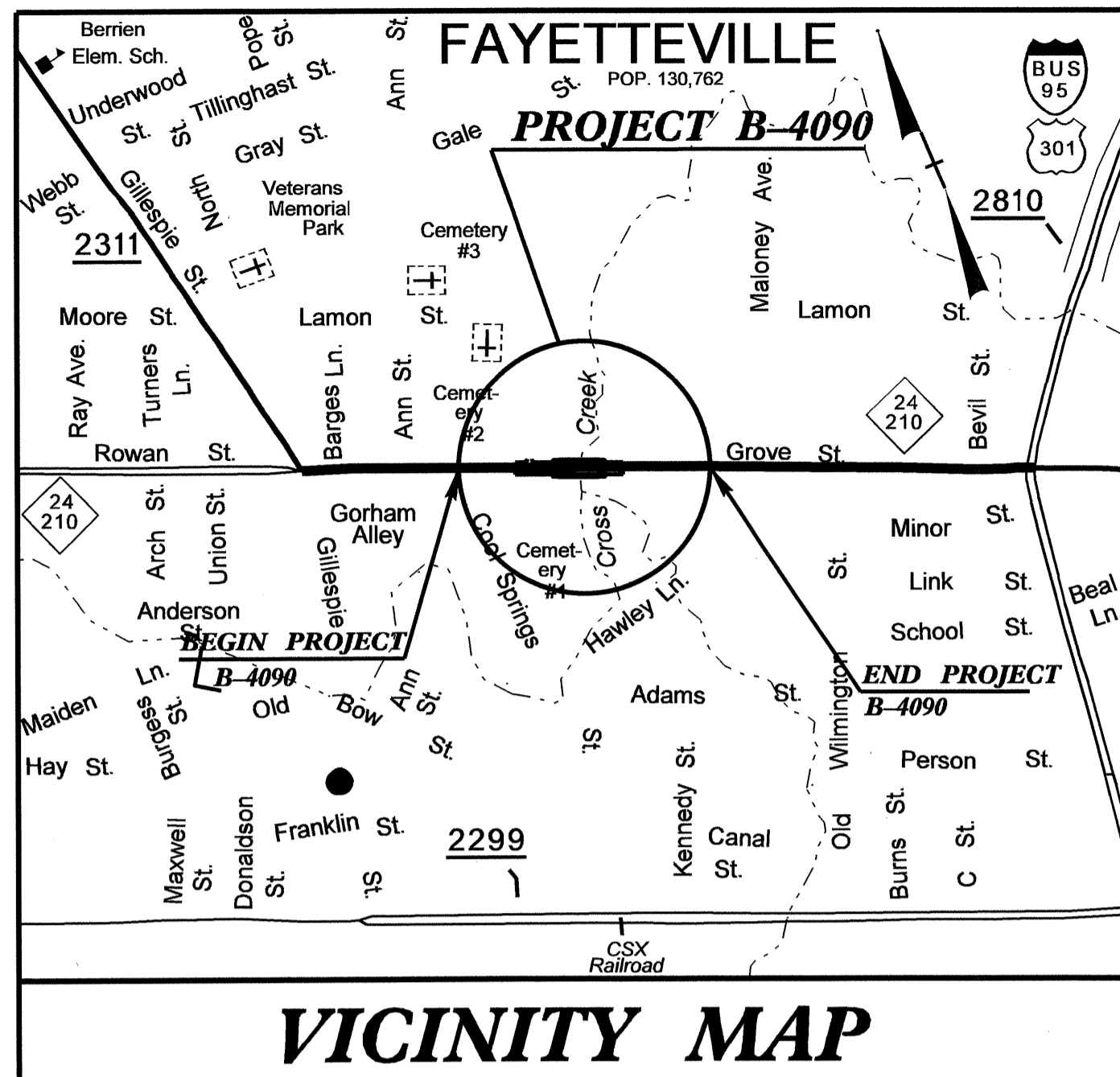


CONTRACT: C202724 TIP PROJECT: B-4090

STRUCTURES

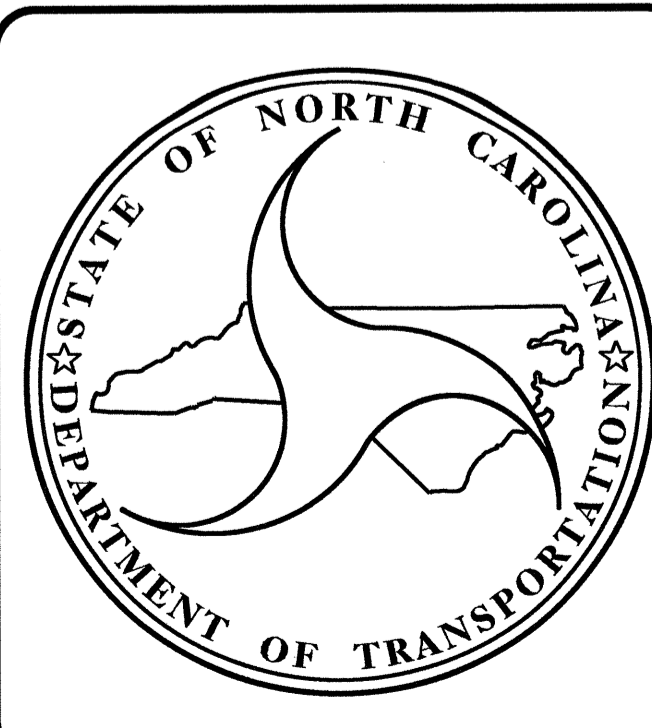
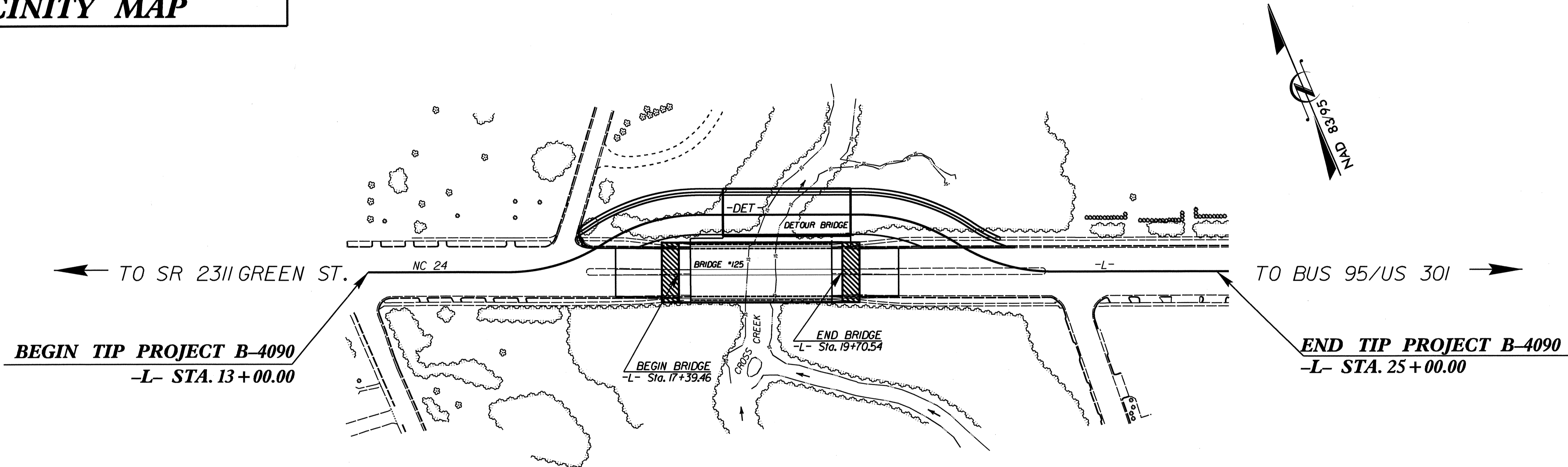


STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
CUMBERLAND COUNTY

**LOCATION: BRIDGE No. 125 ON NC 24 (GROVE ST.) OVER
CROSS CREEK IN FAYETTEVILLE**

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

| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|-----------------|-----------------------------|-------------|--------------|
| N.C. | B-4090 | | |
| STATE PROJ. NO. | F. A. PROJ. NO. | DESCRIPTION | |
| 33448.1.1 | BRSTP-0024(12) | P.E. | |
| 33448.3.1 | BRSTP-0024(17) | UTIL. & RW | |
| 33448.2.2 | BRSTP-0024(50) | CONST. | |
| | | | |
| | | | |



DESIGN DATA

| | |
|------------|---------|
| ADT 2010 = | 40,135 |
| ADT 2030 = | 63,700 |
| DHV = | 10 % |
| D = | 60 % |
| T = | 5 % * |
| V = | 40 MPH |
| * TTST 2% | DUAL 3% |

PROJECT LENGTH

| | |
|---------------------------------------|----------|
| LENGTH ROADWAY TIP PROJECT B-4090 = | 0.183 MI |
| LENGTH STRUCTURE TIP PROJECT B-4090 = | 0.044 MI |
| TOTAL LENGTH TIP PROJECT B-4090 = | 0.227 MI |

Prepared In the Office of:
DIVISION OF HIGHWAYS

2006 STANDARD SPECIFICATIONS

LETTING DATE :
NOVEMBER 15, 2011

| |
|---|
| J. C. FRYE, P.E. PROJECT ENGINEER |
| T. H. FANG, P.E. PROJECT DESIGN ENGINEER |

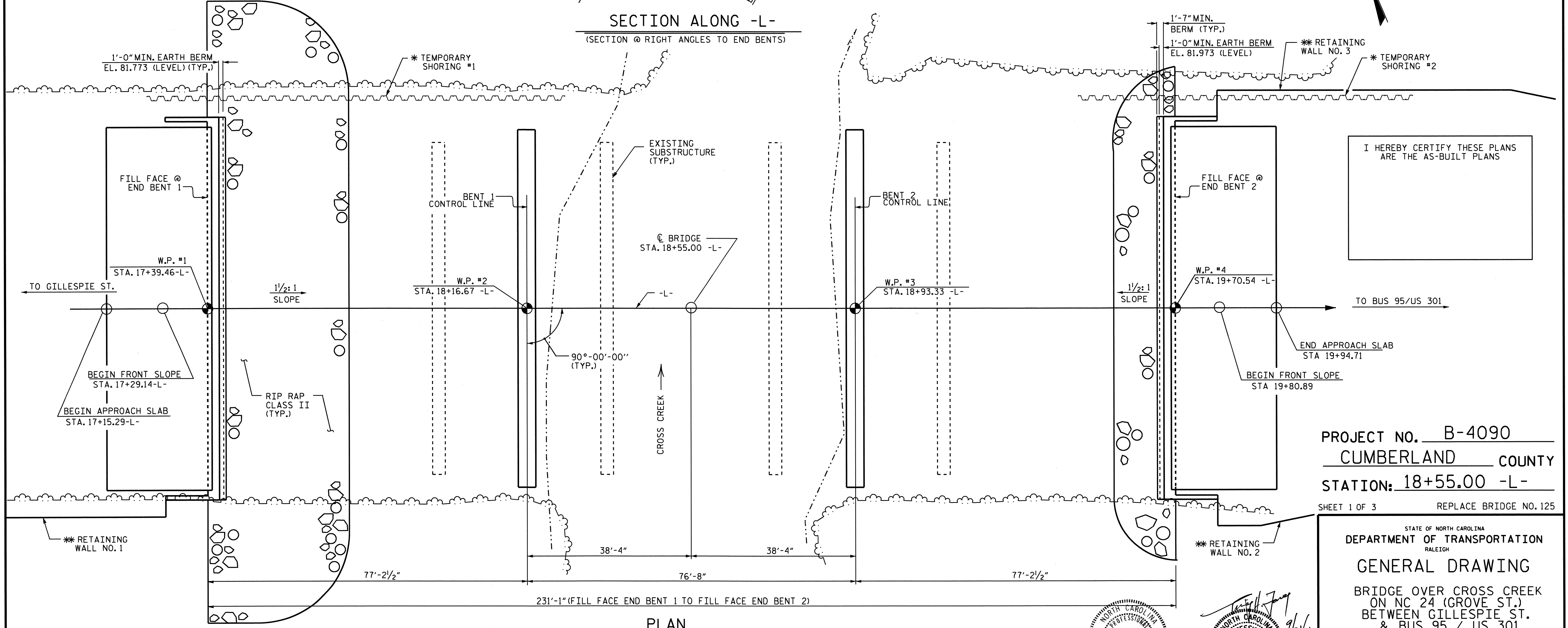
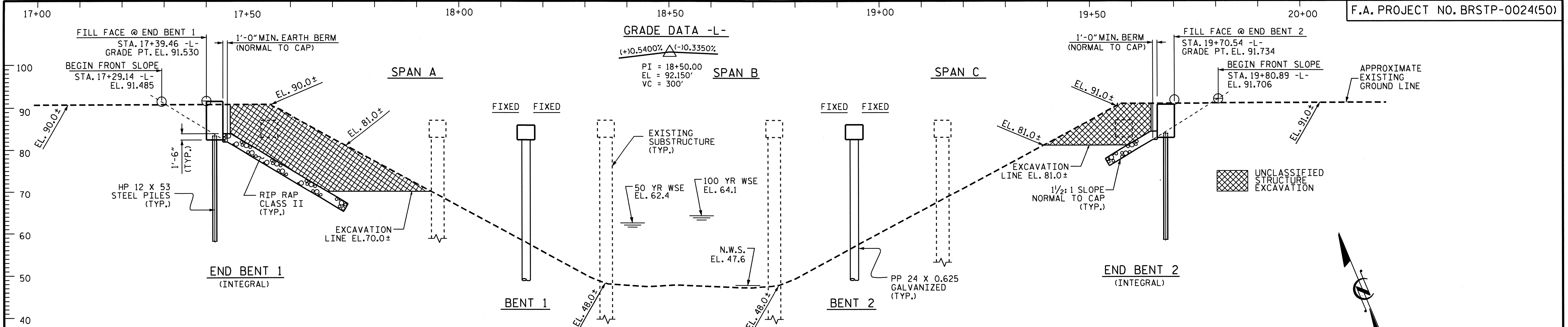
STRUCTURE DESIGN UNIT
1000 BIRCH RIDGE DR.
RALEIGH, N.C. 27610

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER
DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR

DATE



PLAN

PILES NOT SHOWN FOR CLARITY

* TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC (SEE ROADWAY PLANS)

* FOR DETAILS AND QUANTITY OF RETAINING WALL, SEE "SOLIDER PILE RETAINING WALL" ON SHEETS NO. W-1 & W-2.

DRAWN BY : K.H. COMPTON DATE : 3/11
 CHECKED BY : B. MATHEW DATE : 4/11

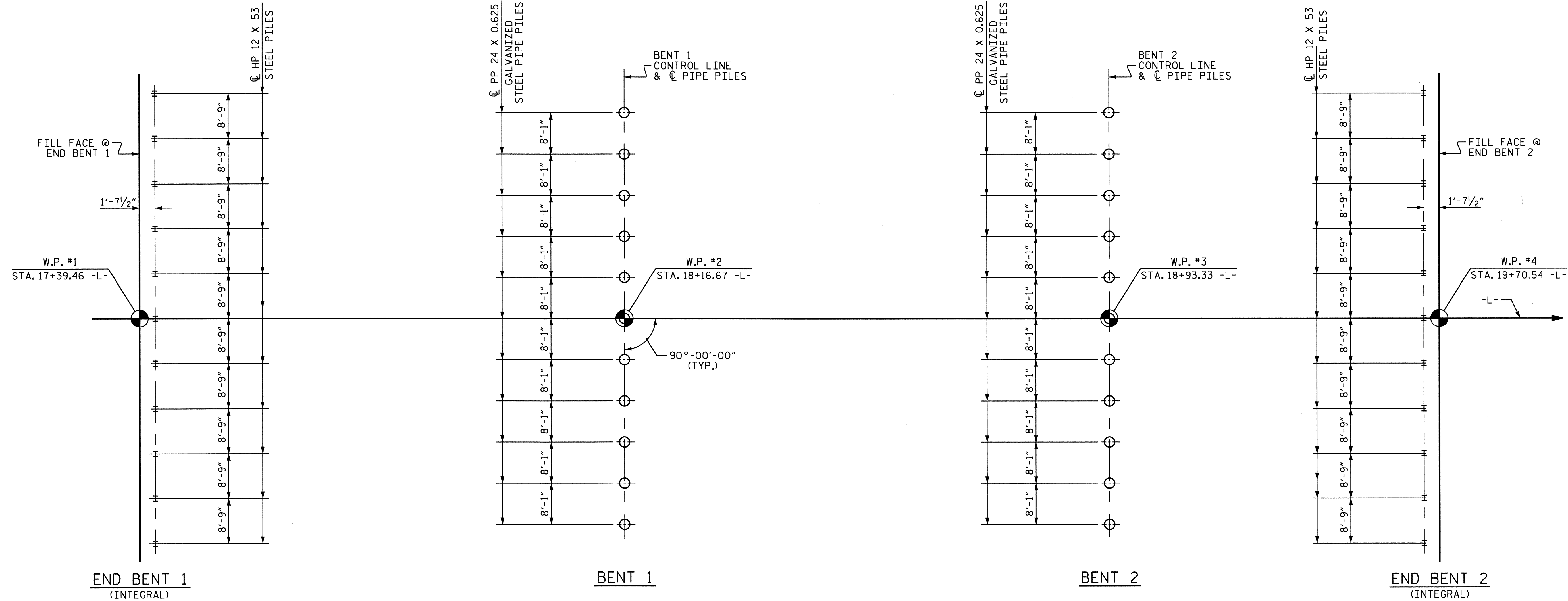
| REVISIONS | | | | | | SHEET NO. | |
|-----------|-----|-------|-----|-----|-------|--------------|----|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-1 | |
| 1 | | | 3 | | | TOTAL SHEETS | 41 |
| 2 | | | 4 | | | | |

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. B-4090
CUMBERLAND COUNTY
 STATION: 18+55.00 -L-

SHEET 1 OF 3 REPLACE BRIDGE NO. 125

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 BRIDGE OVER CROSS CREEK
 ON NC 24 (GROVE ST.)
 BETWEEN GILLESPIE ST.
 & BUS 95 / US 301



FOUNDATION LAYOUT
ORIENT PILES AT END BENTS AS SHOWN.

NOTES

FOR PILES, SEE PROJECT SPECIAL PROVISIONS.

PILES AT END BENTS 1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 115 TONS PER PILE.

DRIVE PILES AT END BENTS 1 AND 2 TO A REQUIRED DRIVING RESISTANCE OF 195 TONS PER PILE.

PILES AT BENTS 1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 225 TONS PER PILE.

DRIVE PILES AT BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 450 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAG OR SCOUR.

DRIVE PILES AT BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 490 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAG OR SCOUR.

INSTALL PILES AT BENTS 1 AND 2 TO TIP ELEVATIONS NO HIGHER THAN 25.0 FT AND 23.0 FT, RESPECTIVELY.

SCOUR CRITICAL ELEVATIONS FOR BENTS 1 AND 2 ARE ELEVATIONS 46.0 FT. AND 44.0 FT., RESPECTIVELY. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENTS 1 AND 2. FOR PILE DRIVING ANALYZER, SEE PILES PROJECT SPECIAL PROVISION.

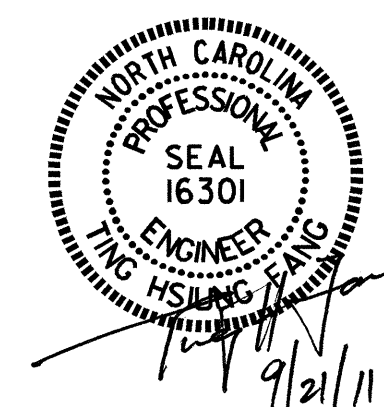
GALVANIZED STEEL PILES ARE REQUIRED IN ACCORDANCE WITH THE PILES PROJECT SPECIAL PROVISION.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 80-125 FT-KIPS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT BENTS 1 AND 2. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH THE PILES PROJECT SPECIAL PROVISION.

THE ENGINEER MAY REQUIRE REDRIVING PILES UP TO 48 HOURS AS SPECIFIED IN THE PILES PROJECT SPECIAL PROVISION.

PROJECT NO. B-4090
CUMBERLAND COUNTY
STATION: 18+55.00 -L-

SHEET 2 OF 3



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
GENERAL DRAWING
BRIDGE OVER CROSS CREEK
ON NC 24 (GROVE ST.)
& BUS 95 / US 301

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

DRAWN BY : K.H. COMPTON DATE : 2/11
CHECKED BY : B. MATHEW DATE : 4/11

TOTAL BILL OF MATERIAL

| | CONSTRUCTION, MAINTENANCE & REMOVAL OF TEMP. STRUCTURE | REMOVAL OF EXISTING STRUCTURE | PDA TESTING | PDA ASSISTANCE | UNCLASSIFIED STRUCTURE EXCAVATION | REINFORCED CONCRETE DECK SLAB | GROOVING BRIDGE FLOORS | CLASS A CONCRETE | BRIDGE APPROACH SLABS | REINFORCING STEEL | 45" PRESTRESSED CONCRETE GIRDER | HP 12 X 53 STEEL PILES | PP 24 X 0.625 GALVANIZED STEEL PILES | PILE REDRIVES | RIP RAP CLASS II (2'-0" THICK) | FILTER FABRIC FOR DRAINAGE | ELASTOMERIC BEARINGS | EVAZOTE JOINT SEALS | CLASSIC CONCRETE BRIDGE RAIL | | | |
|----------------|--|-------------------------------|-------------|----------------|-----------------------------------|-------------------------------|------------------------|------------------|-----------------------|-------------------|---------------------------------|------------------------|--------------------------------------|---------------|--------------------------------|----------------------------|----------------------|---------------------|------------------------------|----------|----------|--------|
| | LUMP SUM | LUMP SUM | EACH | EACH | LUMP SUM | SO. FT. | SO. FT. | CU. YDS. | LUMP SUM | LBS. | NO. | NO. | NO. | EACH | TONS | SO. YDS. | LUMP SUM | LUMP SUM | LIN. FT. | | | |
| SUPERSTRUCTURE | | | | | | 20,181 | 16,345 | | | | 27 | 2,047.5 | | | | | LUMP SUM | | 462.17 | | | |
| END BENT 1 | | | | | | | | 47.0 | | 6,856 | | 11 | 660 | 4 | 405 | 450 | | | | | | |
| BENT 1 | | | 1 | 1 | | | | 48.6 | | 6,939 | | | 11 | 825 | 11 | | | | | | | |
| BENT 2 | | | 1 | 1 | | | | 48.6 | | 6,939 | | | 11 | 825 | 11 | | | | | | | |
| END BENT 2 | | | | | | | | 47.0 | | 6,856 | | 11 | 550 | 4 | 80 | 90 | | | | | | |
| TOTAL | LUMP SUM | LUMP SUM | 2 | 2 | LUMP SUM | 20,181 | 16,345 | 191.2 | LUMP SUM | 27,590 | 27 | 2,047.5 | 22 | 1210 | 22 | 1650 | 30 | 485 | 540 | LUMP SUM | LUMP SUM | 462.17 |

NOTES:

ASSUMED LIVE LOAD = HL- 93 OR ALTERNATE LOADING.

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

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

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH HEC 18, "EVALUATING SCOUR AT BRIDGES", MAY, 2001.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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.

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.

THE EXISTING STRUCTURE CONSISTING OF 5 SPANS: 1 @ 40'-3", 3 @ 40'-3", 1 @ 40'-3"; 68'-0" CLEAR ROADWAY WIDTH AND A RC FLOOR ON I-BEAMS; END BENTS 1 & 2 AND INTERIOR BENTS 1 & 4 CONSISTING OF RC CAPS ON HP PILES, INTERIOR BENTS 2 & 3 CONSISTING OF RC COLUMNS ON RC FOOTINGS LOCATED AT THE PROPOSED STRUCTURE SITE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET S-1 SHALL BE EXCAVATED FOR A DISTANCE OF 60 FEET RIGHT AND LEFT SIDE AT END BENTS 1 AND 2 OF THE CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE MEASURED AND PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION.

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.

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 18+55.00-L-".

FOR INTERIOR BENTS 1 AND 2 ONLY PARTIAL GALVANIZING OF THE PILES IS REQUIRED. SEE INTERIOR BENT SHEET(S) FOR REQUIRED GALVANIZED LENGTHS. PAYMENT FOR PARTIALLY GALVANIZED PILES WILL BE MADE UNDER THE CONTRACT UNIT PRICE FOR GALVANIZED STEEL PILES.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

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

THE CONTRACTOR WILL BE REQUIRED TO CONSTRUCT, MAINTAIN AND AFTERWARDS REMOVE A TEMPORARY STRUCTURE AT STA. 18+55.00 -L- FOR USE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURE, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

STEEL SHEET PILING REQUIRED FOR SHORING SHALL BE HOT ROLLED.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

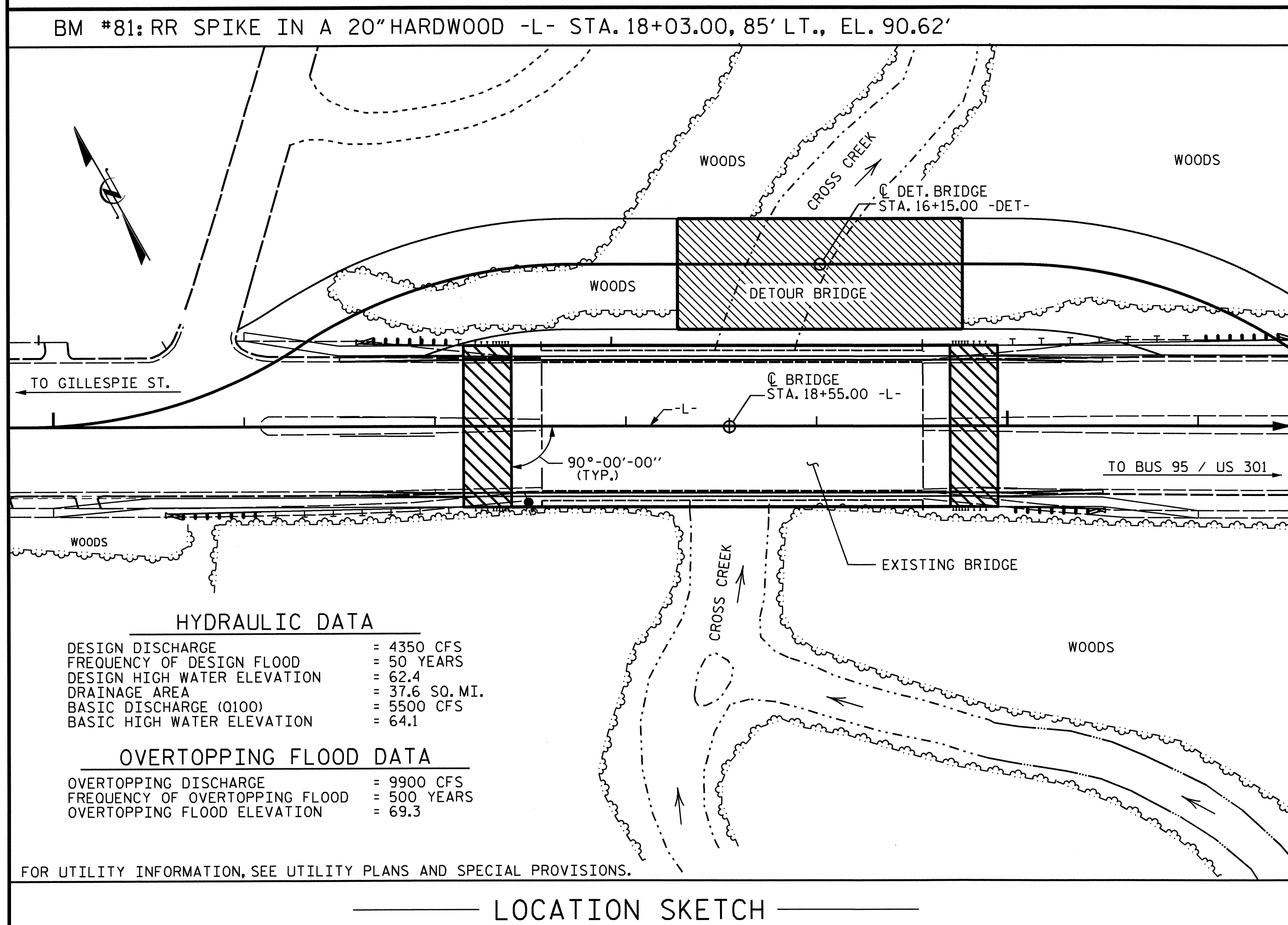
FOR CLASSIC CONCRETE BRIDGE RAIL, SEE SPECIAL PROVISIONS.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

FOR CURING CONCRETE, SEE SPECIAL PROVISIONS.

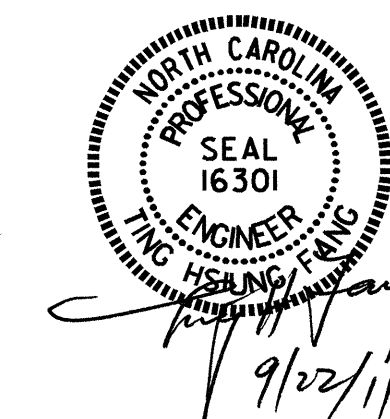
FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

FOR FORMS FOR CONCRETE BRIDGE DECKS, SEE SPECIAL PROVISIONS.



PROJECT NO. B-4090
CUMBERLAND COUNTY
 STATION: 18+55.00 -L-

SHEET 3 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 BRIDGE OVER CROSS CREEK
 ON NC 24 (GROVE ST.)
 BETWEEN GILLESPIE ST.
 & BUS 95 / US 301

DRAWN BY: HARISH SHAH DATE: 01-14-11
 CHECKED BY: B. MATHEW DATE: 4-13-11

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

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 | | | |
|--------------------------|------------|----------------------|---------------------------------|-----------------------------------|---------------|------------------------|------------------------------|---------------|------|-----------------|---|------------------------------|---------------|------|-----------------|---|---------------------|------------------------------|---------------|------|----------------|-----------------|---|--|
| | | | | | | LIVELOAD FACTORS | MOMENT | | | | | SHEAR | | | | | LIVELOAD FACTORS | MOMENT | | | | | | |
| | | | | | | | DISTRIBUTION FACTORS (DF) | RATING FACTOR | SPAN | GIRDER LOCATION | DISTANCE FROM LEFT END OF SPAN (ft) | DISTRIBUTION FACTORS (DF) | RATING FACTOR | SPAN | GIRDER LOCATION | DISTANCE FROM LEFT END OF SPAN (ft) | | DISTRIBUTION FACTORS (DF) | RATING FACTOR | SPAN | | GIRDER LOCATION | DISTANCE FROM LEFT END OF SPAN (ft) | |
| DESIGN LOAD RATING | HL-93(Inv) | N/A | 1 | 1.085 | -- | 1.75 | 0.800 | 1.78 | A | I | 37.25 | 0.957 | 2.19 | A | I | 29.8 | 0.80 | 0.957 | 1.08 | A | I | 37.25 | | |
| | HL-93(Opr) | N/A | -- | 2.312 | -- | 1.35 | 0.800 | 2.31 | A | I | 37.25 | 0.957 | 2.84 | A | I | 29.8 | N/A | -- | -- | -- | -- | -- | | |
| | HS-20(Inv) | 36.000 | 2 | 1.518 | 54.644 | 1.75 | 0.863 | 2.35 | A | ER | 37.25 | 0.957 | 2.71 | A | I | 29.8 | 0.80 | 0.8 | 1.52 | A | I | 37.25 | | |
| | HS-20(Opr) | 36.000 | -- | 3.050 | 109.805 | 1.35 | 0.863 | 3.05 | A | ER | 37.25 | 0.957 | 3.51 | A | I | 29.8 | N/A | -- | -- | -- | -- | -- | | |
| LEGAL LOAD RATING | SV | SNSH | 13.500 | -- | 3.442 | 46.468 | 1.40 | 0.863 | 6.67 | A | ER | 37.25 | 0.957 | 7.58 | A | I | 29.8 | 0.80 | 0.8 | 3.44 | A | I | 37.25 | |
| | | SNGARBS2 | 20.000 | -- | 2.558 | 51.167 | 1.40 | 0.863 | 4.96 | A | ER | 37.25 | 0.957 | 5.54 | A | I | 29.8 | 0.80 | 0.8 | 2.56 | A | I | 37.25 | |
| | | SNAGRIS2 | 22.000 | -- | 2.420 | 53.239 | 1.40 | 0.863 | 4.69 | A | ER | 37.25 | 0.957 | 5.20 | A | I | 29.8 | 0.80 | 0.8 | 2.42 | A | I | 37.25 | |
| | | SNCOTTS3 | 27.250 | -- | 1.713 | 46.671 | 1.40 | 0.863 | 3.32 | A | ER | 37.25 | 0.957 | 3.80 | A | I | 29.8 | 0.80 | 0.8 | 1.71 | A | I | 37.25 | |
| | | SNAGGRS4 | 34.925 | -- | 1.429 | 49.896 | 1.40 | 0.863 | 2.77 | A | ER | 37.25 | 0.957 | 3.26 | A | I | 29.8 | 0.80 | 0.8 | 1.43 | A | I | 37.25 | |
| | | SNS5A | 35.550 | -- | 1.397 | 49.673 | 1.40 | 0.863 | 2.71 | A | ER | 37.25 | 0.957 | 3.35 | A | I | 29.8 | 0.80 | 0.8 | 1.40 | A | I | 37.25 | |
| | | SNS6A | 39.950 | -- | 1.281 | 51.172 | 1.40 | 0.863 | 2.48 | A | ER | 37.25 | 0.957 | 3.10 | A | I | 29.8 | 0.80 | 0.8 | 1.28 | A | I | 37.25 | |
| | SNS7B | 42.000 | -- | 1.220 | 51.231 | 1.40 | 0.863 | 2.36 | A | ER | 37.25 | 0.957 | 3.11 | A | I | 29.8 | 0.80 | 0.8 | 1.22 | A | I | 37.25 | | |
| | TTST | TNAGRIT3 | 33.000 | -- | 1.562 | 51.535 | 1.40 | 0.863 | 3.03 | A | ER | 37.25 | 0.957 | 3.66 | A | I | 29.8 | 0.80 | 0.8 | 1.56 | A | I | 37.25 | |
| | | TNT4A | 33.075 | -- | 1.568 | 51.87 | 1.40 | 0.863 | 3.04 | A | ER | 37.25 | 0.957 | 3.52 | A | I | 29.8 | 0.80 | 0.8 | 1.57 | A | I | 37.25 | |
| | | TNT6A | 41.600 | -- | 1.281 | 53.298 | 1.40 | 0.863 | 2.48 | A | ER | 37.25 | 0.957 | 3.43 | A | I | 29.8 | 0.80 | 0.8 | 1.28 | A | I | 37.25 | |
| | | TNT7A | 42.000 | -- | 1.287 | 54.056 | 1.40 | 0.863 | 2.49 | A | ER | 37.25 | 0.957 | 3.34 | A | I | 29.8 | 0.80 | 0.8 | 1.29 | A | I | 37.25 | |
| | | TNT7B | 42.000 | -- | 1.330 | 55.864 | 1.40 | 0.863 | 2.58 | A | ER | 37.25 | 0.957 | 2.99 | A | I | 29.8 | 0.80 | 0.8 | 1.33 | A | I | 37.25 | |
| | | TNAGRIT4 | 43.000 | -- | 1.266 | 54.453 | 1.40 | 0.863 | 2.45 | A | ER | 37.25 | 0.957 | 2.88 | A | I | 29.8 | 0.80 | 0.8 | 1.27 | A | I | 37.25 | |
| TNAGT5A | | 45.000 | -- | 1.194 | 53.752 | 1.40 | 0.863 | 2.31 | A | ER | 37.25 | 0.957 | 2.93 | A | I | 29.8 | 0.80 | 0.8 | 1.19 | A | I | 37.25 | | |
| TNAGT5B | 45.000 | 3 | 1.180 | 53.122 | 1.40 | 0.863 | 2.29 | A | ER | 37.25 | 0.957 | 2.73 | A | I | 29.8 | 0.80 | 0.8 | 1.18 | A | I | 37.25 | | | |

NOTES:

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

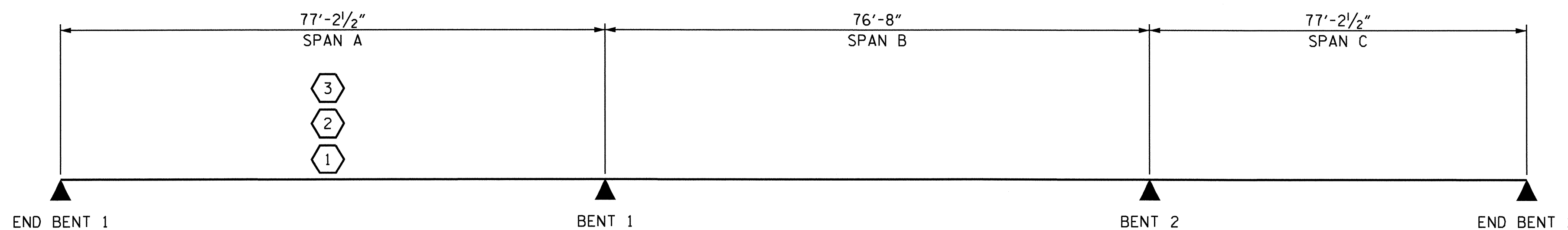
ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

1. SPANS B AND C RATING ARE SIMILAR

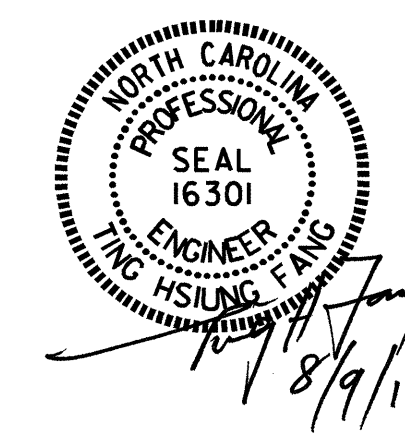
- 2.
- 3.
- 4.

| | |
|--|----------------------------|
| # | CONTROLLING LOAD RATING |
| 1 | DESIGN LOAD RATING (HL-93) |
| 2 | DESIGN LOAD RATING (HS-20) |
| 3 | LEGAL LOAD RATING ** |
| ** SEE CHART FOR VEHICLE TYPE | |
| GIRDER LOCATION | |
| I - INTERIOR GIRDER EL - EXTERIOR LEFT GIRDER ER - EXTERIOR RIGHT GIRDER | |



LRFR SUMMARY

PROJECT NO. B-4090
CUMBERLAND COUNTY
 STATION: 18+55.00 -L-



| | | | | | |
|---|-----|-------|-----|-----|-----------------------|
| STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH | | | | | |
| STANDARD LRFR SUMMARY FOR PRESTRESSED CONCRETE GIRDERS (NON-INTERSTATE TRAFFIC) | | | | | |
| REVISIONS | | | | | |
| NO. | BY: | DATE: | NO. | BY: | DATE: |
| 1 | | | 3 | | |
| 2 | | | 4 | | |
| SHEET NO. S-4 | | | | | TOTAL SHEETS 41 |

ASSEMBLED BY : RAMAN PATEL DATE : 07-29-11
 CHECKED BY : E. L. OMILE DATE : 08-01-11
 DRAWN BY : MAA 1/08 REV. 11/12/08R MAA/GM
 CHECKED BY : GM/DI 2/08

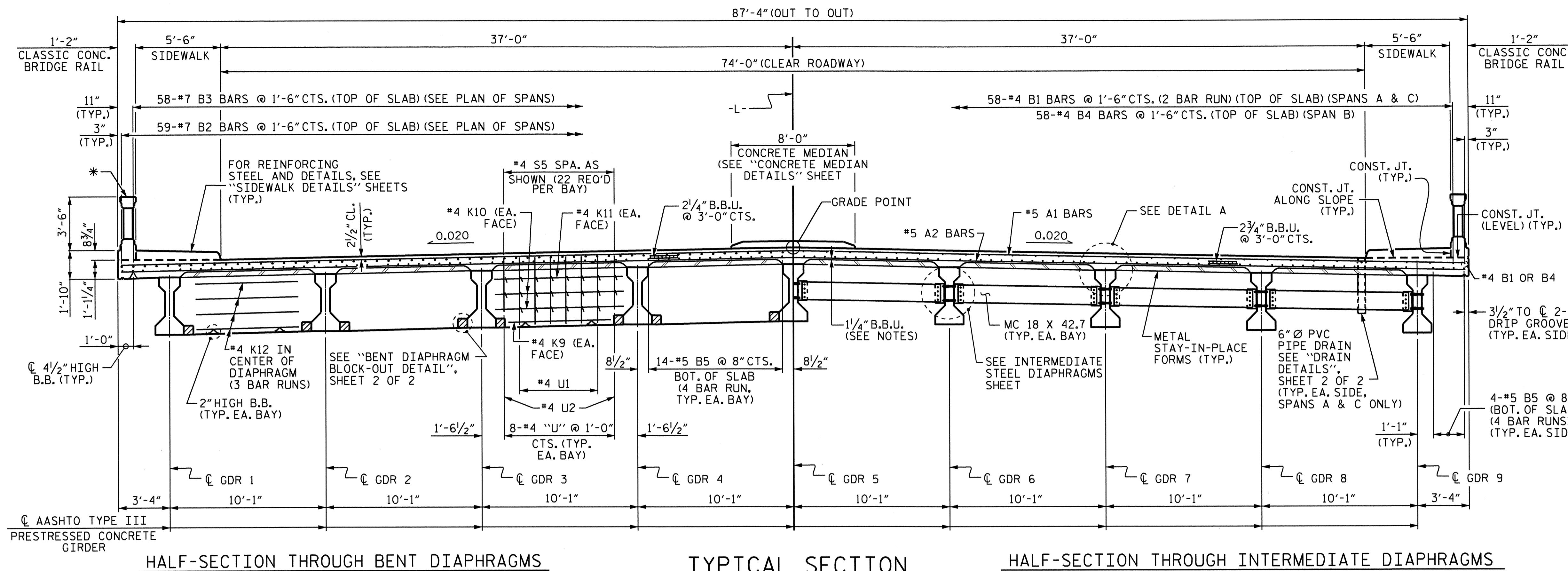
NOTES

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.

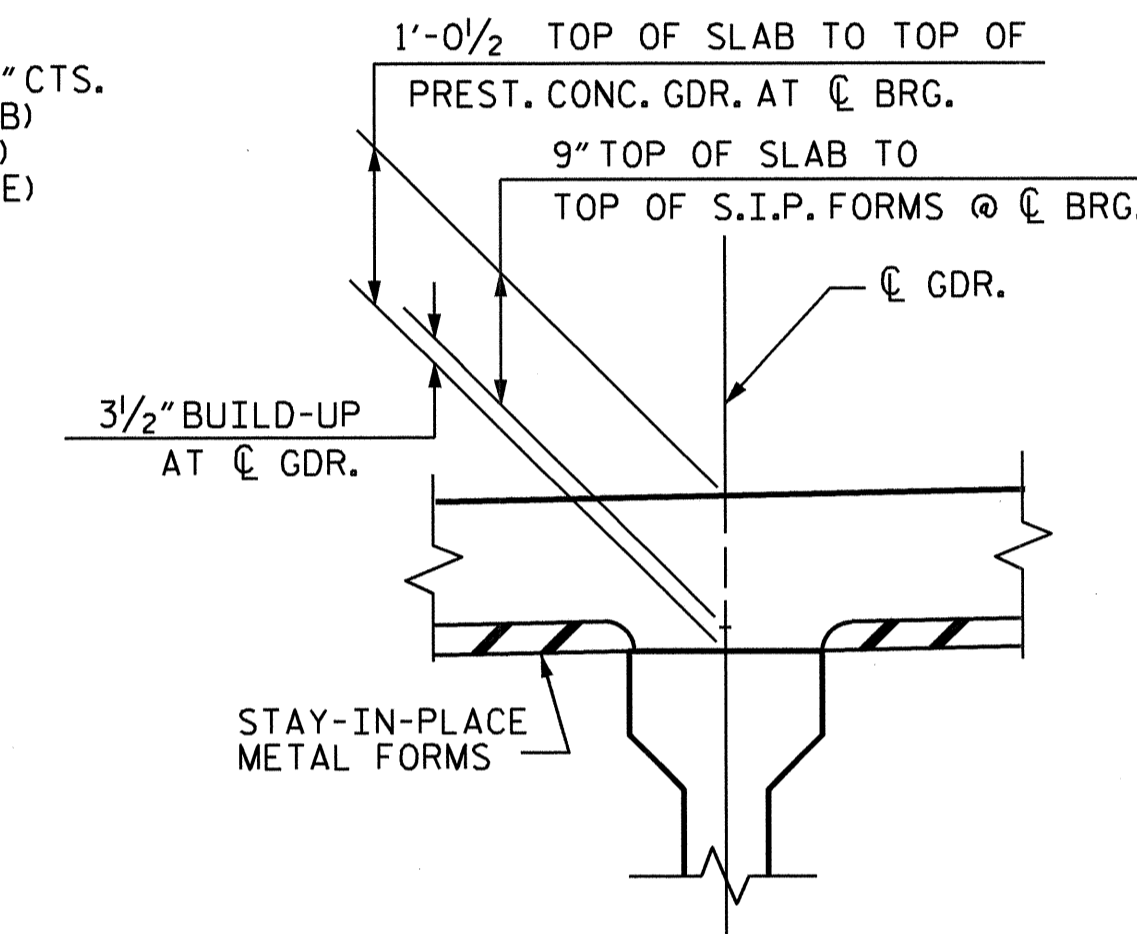
LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

CLASSIC BRIDGE RAIL SIDEWALK AND MEDIAN 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.

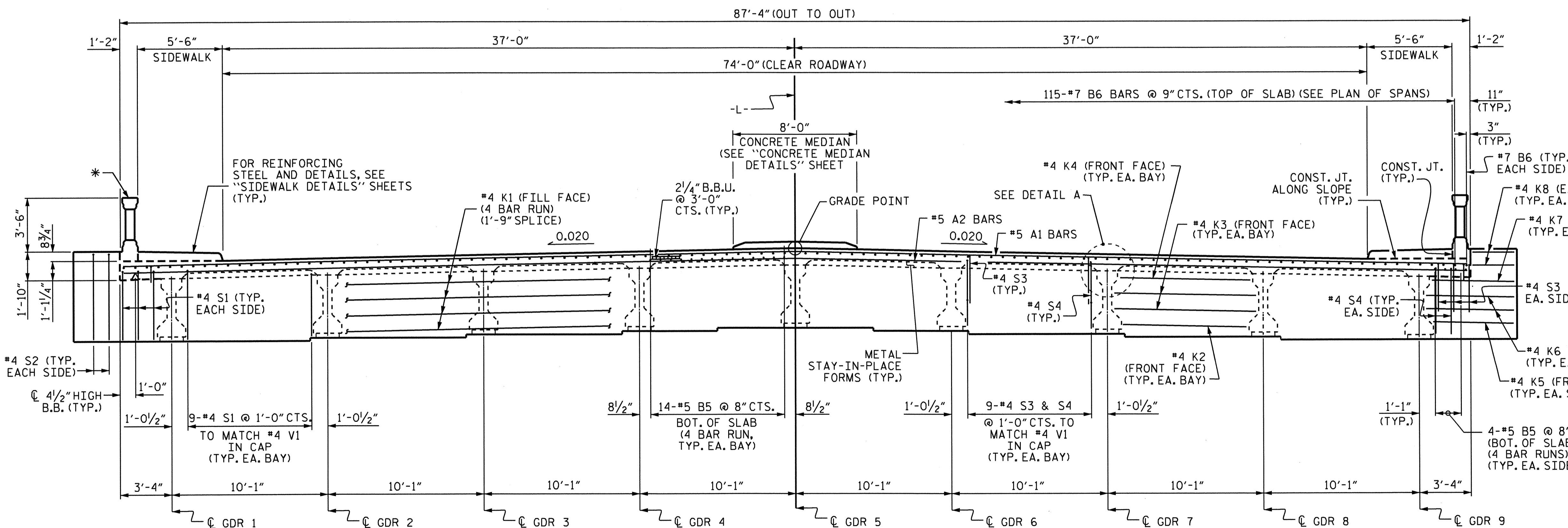
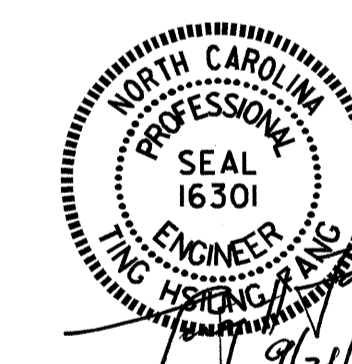
FOR WING ELEVATIONS AND DETAILS, SEE "PLAN OF SPANS DETAILS" SHEETS.



* FOR CLASSIC BRIDGE RAIL REINFORCING STEEL AND DETAILS, SEE "CLASSIC CONCRETE BRIDGE RAIL WITH SIDEWALK" SHEETS.



DETAIL A



TYPICAL SECTION

* FOR CLASSIC BRIDGE RAIL REINFORCING STEEL AND DETAILS, SEE "CLASSIC CONCRETE BRIDGE RAIL WITH SIDEWALK" SHEETS.

PROJECT NO. B-4090
 CUMBERLAND COUNTY
 STATION: 18+55.00 -L-

SHEET 1 OF 2

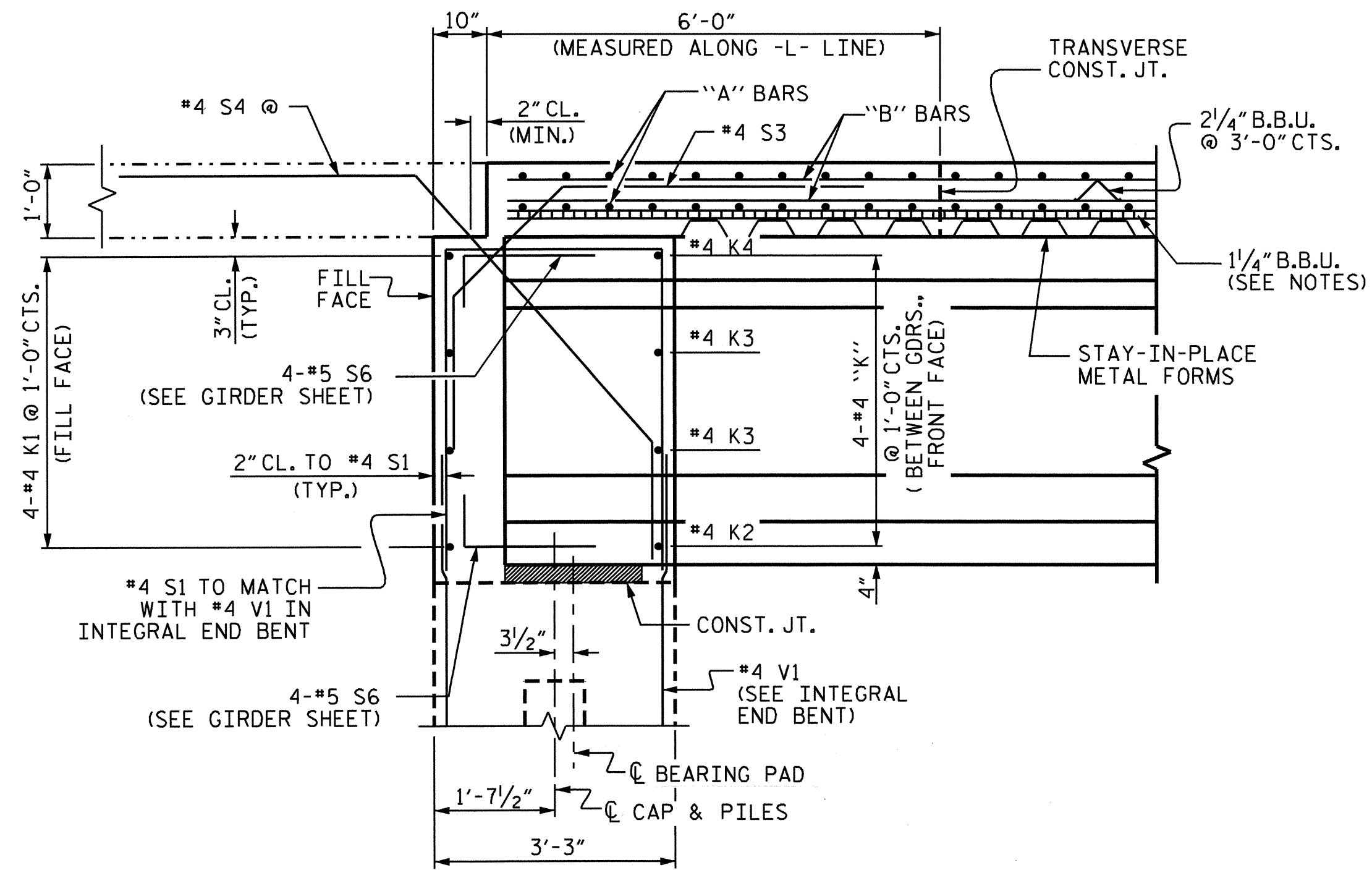
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 TYPICAL SECTION

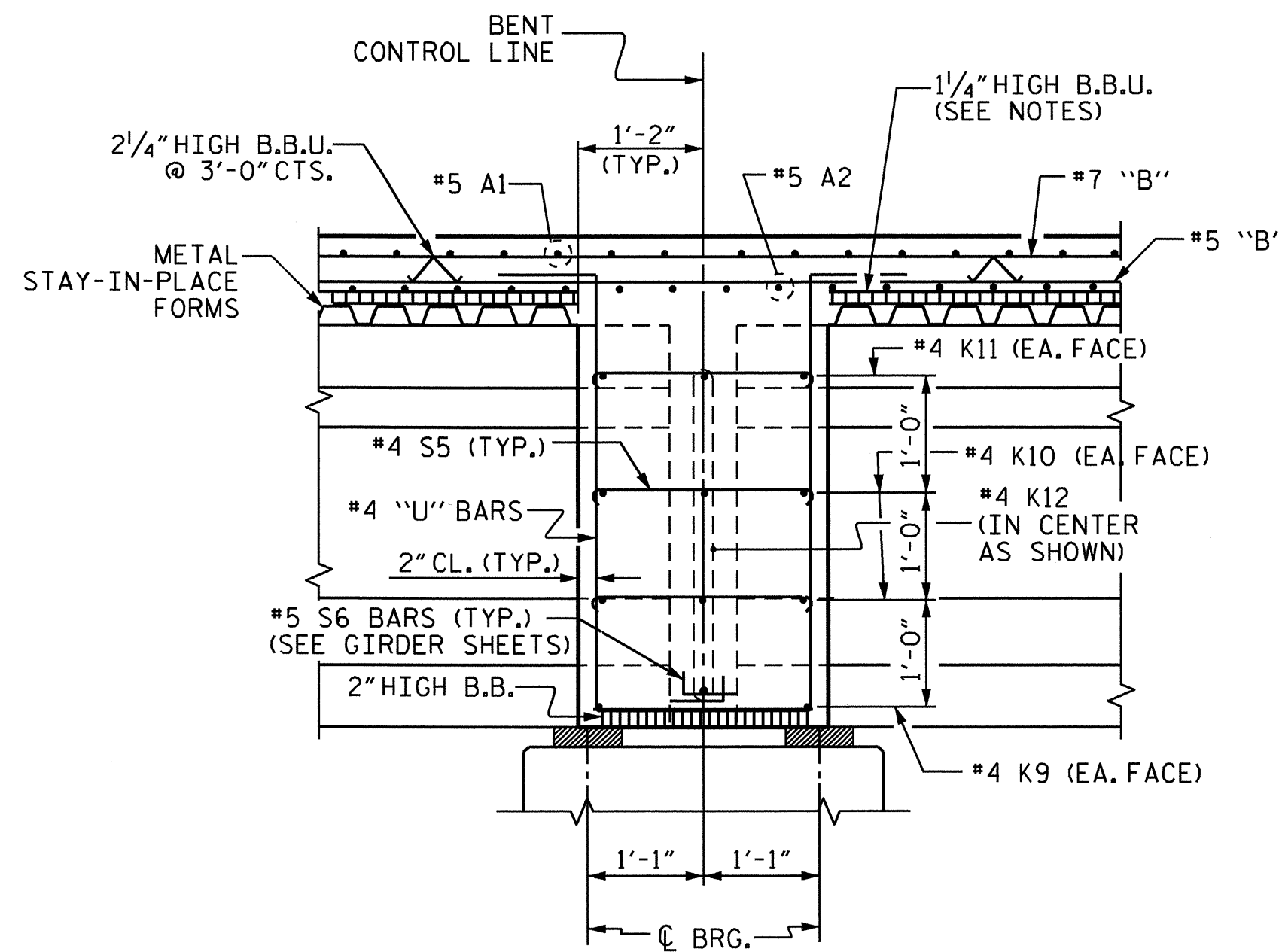
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 CHECKED BY: J.H. CARDEN DATE: 3/11

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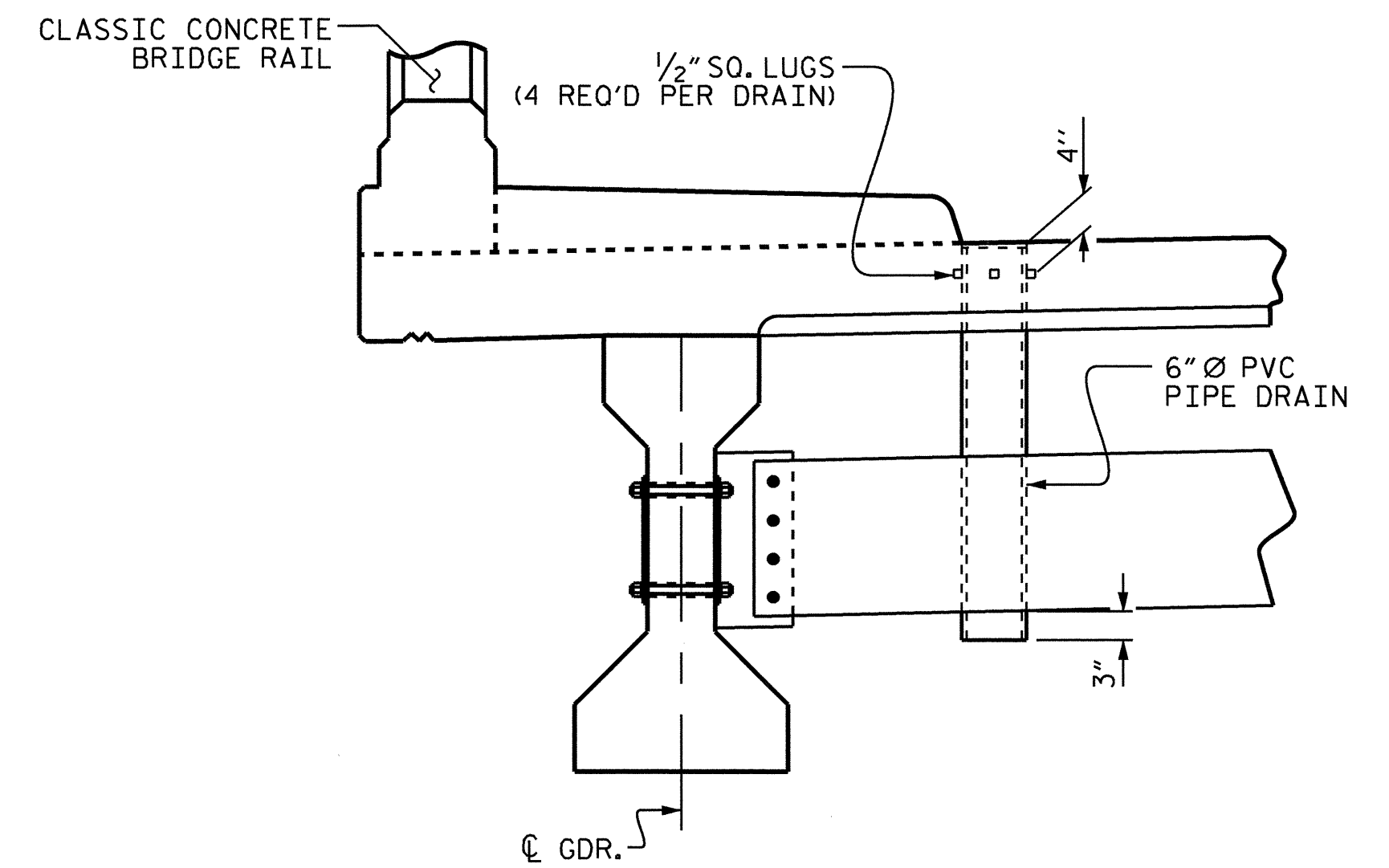
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| NO. | BY: | DATE: | NO. | BY: | DATE: | S-5 |
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| 2 | | | 4 | | | 41 |



SECTION THROUGH INTEGRAL END BENT

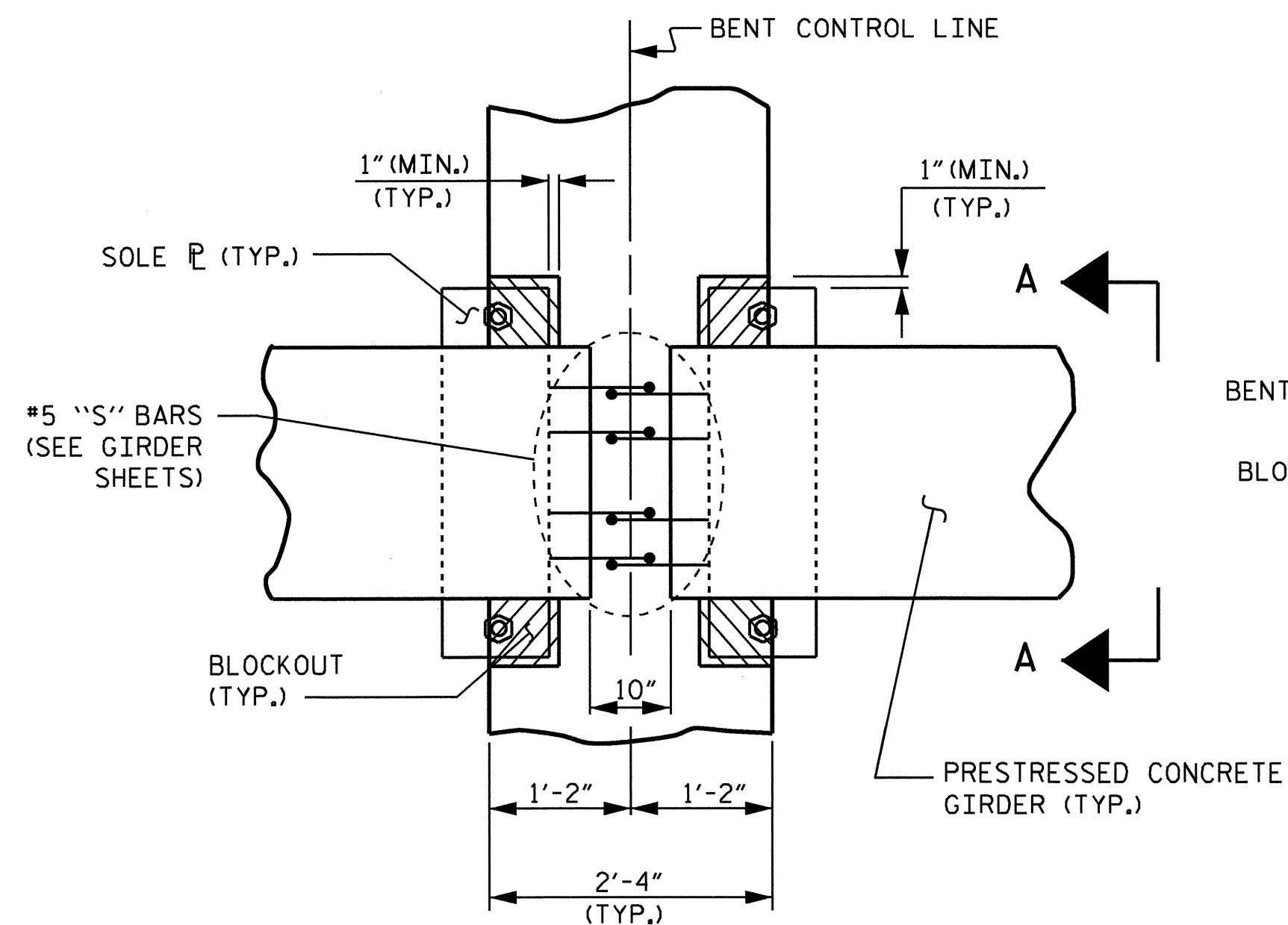


SECTION THROUGH BENT DIAPHRAGM

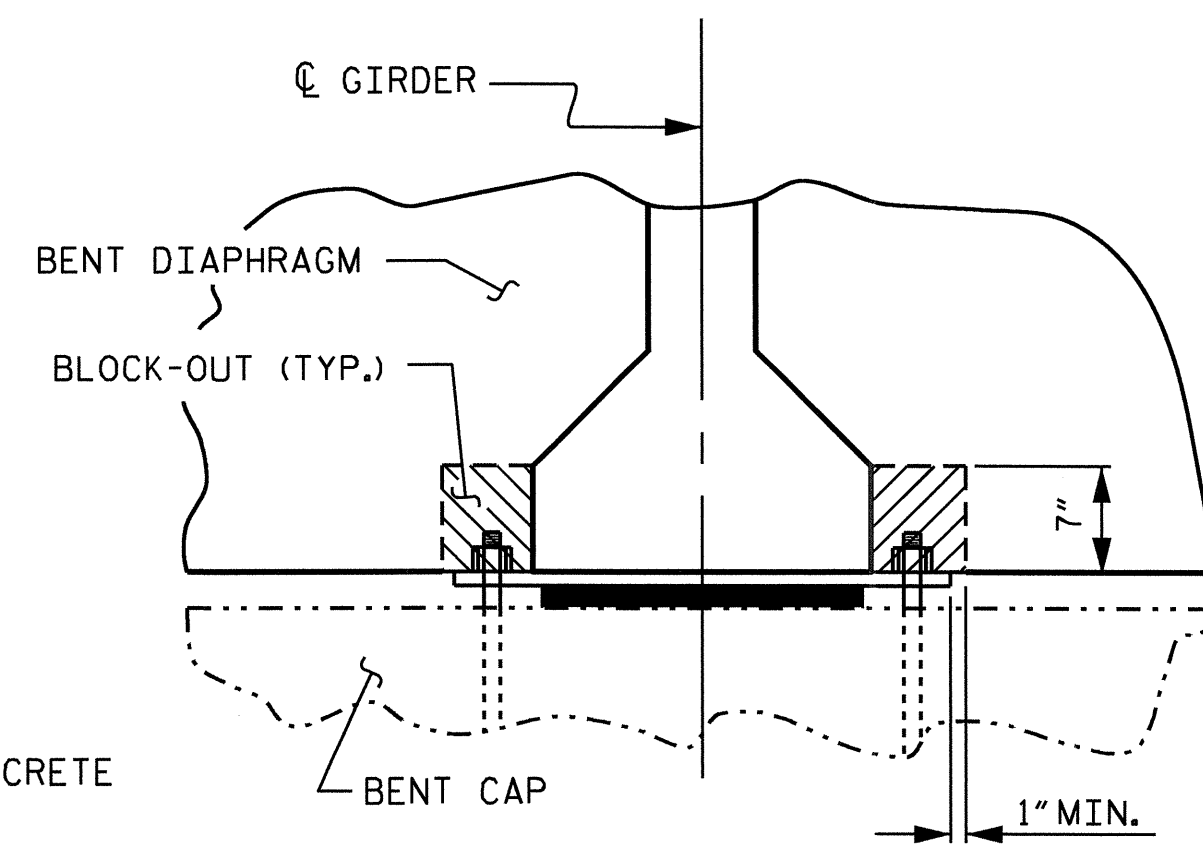


DRAIN DETAILS

TOP OF FLOOR DRAIN TO BE SET $\frac{3}{8}$ " BELOW SURFACE OF SLAB.
 4 - $\frac{1}{2}$ " SQUARE LUGS TO BE GLUED TO THE PVC PIPE AT EQUAL SPACES AROUND THE PIPE DRAIN APPROXIMATELY 4" FROM THE TOP OF THE PIPE.
 THE 6" Ø PVC PIPES AND FITTINGS SHALL BE SCHEDULE 40 AND CONFORM TO ASTM D1785.
 COUPLING IN DRAIN PIPE WILL BE PERMITTED AS APPROVED BY THE ENGINEER.
 SEE PLAN OF SPANS FOR LOCATION OF 6" Ø PVC PIPE DRAINS.



PLAN



SECTION A-A

BENT DIAPHRAGM BLOCKOUT DETAIL



PROJECT NO. B-4090
CUMBERLAND COUNTY
 STATION: 18+55.00 -L-

SHEET 2 OF 2

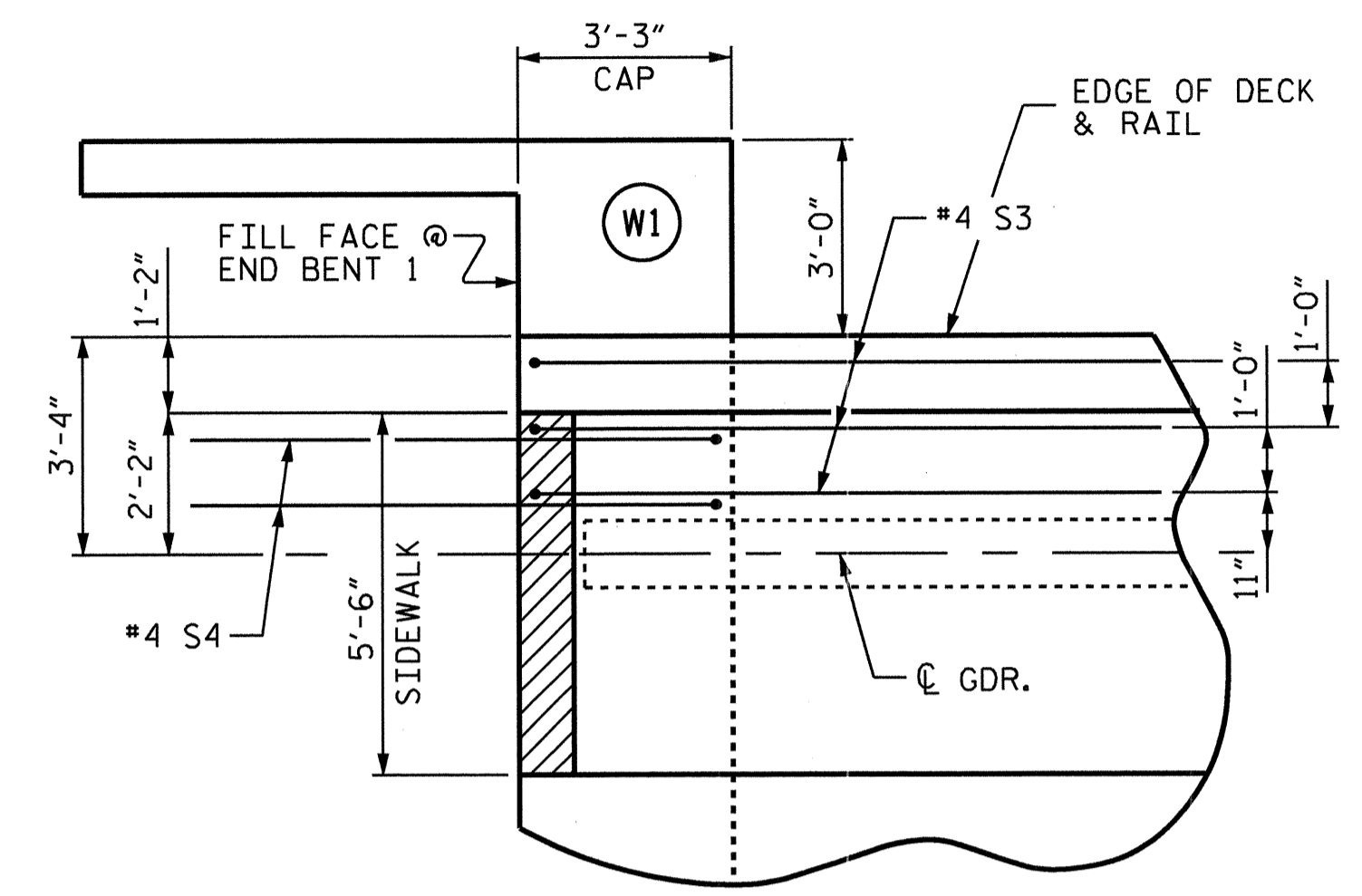
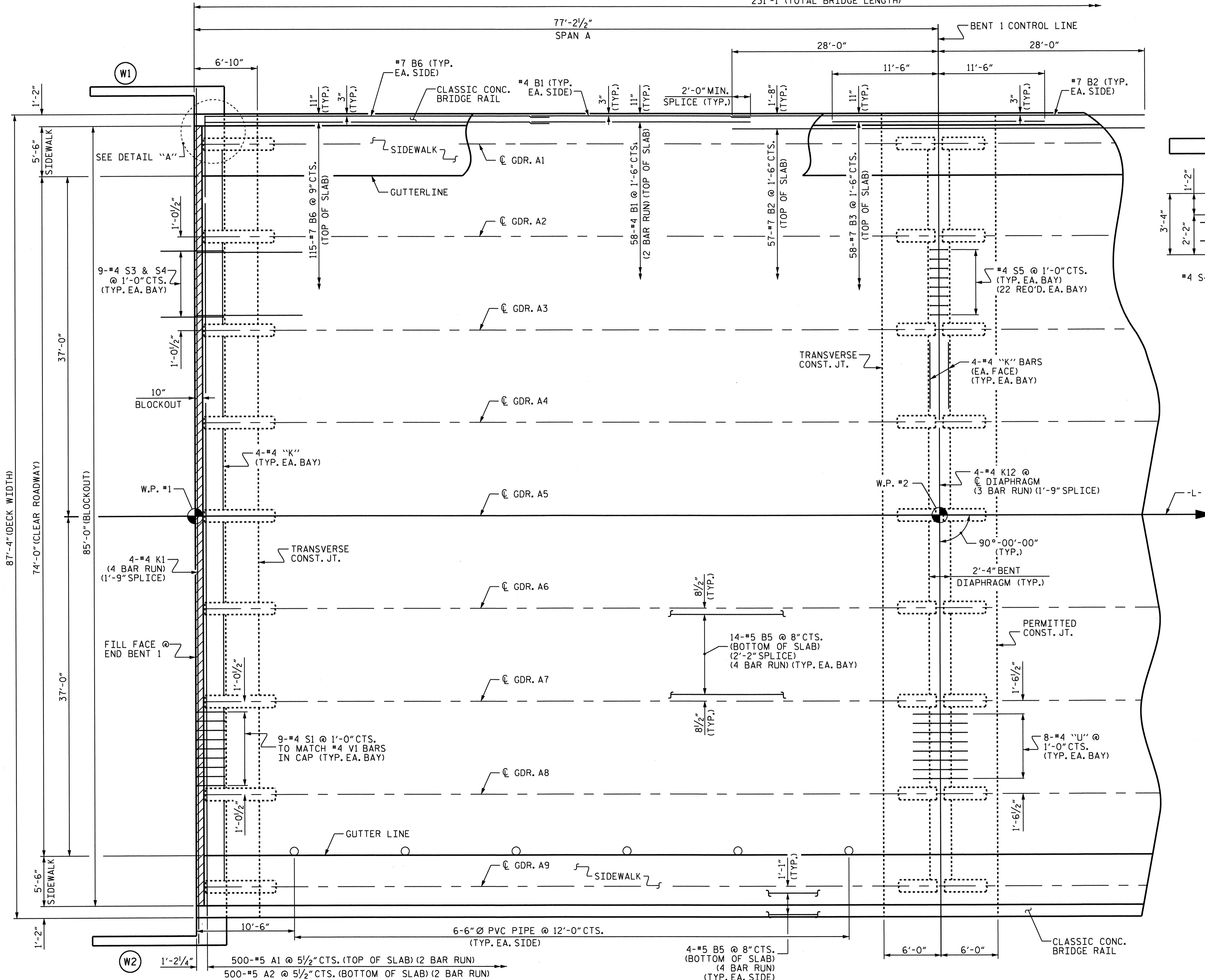
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 TYPICAL SECTION

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
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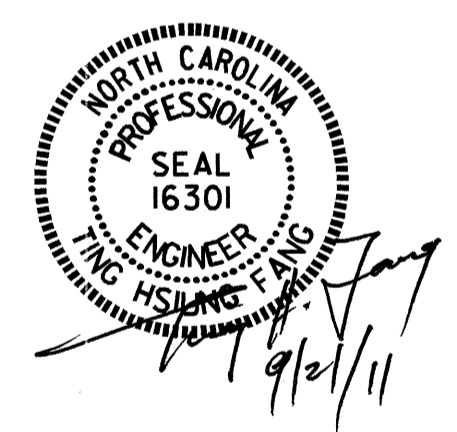
DRAWN BY : K.H. COMPTON DATE : 2/11
 CHECKED BY : J.H. CARDEN DATE : 3/11

231'-1" (TOTAL BRIDGE LENGTH)

77'-2 1/2"
SPAN A



DETAIL "A"
S1 BARS NOT SHOWN FOR CLARITY.
WING WALL W1 SHOWN, OTHER WINGS SIMILAR.



