028 | 0.029 | 0.030 | 0.031 | 0.031 | 0.030 | 0.030 | 0.029 | 0.028 | 0.026 | 0.024 | 0.022 | 0.020 | 0.018 | 0.015 | 0.012 | 0.009 | 0.006 | 0.003 | 0.000 |
| TOTAL DEAD LOAD DEFLECTION | 0.000 | 0.054 | 0.106 | 0.155 | 0.203 | 0.247 | 0.289 | 0.328 | 0.362 | 0.393 | 0.420 | 0.441 | 0.458 | 0.470 | 0.476 | 0.477 | 0.473 | 0.463 | 0.449 | 0.429 | 0.405 | 0.376 | 0.344 | 0.308 | 0.269 | 0.228 | 0.185 | 0.140 | 0.094 | 0.048 | 0.000 |
| VERTICAL CURVE ORDINATE | 0.000 | 0.231 | 0.469 | 0.714 | 0.964 | 1.207 | 1.432 | 1.640 | 1.828 | 1.995 | 2.142 | 2.267 | 2.368 | 2.446 | 2.500 | 2.529 | 2.533 | 2.512 | 2.465 | 2.392 | 2.294 | 2.171 | 2.022 | 1.849 | 1.652 | 1.431 | 1.188 | 0.922 | 0.635 | 0.327 | 0.000 |
| SUPERELEVATION ORDINATE | 0.000 | -0.074 | -0.144 | -0.209 | -0.269 | -0.324 | -0.375 | -0.421 | -0.462 | -0.499 | -0.531 | -0.557 | -0.580 | -0.597 | -0.610 | -0.617 | -0.620 | -0.619 | -0.612 | -0.601 | -0.584 | -0.564 | -0.538 | -0.507 | -0.472 | -0.432 | -0.387 | -0.338 | -0.284 | -0.225 | -0.161 |
| CAMBER DUE TO DISSIPATION RESULTING FROM HEAT CURVING | 0.224 | 0.224 | 0.224 | 0.224 | 0.224 | 0.224 | 0.213 | 0.313 | 0.313 | 0.313 | 0.313 | 0.313 | 0.313 | 0.313 | 0.313 | 0.313 | 0.313 | 0.313 | 0.313 | 0.313 | 0.313 | 0.313 | 0.313 | 0.313 | 0.313 | 0.213 | 0.224 | 0.224 | 0.224 | 0.224 | 0.224 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| REQUIRED CAMBER | 2 11/16″ | 5 1/4″ | 7 7/8″ | 10 5/8″ | 13 7/16″ | 16 1/4″ | 18 11/16″ | 22 5/16″ | 24 1/2″ | 26 7/16″ | 28 1/8″ | 29 9/16″ | 30 11/16″ | 31 9/16″ | 32 1/8″ | 32 7/16″ | 32 3/8″ | 32 1/16″ | 31 3/8″ | 30 3/8″ | 29 1/8″ | 27 9/16″ | 25 11/16″ | 23 9/16″ | 21 1/8″ | 17 1/4″ | 14 1/2″ | 11 3/8″ | 8 1/16″ | 4 1/2″ | 0″ |

## DEAD LOAD DEFLECTION & CAMBER TABLE FOR GIRDER 6

| THIRTIETH POINTS | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEFLECTION DUE TO WEIGHT OF STEEL & SLAB ✳ | 0.000 | 0.038 | 0.074 | 0.108 | 0.140 | 0.171 | 0.200 | 0.226 | 0.251 | 0.272 | 0.291 | 0.306 | 0.318 | 0.327 | 0.332 | 0.333 | 0.331 | 0.325 | 0.316 | 0.303 | 0.286 | 0.267 | 0.245 | 0.221 | 0.194 | 0.165 | 0.135 | 0.103 | 0.069 | 0.035 | 0.000 |
| DEFLECTION DUE TO WEIGHT OF RAIL | 0.000 | 0.003 | 0.006 | 0.009 | 0.012 | 0.015 | 0.017 | 0.019 | 0.021 | 0.023 | 0.025 | 0.026 | 0.027 | 0.028 | 0.028 | 0.028 | 0.028 | 0.028 | 0.027 | 0.026 | 0.025 | 0.023 | 0.021 | 0.020 | 0.017 | 0.015 | 0.012 | 0.009 | 0.006 | 0.003 | 0.000 |
| TOTAL DEAD LOAD DEFLECTION | 0.000 | 0.041 | 0.080 | 0.117 | 0.152 | 0.186 | 0.217 | 0.246 | 0.272 | 0.295 | 0.315 | 0.332 | 0.345 | 0.355 | 0.360 | 0.361 | 0.359 | 0.353 | 0.342 | 0.329 | 0.311 | 0.291 | 0.267 | 0.240 | 0.212 | 0.180 | 0.147 | 0.112 | 0.076 | 0.038 | 0.000 |
| VERTICAL CURVE ORDINATE | 0.000 | 0.251 | 0.510 | 0.776 | 1.050 | 1.321 | 1.573 | 1.805 | 2.017 | 2.205 | 2.370 | 2.510 | 2.625 | 2.712 | 2.773 | 2.806 | 2.810 | 2.786 | 2.733 | 2.651 | 2.541 | 2.402 | 2.236 | 2.043 | 1.823 | 1.578 | 1.308 | 1.014 | 0.697 | 0.359 | 0.000 |
| SUPERELEVATION ORDINATE | 0.000 | -0.075 | -0.144 | -0.210 | -0.270 | -0.326 | -0.378 | -0.425 | -0.467 | -0.504 | -0.537 | -0.565 | -0.588 | -0.606 | -0.620 | -0.629 | -0.633 | -0.633 | -0.628 | -0.618 | -0.604 | -0.584 | -0.560 | -0.532 | -0.498 | -0.460 | -0.417 | -0.370 | -0.318 | -0.261 | -0.200 |
| CAMBER DUE TO DISSIPATION RESULTING FROM HEAT CURVING | 0.229 | 0.229 | 0.229 | 0.229 | 0.229 | 0.229 | 0.217 | 0.319 | 0.319 | 0.319 | 0.319 | 0.319 | 0.319 | 0.319 | 0.319 | 0.319 | 0.319 | 0.319 | 0.319 | 0.319 | 0.319 | 0.319 | 0.319 | 0.319 | 0.217 | 0.217 | 0.229 | 0.229 | 0.229 | 0.229 | 0.229 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| REQUIRED CAMBER | 0″ | 5 3/8″ | 8 1/16″ | 10 15/16″ | 13 15/16″ | 16 7/8″ | 19 9/16″ | 23 3/8″ | 25 11/16″ | 27 13/16″ | 29 5/8″ | 31 3/16″ | 32 7/16″ | 33 3/8″ | 34″ | 34 5/16″ | 34 1/4″ | 33 7/8″ | 33 3/16″ | 32 3/16″ | 30 13/16″ | 29 1/8″ | 27 1/8″ | 24 7/8″ | 21 1/16″ | 18 3/16″ | 15 3/16″ | 11 13/16″ | 8 3/16″ | 4 3/8″ | 0″ |

✳ INCLUDES ALL STRUCTURAL STEEL COMPONENTS, SLAB (SAND-LIGHTWEIGHT), BUILD-UP (SAND-LIGHTWEIGHT), & STAY-IN-PLACE METAL FORMS.

NOTES:

THIRTIETH POINTS SHOWN ARE MEASURED ALONG ℄ GIRDER AND ARE GIVEN BETWEEN ℄ BEARINGS.

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

PROJECT NO. U-5806

CABARRUS COUNTY

STATION: 15+75.56 -Y1-
27+06.95 -L-

SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033752 SETH A. DENNEY
DocuSigned by: Seth A. Denney
E8EB154C09E0410...
10/23/2017

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040769 ANDREW L. PHILLIPS
DocuSigned by: Andrew L. Phillips
2B869ABAD4004D3...
10/23/2017

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102

This document, together with the concepts and designs presented herein, as an instrument of services, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adoption by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



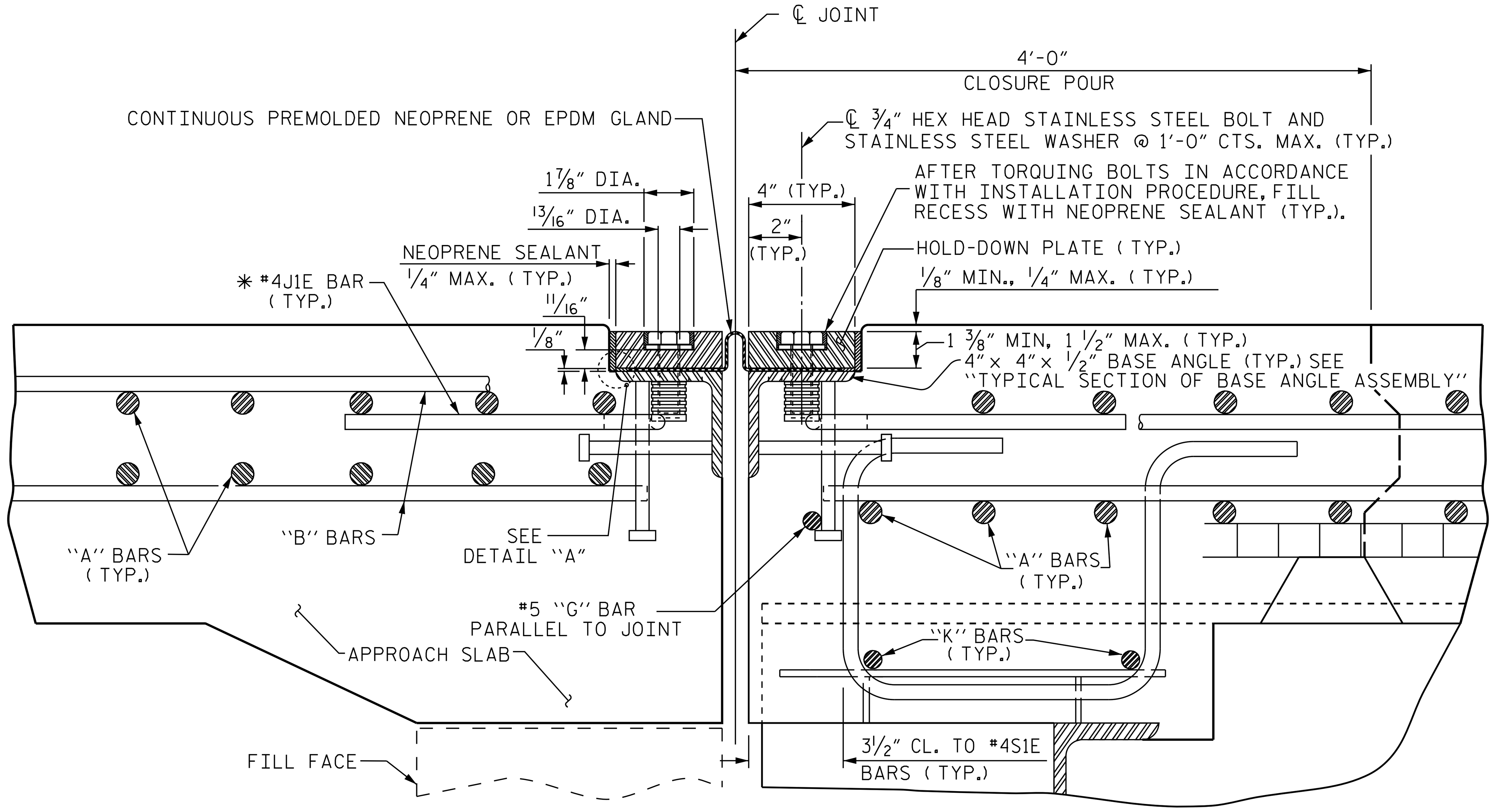
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
DEAD LOAD DEFLECTIONS AND CAMBER

| REVISIONS | | | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | | NO. | BY: | DATE: | | S-24 |
| 1 | | | | 3 | | | | TOTAL SHEETS |
| 2 | | | | 4 | | | | 50 |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY: D. D. LOWERY DATE: 10/17
CHECKED BY: A. L. PHILLIPS DATE: 10/17
DESIGN ENGINEER OF RECORD: S.A. DENNEY DATE: 10/17




# EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- STEEL SUPERSTRUCTURE

* THE QUANTITY OF #4J1E BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1E BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1E BARS SPECIFIED, ADDITIONAL J1E BARS WILL NOT BE REQUIRED.

## INSTALLATION PROCEDURE

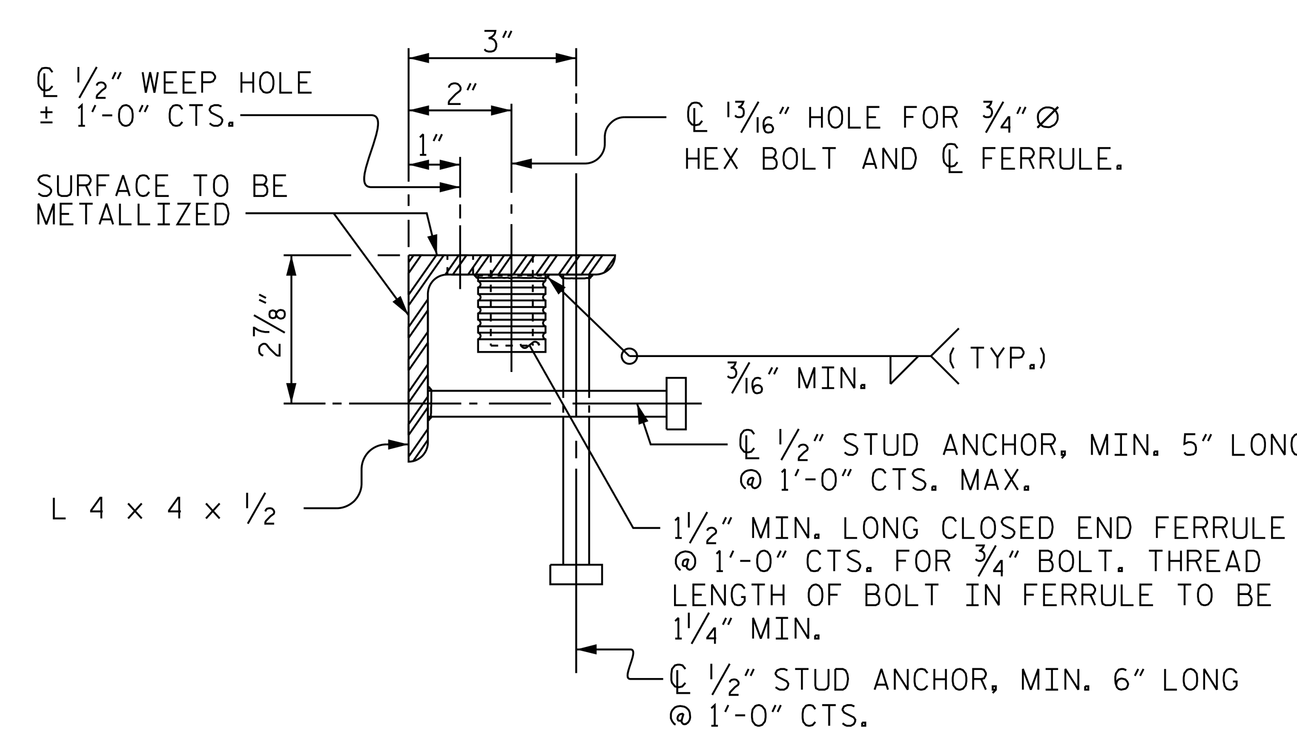
1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 4 1/8" TO 4 1/4" WIDE AND OF SUCH THICKNESS AS TO PROVIDE FOR CORRECT FINAL ELEVATION OF TOP OF HOLD-DOWN PLATES. THE TEMPLATE SHALL BE ATTACHED TO THE BASE ANGLE ASSEMBLY WITH THE 3/4" Ø HEX HEAD BOLTS PROVIDED FOR THE HOLD-DOWN PLATES. A 1" Ø HOLE SHALL BE PROVIDED IN THE TEMPLATE CENTERED OVER EACH WEEP HOLE IN THE 4" X 4" X 1/2" BASE ANGLE. OTHER METHODS OF INSURING DRAINAGE THROUGH WEEP HOLES MAY BE EMPLOYED SUBJECT TO ENGINEER'S APPROVAL.
2. AFTER THE CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE THE TEMPLATE. THOROUGHLY CLEAN THE BOLT HOLES AND THE ANGLE PLATE. REMOVE ANY EXCESS CONCRETE THAT COMES OUT OF THE WEEP HOLES. ANY DAMAGED STEEL SHALL BE COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
3. LAY THE GLAND ON THE BASE ANGLE AND FIELD MARK THE GLAND FOR THE BOLT HOLES. HOLES IN THE GLAND SHALL BE PUNCHED 7/8" IN DIAMETER WITH A HAND PUNCH.
4. IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE BUT DO NOT TIGHTEN. THE ENGINEER SHALL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.
5. AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND GLAND. APPLY NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE "INSTALLATION SKETCH". PLACE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY WITH THE BOLTS TO 88 FT-LBS WITH A TORQUE WRENCH. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT-LBS AFTER SEVEN (7) DAYS.
6. AFTER PROPER TORQUING, CLEAN THE BOLT HOLE RECESSES AND THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE, COMPLETELY FILL THESE RECESSES WITH NEOPRENE SEALANT.

## GENERAL NOTES

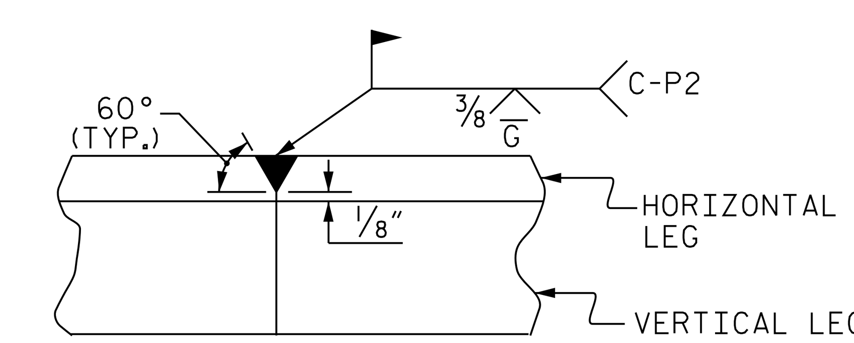
1. FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
2. ALL PLATES AND ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL CONFORM TO ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL. ALL STUD ANCHORS SHALL CONFORM TO AASHTO M169, GRADES 1010 THRU 1020 OR APPROVED EQUAL. ALL CONCRETE INSERTS SHALL BE CLOSED END AND SHALL CONFORM TO AASHTO M169, GRADE 12L14. TENSILE CAPACITY SHALL BE 3000 LBS. MIN.
3. A PREMOLDED CORRUGATED OR NON-CORRUGATED GLAND SHALL BE USED FOR JOINTS SKEWED BETWEEN 50° THRU 130°. FOR JOINTS SKEWED LESS THAN 50° OR MORE THAN 130°, ONLY A CORRUGATED GLAND SHALL BE USED.
4. CLOSED END FERRULES AND STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.
5. SURFACES COMING IN CONTACT WITH NEOPRENE SHALL BE GROUND SMOOTH PRIOR TO METALLIZING.
6. UPON COMPLETION OF SHOP FABRICATION, THE HOLD DOWN PLATE AND BASE ANGLE ASSEMBLY, AS SHOWN IN THE "TYPICAL SECTION OF BASE ANGLE ASSEMBLY", SHALL BE METALLIZED. SEE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
7. BASE ANGLE ASSEMBLY SHALL BE CONTINUOUS FOR THE LENGTH OF THE JOINT. AT CROWN BREAKS, THE ENDS OF THE BASE ANGLE ASSEMBLY SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE FOR SKEWS LESS THAN 80° AND GREATER THAN 100°. FINISHED WELD SHALL BE GROUND SMOOTH AND COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
8. FIELD SPLICES OF HOLD-DOWN PLATES SHALL BE KEPT TO A MINIMUM. CONTRACTOR SHALL FURNISH DETAILED PLANS SHOWING PROPOSED SPLICE LOCATIONS FOR APPROVAL. HOLD-DOWN PLATES SHALL NOT EXCEED 20' LENGTHS UNLESS APPROVED BY THE ENGINEER.
9. NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.
10. THE CONTRACTOR MAY, AT HIS OPTION, USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF CONCRETE INSERTS FOR COVER PLATES. THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SPECIAL PROVISIONS.

MOVEMENT AND SETTING AT JOINT

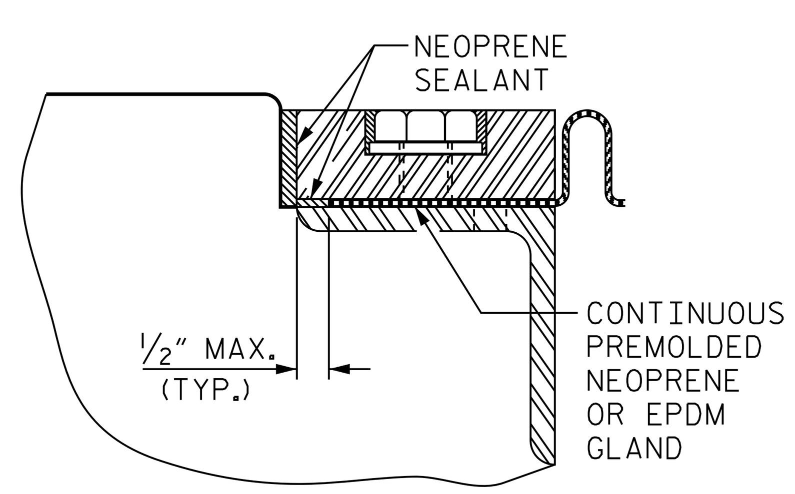
| BENT NO. | SKEW ANGLE | TOTAL MOVEMENT (ALONG EXPANSION CHORD) | PERPENDICULAR JOINT OPENING AT 45° F | PERPENDICULAR JOINT OPENING AT 60° F | PERPENDICULAR JOINT OPENING AT 90° F |
|---|---|---|---|---|---|
| EB1 | 90°-24'-29" | 0" | 2" | 2" | 2" |
| EB2 | 62°-35'-47" | 1 1/2" | 2 7/8" | 2 11/16" | 2 1/4" |



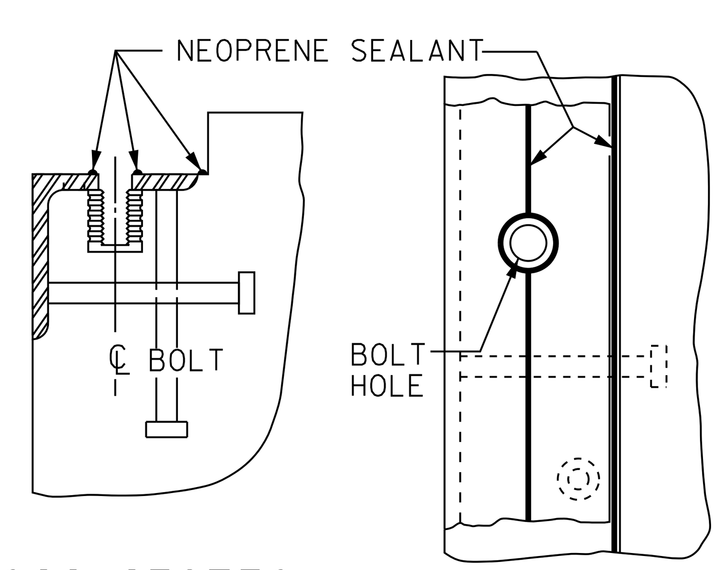

# TYPICAL SECTION OF BASE ANGLE ASSEMBLY




# DETAIL- FIELD WELD SPLICE OF BASE ANGLE




# DETAIL "A"




CROSS SECTION    PLAN VIEW

# INSTALLATION SKETCH

PROJECT NO. U-5806

CABARRUS COUNTY

STATION: 15+75.56 -Y1- 27+06.95 -L-

SHEET 1 OF 2

SEAL 033752 — SETH A. DENNEY — NORTH CAROLINA PROFESSIONAL ENGINEER
DocuSigned by: Seth A. Denney — E8EB154CC9ED410... — 10/23/2017

SEAL 040769 — ANDREW L. PHILLIPS — NORTH CAROLINA PROFESSIONAL ENGINEER
DocuSigned by: Andrew L. Phillips — 2B869ABAD4004D3... — 10/23/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

# EXPANSION JOINT SEAL DETAILS

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102



**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

REVISIONS

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

SHEET NO. S-25
TOTAL SHEETS 50

| | | | |
|---|---|---|---|
| ASSEMBLED BY : D.D. LOWERY | | DATE : | 10/17 |
| CHECKED BY : A.L. PHILLIPS | | DATE : | 10/17 |
| DRAWN BY : REK 9/87 | | REV. 5/7/03R | RWW/JTE |
| CHECKED BY : CRK 10/87 | | REV. 5/1/06R | TLA/GM |
| | | REV. 10/1/11 | MAA/GM |

10/23/2017 K:\RDT_Structures_Bridge\NC\011036388 - U-5806 FinalDesign\Cad\Dgn\025_U-5806_EJ01.dgn

STD. NO. EJS1


PROJECT NO. U-5806

CABARRUS COUNTY

STATION: 15+75.56 -Y1- 27+06.95 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033752 SETH A. DENNEY — Seth A. Denney 10/23/2017

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040769 ANDREW L. PHILLIPS — Andrew L. Phillips 10/23/2017

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102



**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-26 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 50 |

| | | | |
|---|---|---|---|
| ASSEMBLED BY : D.D. LOWERY | | DATE : 10/17 | |
| CHECKED BY : A.L. PHILLIPS | | DATE : 10/17 | |
| DRAWN BY : REK 9/87 | REV. 10/1/11 | MAA/GM | |
| CHECKED BY : CRK 10/87 | REV. 7/12 | MAA/GM | |
| | REV. 6/13 | MAA/GM | |

10/23/2017 K:\RDI_Structures_Bridge\NC\011036388 - U-5806_Final Design\Cad\Dgn\026_U-5806_EJ02.dgn

STD. NO. EJS2

NOTE:

FOR BARRIER RAIL NOTES, SEE "CONCRETE BARRIER RAIL", SHEET 2 OF 2.

U.N.O. - DENOTES UNLESS NOTED OTHERWISE.


## PLAN OF BARRIER RAIL

✱ MEASURED ALONG ℄ JOINT (PERPENDICULAR)
✱✱ ARC LENGTHS MEASURED ALONG OUTSIDE EDGE OF SUPERSTRUCTURE

(A) SEE "PLAN AT END OF RAIL" DETAIL @ END BENT 1 ON SHEET 2 OF 2 FOR LOCATIONS & BAR TYPES .

(B) SEE "PLAN AT END OF RAIL" DETAIL @ END BENT 2 ON SHEET 2 OF 2 FOR LOCATIONS & BAR TYPES .

PROJECT NO. U-5806

CABARRUS COUNTY

STATION: 15+75.56 -Y1-
27+06.95 -L-

SHEET 1 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 033752 ENGINEER SETH A. DENNEY
DocuSigned by: Seth A. Denney
E8EB154CC9ED410...
10/23/2017

NORTH CAROLINA PROFESSIONAL SEAL 040769 ENGINEER ANDREW L. PHILLIPS
DocuSigned by: Andrew L. Phillips
2B869ABAD4004D3...
10/23/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONCRETE BARRIER RAIL PLAN

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102

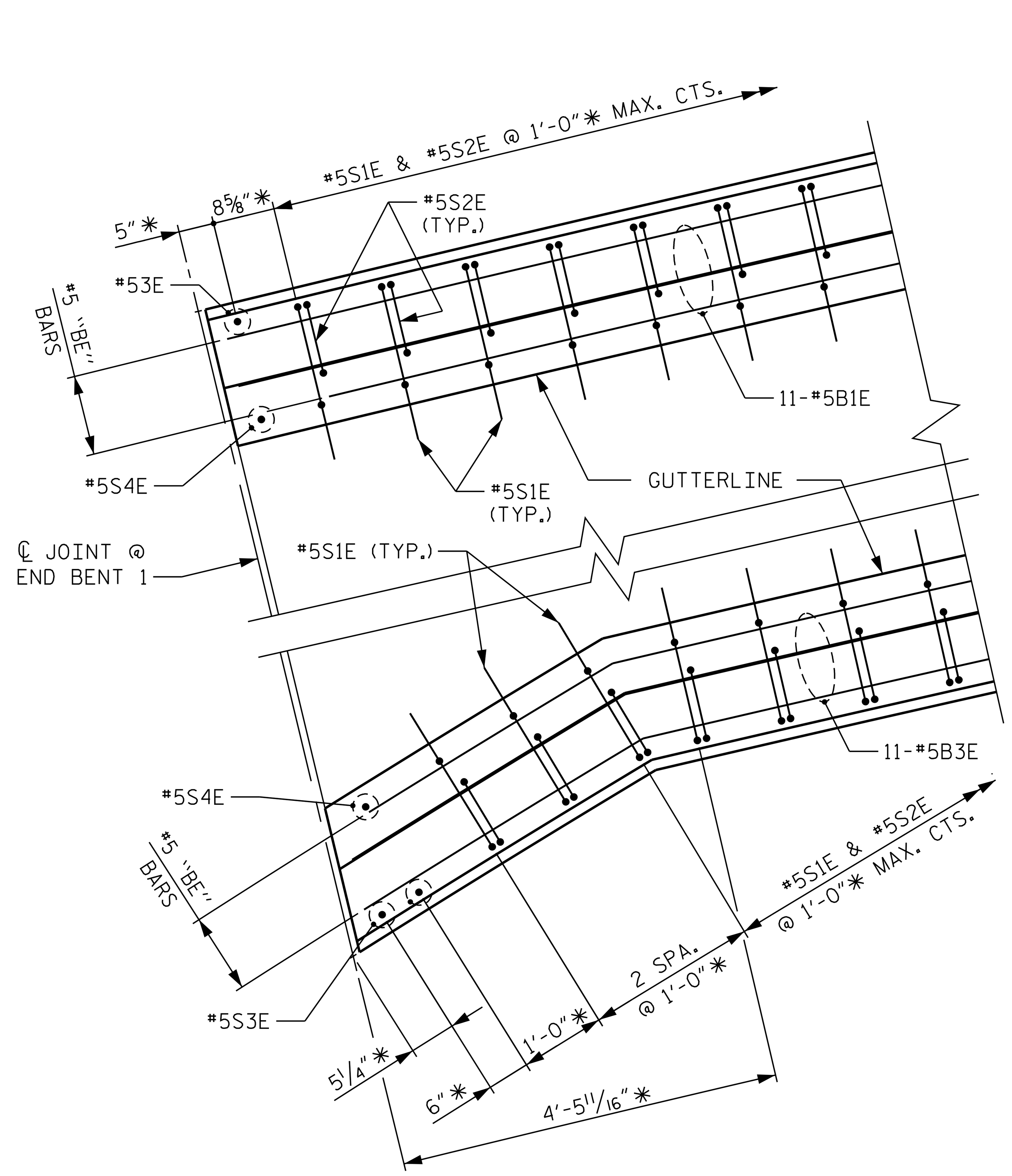


DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

| REVISIONS | | | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | | | S-27 |
| 1 | | | 3 | | | | | TOTAL SHEETS |
| 2 | | | 4 | | | | | 50 |

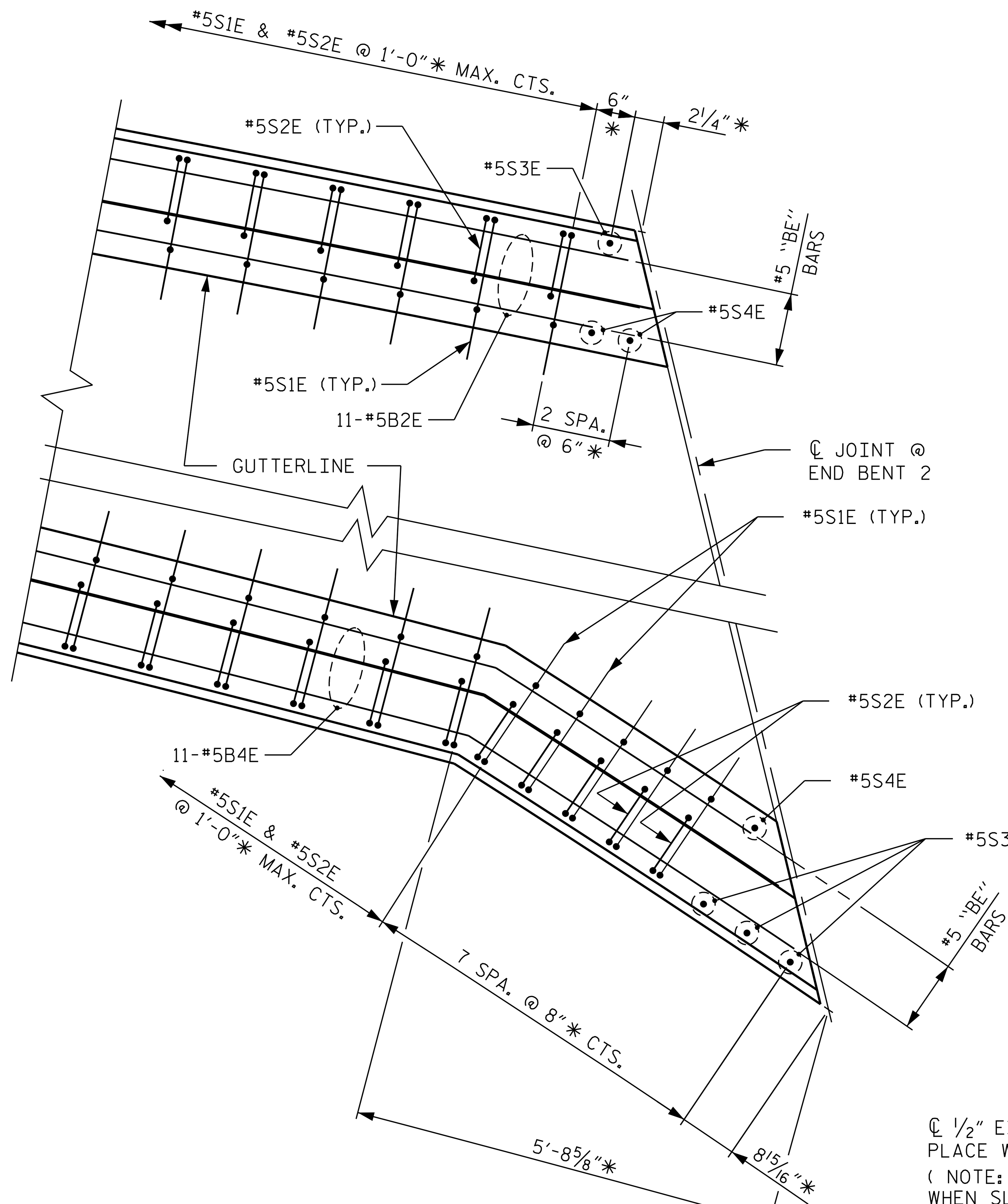
DRAWN BY: D.D.LOWERY DATE: 10/17
CHECKED BY: A.L.PHILLIPS DATE: 10/17
DESIGN ENGINEER OF RECORD: S.A.DENNEY DATE: 10/17

10/23/2017 K:\RDI_Structures_Bridge\NC\011035388 - U-5806 FinalDesign\Cad\Dgn\027_U-5806_BR01.dgn




## PLAN AT END OF RAIL

(@ END BENT 1)
✱ ARC LENGTHS MEASURED ALONG OUTSIDE EDGE OF CONCRETE DECK




## PLAN AT END OF RAIL

(@ END BENT 2)
✱ ARC LENGTHS MEASURED ALONG OUTSIDE EDGE OF CONCRETE DECK

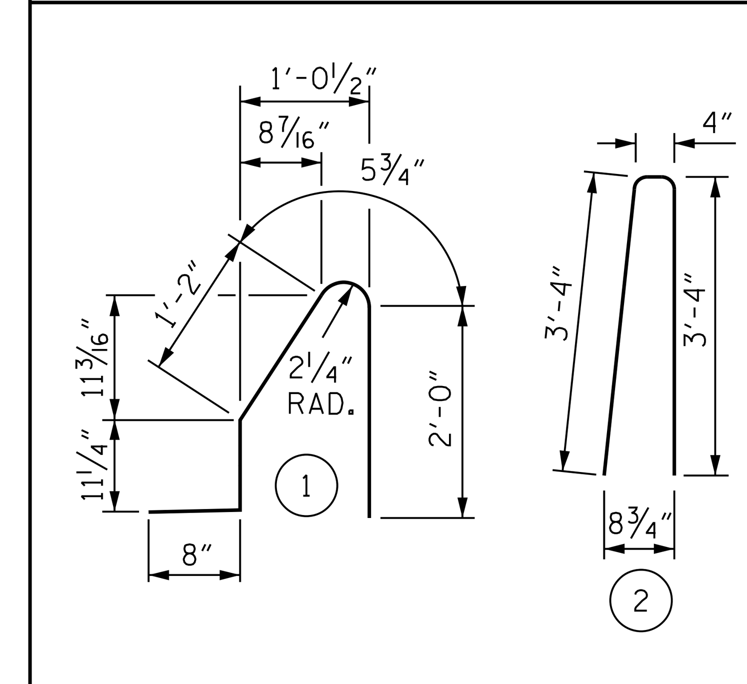
## NOTES

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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

## BAR TYPES




ALL BAR DIMENSIONS ARE OUT TO OUT

## BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

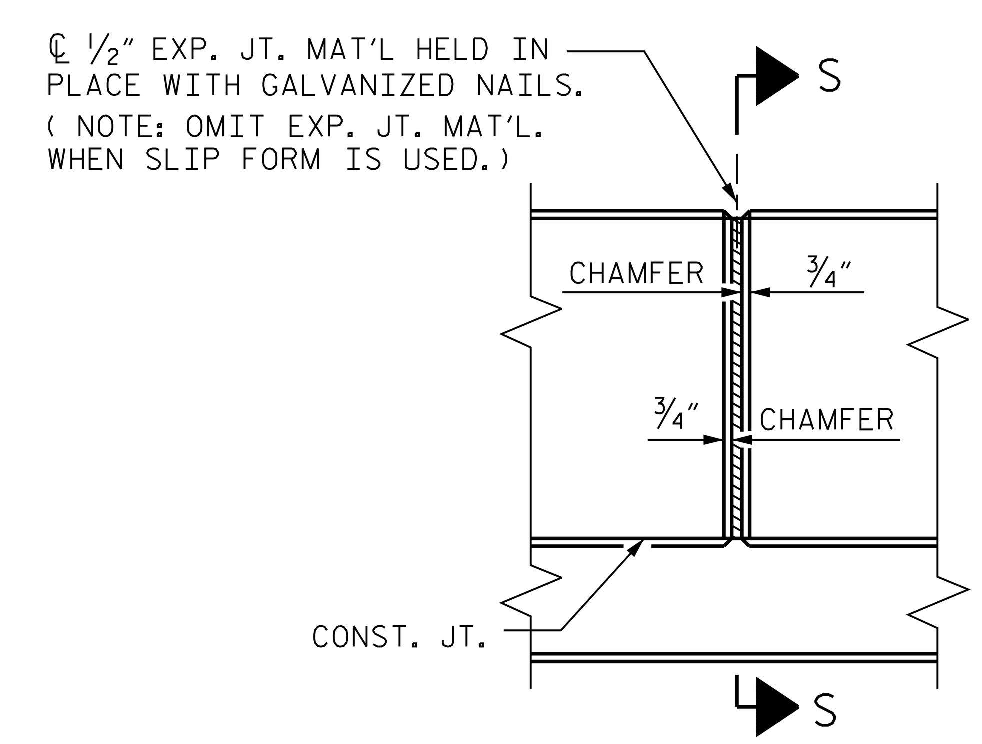
| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| B1E | 143 | #5 | STR | 24'-7" | 3,667 |
| B2E | 11 | #5 | STR | 25'-7" | 294 |
| B3E | 11 | #5 | STR | 24'-8" | 283 |
| B4E | 11 | #5 | STR | 27'-8" | 317 |
| S1E | 403 | #5 | 1 | 4'-11" | 2,067 |
| S2E | 403 | #5 | 2 | 7'-0" | 2,942 |
| S3E | 7 | #5 | STR | 3'-11" | 29 |
| S4E | 5 | #5 | STR | 2'-4" | 12 |

| | |
|---|---|
| EPOXY COATED REINFORCING STEEL | 9,611 LBS. |
| CLASS AA CONCRETE | 55.0 CU. YDS. |
| CONCRETE BARRIER RAIL ✱✱ | 405.0 LIN. FT. |

"E" DENOTES EPOXY COATED REINFORCING STEEL.

