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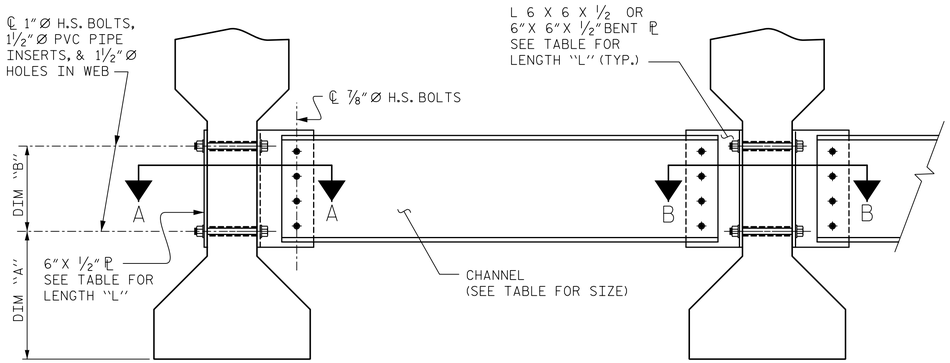
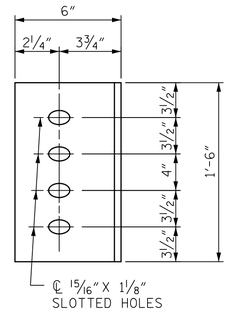


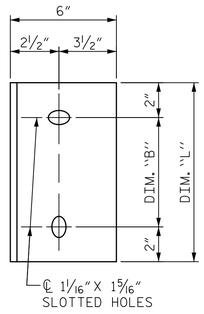

EXTERIOR GIRDER

INTERIOR GIRDER

## PART SECTION AT INTERMEDIATE DIAPHRAGM




DIAPHRAGM FACE




WEB FACE

## CONNECTOR PLATE DETAILS

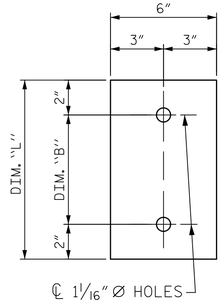
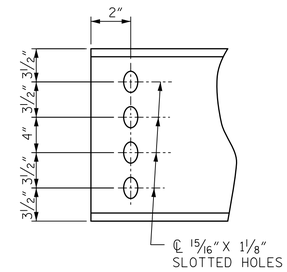



PLATE DETAILS




CHANNEL END

## STRUCTURAL STEEL NOTES

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

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

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

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

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

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

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

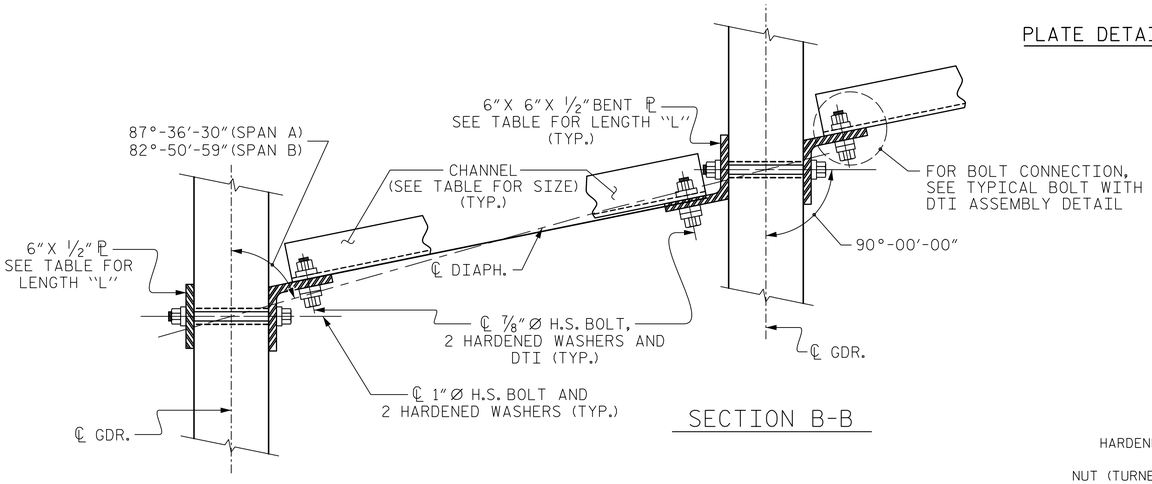
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST ¼" PROJECTION BEYOND THE NUT.

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

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

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

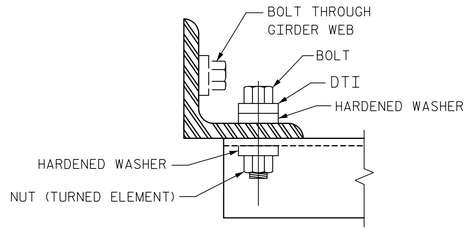
THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.




SECTION A-A

SECTION B-B

## CONNECTION DETAILS




BOLT WITH DTI ASSEMBLY DETAIL

## TABLE

| GIRDER TYPE | CHANNEL SIZE | DIM "A" | DIM "B" | DIM "L" |
|---|---|---|---|---|
| IV | MC 18 x 42.7 | 1'-9½" | 1'-2" | 1'-6" |

PROJECT NO. I-4400C

BUNCOMBE COUNTY

STATION: POC 22+70.63 -Y12-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

# STANDARD INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PRESTRESSED CONCRETE GIRDERS

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY | DATE | NO. | BY | DATE | S5-16 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 37 |

Digitally signed by: CARLY K. ERVIN
NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL 47328 5/14/2019 ENGINEER KYLE ERVIN

| | |
|---|---|
| ASSEMBLED BY : B. VAUGHN | DATE : 11/18 |
| CHECKED BY : K. ERVIN | DATE : 2/19 |
| DRAWN BY : TLA 6/05 | REV. 5/1/06RRR KMM/GM |
| CHECKED BY : VC 6/05 | REV. 10/1/11 MAA/GM |
| | REV. 12/17 MAA/THC |

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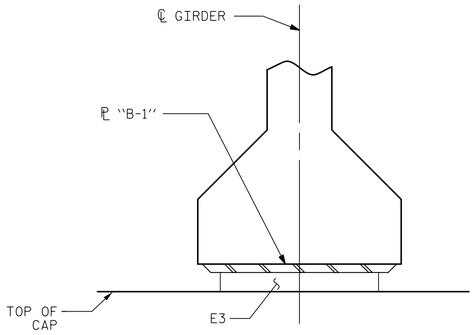
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

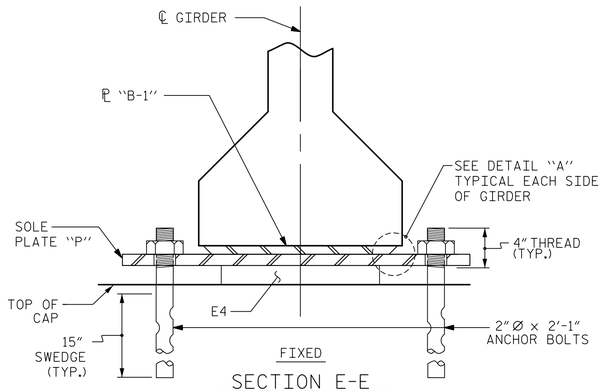
| | | |
|---|---|---|
| DRAWN BY B. VAUGHN | DATE 11/18 | DWG. NO. 16 |
| CHECKED BY K. ERVIN | DATE 1/19 | |
| DESIGN ENGINEER OF RECORD K. ERVIN | DATE 11/18 | |

STD. NO. PCG10



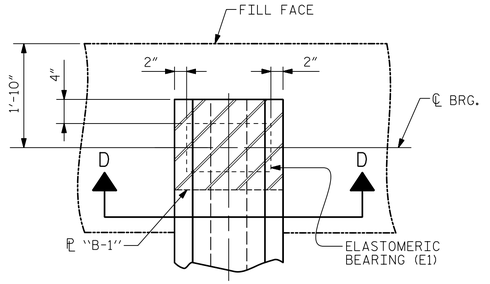

FIXED

SECTION D-D

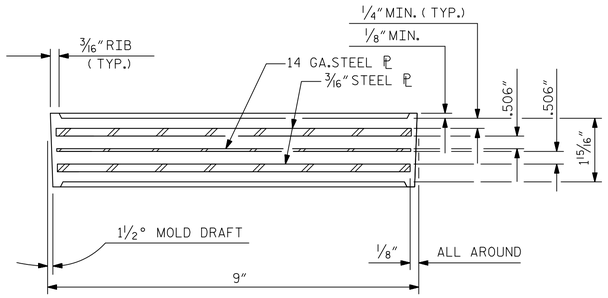



FIXED

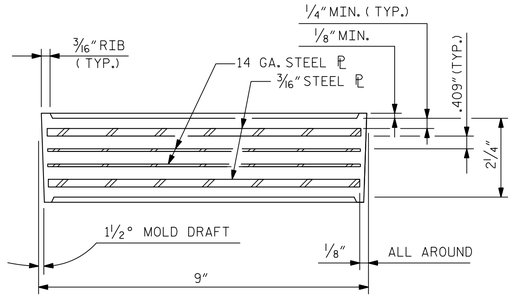
SECTION E-E



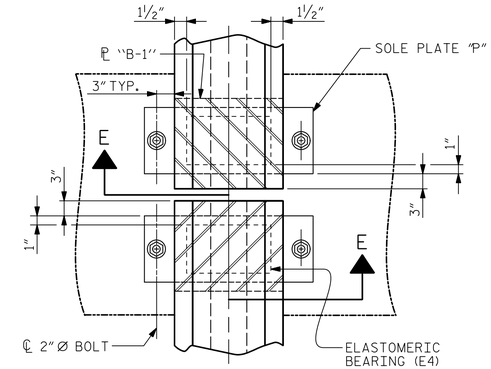

TYPICAL BEARING PLAN AT END BENT



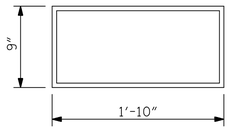

TYPICAL SECTION OF ELASTOMERIC BEARINGS




TYPICAL SECTION OF ELASTOMERIC BEARINGS



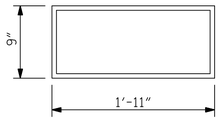

TYPICAL BEARING PLAN AT BENT




E3 (12 REQ'D )

PLAN VIEW OF ELASTOMERIC BEARING

TYPE IV

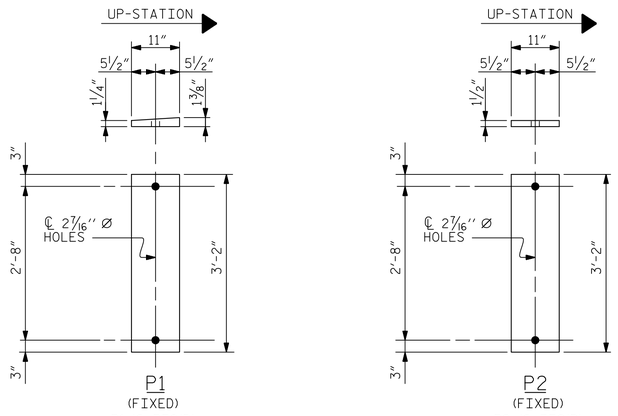



E4 (12 REQ'D)

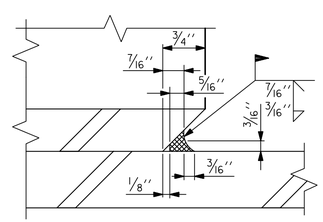
PLAN VIEW OF ELASTOMERIC BEARING

TYPE V

| MAXIMUM ALLOWABLE SERVICE LOADS | |
|---|---|
| D.L.+L.L. (NO IMPACT) | |
| TYPE IV | 225 k |
| TYPE V | 365 k |




SOLE PLATE DETAILS ( "P" )




DETAIL "A"

## NOTES

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF 1/2 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

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

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

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

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

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS AND NUTS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

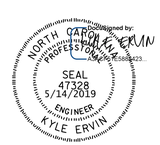
ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.

FOR BEARING AND SOLE PLATE LOCATIONS, SEE "FRAMING PLAN" SHEET.

PROJECT NO. I-4400C

BUNCOMBE COUNTY

STATION: POC 22+70.63 -Y12-




STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

# ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY | DATE | NO. | BY | DATE | S5-17 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 37 |

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DRAWN BY B. VAUGHN DATE 11/18
CHECKED BY K. ERVIN DATE 11/18
DESIGN ENGINEER OF RECORD K. ERVIN DATE 11/18

DWG. NO. 17

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

| | | | |
|---|---|---|---|
| ASSEMBLED BY : B. VAUGHN | | DATE : 11/18 | |
| CHECKED BY : K. ERVIN | | DATE : 2/19 | |
| DRAWN BY : EEM 2/97 | REV. 5/1/06 | TLA/GM | |
| CHECKED BY : VAP 2/97 | REV. 10/1/11 | MAA/GM | |
| | REV. 6/13 | AAC/MAA | |

STD. NO. EB3 AND EB4

## DEAD LOAD DEFLECTION TABLE FOR SPAN A

| 0.6"Ø LOW RELAXATION STRANDS | GIRDER 1 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TENTH POINTS | 0.00 | 0.10 | 0.20 | 0.30 | 0.40 | 0.50 | 0.60 | 0.70 | 0.80 | 0.90 | 1.00 |
| CAMBER (GIRDER ALONE IN PLACE) ↑ | 0.000 | 0.058 | 0.109 | 0.149 | 0.175 | 0.183 | 0.175 | 0.149 | 0.109 | 0.058 | 0.000 |
| DEFLECTION DUE TO SUPERIMPOSED D.L.* ↓ | 0.000 | -0.042 | -0.081 | -0.112 | -0.132 | -0.138 | -0.132 | -0.112 | -0.081 | -0.042 | 0.000 |
| FINAL CAMBER ↑ | 0 | 3/16 | 5/16 | 7/16 | 1/2 | 9/16 | 1/2 | 7/16 | 5/16 | 3/16 | 0 |

## DEAD LOAD DEFLECTION TABLE FOR SPAN A

| 0.6"Ø LOW RELAXATION STRANDS | GIRDER 2 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TENTH POINTS | 0.00 | 0.10 | 0.20 | 0.30 | 0.40 | 0.50 | 0.60 | 0.70 | 0.80 | 0.90 | 1.00 |
| CAMBER (GIRDER ALONE IN PLACE) ↑ | 0.000 | 0.058 | 0.109 | 0.149 | 0.175 | 0.183 | 0.175 | 0.149 | 0.109 | 0.058 | 0.000 |
| DEFLECTION DUE TO SUPERIMPOSED D.L.* ↓ | 0.000 | -0.047 | -0.092 | -0.127 | -0.149 | -0.157 | -0.149 | -0.127 | -0.092 | -0.047 | 0.000 |
| FINAL CAMBER ↑ | 0 | 1/8 | 3/16 | 1/4 | 5/16 | 5/16 | 5/16 | 1/4 | 3/16 | 1/8 | 0 |

## DEAD LOAD DEFLECTION TABLE FOR SPAN A

| 0.6"Ø LOW RELAXATION STRANDS | GIRDER 3 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TENTH POINTS | 0.00 | 0.10 | 0.20 | 0.30 | 0.40 | 0.50 | 0.60 | 0.70 | 0.80 | 0.90 | 1.00 |
| CAMBER (GIRDER ALONE IN PLACE) ↑ | 0.000 | 0.058 | 0.109 | 0.149 | 0.175 | 0.183 | 0.175 | 0.149 | 0.109 | 0.058 | 0.000 |
| DEFLECTION DUE TO SUPERIMPOSED D.L.* ↓ | 0.000 | -0.046 | -0.090 | -0.125 | -0.147 | -0.154 | -0.147 | -0.125 | -0.090 | -0.046 | 0.000 |
| FINAL CAMBER ↑ | 0 | 1/8 | 1/4 | 5/16 | 5/16 | 3/8 | 5/16 | 5/16 | 1/4 | 1/8 | 0 |

## DEAD LOAD DEFLECTION TABLE FOR SPAN A

| 0.6"Ø LOW RELAXATION STRANDS | GIRDER 4 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TENTH POINTS | 0.00 | 0.10 | 0.20 | 0.30 | 0.40 | 0.50 | 0.60 | 0.70 | 0.80 | 0.90 | 1.00 |
| CAMBER (GIRDER ALONE IN PLACE) ↑ | 0.000 | 0.058 | 0.109 | 0.149 | 0.175 | 0.183 | 0.175 | 0.149 | 0.109 | 0.058 | 0.000 |
| DEFLECTION DUE TO SUPERIMPOSED D.L.* ↓ | 0.000 | -0.047 | -0.092 | -0.127 | -0.149 | -0.157 | -0.149 | -0.127 | -0.092 | -0.047 | 0.000 |
| FINAL CAMBER ↑ | 0 | 1/8 | 3/16 | 1/4 | 5/16 | 5/16 | 5/16 | 1/4 | 3/16 | 1/8 | 0 |

## DEAD LOAD DEFLECTION TABLE FOR SPAN A

| 0.6"Ø LOW RELAXATION STRANDS | GIRDER 5 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TENTH POINTS | 0.00 | 0.10 | 0.20 | 0.30 | 0.40 | 0.50 | 0.60 | 0.70 | 0.80 | 0.90 | 1.00 |
| CAMBER (GIRDER ALONE IN PLACE) ↑ | 0.000 | 0.058 | 0.109 | 0.149 | 0.175 | 0.183 | 0.175 | 0.149 | 0.109 | 0.058 | 0.000 |
| DEFLECTION DUE TO SUPERIMPOSED D.L.* ↓ | 0.000 | -0.049 | -0.094 | -0.130 | -0.153 | -0.161 | -0.153 | -0.130 | -0.094 | -0.049 | 0.000 |
| FINAL CAMBER ↑ | 0 | 1/8 | 3/16 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 3/16 | 1/8 | 0 |

## DEAD LOAD DEFLECTION TABLE FOR SPAN A

| 0.6"Ø LOW RELAXATION STRANDS | GIRDER 6 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TENTH POINTS | 0.00 | 0.10 | 0.20 | 0.30 | 0.40 | 0.50 | 0.60 | 0.70 | 0.80 | 0.90 | 1.00 |
| CAMBER (GIRDER ALONE IN PLACE) ↑ | 0.000 | 0.058 | 0.109 | 0.149 | 0.175 | 0.183 | 0.175 | 0.149 | 0.109 | 0.058 | 0.000 |
| DEFLECTION DUE TO SUPERIMPOSED D.L.* ↓ | 0.000 | -0.044 | -0.085 | -0.117 | -0.137 | -0.144 | -0.137 | -0.117 | -0.085 | -0.044 | 0.000 |
| FINAL CAMBER ↑ | 0 | 3/16 | 5/16 | 3/8 | 7/16 | 7/16 | 7/16 | 3/8 | 5/16 | 3/16 | 0 |

## DEAD LOAD DEFLECTION TABLE FOR SPAN B

| 0.6"Ø LOW RELAXATION STRANDS | GIRDER 1 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TENTH POINTS | 0.00 | 0.10 | 0.20 | 0.30 | 0.40 | 0.50 | 0.60 | 0.70 | 0.80 | 0.90 | 1.00 |
| CAMBER (GIRDER ALONE IN PLACE) ↑ | 0.000 | 0.058 | 0.109 | 0.150 | 0.175 | 0.184 | 0.175 | 0.150 | 0.109 | 0.058 | 0.000 |
| DEFLECTION DUE TO SUPERIMPOSED D.L.* ↓ | 0.000 | -0.043 | -0.083 | -0.115 | -0.135 | -0.143 | -0.135 | -0.115 | -0.083 | -0.043 | 0.000 |
| FINAL CAMBER ↑ | 0 | 3/16 | 5/16 | 7/16 | 1/2 | 1/2 | 1/2 | 7/16 | 5/16 | 3/16 | 0 |

## DEAD LOAD DEFLECTION TABLE FOR SPAN B

| 0.6"Ø LOW RELAXATION STRANDS | GIRDER 2 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TENTH POINTS | 0.00 | 0.10 | 0.20 | 0.30 | 0.40 | 0.50 | 0.60 | 0.70 | 0.80 | 0.90 | 1.00 |
| CAMBER (GIRDER ALONE IN PLACE) ↑ | 0.000 | 0.058 | 0.109 | 0.150 | 0.175 | 0.184 | 0.175 | 0.150 | 0.109 | 0.058 | 0.000 |
| DEFLECTION DUE TO SUPERIMPOSED D.L.* ↓ | 0.000 | -0.048 | -0.094 | -0.130 | -0.154 | -0.161 | -0.154 | -0.130 | -0.094 | -0.048 | 0.000 |
| FINAL CAMBER ↑ | 0 | 1/8 | 3/16 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 3/16 | 1/8 | 0 |

## DEAD LOAD DEFLECTION TABLE FOR SPAN B

| 0.6"Ø LOW RELAXATION STRANDS | GIRDER 3 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TENTH POINTS | 0.00 | 0.10 | 0.20 | 0.30 | 0.40 | 0.50 | 0.60 | 0.70 | 0.80 | 0.90 | 1.00 |
| CAMBER (GIRDER ALONE IN PLACE) ↑ | 0.000 | 0.058 | 0.109 | 0.150 | 0.175 | 0.184 | 0.175 | 0.150 | 0.109 | 0.058 | 0.000 |
| DEFLECTION DUE TO SUPERIMPOSED D.L.* ↓ | 0.000 | -0.047 | -0.093 | -0.128 | -0.151 | -0.158 | -0.151 | -0.128 | -0.093 | -0.047 | 0.000 |
| FINAL CAMBER ↑ | 0 | 1/8 | 3/16 | 1/4 | 5/16 | 5/16 | 5/16 | 1/4 | 3/16 | 1/8 | 0 |