PROJECT NO. B-4090
CUMBERLAND COUNTY
STATION: 18+55.00 -L-

SHEET 1 OF 5

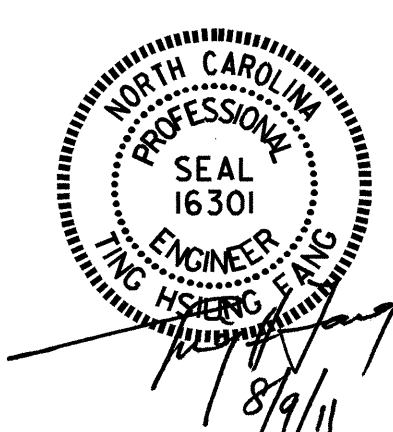
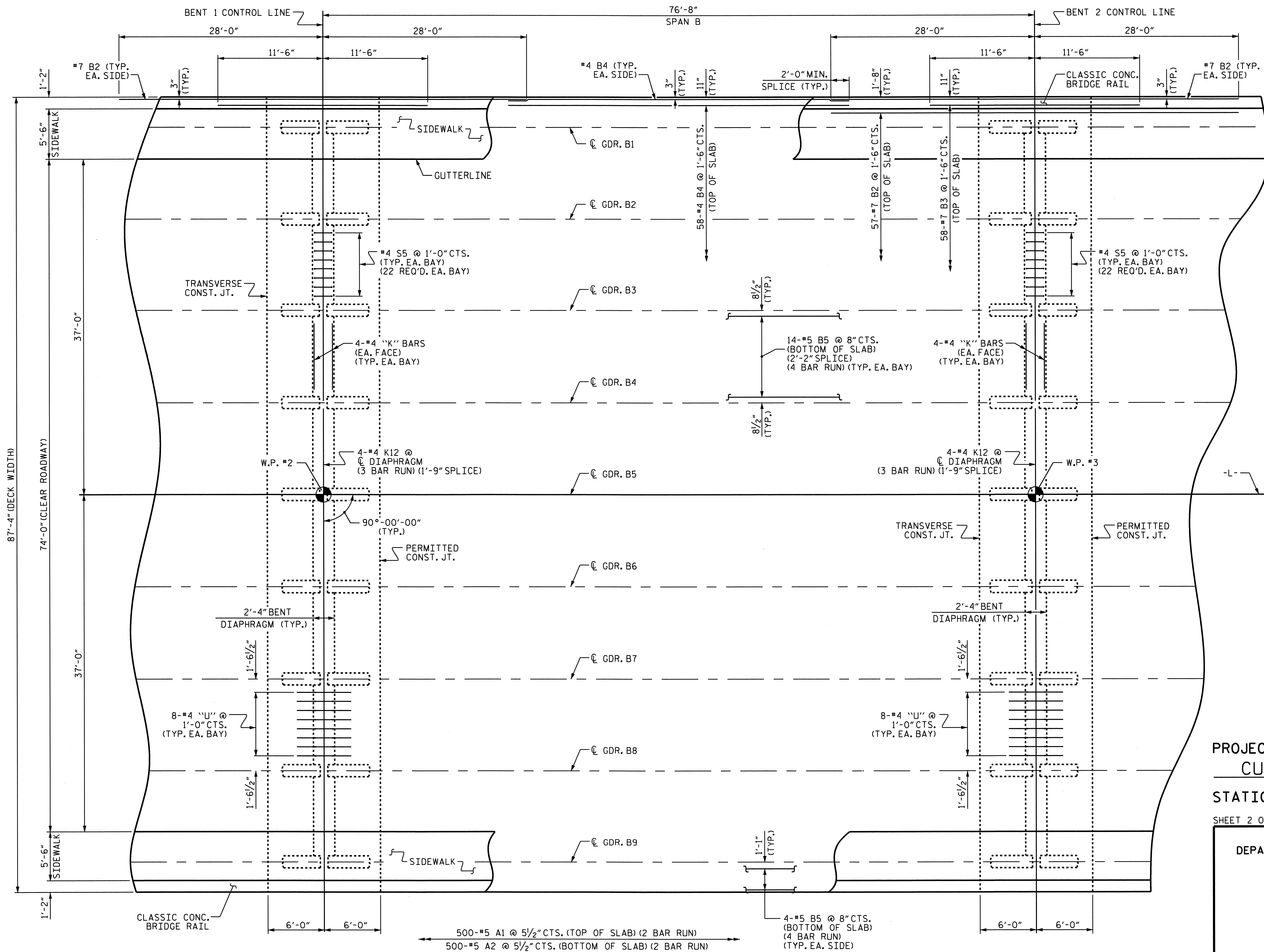
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
PLAN OF SPAN
SPAN A

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|-----------|-----|-------|-----|-----|-------|-----------|----|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-7 | |
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| 2 | | | 4 | | | SHEETS | |

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CHECKED BY : J.H. CARDEN DATE : 3/11

PLAN OF SPAN A

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PROJECT NO. B-4090
CUMBERLAND COUNTY
 STATION: 18+55.00 -L-
 SHEET 2 OF 5

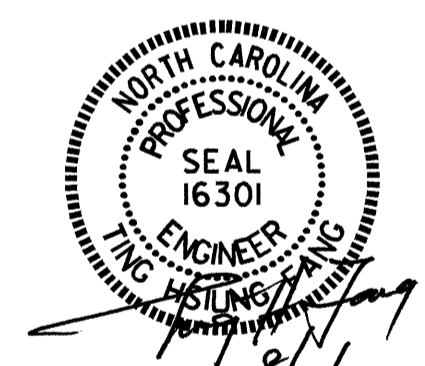
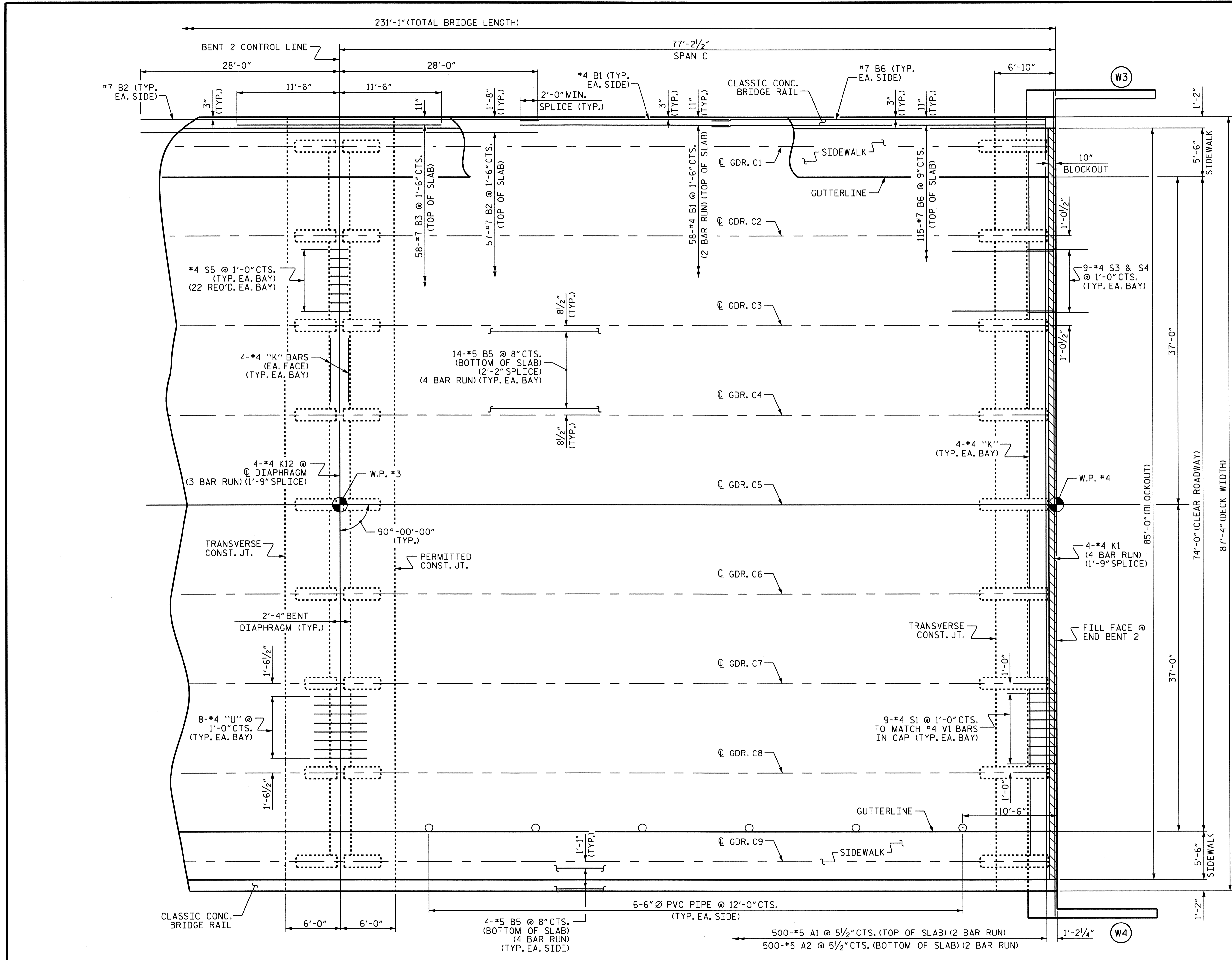
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PLAN OF SPAN
 SPAN B

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| NO. | BY: | DATE: | NO. | BY: | DATE: | S-8 |
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| 2 | | | 4 | | | 41 |

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 CHECKED BY : J.H. CARDEN DATE : 3/11

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 OTNGUYEN

PLAN OF SPAN B



PROJECT NO. B-4090
CUMBERLAND COUNTY
 STATION: 18+55.00 -L-
 SHEET 3 OF 5

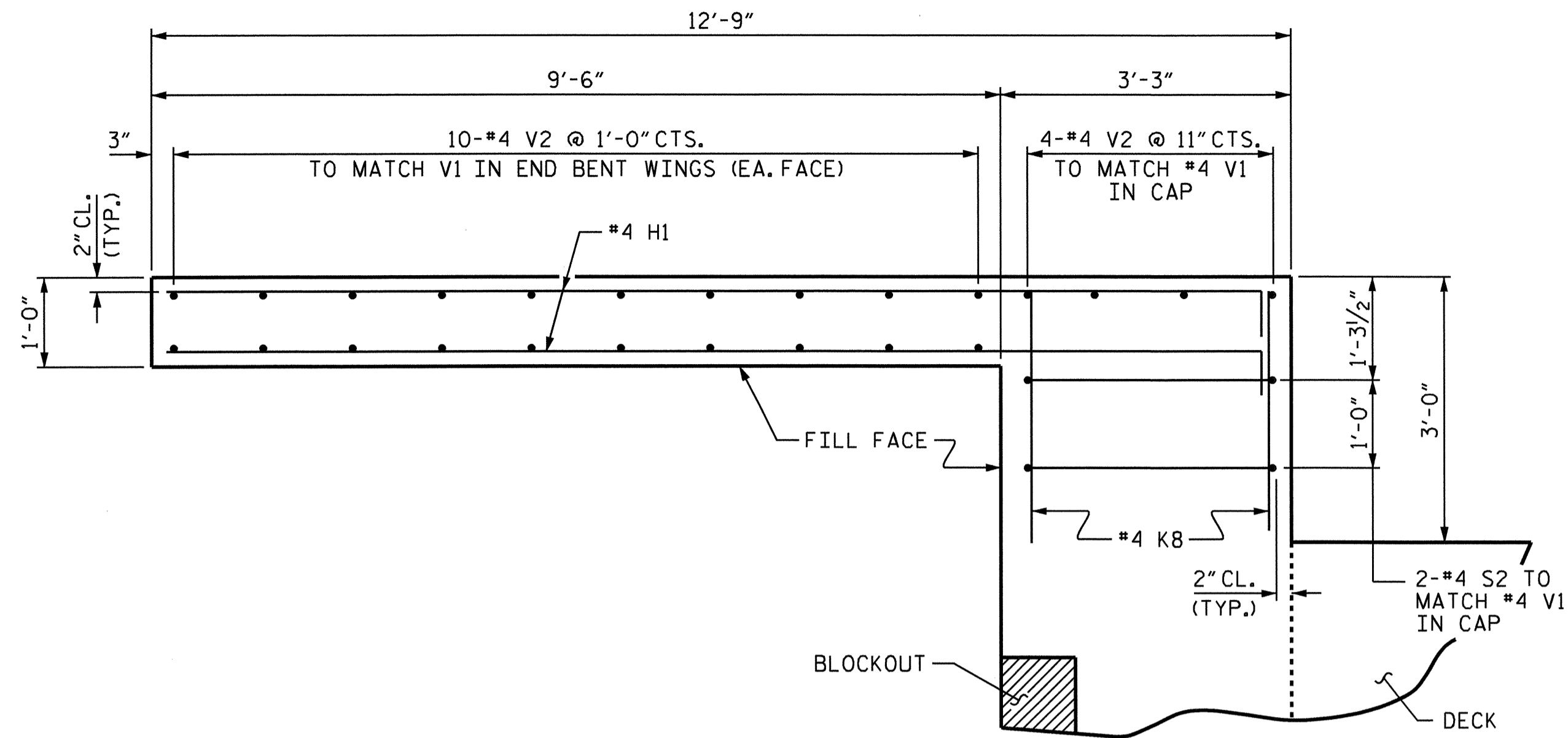
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PLAN OF SPAN
 SPAN C

| REVISIONS | | | | | | SHEET NO. | |
|-----------|-----|-------|-----|-----|-------|--------------|----|
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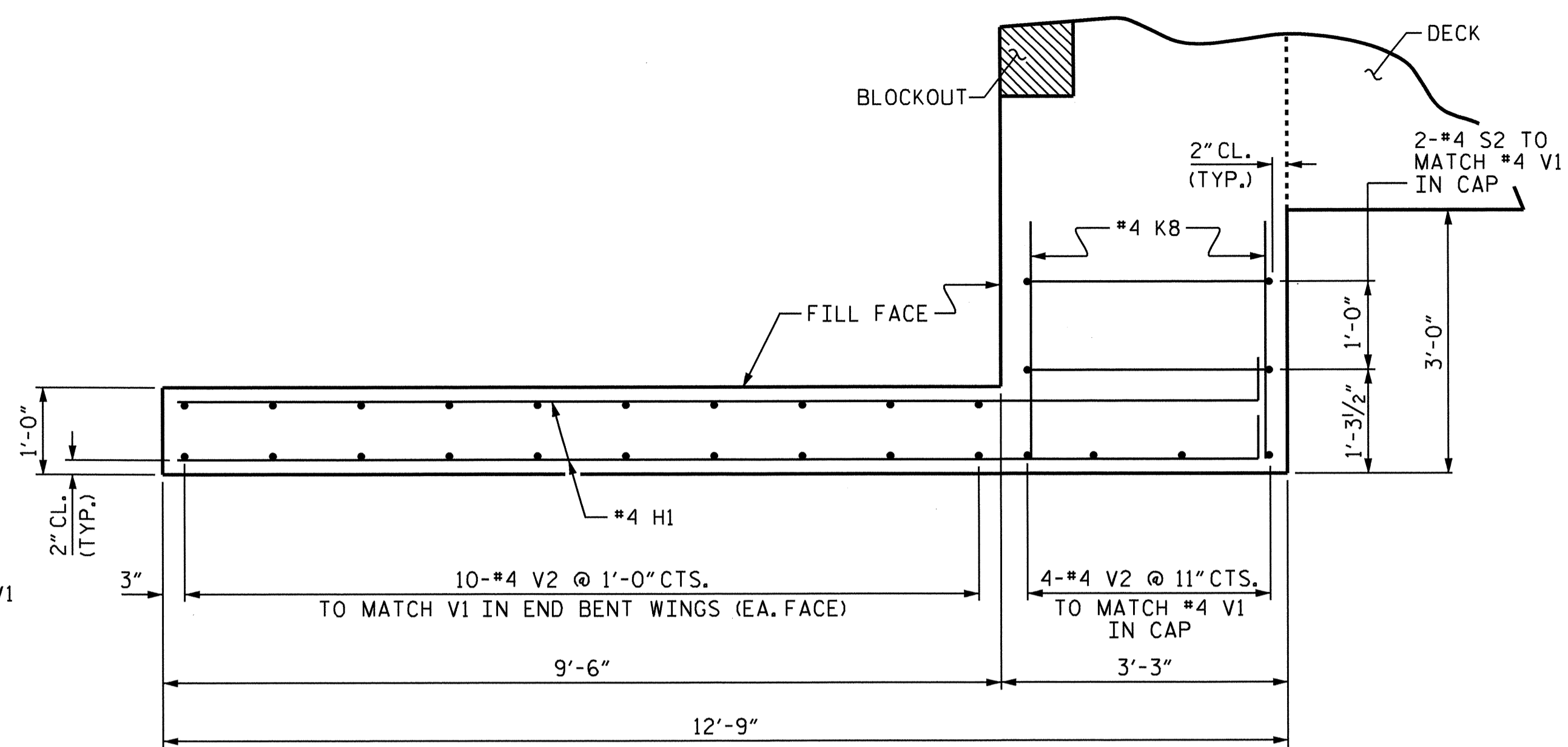
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 CHECKED BY : J.H. CARDEN DATE : 3/11

PLAN OF SPAN C

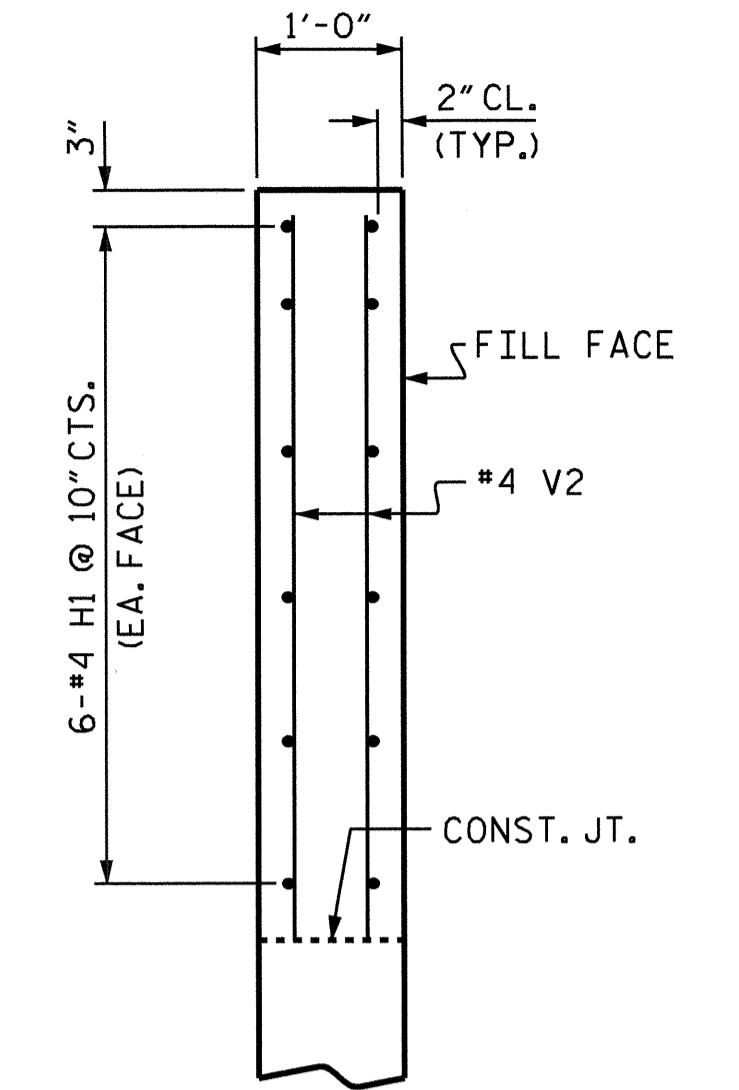
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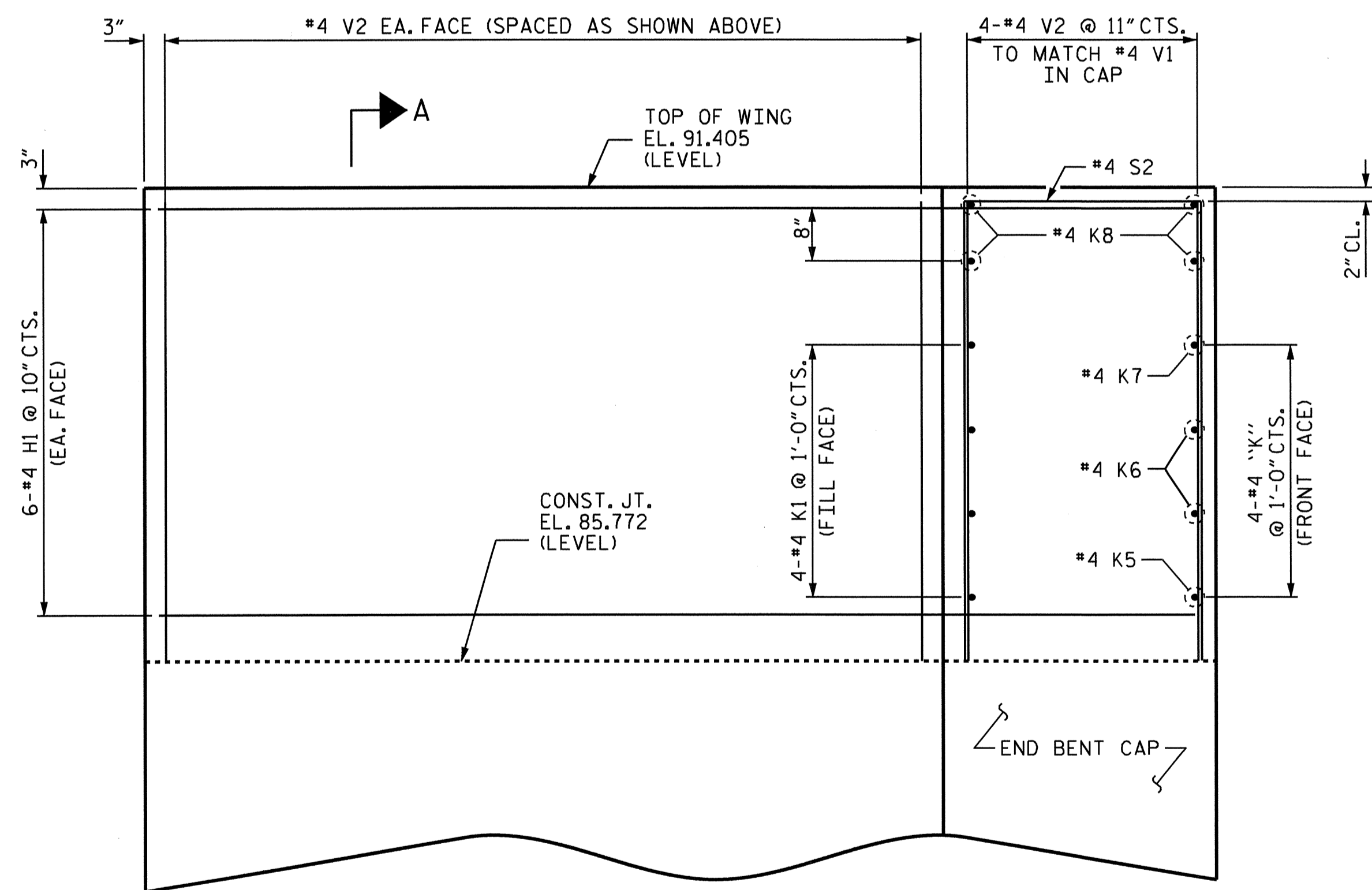
PLAN OF WING (W1)



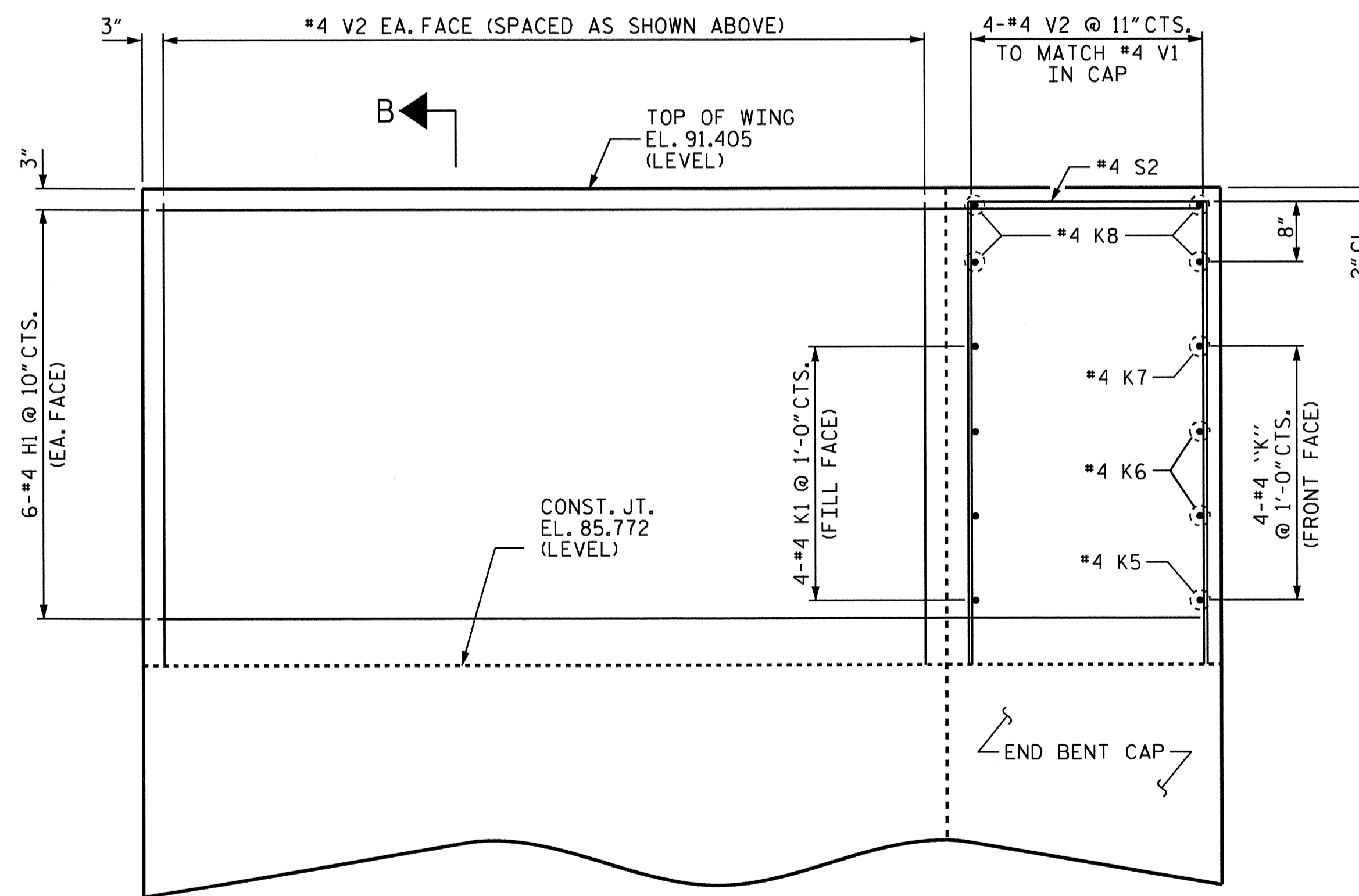
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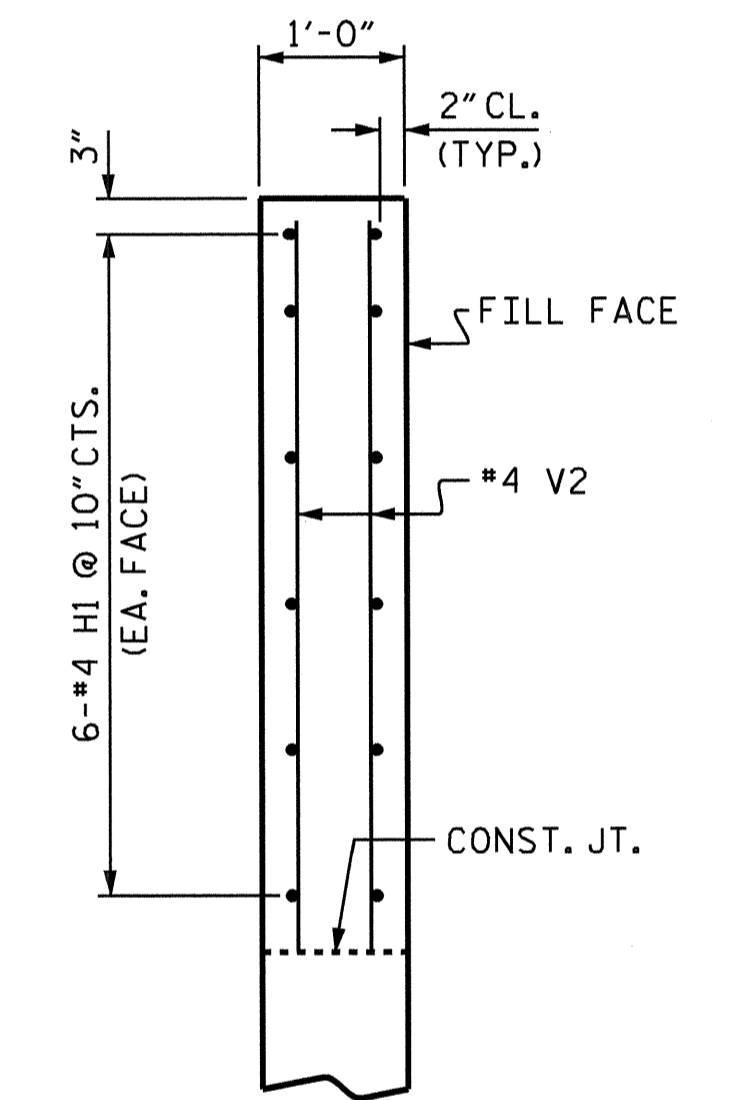
SECTION A-A



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

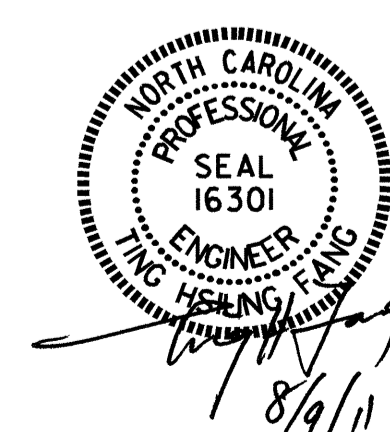


SECTION B-B

PROJECT NO. B-4090
CUMBERLAND COUNTY
 STATION: 18+55.00 -L-

SHEET 4 OF 5

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

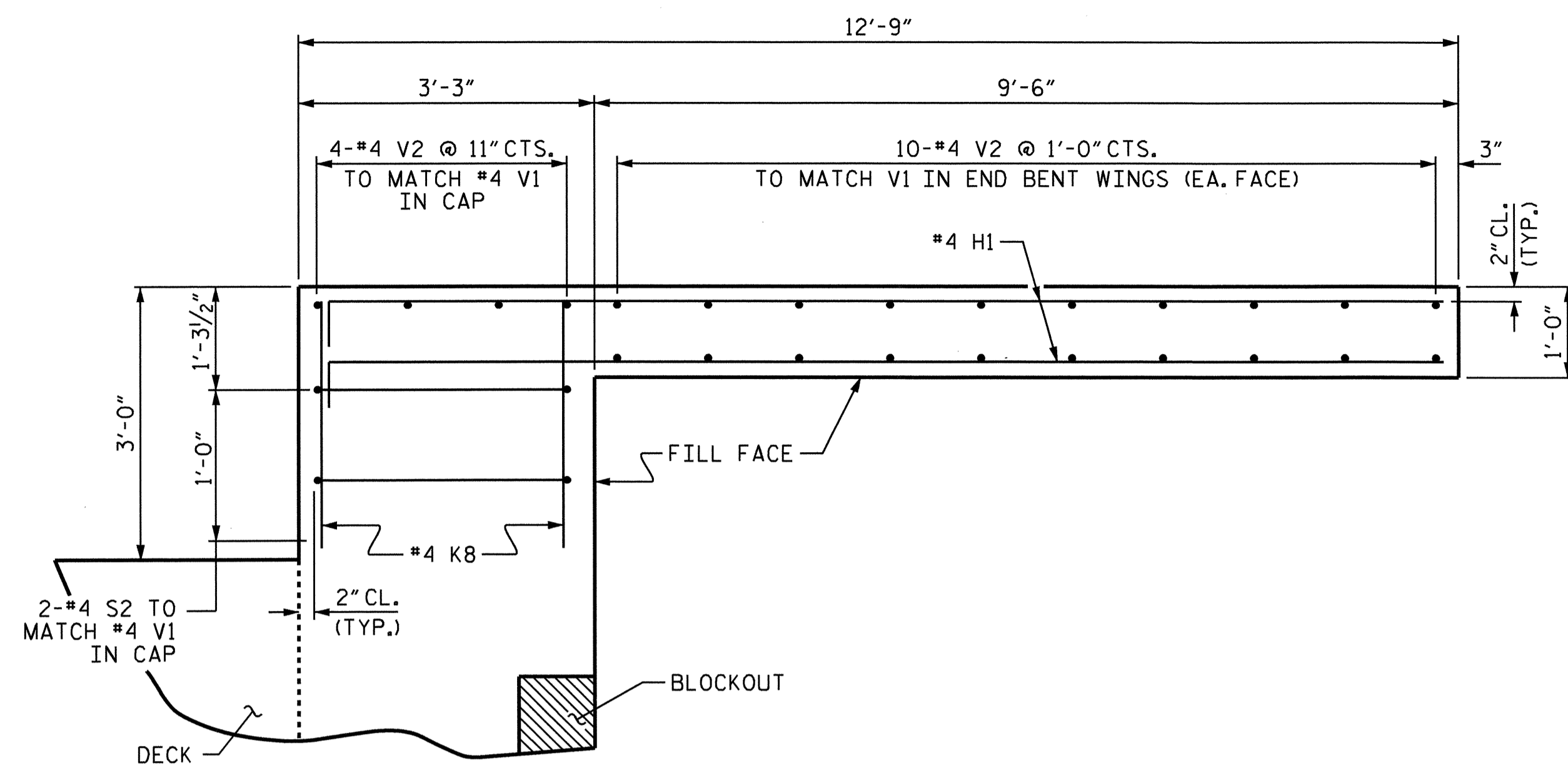


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 CHECKED BY: J.H. CARDEN DATE: 3/11

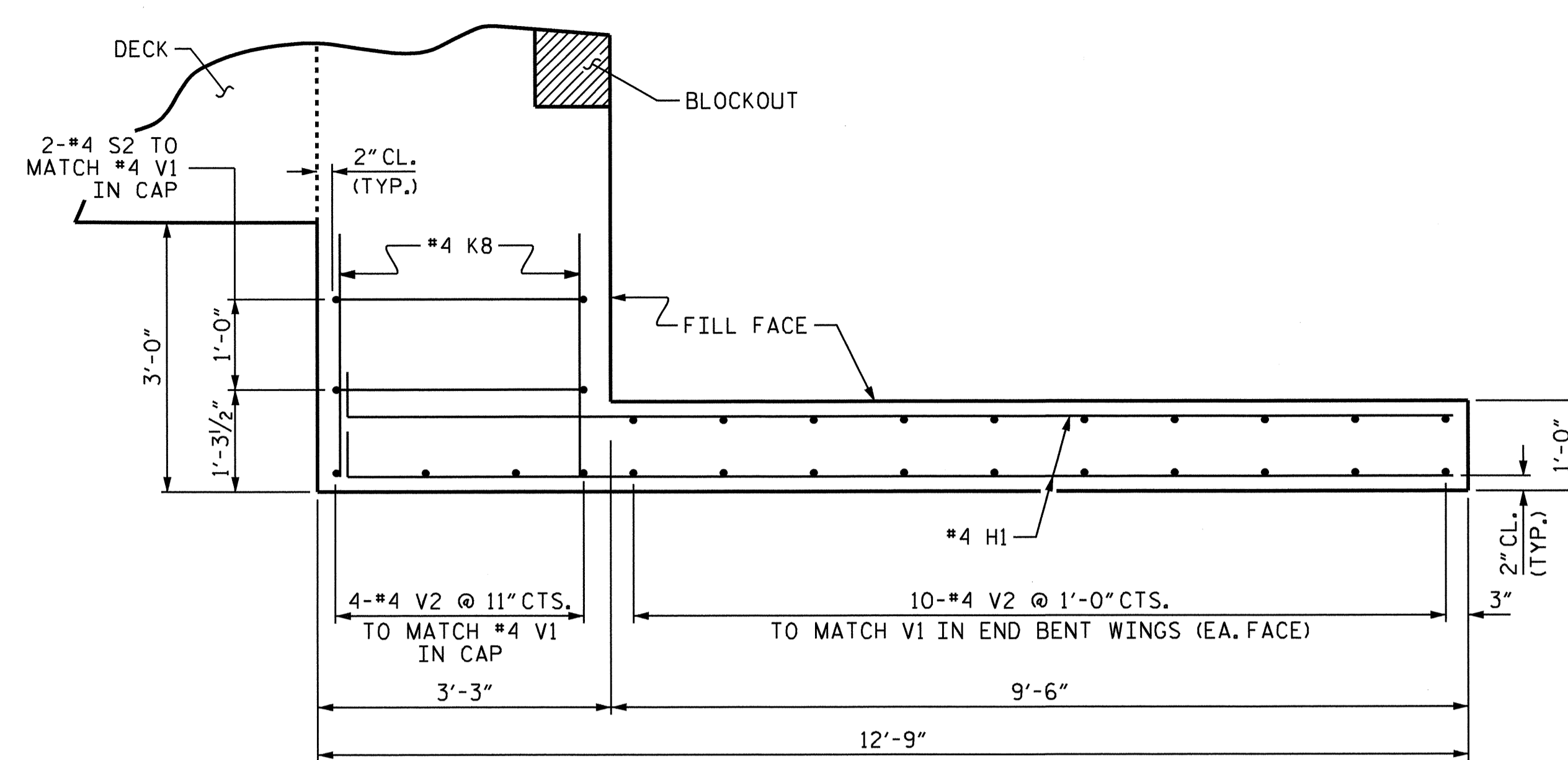
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ABUTMENT WINGS
 FOR END BENT REINFORCING STEEL AND DETAILS.
 SEE "SUBSTRUCTURE END BENTS 1 & 2" SHEETS.

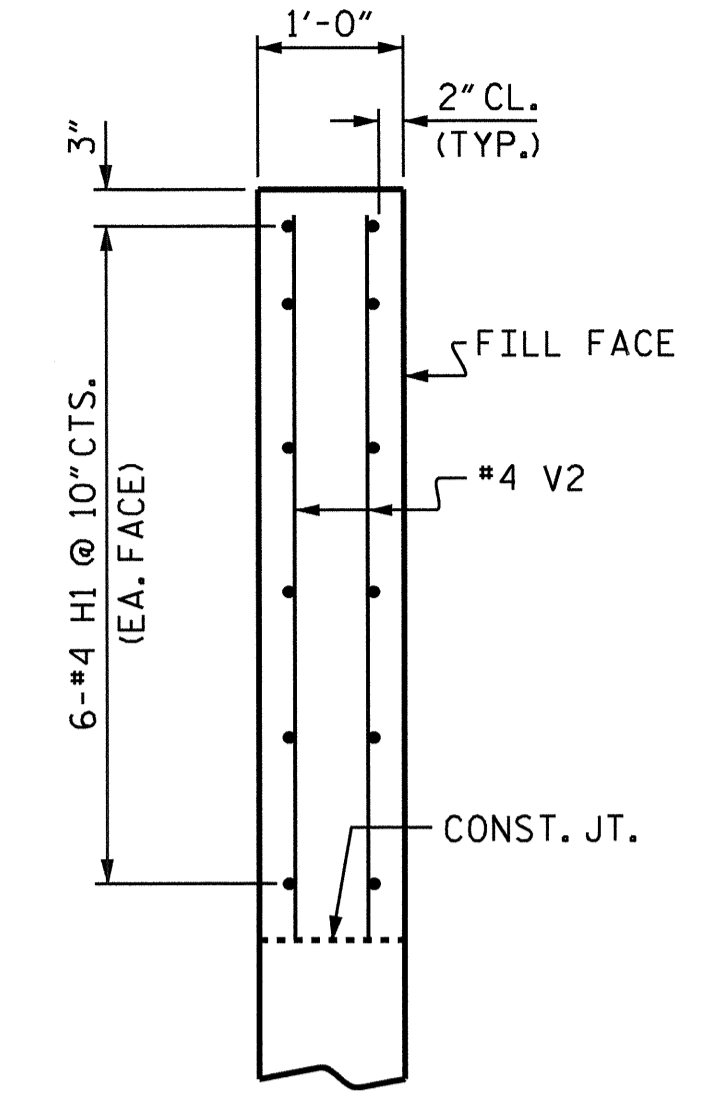
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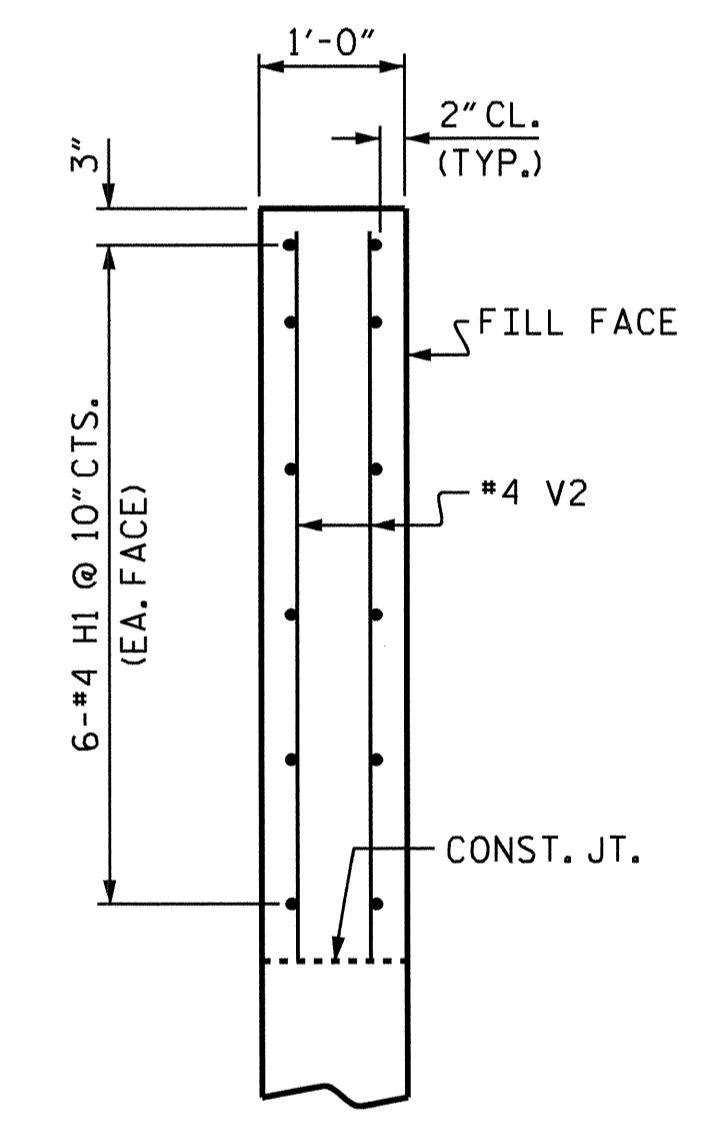
PLAN OF WING (W3)



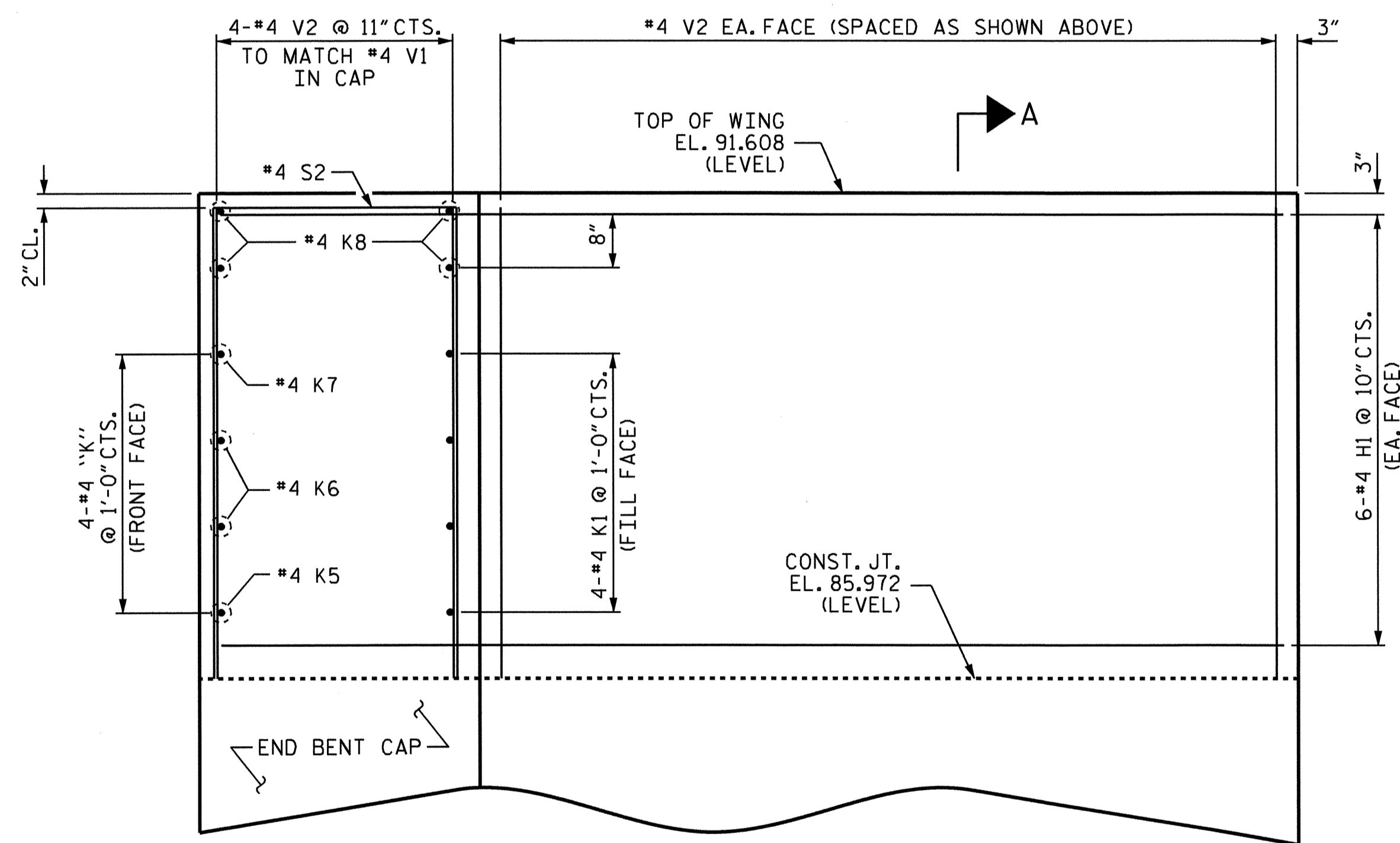
PLAN OF WING (W4)



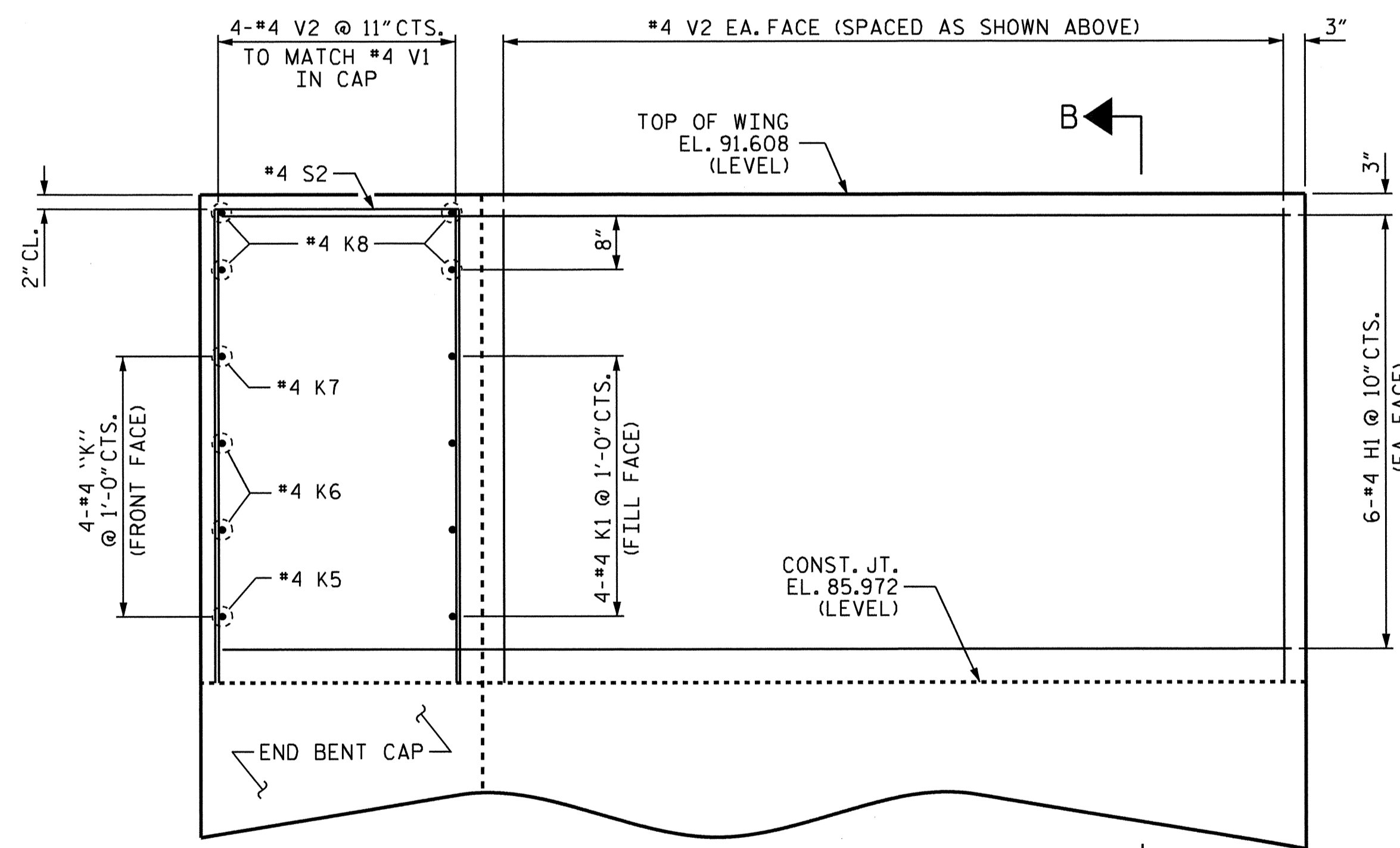
SECTION A-A



SECTION B-B



ELEVATION OF WING (W3)

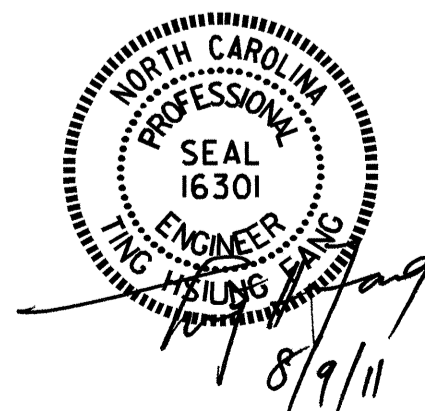


ELEVATION OF WING (W4)

PROJECT NO. B-4090
 CUMBERLAND COUNTY
 STATION: 18+55.00 -L-

SHEET 5 OF 5

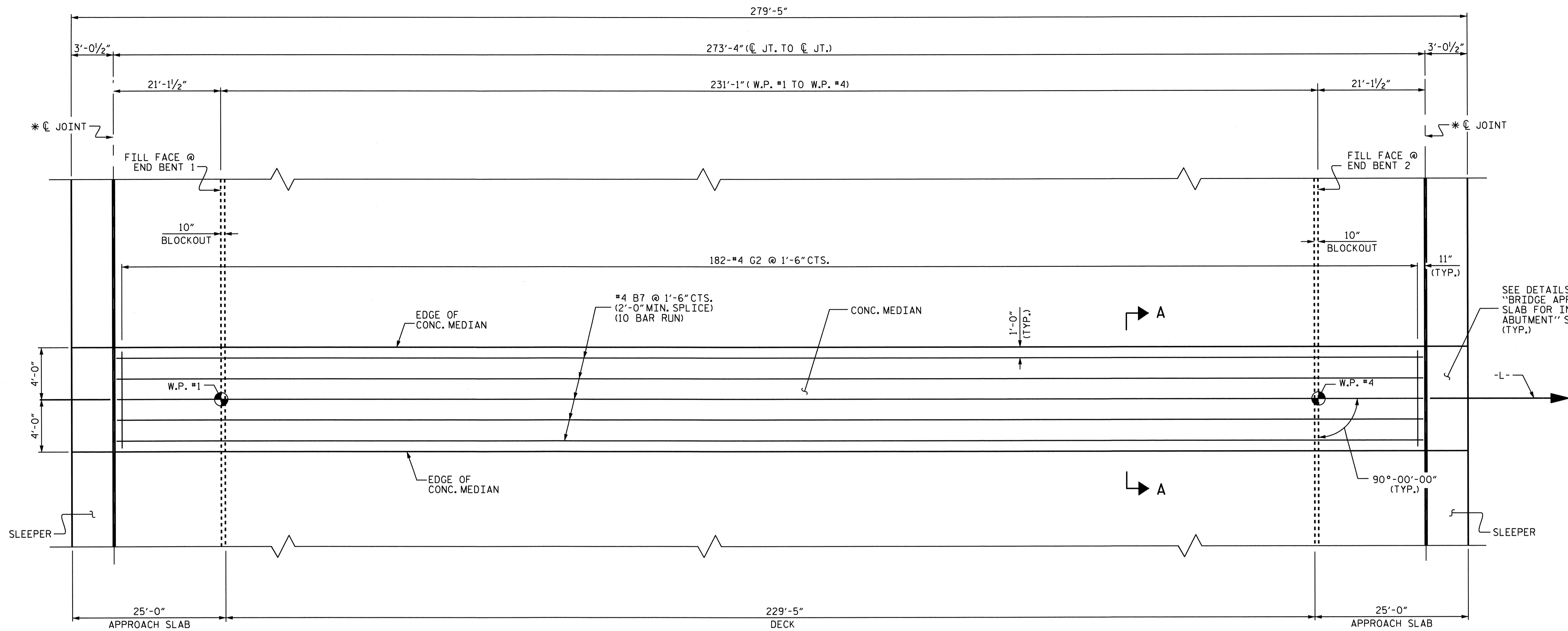
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|--|-----|-------|-----|-----|--------------------|
| STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH | | | | | |
| SUPERSTRUCTURE PLAN OF SPAN DETAILS | | | | | |
| REVISIONS | | | | | |
| NO. | BY: | DATE: | NO. | BY: | DATE: |
| 1 | | | 3 | | |
| 2 | | | 4 | | |
| SHEET NO. S-11 | | | | | TOTAL SHEETS 41 |



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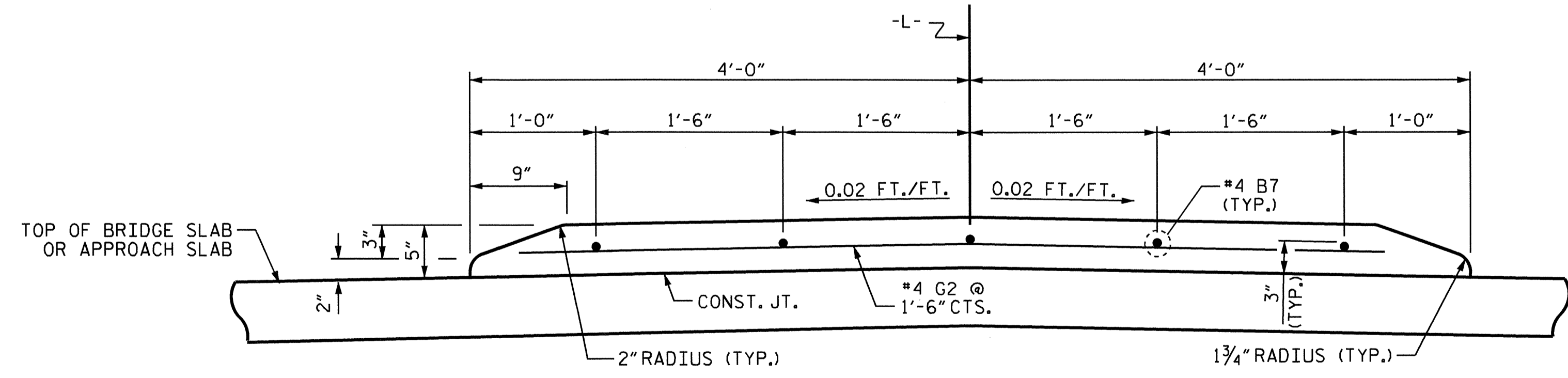
ABUTMENT WINGS
 FOR END BENT REINFORCING STEEL AND DETAILS,
 SEE "SUBSTRUCTURE END BENTS 1 & 2" SHEETS.



PLAN

* FOR EVAZOTE JOINT DETAILS IN APPROACH SLAB, SEE "BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT" DETAILS

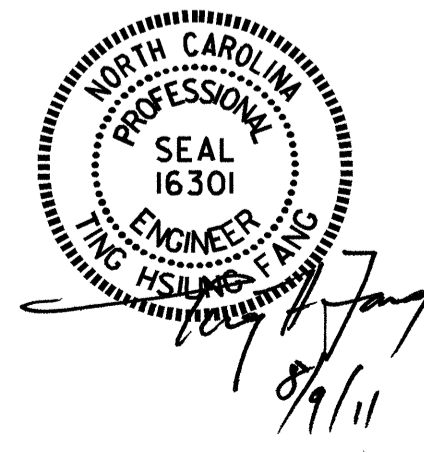
ALL REINFORCING STEEL IN THE CONCRETE MEDIAN SHALL BE EPOXY COATED.



SECTION A-A

FOR CONCRETE MEDIAN ON SLEEPER SLABS, SEE "BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT" SHEETS.
SEE NOTES ON "SIDEWALK DETAILS" SHEET.

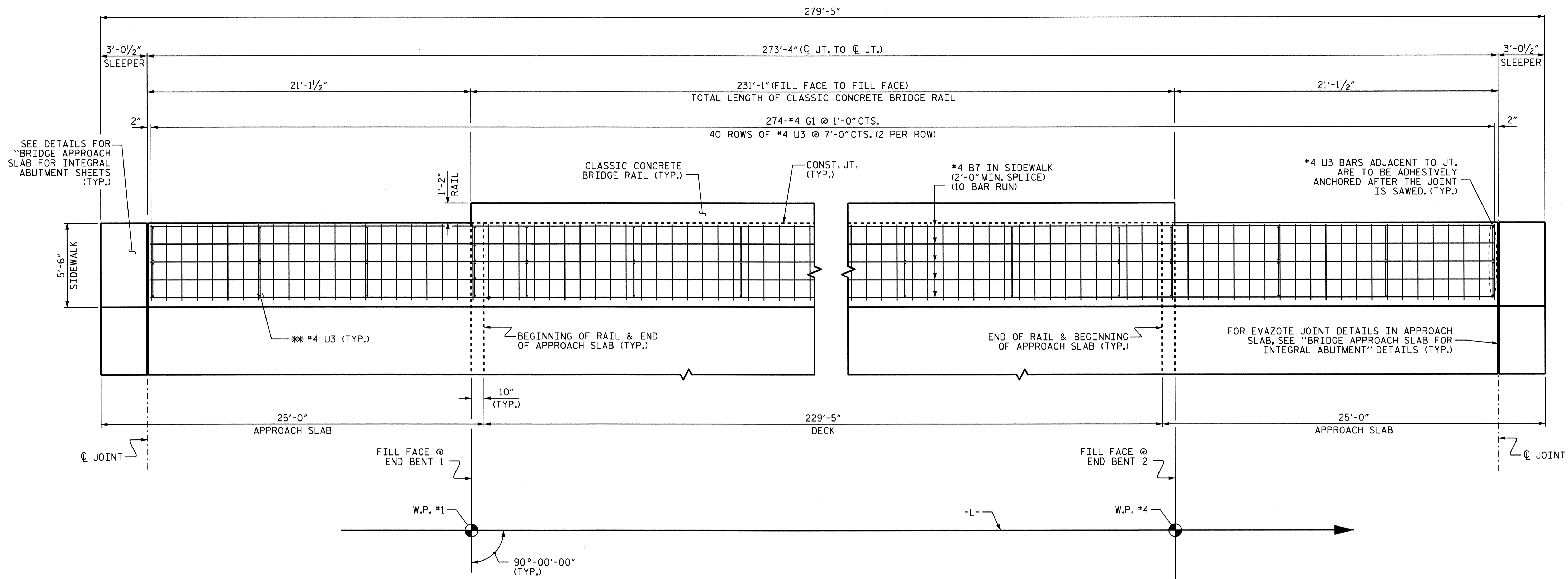
PROJECT NO. B-4090
CUMBERLAND COUNTY
STATION: 18+55.00 -L-



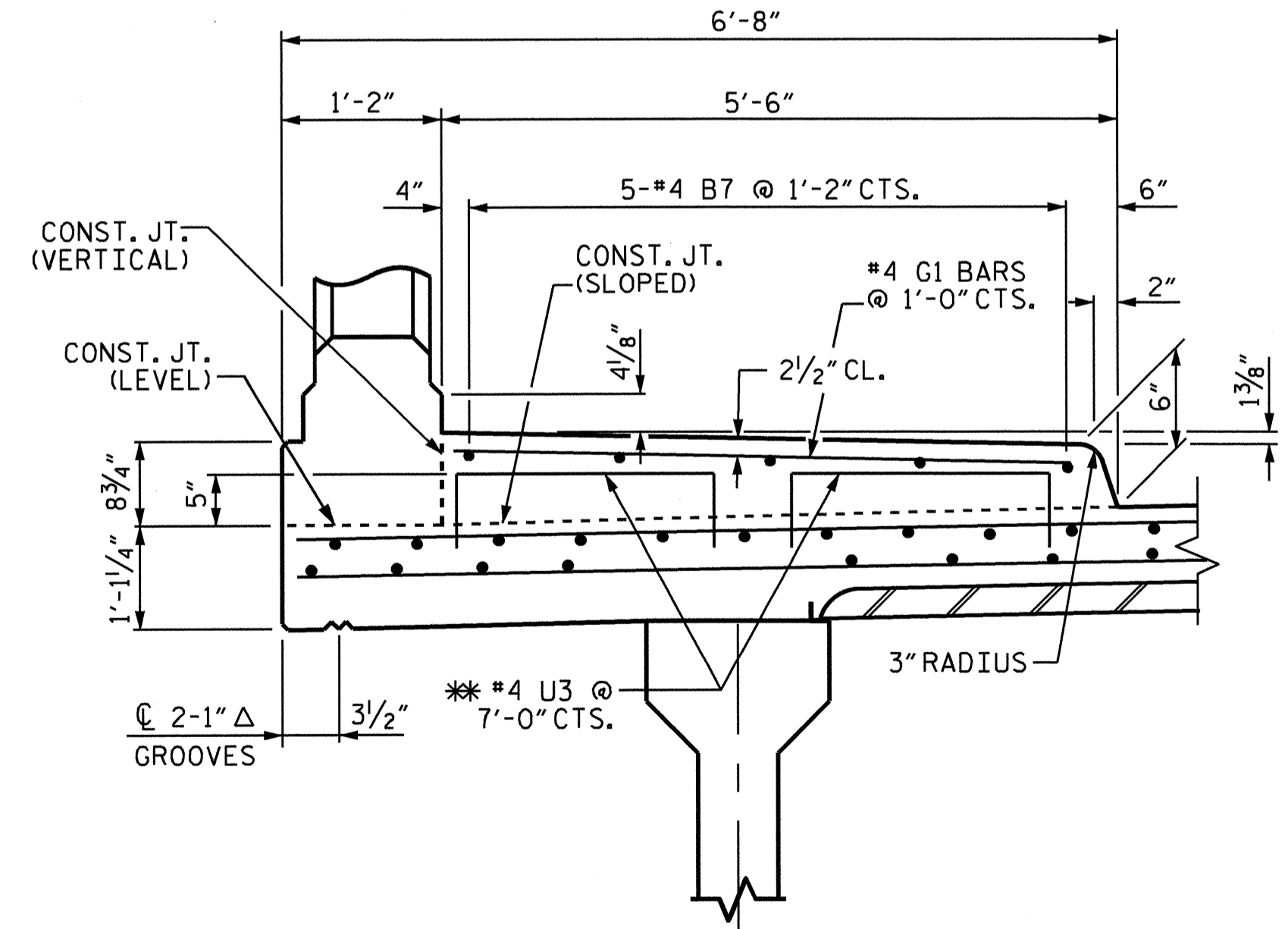
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
CONCRETE MEDIAN
DETAILS

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-12 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 41 |

DRAWN BY: OT NGUYEN DATE: 7/27/11
CHECKED BY: T. H. FANG DATE: 7/28/11



PLAN OF SIDEWALK
LEFT SIDE SHOWN, RIGHT SIDE SIMILAR



SECTION THRU SIDEWALK

FOR SECTION AND DETAILS ON SLEEPER SLABS SEE "BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT" SHEET.

NOTES:

- THE JOINTS IN THE APPROACH SLABS SHALL BE SAWED PRIOR TO THE CASTING OF THE SIDEWALK & CONCRETE MEDIAN.
- GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK & CONCRETE MEDIAN IN ACCORDANCE WITH ARTICLE B25-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FEET TO 10 FEET BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINT WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.
- FOR SIDEWALK COVER PLATE DETAILS, SEE "BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT" SHEETS.
- FOR SIDEWALK AND CONCRETE MEDIAN DETAILS ON SLEEPER SLABS, SEE "BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT" SHEETS.
- FOR CLASSIC CONCRETE BRIDGE RAIL REINFORCING STEEL AND DETAILS, SEE "CLASSIC CONCRETE BRIDGE RAIL" SHEETS.
- * THE #4 U3 BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER DECK OR APPROACH SLAB HAS BEEN SCREEDED OFF, EXCEPT AS NOTED.

- SIDEWALKS AND CONCRETE MEDIAN ON THE BRIDGE EXTENDING TO THE EXPANSION JOINT IN THE APPROACH SLABS ARE INCLUDED IN THE SUPERSTRUCTURE BILL OF MATERIAL AND PAID FOR AS PART OF THE REINFORCED CONCRETE DECK PAY ITEM. SIDEWALKS ON THE SLEEPER SLAB ONLY ARE INCLUDED IN THE APPROACH SLAB BILL OF MATERIAL AND PAID FOR AS PART OF THE BRIDGE APPROACH SLABS PAY ITEM.
- THE SIDEWALKS AND CONCRETE MEDIAN ON A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.
- ALL REINFORCING STEEL IN THE SIDEWALKS AND MEDIAN SHALL BE EPOXY COATED.



