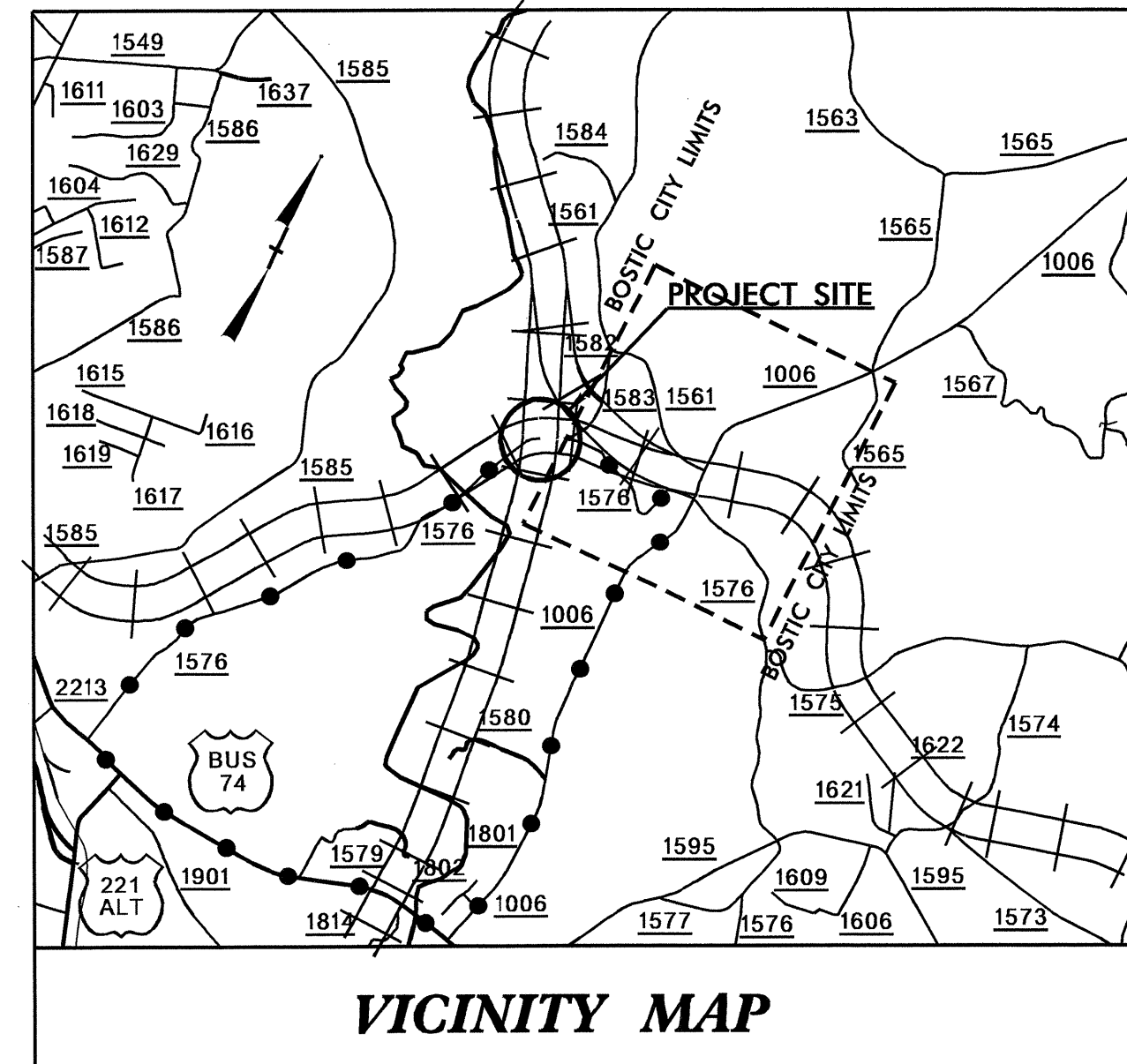


09/08/99

TIP PROJECT: B-4632

CONTRACT: C203004

STRUCTURE



●●●●● OFFSITE DETOUR

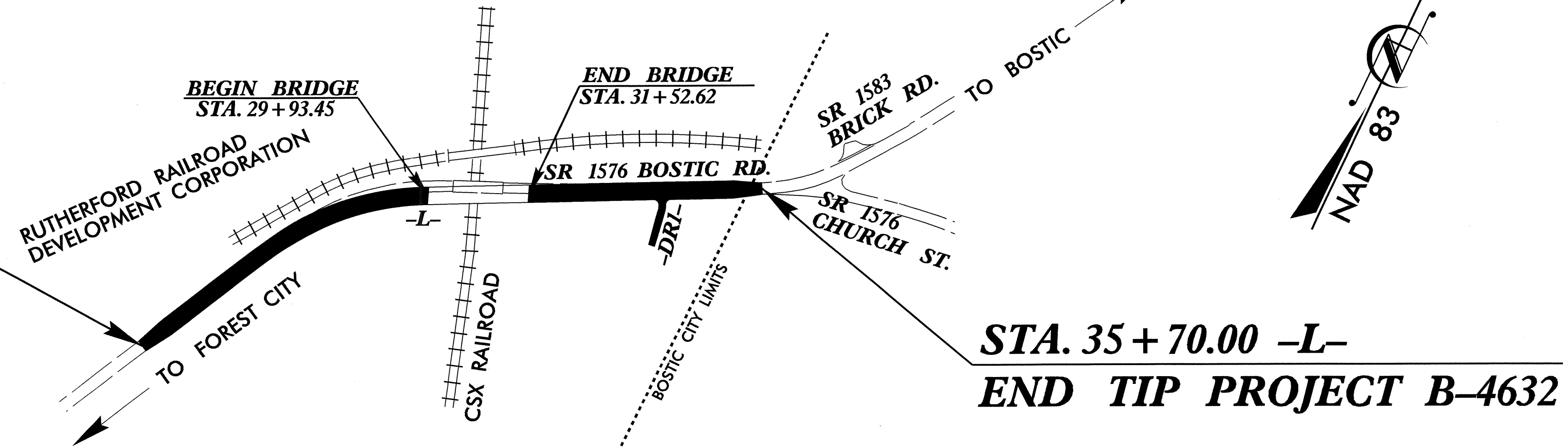
STA 24+15.00 -L-  
BEGIN TIP PROJECT B-4632

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**RUTHERFORD COUNTY**

LOCATION: BRIDGE NO. 69 OVER CSX RAILROAD ON  
SR 1576

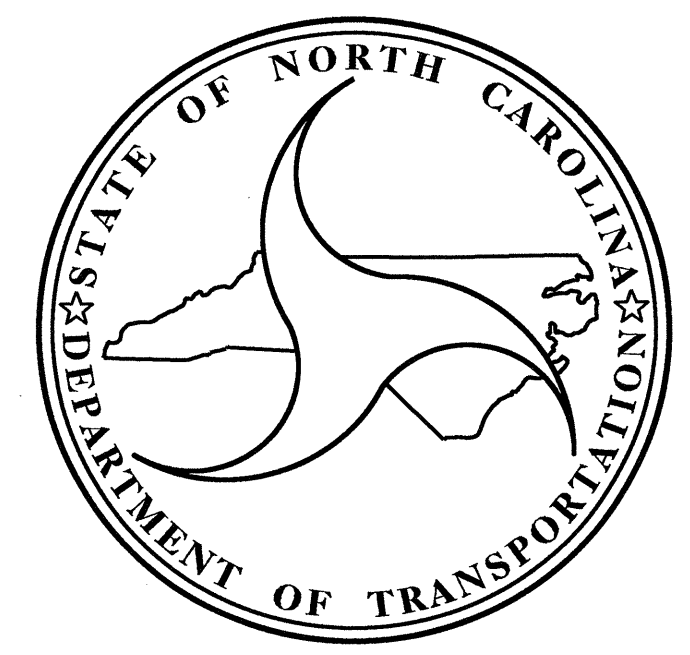
TYPE OF WORK: GRADING, PAVING, DRAINAGE, AND STRUCTURE



STA. 35+70.00 -L-  
END TIP PROJECT B-4632

| STATE           | STATE PROJECT REFERENCE NO. | SHEET NO.    | TOTAL SHEETS |
|-----------------|-----------------------------|--------------|--------------|
| N.C.            | B-4632                      |              |              |
| STATE PROJ. NO. | F.A. PROJ. NO.              | DESCRIPTION  |              |
| 33806.1.1       | BRSTP-1576(1)               | P.E.         |              |
| 33806.2.1       | BRSTP-1576(1)               | ROWUTIL.     |              |
| 33806.3.1       | BRSTP-1576(1)               | CONSTRUCTION |              |
|                 |                             |              |              |
|                 |                             |              |              |

09-MAY-2012 08:41  
\$\$\$\$\$DGN\$\$\$\$\$  
mpool



**DESIGN DATA**

|          |   |        |
|----------|---|--------|
| ADT 2011 | = | 3,396  |
| ADT 2031 | = | 4,875  |
| DHV      | = | 10 %   |
| D        | = | 60 %   |
| T        | = | 4 % *  |
| V        | = | 50 MPH |

\*(TTST 1% + DUAL 3%)  
FUNC. CLASS = RURAL COLLECTOR  
SUBREGIONAL TIER

**PROJECT LENGTH**

|  |   |             |
|--|---|-------------|
| LENGTH OF ROADWAY TIP PROJECT B-4632   | = | 0.189 MILES |
| LENGTH OF STRUCTURE TIP PROJECT B-4632 | = | 0.030 MILES |
| TOTAL LENGTH STATE TIP PROJECT B-4632  | = | 0.219 MILES |

Prepared in the Office of:  
**DIVISION OF HIGHWAYS**  
1000 Birch Ridge Dr., Raleigh NC, 27610

2012 STANDARD SPECIFICATIONS

LETTING DATE:  
OCTOBER 16, 2012

Q.H. NGUYEN, P.E.  
PROJECT ENGINEER

MARC G. CHEEK, P.E.  
PROJECT DESIGN ENGINEER

STRUCTURES MANAGEMENT UNIT

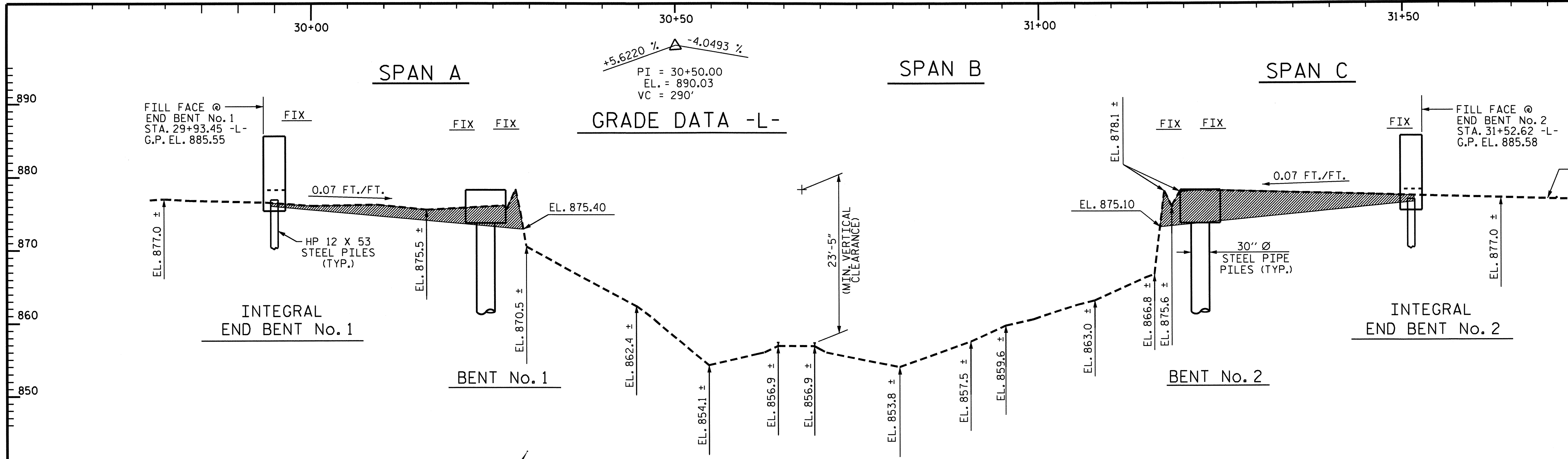
DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

STATE HIGHWAY ENGINEER - DESIGN

DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION

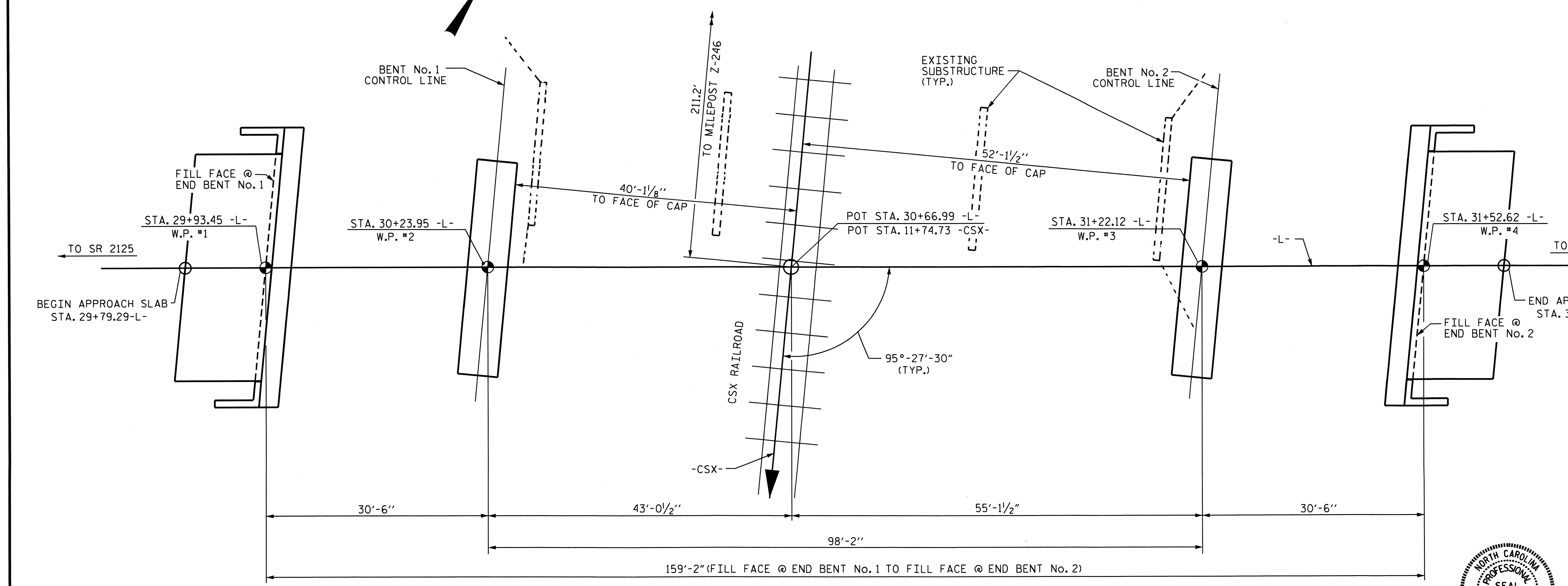
APPROVED FOR  
DIVISION ADMINISTRATOR

P.E.  
DATE



SECTION ALONG -L-

SECTION THRU END BENTS & BENTS ARE TAKEN AT RIGHT ANGLES



PLAN

PILES ARE NOT SHOWN IN PLAN VIEW



Quang H. Nguyen 8-22-12

PROJECT NO. B-4632  
 RUTHERFORD COUNTY  
 STATION: 30+66.99 -L-  
11+74.73 -CSX-

SHEET 1 OF 3 REPLACES BRIDGE NO. 69 MILEPOST Z-246.04

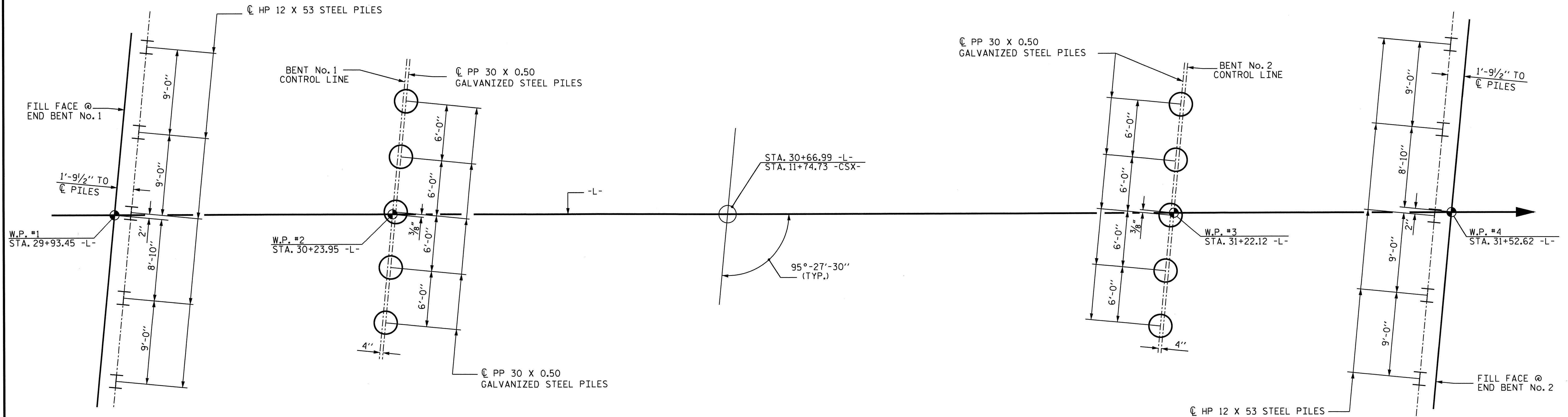
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**  
 FOR BRIDGE OVER  
 CSX RAILROAD ON SR 1576

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

TOTAL SHEETS: 34

DRAWN BY : V.X. NGUYEN DATE : 12/10/09  
 CHECKED BY : M.G. CHEEK DATE : 01/10



END BENT No. 1

BENT No. 1

### FOUNDATION LAYOUT

ALL PILES IN THE END BENTS ARE HP 12 X 53 STEEL PILES  
 ALL BENT PILES ARE PP 30 X 0.50 GALVANIZED STEEL PILES  
 THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT  
 THE CENTERLINE OF THE 30" STEEL PIPE PILES IS OFFSET  
 4" FROM THE BENT CONTROL LINE AT BENTS No.1 & No.2.

### NOTES

PILES AT END BENT No.1 & END BENT No.2 ARE DESIGNED  
 FOR A FACTORED RESISTANCE OF 65 TONS PER PILE.

DRIVE PILES AT END BENT No.1 & END BENT No.2 TO A REQUIRED DRIVING  
 RESISTANCE OF 108 TONS PER PILE.

PILES AT BENT No.1 & BENT No.2 ARE DESIGNED FOR A FACTORED  
 RESISTANCE OF 195 TONS PER PILE.

DRIVE PILES AT BENT No.1 & BENT No.2 TO A REQUIRED DRIVING  
 RESISTANCE OF 325 TONS PER PILE.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED  
 ENERGY IN THE RANGE OF 25.9 FT-LBS PER BLOW WILL BE REQUIRED TO  
 DRIVE PILES AT BENT No.1 & BENT No.2. THIS ESTIMATED ENERGY RANGE DOES  
 NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT  
 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

INSTALL PILES AT BENT No.1 & BENT No.2 TO A TIP ELEVATION  
 NO HIGHER THAN 821 FT.

BENT No. 2

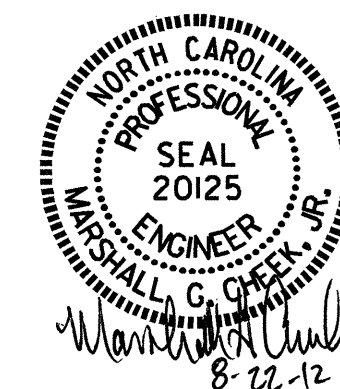
END BENT No. 2

PROJECT NO. B-4632  
RUTHERFORD COUNTY  
 STATION: 30+66.99 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

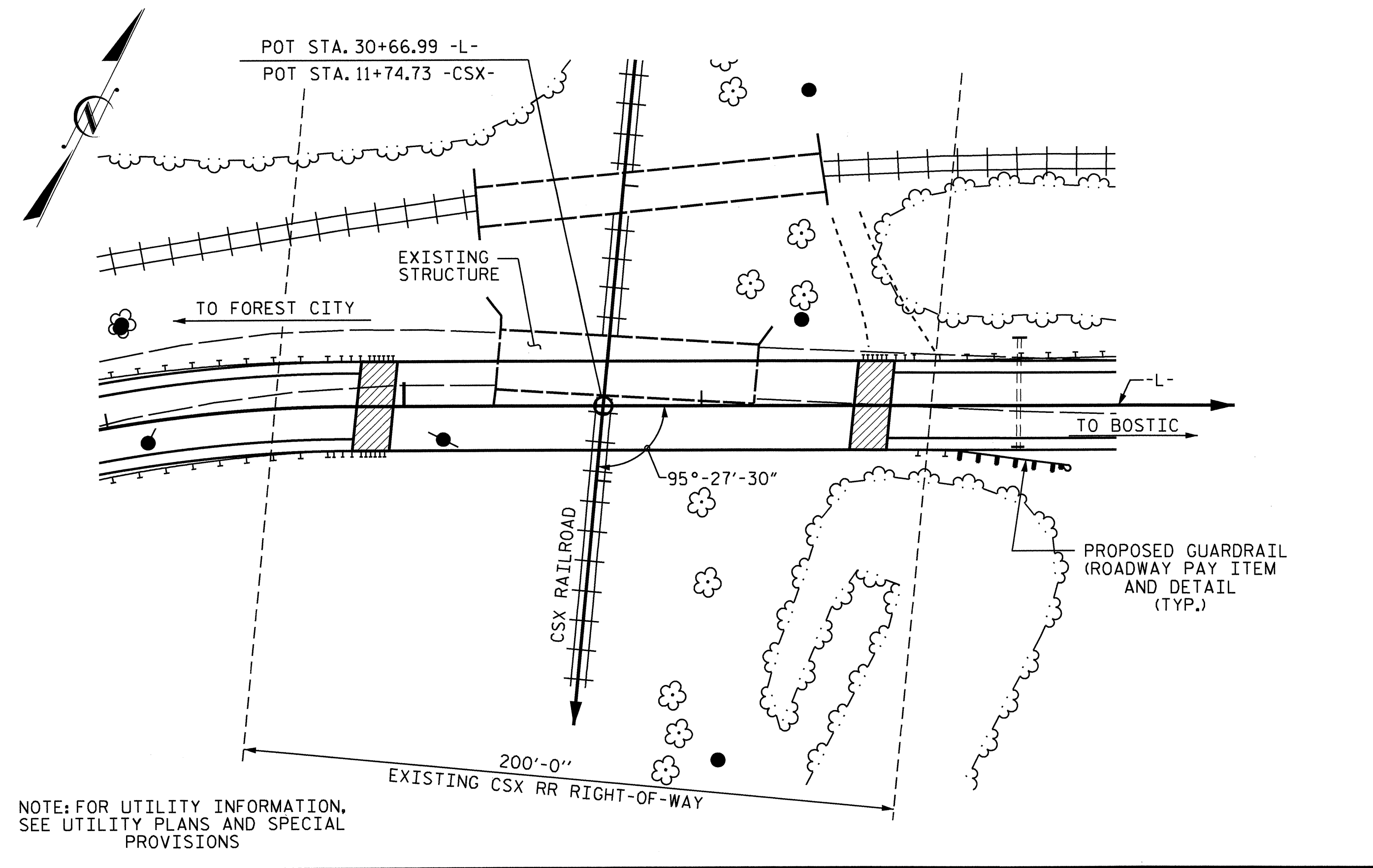
GENERAL DRAWING  
 FOR BRIDGE OVER  
 CSX RAILROAD ON SR 1576



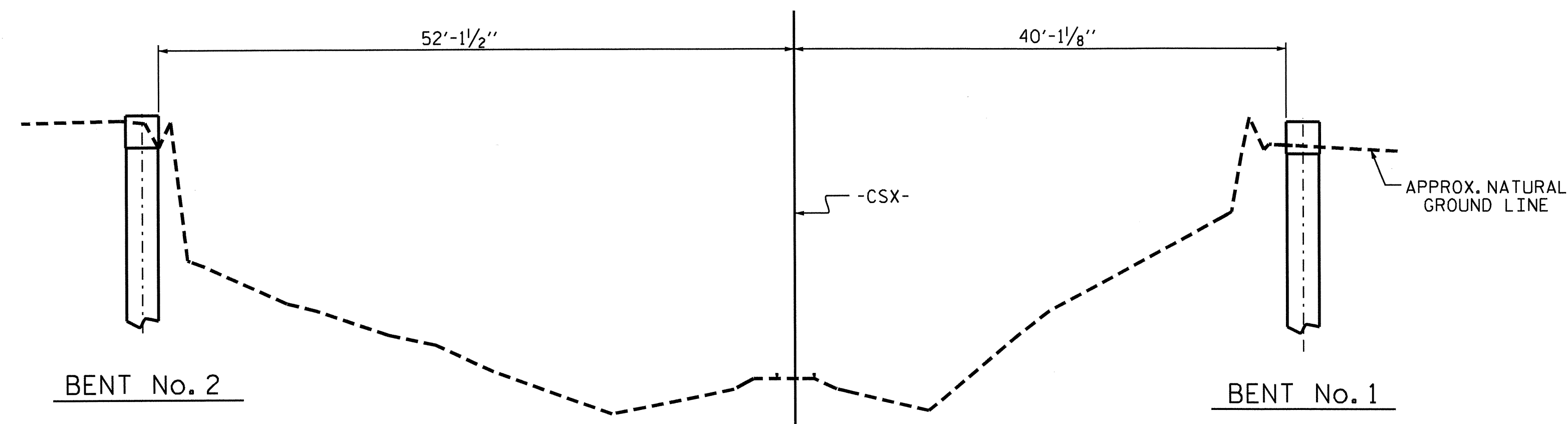
DRAWN BY : M. POOLE DATE : 03/12  
 CHECKED BY : M. G. CHEEK DATE : 04/12

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





LOCATION SKETCH



SECTION THRU RAILROAD  
(LOOKING STATION AHEAD ALONG RAILROAD)

SPAN LENGTHS BASED ON THIS SECTION

TOTAL BILL OF MATERIAL

|                | REMOVAL OF EXISTING STRUCTURE | UNCLASSIFIED STRUCTURE EXCAVATION | REINFORCED CONCRETE DECK SLAB | GROOVING BRIDGE FLOORS | CLASS A CONCRETE | BRIDGE APPROACH SLABS | REINFORCING STEEL | MODIFIED 63" PRESTRESSED CONCRETE GIRDERS | HP 12 X 53 STEEL PILES | PP 30 X 0.50 GALVANIZED STEEL PILES | TWO BAR METAL RAIL | 1'-2" X 2'-6" CONCRETE PARAPET | 72" CHAIN LINK FENCE | ELASTOMERIC BEARINGS |          |        |          |
|----------------|-------------------------------|-----------------------------------|-------------------------------|------------------------|------------------|-----------------------|-------------------|---|------------------------|-------------------------------------|--------------------|--------------------------------|----------------------|----------------------|----------|--------|----------|
|                | LUMP SUM                      | LUMP SUM                          | SQ.FT.                        | SQ.FT.                 | CU.YDS.          | LUMP SUM              | LBS.              | NO.                                       | LIN.FT.                | NO.                                 | LIN.FT.            | LIN.FT.                        | LIN.FT.              | LIN.FT.              | LUMP SUM |        |          |
| SUPERSTRUCTURE | LUMP SUM                      |                                   | 5186                          | 5520                   |                  | LUMP SUM              |                   | 12  | 621.33                 |                                     |                    | 303.09                         | 318.33               | 314.33               | LUMP SUM |        |          |
| END BENT NO. 1 |                               | LUMP SUM                          |                               |                        |                  | 24.3                  | 2989              |   | 5                      | 250                                 |                    |                                |                      |                      |          |        |          |
| BENT NO. 1     |                               |                                   |                               |                        |                  | 25.9                  | 2573              |   |                        | 5                                   | 250                |                                |                      |                      |          |        |          |
| BENT NO. 2     |                               |                                   |                               |                        |                  | 25.9                  | 2573              |   |                        | 5                                   | 325                |                                |                      |                      |          |        |          |
| END BENT NO. 2 |                               | LUMP SUM                          |                               |                        |                  | 24.3                  | 2984              |   | 5                      | 255                                 |                    |                                |                      |                      |          |        |          |
| TOTAL          | LUMP SUM                      | LUMP SUM                          | 5186                          | 5520                   | 100.4            | LUMP SUM              | 11119             | 12  | 621.33                 | 10                                  | 505                | 10                             | 575                  | 303.09               | 318.33   | 314.33 | LUMP SUM |

DRAWN BY : V. X. NGUYEN DATE : 12/09  
CHECKED BY : M.G. CHEEK DATE : 05/12

NOTES

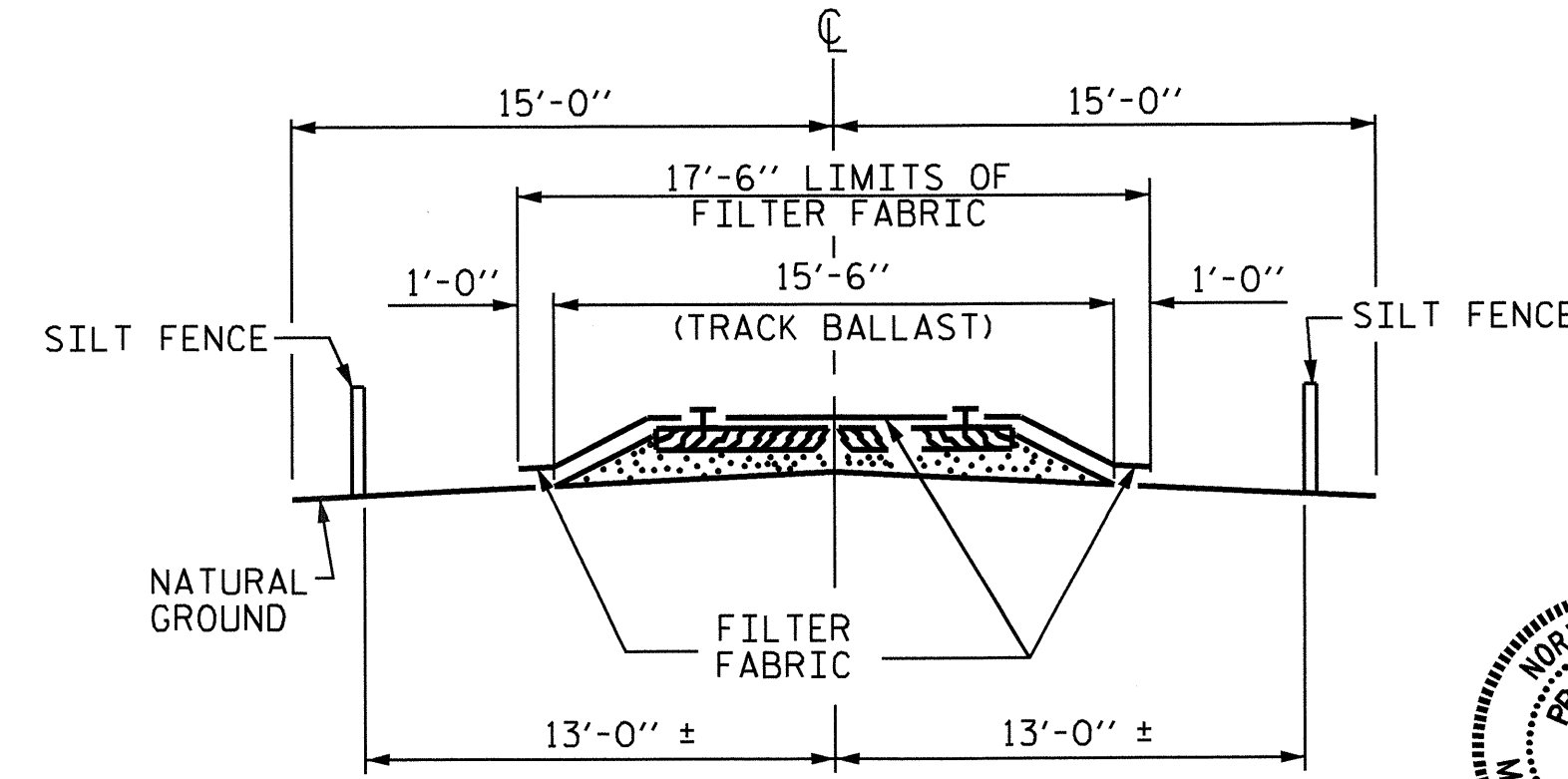
ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.  
FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.  
THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

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 EXISTING 3-SPAN STRUCTURE (1 @ 25'-10", 1 @ 36'-2", 1 @ 25'-10") CONSISTING OF STEEL PLANK FLOOR ON 8 LINES OF STEEL I-BEAMS WITH A 4" ASPHALT WEARING SURFACE, AND ON A SUBSTRUCTURE CONSISTING OF TIMBER CAPS AND TIMBER PILES AT THE BENTS AND END BENT NO. 1 AND YOUNG MASONRY ABUTMENT AT END BENT NO. 2, AND LOCATED AT THE SITE OF THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT. SEE SPECIAL PROVISION FOR "REMOVAL OF EXISTING STRUCTURE".

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 25 FT. EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.



RAILROAD EROSION CONTROL DETAIL

NOTES  
RAILROAD EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO PERFORMING ANY WORK IN THE RAILROAD RIGHT-OF-WAY.  
ADDITIONAL EROSION CONTROL MEASURES FOR PROTECTION OF RAILROAD DITCHES MAY BE REQUIRED AS DIRECTED BY THE ENGINEER.  
NO SEPARATE PAYMENT WILL BE MADE FOR RAILROAD EROSION CONTROL MEASURES.  
LIMITS OF SILT FENCE AND FILTER FABRIC PARALLEL TO RAILROAD SHALL EXTEND A MINIMUM OF 25'-0" OUTSIDE EDGE OF SUPERSTRUCTURE OR TOE OF SLOPE ON CONSTRUCTION. A GREATER LENGTH OF SILT FENCE OR FILTER FABRIC MAY BE REQUIRED IF SO DIRECTED BY THE ENGINEER.  
FILTER FABRIC TO BE NAILED TO TIMBER RAIL TIES WITH PRIME SOURCE "GRIP CAP" OR EQUIVALENT. FILTER FABRIC ON SHOULDER TO BE SECURED AS DIRECTED BY THE ENGINEER AND RAILROAD.

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.

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

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.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

THE RAILROAD TRACK TOP OF RAIL ELEVATIONS SHOWN ON THE PLANS ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE TOP OF RAIL ELEVATIONS AND REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

FOR MINIMIZING RAILROAD FLAGGING SERVICE, SEE STANDARD SPECIFICATIONS.



| TRACK STATION  | LEFT RAIL | RIGHT RAIL |
|----------------|-----------|------------|
| 11+40.00 -CSX- | 856.64    | 856.65     |
| 11+60.00 -CSX- | 856.66    | 856.66     |
| 11+80.00 -CSX- | 856.68    | 856.67     |
| 12+00.00 -CSX- | 856.68    | 856.65     |

PROJECT NO. B-4632  
RUTHERFORD COUNTY  
STATION: 30+66.99 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

GENERAL DRAWING  
FOR BRIDGE OVER CSX  
RAILROAD ON SR 1576

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

TOTAL SHEETS 34



LOAD FACTORS:

|                                     |             |               |               |
|-------------------------------------|-------------|---------------|---------------|
| DESIGN<br>LOAD<br>RATING<br>FACTORS | LIMIT STATE | $\gamma_{DC}$ | $\gamma_{DW}$ |
|                                     | 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)<br>(TONS) | CONTROLLING<br>LOAD RATING<br># | MINIMUM<br>RATING FACTORS<br>(RF) | TONS = W X RF | STRENGTH I LIMIT STATE |                              |               |      |                 |   |                              |               |      |                 | SERVICE III LIMIT STATE                   |                     |                              |               |      | COMMENT NUMBER |                 |   |
|   |            |                      |                                 |                                   |               | LIVELOAD<br>FACTORS    | MOMENT                       |               |      |                 |   | SHEAR                        |               |      |                 |   | LIVELOAD<br>FACTORS | MOMENT                       |               |      |                |                 |   |
|   |            |                      |                                 |                                   |               |                        | DISTRIBUTION<br>FACTORS (DF) | RATING FACTOR | SPAN | GIRDER LOCATION | DISTANCE FROM<br>LEFT END OF<br>SPAN (ft) | DISTRIBUTION<br>FACTORS (DF) | RATING FACTOR | SPAN | GIRDER LOCATION | DISTANCE FROM<br>LEFT END OF<br>SPAN (ft) |                     | DISTRIBUTION<br>FACTORS (DF) | RATING FACTOR | SPAN |                | GIRDER LOCATION | DISTANCE FROM<br>LEFT END OF<br>SPAN (ft) |
| DESIGN<br>LOAD<br>RATING  | HL-93(Inv) | N/A                  | 1                               | 1.128                             | --            | 1.75                   | 0.774                        | 1.42          | B    | EL              | 47.960                                    | 0.879                        | 1.17          | B    | I               | 76.736                                    | 0.80                | 0.879                        | 1.13          | B    | I              | 47.960          |   |
|   | HL-93(0pr) | N/A                  | --                              | 1.517                             | --            | 1.35                   | 0.774                        | 1.84          | B    | EL              | 47.960                                    | 0.879                        | 1.52          | B    | I               | 76.736                                    | N/A                 | --                           | --            | --   | --             | --              |   |
|   | HS-20(Inv) | 36.000               | 2                               | 1.528                             | 55.005        | 1.75                   | 0.774                        | 1.96          | B    | EL              | 47.960                                    | 0.879                        | 1.53          | B    | I               | 76.736                                    | 0.80                | 0.722                        | 1.56          | B    | I              | 47.960          |   |
|   | HS-20(0pr) | 36.000               | --                              | 1.981                             | 71.303        | 1.35                   | 0.774                        | 2.54          | B    | EL              | 47.960                                    | 0.879                        | 1.98          | B    | I               | 76.736                                    | N/A                 | --                           | --            | --   | --             | --              |   |
| LEGAL<br>LOAD<br>RATING   | SV         | SNSH                 | 13.500                          | --                                | 3.685         | 49.745                 | 1.4                          | 0.774         | 5.78 | B               | EL  | 47.960                       | 0.879         | 4.63 | B               | I   | 76.736              | 0.80                         | 0.722         | 3.68 | B              | I               | 47.960                                    |
|   |            | SNGARBS2             | 20.000                          | --                                | 2.675         | 53.498                 | 1.4                          | 0.774         | 4.20 | B               | EL  | 47.960                       | 0.879         | 3.27 | B               | I   | 76.736              | 0.80                         | 0.722         | 2.67 | B              | I               | 47.960                                    |
|   |            | SNAGRIS2             | 22.000                          | --                                | 2.504         | 55.098                 | 1.4                          | 0.774         | 3.93 | B               | EL  | 47.960                       | 0.879         | 3.02 | B               | I   | 76.736              | 0.80                         | 0.722         | 2.50 | B              | I               | 47.960                                    |
|   |            | SNCOTTS3             | 27.250                          | --                                | 1.832         | 49.911                 | 1.4                          | 0.774         | 2.87 | B               | EL  | 47.960                       | 0.879         | 2.31 | B               | I   | 76.736              | 0.80                         | 0.722         | 1.83 | B              | I               | 47.960                                    |
|   |            | SNAGGRS4             | 34.925                          | --                                | 1.503         | 52.501                 | 1.4                          | 0.774         | 2.36 | B               | EL  | 47.960                       | 0.879         | 1.90 | B               | I   | 76.736              | 0.80                         | 0.722         | 1.50 | B              | I               | 47.960                                    |
|   |            | SNS5A                | 35.550                          | --                                | 1.472         | 52.324                 | 1.4                          | 0.774         | 2.31 | B               | EL  | 47.960                       | 0.879         | 1.91 | B               | I   | 76.736              | 0.80                         | 0.722         | 1.47 | B              | I               | 47.960                                    |
|   |            | SNS6A                | 39.950                          | --                                | 1.339         | 53.503                 | 1.4                          | 0.774         | 2.10 | B               | EL  | 47.960                       | 0.879         | 1.74 | B               | I   | 76.736              | 0.80                         | 0.722         | 1.34 | B              | I               | 47.960                                    |
|   | SNS7B      | 42.000               | --                              | 1.275                             | 53.548        | 1.4                    | 0.774                        | 2.00          | B    | EL              | 47.960                                    | 0.879                        | 1.70          | B    | I               | 76.736                                    | 0.80                | 0.722                        | 1.27          | B    | I              | 47.960          |   |
|   | TTST       | TNAGRIT3             | 33.000                          | --                                | 1.630         | 53.785                 | 1.4                          | 0.774         | 2.56 | B               | EL  | 47.960                       | 0.879         | 2.07 | B               | I   | 76.736              | 0.80                         | 0.722         | 1.63 | B              | I               | 47.960                                    |
|   |            | TNT4A                | 33.075                          | --                                | 1.634         | 54.045                 | 1.4                          | 0.774         | 2.56 | B               | EL  | 47.960                       | 0.879         | 2.03 | B               | I   | 76.736              | 0.80                         | 0.722         | 1.63 | B              | I               | 47.960                                    |
|   |            | TNT6A                | 41.600                          | --                                | 1.326         | 55.143                 | 1.4                          | 0.774         | 2.08 | B               | EL  | 47.960                       | 0.879         | 1.79 | B               | I   | 76.736              | 0.80                         | 0.722         | 1.33 | B              | I               | 47.960                                    |
|   |            | TNT7A                | 42.000                          | --                                | 1.327         | 55.720                 | 1.4                          | 0.774         | 2.08 | B               | EL  | 47.960                       | 0.879         | 1.76 | B               | I   | 76.736              | 0.80                         | 0.722         | 1.33 | B              | I               | 47.960                                    |
|   |            | TNT7B                | 42.000                          | --                                | 1.359         | 57.079                 | 1.4                          | 0.774         | 2.13 | B               | EL  | 47.960                       | 0.879         | 1.66 | B               | I   | 76.736              | 0.80                         | 0.722         | 1.36 | B              | I               | 47.960                                    |
|   |            | TNAGRIT4             | 43.000                          | --                                | 1.303         | 56.021                 | 1.4                          | 0.774         | 2.04 | B               | EL  | 47.960                       | 0.879         | 1.61 | B               | I   | 76.736              | 0.80                         | 0.722         | 1.30 | B              | I               | 47.960                                    |
| TNAGT5A   |            | 45.000               | --                              | 1.233                             | 55.490        | 1.4                    | 0.774                        | 1.93          | B    | EL              | 47.960                                    | 0.879                        | 1.59          | B    | I               | 76.736                                    | 0.80                | 0.722                        | 1.23          | B    | I              | 47.960          |   |
| TNAGT5B   | 45.000     | 3                    | 1.222                           | 55.009                            | 1.4           | 0.774                  | 1.92                         | B             | EL   | 47.960          | 0.879                                     | 1.54                         | B             | I    | 76.736          | 0.80                                      | 0.722               | 1.22                         | B             | I    | 47.960         |                 |   |

NOTES:

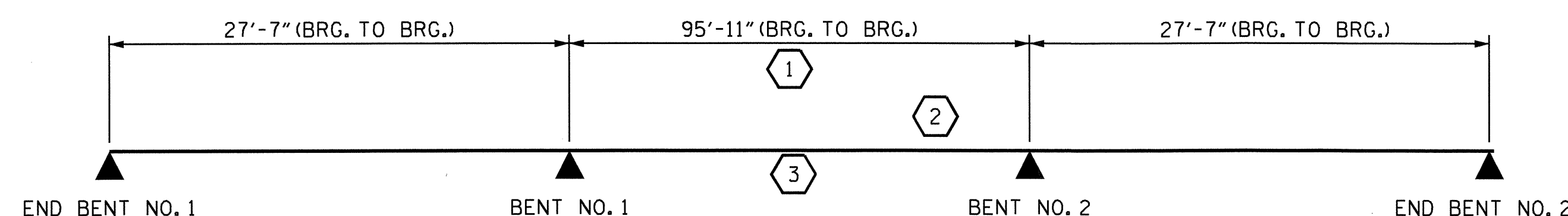
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

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

COMMENTS:

- 1.
- 2.
- 3.
- 4.

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



LRFR SUMMARY

PROJECT NO. B-4632  
RUTHERFORD COUNTY  
 STATION: 30+66.99 -L-

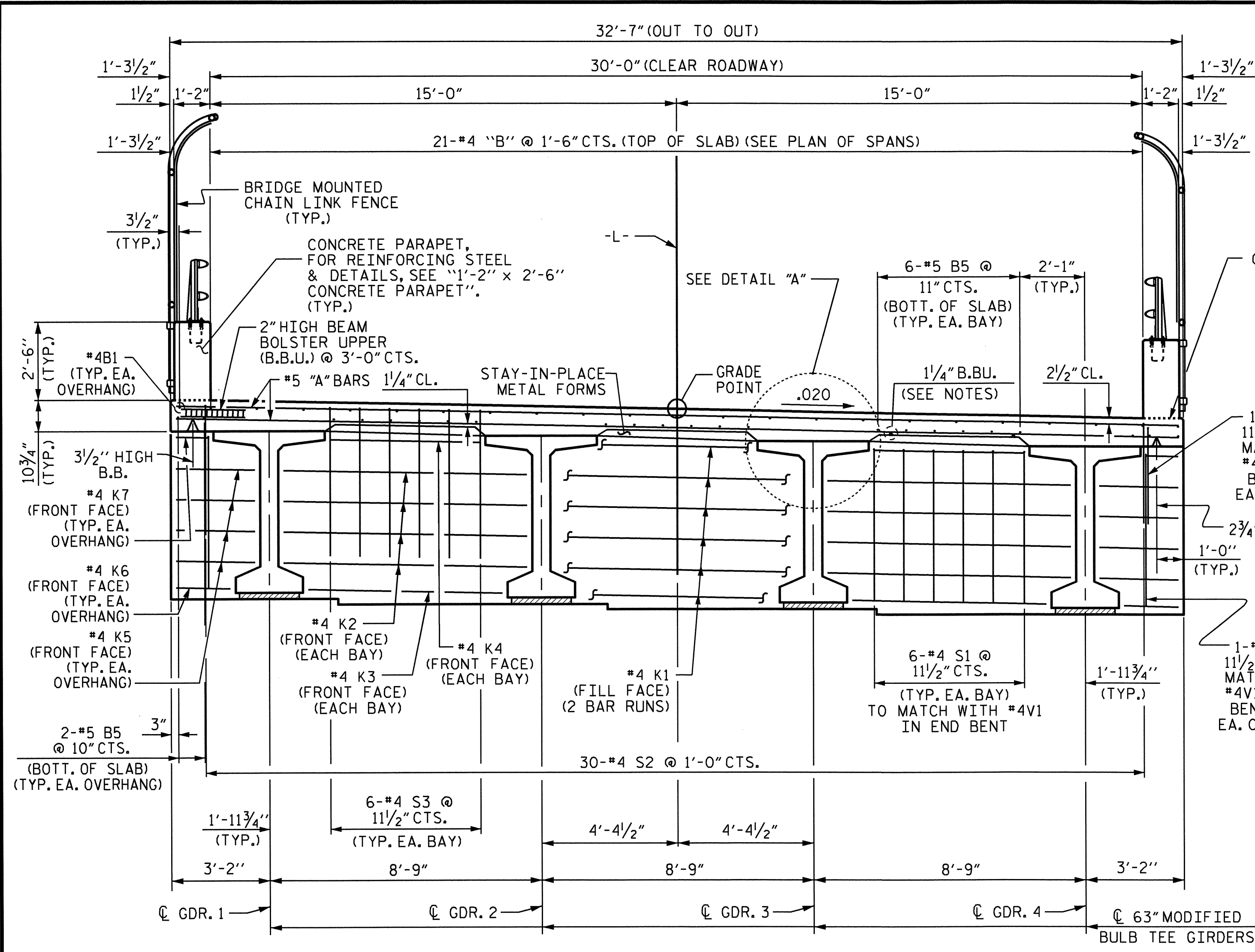
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

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

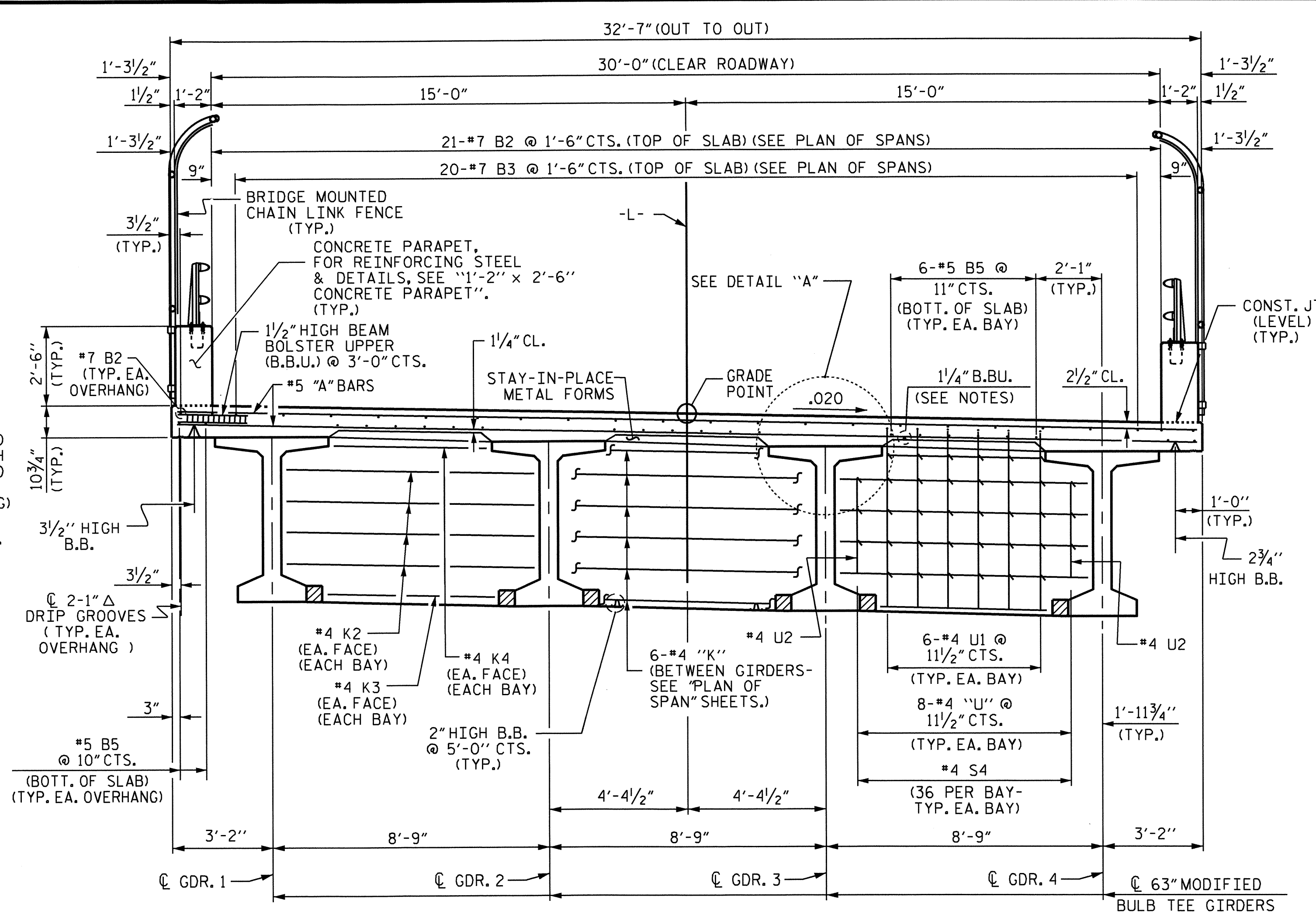


|                           |                       |
|---------------------------|-----------------------|
| ASSEMBLED BY : J.R. MCROY | DATE : 3/12           |
| CHECKED BY : M.G. CHEEK   | DATE : 4/12           |
| DRAWN BY : MAA 1/08       | REV. 11/12/08R MAA/GM |
| CHECKED BY : GM/DI 2/08   |                       |

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



**END ELEVATION**  
(END BENT #1 SHOWN, END BENT #2 SIMILAR)



**TYPICAL SECTION**  
(SHOWING BENT DIAPHRAGMS)

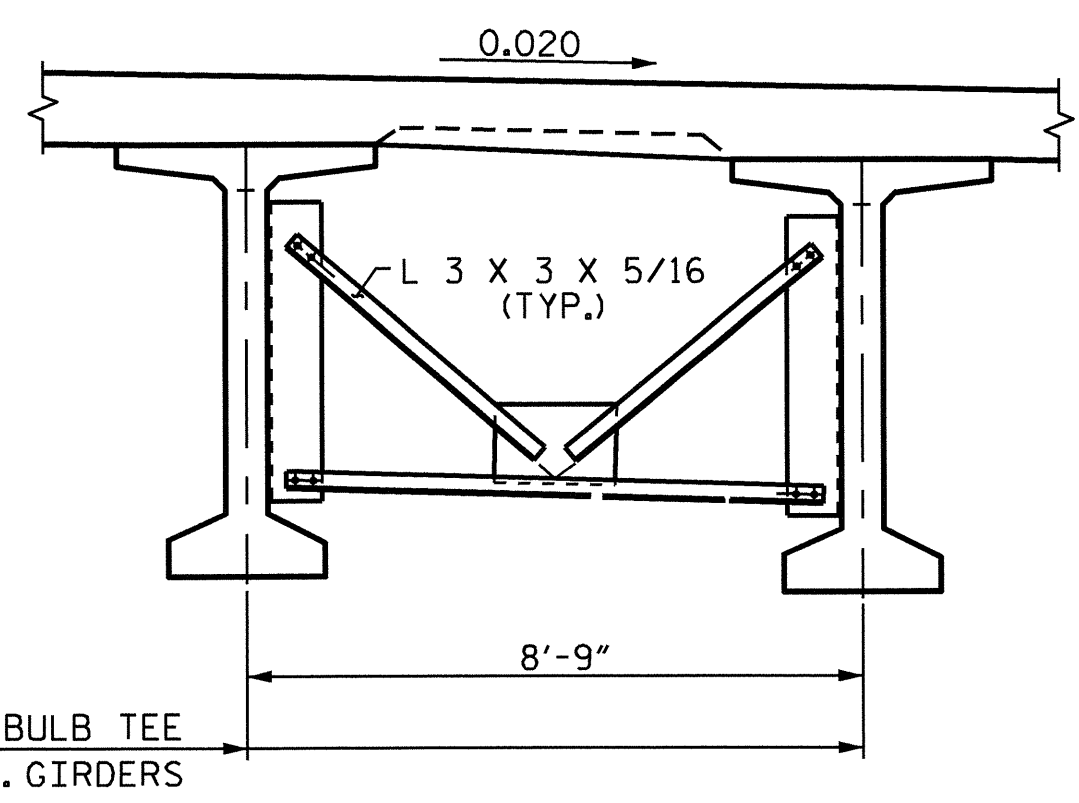
**NOTES**

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

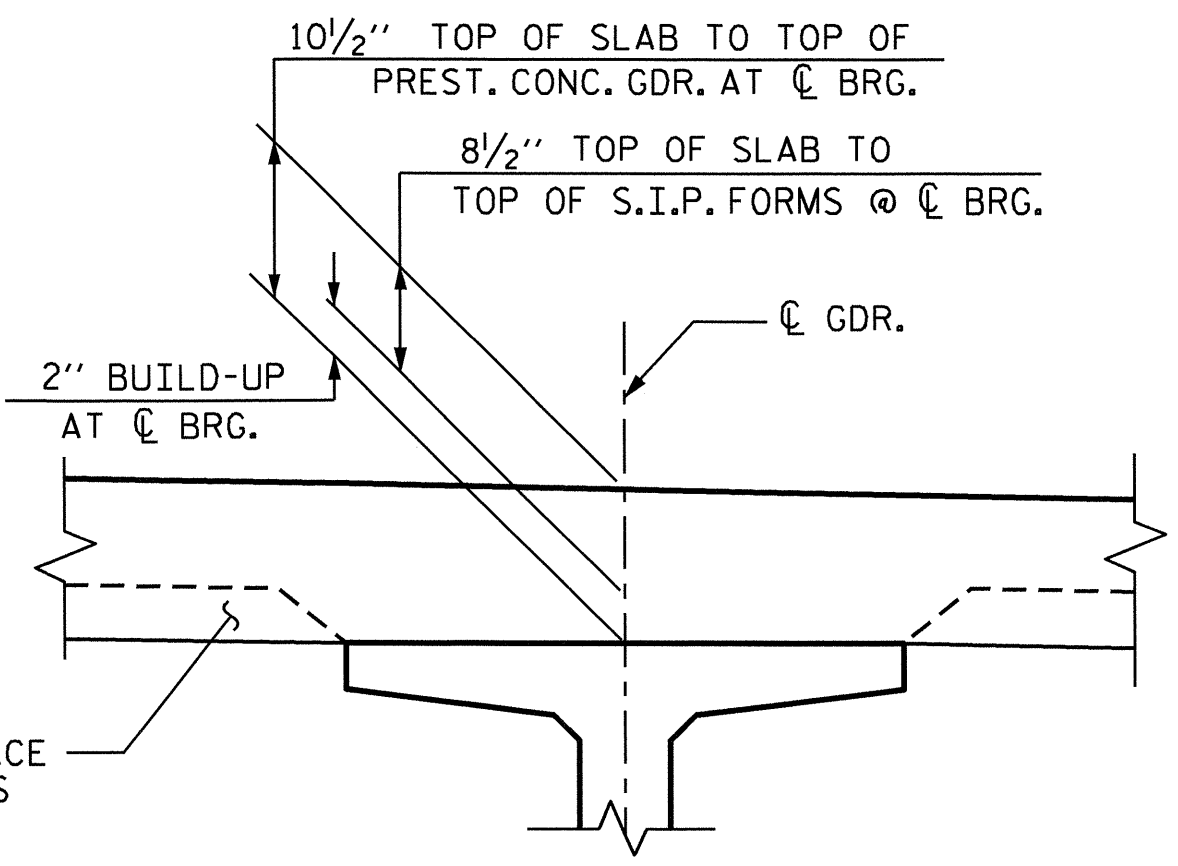
LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

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



**TYPICAL SECTION**  
SHOWING INTERMEDIATE DIAPHRAGMS  
(FOR INTERMEDIATE STEEL DIAPHRAGMS DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR 63" BULB TEE PRESTRESSED CONCRETE GIRDERS" SHEET 4 OF 4.)