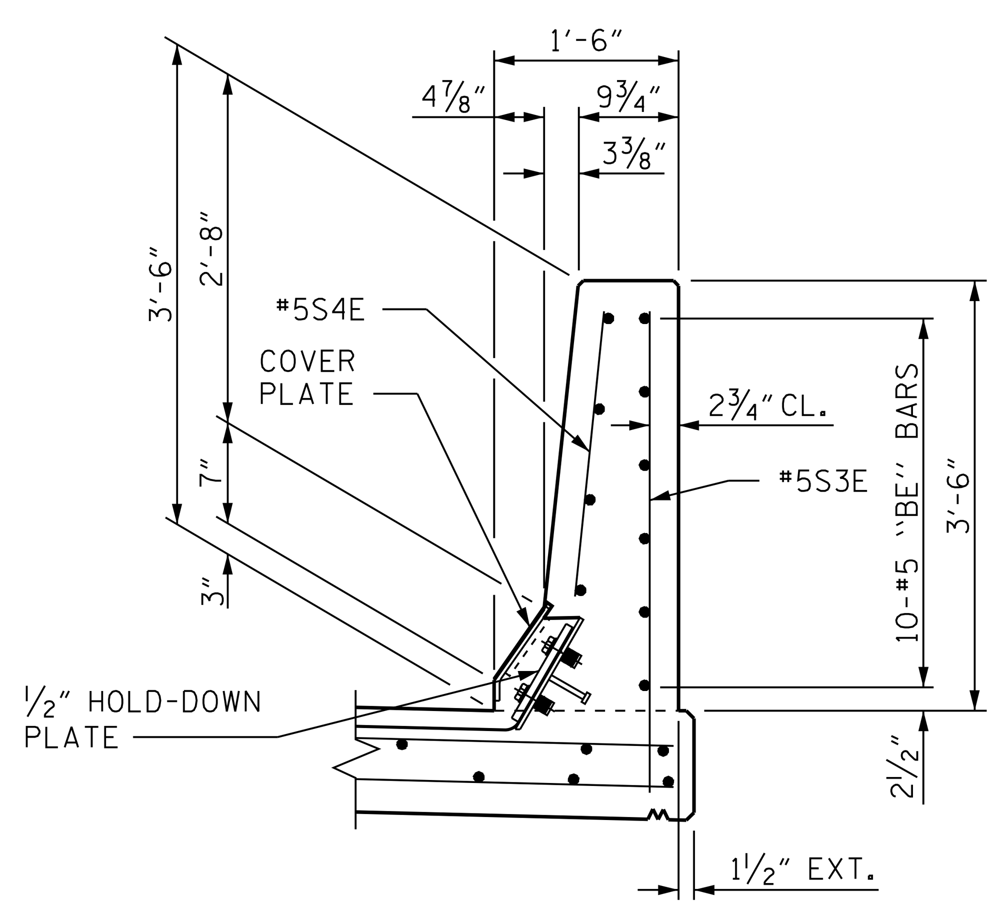
✱✱ QUANTITIES DO NOT INCLUDE BARRIER RAILS ON APPROACH SLABS.

B3E AND B4E BARS MAY BE FIELD BENT.

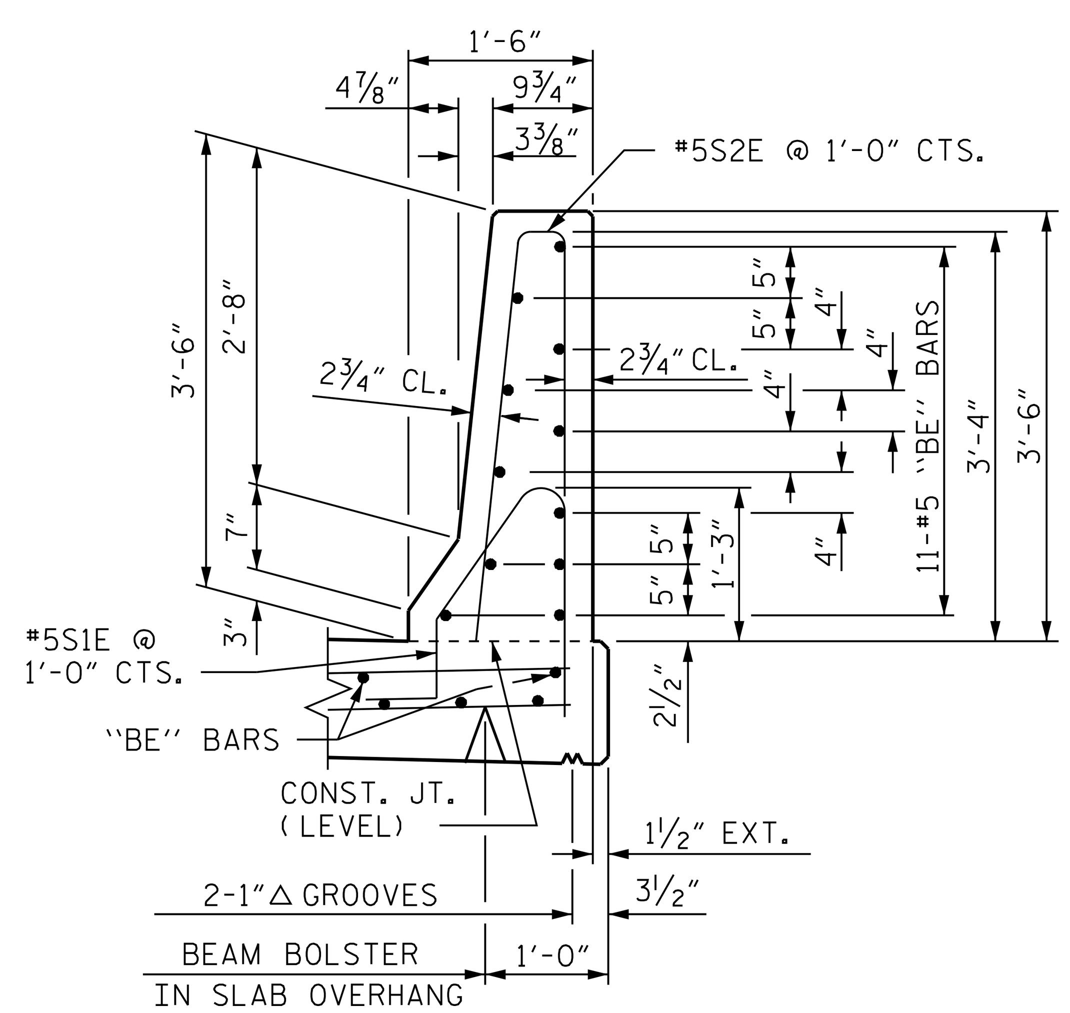



## ELEVATION AT EXPANSION JOINTS

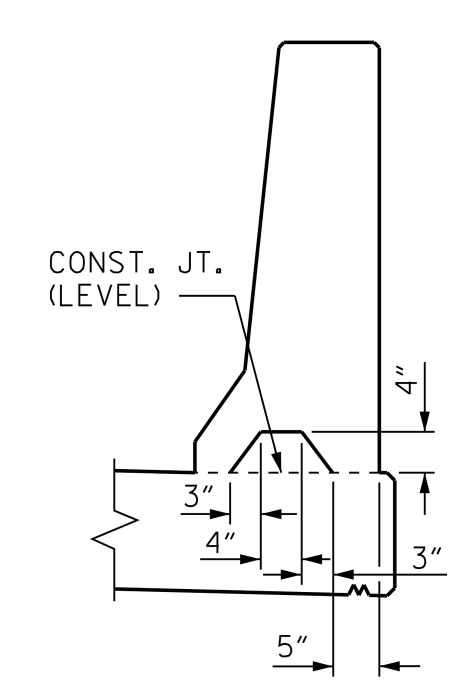
## BARRIER RAIL DETAILS




## SECTION THRU RAIL @ END VIEW




## SECTION THRU RAIL




## SECTION S-S

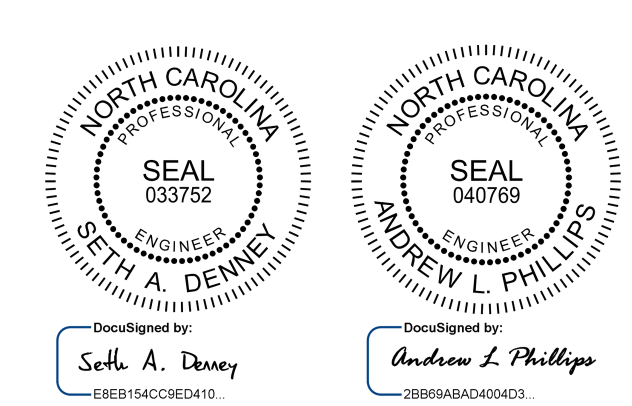
AT DAM IN OPEN JOINT (THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)

PROJECT NO. U-5806

CABARRUS COUNTY

STATION: 15+75.56 -Y1- 27+06.95 -L-

SHEET 2 OF 2




Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

# CONCRETE BARRIER RAIL

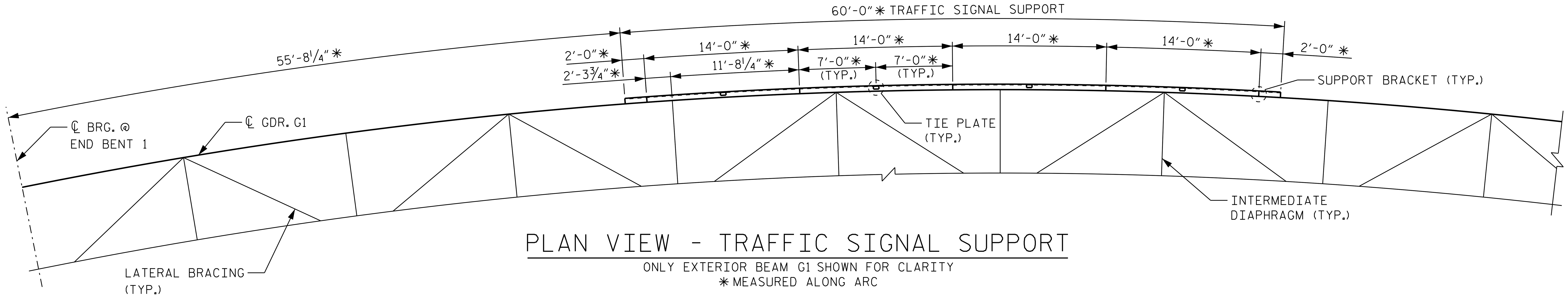
| REVISIONS | | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | | S-28 |
| 1 | | | 3 | | | | TOTAL SHEETS |
| 2 | | | 4 | | | | 50 |

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

| | | | |
|---|---|---|---|
| ASSEMBLED BY : D.D. LOWERY | | DATE : | 10/17 |
| CHECKED BY : A.L. PHILLIPS | | DATE : | 10/17 |
| DRAWN BY : ARB 5/87 | REV. 10/1/11 | | MAA/GM |
| CHECKED BY : SJD 9/87 | REV. 7/12 | | MAA/GM |
| | REV. 6/13 | | MAA/GM |

10/23/2017 K:\RDT_Structures_Bridge\NC\011036388 - U-5806 FinalDesign\Cad\Dgn\028_U-5806_BR02.dgn

STD. NO. CBR1




PLAN VIEW - TRAFFIC SIGNAL SUPPORT

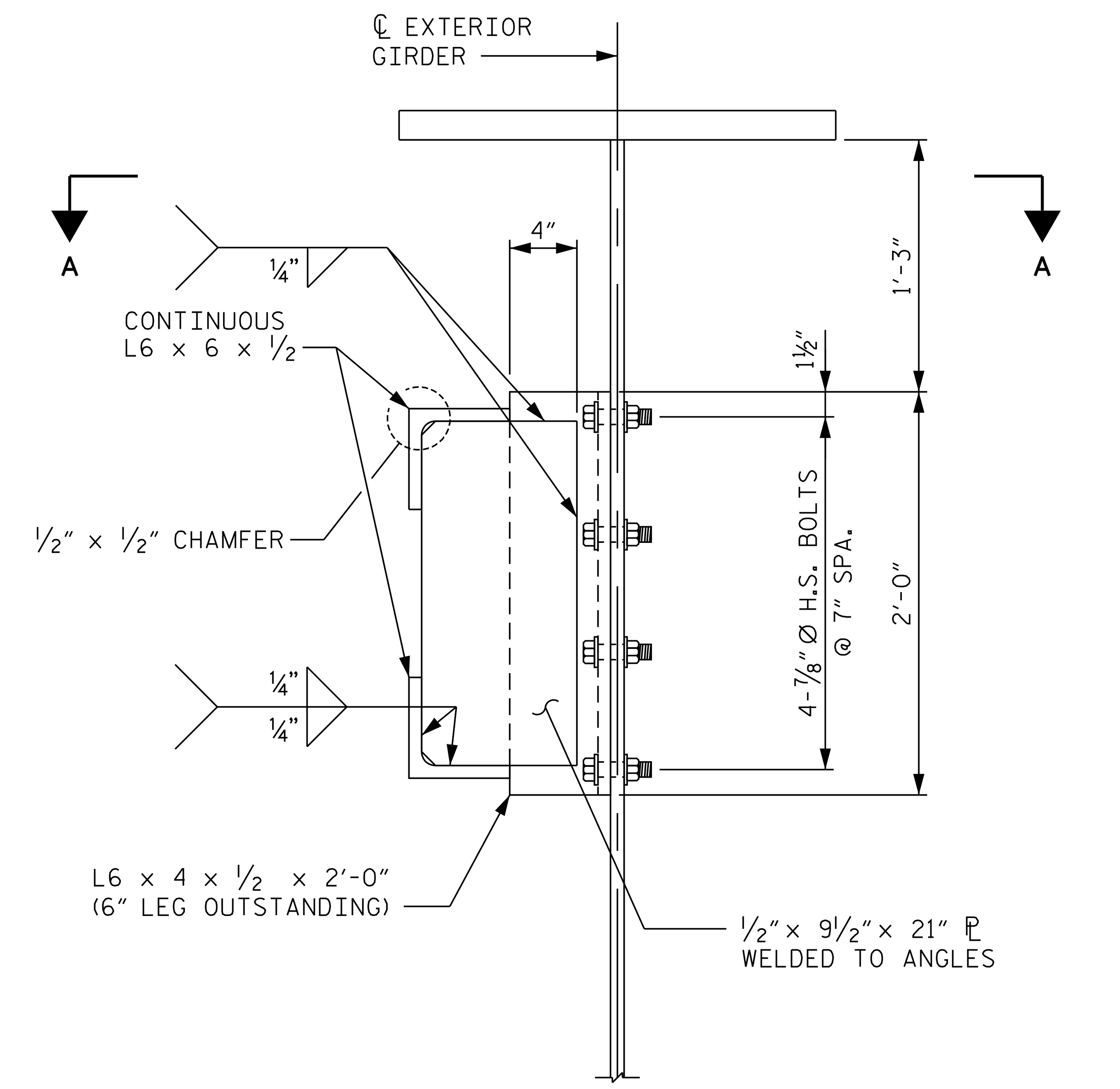
ONLY EXTERIOR BEAM G1 SHOWN FOR CLARITY
✱ MEASURED ALONG ARC

## NOTES:

ALL FIELD CONNECTIONS FOR THE TRAFFIC SIGNAL SUPPORT SYSTEM SHALL BE MADE WITH ⅞" DIAMETER HIGH STRENGTH BOLTS, UNLESS NOTED OTHERWISE.

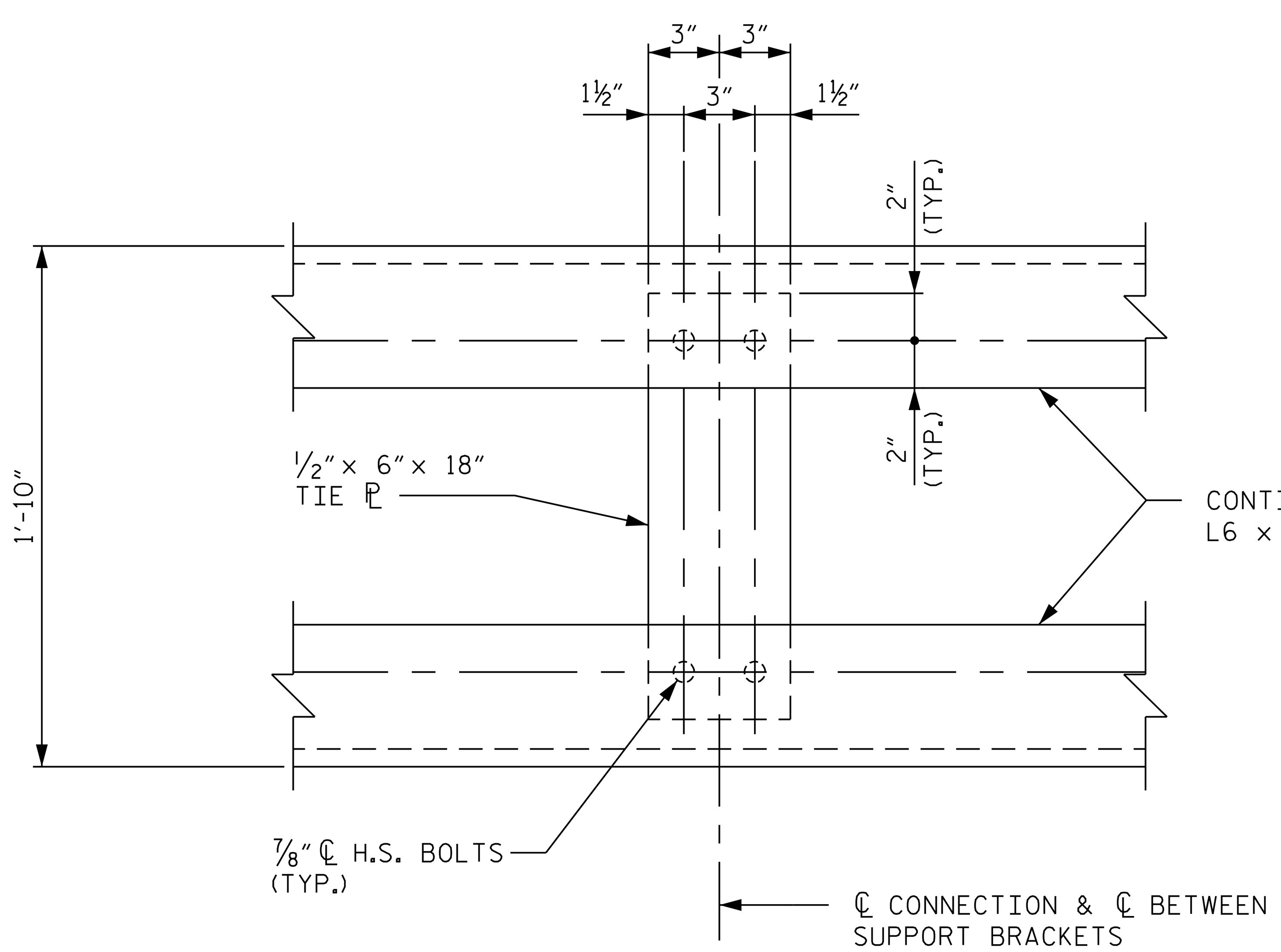
STRUCTURAL STEEL FOR SIGNAL SUPPORT BRACKETS SHALL BE ASTM A709 GR. 36. THE INDIVIDUAL SIGNAL SUPPORT BRACKETS ARE DESIGNED FOR A MAXIMUM 2 KIP VERTICAL LOAD OR 60 K-IN MOMENT. IF LOAD/MOMENTS (PROVIDED BY OTHERS) ARE GREATER THAN INDICATED, THEN A NEW ANALYSIS OF GIRDER/BRACKETS SHALL BE PERFORMED.

THE WEIGHT OF STRUCTURAL STEEL FOR THE SIGNAL SUPPORT BRACKETS IS INCLUDED IN THE PAY ITEM FOR APPROXIMATE LBS. STRUCTURAL STEEL.



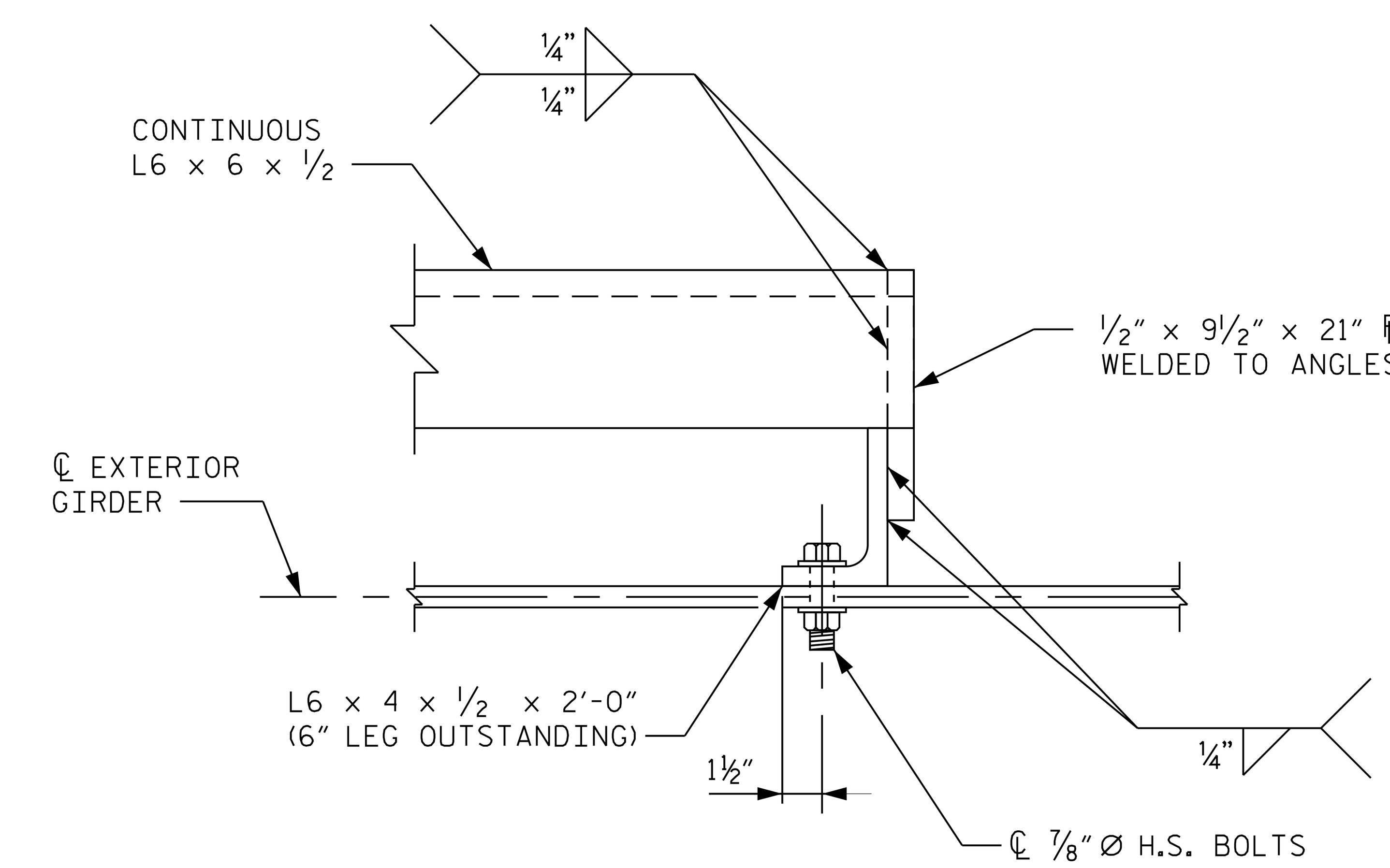

TRAFFIC SIGNAL SUPPORT BRACKET

FOR TRAFFIC SIGNAL SUPPORT BRACKET LOCATIONS SEE PLAN VIEW




TIE PLATE DETAIL

FOR TIE ℙ LOCATIONS, SEE PLAN VIEW




SECTION A-A

PROJECT NO. U-5806
CABARRUS COUNTY
STATION: 15+75.56 -Y1-
27+06.95 -L-

NORTH CAROLINA PROFESSIONAL SEAL 033752 ENGINEER SETH A. DENNEY
DocuSigned by: Seth A. Denney
E8EB154CC9ED410...
10/23/2017

NORTH CAROLINA PROFESSIONAL SEAL 040769 ENGINEER ANDREW L. PHILLIPS
DocuSigned by: Andrew L. Phillips
2BB69ABAD4004D3...
10/23/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TRAFFIC SIGNAL SUPPORT DETAILS

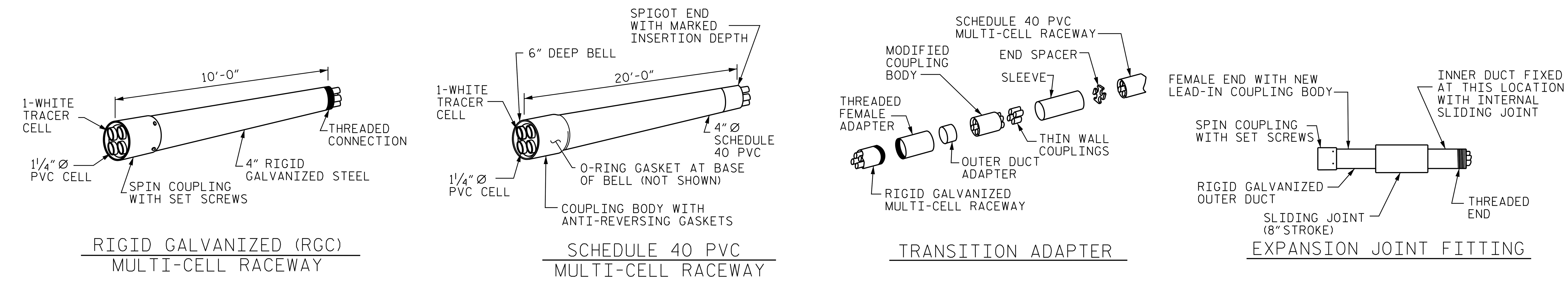
Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

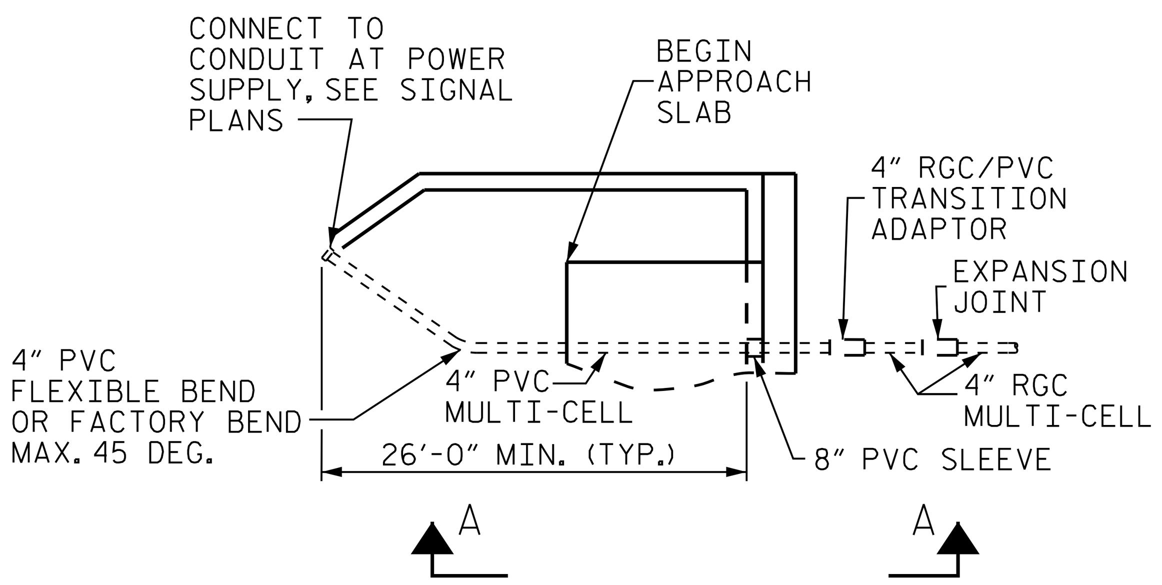
| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-29 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 50 |

DRAWN BY: D. D. LOWERY DATE: 10/17
CHECKED BY: A. L. PHILLIPS DATE: 10/17
DESIGN ENGINEER OF RECORD: S.A. DENNEY DATE: 10/17



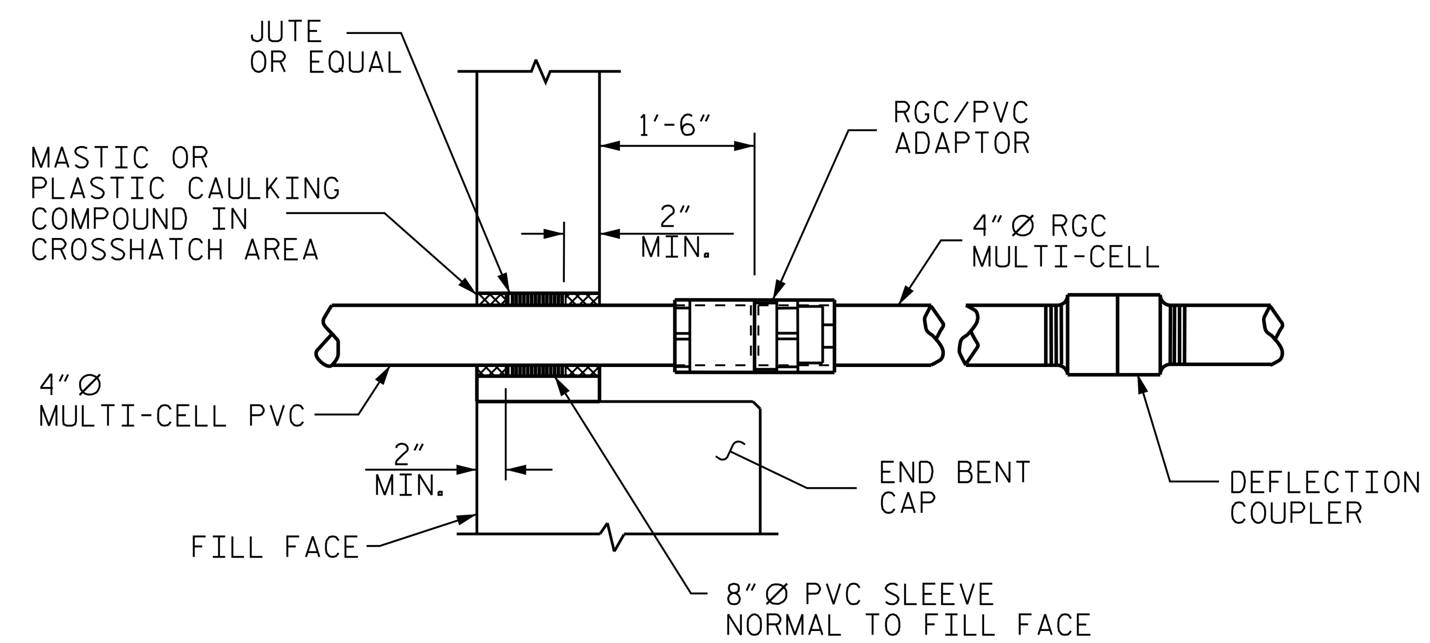

## DETAIL "D"

4" MULTI-CELL COMPONENTS



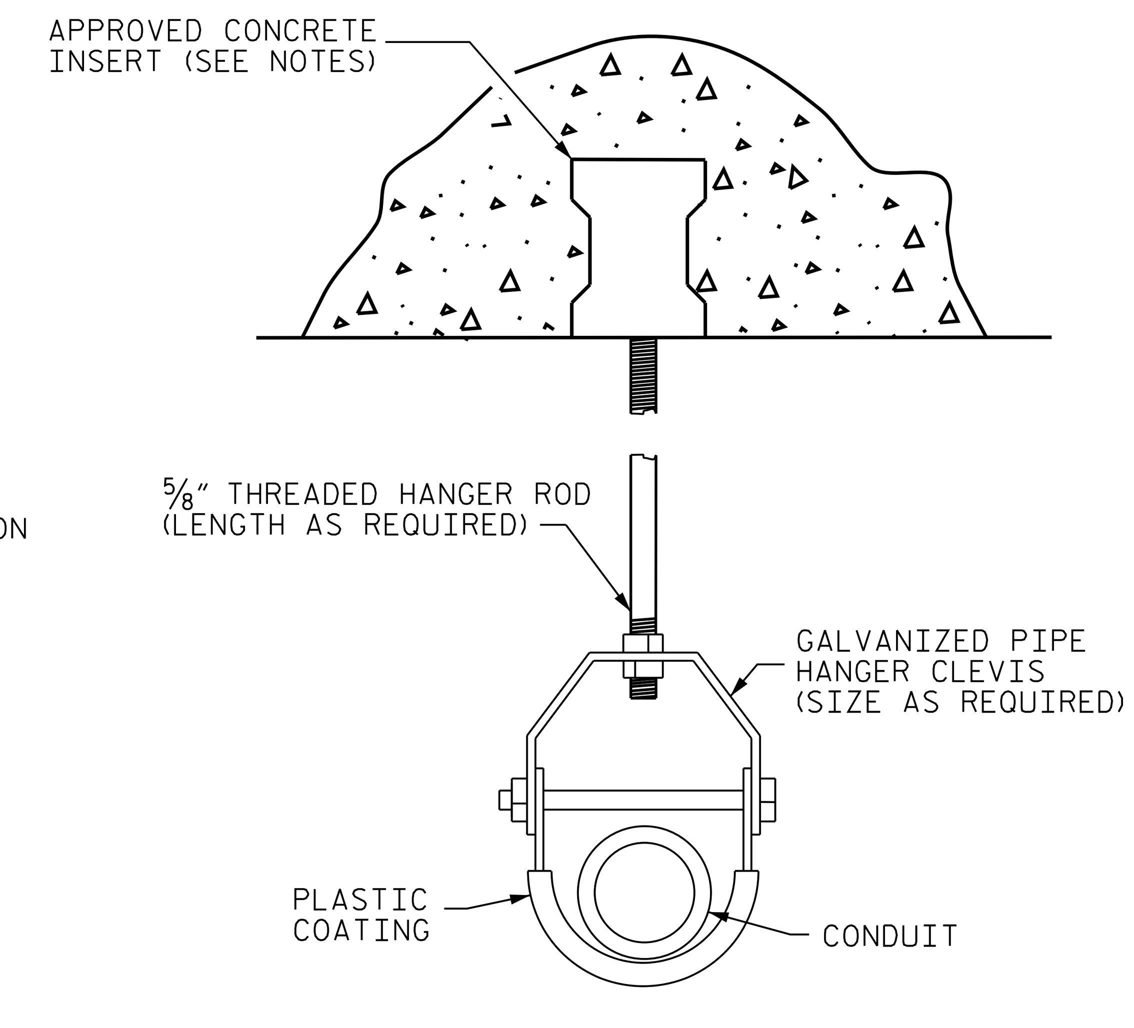

## DETAIL "A"

TERMINATION OF CONDUIT AT MSE WALL




## DETAIL "B"

PVC SLEEVE INSTALLATION & RGC/PVC ADAPTOR AT BACKWALL.




## DETAIL "C"

HANGER ASSEMBLY

## NOTES

THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE TOTAL QUANTITY OF CONDUIT NEEDED TO COMPLETE THE WORK AND THAT THE CONDUIT(S) ARE PLACED AT THE NOTED DIMENSION AND ABOVE THE BOTTOM OF THE GIRDER.

THE INSTALLATION OF THE CONDUIT SYSTEM SHALL BE PAID FOR AS LUMP SUM. THE PRICE SHALL INCLUDE ALL CONDUIT, HANGERS, STABILIZERS, EXPANSION JOINTS, CONCRETE INSERTS, PVC SLEEVES AND ALL NECESSARY HARDWARE TO COMPLETE THE WORK.

THE CONTRACTOR SHALL FIELD VERIFY THAT THE CONDUIT SYSTEM IS NOT IN CONFLICT WITH THE GUARDRAIL POSTS.

SEE DETAIL "C" FOR HANGER ASSEMBLY INSTALLATION.

