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CONTRACT: C203662 TIP NO: B-5142

STATE OF NORTH CAROLINA

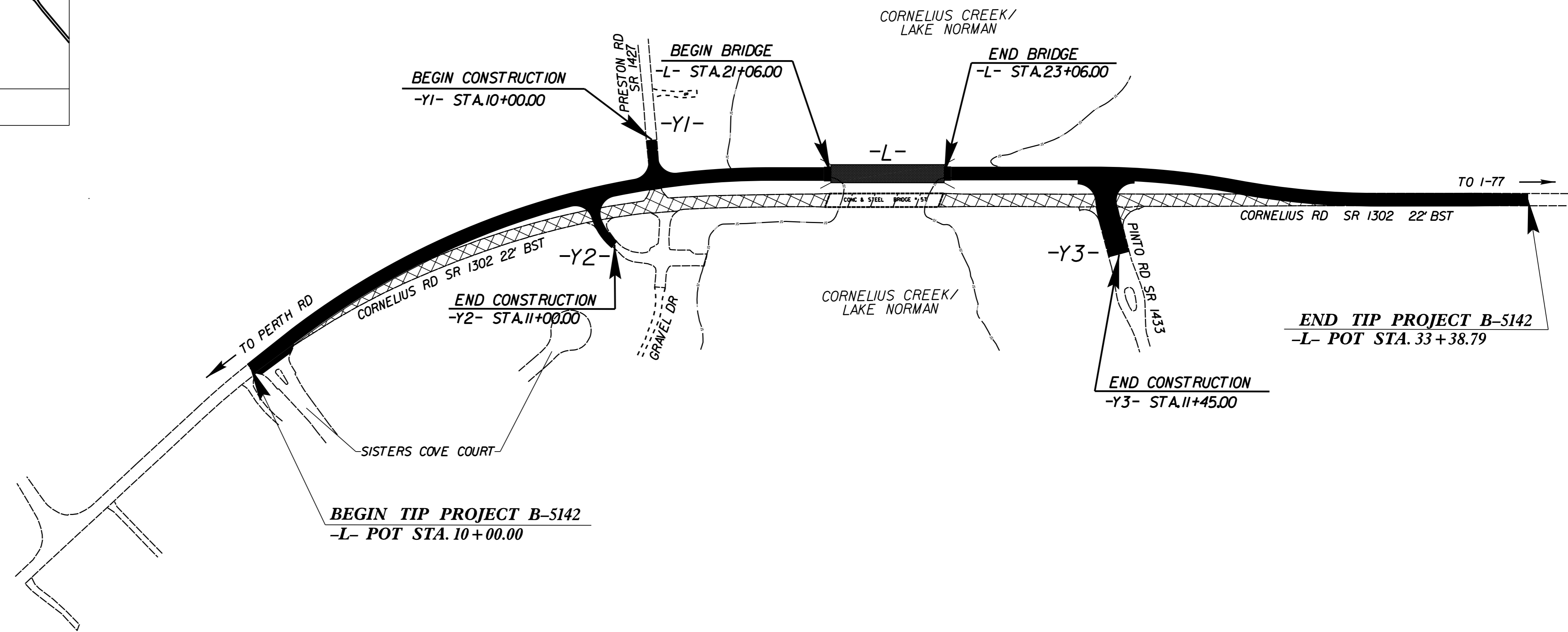
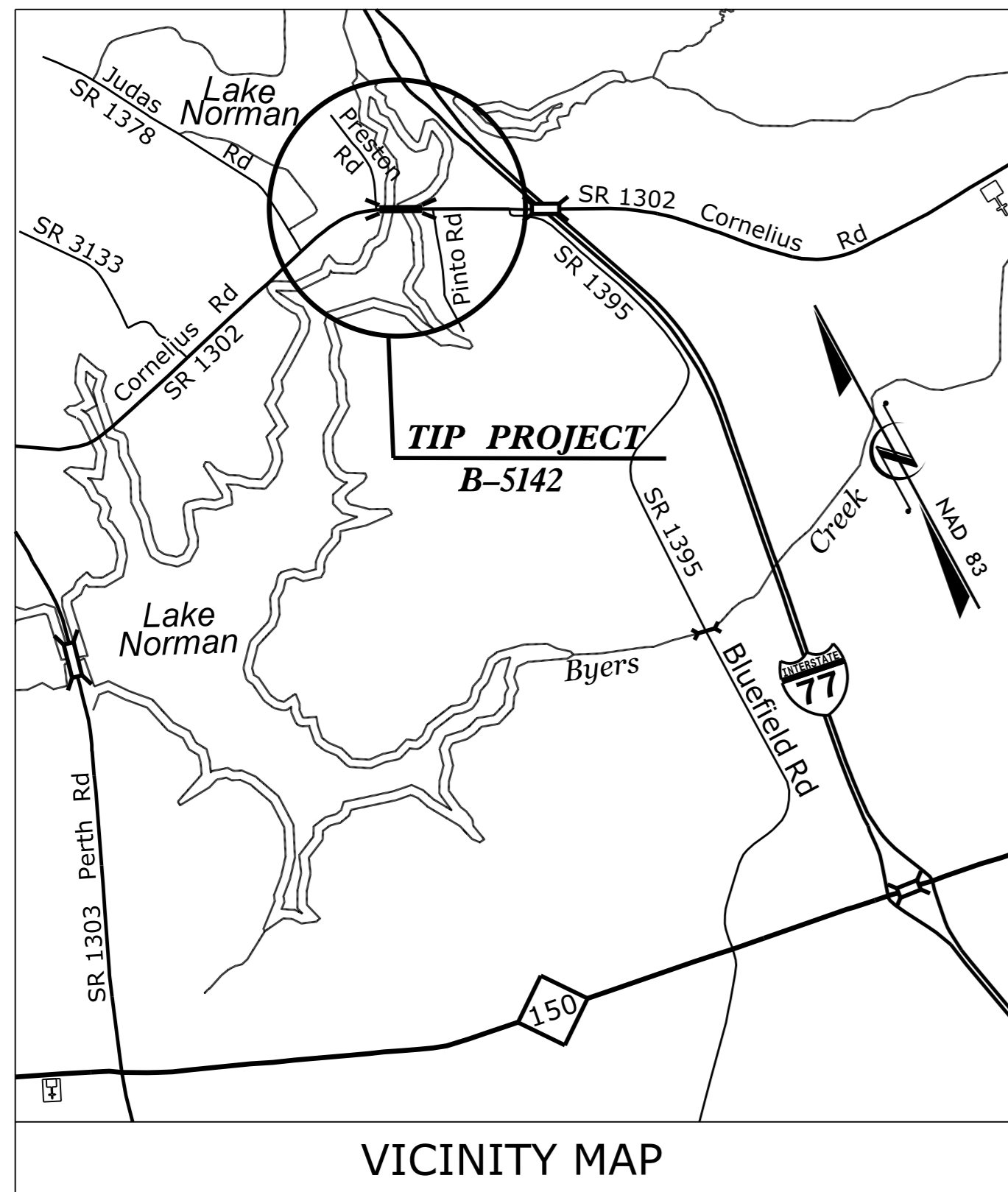
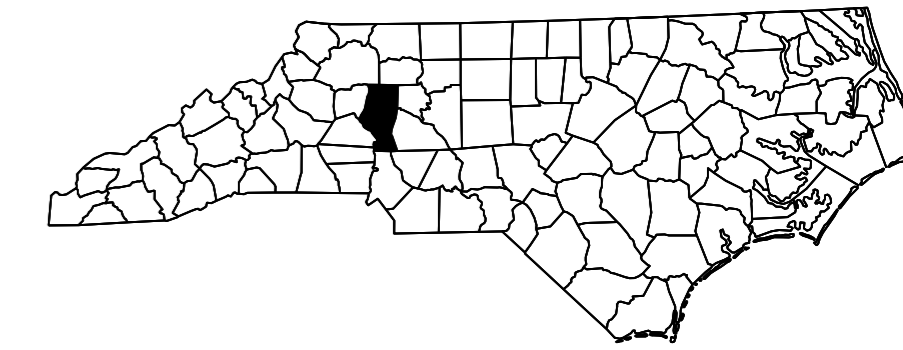
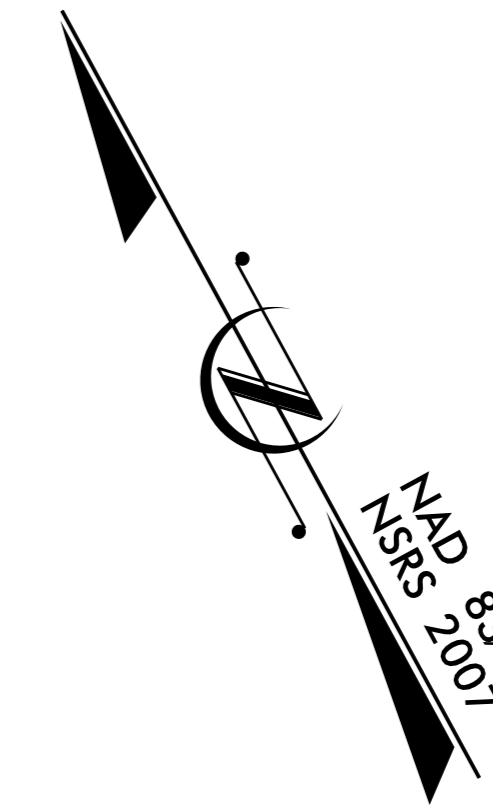
DIVISION OF HIGHWAYS

IREDELL COUNTY

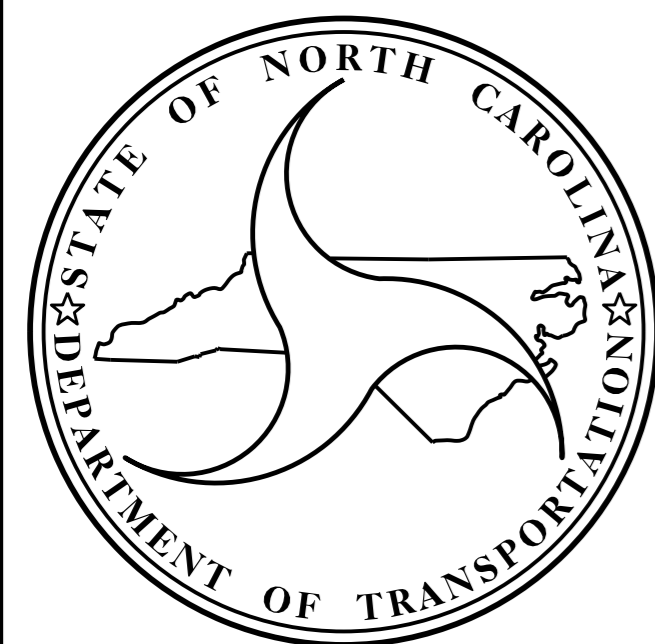
**LOCATION: REPLACE BRIDGE NO. 57 ON SR 1302
OVER CORNELIUS CREEK**

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|-----------------|-----------------------------|-------------|--------------|
| N.C. | B-5142 | | |
| STATE PROJ. NO. | F.A. PROJ. NO. | DESCRIPTION | |
| 42303.1.1 | BRZ-1302(41) | PE | |
| 42303.2.FD1 | BRZ-1302(41) | R/W, UTIL | |
| 42303.3.FD1 | BRZ-1302(41) | CONST. | |
| | | | |
| | | | |
| | | | |



STRUCTURE



DESIGN DATA

ADT 2016 = 10,884
 ADT 2036 = 18,164
 K = 12 %
 D = 70 %
 T = 4 % *
 V = 60 MPH
 * TTST = 3 DUAL 1
 FUNC CLASS =
 Collector
 SUB-REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-5142 = 0.405 MILES
 LENGTH OF STRUCTURE TIP PROJECT B-5142 = 0.038 MILES
 TOTAL LENGTH OF TIP PROJECT B-5142 = 0.443 MILES

Prepared in the Office of:
DIVISION OF HIGHWAYS
 STRUCTURES MANAGEMENT UNIT
 1000 BIRCH RIDGE DR.
 RALEIGH, N.C. 27610

2012 STANDARD SPECIFICATIONS

LETTING DATE :

JUNE 21, 2016

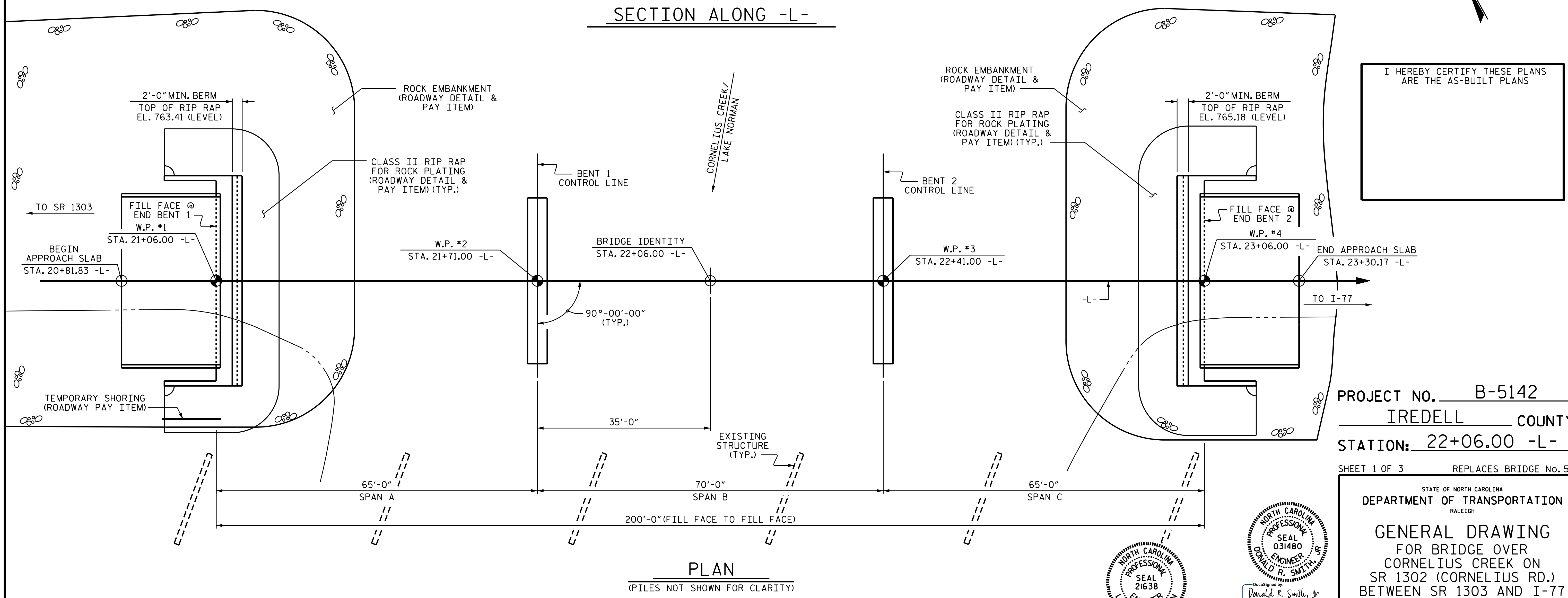
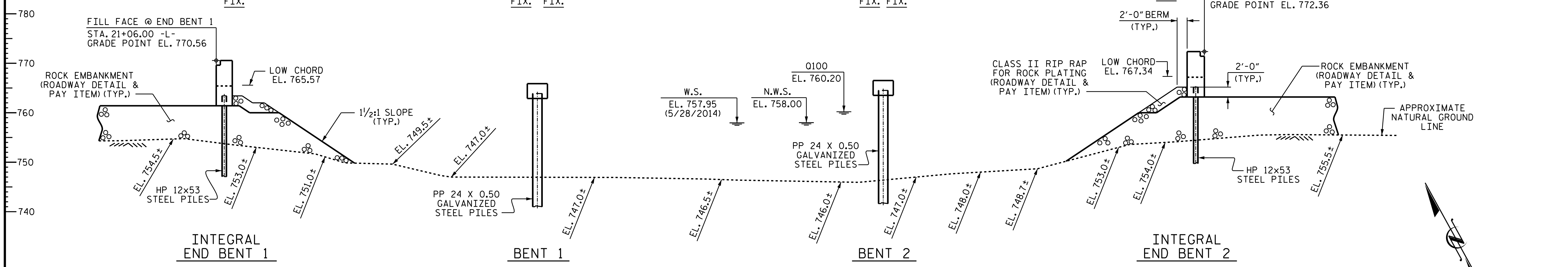
LAURA E. SUTTON, PE
 PROJECT ENGINEER

DONALD R. SMITH, JR., PE
 PROJECT DESIGN ENGINEER

GRADE DATA

-3.6612% +0.9000%

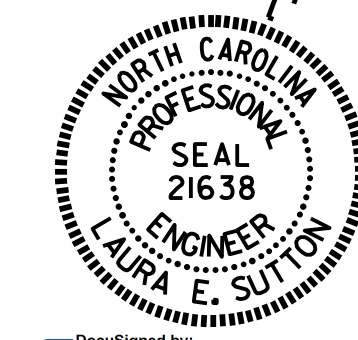
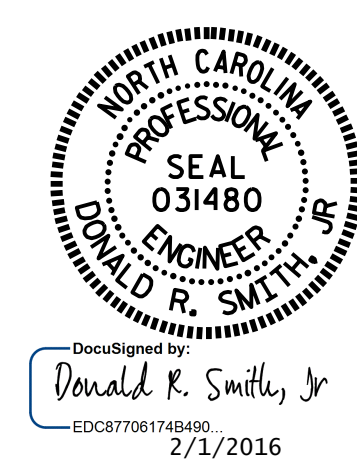
PI. STA. 18+15.00 -L-
EL. = 767.94
VC = 525'



I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. B-5142
IREDELL COUNTY
STATION: 22+06.00 -L-
SHEET 1 OF 3 REPLACES BRIDGE No. 57

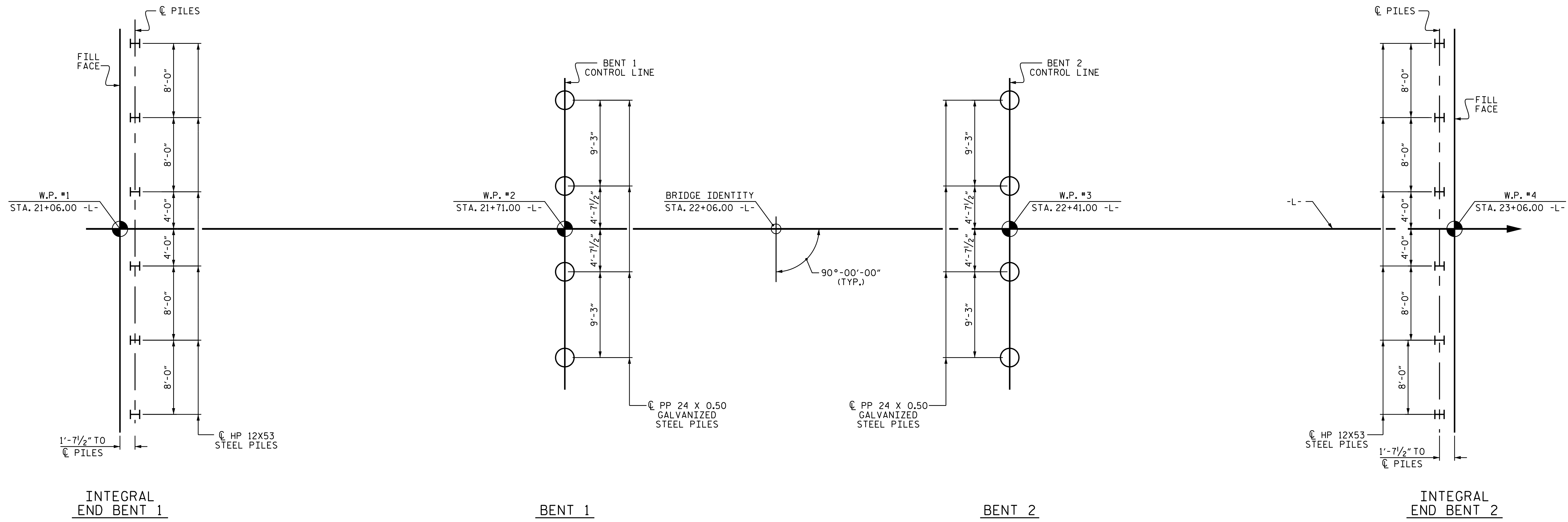
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
GENERAL DRAWING
FOR BRIDGE OVER
CORNELIUS CREEK ON
SR 1302 (CORNELIUS RD.)
BETWEEN SR 1303 AND I-77



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY : J.D. HAWK DATE : 6-29-15
CHECKED BY : K.D. LAYNE DATE : 8-13-15
DESIGN ENGINEER OF RECORD : T.H. CARROLL DATE : 8/18/15

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

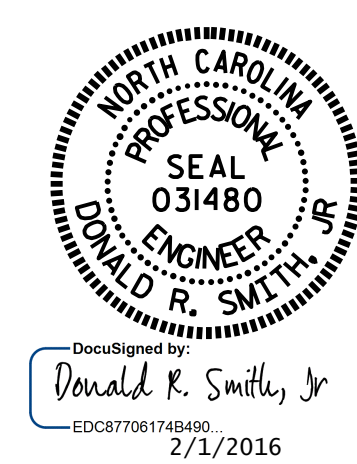


FOUNDATION LAYOUT
PILE LOCATION IS TO THE CENTERLINE PILE.

NOTES

- FOR PILES, SEE SPECIAL PROVISIONS.
- OBSERVE A 2 MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT TO WITHIN 2 FEET OF FINISHED GRADE BEFORE BEGINNING END BENT CONSTRUCTION AT END BENT 1 AND END BENT 2.
- PILES AT END BENT 1 AND END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 105 TONS PER PILE.
- DRIVE PILES AT END BENT 1 AND END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 175 TONS PER PILE.
- PILES AT BENT 1 AND BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 250 TONS PER PILE.
- DRIVE PILES AT BENT 1 TO A TIP ELEVATION NO HIGHER THAN 710 FEET AND SATISFY THE REQUIRED DRIVING RESISTANCE OF 417 TONS PER PILE.
- DRIVE PILES AT BENT 2 TO A TIP ELEVATION NO HIGHER THAN 714 FEET AND SATISFY THE REQUIRED DRIVING RESISTANCE OF 417 TONS PER PILE.
- THE SCOUR CRITICAL ELEVATION FOR BENT 1 AND BENT 2 IS EL. 732.00. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.
- IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 80,000 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT BENT 1 AND BENT 2. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.
- TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING MAY BE REQUIRED AT BENT 1 AND BENT 2. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS AND FOR PILE DRIVING CRITERIA, SEE "PILES" SPECIAL PROVISION.

PROJECT NO. B-5142
IREDELL COUNTY
 STATION: 22+06.00 -L-
 SHEET 2 OF 3



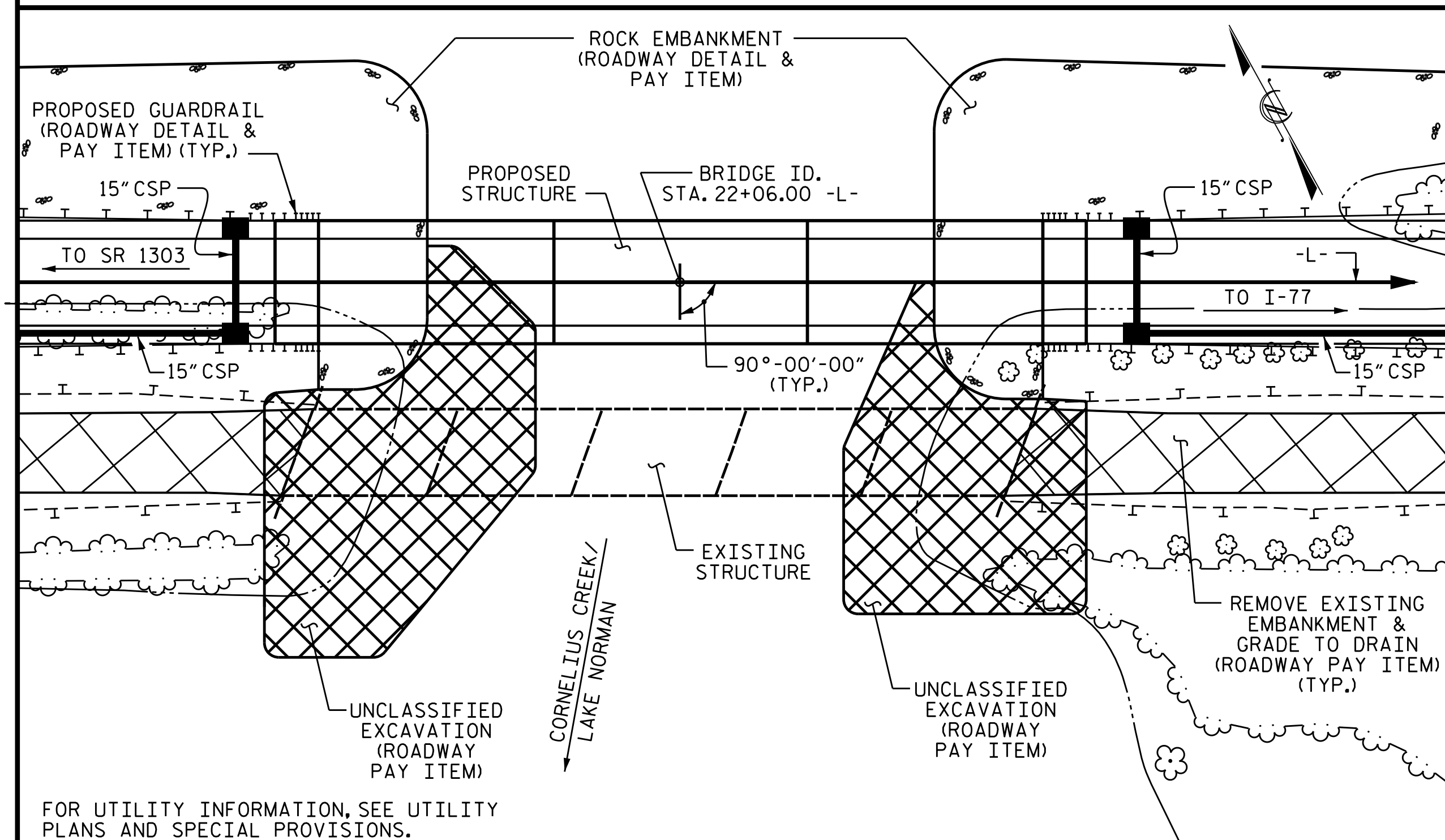
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE OVER CORNELIUS
 CREEK ON SR 1302
 (CORNELIUS RD.)
 BETWEEN SR 1303 AND I-77

DRAWN BY : J.D. HAWK DATE : 6-29-15
 CHECKED BY : K.D. LAYNE DATE : 8-13-15
 DESIGN ENGINEER OF RECORD: T.H. CARROLL DATE : 8/18/15

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 | | | 38 |

BM #2: CHISLED SQUARE IN CONC. GUTTER ON EAST SIDE OF PINTO RD.,
158' RIGHT OF STA. 26+49 -L-, EL. 770.92



LOCATION SKETCH

| HYDRAULIC DATA | | OVERTOPPING FLOOD DATA | |
|-----------------------------|---------------|--------------------------------|-------------|
| DESIGN DISCHARGE | = 2,240 CFS | OVERTOPPING DISCHARGE | = N/A |
| FREQUENCY OF DESIGN FLOOD | = 25 YRS. | FREQUENCY OF OVERTOPPING FLOOD | = 500+ YRS. |
| DESIGN HIGH WATER ELEVATION | = N/A★ | OVERTOPPING FLOOD ELEVATION | = 770.5 |
| DRAINAGE AREA | = 6.1 SQ. MI. | | |
| BASE DISCHARGE (Q100) | = 2,880 CFS | | |
| BASE HIGH WATER ELEVATION | = 760.2★★ | | |

★ CORNELIUS CREEK EFFECTIVE FEMA MODEL BEGINS 0.4 MILES UPSTREAM OF BRIDGE 57. BRIDGE 57 IS LOCATED WITHIN THE BACKWATER OF CATAWBA RIVER (LAKE NORMAN). BRIDGE 57 NOT INCLUDED IN EFFECTIVE MODEL.
★★ BACKWATER OF CATAWBA RIVER (LAKE NORMAN).

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18 - EVALUATING SCOUR AT BRIDGES".
FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
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 SECURING OF VESSELS, SEE SPECIAL PROVISIONS.
FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.
FOR UTILITY PIPING AND SUSPENSION SYSTEM, SEE SPECIAL PROVISIONS.
FOR TEMPORARY ACCESS, SEE SPECIAL PROVISIONS.
THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.
PRESTRESSED CONCRETE DECK PANELS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
FOR ROCK EMBANKMENT AND CORE MATERIAL IN AREAS OF END BENTS, SEE ROADWAY PLANS.
NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.

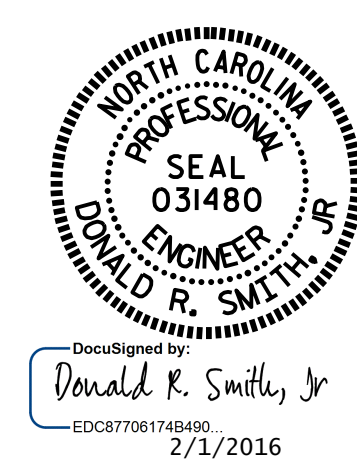
INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 22+06.00 -L-".
THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLES 1024-5 AND 1024-6 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.
FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRANSPORTATION MANAGEMENT PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.
AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING STRUCTURE CONSISTING OF 5 SPANS (5 @ 40'-0") WITH A REINFORCED CONCRETE DECK ON I-BEAMS WITH A CLEAR ROADWAY WIDTH OF 24'-0" ON REINFORCED CONCRETE CAP AND TIMBER PILES AT END BENTS AND REINFORCED CONCRETE CAP ON TIMBER PILES WITH DOUBLE CAPS AT BENTS AND LOCATED JUST DOWNSTREAM FROM THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.
THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.
REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO THE WATER. THE CONTRACTOR SHALL SUBMIT PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.
FOR INTERIOR BENTS, ONLY PARTIAL GALVANIZING OF THE PILES IS REQUIRED. SEE INTERIOR BENT SHEETS FOR REQUIRED GALVANIZED LENGTHS. PAYMENT FOR PARTIALLY GALVANIZED PILES WILL BE MADE UNDER THE CONTRACT UNIT PRICE FOR GALVANIZED STEEL PILES.
FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

| | REMOVAL OF EXISTING STRUCTURE | PDA TESTING | REINFORCED CONCRETE DECK SLAB | GROOVING BRIDGE FLOORS | CLASS A CONCRETE | BRIDGE APPROACH SLABS | REINFORCING STEEL | 45" PRESTRESSED CONCRETE GIRDERS | HP 12x53 STEEL PILES | PP 24x0.50 GALVANIZED STEEL PILES | TWO BAR METAL RAIL | 1'-2" X 2'-6" CONCRETE PARAPET | ELASTOMERIC BEARINGS | 12-INCH WATER LINE PIPE AND SUSPENSION SYSTEM | 8-INCH FORCE MAIN SEWER PIPE AND SUSPENSION SYSTEM | TEMPORARY ACCESS | ASBESTOS ASSESSMENT | | |
|----------------|-------------------------------|-------------|-------------------------------|------------------------|------------------|-----------------------|-------------------|----------------------------------|----------------------|-----------------------------------|--------------------|--------------------------------|----------------------|---|--|------------------|---------------------|----------|----------|
| | LUMP SUM | EA. | SQ. FT. | SQ. FT. | CU. YDS. | LUMP SUM | LBS. | NO. | LIN. FT. | NO. | LIN. FT. | NO. | LIN. FT. | LUMP SUM | LUMP SUM | LUMP SUM | LUMP SUM | LUMP SUM | |
| SUPERSTRUCTURE | | | 7,317 | 7,634 | | LUMP SUM | | 12 | 785.67 | | 381.17 | 396.67 | LUMP SUM | LUMP SUM | LUMP SUM | | | | |
| END BENT 1 | | | | | 25.0 | | 3,142 | | 6 | 270 | | | | | | | | | |
| BENT 1 | | | | | 15.5 | | 2,151 | | | 4 | 250 | | | | | | | | |
| BENT 2 | | | | | 15.5 | | 2,151 | | | 4 | 220 | | | | | | | | |
| END BENT 2 | | | | | 25.0 | | 3,142 | | 6 | 330 | | | | | | | | | |
| TOTAL | LUMP SUM | 1 | 7,317 | 7,634 | 81.0 | LUMP SUM | 10,586 | 12 | 785.67 | 12 | 600 | 8 | 470 | 381.17 | 396.67 | LUMP SUM | LUMP SUM | LUMP SUM | LUMP SUM |

PROJECT NO. B-5142
IREDELL COUNTY
STATION: 22+06.00 -L-

SHEET 3 OF 3



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
GENERAL DRAWING
FOR BRIDGE OVER
CORNELIUS CREEK ON
SR 1302 (CORNELIUS RD.)
BETWEEN SR 1303 AND I-77

DRAWN BY: J.D. HAWK DATE: 6-29-15
CHECKED BY: K.D. LAYNE DATE: 8-13-15
DESIGN ENGINEER OF RECORD: T. H. CARROLL DATE: 8/18/15

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

LOAD FACTORS:

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

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

| LEVEL | VEHICLE | WEIGHT (W) (TONS) | CONTROLLING LOAD RATING # | MINIMUM RATING FACTORS (RF) | TONS = W X RF | STRENGTH I LIMIT STATE | | | | | | | | | | SERVICE III LIMIT STATE | | | | | COMMENT NUMBER | | | |
|--------------------|------------|----------------------|---------------------------|-----------------------------|---------------|------------------------|---------------------------|---------------|------|-----------------|-------------------------------------|---------------------------|---------------|------|-----------------|-------------------------------------|------------------|---------------------------|---------------|------|----------------|-----------------|-------------------------------------|--|
| | | | | | | MOMENT | | | | | SHEAR | | | | | MOMENT | | | | | | | | |
| | | | | | | LIVELOAD FACTORS | 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) | LIVELOAD FACTORS | DISTRIBUTION FACTORS (DF) | RATING FACTOR | SPAN | | GIRDER LOCATION | DISTANCE FROM LEFT END OF SPAN (ft) | |
| DESIGN LOAD RATING | HL-93(Inv) | N/A | 1 | 1.02 | -- | 1.75 | 0.863 | 1.41 | A | EL | 31.146 | 0.946 | 1.71 | B | I | 27.133 | 0.80 | 0.946 | 1.02 | B | I | 33.917 | | |
| | HL-93(0pr) | N/A | -- | 1.83 | -- | 1.35 | 0.863 | 1.83 | A | EL | 31.146 | 0.946 | 2.22 | B | I | 27.133 | N/A | -- | -- | -- | -- | -- | | |
| | HS-20(Inv) | 36.000 | 2 | 1.32 | 47.472 | 1.75 | 0.863 | 1.80 | A | EL | 31.146 | 0.946 | 2.01 | B | I | 27.133 | 0.80 | 0.803 | 1.32 | B | I | 33.917 | | |
| | HS-20(0pr) | 36.000 | -- | 2.34 | 84.199 | 1.35 | 0.863 | 2.34 | A | EL | 31.146 | 0.946 | 2.60 | B | I | 27.133 | N/A | -- | -- | -- | -- | -- | | |
| LEGAL LOAD RATING | SV | SNSH | 13.500 | -- | 2.91 | 39.289 | 1.40 | 0.863 | 4.92 | A | EL | 31.146 | 0.946 | 5.50 | B | I | 27.133 | 0.80 | 0.813 | 2.91 | A | I | 31.146 | |
| | | SNGARBS2 | 20.000 | -- | 2.21 | 44.094 | 1.40 | 0.863 | 3.74 | A | EL | 31.146 | 0.946 | 4.05 | B | I | 27.133 | 0.80 | 0.803 | 2.20 | B | I | 33.917 | |
| | | SNAGRIS2 | 22.000 | -- | 2.10 | 46.101 | 1.40 | 0.863 | 3.57 | A | EL | 31.146 | 0.946 | 3.82 | B | I | 27.133 | 0.80 | 0.803 | 2.10 | B | I | 33.917 | |
| | | SNCOTTS3 | 27.250 | -- | 1.45 | 39.497 | 1.40 | 0.863 | 2.45 | A | EL | 31.146 | 0.946 | 2.76 | B | I | 27.133 | 0.80 | 0.813 | 1.45 | A | I | 31.146 | |
| | | SNAGRS4 | 34.925 | -- | 1.23 | 42.863 | 1.40 | 0.863 | 2.08 | A | EL | 31.146 | 0.946 | 2.39 | B | I | 27.133 | 0.80 | 0.813 | 1.23 | A | I | 31.146 | |
| | | SNS5A | 35.550 | -- | 1.20 | 42.627 | 1.40 | 0.863 | 2.03 | A | EL | 31.146 | 0.946 | 2.48 | B | I | 27.133 | 0.80 | 0.813 | 1.20 | A | I | 31.146 | |
| | | SNS6A | 39.950 | -- | 1.10 | 44.099 | 1.40 | 0.863 | 1.87 | A | EL | 31.146 | 0.946 | 2.30 | B | I | 27.133 | 0.80 | 0.803 | 1.10 | B | I | 33.917 | |
| | SNS7B | 42.000 | -- | 1.05 | 44.156 | 1.40 | 0.863 | 1.78 | A | EL | 31.146 | 0.946 | 2.33 | B | I | 27.133 | 0.80 | 0.803 | 1.05 | B | I | 33.917 | | |
| | TTST | TNAGRIT3 | 33.000 | -- | 1.35 | 44.449 | 1.40 | 0.863 | 2.29 | A | EL | 31.146 | 0.946 | 2.71 | B | I | 27.133 | 0.80 | 0.803 | 1.35 | B | I | 33.917 | |
| | | TNT4A | 33.075 | -- | 1.35 | 44.773 | 1.40 | 0.863 | 2.30 | A | EL | 31.146 | 0.946 | 2.59 | B | I | 27.133 | 0.80 | 0.803 | 1.35 | B | I | 33.917 | |
| | | TNT6A | 41.600 | -- | 1.11 | 46.158 | 1.40 | 0.863 | 1.89 | A | EL | 31.146 | 0.946 | 2.60 | B | I | 27.133 | 0.80 | 0.803 | 1.11 | B | I | 33.917 | |
| | | TNT7A | 42.000 | -- | 1.12 | 46.897 | 1.40 | 0.863 | 1.91 | A | EL | 31.146 | 0.946 | 2.49 | B | I | 27.133 | 0.80 | 0.803 | 1.12 | B | I | 33.917 | |
| | | TNT7B | 42.000 | -- | 1.16 | 48.671 | 1.40 | 0.863 | 1.99 | A | EL | 31.146 | 0.946 | 2.23 | B | I | 27.133 | 0.80 | 0.803 | 1.16 | B | I | 33.917 | |
| | | TNAGRIT4 | 43.000 | -- | 1.10 | 47.285 | 1.40 | 0.863 | 1.88 | A | EL | 31.146 | 0.946 | 2.14 | B | I | 27.133 | 0.80 | 0.803 | 1.10 | B | I | 33.917 | |
| TNAGT5A | | 45.000 | -- | 1.04 | 46.601 | 1.40 | 0.863 | 1.77 | A | EL | 31.146 | 0.946 | 2.20 | B | I | 27.133 | 0.80 | 0.803 | 1.04 | B | I | 33.917 | | |
| TNAGT5B | 45.000 | 3 | 1.02 | 45.987 | 1.40 | 0.863 | 1.74 | A | EL | 31.146 | 0.946 | 2.03 | B | I | 27.133 | 0.80 | 0.803 | 1.02 | B | I | 33.917 | | | |

NOTES:

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

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

CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

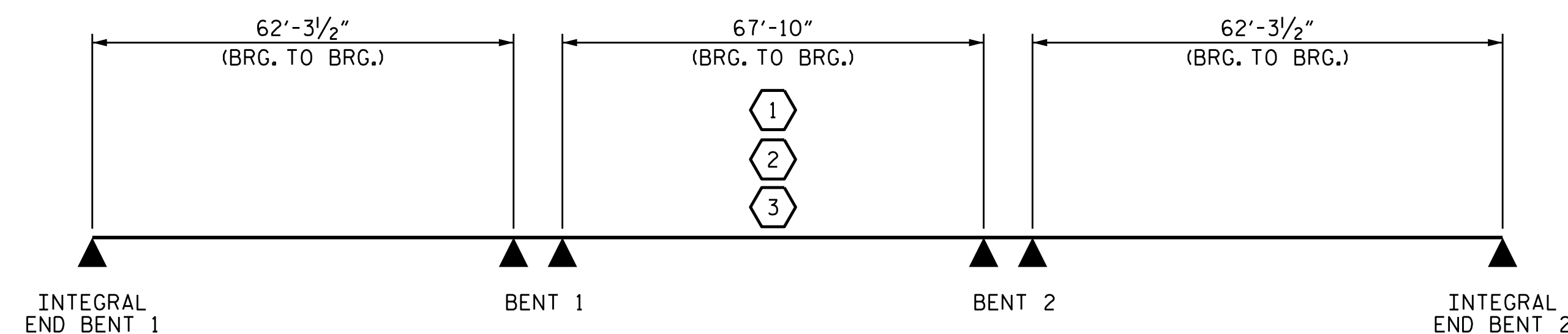
2 DESIGN LOAD RATING (HS-20)

3 LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

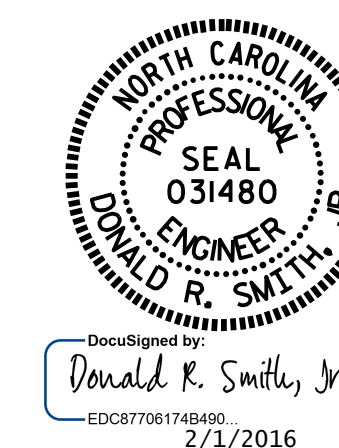
GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. B-5142
IREDELL COUNTY
 STATION: 22+06.00 -L-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 LRFR SUMMARY FOR
 PRESTRESSED
 CONCRETE GIRDERS
 (NON-INTERSTATE TRAFFIC)

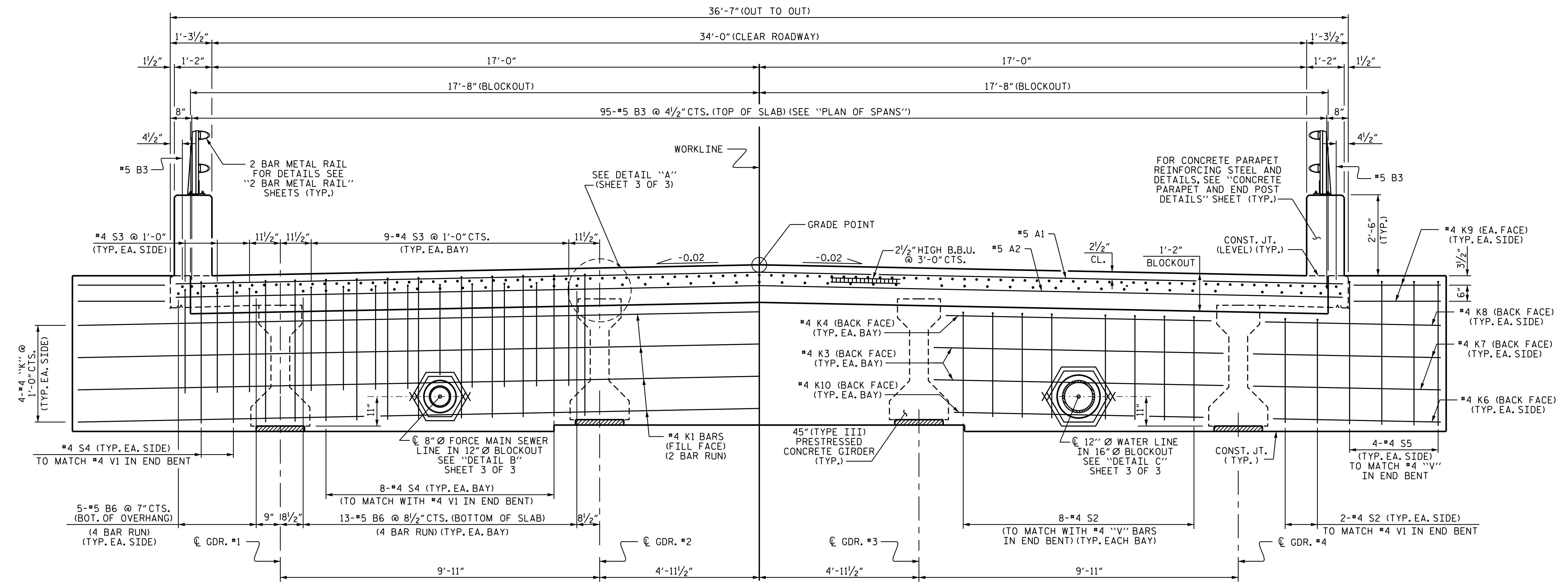
| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-4 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 38 |

ASSEMBLED BY : T. H. CARROLL DATE : 5/12/15
 CHECKED BY : H. P. KIM DATE : 5/14/15

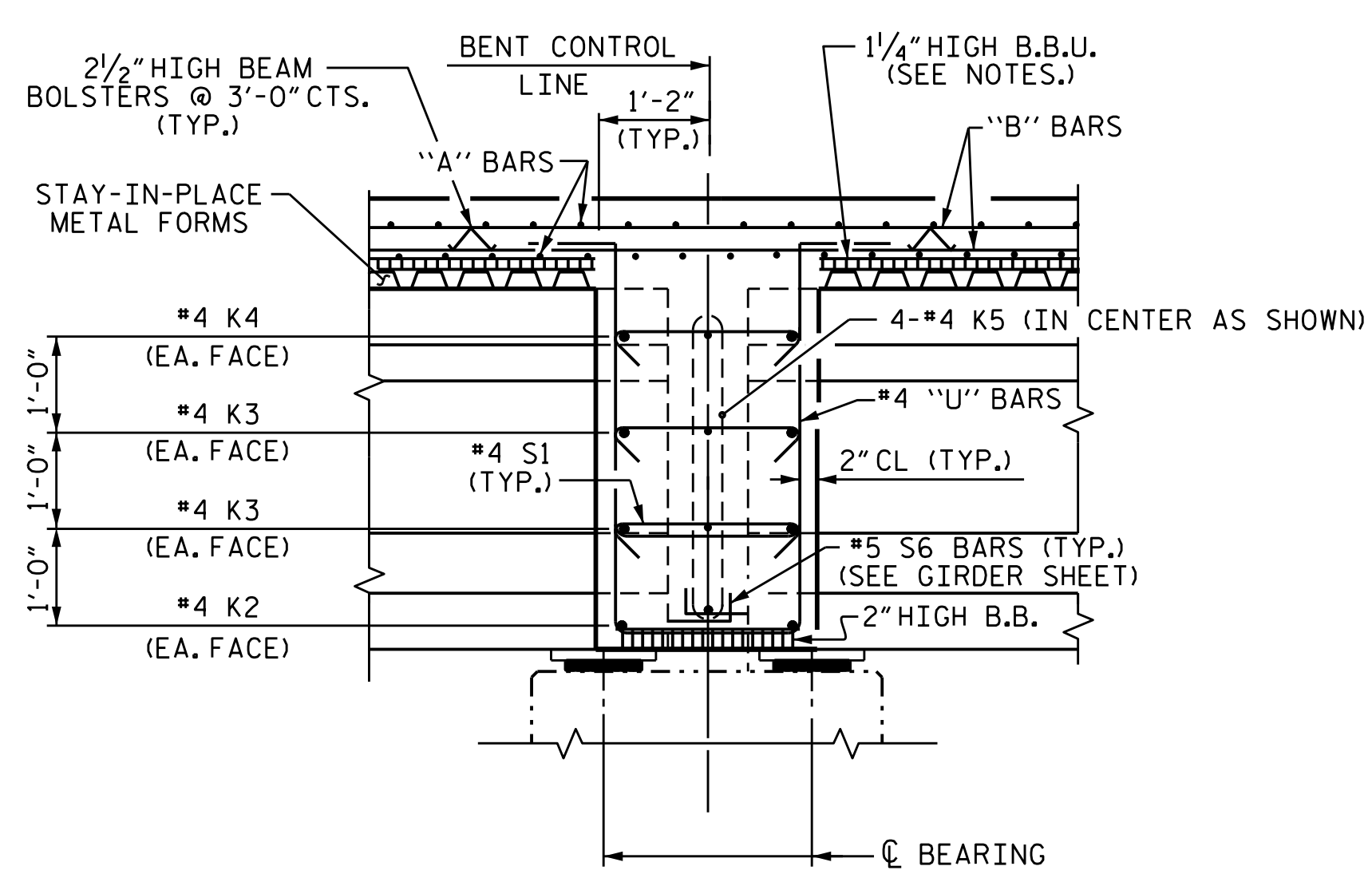
DRAWN BY : MAA 1/08 REV. 11/12/08RR MAA/GM
 CHECKED BY : GM/DI 2/08 REV. 10/1/11 MAA/GM

DESIGN ENGINEER OF RECORD:
 T. H. CARROLL DATE : 8/18/15

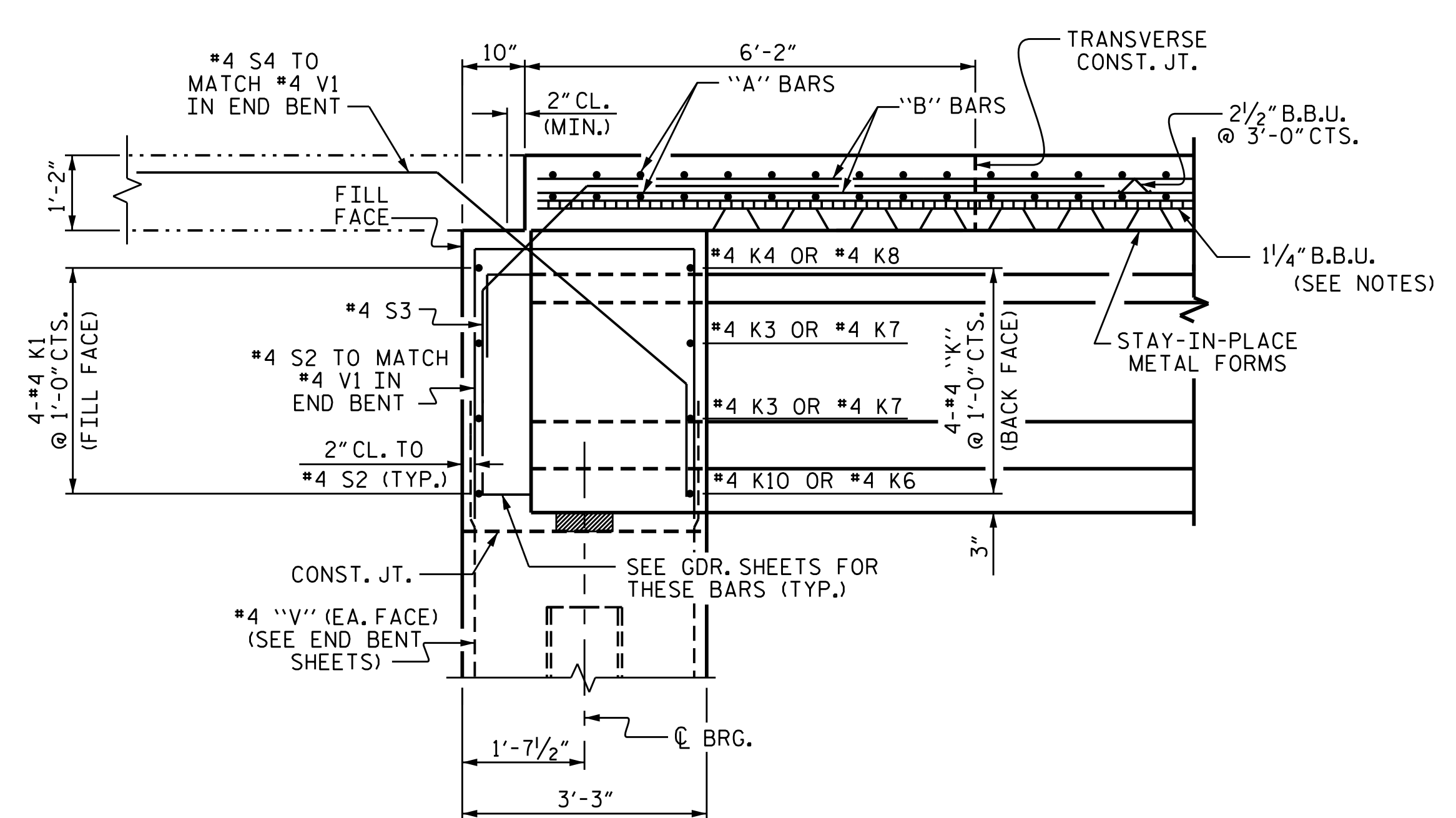
DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED



TYPICAL SECTION @ INTEGRAL END BENT
(END BENT 1 SHOWN, END BENT 2 SIMILAR)

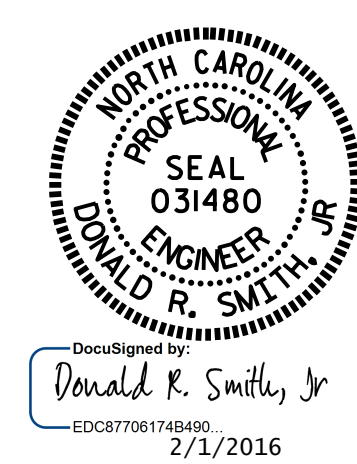


SECTION THROUGH BENT DIAPHRAGM



SECTION THROUGH INTEGRAL END BENT

PROJECT NO. B-5142
IREDELL COUNTY
 STATION: 22+06.00 -L-
 SHEET 1 OF 3



| | | | | | |
|-------------------------|-----|------------------------------|-----|-----|-------|
| STATE OF NORTH CAROLINA | | DEPARTMENT OF TRANSPORTATION | | | |
| RALEIGH | | SUPERSTRUCTURE | | | |
| TYPICAL SECTION | | REVISIONS | | | |
| NO. | BY: | DATE: | NO. | BY: | DATE: |
| 1 | | | 3 | | |
| 2 | | | 4 | | |

DRAWN BY: K. D. LAYNE DATE: 4-27-15
 CHECKED BY: J. D. HAWK DATE: 5-12-15
 DESIGN ENGINEER OF RECORD: T. H. CARROLL DATE: 8-18-15

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 FINAL UNLESS ALL
 SIGNATURES COMPLETED

| | |
|--------------|----|
| SHEET NO. | |
| S-5 | |
| TOTAL SHEETS | 38 |

NOTES

PROVIDE 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2 1/2" ABOVE THE TOP OF THE REMOVABLE FORM.

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

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

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

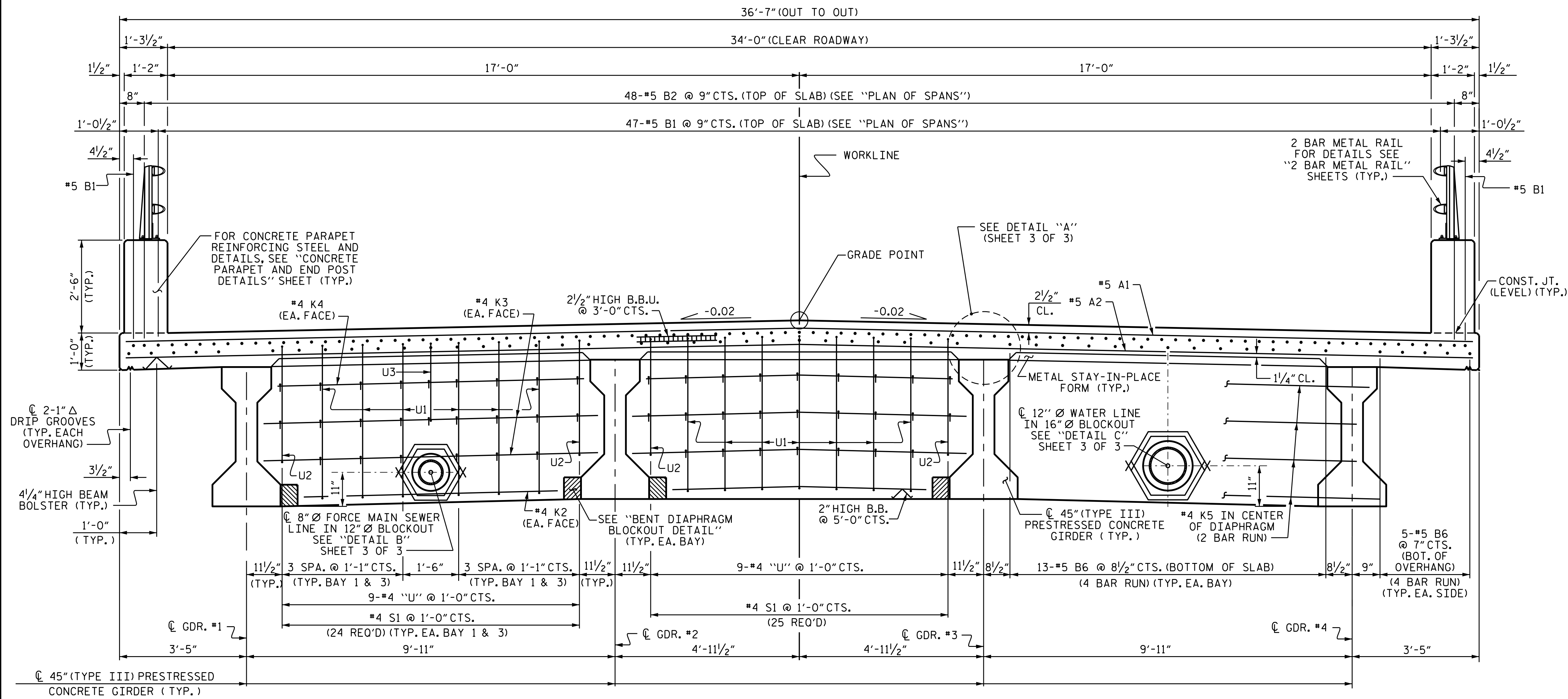
FOR WING DETAILS, SEE "PLAN OF SPANS DETAILS" SHEETS.

FOR UTILITY PIPING AND SUSPENSION SYSTEM, SEE STRUCTURE UTILITY SPECIAL PROVISIONS. FOR DETAILS, SEE SHEETS S-33 THROUGH S-36.

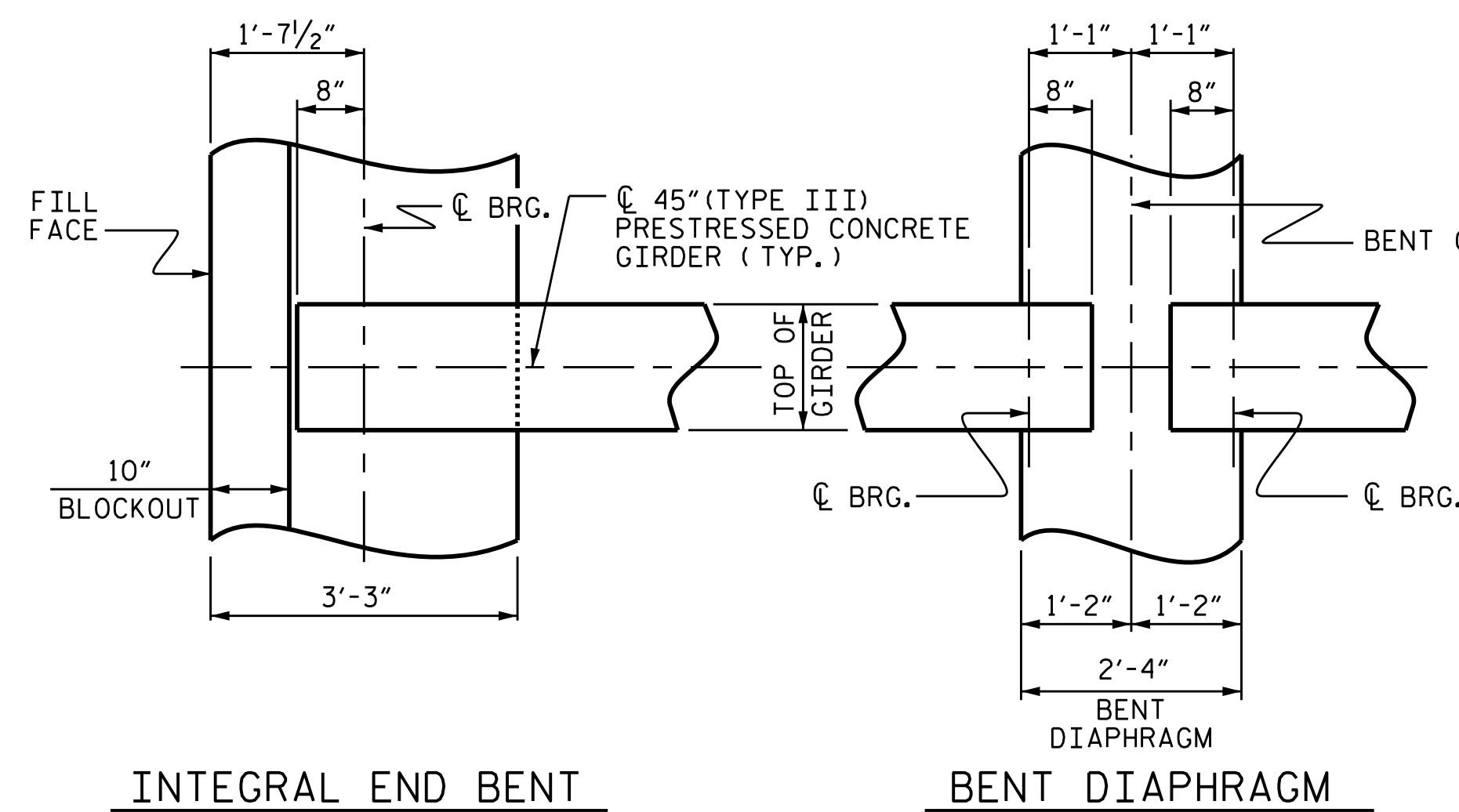
REINFORCING STEEL MAY BE FIELD BENT, SHIFTED OR CUT AS NECESSARY FOR INSTALLATION OF THE 12" Ø AND THE 16" Ø PVC SLEEVES.