**DETAIL "A"**

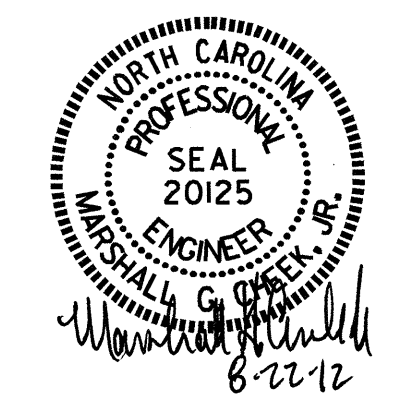
PROJECT NO. B-4632  
RUTHERFORD COUNTY  
STATION: 30+66.99 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

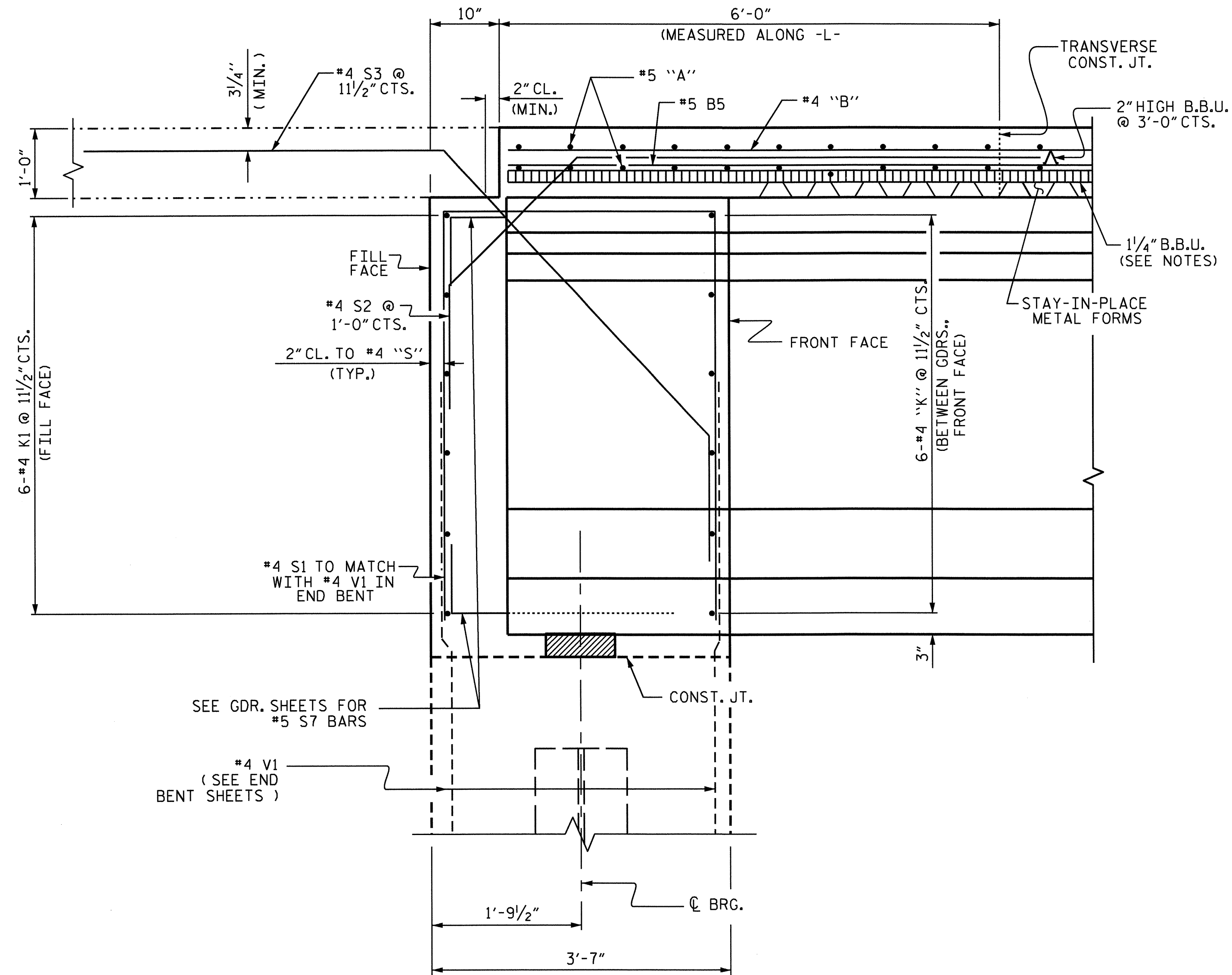
**SUPERSTRUCTURE**  
**TYPICAL SECTION**

| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-5          |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |
| 2         |     |       | 4   |     |       | 34           |

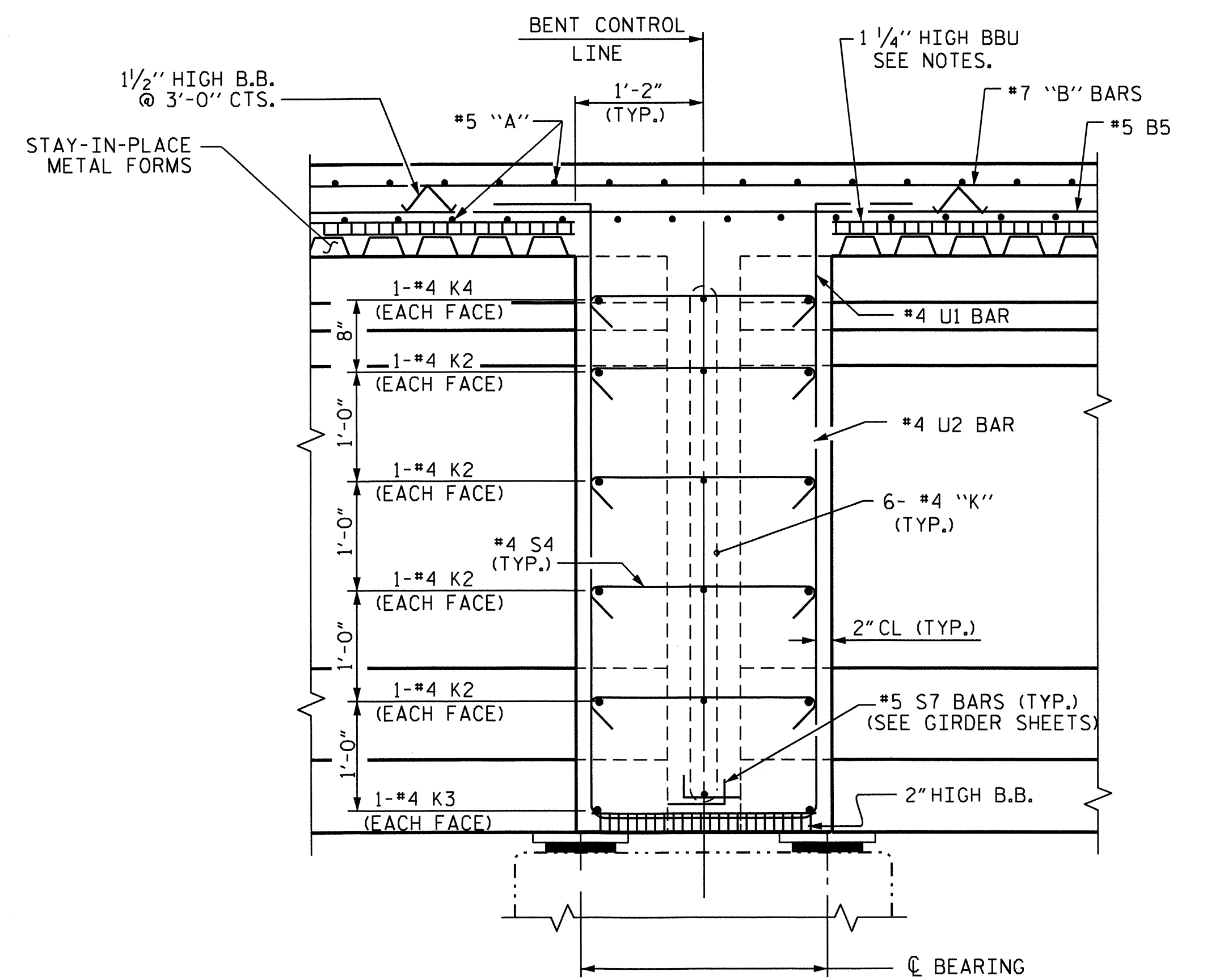


DRAWN BY : A.L. FIGUEROA/VXN DATE : 5-17-11  
CHECKED BY : M.G. CHEEK DATE : 9-11

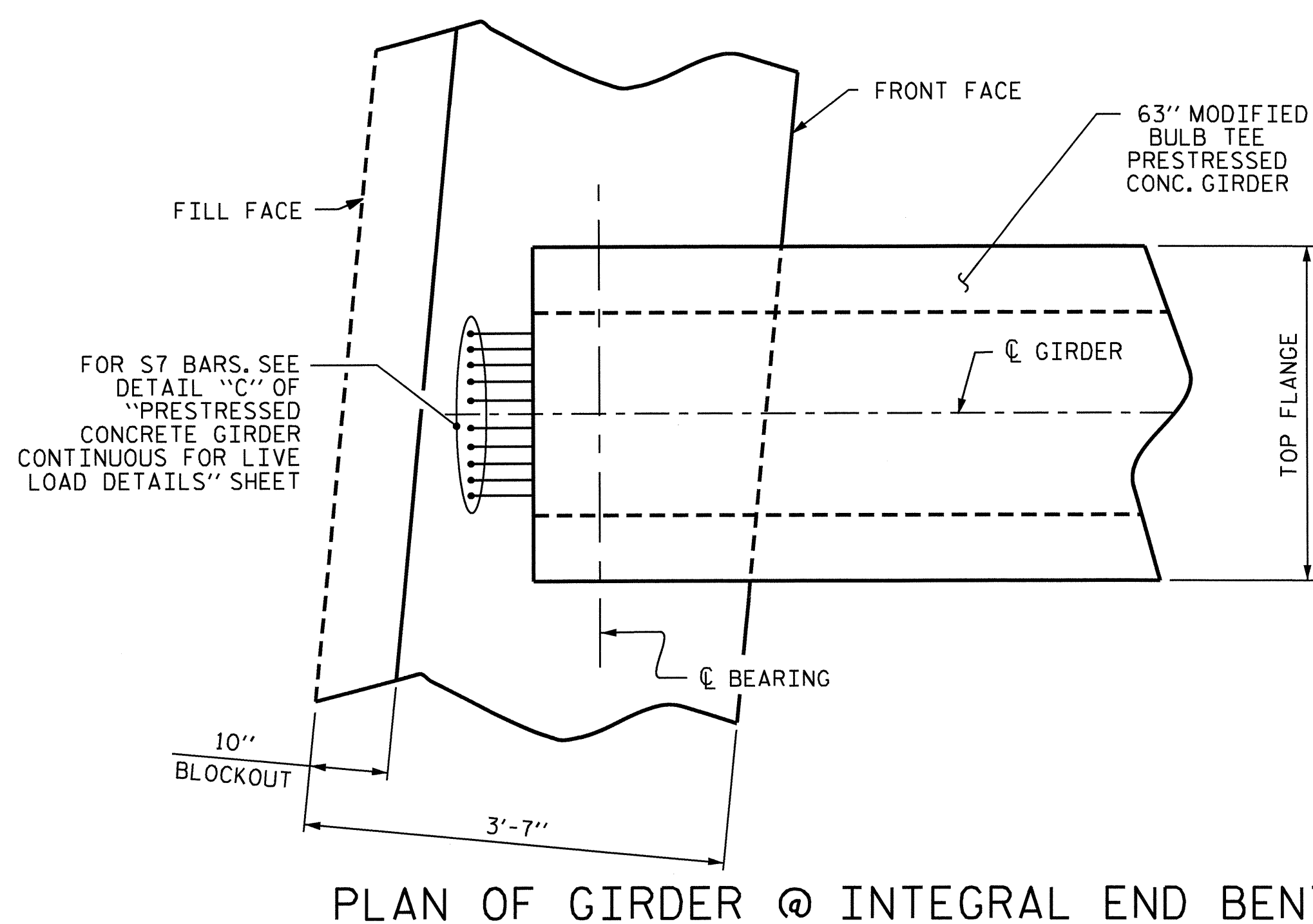




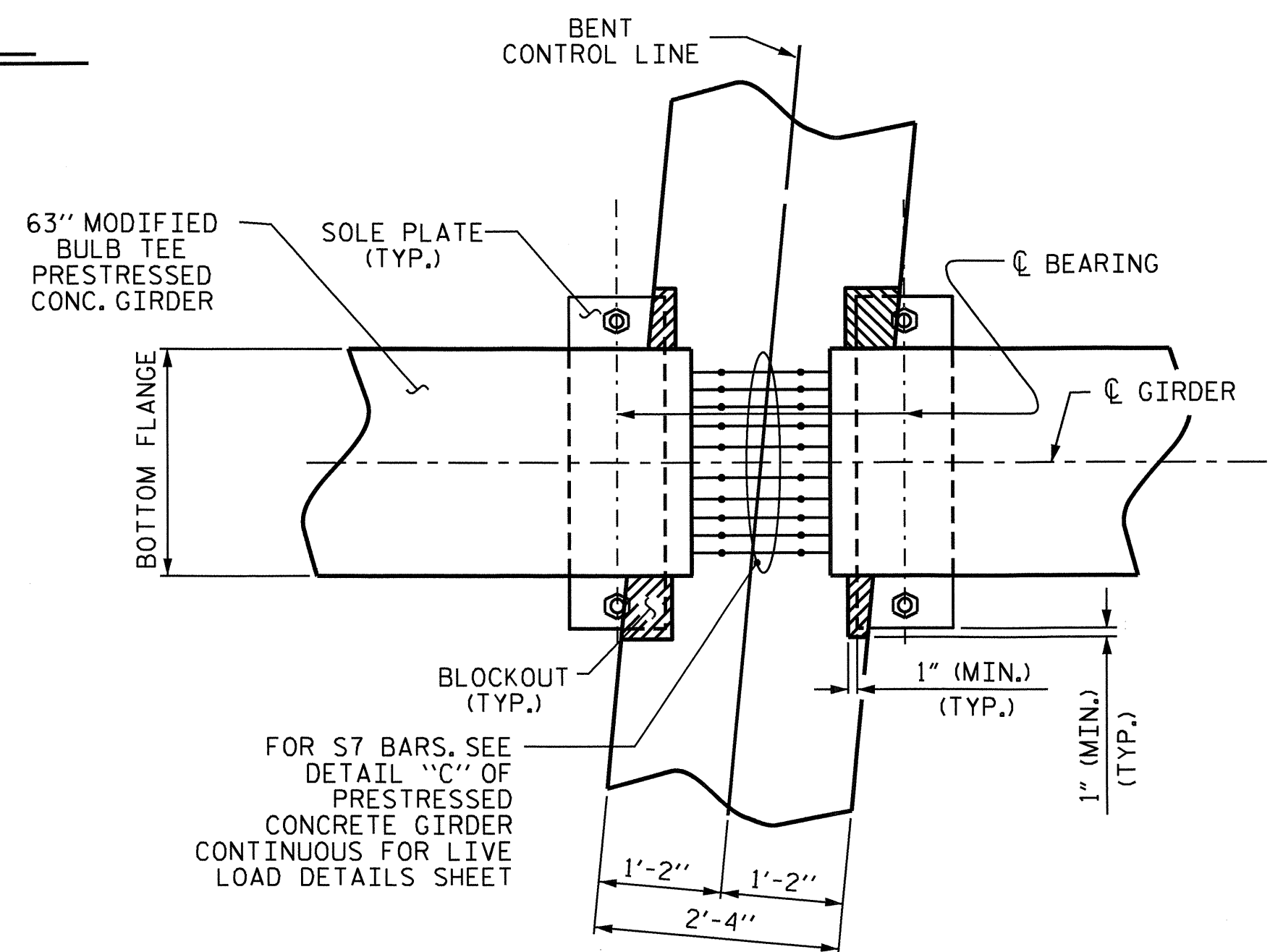
SECTION THRU END BENT



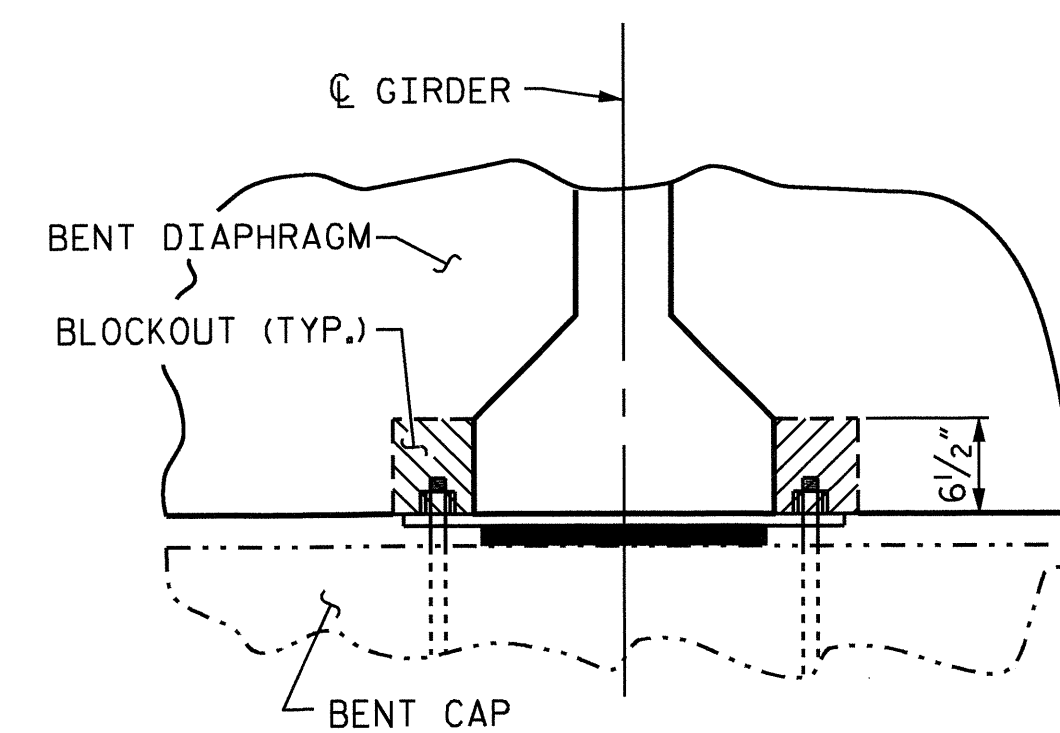
SECTION THRU CONTINUOUS BENT DIAPHRAGM



PLAN OF GIRDER @ INTEGRAL END BENT



BENT DIAPHRAGM BLOCK-OUT DETAIL



SECTION

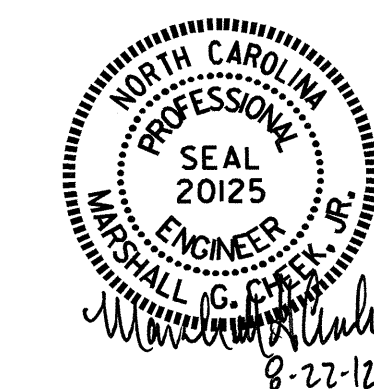
PROJECT NO. B-4632  
 RUTHERFORD COUNTY  
 STATION: 30+66.99 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

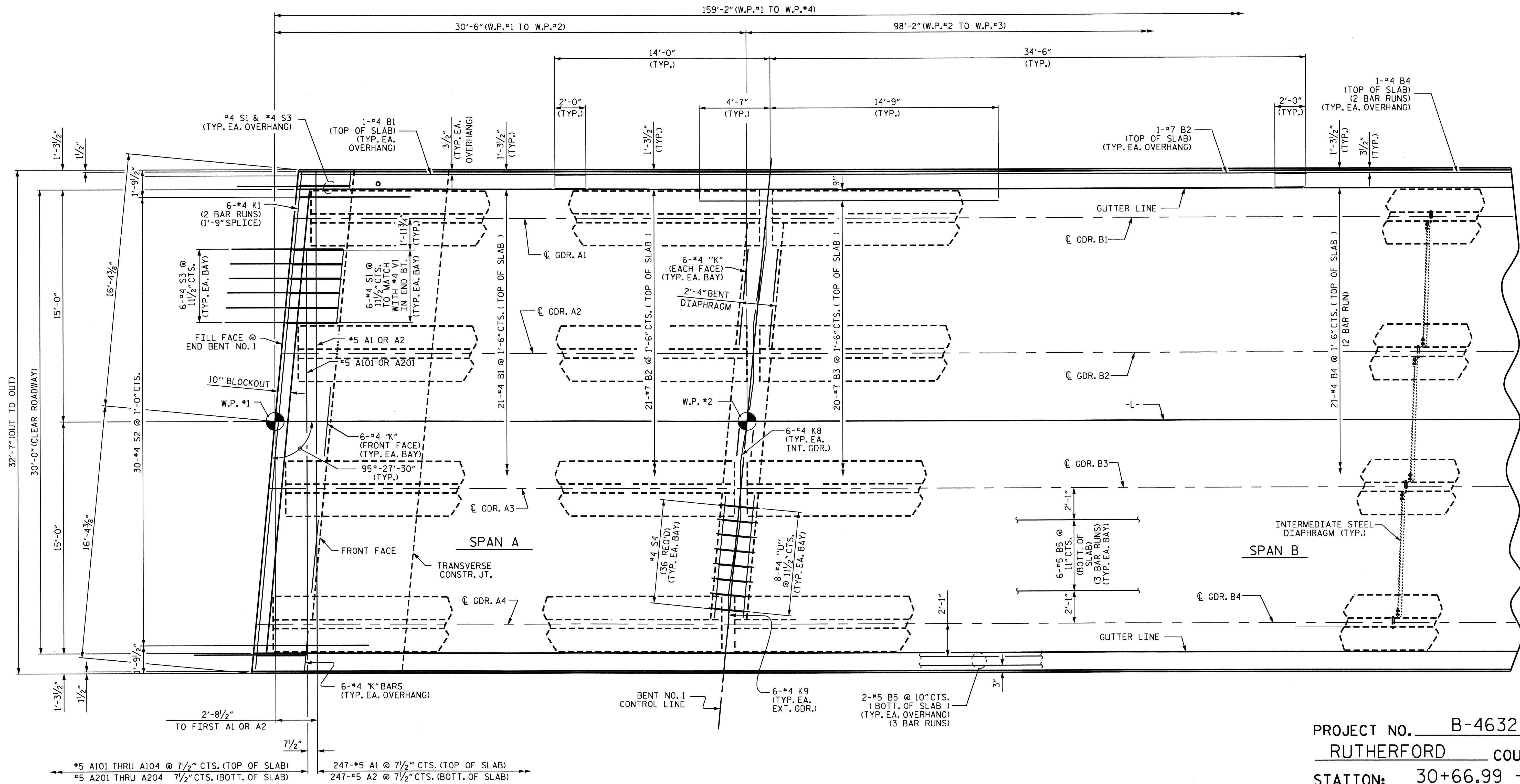
SUPERSTRUCTURE  
 TYPICAL SECTION  
 DETAILS

| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-6          |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |
| 2         |     |       | 4   |     |       | 34           |



DRAWN BY: A.L. FIGUEROA/VXN DATE: 5-17-11  
 CHECKED BY: M.G. CHEEK DATE: 9-11





**PLAN OF SPANS A AND B**

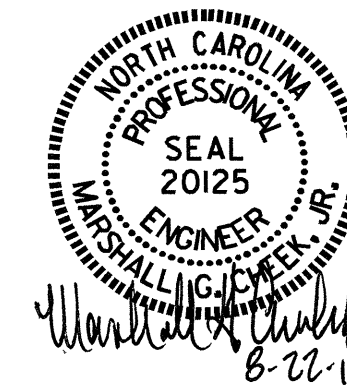
FOR INTERMEDIATE DIAPHRAGMS, SEE "INTERMEDIATE STEEL DIAPHRAGMS" SHEET.

PROJECT NO. B-4632  
RUTHERFORD COUNTY  
 STATION: 30+66.99 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

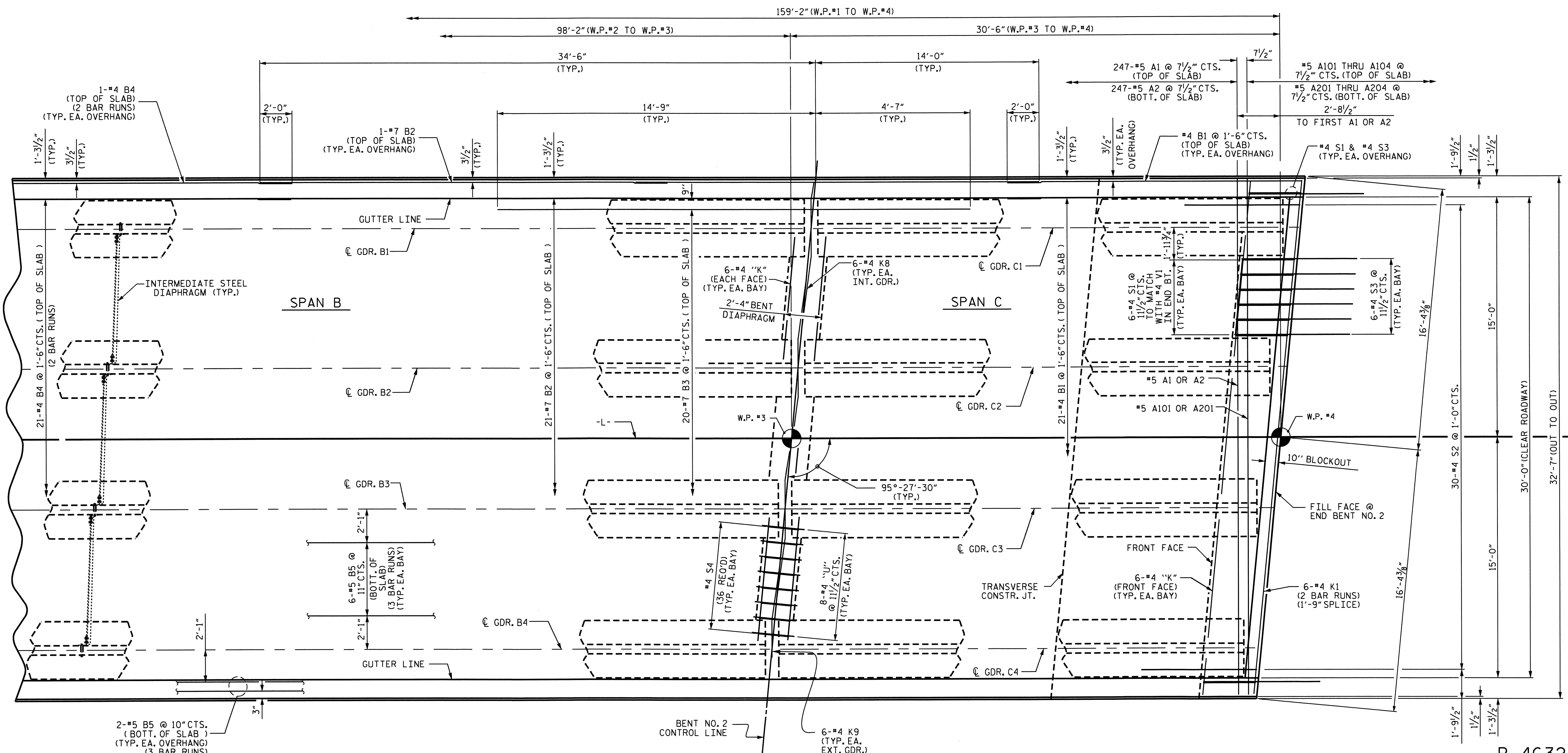
SUPERSTRUCTURE  
 PLAN OF SPANS A AND B



DRAWN BY : A.L. FIGUEROA/VXN DATE : 5-17-11  
 CHECKED BY : M.G. CHEEK DATE : 9-11

05-JUL-2012 09:52  
 R:\STRUCTURE\PLANS\Final Plans\B-4632-SD\_05.S\*.dgn  
 dahodge

| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-7          |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |
| 2         |     |       | 4   |     |       | 34           |



**PLAN OF SPANS B AND C**  
 FOR INTERMEDIATE DIAPHRAGMS, SEE "INTERMEDIATE STEEL DIAPHRAGMS" SHEET.

PROJECT NO. B-4632  
 RUTHERFORD COUNTY  
 STATION: 30+66.99 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

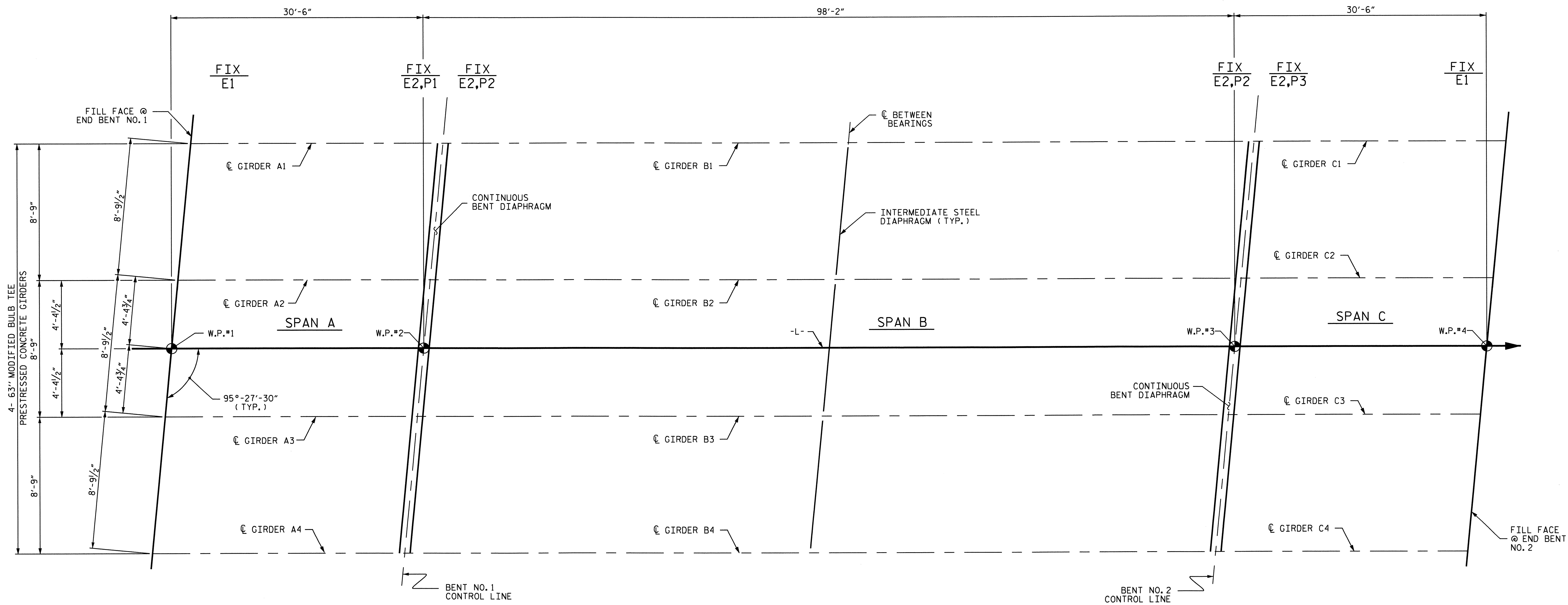
SUPERSTRUCTURE  
 PLAN OF SPANS B AND C



DRAWN BY : A.L. FIGUEROA/VXN DATE : 5-17-11  
 CHECKED BY : M.G. CHEEK DATE : 9-11

05-JUL-2012 09:52  
 R:\Structures\Plans\Final Plans\B-4632\_SD\_05\_S4.dgn  
 dahodge

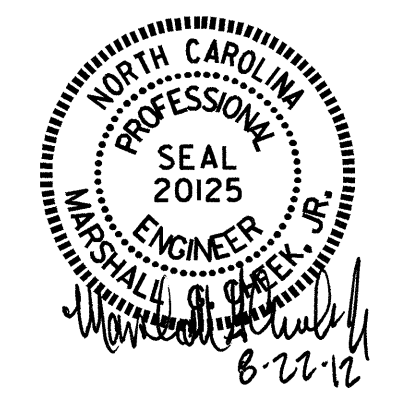
| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-8          |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |
| 2         |     |       | 4   |     |       | 34           |



GIRDER LAYOUT

PROJECT NO. B-4632  
RUTHERFORD COUNTY  
 STATION: 30+66.99 -L-

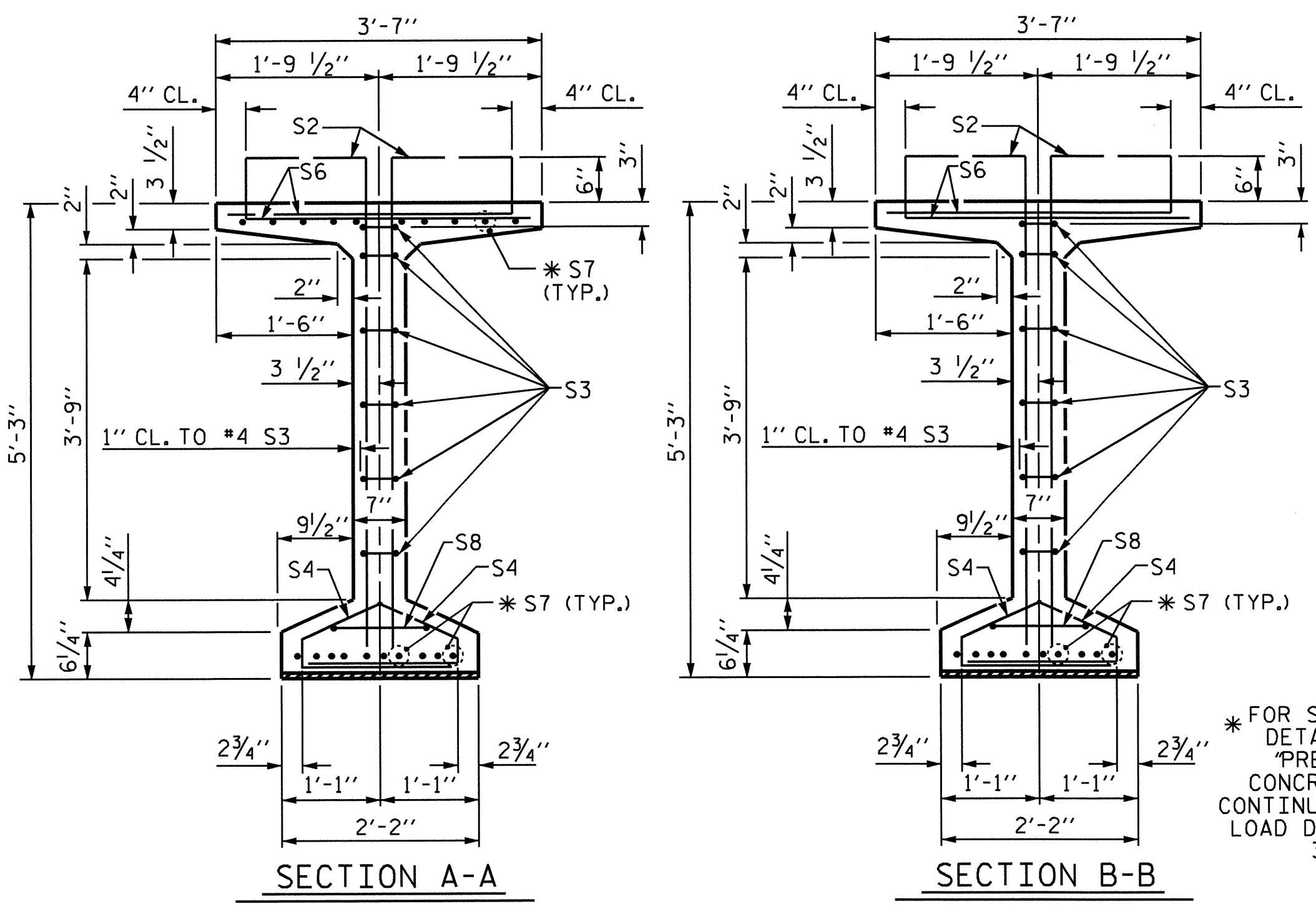
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 GIRDER LAYOUT  
 (SPANS A, B, & C)



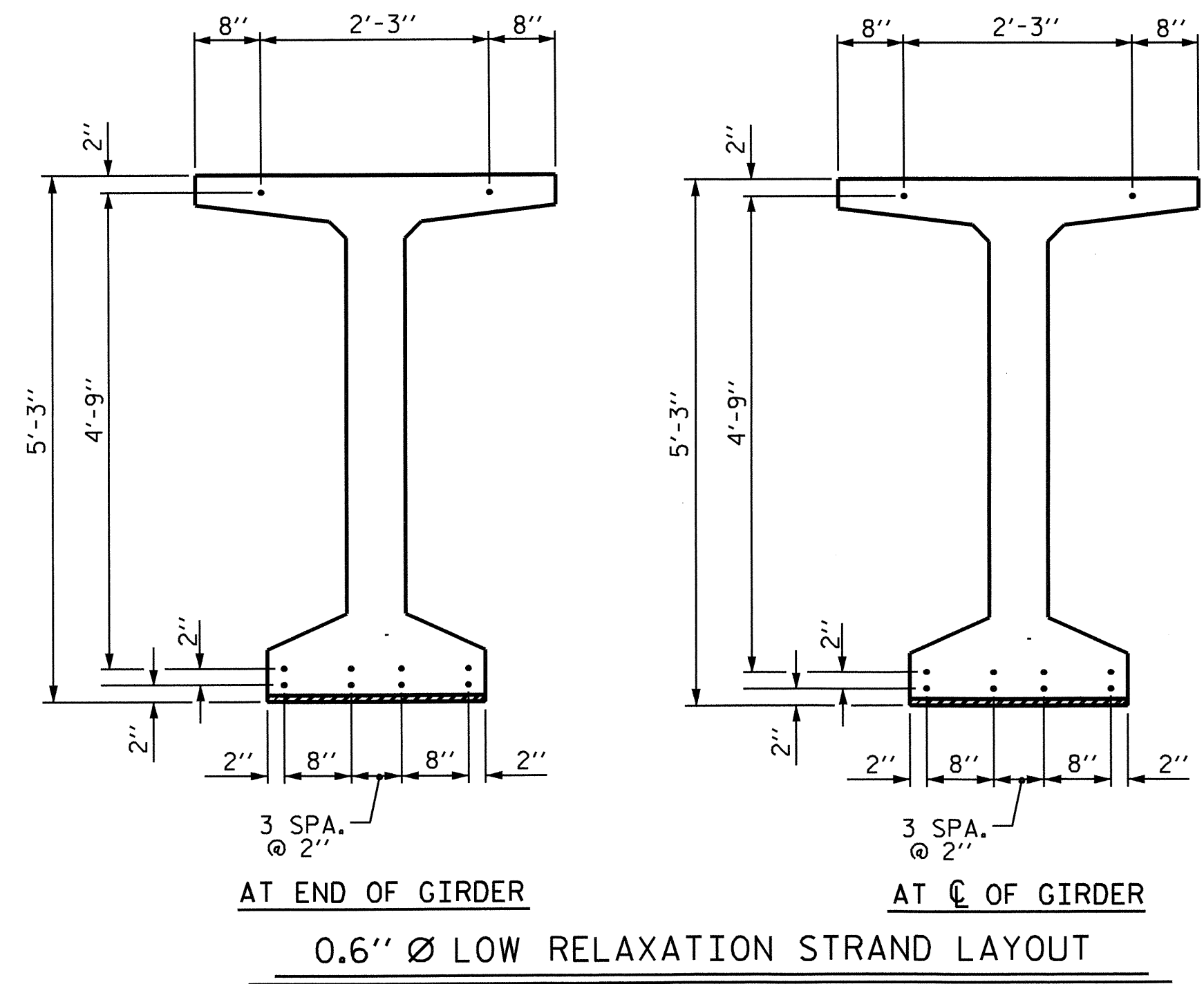
| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-9          |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |
| 2         |     |       | 4   |     |       | 34           |

DRAWN BY : A.L. FIGUEROA/VXN DATE : 05/17/11  
 CHECKED BY : M.G. CHEEK DATE : 9/11





\* FOR S7 BARS, SEE  
DETAIL "C" OF  
"PRESTRESSED  
CONCRETE GIRDER  
CONTINUOUS FOR LIVE  
LOAD DETAIL", SHEET  
3 OF 4.

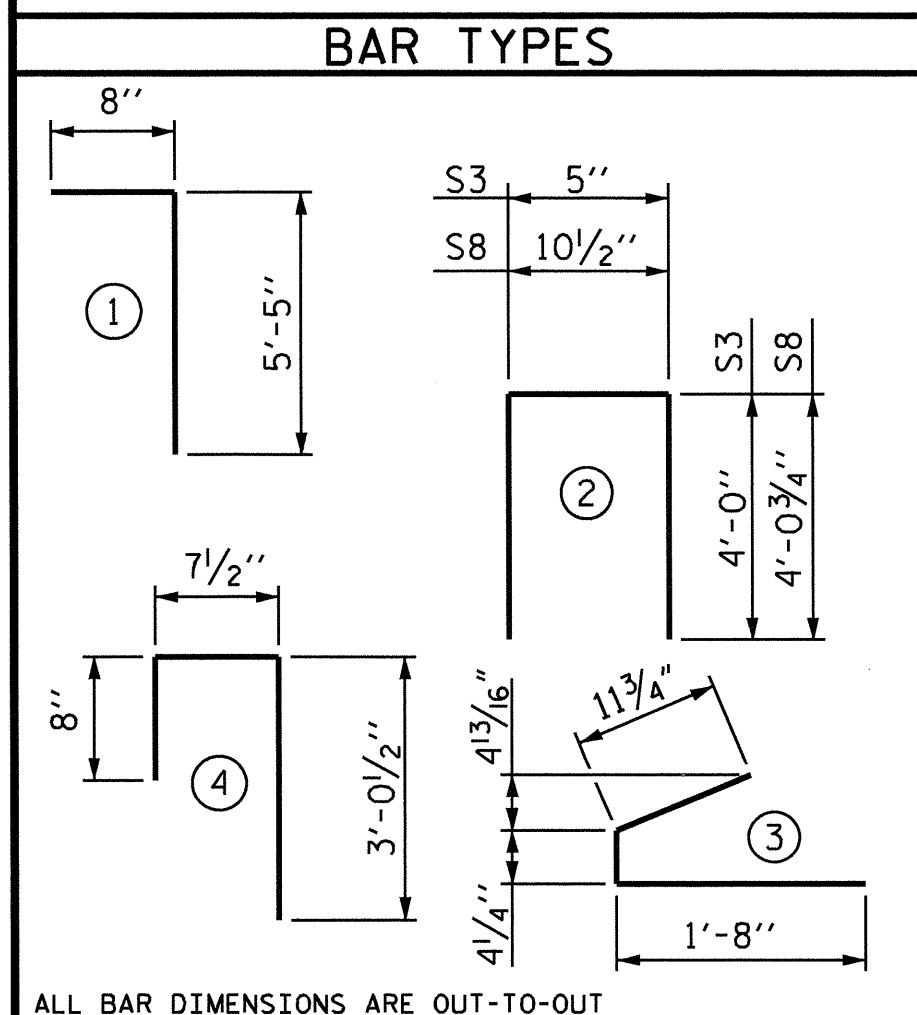


| 0.6" Ø L. R. GRADE 270 STRANDS |   |   |
|--------------------------------|---|---|
| AREA<br>(SQUARE INCHES)        | ULTIMATE<br>STRENGTH<br>(LBS. PER STRAND) | APPLIED<br>PRESTRESS<br>(LBS. PER STRAND) |
| 0.217                          | 58,600                                    | 43,950      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

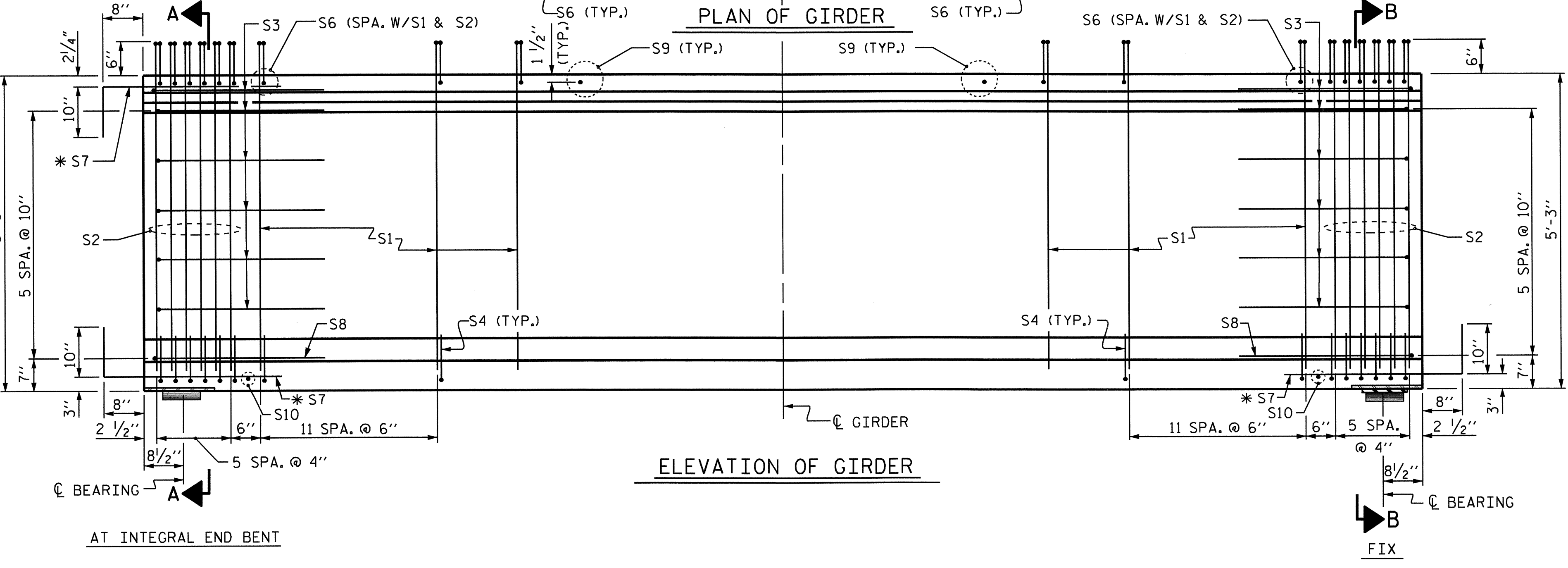
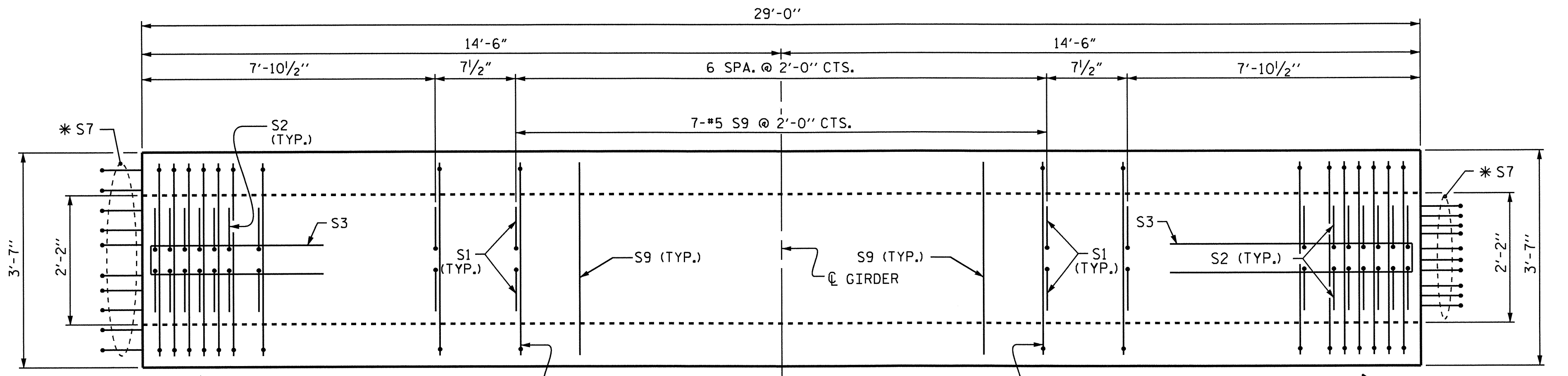
| REINFORCING STEEL FOR ONE GDR |        |      |      |        |        |
|-------------------------------|--------|------|------|--------|--------|
| BAR                           | NUMBER | SIZE | TYPE | LENGTH | WEIGHT |
| S1                            | 62     | #4   | 1    | 6'-1"  | 252    |
| S2                            | 24     | #5   | 1    | 6'-1"  | 152    |
| S3                            | 12     | #4   | 2    | 8'-5"  | 67     |
| S4                            | 72     | #4   | 3    | 3'-0"  | 144    |
| S6                            | 86     | #5   | 4    | 3'-8"  | 329    |
| *S7                           | 30     | #5   | STR  | 3'-8"  | 115    |
| S8                            | 2      | #5   | 2    | 9'-0"  | 19     |
| S9                            | 7      | #5   | STR  | 3'-3"  | 24     |
| S10                           | 2      | #3   | STR  | 1'-10" | 1      |

\* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.



| QUANTITIES FOR ONE GIRDER |                   |      |                     |
|---------------------------|-------------------|------|---------------------|
|                           | REINFORCING STEEL |      | 5000 PSI CONCRETE   |
|                           | LB.               | C.Y. | 0.6" Ø L.R. STRANDS |
|                           | 1,111             | 5.7  | 10                  |

| GIRDERS REQUIRED |        |        |              |
|------------------|--------|--------|--------------|
| SPAN             | NUMBER | LENGTH | TOTAL LENGTH |
| SPAN A           | 4      | 29'-0" | 116'-0"      |
| SPAN C           | 4      | 29'-0" | 116'-0"      |



PROJECT NO. B-4632  
RUTHERFORD COUNTY  
 STATION: 30+66.99 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 63" PRESTRESSED CONCRETE  
 MODIFIED BULB TEE  
 CONTINUOUS FOR LIVE LOAD  
 SPAN A OR SPAN C



|                           |                       |
|---------------------------|-----------------------|
| ASSEMBLED BY : J.R. MCROY | DATE : 4/12           |
| CHECKED BY : M.G. CHEEK   | DATE : 4/12           |
| DRAWN BY : EEM 2/6/97     | REV. 10/17/00 RHW/LES |
| CHECKED BY : VAP 2/6/97   | REV. 5/1/06R TLA/GM   |
|                           | REV. 10/1/11 MAA/GM   |

| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-10         |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |
| 2         |     |       | 4   |     |       | 34           |





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 IN SPAN A OR C SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4,000 PSI.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER IN SPAN B SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4,800 PSI.

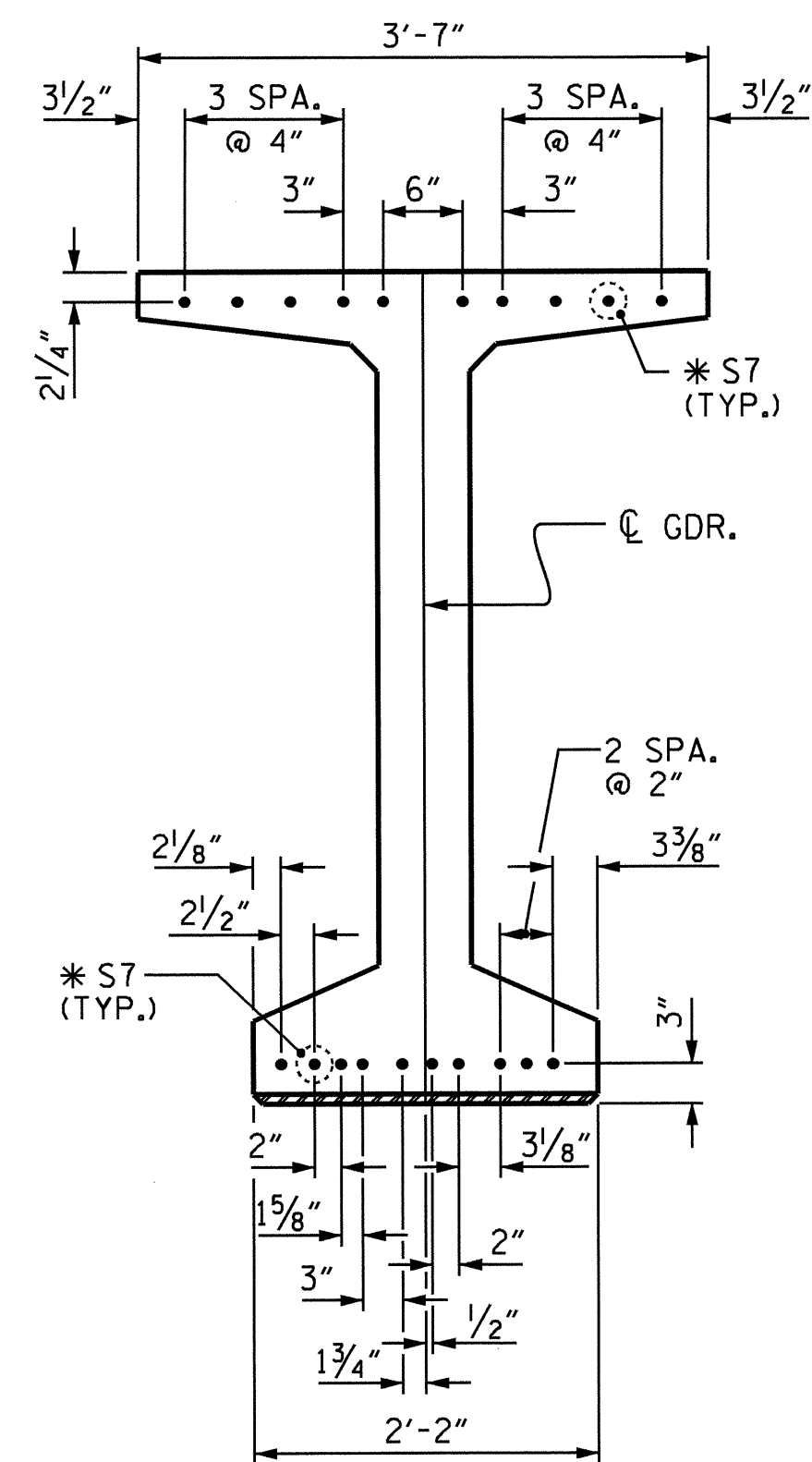
DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

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

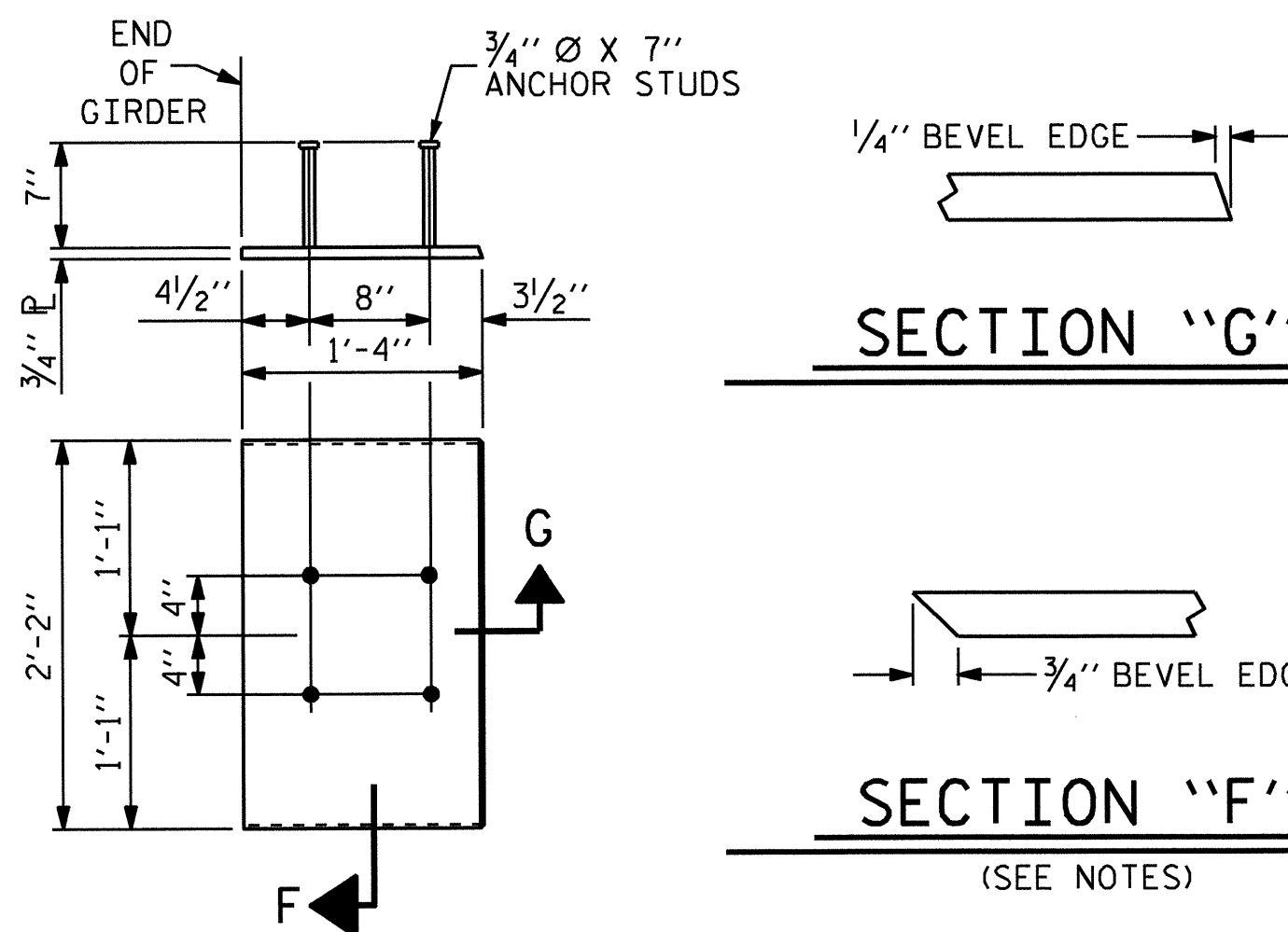
WHEN DRAPED STRANDS ARE DETAILED, THE LONGITUDINAL LOCATION OF THE HOLD DOWN DEVICES SHALL BE WITHIN 6" OF THE LOCATION SHOWN AND THE CENTER OF GRAVITY OF THE GROUP OF DRAPED STRANDS SHALL BE LOCATED WITHIN 1/2" OF THE THEORETICAL LOCATION SHOWN.

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

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



DETAIL "C"



SECTION "G"

SECTION "F"

(SEE NOTES)

EMBEDDED PLATE "B-1" DETAILS FOR AASHTO 63" MODIFIED BULB TEES

(2 REQ'D PER GIRDER)

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

| 0.6" Ø LOW RELAXATION                 | SPAN A             |    |       |       |       |       |       |       |       |       |         |   |
|---------------------------------------|--------------------|----|-------|-------|-------|-------|-------|-------|-------|-------|---------|---|
|                                       | GIRDERS #1 THRU #4 |    |       |       |       |       |       |       |       |       |         |   |
| TENTH POINTS                          | CL BRG.            | .1 | .2    | .3    | .4    | .5    | .6    | .7    | .8    | .9    | CL BRG. |   |
| CAMBER ( GIRDER ALONE IN PLACE )      | ↑                  | 0  | 0.003 | 0.006 | 0.008 | 0.010 | 0.010 | 0.010 | 0.008 | 0.006 | 0.003   | 0 |
| * DEFLECTION DUE TO SUPERIMPOSED D.L. | ↓                  | 0  | 0.000 | 0.000 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.000 | 0.000   | 0 |
| FINAL CAMBER                          | ↑                  | 0  | 1/16" | 1/16" | 1/8"  | 1/8"  | 1/8"  | 1/8"  | 1/8"  | 1/16" | 1/16"   | 0 |

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

| 0.6" Ø LOW RELAXATION                 | SPAN B    |    |       |         |         |        |         |        |         |         |         |   |
|---------------------------------------|-----------|----|-------|---------|---------|--------|---------|--------|---------|---------|---------|---|
|                                       | GIRDER #1 |    |       |         |         |        |         |        |         |         |         |   |
| TENTH POINTS                          | CL BRG.   | .1 | .2    | .3      | .4      | .5     | .6      | .7     | .8      | .9      | CL BRG. |   |
| CAMBER ( GIRDER ALONE IN PLACE )      | ↑         | 0  | 0.081 | 0.153   | 0.209   | 0.245  | 0.257   | 0.245  | 0.209   | 0.153   | 0.081   | 0 |
| * DEFLECTION DUE TO SUPERIMPOSED D.L. | ↓         | 0  | 0.030 | 0.057   | 0.078   | 0.091  | 0.096   | 0.091  | 0.078   | 0.057   | 0.030   | 0 |
| FINAL CAMBER                          | ↑         | 0  | 5/8"  | 1 3/16" | 1 9/16" | 1 7/8" | 1 5/16" | 1 7/8" | 1 9/16" | 1 3/16" | 5/8"    | 0 |

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

| 0.6" Ø LOW RELAXATION                 | SPAN B          |    |       |         |        |        |         |        |        |         |         |   |
|---------------------------------------|-----------------|----|-------|---------|--------|--------|---------|--------|--------|---------|---------|---|
|                                       | GIRDERS #2 & #3 |    |       |         |        |        |         |        |        |         |         |   |
| TENTH POINTS                          | CL BRG.         | .1 | .2    | .3      | .4     | .5     | .6      | .7     | .8     | .9      | CL BRG. |   |
| CAMBER ( GIRDER ALONE IN PLACE )      | ↑               | 0  | 0.081 | 0.153   | 0.209  | 0.245  | 0.257   | 0.245  | 0.209  | 0.153   | 0.081   | 0 |
| * DEFLECTION DUE TO SUPERIMPOSED D.L. | ↓               | 0  | 0.033 | 0.062   | 0.085  | 0.100  | 0.105   | 0.100  | 0.085  | 0.062   | 0.033   | 0 |
| FINAL CAMBER                          | ↑               | 0  | 9/16" | 1 1/16" | 1 1/2" | 1 3/4" | 1 5/16" | 1 3/4" | 1 1/2" | 1 1/16" | 9/16"   | 0 |

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

| 0.6" Ø LOW RELAXATION                 | SPAN B    |    |       |         |        |        |         |        |        |         |         |   |
|---------------------------------------|-----------|----|-------|---------|--------|--------|---------|--------|--------|---------|---------|---|
|                                       | GIRDER #4 |    |       |         |        |        |         |        |        |         |         |   |
| TENTH POINTS                          | CL BRG.   | .1 | .2    | .3      | .4     | .5     | .6      | .7     | .8     | .9      | CL BRG. |   |
| CAMBER ( GIRDER ALONE IN PLACE )      | ↑         | 0  | 0.081 | 0.153   | 0.209  | 0.245  | 0.257   | 0.245  | 0.209  | 0.153   | 0.081   | 0 |
| * DEFLECTION DUE TO SUPERIMPOSED D.L. | ↓         | 0  | 0.029 | 0.056   | 0.076  | 0.089  | 0.094   | 0.089  | 0.076  | 0.056   | 0.029   | 0 |
| FINAL CAMBER                          | ↑         | 0  | 5/8"  | 1 3/16" | 1 5/8" | 1 7/8" | 1 5/16" | 1 7/8" | 1 5/8" | 1 3/16" | 5/8"    | 0 |

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

| 0.6" Ø LOW RELAXATION                 | SPAN C             |    |       |       |       |       |       |       |       |       |         |   |
|---------------------------------------|--------------------|----|-------|-------|-------|-------|-------|-------|-------|-------|---------|---|
|                                       | GIRDERS #1 THRU #4 |    |       |       |       |       |       |       |       |       |         |   |
| TENTH POINTS                          | CL BRG.            | .1 | .2    | .3    | .4    | .5    | .6    | .7    | .8    | .9    | CL BRG. |   |
| CAMBER ( GIRDER ALONE IN PLACE )      | ↑                  | 0  | 0.003 | 0.006 | 0.008 | 0.010 | 0.010 | 0.010 | 0.008 | 0.006 | 0.003   | 0 |
| * DEFLECTION DUE TO SUPERIMPOSED D.L. | ↓                  | 0  | 0.000 | 0.000 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.000 | 0.000   | 0 |
| FINAL CAMBER                          | ↑                  | 0  | 1/16" | 1/16" | 1/8"  | 1/8"  | 1/8"  | 1/8"  | 1/8"  | 1/16" | 1/16"   | 0 |

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

PROJECT NO. B-4632  
RUTHERFORD COUNTY  
STATION: 30+66.99 -L-

SHEET 3 OF 4

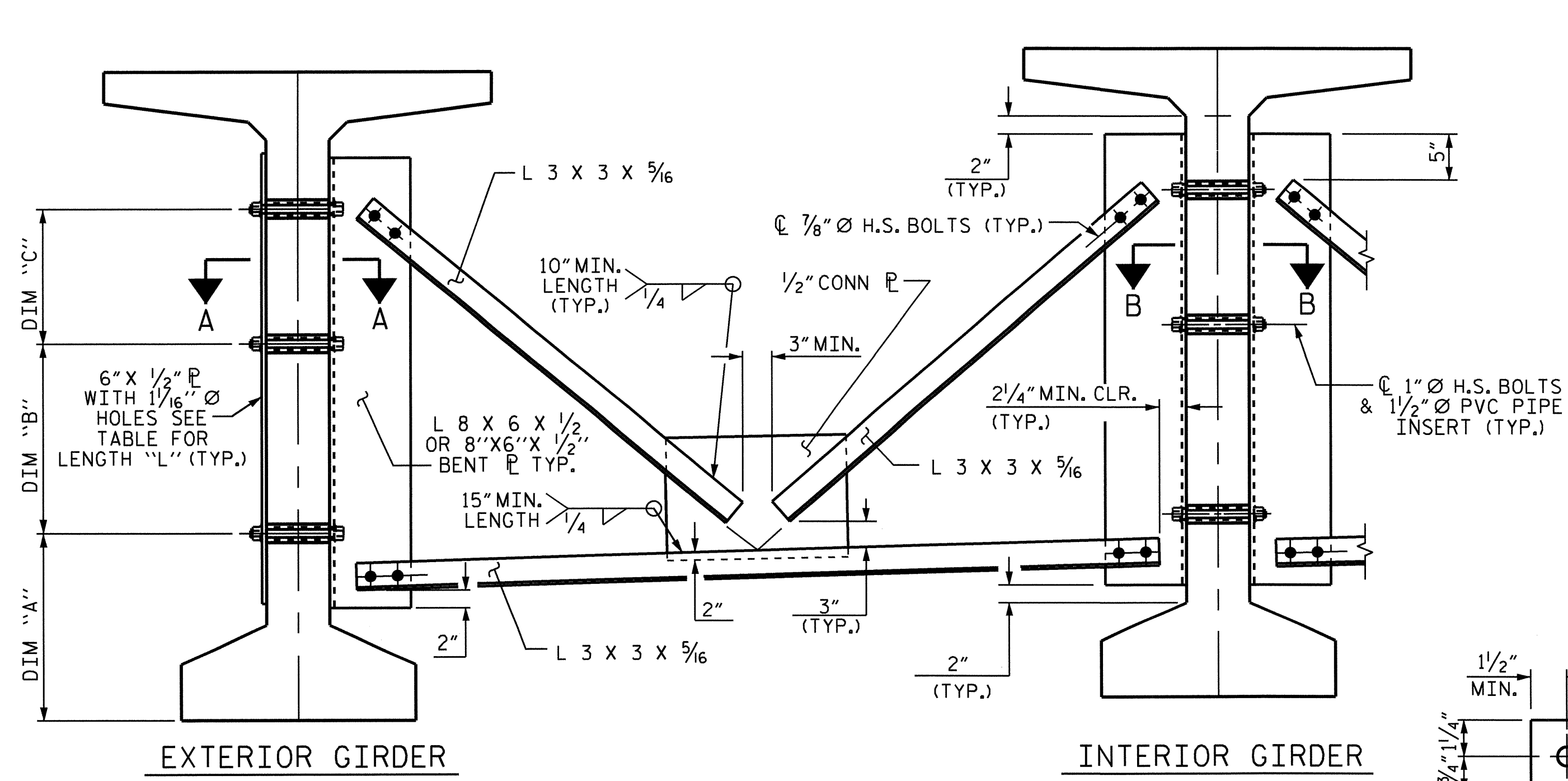
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
PRESTRESSED CONCRETE GIRDER  
CONTINUOUS FOR LIVE LOAD  
DETAILS



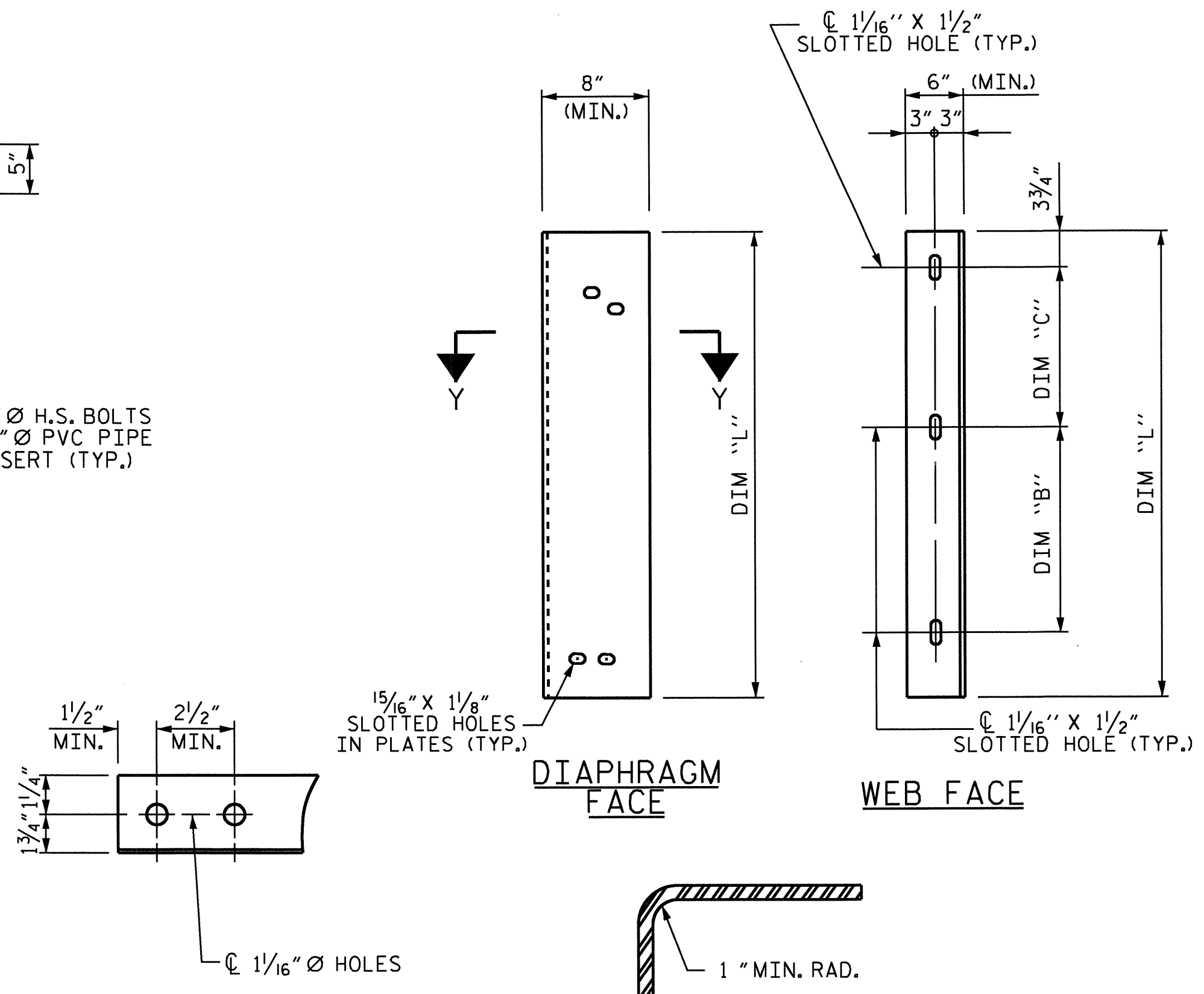
| REVISIONS |     |       |     |     |       | SHEET NO.       |  |
|-----------|-----|-------|-----|-----|-------|-----------------|--|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-12            |  |
| 1         |     |       | 3   |     |       | TOTAL SHEETS 34 |  |
| 2         |     |       | 4   |     |       |                 |  |

|                           |                        |
|---------------------------|------------------------|
| ASSEMBLED BY : J.R. MCROY | DATE : 4/12            |
| CHECKED BY : M.G. CHEEK   | DATE : 4/12            |
| DRAWN BY : ELR 11/91      | REV. 7/10/01RR LES/RDR |
| CHECKED BY : GRP 11/91    | REV. 5/1/06 TLA/GM     |
|                           | REV. 10/1/11 MAA/GM    |





PART SECTION AT INTERMEDIATE DIAPHRAGM



CONNECTOR PLATE DETAIL

STRUCTURAL STEEL NOTES

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

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

TENSION ON THE ASTM A449 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL 1/4 TURN.

