

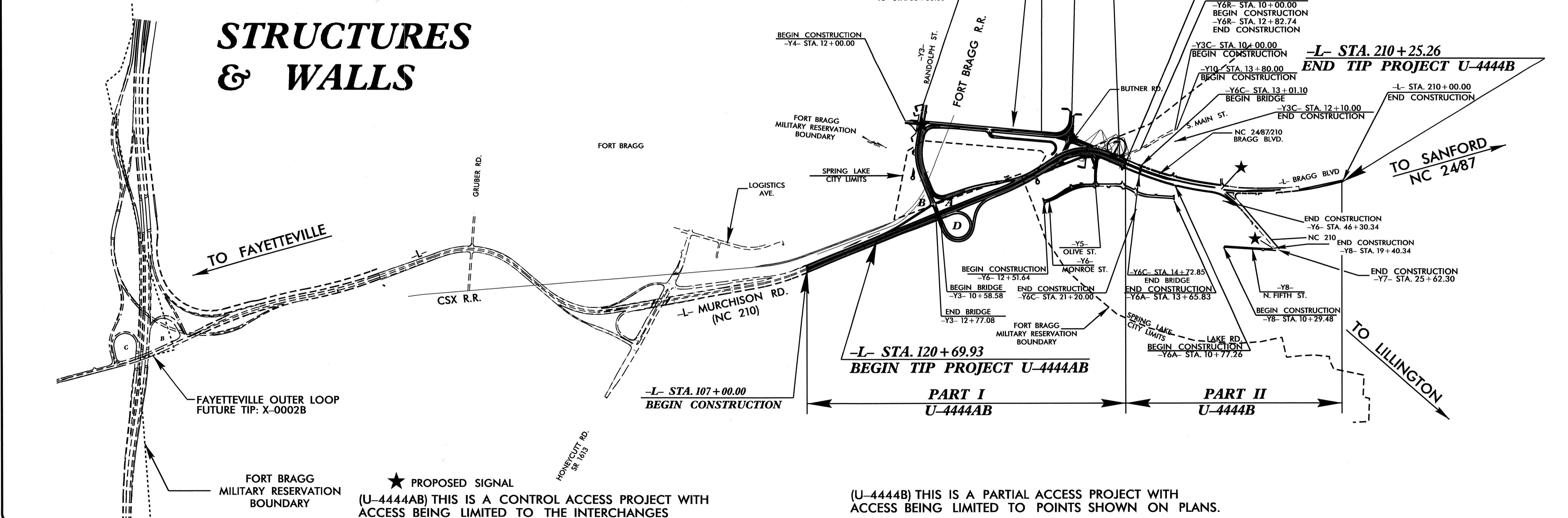
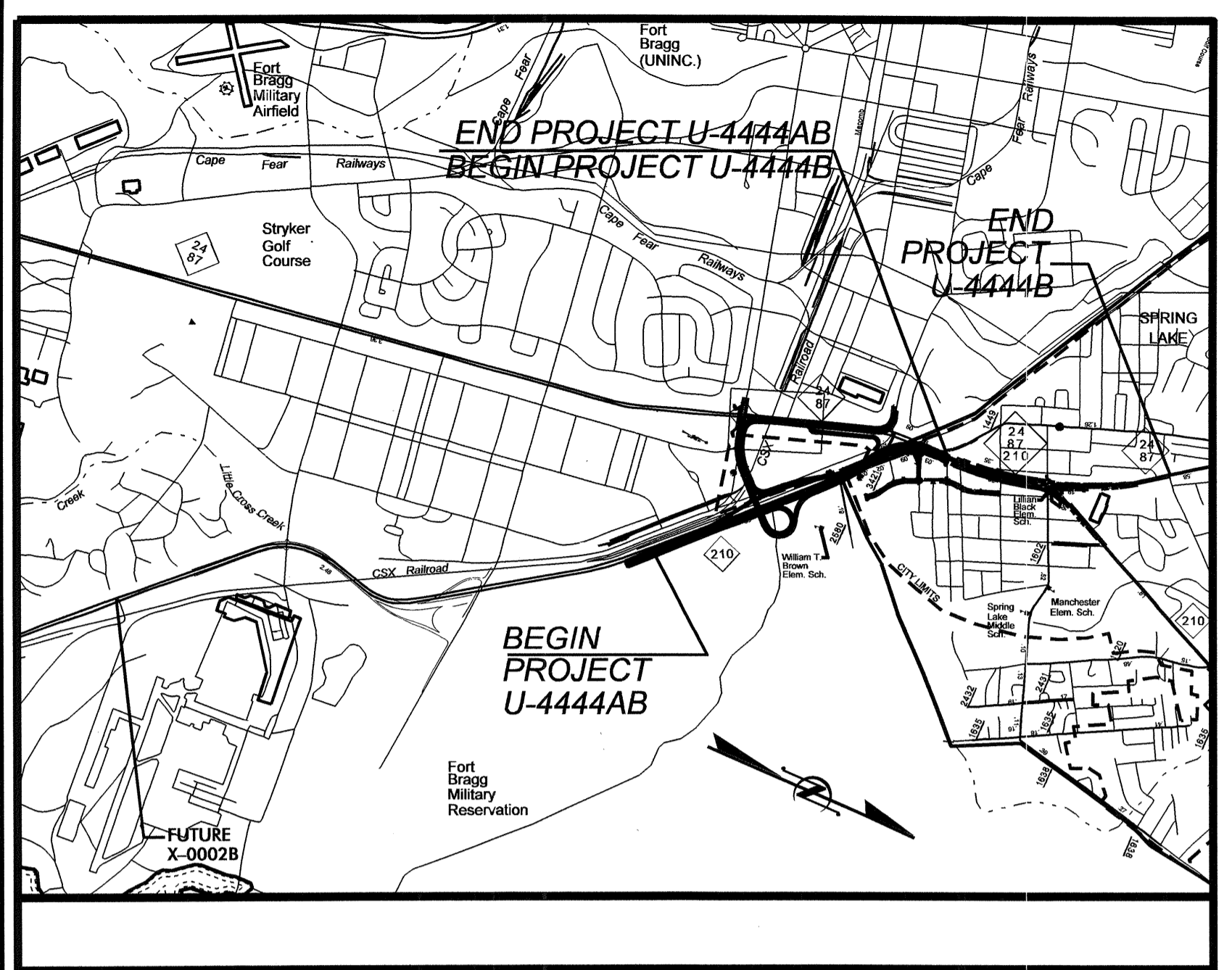
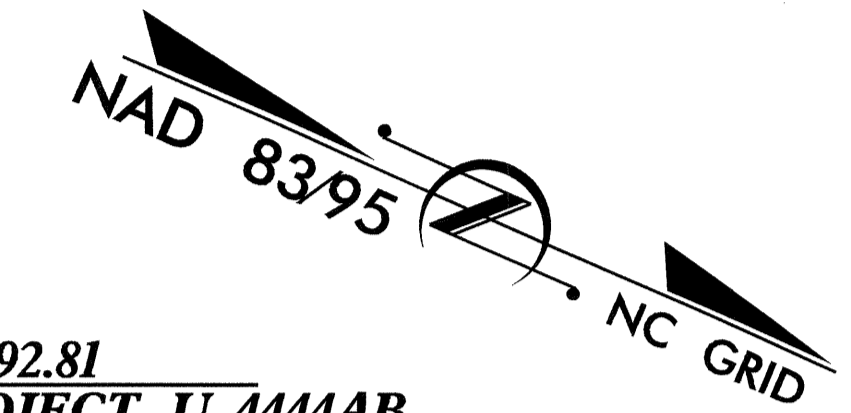
| STATE           | STATE PROJECT REFERENCE NO. | SHEET NO.          | TOTAL SHEETS |
|-----------------|-----------------------------|--------------------|--------------|
| N.C.            | U-4444ABU-4444B             |                    |              |
| STATE PROJ. NO. | F.A. PROJ. NO.              | DESCRIPTION        |              |
| 36492.1.2       | STP-0210(11)                | PE (U-4444B)       |              |
| 36492.2.2       | STP-0210(25)                | RW & UTL (U-4444B) |              |
| 36492.3.4       | STP-0210(23)                | CONST. (U-4444B)   |              |
| 36492.1.2       | STP-0210(11)                | PE (U-4444B)       |              |
| 36492.2.2       | STP-0210(25)                | RW & UTL (U-4444B) |              |
| 36492.3.4       | STP-0210(23)                | CONST. (U-4444B)   |              |

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# CUMBERLAND COUNTY

LOCATION: NC 210 (MURCHISON ROAD) FROM NORTH OF SR 1613 (HONEYCUTT ROAD)  
TO NORTH OF NC 24-87-210 INTERSECTION IN SPRING LAKE

TYPE OF WORK: GRADING, DRAINAGE, PAVING, SIGNALS, AND STRUCTURES

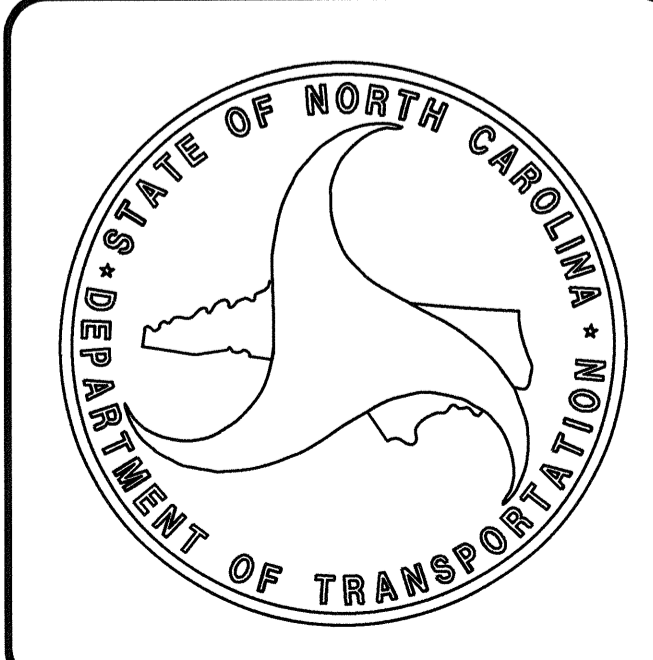


★ PROPOSED SIGNAL  
(U-4444AB) THIS IS A CONTROL ACCESS PROJECT WITH ACCESS BEING LIMITED TO THE INTERCHANGES

(U-4444B) THIS IS A PARTIAL ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS SHOWN ON PLANS.

29-AUG-2012 08:41  
\$\$\$\$\$DGN\$\$\$\$\$  
padkins

CONTRACT: C202826 TIP PROJECTS: U-4444AB/U-4444B



| PROJECT LENGTH                                     |             |
|--|-------------|
| LENGTH ROADWAY TIP PROJECT U-4444AB=               | 0.932 Miles |
| TOTAL LENGTH STATE TIP PROJECT U-4444AB=           | 0.932 Miles |
| LENGTH ROADWAY TIP PROJECT U-4444B=                | 0.764 Miles |
| TOTAL LENGTH STATE TIP PROJECT U-4444B=            | 0.764 Miles |
| LENGTH ROADWAY TIP PROJECT U-4444AB / U-4444B=     | 1.696 Miles |
| TOTAL LENGTH STATE TIP PROJECT U-4444AB / U-4444B= | 1.696 Miles |

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

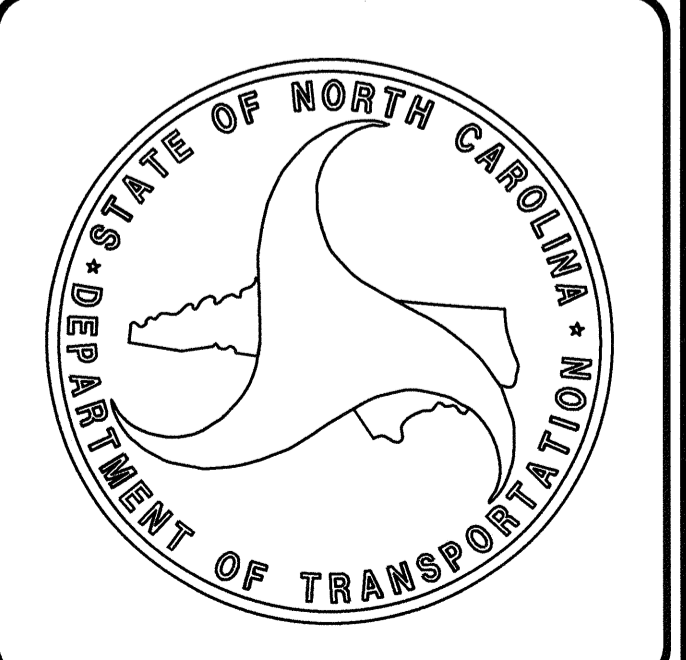
2012 STANDARD SPECIFICATIONS

LETTING DATE:  
October 16, 2012

OMAR R. AZIZI, PE  
PROJECT ENGINEER

TIMOTHY L. COGGINS, PE  
PROJECT DESIGN ENGINEER

**STRUCTURES MANAGEMENT UNIT**  
1000 Birch Ridge Dr.  
Raleigh, N.C. 27610



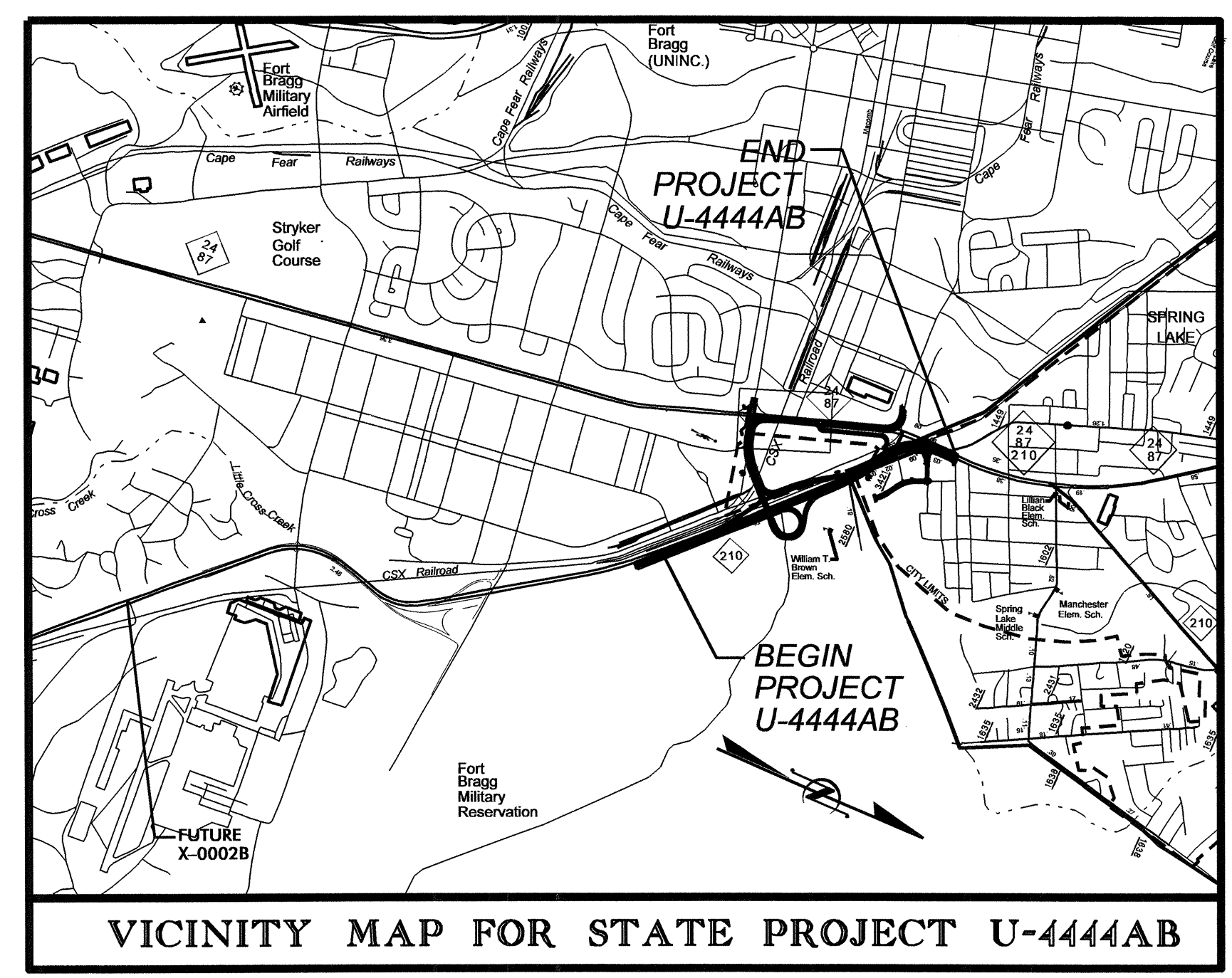
| STATE           | STATE PROJECT REFERENCE NO. | SHEET NO.   | TOTAL SHEETS |
|-----------------|-----------------------------|-------------|--------------|
| N.C.            | U-4444AB                    |             |              |
| STATE PROJ. NO. | P.A. PROJ. NO.              | DESCRIPTION |              |
| 36492.1.2       | STP-0210(11)                | PE          |              |
| 36492.2.1       | STP-0210(11)                | RW & UTL    |              |
| 36492.3.4       | STP-0210(23)                | CONST.      |              |
|                 |                             |             |              |
|                 |                             |             |              |
|                 |                             |             |              |

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**CUMBERLAND COUNTY**

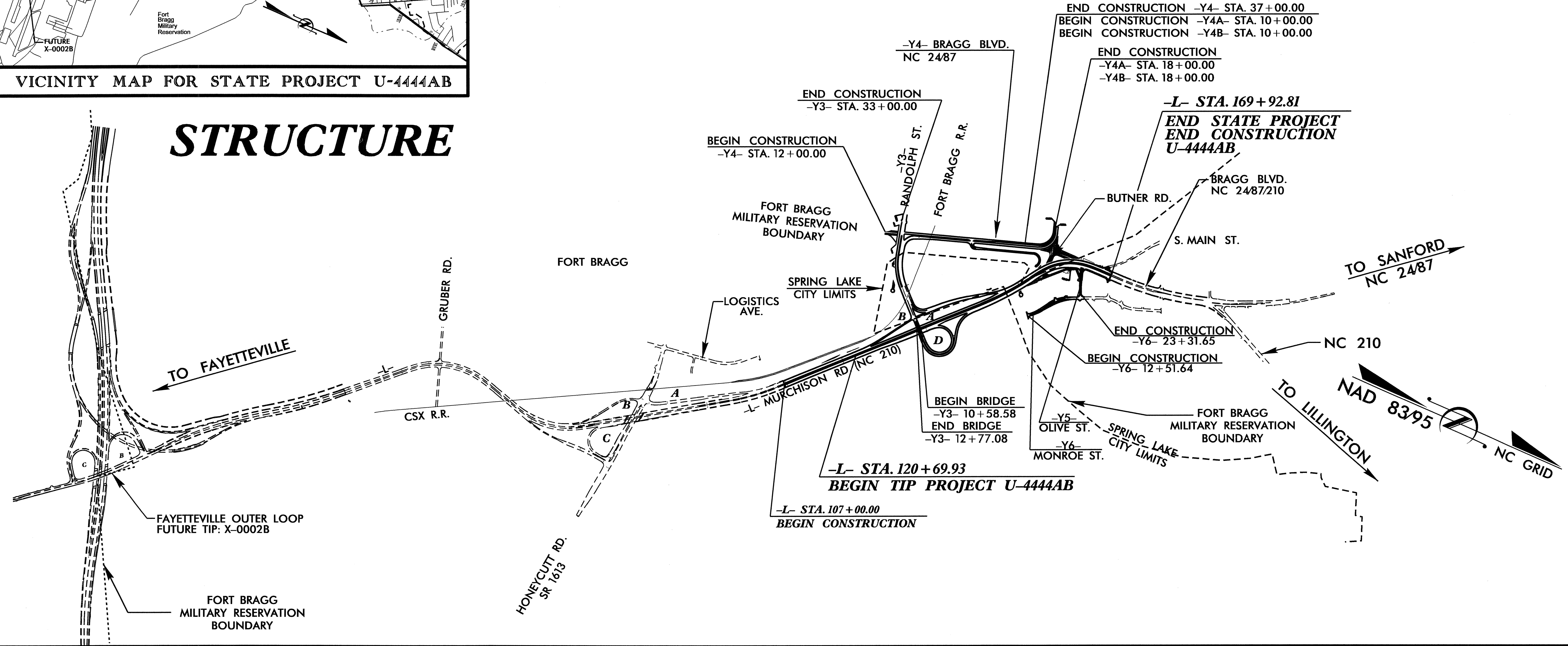
LOCATION: NC 210 (MURCHISON ROAD) FROM NORTH OF SR 1613 (HONEYCUTT ROAD) TO SOUTH MAIN ST. IN SPRING LAKE

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



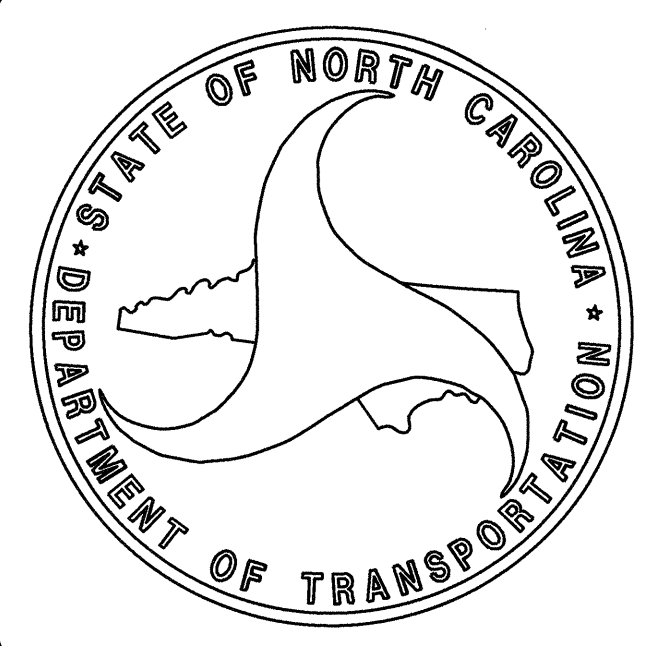
VICINITY MAP FOR STATE PROJECT U-4444AB

**STRUCTURE**



TIP PROJECT: U-4444AB

CONTRACT: C202826



**DESIGN DATA**

|                          |                       |
|--------------------------|-----------------------|
| ADT 2012 =               | 62,900                |
| ADT 2035 =               | 69,400                |
| DHV =                    | 8 %                   |
| D =                      | 60 %                  |
| T =                      | 5 % *                 |
| V =                      | 60 MPH                |
| * TTST 3% FUNC. CLASS. = | DUAL 2% URBAN FREEWAY |

**PROJECT LENGTH**

|   |             |
|---|-------------|
| LENGTH ROADWAY TIP PROJECT U-4444AB =     | 0.932 Miles |
| LENGTH STRUCTURES TIP PROJECT U-4444AB =  | 0.000 Miles |
| TOTAL LENGTH STATE TIP PROJECT U-4444AB = | 0.932 Miles |

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

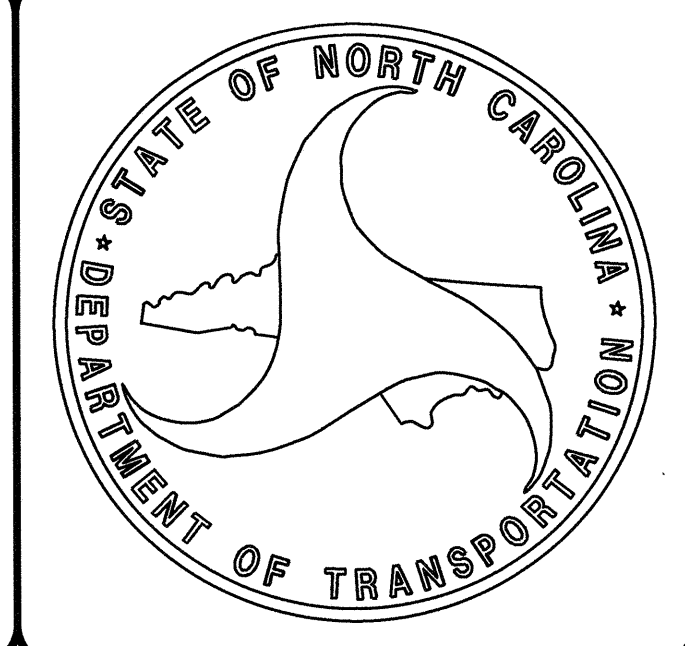
2012 STANDARD SPECIFICATIONS

LETTING DATE:  
October 16, 2012

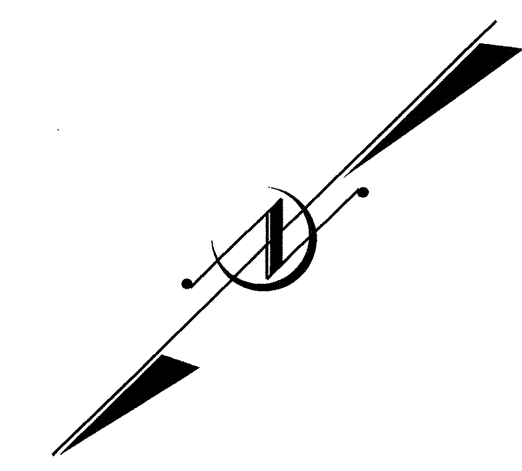
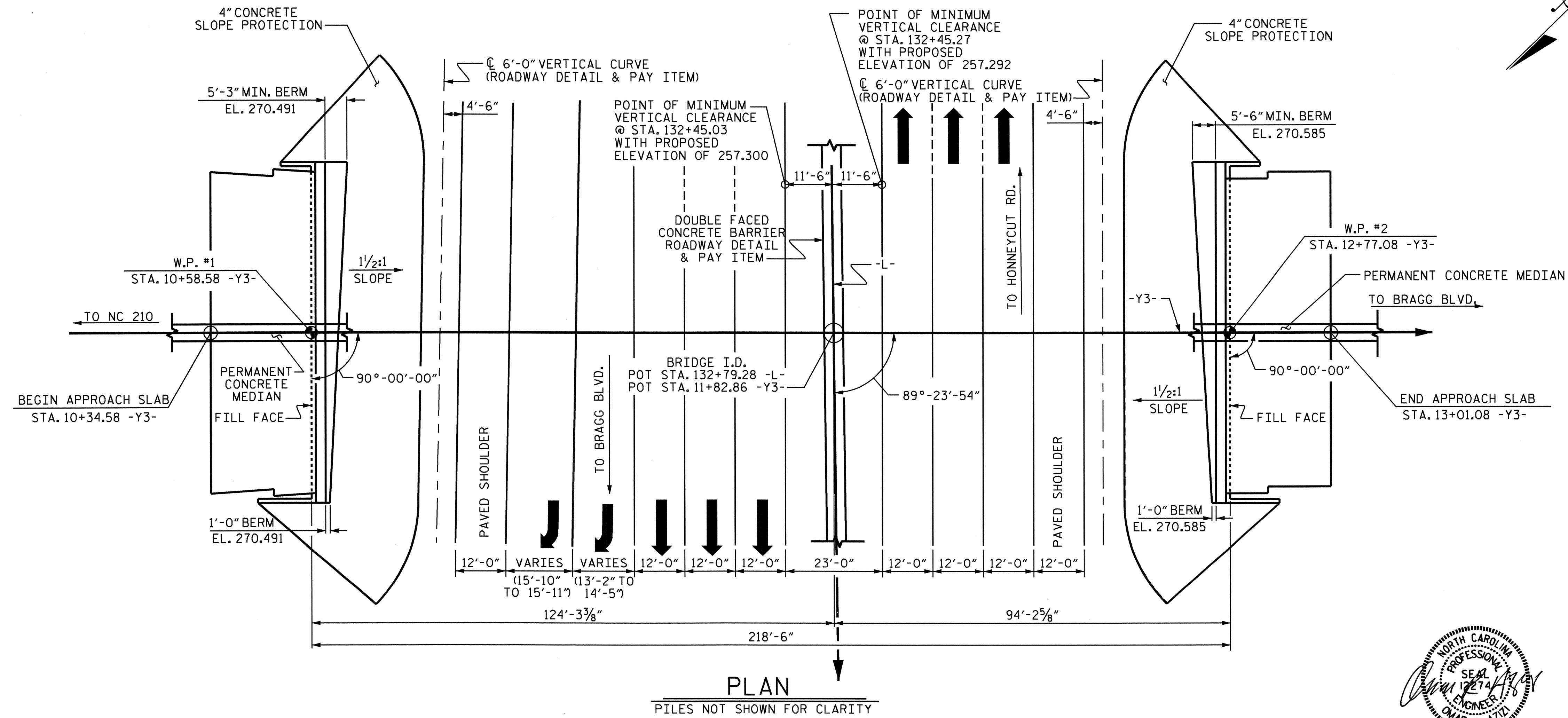
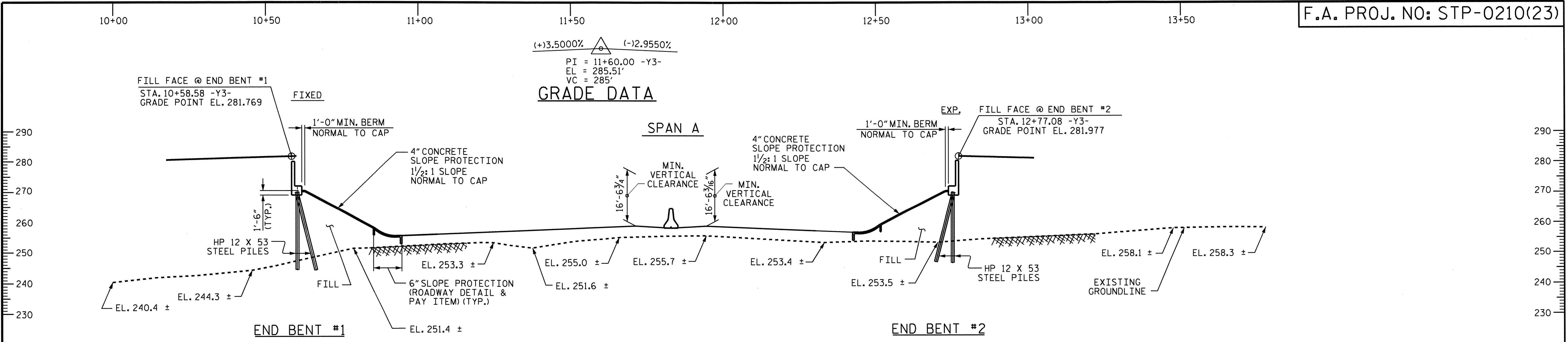
OMAR R. AZIZI, PE  
PROJECT ENGINEER

TIMOTHY L. COGGINS, PE  
PROJECT DESIGN ENGINEER

STRUCTURES MANAGEMENT UNIT  
1000 Birch Ridge Dr.  
Raleigh, N.C. 27610



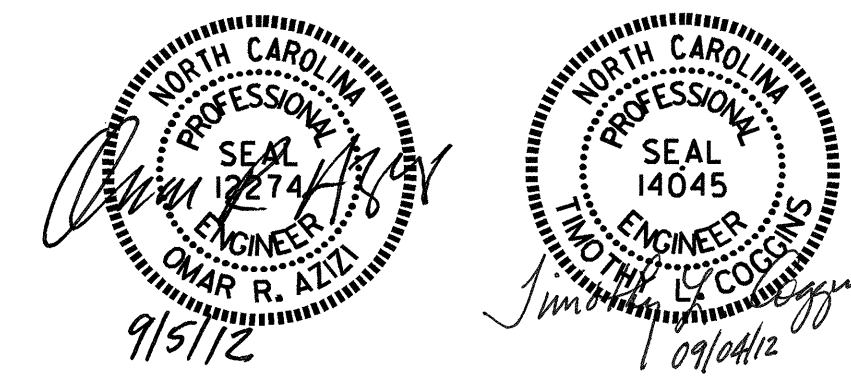
04-SEP-2012 09:24  
\$\$\$\$\$DGN\$\$\$\$\$  
t.coggins



PROJECT NO. U-4444AB  
CUMBERLAND COUNTY  
 STATION: 132+79.28 -L-  
11+82.86 -Y3-

SHEET 1 OF 3 BRIDGE NO. 413

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE ON  
 RANDOLPH STREET EXT.  
 OVER NC 210



DRAWN BY: B.N.BARODAWALA DATE: 6-21-11  
 CHECKED BY: J. B. WILSON DATE: 7-29-11

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

**NOTES**

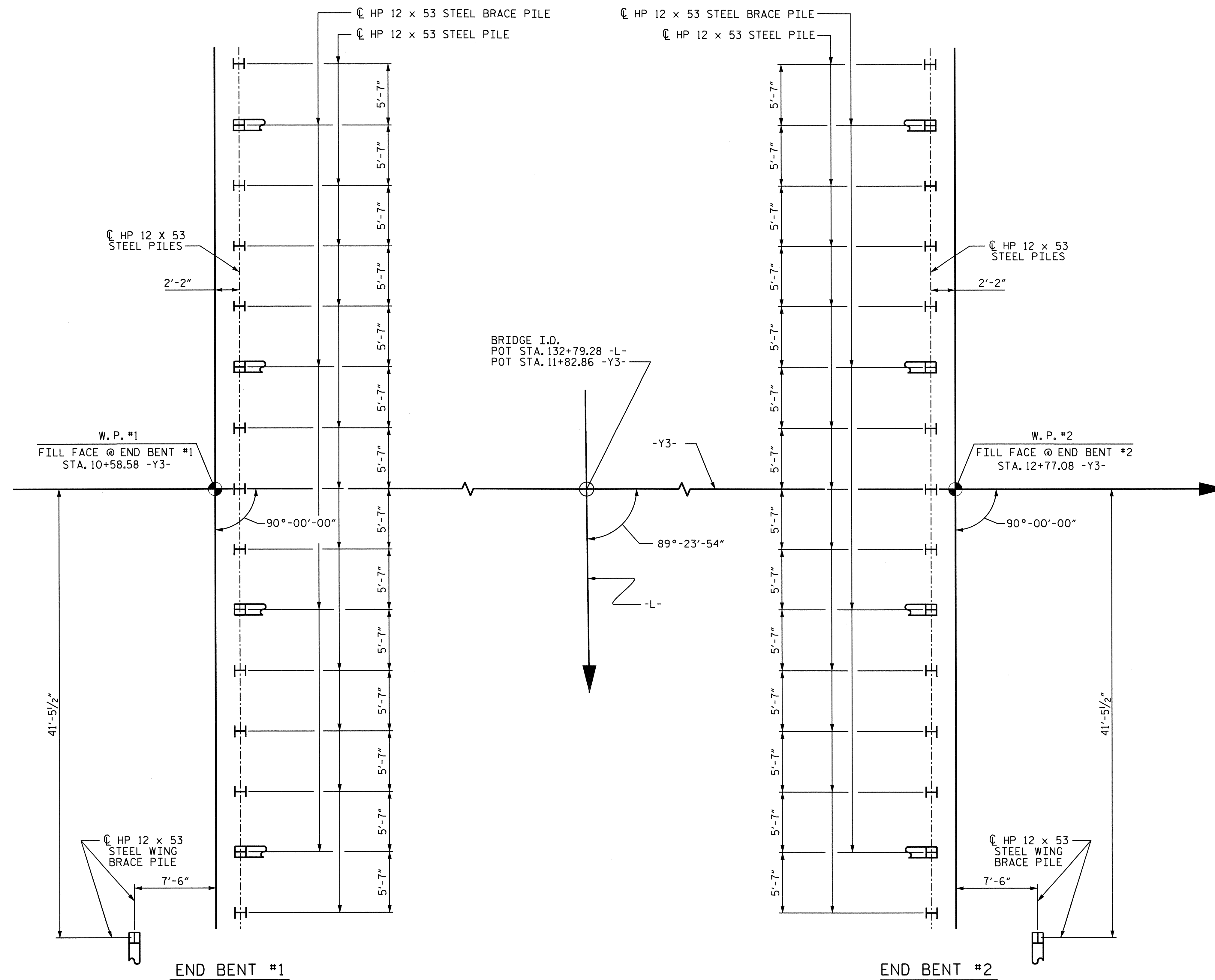
FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATION.

PILES AT END BENT NO.1 AND END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 145 TONS PER PILE.

DRIVE PILES AT END BENT NO.1 AND END BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 235 TONS PER PILE.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 60 TO 110 FT-KIPS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT END BENT NO.1 AND END BENT NO.2. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.

TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.



**FOUNDATION LAYOUT PLAN**

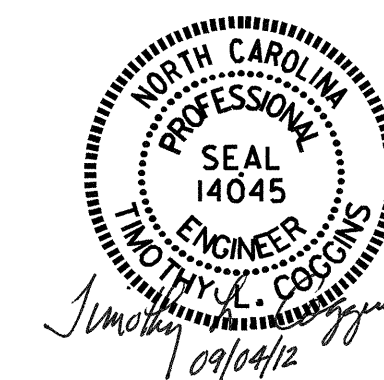
DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE.  
BRACE PILES ARE TO BE BATTERED @ 3 : 12.

PROJECT NO. U-4444AB  
CUMBERLAND COUNTY  
 STATION: 132+79.28 -L-  
11+82.86 -Y3-  
 SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**

FOR BRIDGE ON  
 RANDOLPH STREET EXT.  
 OVER NC 210



DRAWN BY : B.N.BARODAWALA DATE : 6-21-11  
 CHECKED BY : J.B.WILSON DATE : 7-29-11

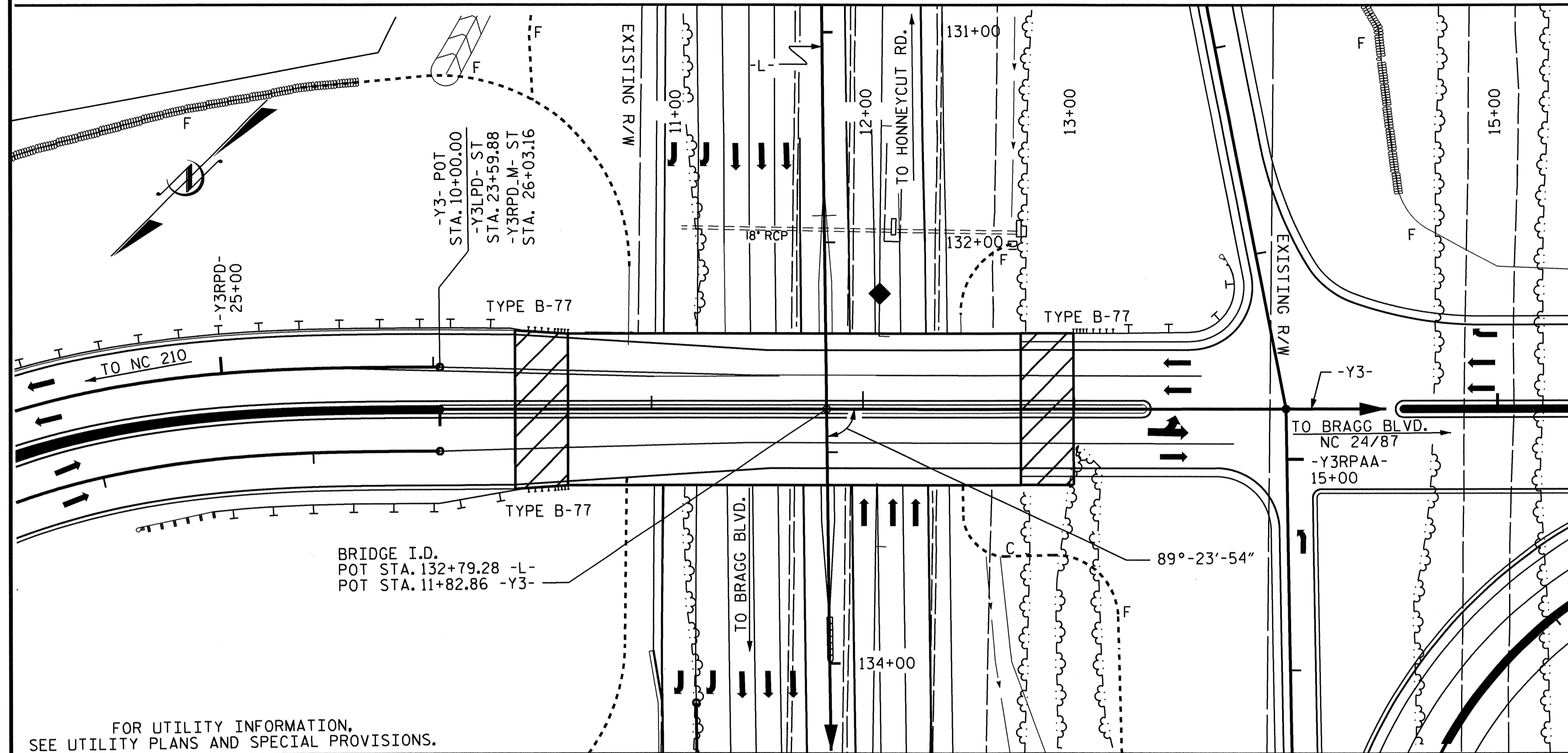
04-SEP-2012 09:22  
 R:\TIP\Projects-U\U4444AB\Structures\Plans\Str\*1\Final Plans\U4444ab.sd.qd.01.dgn  
 tcoggins

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

STR. #1

BM 84 @ -L- STA. 132+39.74, RR SPIKE IN BASE OF 24" PINE (66.52' RT), EL.= 251.58

NOTES:



LOCATION SKETCH

- ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
- FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
- REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
- FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.
- THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
- ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.
- FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS.
- THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
- FOR TEMPORARY BENTS, SEE SPECIAL PROVISIONS.

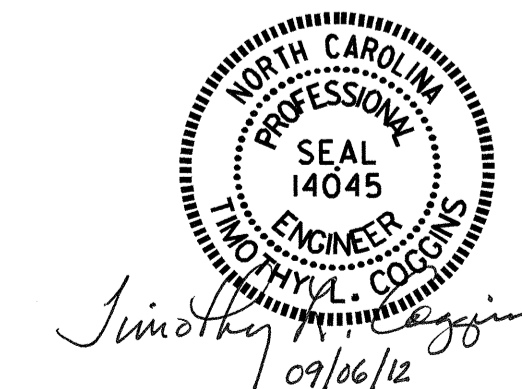
- THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.
- 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.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR UTILITY INFORMATION,  
SEE UTILITY PLANS AND SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

|                | PDA TESTING | REINFORCED CONCRETE DECK SLAB | GROOVING BRIDGE FLOORS | CLASS A CONCRETE | BRIDGE APPROACH SLABS | REINFORCING STEEL | STRUCTURAL STEEL | HP 12 X 53 STEEL PILES |          | PILE REDRIVES | CONCRETE BARRIER RAIL | 4" SLOPE PROTECTION | POT BEARINGS | EXPANSION JOINT SEALS |
|----------------|-------------|-------------------------------|------------------------|------------------|-----------------------|-------------------|------------------|------------------------|----------|---------------|-----------------------|---------------------|--------------|-----------------------|
|                |             |                               |                        |                  |                       |                   |                  | NO.                    | LIN. FT. |               |                       |                     |              |                       |
| SUPERSTRUCTURE | EACH        | SO. FT.                       | SO. FT.                | CU. YDS.         | LUMP SUM              | LBS.              | APPROX. LBS.     |                        |          |               | LIN. FT.              | SO. YDS.            | LUMP SUM     | LUMP SUM              |
| END BENT NO.1  |             |                               |                        | 69.4             |                       | 10,543            |                  | 16                     | 1,240    | 15            |                       | 817                 |              |                       |
| END BENT NO.2  |             |                               |                        | 69.8             |                       | 10,562            |                  | 16                     | 1,200    | 15            |                       | 799                 |              |                       |
| TOTAL          | 1           | 16,283                        | 18,193                 | 139.2            | LUMP SUM              | 21,105            | 1,083,400        | 32                     | 2,440    | 30            | 472.77                | 1,616               | LUMP SUM     | LUMP SUM              |

PROJECT NO. U-4444AB  
CUMBERLAND COUNTY  
 STATION: 132+79.28 -L-  
11+82.86 -Y3-  
 SHEET 3 OF 3



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GENERAL DRAWING  
 FOR BRIDGE ON  
 RANDOLPH STREET EXT.  
 OVER NC 210

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

DRAWN BY : B.N.BARODAWALA DATE : 6-10-11  
 CHECKED BY : J. B. WILSON DATE : 7-29-11

LOAD FACTORS:

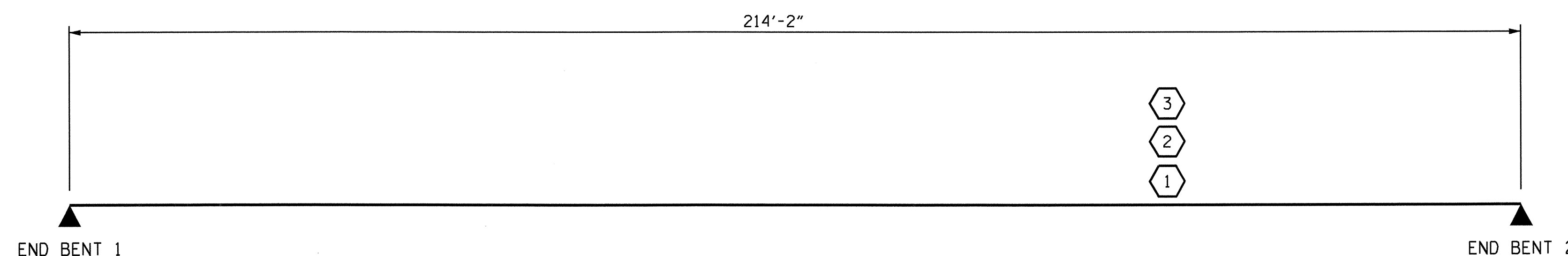
|                            |             |               |               |
|----------------------------|-------------|---------------|---------------|
| DESIGN LOAD RATING FACTORS | LIMIT STATE | $\gamma_{DC}$ | $\gamma_{DW}$ |
|                            | STRENGTH I  | 1.25          | 1.50    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

| LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR STEEL GIRDERS |                                   |                      |                           |                             |               |                                     |                           |               |      |                 |                                     |                           |               |      |                 |                                     |                                     |                           |               |      |                |                 |                                     |
|--|-----------------------------------|----------------------|---------------------------|-----------------------------|---------------|-------------------------------------|---------------------------|---------------|------|-----------------|-------------------------------------|---------------------------|---------------|------|-----------------|-------------------------------------|-------------------------------------|---------------------------|---------------|------|----------------|-----------------|-------------------------------------|
| LEVEL  | VEHICLE                           | WEIGHT (W)<br>(TONS) | CONTROLLING LOAD RATING # | MINIMUM RATING FACTORS (RF) | TONS = W x RF | STRENGTH I LIMIT STATE              |                           |               |      |                 |                                     |                           |               |      |                 | SERVICE II LIMIT STATE              |                                     |                           |               |      | COMMENT NUMBER |                 |                                     |
|  |                                   |                      |                           |                             |               | MOMENT                              |                           |               |      |                 | SHEAR                               |                           |               |      |                 | MOMENT                              |                                     |                           |               |      |                |                 |                                     |
|  |                                   |                      |                           |                             |               | LIVE-LOAD FACTORS ( $\gamma_{LL}$ ) | DISTRIBUTION FACTORS (DF) | RATING FACTOR | SPAN | GIRDER LOCATION | DISTANCE FROM LEFT END OF SPAN (FT) | DISTRIBUTION FACTORS (DF) | RATING FACTOR | SPAN | GIRDER LOCATION | DISTANCE FROM LEFT END OF SPAN (FT) | LIVE-LOAD FACTORS ( $\gamma_{LL}$ ) | DISTRIBUTION FACTORS (DF) | RATING FACTOR | SPAN |                | GIRDER LOCATION | DISTANCE FROM LEFT END OF SPAN (FT) |
| DESIGN LOAD RATING   | HL-93 (INVENTORY)                 | N/A                  | ①                         | 1.14                        | --            | 1.75                                | 0.704                     | 1.58          | A    | E               | 107.08                              | 0.935                     | 1.14          | A    | I               | 160.62                              | 1.30                                | 0.704                     | 1.89          | A    | E              | 107.08          |                                     |
|  | HL-93 (OPERATING)                 | N/A                  |                           | 1.48                        | --            | 1.35                                | 0.704                     | 2.05          | A    | E               | 107.08                              | 0.935                     | 1.48          | A    | I               | 160.62                              | 1.00                                | 0.704                     | 2.45          | A    | E              | 107.08          |                                     |
|  | HS-20 (INVENTORY)                 | 36.00                | ②                         | 1.80                        | 64.800        | 1.75                                | 0.704                     | 2.80          | A    | E               | 107.08                              | 0.935                     | 1.80          | A    | I               | 160.62                              | 1.30                                | 0.704                     | 3.34          | A    | E              | 107.08          |                                     |
|  | HS-20 (OPERATING)                 | 36.00                |                           | 2.33                        | 83.880        | 1.35                                | 0.704                     | 3.63          | A    | E               | 107.08                              | 0.935                     | 2.33          | A    | I               | 160.62                              | 1.00                                | 0.704                     | 4.34          | A    | E              | 107.08          |                                     |
| LEGAL LOAD RATING  | SINGLE VEHICLE (SV)               | SNSH                 | 13.500                    |                             | 5.72          | 77.220                              | 1.40                      | 0.704         | 8.87 | A               | E                                   | 107.08                    | 0.935         | 5.72 | A               | I                                   | 160.62                              | 1.30                      | 0.704         | 8.46 | A              | E               | 107.08                              |
|  |                                   | SNGARBS2             | 20.000                    |                             | 3.95          | 79.000                              | 1.40                      | 0.704         | 6.16 | A               | E                                   | 107.08                    | 0.935         | 3.95 | A               | I                                   | 160.62                              | 1.30                      | 0.704         | 5.89 | A              | E               | 107.08                              |
|  |                                   | SNAGRIS2             | 22.000                    |                             | 3.61          | 79.420                              | 1.40                      | 0.704         | 5.68 | A               | E                                   | 107.08                    | 0.935         | 3.61 | A               | I                                   | 160.62                              | 1.30                      | 0.704         | 5.42 | A              | E               | 107.08                              |
|  |                                   | SNCOTTS3             | 27.250                    |                             | 2.85          | 77.663                              | 1.40                      | 0.704         | 4.39 | A               | E                                   | 107.08                    | 0.935         | 2.85 | A               | I                                   | 160.62                              | 1.30                      | 0.704         | 4.20 | A              | E               | 107.08                              |
|  |                                   | SNAGGRS4             | 34.925                    |                             | 2.27          | 79.280                              | 1.40                      | 0.704         | 3.51 | A               | E                                   | 107.08                    | 0.935         | 2.27 | A               | I                                   | 160.62                              | 1.30                      | 0.704         | 3.35 | A              | E               | 107.08                              |
|  |                                   | SNS5A                | 35.550                    |                             | 2.26          | 80.343                              | 1.40                      | 0.704         | 3.44 | A               | E                                   | 107.08                    | 0.935         | 2.26 | A               | I                                   | 160.62                              | 1.30                      | 0.704         | 3.28 | A              | E               | 107.08                              |
|  |                                   | SNS6A                | 39.950                    |                             | 2.03          | 81.099                              | 1.40                      | 0.704         | 3.09 | A               | E                                   | 107.08                    | 0.935         | 2.03 | A               | I                                   | 160.62                              | 1.30                      | 0.704         | 2.95 | A              | E               | 107.08                              |
|  |                                   | SNS7B                | 42.000                    |                             | 1.95          | 81.900                              | 1.40                      | 0.704         | 2.94 | A               | E                                   | 107.08                    | 0.935         | 1.95 | A               | I                                   | 53.54                               | 1.30                      | 0.704         | 2.81 | A              | E               | 107.08                              |
|  | TRUCK TRACTOR SEMI-TRAILER (TTST) | TNAGRIT3             | 33.000                    |                             | 2.44          | 80.520                              | 1.40                      | 0.704         | 3.75 | A               | E                                   | 107.08                    | 0.935         | 2.44 | A               | I                                   | 160.62                              | 1.30                      | 0.704         | 3.58 | A              | E               | 107.08                              |
|  |                                   | TNT4A                | 33.075                    |                             | 2.41          | 79.711                              | 1.40                      | 0.704         | 3.75 | A               | E                                   | 107.08                    | 0.935         | 2.41 | A               | I                                   | 160.62                              | 1.30                      | 0.704         | 3.58 | A              | E               | 107.08                              |
|  |                                   | TNT6A                | 41.600                    |                             | 2.00          | 83.200                              | 1.40                      | 0.704         | 3.00 | A               | E                                   | 107.08                    | 0.935         | 2.00 | A               | I                                   | 53.54                               | 1.30                      | 0.704         | 2.87 | A              | E               | 107.08                              |
|  |                                   | TNT7A                | 42.000                    |                             | 1.98          | 83.160                              | 1.40                      | 0.704         | 2.99 | A               | E                                   | 107.08                    | 0.935         | 1.98 | A               | I                                   | 160.62                              | 1.30                      | 0.704         | 2.85 | A              | E               | 107.08                              |
|  |                                   | TNT7B                | 42.000                    |                             | 1.93          | 81.060                              | 1.40                      | 0.704         | 3.02 | A               | E                                   | 107.08                    | 0.935         | 1.93 | A               | I                                   | 160.62                              | 1.30                      | 0.704         | 2.88 | A              | E               | 107.08                              |
|  |                                   | TNAGRIT4             | 43.000                    |                             | 1.88          | 80.840                              | 1.40                      | 0.704         | 2.92 | A               | E                                   | 107.08                    | 0.935         | 1.88 | A               | I                                   | 160.62                              | 1.30                      | 0.704         | 2.79 | A              | E               | 107.08                              |
| TNAGT5A  | 45.000                            |                      | 1.82                      | 81.900                      | 1.40          | 0.704                               | 2.79                      | A             | E    | 107.08          | 0.935                               | 1.82                      | A             | I    | 160.62          | 1.30                                | 0.704                               | 2.66                      | A             | E    | 107.08         |                 |                                     |
| TNAGT5B  | 45.000                            |                      | ③                         | 1.80                        | 81.000        | 1.40                                | 0.704                     | 2.77          | A    | E               | 107.08                              | 0.935                     | 1.80          | A    | I               | 160.62                              | 1.30                                | 0.704                     | 2.65          | A    | E              | 107.08          |                                     |

NOTES:  
 MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE II LIMIT STATES.  
 ALLOWABLE STRESS FOR SERVICE II LIMIT STATE ARE AS REQUIRED FOR DESIGN.

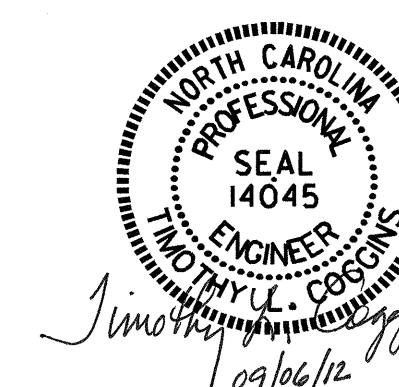
COMMENTS:  
 1.  
 2.  
 3.  
 4.

|  |                               |
|--|-------------------------------|
| #  | 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<br>E - EXTERIOR GIRDER |                               |



LRFR SUMMARY

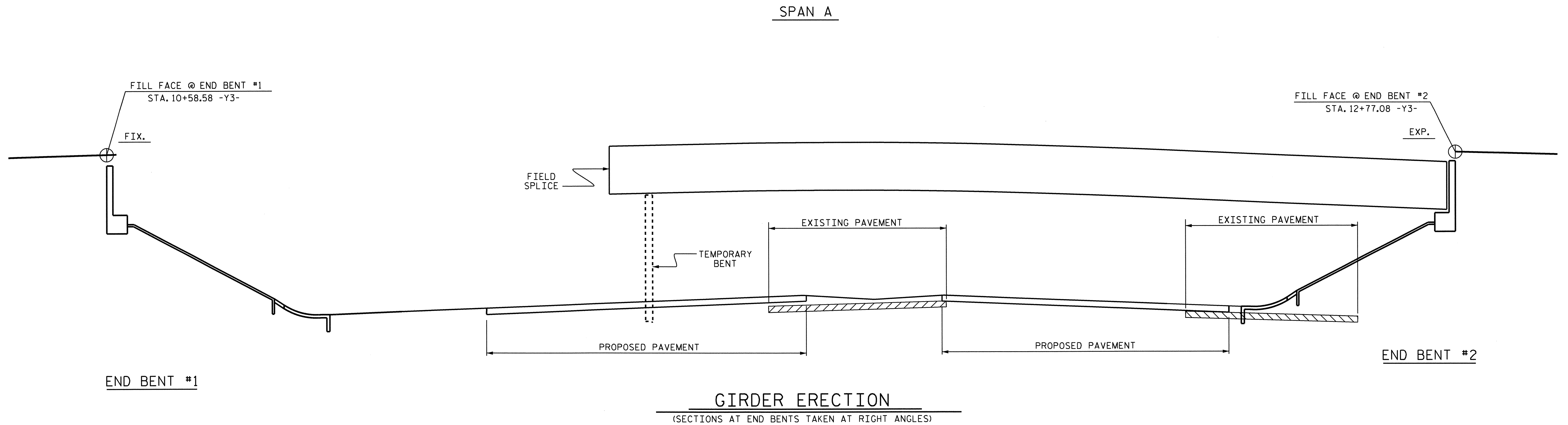
PROJECT NO. U-4444AB  
CUMBERLAND COUNTY  
 STATION: 132+79.28 -L-



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

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

ASSEMBLED BY: N. Ruffin DATE: 9-6-12  
 CHECKED BY: T.L. COGGINS DATE: 9-6-12  
 DRAWN BY: MAA I/OB REV. 11/12/OBRR MAA/GM  
 CHECKED BY: GM/DI 2/OB REV. 10/1/11 MAA/GM



**ERECTION NOTES**

FOR TEMPORARY BENTS, SEE SPECIAL PROVISIONS.

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

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

THE STRUCTURAL STEEL SHALL BE SUPPORTED DURING ERECTION IN ITS CAMBERED POSITION. A MINIMUM OF ONE TEMPORARY BENT SHALL BE USED IN SPAN A.

THE TEMPORARY BENT SHALL REMAIN IN PLACE UNTIL ALL GIRDERS, DIAPHRAGMS, AND CROSSFRAMES ARE IN PLACE AND ALL HIGH STRENGTH BOLTS ARE TIGHTENED.

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

THE CONTRACTOR'S ERECTION PLANS SHALL INCLUDE A METHOD OF TEMPORARY BENT REMOVAL THAT WILL UNIFORMLY TRANSFER THE STRUCTURAL WEIGHT TO THE DIAPHRAGMS/CROSSFRAMES AND THE GIRDERS WILL REMAIN IN THE CAMBERED POSITIONS.

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

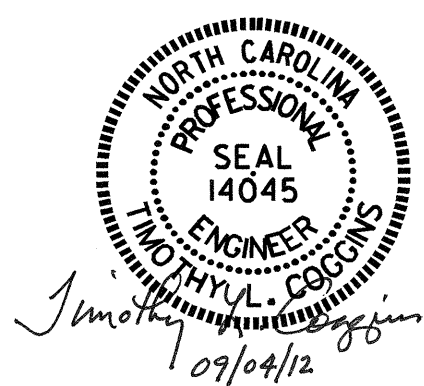
THE CONTRACTOR IS RESPONSIBLE FOR DESIGNING THE TEMPORARY BENT. THE DESIGNS SHALL BE COMPLETED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NORTH CAROLINA. THE CONTRACTOR SHALL SUBMIT SIGNED AND SEALED WORKING DRAWINGS AND CALCULATIONS FOR APPROVAL BY THE ENGINEER.

DURING THE GIRDER ERECTION PROCEDURE, THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING TEMPORARY LATERAL BRACING AND OTHER MEANS OF SUPPORT, AS REQUIRED, TO ENSURE STABILITY OF THE GIRDERS, AVOID UPLIFT OF THE GIRDERS AT THE TEMPORARY BENTS AND TO ENSURE PLUMBNESS OF THE GIRDERS IN THE FINAL CONDITION.

NO SEPARATE MEASUREMENT OR PAYMENT WILL BE MADE FOR PROVIDING THE TEMPORARY BENT. THE COST FOR ALL MATERIALS, EQUIPMENT, TOOLS, LABOR AND ANY INCIDENTALS NECESSARY TO PROVIDE THE TEMPORARY BENT SHALL BE CONSIDERED INCIDENTAL TO THE LUMP SUM BID PRICE FOR STRUCTURAL STEEL.

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

PROJECT NO. U-4444AB  
CUMBERLAND COUNTY  
 STATION: 132+79.28 -L-



|  |     |       |     |     |                    |
|--|-----|-------|-----|-----|--------------------|
| STATE OF NORTH CAROLINA<br>DEPARTMENT OF TRANSPORTATION<br>RALEIGH |     |       |     |     |                    |
| <b>GIRDER ERECTION<br/>DETAILS</b>                                 |     |       |     |     |                    |
| REVISIONS  |     |       |     |     | SHEET NO.          |
| NO.  | BY: | DATE: | NO. | BY: | DATE:              |
| 1  |     |       | 3   |     |                    |
| 2  |     |       | 4   |     |                    |
|  |     |       |     |     | TOTAL SHEETS<br>29 |

DRAWN BY B.N.B. / P.S. PARIS DATE: 6-27-12  
 CHECKED BY: I.L. COGGINS DATE: 6-28-12

**NOTES:**

PROVIDE 1 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.

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

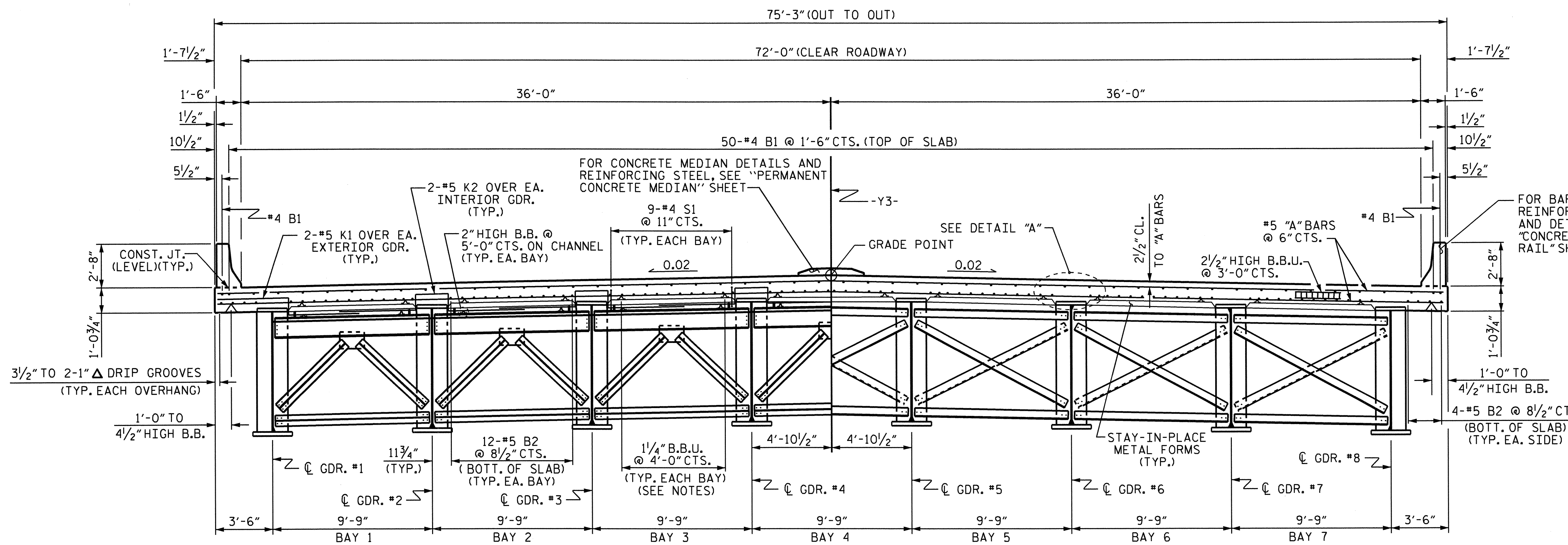
THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN METAL STAY-IN-PLACE FORM SUPPORTS OR FORMS AND GIRDER STIFFENERS OR CONNECTOR PLATES. THE PROPOSAL SHALL BE INDICATED, AS APPROPRIATE, ON EITHER THE STEEL WORKING DRAWINGS OR THE METAL STAY-IN-PLACE FORM WORKING DRAWINGS.

DIRECTION OF CASTING DECK CONCRETE SHALL BE FROM THE FIXED BEARING END TOWARD THE EXPANSION BEARING END OF THE SPAN.

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

PREVIOUSLY CAST CONCRETE IN SIMPLE SPAN, POUR #1 SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

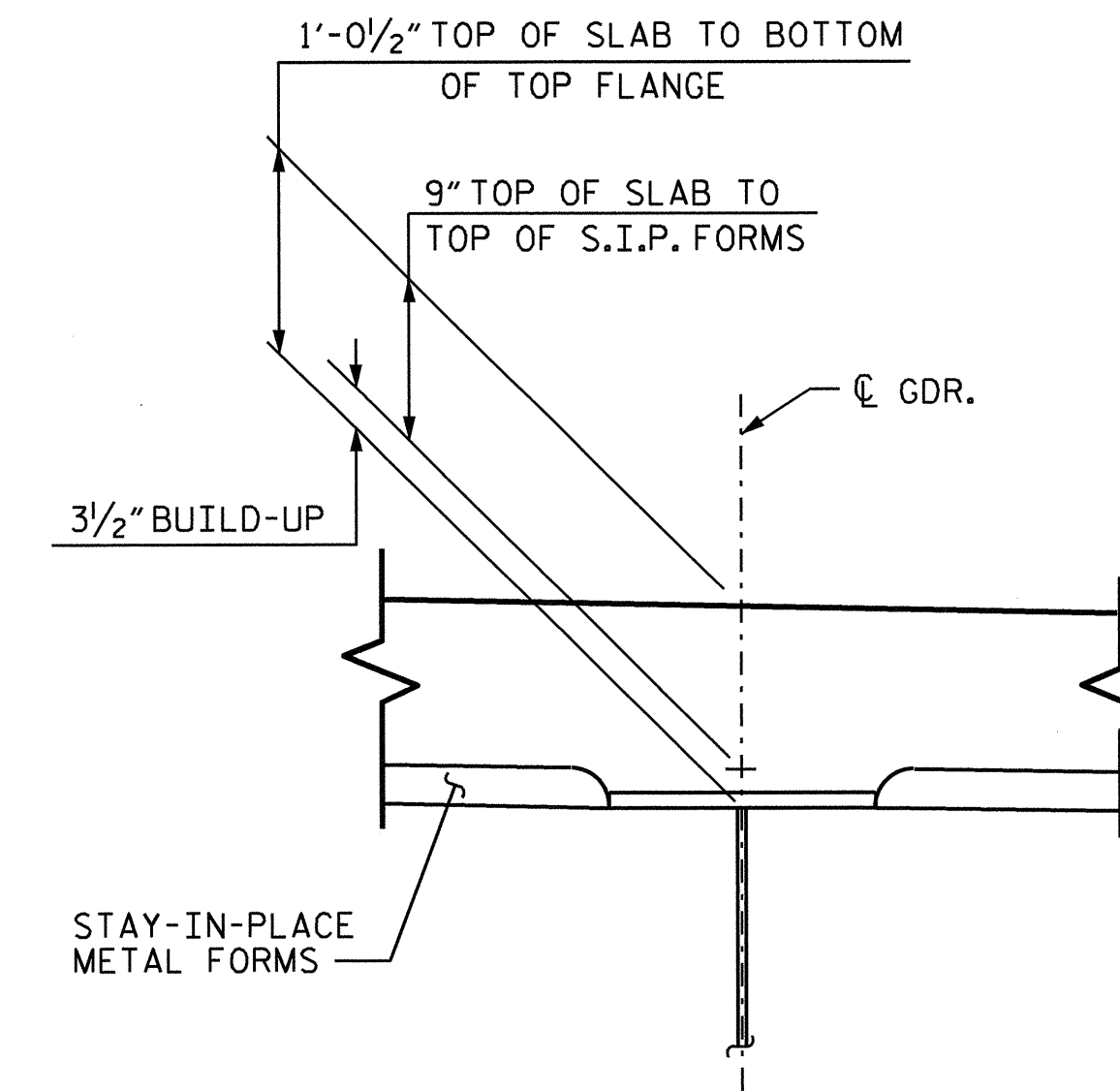
METAL STAY-IN-PLACE FORMS SHALL NOT BE WELDED TO GIRDER FLANGES IN THE ZONES REQUIRING CHAMPY V-NOTCH TEST. SEE STRUCTURAL STEEL DETAIL SHEETS.



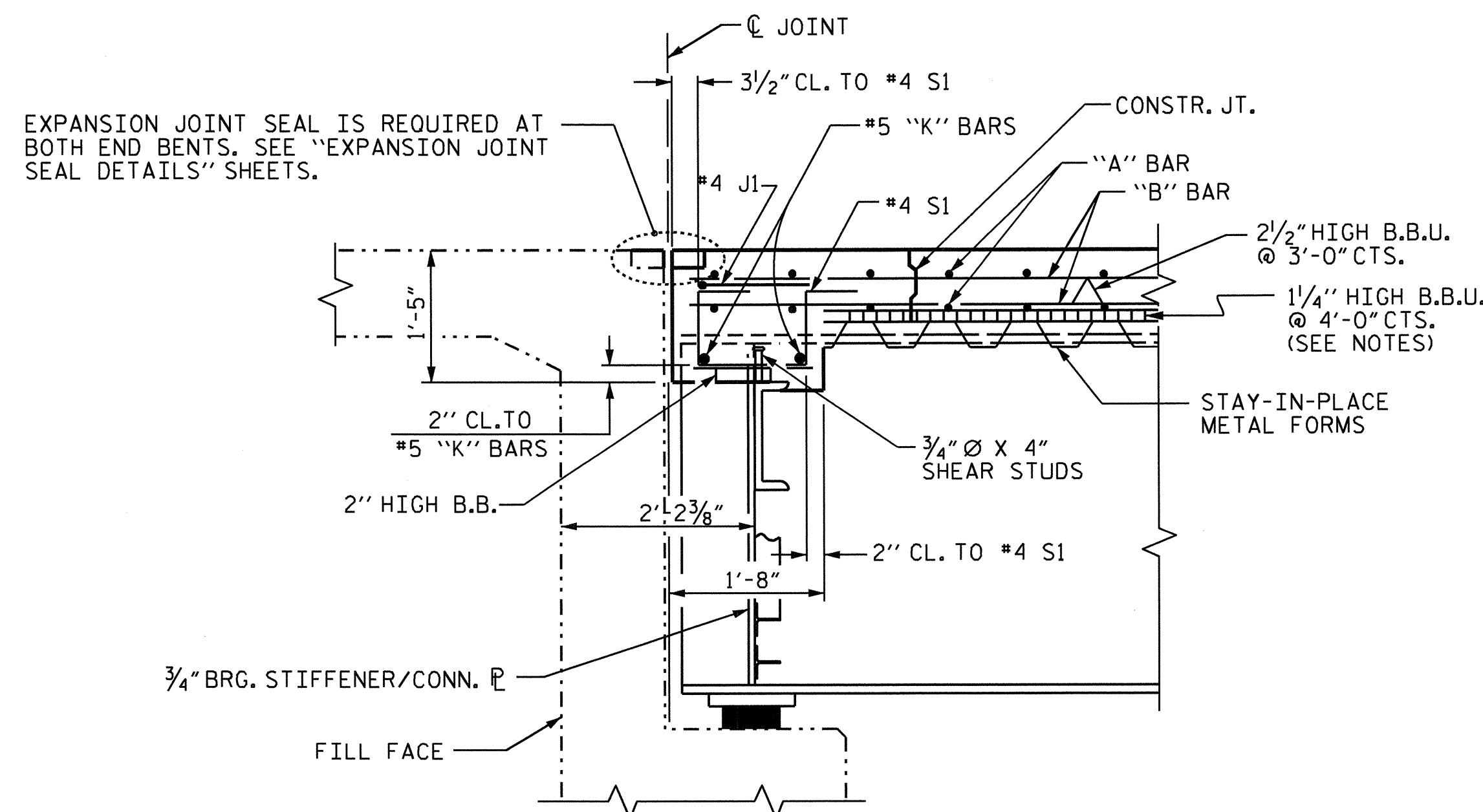
HALF SECTION @ END BENT DIAPHRAGMS

HALF SECTION @ INTERMEDIATE DIAPHRAGMS

TYPICAL SECTION



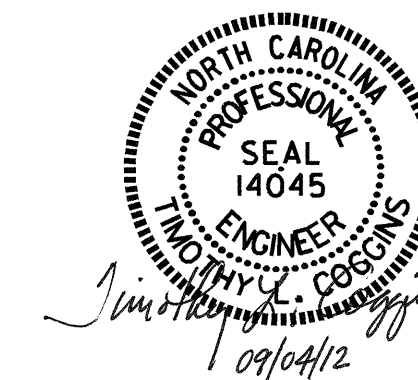
DETAIL "A"



SECTION @ END BENT

DRAWN BY: B.N.BARODAWALA DATE: 10/12/10  
 CHECKED BY: PEGGY PARISI DATE: 1-18-11

04-SEP-2012 09:20  
 R:\TIP\Projects-U\U4444AB\Structures\Plans\Str\*1\Final Plans\U4444ab.sd.ts.01.dgn  
 fcoggins

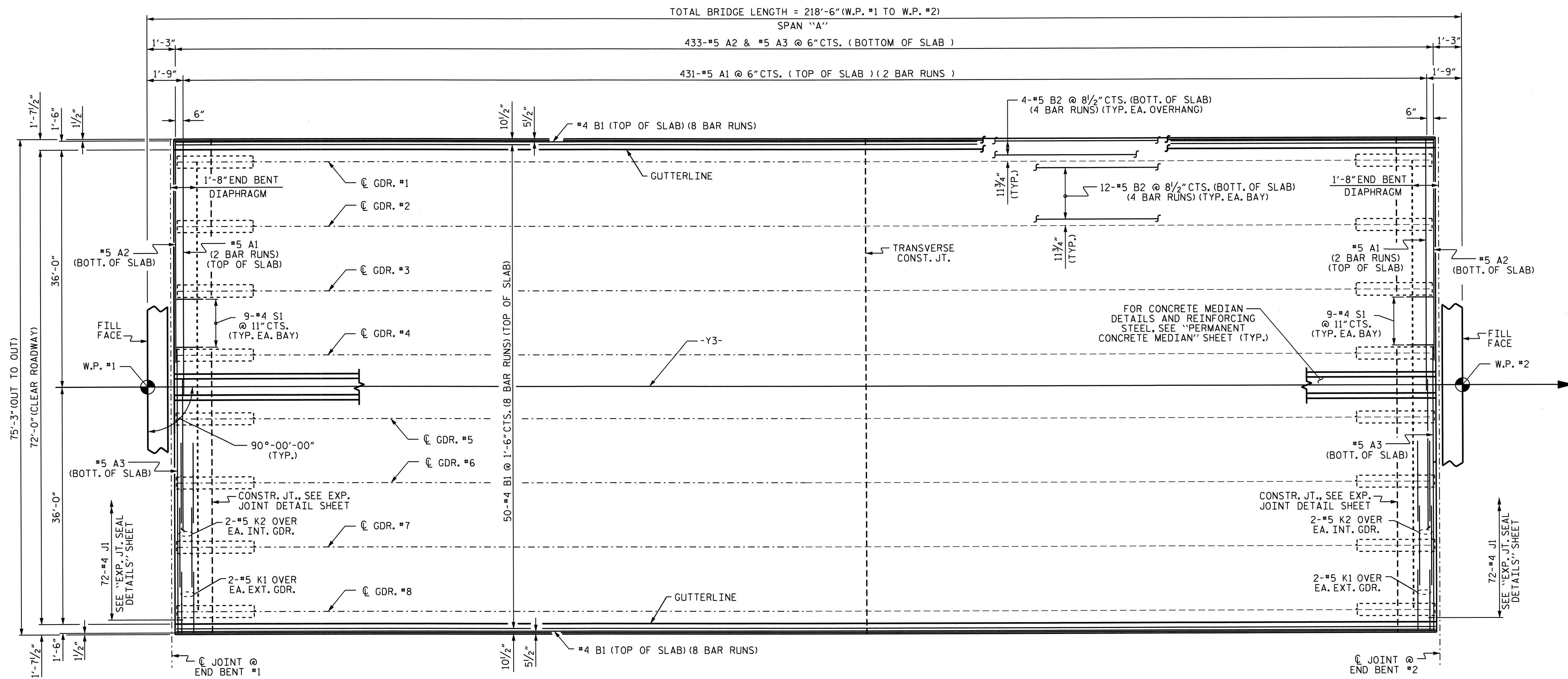


PROJECT NO. U-4444AB  
 CUMBERLAND COUNTY  
 STATION: 132+79.28 -L-

|                              |     |       |     |     |       |                    |
|------------------------------|-----|-------|-----|-----|-------|--------------------|
| STATE OF NORTH CAROLINA      |     |       |     |     |       | SHEET NO.          |
| DEPARTMENT OF TRANSPORTATION |     |       |     |     |       |                    |
| RALEIGH                      |     |       |     |     |       | S-6                |
| SUPERSTRUCTURE               |     |       |     |     |       |                    |
| TYPICAL SECTION              |     |       |     |     |       | TOTAL SHEETS<br>29 |
| REVISIONS                    |     |       |     |     |       |                    |
| NO.                          | BY: | DATE: | NO. | BY: | DATE: |                    |
| 1                            |     |       | 3   |     |       |                    |
| 2                            |     |       | 4   |     |       |                    |

STR. #1

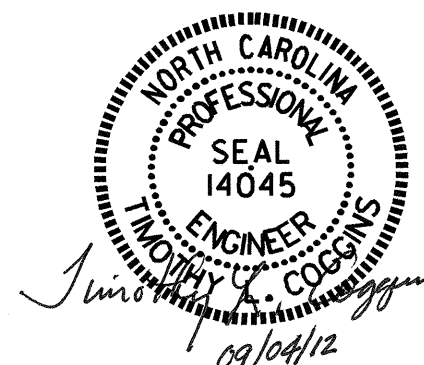




**PLAN OF SPAN "A"**

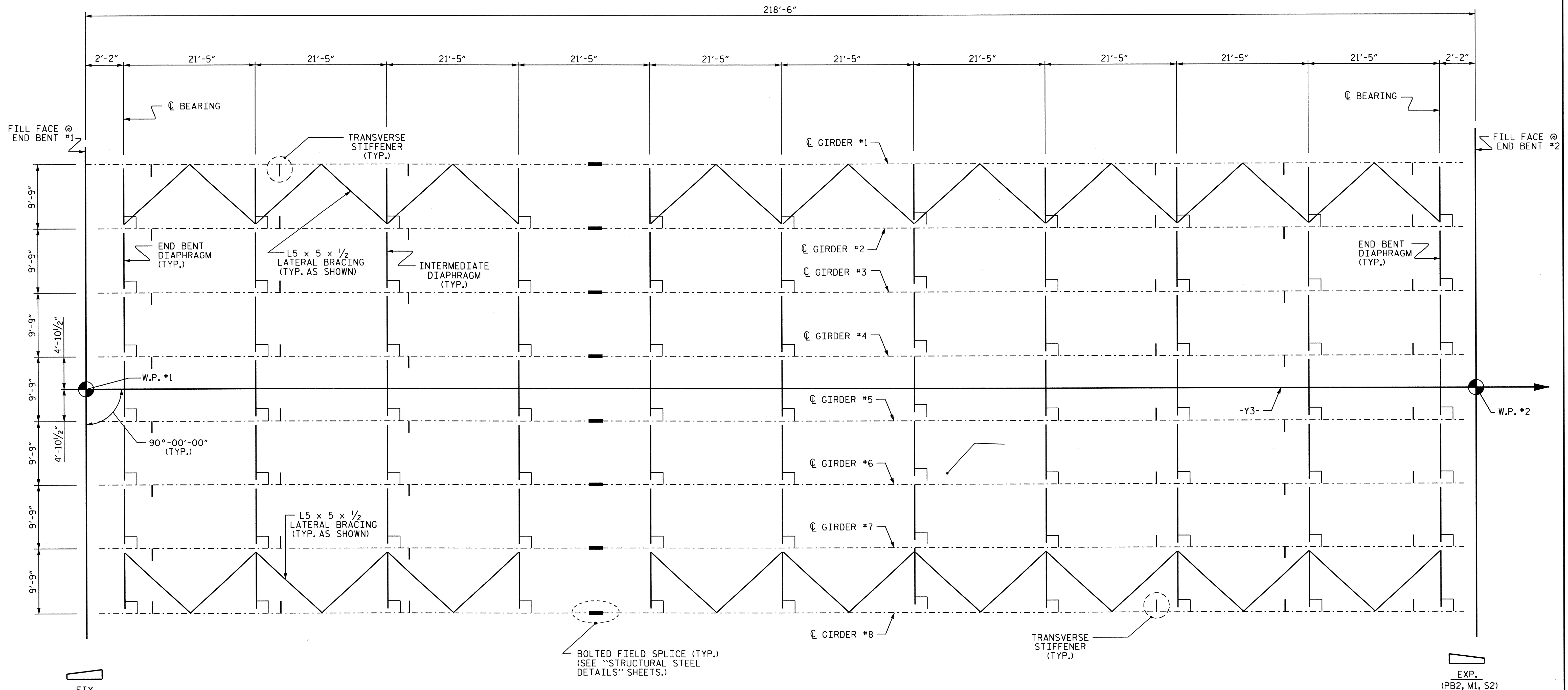
FOR LOCATION OF INTERMEDIATE DIAPHRAGM, SEE "FRAMING PLAN."  
 FOR LOCATION OF TRANSVERSE CONSTRUCTION JOINT, SEE POURING SEQUENCE ON BILL OF MATERIAL SHEET.  
 FOR BARRIER RAIL REINFORCING STEEL AND DETAILS, SEE "CONCRETE BARRIER RAIL" SHEET.

PROJECT NO. U-4444AB  
CUMBERLAND COUNTY  
 STATION: 132+79.28 -L-



|                              |     |       |     |     |              |
|------------------------------|-----|-------|-----|-----|--------------|
| STATE OF NORTH CAROLINA      |     |       |     |     |              |
| DEPARTMENT OF TRANSPORTATION |     |       |     |     |              |
| RALEIGH                      |     |       |     |     |              |
| SUPERSTRUCTURE               |     |       |     |     |              |
| PLAN OF SPAN                 |     |       |     |     |              |
| REVISIONS                    |     |       |     |     | SHEET NO.    |
| NO.                          | BY: | DATE: | NO. | BY: | DATE:        |
| 1                            |     |       | 3   |     |              |
| 2                            |     |       | 4   |     |              |
|                              |     |       |     |     | TOTAL SHEETS |
|                              |     |       |     |     | 29           |

DRAWN BY: B.N.BARODAWALA DATE: 10/12/10  
 CHECKED BY: PEGGY PARISI DATE: 1-18-11



SPAN A

**FRAMING PLAN**

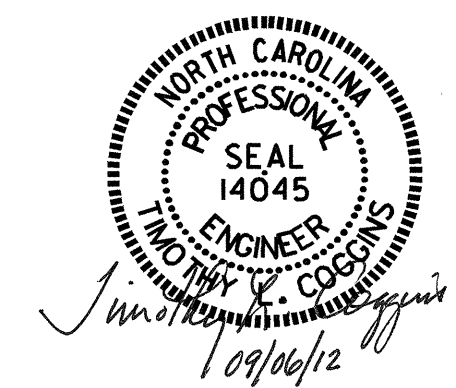
NO LATERAL BRACING IN BAYS WITH BOLTED FIELD SPLICE

FOR DIMENSION ALONG GIRDER AND PLATE SIZE OF TRANSVERSE STIFFENERS, SEE "STRUCTURAL STEEL DETAILS" SHEET 1 OF 4

PROJECT NO. U-4444AB  
CUMBERLAND COUNTY  
 STATION: 132+79.28 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

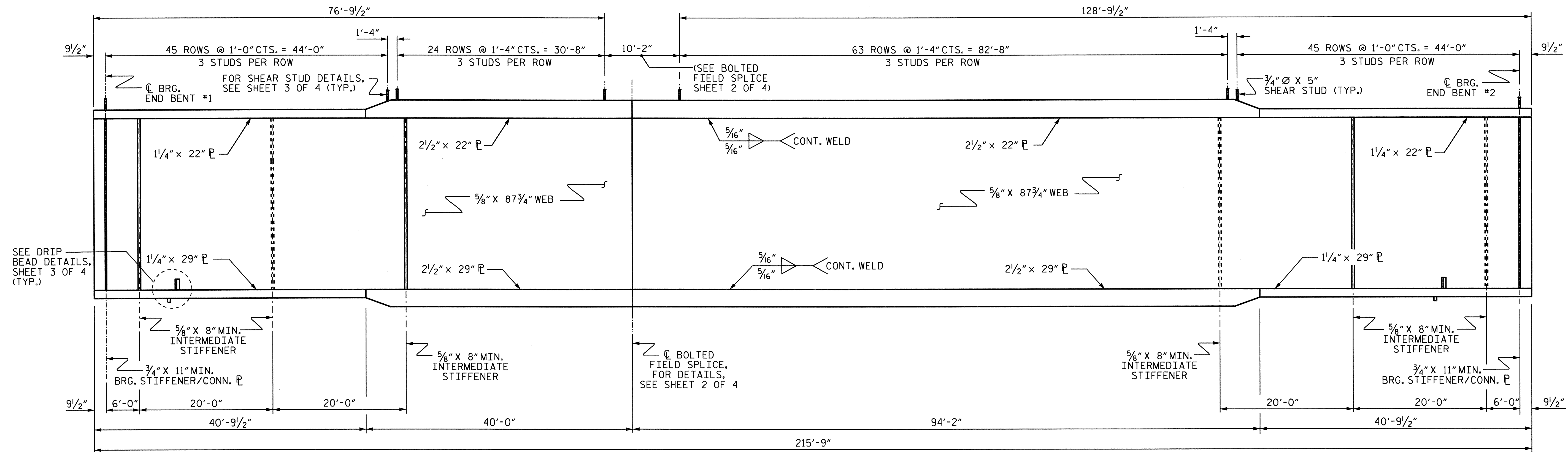
SUPERSTRUCTURE  
 FRAMING PLAN



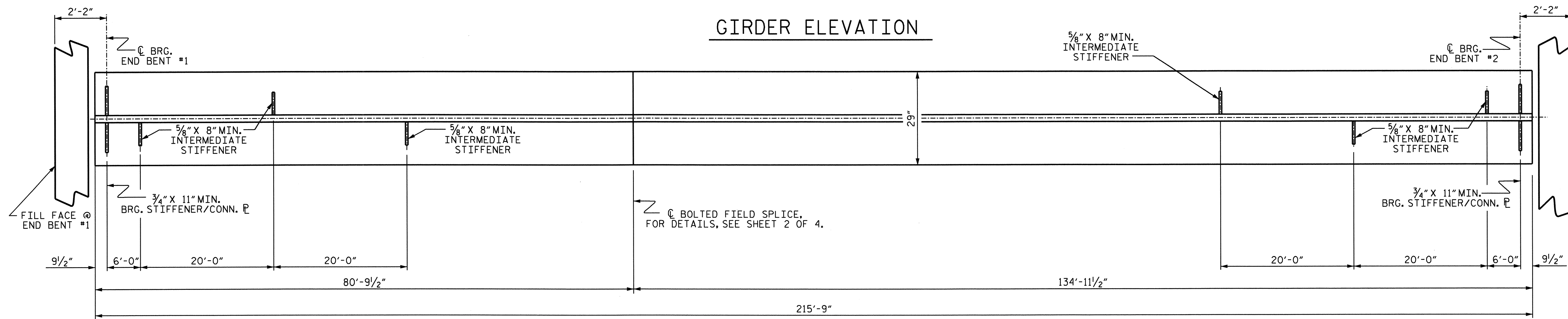
| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-8          |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |
| 2         |     |       | 4   |     |       | 29           |

DRAWN BY: B.N.BARODAWALA DATE: 10-19-10  
 CHECKED BY: PEGGY PARISI DATE: 1-18-11

STR. #1

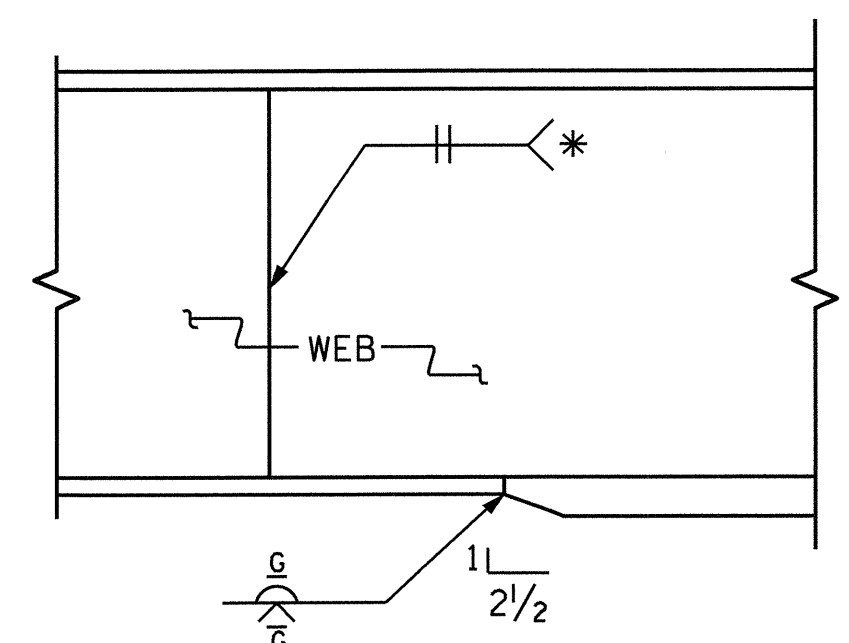


GIRDER ELEVATION

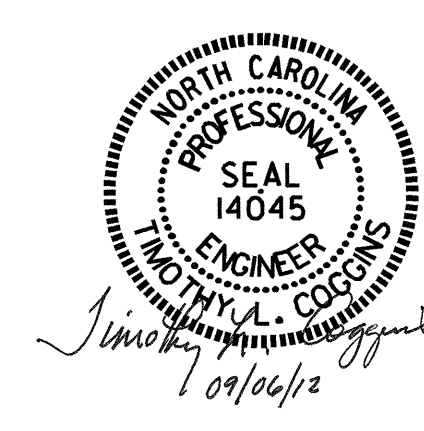


BOTTOM FLANGE DETAIL

NOTE:  
INTERMEDIATE STIFFENERS TO BE ON INTERIOR SIDE OF WEB FOR EXTERIOR GIRDERS.



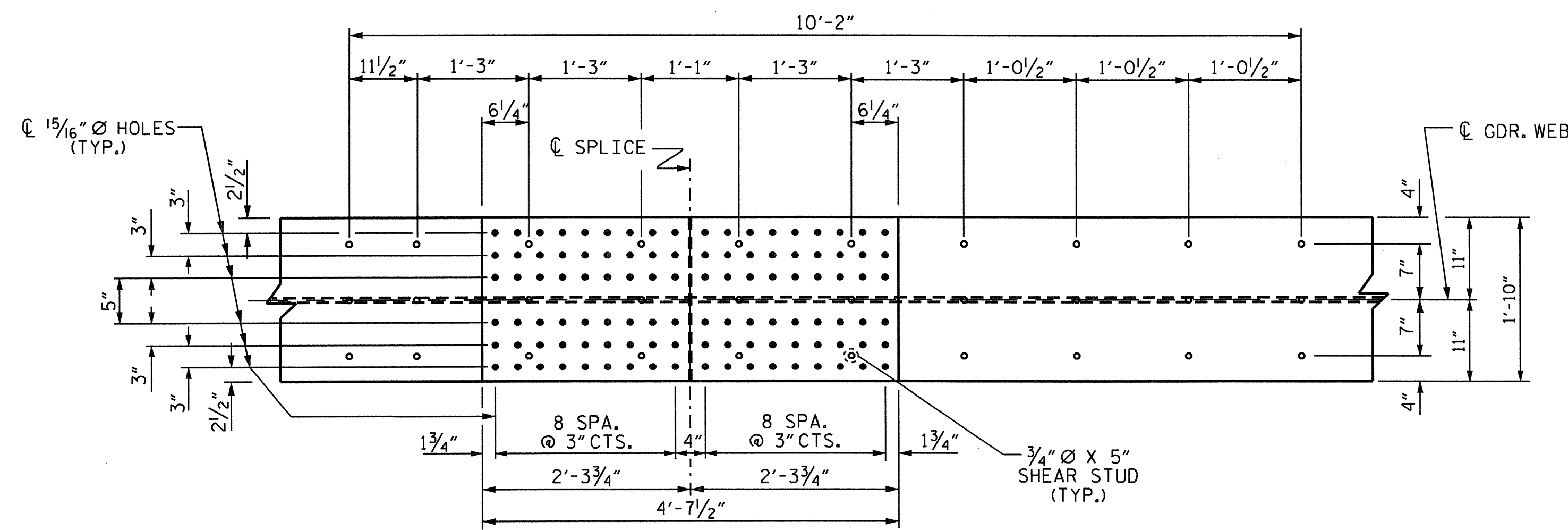
PROJECT NO. U-4444AB  
CUMBERLAND COUNTY  
STATION: 132+79.28 -L-  
SHEET 1 OF 4



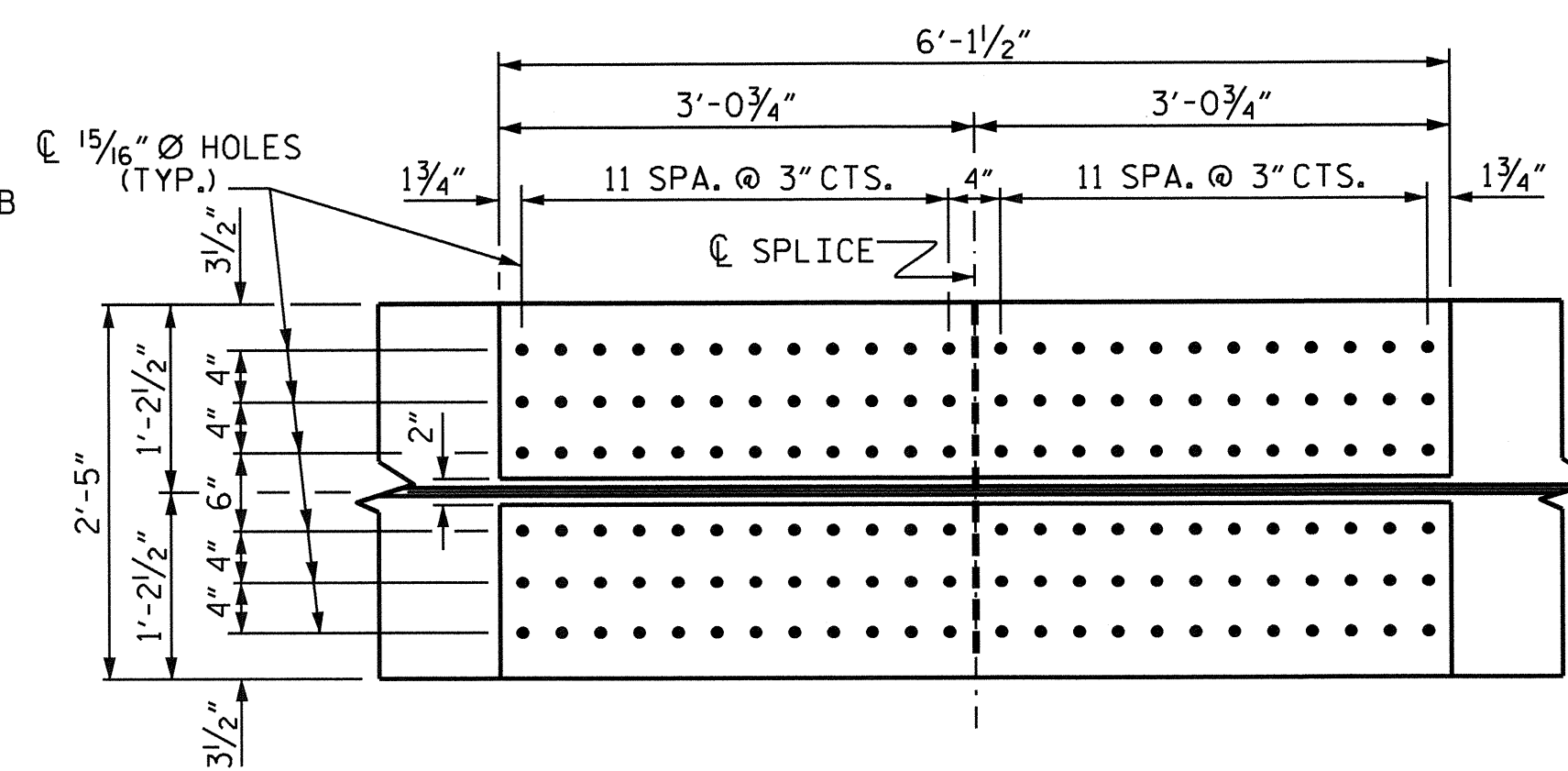
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
STRUCTURAL STEEL  
DETAILS

| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-9          |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |
| 2         |     |       | 4   |     |       | 29           |

DRAWN BY: B.N.BARODAWALA      DATE: 10-19-10  
CHECKED BY: PEGGY PARISI      DATE: 1-18-11



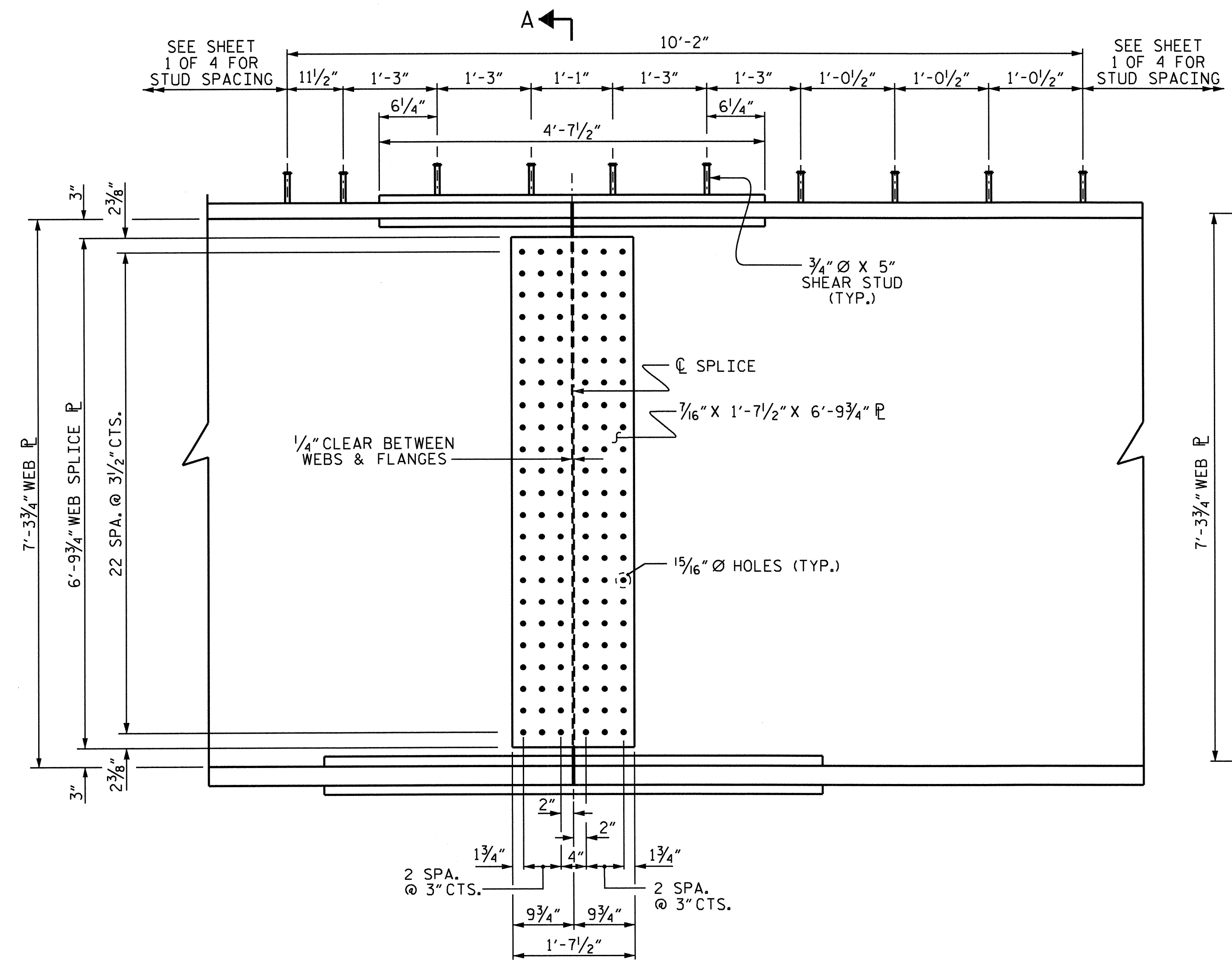
PLAN (TOP OF TOP FLANGE)



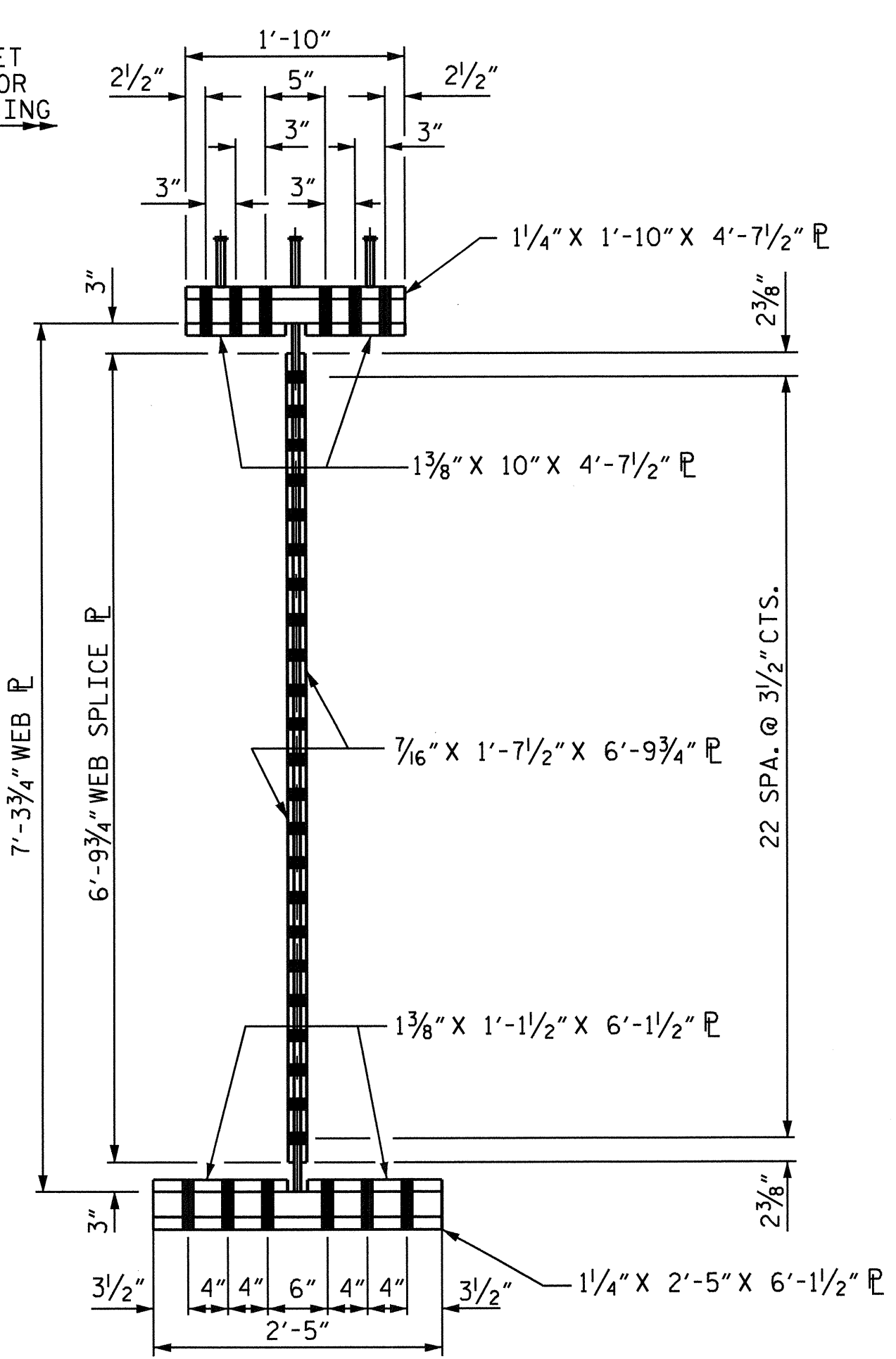
PLAN (TOP OF BOTTOM FLANGE)

**NOTES :**

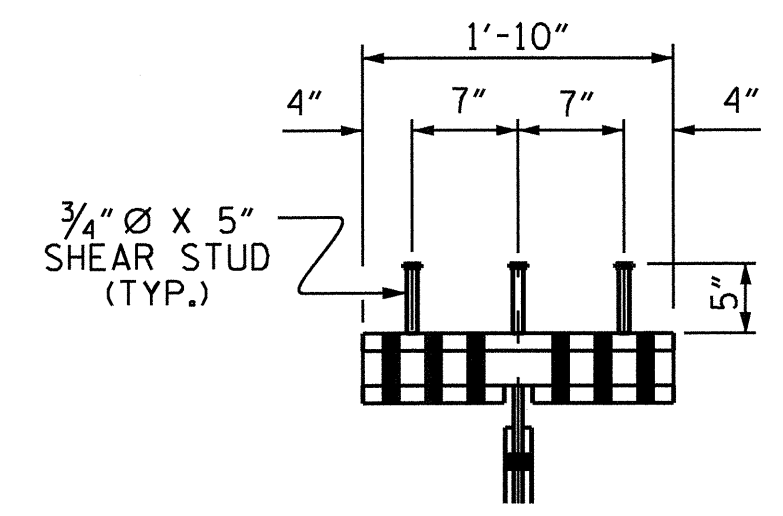
- ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.
- ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL, UNLESS OTHERWISE NOTED.
- ALL FIELD CONNECTIONS TO BE 7/8" DIA. HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.
- BEARING STIFFENERS ARE TO BE PLACED NORMAL TO THE WEB OF THE GIRDER AND SHALL BE PLUMB.
- PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION. KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES. KEEP 6" MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.
- A CHARPY V-NOTCH TEST IS REQUIRED FOR WEB PLATES, BOTTOM FLANGE PLATES, BOTTOM FLANGE SPLICE PLATES AND WEB SPLICE PLATES FOR ALL GIRDERS AND IN ACCORDANCE WITH ARTICLE 1072-7 OF THE STANDARD SPECIFICATIONS.
- STUDS ON GIRDERS MAY BE SHIFTED UP TO 1" IF NECESSARY TO CLEAR FLANGE SPLICE WELD.
- TENSION ON THE AASHTO M164 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-8 OF THE STANDARD SPECIFICATIONS.
- END OF GIRDERS SHALL BE PLUMB.
- SHEAR STUDS ARE TO BE SHOP WELDED ON TOP OF PLATE BEFORE FIELD ASSEMBLY.
- AT THE CONTRACTOR'S OPTION, THE DIAPHRAGM WITH THE WELDED GUSSET PLATES MAY BE USED IN LIEU OF THE DIAPHRAGM WITH BOLTED ANGLES AT NO ADDITIONAL COST TO THE DEPARTMENT.