THE 12" Ø AND 16" Ø PVC SLEEVES ARE TO BE FLUSH WITH BOTH FACES OF THE INTEGRAL END BENTS AND BENT DIAPHRAGMS.

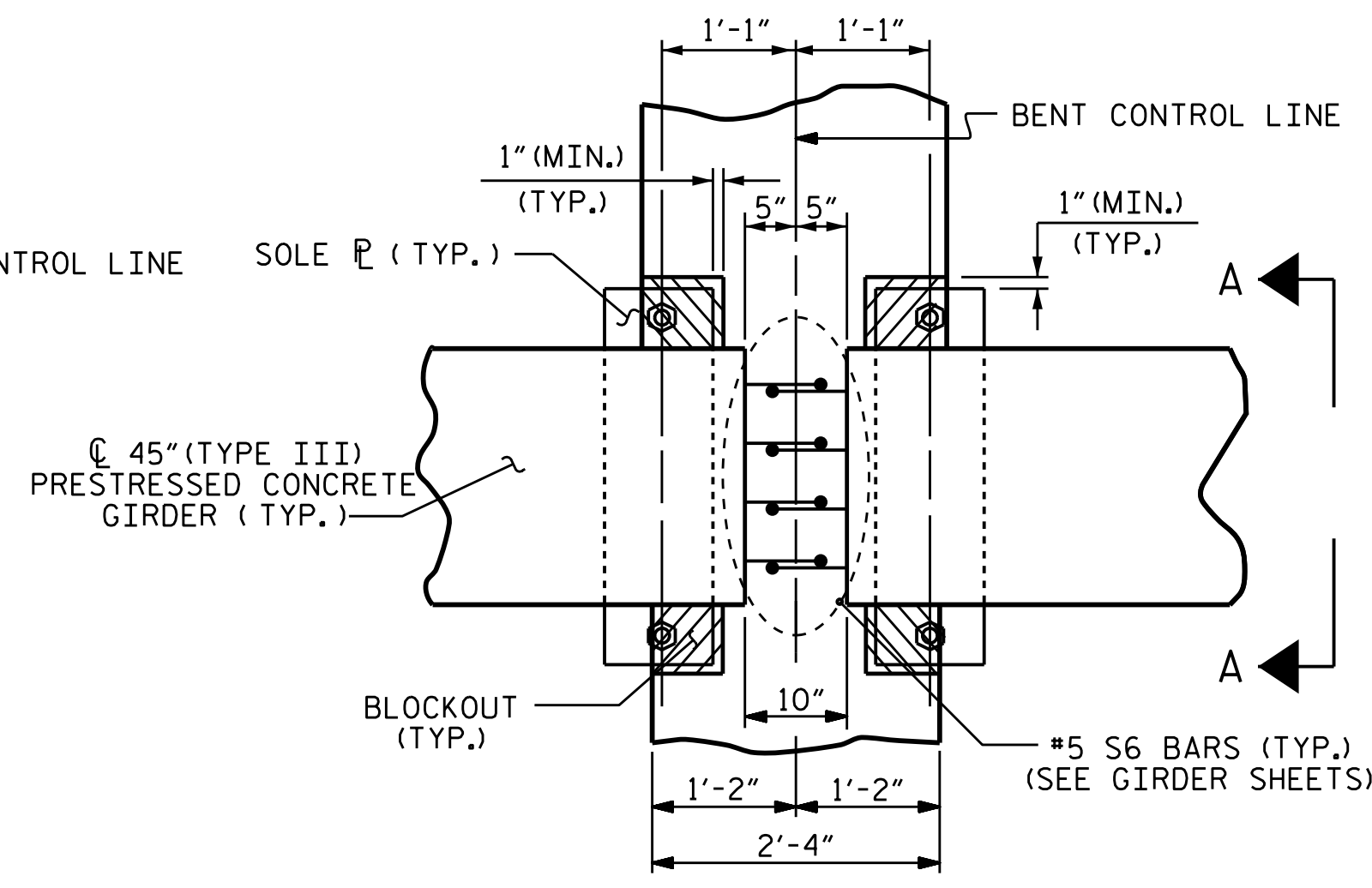
CENTER UTILITY IN BLOCKOUT AND FILL ANNULAR SPACE AROUND UTILITY PIPE WITH JOINT FILLER IN ACCORDANCE WITH STANDARD SPECIFICATION ARTICLE 1028-1.



TYPICAL SECTION AT BENT DIAPHRAGM

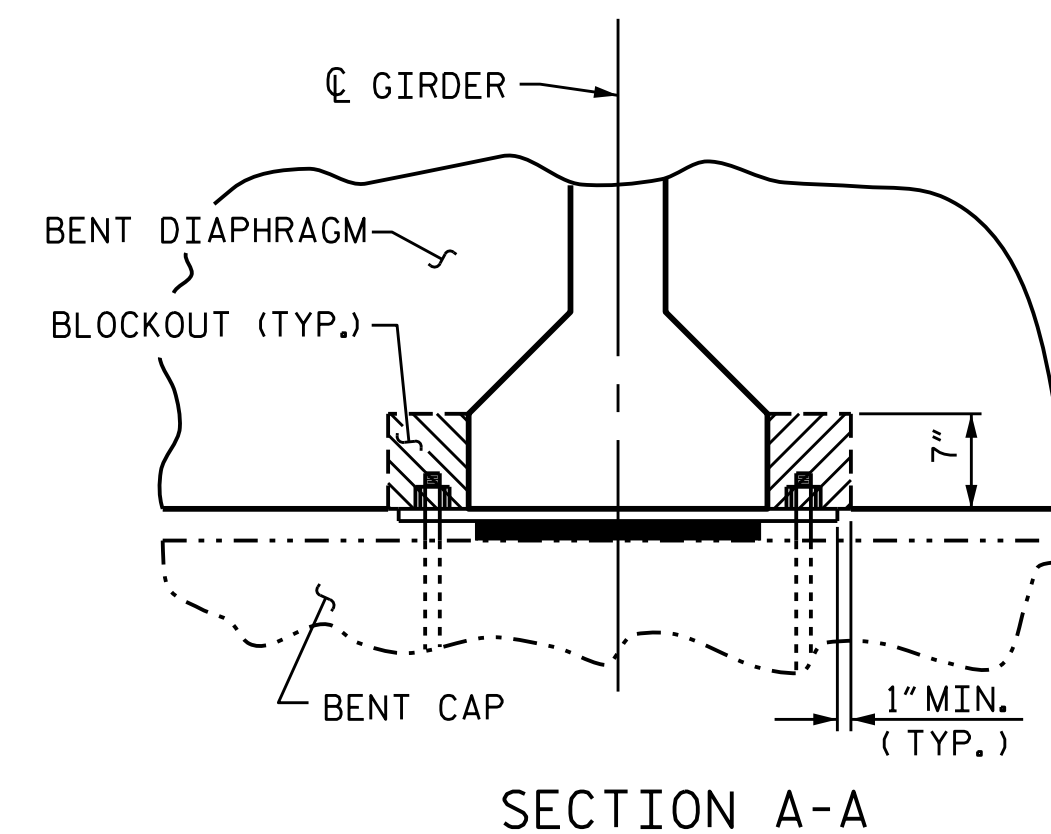


PLAN OF GIRDER



PLAN

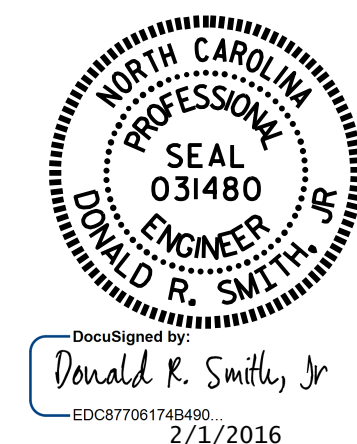
BENT DIAPHRAGM BLOCKOUT DETAIL



SECTION A-A

PROJECT NO. B-5142
IREDELL COUNTY
 STATION: 22+06.00 -L-

SHEET 2 OF 3



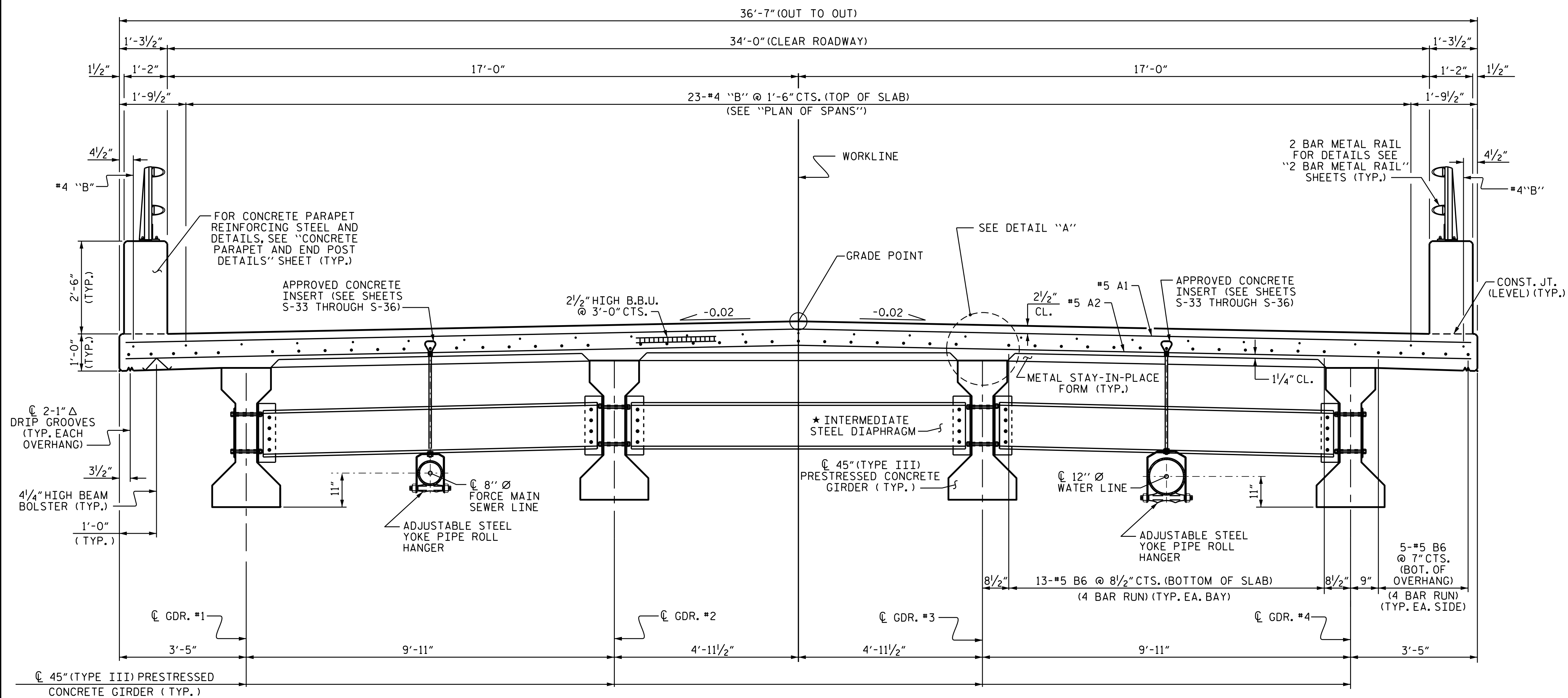
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 TYPICAL SECTION

REVISIONS

| NO. | BY: | DATE: | NO. | BY: | DATE: | SHEET NO. |
|-----|-----|-------|-----|-----|-------|-----------------|
| 1 | | | 3 | | | S-6 |
| 2 | | | 4 | | | TOTAL SHEETS 38 |

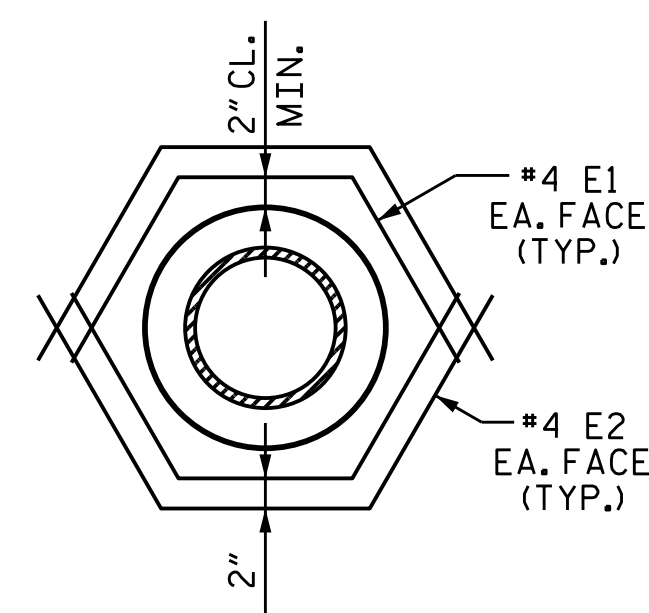
DRAWN BY : K. D. LAYNE DATE : 4-27-15
 CHECKED BY : J. D. HAWK DATE : 5-12-15
 DESIGN ENGINEER OF RECORD: T. H. CARROLL DATE : 8-18-15

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

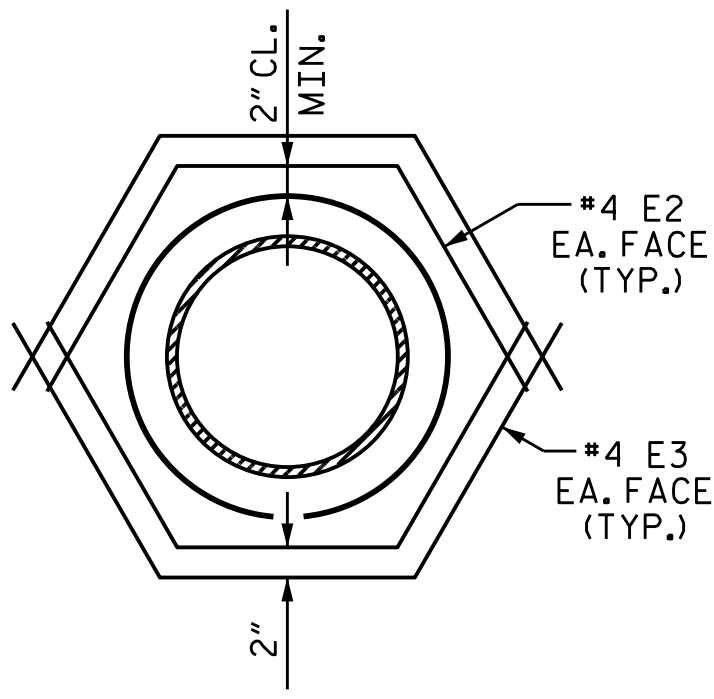


TYPICAL SECTION AT INTERMEDIATE DIAPHRAGM

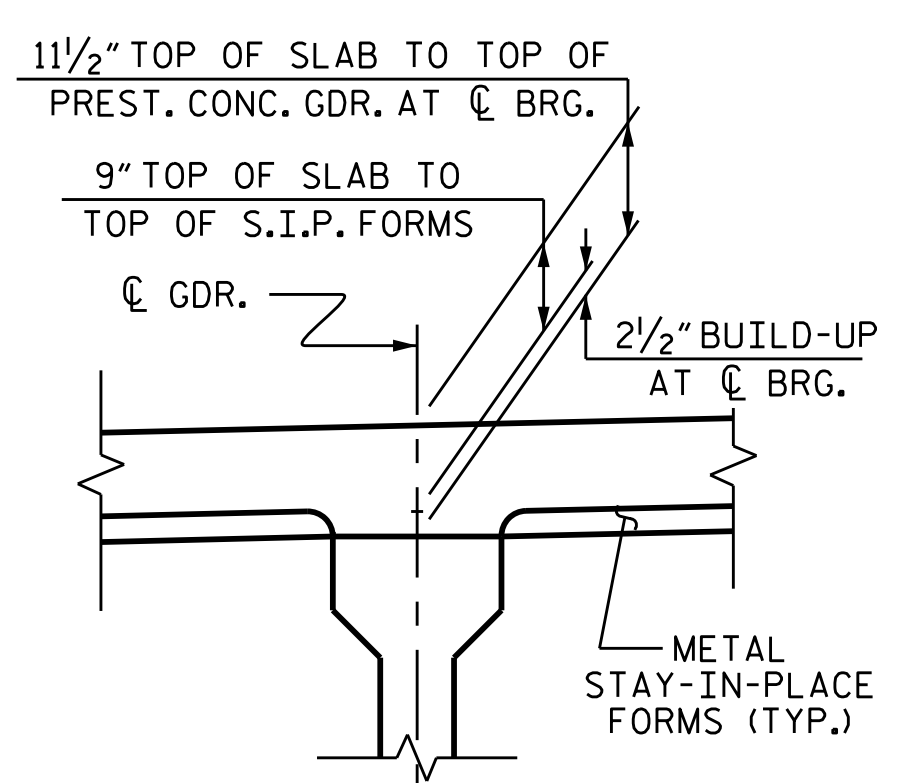
* FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE III PRESTRESSED CONCRETE GIRDERS" SHEET.



DETAIL "B"
8" Ø FORCE MAIN SEWER LINE IN 12" Ø BLOCKOUT



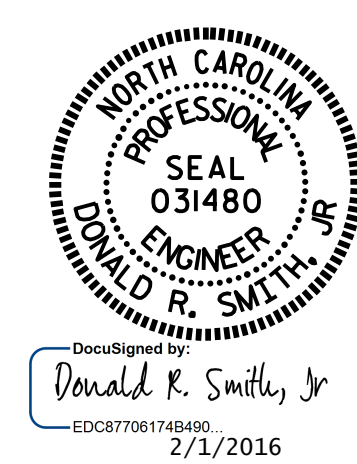
DETAIL "C"
12" Ø WATER LINE IN 16" Ø BLOCKOUT



DETAIL "A"

PROJECT NO. B-5142
IREDELL COUNTY
 STATION: 22+06.00 -L-

SHEET 3 OF 3

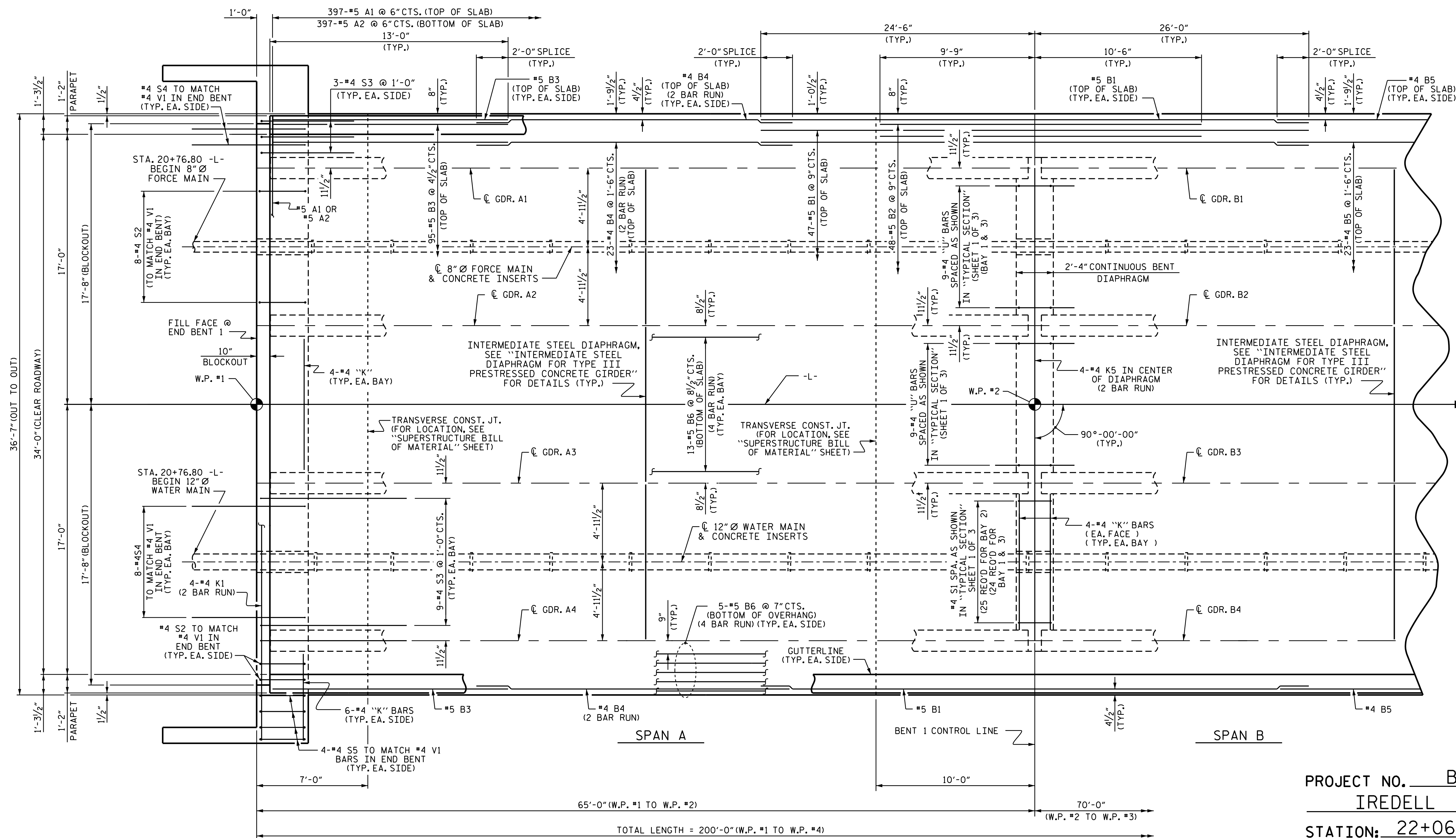


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 TYPICAL SECTION

DRAWN BY: K. D. LAYNE DATE: 4-27-15
 CHECKED BY: J. D. HAWK DATE: 5-12-15
 DESIGN ENGINEER OF RECORD: T. H. CARROLL DATE: 8-18-15

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
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| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-7 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 38 |

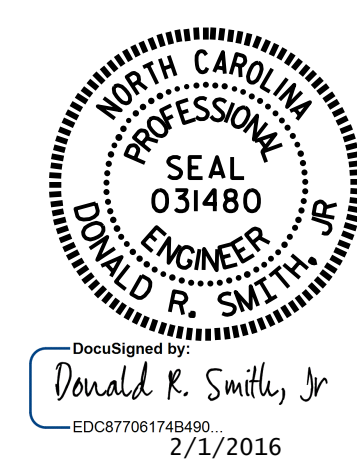


PROJECT NO. B-5142
IREDELL COUNTY
 STATION: 22+06.00 -L-

PARTIAL PLAN OF SPANS

SHEET 1 OF 3

NOTES
 FOR CONCRETE PARAPET DETAILS AND REINFORCING STEEL, SEE "CONCRETE PARAPET AND END POST DETAILS" SHEETS.
 FOR SECTIONS, SEE "TYPICAL SECTION" SHEETS.
 SEE "PLAN OF SPANS DETAILS" FOR ADDITIONAL REINFORCING STEEL IN WINGS.
 SEE SHEETS S-33 THROUGH S-36 AND SPECIAL PROVISIONS FOR DETAILS AND INSTALLATION OF 8" Ø FORCE MAIN AND 12" Ø WATER MAIN.

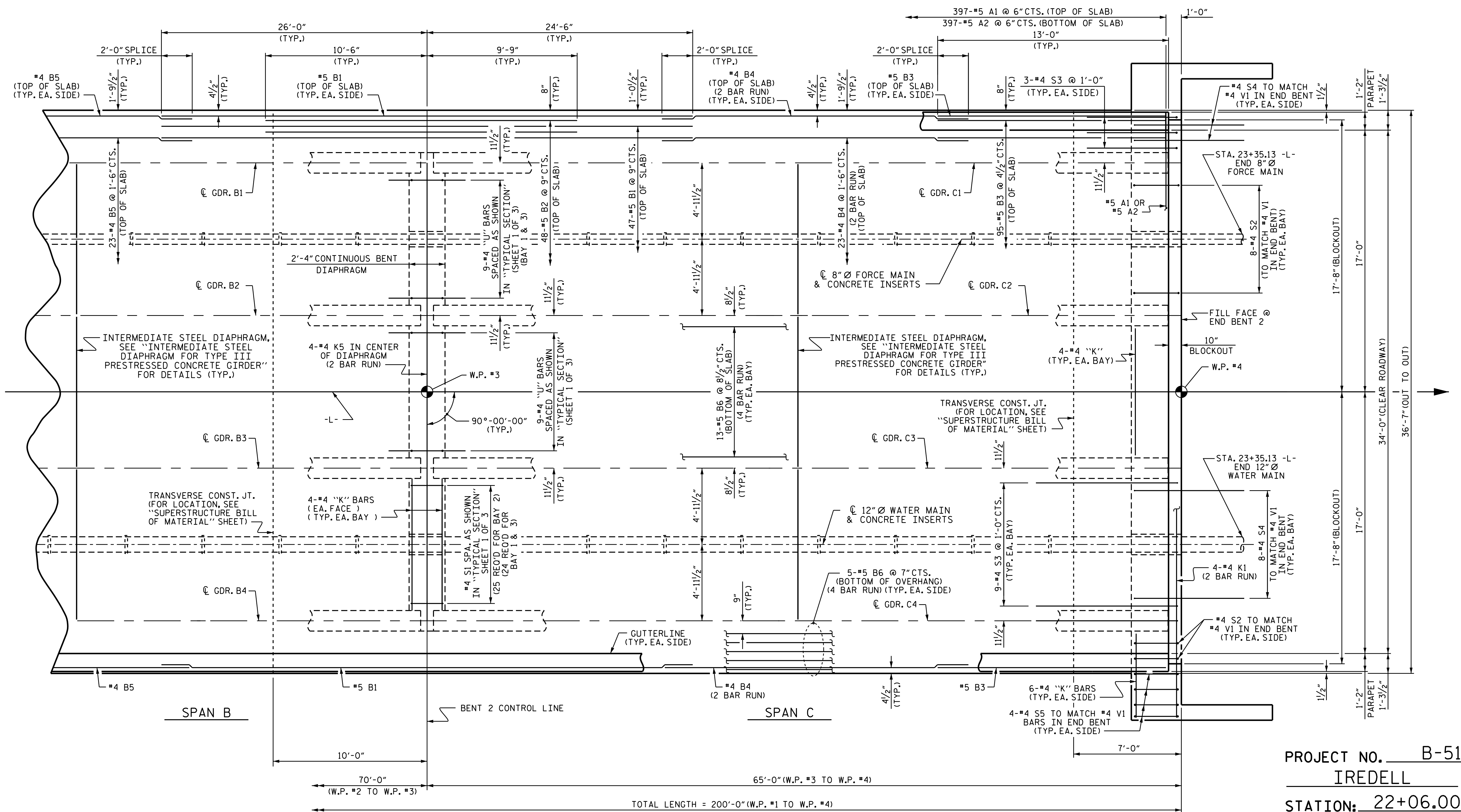


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PLAN OF SPANS

DRAWN BY : K. D. LAYNE DATE : 4-29-15
 CHECKED BY : J. D. HAWK DATE : 5-12-15
 DESIGN ENGINEER OF RECORD : T. H. CARROLL DATE : 8-18-15

DOCUMENT NOT CONSIDERED
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| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-8 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 38 |

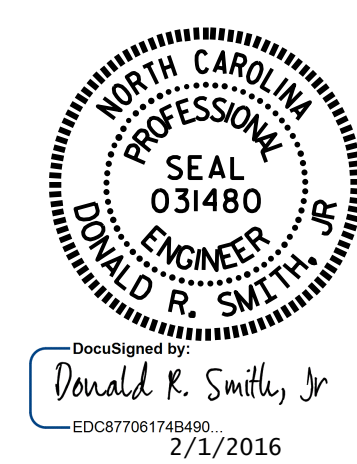


PARTIAL PLAN OF SPANS

PROJECT NO. B-5142
 IREDELL COUNTY
 STATION: 22+06.00 -L-

SHEET 2 OF 3

NOTES
 FOR CONCRETE PARAPET DETAILS AND REINFORCING STEEL, SEE "CONCRETE PARAPET AND END POST DETAILS" SHEETS.
 FOR SECTIONS, SEE "TYPICAL SECTION" SHEETS.
 SEE "PLAN OF SPANS DETAILS" SHEETS FOR ADDITIONAL REINFORCING STEEL IN WINGS.
 SEE SHEETS S-33 THROUGH S-36 AND SPECIAL PROVISIONS FOR DETAILS AND INSTALLATION OF 8" Ø FORCE MAIN AND 12" Ø WATER MAIN.

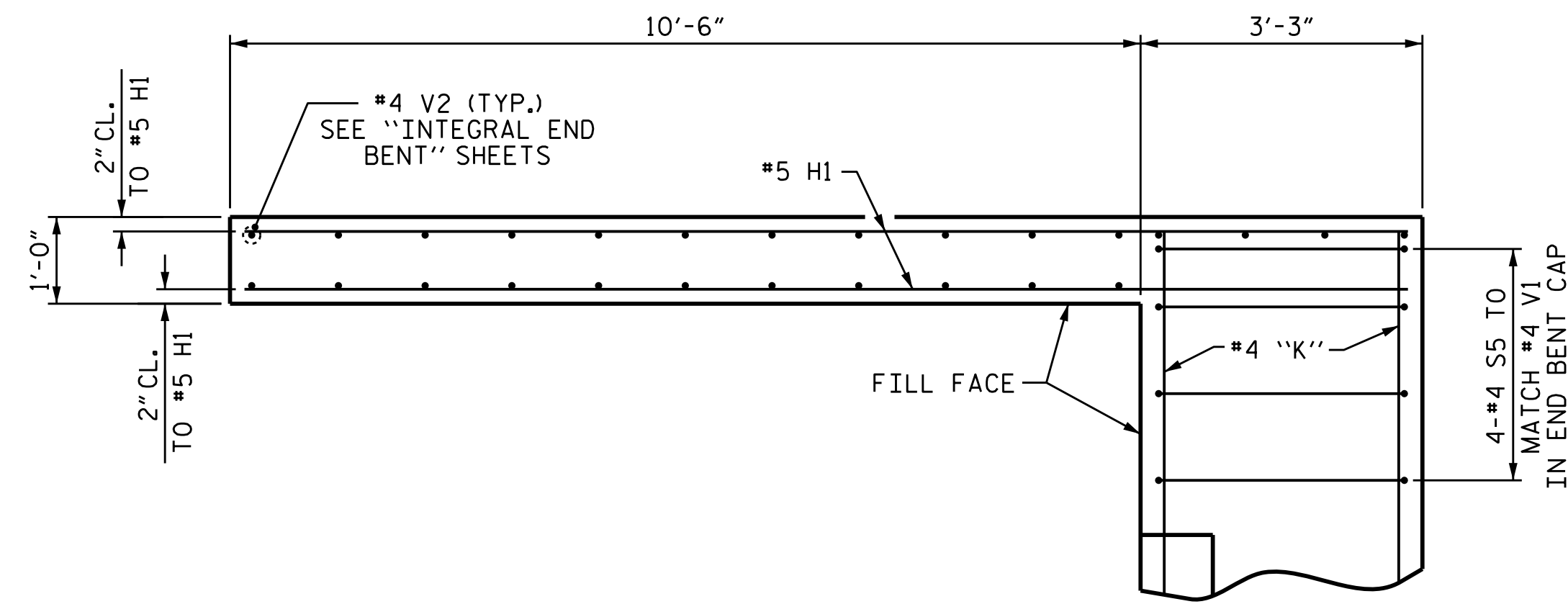


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PLAN OF SPANS

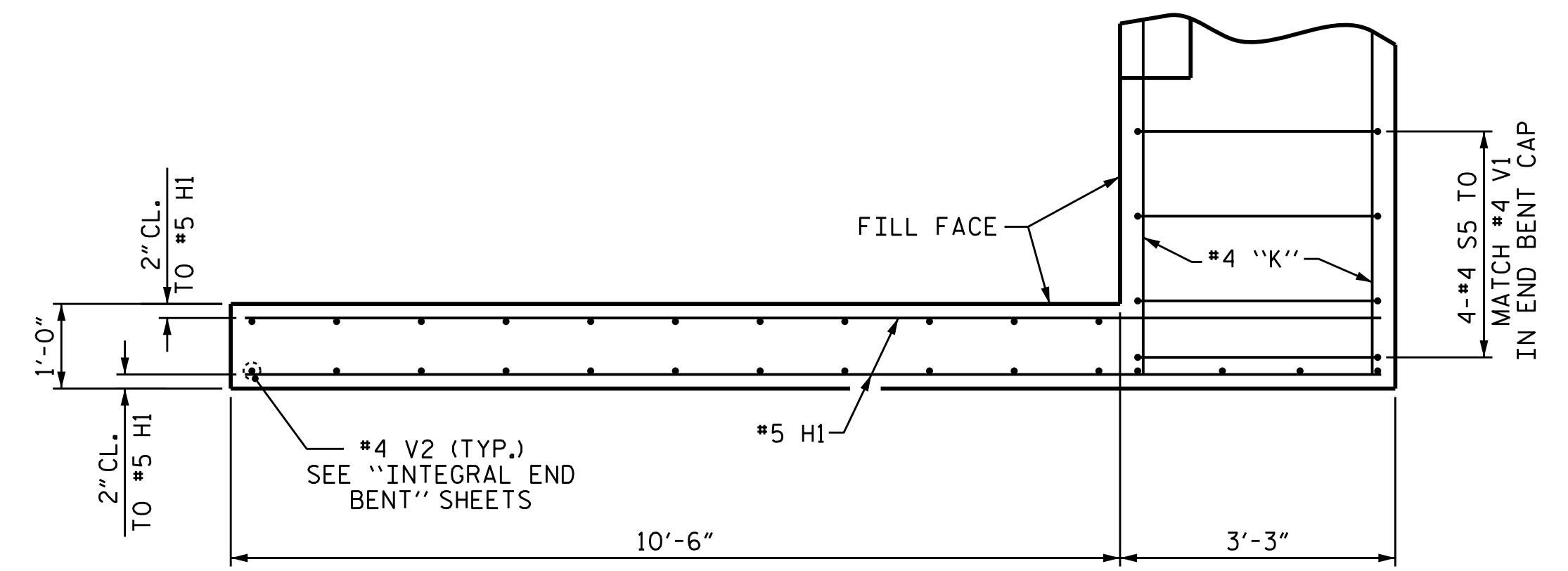
DRAWN BY: K. D. LAYNE DATE: 4-29-15
 CHECKED BY: J. D. HAWK DATE: 5-12-15
 DESIGN ENGINEER OF RECORD: T. H. CARROLL DATE: 8-18-15

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

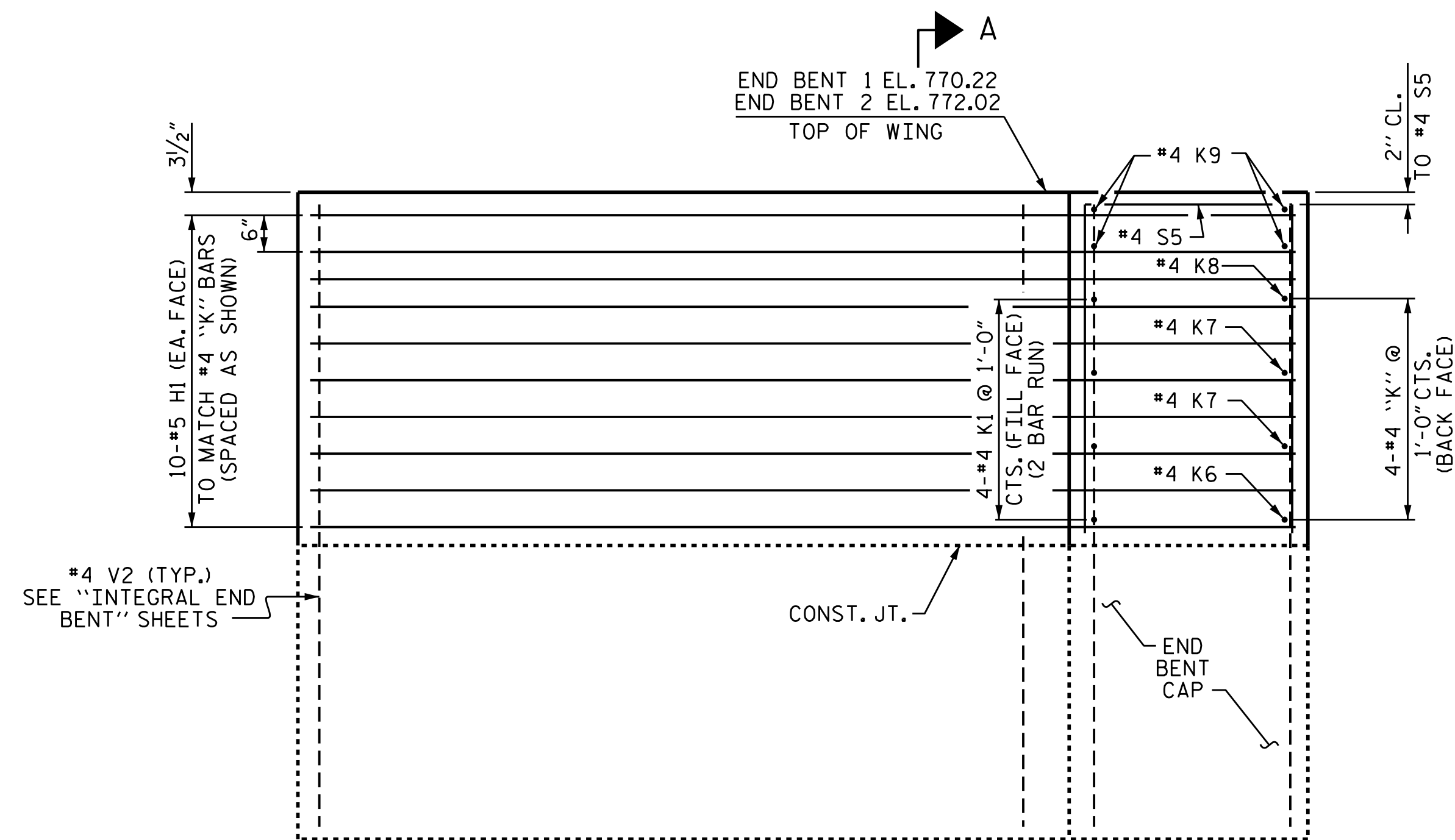
| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | TOTAL SHEETS |
| 1 | | | 3 | | | 38 |
| 2 | | | 4 | | | |



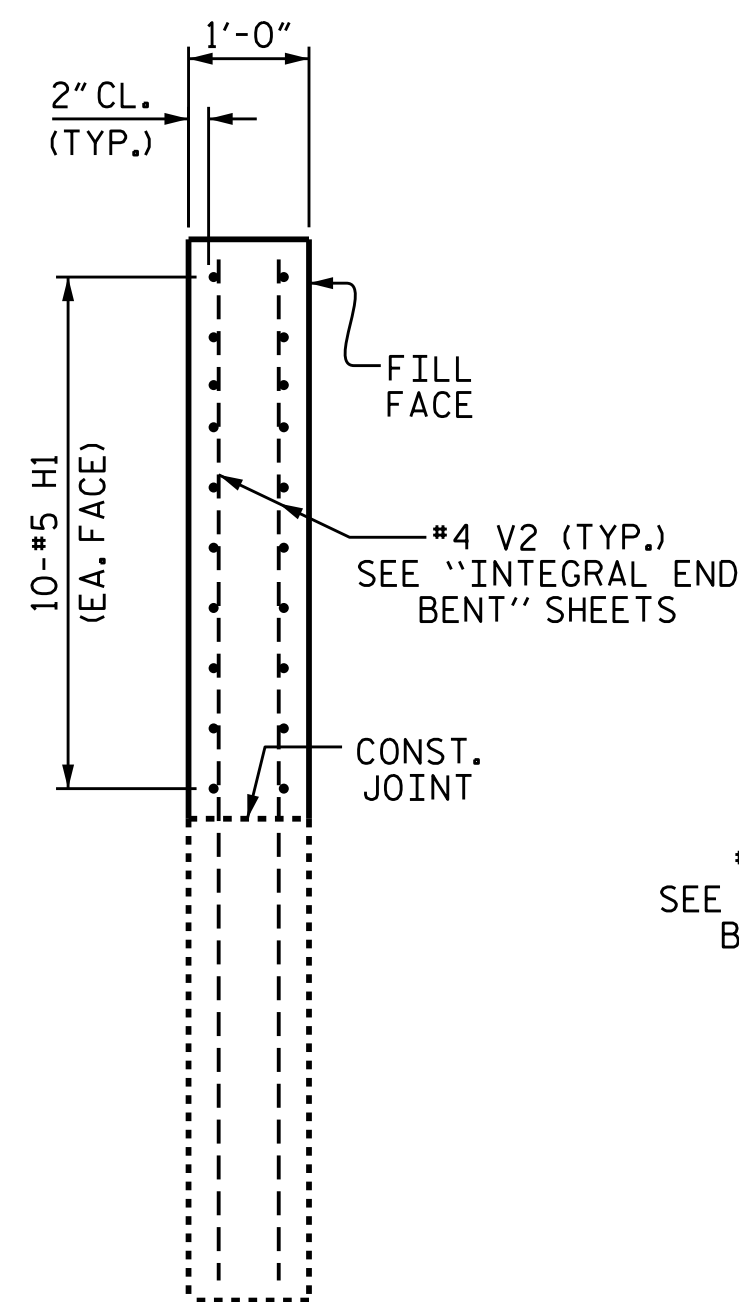
PLAN OF LEFT WING



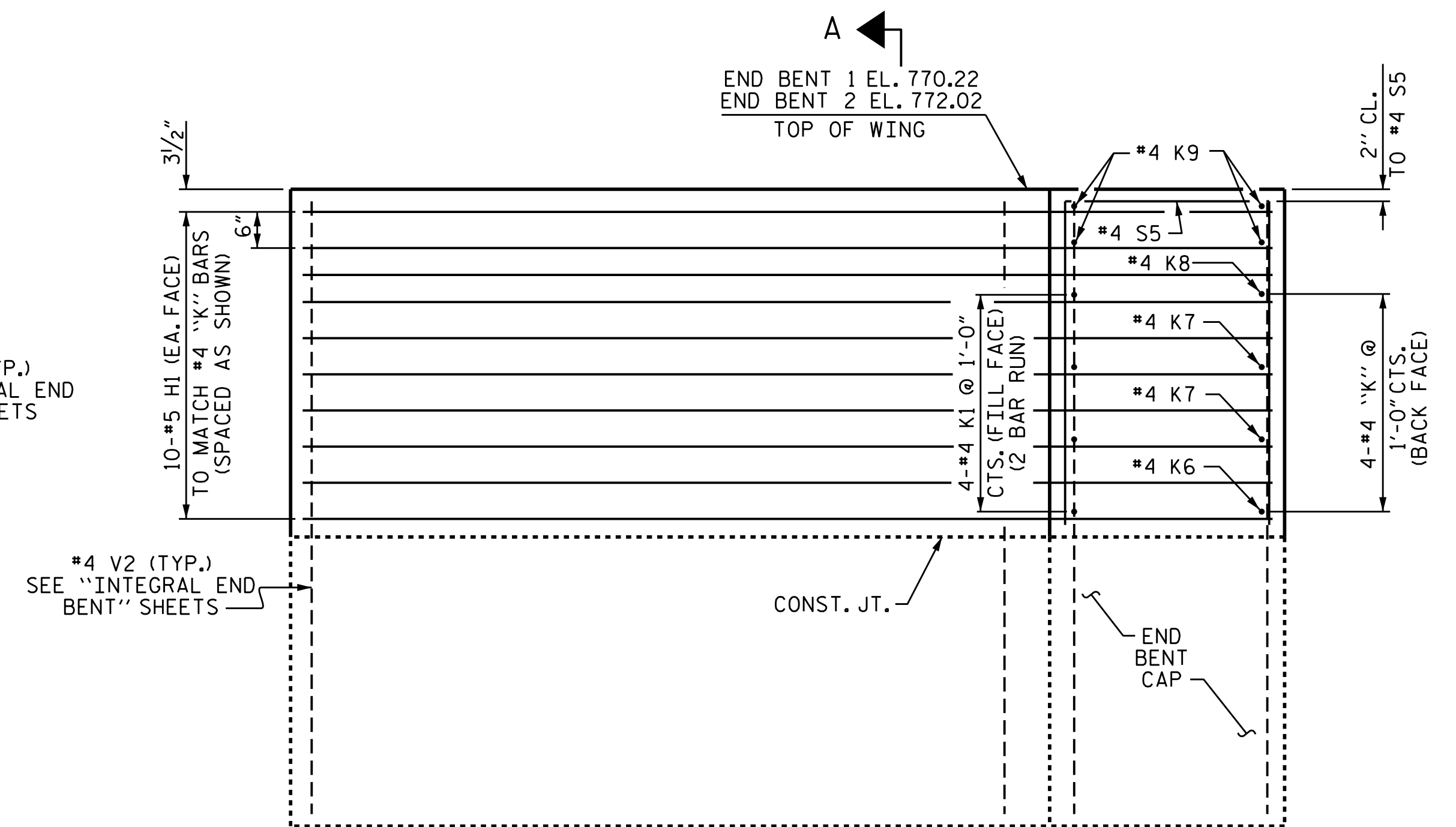
PLAN OF RIGHT WING



ELEVATION OF LEFT WING



SECTION A-A



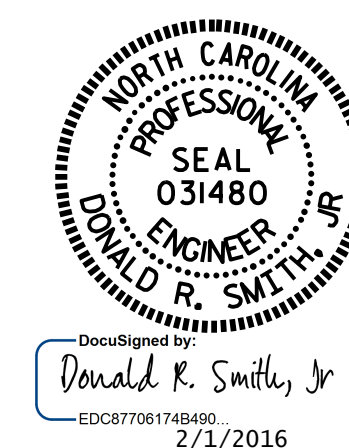
ELEVATION OF RIGHT WING

END BENT 1

END BENT 2 SIMILAR

PROJECT NO. B-5142
IREDELL COUNTY
 STATION: 22+06.00 -L-

SHEET 3 OF 3

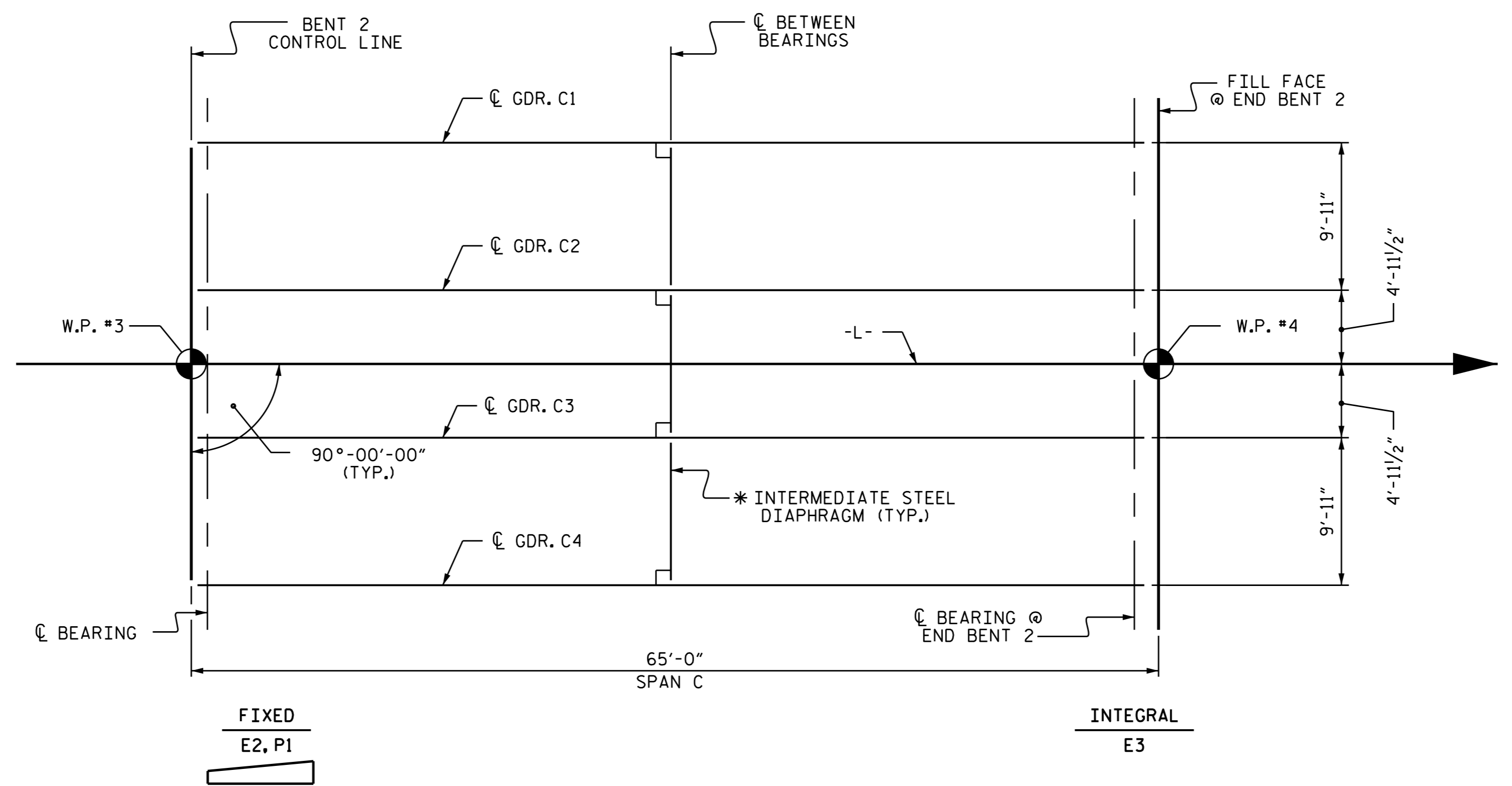
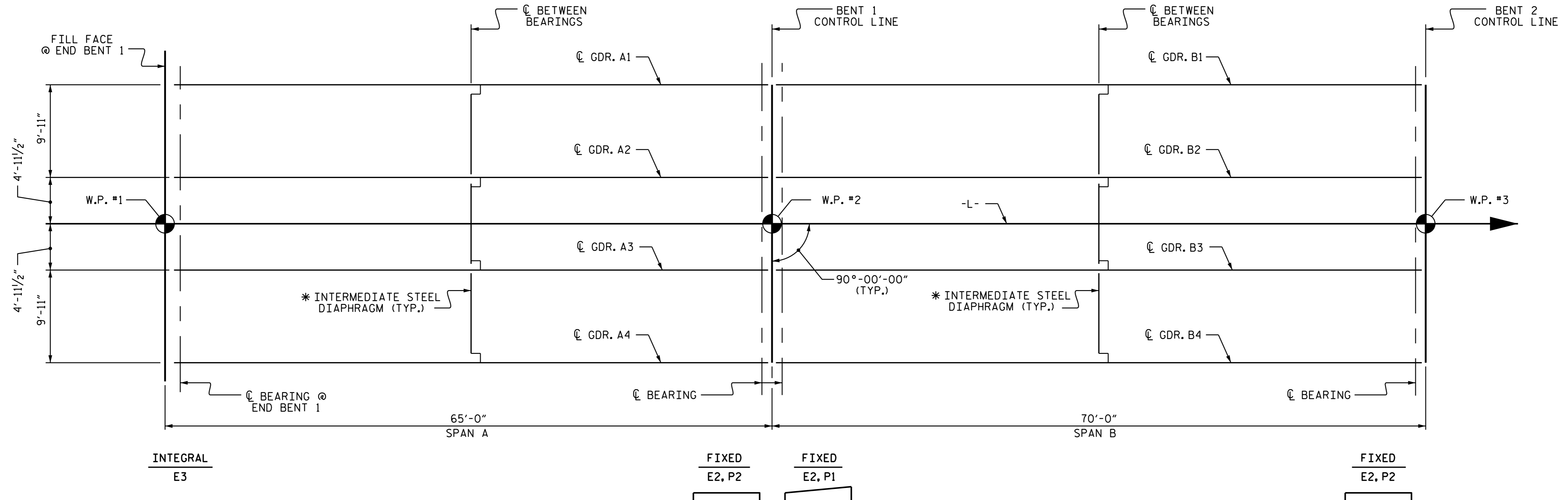


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PLAN OF SPANS
 DETAILS

DRAWN BY : K. D. LAYNE DATE : 4-29-15
 CHECKED BY : J. D. HAWK DATE : 5-12-15
 DESIGN ENGINEER OF RECORD: T. H. CARROLL DATE : 8-18-15

DOCUMENT NOT CONSIDERED
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 SIGNATURES COMPLETED

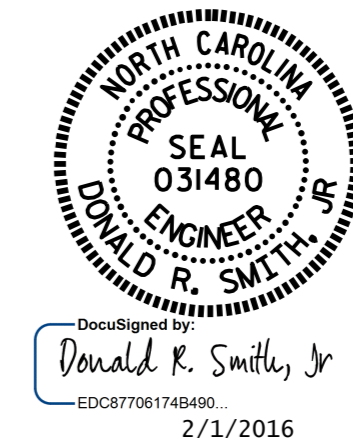
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| NO. | BY: | DATE: | NO. | BY: | DATE: | S-10 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 38 |



GIRDER LAYOUT

* SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE III PRESTRESSED CONCRETE GIRDERS".