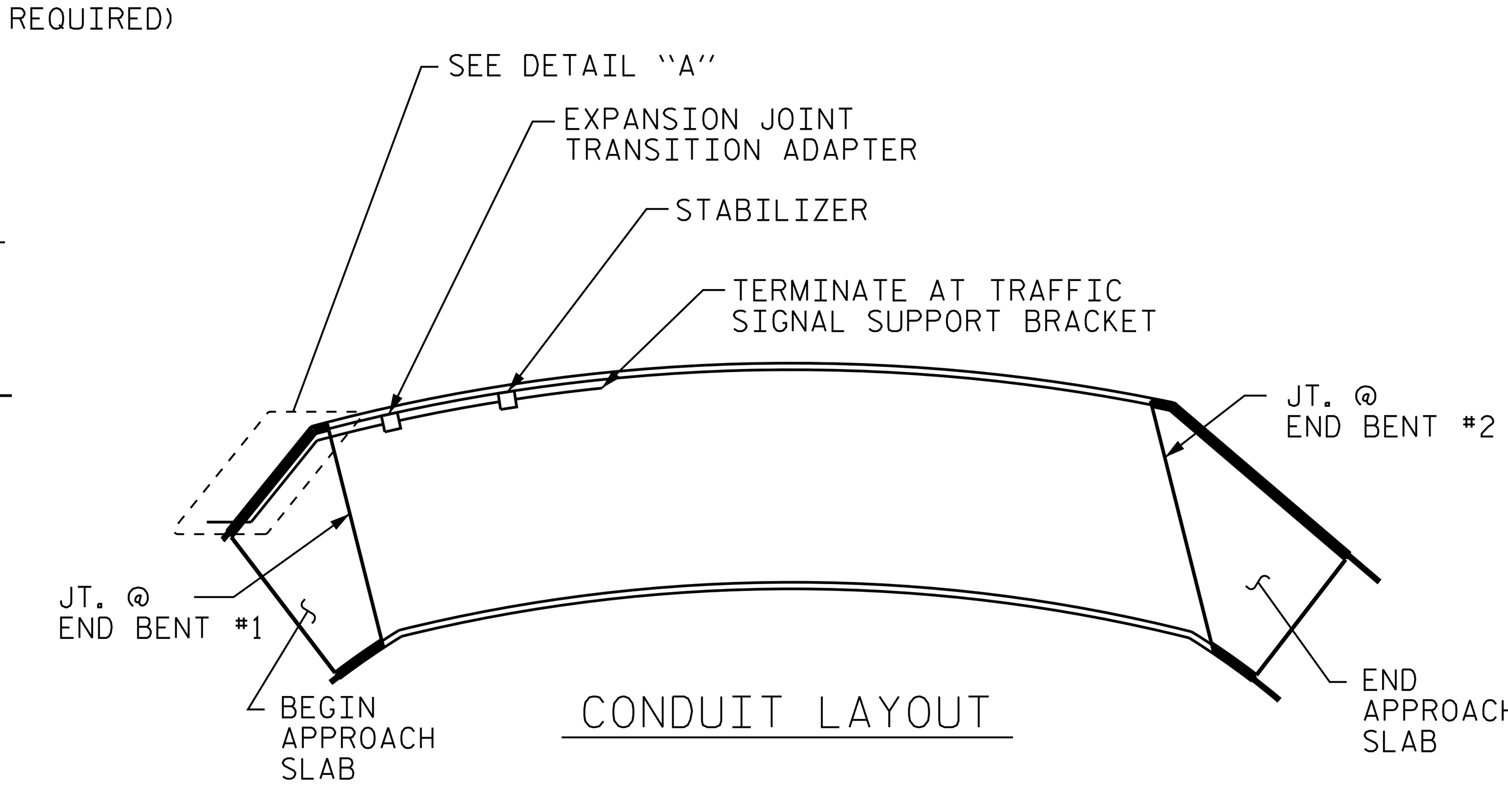
INSTALL SLEEVES PARALLEL TO GIRDERS. SEE DETAIL "B" FOR SLEEVE INSTALLATION.

PROVIDE TRANSITION ADAPTOR (AND EXPANSION JOINT) FOR CONDUIT AT END BENT 1.

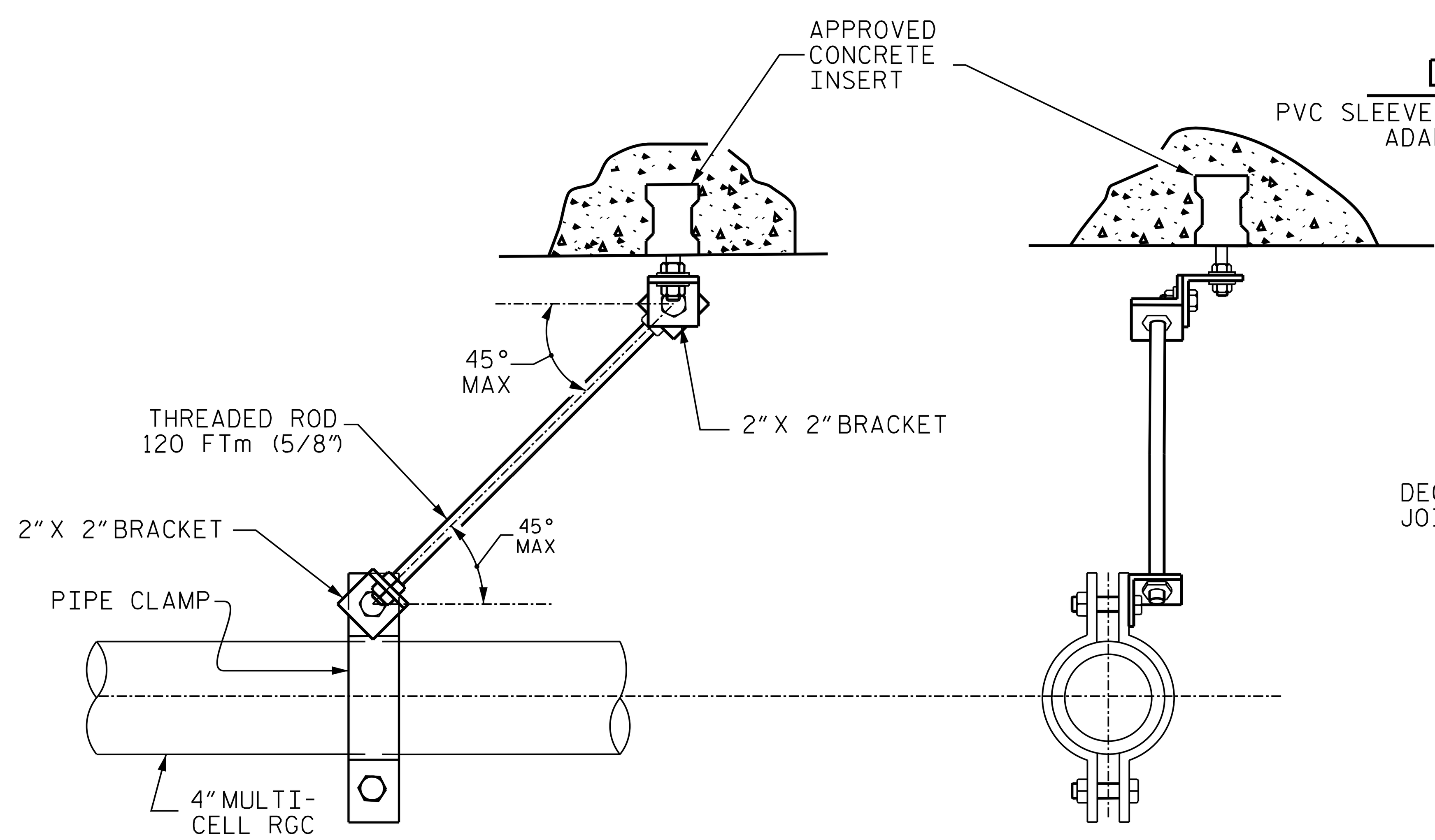
INSTALL STABILIZERS MIDWAY BETWEEN DECK EXPANSION JOINTS. STABILIZER CAN NOT BE USED INSTEAD OF A HANGER ASSEMBLY.

THE CONCRETE SCREW INSERT SHALL HAVE A ROD SIZE OF 5/8" AND A PULL FORCE OF 1260 lbs.

FOR ELECTRICAL CONDUIT SYSTEM FOR SIGNALS, SEE SPECIAL PROVISIONS.

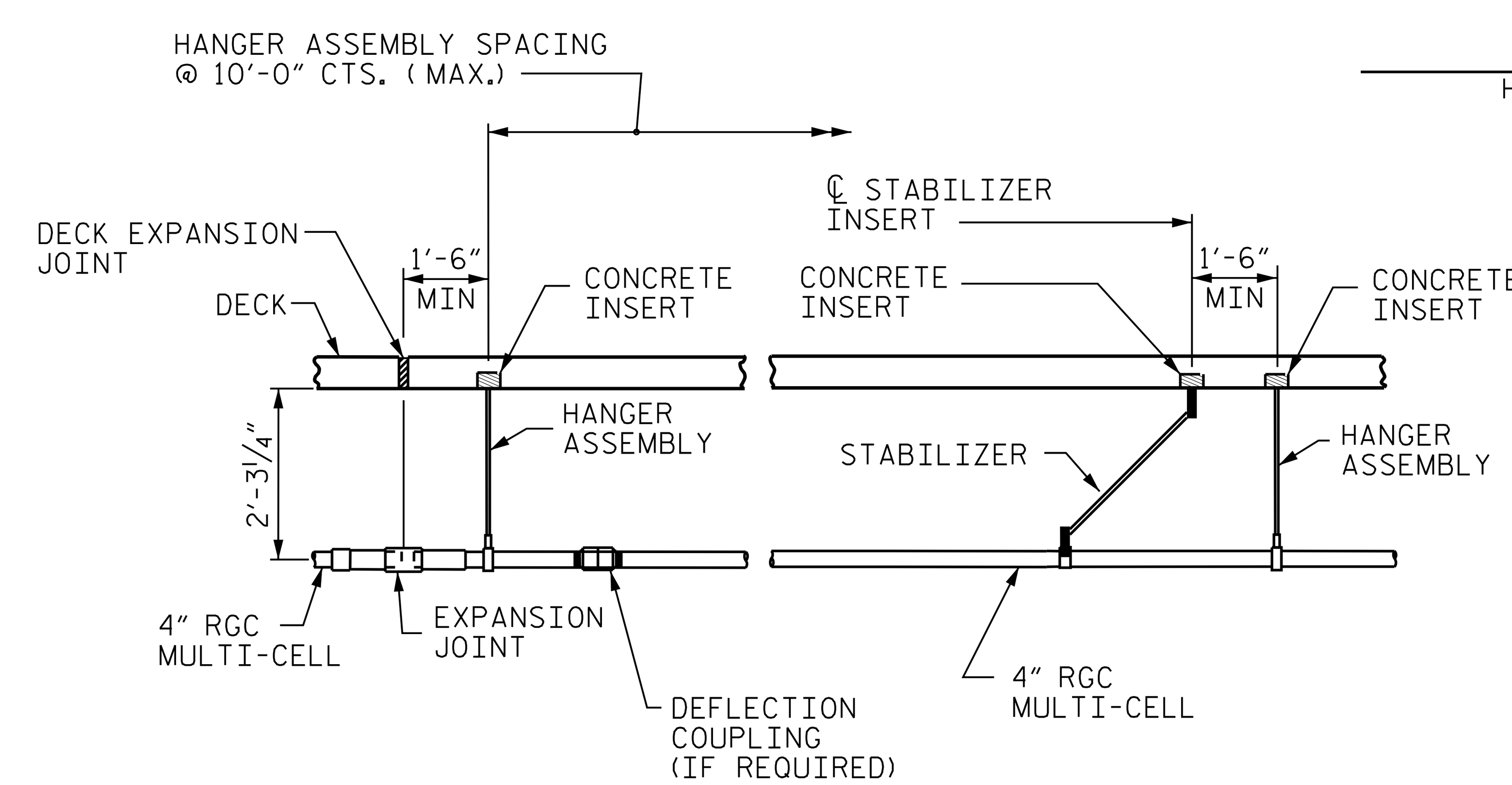



CONDUIT LAYOUT

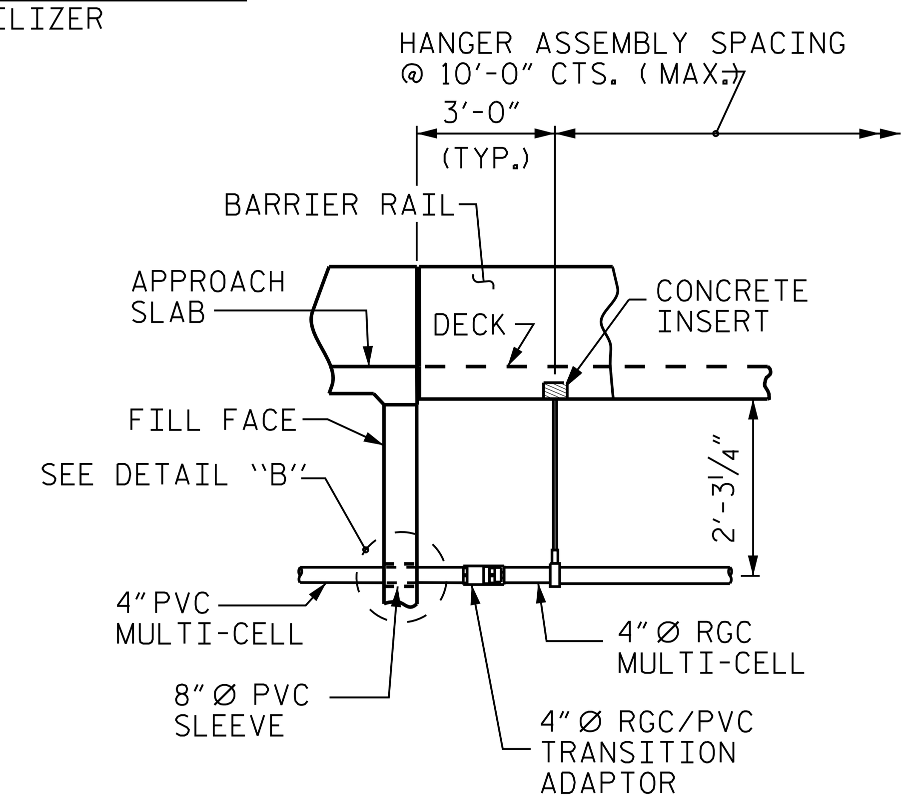



## DETAIL "E"

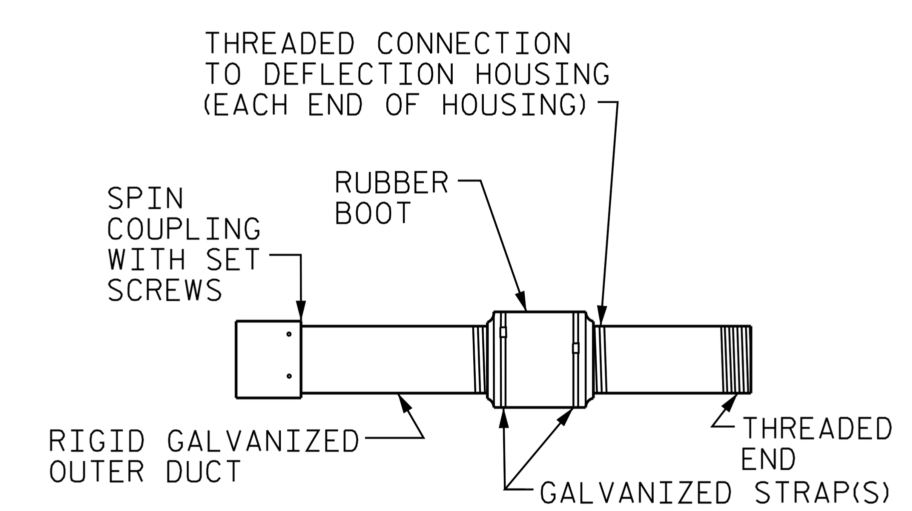
STABILIZER




VIEW B-B




VIEW A-A




## DETAIL "F"

DEFLECTION COUPLING

# ELECTRIC CONDUIT DETAILS

PROJECT NO. U-5806

CABARRUS COUNTY

STATION: 15+75.56 -Y1-
27+06.95 -L-

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033752 SETH A. DENNEY
DocuSigned by: Seth A. Denney
E8EB154CC9E0410...
10/23/2017

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040769 ANDREW L. PHILLIPS
DocuSigned by: Andrew L. Phillips
2B869ABAD4004D3...
10/23/2017

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102



**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

ELECTRICAL CONDUIT SYSTEM FOR SIGNALS

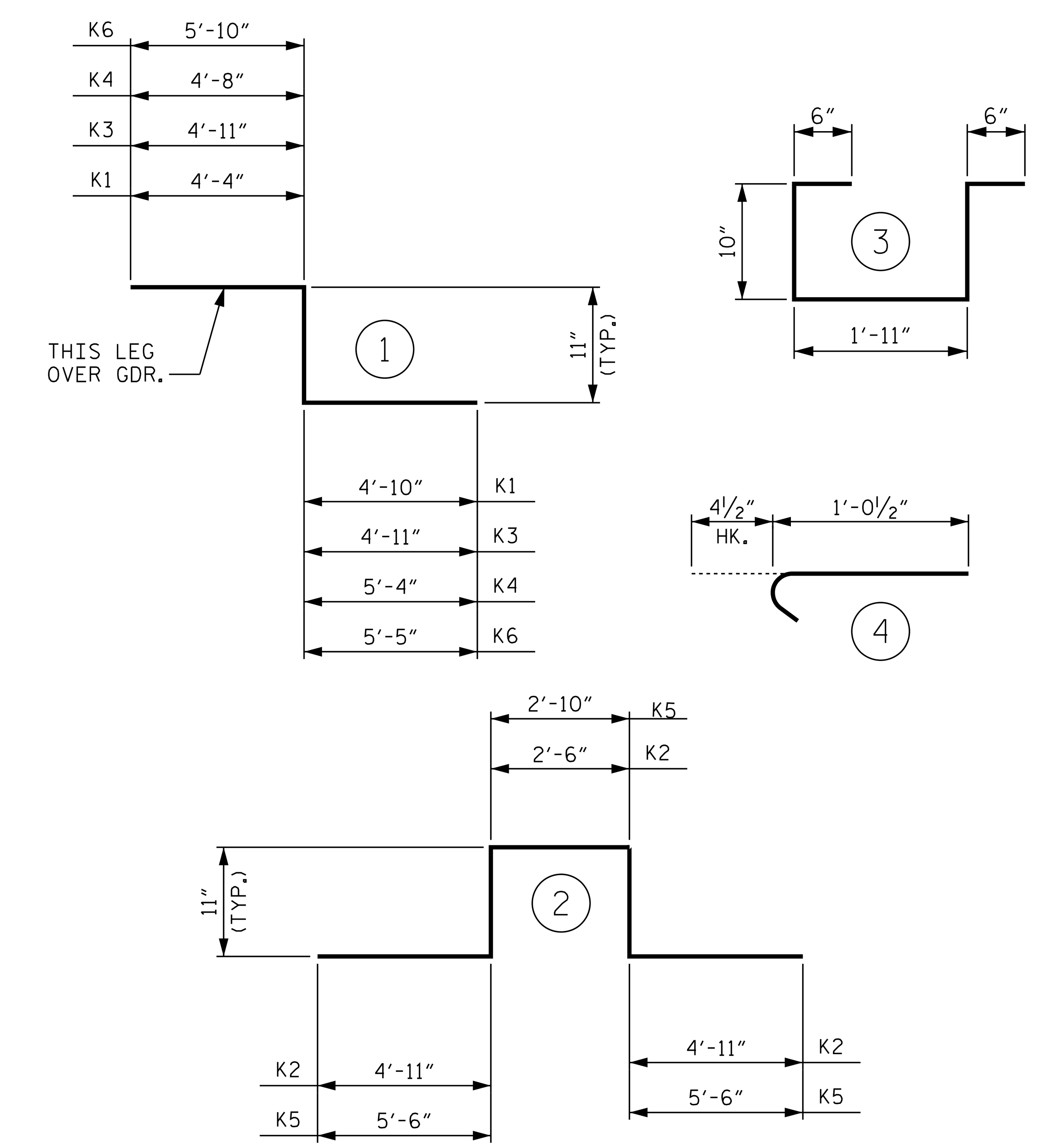
| ASSEMBLED BY : D.D. LOWERY | DATE : 10/17 | |
|---|---|---|
| CHECKED BY : A.L. PHILLIPS | DATE : 10/17 | |
| DRAWN BY : RWW 2-4-03 | REV. 5/1/06 | TLA/GM |
| CHECKED BY : DBM 2-4-03 | REV. 10/1/11 | MAA/GM |

| REVISIONS | | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | | S-30 |
| 1 | | | 3 | | | | TOTAL SHEETS |
| 2 | | | 4 | | | | 50 |

STD. NO. ECS1

10/23/2017 K:\RDT\Structures_Bridge\NC\011036388 - U-5806 FinalDesign\Cad\Dgn\030_U-5806_ECS01.dgn

## BAR TYPES




ALL BAR DIMENSIONS ARE OUT TO OUT.

## REINFORCING STEEL SCHEDULE

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT | BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT | BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A1E | 372 | 5 | STR | 40'-0" | 15520 | A141E | 1 | 5 | STR | 23'-2" | 24 | A235 | 1 | 5 | STR | 34'-11" | 36 |
| A2E | 372 | 5 | STR | 20'-1" | 7792 | A142E | 1 | 5 | STR | 21'-3" | 22 | A236 | 1 | 5 | STR | 33'-0" | 34 |
| A3 | 372 | 5 | STR | 40'-0" | 15520 | A143E | 1 | 5 | STR | 19'-4" | 20 | A237 | 1 | 5 | STR | 31'-0" | 32 |
| A4 | 372 | 5 | STR | 20'-1" | 7792 | A144E | 1 | 5 | STR | 17'-4" | 18 | A238 | 1 | 5 | STR | 29'-1" | 30 |
| A5E | 6 | 6 | STR | 5'-8" | 51 | A145E | 1 | 5 | STR | 15'-5" | 16 | A239 | 1 | 5 | STR | 27'-1" | 28 |
| | | | | | | A146E | 1 | 5 | STR | 13'-7" | 14 | A240 | 1 | 5 | STR | 25'-2" | 26 |
| A101E | 3 | 5 | STR | 5'-1" | 16 | A147E | 1 | 5 | STR | 11'-10" | 12 | A241 | 1 | 5 | STR | 23'-2" | 24 |
| A102E | 1 | 5 | STR | 7'-3" | 8 | A148E | 1 | 5 | STR | 10'-1" | 11 | A242 | 1 | 5 | STR | 21'-3" | 22 |
| A103E | 1 | 5 | STR | 9'-6" | 10 | A149E | 1 | 5 | STR | 8'-4" | 9 | A243 | 1 | 5 | STR | 19'-4" | 20 |
| A104E | 1 | 5 | STR | 11'-8" | 12 | A150E | 1 | 5 | STR | 6'-7" | 7 | A244 | 1 | 5 | STR | 17'-4" | 18 |
| A105E | 1 | 5 | STR | 13'-11" | 15 | A151E | 3 | 5 | STR | 4'-10" | 15 | A245 | 1 | 5 | STR | 15'-5" | 16 |
| A106E | 1 | 5 | STR | 16'-1" | 17 | | | | | | | A246 | 1 | 5 | STR | 13'-7" | 14 |
| A107E | 1 | 5 | STR | 18'-3" | 19 | A201 | 3 | 5 | STR | 5'-1" | 16 | A247 | 1 | 5 | STR | 11'-10" | 12 |
| A108E | 1 | 5 | STR | 20'-6" | 21 | A202 | 1 | 5 | STR | 7'-3" | 8 | A248 | 1 | 5 | STR | 10'-1" | 11 |
| A109E | 1 | 5 | STR | 22'-8" | 24 | A203 | 1 | 5 | STR | 9'-6" | 10 | A249 | 1 | 5 | STR | 8'-4" | 9 |
| A110E | 1 | 5 | STR | 24'-11" | 26 | A204 | 1 | 5 | STR | 11'-8" | 12 | A250 | 1 | 5 | STR | 6'-7" | 7 |
| A111E | 1 | 5 | STR | 27'-1" | 28 | A205 | 1 | 5 | STR | 13'-11" | 15 | A251 | 3 | 5 | STR | 4'-10" | 15 |
| A112E | 1 | 5 | STR | 29'-3" | 31 | A206 | 1 | 5 | STR | 16'-1" | 17 | | | | | | |
| A113E | 1 | 5 | STR | 31'-6" | 33 | A207 | 1 | 5 | STR | 18'-3" | 19 | B1E | 304 | 4 | STR | 27'-2" | 5517 |
| A114E | 1 | 5 | STR | 33'-8" | 35 | A208 | 1 | 5 | STR | 20'-6" | 21 | B2 | 252 | 5 | STR | 52'-4" | 13755 |
| A115E | 1 | 5 | STR | 35'-10" | 37 | A209 | 1 | 5 | STR | 22'-8" | 24 | B3E | 2 | 4 | STR | 5'-6" | 7 |
| A116E | 1 | 5 | STR | 38'-1" | 40 | A210 | 1 | 5 | STR | 24'-11" | 26 | B4 | 2 | 5 | STR | 5'-6" | 11 |
| A117E | 1 | 5 | STR | 40'-3" | 42 | A211 | 1 | 5 | STR | 27'-1" | 28 | | | | | | |
| A118E | 1 | 5 | STR | 42'-5" | 44 | A212 | 1 | 5 | STR | 29'-3" | 31 | G1E | 1 | 5 | STR | 56'-1" | 58 |
| A119E | 1 | 5 | STR | 44'-8" | 47 | A213 | 1 | 5 | STR | 31'-6" | 33 | G2E | 2 | 5 | STR | 33'-1" | 69 |
| A120E | 1 | 5 | STR | 46'-10" | 49 | A214 | 1 | 5 | STR | 33'-8" | 35 | | | | | | |
| A121E | 1 | 5 | STR | 49'-0" | 51 | A215 | 1 | 5 | STR | 35'-10" | 37 | J1E | 114 | 4 | 4 | 1'-5" | 108 |
| A122E | 1 | 5 | STR | 51'-3" | 53 | A216 | 1 | 5 | STR | 38'-1" | 40 | | | | | | |
| A123E | 1 | 5 | STR | 53'-5" | 56 | A217 | 1 | 5 | STR | 40'-3" | 42 | K1E | 3 | 5 | 1 | 10'-1" | 32 |
| A124E | 1 | 5 | STR | 55'-7" | 58 | A218 | 1 | 5 | STR | 42'-5" | 44 | K2E | 12 | 5 | 2 | 14'-2" | 177 |
| A125E | 1 | 5 | STR | 54'-7" | 57 | A219 | 1 | 5 | STR | 44'-8" | 47 | K3E | 3 | 5 | 1 | 10'-8" | 33 |
| A126E | 1 | 5 | STR | 52'-7" | 55 | A220 | 1 | 5 | STR | 46'-10" | 49 | K4E | 3 | 5 | 1 | 10'-11" | 34 |
| A127E | 1 | 5 | STR | 50'-8" | 53 | A221 | 1 | 5 | STR | 49'-0" | 51 | K5E | 12 | 5 | 2 | 15'-8" | 196 |
| A128E | 1 | 5 | STR | 48'-8" | 51 | A222 | 1 | 5 | STR | 51'-3" | 53 | K6E | 3 | 5 | 1 | 12'-2" | 38 |
| A129E | 1 | 5 | STR | 46'-9" | 49 | A223 | 1 | 5 | STR | 53'-5" | 56 | | | | | | |
| A130E | 1 | 5 | STR | 44'-9" | 47 | A224 | 1 | 5 | STR | 55'-7" | 58 | S1E | 80 | 4 | 3 | 4'-7" | 245 |
| A131E | 1 | 5 | STR | 42'-8" | 45 | A225 | 1 | 5 | STR | 54'-7" | 57 | | | | | | |
| A132E | 1 | 5 | STR | 40'-10" | 43 | A226 | 1 | 5 | STR | 52'-7" | 55 | | | | | | |
| A133E | 1 | 5 | STR | 38'-10" | 41 | A227 | 1 | 5 | STR | 50'-8" | 53 | | | | | | |
| A134E | 1 | 5 | STR | 36'-11" | 39 | A228 | 1 | 5 | STR | 48'-8" | 51 | | | | | | |
| A135E | 1 | 5 | STR | 34'-11" | 36 | A229 | 1 | 5 | STR | 46'-9" | 49 | | | | | | |
| A136E | 1 | 5 | STR | 33'-0" | 34 | A230 | 1 | 5 | STR | 44'-9" | 47 | | | | | | |
| A137E | 1 | 5 | STR | 31'-0" | 32 | A231 | 1 | 5 | STR | 42'-8" | 45 | REINFORCING STEEL | | | | | 38,684 |
| A138E | 1 | 5 | STR | 29'-1" | 30 | A232 | 1 | 5 | STR | 40'-10" | 43 | | | | | | |
| A139E | 1 | 5 | STR | 27'-1" | 28 | A233 | 1 | 5 | STR | 38'-10" | 41 | EPOXY COATED | | | | | |
| A140E | 1 | 5 | STR | 25'-2" | 26 | A234 | 1 | 5 | STR | 36'-11" | 39 | REINFORCING STEEL | | | | | 31,483 |

"E" DENOTES EPOXY COATED REINFORCING STEEL.

## 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 | 2'-0" | 1'-9" | 2'-0" | 1'-9" | 2'-9" |
| #5 | 2'-6" | 2'-2" | 2'-6" | 2'-2" | 3'-5" |
| #6 | 3'-0" | 2'-7" | 3'-10" | 2'-7" | 4'-4" |
| #7 | 5'-3" | 3'-6" | | | |
| #8 | 6'-10" | 4'-7" | | | |

## SUPERSTRUCTURE BILL OF MATERIAL

| | CLASS AA CONCRETE | REINFORCING STEEL | EPOXY COATED REINFORCING STEEL |
|---|---|---|---|
| | (CU. YDS.) | (LBS.) | (LBS.) |
| POUR 1 | 84.7 | | |
| POUR 2 | 69.9 | | |
| POUR 3 | 218.3 | | |
| POUR 4 | 25.5 | | |
| TOTALS ** | 398.4 | 38,663 | 31,473 |

** QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED.

## NOTES:

ALL DECK CONCRETE IS TO BE SAND-LIGHTWEIGHT CONCRETE WITH A DENSITY OF 120 PCF.

POUR #2 CAN BE POURED AT ANY POINT AFTER THE COMPLETION OF POUR #1. POURS #1 & #2 SHALL NOT BE POURED SIMULTANEOUSLY.

## GROOVING BRIDGE FLOORS

| | | |
|---|---|---|
| APPROACH SLABS | 2,395 | SQ.FT. |
| BRIDGE DECK | 9,833 | SQ.FT. |
| TOTAL | 12,228 | SQ.FT. |

NORTH CAROLINA PROFESSIONAL SEAL 033752 ENGINEER SETH A. DENNEY
DocuSigned by: Seth A. Denney E8EB154CC9ED410... 10/23/2017

NORTH CAROLINA PROFESSIONAL SEAL 040769 ENGINEER ANDREW L. PHILLIPS
DocuSigned by: Andrew L. Phillips 2B869ABAD4004D3... 10/23/2017

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102



**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

PROJECT NO. U-5806
CABARRUS COUNTY
STATION: 15+75.56 -Y1-
27+06.95 -L-
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
BILL OF MATERIAL

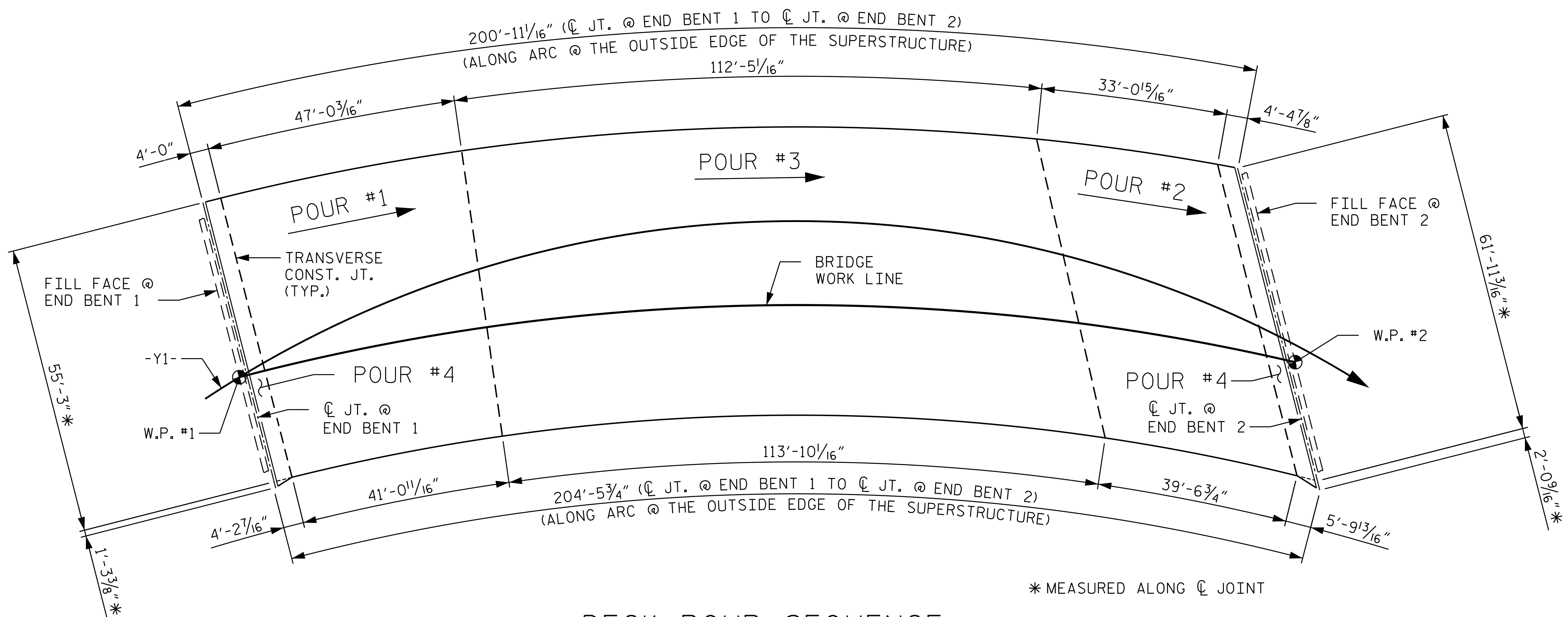
| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-31 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 50 |

DRAWN BY: D. D. LOWERY DATE: 10/17
CHECKED BY: A. L. PHILLIPS DATE: 10/17
DESIGN ENGINEER OF RECORD: S.A. DENNEY DATE: 10/17

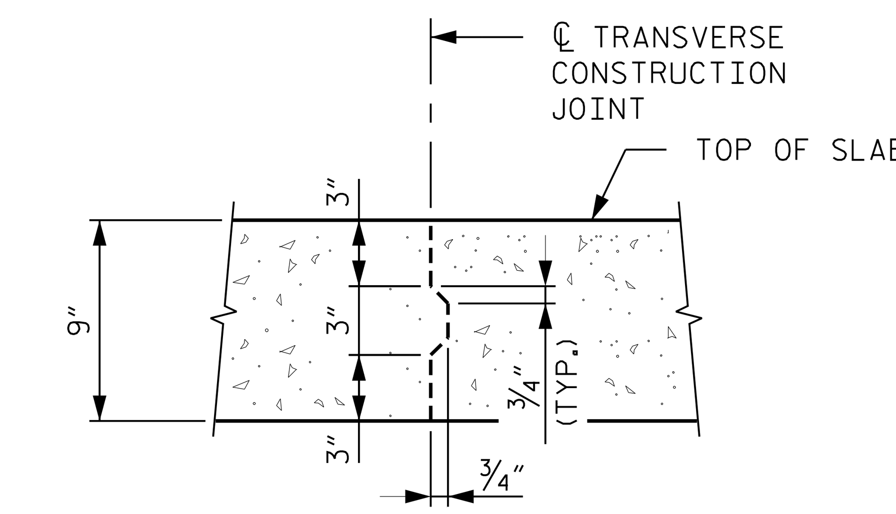
10/23/2017 K:\RDT_Structures_Bridge\NC\011036388 - U-5806 FinalDesign\Cad\Dgn\03_U-5806_BOM01.dgn

NOTE:

FOR NOTES SEE "SUPERSTRUCTURE BILL OF MATERIAL", SHEET 1 OF 2.