ELEVATION



SECTION A-A



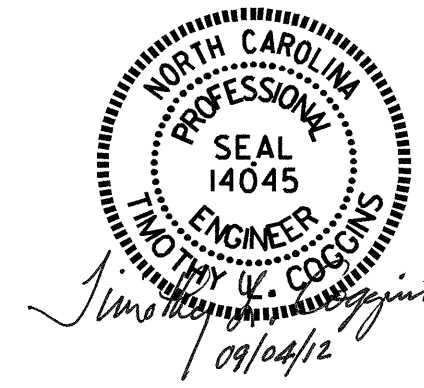
SHEAR STUD DETAIL FOR TOP FLANGE SPLICE PLATE

PROJECT NO. U-4444AB  
CUMBERLAND COUNTY  
 STATION: 132+79.28 -L-

SHEET 2 OF 4

DRAWN BY : B.N.BARODAWALA DATE : 10-21-10  
 CHECKED BY : PEGGY PARISI DATE : 1-18-11

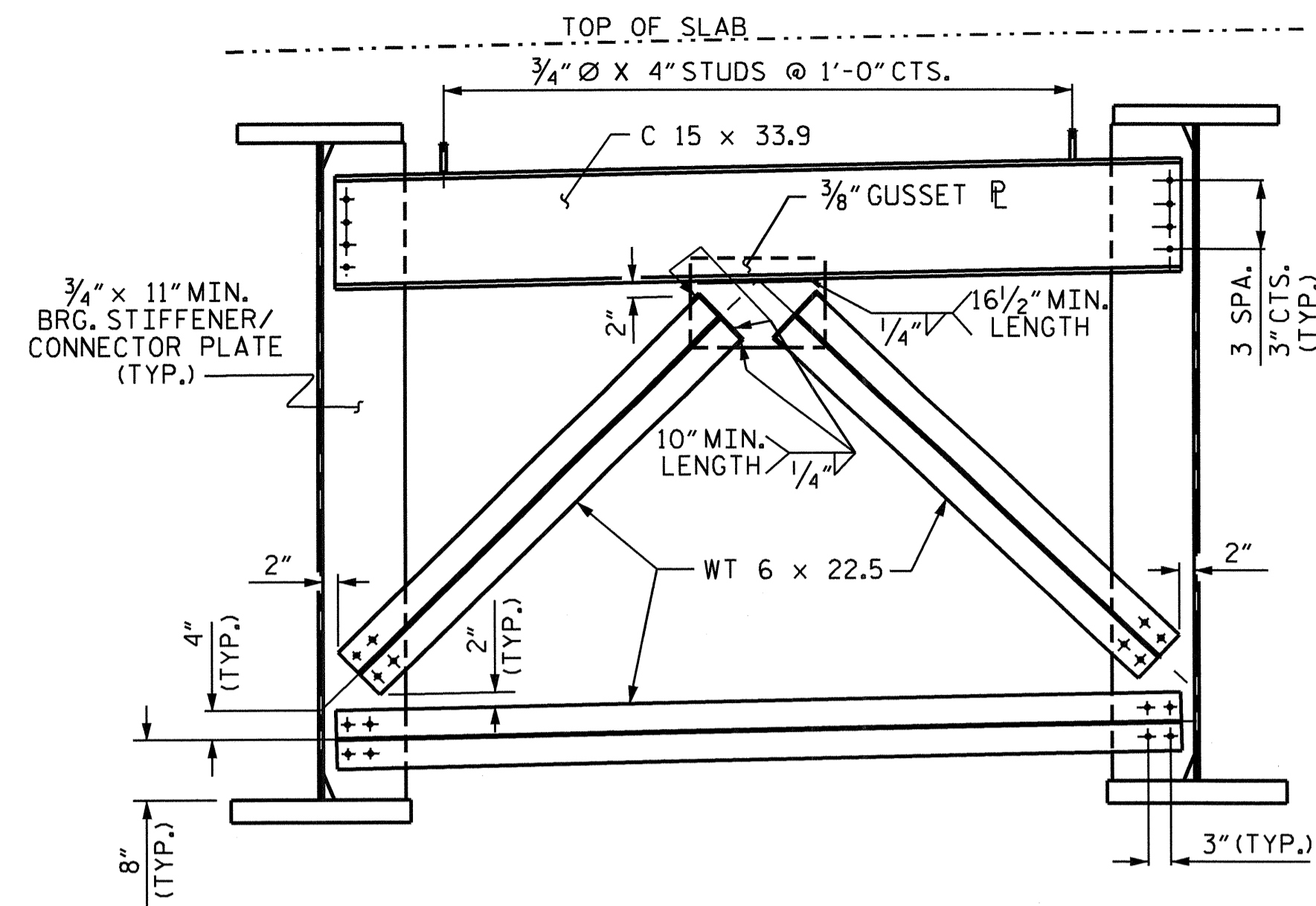
04-SEP-2012 09:18  
 R:\TIP\Projects-U\U4444AB\Structures\Plans\Str\*1\Final Plans\U4444ab.sd.ss.01.dgn  
 rcoggins



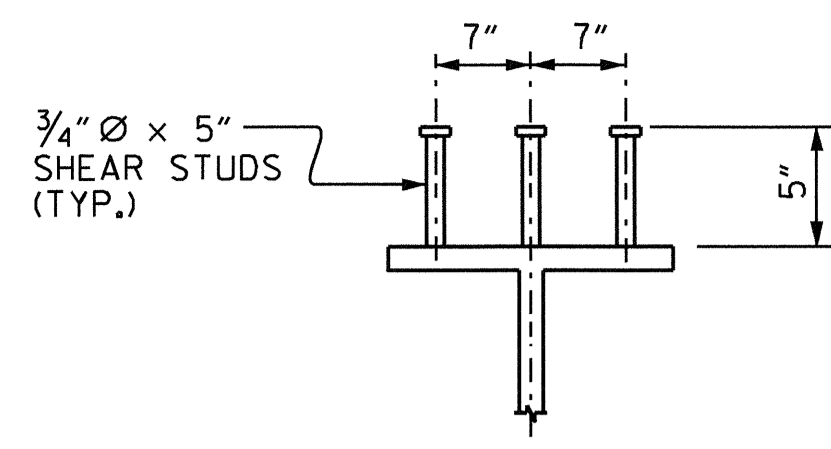
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 STRUCTURAL STEEL  
 DETAILS  
 BOLTED FIELD SPLICE

| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-10         |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |
| 2         |     |       | 4   |     |       | 29           |

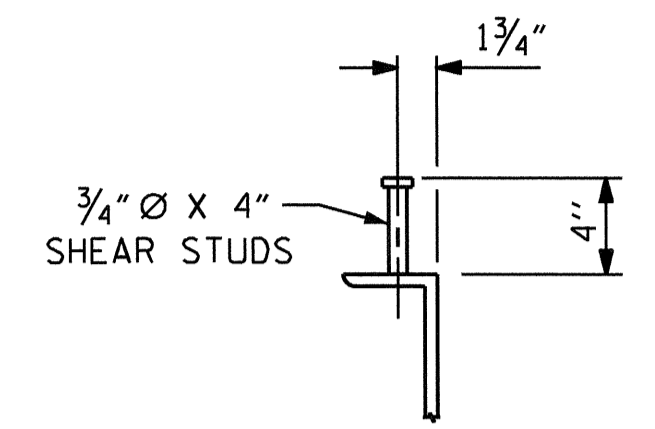
STR. #1



TYPICAL END BENT CROSSFRAME

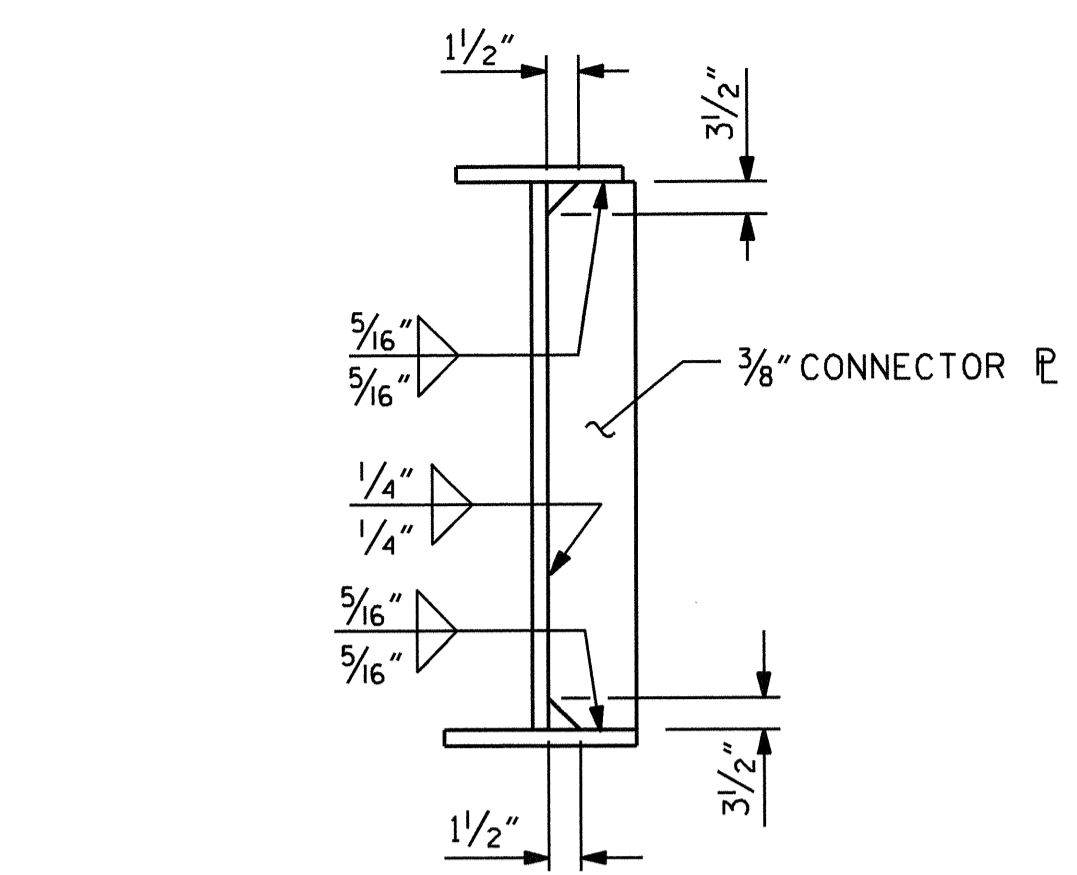


ON GIRDERS

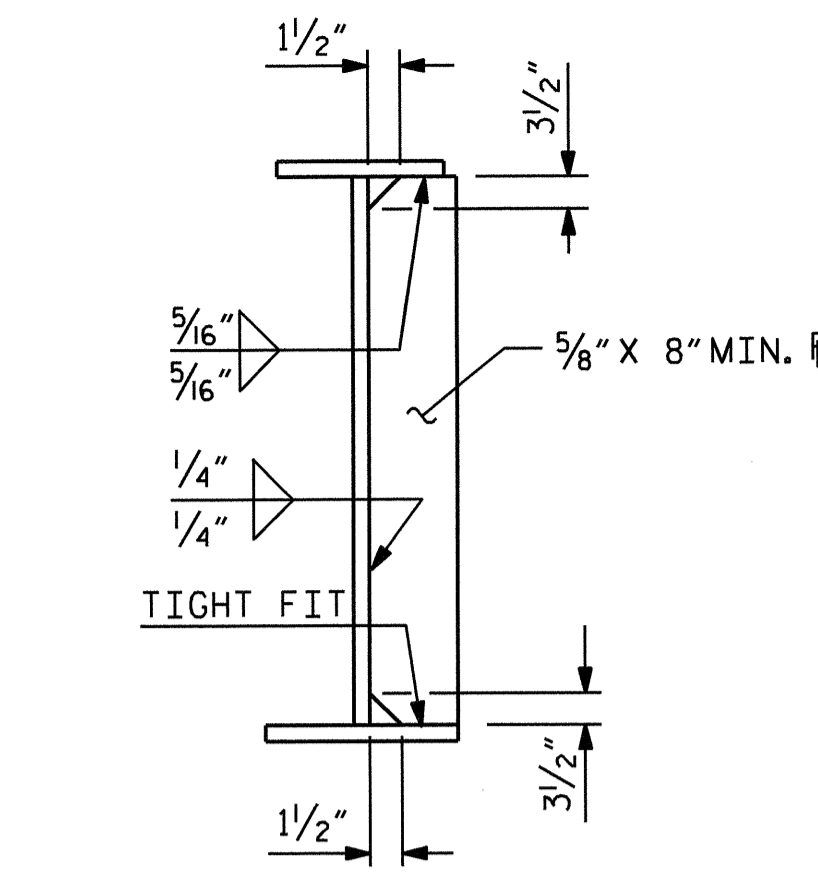


ON CHANNELS

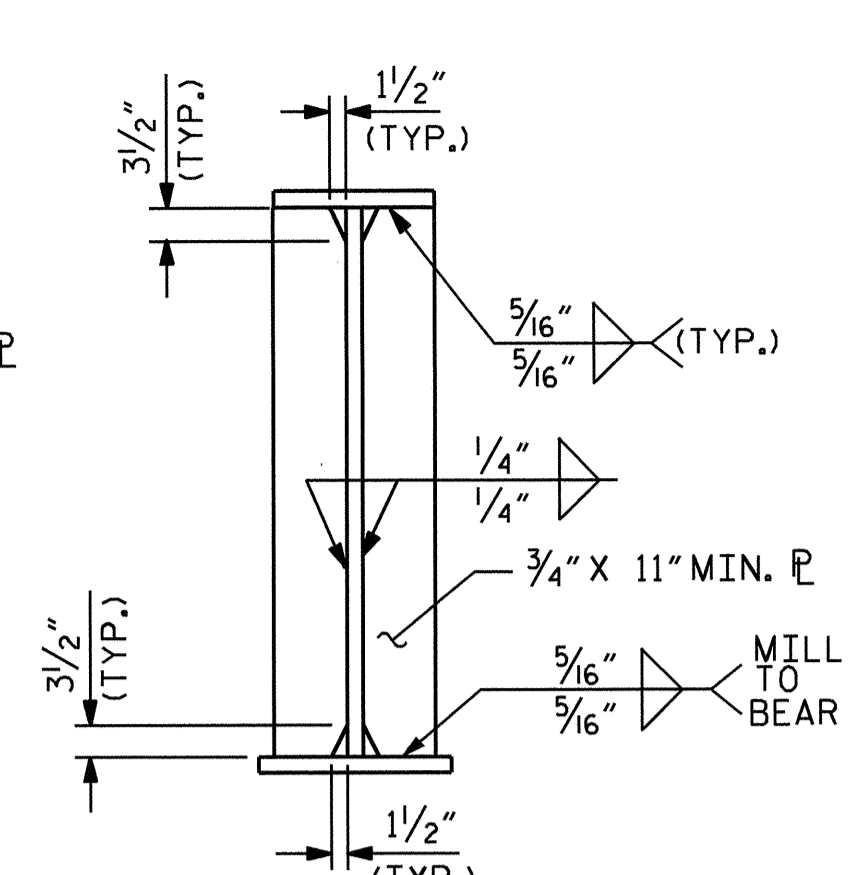
SHEAR STUD DETAILS



CONNECTOR PLATE DETAILS

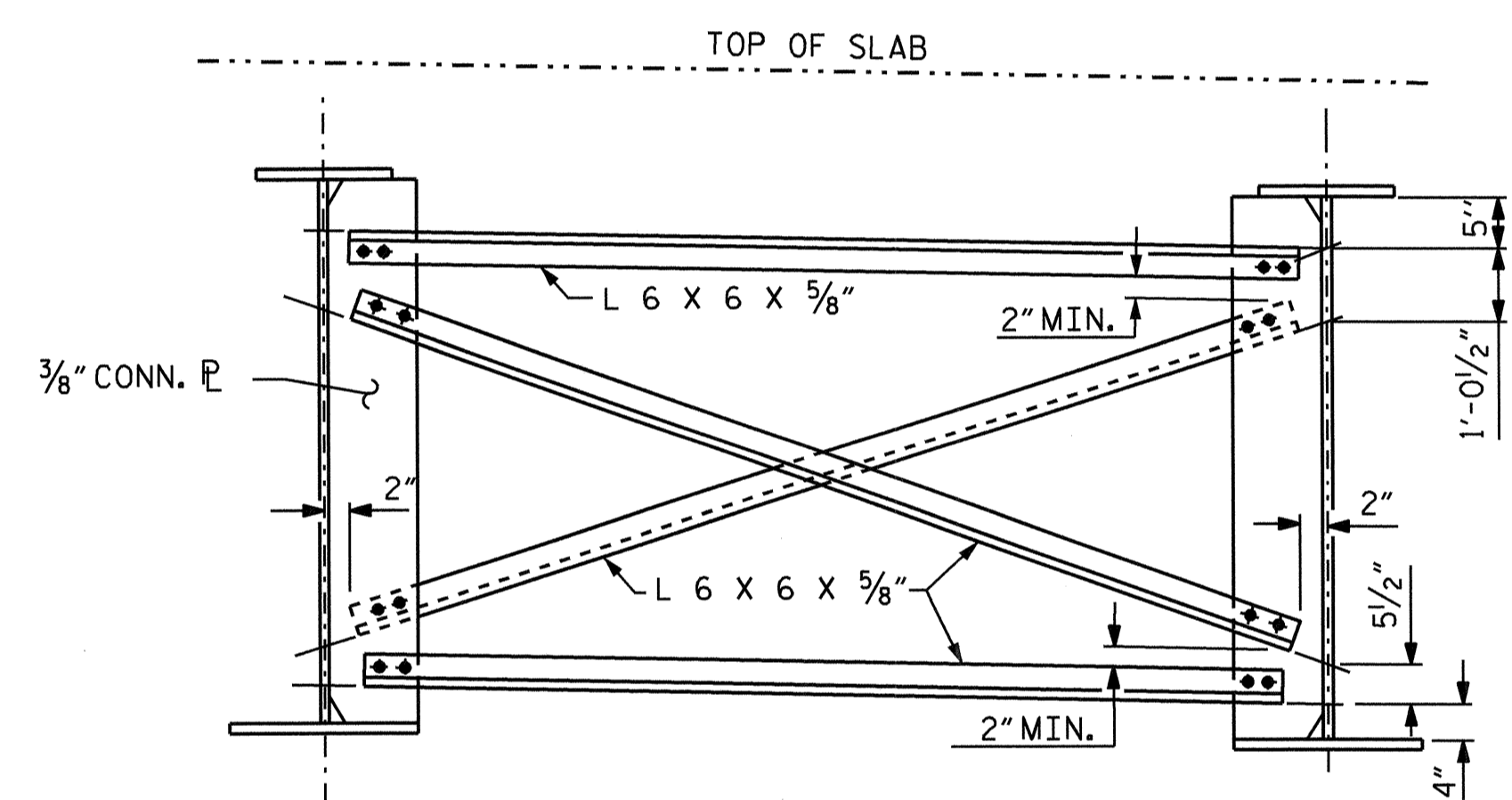


INTERMEDIATE STIFFENER PLATE DETAILS

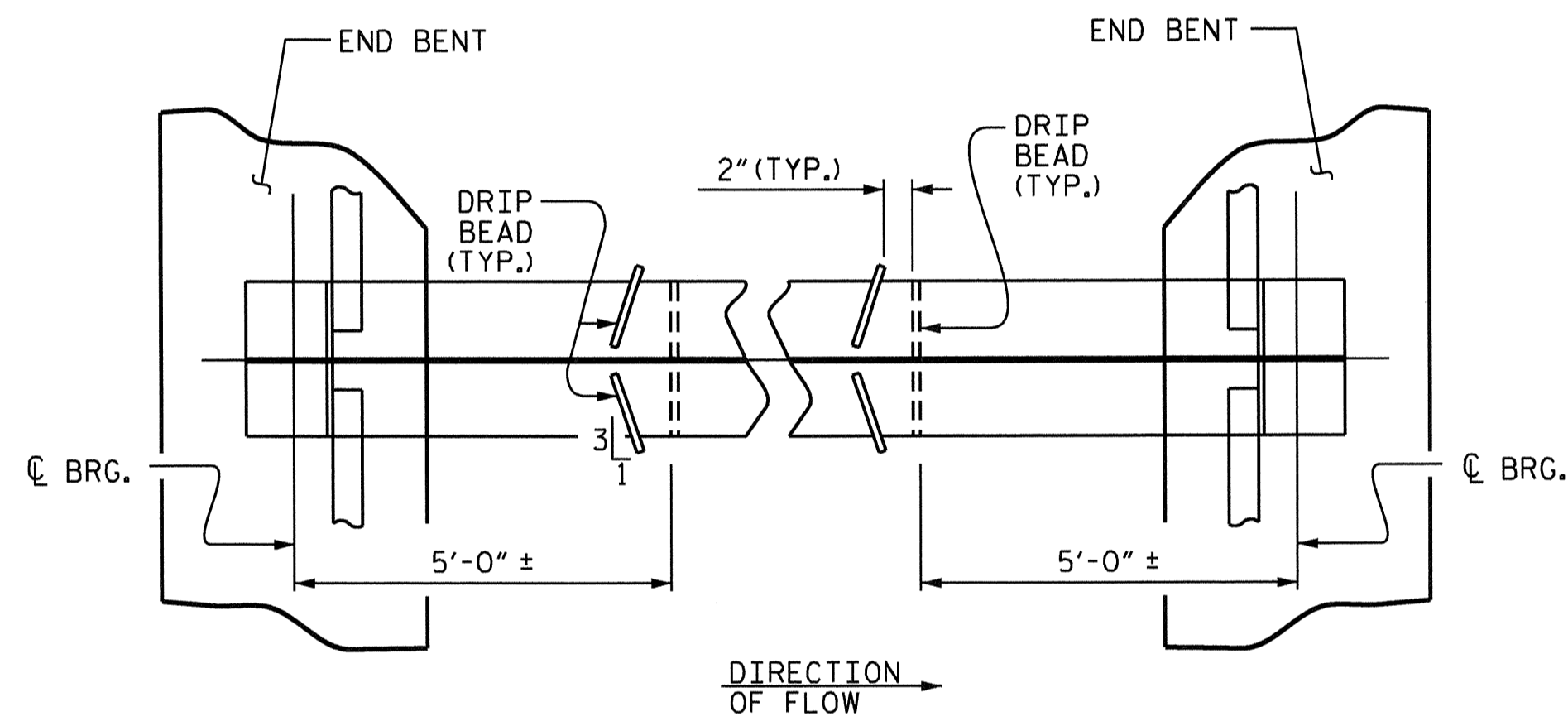


BEARING STIFFENER/CONNECTOR PLATE DETAILS

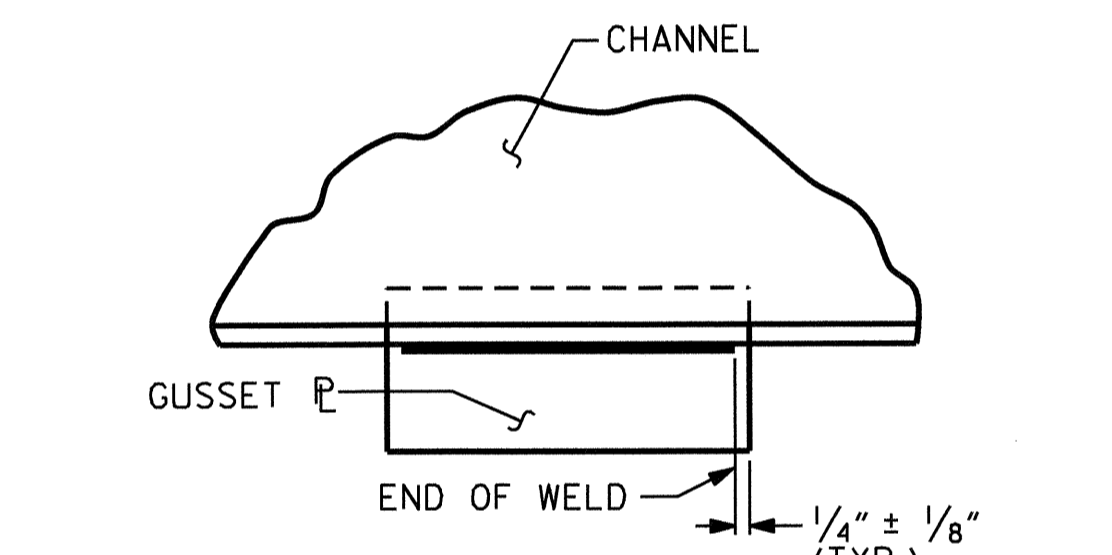
NOTE: THE BEARING STIFFENER SHALL BE WELDED TO THE BOTTOM FLANGE ONLY WHEN USED AS A CONNECTOR PLATE.



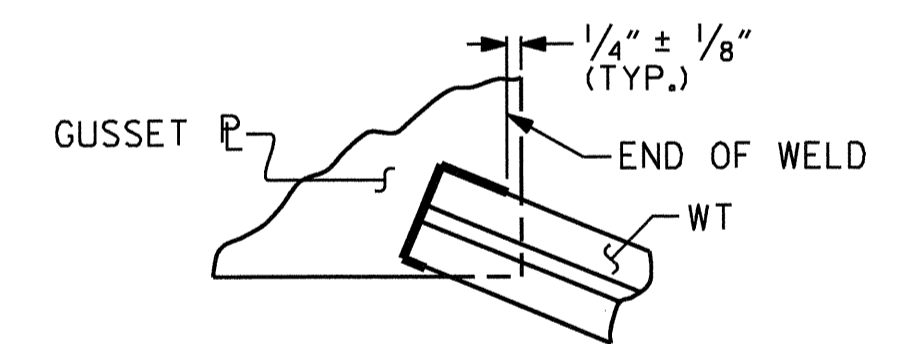
TYPICAL INTERMEDIATE CROSSFRAME



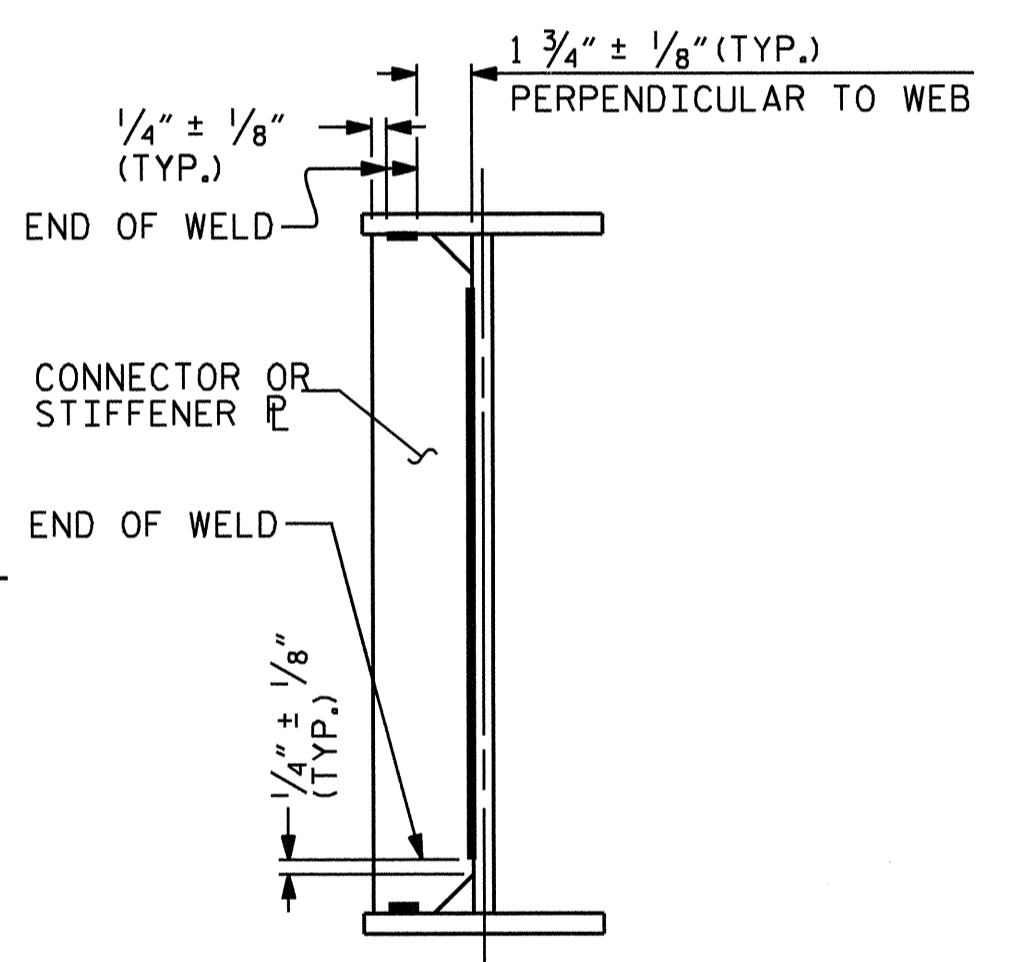
PART PLAN - BOTTOM FLANGE



TYPICAL GUSSET PLATE CONNECTION



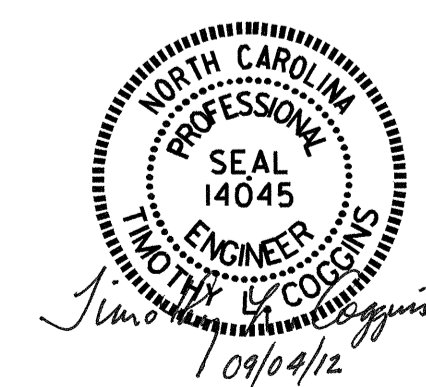
TYPICAL "TEE" TO GUSSET PLATE CONNECTION



TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS

WELD TERMINATION DETAILS

PROJECT NO. U-4444AB  
 CUMBERLAND COUNTY  
 STATION: 132+79.28 -L-  
 SHEET 3 OF 4



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 STRUCTURAL STEEL DETAILS

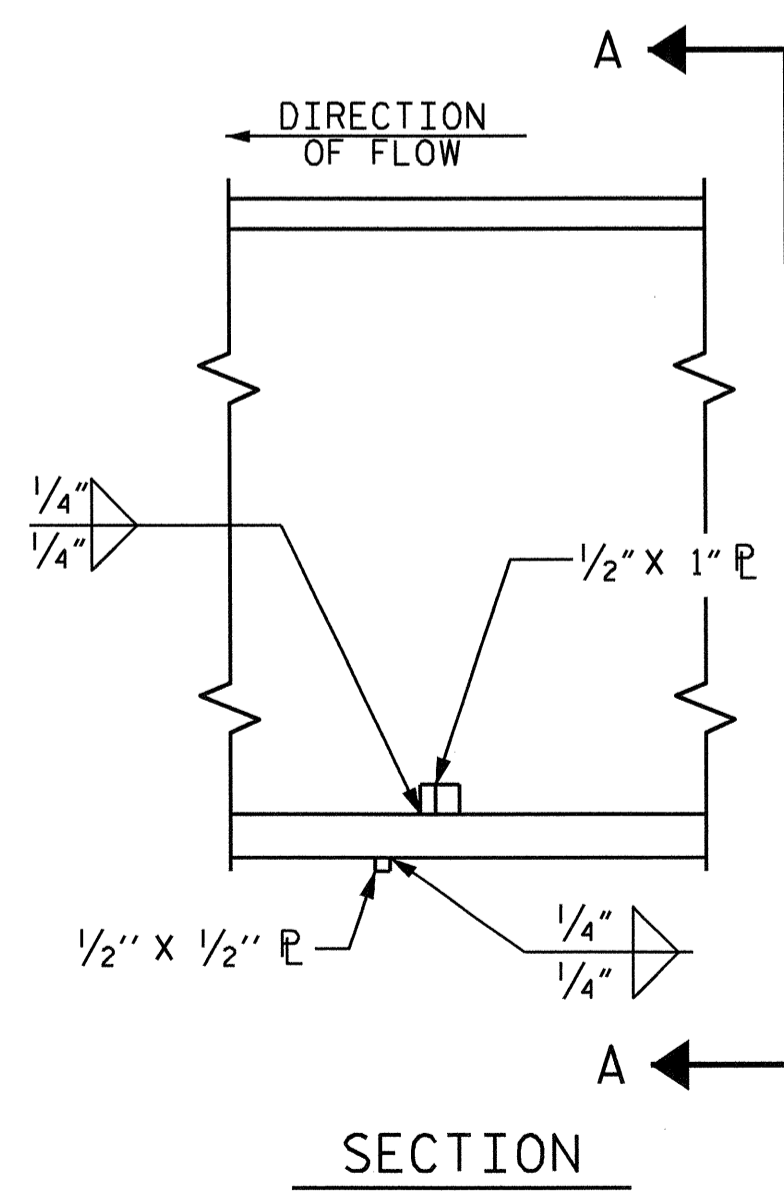
| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-11         |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |
| 2         |     |       | 4   |     |       | 29           |

STR. #1

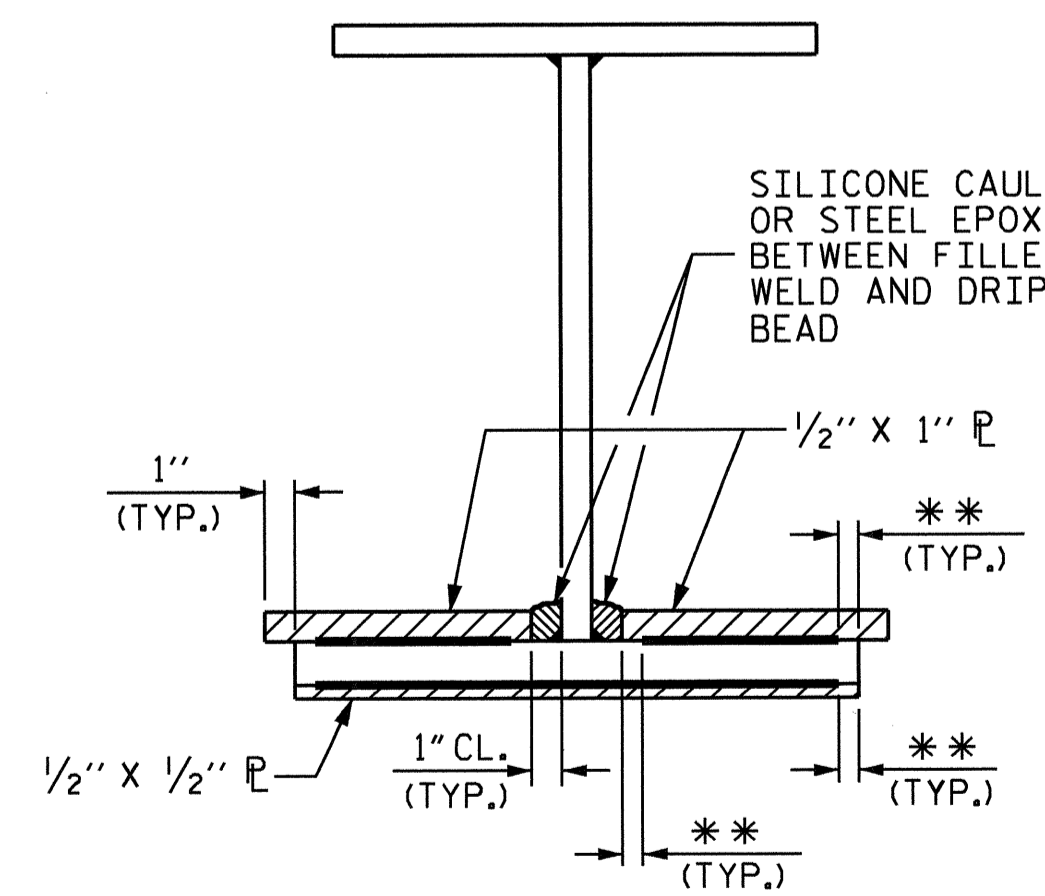
DRAWN BY: B.N. BARODAWALA DATE: 10-22-10  
 CHECKED BY: PEGGY PARISI DATE: 1-18-11

04-SEP-2012 09:18  
 R:\TIP\Projects-U\U4444AB\Structures\Plans\Str\1\Final Plans\U4444ab\_sd.ss.01.dgn  
 tcozzolino

DRIP BEAD DETAILS



SECTION



VIEW A-A

\*\* SEE "WELD TERMINATION DETAILS"

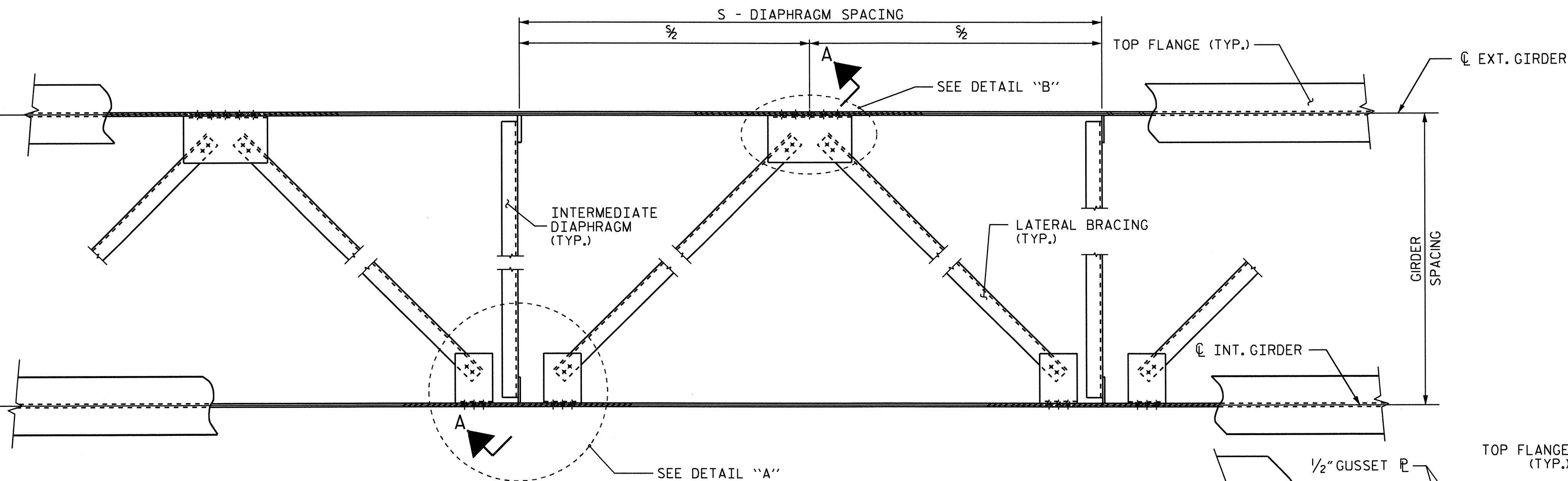
DEAD LOAD DEFLECTION TABLE FOR GIRDERS

| @ THIRTIETH POINTS BETWEEN C BEARINGS    | SPAN A          |                                  |                                  |                                 |                                  |       |                                  |                                  |                                  |                                   |                                  |                                    |                                   |                                  |                                  |                                  |                                  |                                  |                                   |                                    |                                  |                                   |                                  |                                  |                                  |       |                                  |                                 |                                  |                                  |       |
|--|-----------------|----------------------------------|----------------------------------|---------------------------------|----------------------------------|-------|----------------------------------|----------------------------------|----------------------------------|-----------------------------------|----------------------------------|------------------------------------|-----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|-----------------------------------|------------------------------------|----------------------------------|-----------------------------------|----------------------------------|----------------------------------|----------------------------------|-------|----------------------------------|---------------------------------|----------------------------------|----------------------------------|-------|
|  | GIRDER 1 THRU 8 |                                  |                                  |                                 |                                  |       |                                  |                                  |                                  |                                   |                                  |                                    |                                   |                                  |                                  |                                  |                                  |                                  |                                   |                                    |                                  |                                   |                                  |                                  |                                  |       |                                  |                                 |                                  |                                  |       |
|  | 0               | 0.033                            | 0.067                            | 0.100                           | 0.133                            | 0.167 | 0.200                            | 0.233                            | 0.267                            | 0.300                             | 0.333                            | 0.367                              | 0.400                             | 0.433                            | 0.467                            | 0.500                            | 0.533                            | 0.567                            | 0.600                             | 0.633                              | 0.667                            | 0.700                             | 0.733                            | 0.767                            | 0.800                            | 0.833 | 0.867                            | 0.900                           | 0.933                            | 0.967                            | 0     |
| DEFLECTION DUE TO WEIGHT OF GIRDER       | 0.000           | 0.038                            | 0.075                            | 0.111                           | 0.145                            | 0.175 | 0.203                            | 0.229                            | 0.252                            | 0.273                             | 0.290                            | 0.305                              | 0.317                             | 0.325                            | 0.330                            | 0.332                            | 0.330                            | 0.325                            | 0.317                             | 0.305                              | 0.290                            | 0.273                             | 0.252                            | 0.229                            | 0.203                            | 0.175 | 0.145                            | 0.111                           | 0.075                            | 0.038                            | 0.000 |
| DEFLECTION DUE TO WEIGHT OF SLAB *       | 0.000           | 0.053                            | 0.128                            | 0.199                           | 0.267                            | 0.328 | 0.383                            | 0.434                            | 0.480                            | 0.520                             | 0.555                            | 0.584                              | 0.607                             | 0.623                            | 0.633                            | 0.636                            | 0.633                            | 0.623                            | 0.607                             | 0.584                              | 0.555                            | 0.520                             | 0.480                            | 0.434                            | 0.383                            | 0.328 | 0.267                            | 0.199                           | 0.128                            | 0.053                            | 0.000 |
| DEFLECTION DUE TO WEIGHT OF BARRIER RAIL | 0.000           | 0.005                            | 0.011                            | 0.016                           | 0.020                            | 0.025 | 0.029                            | 0.033                            | 0.036                            | 0.039                             | 0.041                            | 0.043                              | 0.045                             | 0.046                            | 0.047                            | 0.047                            | 0.047                            | 0.046                            | 0.045                             | 0.043                              | 0.041                            | 0.039                             | 0.036                            | 0.033                            | 0.029                            | 0.025 | 0.020                            | 0.016                           | 0.011                            | 0.005                            | 0.000 |
| TOTAL DEAD LOAD DEFLECTION               | 0.000           | 0.097                            | 0.214                            | 0.326                           | 0.432                            | 0.528 | 0.615                            | 0.696                            | 0.768                            | 0.832                             | 0.886                            | 0.932                              | 0.968                             | 0.994                            | 1.010                            | 1.015                            | 1.010                            | 0.994                            | 0.968                             | 0.932                              | 0.886                            | 0.832                             | 0.768                            | 0.696                            | 0.615                            | 0.528 | 0.432                            | 0.326                           | 0.214                            | 0.097                            | 0.000 |
| VERTICAL CURVE ORDINATE                  | 0.000           | 0.167                            | 0.323                            | 0.468                           | 0.600                            | 0.721 | 0.831                            | 0.929                            | 1.016                            | 1.091                             | 1.154                            | 1.206                              | 1.247                             | 1.276                            | 1.293                            | 1.299                            | 1.293                            | 1.276                            | 1.247                             | 1.206                              | 1.154                            | 1.091                             | 1.016                            | 0.929                            | 0.831                            | 0.721 | 0.600                            | 0.468                           | 0.323                            | 0.167                            | 0.000 |
| REQUIRED CAMBER                          | 0               | 3 <sup>3</sup> / <sub>16</sub> " | 6 <sup>7</sup> / <sub>16</sub> " | 9 <sup>1</sup> / <sub>2</sub> " | 12 <sup>3</sup> / <sub>8</sub> " | 15"   | 17 <sup>3</sup> / <sub>8</sub> " | 19 <sup>1</sup> / <sub>2</sub> " | 21 <sup>3</sup> / <sub>8</sub> " | 23 <sup>1</sup> / <sub>16</sub> " | 24 <sup>1</sup> / <sub>2</sub> " | 25 <sup>11</sup> / <sub>16</sub> " | 26 <sup>9</sup> / <sub>16</sub> " | 27 <sup>1</sup> / <sub>4</sub> " | 27 <sup>5</sup> / <sub>8</sub> " | 27 <sup>3</sup> / <sub>4</sub> " | 27 <sup>5</sup> / <sub>8</sub> " | 27 <sup>1</sup> / <sub>4</sub> " | 26 <sup>9</sup> / <sub>16</sub> " | 25 <sup>11</sup> / <sub>16</sub> " | 24 <sup>1</sup> / <sub>2</sub> " | 23 <sup>1</sup> / <sub>16</sub> " | 21 <sup>3</sup> / <sub>8</sub> " | 19 <sup>1</sup> / <sub>2</sub> " | 17 <sup>3</sup> / <sub>8</sub> " | 15"   | 12 <sup>3</sup> / <sub>8</sub> " | 9 <sup>1</sup> / <sub>2</sub> " | 6 <sup>7</sup> / <sub>16</sub> " | 3 <sup>3</sup> / <sub>16</sub> " | 0     |

\* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS. ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

NOTES

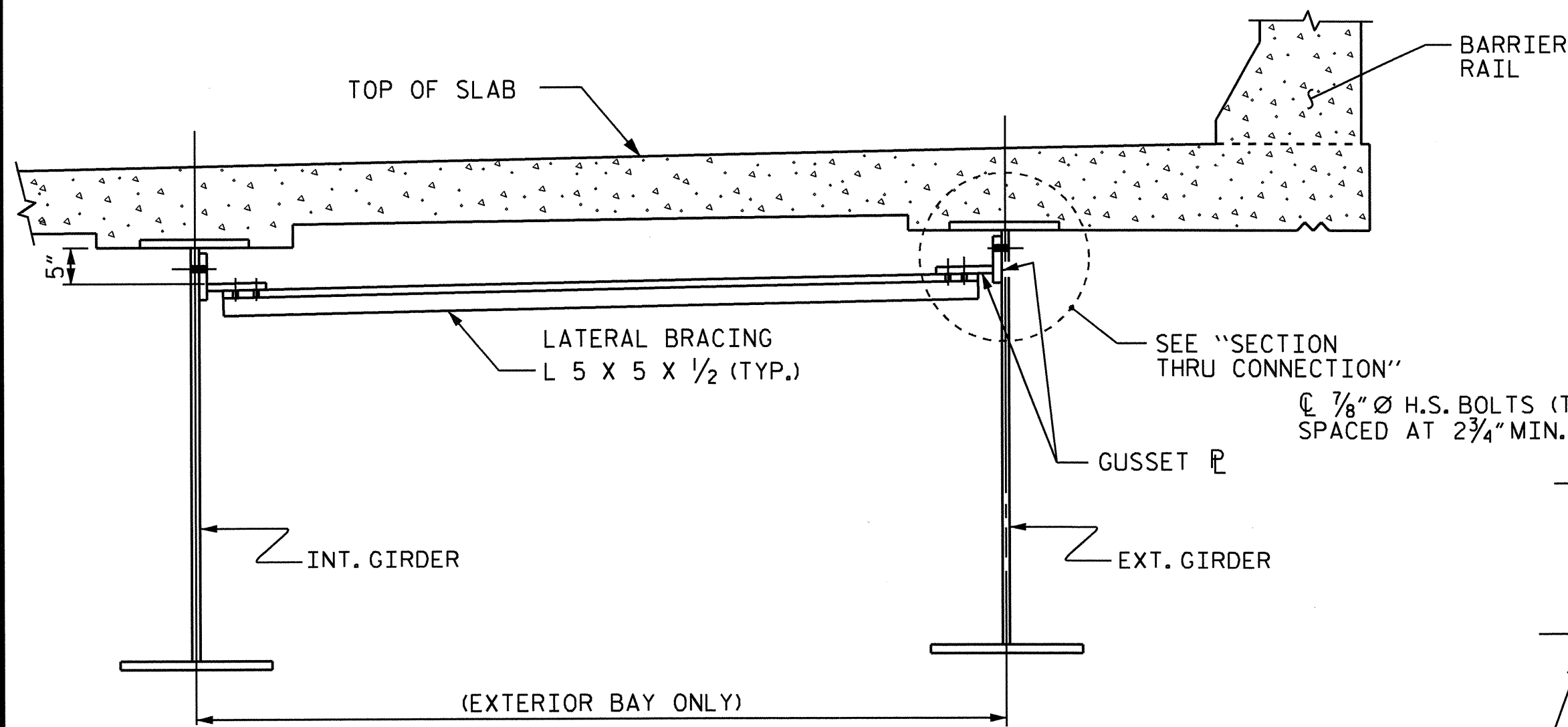
LATERAL BRACING ASSEMBLY SHALL COMPLY WITH SECTION 1072 OF THE STANDARD SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W OR APPROVED EQUAL. TENSION ON THE ASTM A325 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. ALL BOLTED CONNECTIONS SHALL BE 7/8" Ø HIGH STRENGTH BOLTS, UNLESS OTHERWISE SPECIFIED. THE CONTRACTOR HAS THE OPTION TO CLIP THE PROTRUDING CORNERS OF THE GUSSET PLATES, AT NO ADDITIONAL COST TO THE DEPARTMENT. BENT GUSSET PLATES OR ROLLED ANGLE SHAPES MAY BE SUBSTITUTED FOR THE WELDED GUSSET PLATES DETAILED IF APPROVED BY THE ENGINEER, AT NO ADDITIONAL COST TO THE DEPARTMENT. INSTALL THE LATERAL BRACING AFTER ERECTING THE EXTERIOR GIRDER AND THE ADJACENT INTERIOR GIRDER AND INSTALLING THE INTERMEDIATE DIAPHRAGMS.



PART PLAN - NEAR TOP FLANGE LATERAL BRACING

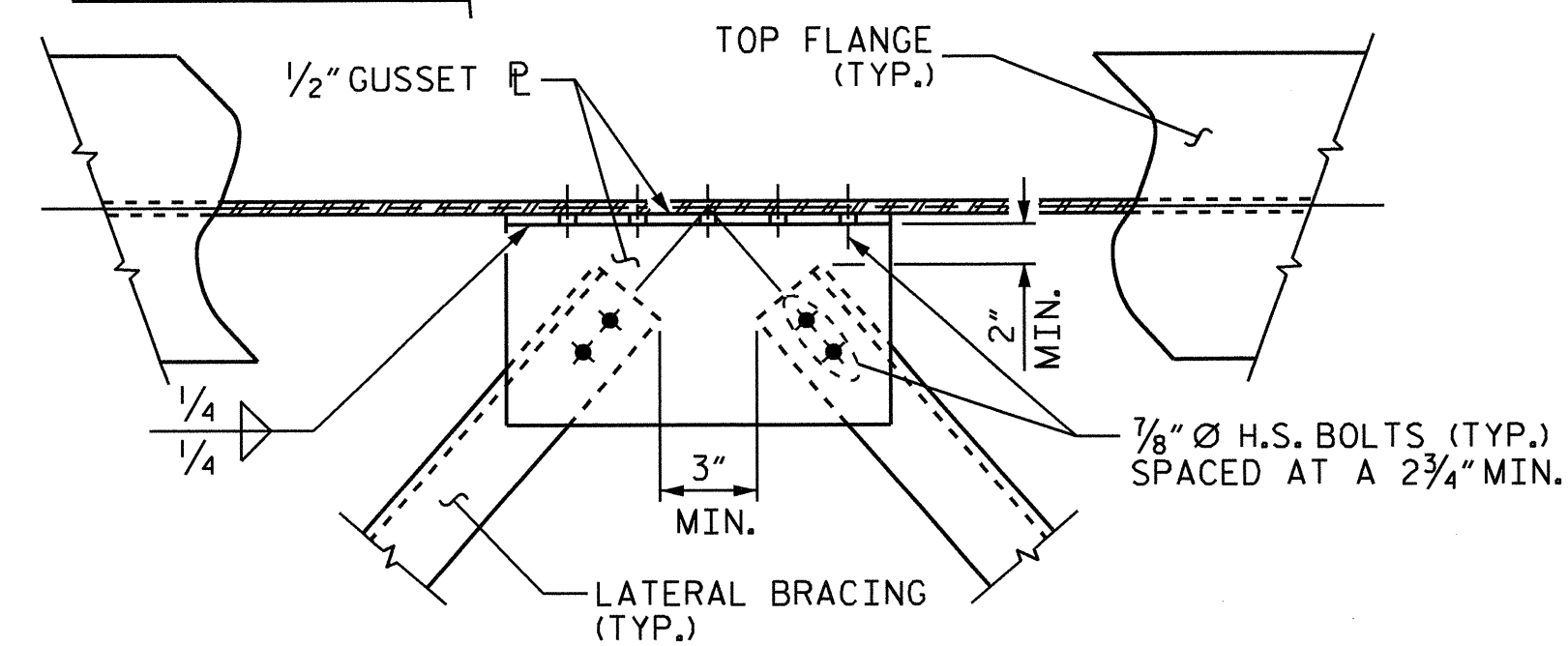
(THROUGHOUT EXTERIOR BAYS ONLY)

| MEMBER        | MAX UNBRACED LENGTH |
|---------------|---------------------|
| L 5 x 5 x 1/2 | 16'-3"              |



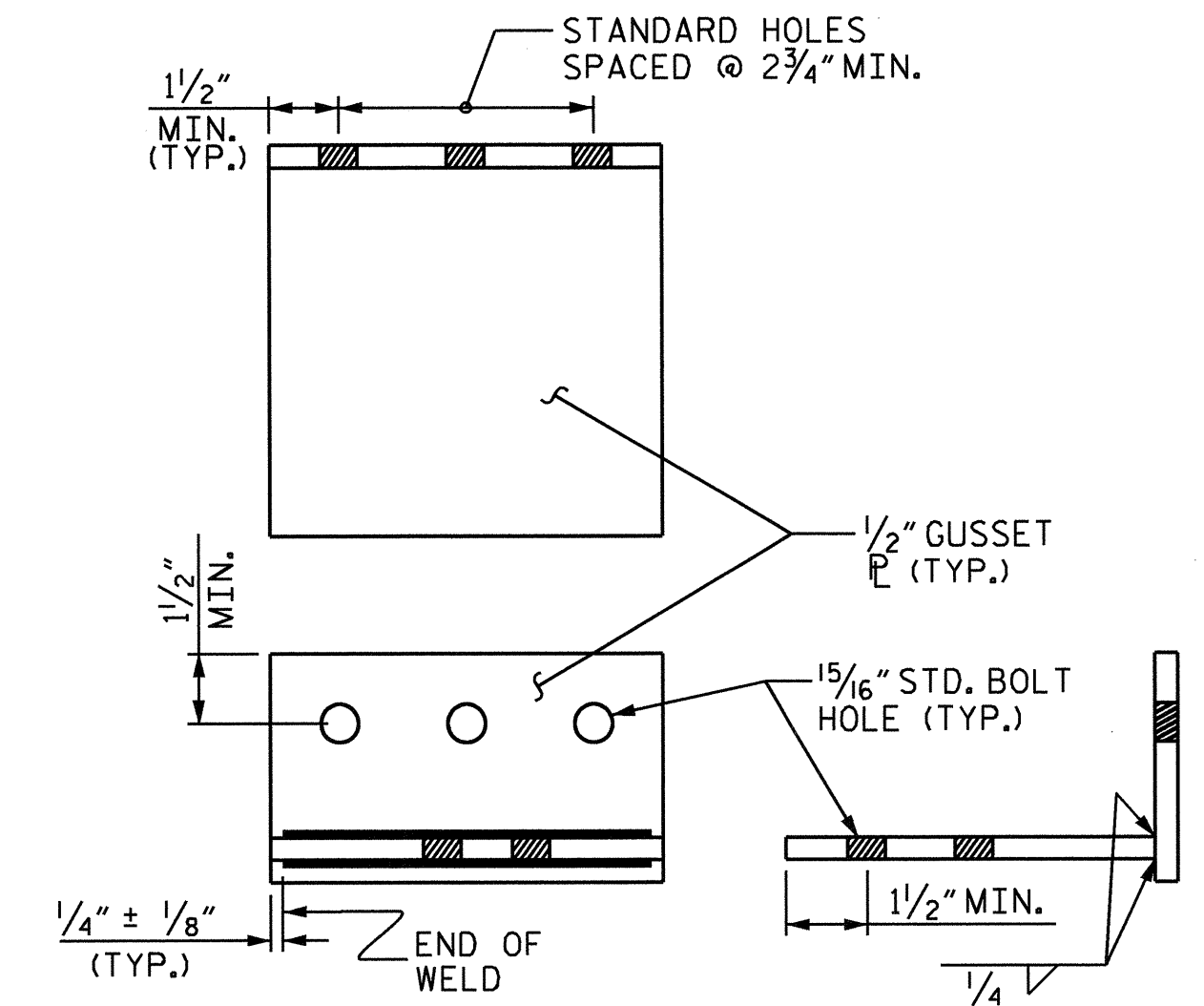
SECTION A-A

(EXTERIOR BAY ONLY)

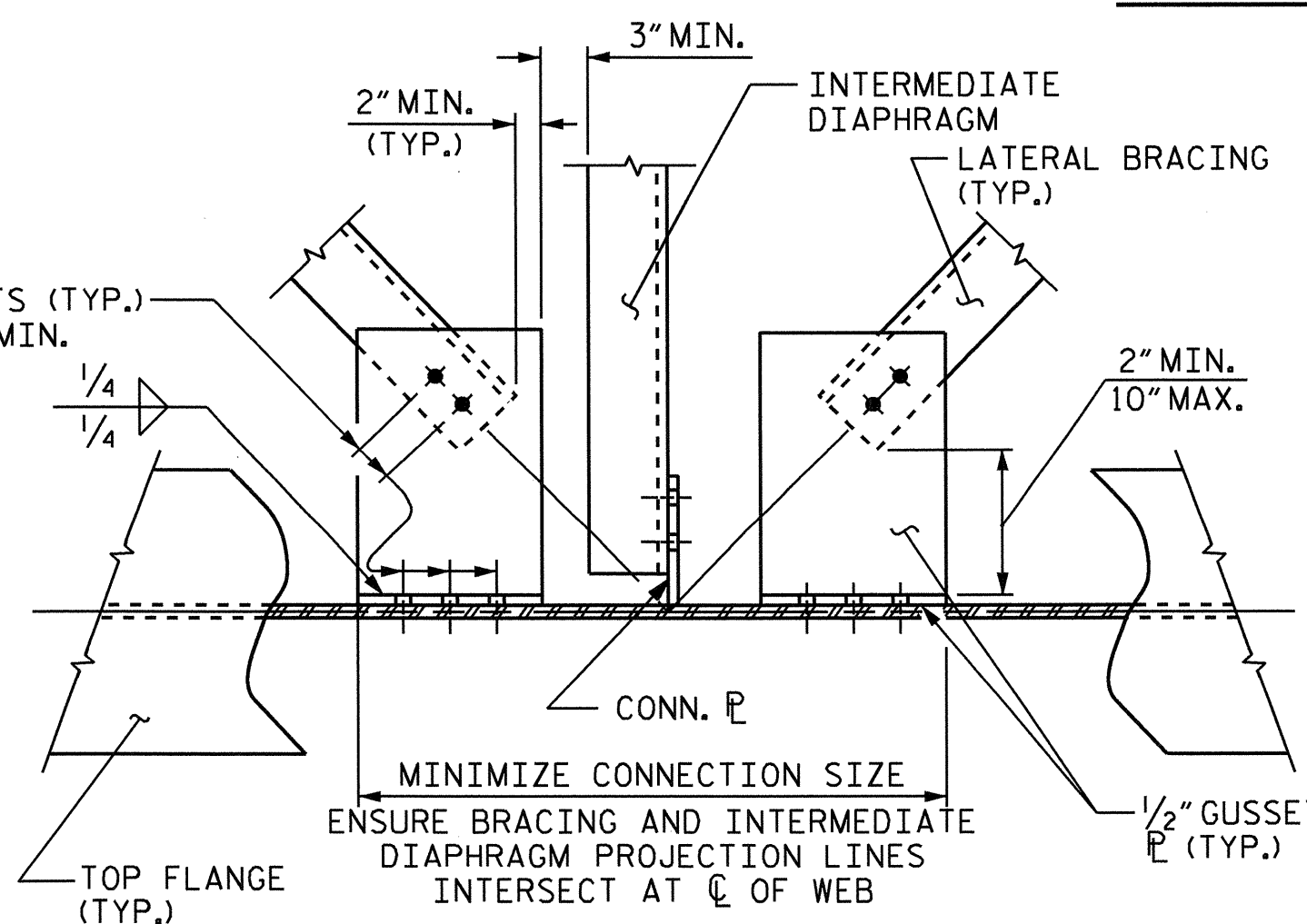


ENSURE BRACING PROJECTION LINES INTERSECT AT C OF WEB

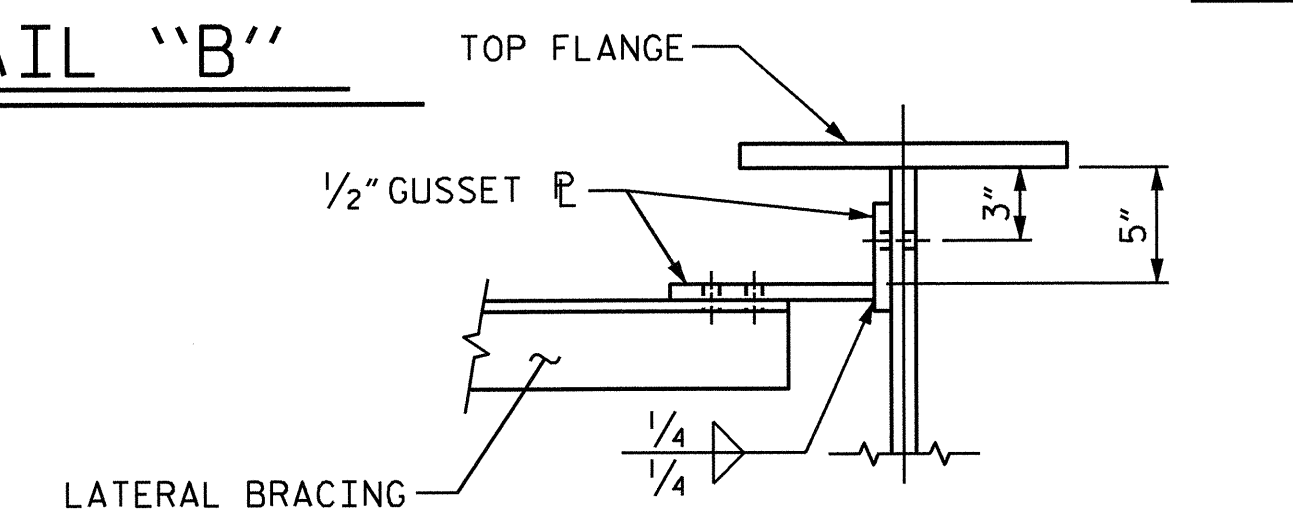
DETAIL "B"



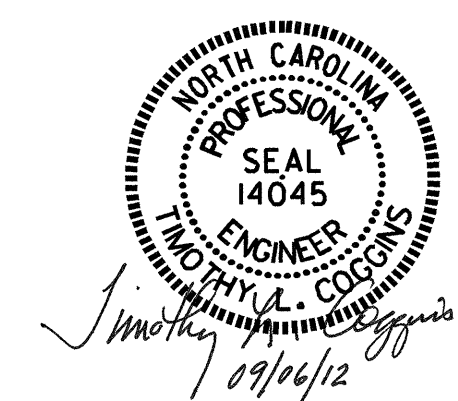
CONNECTION DETAIL



DETAIL "A"



SECTION THRU CONNECTION



PROJECT NO. U-4444AB  
 CUMBERLAND COUNTY  
 STATION: 132+79.28 -L-

SHEET 4 OF 4

| STATE OF NORTH CAROLINA<br>DEPARTMENT OF TRANSPORTATION<br>RALEIGH<br>STANDARD<br>LATERAL BRACING |     |       |     |     |       |
|---|-----|-------|-----|-----|-------|
| REVISIONS   |     |       |     |     |       |
| NO.   | BY: | DATE: | NO. | BY: | DATE: |
| 1   |     |       | 3   |     |       |
| 2   |     |       | 4   |     |       |

ASSEMBLED BY: B.N.BARODAWALA DATE: 10-28-10  
 CHECKED BY: PEGGY PARISI DATE: 1-18-11  
 DRAWN BY: WMC 6/11  
 CHECKED BY: GM 6/11

ADDED: 10/31/11  
 06-SEP-2012 14:12  
 R:\TIPProjects-U\U4444AB\Structures\Plans\Str\*1\Final Plans\U4444ab.sd.ss.01.dgn  
 tcoggins

STR. #1  
 STD. NO. LB1

**NOTES**

FOR POT BEARINGS, SEE SPECIAL PROVISIONS.

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

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

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

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

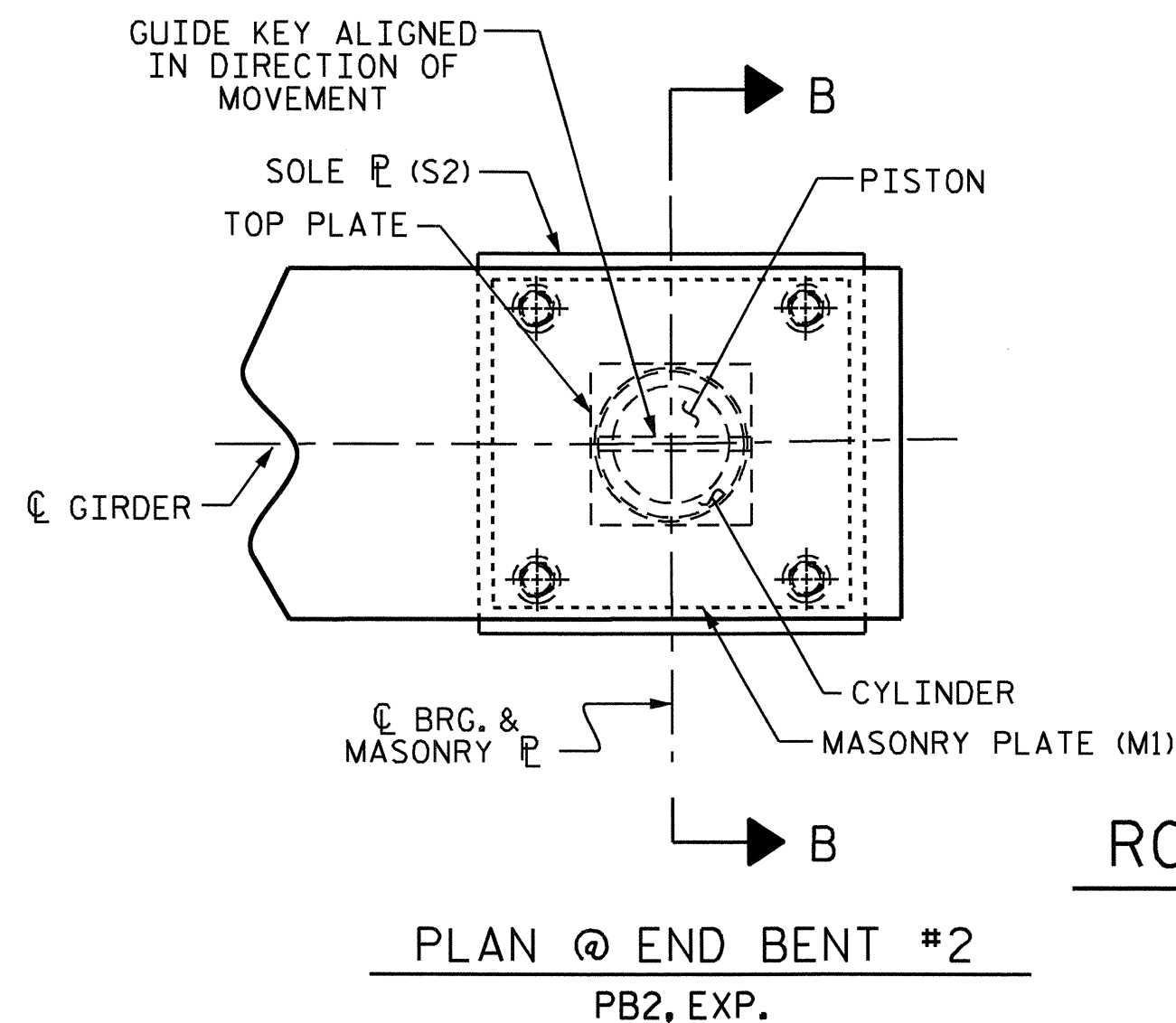
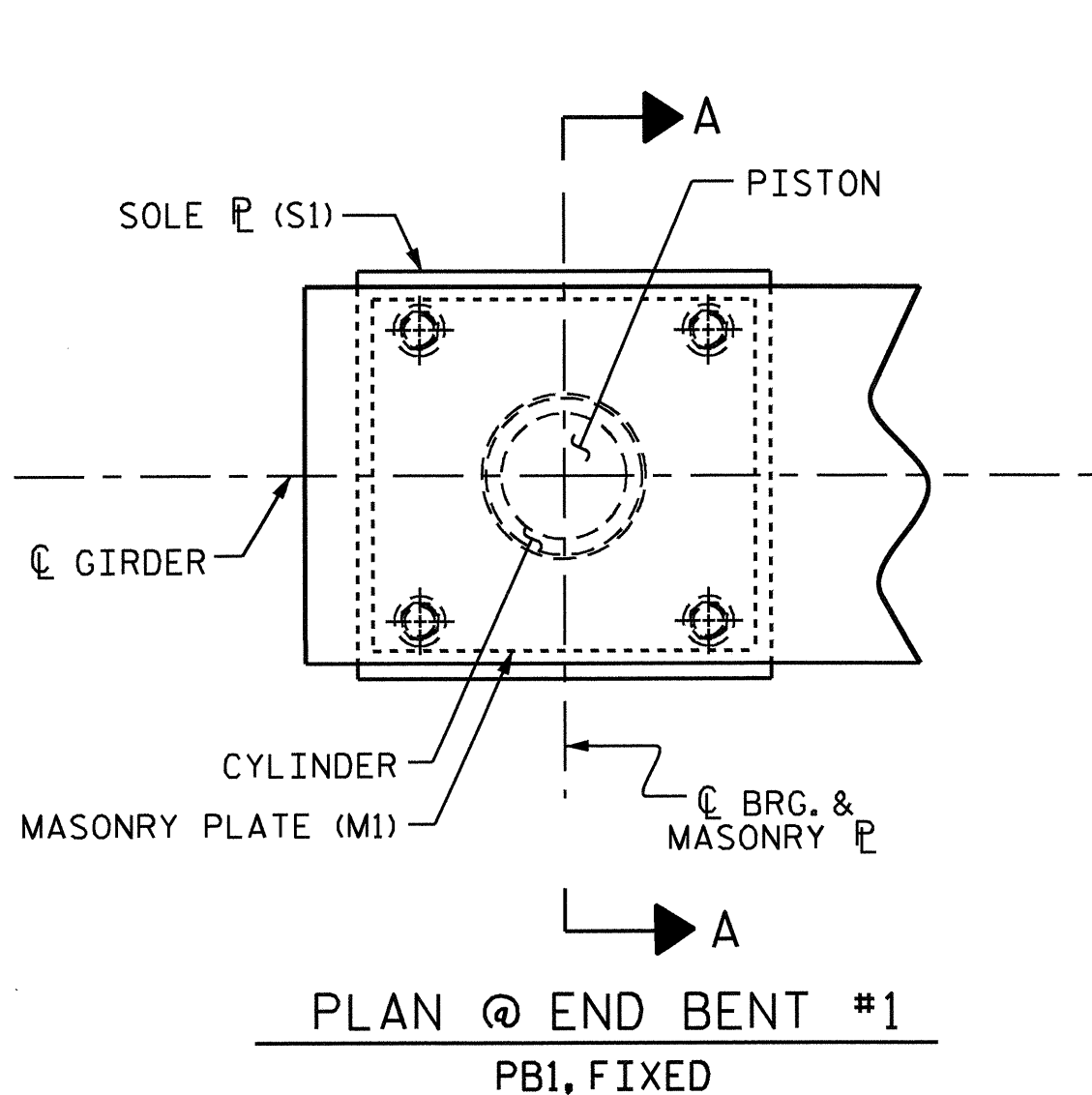
SOLE PLATES SHOULD BE WELDED TO BEAM FLANGES AND ANCHOR BOLTS SHOULD BE GROUTED BEFORE FALSEWORK IS PLACED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

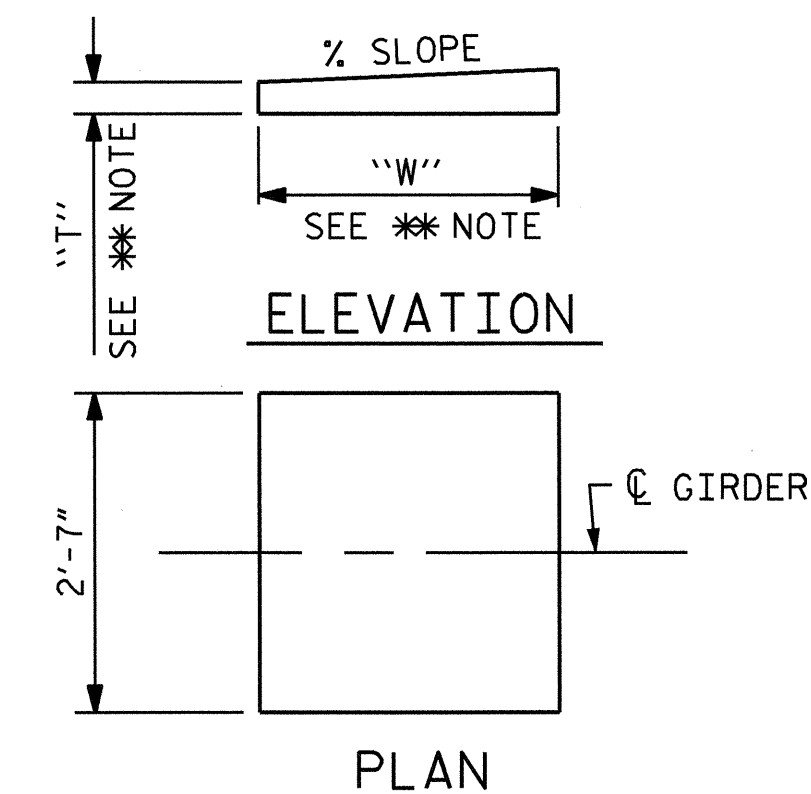
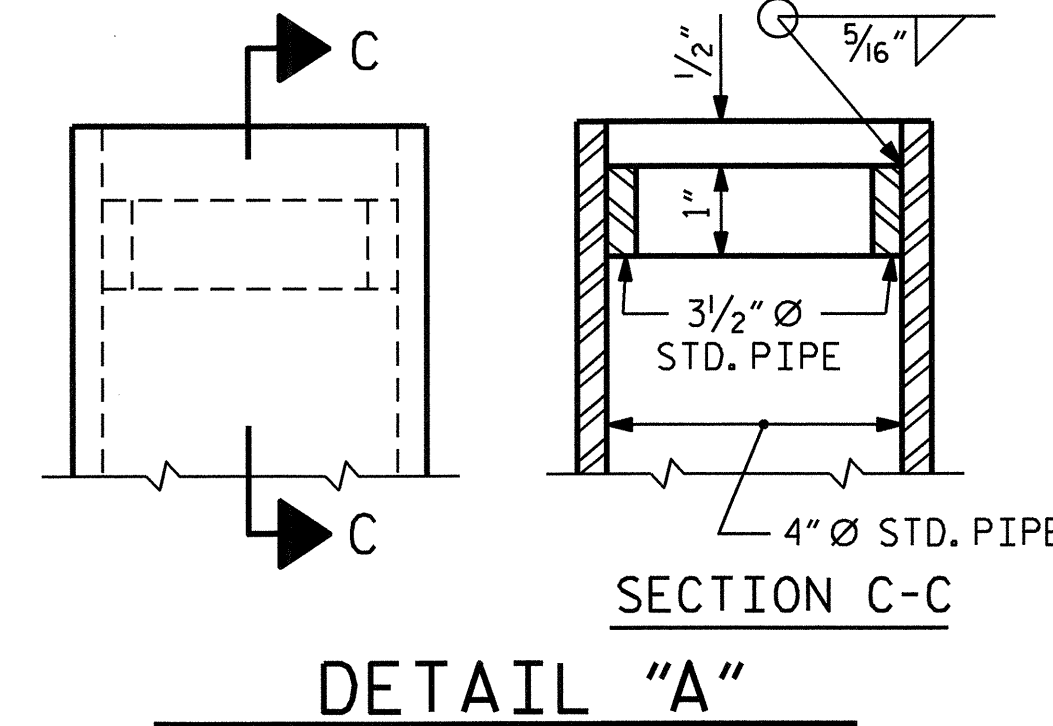
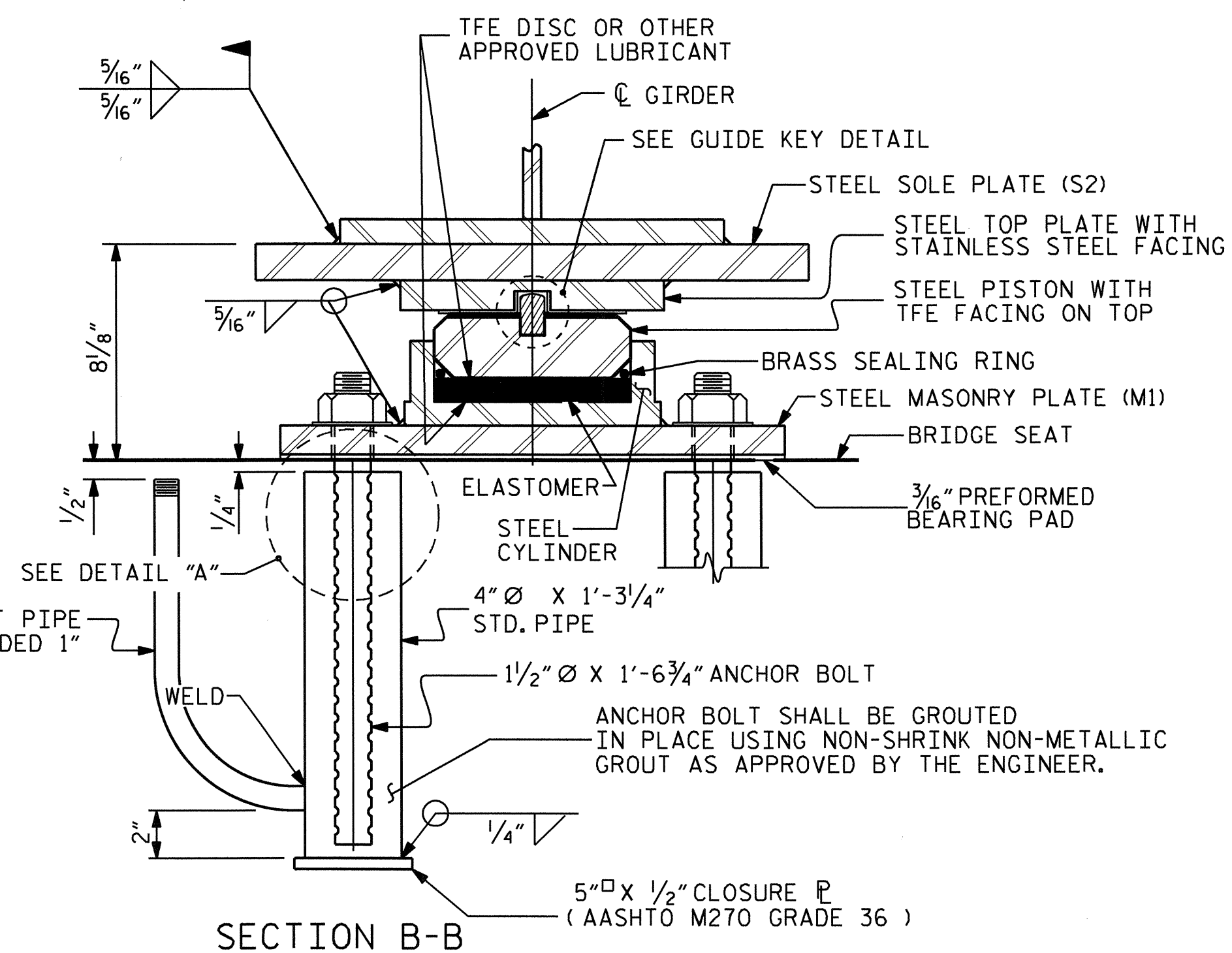
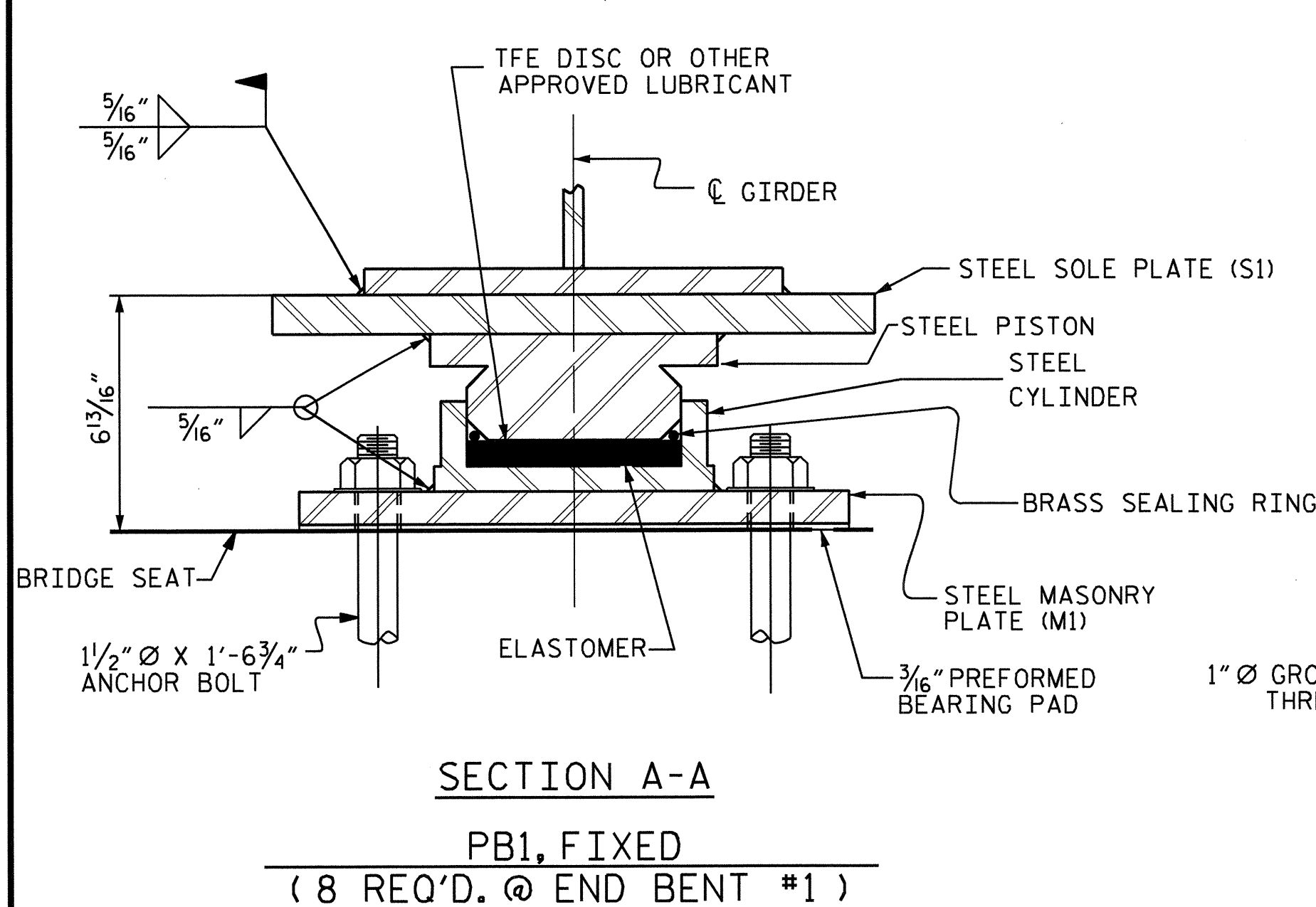
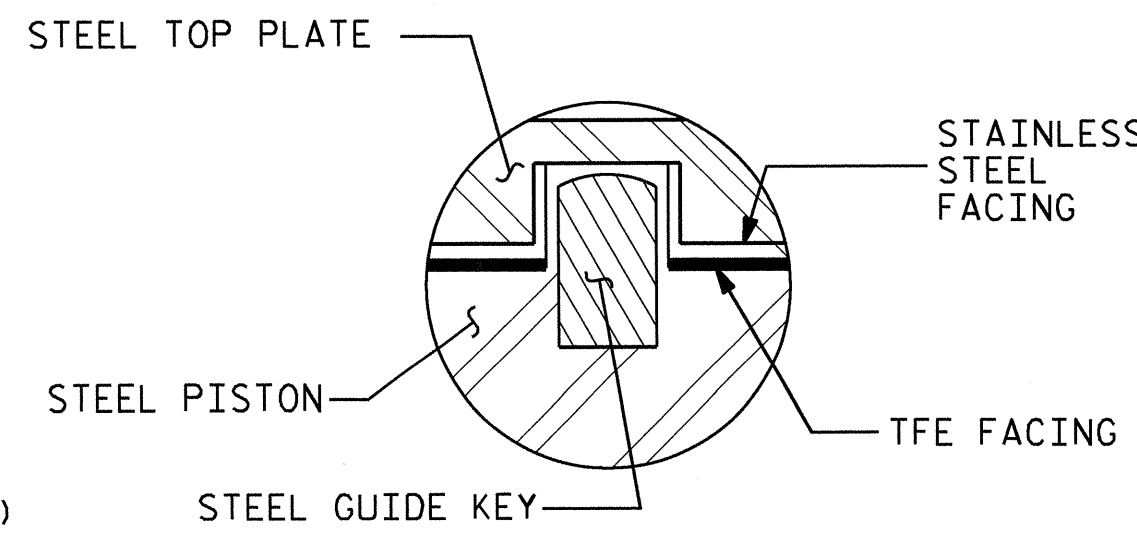
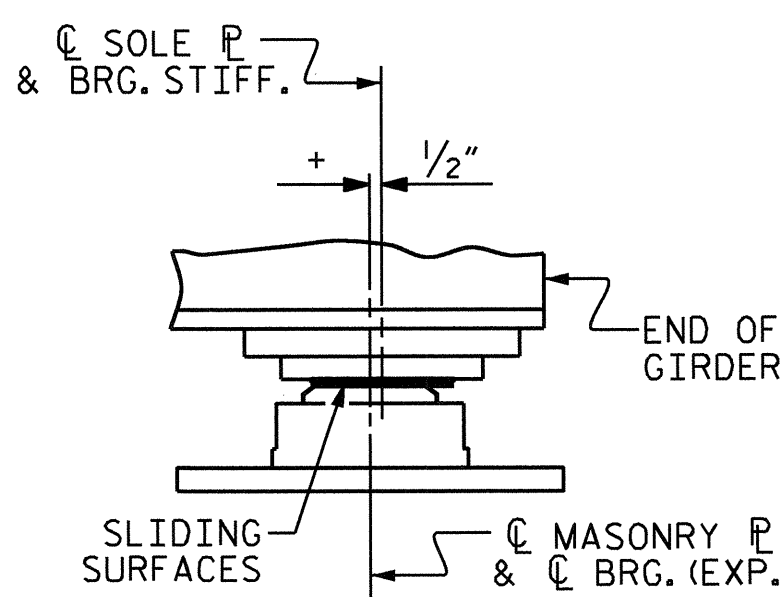
FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

THE CONTRACTOR MAY SUBSTITUTE DISC BEARINGS FOR THE POT BEARINGS SHOWN. FOR OPTIONAL DISC BEARINGS, SEE SPECIAL PROVISIONS.

THE CONTRACTOR SHALL ADJUST THE GIRDER BUILDUPS AS NECESSARY TO INCORPORATE A MAXIMUM PERMISSIBLE VARIATION IN POT BEARING DEPTH OF 1/2", SEE SPECIAL PROVISION FOR POT BEARINGS.