## DEAD LOAD DEFLECTION TABLE FOR SPAN B

| 0.6"Ø LOW RELAXATION STRANDS | GIRDER 4 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TENTH POINTS | 0.00 | 0.10 | 0.20 | 0.30 | 0.40 | 0.50 | 0.60 | 0.70 | 0.80 | 0.90 | 1.00 |
| CAMBER (GIRDER ALONE IN PLACE) ↑ | 0.000 | 0.058 | 0.109 | 0.150 | 0.175 | 0.184 | 0.175 | 0.150 | 0.109 | 0.058 | 0.000 |
| DEFLECTION DUE TO SUPERIMPOSED D.L.* ↓ | 0.000 | -0.048 | -0.094 | -0.130 | -0.153 | -0.161 | -0.153 | -0.130 | -0.094 | -0.048 | 0.000 |
| FINAL CAMBER ↑ | 0 | 1/8 | 3/16 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 3/16 | 1/8 | 0 |

## DEAD LOAD DEFLECTION TABLE FOR SPAN B

| 0.6"Ø LOW RELAXATION STRANDS | GIRDER 5 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TENTH POINTS | 0.00 | 0.10 | 0.20 | 0.30 | 0.40 | 0.50 | 0.60 | 0.70 | 0.80 | 0.90 | 1.00 |
| CAMBER (GIRDER ALONE IN PLACE) ↑ | 0.000 | 0.058 | 0.109 | 0.150 | 0.175 | 0.184 | 0.175 | 0.150 | 0.109 | 0.058 | 0.000 |
| DEFLECTION DUE TO SUPERIMPOSED D.L.* ↓ | 0.000 | -0.050 | -0.097 | -0.134 | -0.157 | -0.165 | -0.157 | -0.134 | -0.097 | -0.050 | 0.000 |
| FINAL CAMBER ↑ | 0 | 1/8 | 1/8 | 3/16 | 3/16 | 1/4 | 3/16 | 3/16 | 1/8 | 1/8 | 0 |

## DEAD LOAD DEFLECTION TABLE FOR SPAN B

| 0.6"Ø LOW RELAXATION STRANDS | GIRDER 6 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TENTH POINTS | 0.00 | 0.10 | 0.20 | 0.30 | 0.40 | 0.50 | 0.60 | 0.70 | 0.80 | 0.90 | 1.00 |
| CAMBER (GIRDER ALONE IN PLACE) ↑ | 0.000 | 0.058 | 0.109 | 0.150 | 0.175 | 0.184 | 0.175 | 0.150 | 0.109 | 0.058 | 0.000 |
| DEFLECTION DUE TO SUPERIMPOSED D.L.* ↓ | 0.000 | -0.045 | -0.087 | -0.120 | -0.141 | -0.148 | -0.141 | -0.120 | -0.087 | -0.045 | 0.000 |
| FINAL CAMBER ↑ | 0 | 3/16 | 1/4 | 3/8 | 7/16 | 7/16 | 7/16 | 3/8 | 1/4 | 3/16 | 0 |

* INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD. DOES NOT INCLUDE WEIGHT OF FORM LINER.
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

PROJECT NO. I-4400C

BUNCOMBE COUNTY

STATION: POC 22+70.63 -Y12-

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 47328 6/7/2019 KYLE ERVIN

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTIONS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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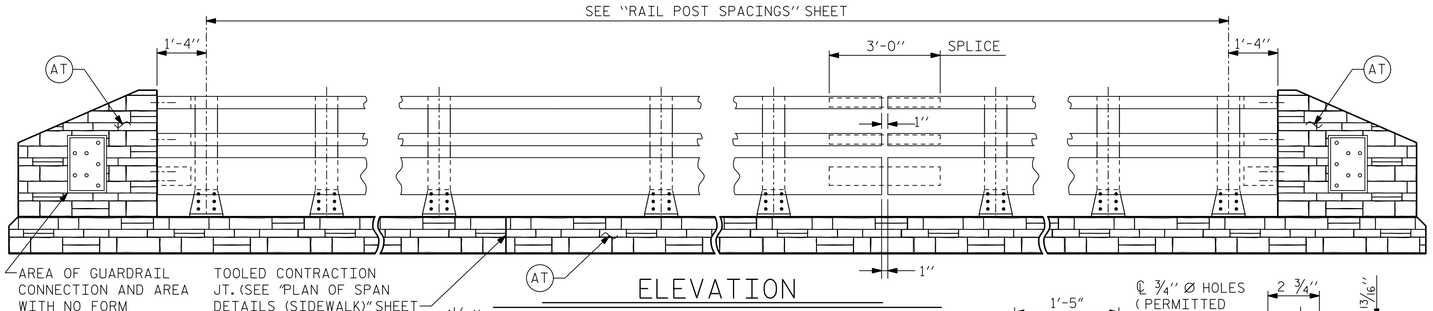
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY B. VAUGHN DATE 11/18
CHECKED BY K. ERVIN DATE 11/18
DESIGN ENGINEER OF RECORD K. ERVIN DATE 11/18

DWG. NO. 18

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY | DATE | NO. | BY | DATE | S5-18 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 37 |



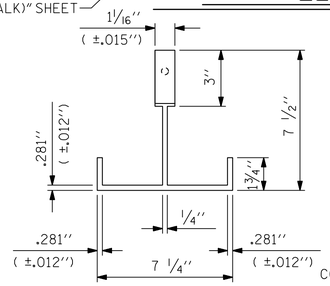

## ELEVATION

NOTE:
FOR ATTACHMENT OF METAL RAIL TO END POST, SEE SHEET 3 OF 4

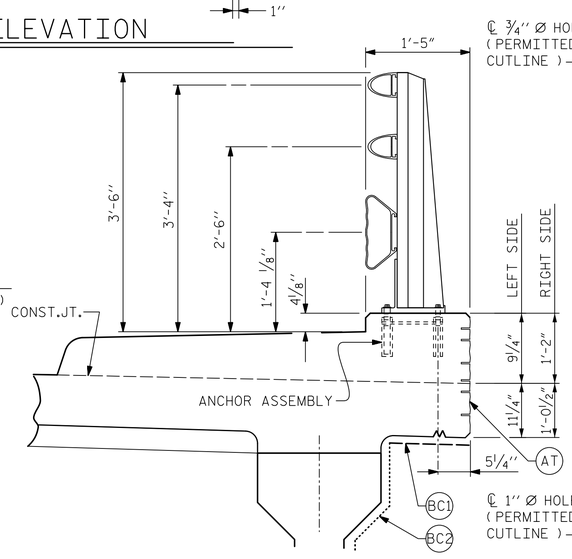
(AT) LIMITS OF FORM LINED ARCHITECTURAL TREATMENT

(BC1) LIMITS OF BRIDGE COATING (LIGHT GRAY)

(BC2) LIMITS OF BRIDGE COATING (DARK GRAY)

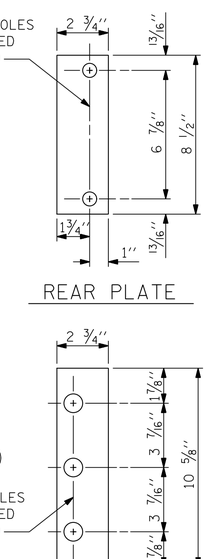



## PLAN




## SECTION THRU RAIL

FOR ANCHOR ASSEMBLY, SEE SHEET 2 OF 4







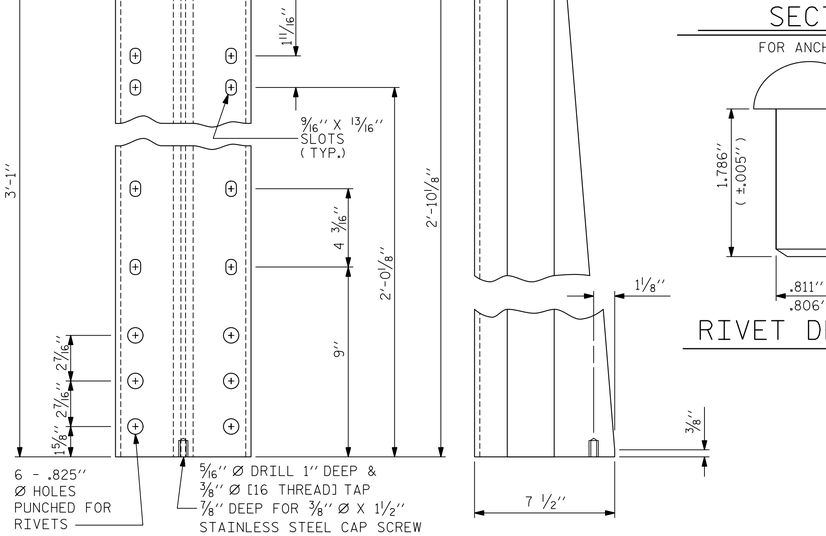
## REAR PLATE




## FRONT PLATE

## SHIM DETAILS

NOTE :
SHIMS MAY BE CUT ALONG PERMITTED CUTLINE OR SLOTTED TO EDGE OF PLATE TO FACILITATE PLACEMENT.

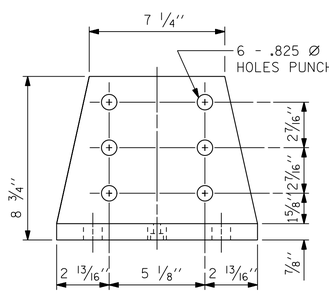



FRONT ELEVATION SIDE ELEVATION

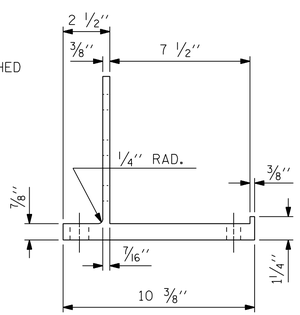
## DETAILS OF POST




## RIVET DETAIL

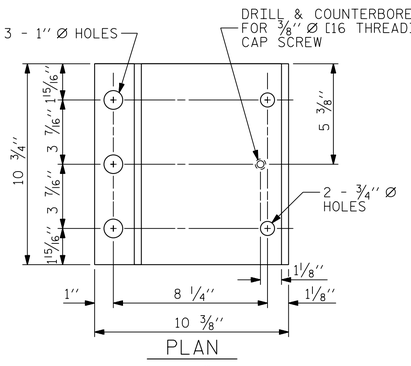



FRONT ELEVATION




SIDE ELEVATION

## POST BASE DETAILS




PLAN

# NOTES

## ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B221 ALLOY 6061-T6.

MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING.

THE BASE OF RAIL POSTS, OR ANY OTHER ALUMINUM SURFACE IN CONTACT WITH CONCRETE SHALL BE THOROUGHLY COATED WITH AN ALUMINUM IMPREGNATED CAULKING COMPOUND OF APPROVED QUALITY.

MATERIAL FOR SHIMS TO BE ASTM B209 ALLOY 6061-T6.

## ANODIZING

ALUMINUM FOR POSTS, BASES, RAILS, EXPANSION BARS, CLAMP BARS, RIVETS, CAPS, SHIMS, ATTACHMENT BRACKETS, AND HOLD-DOWN PLATES SHALL BE ANODIZED BROWN.

ANY DAMAGE TO THE ANODIZED SURFACE OF THE RAIL OR COMPONENTS DURING CONSTRUCTION SHALL BE REPAIRED ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS AT THE DIRECTION OF THE ENGINEER AND AT THE CONTRACTOR'S EXPENSE.

THE CONTRACTOR SHALL SUBMIIT A SAMPLE OF COMPATIBLE BROWN EXTERIOR ACRYLIC PAINT TO THE ENGINEER. THIS PAINT SHALL MATCH THE ANODIZED RAIL COLOR AS CLOSELY AS POSSIBLE. AFTER ERECTION OF THE ANODIZED ALUMINUM RAILING, ALL EXPOSED ANCHOR BOLTS, NUTS, WASHERS, MACHINE SCREWS, CAP SCREWS, BOLTS, ATTACHMENT BRACKETS, AND BUILT UP ANGLES SHALL BE COATED WITH TWO COATS OF THIS PAINT.

## GENERAL NOTES

RAILING SHALL BE CONTINUOUS FROM END POST TO END POST OF BRIDGE. EACH JOINT IN RAIL LENGTH SHALL BE SPLICED AS DETAILED. PANEL LENGTHS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS. PLACE ONE JOINT SPLICE JUST BEYOND THE 3RD RAIL POST FROM EACH END, TYPICALLY 14' FROM THE END. PLACE OTHER JOINTS AS NEEDED.

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE SHEET 3 OF 4.

CAP SCREWS SHALL BE ASTM F593 ALLOY 305 STAINLESS STEEL. WASHERS FOR RAIL ATTACHMENT SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

CERTIFIED MILL REPORTS ARE REQUIRED FOR RAILS AND POSTS. SHOP INSPECTION IS NOT REQUIRED.

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

METHOD OF MEASUREMENT FOR METAL RAILS: FOR LENGTH OF METAL RAILS TO BE PAID FOR, SEE THE STANDARD SPECIFICATIONS.

CURVED RAIL USAGE: WHERE RAILS ARE TO BE USED ON BRIDGES ON HORIZONTAL AND/OR VERTICAL CURVATURE THE CONTRACTOR MAY, AT HIS OPTION, HAVE THE REQUIRED CURVATURE IN THE RAIL FORMED IN THE SHOP OR IN THE FIELD. IN EITHER EVENT, THE RAIL SHALL CONFORM WITHOUT BUCKLING OR KINKING TO THE REQUIRED CURVATURE IN A UNIFORM MANNER ACCEPTABLE TO THE ENGINEER.

TO INSURE FUTURE IDENTIFICATION OF THE FABRICATOR, A PERMANENT IDENTIFYING MARK SHALL BE PLACED ON EACH POST. THE METHOD OF MARKING AND LOCATION SHALL BE SUCH THAT IT DOES NOT DETRACT FROM THE APPEARANCE OF THE POST, BUT REMAIN VISIBLE AFTER RAIL PLACEMENT.

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

ALLOY 6351-T5 MAY BE SUBSTITUTED FOR ALLOY 6061-T6 WHERE APPLICABLE.

MINOR VARIATIONS IN DETAILS OF METAL RAIL WILL BE CONSIDERED. DETAILS OF SUCH VARIATIONS, IF DESIRED, SHALL BE SUBMITTED FOR APPROVAL.

PAY LENGTH = 380.10 LIN. FT. ALONG ARC

3 BAR METAL RAIL SHALL BE ANODIZED BROWN, SEE NOTES.

PROJECT NO. I-4400C

BUNCOMBE COUNTY

STATION: POC 22+70.63 -Y12-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

3 BAR METAL RAIL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 47328 6/7/2019 ENGINEER KYLE ERVIN

| | | | |
|---|---|---|---|
| ASSEMBLED BY : | B. VAUGHN | DATE : | 11/18 |
| CHECKED BY : | K. ERVIN | DATE : | 2/19 |
| DRAWN BY : JMB | 1/88 | REV. 5/1/06 | TLA/GM |
| CHECKED BY : GGH | 1/88 | REV. 10/1/11 | MAA/GM |
| | | REV. 12/17 | MAA/THC |

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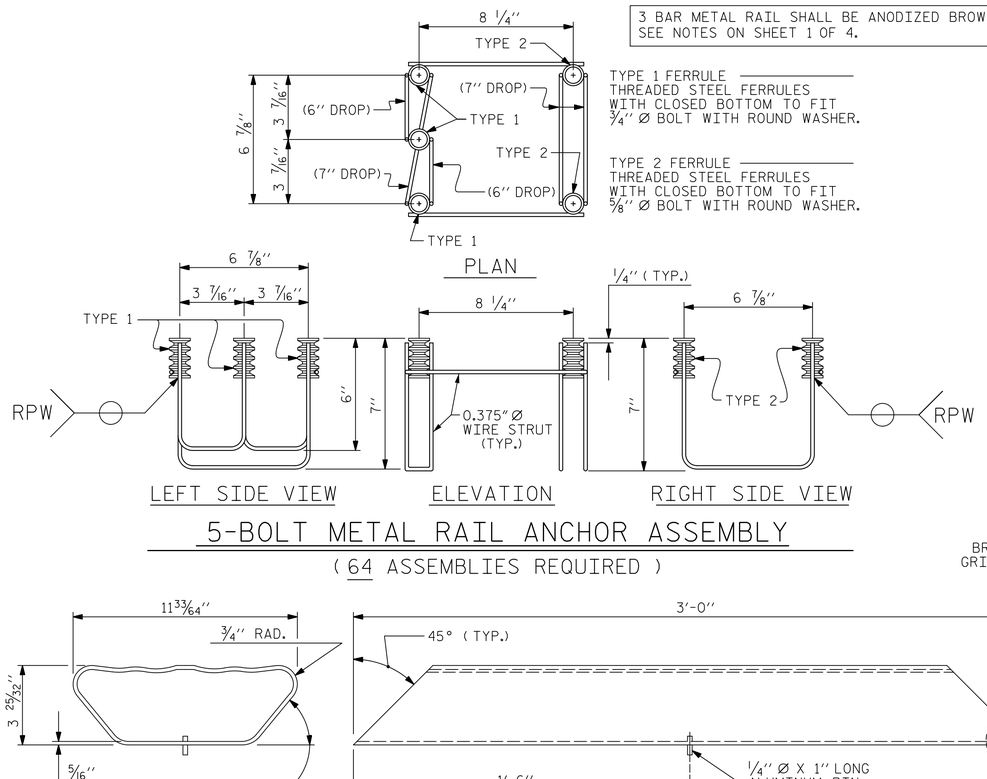
| | | | |
|---|---|---|---|
| DRAWN BY | B. VAUGHN | DATE | 11/18 |
| CHECKED BY | K. ERVIN | DATE | 01/19 |
| DESIGN ENGINEER OF RECORD | K. ERVIN | DATE | 11/18 |

DWG. NO. 19

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY | DATE | NO. | BY | DATE | S5-19 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 37 |

STD. NO. BMR5

3 BAR METAL RAIL SHALL BE ANODIZED BROWN, SEE NOTES ON SHEET 1 OF 4.




TYPE 1 FERRULE — THREADED STEEL FERRULES WITH CLOSED BOTTOM TO FIT 3/4'' Ø BOLT WITH ROUND WASHER.

TYPE 2 FERRULE — THREADED STEEL FERRULES WITH CLOSED BOTTOM TO FIT 5/8'' Ø BOLT WITH ROUND WASHER.

## 5-BOLT METAL RAIL ANCHOR ASSEMBLY

( 64 ASSEMBLIES REQUIRED )

## NOTES

STRUCTURAL CONCRETE ANCHOR ASSEMBLY

THE STRUCTURAL CONCRETE ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2'' FOR 3/4'' FERRULES AND 1 3/4'' FOR 5/8'' FERRULES.

B. 3 - 3/4'' Ø X 2 1/2'' BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4'' Ø X 2 1/2'' GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

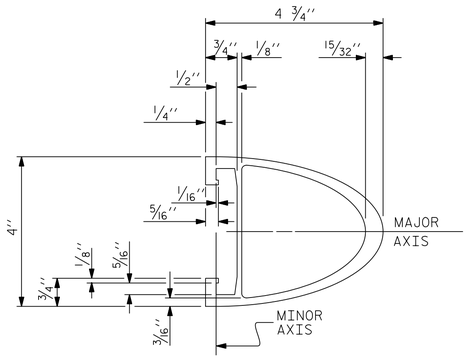
C. 2 - 5/8'' Ø X 2 1/4'' BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 5/8'' Ø X 2 1/4'' GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

D. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16'' Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

E. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.

F. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.

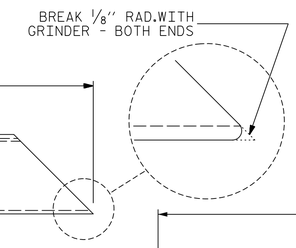
G. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

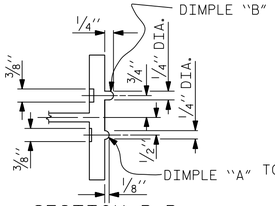



## TOP & MIDDLE RAIL SECTION

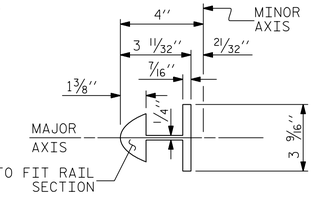



## BOTTOM RAIL EXPANSION BAR

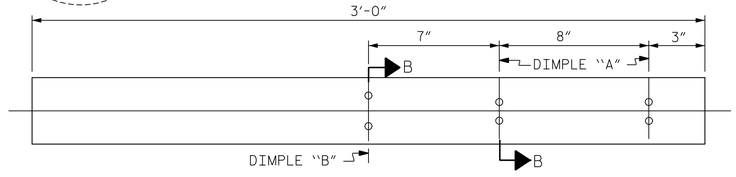



SECTION B-B

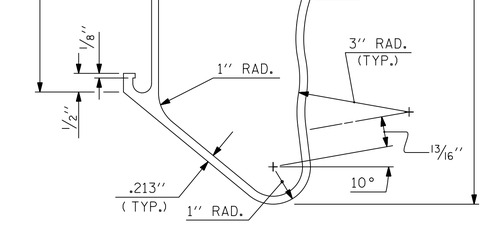



BAR SECTION



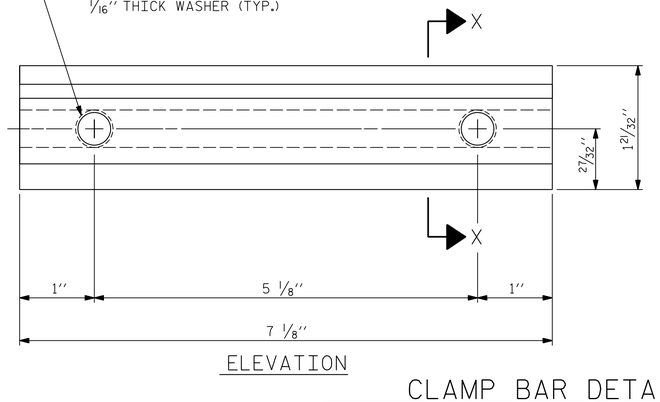

BACK ELEVATION

## TOP & MIDDLE RAIL EXPANSION BAR

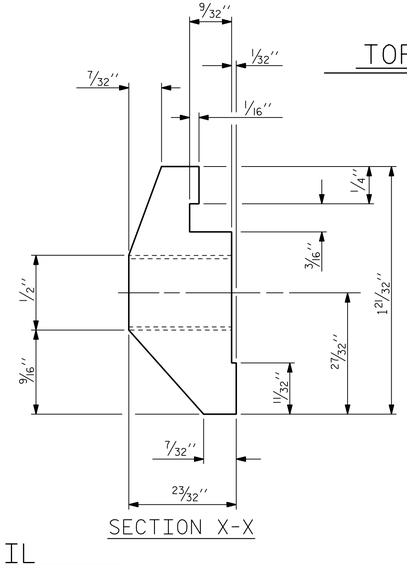



## BOTTOM RAIL SECTION

1/2'' Ø [13 THREAD] HOLE FOR 1/2'' Ø X 1'' STAINLESS STEEL HEX HEAD CAP SCREW & 1 1/16'' O.D., 17/32'' I.D., 1/16'' THICK WASHER (TYP.)