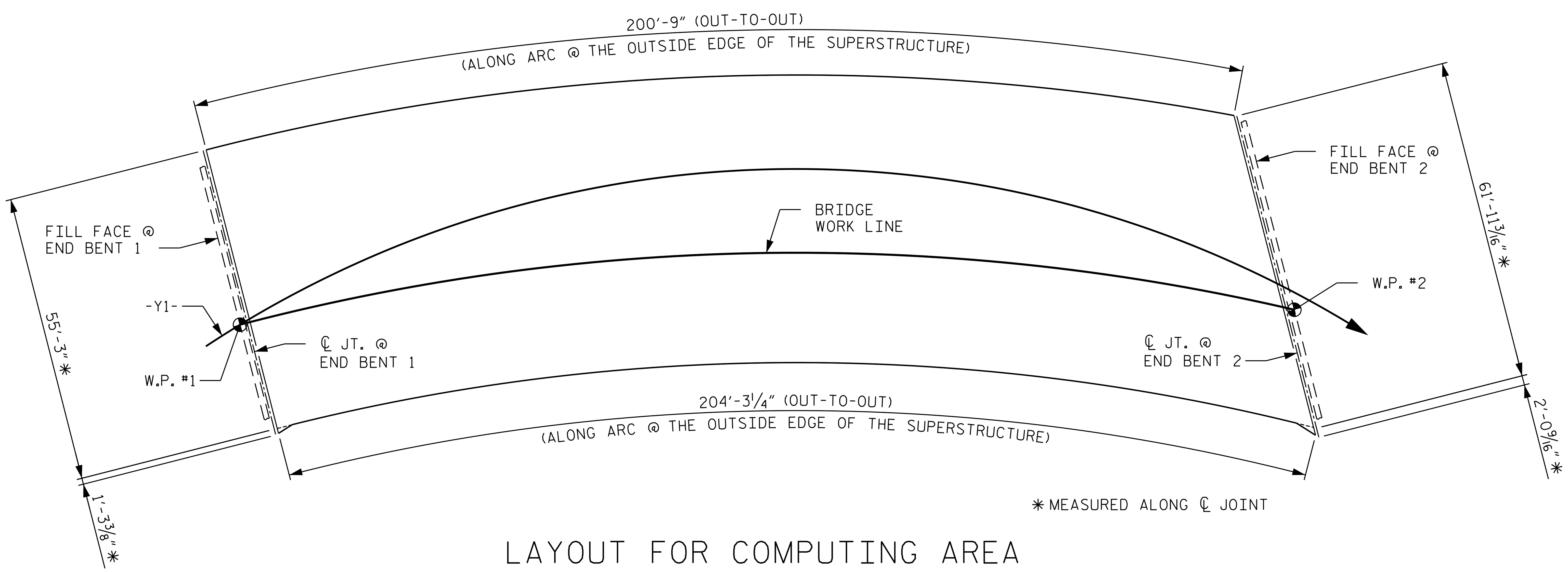



DECK POUR SEQUENCE




TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB

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




LAYOUT FOR COMPUTING AREA
OF REINFORCED CONCRETE DECK SLAB
( SQ. FT. = 11,151 )

PROJECT NO. U-5806

CABARRUS COUNTY

STATION: 15+75.56 -Y1-
27+06.95 -L-

SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 033752 ENGINEER SETH A. DENNEY

NORTH CAROLINA PROFESSIONAL SEAL 040769 ENGINEER ANDREW L. PHILLIPS

DocuSigned by: Seth A. Denney E8EB154CC9ED410... 10/23/2017

DocuSigned by: Andrew L. Phillips 2B869ABAD4004D3... 10/23/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

BILL OF MATERIAL

Kimley»Horn

421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102



| REVISIONS | | | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | | | S-32 |
| 1 | | | 3 | | | | | TOTAL SHEETS |
| 2 | | | 4 | | | | | 50 |

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

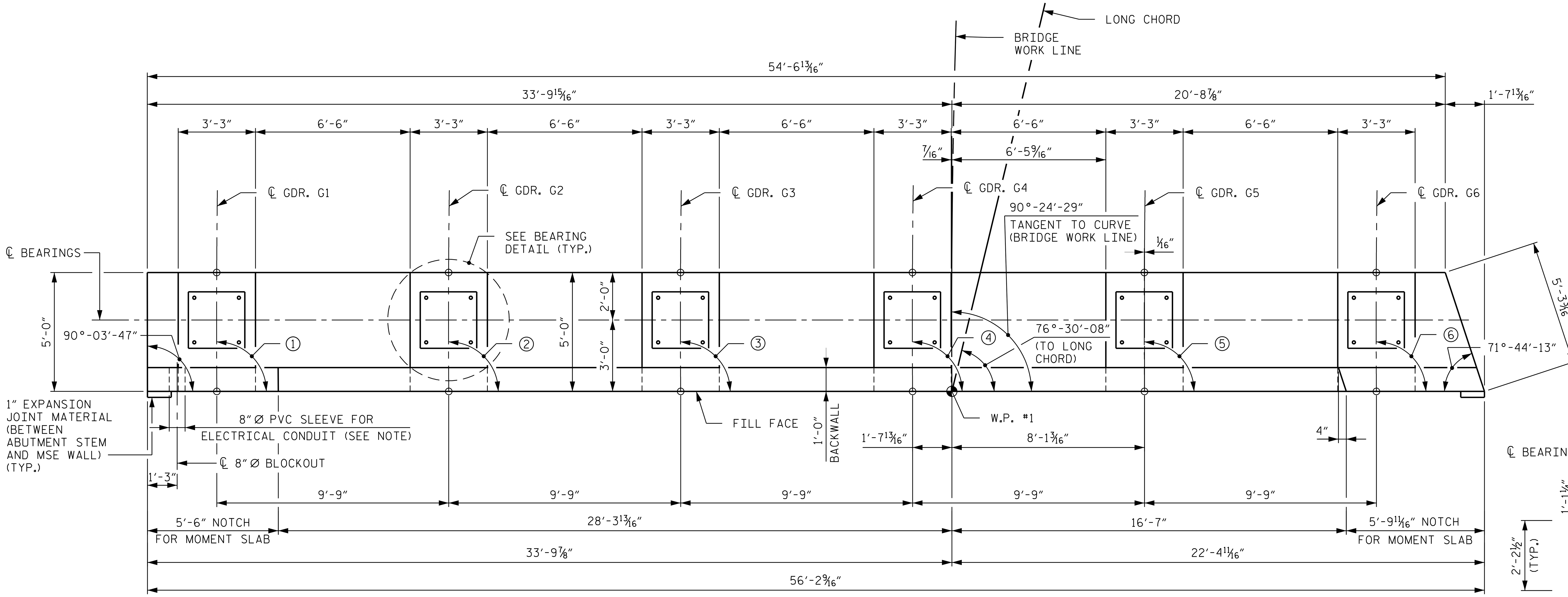
| | | | |
|---|---|---|---|
| DRAWN BY: | D.D.LOWERY | DATE: | 10/17 |
| CHECKED BY: | A.L.PHILLIPS | DATE: | 10/17 |
| DESIGN ENGINEER OF RECORD: | S.A.DENNEY | DATE: | 10/17 |

10/23/2017 K:\RDI_Structures_Bridge\NC\011036388 - U-5806 FinalDesign\Cad\Dgn\032_U-5806_BOM02.dgn

NOTE:

FOR END BENT NOTES, SEE "END BENT 1" SHEET 5 OF 5.

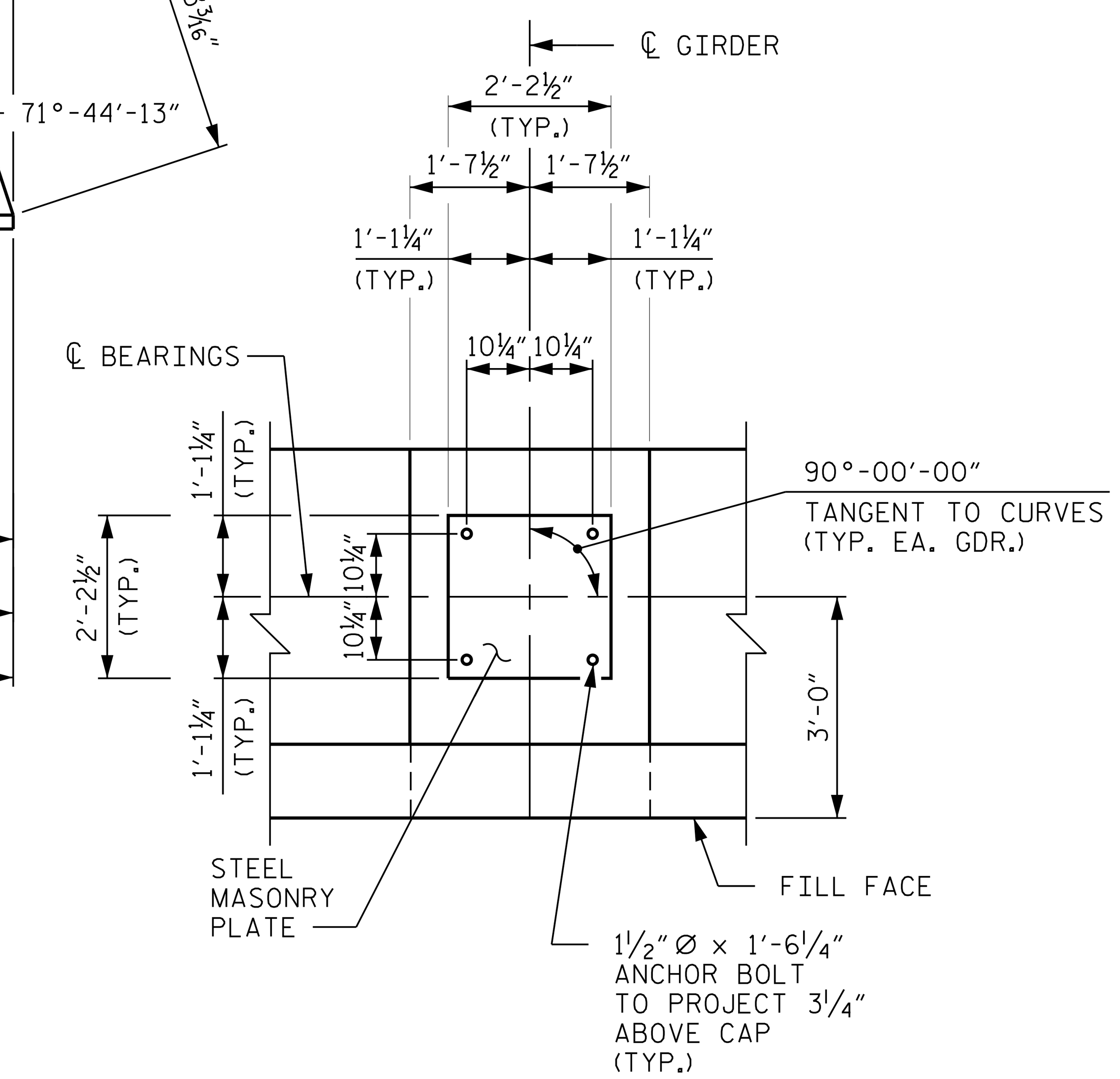
FOR ELECTRICAL CONDUIT INFORMATION, SEE "ELECTRICAL CONDUIT SYSTEM FOR SIGNALS" SHEET.




PLAN

-Y1- NOT SHOWN FOR CLARITY. SEE GENERAL DRAWING SHEETS FOR -Y1- AND BRIDGE WORK LINE INTERACTION.

| GIRDER ANGLES | |
|---|---|
| ALL ANGLES ARE TANGENT TO CURVE | |
| 1 | 90°-22′-49″ |
| 2 | 90°-23′-19″ |
| 3 | 90°-23′-51″ |
| 4 | 90°-24′-24″ |
| 5 | 90°-24′-58″ |
| 6 | 90°-25′-35″ |




BEARING DETAIL

ALL DIMENSIONS ARE WITH RESPECT TO THE INTERSECTION OF THE ℄ BEARING AND ℄ GIRDERS.

PROJECT NO. U-5806

CABARRUS COUNTY

STATION: 15+75.56 -Y1-
27+06.95 -L-

SHEET 1 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 033752 ENGINEER SETH A. DENNEY

DocuSigned by: Seth A. Denney E8EB154C0ED410... 10/23/2017

NORTH CAROLINA PROFESSIONAL SEAL 040769 ENGINEER ANDREW L. PHILLIPS

DocuSigned by: Andrew L. Phillips 2B869ABAD4004D3... 10/23/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102

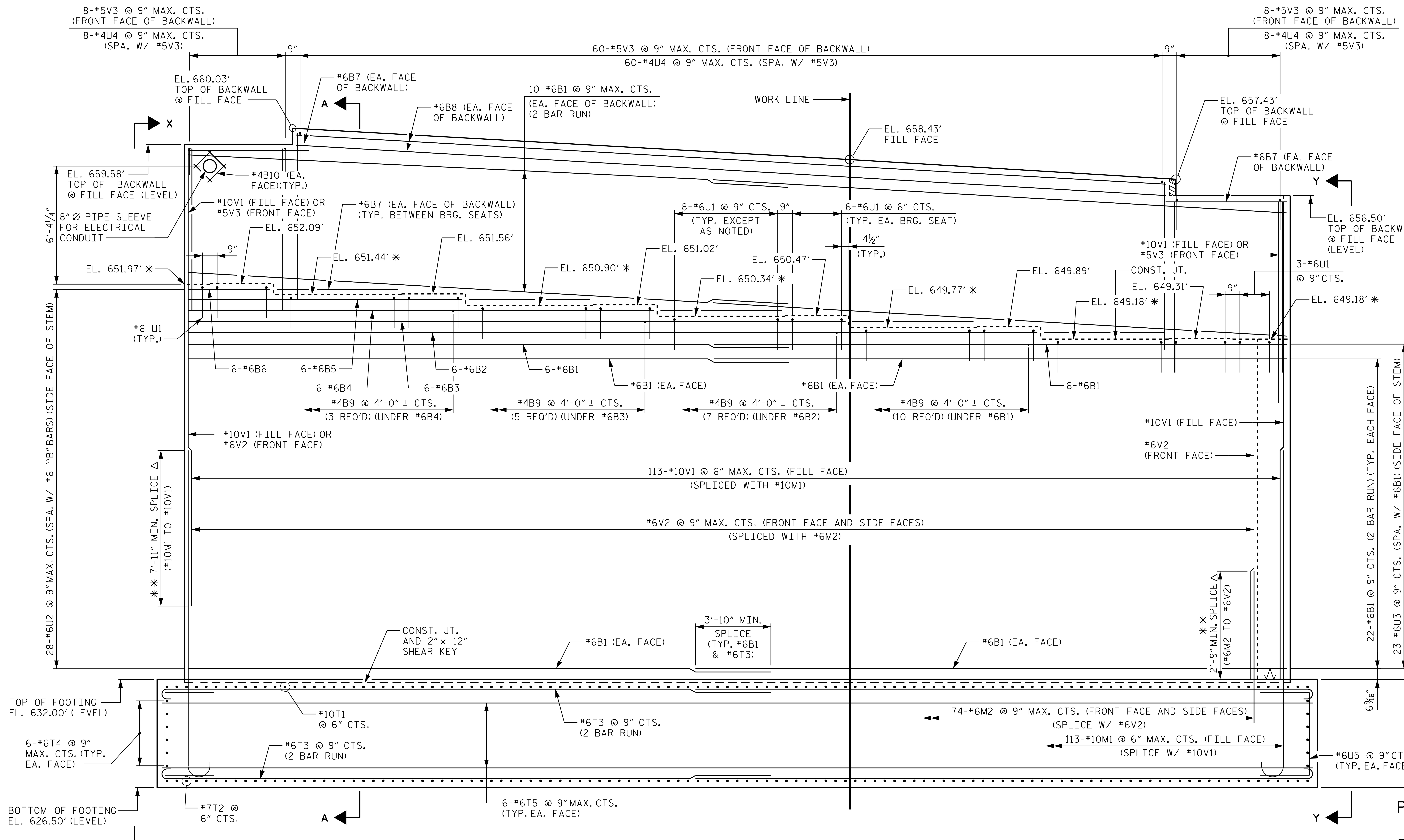


| REVISIONS | | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | | S-33 |
| 1 | | | 3 | | | | TOTAL SHEETS |
| 2 | | | 4 | | | | 50 |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY: D. D. LOWERY DATE: 10/17
CHECKED BY: A. L. PHILLIPS DATE: 10/17
DESIGN ENGINEER OF RECORD: S.A. DENNEY DATE: 10/17

10/23/2017 K:\RDI_Structures_Bridge\NC\011036388 - U-5806 Final Design\Cad\Dgn\033_U-5806_EB101.dgn




# ELEVATION

✱ FOR LOCATION OF ELEVATION BETWEEN BRIDGE SEATS, SEE END BENT 1, SHEET 5 OF 5.

△ #10M1 & #6M2 BARS HAVE MORE PROJECTION LENGTH THAN REQUIRED TO ACCOUNT FOR VARIABLE TOP OF CAP & TOP OF BACKWALL ELEVATIONS. #10V1 & #6V2 BARS SHALL BE PLACED SUCH THAT THEY TERMINATE AT THE TOP OF BACKWALL & BEARING SEAT, RESPECTIVELY. SPLICE LENGTH WILL VARY.

## NOTES:

FOR SECTION A-A, SEE "END BENT 1" SHEET 5 OF 5.

FOR VIEWS X-X AND Y-Y, SEE "END BENT 1" SHEET 3 OF 5.

WORK LINE OCCURS AT THE INTERSECTION OF WORK POINT AND FILL FACE.

FOR FOOTING DIMENSIONS AND ADDITIONAL REINFORCING DETAILS, SEE "END BENT 1" SHEET 4 OF 5.

FOR ADDITIONAL END BENT NOTES, SEE "END BENT 1" SHEET 5 OF 5.

FOR NOTE ✱✱, SEE "END BENT 1" SHEET 5 OF 5.

"V" BARS AND B1 BARS MAY BE SHIFTED SLIGHTLY TO AVOID 8"Ø PIPE SLEEVE.

PROJECT NO. U-5806
CABARRUS COUNTY
STATION: 15+75.56 -Y1-
27+06.95 -L-
SHEET 2 OF 5

SEAL 033752 — NORTH CAROLINA PROFESSIONAL ENGINEER — SETH A. DENNEY
DocuSigned by: Seth A. Denney
E8EB154CC9ED410...
10/23/2017

SEAL 040769 — NORTH CAROLINA PROFESSIONAL ENGINEER — ANDREW L. PHILLIPS
DocuSigned by: Andrew L. Phillips
2B869ABAD4004D3...
10/23/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102



**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

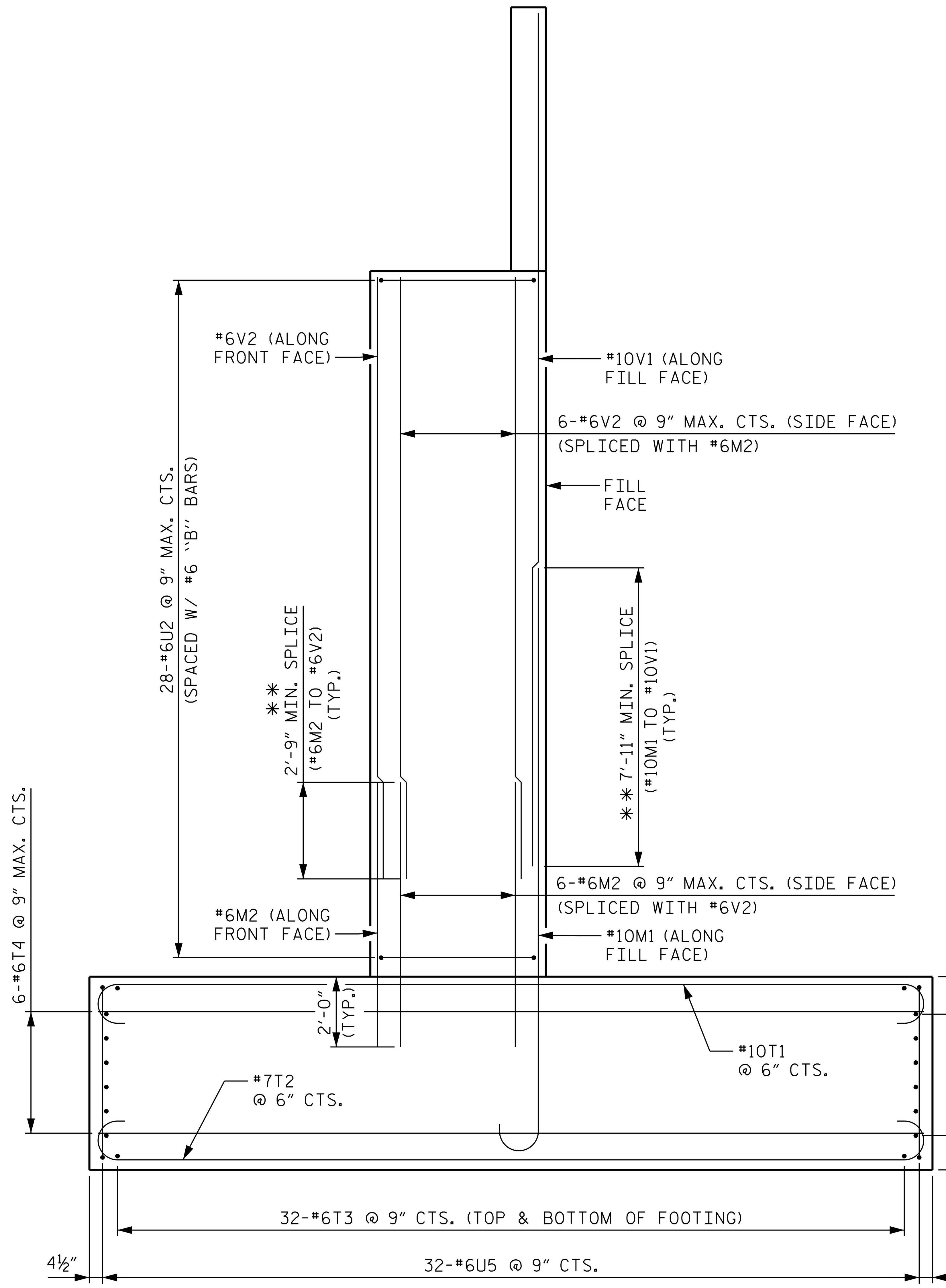
| REVISIONS | | | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | | | S-34 |
| 1 | | | 3 | | | | | TOTAL SHEETS |
| 2 | | | 4 | | | | | 50 |

| | | |
|---|---|---|
| DRAWN BY: D. D. LOWERY | DATE: 10/17 |
| CHECKED BY: A. L. PHILLIPS | DATE: 10/17 |
| DESIGN ENGINEER OF RECORD: S.A. DENNEY | DATE: 10/17 |

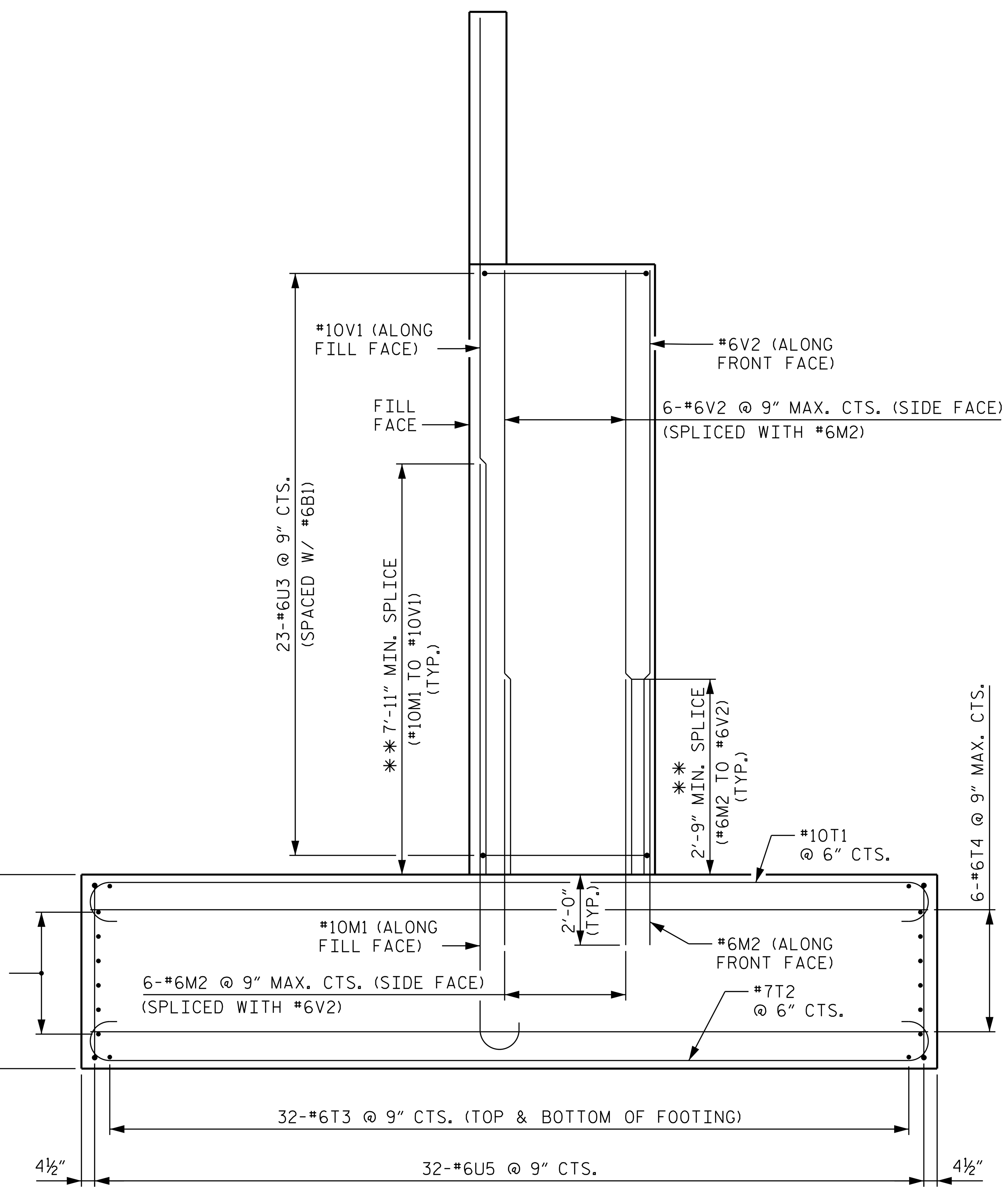
NOTE:

FOR END BENT NOTES, SEE "END BENT 1" SHEET 5 OF 5.

FOR NOTE ✱✱, SEE "END BENT 1" SHEET 5 OF 5.




VIEW X-X




VIEW Y-Y

PROJECT NO. U-5806

CABARRUS COUNTY

STATION: 15+75.56 -Y1-
27+06.95 -L-

SHEET 3 OF 5

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033752 SETH A. DENNEY

DocuSigned by: Seth A. Denney
E8EB154C09ED410...
10/23/2017

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040769 ANDREW L. PHILLIPS

DocuSigned by: Andrew L. Phillips
2BB69ABAD4004D3...
10/23/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

Kimley»Horn

421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102



**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

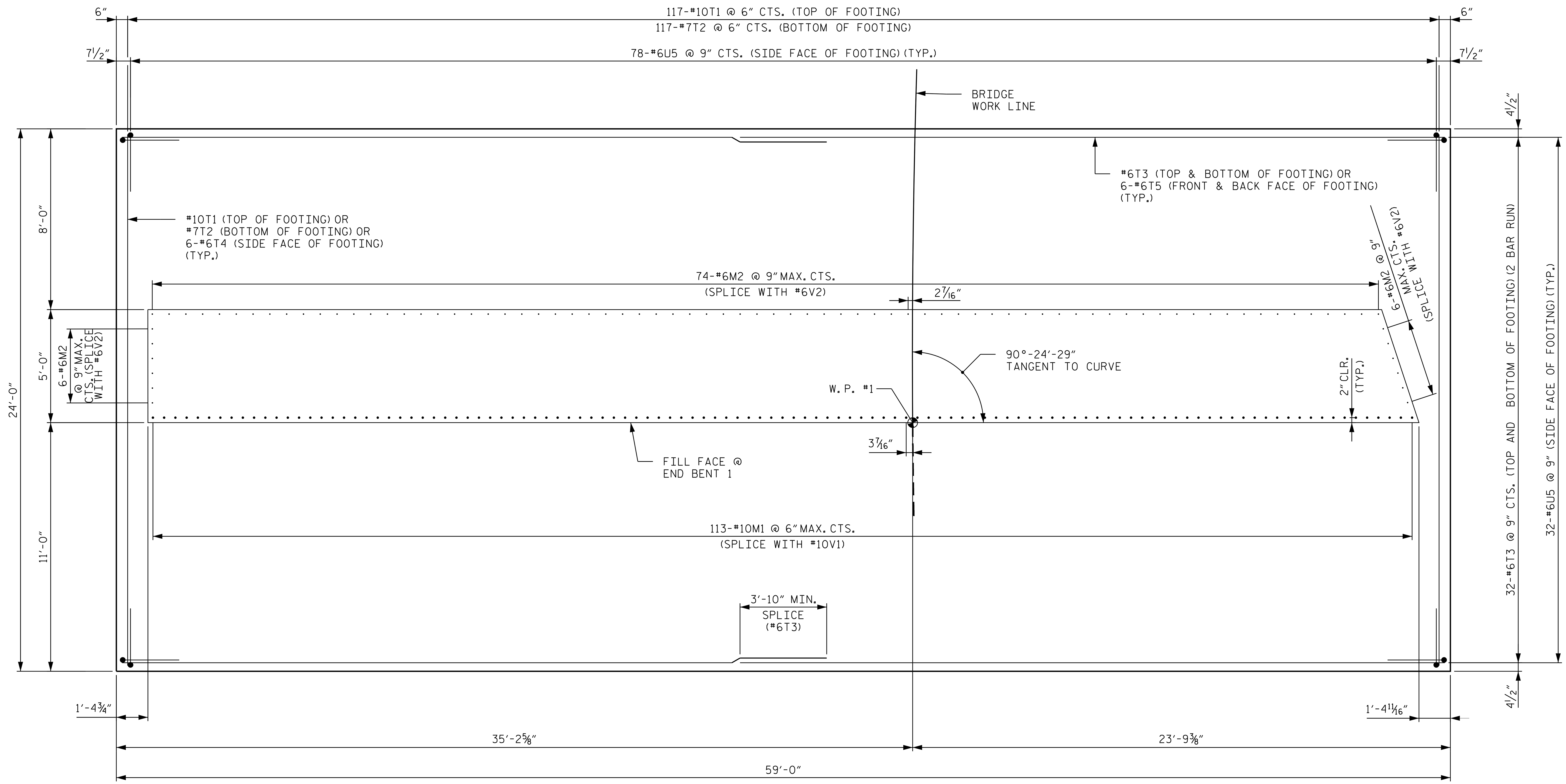
| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-35 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 50 |

| | |
|---|---|
| DRAWN BY: D.D.LOWERY | DATE: 10/17 |
| CHECKED BY: A.L.PHILLIPS | DATE: 10/17 |
| DESIGN ENGINEER OF RECORD: S.A.DENNEY | DATE: 10/17 |

10/23/2017 K:\RDI_Structures_Bridge\NC\011036388 - U-5806 FinalDesign\Cad\Dgn\035_U-5806_EB103.dgn

NOTE:

FOR END BENT NOTES, SEE "END BENT 1" SHEET 5 OF 5.




FOOTING PLAN

PROJECT NO. U-5806

CABARRUS COUNTY

STATION: 15+75.56 -Y1-
27+06.95 -L-

SHEET 4 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 033752 ENGINEER SETH A. DENNEY
DocuSigned by: Seth A. Denney
E8EB154C0E0410...
10/23/2017

NORTH CAROLINA PROFESSIONAL SEAL 040769 ENGINEER ANDREW L. PHILLIPS
DocuSigned by: Andrew L. Phillips
2B869ABAD4004D3...
10/23/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

Kimley»Horn

421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102



**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

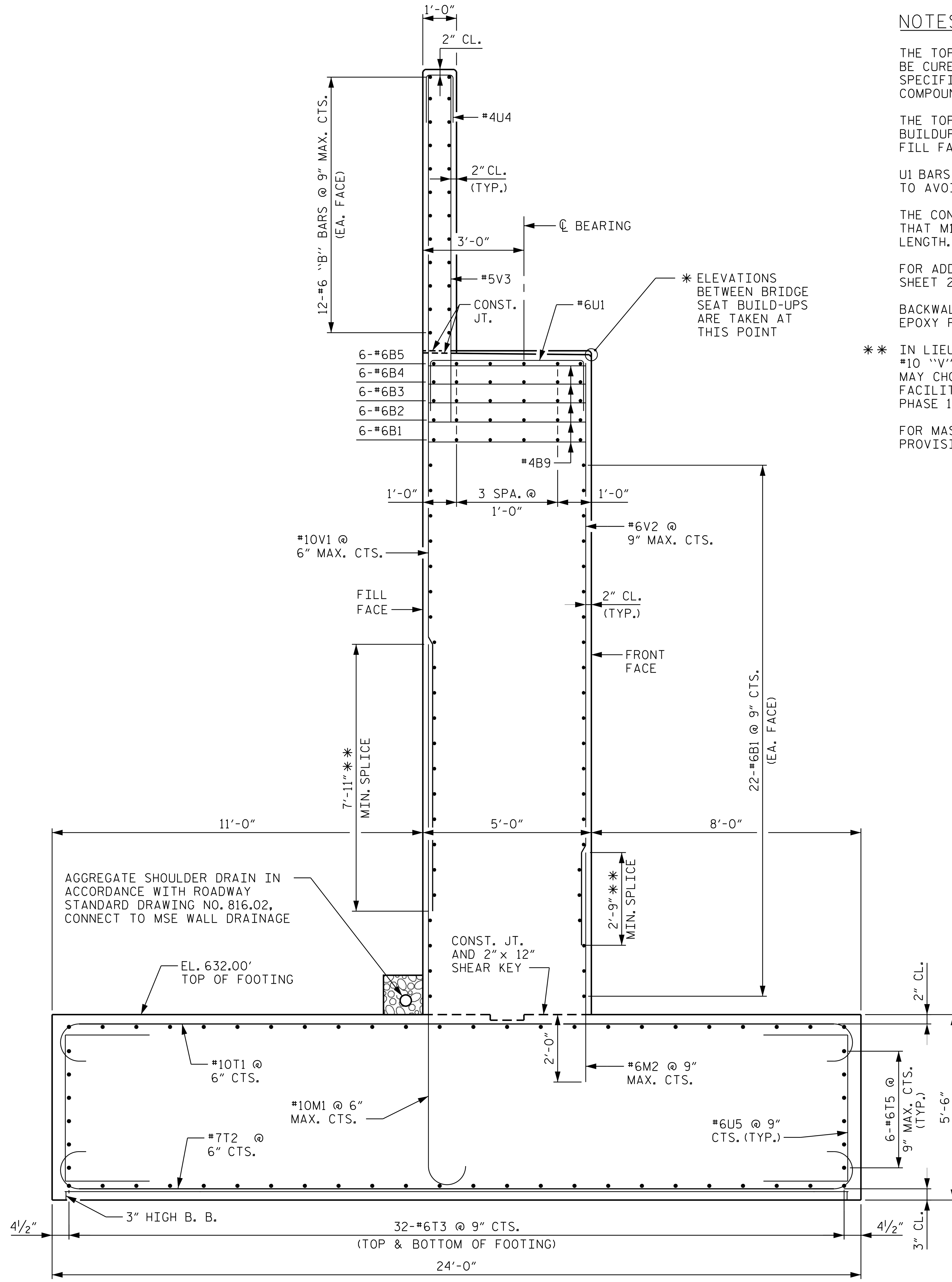
| REVISIONS | | | | | |
|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: |
| 1 | | | 3 | | |
| 2 | | | 4 | | |

SHEET NO. S-36

TOTAL SHEETS 50

DRAWN BY: D. D. LOWERY DATE: 10/17
CHECKED BY: A. L. PHILLIPS DATE: 10/17
DESIGN ENGINEER OF RECORD: S.A. DENNEY DATE: 10/17

10/23/2017 K:\RDI_Structures_Bridge\NC\011035388 - U-5806 Final Design\Cad\Dgn\036_U-5806_EB104.dgn




SECTION A-A

NOTES:

THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPE TRANSVERSELY FROM THE FILL FACE TO THE FRONT FACE AT THE RATE OF 2%.

U1 BARS UNDER BEARING SEATS MAY BE SHIFTED SLIGHTLY TO AVOID ANCHOR BOLTS.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT M1 & M2 BARS ARE DETAILED WITH 3'-0" OF EXTRA LENGTH.

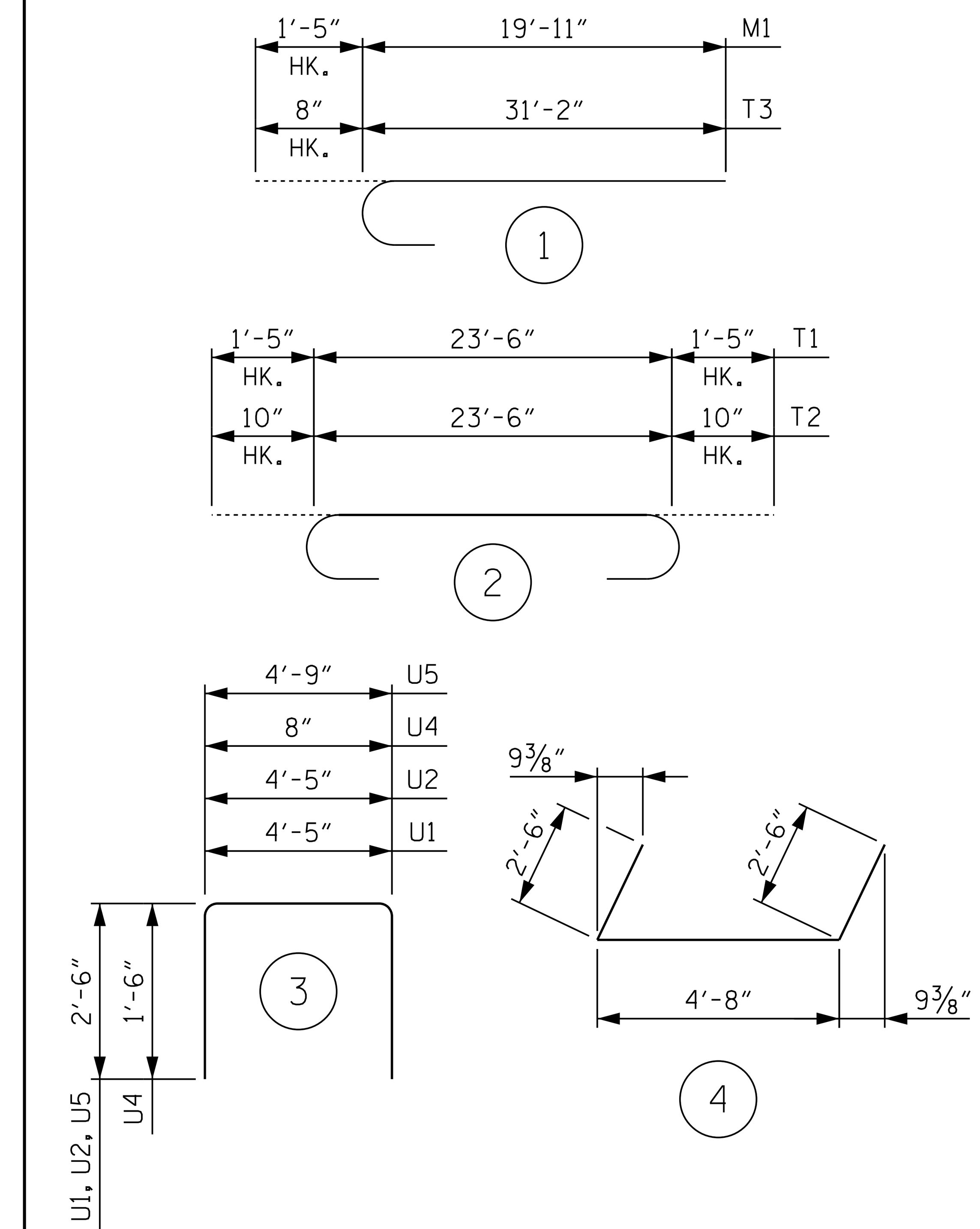
FOR ADDITIONAL NOTES, SEE GENERAL DRAWING SHEET 2 OF 4 OR SHEET 4 OF 4.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

** IN LIEU OF SPLICES SHOWN FOR #10 "M" BARS TO #10 "V" BARS BETWEEN FOOTING AND STEM, CONTRACTOR MAY CHOOSE TO USE MECHANICAL COUPLERS TO FACILITATE CONSTRUCTION OF THE FOOTING DURING PHASE 1 OF THE PROJECT.

FOR MASS CONCRETE AT END BENT NO. 1, SEE SPECIAL PROVISIONS.