**END BENT #2  
TEMPERATURE AND  
ROTATION SETTING DETAILS**  
(TEMPERATURE SETTING FOR 90° IS SHOWN)



\*\* NOTE: DIMENSIONS "W" AND "T" ARE TO BE DETERMINED BY THE MANUFACTURER.

| SOLE PLATE INFORMATION |             |     |         |
|------------------------|-------------|-----|---------|
| MARK                   | LOCATION    | No. | % SLOPE |
| S1                     | END BENT #1 | 8   | 2.52    |
| S2                     | END BENT #2 | 8   | -2.33   |

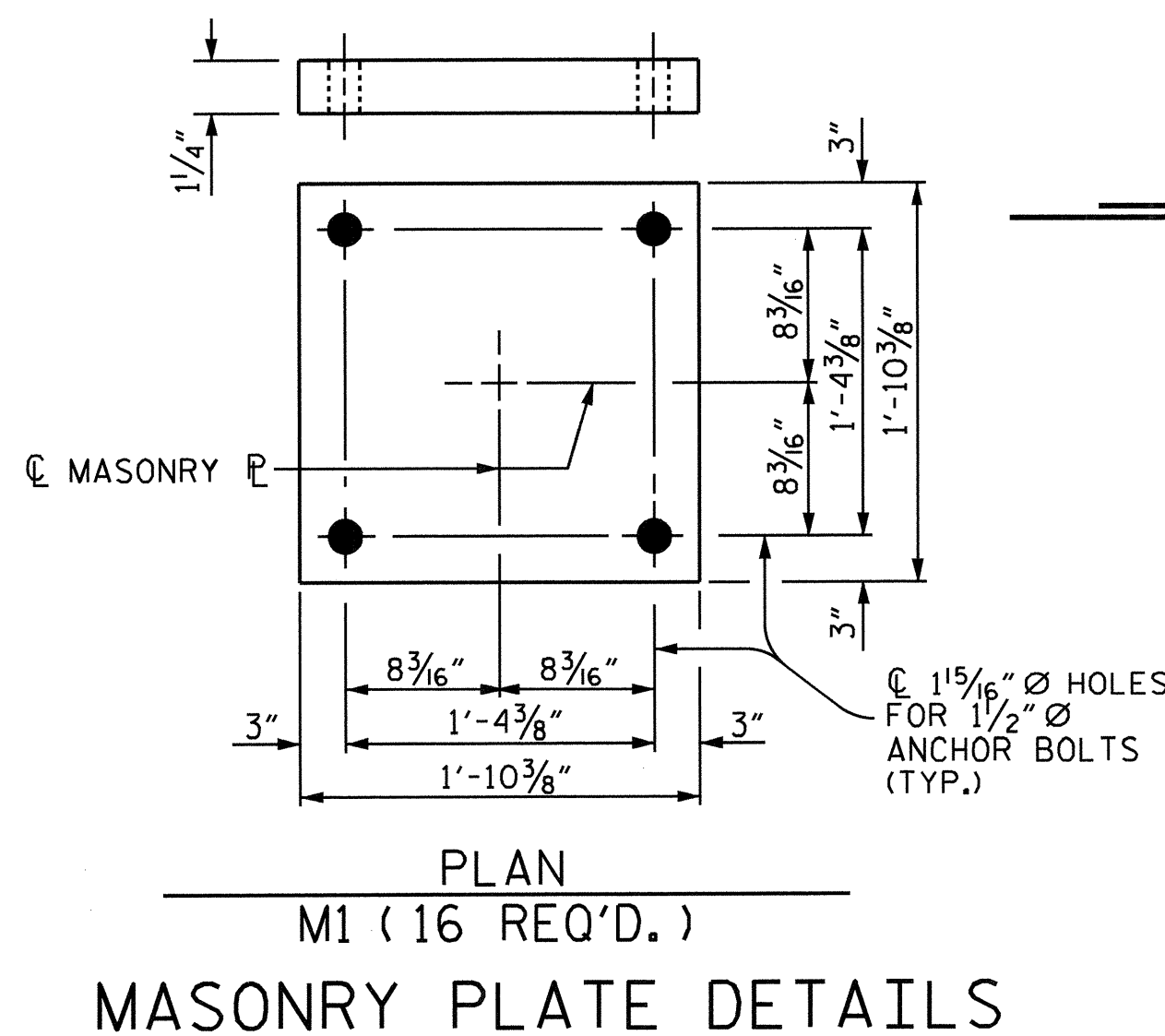
| TABLE FOR PLATE SETTING DATA<br>(EXPANSION POT BEARINGS) |        |       |       |          |
|--|--------|-------|-------|----------|
| TEMPERATURE AT TIME OF SETTING                           | 45° F  | 60° F | 90° F | *        |
| END BENT #2  | - 1/2" | 0     | 1/2"  | -1 3/16" |

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

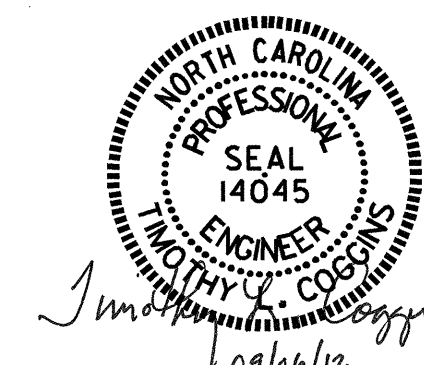
**TEMPERATURE SETTING DETAIL**

| TABLE FOR LOADS AND MOVEMENT |             |                                 |      |       |       |                              |                         |
|------------------------------|-------------|---------------------------------|------|-------|-------|------------------------------|-------------------------|
| BEARING                      | LOCATION    | UNFACTORED VERTICAL LOAD (KIPS) |      |       |       | FACTORED LATERAL LOAD (KIPS) | TOTAL MOVEMENT (INCHES) |
|                              |             | DC                              | DW   | LIVE  |       |                              |                         |
|                              |             |                                 |      | LL    | IM    |                              |                         |
| PB1 (FIXED)                  | END BENT #1 | 225.8                           | 28.9 | 149.7 | 404.4 | 84.2                         | -                       |
| PB2 (EXP.)                   | END BENT #2 | 225.8                           | 28.9 | 149.7 | 404.4 | 84.2                         | 2 3/16"                 |

**POT BEARING DETAILS**



ASSEMBLED BY : B.N.BARODAWALA DATE : 10-21-10  
 CHECKED BY : PEGGY PARISI DATE : 1-18-11  
 DRAWN BY : RWW 8/99 REV. 5/7/03 RWW/JTE  
 CHECKED BY : LES 8/99 REV. 5/1/06R TLA/GM  
 REV. 10/1/11 MAA/GM

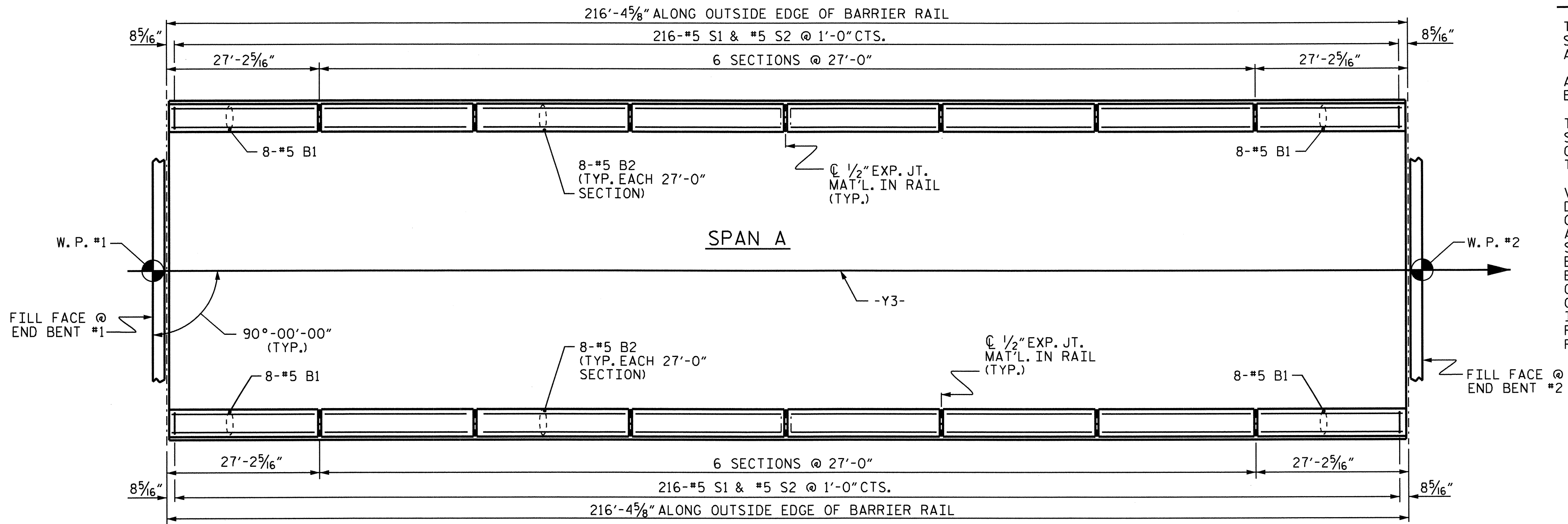


PROJECT NO. U-4444AB  
 CUMBERLAND COUNTY  
 STATION: 132+79.28 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 POT BEARING  
 DETAILS

| REVISIONS |     |       |     |     |       | SHEET NO.       |
|-----------|-----|-------|-----|-----|-------|-----------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-13            |
| 1         |     |       | 3   |     |       | TOTAL SHEETS 29 |
| 2         |     |       | 4   |     |       |                 |

STR. #1 STD. NO. PB1



**PLAN OF BARRIER RAIL**

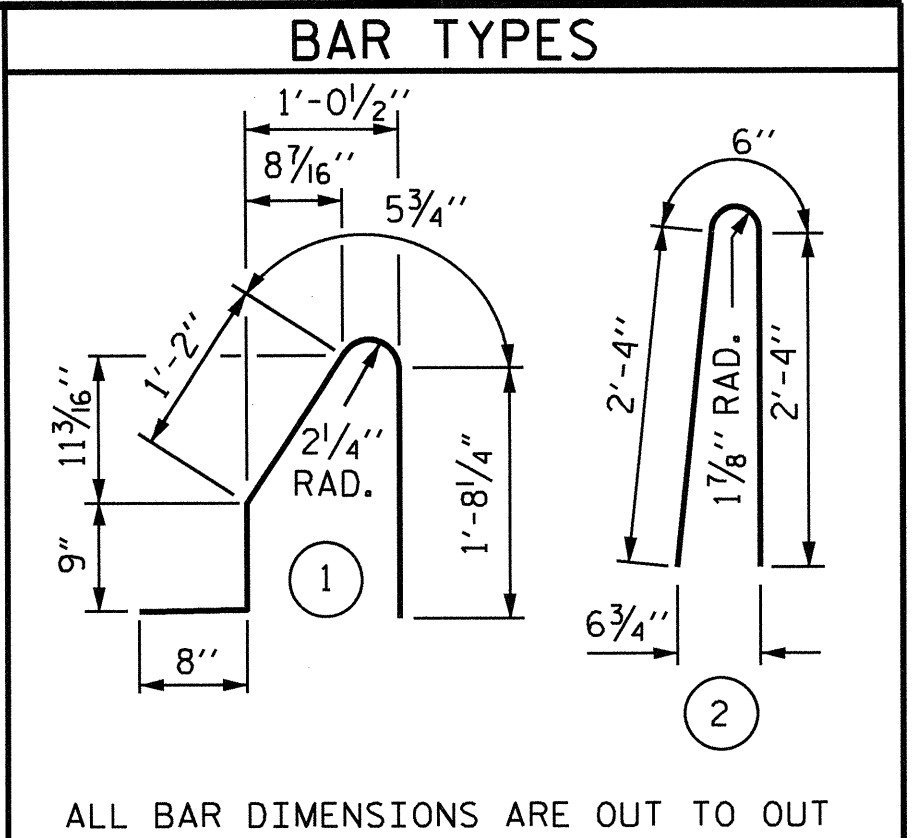
**NOTES**

THE BARRIER RAIL SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

THE #5 S1 AND #5 S2 BARS MAY BE SHIFTED SLIGHTLY IN ORDER TO MAINTAIN A 2" MINIMUM CLEARANCE TO 1/2" EXPANSION JOINT MATERIAL IN THE BARRIER RAIL.

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

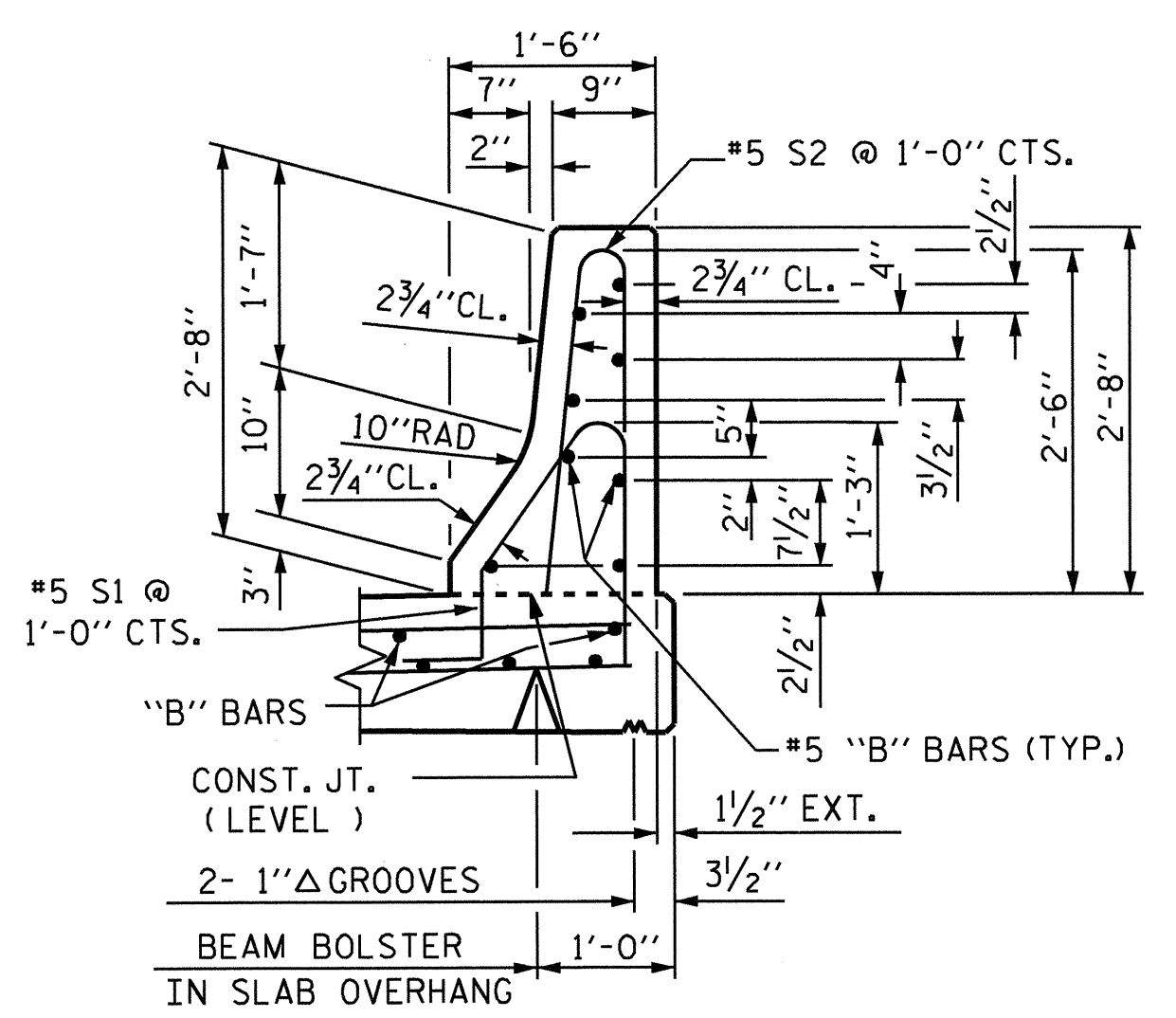


**BAR TYPES**

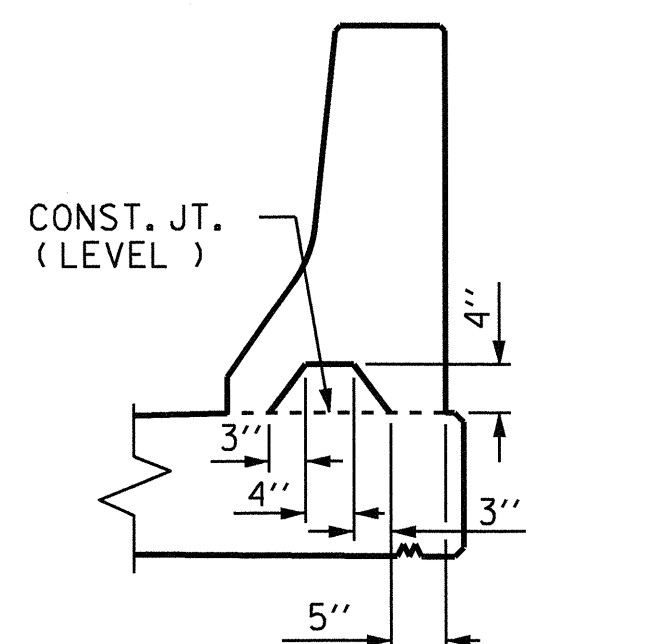
ALL BAR DIMENSIONS ARE OUT TO OUT

| BILL OF MATERIAL                 |      |        |                 |               |  |
|----------------------------------|------|--------|-----------------|---------------|--|
| FOR CONCRETE BARRIER RAIL ONLY   |      |        |                 |               |  |
| BAR NO.                          | SIZE | TYPE   | LENGTH          | WEIGHT        |  |
| * B1                             | 32   | #5 STR | 26'-9"          | 893           |  |
| * B2                             | 96   | #5 STR | 26'-7"          | 2662          |  |
| * S1                             | 432  | #5 1   | 4'-9"           | 2140          |  |
| * S2                             | 432  | #5 2   | 5'-2"           | 2328          |  |
| * EPOXY COATED REINFORCING STEEL |      |        |                 | 8023 LBS.     |  |
| CLASS AA CONCRETE                |      |        |                 | 43.4 CU. YDS. |  |
| CONCRETE BARRIER RAIL            |      |        |                 |               |  |
| SUPERSTRUCTURE                   |      |        | 432.77 LIN. FT. |               |  |
| ● APPROACH SLABS                 |      |        | 40.00 LIN. FT.  |               |  |
| TOTAL                            |      |        | 472.77 LIN. FT. |               |  |

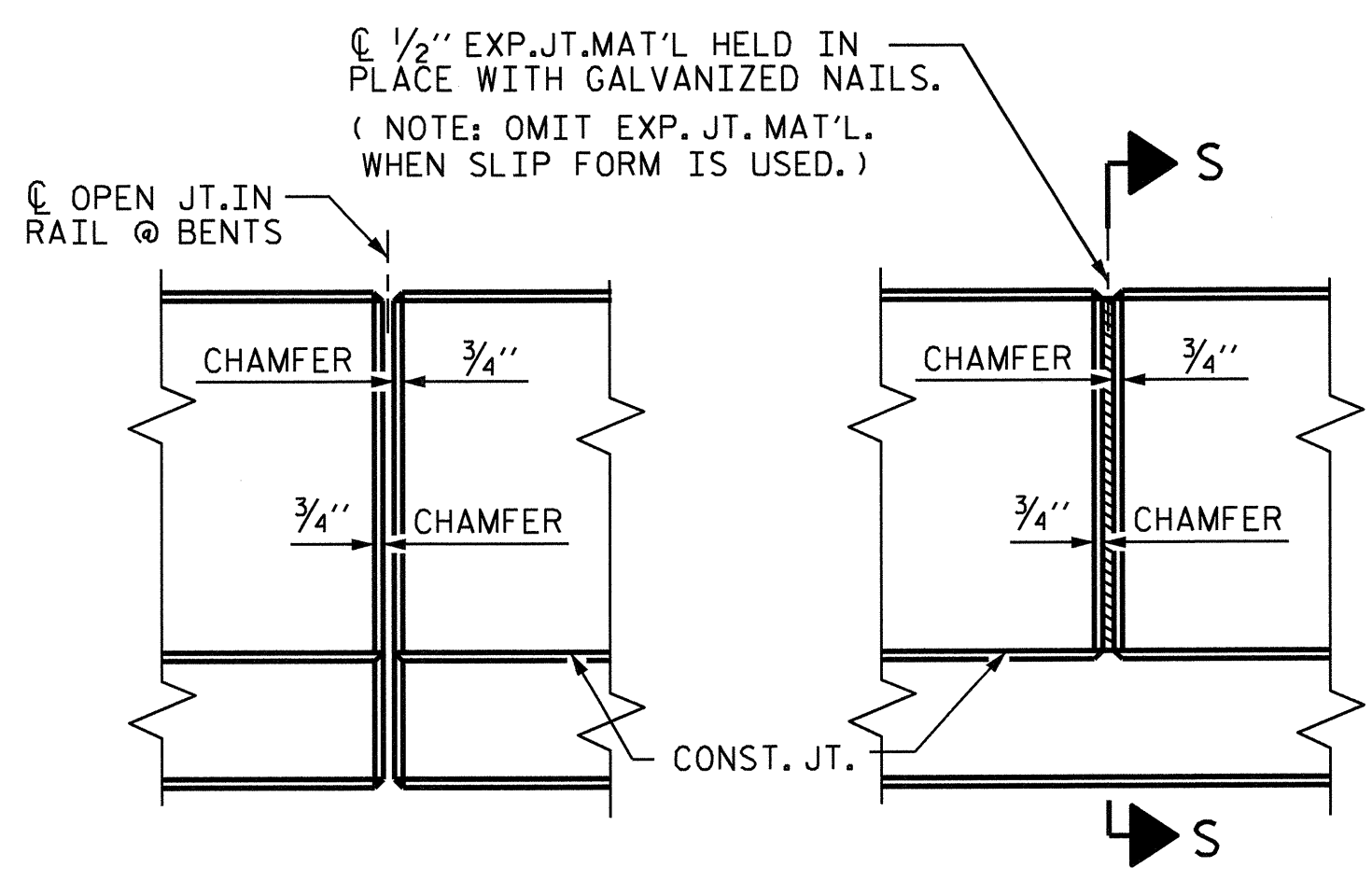
FOR EPOXY COATED REINFORCING STEEL AND CLASS AA CONCRETE IN THE BARRIER RAIL ON THE APPROACH SLABS, SEE "BRIDGE APPROACH SLAB DETAILS" SHEET.



**SECTION THRU RAIL**



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



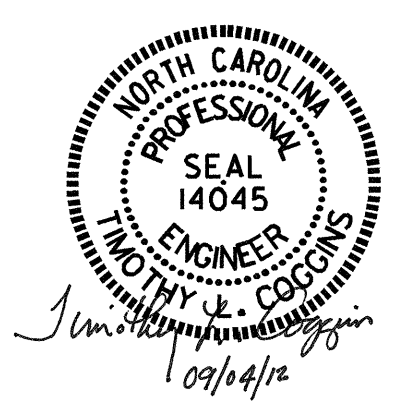
**ELEVATION AT EXPANSION JOINTS**

**BARRIER RAIL DETAILS**

PROJECT NO. U-4444AB  
CUMBERLAND COUNTY  
 STATION: 132+79.28 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 CONCRETE  
 BARRIER RAIL



|                                |                      |
|--------------------------------|----------------------|
| ASSEMBLED BY : B.N. BARODAWALA | DATE : 10-19-10      |
| CHECKED BY : PEGGY PARISI      | DATE : 1-18-11       |
| DRAWN BY : ARB 5/87            | REV. 5/7/03R RWW/JTE |
| CHECKED BY : SJD 9/87          | REV. 5/1/06R TLA/GM  |
|                                | REV. 10/1/11 MAA/GM  |

| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-14         |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |
| 2         |     |       | 4   |     |       | 29           |



NOTES

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

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.)

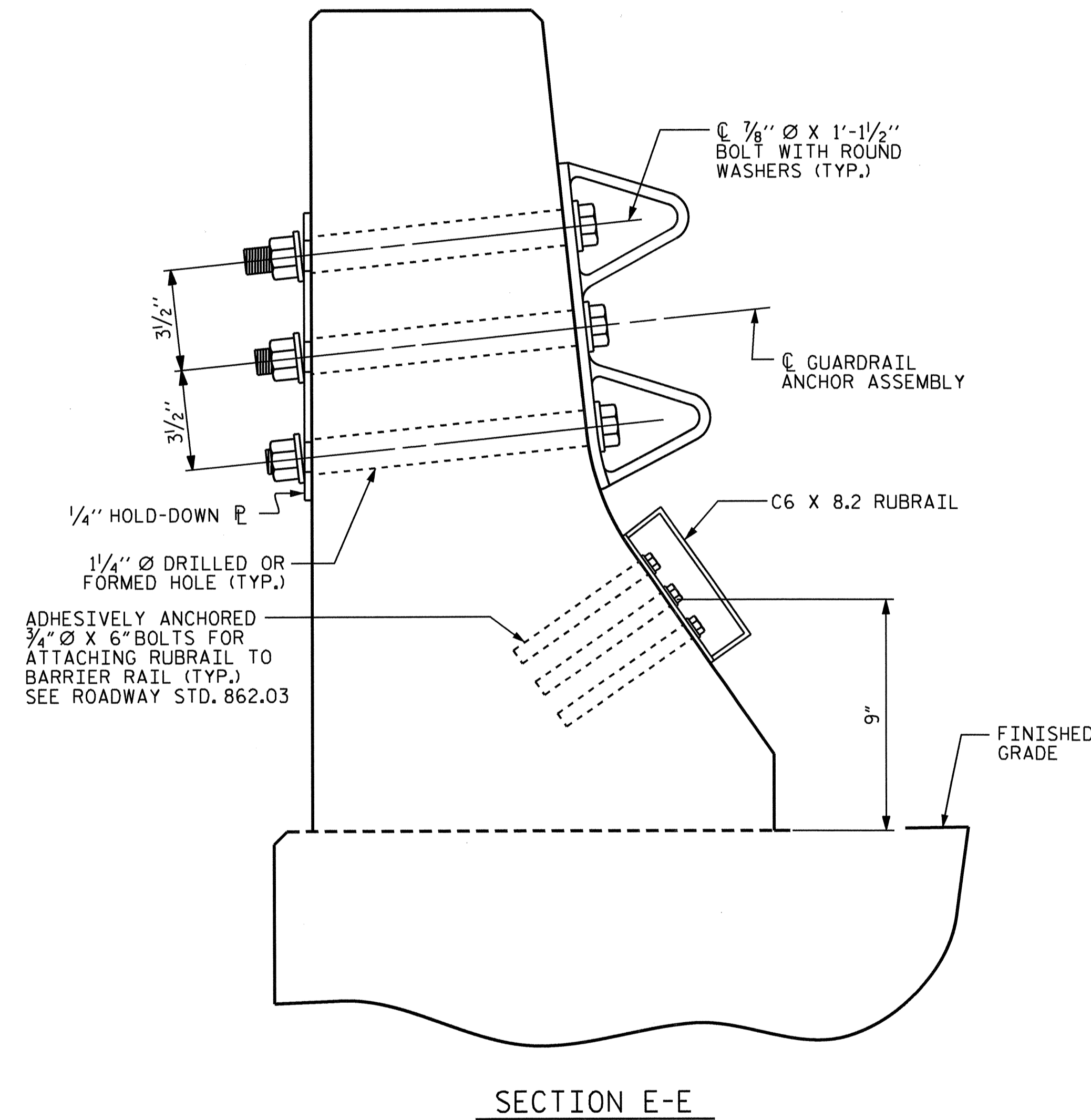
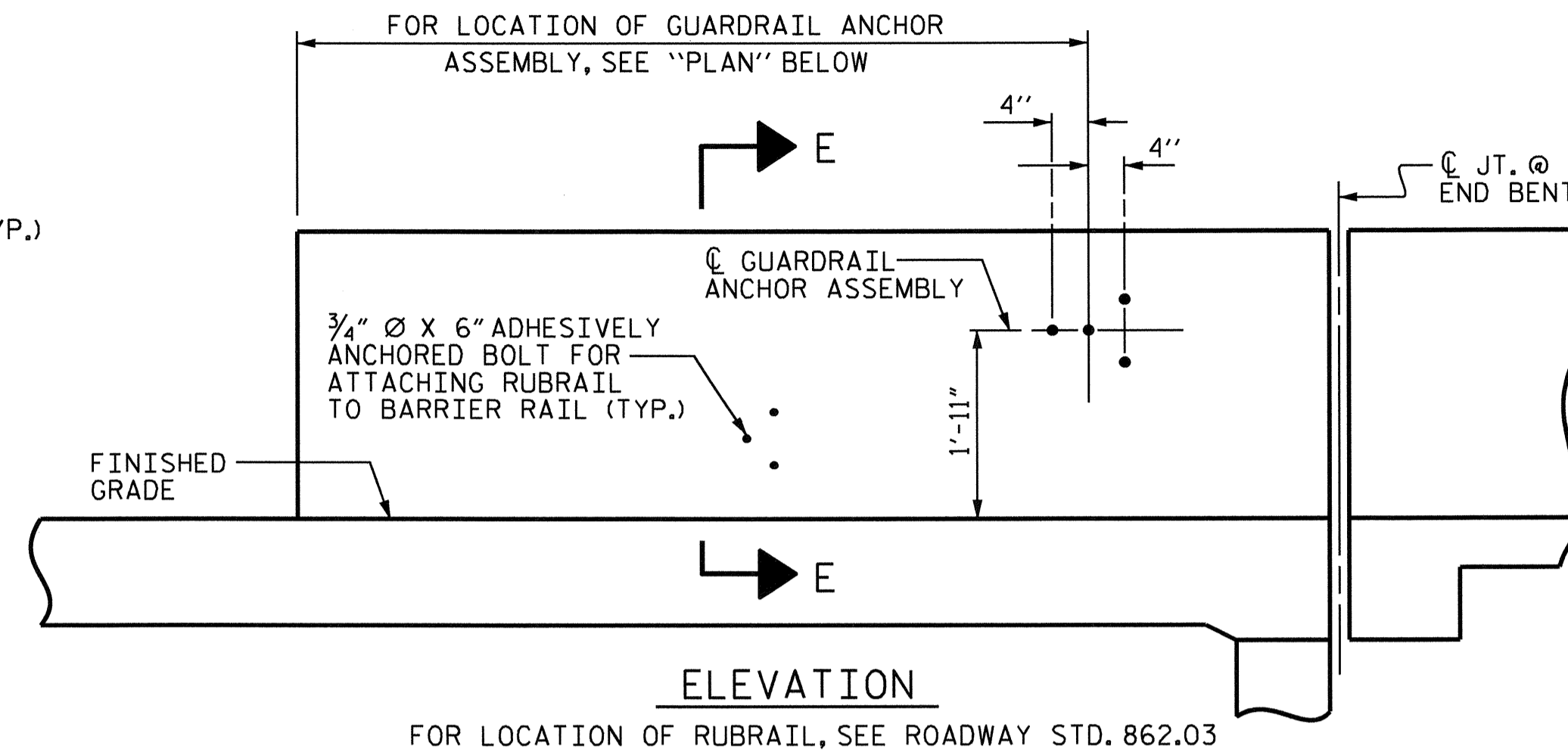
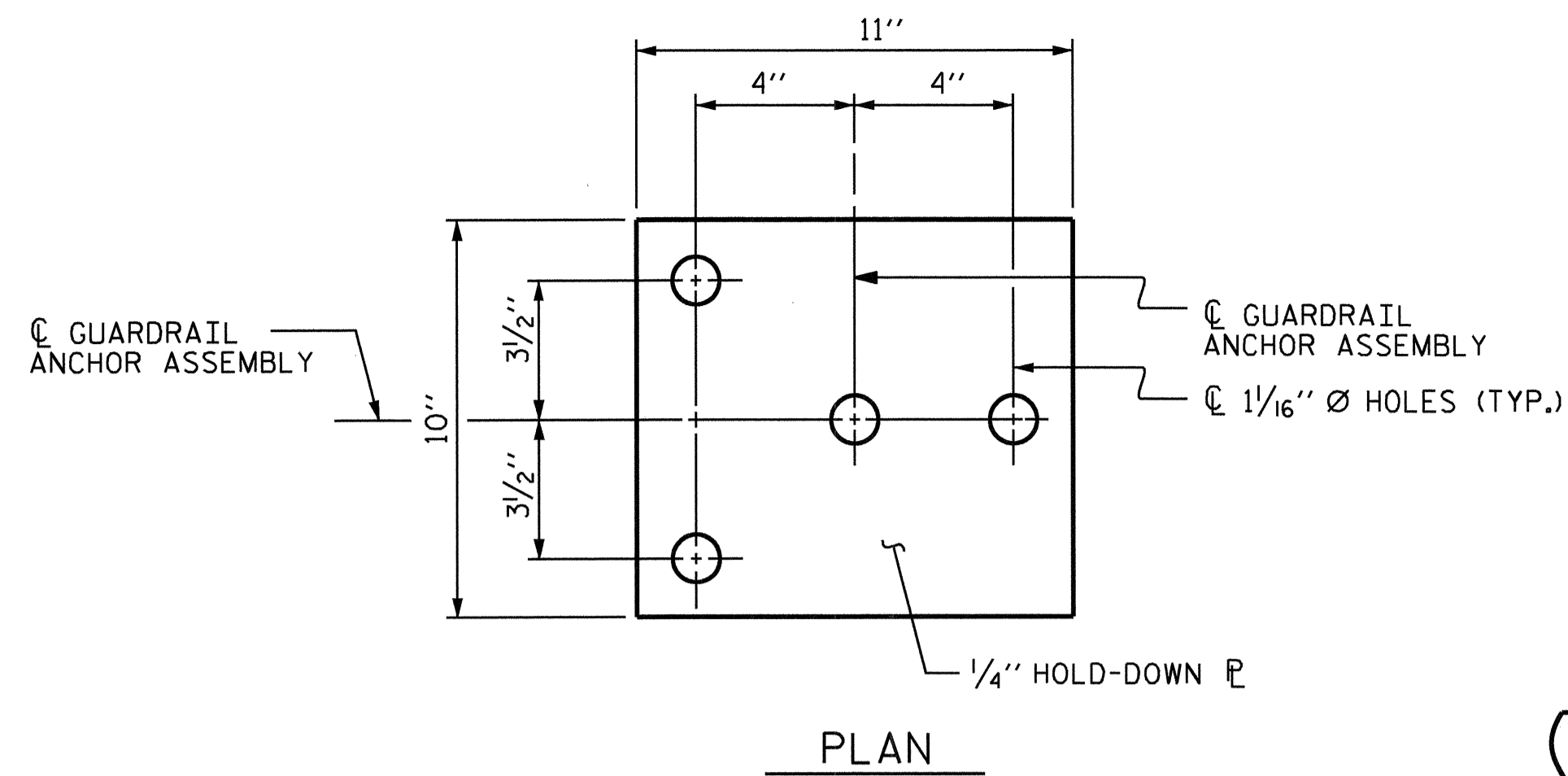
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

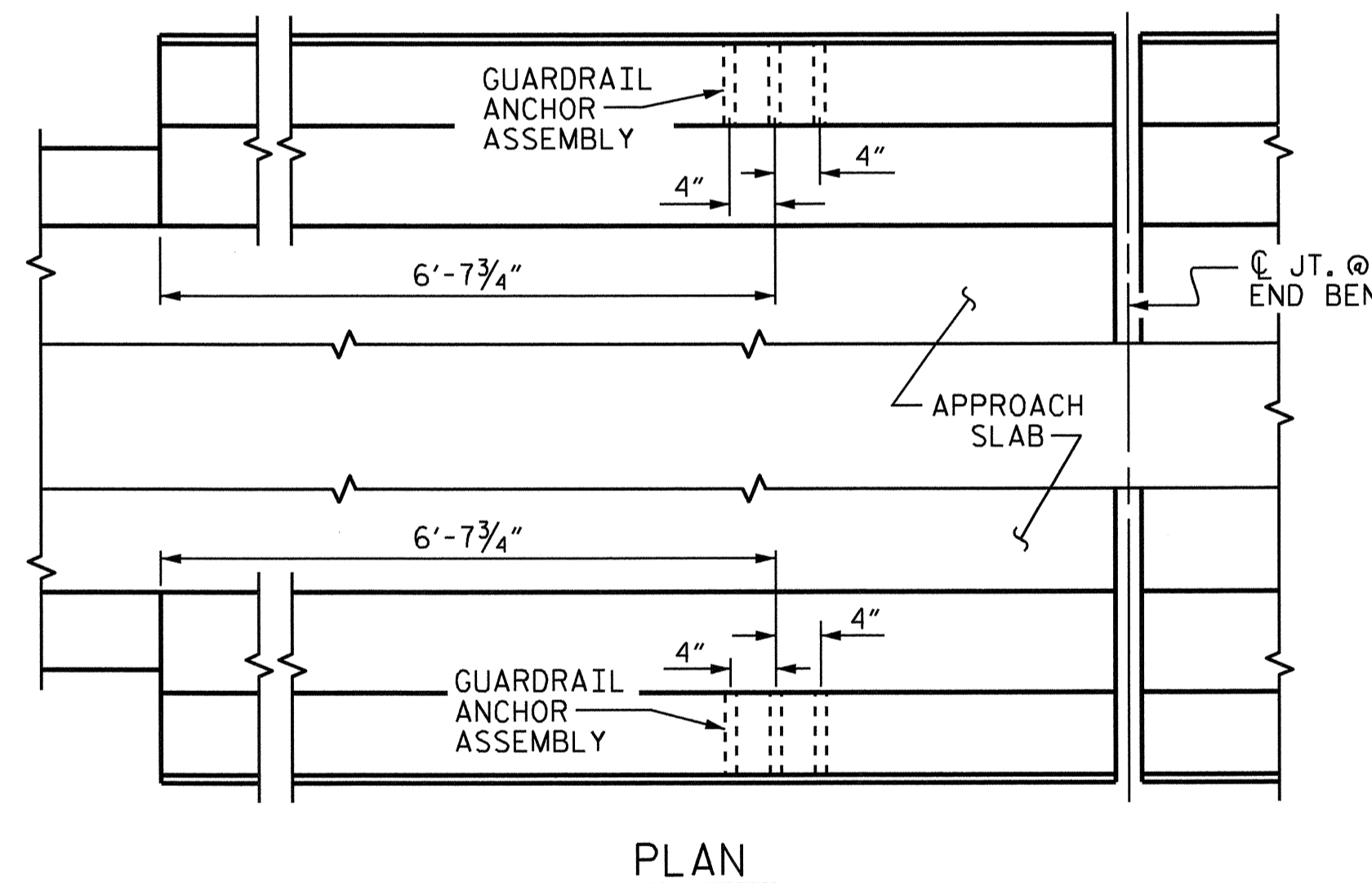
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

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

THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.

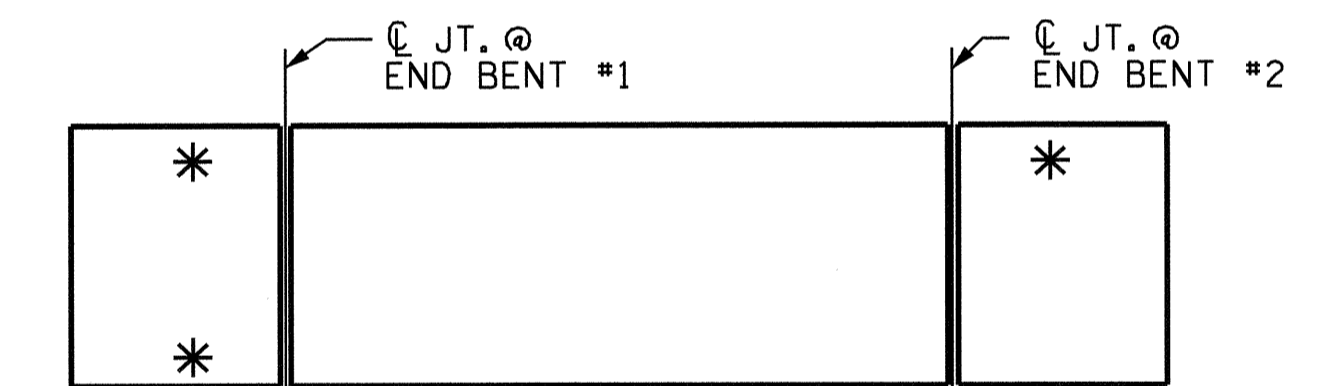


GUARDRAIL ANCHOR ASSEMBLY DETAILS



LOCATION OF ANCHORS FOR GUARDRAIL

END BENT #1 SHOWN, END BENT #2 SIMILAR, EXCEPT ANCHOR ON LEFT SIDE ONLY.

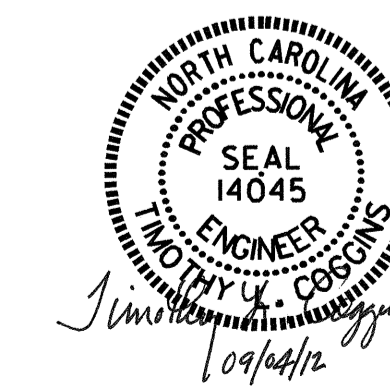


SKETCH SHOWING POINTS OF ATTACHMENTS

\* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. U-4444AB  
 CUMBERLAND COUNTY  
 STATION: 132+79.28 -L-

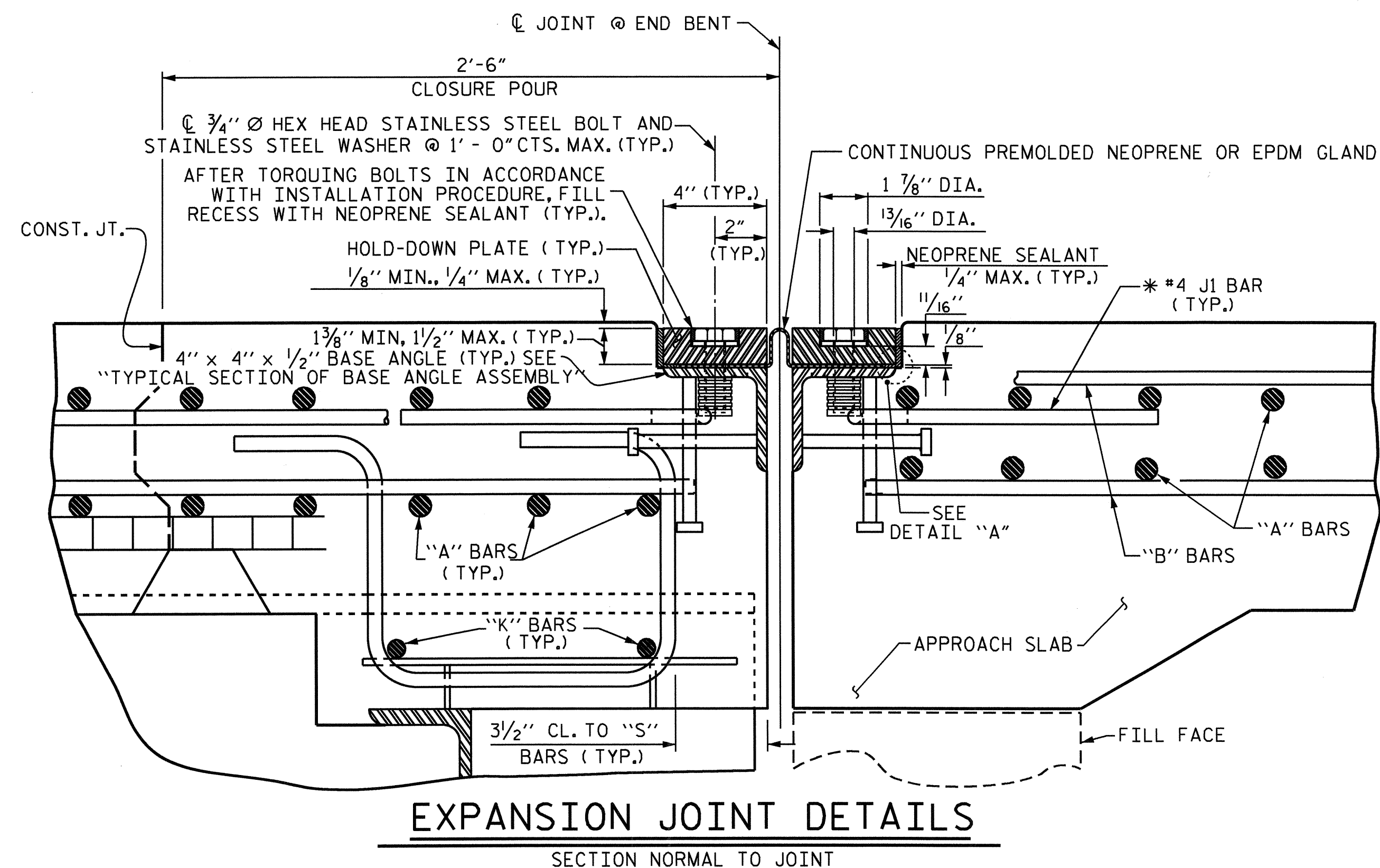
SHEET 2 OF 2



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 GUARDRAIL ANCHORAGE  
 FOR BARRIER RAIL

| REVISIONS |     |       |     |     |       | SHEET NO.    |  |
|-----------|-----|-------|-----|-----|-------|--------------|--|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-15         |  |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |  |
| 2         |     |       | 4   |     |       | 29           |  |

|                              |                 |
|------------------------------|-----------------|
| ASSEMBLED BY : B.N.BARODAWAL | DATE : 10-19-10 |
| CHECKED BY : PEGGY PARISI    | DATE : 1-18-11  |
| DRAWN BY : TLA               | 5/06            |
| CHECKED BY : GM              | 5/06            |
| ADDED 5/1/06RR               | KMM/GM          |
| REV. 10/1/11                 | MAA/GM          |



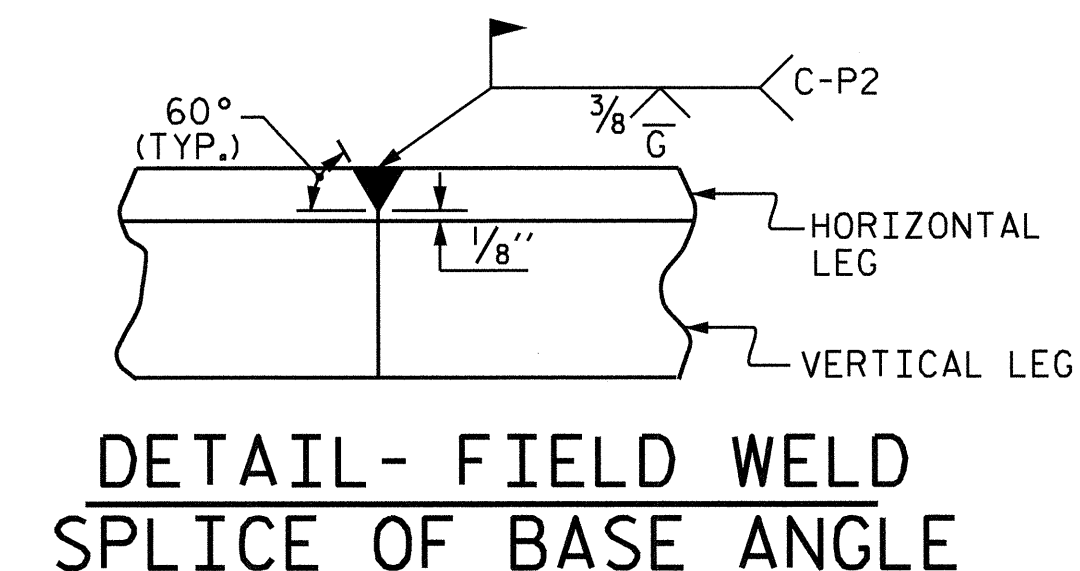
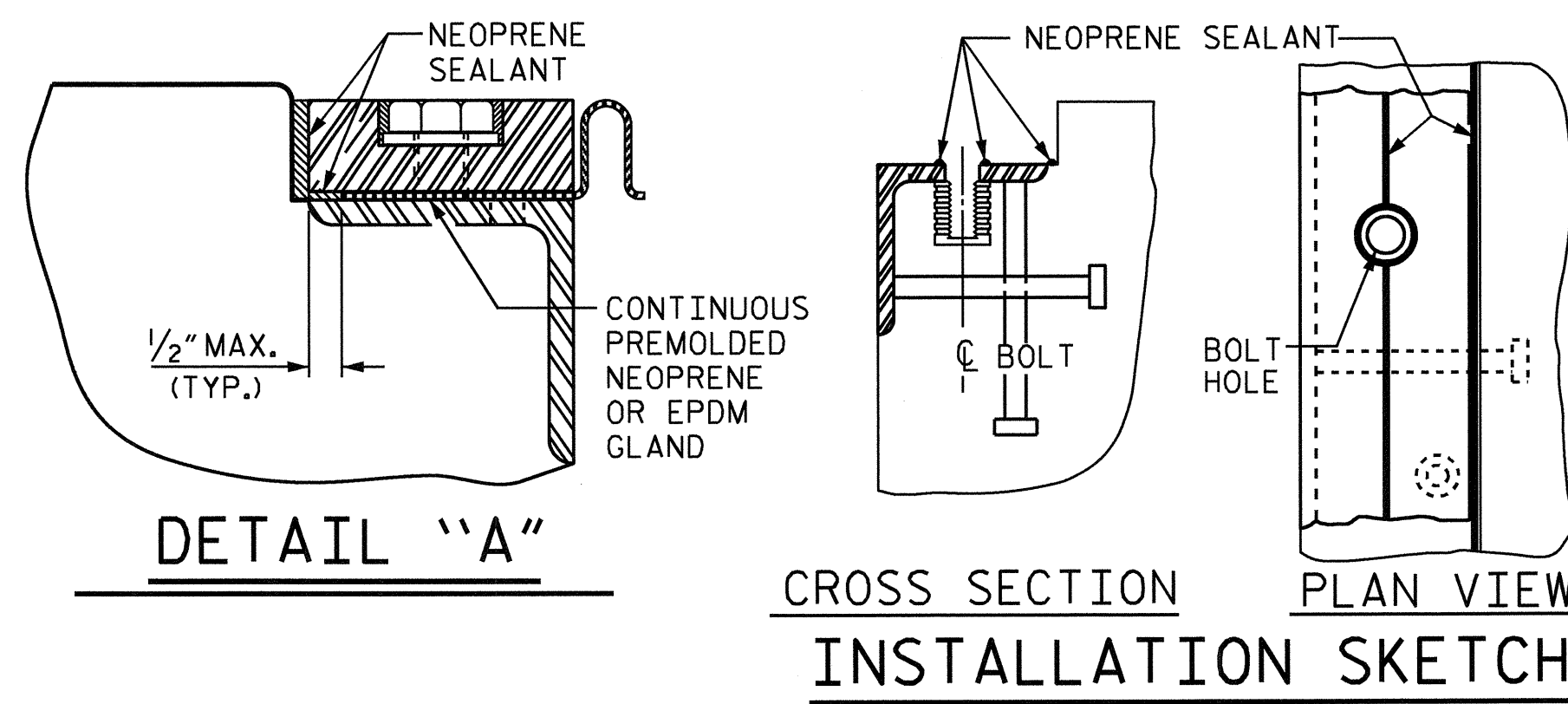
\* THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.

**INSTALLATION PROCEDURE**

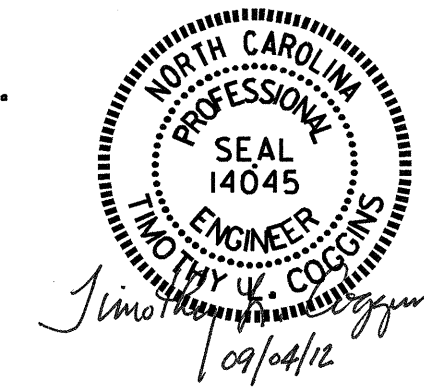
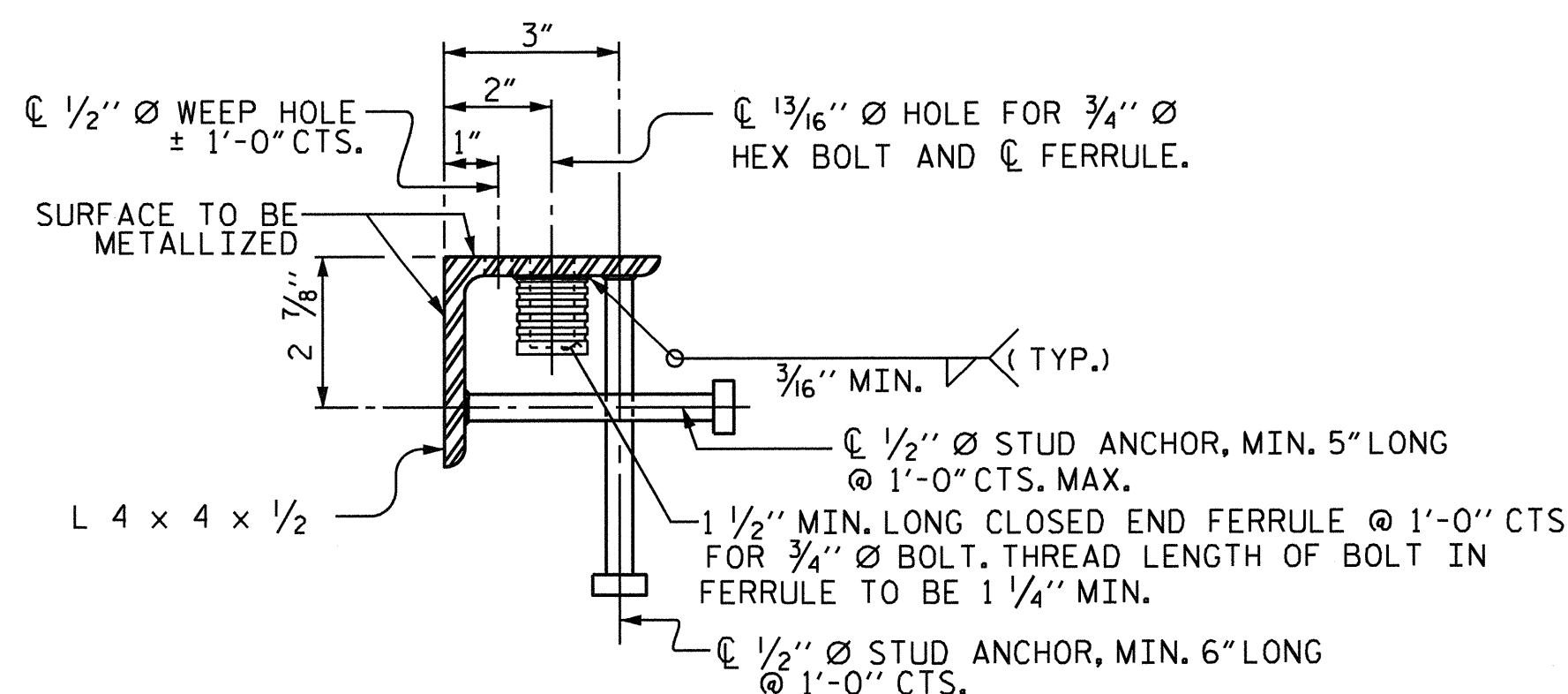
1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 4 1/8" TO 4 1/4" WIDE AND OF SUCH THICKNESS AS TO PROVIDE FOR CORRECT FINAL ELEVATION OF TOP OF HOLD-DOWN PLATES. THE TEMPLATE SHALL BE ATTACHED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

**GENERAL NOTES**

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



| MOVEMENT AND SETTING AT JOINT |             |                                |                                      |                                      |                                      |
|-------------------------------|-------------|--------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| END BENT NO.                  | SKEW ANGLE  | TOTAL MOVEMENT (ALONG CL RDWY) | PERPENDICULAR JOINT OPENING AT 45° F | PERPENDICULAR JOINT OPENING AT 60° F | PERPENDICULAR JOINT OPENING AT 90° F |
| 1                             | 90°-00'-00" | 0                              | 1"                                   | 1"                                   | 1"                                   |
| 2                             | 90°-00'-00" | 2 3/16"                        | 2 1/8"                               | 1 13/16"                             | 1 5/16"                              |

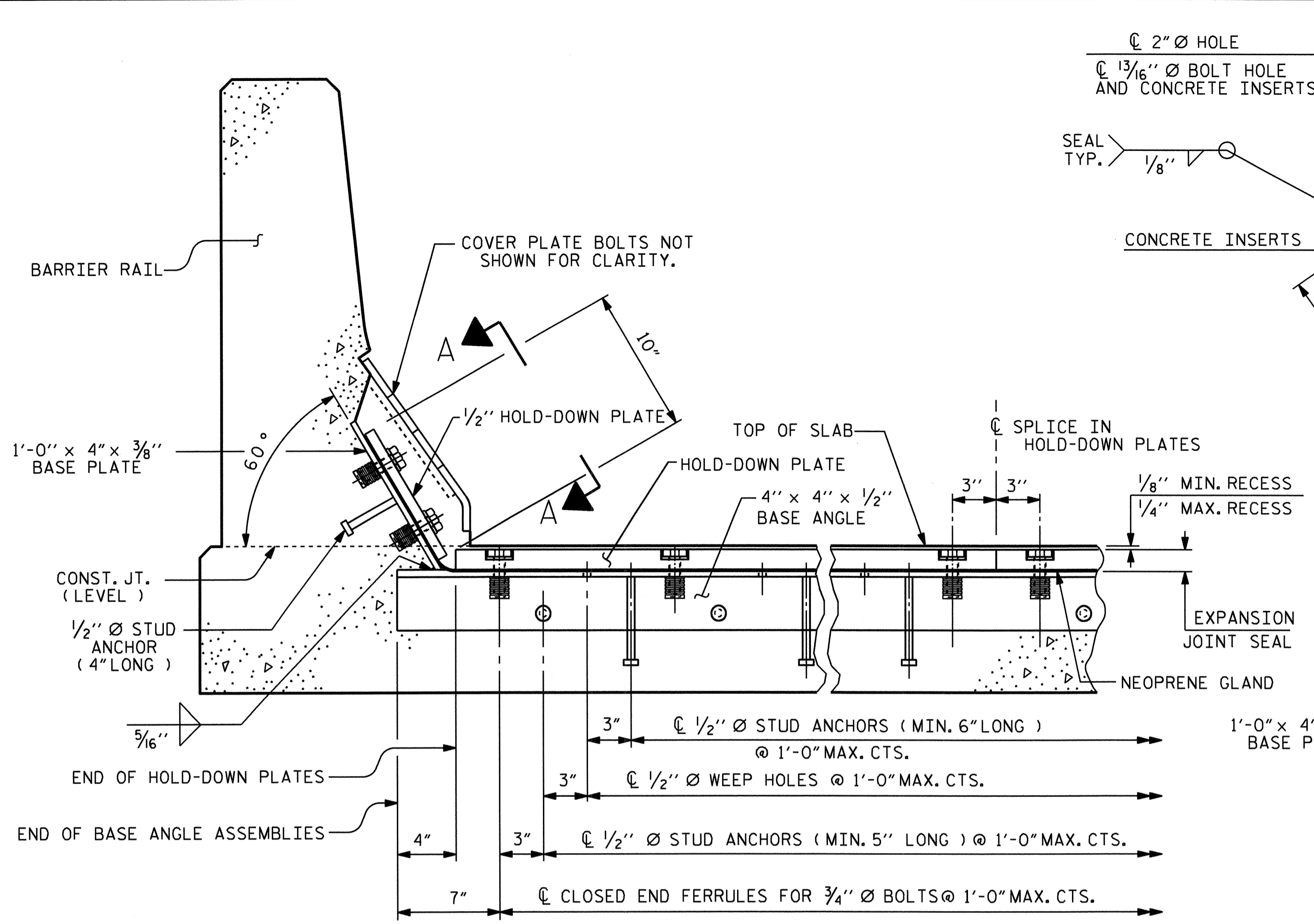


PROJECT NO. U-4444AB  
CUMBERLAND COUNTY  
 STATION: 132+79.29 -L-

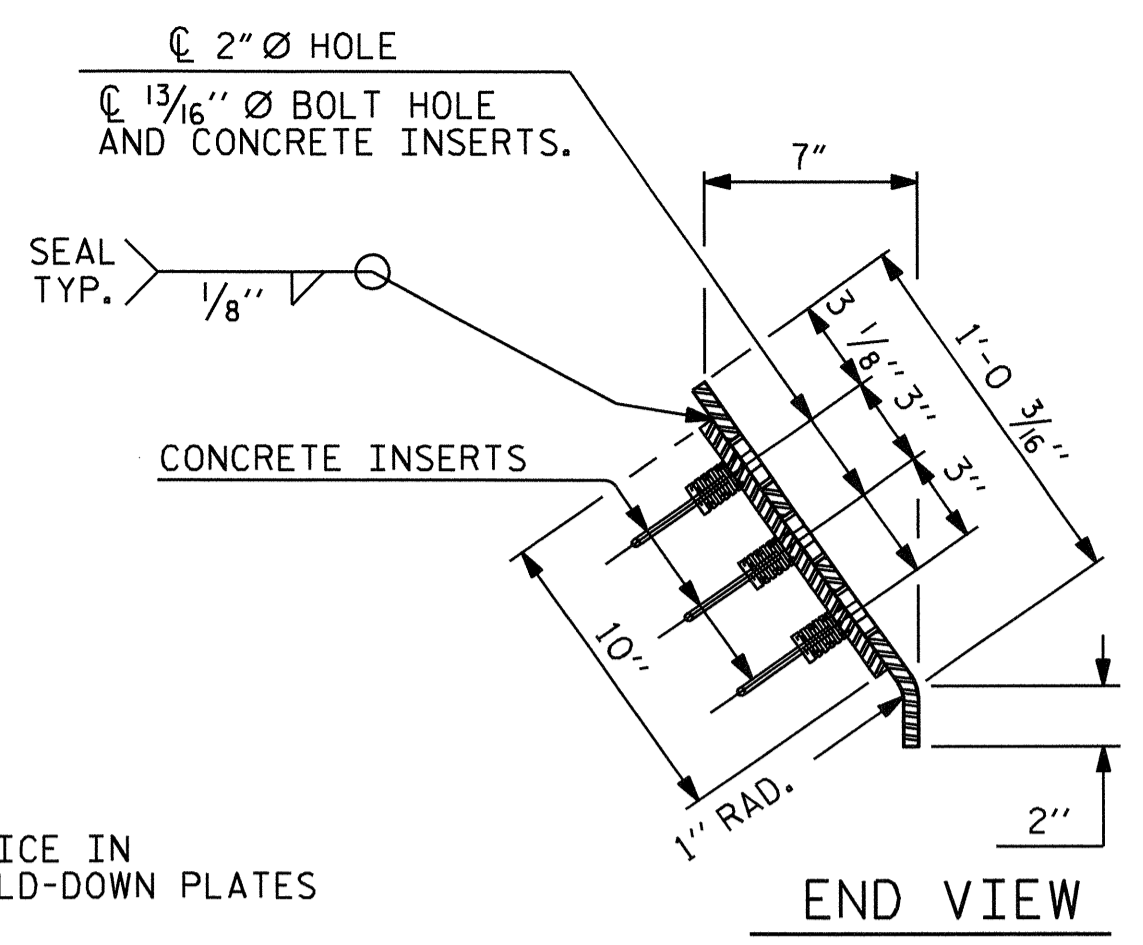
SHEET 1 OF 2

| STATE OF NORTH CAROLINA<br>DEPARTMENT OF TRANSPORTATION<br>RALEIGH |     |       |     |     |                 |
|--|-----|-------|-----|-----|-----------------|
| STANDARD<br>EXPANSION JOINT<br>SEAL DETAILS                        |     |       |     |     |                 |
| REVISIONS  |     |       |     |     | SHEET NO.       |
| NO.  | BY: | DATE: | NO. | BY: | DATE:           |
| 1  |     |       | 3   |     |                 |
| 2  |     |       | 4   |     |                 |
|  |     |       |     |     | S-16            |
|  |     |       |     |     | TOTAL SHEETS 29 |

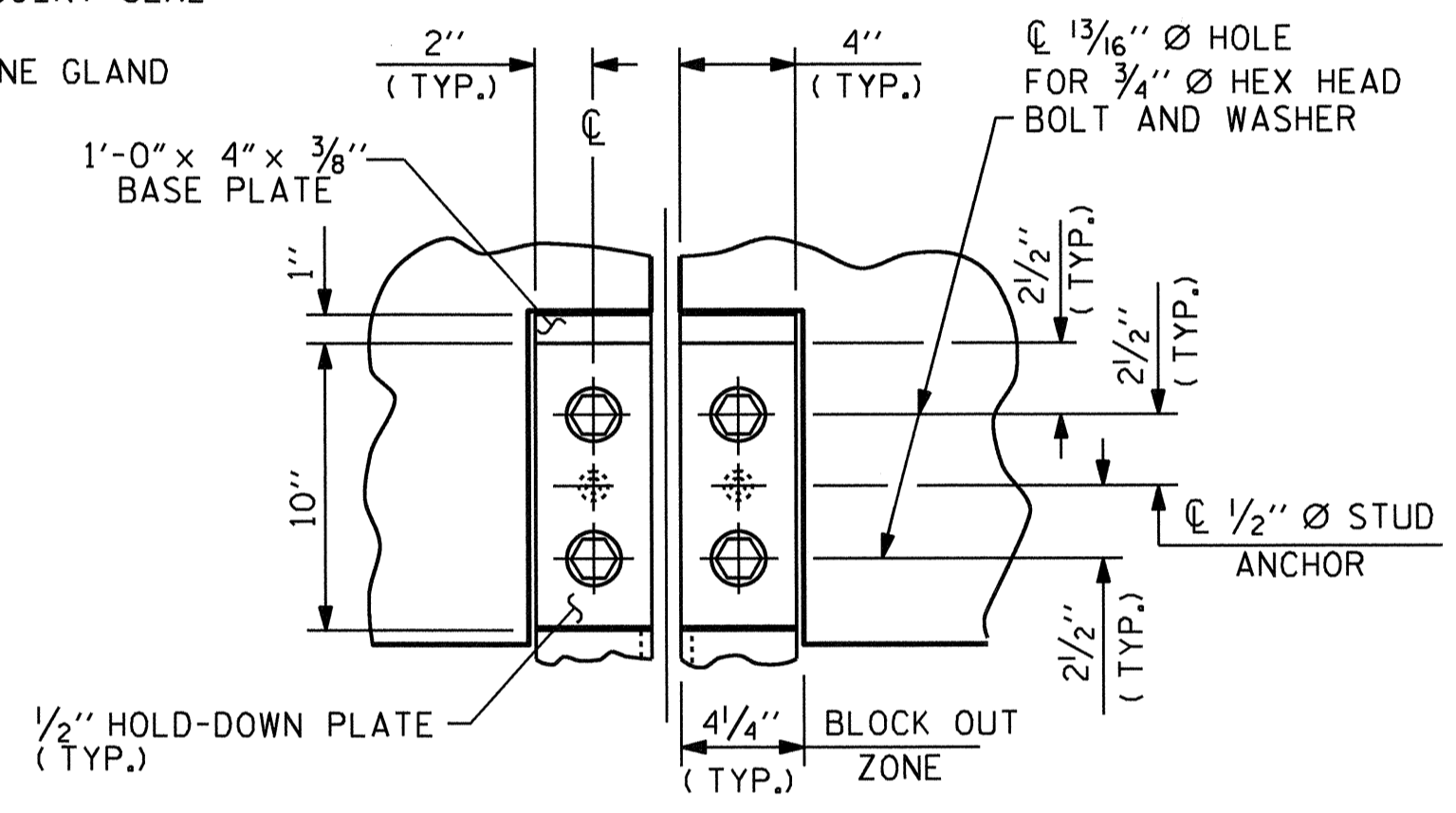
ASSEMBLED BY: B.N. BARODAWALA DATE: 10-12-10  
 CHECKED BY: PEGGY PARISI DATE: 1-18-11  
 DRAWN BY: REK 9/87 REV. 5/7/03R RWW/JTE  
 CHECKED BY: CRK 10/87 REV. 5/1/06R TLA/GM  
 REV. 10/1/11 MAA/GM



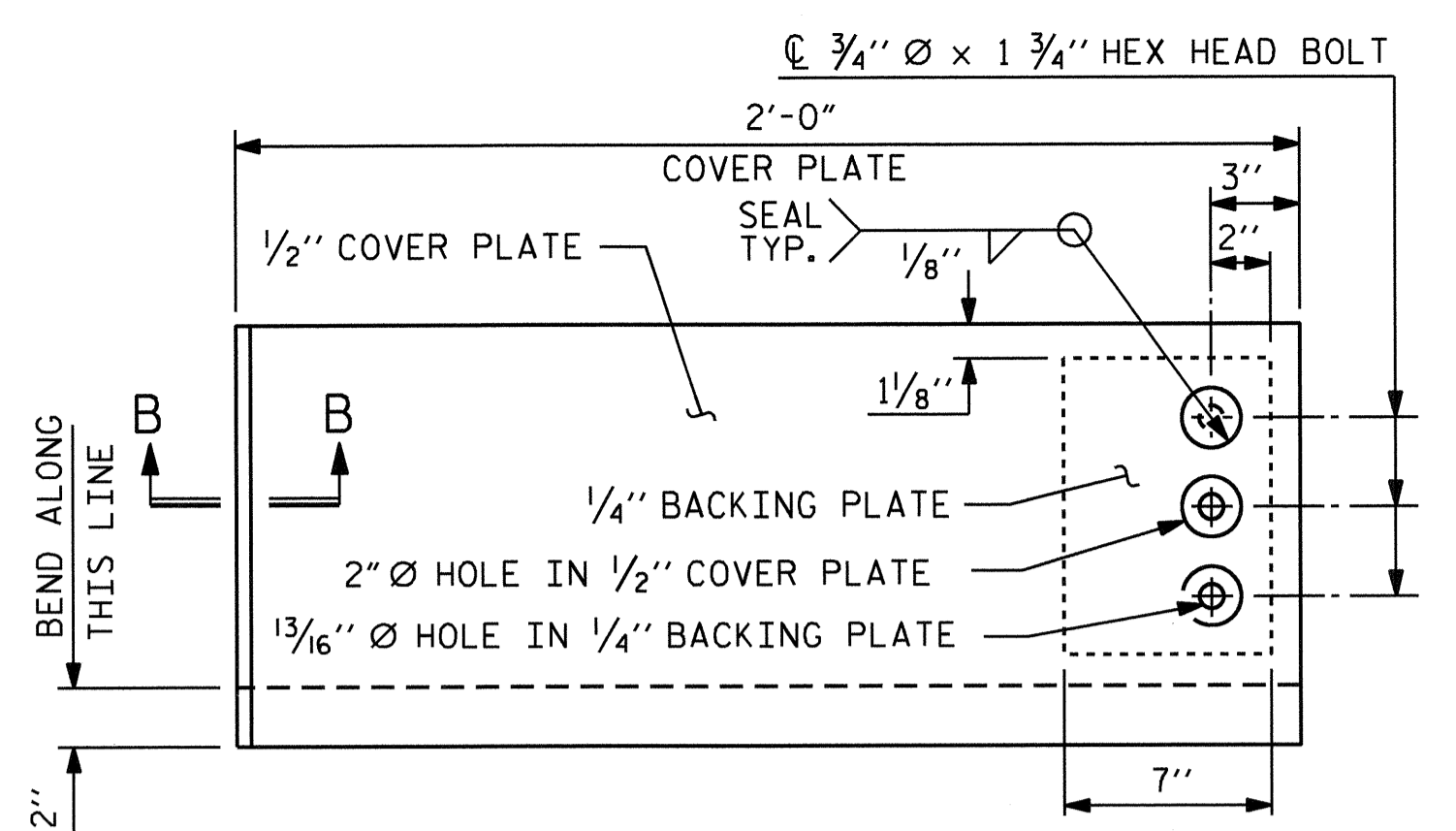
SECTION THRU RAIL NORMAL TO JOINT



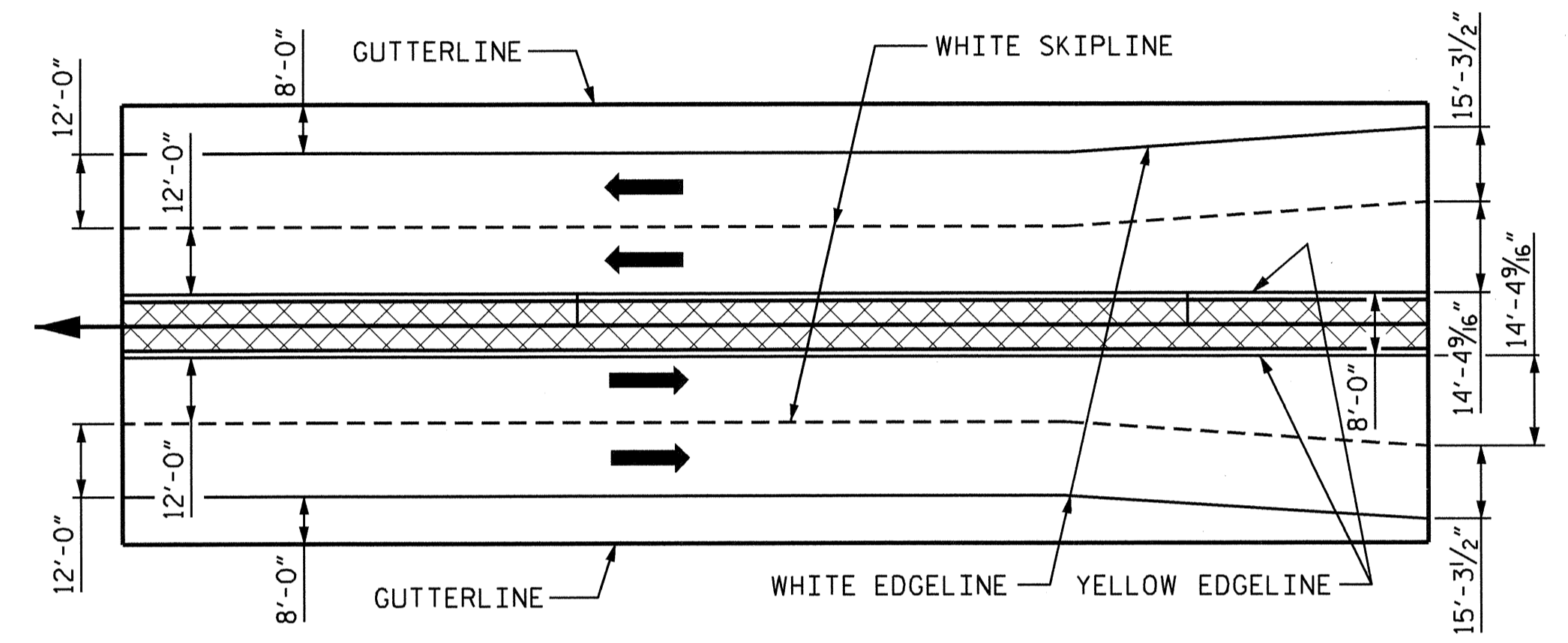
END VIEW



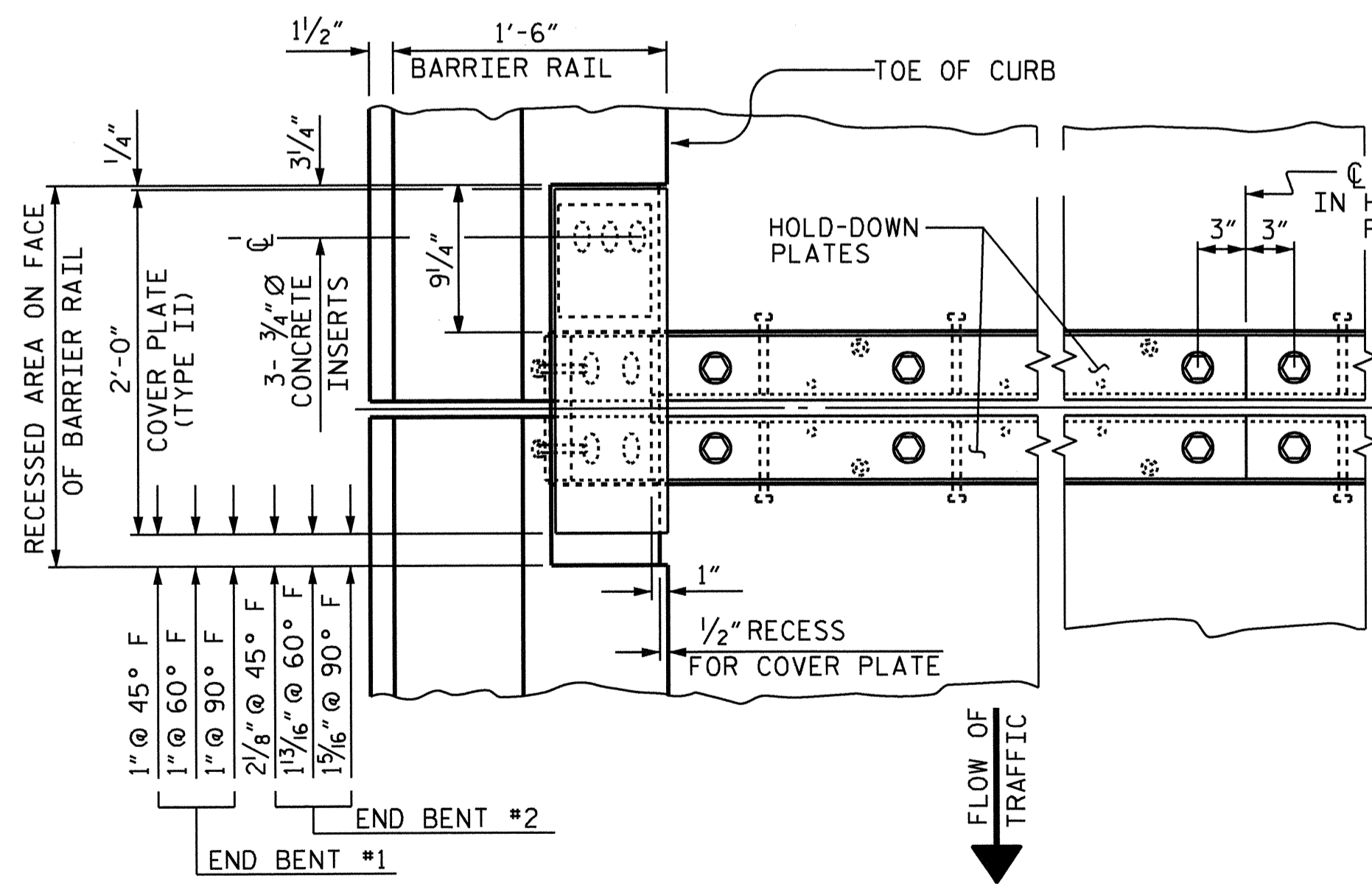
SECTION A - A



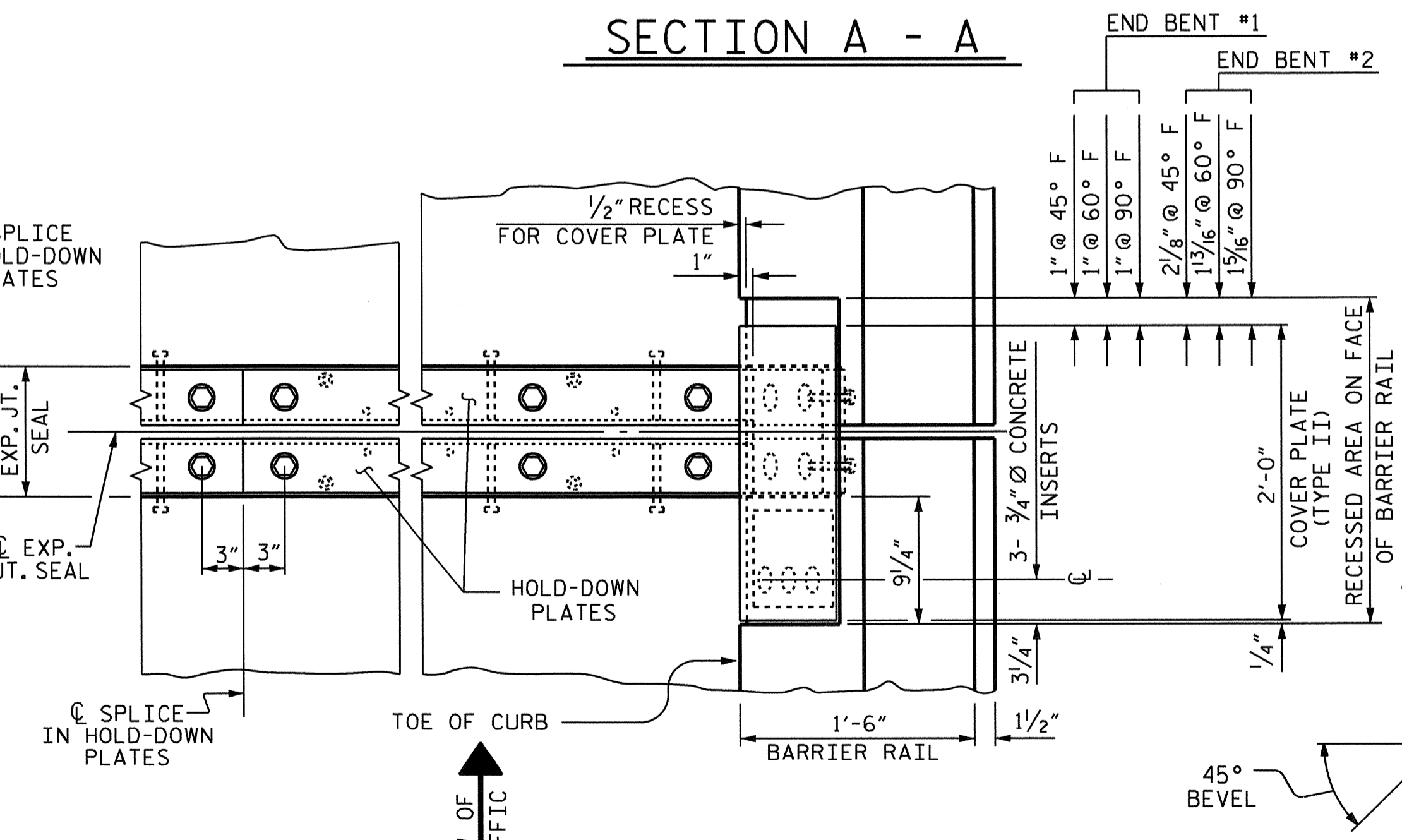
TYPE II - ELEVATION VIEW  
COVER PLATE DETAILS



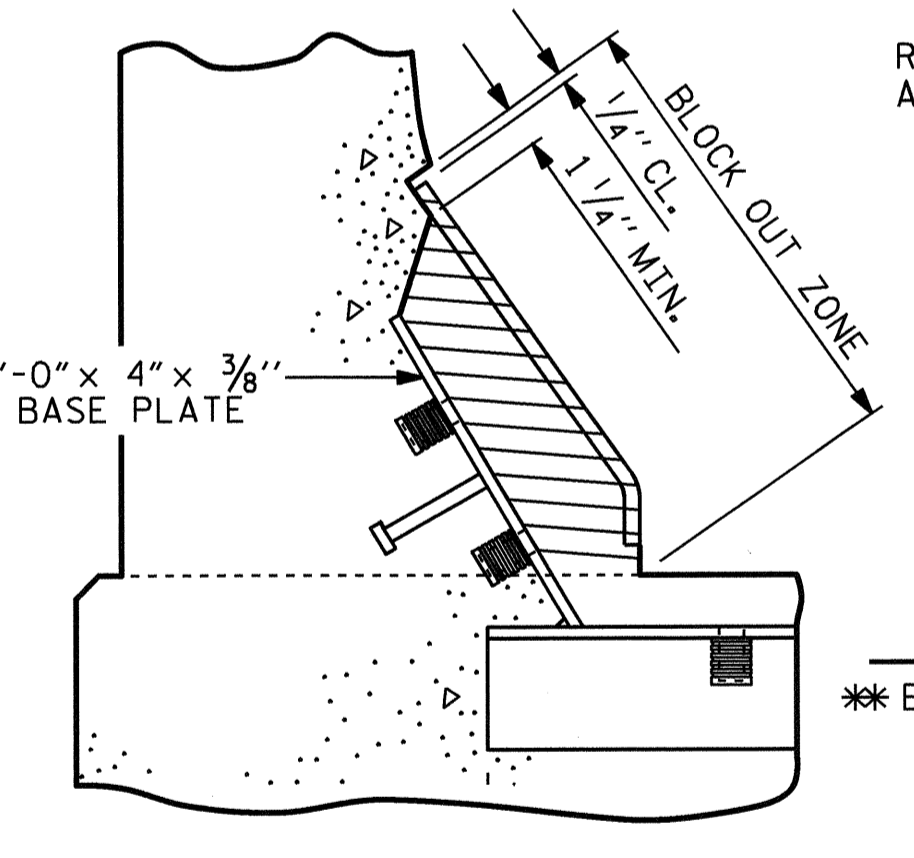
PAVEMENT MARKING ALIGNMENT



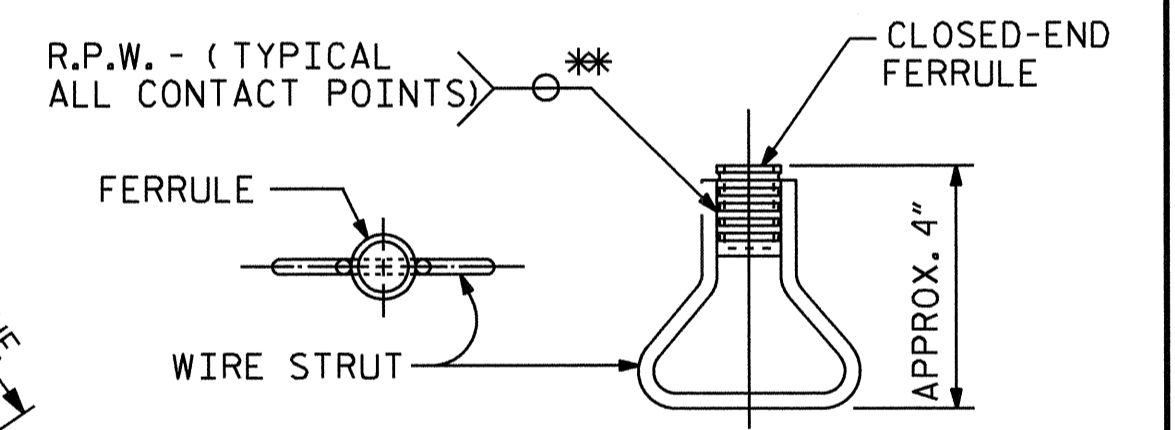
PLAN OF EXPANSION JOINT SEAL - LEFT SIDE



PLAN OF EXPANSION JOINT SEAL - RIGHT SIDE



BLOCK OUT DETAIL  
SEE "SECTION A - A" FOR OTHER DETAILS.

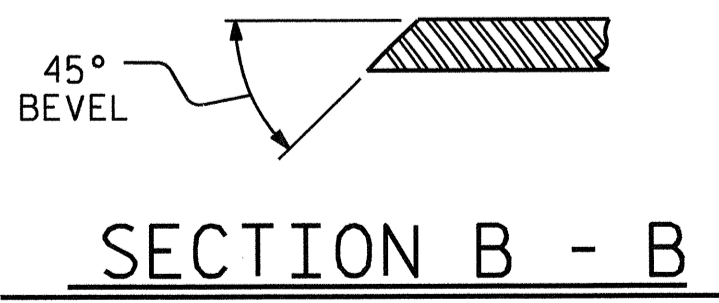


CONCRETE INSERT  
PLAN ELEVATION

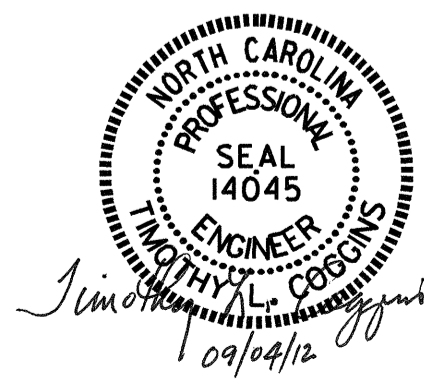
\* EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.

PROJECT NO. U-4444AB  
CUMBERLAND COUNTY  
STATION: 132+79.29 -L-

SHEET 2 OF 2

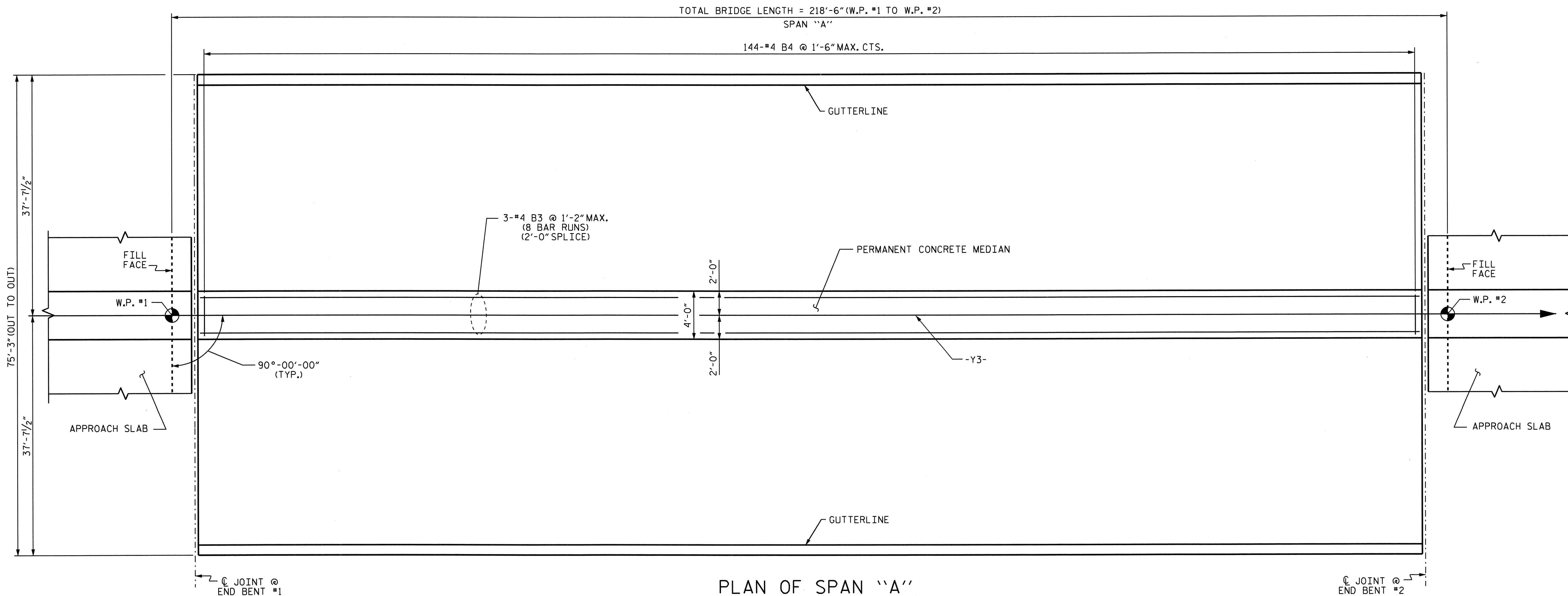


SECTION B - B

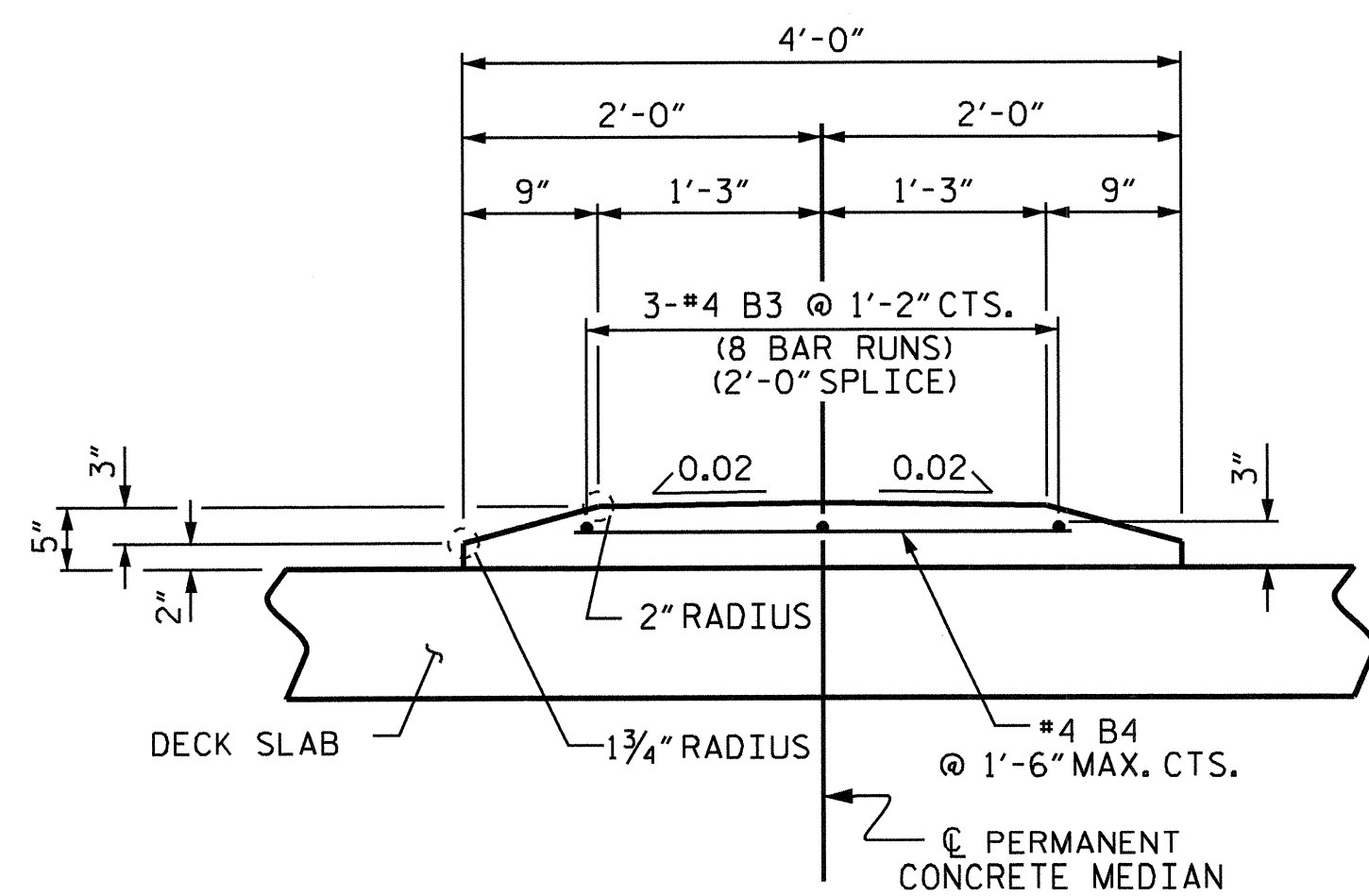


| STATE OF NORTH CAROLINA<br>DEPARTMENT OF TRANSPORTATION<br>RALEIGH |     |       |     |     |       |
|--|-----|-------|-----|-----|-------|
| STANDARD   |     |       |     |     |       |
| EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL                      |     |       |     |     |       |
| REVISIONS  |     |       |     |     |       |
| NO.  | BY: | DATE: | NO. | BY: | DATE: |
| 1  |     |       | 3   |     |       |
| 2  |     |       | 4   |     |       |

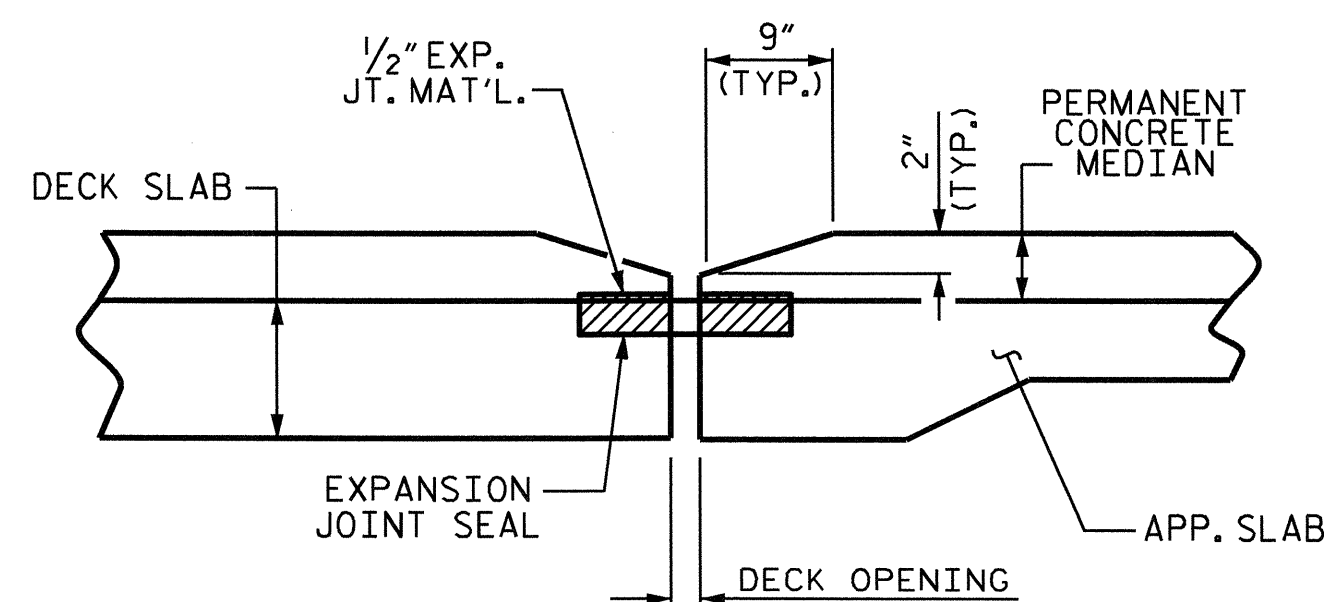
ASSEMBLED BY: B.N.BARODAWALA DATE: 10-12-10  
CHECKED BY: PEGGY PARISI DATE: 1-18-11  
DRAWN BY: REK 9/87  
CHECKED BY: CRK 10/87  
REV. 10/17/00 RWW/LES  
REV. 5/1/06 TLA/GM  
REV. 10/1/11 MAA/GM



PLAN OF SPAN "A"



REINFORCING STEEL DETAILS



SECTION AT EXPANSION JOINT

PERMANENT CONCRETE MEDIAN DETAILS

BILL OF MATERIAL FOR PERMANENT CONCRETE MEDIAN

| BAR                              | NO. | SIZE | TYPE | LENGTH | WEIGHT        |
|----------------------------------|-----|------|------|--------|---------------|
| * B3                             | 24  | #4   | STR  | 28'-9" | 461           |
| * B4                             | 144 | #4   | STR  | 2'-8"  | 257           |
| * EPOXY COATED REINFORCING STEEL |     |      |      |        | 718 LBS.      |
| CLASS AA CONCRETE                |     |      |      |        | 11.8 CU. YDS. |

NOTES

NO SEPARATE MEASUREMENT OR PAYMENT WILL BE MADE FOR MATERIALS OR LABOR TO CONSTRUCT THE PERMANENT CONCRETE MEDIAN. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE SQUARE FOOT PRICE BID FOR THE REINFORCED CONCRETE DECK SLAB.

FOR PERMANENT CONCRETE MEDIAN ON APPROACH SLABS, SEE "BRIDGE APPROACH SLAB" SHEETS.

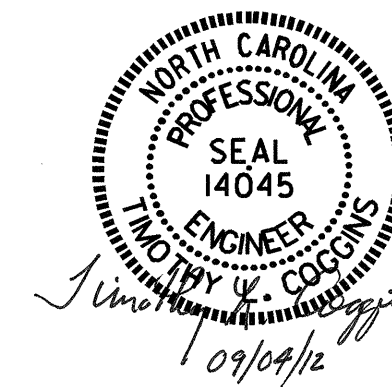
ALL REINFORCING STEEL IN PERMANENT CONCRETE MEDIANS SHALL BE EPOXY COATED.