PROJECT NO. B-5142
IREDELL COUNTY
 STATION: 22+06.00 -L-



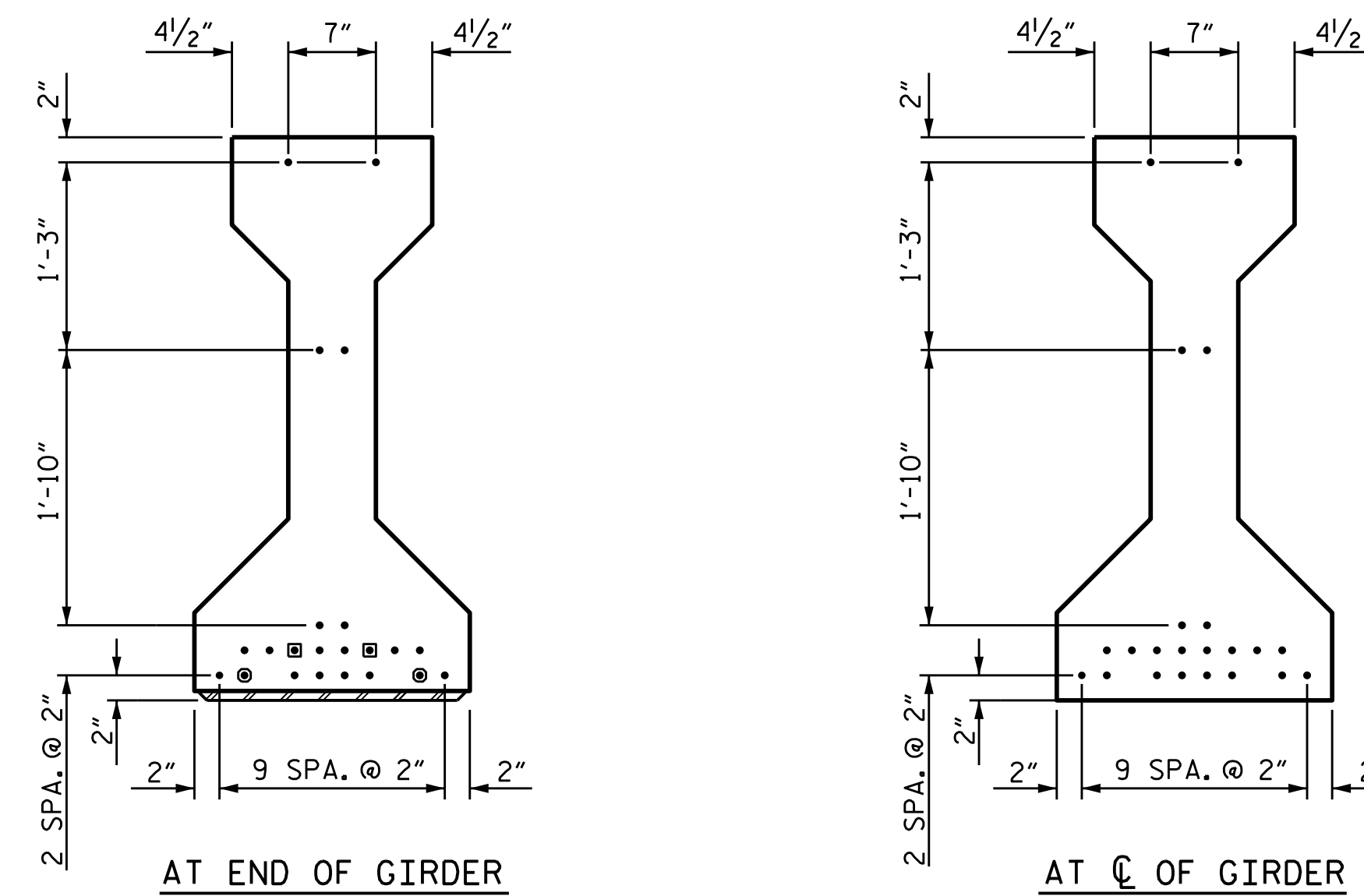
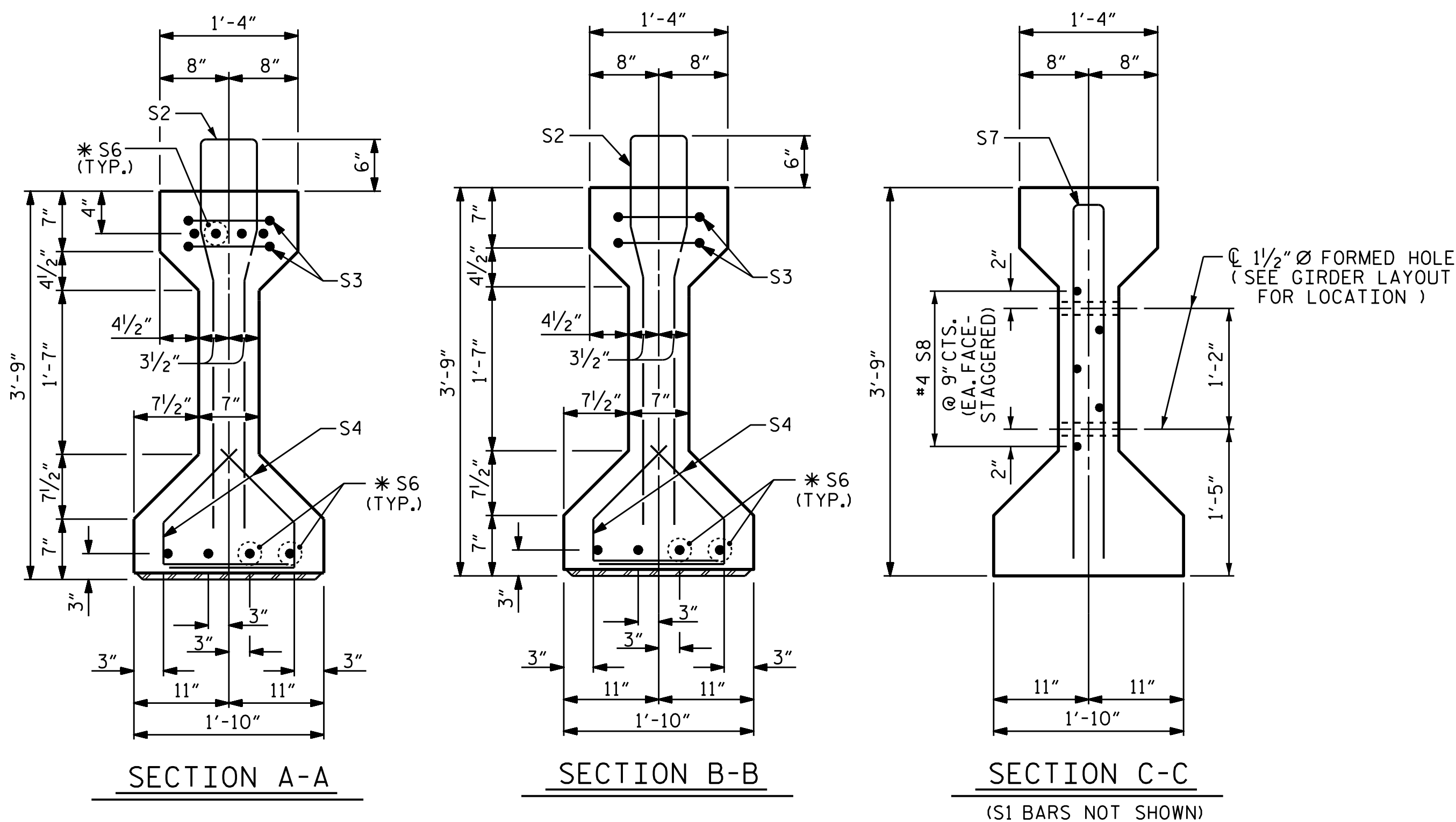
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUPERSTRUCTURE
 GIRDER LAYOUT**

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-11 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 38 |

DRAWN BY : K. D. LAYNE DATE : 4-29-15
 CHECKED BY : J.D. HAWK DATE : 5-12-15
 DESIGN ENGINEER OF RECORD : T. H. CARROLL DATE : 8-18-15

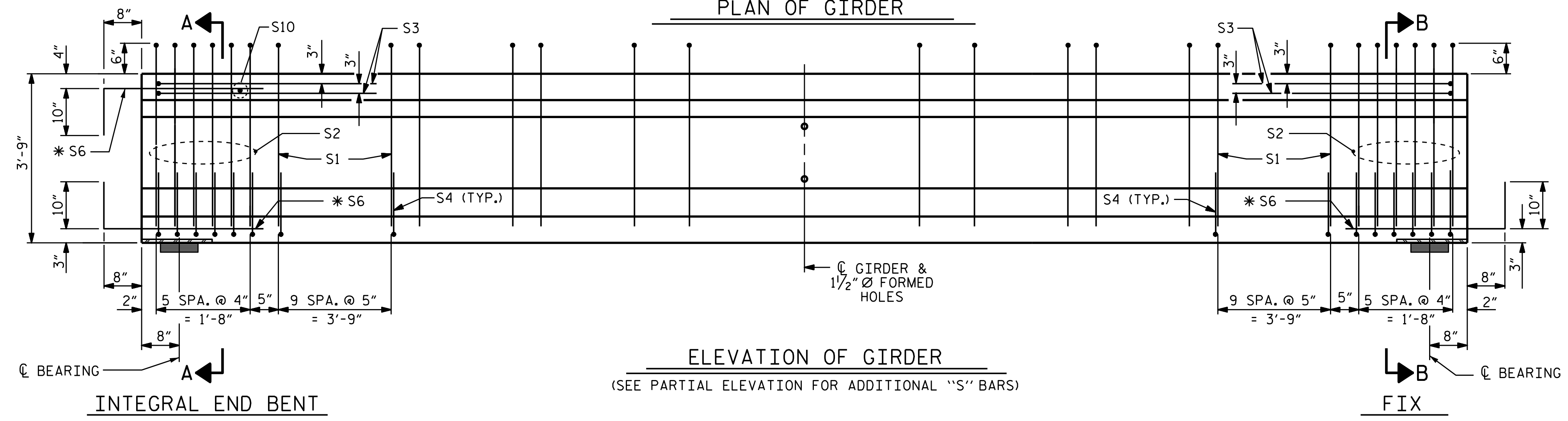
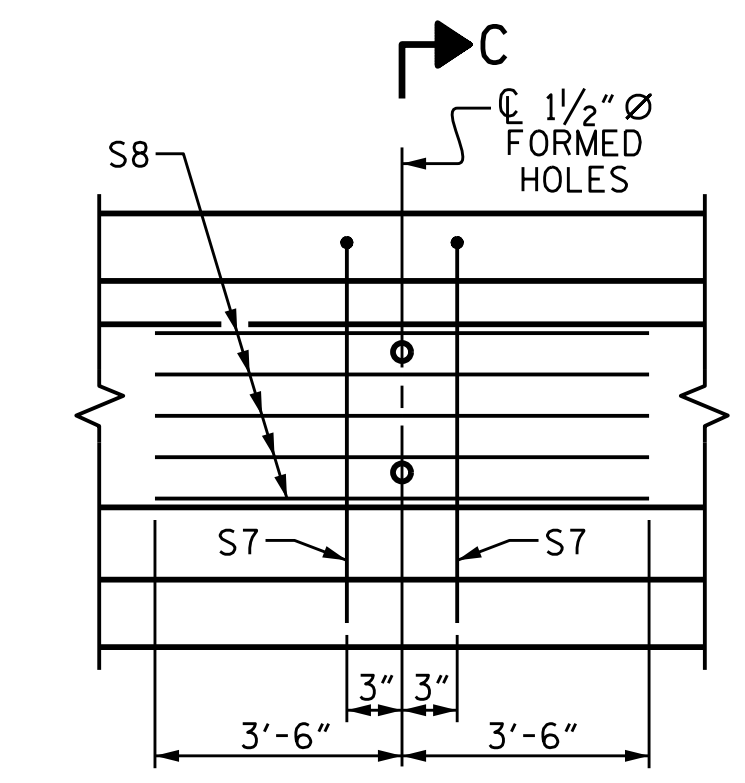
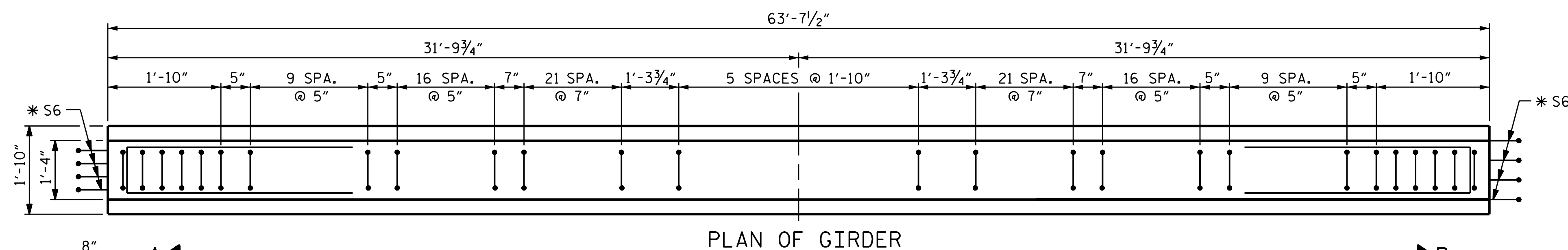
DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED



0.6" Ø LOW RELAXATION STRAND LAYOUT

DEBONDING LEGEND

- FULLY BONDED STRANDS
- STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ⊙ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER



0.6" Ø L. R. GRADE 270 STRANDS

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

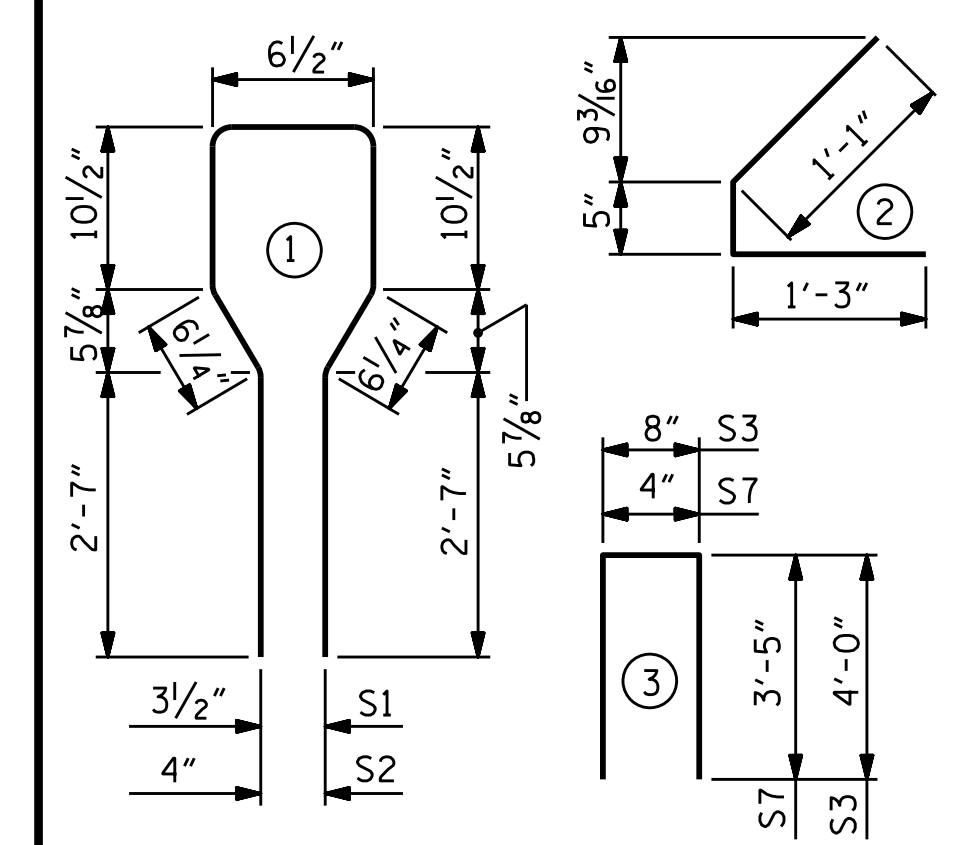
REINFORCING STEEL FOR ONE GIRDER

| BAR | NUMBER | SIZE | TYPE | LENGTH | WEIGHT |
|-----|--------|------|------|--------|--------|
| S1 | 104 | #4 | 1 | 8'-6" | 591 |
| S2 | 12 | #6 | 1 | 8'-6" | 153 |
| S3 | 4 | #4 | 3 | 8'-8" | 23 |
| S4 | 64 | #4 | 2 | 2'-9" | 118 |
| *S6 | 12 | #5 | STR | 3'-8" | 46 |
| S7 | 2 | #5 | 3 | 7'-2" | 15 |
| S8 | 5 | #4 | STR | 7'-0" | 23 |
| S10 | 1 | #3 | STR | 1'-0" | 1 |

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

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

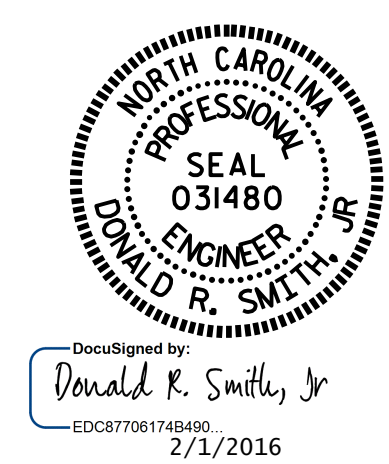
| REINFORCING STEEL | 6,000 PSI CONCRETE | 0.6" Ø L. R. STRANDS |
|-------------------|--------------------|----------------------|
| LBS. | C.Y. | No. |
| 970 | 9.2 | 22 |

GIRDERS REQUIRED

| | NUMBER | LENGTH | TOTAL LENGTH |
|--------|--------|----------|--------------|
| SPAN A | 4 | 63'-7/2" | 254'-6" |
| SPAN C | 4 | 63'-7/2" | 254'-6" |

PROJECT NO. B-5142
IREDELL COUNTY
STATION: 22+06.00 -L-

SHEET 1 OF 3

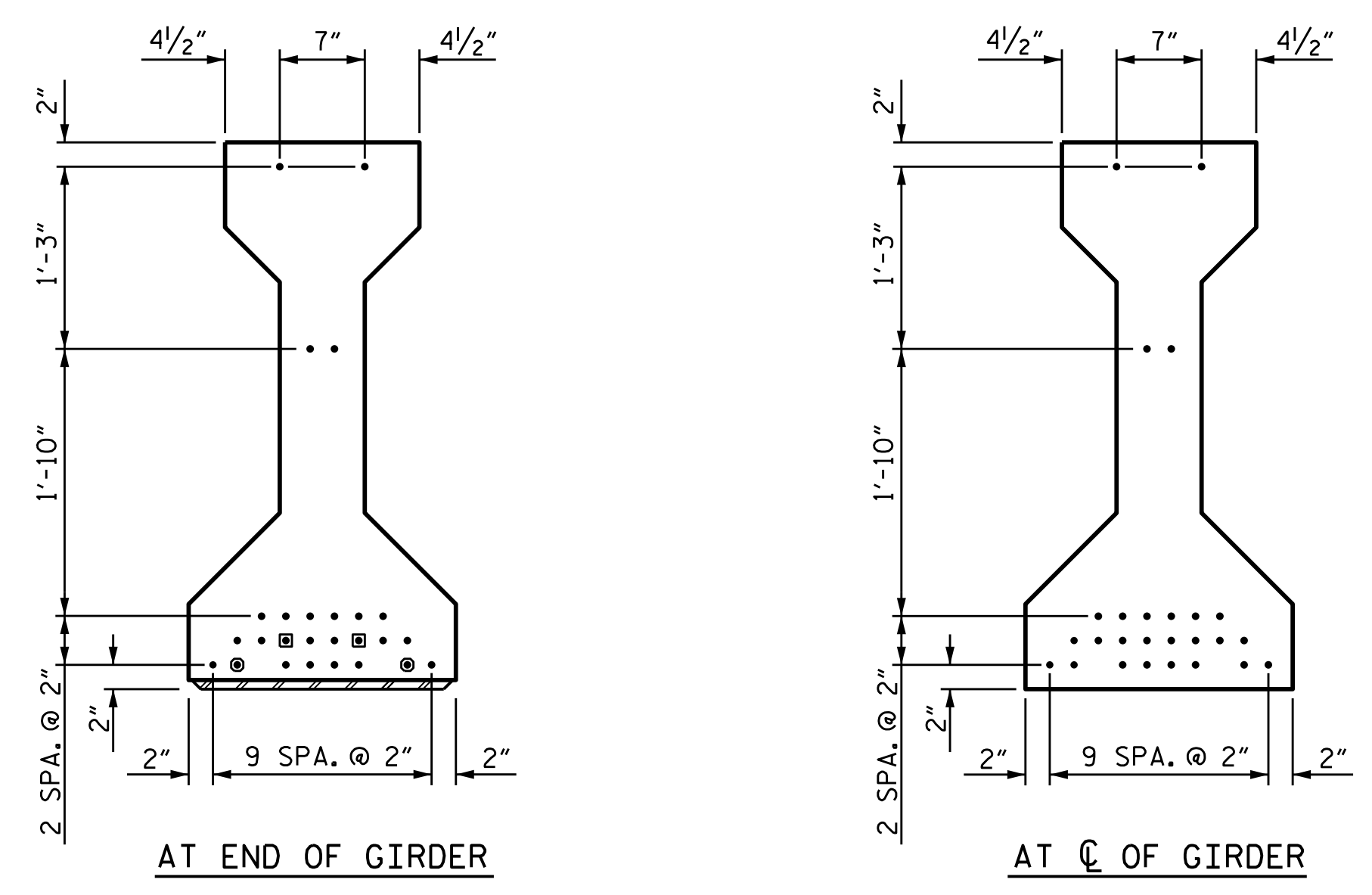
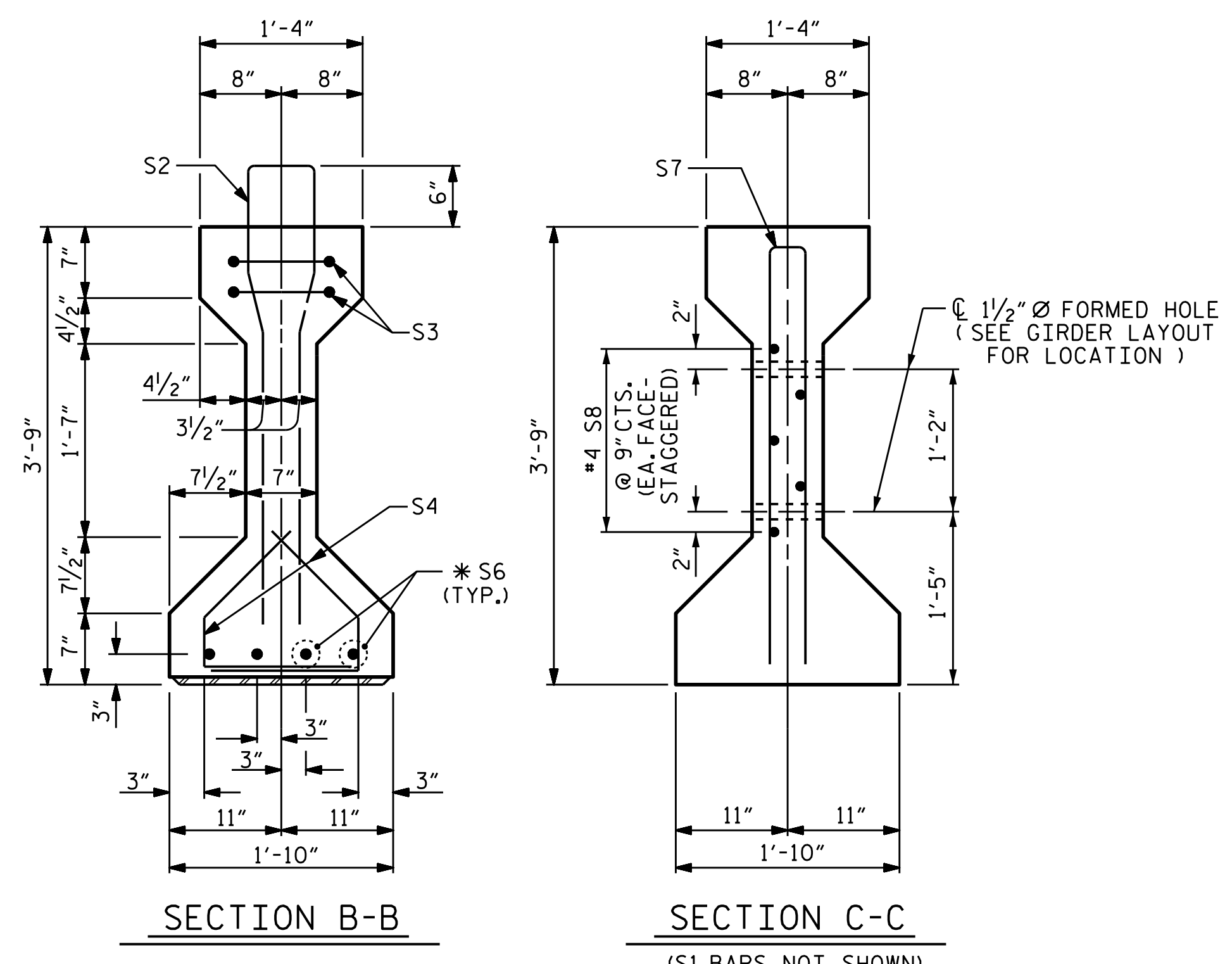


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
AASHTO TYPE III
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
SPANS A & C

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-12 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 38 |

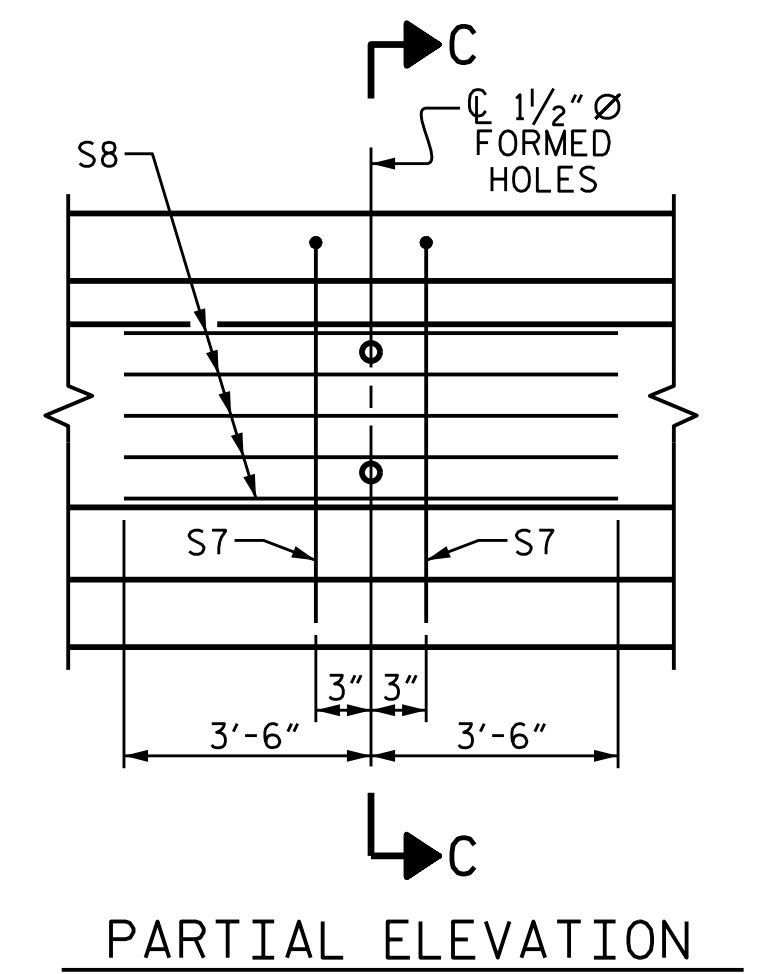
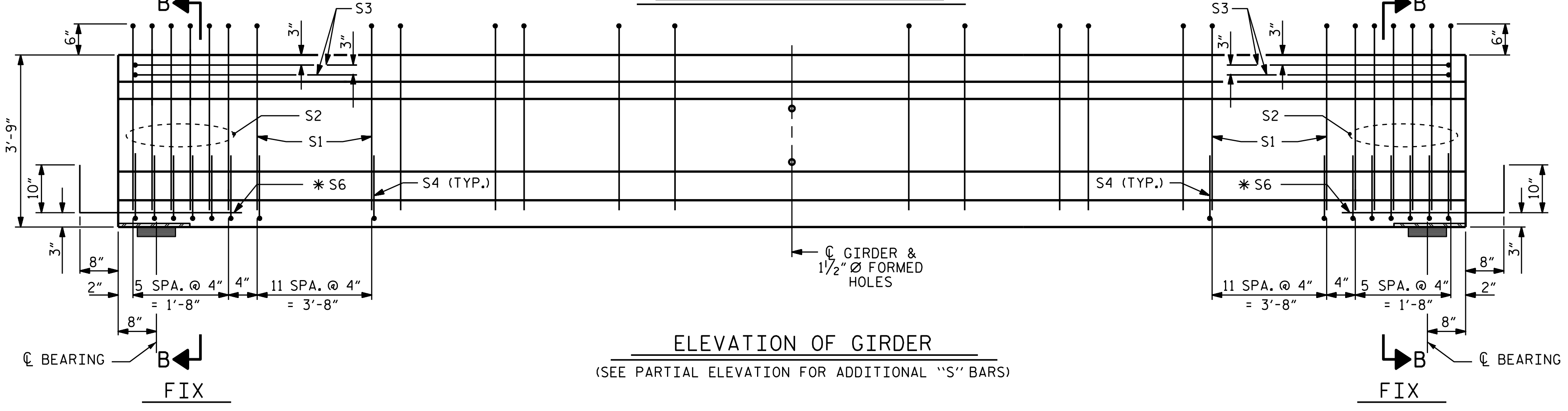
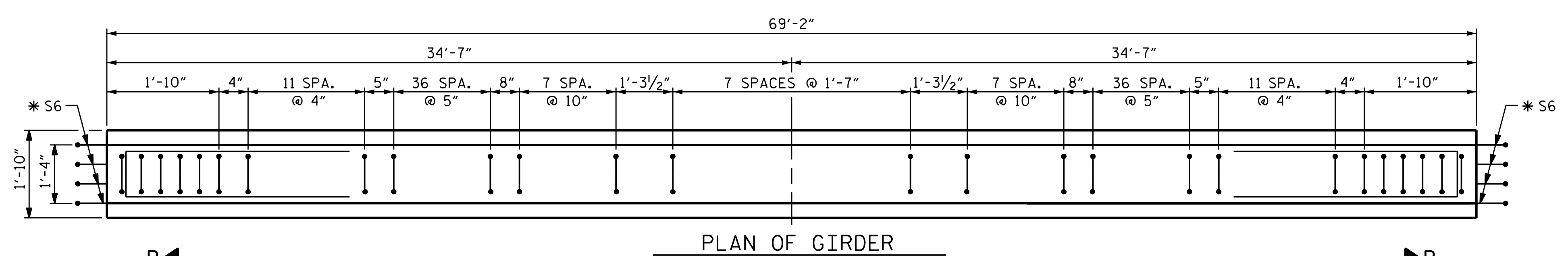
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

| | | | |
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| ASSEMBLED BY : K. D. LAYNE | DATE : 4-29-15 | | |
| CHECKED BY : J. D. HAWK | DATE : 5-12-15 | | |
| DRAWN BY : ELR 8/91 | REV. 5/1/06R | TLA/GM | DESIGN ENGINEER OF RECORD: |
| CHECKED BY : GRP 8/91 | REV. 10/1/11 | MAA/GM | T. H. CARROLL |
| | REV. 1/15 | MAA/TMG | DATE : 8-18-15 |



DEBONDING LEGEND

- FULLY BONDED STRANDS
- STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ⊙ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER

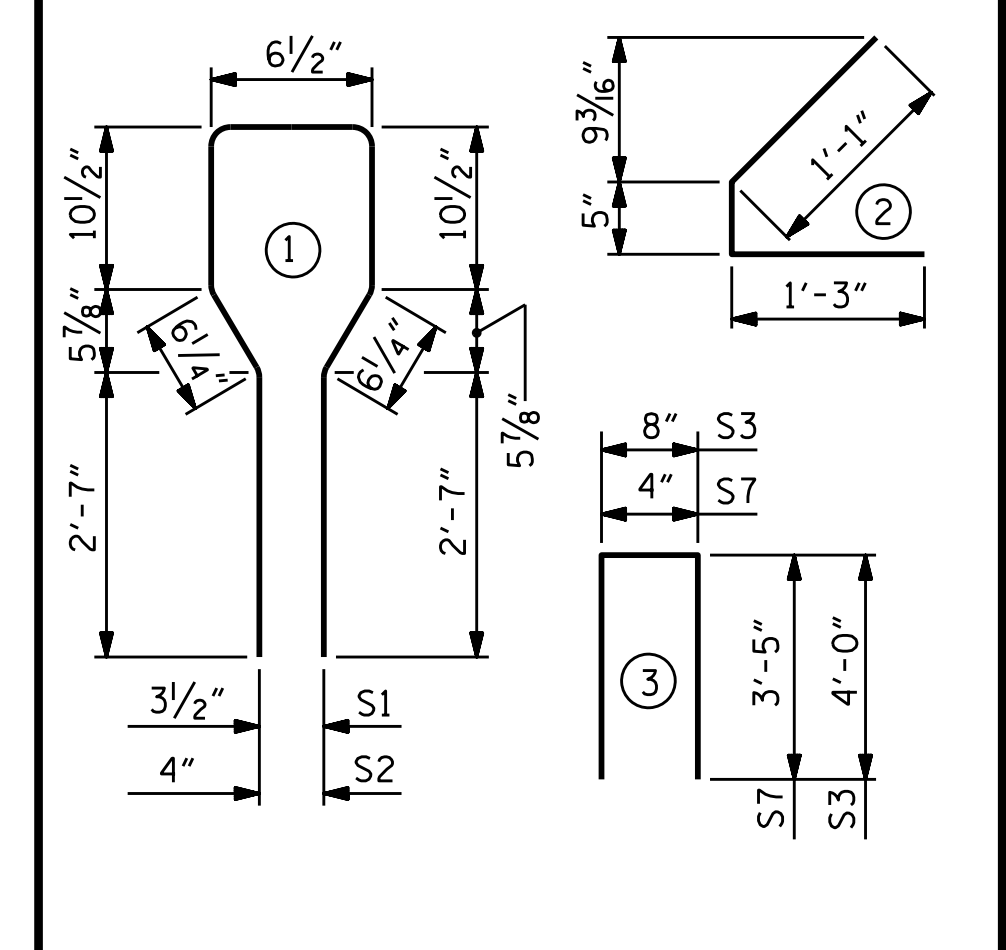


| 0.6" Ø L. R. GRADE 270 STRANDS | | |
|--------------------------------|--|--|
| AREA (SQUARE INCHES) | ULTIMATE STRENGTH (LBS. PER STRAND) | APPLIED PRESTRESS (LBS. PER STRAND) |
| 0.217 | 58,600 | 43,950 |

| REINFORCING STEEL FOR ONE GIRDER | | | | | |
|----------------------------------|--------|------|------|--------|--------|
| BAR | NUMBER | SIZE | TYPE | LENGTH | WEIGHT |
| S1 | 122 | #4 | 1 | 8'-6" | 693 |
| S2 | 12 | #6 | 1 | 8'-6" | 153 |
| S3 | 4 | #4 | 3 | 8'-8" | 23 |
| S4 | 72 | #4 | 2 | 2'-9" | 132 |
| *S6 | 8 | #5 | STR | 3'-8" | 31 |
| S7 | 2 | #5 | 3 | 7'-2" | 15 |
| S8 | 5 | #4 | STR | 7'-0" | 23 |

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

BAR TYPES
ALL BAR DIMENSIONS ARE OUT-TO-OUT

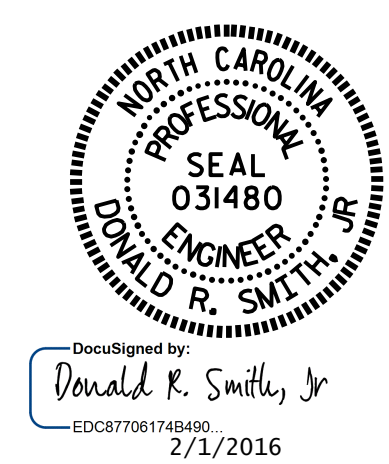


| QUANTITIES FOR ONE GIRDER | | | |
|---------------------------|--------------------|--------------|-----|
| REINFORCING STEEL | 7,000 PSI CONCRETE | 0.6" Ø L. R. | |
| | LBS. | C.Y. | No. |
| | 1,070 | 10.0 | 26 |

| GIRDERS REQUIRED | | | |
|------------------|--------|--------|--------------|
| SPAN | NUMBER | LENGTH | TOTAL LENGTH |
| SPAN B | 4 | 69'-2" | 276'-8" |

PROJECT NO. B-5142
 IREDELL COUNTY
 STATION: 22+06.00 -L-

SHEET 2 OF 3

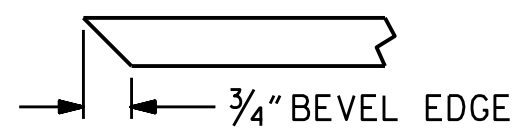
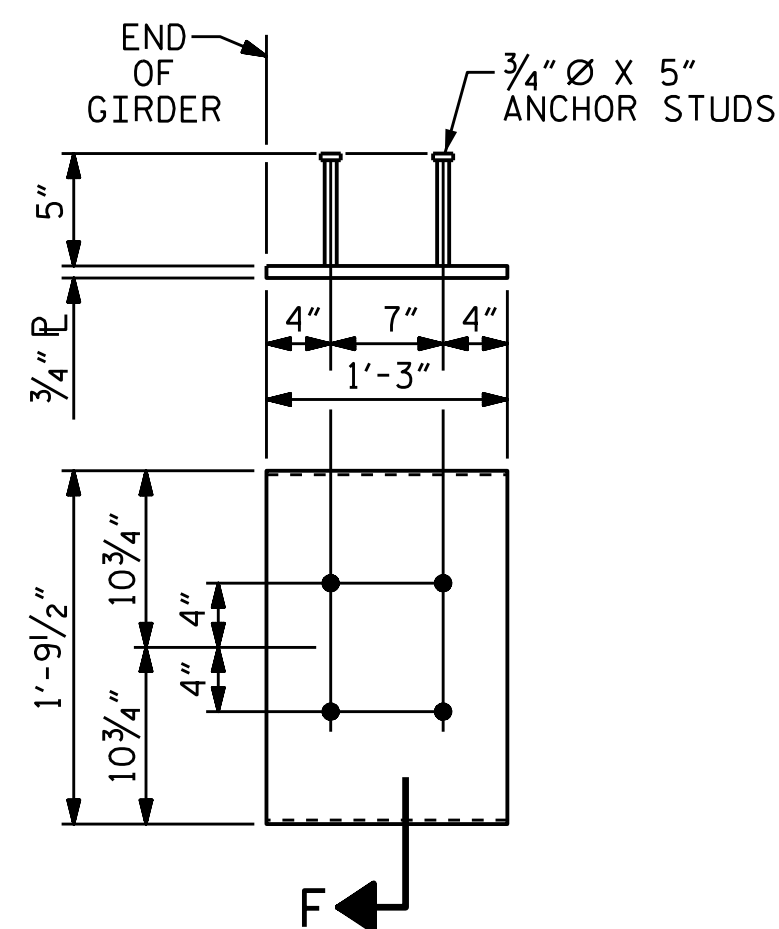


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 AASHTO TYPE III
 PRESTRESSED CONCRETE GIRDER
 CONTINUOUS FOR LIVE LOAD
 SPAN B

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ASSEMBLED BY : K. D. LAYNE DATE : 4-29-15
 CHECKED BY : J. D. HAWK DATE : 5-12-15
 DRAWN BY : ELR 8/91 REV. 5/1/06R TLA/GM DESIGN ENGINEER OF RECORD:
 CHECKED BY : GRP 8/91 REV. 10/1/11 MAA/GM T. H. CARROLL DATE : 8-18-15
 REV. 1/15 MAA/TMG



SECTION "F"

(SEE NOTES)

EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE III GIRDER
(2 REQ'D PER GIRDER)

NOTES

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

AT ENDS OF GIRDERS TO BE EMBEDDED IN CONCRETE DIAPHRAGMS OR END WALLS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER ENDS.

OTHERWISE, PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4,600 PSI. FOR SPANS A & C AND 5,600 PSI. FOR SPAN B

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

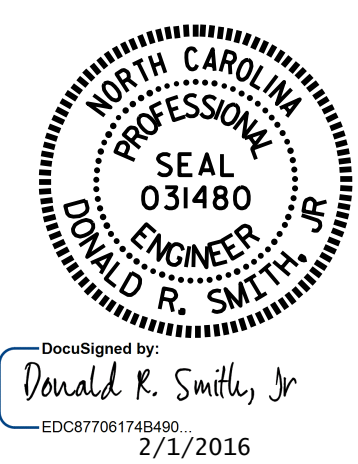
THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF 1/4".

| DEAD LOAD DEFLECTION TABLE FOR GIRDERS | | | | | | | | | | | | | | | | | | | | | | | |
|--|-----------------|-------|-------|-------|-------|--------|-------|--------|-------|-------|-------|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0.6" Ø LOW RELAXATION | SPAN A & SPAN C | | | | | | | | | | | | | | | | | | | | | | |
| | GIRDERS 1 & 4 | | | | | | | | | | | GIRDERS 2 & 3 | | | | | | | | | | | |
| | TENTH POINTS | 0.0 | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 0.0 | 0.0 | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 0.0 |
| CAMBER (GIRDER ALONE IN PLACE) | ↑ | 0.000 | 0.034 | 0.065 | 0.088 | 0.103 | 0.109 | 0.103 | 0.088 | 0.065 | 0.034 | 0.000 | 0.000 | 0.034 | 0.065 | 0.088 | 0.103 | 0.109 | 0.103 | 0.088 | 0.065 | 0.034 | 0.000 |
| * DEFLECTION DUE TO SUPERIMPOSED D.L. | ↓ | 0.000 | 0.020 | 0.038 | 0.052 | 0.061 | 0.064 | 0.061 | 0.052 | 0.038 | 0.020 | 0.000 | 0.000 | 0.023 | 0.044 | 0.060 | 0.070 | 0.074 | 0.070 | 0.060 | 0.044 | 0.023 | 0.000 |
| FINAL CAMBER | ↑ | 0 | 3/16" | 5/16" | 7/16" | 1/2" | 9/16" | 1/2" | 7/16" | 5/16" | 3/16" | 0 | 0 | 1/8" | 1/4" | 5/16" | 3/8" | 7/16" | 3/8" | 5/16" | 1/4" | 1/8" | 0 |
| 0.6" Ø LOW RELAXATION | SPAN B | | | | | | | | | | | | | | | | | | | | | | |
| | GIRDERS 1 & 4 | | | | | | | | | | | GIRDERS 2 & 3 | | | | | | | | | | | |
| | TENTH POINTS | 0.0 | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 0.0 | 0.0 | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 0.0 |
| CAMBER (GIRDER ALONE IN PLACE) | ↑ | 0.000 | 0.045 | 0.086 | 0.118 | 0.138 | 0.145 | 0.138 | 0.118 | 0.086 | 0.045 | 0.000 | 0.000 | 0.045 | 0.086 | 0.118 | 0.138 | 0.145 | 0.138 | 0.118 | 0.086 | 0.045 | 0.000 |
| * DEFLECTION DUE TO SUPERIMPOSED D.L. | ↓ | 0.000 | 0.026 | 0.050 | 0.068 | 0.080 | 0.084 | 0.080 | 0.068 | 0.050 | 0.026 | 0.000 | 0.000 | 0.030 | 0.057 | 0.078 | 0.092 | 0.096 | 0.092 | 0.078 | 0.057 | 0.030 | 0.000 |
| FINAL CAMBER | ↑ | 0 | 1/4" | 7/16" | 5/8" | 11/16" | 3/4" | 11/16" | 5/8" | 7/16" | 1/4" | 0 | 0 | 3/16" | 3/8" | 1/2" | 9/16" | 9/16" | 9/16" | 1/2" | 3/8" | 3/16" | 0 |

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

PROJECT NO. B-5142
IREDELL COUNTY
STATION: 22+06.00 -L-

SHEET 3 OF 3



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
DETAILS

| | |
|---------------------------|----------------------------|
| ASSEMBLED BY : K.D. LAYNE | DATE : 4-29-15 |
| CHECKED BY : J.D. HAWK | DATE : 5-12-15 |
| DRAWN BY : ELR 11/91 | REV. 10/1/11 |
| CHECKED BY : GRP 11/91 | REV. 1/15 |
| MAA/GM | DESIGN ENGINEER OF RECORD: |
| MAA/TMG | T. H. CARROLL |
| MAA/TMG | DATE : 8-18-15 |

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 | | | 38 |

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 1/4 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 AN 8 MIL THICK 99.99 PERCENT ZINC (W-Zn-1) THERMAL SPRAYED COATING WITH A 0.5 MIL THICK SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE THERMAL SPRAYED COATINGS SPECIAL PROVISION AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

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

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

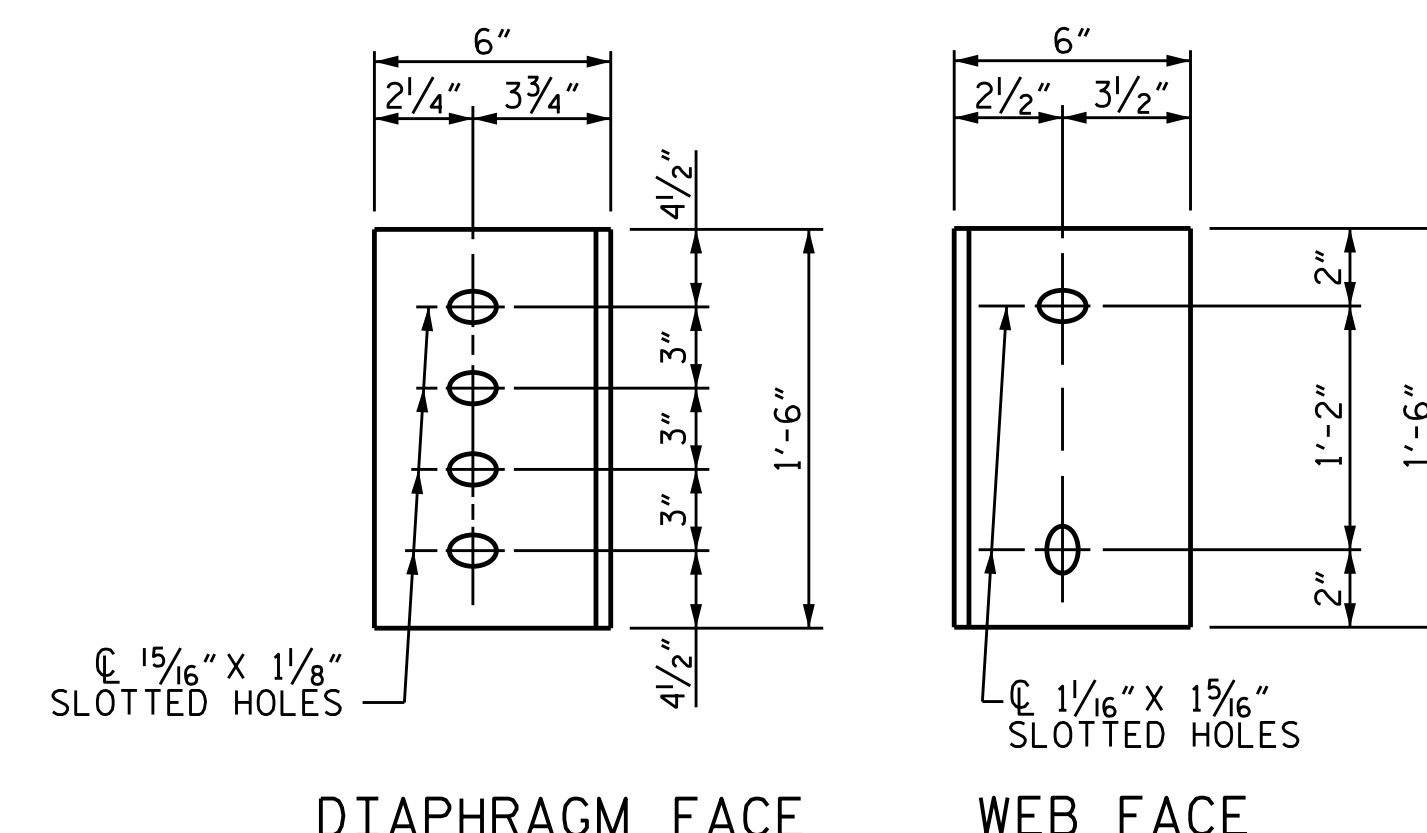
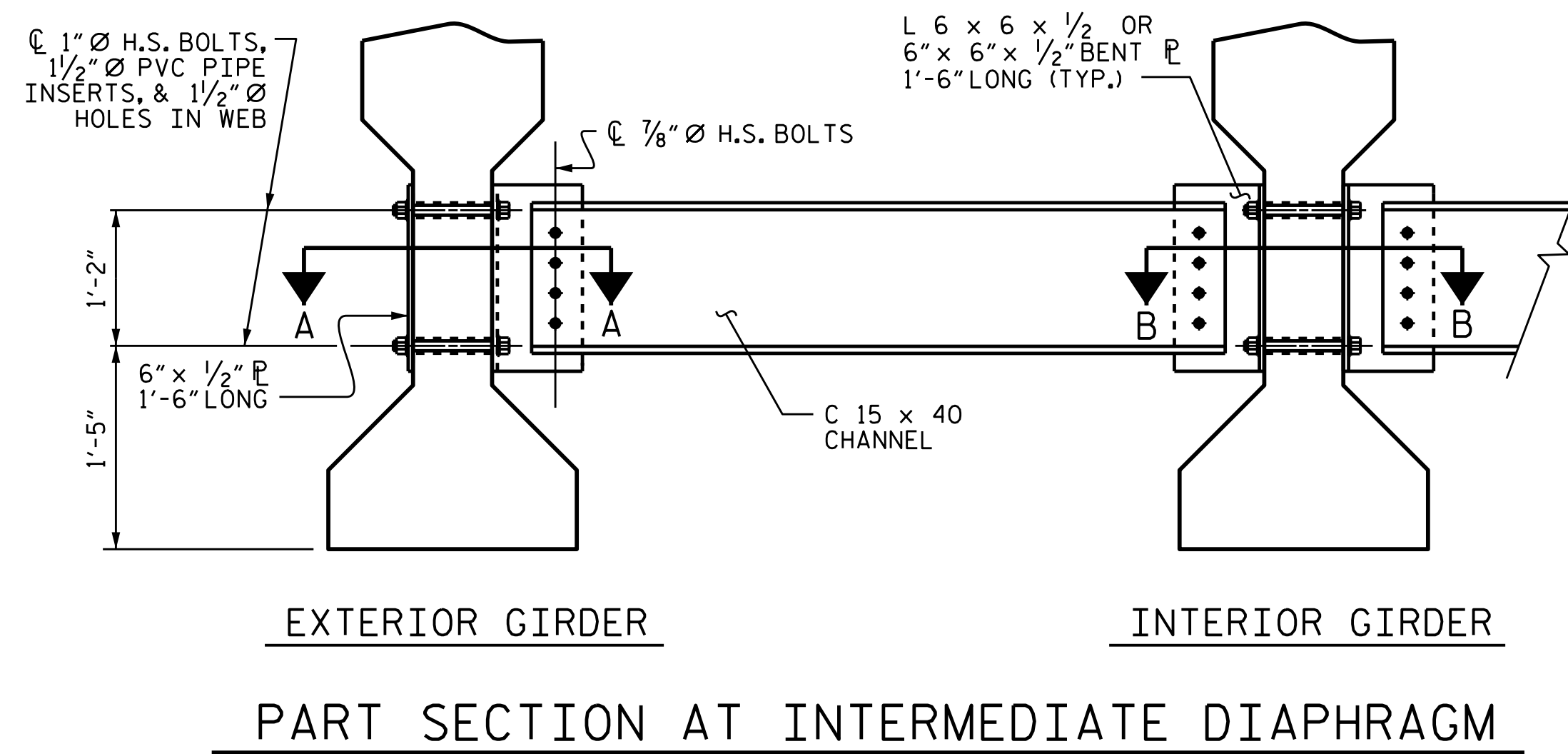
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

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

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

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



CONNECTOR PLATE DETAILS

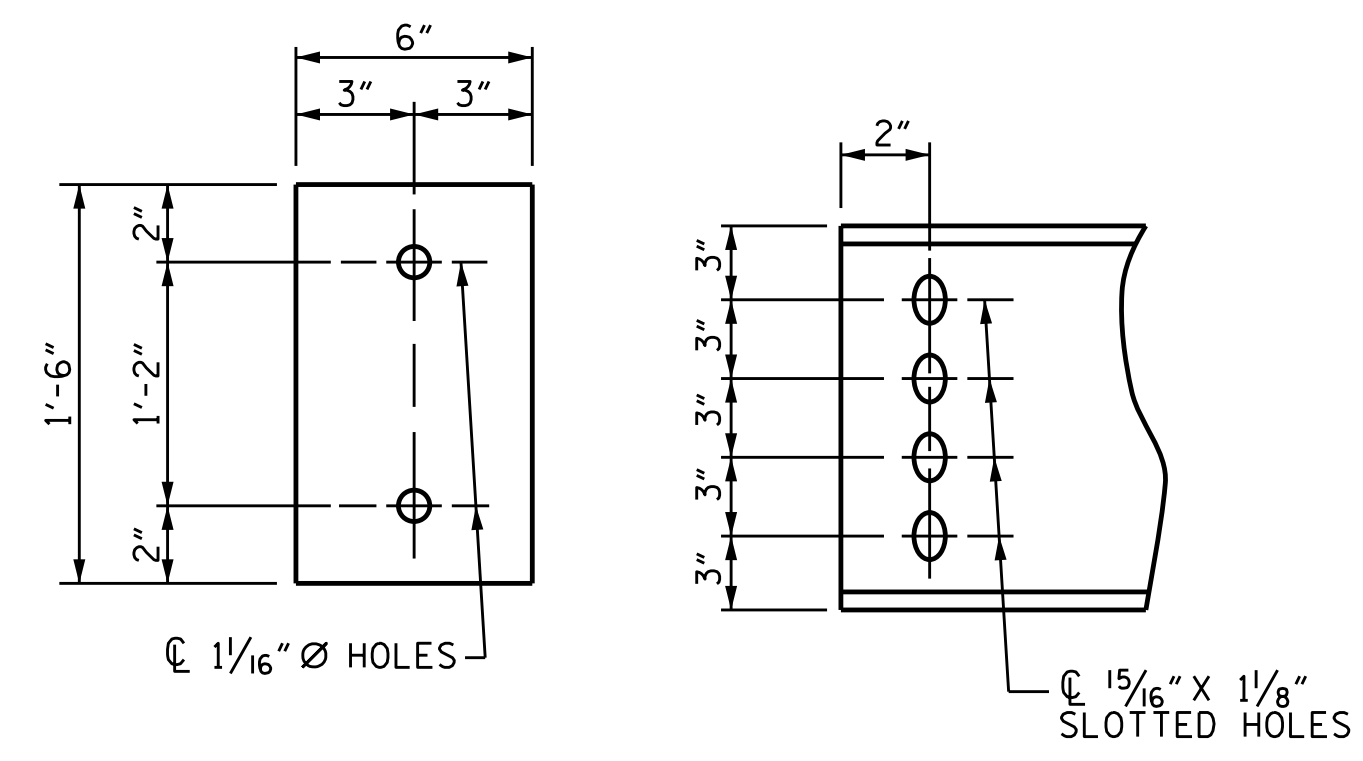
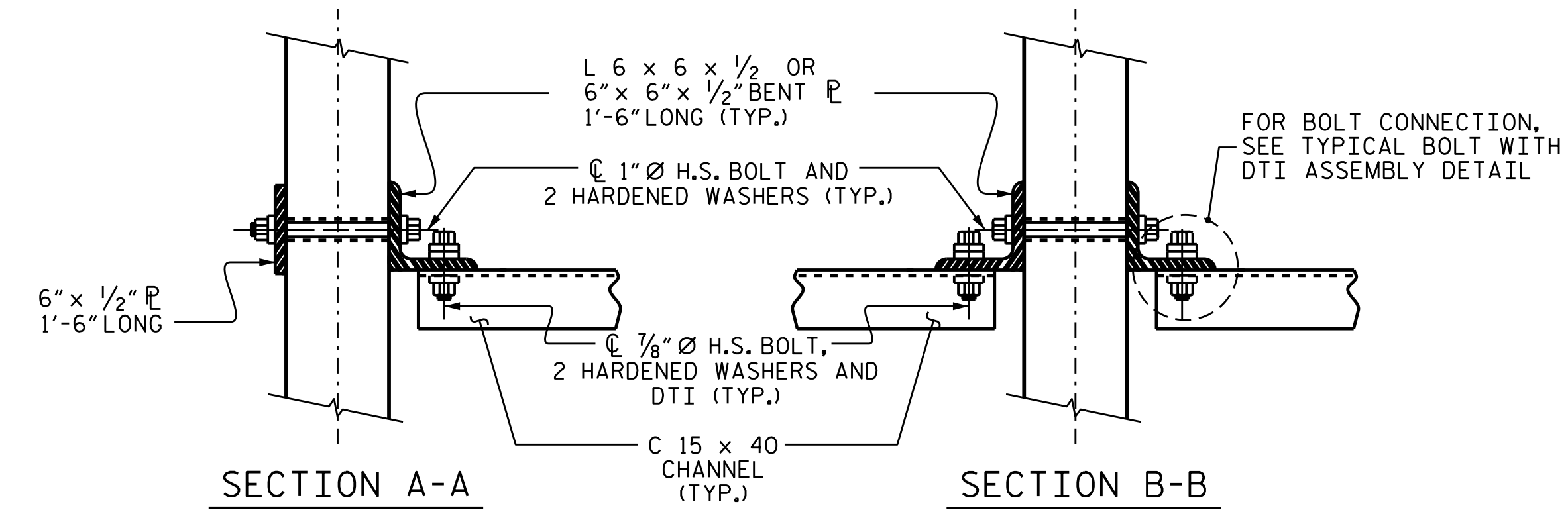
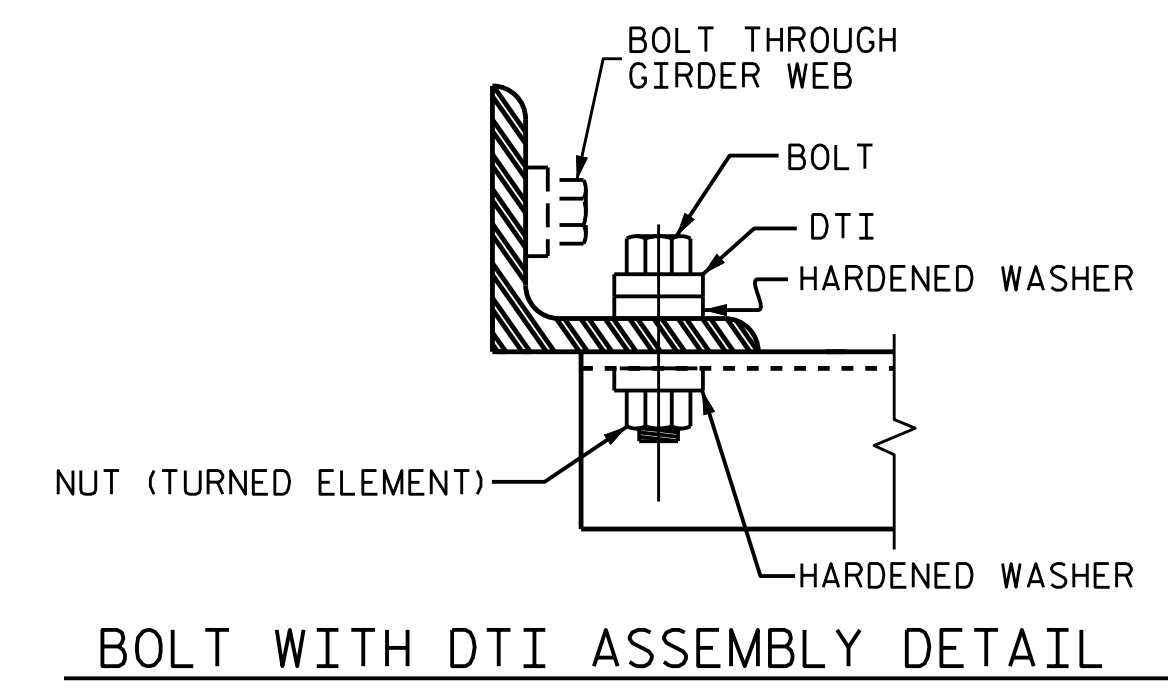


PLATE DETAILS CHANNEL END

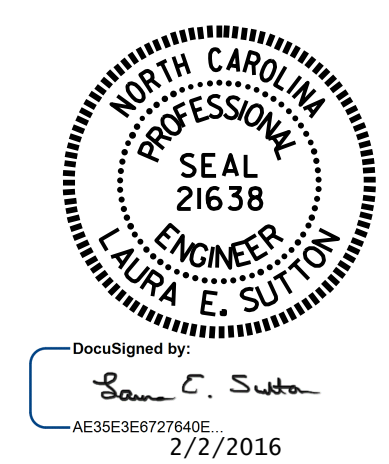


CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

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IREDELL COUNTY
 STATION: 22+06.00 -L-



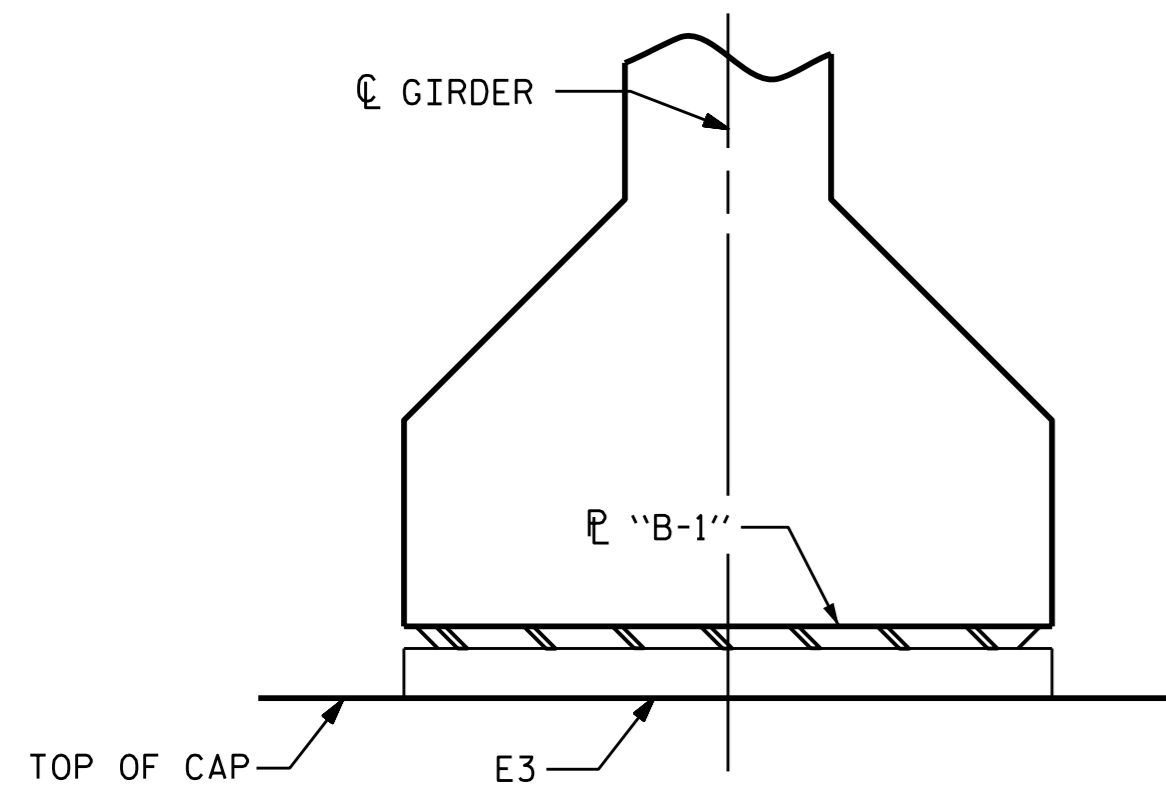
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