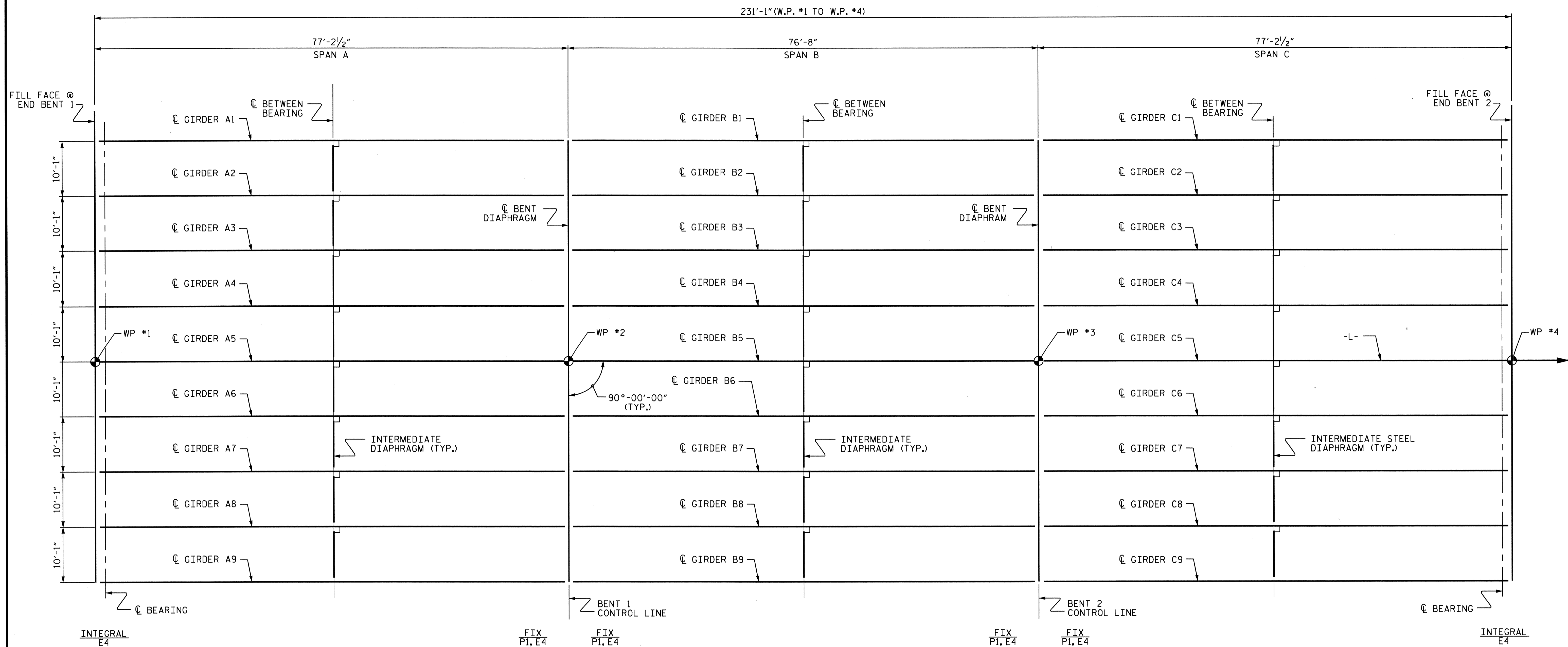
PROJECT NO. B-4090
CUMBERLAND COUNTY
STATION: 18+55.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
SIDEWALK DETAILS

DRAWN BY : K. H. COMPTON DATE : 2/11
CHECKED BY : O. T. NGUYEN DATE : 7/11

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| REVISIONS | | | | | | SHEET NO. |
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| 1 | | | 3 | | | TOTAL SHEETS 41 |
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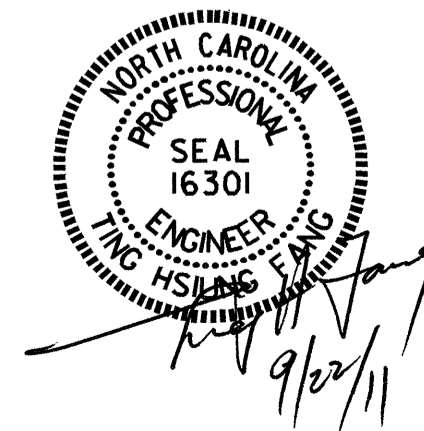


FRAMING PLAN

PROJECT NO. B-4090
CUMBERLAND COUNTY
 STATION: 18+55.00 -L-

| DEAD LOAD DEFLECTION TABLE | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------------------|----------------|---------------|---------|--------|--------|---------|---------|---------|--------|---------|---------|---|---------------|-------|---------|---------|---------|---------|---------|---------|---------|-------|---|
| 0.6" Ø LOW RELAXATION | SPANS A, B & C | | | | | | | | | | | | | | | | | | | | | | |
| | TENTH POINTS | GIRDERS 1 & 9 | | | | | | | | | | | GIRDERS 2 - 8 | | | | | | | | | | |
| | | 0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 | 0 | 0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 | 0 |
| CAMBER (GIRDER ALONE IN PLACE) | ↑ | 0 | 1.223 | 2.314 | 3.169 | 3.711 | 3.897 | 3.711 | 3.169 | 2.314 | 1.223 | 0 | 0 | 1.223 | 2.314 | 3.169 | 3.711 | 3.897 | 3.711 | 3.169 | 2.314 | 1.223 | 0 |
| * DEFLECTION DUE TO SUPERIMPOSED D.L. | ↓ | 0 | 0.413 | 0.782 | 1.071 | 1.254 | 1.317 | 1.254 | 1.071 | 0.782 | 0.413 | 0 | 0 | 0.468 | 0.885 | 1.211 | 1.419 | 1.490 | 1.419 | 1.211 | 0.885 | 0.469 | 0 |
| FINAL CAMBER | ↑ | 0 | 1 3/16" | 1 1/8" | 2 1/8" | 2 7/16" | 2 9/16" | 2 7/16" | 2 1/8" | 1 1/16" | 1 3/16" | 0 | 0 | 3/4" | 1 1/16" | 1 5/16" | 2 5/16" | 2 7/16" | 2 5/16" | 1 5/16" | 1 7/16" | 3/4" | 0 |

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

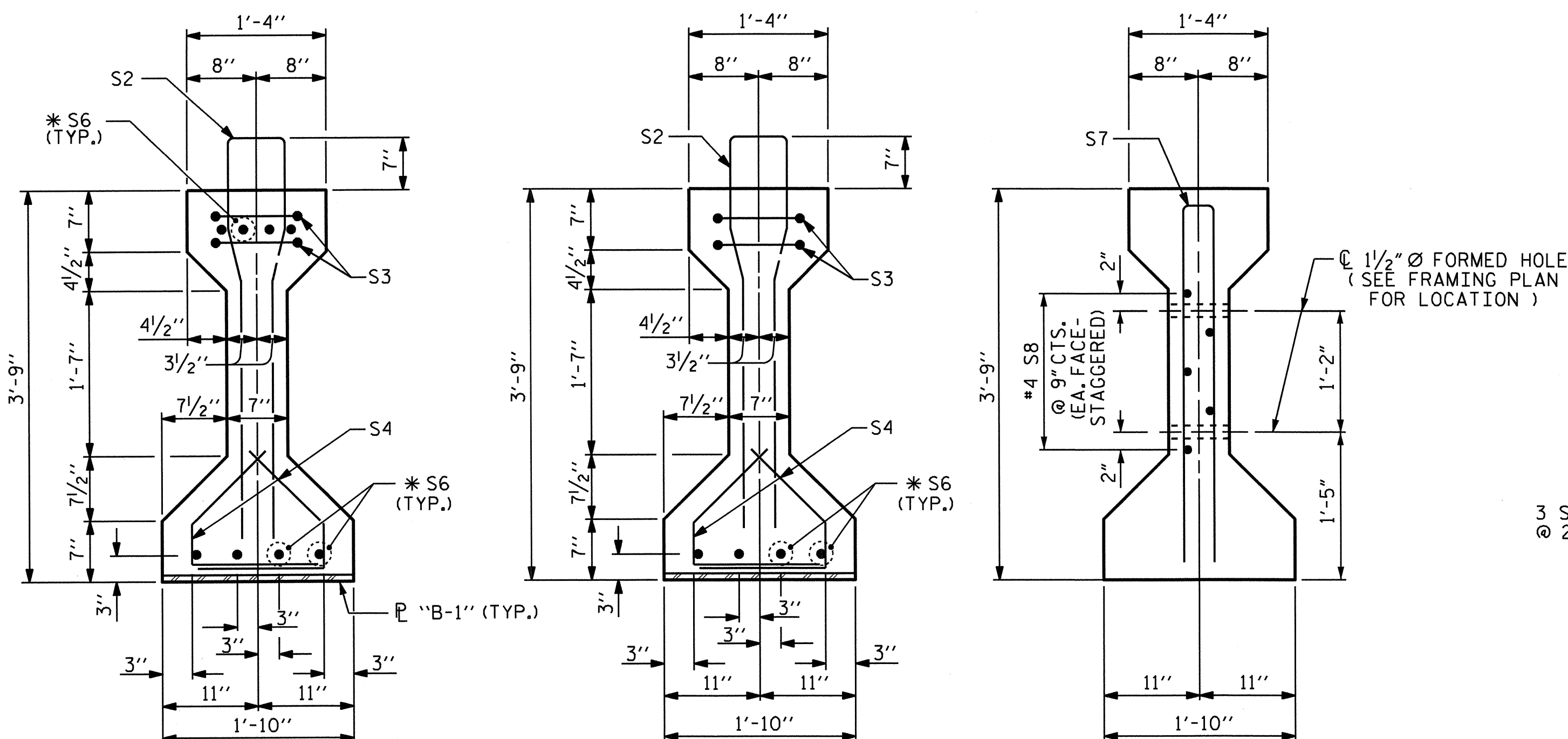


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE

**FRAMING PLAN &
 DEAD LOAD
 DEFLECTIONS**

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-14 |
| 1 | | | 3 | | | TOTAL SHEETS |
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DRAWN BY : K.H. COMPTON DATE : 2/11
 CHECKED BY : J.H. CARDEN DATE : 3/11



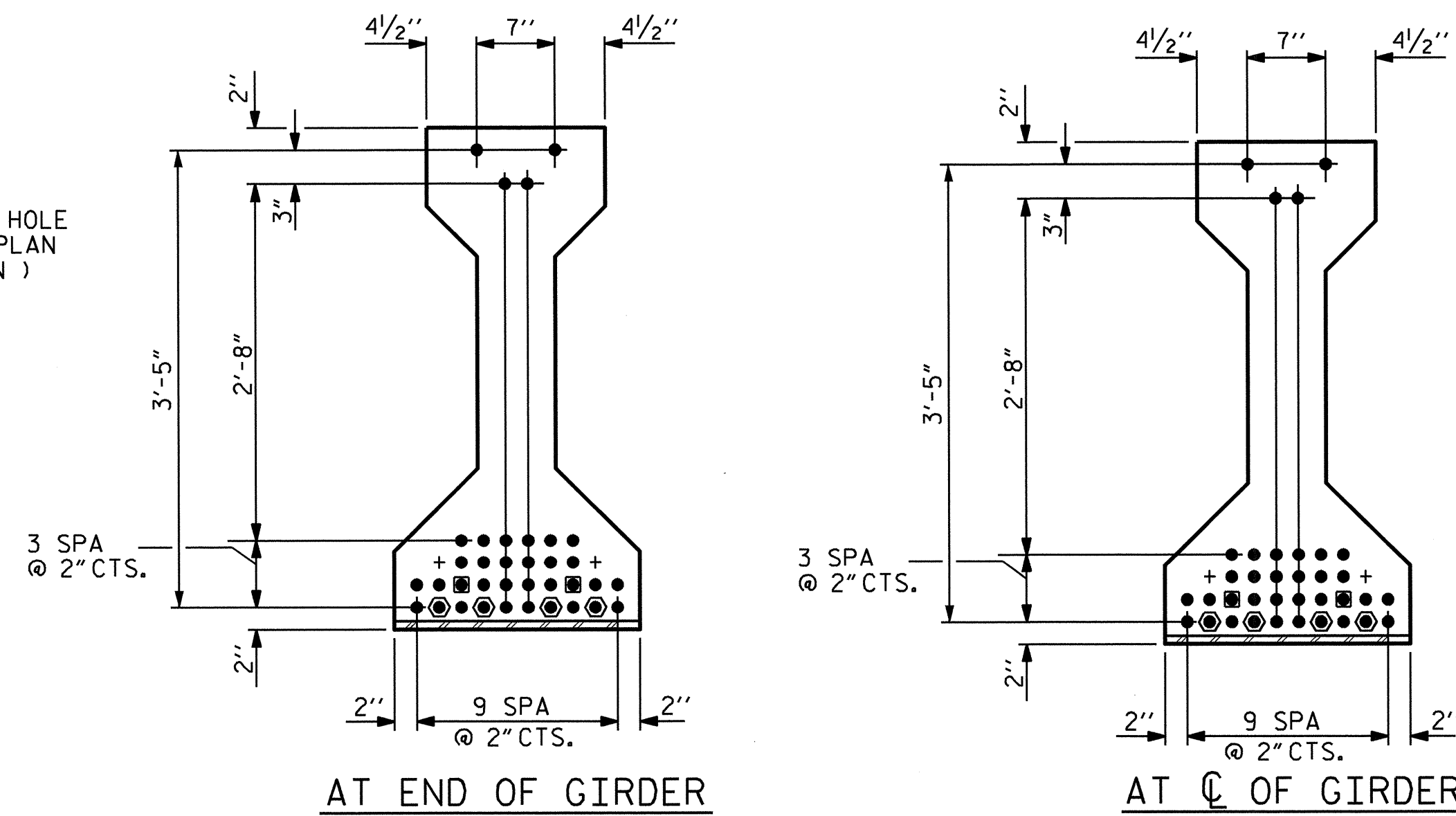
SECTION A-A

(FOR EMBEDDED "B-1" DETAILS SEE SHEET 3 OF 3)

SECTION B-B

SECTION C-C

(S1 BARS NOT SHOWN)



0.6" Ø LOW RELAXATION STRAND LAYOUT

(36 STRANDS, ALL STRAIGHT, 6 DEBONDED STRANDS)

DEBONDING LEGEND

- FULLY BONDED STRANDS
- ⊙ STRANDS DEBONDED FOR 18'-0" FROM END OF GIRDER
- ⊠ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER

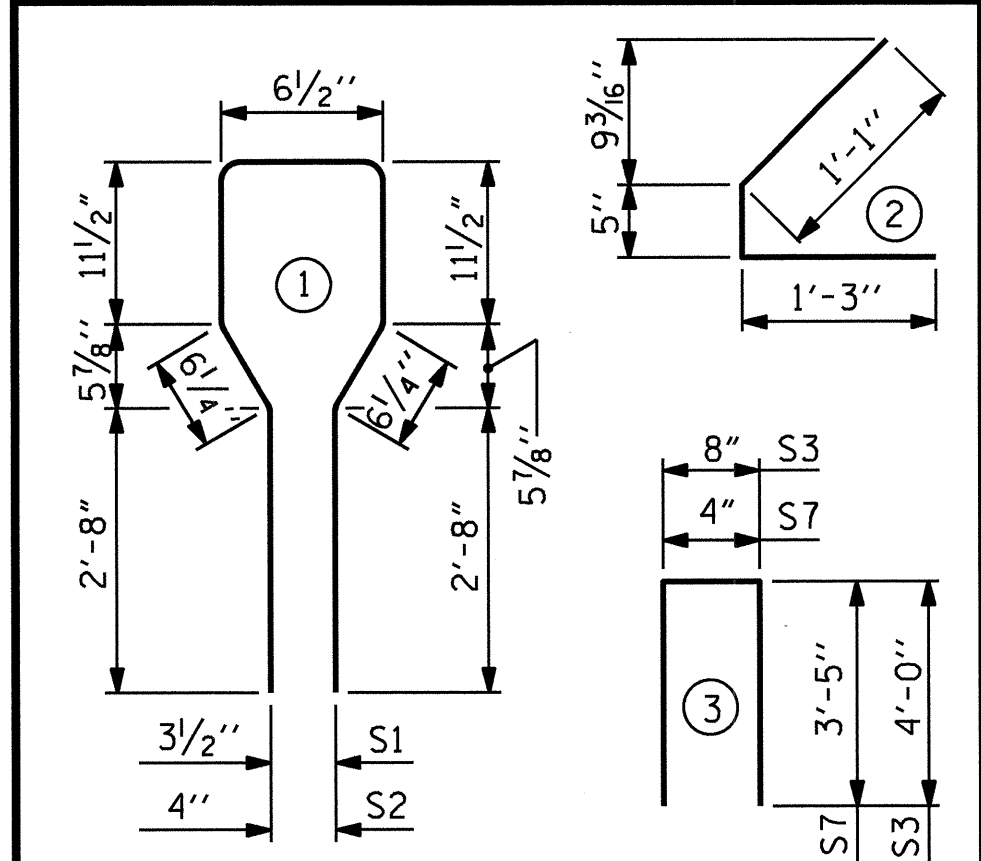
| 0.6" Ø L. R. GRADE 270 STRANDS | | |
|--------------------------------|--|--|
| AREA (SQUARE INCHES) | ULTIMATE STRENGTH (LBS. PER STRAND) | APPLIED PRESTRESS (LBS. PER STRAND) |
| 0.217 | 58,600 | 43,950 |

REINFORCING STEEL FOR ONE GIRDER

| BAR | NUMBER | SIZE | TYPE | LENGTH | WEIGHT |
|------|--------|------|------|--------|--------|
| S1 | 126 | #4 | 1 | 8'-10" | 743 |
| S2 | 12 | #6 | 1 | 8'-10" | 159 |
| S3 | 4 | #4 | 3 | 8'-8" | 23 |
| S4 | 72 | #4 | 2 | 2'-9" | 132 |
| * 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 |

* 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 | 9500 PSI CONCRETE | 0.6" Ø L. R. STRANDS |
|-------------------|-------------------|----------------------|
| LB. | C.Y. | No. |
| 1,142 | 10.9 | 36 |

GIRDERS REQUIRED

| | NUMBER | LENGTH | TOTAL LENGTH |
|--------|--------|---------|--------------|
| SPAN A | 9 | 75'-10" | 682.50' |
| SPAN C | 9 | 75'-10" | 682.50' |

FOR PRESTRESSED GIRDER NOTES, SEE SHEET 2 OF 3.

PROJECT NO. B-4090
CUMBERLAND COUNTY
 STATION: 18+55.00 -L-

SHEET 1 OF 3

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



| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-15 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 41 |

| | |
|-----------------------------|------------------------|
| ASSEMBLED BY : K.H. COMPTON | DATE : 2/11 |
| CHECKED BY : J.H. CARDEN | DATE : 3/11 |
| DRAWN BY : ELR 8/91 | REV. 7/17/98 RWW/LES |
| CHECKED BY : GRP 8/91 | REV. 10/17/00R RWW/LES |
| | REV. 5/1/06 TLA/GM |

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. BEVEL EDGES OF PLATE "B-1" TO GIVE CLOSE FIT BUT NOT TIGHT FIT TO STEEL CASTING FORM.

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 7600 PSI.

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

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".

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

0.6" Ø L. R. GRADE 270 STRANDS

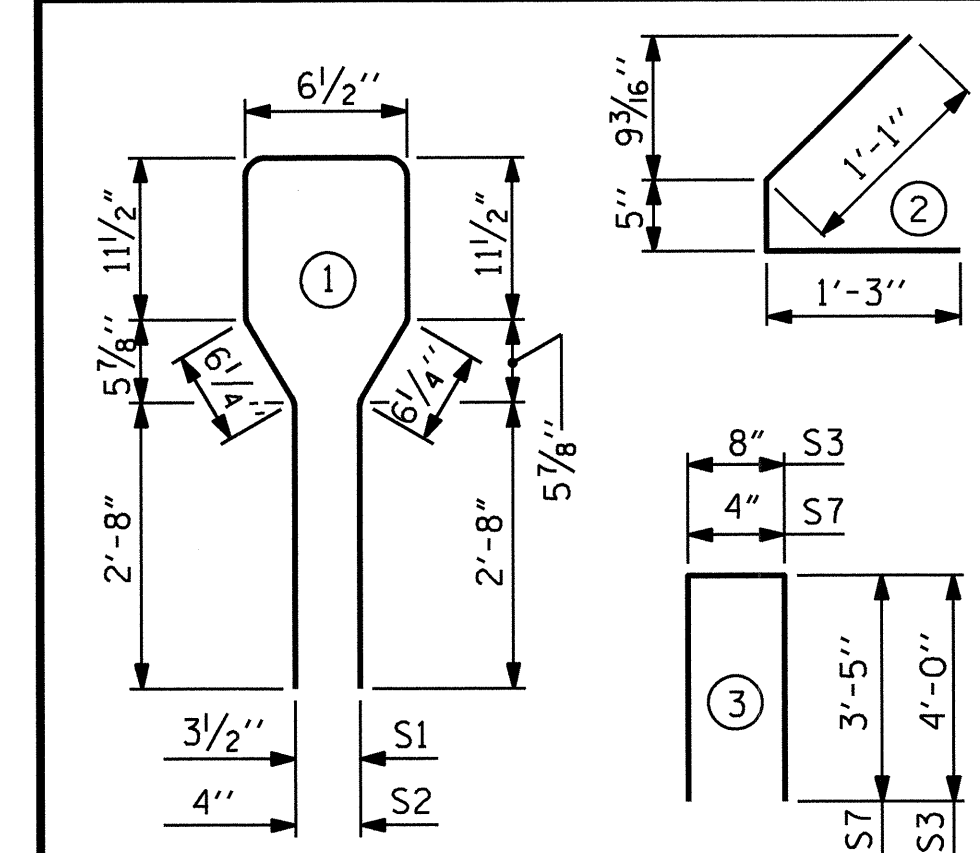
| AREA (SQUARE INCHES) | ULTIMATE STRENGTH (LBS. PER STRAND) | APPLIED PRESTRESS (LBS. PER STRAND) |
|-------------------------|--|--|
| 0.217 | 58,600 | 43,950 |

REINFORCING STEEL FOR ONE GIRDER

| BAR | NUMBER | SIZE | TYPE | LENGTH | WEIGHT |
|------|--------|------|------|--------|--------|
| S1 | 126 | #4 | 1 | 8'-10" | 743 |
| S2 | 12 | #6 | 1 | 8'-10" | 159 |
| 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 |

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

BAR TYPES



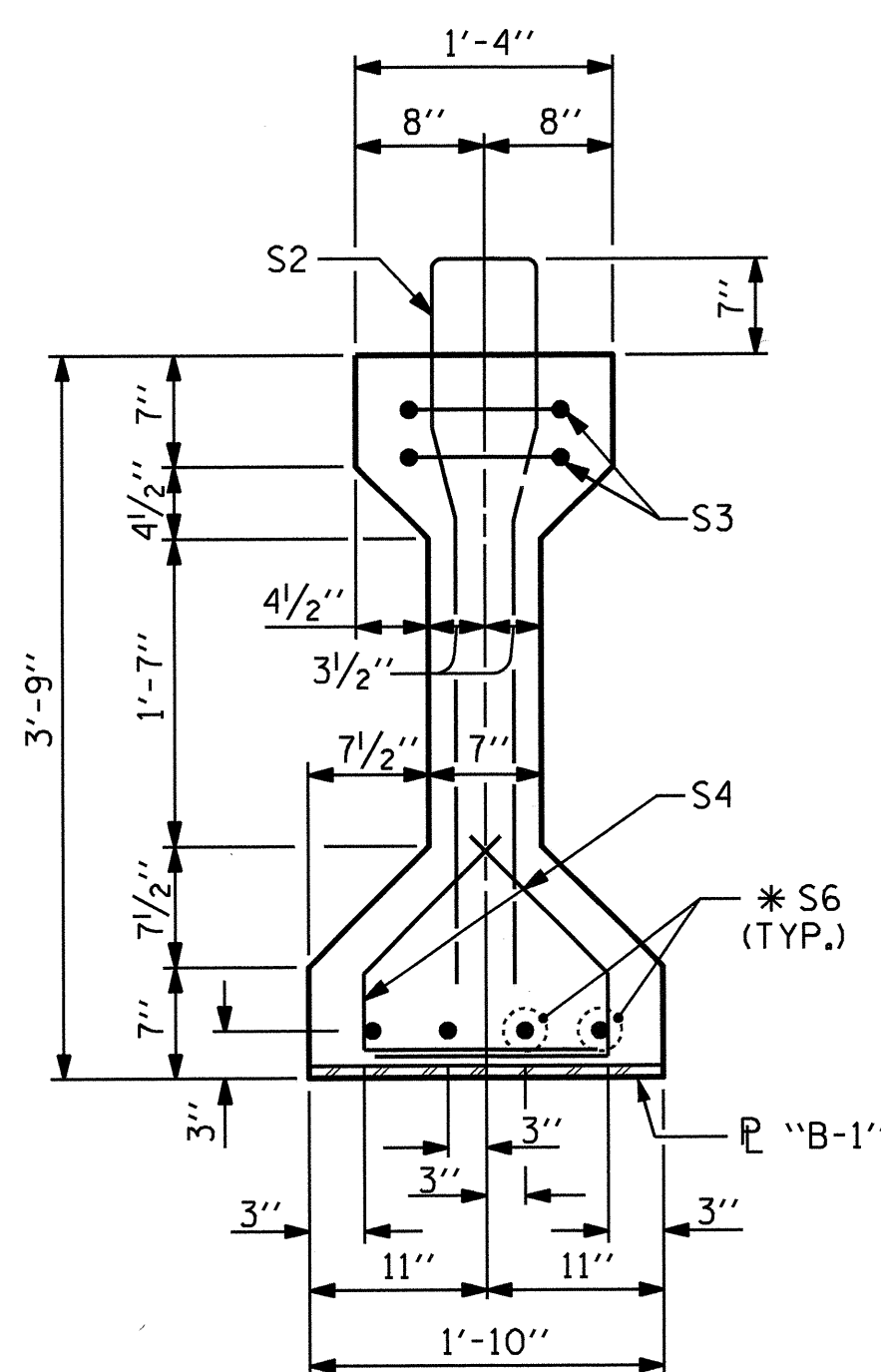
ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

| REINFORCING STEEL | 9500 PSI CONCRETE | 0.6" Ø L. R. STRANDS |
|-------------------|-------------------|----------------------|
| LB. | C.Y. | No. |
| 1,127 | 10.9 | 36 |

GIRDERS REQUIRED

| NUMBER | LENGTH | TOTAL LENGTH |
|--------|---------|--------------|
| 9 | 75'-10" | 682.50' |

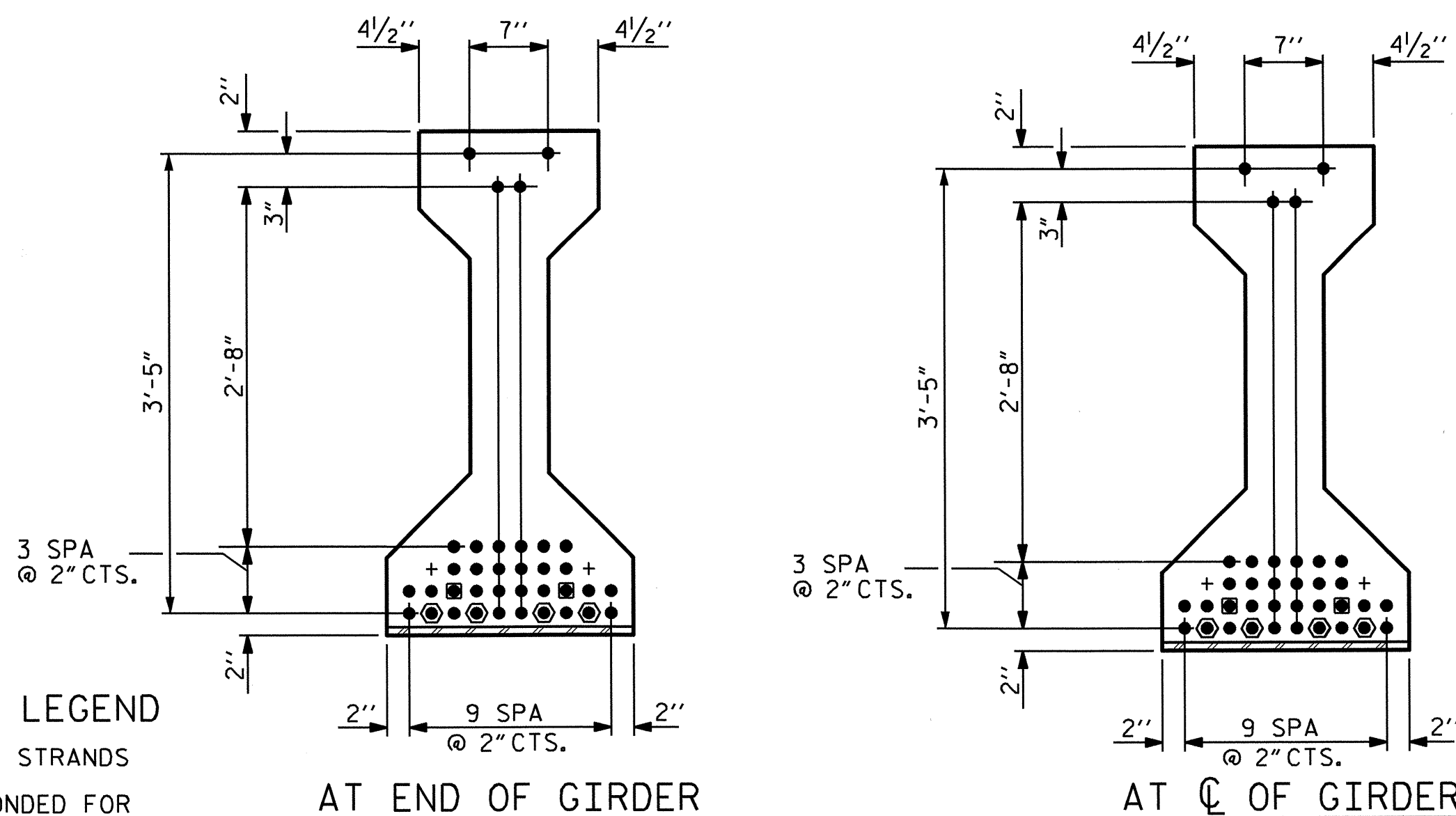


SECTION B-B

(FOR EMBEDDED "B-1" DETAILS SEE SHEET 3 OF 3)

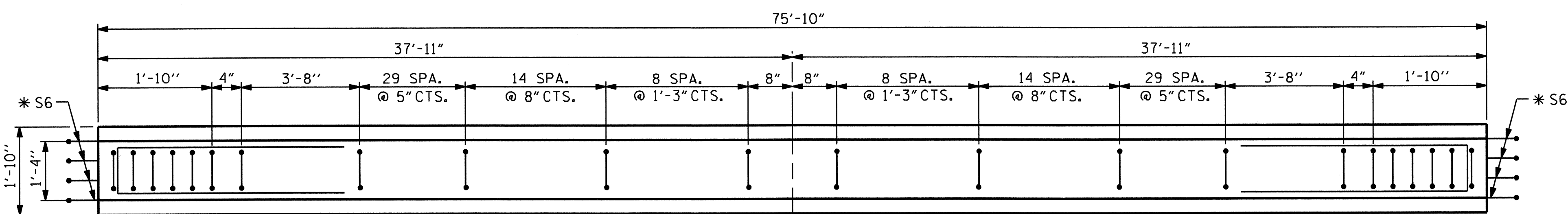
DEBONDING LEGEND

- FULLY BONDED STRANDS
- STRANDS DEBONDED FOR 18'-0" FROM END OF GIRDER
- ◻ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER

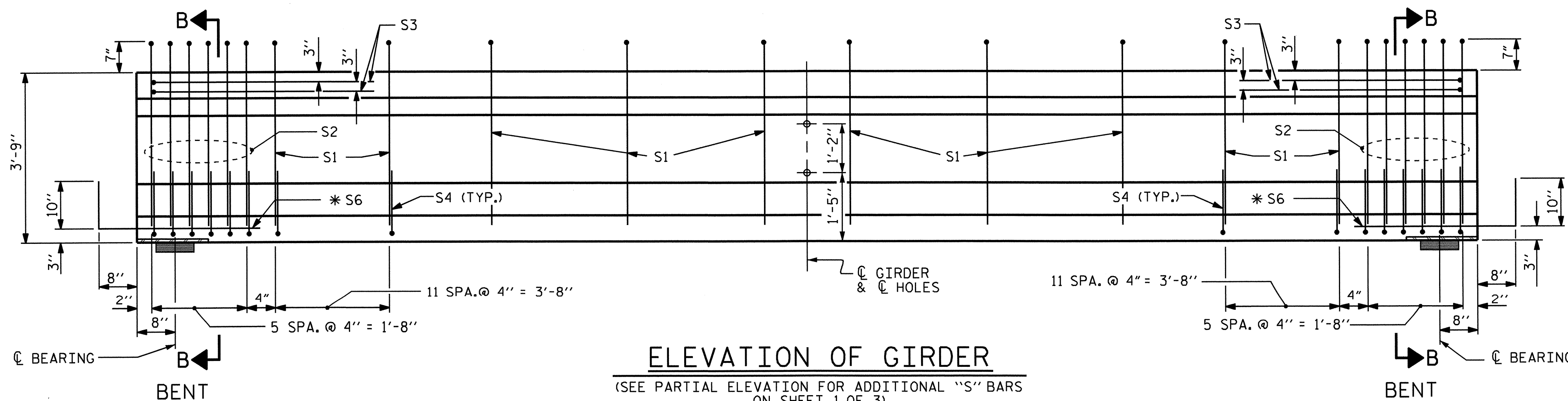


0.6" Ø LOW RELAXATION STRAND LAYOUT

(36 STRANDS, ALL STRAIGHT, 6 DEBONDED STRANDS)



PLAN OF GIRDER



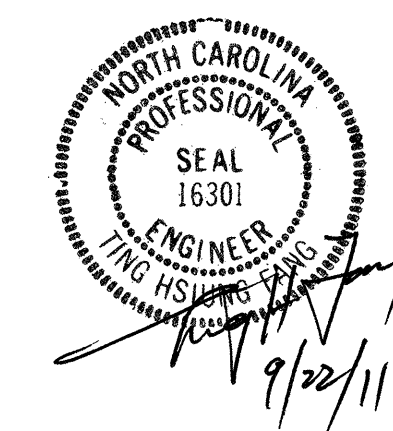
ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS ON SHEET 1 OF 3)

PROJECT NO. B-4090
CUMBERLAND COUNTY
 STATION: 18+55.00 -L-

SHEET 2 OF 3

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



| | |
|-----------------------------|------------------------|
| ASSEMBLED BY : K.H. COMPTON | DATE : 2/11 |
| CHECKED BY : J.H. GARDEN | DATE : 3/11 |
| DRAWN BY : ELR 8/91 | REV. 7/17/98 RWW/LES |
| CHECKED BY : GRP 8/91 | REV. 10/17/00R RWW/LES |
| | REV. 5/1/06 TLA/GM |

STRUCTURAL STEEL NOTES

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

TENSION ON THE AASHTO M164 BOLTS THROUGH THE CHANNEL MEMBER SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR DIRECT TENSION INDICATORS, SEE SPECIAL PROVISIONS.

TENSION ON THE AASHTO M164 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL 1/4 TURN.

THE PLATES, BENT PLATES, CHANNELS, ANGLES, AND PLATE WASHERS 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 PROVISIONS AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

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

USE A MINIMUM 7/16" THICK PLATE WASHER WITH STANDARD HOLES UNDER EACH BOLT HEAD AND NUT. THE PLATE WASHERS SHALL HAVE SUFFICIENT SIZE TO COVER THE HOLES AFTER INSTALLATION. HARDENED WASHERS AND DIRECT TENSION INDICATORS ARE TO BE USED IN CONJUNCTION WITH THE PLATE WASHERS IN THE CHANNEL MEMBER CONNECTION.

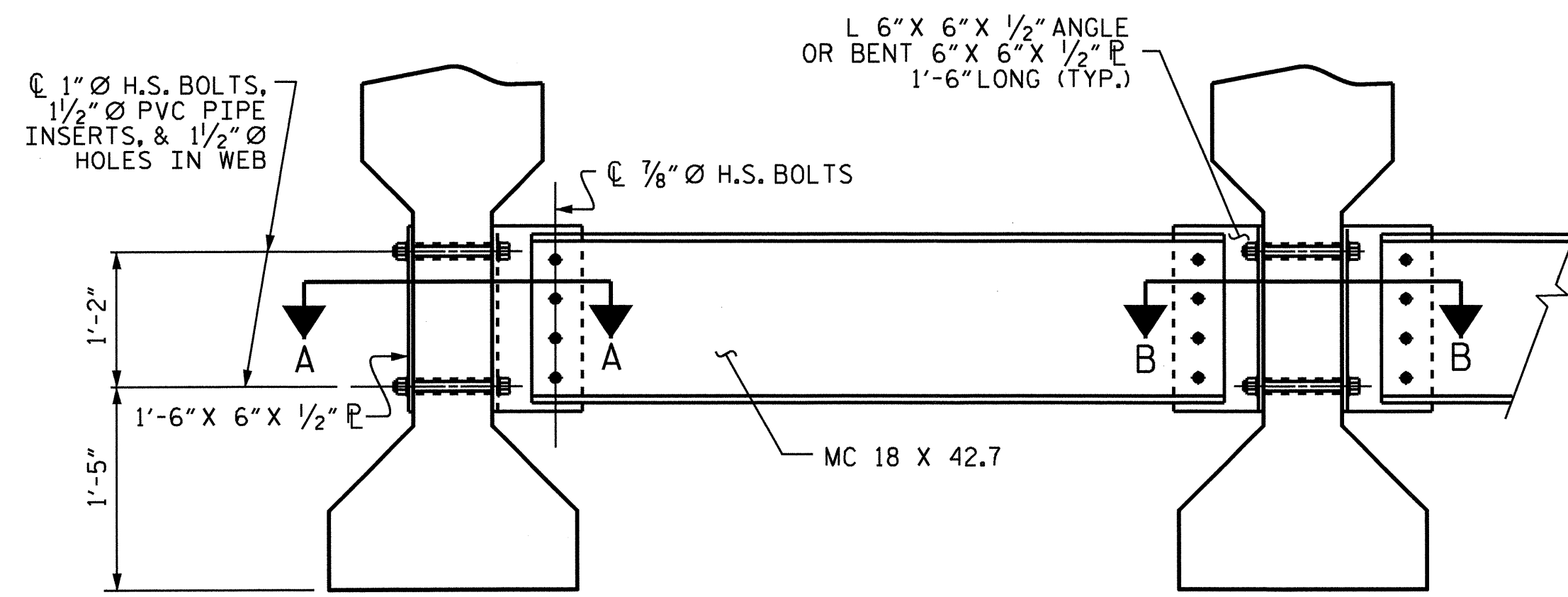
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF ALL BOLTS TO ACCOMMODATE WASHERS, AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

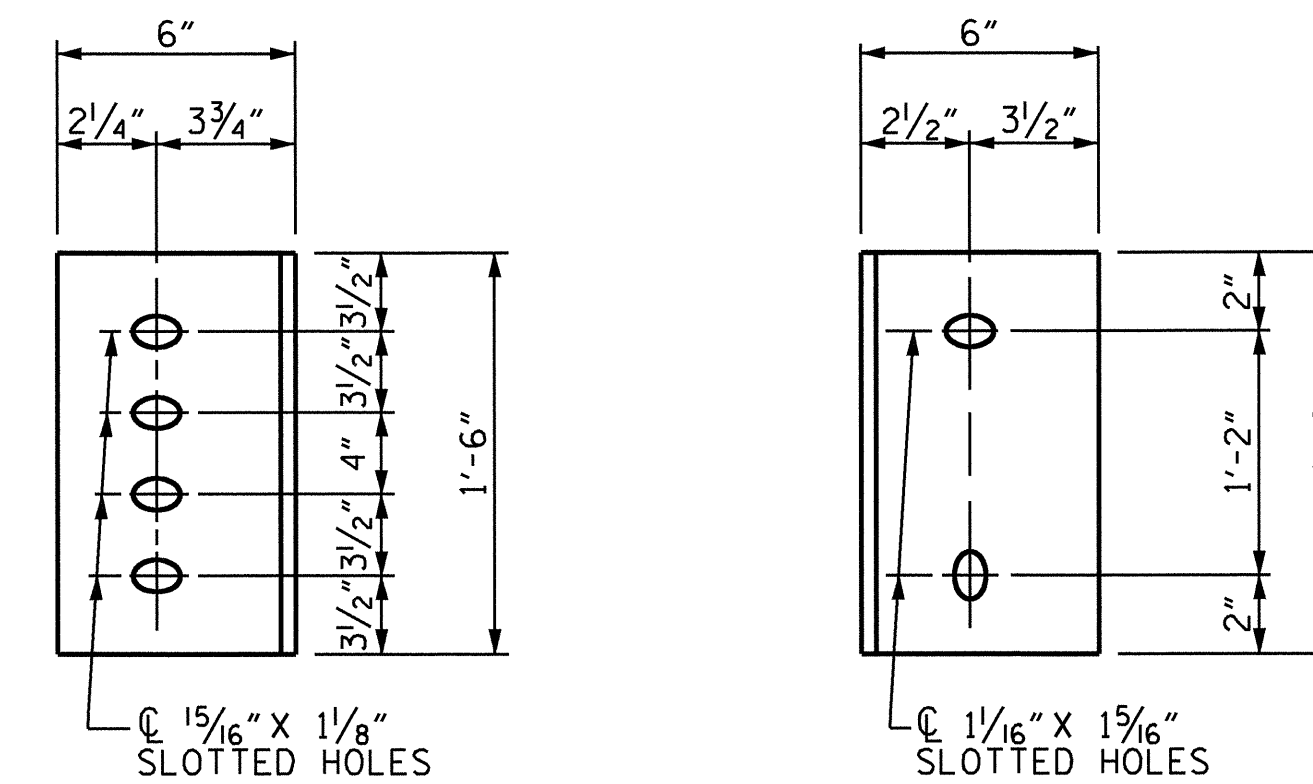
CONTRACTOR SHALL SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

IN THE EXTERIOR BAYS, TEMPORARY STRUTS SHALL BE PLACED BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED. ALL AASHTO M164 H.S. BOLTS SHALL BE FULLY TIGHTENED AFTER THE STRUTS HAVE BEEN REMOVED.

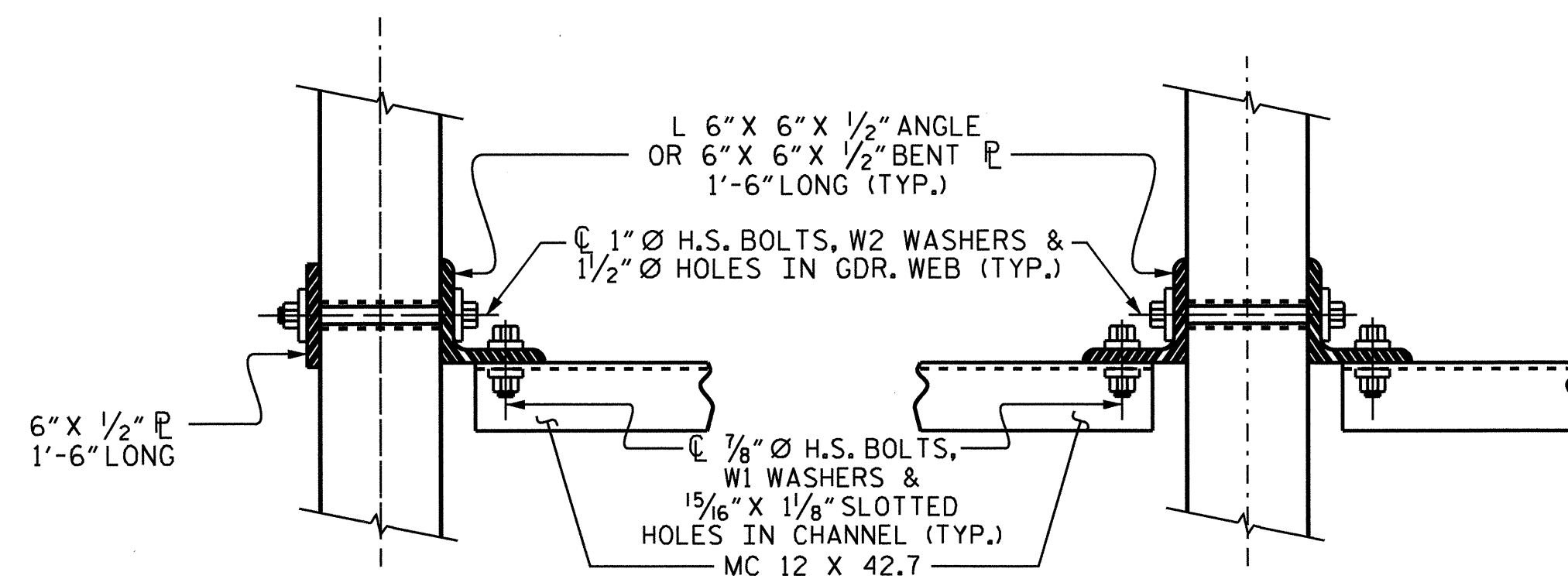
THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.



EXTERIOR GIRDER INTERIOR GIRDER
PART SECTION AT INTERMEDIATE DIAPHRAGM
 (TYPICAL FOR EACH BAY)



CONNECTOR PLATE DETAILS



SECTION A-A SECTION B-B
CONNECTION DETAILS
 FOR LOCATION OF INTERMEDIATE DIAPHRAGMS, SEE "FRAMING PLAN" SHEET.

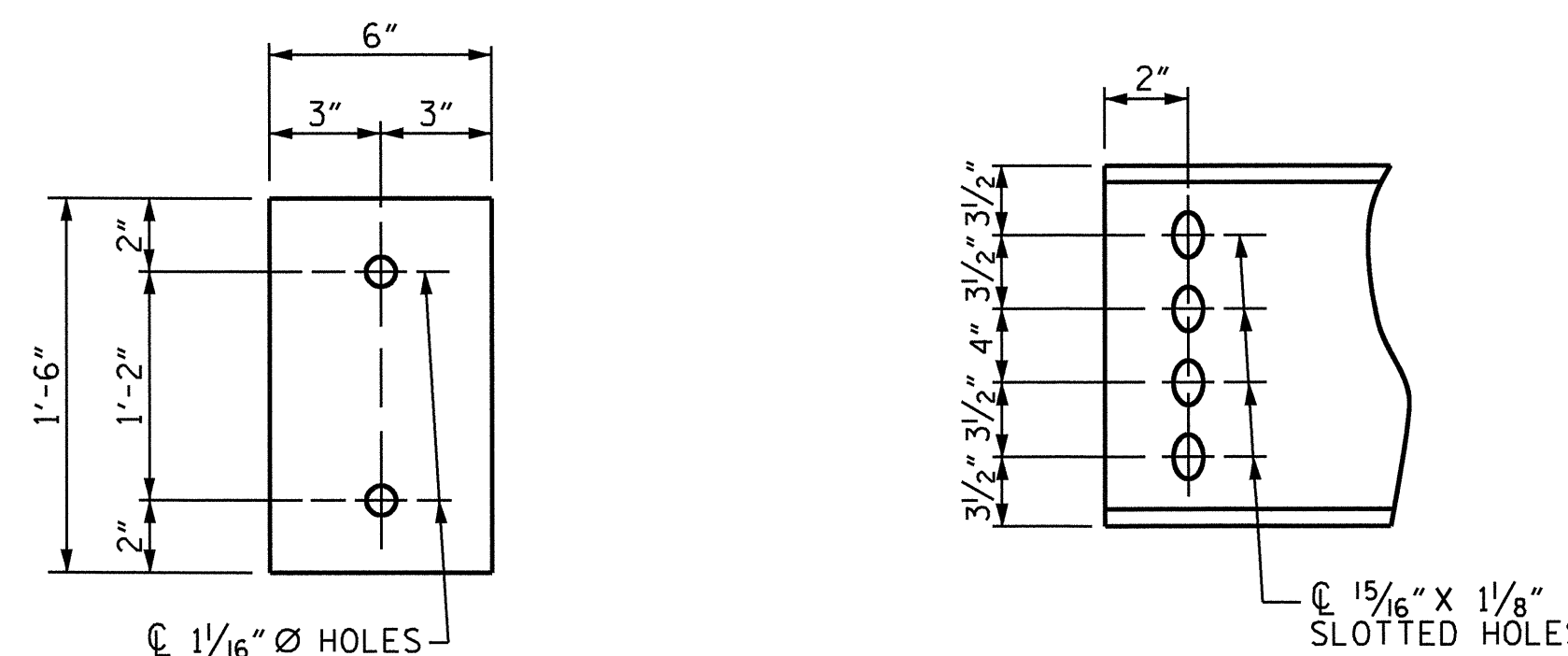
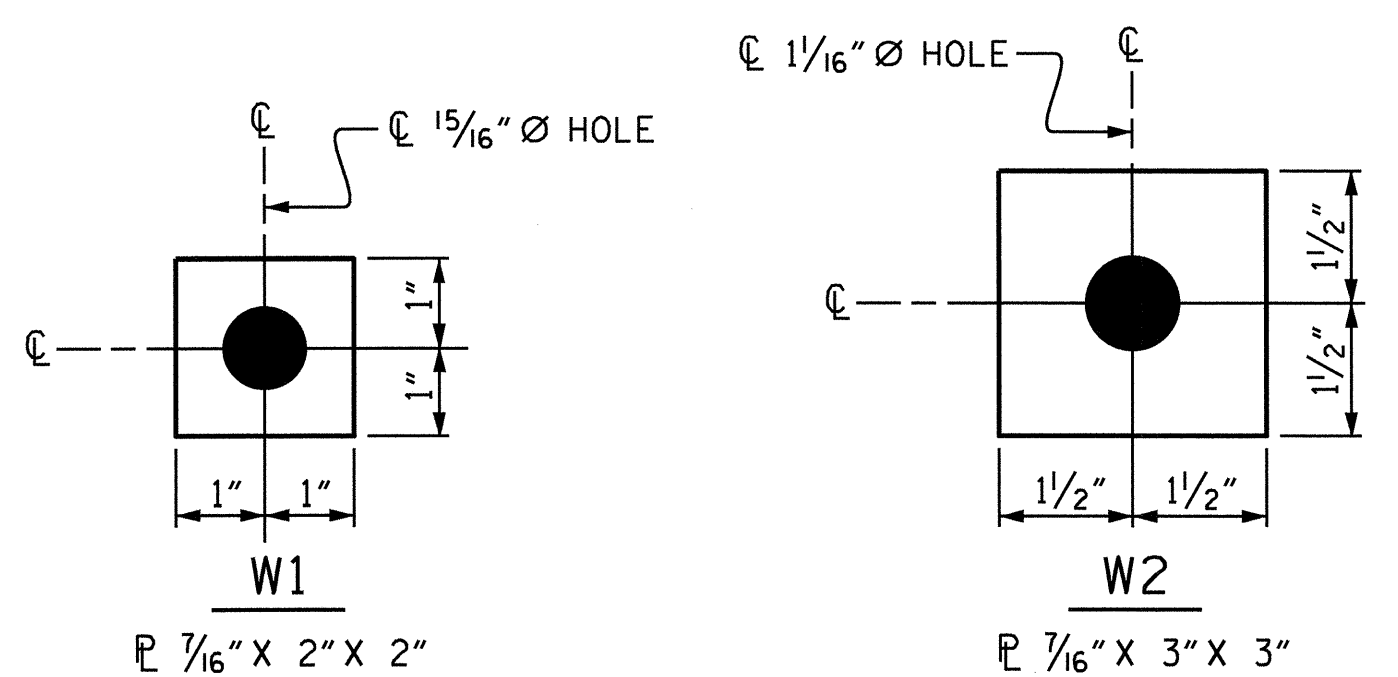


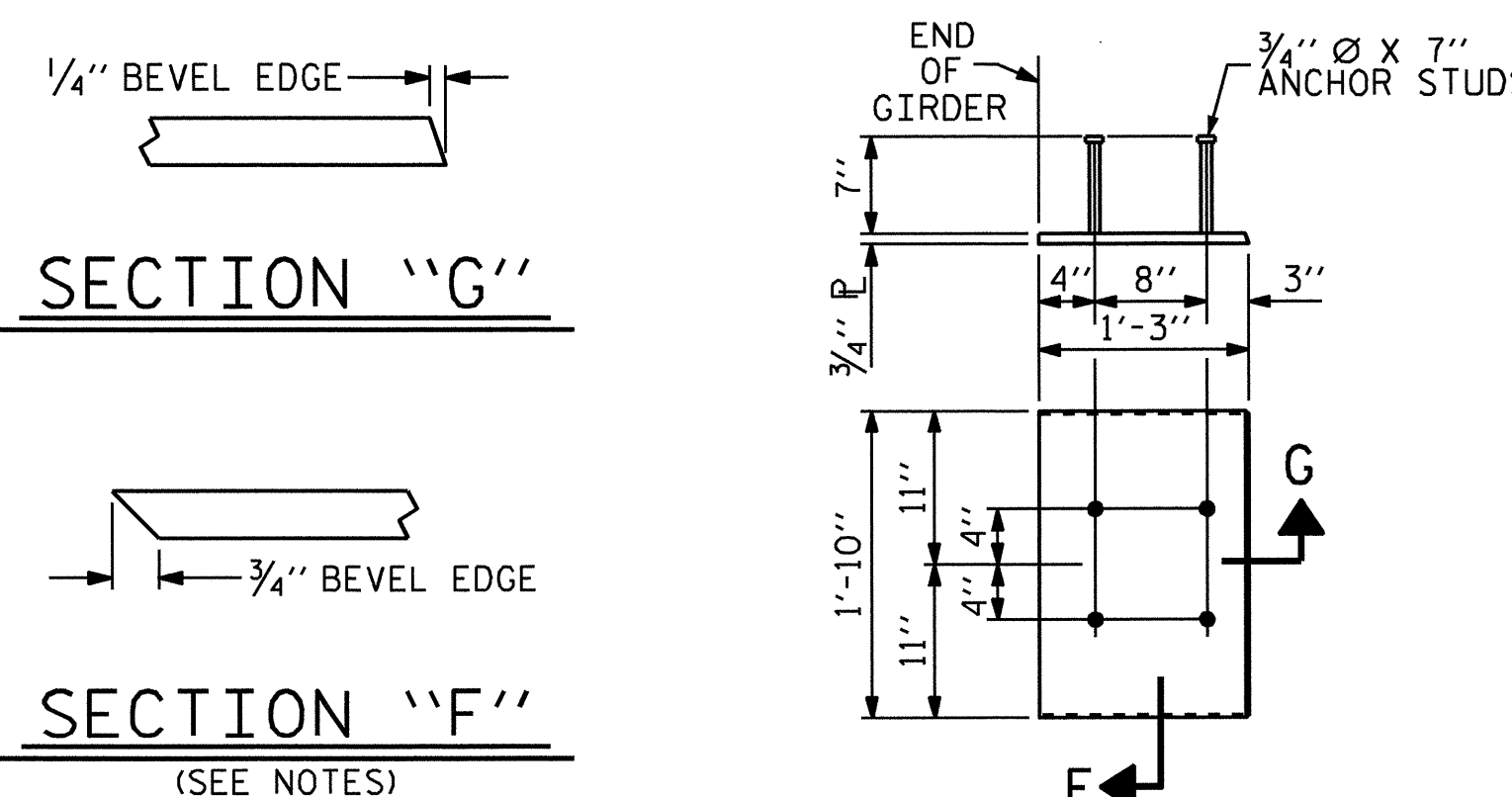
PLATE DETAILS CHANNEL END



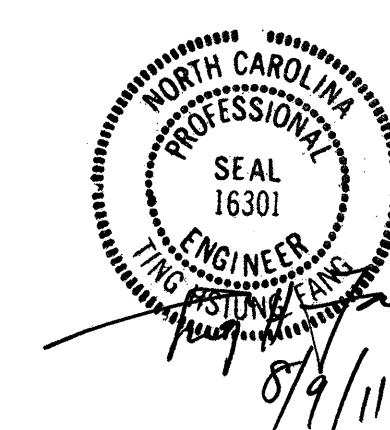
USE WITH 7/8" \varnothing HVY. HEX NUTS & DIRECT TENSION INDICATOR WASHERS AT DIAPHRAGM CHANNEL TO CONNECTOR PLATE CONNECTIONS

USE WITH 1" \varnothing HVY. HEX NUTS AT CONNECTOR PLATE TO GIRDER CONNECTIONS

WASHER DETAILS



EMBEDDED PLATE "B-1" DETAILS
 (2 REQ'D PER GIRDER)



PROJECT NO. B-4090
CUMBERLAND COUNTY
 STATION: 18+55.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 INTERMEDIATE STEEL
 DIAPHRAGMS FOR TYPE III
 PRESTRESSED CONCRETE
 GIRDERS

| | |
|-----------------------------|---------------------|
| ASSEMBLED BY : K.H. COMPTON | DATE : 2/11 |
| CHECKED BY : J.H. CARDEN | DATE : 3/11 |
| DRAWN BY : TLA 6/05 | ADDED 10/21/05 |
| CHECKED BY : VC 6/05 | REV. 5/1/06R KMM/GM |

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-17 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 41 |

NOTES

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

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

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

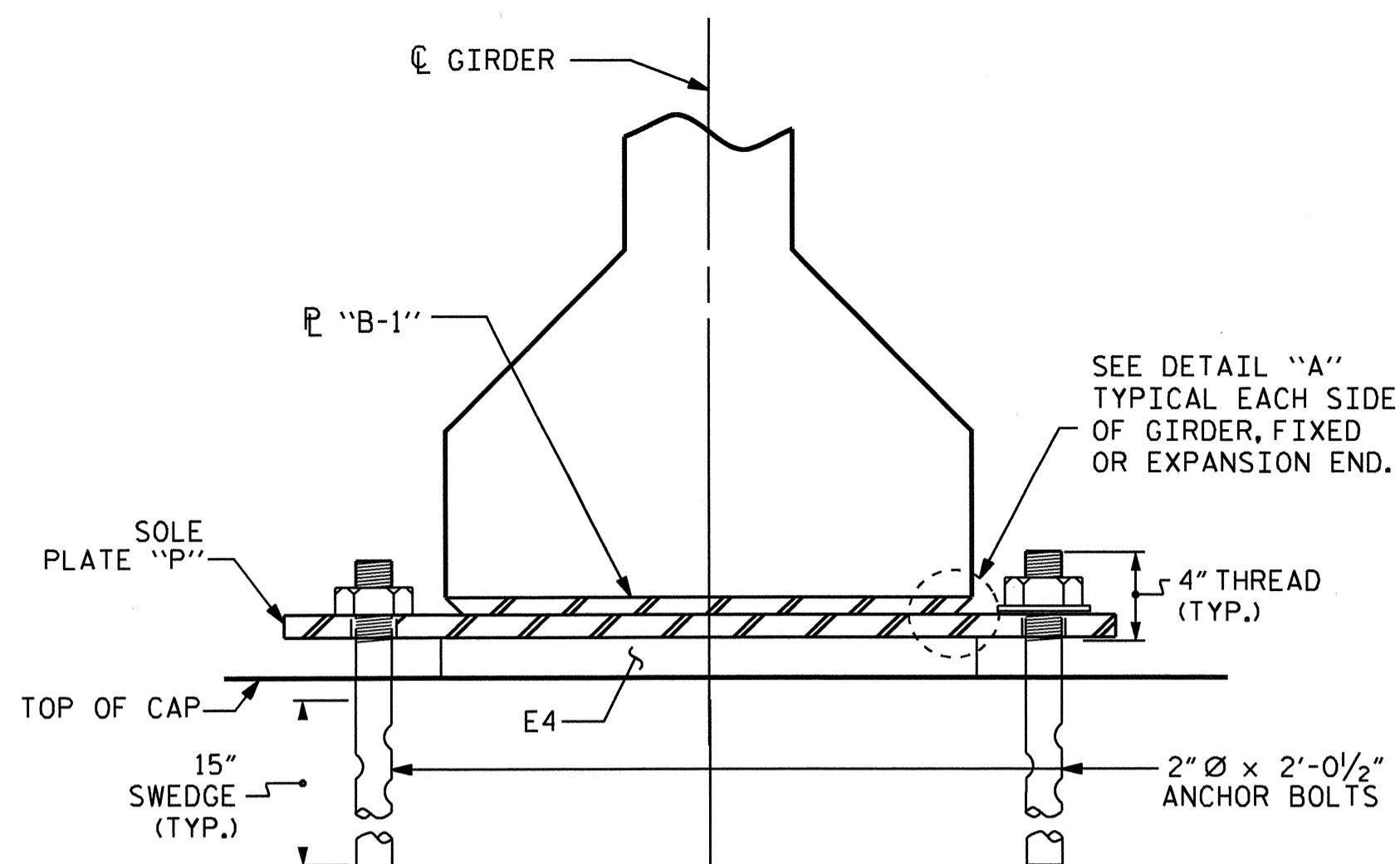
WHEN WELDING THE SOLE PLATE TO THE EMBEDDED PLATE IN THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE SOLE PLATE DOES NOT EXCEED 300°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.

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

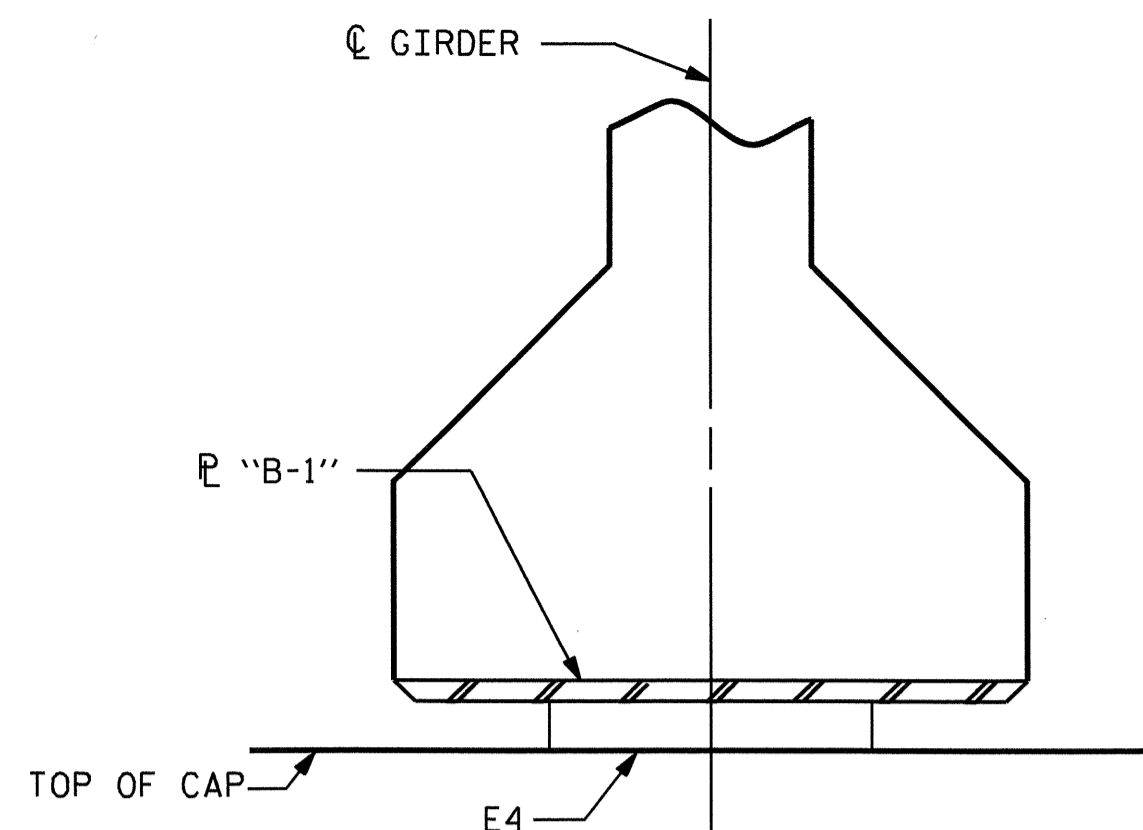
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLT, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

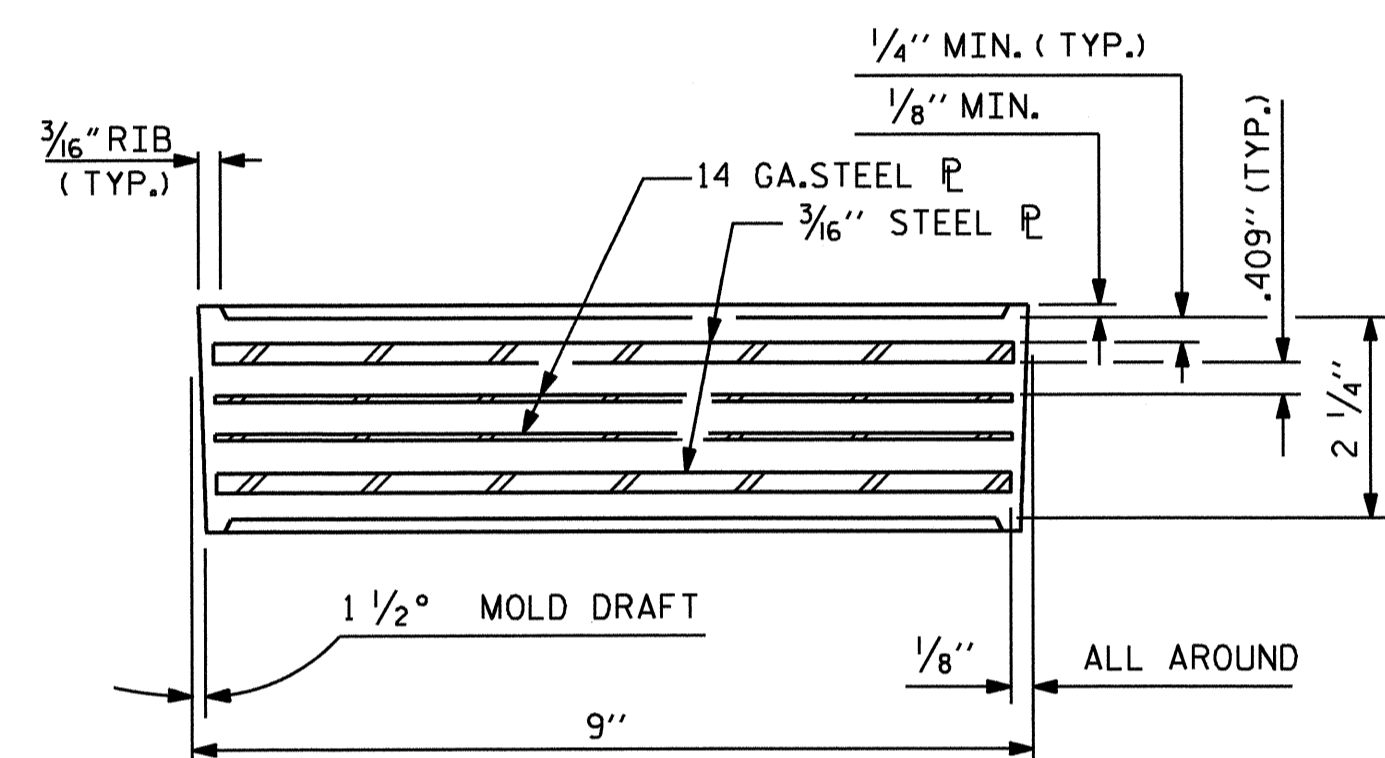
ELASTOMER IN ALL BEARINGS SHALL BE 50 DUROMETER HARDNESS.



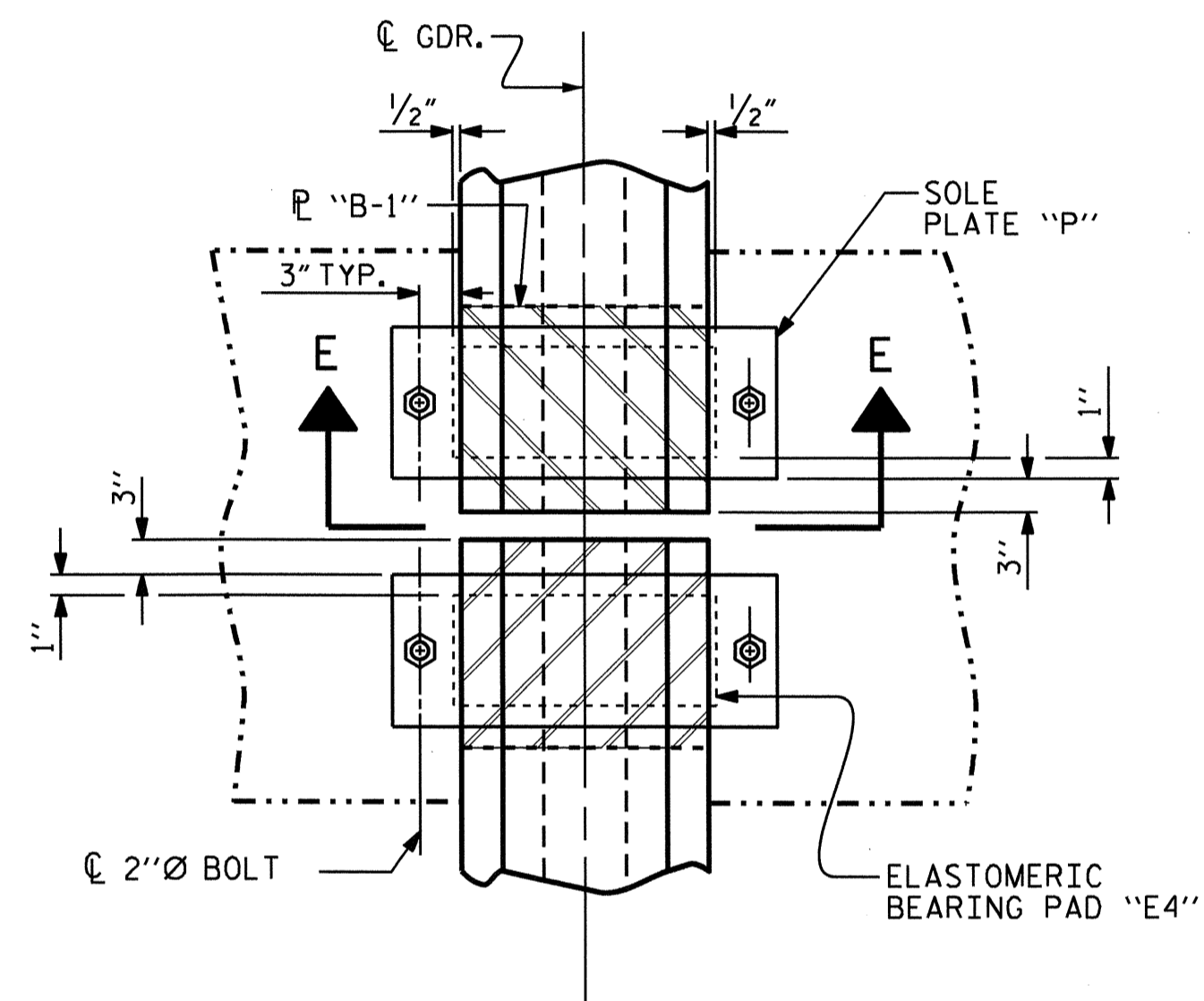
SECTION E-E
(AT BENTS)



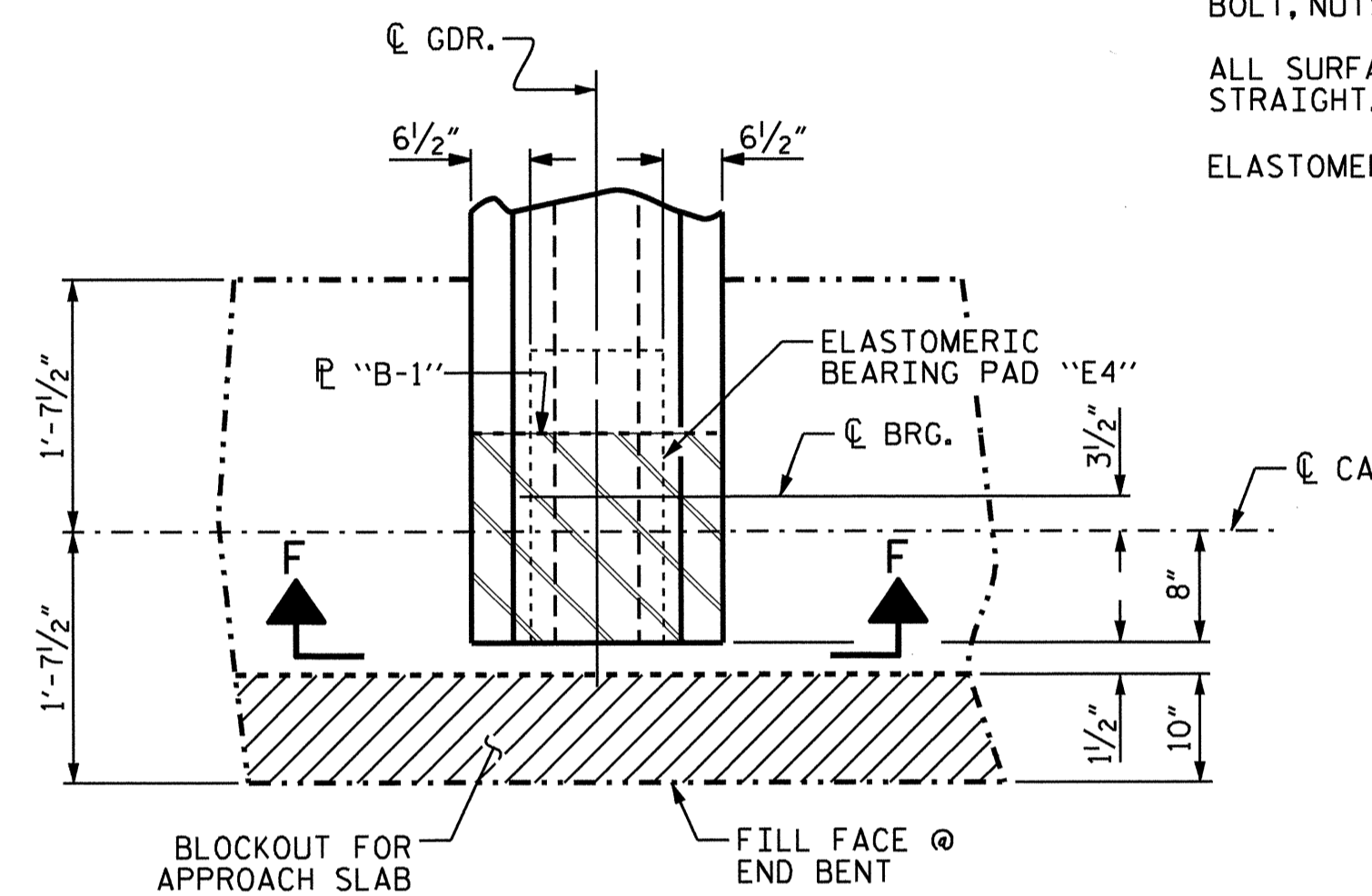
SECTION F-F
(AT INTEGRAL END BENT)



TYPICAL SECTION OF ELASTOMERIC BEARINGS

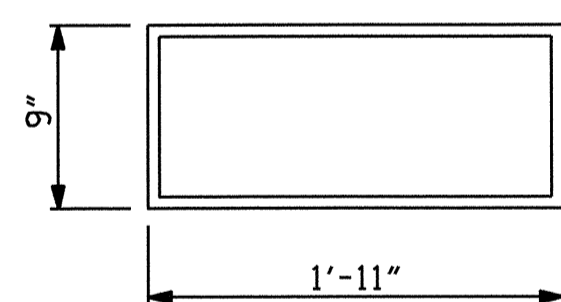


PLAN VIEW @ BENT



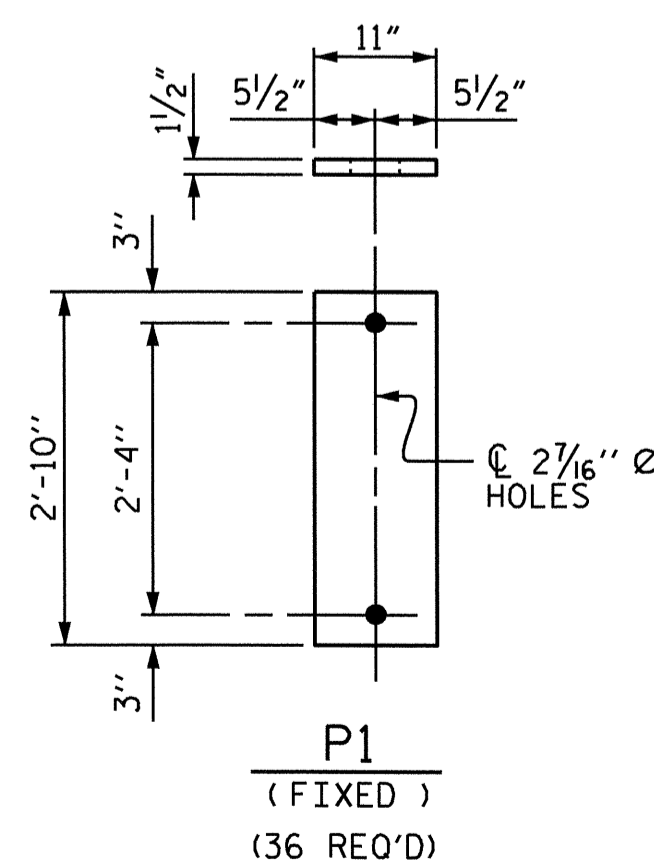
TYPICAL PLAN @ END BENT
(INTEGRAL)

| LOAD RATINGS | |
|--------------|---------------|
| TYPE V | MAX.D.L.+L.L. |
| | 180 K |

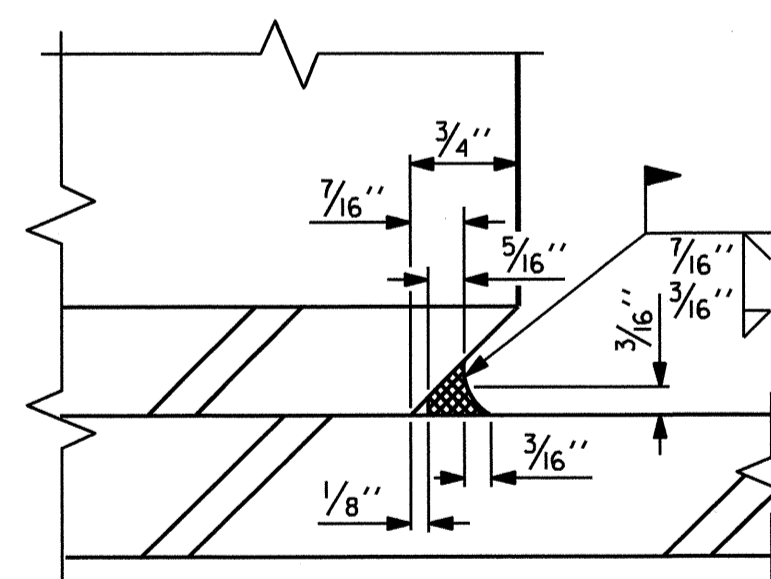


E4 (54 REQ'D)
PLAN VIEW OF ELASTOMERIC BEARING

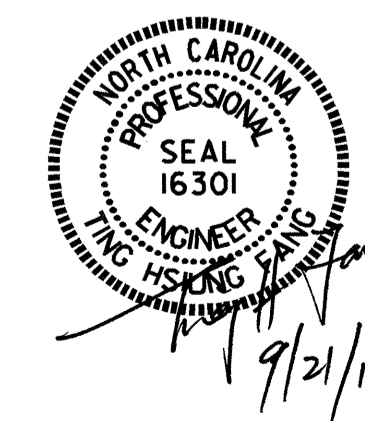
TYPE V



SOLE PLATE DETAILS ("P")



DETAIL "A"

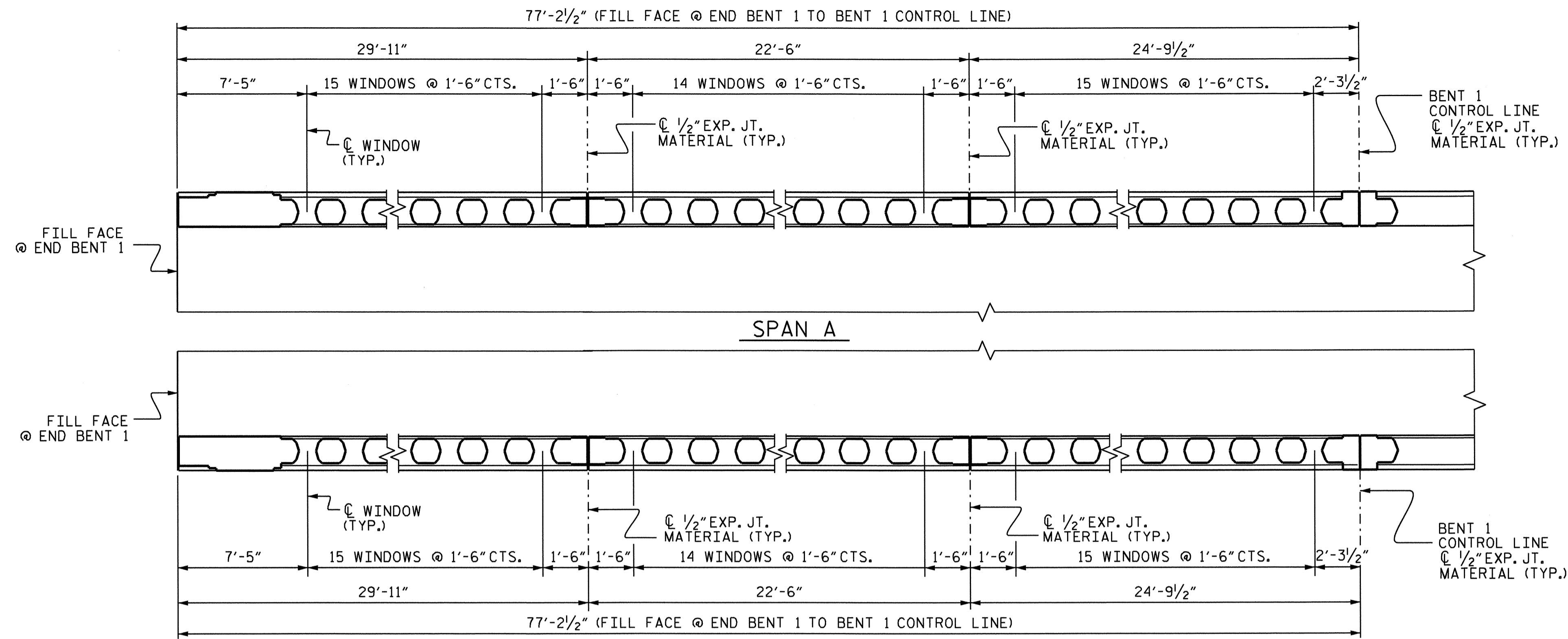


PROJECT NO. B-4090
CUMBERLAND COUNTY
STATION: 18+55.00 -L-

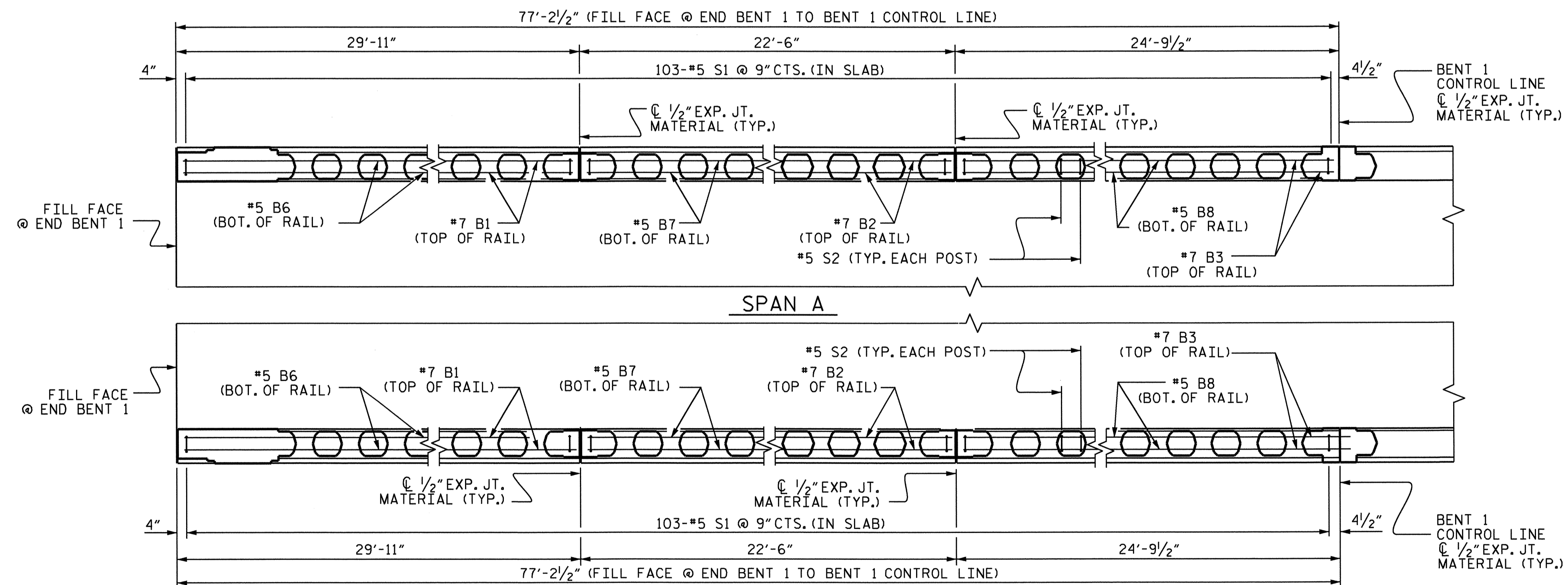
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
ELASTOMERIC BEARING
DETAILS
PRESTRESSED CONCRETE GIRDER
SUPERSTRUCTURE

| | |
|-----------------------------|-----------------------|
| ASSEMBLED BY : K.H. COMPTON | DATE : 2/11 |
| CHECKED BY : J.H. CARDEN | DATE : 3/11 |
| DRAWN BY : EEM 2/97 | REV. 8/16/99 RWW/LES |
| CHECKED BY : VAP 2/97 | REV. 10/17/00 RWW/LES |
| | REV. 5/1/06 TLA/GM |

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-18 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 41 |

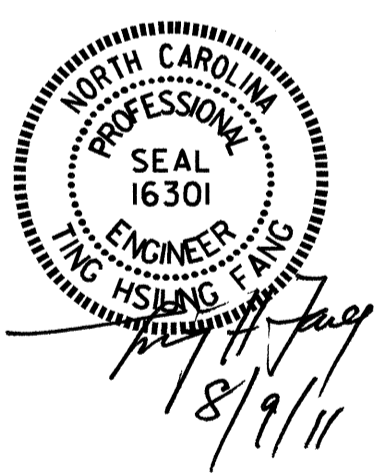


RAIL POST SPACING



REINFORCING STEEL PLACEMENT

FOR PLACEMENT OF S2 BARS IN PILASTERS & POSTS SEE SHEET 4 OF 6.