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

PROJECT NO. U-4444AB  
 CUMBERLAND COUNTY  
 STATION: 132+79.28 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 PERMANENT  
 CONCRETE MEDIAN

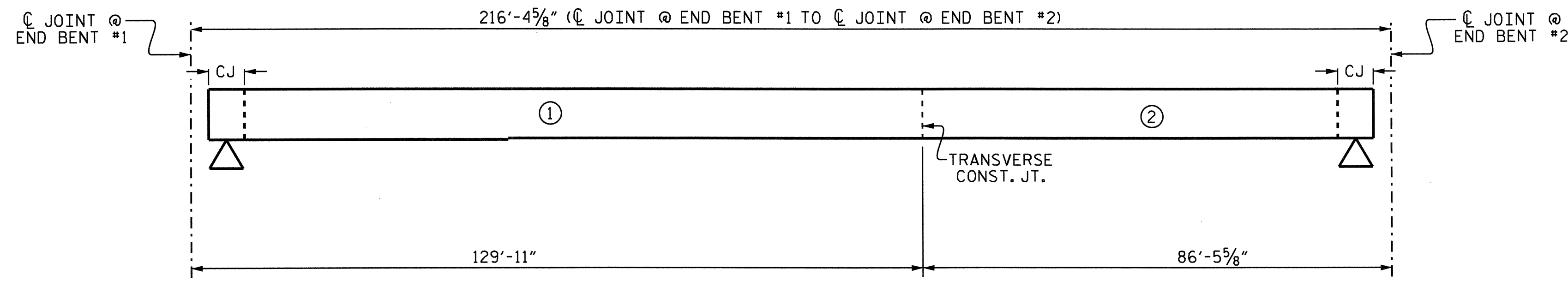


DRAWN BY: B.N.BARODAWALA DATE: 12-14-11  
 CHECKED BY: PEGGY PARISI DATE: 12-14-11

04-SEP-2012 09:12  
 R:\TIP\Projects-U\U4444AB\Structures\Plans\Str\*1\FinalPlans\U4444ab.sd.md.01.dgn  
 tcoggins

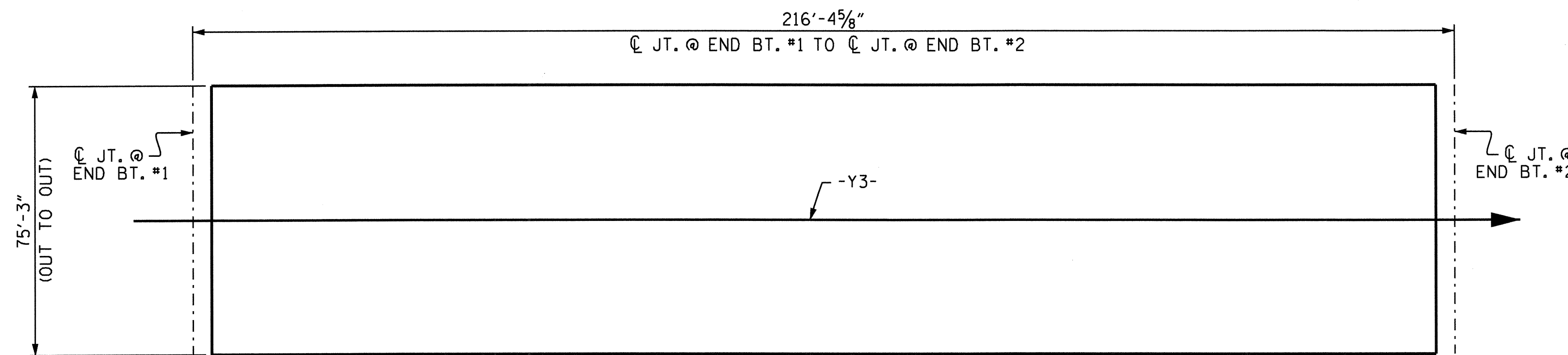
| REVISIONS |     |       |     |     |       | SHEET NO.       |
|-----------|-----|-------|-----|-----|-------|-----------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: |                 |
| 1         |     |       | 3   |     |       | S-18            |
| 2         |     |       | 4   |     |       | TOTAL SHEETS 29 |

STR. #1

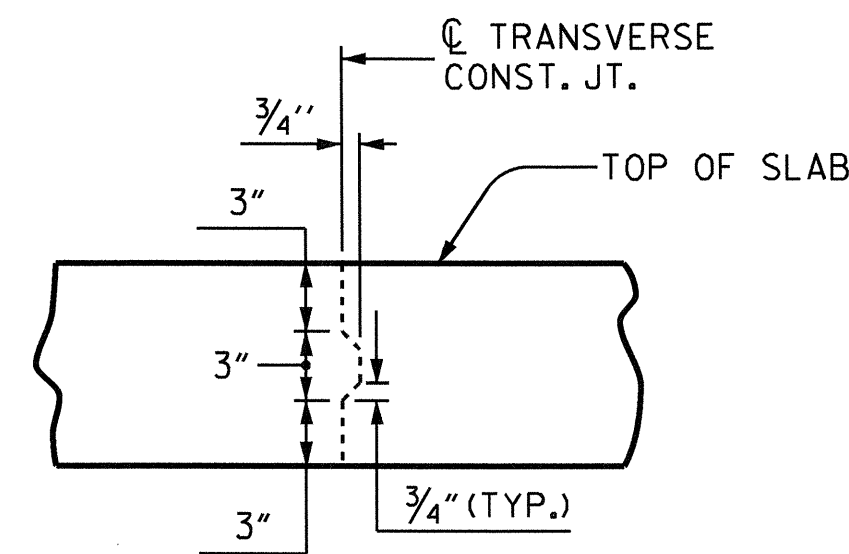


**POURING SEQUENCE**

CJ = CONSTRUCTION JOINT  
(SEE "EXPANSION JOINT  
SEAL DETAILS" SHEET)



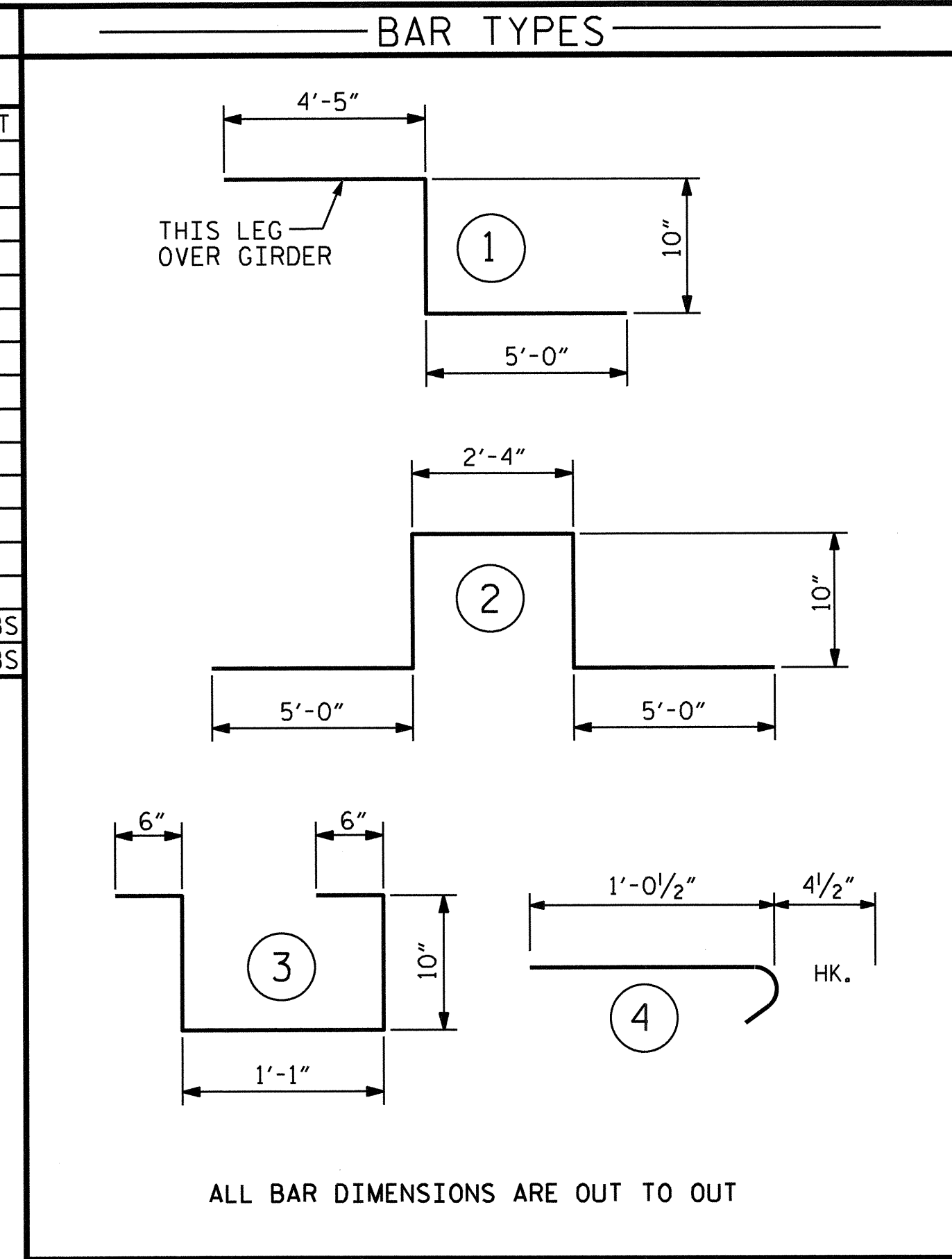
LAYOUT FOR COMPUTING AREA  
OF REINFORCED CONCRETE DECK SLAB  
(SQ. FT. = 16,283)



**TRANSVERSE CONSTRUCTION JOINT DETAIL**

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

| BILL OF MATERIAL            |     |      |      |        |              |
|-----------------------------|-----|------|------|--------|--------------|
| SUPERSTRUCTURE              |     |      |      |        |              |
| BAR                         | NO. | SIZE | TYPE | LENGTH | WEIGHT       |
| * A1                        | 862 | #5   | STR  | 38'-9" | 34,839       |
| A2                          | 433 | #5   | STR  | 33'-8" | 15,205       |
| A3                          | 433 | #5   | STR  | 43'-5" | 19,608       |
| * B1                        | 416 | #4   | STR  | 28'-9" | 7,989        |
| B2                          | 368 | #5   | STR  | 55'-8" | 21,366       |
| * J1                        | 144 | #4   | 4    | 1'-5"  | 136          |
| * K1                        | 8   | #5   | 1    | 10'-3" | 86           |
| * K2                        | 24  | #5   | 2    | 14'-0" | 350          |
| * S1                        | 126 | #4   | 3    | 3'-9"  | 316          |
| REINFORCING STEEL           |     |      |      |        | = 56,179 LBS |
| * EPOXY COATED REINF. STEEL |     |      |      |        | = 43,716 LBS |



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

| BAR SIZE | SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL |          | APPROACH SLABS |          | PARAPET AND BARRIER RAIL |
|----------|---|----------|----------------|----------|--------------------------|
|          | EPOXY COATED  | UNCOATED | EPOXY COATED   | UNCOATED |                          |
| #4       | 2'-0"   | 1'-9"    | 2'-0"          | 1'-9"    | 2'-9"                    |
| #5       | 2'-6"   | 2'-2"    | 2'-6"          | 2'-2"    | 3'-5"                    |
| #6       | 3'-0"   | 2'-7"    | 3'-10"         | 2'-7"    | 4'-4"                    |
| #7       | 5'-3"   | 3'-6"    |                |          |                          |
| #8       | 6'-10"  | 4'-7"    |                |          |                          |

— SUPERSTRUCTURE BILL OF MATERIAL —

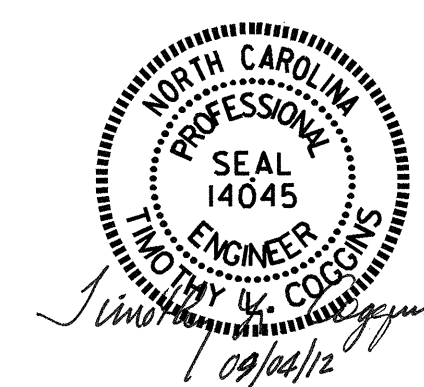
|           | CONCRETE CLASS AA (CU. YDS.) | REINFORCING STEEL (LBS.) | EPOXY COATED REINFORCING STEEL (LBS.) |
|-----------|------------------------------|--------------------------|---------------------------------------|
| POUR #1   | 321.8                        |                          |                                       |
| POUR #2   | 214.7                        | 56,179                   | 43,716                                |
| ** TOTALS | 536.5                        |                          |                                       |

\*\* QUANTITIES FOR BARRIER RAILS ARE NOT INCLUDED

GROOVING BRIDGE FLOORS

|                |               |
|----------------|---------------|
| APPROACH SLABS | 3,353 SQ.FT.  |
| BRIDGE DECK    | 14,840 SQ.FT. |
| TOTAL          | 18,193 SQ.FT. |

PROJECT NO. U-4444AB  
CUMBERLAND COUNTY  
STATION: 132+79.29 -L-



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

DRAWN BY : B.N.BARODAWALA DATE : 10-22-10  
CHECKED BY : PEGGY PARISI DATE : 1-18-11

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

**NOTES**

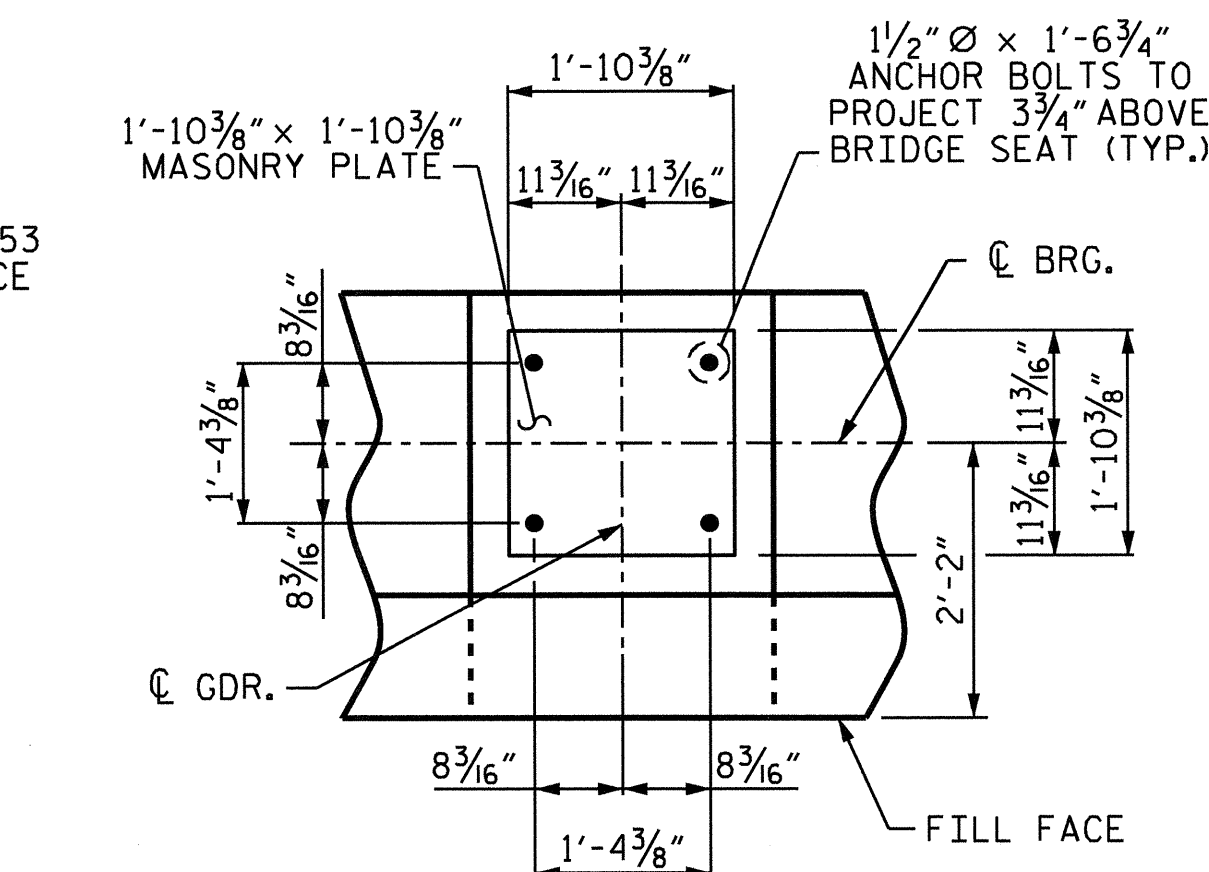
STIRRUPS AND U2 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

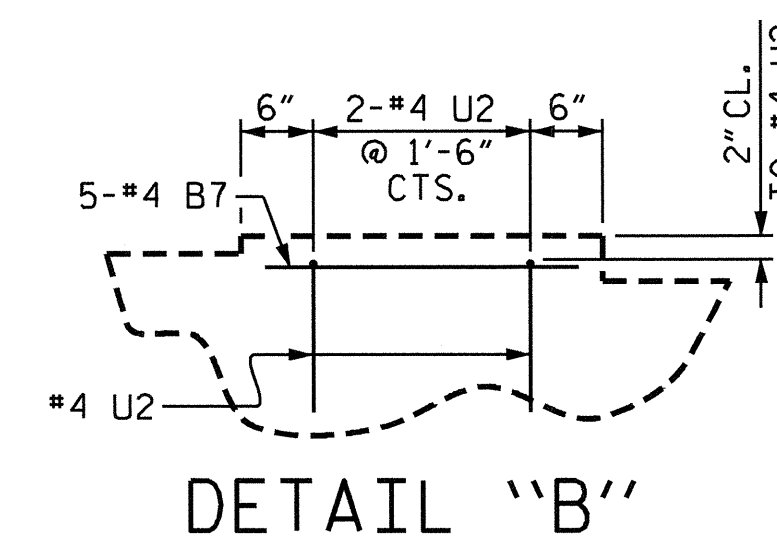
THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

THE TOP SURFACE OF THE END BENT CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

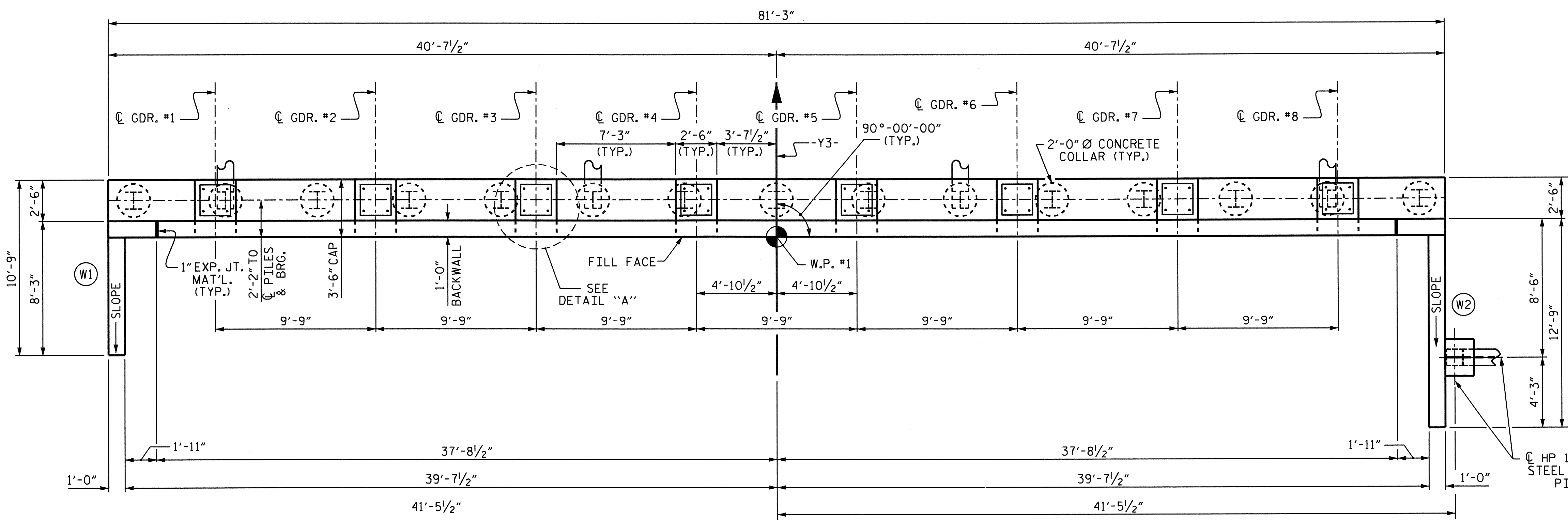
INSTALL THE 4" DIA. DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS. SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.



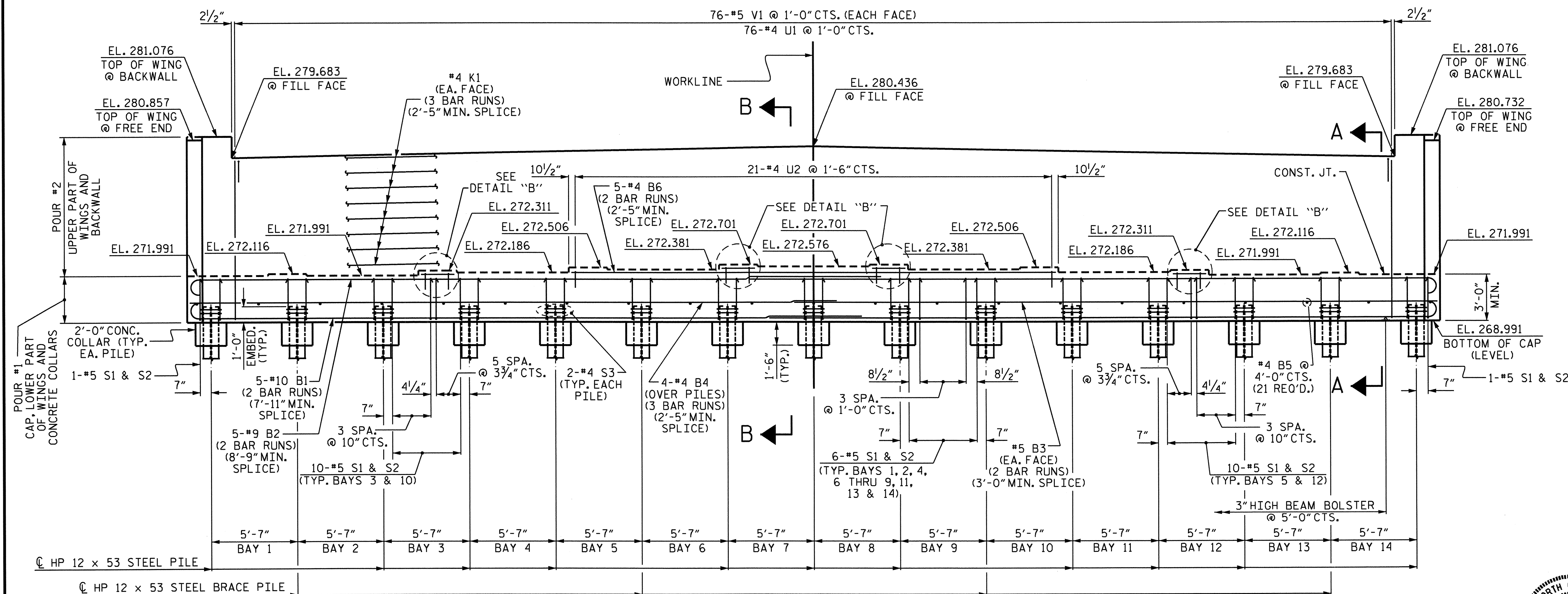
**DETAIL "A"**  
(TYP. EA. GDR.)



**DETAIL "B"**



**PLAN**



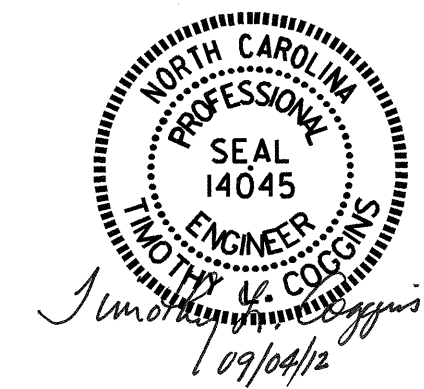
**ELEVATION**

WING BRACE PILE NOT SHOWN FOR CLARITY.

PROJECT NO. U-4444AB  
CUMBERLAND COUNTY  
 STATION: 132+79.28 -L-

SHEET 1 OF 3

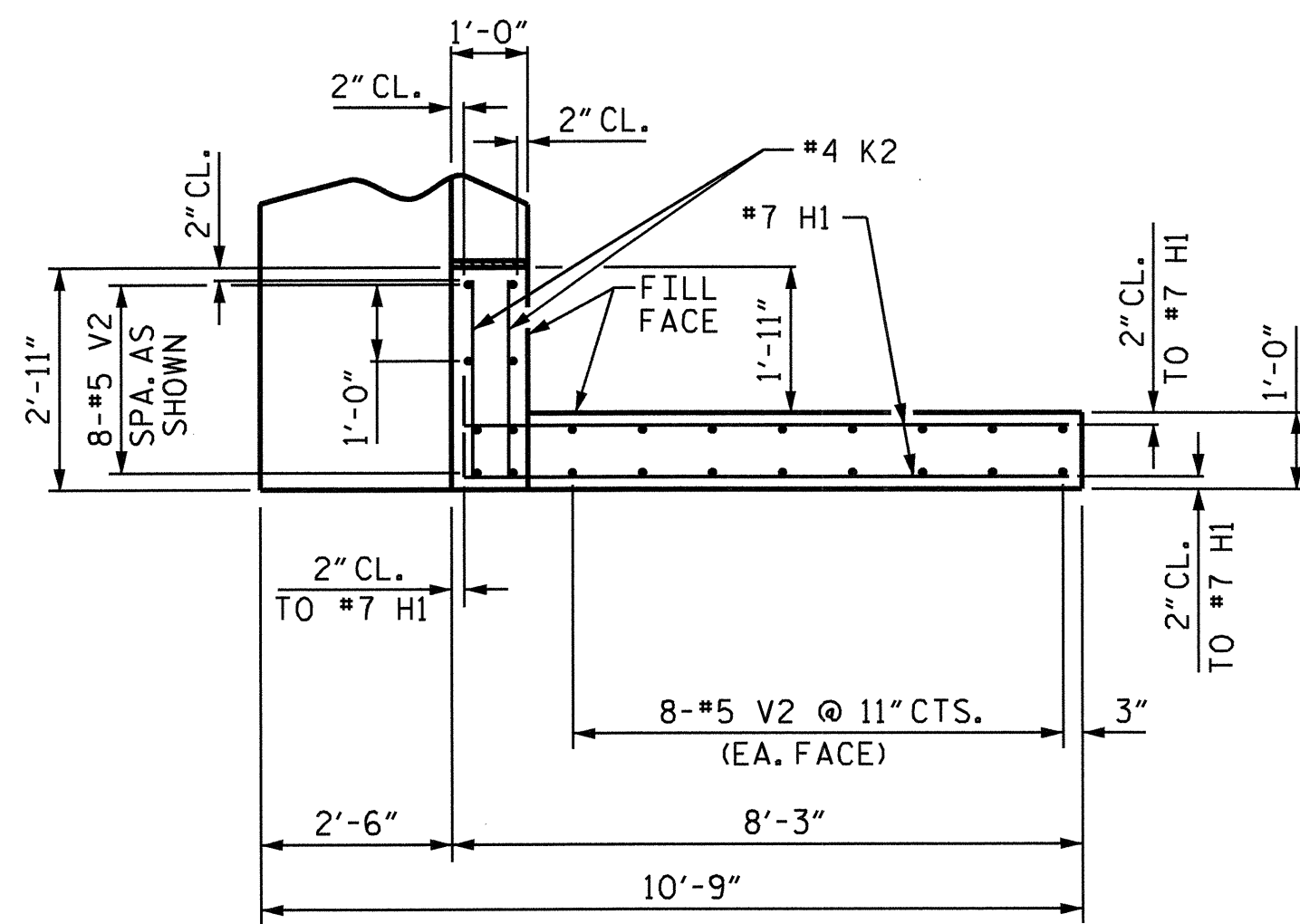
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT #1



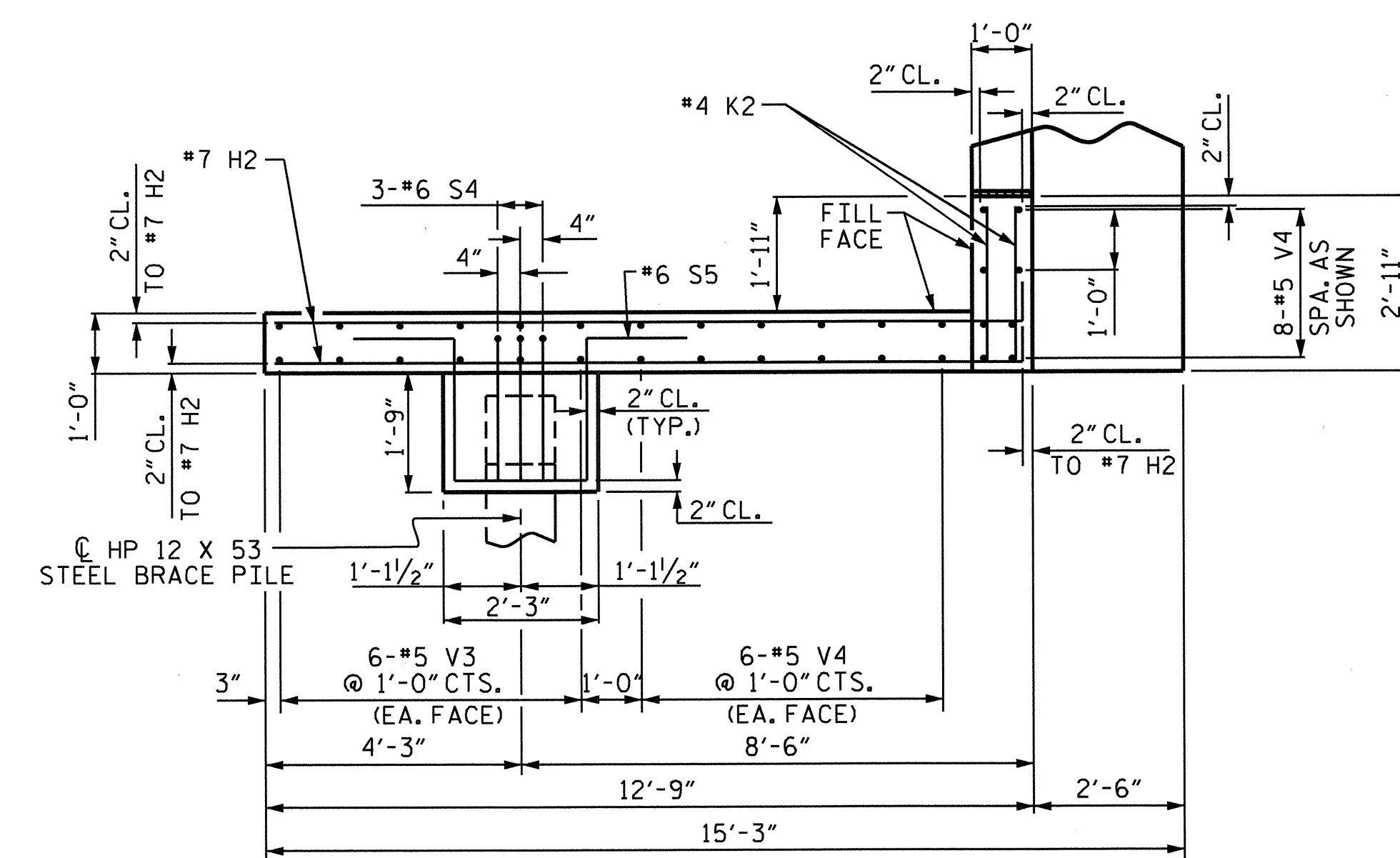
| REVISIONS |     |       |     |     |       | SHEET NO.<br>S-20  |
|-----------|-----|-------|-----|-----|-------|--------------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: |                    |
| 1         |     |       | 3   |     |       | TOTAL SHEETS<br>29 |
| 2         |     |       | 4   |     |       |                    |

DRAWN BY: JASON B. WILSON DATE: 01/05/11  
 CHECKED BY: B.N. BARODAWALA DATE: 6/13/11

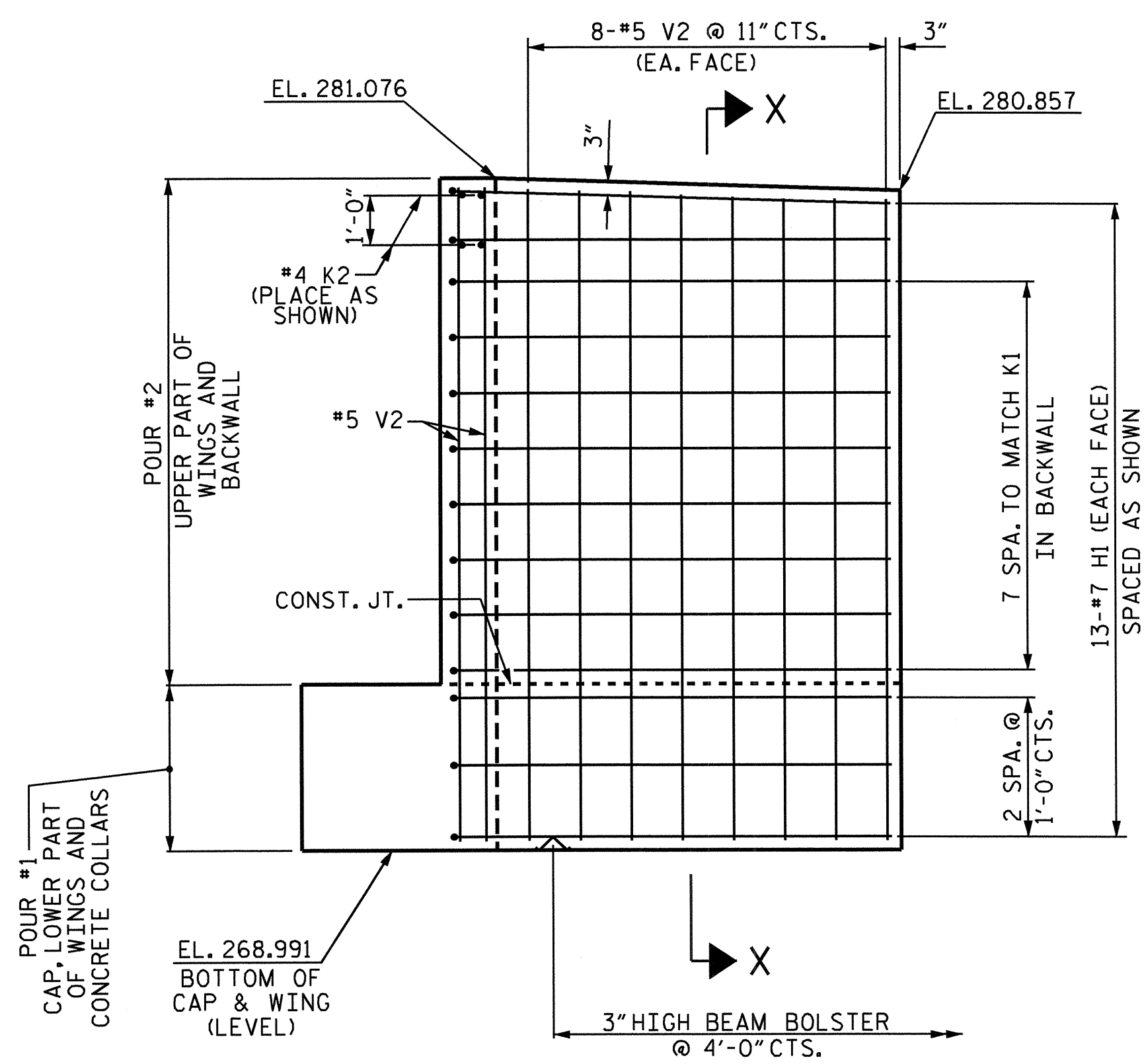
STR. #1



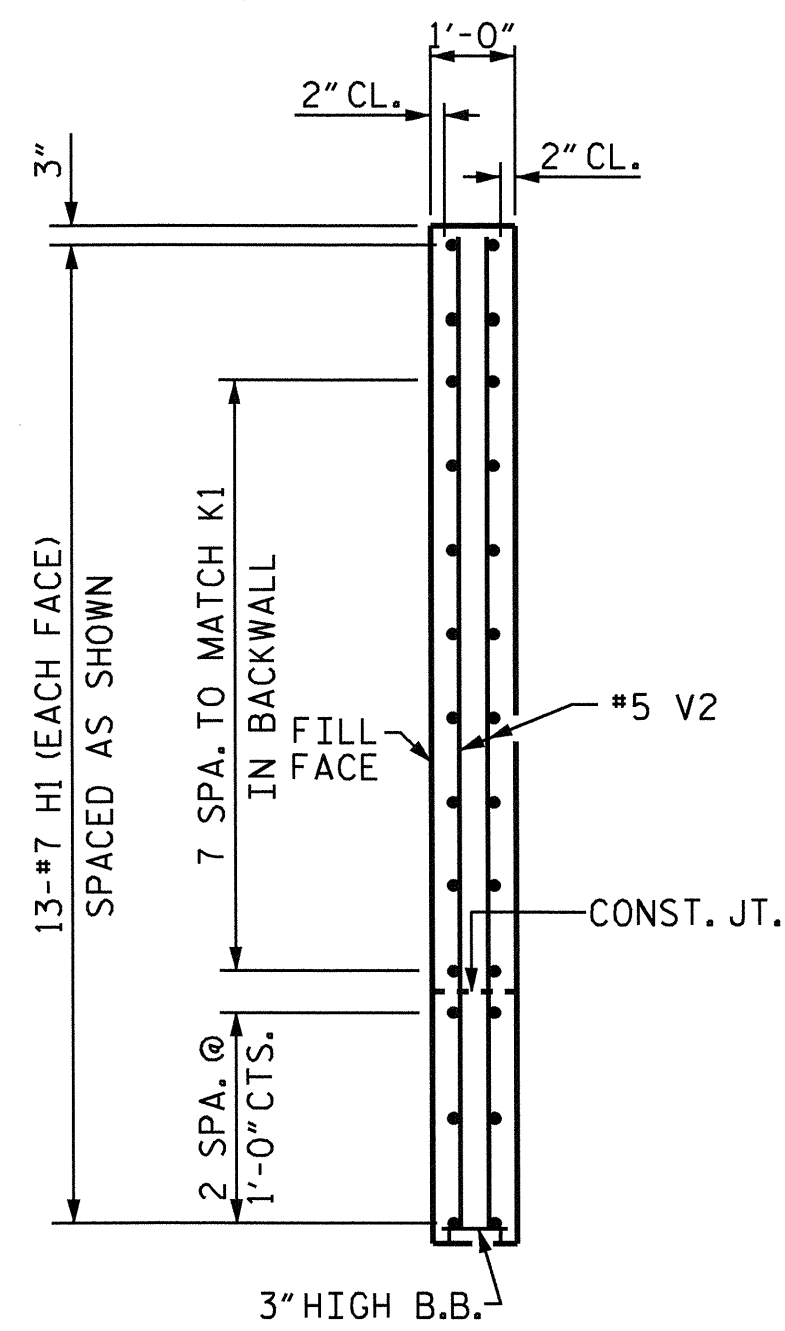
PLAN OF WING W1



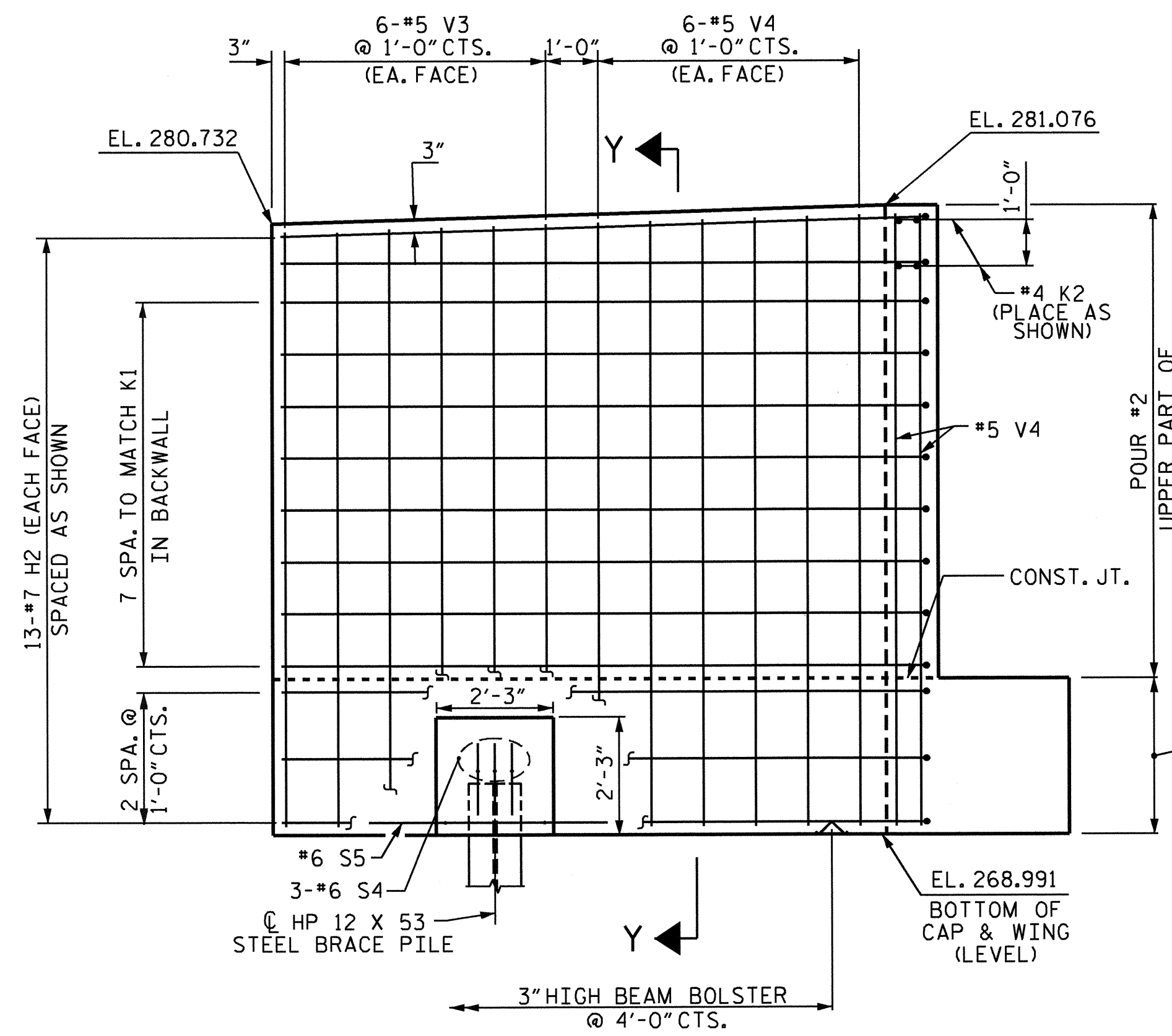
PLAN OF WING W2



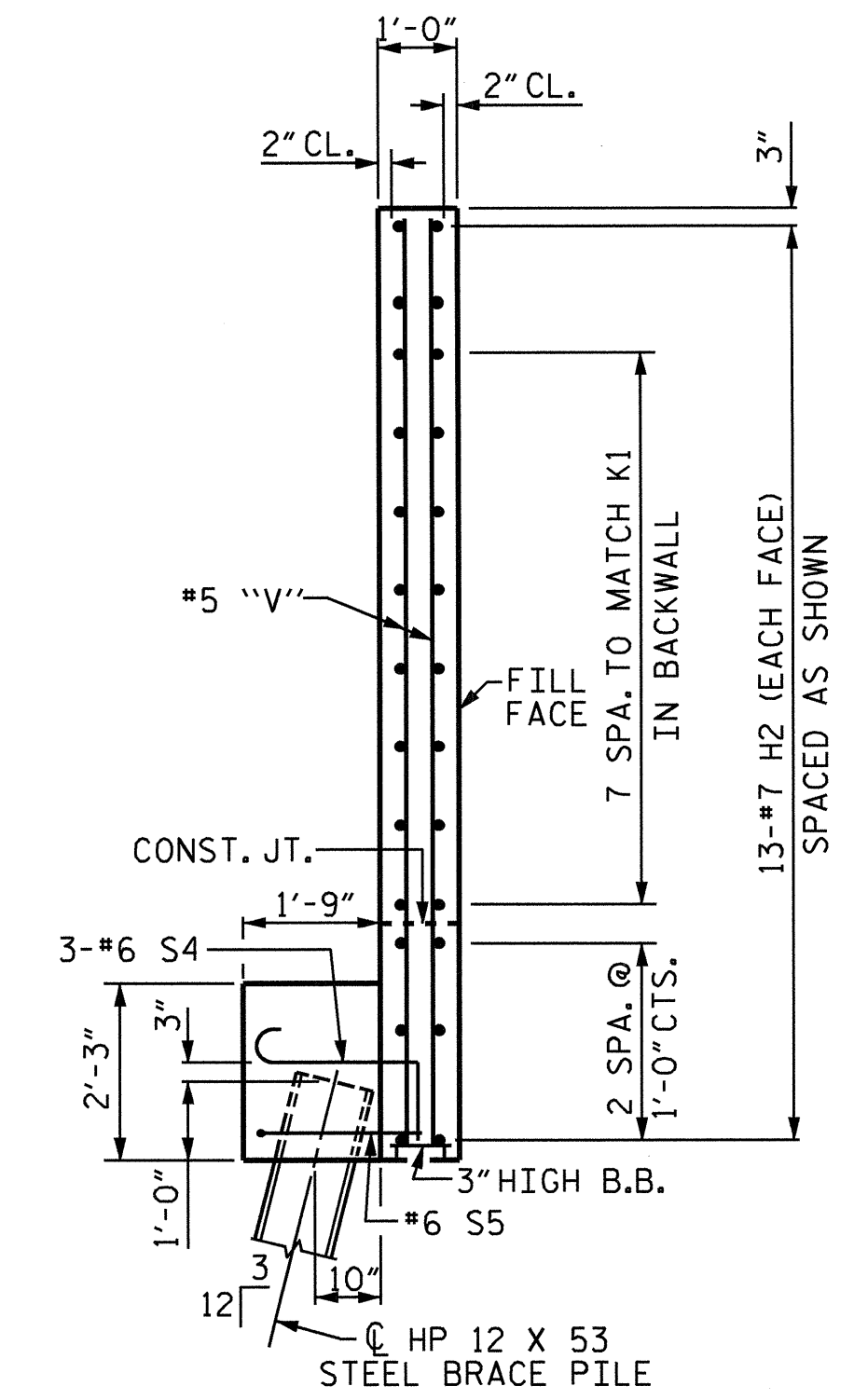
ELEVATION OF WING W1



SECTION X-X



ELEVATION OF WING W2

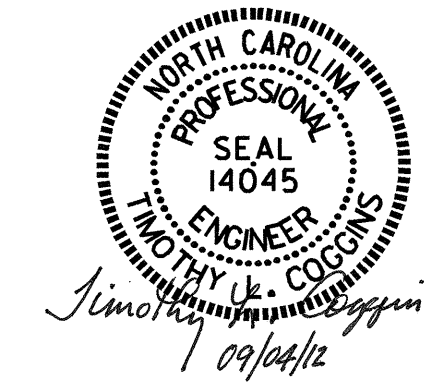


SECTION Y-Y

PROJECT NO. U-4444AB  
 CUMBERLAND COUNTY  
 STATION: 132+79.28 -L-

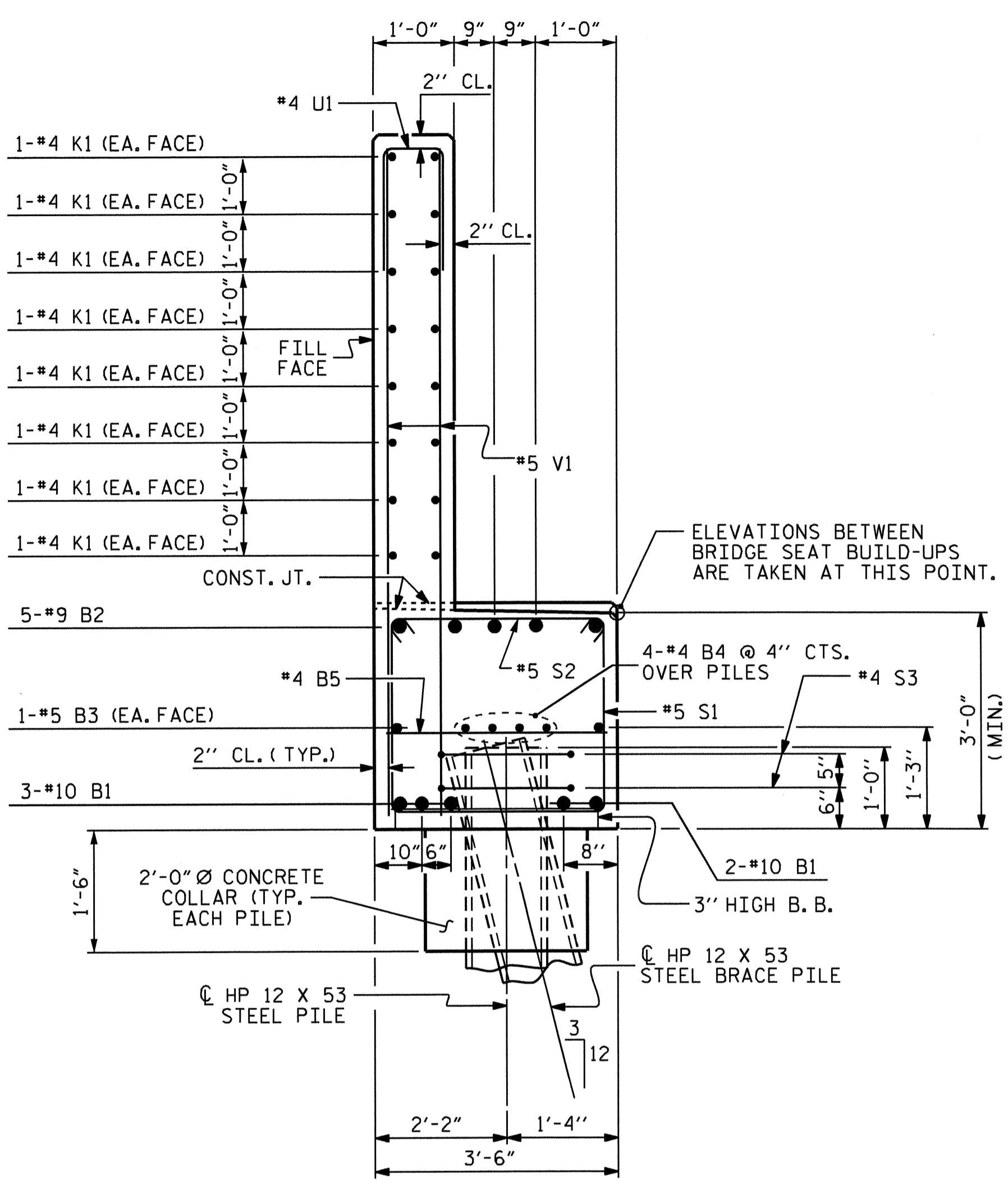
SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT #1

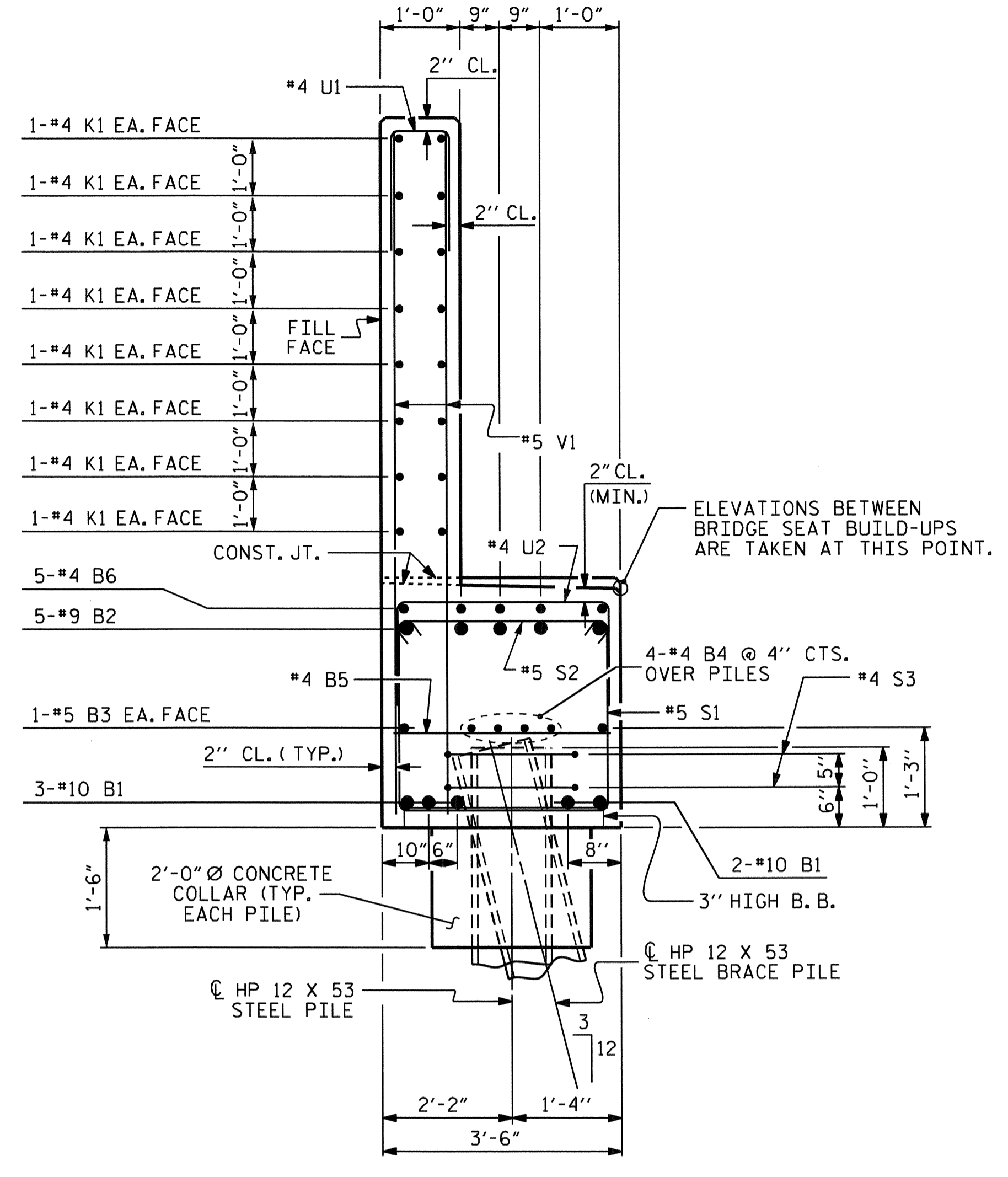


| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-21         |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |
| 2         |     |       | 4   |     |       | 29           |

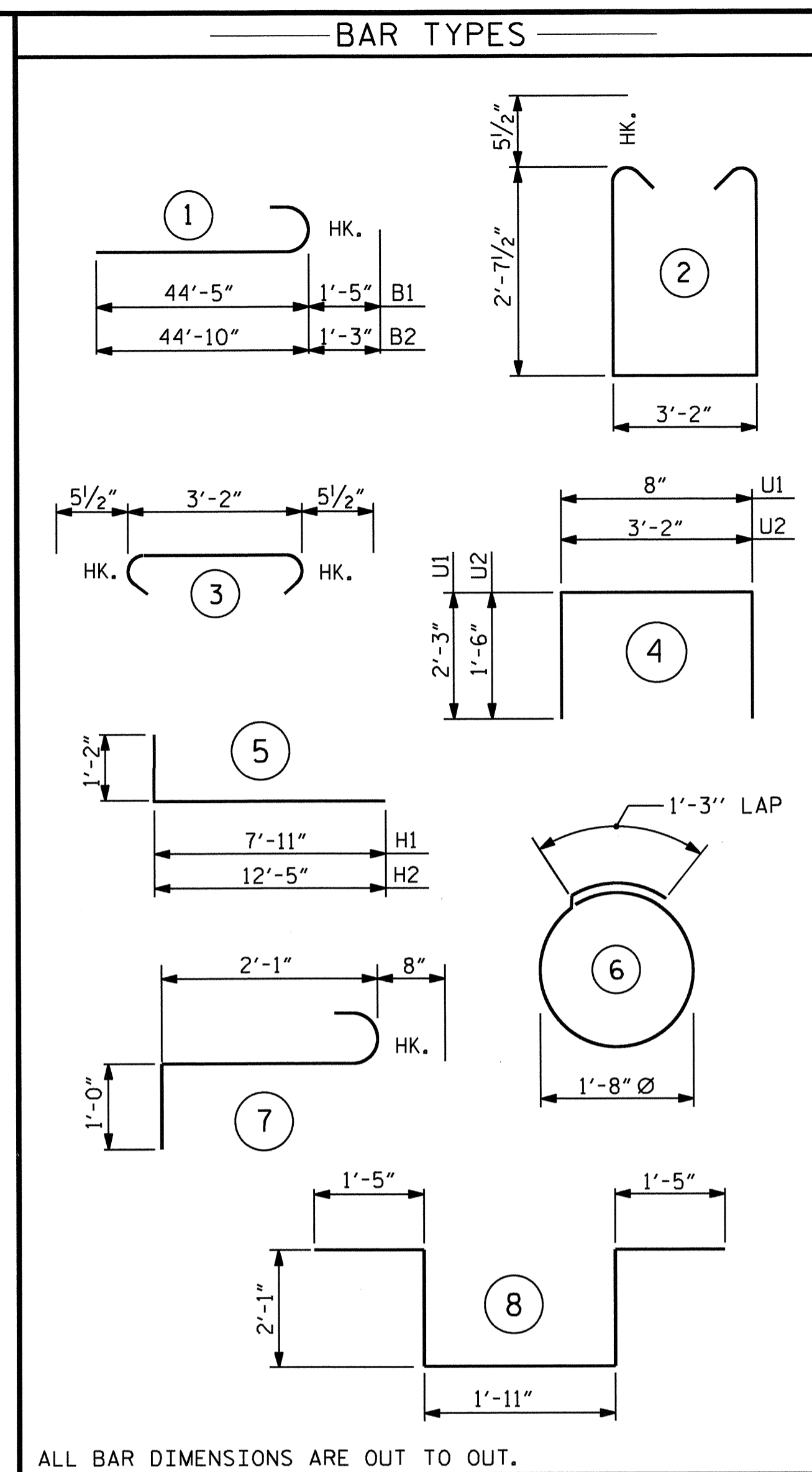
DRAWN BY: JASON B. WILSON DATE: 01/05/11  
 CHECKED BY: B.N. BARODAWALA DATE: 6/13/11



SECTION A-A

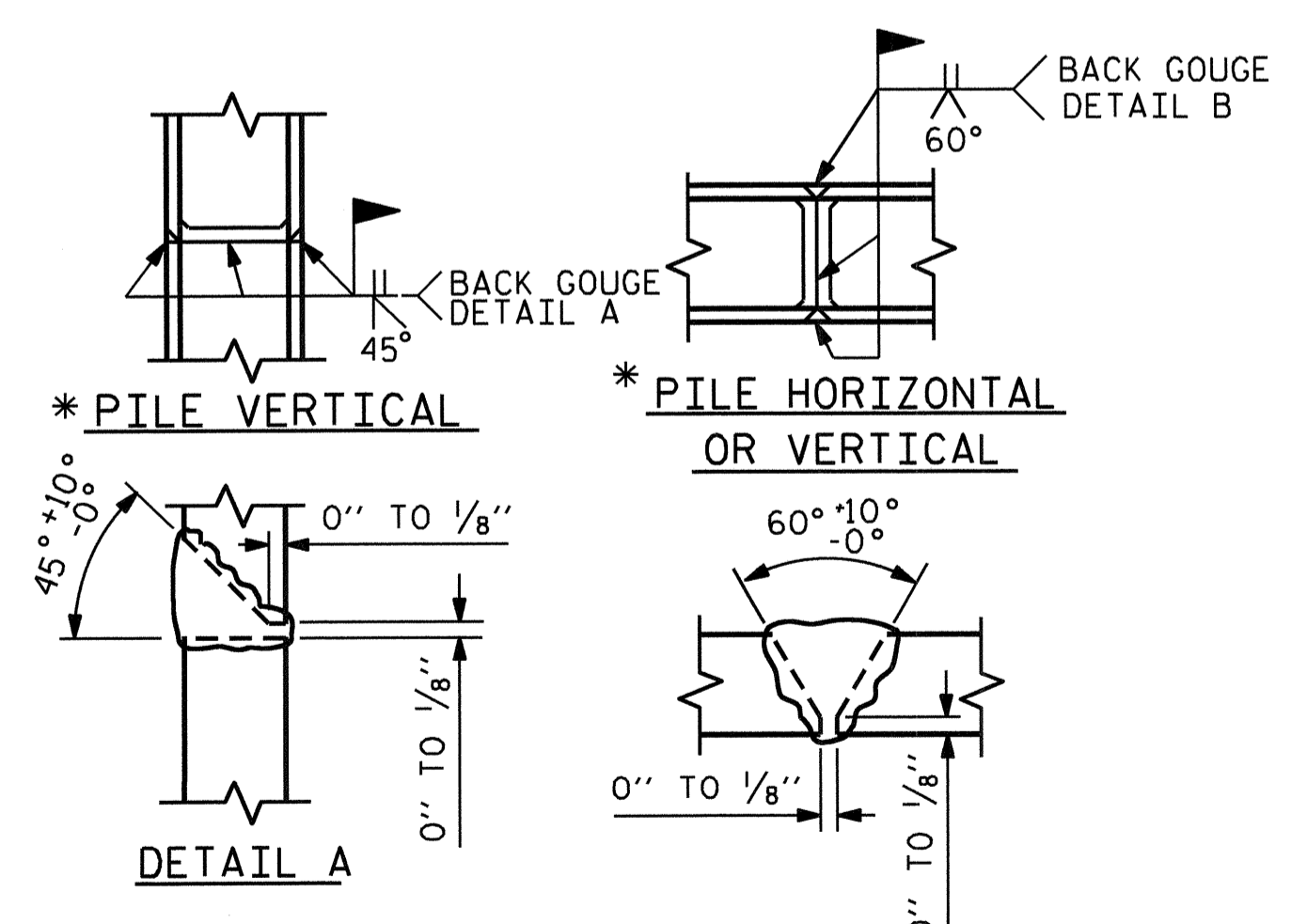


SECTION B-B

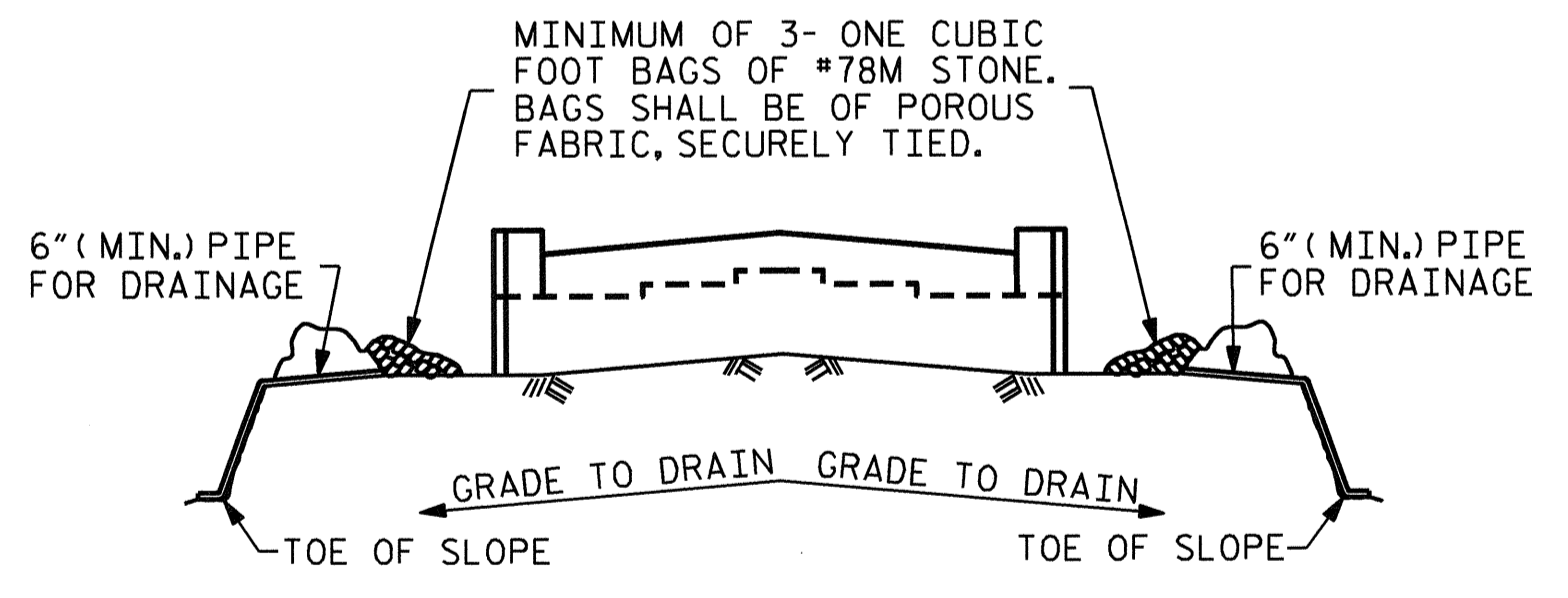


ALL BAR DIMENSIONS ARE OUT TO OUT.

| BILL OF MATERIAL  |     |      |      |         |                |
|---|-----|------|------|---------|----------------|
| END BENT #1   |     |      |      |         |                |
| BAR   | NO. | SIZE | TYPE | LENGTH  | WEIGHT         |
| B1  | 10  | #10  | 1    | 45'-10" | 1,972          |
| B2  | 10  | #9   | 1    | 46'-1"  | 1,567          |
| B3  | 4   | #5   | STR  | 42'-0"  | 175            |
| B4  | 12  | #4   | STR  | 28'-7"  | 229            |
| B5  | 21  | #4   | STR  | 3'-2"   | 44             |
| B6  | 10  | #4   | STR  | 16'-11" | 113            |
| B7  | 20  | #4   | STR  | 2'-2"   | 29             |
| H1  | 26  | #7   | 5    | 9'-1"   | 483            |
| H2  | 26  | #7   | 5    | 13'-7"  | 722            |
| K1  | 48  | #4   | STR  | 28'-7"  | 916            |
| K2  | 8   | #4   | STR  | 2'-7"   | 14             |
| S1  | 102 | #5   | 2    | 9'-4"   | 993            |
| S2  | 102 | #5   | 3    | 4'-1"   | 434            |
| S3  | 30  | #4   | 6    | 6'-6"   | 130            |
| S4  | 3   | #6   | 7    | 3'-9"   | 17             |
| S5  | 1   | #6   | 8    | 8'-11"  | 13             |
| U1  | 76  | #4   | 4    | 5'-2"   | 262            |
| U2  | 29  | #4   | 4    | 6'-2"   | 119            |
| V1  | 152 | #5   | STR  | 10'-4"  | 1,638          |
| V2  | 24  | #5   | STR  | 11'-6"  | 288            |
| V3  | 12  | #5   | STR  | 11'-5"  | 143            |
| V4  | 20  | #5   | STR  | 11'-7"  | 242            |
| REINFORCING STEEL   |     |      |      |         | = 10,543 LBS   |
| CLASS A CONCRETE BREAKDOWN  |     |      |      |         |                |
| POUR #1 (CAP, LOWER PART OF WINGS, WING BRACE PILE CAP & CONC. COLLARS) |     |      |      |         |                |
|   |     |      |      |         | 39.4 CU. YDS.  |
| POUR #2 (BACKWALL & UPPER PART OF WINGS)                                |     |      |      |         |                |
|   |     |      |      |         | 30.0 CU. YDS.  |
| TOTAL CLASS A CONCRETE  |     |      |      |         | 69.4 CU. YDS.  |
| HP 12 X 53 STEEL PILES  |     |      |      |         |                |
| NO. 16  |     |      |      |         | 1,240 LIN. FT. |
| PILE REDRIVES   |     |      |      |         | EA. 15         |



PILE SPLICE DETAILS

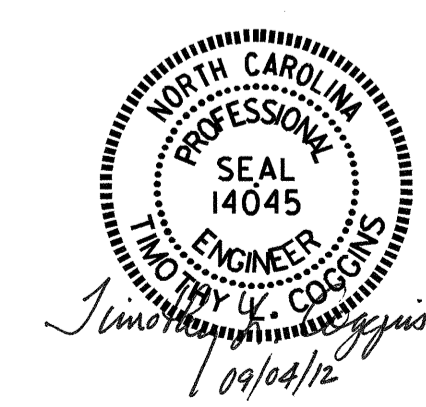


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



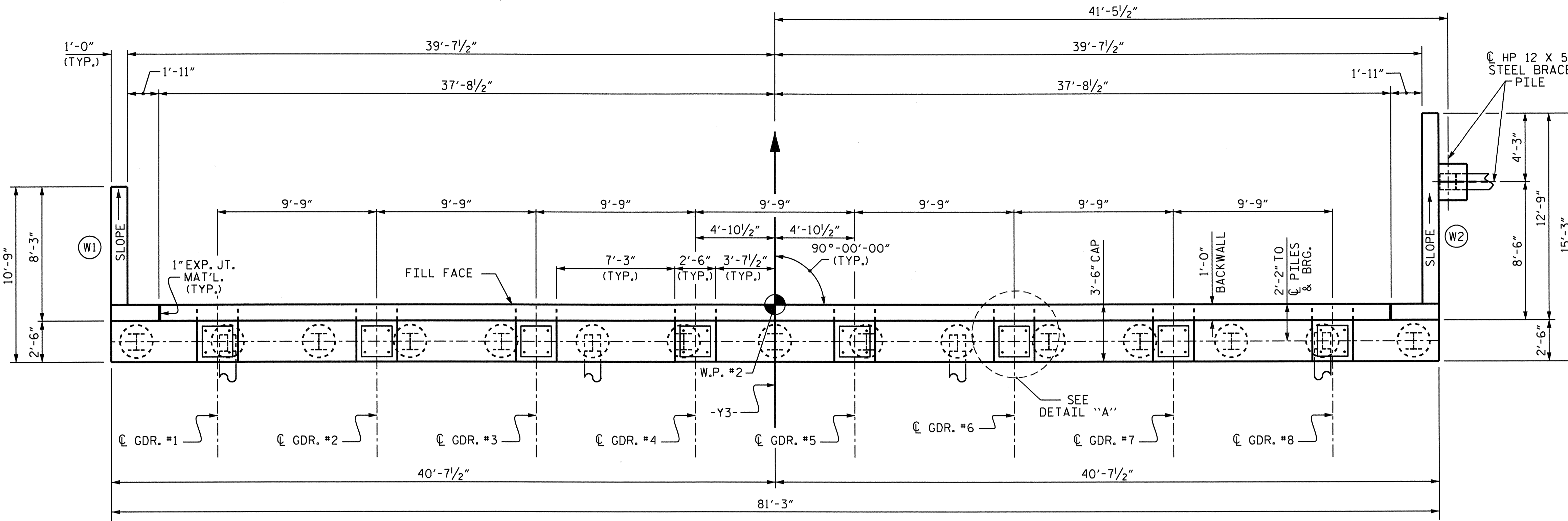
PROJECT NO. U-4444AB  
 CUMBERLAND COUNTY  
 STATION: 132+79.28 -L-

SHEET 3 OF 3

| STATE OF NORTH CAROLINA<br>DEPARTMENT OF TRANSPORTATION<br>RALEIGH |     |       |     |     |                    |
|--|-----|-------|-----|-----|--------------------|
| SUBSTRUCTURE<br>END BENT #1  |     |       |     |     |                    |
| REVISIONS  |     |       |     |     | SHEET NO.          |
| NO.  | BY: | DATE: | NO. | BY: | DATE:              |
| 1  |     |       | 3   |     |                    |
| 2  |     |       | 4   |     |                    |
|  |     |       |     |     | S-22               |
|  |     |       |     |     | TOTAL SHEETS<br>29 |

DRAWN BY: JASON B. WILSON DATE: 01/06/11  
 CHECKED BY: B.N. BARODAWALA DATE: 6/13/11





**NOTES**

STIRRUPS AND U2 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

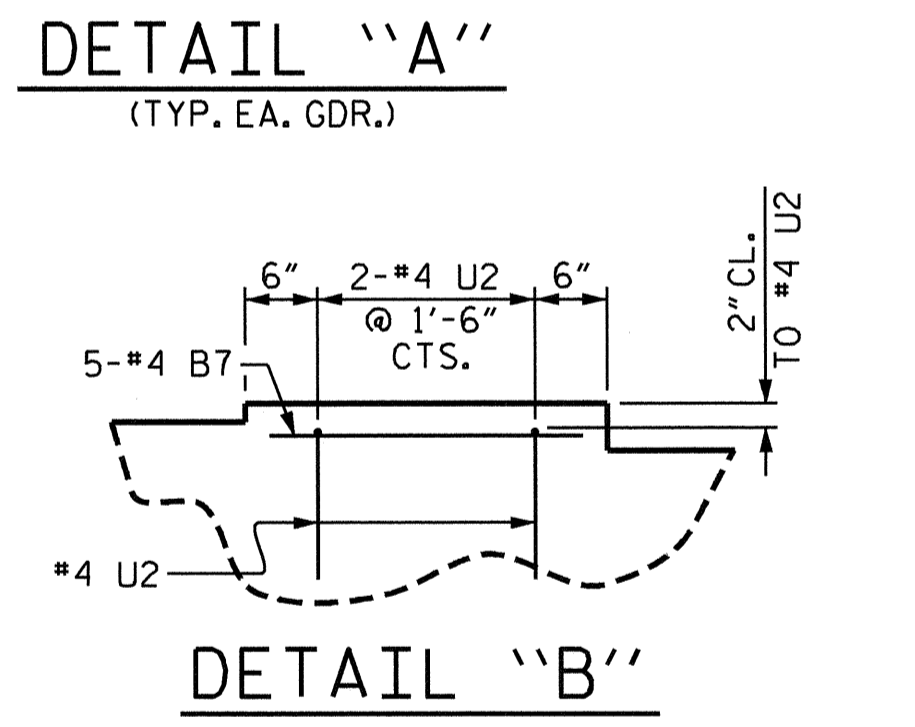
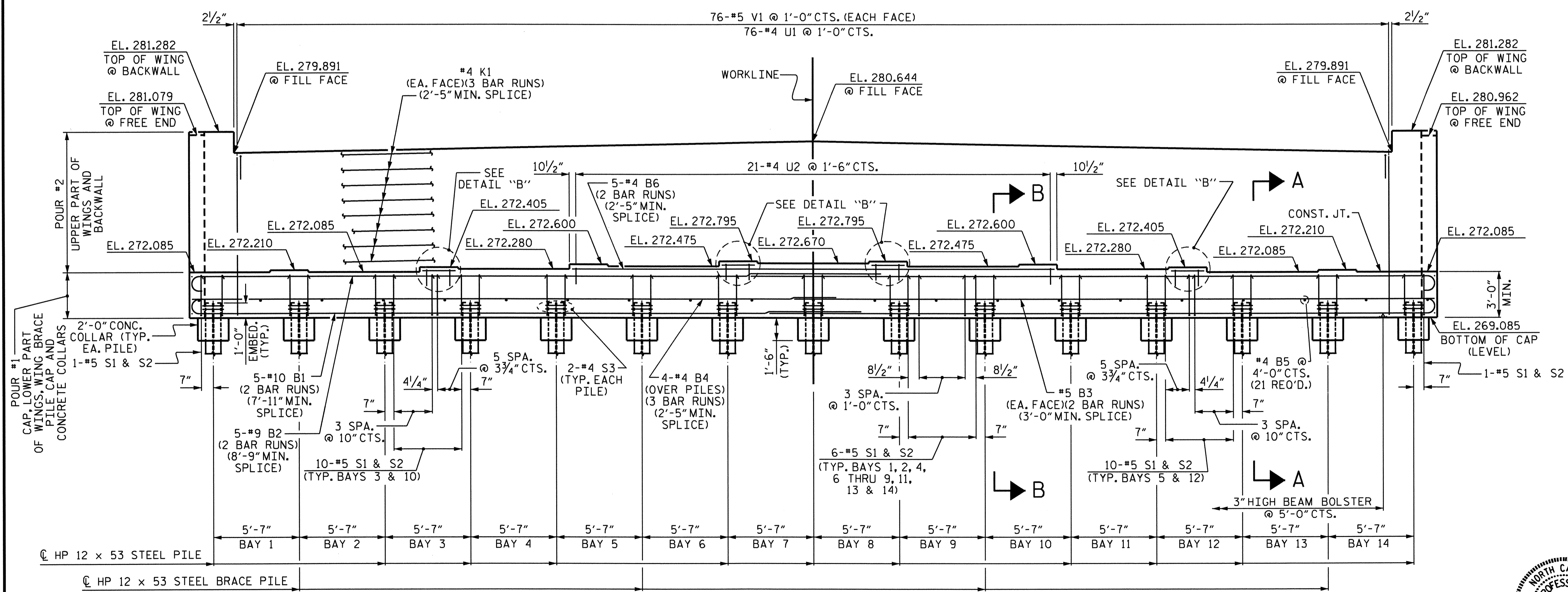
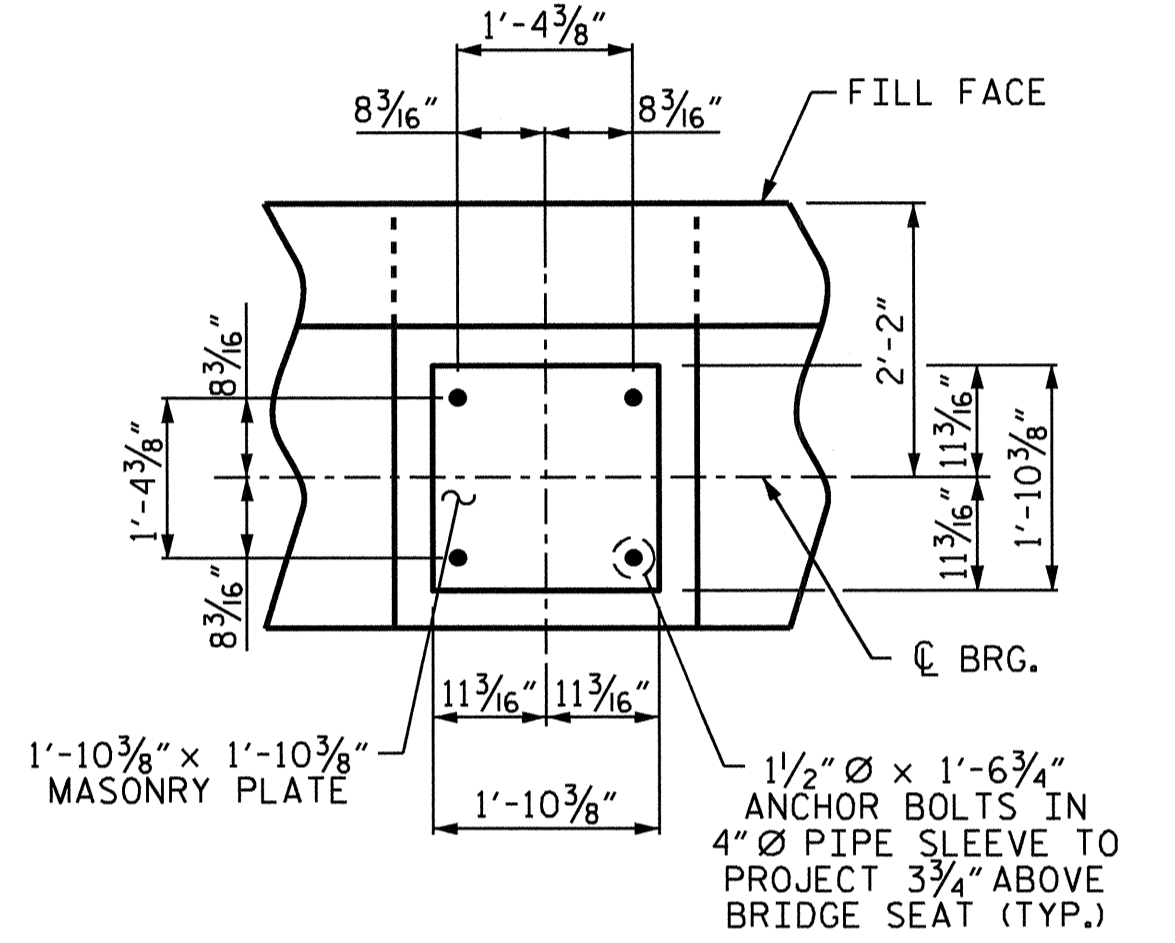
BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

THE TOP SURFACE OF THE END BENT CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

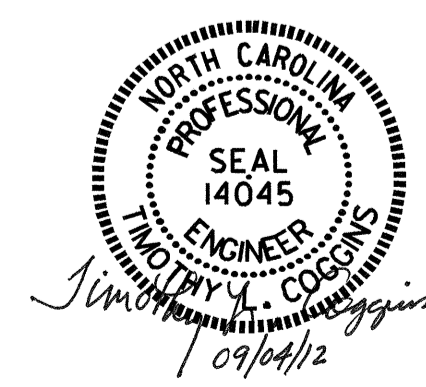
INSTALL THE 4" DIA. DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS. SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

FOR PIPE INSERT DETAILS, SEE "POT BEARING DETAILS" SHEET.



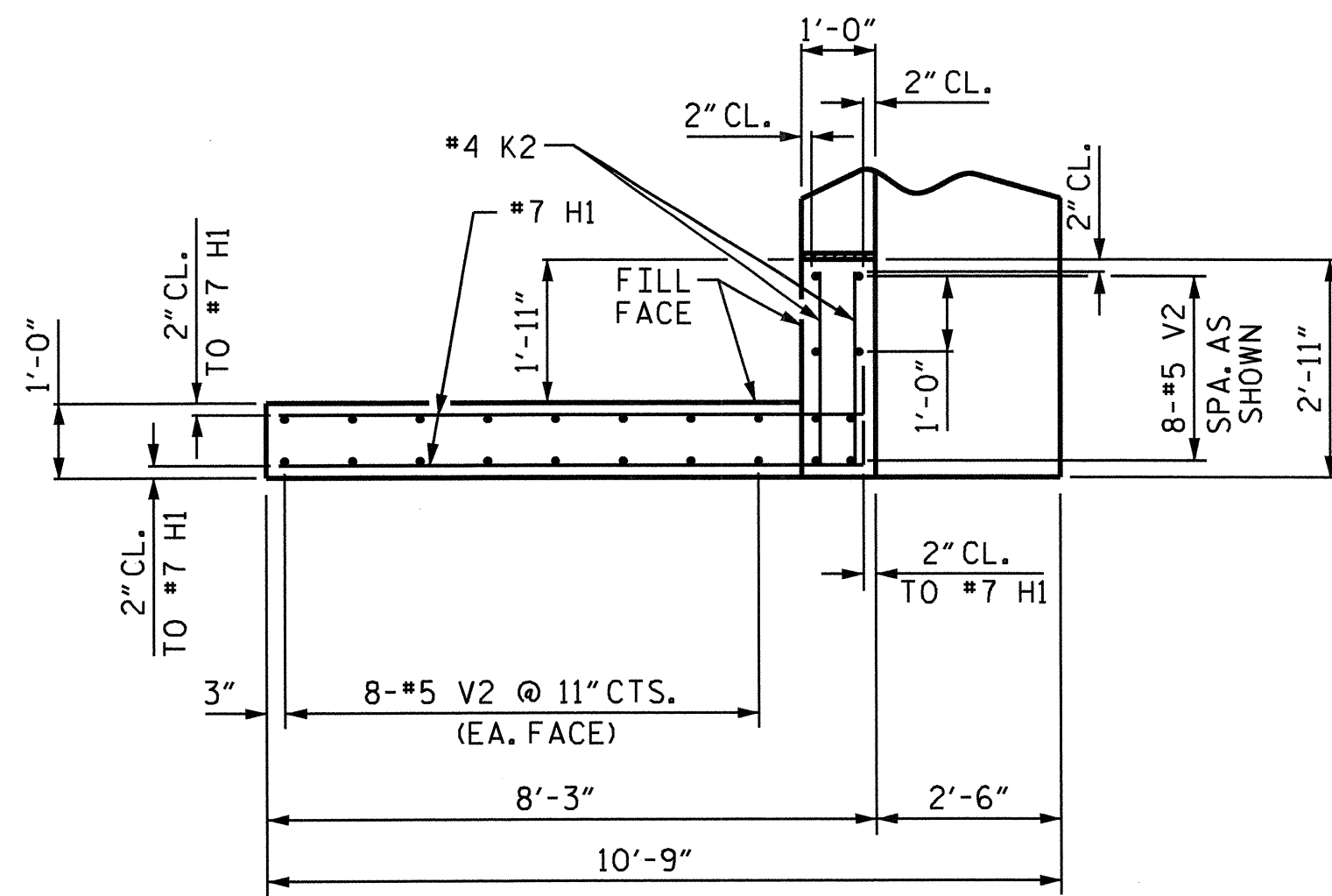
PROJECT NO. U-4444AB  
CUMBERLAND COUNTY  
 STATION: 132+79.28 -L-  
 SHEET 1 OF 3

|  |     |       |     |     |                    |
|--|-----|-------|-----|-----|--------------------|
| STATE OF NORTH CAROLINA<br>DEPARTMENT OF TRANSPORTATION<br>RALEIGH |     |       |     |     |                    |
| SUBSTRUCTURE<br>END BENT #2  |     |       |     |     |                    |
| REVISIONS  |     |       |     |     | SHEET NO.          |
| NO.  | BY: | DATE: | NO. | BY: | DATE:              |
| 1  |     |       | 3   |     |                    |
| 2  |     |       | 4   |     |                    |
|  |     |       |     |     | TOTAL SHEETS<br>29 |

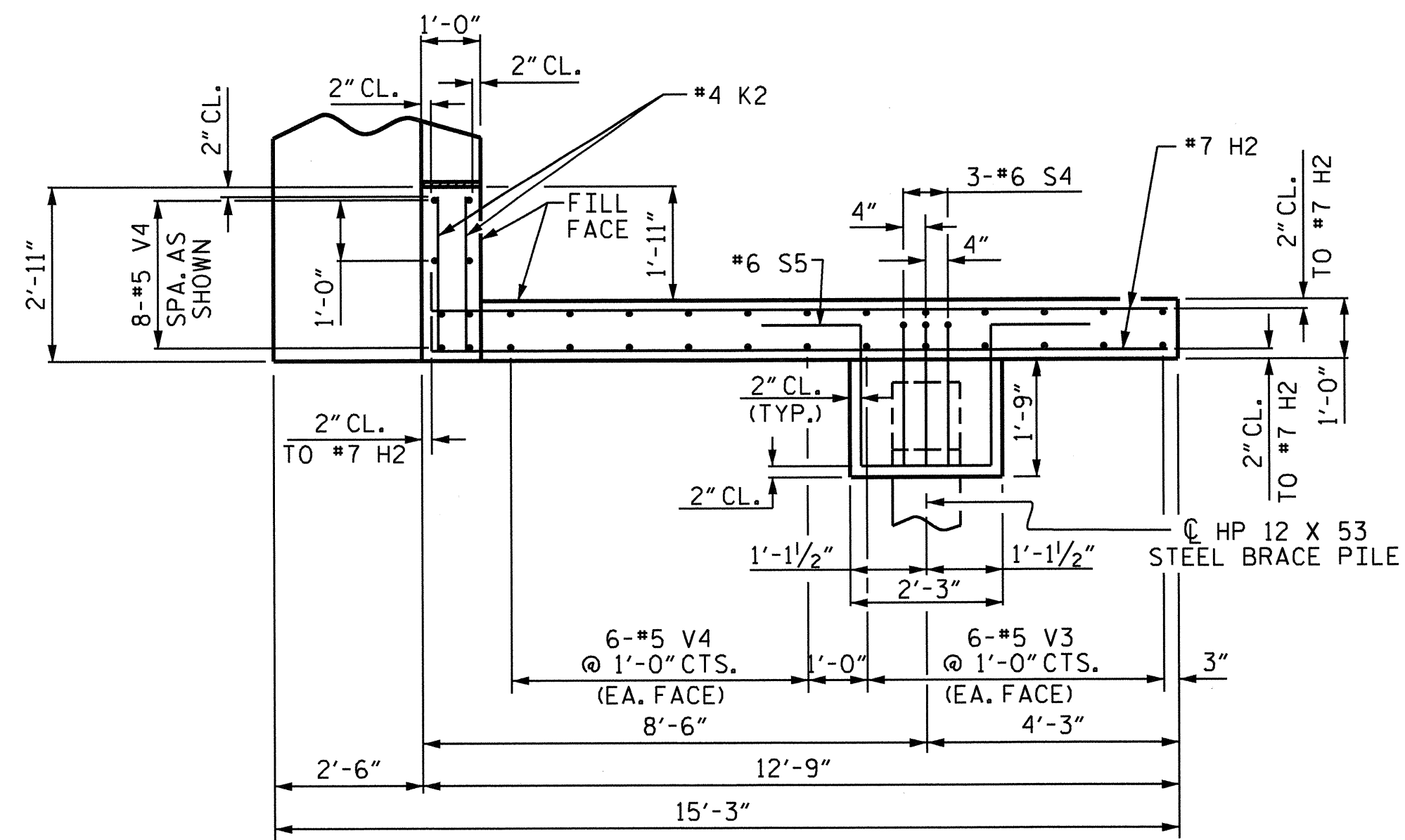


DRAWN BY: JASON B. WILSON DATE: 01/14/11  
 CHECKED BY: B.N. BARODAWALA DATE: 6/13/11

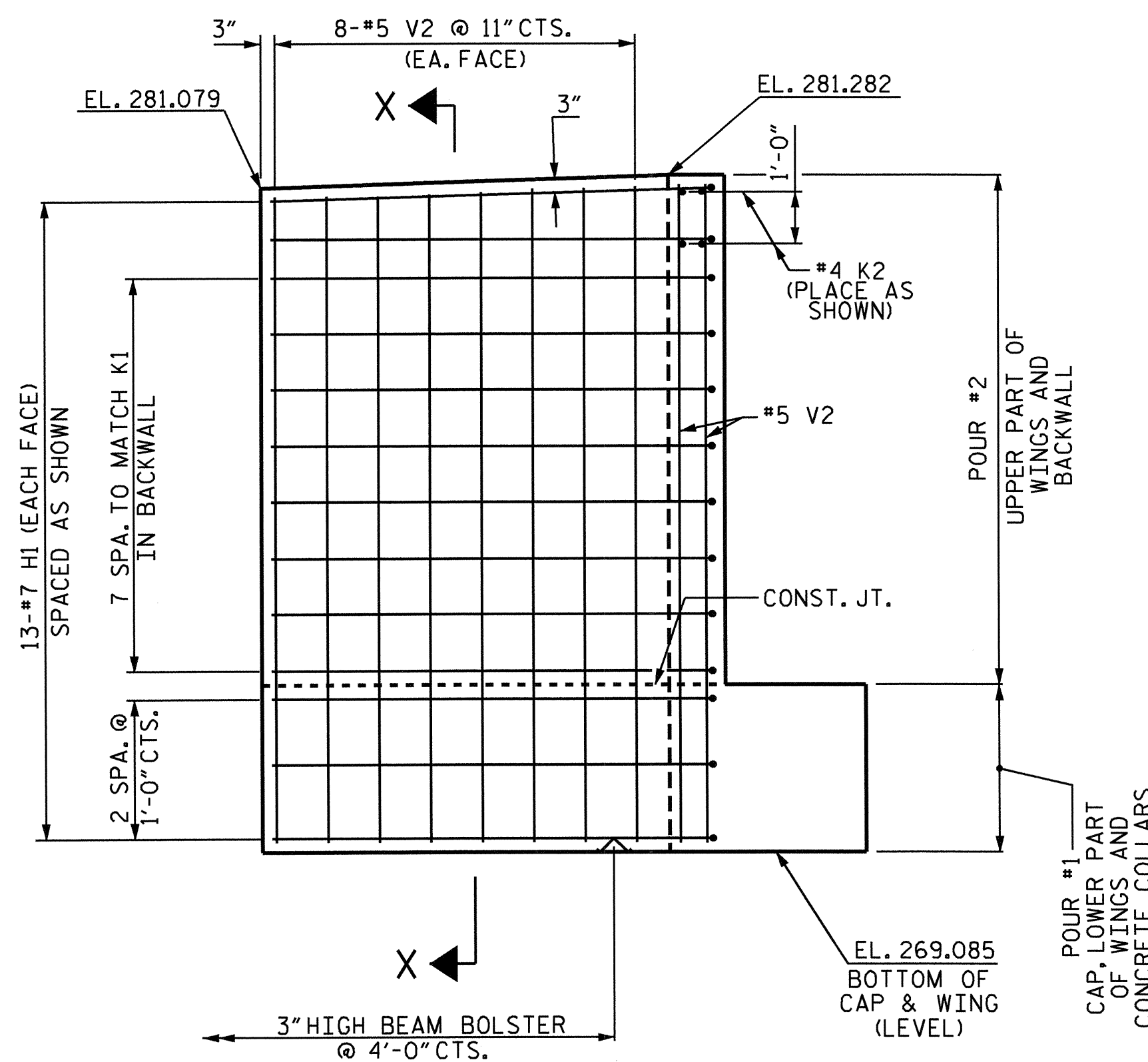
STR. #1



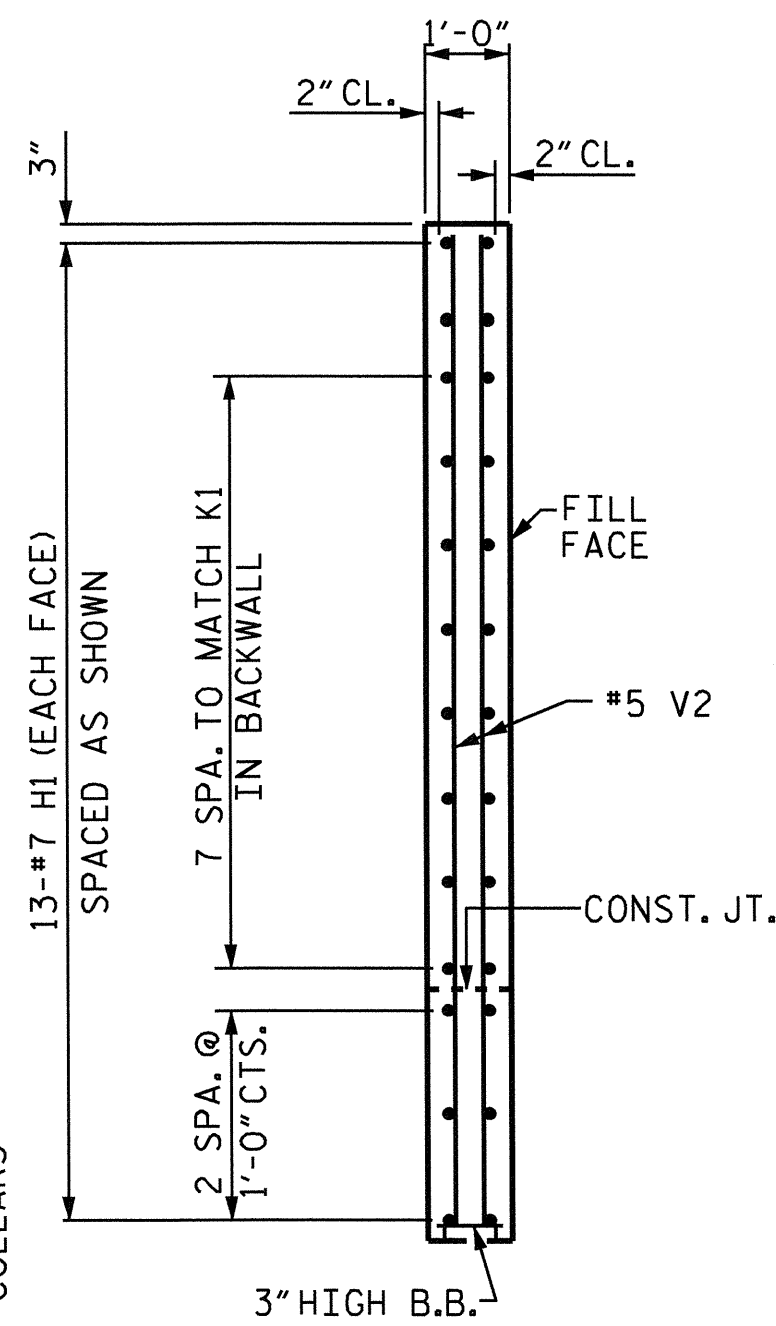
PLAN OF WING W1



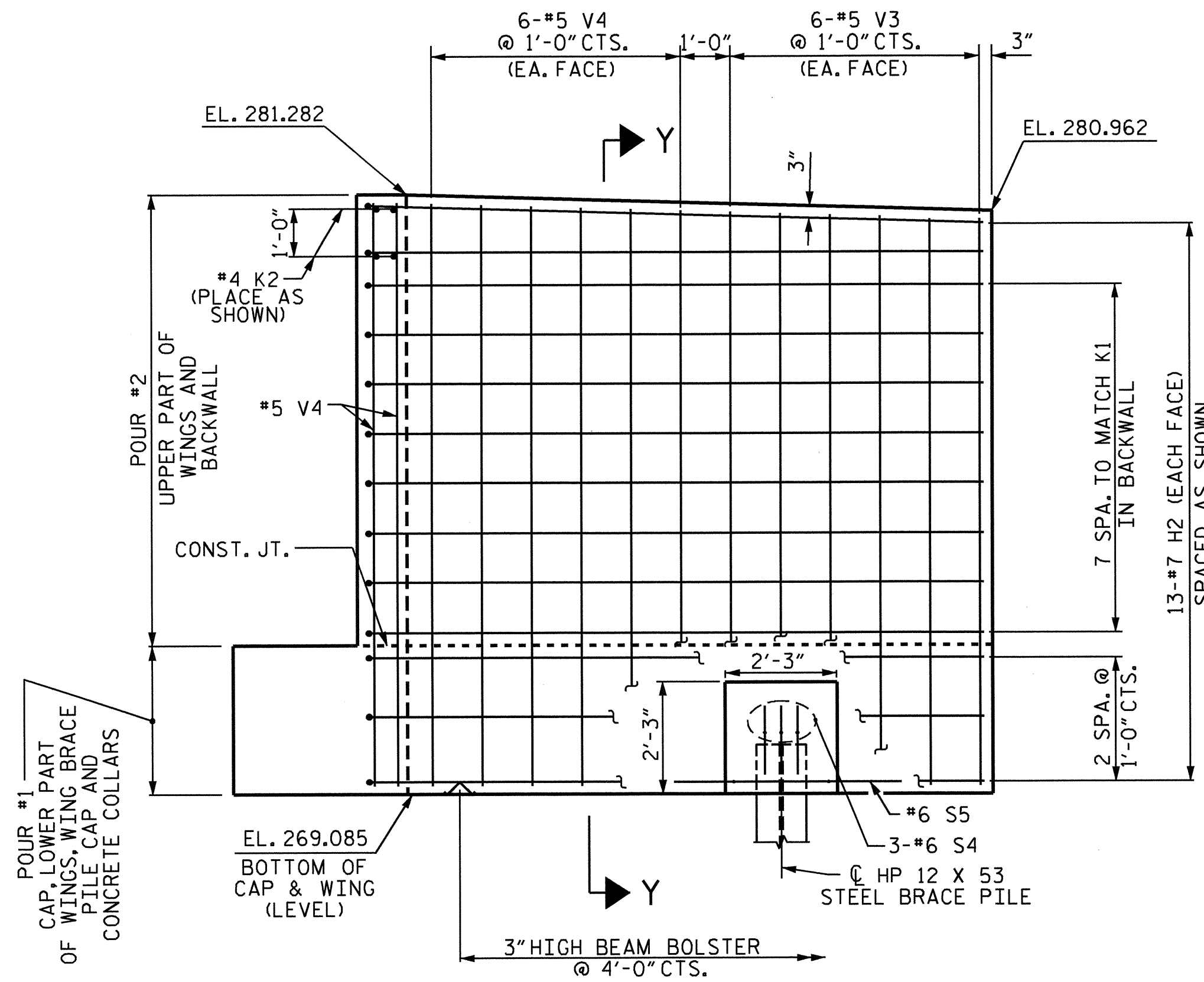
PLAN OF WING W2



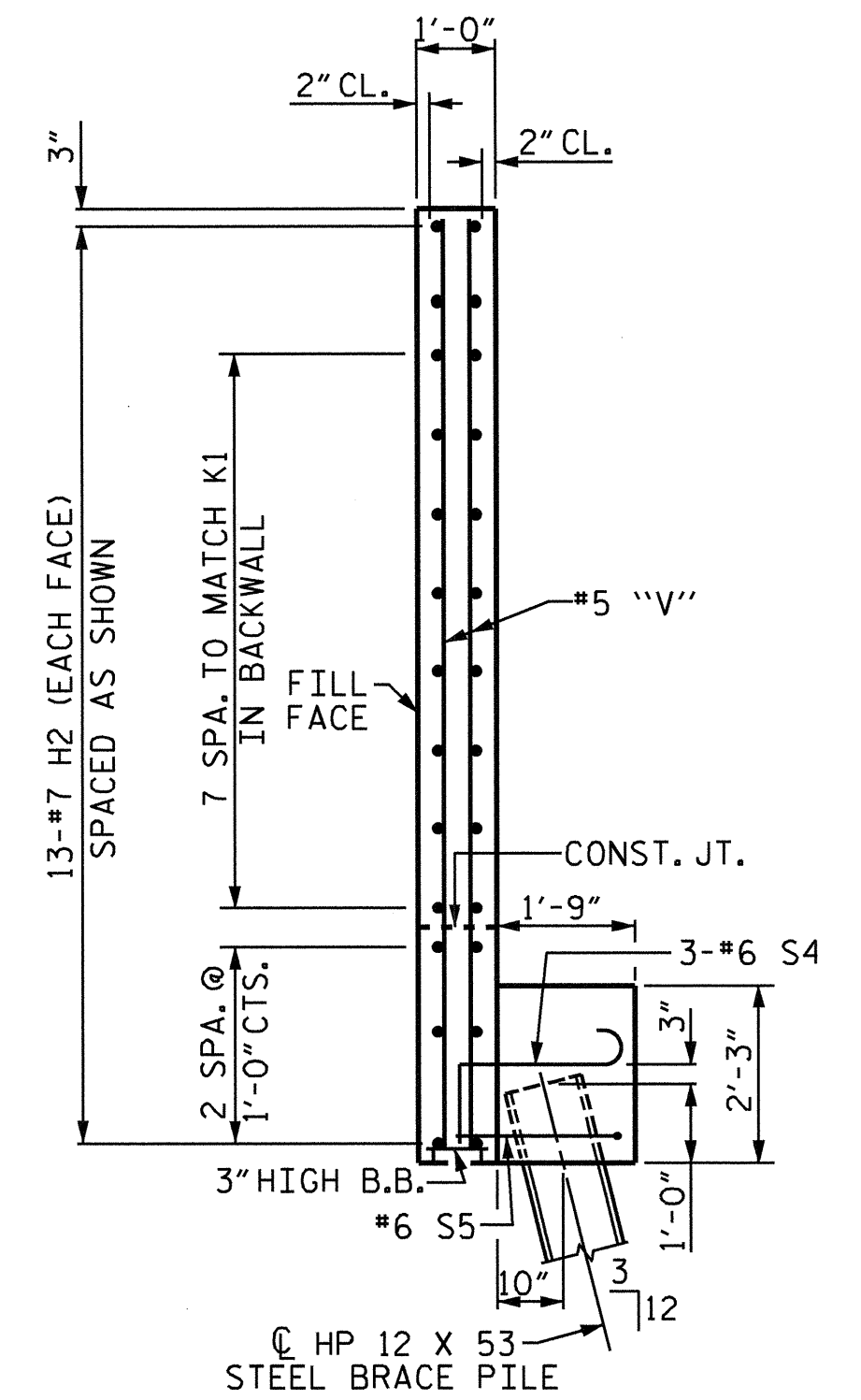
ELEVATION OF WING W1



SECTION X-X



ELEVATION OF WING W2



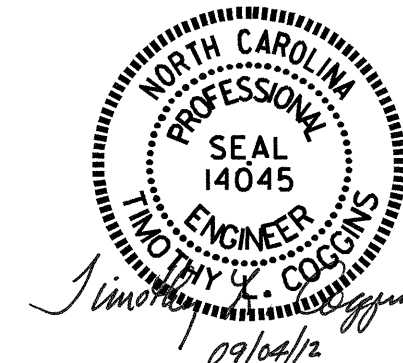
SECTION Y-Y

PROJECT NO. U-4444AB  
 CUMBERLAND COUNTY  
 STATION: 132+79.28 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT #2



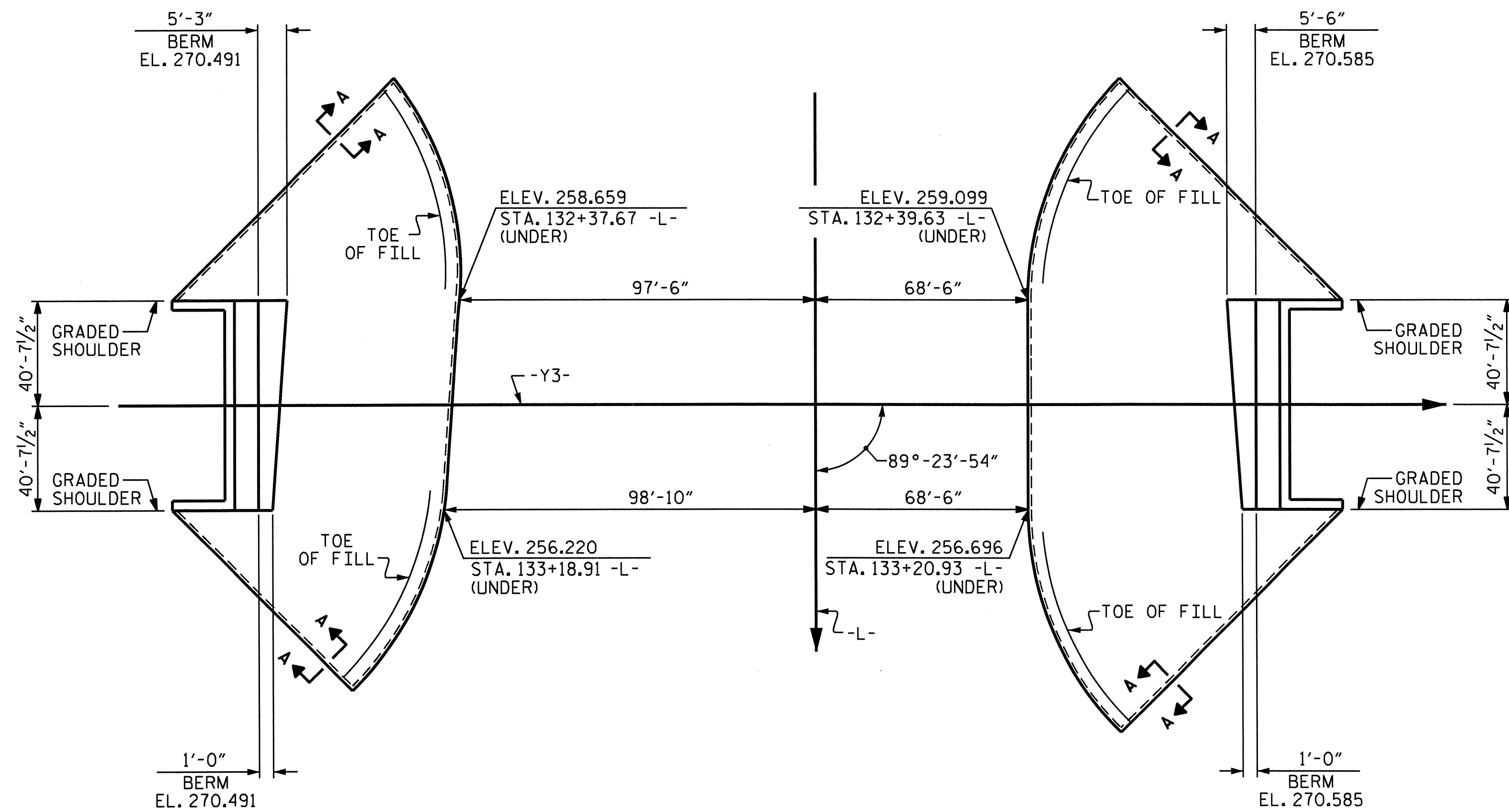
DRAWN BY: JASON B. WILSON DATE: 01/05/11  
 CHECKED BY: B.N. BARODAWALA DATE: 6/13/11

04-SEP-2012 09:08  
 R:\TIP\Projects\U4444AB\Structures\Plans\Str#1\Final Plans\U4444ab.sd,eb.01.dgn  
 tcoggins

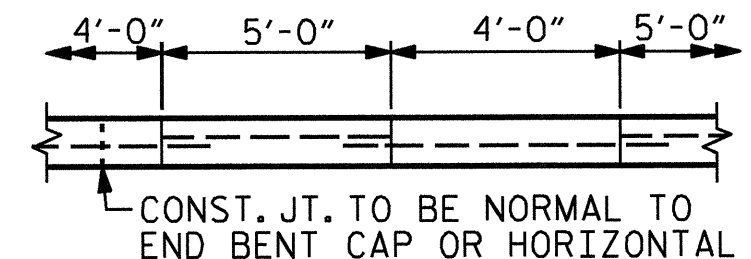
| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-24         |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |
| 2         |     |       | 4   |     |       | 29           |

STR. #1



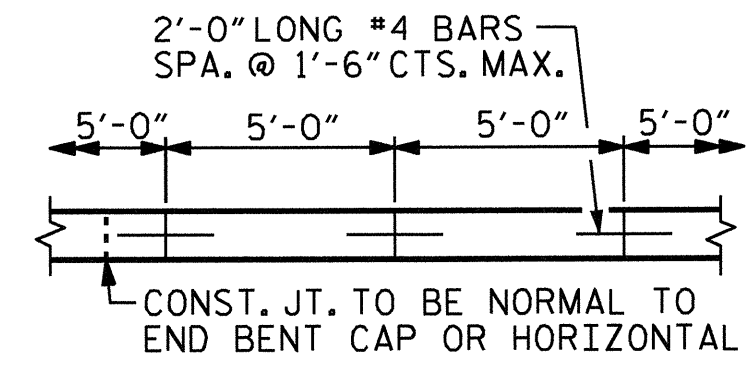


PLAN



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

OPTIONAL POURING DETAIL



STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL

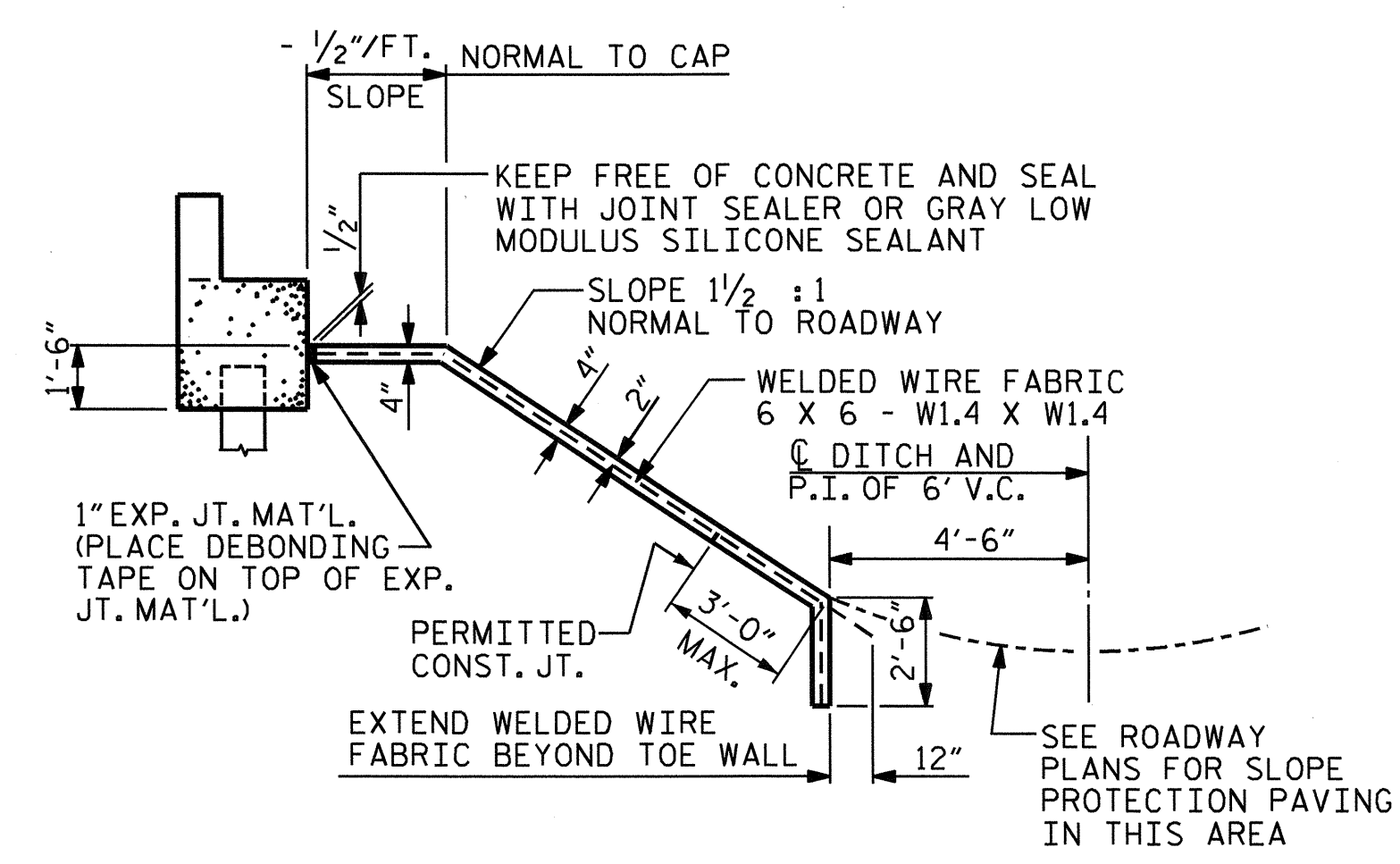
GENERAL NOTES

SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS.