INTERMEDIATE
 STEEL DIAPHRAGMS
 FOR TYPE III
 PRESTRESSED CONCRETE
 GIRDERS

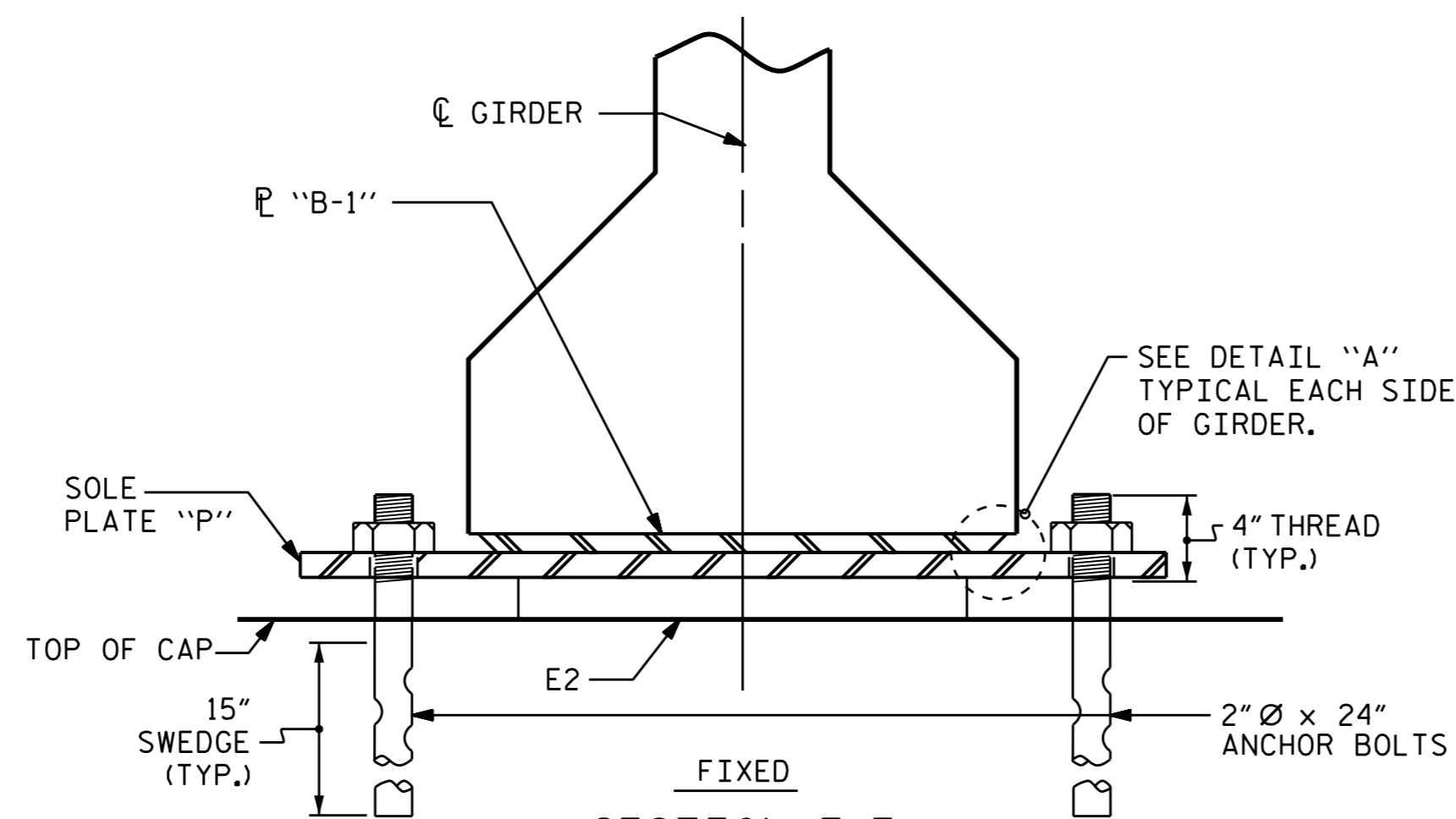
DRAWN BY : K. D. LAYNE DATE : 4-29-15
 CHECKED BY : J. D. HAWK DATE : 5-12-15
 DESIGN ENGINEER OF RECORD: L. E. SUTTON DATE : 10-12-15

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

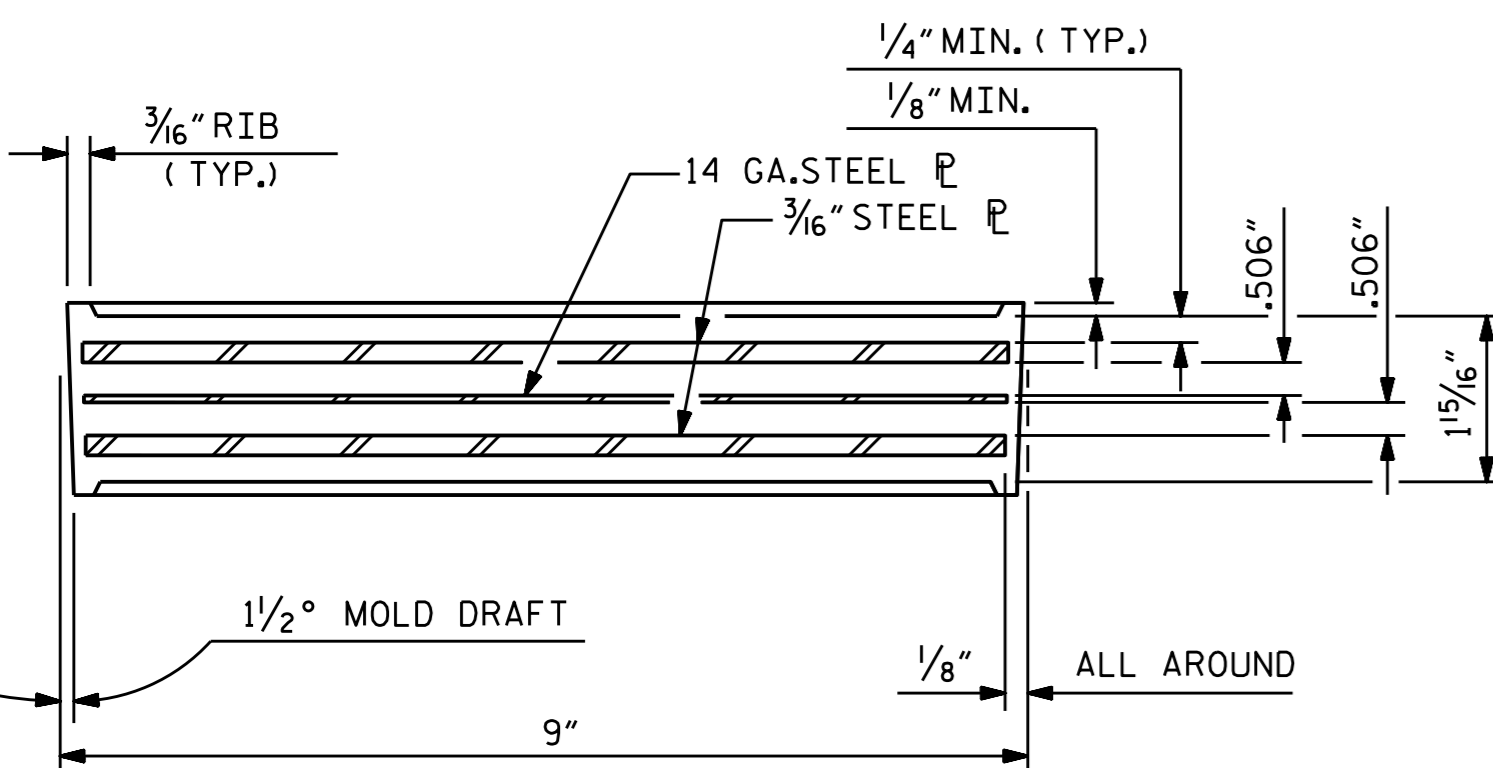
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|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-15 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 38 |



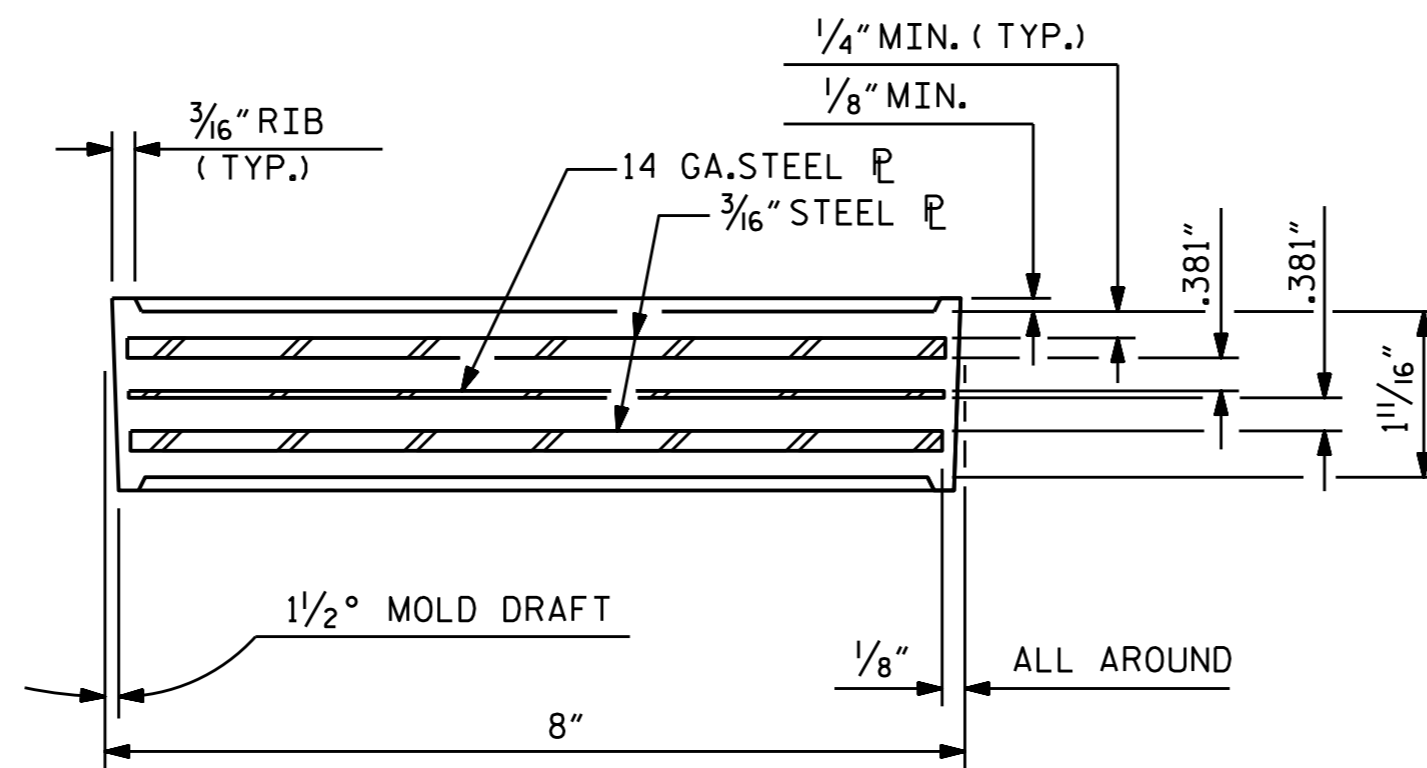
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SECTION D-D



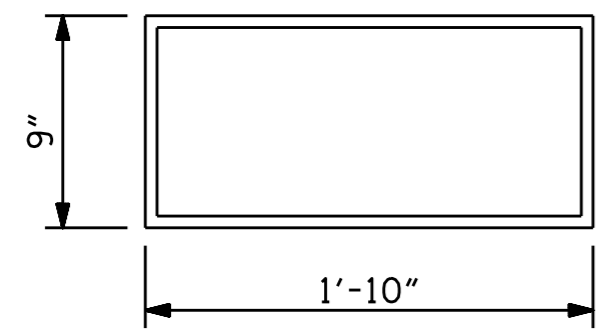
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SECTION E-E



TYPICAL SECTION OF ELASTOMERIC BEARINGS

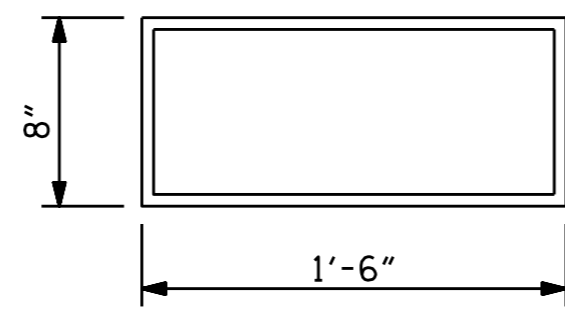


TYPICAL SECTION OF ELASTOMERIC BEARINGS



E3 (8 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

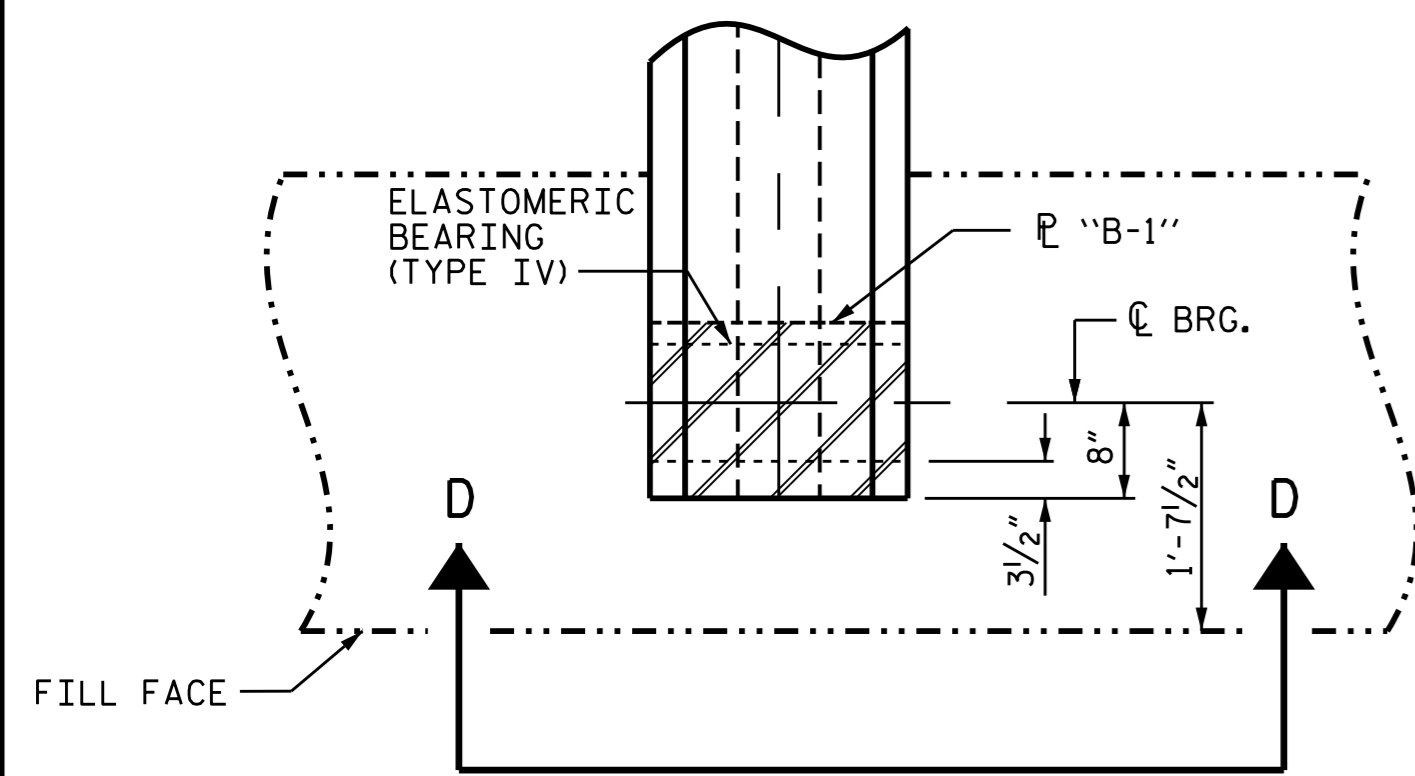


E2 (16 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

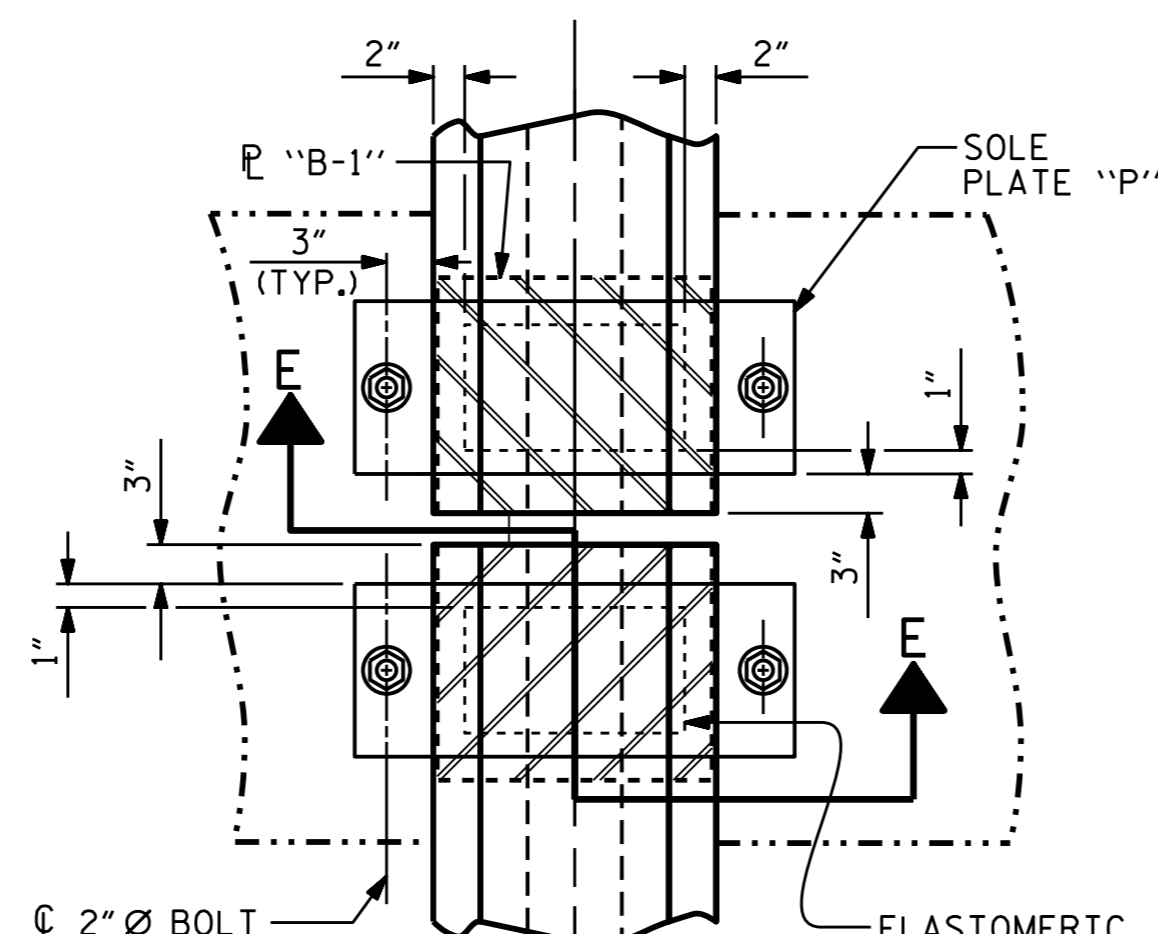
TYPE III

AT BENTS



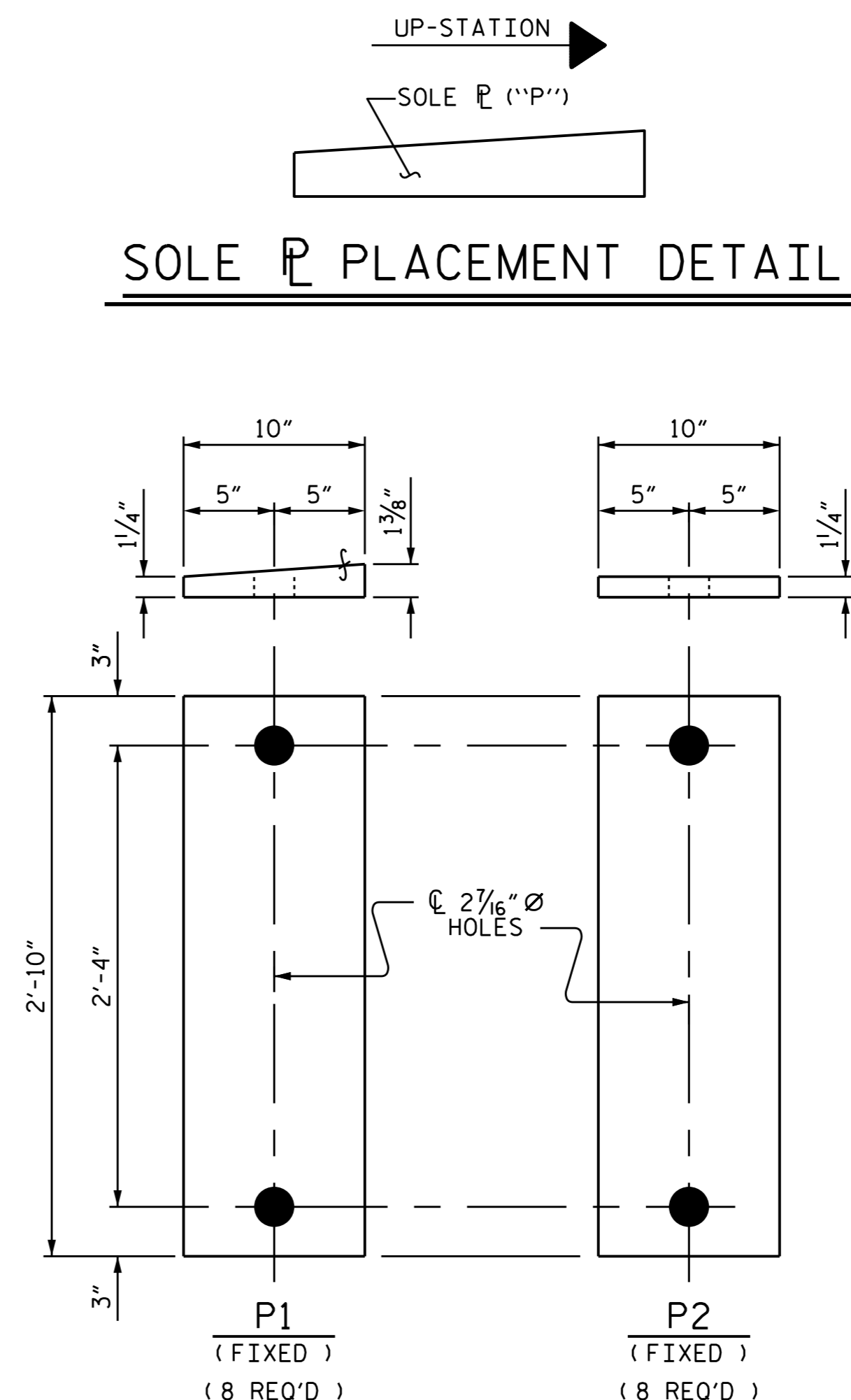
TYPICAL PLAN

(SHOWING INTEGRAL END BENTS)



TYPICAL PLAN

(SHOWING CONTINUOUS BENT)



SOLE PLATE DETAILS

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 THEN BE BURRED WITH A SHARP POINTED TOOL.

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

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

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

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

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

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

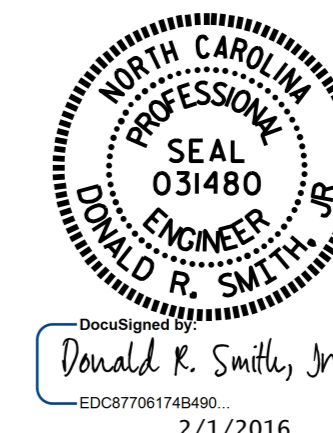
ALL BEARING PLATES SHALL BE AASHTO M270 GRADE 50.

MAXIMUM ALLOWABLE SERVICE LOADS

D.L.+L.L. (NO IMPACT)

| | |
|----------|-------|
| TYPE III | 205 k |
| TYPE IV | 225 k |

PROJECT NO. B-5142
IREDELL COUNTY
STATION: 22+06.00 -L-



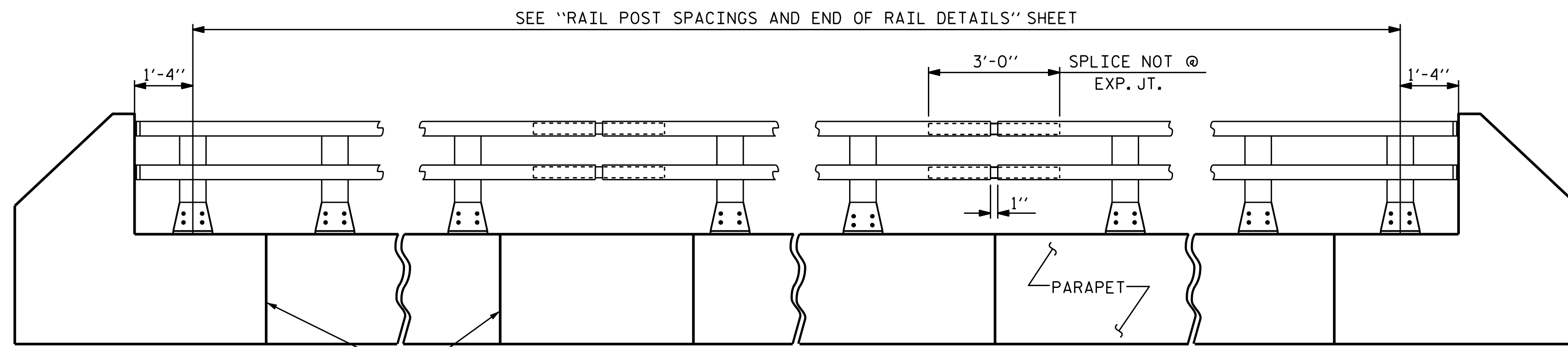
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
ELASTOMERIC BEARING
DETAILS
PRESTRESSED CONCRETE GIRDER
SUPERSTRUCTURE

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

TOTAL SHEETS: 38

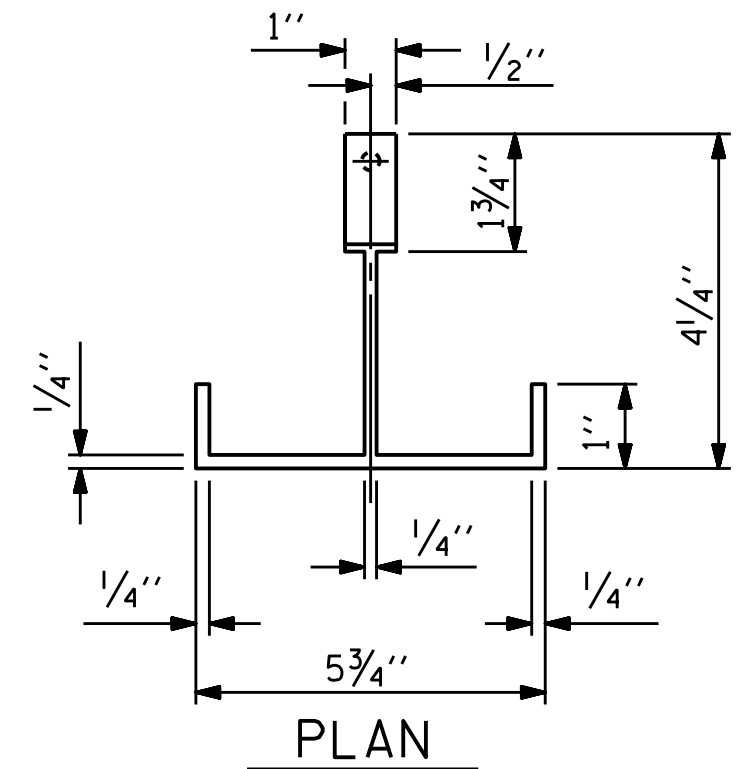
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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|---------------------------|---------------|--|---------------|
| ASSEMBLED BY: K. D. LAYNE | DATE: 4-29-15 | DESIGN ENGINEER OF RECORD: T. H. CARROLL | DATE: 8-18-15 |
| CHECKED BY: J. D. HAWK | DATE: 5-12-15 | | |
| DRAWN BY: WJH 8/89 | REV. 10/1/11 | MAA/GM | |
| CHECKED BY: CRK 8/89 | REV. 6/13 | AAC/MAA | |
| | REV. 1/15 | MAA/TMG | |

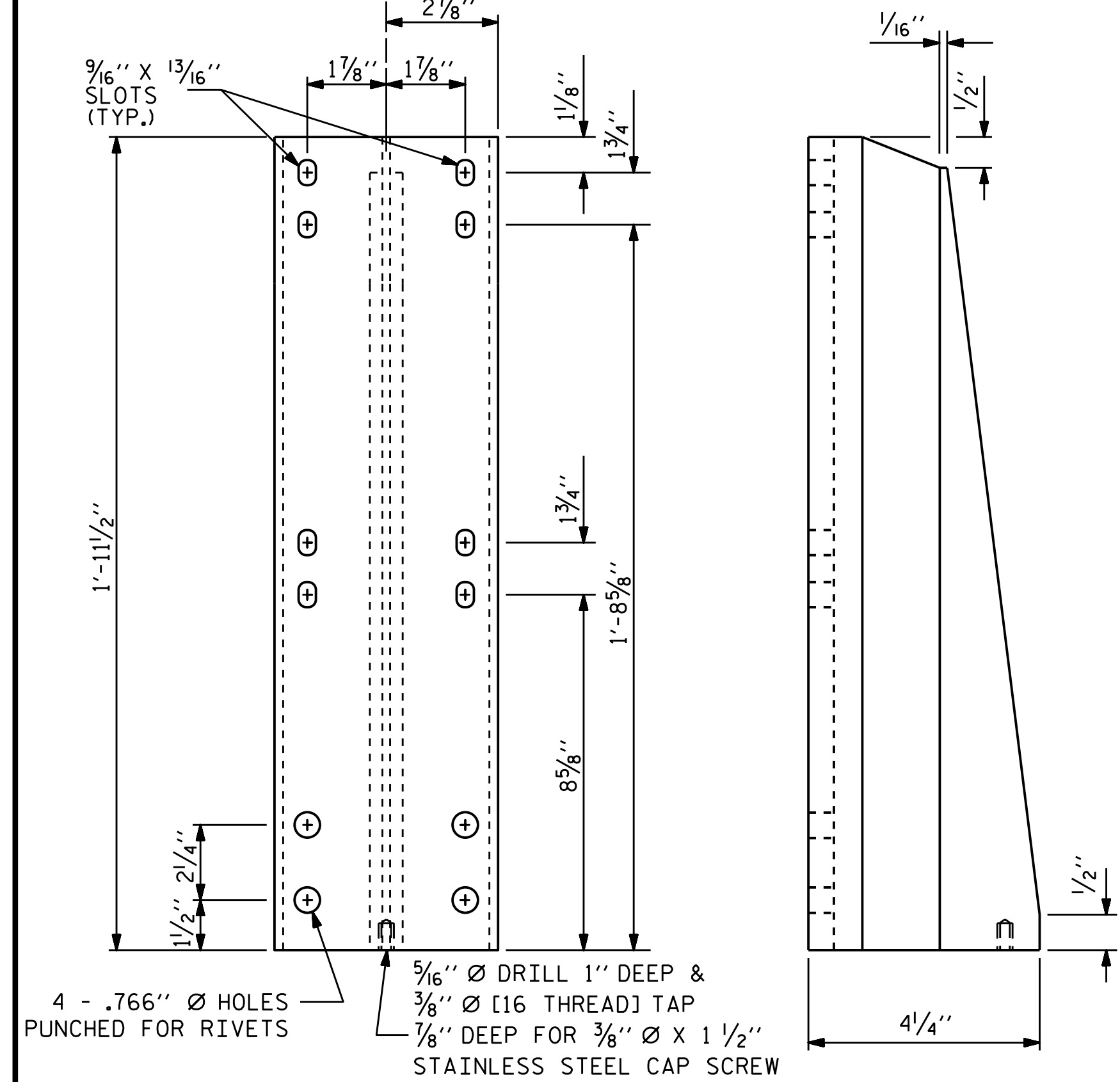


ELEVATION

NOTE : FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR2.



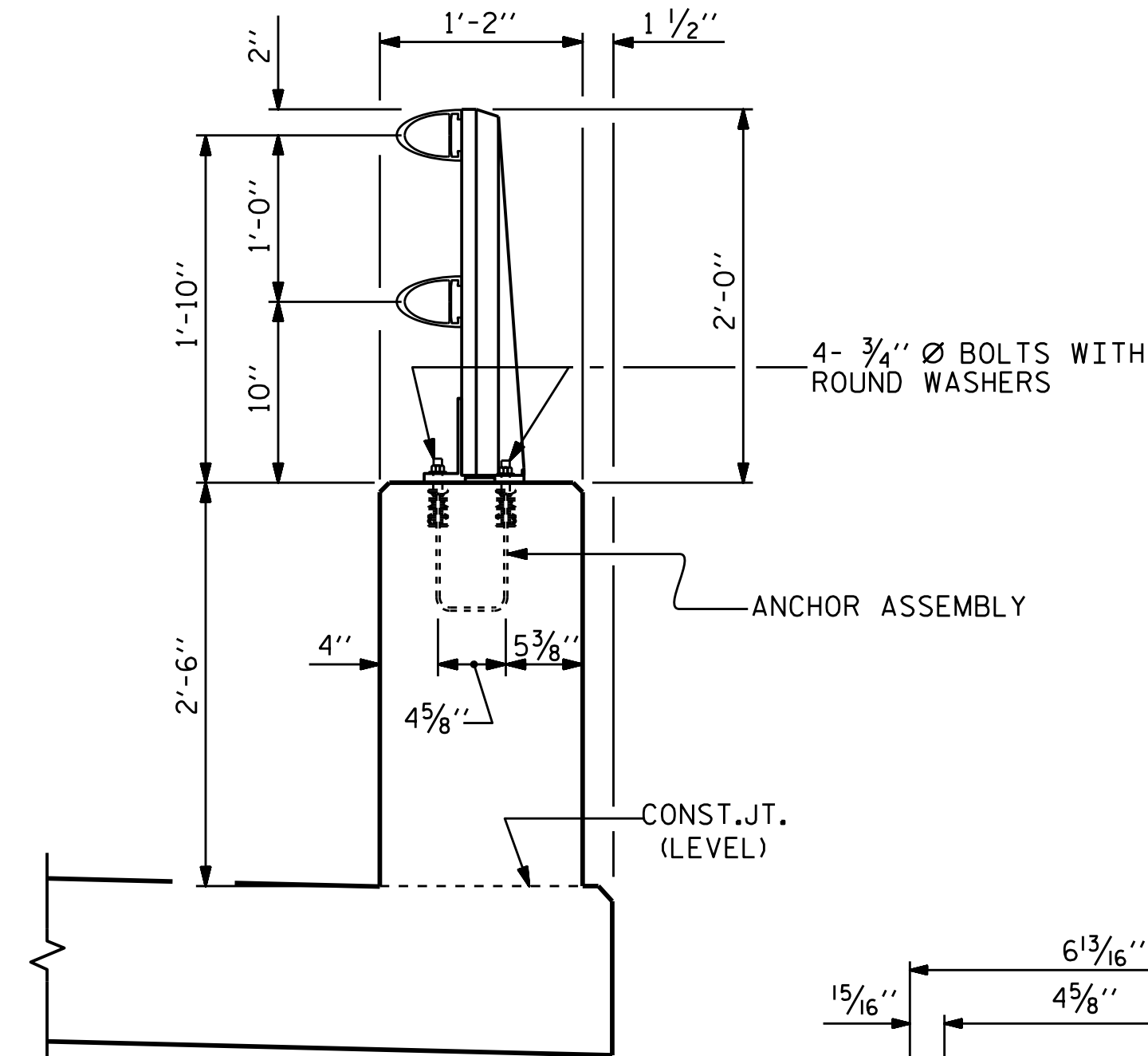
PLAN



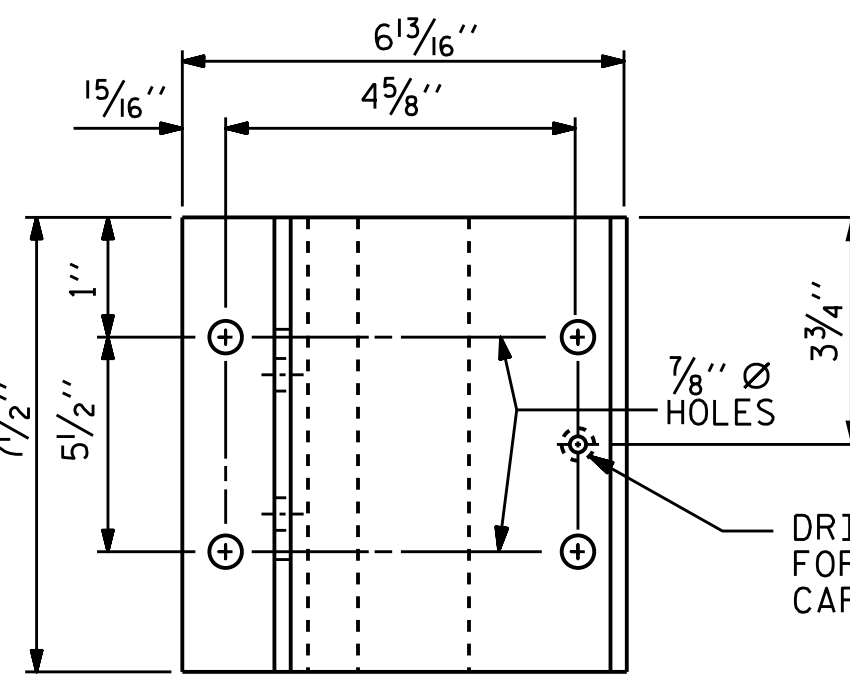
FRONT ELEVATION

SIDE ELEVATION

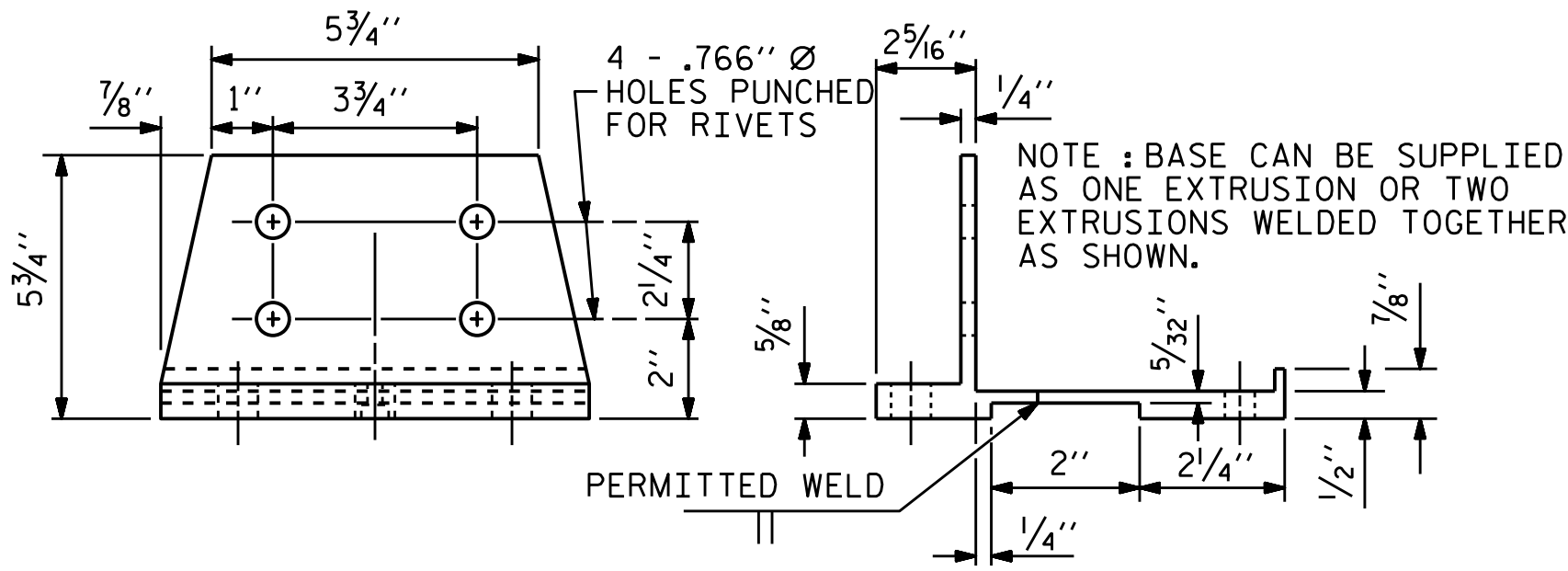
DETAILS OF POST



SECTION THROUGH PARAPET AND RAIL



PLAN

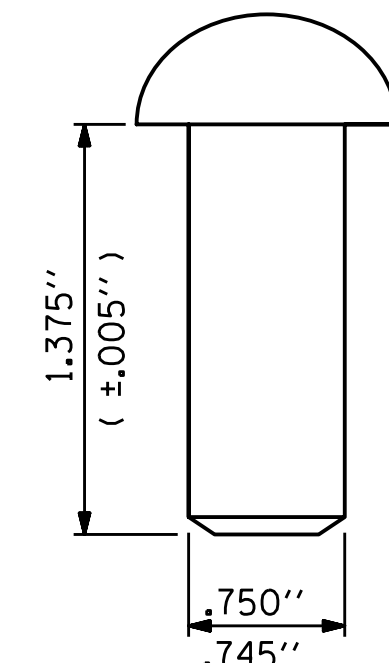


FRONT ELEVATION

SIDE ELEVATION

POST BASE DETAILS

PAY LENGTH = 381.17 LIN. FT.



RIVET DETAIL

NOTES

AT THE CONTRACTOR'S OPTION, METAL RAIL MAY BE EITHER ALUMINUM OR GALVANIZED STEEL IN ACCORDANCE WITH THE REQUIREMENTS OF THE GENERAL NOTES AND THE FOLLOWING SPECIFICATIONS FOR THE ALTERNATE MATERIALS; HOWEVER, THE CONTRACTOR WILL BE REQUIRED TO USE THE SAME RAIL MATERIAL ON ALL STRUCTURES ON THE PROJECT FOR WHICH METAL RAIL IS DESIGNATED.

UNLESS OTHERWISE REQUIRED IN THE CONTRACT DOCUMENTS, THE CONTRACTOR HAS THE OPTION TO USE AN ALTERNATE TO THE 2 BAR METAL RAIL. THE ALTERNATE RAIL SHALL MEET THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AND MUST BE LISTED ON THE DEPARTMENT'S APPROVED PRODUCTS LIST (APL) UNDER "2 BAR METAL RAIL ALTERNATE". ADJUSTMENTS TO THE CONCRETE PARAPET WILL NOT BE ALLOWED.

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B-221 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.

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

POST, POST BASES, RAILS, EXPANSION BARS AND CLAMP BARS: AASHTO M270 GRADE 36 STRUCTURAL STEEL - GALVANIZED TO AASHTO M111.

RIVETS: RIVETS SHALL MEET THE REQUIREMENTS OF ASTM A502 FOR GRADE 1 RIVETS.

THE CUT ENDS OF GALVANIZED STEEL RAILING, AFTER GRINDING SMOOTH SHALL BE GIVEN TWO COATS OF ZINC RICH PAINT MEETING THE REQUIREMENTS OF FEDERAL SPECIFICATION MIL-P-26915 USAF TYPE 1, OR OF FEDERAL SPECIFICATIONS TT-P-641.

SHIMS: SHIMS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

RAIL CAPS: RAIL CAPS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

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.

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE STANDARD NO. BMR2.

CAP SCREWS SHALL BE ASTM F593 ALLOY 305 STAINLESS STEEL. WASHERS 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 REMAINS VISIBLE AFTER RAIL PLACEMENT.

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

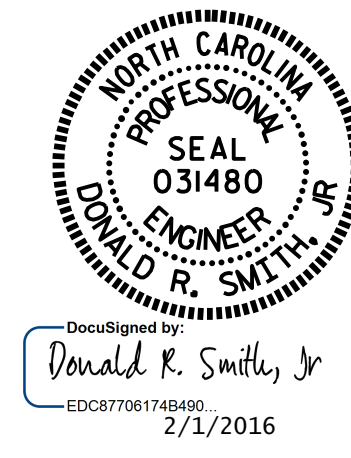
ALLOY 6351-T5 MAY BE SUBSTITUTED FOR ALLOY 6061-T6 WHERE APPLICABLE.

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

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF PARAPET SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

PROJECT NO. B-5142
IREDELL COUNTY
STATION: 22+06.00 -L-

SHEET 1 OF 2

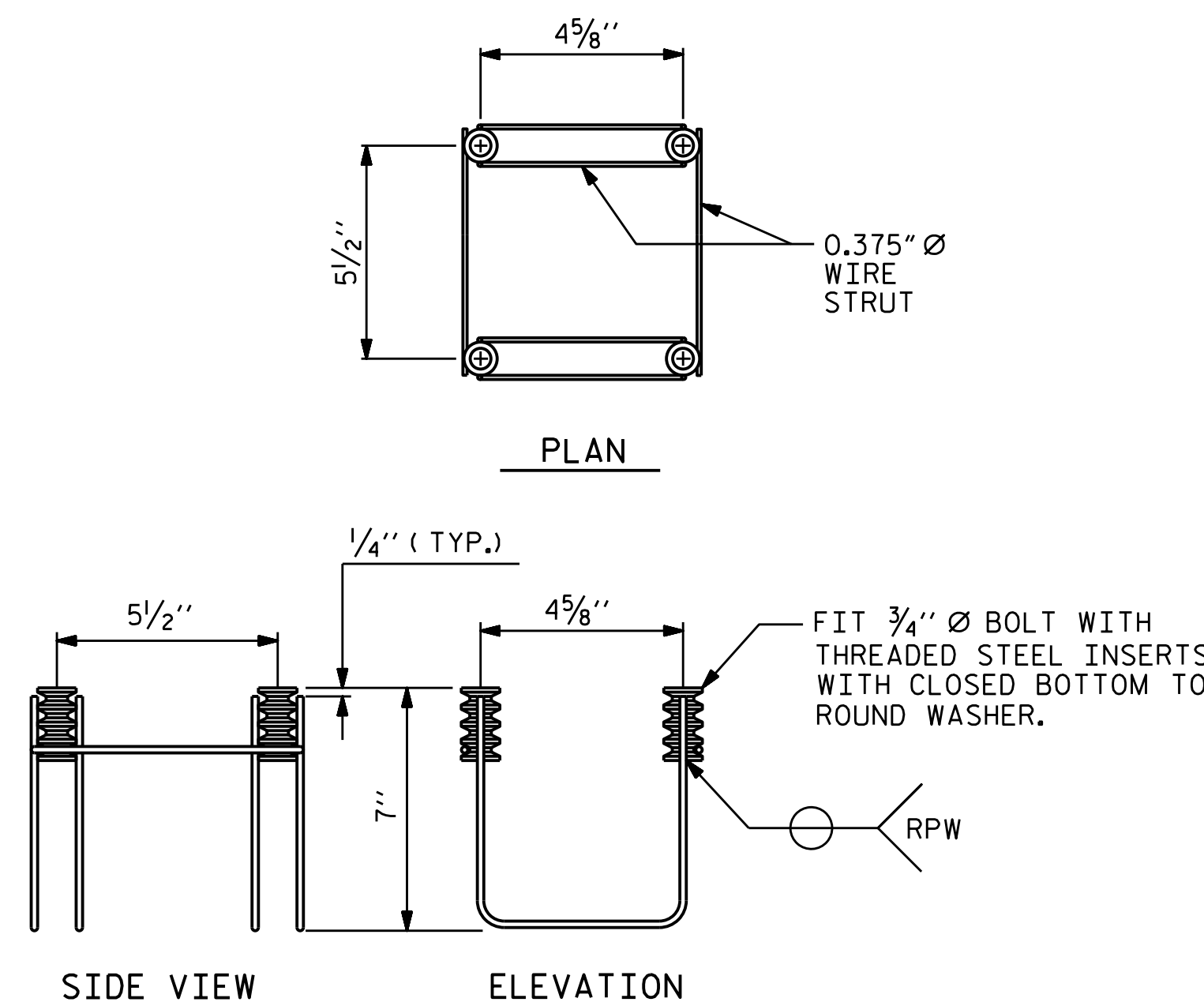


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
2 BAR METAL RAIL

| | |
|----------------------------|---------------------|
| ASSEMBLED BY : K. D. LAYNE | DATE : 4-29-15 |
| CHECKED BY : J. D. HAWK | DATE : 5-12-15 |
| DRAWN BY : EEM 6/94 | REV. 5/1/06 TLA/GM |
| CHECKED BY : ROW 6/94 | REV. 10/1/11 MAA/GM |
| | REV. 6/13 MAA/GM |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

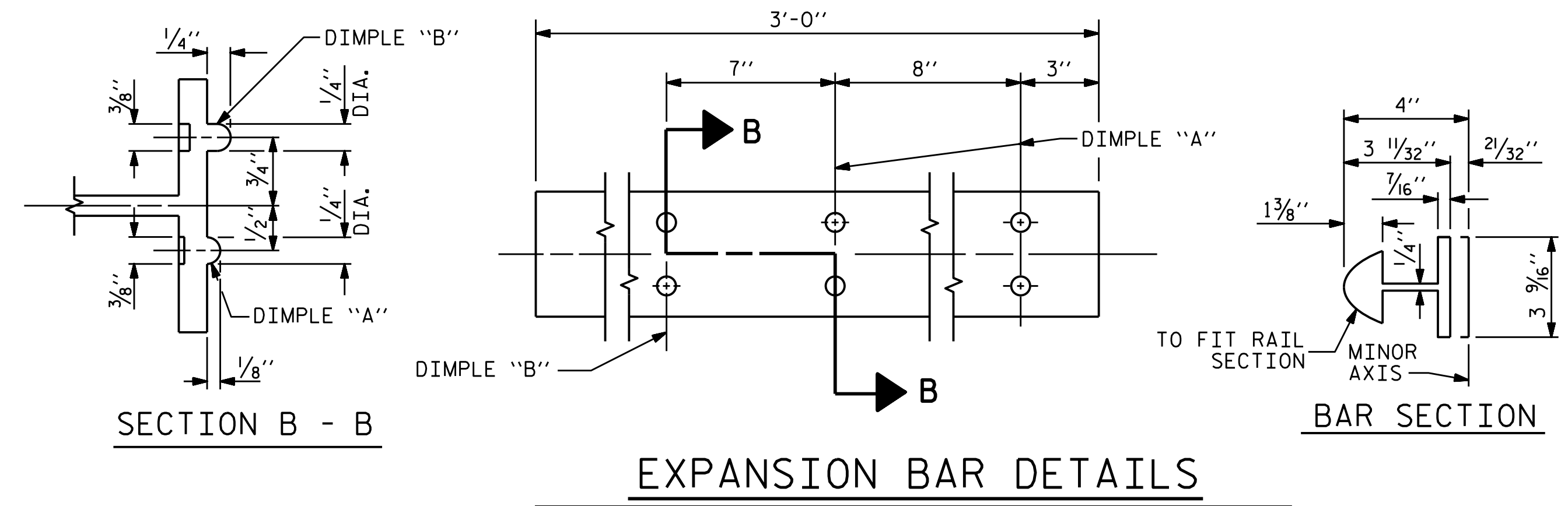
| REVISIONS | | | | SHEET NO. |
|--------------|-----|-------|-----|-----------|
| NO. | BY: | DATE: | NO. | DATE: |
| 1 | | | 3 | |
| 2 | | | 4 | |
| TOTAL SHEETS | | | | 38 |



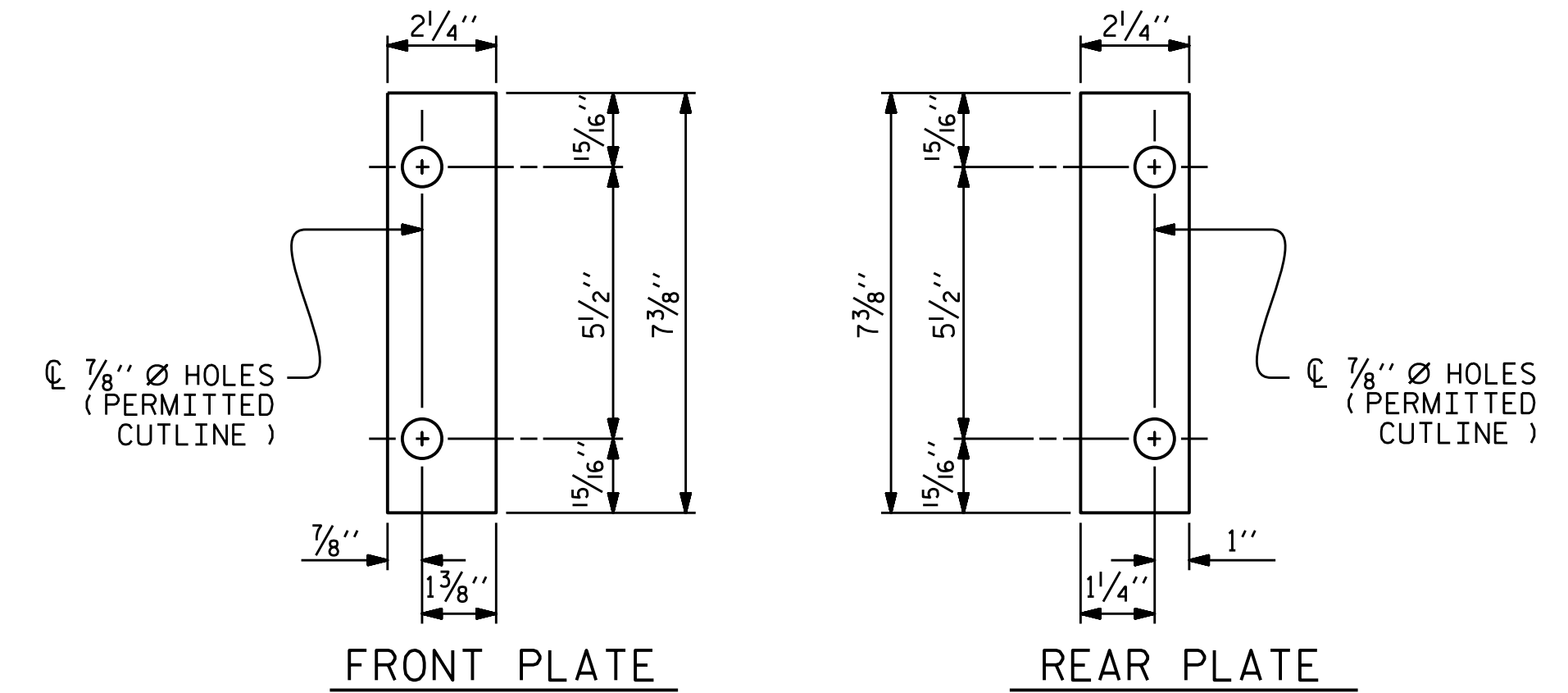
4-BOLT METAL RAIL ANCHOR ASSEMBLY
(66 ASSEMBLIES REQUIRED)

NOTES

- THE STRUCTURAL CONCRETE ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS :
- 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.
 - 4 - 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.
 - 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.
 - THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.
 - 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.
 - BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.
- THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE METAL RAIL ANCHOR ASSEMBLY. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE THE STANDARD SPECIFICATIONS.
- WHEN ADHESIVELY ANCHORED ANCHOR BOLTS ARE USED, BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. NUTS SHALL MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

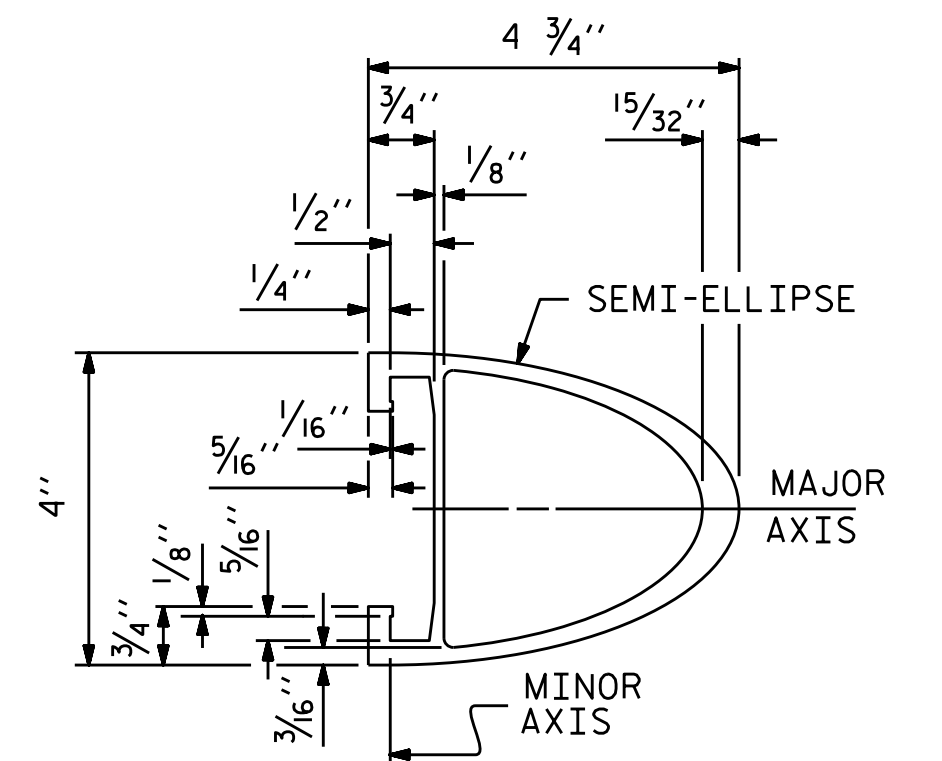


EXPANSION BAR DETAILS

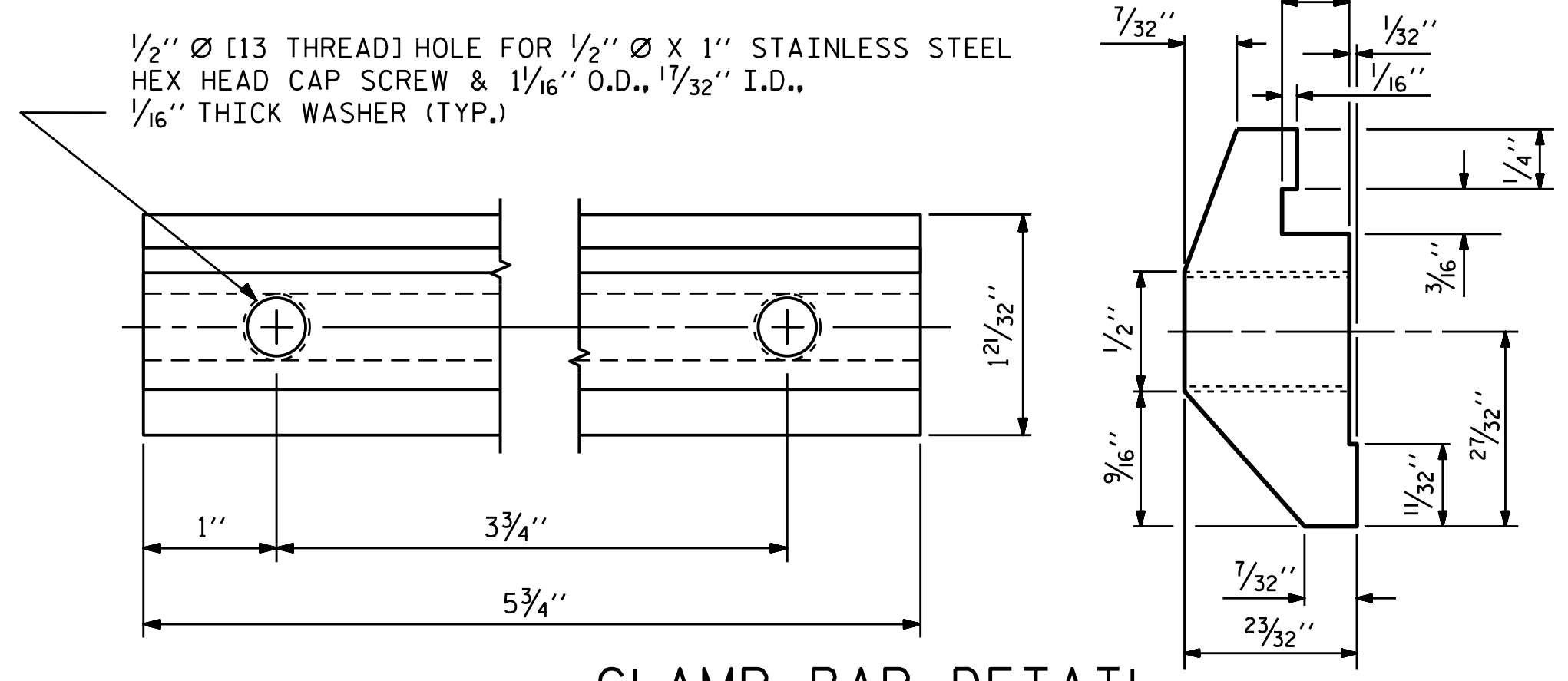


SHIM DETAILS

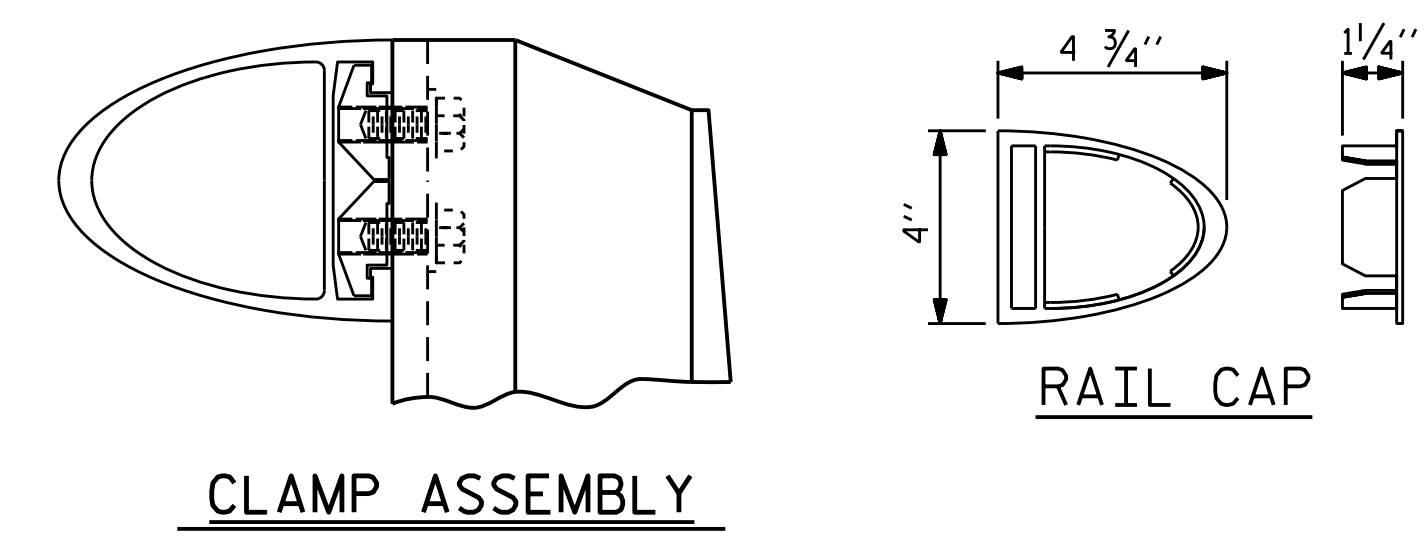
NOTE :
SHIMS MAY BE CUT ALONG PERMITTED CUTLINE OR SLOTTED TO EDGE OF PLATE TO FACILITATE PLACEMENT.