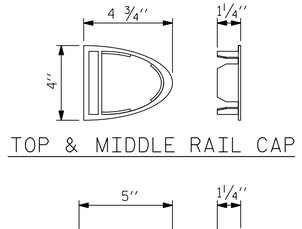

ELEVATION



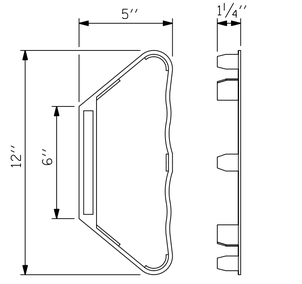

SECTION X-X

## CLAMP BAR DETAIL

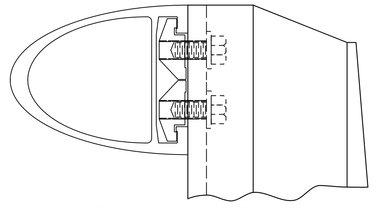
( 6 REQUIRED PER POST )




TOP & MIDDLE RAIL CAP




BOTTOM RAIL CAP



## CLAMP ASSEMBLY

TOP RAIL SHOWN
( MIDDLE & BOTTOM RAIL ARE SIMILAR )

NORTH CAROLINA PROFESSIONAL SEAL 47328 ENGINEER KYLE ERVIN — Kyle Ervin — 6/7/2019

PROJECT NO. I-4400C

BUNCOMBE COUNTY

STATION: POC 22+70.63 -Y12-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

3 BAR METAL RAIL

| ASSEMBLED BY : B. VAUGHN | DATE : 11/18 |
|---|---|
| CHECKED BY : K. ERVIN | DATE : 2/19 |
| DRAWN BY : JMB 1/88 | REV. 5/1/06 TLA/GM |
| CHECKED BY : GGH 1/88 | REV. 10/1/11 MAA/GM |
| | REV. 12/17 MAA/THC |

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| DRAWN BY B. VAUGHN | DATE 11/18 |
|---|---|
| CHECKED BY K. ERVIN | DATE 1/19 |
| DESIGN ENGINEER OF RECORD K. ERVIN | DATE 11/18 |

DWG. NO. 20

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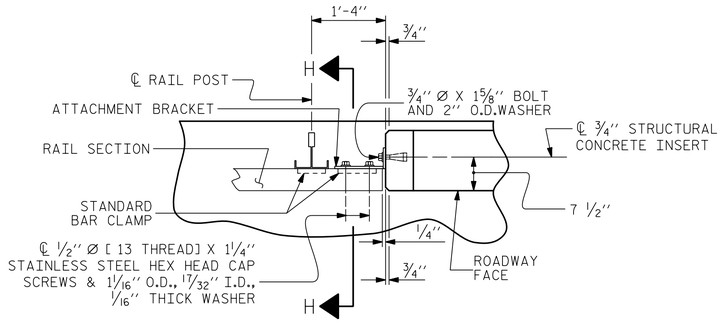
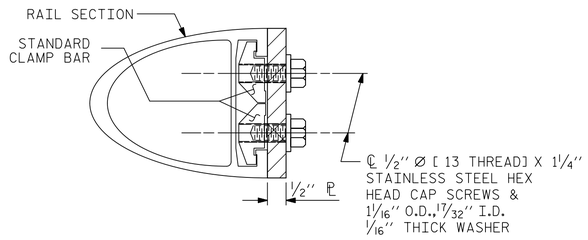
| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY | DATE | NO. | BY | DATE | S5-20 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 37 |

STD. NO. BMR6



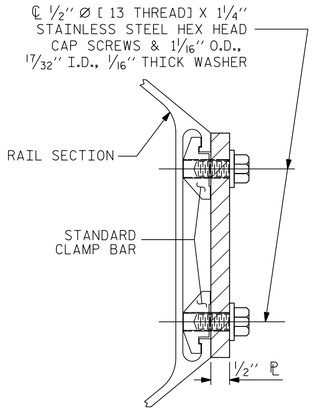

## PLAN OF RAIL AND END POST

( STIFFENER ON 1/2'' ℙ NOT SHOWN FOR CLARITY )



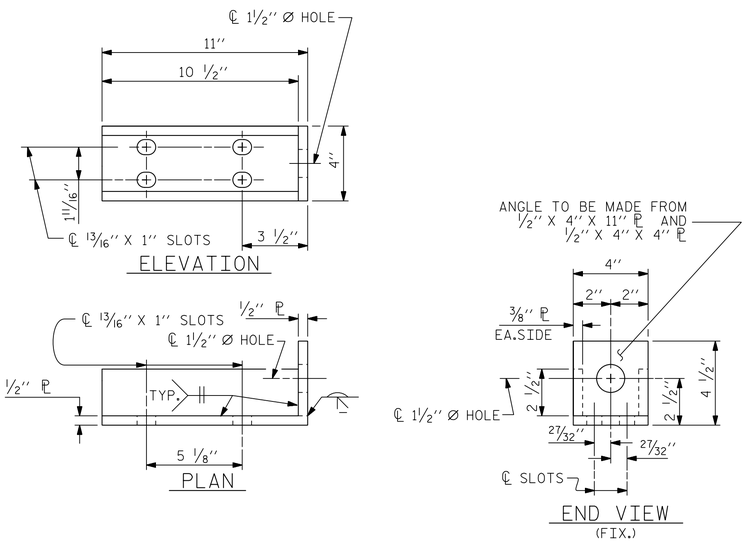

## SECTION H-H

( FOR TOP & MIDDLE RAIL )



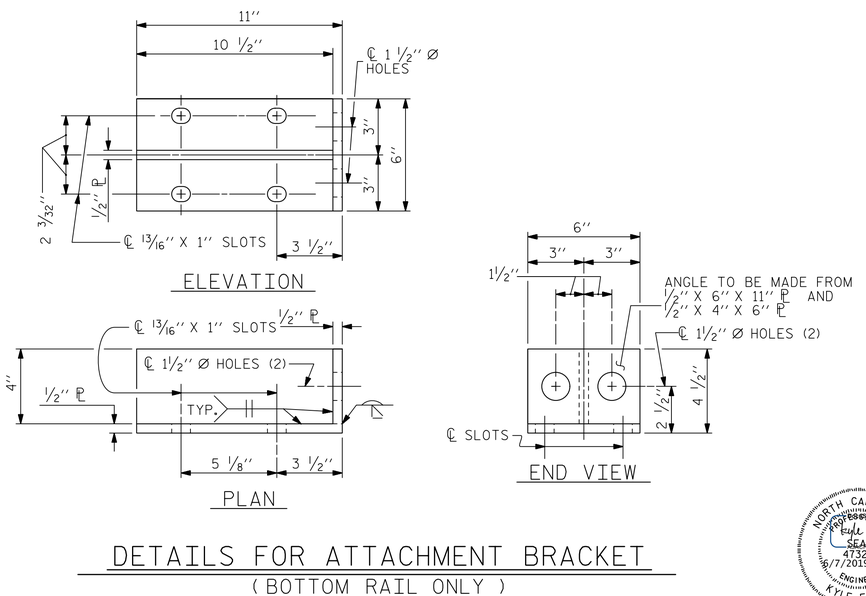

## SECTION H-H

( FOR BOTTOM RAIL )




## DETAILS FOR ATTACHMENT BRACKET

( TOP & MIDDLE RAIL ONLY )




## DETAILS FOR ATTACHMENT BRACKET

( BOTTOM RAIL ONLY )

## NOTES

METAL RAIL TO END POST CONNECTION

THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:

A. 1/2'' PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.

B. 3/4'' STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4'' Ø X 1 5/8'' BOLT WITH 2'' O.D. WASHER IN PLACE. THE 3/4'' Ø X 1 5/8'' BOLT SHALL HAVE N. C. THREADS.

C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F. WASHERS FOR RAIL ATTACHMENT SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

D. STANDARD CLAMP BARS (SHEET 2 OF 4).

THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 3 BAR METAL RAIL.

THE 3/4'' STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

THE COST OF THE 3/4'' STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE 1/2'' PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4'' Ø X 1 5/8'' BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4'' Ø X 6 1/2'' BOLT AND 2'' O.D.WASHER. ALL SPECIFICATIONS THAT APPLY TO THE 3/4'' Ø X 1 5/8'' BOLT SHALL APPLY TO THE 3/4'' Ø X 6 1/2'' BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

## NOTES

STRUCTURAL CONCRETE INSERT

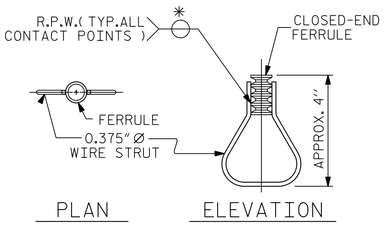
THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1 1/2''.

B. 1 - 3/4'' Ø X 1 5/8'' BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. AT THE CONTRACTORS OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE 3/4'' Ø X 1 5/8'' GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

C. WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16'' Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

3 BAR METAL RAIL SHALL BE ANODIZED BROWN, SEE NOTES ON SHEET 1 OF 4.




## STRUCTURAL CONCRETE INSERT

* EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.

**PROJECT NO.** I-4400C

BUNCOMBE **COUNTY**

**STATION:** POC 22+70.63 -Y12-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

3 BAR METAL RAIL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 47328 6/7/2019 ENGINEER KYLE ERVIN

| | | | | | |
|---|---|---|---|---|---|
| ASSEMBLED BY : B. VAUGHN | | DATE : 11/18 | | | |
| CHECKED BY : K. ERVIN | | DATE : 2/19 | | | |
| DRAWN BY : JMB 1/88 | REV. 5/1/06 | TLA/GM | | | |
| CHECKED BY : GGH 1/88 | REV. 10/1/11 | MAA/GM | | | |
| | REV. 12/17 | MAA/THC | | | |

NOTE: FOR RAIL POST SPACINGS, SEE SHEET 4 OF 4

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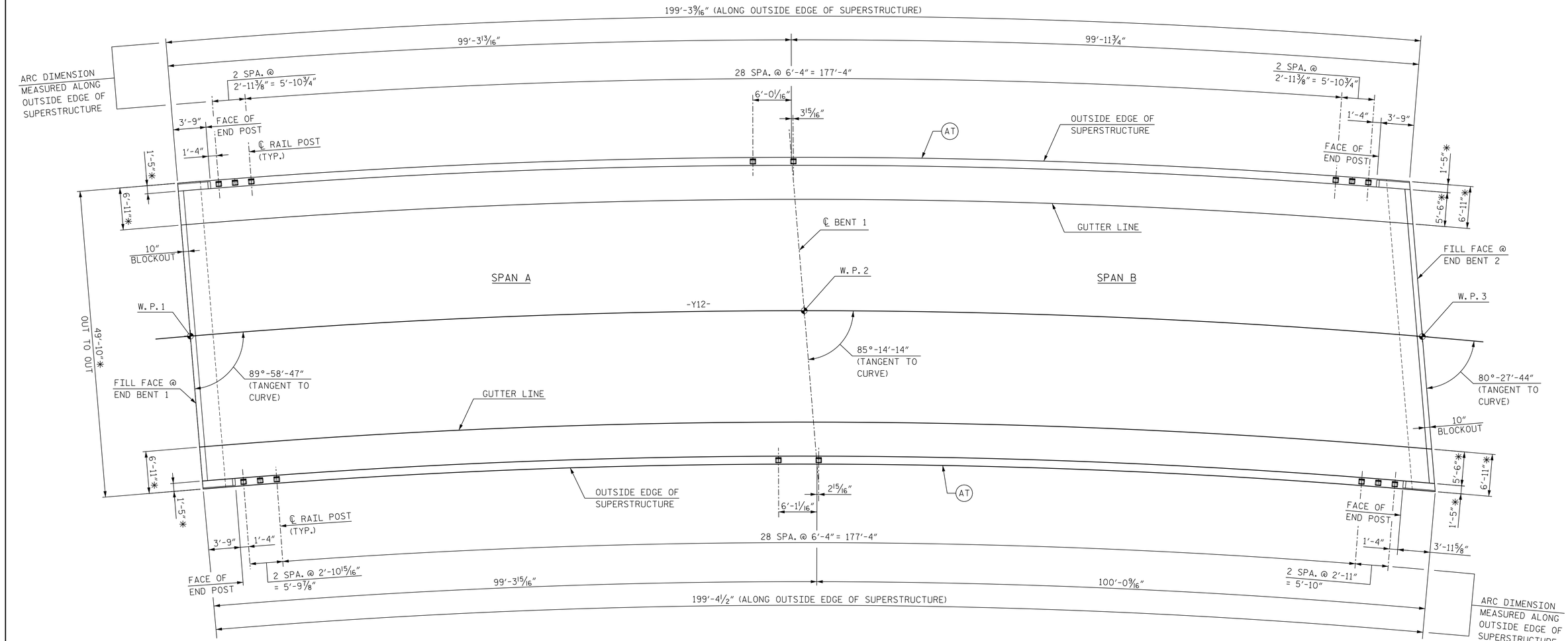
DRAWN BY B. VAUGHN DATE 11/18
CHECKED BY K. ERVIN DATE 1/19
DESIGN ENGINEER OF RECORD K. ERVIN DATE 11/18

DWG. NO. 21

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY | DATE | NO. | BY | DATE | S5-21 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 37 |

STD. NO. BMR7




## PLAN OF RAIL POST SPACINGS

* RADIAL DIMENSION

**NOTE:**

POST CENTERLINE SHALL NOT BE LOCATED LESS THAN 1′-0″ FROM CONTRACTION JOINT IN SIDEWALK AND PARAPET. FOR ADDITIONAL CONTRACTION JOINT INFORMATION, SEE "PLAN OF SPAN DETAILS (SIDEWALKS)" SHEET.

(AT) LIMITS OF FORM LINED ARCHITECTURAL TREATMENT

**PROJECT NO.** I-4400C

BUNCOMBE **COUNTY**

**STATION:** POC 22+70.63 -Y12-

SHEET 4 OF 4

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 47328 6/7/2019 ENGINEER KYLE ERVIN

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DESIGN ENGINEER OF RECORD K. ERVIN DATE 11/18

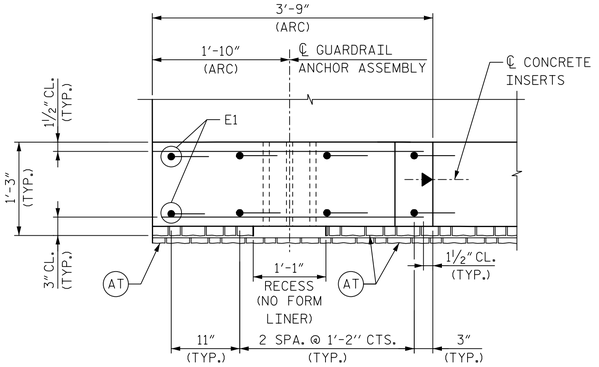
DWG. NO. 22

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

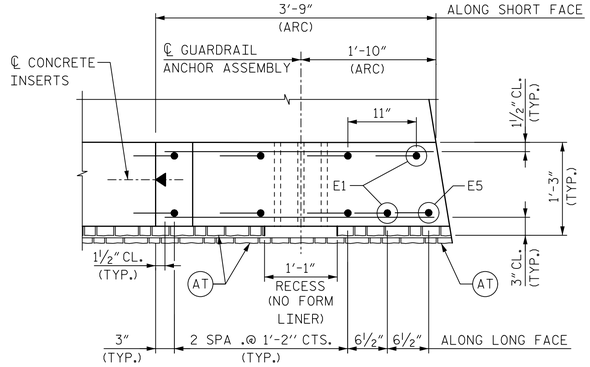
SUPERSTRUCTURE

RAIL POST SPACING

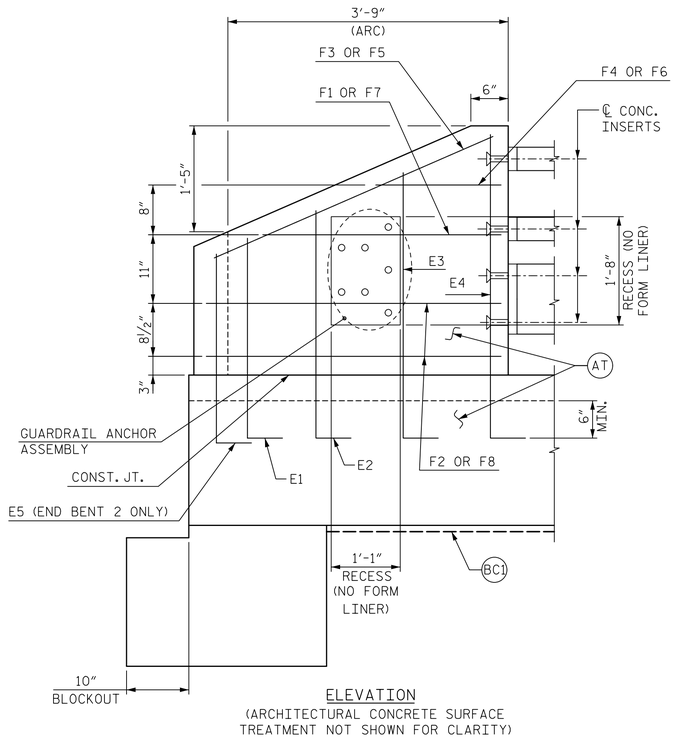
| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY | DATE | NO. | BY | DATE | S5-22 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 37 |



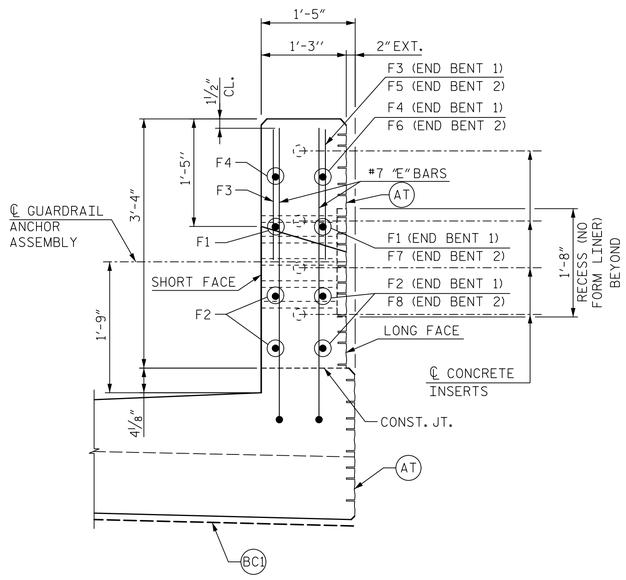

PLAN
(END BENT 1)




PLAN
(END BENT 2)




ELEVATION
(ARCHITECTURAL CONCRETE SURFACE
TREATMENT NOT SHOWN FOR CLARITY)




END VIEW

## END POST DETAILS

RIGHT SIDE OF END BENT 1 AND END BENT 2 SHOWN,
LEFT SIDE SIMILAR

### BILL OF MATERIAL FOR ONE END POST AT END BENT 1 (2 REQUIRED)

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| ✳E1 | 2 | #7 | 1 | 3′-5″ | 14 |
| ✳E2 | 2 | #7 | 1 | 4′-0″ | 17 |
| ✳E3 | 2 | #7 | 1 | 4′-7″ | 19 |
| ✳E4 | 2 | #7 | 1 | 5′-0″ | 21 |
| ✳F1 | 2 | #6 | STR. | 3′-4″ | 10 |
| ✳F2 | 4 | #6 | STR. | 3′-6″ | 21 |
| ✳F3 | 2 | #6 | STR. | 3′-5″ | 11 |
| ✳F4 | 2 | #6 | STR. | 1′-9″ | 6 |

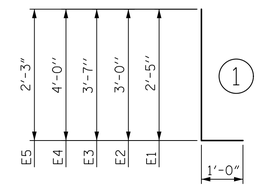
| | | |
|---|---|---|
| ✳EPOXY COATED REINFORCING STEEL | 119 | LBS. |
| CLASS AA CONCRETE | 0.6 | CU. YDS. |
| ARCHITECTURAL CONCRETE SURFACE TREATMENT | 11 | SQ. FT. |

### BILL OF MATERIAL FOR ONE END POST AT END BENT 2 (2 REQUIRED)

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| ✳E1 | 2 | #7 | 1 | 3′-5″ | 14 |
| ✳E2 | 2 | #7 | 1 | 4′-0″ | 17 |
| ✳E3 | 2 | #7 | 1 | 4′-7″ | 19 |
| ✳E4 | 2 | #7 | 1 | 5′-0″ | 21 |
| ✳E5 | 1 | #7 | 1 | 3′-3″ | 7 |
| ✳F1 | 1 | #6 | STR. | 3′-4″ | 5 |
| ✳F2 | 2 | #6 | STR. | 3′-6″ | 11 |
| ✳F3 | 1 | #6 | STR. | 3′-5″ | 6 |
| ✳F4 | 1 | #6 | STR. | 1′-9″ | 3 |
| ✳F5 | 1 | #6 | STR. | 3′-7″ | 6 |
| ✳F6 | 1 | #6 | STR. | 1′-10″ | 3 |
| ✳F7 | 1 | #6 | STR. | 3′-6″ | 6 |
| ✳F8 | 2 | #6 | STR. | 3′-8″ | 12 |

| | | |
|---|---|---|
| ✳EPOXY COATED REINFORCING STEEL | 130 | LBS. |
| CLASS AA CONCRETE | 0.6 | CU. YDS. |
| ARCHITECTURAL CONCRETE SURFACE TREATMENT | 11 | SQ. FT. |