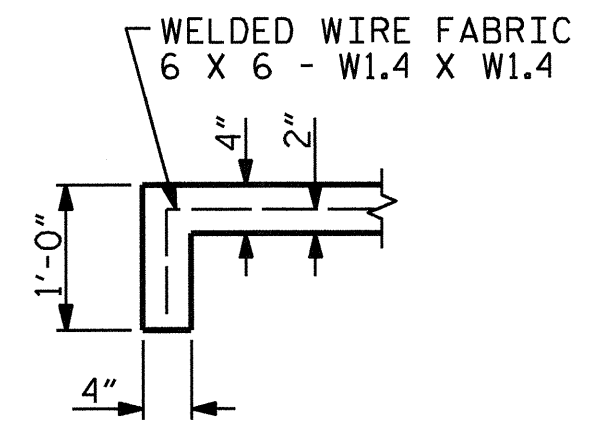
SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL BE POURED IN 5' STRIPS AS SHOWN IN THE "POURING DETAIL" WITH 2'-0" LONG #4 BARS PLACED ALONG THE SLOPE BETWEEN STRIPS AT 1'-6" MAXIMUM SPACING. SLOPE PROTECTION MAY BE POURED IN ALTERNATE 4' AND 5' STRIPS AS SHOWN IN THE "OPTIONAL POURING DETAIL" WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6". THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

| BRIDGE @<br>STA. 132+79.28 -L- | 4" INCH<br>SLOPE PROTECTION | *<br>WELDED WIRE FABRIC<br>60" INCHES WIDE |
|--------------------------------|-----------------------------|--|
|                                | SQUARE YARDS                | APPROX. L.F.                               |
| END BENT 1                     | 817                         | 1634                                       |
| END BENT 2                     | 799                         | 1598                                       |

\* QUANTITY SHOWN IS BASED ON 5' POURS.



SECTION ALONG C ROADWAY WHEN FILL CATCHES IN DITCH

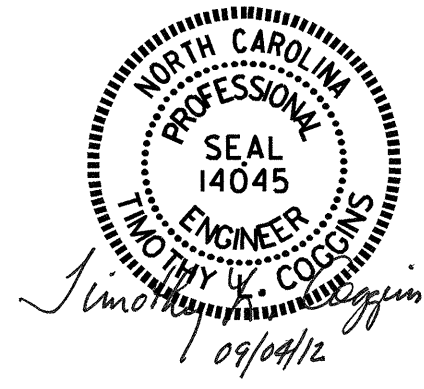


SECTION A-A

PROJECT NO. U-4444AB  
CUMBERLAND COUNTY  
STATION: 132+79.28 -L-

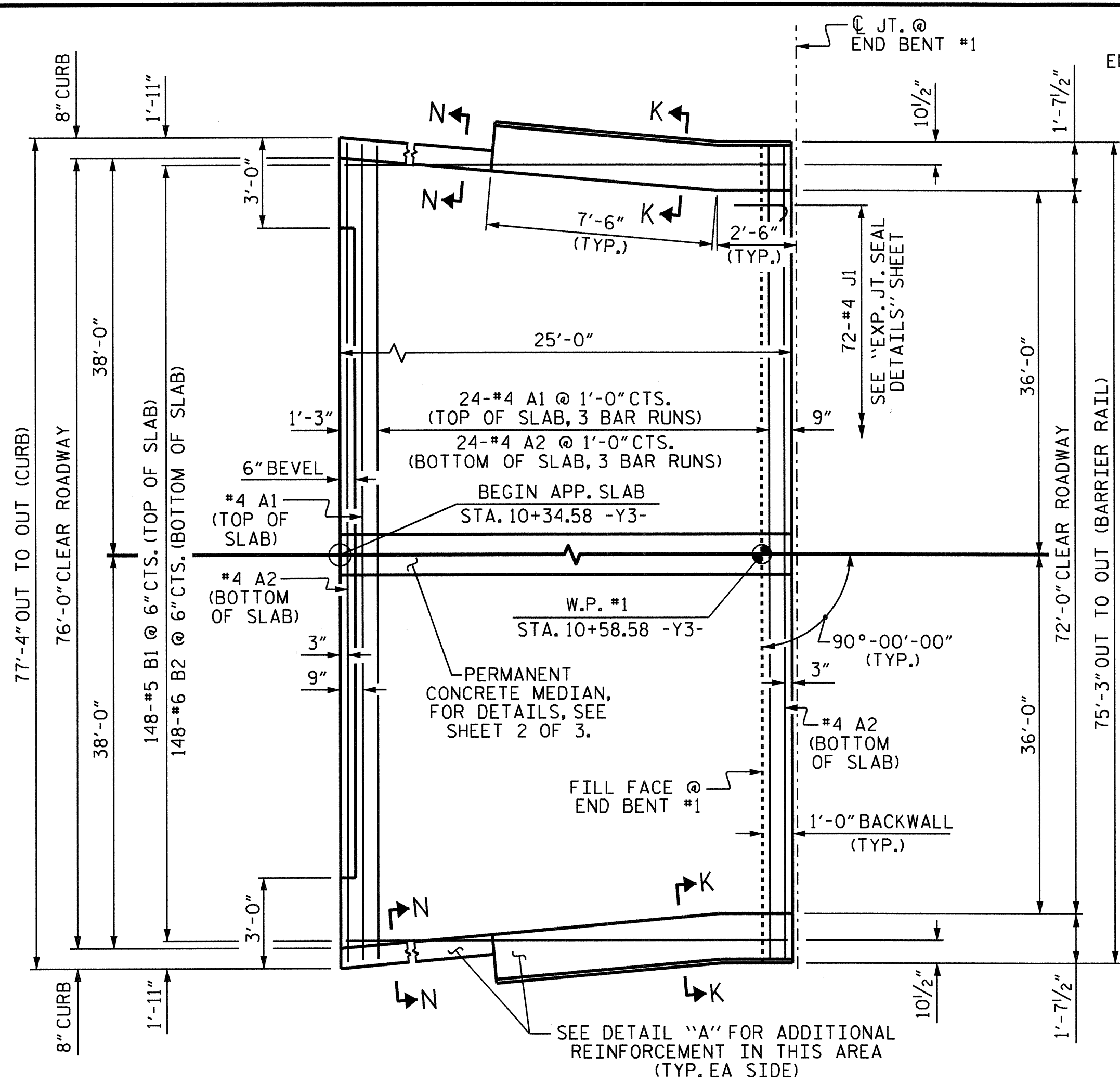
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SLOPE PROTECTION  
DETAILS

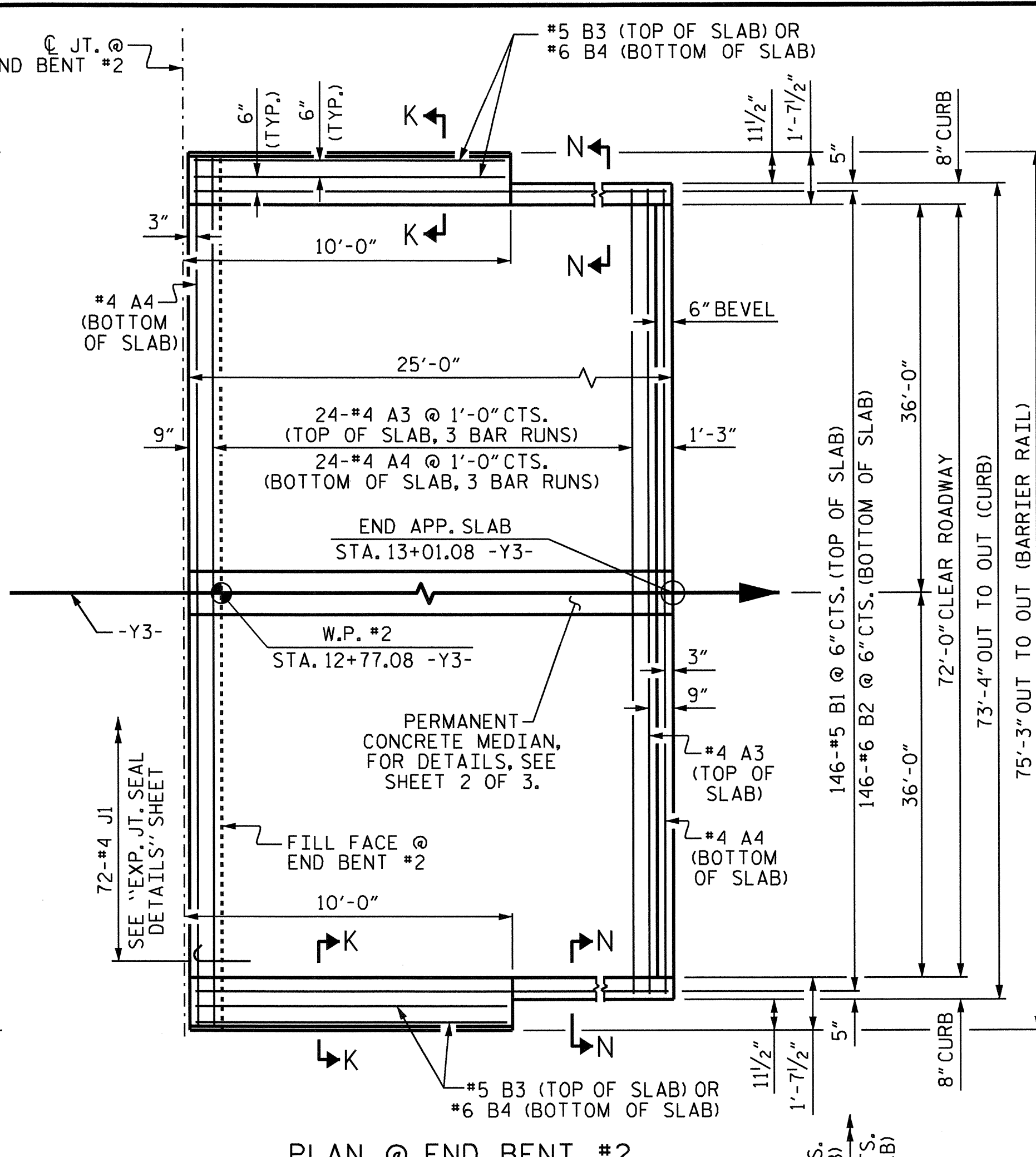


|                              |                      |
|------------------------------|----------------------|
| ASSEMBLED BY : J.B. WILSON   | DATE : 7/11/11       |
| CHECKED BY : B.N. BARODAWALA | DATE : 7/14/11       |
| DRAWN BY : ELR 5/92          | REV. 5/1/06 TLA/GM   |
| CHECKED BY : GRP 6/92        | REV. 10/1/11 MAA/GM  |
|                              | REV. 12/21/11 MAA/GM |

| REVISIONS |     |       |     |     |       | SHEET NO.<br>S-26  |
|-----------|-----|-------|-----|-----|-------|--------------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: |                    |
| 1         |     |       | 3   |     |       | TOTAL SHEETS<br>29 |
| 2         |     |       | 4   |     |       |                    |



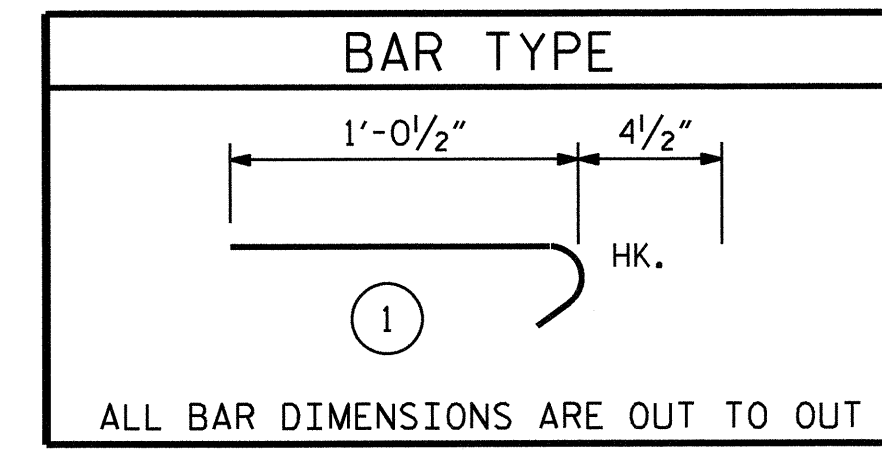
PLAN @ END BENT #1



PLAN @ END BENT #2

NOTES

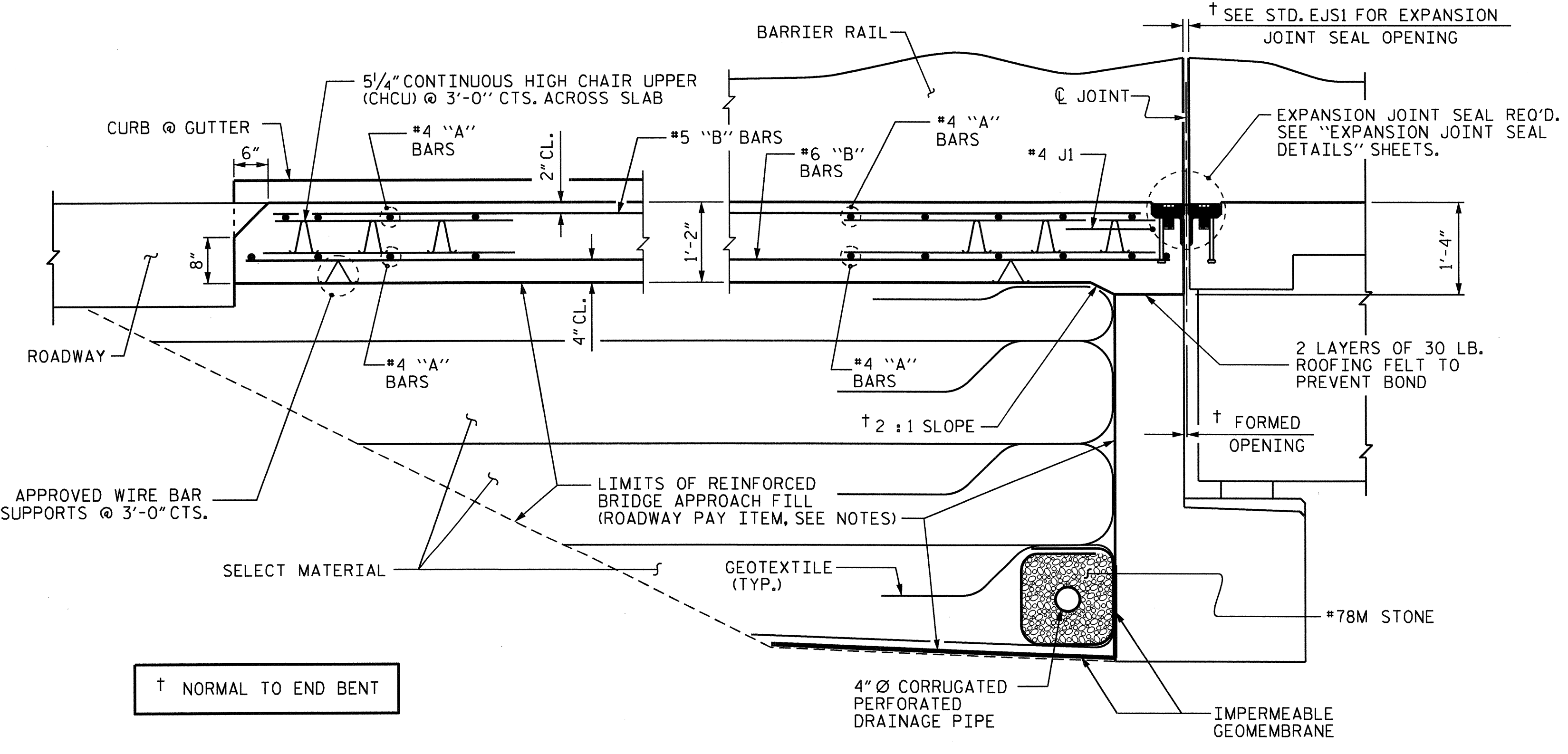
APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.  
 FOR REINFORCED BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, AND SELECT MATERIAL, SEE ROADWAY PLANS.  
 AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.  
 FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.



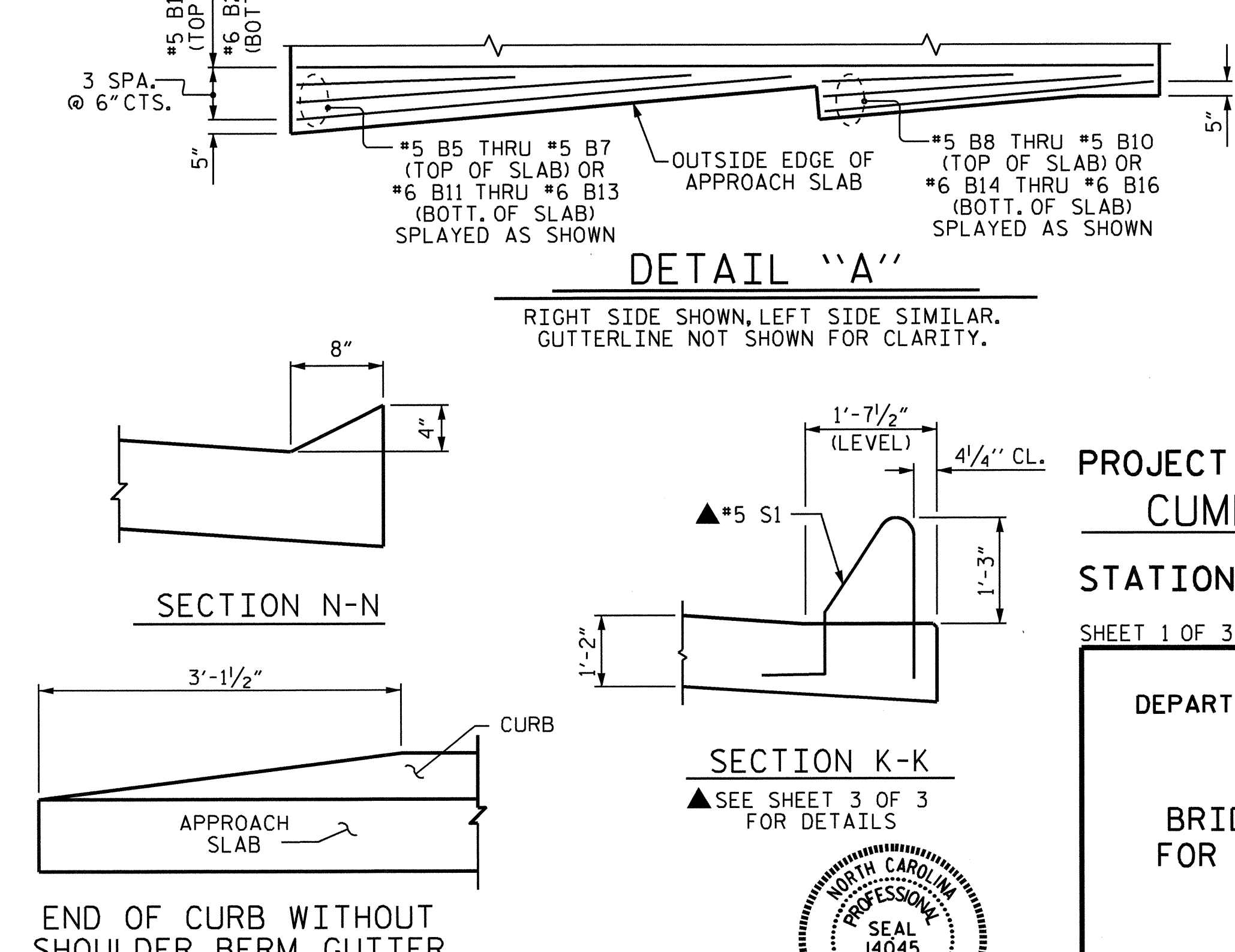
ALL BAR DIMENSIONS ARE OUT TO OUT  
 \*\* QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED. SEE SHEET 3 OF 3.

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

| BILL OF MATERIAL                |     |      |      |         |        |
|---------------------------------|-----|------|------|---------|--------|
| APPROACH SLAB AT EB #1          |     |      |      |         |        |
| BAR                             | NO. | SIZE | TYPE | LENGTH  | WEIGHT |
| *A1                             | 75  | #4   | STR  | 27'-0"  | 1353   |
| A2                              | 78  | #4   | STR  | 26'-10" | 1398   |
| *B1                             | 148 | #5   | STR  | 23'-10" | 3679   |
| B2                              | 148 | #6   | STR  | 24'-8"  | 5483   |
| *B5                             | 2   | #5   | STR  | 6'-3"   | 13     |
| *B6                             | 2   | #5   | STR  | 11'-4"  | 24     |
| *B7                             | 2   | #5   | STR  | 14'-3"  | 30     |
| *B8                             | 2   | #5   | STR  | 5'-6"   | 11     |
| *B9                             | 2   | #5   | STR  | 8'-7"   | 18     |
| *B10                            | 2   | #5   | STR  | 9'-6"   | 20     |
| B11                             | 2   | #6   | STR  | 6'-3"   | 19     |
| B12                             | 2   | #6   | STR  | 11'-4"  | 34     |
| B13                             | 2   | #6   | STR  | 14'-3"  | 43     |
| B14                             | 2   | #6   | STR  | 5'-6"   | 17     |
| B15                             | 2   | #6   | STR  | 8'-7"   | 26     |
| B16                             | 2   | #6   | STR  | 9'-6"   | 29     |
| *JI                             | 72  | #4   | 1    | 1'-5"   | 68     |
| REINFORCING STEEL               |     |      |      | LBS.    | 7049   |
| *EPOXY COATED REINFORCING STEEL |     |      |      | ** LBS. | 5216   |
| CLASS AA CONCRETE               |     |      |      | ** C.Y. | 82.3   |
| APPROACH SLAB AT EB #2          |     |      |      |         |        |
| BAR                             | NO. | SIZE | TYPE | LENGTH  | WEIGHT |
| *A3                             | 75  | #4   | STR  | 26'-4"  | 1319   |
| A4                              | 78  | #4   | STR  | 26'-2"  | 1363   |
| *B1                             | 146 | #5   | STR  | 23'-10" | 3629   |
| B2                              | 146 | #6   | STR  | 24'-8"  | 5409   |
| *B3                             | 4   | #5   | STR  | 9'-7"   | 40     |
| B4                              | 4   | #6   | STR  | 9'-7"   | 58     |
| *JI                             | 72  | #4   | 1    | 1'-5"   | 68     |
| REINFORCING STEEL               |     |      |      | LBS.    | 6830   |
| *EPOXY COATED REINFORCING STEEL |     |      |      | ** LBS. | 5056   |
| CLASS AA CONCRETE               |     |      |      | ** C.Y. | 80.4   |



SECTION THRU SLAB



CURB DETAILS

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

PROJECT NO. U-4444AB  
 CUMBERLAND COUNTY  
 STATION: 132+79.28 -L-

SHEET 1 OF 3

| STATE OF NORTH CAROLINA<br>DEPARTMENT OF TRANSPORTATION<br>RALEIGH |     |       |     |     |       |
|--|-----|-------|-----|-----|-------|
| STANDARD<br>BRIDGE APPROACH SLAB<br>FOR FLEXIBLE PAVEMENT          |     |       |     |     |       |
| REVISIONS  |     |       |     |     |       |
| NO.  | BY: | DATE: | NO. | BY: | DATE: |
| 1  |     |       | 3   |     |       |
| 2  |     |       | 4   |     |       |

SHEET NO. S-27  
 TOTAL SHEETS 29

ASSEMBLED BY: PEGGY PARISI DATE: 5-18-12  
 CHECKED BY: T.L. AVERETTE DATE: 6-14-12  
 DRAWN BY: EEM 3/95  
 CHECKED BY: VAP 3/95  
 REV. 5/7/03R RWM/JTE  
 REV. 5/1/06RR KMM/GM  
 REV. 10/1/11 MAA/GM

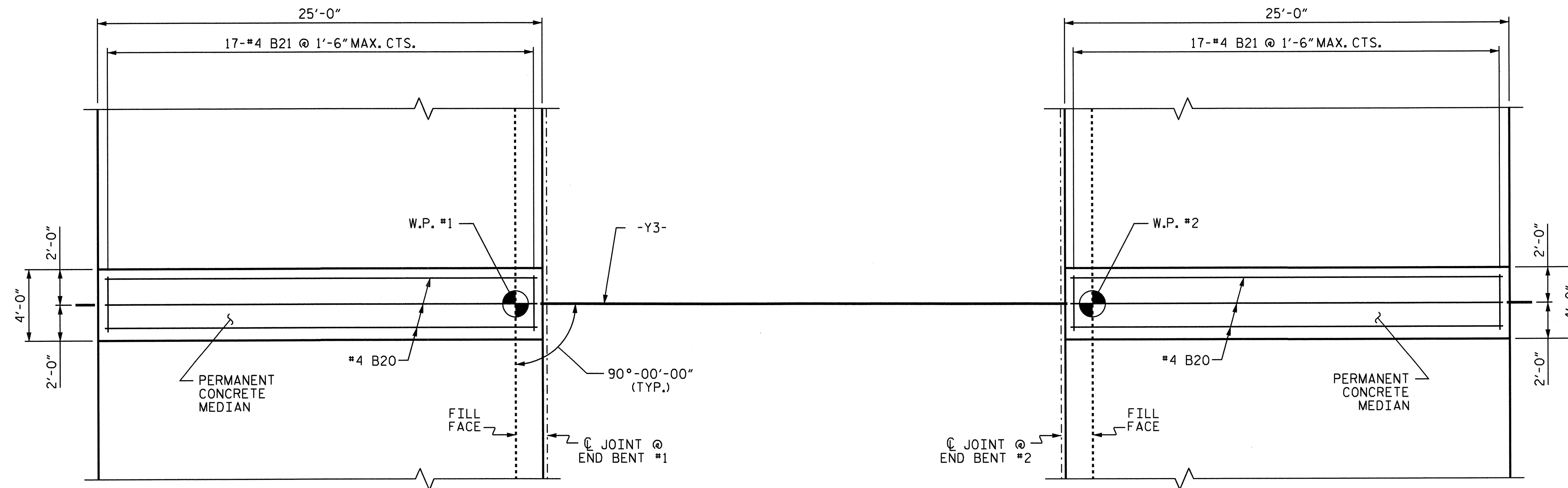
**NOTES**

NO SEPARATE MEASUREMENT OR PAYMENT WILL BE MADE FOR MATERIALS OR LABOR TO CONSTRUCT THE PERMANENT CONCRETE MEDIAN. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR THE REINFORCED CONCRETE DECK SLAB.

ALL REINFORCING STEEL IN PERMANENT CONCRETE MEDIANS SHALL BE EPOXY COATED.

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

FOR PERMANENT CONCRETE MEDIAN ON BRIDGE, SEE SUPERSTRUCTURE PLANS, "PERMANENT CONCRETE MEDIAN" SHEET.

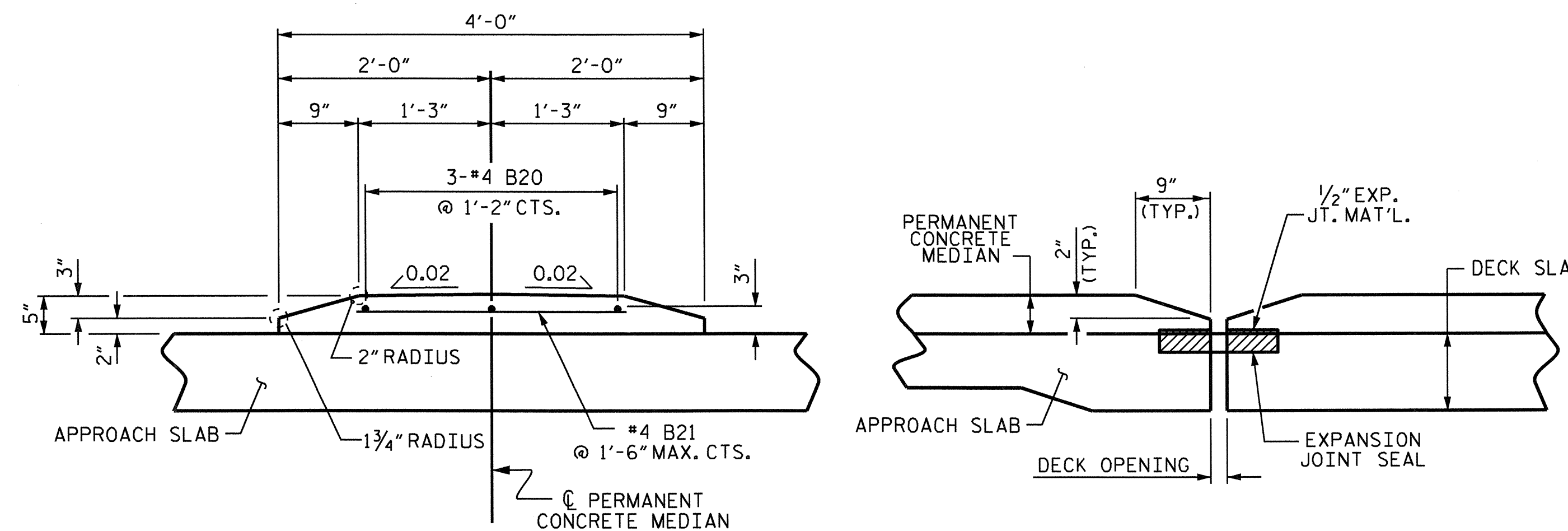


APPROACH SLAB @ END BENT #1

APPROACH SLAB @ END BENT #2

**PLAN**

| BILL OF MATERIAL                 |     |      |      |        |              |
|----------------------------------|-----|------|------|--------|--------------|
| CONCRETE MEDIAN                  |     |      |      |        |              |
| BAR                              | NO. | SIZE | TYPE | LENGTH | WEIGHT       |
| * B20                            | 6   | #4   | STR  | 24'-0" | 96           |
| * B21                            | 34  | #4   | STR  | 2'-8"  | 61           |
| * EPOXY COATED REINFORCING STEEL |     |      |      |        | 157 LBS.     |
| CLASS AA CONCRETE                |     |      |      |        | 2.8 CU. YDS. |



REINFORCING STEEL DETAILS

SECTION AT EXPANSION JOINT

**PERMANENT CONCRETE MEDIAN DETAILS**

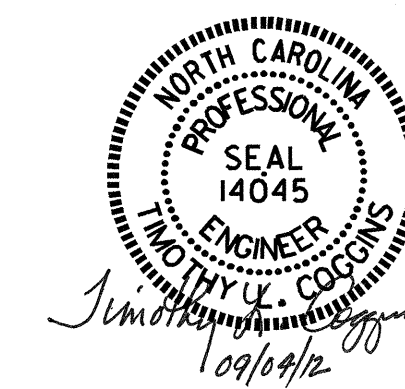
PROJECT NO. U-4444AB  
CUMBERLAND COUNTY  
 STATION: 132+79.28 -L-

SHEET 2 OF 3

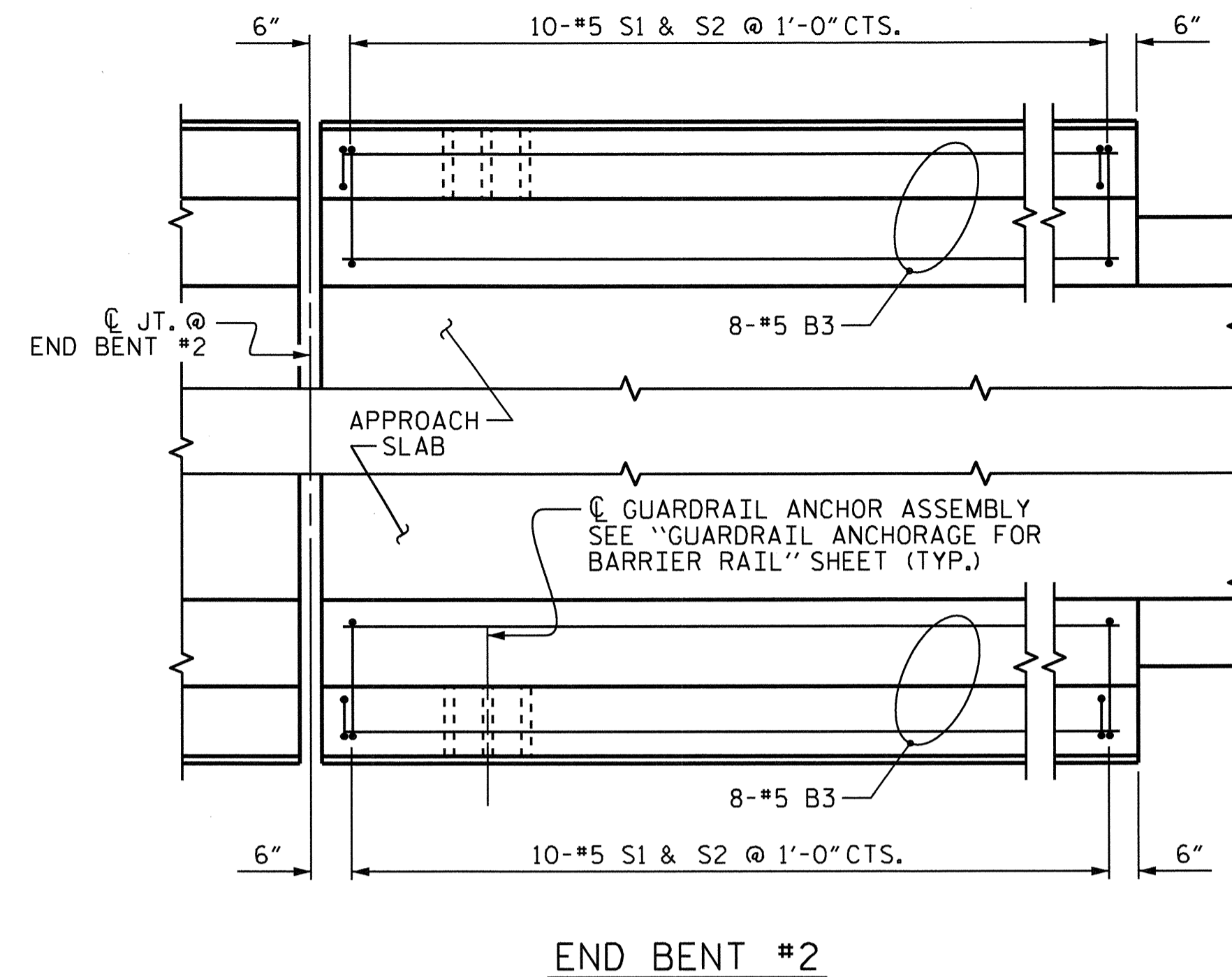
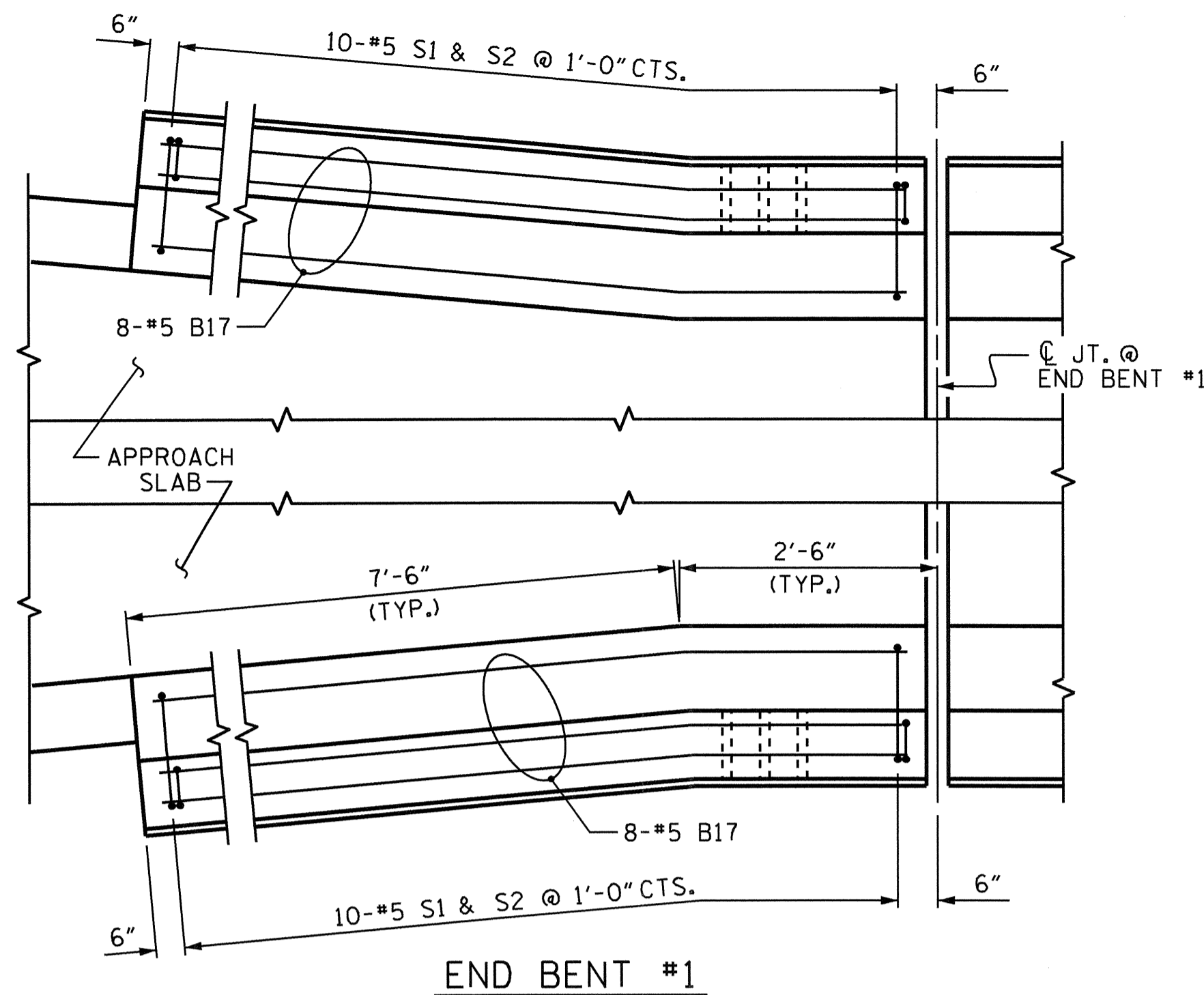
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**APPROACH SLAB  
 PERMANENT  
 CONCRETE MEDIAN**

| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-28         |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |
| 2         |     |       | 4   |     |       | 29           |



DRAWN BY: PEGGY PARISI DATE: 5-21-12  
 CHECKED BY: T.L. AVERETTE DATE: 6-14-12



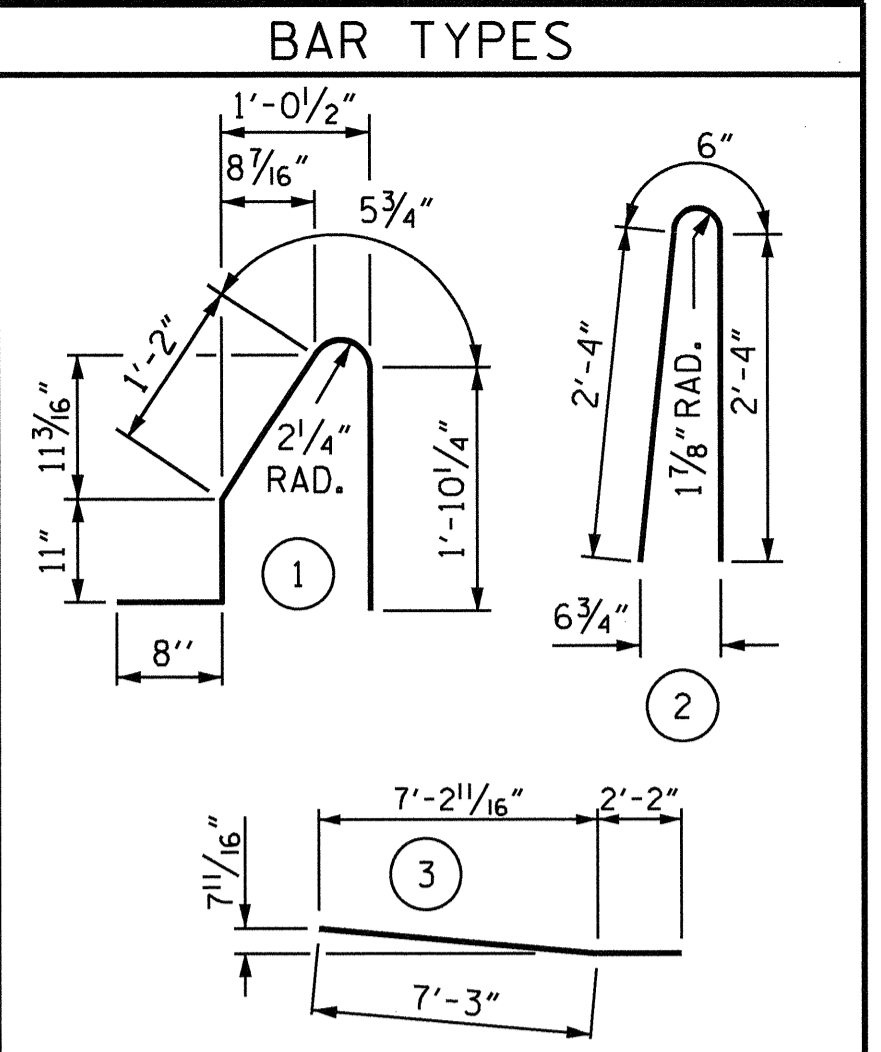
PLAN OF BARRIER RAIL

**NOTES**

THE COST OF THE BARRIER RAIL ON THE APPROACH SLAB SHALL BE INCLUDED IN THE LINEAR FOOT CONTRACT PRICE BID FOR "CONCRETE BARRIER RAIL".

THE BARRIER RAIL ON EACH APPROACH SLAB SHALL NOT BE CAST UNTIL ALL APPROACH SLAB CONCRETE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

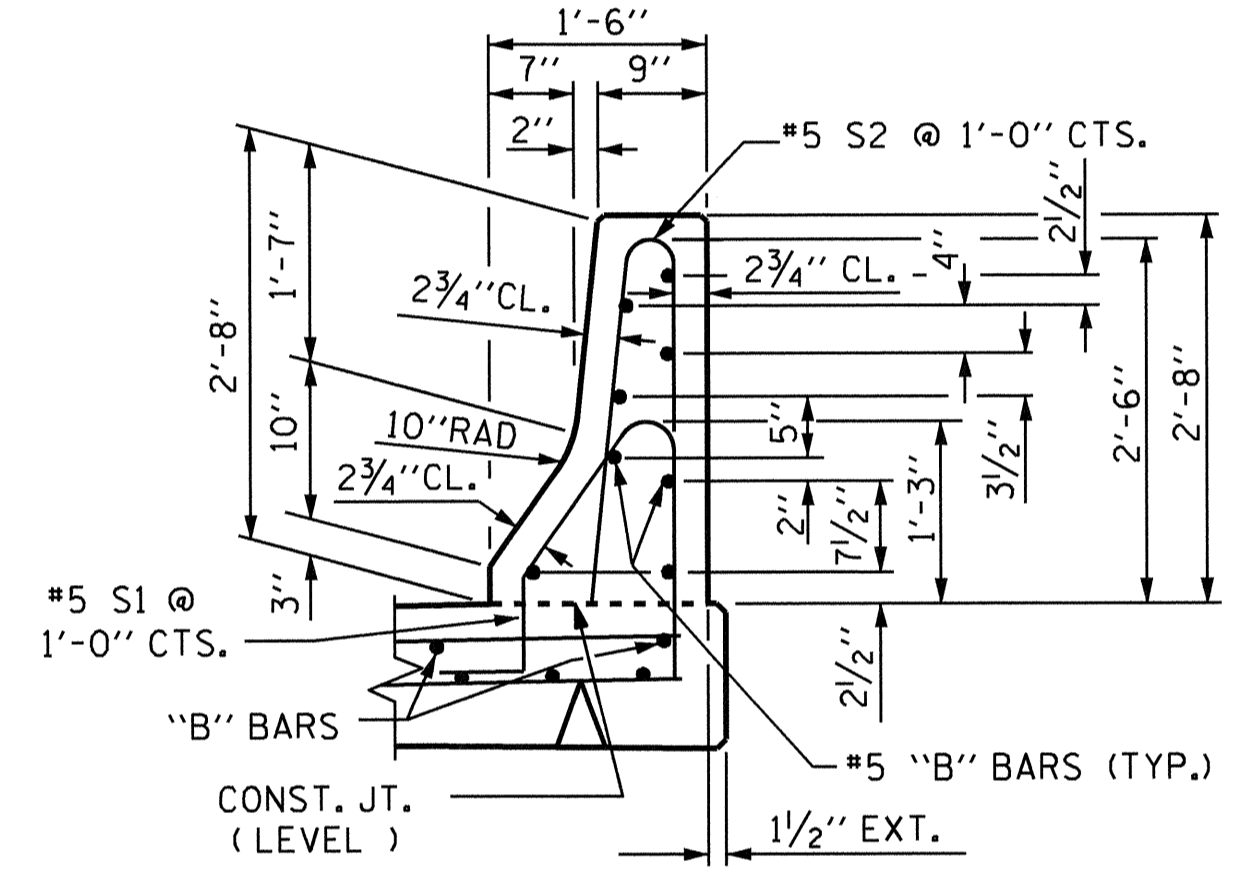
ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.



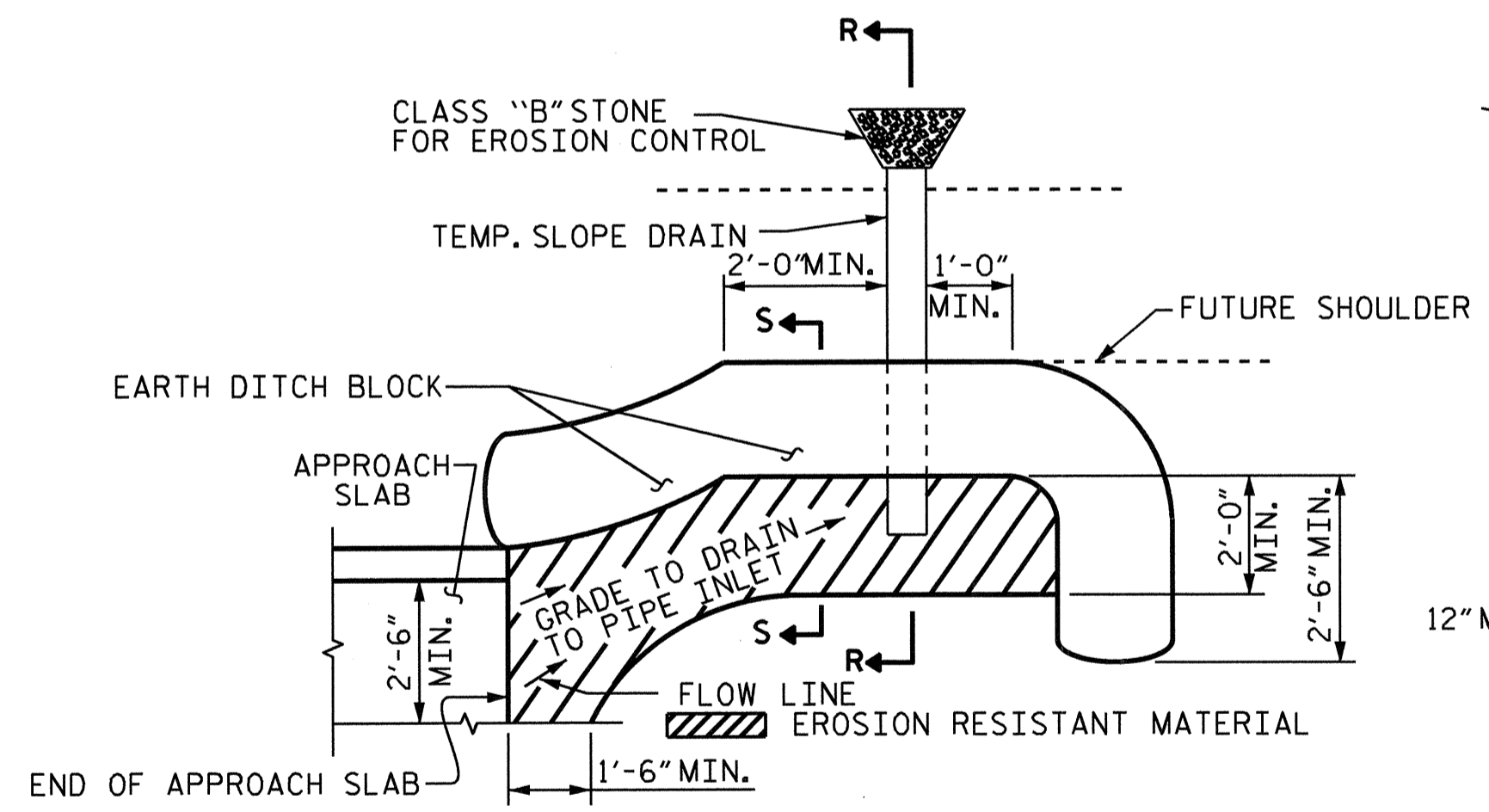
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

| BARRIER RAIL ONLY                |     |      |      |                |        |
|----------------------------------|-----|------|------|----------------|--------|
| BAR                              | NO. | SIZE | TYPE | LENGTH         | WEIGHT |
| *B3                              | 16  | #5   | STR  | 9'-7"          | 160    |
| *B17                             | 16  | #5   | 3    | 9'-5"          | 157    |
| *S1                              | 40  | #5   | 1    | 5'-1"          | 212    |
| *S2                              | 40  | #5   | 2    | 5'-2"          | 216    |
| * EPOXY COATED REINFORCING STEEL |     |      |      | LBS.           | 745    |
| CLASS AA CONCRETE                |     |      |      | C. Y.          | 4.0    |
| CONCRETE BARRIER RAIL            |     |      |      | 40.00 LIN. FT. |        |



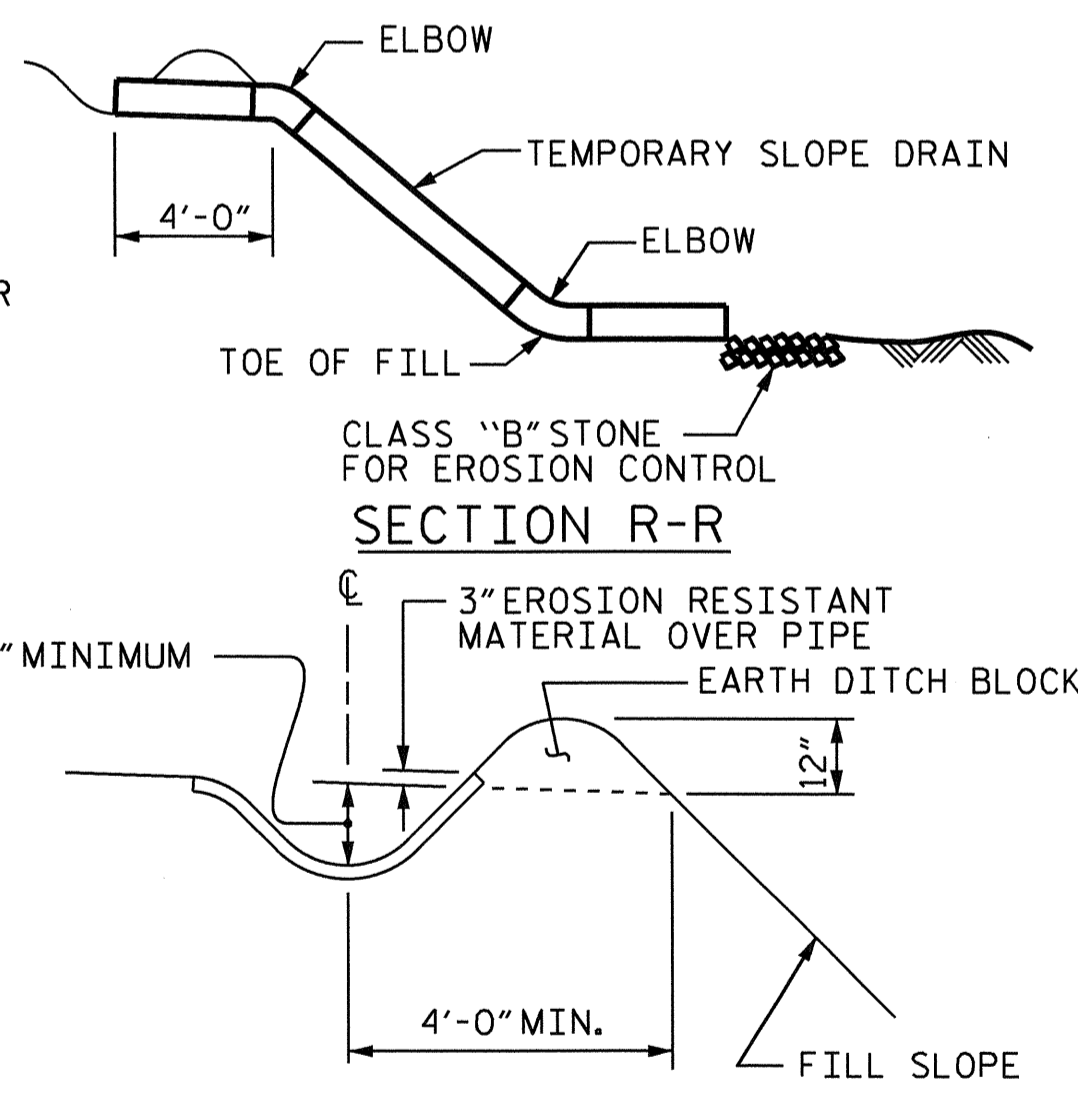
SECTION THRU RAIL



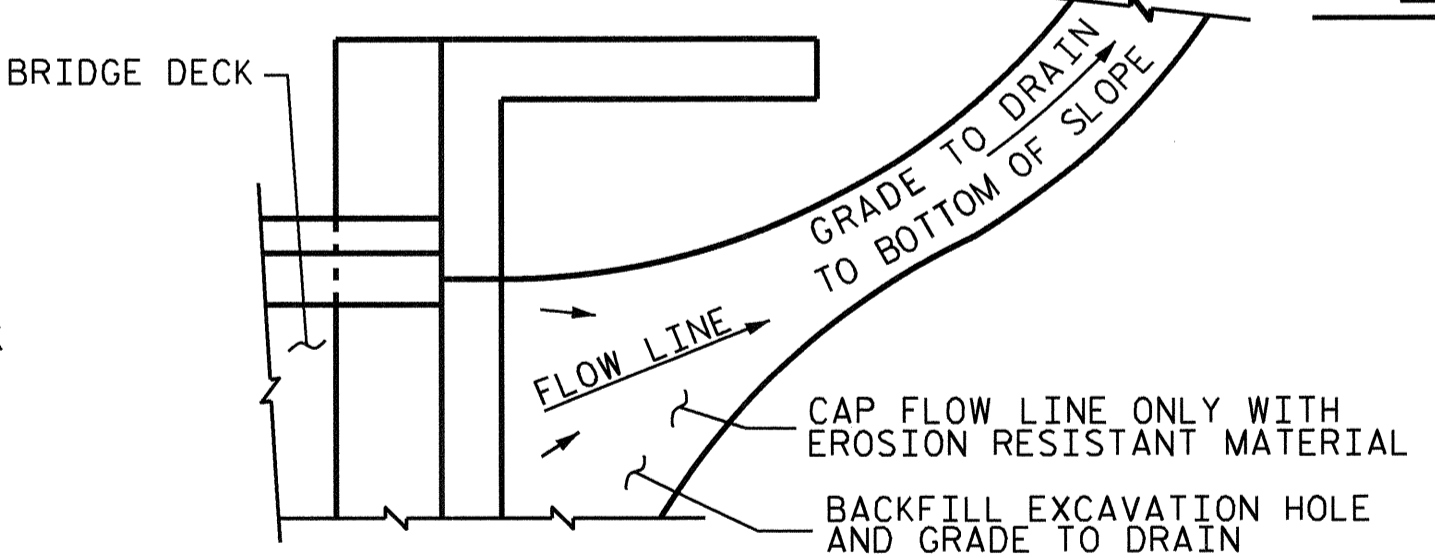
PLAN VIEW

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



SECTION S-S



TEMPORARY DRAINAGE DETAIL

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.

|                             |                        |
|-----------------------------|------------------------|
| ASSEMBLED BY : PEGGY PARISI | DATE : 5-18-12         |
| CHECKED BY : T.L. AVERETTE  | DATE : 6-14-12         |
| DRAWN BY : FCJ 11/88        | REV. 5/7/03 RWW/JTE    |
| CHECKED BY : ARB 11/88      | REV. 5/1/06RRR MAA/KMM |
|                             | REV. 10/1/11 MAA/GM    |



PROJECT NO. U-4444AB  
CUMBERLAND COUNTY  
STATION: 132+79.28 -L-

SHEET 3 OF 3

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

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





12+50

13+00

13+50

14+00

14+50

15+00

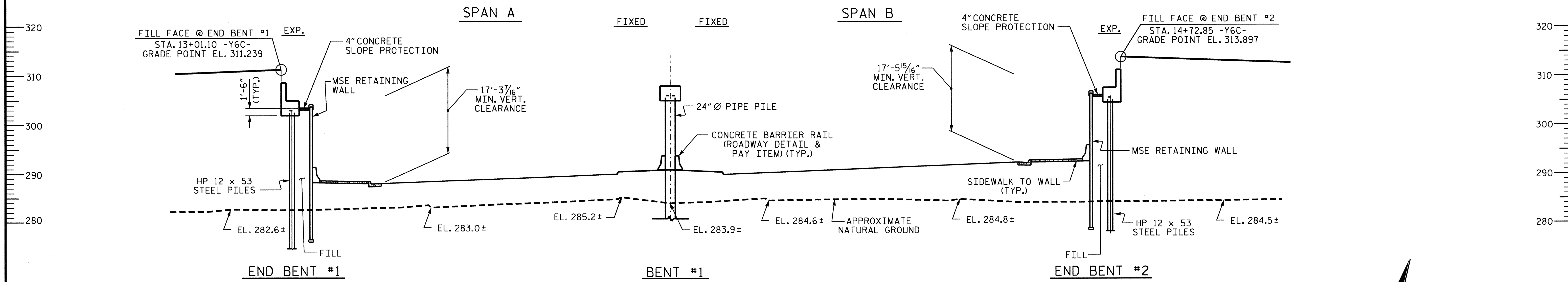
HORIZONTAL CURVE DATA -L-

PI STA. 178+80.28  
Δ = 15°-41'-11.0" (LT)  
D = 1°-01'-16.1"  
L = 1536.17'  
T = 772.92'  
R = 5611.00'

(+).9554% (-).5768%

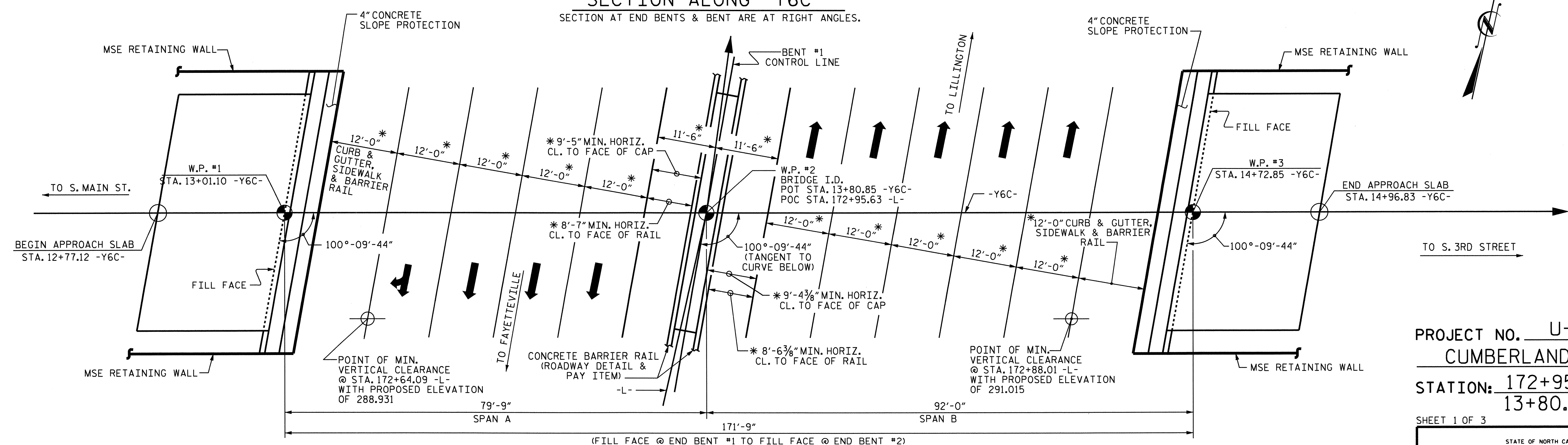
PI = 14+15.68 -Y6C-  
EL = 319.40'  
VC = 286'

GRADE DATA



SECTION ALONG -Y6C-

SECTION AT END BENTS & BENT ARE AT RIGHT ANGLES.



PLAN

PILES NOT SHOWN FOR CLARITY  
\* RADIAL DIMENSION

PROJECT NO. U-4444B  
CUMBERLAND COUNTY  
STATION: 172+95.63 -L-  
13+80.85 -Y6C-  
SHEET 1 OF 3 BRIDGE NO. 417

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
GENERAL DRAWING  
FOR BRIDGE ON  
POE AVENUE OVER  
NC 24/87/210  
BETWEEN S. MAIN ST.  
& S. 3rd ST.

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

TOTAL SHEETS 30

DRAWN BY : B.N.BARODAWALA DATE : 8-22-11  
CHECKED BY : T.L.AVERETTE DATE : 7-9-12

STR. #1

**NOTES**

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO. 1 AND END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 105 TONS AND 115 TONS PER PILE, RESPECTIVELY.

PILES AT BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 265 TONS PER PILE.

DRIVE PILES AT END BENT NO. 1 AND END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 175 TONS AND 195 TONS PER PILE, RESPECTIVELY.

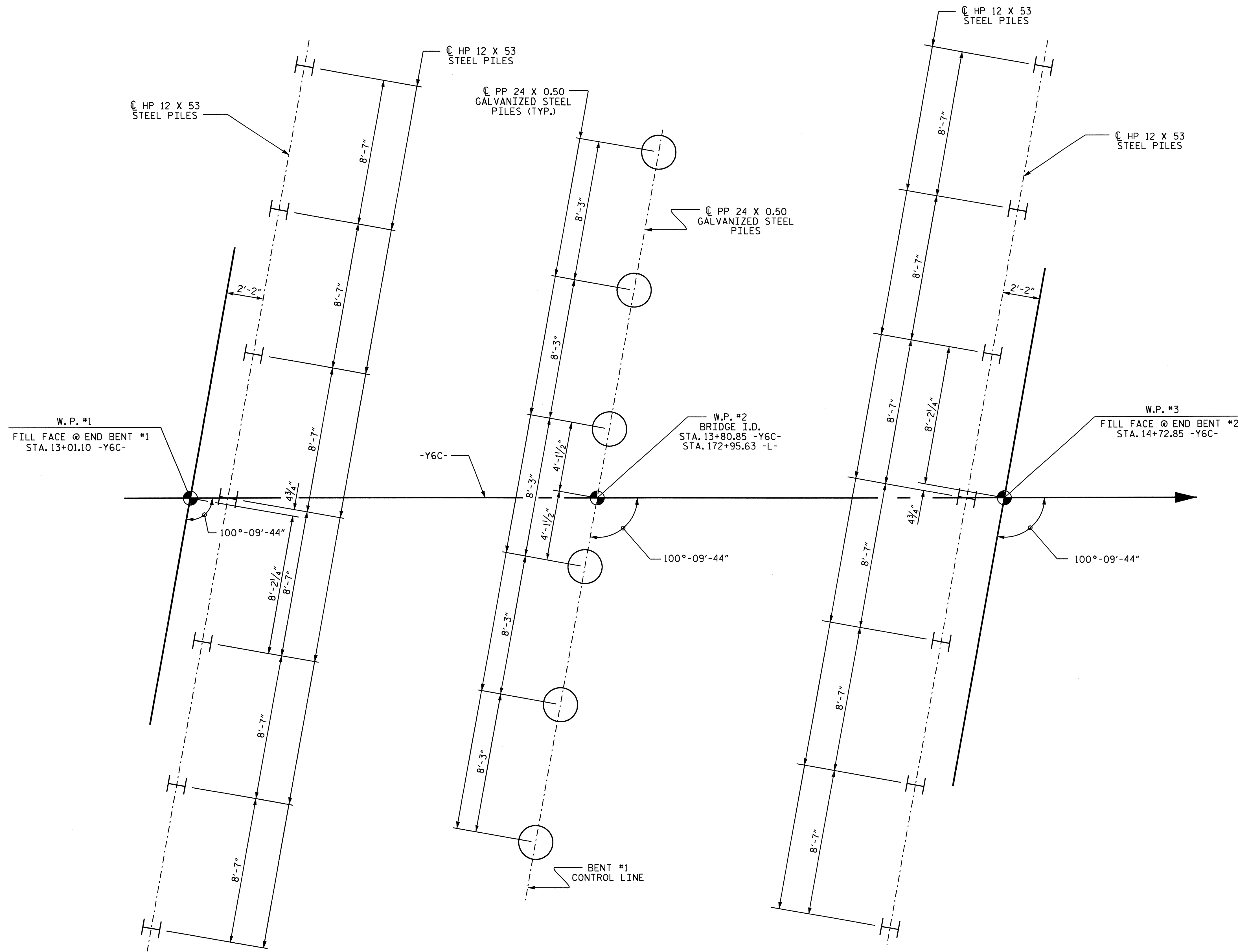
DRIVE PILES AT BENT NO. 1 TO A REQUIRED DRIVING RESISTANCE OF 445 TONS PER PILE.

INSTALL PILES AT BENT NO. 1 TO A TIP ELEVATION NO HIGHER THAN 250 FT.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 125,000 FT-LBS TO 150,000 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT BENT NO. 1. THIS ESTIMATED ENERGY RANGES DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3 (D)(2) OF THE STANDARD SPECIFICATIONS.

TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PIPE PILE PLATES ARE REQUIRED FOR STEEL PIPE PILES AT BENT NO. 1. USE PIPE PILE PLATES WITH A DIAMETER EQUAL TO THE PIPE PILE DIAMETER. FOR STEEL PIPE PILE PLATES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

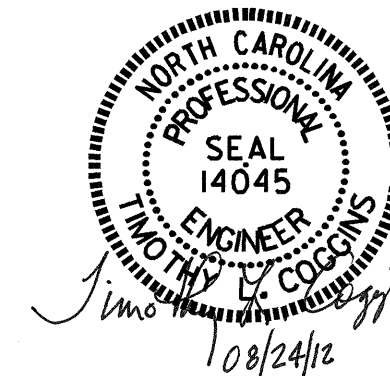


**FOUNDATION LAYOUT PLAN**

DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE.  
 -L- NOT SHOWN FOR CLARITY.

DRAWN BY : B.N.BARODAWALA DATE : 7-5-12  
 CHECKED BY : T.L.AVERETTE DATE : 7-9-12

24-AUG-2012 12:40  
 R:\TIP\Projects-UU4444B\structures\Plans\Final Plans\U4444b.sd.gd.01.dgn  
 tcoogins



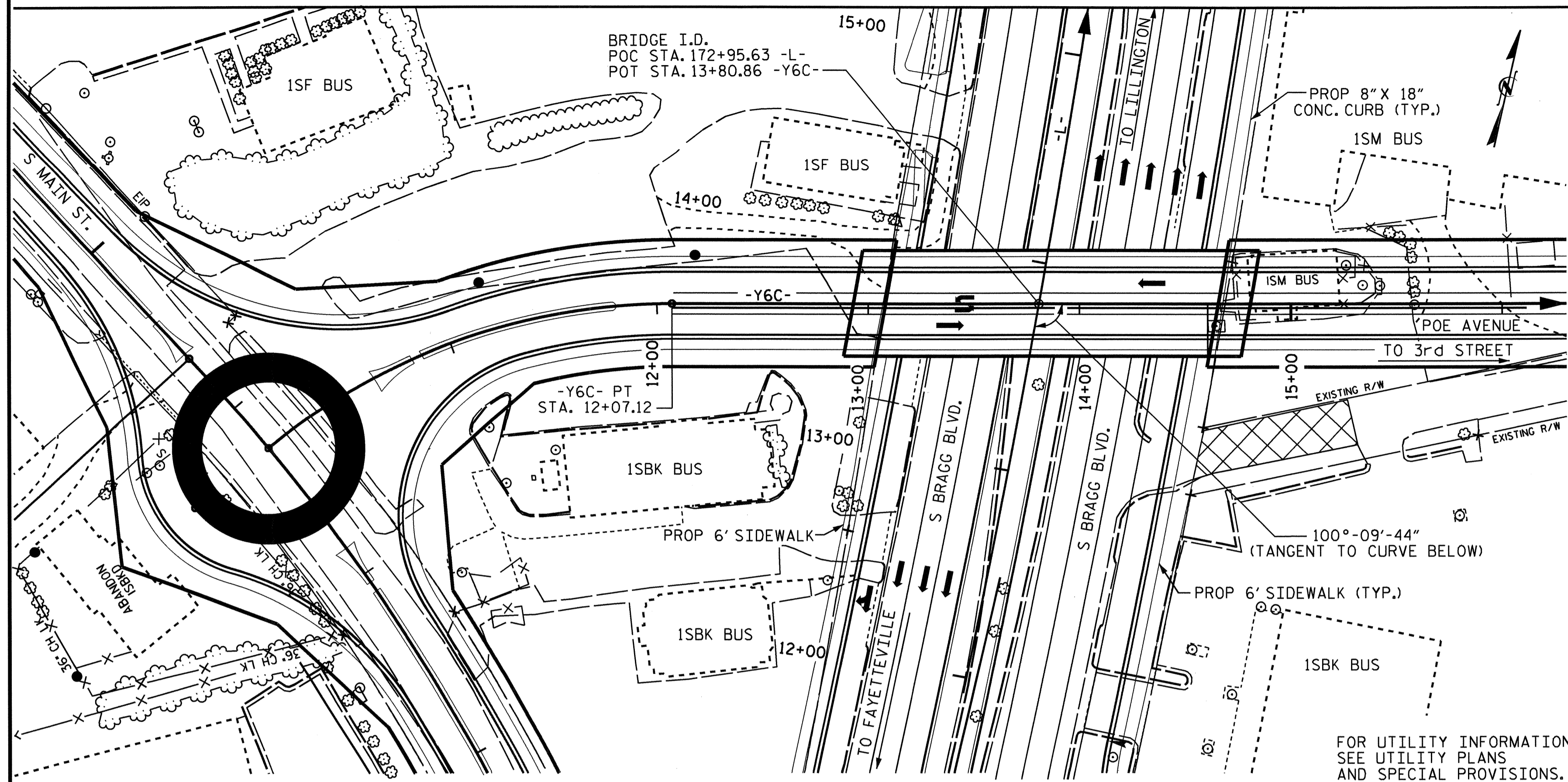
PROJECT NO. U-4444B  
CUMBERLAND COUNTY  
 STATION: 172+95.63 -L-  
13+80.85 -Y6C-  
 SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE ON  
 POE AVENUE OVER  
 NC 24/87/210  
 BETWEEN S. MAIN ST.  
 & S. 3rd ST.

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

STR. #1

BM #86: RR SPIKE IN BASE OF 12 INCH POWER POLE; STA. 175+31.17 -L-, 1.170' RT. ; ELEV. 288.22



LOCATION SKETCH

NOTES:

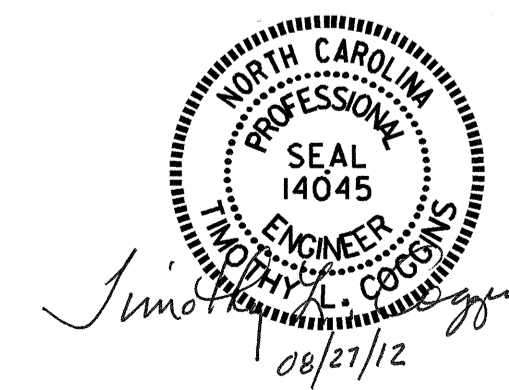
ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.  
 FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.  
 FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.  
 REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.  
 FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.  
 THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.  
 FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS.  
 THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.  
 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.

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 SLOPE PROTECTION DETAILS AND PAY ITEM, SEE MSE WALL PLANS.  
 FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.  
 FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.  
 FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.  
 FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.  
 FOR INTERIOR BENT 1, ONLY PARTIAL GALVANIZING OF THE PILES IS REQUIRED. SEE INTERIOR BENT SHEETS FOR REQUIRED GALVANIZING LENGTHS. PAYMENT FOR PARTIALLY GALVANIZED PILES WILL BE MADE UNDER THE CONTRACT UNIT PRICE FOR GALVANIZED STEEL PILES.

TOTAL BILL OF MATERIAL

|                | PDA TESTING | REINFORCED CONCRETE DECK SLAB | GROOVING BRIDGE FLOORS | CLASS A CONCRETE | BRIDGE APPROACH SLABS | REINFORCING STEEL | 54" PRESTRESSED CONCRETE GIRDERS |          | HP 12 X 53 STEEL PILES |          | PP 24 X 0.50 GALVANIZED STEEL PILES |          | PIPE PILE PLATES | PILE REDRIVES | THREE BAR METAL RAIL | 104" CHAIN LINK FENCE | 4" SLOPE PROTECTION | ELASTOMERIC BEARINGS | FOAM JOINT SEALS |          |
|----------------|-------------|-------------------------------|------------------------|------------------|-----------------------|-------------------|----------------------------------|----------|------------------------|----------|-------------------------------------|----------|------------------|---------------|----------------------|-----------------------|---------------------|----------------------|------------------|----------|
|                |             |                               |                        |                  |                       |                   | NO.                              | LIN. FT. | NO.                    | LIN. FT. | NO.                                 | LIN. FT. |                  |               |                      |                       |                     |                      |                  | EACH     |
| SUPERSTRUCTURE | EACH        | SO. FT.                       | SO. FT.                | CU. YDS.         | LUMP SUM              | LBS.              | 12                               | 1,007.88 |                        |          |                                     |          |                  |               | 323.70               | 333.27                |                     |                      | LUMP SUM         | LUMP SUM |
| END BENT NO.1  |             |                               |                        | 34.4             |                       | 5,436             |                                  |          | 7                      | 560      |                                     |          |                  | 4             |                      |                       | 15                  |                      |                  |          |
| BENT NO.1      |             |                               |                        | 21.7             |                       | 3,340             |                                  |          |                        |          | 6                                   | 450      | 6                | 3             |                      |                       |                     |                      |                  |          |
| END BENT NO.2  |             |                               |                        | 33.7             |                       | 5,454             |                                  |          | 7                      | 595      |                                     |          |                  | 4             |                      |                       | 15                  |                      |                  |          |
| TOTAL          | 1           | 8,072                         | 6,696                  | 89.8             | LUMP SUM              | 14,230            | 12                               | 1,007.88 | 14                     | 1,155    | 6                                   | 450      | 6                | 11            | 323.70               | 333.27                | 30                  |                      | LUMP SUM         | LUMP SUM |

PROJECT NO. U-4444B  
CUMBERLAND COUNTY  
 STATION: 172+95.63 -L-  
13+80.85 -Y6C-  
 SHEET 3 OF 3



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GENERAL DRAWING  
 FOR BRIDGE ON  
 POE AVENUE OVER  
 NC 24/87/210  
 BETWEEN S. MAIN ST.  
 & S. 3rd ST.

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

DRAWN BY: B.N.BARODAWALA DATE: 8-22-11  
 CHECKED BY: I.L.AVERETTE DATE: 7-9-12

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

LOAD FACTORS:

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

| LEVEL              | VEHICLE                           | WEIGHT (W)<br>(TONS) | CONTROLLING LOAD RATING # | MINIMUM RATING FACTORS (RF) | TONS = W x RF | STRENGTH I LIMIT STATE              |                           |               |      |                 |                                     |                           |               |      |                 | SERVICE III LIMIT STATE             |                                     |                           |               |      | COMMENT NUMBER |                 |                                     |  |
|--------------------|-----------------------------------|----------------------|---------------------------|-----------------------------|---------------|-------------------------------------|---------------------------|---------------|------|-----------------|-------------------------------------|---------------------------|---------------|------|-----------------|-------------------------------------|-------------------------------------|---------------------------|---------------|------|----------------|-----------------|-------------------------------------|--|
|                    |                                   |                      |                           |                             |               | MOMENT                              |                           |               |      |                 | SHEAR                               |                           |               |      |                 | MOMENT                              |                                     |                           |               |      |                |                 |                                     |  |
|                    |                                   |                      |                           |                             |               | LIVE-LOAD FACTORS ( $\gamma_{LL}$ ) | DISTRIBUTION FACTORS (DF) | RATING FACTOR | SPAN | GIRDER LOCATION | DISTANCE FROM LEFT END OF SPAN (FT) | DISTRIBUTION FACTORS (DF) | RATING FACTOR | SPAN | GIRDER LOCATION | DISTANCE FROM LEFT END OF SPAN (FT) | LIVE-LOAD FACTORS ( $\gamma_{LL}$ ) | DISTRIBUTION FACTORS (DF) | RATING FACTOR | SPAN |                | GIRDER LOCATION | DISTANCE FROM LEFT END OF SPAN (FT) |  |
| DESIGN LOAD RATING | HL-93 (INVENTORY)                 | N/A                  | ①                         | 1.025                       | --            | 1.75                                | 0.798                     | 1.38          | A    | ER              | 38.241                              | 0.818                     | 1.82          | A    | ER              | 30.593                              | 0.80                                | 0.798                     | 1.03          | B    | EL             | 44.338          |                                     |  |
|                    | HL-93 (OPERATING)                 | N/A                  |                           | 1.788                       | --            | 1.35                                | 0.798                     | 1.79          | A    | ER              | 38.241                              | 0.818                     | 2.36          | A    | ER              | 30.593                              | N/A                                 | --                        | --            | --   | --             | --              |                                     |  |
|                    | HS-20 (INVENTORY)                 | 36.000               | ②                         | 1.394                       | 50.184        | 1.75                                | 0.798                     | 1.82          | A    | ER              | 38.241                              | 0.818                     | 2.16          | A    | ER              | 30.593                              | 0.80                                | 0.798                     | 1.39          | B    | EL             | 44.338          |                                     |  |
|                    | HS-20 (OPERATING)                 | 36.000               |                           | 2.363                       | 85.068        | 1.35                                | 0.798                     | 2.36          | A    | ER              | 38.241                              | 0.818                     | 2.80          | A    | ER              | 30.593                              | N/A                                 | --                        | --            | --   | --             | --              |                                     |  |
| LEGAL LOAD RATING  | SINGLE VEHICLE (SV)               | SNSH                 | 13.500                    |                             | 3.255         | 43.943                              | 1.40                      | 0.798         | 5.19 | A               | ER                                  | 38.241                    | 0.818         | 6.07 | A               | ER                                  | 30.593                              | 0.80                      | 0.798         | 3.25 | B              | EL              | 44.338                              |  |
|                    |                                   | SNGARBS2             | 20.000                    |                             | 2.378         | 47.560                              | 1.40                      | 0.798         | 3.85 | A               | ER                                  | 38.241                    | 0.818         | 4.42 | A               | ER                                  | 30.593                              | 0.80                      | 0.798         | 2.38 | B              | EL              | 44.338                              |  |
|                    |                                   | SNAGRIS2             | 22.000                    |                             | 2.233         | 49.126                              | 1.40                      | 0.798         | 3.64 | A               | ER                                  | 38.241                    | 0.818         | 4.15 | A               | ER                                  | 30.593                              | 0.80                      | 0.798         | 2.23 | B              | EL              | 44.338                              |  |
|                    |                                   | SNCOTTS3             | 27.250                    |                             | 1.618         | 44.091                              | 1.40                      | 0.798         | 2.58 | A               | ER                                  | 38.241                    | 0.818         | 3.04 | A               | ER                                  | 30.593                              | 0.80                      | 0.798         | 1.62 | B              | EL              | 44.338                              |  |
|                    |                                   | SNAGGRS4             | 34.925                    |                             | 1.334         | 46.590                              | 1.40                      | 0.798         | 2.15 | A               | ER                                  | 38.241                    | 0.818         | 2.60 | A               | ER                                  | 30.593                              | 0.80                      | 0.798         | 1.33 | B              | EL              | 44.338                              |  |
|                    |                                   | SNS5A                | 35.550                    |                             | 1.306         | 46.428                              | 1.40                      | 0.798         | 2.10 | A               | ER                                  | 38.241                    | 0.818         | 2.67 | A               | ER                                  | 30.593                              | 0.80                      | 0.798         | 1.31 | B              | EL              | 44.338                              |  |
|                    |                                   | SNS6A                | 39.950                    |                             | 1.191         | 47.580                              | 1.40                      | 0.798         | 1.93 | A               | ER                                  | 38.241                    | 0.818         | 2.47 | A               | ER                                  | 30.593                              | 0.80                      | 0.798         | 1.19 | B              | EL              | 44.338                              |  |
|                    |                                   | SNS7B                | 42.000                    |                             | 1.134         | 47.628                              | 1.40                      | 0.798         | 1.83 | A               | ER                                  | 38.241                    | 0.818         | 2.47 | A               | ER                                  | 30.593                              | 0.80                      | 0.798         | 1.13 | B              | EL              | 44.338                              |  |
|                    | TRUCK TRACTOR SEMI-TRAILER (TTST) | TNAGRIT3             | 33.000                    |                             | 1.450         | 47.850                              | 1.40                      | 0.798         | 2.35 | A               | ER                                  | 38.241                    | 0.818         | 2.91 | A               | ER                                  | 30.593                              | 0.80                      | 0.798         | 1.45 | B              | EL              | 44.338                              |  |
|                    |                                   | TNT4A                | 33.075                    |                             | 1.454         | 48.091                              | 1.40                      | 0.798         | 2.36 | A               | ER                                  | 38.241                    | 0.818         | 2.81 | A               | ER                                  | 30.593                              | 0.80                      | 0.798         | 1.45 | B              | EL              | 44.338                              |  |
|                    |                                   | TNT6A                | 41.600                    |                             | 1.182         | 49.171                              | 1.40                      | 0.798         | 1.92 | A               | ER                                  | 38.241                    | 0.818         | 2.72 | A               | ER                                  | 30.593                              | 0.80                      | 0.798         | 1.18 | B              | EL              | 44.338                              |  |
|                    |                                   | TNT7A                | 42.000                    |                             | 1.184         | 49.728                              | 1.40                      | 0.798         | 1.93 | A               | ER                                  | 38.241                    | 0.818         | 2.65 | A               | ER                                  | 30.593                              | 0.80                      | 0.798         | 1.18 | B              | EL              | 44.338                              |  |
|                    |                                   | TNT7B                | 42.000                    |                             | 1.216         | 51.072                              | 1.40                      | 0.798         | 2.00 | A               | ER                                  | 38.241                    | 0.818         | 2.38 | A               | ER                                  | 30.593                              | 0.80                      | 0.798         | 1.22 | B              | EL              | 44.338                              |  |
|                    |                                   | TNAGRIT4             | 43.000                    |                             | 1.163         | 50.009                              | 1.40                      | 0.798         | 1.90 | A               | ER                                  | 38.241                    | 0.818         | 2.29 | A               | ER                                  | 30.593                              | 0.80                      | 0.798         | 1.16 | B              | EL              | 44.338                              |  |
| TNAGT5A            | 45.000                            |                      | 1.100                     | 49.500                      | 1.40          | 0.798                               | 1.79                      | A             | ER   | 38.241          | 0.818                               | 2.33                      | A             | ER   | 30.593          | 0.80                                | 0.798                               | 1.10                      | B             | EL   | 44.338         |                 |                                     |  |
| TNAGT5B            | 45.000                            |                      | ③                         | 1.090                       | 49.050        | 1.40                                | 0.798                     | 1.77          | A    | ER              | 38.241                              | 0.818                     | 2.18          | A    | ER              | 30.593                              | 0.80                                | 0.798                     | 1.09          | B    | EL             | 44.338          |                                     |  |

**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)

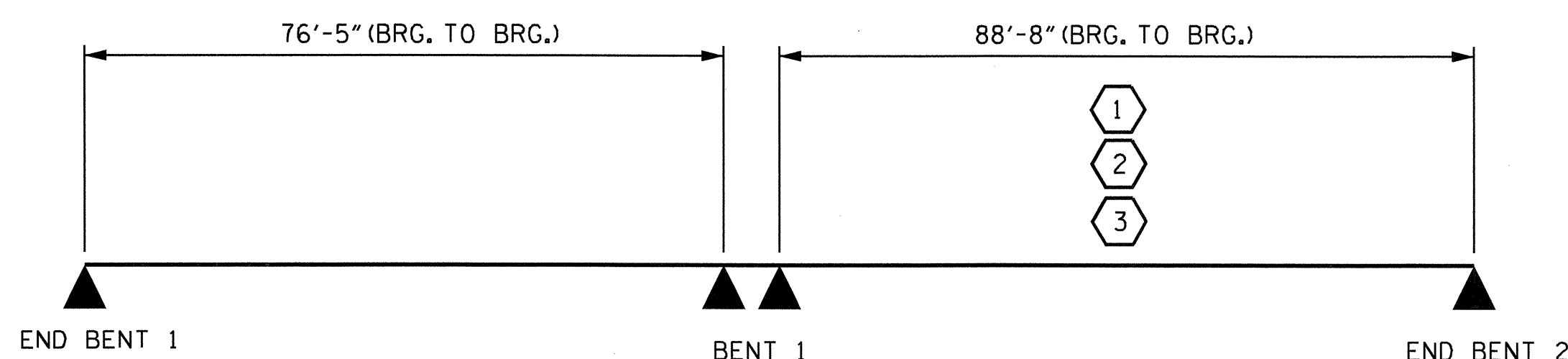
③ LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

---

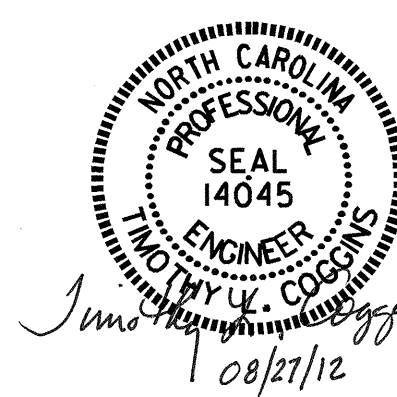
GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. U-4444B  
CUMBERLAND COUNTY  
 STATION: 172+95.63 -L-



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

|                         |                        |
|-------------------------|------------------------|
| ASSEMBLED BY: A.M. LEE  | DATE: 8-17-12          |
| CHECKED BY: N.M. RUFFIN | DATE: 8-17-12          |
| DRAWN BY: MAA 1/08      | REV. 11/12/OBRR MAA/GM |
| CHECKED BY: GM/DI 2/08  | REV. 10/1/11 MAA/GM    |

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

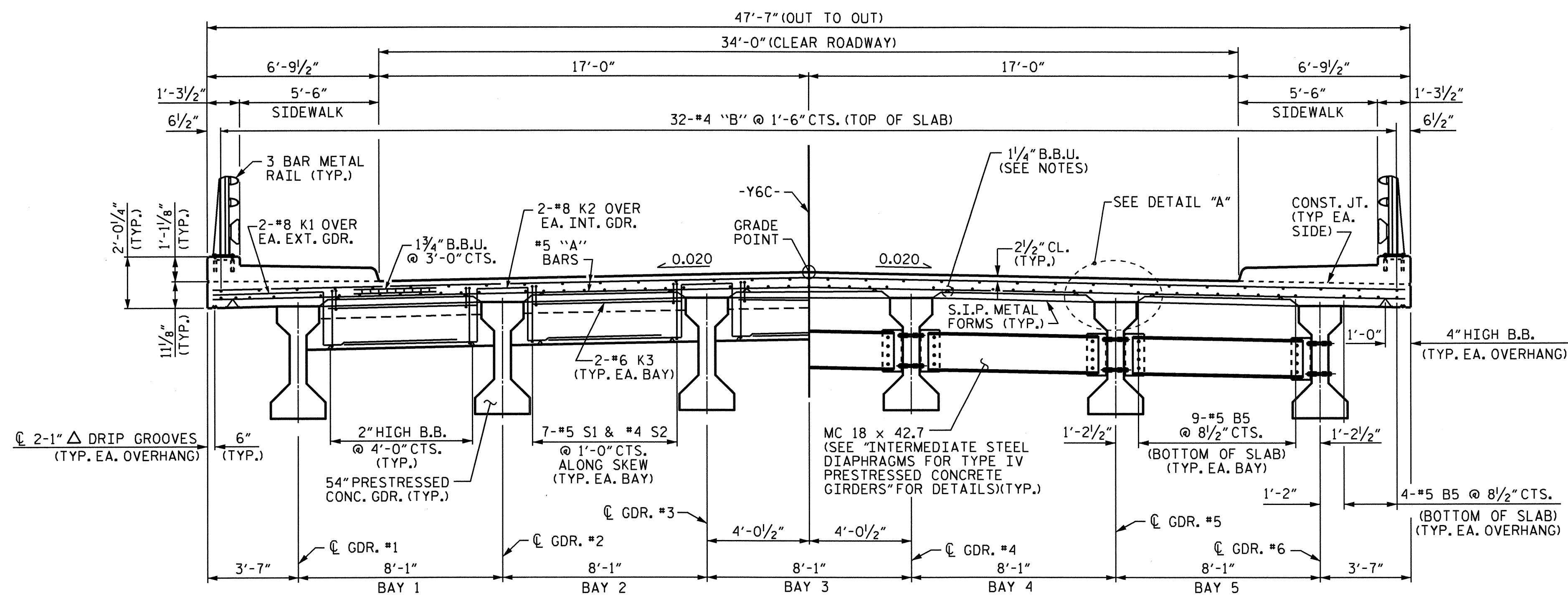
**NOTES**

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.) AT 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.