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

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

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

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

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

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

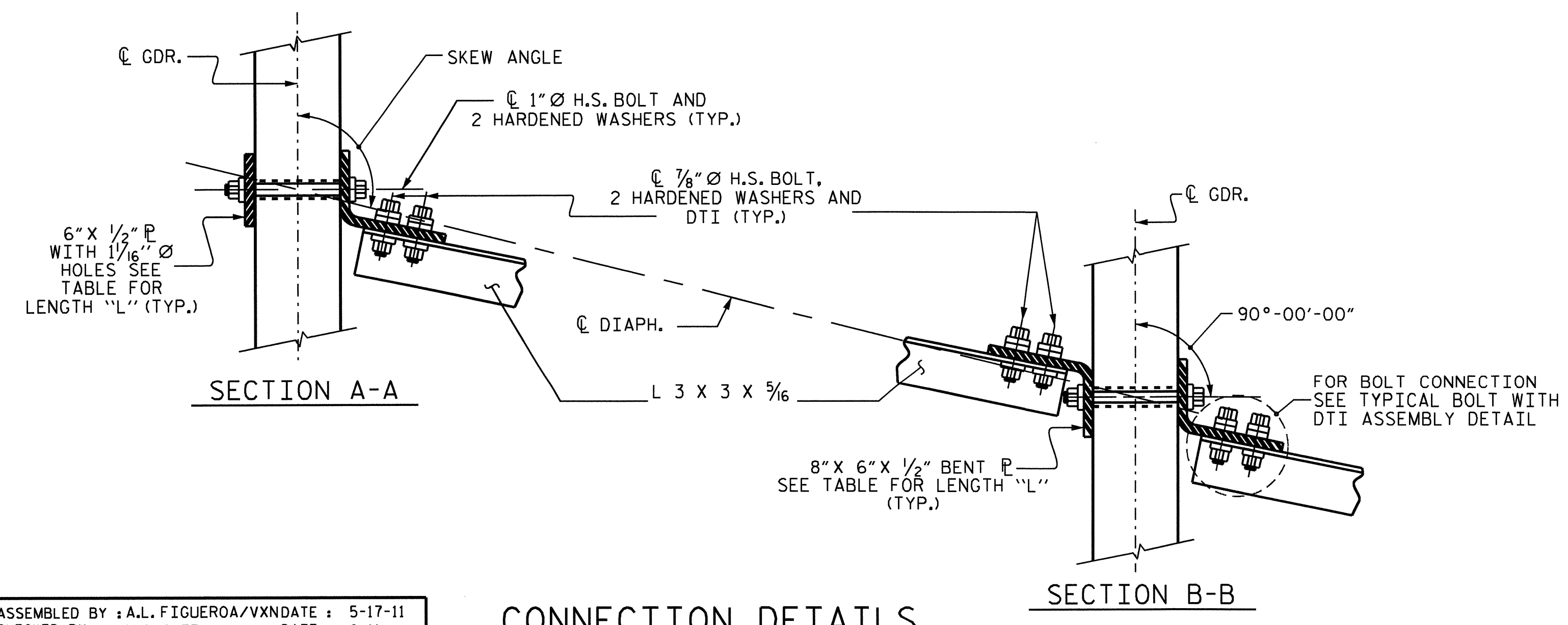
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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

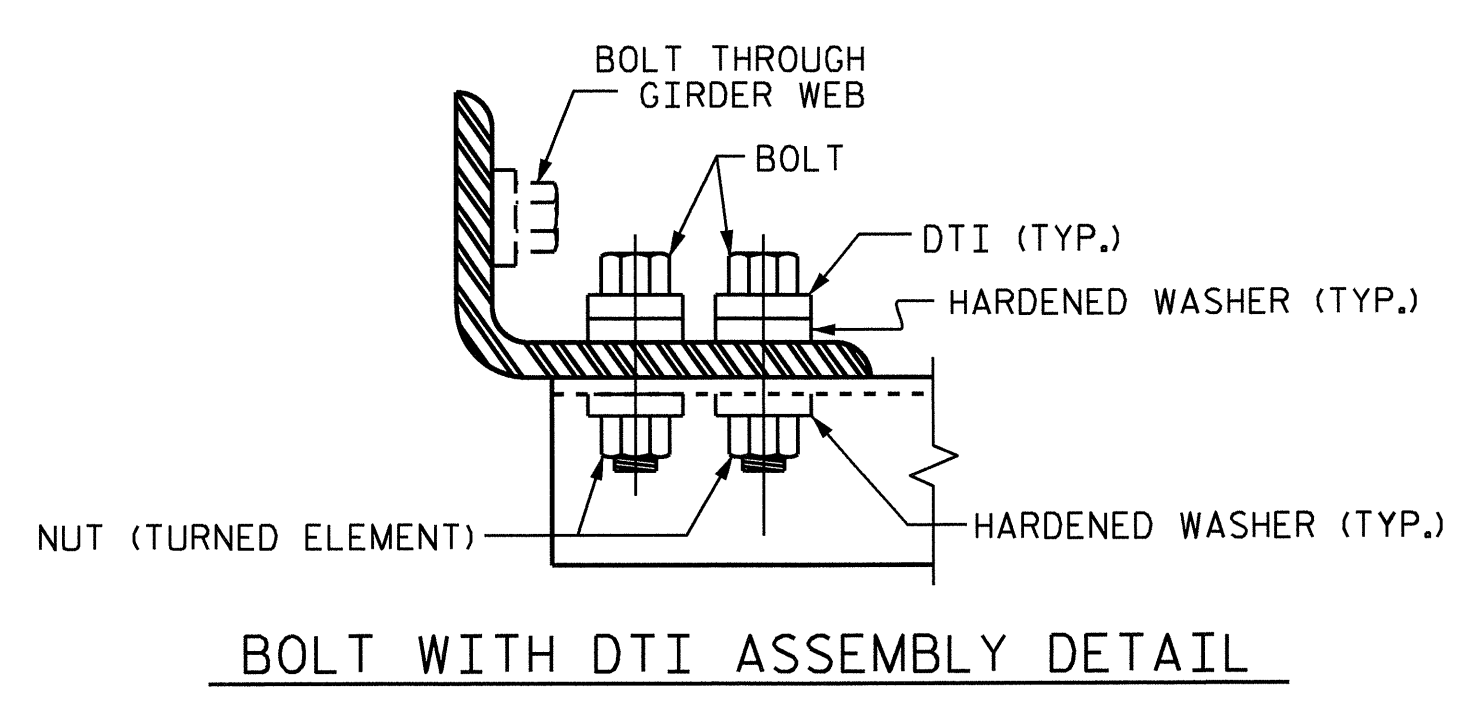
THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.

TABLE

| GIRDER TYPE  | DIM "A"   | DIM "B" | DIM "C" | DIM "L" |
|--------------|-----------|---------|---------|---------|
| 63" BULB TEE | 1'-7 3/4" | 1'-3"   | 1'-3"   | 3'-5"   |

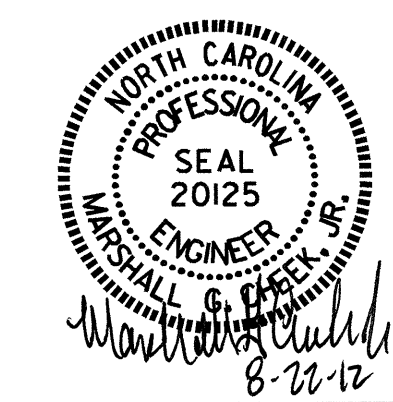


CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

PROJECT NO. B-4632  
 RUTHERFORD COUNTY  
 STATION: 30+66.99 -L-  
 SHEET 4 OF 4



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 INTERMEDIATE  
 STEEL DIAPHRAGMS  
 FOR 63" MODIFIED BULB TEE  
 PRESTRESSED CONCRETE  
 GIRDERS

| REVISIONS |     |       |     |     |       | SHEET NO.    |  |
|-----------|-----|-------|-----|-----|-------|--------------|--|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-13         |  |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |  |
| 2         |     |       | 4   |     |       | 34           |  |

ASSEMBLED BY: A.L. FIGUEROA/VXNDATE: 5-17-11  
 CHECKED BY: M.G. CHEEK DATE: 9-11  
 DRAWN BY: RWW 11/09  
 CHECKED BY: GM 11/09  
 ADDED 11/23/09R  
 REV. 10/1/11 MAA/GM

**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.

THE 2" Ø PIPE SLEEVE SHALL BE CUT FROM SCHEDULE 40 PVC PLASTIC PIPE. THE PVC PLASTIC PIPE SHALL MEET THE REQUIREMENTS OF ASTM D1785.

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

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

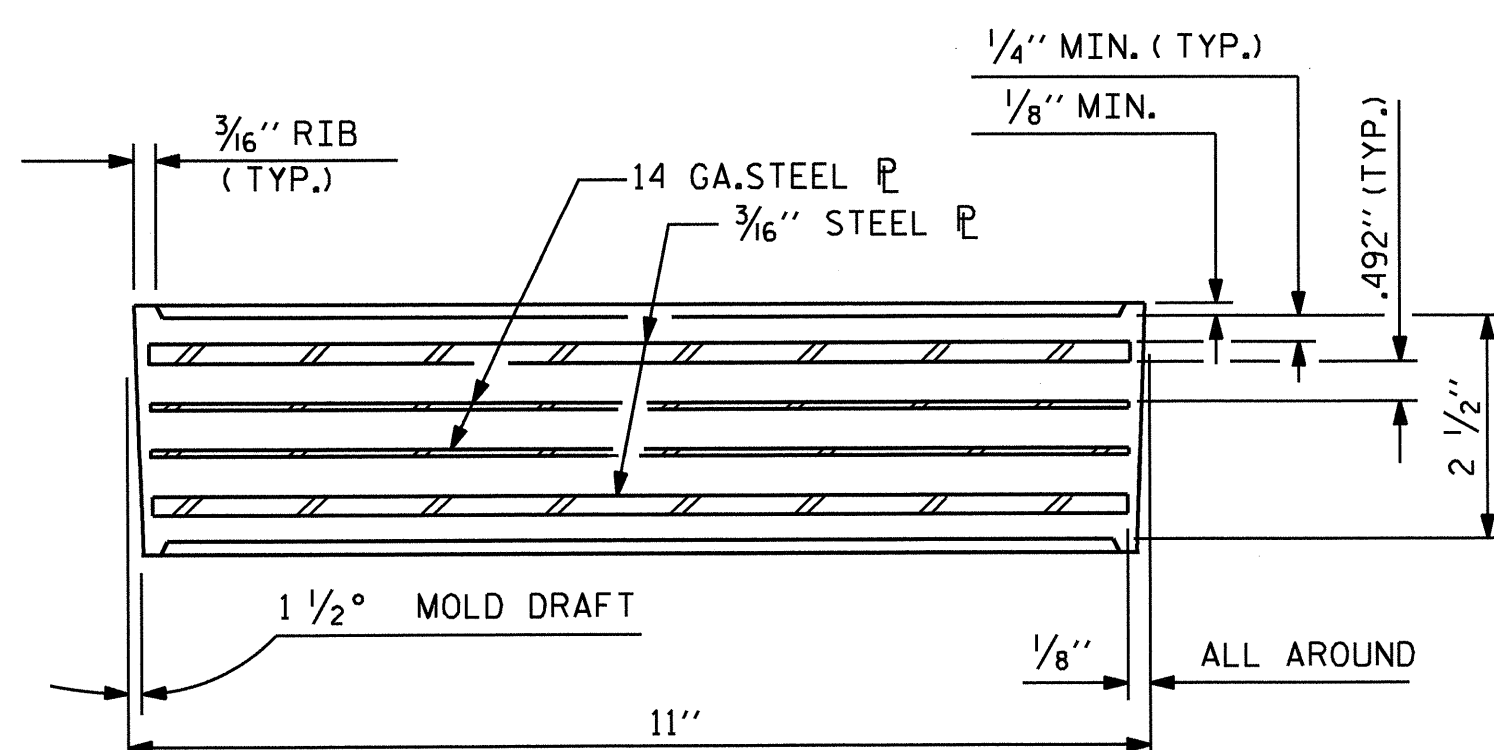
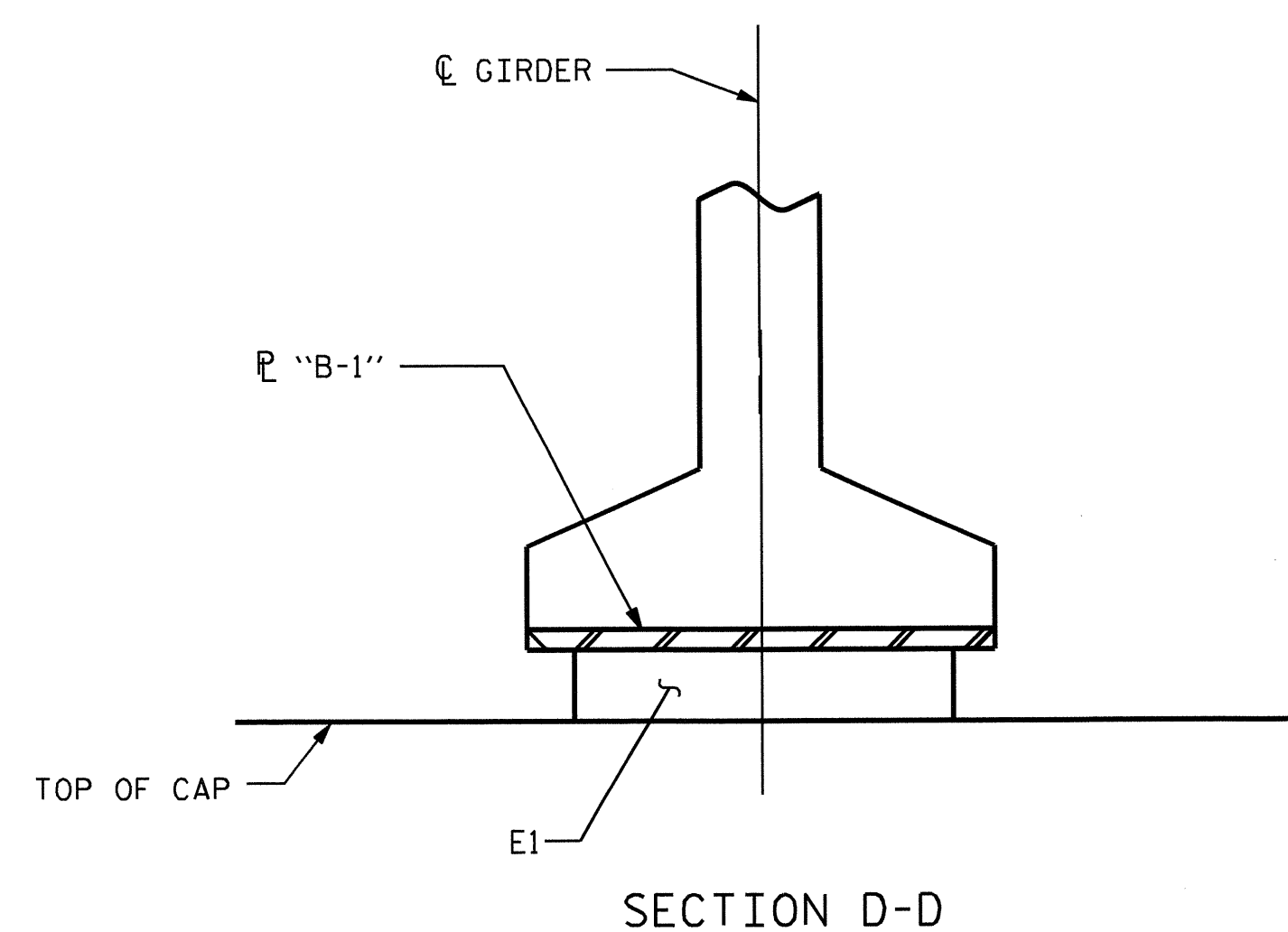
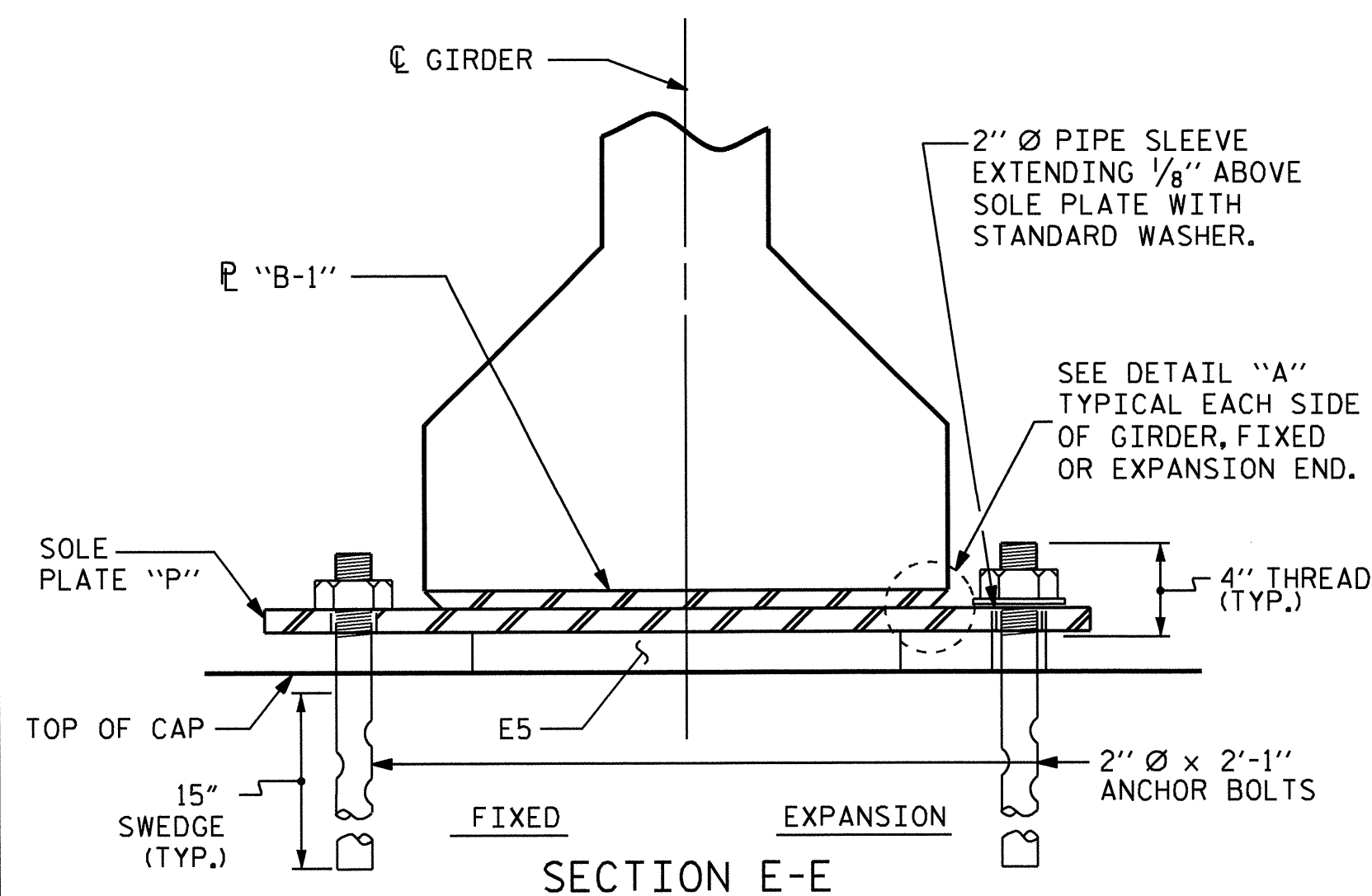
WHEN WELDING THE SOLE PLATE TO THE EMBEDDED PLATE IN THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE SOLE PLATE DOES NOT EXCEED 300°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.

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

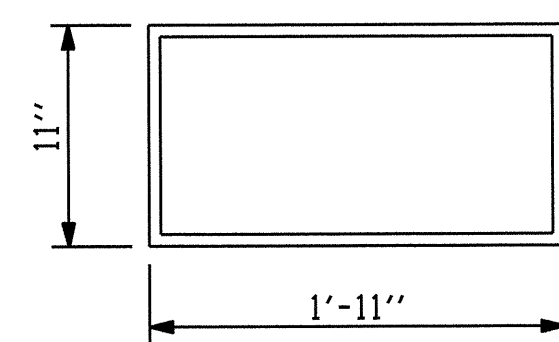
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

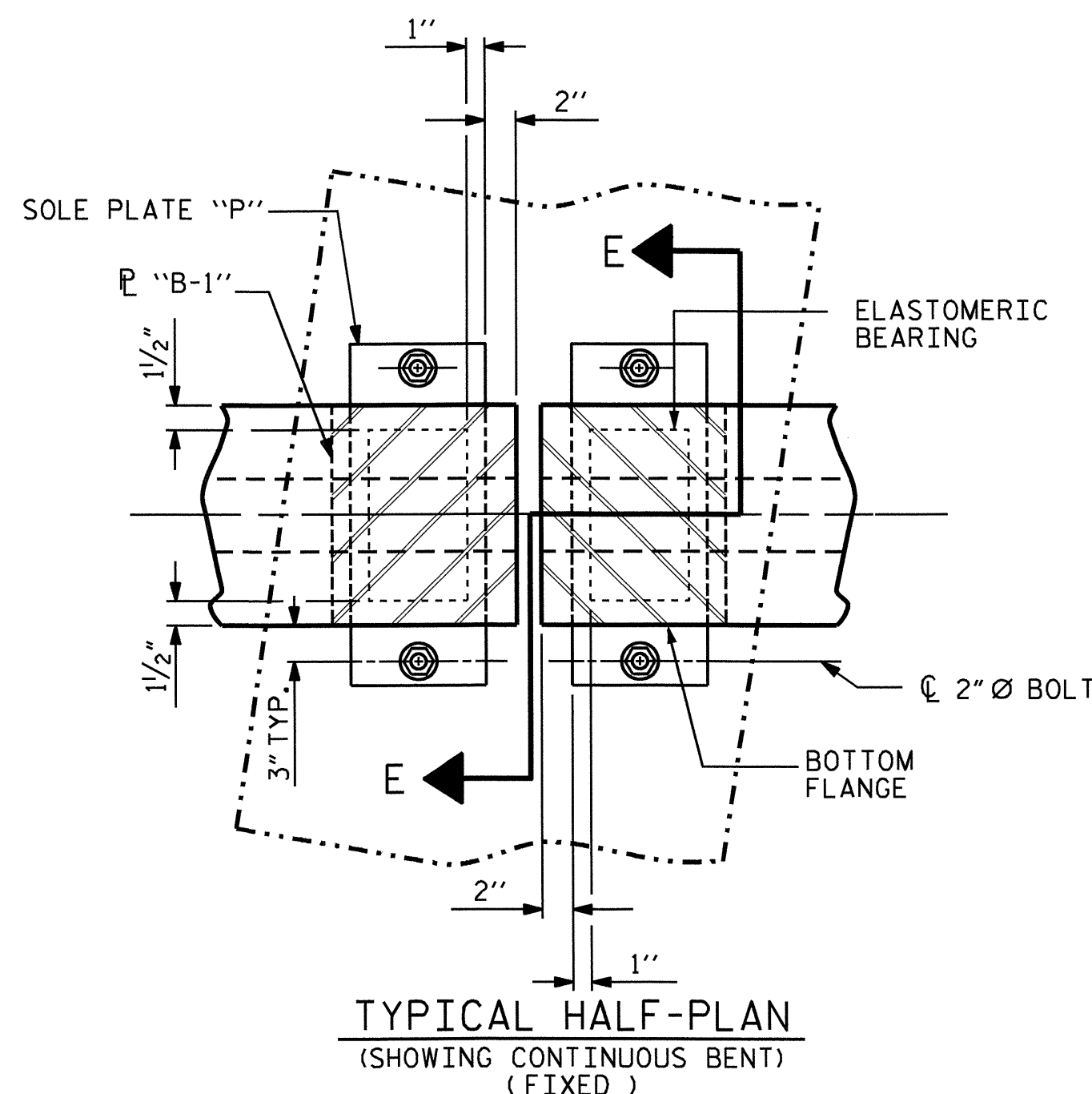
| — LOAD RATINGS — |                         |
|------------------|-------------------------|
| TYPE VI          | MAX.D.L.+ L.L.<br>263 K |



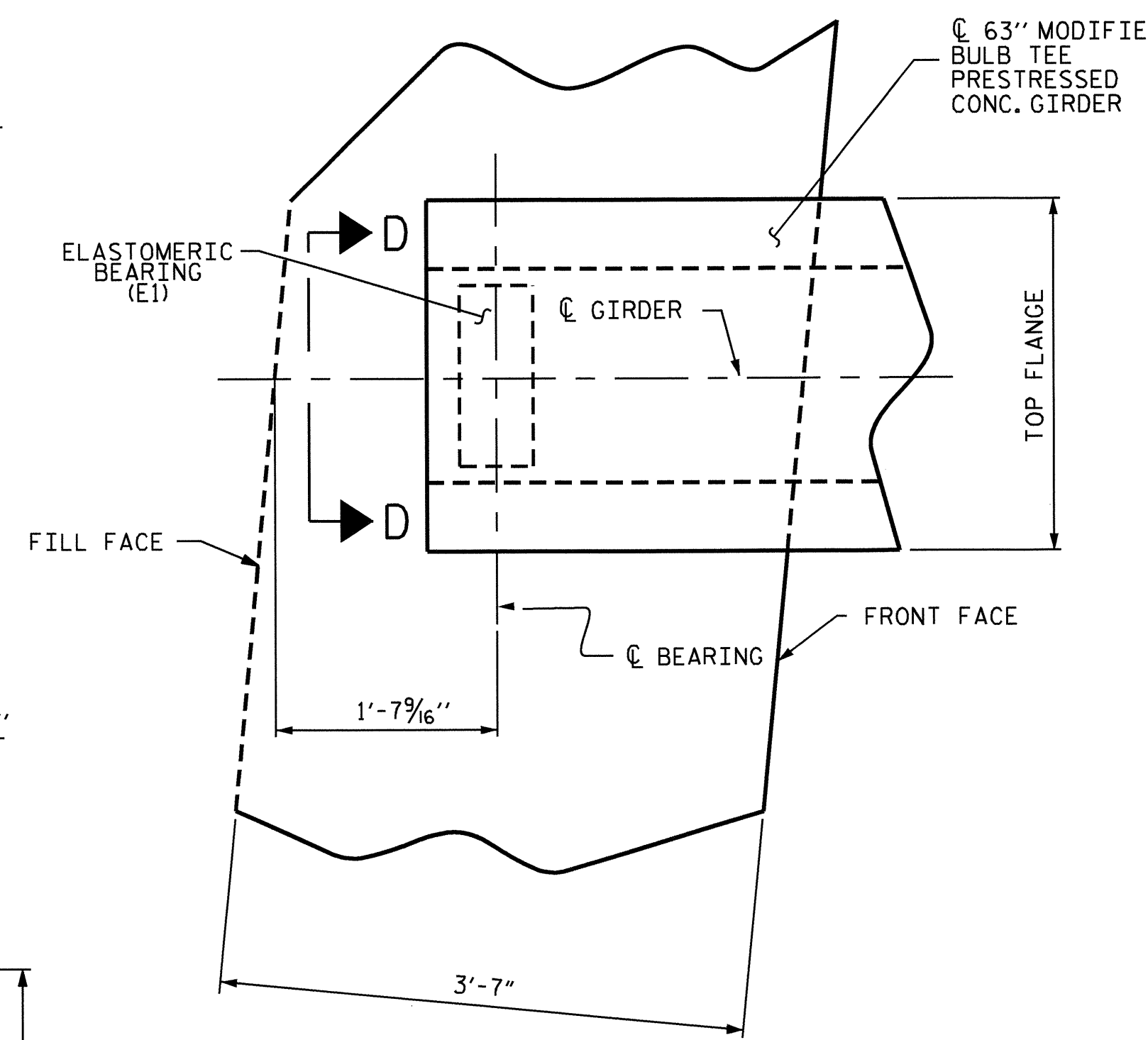
TYPICAL SECTION OF ELASTOMERIC BEARINGS



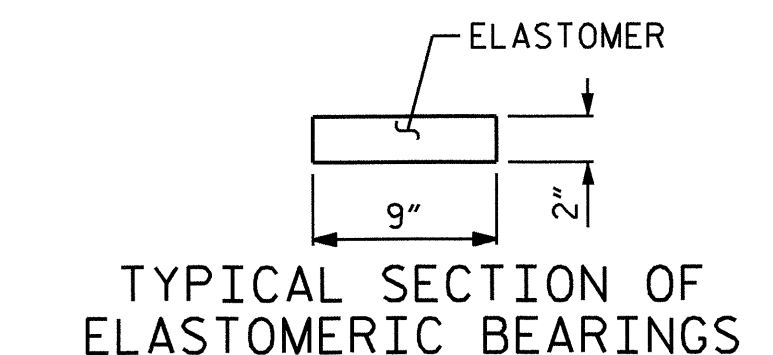
E5 (16 REQ'D)  
PLAN VIEW OF ELASTOMERIC BEARING  
TYPE VI



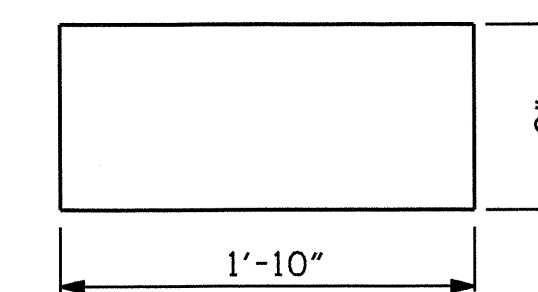
TYPICAL HALF-PLAN  
(SHOWING CONTINUOUS BENT)  
(FIXED)



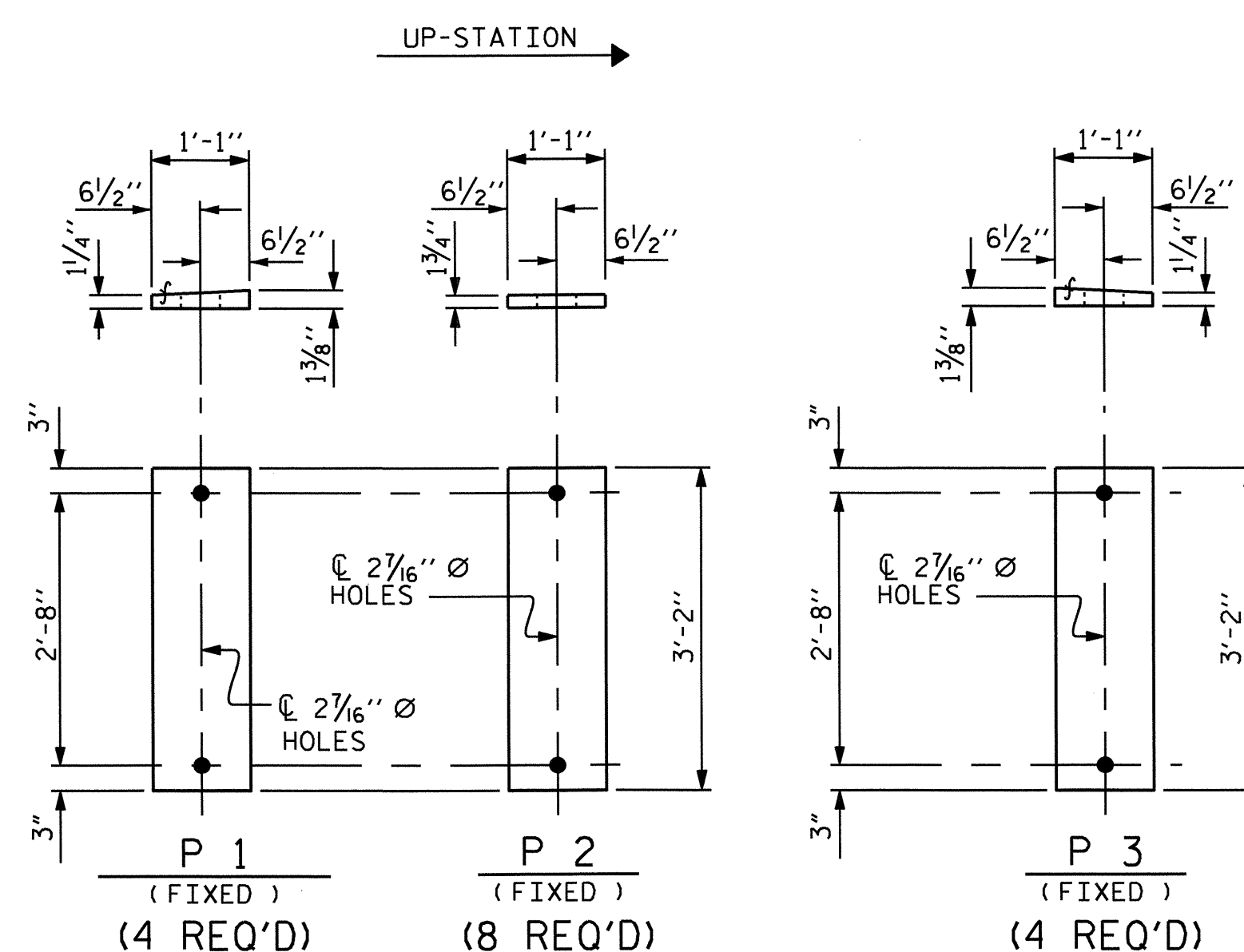
PLAN OF GIRDER @  
INTEGRAL END BENT



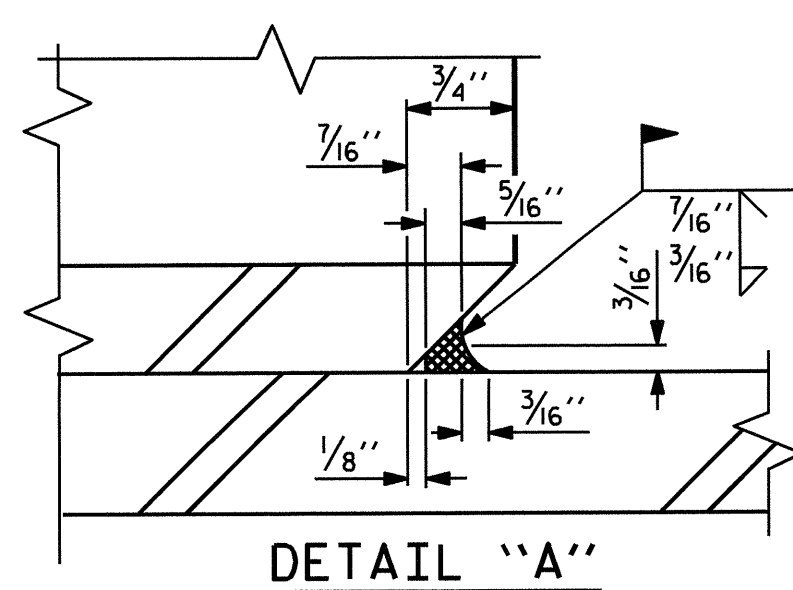
TYPICAL SECTION OF  
ELASTOMERIC BEARINGS



E1  
(FIXED)  
E1 (8 REQ'D)  
PLAN VIEW OF  
ELASTOMERIC BEARING  
(@ END BENTS)

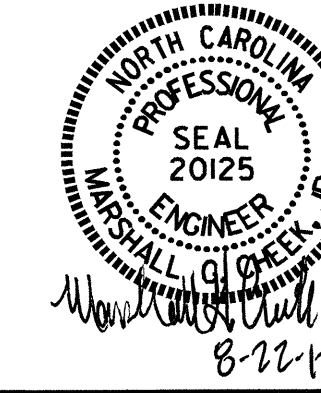


SOLE PLATE DETAILS ("P")



DETAIL "A"

|                                  |                       |
|----------------------------------|-----------------------|
| ASSEMBLED BY : A.L. FIGUEROA/VXN | DATE : 5-17-11        |
| CHECKED BY : M.G. CHEEK          | DATE : 9-11           |
| DRAWN BY : EEM 2/97              | REV. 10/17/00 RWW/LES |
| CHECKED BY : VAP 2/97            | REV. 5/1/06 TLA/GM    |
|                                  | REV. 10/1/11 MAA/GM   |



PROJECT NO. B-4632  
RUTHERFORD COUNTY  
STATION: 30+66.99 -L-

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

| REVISIONS |     |       |     | SHEET NO. |       |              |
|-----------|-----|-------|-----|-----------|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY:       | DATE: | S-14         |
| 1         |     |       | 3   |           |       | TOTAL SHEETS |
| 2         |     |       | 4   |           |       | 34           |

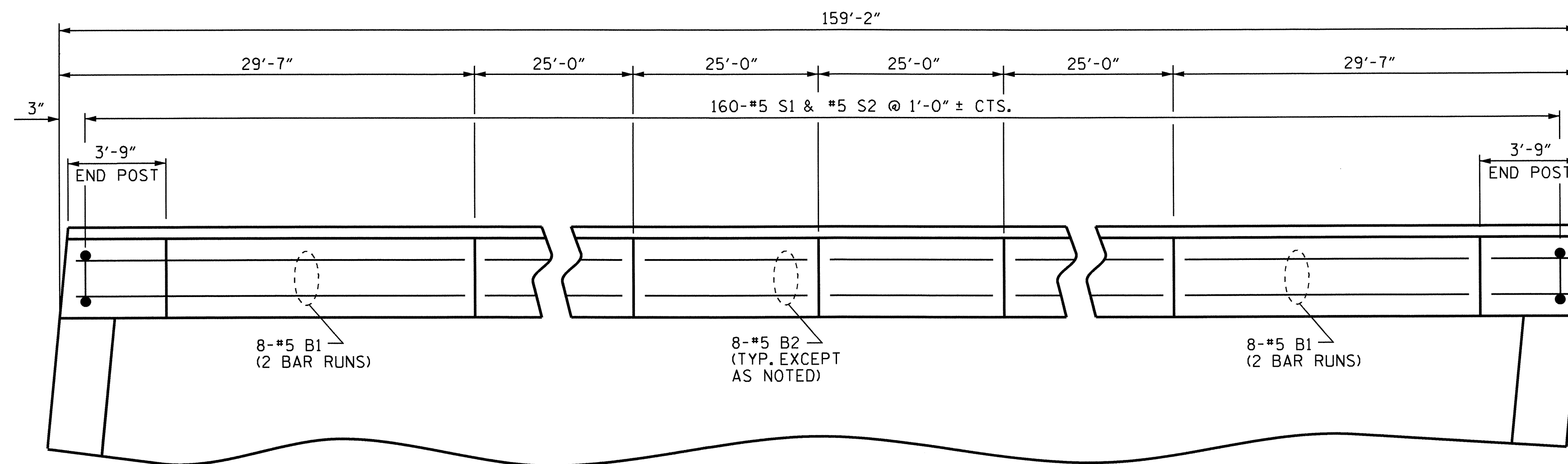
**NOTES**

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

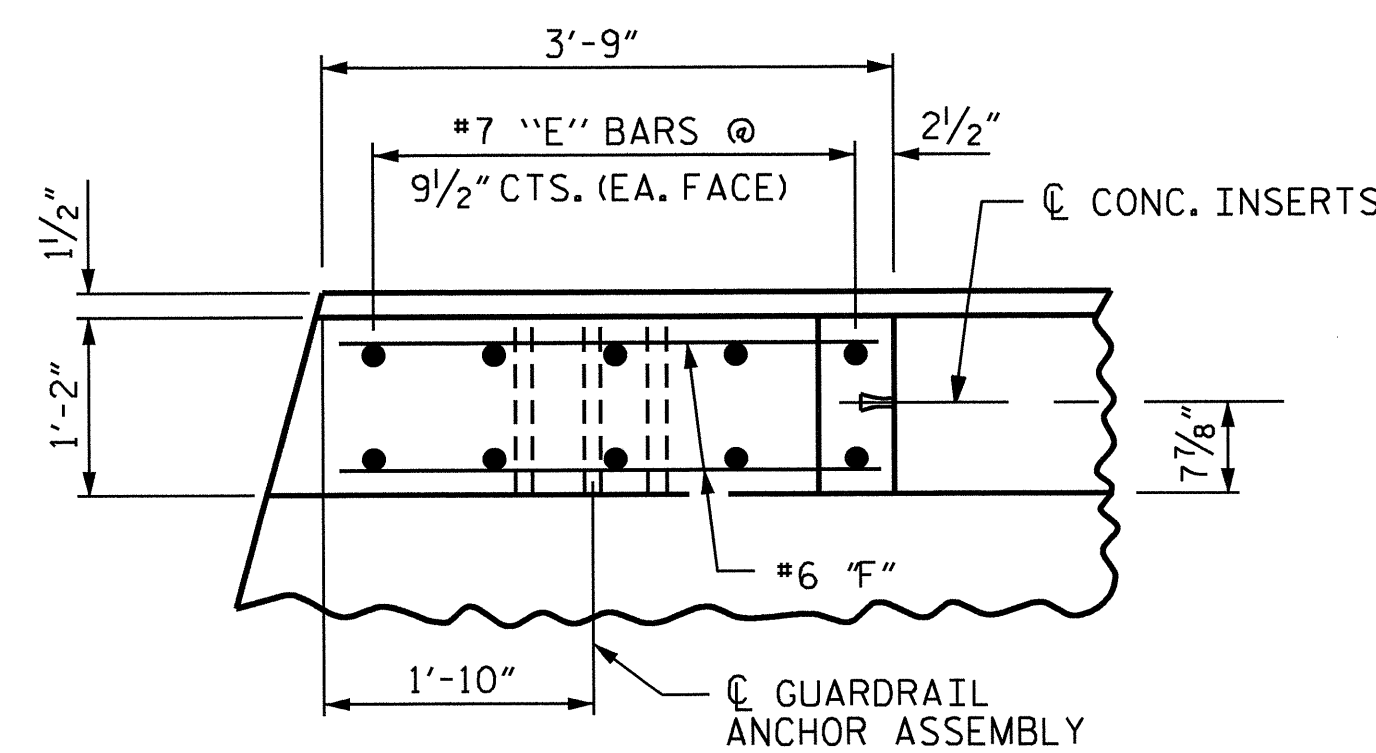
ALL REINFORCING STEEL IN CONCRETE PARAPETS SHALL BE EPOXY COATED.

SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEET FOR CONCRETE INSERT DETAILS.

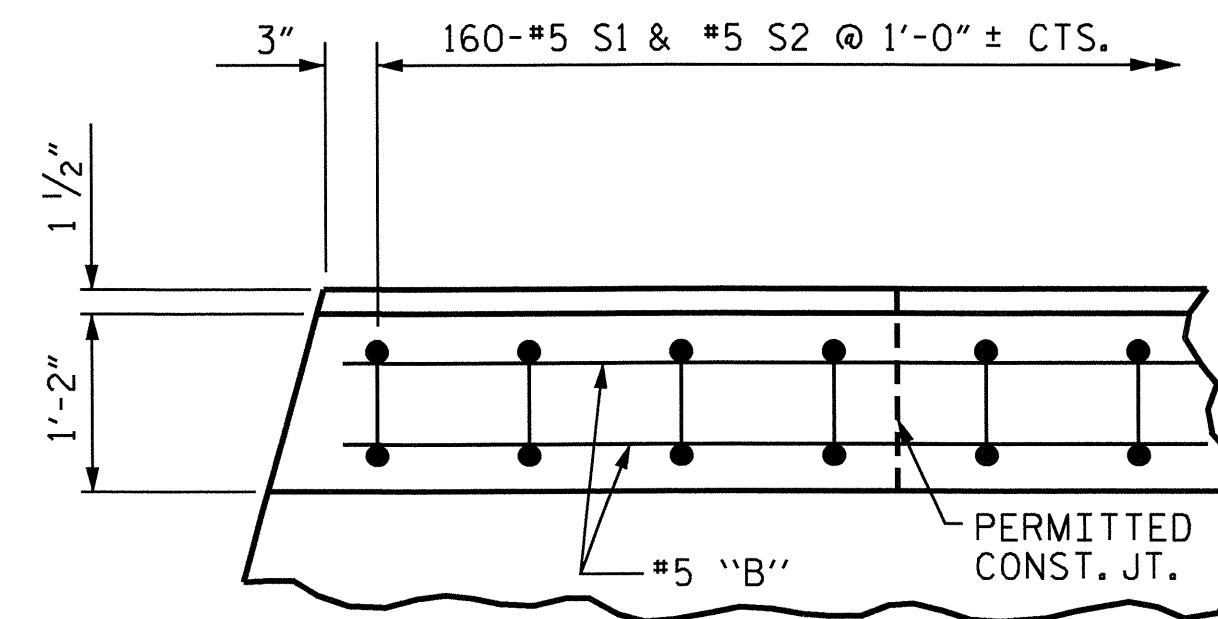
SEE "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" SHEET FOR GUARDRAIL ANCHOR ASSEMBLY.



**PLAN OF PARAPET & END POST**  
(TYP. EA. SIDE)

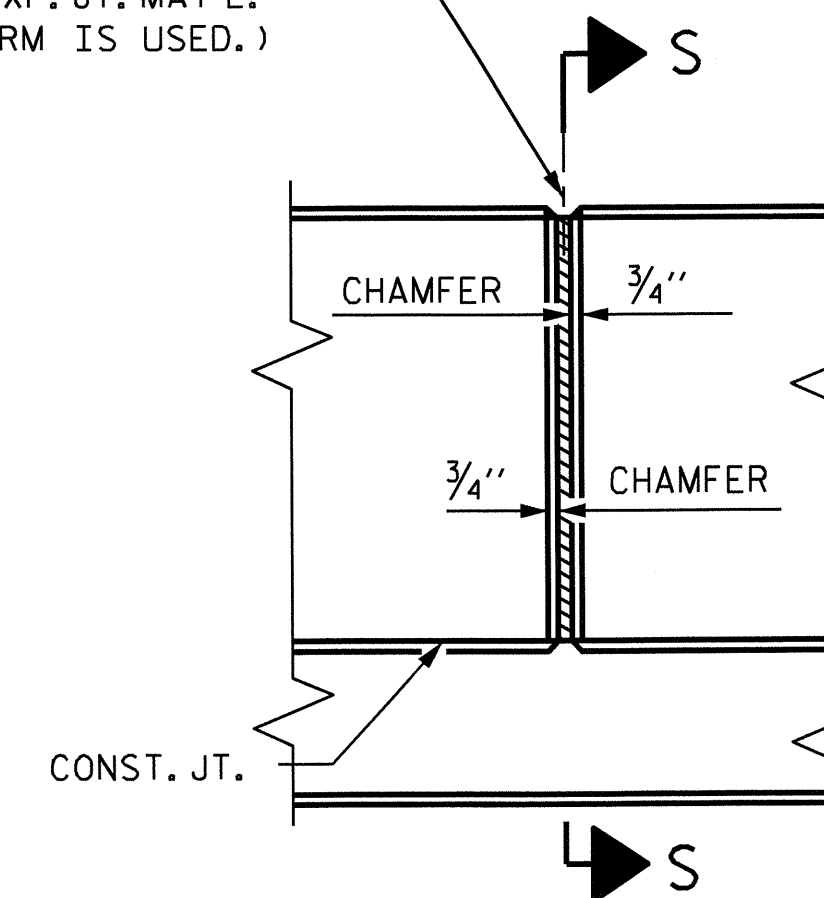


**PLAN OF END POST DETAIL**

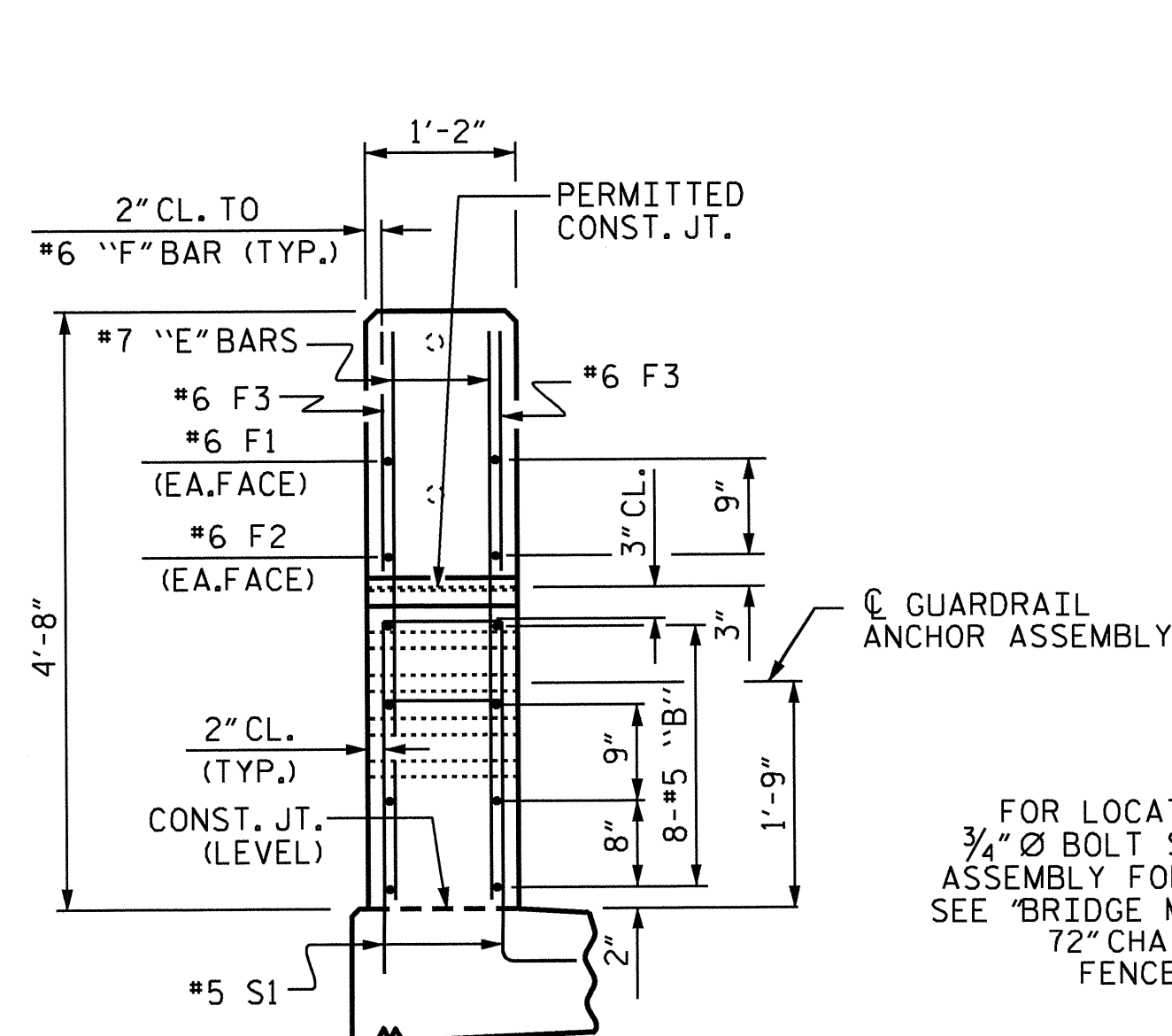


**PLAN OF PARAPET DETAIL**

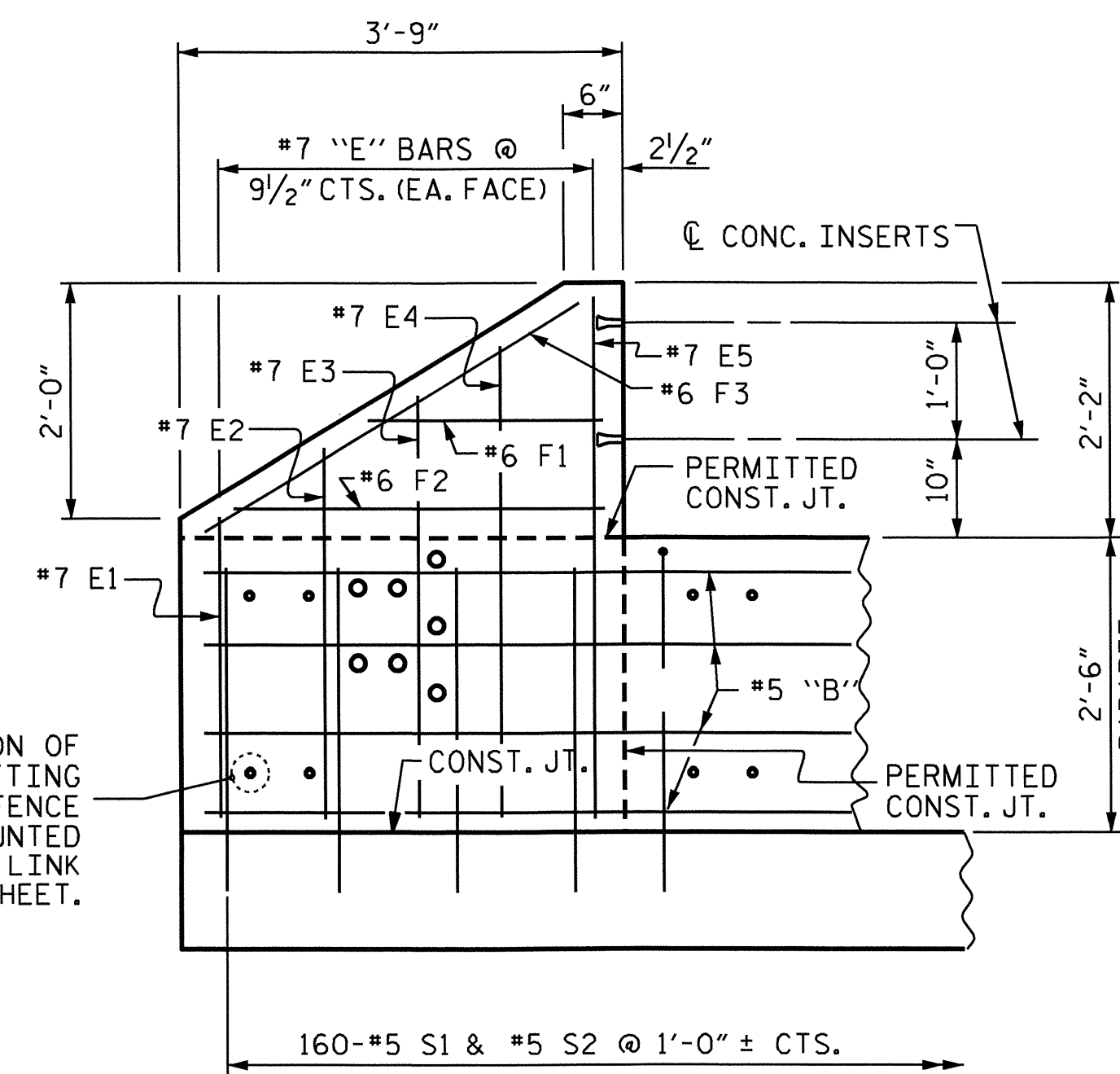
1/2" EXP. JT. MAT'L HELD IN PLACE WITH GALVANIZED NAILS. (NOTE: OMIT EXP. JT. MAT'L. WHEN SLIP FORM IS USED.)