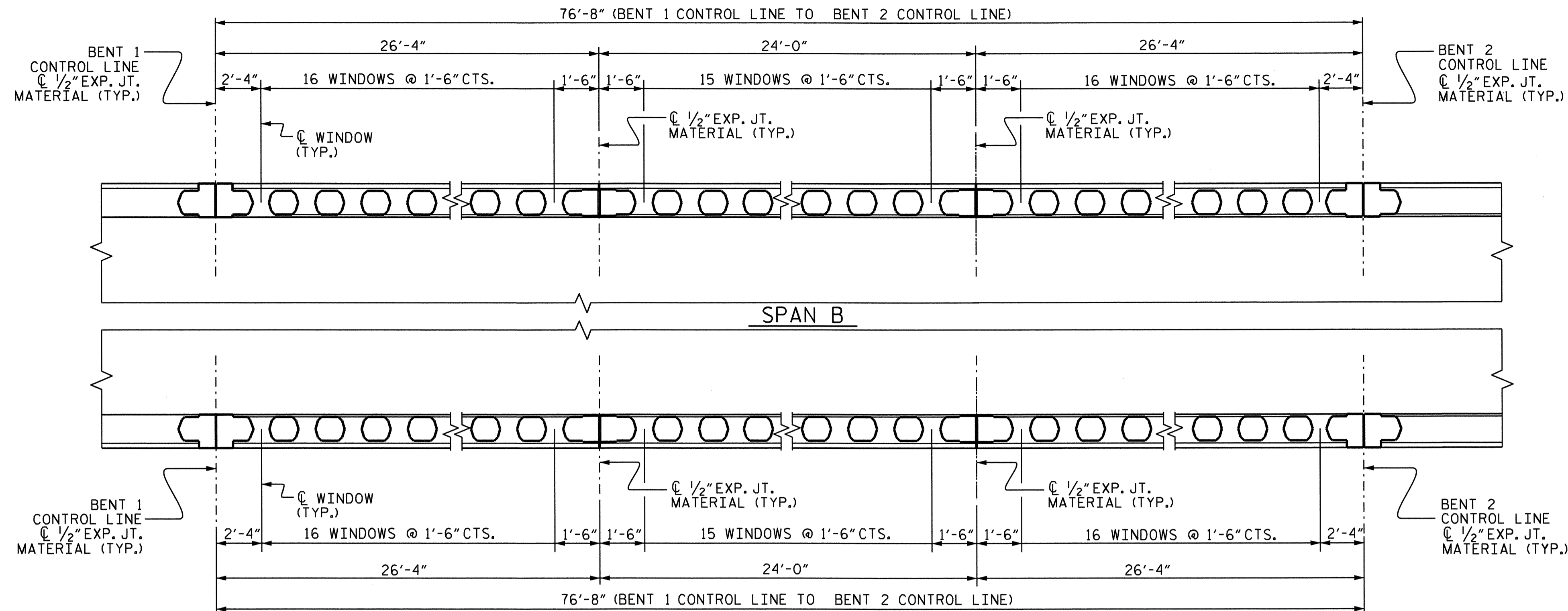
PROJECT NO. B-4090
CUMBERLAND COUNTY
 STATION: 18+55.00 -L-

SHEET 1 OF 6

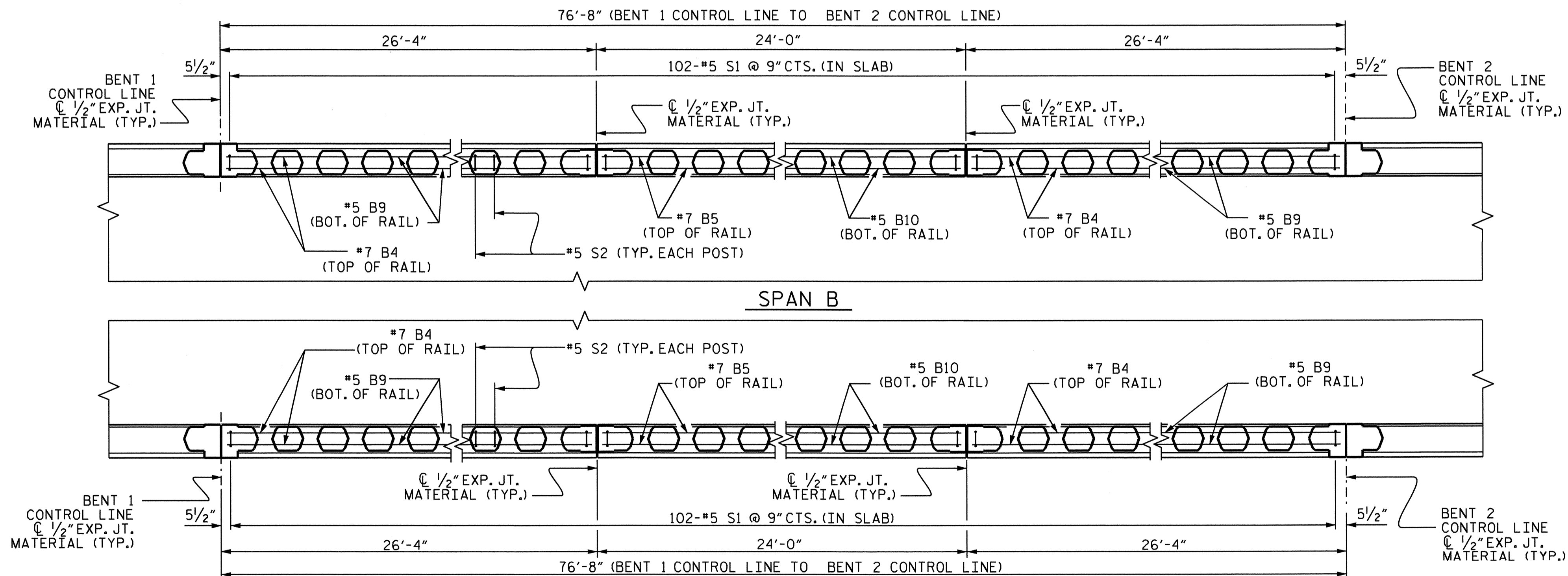
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 CLASSIC CONCRETE
 BRIDGE RAIL
 SPAN A

| REVISIONS | | | | | | SHEET NO. | |
|-----------|-----|-------|-----|-----|-------|-----------|----|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-19 | |
| 1 | | | 3 | | | TOTAL | 41 |
| 2 | | | 4 | | | SHEETS | |

DRAWN BY : K.H. COMPTON DATE : 5/11
 CHECKED BY : J.H. CARDEN DATE : 5/11

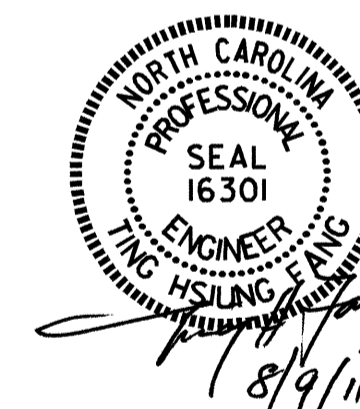


RAIL POST SPACING



REINFORCING STEEL PLACEMENT

FOR PLACEMENT OF S2 BARS IN PILASTERS & POSTS SEE SHEET 4 OF 6.



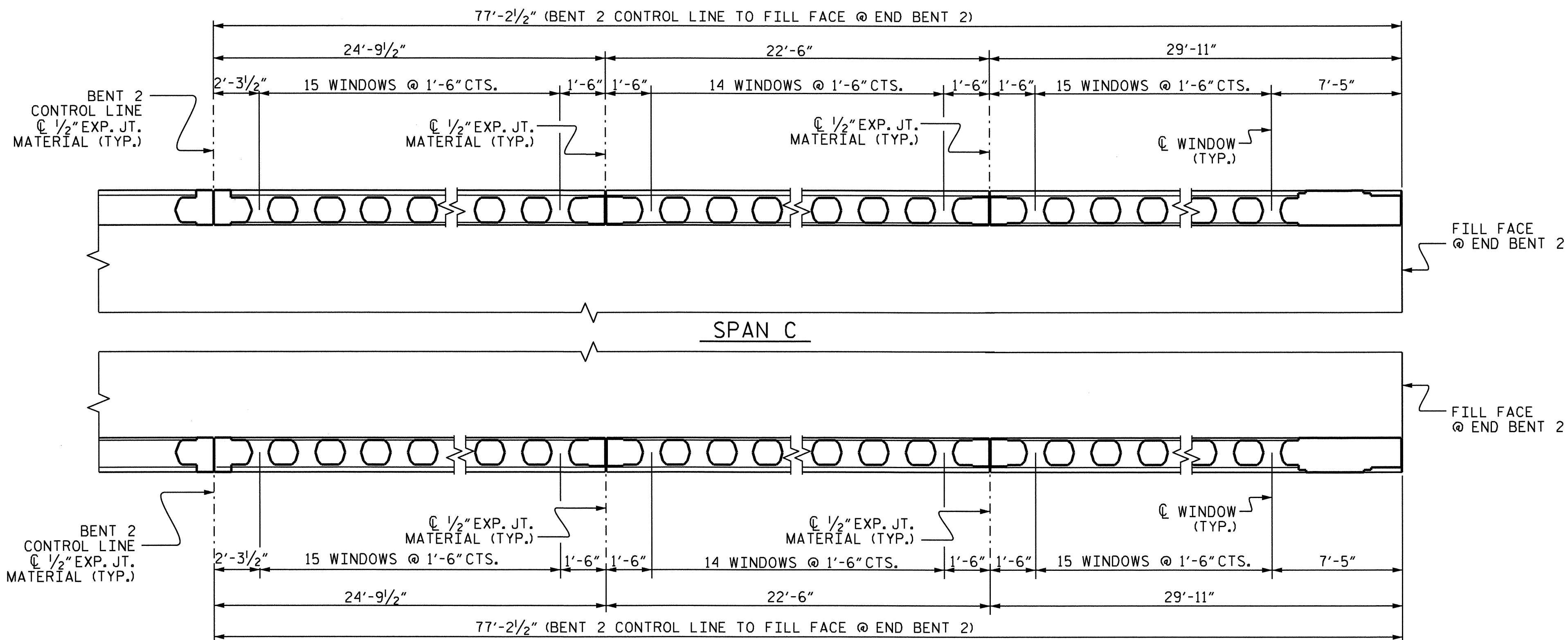
PROJECT NO. B-4090
CUMBERLAND COUNTY
 STATION: 18+55.00 -L-

SHEET 2 OF 6

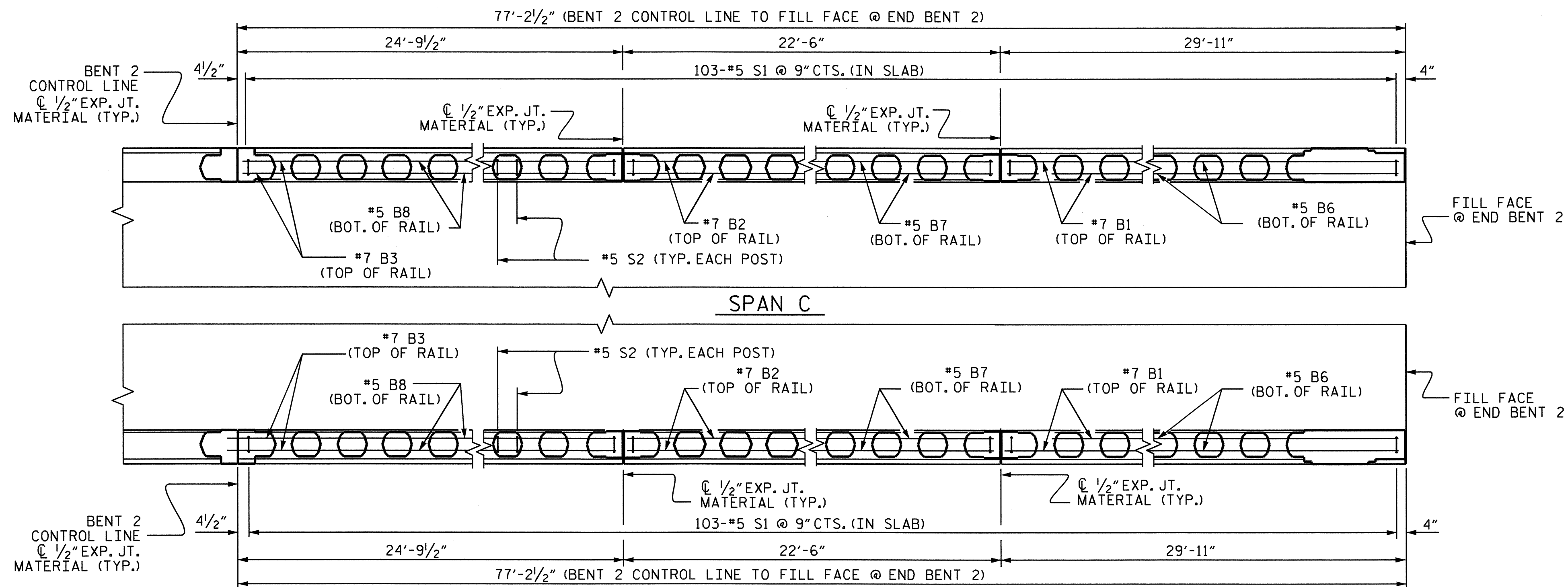
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 CLASSIC CONCRETE
 BRIDGE RAIL
 SPAN B

| REVISIONS | | | | | | SHEET NO. | |
|-----------|-----|-------|-----|-----|-------|--------------|----|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-20 | |
| 1 | | | 3 | | | TOTAL SHEETS | 41 |
| 2 | | | 4 | | | | |

DRAWN BY : K.H. COMPTON DATE : 5/11
 CHECKED BY : J.H. CARDEN DATE : 5/11

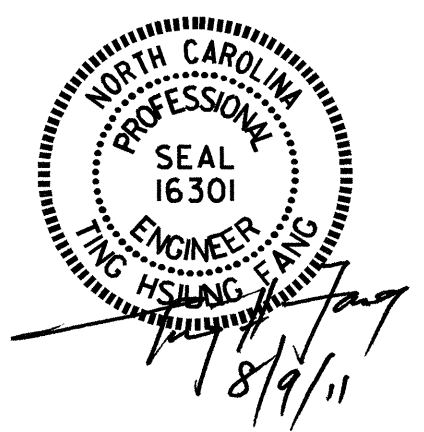


RAIL POST SPACING



REINFORCING STEEL PLACEMENT

FOR PLACEMENT OF S2 BARS IN PILASTERS & POSTS SEE SHEET 4 OF 6.



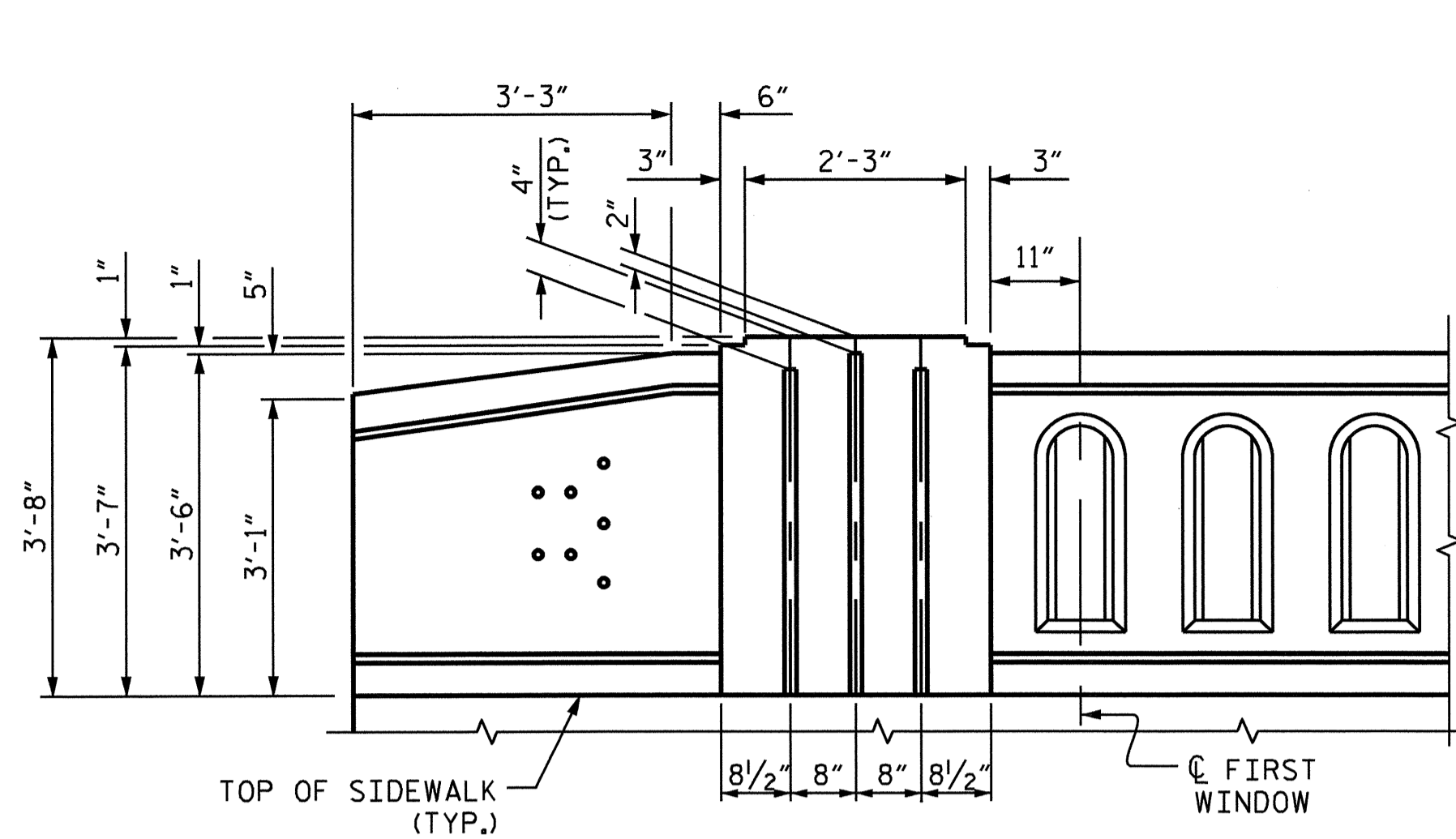
PROJECT NO. B-4090
CUMBERLAND COUNTY
 STATION: 18+55.00 -L-

SHEET 3 OF 6

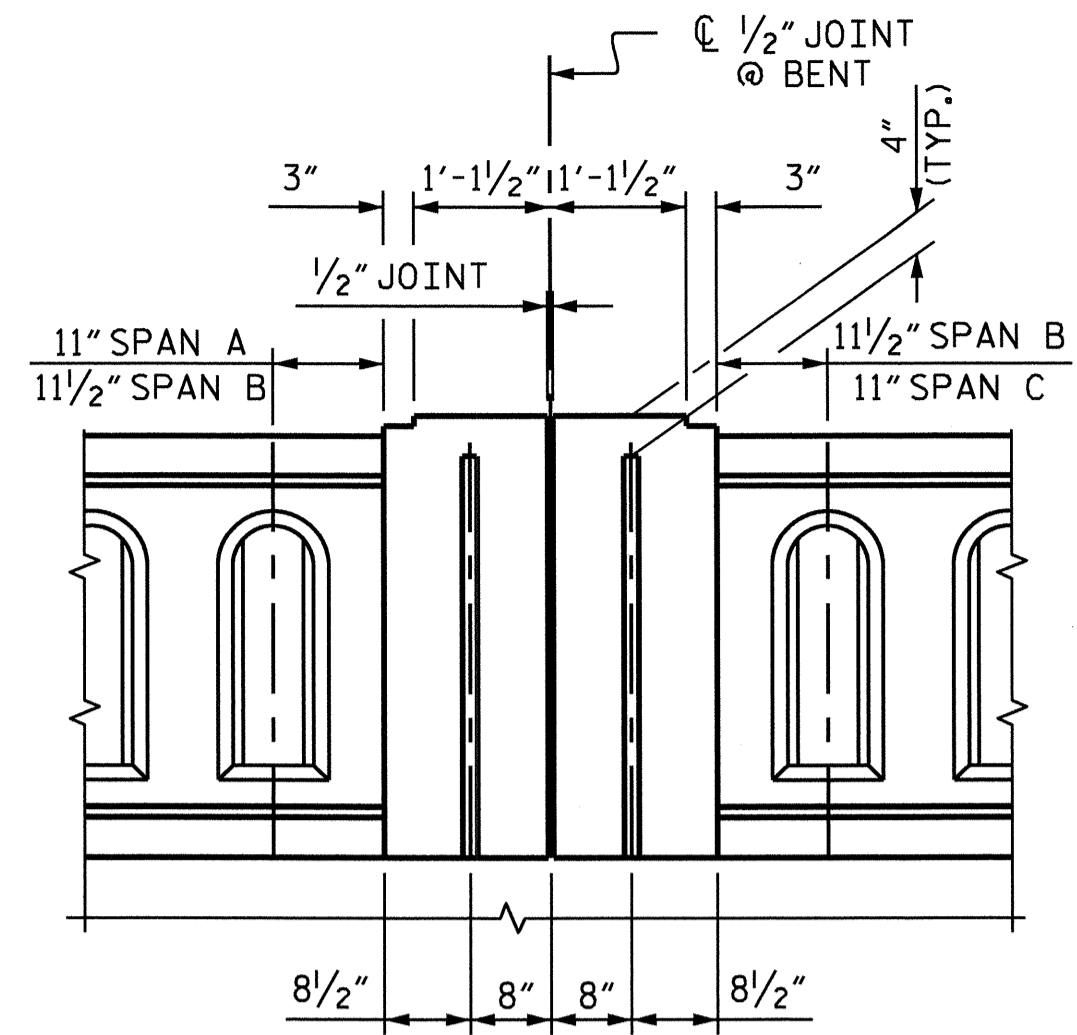
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 CLASSIC CONCRETE
 BRIDGE RAIL
 SPAN C

| REVISIONS | | | | | | SHEET NO. | |
|-----------|-----|-------|-----|-----|-------|--------------|----|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-21 | |
| 1 | | | 3 | | | TOTAL SHEETS | 41 |
| 2 | | | 4 | | | | |

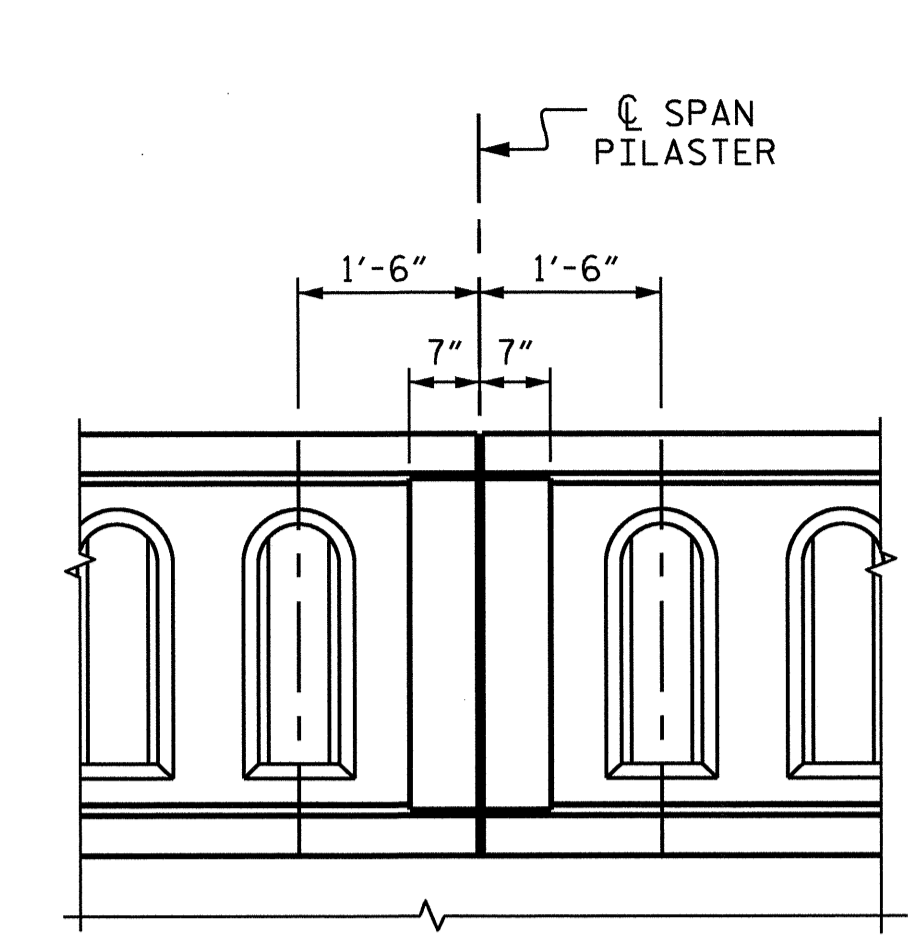
DRAWN BY : K.H. COMPTON DATE : 5/11
 CHECKED BY : J.H. CARDEN DATE : 5/11



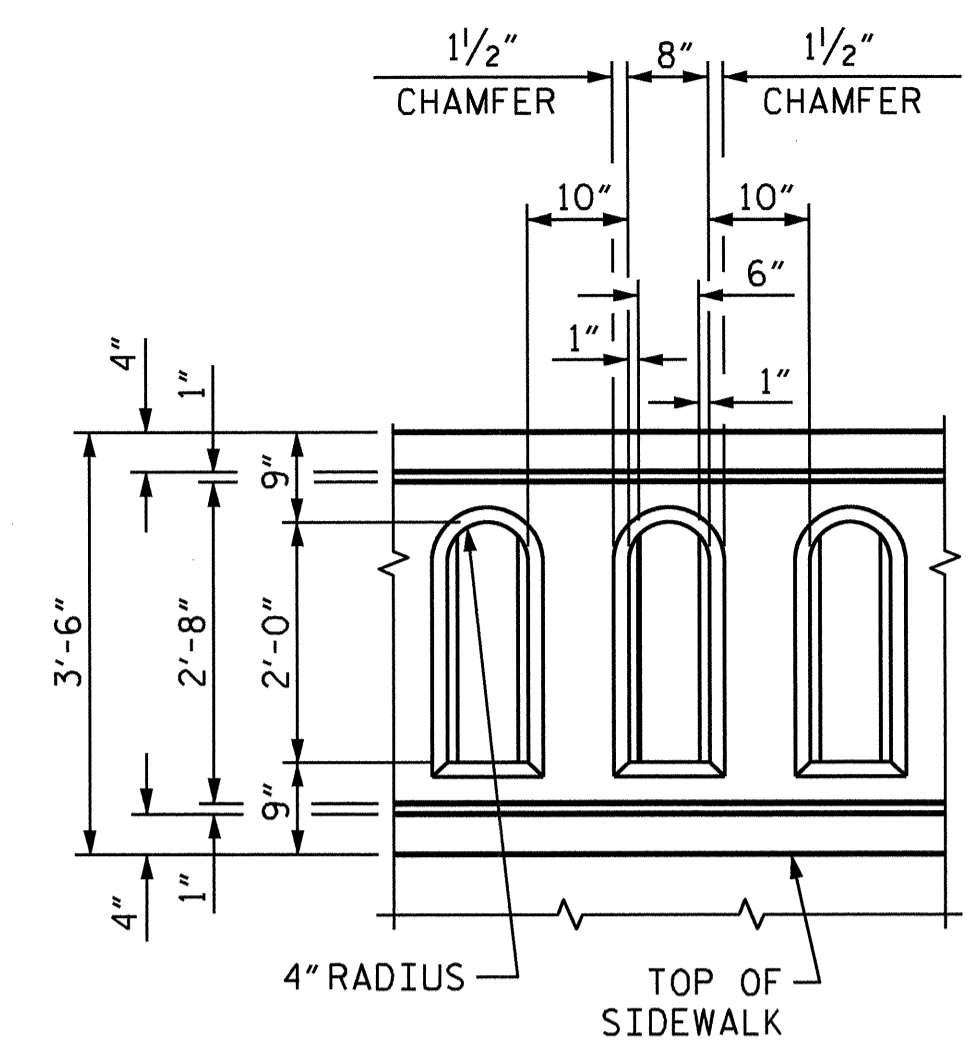
LEFT INTERIOR ELEVATION



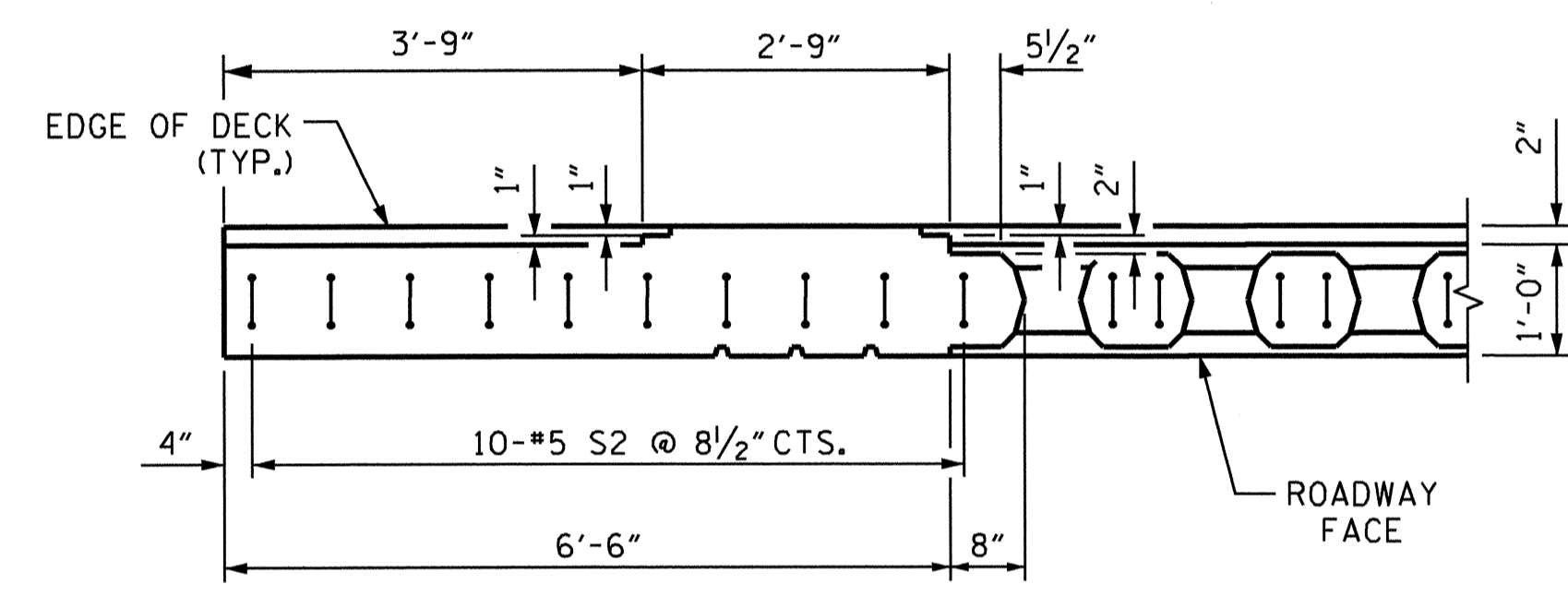
LEFT INTERIOR ELEVATION



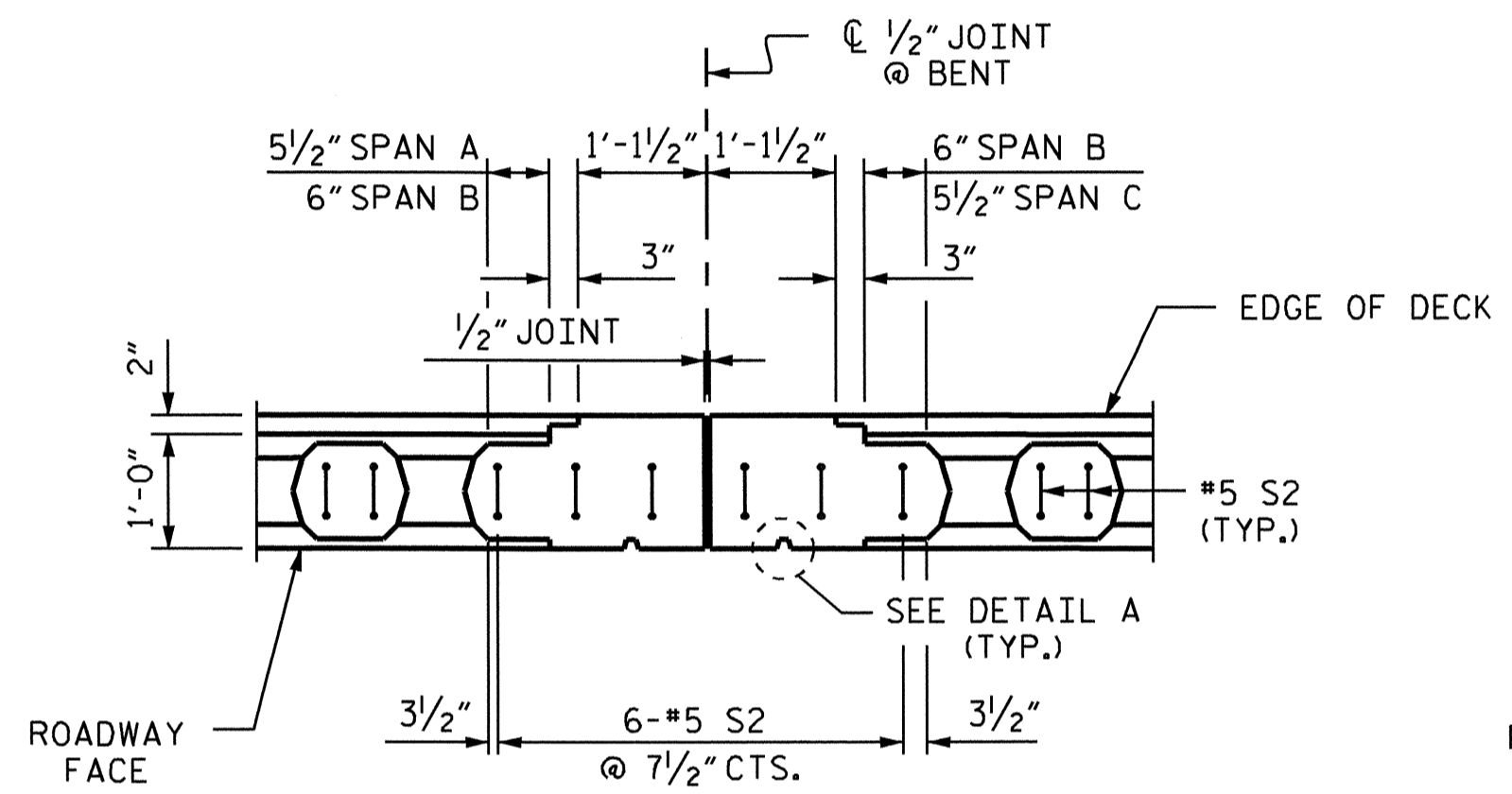
LEFT INTERIOR ELEVATION



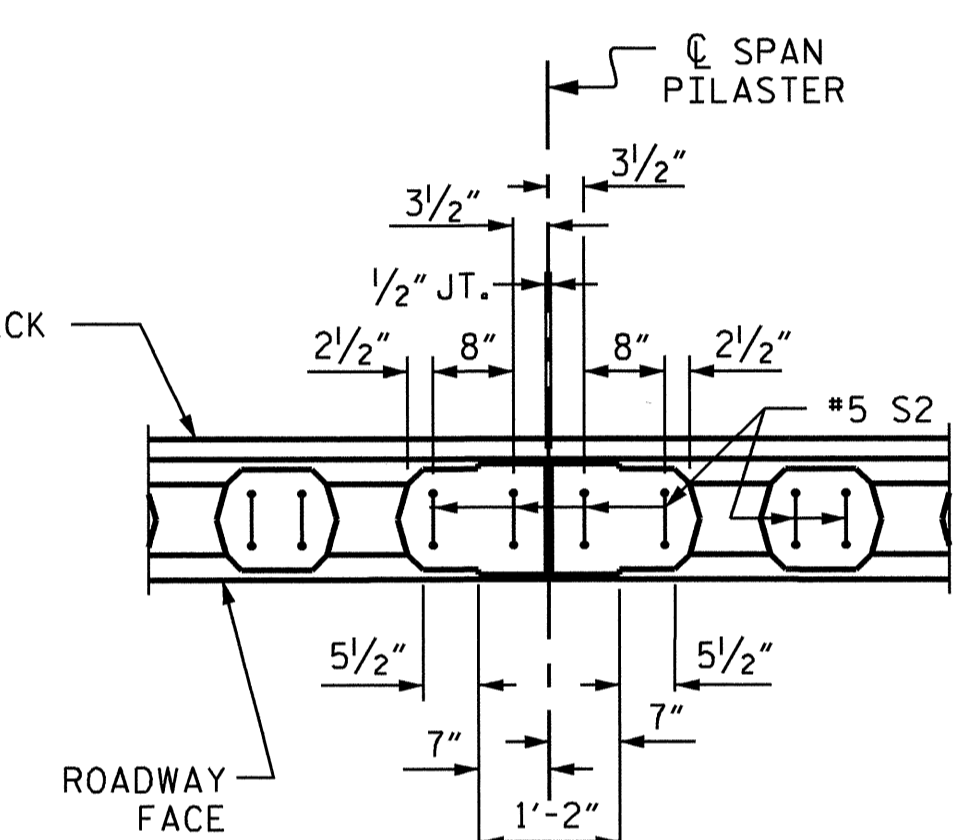
ELEVATION



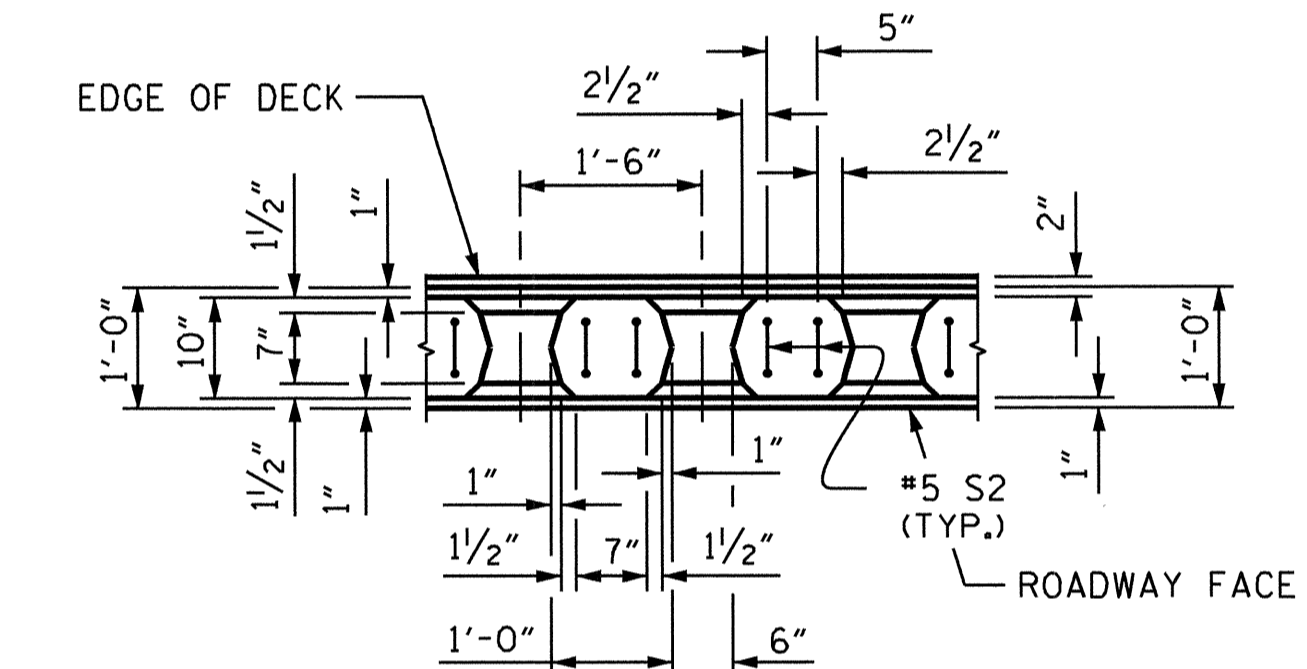
LEFT SIDE PLAN
(LEFT SHOWN, RIGHT SIMILIAR)



LEFT SIDE PLAN
(LEFT SHOWN, RIGHT SIMILIAR)

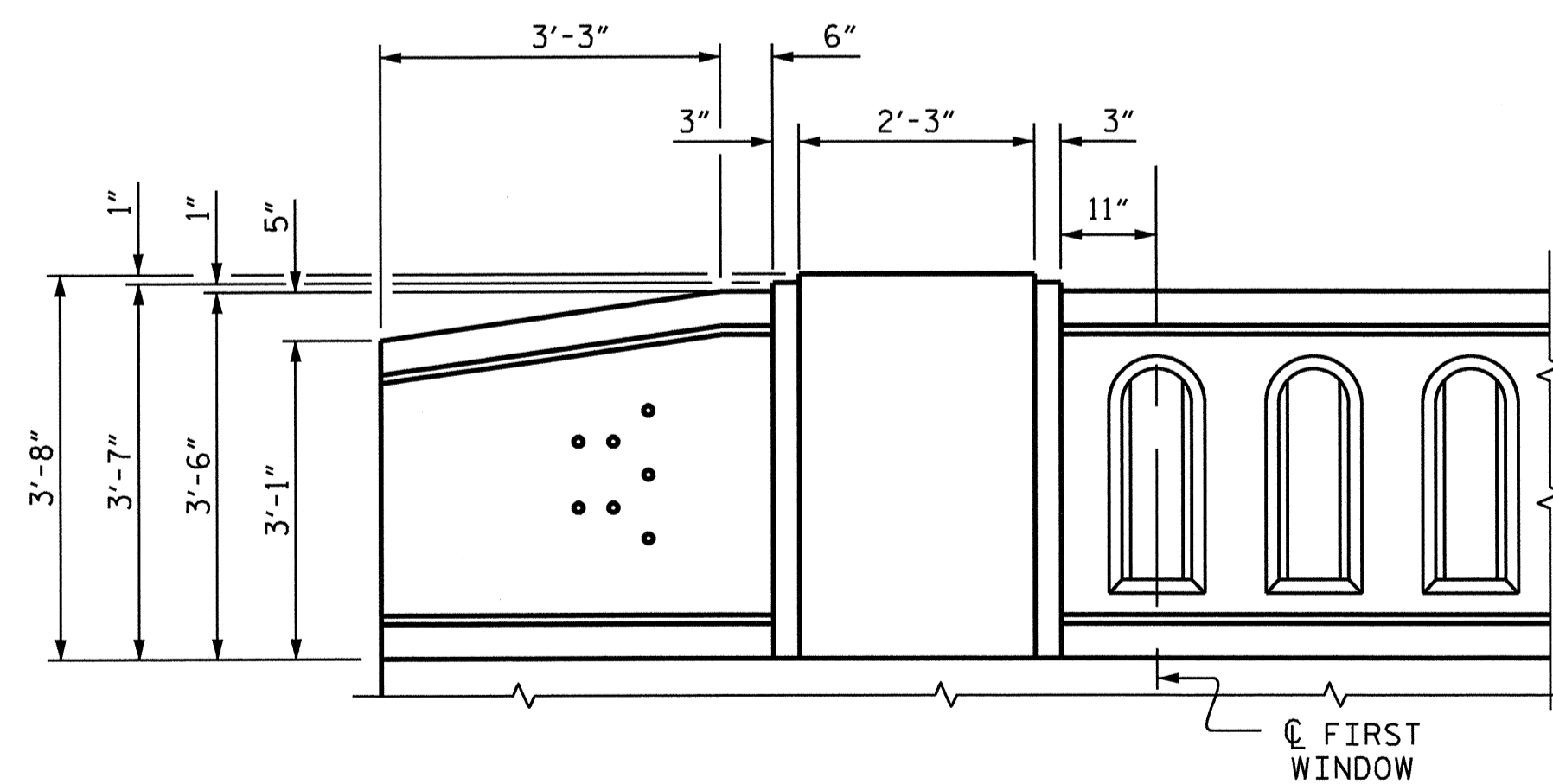


PLAN

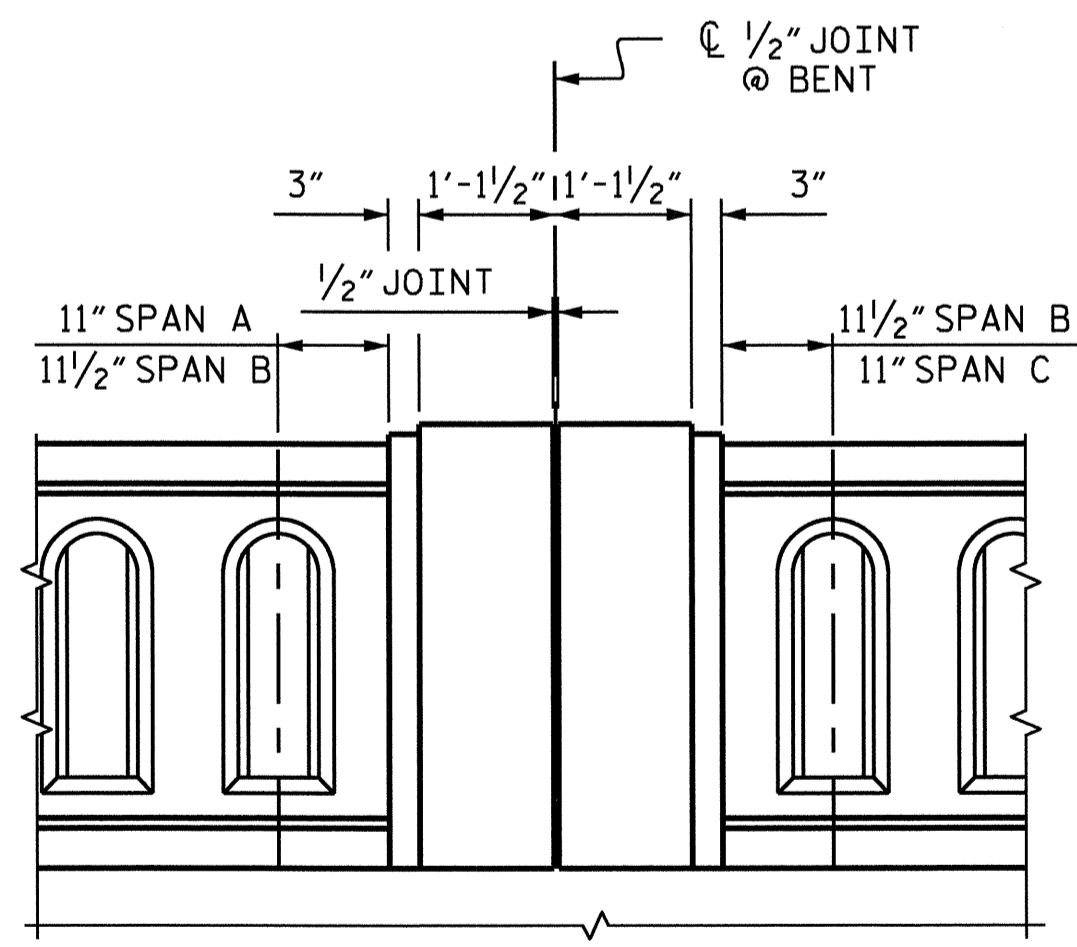


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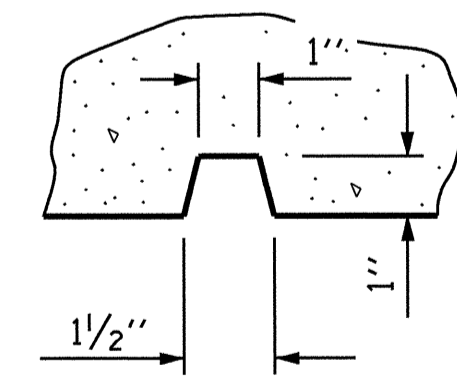
WINDOW DETAIL



RIGHT EXTERIOR ELEVATION



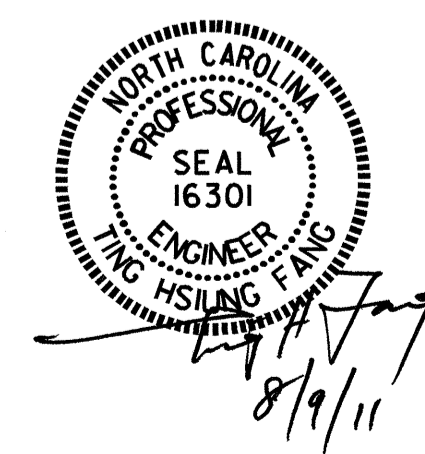
RIGHT EXTERIOR ELEVATION



DETAIL A

END BENT PILASTER
(END BENT 1 SHOWN, END BENT 2 SIM. BUT OPPOSITE)

BENT PILASTER
(BENT 1 SHOWN, BENT 2 SIMILIAR)



PROJECT NO. B-4090
CUMBERLAND COUNTY
 STATION: 18+55.00 -L-
 SHEET 4 OF 6

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 CLASSIC CONCRETE
 BRIDGE RAIL WITH
 SIDEWALK

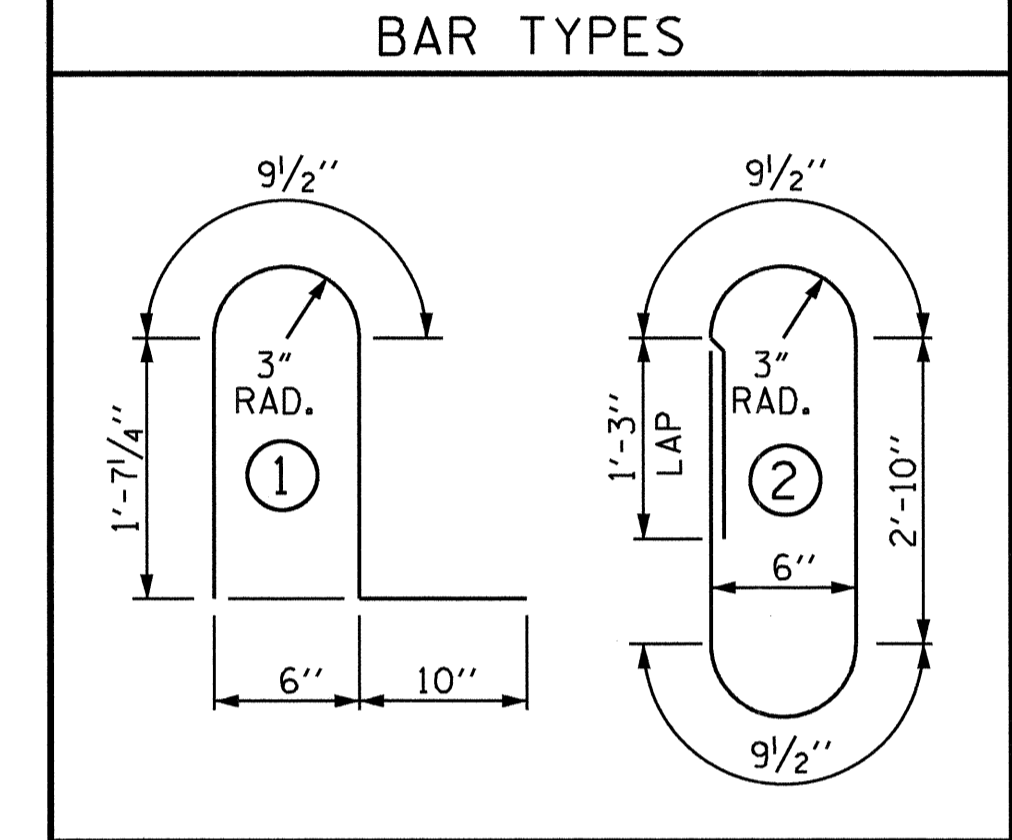
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|-----------|-----|-------|-----|-----|-------|-----------|----|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-22 | |
| 1 | | | 3 | | | TOTAL | 41 |
| 2 | | | 4 | | | SHEETS | |

DRAWN BY : K.H. COMPTON DATE : 5/11
 CHECKED BY : J.H. CARDEN DATE : 5/11

09-AUG-2011 13:31
 Y:\TIPPOjects\B\B4090\Structures\Final Plans\B4090.sd.txb.dgn
 OTNGUYEN

| BILL OF MATERIAL | | | | | |
|-------------------|-----|------|------|---------|--------|
| RAILS & PILASTERS | | | | | |
| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
| * B1 | 8 | #7 | STR | 29'-6" | 482 |
| * B2 | 8 | #7 | STR | 22'-1" | 361 |
| * B3 | 8 | #7 | STR | 24'-5" | 399 |
| * B4 | 8 | #7 | STR | 25'-11" | 424 |
| * B5 | 4 | #7 | STR | 23'-7" | 193 |
| * B6 | 8 | #5 | STR | 29'-6" | 246 |
| * B7 | 8 | #5 | STR | 22'-1" | 184 |
| * B8 | 8 | #5 | STR | 24'-5" | 204 |
| * B9 | 8 | #5 | STR | 25'-11" | 216 |
| * B10 | 4 | #5 | STR | 23'-7" | 98 |
| * S1 | 616 | #5 | 1 | 4'-10" | 3105 |
| * S2 | 616 | #5 | 2 | 8'-6" | 5461 |

| | |
|----------------------------------|-----------------|
| * EPOXY COATED REINFORCING STEEL | 11,373 LBS. |
| CLASS AA CONCRETE | 59.9 C.Y. |
| CLASSIC CONCRETE BRIDGE RAIL | 462.17 LIN. FT. |



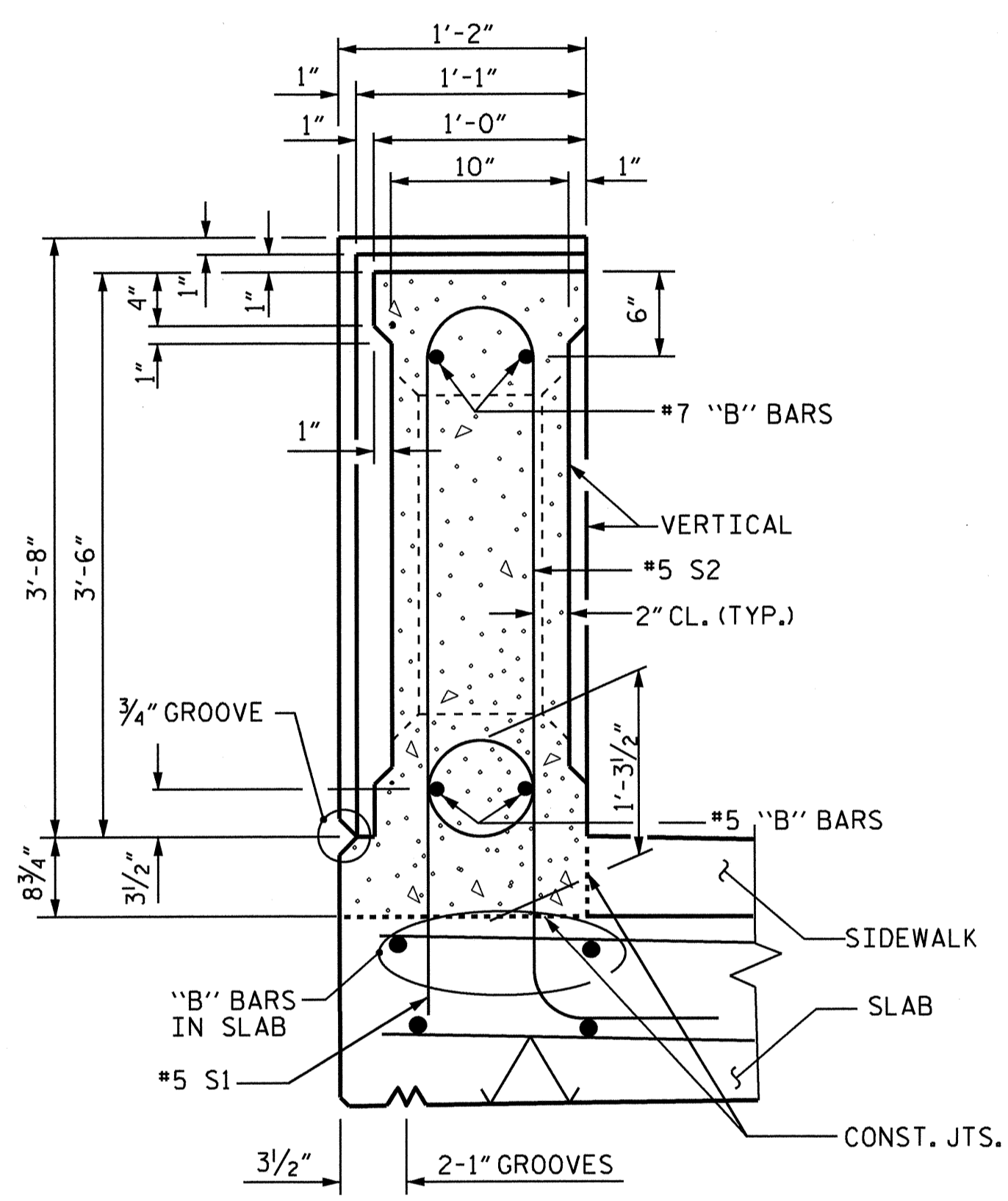
NOTES :

CLASSIC CONCRETE BRIDGE RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.

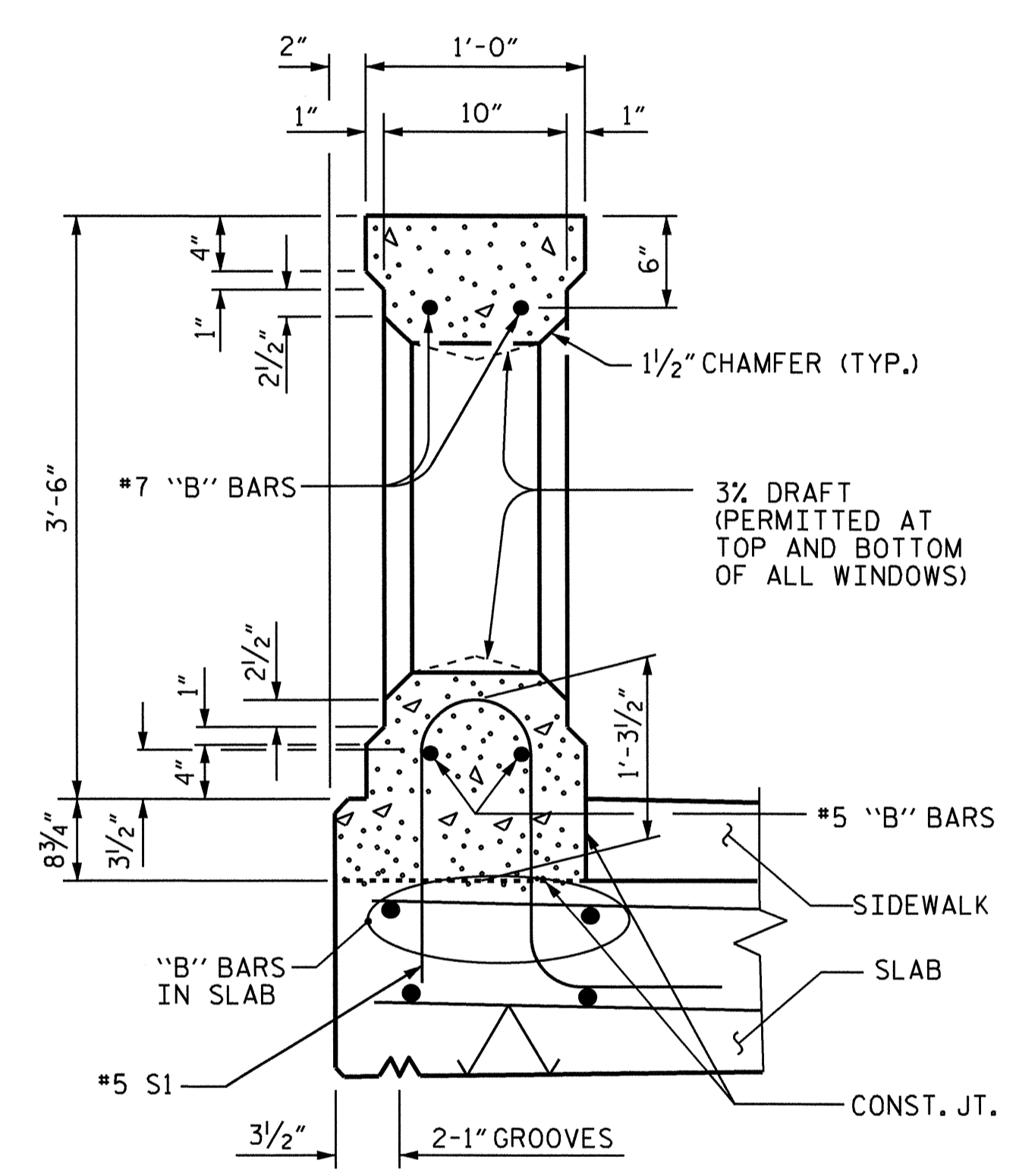
ALL REINFORCING STEEL IN CLASSIC CONCRETE BRIDGE RAIL SHALL BE EPOXY COATED.

PROVIDE A CLASS I SURFACE FINISH FOR ALL EXPOSED SURFACES.

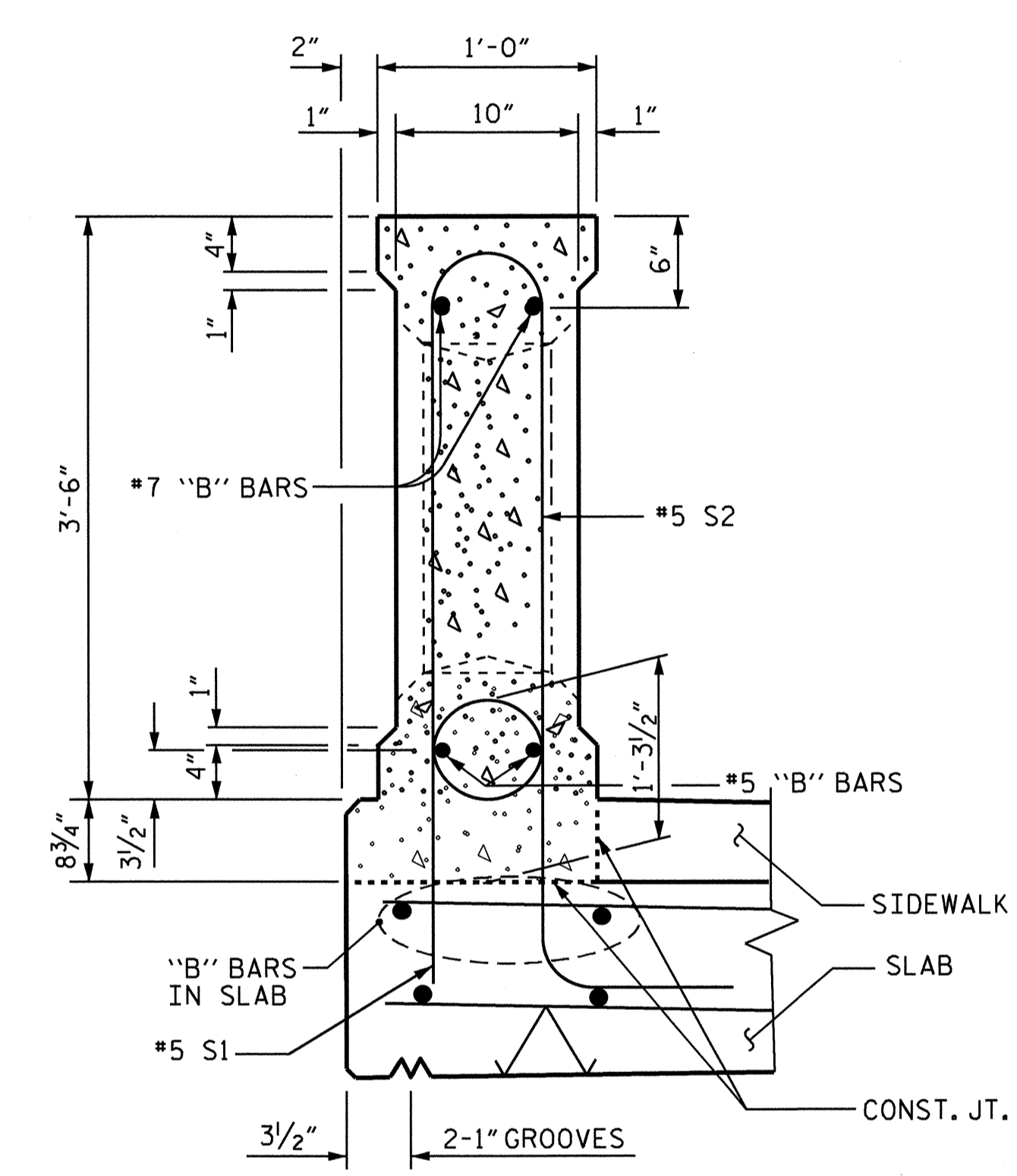
FOR CLASSIC CONCRETE BRIDGE RAIL, SEE SPECIAL PROVISIONS.