## BAR TYPES



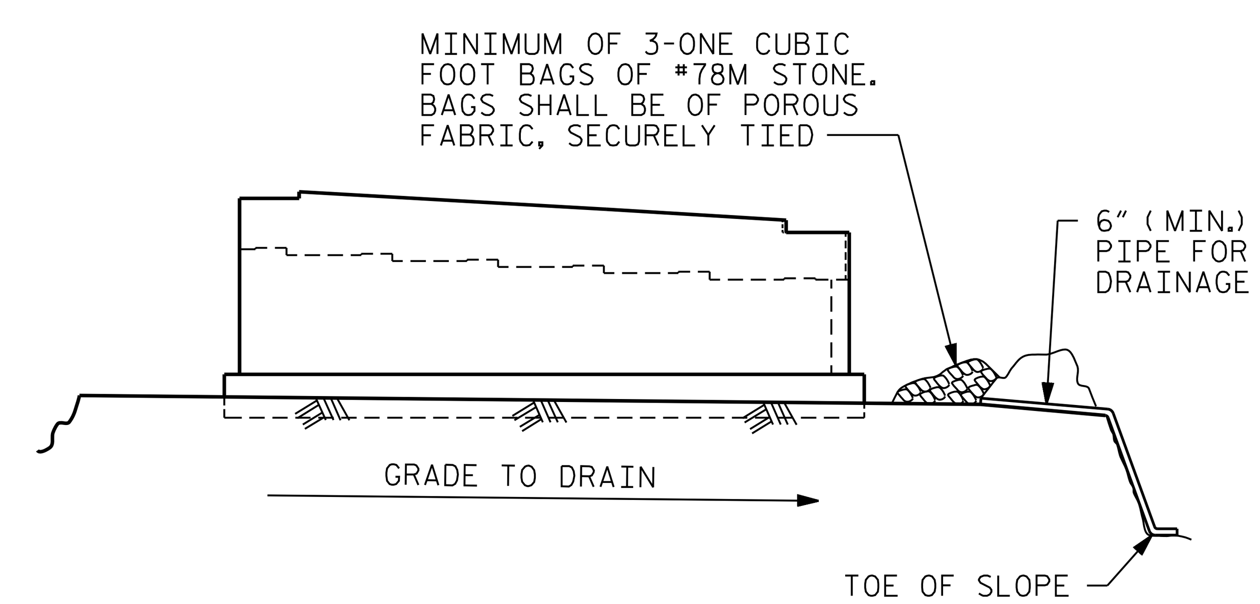

ALL BAR DIMENSIONS ARE OUT TO OUT.

## BILL OF MATERIAL

### END BENT 1

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| B1 | 140 | 6 | STR | 29'-11" | 6291 |
| B2 | 6 | 6 | STR | 43'-2" | 389 |
| B3 | 6 | 6 | STR | 33'-5" | 301 |
| B4 | 6 | 6 | STR | 23'-8" | 213 |
| B5 | 6 | 6 | STR | 13'-11" | 125 |
| B6 | 6 | 6 | STR | 4'-2" | 38 |
| B7 | 14 | 6 | STR | 6'-2" | 130 |
| B8 | 4 | 6 | STR | 44'-3" | 266 |
| B9 | 25 | 4 | STR | 4'-8" | 78 |
| B10 | 8 | 4 | STR | 1'-3" | 7 |
| | | | | | |
| M1 | 113 | 10 | 1 | 21'-4" | 10373 |
| M2 | 86 | 6 | STR | 10'-7" | 1367 |
| | | | | | |
| T1 | 117 | 10 | 2 | 26'-4" | 13258 |
| T2 | 117 | 7 | 2 | 25'-2" | 6019 |
| T3 | 128 | 6 | 1 | 31'-10" | 6120 |
| T4 | 12 | 6 | STR | 23'-6" | 424 |
| T5 | 12 | 6 | STR | 58'-6" | 1054 |
| | | | | | |
| U1 | 80 | 6 | 3 | 9'-5" | 1132 |
| U2 | 28 | 6 | 3 | 9'-5" | 396 |
| U3 | 23 | 6 | 4 | 9'-8" | 334 |
| U4 | 76 | 4 | 3 | 3'-8" | 186 |
| U5 | 220 | 6 | 3 | 9'-9" | 3222 |
| | | | | | |
| V1 | 113 | 10 | STR | 24'-4" | 11832 |
| V2 | 86 | 6 | STR | 17'-1" | 2207 |
| V3 | 76 | 5 | STR | 10'-6" | 832 |
| | | | | | |
| | | | | | |
| | | | | | |
| TOTAL REINFORCING STEEL | | | | | 66,592 LBS. |

| CLASS A CONCRETE BREAKDOWN | | |
|---|---|---|
| POUR #1 | FOOTING | 288.4 C.Y. |
| POUR #2 | ABUTMENT STEM | 189.4 C.Y. |
| POUR #3 | BACKWALL | 16.9 C.Y. |
| TOTAL CLASS A CONCRETE | | 494.7 C.Y. |




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.

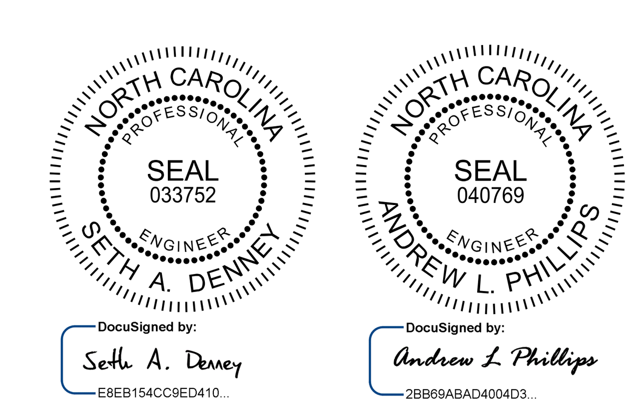
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

PROJECT NO. U-5806
CABARRUS COUNTY
STATION: 15+75.56 -Y1-
27+06.95 -L-

SHEET 5 OF 5




STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102



| REVISIONS | | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | | S-37 |
| 1 | | | 3 | | | | TOTAL SHEETS |
| 2 | | | 4 | | | | 50 |

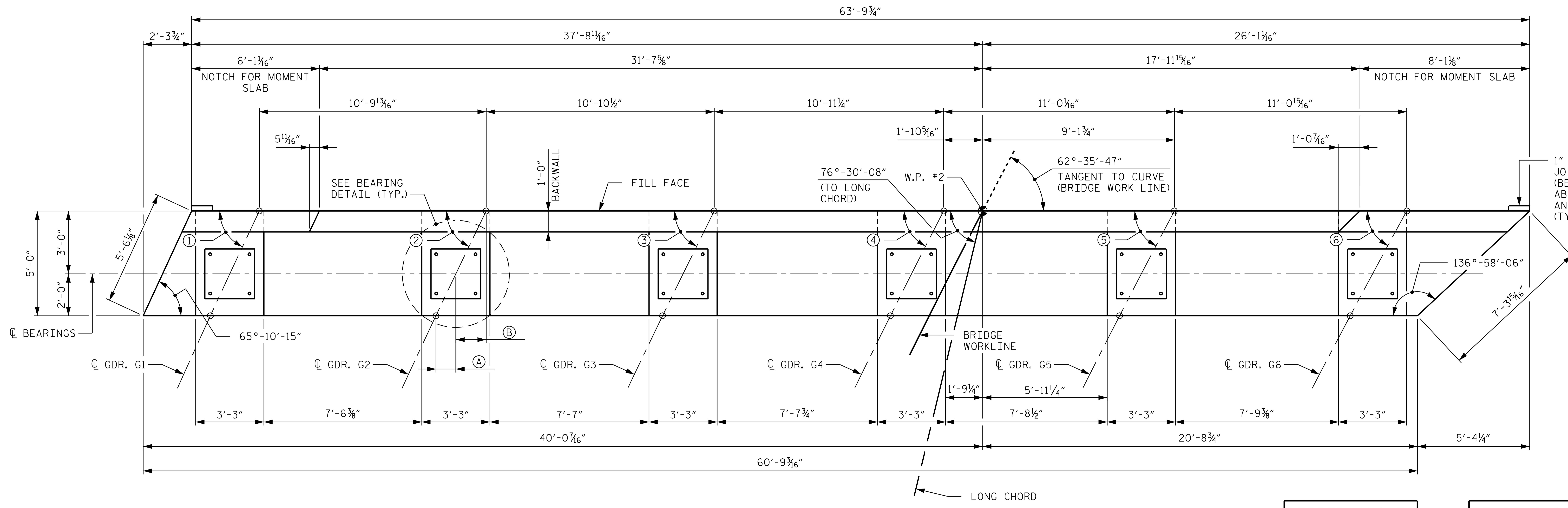
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY: D. D. LOWERY DATE: 10/17
CHECKED BY: A. L. PHILLIPS DATE: 10/17
DESIGN ENGINEER OF RECORD: S. A. DENNEY DATE: 10/17

10/23/2017 K:\RDT_Structures_Bridge\NC\011035388 - U-5806 Final Design\Cad\Dgn\037_U-5806_EB105.dgn

NOTE:

FOR END BENT NOTES, SEE "END BENT 2" SHEET 5 OF 5.

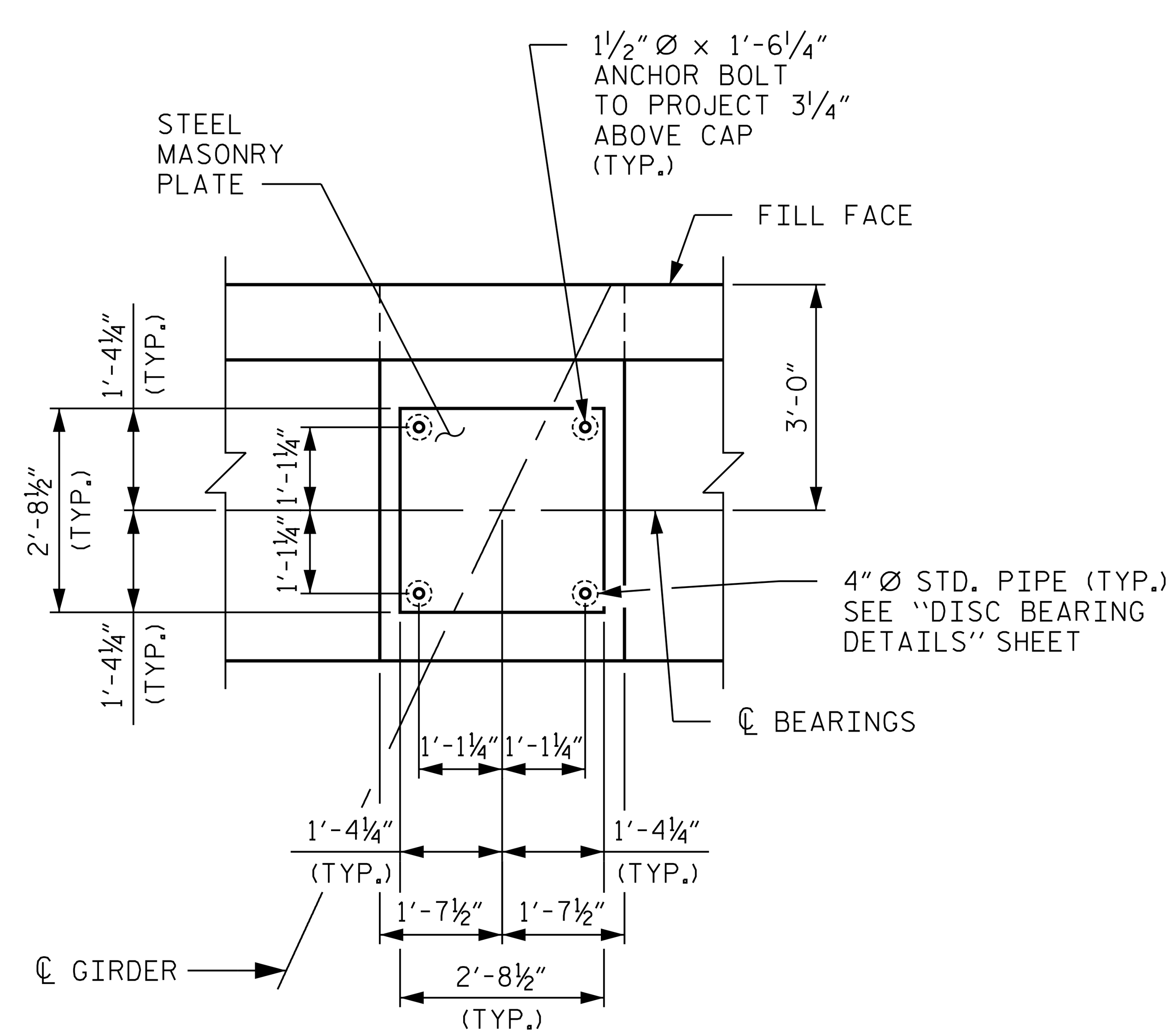



## PLAN

-Y1- NOT SHOWN FOR CLARITY. SEE GENERAL DRAWING SHEETS FOR -Y1- AND BRIDGE WORK LINE INTERACTION.

| GIRDER ANGLES | |
|---|---|
| ALL ANGLES ARE TANGENT TO CURVE | |
| 1 | 64°-36'-34" |
| 2 | 64°-00'-30" |
| 3 | 63°-22'-37" |
| 4 | 62°-42'-45" |
| 5 | 62°-00'-45" |
| 6 | 61°-16'-26" |

| BEARING DIMENSIONS | |
|---|---|
| G1 | Ⓐ 11⅛"<br>Ⓑ 1'-4 15/16" |
| G2 | Ⓐ 11⅜"<br>Ⓑ 1'-5⅜" |
| G3 | Ⓐ 11¾"<br>Ⓑ 1'-5⅞" |
| G4 | Ⓐ 1'-0 1/16"<br>Ⓑ 1'-6⅜" |
| G5 | Ⓐ 1'-0 7/16"<br>Ⓑ 1'-6 15/16" |
| G6 | Ⓐ 1'-0 13/16"<br>Ⓑ 1'-7 9/16" |




## BEARING DETAIL

PROJECT NO. U-5806

CABARRUS COUNTY

STATION: 15+75.56 -Y1- 27+06.95 -L-

SHEET 1 OF 5

SEAL 033752 NORTH CAROLINA PROFESSIONAL ENGINEER SETH A. DENNEY

DocuSigned by: Seth A. Denney E8EB154C9ED410... 10/23/2017

SEAL 040769 NORTH CAROLINA PROFESSIONAL ENGINEER ANDREW L. PHILLIPS

DocuSigned by: Andrew L. Phillips 2B869ABAD4004D3... 10/23/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

| REVISIONS | | | | | | | |
|---|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | SHEET NO. | S-38 |
| 1 | | | 3 | | | TOTAL SHEETS | 50 |
| 2 | | | 4 | | | | |

DRAWN BY: D.D.LOWERY DATE: 10/17
CHECKED BY: A.L.PHILLIPS DATE: 10/17
DESIGN ENGINEER OF RECORD: S.A.DENNEY DATE: 10/17

10/23/2017 K:\RDT_Structures_Bridge\NC\011035388 - U-5806 FinalDesign\Cad\Dgn\038_U-5806_EB201.dgn

NOTES:

FOR SECTION A-A, SEE "END BENT 2" SHEET 5 OF 5.

FOR VIEWS X-X AND Y-Y, SEE "END BENT 2" SHEET 3 OF 5.

WORK LINE OCCURS AT THE INTERSECTION OF WORK POINT AND FILL FACE.

FOR FOOTING DIMENSIONS AND ADDITIONAL REINFORCING DETAILS, SEE "END BENT 2" SHEET 4 OF 5.

FOR ADDITIONAL END BENT NOTES, SEE "END BENT 2" SHEET 5 OF 5.

FOR NOTE ✱✱, SEE "END BENT 2" SHEET 5 OF 5.


## ELEVATION

✱ FOR LOCATION OF ELEVATION BETWEEN BRIDGE SEATS, SEE END BENT 2, SHEET 5 OF 5.

△ #10M1 & #6M2 BARS HAVE MORE PROJECTION LENGTH THAN REQUIRED TO ACCOUNT FOR VARIABLE TOP OF CAP & TOP OF BACKWALL ELEVATIONS. #10V1 & #6V2 BARS SHALL BE PLACED SUCH THAT THEY TERMINATE AT THE TOP OF BACKWALL & BEARING SEAT, RESPECTIVELY. SPLICE LENGTH WILL VARY.

PROJECT NO. U-5806

CABARRUS COUNTY

STATION: 15+75.56 -Y1- 27+06.95 -L-

SHEET 2 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 033752 ENGINEER SETH A. DENNEY

NORTH CAROLINA PROFESSIONAL SEAL 040769 ENGINEER ANDREW L. PHILLIPS

DocuSigned by: Seth A. Denney E8EB154CC9E0410... 10/23/2017

DocuSigned by: Andrew L. Phillips 2B869ABAD4004D3... 10/23/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

| REVISIONS | | | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | | | S-39 |
| 1 | | | 3 | | | | | TOTAL SHEETS |
| 2 | | | 4 | | | | | 50 |

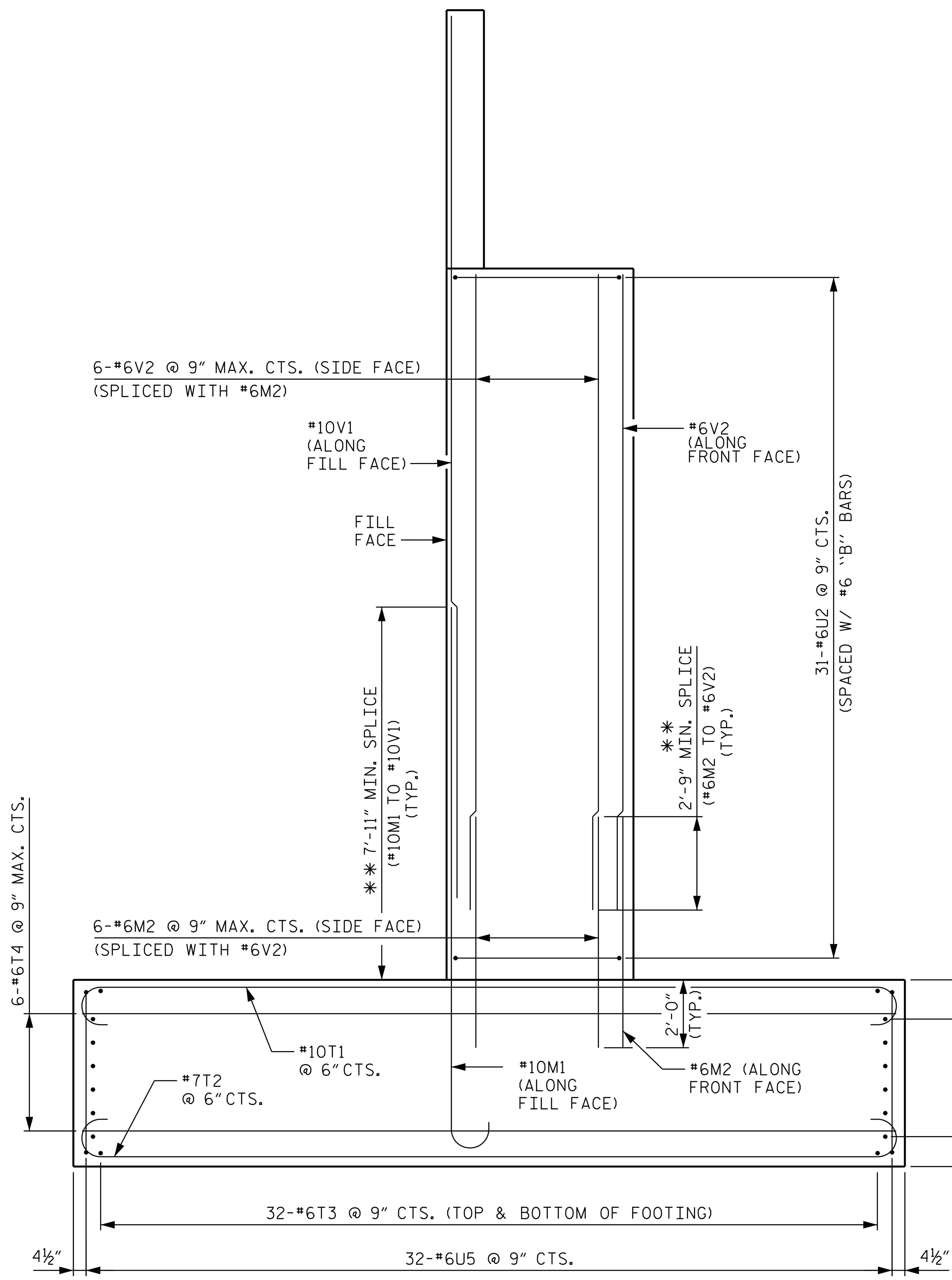
DRAWN BY: D.D.LOWERY DATE: 10/17
CHECKED BY: A.L.PHILLIPS DATE: 10/17
DESIGN ENGINEER OF RECORD: S.A.DENNEY DATE: 10/17

10/23/2017 K:\RDT_Structures_Bridge\NC\011035388 - U-5806 Final Design\Cad\Dgn\039_U-5806_EB202.dgn

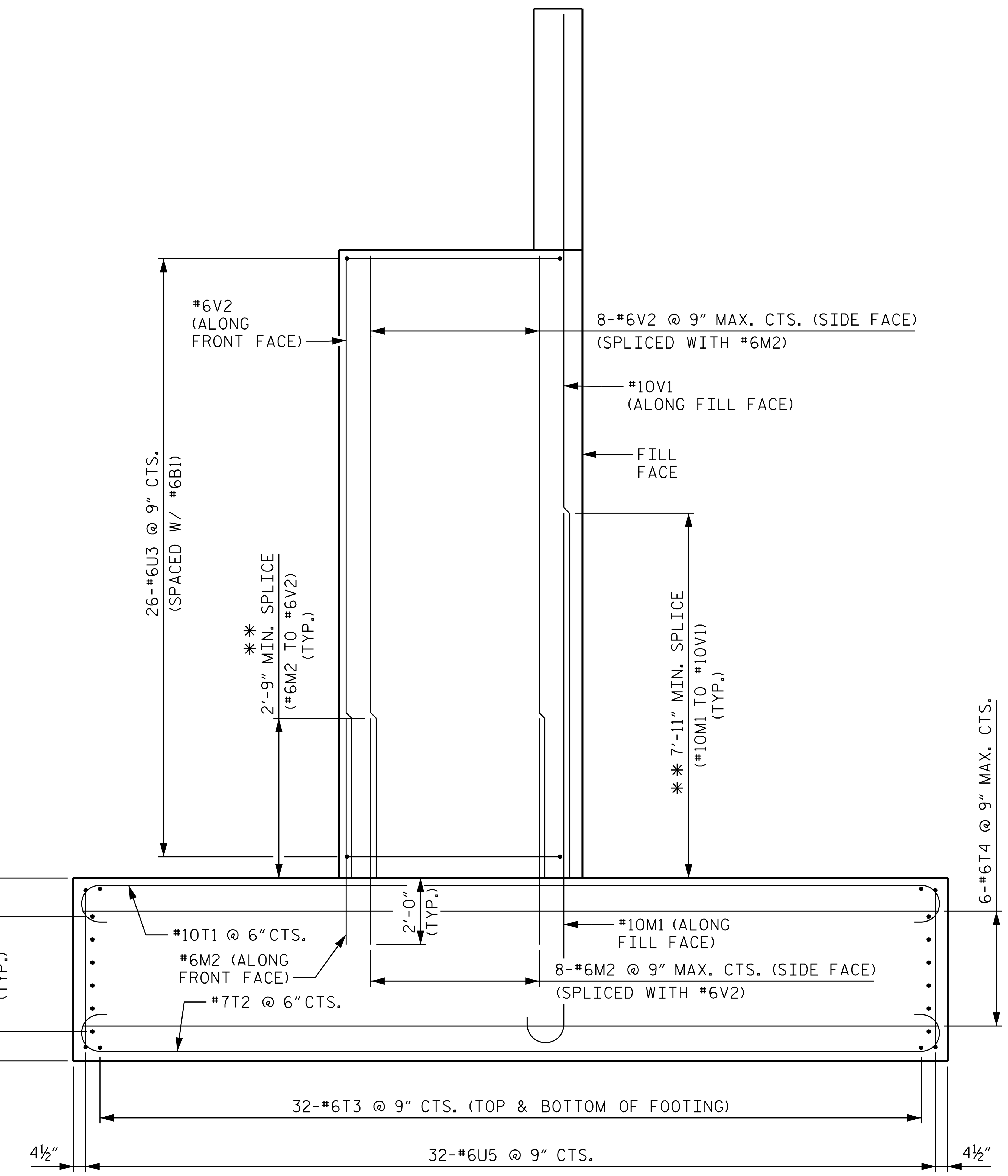
NOTE:

FOR END BENT NOTES, SEE "END BENT 2" SHEET 5 OF 5.

FOR NOTE ✻✻, SEE "END BENT 2" SHEET 5 OF 5.




VIEW X-X



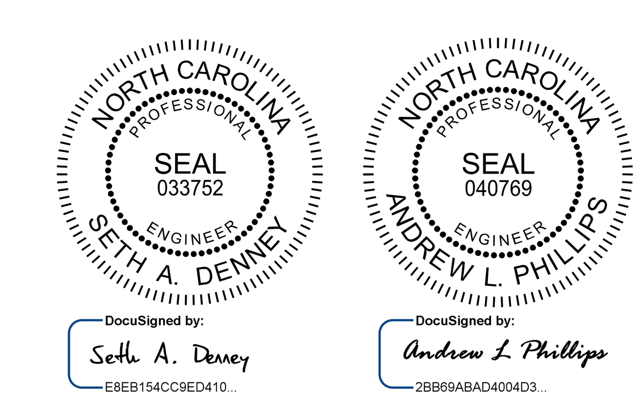

VIEW Y-Y

PROJECT NO. U-5806

CABARRUS COUNTY

STATION: 15+75.56 -Y1-
27+06.95 -L-

SHEET 3 OF 5




STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102



**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

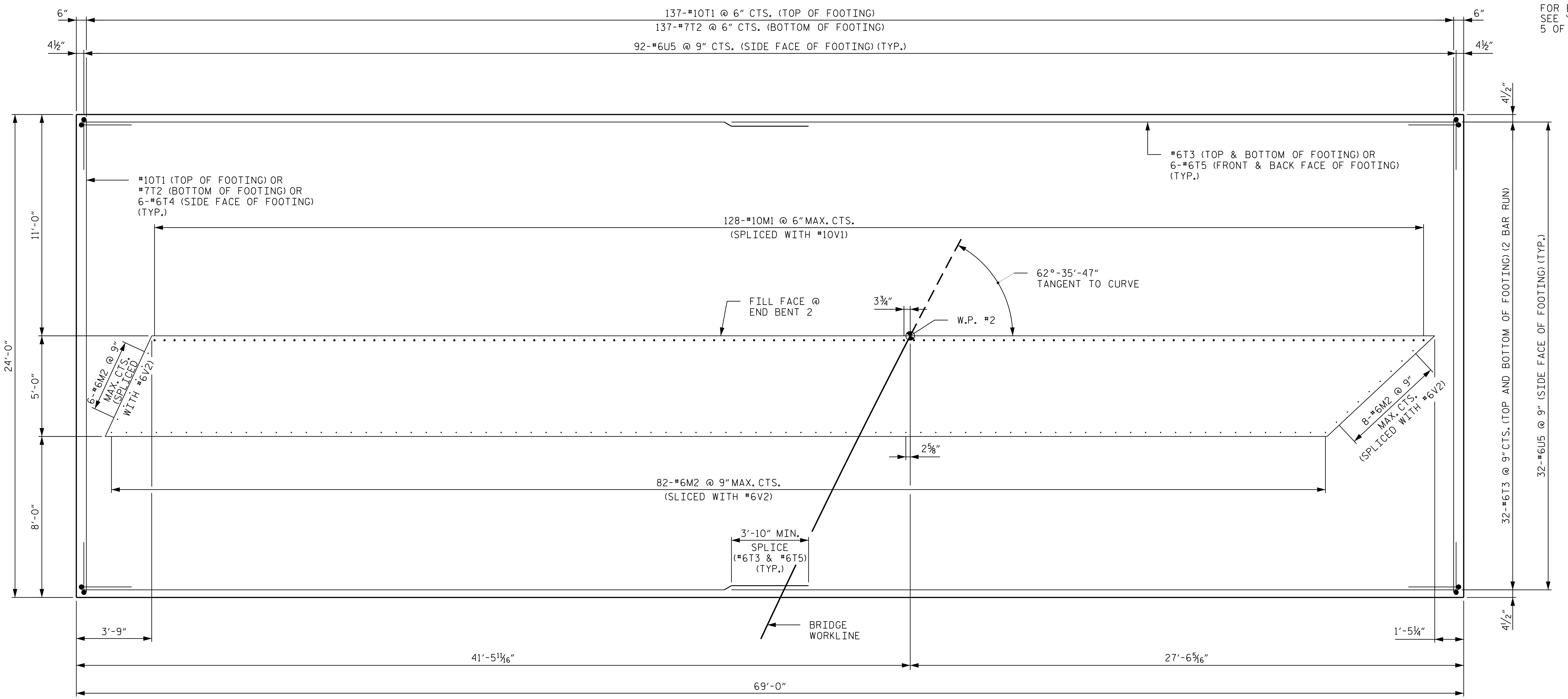
DRAWN BY: D.D.LOWERY DATE: 10/17
CHECKED BY: A.L.PHILLIPS DATE: 10/17
DESIGN ENGINEER OF RECORD: S.A.DENNEY DATE: 10/17

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-40 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 50 |

10/23/2017 K:\RDI_Structures_Bridge\NC\011036388 - U-5806 Final Design\Cad\Dgn\040_U-5806_EB203.dgn

NOTE:

FOR END BENT NOTES, SEE "END BENT 2" SHEET 5 OF 5.




FOOTING PLAN

PROJECT NO. U-5806

CABARRUS COUNTY

STATION: 15+75.56 -Y1- 27+06.95 -L-

SHEET 4 OF 5

SEAL 033752 — NORTH CAROLINA PROFESSIONAL ENGINEER — SETH A. DENNEY

DocuSigned by: Seth A. Denney — E8EB154CC9ED410... — 10/23/2017

SEAL 040769 — NORTH CAROLINA PROFESSIONAL ENGINEER — ANDREW L. PHILLIPS

DocuSigned by: Andrew L. Phillips — 2B869ABAD4004D3... — 10/23/2017

Kimley»Horn

421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

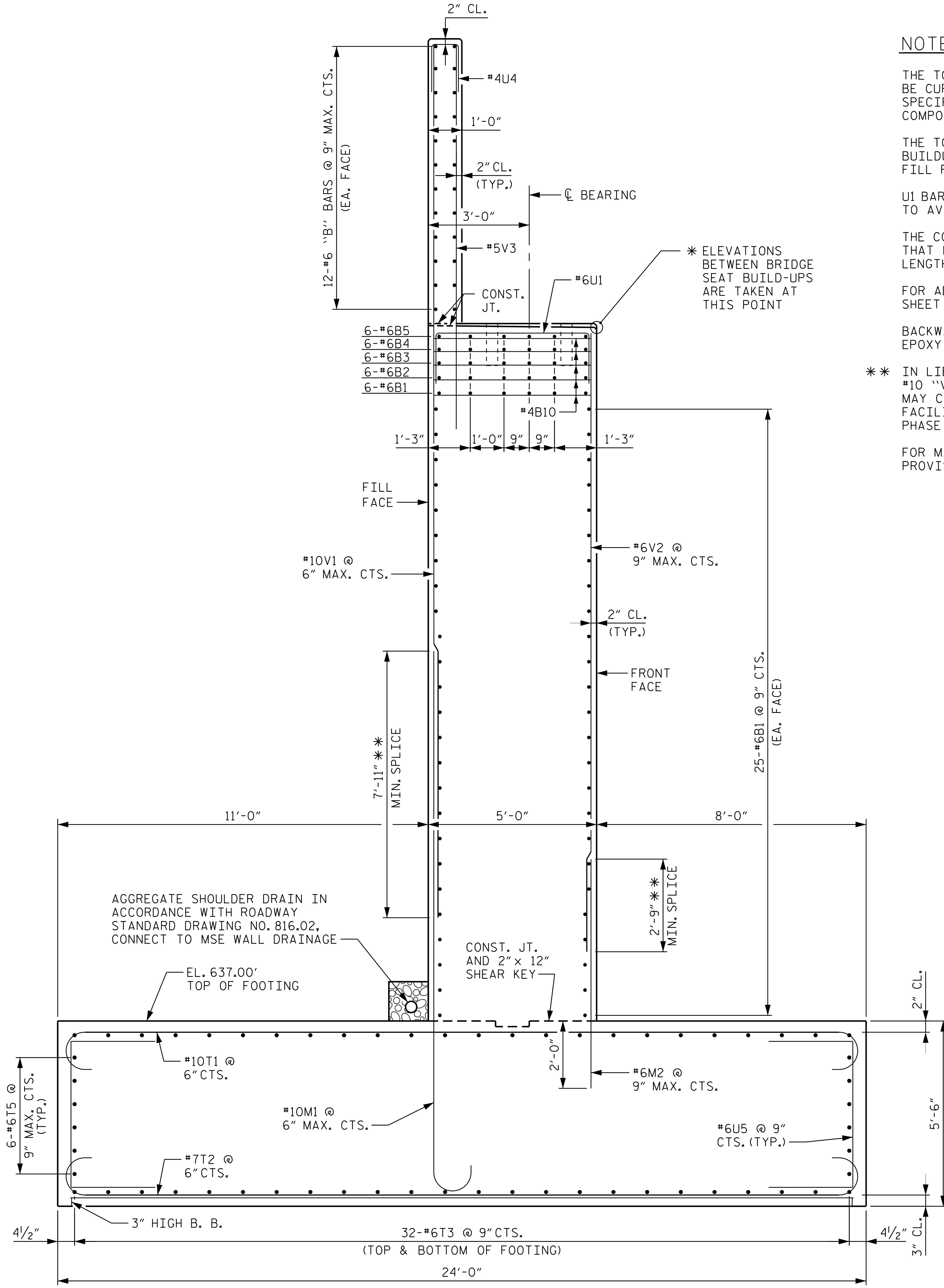
END BENT 2

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-41 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 50 |

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

| | |
|---|---|
| DRAWN BY: D. D. LOWERY | DATE: 10/17 |
| CHECKED BY: A. L. PHILLIPS | DATE: 10/17 |
| DESIGN ENGINEER OF RECORD: S. A. DENNEY | DATE: 10/17 |

10/23/2017 K:\RDI_Structures_Bridge\NC\011035388 - U-5806 Final Design\Cad\Dgn\04\U-5806_EB204.dgn




SECTION A-A

NOTES:

THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPE TRANSVERSELY FROM THE FILL FACE TO THE FRONT FACE AT THE RATE OF 2%.

U1 BARS UNDER BEARING SEATS MAY BE SHIFTED SLIGHTLY TO AVOID ANCHOR BOLTS.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT M1 & M2 BARS ARE DETAILED WITH 3'-0" OF EXTRA LENGTH.

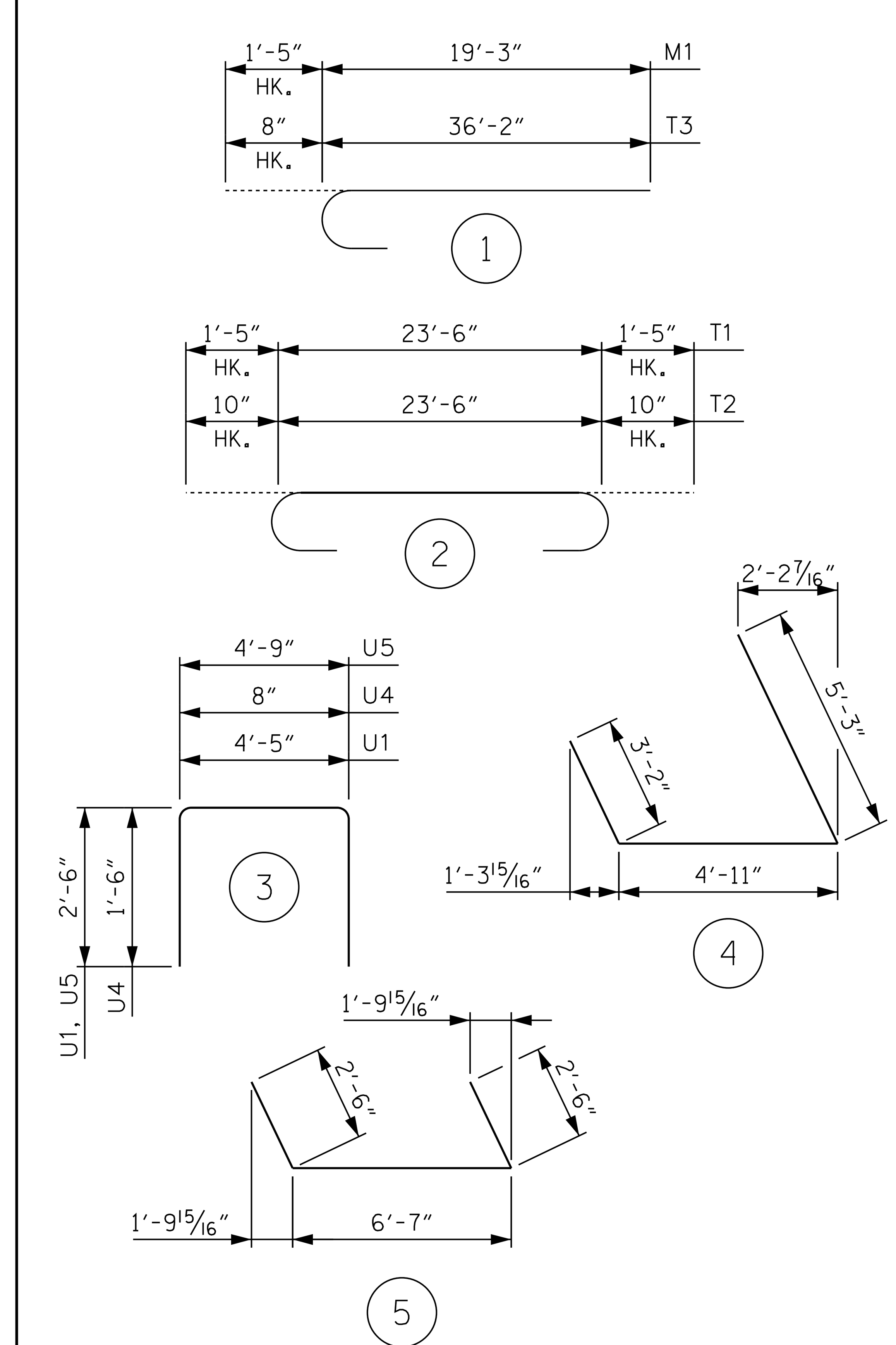
FOR ADDITIONAL NOTES, SEE GENERAL DRAWING SHEET 2 OF 4 OR SHEET 4 OF 4.

BACKWALL SHALL BE PLACED BEFORE APPLYING EPOXY PROTECTIVE COATING.