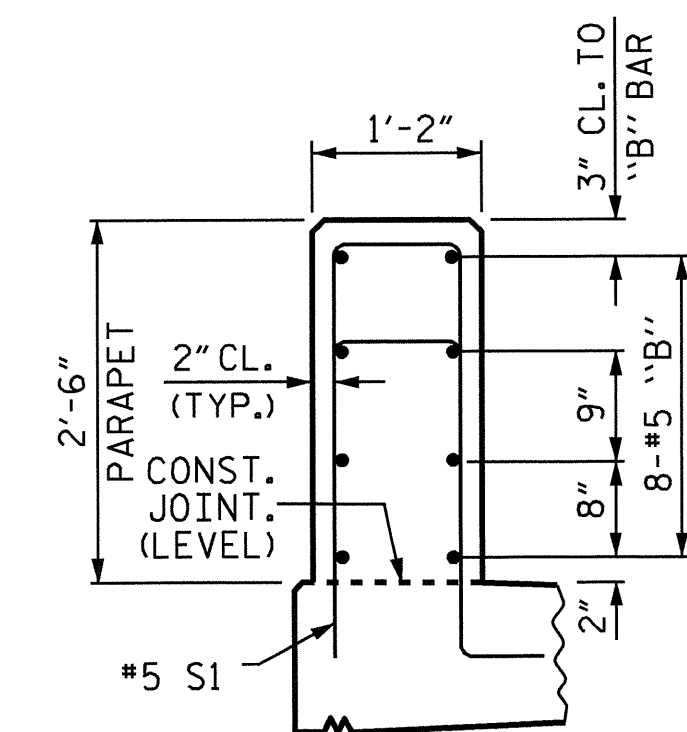
**ELEVATION AT JOINTS IN PARAPET**



**END VIEW**

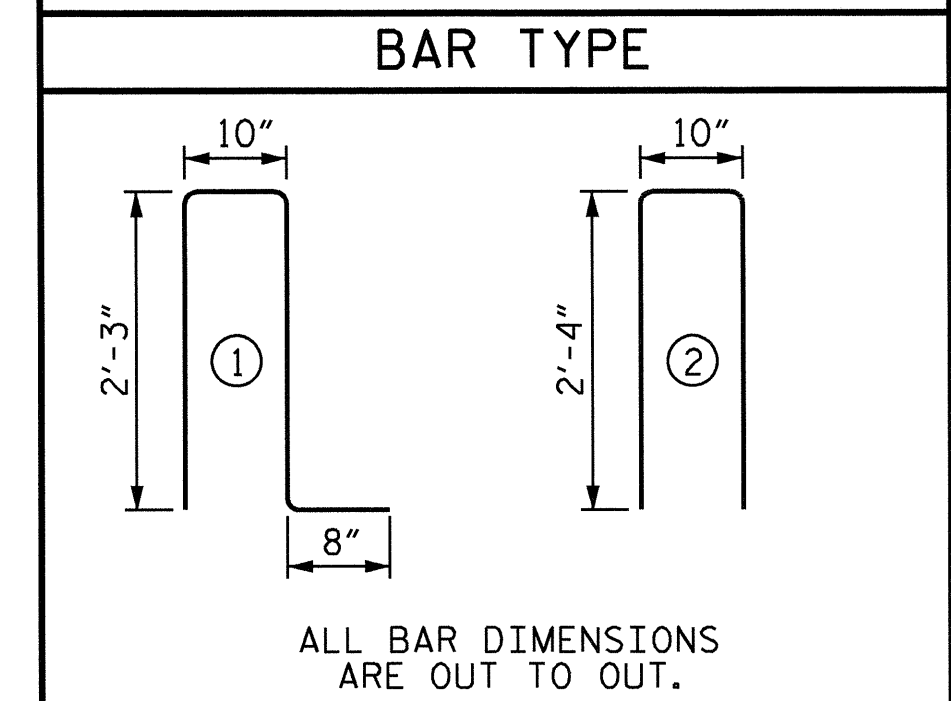


**ELEVATION**



**SECTION THRU PARAPET**

| BILL OF MATERIAL                 |     |      |      |        |                 |
|----------------------------------|-----|------|------|--------|-----------------|
| PARAPET & FOUR END POSTS         |     |      |      |        |                 |
| BAR                              | NO. | SIZE | TYPE | LENGTH | WEIGHT          |
| *B1                              | 64  | #5   | STR  | 16'-5" | 1096            |
| *B2                              | 64  | #5   | STR  | 24'-7" | 1641            |
| *E1                              | 8   | #7   | STR  | 2'-6"  | 41              |
| *E2                              | 8   | #7   | STR  | 3'-0"  | 49              |
| *E3                              | 8   | #7   | STR  | 3'-6"  | 57              |
| *E4                              | 8   | #7   | STR  | 4'-0"  | 65              |
| *E5                              | 8   | #7   | STR  | 4'-4"  | 71              |
| *F1                              | 8   | #6   | STR  | 1'-10" | 22              |
| *F2                              | 8   | #6   | STR  | 3'-0"  | 36              |
| *F3                              | 8   | #6   | STR  | 3'-4"  | 40              |
| *S1                              | 320 | #5   | 1    | 7'-0"  | 2336            |
| *S2                              | 320 | #5   | 2    | 5'-6"  | 1836            |
| * EPOXY COATED REINFORCING STEEL |     |      |      |        | 7,290 LBS.      |
| 1'-2" x 2'-6" CONCRETE PARAPET   |     |      |      |        | 318.33 LIN. FT. |
| CLASS AA CONCRETE                |     |      |      |        | 35.2 CU. YD.    |



PROJECT NO. B-4632  
RUTHERFORD COUNTY  
STATION: 30+66.99 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUPERSTRUCTURE  
1'-2" x 2'-6"  
CONCRETE PARAPET



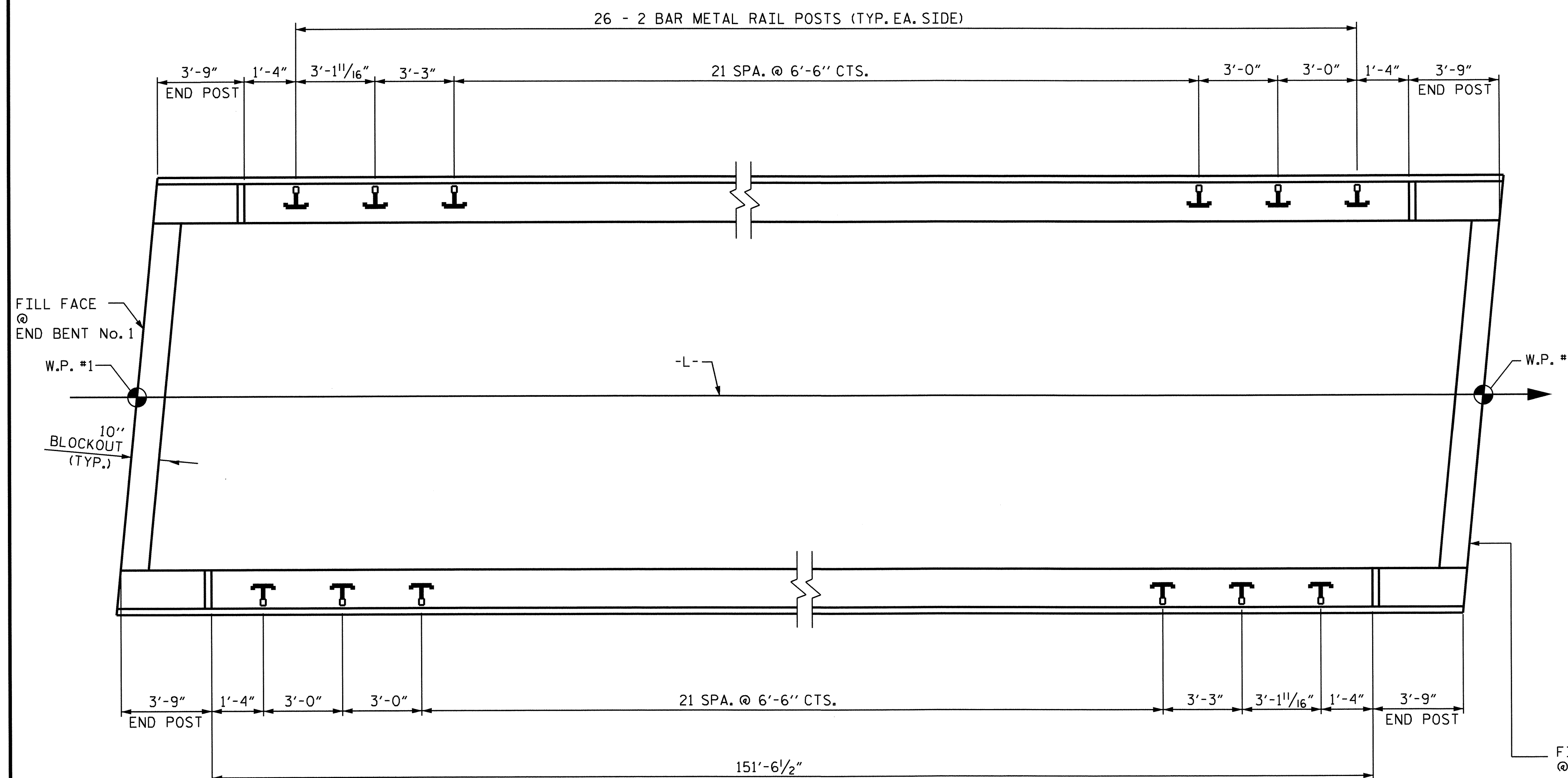
| REVISIONS |     |       |     |     |       | SHEET NO.       |  |
|-----------|-----|-------|-----|-----|-------|-----------------|--|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-15            |  |
| 1         |     |       | 3   |     |       | TOTAL SHEETS 34 |  |
| 2         |     |       | 4   |     |       |                 |  |

DRAWN BY: A.L. FIGUEROA/VXN DATE: 5-17-11  
CHECKED BY: M.G. CHEEK DATE: 9-11

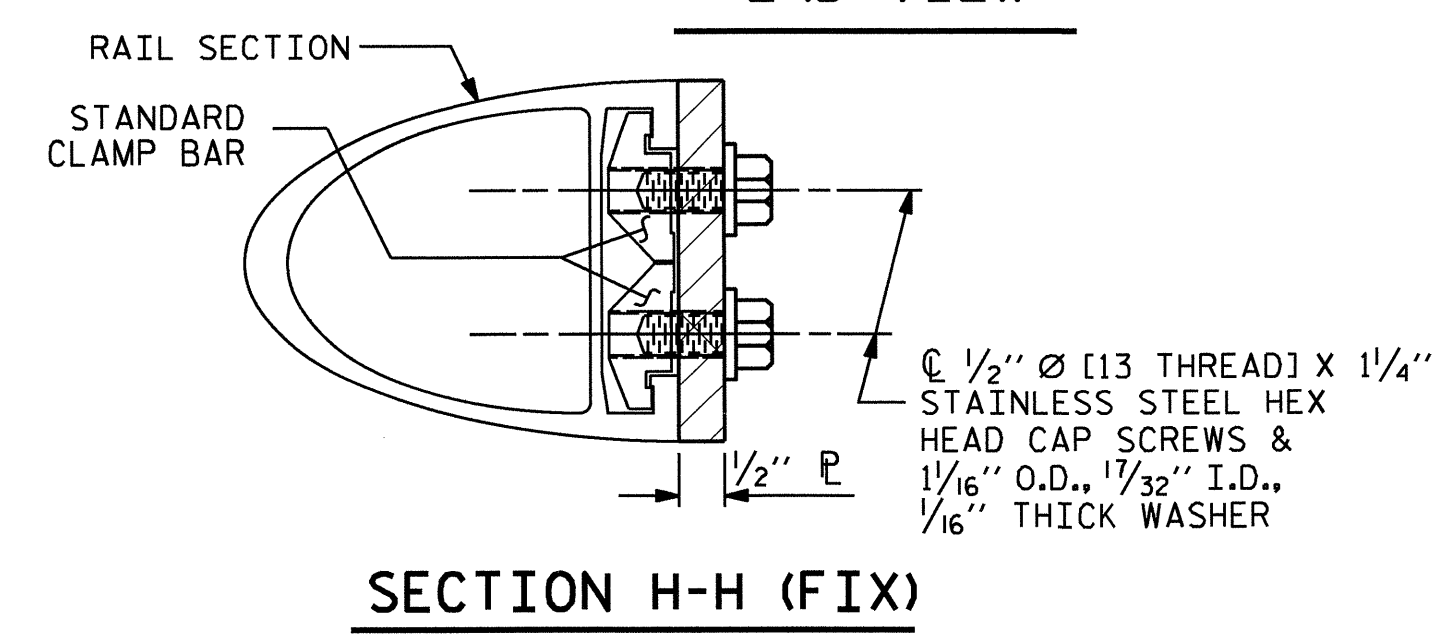
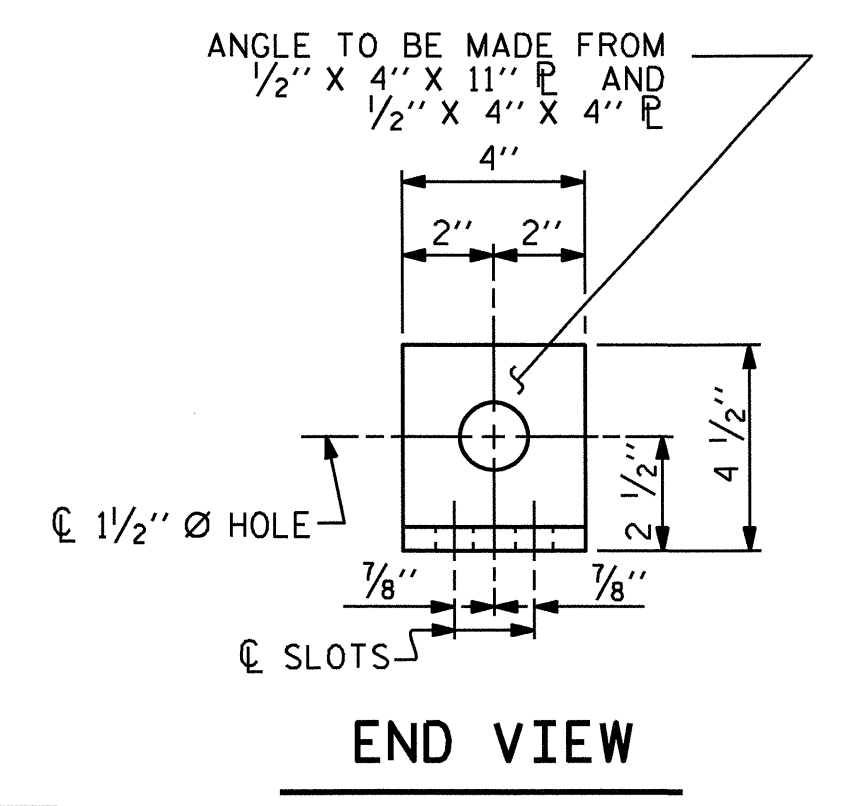
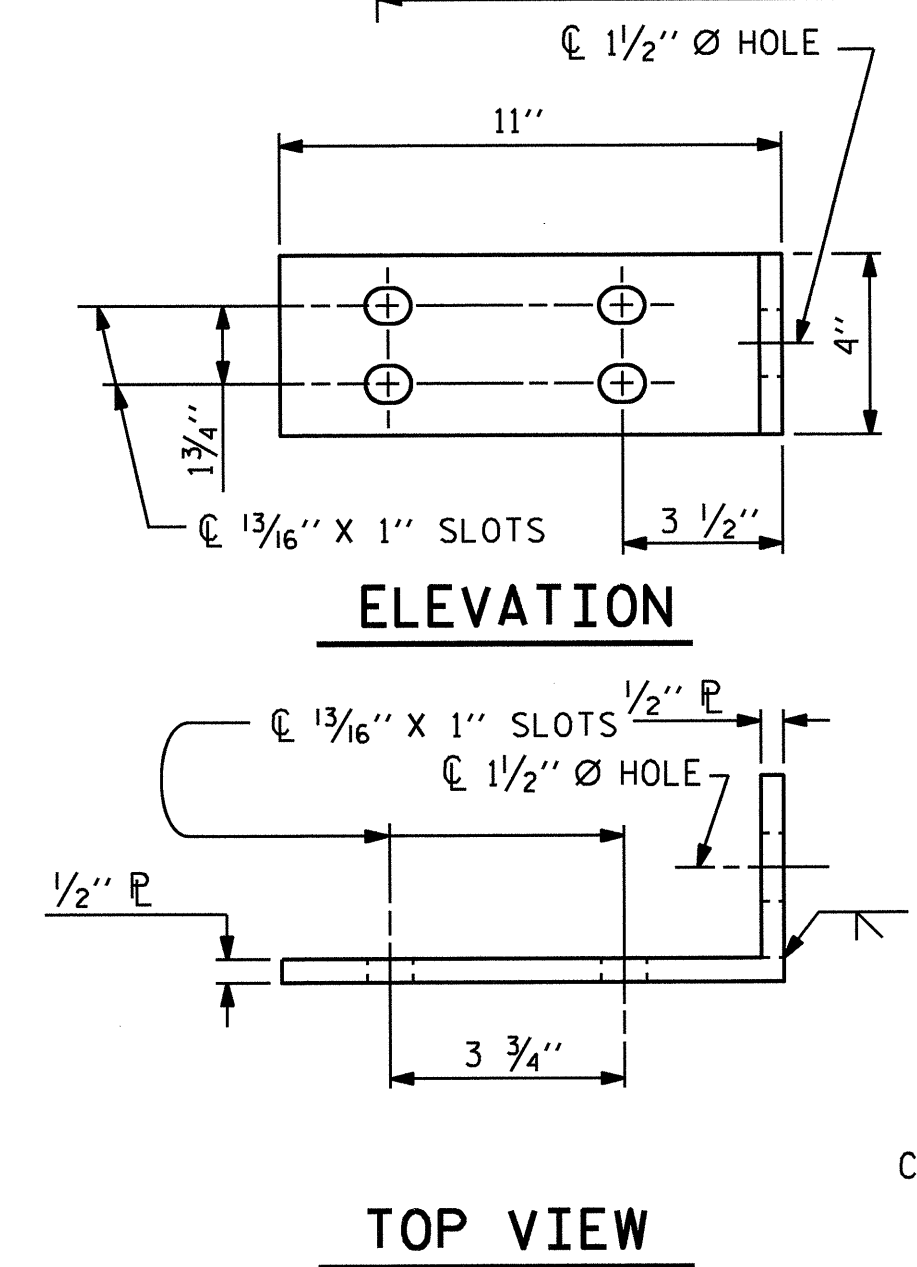
29-JUN-2012 07:48  
R:\Structures\Final Plans\B-4632.SD.09.2MR.dgn  
dahodge

**PARAPET AND END POST FOR TWO BAR RAIL**

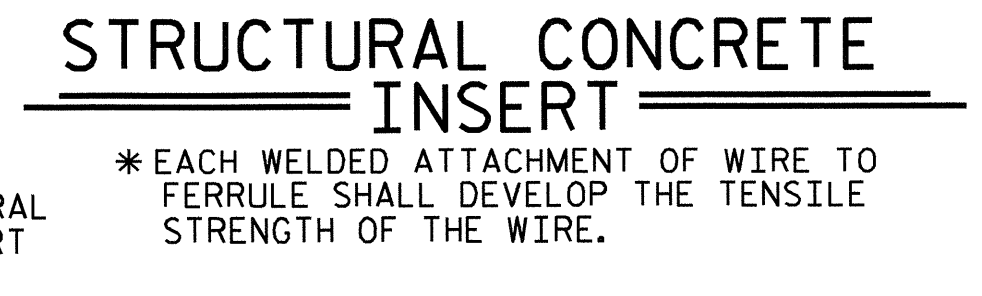
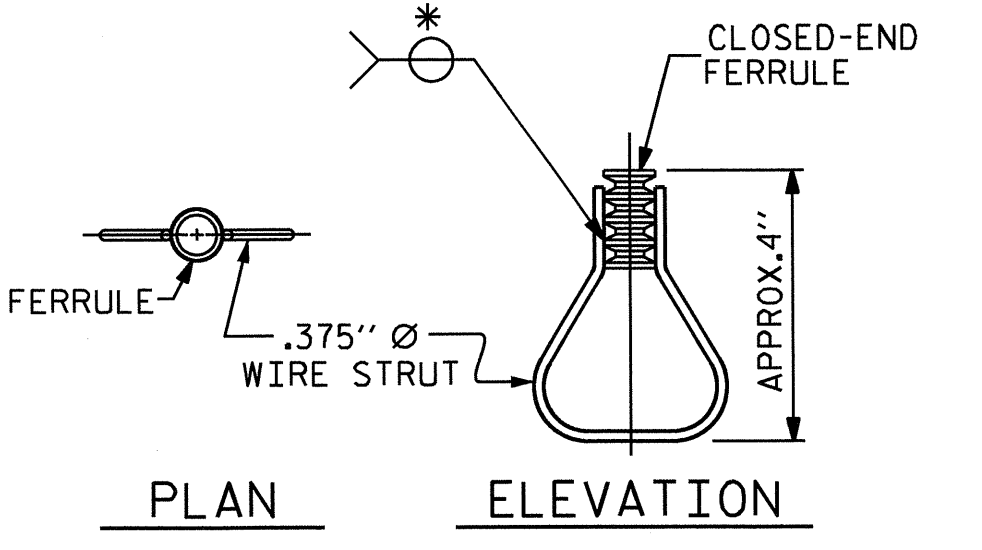
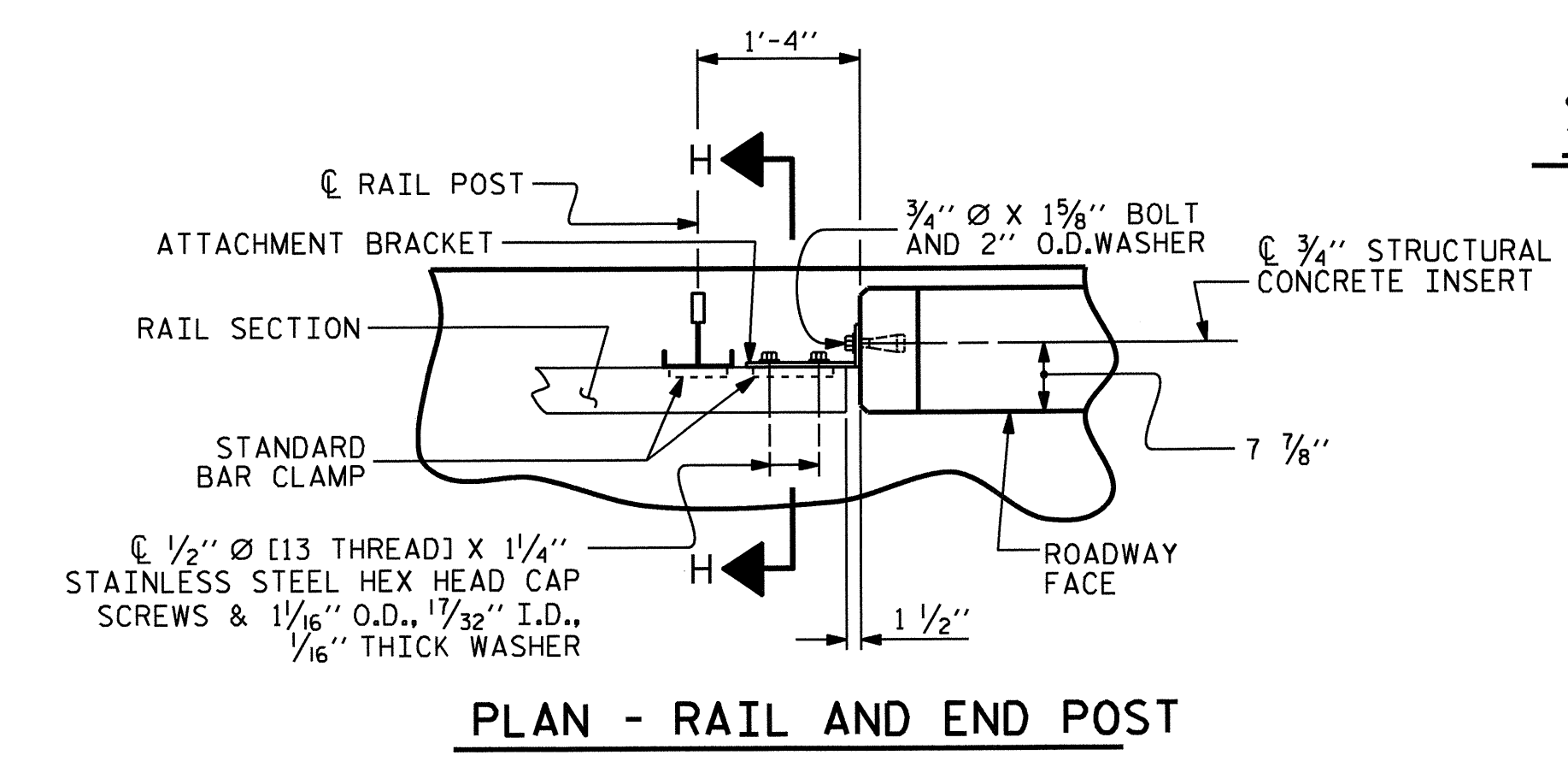




**PLAN OF RAIL POST SPACINGS**



**DETAILS FOR ATTACHING METAL RAIL TO END POST**



PROJECT NO. B-4632  
 RUTHERFORD COUNTY  
 STATION: 30+66.99 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 RAIL POST SPACINGS  
 AND  
 END OF RAIL DETAILS



| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-16         |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |
| 2         |     |       | 4   |     |       | 34           |

ASSEMBLED BY: A.L. FIGUEROA/VXN DATE: 5-17-11  
 CHECKED BY: M.G. CHEEK DATE: 9-11  
 DRAWN BY: FCJ 1/88 REV. 5/7/03 RWW/JTE  
 CHECKED BY: CRK 3/89 REV. 5/1/06 TLA/GM  
 REV. 10/1/11 MAA/GM

**NOTES**

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

**ALUMINUM RAILS**

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B-221 ALLOY 6061-T6. MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING.

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

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

**GALVANIZED STEEL RAILS**

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

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

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

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

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

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

**GENERAL NOTES**

RAILING SHALL BE CONTINUOUS FROM END POST TO END POST OF BRIDGE. EACH JOINT IN RAIL LENGTH SHALL BE SPLICED AS DETAILED. PANEL LENGTHS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS.

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

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

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

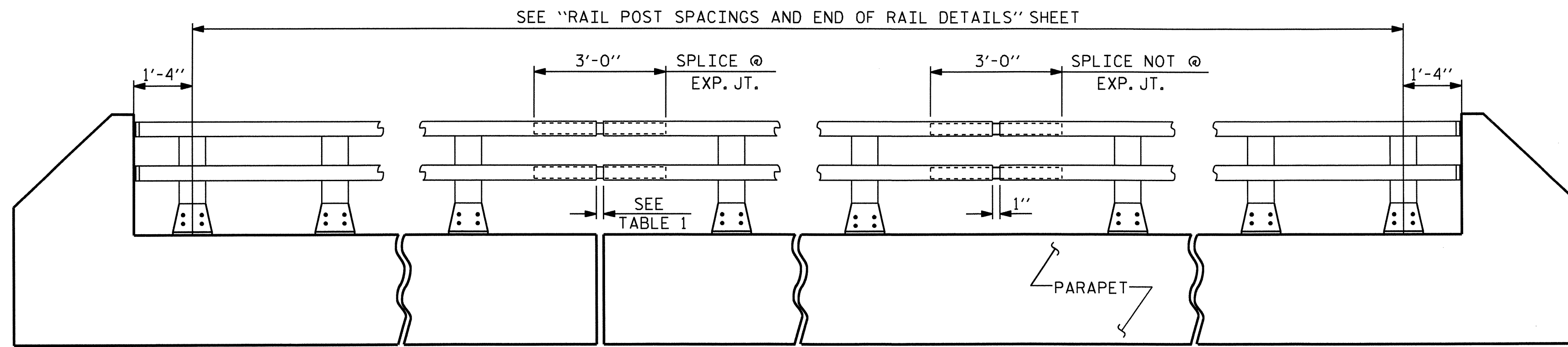
SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

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

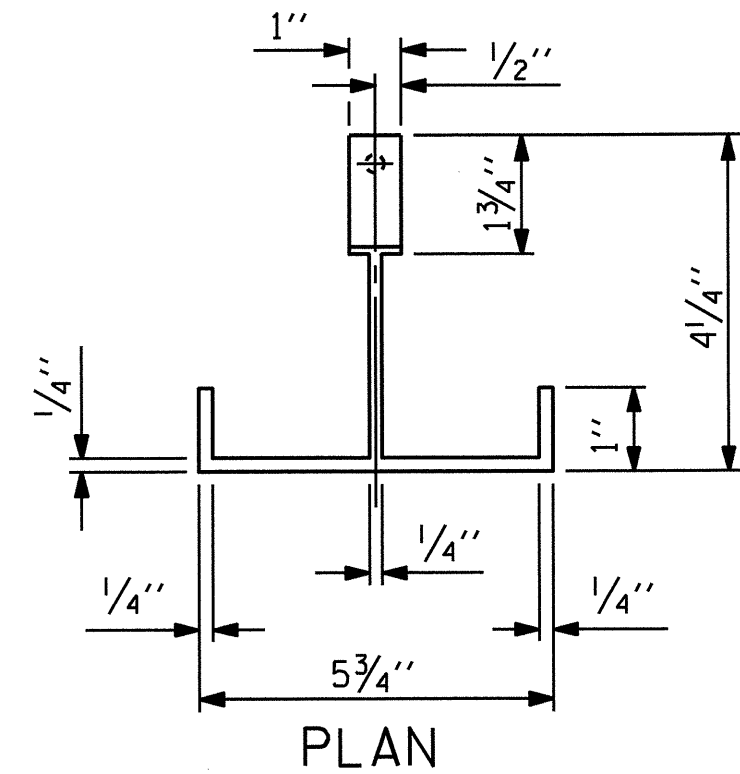
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT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

PAY LENGTH = 303.09 LIN. FT.

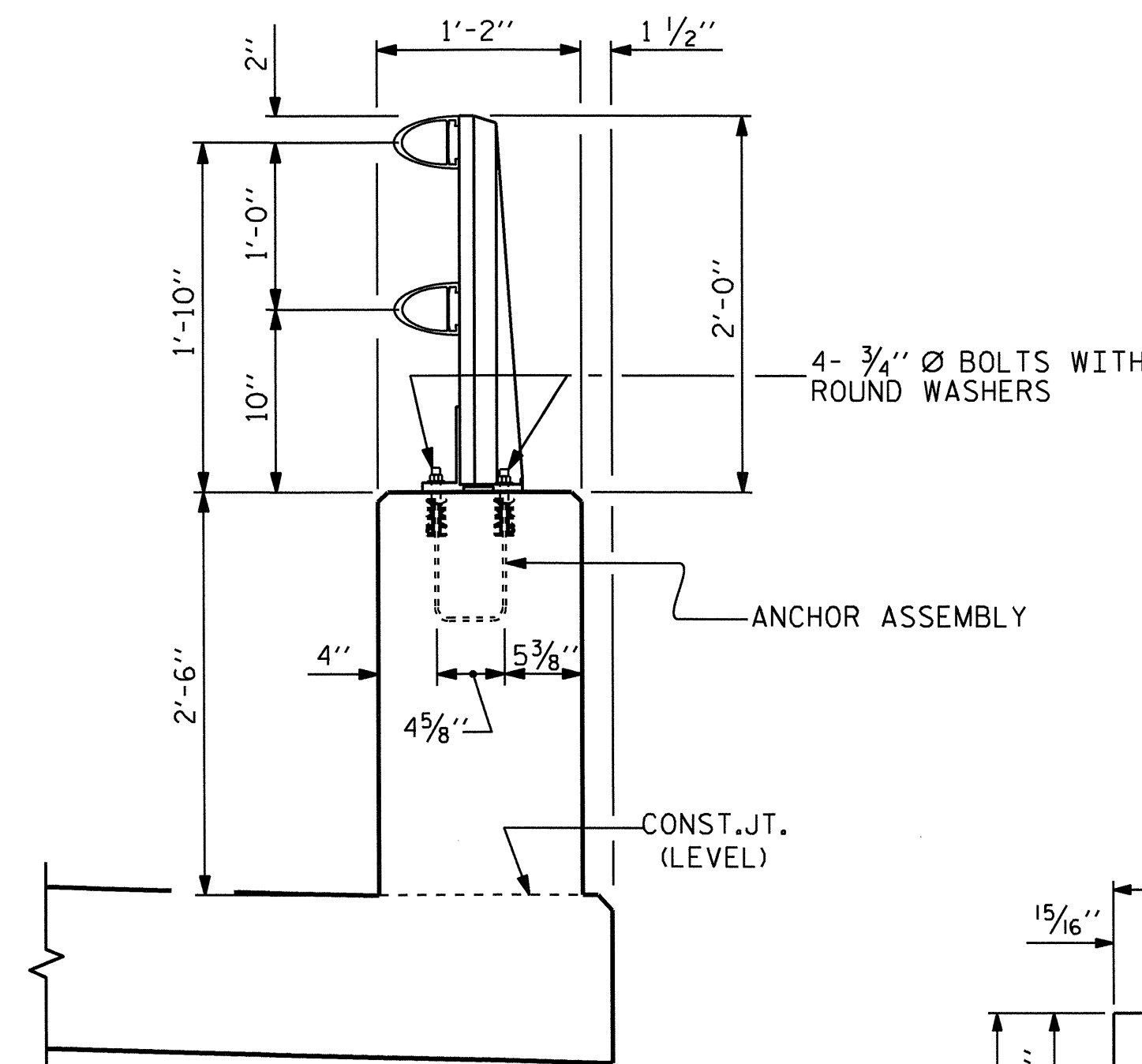


**ELEVATION**

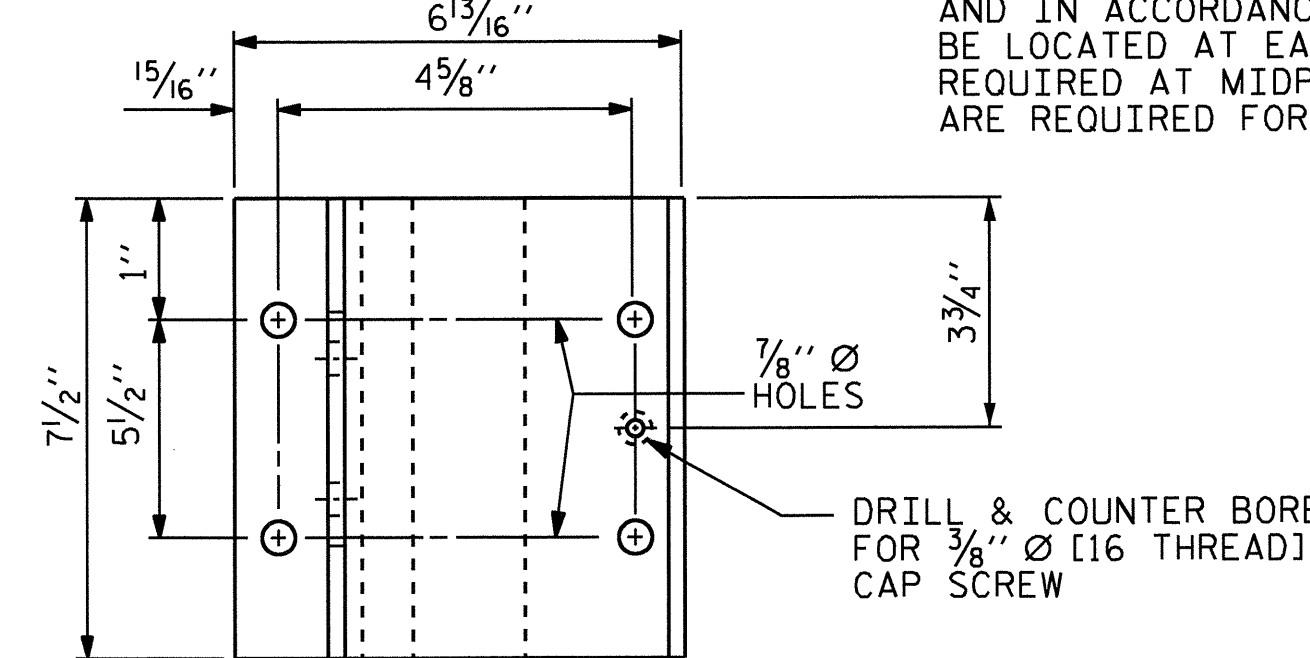
NOTE: FOR ATTACHMENT OF METAL RAIL TO END POST, SEE SHEET 2 OF 4 "RAIL POST SPACING AND END OF RAIL DETAILS".



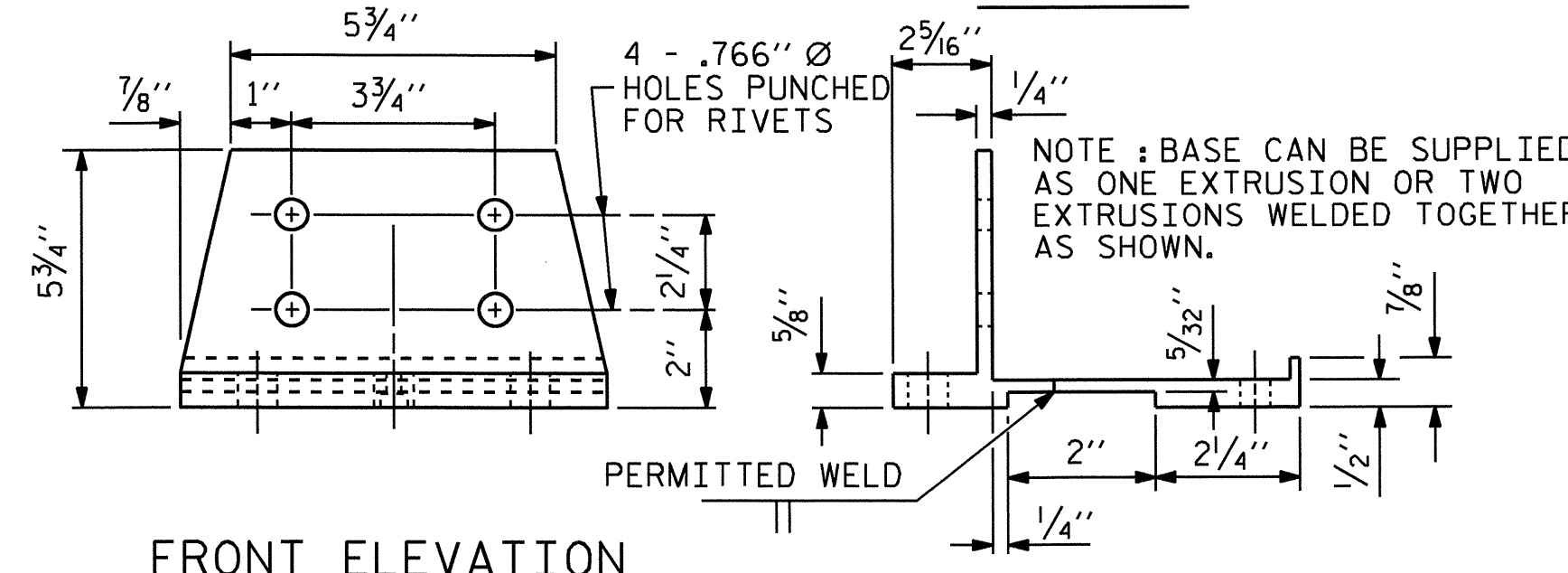
**PLAN**



**SECTION THRU PARAPET AND RAIL**



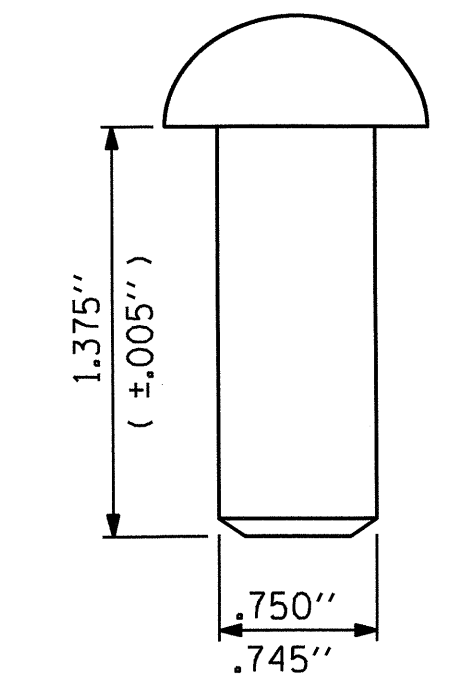
**PLAN**



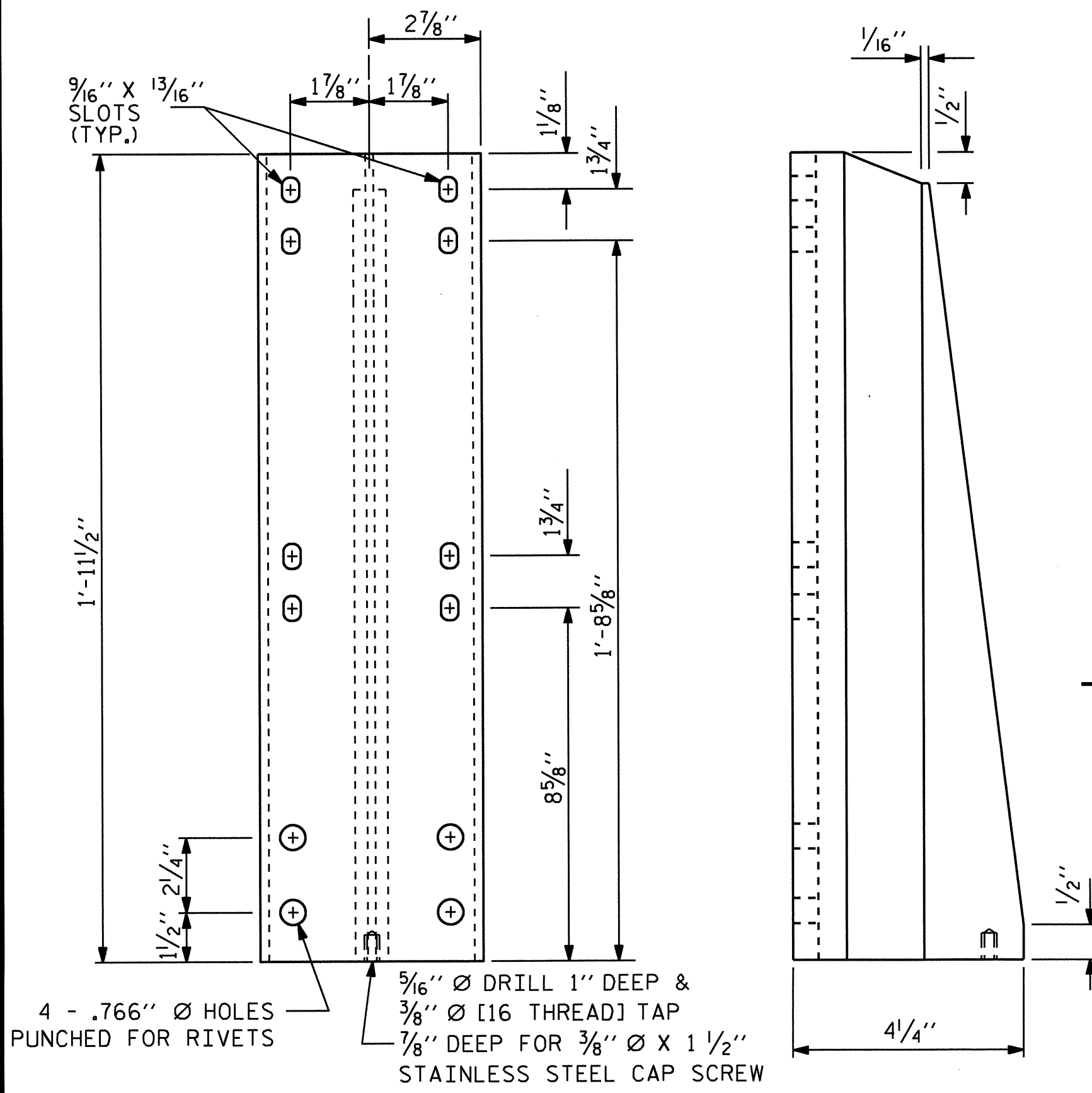
**FRONT ELEVATION**

**SIDE ELEVATION**

**POST BASE DETAILS**



**RIVET DETAIL**

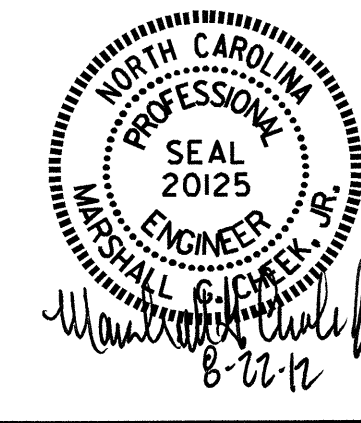


**FRONT ELEVATION**

**SIDE ELEVATION**

**DETAILS OF POST**

|                |                   |              |         |
|----------------|-------------------|--------------|---------|
| ASSEMBLED BY : | A.L. FIGUEROA/VXN | DATE :       | 5-17-11 |
| CHECKED BY :   | M.G. CHEEK        | DATE :       | 9-11    |
| DRAWN BY :     | EEM 6/94          | REV. 5/7/03R | RWW/JTE |
| CHECKED BY :   | RGW 6/94          | REV. 5/1/06  | TLA/GM  |
|                |                   | REV. 10/1/11 | MAA/GM  |



PROJECT NO. B-4632  
RUTHERFORD COUNTY  
 STATION: 30+66.99 -L-

SHEET 3 OF 4

|  |     |       |     |     |                    |
|--|-----|-------|-----|-----|--------------------|
| STATE OF NORTH CAROLINA<br>DEPARTMENT OF TRANSPORTATION<br>RALEIGH |     |       |     |     |                    |
| STANDARD<br>2 BAR METAL RAIL                                       |     |       |     |     |                    |
| REVISIONS  |     |       |     |     |                    |
| NO.  | BY: | DATE: | NO. | BY: | DATE:              |
| 1  |     |       | 3   |     |                    |
| 2  |     |       | 4   |     |                    |
|  |     |       |     |     | SHEET NO.<br>S-17  |
|  |     |       |     |     | TOTAL SHEETS<br>34 |

STD. NO. BMR3



NOTES

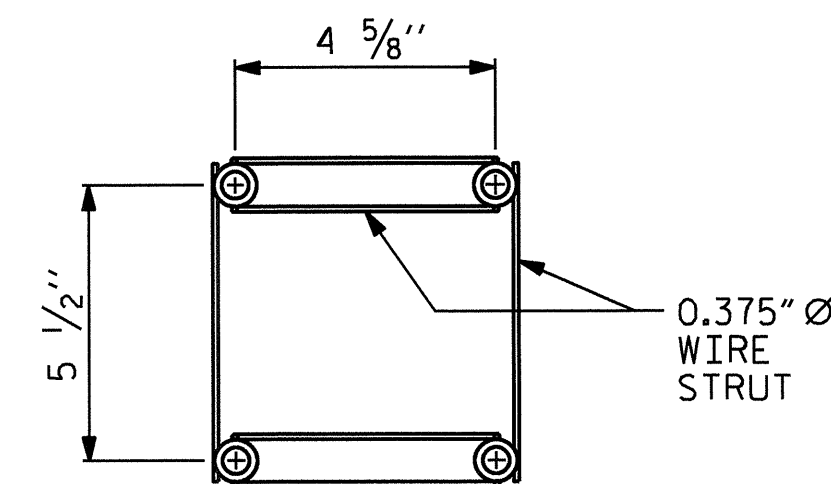
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

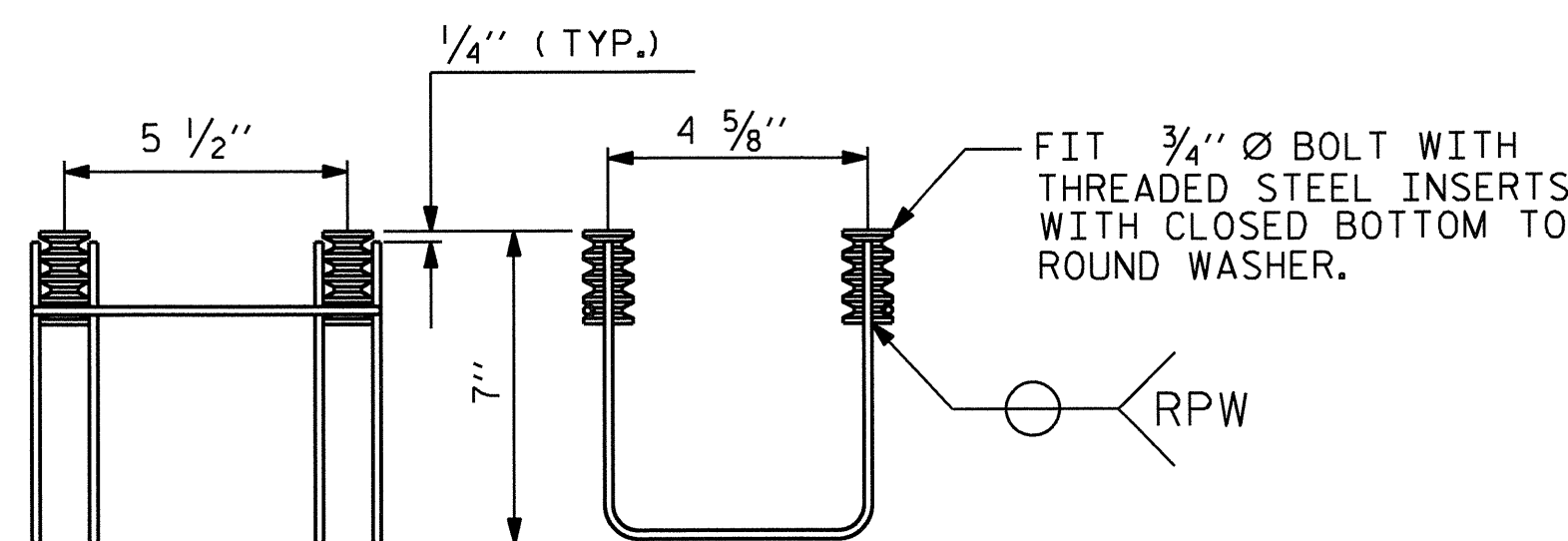
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.
- B. 4 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 2 1/2" GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.
- C. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 1/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.
- D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.
- E. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.
- F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE METAL RAIL ANCHOR ASSEMBLY. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE THE STANDARD SPECIFICATIONS.

WHEN ADHESIVELY ANCHORED ANCHOR BOLTS ARE USED, BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. NUTS SHALL MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.



PLAN

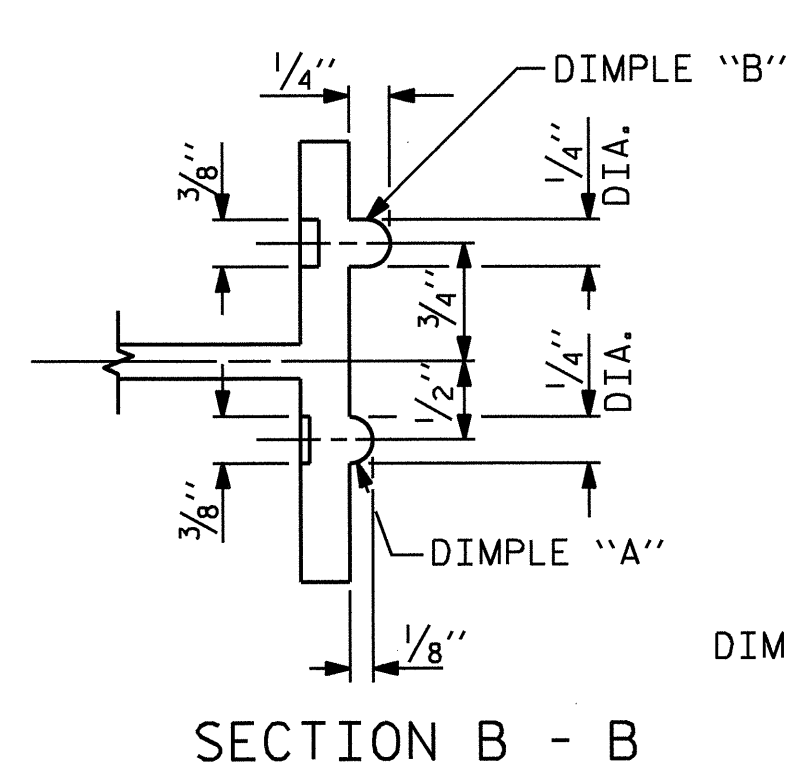


SIDE VIEW

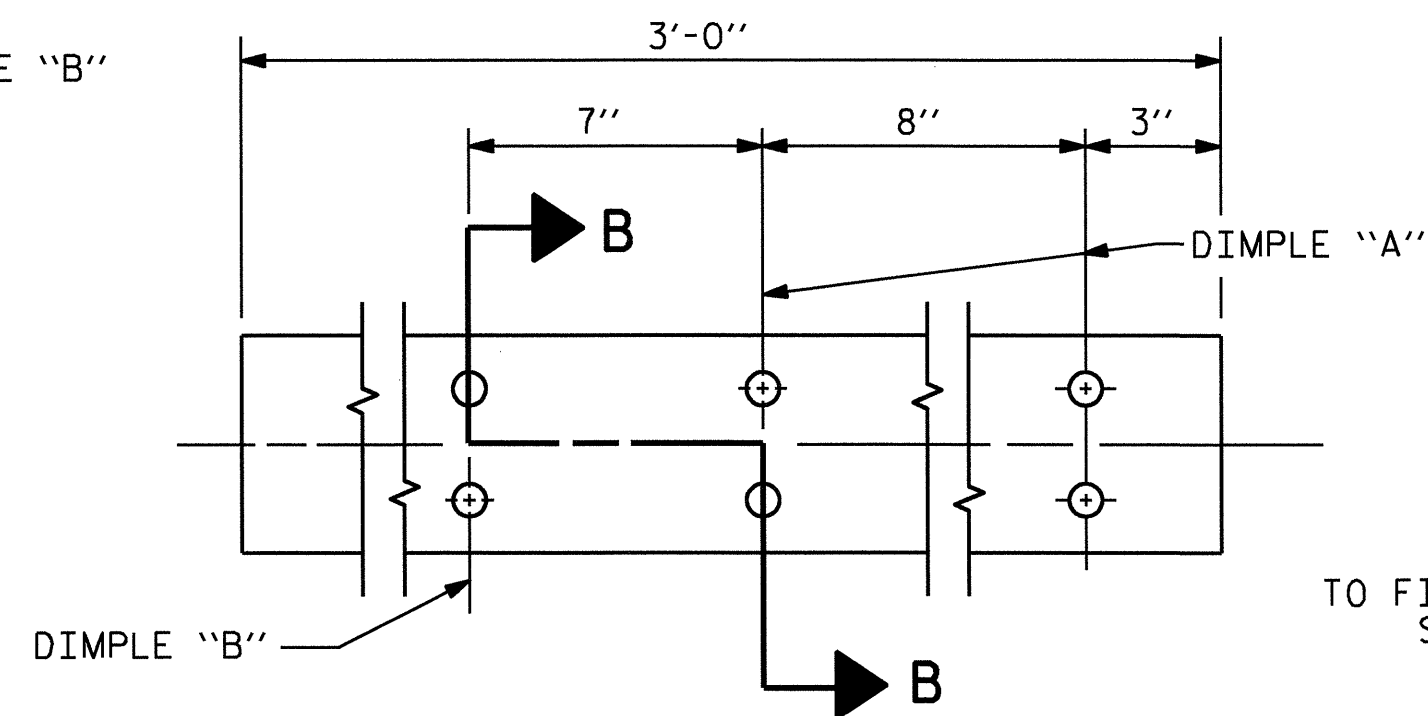
ELEVATION

4-BOLT METAL RAIL ANCHOR ASSEMBLY

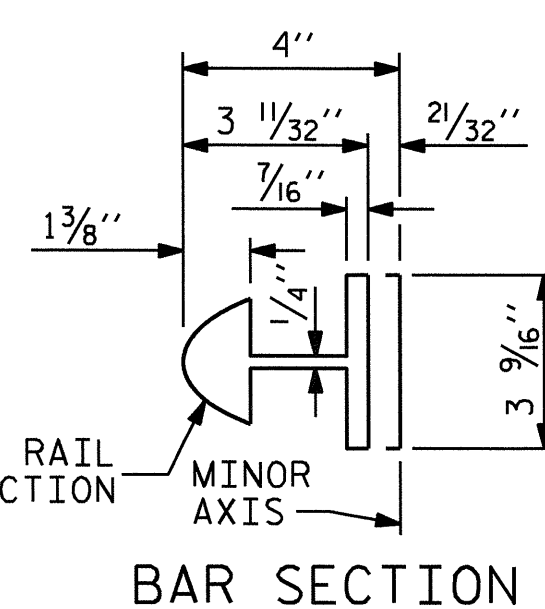
( 52 ASSEMBLIES REQUIRED )