### BAR TYPE




ALL BAR DIMENSIONS ARE OUT TO OUT

(AT) LIMITS OF FORM LINED ARCHITECTURAL TREATMENT

(BC1) LIMITS OF BRIDGE COATING (LIGHT GRAY)

PROJECT NO. I-4400C

BUNCOMBE COUNTY

STATION: POC 22+70.63 -Y12-

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 047328 ENGINEER KYLE ERVIN 6/7/2019

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CHECKED BY K. ERVIN DATE 1/19
DESIGN ENGINEER OF RECORD K. ERVIN DATE 11/18

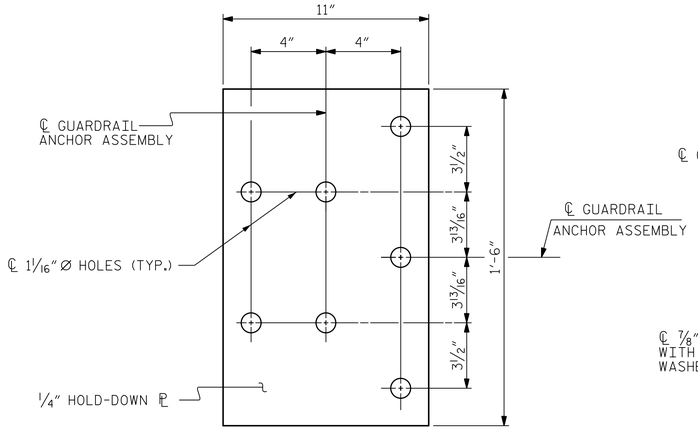
DWG. NO. 23

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

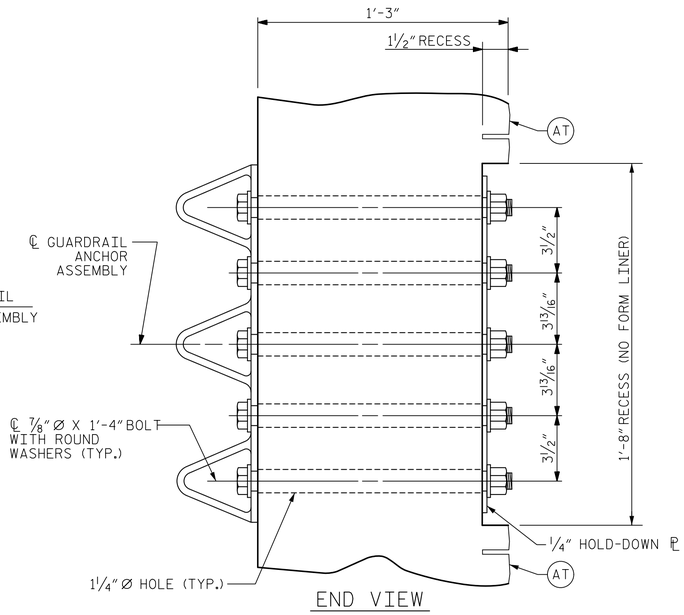
SUPERSTRUCTURE

END POST DETAILS

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY | DATE | NO. | BY | DATE | S5-23 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 37 |




PLAN




END VIEW

# GUARDRAIL ANCHOR ASSEMBLY DETAILS

## NOTES

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

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

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

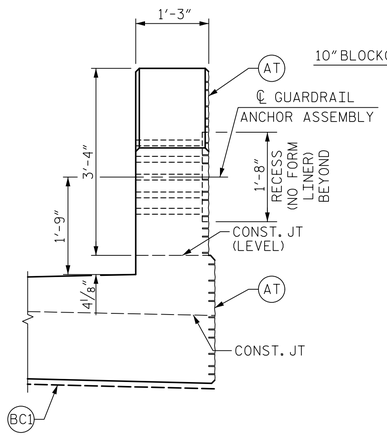
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

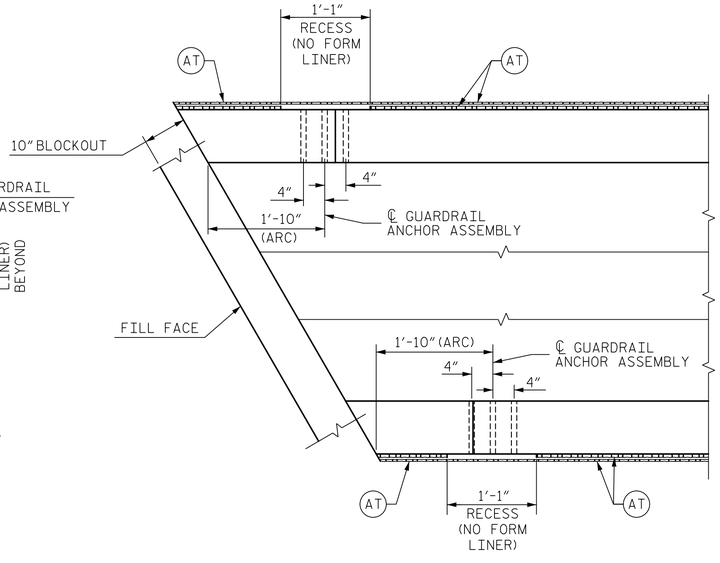
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

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



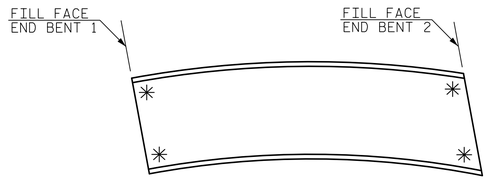

END VIEW




PLAN

END BENT 1 SHOWN, END BENT 2 SIMILAR

# LOCATION OF GUARDRAIL ANCHOR AT END POST




# SKETCH SHOWING POINTS OF ATTACHMENT

✳ LOCATION OF GUARDRAIL ATTACHMENT

(AT) LIMITS OF FORM LINED ARCHITECTURAL TREATMENT

(BC1) LIMITS OF BRIDGE COATING (LIGHT GRAY)

PROJECT NO. I-4400C

BUNCOMBE COUNTY

STATION: POC 22+70.63 -Y12-

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 047328 6/7/2019 ENGINEER KYLE ERVIN

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS & VERTICAL CONCRETE BARRIER RAIL

| ASSEMBLED BY : B. VAUGHN | DATE : 11/18 |
|---|---|
| CHECKED BY : K. ERVIN | DATE : 2/19 |
| DRAWN BY : MAA 5/10 | REV. 1/15 MAA/TMG |
| CHECKED BY : GM 5/10 | REV. 12/17 MAA/THC |
| | REV. 5/18 MAA/THC |

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DRAWN BY B. VAUGHN DATE 11/18
CHECKED BY K. ERVIN DATE 01/19
DESIGN ENGINEER OF RECORD K. ERVIN DATE 01/19
DWG. NO. 24

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY | DATE | NO. | BY | DATE | S5-24 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 37 |

STD. NO. GRA3

## BILL OF REINFORCING

EPOXY COATED - DECK

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| A1 | 387 | 5 | STR. | 49′-1″ | 19,812 |
| A2 | 786 | 4 | STR. | 4′-6″ | 2,363 |
| A3 | 1 | 5 | STR. | 49′-11″ | 52 |
| A4 | 1 | 5 | STR. | 6′-0″ | 7 |
| A5 | 1 | 5 | STR. | 12′-0″ | 13 |
| A6 | 1 | 5 | STR. | 18′-0″ | 19 |
| A7 | 1 | 5 | STR. | 24′-0″ | 25 |
| A8 | 1 | 5 | STR. | 30′-1″ | 32 |
| A9 | 1 | 5 | STR. | 36′-1″ | 38 |
| A10 | 1 | 5 | STR. | 42′-1″ | 44 |
| A11 | 1 | 5 | STR. | 42′-2″ | 44 |
| A12 | 1 | 5 | STR. | 36′-2″ | 38 |
| A13 | 1 | 5 | STR. | 30′-3″ | 32 |
| A14 | 1 | 5 | STR. | 24′-4″ | 26 |
| A15 | 1 | 5 | STR. | 18′-4″ | 20 |
| A16 | 1 | 5 | STR. | 12′-5″ | 13 |
| A17 | 1 | 5 | STR. | 6′-6″ | 7 |

## BILL OF REINFORCING

EPOXY COATED - DECK

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| B1 | 204 | 4 | STR. | 22′-2″ | 3,021 |
| B2 | 132 | 6 | STR. | 20′-1″ | 3,982 |
| B3 | 102 | 7 | STR. | 30′-0″ | 6,255 |
| B4 | 66 | 7 | STR. | 46′-0″ | 6,206 |
| S1 | 76 | 4 | 1 | 11′-11″ | 605 |
| S2 | 72 | 4 | 1 | 10′-9″ | 517 |
| U2 | 25 | 5 | 2 | 13′-0″ | 339 |
| U3 | 10 | 5 | 2 | 11′-0″ | 115 |
| EPOXY COATED REINFORCING STEEL TOTAL: | | | | | 43,625 |

## BILL OF REINFORCING

EPOXY COATED - SIDEWALK

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| B5 | 84 | 4 | STR. | 30′-0″ | 1,684 |
| G1 | 397 | 4 | STR. | 6′-2″ | 1,636 |
| U4 | 87 | 4 | 3 | 3′-4″ | 194 |
| U5 | 29 | 4 | 3 | 3′-6″ | 68 |
| EPOXY COATED REINFORCING STEEL TOTAL: | | | | | 3,582 |

## BILL OF REINFORCING

UNCOATED - DECK

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| A101 | 387 | 5 | STR. | 49′-1″ | 19,812 |
| A103 | 1 | 5 | STR. | 49′-11″ | 52 |
| A104 | 1 | 5 | STR. | 6′-0″ | 7 |
| A105 | 1 | 5 | STR. | 12′-0″ | 13 |
| A106 | 1 | 5 | STR. | 18′-0″ | 19 |
| A107 | 1 | 5 | STR. | 24′-0″ | 25 |
| A108 | 1 | 5 | STR. | 30′-1″ | 32 |
| A109 | 1 | 5 | STR. | 36′-1″ | 38 |
| A110 | 1 | 5 | STR. | 42′-1″ | 44 |
| A111 | 1 | 5 | STR. | 42′-2″ | 44 |
| A112 | 1 | 5 | STR. | 36′-2″ | 38 |
| A113 | 1 | 5 | STR. | 30′-3″ | 32 |
| A114 | 1 | 5 | STR. | 24′-4″ | 26 |
| A115 | 1 | 5 | STR. | 18′-4″ | 20 |
| A116 | 1 | 5 | STR. | 12′-5″ | 13 |
| A117 | 1 | 5 | STR. | 6′-6″ | 7 |
| B101 | 252 | 5 | STR. | 40′-5″ | 10,623 |
| B102 | 63 | 7 | STR. | 46′-0″ | 5,924 |

## BILL OF REINFORCING

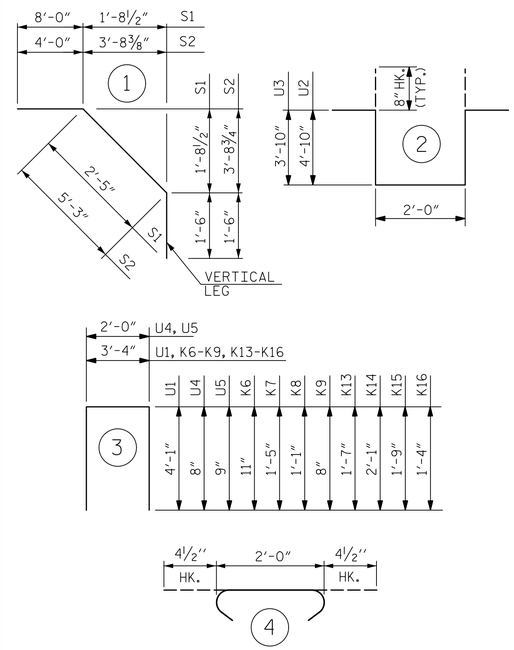
UNCOATED -DECK

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| K1 | 5 | 5 | STR. | 49′-3″ | 257 |
| K2 | 20 | 5 | STR. | 6′-11″ | 145 |
| K3 | 40 | 5 | STR. | 7′-11″ | 331 |
| K4 | 20 | 5 | STR. | 7′-3″ | 152 |
| K5 | 10 | 5 | STR. | 6′-5″ | 67 |
| K6 | 2 | 5 | 3 | 5′-2″ | 11 |
| K7 | 4 | 5 | 3 | 6′-2″ | 26 |
| K8 | 2 | 5 | 3 | 5′-6″ | 12 |
| K9 | 2 | 5 | 3 | 4′-8″ | 10 |
| K10 | 10 | 5 | STR. | 5′-3″ | 55 |
| K11 | 5 | 5 | STR. | 44′-4″ | 232 |
| K12 | 5 | 5 | STR. | 49′-11″ | 261 |
| K13 | 2 | 5 | 3 | 6′-6″ | 14 |
| K14 | 4 | 5 | 3 | 7′-6″ | 32 |
| K15 | 2 | 5 | 3 | 6′-10″ | 15 |
| K16 | 2 | 5 | 3 | 6′-0″ | 13 |
| S3 | 130 | 4 | 4 | 2′-9″ | 239 |
| U1 | 76 | 5 | 3 | 11′-6″ | 912 |
| REINFORCING STEEL TOTAL: | | | | | 39,553 |

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

| BAR SIZE | SUPERSTRUCTURE EXCEPT APPROACH SLABS, AND SIDEWALK | | APPROACH SLABS | | SIDEWALK |
|---|---|---|---|---|---|
| | EPOXY COATED | UNCOATED | EPOXY COATED | UNCOATED | EPOXY COATED |
| #4 | 1′-11″ | 1′-7″ | 1′-11″ | 1′-7″ | 1′-11″ |
| #5 | 2′-5″ | 2′-0″ | 2′-5″ | 2′-0″ | 2′-5″ |
| #6 | 2′-10″ | 2′-5″ | 2′-10″ | 2′-5″ | 2′-10″ |
| #7 | 4′-2″ | 2′-9″ | | | |

## BAR TYPES

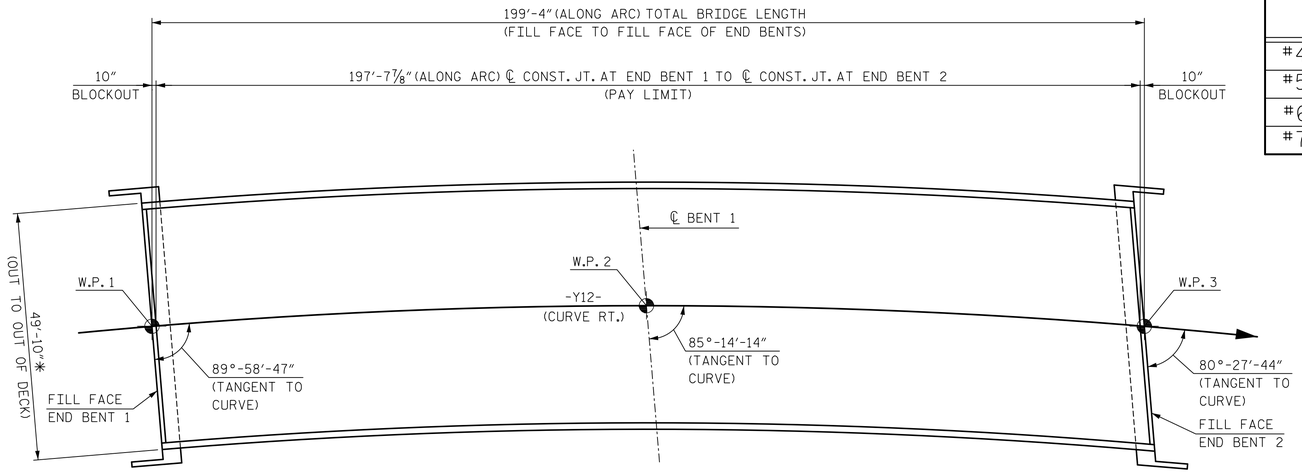



ALL BAR DIMENSIONS ARE OUT TO OUT

## SUPERSTRUCTURE BILL OF MATERIAL

| | CLASS AA CONCRETE | REINFORCING STEEL | EPOXY COATED REINFORCING STEEL |
|---|---|---|---|
| | ( CU. YDS. ) | ( LBS. ) | ( LBS. ) |
| POUR 1 | 128.8 | 39,553 | 43,625 |
| POUR 2 | 177.9 | | |
| POUR 3 | 82.7 | | |
| SIDEWALK | 64.2 | ——— | 3,582 |
| | | | |
| TOTALS | 453.6 | 39,553 | 47,207 |

| | | |
|---|---|---|
| ARCHITECTURAL CONCRETE SURFACE TREATMENT | SQ. FT. | 817 |
| APPLICATION OF BRIDGE COATING (LIGHT GRAY) | SQ. FT. | 690 |
| APPLICATION OF BRIDGE COATING (DARK GRAY) | SQ. FT. | 2,819 |




## LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 9,933)

✱ RADIAL DIMENSION

## GROOVING BRIDGE FLOORS

| | |
|---|---|
| APPROACH SLABS | 1,595 SQ.FT. |
| BRIDGE DECK | 6,512 SQ.FT. |
| TOTAL | 8,107 SQ.FT. |

PROJECT NO. I-4400C

BUNCOMBE COUNTY

STATION: POC 22+70.63 -Y12-

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 047328 KYLE ERVIN 6/7/2019

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

SUPERSTRUCTURE BILL OF MATERIAL

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DWG. NO. 25

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY | DATE | NO. | BY | DATE | S5-25 |
| 1 | | | 3 | | | TOTAL SHEETS |
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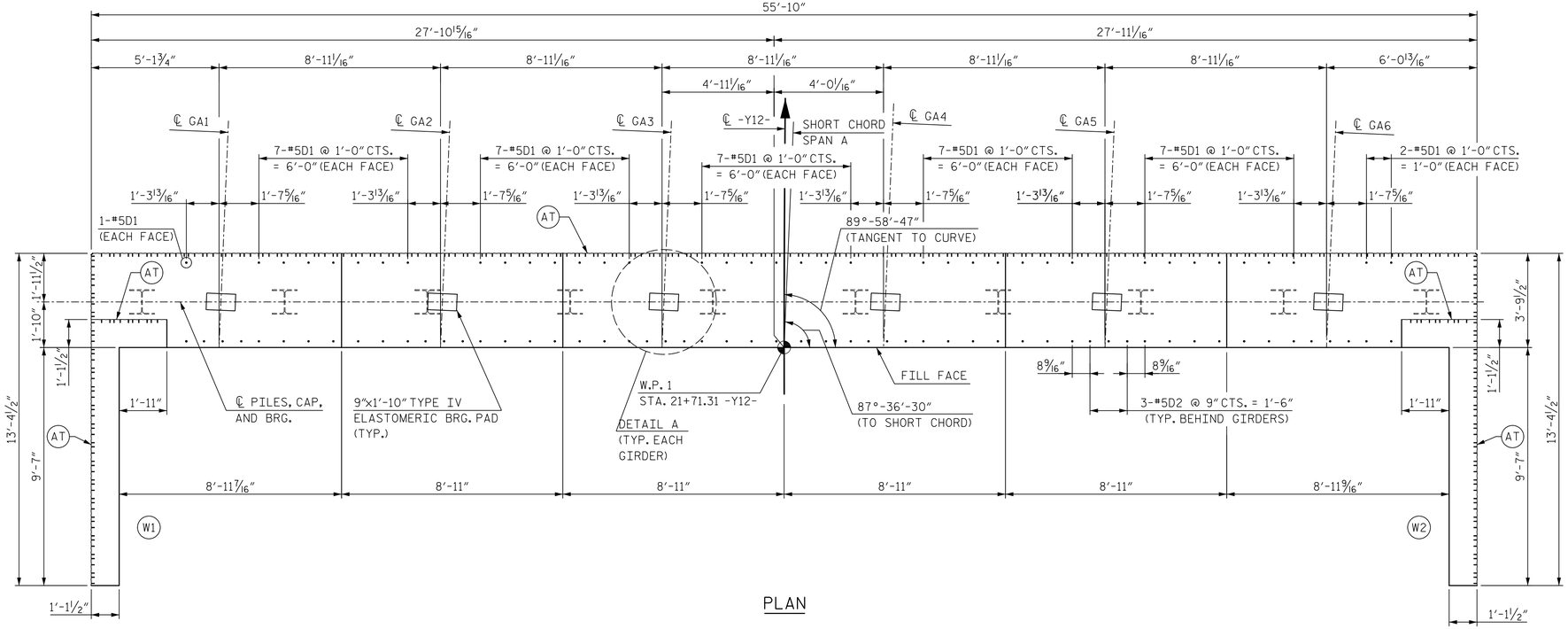
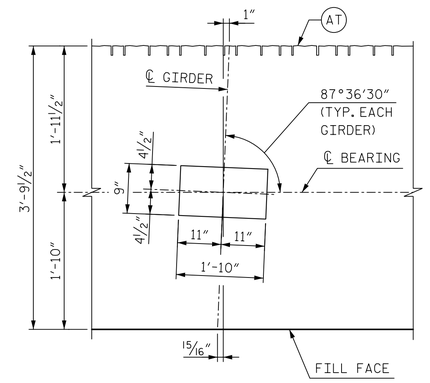
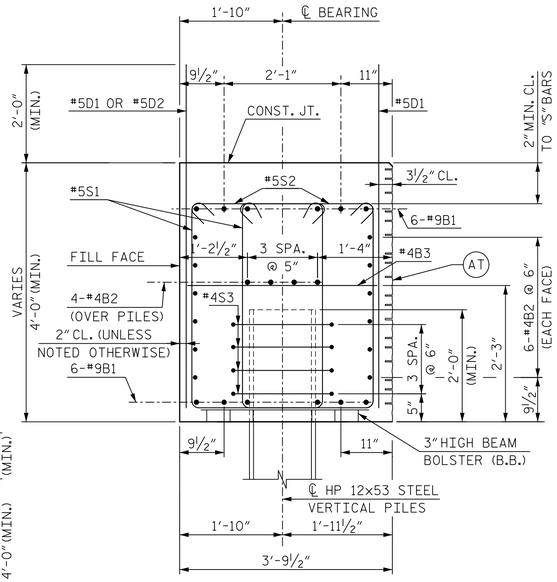
STD. NO. BOM2