RAIL SECTION

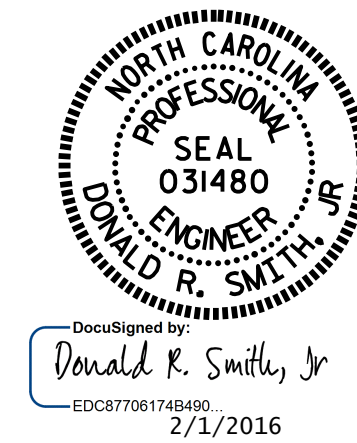


CLAMP BAR DETAIL
(4 REQUIRED PER POST)



CLAMP ASSEMBLY

RAIL CAP



PROJECT NO. B-5142
IREDELL COUNTY
STATION: 22+06.00 -L-
SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
2 BAR METAL RAIL

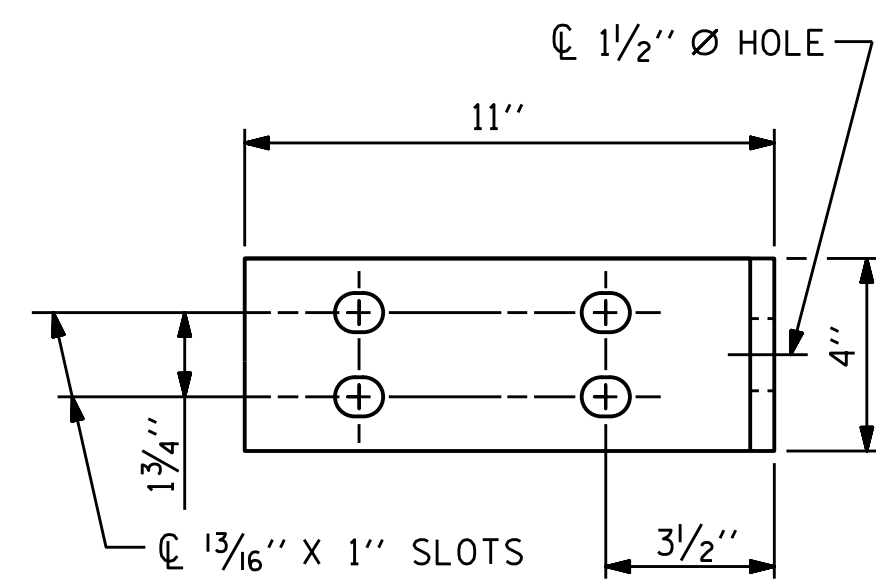
| | |
|----------------------------|----------------------|
| ASSEMBLED BY : K. D. LAYNE | DATE : 4-29-15 |
| CHECKED BY : J. D. HAWK | DATE : 5-12-15 |
| DRAWN BY : EEM 6/94 | REV. 8/16/99 MAB/LES |
| CHECKED BY : ROW 6/94 | REV. 5/1/06R KMM/GM |
| | REV. 10/1/11 MAA/GM |

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

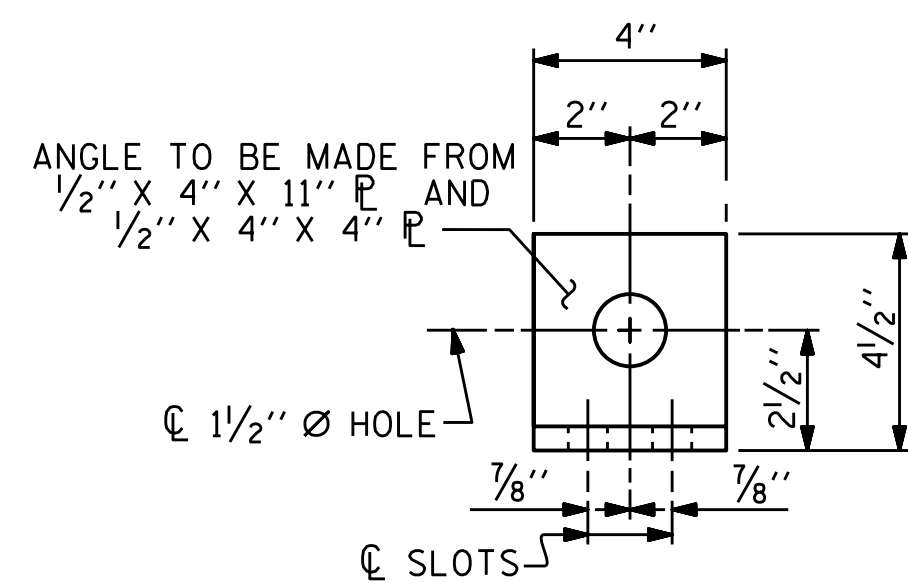
| REVISIONS | | SHEET NO. |
|-----------|-----|-----------|
| NO. | BY: | DATE: |
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |

TOTAL SHEETS
38

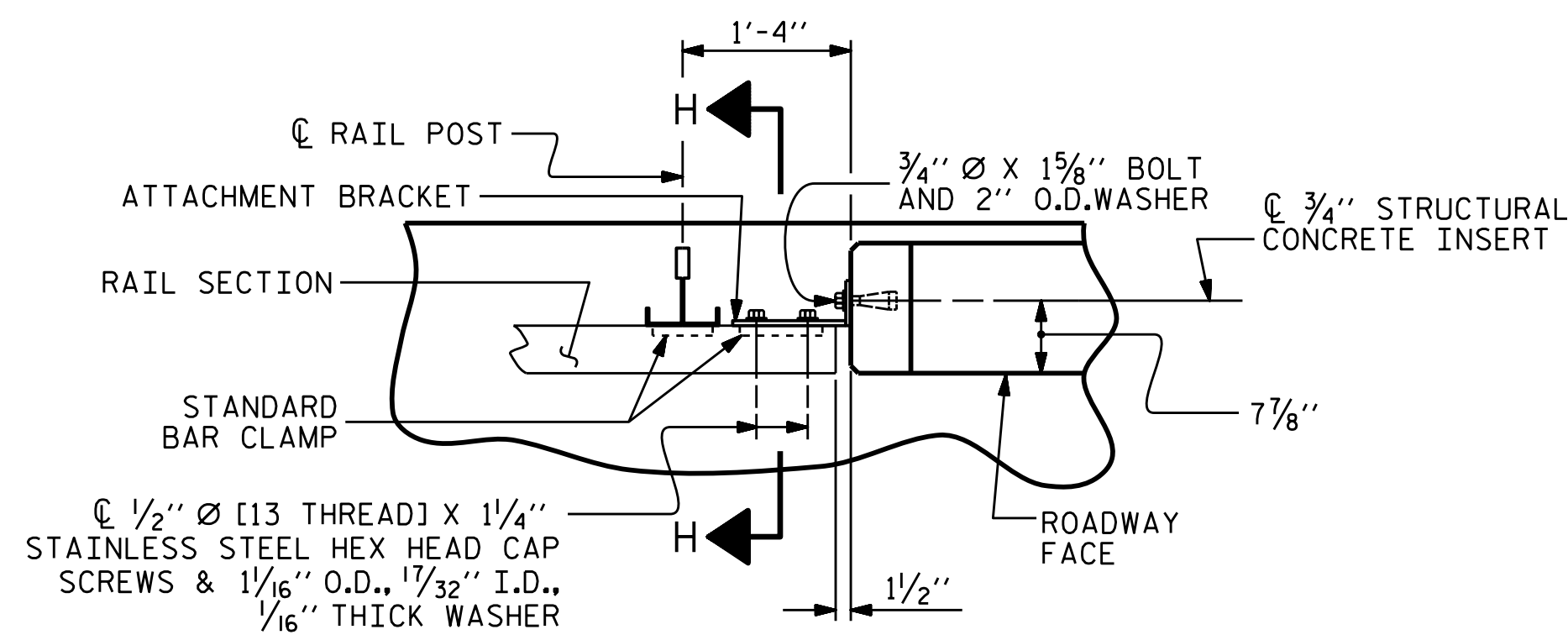
SEE SHEET 2 OF 2 FOR
RAIL POST SPACINGS



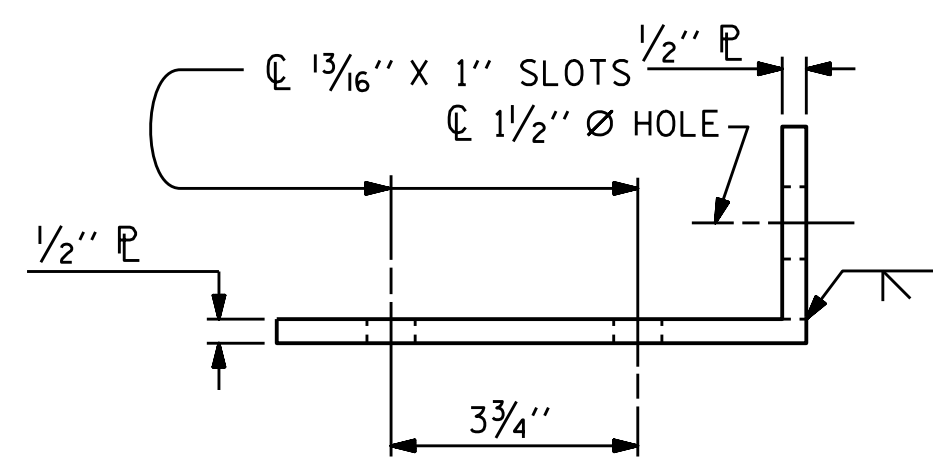
ELEVATION



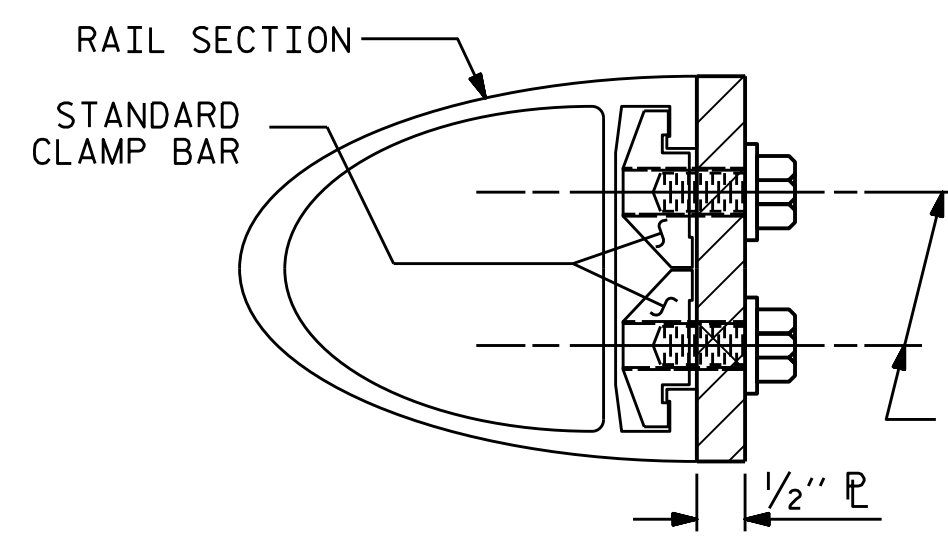
END VIEW



PLAN - RAIL AND END POST



TOP VIEW



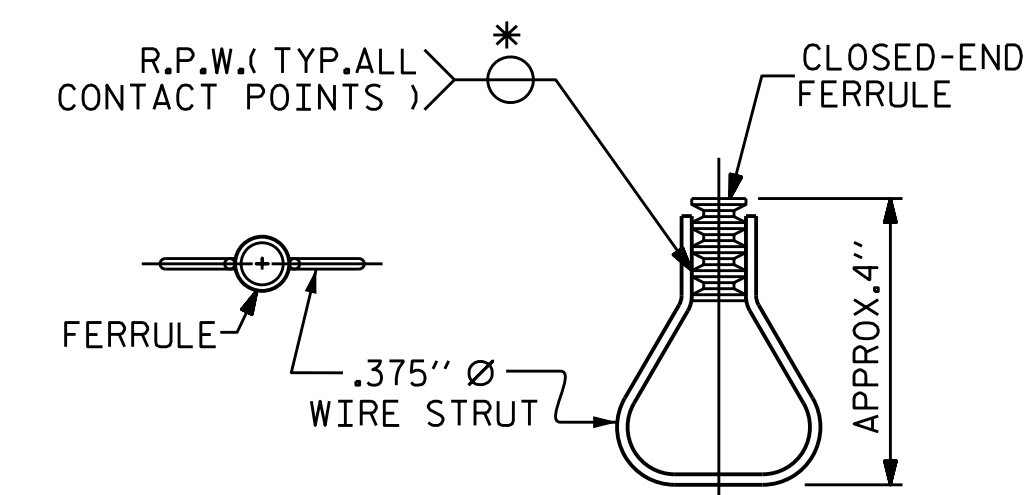
SECTION H-H (FIX)

DETAILS FOR ATTACHING METAL RAIL TO END POST

NOTES

- 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 CONTRACTOR'S 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.
- 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 4,800 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.
 - D. STANDARD CLAMP BARS (SEE METAL RAIL SHEET).
 - E. 1/2" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.
- 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 1 OR 2 BAR METAL RAILS.
- 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.

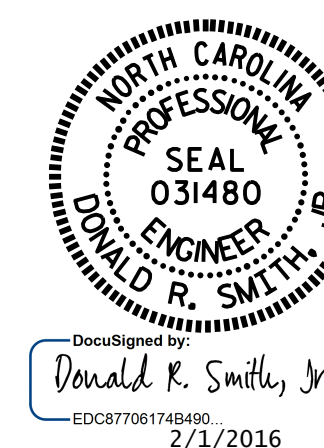


PLAN ELEVATION
STRUCTURAL CONCRETE INSERT

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

PROJECT NO. B-5142
IREDELL COUNTY
STATION: 22+06.00 -L-

SHEET 1 OF 2

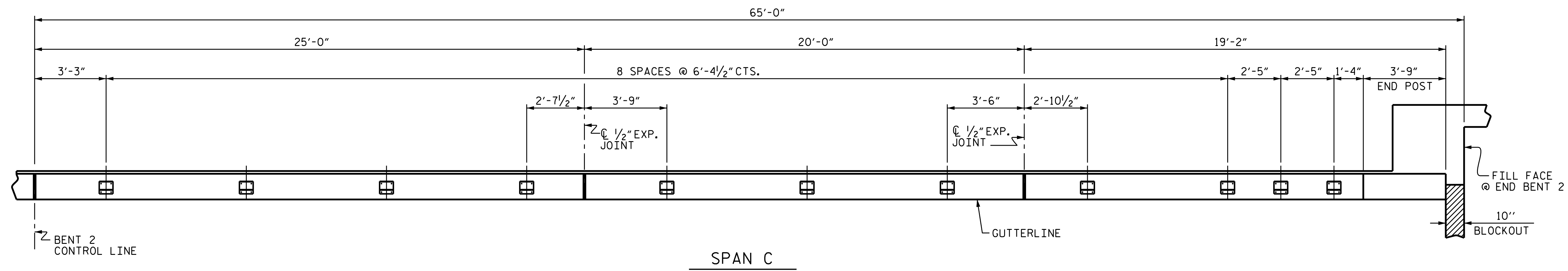
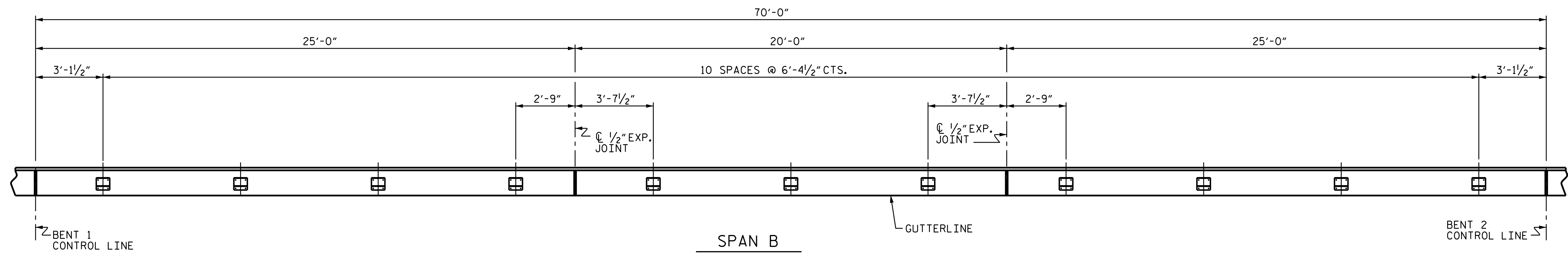
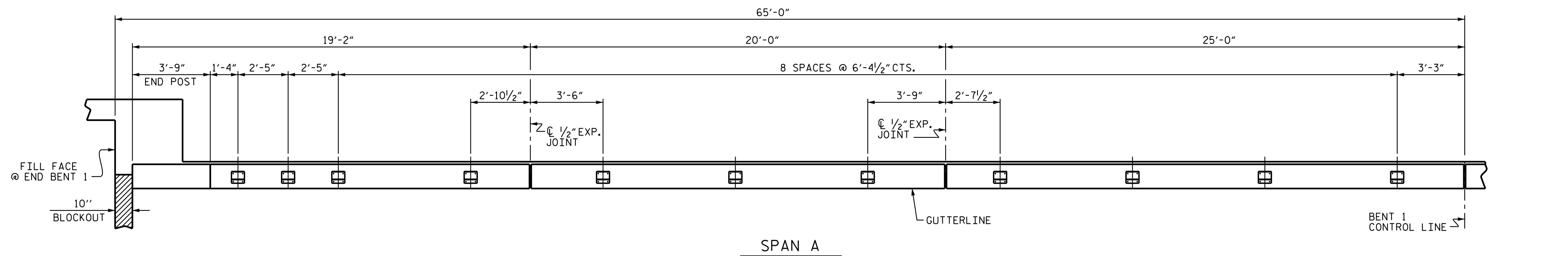


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
RAIL POST SPACINGS
AND
END OF RAIL DETAILS
FOR ONE OR TWO BAR METAL RAILS

| | |
|----------------------------|---------------------|
| ASSEMBLED BY : K. D. LAYNE | DATE : 4-29-15 |
| CHECKED BY : J. D. HAWK | DATE : 5-12-15 |
| DRAWN BY : FCJ 1/88 | REV. 5/7/03 RWW/JTE |
| CHECKED BY : CRK 3/89 | REV. 5/1/06 TLA/GM |
| | REV. 10/1/11 MAA/GM |

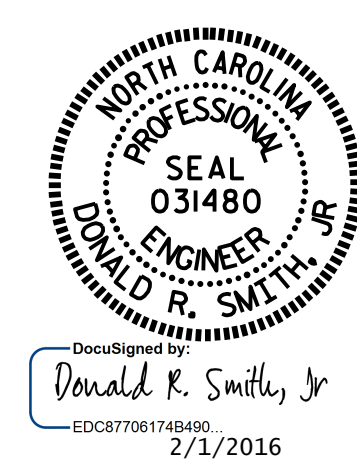
DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

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



PLAN OF RAIL POST SPACINGS
LEFT SIDE SHOWN, RIGHT SIDE SIMILAR

PROJECT NO. B-5142
IREDELL COUNTY
 STATION: 22+06.00 -L-
 SHEET 2 OF 2

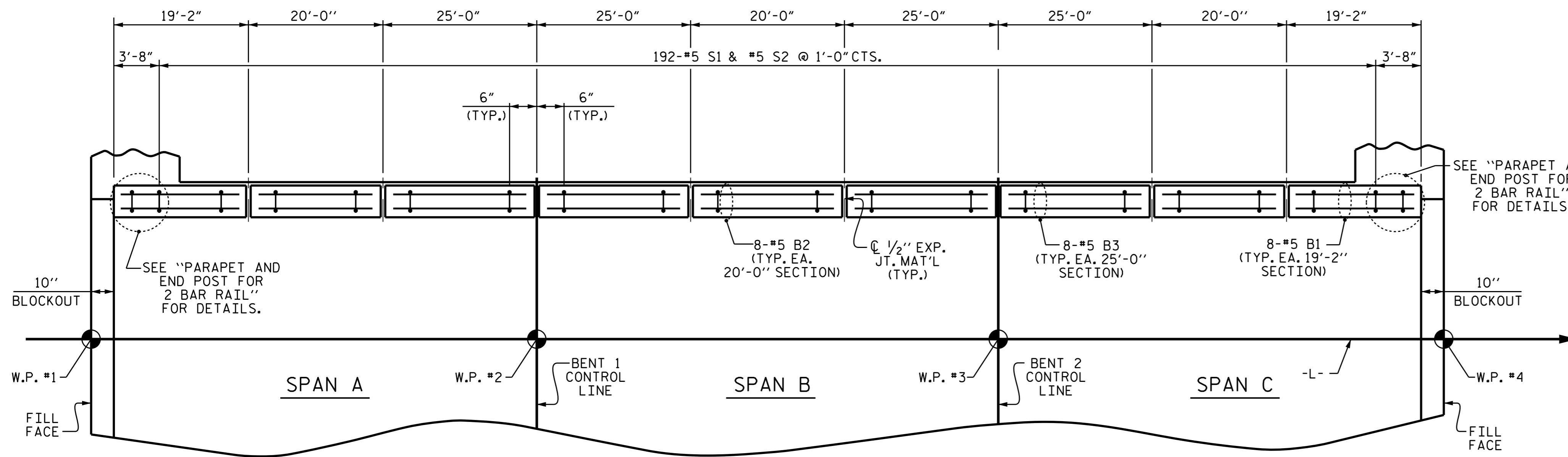


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
RAIL POST SPACINGS

DRAWN BY: K. D. LAYNE DATE: 4-29-15
 CHECKED BY: J. D. HAWK DATE: 5-12-15

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 | | | 38 |



PLAN OF PARAPET

LEFT SIDE SHOWN, RIGHT SIDE SIMILAR

NOTES

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

ALL REINFORCING STEEL IN PARAPET AND END POSTS SHALL BE EPOXY COATED.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF PARAPET SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

FOR DETAILS OF CONCRETE INSERTS IN END POSTS, SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEET.

FOR LOCATION OF GUARDRAIL ANCHOR ASSEMBLIES, SEE "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" SHEET.

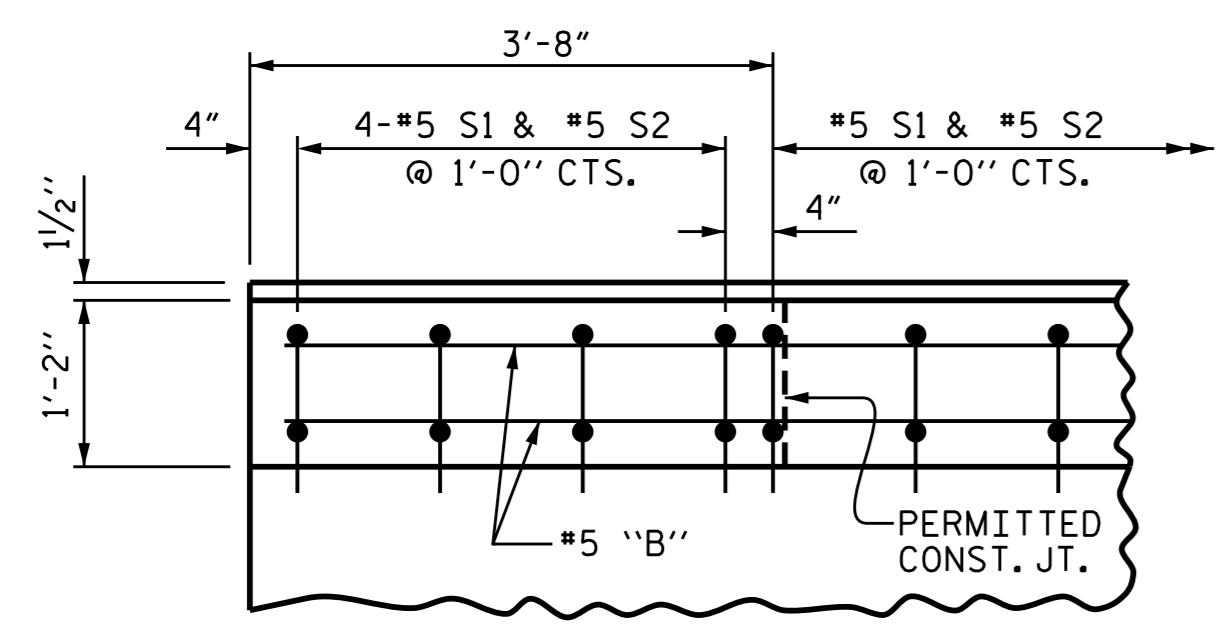
BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.

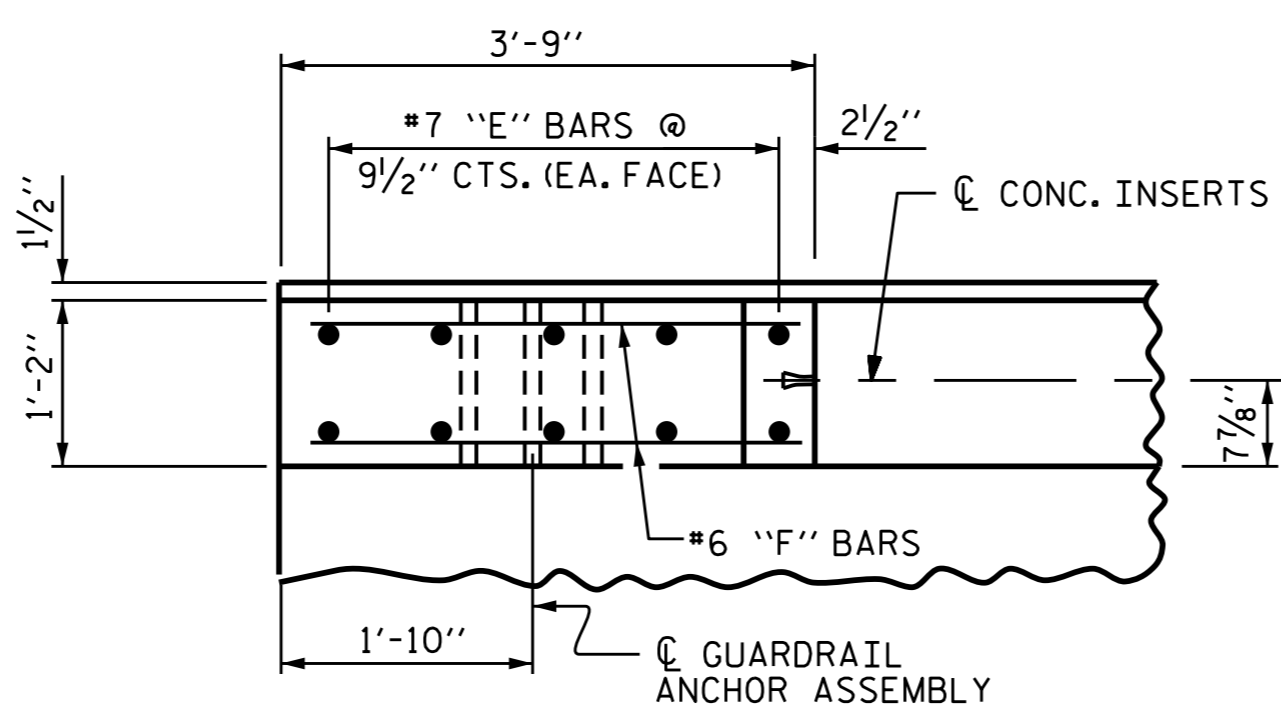
BILL OF MATERIAL

PARAPET AND END POSTS

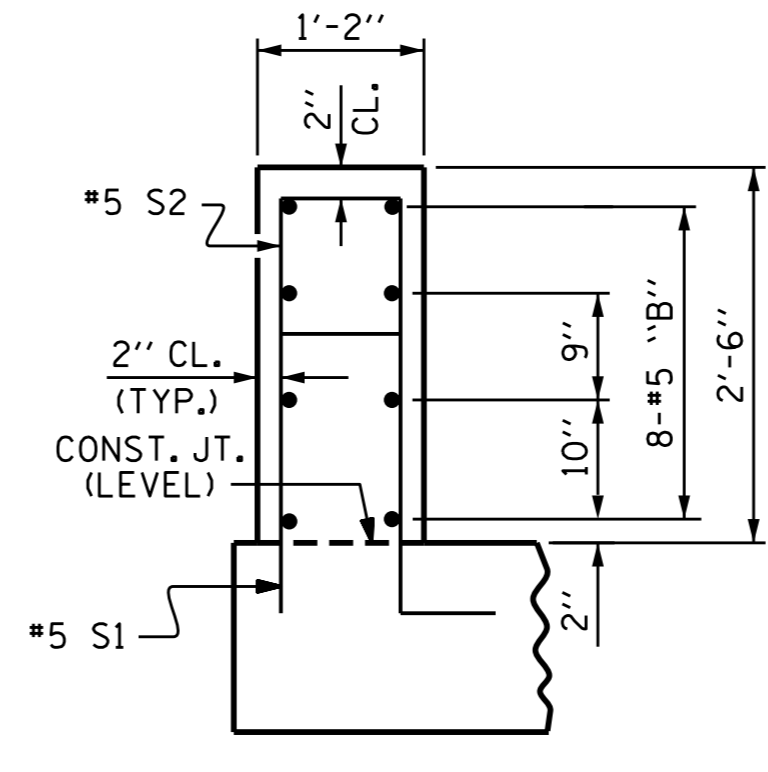
| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|----------------------------------|-----|------|------|----------|--------|
| *B1 | 32 | #5 | STR | 18'-9" | 626 |
| *B2 | 48 | #5 | STR | 19'-7" | 980 |
| *B3 | 64 | #5 | STR | 24'-7" | 1641 |
| *E1 | 8 | #7 | STR | 2'-6" | 41 |
| *E2 | 8 | #7 | STR | 3'-0" | 49 |
| *E3 | 8 | #7 | STR | 3'-6" | 57 |
| *E4 | 8 | #7 | STR | 4'-0" | 65 |
| *E5 | 8 | #7 | STR | 4'-4" | 71 |
| *F1 | 8 | #6 | STR | 1'-10" | 22 |
| *F2 | 8 | #6 | STR | 3'-0" | 36 |
| *F3 | 8 | #6 | STR | 3'-6" | 42 |
| *S1 | 400 | #5 | 1 | 5'-5" | 2260 |
| *S2 | 400 | #5 | 2 | 5'-6" | 2295 |
| * EPOXY COATED REINFORCING STEEL | | | | LBS. | 8,185 |
| CLASS AA CONCRETE | | | | CU. YDS. | 43.7 |
| 1'-2" X 2'-6" CONCRETE PARAPET | | | | LIN. FT. | 396.67 |



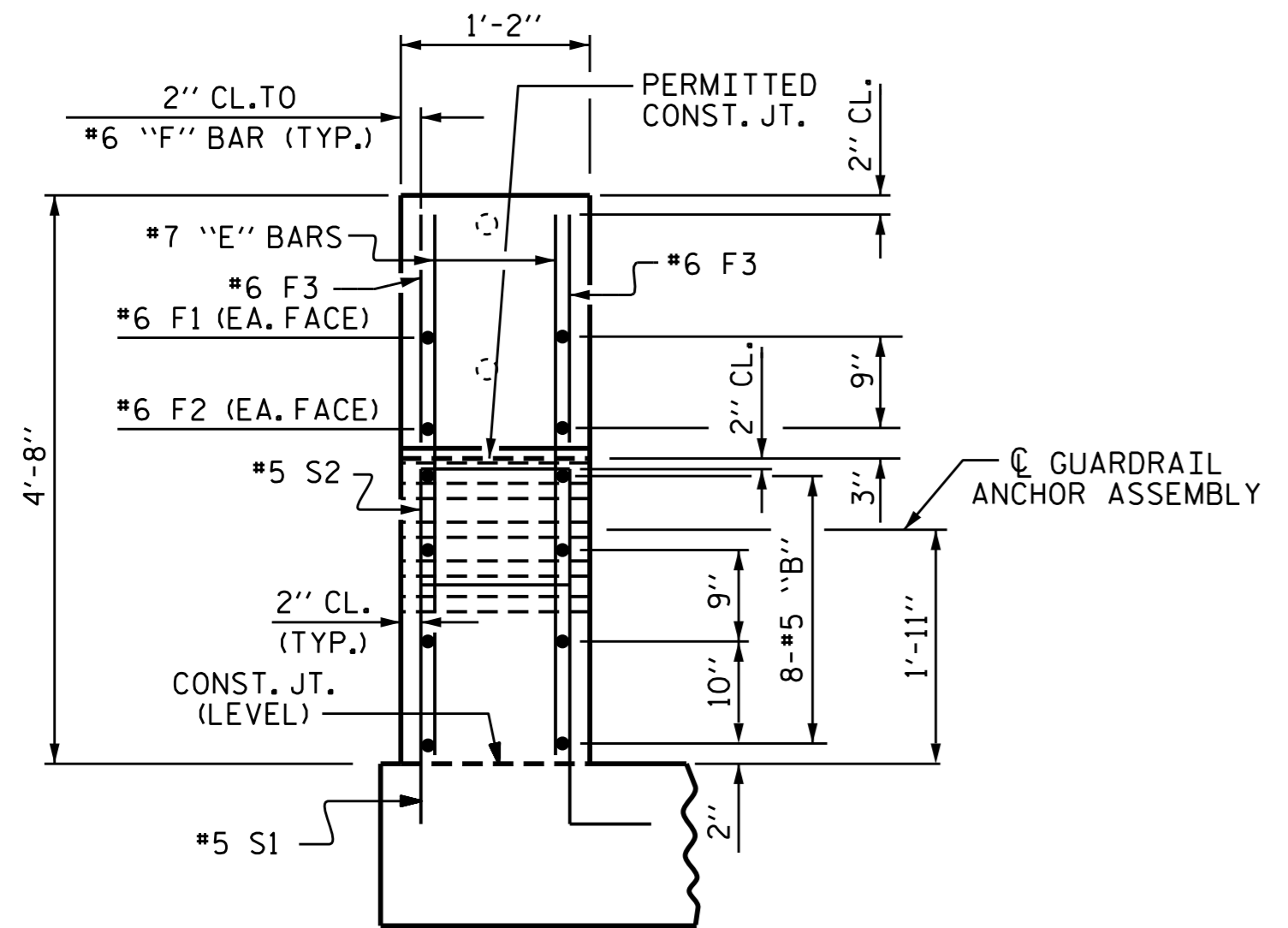
PLAN OF PARAPET



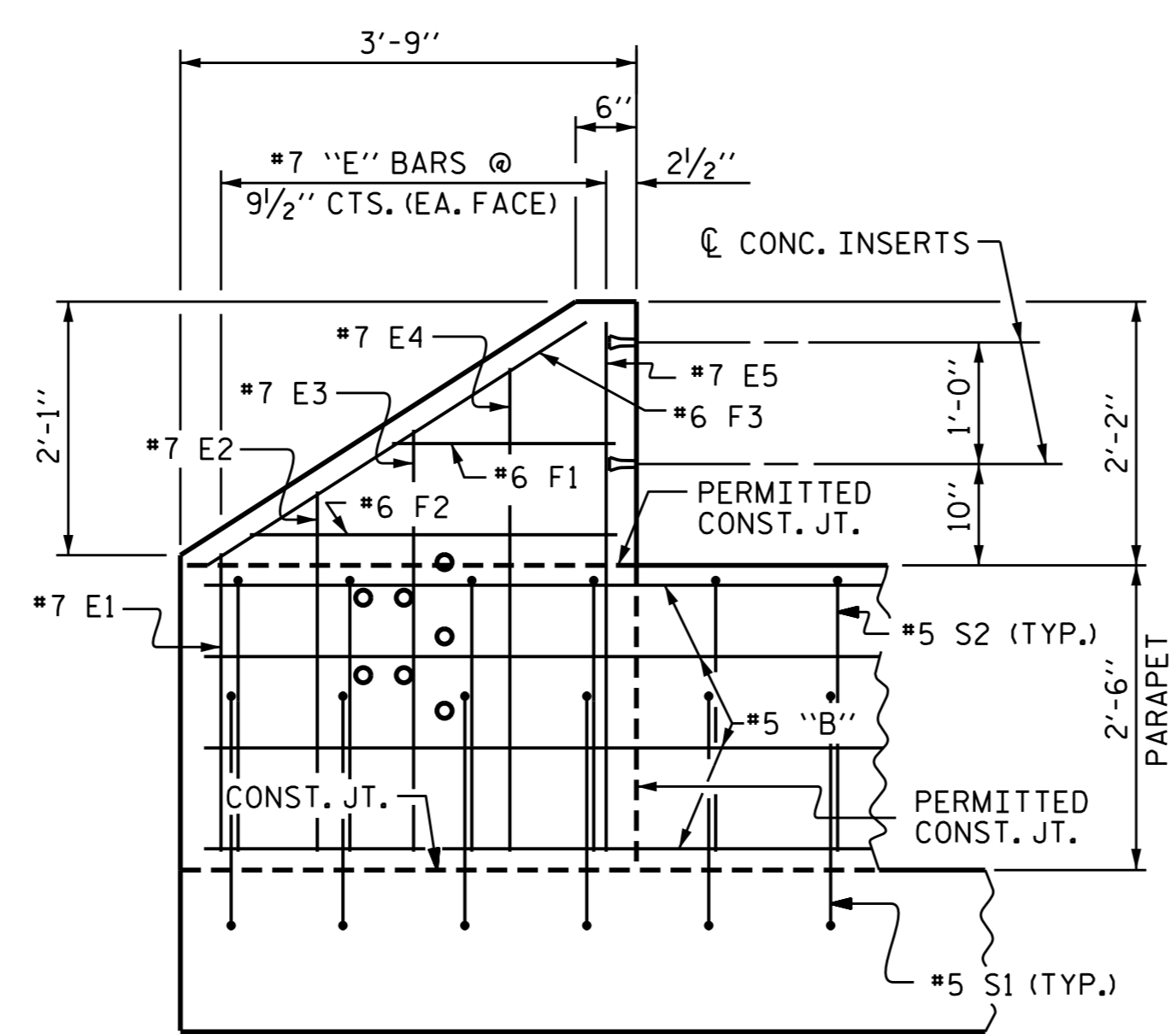
PLAN OF END POST



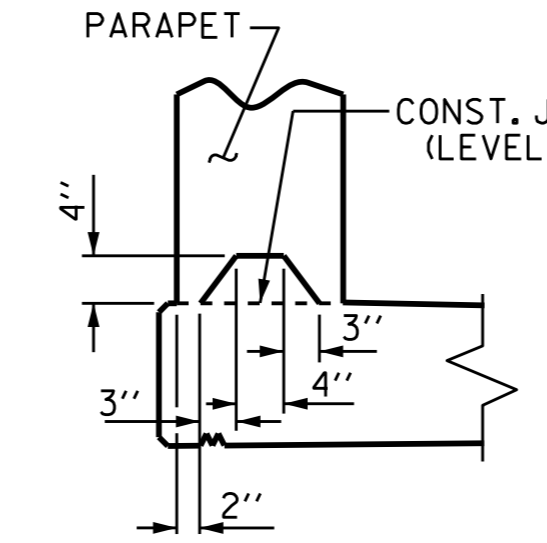
SECTION THROUGH PARAPET



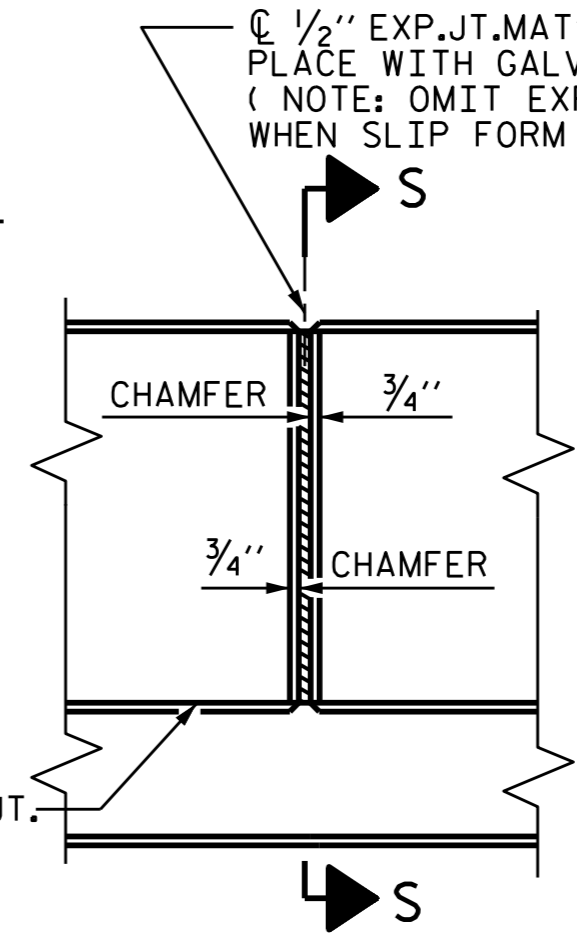
END VIEW



ELEVATION

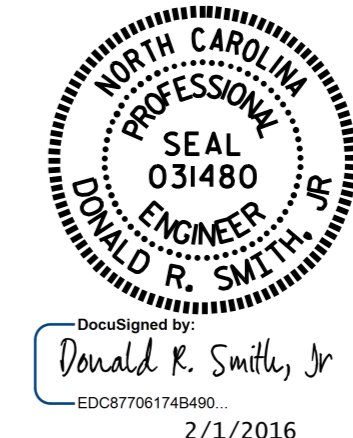


SECTION S-S
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)



ELEVATION AT EXPANSION JOINTS

CONCRETE PARAPET DETAILS



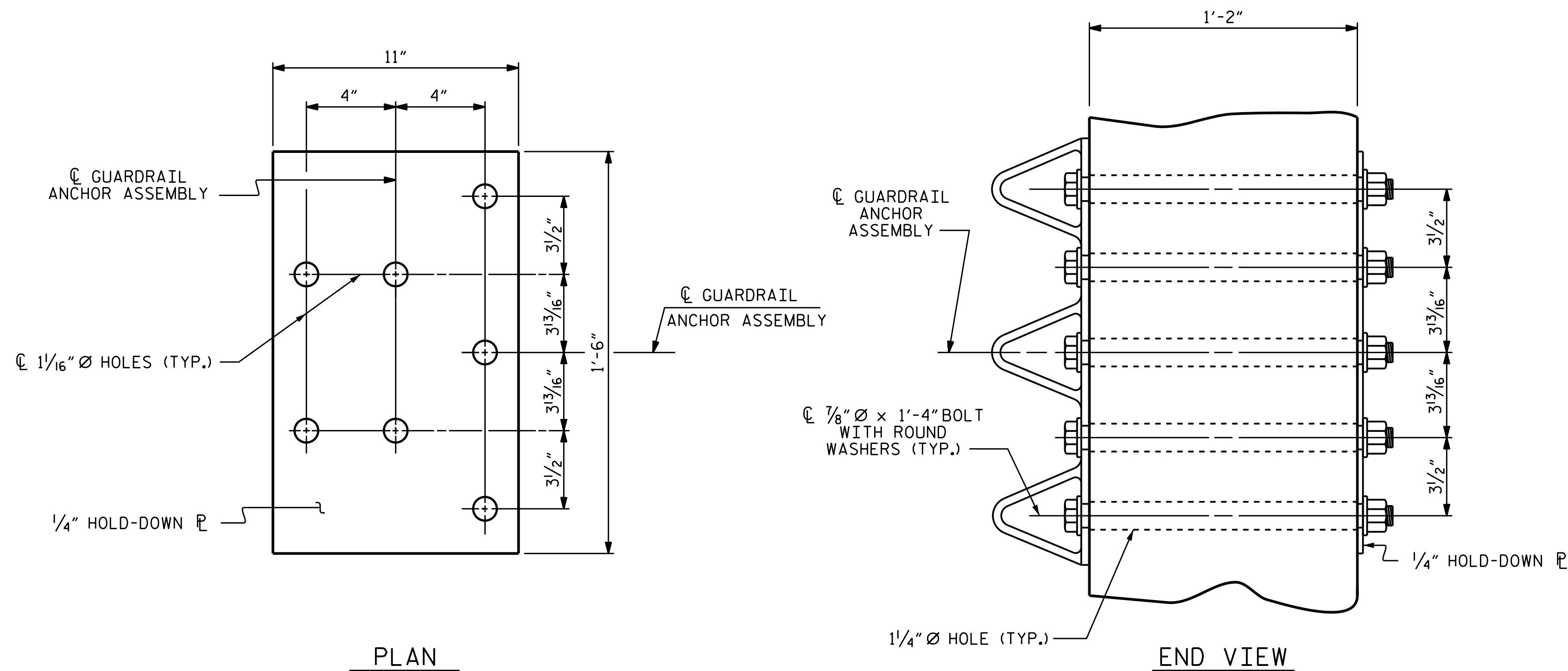
PROJECT NO. B-5142
IREDELL COUNTY
 STATION: 22+06.00 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 CONCRETE PARAPET
 AND
 END POST DETAILS

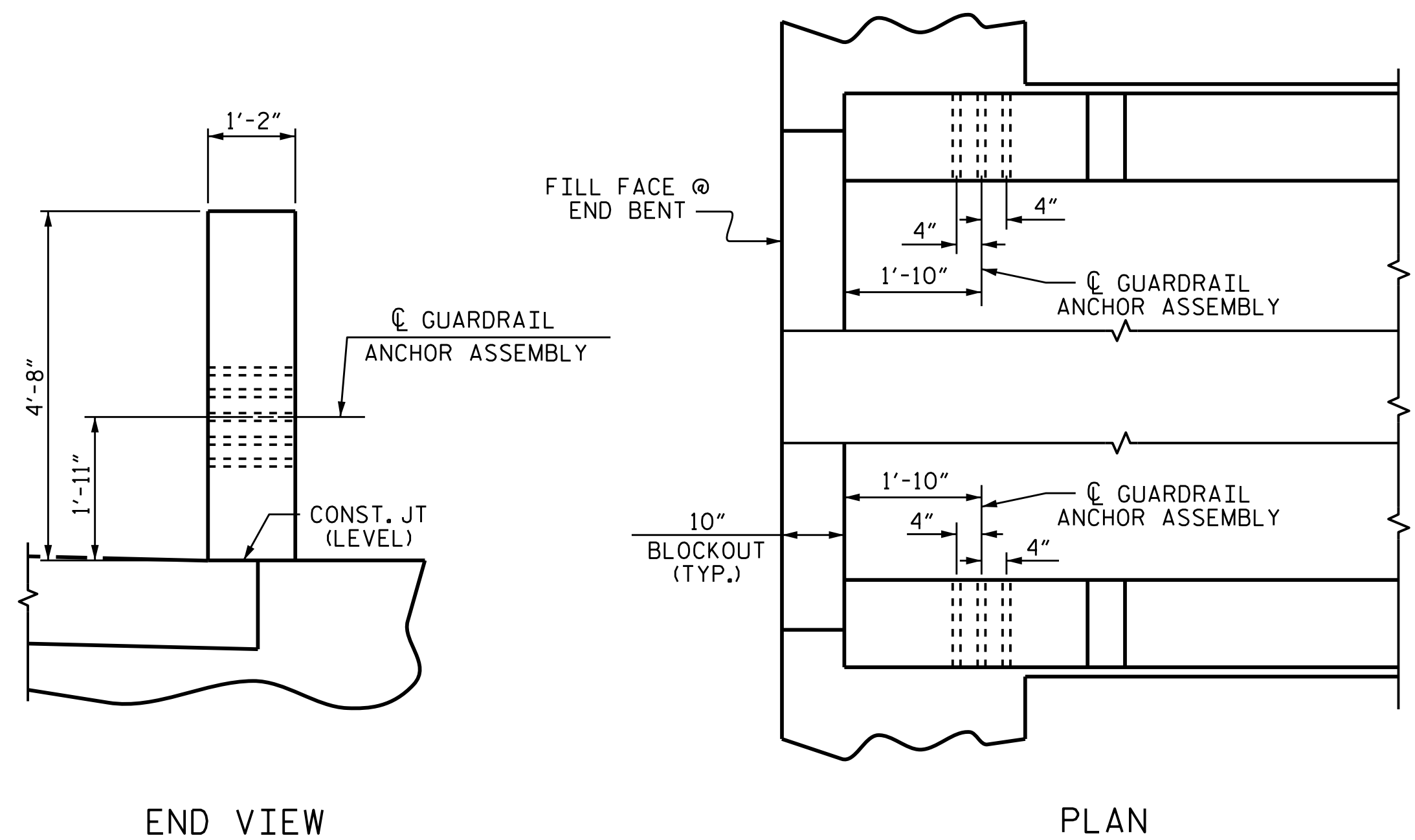
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|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-21 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 38 |

DRAWN BY: K. D. LAYNE DATE: 4-29-15
 CHECKED BY: J. D. HAWK DATE: 5-12-15

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED



GUARDRAIL ANCHOR ASSEMBLY DETAILS



LOCATION OF GUARDRAIL ANCHOR AT END POST

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 7 - 1/8" 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 1/8" 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.

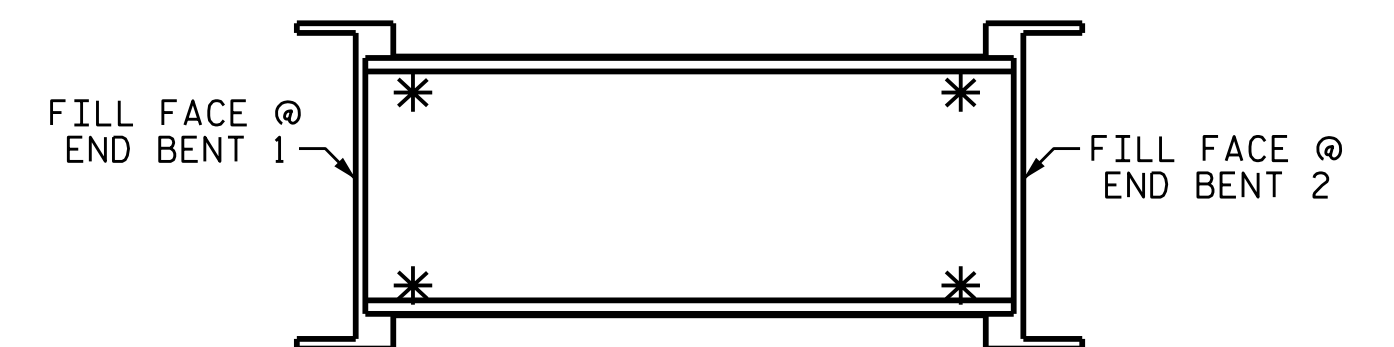
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.