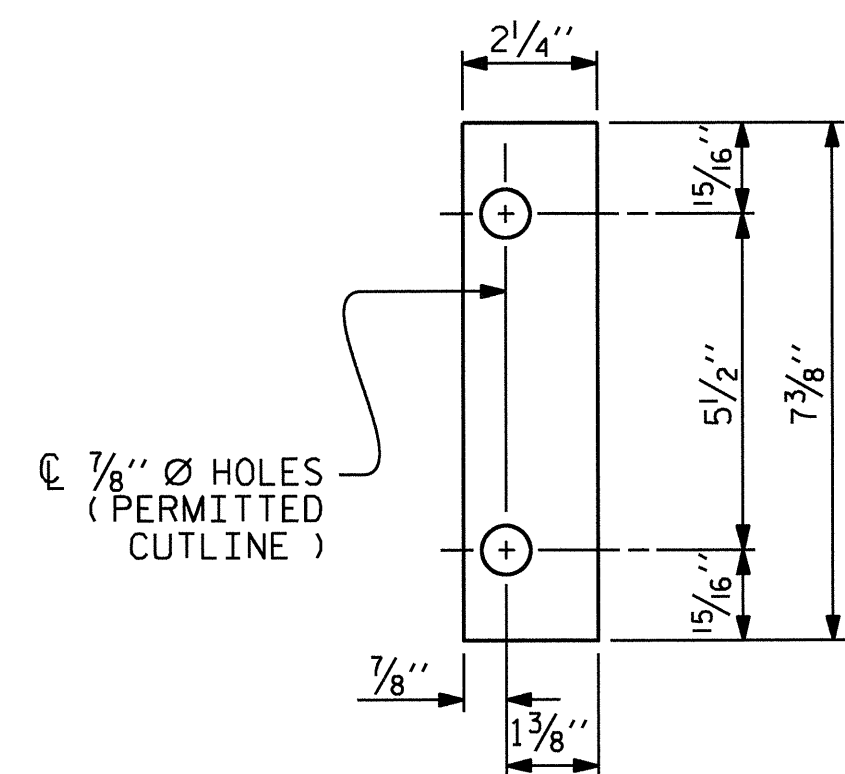
SECTION B - B



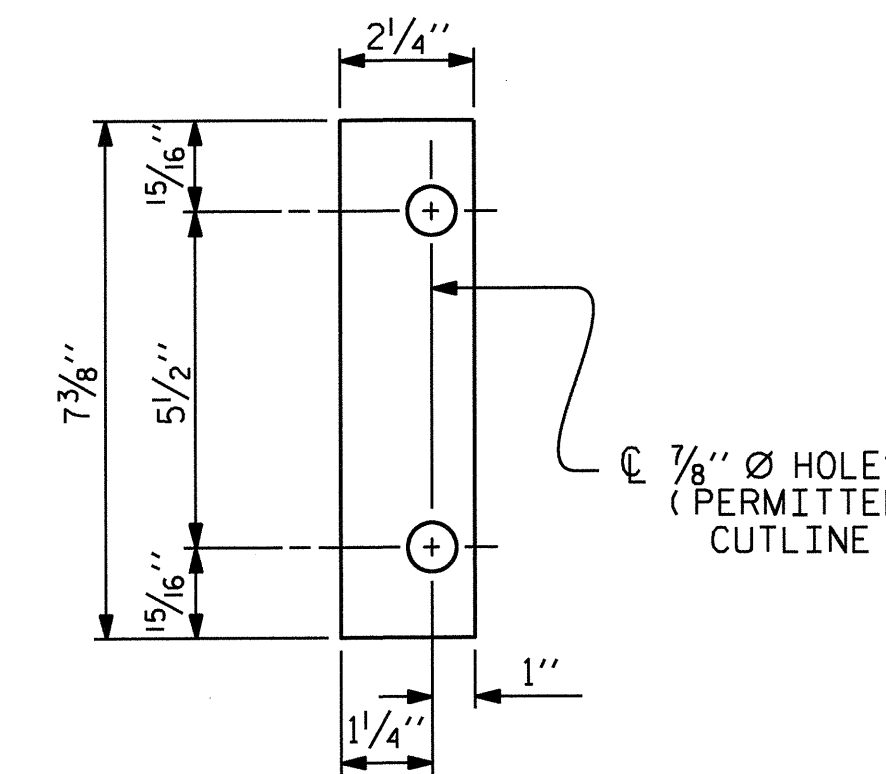
EXPANSION BAR DETAILS



BAR SECTION



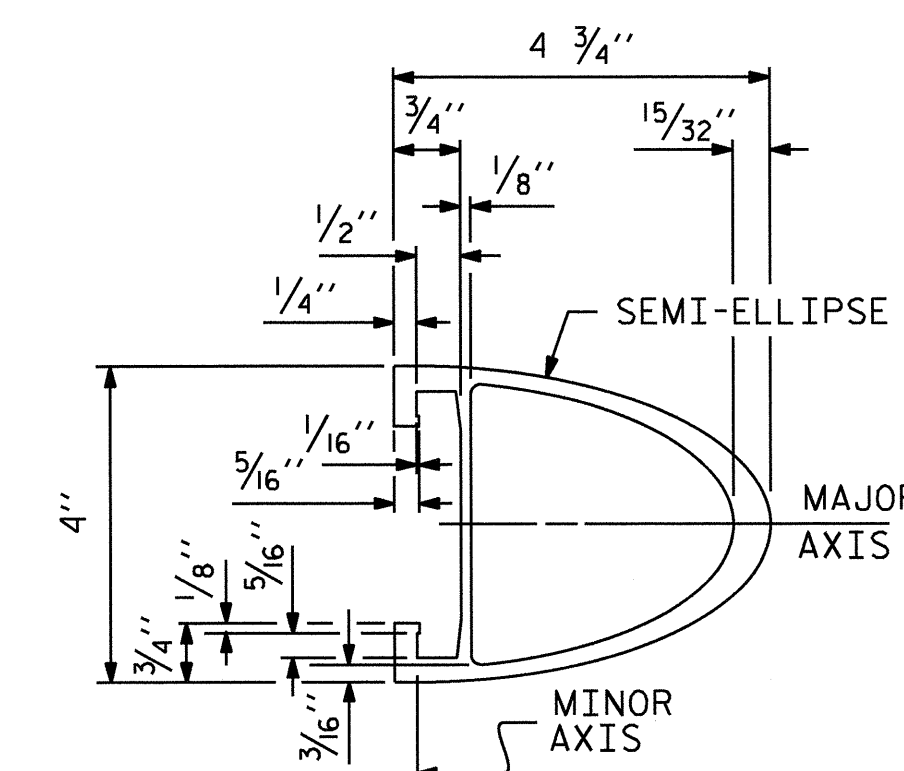
FRONT PLATE



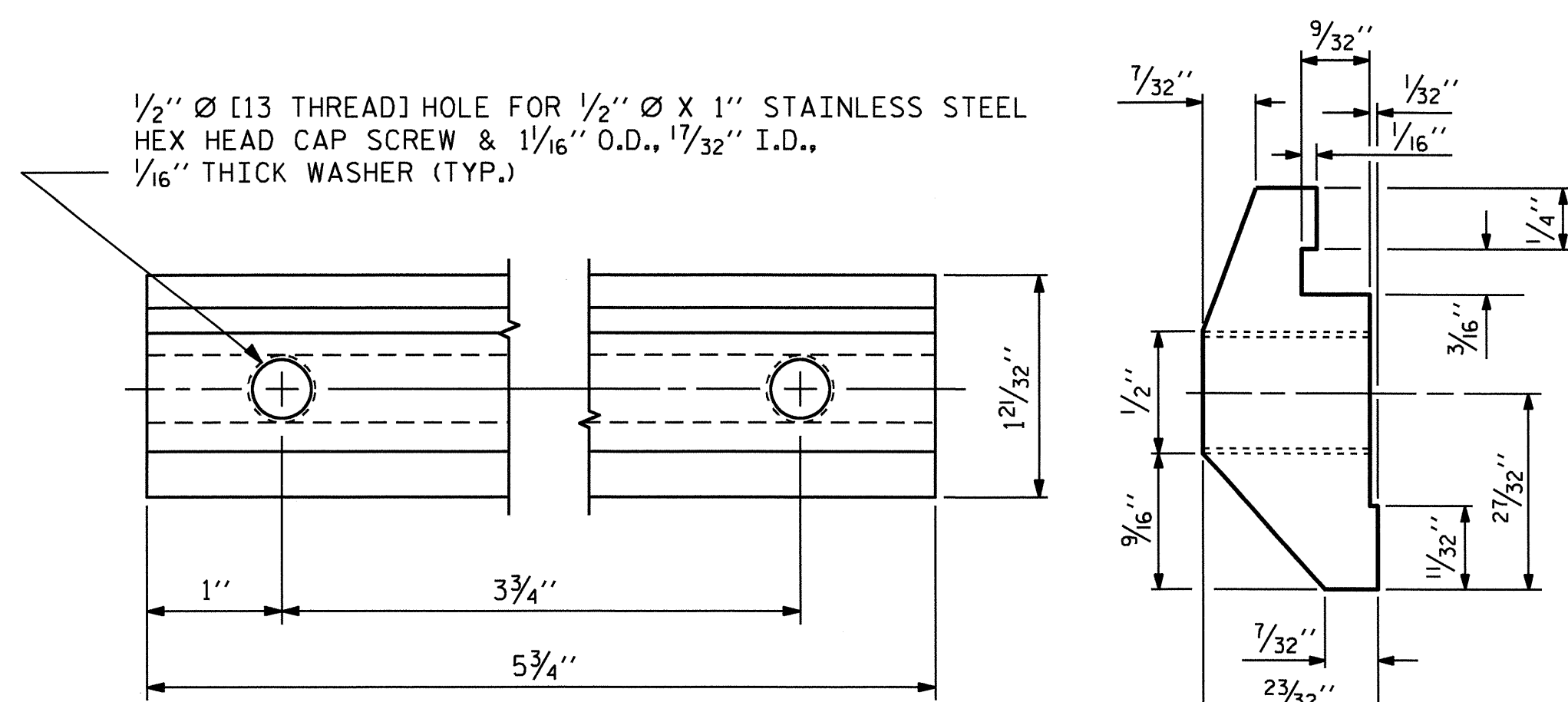
REAR PLATE

SHIM DETAILS

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

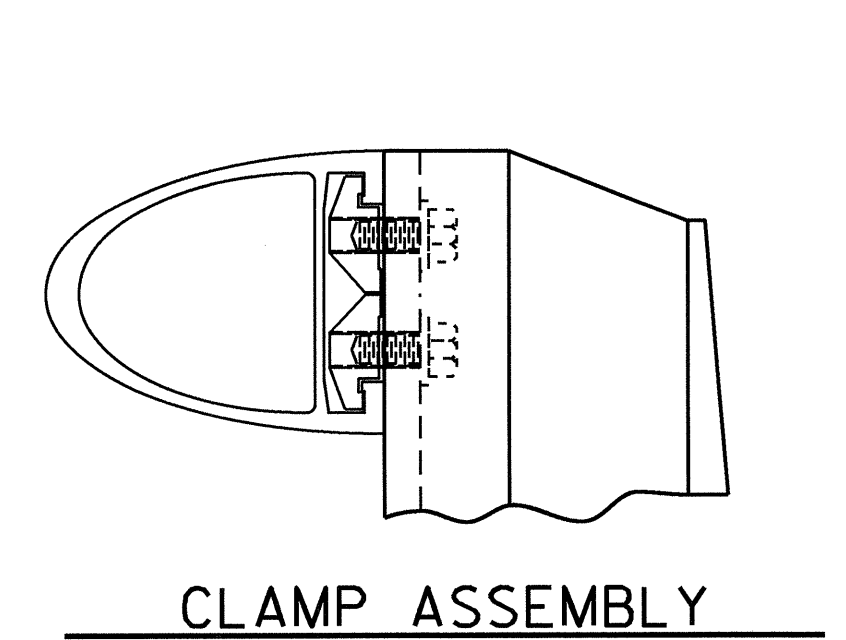


RAIL SECTION

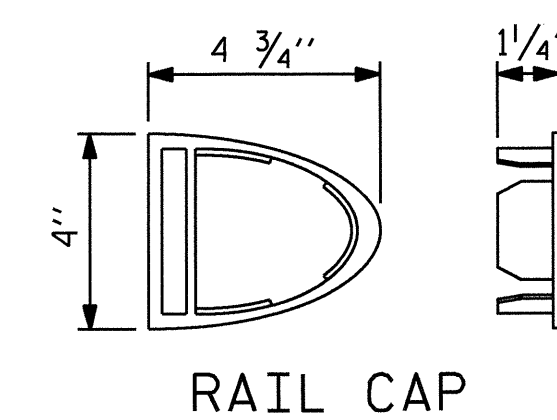


CLAMP BAR DETAIL

( 4 REQUIRED PER POST )



CLAMP ASSEMBLY



RAIL CAP

PROJECT NO. B-4632  
RUTHERFORD COUNTY  
STATION: 30+66.99 -L-

SHEET 4 OF 4

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



|                                  |                      |
|----------------------------------|----------------------|
| ASSEMBLED BY : A.L. FIGUEROA/VXN | DATE : 5-17-11       |
| CHECKED BY : M.G. CHEEK          | DATE : 9-11          |
| DRAWN BY : EEM 6/94              | REV. 8/16/99 MAB/LES |
| CHECKED BY : RGW 6/94            | REV. 5/1/06R KMM/GM  |
|                                  | REV. 10/1/11 MAA/GM  |

| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-18         |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |
| 2         |     |       | 4   |     |       | 34           |



**NOTES**

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

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

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

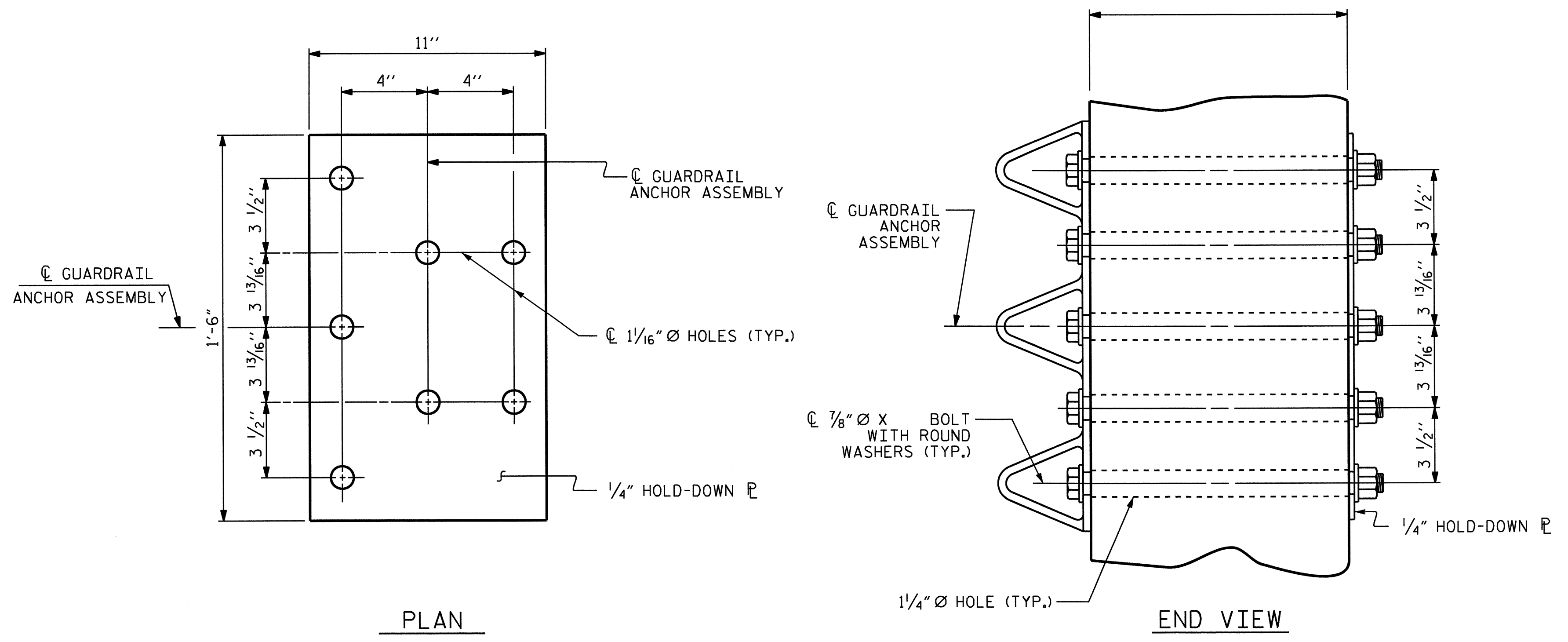
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

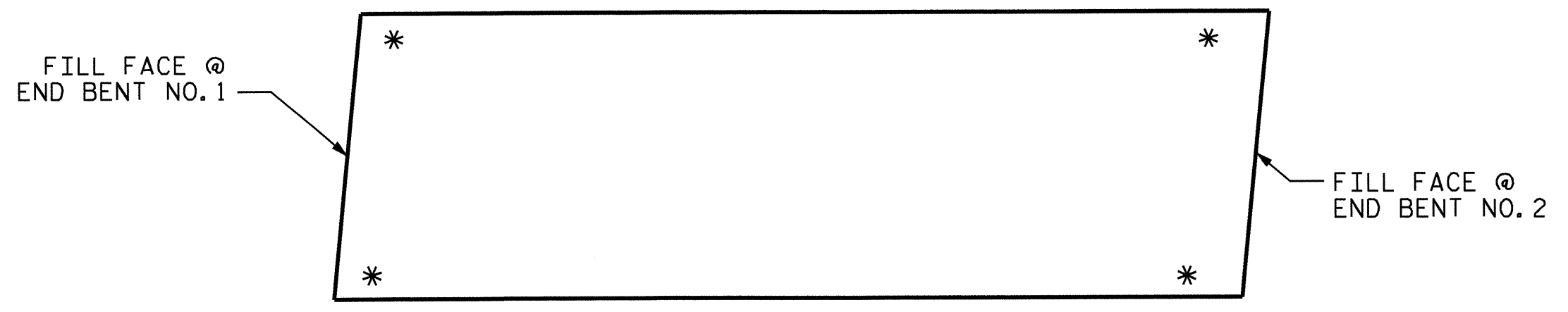
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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

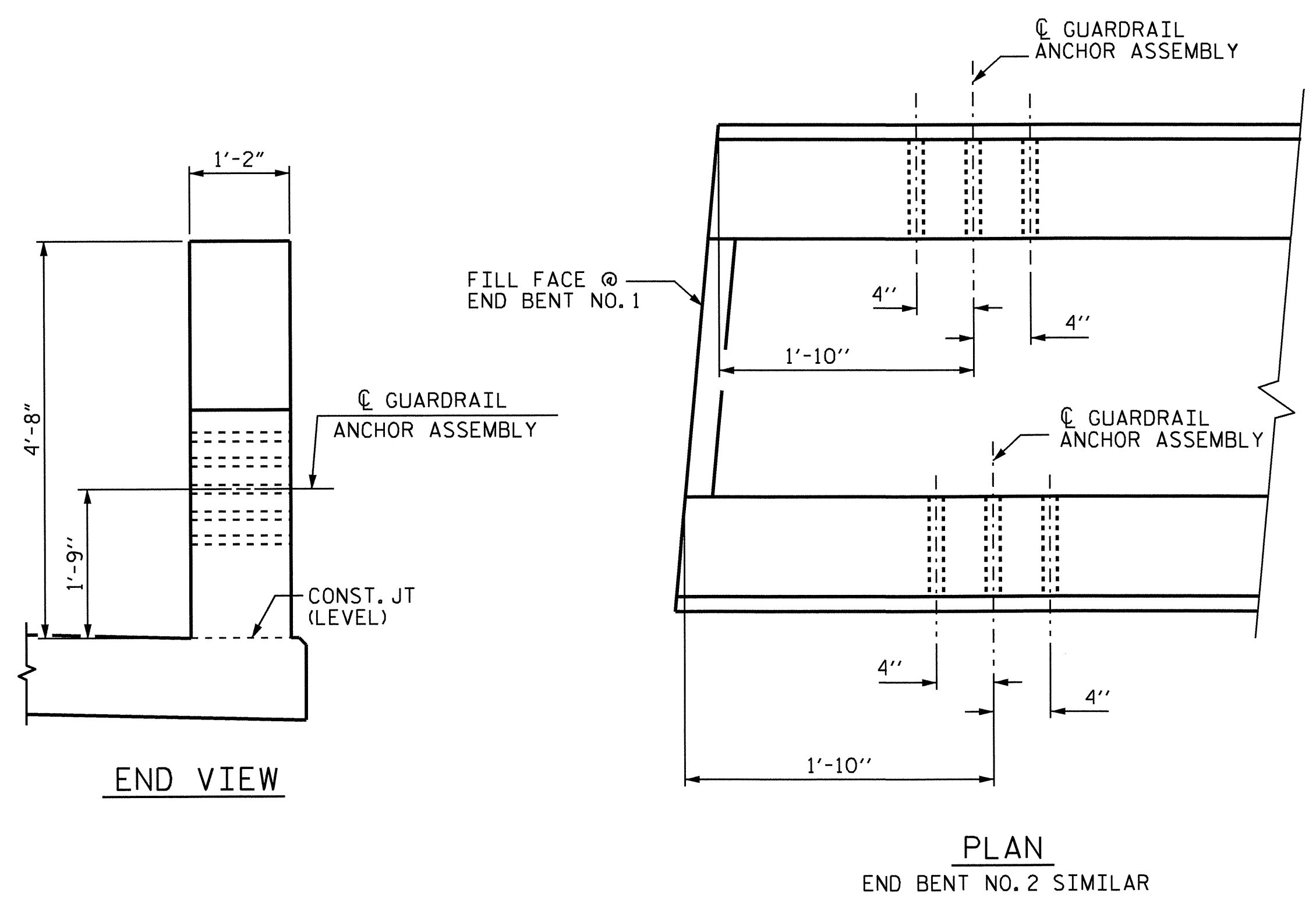
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



**PLAN**  
**END VIEW**  
**GUARDRAIL ANCHOR ASSEMBLY DETAILS**



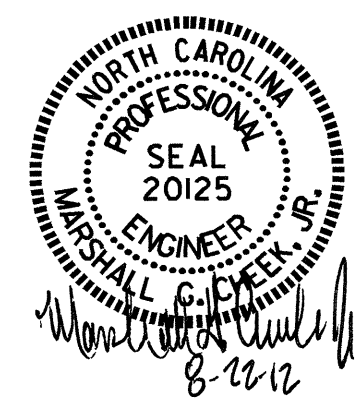
**SKETCH SHOWING POINTS OF ATTACHMENT**  
\* LOCATION OF GUARDRAIL ATTACHMENT



**END VIEW**  
**PLAN**  
**END BENT NO. 2 SIMILAR**  
**LOCATION OF GUARDRAIL ANCHOR AT END POST**

PROJECT NO. B-4632  
RUTHERFORD COUNTY  
STATION: 30+66.99 -L-

|   |     |       |     |     |   |
|---|-----|-------|-----|-----|---|
| STATE OF NORTH CAROLINA<br>DEPARTMENT OF TRANSPORTATION<br>RALEIGH                                |     |       |     |     |   |
| STANDARD<br>GUARDRAIL ANCHORAGE<br>DETAILS FOR METAL<br>RAILS & VERTICAL<br>CONCRETE BARRIER RAIL |     |       |     |     |   |
| REVISIONS   |     |       |     |     |   |
| NO.   | BY: | DATE: | NO. | BY: | DATE:                                   |
| 1   |     |       | 3   |     |   |
| 2   |     |       | 4   |     |   |
|   |     |       |     |     | SHEET NO.<br>S-19<br>TOTAL SHEETS<br>34 |



|                                  |                |
|----------------------------------|----------------|
| ASSEMBLED BY : A.L. FIGUEROA/VXN | DATE : 5-17-11 |
| CHECKED BY : M.G. CHEEK          | DATE : 9-11    |
| DRAWN BY : MAA                   | 5/10           |
| CHECKED BY : GM                  | 5/10           |
| ADDED 5/6/10                     |                |
| REV. 10/1/11                     | MAA/GM         |
| REV. 12/5/11                     | MAA/GM         |

**NOTES:**

FOR 72" CHAIN LINK FENCE, SEE SPECIAL PROVISIONS.

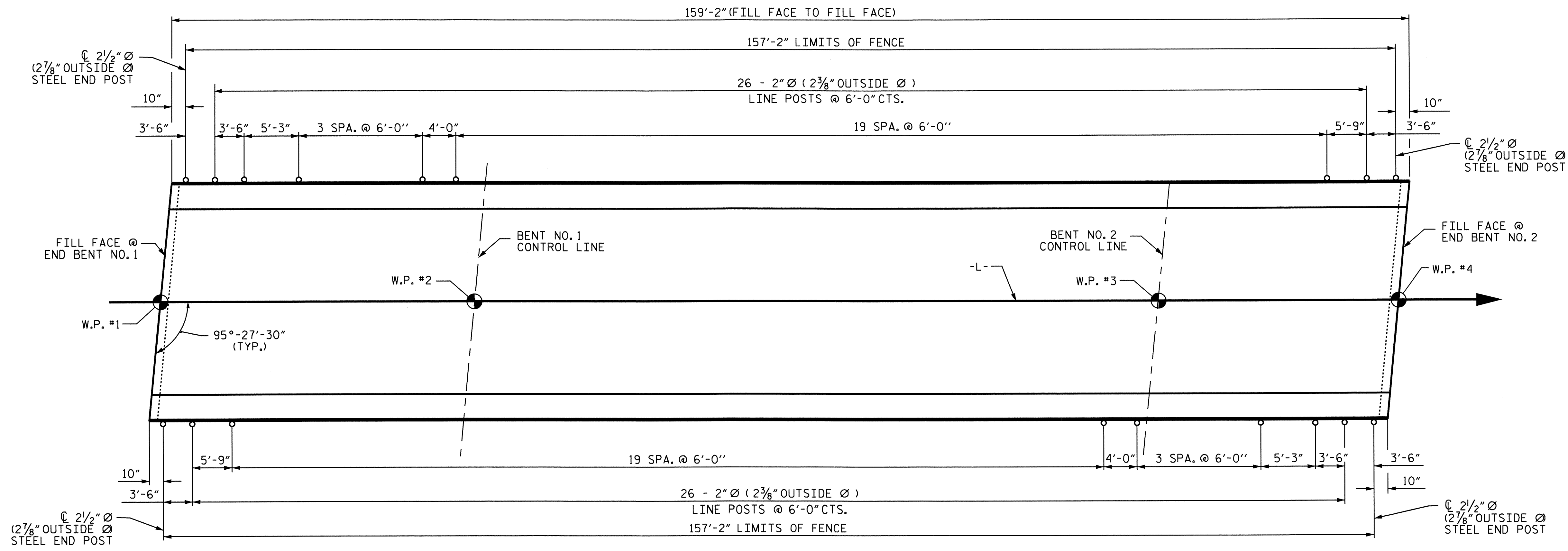
MATERIAL FOR ANCHOR BOLTS SHALL BE TYPE 304 STAINLESS STEEL WITH A MINIMUM 9000 PSI ULTIMATE STRENGTH. NUTS AND WASHERS SHALL BE TYPE 304 STAINLESS STEEL. ANCHOR BOLTS SHALL BE EMBEDDED AS PER ADHESIVE BONDING SYSTEM MANUFACTURER SPECIFICATIONS. NUTS SHALL BE AMERICAN STANDARD FINISHED HEXAGON THICK NUTS, CLASS 2B THREADS.

FOR SETTING ANCHOR BOLTS, THE CONTRACTOR SHALL USE AN ADHESIVE BONDING SYSTEM. LEVEL ONE FIELD TESTING OF BONDING SYSTEM IS REQUIRED AND THE YIELD LOAD OF THE 3/4" Ø BOLTS IS 12.0 KIPS.

ALL FENCE MATERIAL SHALL MEET THE REQUIREMENTS OF SECTION 1050 OF THE STANDARD SPECIFICATIONS, GALVANIZE ALL STEEL PARTS AND HARDWARE IN ACCORDANCE WITH ARTICLE 1076 OF THE STANDARD SPECIFICATIONS.

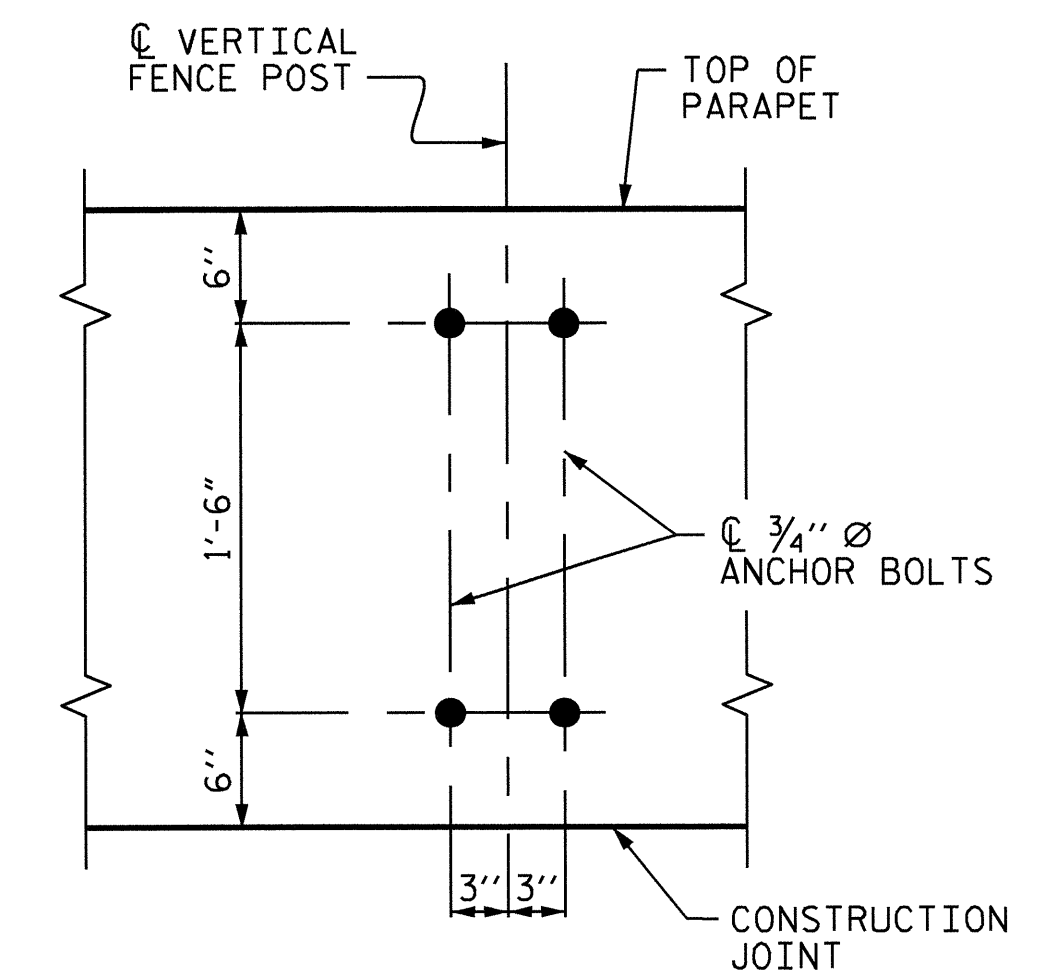
FENCE POST LOCATIONS SHALL BE SHIFTED, AS NECESSARY, TO MAINTAIN 12" MINIMUM DISTANCE FROM ANCHOR BOLT TO JOINTS IN BARRIER RAIL.

DIMENSIONS TAKEN ALONG OUTSIDE FACE OF BARRIER RAIL.

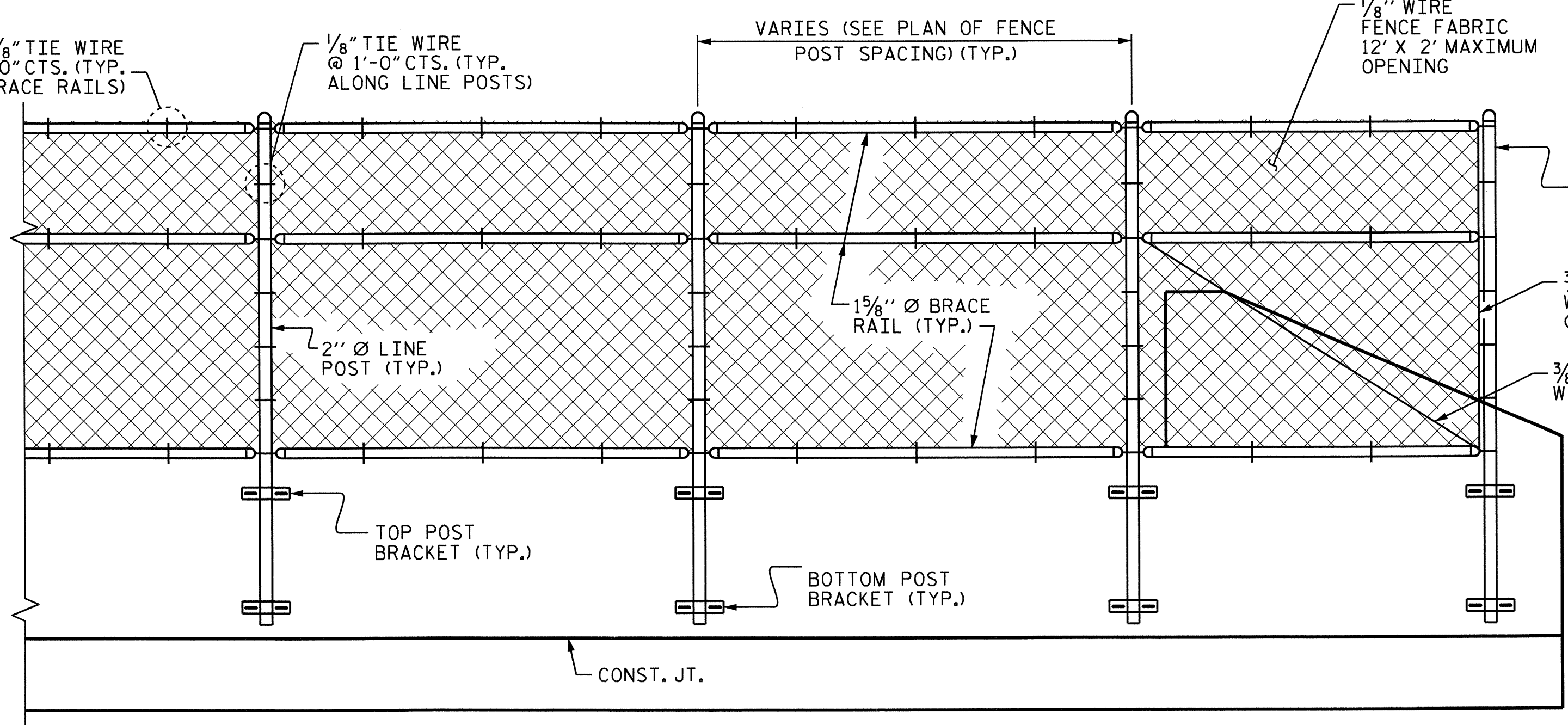
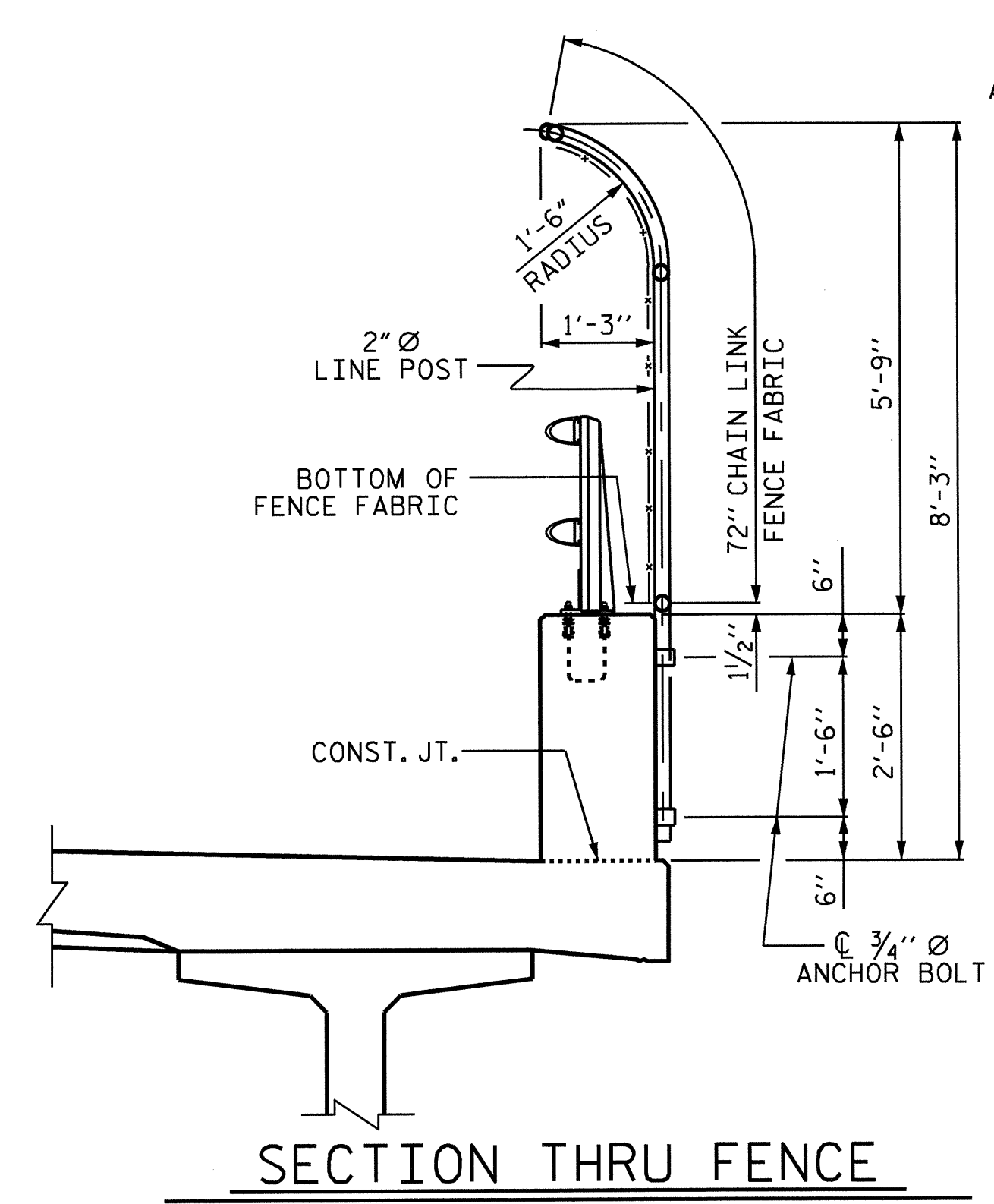


**PLAN OF FENCE POST SPACING**

PAY LENGTH 314.33 FEET



**BOLT SETTING DETAIL**

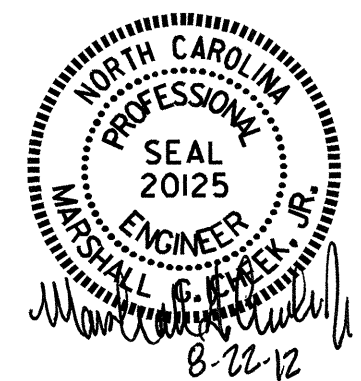


**PARTIAL ELEVATION**

2 BAR METAL RAIL NOT SHOWN FOR CLARITY

PROJECT NO. B-4632  
 RUTHERFORD COUNTY  
 STATION: 30+66.99 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 BRIDGE MOUNTED  
 72" CHAIN LINK FENCE

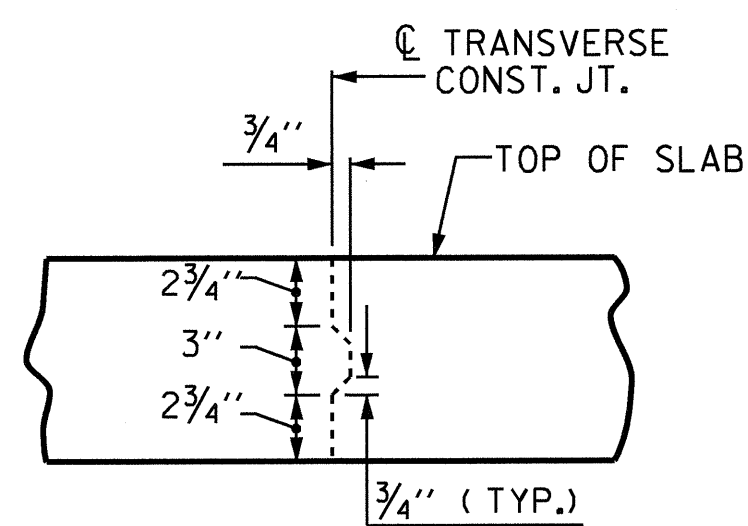


| REVISIONS |     |       |     |     |       | SHEET NO.    |    |
|-----------|-----|-------|-----|-----|-------|--------------|----|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-20         |    |
| 1         |     |       | 3   |     |       | TOTAL SHEETS | 34 |
| 2         |     |       | 4   |     |       |              |    |

DRAWN BY: A.L.FIGUEROA/VXN DATE: 5-17-11  
 CHECKED BY: M.G.CHEEK DATE: 9-11

05-JUL-2012 09:50  
 R:\structures\Plans\Final Plans\B-4632-SD-09-2MR.dgn  
 dahodge





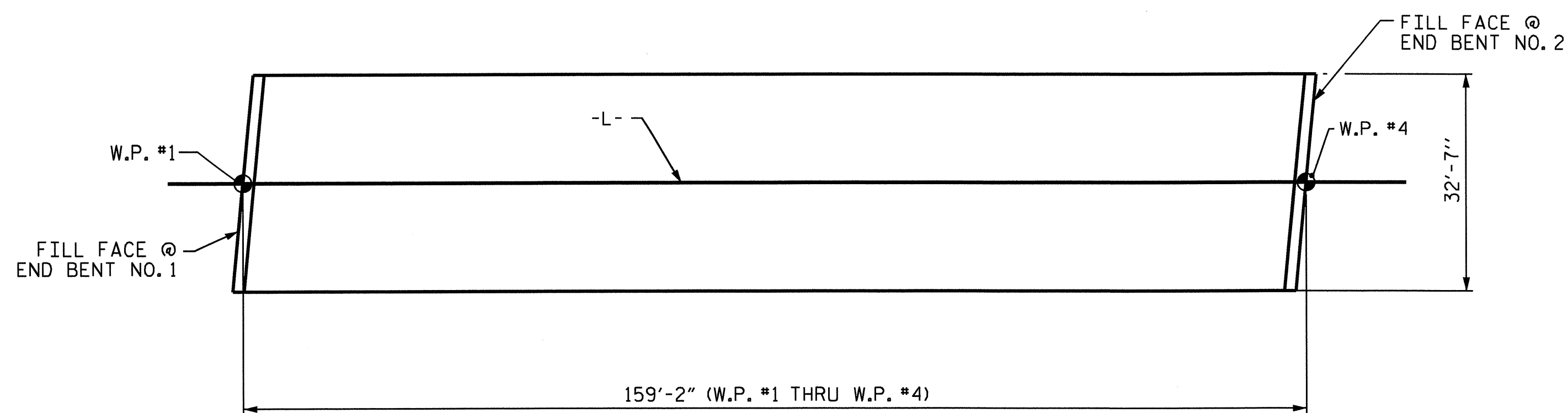
### TRANSVERSE CONSTRUCTION JOINT DETAIL

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

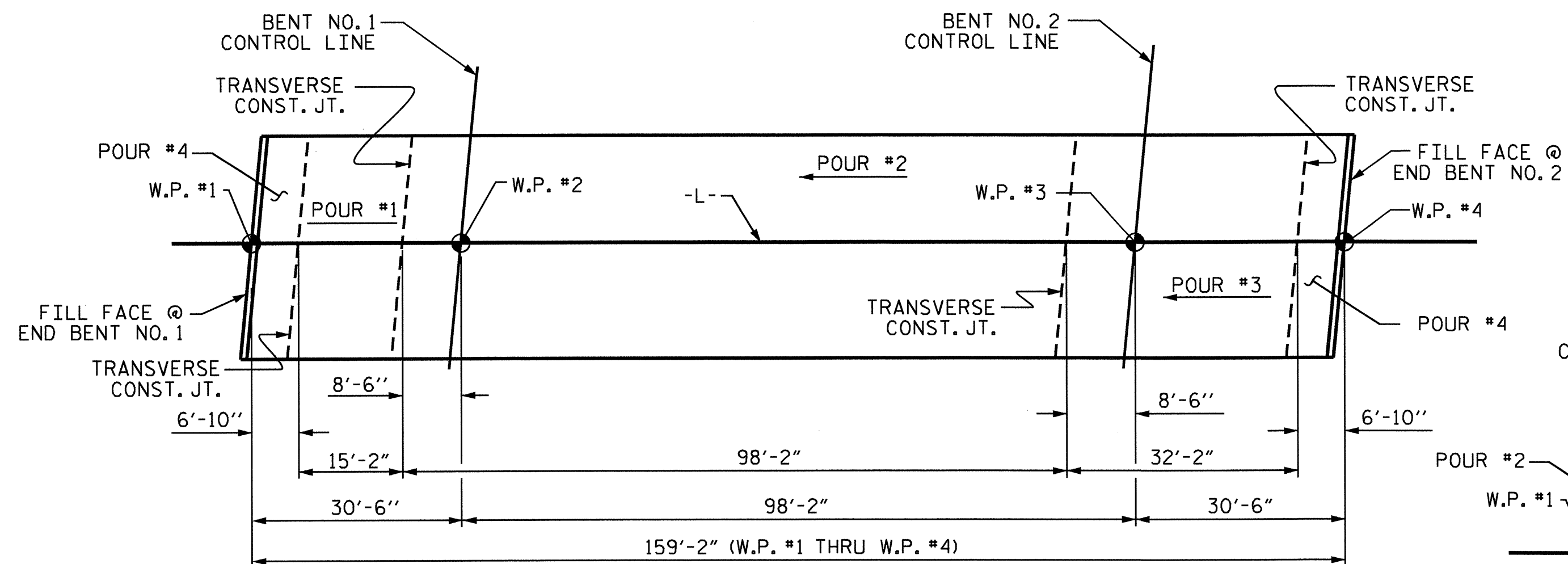
| SUPERSTRUCTURE BILL OF MATERIAL |                   |                   |                                |
|---------------------------------|-------------------|-------------------|--------------------------------|
|                                 | CLASS AA CONCRETE | REINFORCING STEEL | EPOXY COATED REINFORCING STEEL |
|                                 | (CU. YDS.)        | (LBS.)            | (LBS.)                         |
| SPAN A, B, AND C                | POUR #1           | 14.7              |                                |
|                                 | POUR #2           | 105.9             | 14,511                         |
|                                 | POUR #3           | 41.8              | 16,461                         |
|                                 | POUR #4           | 38.2              |                                |
| TOTALS **                       | 200.6             | 14,511            | 16,461                         |

\*\* QUANTITIES FOR CONCRETE PARAPET AND RAIL ARE NOT INCLUDED

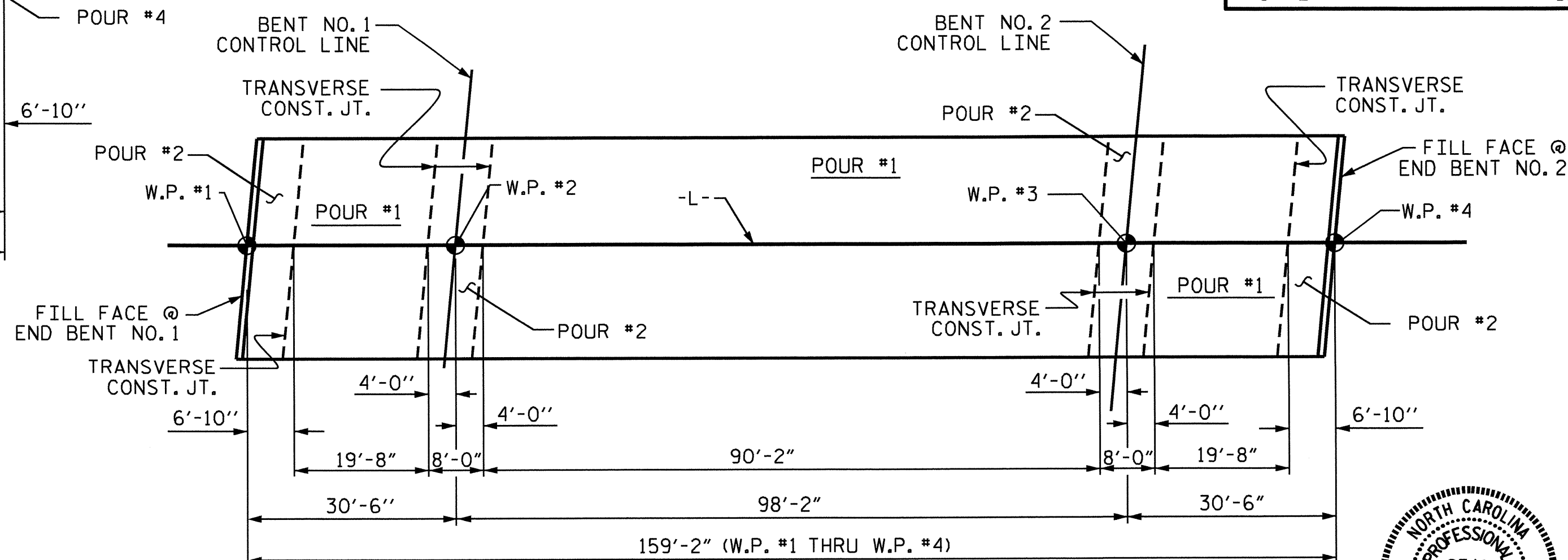
| SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS |   |          |                |          |                          |
|--|---|----------|----------------|----------|--------------------------|
| BAR SIZE   | SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, 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"    |                |          |                          |



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 5,186)



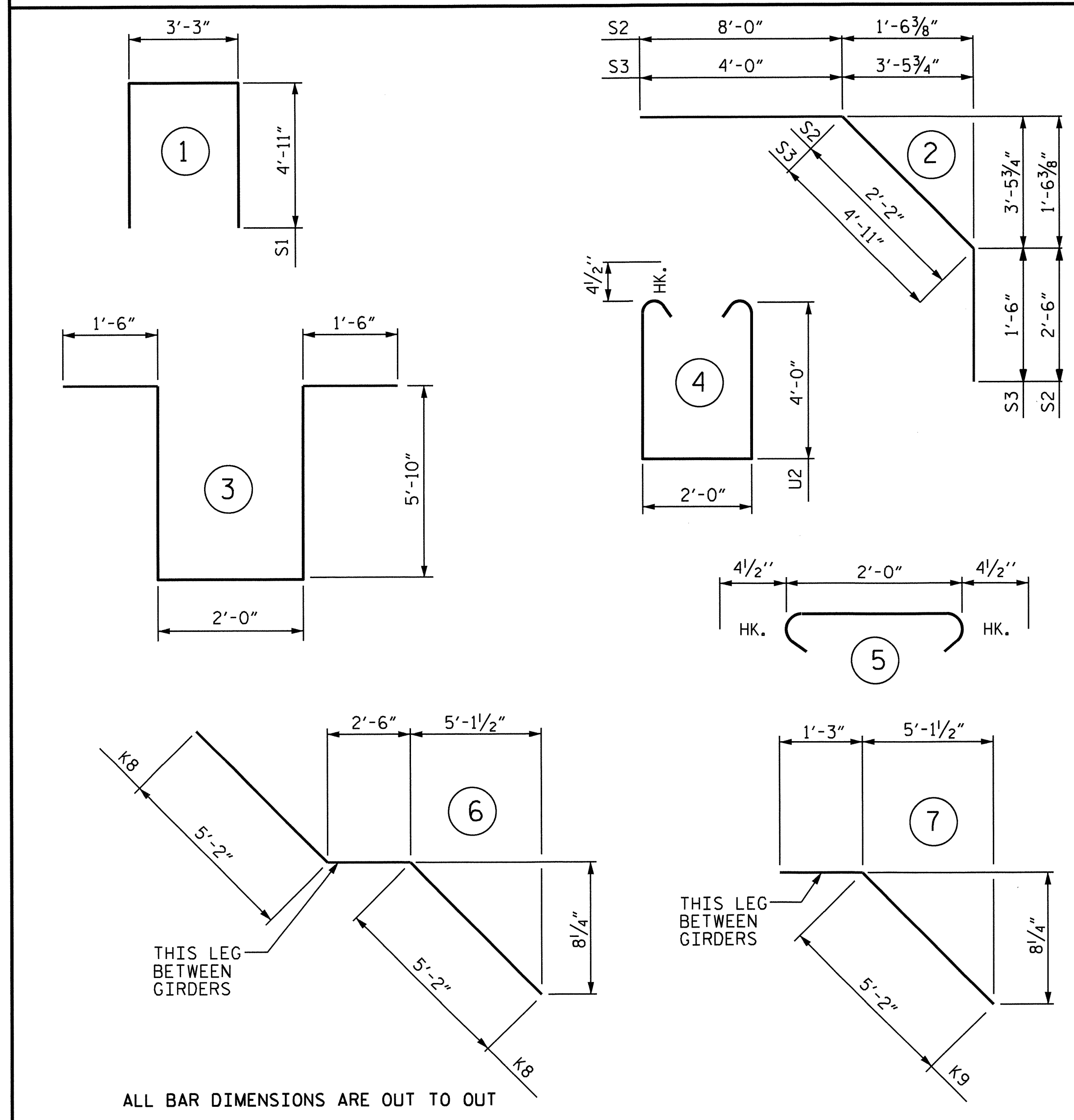
### POURING SEQUENCE



### OPTIONAL POURING SEQUENCE

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

### BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

### REINFORCING BAR SCHEDULE SPANS A THRU C

| BAR NO. | NO. | SIZE | TYPE | LENGTH  | WEIGHT |
|---------|-----|------|------|---------|--------|
| * A1    | 247 | #5   | STR  | 32'-3"  | 8,308  |
| * A101  | 2   | #5   | STR  | 27'-1"  | 56     |
| * A102  | 2   | #5   | STR  | 20'-6"  | 43     |
| * A103  | 2   | #5   | STR  | 14'-0"  | 29     |
| * A104  | 2   | #5   | STR  | 7'-5"   | 15     |
| A2      | 247 | #5   | STR  | 32'-3"  | 8,308  |
| A201    | 2   | #5   | STR  | 27'-1"  | 56     |
| A202    | 2   | #5   | STR  | 20'-6"  | 43     |
| A203    | 2   | #5   | STR  | 14'-0"  | 29     |
| A204    | 2   | #5   | STR  | 7'-5"   | 15     |
| * B1    | 46  | #4   | STR  | 17'-8"  | 543    |
| * B2    | 46  | #7   | STR  | 48'-6"  | 4,560  |
| * B3    | 40  | #7   | STR  | 19'-4"  | 1,581  |
| * B4    | 46  | #4   | STR  | 17'-7"  | 540    |
| B5      | 66  | #5   | STR  | 53'-11" | 3,712  |
| K1      | 24  | #4   | STR  | 17'-1"  | 274    |
| K2      | 72  | #4   | STR  | 7'-10"  | 377    |
| K3      | 18  | #4   | STR  | 5'-1"   | 61     |
| K4      | 18  | #4   | STR  | 4'-10"  | 58     |
| K5      | 16  | #4   | STR  | 2'-6"   | 27     |
| K6      | 4   | #4   | STR  | 1'-9"   | 5      |
| K7      | 4   | #4   | STR  | 1'-1"   | 3      |
| K8      | 24  | #4   | 6    | 12'-10" | 206    |
| K9      | 24  | #4   | 7    | 6'-5"   | 103    |
| S1      | 40  | #4   | 1    | 13'-1"  | 350    |
| * S2    | 60  | #4   | 2    | 12'-8"  | 508    |
| * S3    | 40  | #4   | 2    | 10'-5"  | 278    |
| S4      | 216 | #4   | 5    | 2'-9"   | 397    |
| U1      | 36  | #4   | 3    | 16'-8"  | 401    |
| U2      | 12  | #4   | 4    | 10'-9"  | 86     |

REINFORCING STEEL = 14,511 LBS.  
\* EPOXY COATED REINFORCING STEEL = 16,461 LBS.

\* THESE BARS ARE EPOXY COATED

### GROOVING BRIDGE FLOORS

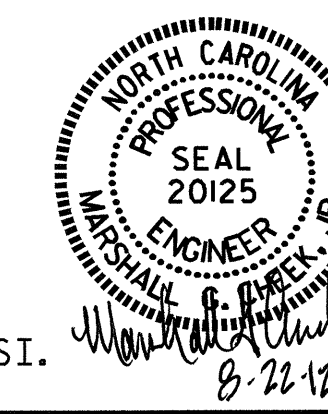
|                |              |
|----------------|--------------|
| APPROACH SLABS | 1236 SQ.FT.  |
| BRIDGE DECK    | 4,284 SQ.FT. |
| TOTAL          | 5,520 SQ.FT. |

PROJECT NO. B-4632  
RUTHERFORD COUNTY  
STATION: 30+66.99 -L-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

### SUPERSTRUCTURE BILL OF MATERIAL

ASSEMBLED BY : A.L. FIGUEROA/VXN DATE : 05-17-11  
CHECKED BY : M.G. CHEEK DATE : 9-11  
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



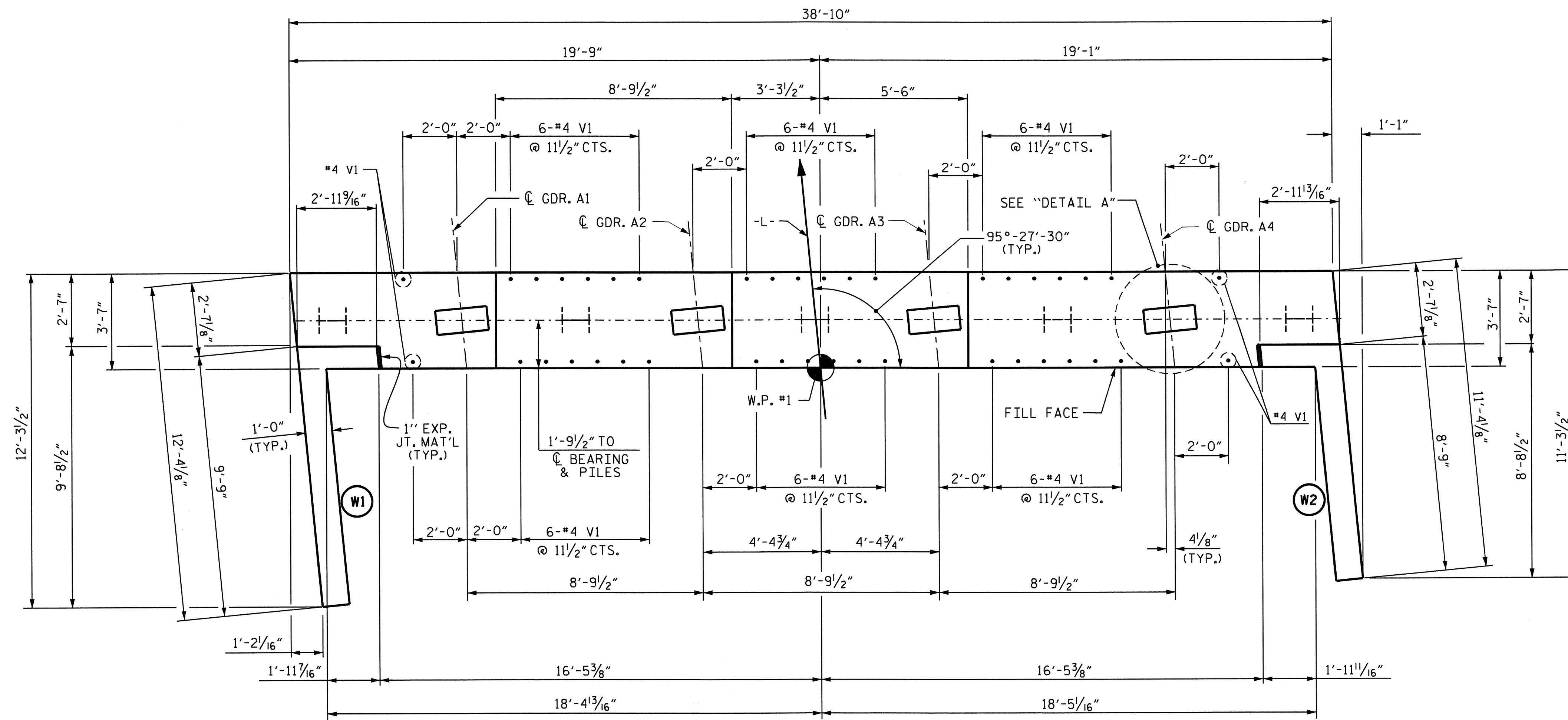
| REVISIONS |     |       |     |     |       | SHEET NO.       |
|-----------|-----|-------|-----|-----|-------|-----------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-21            |
| 1         |     |       | 3   |     |       | TOTAL SHEETS 34 |
| 2         |     |       | 4   |     |       |                 |

STD. NO. BOM2

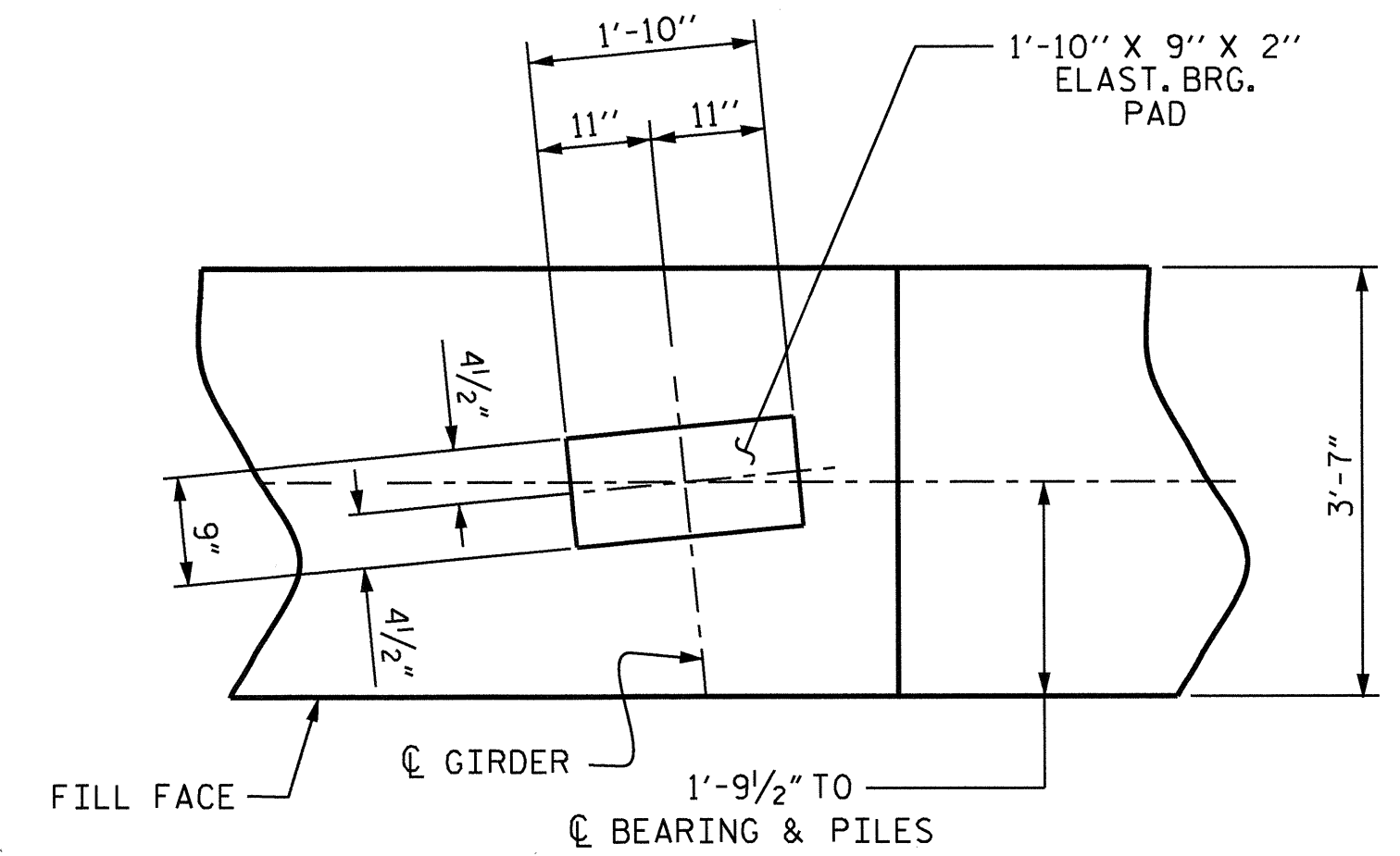


**NOTES**

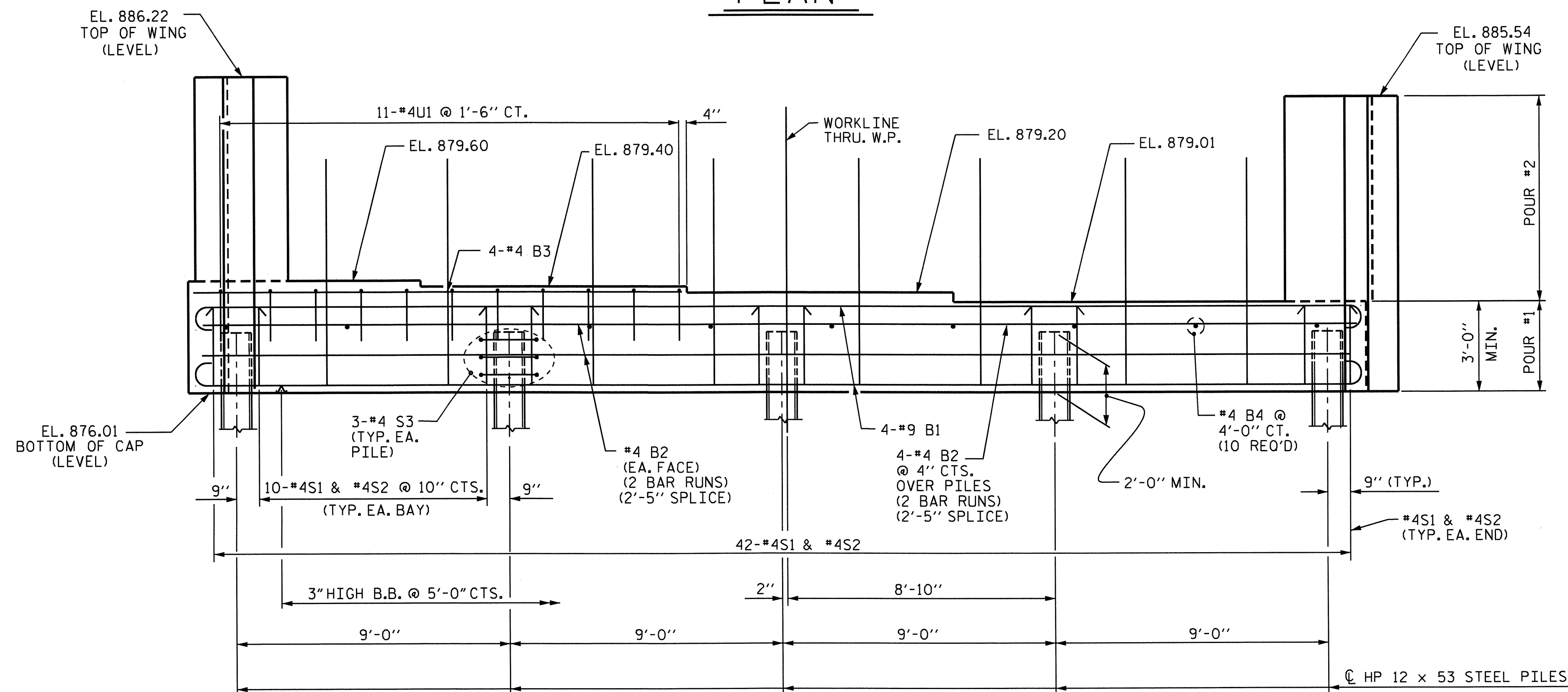
THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS. SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.