#5 GI BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.

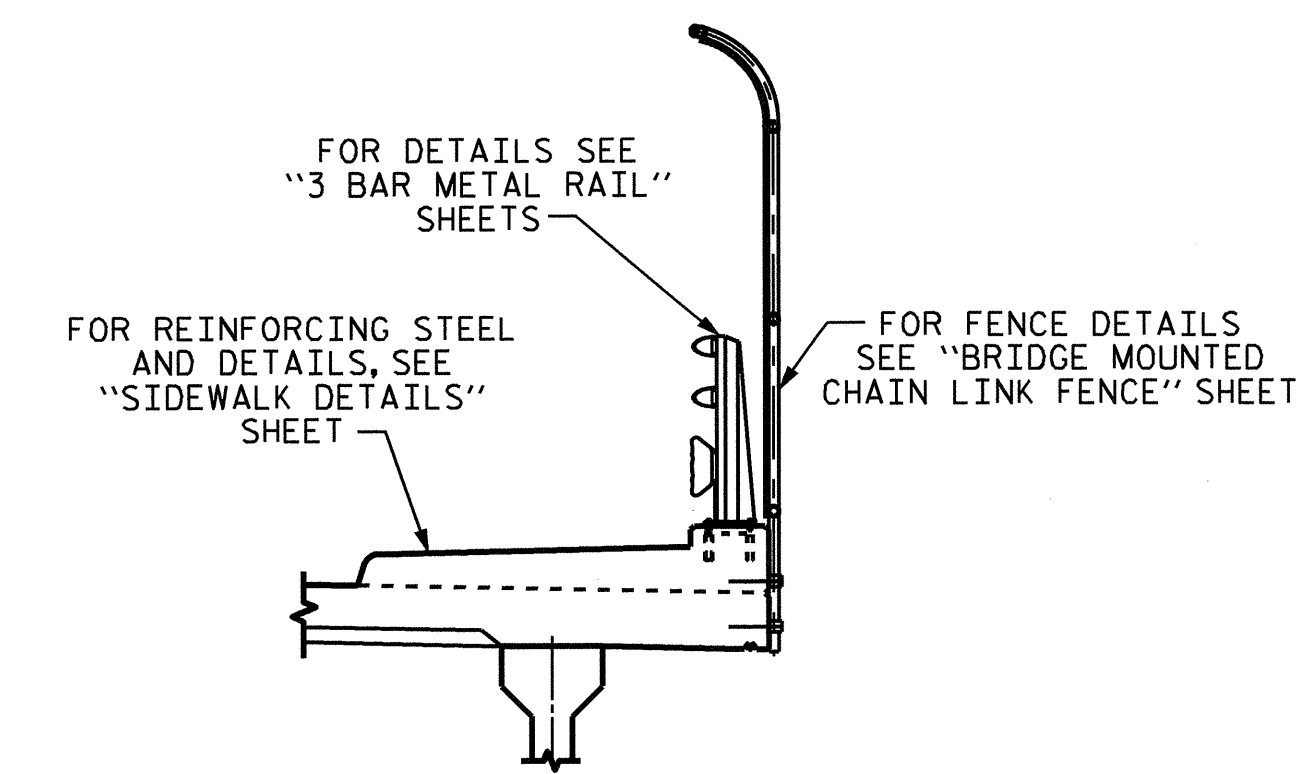


**TYPICAL HALF SECTION**

SHOWING END BENT DIAPHRAGMS  
FENCE NOT SHOWN, SEE PART SECTION THIS SHEET.

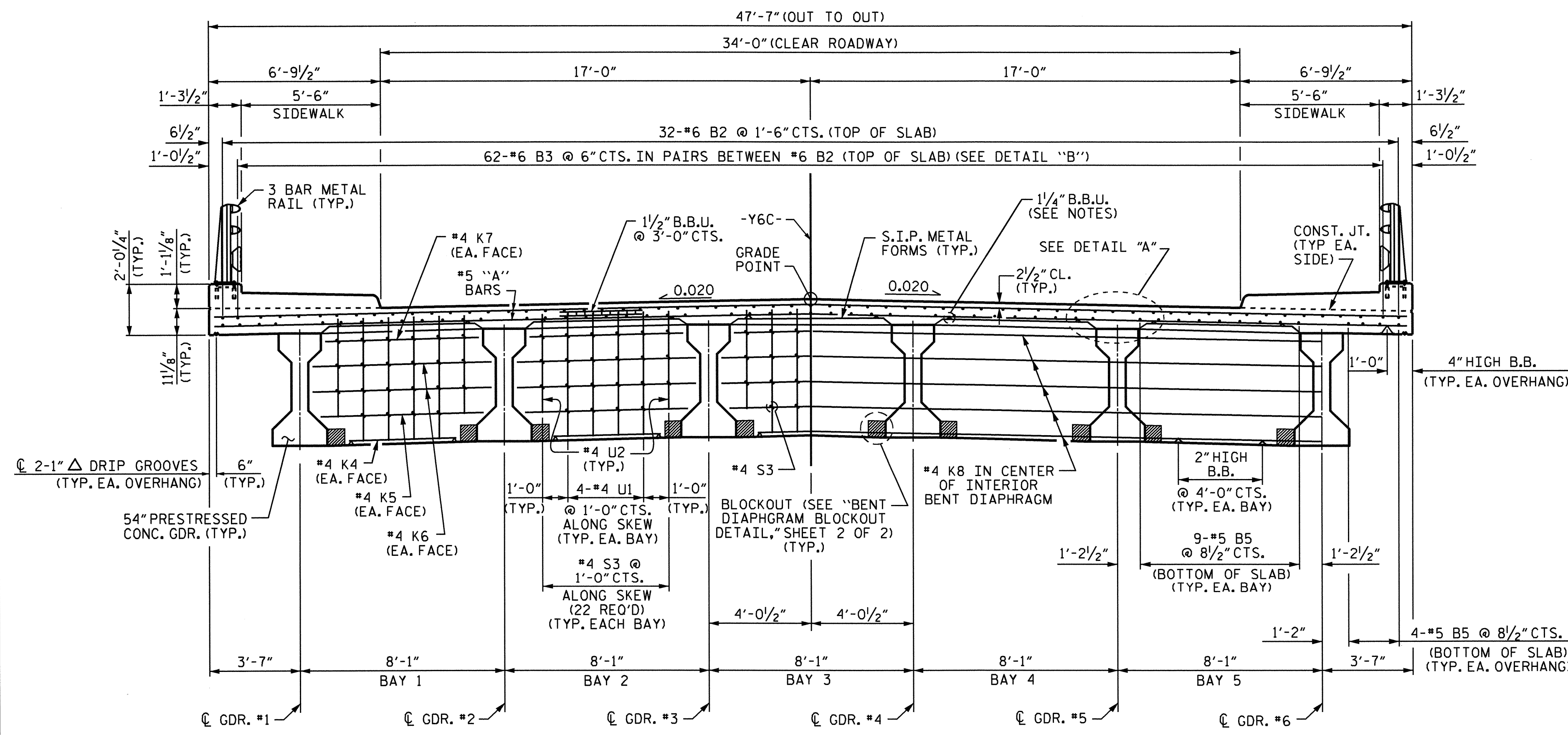
**TYPICAL HALF SECTION**

SHOWING INTERMEDIATE DIAPHRAGMS  
FENCE NOT SHOWN, SEE PART SECTION THIS SHEET.



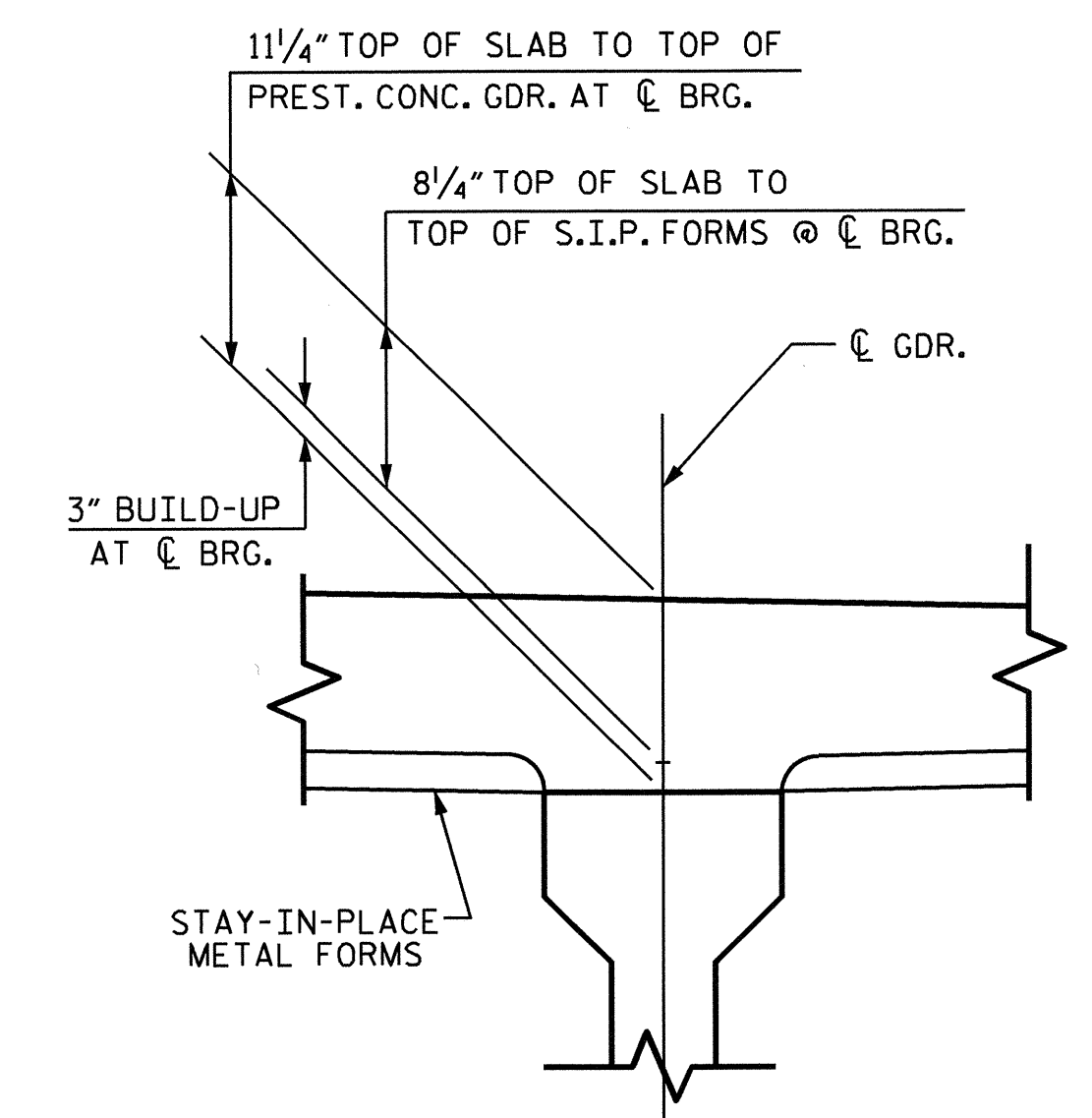
**PART SECTION**

(TYP. EACH OVERHANG)

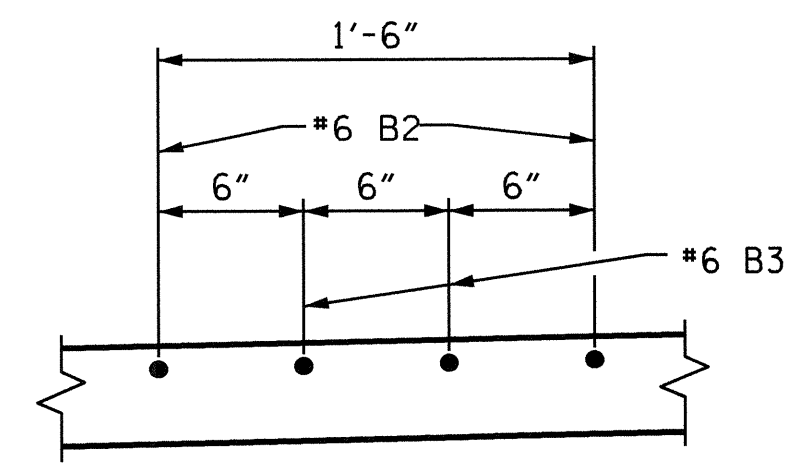


**TYPICAL SECTION**

SHOWING BENT DIAPHRAGMS



**DETAIL "A"**



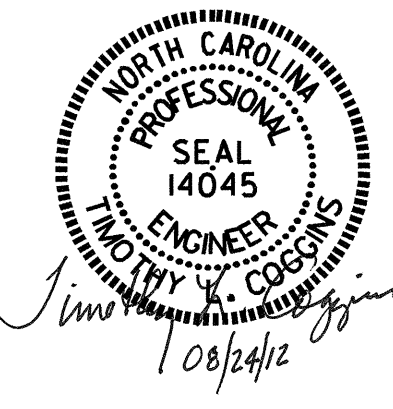
**DETAIL "B"**

SHOWING TOP OF SLAB "B" BAR SPACING  
@ CONTINUOUS BENT DIAPHRAGM

PROJECT NO. U-4444B  
CUMBERLAND COUNTY  
STATION: 172+95.63 -L-

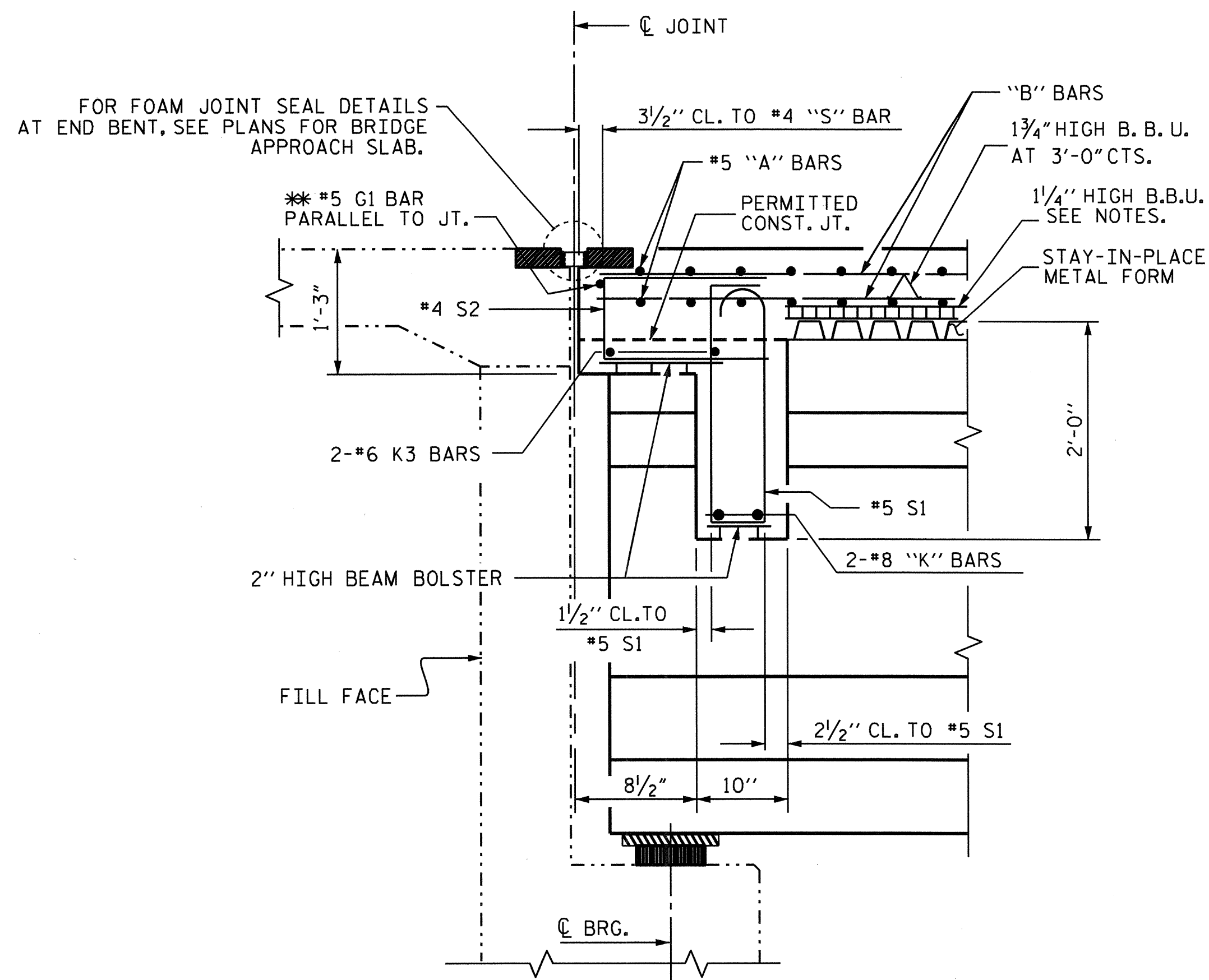
SHEET 1 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
TYPICAL SECTION



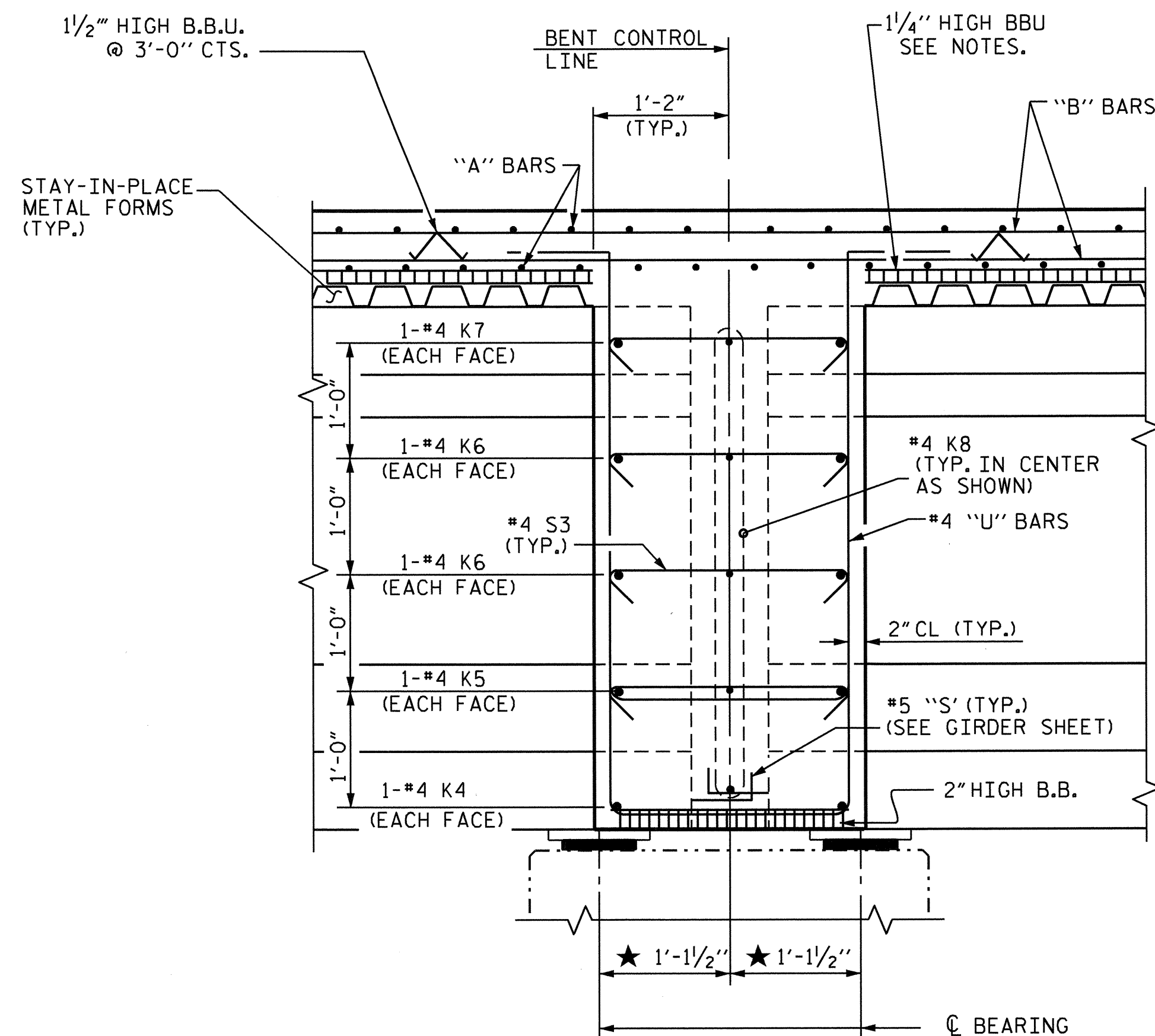
| REVISIONS |     |       |     |     |       | SHEET NO.       |
|-----------|-----|-------|-----|-----|-------|-----------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: |                 |
| 1         |     |       | 3   |     |       | S-5             |
| 2         |     |       | 4   |     |       | TOTAL SHEETS 30 |

DRAWN BY : B.N.BARODAWALA DATE : 9-14-11  
CHECKED BY : PEGGY PARISI DATE : 1-19-12



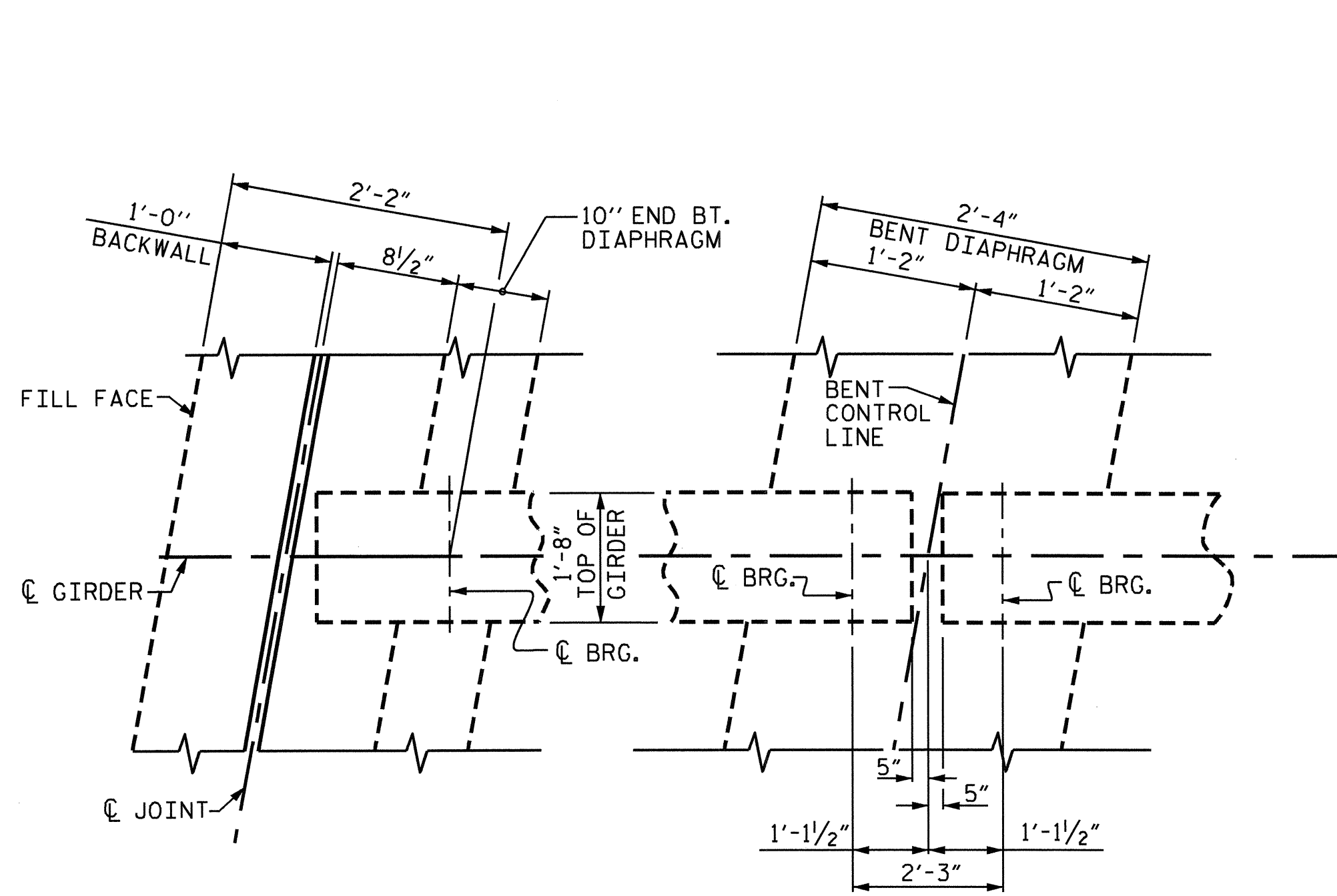
**SECTION THRU END BENT DIAPHRAGM**

\*\* #5 G1 BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.



**SECTION THRU BENT DIAPHRAGM**

★ MEASURED ALONG CL GIRDER

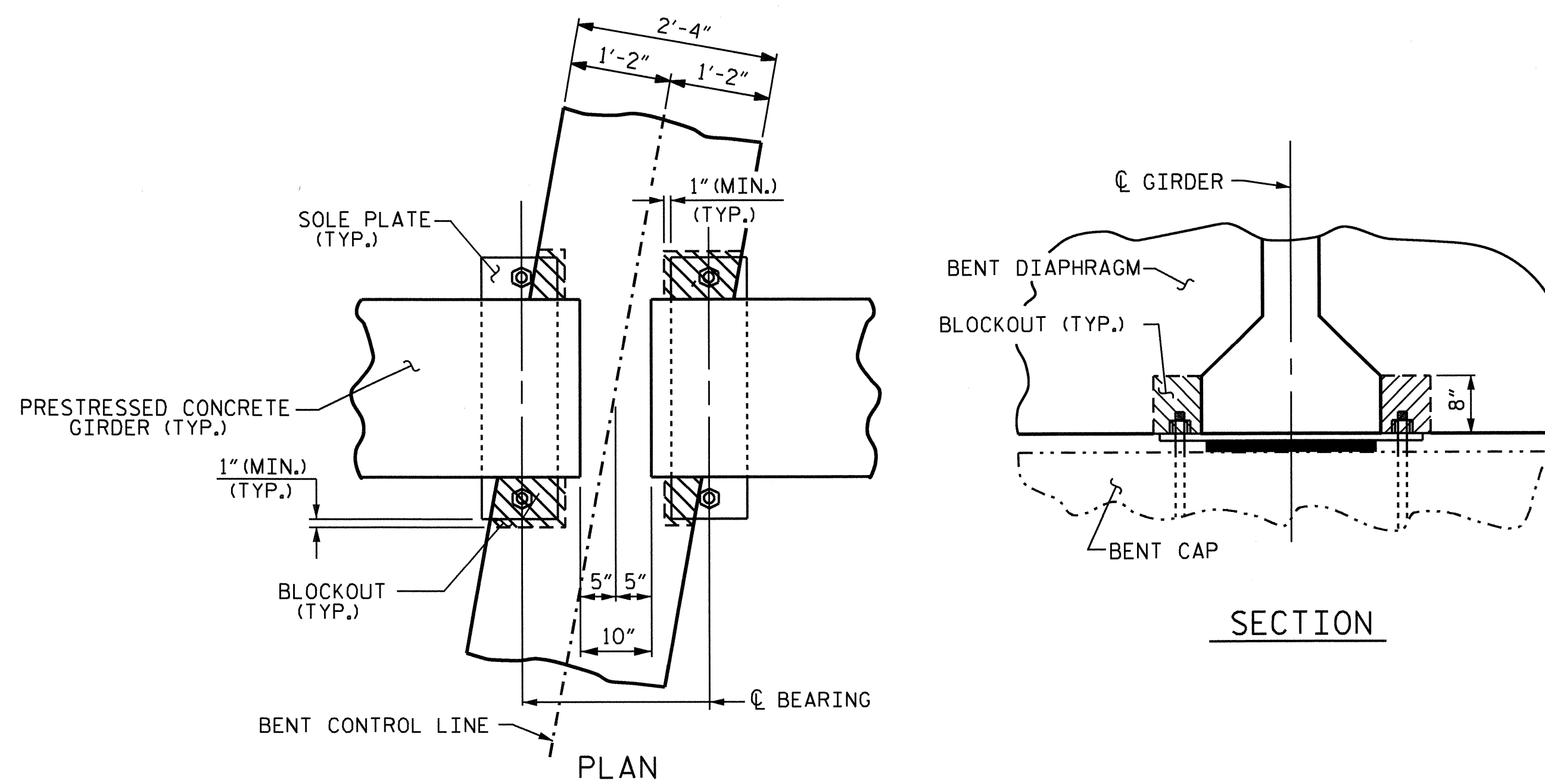


**END BENT DIAPHRAGM**

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

**BENT DIAPHRAGM**

**PLAN**



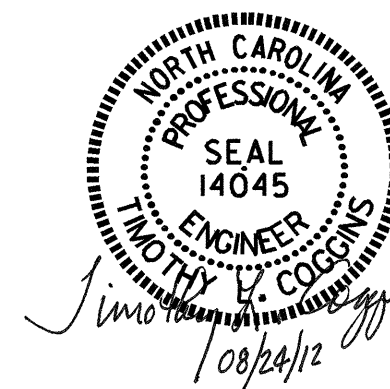
**BENT DIAPHRAGM BLOCKOUT DETAIL**

PROJECT NO. U-4444B  
CUMBERLAND COUNTY  
 STATION: 172+95.63 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 TYPICAL SECTION  
 DETAILS

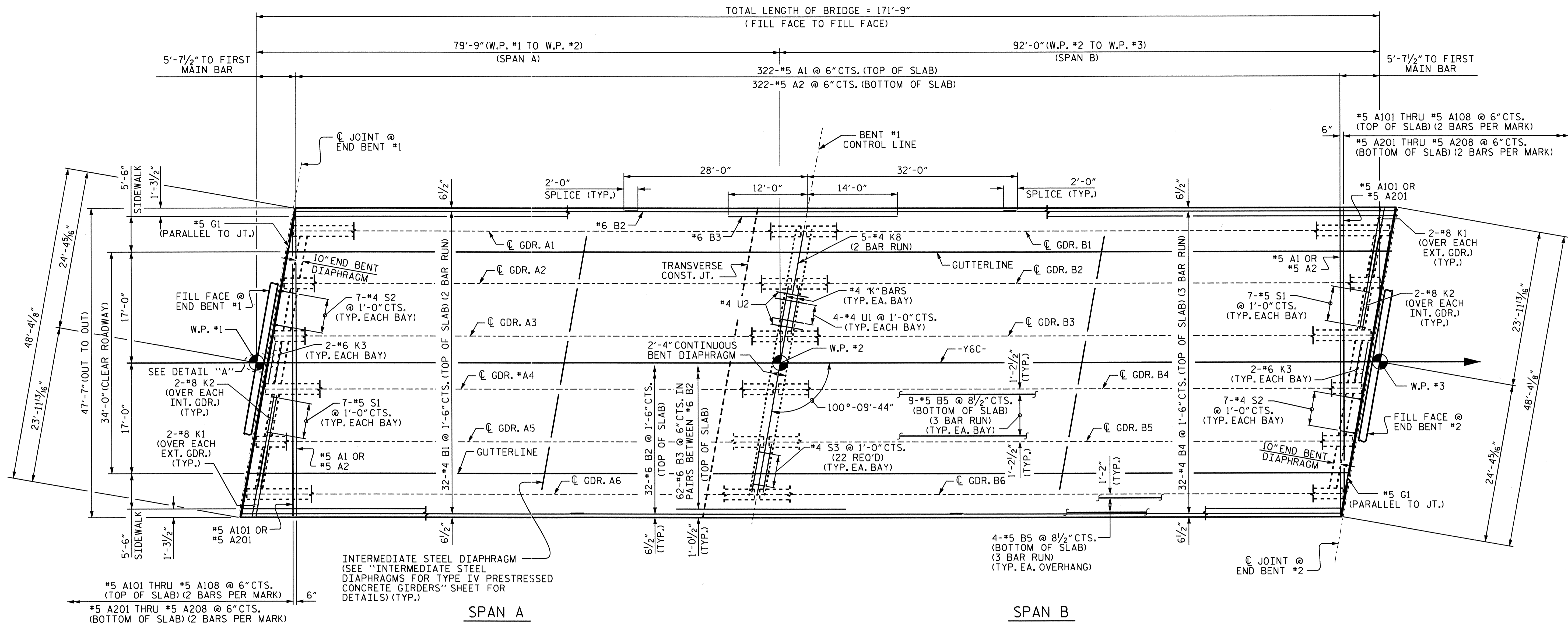


DRAWN BY: B.N.BARODAWALA DATE: 9-14-11  
 CHECKED BY: PEGGY PARISI DATE: 1-19-12

24-AUG-2012 12:37  
 R:\TIP\Projects-U\U4444B\structures\Plans\Final Plans\U4444b.sd..ts..01.dgn  
 tcoggins

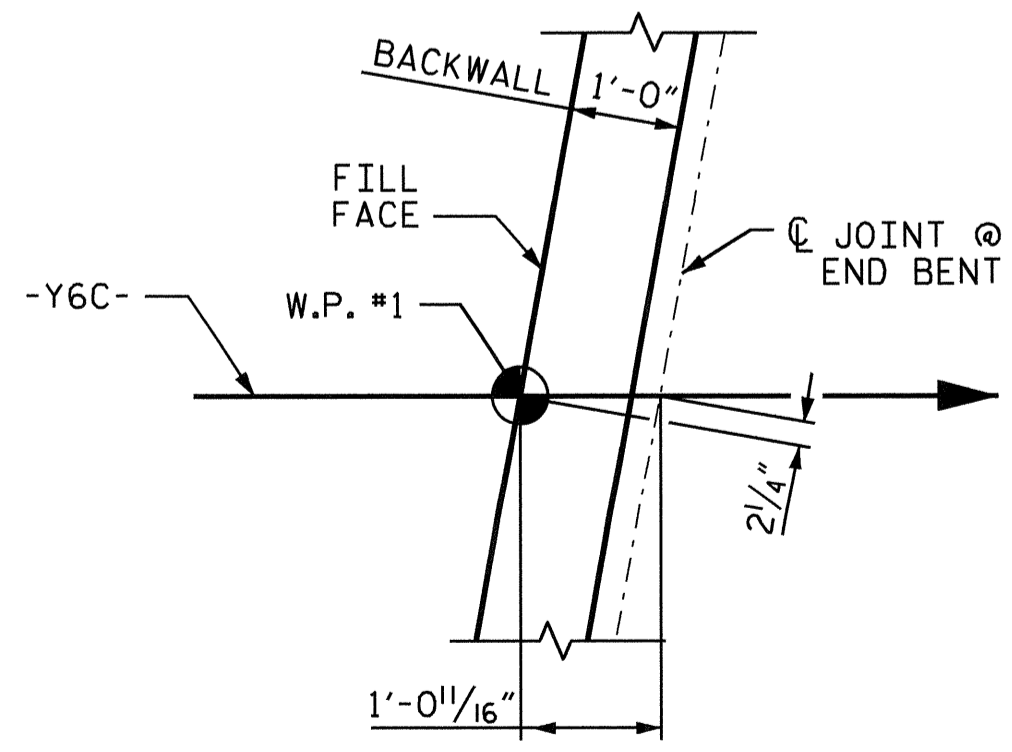
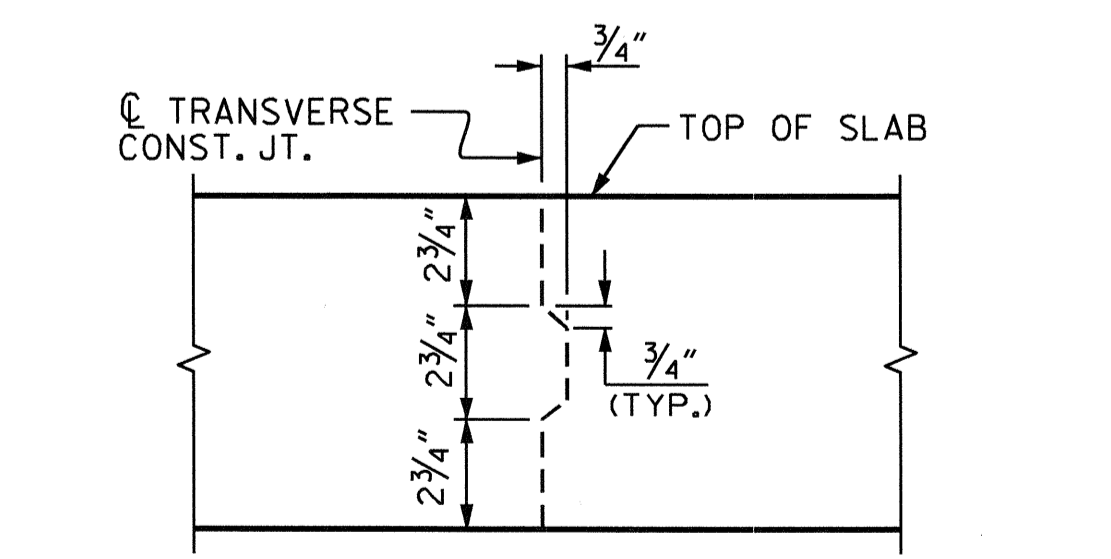
| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-6          |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |
| 2         |     |       | 4   |     |       | 30           |

STR. #1



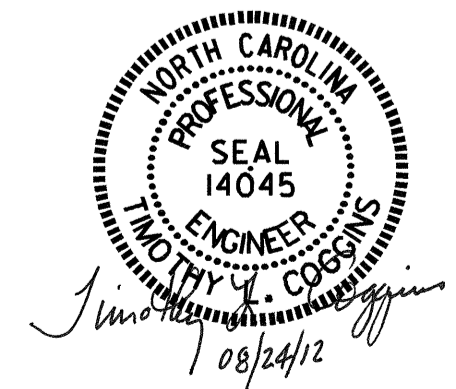
**PLAN OF SPANS**

FOR SIDEWALK REINFORCEMENT AND DETAILS, SEE "SIDEWALK DETAILS" SHEET



PROJECT NO. U-4444B  
CUMBERLAND COUNTY  
STATION: 172+95.63 -L-

|  |     |       |     |     |  |
|--|-----|-------|-----|-----|--|
| STATE OF NORTH CAROLINA<br>DEPARTMENT OF TRANSPORTATION<br>RALEIGH |     |       |     |     |  |
| SUPERSTRUCTURE<br>PLAN OF SPANS                                    |     |       |     |     |  |
| REVISIONS  |     |       |     |     |  |
| NO.  | BY: | DATE: | NO. | BY: | DATE:                                  |
| 1  |     |       | 3   |     |  |
| 2  |     |       | 4   |     |  |
|  |     |       |     |     | SHEET NO.<br>S-7<br>TOTAL SHEETS<br>30 |



DRAWN BY: B.N.BARODAWALA DATE: 9-14-11  
CHECKED BY: PEGGY PARIST DATE: 1-19-12

**NOTES**

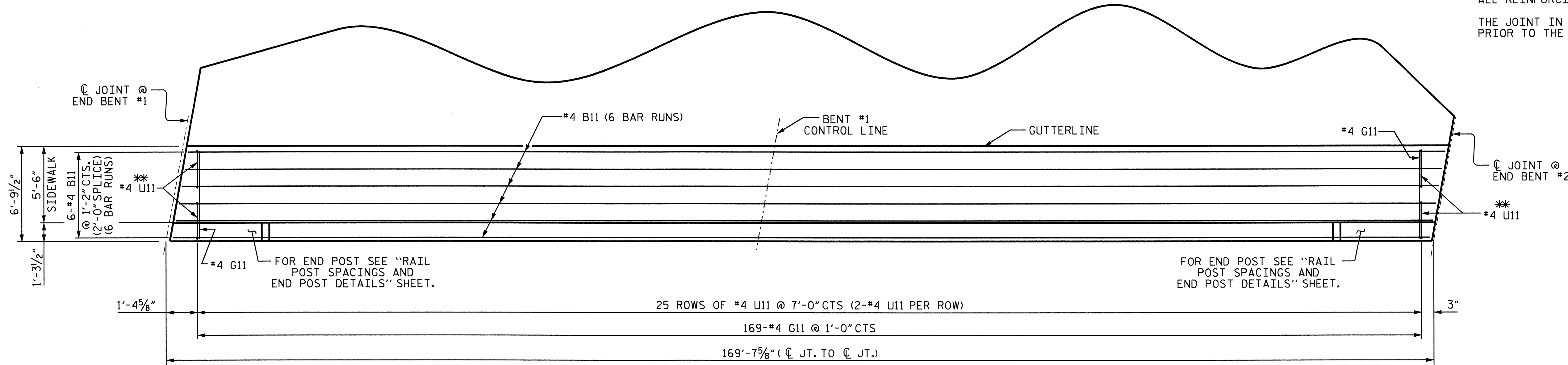
THE SIDEWALK IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT UNIT HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

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

PAYMENT FOR SIDEWALK AND END POSTS SHALL BE INCLUDED IN UNIT BID PRICE FOR "REINFORCED CONCRETE DECK SLAB."

ALL REINFORCING STEEL IN SIDEWALK SHALL BE EPOXY COATED.

THE JOINT IN THE DECK AT THE END BENTS SHALL BE SAWED PRIOR TO THE CASTING OF THE SIDEWALKS.



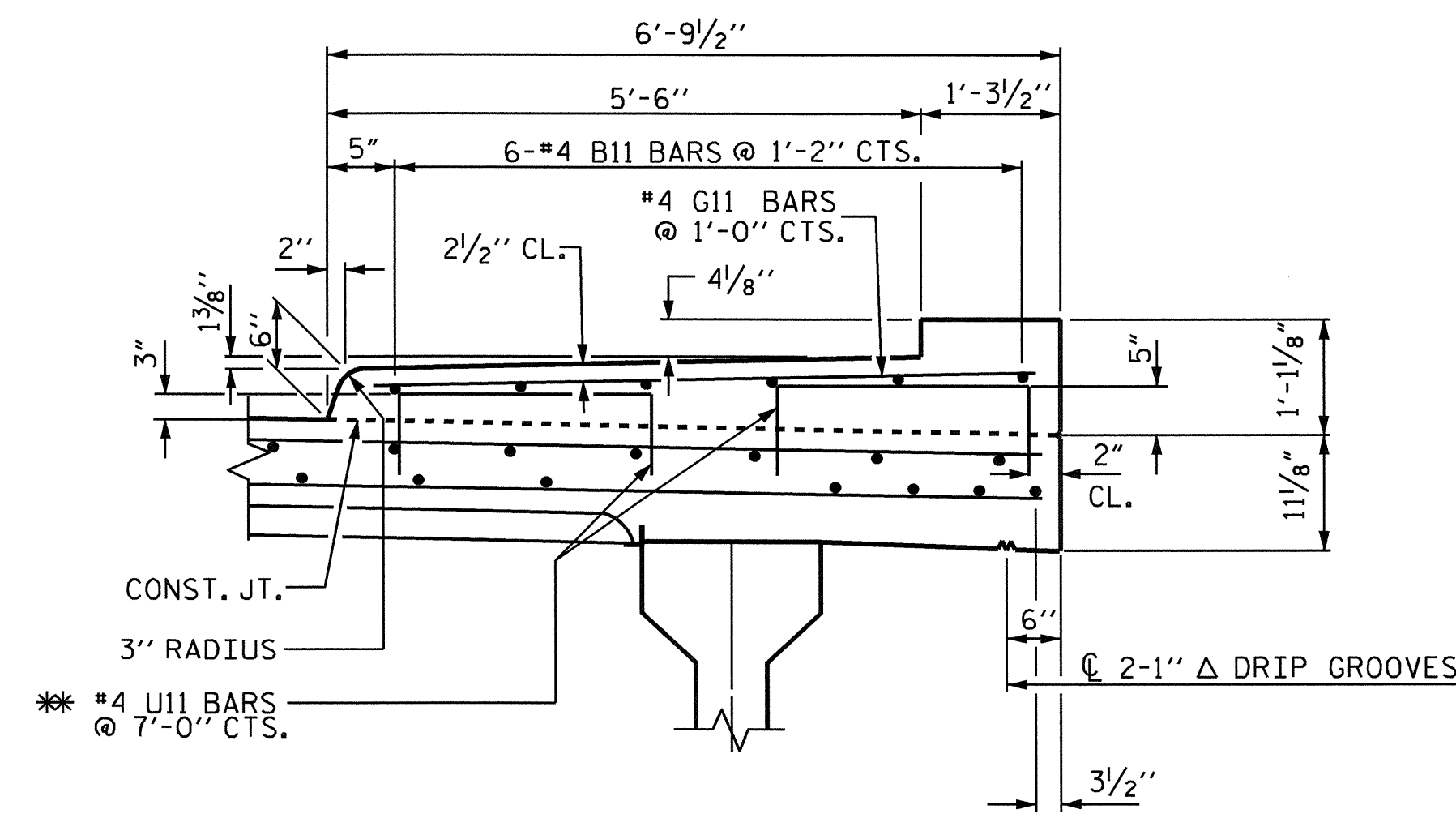
SPAN A

SPAN B

**PLAN OF SIDEWALK**

(RIGHT SIDE SHOWN, LEFT SIDE SIMILAR)

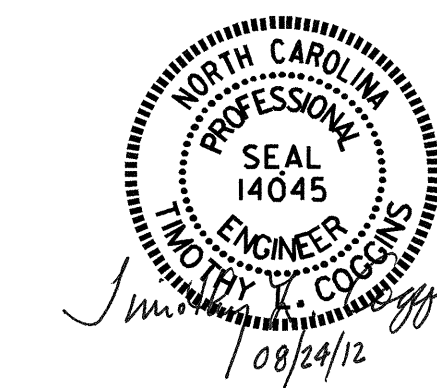
| BILL OF MATERIAL FOR SIDEWALK    |     |      |      |         |               |
|----------------------------------|-----|------|------|---------|---------------|
| BAR                              | NO. | SIZE | TYPE | LENGTH  | WEIGHT        |
| * B11                            | 72  | #4   | STR  | 29'-11" | 1439          |
| * G11                            | 338 | #4   | STR  | 6'-3"   | 1411          |
| * U11                            | 100 | #4   | 1    | 3'-4"   | 223           |
| * EPOXY COATED REINFORCING STEEL |     |      |      |         | 3073 LBS.     |
| CLASS AA CONCRETE                |     |      |      |         | 59.2 CU. YDS. |
| BAR TYPE                         |     |      |      |         |               |
|                                  |     |      |      |         |               |
| DIMENSIONS ARE OUT TO OUT.       |     |      |      |         |               |



**SECTION THRU SIDEWALK**

\*\* "U" BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF.

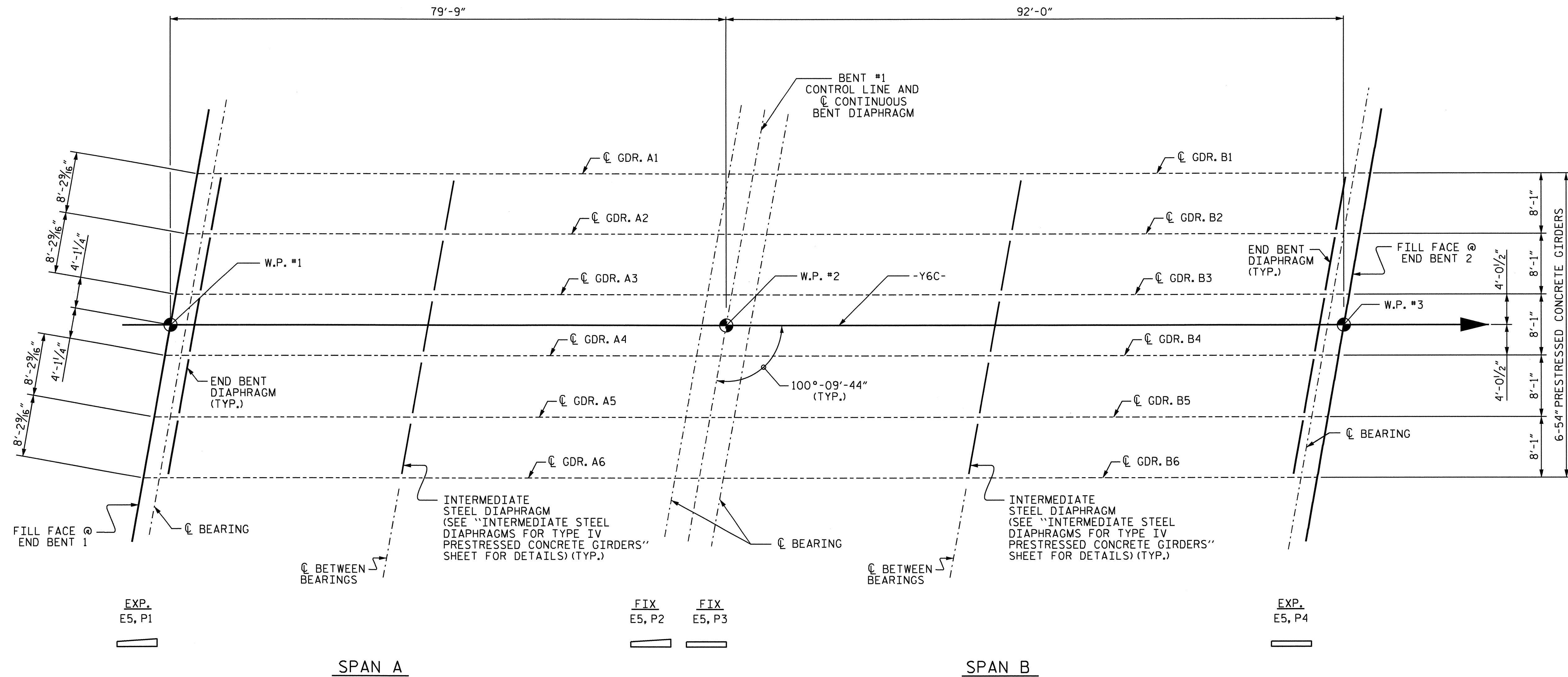
PROJECT NO. U-4444B  
CUMBERLAND COUNTY  
 STATION: 172+95.63 -L-



| STATE OF NORTH CAROLINA<br>DEPARTMENT OF TRANSPORTATION<br>RALEIGH |     |       |     |     |                 |
|--|-----|-------|-----|-----|-----------------|
| SUPERSTRUCTURE<br>SIDEWALK DETAILS                                 |     |       |     |     |                 |
| REVISIONS  |     |       |     |     | SHEET NO.       |
| NO.  | BY: | DATE: | NO. | BY: | DATE:           |
| 1  |     |       | 3   |     |                 |
| 2  |     |       | 4   |     |                 |
|  |     |       |     |     | S-8             |
|  |     |       |     |     | TOTAL SHEETS 30 |

DRAWN BY : B.N.BARODAWALA DATE : 9-14-11  
 CHECKED BY : PEGGY PARISI DATE : 1-19-12

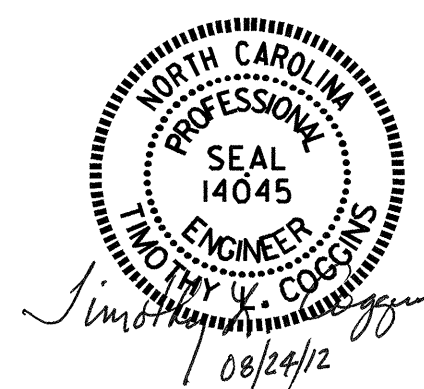




GIRDER LAYOUT

PROJECT NO. U-4444B  
CUMBERLAND COUNTY  
 STATION: 172+95.63 -L-

|  |     |       |     |     |           |
|--|-----|-------|-----|-----|-----------|
| STATE OF NORTH CAROLINA<br>DEPARTMENT OF TRANSPORTATION<br>RALEIGH |     |       |     |     |           |
| SUPERSTRUCTURE<br>GIRDER LAYOUT                                    |     |       |     |     |           |
| REVISIONS  |     |       |     |     | SHEET NO. |
| NO.  | BY: | DATE: | NO. | BY: | DATE:     |
| 1  |     |       | 3   |     |           |
| 2  |     |       | 4   |     |           |
| TOTAL SHEETS   |     |       |     |     | 30        |

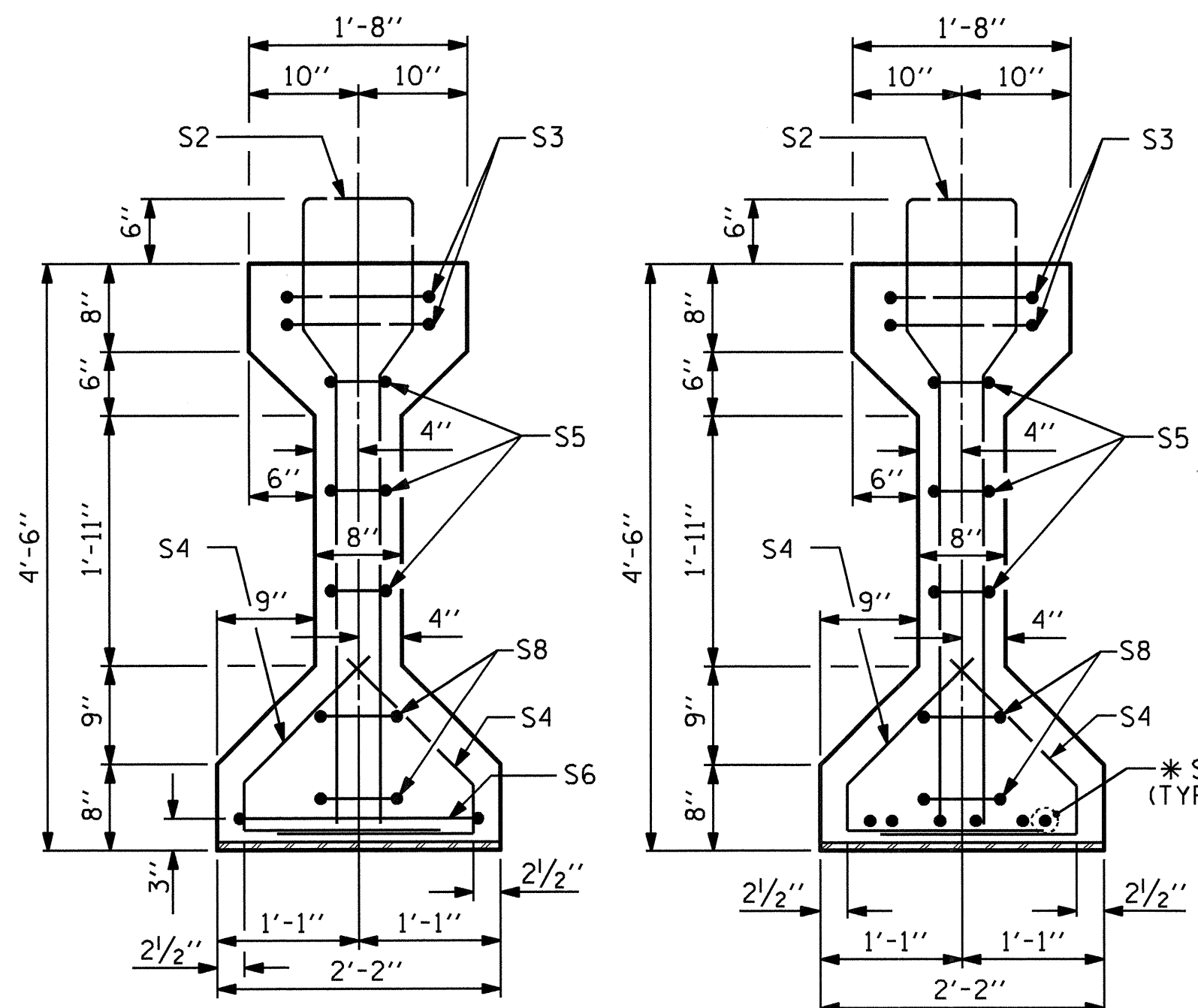


DRAWN BY : B.N.BARODAWALA DATE : 9-14-11  
 CHECKED BY : PEGGY PARISI DATE : 1-19-12

24-AUG-2012 12:34  
 R:\TIP\Projects-U\U4444B\structures\Plans\Final Plans\U4444b.sd.fp.01.dgn  
 tcoggins

STR. #1

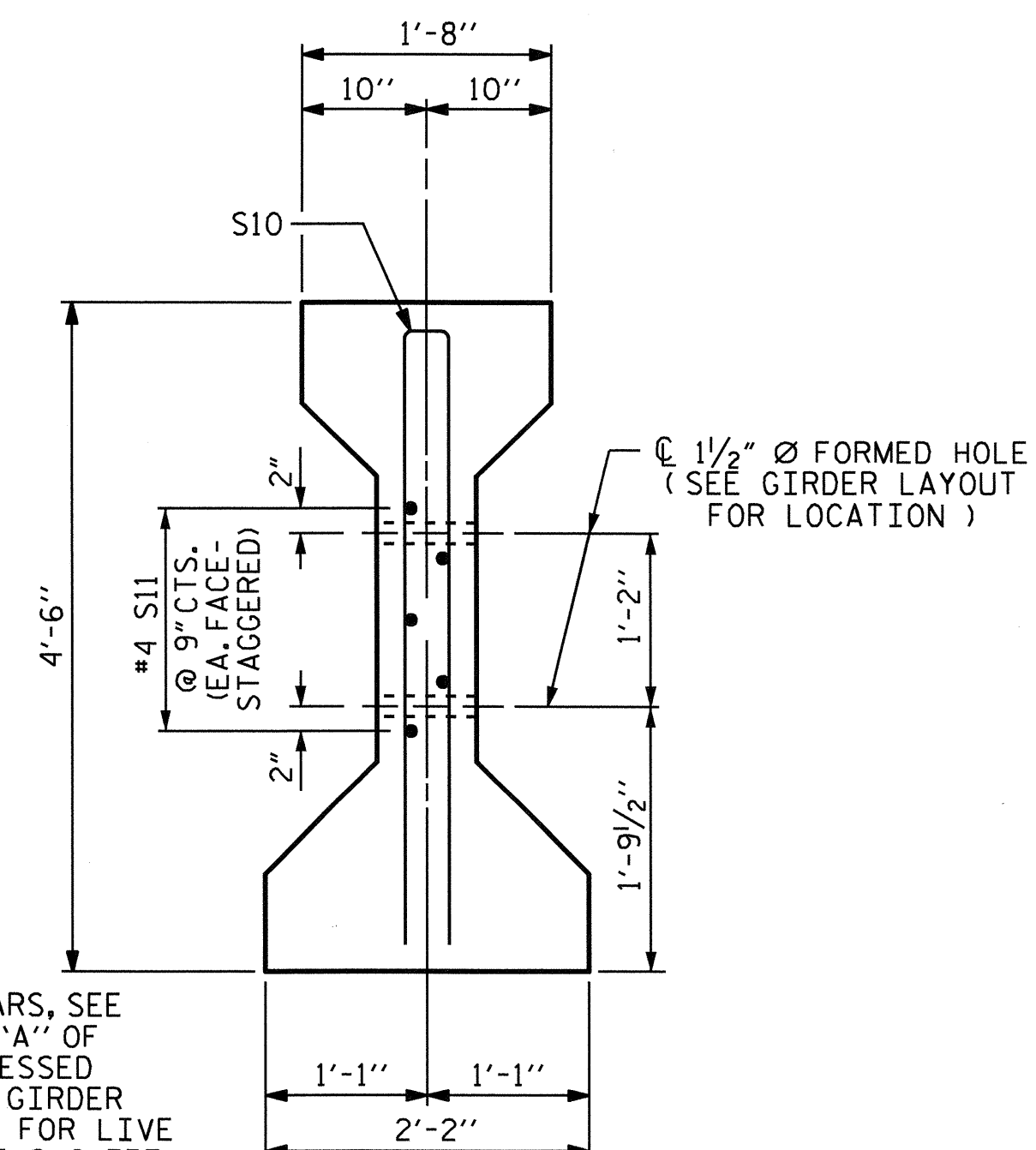




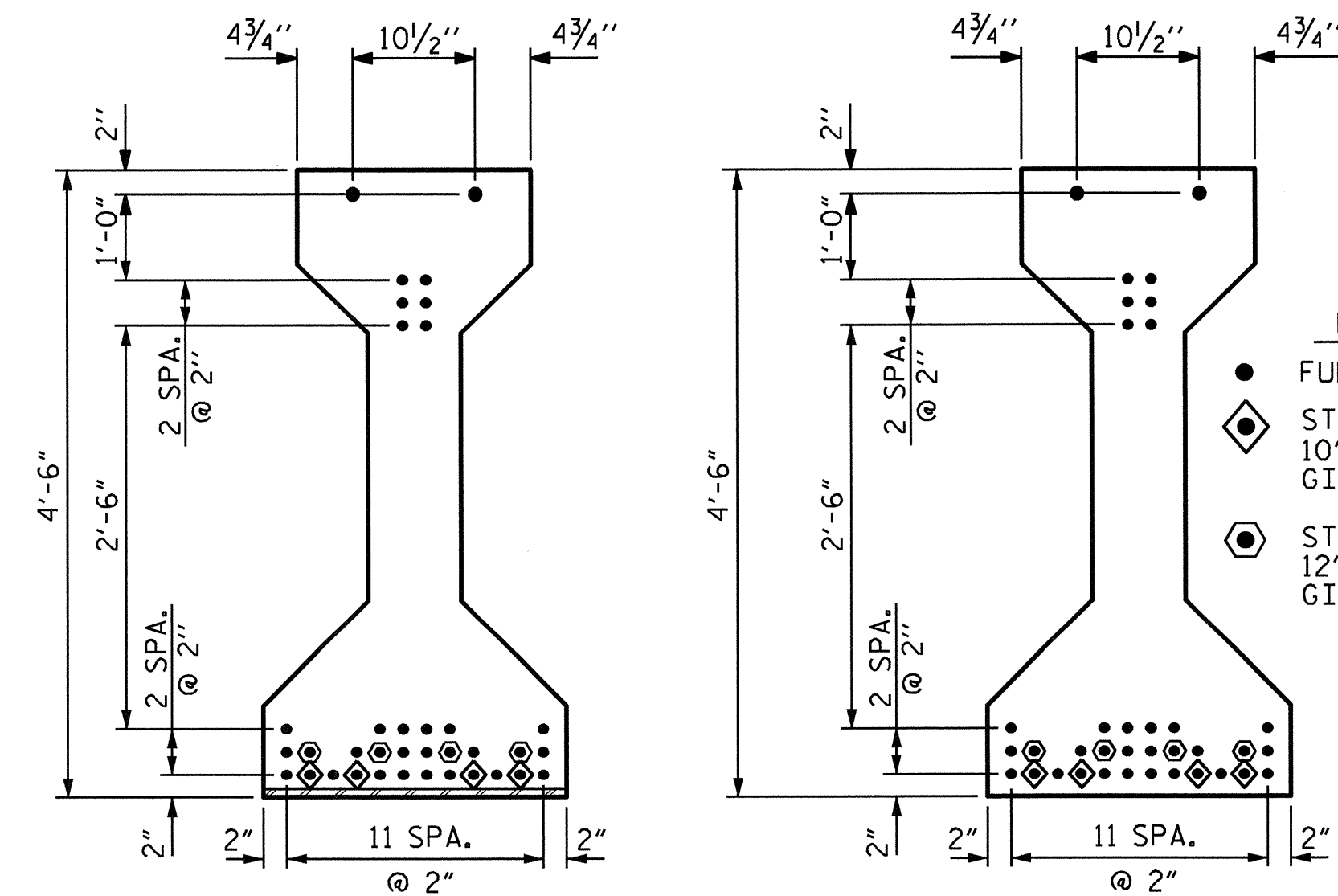
SECTION A-A

SECTION B-B

\* FOR S7 BARS, SEE  
DETAIL "A" OF  
PRESTRESSED  
CONCRETE GIRDER  
CONTINUOUS FOR LIVE  
LOAD DETAILS SHEET



SECTION C-C  
(S1 BARS NOT SHOWN)

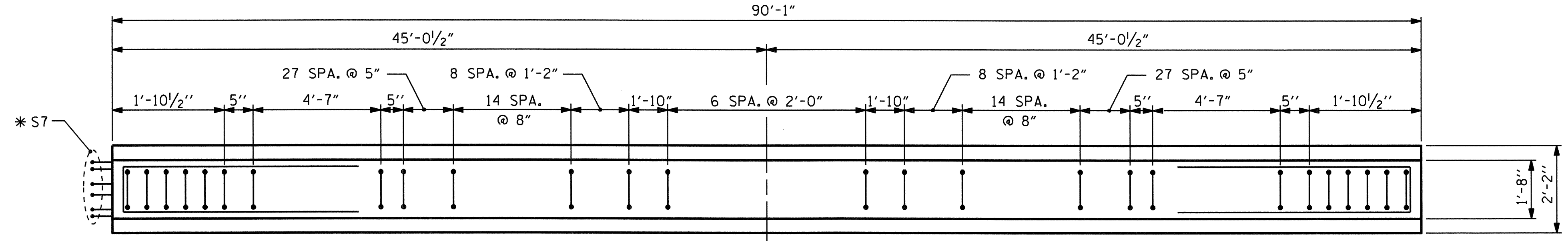


AT END OF GIRDER

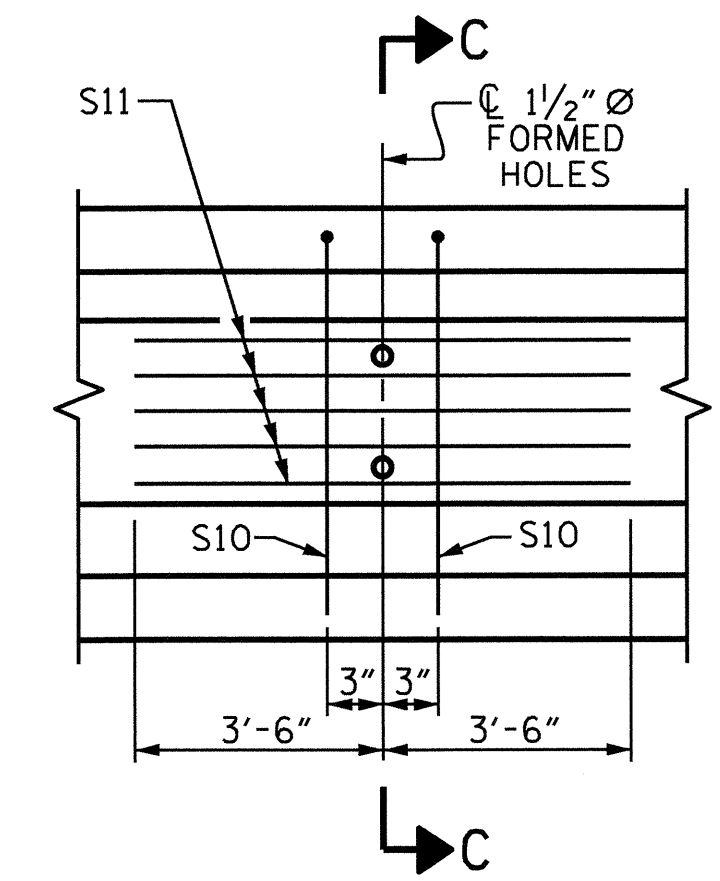
AT C OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

**DEBONDING LEGEND**  
 ● FULLY BONDED STRANDS  
 ◊ STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER  
 ⊙ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER

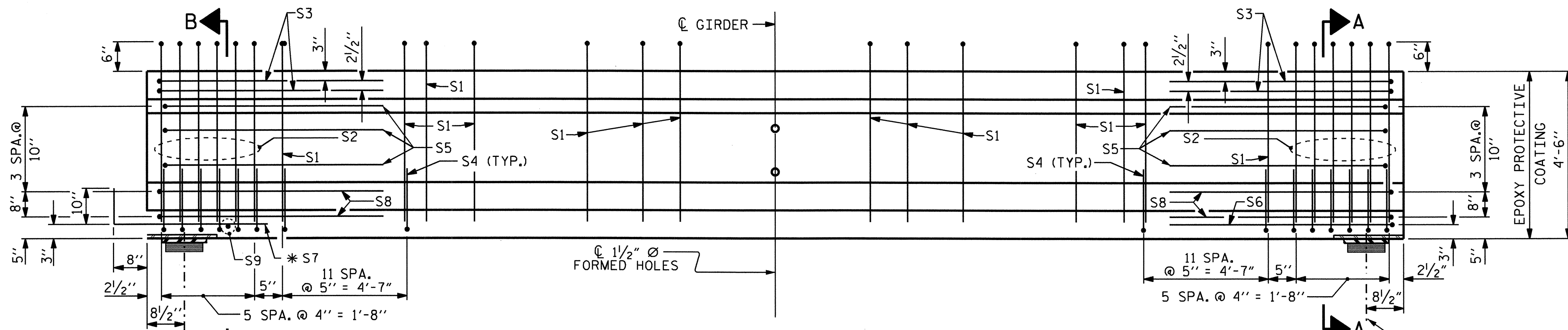


PLAN OF GIRDER



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM  
REINFORCING STEEL FOR ALL GIRDERS



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

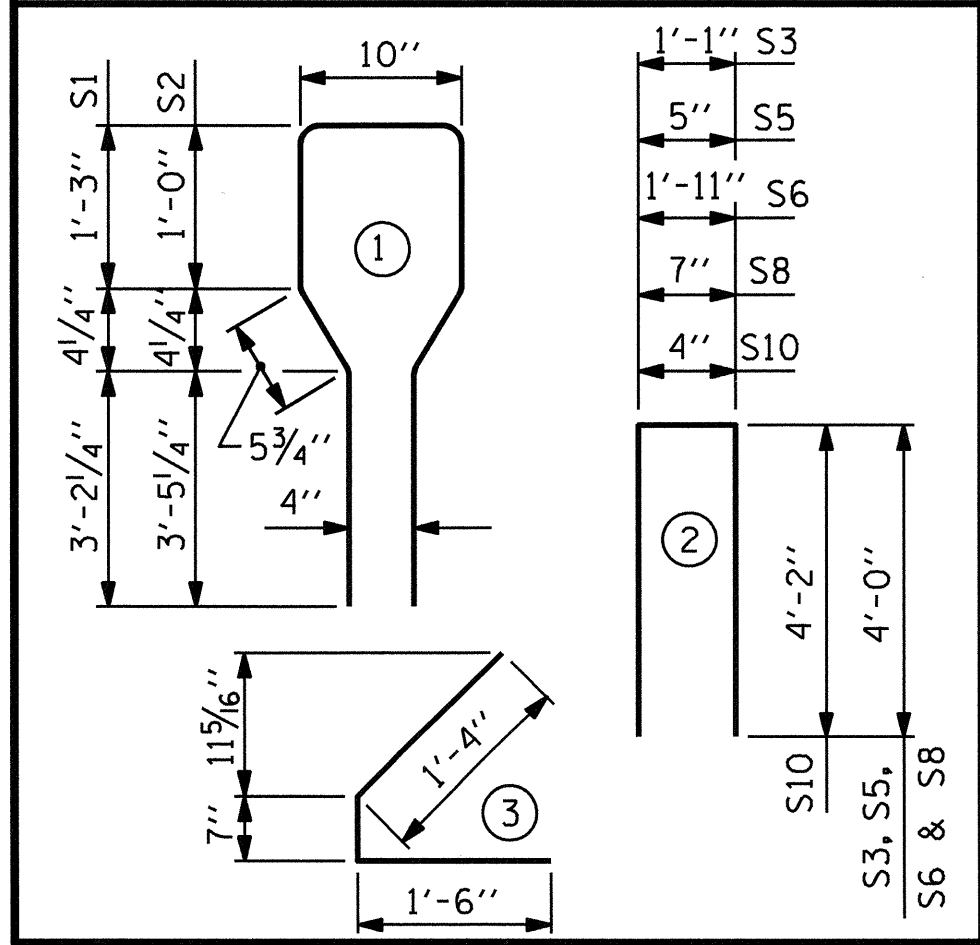
| 0.6" Ø L. R. GRADE 270 STRANDS |   |   |
|--------------------------------|---|---|
| AREA<br>(SQUARE INCHES)        | ULTIMATE<br>STRENGTH<br>(LBS. PER STRAND) | APPLIED<br>PRESTRESS<br>(LBS. PER STRAND) |
| 0.217                          | 58,600                                    | 43,950      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

| REINFORCING STEEL FOR ONE GIRDER |        |      |      |        |        |  |
|----------------------------------|--------|------|------|--------|--------|--|
| BAR                              | NUMBER | SIZE | TYPE | LENGTH | WEIGHT |  |
| S1                               | 131    | #4   | 1    | 10'-8" | 933    |  |
| S2                               | 12     | #6   | 1    | 10'-8" | 192    |  |
| S3                               | 4      | #4   | 2    | 9'-1"  | 24     |  |
| S4                               | 72     | #4   | 3    | 3'-5"  | 164    |  |
| S5                               | 6      | #4   | 2    | 8'-5"  | 34     |  |
| S6                               | 1      | #4   | 2    | 9'-11" | 7      |  |
| * S7                             | 6      | #5   | STR  | 3'-8"  | 23     |  |
| S8                               | 4      | #4   | 2    | 8'-7"  | 23     |  |
| S9                               | 1      | #3   | STR  | 1'-10" | 1      |  |
| S10                              | 2      | #5   | 2    | 8'-8"  | 18     |  |
| S11                              | 5      | #4   | STR  | 7'-0"  | 23     |  |

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

**BAR TYPES**

ALL BAR DIMENSIONS ARE OUT-TO-OUT



**QUANTITIES FOR ONE GIRDER**

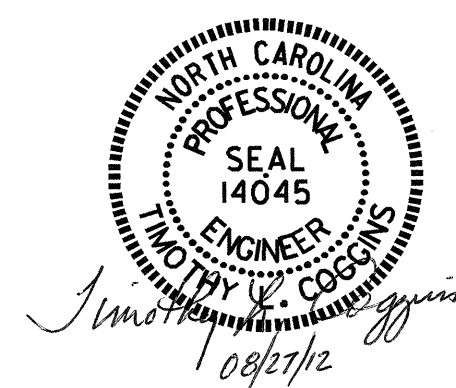
|        | REINFORCING STEEL | 6500 PSI CONCRETE | 0.6" Ø L. R. STRANDS |
|--------|-------------------|-------------------|----------------------|
|        | LB.               | C.Y.              | No.                  |
| GIRDER | 1442              | 18.3              | 36                   |

**GIRDERS REQUIRED**

| NUMBER | LENGTH | TOTAL LENGTH |
|--------|--------|--------------|
| 6      | 90'-1" | 540'-6"      |

PROJECT NO. U-4444B  
 CUMBERLAND COUNTY  
 STATION: 172+95.63 -L-  
 SHEET 2 OF 4

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



| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-11         |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |
| 2         |     |       | 4   |     |       | 30           |

ASSEMBLED BY : B.N.BARODAWALA DATE : 1-18-12  
 CHECKED BY : PEGGY PARISI DATE : 1-19-12  
 DRAWN BY : ELR 8/91 REV. 10/17/00R RWW/LES  
 CHECKED BY : GRP 8/91 REV. 5/1/06R TLA/GM  
 REV. 10/1/11 MAA/GM

NOTES

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES INDICATED IN ELEVATION VIEW.

EMBEDDED PLATE "B-1" SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. BEVEL EDGES OF PLATE "B-1" TO GIVE CLOSE FIT BUT NOT TIGHT FIT TO STEEL CASTING FORM.

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

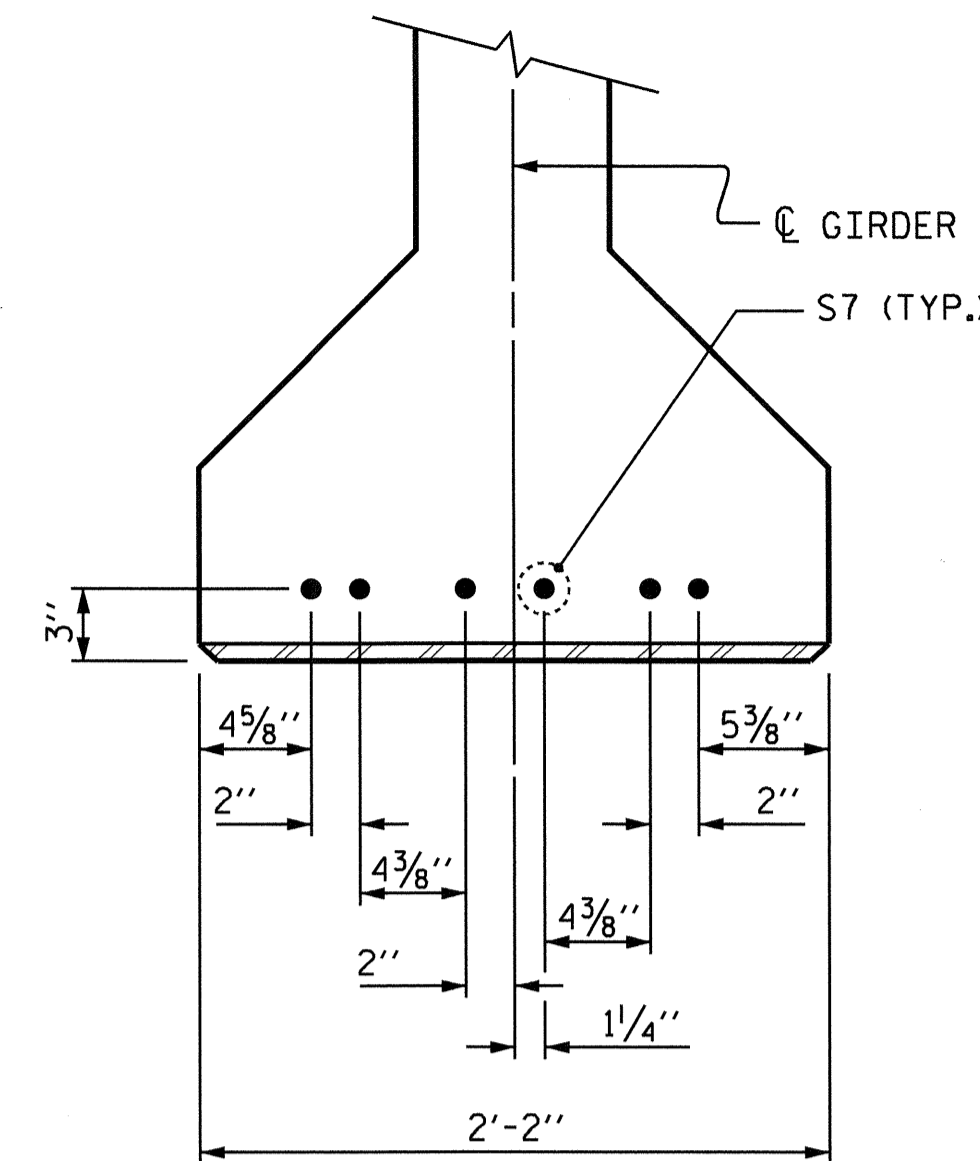
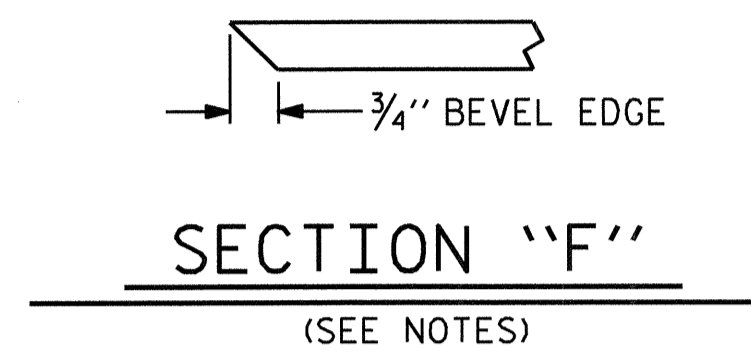
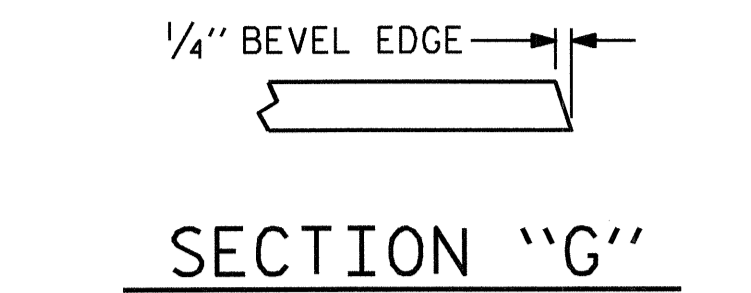
AT ENDS OF GIRDERS TO BE EMBEDDED IN CONCRETE DIAPHRAGMS OR END WALLS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER ENDS. OTHERWISE, PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4200 PSI FOR SPAN A AND 5200 PSI FOR SPAN B.

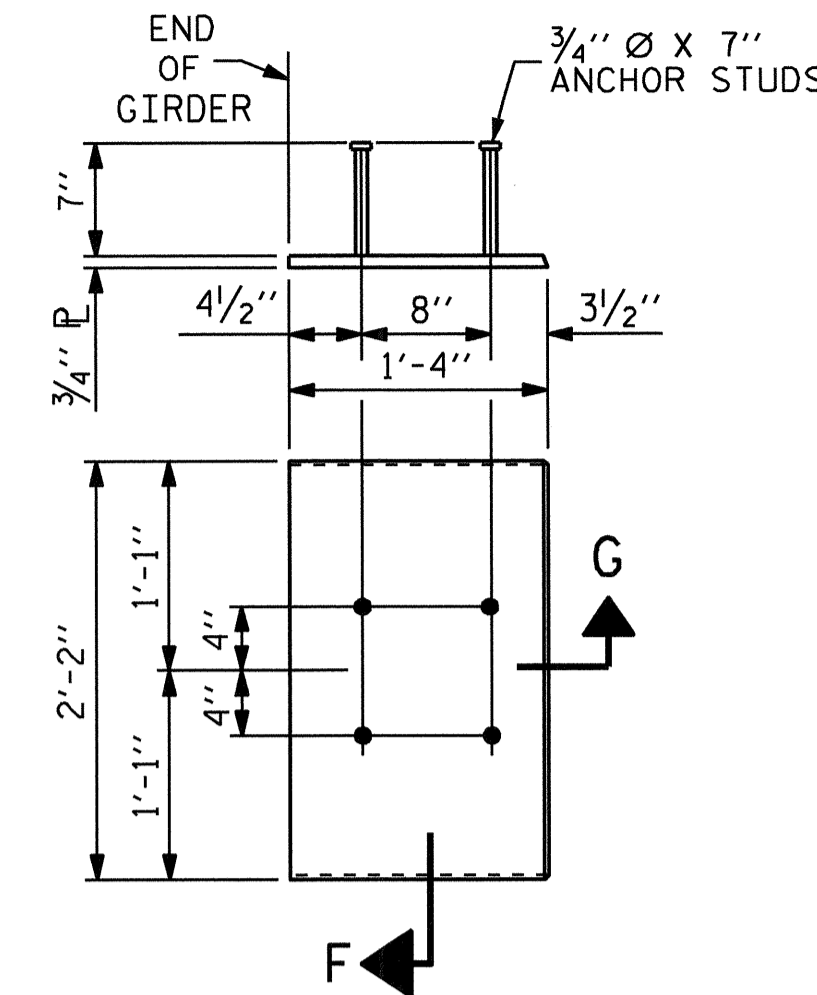
DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

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

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 "A"  
(FOR AASHTO TYPE IV GIRDERS)



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

| DEAD LOAD DEFLECTION TABLE FOR SPAN A |             |       |       |       |        |        |        |       |       |       |   |
|---------------------------------------|-------------|-------|-------|-------|--------|--------|--------|-------|-------|-------|---|
| 0.6 Ø LOW RELAXATION                  | ALL GIRDERS |       |       |       |        |        |        |       |       |       |   |
| TENTH POINTS                          | 0           | .1    | .2    | .3    | .4     | .5     | .6     | .7    | .8    | .9    | 0 |
| CAMBER (GIRDER ALONE IN PLACE)        | ↑ 0         | 0.038 | 0.072 | 0.099 | 0.116  | 0.121  | 0.116  | 0.099 | 0.072 | 0.038 | 0 |
| * DEFLECTION DUE TO SUPERIMPOSED D.L. | ↓ 0         | 0.020 | 0.038 | 0.052 | 0.061  | 0.064  | 0.061  | 0.052 | 0.038 | 0.020 | 0 |
| FINAL CAMBER                          | ↑ 0         | 3/16" | 7/16" | 9/16" | 11/16" | 11/16" | 11/16" | 9/16" | 7/16" | 3/16" | 0 |

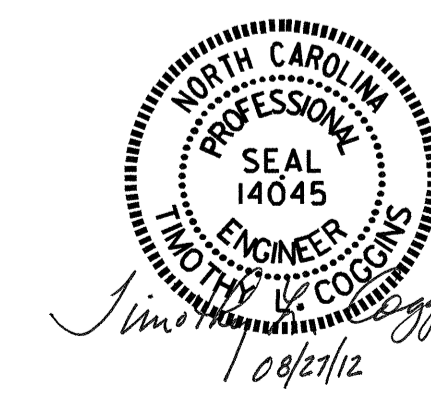
\* INCLUDES FUTURE WEARING SURFACE  
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

| DEAD LOAD DEFLECTION TABLE FOR SPAN B |             |       |        |        |         |        |         |        |        |       |   |
|---------------------------------------|-------------|-------|--------|--------|---------|--------|---------|--------|--------|-------|---|
| 0.6 Ø LOW RELAXATION                  | ALL GIRDERS |       |        |        |         |        |         |        |        |       |   |
| TENTH POINTS                          | 0           | .1    | .2     | .3     | .4      | .5     | .6      | .7     | .8     | .9    | 0 |
| CAMBER (GIRDER ALONE IN PLACE)        | ↑ 0         | 0.071 | 0.134  | 0.183  | 0.215   | 0.225  | 0.215   | 0.183  | 0.134  | 0.071 | 0 |
| * DEFLECTION DUE TO SUPERIMPOSED D.L. | ↓ 0         | 0.035 | 0.066  | 0.090  | 0.105   | 0.111  | 0.105   | 0.090  | 0.066  | 0.035 | 0 |
| FINAL CAMBER                          | ↑ 0         | 7/16" | 13/16" | 1 1/8" | 1 5/16" | 1 3/8" | 1 5/16" | 1 1/8" | 13/16" | 7/16" | 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. U-4444B  
CUMBERLAND COUNTY  
STATION: 172+95.63 -L-

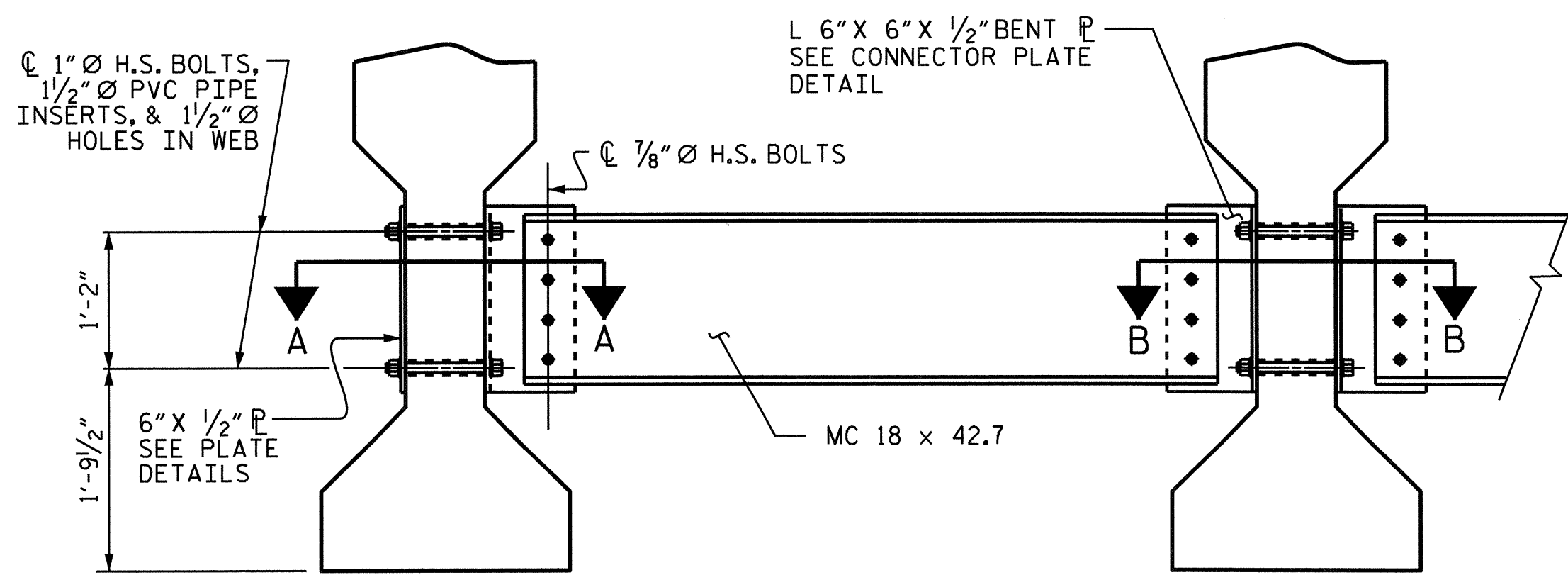
SHEET 3 OF 4



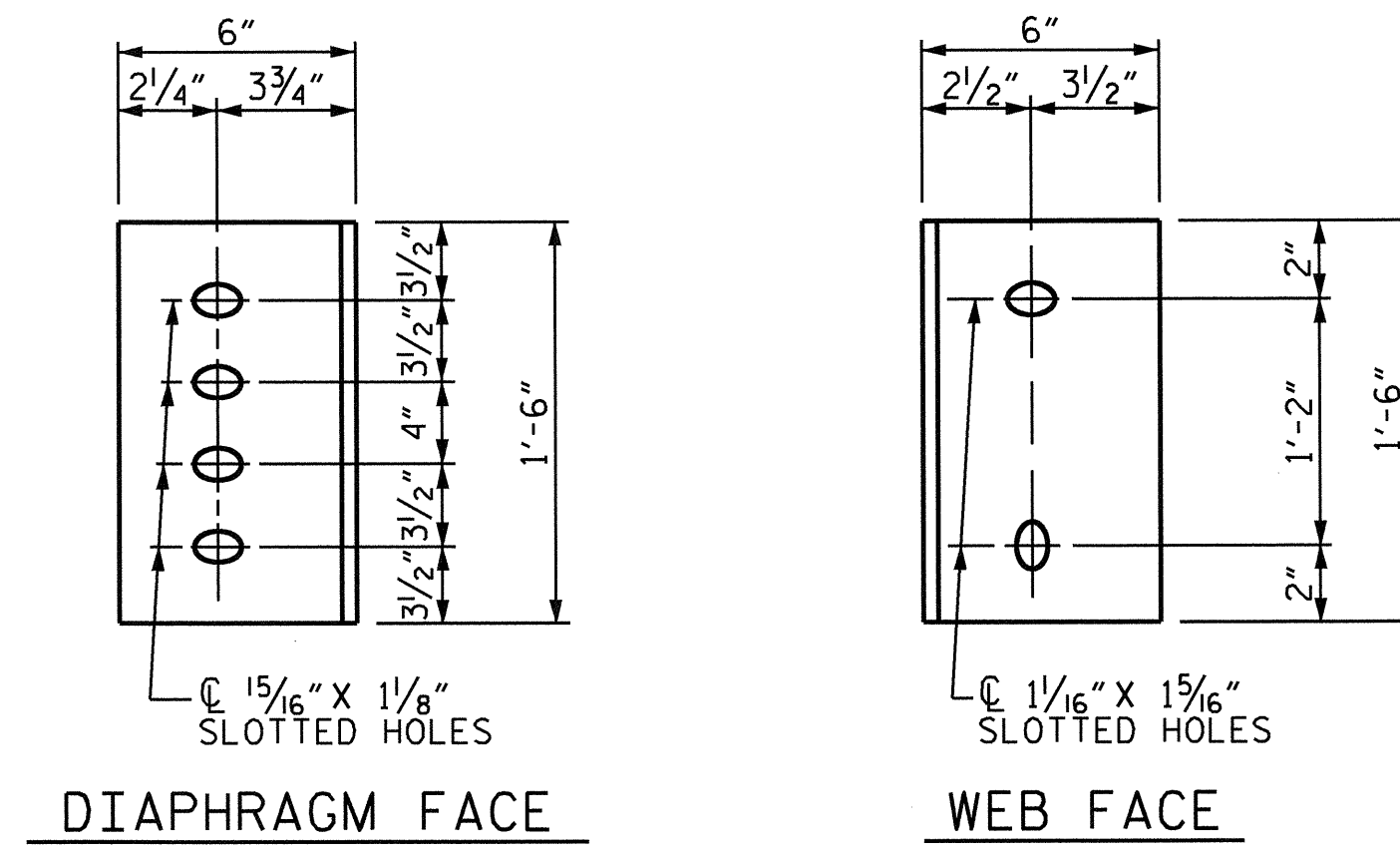
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
PRESTRESSED CONCRETE GIRDER  
CONTINUOUS FOR LIVE LOAD  
DETAILS

|                               |                        |
|-------------------------------|------------------------|
| ASSEMBLED BY : B.N.BARODAWALA | DATE : 9-14-11         |
| CHECKED BY : PEGGY PARISI     | DATE : 1-19-12         |
| DRAWN BY : ELR 11/91          | REV. 7/10/OIRR LES/RDR |
| CHECKED BY : GRP 11/91        | REV. 5/1/06R TLA/GM    |
|                               | REV. 10/1/11 MAA/GM    |

| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-12         |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |
| 2         |     |       | 4   |     |       | 30           |



EXTERIOR GIRDER  
INTERIOR GIRDER  
PART SECTION AT INTERMEDIATE DIAPHRAGM



DIAPHRAGM FACE  
WEB FACE  
CONNECTOR PLATE DETAILS

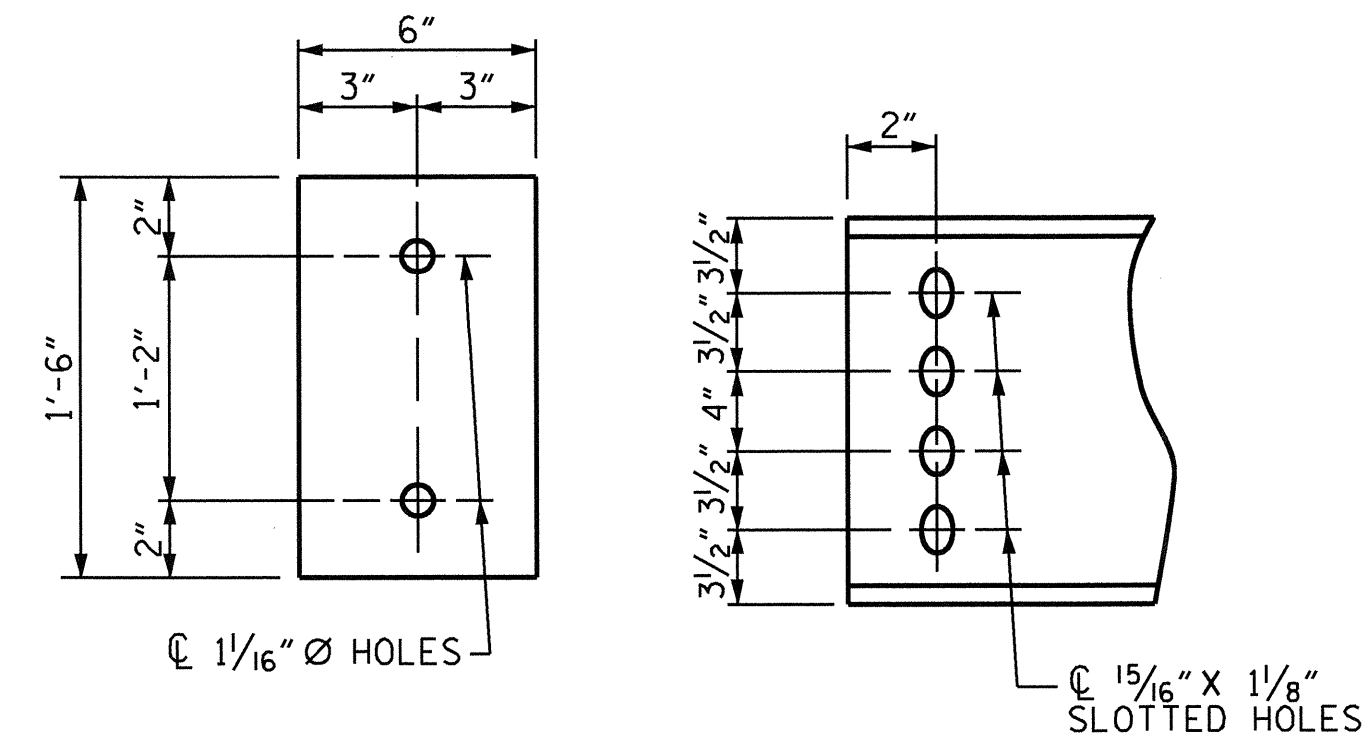


PLATE DETAILS  
CHANNEL END

STRUCTURAL STEEL NOTES

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

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

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

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

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

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

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

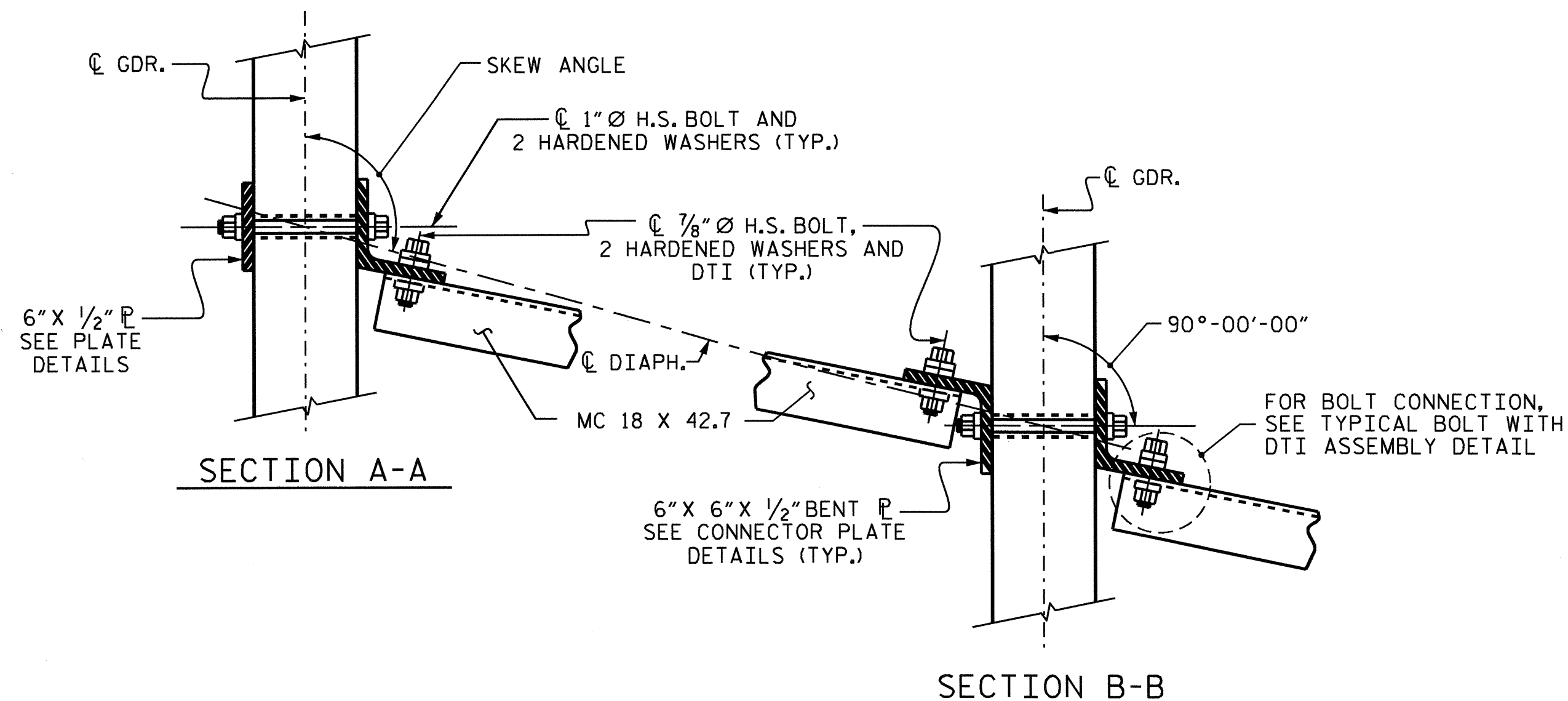
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

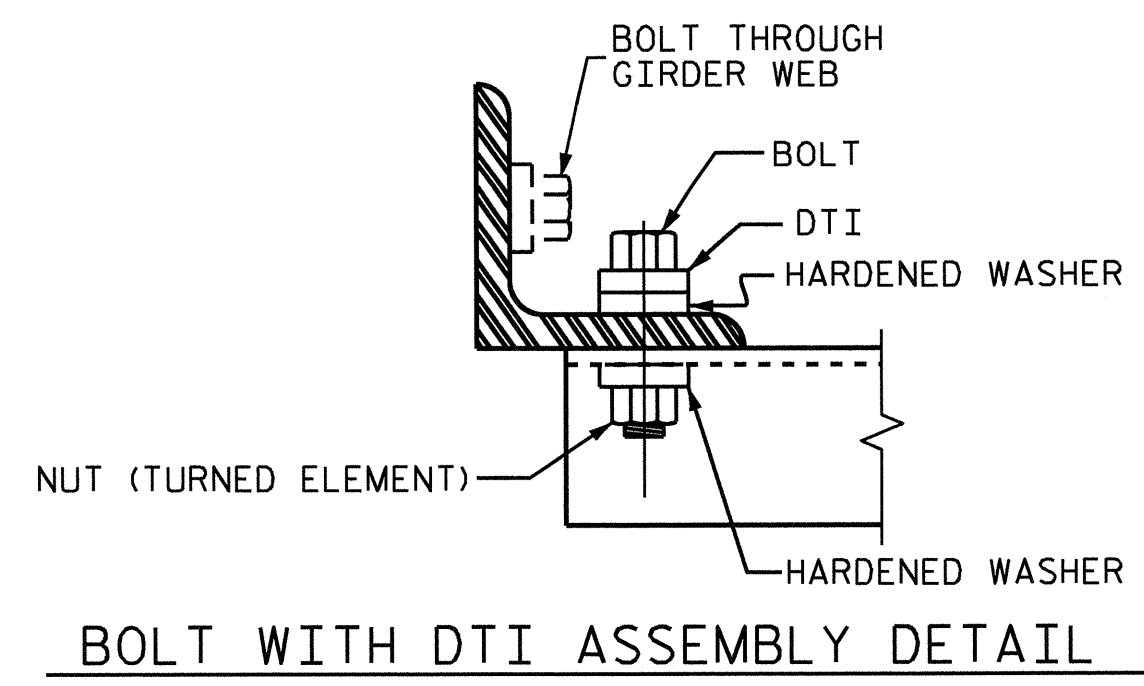
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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

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



CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

PROJECT NO. U-4444B  
CUMBERLAND COUNTY  
STATION: 172+95.63 -L-

SHEET 4 OF 4

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



ASSEMBLED BY: B.N. BARODAWAL DATE: 9-14-11  
CHECKED BY: PEGGY PARISI DATE: 1-19-12  
DRAWN BY: TLA 6/05  
CHECKED BY: VC 6/05  
ADDED: 10/21/05  
REV. 5/1/06RRR KMM/GM  
REV. 10/1/11 MAA/GM

| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-13         |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |
| 2         |     |       | 4   |     |       | 30           |

**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.

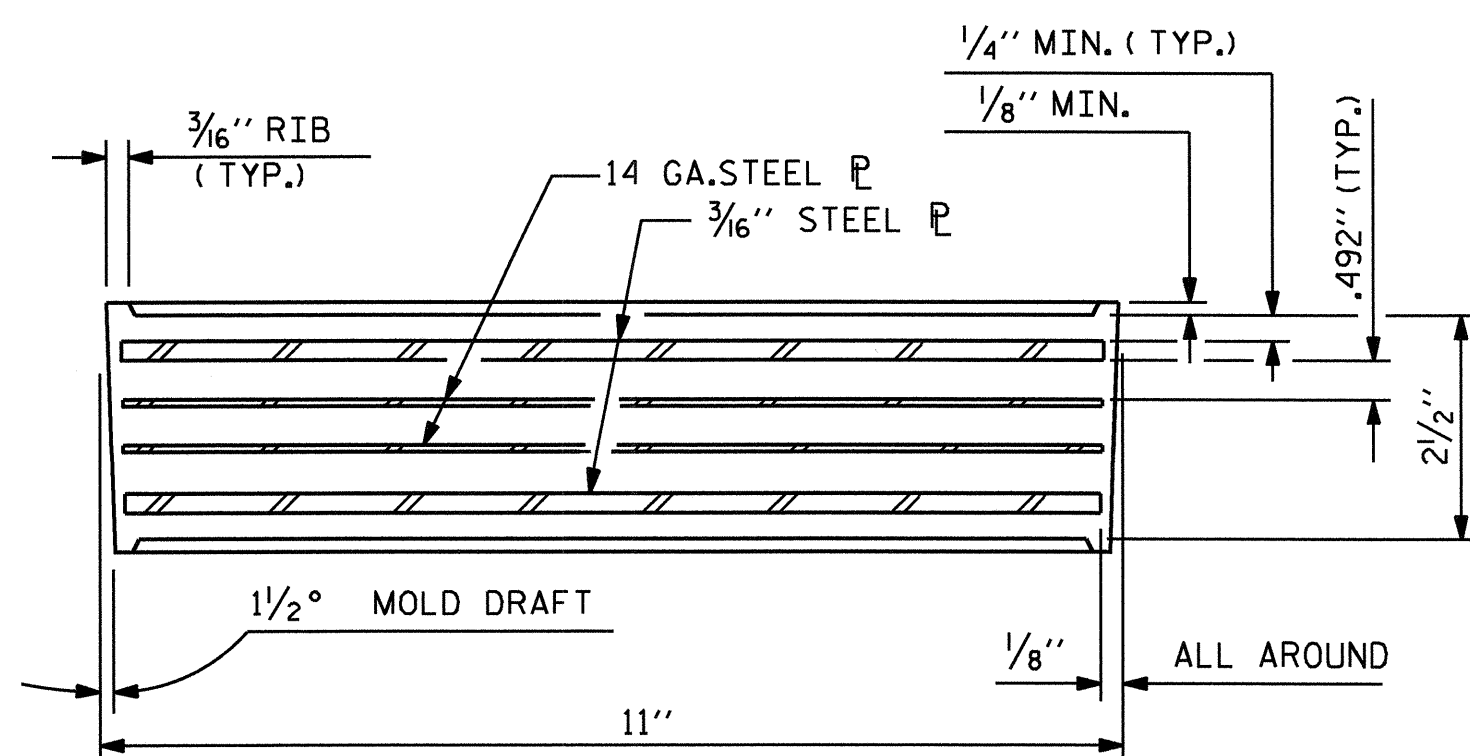
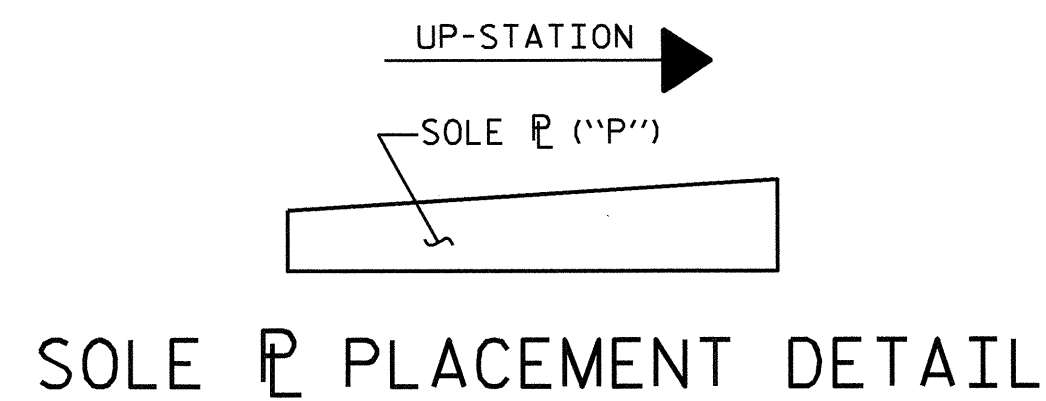
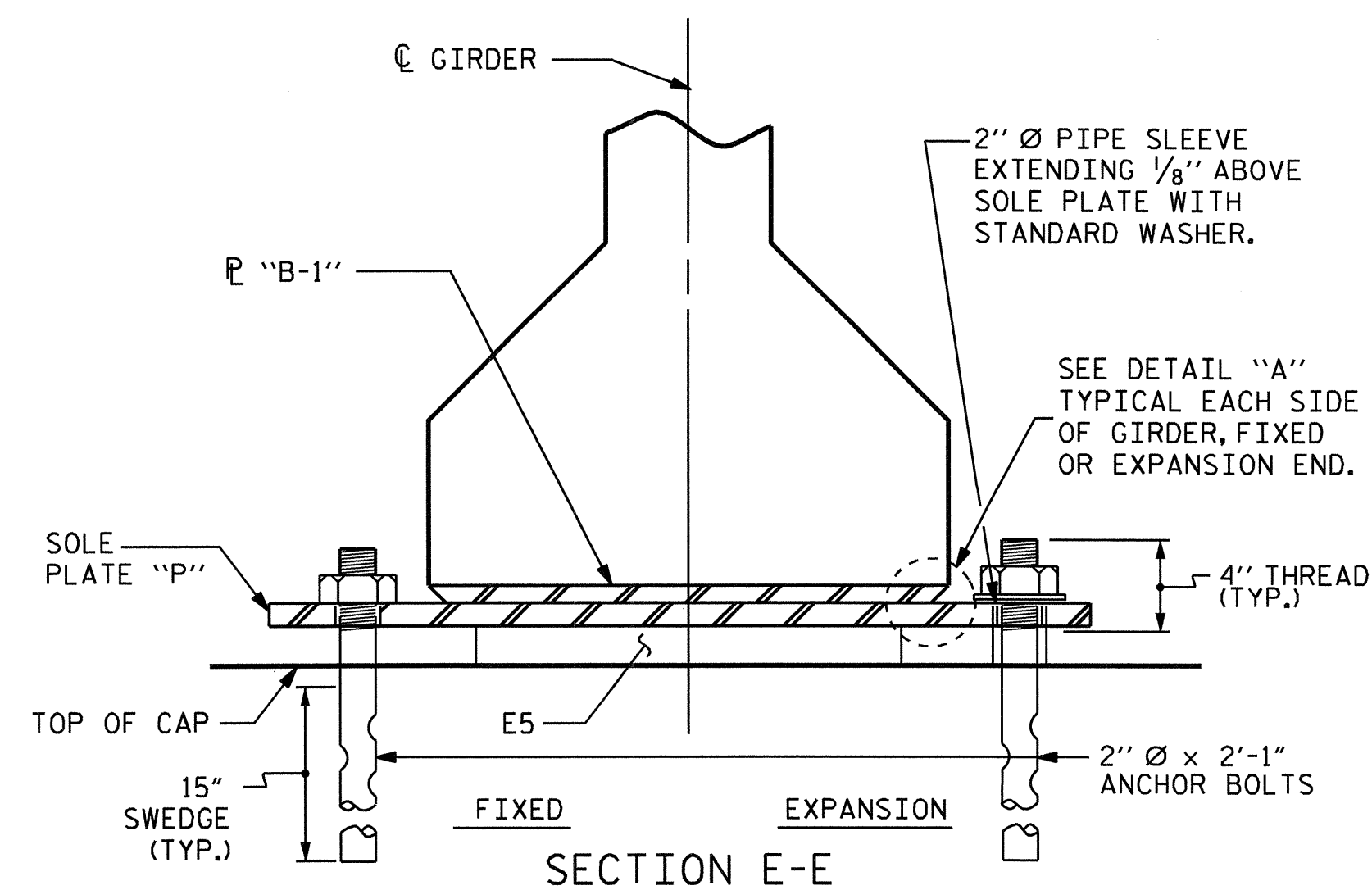
WHEN WELDING THE SOLE PLATE TO THE EMBEDDED PLATE IN THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE SOLE PLATE DOES NOT EXCEED 300°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.