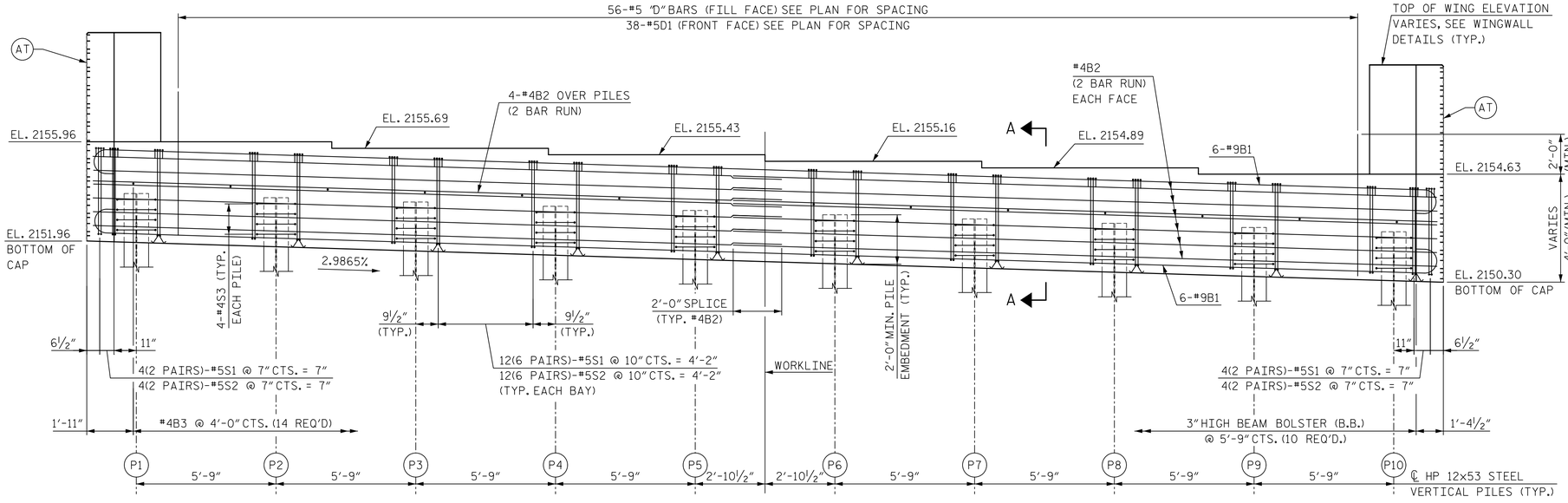

PLAN




DETAIL A




SECTION A-A




ELEVATION

AT LIMITS OF FORM LINED ARCHITECTURAL TREATMENT

| TOP OF PILE ELEVATIONS | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| PILE | (P1) | (P2) | (P3) | (P4) | (P5) | (P6) | (P7) | (P8) | (P9) | (P10) |
| ELEVATION | 2153.94 | 2153.77 | 2153.60 | 2153.42 | 2153.25 | 2153.08 | 2152.91 | 2152.74 | 2152.56 | 2152.39 |

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 47328 ENGINEER KYLE ERVIN
6/7/2019

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DWG. NO. 26

**PROJECT NO.** I-4400C
BUNCOMBE **COUNTY**
**STATION:** POC 22+70.63 -Y12-

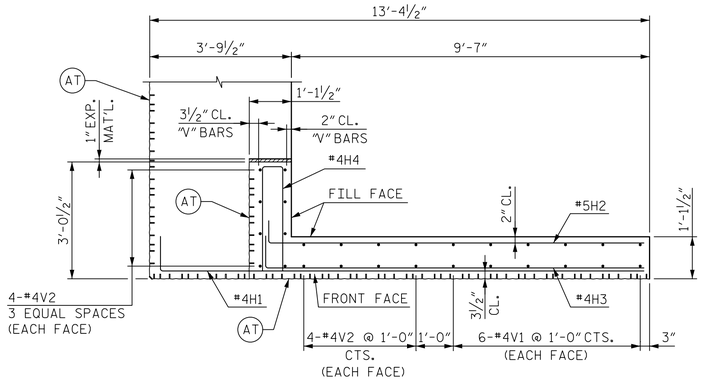
SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

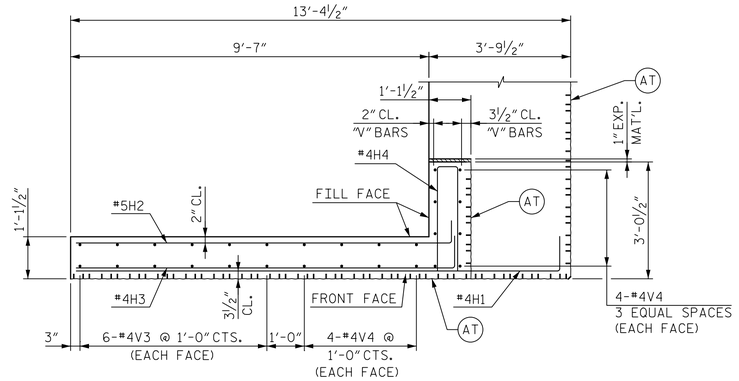
SUBSTRUCTURE

END BENT 1

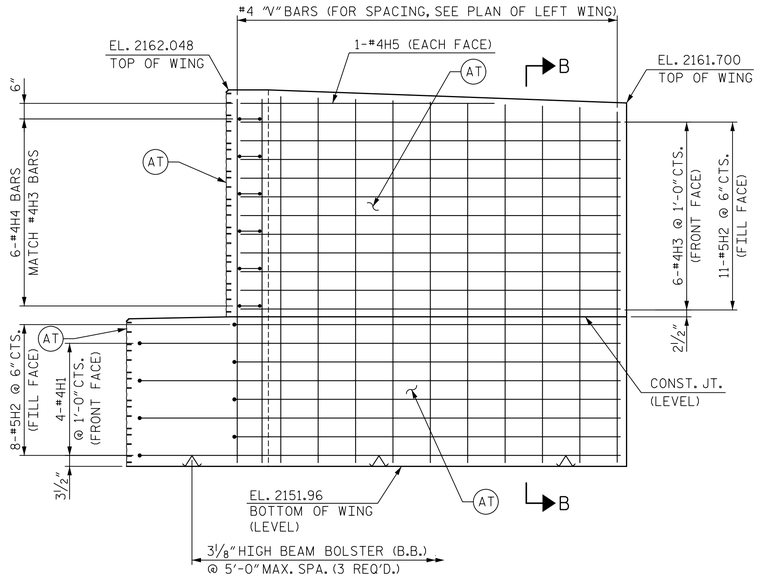
| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY | DATE | NO. | BY | DATE | S5-26 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 37 |




PLAN OF LEFT WING (W1)

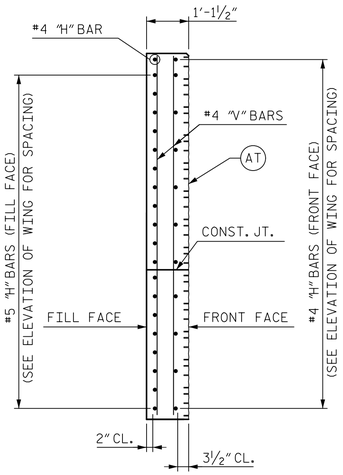



PLAN OF RIGHT WING (W2)

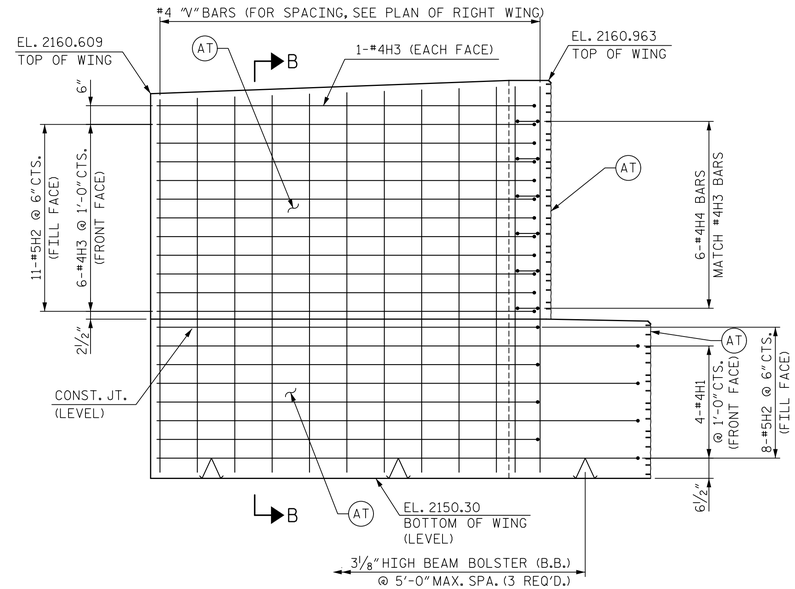



ELEVATION OF LEFT WING (W1)

(ARCHITECTURAL CONCRETE SURFACE TREATMENT NOT SHOWN FOR CLARITY)



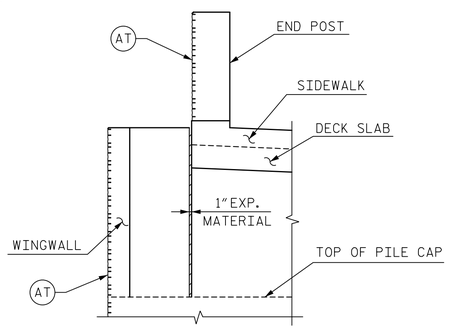

SECTION B-B




ELEVATION OF RIGHT WING (W2)

(ARCHITECTURAL CONCRETE SURFACE TREATMENT NOT SHOWN FOR CLARITY)

(AT) LIMITS OF FORM LINED ARCHITECTURAL TREATMENT




ELEVATION OF WINGWALL EXPANSION MATERIAL

(SEE SECTIONS D-D AND E-E ON "TYPICAL SECTION DETAILS" SHEET FOR LIMITS OF ARCHITECTURAL CONCRETE SURFACE TREATMENT ON SIDE OF END BENT DIAPHRAGM)

PROJECT NO. I-4400C

BUNCOMBE COUNTY

STATION: POC 22+70.63 -Y12-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
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RALEIGH

# SUBSTRUCTURE

## END BENT 1 WINGWALLS

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 47328 6/7/2019 KYLE ERVIN

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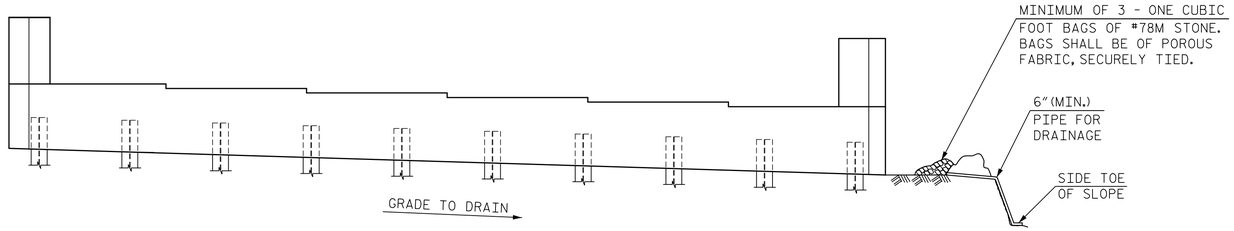
DESIGN ENGINEER OF RECORD K. ERVIN DATE 2/19

DWG. NO. 27

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY | DATE | NO. | BY | DATE | S5-27 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 37 |

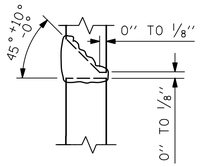



BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

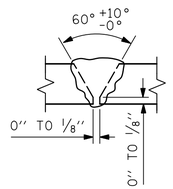
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

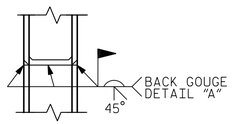
## TEMPORARY DRAINAGE AT END BENT 1



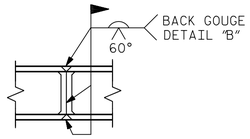

DETAIL "A"




DETAIL "B"




* PILE VERTICAL

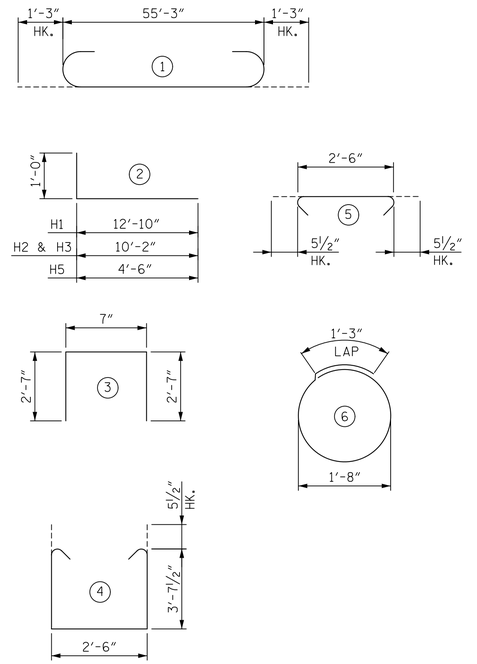



* PILE HORIZONTAL OR VERTICAL

* POSITION OF PILE DURING WELDING.

## PILE SPLICE DETAILS

## BAR TYPES




ALL BAR DIMENSIONS ARE OUT TO OUT

## BILL OF REINFORCING

END BENT 1

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| B1 | 12 | 9 | 1 | 57'-9" | 2,357 |
| B2 | 32 | 4 | STR. | 28'-8" | 613 |
| B3 | 14 | 4 | STR. | 3'-4" | 32 |
| | | | | | |
| D1 | 76 | 5 | STR. | 6'-3" | 496 |
| D2 | 18 | 5 | STR. | 7'-10" | 147 |
| | | | | | |
| H1 | 8 | 4 | 2 | 13'-10" | 74 |
| H2 | 38 | 5 | 2 | 11'-2" | 443 |
| H3 | 14 | 4 | 2 | 11'-2" | 105 |
| H4 | 12 | 4 | 3 | 5'-9" | 46 |
| H5 | 2 | 4 | 2 | 5'-6" | 8 |
| | | | | | |
| S1 | 116 | 5 | 4 | 10'-8" | 1,291 |
| S2 | 116 | 5 | 5 | 3'-5" | 414 |
| S3 | 40 | 4 | 6 | 6'-6" | 174 |
| | | | | | |
| V1 | 12 | 4 | STR. | 9'-3" | 75 |
| V2 | 16 | 4 | STR. | 9'-6" | 102 |
| V3 | 12 | 4 | STR. | 9'-10" | 79 |
| V4 | 16 | 4 | STR. | 10'-1" | 108 |

## QUANTITIES

| | | |
|---|---|---|
| REINFORCING STEEL | LBS. | 6,564 |
| | | |
| CLASS "A" CONCRETE BREAKDOWN | | |
| POUR 1 - CAP & BOT. OF WINGS | CU. YDS. | 36.0 |
| POUR 2 - TOP OF WINGS | CU. YDS. | 6.4 |
| TOTAL | CU. YDS. | 42.4 |
| | | |
| HP 12x53 STEEL PILES | NO. | 10 |
| | LIN. FT. | 695 |
| | | |
| PILE DRIVING EQUIPMENT SETUP | | |
| FOR HP 12x53 STEEL PILES | EACH | 10 |
| | | |
| ARCHITECTURAL CONCRETE SURFACE TREATMENT | SQ. FT. | 509 |

NOTES:

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

THE END BENT DIAPHRAGM SHALL BE POURED MONOLITHICALLY WITH THE SUPERSTRUCTURE. CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED IN THE SUPERSTRUCTURE BILL OF MATERIALS. FOR DETAILS, SEE SUPERSTRUCTURE SHEETS.

**PROJECT NO.** I-4400C

BUNCOMBE **COUNTY**

**STATION:** POC 22+70.63 -Y12-

SHEET 3 OF 3


STATE OF NORTH CAROLINA
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RALEIGH

SUBSTRUCTURE

END BENT 1

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DESIGN ENGINEER OF RECORD K. ERVIN DATE 2/19

DWG. NO. 28

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|---|---|---|---|---|---|---|
| NO. | BY | DATE | NO. | BY | DATE | S5-28 |
| 1 | | | 3 | | | TOTAL SHEETS |
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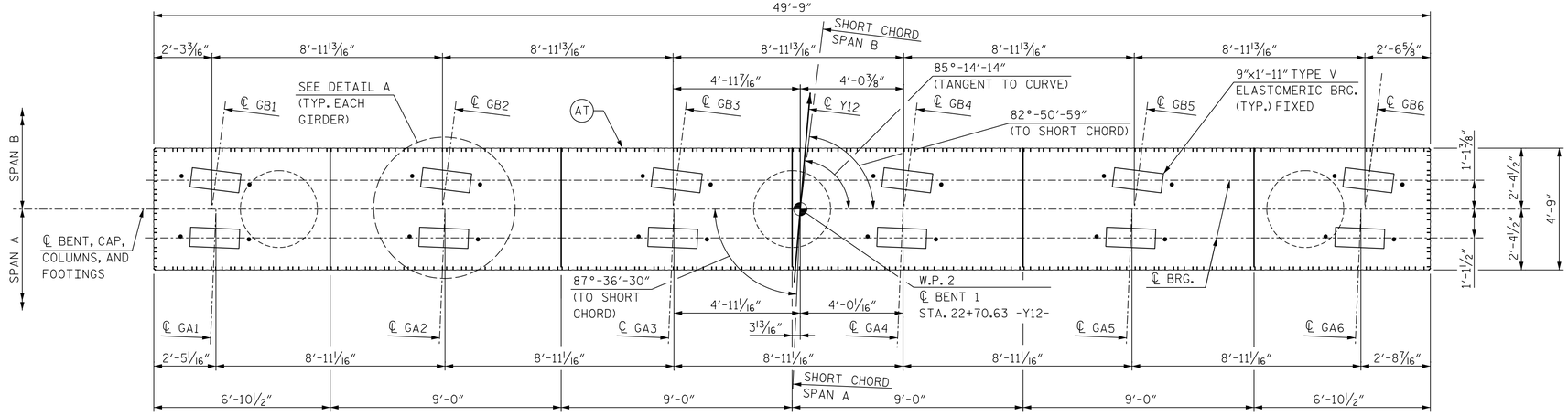
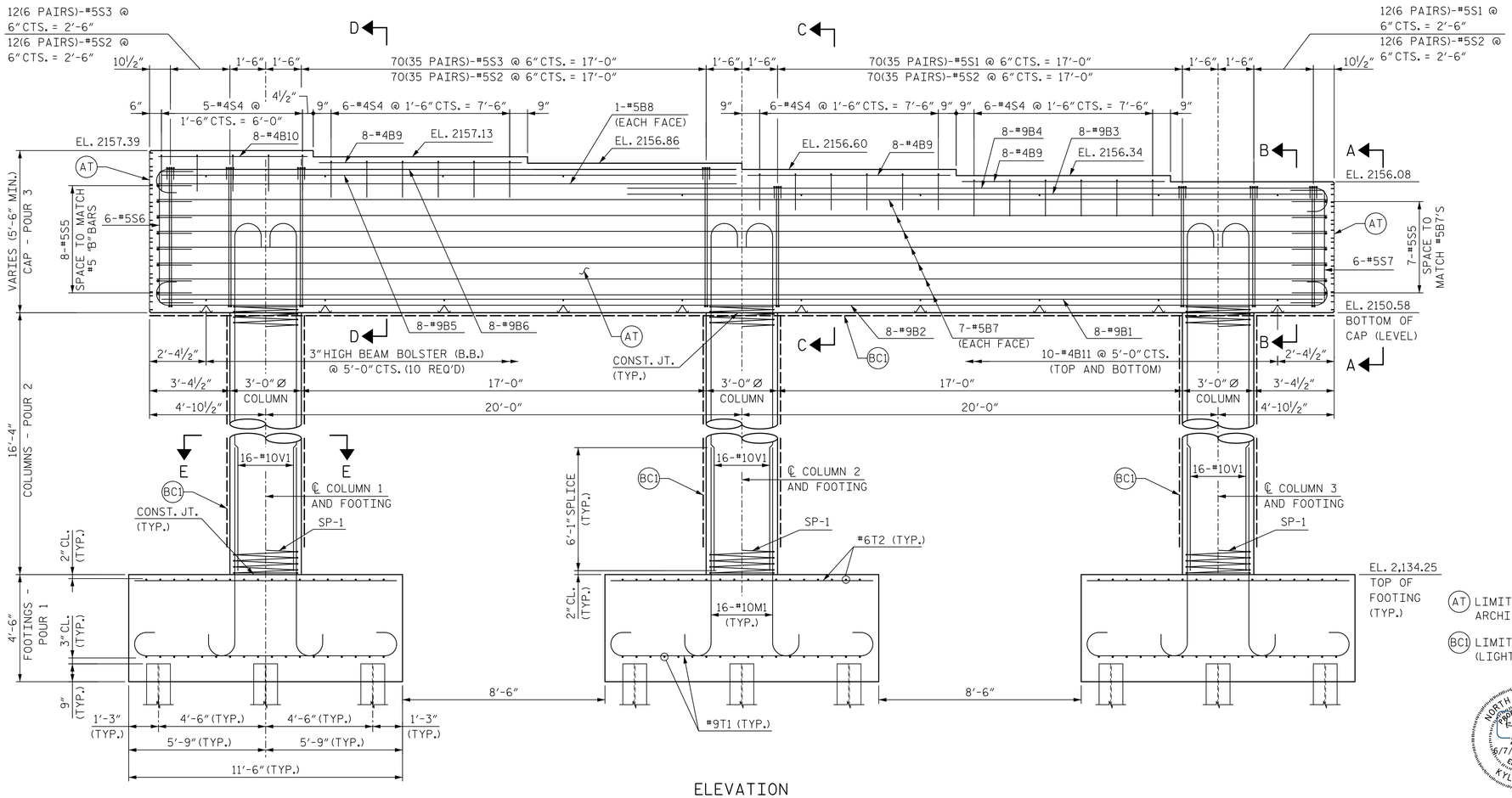



PLAN




ELEVATION

(ARCHITECTURAL CONCRETE SURFACE TREATMENT NOT SHOWN FOR CLARITY)

NOTES:

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

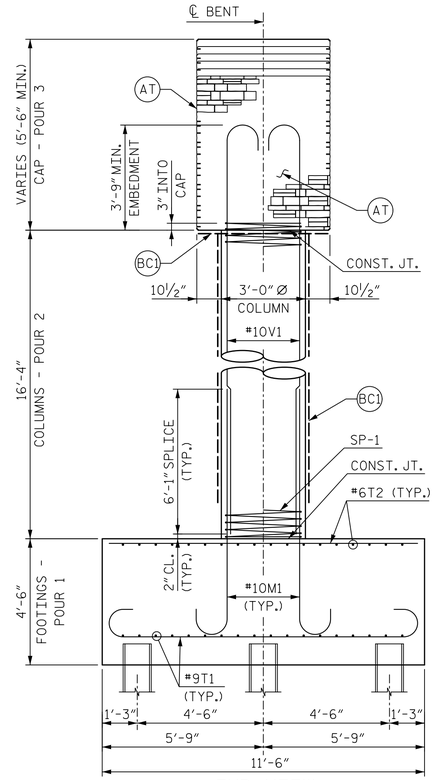
HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

FOR FOOTING PLAN, DETAIL A, AND PILE SPLICE DETAILS, SEE "BENT 1" (2 OF 3) SHEET.