SECTION THRU PILASTER
(AT END BENTS & BENTS)



SECTION THRU WINDOW OF RAIL

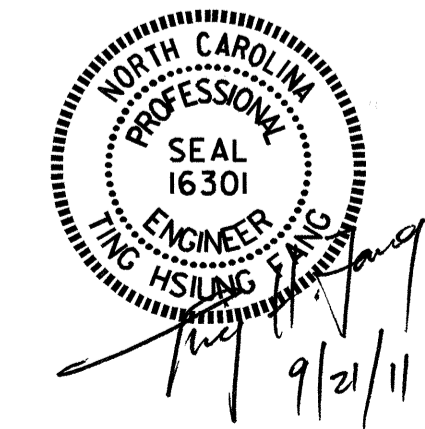


SECTION THRU POST

PROJECT NO. B-4090
CUMBERLAND COUNTY
 STATION: 18+55.00 -L-

SHEET 5 OF 6

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 CLASSIC CONCRETE
 BRIDGE RAIL



DRAWN BY : K.H. COMPTON DATE : 5/11
 CHECKED BY : J.H. CARDEN DATE : 5/11

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-23 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 41 |

NOTES

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

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

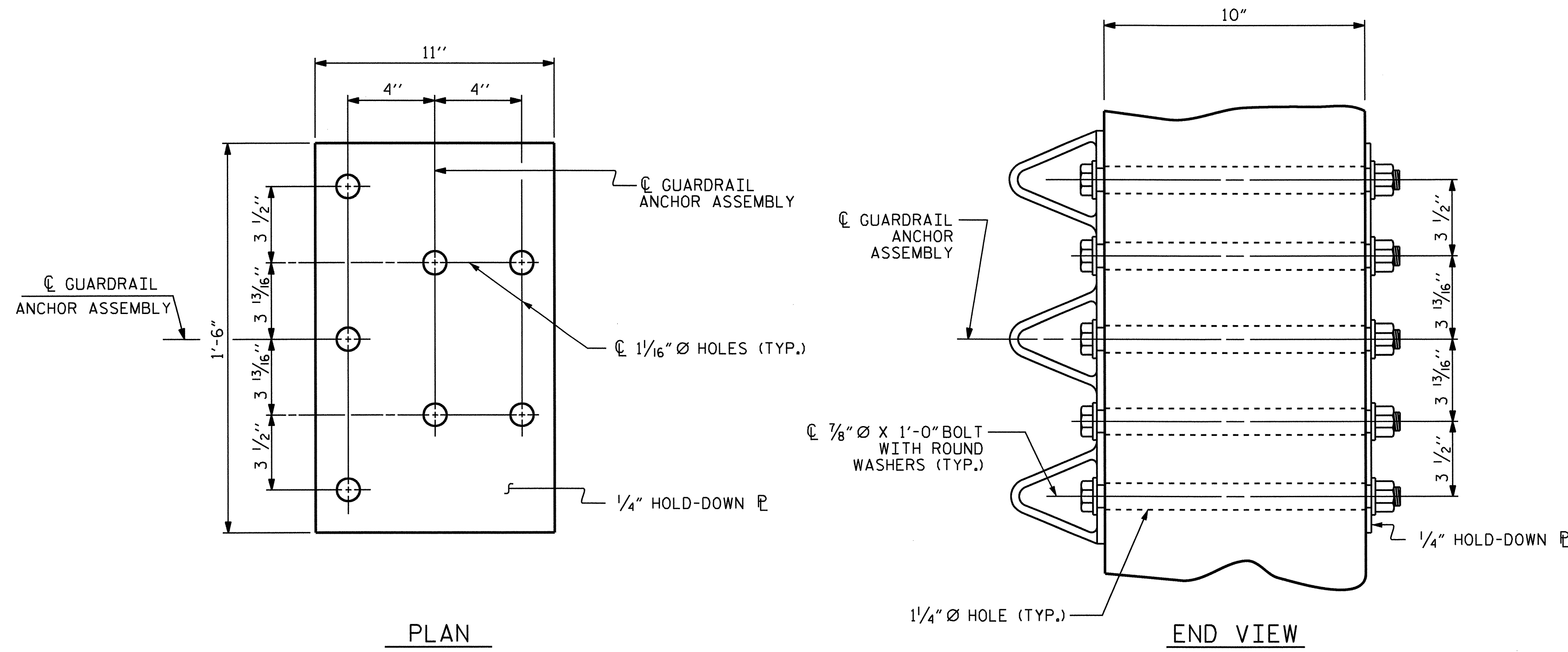
BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS.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

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

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

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

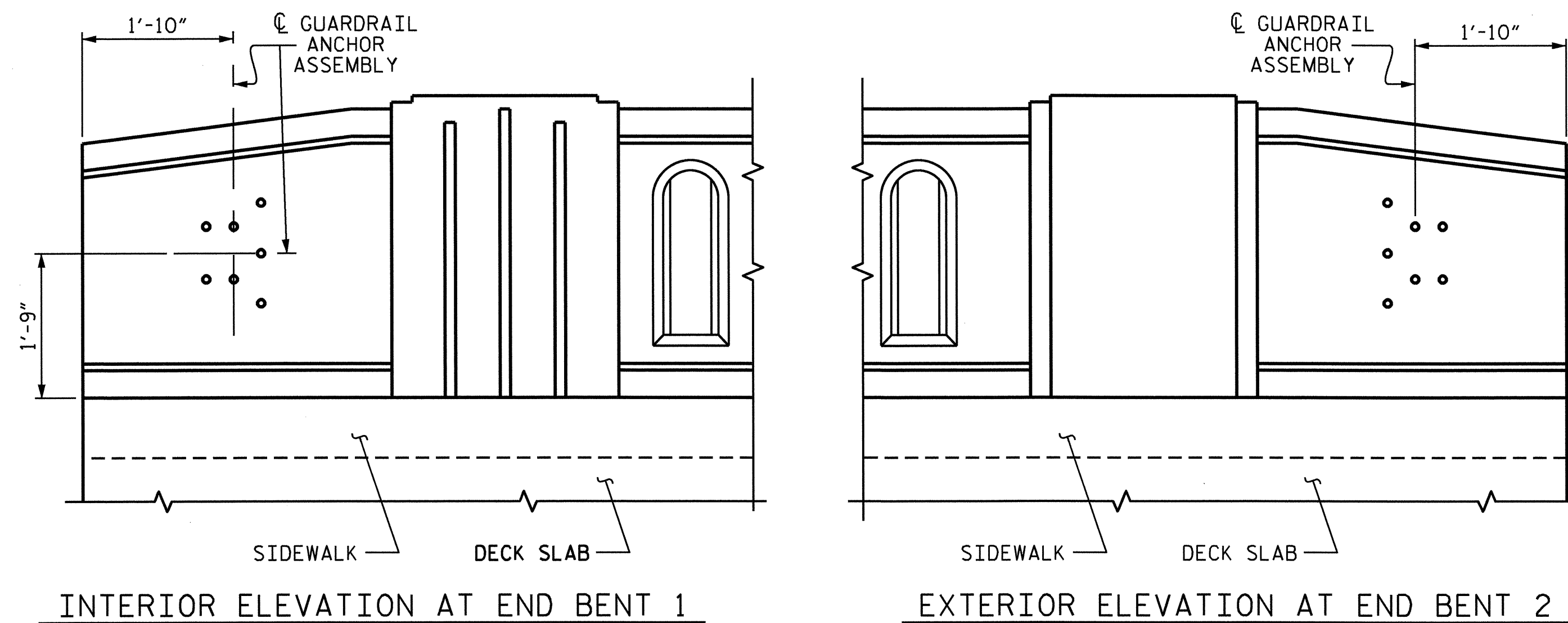
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



PLAN

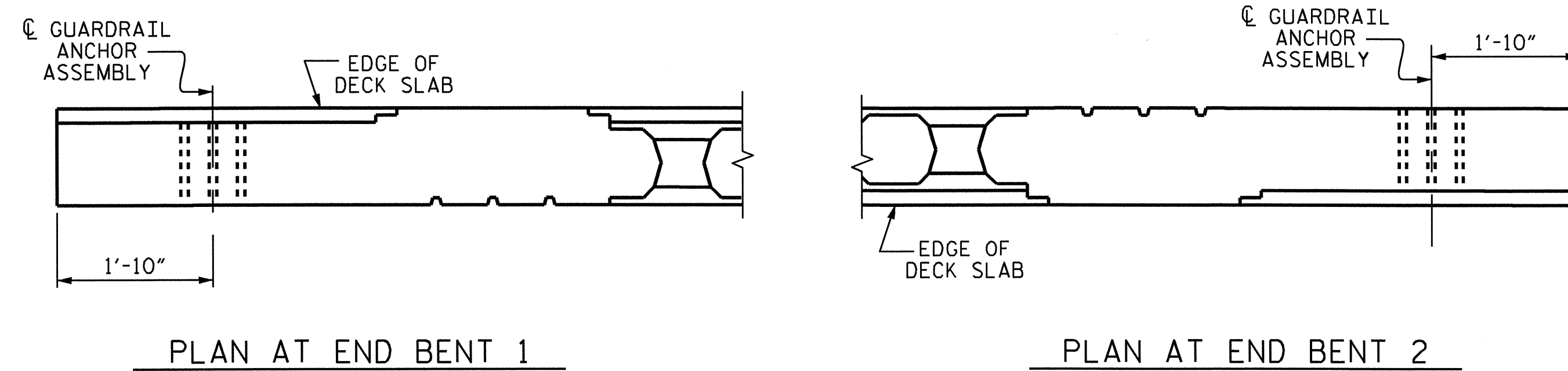
END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS



INTERIOR ELEVATION AT END BENT 1

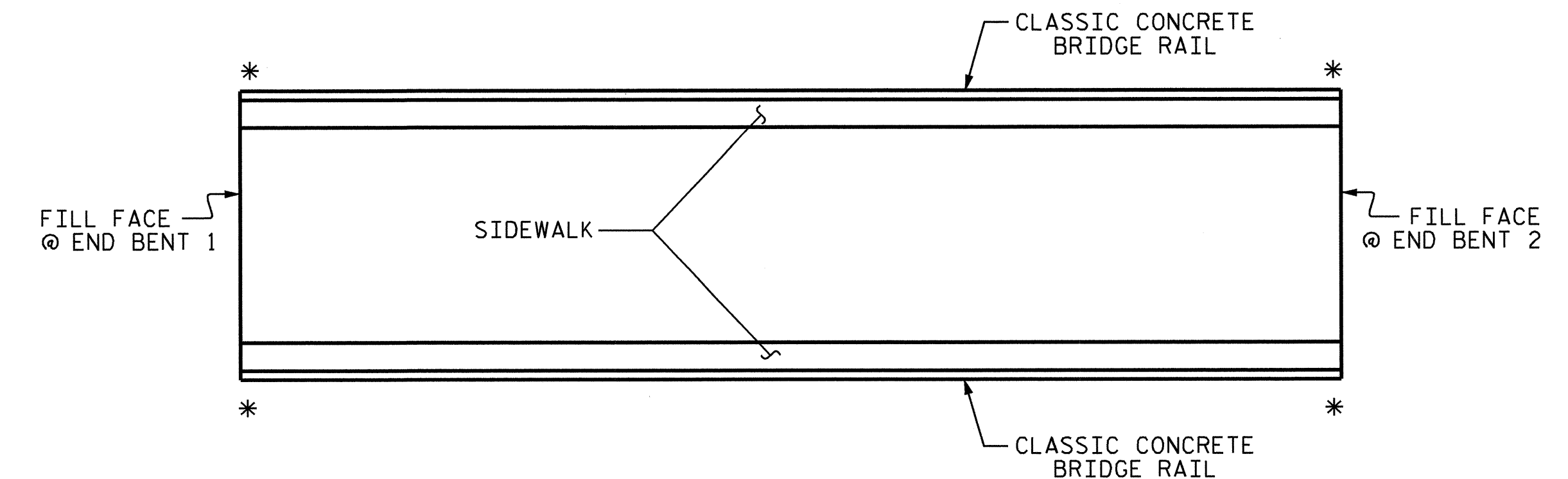
EXTERIOR ELEVATION AT END BENT 2



PLAN AT END BENT 1

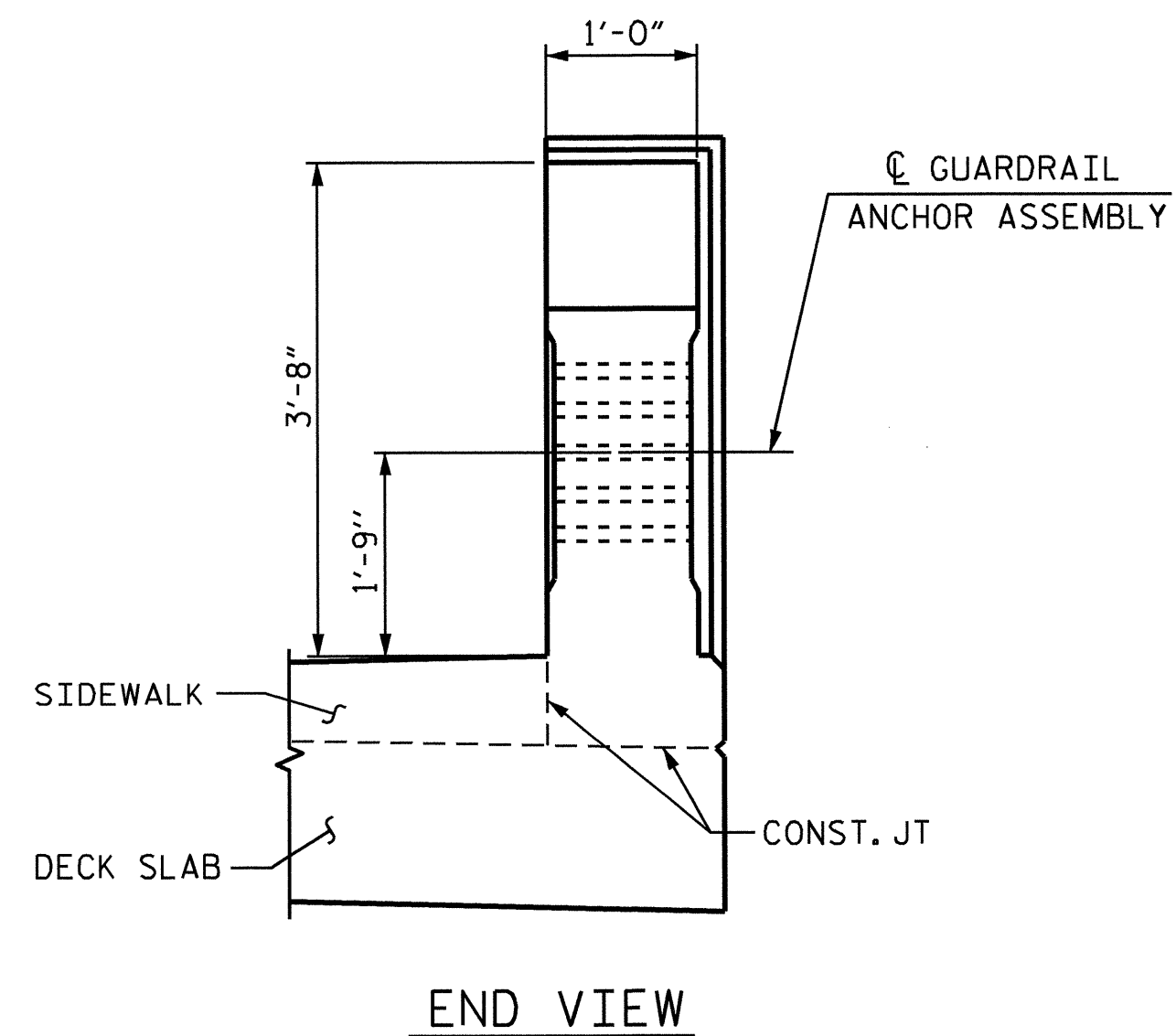
PLAN AT END BENT 2

LOCATION OF GUARDRAIL ANCHOR AT END POST

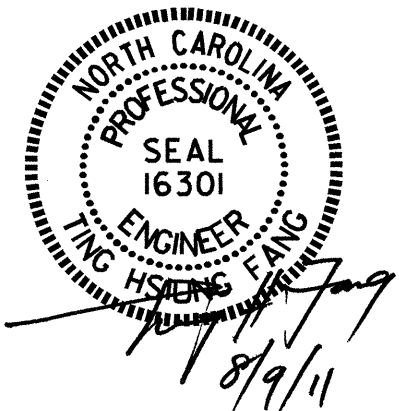


SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT



END VIEW



PROJECT NO. B-4090
 CUMBERLAND COUNTY
 STATION: 18+55.00 -L-

SHEET 6 OF 6

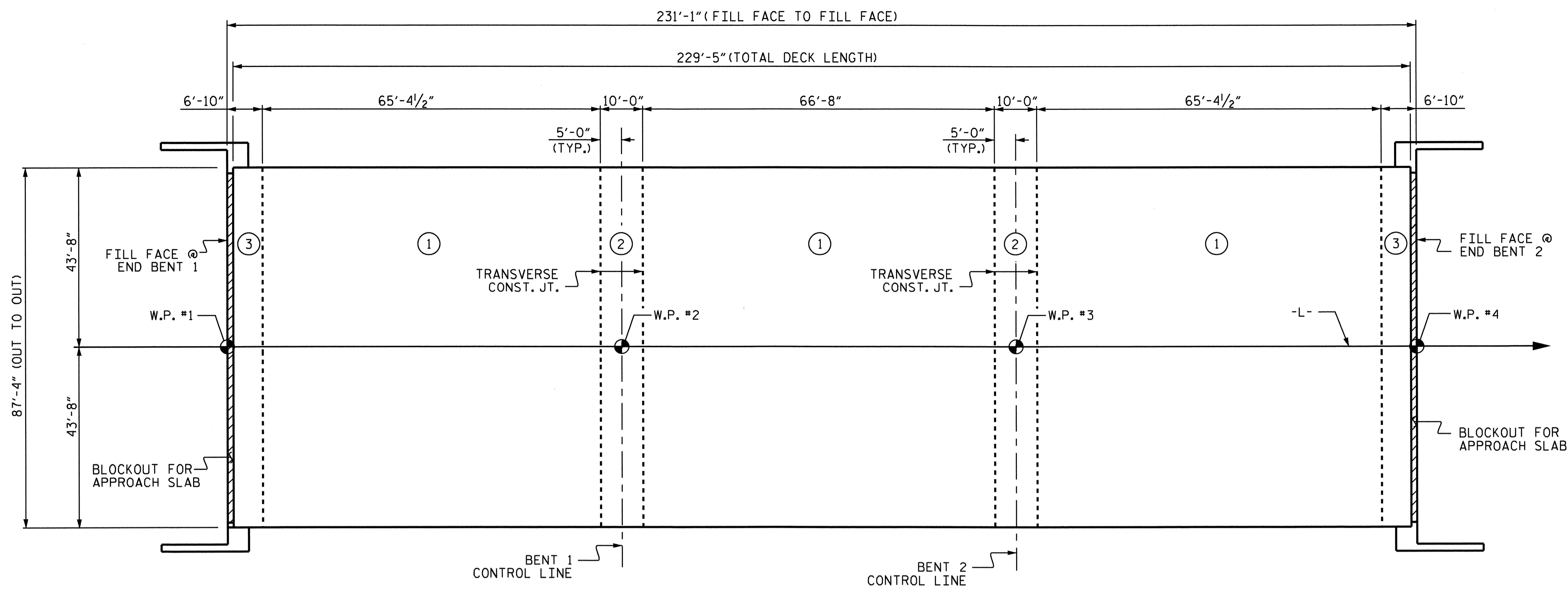
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 GUARDRAIL ANCHORAGE
 DETAILS

| | |
|-----------------------------|-----------------------|
| ASSEMBLED BY : K.H. COMPTON | DATE : 5/11 |
| CHECKED BY : J.H. CARDEN | DATE : 5/11 |
| DRAWN BY : EEM 6/94 | REV. 10/17/00 RWW/LES |
| CHECKED BY : RGW 6/94 | REV. 5/7/03 RWW/JTE |
| | REV. 5/1/06 TLA/GM |

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

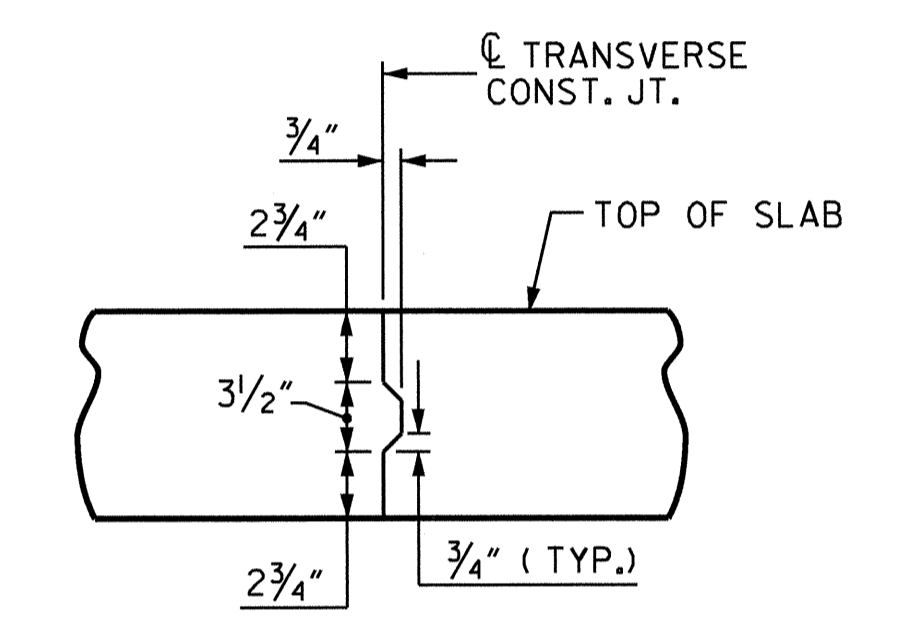
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|--------------|------|
| SHEET NO. | S-24 |
| TOTAL SHEETS | 41 |

STD. NO. BMR8



OPTIONAL POURING SEQUENCE

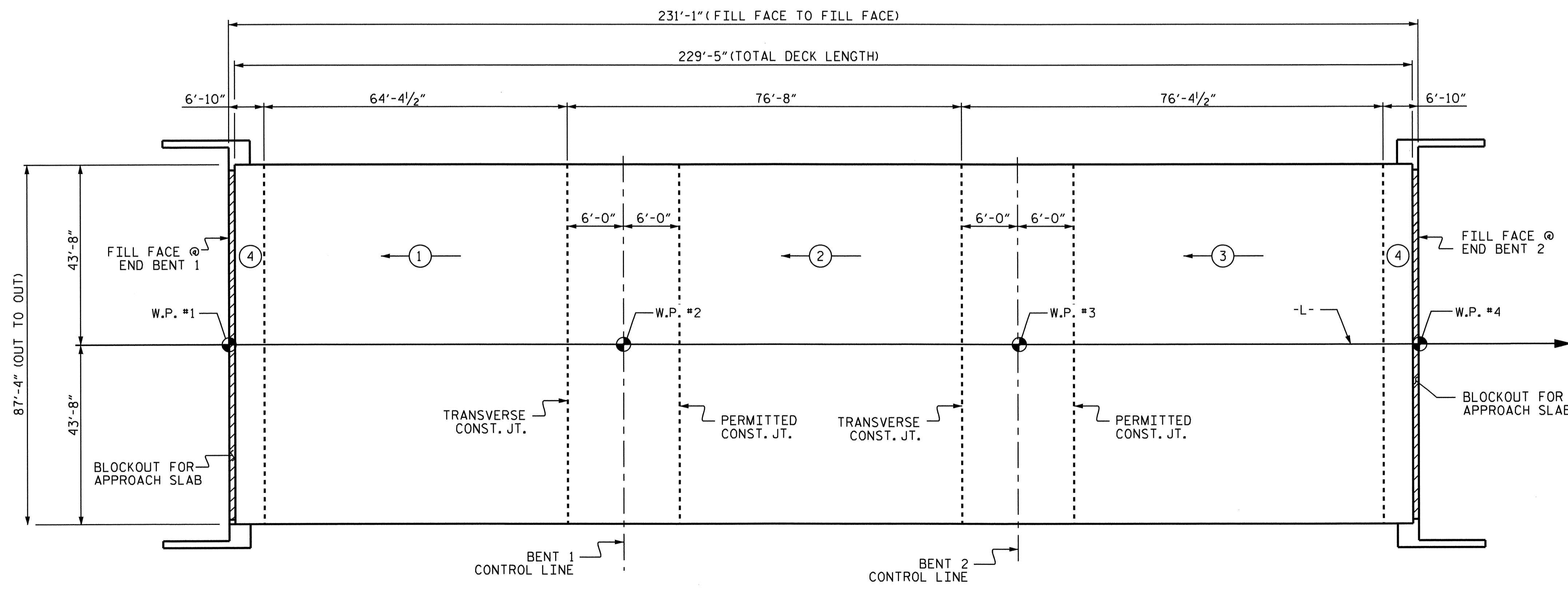
POURS 2 CANNOT BE STARTED UNTIL BOTH ADJACENT
POURS 1 REACH A MINIMUM OF 3000 PSI.



**TRANSVERSE CONSTRUCTION JOINT
DETAIL**

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

NOTE: THE UPPER PORTION OF THE WINGS SHALL
BE POURED WITH THE SUPERSTRUCTURE.

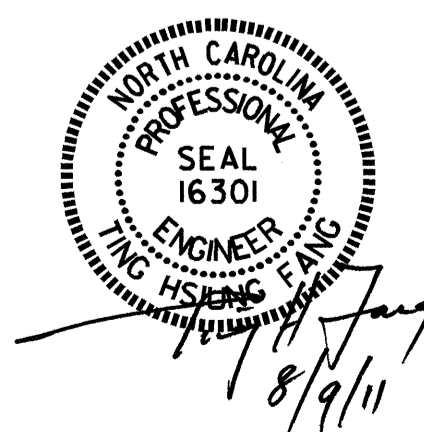


POURING SEQUENCE

← # = INDICATES POUR NUMBER
AND DIRECTION OF POUR

PROJECT NO. B-4090
CUMBERLAND COUNTY
STATION: 18+55.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
POUR SEQUENCE



| | |
|-----------------------------|----------------------|
| ASSEMBLED BY : K.H. COMPTON | DATE : 2/11 |
| CHECKED BY : J.H. CARDEN | DATE : 3/11 |
| DRAWN BY : JMB 5/87 | REV. 6/1/94 EEM/GRP |
| CHECKED BY : SJD 9/87 | REV. 8/16/99 RWW/LES |
| | REV. 5/1/06 TLA/GM |

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|-----------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-25 |
| 1 | | | 3 | | | TOTAL SHEETS 41 |
| 2 | | | 4 | | | |

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" | | | |

GROOVING BRIDGE FLOORS

| | | |
|----------------|--------|--------|
| APPROACH SLABS | 2,580 | SO.FT. |
| BRIDGE DECK | 13,765 | SO.FT. |
| TOTAL | 16,345 | SO.FT. |

| SUPERSTRUCTURE BILL OF MATERIAL | | | | | | | |
|---------------------------------|-------------------|-------|-------|-------|-------|-------------------------|--|
| | CLASS AA CONCRETE | | | | | REINFORCING STEEL (LBS) | * EPOXY COATED REINFORCING STEEL (LBS) |
| | (CU. YD.) | | | | | | |
| POUR NO. | #1 | #2 | #3 | #4 | TOTAL | | |
| DECK | 189.7 | 261.5 | 260.7 | 144.1 | 856.0 | 80,586 | 86,754 |
| SIDEWALK | | | | | 34.1 | | ** |
| CONC. MEDIAN | | | | | 31.8 | | ** |
| TOTALS ** | | | | | 921.9 | 80,586 | 86,754 |

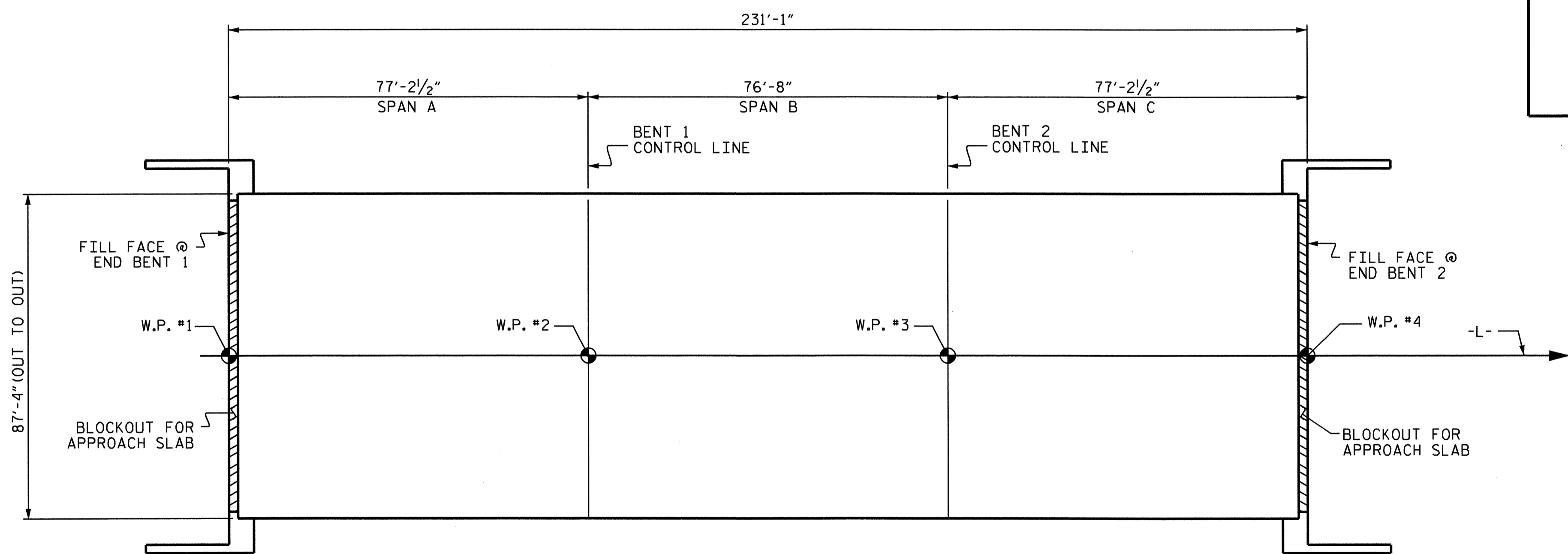
** QUANTITIES INCLUDED WITH SPAN TOTALS

BAR TYPES

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|-----|------|------|------|---------|--------|
| *A1 | 1000 | #5 | STR | 44'-9" | 46674 |
| A2 | 1000 | #5 | STR | 44'-7" | 46500 |
| *B1 | 240 | #4 | STR | 19'-5" | 3113 |
| *B2 | 118 | #7 | STR | 56'-0" | 13507 |
| *B3 | 116 | #7 | STR | 23'-0" | 5453 |
| *B4 | 60 | #4 | STR | 24'-8" | 989 |
| B5 | 480 | #5 | STR | 58'-11" | 29496 |
| *B6 | 234 | #7 | STR | 15'-8" | 7493 |
| *B7 | 150 | #4 | STR | 29'-2" | 2923 |
| *G1 | 548 | #4 | STR | 5'-2" | 1891 |
| *G2 | 182 | #4 | STR | 7'-0" | 851 |
| H1 | 48 | #4 | 5 | 12'-11" | 414 |
| K1 | 32 | #4 | STR | 24'-7" | 525 |
| K2 | 16 | #4 | STR | 7'-11" | 85 |
| K3 | 32 | #4 | STR | 9'-2" | 196 |
| K4 | 16 | #4 | STR | 8'-5" | 90 |
| K5 | 4 | #4 | STR | 5'-1" | 14 |
| K6 | 8 | #4 | STR | 5'-8" | 30 |
| K7 | 4 | #4 | STR | 5'-4" | 14 |
| K8 | 16 | #4 | STR | 2'-8" | 29 |
| K9 | 32 | #4 | STR | 6'-9" | 144 |
| K10 | 64 | #4 | STR | 9'-1" | 388 |
| K11 | 32 | #4 | STR | 8'-4" | 178 |
| K12 | 24 | #4 | STR | 28'-2" | 452 |
| S1 | 156 | #4 | 3 | 10'-0" | 1042 |
| S2 | 8 | #4 | 3 | 14'-1" | 75 |
| *S3 | 156 | #4 | 4 | 11'-8" | 1216 |
| *S4 | 152 | #4 | 4 | 10'-0" | 1015 |
| S5 | 352 | #4 | 2 | 2'-9" | 647 |
| *U1 | 96 | #4 | 1 | 14'-6" | 930 |
| *U2 | 32 | #4 | 1 | 12'-6" | 267 |
| *U3 | 160 | #4 | 6 | 3'-4" | 356 |
| V2 | 96 | #4 | STR | 5'-4" | 342 |

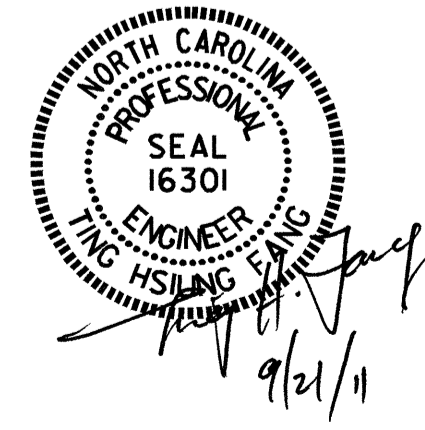
ALL BAR DIMENSIONS ARE OUT TO OUT

REINFORCING STEEL = 80,586 LBS
*EPOXY COATED REINF. STEEL = 86,754 LBS



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ. FT. = 20,181)

PROJECT NO. B-4090
CUMBERLAND COUNTY
STATION: 18+55.00 -L-



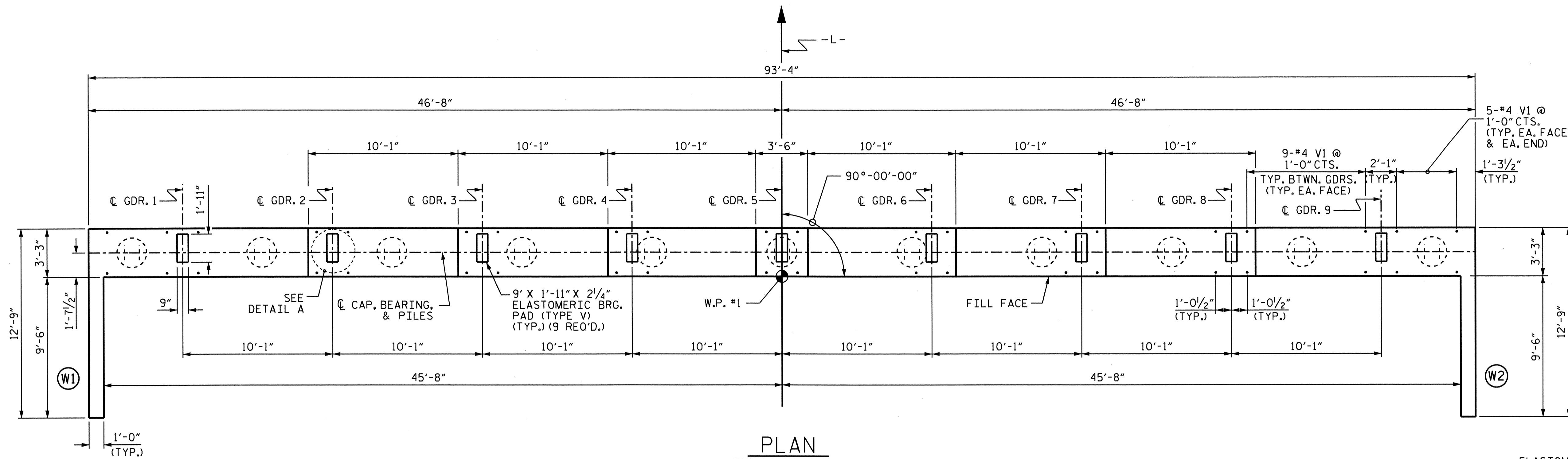
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|-----------|-----|-------|-----|-----|-------|-----------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-26 |
| 1 | | | 3 | | | TOTAL SHEETS 41 |
| 2 | | | 4 | | | |

| | |
|-----------------------------|----------------------|
| ASSEMBLED BY : K.H. COMPTON | DATE : 2/11 |
| CHECKED BY : J.H. CARDEN | DATE : 3/11 |
| DRAWN BY : JMB 5/87 | REV. 6/1/94 EEM/GRP |
| CHECKED BY : SJD 9/87 | REV. 8/16/99 RWW/LES |
| | REV. 5/1/06 TLA/GM |

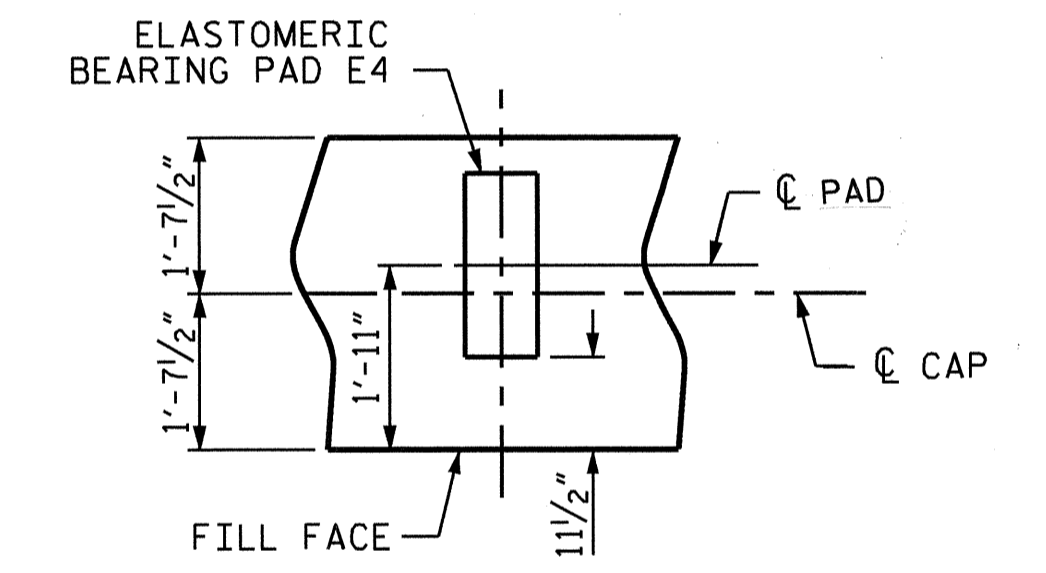
NOTES:

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

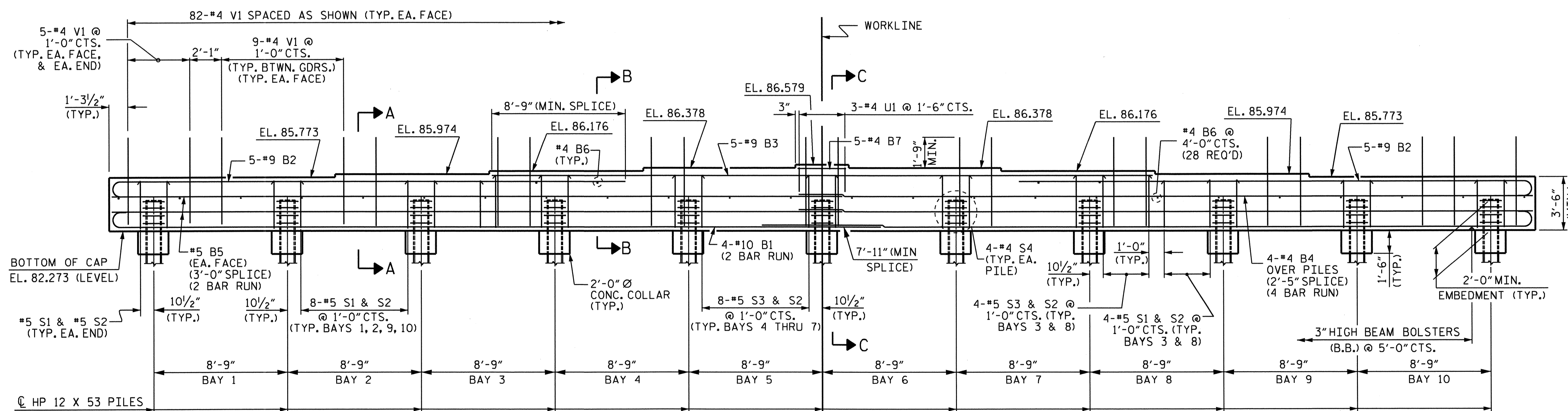
THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.



PLAN



DETAIL A



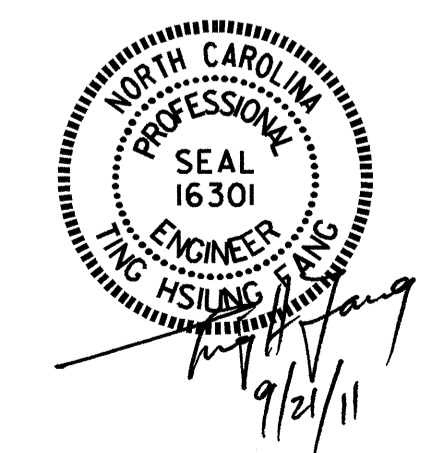
ELEVATION

PROJECT NO. B-4090
CUMBERLAND COUNTY
 STATION: 18+55.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

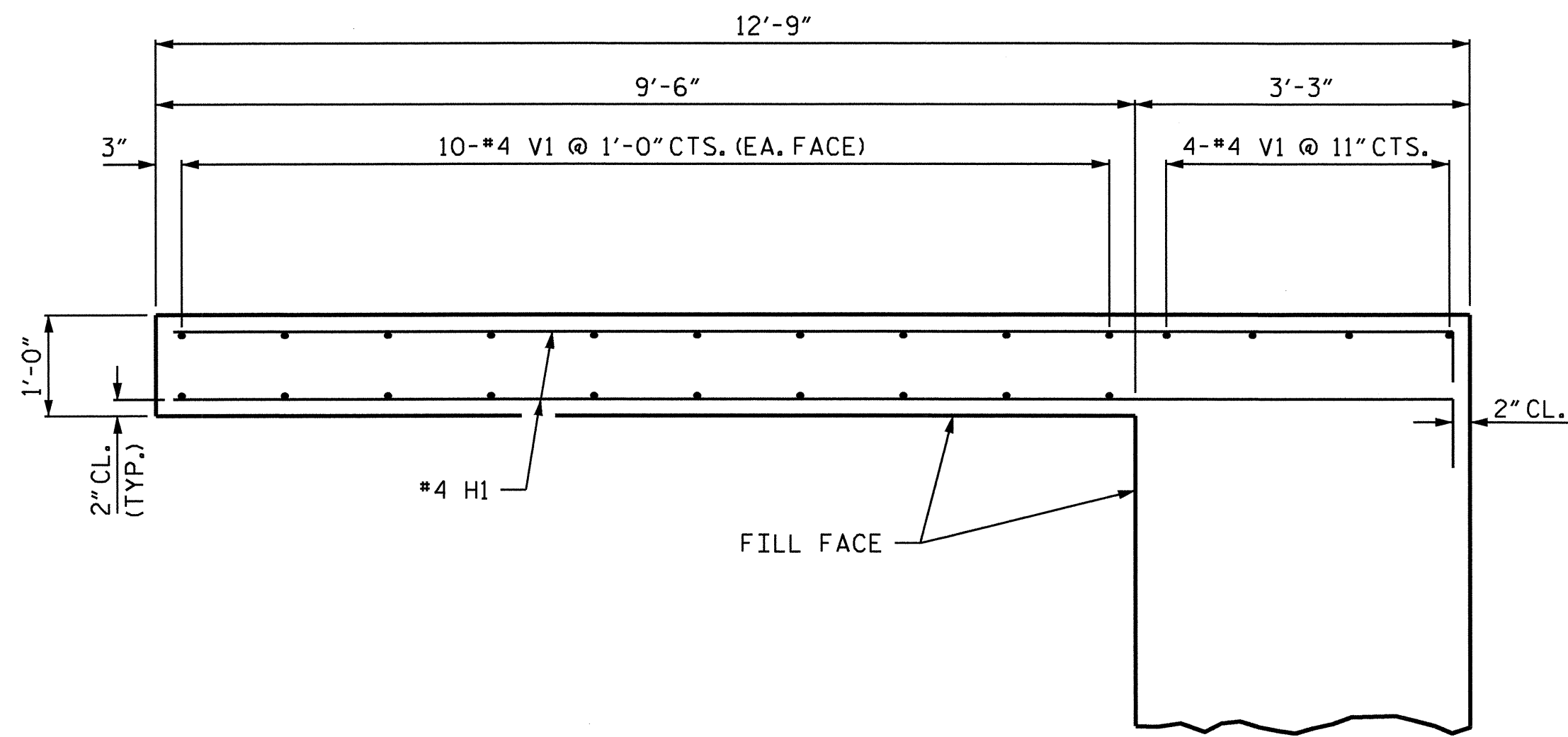
**SUBSTRUCTURE
 END BENT 1
 (INTEGRAL)**



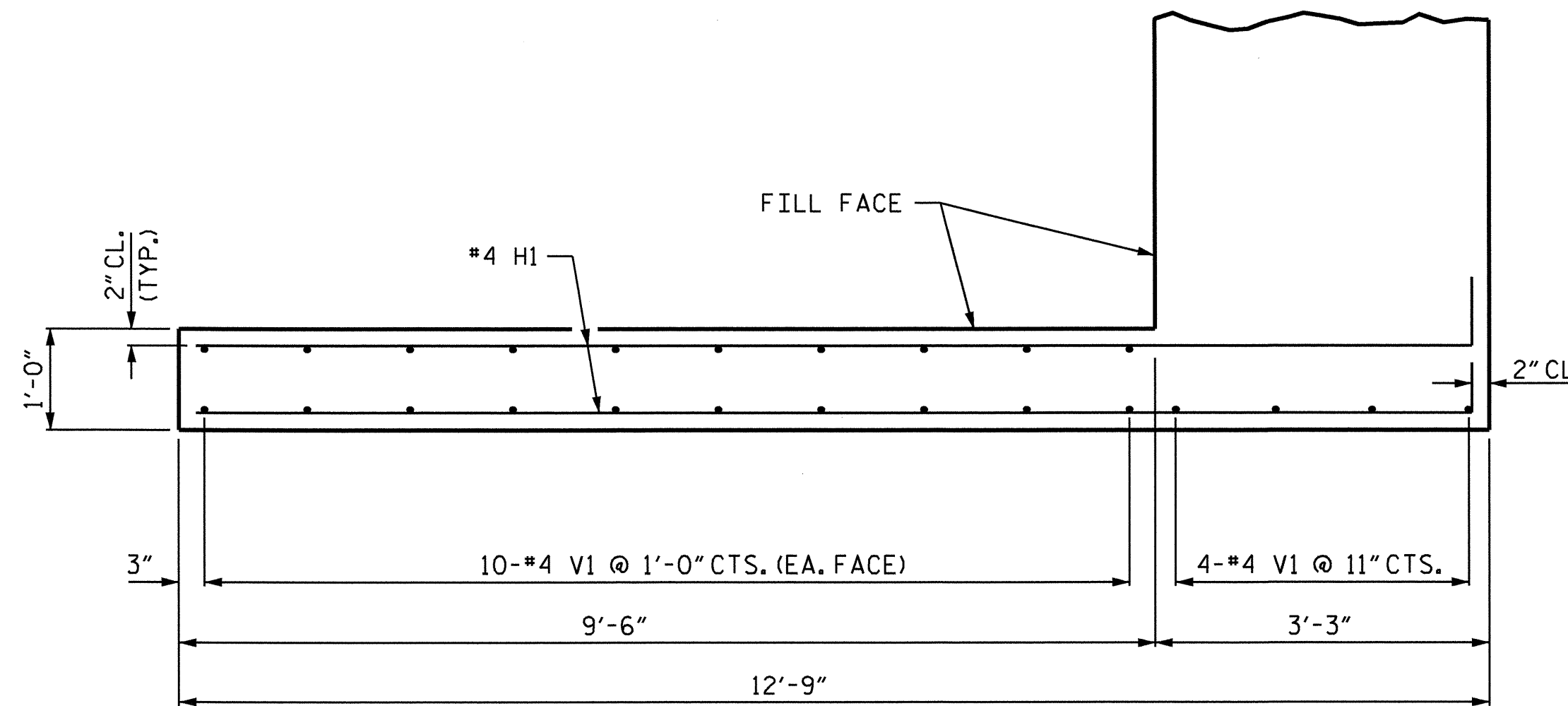
DRAWN BY: K.H. COMPTON DATE: 2/11
 CHECKED BY: B. MATHEW DATE: 2/11

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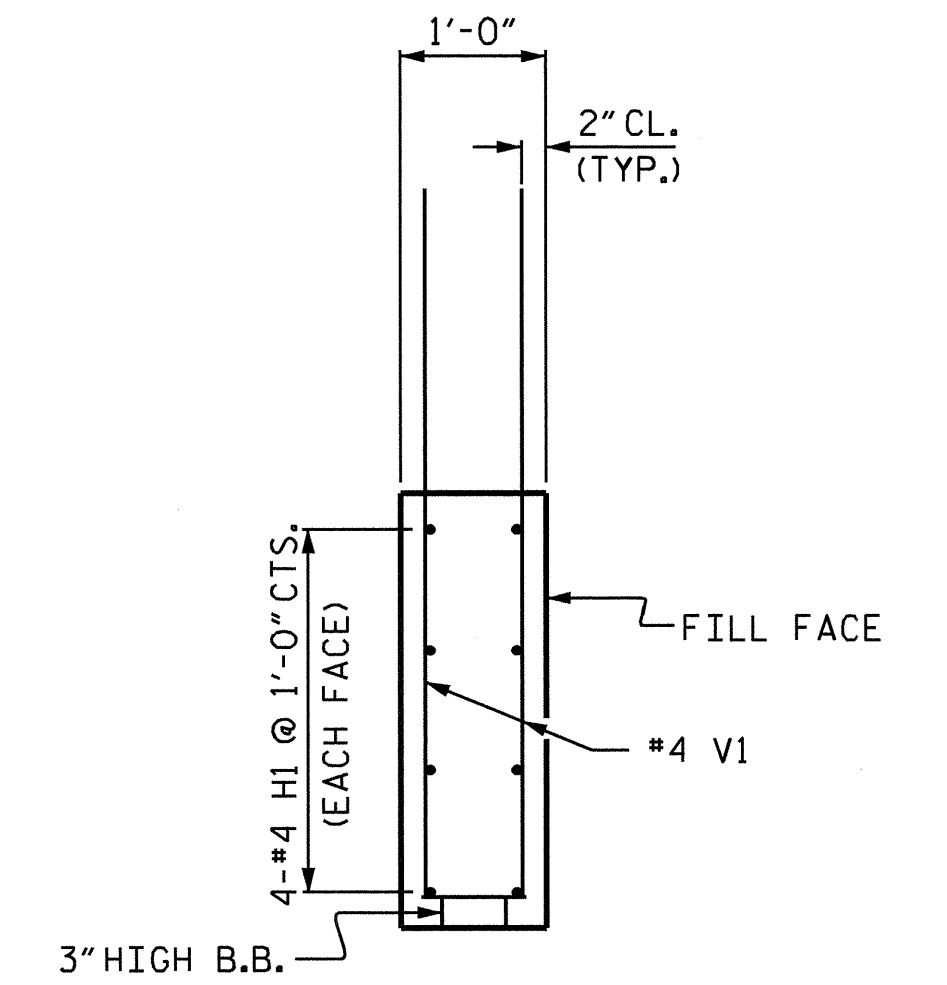
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|-----------|-----|-------|-----|-----|-------|--------------------|
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| 1 | | | 3 | | | TOTAL SHEETS 41 |
| 2 | | | 4 | | | |



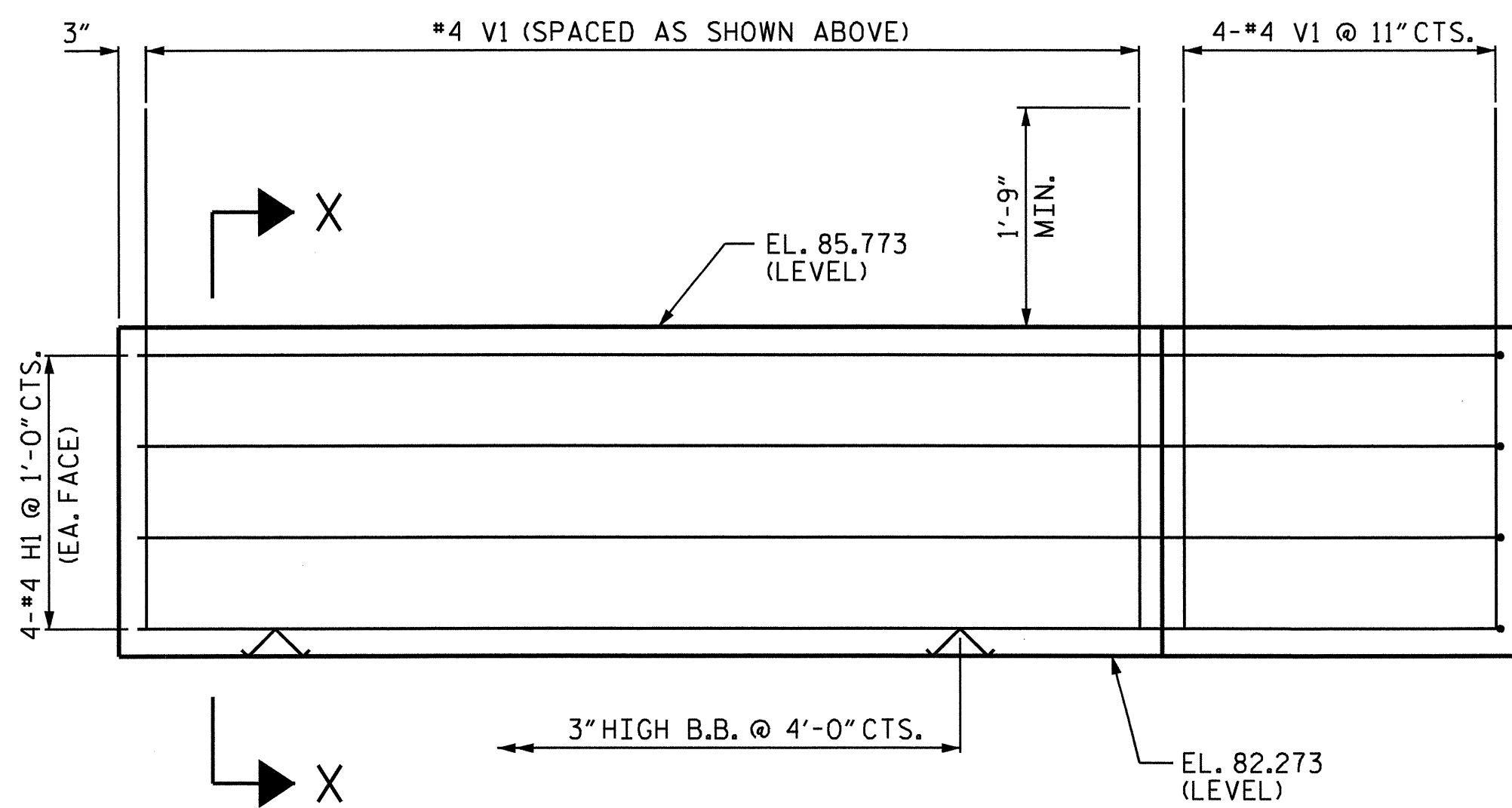
PLAN OF WING (W1)



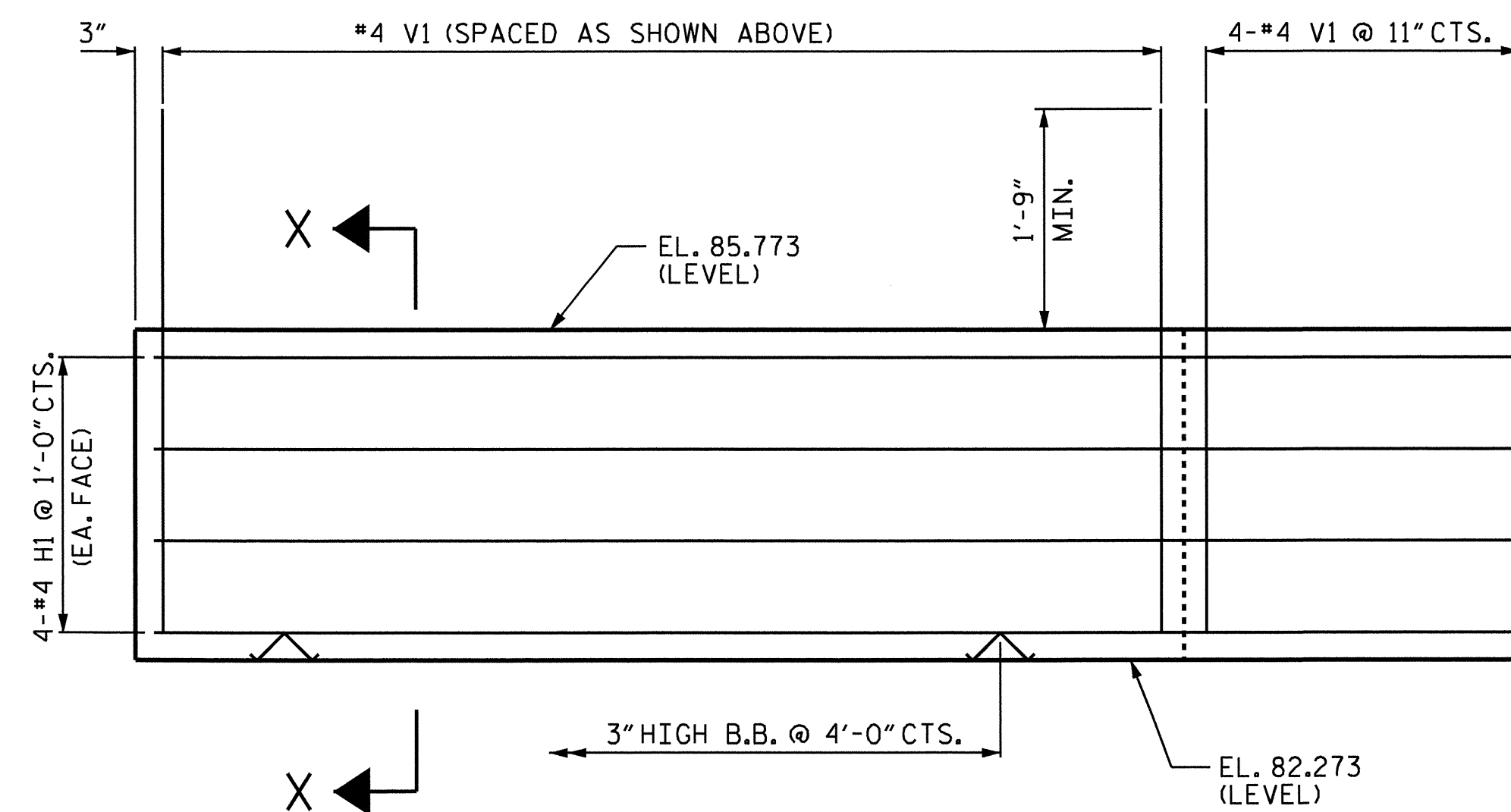
PLAN OF WING (W2)



SECTION X-X



ELEVATION OF WING (W1)

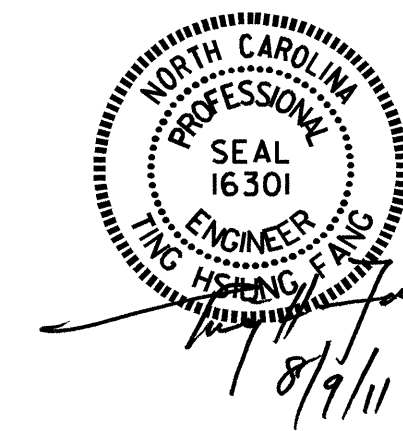


ELEVATION OF WING (W2)

PROJECT NO. B-4090
CUMBERLAND COUNTY
 STATION: 18+55.00 -L-

SHEET 2 OF 3

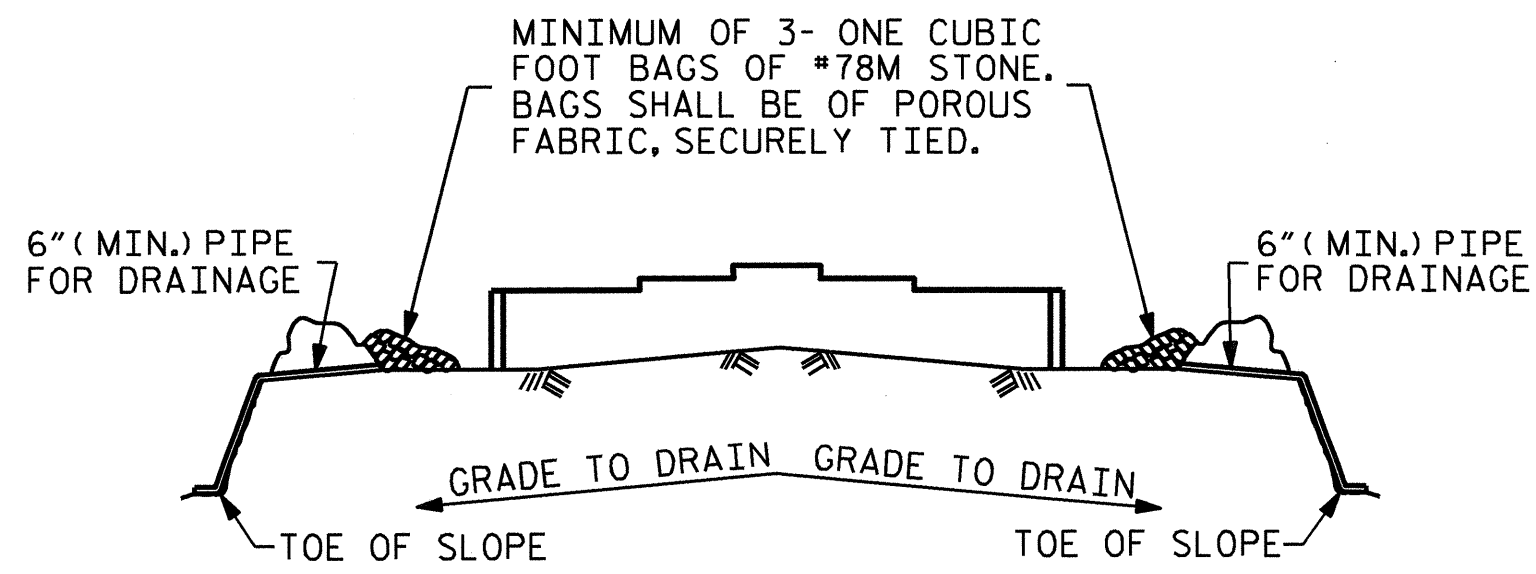
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT 1
 (INTEGRAL)



DRAWN BY : K.H. COMPTON DATE : 2/11
 CHECKED BY : B. MATHEW DATE : 2/11

09-AUG-2011 13:30
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 OTNGUYEN

| REVISIONS | | | | | | SHEET NO. | |
|-----------|-----|-------|-----|-----|-------|--------------|----|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-28 | |
| 1 | | | 3 | | | TOTAL SHEETS | 41 |
| 2 | | | 4 | | | | |

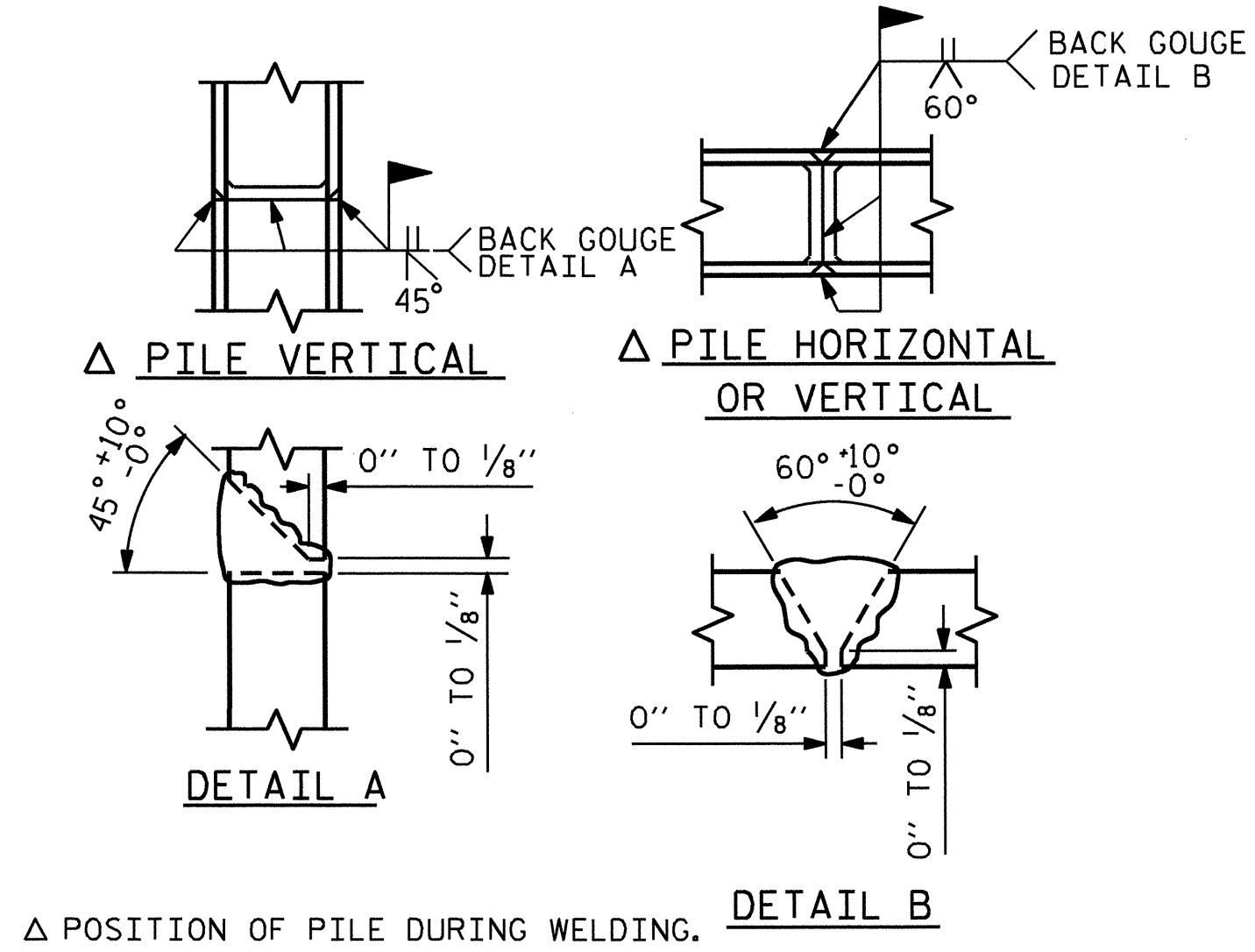


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

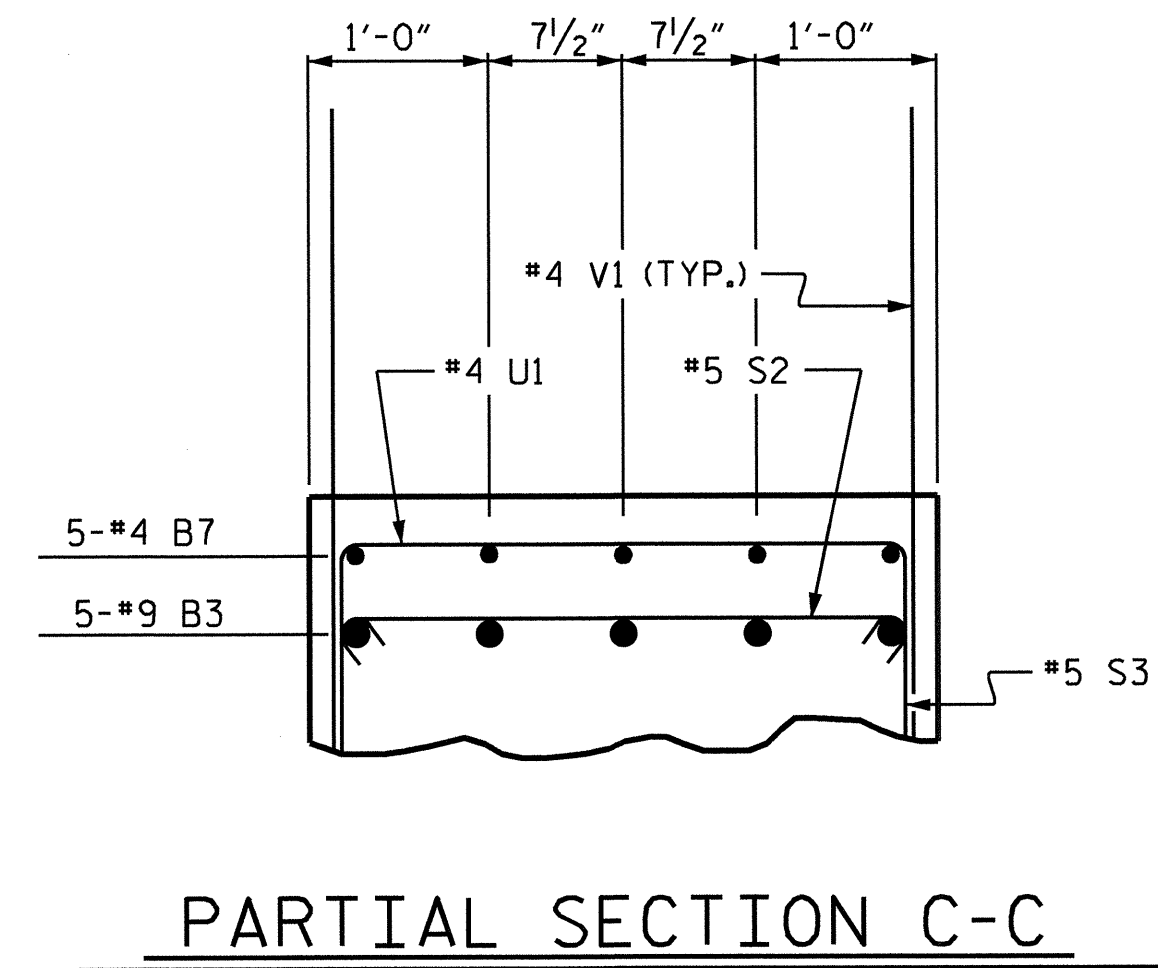
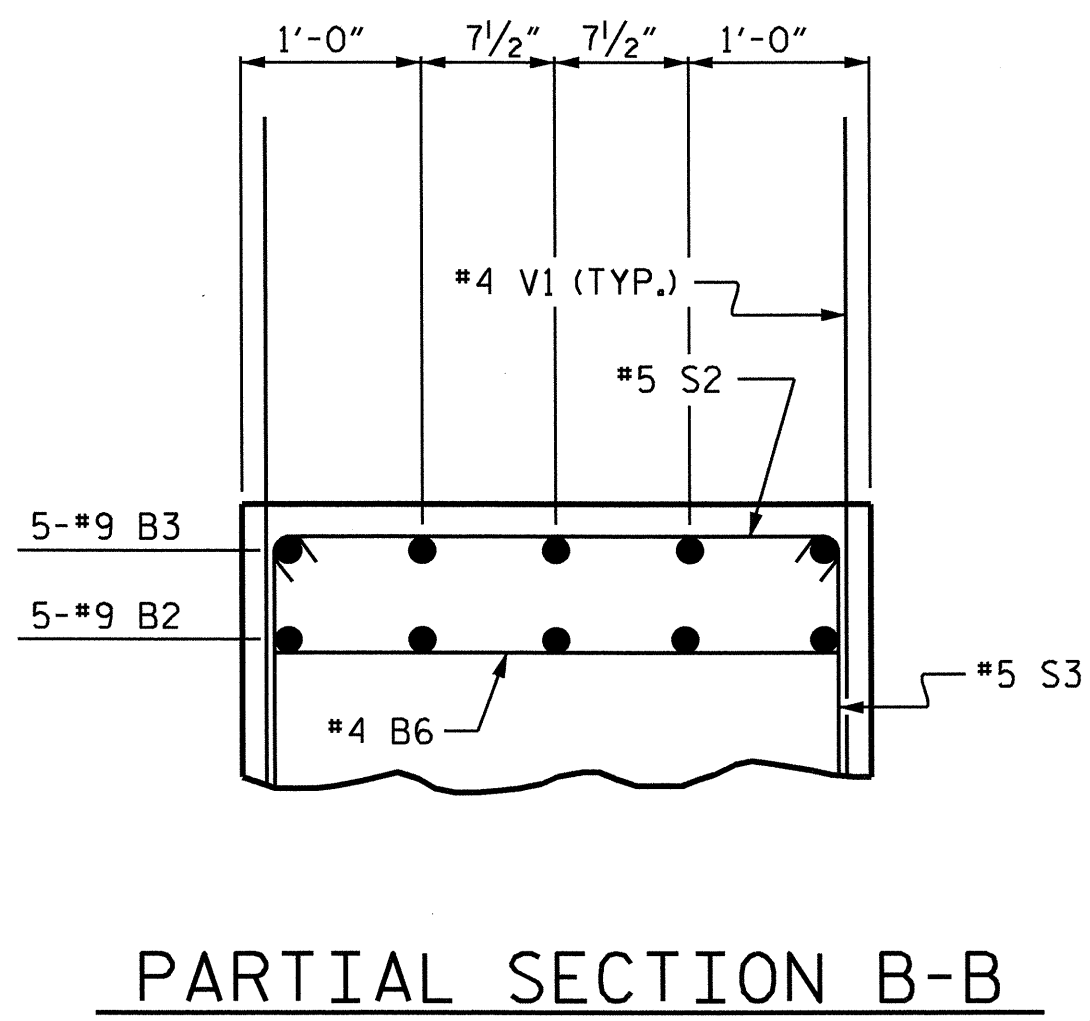
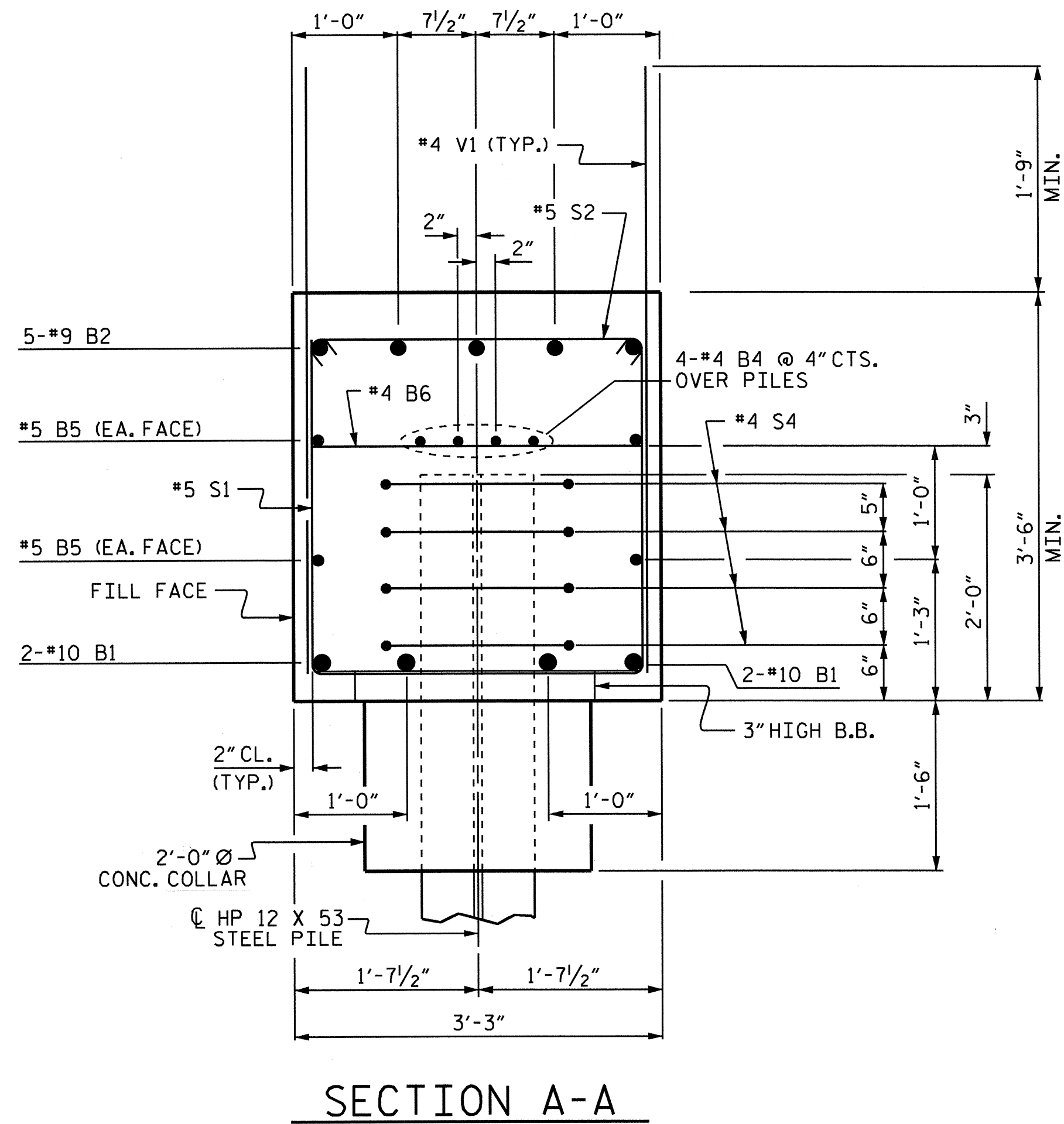
TEMPORARY DRAINAGE AT END BENT



PILE SPLICE DETAILS

| BAR TYPES | | | | | | BILL OF MATERIAL | | | | | |
|---------------------------------------|-----|------|------|---------|--------|------------------|-----|------|------|----------|--------|
| | | | | | | END BENT 1 | | | | | |
| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT | BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
| B1 | 8 | #10 | 1 | 51'-10" | 1784 | H1 | 16 | #4 | 2 | 13'-1" | 140 |
| B2 | 10 | #9 | 1 | 34'-8" | 1179 | S1 | 42 | #5 | 5 | 10'-1" | 442 |
| B3 | 5 | #9 | STR | 43'-6" | 740 | S2 | 82 | #5 | 4 | 3'-10" | 328 |
| B4 | 16 | #4 | STR | 25'-1" | 268 | S3 | 40 | #5 | 5 | 10'-11" | 455 |
| B5 | 8 | #5 | STR | 48'-0" | 401 | S4 | 44 | #4 | 6 | 6'-6" | 191 |
| B6 | 28 | #4 | STR | 2'-11" | 55 | U1 | 3 | #4 | 3 | 5'-11" | 12 |
| B7 | 5 | #4 | STR | 3'-2" | 11 | V1 | 212 | #4 | STR | 6'-0" | 850 |
| REINFORCING STEEL | | | | | | | | | | LBS. | 6,856 |
| CLASS A CONCRETE BREAKDOWN : | | | | | | | | | | | |
| POUR #1 - CAP, COLLARS, & LOWER WINGS | | | | | | | | | | C.Y. | 47.0 |
| HP 12 x 53 STEEL PILES | | | | | | | | | | LIN. FT. | 660 |
| NO. = 11 | | | | | | | | | | EA. | 4 |
| PILE REDRIVES | | | | | | | | | | | |

ALL BAR DIMENSIONS ARE OUT TO OUT.