✱✱ IN LIEU OF SPLICES SHOWN FOR #10 "M" BARS TO #10 "V" BARS BETWEEN FOOTING AND STEM, CONTRACTOR MAY CHOOSE TO USE MECHANICAL COUPLERS TO FACILITATE CONSTRUCTION OF THE FOOTING DURING PHASE 1 OF THE PROJECT.

FOR MASS CONCRETE AT END BENT NO. 2, SEE SPECIAL PROVISIONS.

## BAR TYPES




ALL BAR DIMENSIONS ARE OUT TO OUT.

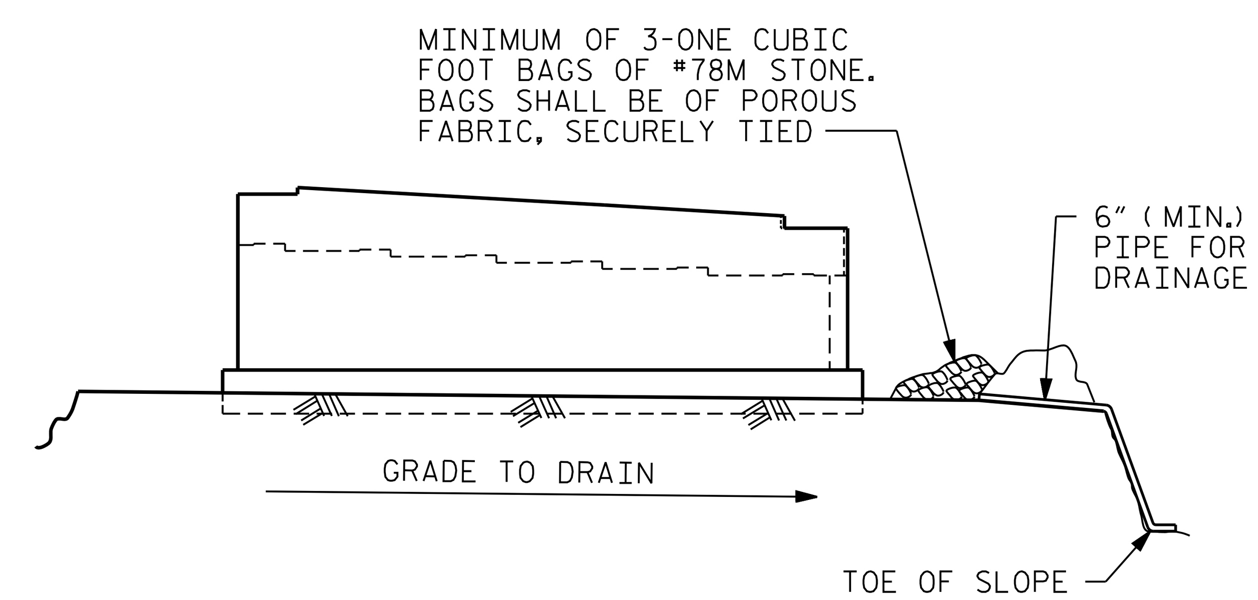
## BILL OF MATERIAL

### END BENT 2

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| B1 | 152 | 6 | STR | 33'-9" | 7705 |
| B2 | 6 | 6 | STR | 46'-7" | 420 |
| B3 | 6 | 6 | STR | 35'-7" | 321 |
| B4 | 6 | 6 | STR | 24'-8" | 222 |
| B5 | 6 | 6 | STR | 13'-10" | 125 |
| B6 | 6 | 6 | STR | 3'-1" | 28 |
| B7 | 10 | 6 | STR | 7'-2" | 108 |
| B8 | 4 | 6 | STR | 7'-7" | 46 |
| B9 | 4 | 6 | STR | 48'-9" | 293 |
| B10 | 26 | 4 | STR | 4'-8" | 81 |
| | | | | | |
| M1 | 128 | 10 | 1 | 20'-8" | 11383 |
| M2 | 96 | 6 | STR | 9'-10" | 1418 |
| | | | | | |
| T1 | 137 | 10 | 2 | 26'-4" | 15524 |
| T2 | 137 | 7 | 2 | 25'-2" | 7047 |
| T3 | 128 | 6 | 1 | 36'-10" | 7081 |
| T4 | 12 | 6 | STR | 23'-6" | 424 |
| T5 | 24 | 6 | STR | 36'-2" | 1304 |
| | | | | | |
| U1 | 82 | 6 | 3 | 9'-5" | 1160 |
| U2 | 31 | 6 | 4 | 13'-4" | 621 |
| U3 | 26 | 6 | 5 | 11'-7" | 452 |
| U4 | 86 | 4 | 3 | 3'-8" | 211 |
| U5 | 248 | 6 | 3 | 9'-9" | 3632 |
| | | | | | |
| V1 | 128 | 10 | STR | 26'-5" | 14550 |
| V2 | 96 | 6 | STR | 19'-2" | 2764 |
| V3 | 86 | 5 | STR | 10'-9" | 964 |

TOTAL REINFORCING STEEL 77,882 LBS.

| CLASS A CONCRETE BREAKDOWN | | |
|---|---|---|
| POUR #1 | FOOTING | 337.3 C.Y. |
| POUR #2 | ABUTMENT STEM | 232.1 C.Y. |
| POUR #3 | BACKWALL | 19.7 C.Y. |
| TOTAL CLASS A CONCRETE | | 589.1 C.Y. |




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

PROJECT NO. U-5806
CABARRUS COUNTY
STATION: 15+75.56 -Y1- 27+06.95 -L-
SHEET 5 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 033752 ENGINEER SETH A. DENNEY
DocuSigned by: Seth A. Denney E8EB154CC9ED410... 10/23/2017

NORTH CAROLINA PROFESSIONAL SEAL 040769 ENGINEER ANDREW L. PHILLIPS
DocuSigned by: Andrew L. Phillips 2B8B9ABAD4004O3... 10/23/2017

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2

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

SHEET NO. S-42
TOTAL SHEETS 50

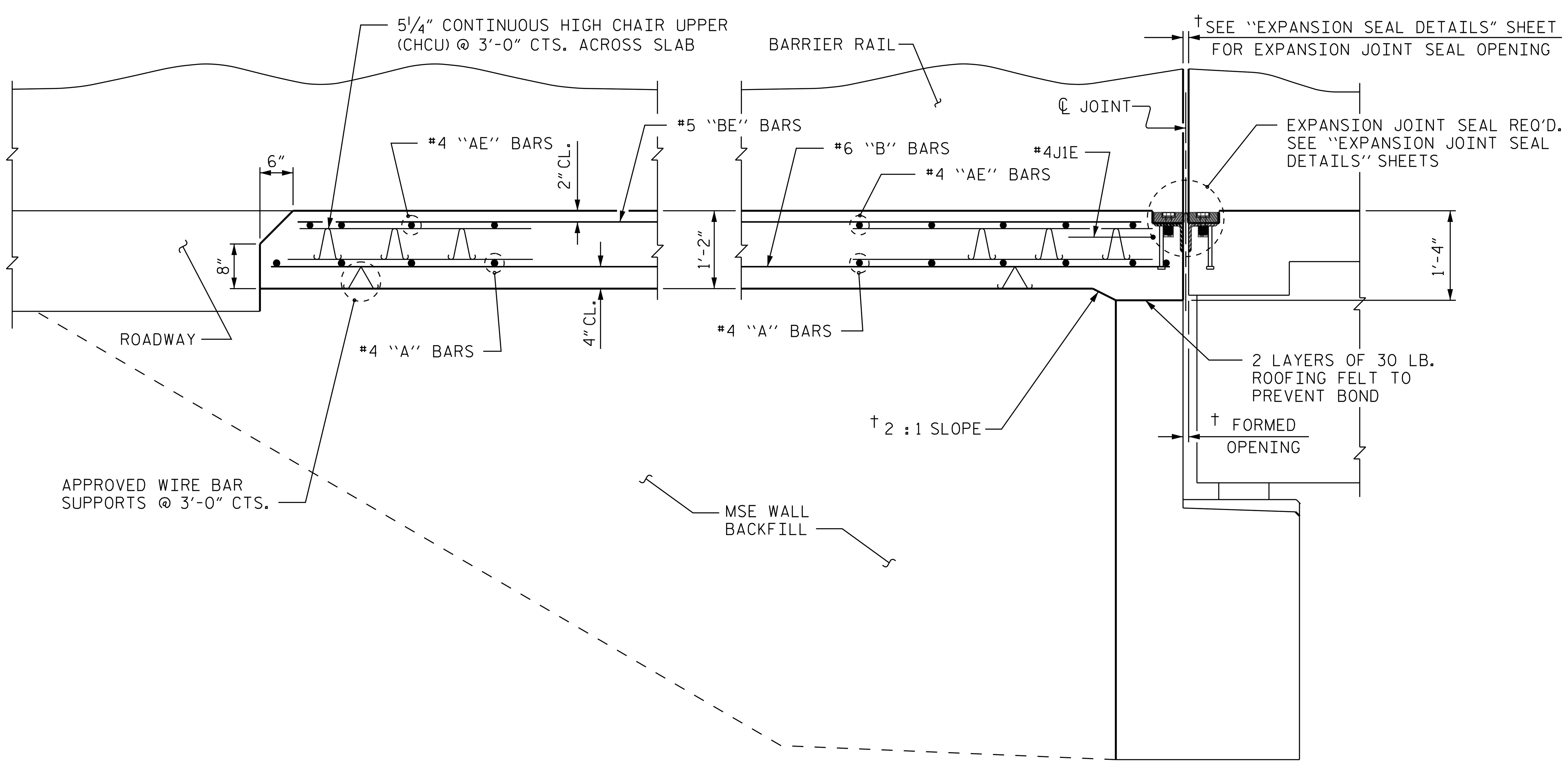
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY: D. D. LOWERY DATE: 10/17
CHECKED BY: A. L. PHILLIPS DATE: 10/17
DESIGN ENGINEER OF RECORD: S. A. DENNEY DATE: 10/17

10/23/2017 K:\RDI_Structures_Bridge\NC\011036388 -U-5806 Final\Design\Cad\Dgn\042_U-5806_EB205.dgn

## NOTES

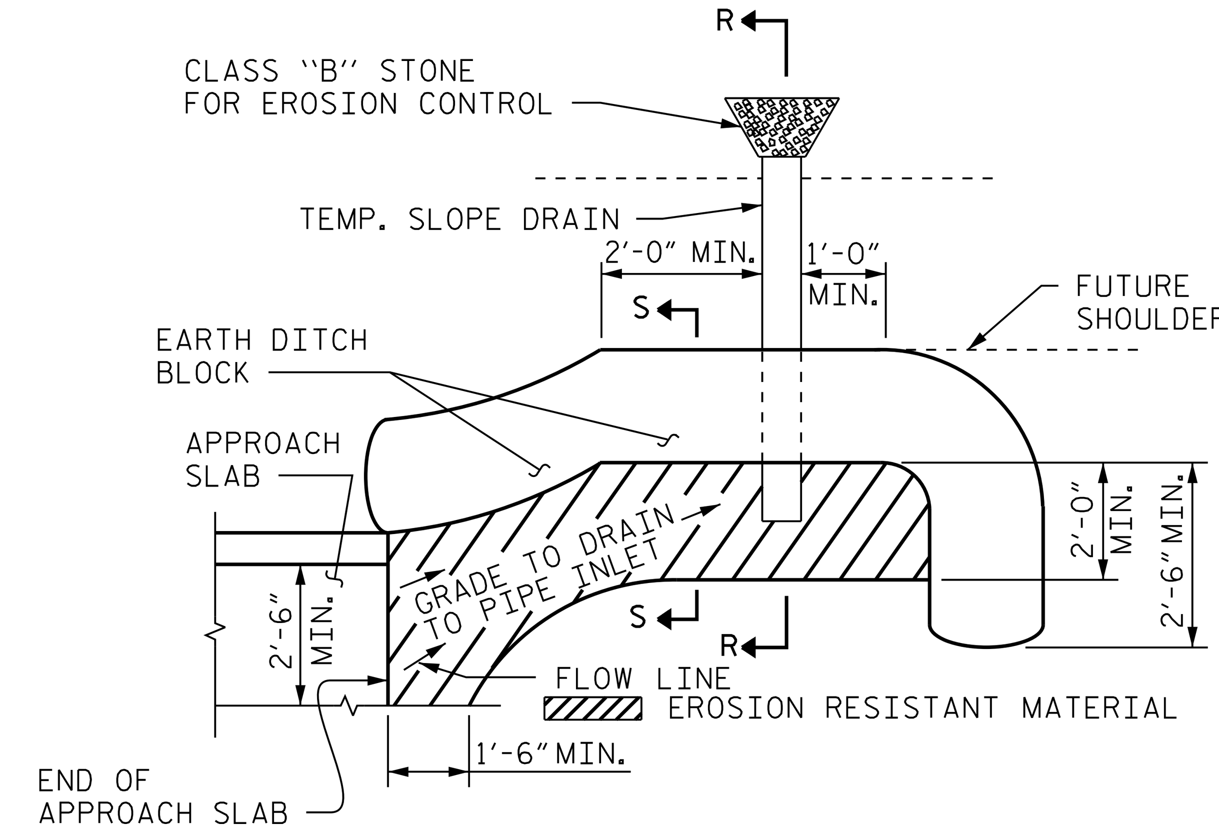
APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.




† NORMAL TO END BENT

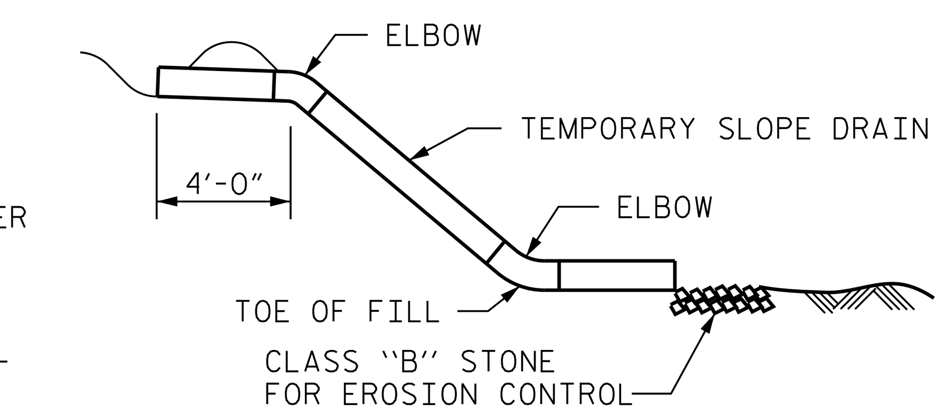
† NORMAL TO END BENT

## SECTION THRU SLAB

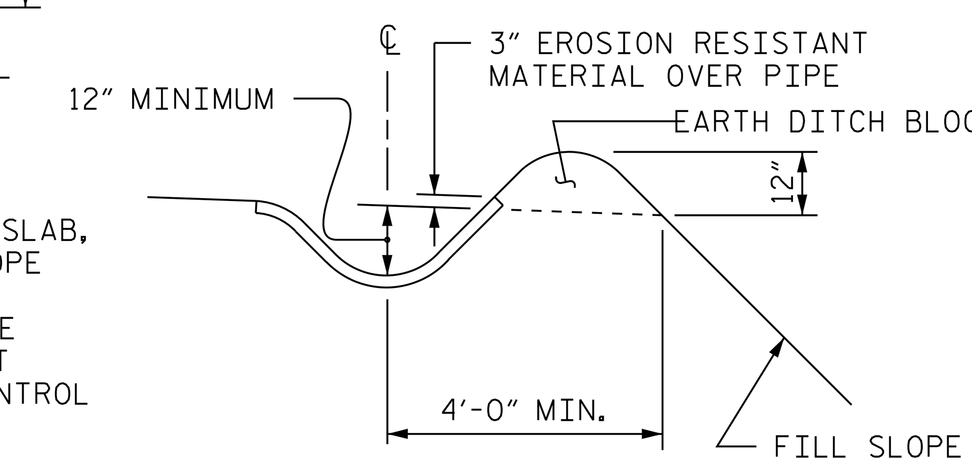



NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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



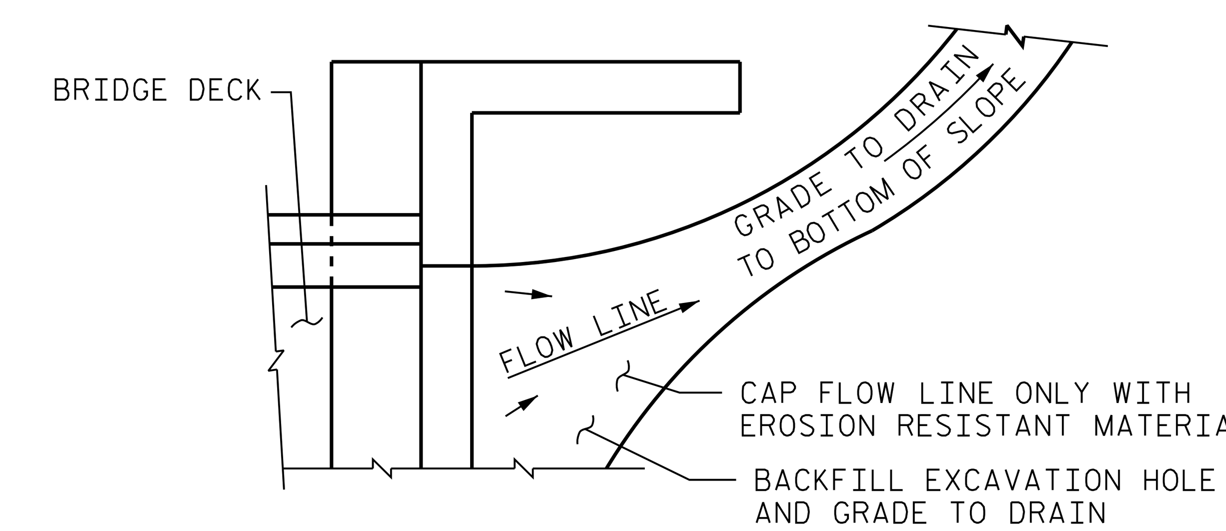

SECTION R-R




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. U-5806
CABARRUS COUNTY
STATION: 15+75.56 -Y1-
27+06.95 -L-

SHEET 1 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 033752 ENGINEER SETH A. DENNEY
DocuSigned by: Seth A. Denney
E8EB154C0E0410...
10/23/2017

NORTH CAROLINA PROFESSIONAL SEAL 040769 ENGINEER ANDREW L. PHILLIPS
DocuSigned by: Andrew L. Phillips
2B869ABAD4004D3...
10/23/2017

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB
FOR FLEXIBLE PAVEMENT

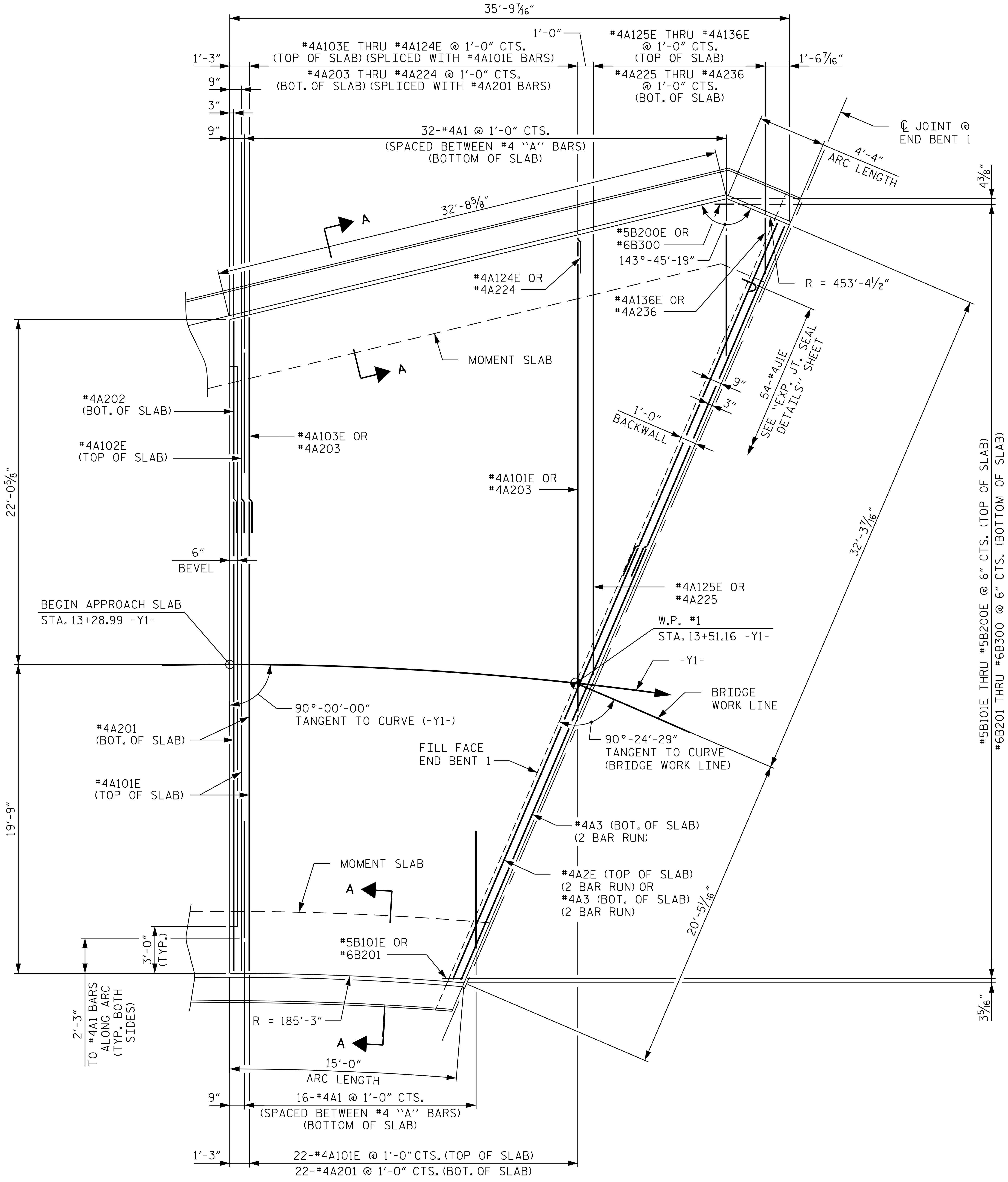
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

| ASSEMBLED BY : D.D. LOWERY | | DATE : 10/17 |
|---|---|---|
| CHECKED BY : A.L. PHILLIPS | | DATE : 10/17 |
| DRAWN BY : EEM 3/95 | REV. 10/1/11 | MAA/GM |
| CHECKED BY : VAP 3/95 | REV. 12/21/11 | MAA/GM |
| | REV. 6/13 | MAA/GM |

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-43 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 50 |

K:\RDT_Structures_Bridge\NC\011036388 - U-5806 Final Design\Cad\Dgn\043_U-5806_AS01.dgn
10/23/2017

STD. NO. BAS2



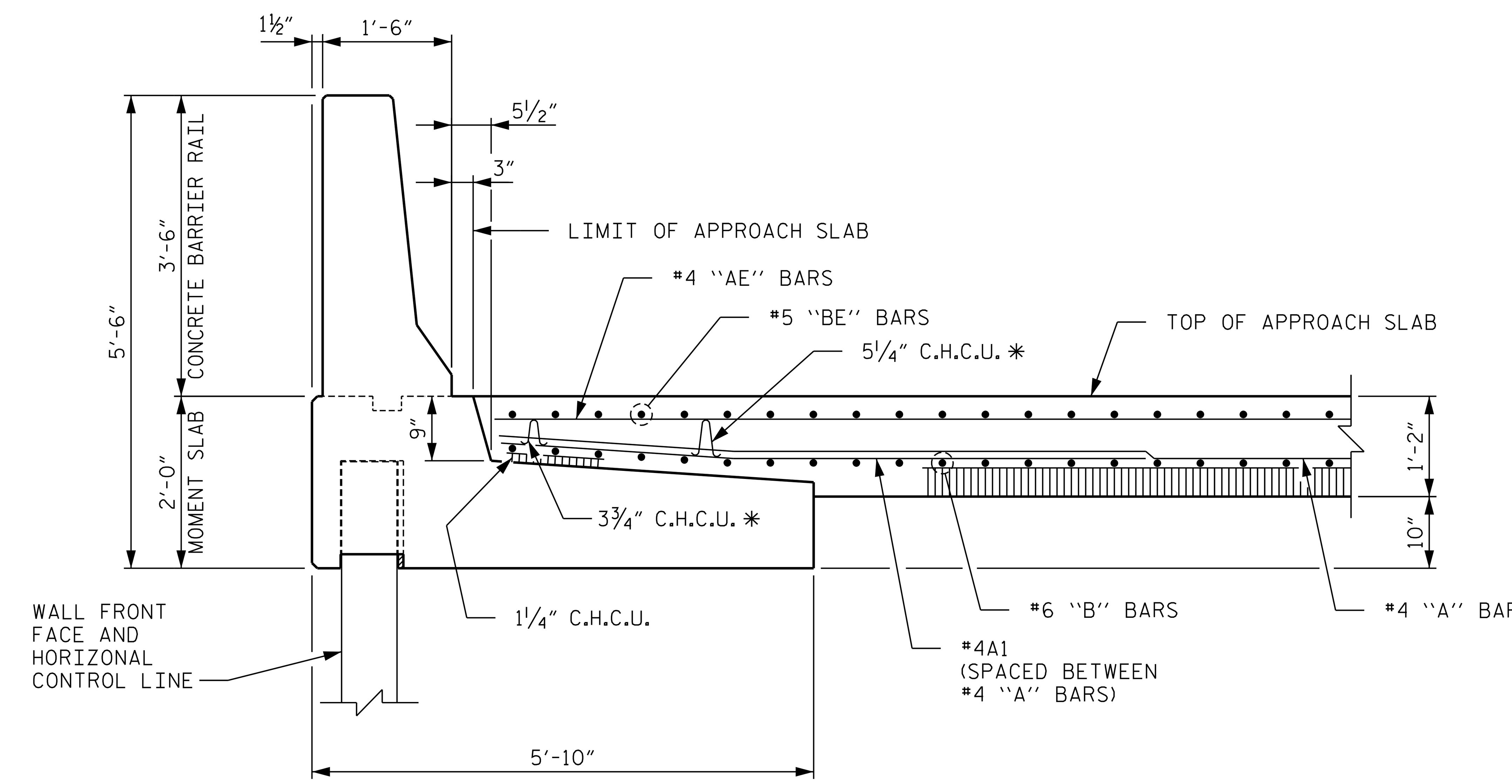

PLAN @ END BENT 1

## NOTES

"A" BARS ARE PARALLEL TO BEGINNING APPROACH SLAB EDGE.

FOR APPROACH SLAB NOTES SEE "BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT", SHEET 1 OF 5.

THE QUANTITY OF #4J1E BARS ON THE BILL OF MATERIAL IS BASED ON 1′-0″ CENTERS. J1E BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1E BARS SPECIFIED, ADDITIONAL J1E BARS WILL NOT BE REQUIRED.




SECTION A-A AT MOMENT SLAB

✳ SPACE C.H.C.U. AS REQUIRED TO ACHIEVE SPECIFIED REBAR CLEAR COVERS.

PROJECT NO. U-5806

CABARRUS COUNTY

STATION: 15+75.56 -Y1-
27+06.95 -L-

SHEET 2 OF 5

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033752 SETH A. DENNEY
DocuSigned by: Seth A. Denney
E8EB154CC9ED410...
10/23/2017

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040769 ANDREW L. PHILLIPS
DocuSigned by: Andrew L. Phillips
2BB69ABAD4004D3...
10/23/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102



| REVISIONS | | | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | | | S-44 |
| 1 | | | 3 | | | | | TOTAL SHEETS |
| 2 | | | 4 | | | | | 50 |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

| | |
|---|---|
| DRAWN BY: D. D. LOWERY | DATE: 10/17 |
| CHECKED BY: A. L. PHILLIPS | DATE: 10/17 |
| DESIGN ENGINEER OF RECORD: S. A. DENNEY | DATE: 10/17 |

10/23/2017 K:\RDI_Structures_Bridge\NC\011035388 - U-5806 Final Design\Cad\Dgn\044_U-5806_AS02.dgn

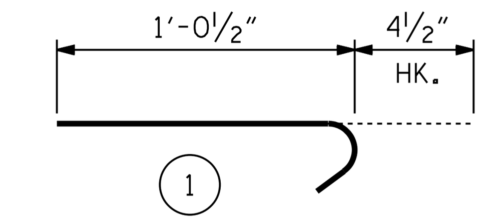
# BILL OF MATERIAL

## APPROACH SLAB AT END BENT #1

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT | BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT | BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT | BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT | BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A1E | 48 | 4 | STR | 30'-0" | 962 | A221 | 1 | 4 | STR | 8'-9" | 6 | B145E | 1 | 5 | STR | 24'-2" | 25 | B205 | 1 | 6 | STR | 15'-7" | 23 | B266 | 1 | 6 | STR | 28'-8" | 43 |
| | | | | | | A222 | 1 | 4 | STR | 6'-8" | 4 | B146E | 1 | 5 | STR | 24'-5" | 25 | B206 | 1 | 6 | STR | 15'-10" | 24 | B267 | 1 | 6 | STR | 28'-11" | 43 |
| A2E | 2 | 4 | STR | 27'-4" | 37 | A223 | 1 | 4 | STR | 4'-7" | 3 | B147E | 1 | 5 | STR | 24'-7" | 26 | B207 | 1 | 6 | STR | 16'-0" | 24 | B268 | 1 | 6 | STR | 29'-1" | 44 |
| A3 | 4 | 4 | STR | 27'-3" | 73 | A224 | 1 | 4 | STR | 2'-6" | 2 | B148E | 1 | 5 | STR | 24'-10" | 26 | B208 | 1 | 6 | STR | 16'-3" | 24 | B269 | 1 | 6 | STR | 29'-4" | 44 |
| A101E | 23 | 4 | STR | 30'-0" | 461 | A225 | 1 | 4 | STR | 28'-2" | 19 | B149E | 1 | 5 | STR | 25'-0" | 26 | B209 | 1 | 6 | STR | 16'-5" | 25 | B270 | 1 | 6 | STR | 29'-6" | 44 |
| A102E | 1 | 4 | STR | 13'-8" | 9 | A226 | 1 | 4 | STR | 26'-1" | 17 | B150E | 1 | 5 | STR | 25'-3" | 26 | B210 | 1 | 6 | STR | 16'-8" | 25 | B271 | 1 | 6 | STR | 29'-9" | 45 |
| A103E | 1 | 4 | STR | 13'-10" | 9 | A227 | 1 | 4 | STR | 24'-0" | 16 | B151E | 1 | 5 | STR | 25'-5" | 27 | B211 | 1 | 6 | STR | 16'-10" | 25 | B272 | 1 | 6 | STR | 29'-11" | 45 |
| A104E | 1 | 4 | STR | 14'-1" | 9 | A228 | 1 | 4 | STR | 21'-11" | 15 | B152E | 1 | 5 | STR | 25'-8" | 27 | B212 | 1 | 6 | STR | 17'-1" | 26 | B273 | 1 | 6 | STR | 30'-2" | 45 |
| A105E | 1 | 4 | STR | 14'-4" | 10 | A229 | 1 | 4 | STR | 19'-10" | 13 | B153E | 1 | 5 | STR | 25'-11" | 27 | B213 | 1 | 6 | STR | 17'-4" | 26 | B274 | 1 | 6 | STR | 30'-5" | 46 |
| A106E | 1 | 4 | STR | 14'-7" | 10 | A230 | 1 | 4 | STR | 17'-9" | 12 | B154E | 1 | 5 | STR | 26'-1" | 27 | B214 | 1 | 6 | STR | 17'-6" | 26 | B275 | 1 | 6 | STR | 30'-7" | 46 |
| A107E | 1 | 4 | STR | 14'-10" | 10 | A231 | 1 | 4 | STR | 15'-8" | 10 | B155E | 1 | 5 | STR | 26'-4" | 27 | B215 | 1 | 6 | STR | 17'-9" | 27 | B276 | 1 | 6 | STR | 30'-10" | 46 |
| A108E | 1 | 4 | STR | 15'-2" | 10 | A232 | 1 | 4 | STR | 13'-7" | 9 | B156E | 1 | 5 | STR | 26'-6" | 28 | B216 | 1 | 6 | STR | 17'-11" | 27 | B277 | 1 | 6 | STR | 31'-0" | 47 |
| A109E | 1 | 4 | STR | 15'-5" | 10 | A233 | 1 | 4 | STR | 11'-6" | 8 | B157E | 1 | 5 | STR | 26'-9" | 28 | B217 | 1 | 6 | STR | 18'-2" | 27 | B278 | 1 | 6 | STR | 31'-3" | 47 |
| A110E | 1 | 4 | STR | 15'-8" | 10 | A234 | 1 | 4 | STR | 9'-1" | 6 | B158E | 1 | 5 | STR | 26'-11" | 28 | B218 | 1 | 6 | STR | 18'-4" | 28 | B279 | 1 | 6 | STR | 31'-6" | 47 |
| A111E | 1 | 4 | STR | 16'-0" | 11 | A235 | 1 | 4 | STR | 6'-4" | 4 | B159E | 1 | 5 | STR | 27'-2" | 28 | B219 | 1 | 6 | STR | 18'-7" | 28 | B280 | 1 | 6 | STR | 31'-8" | 48 |
| A112E | 1 | 4 | STR | 16'-3" | 11 | A236 | 1 | 4 | STR | 3'-7" | 2 | B160E | 1 | 5 | STR | 27'-5" | 29 | B220 | 1 | 6 | STR | 18'-10" | 28 | B281 | 1 | 6 | STR | 31'-11" | 48 |
| A113E | 1 | 4 | STR | 16'-7" | 11 | | | | | | | B161E | 1 | 5 | STR | 27'-7" | 29 | B221 | 1 | 6 | STR | 19'-0" | 29 | B282 | 1 | 6 | STR | 32'-1" | 48 |
| A114E | 1 | 4 | STR | 16'-11" | 11 | B101E | 1 | 5 | STR | 1'-3" | 1 | B162E | 1 | 5 | STR | 27'-10" | 29 | B222 | 1 | 6 | STR | 19'-3" | 29 | B283 | 1 | 6 | STR | 32'-4" | 49 |
| A115E | 1 | 4 | STR | 17'-2" | 11 | B102E | 1 | 5 | STR | 14'-11" | 16 | B163E | 1 | 5 | STR | 28'-0" | 29 | B223 | 1 | 6 | STR | 19'-5" | 29 | B284 | 1 | 6 | STR | 32'-6" | 49 |
| A116E | 1 | 4 | STR | 17'-6" | 12 | B103E | 1 | 5 | STR | 15'-2" | 16 | B164E | 1 | 5 | STR | 28'-3" | 29 | B224 | 1 | 6 | STR | 19'-8" | 30 | B285 | 1 | 6 | STR | 32'-9" | 49 |
| A117E | 1 | 4 | STR | 17'-2" | 11 | B104E | 1 | 5 | STR | 15'-4" | 16 | B165E | 1 | 5 | STR | 28'-5" | 30 | B225 | 1 | 6 | STR | 19'-10" | 30 | B286 | 1 | 6 | STR | 30'-11" | 46 |
| A118E | 1 | 4 | STR | 15'-1" | 10 | B105E | 1 | 5 | STR | 15'-7" | 16 | B166E | 1 | 5 | STR | 28'-8" | 30 | B226 | 1 | 6 | STR | 20'-1" | 30 | B287 | 1 | 6 | STR | 29'-1" | 44 |
| A119E | 1 | 4 | STR | 13'-0" | 9 | B106E | 1 | 5 | STR | 15'-10" | 17 | B167E | 1 | 5 | STR | 28'-11" | 30 | B227 | 1 | 6 | STR | 20'-4" | 31 | B288 | 1 | 6 | STR | 27'-3" | 41 |
| A120E | 1 | 4 | STR | 10'-11" | 7 | B107E | 1 | 5 | STR | 16'-0" | 17 | B168E | 1 | 5 | STR | 29'-1" | 30 | B228 | 1 | 6 | STR | 20'-6" | 31 | B289 | 1 | 6 | STR | 25'-5" | 38 |
| A121E | 1 | 4 | STR | 8'-9" | 6 | B108E | 1 | 5 | STR | 16'-3" | 17 | B169E | 1 | 5 | STR | 29'-4" | 31 | B229 | 1 | 6 | STR | 20'-9" | 31 | B290 | 1 | 6 | STR | 23'-7" | 35 |
| A122E | 1 | 4 | STR | 6'-8" | 4 | B109E | 1 | 5 | STR | 16'-5" | 17 | B170E | 1 | 5 | STR | 29'-6" | 31 | B230 | 1 | 6 | STR | 20'-11" | 31 | B291 | 1 | 6 | STR | 21'-8" | 33 |
| A123E | 1 | 4 | STR | 4'-7" | 3 | B110E | 1 | 5 | STR | 16'-8" | 17 | B171E | 1 | 5 | STR | 29'-9" | 31 | B231 | 1 | 6 | STR | 21'-2" | 32 | B292 | 1 | 6 | STR | 19'-10" | 30 |
| A124E | 1 | 4 | STR | 2'-6" | 2 | B111E | 1 | 5 | STR | 16'-10" | 18 | B172E | 1 | 5 | STR | 29'-11" | 31 | B232 | 1 | 6 | STR | 21'-4" | 32 | B293 | 1 | 6 | STR | 18'-0" | 27 |
| A125E | 1 | 4 | STR | 28'-2" | 19 | B112E | 1 | 5 | STR | 17'-1" | 18 | B173E | 1 | 5 | STR | 30'-2" | 31 | B233 | 1 | 6 | STR | 21'-7" | 32 | B294 | 1 | 6 | STR | 16'-2" | 24 |
| A126E | 1 | 4 | STR | 26'-1" | 17 | B113E | 1 | 5 | STR | 17'-4" | 18 | B174E | 1 | 5 | STR | 30'-5" | 32 | B234 | 1 | 6 | STR | 21'-10" | 33 | B295 | 1 | 6 | STR | 14'-4" | 22 |
| A127E | 1 | 4 | STR | 24'-0" | 16 | B114E | 1 | 5 | STR | 17'-6" | 18 | B175E | 1 | 5 | STR | 30'-7" | 32 | B235 | 1 | 6 | STR | 22'-0" | 33 | B296 | 1 | 6 | STR | 12'-6" | 19 |
| A128E | 1 | 4 | STR | 21'-11" | 15 | B115E | 1 | 5 | STR | 17'-9" | 19 | B176E | 1 | 5 | STR | 30'-10" | 32 | B236 | 1 | 6 | STR | 22'-3" | 33 | B297 | 1 | 6 | STR | 10'-8" | 16 |
| A129E | 1 | 4 | STR | 19'-10" | 13 | B116E | 1 | 5 | STR | 17'-11" | 19 | B177E | 1 | 5 | STR | 31'-0" | 32 | B237 | 1 | 6 | STR | 22'-5" | 34 | B298 | 1 | 6 | STR | 7'-8" | 12 |
| A130E | 1 | 4 | STR | 17'-9" | 12 | B117E | 1 | 5 | STR | 18'-2" | 19 | B178E | 1 | 5 | STR | 31'-3" | 33 | B238 | 1 | 6 | STR | 22'-8" | 34 | B299 | 1 | 6 | STR | 4'-5" | 7 |
| A131E | 1 | 4 | STR | 15'-8" | 10 | B118E | 1 | 5 | STR | 18'-4" | 19 | B179E | 1 | 5 | STR | 31'-6" | 33 | B239 | 1 | 6 | STR | 22'-10" | 34 | B300 | 1 | 6 | STR | 1'-2" | 2 |
| A132E | 1 | 4 | STR | 13'-7" | 9 | B119E | 1 | 5 | STR | 18'-7" | 19 | B180E | 1 | 5 | STR | 31'-8" | 33 | B240 | 1 | 6 | STR | 23'-1" | 35 | | | | | | |
| A133E | 1 | 4 | STR | 11'-6" | 8 | B120E | 1 | 5 | STR | 18'-10" | 20 | B181E | 1 | 5 | STR | 31'-11" | 33 | B241 | 1 | 6 | STR | 23'-4" | 35 | J1E | 54 | 4 | 1 | 1'-5" | 51 |
| A134E | 1 | 4 | STR | 9'-1" | 6 | B121E | 1 | 5 | STR | 19'-0" | 20 | B182E | 1 | 5 | STR | 32'-1" | 33 | B242 | 1 | 6 | STR | 23'-6" | 35 | | | | | | |
| A135E | 1 | 4 | STR | 6'-4" | 4 | B122E | 1 | 5 | STR | 19'-3" | 20 | B183E | 1 | 5 | STR | 32'-4" | 34 | B243 | 1 | 6 | STR | 23'-9" | 36 | | | | | | |
| A136E | 1 | 4 | STR | 3'-7" | 2 | B123E | 1 | 5 | STR | 19'-5" | 20 | B184E | 1 | 5 | STR | 32'-6" | 34 | B244 | 1 | 6 | STR | 23'-11" | 36 | | | | | | |
| | | | | | | B124E | 1 | 5 | STR | 19'-8" | 21 | B185E | 1 | 5 | STR | 32'-9" | 34 | B245 | 1 | 6 | STR | 24'-2" | 36 | | | | | | |
| A201 | 23 | 4 | STR | 30'-0" | 461 | B125E | 1 | 5 | STR | 19'-10" | 21 | B186E | 1 | 5 | STR | 30'-11" | 32 | B246 | 1 | 6 | STR | 24'-5" | 37 | | | | | | |
| A202 | 1 | 4 | STR | 13'-8" | 9 | B126E | 1 | 5 | STR | 20'-1" | 21 | B187E | 1 | 5 | STR | 29'-1" | 30 | B247 | 1 | 6 | STR | 24'-7" | 37 | | | | | | |
| A203 | 1 | 4 | STR | 13'-10" | 9 | B127E | 1 | 5 | STR | 20'-4" | 21 | B188E | 1 | 5 | STR | 27'-3" | 28 | B248 | 1 | 6 | STR | 24'-10" | 37 | | | | | | |
| A204 | 1 | 4 | STR | 14'-1" | 9 | B128E | 1 | 5 | STR | 20'-6" | 21 | B189E | 1 | 5 | STR | 25'-5" | 27 | B249 | 1 | 6 | STR | 25'-0" | 38 | | | | | | |
| A205 | 1 | 4 | STR | 14'-4" | 10 | B129E | 1 | 5 | STR | 20'-9" | 22 | B190E | 1 | 5 | STR | 23'-7" | 25 | B250 | 1 | 6 | STR | 25'-3" | 38 | | | | | | |
| A206 | 1 | 4 | STR | 14'-7" | 10 | B130E | 1 | 5 | STR | 20'-11" | 22 | B191E | 1 | 5 | STR | 21'-8" | 23 | B251 | 1 | 6 | STR | 25'-5" | 38 | | | | | | |
| A207 | 1 | 4 | STR | 14'-10" | 10 | B131E | 1 | 5 | STR | 21'-2" | 22 | B192E | 1 | 5 | STR | 19'-10" | 21 | B252 | 1 | 6 | STR | 25'-8" | 39 | | | | | | |
| A208 | 1 | 4 | STR | 15'-2" | 10 | B132E | 1 | 5 | STR | 21'-4" | 22 | B193E | 1 | 5 | STR | 18'-0" | 19 | B253 | 1 | 6 | STR | 25'-11" | 39 | | | | | | |
| A209 | 1 | 4 | STR | 15'-5" | 10 | B133E | 1 | 5 | STR | 21'-7" | 23 | B194E | 1 | 5 | STR | 16'-2" | 17 | B254 | 1 | 6 | STR | 26'-1" | 39 | | | | | | |
| A210 | 1 | 4 | STR | 15'-8" | 10 | B134E | 1 | 5 | STR | 21'-10" | 23 | B195E | 1 | 5 | STR | 14'-4" | 15 | B255 | 1 | 6 | STR | 26'-4" | 40 | | | | | | |
| A211 | 1 | 4 | STR | 16'-0" | 11 | B135E | 1 | 5 | STR | 22'-0" | 23 | B196E | 1 | 5 | STR | 12'-6" | 13 | B256 | 1 | 6 | STR | 26'-6" | 40 | | | | | | |
| A212 | 1 | 4 | STR | 16'-3" | 11 | B136E | 1 | 5 | STR | 22'-3" | 23 | B197E | 1 | 5 | STR | 10'-8" | 11 | B257 | 1 | 6 | STR | 26'-9" | 40 | | | | | | |
| A213 | 1 | 4 | STR | 16'-7" | 11 | B137E | 1 | 5 | STR | 22'-5" | 23 | B198E | 1 | 5 | STR | 7'-8" | 8 | B258 | 1 | 6 | STR | 26'-11" | 40 | | | | | | |
| A214 | 1 | 4 | STR | 16'-11" | 11 | B138E | 1 | 5 | STR | 22'-8" | 24 | B199E | 1 | 5 | STR | 4'-5" | 5 | B259 | 1 | 6 | STR | 27'-2" | 41 | | | | | | |
| A215 | 1 | 4 | STR | 17'-2" | 11 | B139E | 1 | 5 | STR | 22'-10" | 24 | B200E | 1 | 5 | STR | 1'-2" | 1 | B260 | 1 | 6 | STR | 27'-5" | 41 | | | | | | |
| A216 | 1 | 4 | STR | 17'-6" | 12 | B140E | 1 | 5 | STR | 23'-1" | 24 | | | | | | | B261 | 1 | 6 | STR | 27'-7" | 41 | REINFORCING STEEL | | | | LBS. | 4,278 |
| A217 | 1 | 4 | STR | 17'-2" | 11 | B141E | 1 | 5 | STR | 23'-4" | 24 | B201 | 1 | 6 | STR | 1'-3" | 2 | B262 | 1 | 6 | STR | 27'-10" | 42 | EPOXY COATED | | | | | |
| A218 | 1 | 4 | STR | 15'-1" | 10 | B142E | 1 | 5 | STR | 23'-6" | 25 | B202 | 1 | 6 | STR | 14'-11" | 22 | B263 | 1 | 6 | STR | 28'-0" | 42 | REINFORCING STEEL | | | | LBS. | 4,215 |
| A219 | 1 | 4 | STR | 13'-0" | 9 | B143E | 1 | 5 | STR | 23'-9" | 25 | B203 | 1 | 6 | STR | 15'-2" | 23 | B264 | 1 | 6 | STR | 28'-3" | 42 | | | | | | |
| A220 | 1 | 4 | STR | 10'-11" | 7 | B144E | 1 | 5 | STR | 23'-11" | 25 | B204 | 1 | 6 | STR | 15'-4" | 23 | B265 | 1 | 6 | STR | 28'-5" | 43 | CLASS AA CONCRETE | | | | C. Y. | 50.3 |