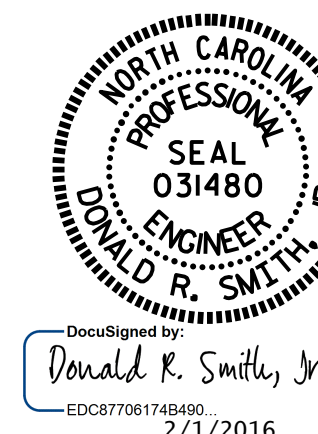
THE 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT

PROJECT NO. B-5142
IREDELL COUNTY
 STATION: 22+06.00 -L-

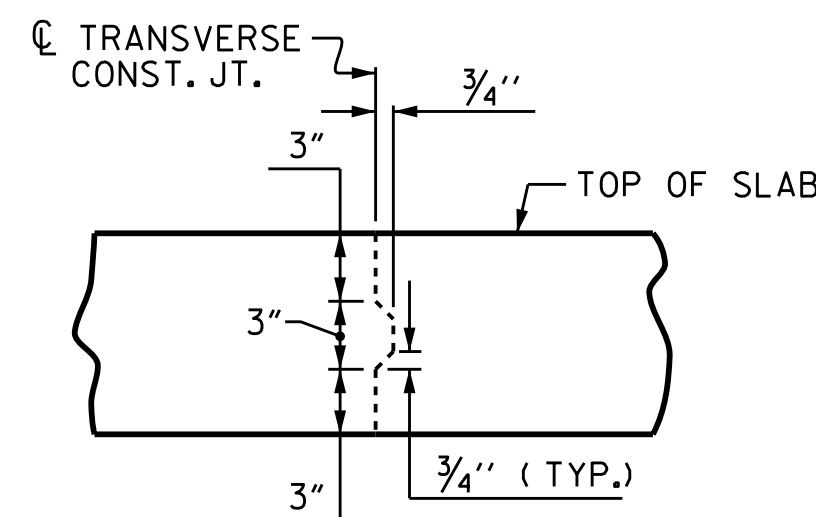


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 GUARDRAIL ANCHORAGE
 DETAILS
 FOR METAL RAILS

| | |
|----------------------------|---------------------|
| ASSEMBLED BY : K. D. LAYNE | DATE : 4-29-15 |
| CHECKED BY : J. D. HAWK | DATE : 5-12-15 |
| DRAWN BY : MAA 5/10 | REV. 12/5/11 MAA/GM |
| CHECKED BY : GM 5/10 | REV. 6/13 MAA/GM |
| | REV. 1/15 MAA/TMC |

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-22 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 38 |



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

GROOVING BRIDGE FLOORS

| | |
|----------------|---------------|
| APPROACH SLABS | 1,497 SQ. FT. |
| BRIDGE DECK | 6,137 SQ. FT. |
| TOTAL | 7,634 SQ. FT. |

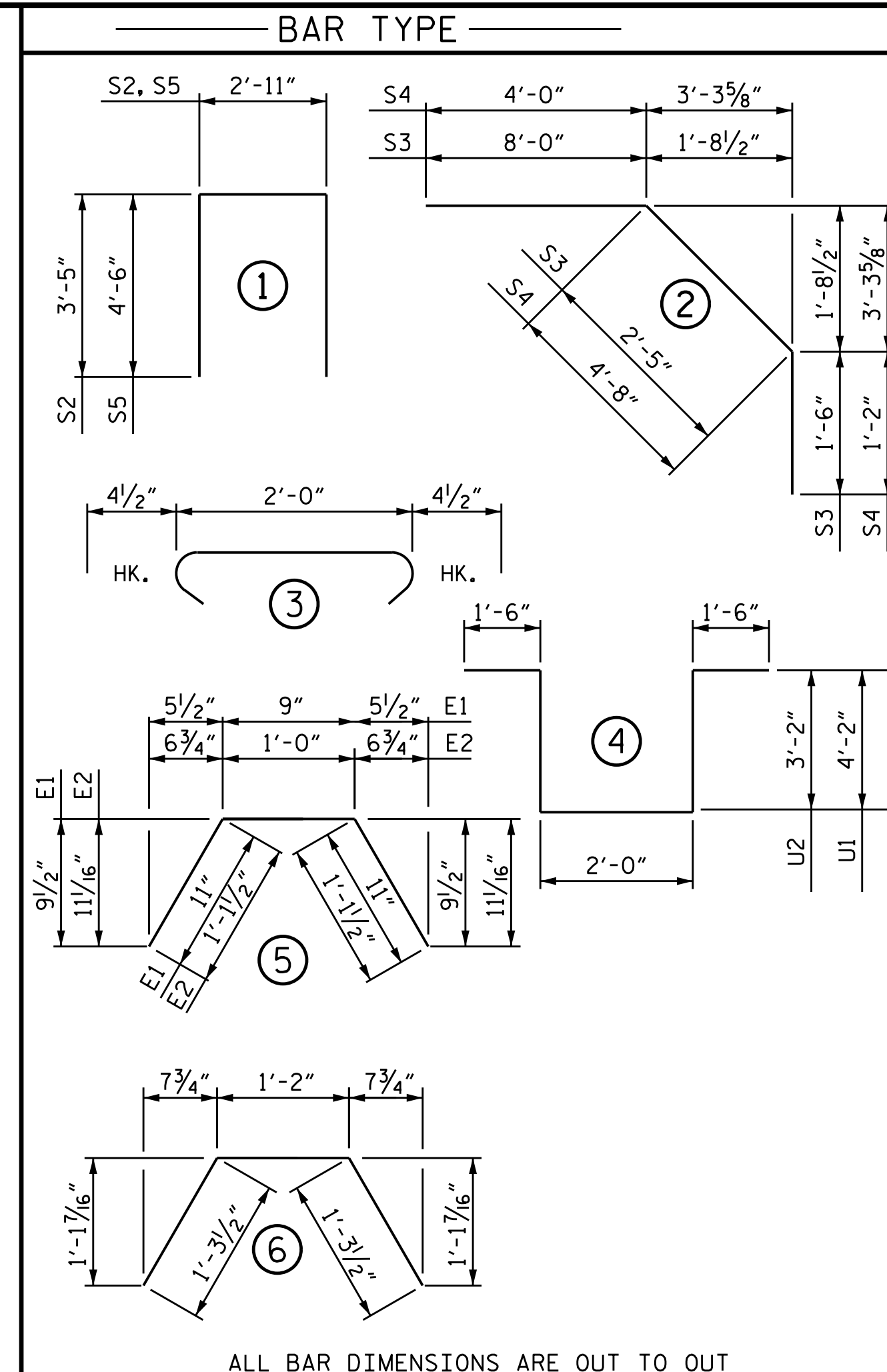
SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

| 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 | 57.0 | | |
| POUR #2 | 92.3 | | |
| POUR #3 | 89.9 | | |
| POUR #4 | 63.2 | | |
| TOTAL ** | 302.4 | 28,838 | 27,148 |

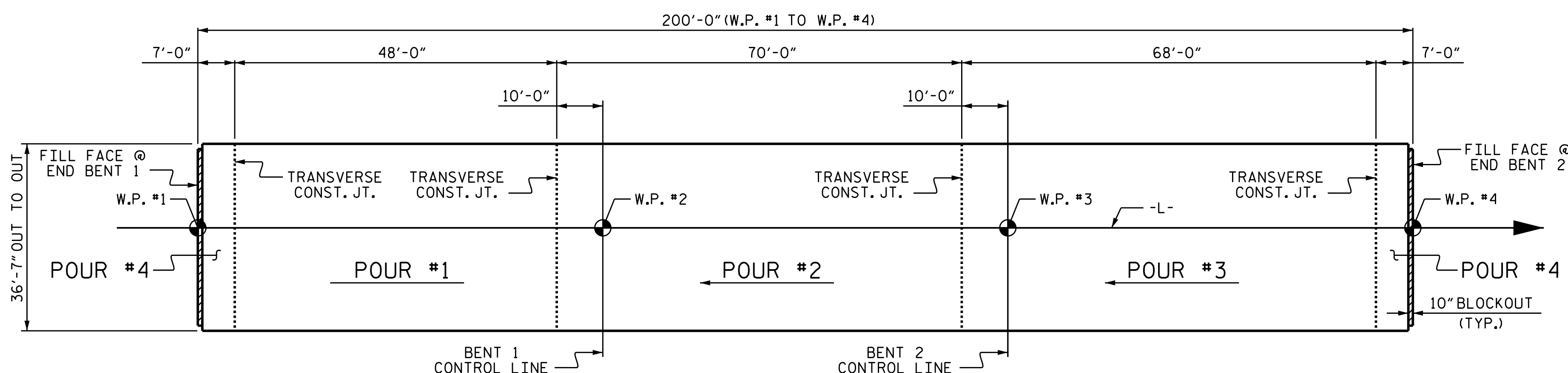
** QUANTITIES FOR CONCRETE PARAPET AND END POSTS ARE NOT INCLUDED



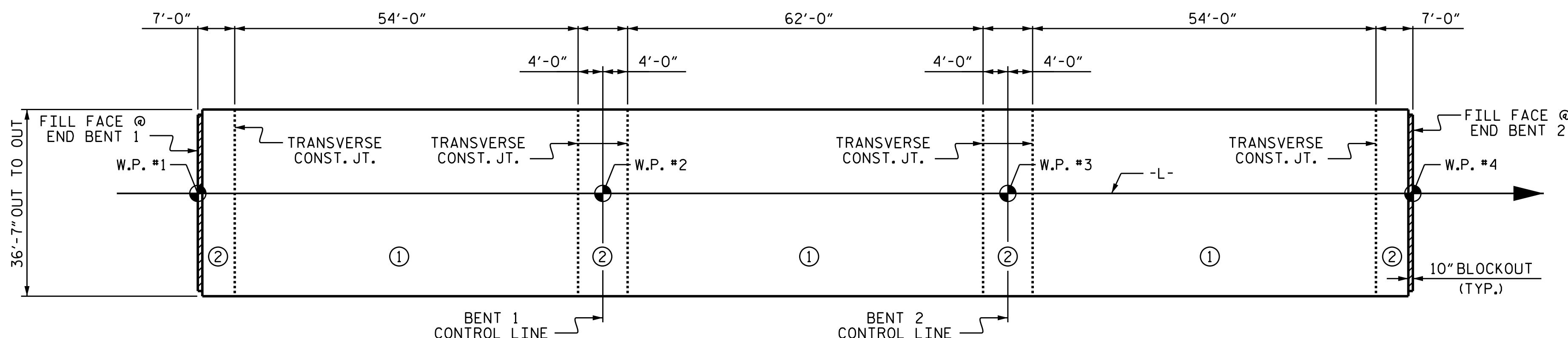
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

| BAR NO. | SIZE | TYPE | LENGTH | WEIGHT | |
|----------------------------------|------|------|--------|---------|-------|
| *A1 | 397 | #5 | STR | 36'-3" | 15010 |
| A2 | 397 | #5 | STR | 36'-3" | 15010 |
| *B1 | 98 | #5 | STR | 50'-6" | 5162 |
| *B2 | 96 | #5 | STR | 20'-3" | 2028 |
| *B3 | 194 | #5 | STR | 12'-10" | 2597 |
| *B4 | 100 | #4 | STR | 16'-4" | 1091 |
| *B5 | 25 | #4 | STR | 22'-0" | 367 |
| B6 | 196 | #5 | STR | 51'-2" | 10460 |
| E1 | 16 | #4 | 5 | 2'-7" | 28 |
| E2 | 32 | #4 | 5 | 3'-3" | 69 |
| E3 | 16 | #4 | 6 | 3'-9" | 40 |
| H1 | 80 | #5 | STR | 13'-5" | 1119 |
| K1 | 16 | #4 | STR | 22'-1" | 236 |
| K2 | 12 | #4 | STR | 6'-6" | 52 |
| K3 | 36 | #4 | STR | 9'-0" | 216 |
| K4 | 18 | #4 | STR | 8'-3" | 99 |
| K5 | 16 | #4 | STR | 16'-6" | 176 |
| K6 | 4 | #4 | STR | 5'-2" | 14 |
| K7 | 8 | #4 | STR | 5'-10" | 31 |
| K8 | 4 | #4 | STR | 5'-5" | 14 |
| K9 | 16 | #4 | STR | 2'-8" | 29 |
| K10 | 6 | #4 | STR | 7'-9" | 31 |
| S1 | 146 | #4 | 3 | 2'-9" | 268 |
| S2 | 56 | #4 | 1 | 9'-9" | 365 |
| *S3 | 66 | #4 | 2 | 11'-11" | 525 |
| *S4 | 56 | #4 | 2 | 9'-10" | 368 |
| S5 | 16 | #4 | 1 | 11'-11" | 127 |
| U1 | 38 | #4 | 4 | 13'-4" | 338 |
| U2 | 12 | #4 | 4 | 11'-4" | 91 |
| U3 | 4 | #4 | 4 | 9'-4" | 25 |
| REINFORCING STEEL | | | LBS. | 28,838 | |
| * EPOXY COATED REINFORCING STEEL | | | LBS. | 27,148 | |



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB & POURING SEQUENCE (SQ. FT. = 7,317)



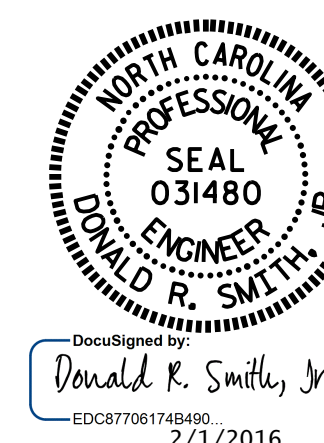
OPTIONAL DECK POURING DETAIL

POUR ② SHALL NOT BE STARTED UNTIL BOTH ADJACENT ① POURS REACH A MINIMUM OF 3,000 PSI

DRAWN BY : K. D. LAYNE DATE : 4-29-15
 CHECKED BY : J. D. HAWK DATE : 5-12-15
 DESIGN ENGINEER OF RECORD : T. H. CARROLL DATE : 8-18-15

27-JAN-2016 12:59
 R:\Structures\Plans\B5142.sd.BM.01.dgn
 jdhawk

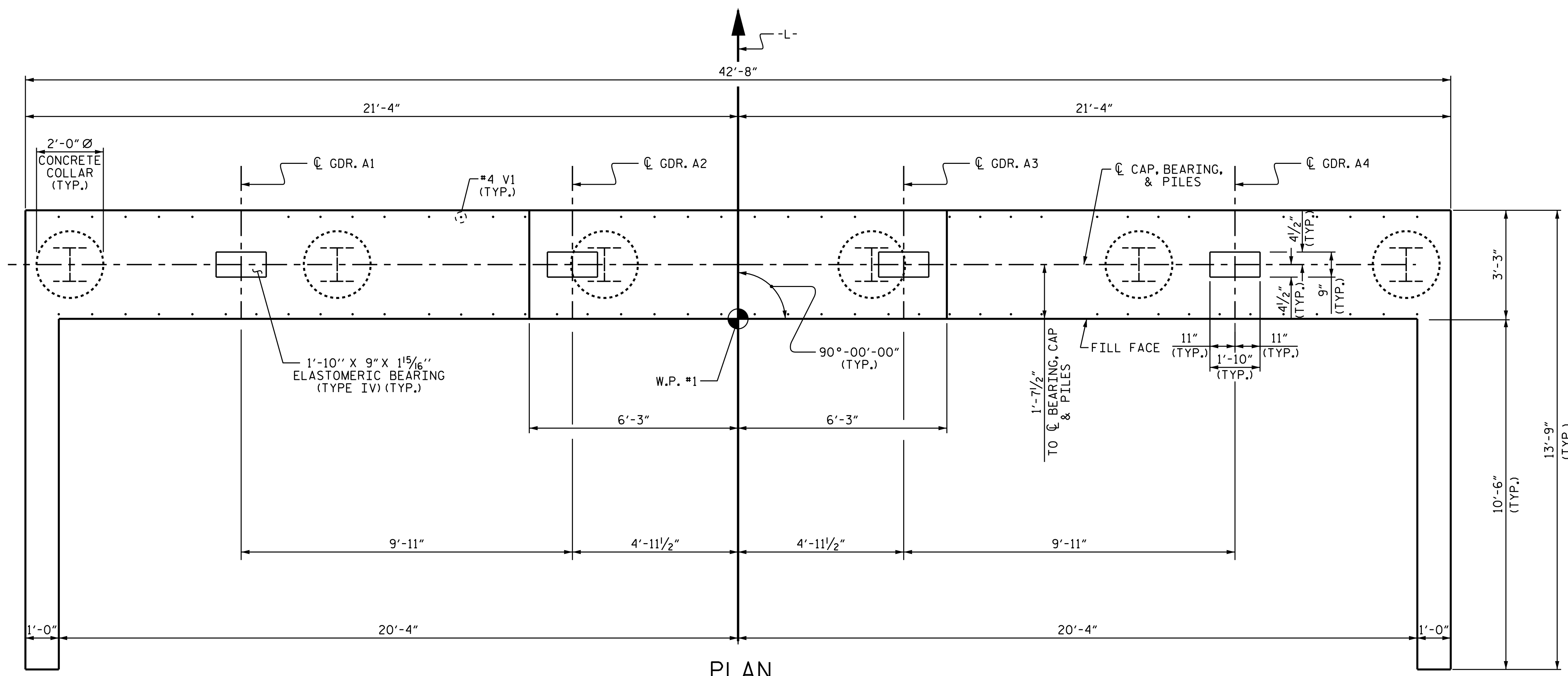
PROJECT NO. B-5142
IREDELL COUNTY
 STATION: 22+06.00 -L-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 BILL OF MATERIAL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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



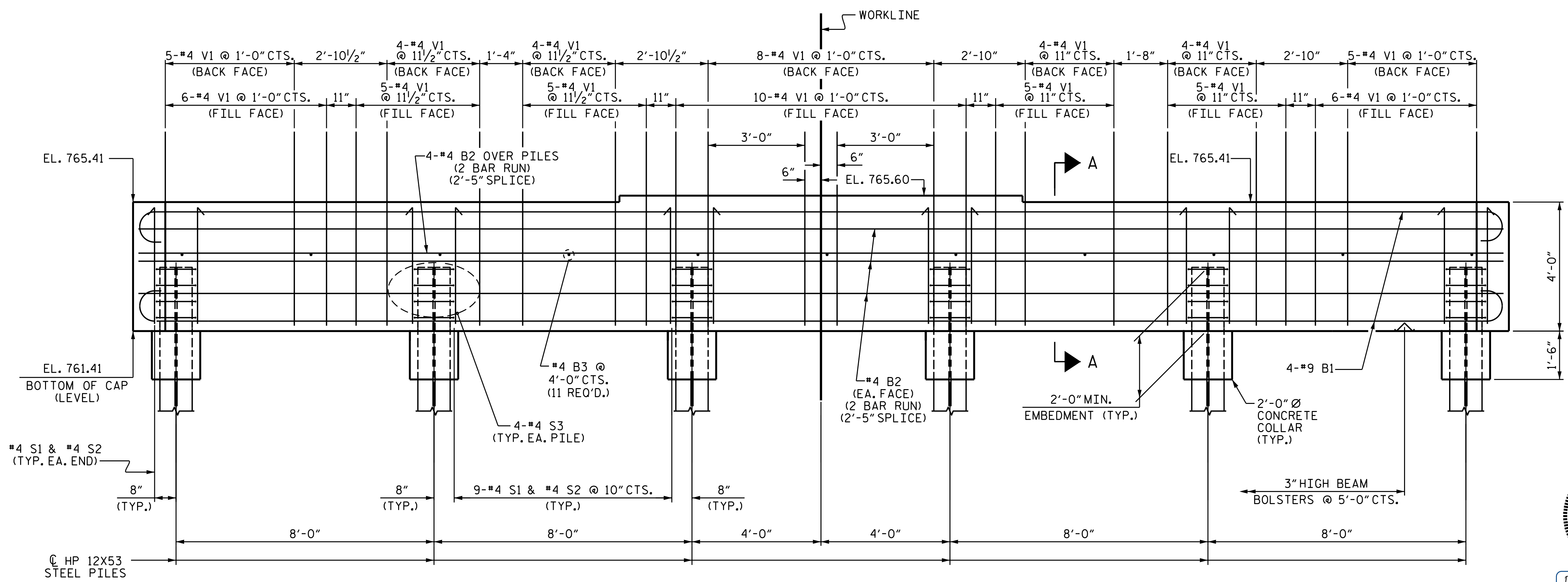
NOTES

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

THE UPPER PORTION OF THE WINGS SHALL BE POURED WITH THE SUPERSTRUCTURE, CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED IN THE SUPERSTRUCTURE BILL OF MATERIAL. FOR DETAILS, SEE SUPERSTRUCTURE PLANS.

INSTALL THE 4" DIA. DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

FOR TEMPORARY DRAINAGE AT END BENT, SEE END BENT 2.

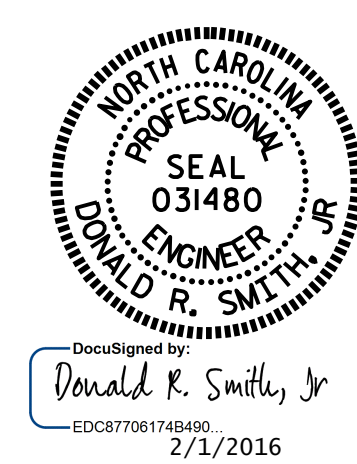


PROJECT NO. B-5142

IREDELL COUNTY

STATION: 22+06.00 -L-

SHEET 1 OF 2



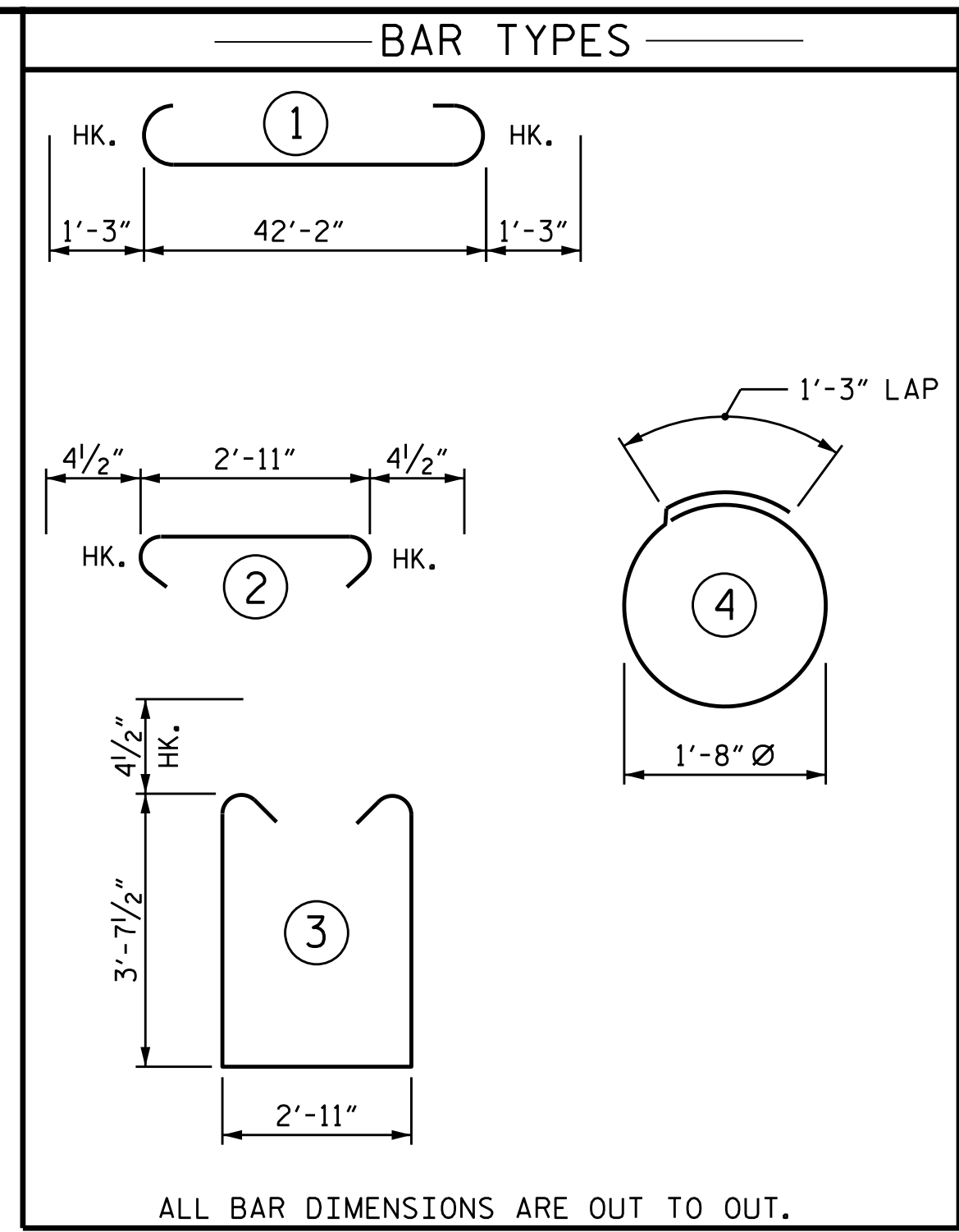
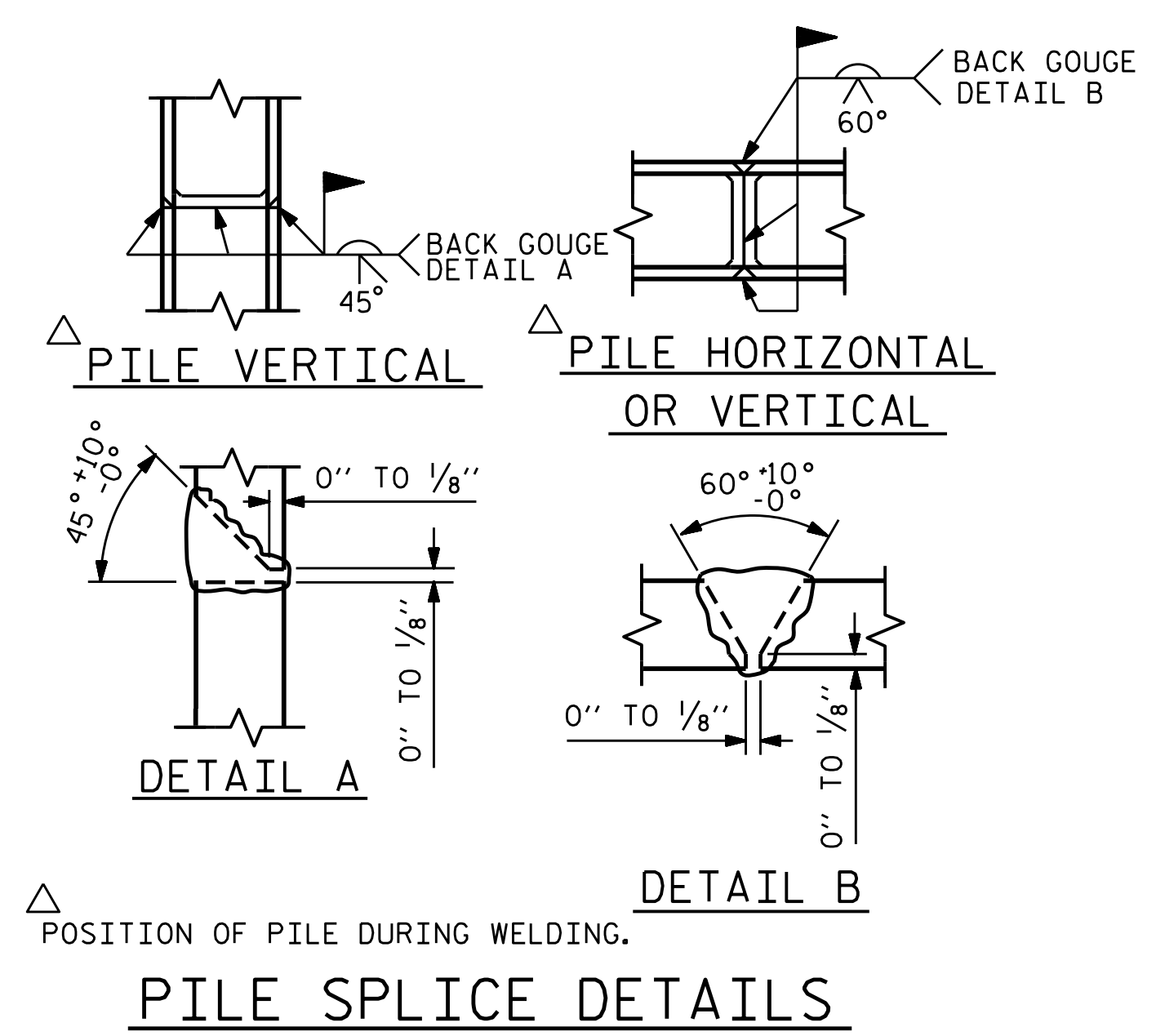
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|-------------------------|-----|------------------------------|-----|---------|-------|
| STATE OF NORTH CAROLINA | | DEPARTMENT OF TRANSPORTATION | | RALEIGH | |
| SUBSTRUCTURE | | | | | |
| INTEGRAL | | | | | |
| END BENT 1 | | | | | |
| REVISIONS | | | | | |
| NO. | BY: | DATE: | NO. | BY: | DATE: |
| 1 | | | 3 | | |
| 2 | | | 4 | | |
| SHEET NO. | | | | | S-24 |
| TOTAL SHEETS | | | | | 38 |

DRAWN BY : J.D. HAWK DATE : 6-11-15

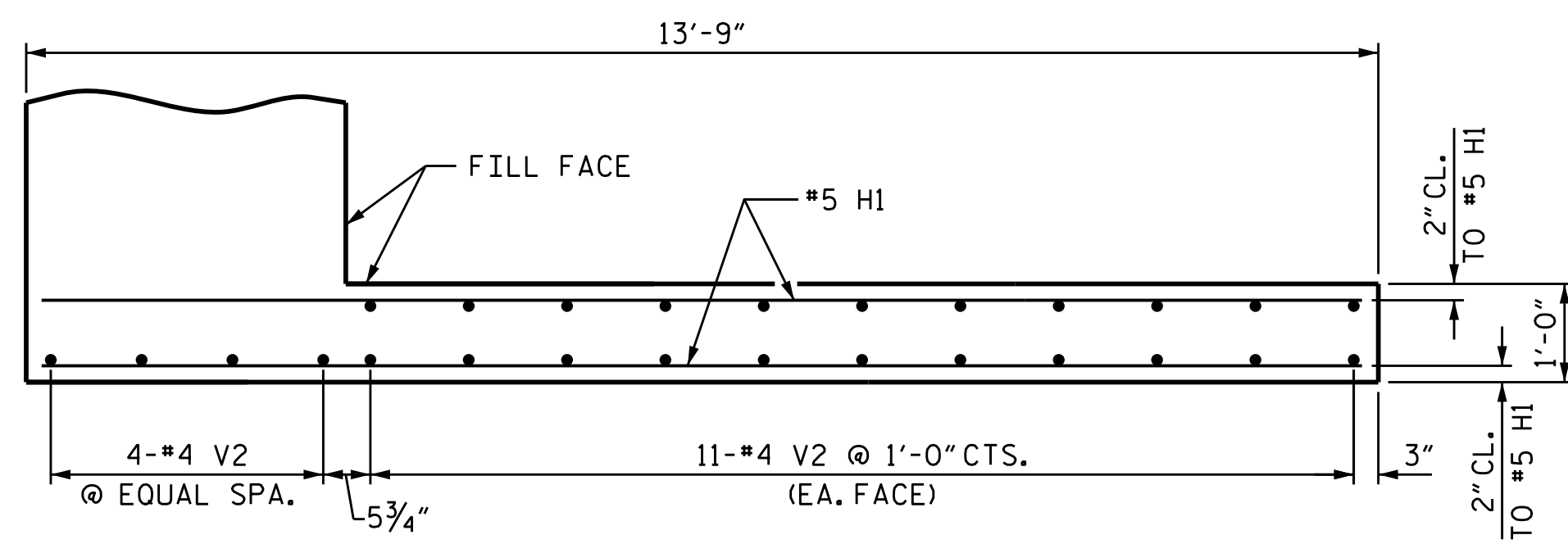
CHECKED BY : K.D. LAYNE DATE : 7-2-15

DESIGN ENGINEER OF RECORD: T.H. CARROLL DATE : 8-18-15

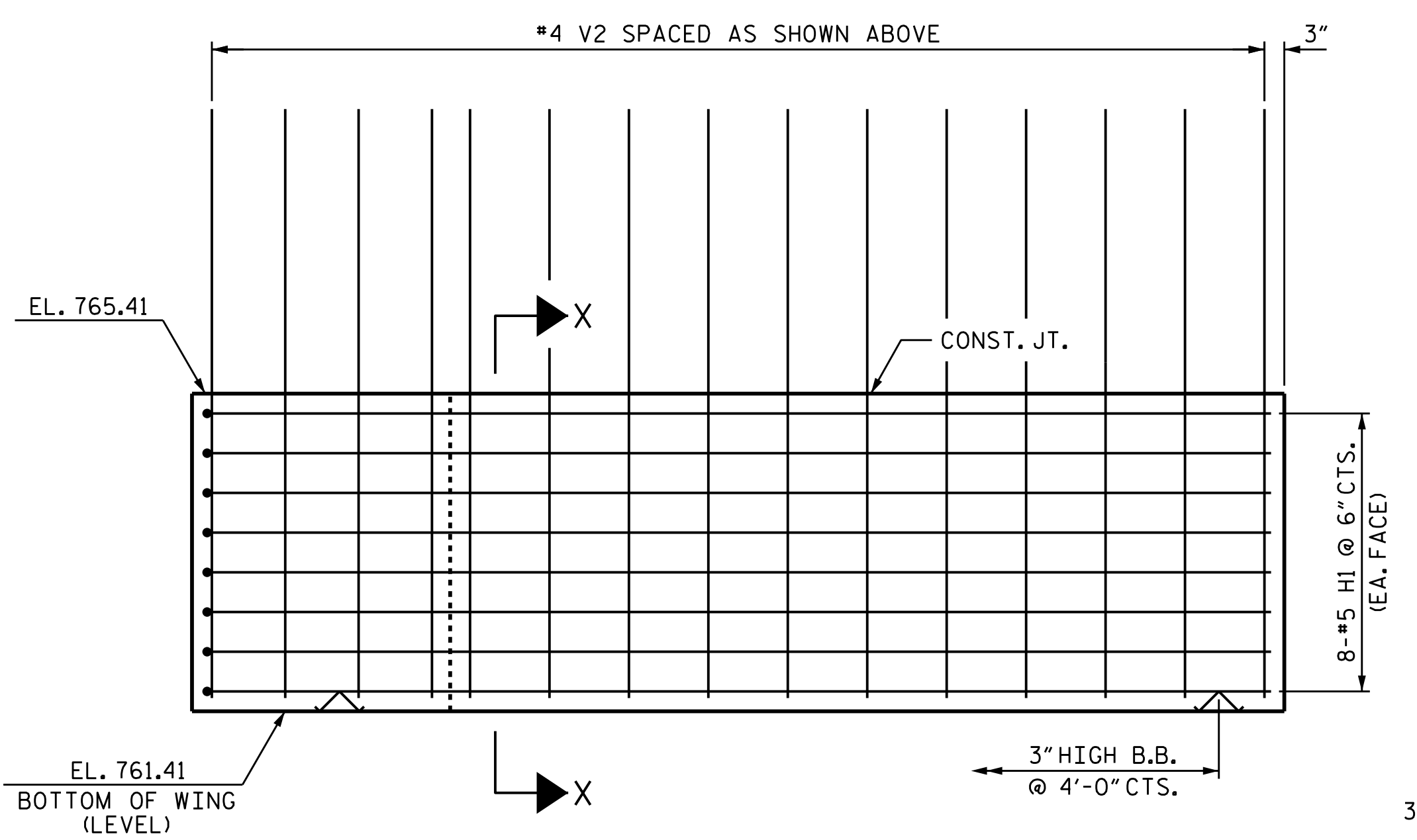
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



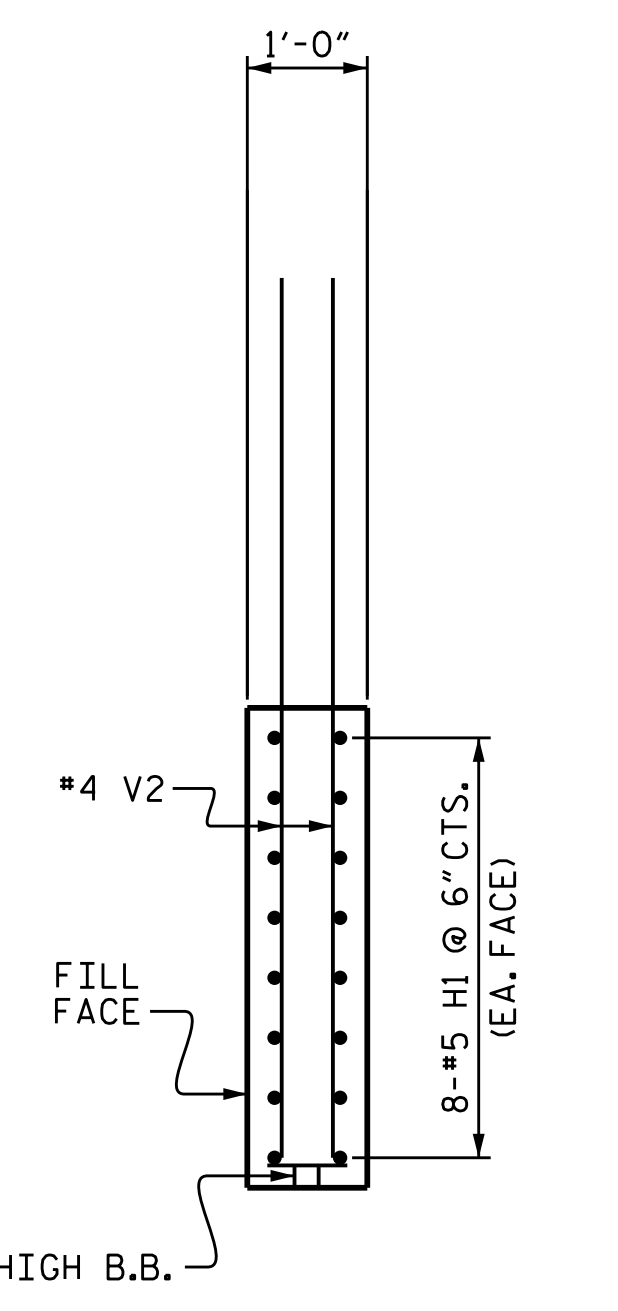
| BILL OF MATERIAL | | | | | |
|---------------------------------|-----|------|------|---------|--------|
| END BENT 1 | | | | | |
| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
| B1 | 8 | #9 | 1 | 44'-8" | 1215 |
| B2 | 20 | #4 | STR | 22'-5" | 299 |
| B3 | 11 | #4 | STR | 2'-11" | 21 |
| H1 | 32 | #5 | STR | 13'-5" | 448 |
| S1 | 47 | #4 | 3 | 10'-11" | 343 |
| S2 | 47 | #4 | 2 | 3'-8" | 115 |
| S3 | 24 | #4 | 4 | 6'-6" | 104 |
| V1 | 76 | #4 | STR | 6'-0" | 305 |
| V2 | 52 | #4 | STR | 8'-5" | 292 |
| REINFORCING STEEL | | | | LBS. | 3,142 |
| CLASS A CONCRETE | | | | C.Y. | 25.0 |
| HP 12 X 53 STEEL PILES NO. 6 | | | | LN. FT. | 270 |



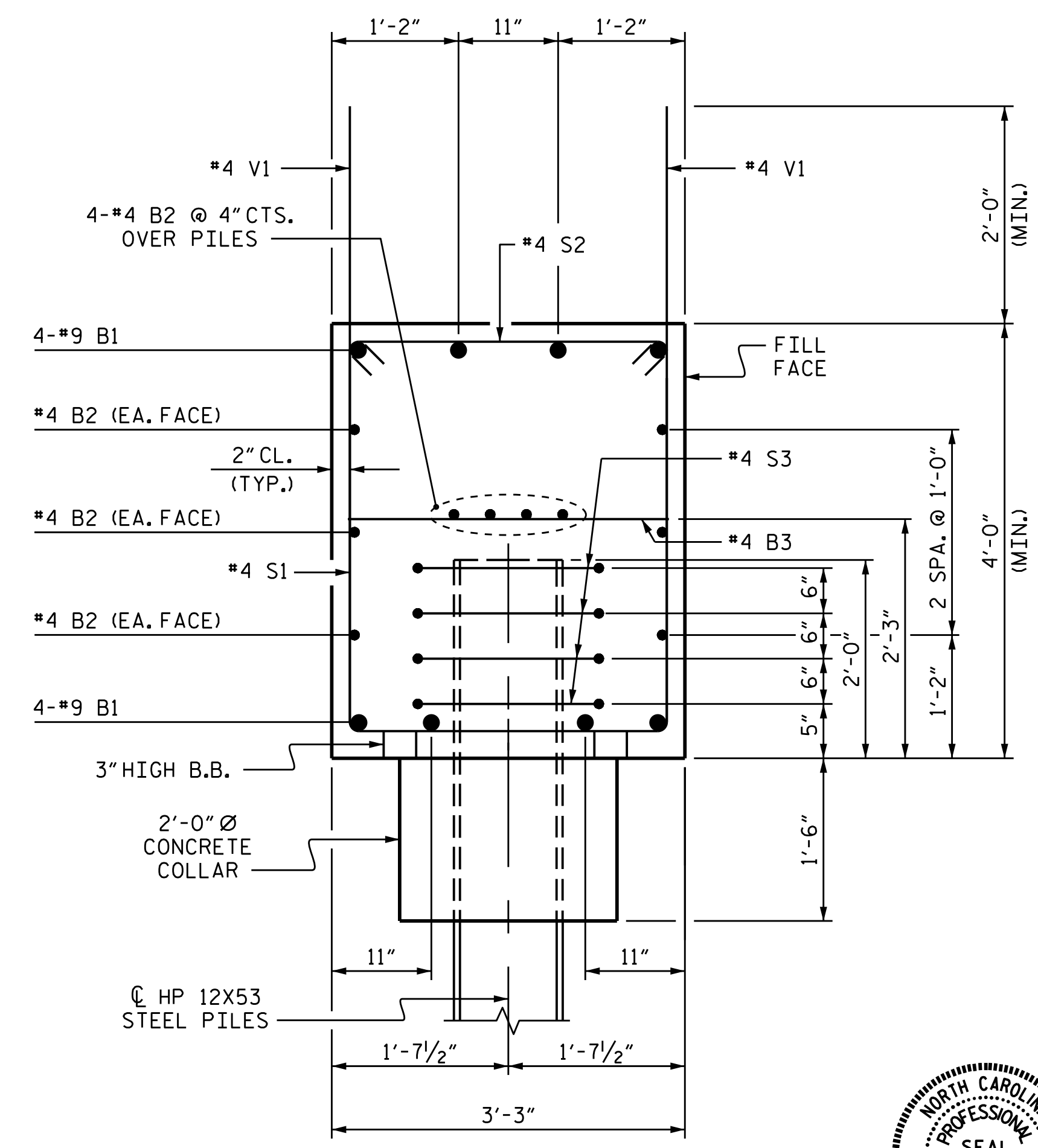
PLAN OF WING
(LEFT WING SHOWN, RIGHT WING SIMILAR)



ELEVATION OF WING
(LEFT WING SHOWN, RIGHT WING SIMILAR)

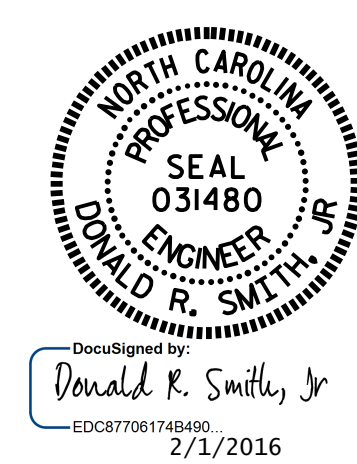


SECTION X-X



SECTION A-A

PROJECT NO. B-5142
IREDELL COUNTY
STATION: 22+06.00 -L-
SHEET 2 OF 2



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

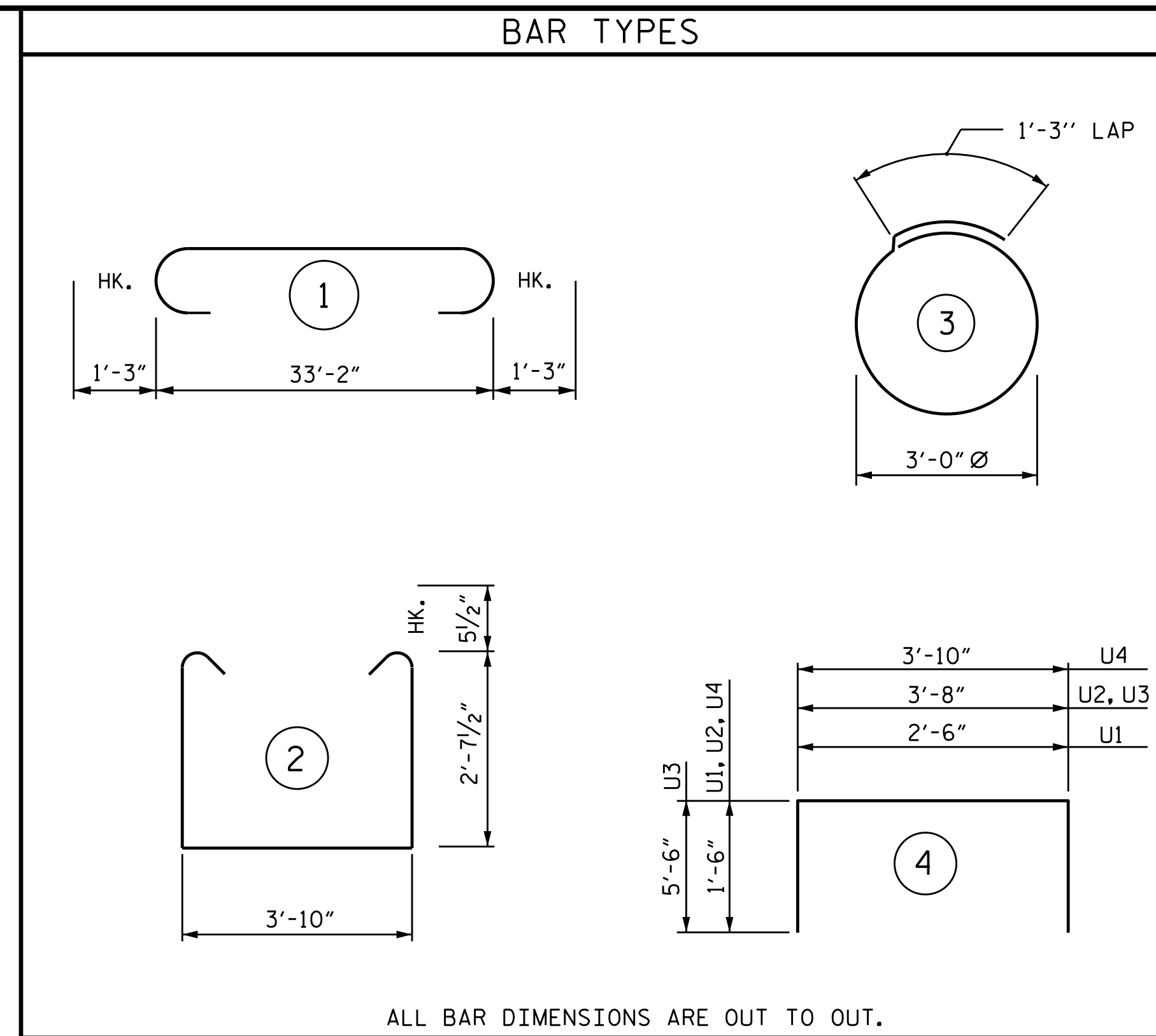
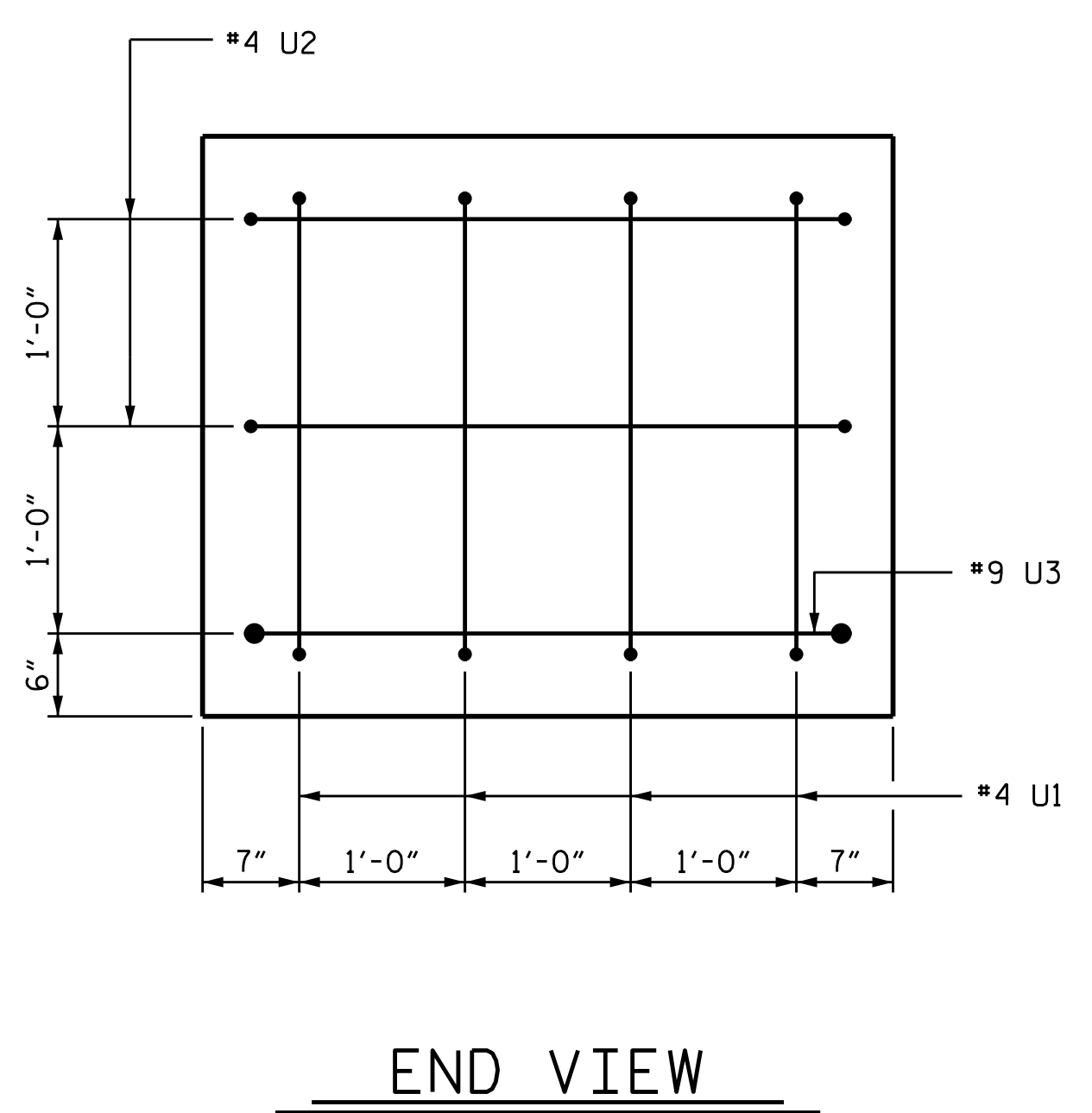
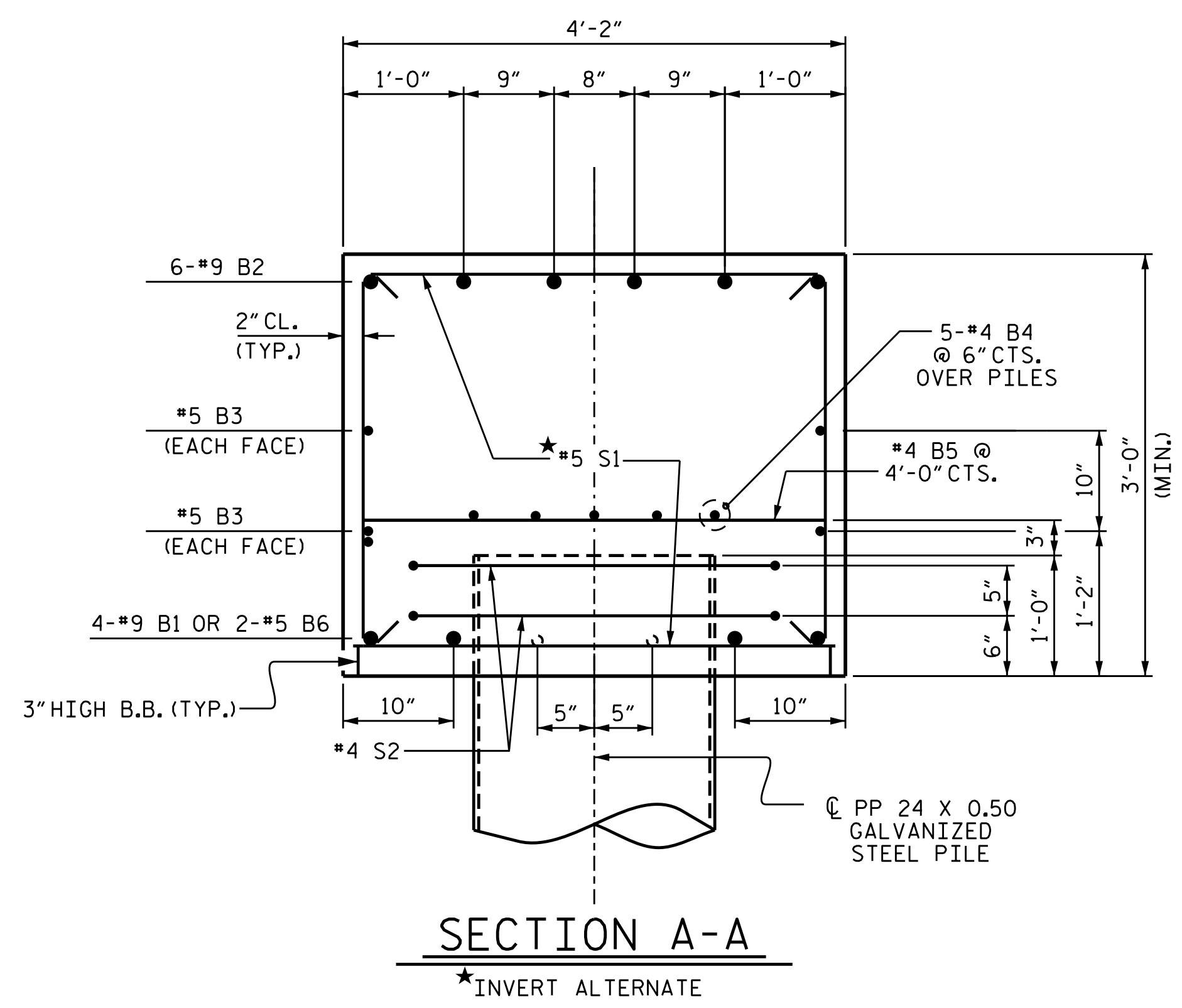
SUBSTRUCTURE
INTEGRAL
END BENT 1

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

SHEET NO. S-25
TOTAL SHEETS 38

DRAWN BY: J.D. HAWK DATE: 6-11-15
CHECKED BY: K.D. LAYNE DATE: 7-2-15
DESIGN ENGINEER OF RECORD: T.H. CARROLL DATE: 8-18-15

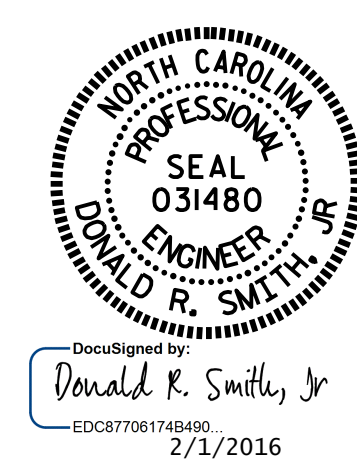
DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED



ALL BAR DIMENSIONS ARE OUT TO OUT.

| BILL OF MATERIAL | | | | | |
|---|-----|------|------|----------|--------|
| BENT 1 | | | | | |
| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
| B1 | 4 | #9 | STR | 33'-4" | 453 |
| B2 | 6 | #9 | 1 | 35'-8" | 728 |
| B3 | 4 | #5 | STR | 33'-4" | 139 |
| B4 | 10 | #4 | STR | 17'-11" | 120 |
| B5 | 9 | #4 | STR | 3'-10" | 23 |
| B6 | 6 | #5 | STR | 6'-11" | 43 |
| S1 | 30 | #5 | 2 | 10'-0" | 313 |
| S2 | 8 | #4 | 3 | 10'-8" | 57 |
| U1 | 8 | #4 | 4 | 5'-6" | 29 |
| U2 | 4 | #4 | 4 | 6'-8" | 18 |
| U3 | 2 | #9 | 4 | 14'-8" | 100 |
| U4 | 28 | #4 | 4 | 6'-10" | 128 |
| REINFORCING STEEL | | | | LBS. | 2,151 |
| CLASS A CONCRETE | | | | C.Y. | 15.5 |
| PP 24 X 0.50 GALVANIZED STEEL PILES NO. 4 | | | | LIN. FT. | 250 |

PROJECT NO. B-5142
IREDELL COUNTY
 STATION: 22+06.00 -L-
 SHEET 2 OF 2



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT 1

DRAWN BY : J.D. HAWK DATE : 6-11-15
 CHECKED BY : K.D. LAYNE DATE : 7-2-15
 DESIGN ENGINEER OF RECORD: T.H. CARROLL DATE : 8-18-15

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

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

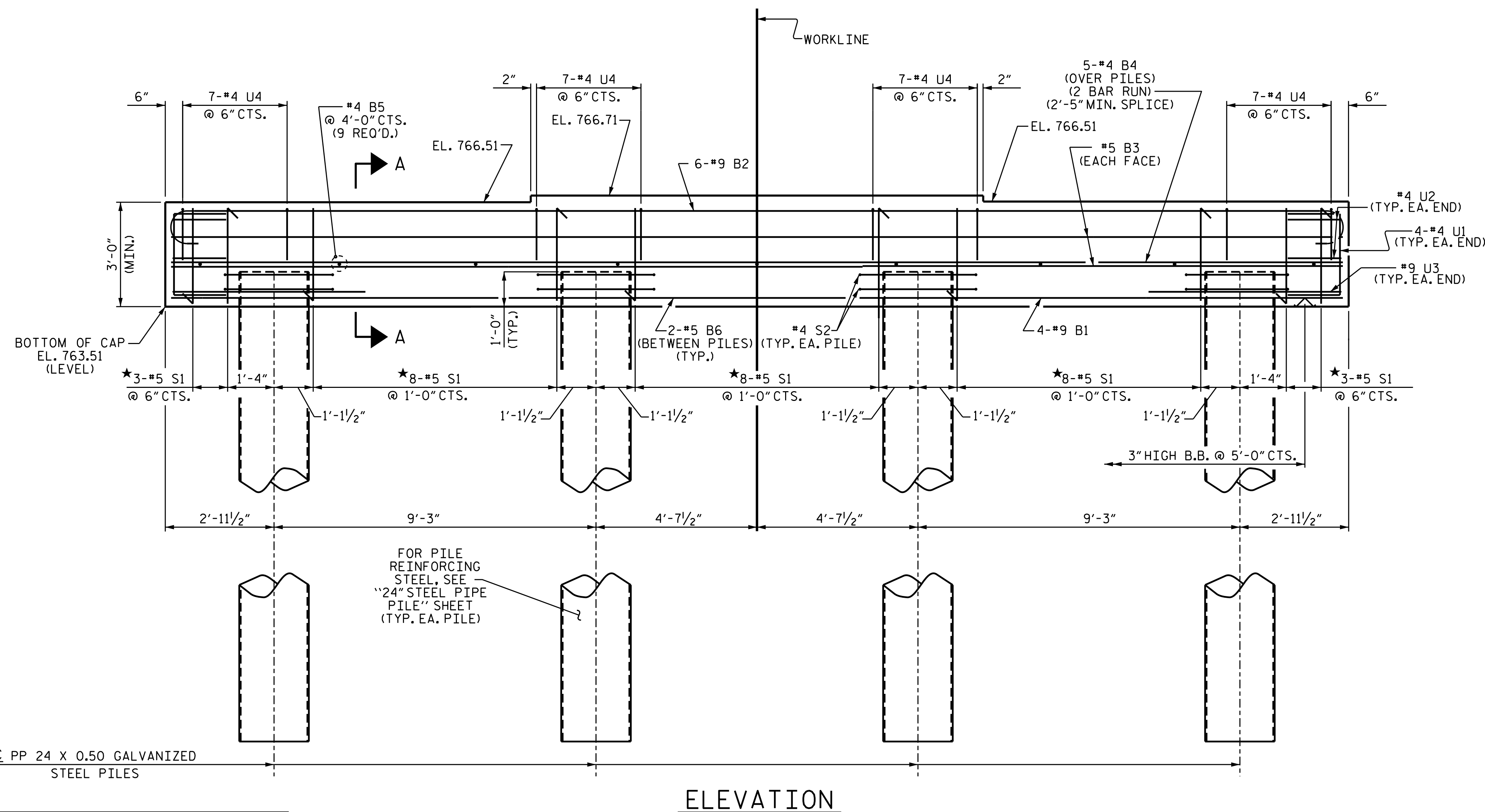
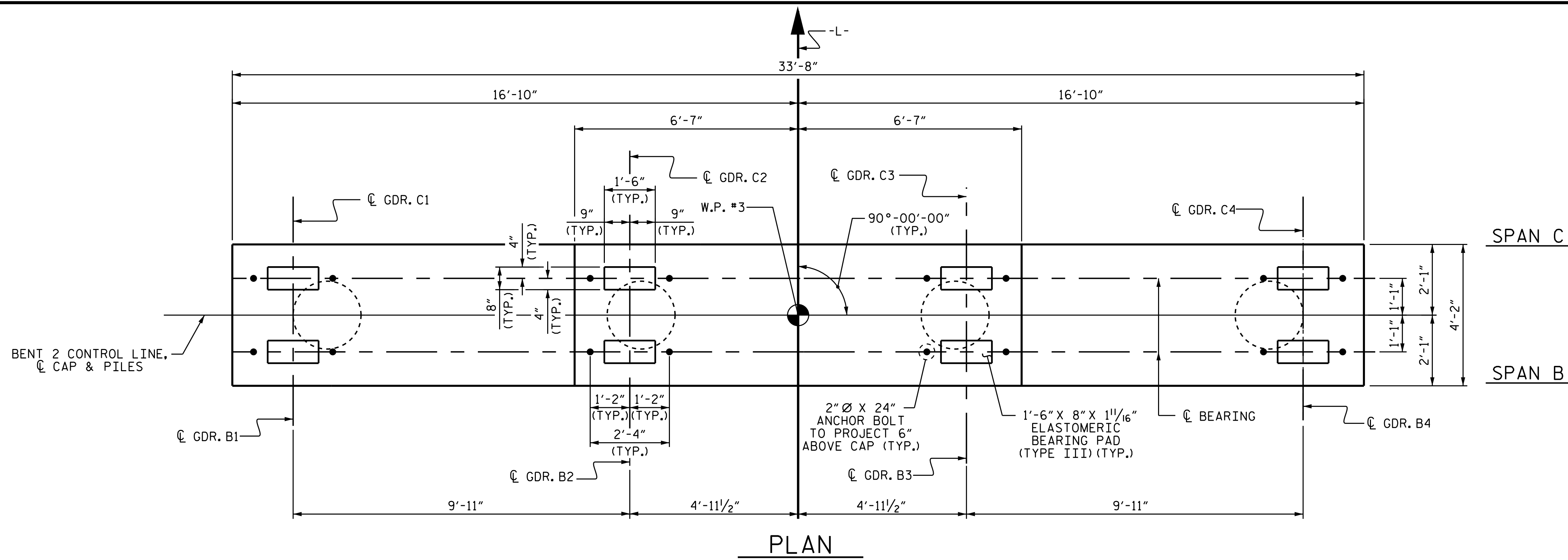
NOTES

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

GALVANIZE THE TOP 40 FEET OF EACH INTERIOR BENT PILE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

★ INVERT ALTERNATE STIRRUPS.

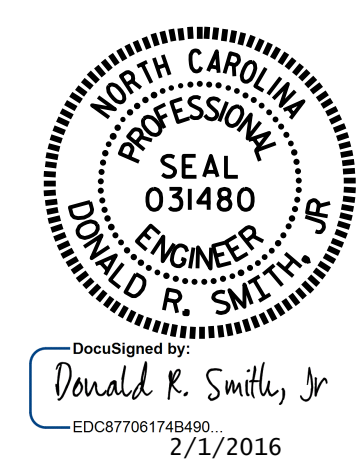
CONCRETE DISPLACED BY 24" STEEL PIPE PILES HAS BEEN DEDUCTED FROM THE CONCRETE QUANTITY.