**PLAN**



**DETAIL A**



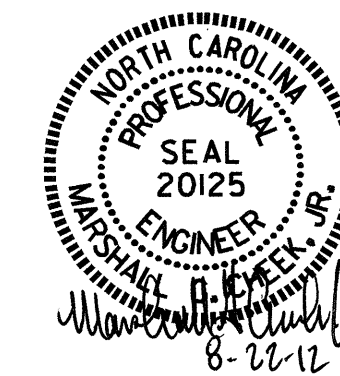
**ELEVATION**

PROJECT NO. B-4632  
RUTHERFORD COUNTY  
 STATION: 30+66.99 -L-

SHEET 1 OF 3

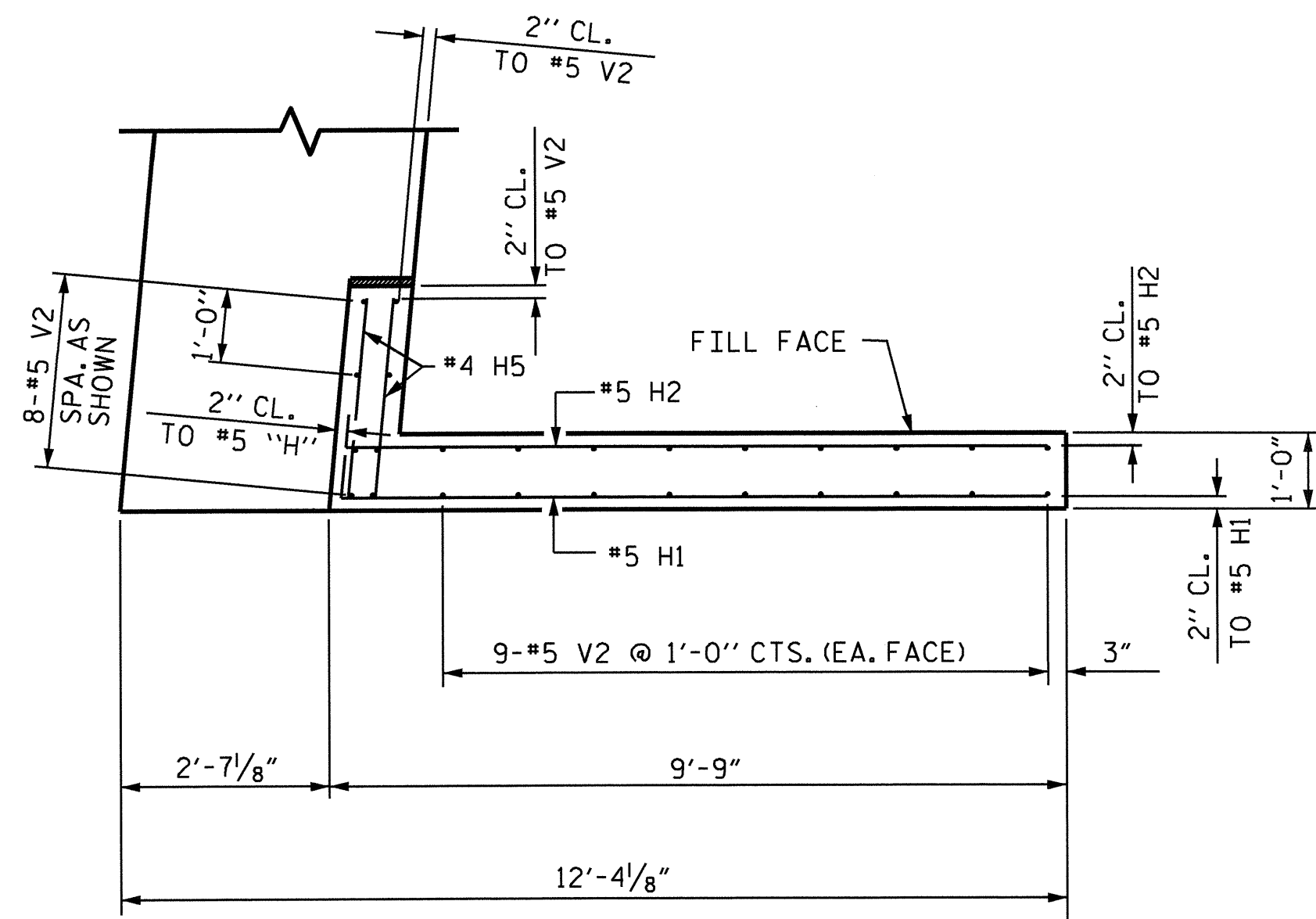
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE  
 END BENT NO. 1**

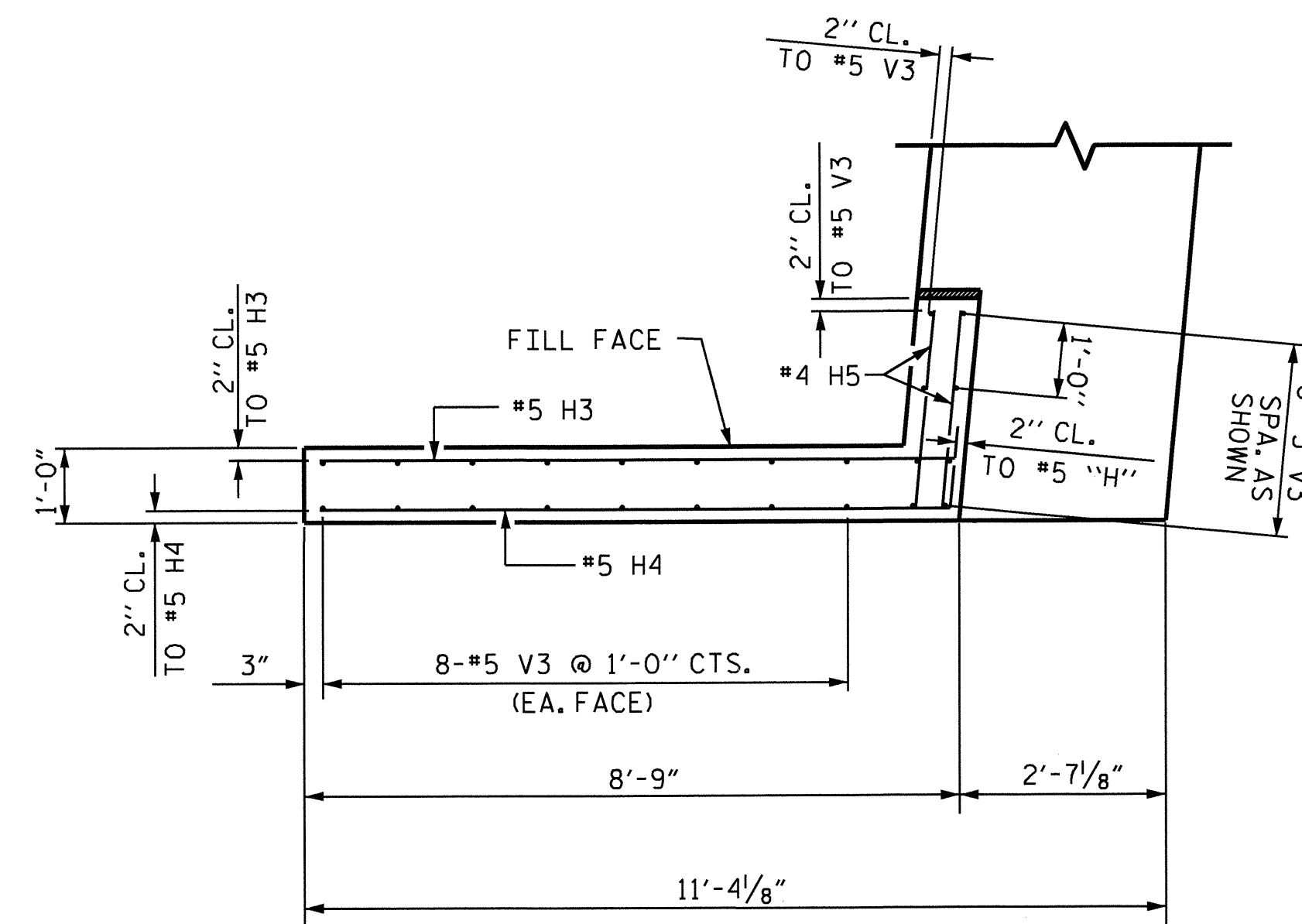


| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-22         |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |
| 2         |     |       | 4   |     |       | 34           |

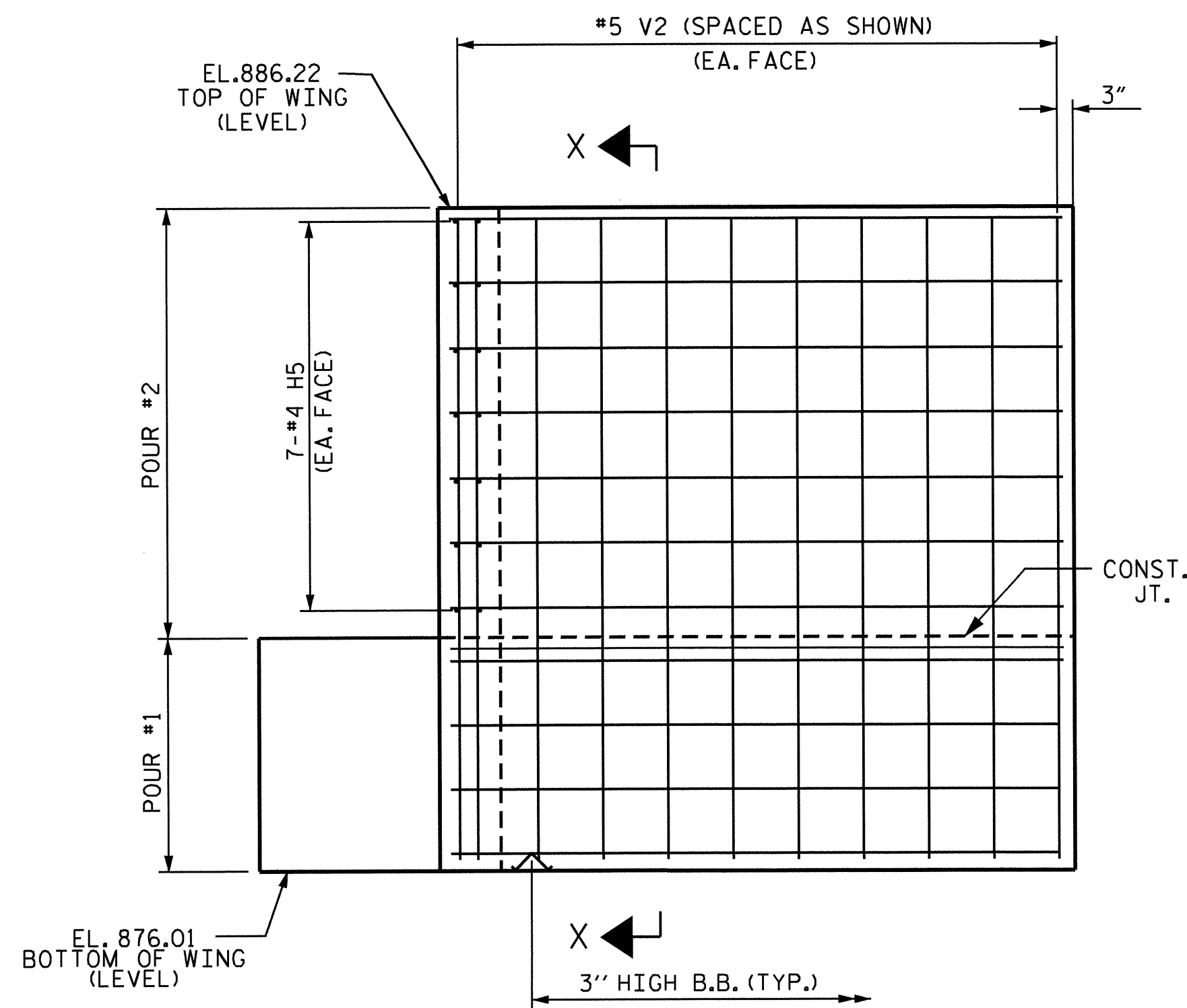
DRAWN BY : V.X. NGUYEN DATE : 9-7-11  
 CHECKED BY : M.G. CHEEK DATE : 9-11



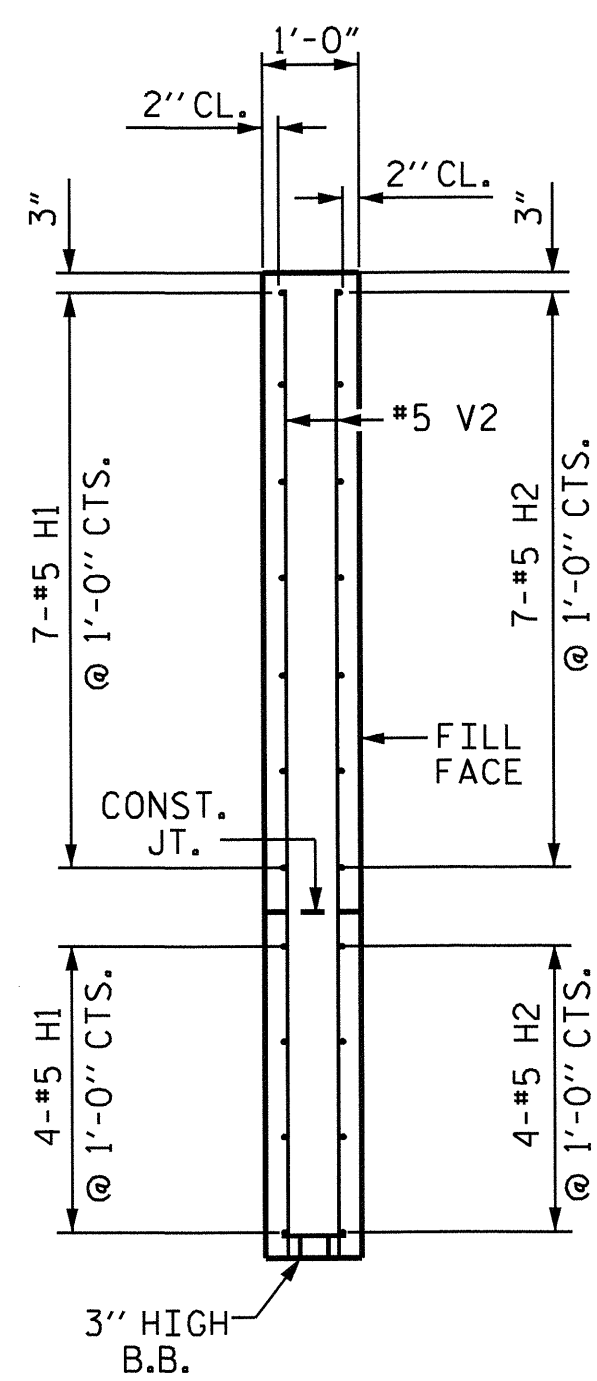
PLAN OF WING - W1



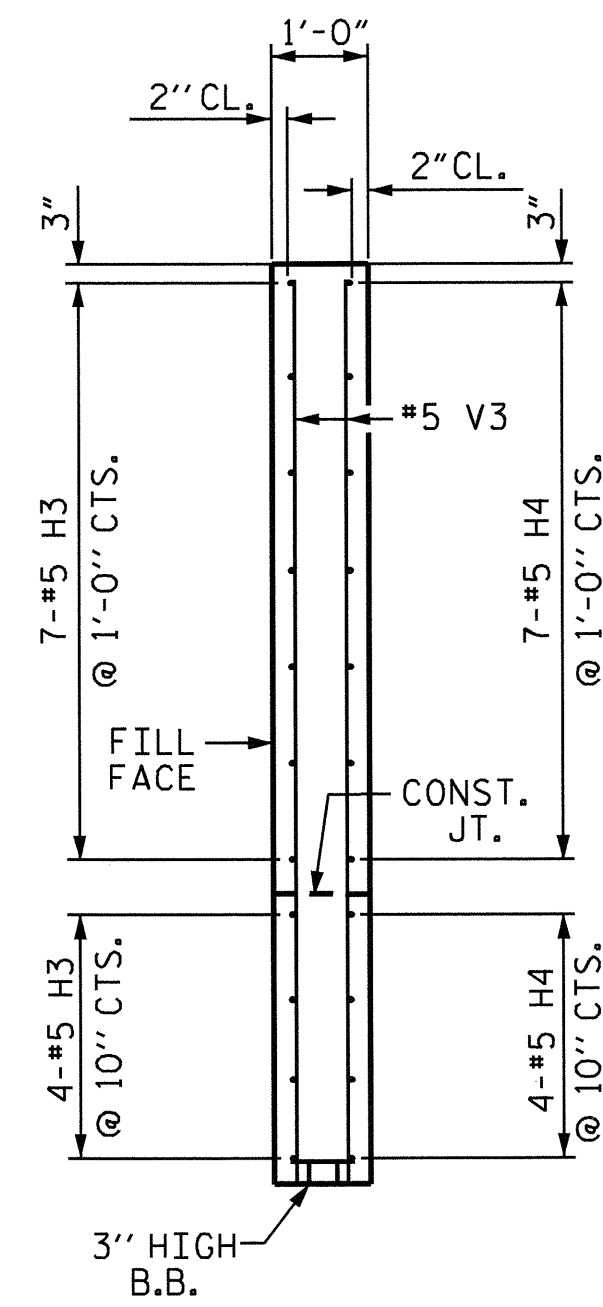
PLAN OF WING - W2



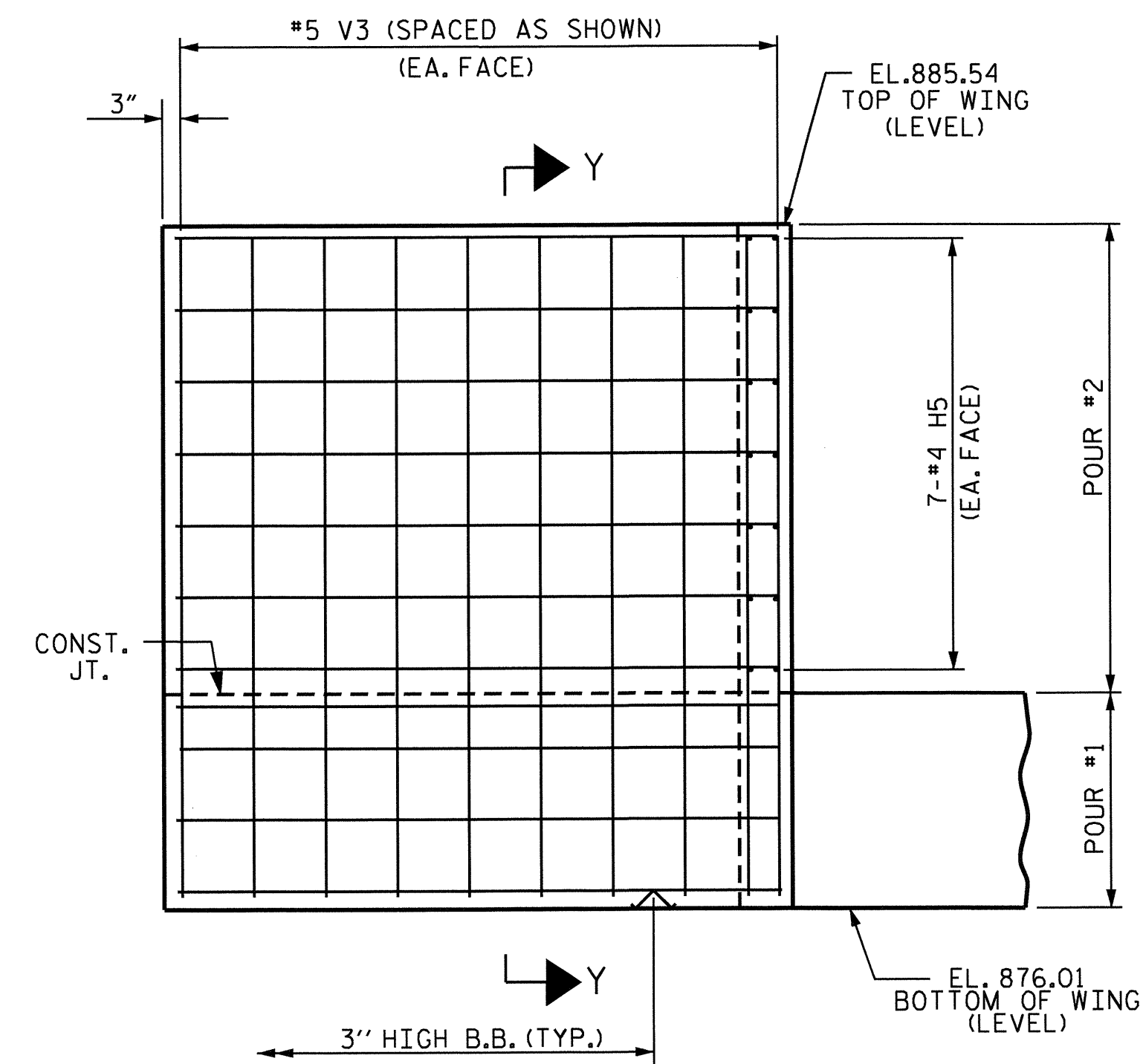
ELEVATION OF WING - W1



SECTION X-X



SECTION Y-Y



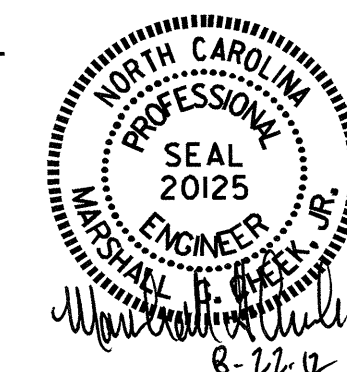
ELEVATION OF WING - W2

PROJECT NO. B-4632  
RUTHERFORD COUNTY  
 STATION: 30+66.99 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

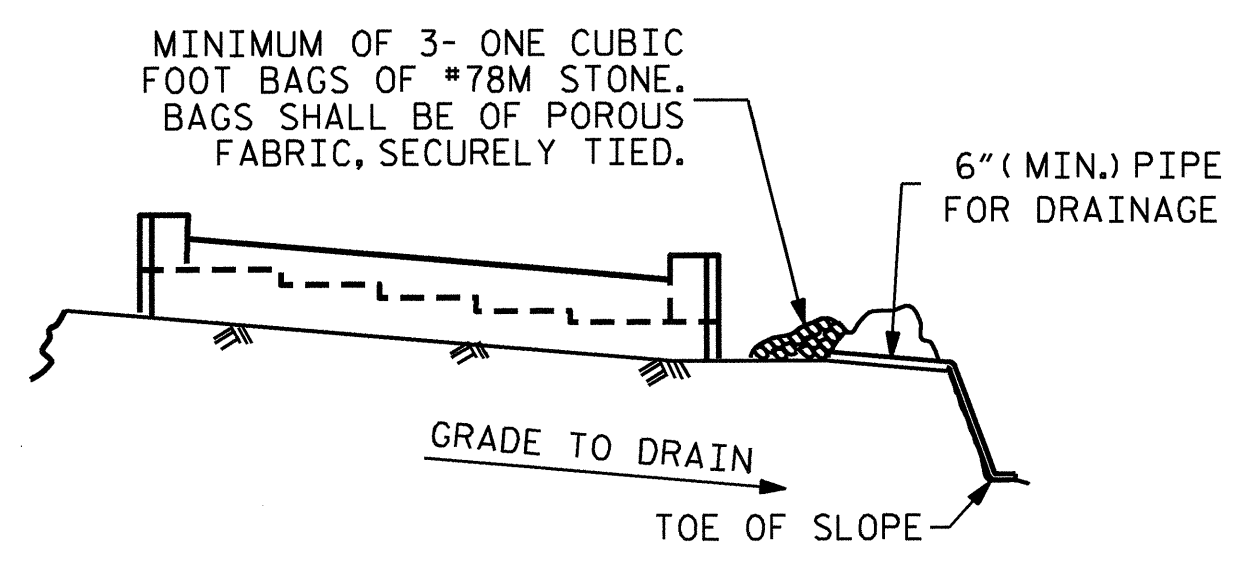
SUBSTRUCTURE  
 END BENT NO. 1



DRAWN BY: V.X. NGUYEN DATE: 9-1-11  
 CHECKED BY: M.G. CHEEK DATE: 9-11

22-AUG-2012 08:28  
 R:\structures\Plans\Final Plans\B-4632\_SD.E\*.dgn  
 mpoole

| REVISIONS |     |       |     |     |       | SHEET NO.    |  |
|-----------|-----|-------|-----|-----|-------|--------------|--|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-23         |  |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |  |
| 2         |     |       | 4   |     |       | 34           |  |

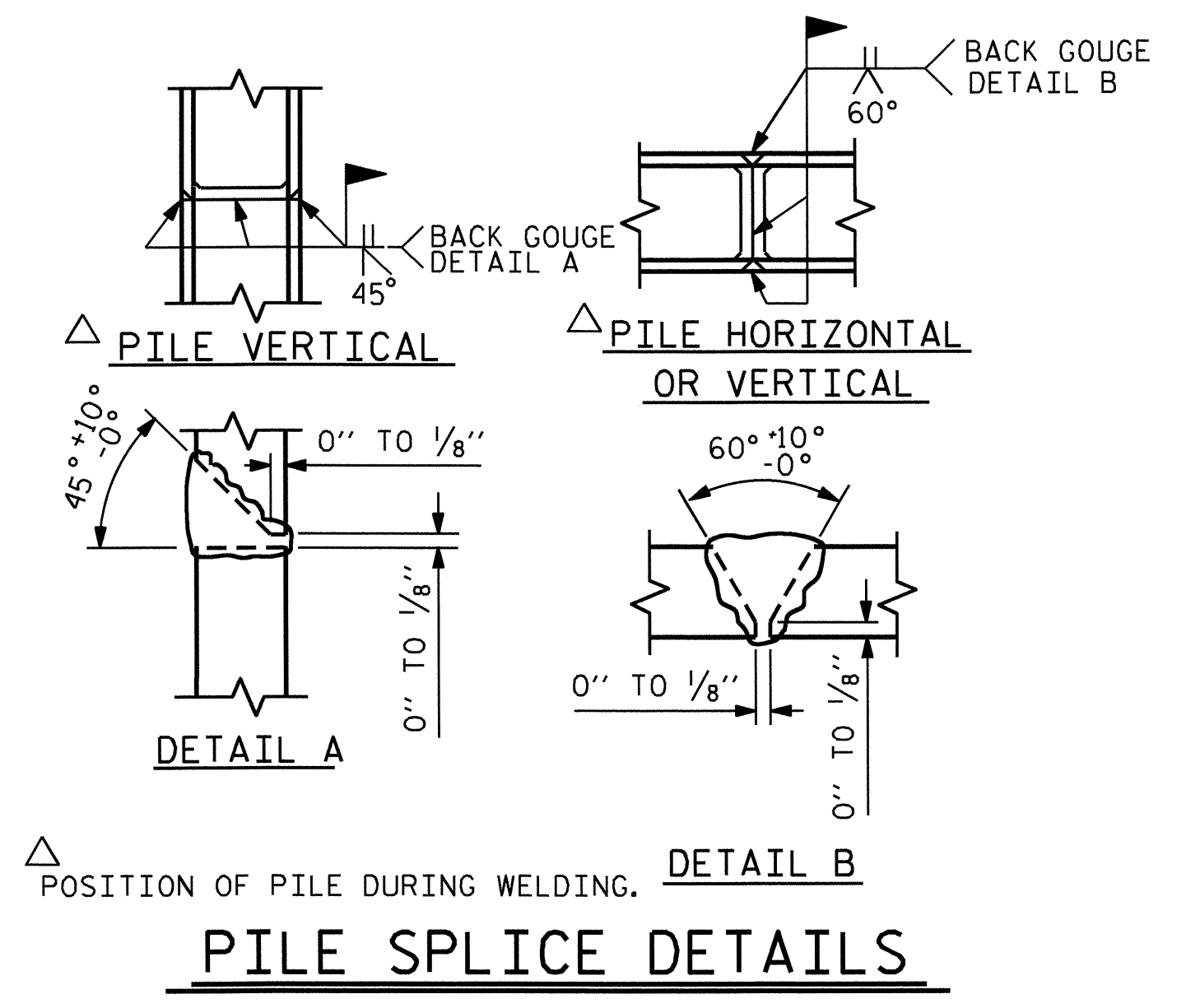


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

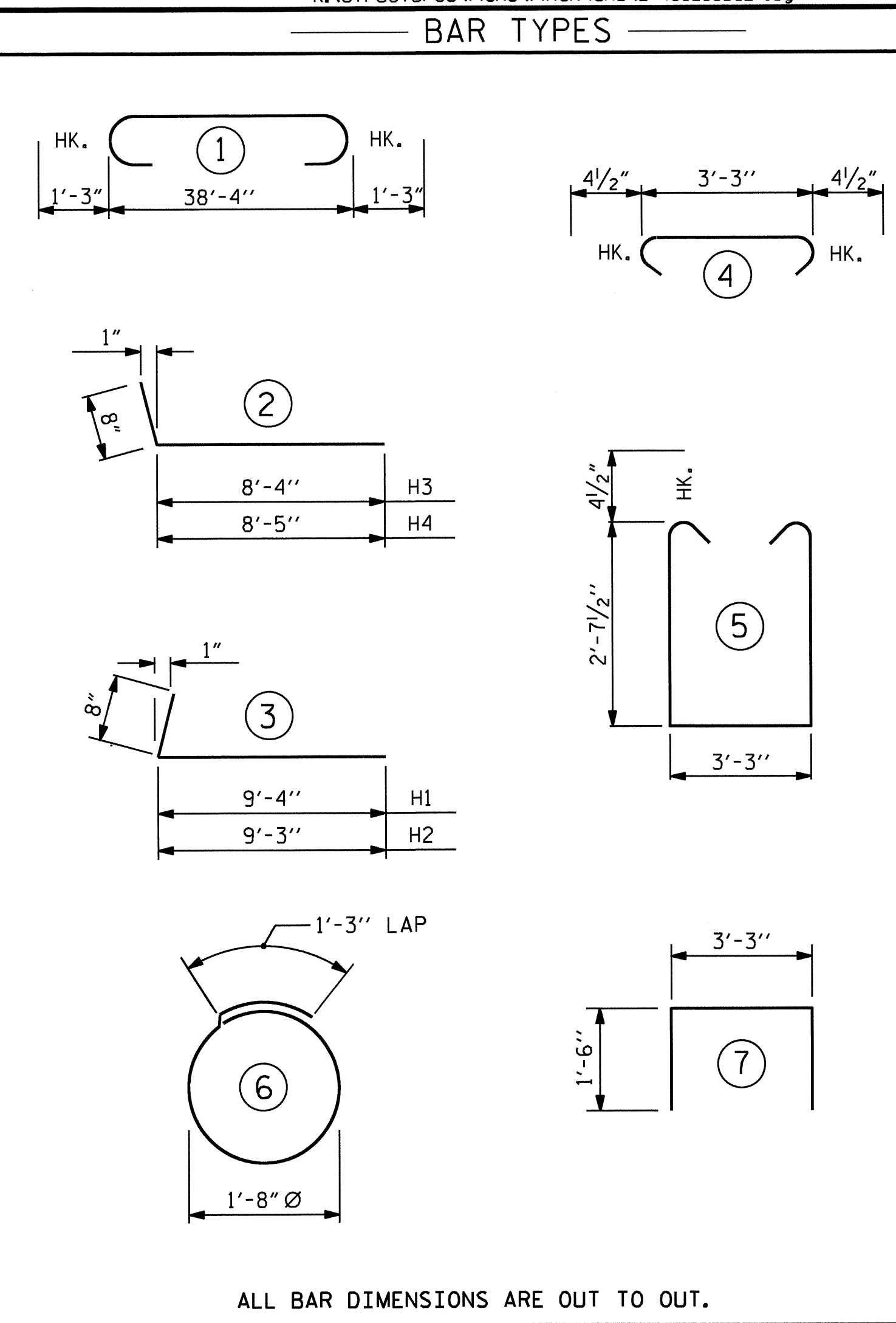
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

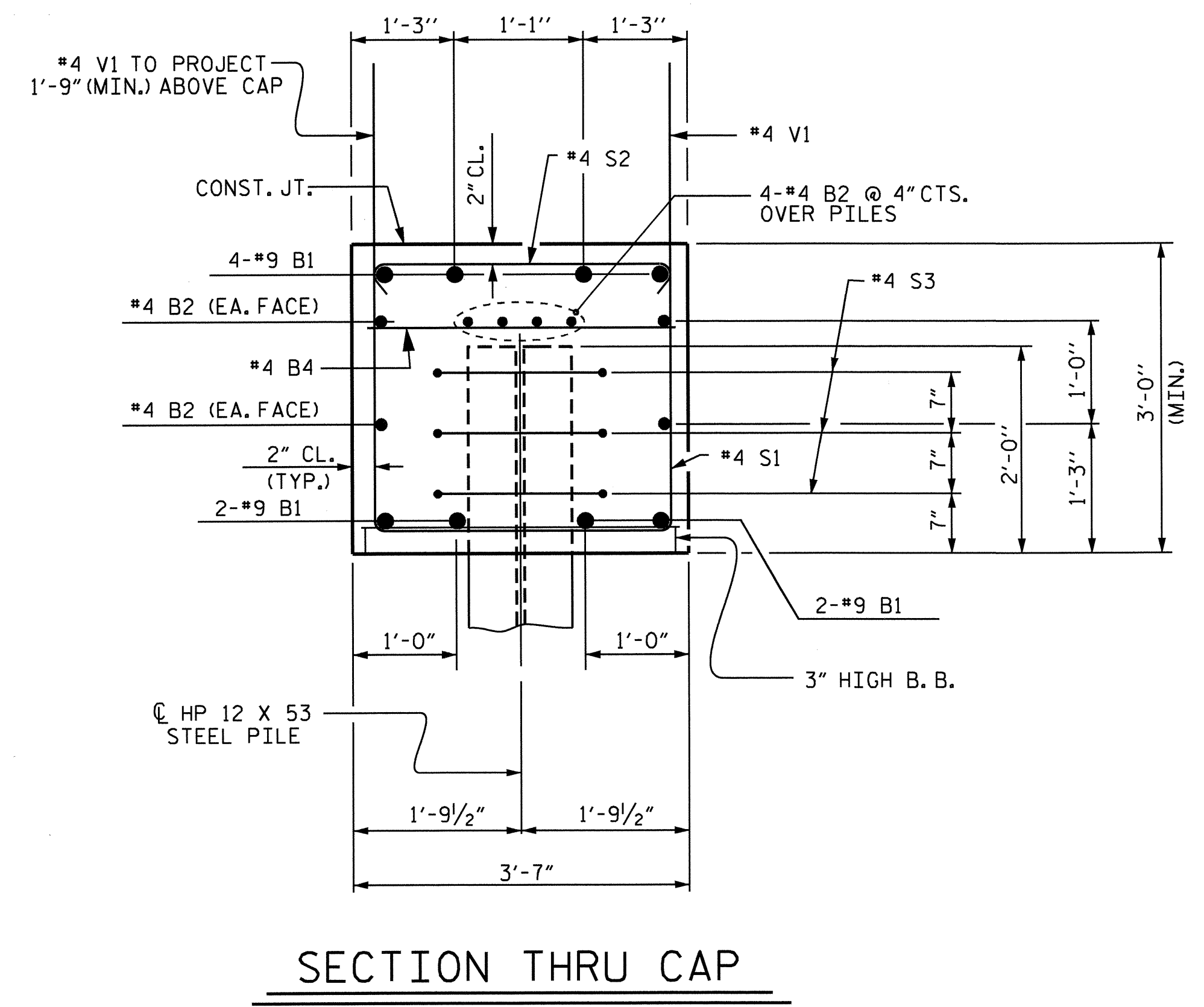


### PILE SPLICE DETAILS

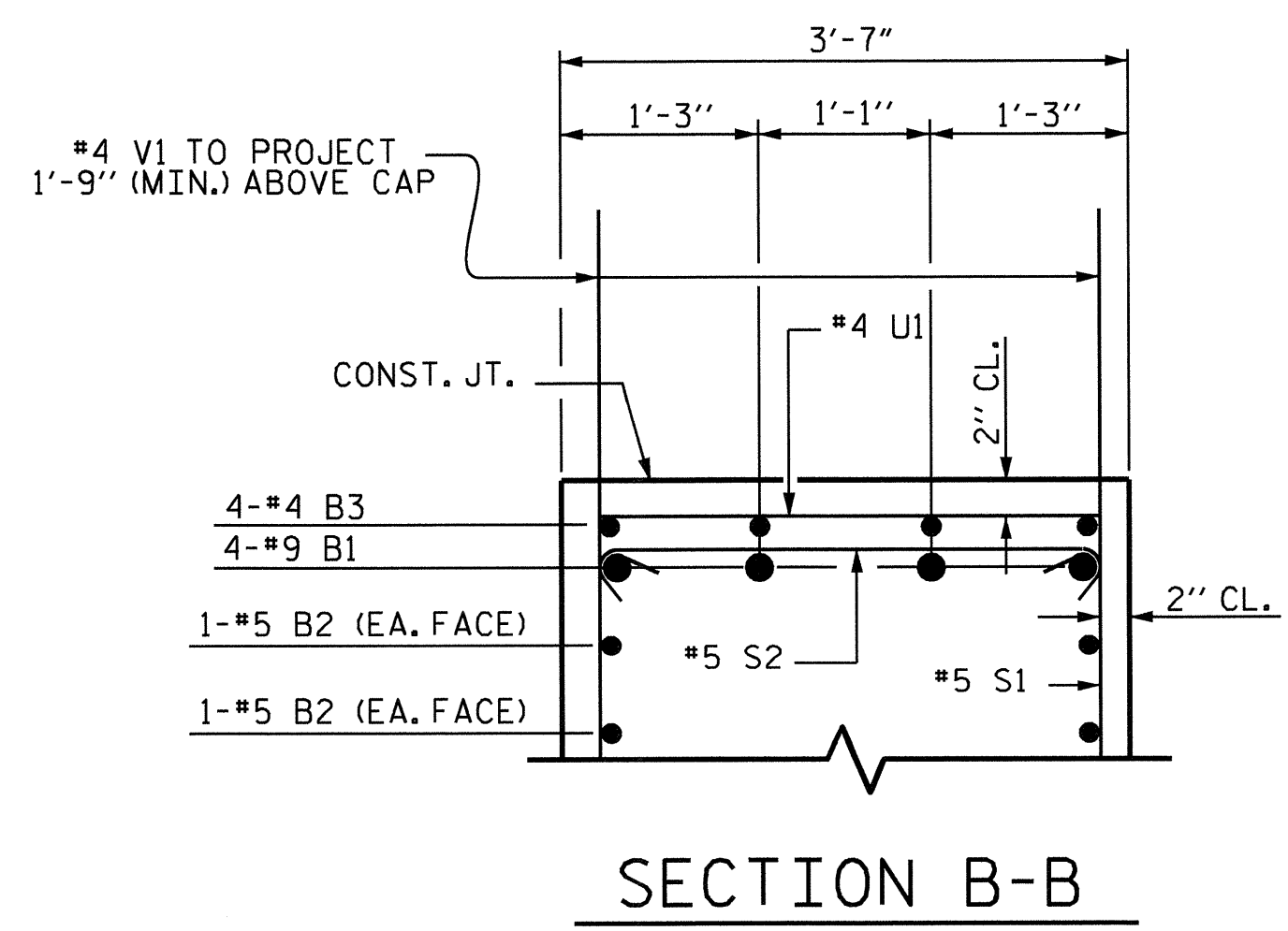


ALL BAR DIMENSIONS ARE OUT TO OUT.

| BILL OF MATERIAL              |     |      |      |         |                 |
|-------------------------------|-----|------|------|---------|-----------------|
| END BENT NO. 1                |     |      |      |         |                 |
| BAR NO.                       | NO. | SIZE | TYPE | LENGTH  | WEIGHT          |
| B1                            | 8   | #9   | 1    | 40'-10" | 1111            |
| B2                            | 16  | #4   | STR  | 20'-6"  | 219             |
| B3                            | 4   | #4   | STR  | 16'-1"  | 43              |
| B4                            | 10  | #4   | STR  | 3'-3"   | 22              |
| H1                            | 11  | #5   | 3    | 10'-0"  | 115             |
| H2                            | 11  | #5   | 3    | 9'-11"  | 114             |
| H3                            | 11  | #5   | 2    | 9'-0"   | 103             |
| H4                            | 11  | #5   | 2    | 9'-1"   | 104             |
| H5                            | 28  | #4   | STR  | 2'-7"   | 48              |
| S1                            | 42  | #4   | 5    | 9'-5"   | 264             |
| S2                            | 42  | #4   | 4    | 4'-0"   | 112             |
| S3                            | 15  | #4   | 6    | 6'-6"   | 65              |
| U1                            | 11  | #4   | 7    | 6'-3"   | 46              |
| V1                            | 40  | #4   | STR  | 4'-9"   | 127             |
| V2                            | 26  | #5   | STR  | 9'-10"  | 267             |
| V3                            | 24  | #5   | STR  | 9'-2"   | 229             |
| REINFORCING STEEL             |     |      |      |         | = 2989 LBS.     |
| CLASS A CONCRETE              |     |      |      |         |                 |
| POUR #1 : CAP & BOT. OF WINGS |     |      |      |         | = 18.8 CU. YDS. |
| POUR #2 : TOP OF WINGS        |     |      |      |         | = 5.5 CU. YDS.  |
| TOTAL CLASS A CONCRETE        |     |      |      |         | = 24.3 CU. YDS. |
| HP 12 X 53 STEEL PILES        |     |      |      |         |                 |
| NO.: 5                        |     |      |      |         | LIN. FT. 250    |



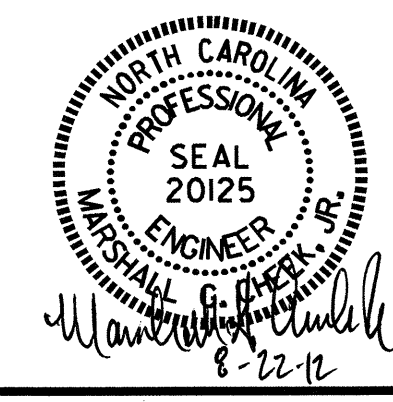
### SECTION THRU CAP



### SECTION B-B

PROJECT NO. B-4632  
RUTHERFORD COUNTY  
 STATION: 30+66.99 -L-

SHEET 3 OF 3  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT NO. 1



DRAWN BY: V.X. NGUYEN DATE: 9-1-11  
 CHECKED BY: M.G. CHEEK DATE: 9-11

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

TOTAL SHEETS: 34



NOTES

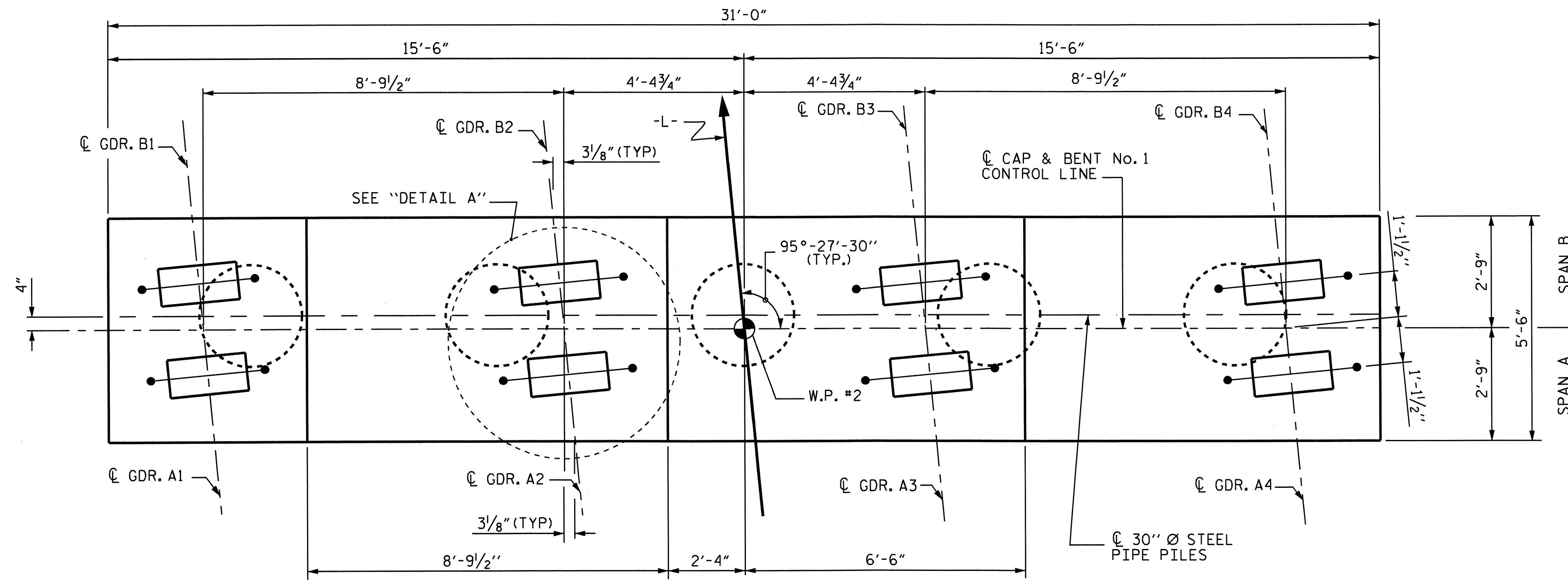
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

"U" BARS IN END OF CAP MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR "B" BARS.

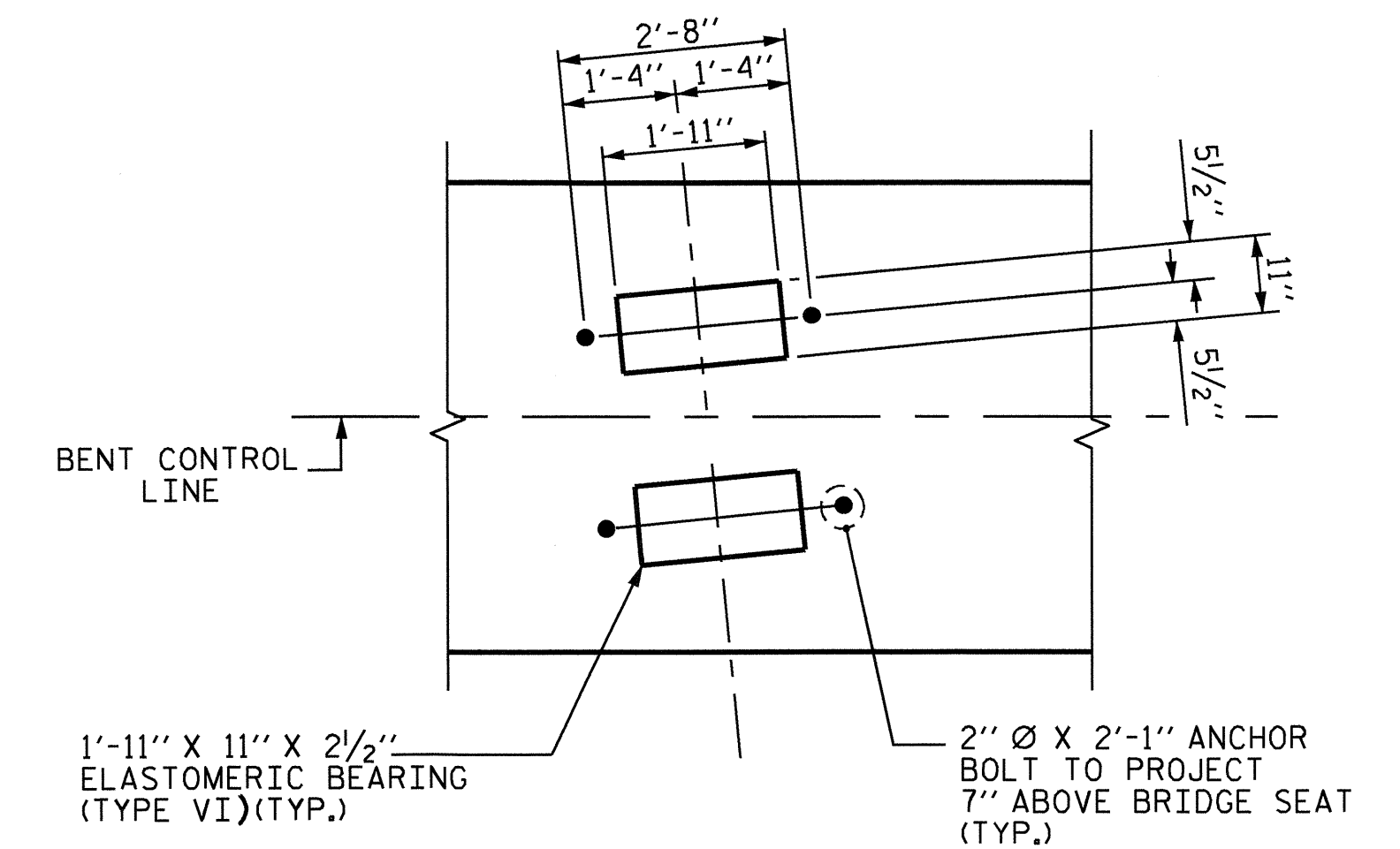
FOR PIPE PILE SPLICE DETAILS, SEE "30" STEEL PIPE PILE" SHEET.

GALVANIZE THE TOP OF EACH INTERIOR BENT PILE A MINIMUM OF 20 FEET. GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

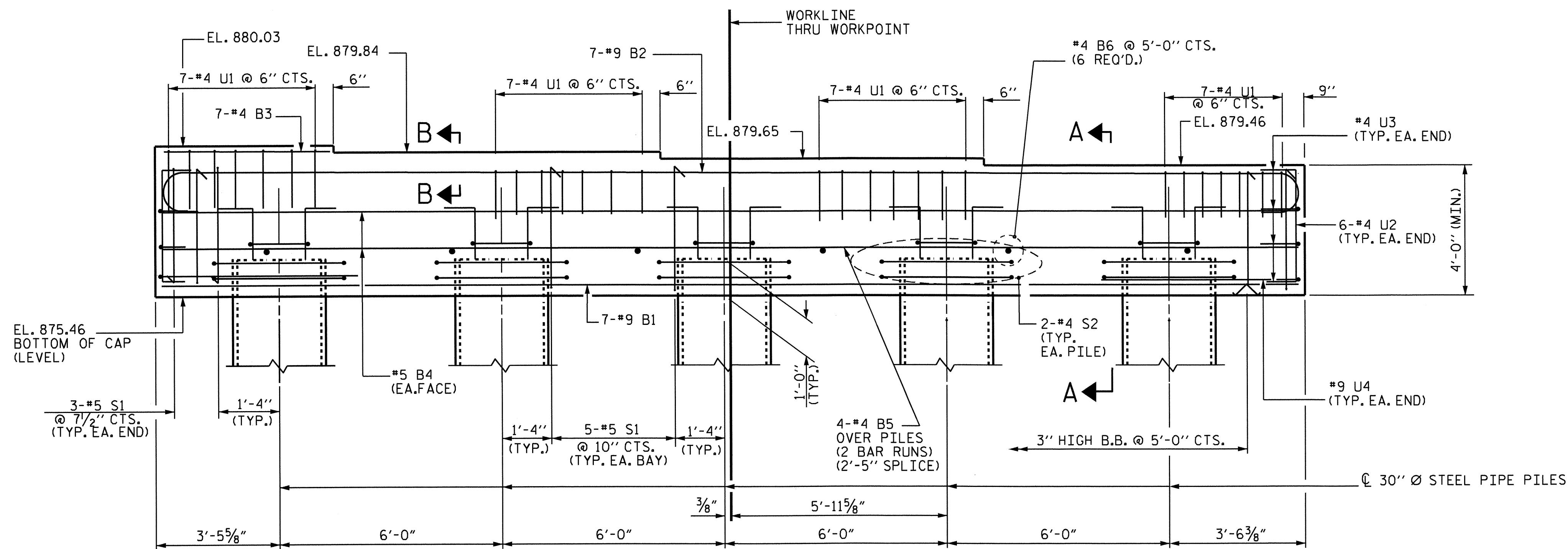
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE CENTERLINE OF THE 30" STEEL PIPE PILES IS OFFSET 4" FROM THE BENT CONTROL LINE.



PLAN



DETAIL A



ELEVATION

FOR STEEL PIPE PILE REINF. STEEL & CONCRETE QUANTITIES, SEE "30" STEEL PIPE PILE" STANDARD. FOR SECTION A-A & SECTION B-B, SEE SHEET 2 OF 2.

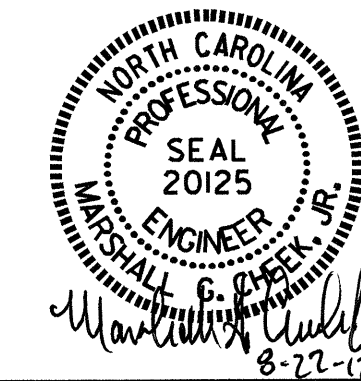
\* INVERT ALTERNATE STIRRUPS

PROJECT NO. B-4632  
RUTHERFORD COUNTY  
 STATION: 30+66.99 -L-

SHEET 1 OF 2

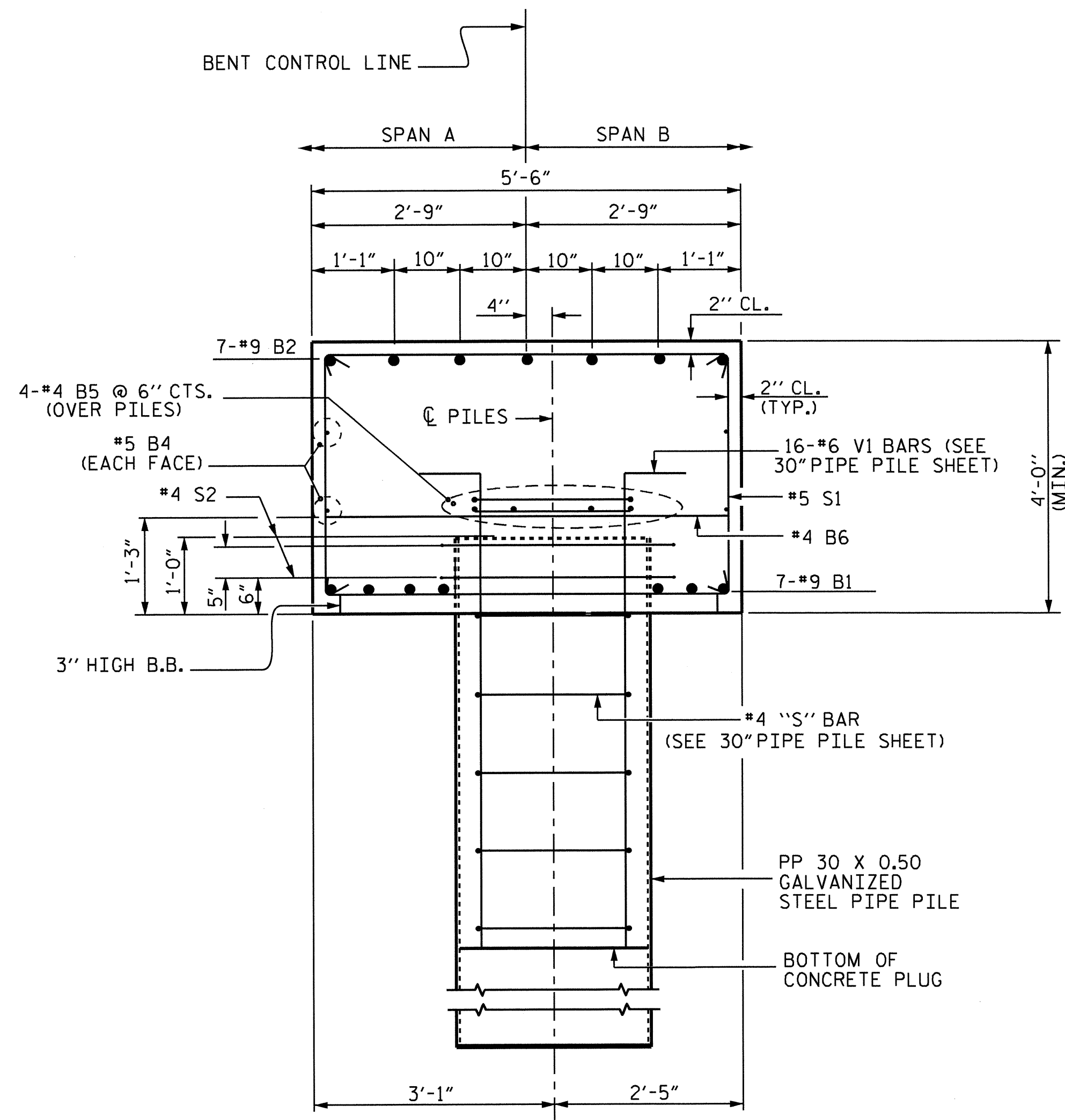
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 BENT No. 1

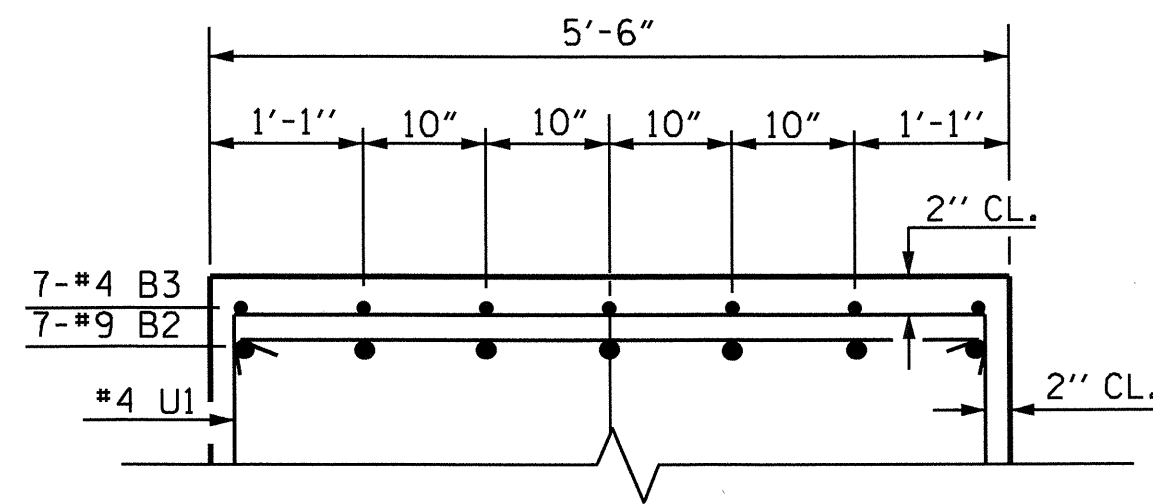


| REVISIONS |     |       |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | DATE: | S-25         |
| 1         |     |       | 3   |       | TOTAL SHEETS |
| 2         |     |       | 4   |       | 34           |

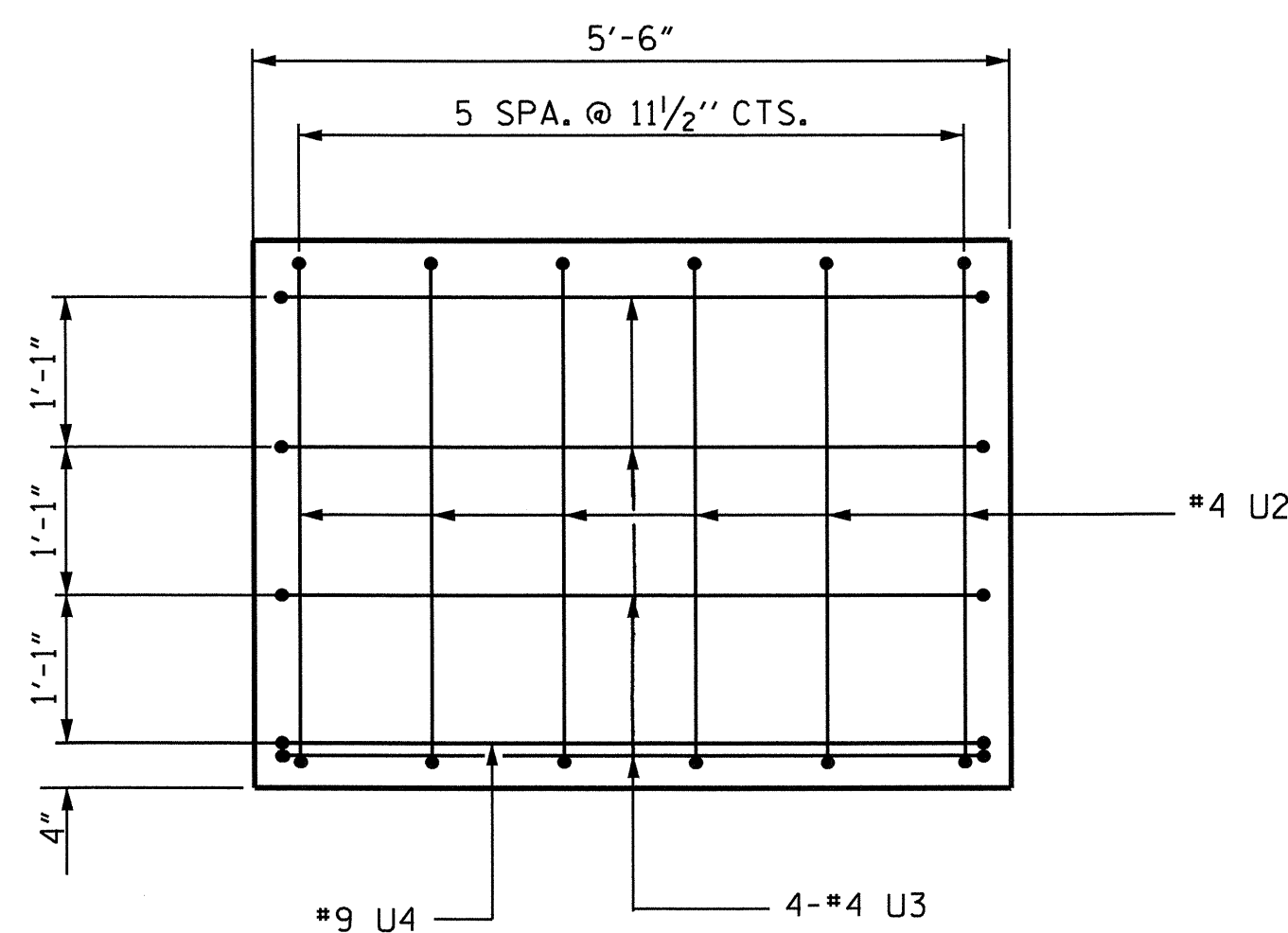
DRAWN BY : B. MATHEW/M. POOLE DATE : 10/31/2011  
 CHECKED BY : M. G. CHEEK DATE : 12/2011



SECTION A-A

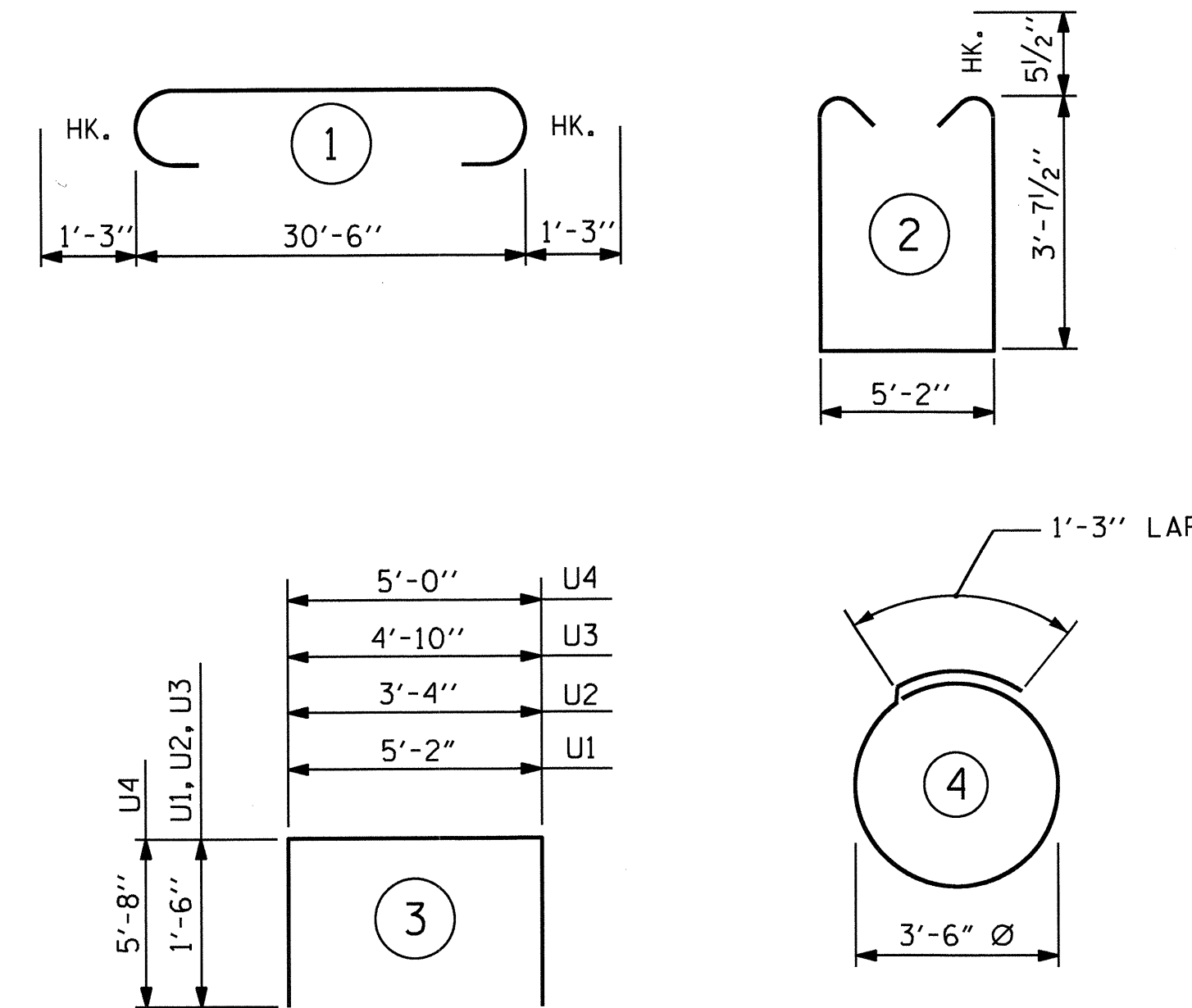


SECTION B-B



END VIEW  
TYP. EA. END

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT NO. 1

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|-----|-----|------|------|--------|--------|
| B1  | 7   | 9    | STR  | 30'-8" | 730    |
| B2  | 7   | 9    | 1    | 33'-0" | 785    |
| B3  | 7   | 4    | STR  | 4'-0"  | 19     |
| B4  | 4   | 5    | STR  | 30'-8" | 128    |
| B5  | 8   | 4    | STR  | 16'-7" | 89     |
| B6  | 6   | 4    | STR  | 5'-2"  | 21     |
| S1  | 26  | 5    | 2    | 13'-4" | 362    |
| S2  | 10  | 4    | 4    | 12'-3" | 82     |
| U1  | 28  | 4    | 3    | 8'-2"  | 153    |
| U2  | 12  | 4    | 3    | 6'-4"  | 51     |
| U3  | 8   | 4    | 3    | 7'-10" | 42     |
| U4  | 2   | 9    | 3    | 16'-4" | 111    |

REINFORCING STEEL LBS. 2573

CLASS "A" CONCRETE  
POUR #1 CAP 25.9 C.Y.  
\*\* TOTAL 25.9 C.Y.