"E" DENOTES EPOXY COATED REINFORCING STEEL

## BAR TYPE




ALL BAR DIMENSIONS ARE OUT TO OUT

✱✱ QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED. SEE "MOMENT SLAB DETAILS" SHEET 3 OF 3.

## SPLICE LENGTHS

| BAR SIZE | EPOXY COATED | UNCOATED |
|---|---|---|
| #4 | 2'-0" | 1'-9" |
| #5 | 2'-6" | 2'-2" |
| #6 | 3'-10" | 2'-7" |

PROJECT NO. U-5806

CABARRUS COUNTY

STATION: 15+75.56 -Y1-
27+06.95 -L-

SHEET 3 OF 5

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033752 SETH A. DENNEY

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040769 ANDREW L. PHILLIPS

DocuSigned by: Seth A. Denney E8EB154C09ED410... 10/23/2017

DocuSigned by: Andrew L. Phillips 2B869ABAD40040D... 10/23/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102



**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

| REVISIONS | | | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | | | S-45 |
| 1 | | | 3 | | | | | TOTAL SHEETS |
| 2 | | | 4 | | | | | 50 |

DRAWN BY: D. D. LOWERY DATE: 10/17
CHECKED BY: A. L. PHILLIPS DATE: 10/17
DESIGN ENGINEER OF RECORD: S.A. DENNEY DATE: 10/17

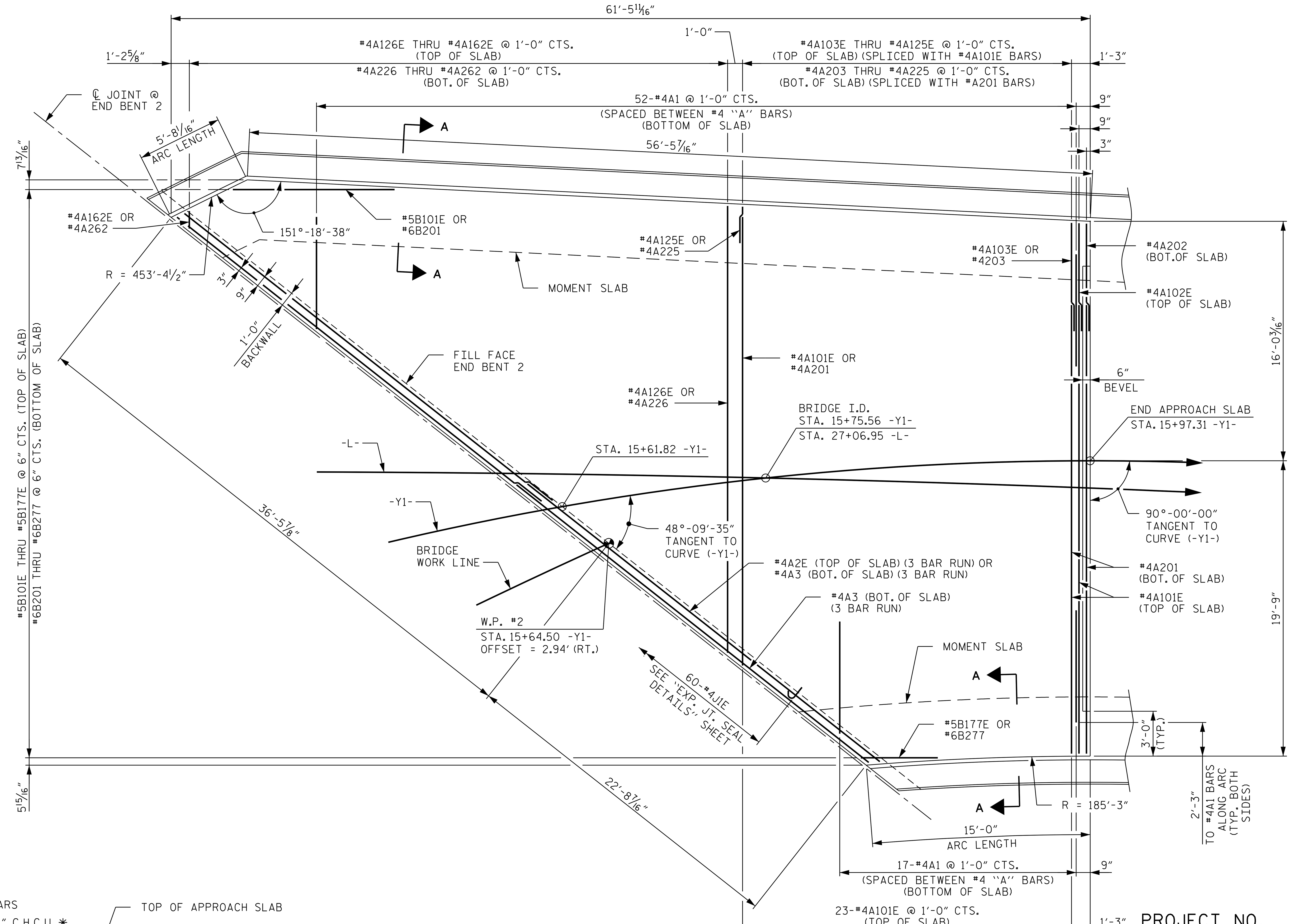
10/23/2017 K:\RDI_Structures_Bridge\NC\011035388 - U-5806_FinalDesign\Cad\Dgn\045_U-5806_AS03.dgn

## NOTES

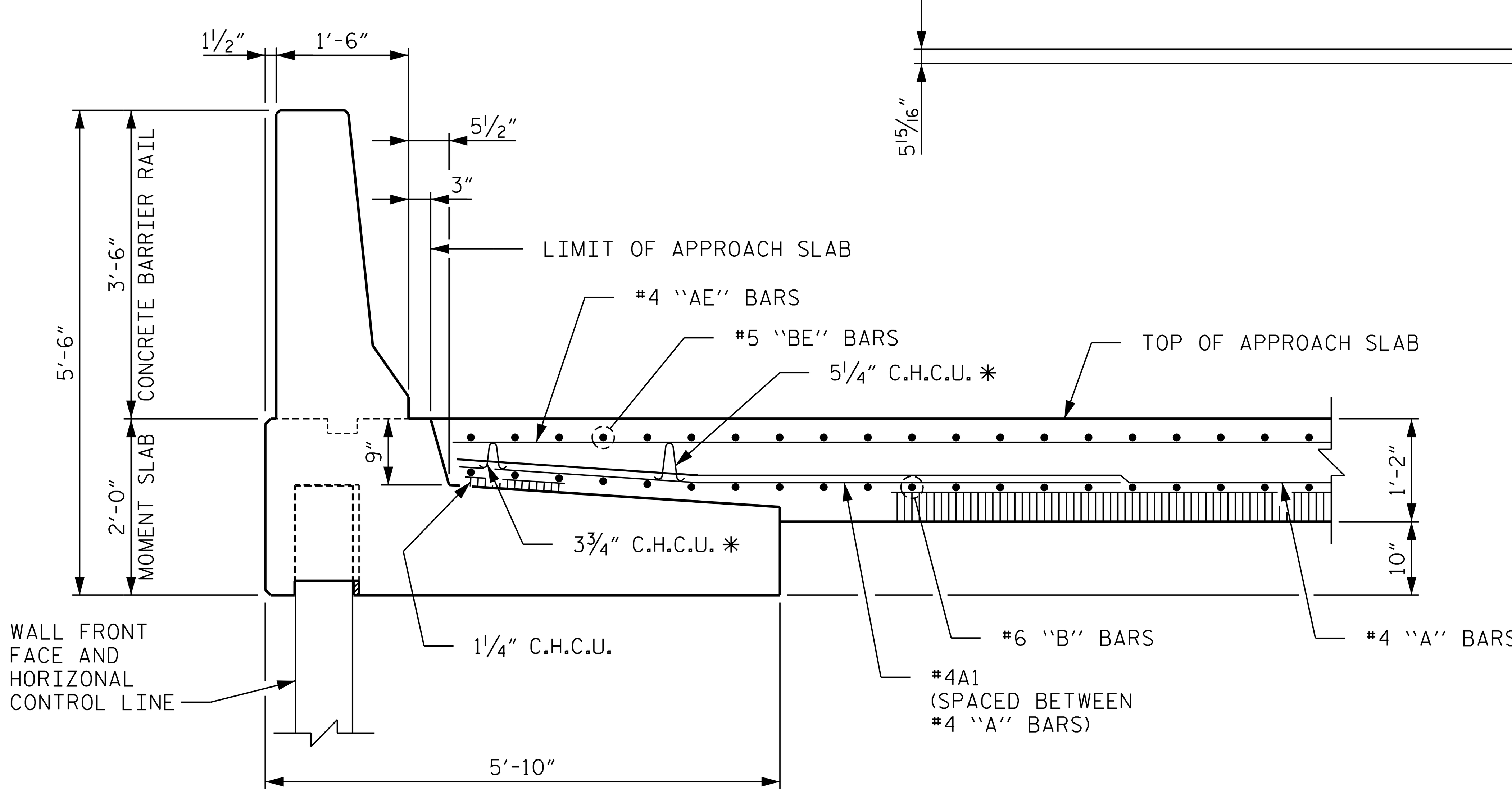
"A" BARS ARE PARALLEL TO END APPROACH SLAB EDGE.

FOR APPROACH SLAB NOTES SEE "BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT", SHEET 1 OF 5.

THE QUANTITY OF #4J1E BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1E BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1E BARS SPECIFIED, ADDITIONAL J1E BARS WILL NOT BE REQUIRED.




PLAN @ END BENT 2




SECTION A-A AT MOMENT SLAB

✱ SPACE C.H.C.U. AS REQUIRED TO ACHIEVE SPECIFIED REBAR CLEAR COVERS.

K:\RDT_Structures_Bridge\NC\011036388 - U-5806 Final Design\Cad\Dgn\046_U-5806_AS04.dgn

10/23/2017

| | | |
|---|---|---|
| DRAWN BY: D.D.LOWERY | | DATE: 10/17 |
| CHECKED BY: A.L.PHILLIPS | | DATE: 10/17 |
| DESIGN ENGINEER OF RECORD: S.A.DENNEY | | DATE: 10/17 |

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033752 SETH A. DENNEY
DocuSigned by: Seth A. Denney
E8EB154CC9ED410...
10/23/2017

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040769 ANDREW L. PHILLIPS
DocuSigned by: Andrew L. Phillips
2B869ABAD400403...
10/23/2017

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102



PROJECT NO. U-5806
CABARRUS COUNTY
STATION: 15+75.56 -Y1- 27+06.95 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

# BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

| REVISIONS | | | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | | NO. | BY: | DATE: | | S-46 |
| 1 | | | | 3 | | | | TOTAL SHEETS |
| 2 | | | | 4 | | | | 50 |

# BILL OF MATERIAL

## APPROACH SLAB AT END BENT #2

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| A1E | 69 | 4 | STR | 7'-6" | 346 |
| | | | | | |
| A2E | 3 | 4 | STR | 21'-1" | 42 |
| A3 | 6 | 4 | STR | 21'-0" | 84 |
| A101E | 24 | 4 | STR | 30'-0" | 481 |
| A102E | 1 | 4 | STR | 7'-6" | 5 |
| A103E | 1 | 4 | STR | 7'-6" | 5 |
| A104E | 1 | 4 | STR | 7'-7" | 5 |
| A105E | 1 | 4 | STR | 7'-8" | 5 |
| A106E | 1 | 4 | STR | 7'-9" | 5 |
| A107E | 1 | 4 | STR | 7'-10" | 5 |
| A108E | 1 | 4 | STR | 7'-11" | 5 |
| A109E | 1 | 4 | STR | 8'-0" | 5 |
| A110E | 1 | 4 | STR | 8'-1" | 5 |
| A111E | 1 | 4 | STR | 8'-2" | 5 |
| A112E | 1 | 4 | STR | 8'-3" | 6 |
| A113E | 1 | 4 | STR | 8'-4" | 6 |
| A114E | 1 | 4 | STR | 8'-6" | 6 |
| A115E | 1 | 4 | STR | 8'-7" | 6 |
| A116E | 1 | 4 | STR | 8'-9" | 6 |
| A117E | 1 | 4 | STR | 8'-8" | 6 |
| A118E | 1 | 4 | STR | 7'-11" | 5 |
| A119E | 1 | 4 | STR | 7'-2" | 5 |
| A120E | 1 | 4 | STR | 6'-5" | 4 |
| A121E | 1 | 4 | STR | 5'-8" | 4 |
| A122E | 1 | 4 | STR | 4'-11" | 3 |
| A123E | 1 | 4 | STR | 4'-2" | 3 |
| A124E | 1 | 4 | STR | 3'-6" | 2 |
| A125E | 1 | 4 | STR | 2'-9" | 2 |
| A126E | 1 | 4 | STR | 29'-10" | 20 |
| A127E | 1 | 4 | STR | 29'-1" | 19 |
| A128E | 1 | 4 | STR | 28'-4" | 19 |
| A129E | 1 | 4 | STR | 27'-8" | 18 |
| A130E | 1 | 4 | STR | 26'-11" | 18 |
| A131E | 1 | 4 | STR | 26'-2" | 17 |
| A132E | 1 | 4 | STR | 25'-5" | 17 |
| A133E | 1 | 4 | STR | 24'-8" | 16 |
| A134E | 1 | 4 | STR | 23'-11" | 16 |
| A135E | 1 | 4 | STR | 23'-2" | 15 |
| A136E | 1 | 4 | STR | 22'-5" | 15 |
| A137E | 1 | 4 | STR | 21'-9" | 15 |
| A138E | 1 | 4 | STR | 21'-0" | 14 |
| A139E | 1 | 4 | STR | 20'-3" | 14 |
| A140E | 1 | 4 | STR | 19'-6" | 13 |
| A141E | 1 | 4 | STR | 18'-9" | 13 |
| A142E | 1 | 4 | STR | 18'-0" | 12 |
| A143E | 1 | 4 | STR | 17'-3" | 12 |
| A144E | 1 | 4 | STR | 16'-7" | 11 |
| A145E | 1 | 4 | STR | 15'-10" | 11 |
| A146E | 1 | 4 | STR | 15'-1" | 10 |
| A147E | 1 | 4 | STR | 14'-4" | 10 |
| A148E | 1 | 4 | STR | 13'-7" | 9 |
| A149E | 1 | 4 | STR | 12'-10" | 9 |
| A150E | 1 | 4 | STR | 12'-1" | 8 |
| A151E | 1 | 4 | STR | 11'-4" | 8 |
| A152E | 1 | 4 | STR | 10'-8" | 7 |
| A153E | 1 | 4 | STR | 9'-11" | 7 |
| A154E | 1 | 4 | STR | 9'-2" | 6 |
| A155E | 1 | 4 | STR | 8'-5" | 6 |
| A156E | 1 | 4 | STR | 7'-8" | 5 |
| A157E | 1 | 4 | STR | 6'-11" | 5 |

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| A158E | 1 | 4 | STR | 6'-2" | 4 |
| A159E | 1 | 4 | STR | 5'-0" | 3 |
| A160E | 1 | 4 | STR | 3'-8" | 2 |
| A161E | 1 | 4 | STR | 2'-5" | 2 |
| A162E | 1 | 4 | STR | 1'-2" | 1 |
| | | | | | |
| A201 | 24 | 4 | STR | 30'-0" | 481 |
| A202 | 1 | 4 | STR | 7'-6" | 5 |
| A203 | 1 | 4 | STR | 7'-6" | 5 |
| A204 | 1 | 4 | STR | 7'-7" | 5 |
| A205 | 1 | 4 | STR | 7'-8" | 5 |
| A206 | 1 | 4 | STR | 7'-9" | 5 |
| A207 | 1 | 4 | STR | 7'-10" | 5 |
| A208 | 1 | 4 | STR | 7'-11" | 5 |
| A209 | 1 | 4 | STR | 8'-0" | 5 |
| A210 | 1 | 4 | STR | 8'-1" | 5 |
| A211 | 1 | 4 | STR | 8'-2" | 5 |
| A212 | 1 | 4 | STR | 8'-3" | 6 |
| A213 | 1 | 4 | STR | 8'-4" | 6 |
| A214 | 1 | 4 | STR | 8'-6" | 6 |
| A215 | 1 | 4 | STR | 8'-7" | 6 |
| A216 | 1 | 4 | STR | 8'-9" | 6 |
| A217 | 1 | 4 | STR | 8'-8" | 6 |
| A218 | 1 | 4 | STR | 7'-11" | 5 |
| A219 | 1 | 4 | STR | 7'-2" | 5 |
| A220 | 1 | 4 | STR | 6'-5" | 4 |
| A221 | 1 | 4 | STR | 5'-8" | 4 |
| A222 | 1 | 4 | STR | 4'-11" | 3 |
| A223 | 1 | 4 | STR | 4'-2" | 3 |
| A224 | 1 | 4 | STR | 3'-6" | 2 |
| A225 | 1 | 4 | STR | 2'-9" | 2 |
| A226 | 1 | 4 | STR | 29'-10" | 20 |
| A227 | 1 | 4 | STR | 29'-1" | 19 |
| A228 | 1 | 4 | STR | 28'-4" | 19 |
| A229 | 1 | 4 | STR | 27'-8" | 18 |
| A230 | 1 | 4 | STR | 26'-11" | 18 |
| A231 | 1 | 4 | STR | 26'-2" | 17 |
| A232 | 1 | 4 | STR | 25'-5" | 17 |
| A233 | 1 | 4 | STR | 24'-8" | 16 |
| A234 | 1 | 4 | STR | 23'-11" | 16 |
| A235 | 1 | 4 | STR | 23'-2" | 15 |
| A236 | 1 | 4 | STR | 22'-5" | 15 |
| A237 | 1 | 4 | STR | 21'-9" | 15 |
| A238 | 1 | 4 | STR | 21'-0" | 14 |
| A239 | 1 | 4 | STR | 20'-3" | 14 |
| A240 | 1 | 4 | STR | 19'-6" | 13 |
| A241 | 1 | 4 | STR | 18'-9" | 13 |
| A242 | 1 | 4 | STR | 18'-0" | 12 |
| A243 | 1 | 4 | STR | 17'-3" | 12 |
| A244 | 1 | 4 | STR | 16'-7" | 11 |
| A245 | 1 | 4 | STR | 15'-10" | 11 |
| A246 | 1 | 4 | STR | 15'-1" | 10 |
| A247 | 1 | 4 | STR | 14'-4" | 10 |
| A248 | 1 | 4 | STR | 13'-7" | 9 |
| A249 | 1 | 4 | STR | 12'-10" | 9 |
| A250 | 1 | 4 | STR | 12'-1" | 8 |
| A251 | 1 | 4 | STR | 11'-4" | 8 |
| A252 | 1 | 4 | STR | 10'-8" | 7 |
| A253 | 1 | 4 | STR | 9'-11" | 7 |
| A254 | 1 | 4 | STR | 9'-2" | 6 |
| A255 | 1 | 4 | STR | 8'-5" | 6 |

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| A256 | 1 | 4 | STR | 7'-8" | 5 |
| A257 | 1 | 4 | STR | 6'-11" | 5 |
| A258 | 1 | 4 | STR | 6'-2" | 4 |
| A259 | 1 | 4 | STR | 5'-0" | 3 |
| A260 | 1 | 4 | STR | 3'-8" | 2 |
| A261 | 1 | 4 | STR | 2'-5" | 2 |
| A262 | 1 | 4 | STR | 1'-2" | 1 |
| | | | | | |
| B101E | 1 | 5 | STR | 10'-9" | 11 |
| B102E | 1 | 5 | STR | 22'-0" | 23 |
| B103E | 1 | 5 | STR | 33'-2" | 35 |
| B104E | 1 | 5 | STR | 44'-4" | 46 |
| B105E | 1 | 5 | STR | 55'-1" | 57 |
| B106E | 1 | 5 | STR | 60'-0" | 63 |
| B107E | 1 | 5 | STR | 59'-7" | 62 |
| B108E | 1 | 5 | STR | 58'-11" | 61 |
| B109E | 1 | 5 | STR | 58'-3" | 61 |
| B110E | 1 | 5 | STR | 57'-8" | 60 |
| B111E | 1 | 5 | STR | 57'-0" | 59 |
| B112E | 1 | 5 | STR | 56'-5" | 59 |
| B113E | 1 | 5 | STR | 55'-9" | 58 |
| B114E | 1 | 5 | STR | 55'-1" | 57 |
| B115E | 1 | 5 | STR | 54'-6" | 57 |
| B116E | 1 | 5 | STR | 53'-10" | 56 |
| B117E | 1 | 5 | STR | 53'-2" | 55 |
| B118E | 1 | 5 | STR | 52'-7" | 55 |
| B119E | 1 | 5 | STR | 51'-11" | 54 |
| B120E | 1 | 5 | STR | 51'-4" | 54 |
| B121E | 1 | 5 | STR | 50'-8" | 53 |
| B122E | 1 | 5 | STR | 50'-0" | 52 |
| B123E | 1 | 5 | STR | 49'-5" | 52 |
| B124E | 1 | 5 | STR | 48'-9" | 51 |
| B125E | 1 | 5 | STR | 48'-2" | 50 |
| B126E | 1 | 5 | STR | 47'-6" | 50 |
| B127E | 1 | 5 | STR | 46'-10" | 49 |
| B128E | 1 | 5 | STR | 46'-3" | 48 |
| B129E | 1 | 5 | STR | 45'-7" | 48 |
| B130E | 1 | 5 | STR | 45'-0" | 47 |
| B131E | 1 | 5 | STR | 44'-4" | 46 |
| B132E | 1 | 5 | STR | 43'-8" | 46 |
| B133E | 1 | 5 | STR | 43'-1" | 45 |
| B134E | 1 | 5 | STR | 42'-5" | 44 |
| B135E | 1 | 5 | STR | 41'-9" | 44 |
| B136E | 1 | 5 | STR | 41'-2" | 43 |
| B137E | 1 | 5 | STR | 40'-6" | 42 |
| B138E | 1 | 5 | STR | 39'-11" | 42 |
| B139E | 1 | 5 | STR | 39'-3" | 41 |
| B140E | 1 | 5 | STR | 38'-7" | 40 |
| B141E | 1 | 5 | STR | 38'-0" | 40 |
| B142E | 1 | 5 | STR | 37'-4" | 39 |
| B143E | 1 | 5 | STR | 36'-9" | 38 |
| B144E | 1 | 5 | STR | 36'-1" | 38 |
| B145E | 1 | 5 | STR | 35'-5" | 37 |
| B146E | 1 | 5 | STR | 34'-10" | 36 |
| B147E | 1 | 5 | STR | 34'-2" | 36 |
| B148E | 1 | 5 | STR | 33'-6" | 35 |
| B149E | 1 | 5 | STR | 32'-11" | 34 |
| B150E | 1 | 5 | STR | 32'-3" | 34 |
| B151E | 1 | 5 | STR | 31'-8" | 33 |
| B152E | 1 | 5 | STR | 31'-0" | 32 |
| B153E | 1 | 5 | STR | 30'-4" | 32 |

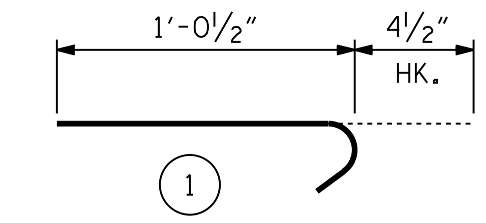
| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| B154E | 1 | 5 | STR | 29'-9" | 31 |
| B155E | 1 | 5 | STR | 29'-1" | 30 |
| B156E | 1 | 5 | STR | 28'-6" | 30 |
| B157E | 1 | 5 | STR | 27'-10" | 29 |
| B158E | 1 | 5 | STR | 27'-2" | 28 |
| B159E | 1 | 5 | STR | 26'-7" | 28 |
| B160E | 1 | 5 | STR | 25'-11" | 27 |
| B161E | 1 | 5 | STR | 25'-3" | 26 |
| B162E | 1 | 5 | STR | 24'-8" | 26 |
| B163E | 1 | 5 | STR | 24'-0" | 25 |
| B164E | 1 | 5 | STR | 23'-5" | 24 |
| B165E | 1 | 5 | STR | 22'-9" | 24 |
| B166E | 1 | 5 | STR | 22'-1" | 23 |
| B167E | 1 | 5 | STR | 21'-6" | 22 |
| B168E | 1 | 5 | STR | 20'-10" | 22 |
| B169E | 1 | 5 | STR | 20'-3" | 21 |
| B170E | 1 | 5 | STR | 19'-7" | 20 |
| B171E | 1 | 5 | STR | 18'-11" | 20 |
| B172E | 1 | 5 | STR | 18'-4" | 19 |
| B173E | 1 | 5 | STR | 17'-8" | 18 |
| B174E | 1 | 5 | STR | 17'-0" | 18 |
| B175E | 1 | 5 | STR | 16'-5" | 17 |
| B176E | 1 | 5 | STR | 15'-9" | 16 |
| B177E | 1 | 5 | STR | 5'-1" | 5 |
| | | | | | |
| B201 | 1 | 6 | STR | 10'-9" | 16 |
| B202 | 1 | 6 | STR | 22'-0" | 33 |
| B203 | 1 | 6 | STR | 33'-2" | 50 |
| B204 | 1 | 6 | STR | 44'-4" | 67 |
| B205 | 1 | 6 | STR | 55'-1" | 83 |
| B206 | 1 | 6 | STR | 60'-0" | 90 |
| B207 | 1 | 6 | STR | 59'-7" | 89 |
| B208 | 1 | 6 | STR | 58'-11" | 88 |
| B209 | 1 | 6 | STR | 58'-3" | 87 |
| B210 | 1 | 6 | STR | 57'-8" | 87 |
| B211 | 1 | 6 | STR | 57'-0" | 86 |
| B212 | 1 | 6 | STR | 56'-5" | 85 |
| B213 | 1 | 6 | STR | 55'-9" | 84 |
| B214 | 1 | 6 | STR | 55'-1" | 83 |
| B215 | 1 | 6 | STR | 54'-6" | 82 |
| B216 | 1 | 6 | STR | 53'-10" | 81 |
| B217 | 1 | 6 | STR | 53'-2" | 80 |
| B218 | 1 | 6 | STR | 52'-7" | 79 |
| B219 | 1 | 6 | STR | 51'-11" | 78 |
| B220 | 1 | 6 | STR | 51'-4" | 77 |
| B221 | 1 | 6 | STR | 50'-8" | 76 |
| B222 | 1 | 6 | STR | 50'-0" | 75 |
| B223 | 1 | 6 | STR | 49'-5" | 74 |
| B224 | 1 | 6 | STR | 48'-9" | 73 |
| B225 | 1 | 6 | STR | 48'-2" | 72 |
| B226 | 1 | 6 | STR | 47'-6" | 71 |
| B227 | 1 | 6 | STR | 46'-10" | 70 |
| B228 | 1 | 6 | STR | 46'-3" | 69 |
| B229 | 1 | 6 | STR | 45'-7" | 68 |
| B230 | 1 | 6 | STR | 45'-0" | 68 |
| B231 | 1 | 6 | STR | 44'-4" | 67 |
| B232 | 1 | 6 | STR | 43'-8" | 66 |
| B233 | 1 | 6 | STR | 43'-1" | 65 |
| B234 | 1 | 6 | STR | 42'-5" | 64 |
| B235 | 1 | 6 | STR | 41'-9" | 63 |
| B236 | 1 | 6 | STR | 41'-2" | 62 |

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| B237 | 1 | 6 | STR | 40'-6" | 61 |
| B238 | 1 | 6 | STR | 39'-11" | 60 |
| B239 | 1 | 6 | STR | 39'-3" | 59 |
| B240 | 1 | 6 | STR | 38'-7" | 58 |
| B241 | 1 | 6 | STR | 38'-0" | 57 |
| B242 | 1 | 6 | STR | 37'-4" | 56 |
| B243 | 1 | 6 | STR | 36'-9" | 55 |
| B244 | 1 | 6 | STR | 36'-1" | 54 |
| B245 | 1 | 6 | STR | 35'-5" | 53 |
| B246 | 1 | 6 | STR | 34'-10" | 52 |
| B247 | 1 | 6 | STR | 34'-2" | 51 |
| B248 | 1 | 6 | STR | 33'-6" | 50 |
| B249 | 1 | 6 | STR | 32'-11" | 49 |
| B250 | 1 | 6 | STR | 32'-3" | 48 |
| B251 | 1 | 6 | STR | 31'-8" | 48 |
| B252 | 1 | 6 | STR | 31'-0" | 47 |
| B253 | 1 | 6 | STR | 30'-4" | 46 |
| B254 | 1 | 6 | STR | 29'-9" | 45 |
| B255 | 1 | 6 | STR | 29'-1" | 44 |
| B256 | 1 | 6 | STR | 28'-6" | 43 |
| B257 | 1 | 6 | STR | 27'-10" | 42 |
| B258 | 1 | 6 | STR | 27'-2" | 41 |
| B259 | 1 | 6 | STR | 26'-7" | 40 |
| B260 | 1 | 6 | STR | 25'-11" | 39 |
| B261 | 1 | 6 | STR | 25'-3" | 38 |
| B262 | 1 | 6 | STR | 24'-8" | 37 |
| B263 | 1 | 6 | STR | 24'-0" | 36 |
| B264 | 1 | 6 | STR | 23'-5" | 35 |
| B265 | 1 | 6 | STR | 22'-9" | 34 |
| B266 | 1 | 6 | STR | 22'-1" | 33 |
| B267 | 1 | 6 | STR | 21'-6" | 32 |
| B268 | 1 | 6 | STR | 20'-10" | 31 |
| B269 | 1 | 6 | STR | 20'-3" | 30 |
| B270 | 1 | 6 | STR | 19'-7" | 29 |
| B271 | 1 | 6 | STR | 18'-11" | 28 |
| B272 | 1 | 6 | STR | 18'-4" | 28 |
| B273 | 1 | 6 | STR | 17'-8" | 27 |
| B274 | 1 | 6 | STR | 17'-0" | 26 |
| B275 | 1 | 6 | STR | 16'-5" | 25 |
| B276 | 1 | 6 | STR | 15'-9" | 24 |
| B277 | 1 | 6 | STR | 5'-1" | 8 |
| | | | | | |
| J1E | 60 | 4 | 1 | 1'-5" | 57 |

| | | |
|---|---|---|
| REINFORCING STEEL | LBS. | 5,393 |
| EPOXY COATED REINFORCING STEEL | LBS. | 4,436 |
| CLASS AA CONCRETE | C.Y. | 63.6 |

"E" DENOTES EPOXY COATED REINFORCING STEEL

## BAR TYPE




ALL BAR DIMENSIONS ARE OUT TO OUT

✱✱ QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED. SEE "MOMENT SLAB DETAILS" SHEET 3 OF 3.