PROJECT NO. B-5142
IREDELL COUNTY
 STATION: 22+06.00 -L-

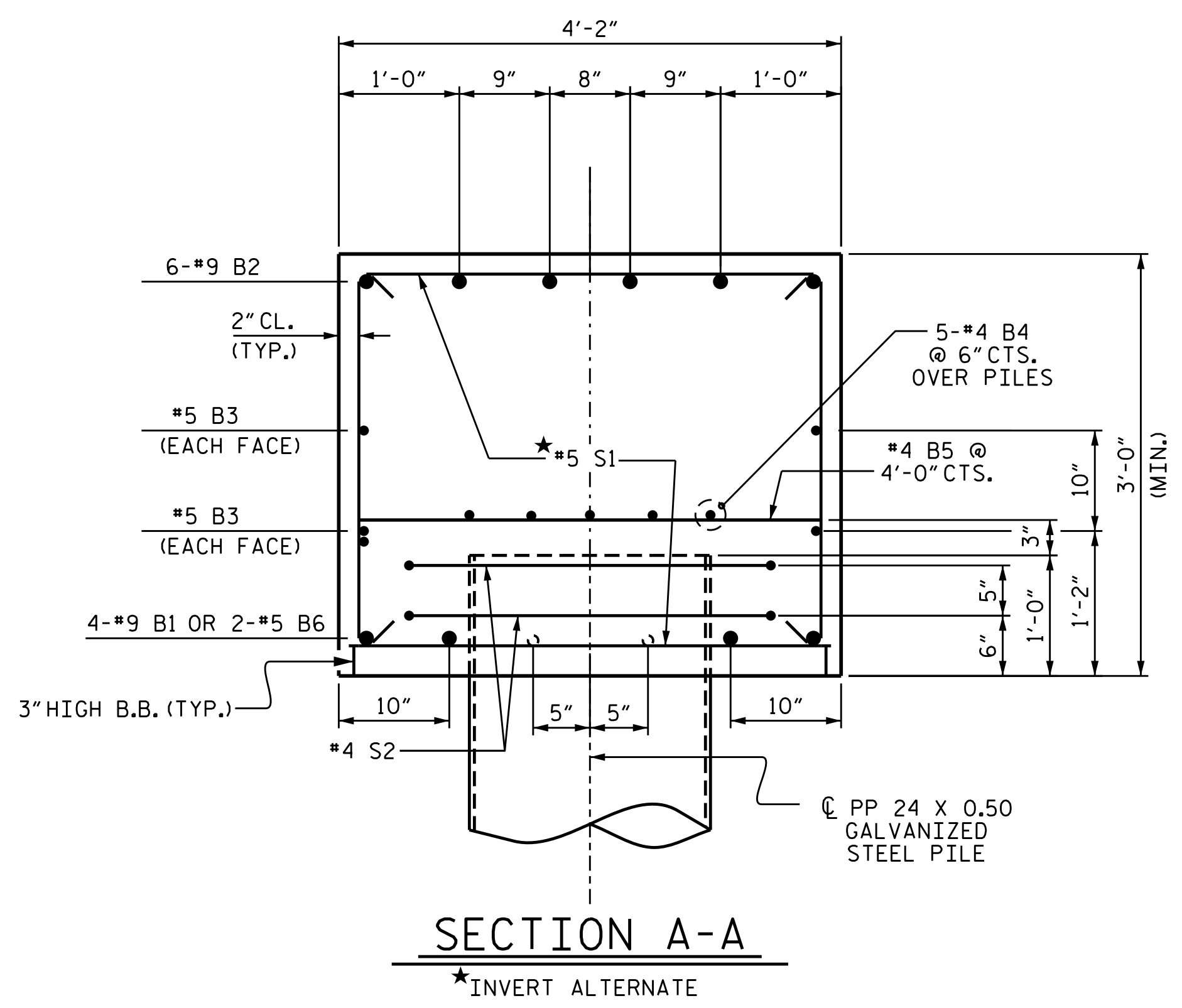
SHEET 1 OF 2

| | | | | | |
|--|-----|-------|-----|-----|--------------|
| STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH | | | | | |
| SUBSTRUCTURE | | | | | |
| BENT 2 | | | | | |
| REVISIONS | | | | | SHEET NO. |
| NO. | BY: | DATE: | NO. | BY: | DATE: |
| 1 | | | 3 | | |
| 2 | | | 4 | | |
| | | | | | TOTAL SHEETS |
| | | | | | 38 |

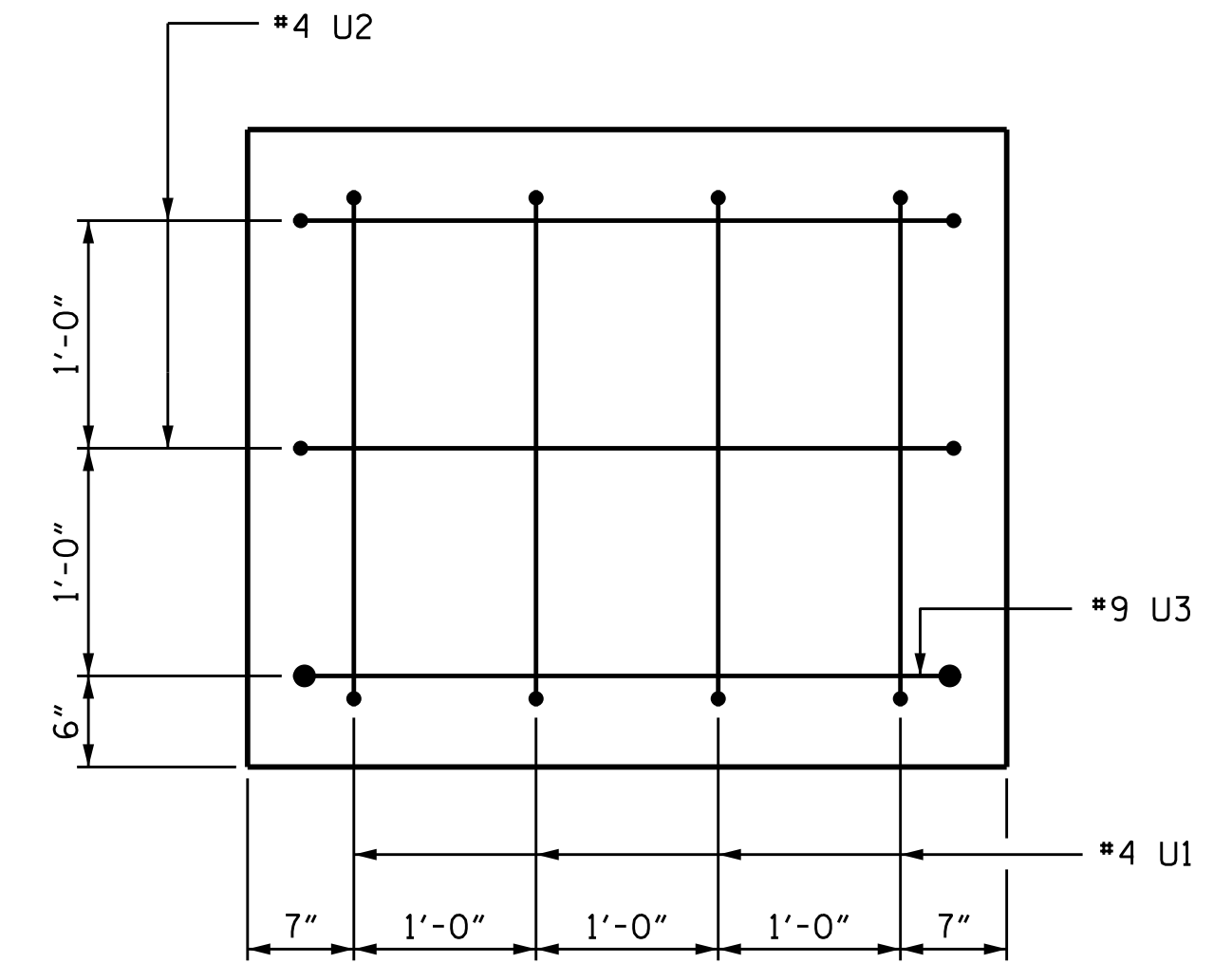


DRAWN BY: J.D. HAWK DATE: 6-11-15
 CHECKED BY: K.D. LAYNE DATE: 7-2-15
 DESIGN ENGINEER OF RECORD: T.H. CARROLL DATE: 8-18-15

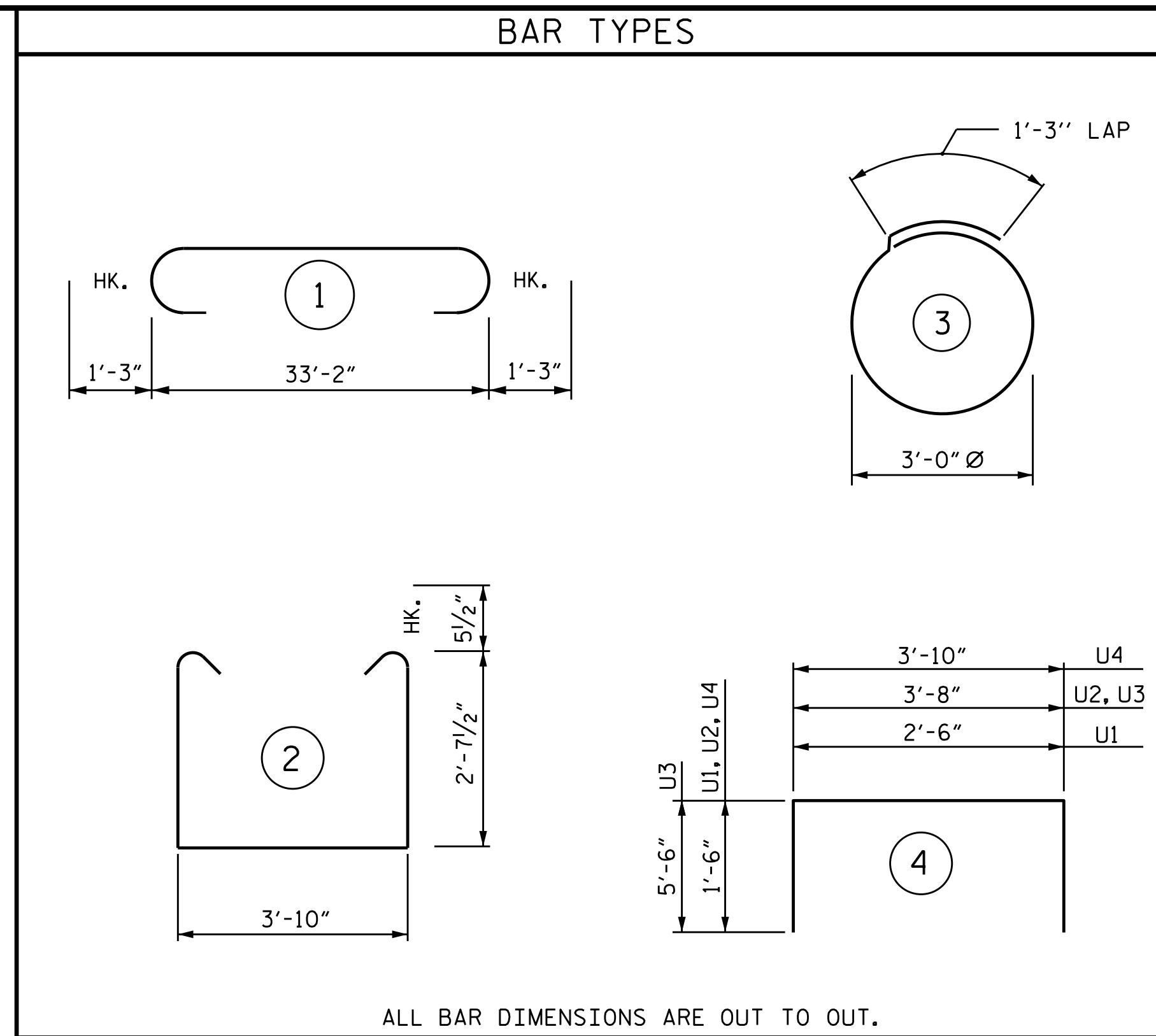
DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED



SECTION A-A
*INVERT ALTERNATE



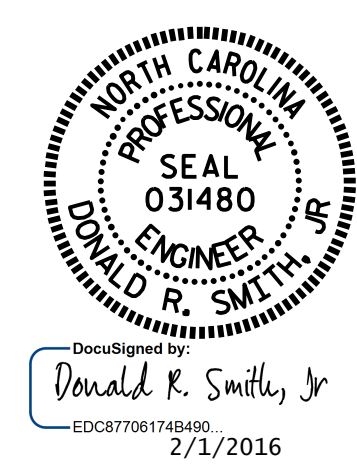
END VIEW



ALL BAR DIMENSIONS ARE OUT TO OUT.

| BILL OF MATERIAL | | | | | |
|---|-----|------|------|---------|--------|
| BENT 2 | | | | | |
| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
| B1 | 4 | #9 | STR | 33'-4" | 453 |
| B2 | 6 | #9 | 1 | 35'-8" | 728 |
| B3 | 4 | #5 | STR | 33'-4" | 139 |
| B4 | 10 | #4 | STR | 17'-11" | 120 |
| B5 | 9 | #4 | STR | 3'-10" | 23 |
| B6 | 6 | #5 | STR | 6'-11" | 43 |
| S1 | 30 | #5 | 2 | 10'-0" | 313 |
| S2 | 8 | #4 | 3 | 10'-8" | 57 |
| U1 | 8 | #4 | 4 | 5'-6" | 29 |
| U2 | 4 | #4 | 4 | 6'-8" | 18 |
| U3 | 2 | #9 | 4 | 14'-8" | 100 |
| U4 | 28 | #4 | 4 | 6'-10" | 128 |
| REINFORCING STEEL | | | | LBS. | 2,151 |
| CLASS A CONCRETE | | | | C.Y. | 15.5 |
| PP 24 X 0.50 GALVANIZED STEEL PILES NO. 4 | | | | LN. FT. | 220 |

PROJECT NO. B-5142
IREDELL COUNTY
 STATION: 22+06.00 -L-
 SHEET 2 OF 2

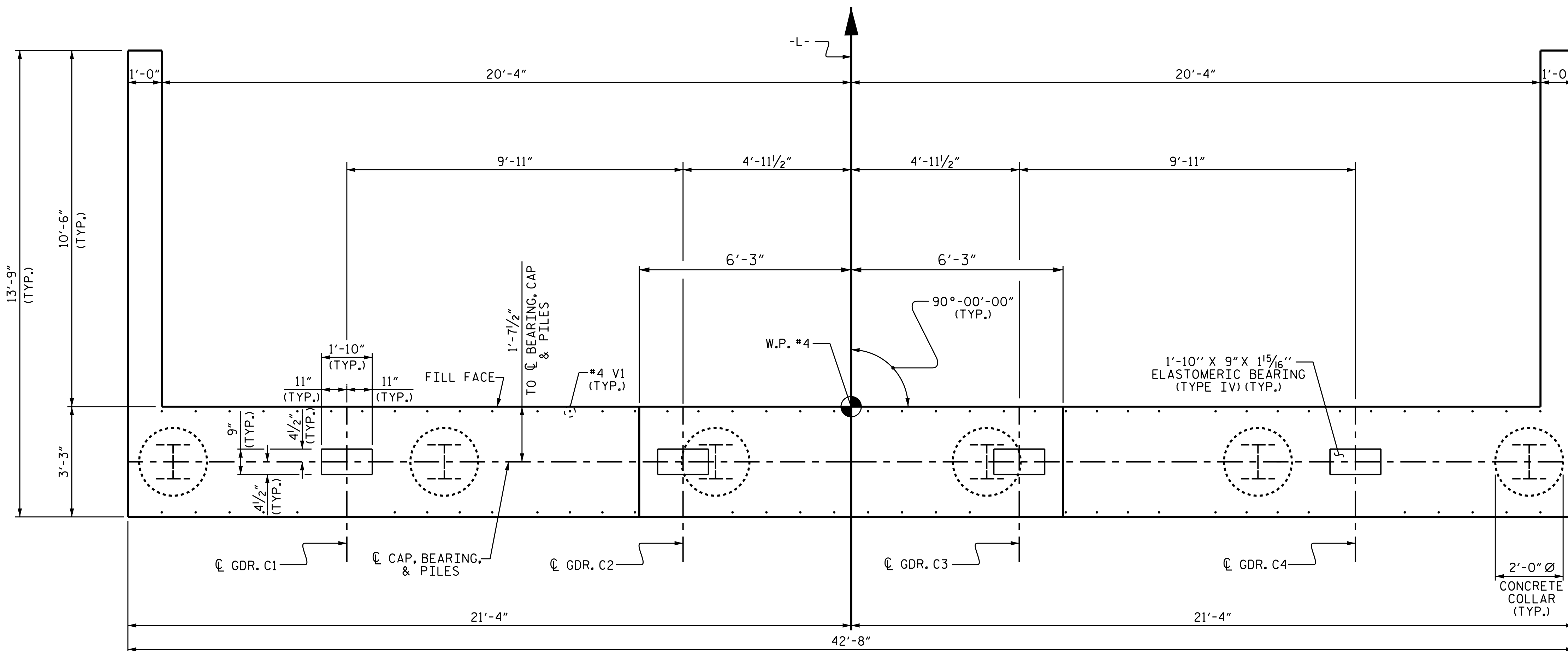


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT 2

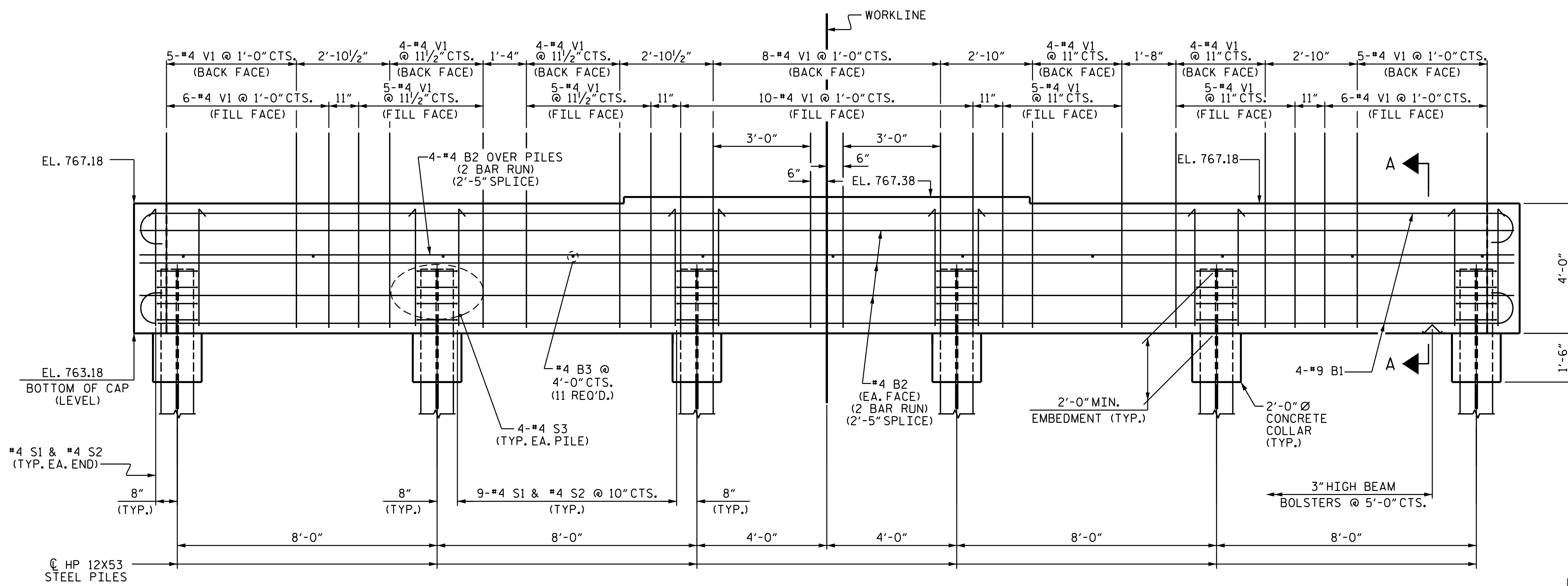
DRAWN BY : J.D. HAWK DATE : 6-11-15
 CHECKED BY : K.D. LAYNE DATE : 7-2-15
 DESIGN ENGINEER OF RECORD: T.H. CARROLL DATE : 8-18-15

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 | | | 38 |



PLAN



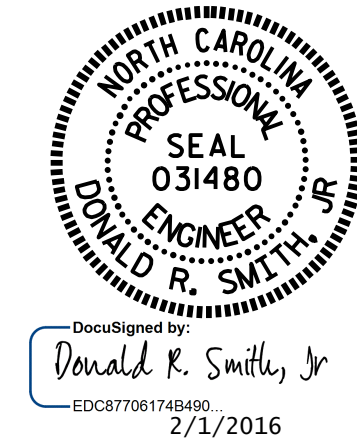
ELEVATION

NOTES

- THE TOP SURFACE OF THE END BENT CAP AND WINGS, EXCEPT THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".
- THE UPPER PORTION OF THE WINGS SHALL BE POURED WITH THE SUPERSTRUCTURE, CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED IN THE SUPERSTRUCTURE BILL OF MATERIAL. FOR DETAILS, SEE SUPERSTRUCTURE PLANS.
- INSTALL THE 4" DIA. DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.
- FOR PILE SPLICE DETAILS, SEE END BENT 1.

PROJECT NO. B-5142
 IREDELL COUNTY
 STATION: 22+06.00 -L-

SHEET 1 OF 2



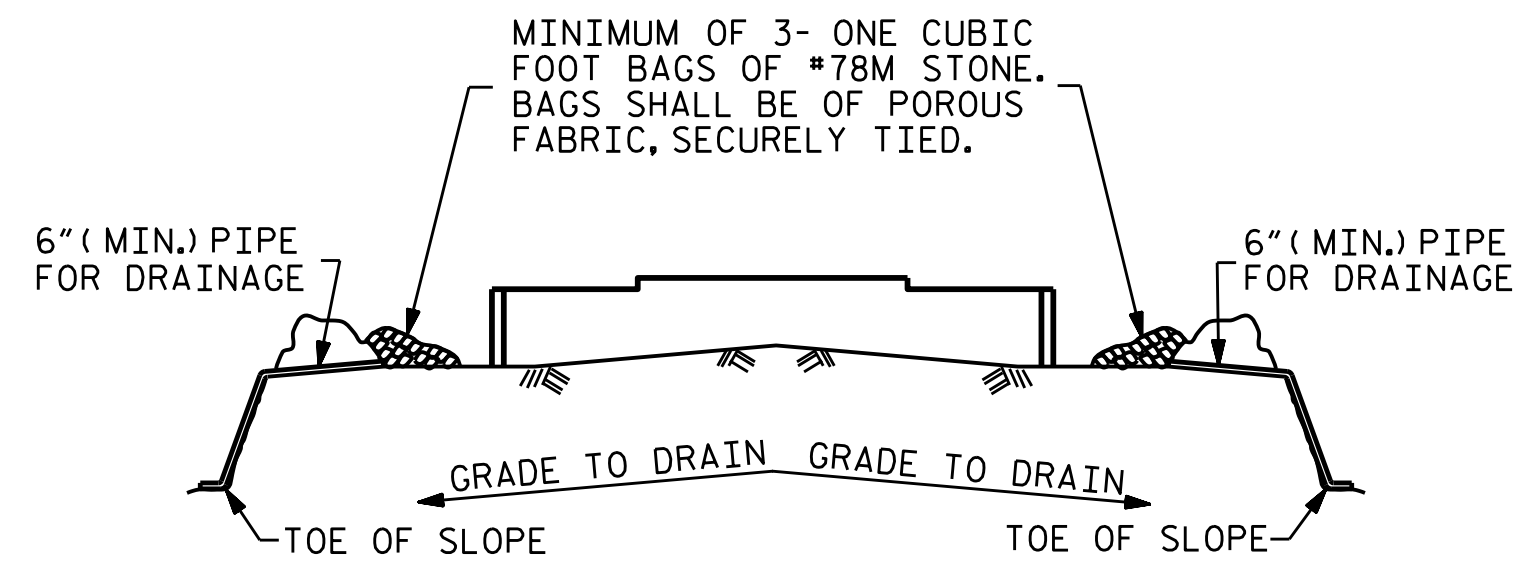
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 INTEGRAL
 END BENT 2

DRAWN BY: J.D. HAWK DATE: 6-11-15
 CHECKED BY: K.D. LAYNE DATE: 7-2-15
 DESIGN ENGINEER OF RECORD: T.H. CARROLL DATE: 8-18-15

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-30 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 38 |

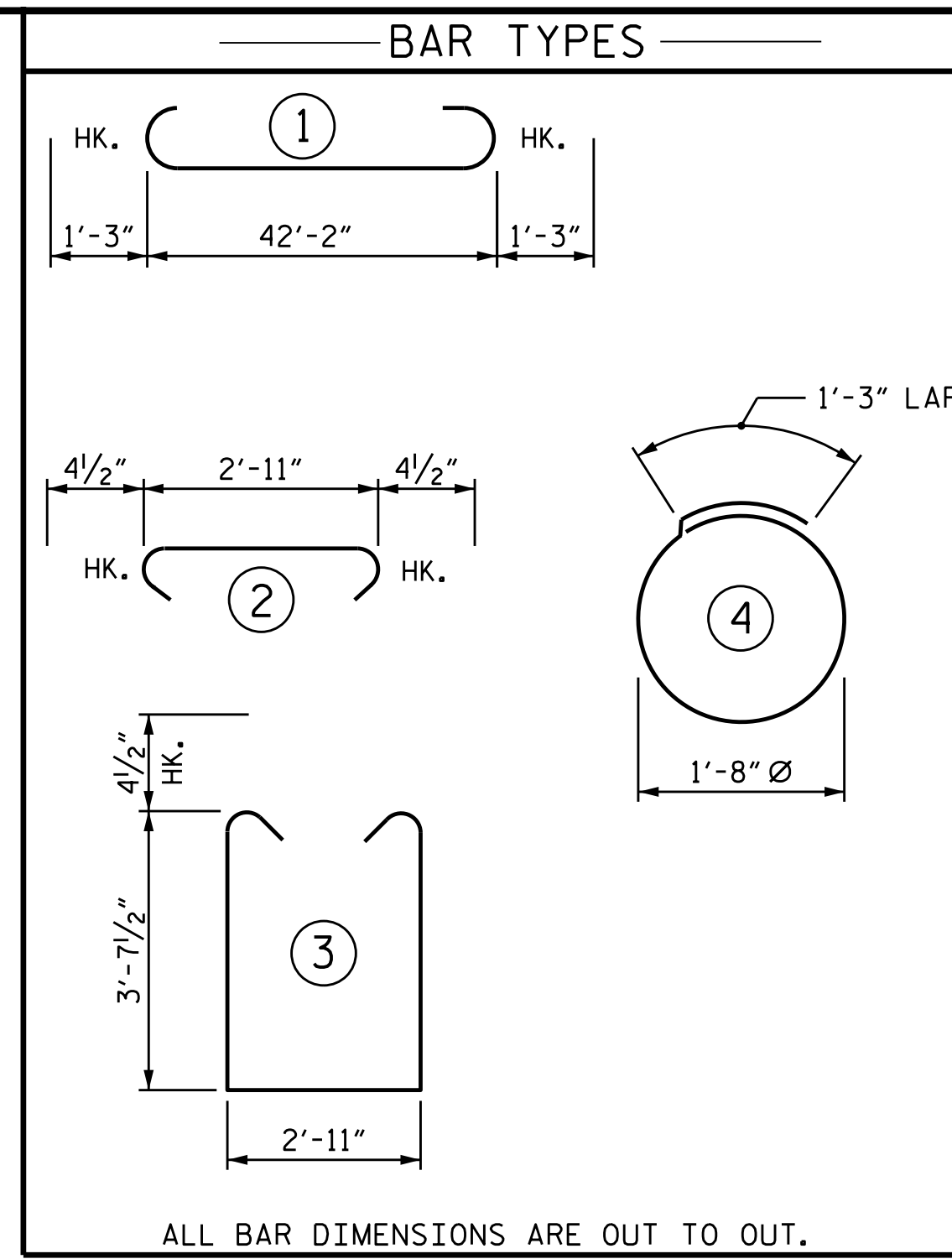


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

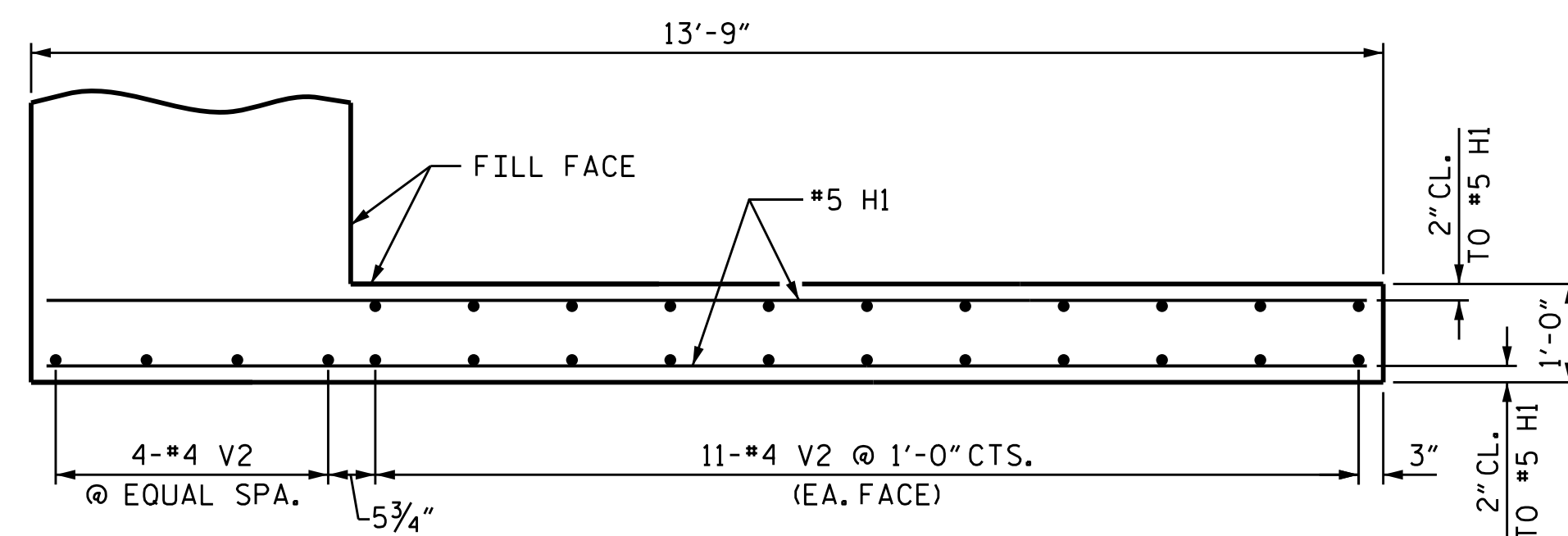


ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

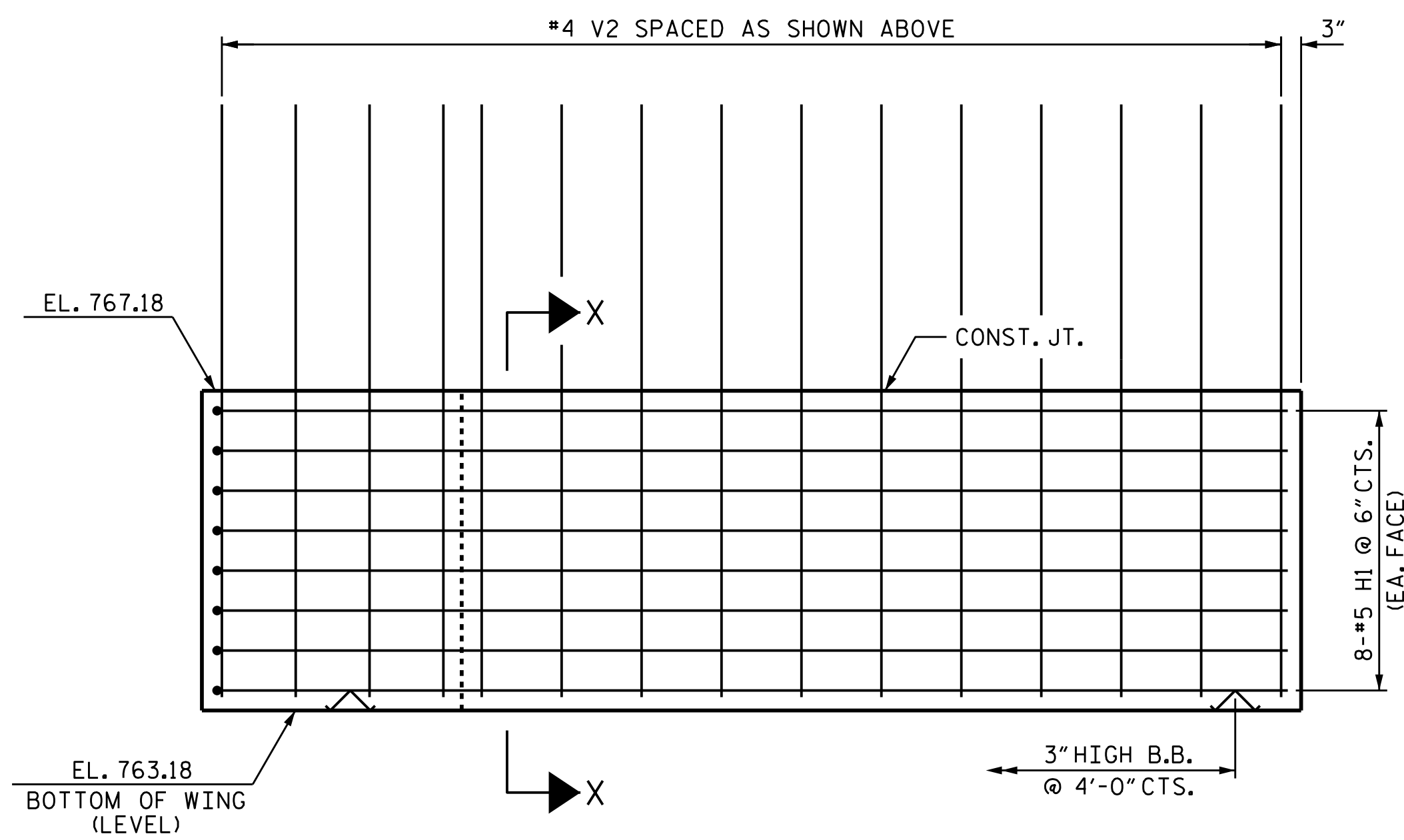
END BENT 2

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---------------------------------|-----|------|------|----------|--------|
| B1 | 8 | #9 | 1 | 44'-8" | 1215 |
| B2 | 20 | #4 | STR | 22'-5" | 299 |
| B3 | 11 | #4 | STR | 2'-11" | 21 |
| H1 | 32 | #5 | STR | 13'-5" | 448 |
| S1 | 47 | #4 | 3 | 10'-11" | 343 |
| S2 | 47 | #4 | 2 | 3'-8" | 115 |
| S3 | 24 | #4 | 4 | 6'-6" | 104 |
| V1 | 76 | #4 | STR | 6'-0" | 305 |
| V2 | 52 | #4 | STR | 8'-5" | 292 |
| REINFORCING STEEL | | | | LBS. | 3,142 |
| CLASS A CONCRETE | | | | C.Y. | 25.0 |
| HP 12 X 53 STEEL PILES NO. 6 | | | | LIN. FT. | 330 |



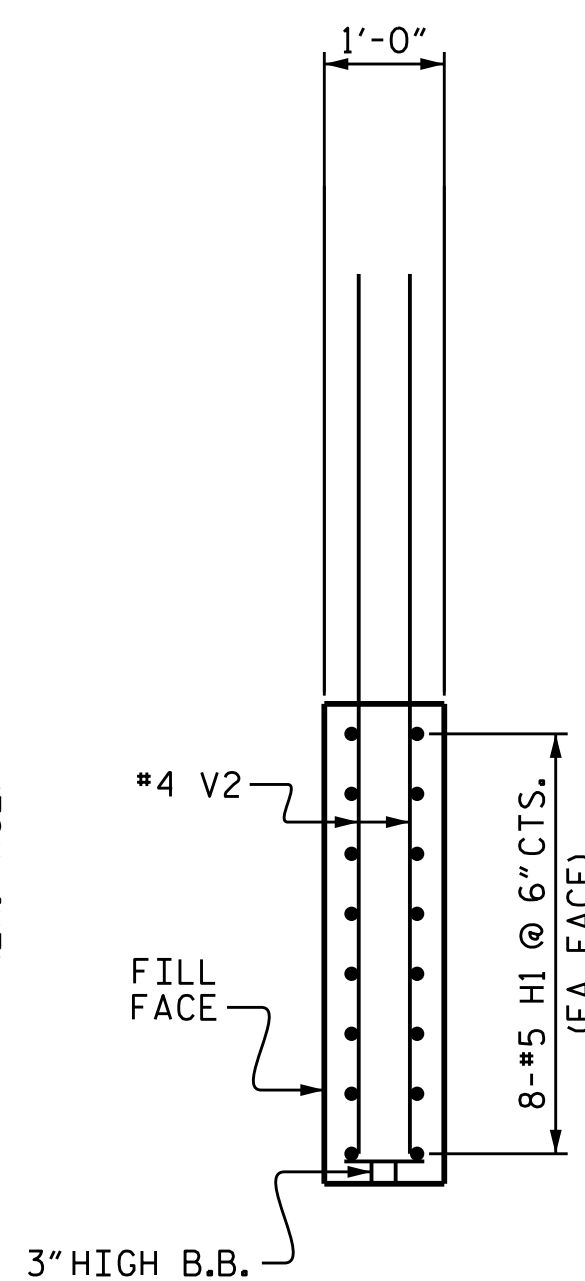
PLAN OF WING

(RIGHT WING SHOWN, LEFT WING SIMILAR)

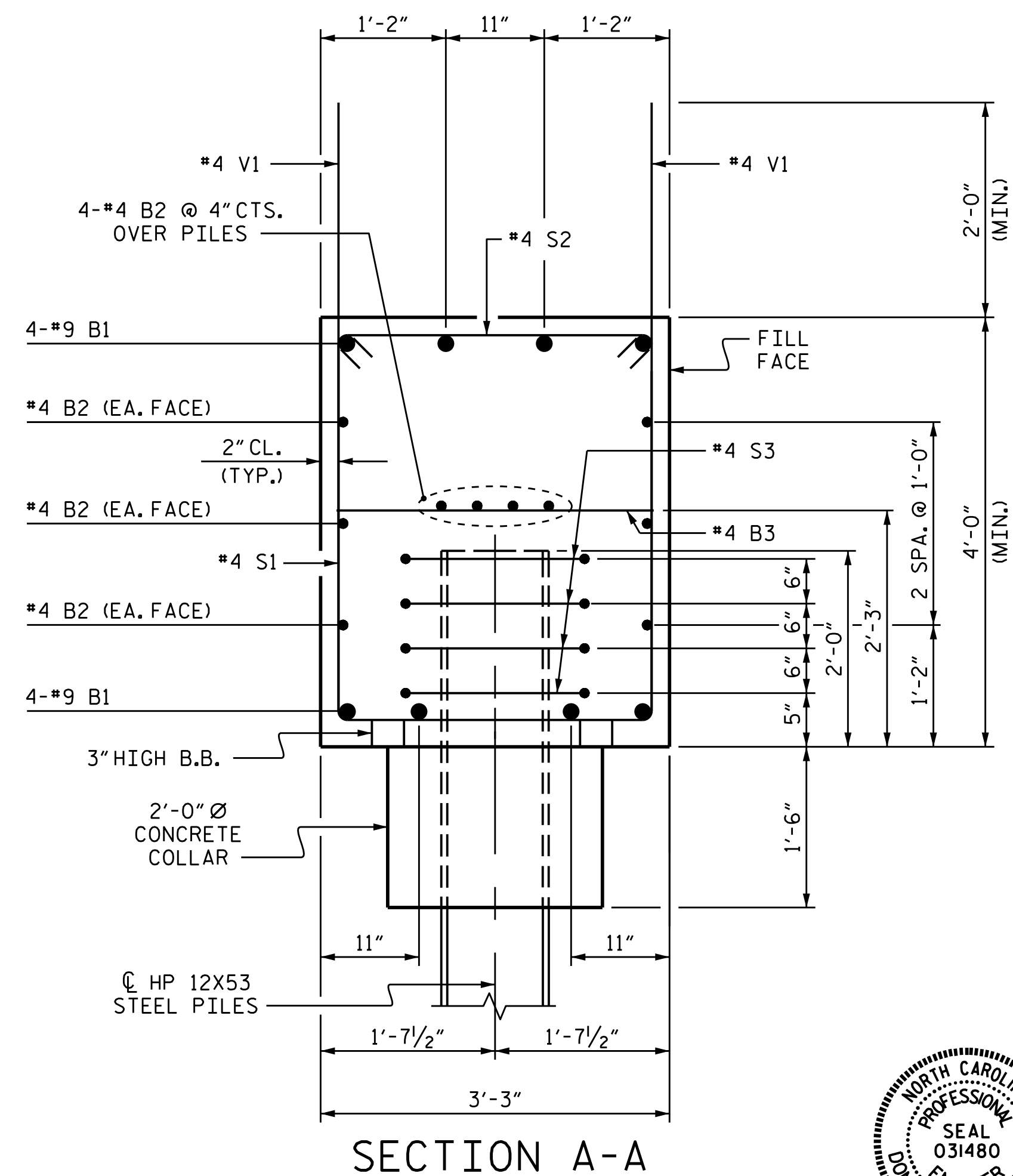


ELEVATION OF WING

(RIGHT WING SHOWN, LEFT WING SIMILAR)



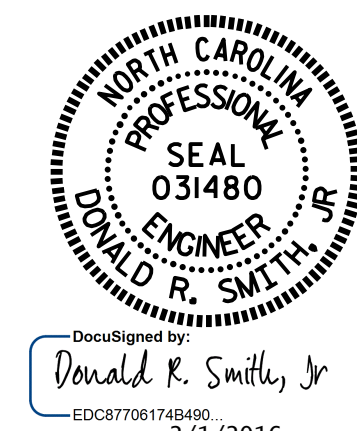
SECTION X-X



SECTION A-A

PROJECT NO. B-5142
IREDELL COUNTY
 STATION: 22+06.00 -L-

SHEET 2 OF 2



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 INTEGRAL
 END BENT 2

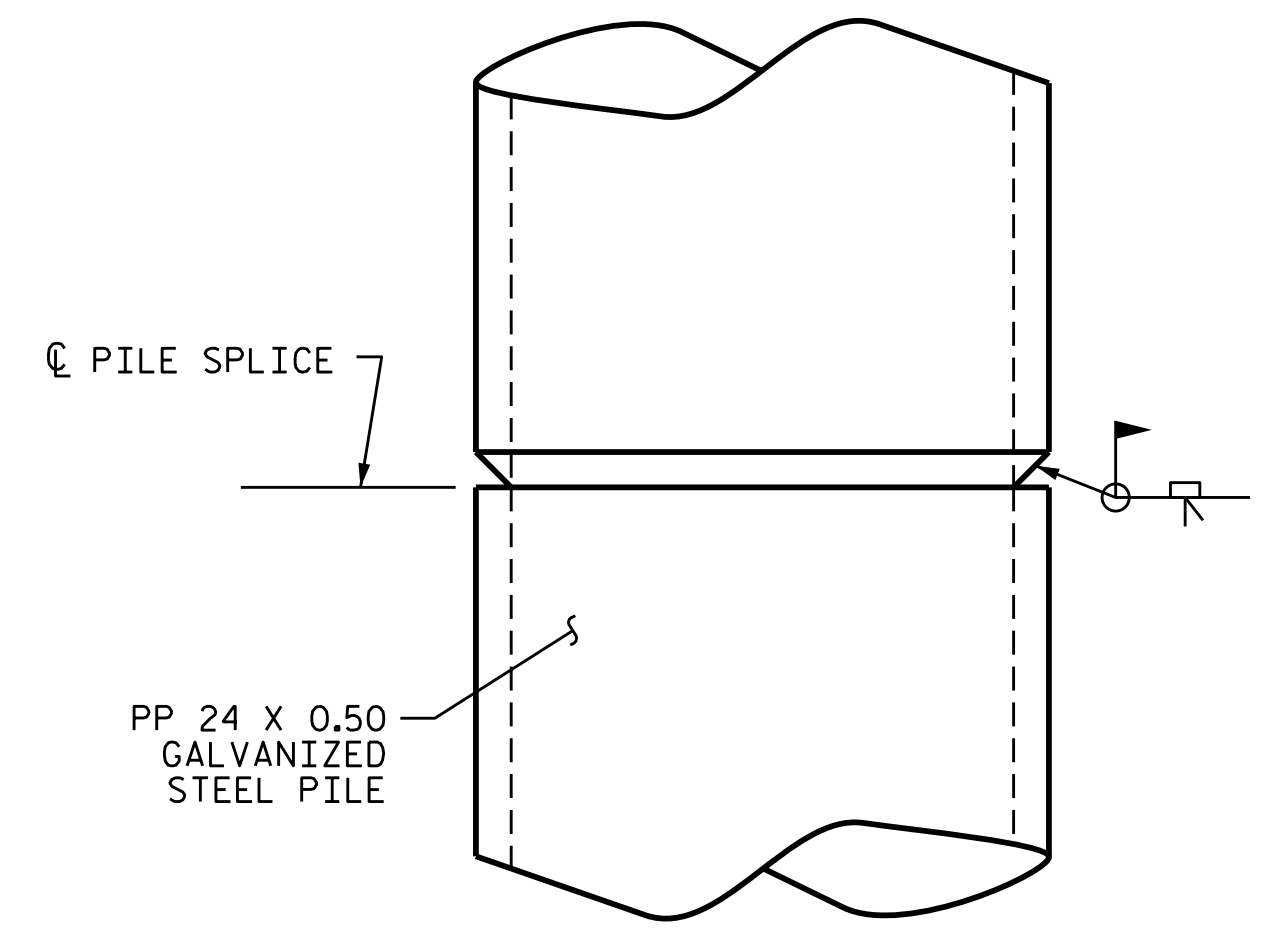
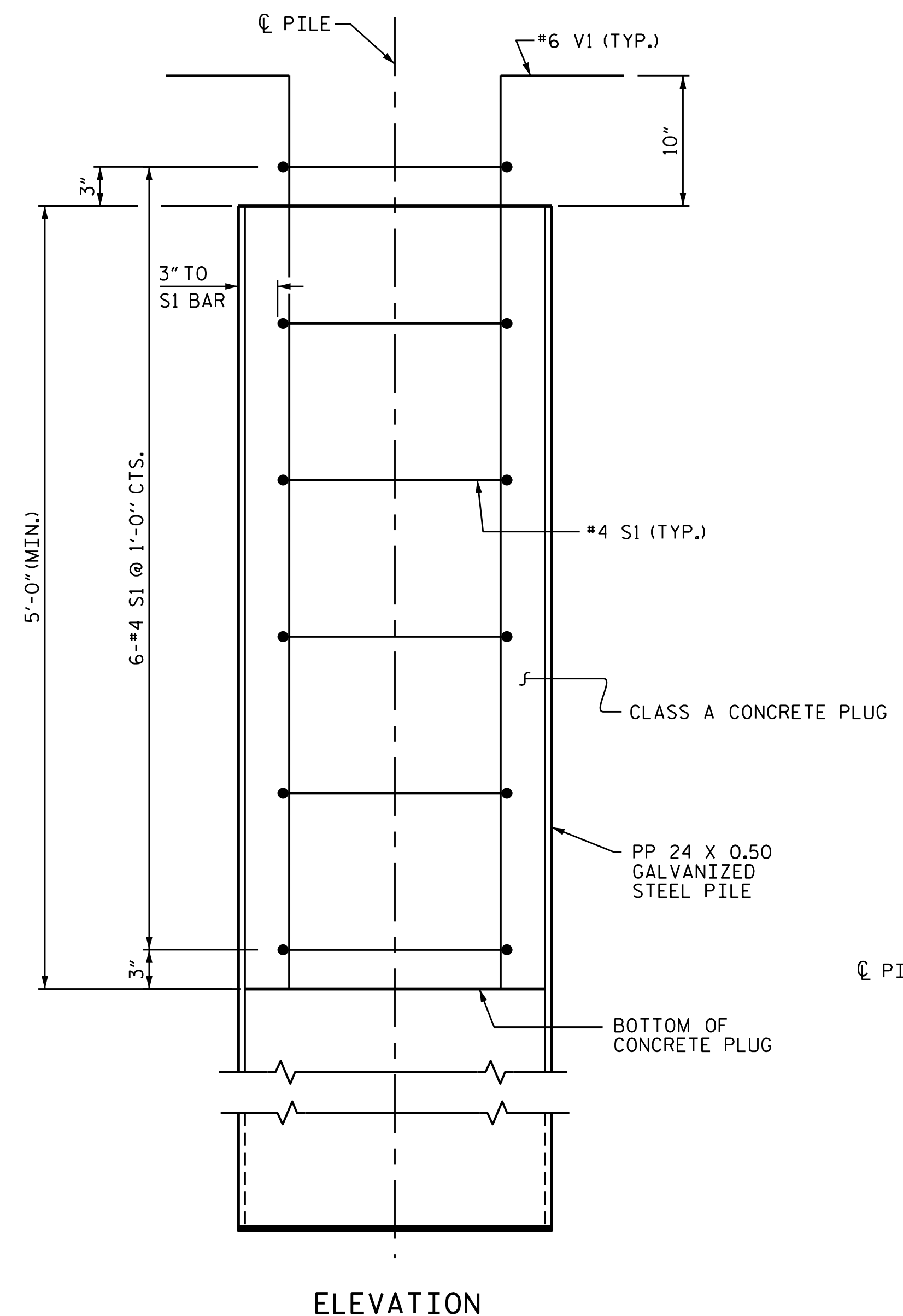
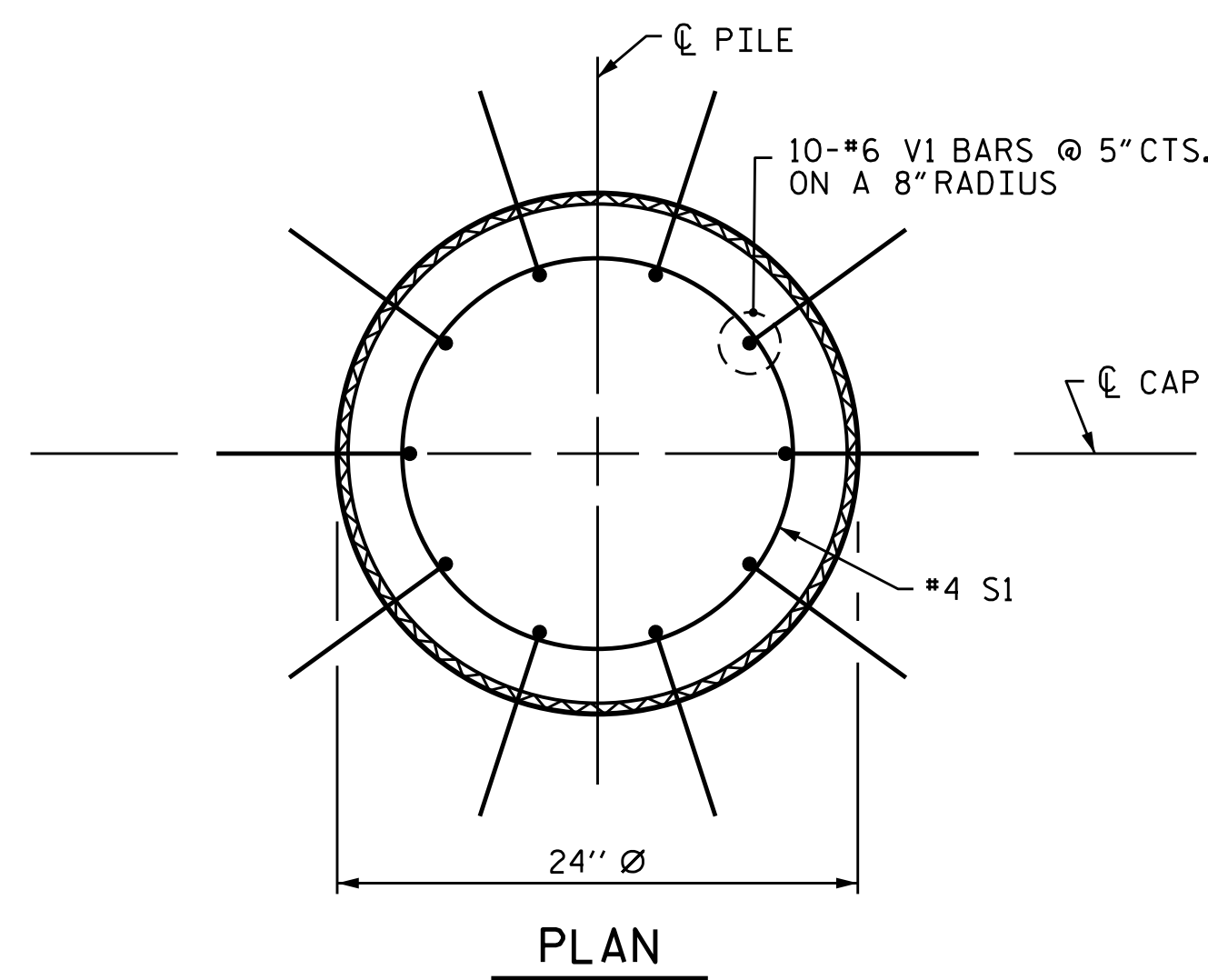
REVISIONS

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

SHEET NO.
S-31
TOTAL SHEETS
38

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY: J.D. HAWK DATE: 6-11-15
 CHECKED BY: K.D. LAYNE DATE: 7-2-15
 DESIGN ENGINEER OF RECORD: T.H. CARROLL DATE: 8-18-15



PP 24 X 0.50 GALVANIZED STEEL PILE
(OPEN END)

NOTES

PIPE PILES SHALL BE IN ACCORDANCE WITH SECTION 1084 OF THE STANDARD SPECIFICATIONS.

GALVANIZE STEEL PIPE PILES IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS UNLESS METALLIZING IS REQUIRED. GALVANIZING OR METALLIZING PIPE PILE PLATES IS NOT REQUIRED.

REMOVE AND REPLACE OR REPAIR TO THE SATISFACTION OF THE ENGINEER PILES THAT ARE DAMAGED, DEFORMED OR COLLAPSED DURING INSTALLATION OR DRIVING.

PILE SPLICES SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS AND AWS D1.1.

FOR OPEN END PIPE PILES, REMOVE ENOUGH SOIL AND WATER FROM INSIDE THE PILES TO CONSTRUCT THE CONCRETE PLUG WITHOUT FOULING THE CONCRETE.

FORM THE CONCRETE PLUG SUCH THAT THE REINFORCING STEEL OR CONCRETE DOES NOT MOVE AND THE CLEARANCE FROM THE REINFORCING STEEL TO THE INSIDE OF THE PILE IS MAINTAINED AFTER CONCRETE PLACEMENT. DO NOT PLACE CONCRETE IN THE BENT CAP UNTIL THE CONCRETE PLUG HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI.

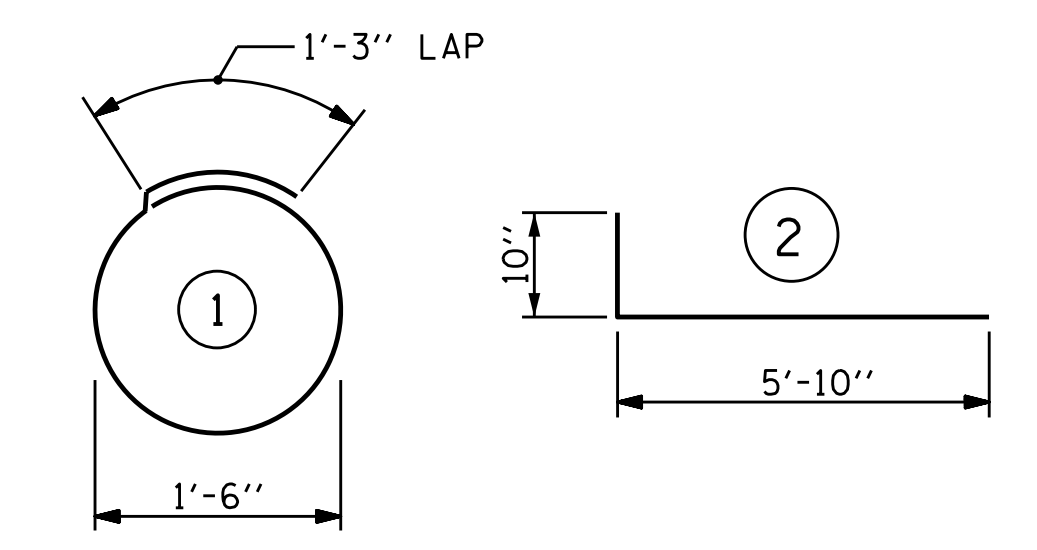
THE REINFORCING STEEL, CLASS A CONCRETE, AND GALVANIZING ARE CONSIDERED INCIDENTAL TO THE CONTRACT UNIT PRICE BID PER LINEAR FOOT FOR PP 24 X 0.50 GALVANIZED STEEL PILES.

BILL OF MATERIAL FOR ONE PP 24 X 0.50 GALVANIZED STEEL PILE

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|-------------------|-----|------|------|--------|--------|
| S1 | 6 | #4 | 1 | 6'-0" | 24 |
| V1 | 10 | #6 | 2 | 6'-8" | 100 |
| REINFORCING STEEL | | | | LBS. | 124 |

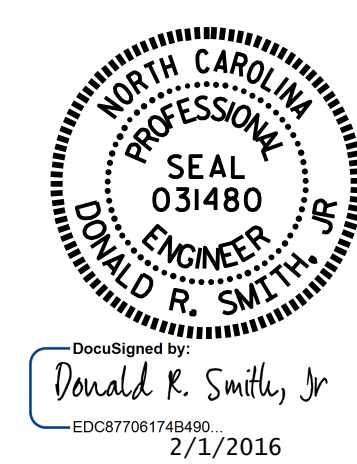
CLASS A CONCRETE
5'-0" MINIMUM PLUG C.Y. 0.5

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT NO. B-5142
IREDELL COUNTY
STATION: 22+06.00 -L-



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
24" STEEL PIPE PILE

| | |
|--------------------------|----------------------|
| ASSEMBLED BY : J.D. HAWK | DATE : 6-11-15 |
| CHECKED BY : K.D. LAYNE | DATE : 7-2-15 |
| DRAWN BY : TLA 8/05 | ADDED 10/1/05 |
| CHECKED BY : GM 9/05 | REV. 5/1/06R MAA/KMM |
| | REV. 10/1/11 MAA/GM |

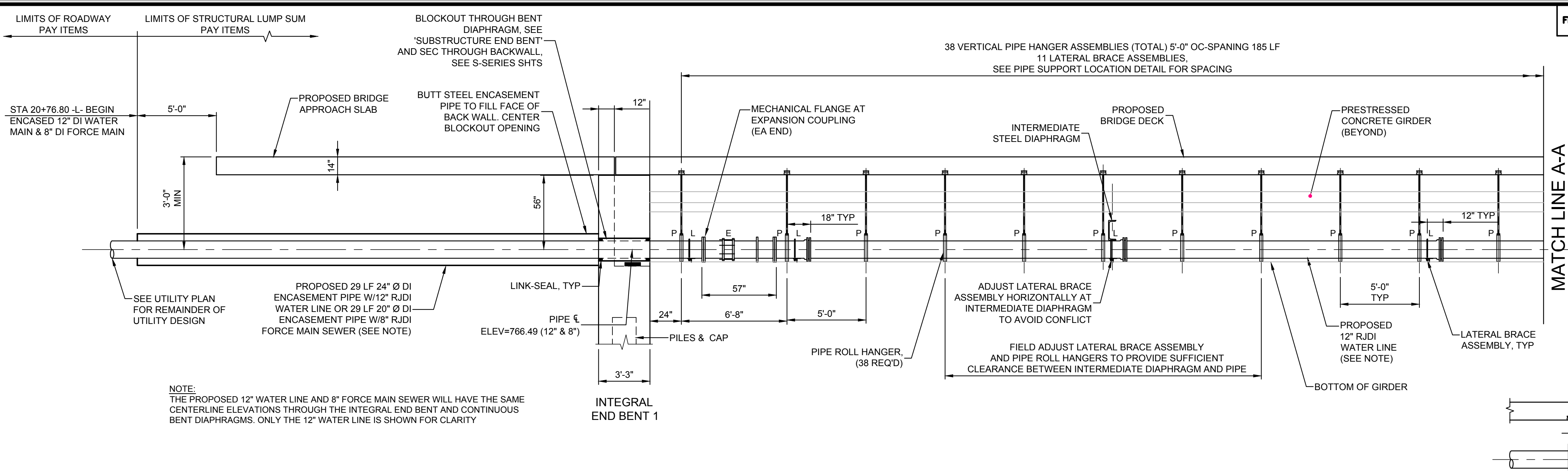
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

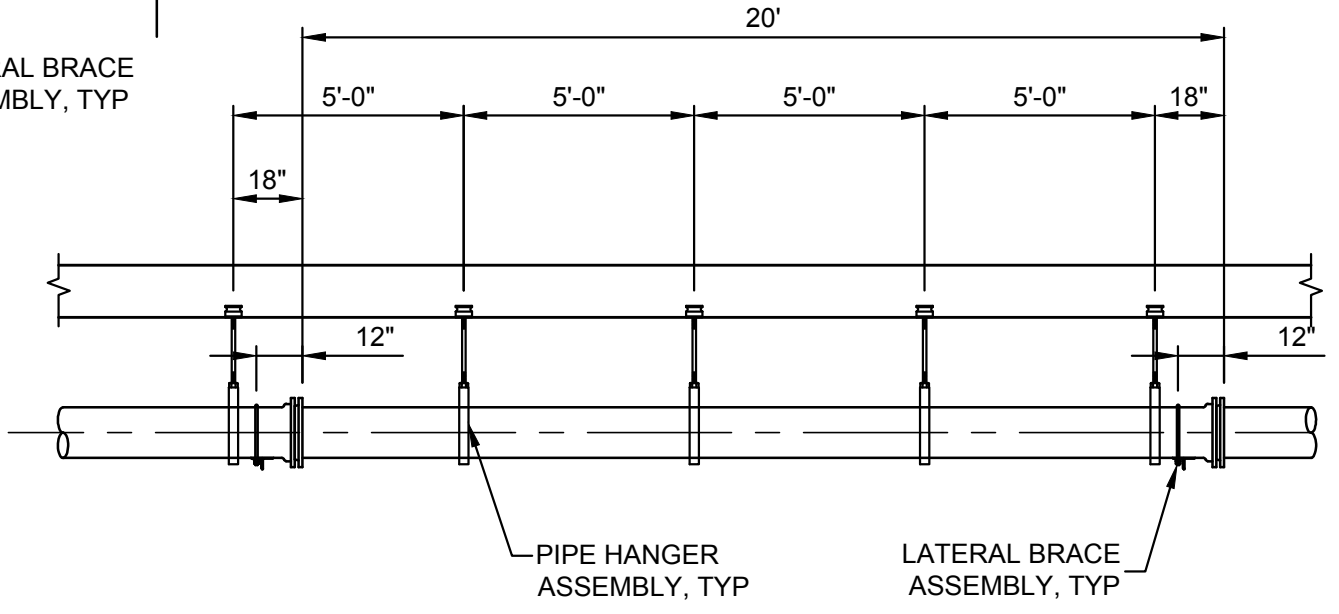
5/14/2019

| | | |
|---|-----------------------|---|
| DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED | PROJECT REFERENCE NO. | SHEET NO. |
| | B-5142 | S-33 |
| | DESIGNED BY: MOS | TOTAL SHEETS 38 |
| | DRAWN BY: MOS | |
| | CHECKED BY: RW#1 | |
| APPROVED BY: | | |
| REVISED: | | |
| NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151 | | SEAL 031444 P. YAN, W. H. HIGGER ENGINEER 2/3/2019 UTILITY CONSTRUCTION PLANS ONLY |

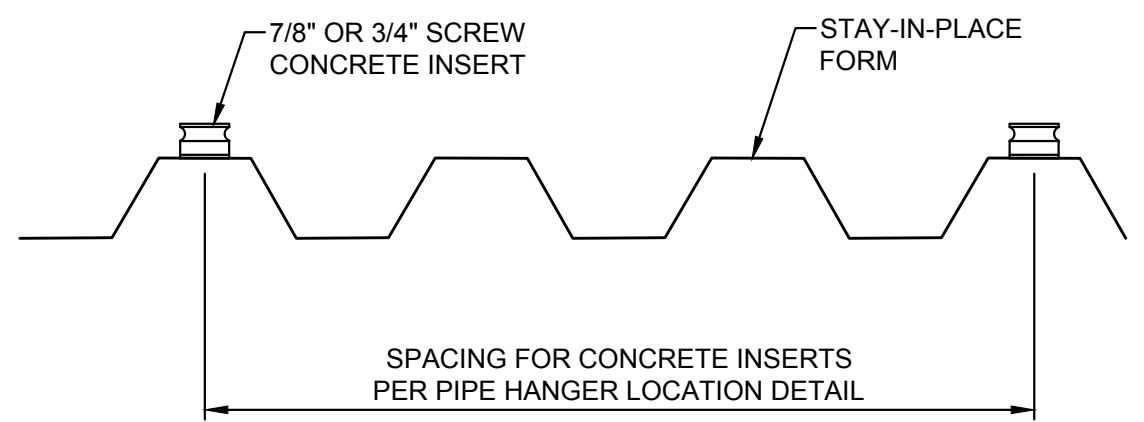
STRUCTURAL UTILITY CONSTRUCTION



NOTE:
THE PROPOSED 12" WATER LINE AND 8" FORCE MAIN SEWER WILL HAVE THE SAME CENTERLINE ELEVATIONS THROUGH THE INTEGRAL END BENT AND CONTINUOUS BENT DIAPHRAGMS. ONLY THE 12" WATER LINE IS SHOWN FOR CLARITY

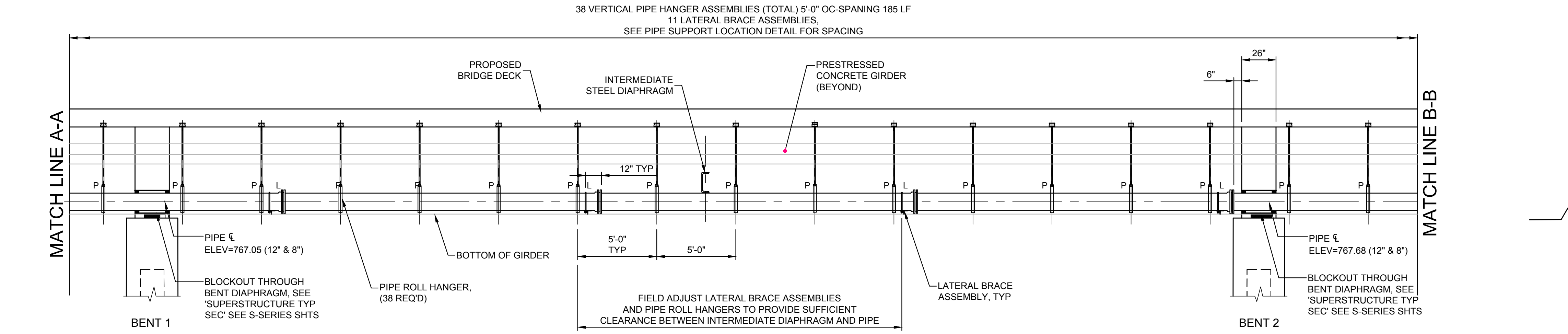


PIPE SUPPORT LOCATION DETAIL
NOT TO SCALE

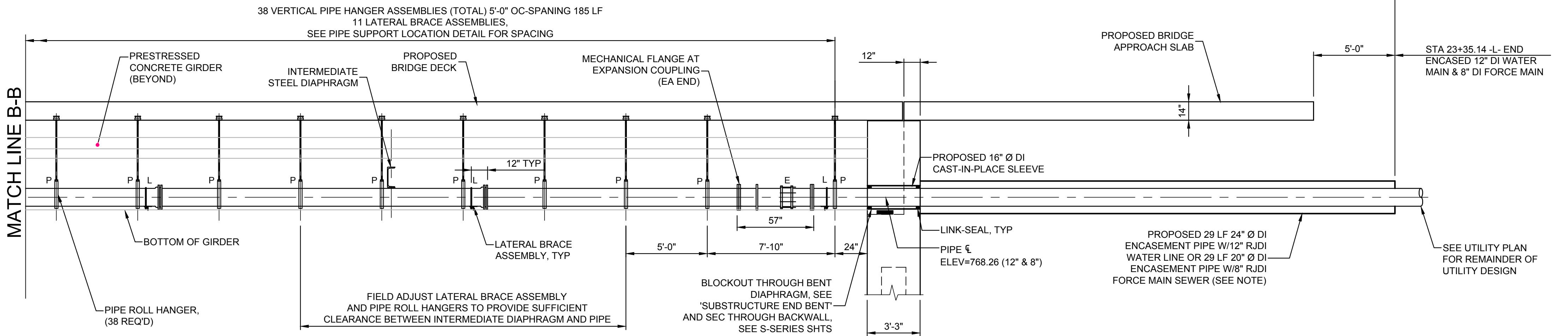


- NOTES:**
- INSERTS MUST BE LOCATED IN THE HIGH PART OF THE STAY-IN-PLACE FORMS.
 - EXACT SPACING MAY VARY IN ORDER TO AVOID LOCATING INSERTS ON SLOPING OR LOW SURFACE OF FORM.