FOR VIEW A-A, SECTIONS, AND BILL OF MATERIALS, SEE "BENT 1" (3 OF 3) SHEET.

LIMITS OF BRIDGE COATING SHALL EXTEND A MINIMUM OF 1 FT BELOW THE PROPOSED GROUND LINE.

W.P. DENOTES WORK POINT




END VIEW

PROJECT NO. I-4400C

BUNCOMBE COUNTY

STATION: POC 22+70.63 -Y12-

(AT) LIMITS OF FORM LINED ARCHITECTURAL TREATMENT

(BC1) LIMITS OF BRIDGE COATING (LIGHT GRAY)

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 47328 6/7/2019 KYLE ERVIN

SHEET 1 OF 3

STATE OF NORTH CAROLINA
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RALEIGH

SUBSTRUCTURE

BENT 1

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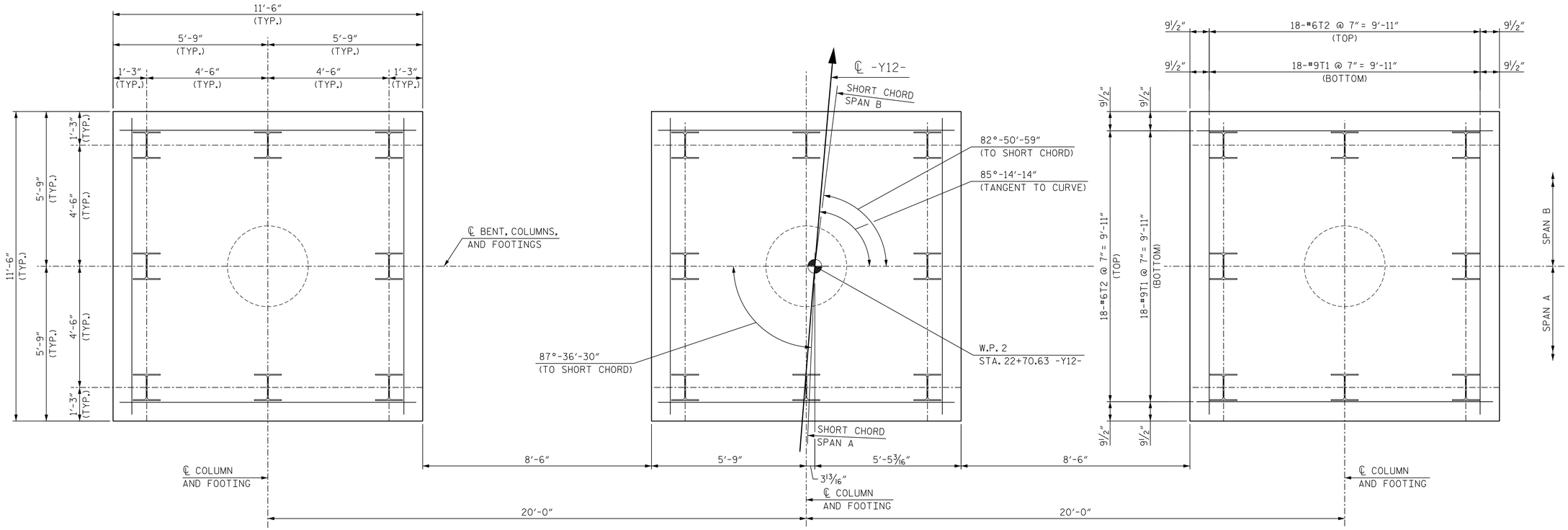
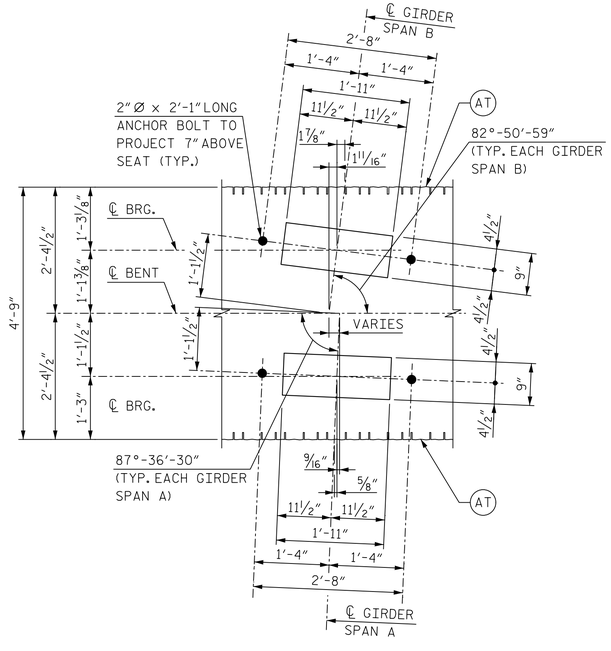
|---|---|---|---|---|---|---|
| NO. | BY | DATE | NO. | BY | DATE | S5-29 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 37 |

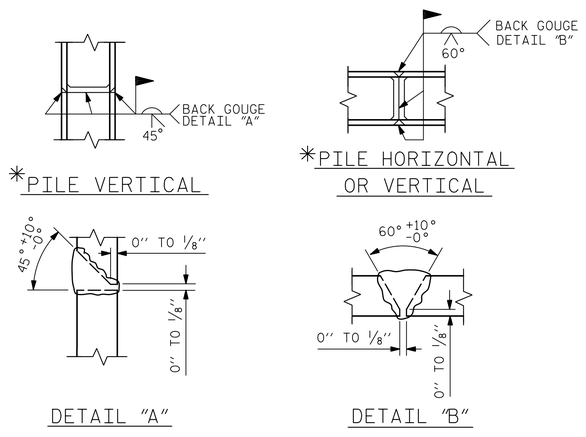



## FOOTING PLAN

(DIMENSIONS AND REINFORCING ARE TYPICAL FOR EACH FOOTING)




DETAIL A




✳ POSITION OF PILE DURING WELDING.

## PILE SPLICE DETAILS

NOTE:
W.P. DENOTES WORK POINT

(AT) LIMITS OF FORM LINED ARCHITECTURAL TREATMENT

PROJECT NO. I-4400C
BUNCOMBE COUNTY
STATION: POC 22+70.63 -Y12-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 47328 6/7/2019 ENGINEER KYLE ERVIN

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DESIGN ENGINEER OF RECORD K. ERVIN DATE 11/18
DWG. NO. 30

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY | DATE | NO. | BY | DATE | S5-30 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 37 |

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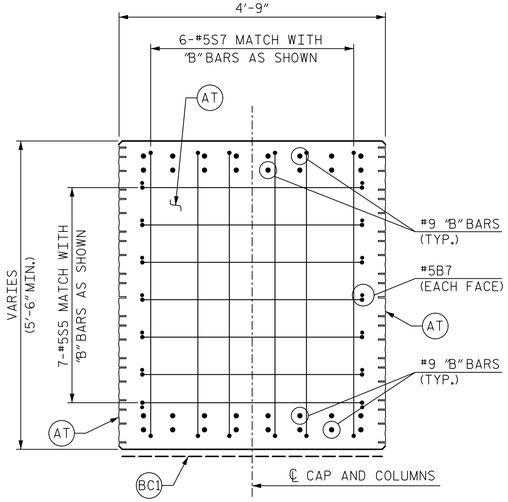
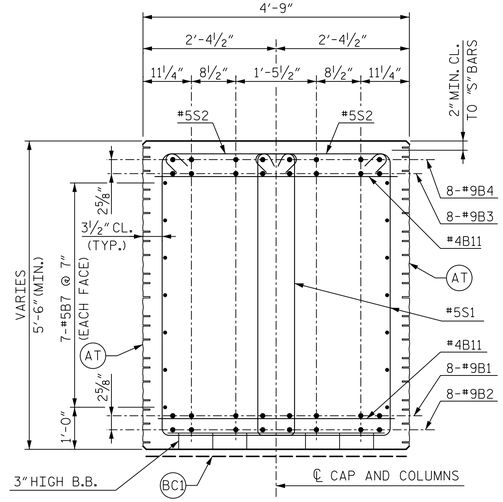
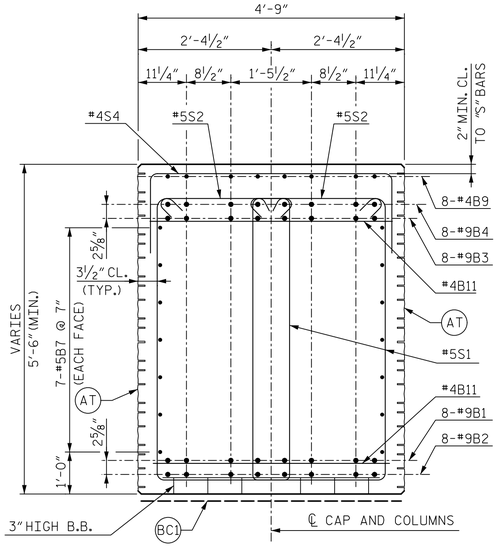



## VIEW A-A

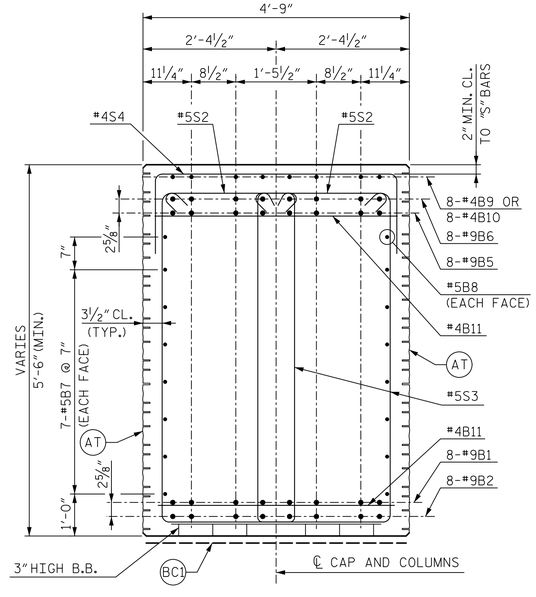
(ARCHITECTURAL CONCRETE SURFACE TREATMENT NOT SHOWN FOR CLARITY)




## SECTION B-B

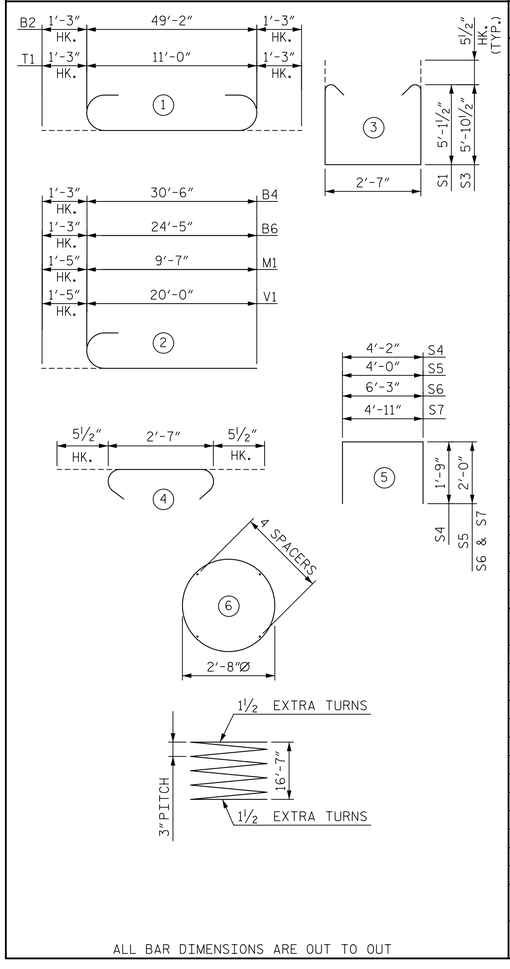



## SECTION C-C




## SECTION D-D

## BAR TYPES




ALL BAR DIMENSIONS ARE OUT TO OUT

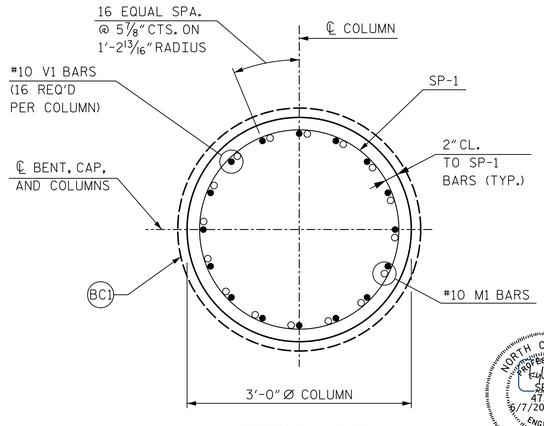
## BILL OF REINFORCING

BENT 1

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| B1 | 8 | 9 | STR | 49'-2" | 1,338 |
| B2 | 8 | 9 | 1 | 51'-8" | 1,406 |
| B3 | 8 | 9 | STR | 30'-6" | 830 |
| B4 | 8 | 9 | 2 | 31'-9" | 864 |
| B5 | 8 | 9 | STR | 24'-5" | 665 |
| B6 | 8 | 9 | 2 | 25'-8" | 699 |
| B7 | 14 | 5 | STR | 49'-2" | 718 |
| B8 | 2 | 5 | STR | 24'-5" | 51 |
| B9 | 24 | 4 | STR | 8'-8" | 139 |
| B10 | 8 | 4 | STR | 6'-5" | 35 |
| B11 | 20 | 4 | STR | 4'-2" | 56 |
| | | | | | |
| M1 | 48 | 10 | 2 | 11'-0" | 2,272 |
| | | | | | |
| S1 | 82 | 5 | 3 | 13'-9" | 1,176 |
| S2 | 164 | 5 | 4 | 3'-6" | 599 |
| S3 | 82 | 5 | 3 | 15'-3" | 1,305 |
| S4 | 23 | 4 | 5 | 7'-8" | 118 |
| S5 | 15 | 5 | 5 | 8'-0" | 126 |
| S6 | 6 | 5 | 5 | 10'-3" | 65 |
| S7 | 6 | 5 | 5 | 8'-11" | 56 |
| | | | | | |
| SP-1 | 3 | ** | 6 | 577'-6" | 1,158 |
| | | | | | |
| T1 | 108 | 9 | 1 | 13'-6" | 4,958 |
| T2 | 108 | 6 | STR | 11'-0" | 1,785 |
| | | | | | |
| V1 | 48 | 10 | 2 | 21'-5" | 4,424 |
| | | | | | |

## QUANTITIES

| | | |
|---|---|---|
| REINFORCING STEEL | LBS. | 23,685 |
| SPIRAL COLUMN REINFORCING STEEL | LBS. | 1,158 |
| CLASS A CONCRETE | | |
| FOOTINGS POUR 1 | CU. YDS. | 66.1 |
| COLUMNS POUR 2 | CU. YDS. | 12.8 |
| CAP POUR 3 | CU. YDS. | 53.9 |
| TOTAL | CU. YDS. | 132.8 |
| HP 12x53 STEEL PILES | NO. | 24 |
| | LIN. FT. | 1,098 |
| FOUNDATION EXCAVATION | LUMP SUM | L.S. |
| PILE DRIVING EQUIPMENT SETUP | | |
| FOR HP 12x53 STEEL PILES | EACH | 24 |
| ARCHITECTURAL CONCRETE SURFACE TREATMENT | SQ. FT. | 668 |
| APPLICATION OF BRIDGE COATING (LIGHT GRAY) | SQ. FT. | 649 |




## SECTION E-E

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 047328 6/7/2019 ENGINEER KYLE ERVIN

(AT) LIMITS OF FORM LINED ARCHITECTURAL TREATMENT

(BC1) LIMITS OF BRIDGE COATING (LIGHT GRAY)

**PROJECT NO.** I-4400C

BUNCOMBE **COUNTY**

**STATION:** POC 22+70.63 -Y12-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

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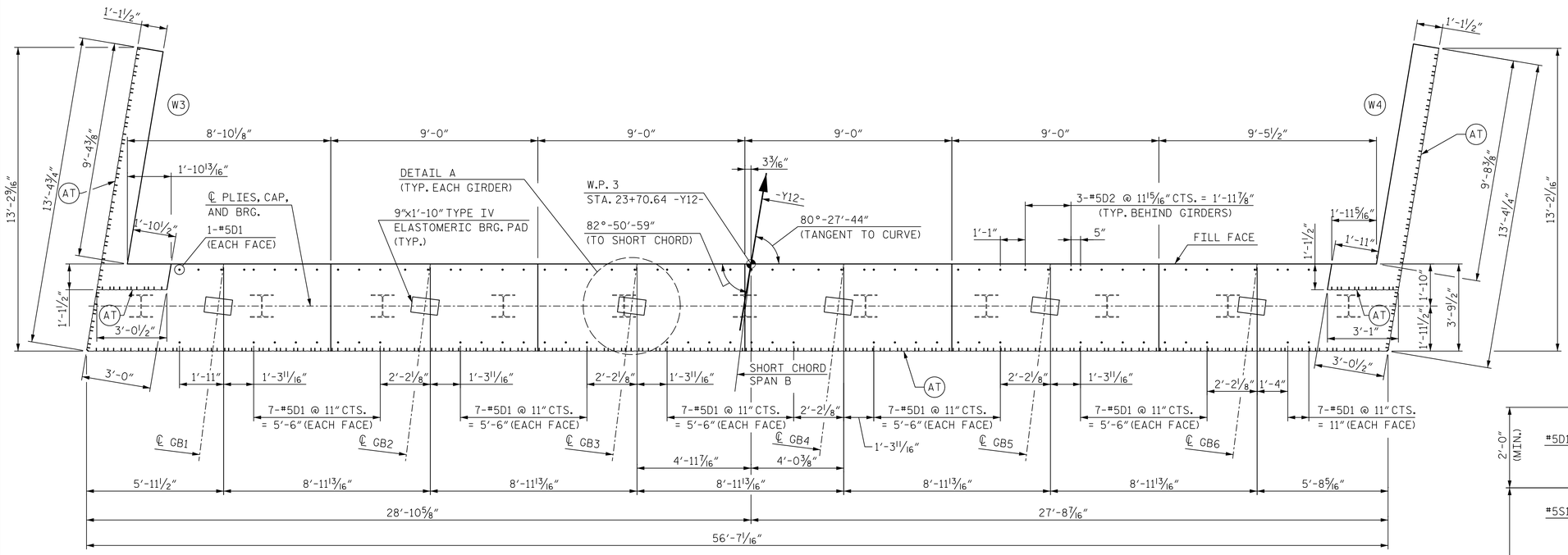
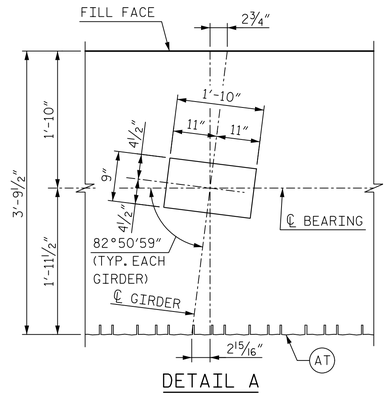
DRAWN BY B. VAUGHN DATE 11/18
CHECKED BY R. RAPP DATE 11/18
DESIGN ENGINEER OF RECORD R. RAPP DATE 11/18

DWG. NO. 31

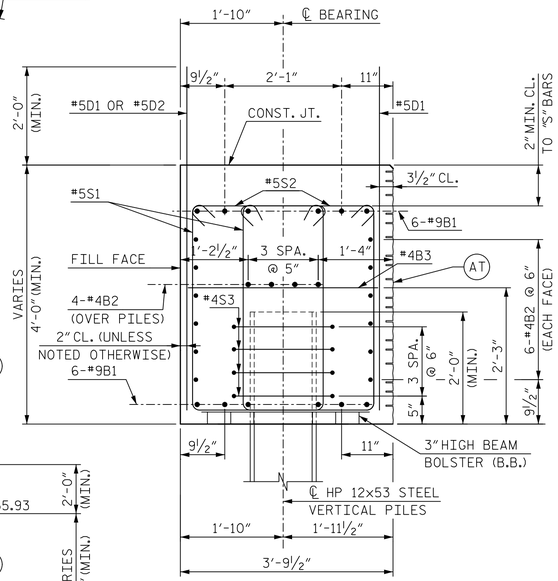
| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY | DATE | NO. | BY | DATE | S5-31 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 37 |