## SPLICE LENGTHS

| BAR SIZE | EPOXY COATED | UNCOATED |
|---|---|---|
| #4 | 2'-0" | 1'-9" |
| #5 | 2'-6" | 2'-2" |
| #6 | 3'-10" | 2'-7" |

PROJECT NO. U-5806

CABARRUS COUNTY

STATION: 15+75.56 -Y1-
27+06.95 -L-

SHEET 5 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 033752 ENGINEER SETH A. DENNEY

DocuSigned by: Seth A. Denney
E8EB154CC9ED410...
10/23/2017

NORTH CAROLINA PROFESSIONAL SEAL 040769 ENGINEER ANDREW L. PHILLIPS

DocuSigned by: Andrew L. Phillips
2B869ABAD40043...
10/23/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SHEET NO. S-47
TOTAL SHEETS 50

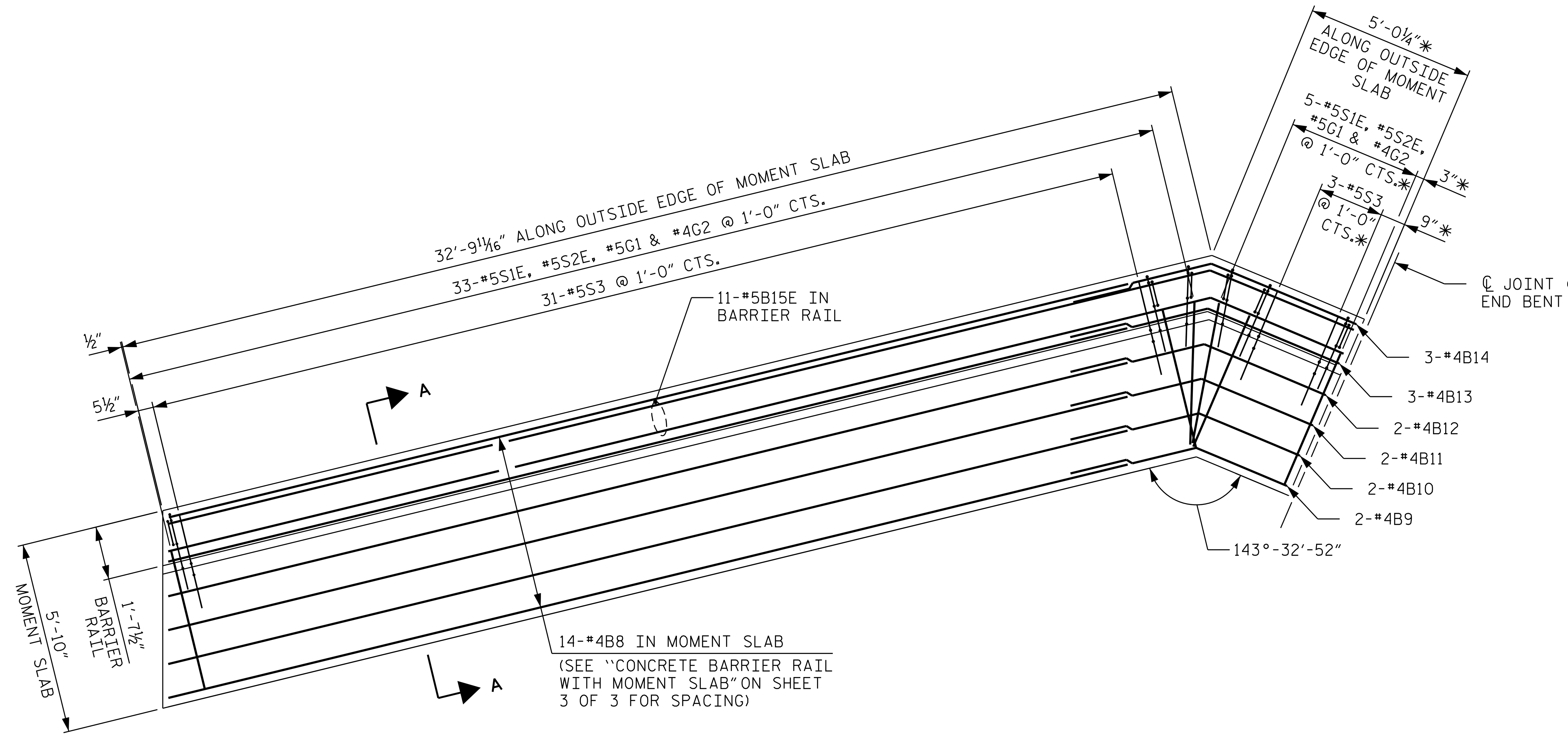
DRAWN BY: D.D.LOWERY DATE: 10/17
CHECKED BY: A.L.PHILLIPS DATE: 10/17
DESIGN ENGINEER OF RECORD: S.A.DENNEY DATE: 10/17

10/23/2017 K:\RDI_Structures_Bridge\NC\011035388 - U-5806_FinalDesign\Cad\Dgn\047_U-5806_AS05.dgn

NOTES:

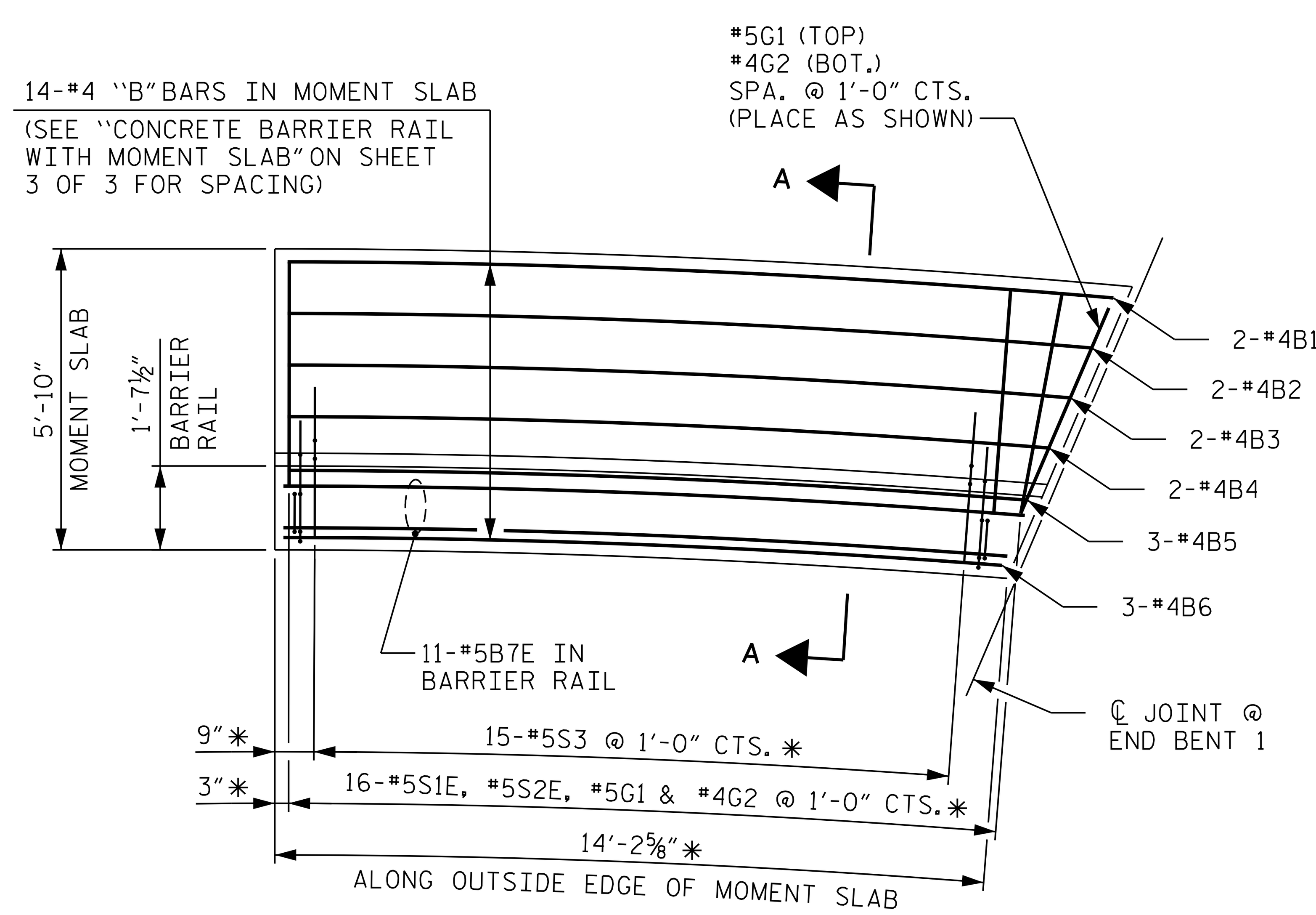
FOR SPACING OF "B" BARS, SEE "MOMENT SLAB DETAILS" SHEET 3 OF 3.

FOR SECTION A-A, SEE "MOMENT SLAB DETAILS" SHEET 3 OF 3.




LEFT SIDE OF STRUCTURE

* MEASURED ALONG ARC




RIGHT SIDE OF STRUCTURE

* MEASURED ALONG ARC

PLAN OF MOMENT SLAB @ END BENT 1

PROJECT NO. U-5806

CABARRUS COUNTY

STATION: 15+75.56 -Y1-
27+06.95 -L-

SHEET 1 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 033752 ENGINEER SETH A. DENNEY

NORTH CAROLINA PROFESSIONAL SEAL 040769 ENGINEER ANDREW L. PHILLIPS

DocuSigned by: Seth A. Denney E8EB154CC9ED410... 10/23/2017

DocuSigned by: Andrew L. Phillips 2B869ABAD40043... 10/23/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

MOMENT SLAB DETAILS

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

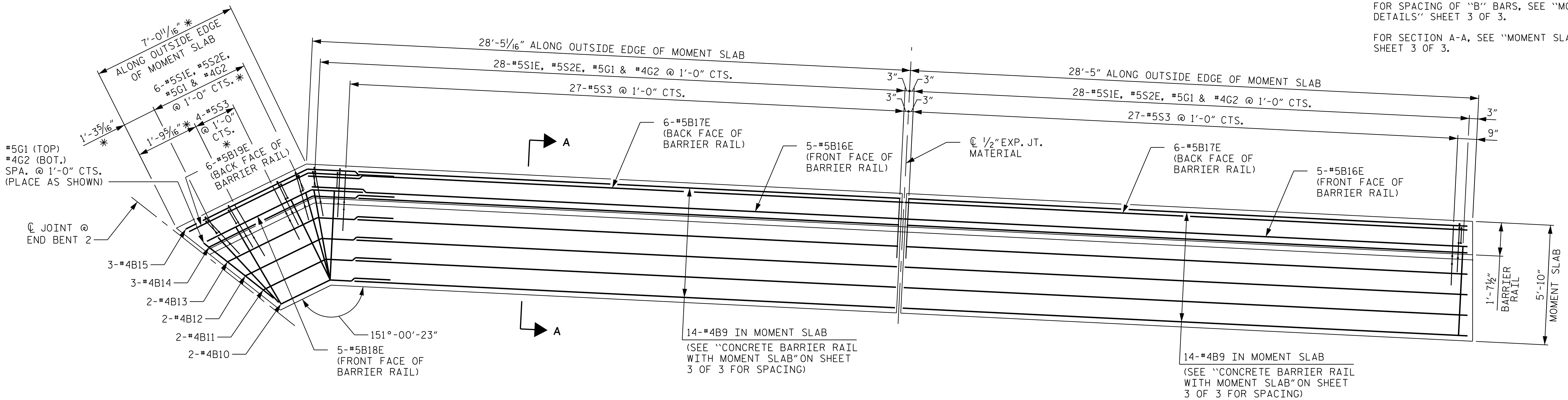
| REVISIONS | | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | | S-48 |
| 1 | | | 3 | | | | TOTAL SHEETS |
| 2 | | | 4 | | | | 50 |

DRAWN BY: D.D.LOWERY DATE: 10/17
CHECKED BY: A.L.PHILLIPS DATE: 10/17
DESIGN ENGINEER OF RECORD: S.A.DENNEY DATE: 10/17

NOTES:

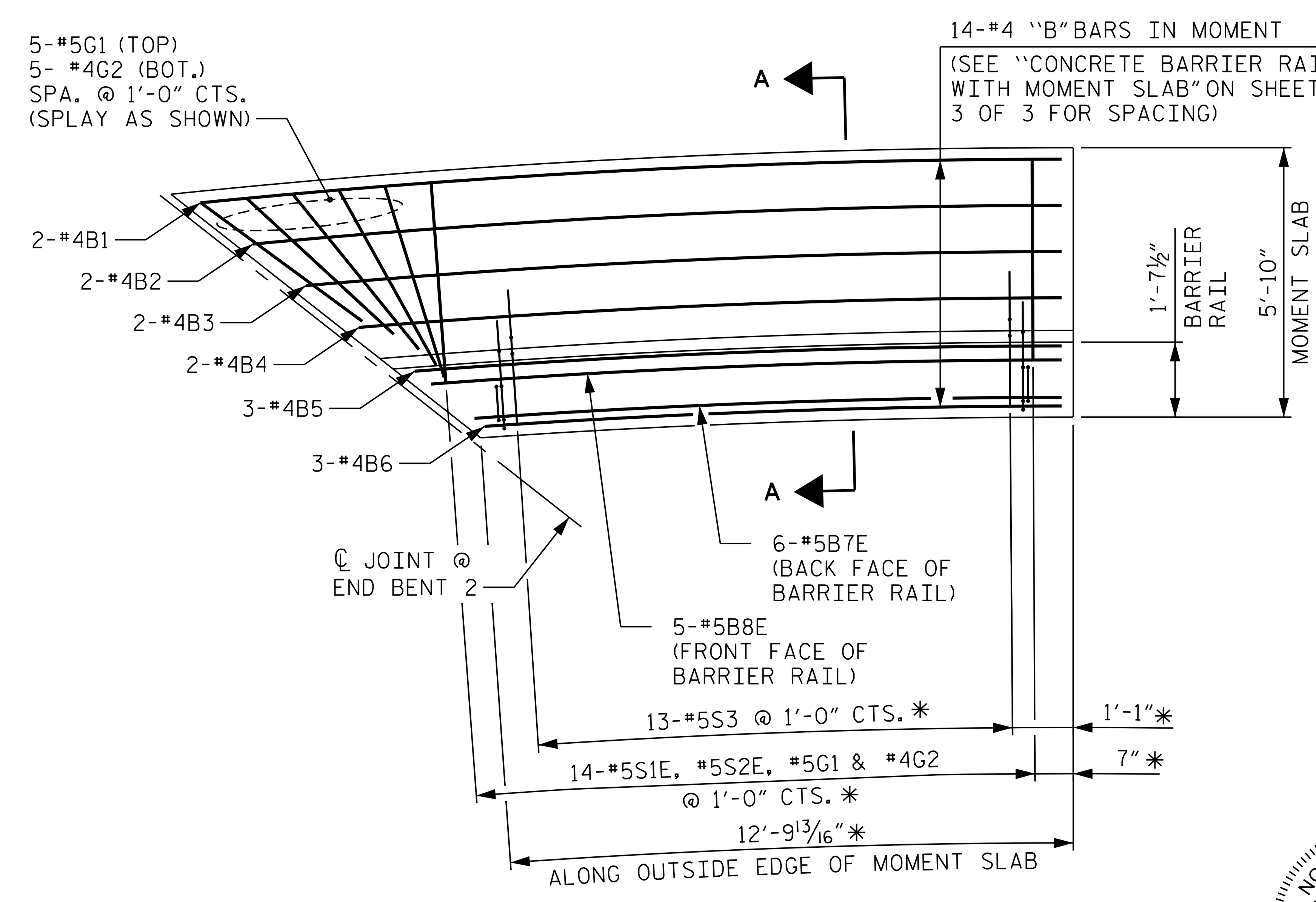
FOR SPACING OF "B" BARS, SEE "MOMENT SLAB DETAILS" SHEET 3 OF 3.

FOR SECTION A-A, SEE "MOMENT SLAB DETAILS" SHEET 3 OF 3.




LEFT SIDE OF STRUCTURE

* MEASURED ALONG ARC




RIGHT SIDE OF STRUCTURE

* MEASURED ALONG ARC

PLAN OF MOMENT SLAB @ END BENT 2

PROJECT NO. U-5806

CABARRUS COUNTY

STATION: 15+75.56 -Y1- 27+06.95 -L-

SHEET 2 OF 3

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033752 SETH A. DENNEY

DocuSigned by: Seth A. Denney E8EB154C09ED410... 10/23/2017

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040769 ANDREW L. PHILLIPS

DocuSigned by: Andrew L. Phillips 2B869ABAD4004D3... 10/23/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

MOMENT SLAB DETAILS

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102

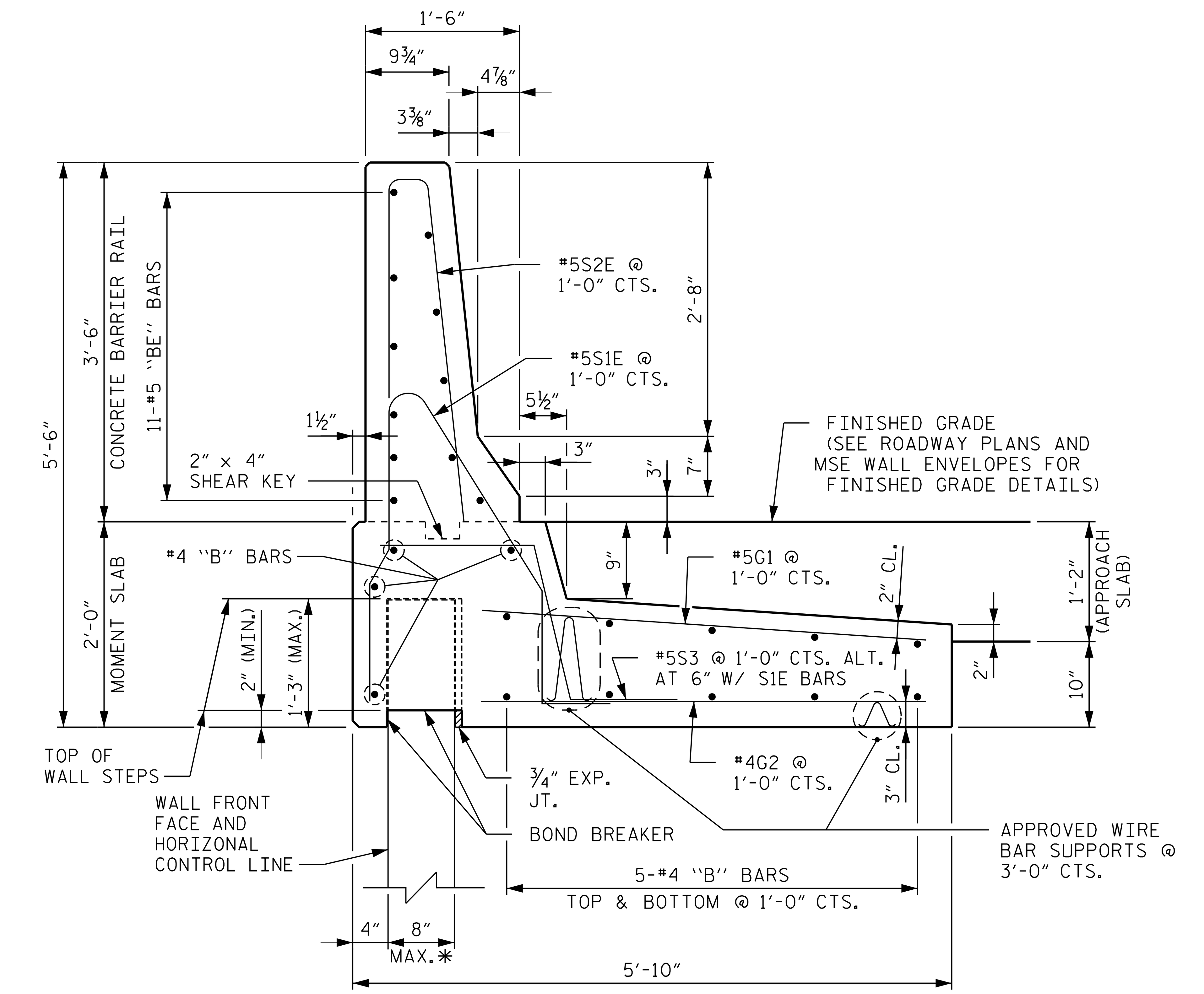


| REVISIONS | | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | | S-49 |
| 1 | | | 3 | | | | TOTAL SHEETS |
| 2 | | | 4 | | | | 50 |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

| | |
|---|---|
| DRAWN BY: D. D. LOWERY | DATE: 10/17 |
| CHECKED BY: A. L. PHILLIPS | DATE: 10/17 |
| DESIGN ENGINEER OF RECORD: S.A. DENNEY | DATE: 10/17 |

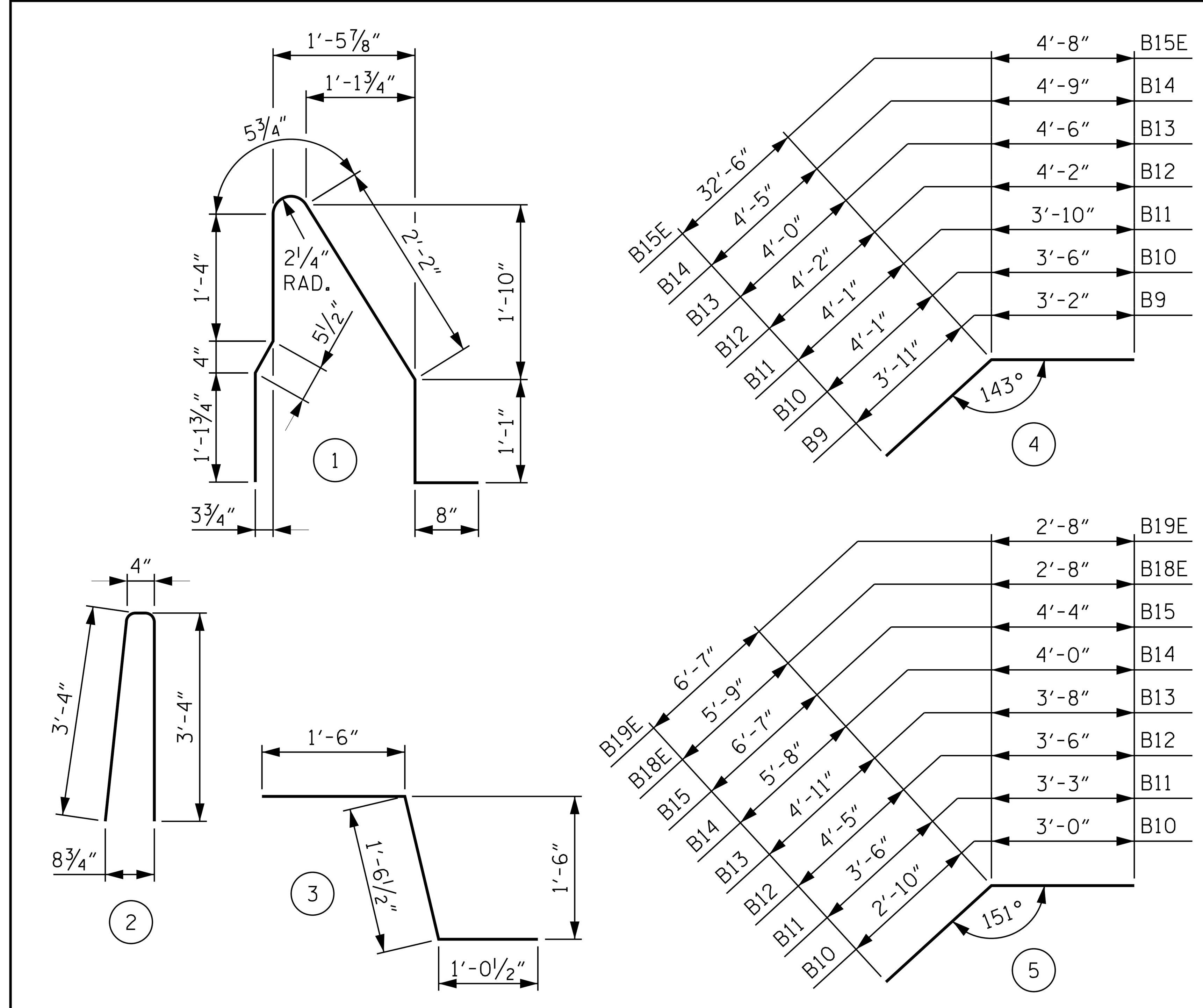
10/23/2017 K:\RDI_Structures_Bridge\NC\011036388 - U-5806 FinalDesign\Cad\Dgn\049_U-5806_MSD02.dgn




## CONCRETE BARRIER RAIL WITH MOMENT SLAB

✱NOTCH NOT PRESENT IN AREA ABOVE END BENT BACKWALL

## BAR TYPES




ALL BAR DIMENSIONS ARE OUT TO OUT

## BILL OF MATERIAL MOMENT SLAB @ END BENT 1

CONC. BARRIER RAIL WITH MOMENT SLAB

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| B1 | 2 | #4 | STR | 16'-0" | 21 |
| B2 | 2 | #4 | STR | 15'-7" | 21 |
| B3 | 2 | #4 | STR | 15'-2" | 20 |
| B4 | 2 | #4 | STR | 14'-9" | 20 |
| B5 | 3 | #4 | STR | 14'-4" | 19 |
| B6 | 3 | #4 | STR | 13'-11" | 37 |
| B7E | 11 | #5 | STR | 16'-0" | 184 |
| B8 | 14 | #4 | STR | 30'-0" | 281 |
| B9 | 2 | #4 | 4 | 7'-1" | 9 |
| B10 | 2 | #4 | 4 | 7'-7" | 10 |
| B11 | 2 | #4 | 4 | 7'-11" | 11 |
| B12 | 2 | #4 | 4 | 8'-4" | 11 |
| B13 | 3 | #4 | 4 | 8'-6" | 11 |
| B14 | 3 | #4 | 4 | 9'-2" | 24 |
| B15E | 11 | #5 | 4 | 37'-2" | 426 |
| G1 | 55 | #5 | STR | 4'-4" | 249 |
| G2 | 55 | #4 | STR | 4'-4" | 159 |
| S1E | 54 | #5 | 1 | 7'-4" | 413 |
| S2E | 54 | #5 | 2 | 7'-0" | 394 |
| S3 | 49 | #5 | 3 | 4'-2" | 213 |

| | | |
|---|---|---|
| REINFORCING STEEL | LBS. | 1,116 |
| EPOXY COATED REINFORCING STEEL | LBS. | 1,417 |
| CLASS AA CONCRETE BARRIER RAIL | C.Y. | 7.2 |
| CLASS A CONCRETE MOMENT SLAB | C.Y. | 15.9 |
| CONCRETE BARRIER RAIL WITH MOMENT SLAB | LIN. FT. | 52.0 |

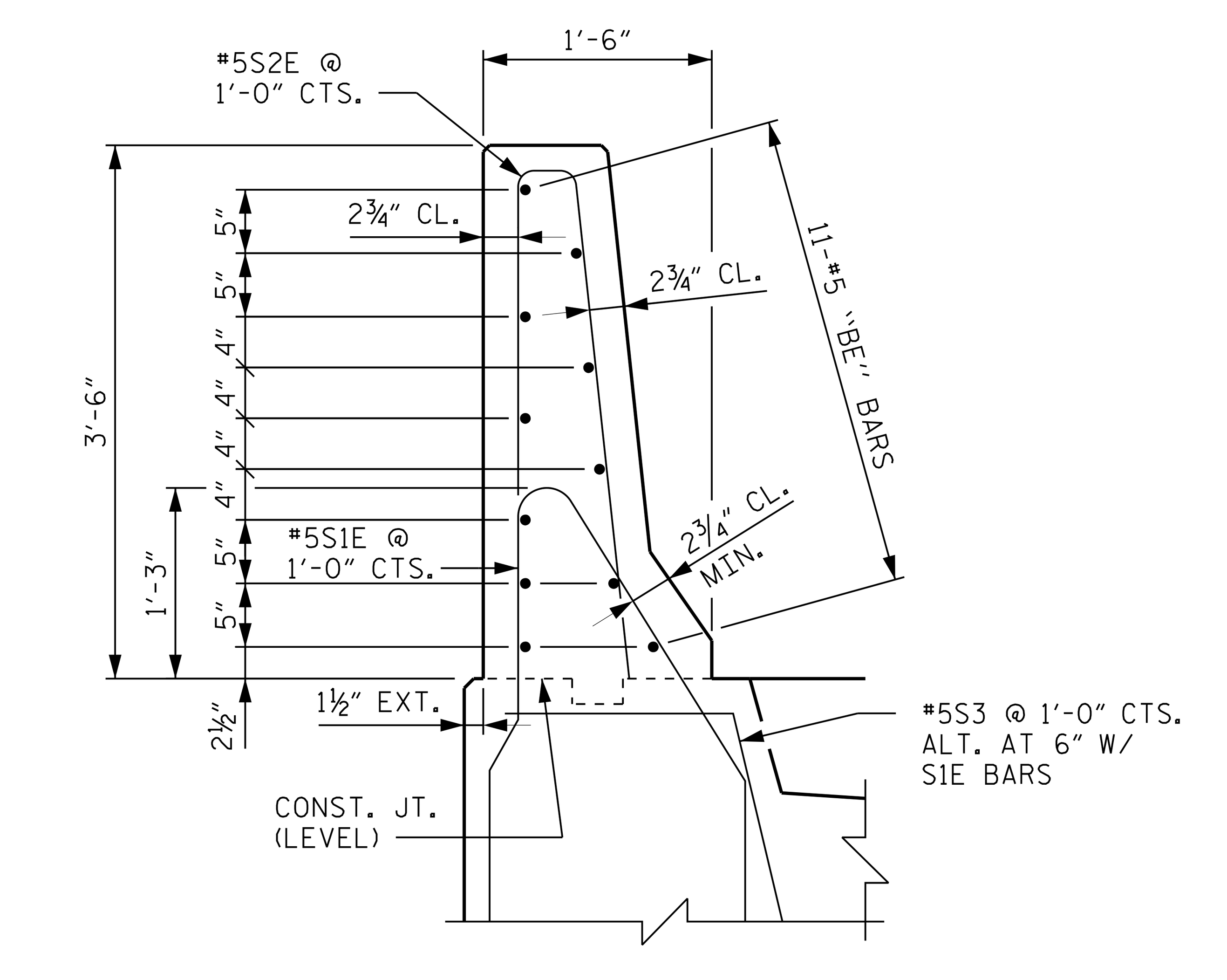
## BILL OF MATERIAL MOMENT SLAB @ END BENT 2

CONC. BARRIER RAIL WITH MOMENT SLAB

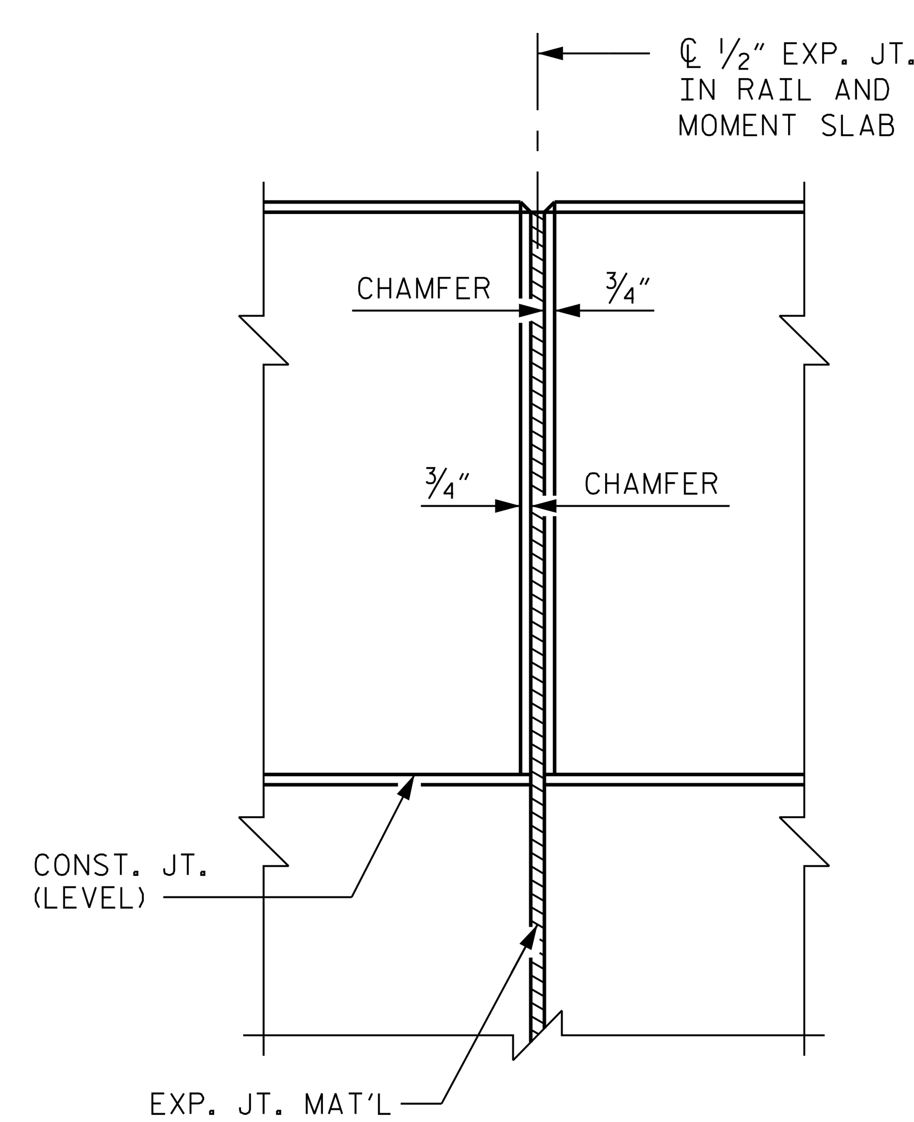
| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| B1 | 2 | #4 | STR | 18'-7" | 25 |
| B2 | 2 | #4 | STR | 17'-6" | 23 |
| B3 | 2 | #4 | STR | 16'-4" | 22 |
| B4 | 2 | #4 | STR | 15'-2" | 20 |
| B5 | 3 | #4 | STR | 14'-0" | 19 |
| B6 | 3 | #4 | STR | 12'-4" | 33 |
| B7E | 6 | #5 | STR | 12'-5" | 78 |
| B8E | 5 | #5 | STR | 13'-9" | 72 |
| B9 | 28 | #4 | STR | 28'-2" | 527 |
| B10 | 2 | #4 | 5 | 5'-10" | 8 |
| B11 | 2 | #4 | 5 | 6'-9" | 9 |
| B12 | 2 | #4 | 5 | 7'-11" | 11 |
| B13 | 2 | #4 | 5 | 8'-7" | 11 |
| B14 | 3 | #4 | 5 | 9'-8" | 13 |
| B15 | 3 | #4 | 5 | 10'-11" | 29 |
| B16E | 10 | #5 | STR | 28'-2" | 294 |
| B17E | 12 | #5 | STR | 28'-2" | 354 |
| B18E | 5 | #5 | 5 | 8'-5" | 44 |
| B19E | 6 | #5 | 5 | 9'-3" | 58 |
| G1 | 83 | #5 | STR | 4'-4" | 375 |
| G2 | 83 | #4 | STR | 4'-4" | 240 |
| S1E | 77 | #5 | 1 | 7'-4" | 589 |
| S2E | 77 | #5 | 2 | 7'-0" | 562 |
| S3 | 72 | #5 | 3 | 4'-2" | 313 |

| | | |
|---|---|---|
| REINFORCING STEEL | LBS. | 1,678 |
| EPOXY COATED REINFORCING STEEL | LBS. | 2,051 |
| CLASS AA CONCRETE BARRIER RAIL | C.Y. | 10.6 |
| CLASS A CONCRETE MOMENT SLAB | C.Y. | 23.4 |
| CONCRETE BARRIER RAIL WITH MOMENT SLAB | LIN. FT. | 76.7 |

"E" DENOTES EPOXY COATED REINFORCING STEEL.




SECTION THRU RAIL




ELEV. @ EXP. JOINTS

## BARRIER RAIL DETAILS

## NOTES:

FOR CONCRETE BARRIER RAIL WITH MOMENT SLAB, SEE CONCRETE BARRIER RAIL WITH MOMENT SLAB PROVISION.

CONCRETE BARRIER RAIL WITH MOMENT SLAB SHALL BE A MINIMUM OF 15' IN LENGTH.

EXPANSION JOINTS SHALL BE PLACED IN THE BARRIER RAIL AND MOMENT SLAB AS SHOWN ON "MOMENT SLAB DETAILS", SHEET 1 OF 3 AND 2 OF 3.

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

THE BARRIER RAIL SHALL NOT BE CAST UNTIL THE MOMENT SLAB CONCRETE HAS ATTAINED AN AGE OF THREE CURING DAYS OR A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI. IN ADDITION, NO FILL MATERIAL, ASPHALT, OR CONSTRUCTION EQUIPMENT IS ALLOWED ON THE MOMENT SLAB PRIOR TO SATISFYING THE MINIMUM CONCRETE CURING AND STRENGTH REQUIREMENTS.

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

IF EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, BARRIERS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH CONCRETE BARRIER RAIL WITH MOMENT SLAB OR CONCRETE FACING FOR RETAINING WALL WILL BE THICKER THAN 8", CONCRETE BARRIER RAIL WITH MOMENT SLAB DETAILS SHALL BE REVISED AND SUBMITTED FOR APPROVAL.

PROJECT NO. U-5806

CABARRUS COUNTY

STATION: 15+75.56 -Y1-
27+06.95 -L-

SHEET 3 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 033752 ENGINEER SETH A. DENNEY
DocuSigned by: Seth A. Denney
E6EB154CC9E0410...
10/23/2017

NORTH CAROLINA PROFESSIONAL SEAL 040769 ENGINEER ANDREW L. PHILLIPS
DocuSigned by: Andrew L. Phillips
2B869ABAD4004O3...
10/23/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

# MOMENT SLAB DETAILS

Kimley»Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102



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

SHEET NO. S-50
TOTAL SHEETS 50

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY: D.D.LOWERY DATE: 10/17
CHECKED BY: A.L.PHILLIPS DATE: 10/17
DESIGN ENGINEER OF RECORD: S.A.DENNEY DATE: 10/17

10/23/2017 K:\RDI_Structures_Bridge\NC\011036388 -U-5806_FinalDesign\Cad\Dgn\050_U-5806_MS003.dgn

# 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 2012 "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 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1-1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 1/4" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A 1/4" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

## DOWELS:

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

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

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

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

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

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

## REINFORCING STEEL:

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

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

## STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE ¾" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 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 (J) RGW REV. 5-7-03 RWW (J) JTE REV. 10-1-11 MAA (J) GM
REV. 8-16-99 RWW (J) LES REV. 5-1-06 TLA (J) GM