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

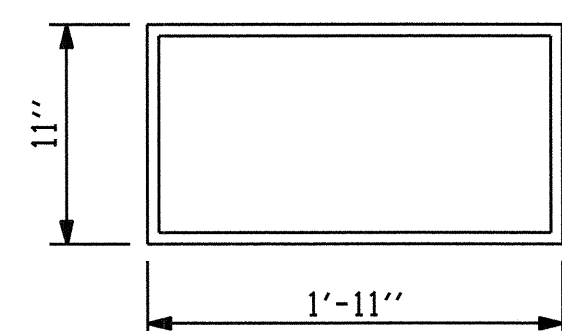
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

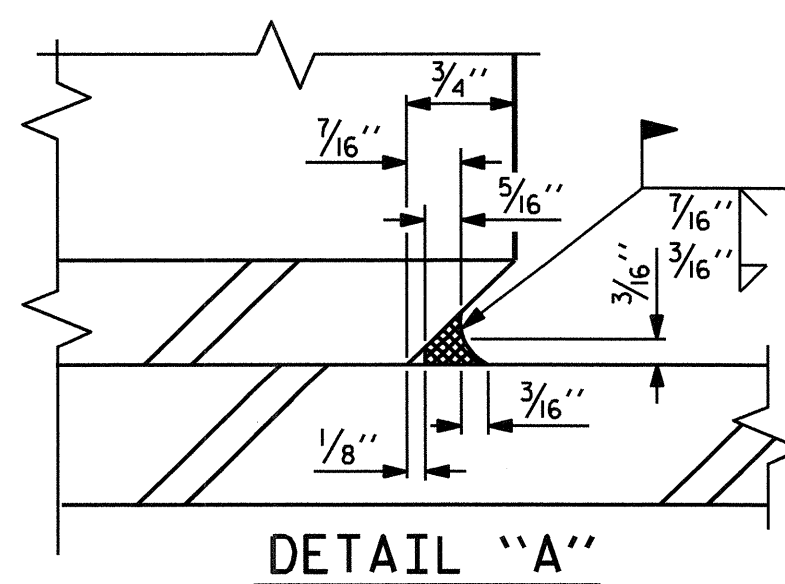
ALL BEARING PLATES SHALL BE AASHTO M270 GRADE 36.



TYPICAL SECTION OF ELASTOMERIC BEARINGS



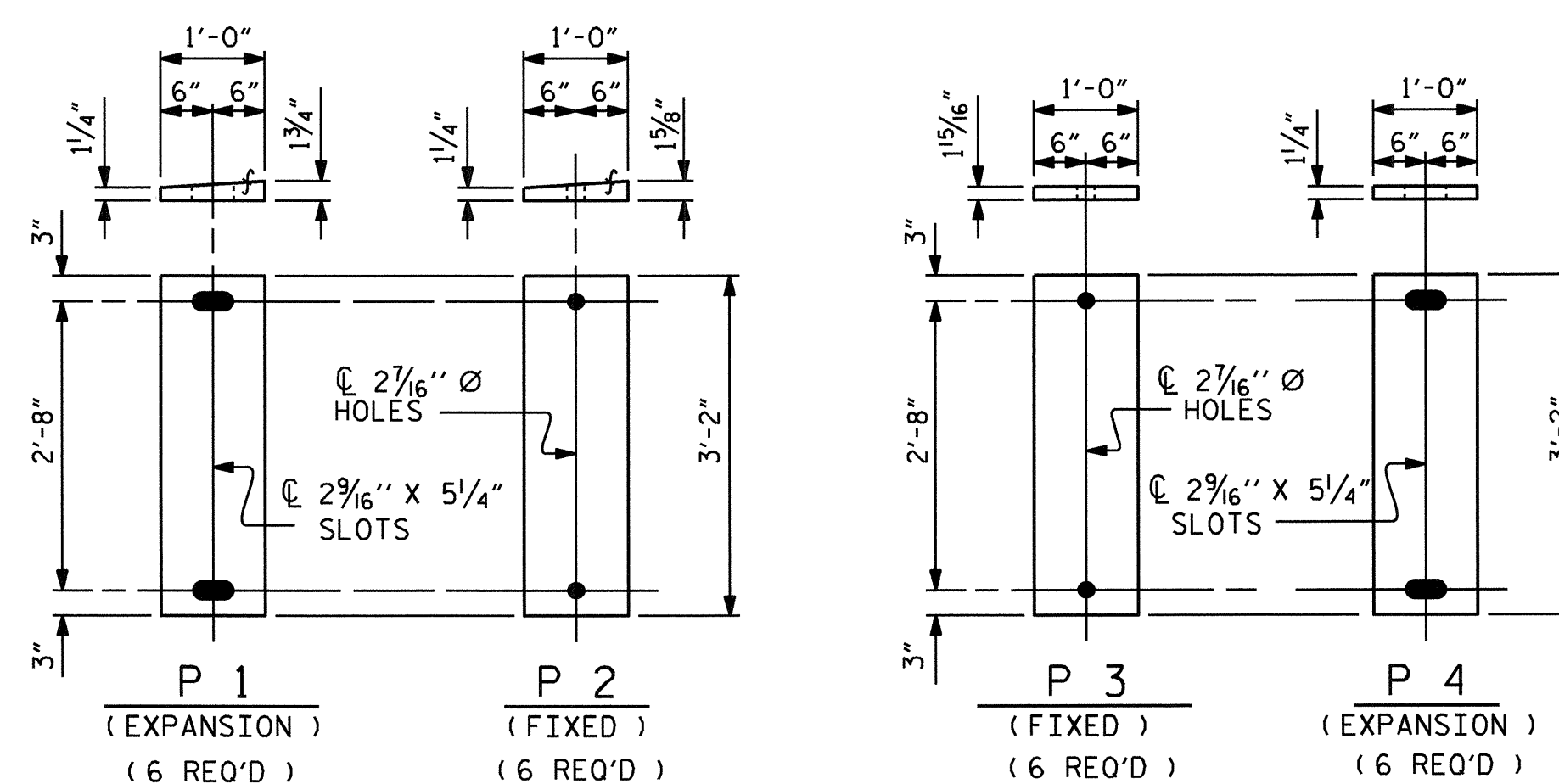
E5 (24 REQ'D)  
PLAN VIEW OF ELASTOMERIC BEARING  
TYPE VI



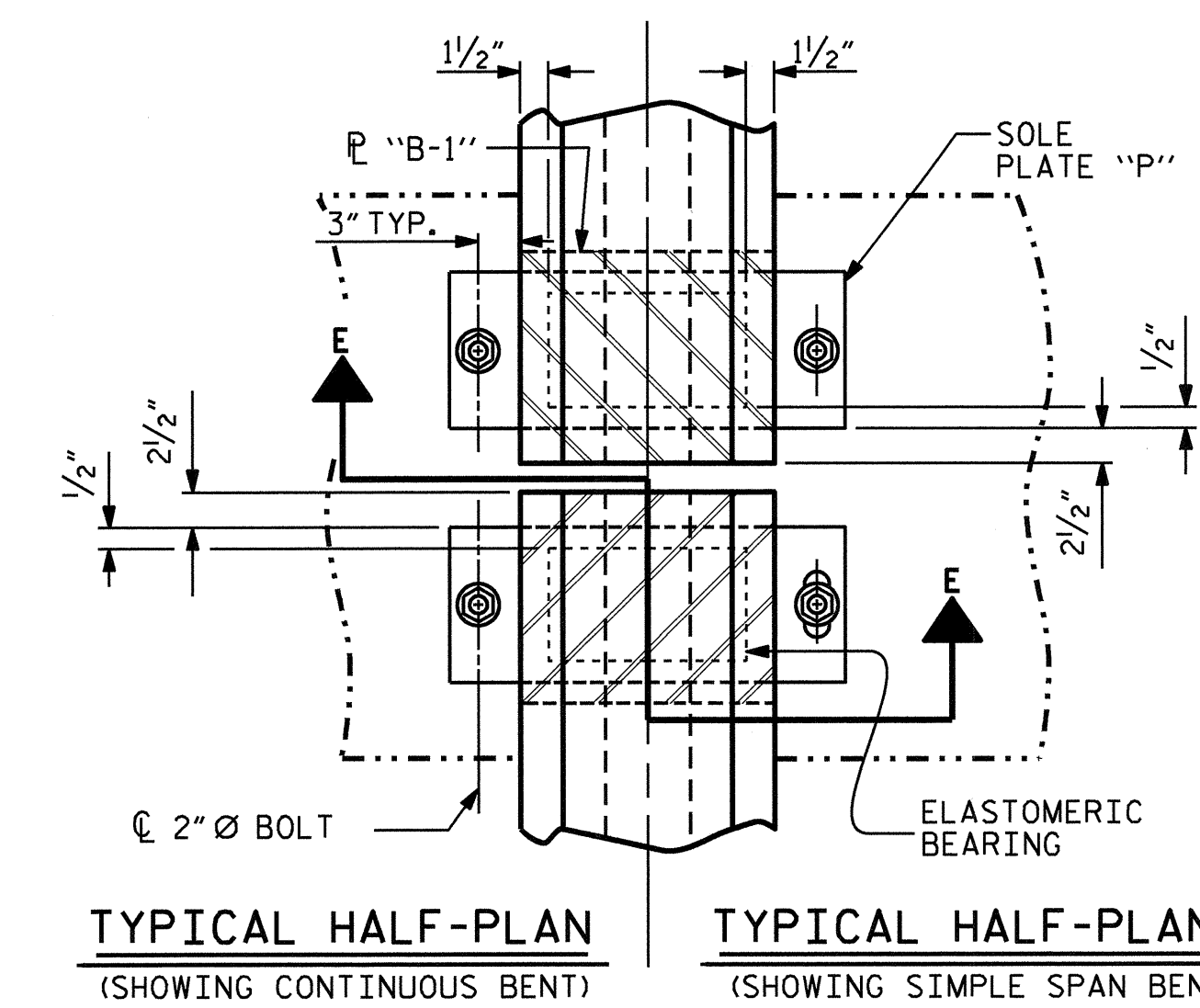
DETAIL "A"

— LOAD RATINGS —

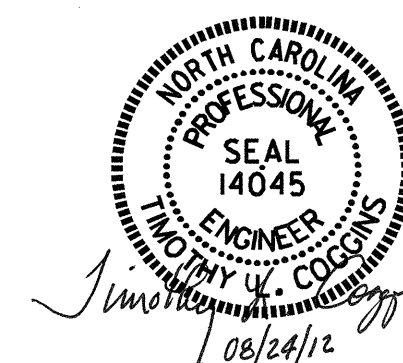
| TYPE VI | MAX.D.L.+ L.L. |
|---------|----------------|
|         | 211 K          |



SOLE PLATE DETAILS ("P")



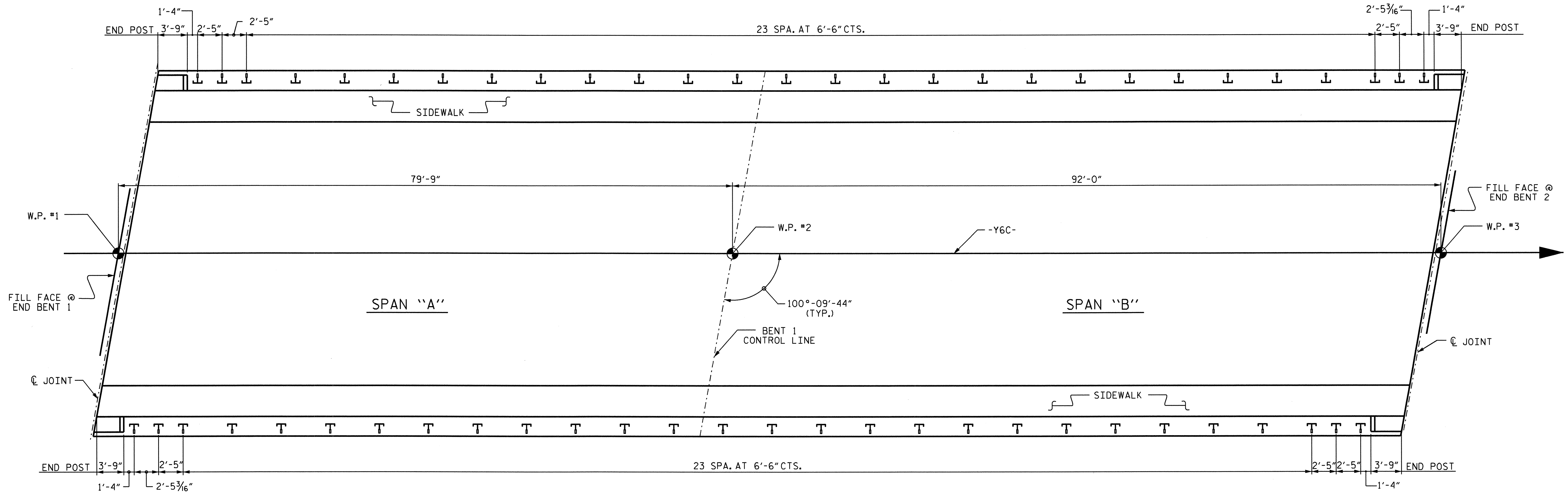
PROJECT NO. U-4444B  
CUMBERLAND COUNTY  
STATION: 172+95.63 -L-



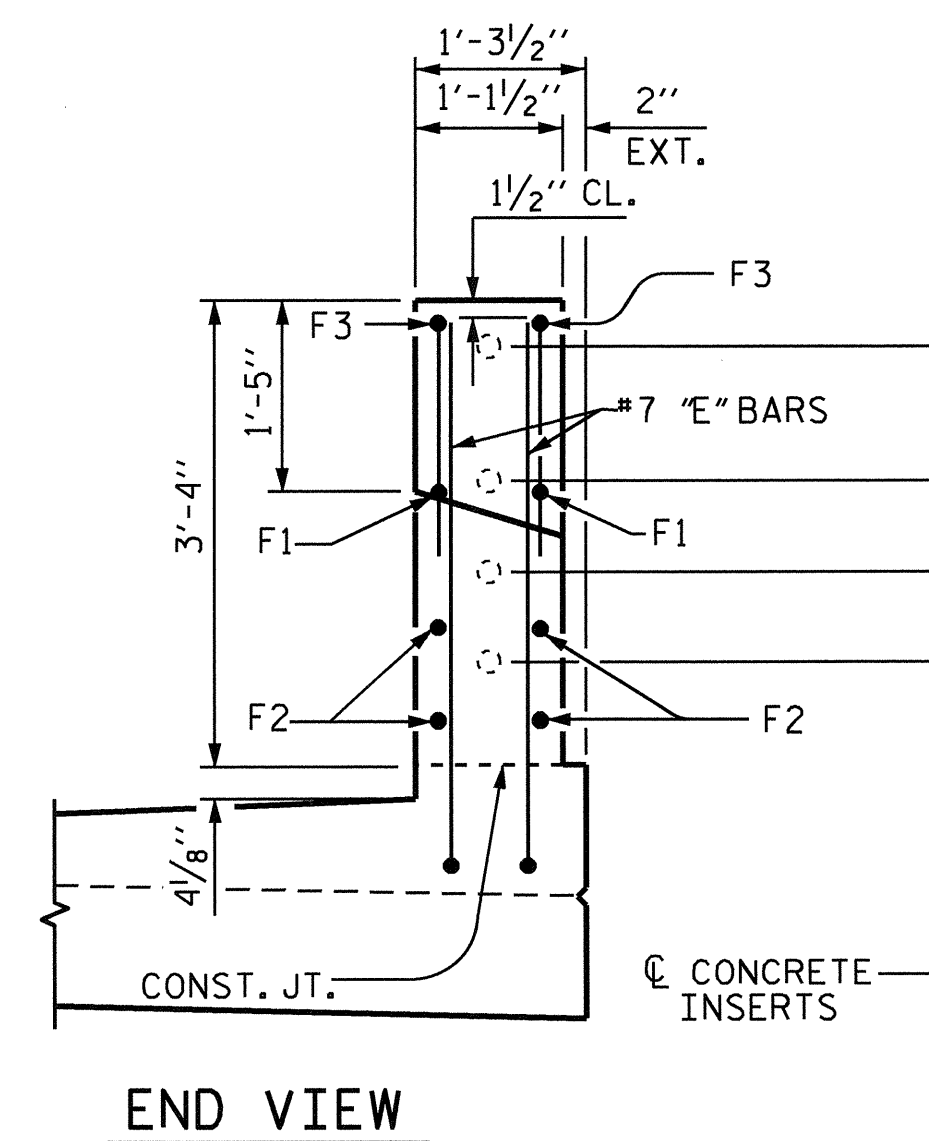
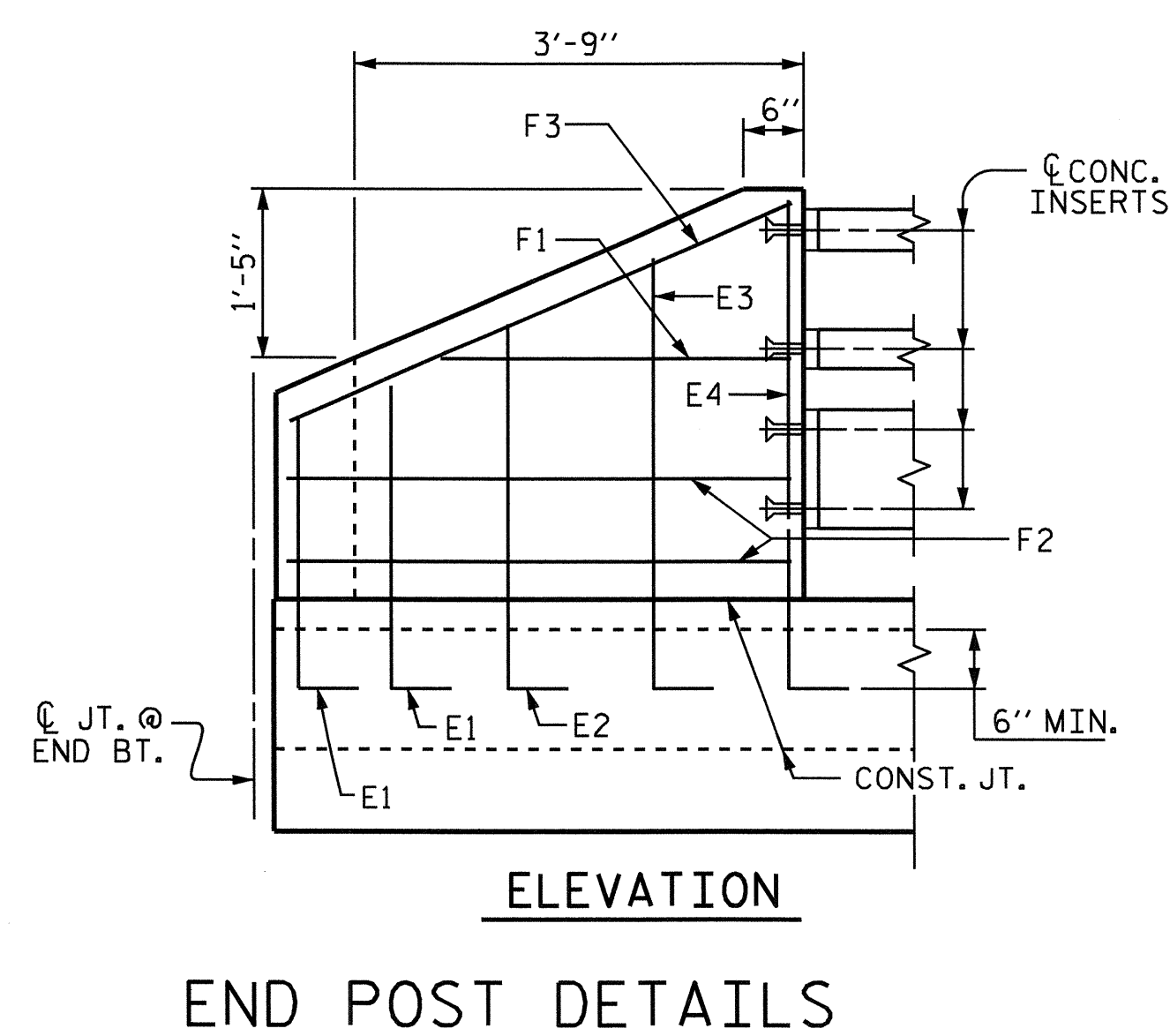
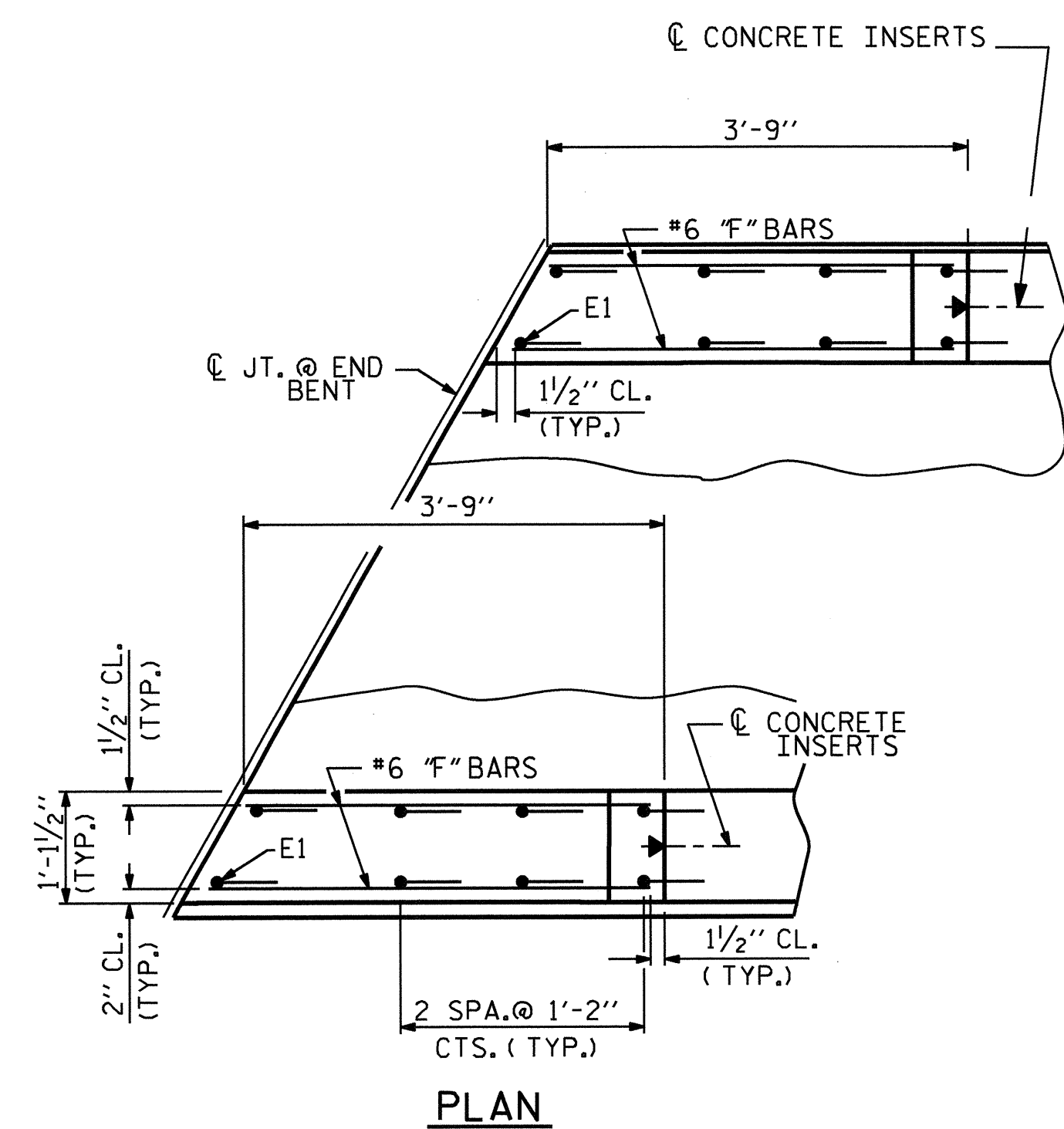
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
ELASTOMERIC BEARING  
DETAILS  
PRESTRESSED CONCRETE GIRDER  
SUPERSTRUCTURE

| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-14         |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |
| 2         |     |       | 4   |     |       | 30           |

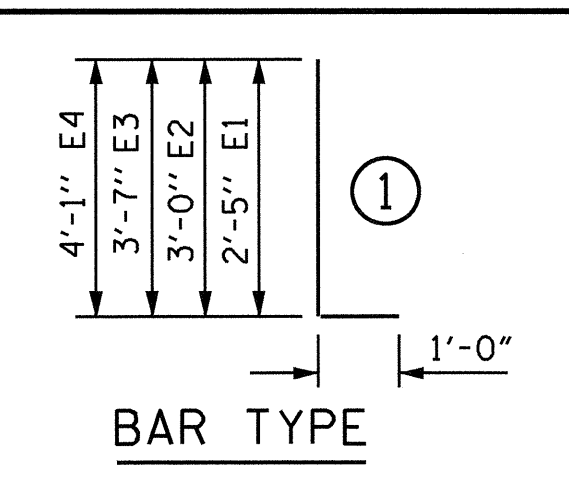
|                               |                       |
|-------------------------------|-----------------------|
| ASSEMBLED BY : B.N.BARODAWALA | DATE : 1-18-12        |
| CHECKED BY : PEGGY PARASI     | DATE : 1-19-12        |
| DRAWN BY : EEM 2/97           | REV. 10/17/00 RWW/LES |
| CHECKED BY : VAP 2/97         | REV. 5/1/06 TLA/GM    |
|                               | REV. 10/1/11 MAA/GM   |



PLAN OF RAIL POST SPACINGS



| BILL FOR FOUR END POSTS          |     |      |      |        |          |          |
|----------------------------------|-----|------|------|--------|----------|----------|
| BAR                              | NO. | SIZE | TYPE | LENGTH | WEIGHT   |          |
| *E1                              | 8   | #7   | 1    | 3'-5"  | 56       |          |
| *E2                              | 8   | #7   | 1    | 4'-0"  | 65       |          |
| *E3                              | 8   | #7   | 1    | 4'-7"  | 75       |          |
| *E4                              | 8   | #7   | 1    | 5'-1"  | 83       |          |
| *F1                              | 8   | #6   | STR  | 2'-10" | 34       |          |
| *F2                              | 16  | #6   | STR  | 3'-5"  | 82       |          |
| *F3                              | 8   | #6   | STR  | 3'-6"  | 42       |          |
| * EPOXY COATED REINFORCING STEEL |     |      |      |        | 437 LBS. |          |
| CLASS AA CONCRETE                |     |      |      |        | 1.7      | CU. YDS. |



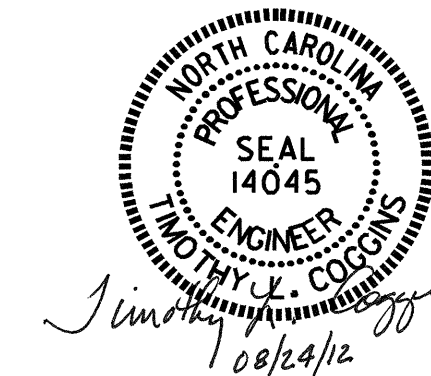
PROJECT NO. U-4444B  
 CUMBERLAND COUNTY  
 STATION: 172+95.63 -L-

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

| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-15         |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |
| 2         |     |       | 4   |     |       | 30           |

DRAWN BY: B.N.BARODAWALA DATE: 9-14-11  
 CHECKED BY: PEGGY PARISI DATE: 1-19-12

24-AUG-2012 12:28  
 R:\TIP\Projects-U\U4444B\structures\Plans\Final Plans\U4444b.sd...01.dgn  
 tcoggins



STR. #1

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 B221 ALLOY 6061-T6. MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING.

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

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

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. PLACE ONE JOINT SPLICE JUST BEYOND THE 3RD RAIL POST FROM EACH END, TYPICALLY 14' FROM THE END. PLACE OTHER JOINTS AS NEEDED.

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE STANDARD NO. BMR7.

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

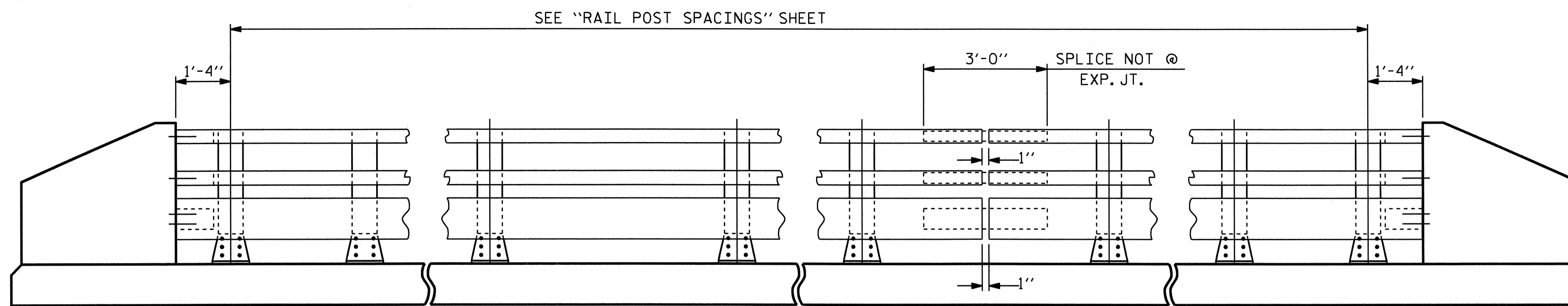
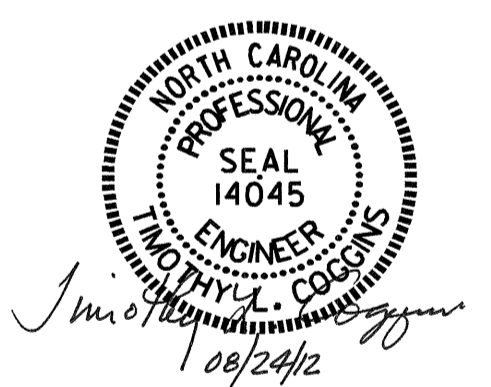
TO INSURE FUTURE IDENTIFICATION OF THE FABRICATOR, A PERMANENT IDENTIFYING MARK SHALL BE PLACED ON EACH POST. THE METHOD OF MARKING AND LOCATION SHALL BE SUCH THAT IT DOES NOT DETRACT FROM THE APPEARANCE OF THE POST, BUT REMAIN VISIBLE AFTER RAIL PLACEMENT.

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

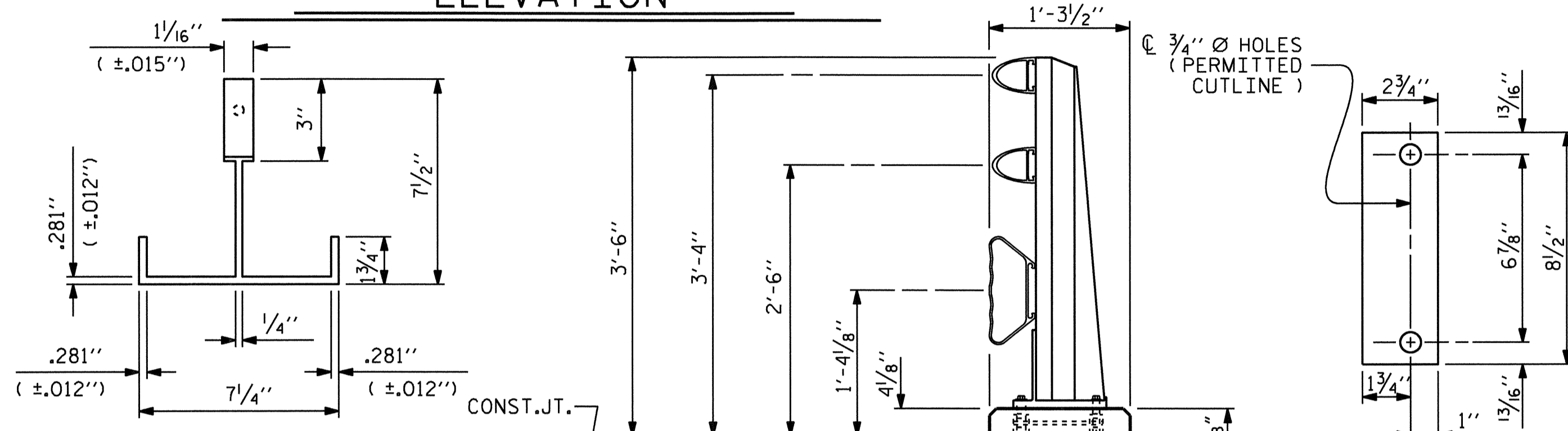
MINOR VARIATIONS IN DETAILS OF METAL RAIL WILL BE CONSIDERED. DETAILS OF SUCH VARIATIONS, IF DESIRED, SHALL BE SUBMITTED FOR APPROVAL.

PAY LENGTH = 323.70 LIN.FT.

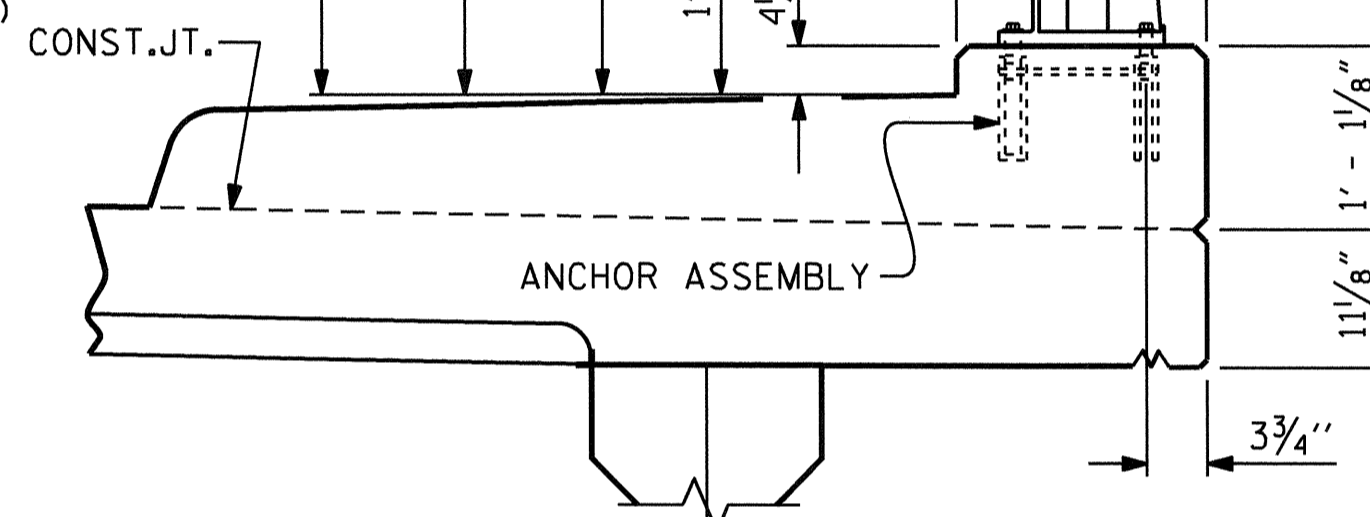


NOTE:  
FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR7.

ELEVATION



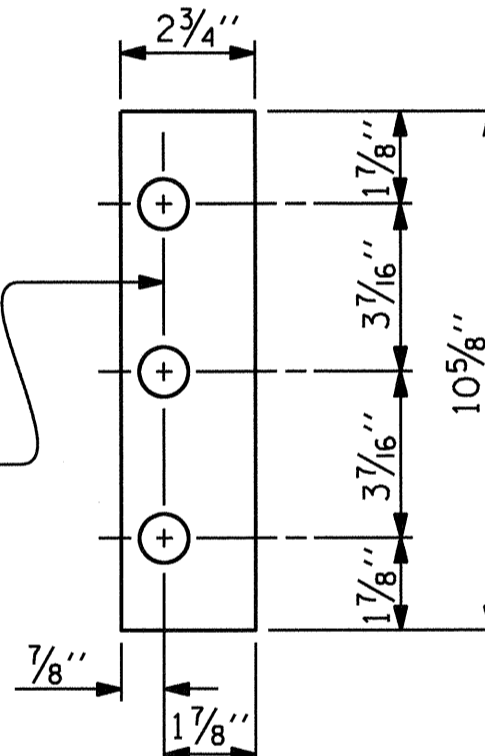
PLAN



SECTION THRU RAIL

FOR ANCHOR ASSEMBLY, SEE "3 BAR METAL RAIL" STD. NO. BMR6

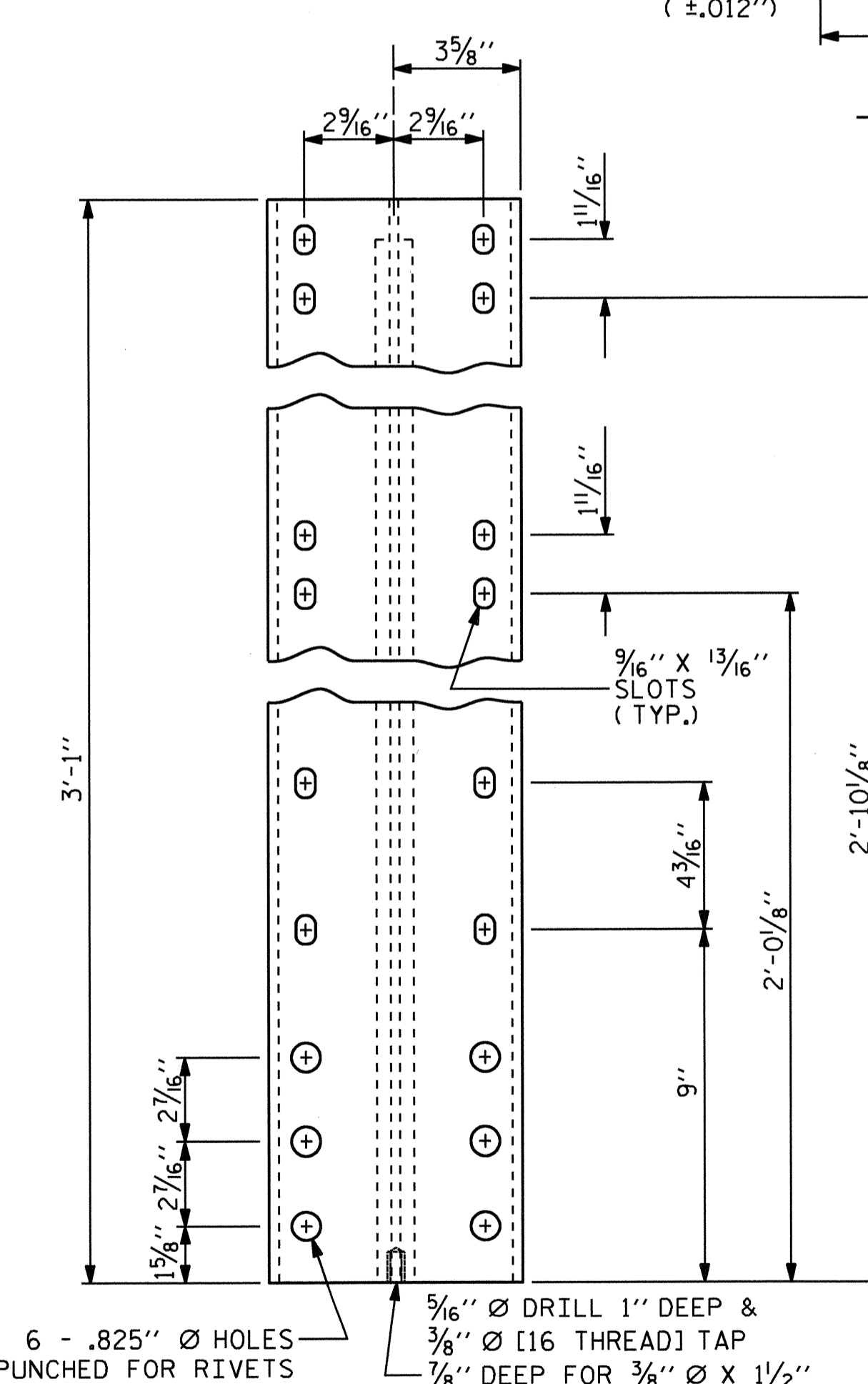
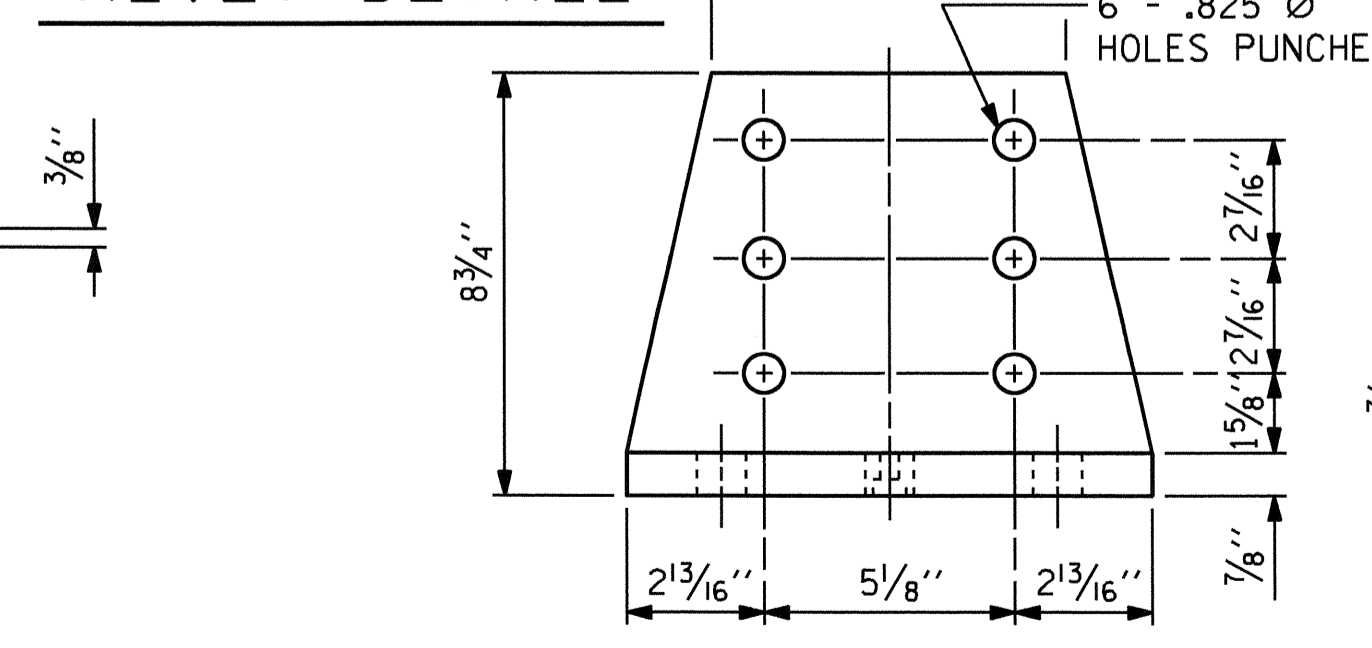
REAR PLATE



FRONT PLATE SHIM DETAILS

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

RIVET DETAIL



FRONT ELEVATION

SIDE ELEVATION

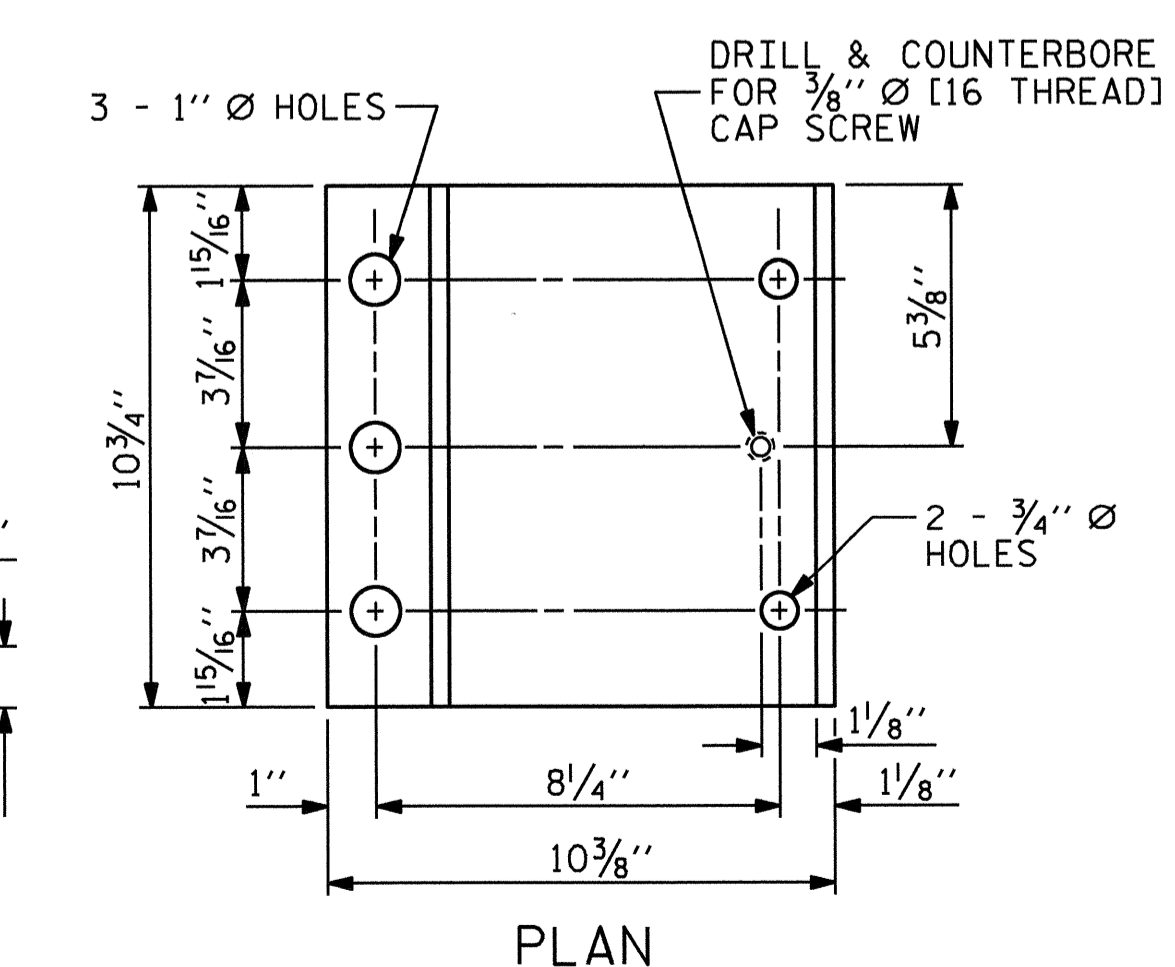
DETAILS OF POST

6 - .825" Ø HOLES PUNCHED FOR RIVETS  
5/16" Ø DRILL 1" DEEP & 3/8" Ø [16 THREAD] TAP 7/8" DEEP FOR 3/8" Ø X 1/2" STAINLESS STEEL CAP SCREW

FRONT ELEVATION

SIDE ELEVATION

POST BASE DETAILS



PLAN

|                               |                     |
|-------------------------------|---------------------|
| ASSEMBLED BY: B.N. BARODAWALA | DATE: 9-14-11       |
| CHECKED BY: PEGGY PARISI      | DATE: 1-19-12       |
| DRAWN BY: JMB 1/88            | REV. 5/7/03 RWW/JTE |
| CHECKED BY: GGH 1/88          | REV. 5/1/06 TLA/GM  |
|                               | REV. 10/1/11 MAA/GM |

24-AUG-2012 12:28 R:\TIP\Projects-U\U4444B\structures\Plans\Final Plans\U4444b.sd\_mr\_01.dgn tcoggins

PROJECT NO. U-4444B  
CUMBERLAND COUNTY  
STATION: 172+95.63 -L-  
SHEET 1 OF 3

|  |     |       |     |     |                 |
|--|-----|-------|-----|-----|-----------------|
| STATE OF NORTH CAROLINA<br>DEPARTMENT OF TRANSPORTATION<br>RALEIGH |     |       |     |     |                 |
| STANDARD<br>3 BAR METAL RAIL                                       |     |       |     |     |                 |
| REVISIONS  |     |       |     |     | SHEET NO.       |
| NO.  | BY: | DATE: | NO. | BY: | DATE:           |
| 1  |     |       | 3   |     |                 |
| 2  |     |       | 4   |     |                 |
|  |     |       |     |     | S-16            |
|  |     |       |     |     | TOTAL SHEETS 30 |

STR. #1 STD. NO. BMR5

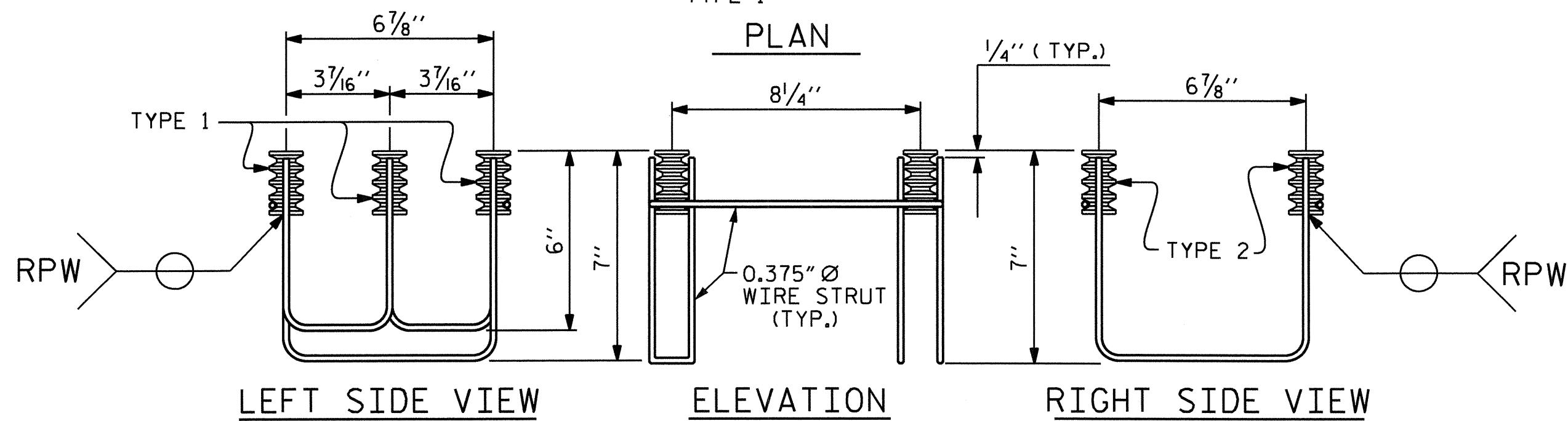
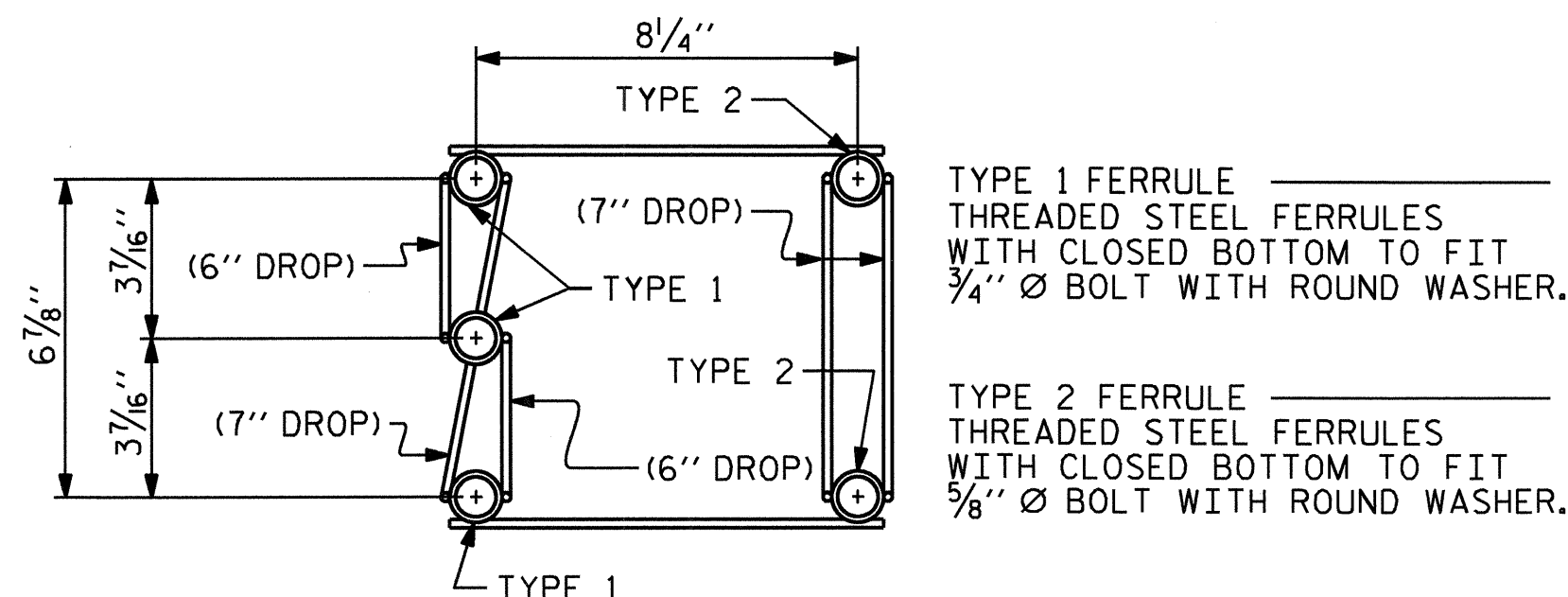


NOTES

STRUCTURAL CONCRETE ANCHOR ASSEMBLY

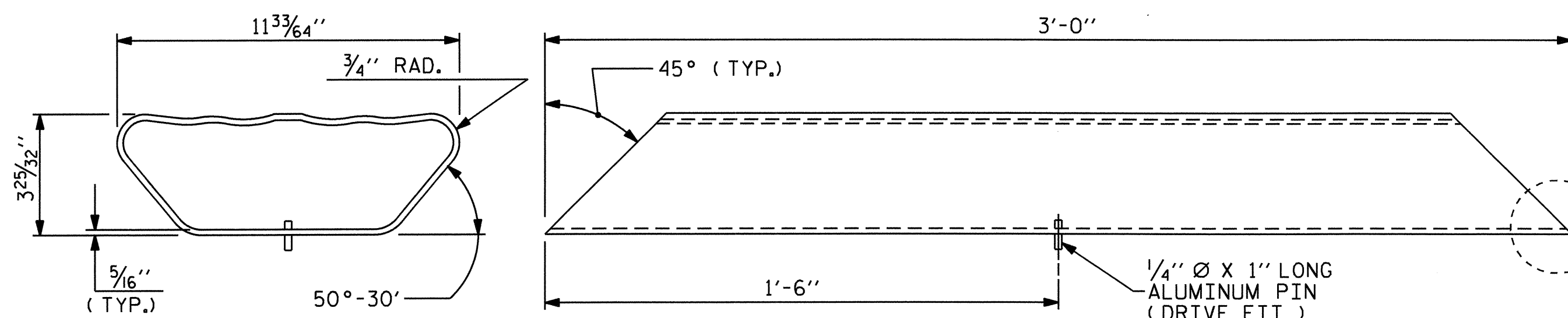
THE STRUCTURAL CONCRETE ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:

- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES AND 1 3/4" FOR 5/8" FERRULES.
- B. 3 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 2 1/2" GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.
- C. 2 - 5/8" Ø X 2 1/4" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 5/8" Ø X 2 1/4" GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.
- D. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.
- E. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.
- F. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.
- G. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

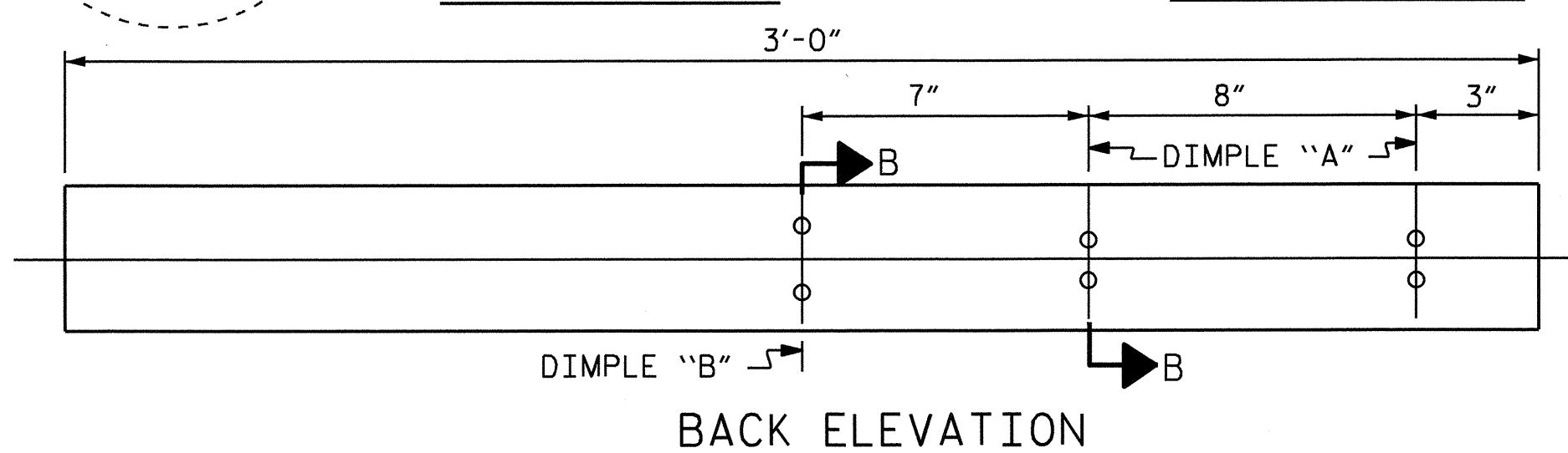
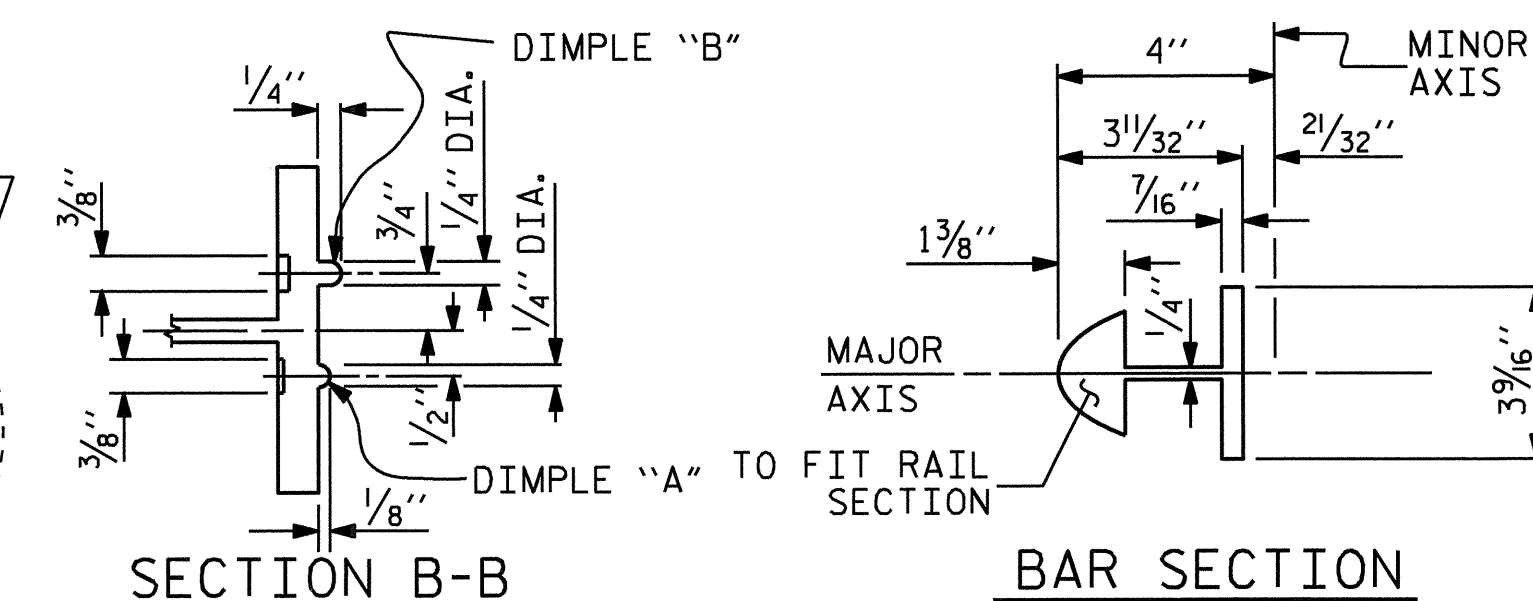
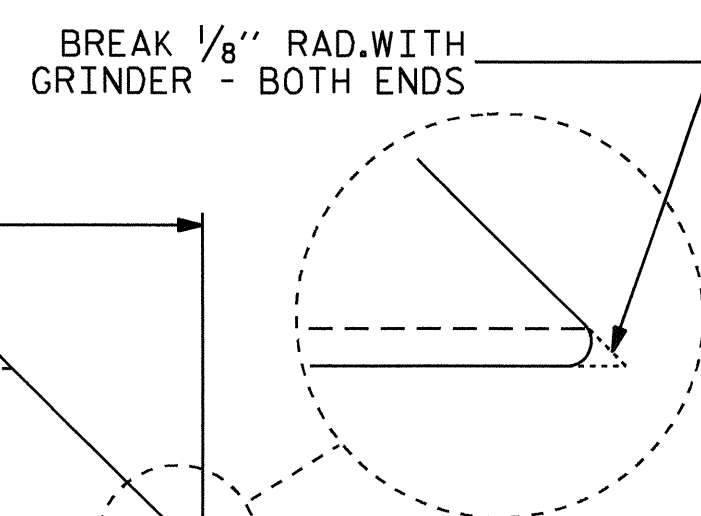


5-BOLT METAL RAIL ANCHOR ASSEMBLY

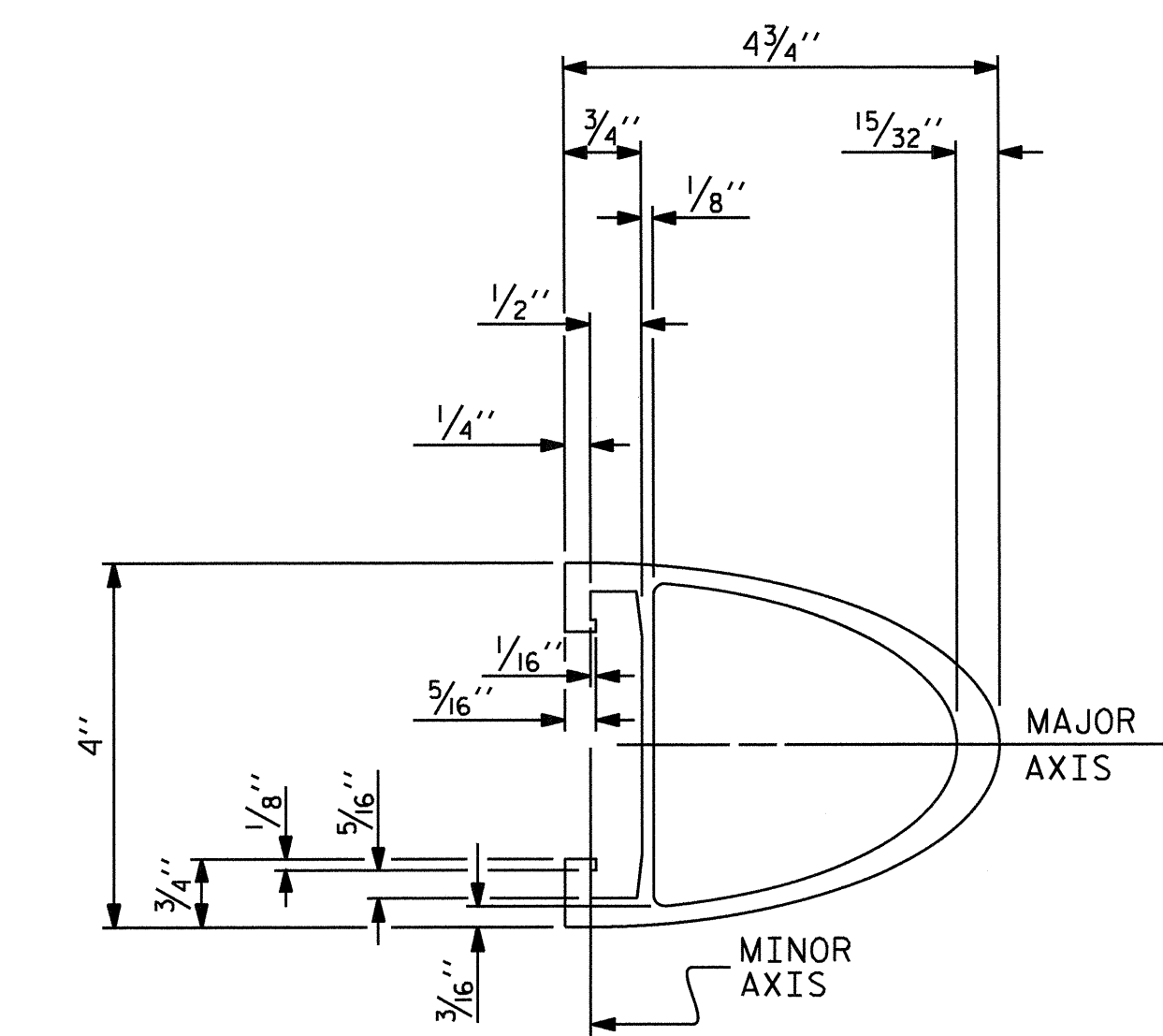
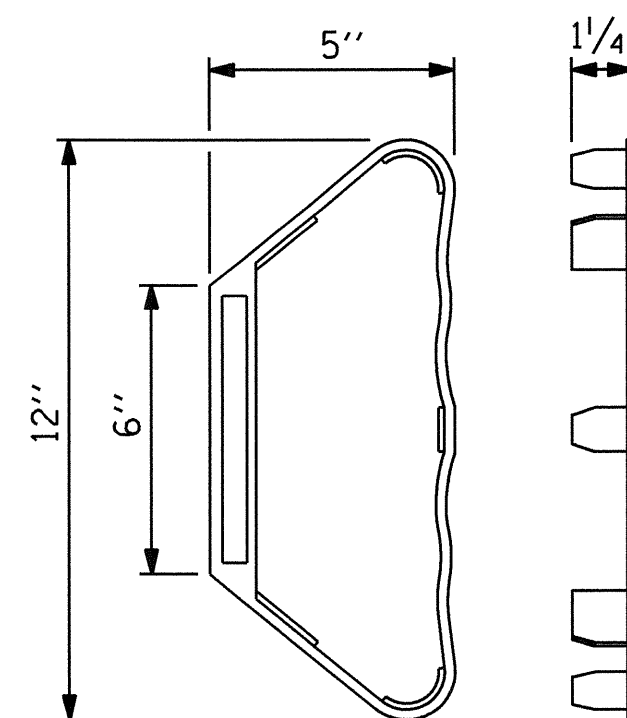
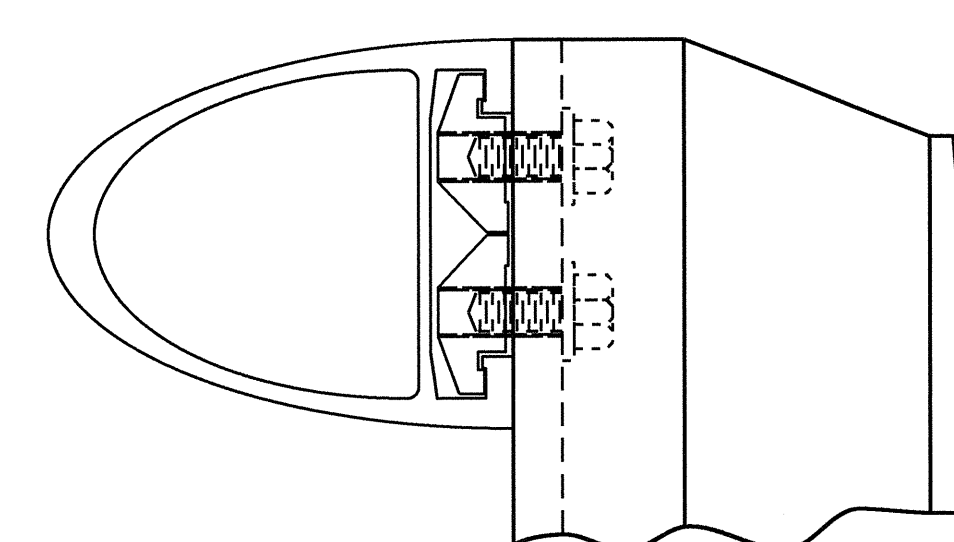
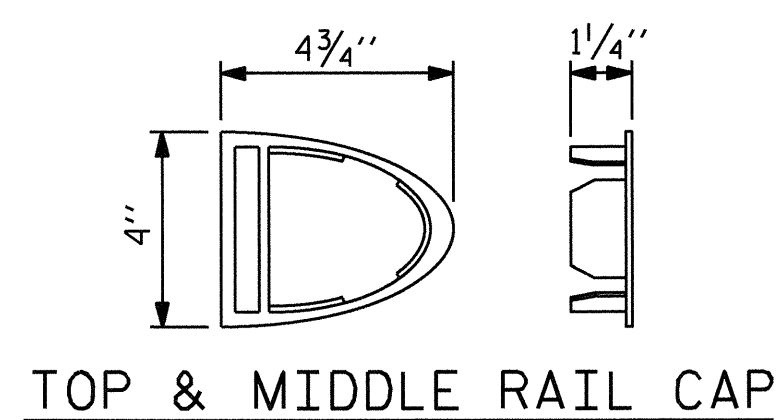
(56 ASSEMBLIES REQUIRED)



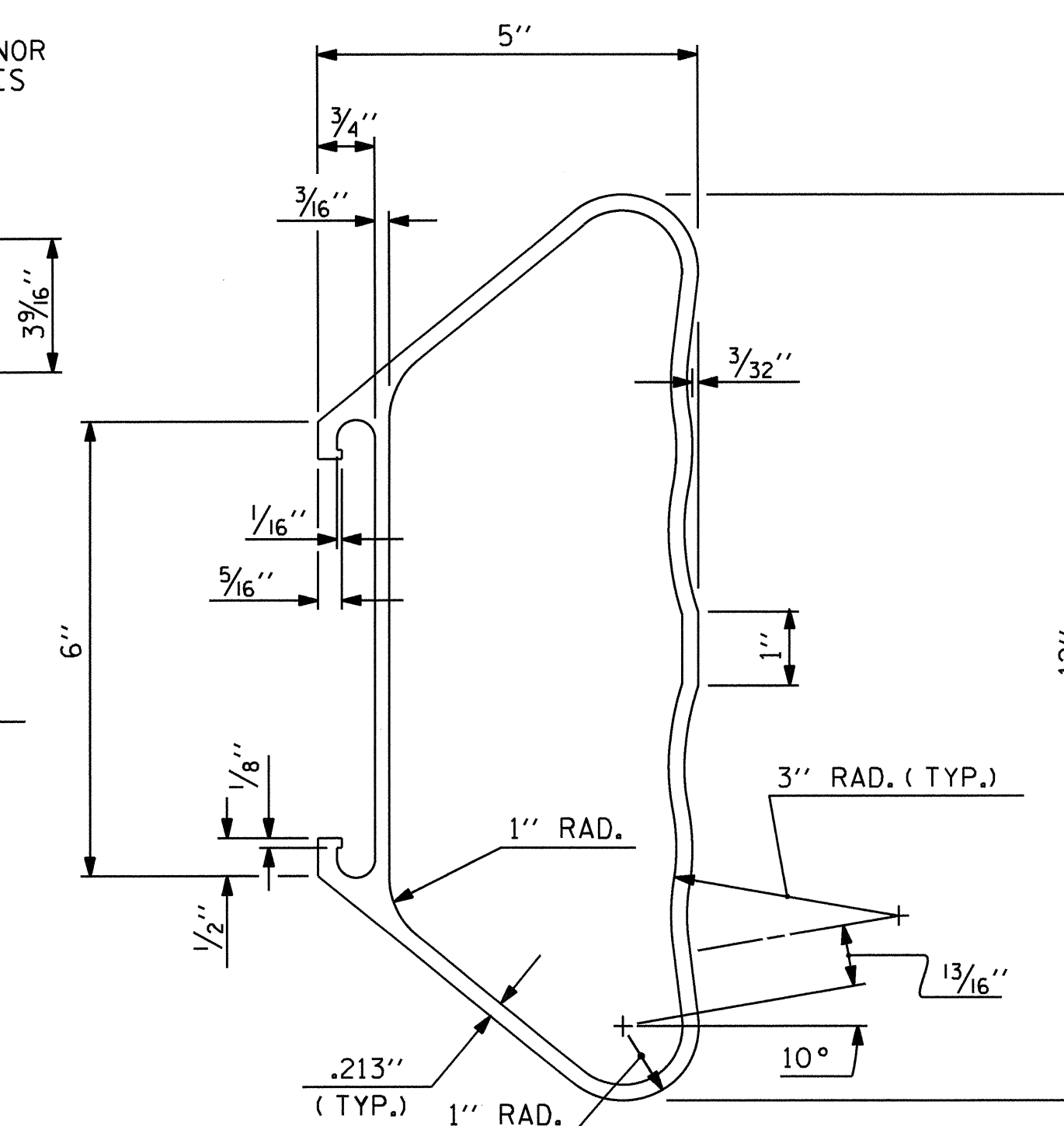
BOTTOM RAIL EXPANSION BAR



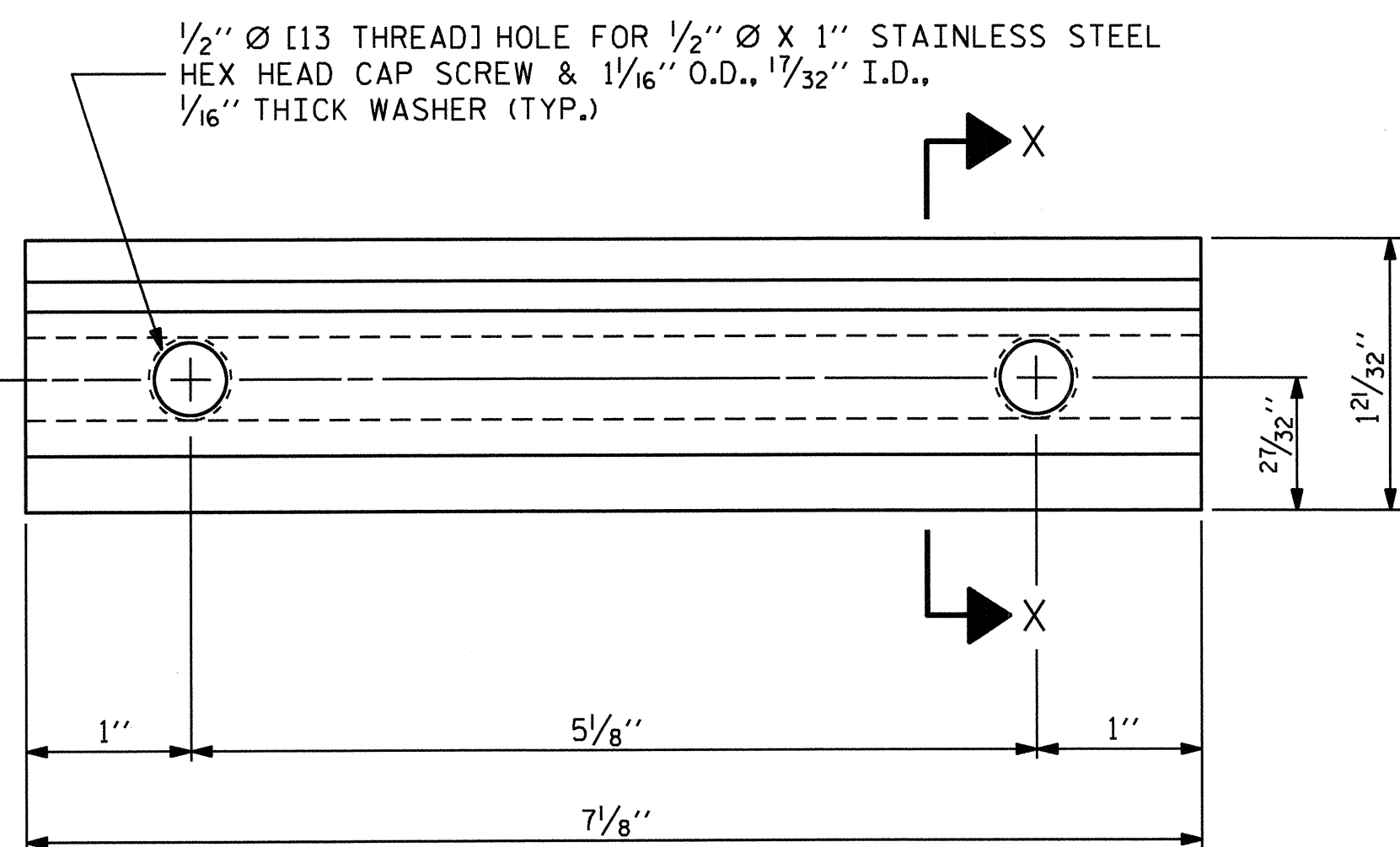
TOP & MIDDLE RAIL EXPANSION BAR



TOP & MIDDLE RAIL SECTION

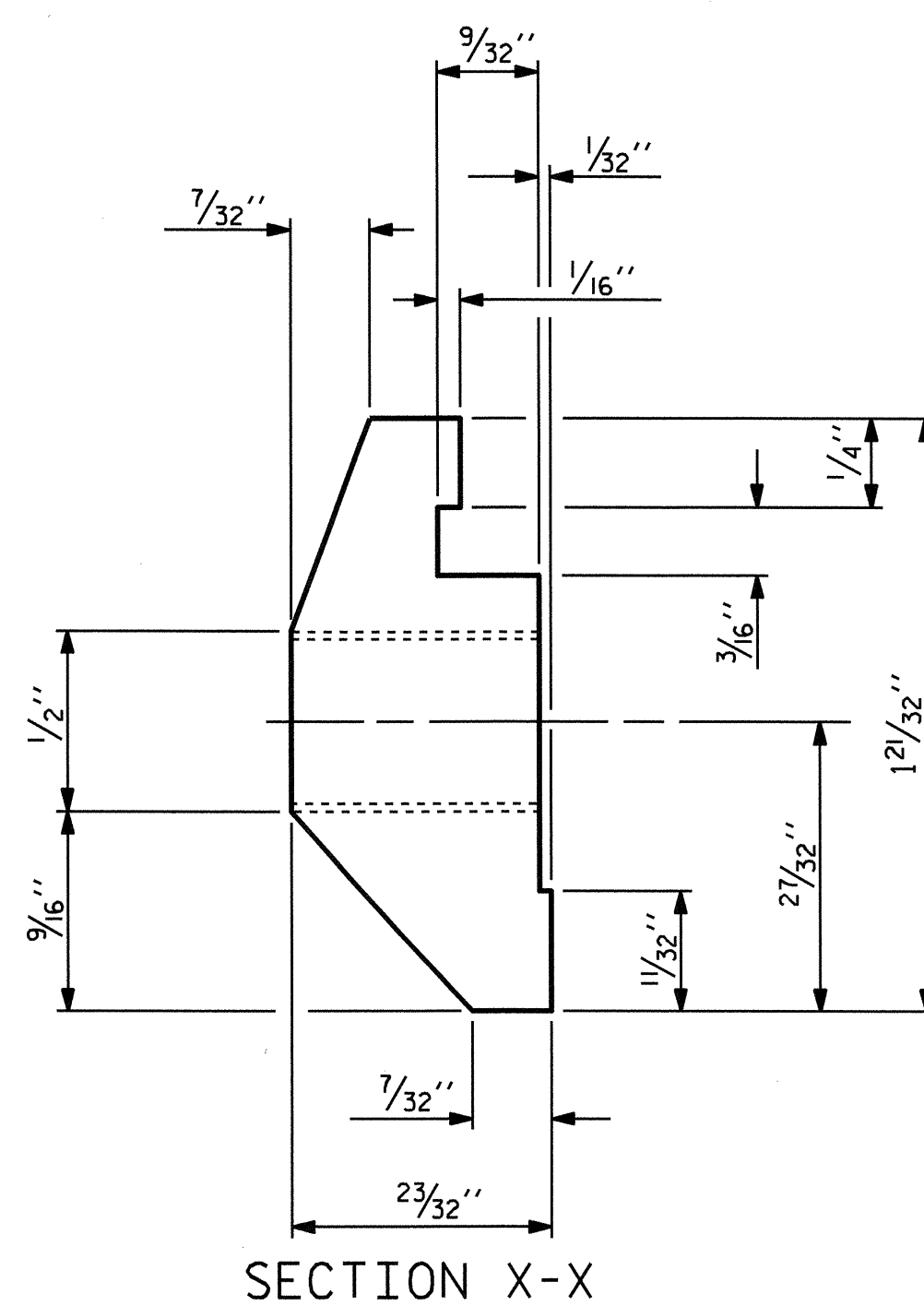


BOTTOM RAIL SECTION



CLAMP BAR DETAIL

(6 REQUIRED PER POST)



|                               |                     |
|-------------------------------|---------------------|
| ASSEMBLED BY : B.N.BARODAWALA | DATE : 9-14-11      |
| CHECKED BY : PEGGY PARISI     | DATE : 1-19-12      |
| DRAWN BY : JMB 1/88           | REV. 5/7/03 RWW/JTE |
| CHECKED BY : GGH 1/88         | REV. 5/1/06 TLA/GM  |
|                               | REV. 10/1/11 MAA/GM |

PROJECT NO. U-4444B  
CUMBERLAND COUNTY  
STATION: 172+95.63 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

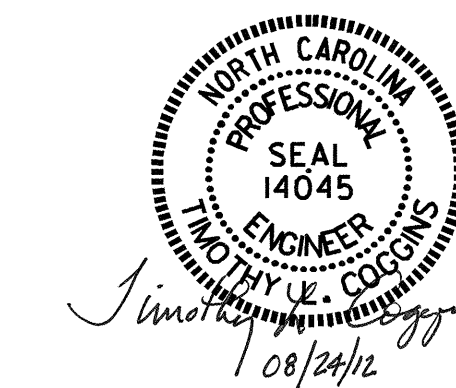
STANDARD

3 BAR METAL RAIL

| REVISIONS |     |       |     | SHEET NO. |                 |
|-----------|-----|-------|-----|-----------|-----------------|
| NO.       | BY: | DATE: | NO. | BY:       | DATE:           |
| 1         |     |       | 3   |           |                 |
| 2         |     |       | 4   |           |                 |
|           |     |       |     |           | S-17            |
|           |     |       |     |           | TOTAL SHEETS 30 |

STR. #1

STD. NO. BMR6



NOTES

METAL RAIL TO END POST CONNECTION

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

- A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
- B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 5/8" BOLT SHALL HAVE N. C. THREADS.
- C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°. WASHERS FOR RAIL ATTACHMENT SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.
- D. STANDARD CLAMP BARS (STD. No. BMR6).

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

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

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

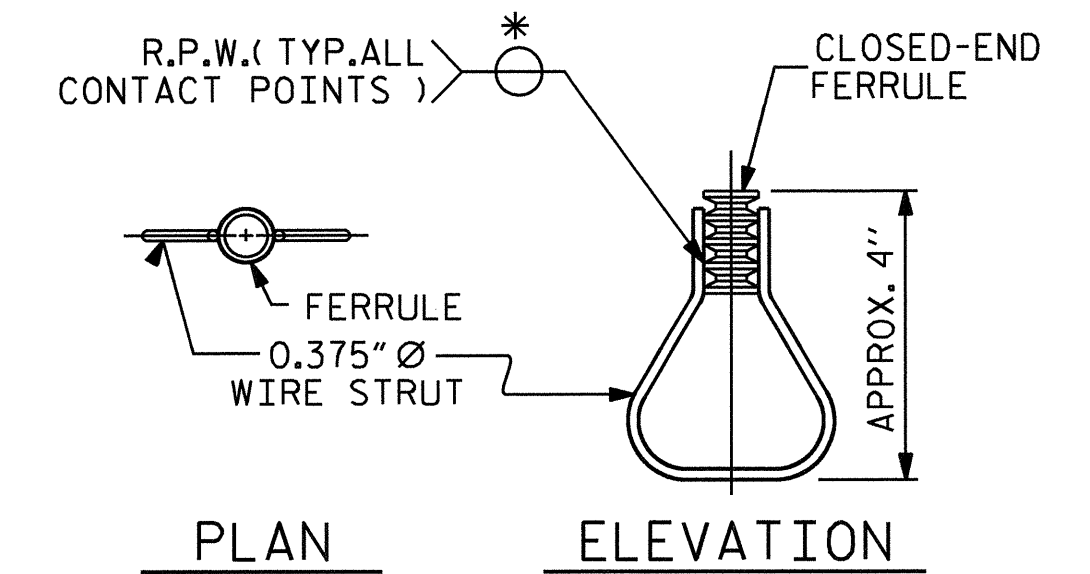
THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø X 1 5/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" Ø X 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT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

NOTES

STRUCTURAL CONCRETE INSERT

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

- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1 1/2".
- B. 1 - 3/4" Ø X 1 5/8" BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 1 5/8" GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.
- C. WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 1/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.