PP 30" X 0.5 GALVANIZED  
STEEL PILES  
NO.: 5 250 LIN. FT.

\*\* CONCRETE DISPLACED BY THE FILLED  
30" Ø STEEL PIPE PILES HAS BEEN  
DEDUCTED.

PROJECT NO. B-4632  
RUTHERFORD COUNTY  
STATION: 30+66.99 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE  
BENT No. 1



REVISIONS

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

SHEET NO.  
S-26  
TOTAL SHEETS  
34

DRAWN BY : B.MATHEW/M.POOLE DATE : 10/31/2011  
CHECKED BY : M.G.CHEEK DATE : 12/2011

**NOTES**

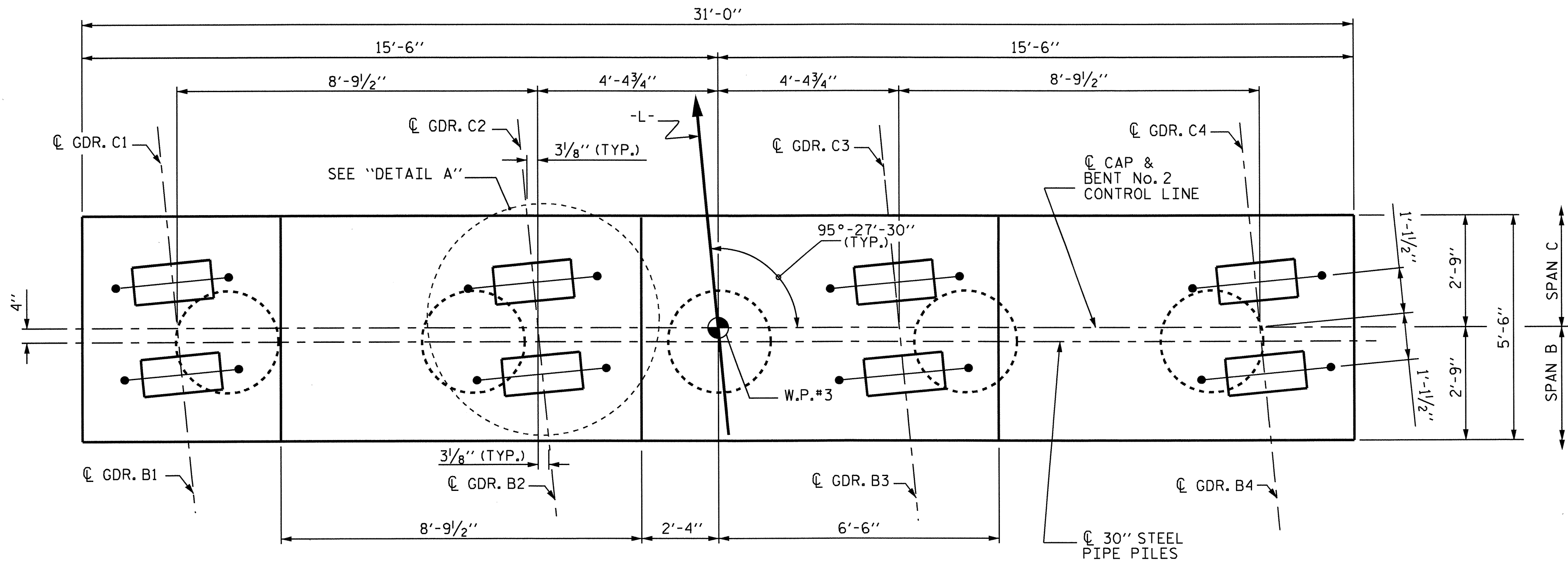
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

"U" BARS IN END OF CAP MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR "B" BARS.

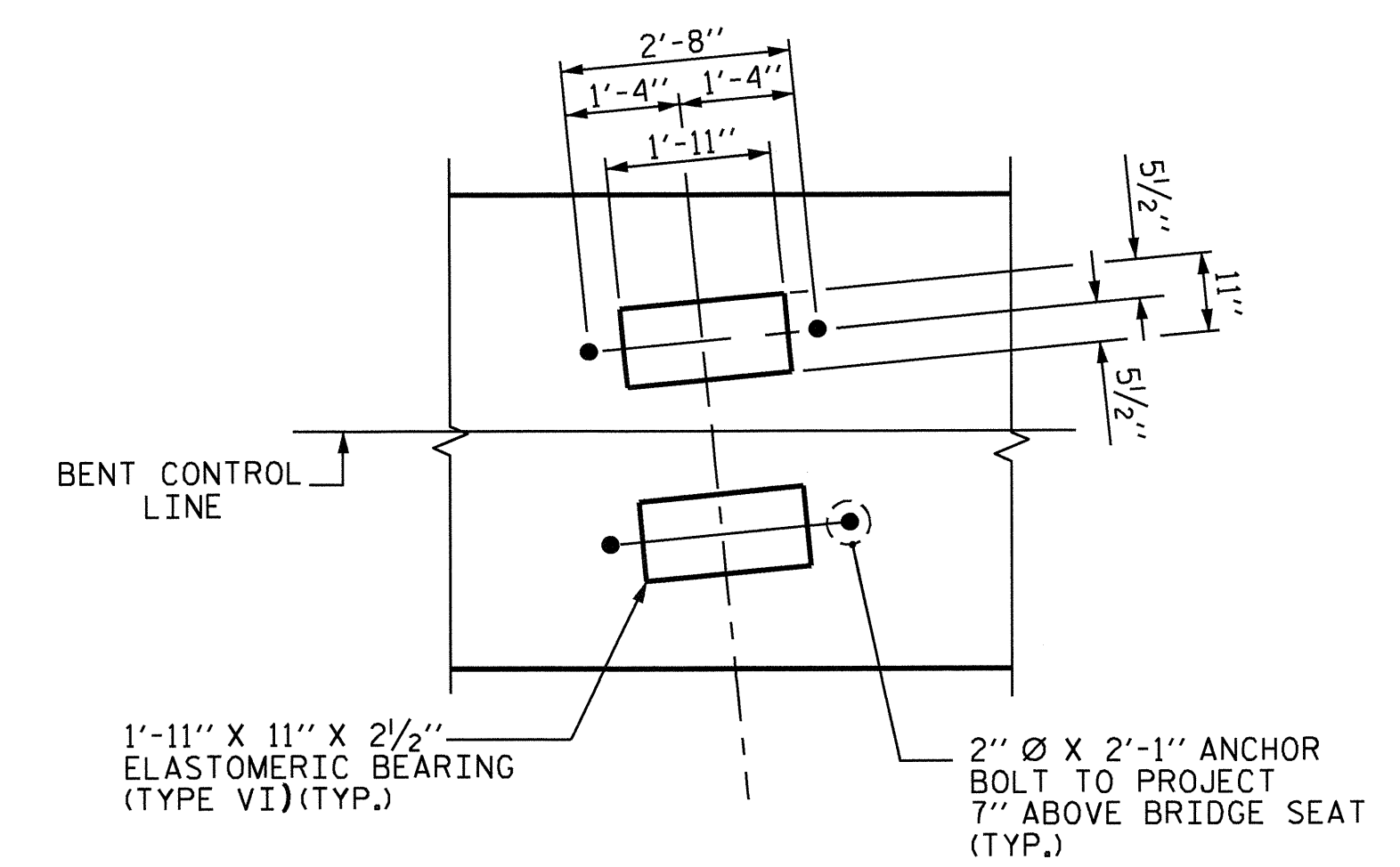
FOR PIPE PILE SPLICE DETAILS, SEE "30" STEEL PIPE PILE" SHEET.

GALVANIZE THE TOP OF EACH INTERIOR BENT PILE A MINIMUM OF 20 FEET. GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

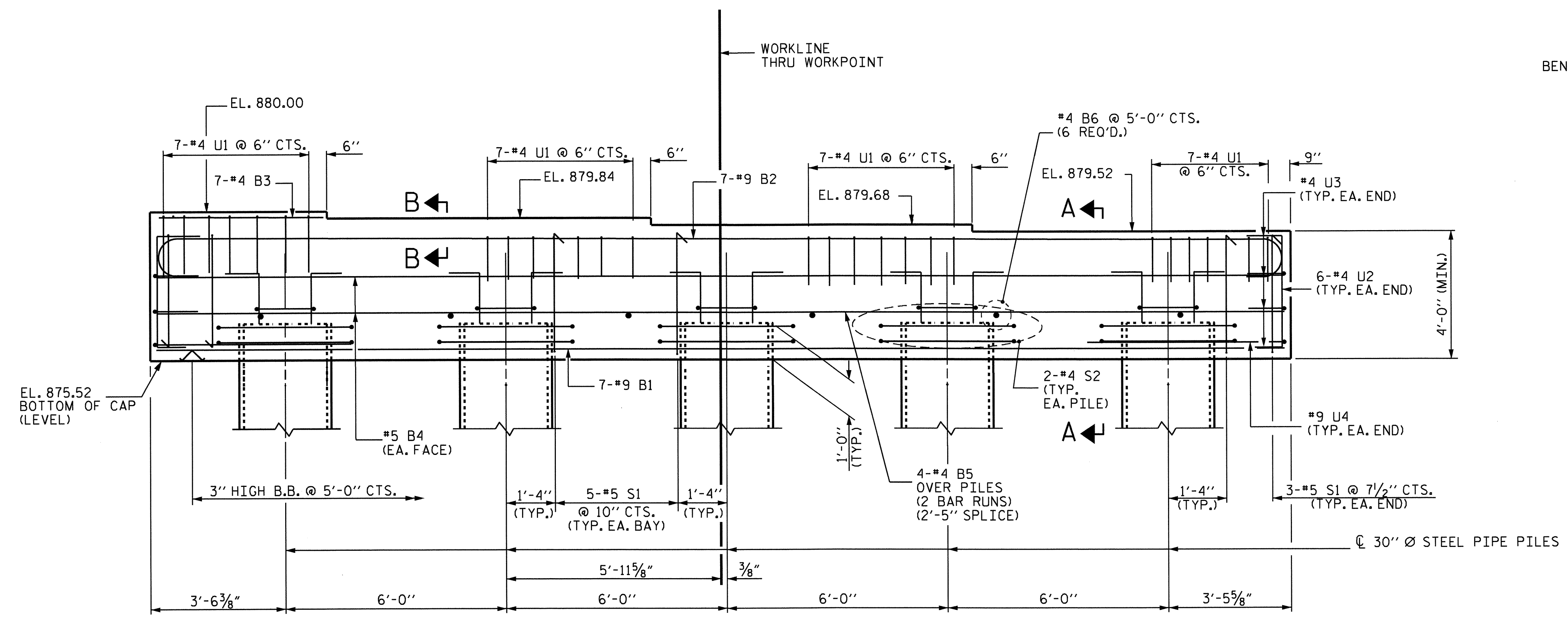
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE CENTERLINE OF THE 30" STEEL PIPE PILES IS OFFSET 4" FROM THE BENT CONTROL LINE.



**PLAN**



**DETAIL A**



**ELEVATION**

FOR STEEL PIPE PILE REINF. STEEL & CONCRETE QUANTITIES, SEE "30" STEEL PIPE PILE" STANDARD.  
FOR SECTION A-A & SECTION B-B, SEE SHEET 2 OF 2.

PROJECT NO. B-4632  
RUTHERFORD COUNTY  
STATION: 30+66.99 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

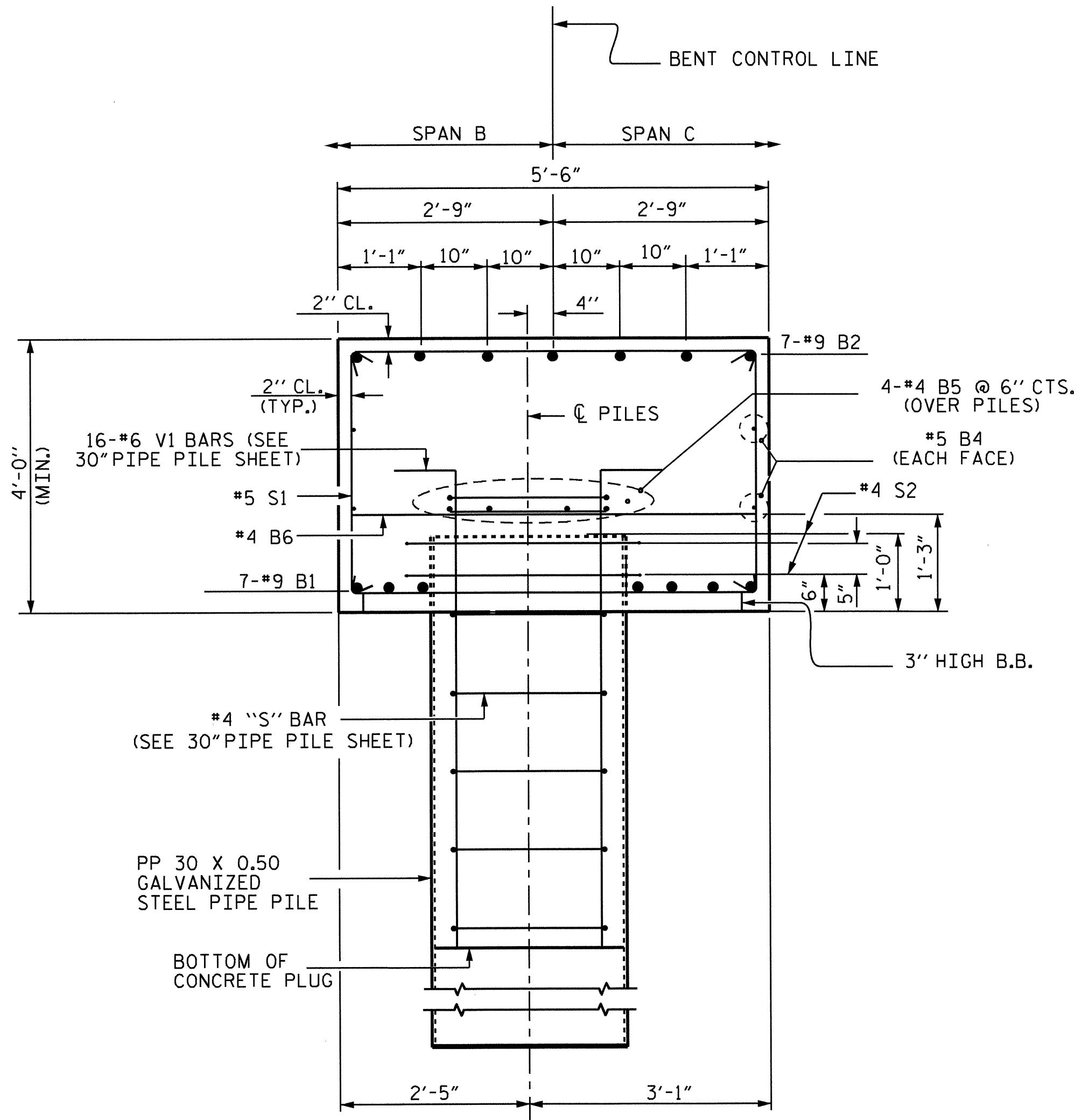
SUBSTRUCTURE  
BENT No. 2



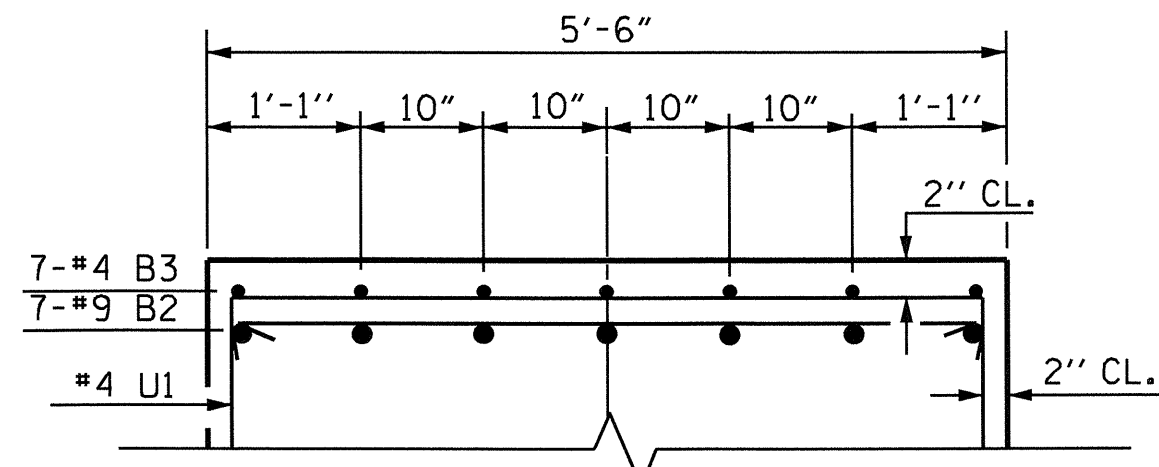
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|-----------|-----|-------|-----|-----------|--------------|
| NO.       | BY: | DATE: | NO. | BY:       | DATE:        |
| 1         |     |       | 3   |           |              |
| 2         |     |       | 4   |           |              |
|           |     |       |     |           | TOTAL SHEETS |
|           |     |       |     |           | 34           |

DRAWN BY : B.MATHEW/M. POOLE DATE : 10/31/2011  
CHECKED BY : M. G. CHEEK DATE : 12/2011

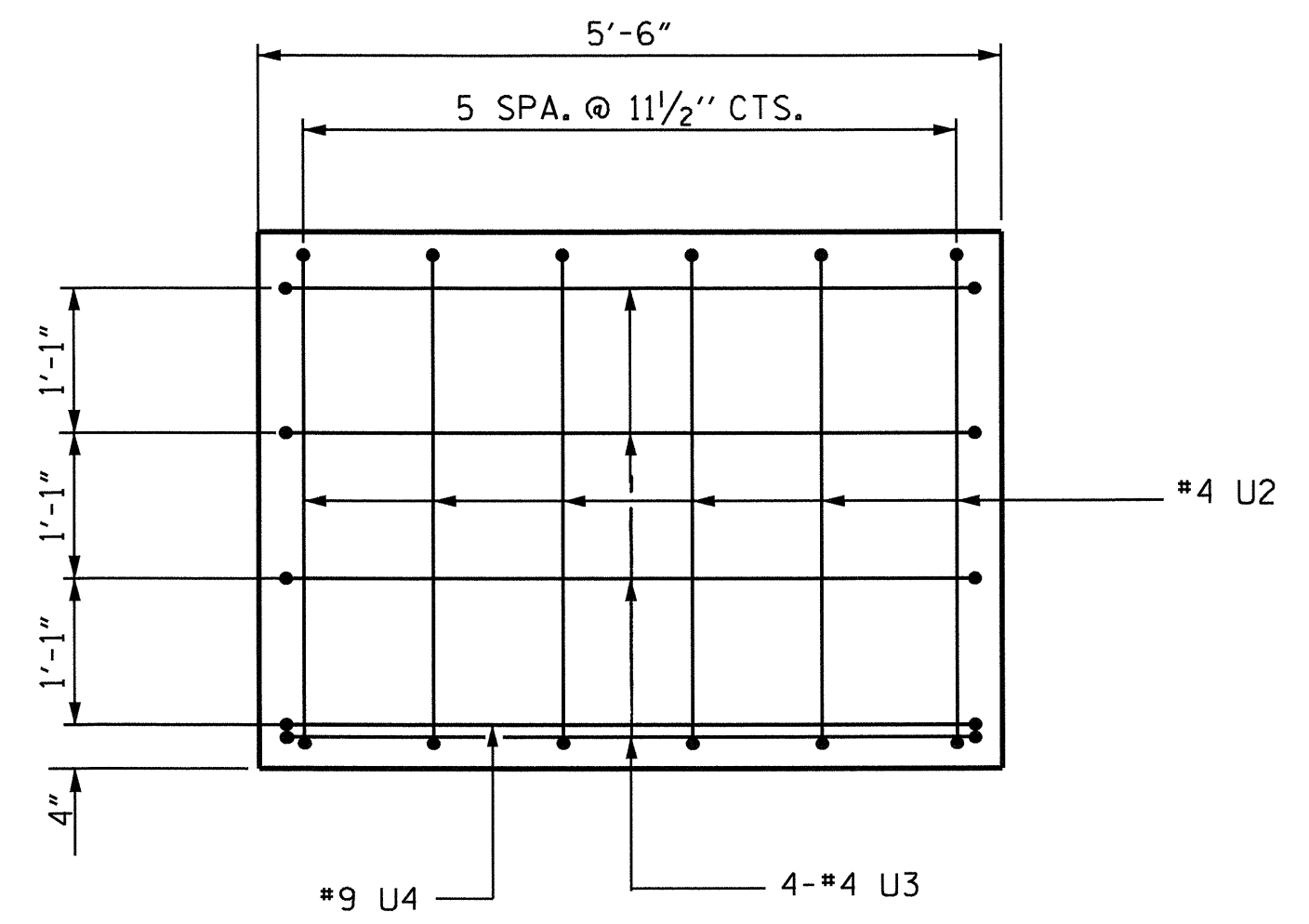




SECTION A-A

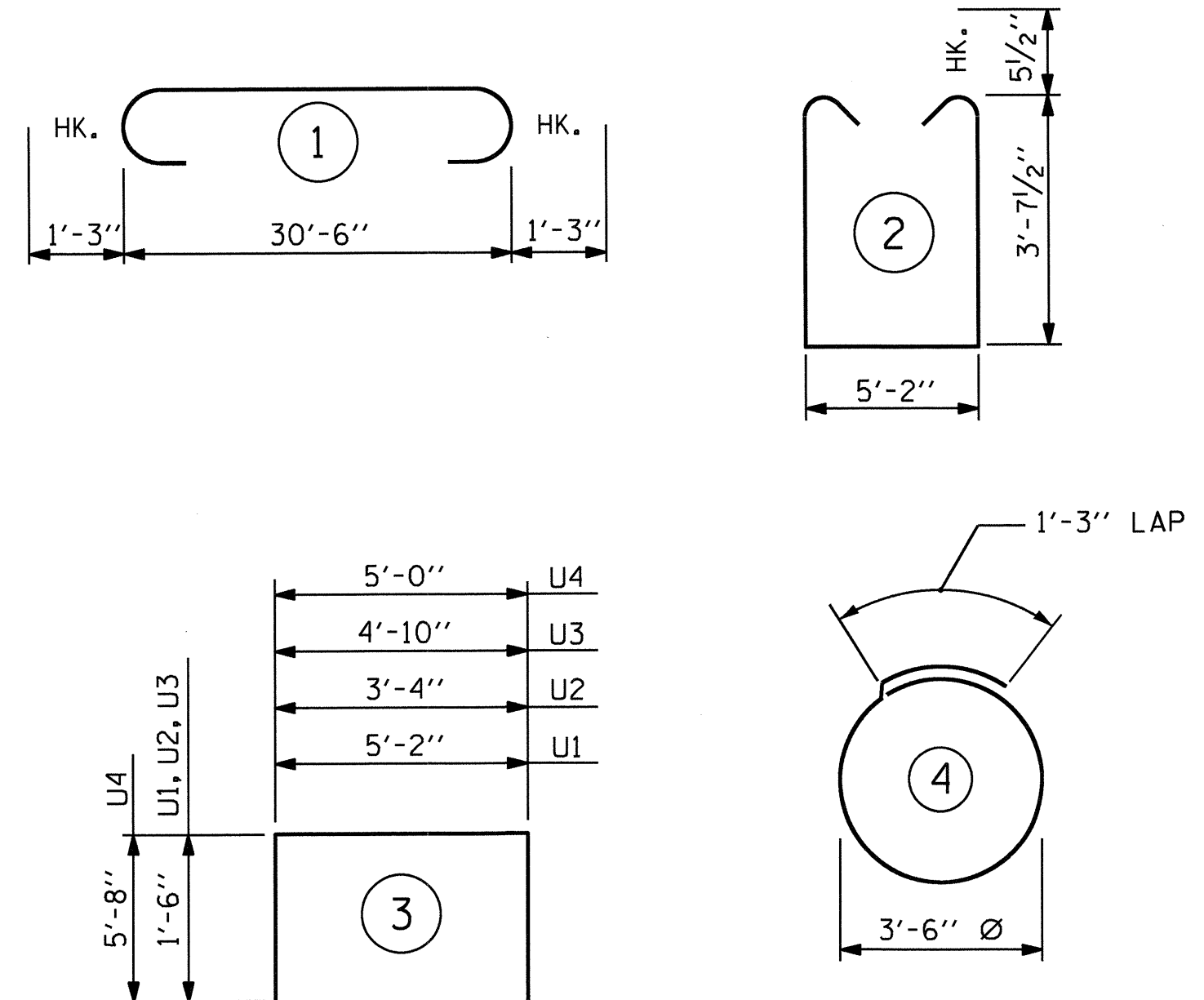


SECTION B-B



END VIEW  
(TYP. EA. END)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT NO. 2

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|-----|-----|------|------|--------|--------|
| B1  | 7   | 9    | STR  | 30'-8" | 730    |
| B2  | 7   | 9    | 1    | 33'-0" | 785    |
| B3  | 7   | 4    | STR  | 4'-0"  | 19     |
| B4  | 4   | 5    | STR  | 30'-8" | 128    |
| B5  | 8   | 4    | STR  | 16'-7" | 89     |
| B6  | 6   | 4    | STR  | 5'-2"  | 21     |
| S1  | 26  | 5    | 2    | 13'-4" | 362    |
| S2  | 10  | 4    | 4    | 12'-3" | 82     |
| U1  | 28  | 4    | 3    | 8'-2"  | 153    |
| U2  | 12  | 4    | 3    | 6'-4"  | 51     |
| U3  | 8   | 4    | 3    | 7'-10" | 42     |
| U4  | 2   | 9    | 3    | 16'-4" | 111    |

|   |      |              |
|---|------|--------------|
| REINFORCING STEEL   | LBS. | 2573         |
| CLASS "A" CONCRETE  |      |              |
| POUR #1 CAP   |      | 25.9 C.Y.    |
| ** TOTAL  |      | 25.9 C.Y.    |
| PP 30" X 0.5 GALVANIZED STEEL PILES   |      |              |
| NO.: 5  |      | 325 LIN. FT. |
| ** CONCRETE DISPLACED BY THE FILLED 30" Ø STEEL PIPE PILES HAS BEEN DEDUCTED. |      |              |

PROJECT NO. B-4632  
RUTHERFORD COUNTY  
 STATION: 30+66.99 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 BENT No. 2

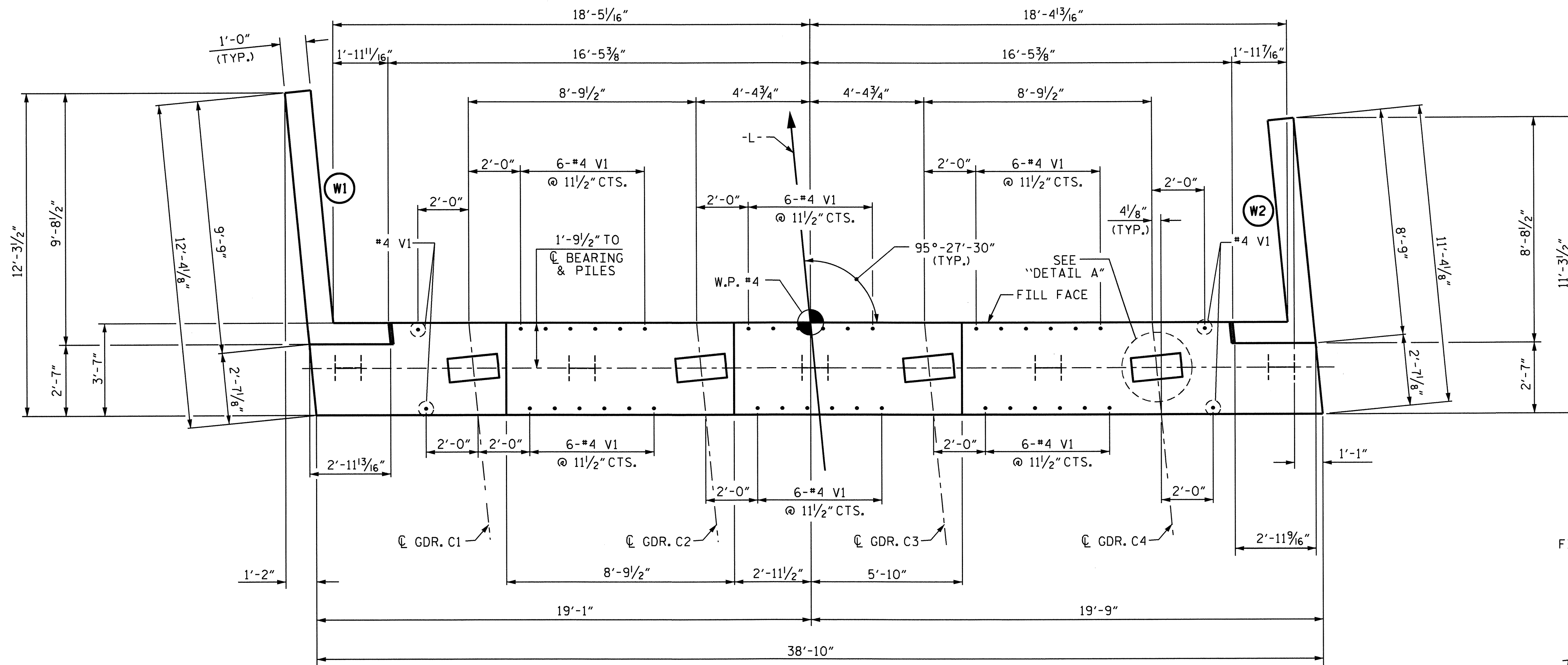


| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-28         |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |
| 2         |     |       | 4   |     |       | 34           |

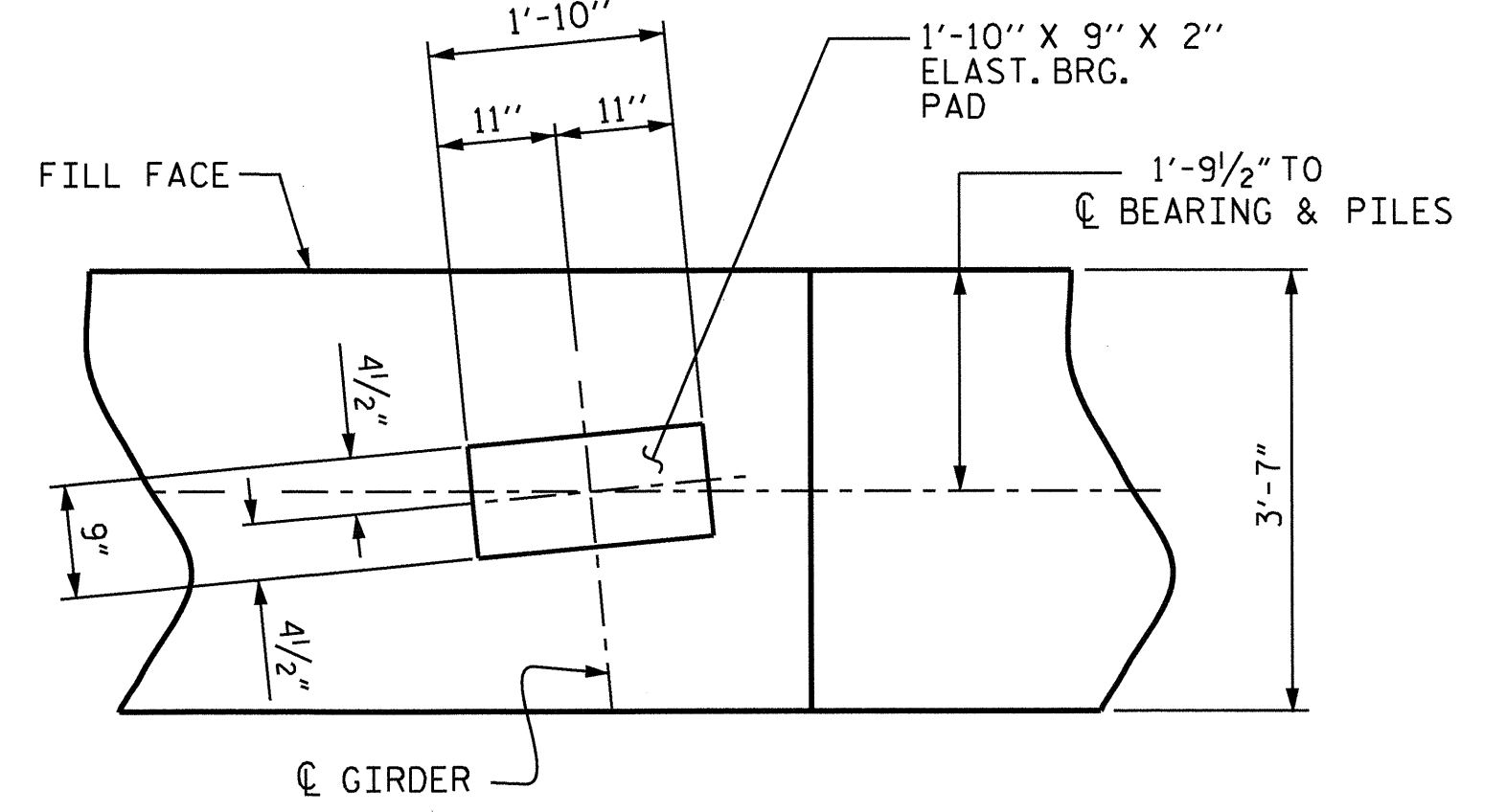
DRAWN BY : B.MATHEW/M. POOLE DATE : 10/31/2011  
 CHECKED BY : M. G. CHEEK DATE : 12/2011

**NOTES**

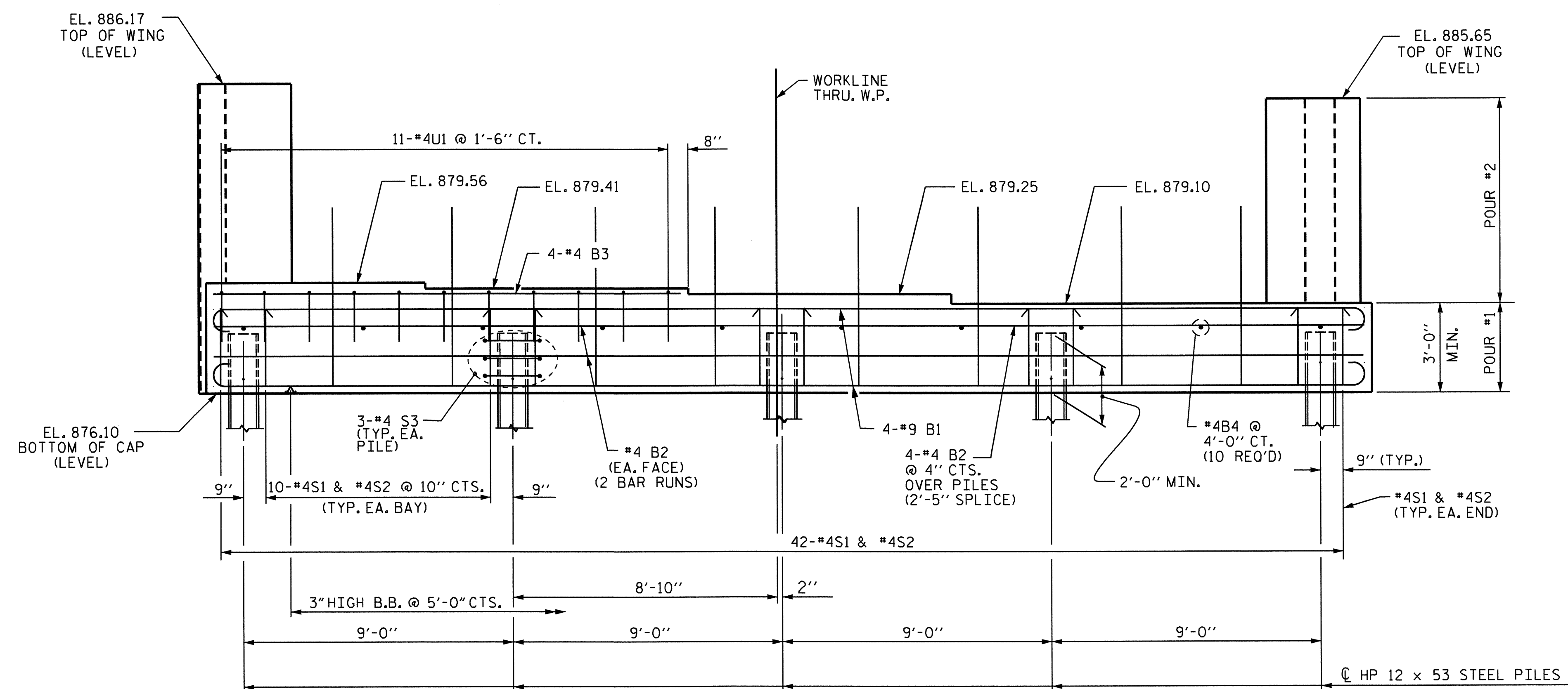
THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS. SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.



**PLAN**



**DETAIL A**



**ELEVATION**

PROJECT NO. B-4632  
RUTHERFORD COUNTY  
 STATION: 30+66.99 -L-

SHEET 1 OF 3

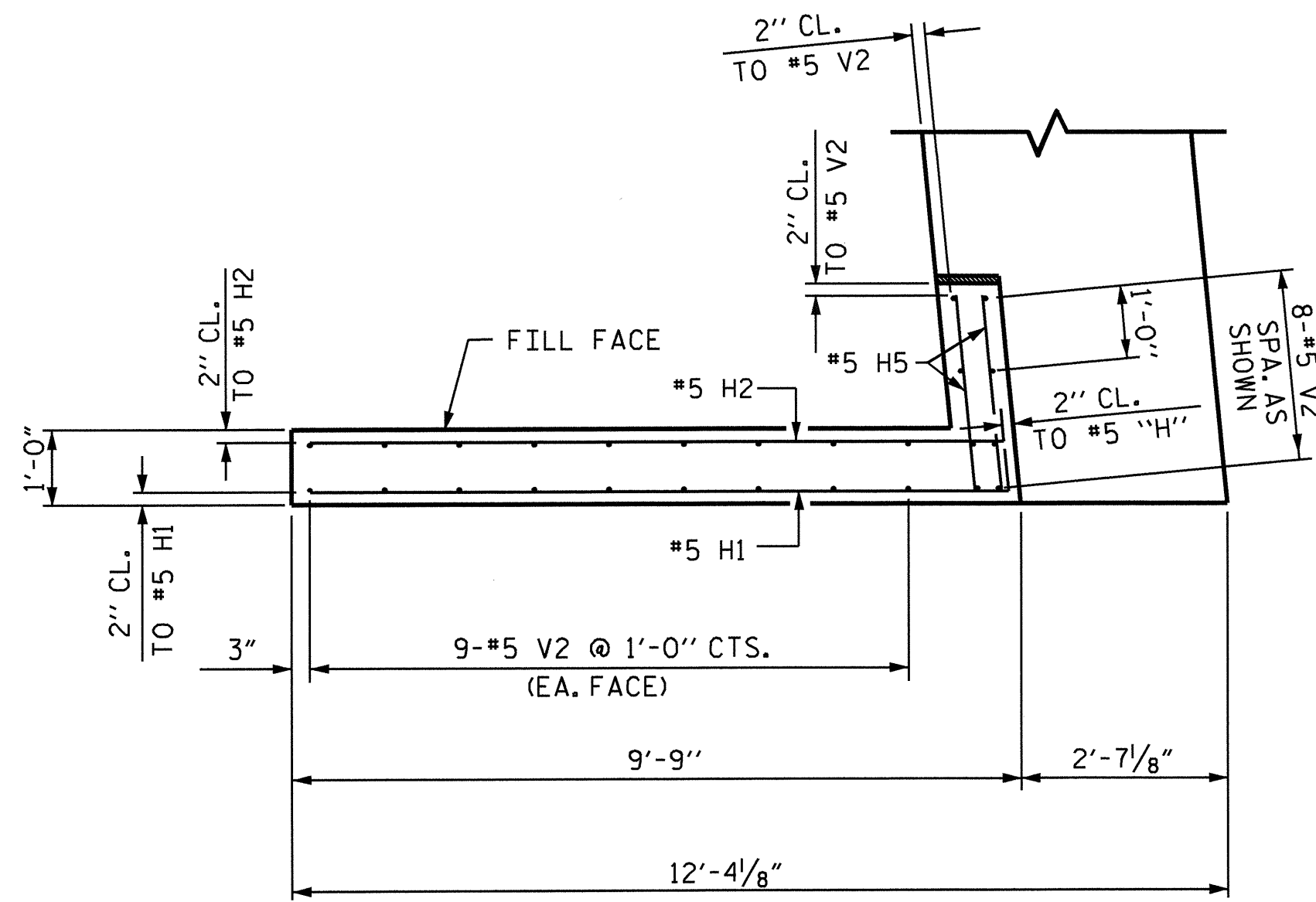
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE  
 END BENT NO. 2**

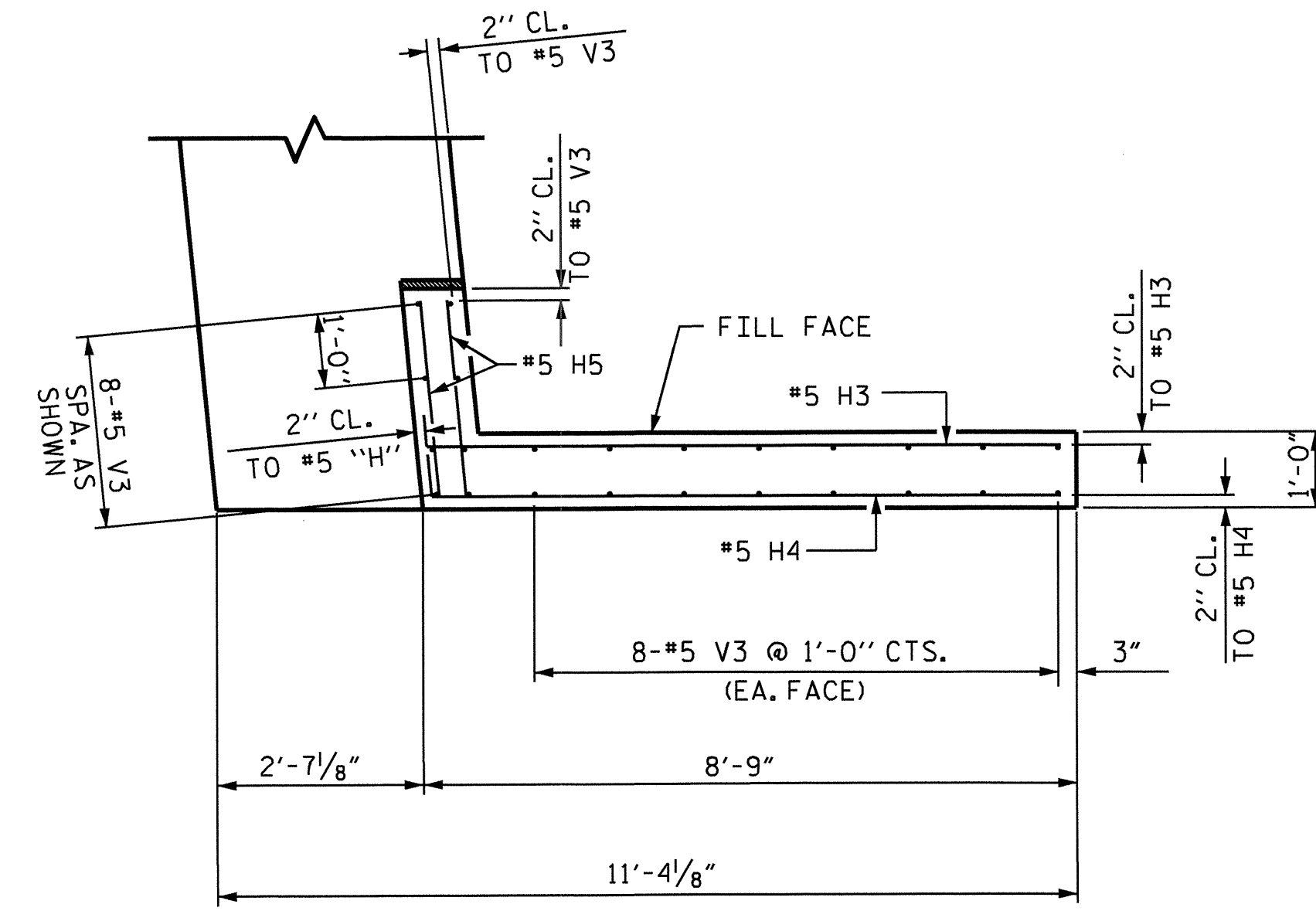


| REVISIONS |     |       |     |     |       | SHEET NO.<br>S-29  |
|-----------|-----|-------|-----|-----|-------|--------------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: |                    |
| 1         |     |       | 3   |     |       | TOTAL SHEETS<br>34 |
| 2         |     |       | 4   |     |       |                    |

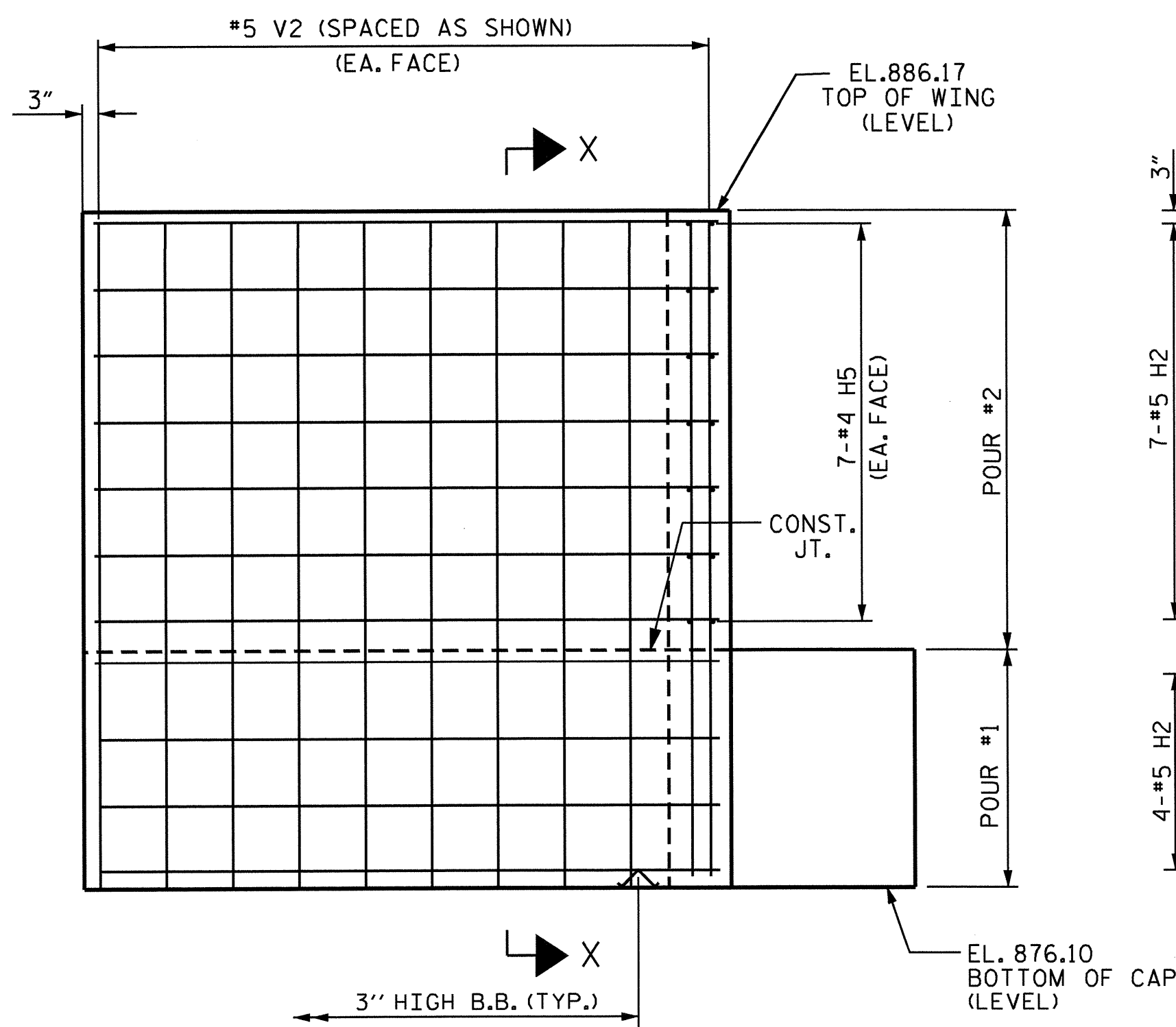
DRAWN BY: V.X. NGUYEN DATE: 9-7-11  
 CHECKED BY: M.G. CHEEK DATE: 9-11