BRIDGE DECK INSERT LOCATION DETAIL
NOT TO SCALE



NOTE:
THE PROPOSED 12" WATER LINE AND 8" FORCE MAIN SEWER WILL HAVE THE SAME CENTERLINE ELEVATIONS THROUGH THE INTEGRAL END BENT AND CONTINUOUS BENT DIAPHRAGMS. ONLY THE 12" WATER LINE IS SHOWN FOR CLARITY



NOTE:
THE PROPOSED 12" WATER LINE AND 8" FORCE MAIN SEWER WILL HAVE THE SAME CENTERLINE ELEVATIONS THROUGH THE INTEGRAL END BENT AND CONTINUOUS BENT DIAPHRAGMS. ONLY THE 12" WATER LINE IS SHOWN FOR CLARITY

- LEGEND**
- P=PIPE HANGER ASSEMBLY
 - L=LATERAL BRACE ASSEMBLY
 - E=EXPANSION COUPLING ASSEMBLY

STRUCTURE PAY ITEMS

- 12" WATER LINE PIPE AND SUSPENSION SYSTEM
- 8" FORCE MAIN SEWER PIPE AND SUSPENSION SYSTEM

SEE S-33 SPECIAL PROVISIONS FOR UTILITY PIPING AND SUSPENSION SYSTEM

UTILITY ATTACHMENT (WATER & SEWER)

NOT TO SCALE

ESTIMATED BILL OF MATERIALS FOR 12" WATER MAIN

| NO. | UNITS | ITEM |
|-----|--------|-----------------------------|
| 1 | 38 EA | PIPE HANGER ASSEMBLY |
| 2 | 11 EA | LATERAL BRACE ASSEMBLY |
| 3 | 2 EA | EXPANSION COUPLING ASSEMBLY |
| 4 | 4 EA | LINK SEAL OR EQUAL |
| 5 | 58 LF | 24" DIA STEEL ENCASUREMENT |
| 6 | 258 LF | 12" RJDI WATER PIPE |

ESTIMATED BILL OF MATERIALS FOR 8" FORCE MAIN

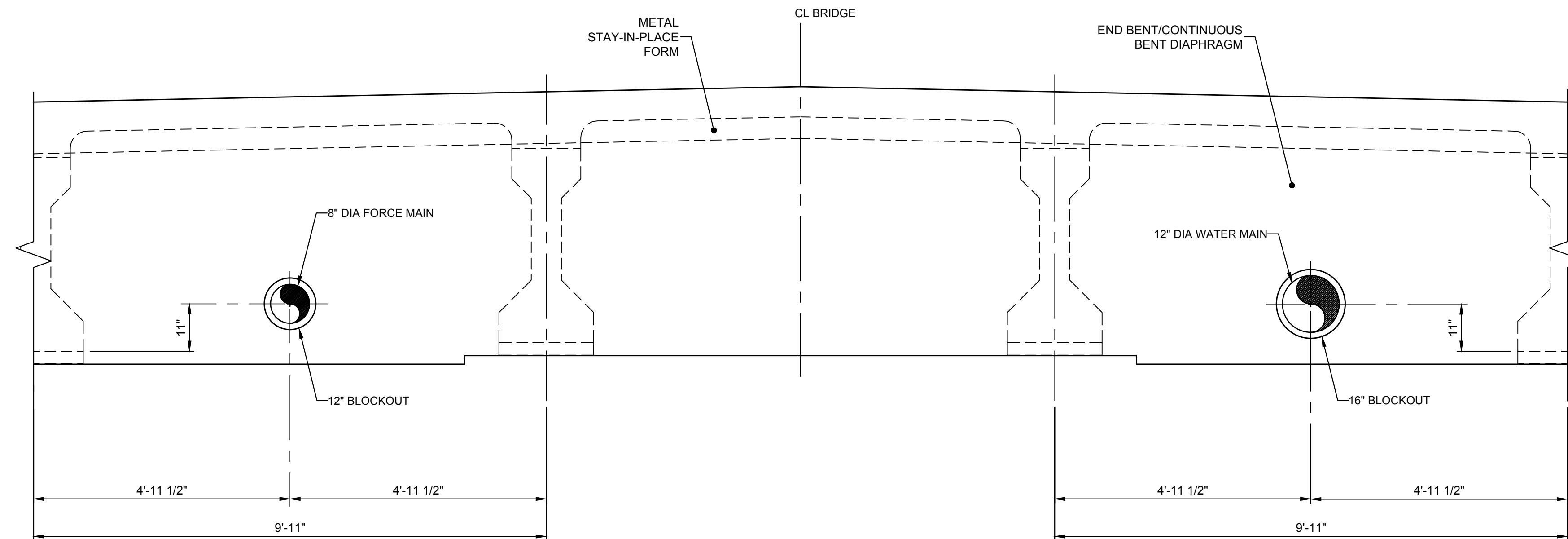
| NO. | UNITS | ITEM |
|-----|--------|-------------------------------|
| 1 | 38 EA | PIPE HANGER ASSEMBLY |
| 2 | 11 EA | LATERAL BRACE ASSEMBLY |
| 3 | 2 EA | EXPANSION COUPLING ASSEMBLY |
| 4 | 4 EA | LINK SEAL OR EQUAL |
| 5 | 58 LF | 20" DIA STEEL ENCASUREMENT |
| 6 | 258 LF | 8" RJDI FORCE MAIN SEWER PIPE |



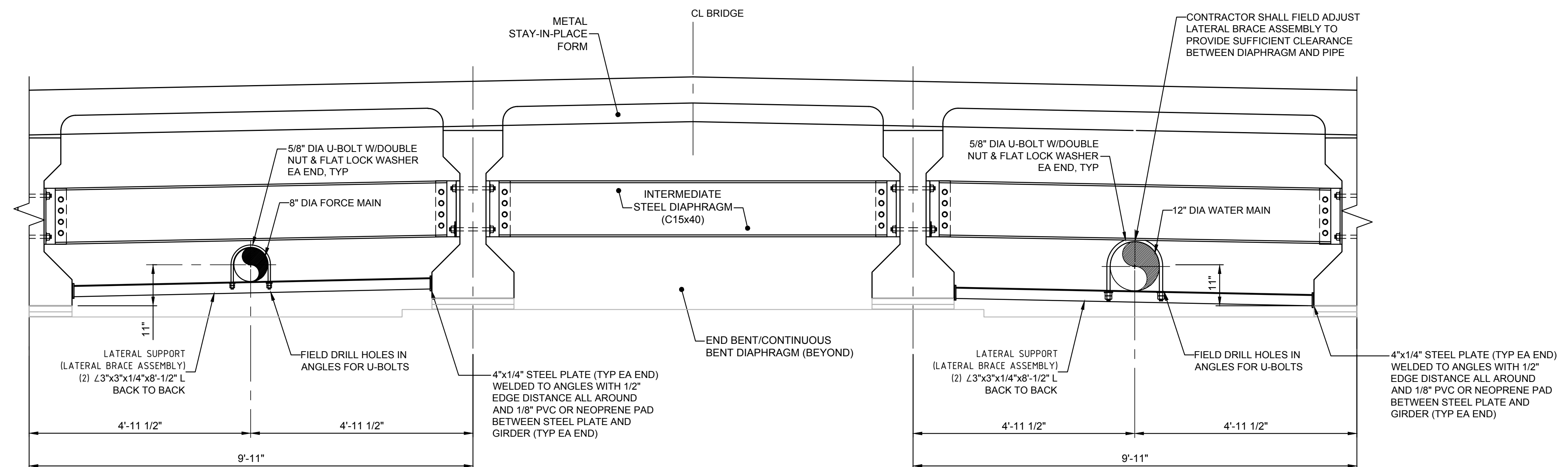
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FINAL UNLESS ALL SIGNATURES
COMPLETED

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| DESIGNED BY: MOS | TOTAL SHEETS 38 |
| DRAWN BY: MOS | |
| CHECKED BY: RW#1 | |
| APPROVED BY: | |
| REVISED: | |
| NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151 | |
| 2/3/2016 RYAN W. HAGER ENGINEER UTILITY CONSTRUCTION PLANS ONLY | |

STRUCTURAL UTILITY CONSTRUCTION



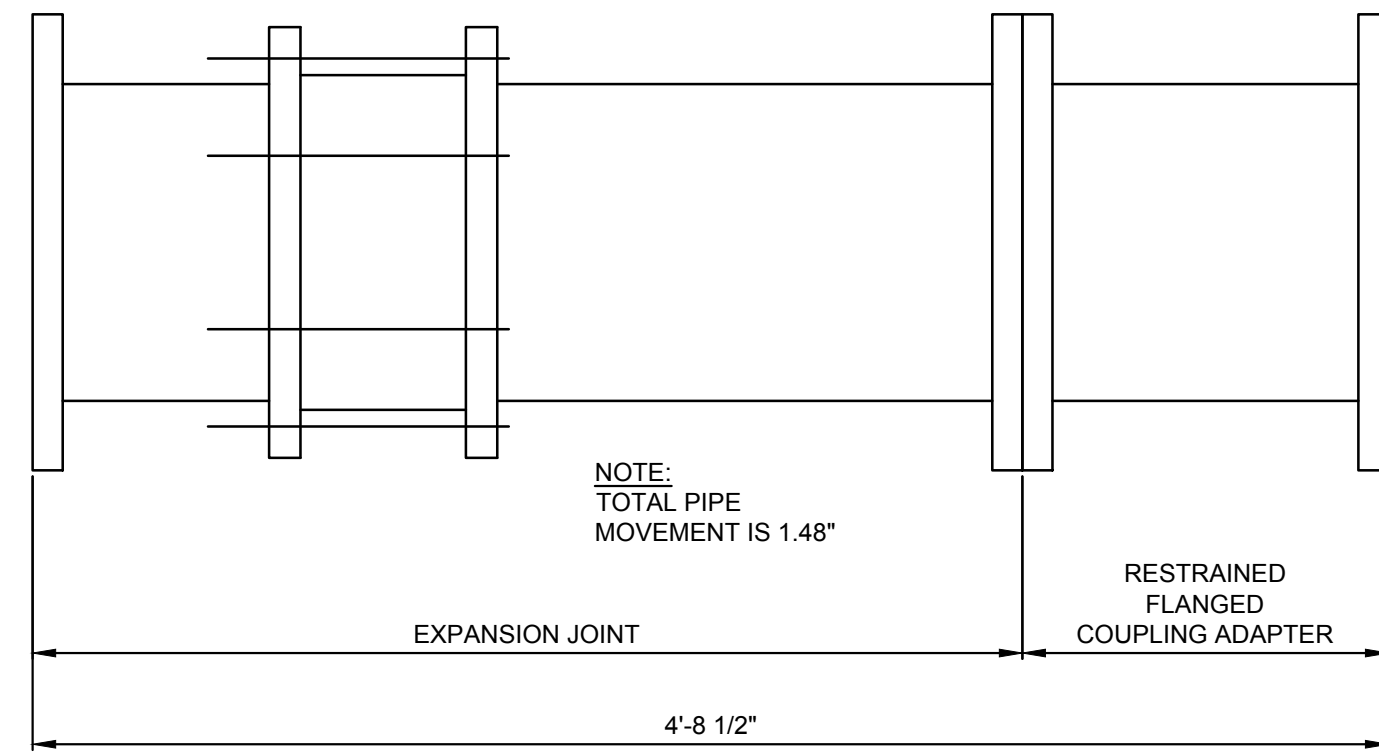
TYPICAL SECTION AT INTERGRAL
END BENT & CONTINUOUS BENT
DIAPHRAGM BLOCKOUT LOCATIONS
NOT TO SCALE



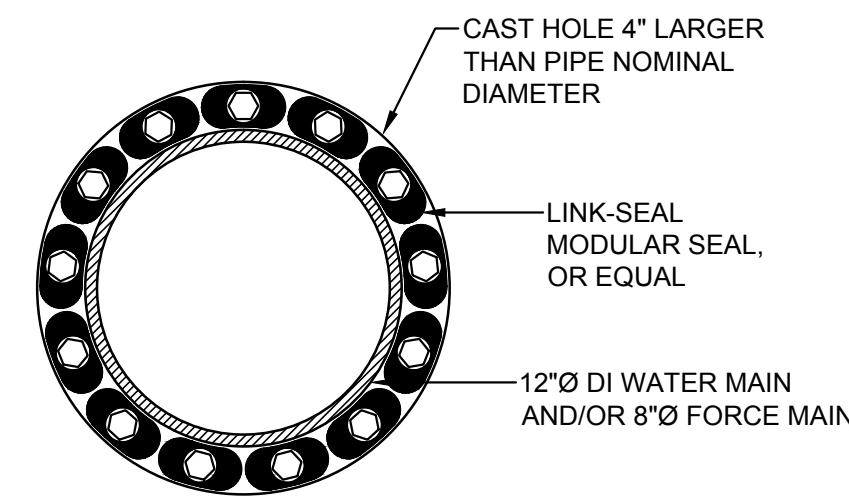
TYPICAL SECTION AT INTERMEDIATE
DIAPHRAGM AND LATERAL SUPPORT
NOT TO SCALE

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL SIGNATURES
COMPLETED

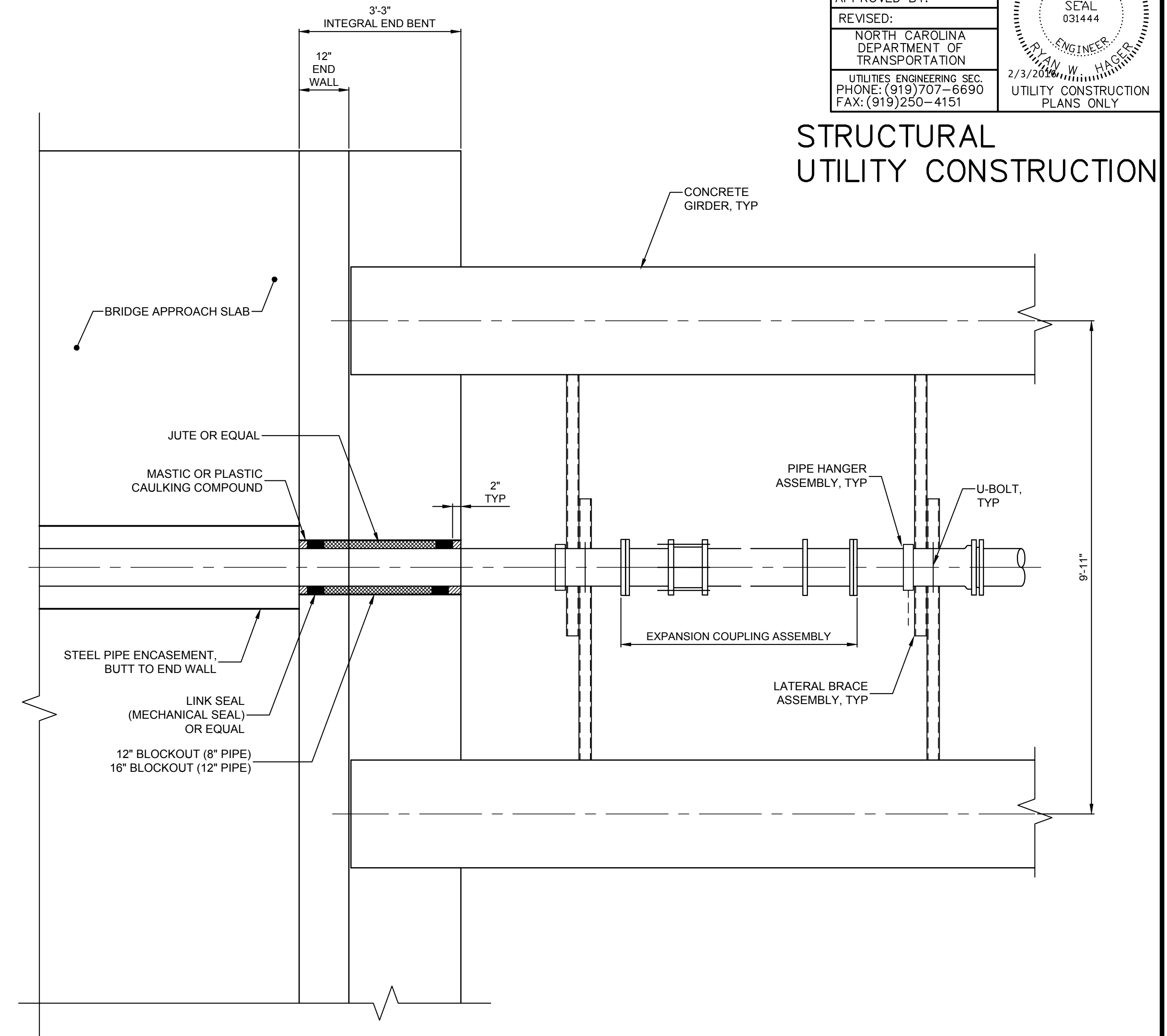
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| DESIGNED BY: MOS | TOTAL SHEETS 38 |
| DRAWN BY: MOS | |
| CHECKED BY: RW#1 | |
| APPROVED BY: | |
| REVISED: | 2/3/2014 |
| NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151 | |
| UTILITY CONSTRUCTION PLANS ONLY | |



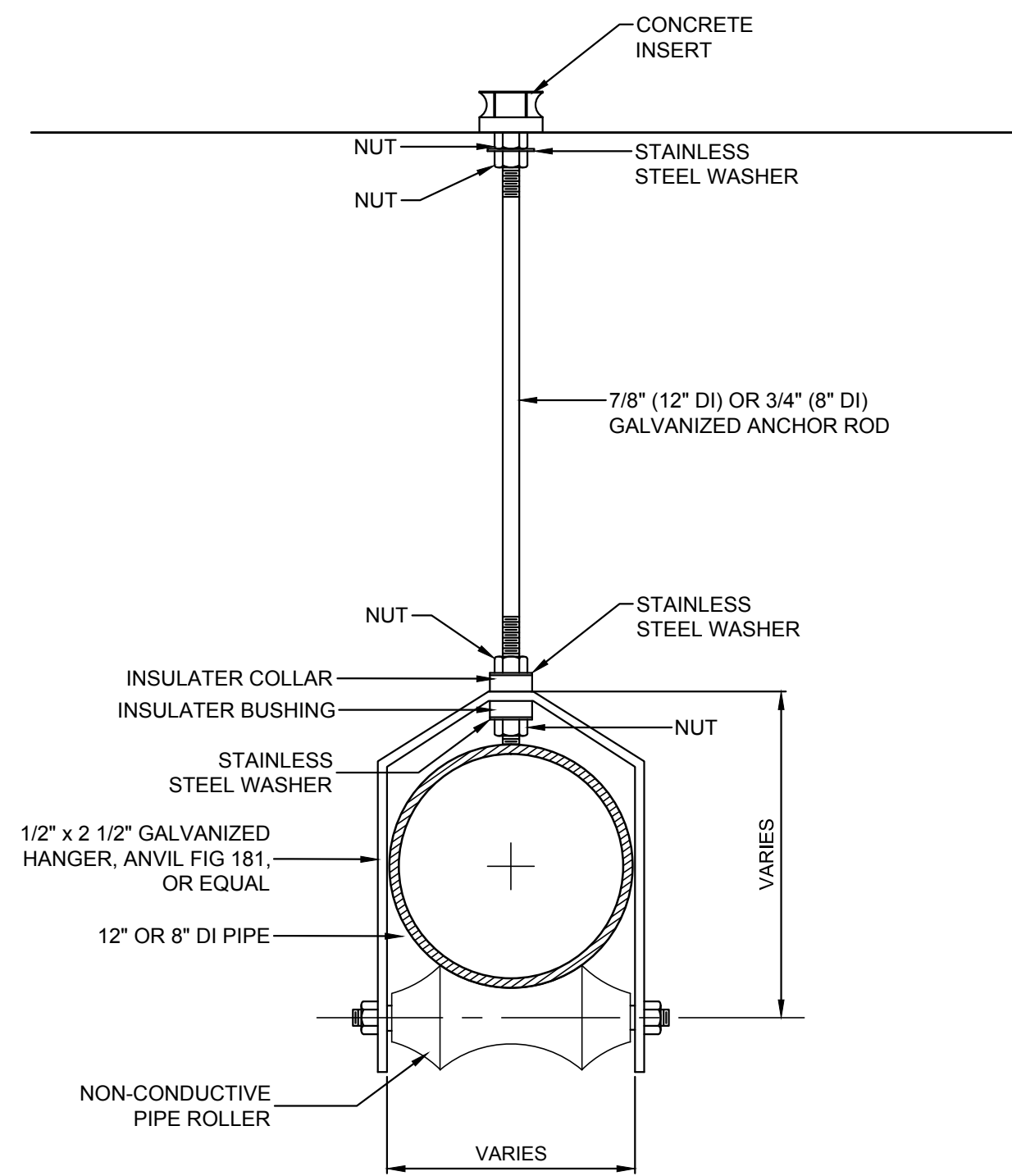
EXPANSION COUPLING ASSEMBLY
NOT TO SCALE



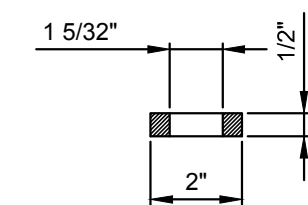
PIPE PENETRATION SEAL
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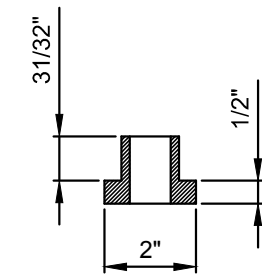
PLAN AT INTERGRAL END BENT
NOT TO SCALE



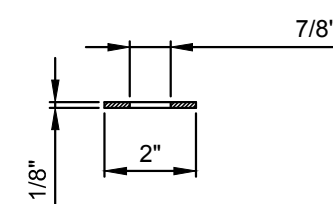
PIPE HANGER ASSEMBLY
NOT TO SCALE



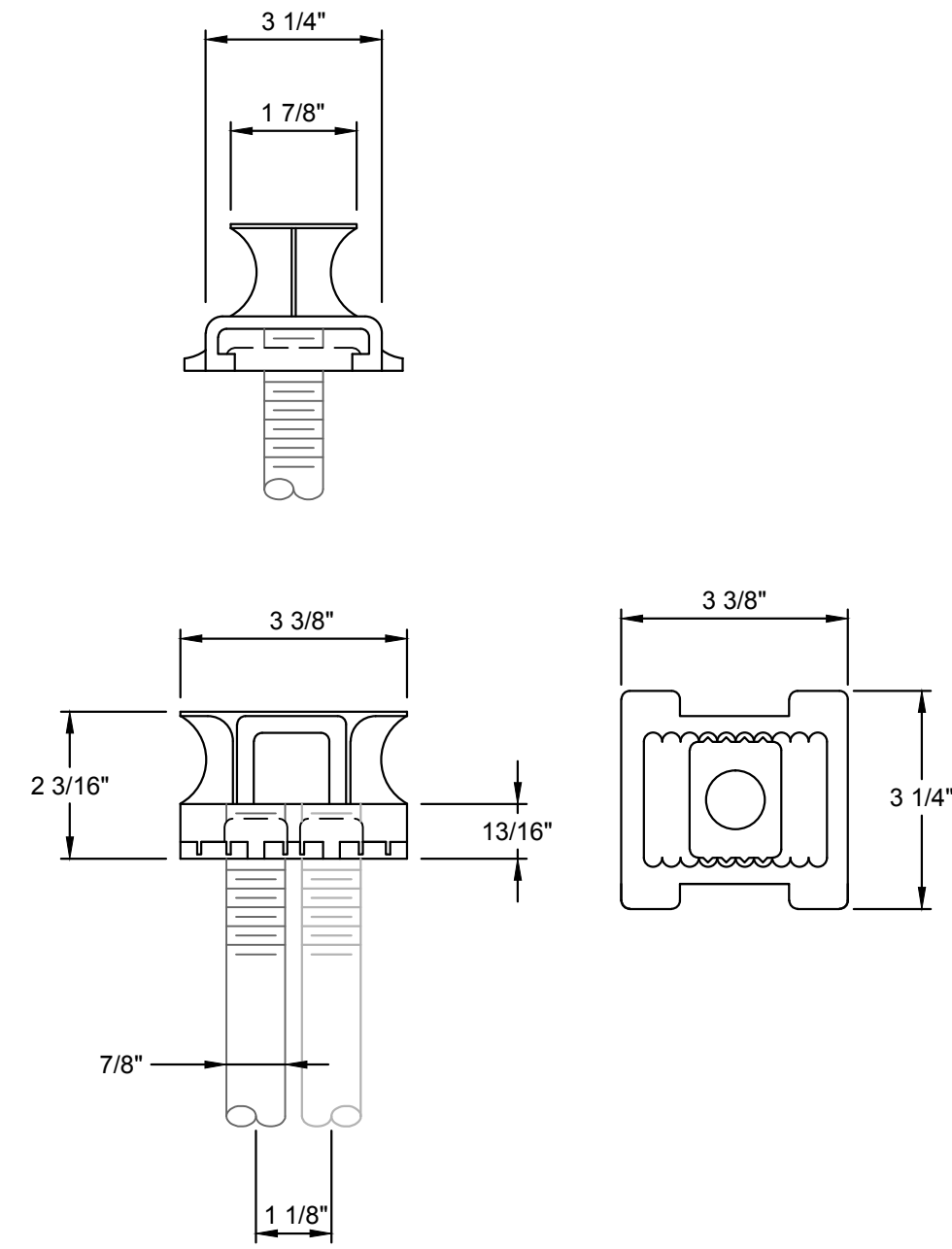
INSULATED COLLAR
NOT TO SCALE



INSULATED BUSHING
NOT TO SCALE



STAINLESS STEEL WASHER
NOT TO SCALE

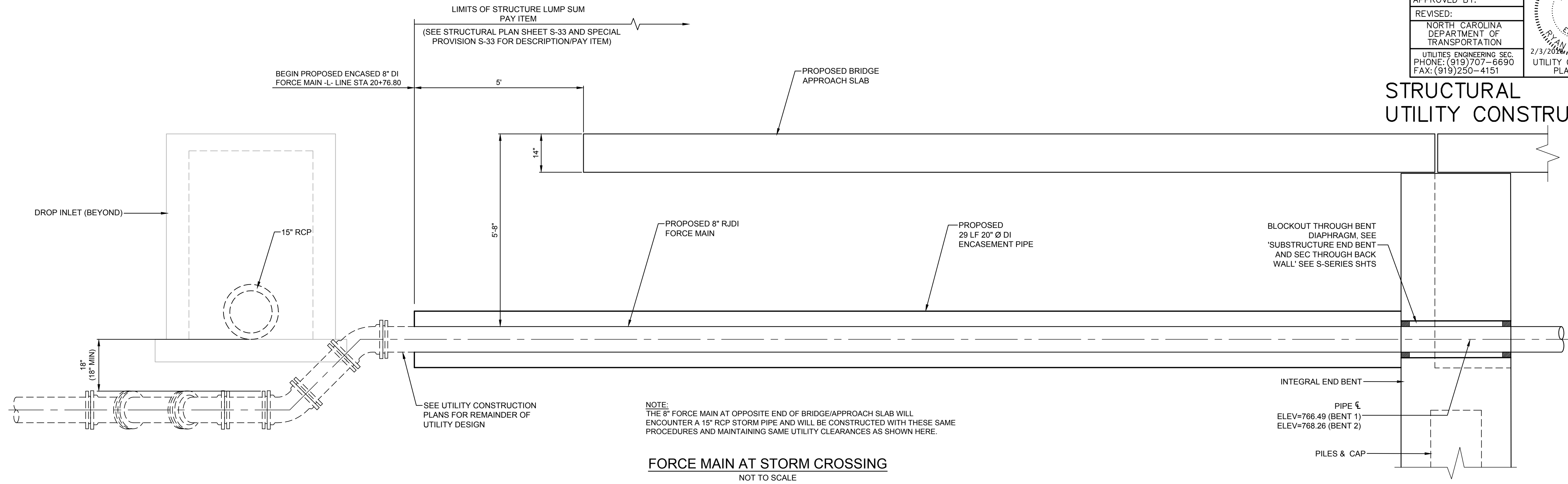


CONCRETE INSERT
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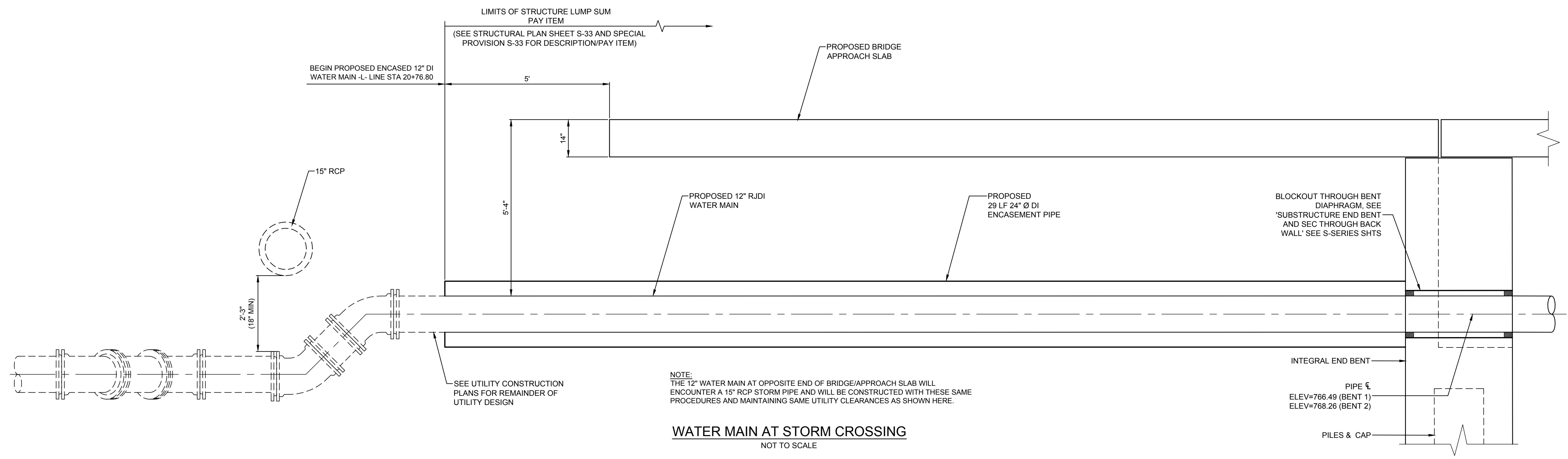
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FINAL UNLESS ALL SIGNATURES
COMPLETED

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| PROJECT REFERENCE NO. B-5142 | SHEET NO. S-36 |
| DESIGNED BY: MOS | TOTAL SHEETS 38 |
| DRAWN BY: MOS | |
| CHECKED BY: RW#1 | |
| APPROVED BY: | |
| REVISED: | 2/3/2014 |
| NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151 | |
| UTILITY CONSTRUCTION PLANS ONLY | |

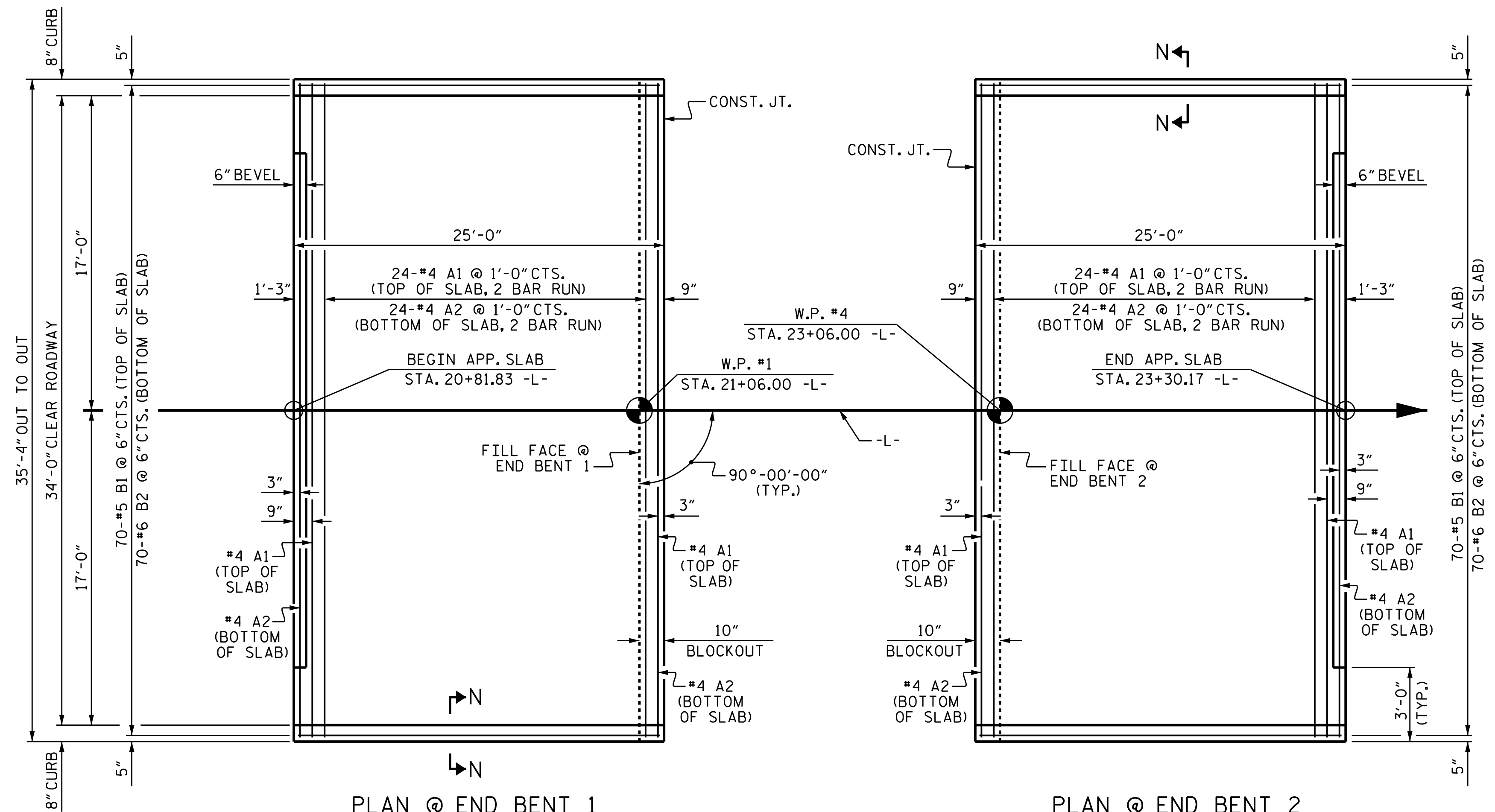
STRUCTURAL UTILITY CONSTRUCTION



FORCE MAIN AT STORM CROSSING
NOT TO SCALE



WATER MAIN AT STORM CROSSING
NOT TO SCALE



NOTES

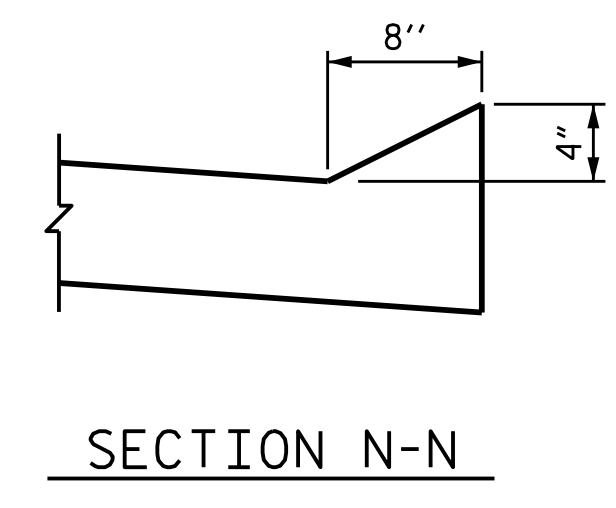
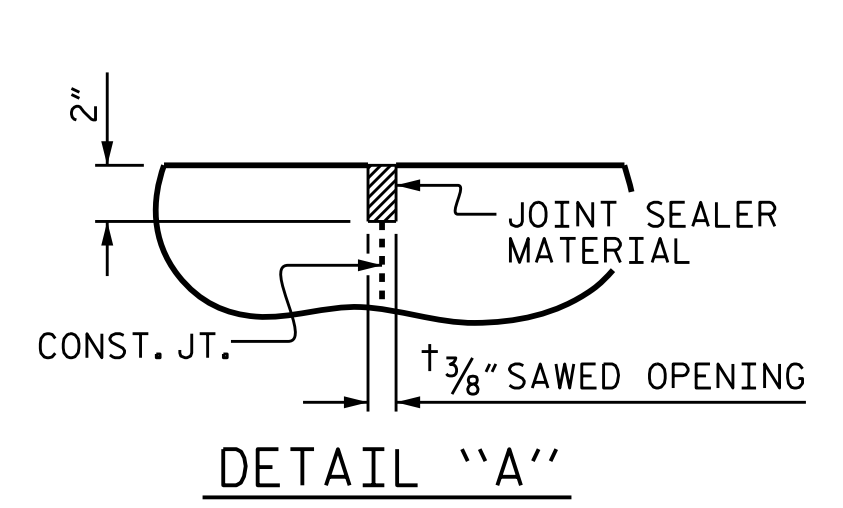
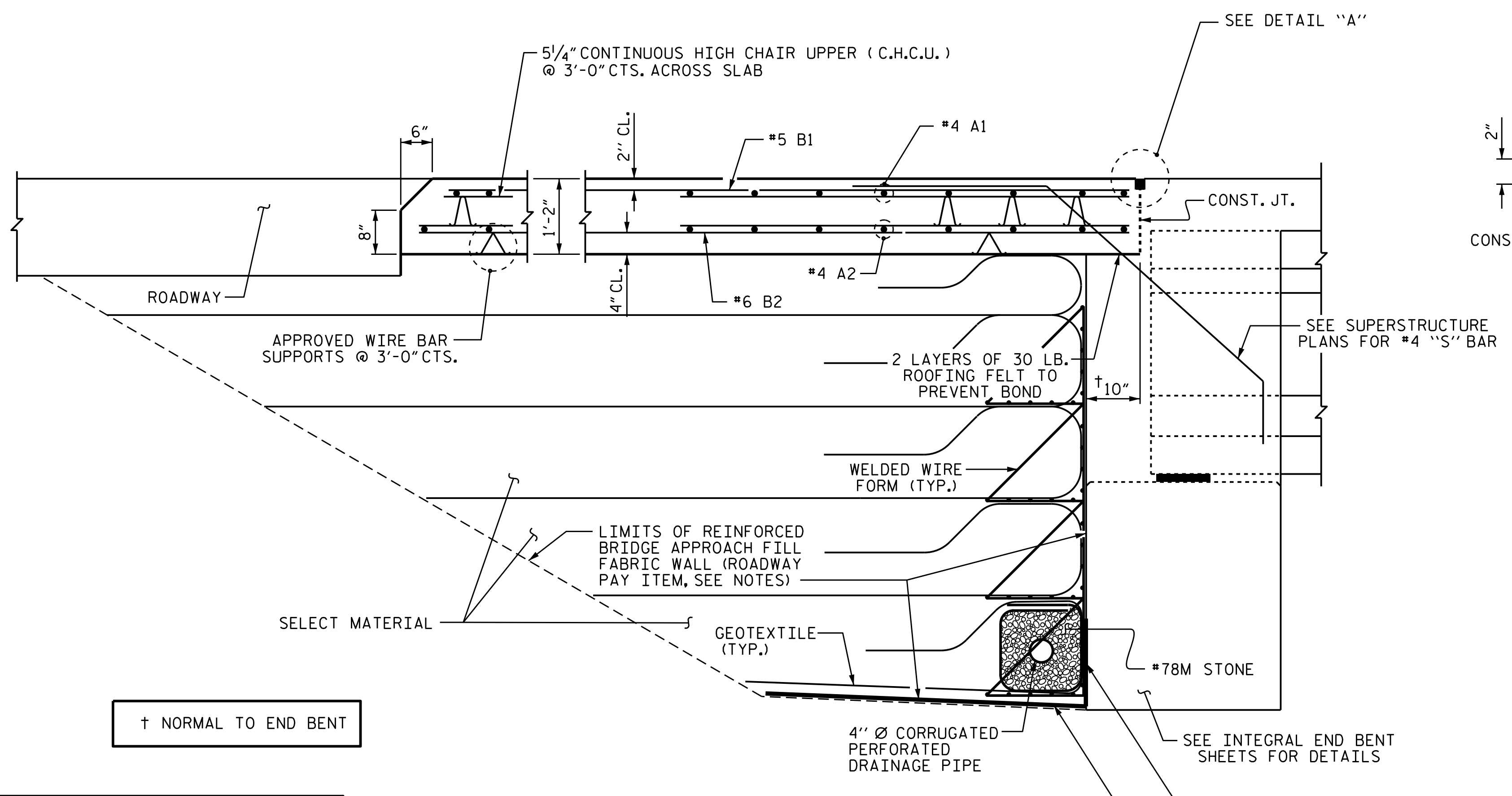
APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.

FOR REINFORCED BRIDGE APPROACH FILL FABRIC WALL INCLUDING GEOTEXTILE, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, WELDED WIRE FORM, AND SELECT MATERIAL, SEE ROADWAY PLANS.

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

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

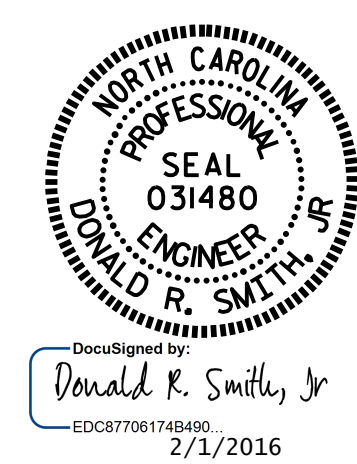
| BILL OF MATERIAL | | | | | |
|----------------------------------|-----|------|------|--------|--------|
| FOR ONE APPROACH SLAB (2 REQ'D) | | | | | |
| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
| * A1 | 52 | #4 | STR | 18'-6" | 643 |
| A2 | 52 | #4 | STR | 18'-5" | 640 |
| * B1 | 70 | #5 | STR | 24'-3" | 1770 |
| B2 | 70 | #6 | STR | 24'-8" | 2593 |
| REINFORCING STEEL | | | | LBS. | 3,233 |
| * EPOXY COATED REINFORCING STEEL | | | | LBS. | 2,413 |
| CLASS AA CONCRETE | | | | C. Y. | 38.2 |



PROJECT NO. B-5142
IREDELL COUNTY
 STATION: 22+06.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 BRIDGE APPROACH SLAB
 FOR INTEGRAL ABUTMENT



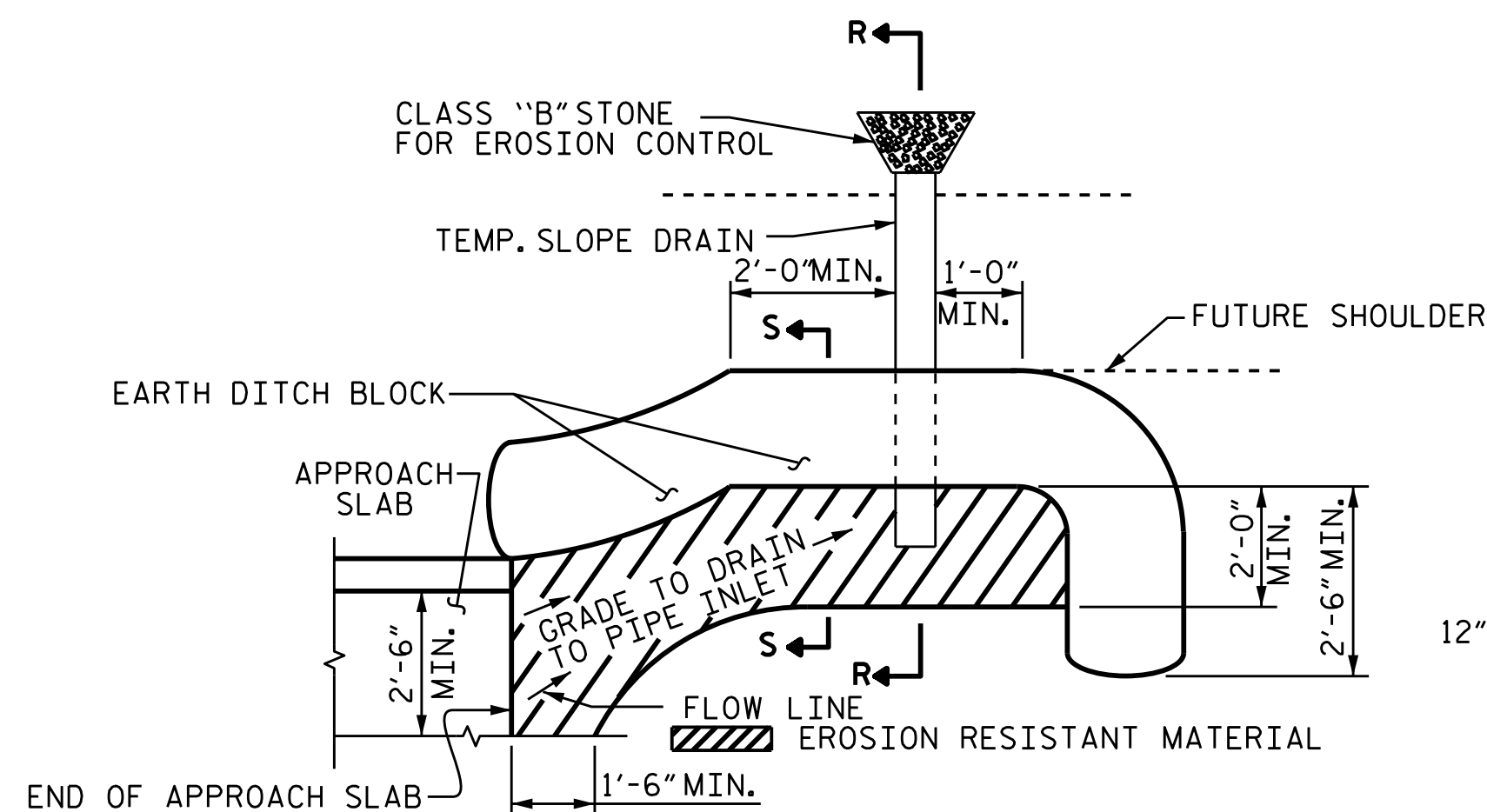
| | |
|----------------------------|----------------------|
| ASSEMBLED BY : K. D. LAYNE | DATE : 4-30-15 |
| CHECKED BY : H.P. KIM | DATE : 5-14-15 |
| DRAWN BY : TLA 10/05 | REV. 10/1/11 MAA/GM |
| CHECKED BY : GM 5/06 | REV. 12/21/11 MAA/GM |
| | REV. 6/13 MAA/GM |

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 jdhawk

DOCUMENT NOT CONSIDERED
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 SIGNATURES COMPLETED

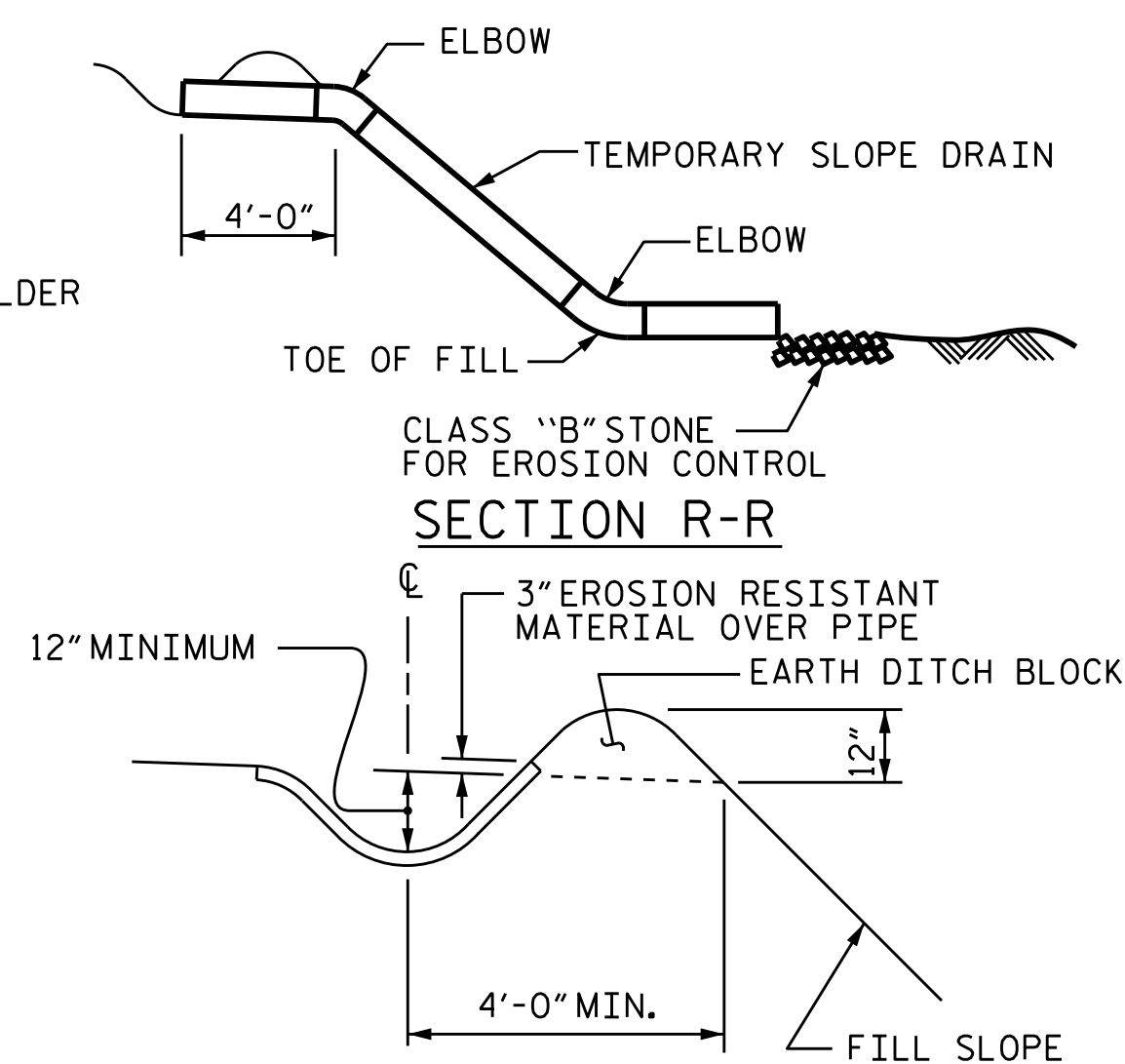
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| NO. | BY: | DATE: | NO. | BY: | DATE: | S-37 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 38 |

STD. NO. BAS5



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.

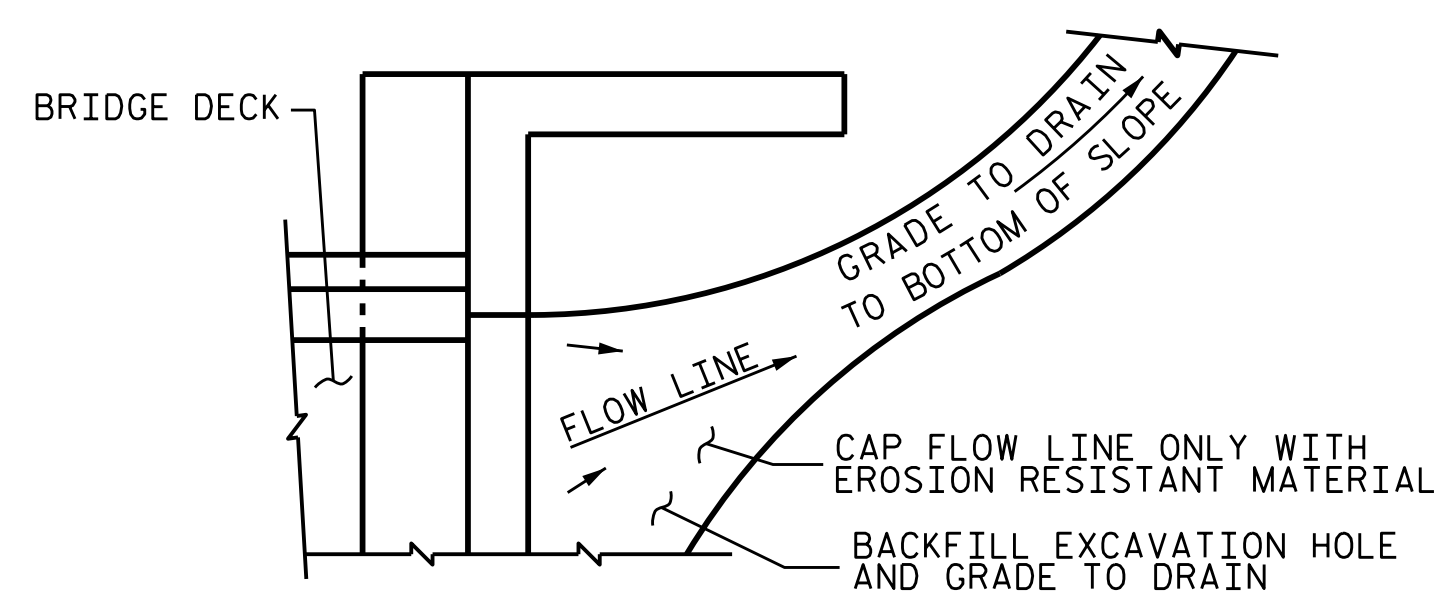
PLAN VIEW



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

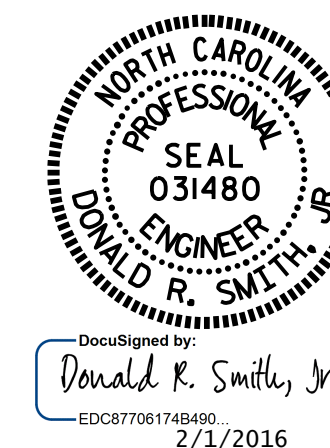


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL

PROJECT NO. B-5142
IREDELL COUNTY
 STATION: 22+06.00 -L-

SHEET 2 OF 2



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 BRIDGE APPROACH
 SLAB DETAILS

| | |
|----------------------------|---------------------|
| ASSEMBLED BY : K. D. LAYNE | DATE : 4-30-15 |
| CHECKED BY : H.P. KIM | DATE : 5-14-15 |
| DRAWN BY : FCJ 11/88 | REV. 10/1/11 MAA/GM |
| CHECKED BY : ARB 11/88 | REV. 7/12 MAA/GM |
| | REV. 6/13 MAA/GM |

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DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

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

STD. NO. BAS4