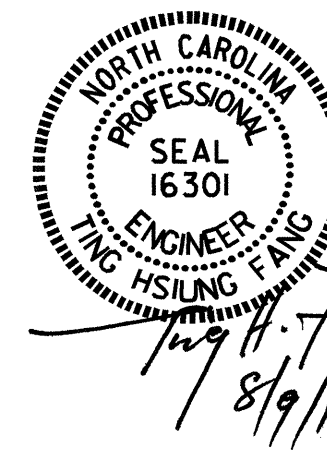
PROJECT NO. B-4090
CUMBERLAND COUNTY
 STATION: 18+55.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE

END BENT 1
 (INTEGRAL)



DRAWN BY: K.H. COMPTON DATE: 2/11
 CHECKED BY: B. MATHEW DATE: 2/11

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| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
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| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 41 |

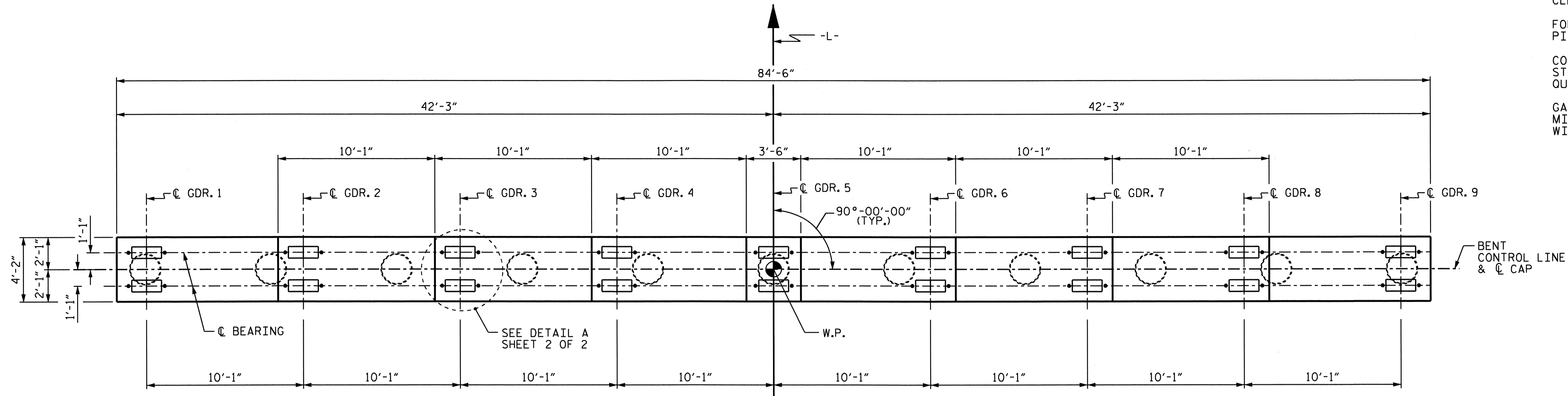
NOTES:

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

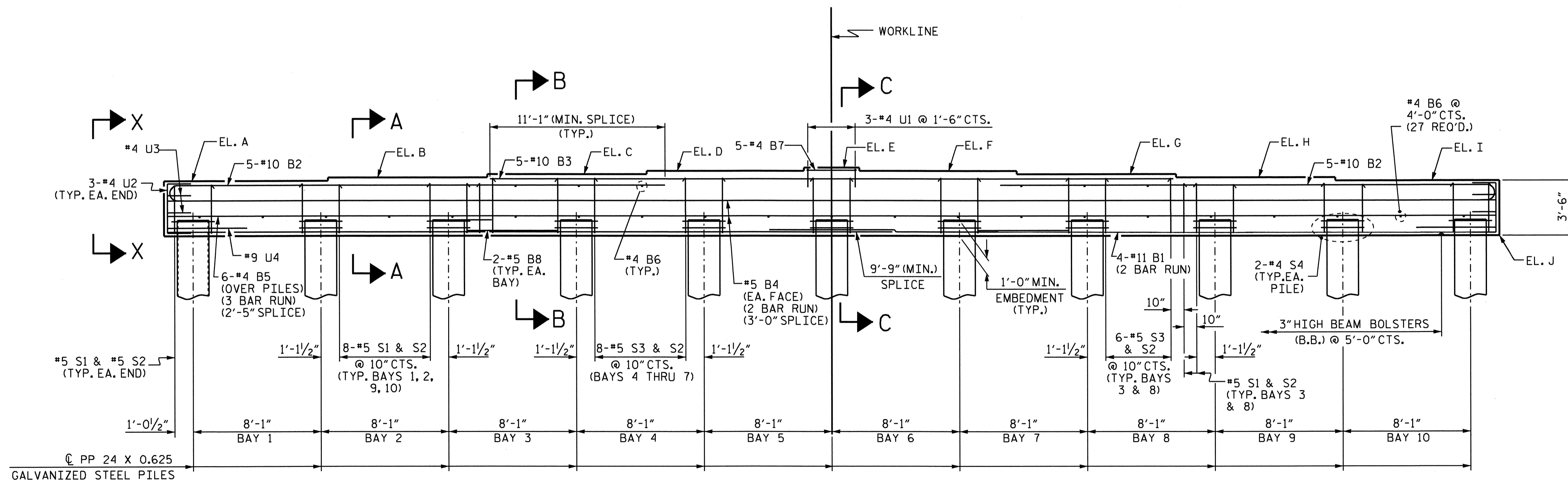
FOR REINFORCING STEEL IN PILE, SEE "24" STEEL PIPE PILE " SHEET.

CONCRETE DISPLACED BY PP 24 X 0.625 GALVANIZED STEEL PILES HAS BEEN DEDUCTED FROM THE CONCRETE QUANTITY.

GALVANIZE THE TOP OF EACH INTERIOR BENT PILE A MINIMUM OF 47 FEET. GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.



| SEAT ELEVATION | | |
|----------------|--------|--------|
| ELEVATION | BENT 1 | BENT 2 |
| A | 85.859 | 85.928 |
| B | 86.060 | 86.130 |
| C | 86.262 | 86.331 |
| D | 86.464 | 86.533 |
| E | 86.665 | 86.735 |
| F | 86.464 | 86.533 |
| G | 86.262 | 86.331 |
| H | 86.060 | 86.130 |
| I | 85.859 | 85.928 |
| J | 82.359 | 82.428 |



PROJECT NO. B-4090
CUMBERLAND COUNTY
 STATION: 18+55.00 -L-

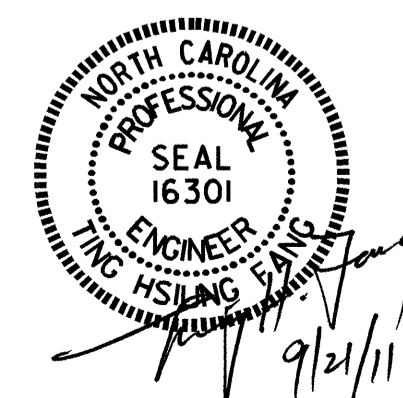
SHEET 1 OF 2

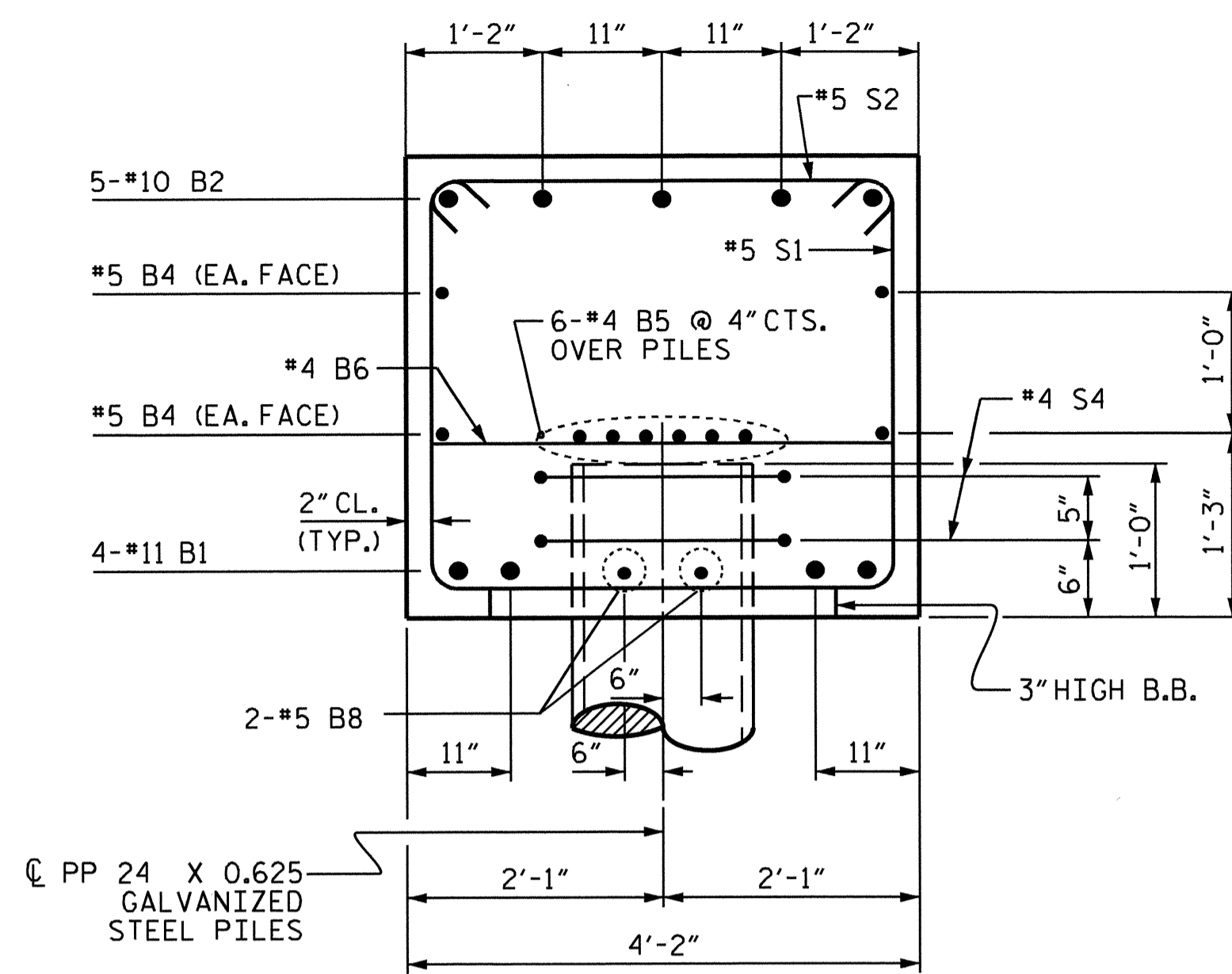
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUBSTRUCTURE

BENTS 1 & 2

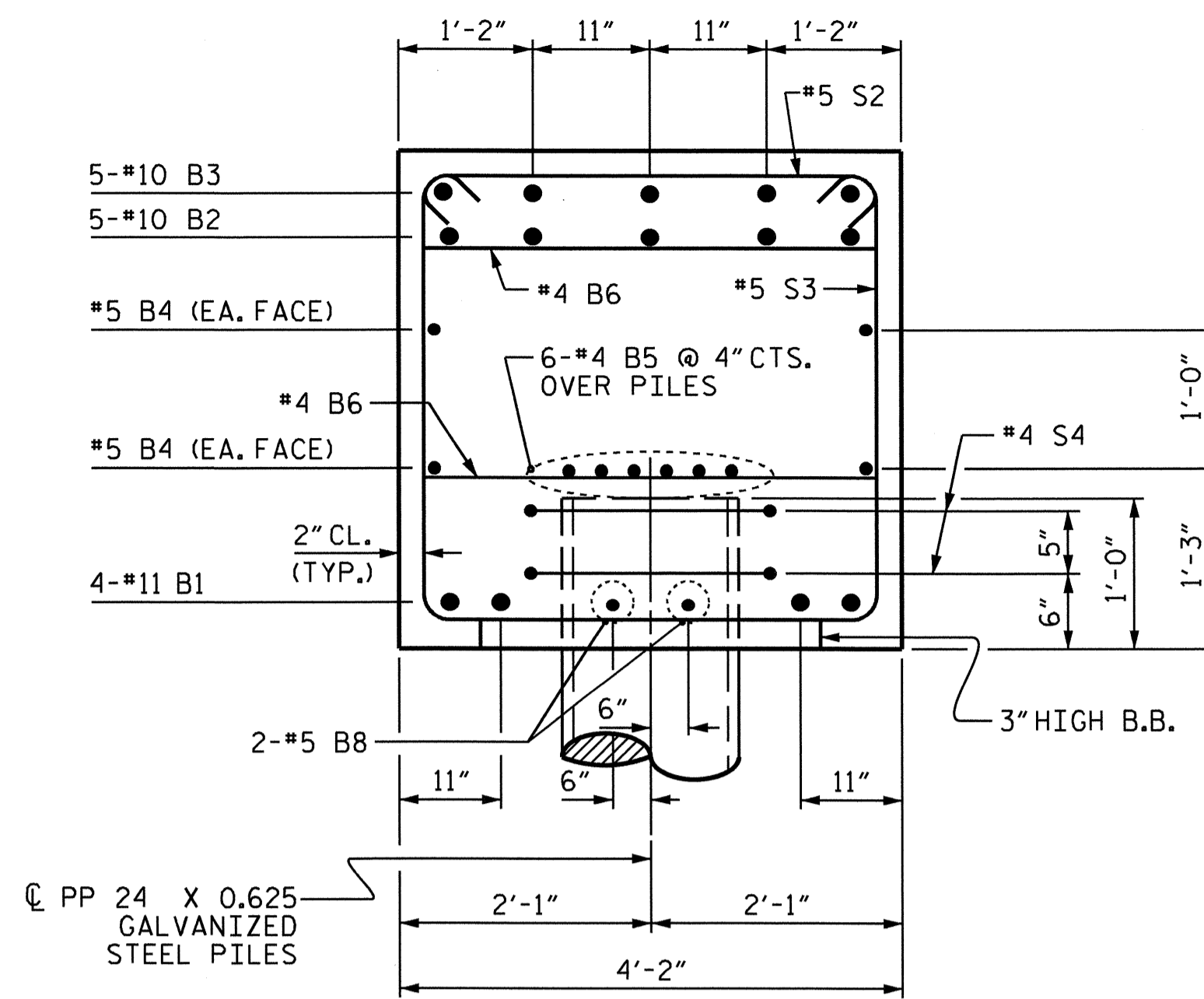
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| NO. | BY: | DATE: | NO. | BY: | DATE: | |
| 1 | | | 3 | | | TOTAL SHEETS 41 |
| 2 | | | 4 | | | |

DRAWN BY : K.H. COMPTON DATE : 2/11
 CHECKED BY : B. MATHEW DATE : 2/11

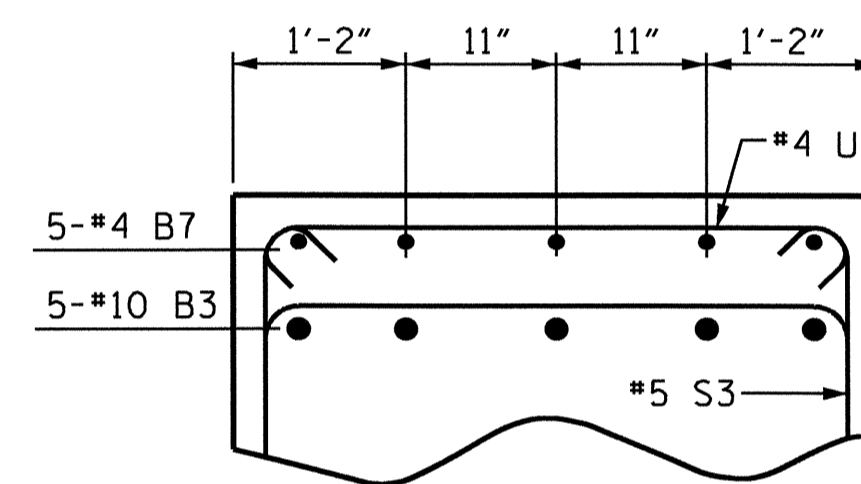




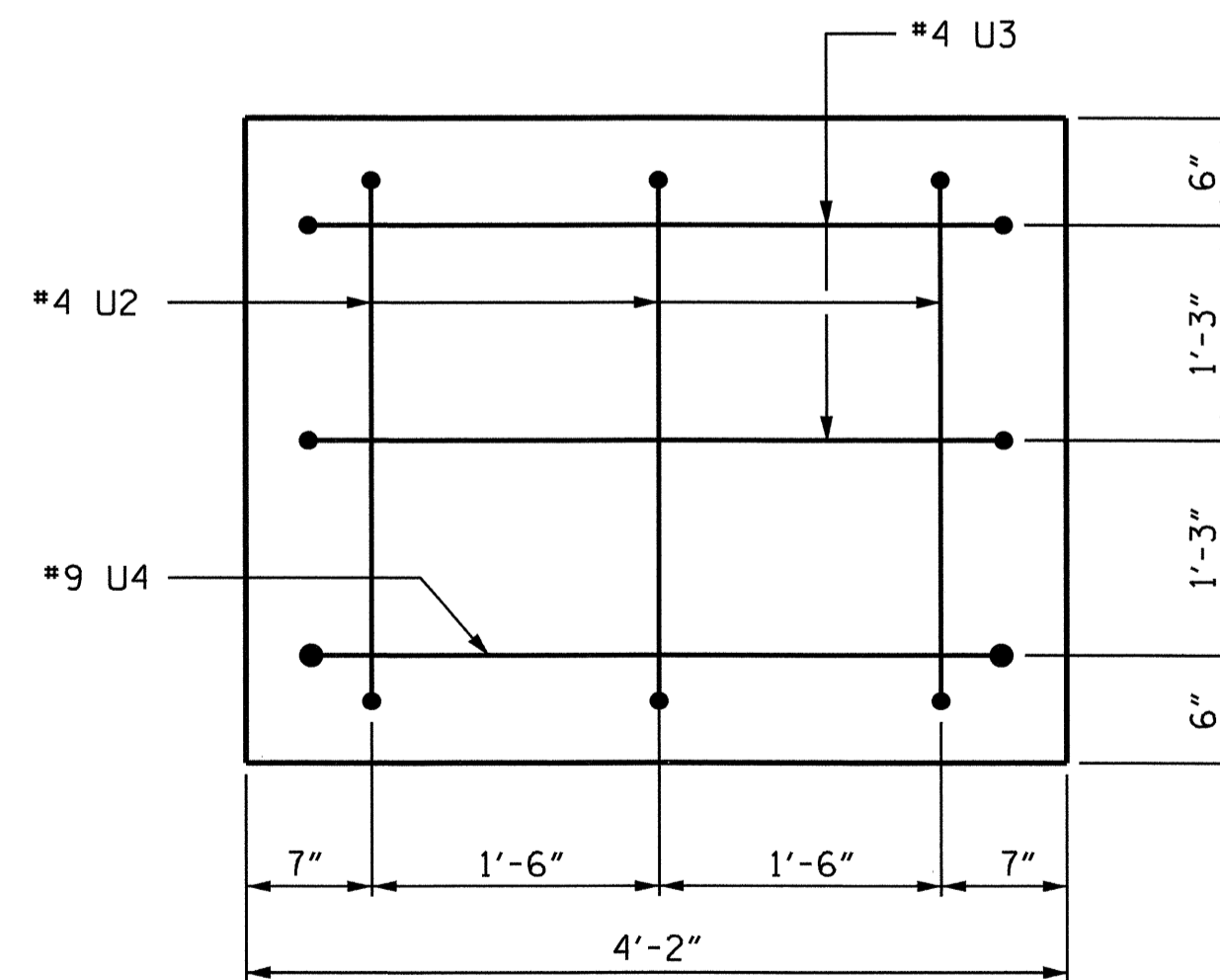
SECTION A-A



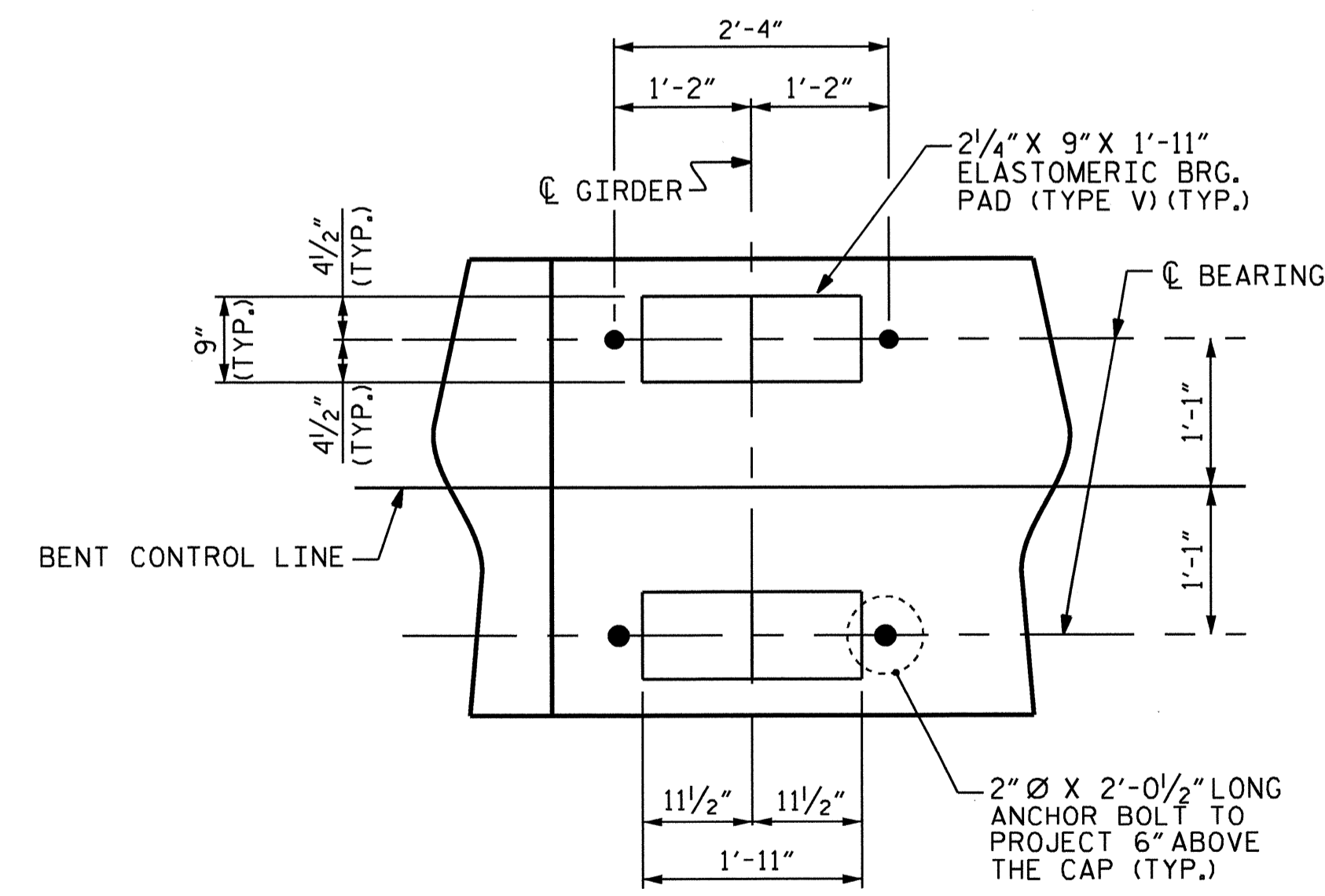
SECTION B-B



PARTIAL SECTION C-C



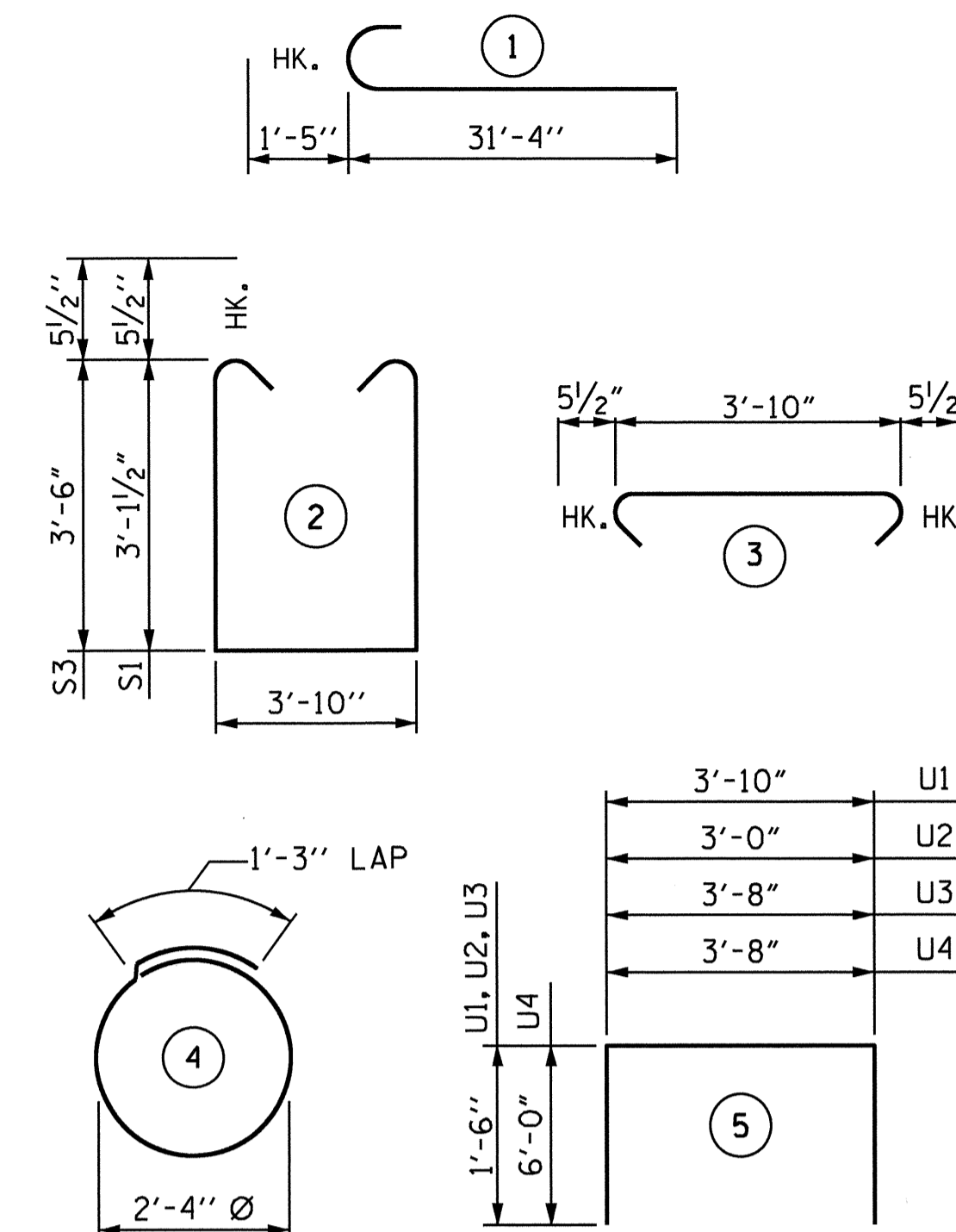
VIEW X-X
(TYP. BOTH ENDS)



DETAIL A
(TYP. EA. GIRDER)

ALL BAR DIMENSIONS ARE OUT TO OUT.

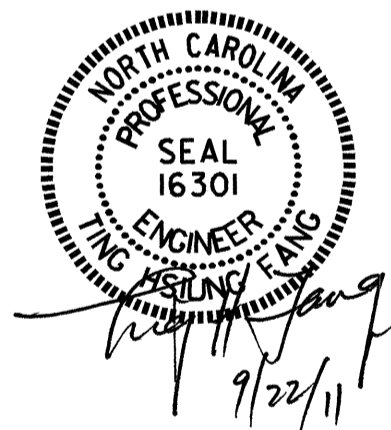
BAR TYPES



BILL OF MATERIAL

FOR ONE BENT

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|-----|------|------|--------|--------------|
| B1 | 8 | #11 | STR | 47'-0" | 1998 |
| B2 | 10 | #10 | 1 | 32'-9" | 1409 |
| B3 | 5 | #10 | STR | 43'-6" | 936 |
| B4 | 8 | #5 | STR | 43'-6" | 363 |
| B5 | 18 | #4 | STR | 30'-0" | 361 |
| B6 | 27 | #4 | STR | 3'-10" | 69 |
| B7 | 5 | #4 | STR | 3'-2" | 11 |
| B8 | 20 | #5 | STR | 5'-10" | 122 |
| S1 | 38 | #5 | 2 | 11'-0" | 436 |
| S2 | 82 | #5 | 3 | 4'-9" | 406 |
| S3 | 44 | #5 | 2 | 11'-9" | 539 |
| S4 | 22 | #4 | 4 | 8'-7" | 126 |
| U1 | 3 | #4 | 5 | 6'-10" | 14 |
| U2 | 6 | #4 | 5 | 6'-0" | 24 |
| U3 | 4 | #4 | 5 | 6'-8" | 18 |
| U4 | 2 | #9 | 5 | 15'-8" | 107 |
| REINFORCING STEEL | | | | | 6,939 LBS. |
| CLASS A CONCRETE CAP | | | | | 48.6 C.Y. |
| PP 24 x 0.625 GALVANIZED STEEL PILES NO. = 11 | | | | | 825 LIN. FT. |
| PILE REDRIVES | | | | | EA. 11 |
| PDA TESTING | | | | | EA. 1 |
| PDA ASSISTANCE | | | | | EA. 1 |



PROJECT NO. B-4090
CUMBERLAND COUNTY
 STATION: 18+55.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE

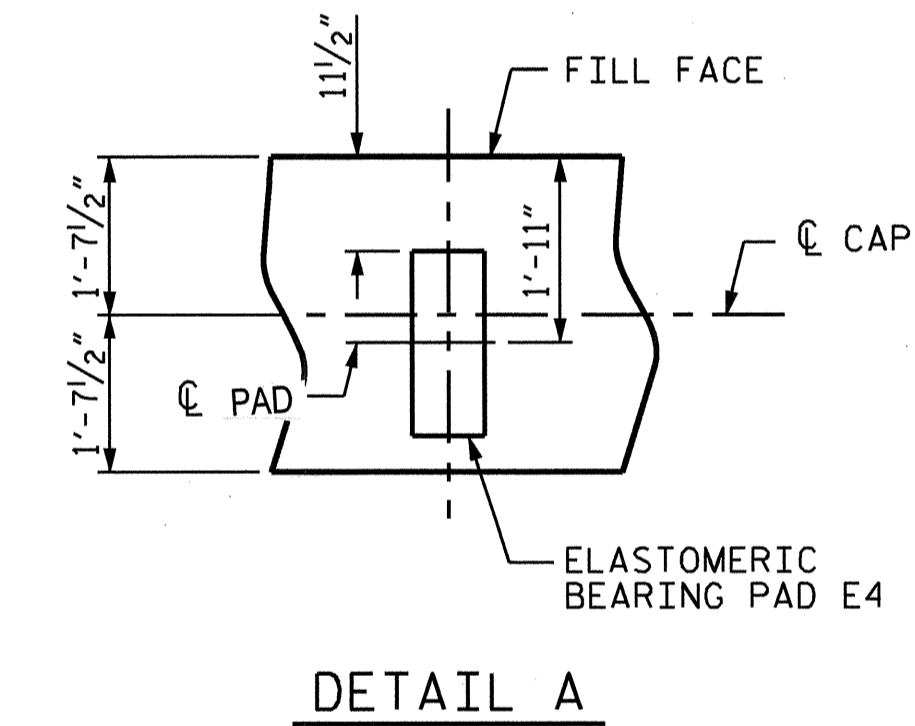
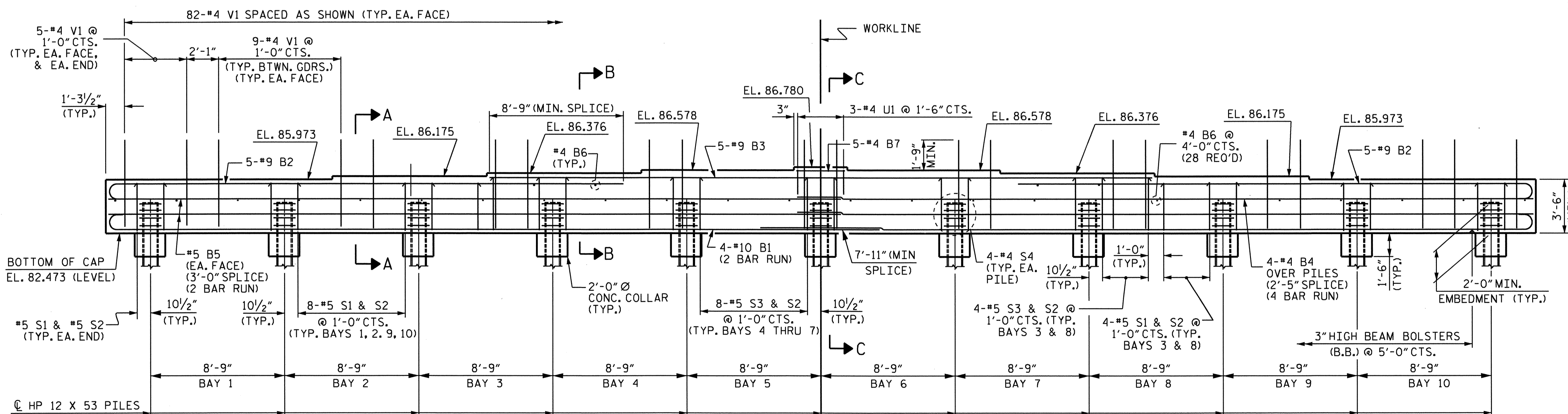
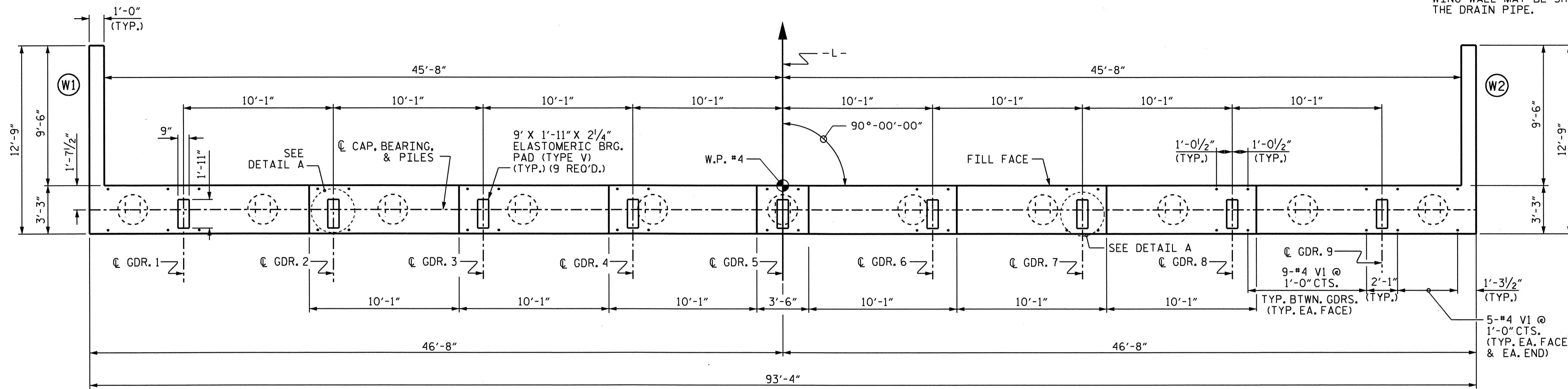
BENTS 1 & 2

DRAWN BY: K.H. COMPTON DATE: 2/11
 CHECKED BY: B. MATHEW DATE: 2/11

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| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|-----------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-31 |
| 1 | | | 3 | | | TOTAL SHEETS 41 |
| 2 | | | 4 | | | |

NOTES:
 STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
 THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER 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.

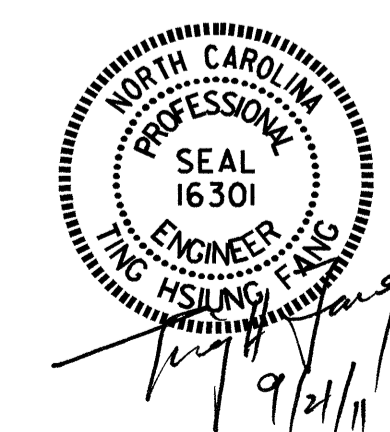


ELEVATION

PROJECT NO. B-4090
CUMBERLAND COUNTY
 STATION: 18+55.00 -L-

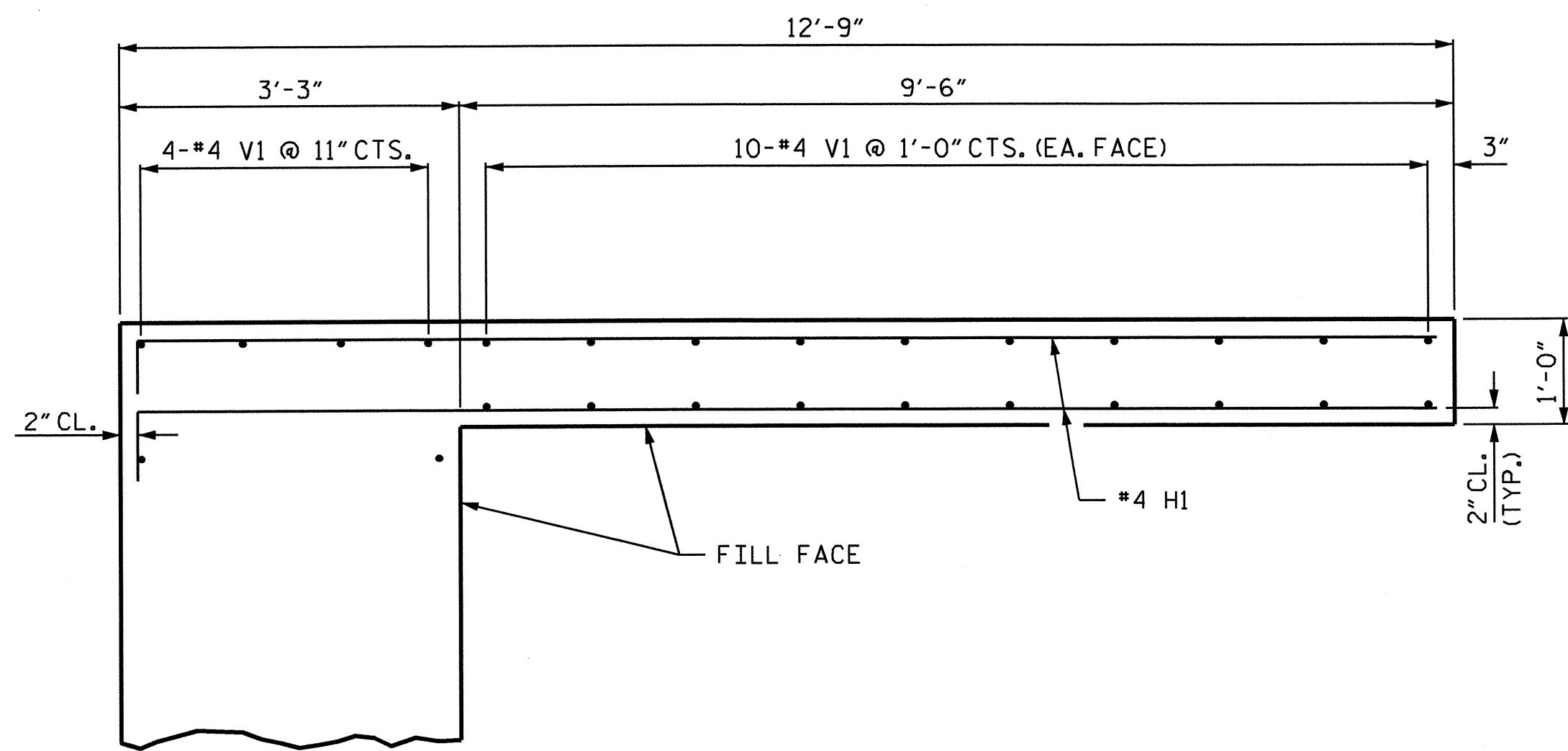
SHEET 1 OF 3

| | | | | | | |
|--|-----|-------|-----|-----|-------|--------------------|
| STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH | | | | | | SHEET NO. S-32 |
| SUBSTRUCTURE END BENT 2 (INTEGRAL) | | | | | | |
| REVISIONS | | | | | | TOTAL SHEETS 41 |
| NO. | BY: | DATE: | NO. | BY: | DATE: | |
| 1 | | | 3 | | | |
| 2 | | | 4 | | | |

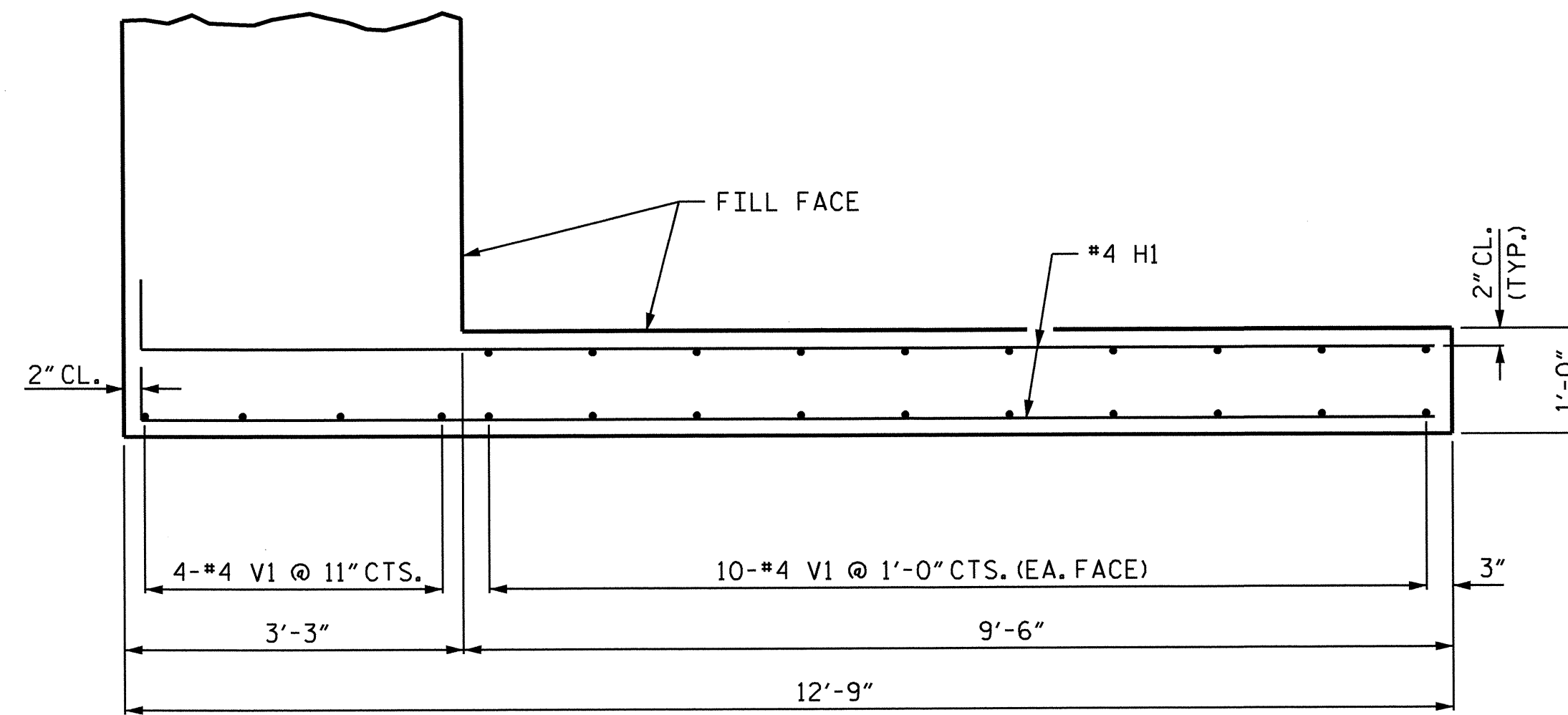


DRAWN BY: K.H. COMPTON DATE: 2/11
 CHECKED BY: B. MATHEW DATE: 2/11

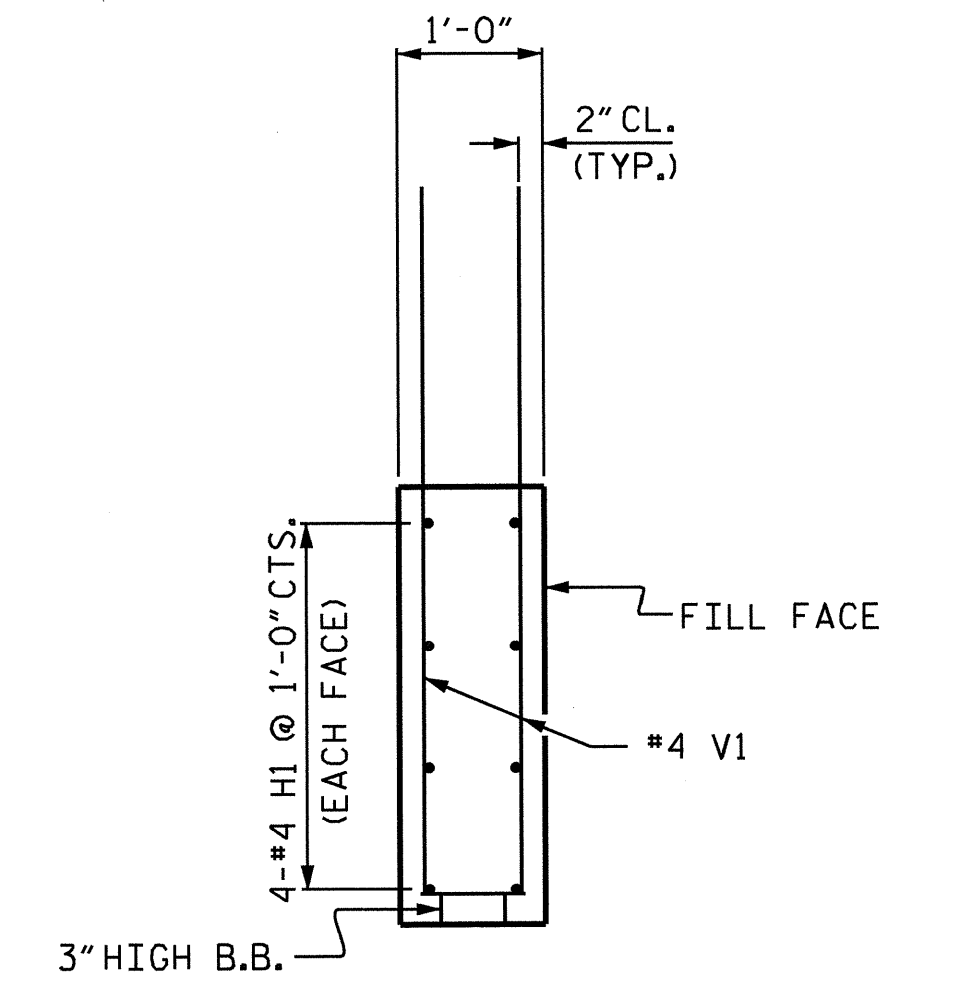
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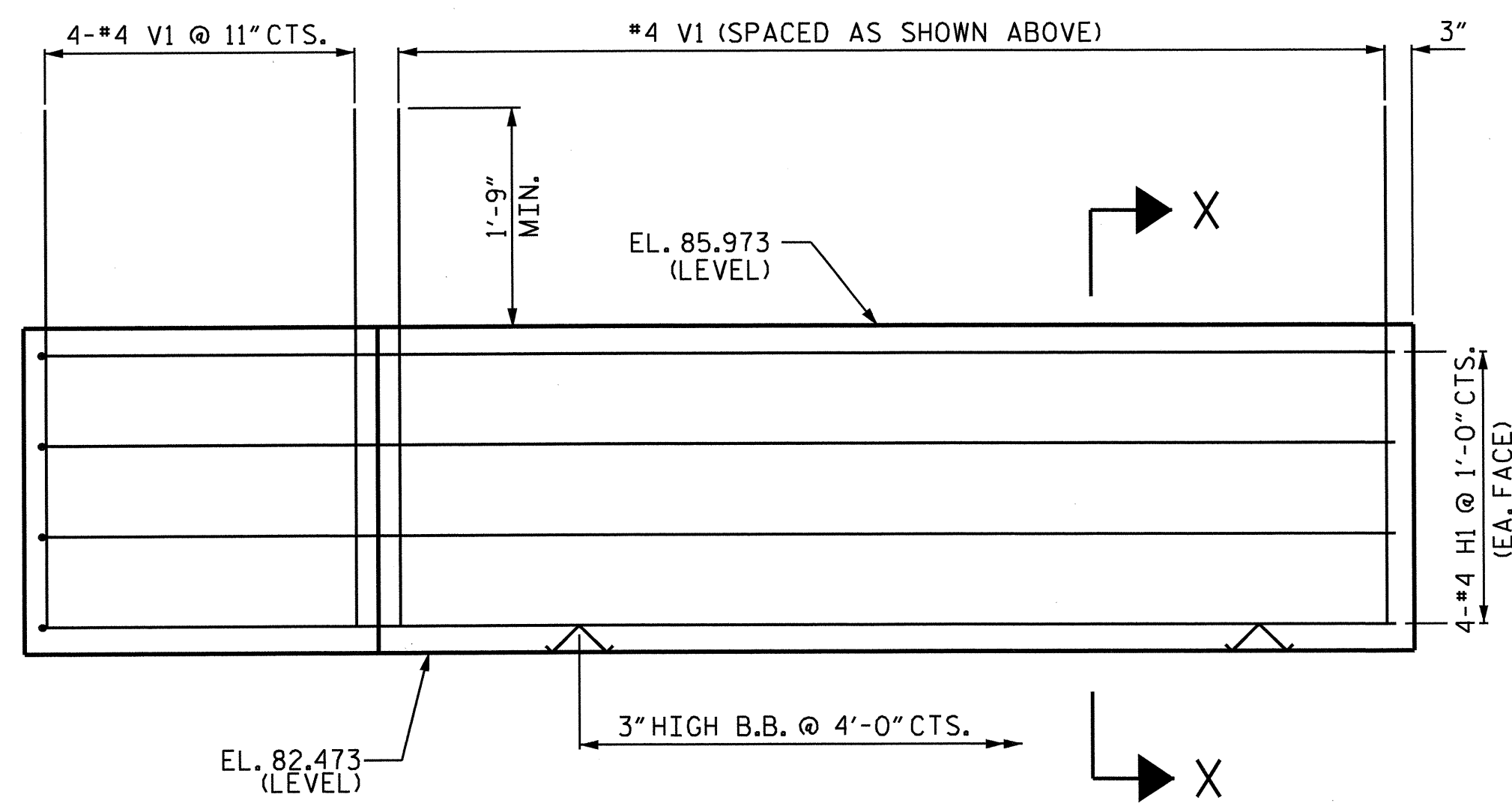
PLAN OF WING (W1)



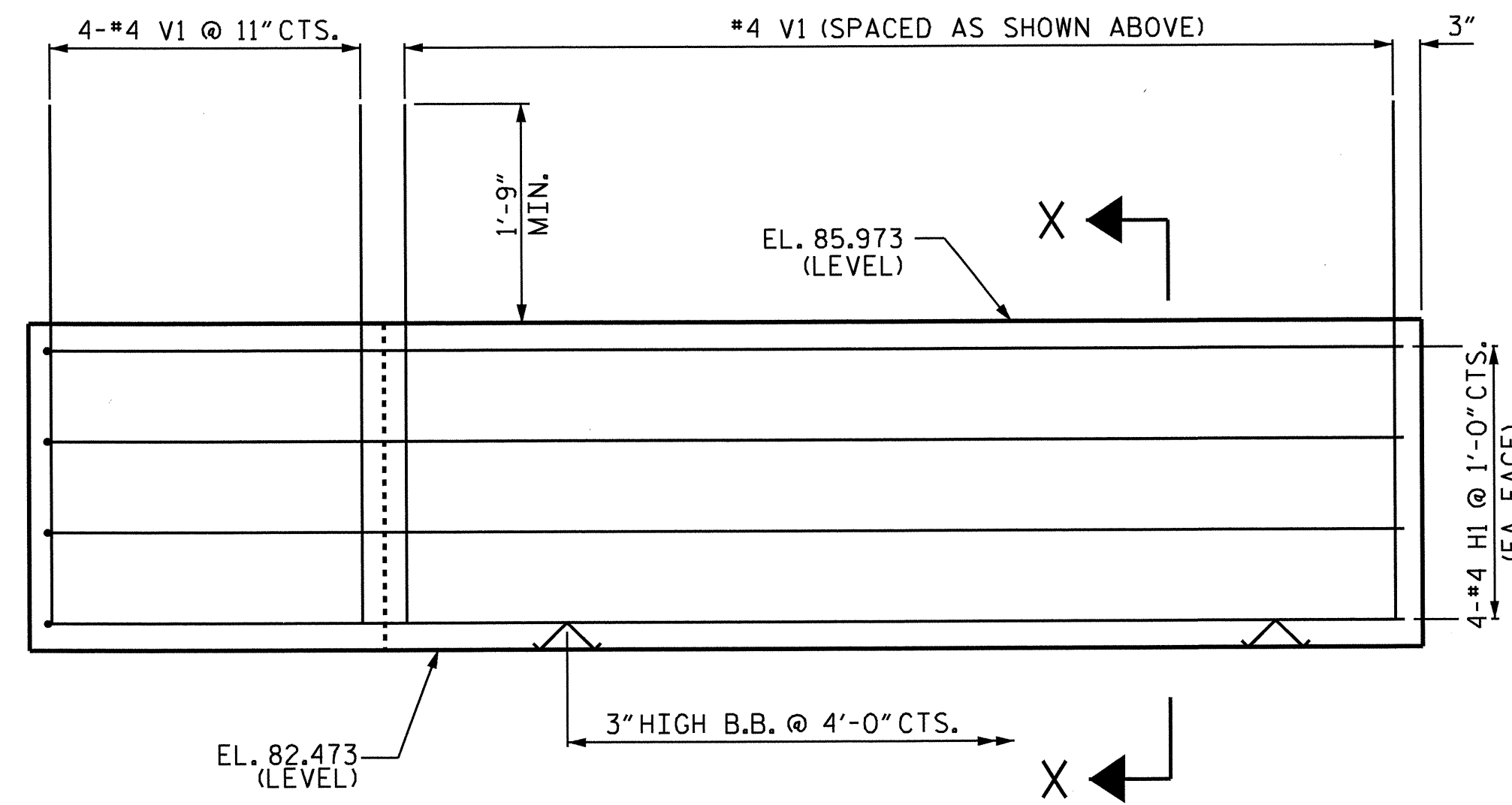
PLAN OF WING (W2)



SECTION X-X



ELEVATION OF WING (W1)



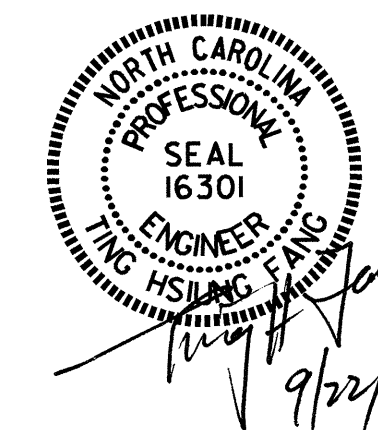
ELEVATION OF WING (W2)

PROJECT NO. B-4090
CUMBERLAND COUNTY
 STATION: 18+55.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

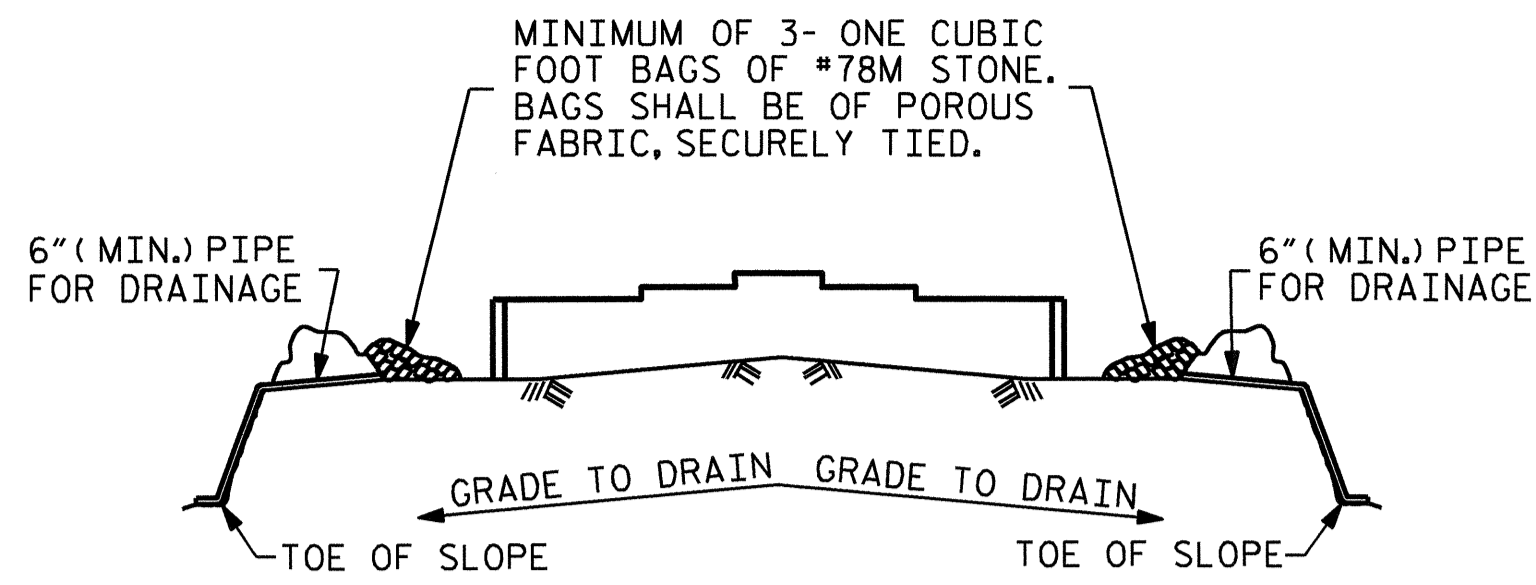
SUBSTRUCTURE
 END BENT 2
 (INTEGRAL)



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 CHECKED BY: B. MATHEW DATE: 2/11

21-SEP-2011 10:38
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| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|-----------------|
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| 2 | | | 4 | | | |

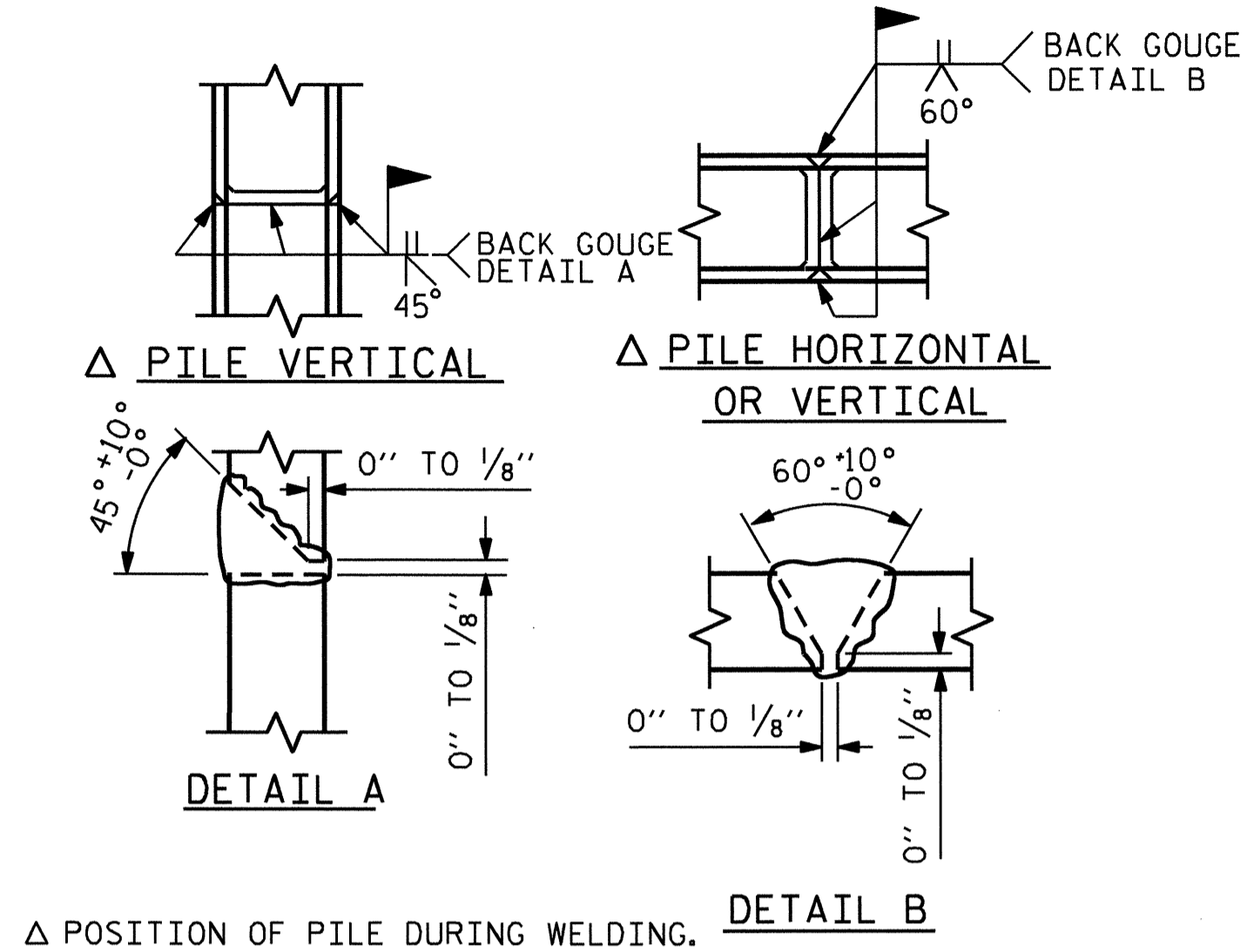


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

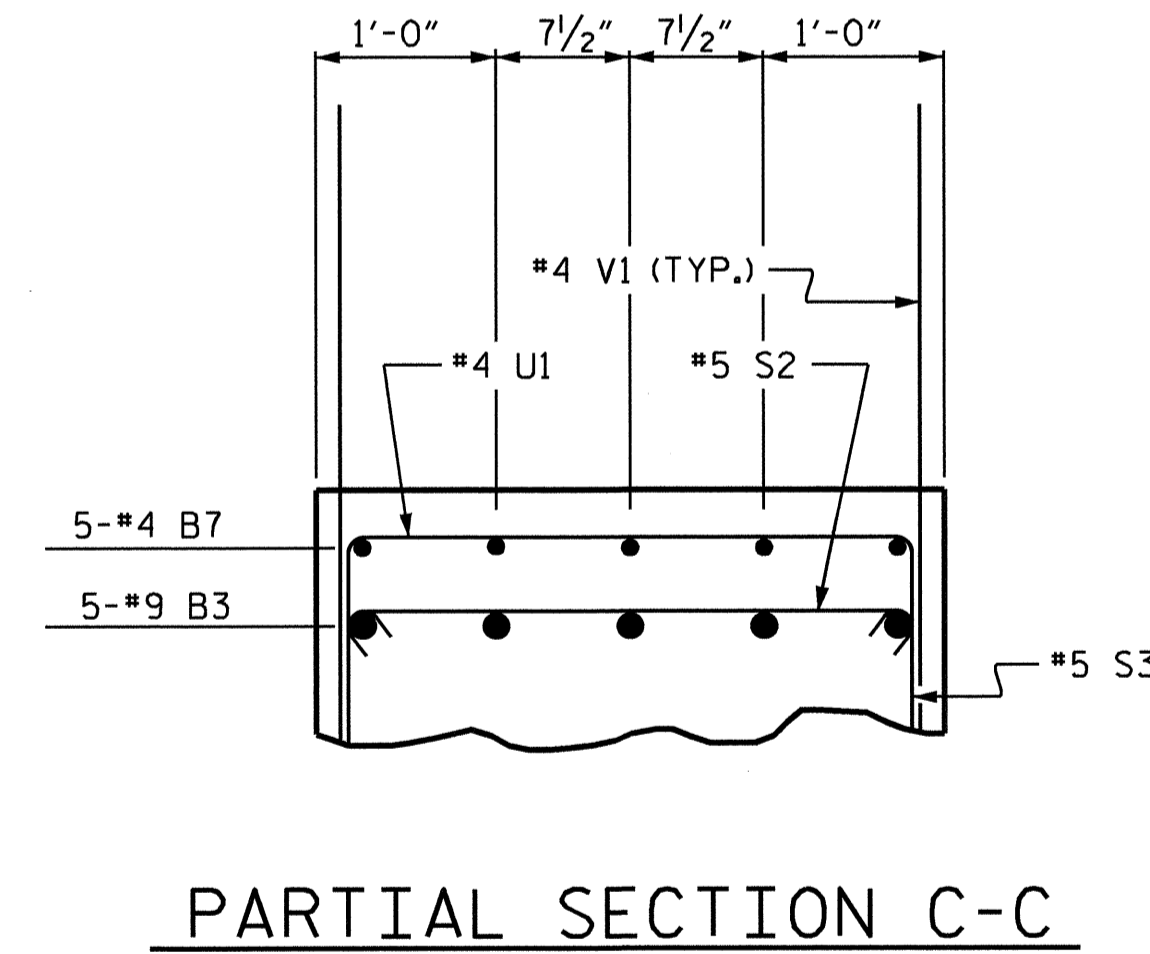
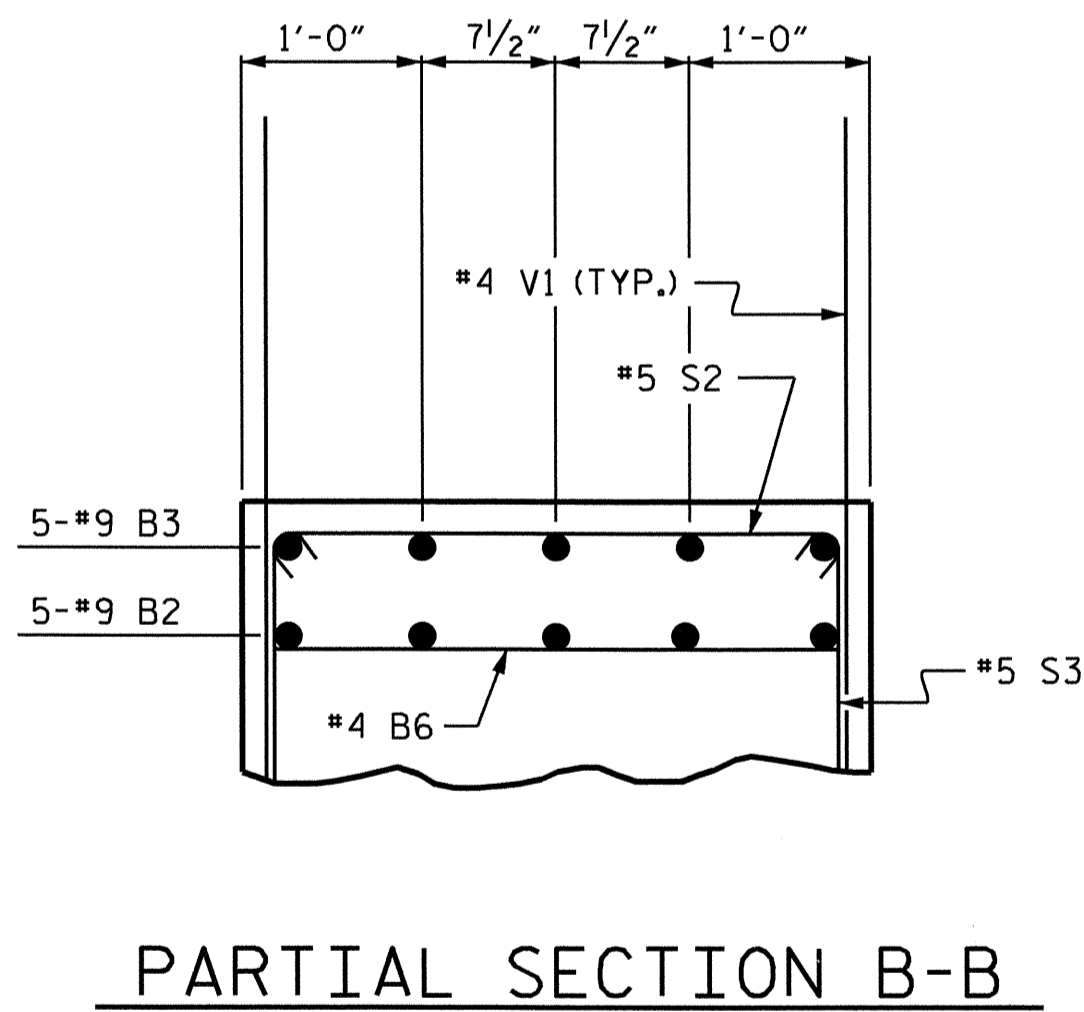
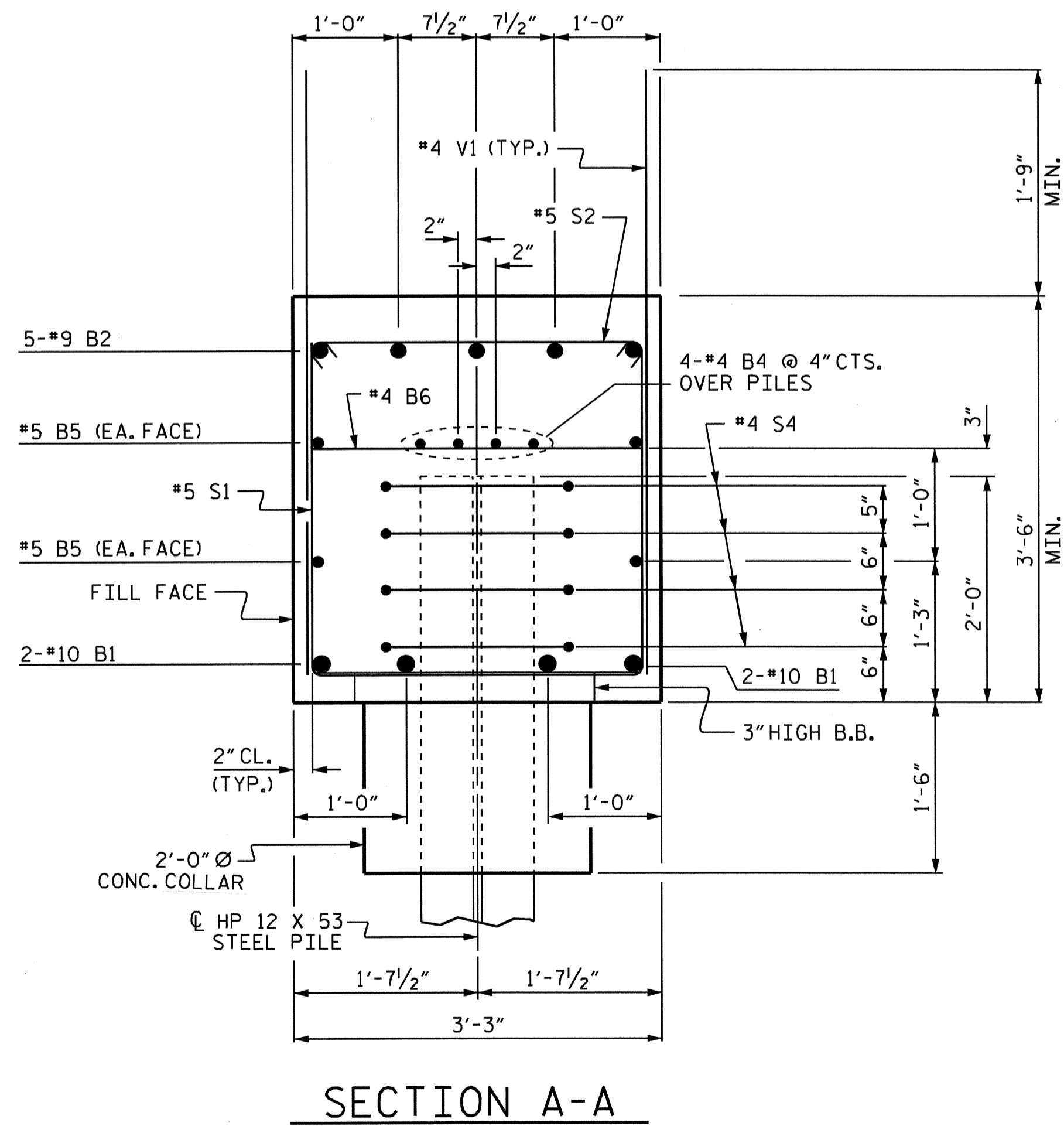
TEMPORARY DRAINAGE AT END BENT



PILE SPLICE DETAILS

| BILL OF MATERIAL | | | | | |
|---------------------------------------|-----|------|------|----------|--------|
| END BENT 2 | | | | | |
| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
| B1 | 8 | #10 | 1 | 51'-10" | 1784 |
| B2 | 10 | #9 | 1 | 34'-8" | 1179 |
| B3 | 5 | #9 | STR | 43'-6" | 740 |
| B4 | 16 | #4 | STR | 25'-1" | 268 |
| B5 | 8 | #5 | STR | 48'-0" | 401 |
| B6 | 28 | #4 | STR | 2'-11" | 55 |
| B7 | 5 | #4 | STR | 3'-2" | 11 |
| H1 | 16 | #4 | 2 | 13'-1" | 140 |
| S1 | 42 | #5 | 5 | 10'-1" | 442 |
| S2 | 82 | #5 | 4 | 3'-10" | 328 |
| S3 | 40 | #5 | 5 | 10'-11" | 455 |
| S4 | 44 | #4 | 6 | 6'-6" | 191 |
| U1 | 3 | #4 | 3 | 5'-11" | 12 |
| V1 | 212 | #4 | STR | 6'-0" | 850 |
| REINFORCING STEEL | | | | LBS. | 6,856 |
| CLASS A CONCRETE BREAKDOWN : | | | | | |
| POUR #1 - CAP, COLLARS, & LOWER WINGS | | | | C.Y. | 47.0 |
| HP 12 x 53 STEEL PILES | | | | LIN. FT. | 550 |
| NO. = 11 | | | | EA. | 4 |
| PILE REDRIVES | | | | EA. | 4 |

ALL BAR DIMENSIONS ARE OUT TO OUT.