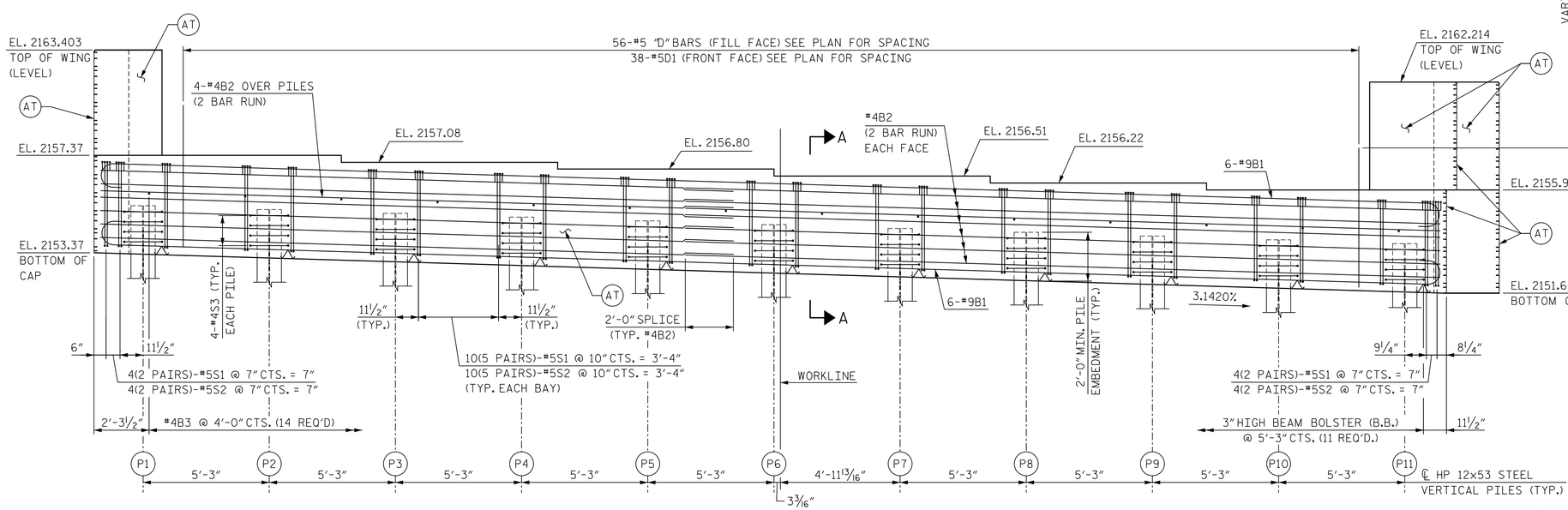

PLAN




DETAIL A




SECTION A-A




ELEVATION

(ARCHITECTURAL CONCRETE SURFACE TREATMENT NOT SHOWN FOR CLARITY)

| TOP OF PILE ELEVATIONS | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PILE | (P1) | (P2) | (P3) | (P4) | (P5) | (P6) | (P7) | (P8) | (P9) | (P10) | (P11) |
| ELEVATION | 2155.35 | 2155.18 | 2155.02 | 2154.85 | 2154.69 | 2154.52 | 2154.36 | 2154.19 | 2154.03 | 2153.86 | 2153.70 |

(AT) LIMITS OF FORM LINED ARCHITECTURAL TREATMENT

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 47328 6/7/2019 KYLE ERVIN

**PROJECT NO.** I-4400C

BUNCOMBE **COUNTY**

**STATION:** POC 22+70.63 -Y12-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

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DRAWN BY B. VAUGHN DATE 2/19
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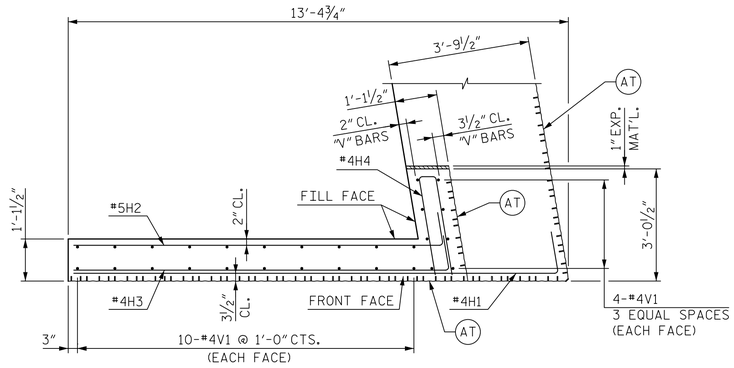
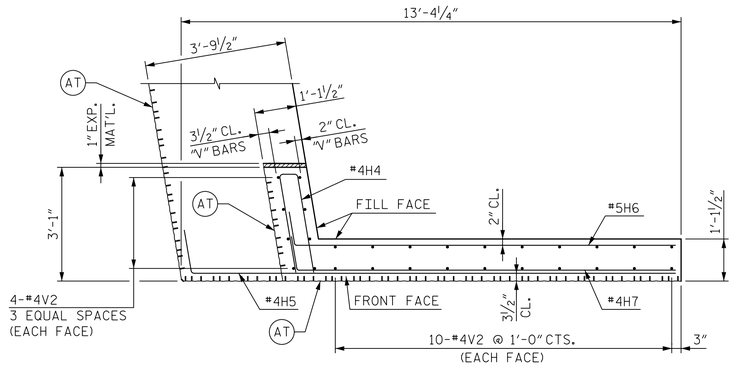
DESIGN ENGINEER OF RECORD K. ERVIN DATE 2/19

DWG. NO. 32

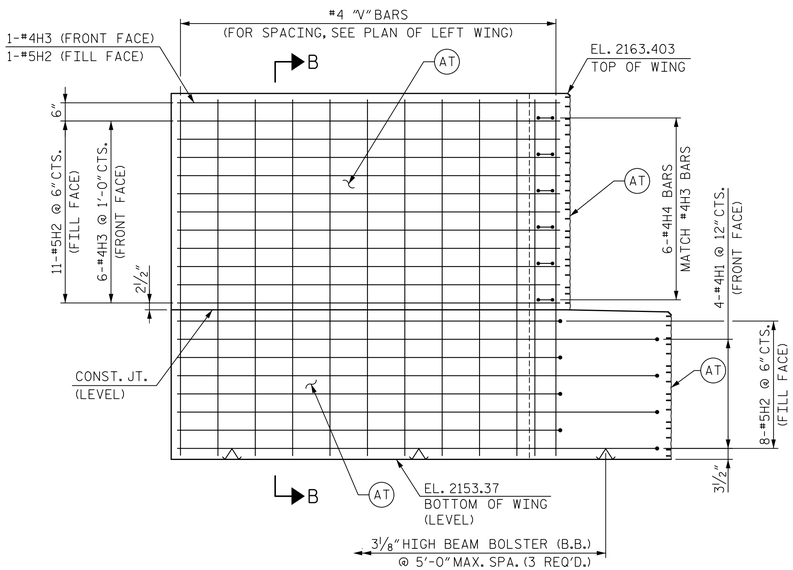
| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY | DATE | NO. | BY | DATE | S5-32 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 37 |




PLAN OF LEFT WING (W3)

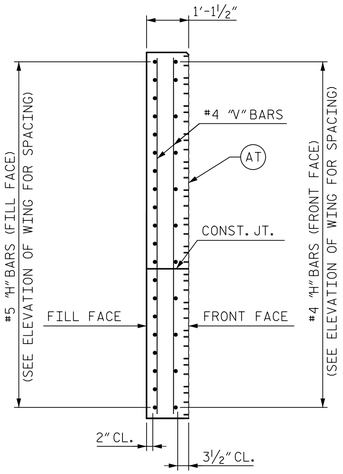



PLAN OF RIGHT WING (W4)

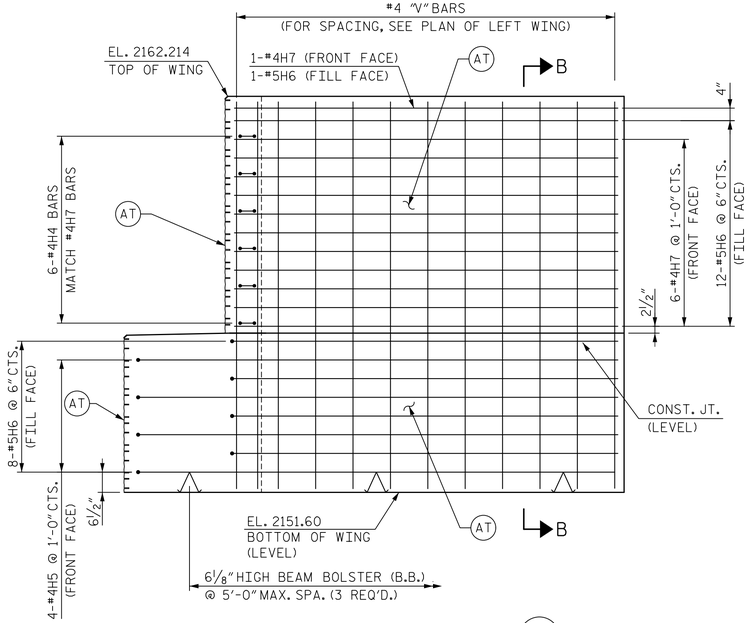



ELEVATION OF LEFT WING (W3)

(ARCHITECTURAL CONCRETE SURFACE TREATMENT NOT SHOWN FOR CLARITY)



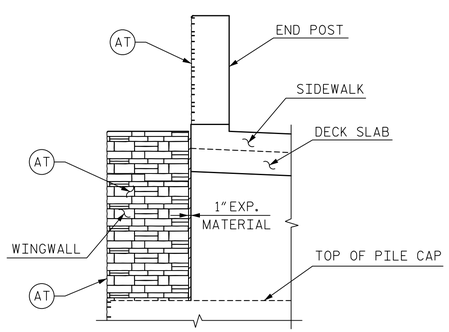

SECTION B-B




ELEVATION OF RIGHT WING (W4)

(ARCHITECTURAL CONCRETE SURFACE TREATMENT NOT SHOWN FOR CLARITY)

(AT) LIMITS OF FORM LINED ARCHITECTURAL TREATMENT




ELEVATION OF WINGWALL EXPANSION MATERIAL

(SEE SECTIONS D-D AND E-E ON "TYPICAL SECTION DETAILS" SHEET FOR LIMITS OF ARCHITECTURAL CONCRETE SURFACE TREATMENT ON SIDE OF END BENT DIAPHRAGM)

**PROJECT NO.** I-4400C

BUNCOMBE **COUNTY**

**STATION:** POC 22+70.63 -Y12-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2
WINGWALLS

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 47328 6/7/2019 ENGINEER KYLE ERVIN

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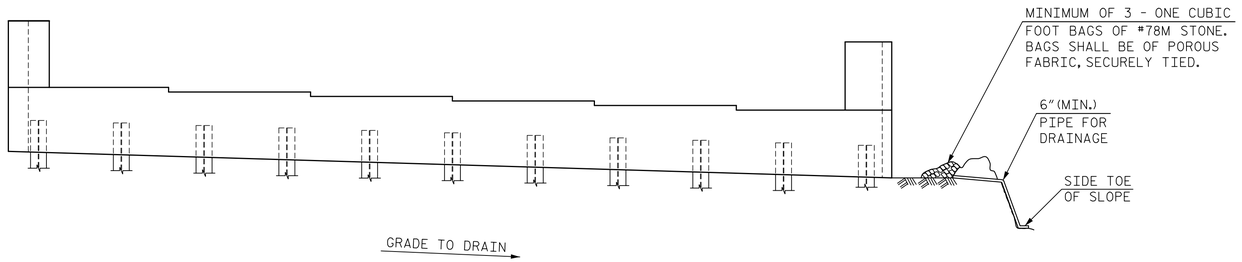
DRAWN BY B. VAUGHN DATE 2/19
CHECKED BY K. ERVIN DATE 2/19
DESIGN ENGINEER OF RECORD K. ERVIN DATE 2/19

DWG. NO. 33

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY | DATE | NO. | BY | DATE | S5-33 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 37 |

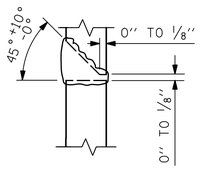



BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

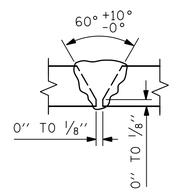
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

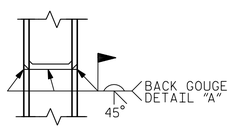
## TEMPORARY DRAINAGE AT END BENT 2



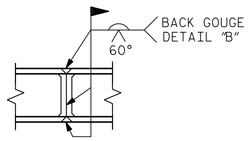

DETAIL "A"




DETAIL "B"




* PILE VERTICAL

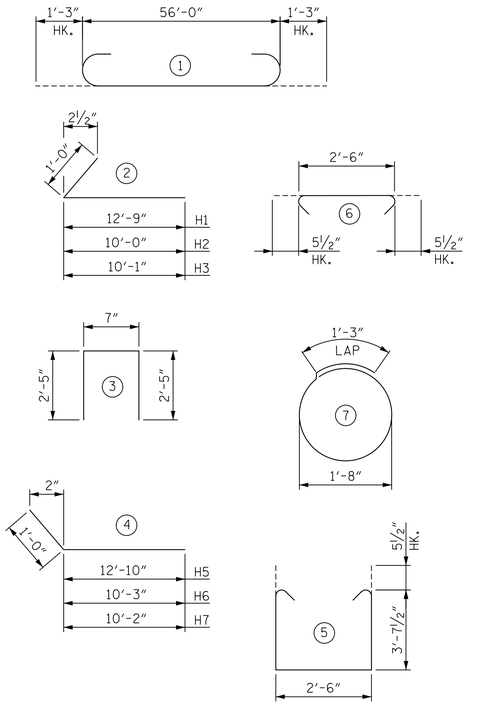



* PILE HORIZONTAL OR VERTICAL

* POSITION OF PILE DURING WELDING.

## PILE SPLICE DETAILS

## BAR TYPES




ALL BAR DIMENSIONS ARE OUT TO OUT

## BILL OF REINFORCING

END BENT 2

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| B1 | 12 | 9 | 1 | 58'-6" | 2,387 |
| B2 | 32 | 4 | STR. | 29'-0" | 620 |
| B3 | 14 | 4 | STR. | 3'-4" | 32 |
| D1 | 76 | 5 | STR. | 6'-3" | 496 |
| D2 | 18 | 5 | STR. | 7'-10" | 147 |
| H1 | 4 | 4 | 2 | 13'-9" | 37 |
| H2 | 20 | 5 | 2 | 11'-0" | 230 |
| H3 | 7 | 4 | 2 | 11'-1" | 52 |
| H4 | 12 | 4 | 3 | 5'-5" | 44 |
| H5 | 4 | 4 | 4 | 13'-10" | 37 |
| H6 | 21 | 5 | 4 | 11'-3" | 247 |
| H7 | 7 | 4 | 4 | 11'-2" | 53 |
| S1 | 108 | 5 | 5 | 10'-8" | 1,202 |
| S2 | 108 | 5 | 6 | 3'-5" | 385 |
| S3 | 44 | 4 | 7 | 6'-6" | 191 |
| V1 | 28 | 4 | STR. | 9'-7" | 180 |
| V2 | 28 | 4 | STR. | 10'-2" | 191 |

## QUANTITIES

| | | |
|---|---|---|
| REINFORCING STEEL | LBS. | 6,531 |
| CLASS "A" CONCRETE BREAKDOWN | | |
| POUR 1 - CAP & BOT. OF WINGS | CU. YDS. | 36.4 |
| POUR 2 - TOP OF WINGS | CU. YDS. | 6.4 |
| TOTAL | CU. YDS. | 42.8 |
| HP 12x53 STEEL PILES | NO. | 11 |
| | LIN. FT. | 627 |
| PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES | EACH | 11 |
| ARCHITECTURAL CONCRETE SURFACE TREATMENT | SQ. FT. | 514 |

NOTES:

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

THE END BENT DIAPHRAGM SHALL BE POURED MONOLITHICALLY WITH THE SUPERSTRUCTURE. CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED IN THE SUPERSTRUCTURE BILL OF MATERIALS. FOR DETAILS, SEE SUPERSTRUCTURE SHEETS.

PROJECT NO. I-4400C

BUNCOMBE COUNTY

STATION: POC 22+70.63 -Y12-

SHEET 3 OF 3


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

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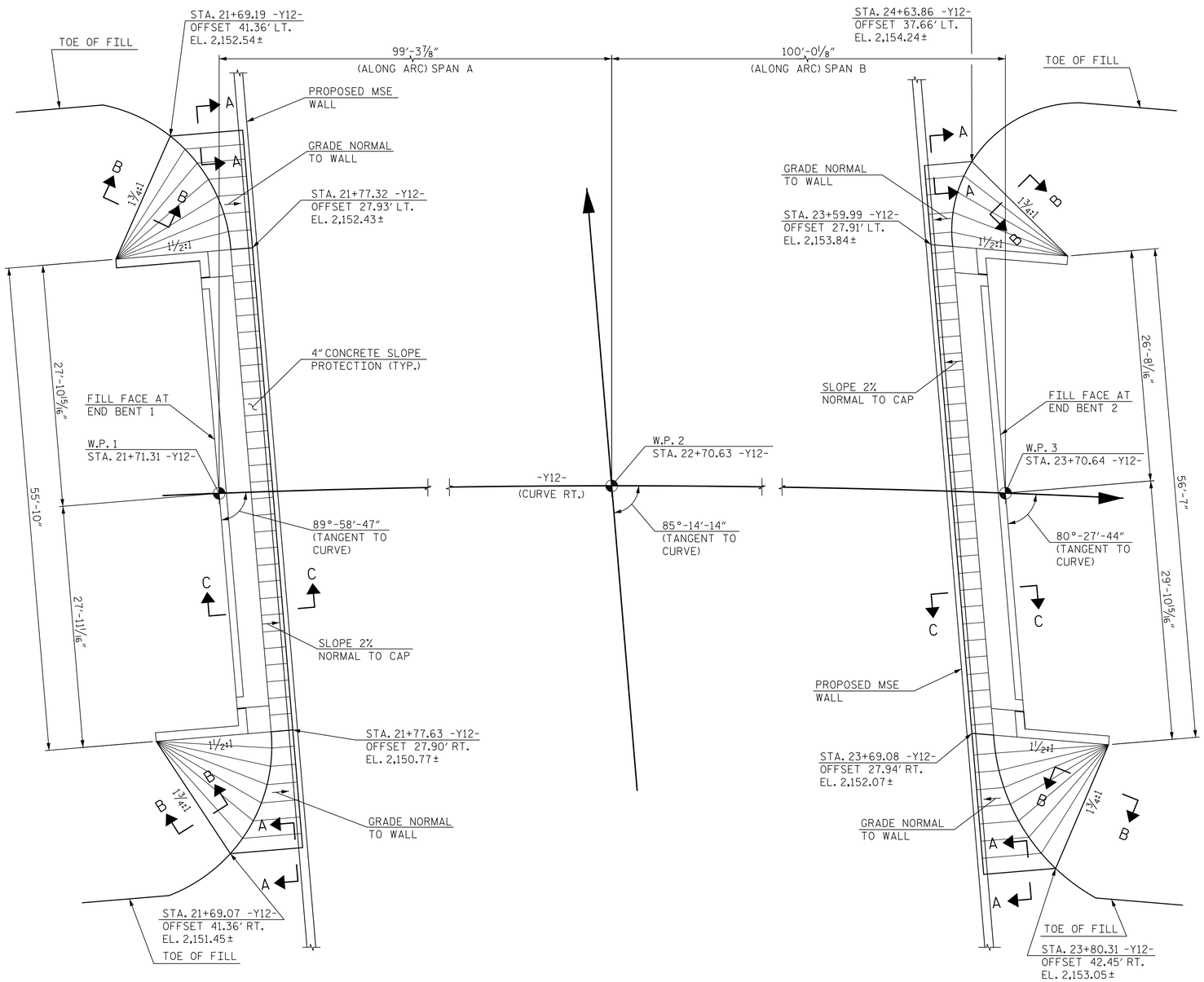
DESIGN ENGINEER OF RECORD K. ERVIN DATE 2/19

DWG. NO. 34

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY | DATE | NO. | BY | DATE | S5-34 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 37 |




PLAN AT END BENT 1




PLAN AT END BENT 2

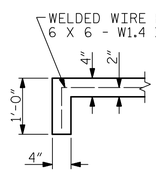
SLOPE PROTECTION LAYOUT

## NOTES:

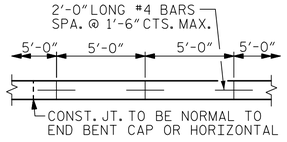
STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS. FOR BERM WIDTH, SEE GENERAL DRAWING. SLOPE PROTECTION SHALL CONSIST OF 4'' POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60'' WIDE. SLOPE PROTECTION SHALL BE POURED IN 5' STRIPS AS SHOWN IN THE "POURING DETAIL" WITH 2'-0" LONG #4 BARS PLACED ALONG THE SLOPE BETWEEN STRIPS AT 1'-6" MAXIMUM SPACING. SLOPE PROTECTION MAY BE POURED IN ALTERNATE 4' AND 5' STRIPS AS SHOWN IN THE "OPTIONAL POURING DETAIL" WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6''. THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

| BRIDGE @ STA. 22+70.63 -Y12- | 4 INCH SLOPE PROTECTION | ✳ WELDED WIRE FABRIC 60 INCHES WIDE |
|---|---|---|
| | SQUARE YARDS | APPROX. L.F. |
| END BENT 1 | 56 | 101 |
| END BENT 2 | 51 | 92 |

✳ QUANTITY SHOWN IS BASED ON 5' POURS.