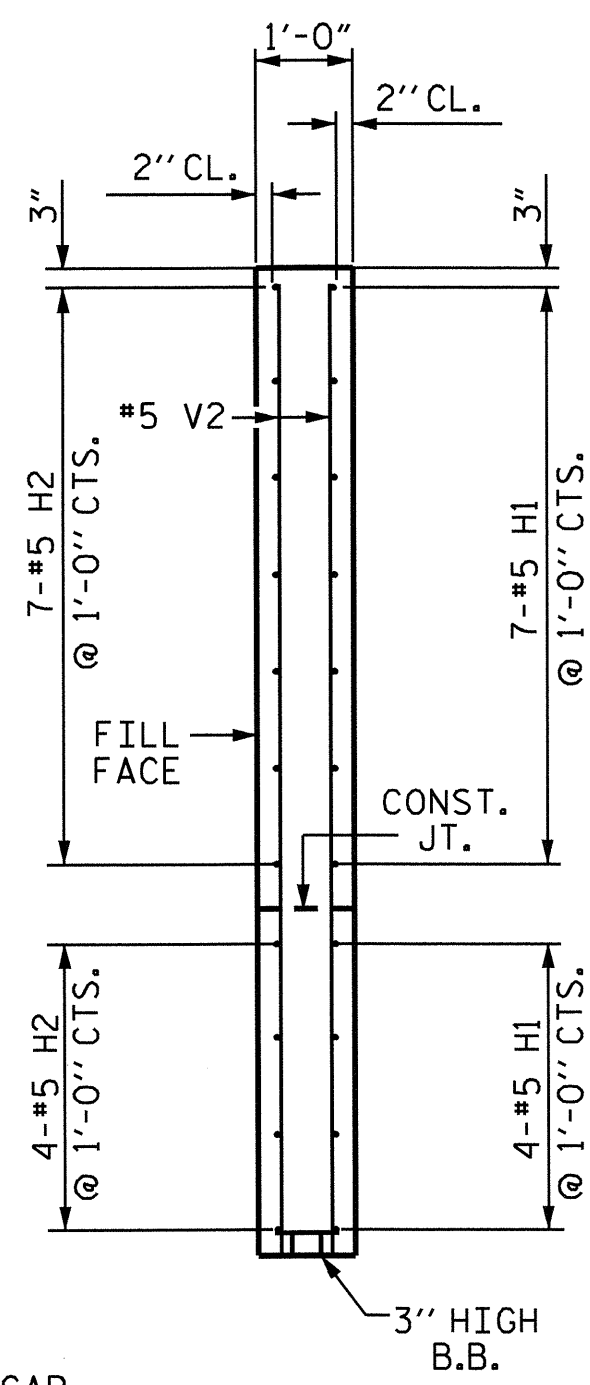
PLAN OF WING - W1



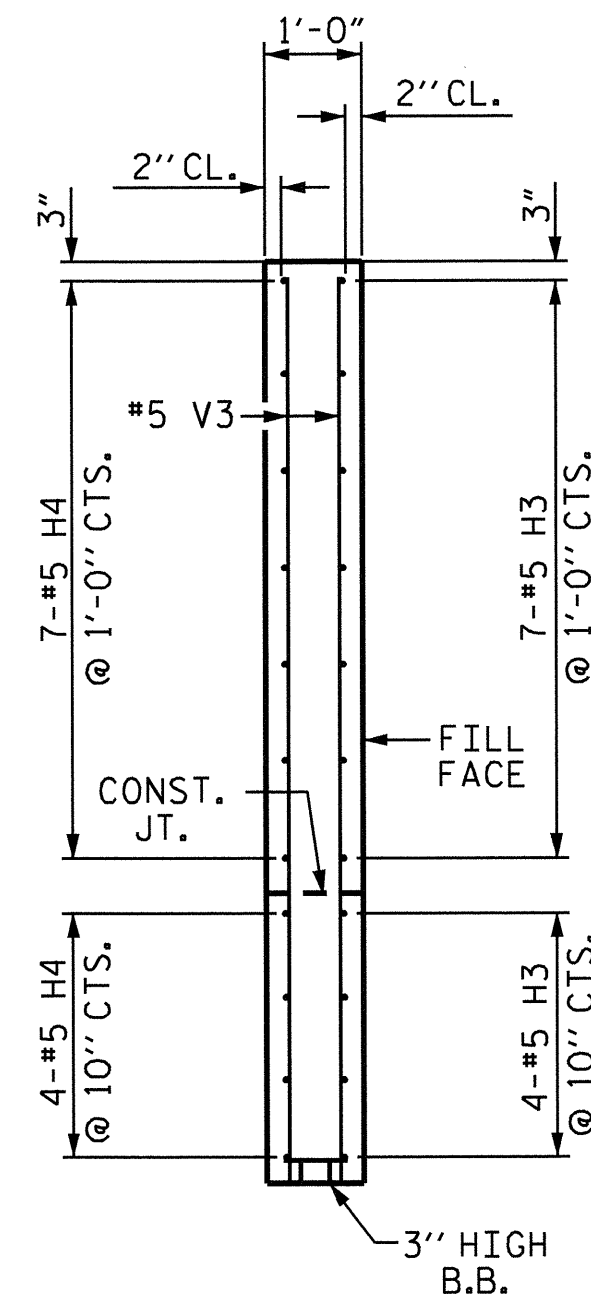
PLAN OF WING - W2



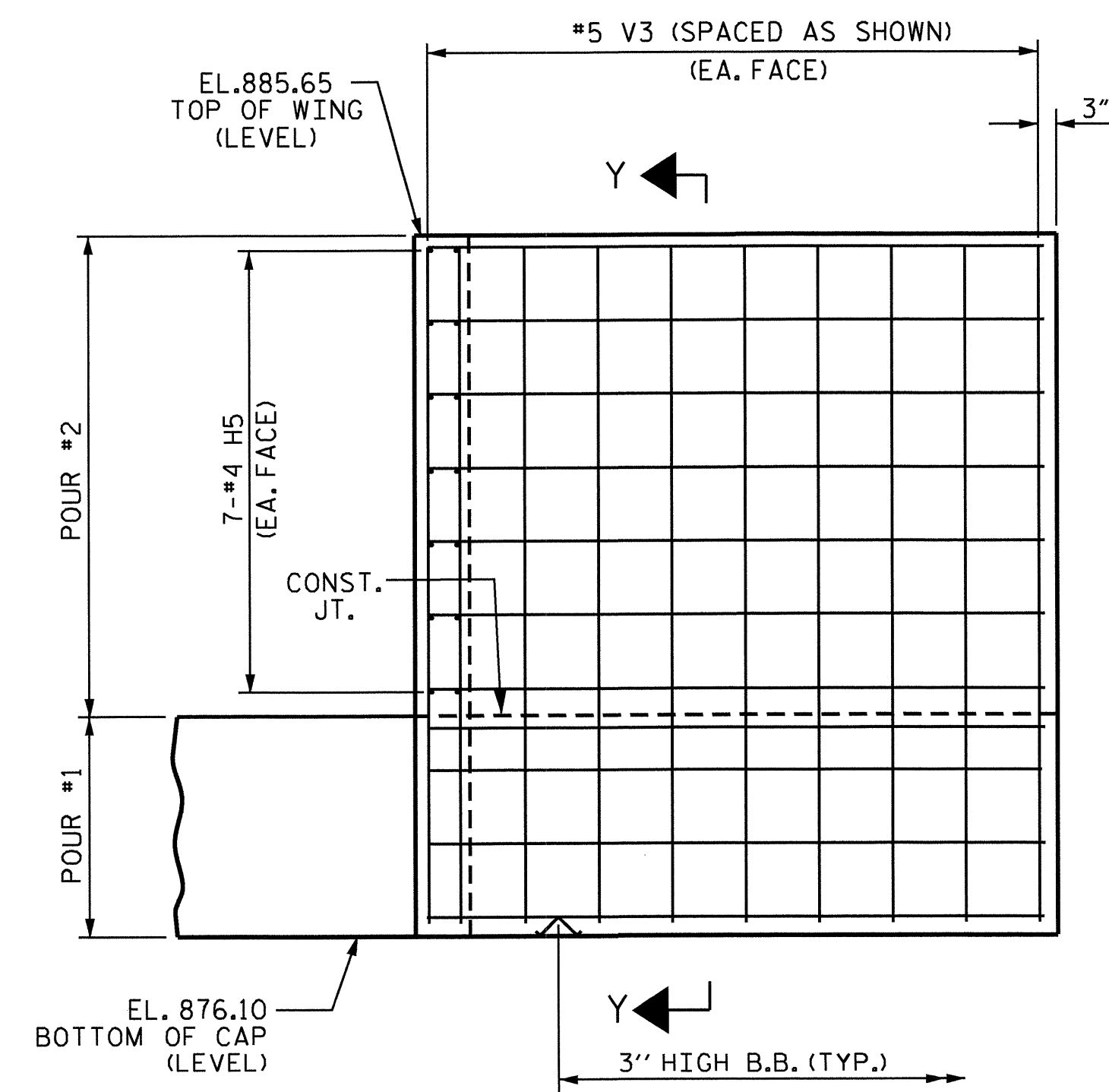
ELEVATION OF WING - W1



SECTION X-X



SECTION Y-Y



ELEVATION OF WING - W2

PROJECT NO. B-4632  
RUTHERFORD COUNTY  
 STATION: 30+66.99 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT NO. 2

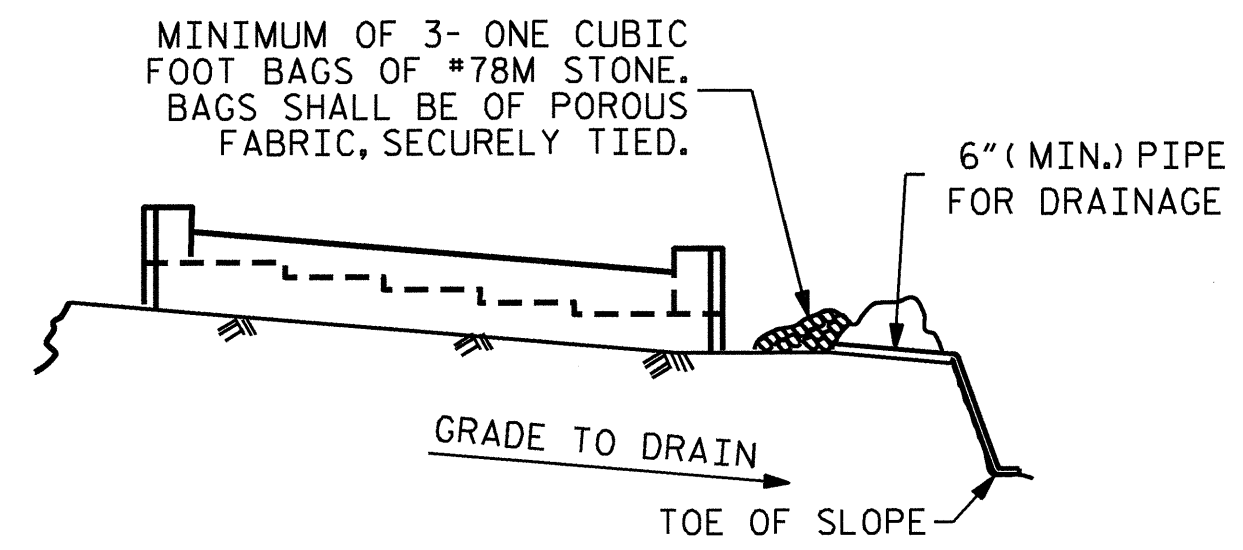


DRAWN BY: V.X. NGUYEN DATE: 9-1-11  
 CHECKED BY: M.G. CHEEK DATE: 9-11

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

SHEET NO. S-30  
TOTAL SHEETS 34



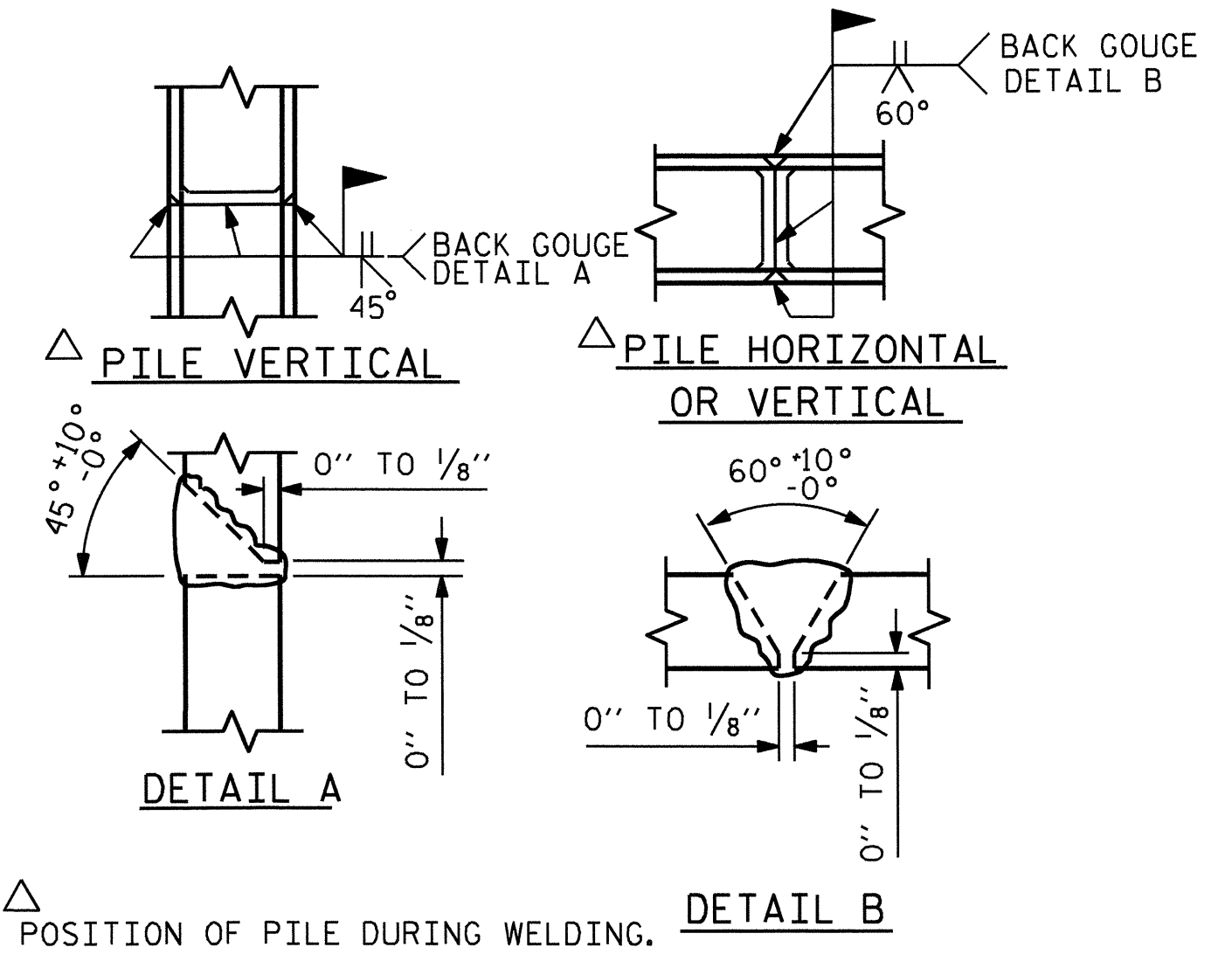


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

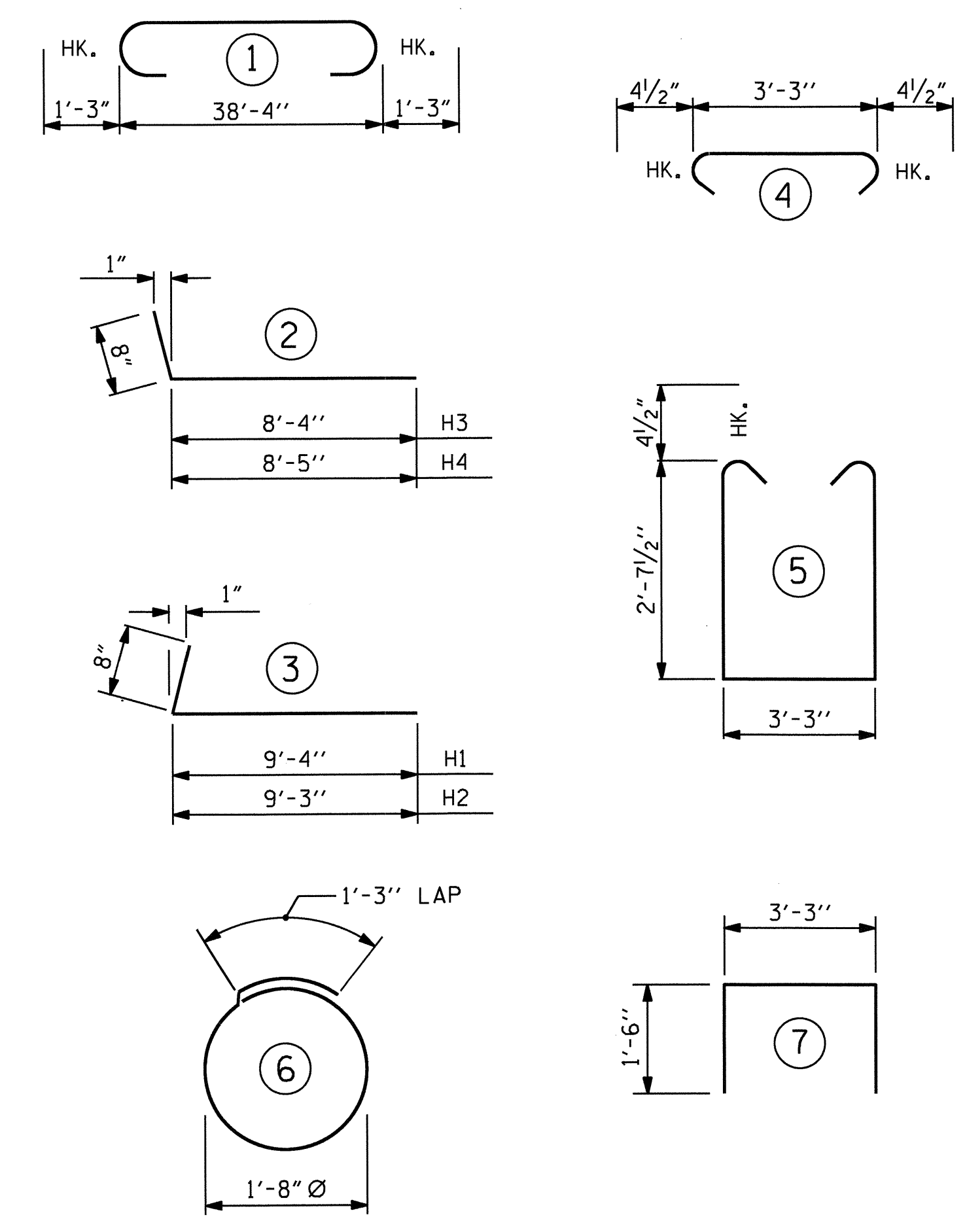
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

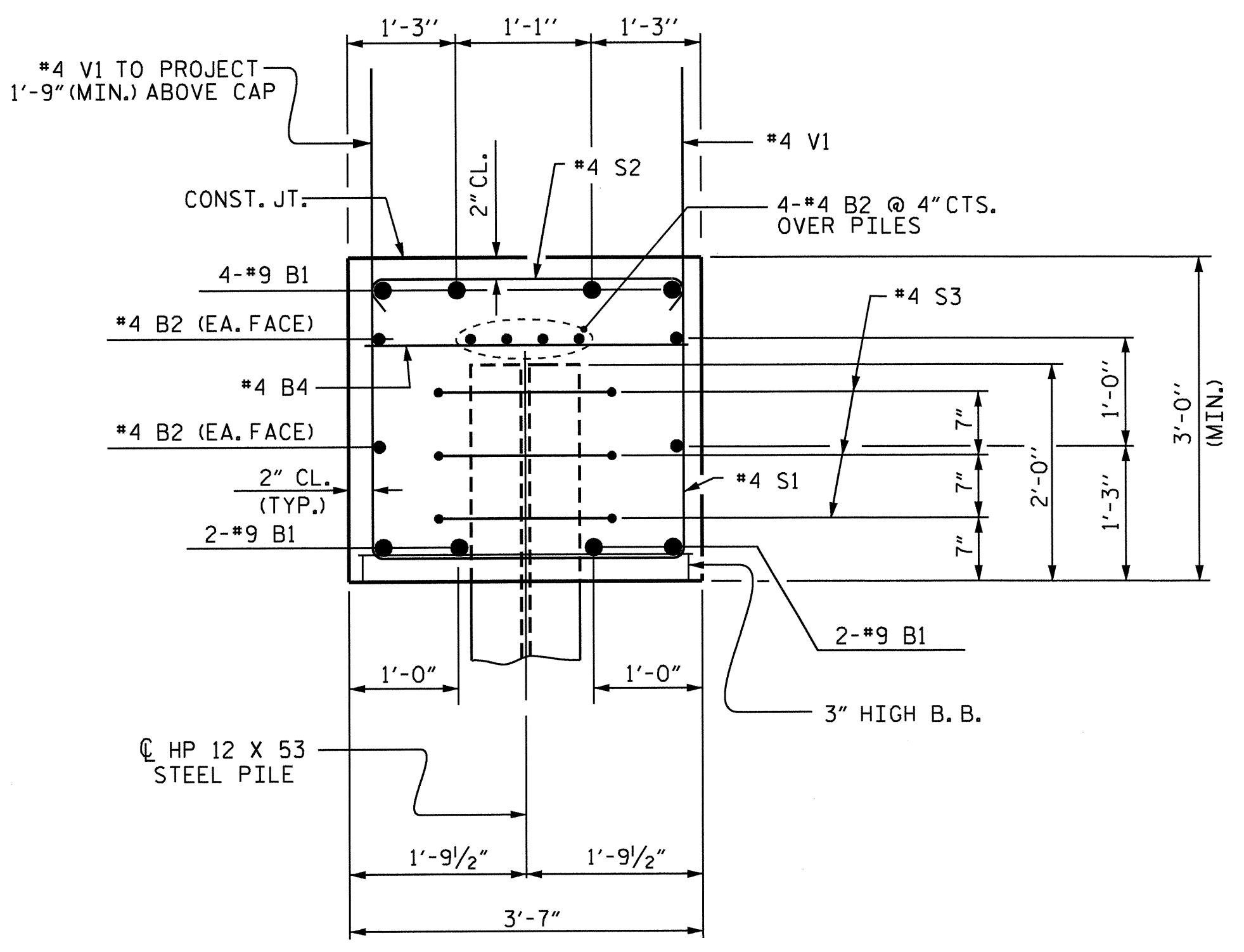


### PILE SPLICE DETAILS

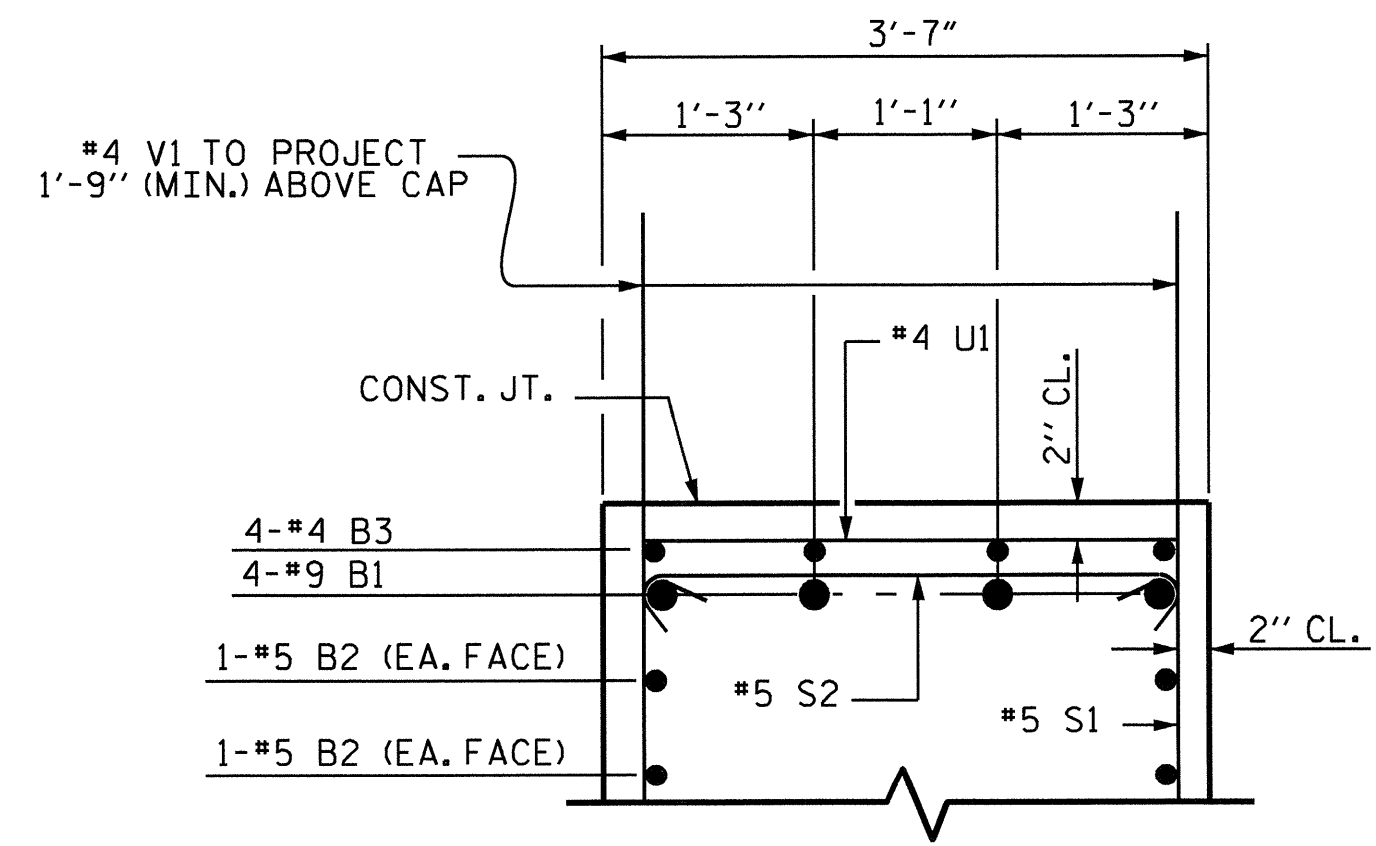


ALL BAR DIMENSIONS ARE OUT TO OUT.

| BILL OF MATERIAL              |     |      |      |         |                 |
|-------------------------------|-----|------|------|---------|-----------------|
| END BENT NO. 2                |     |      |      |         |                 |
| BAR                           | NO. | SIZE | TYPE | LENGTH  | WEIGHT          |
| B1                            | 8   | #9   |      | 40'-10" | 1111            |
| B2                            | 16  | #4   | STR  | 20'-6"  | 219             |
| B3                            | 4   | #4   | STR  | 16'-1"  | 43              |
| B4                            | 10  | #4   | STR  | 3'-3"   | 22              |
| H1                            | 11  | #5   | 3    | 10'-0"  | 115             |
| H2                            | 11  | #5   | 3    | 9'-11"  | 114             |
| H3                            | 11  | #5   | 2    | 9'-0"   | 103             |
| H4                            | 11  | #5   | 2    | 9'-1"   | 104             |
| H5                            | 28  | #4   | STR  | 2'-7"   | 48              |
| S1                            | 42  | #4   | 5    | 9'-5"   | 264             |
| S2                            | 42  | #4   | 4    | 4'-0"   | 112             |
| S3                            | 15  | #4   | 6    | 6'-6"   | 65              |
| U1                            | 11  | #4   | 7    | 6'-3"   | 46              |
| V1                            | 40  | #4   | STR  | 4'-9"   | 127             |
| V2                            | 26  | #5   | STR  | 9'-8"   | 262             |
| V3                            | 24  | #5   | STR  | 9'-2"   | 229             |
| REINFORCING STEEL             |     |      |      |         | = 2984 LBS.     |
| CLASS A CONCRETE              |     |      |      |         |                 |
| POUR #1 : CAP & BOT. OF WINGS |     |      |      |         | = 18.8 CU. YDS. |
| POUR #2 : TOP OF WINGS        |     |      |      |         | = 5.5 CU. YDS.  |
| TOTAL CLASS A CONCRETE        |     |      |      |         | = 24.3 CU. YDS. |
| HP 12 X 53 STEEL PILES        |     |      |      |         |                 |
| NO.: 5                        |     |      |      |         | LIN. FT. 255    |



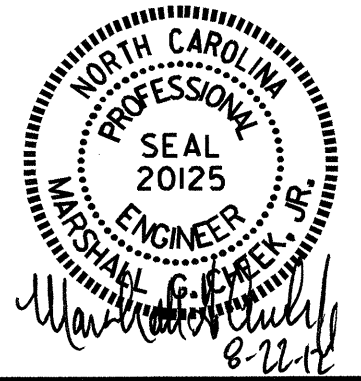
### SECTION THRU CAP



### SECTION B-B

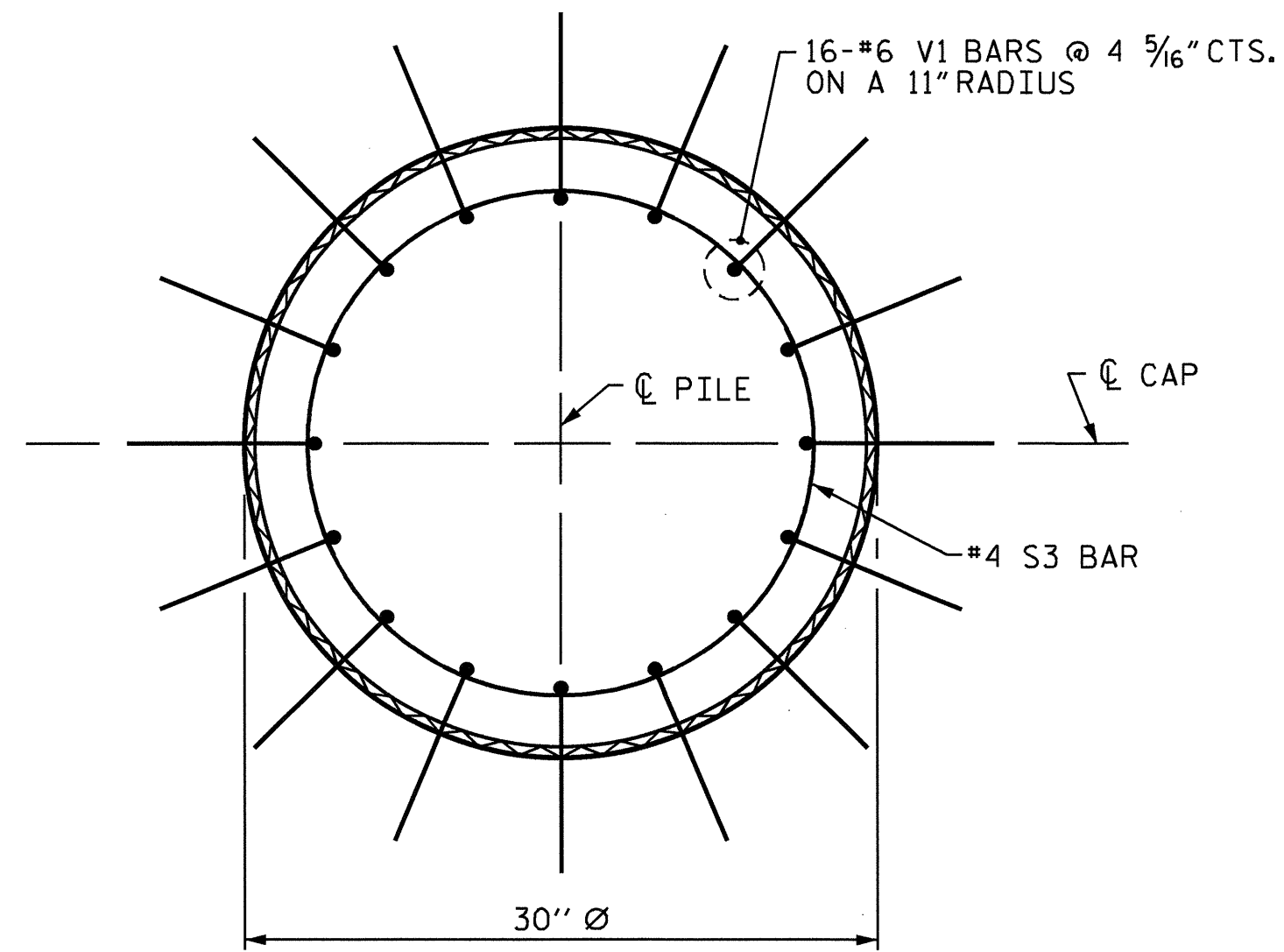
PROJECT NO. B-4632  
RUTHERFORD COUNTY  
 STATION: 30+66.99 -L-  
 SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT NO. 2

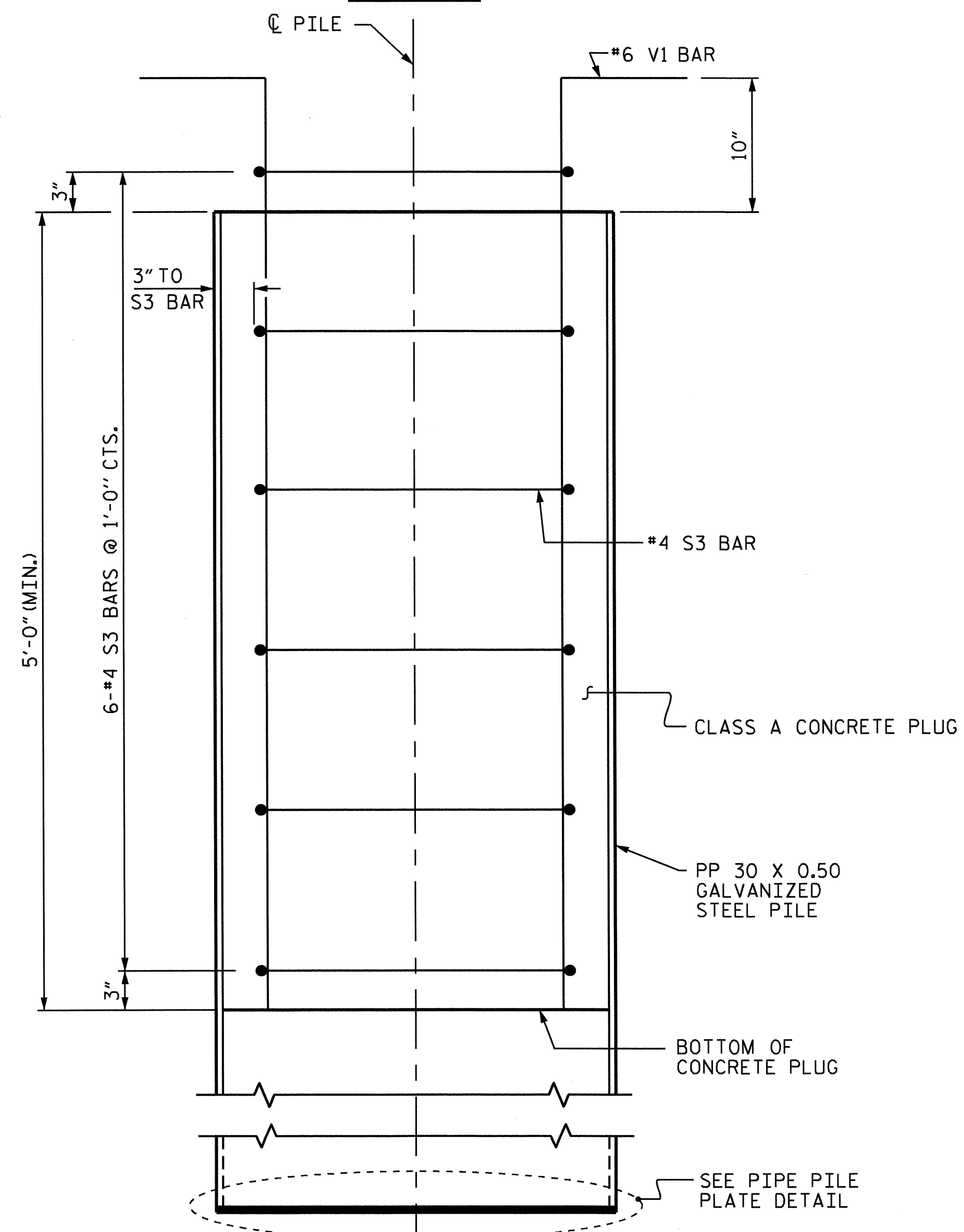


| REVISIONS |     |       |     | SHEET NO. |       |
|-----------|-----|-------|-----|-----------|-------|
| NO.       | BY: | DATE: | NO. | BY:       | DATE: |
| 1         |     |       | 3   |           |       |
| 2         |     |       | 4   |           |       |

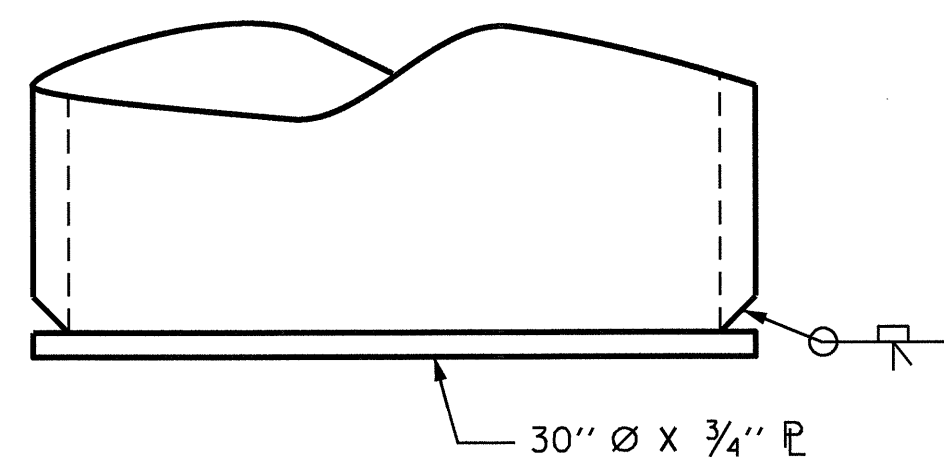
TOTAL SHEETS: 34



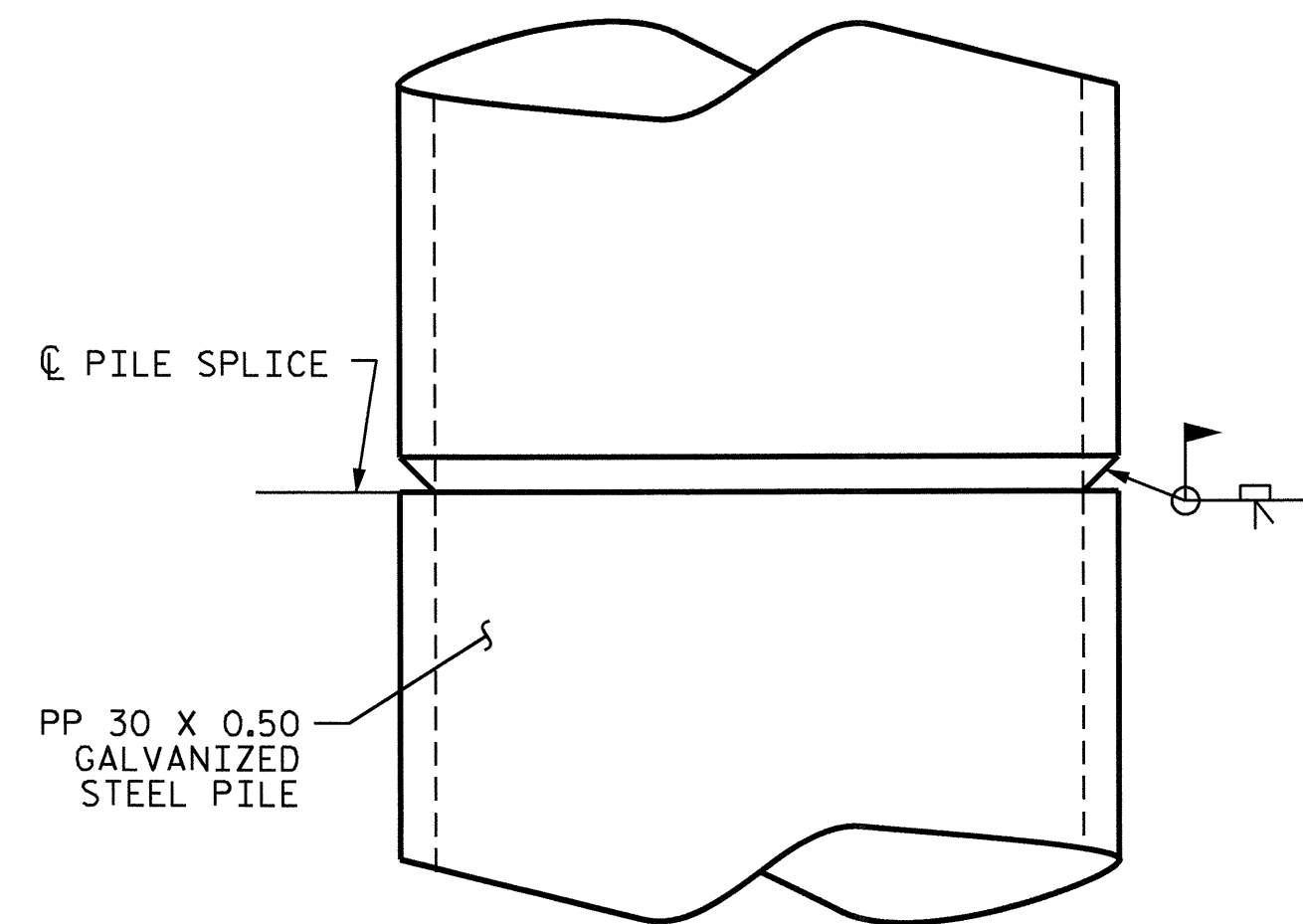
PLAN



ELEVATION



PIPE PILE PLATE DETAIL



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.

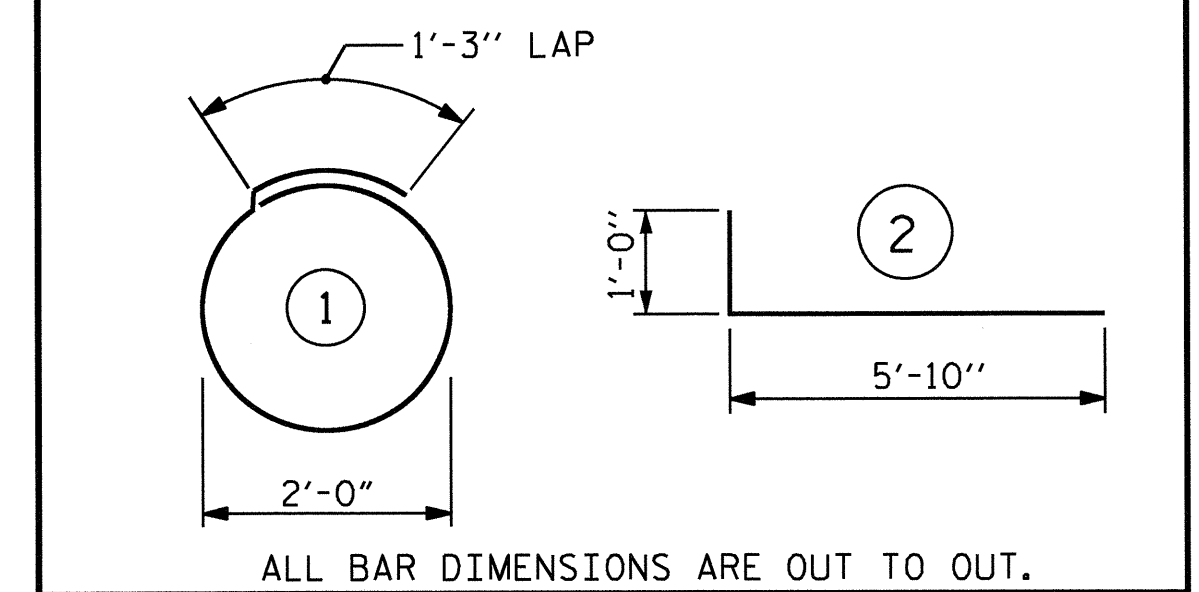
THE REINFORCING STEEL, CLASS A CONCRETE, AND GALVANIZING ARE CONSIDERED INCIDENTAL TO THE CONTRACT UNIT PRICE BID PER LINEAR FOOT FOR PP 30 X 0.50 GALVANIZED STEEL PILES.

BILL OF MATERIAL FOR ONE PP 30 X 0.50 GALVANIZED STEEL PILE

| BAR                 | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---------------------|-----|------|------|--------|--------|
| S3                  | 6   | #4   | 1    | 7'-7"  | 30     |
| V1                  | 16  | #6   | 2    | 6'-10" | 164    |
| REINFORCING STEEL = |     |      |      | 194    | lbs    |

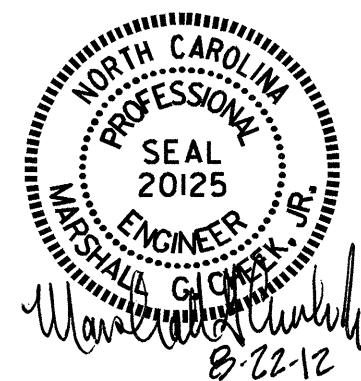
CLASS A CONCRETE  
5'-0" MINIMUM PLUG 0.8 CY

BAR TYPES



PROJECT NO. B-4632  
RUTHERFORD COUNTY  
STATION: 30+66.99 -L-

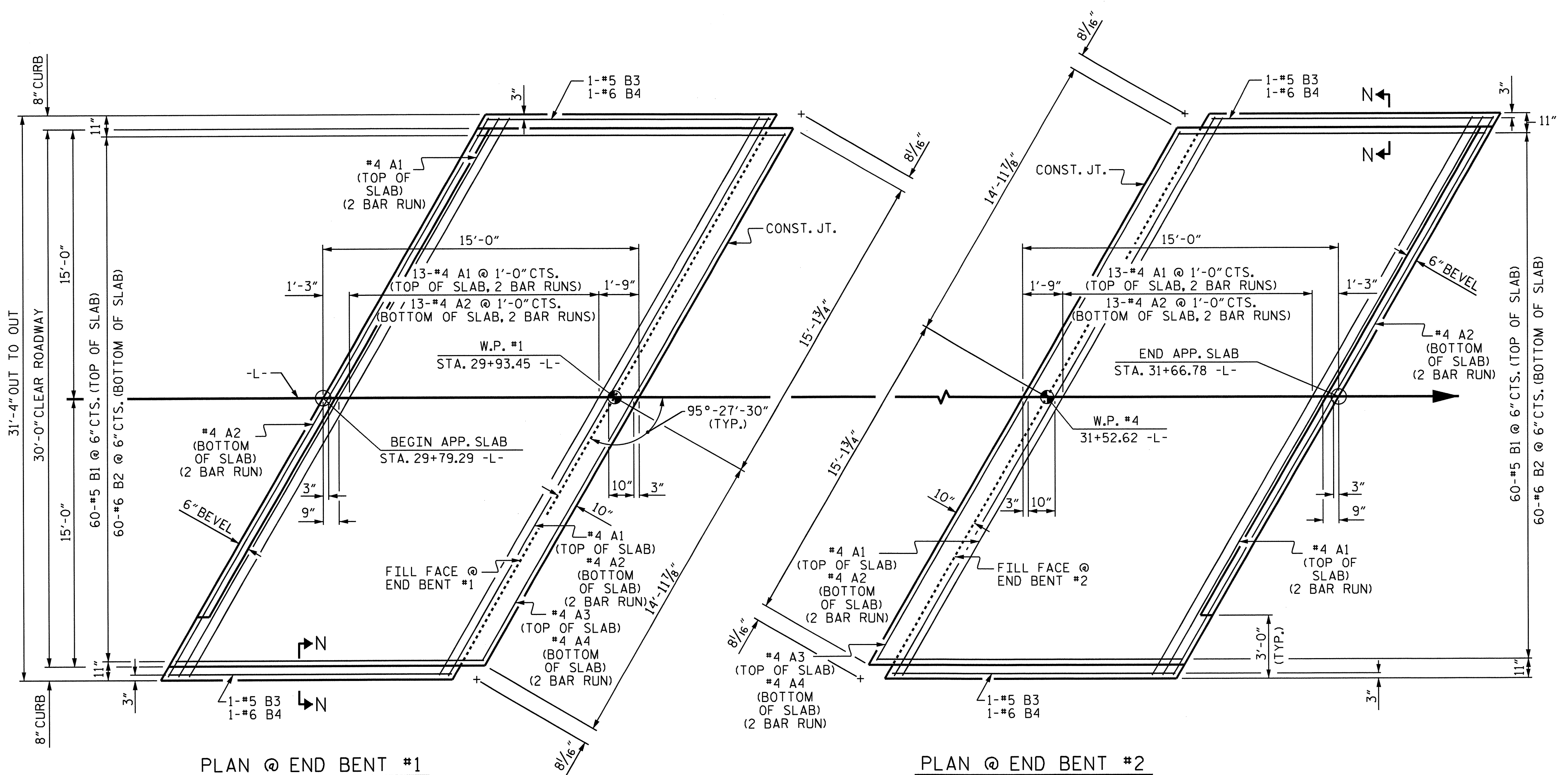
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
30" STEEL PIPE PILE



| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-32         |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |
| 2         |     |       | 4   |     |       | 34           |

|  |                      |
|--|----------------------|
| ASSEMBLED BY : B. MATHEW/M. POOLE DATE : 10/2011 | ADDED 10/1/05        |
| CHECKED BY : M. G. CHEEK DATE : 12/2011          | REV. 5/1/06R MAA/KMM |
| DRAWN BY : TLA 8/05                              | REV. 10/1/11 MAA/GM  |
| CHECKED BY : GM 9/05                             |                      |

| BILL OF MATERIAL                 |     |      |      |         |        |
|----------------------------------|-----|------|------|---------|--------|
| FOR ONE APPROACH SLAB (2 REQ'D)  |     |      |      |         |        |
| BAR                              | NO. | SIZE | TYPE | LENGTH  | WEIGHT |
| * A1                             | 30  | #4   | STR  | 16'-7"  | 332    |
| A2                               | 30  | #4   | STR  | 16'-6"  | 331    |
| * A3                             | 2   | #4   | STR  | 15'-11" | 21     |
| A4                               | 2   | #4   | STR  | 15'-10" | 21     |
| * B1                             | 60  | #5   | STR  | 14'-1"  | 881    |
| B2                               | 60  | #6   | STR  | 14'-6"  | 1307   |
| * B3                             | 2   | #5   | STR  | 13'-8"  | 29     |
| B4                               | 2   | #6   | STR  | 13'-8"  | 41     |
| REINFORCING STEEL                |     |      |      | LBS.    | 1,700  |
| * EPOXY COATED REINFORCING STEEL |     |      |      | LBS.    | 1,263  |
| CLASS AA CONCRETE                |     |      |      | C. Y.   | 20.3   |



2'-0" SPLICE FOR A1 OR A3  
1'-9" SPLICE FOR A2 OR A4

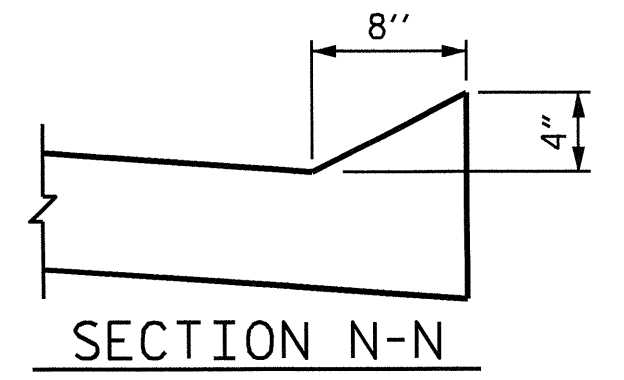
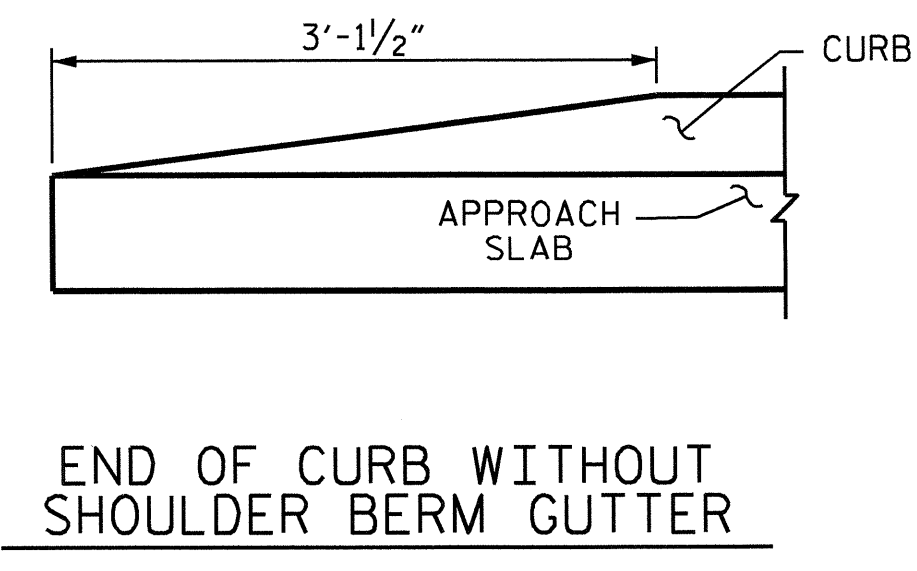
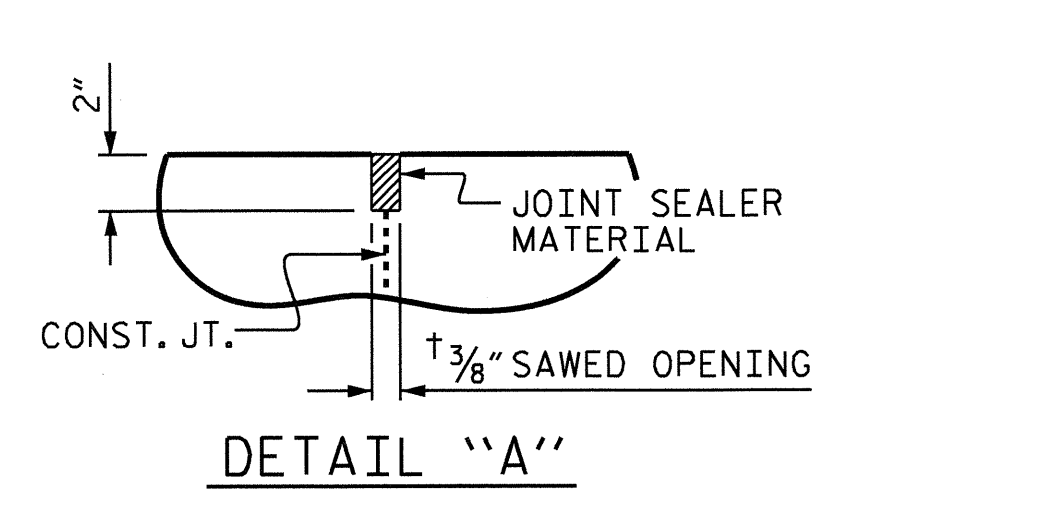
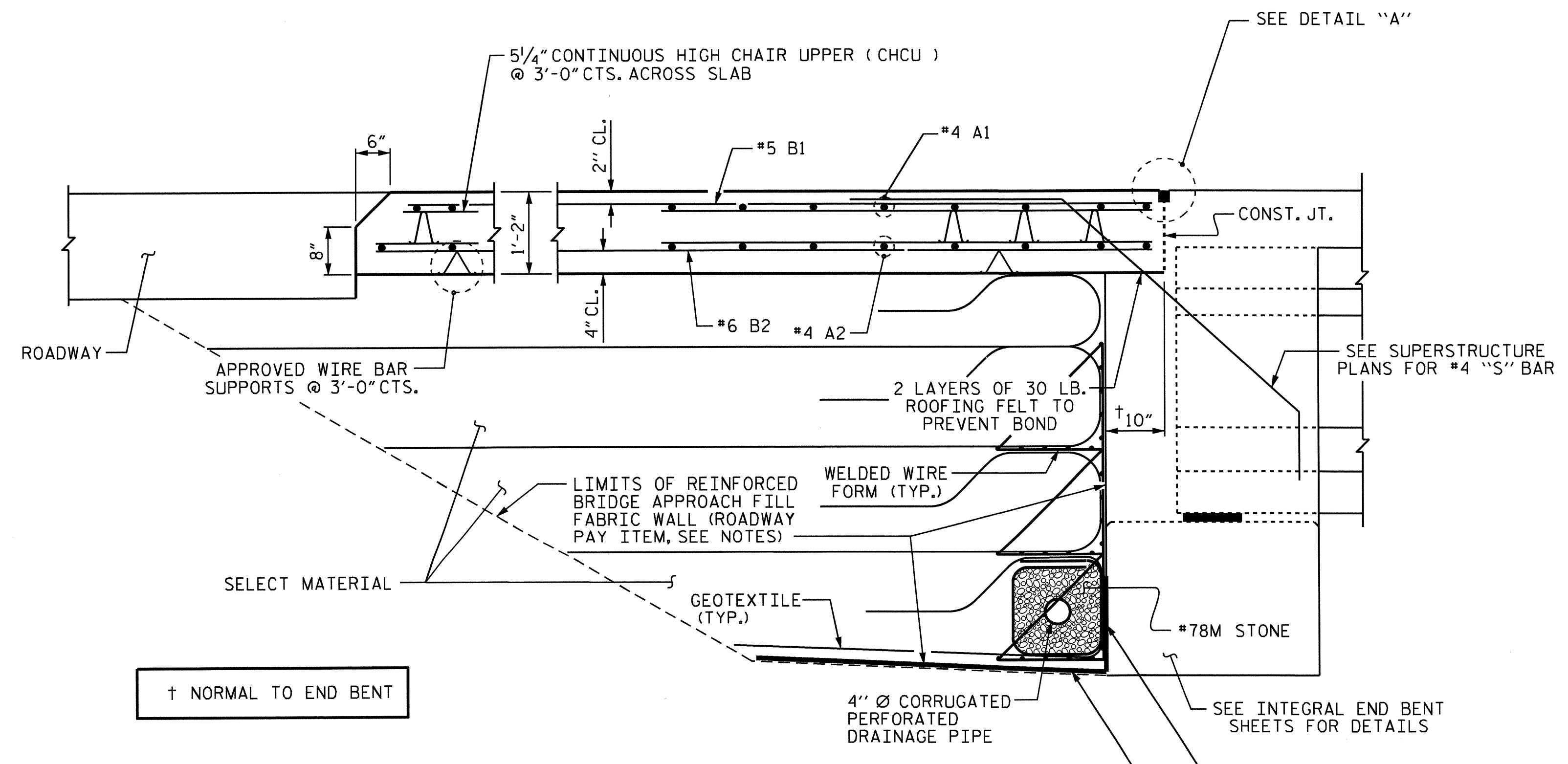
**NOTES**

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

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

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

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



PROJECT NO. B-4632  
RUTHERFORD COUNTY  
 STATION: 30+66.99 -L-

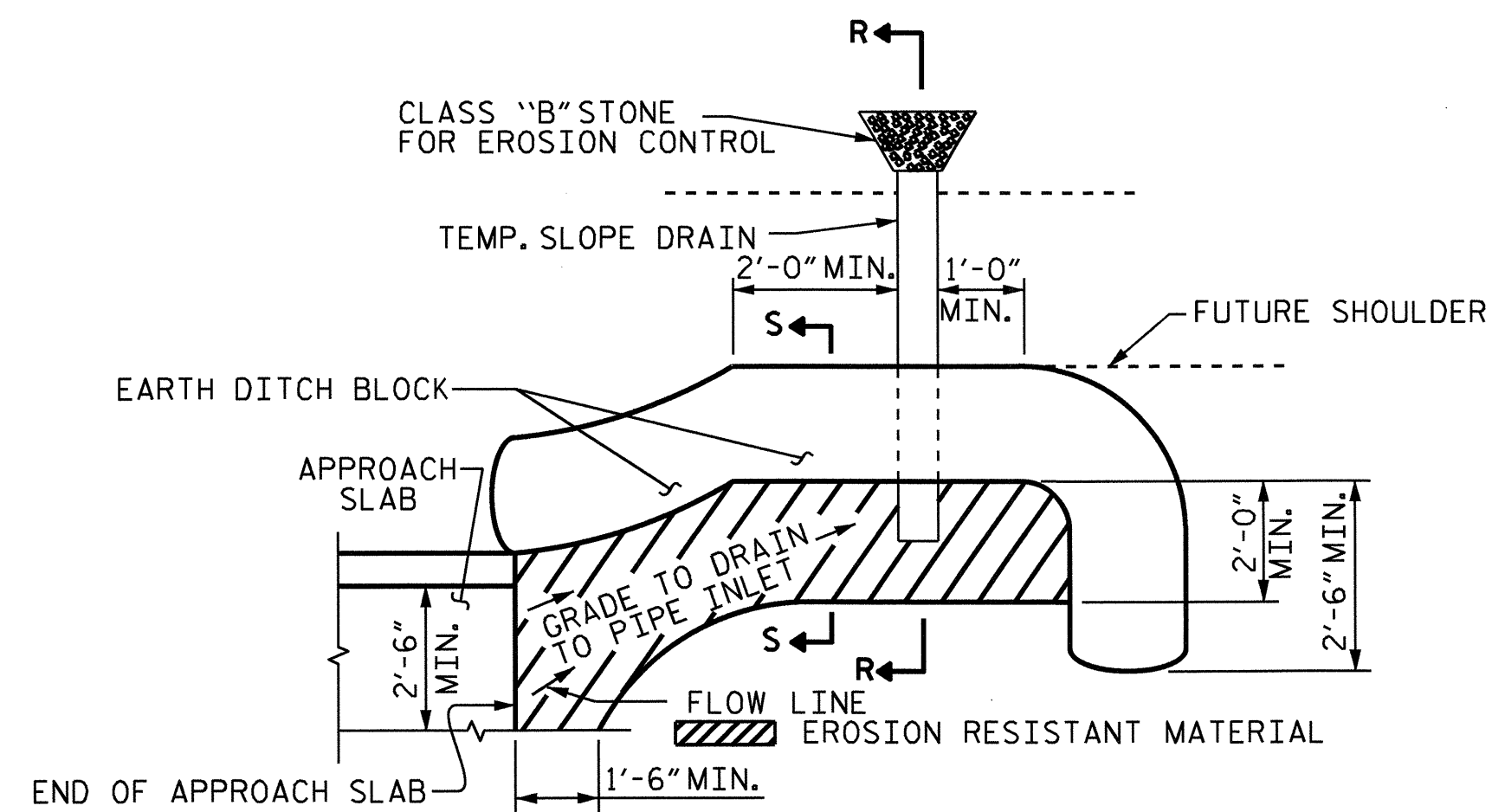
SHEET 1 OF 2  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 BRIDGE APPROACH SLAB  
 FOR INTEGRAL ABUTMENT

| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-33         |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |
| 2         |     |       | 4   |     |       | 34           |

ASSEMBLED BY : D. HODGE DATE : 10/11  
 CHECKED BY : M.G. CHEEK DATE : 10/11  
 DRAWN BY : TLA 10/05  
 CHECKED BY : GM 5/06

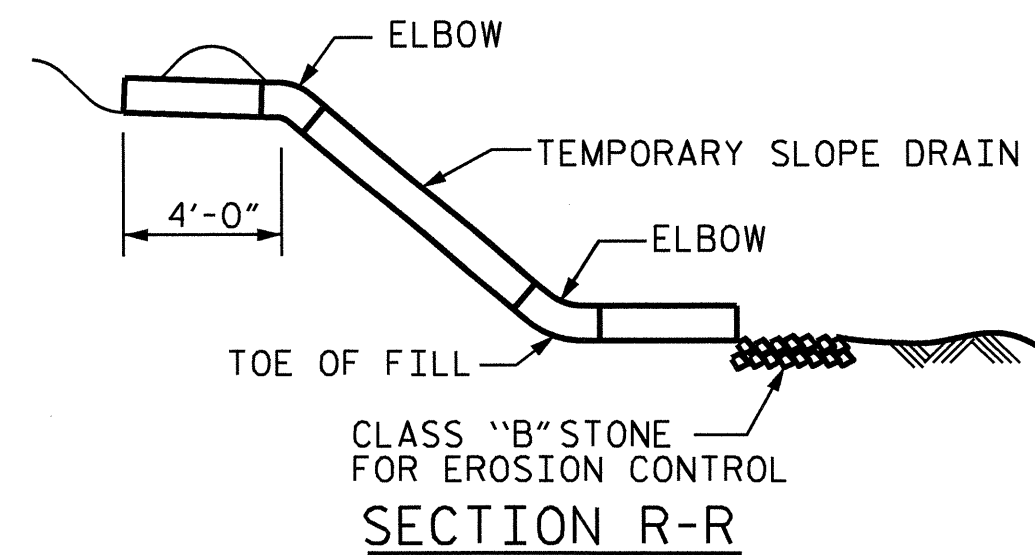
**SECTION THRU SLAB**



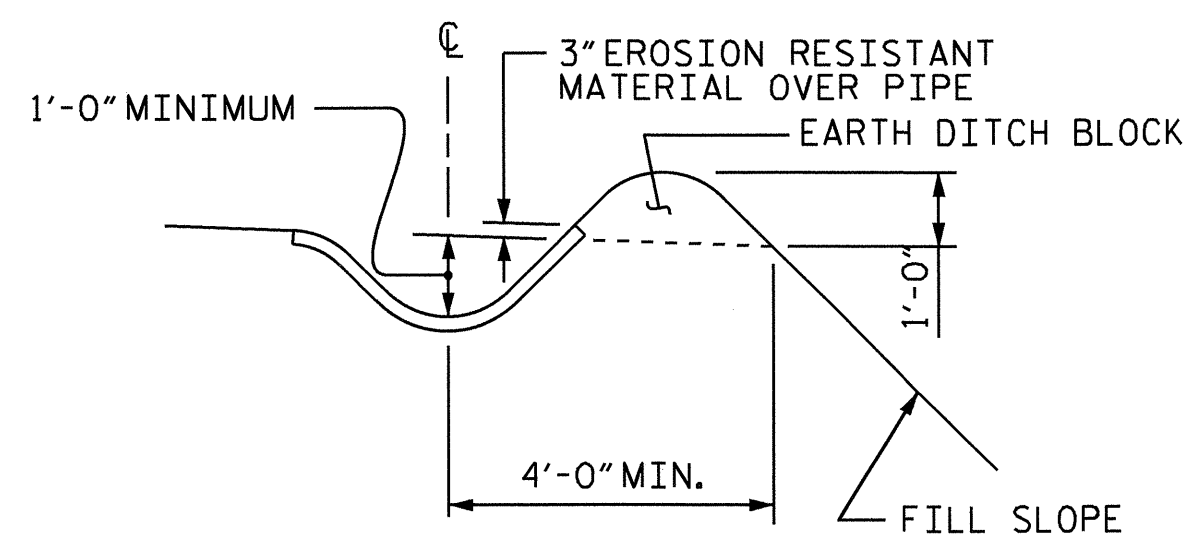


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

PLAN VIEW

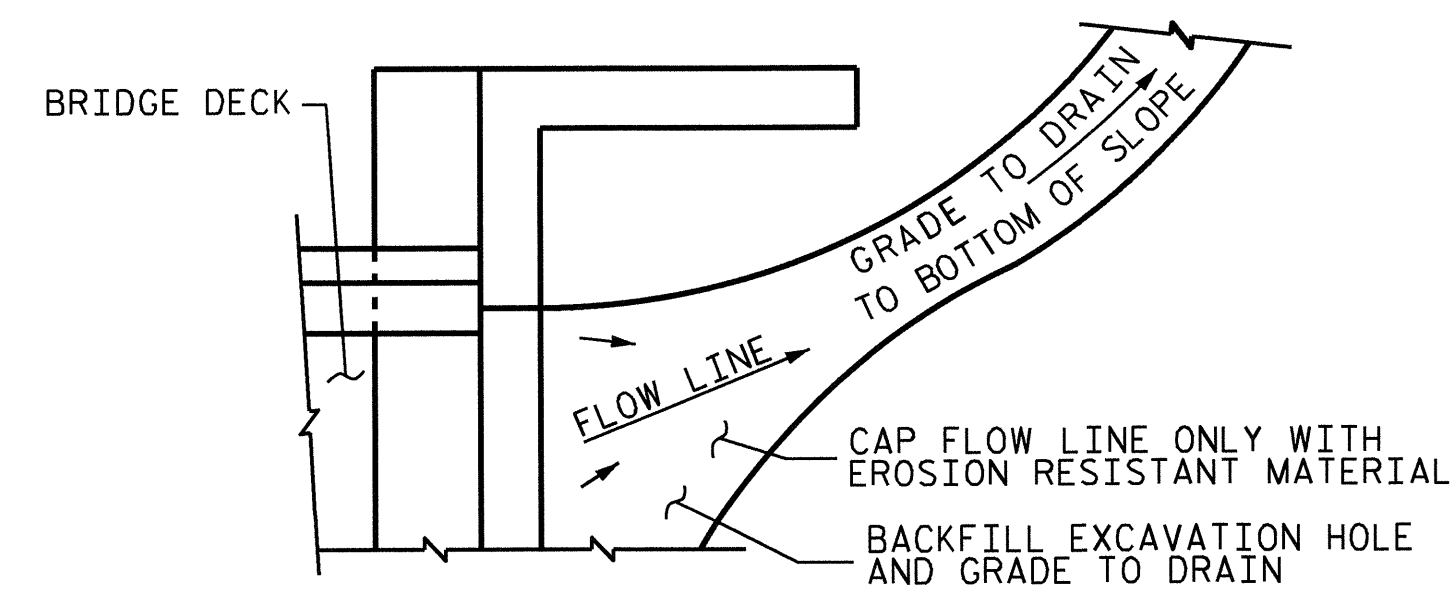


SECTION R-R



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS



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

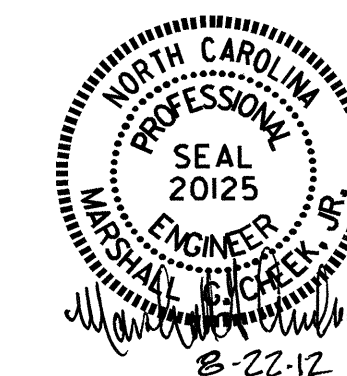
TEMPORARY DRAINAGE DETAIL

PROJECT NO. B-4632  
RUTHERFORD COUNTY  
 STATION: 30+66.99 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

BRIDGE APPROACH SLAB  
 FOR INTEGRAL ABUTMENT



DRAWN BY : D. HODGE DATE : 10/11  
 CHECKED BY : M.G. CHEEK DATE : 10/11

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

## 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.

# ENGLISH

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