PROJECT NO. B-4090

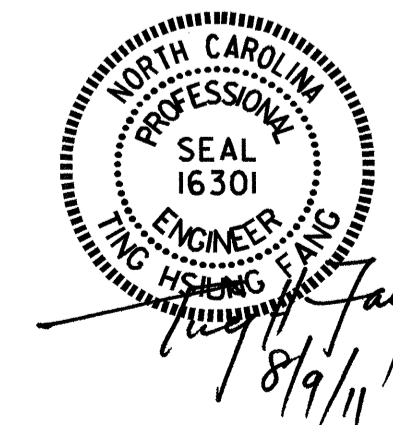
CUMBERLAND COUNTY

STATION: 18+55.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

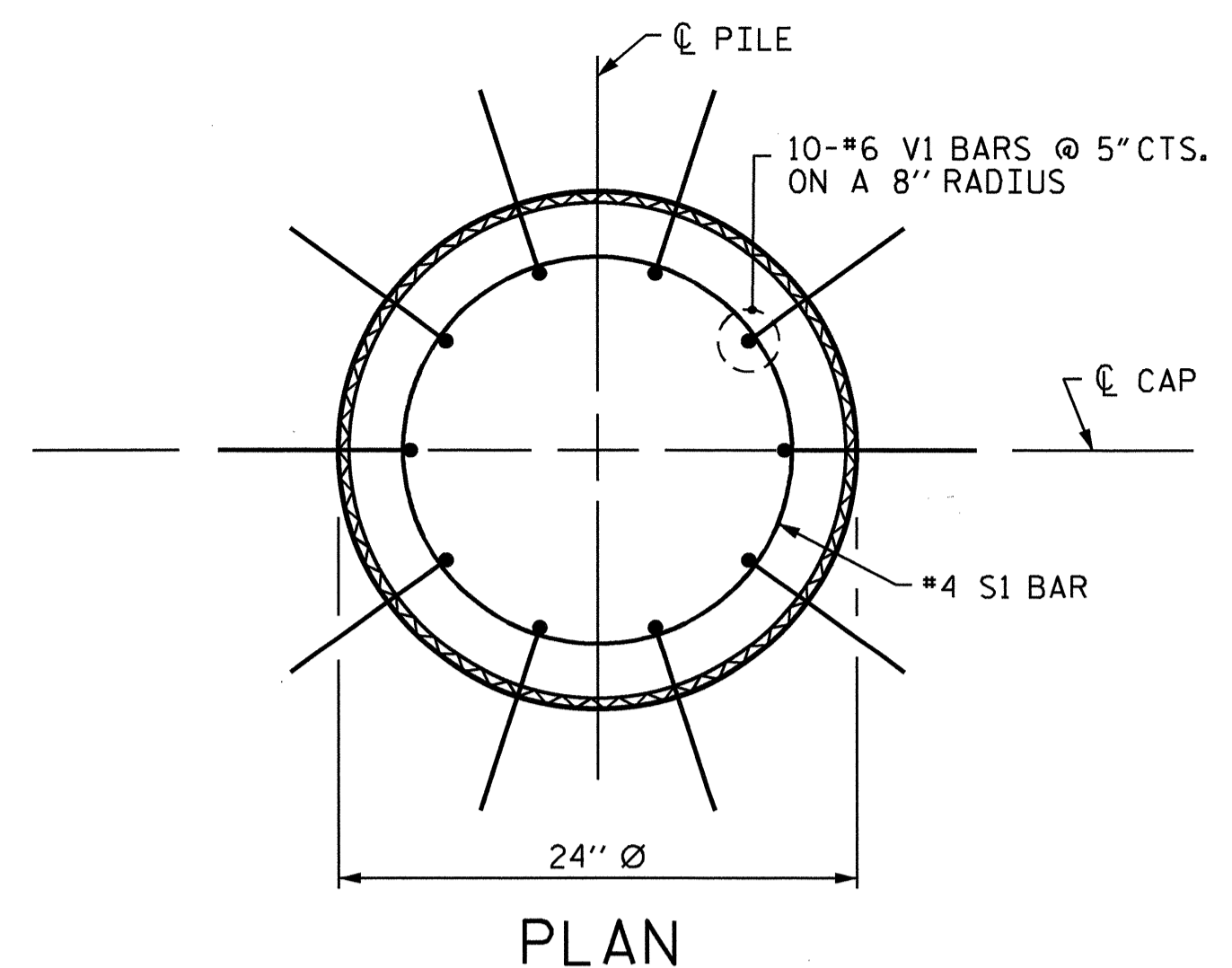
SUBSTRUCTURE
END BENT 2
(INTEGRAL)



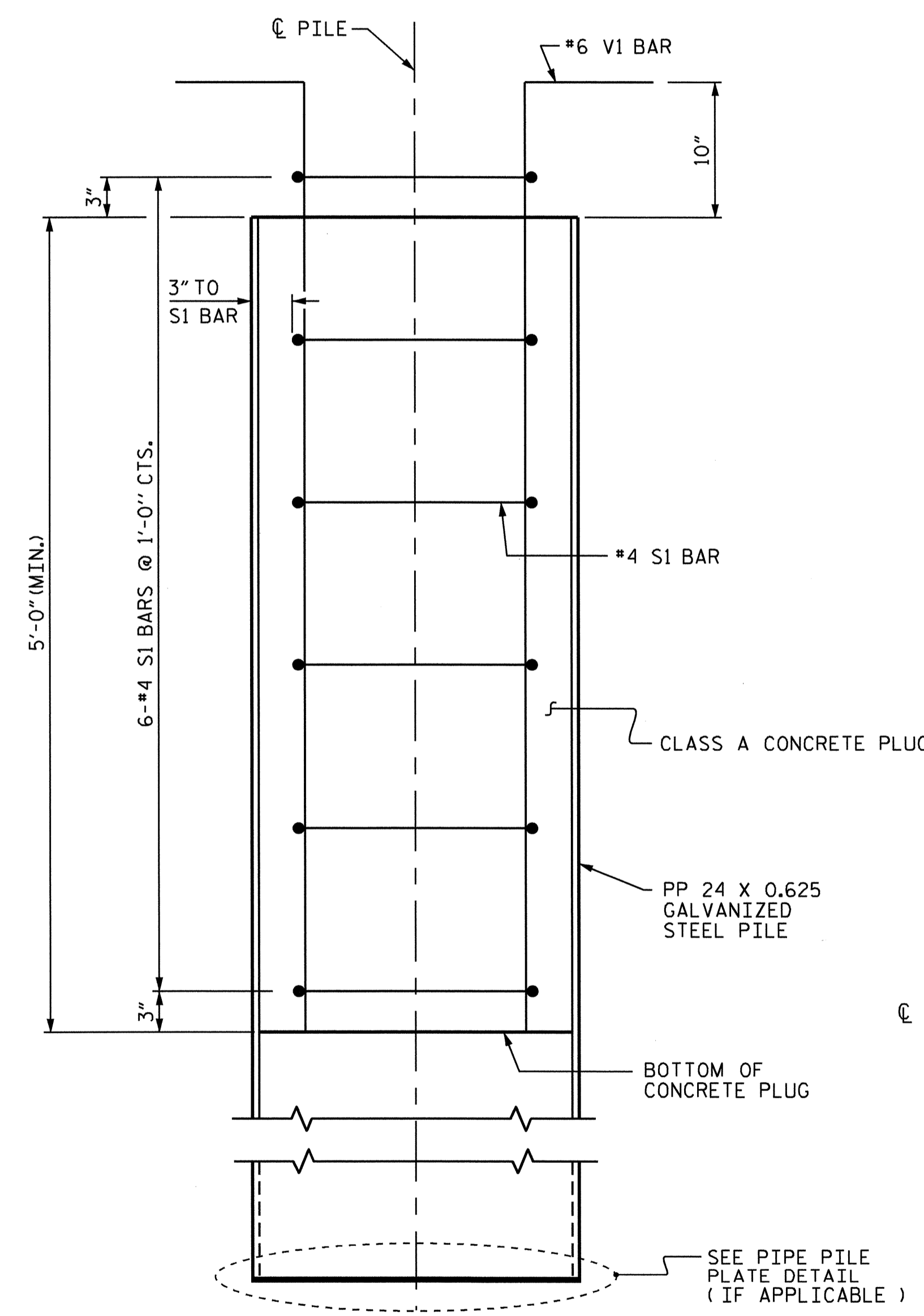
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CHECKED BY : B. MATHEW DATE : 2/11

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| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|-----------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-34 |
| 1 | | | 3 | | | TOTAL SHEETS 41 |
| 2 | | | 4 | | | |

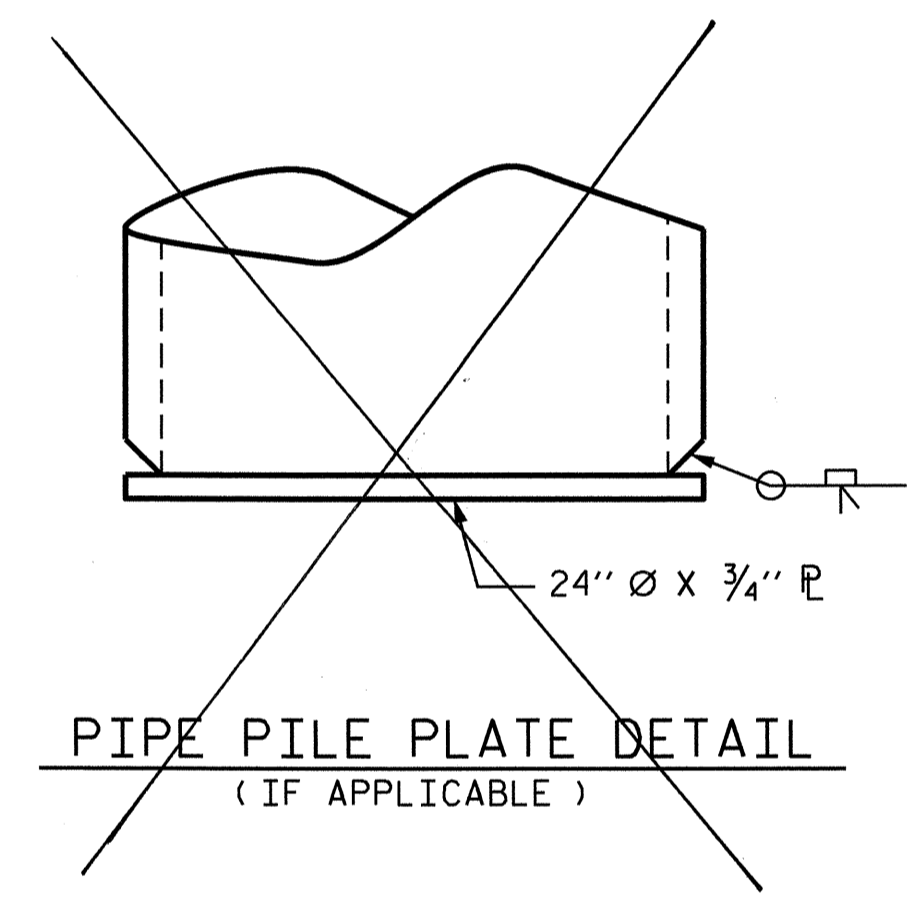


PLAN

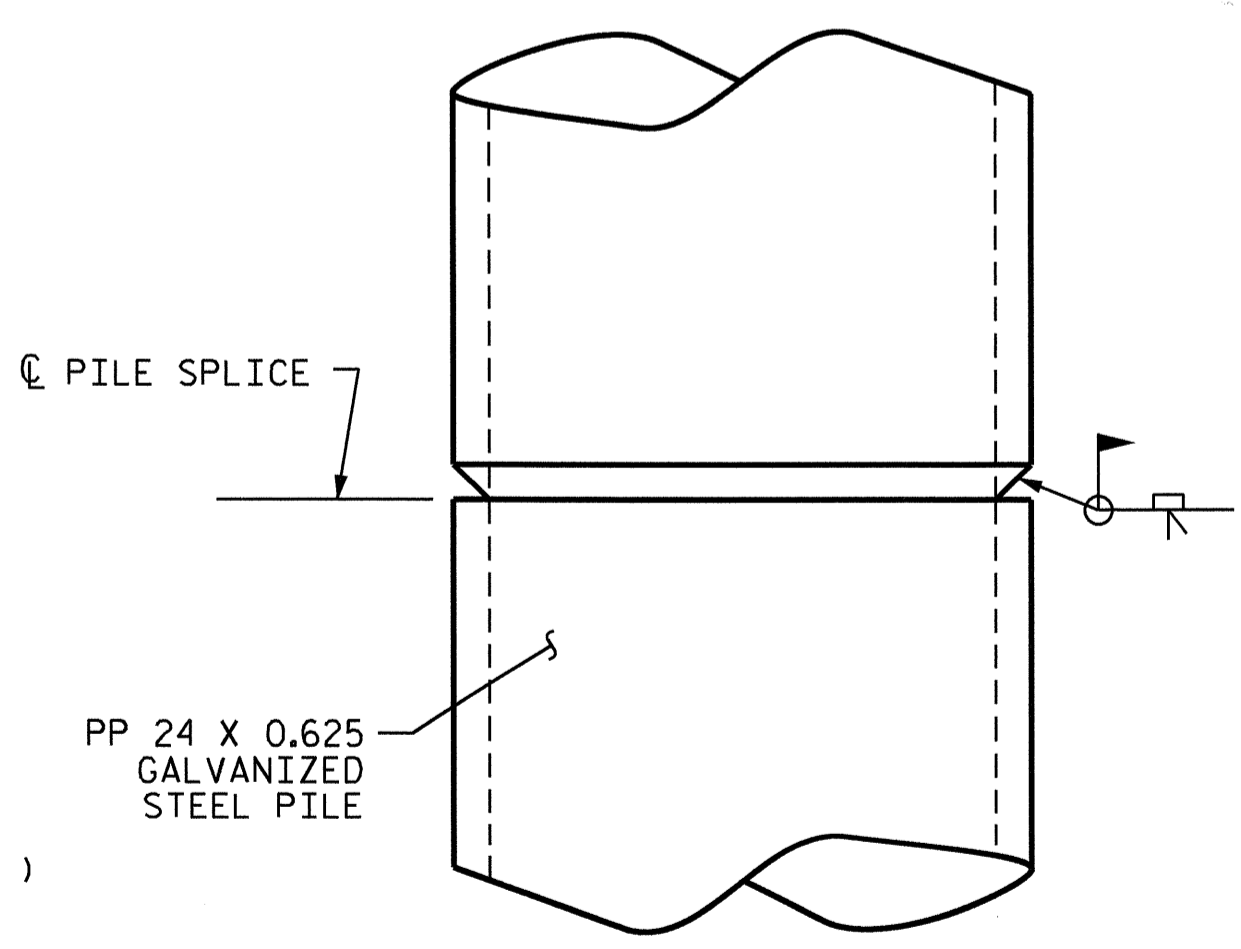


ELEVATION

PP 24 X 0.625 GALVANIZED STEEL PILE
(OPEN OR CLOSED END)



PIPE PILE PLATE DETAIL
(IF APPLICABLE)



PIPE PILE SPLICE DETAIL

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.

PIPE PILE PLATES, IF REQUIRED, SHALL BE IN ACCORDANCE WITH SECTION 450 OF THE STANDARD SPECIFICATIONS.

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 CLOSED END PIPE PILES, REMOVE ALL SOIL AND WATER FROM INSIDE THE PILES JUST PRIOR TO PLACING REINFORCING STEEL AND CONCRETE FOR THE CONCRETE PLUG.

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.

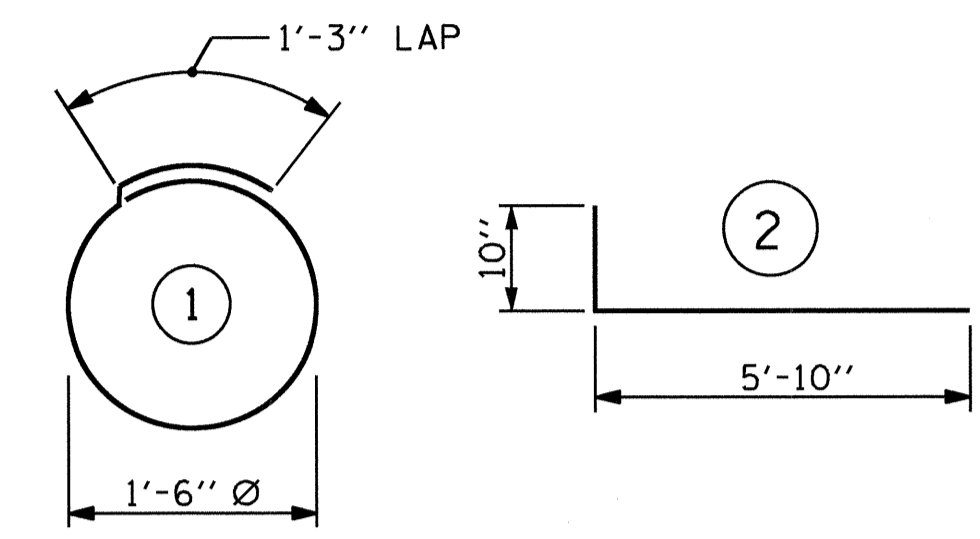
THE REINFORCING STEEL, CLASS A CONCRETE, AND GALVANIZING ARE CONSIDERED INCIDENTAL TO THE CONTRACT UNIT PRICE BID PER LINEAR FOOT FOR PP 24 X 0.625 GALVANIZED STEEL PILES.

BILL OF MATERIAL FOR ONE
PP 24 X 0.625 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 = | | | | 124 | lbs |

CLASS A CONCRETE
5'-0" MINIMUM PLUG 0.6 CY

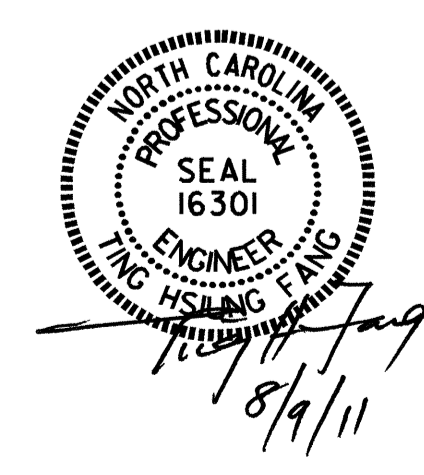
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

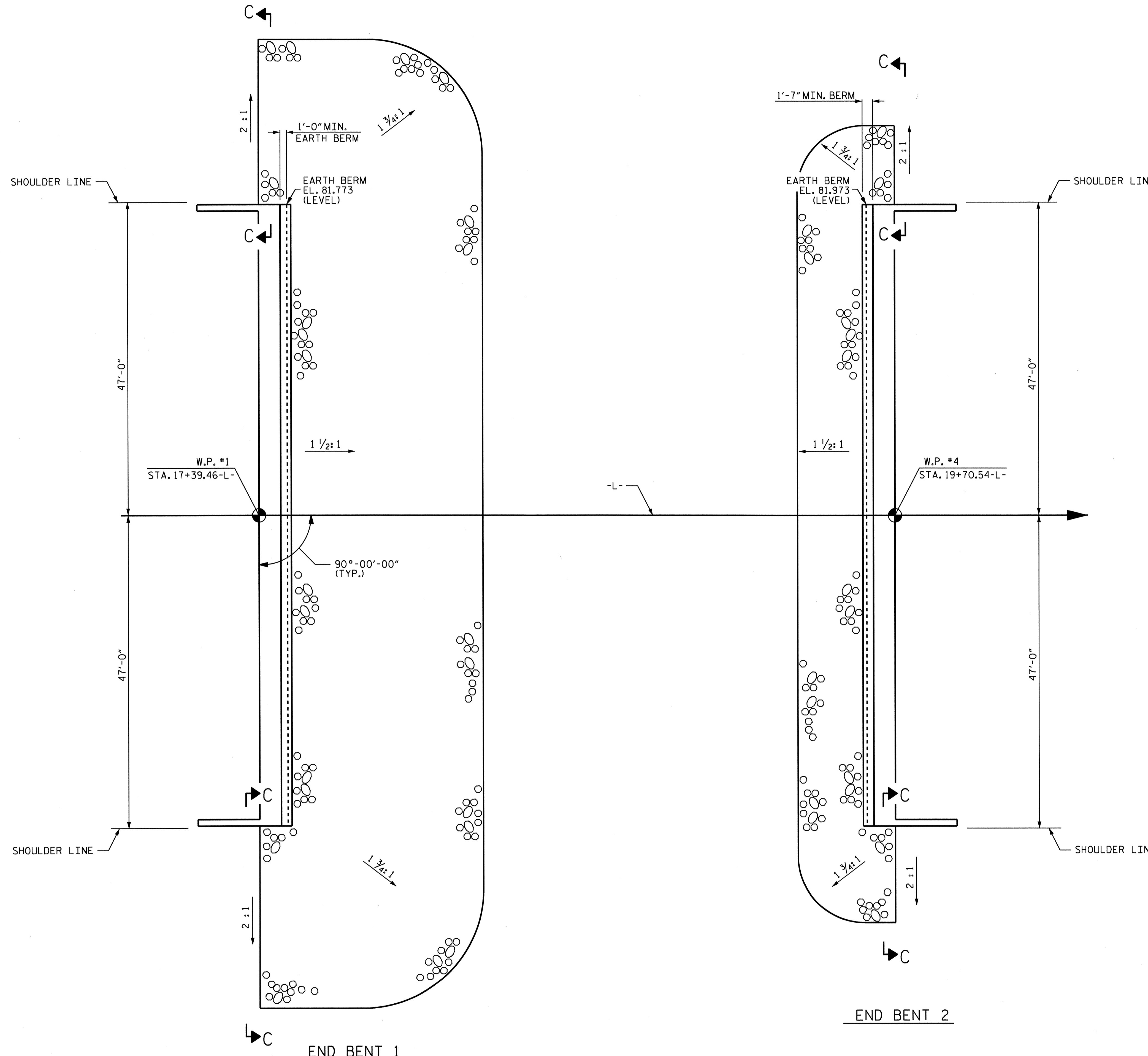
PROJECT NO. B-4090
CUMBERLAND COUNTY
STATION: 18+55.00 -L-

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

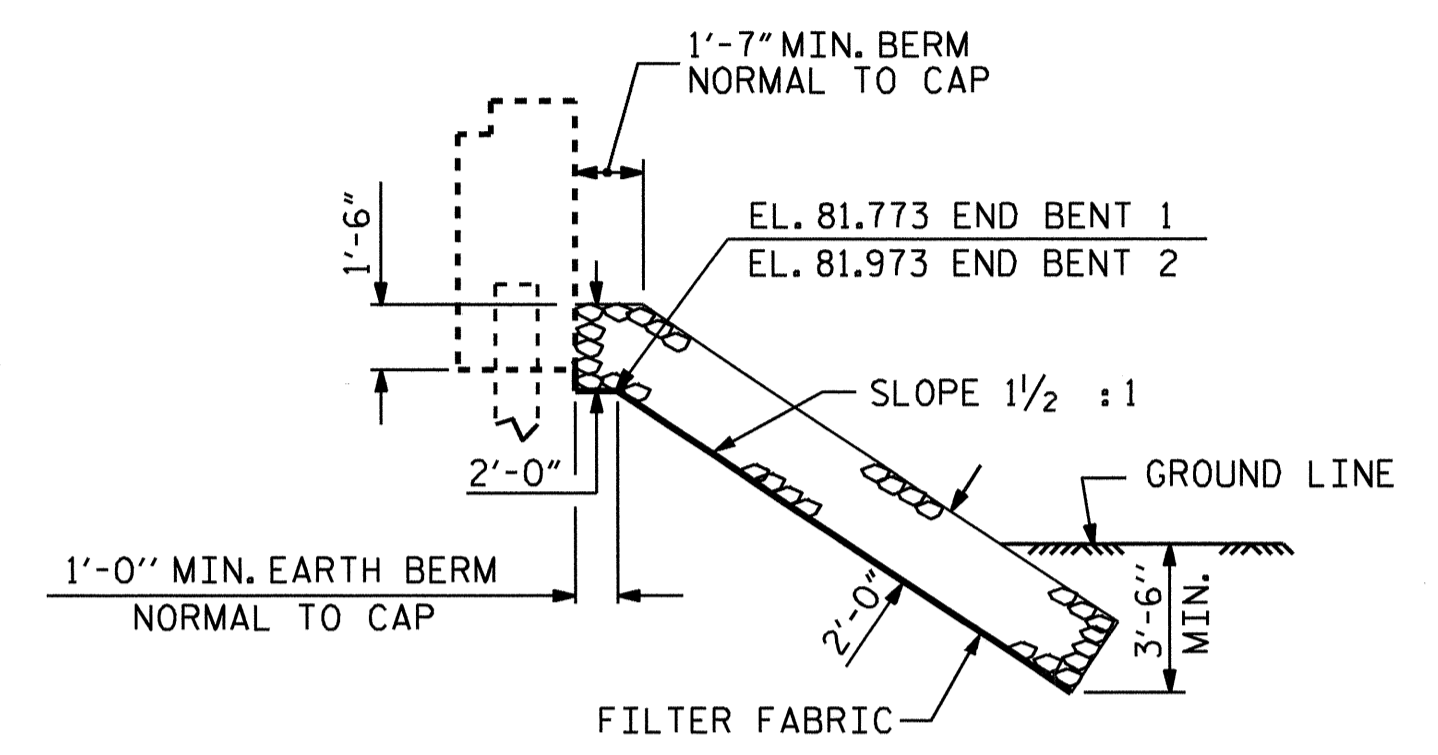


| | |
|------------------------------|----------------------|
| ASSEMBLED BY : K. H. COMPTON | DATE : 2/11 |
| CHECKED BY : B. MATHEW | DATE : 2/11 |
| DRAWN BY : TLA 8/05 | ADDED 10/1/05 |
| CHECKED BY : GM 9/05 | REV. 5/1/06R MAA/KMM |

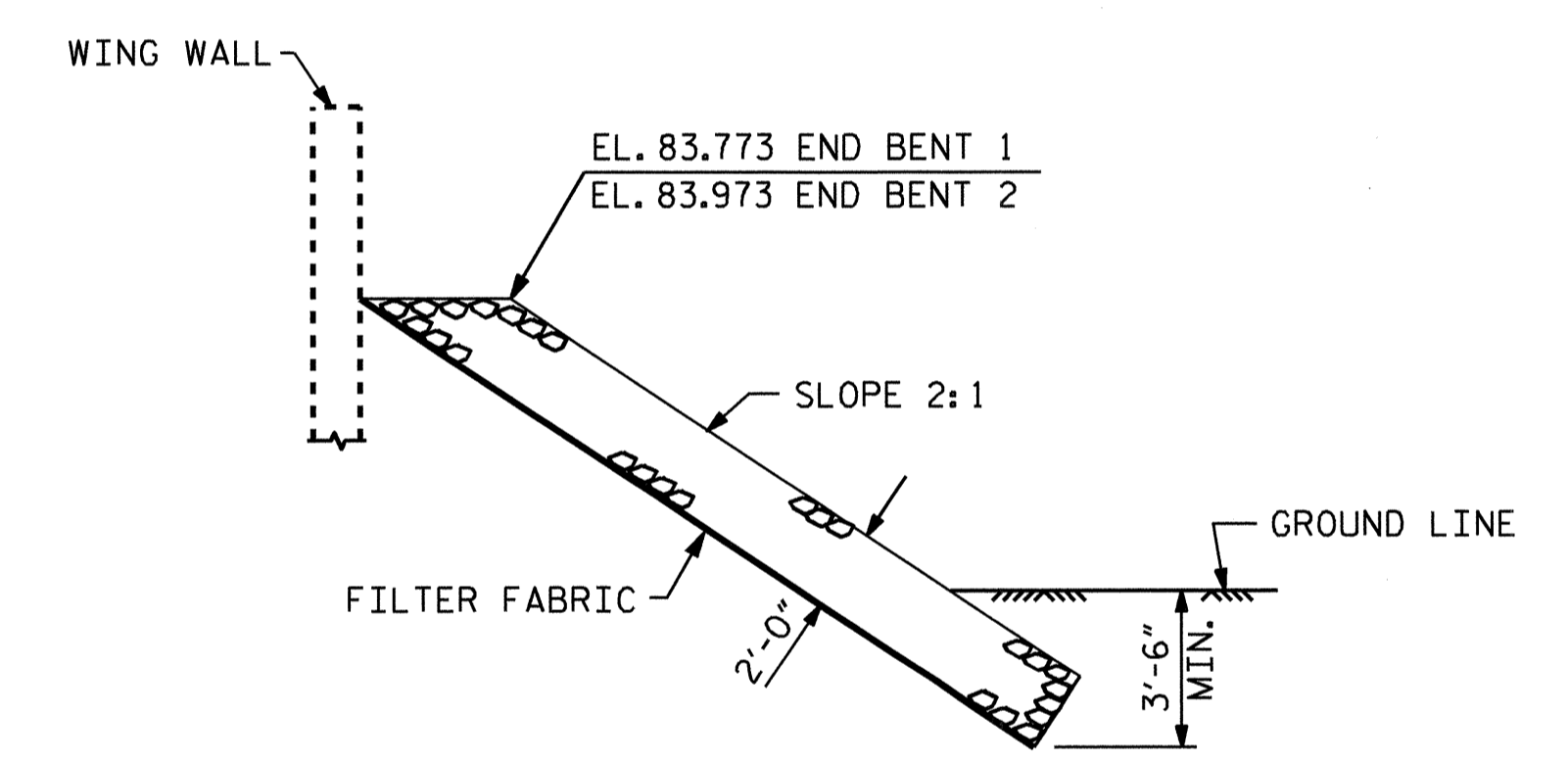
| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-35 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 41 |



| ESTIMATED QUANTITIES | | |
|-------------------------------|---------------------|-------------------------------|
| BRIDGE @ STA. 18+55.00 -L- | RIP RAP CLASS II | FILTER FABRIC FOR DRAINAGE |
| | TONS | SQUARE YARDS |
| END BENT 1 | 405 | 450 |
| END BENT 2 | 80 | 90 |
| TOTAL | 485 | 540 |



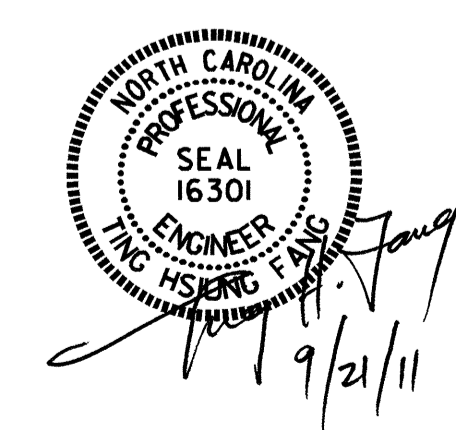
SECTION C-C



SECTION C-C

BERM RIP RAPPED

PROJECT NO. B-4090
CUMBERLAND COUNTY
 STATION: 18+55.00 -L-

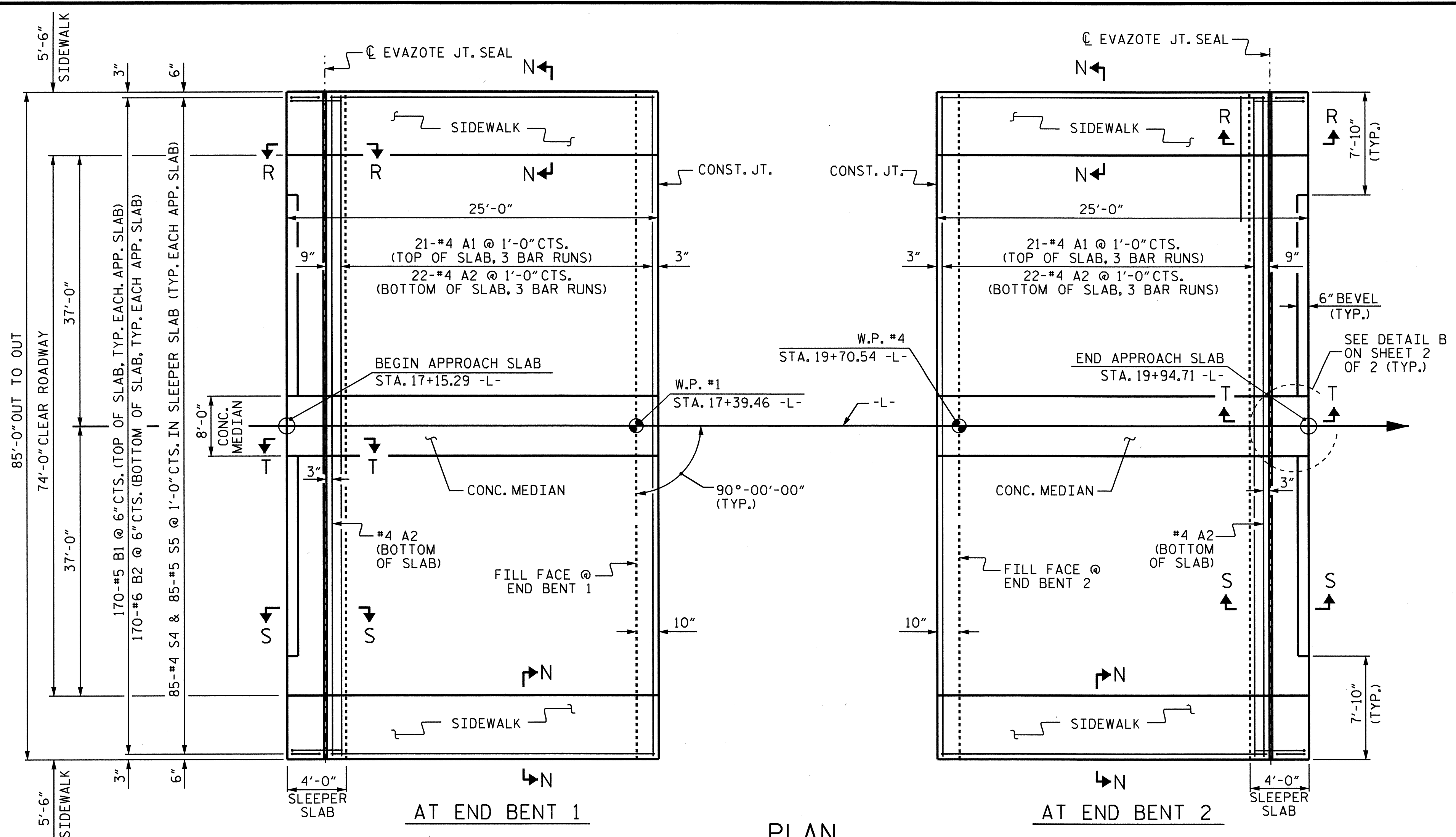


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 RIP RAP DETAILS

DRAWN BY: K.H. COMPTON DATE: 3/11
 CHECKED BY: T.H. FANG DATE: 7/13/11

| REVISIONS | | | | | | SHEET NO. | |
|-----------|-----|-------|-----|-----|-------|-----------------|--|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-36 | |
| 1 | | | 3 | | | TOTAL SHEETS 41 | |
| 2 | | | 4 | | | | |

21-SEP-2011 14:02
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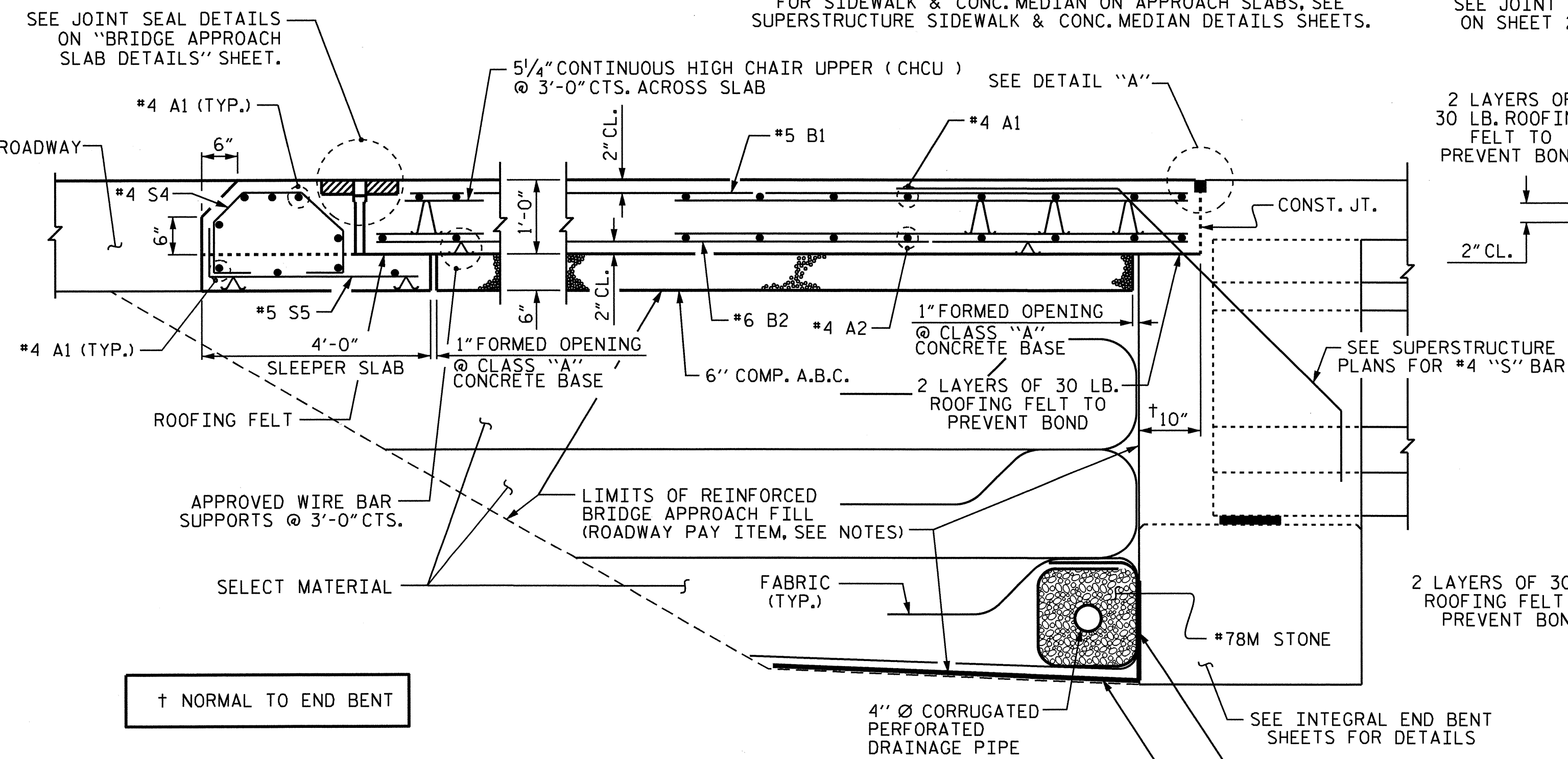


AT END BENT 1

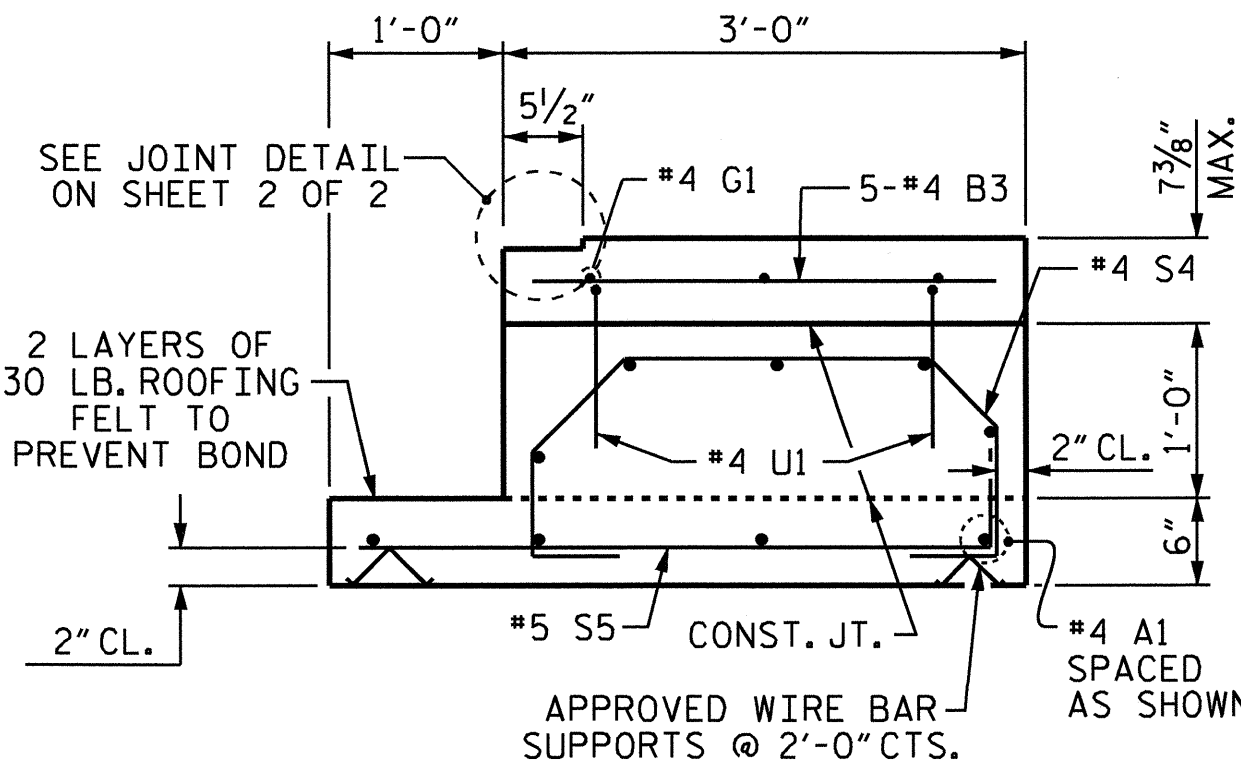
AT END BENT 2

PLAN

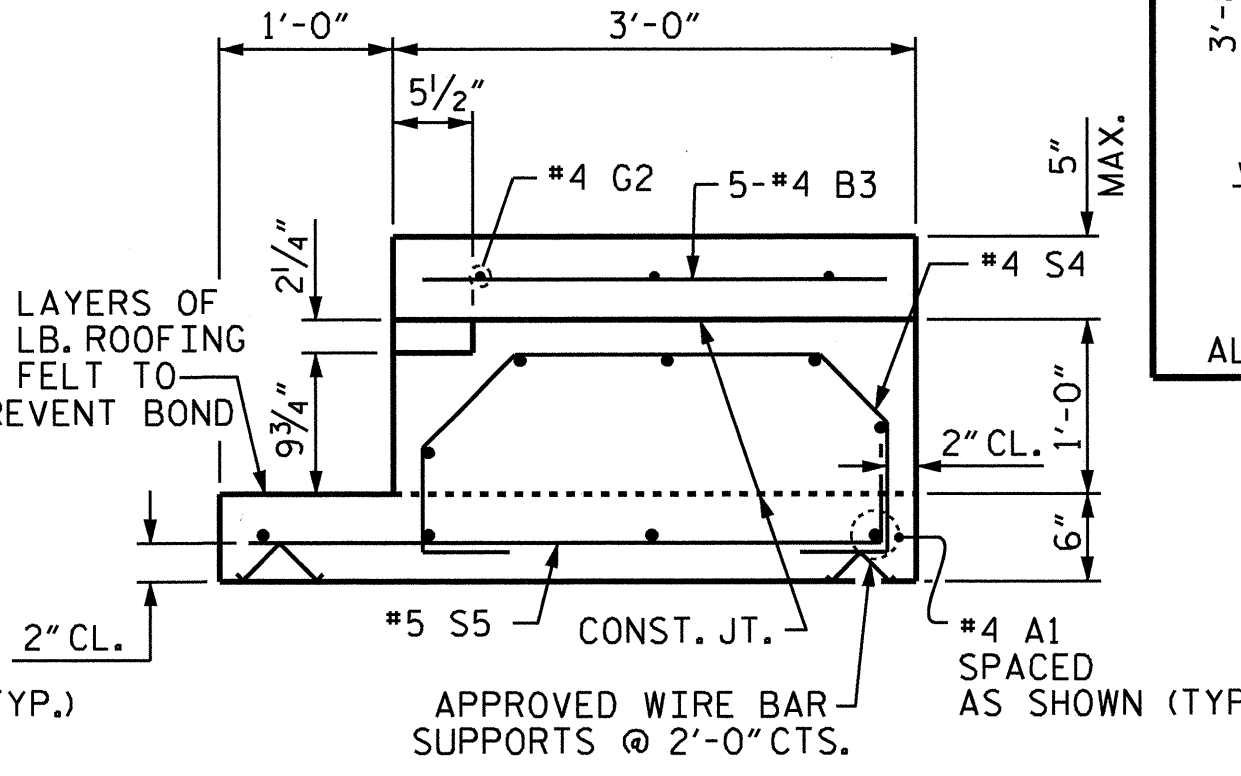
DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS.
 #4 A1 BARS IN SLEEPER SLAB NOT SHOWN FOR CLARITY.
 FOR SIDEWALK & CONC. MEDIAN ON APPROACH SLABS, SEE SUPERSTRUCTURE SIDEWALK & CONC. MEDIAN DETAILS SHEETS.



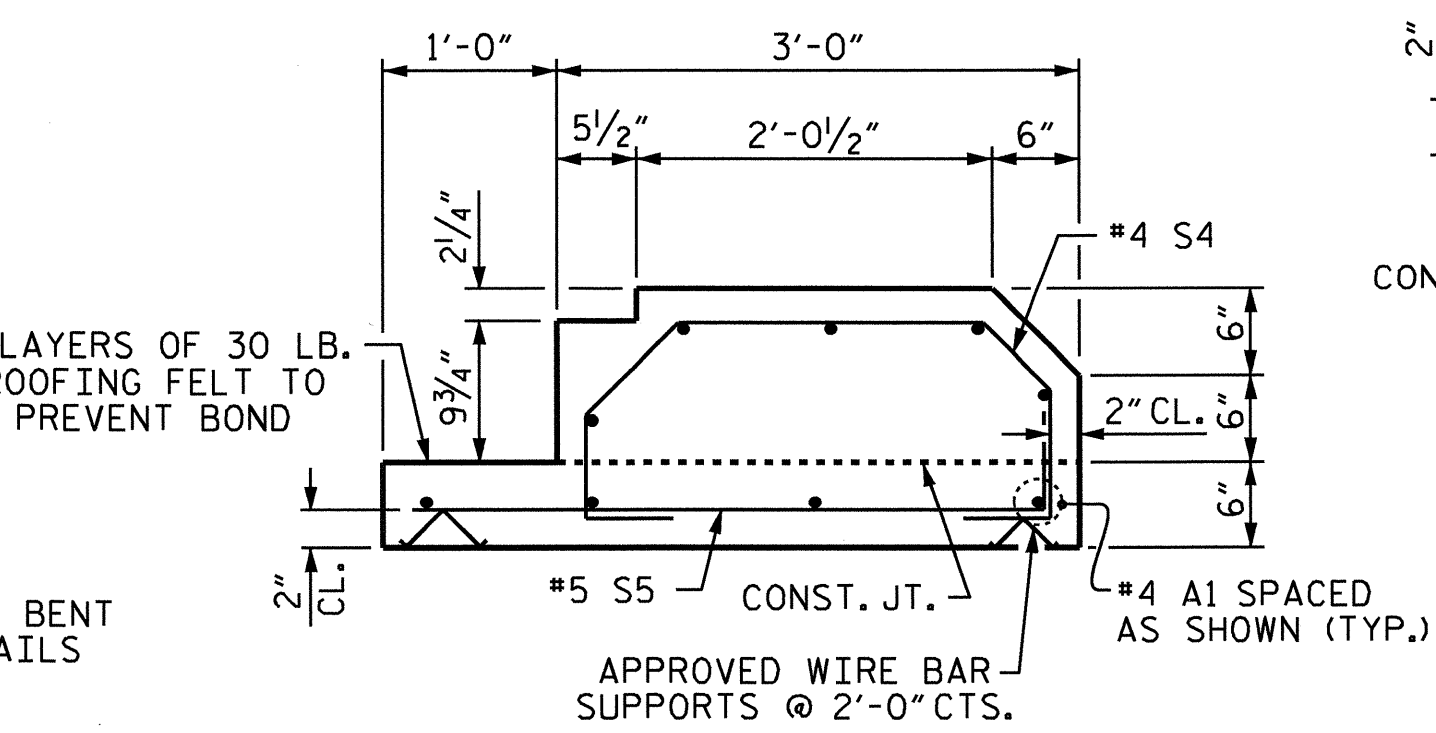
SECTION THRU SLAB
 CONCRETE MEDIAN NOT SHOWN FOR CLARITY.



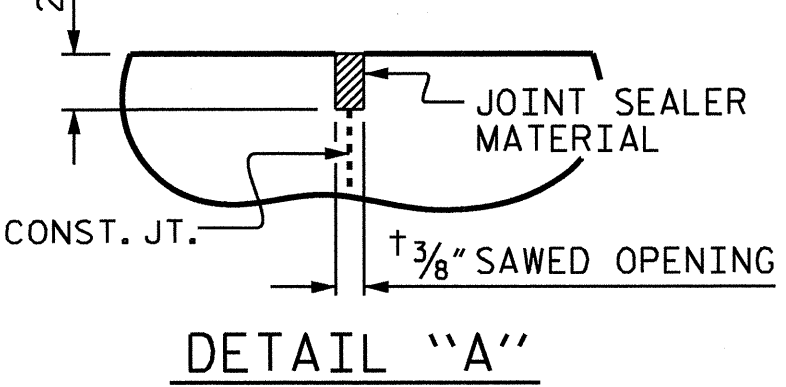
SECTION R-R
 SHOWING SIDEWALK ON SLEEPER SLAB



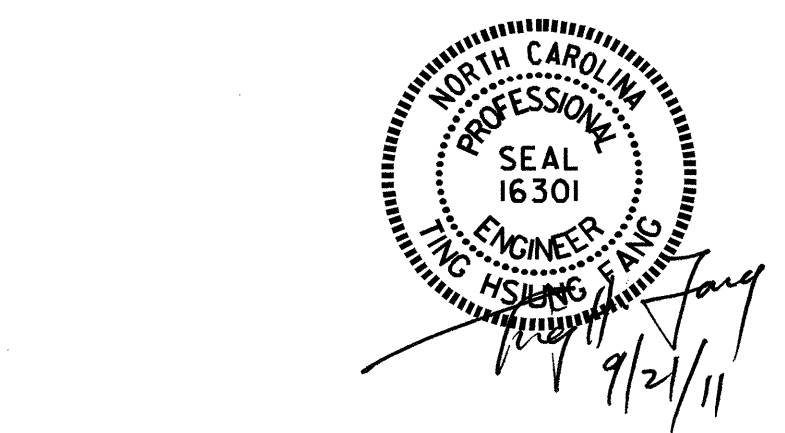
SECTION T-T
 SHOWING CONCRETE MEDIAN ON SLEEPER SLAB



SECTION S-S
 SHOWING SLEEPER SLAB



DETAIL "A"



NOTES

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

FOR REINFORCED BRIDGE APPROACH FILL INCLUDING FABRIC, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, 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 6" COMP. A.B.C. SHALL BE FLUSH WITH THE SLEEPER SLAB AND SHALL EXTEND 1'-0" OUTSIDE OF EACH EDGE OF THE APPROACH SLAB.

THE CONTRACTOR MAY USE 4" TYPE B-25.0B ASPHALT CONCRETE BASE COURSE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE BASE COURSE SHALL BE FLUSH WITH THE SLEEPER SLAB, AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB.

THE CONTRACTOR MAY USE 5" CLASS "A" CONCRETE BASE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE CONCRETE BASE SHALL BE FLUSH WITH THE SLEEPER SLAB, AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB. THE CONCRETE SHALL BE FINISHED TO A SMOOTH SURFACE AND A LAYER OF 30 LB ROOFING FELT SHALL BE PLACED BETWEEN THE CONCRETE BASE AND THE APPROACH SLAB TO PREVENT BOND. THE APPROACH SLAB SHALL NOT BE CAST UNTIL THE CONCRETE BASE HAS REACHED AN AGE OF THREE CURING DAYS.

THE VERTICAL JOINT ON THE RIGHT AND LEFT SIDE OF THE APPROACH SLAB AT THE ENDS OF THE EVAZOTE JOINT SHALL BE FILLED WITH SILICONE OR OTHER APPROVED MATERIAL IN ORDER TO PREVENT BACKFILL FROM ENTERING THE JOINT OPENING.

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 TYPE SL LOW MODULUS SILICONE SEALANT.

WITH EVAZOTE JOINT SEAL

FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 2 1/2".

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

BILL OF MATERIAL

FOR ONE APPROACH SLAB (2 REQ'D)

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|------|-----|------|------|--------|--------|
| * A1 | 90 | #4 | STR | 29'-7" | 1779 |
| A2 | 69 | #4 | STR | 29'-5" | 1356 |
| * B1 | 170 | #5 | STR | 21'-1" | 3738 |
| B2 | 170 | #6 | STR | 21'-7" | 5511 |
| * B3 | 15 | #4 | STR | 2'-8" | 27 |
| * G1 | 6 | #4 | STR | 5'-0" | 20 |
| * G2 | 3 | #4 | STR | 7'-0" | 14 |
| * S4 | 85 | #4 | 1 | 5'-3" | 298 |
| S5 | 85 | #5 | 2 | 4'-3" | 377 |
| * U1 | 8 | #4 | 3 | 3'-4" | 18 |

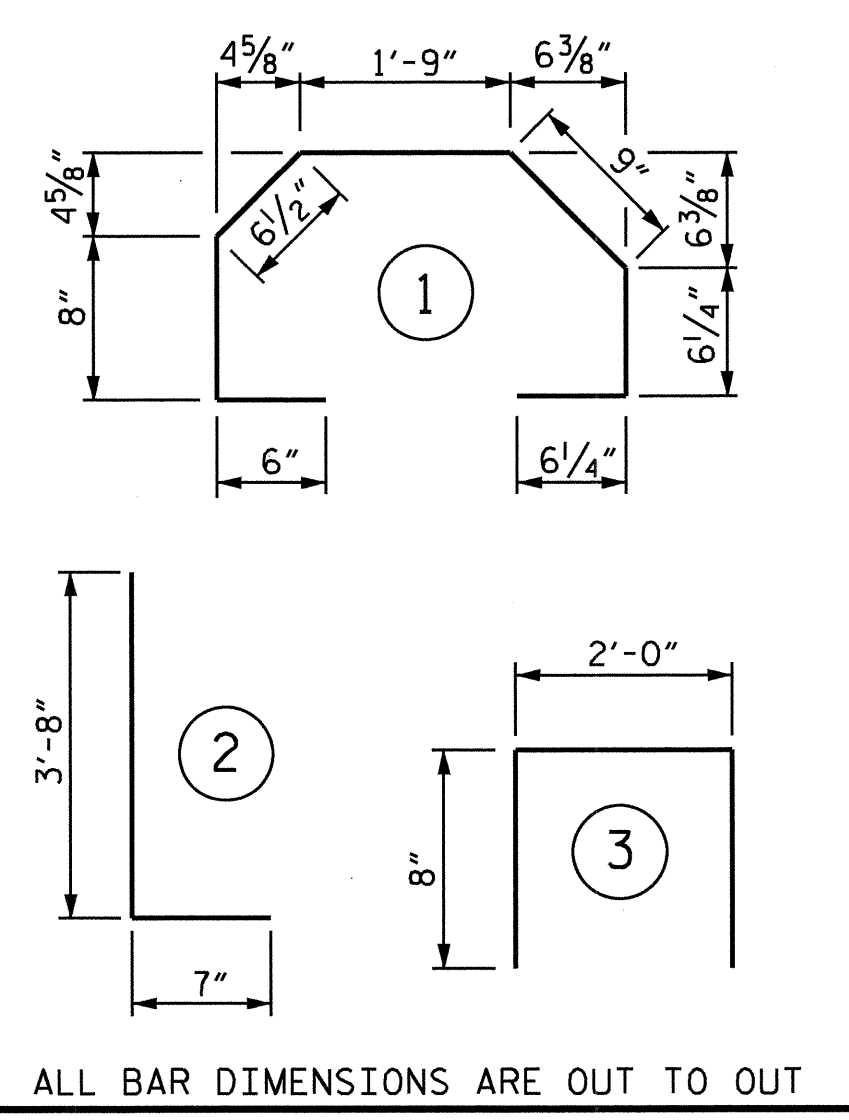
REINFORCING STEEL LBS. 7244

* EPOXY COATED REINFORCING STEEL LBS. 5894

CLASS AA CONCRETE

| POUR | THICKNESS | UNIT | WEIGHT |
|-----------------------------------|-----------|--------------|-------------|
| POUR #1 - SLEEPER SLAB | | C. Y. | 6.3 |
| POUR #2 - SLAB | | C. Y. | 73.3 |
| POUR #3 - SIDEWALK & CONC. MEDIAN | | C. Y. | 1.0 |
| TOTAL | | C. Y. | 80.6 |

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

SPLICE CHART

| BAR | SIZE | SPLICE |
|------|------|--------|
| * A1 | #4 | 2'-0" |
| A2 | #4 | 1'-9" |

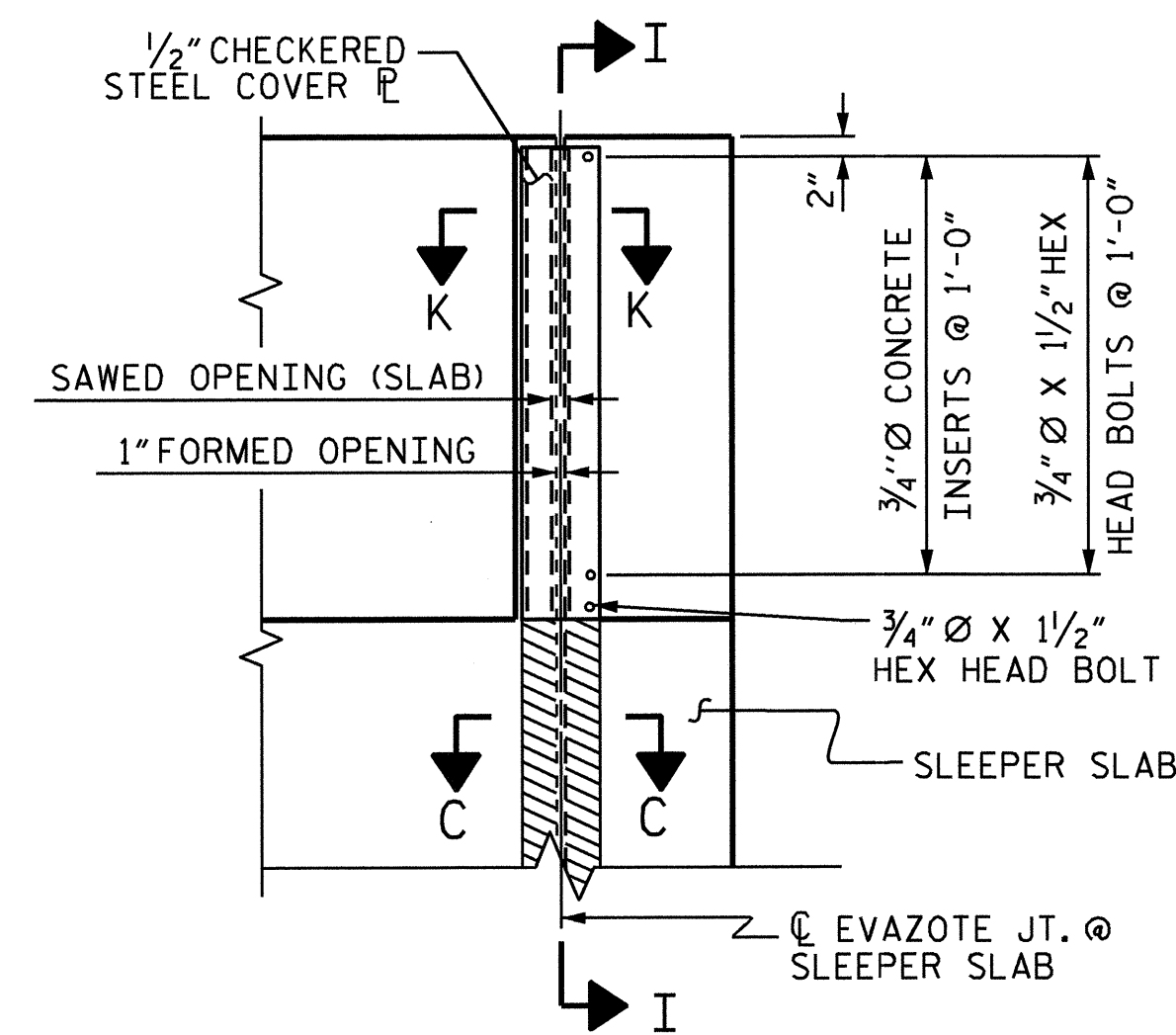
PROJECT NO. B-4090
 CUMBERLAND COUNTY
 STATION: 18+55.00 -L-

SHEET 1 OF 2

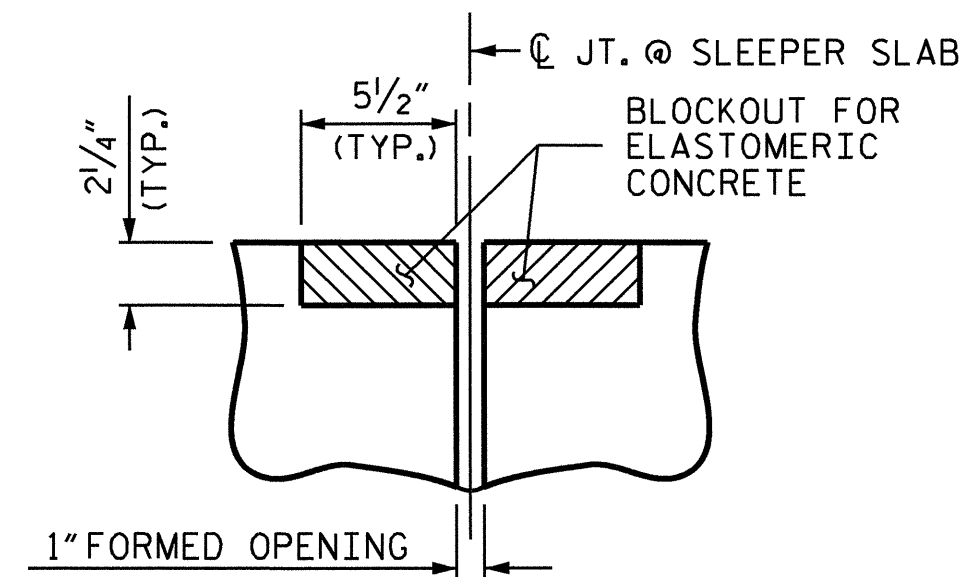
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 BRIDGE APPROACH SLAB
 FOR INTEGRAL ABUTMENT
 WITH SIDEWALK

| REVISIONS | | | | | | SHEET NO. | |
|-----------|-----|-------|-----|-----|-------|-----------------|--|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-37 | |
| 1 | | | 3 | | | TOTAL SHEETS 41 | |
| 2 | | | 4 | | | | |

ASSEMBLED BY : HARISH SHAH DATE : 7-05-11
 CHECKED BY : T.H. FANG DATE : 7-28-11
 DRAWN BY : TLA 10/05 ADDED 5/1/06R KMM/GM
 CHECKED BY : GM 5/06



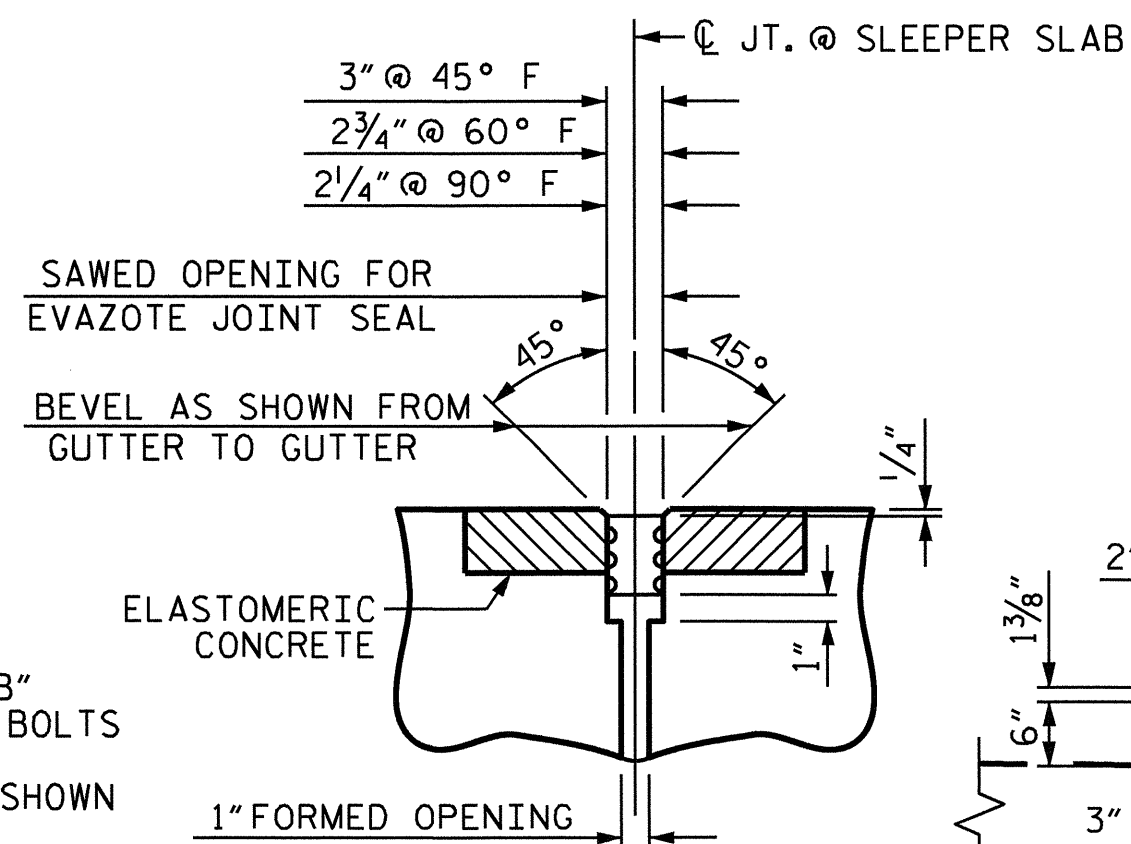
PLAN VIEW OF EVAZOTE JOINT SEAL @ SLEEPER SLAB FOR SIDEWALK



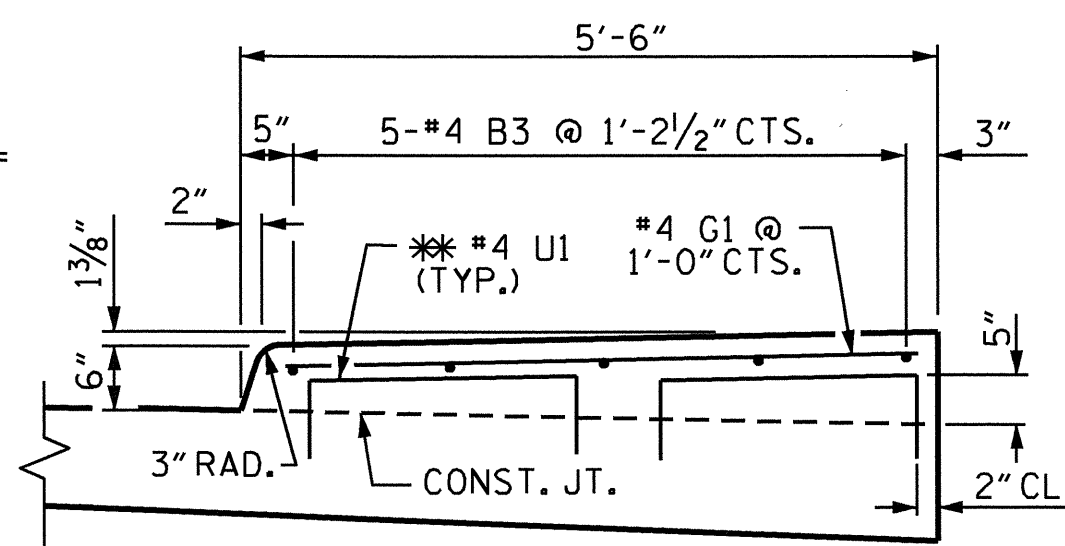
SECTION C-C EVAZOTE JOINT SEAL (PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS)

| ELASTOMERIC CONCRETE | |
|----------------------|----------------------------------|
| END BENT | ELASTOMERIC CONCRETE * (CU. FT.) |
| 1 | 12.72 |
| 2 | 12.72 |
| TOTAL | 25.44 |

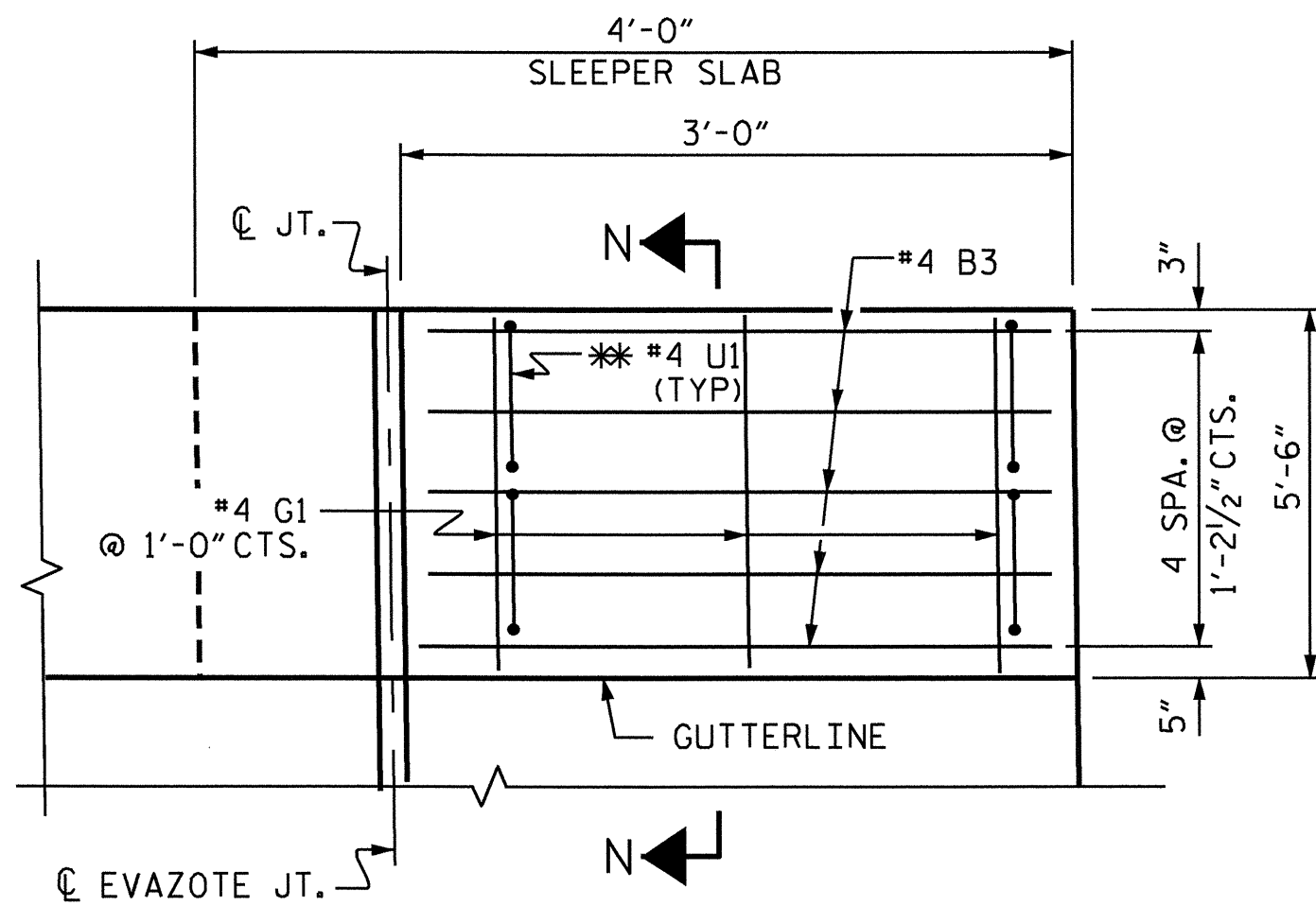
* BASED ON THE MINIMUM BLOCKOUT SHOWN.



SECTION C-C EVAZOTE JOINT SEAL (EXPANSION)



SECTION N-N



PLAN

** #4 U1 BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER SLEEPER SLAB HAS BEEN SCREEDED OFF.

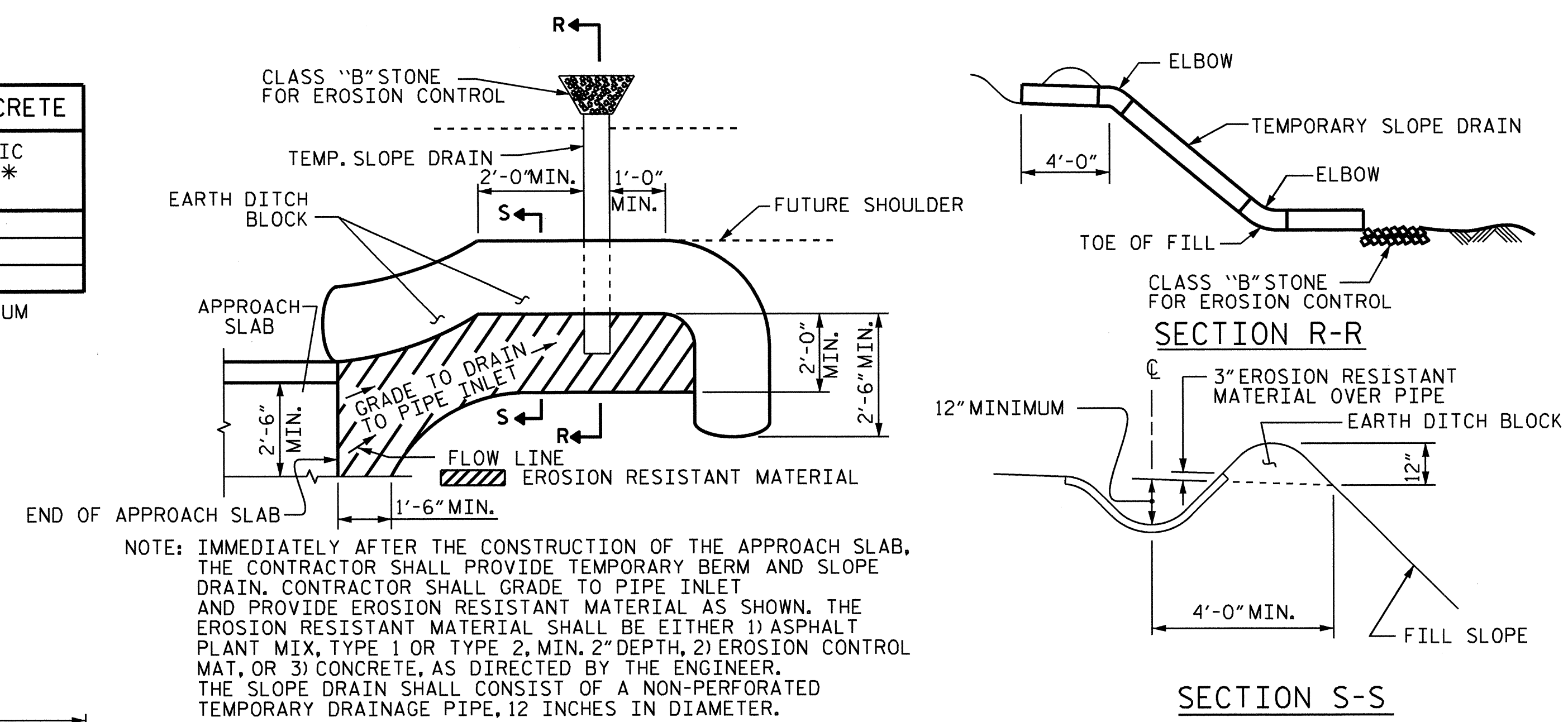
SIDEWALK DETAILS ON SLEEPER SLAB

COVER PLATE NOTES

THE STEEL PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 OR APPROVED EQUAL. AFTER FABRICATION, THE PLATES SHALL BE COMMERCIALY BLAST CLEANED AND COATED WITH A MINIMUM THICKNESS OF 4 MILS (DRY) OF ZINC RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. AT THE CONTRACTOR'S OPTION, THESE SURFACES MAY BE METALLIZED TO A MINIMUM THICKNESS OF 6 MILS. SEE SPECIAL PROVISIONS FOR THERMAL SPRAYED COATINGS (METALLIZATION).

THE 3/4" DIAMETER HEX HEAD BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL.

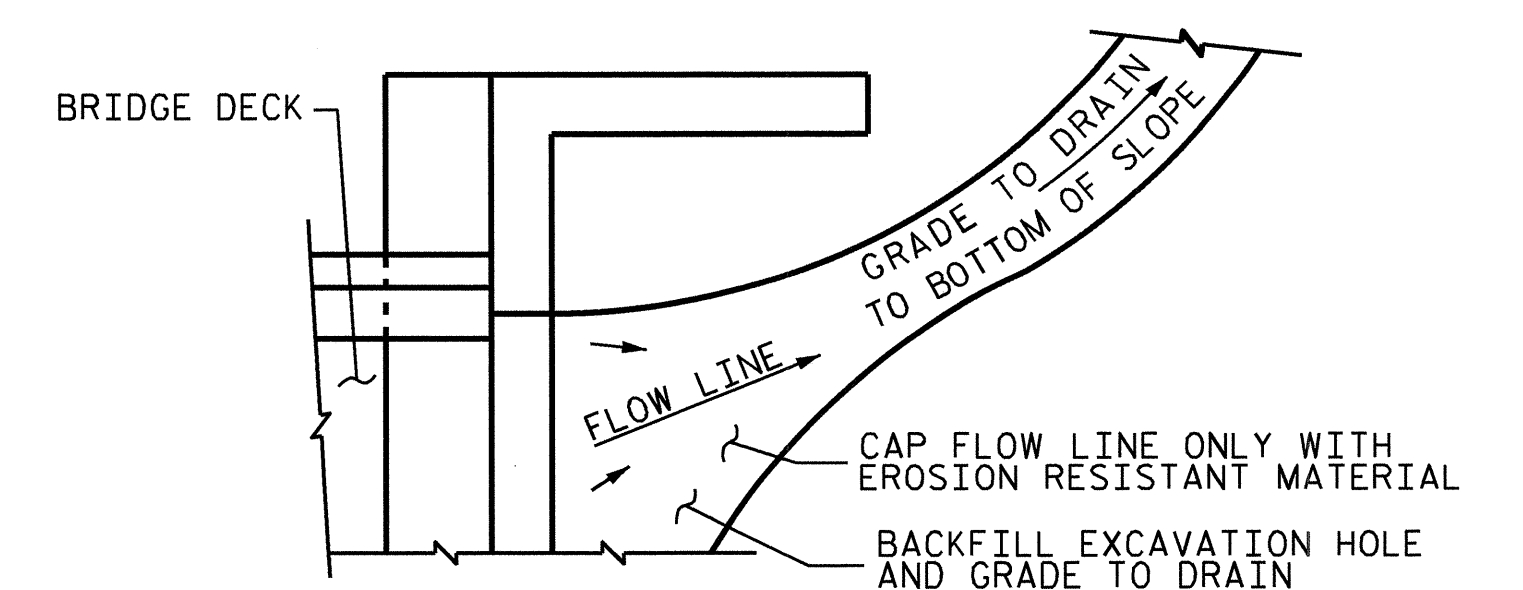
NO SEPARATE PAYMENT WILL BE MADE FOR FURNISHING AND INSTALLING THE COVER PLATE. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE LUMP SUM PRICE FOR "EVAZOTE JOINT SEALS".