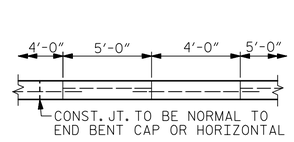



SECTION A-A



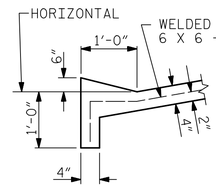

STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL

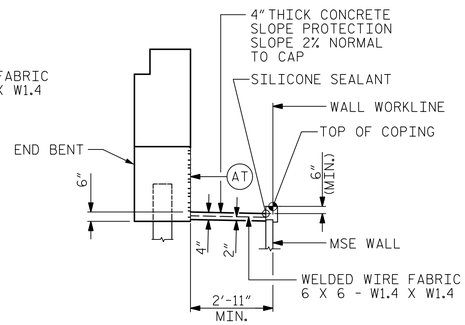



POUR A 4'-0'' STRIP FIRST. STRIP WIDTHS MAY VARY IN CURVED PORTION.

OPTIONAL POURING DETAIL




SECTION B-B




SECTION C-C

(AT) LIMITS OF FORM LINED ARCHITECTURAL TREATMENT

PROJECT NO. I-4400C

BUNCOMBE COUNTY

STATION: POC 22+70.63 -Y12-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

SLOPE PROTECTION DETAILS

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 47328 6/7/2019 KYLE ERVIN

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY B. VAUGHN DATE 11/18
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DWG. NO. 35

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY | DATE | NO. | BY | DATE | S3-35 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 37 |

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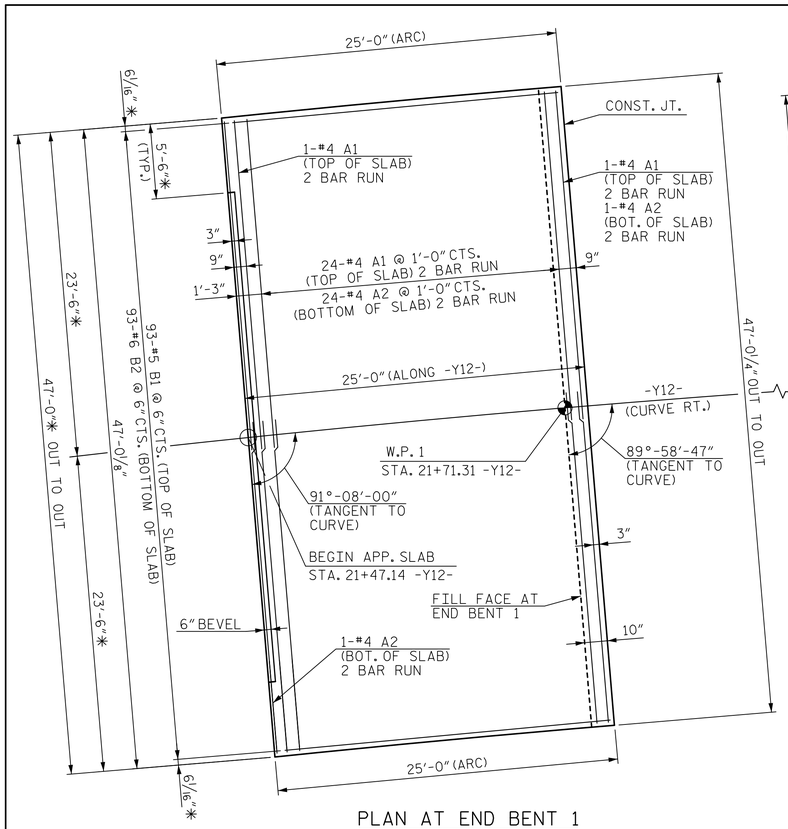
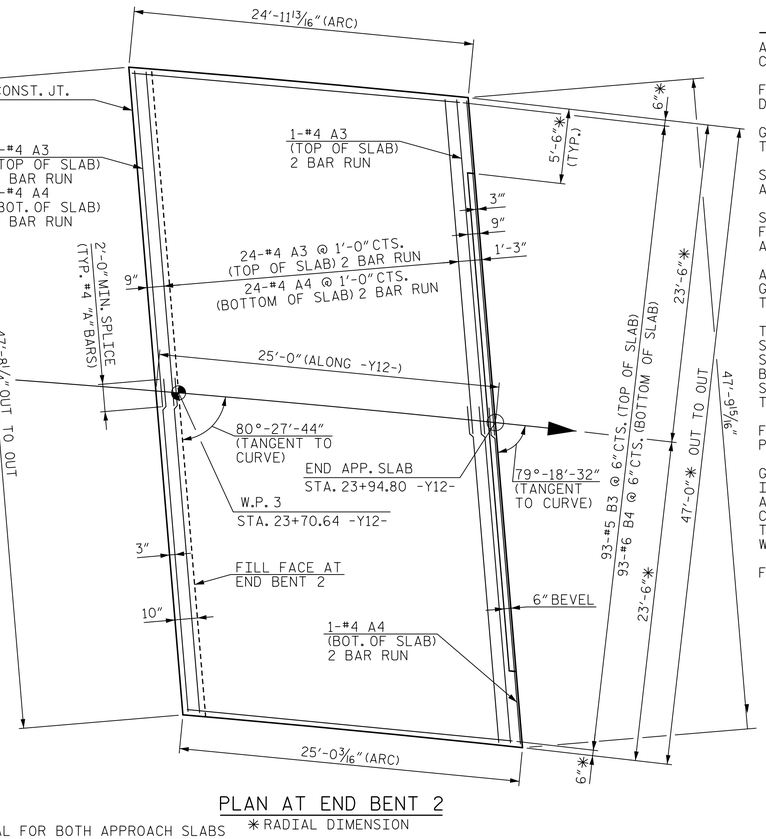
STD. NO. SP1




## PLAN AT END BENT 1

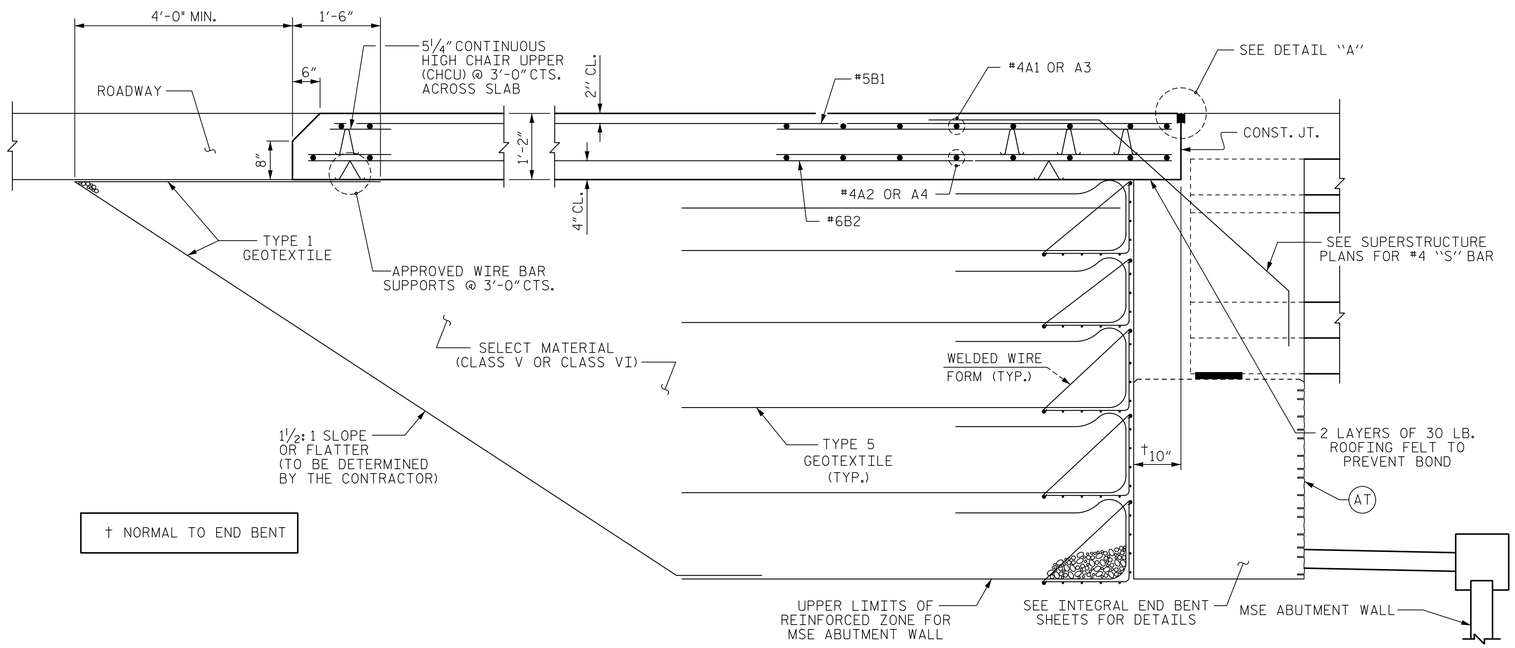
* RADIAL DIMENSION




## PLAN AT END BENT 2

* RADIAL DIMENSION

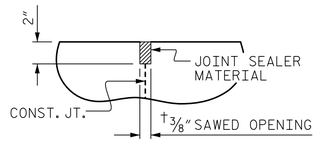
DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS
SIDEWALKS ON APPROACH SLABS NOT SHOWN FOR CLARITY




† NORMAL TO END BENT

## SECTION THRU SLAB

(TYPE A - ALTERNATE APPROACH FILL)




## DETAIL "A"

(AT) LIMITS OF FORM LINED ARCHITECTURAL TREATMENT

## NOTES

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

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 6" Ø DRAINAGE PIPE, AND SELECT MATERIAL, SEE ROADWAY PLANS.

GEOTEXTILE SHALL BE TYPE 1 AND TYPE 5 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

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

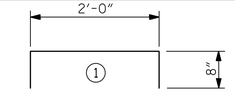
THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWED NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.

FOR SIDEWALK ON APPROACH SLAB REINFORCING STEEL PLACEMENT, SEE "BRIDGE APPROACH SLAB DETAILS" SHEET.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF SIDEWALK IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT A SPACING OF 8 FT. TO 10 FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINT WILL BE REQUIRED SEGMENTS LESS THAN 10 FEET IN LENGTH.

FOR EDGE OF APPROACH SLAB ARC OFFSETS, SEE SHEET 2 OF 2.

## BAR TYPES




ALL BAR DIMENSIONS ARE OUT TO OUT

## BILL OF MATERIAL

### FOR APPROACH SLAB AT END BENT 1

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| * A1 | 52 | 4 | STR | 24'-4" | 846 |
| A2 | 52 | 4 | STR | 24'-4" | 846 |
| | | | | | |
| * B1 | 93 | 5 | STR | 24'-1" | 2,336 |
| B2 | 93 | 6 | STR | 24'-7" | 3,434 |
| * B5 | 10 | 4 | STR | 24'-7" | 165 |
| | | | | | |
| * G1 | 50 | 4 | STR | 5'-1" | 170 |
| | | | | | |
| * U1 | 20 | 4 | 1 | 3'-4" | 45 |
| | | | | | |
| REINFORCING STEEL | | | | LBS. | 4,280 |
| * EPOXY COATED REINFORCING STEEL | | | | LBS. | 3,562 |
| | | | | | |
| CLASS AA CONCRETE BREAKDOWN | | | | | |
| APPROACH SLAB | | | | C. Y. | 50.6 |
| SIDEWALK | | | | C. Y. | 5.6 |
| TOTAL | | | | C. Y. | 56.2 |

## BILL OF MATERIAL

### FOR APPROACH SLAB AT END BENT 2

| | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| * A3 | 52 | 4 | STR | 24'-8" | 857 |
| A4 | 52 | 4 | STR | 24'-8" | 857 |
| | | | | | |
| * B3 | 93 | 5 | STR | 24'-1" | 2,336 |
| B4 | 93 | 6 | STR | 24'-7" | 3,434 |
| * B5 | 10 | 4 | STR | 24'-7" | 165 |
| | | | | | |
| * G1 | 50 | 4 | STR | 5'-1" | 170 |
| | | | | | |
| * U1 | 20 | 4 | 1 | 3'-4" | 45 |
| | | | | | |
| REINFORCING STEEL | | | | LBS. | 4,291 |
| * EPOXY COATED REINFORCING STEEL | | | | LBS. | 3,573 |
| | | | | | |
| CLASS AA CONCRETE BREAKDOWN | | | | | |
| APPROACH SLAB | | | | C. Y. | 50.6 |
| SIDEWALK | | | | C. Y. | 5.6 |
| TOTAL | | | | C. Y. | 56.2 |

**PROJECT NO.** I-4400C

BUNCOMBE **COUNTY**

**STATION:** POC 22+70.63 -Y12-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

# BRIDGE APPROACH SLAB FOR INTEGRAL END BENT

Digitally signed by: CAROLINA KYLE ERVIN
NORTH CAROLINA PROFESSIONAL ENGINEER 047328
SEAL 47328 6/13/2019 ENGINEER KYLE ERVIN

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

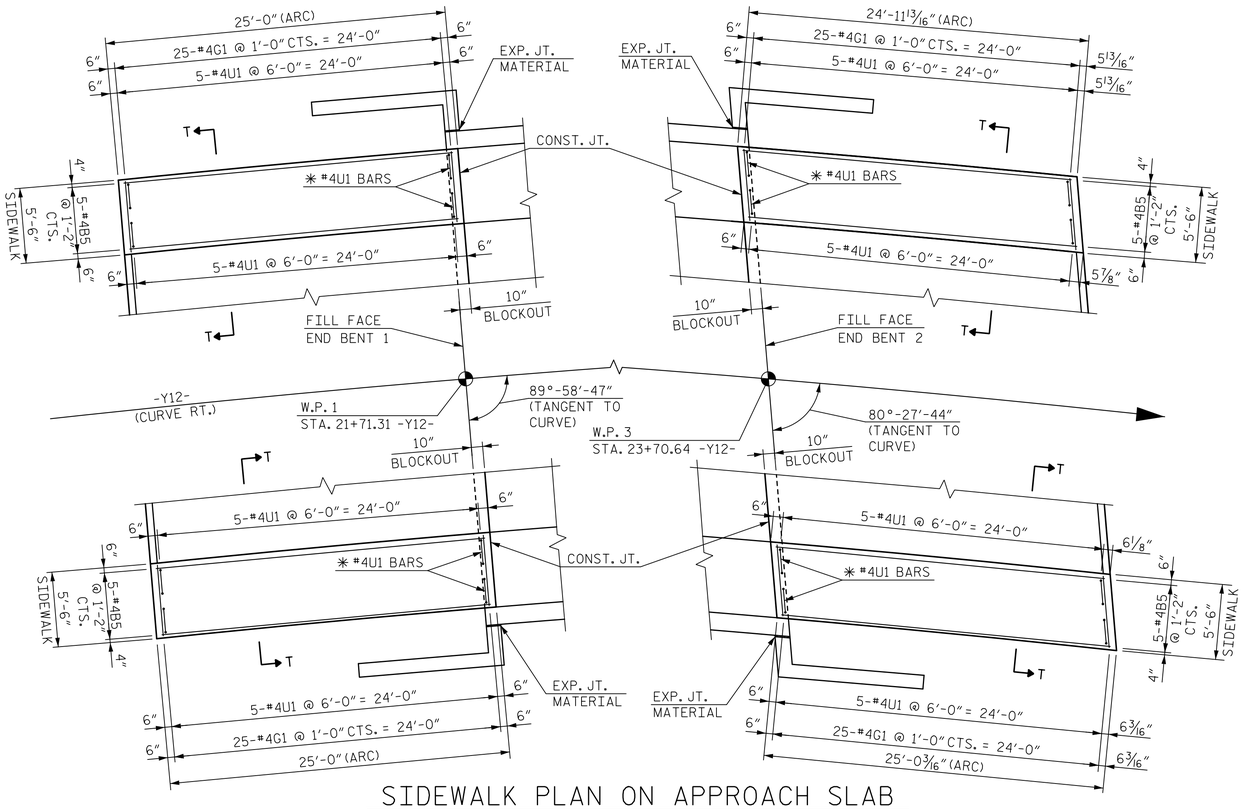
HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY B. VAUGHN DATE 11/18
CHECKED BY K. ERVIN DATE 11/18
DESIGN ENGINEER OF RECORD K. ERVIN DATE 11/18

DWG. NO. 36

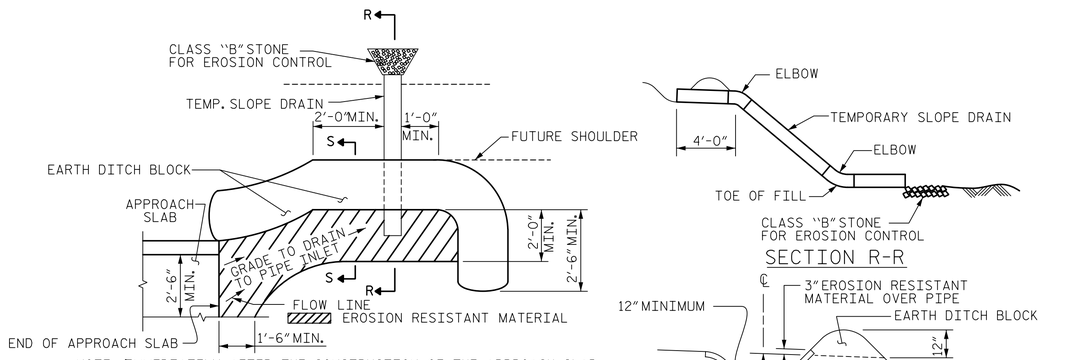
| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY | DATE | NO. | BY | DATE | S5-36 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 37 |

STD. NO. BAS5




## SIDEWALK PLAN ON APPROACH SLAB

* THESE "U" BARS ARE TO BE PLACED AFTER THE SAWING OF THE JOINT. HOLES SHALL BE DRILLED AND "U" BARS GROUTED IN PLACE.




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.

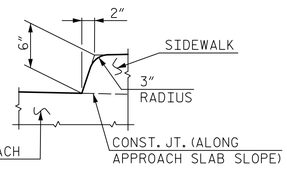
PLAN VIEW



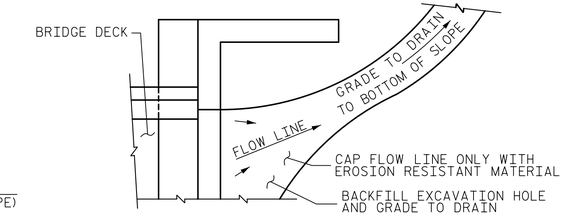

SECTION S-S

## TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

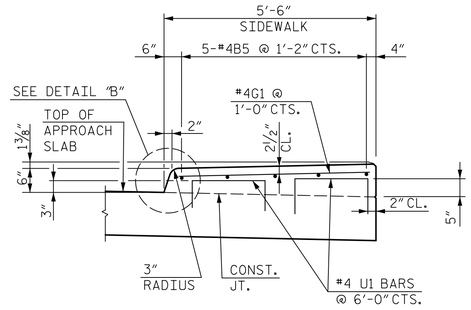



DETAIL "B"



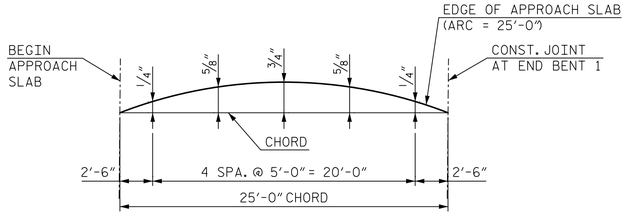

NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL

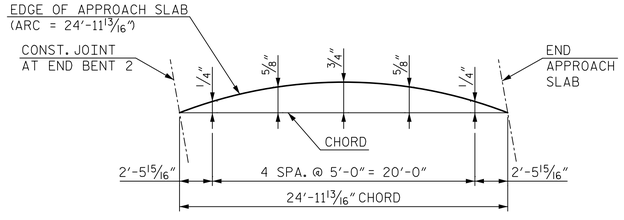



SECTION T-T

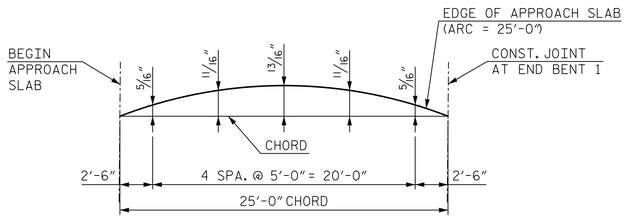
SECTION THRU SIDEWALK



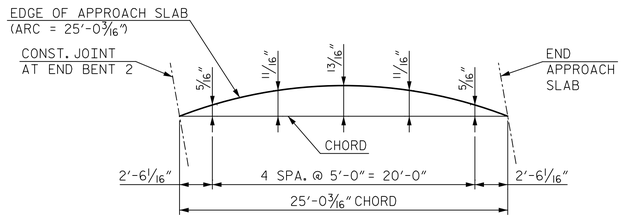

LEFT EDGE OF SLAB
(R = 1,223.500')




LEFT EDGE OF SLAB
(R = 1,223.500')




RIGHT EDGE OF SLAB
(R = 1,176.500')




RIGHT EDGE OF SLAB
(R = 1,176.500')

## ARC OFFSETS - APPROACH SLAB AT END BENT 1

## ARC OFFSETS - APPROACH SLAB AT END BENT 2

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

Documents originated by: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 47328 5/14/2019 ENGINEER KYLE ERVIN

HNTB NORTH CAROLINA, P.C.
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DRAWN BY B. VAUGHN DATE 11/18
CHECKED BY K. ERVIN DATE 11/18
DESIGN ENGINEER OF RECORD K. ERVIN DATE 11/18

DWG. NO. 37

PROJECT NO. I-4400C
BUNCOMBE COUNTY
STATION: POC 22+70.63 -Y12-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY | DATE | NO. | BY | DATE | S5-37 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 37 |

STD. NO. BAS4