PLAN VIEW

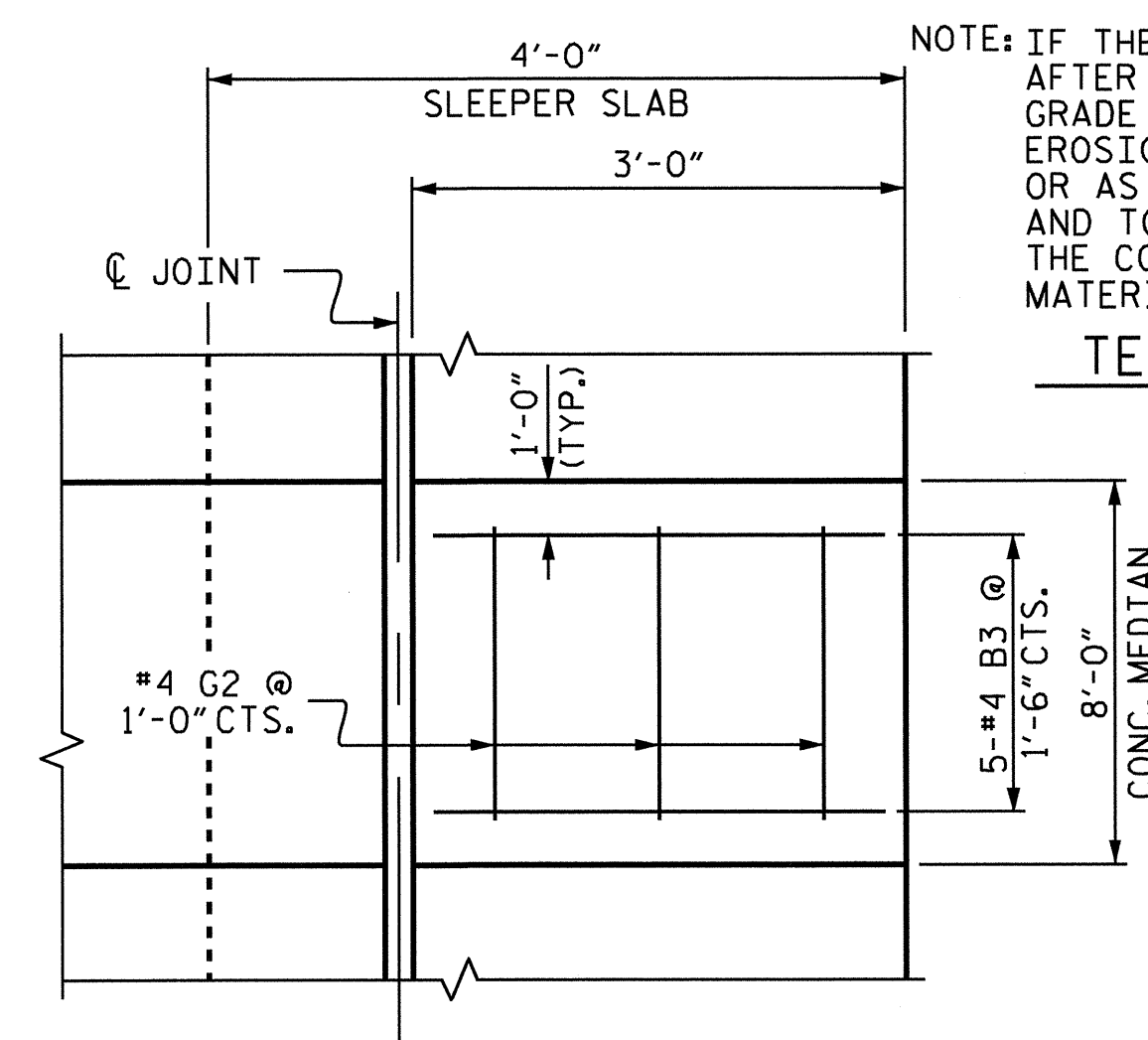
TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



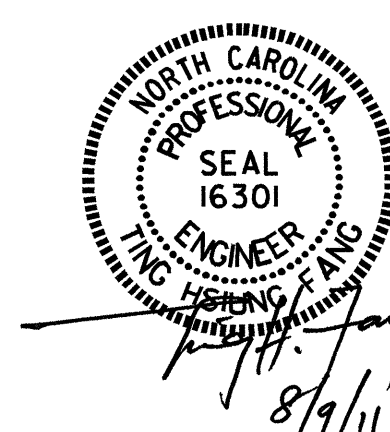
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL



DETAIL B

FOR SECTION THRU CONCRETE MEDIAN, SEE "CONCRETE MEDIAN" SHEET.



PROJECT NO. B-4090
CUMBERLAND COUNTY
 STATION: 18+55.00 -L-

SHEET 2 OF 2

| STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH | | | | | |
|--|-----|-------|-----|-----|-------|
| STANDARD | | | | | |
| BRIDGE APPROACH SLAB DETAILS | | | | | |
| REVISIONS | | | | | |
| NO. | BY: | DATE: | NO. | BY: | DATE: |
| 1 | | | 3 | | |
| 2 | | | 4 | | |

SHEET NO.
S-38
TOTAL SHEETS
41

STD. NO. BAS10 (SHT 12)

| | |
|---------------------------|---------------|
| ASSEMBLED BY: HARISH SHAH | DATE: 7-05-11 |
| CHECKED BY: T.H. FANG | DATE: 7-28-11 |
| DRAWN BY: FCJ | 11/88 |
| CHECKED BY: ARB | 11/88 |
| REV. 10/17/00 | RWW/LES |
| REV. 5/7/03 | RWW/JTE |
| REV. 5/1/08 | MAA/KMM |

OVERHANG BRACKET CALCULATION INSTRUCTIONS

AASHTO SHAPES - TYPES III, IV, V, AND VI

1. RECORD KNOWN INFORMATION ON "BRIDGE OVERHANG BRACKET SUMMARY" ON SHEET 2
2. CALCULATE THE MAXIMUM SCREED LOAD PER BRACKET (SLPB) WITH AN ESTIMATED $R = 1.5$. $SLPB = R \times W$. ROUND VALUE UP TO NEAREST SLPB VALUE INDICATED ON APPROPRIATE TABLE 1-1, 1-2, 1-3, OR 1-4.
3. WITH THE ESTIMATED SLPB, OVERHANG SLAB THICKNESS, "K" VALUE, AND 45° HANGER SAFE WORKING LOAD (SWL), ENTER THE APPROPRIATE TABLE 1-1, 1-2, 1-3, OR 1-4 (BASED ON OVERHANG DIMENSION) AND DETERMINE THE BRACKET SPACING, S.
4. CALCULATE S/D1 AND S/D2, ROUNDING UP TO NEAREST VALUE IN TABLE 2. ENTER TABLE 2 AND DETERMINE R VALUE.
5. CALCULATE REVISED SLPB. ROUND VALUE UP TO NEAREST SLPB VALUE INDICATED ON APPROPRIATE TABLE 1-1, 1-2, 1-3, OR 1-4.
6. WITH THE REVISED SLPB, OVERHANG SLAB THICKNESS, "K" VALUE, AND 45° HANGER SAFE WORKING LOAD (SWL), ENTER THE APPROPRIATE TABLE 1-1, 1-2, 1-3 OR 1-4 (BASED ON OVERHANG DIMENSION) AND DETERMINE REVISED BRACKET SPACING, S.
7. CONTINUE ITERATIONS OF STEPS 4-6 UNTIL THE REVISED BRACKET SPACING, S, IS THE SAME AS THE PREVIOUS S VALUE.
8. CHECK LUMBER JOIST SPACING: WITH BRACKET SPACING VALUE, S, ROUND THIS VALUE UP TO THE NEAREST VALUE OF ALLOWABLE SPAN LENGTH OF JOIST OF TABLE 3. USING THIS VALUE, ALONG WITH THE AVERAGE OVERHANG SLAB THICKNESS AND THE LUMBER JOIST SIZE, DETERMINE JOIST SPACING FROM TABLE 3. IF NECESSARY, ADJUST LUMBER JOIST SIZE AND/OR JOIST SPACING TO MEET ALLOWABLE SPAN LENGTH OF JOIST.
9. CONVERSELY, IF THE DESIRED JOIST SPACING IS KNOWN, USE THIS ALONG WITH THE AVERAGE OVERHANG SLAB THICKNESS AND THE LUMBER JOIST SIZE TO DETERMINE IF ALLOWABLE SPAN LENGTH OF JOIST IS GREATER THAN THE BRACKET SPACING, S. IF NECESSARY, ADJUST LUMBER JOIST SIZE TO MEET REQUIREMENTS OF ALLOWABLE SPAN LENGTH OF JOIST AND JOIST SPACING.
10. RECORD REMAINING INFORMATION ON "BRIDGE OVERHANG BRACKET SUMMARY" FORM.
11. SUBMIT FORM AND CALCULATIONS FOR REVIEW AND APPROVAL.

TABLE 1-1 (FOR USE ON UP TO 2'-0" OVERHANG & 54" HORIZONTAL LEG LENGTH OF THE OVERHANG BRACKET)

| AVG. SLAB THICKNESS (in) | BRACKET DIMENSION (in) | SCREED LOAD PER BRACKET | | | | | | | | 45° HANGER SWL (lbs) | |
|--------------------------|------------------------|-------------------------|-----------|-----------|-----------|-----------|-----------|-----------|----------|----------------------|--------|
| | | 2500 lbs. | 2250 lbs. | 2000 lbs. | 1750 lbs. | 1500 lbs. | 1250 lbs. | 1000 lbs. | 750 lbs. | | 0 lbs. |
| | | BRACKET SPACING | | | | | | | | | |
| 10 | 30 | 3'-6" | 4'-0" | 4'-5" | 2'-1" | 2'-7" | 3'-2" | 3'-8" | 4'-2" | 5'-9" | 4000 |
| | 40 | 3'-6" | 4'-0" | 4'-5" | 2'-1" | 2'-7" | 3'-2" | 3'-8" | 4'-2" | 5'-9" | 4000 |
| | 50 | 3'-6" | 4'-0" | 4'-5" | 2'-1" | 2'-7" | 3'-2" | 3'-8" | 4'-2" | 5'-9" | 4000 |
| 12 | 30 | 3'-2" | 3'-7" | 4'-1" | 2'-4" | 2'-10" | 3'-4" | 3'-9" | 5'-2" | 4000 | |
| | 40 | 3'-2" | 3'-7" | 4'-1" | 2'-4" | 2'-10" | 3'-4" | 3'-9" | 5'-2" | 4000 | |
| | 50 | 3'-2" | 3'-7" | 4'-1" | 2'-4" | 2'-10" | 3'-4" | 3'-9" | 5'-2" | 4000 | |
| 14 | 30 | 2'-10" | 3'-4" | 3'-9" | 2'-2" | 2'-7" | 3'-0" | 3'-5" | 4'-9" | 4000 | |
| | 40 | 2'-10" | 3'-4" | 3'-9" | 2'-2" | 2'-7" | 3'-0" | 3'-5" | 4'-9" | 4000 | |
| | 50 | 2'-10" | 3'-4" | 3'-9" | 2'-2" | 2'-7" | 3'-0" | 3'-5" | 4'-9" | 4000 | |
| 16 | 30 | 2'-8" | 3'-0" | 3'-5" | 2'-0" | 2'-4" | 2'-9" | 3'-2" | 4'-4" | 4000 | |
| | 40 | 2'-8" | 3'-0" | 3'-5" | 2'-0" | 2'-4" | 2'-9" | 3'-2" | 4'-4" | 4000 | |
| | 50 | 2'-8" | 3'-0" | 3'-5" | 2'-0" | 2'-4" | 2'-9" | 3'-2" | 4'-4" | 4000 | |

TABLE 1-2 (FOR USE ON OVER 2'-0" TO 2'-6" OVERHANG & 54" HORIZONTAL LEG LENGTH OF THE OVERHANG BRACKET)

| AVG. SLAB THICKNESS (in) | BRACKET DIMENSION (in) | SCREED LOAD PER BRACKET | | | | | | | | 45° HANGER SWL (lbs) | |
|--------------------------|------------------------|-------------------------|-----------|-----------|-----------|-----------|-----------|-----------|----------|----------------------|--------|
| | | 2500 lbs. | 2250 lbs. | 2000 lbs. | 1750 lbs. | 1500 lbs. | 1250 lbs. | 1000 lbs. | 750 lbs. | | 0 lbs. |
| | | BRACKET SPACING | | | | | | | | | |
| 10 | 30 | 3'-1" | 3'-6" | 4'-0" | 2'-4" | 2'-9" | 3'-3" | 3'-8" | 5'-1" | 4000 | |
| | 40 | 3'-1" | 3'-6" | 4'-0" | 2'-4" | 2'-9" | 3'-3" | 3'-8" | 5'-1" | 4000 | |
| | 50 | 3'-1" | 3'-6" | 4'-0" | 2'-4" | 2'-9" | 3'-3" | 3'-8" | 5'-1" | 4000 | |
| 12 | 30 | 2'-9" | 3'-2" | 3'-7" | 2'-1" | 2'-6" | 2'-11" | 3'-4" | 4'-6" | 4000 | |
| | 40 | 2'-9" | 3'-2" | 3'-7" | 2'-1" | 2'-6" | 2'-11" | 3'-4" | 4'-6" | 4000 | |
| | 50 | 2'-9" | 3'-2" | 3'-7" | 2'-1" | 2'-6" | 2'-11" | 3'-4" | 4'-6" | 4000 | |
| 14 | 30 | 2'-6" | 2'-10" | 3'-3" | 2'-3" | 2'-7" | 3'-0" | 4'-1" | 4000 | | |
| | 40 | 2'-6" | 2'-10" | 3'-3" | 2'-3" | 2'-7" | 3'-0" | 4'-1" | 4000 | | |
| | 50 | 2'-6" | 2'-10" | 3'-3" | 2'-3" | 2'-7" | 3'-0" | 4'-1" | 4000 | | |
| 16 | 30 | 2'-3" | 2'-7" | 2'-11" | 2'-1" | 2'-5" | 2'-9" | 3'-9" | 4000 | | |
| | 40 | 2'-3" | 2'-7" | 2'-11" | 2'-1" | 2'-5" | 2'-9" | 3'-9" | 4000 | | |
| | 50 | 2'-3" | 2'-7" | 2'-11" | 2'-1" | 2'-5" | 2'-9" | 3'-9" | 4000 | | |

TABLE 1-3 (FOR USE ON OVER 2'-6" TO 3'-0" OVERHANG & 54" HORIZONTAL LEG LENGTH OF THE OVERHANG BRACKET)

| AVG. SLAB THICKNESS (in) | BRACKET DIMENSION (in) | SCREED LOAD PER BRACKET | | | | | | | | 45° HANGER SWL (lbs) | |
|--------------------------|------------------------|-------------------------|-----------|-----------|-----------|-----------|-----------|-----------|----------|----------------------|--------|
| | | 2500 lbs. | 2250 lbs. | 2000 lbs. | 1750 lbs. | 1500 lbs. | 1250 lbs. | 1000 lbs. | 750 lbs. | | 0 lbs. |
| | | BRACKET SPACING | | | | | | | | | |
| 10 | 30 | | | | | 2'-1" | 2'-6" | 2'-11" | 3'-4" | 4'-6" | 4000 |
| | 40 | | | | | 2'-1" | 2'-6" | 2'-11" | 3'-4" | 4'-6" | 4000 |
| | 50 | 2'-9" | 3'-2" | 3'-7" | 4'-0" | 4'-5" | 4'-10" | 5'-3" | 5'-7" | 6'-7" | 6000 |
| 12 | 30 | | | | | | | | | | 4000 |
| | 40 | | | | | | | | | | 4000 |
| | 50 | 2'-9" | 3'-2" | 3'-7" | 4'-0" | 4'-5" | 4'-10" | 5'-3" | 5'-7" | 6'-7" | 6000 |
| 14 | 30 | | | | | | | | | | 4000 |
| | 40 | | | | | | | | | | 4000 |
| | 50 | 2'-9" | 3'-2" | 3'-7" | 4'-0" | 4'-5" | 4'-10" | 5'-3" | 5'-7" | 6'-7" | 6000 |
| 16 | 30 | | | | | | | | | | 4000 |
| | 40 | | | | | | | | | | 4000 |
| | 50 | 2'-9" | 3'-2" | 3'-7" | 4'-0" | 4'-5" | 4'-10" | 5'-3" | 5'-7" | 6'-7" | 6000 |

TABLE 1-4 (FOR USE ON OVER 3'-0" TO 3'-6" OVERHANG & 54" HORIZONTAL LEG LENGTH OF THE OVERHANG BRACKET)

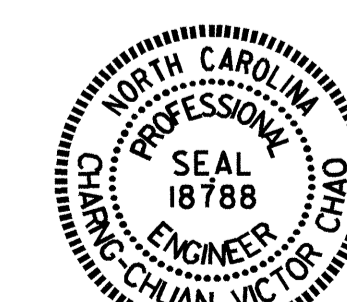
| AVG. SLAB THICKNESS (in) | BRACKET DIMENSION (in) | SCREED LOAD PER BRACKET | | | | | | | | 45° HANGER SWL (lbs) | |
|--------------------------|------------------------|-------------------------|-----------|-----------|-----------|-----------|-----------|-----------|----------|----------------------|--------|
| | | 2500 lbs. | 2250 lbs. | 2000 lbs. | 1750 lbs. | 1500 lbs. | 1250 lbs. | 1000 lbs. | 750 lbs. | | 0 lbs. |
| | | BRACKET SPACING | | | | | | | | | |
| 10 | 30 | | | | | | 2'-1" | 2'-5" | 2'-9" | 3'-10" | 4000 |
| | 40 | | | | | | 2'-1" | 2'-5" | 2'-9" | 3'-10" | 4000 |
| | 50 | 2'-4" | 2'-8" | 3'-0" | 3'-4" | 3'-8" | 4'-1" | 4'-5" | 4'-9" | 5'-9" | 6000 |
| 12 | 30 | | | | | | 2'-1" | 2'-5" | 2'-9" | 3'-10" | 4000 |
| | 40 | | | | | | 2'-1" | 2'-5" | 2'-9" | 3'-10" | 4000 |
| | 50 | 2'-4" | 2'-8" | 3'-0" | 3'-4" | 3'-8" | 4'-1" | 4'-5" | 4'-9" | 5'-9" | 6000 |
| 14 | 30 | | | | | | 2'-0" | 2'-6" | 3'-1" | 3'-11" | 4000 |
| | 40 | | | | | | 2'-0" | 2'-6" | 3'-1" | 3'-11" | 4000 |
| | 50 | 2'-4" | 2'-8" | 3'-0" | 3'-4" | 3'-8" | 4'-1" | 4'-5" | 4'-9" | 5'-9" | 6000 |
| 16 | 30 | | | | | | 2'-0" | 2'-6" | 3'-1" | 3'-11" | 4000 |
| | 40 | | | | | | 2'-0" | 2'-6" | 3'-1" | 3'-11" | 4000 |
| | 50 | 2'-4" | 2'-8" | 3'-0" | 3'-4" | 3'-8" | 4'-1" | 4'-5" | 4'-9" | 5'-9" | 6000 |

DEFINITIONS

- SLPB = SCREED LOAD PER BRACKET ($R \times W$)
- R = SCREED LOAD FACTOR, OBTAINED FROM TABLE 2
- W = WHEEL LOAD
- S = BRACKET SPACING
- T = AVERAGE SLAB THICKNESS
- SWL = SAFE WORKING LOAD
- K = DIMENSION DEFINED ON "BRIDGE OVERHANG BRACKET SUMMARY" ON SHEET 2
- L = OVERHANG MEASURED FROM EDGE OF TOP FLANGE TO EDGE OF SUPERSTRUCTURE

PROJECT NO. B-4090
 CUMBERLAND COUNTY
 STATION: 18+55.00 -L-

SHEET 1 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD OVERHANG
 FALSEWORK
 AASHTO TYPES
 III, IV, V, AND VI

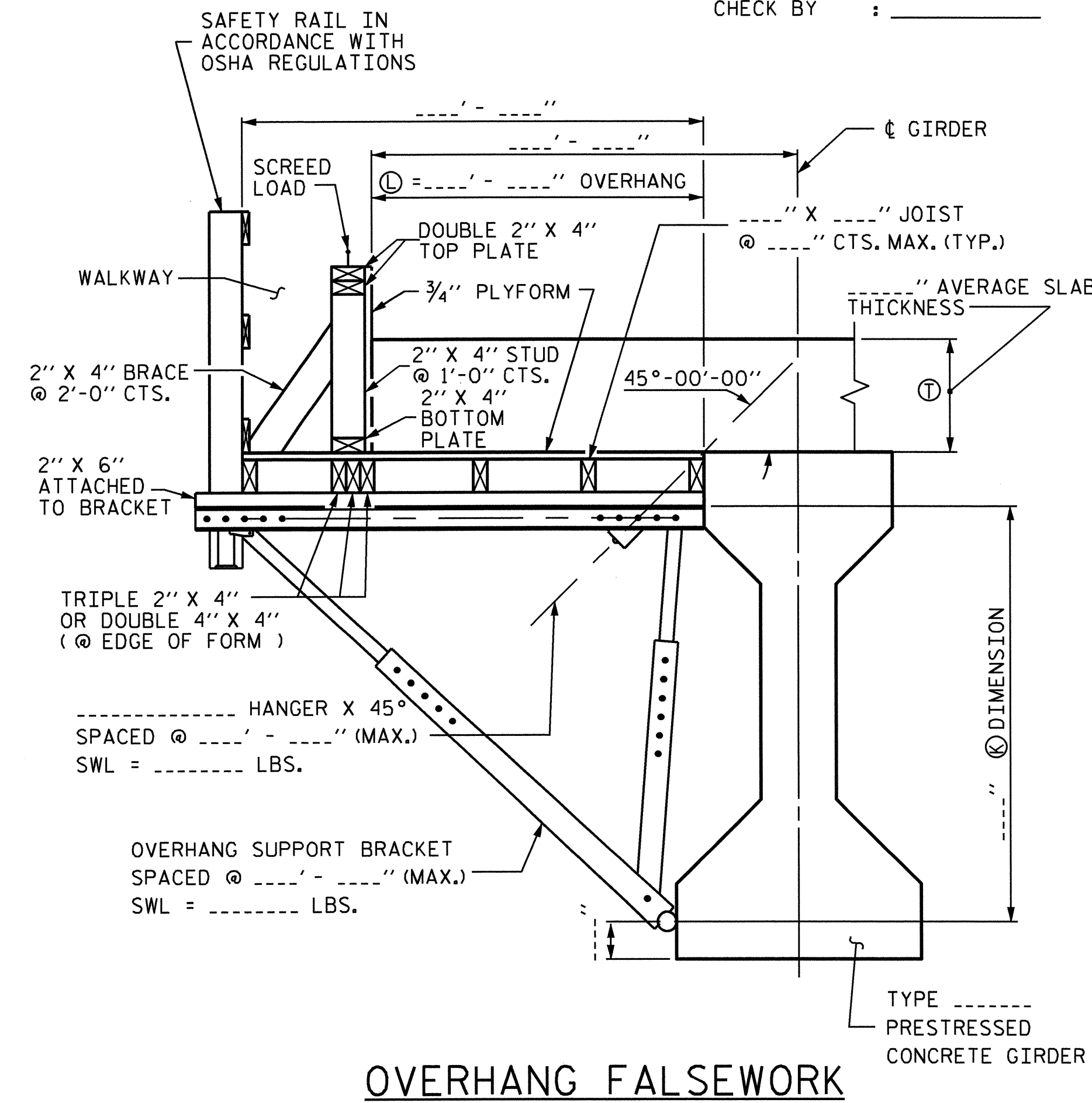
| REVISIONS | | | | | | SHEET NO. S-39 TOTAL SHEETS 41 |
|-----------|-----|-------|-----|-----|-------|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | |
| 1 | | | 3 | | | |
| 2 | | | 4 | | | |

ASSEMBLED BY: DATE:
 CHECKED BY: DATE:
 DRAWN BY: R. WRIGHT 06/04 REV.
 CHECKED BY: C. V. CHAO 06/04

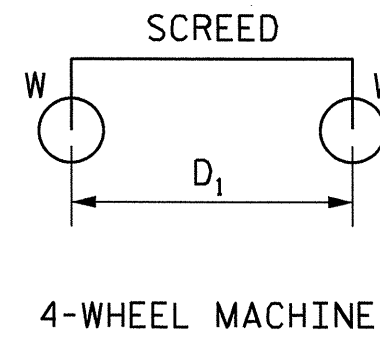
BRIDGE OVERHANG BRACKET SUMMARY

TOTAL SCREED WEIGHT = _____ LBS.
 NUMBER OF SCREED WHEELS = _____
 SCREED WHEEL LOAD (W) = _____ LBS.
 SCREED LOAD PER BRACKET = _____ LBS.

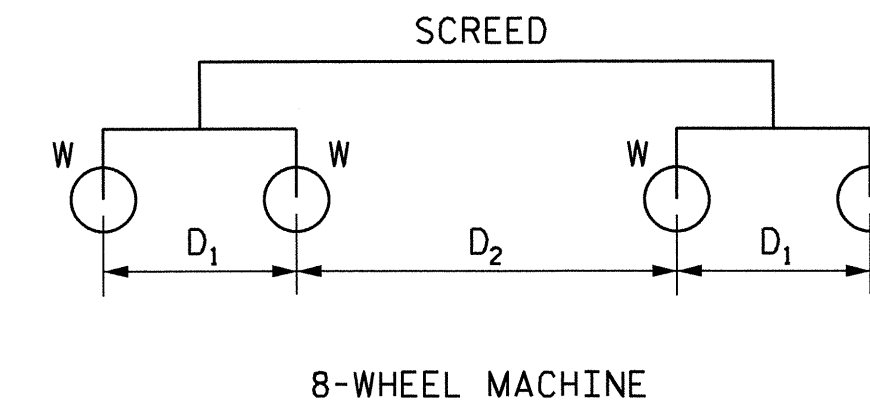
PROJECT No. : _____
 COUNTY : _____
 STATION : _____
 DESCRIPTION : _____
 DATE : _____
 DESIGN BY : _____
 CHECK BY : _____



OVERHANG FALSEWORK



4-WHEEL MACHINE



8-WHEEL MACHINE

TABLE 2: SCREED LOAD FACTOR "R"

| 4 WHEEL MACHINE | |
|-----------------|------|
| S/D1 | R |
| <= 1.0 | 1.00 |
| 1.1 | 1.09 |
| 1.2 | 1.17 |
| 1.3 | 1.23 |
| 1.4 | 1.29 |
| 1.5 | 1.33 |
| 1.6 | 1.38 |
| 1.7 | 1.41 |
| 1.8 | 1.44 |
| 1.9 | 1.47 |
| 2.0 | 1.50 |
| 2.2 | 1.55 |
| 2.4 | 1.58 |
| 2.6 | 1.62 |
| 2.8 | 1.64 |
| 3.0 | 1.67 |
| 3.5 | 1.71 |
| 4.0 | 1.75 |

| | | THE SCREED LOAD FACTOR R (FOR 8 WHEEL MACHINE) | | | | | | | | | | | | | | | | | |
|------------------|--------|--|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | | S/D ₂ | | | | | | | | | | | | | | | | | |
| | | <= 1.0 | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 2.0 | 2.2 | 2.4 | 2.6 | 2.8 | 3.0 | 3.5 | 4.0 |
| S/D ₁ | <= 1.0 | 1.00 | 1.09 | 1.17 | 1.23 | 1.29 | 1.33 | 1.38 | 1.41 | 1.44 | 1.47 | 1.50 | 1.55 | 1.58 | 1.62 | 1.64 | 1.67 | 1.71 | 1.75 |
| | 1.1 | 1.09 | 1.18 | 1.26 | 1.32 | 1.38 | 1.42 | 1.47 | 1.50 | 1.54 | 1.56 | 1.59 | 1.64 | 1.67 | 1.71 | 1.73 | 1.76 | 1.81 | 1.84 |
| | 1.2 | 1.17 | 1.26 | 1.33 | 1.40 | 1.45 | 1.50 | 1.54 | 1.58 | 1.61 | 1.64 | 1.67 | 1.71 | 1.75 | 1.78 | 1.81 | 1.83 | 1.88 | 1.92 |
| | 1.3 | 1.23 | 1.32 | 1.40 | 1.46 | 1.52 | 1.56 | 1.61 | 1.64 | 1.68 | 1.70 | 1.73 | 1.78 | 1.81 | 1.85 | 1.87 | 1.90 | 1.95 | 1.98 |
| | 1.4 | 1.29 | 1.38 | 1.45 | 1.52 | 1.57 | 1.62 | 1.66 | 1.70 | 1.73 | 1.76 | 1.79 | 1.83 | 1.87 | 1.90 | 1.93 | 1.95 | 2.00 | 2.07 |
| | 1.5 | 1.33 | 1.42 | 1.50 | 1.56 | 1.62 | 1.67 | 1.71 | 1.75 | 1.78 | 1.81 | 1.83 | 1.88 | 1.92 | 1.95 | 1.98 | 2.00 | 2.10 | 2.17 |
| | 1.6 | 1.38 | 1.47 | 1.54 | 1.61 | 1.66 | 1.71 | 1.75 | 1.79 | 1.82 | 1.85 | 1.88 | 1.92 | 1.96 | 1.99 | 2.04 | 2.08 | 2.18 | 2.25 |
| | 1.7 | 1.41 | 1.50 | 1.58 | 1.64 | 1.70 | 1.75 | 1.79 | 1.82 | 1.86 | 1.89 | 1.91 | 1.96 | 2.00 | 2.05 | 2.11 | 2.16 | 2.25 | 2.32 |
| | 1.8 | 1.44 | 1.54 | 1.61 | 1.68 | 1.73 | 1.78 | 1.82 | 1.86 | 1.89 | 1.92 | 1.94 | 1.99 | 2.06 | 2.12 | 2.17 | 2.22 | 2.32 | 2.39 |
| | 1.9 | 1.47 | 1.56 | 1.64 | 1.70 | 1.76 | 1.81 | 1.85 | 1.89 | 1.92 | 1.95 | 1.97 | 2.04 | 2.11 | 2.18 | 2.23 | 2.28 | 2.38 | 2.45 |
| | 2.0 | 1.50 | 1.59 | 1.67 | 1.73 | 1.79 | 1.83 | 1.88 | 1.91 | 1.94 | 1.97 | 2.00 | 2.09 | 2.17 | 2.23 | 2.29 | 2.33 | 2.43 | 2.50 |
| | 2.2 | 1.55 | 1.64 | 1.71 | 1.78 | 1.83 | 1.88 | 1.92 | 1.96 | 1.99 | 2.04 | 2.09 | 2.18 | 2.26 | 2.32 | 2.38 | 2.42 | 2.52 | 2.59 |
| | 2.4 | 1.58 | 1.67 | 1.75 | 1.81 | 1.87 | 1.92 | 1.96 | 2.00 | 2.06 | 2.11 | 2.17 | 2.26 | 2.33 | 2.40 | 2.45 | 2.50 | 2.60 | 2.67 |
| | 2.6 | 1.62 | 1.71 | 1.78 | 1.85 | 1.90 | 1.95 | 1.99 | 2.05 | 2.12 | 2.18 | 2.23 | 2.32 | 2.40 | 2.46 | 2.52 | 2.56 | 2.66 | 2.73 |
| | 2.8 | 1.64 | 1.73 | 1.81 | 1.87 | 1.93 | 1.98 | 2.04 | 2.11 | 2.17 | 2.23 | 2.29 | 2.38 | 2.45 | 2.52 | 2.57 | 2.62 | 2.71 | 2.79 |
| | 3.0 | 1.67 | 1.76 | 1.83 | 1.90 | 1.95 | 2.00 | 2.08 | 2.16 | 2.22 | 2.28 | 2.33 | 2.42 | 2.50 | 2.56 | 2.62 | 2.67 | 2.76 | 2.83 |
| 3.5 | 1.71 | 1.81 | 1.88 | 1.95 | 2.00 | 2.10 | 2.18 | 2.25 | 2.32 | 2.38 | 2.43 | 2.52 | 2.60 | 2.66 | 2.71 | 2.76 | 2.86 | 2.93 | |
| 4.0 | 1.75 | 1.84 | 1.92 | 1.98 | 2.07 | 2.17 | 2.25 | 2.32 | 2.39 | 2.45 | 2.50 | 2.59 | 2.67 | 2.73 | 2.79 | 2.83 | 2.93 | 3.00 | |

TABLE 3: ALLOWABLE SPAN LENGTH OF JOISTS AND JOIST SPACINGS

| AVG. SLAB THICKNESS (IN) | LUMBER JOIST SIZE (IN X IN) | JOIST SPACINGS | | | |
|--------------------------|-----------------------------|----------------|---------|---------|---------|
| | | 15 IN | 12 IN | 10 IN | 8 IN |
| 10 | 2 X 4 | — | 4' - 6" | 4' - 9" | 5' - 0" |
| | 4 X 4 | 5' - 9" | 6' - 3" | 6' - 6" | 6' - 7" |
| 12 | 2 X 4 | — | 4' - 3" | 4' - 9" | 5' - 0" |
| | 4 X 4 | 5' - 3" | 6' - 0" | 6' - 3" | 6' - 5" |
| 14 | 2 X 4 | — | 4' - 0" | 4' - 6" | 5' - 0" |
| | 4 X 4 | — | 5' - 6" | 6' - 0" | 6' - 4" |
| 16 | 2 X 4 | — | 4' - 0" | 4' - 3" | 4' - 9" |
| | 4 X 4 | — | 5' - 3" | 5' - 9" | 6' - 3" |

NOTES

DESIGN INCLUDES CONSTRUCTION LIVE LOAD 20 PSF ON THE AREA SUPPORTED AND 75 PLF AT THE OUTSIDE DECK OF OVERHANGS.

REQUIRED MINIMUM DIAGONAL LEG CAPACITY: 3600 LB WORKING LOAD

THE CONTRACTOR HAS THE OPTION OF SUBMITTING HIS OWN DESIGN FOR OVERHANG FALSEWORK IN ACCORDANCE WITH THE SPECIAL PROVISIONS.

SUBMITTALS UTILIZING THE INSTRUCTIONS AND PROCEDURES DESCRIBED ON SHEET 1 OF 3 SHALL BE IN ACCORDANCE WITH THE APPLICABLE SECTIONS OF THE SPECIFICATIONS AND SPECIAL PROVISIONS, EXCEPT THAT CALCULATIONS FOR OVERHANG FALSEWORK NEED NOT BE SEALED BY A REGISTERED ENGINEER.

FOR OVERHANG FALSEWORK BRACING DESIGN, SEE SHEET 3 OF 3.

PROJECT No. B-4090
CUMBERLAND COUNTY
 STATION: 18+55.00 -L-

SHEET 2 OF 3



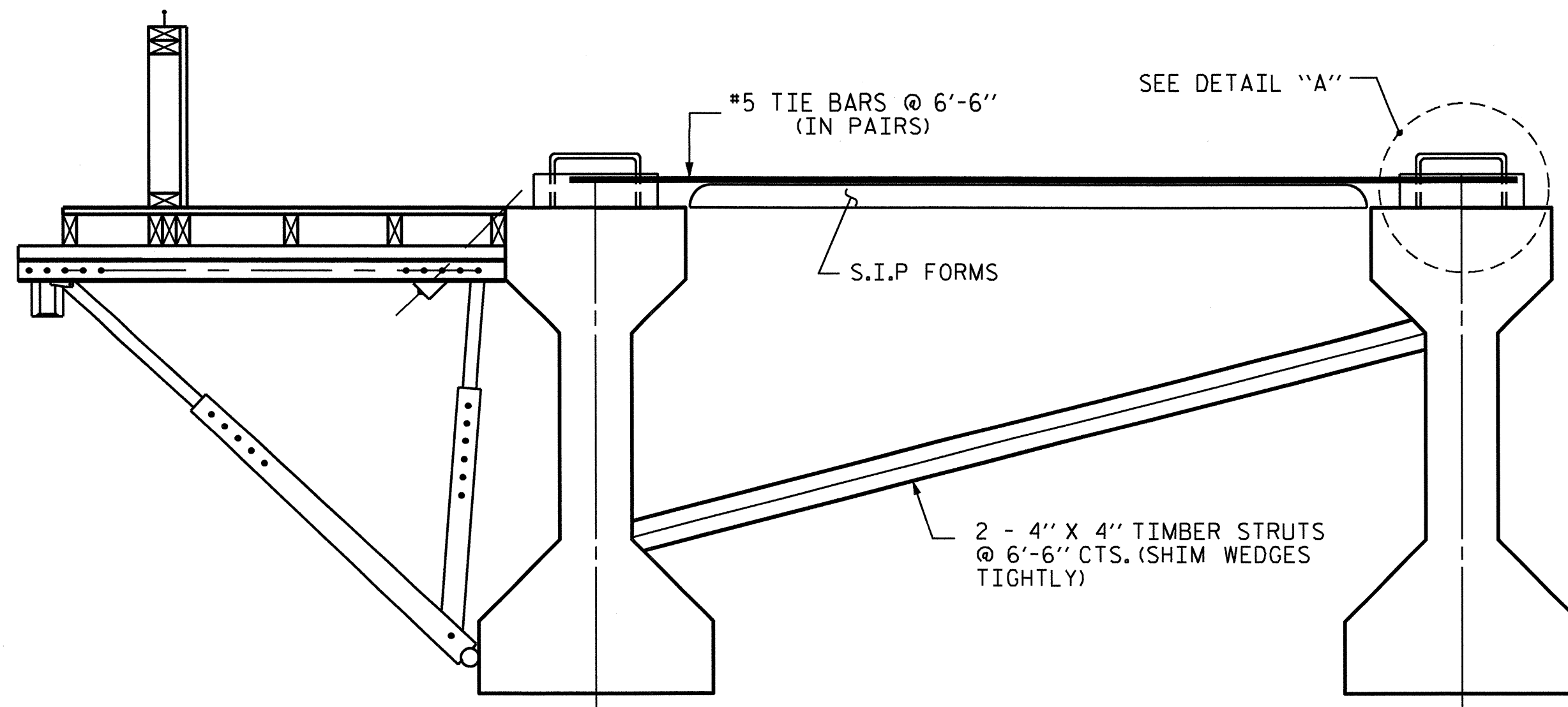
Chang-Chuan Victor Chao
 8-8-2011

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD OVERHANG FALSEWORK
 AASHTO TYPES III, IV, V, AND VI

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|-----------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-40 |
| 1 | | | 3 | | | TOTAL SHEETS 41 |
| 2 | | | 4 | | | |

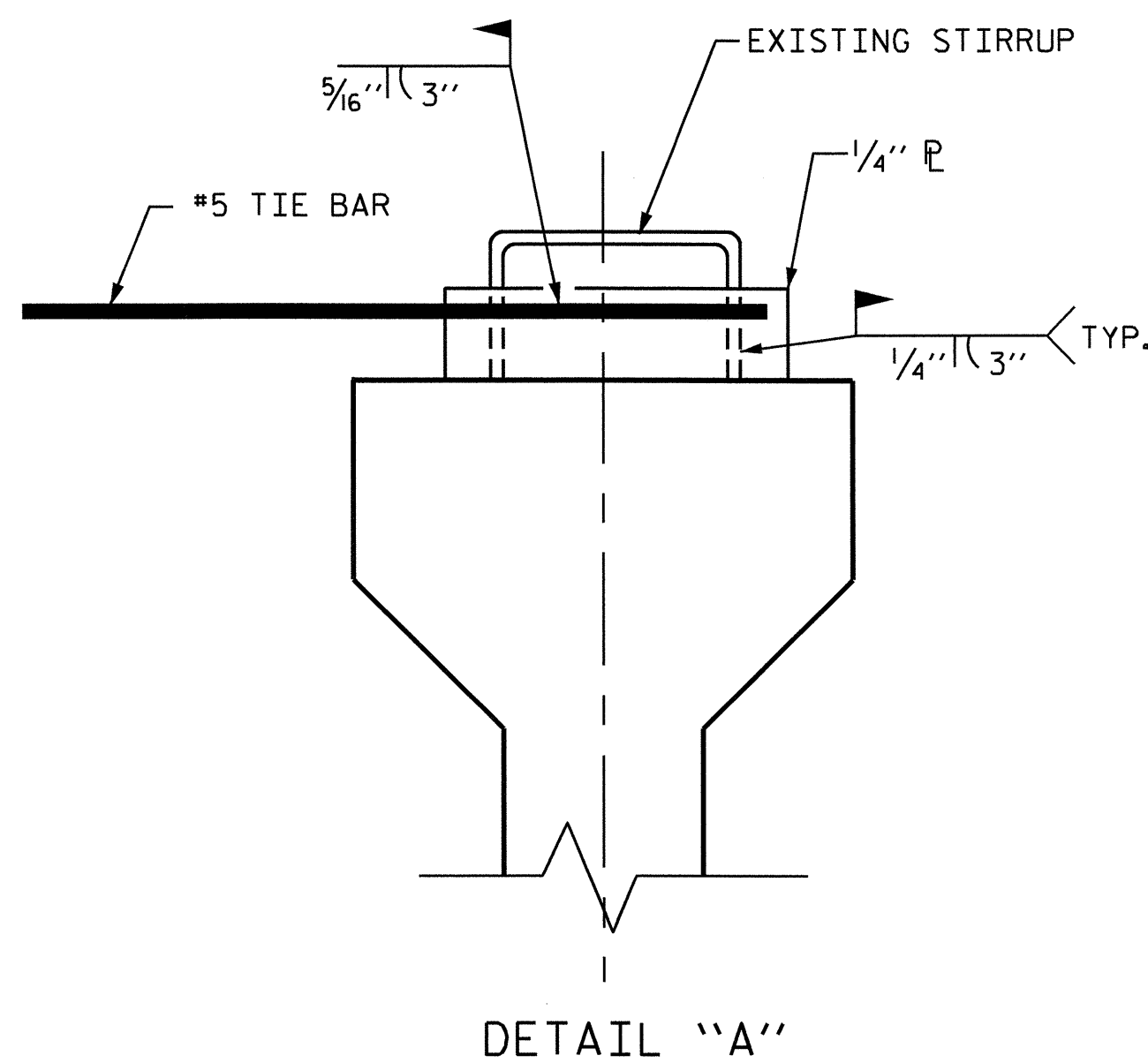
ASSEMBLED BY: _____ DATE: _____
 CHECKED BY: _____ DATE: _____
 DRAWN BY: R. WRIGHT 06/04 REV.
 CHECKED BY: C. V. CHAO 06/04



EXTERIOR GIRDER

INTERIOR GIRDER

DETAIL OF REQUIRED OVERHANG FALSEWORK BRACING SYSTEM



NOTES:

EACH #5 TIE BAR SHALL BE WELDED TO ONE STIRRUP LOOP AS SHOWN IN DETAIL "A". #5 TIE BARS SHALL BE WELDED TO TWO ADJACENT STIRRUPS OF THE EXTERIOR GIRDER AND THE ADJACENT INTERIOR GIRDER BETWEEN PERMANENT DIAPHRAGMS. WELD STEEL PLATES IN BETWEEN THE TIE BARS AND THE STIRRUP LOOP. WELDING TWO TIE BARS TO THE SAME STIRRUP LOOP SHALL NOT BE PERMITTED.

MAXIMUM SPACING BETWEEN THE BRACING (TIE BARS-TIMBER STRUT) IS 6'-6" CTS. #5 TIE BARS SHALL BE LOCATED OVER A TIMBER STRUT.

INSTALL TIE BARS AND TIMBER STRUTS PRIOR TO PLACEMENT OF CONCRETE OR SCREED WEIGHT ONTO THE OVERHANG FALSEWORK.

PROJECT NO. B-4090

CUMBERLAND COUNTY

STATION: 18+55.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD OVERHANG
FALSEWORK
AASHTO TYPES
III, IV, V, AND VI



Chuan Victor Chao
8-8-2011

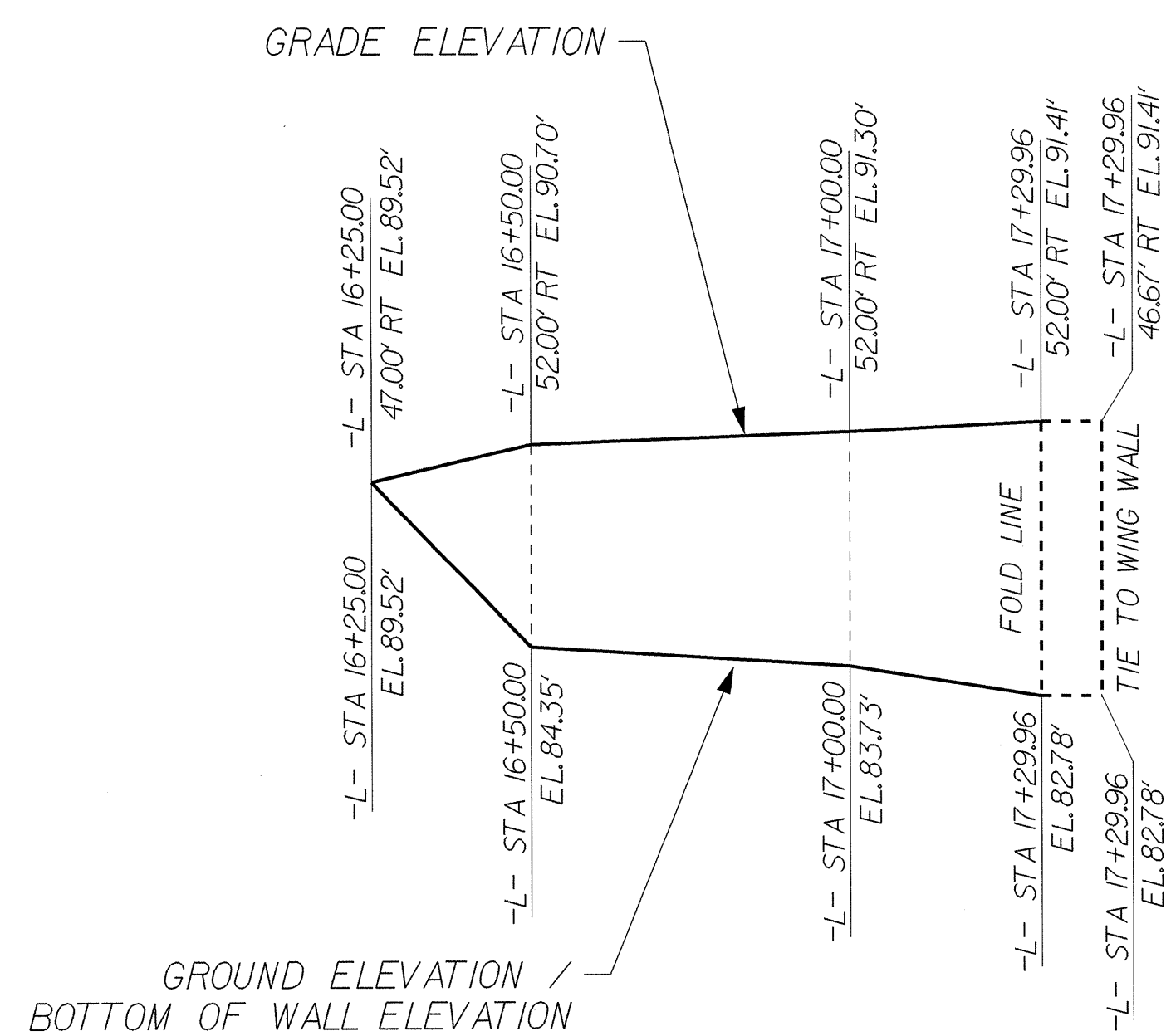
DRAWN BY: R. WRIGHT 06/04 DATE : _____
CHECKED BY: C. V. CHAO 06/04 DATE : _____

08-AUG-2011 11:33
C:\OLD\FILES\dwir\Victor\OverhangFalsework\TIEBAR&STRUT\B-4090.TYPE.III\B4090newOverHangSheets.dgn
vchao

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

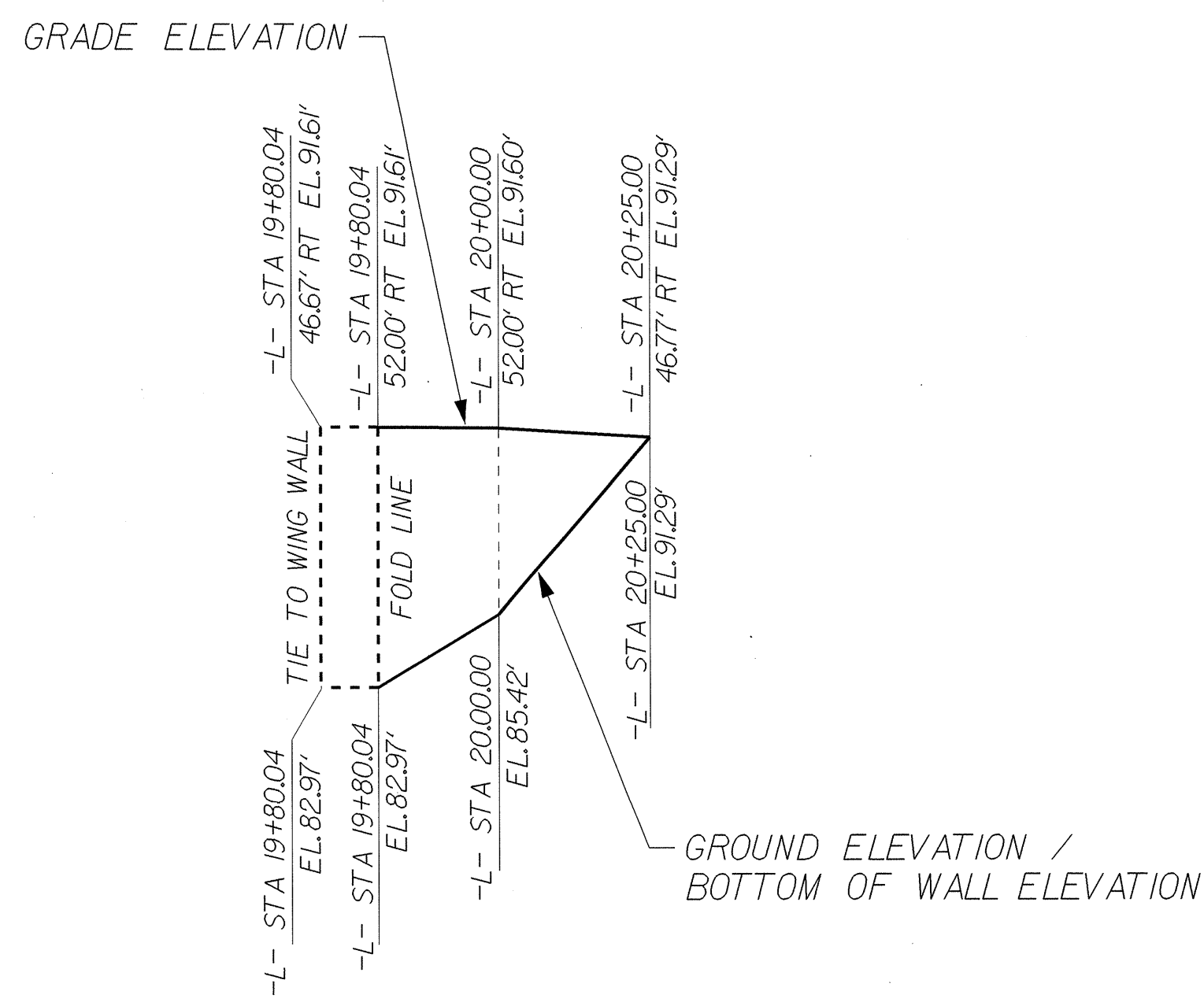


9/16/11



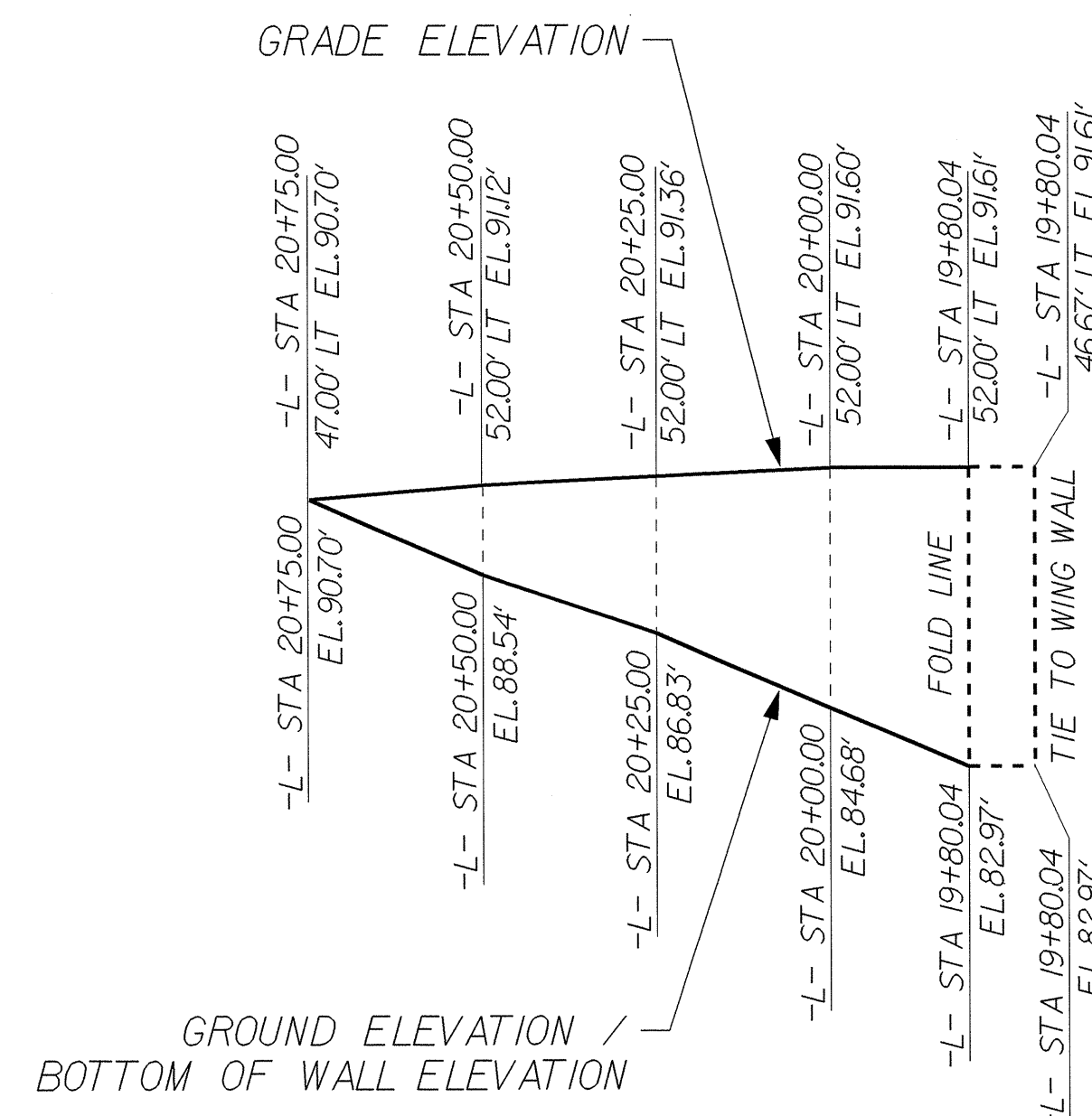
RETAINING WALL NO. 1 ELEVATION

N.T.S



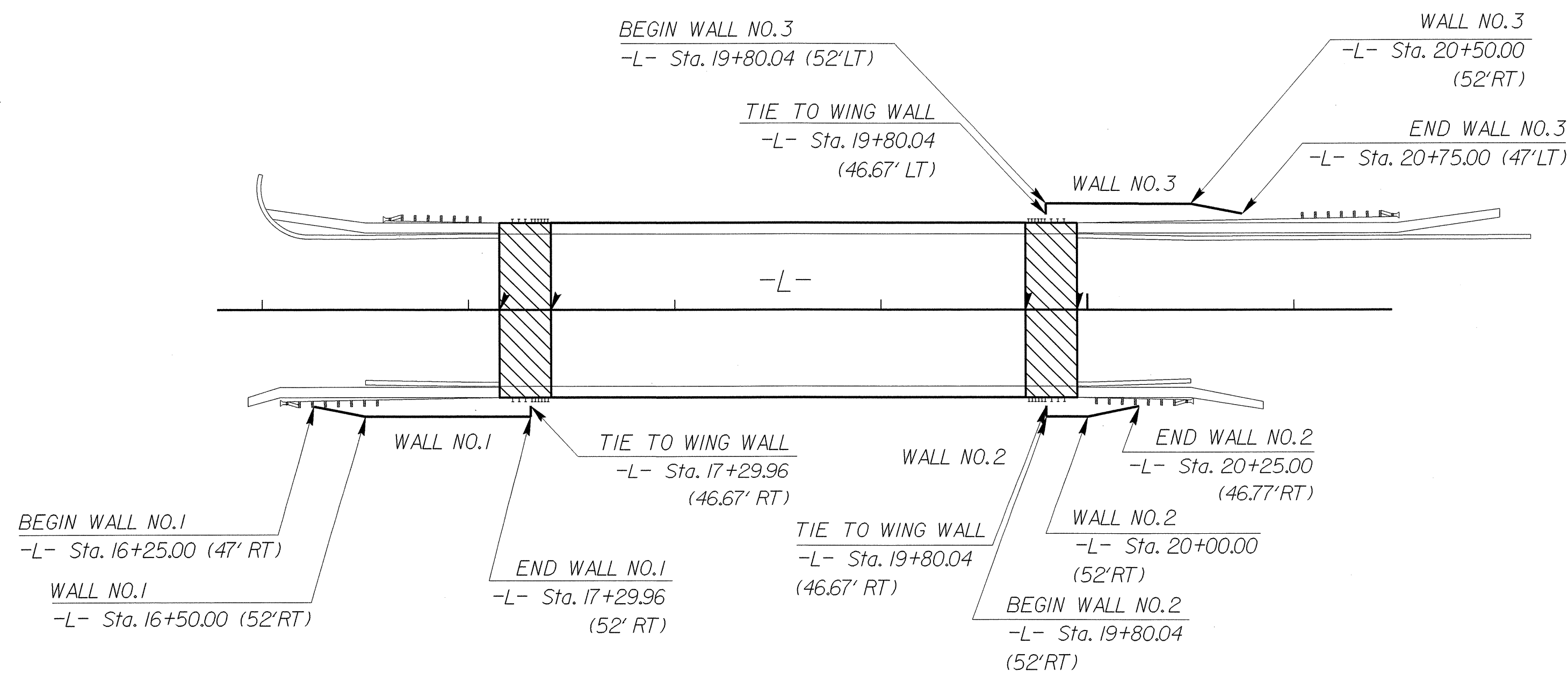
RETAINING WALL NO. 2 ELEVATION

N.T.S



RETAINING WALL NO. 3 ELEVATION

N.T.S



RETAINING WALLS PLAN VIEW

N.T.S

| TOTAL BILL OF MATERIAL | | |
|------------------------|-----------------------------|------------|
| WALL NO.1 | SOLDIER PILE RETAINING WALL | 775 SQ.FT. |
| WALL NO.2 | SOLDIER PILE RETAINING WALL | 300 SQ.FT. |
| WALL NO.3 | SOLDIER PILE RETAINING WALL | 520 SQ.FT. |

PROJECT NO.: 33488.1.1 (B-4090)
CUMBERLAND COUNTY
STATION: VARIES

SHEET 1 OF 2

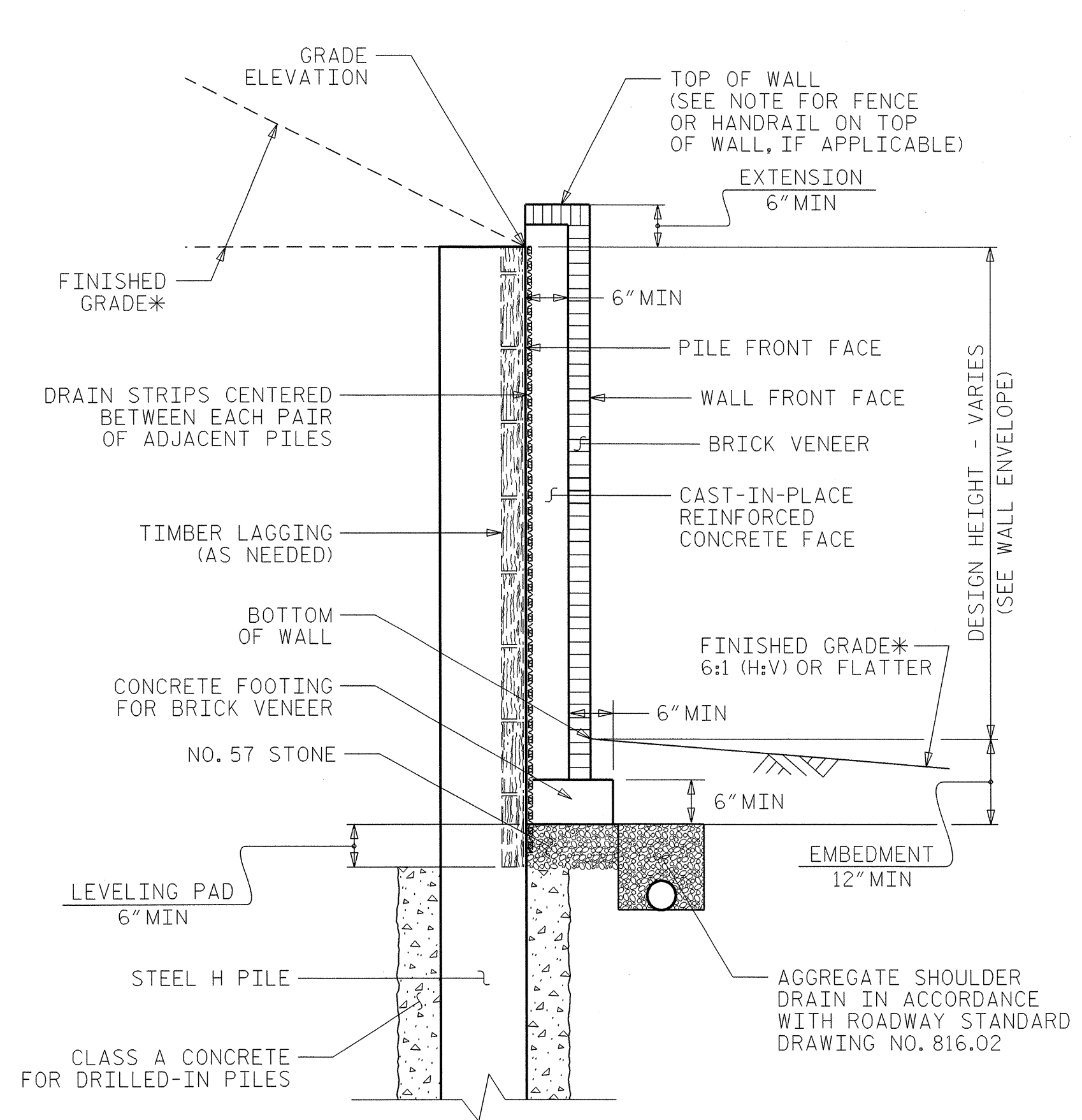
SOLDIER PILE RETAINING WALLS
PLAN AND ELEVATION

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

GEOTECHNICAL ENGINEERING UNIT

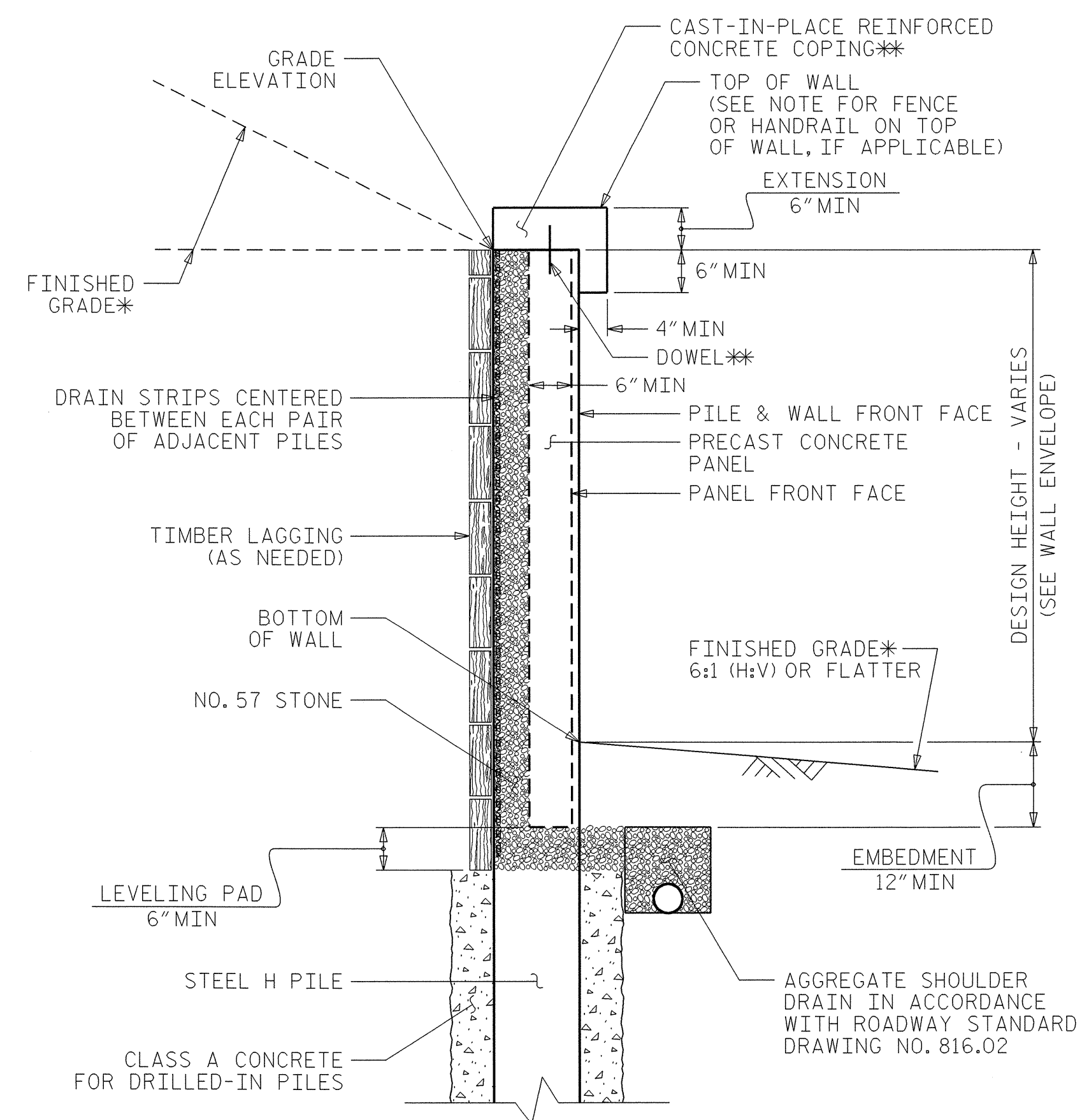
EASTERN REGIONAL OFFICE
 WESTERN REGIONAL OFFICE
 CONTRACT OFFICE

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH



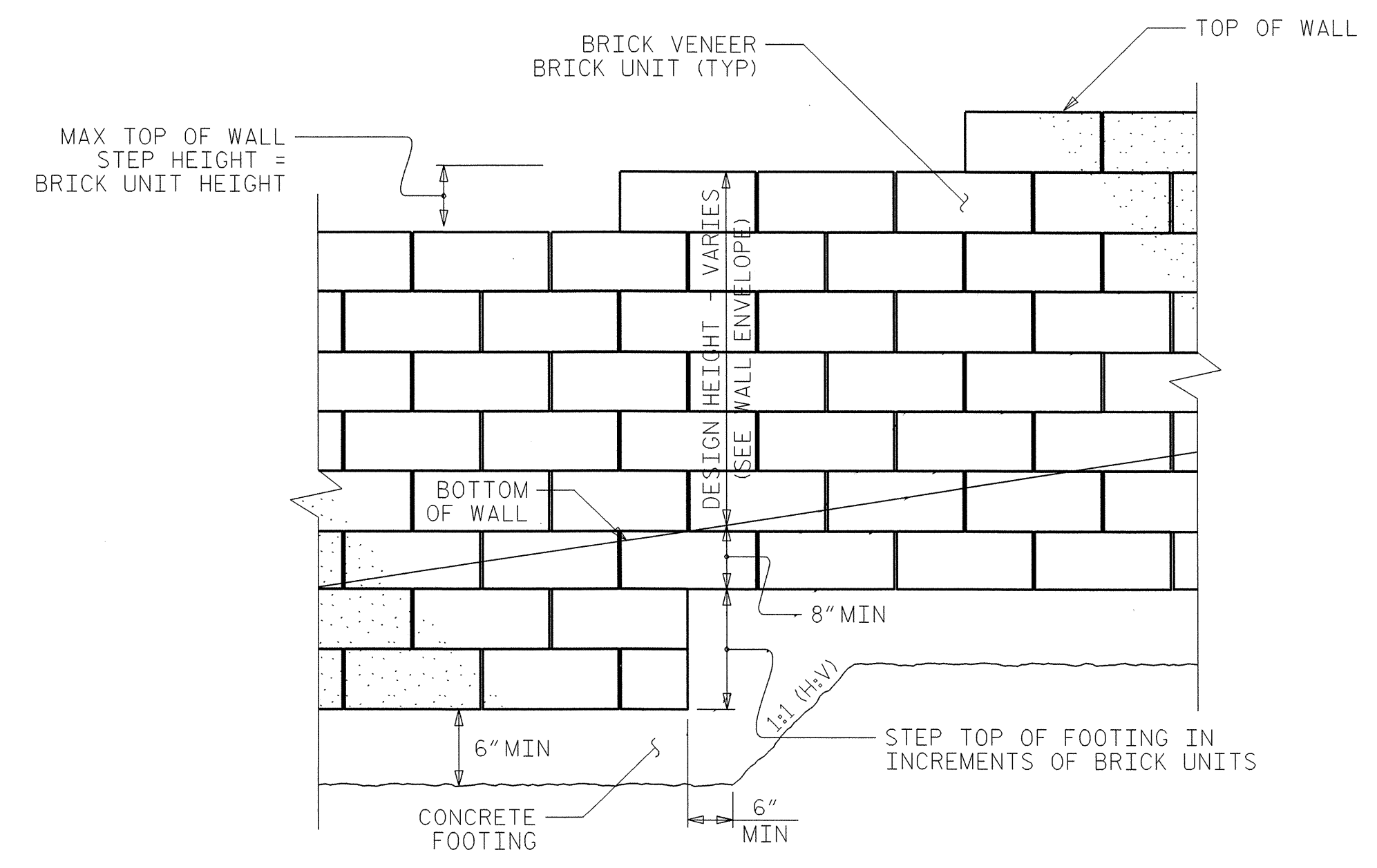
**WALL NO. 1 TYPICAL SECTION
 SOLDIER PILE WALL WITH CAST-IN-PLACE FACE
 WITH BRICK VENEER**

*SEE ROADWAY PLANS FOR FINISHED GRADE AND DITCH DETAILS.



**WALL NO. 2 & NO. 3 TYPICAL SECTION
 SOLDIER PILE WALL WITH PRECAST PANEL**

*SEE ROADWAY PLANS FOR FINISHED GRADE AND DITCH DETAILS.
 **AT THE CONTRACTOR'S OPTION, EXTEND COPING DOWN BACK OF PANELS A MINIMUM OF 6\"/>



BRICK VENEER TYPICAL STEPPING

NOTES:

- FOR SOLDIER PILE RETAINING WALLS, SEE SOLDIER PILE RETAINING WALLS PROVISION.
- FOR STEEL BEAM GUARDRAIL, SEE ROADWAY PLANS AND SECTION 862 OF THE STANDARD SPECIFICATIONS.
- AT THE CONTRACTOR'S OPTION, USE DRIVEN PILES FOR RETAINING WALL NO. 1, NO. 2 AND NO. 3.
- USE A SOLDIER PILE RETAINING WALL WITH A CAST-IN-PLACE REINFORCED CONCRETE FACE FOR RETAINING WALL NO. 1.
- USE A SOLDIER PILE RETAINING WALL WITH PRECAST CONCRETE PANELS FOR RETAINING WALL NO. 2 AND NO. 3.
- PAINT PILES GRAY FOR RETAINING WALL NO. 2 AND NO. 3.
- A BRICK VENEER IS REQUIRED FOR RETAINING WALL NO. 1 AS SHOWN. SUBMIT BRICK SAMPLES FOR APPROVAL BEFORE BEGINNING SOLDIER PILE WALL CONSTRUCTION.
- BEFORE BEGINNING SOLDIER PILE WALL DESIGN FOR RETAINING WALL NO. 1, NO. 2 AND NO. 3, SURVEY WALL LOCATION AND SUBMIT A REVISED WALL PROFILE VIEW (WALL ENVELOPE) FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THE REVISED WALL ENVELOPE ACCEPTED.
- DESIGN RETAINING WALL NO. 1, NO. 2 AND NO. 3 FOR WALL HEIGHTS EQUAL TO THE DESIGN HEIGHT (DIFFERENCE BETWEEN GRADE ELEVATION AND BOTTOM OF WALL ELEVATION) PLUS EMBEDMENT (DIFFERENCE BETWEEN BOTTOM OF WALL ELEVATION AND TOP OF LEVELING PAD ELEVATION).
- DESIGN RETAINING WALL NO. 1, NO. 2 AND NO. 3 FOR THE FOLLOWING:
 1) MINIMUM DESIGN LIFE = 75 YEARS
 2) IN-SITU ASSUMED MATERIAL PARAMETERS:
 UNIT WEIGHT, $\gamma = 120$ PCF
 FRICTION ANGLE, $\phi = 30$ DEGREES
 COHESION, $c = 0$ PSF
- DESIGN RETAINING WALL NO. 1, NO. 2 AND NO. 3 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.
- TEMPORARY SHORING MAY BE REQUIRED FOR RETAINING WALL NO. 1, NO. 2 AND NO. 3, IN ACCORDANCE WITH THE TEMPORARY SHORING PROVISION. SEE ROADWAY, STRUCTURE OR TRAFFIC CONTROL PLANS.
- USE EXPANSION JOINT MATERIAL BETWEEN THE END OF WALLS AND BRIDGE WINGS. USE FILTER FABRIC ALONG THE HEIGHT OF WALL WHERE FILL IS BEING PLACED AND THE WALL TIES TO THE BRIDGE WINGS.

PROJECT NO.: 33488.1.1 (B-4090)
CUMBERLAND COUNTY
STATION: VARIES
 SHEET 2 OF 2

**RETAINING WALL NO. 1, 2 & 3
 SOLDIER PILE RETAINING WALL
 NOTES AND DETAILS**

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

GEOTECHNICAL ENGINEERING UNIT

EASTERN REGIONAL OFFICE
 WESTERN REGIONAL OFFICE
 CONTRACT OFFICE

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2006 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

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