STRUCTURAL CONCRETE INSERT

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

PROJECT NO. U-4444B  
CUMBERLAND COUNTY  
 STATION: 172+95.63 -L-

SHEET 3 OF 3

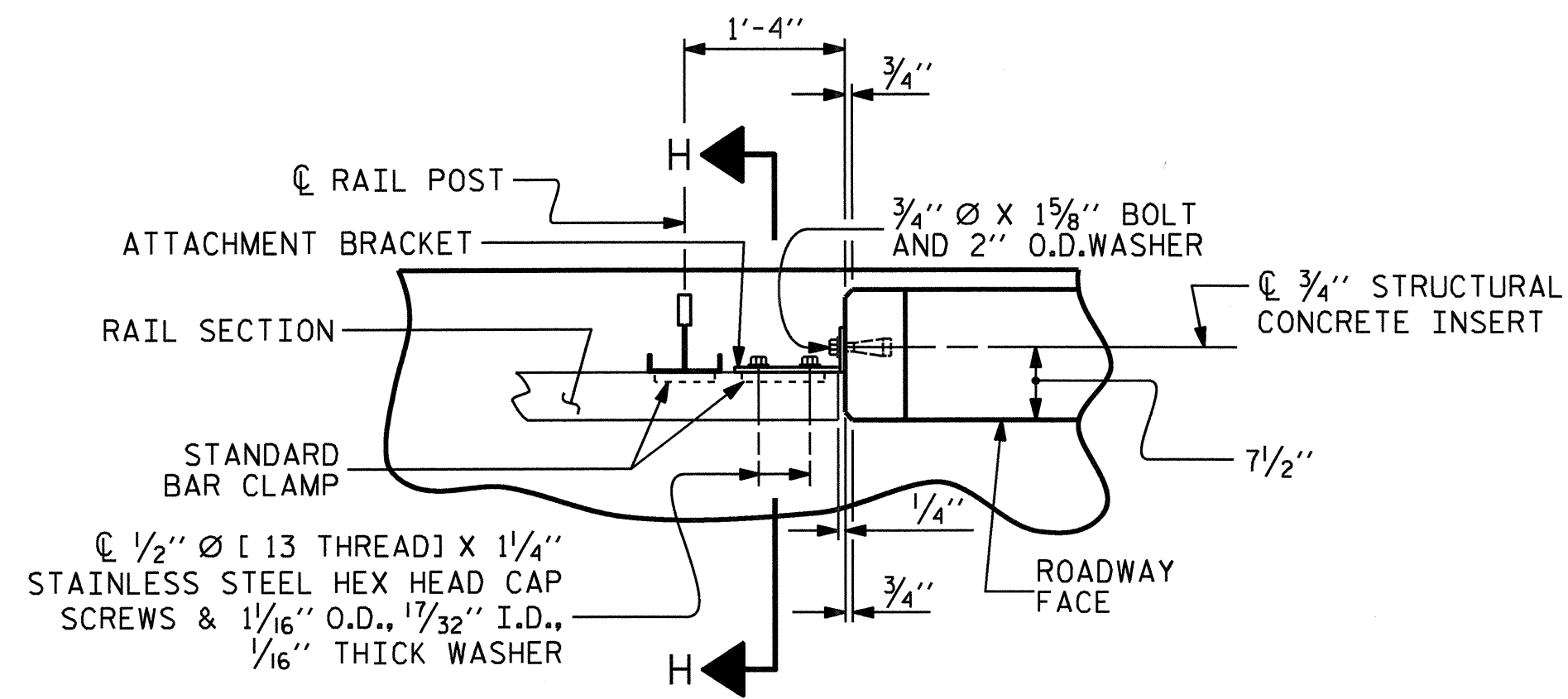
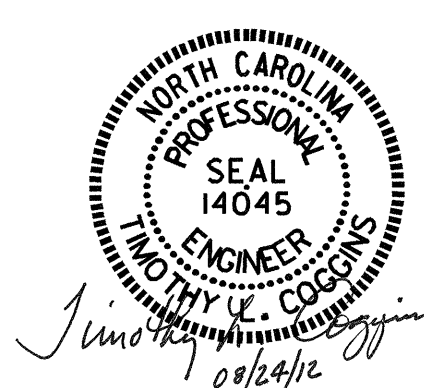
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD

3 BAR METAL RAIL

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

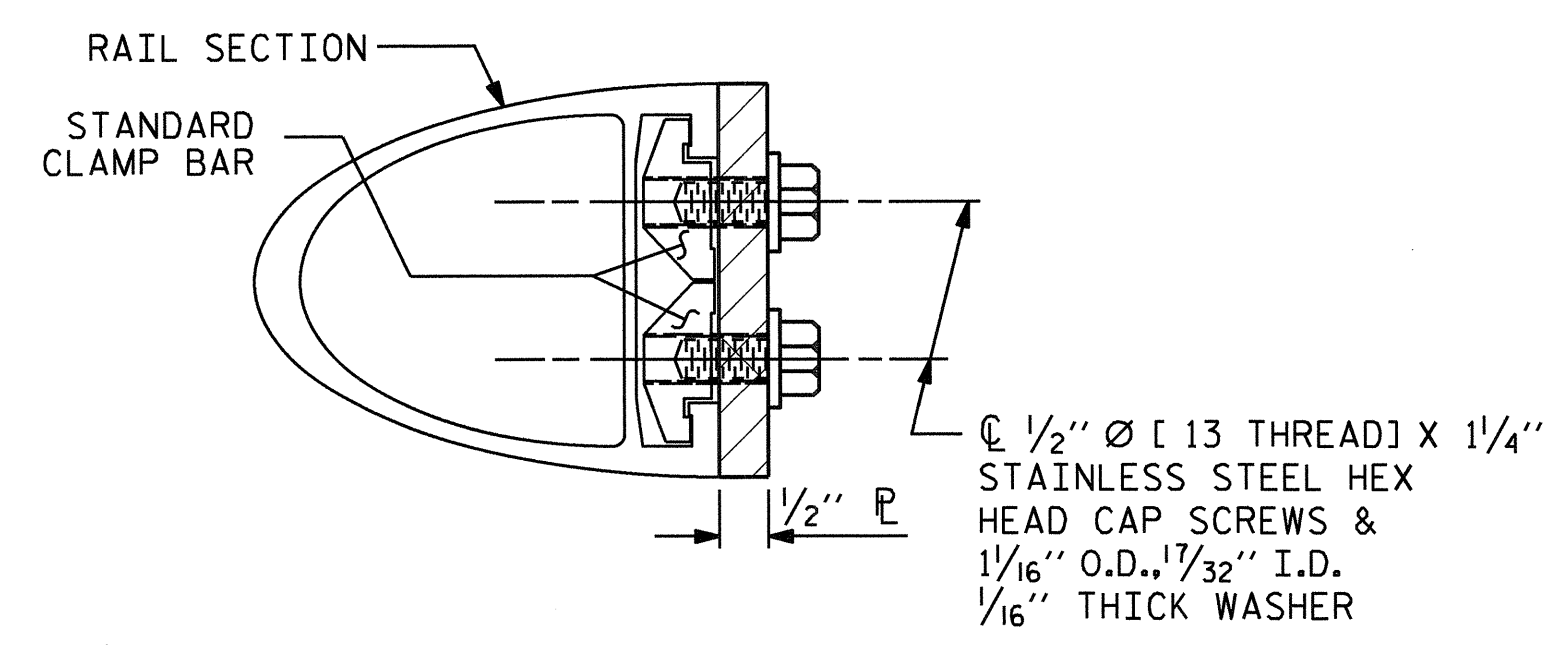
STR. #1

STD. NO. BMR7



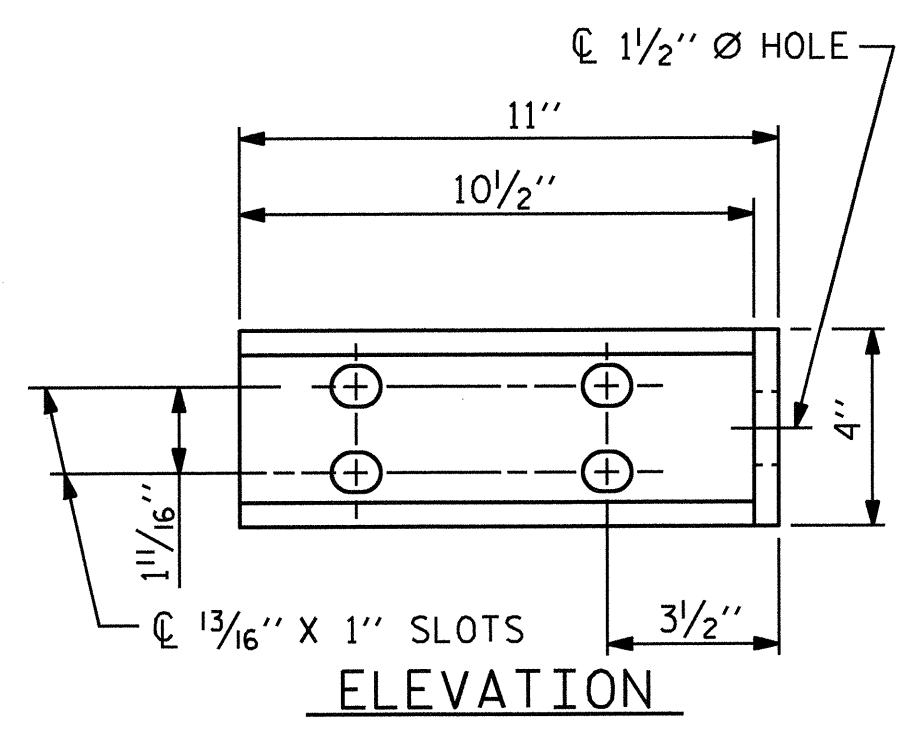
PLAN OF RAIL AND END POST

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

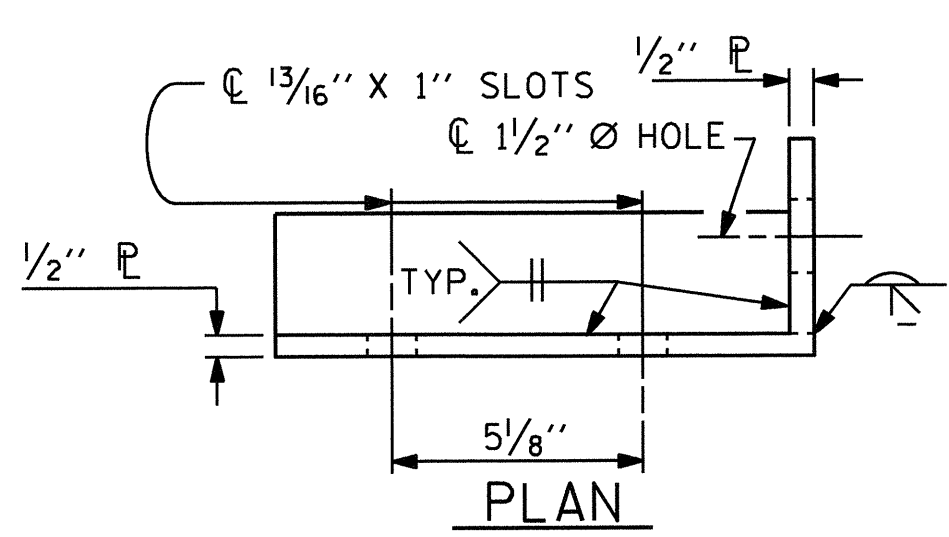


SECTION H-H

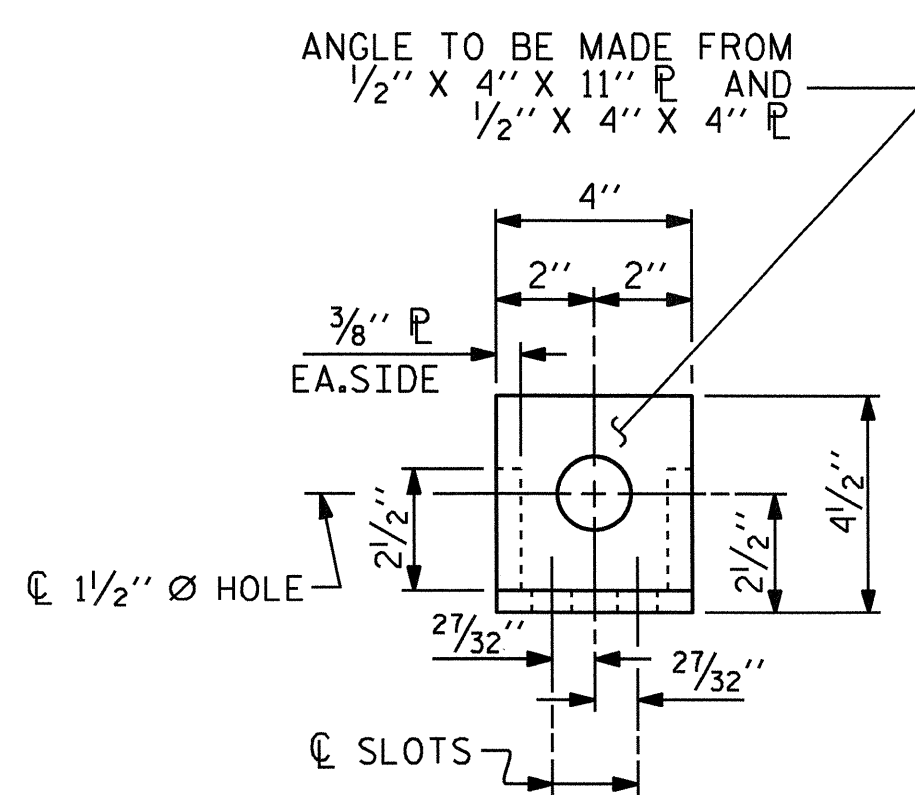
(FOR TOP & MIDDLE RAIL)



ELEVATION



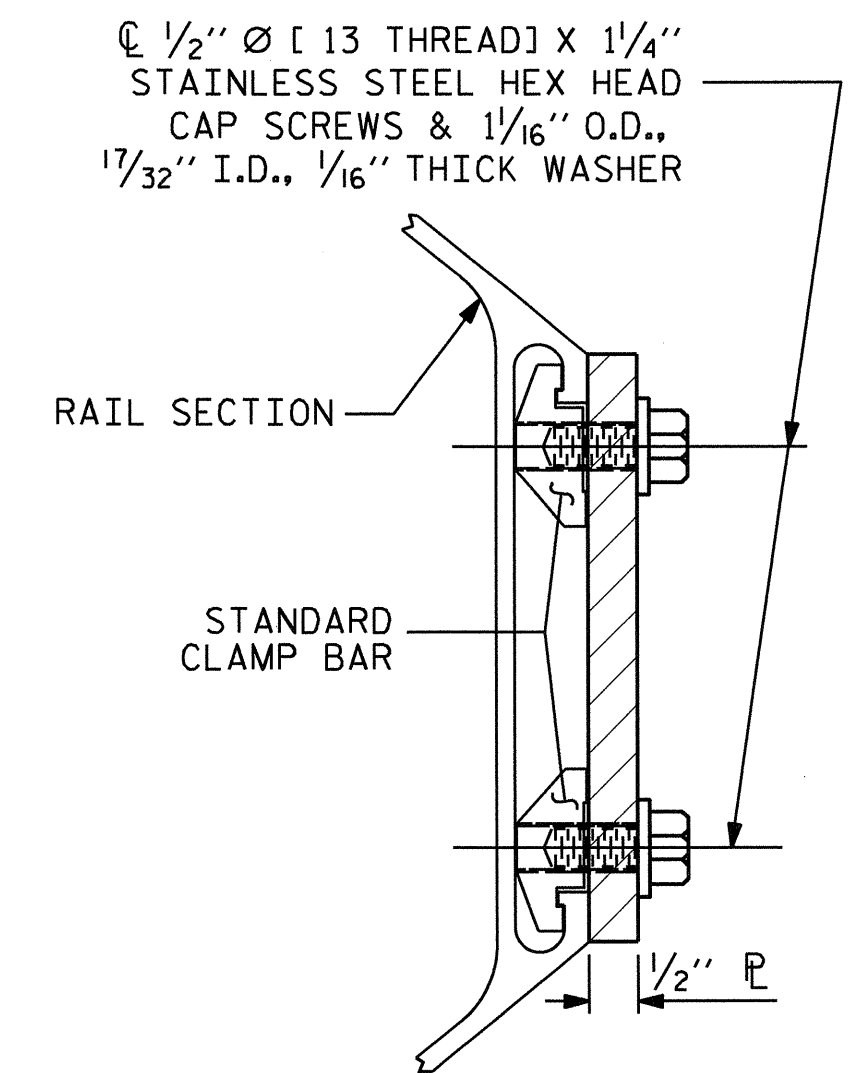
PLAN



END VIEW  
 (FIX. AND EXP.)

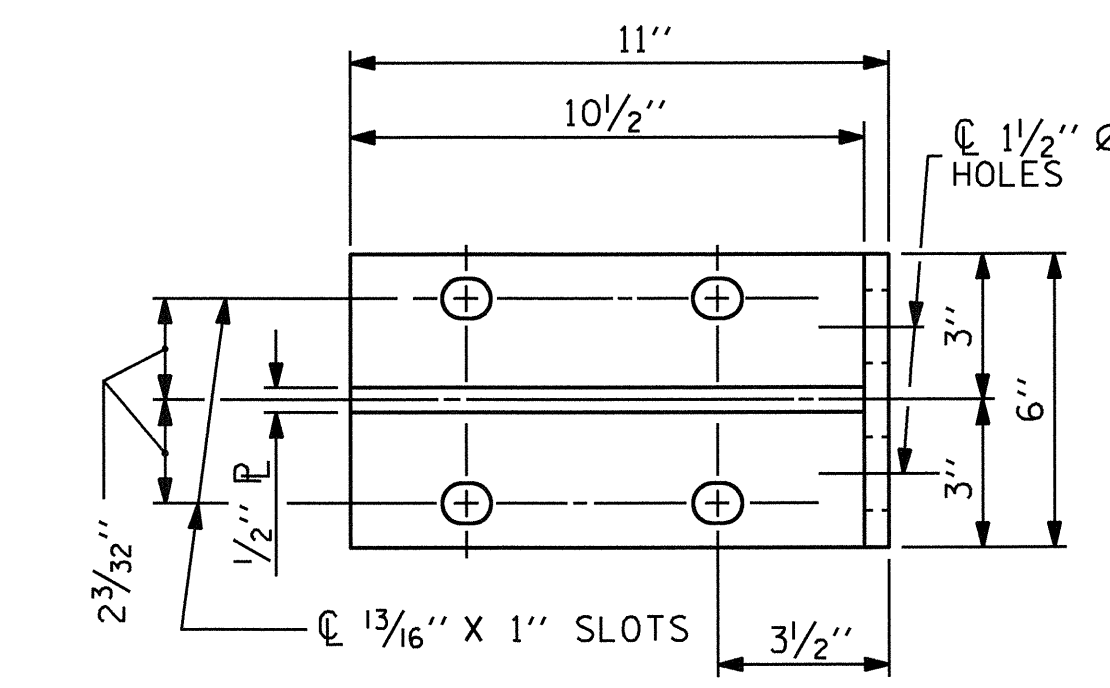
DETAILS FOR ATTACHMENT BRACKET

(TOP & MIDDLE RAIL ONLY)

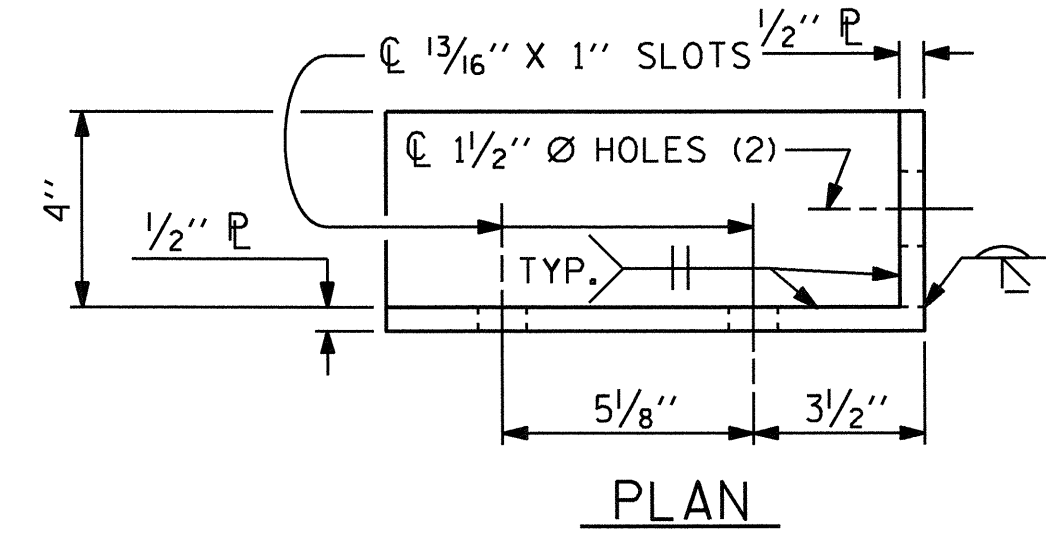


SECTION H-H

(FOR BOTTOM RAIL)



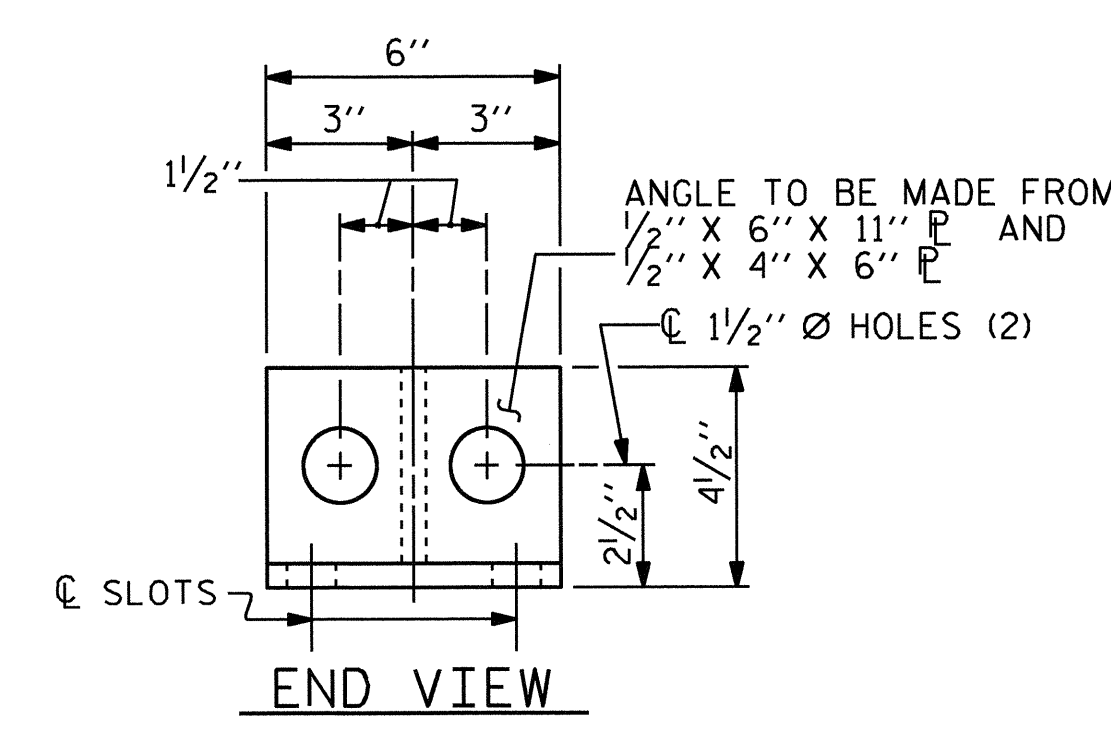
ELEVATION



PLAN

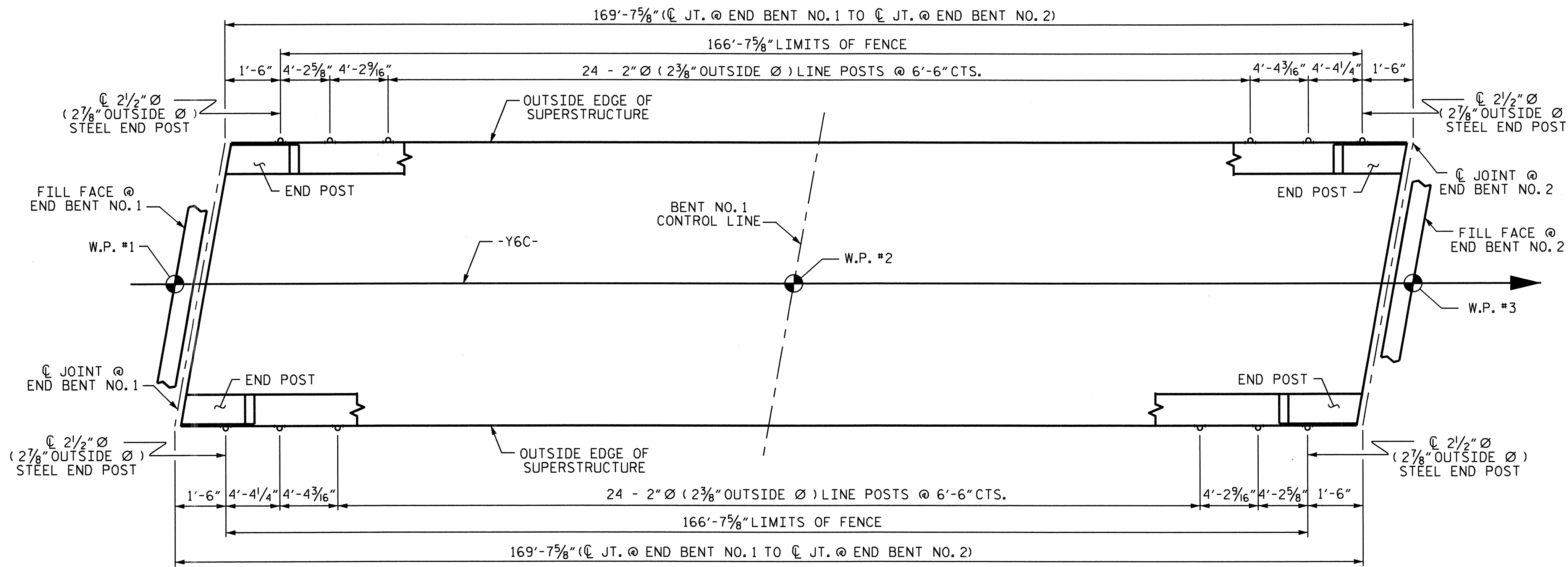
DETAILS FOR ATTACHMENT BRACKET

(BOTTOM RAIL ONLY)



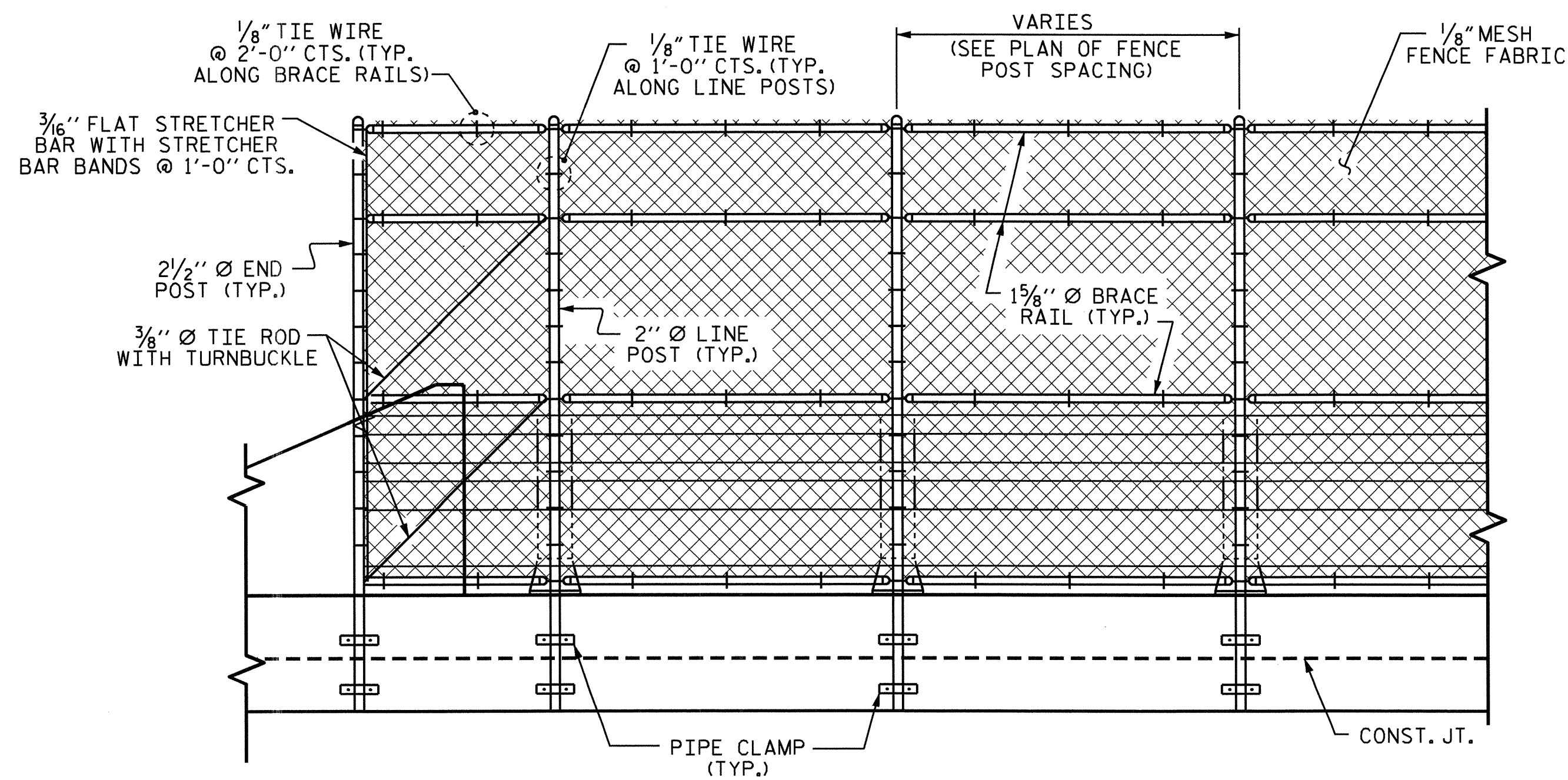
END VIEW

|                               |               |
|-------------------------------|---------------|
| ASSEMBLED BY: B.N. BARODAWALA | DATE: 9-14-11 |
| CHECKED BY: PEGGY PARISI      | DATE: 1-19-12 |
| DRAWN BY: JMB                 | 1/88          |
| CHECKED BY: GGH               | 1/88          |
| REV. 5/7/03                   | RWW/JTE       |
| REV. 5/1/06                   | TLA/GM        |
| REV. 10/1/11                  | MAA/GM        |

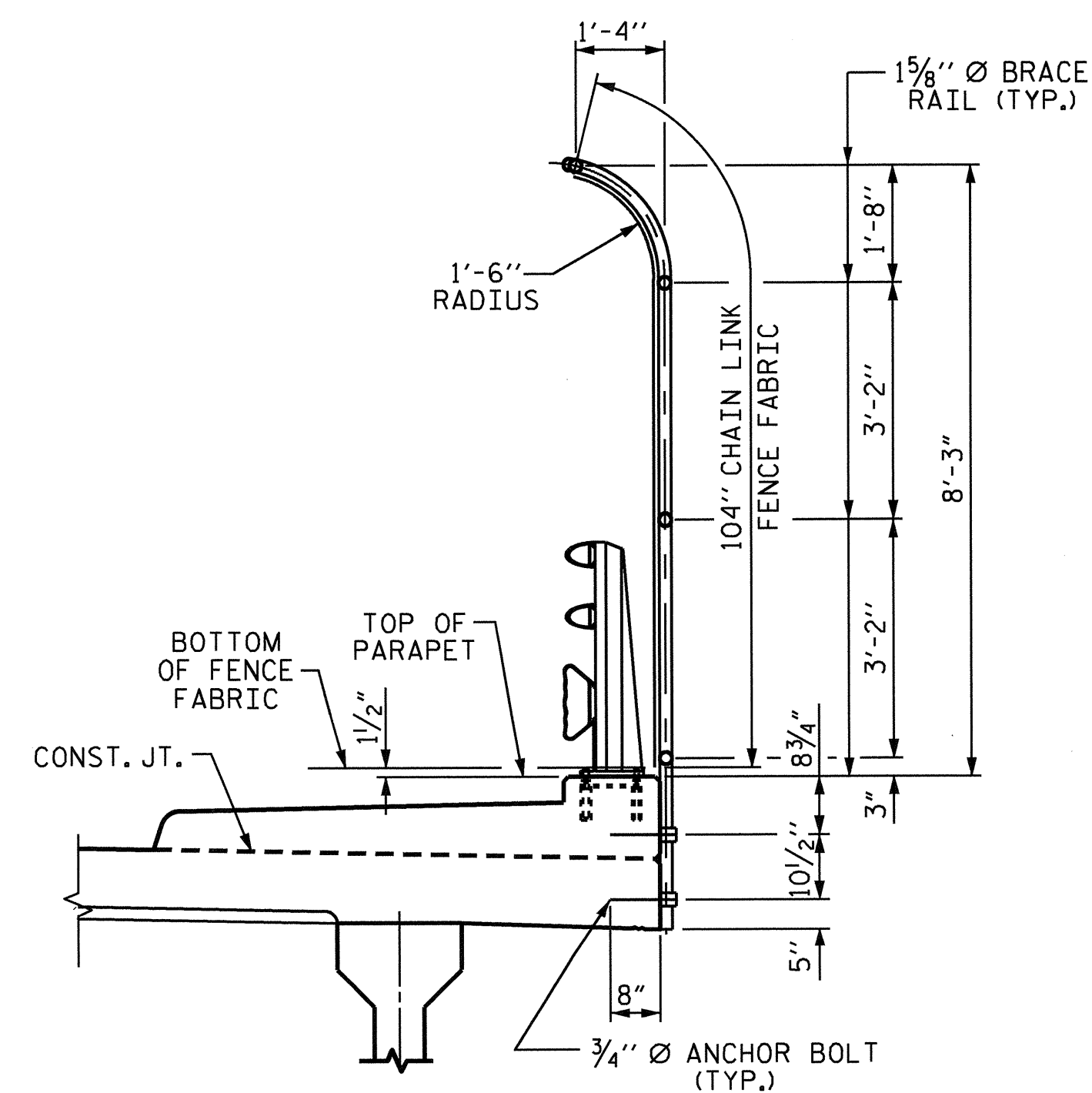


**PLAN OF FENCE POST SPACING**

PAY LENGTH 333.27 FEET



**PARTIAL ELEVATION**



**SECTION THRU FENCE**

**NOTES**

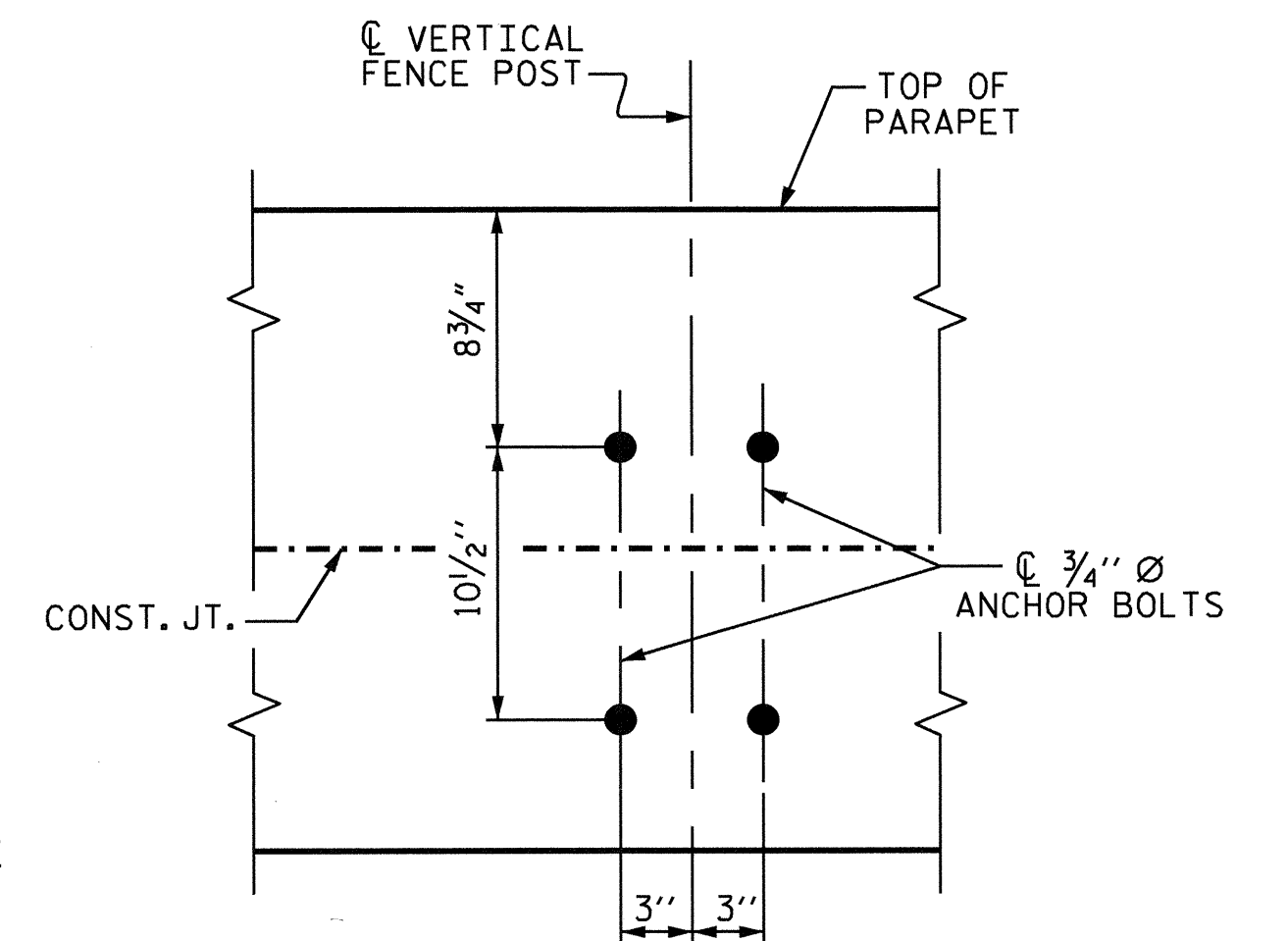
FOR BRIDGE MOUNTED CHAIN LINK FENCE, SEE SPECIAL PROVISIONS.

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.

DIMENSIONS TAKEN ALONG OUTSIDE FACE OF DECK SLAB AND SIDEWALK.



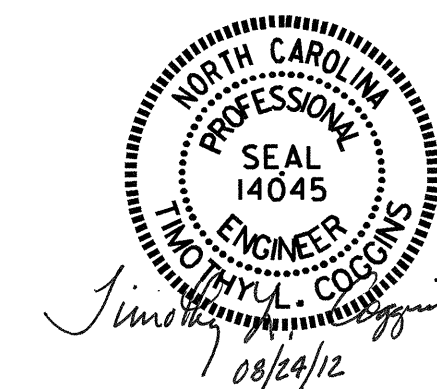
**BOLT SETTING DETAIL**

PROJECT NO. U-4444B  
CUMBERLAND COUNTY  
 STATION: 172+95.63 -L-

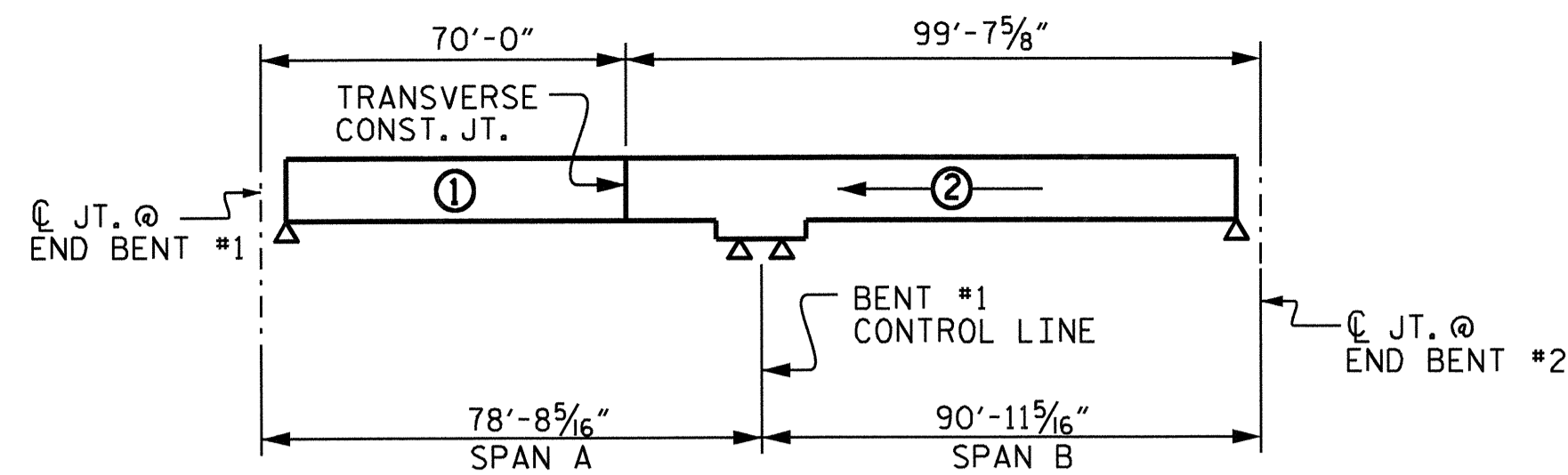
|  |     |       |     |     |                 |
|--|-----|-------|-----|-----|-----------------|
| STATE OF NORTH CAROLINA<br>DEPARTMENT OF TRANSPORTATION<br>RALEIGH |     |       |     |     |                 |
| SUPERSTRUCTURE<br>BRIDGE MOUNTED<br>CHAIN LINK FENCE               |     |       |     |     |                 |
| REVISIONS  |     |       |     |     | SHEET NO.       |
| NO.  | BY: | DATE: | NO. | BY: | DATE:           |
| 1  |     |       | 3   |     |                 |
| 2  |     |       | 4   |     |                 |
|  |     |       |     |     | S-19            |
|  |     |       |     |     | TOTAL SHEETS 30 |

DRAWN BY: B.N.BARODAWALA DATE: 9-14-11  
 CHECKED BY: PEGGY PARISI DATE: 1-19-12

24-AUG-2012 12:26  
 R:\TIP\Projects-U\U4444B\structures\Plans\Final Plans\U4444b.sd.bmcif\_01.dgn  
 rcoogins

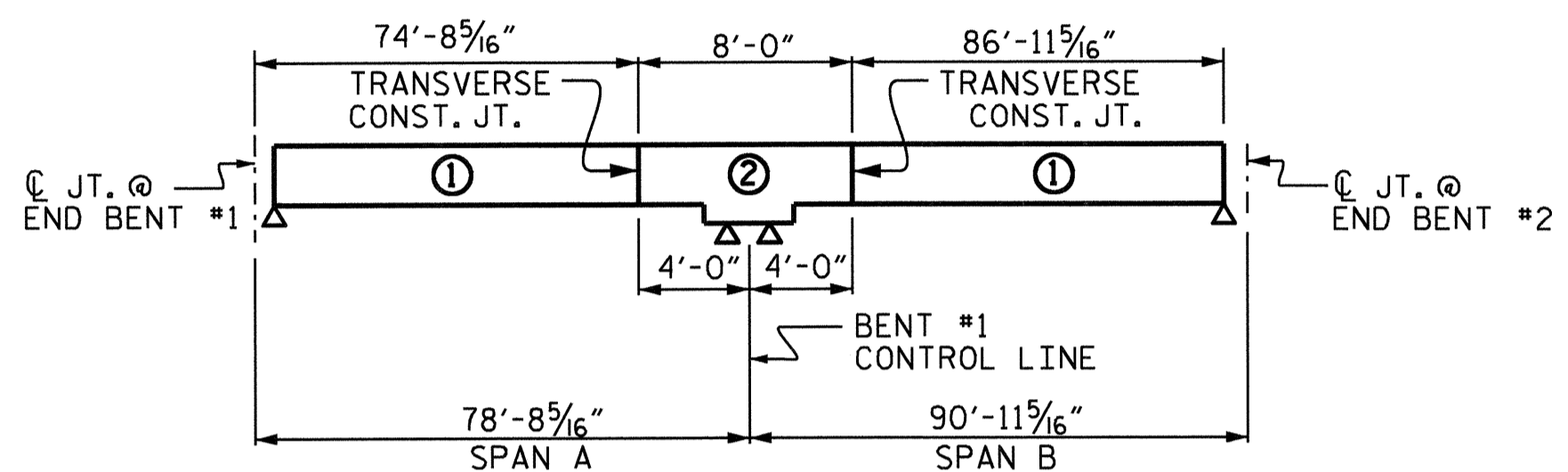


STR. #1



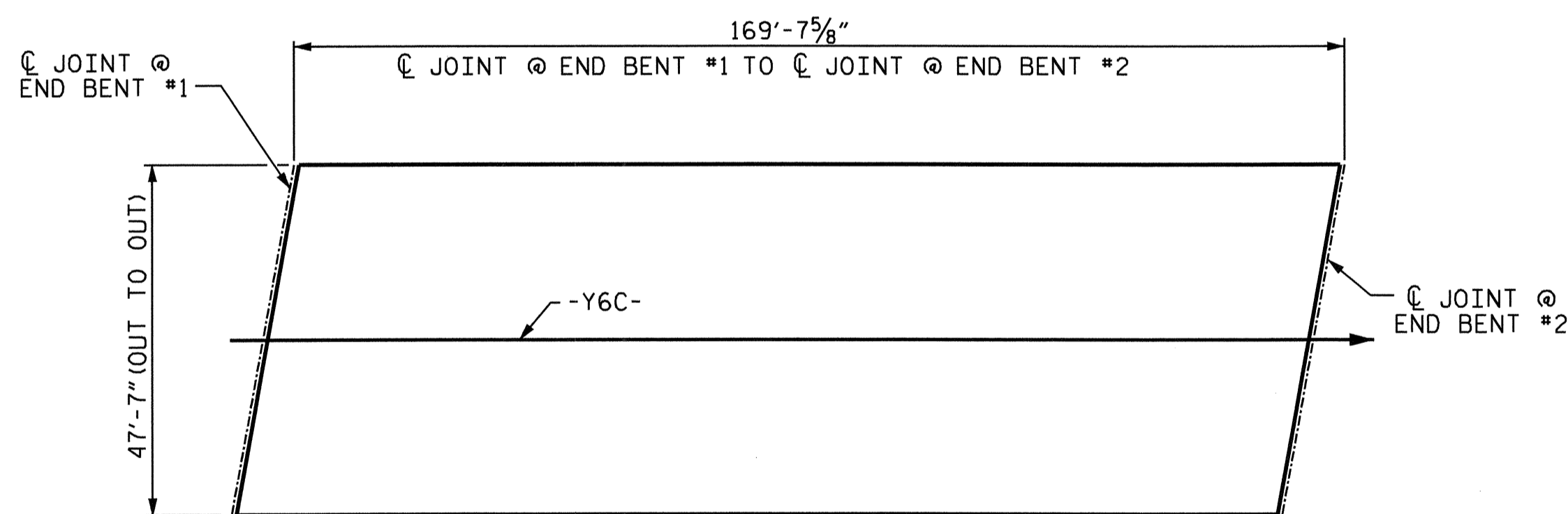
**POURING SEQUENCE**

(CONTINUOUS FOR LIVE LOAD)



**OPTIONAL POURING SEQUENCE**

(CONTINUOUS FOR LIVE LOAD)



LAYOUT FOR COMPUTING AREA  
OF REINFORCED CONCRETE DECK SLAB  
(SQ. FT. = 8,072)

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

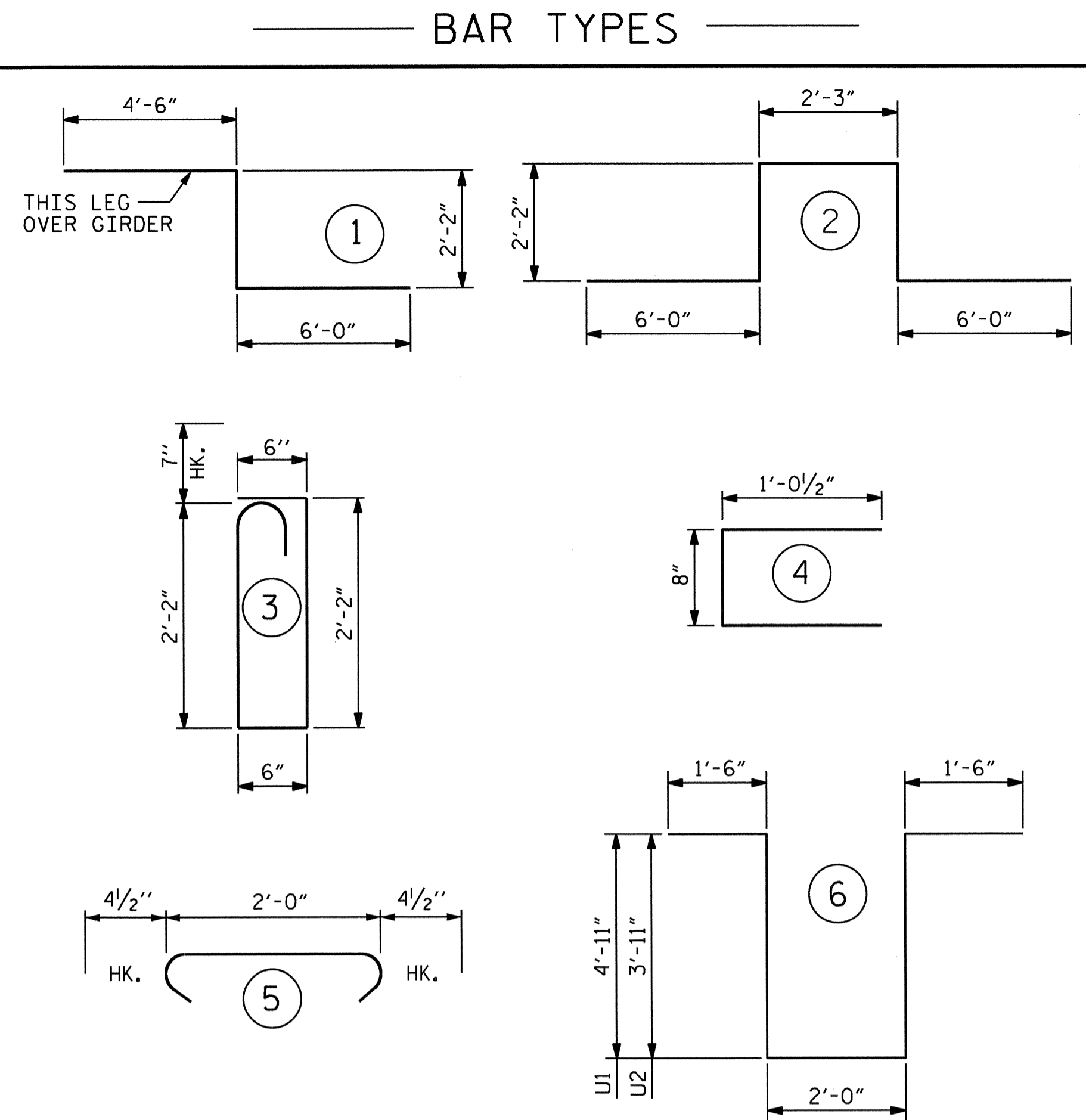
| BAR SIZE | SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL |          | APPROACH SLABS |          | PARAPET AND BARRIER RAIL |
|----------|---|----------|----------------|----------|--------------------------|
|          | EPOXY COATED  | UNCOATED | EPOXY COATED   | UNCOATED |                          |
| #4       | 2'-0"   | 1'-9"    | 2'-0"          | 1'-9"    | 2'-9"                    |
| #5       | 2'-6"   | 2'-2"    | 2'-6"          | 2'-2"    | 3'-5"                    |
| #6       | 3'-0"   | 2'-7"    | 3'-10"         | 2'-7"    | 4'-4"                    |
| #7       | 5'-3"   | 3'-6"    |                |          |                          |
| #8       | 6'-10"  | 4'-7"    |                |          |                          |

**GROOVING BRIDGE FLOORS**

|                |       |        |
|----------------|-------|--------|
| APPROACH SLABS | 1,479 | SO.FT. |
| BRIDGE DECK    | 5,217 | SO.FT. |
| TOTAL          | 6,696 | SO.FT. |

**BILL OF MATERIAL**

| BAR               | NO. | SIZE | TYPE | LENGTH  | WEIGHT |
|-------------------|-----|------|------|---------|--------|
| *A1               | 322 | 5    | STR  | 47'-3"  | 15,869 |
| A2                | 322 | 5    | STR  | 47'-3"  | 15,869 |
| *A101             | 4   | 5    | STR  | 39'-9"  | 166    |
| *A102             | 4   | 5    | STR  | 34'-2"  | 143    |
| *A103             | 4   | 5    | STR  | 28'-7"  | 119    |
| *A104             | 4   | 5    | STR  | 23'-0"  | 96     |
| *A105             | 4   | 5    | STR  | 17'-5"  | 73     |
| *A106             | 4   | 5    | STR  | 11'-10" | 49     |
| *A107             | 4   | 5    | STR  | 6'-3"   | 26     |
| *A108             | 4   | 5    | STR  | 3'-3"   | 14     |
| A201              | 4   | 5    | STR  | 42'-4"  | 177    |
| A202              | 4   | 5    | STR  | 36'-9"  | 153    |
| A203              | 4   | 5    | STR  | 31'-2"  | 130    |
| A204              | 4   | 5    | STR  | 25'-7"  | 107    |
| A205              | 4   | 5    | STR  | 20'-0"  | 83     |
| A206              | 4   | 5    | STR  | 14'-5"  | 60     |
| A207              | 4   | 5    | STR  | 8'-10"  | 37     |
| A208              | 4   | 5    | STR  | 3'-3"   | 14     |
| *B1               | 64  | 4    | STR  | 27'-3"  | 1,165  |
| *B2               | 32  | 6    | STR  | 60'-0"  | 2,884  |
| *B3               | 62  | 6    | STR  | 26'-0"  | 2,421  |
| *B4               | 96  | 4    | STR  | 21'-7"  | 1,384  |
| B5                | 159 | 5    | STR  | 57'-11" | 9,605  |
| *G1               | 2   | 5    | STR  | 48'-0"  | 100    |
| *K1               | 8   | 8    | 1    | 12'-8"  | 271    |
| *K2               | 16  | 8    | 2    | 18'-7"  | 794    |
| *K3               | 20  | 6    | STR  | 6'-2"   | 185    |
| K4                | 10  | 4    | STR  | 4'-4"   | 29     |
| K5                | 10  | 4    | STR  | 6'-6"   | 43     |
| K6                | 20  | 4    | STR  | 7'-2"   | 96     |
| K7                | 10  | 4    | STR  | 6'-2"   | 41     |
| K8                | 10  | 4    | STR  | 21'-8"  | 145    |
| *S1               | 70  | 5    | 3    | 5'-11"  | 432    |
| *S2               | 70  | 4    | 4    | 2'-9"   | 129    |
| S3                | 110 | 4    | 5    | 2'-9"   | 202    |
| *U1               | 20  | 4    | 6    | 14'-10" | 198    |
| *U2               | 10  | 4    | 6    | 12'-10" | 86     |
| REINFORCING STEEL |     |      |      | LBS.    | 26,791 |
| *EPOXY COATED     |     |      |      |         |        |
| REINFORCING STEEL |     |      |      | LBS.    | 26,604 |



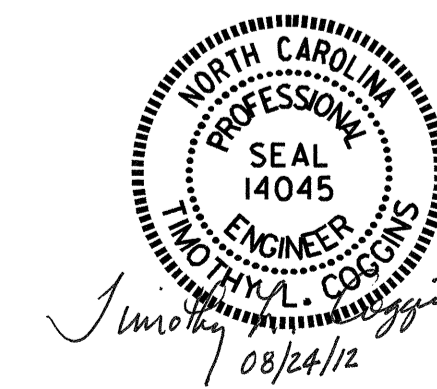
ALL BAR DIMENSIONS ARE OUT TO OUT

**SUPERSTRUCTURE BILL OF MATERIAL**

|           | CLASS AA CONCRETE | REINFORCING STEEL | EPOXY COATED REINFORCING STEEL |
|-----------|-------------------|-------------------|--------------------------------|
|           | (CU.YDS.)         | (LBS.)            | (LBS.)                         |
| POUR #1   | 104.5             | 26,791            | 26,604                         |
| POUR #2   | 164.5             |                   |                                |
| TOTALS ** | 269.0             | 26,791            | 26,604                         |

\*\*QUANTITIES FOR SIDEWALK AND END POSTS ARE NOT INCLUDED.

PROJECT NO. U-4444B  
CUMBERLAND COUNTY  
STATION: 172+95.63 -L-



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

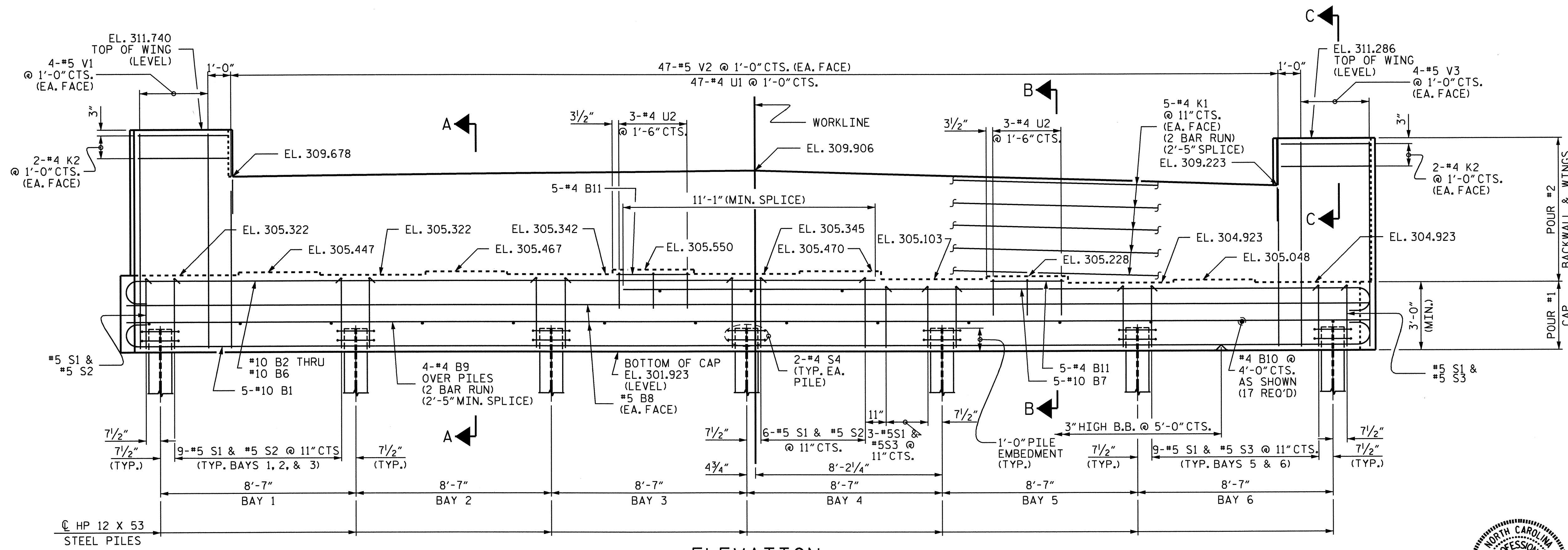
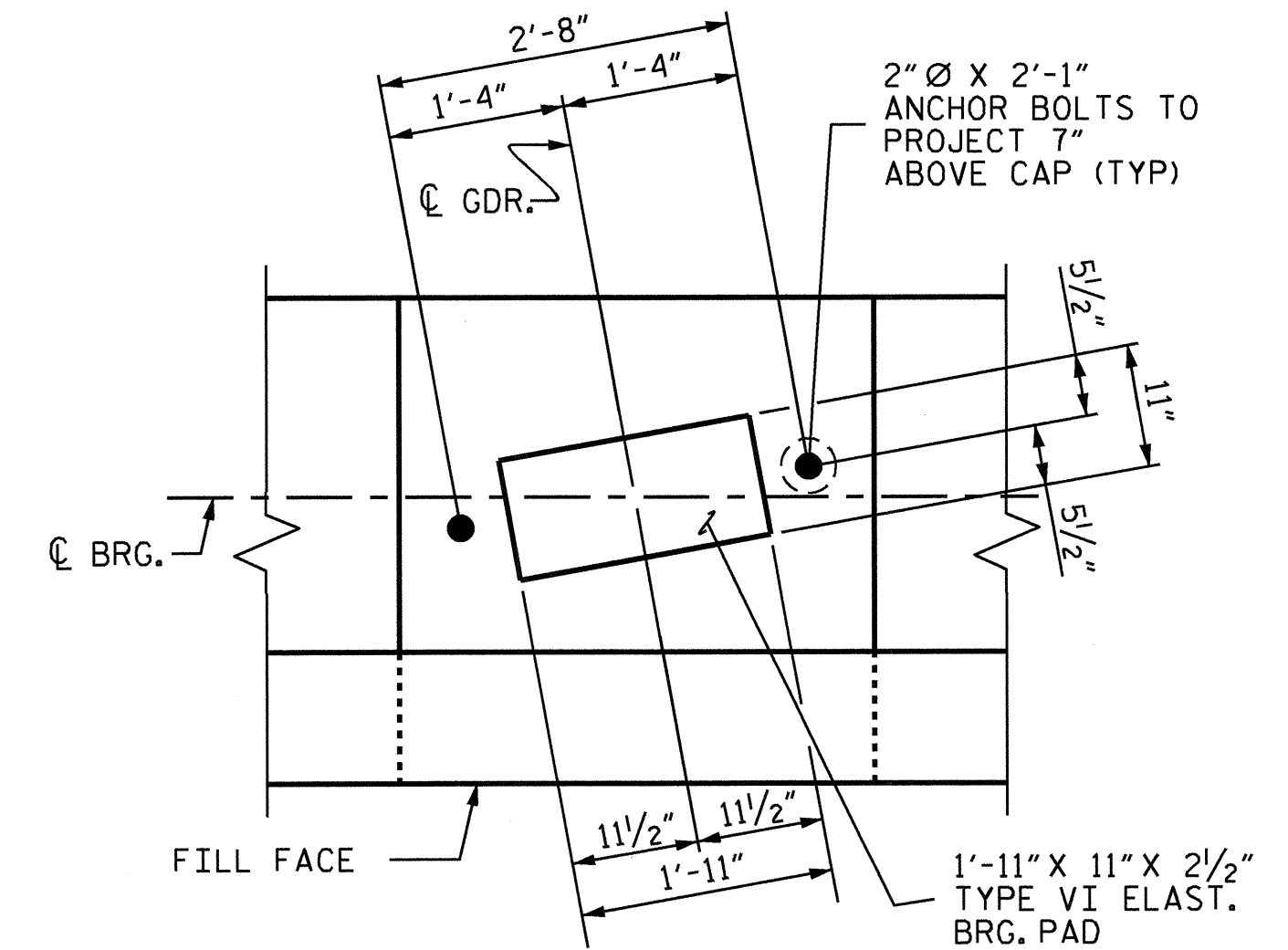
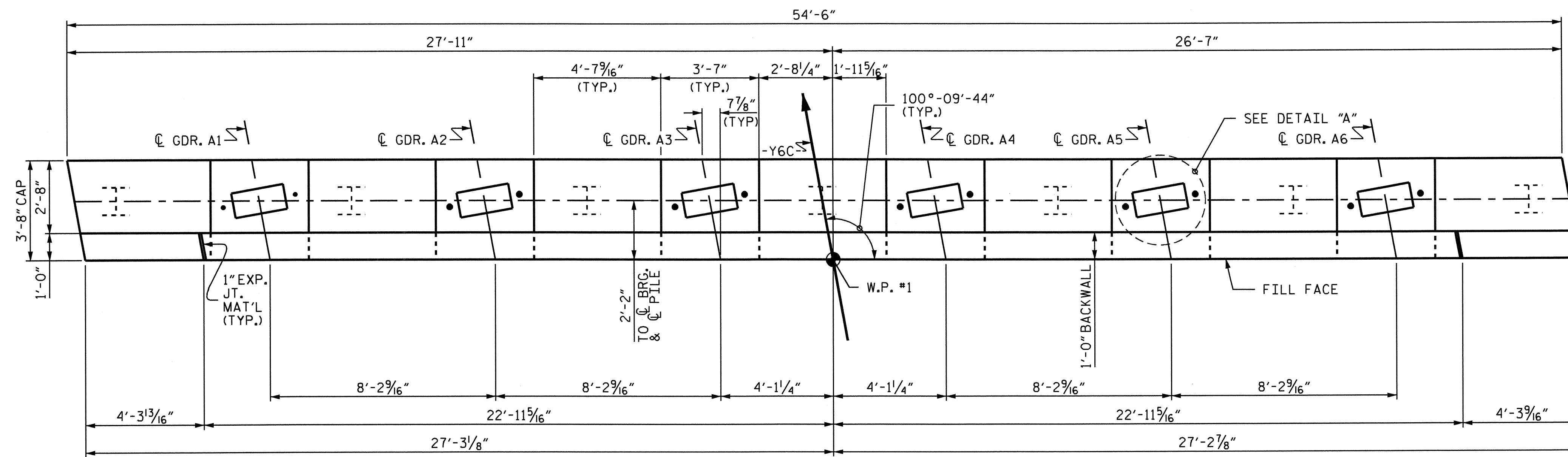
|                               |                      |
|-------------------------------|----------------------|
| ASSEMBLED BY : B.N.BARODAWALA | DATE : 9-14-11       |
| CHECKED BY : PEGGY PARISI     | DATE : 1-19-12       |
| DRAWN BY : JMB 5/87           | REV. 8/16/99 RWW/LES |
| CHECKED BY : SJD 9/87         | REV. 5/1/06 TLA/GM   |
|                               | REV. 10/1/11 MAA/GM  |

| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-20         |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |
| 2         |     |       | 4   |     |       | 30           |

STR. #1 STD. NO. BOM2

**NOTES**

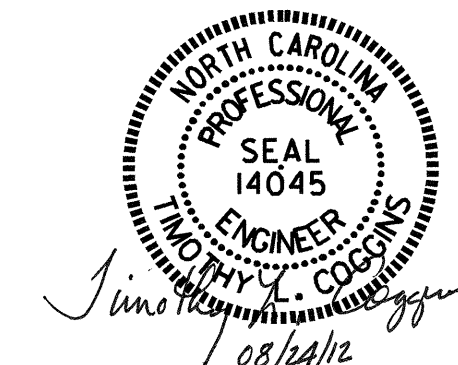
- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
- THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
- THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.



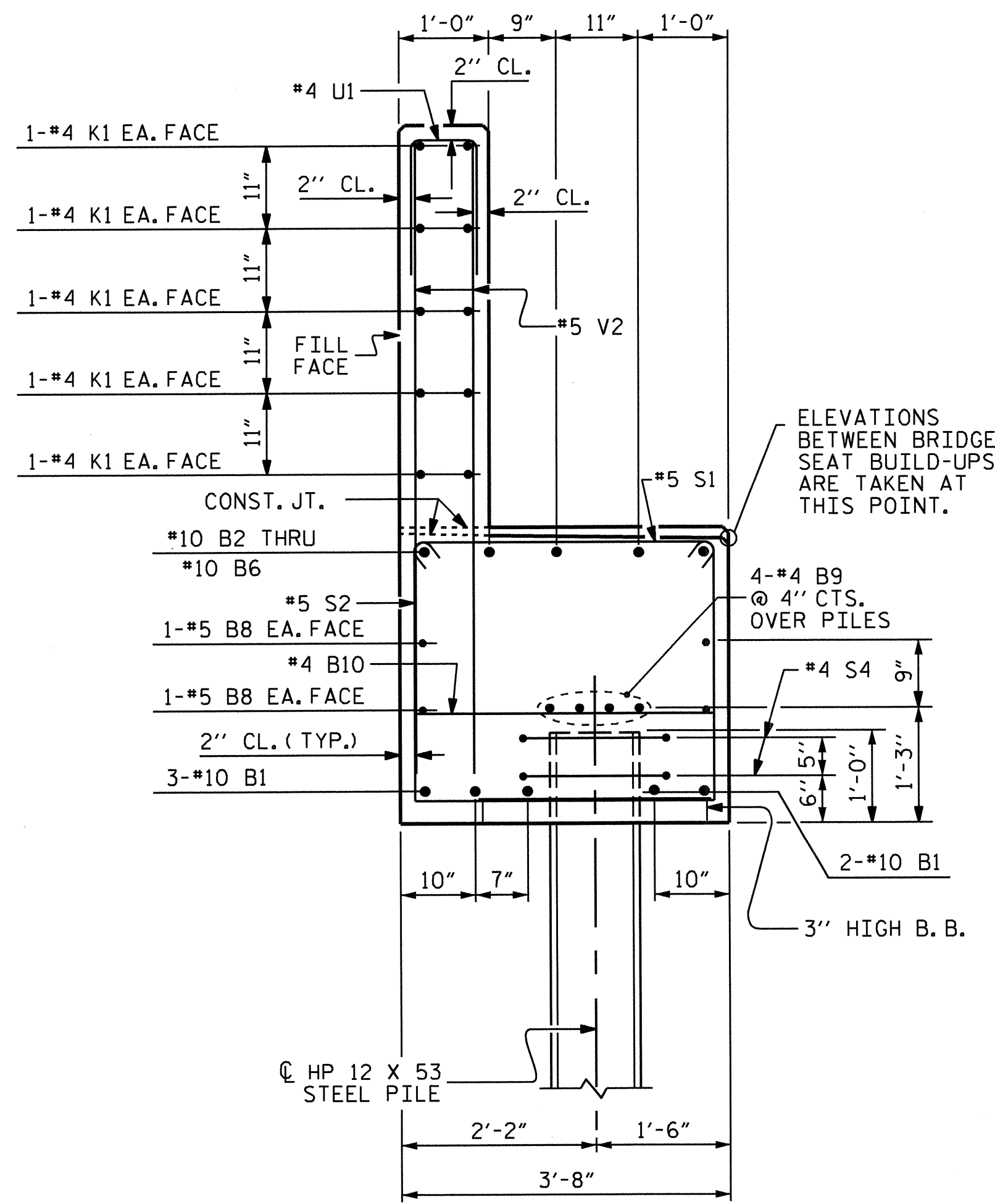
PROJECT NO. U-4444B  
 CUMBERLAND COUNTY  
 STATION: 172+95.63 -L-

SHEET 1 OF 2

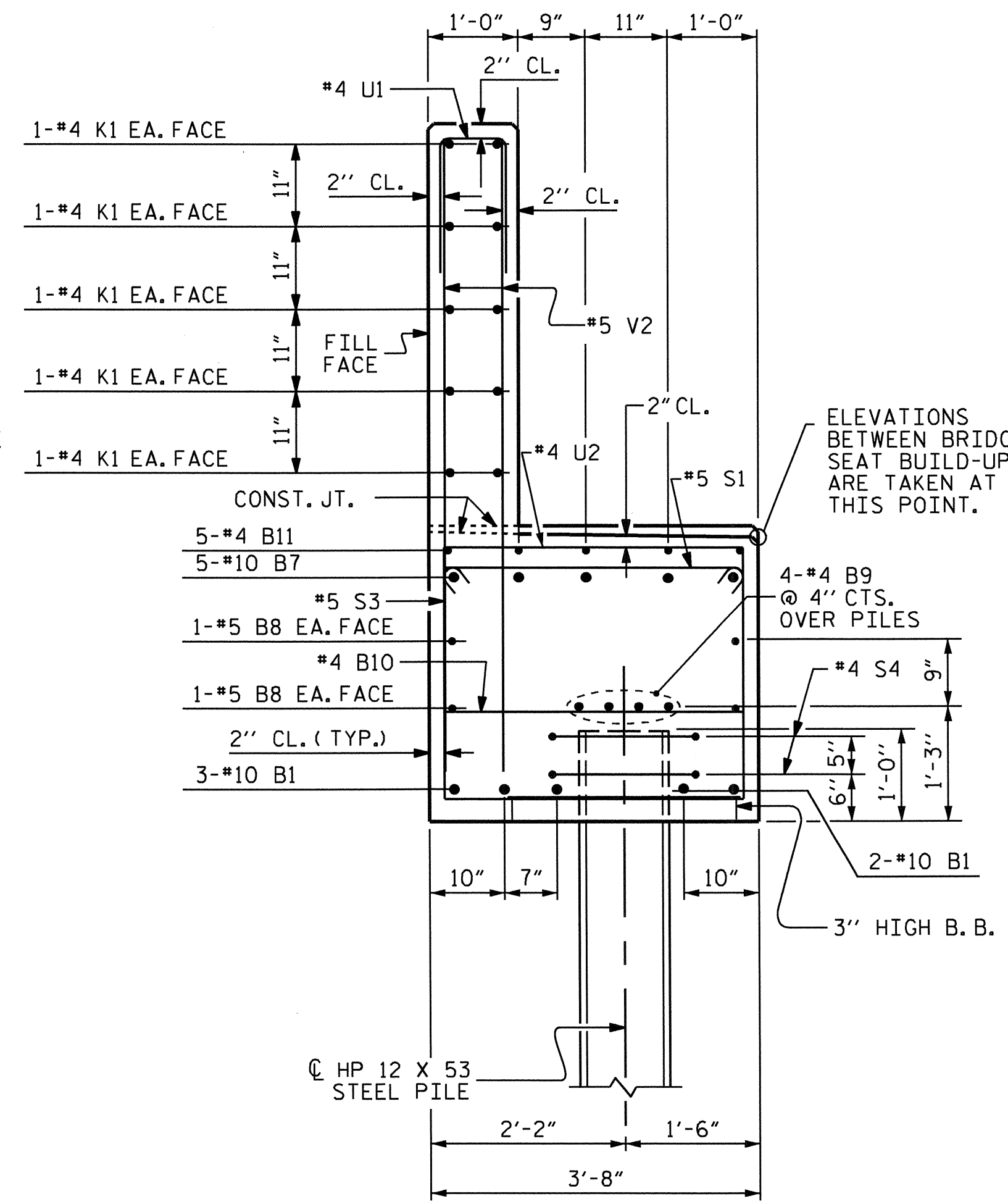
|  |     |       |     |     |       |                    |
|--|-----|-------|-----|-----|-------|--------------------|
| STATE OF NORTH CAROLINA<br>DEPARTMENT OF TRANSPORTATION<br>RALEIGH |     |       |     |     |       | SHEET NO.<br>S-21  |
| SUBSTRUCTURE   |     |       |     |     |       |                    |
| END BENT #1  |     |       |     |     |       | TOTAL SHEETS<br>30 |
| REVISIONS  |     |       |     |     |       |                    |
| NO.  | BY: | DATE: | NO. | BY: | DATE: |                    |
| 1  |     |       | 3   |     |       |                    |
| 2  |     |       | 4   |     |       |                    |



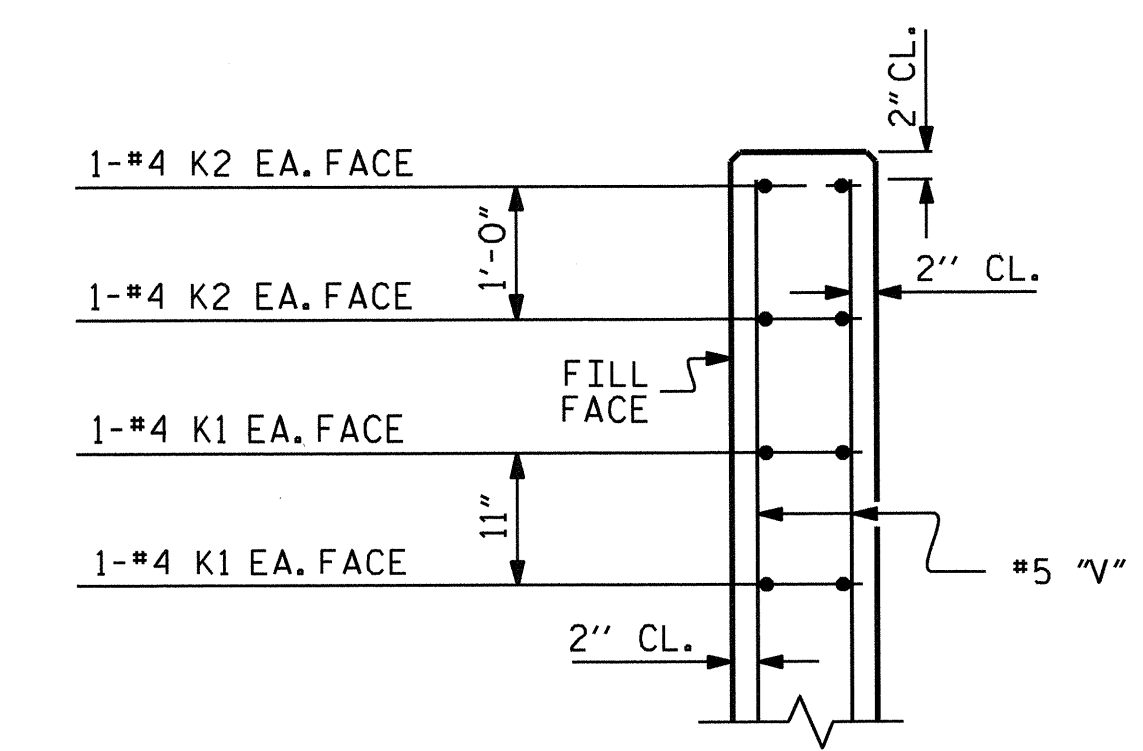
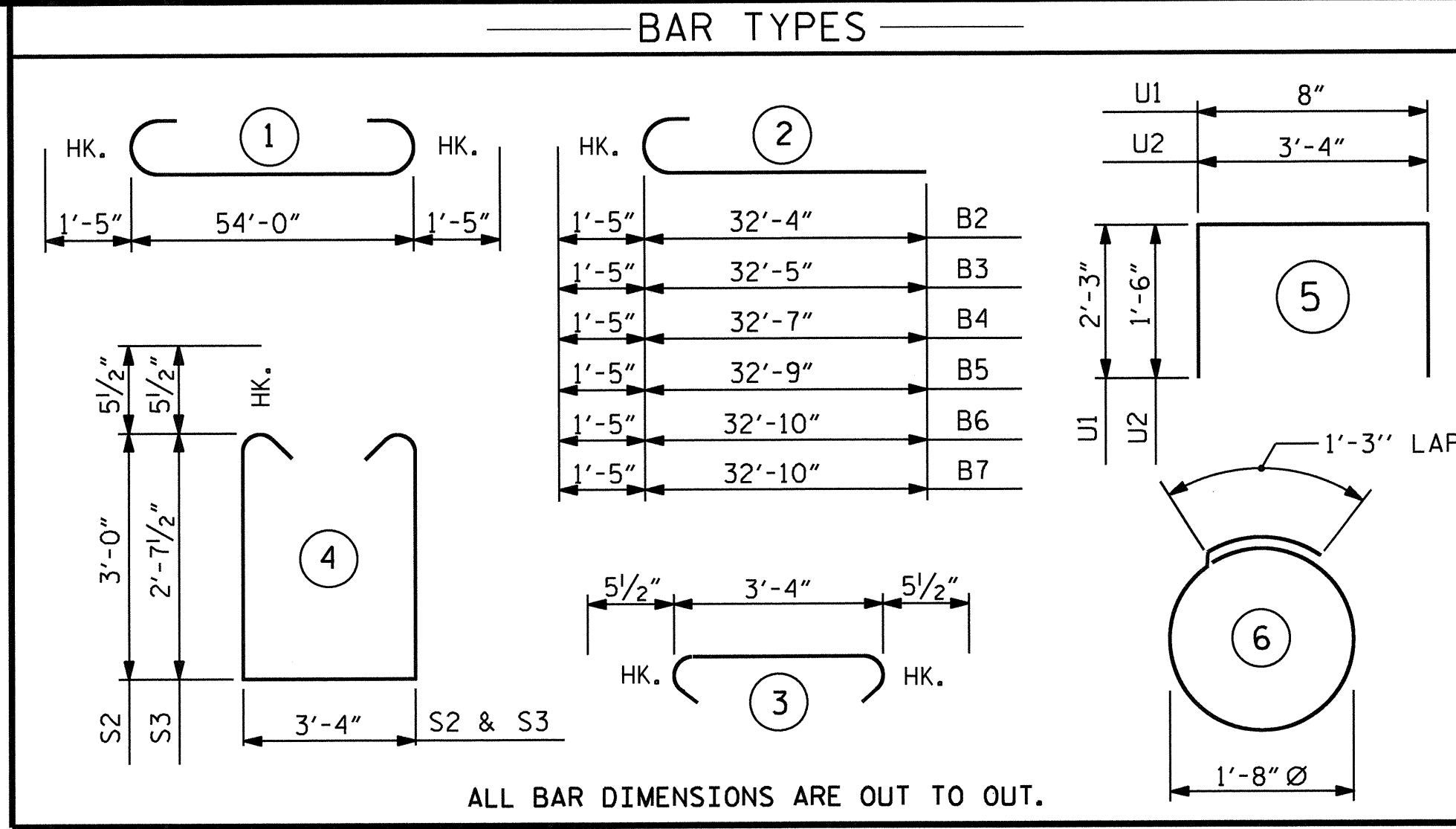
DRAWN BY: A. M. LEE DATE: 12/2011  
 CHECKED BY: B. L. GREEN DATE: 1/2012



SECTION A-A

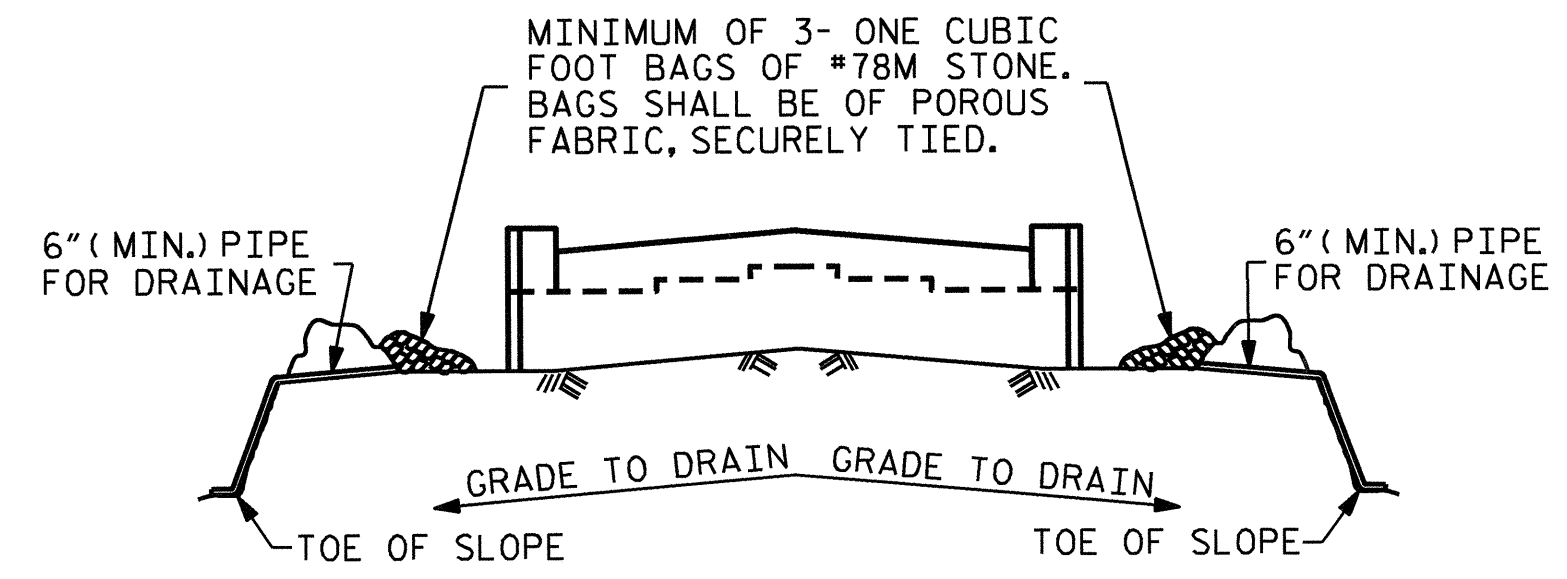


SECTION B-B



SECTION C-C

| BILL OF MATERIAL             |     |      |      |               |        |
|------------------------------|-----|------|------|---------------|--------|
| END BENT #1                  |     |      |      |               |        |
| BAR                          | NO. | SIZE | TYPE | LENGTH        | WEIGHT |
| B1                           | 5   | #10  | 1    | 56'-10"       | 1223   |
| B2                           | 1   | #10  | 2    | 33'-9"        | 145    |
| B3                           | 1   | #10  | 2    | 33'-10"       | 146    |
| B4                           | 1   | #10  | 2    | 34'-0"        | 146    |
| B5                           | 1   | #10  | 2    | 34'-2"        | 147    |
| B6                           | 1   | #10  | 2    | 34'-3"        | 147    |
| B7                           | 5   | #10  | 2    | 34'-3"        | 737    |
| B8                           | 4   | #5   | STR  | 54'-0"        | 225    |
| B9                           | 8   | #4   | STR  | 28'-4"        | 151    |
| B10                          | 17  | #4   | STR  | 3'-4"         | 38     |
| B11                          | 10  | #4   | STR  | 3'-3"         | 22     |
| K1                           | 20  | #4   | STR  | 28'-4"        | 379    |
| K2                           | 8   | #4   | STR  | 3'-11"        | 21     |
| S1                           | 56  | #5   | 3    | 4'-3"         | 248    |
| S2                           | 34  | #5   | 4    | 10'-3"        | 363    |
| S3                           | 22  | #5   | 4    | 9'-6"         | 218    |
| S4                           | 14  | #4   | 6    | 6'-6"         | 61     |
| U1                           | 47  | #4   | 5    | 5'-2"         | 162    |
| U2                           | 6   | #4   | 5    | 6'-4"         | 25     |
| V1                           | 8   | #5   | STR  | 9'-5"         | 79     |
| V2                           | 94  | #5   | STR  | 6'-11"        | 678    |
| V3                           | 8   | #5   | STR  | 9'-0"         | 75     |
| TOTAL REINFORCING STEEL      |     |      |      | 5436 LBS.     |        |
| CLASS A CONCRETE BREAKDOWN   |     |      |      |               |        |
| POUR #1 (CAP)                |     |      |      | 24.9 CU. YDS. |        |
| POUR #2 (BACKWALL & WINGS)   |     |      |      | 9.5 CU. YDS.  |        |
| TOTAL CLASS A CONCRETE       |     |      |      | 34.4 CU. YDS. |        |
| HP 12 X 53 STEEL PILES NO. 7 |     |      |      | 560 LIN. FT.  |        |
| PILE REDRIVES                |     |      |      | 4 EACH        |        |

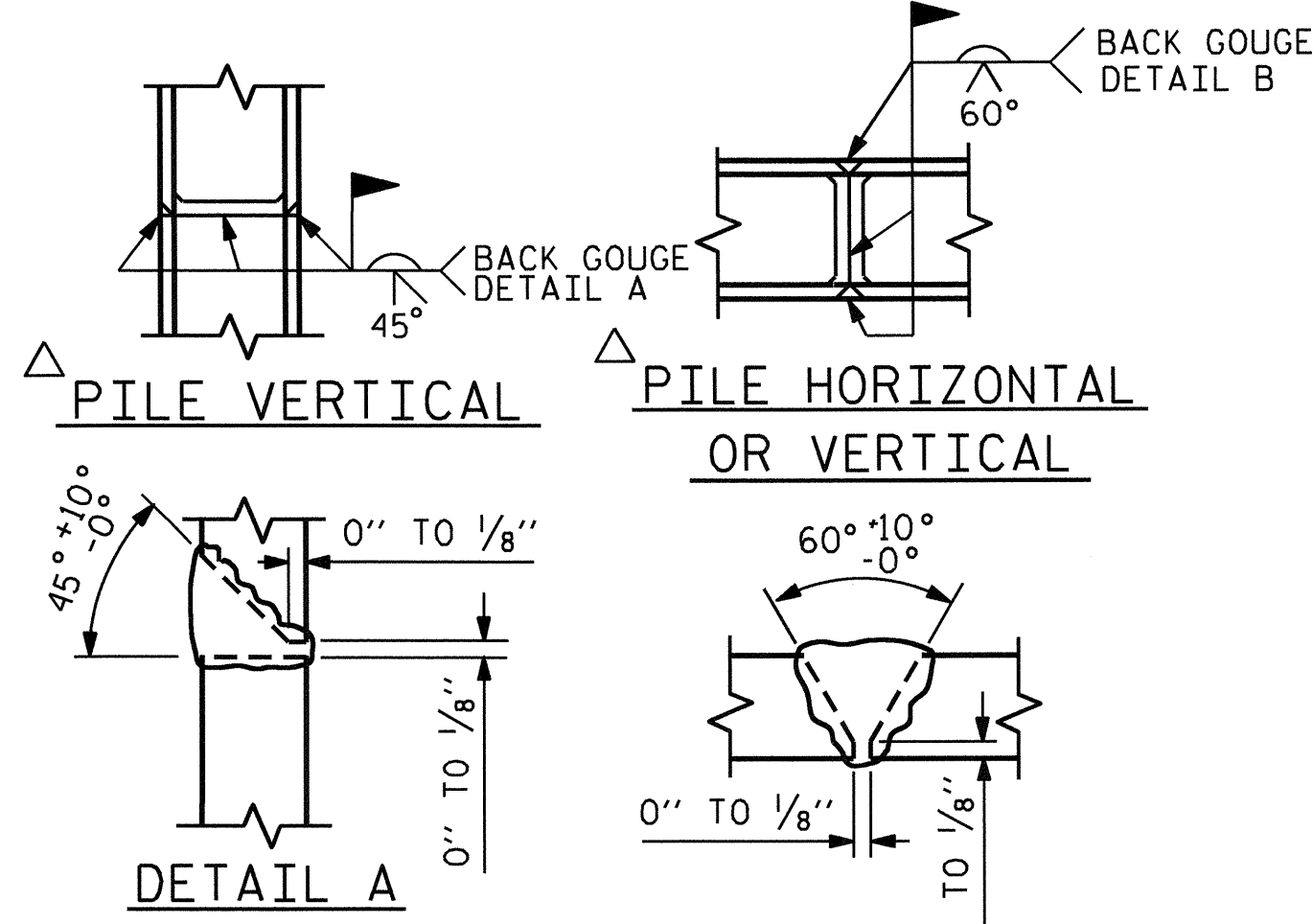


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

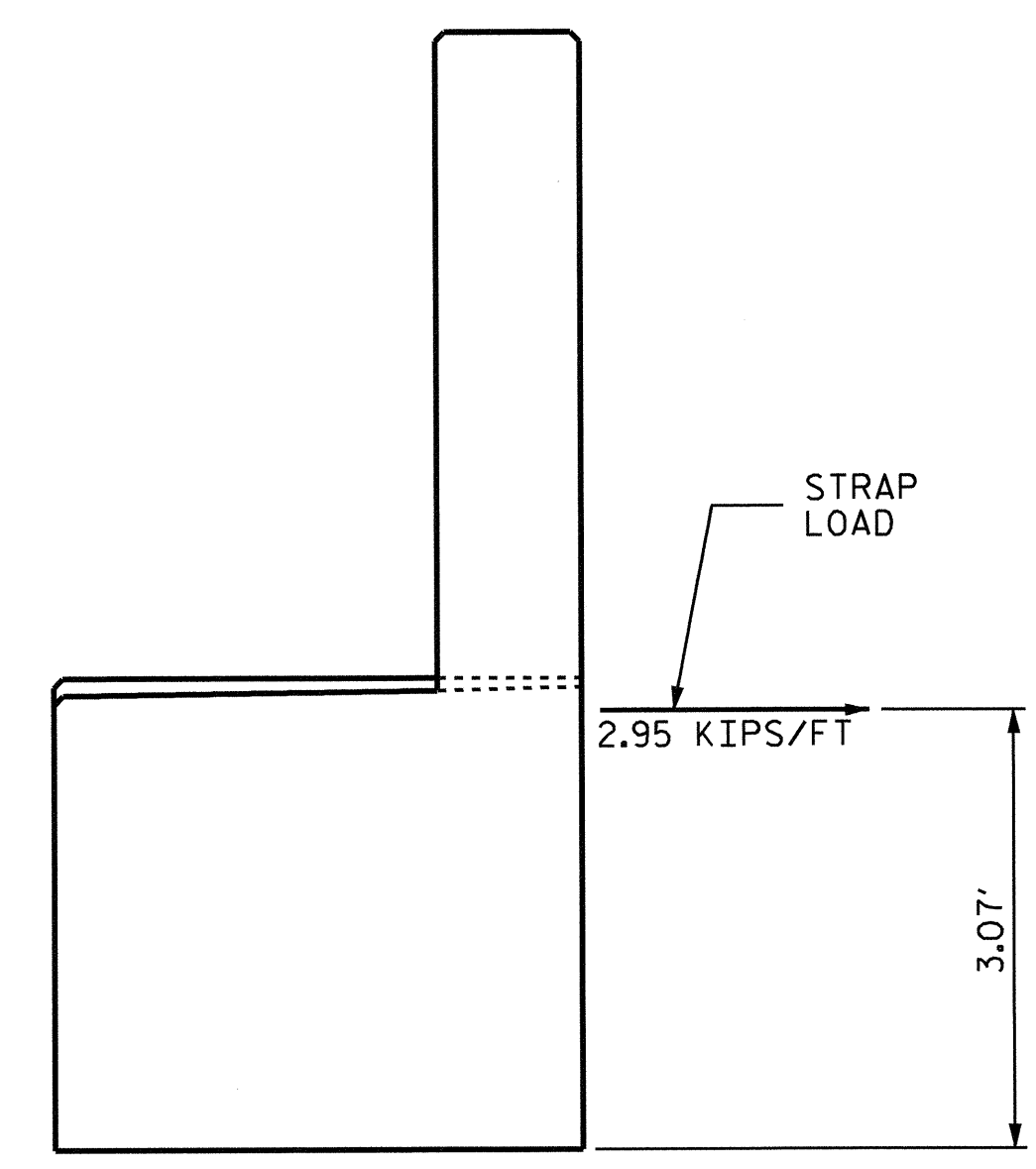
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

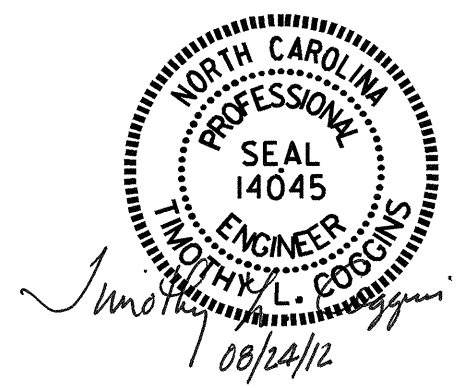
TEMPORARY DRAINAGE AT END BENT



PILE SPLICE DETAILS



STRAP LOAD DETAIL



PROJECT NO. U-4444B  
 CUMBERLAND COUNTY  
 STATION: 172+95.63 -L-

| STATE OF NORTH CAROLINA<br>DEPARTMENT OF TRANSPORTATION<br>RALEIGH |     |       |     |     |                    |
|--|-----|-------|-----|-----|--------------------|
| SUBSTRUCTURE   |     |       |     |     |                    |
| END BENT #1  |     |       |     |     |                    |
| REVISIONS  |     |       |     |     | SHEET NO.          |
| NO.  | BY: | DATE: | NO. | BY: | DATE:              |
| 1  |     |       | 3   |     |                    |
| 2  |     |       | 4   |     |                    |
|  |     |       |     |     | TOTAL SHEETS<br>30 |

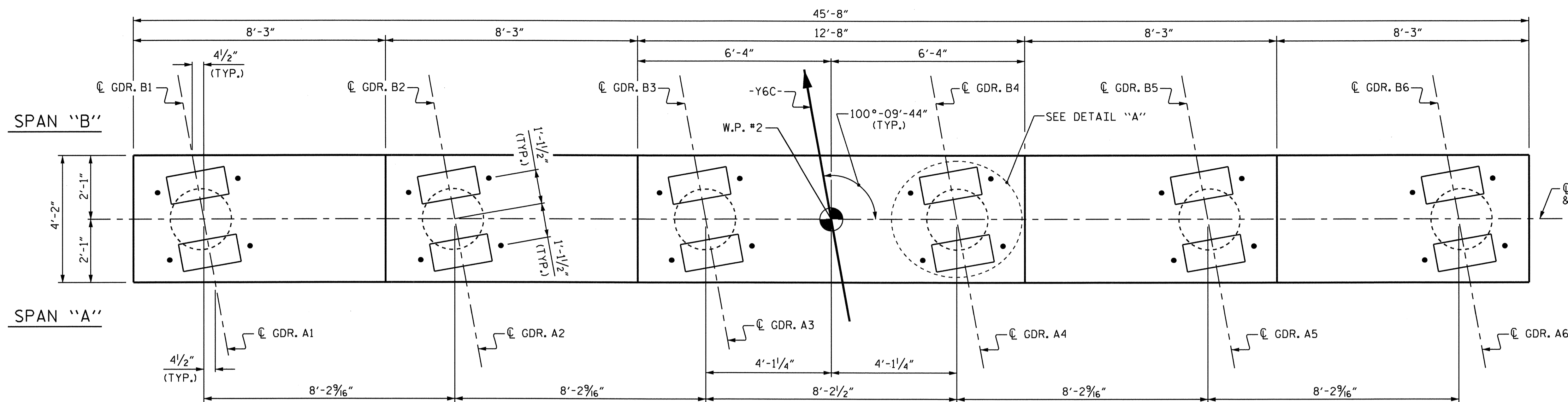
DRAWN BY: A. M. LEE DATE: 12/2011  
 CHECKED BY: B. L. GREEN DATE: 1/2012

**NOTES**

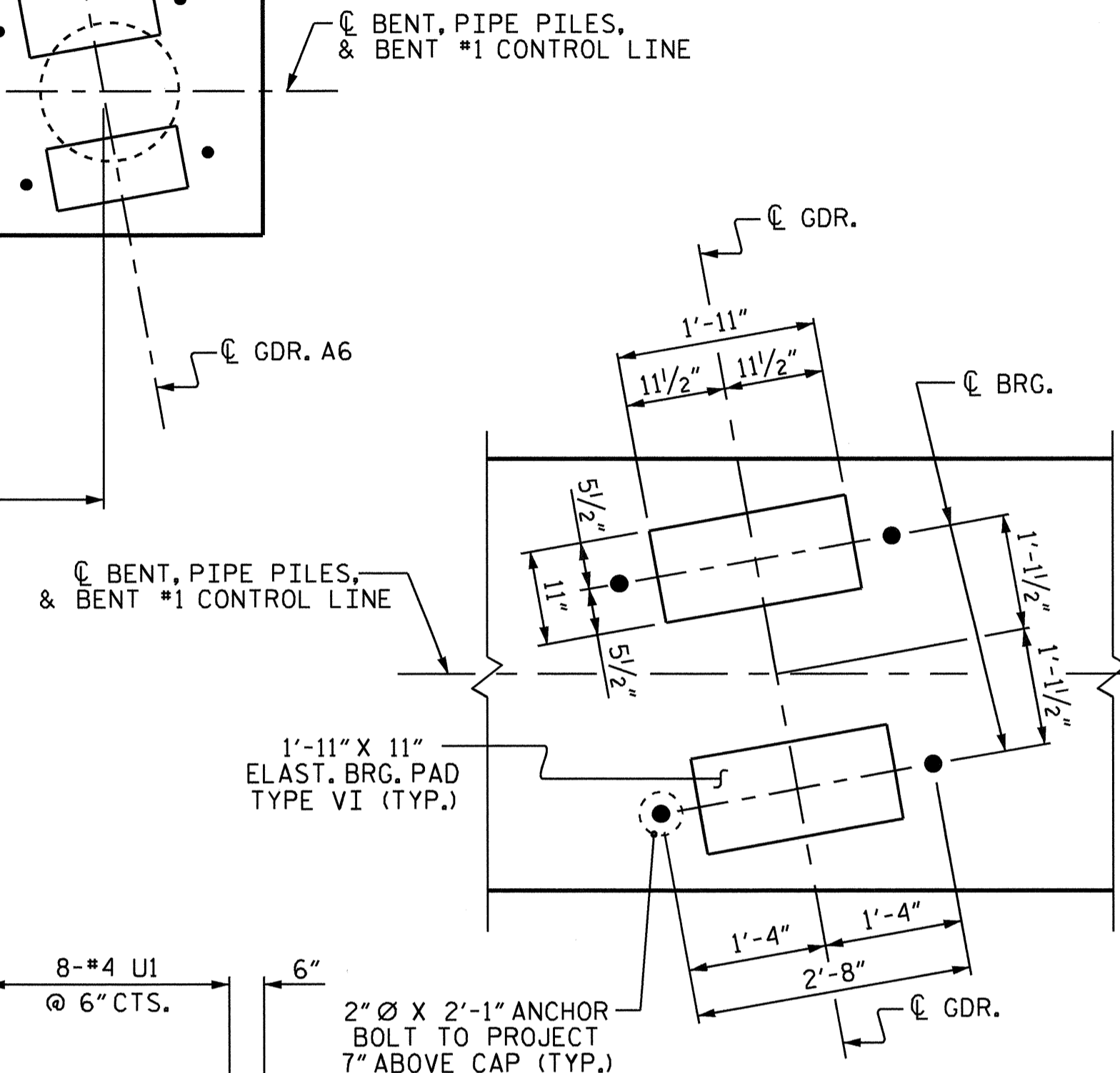
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

GALVANIZE THE TOP OF EACH INTERIOR BENT PILE A MINIMUM OF 35 FEET. GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

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

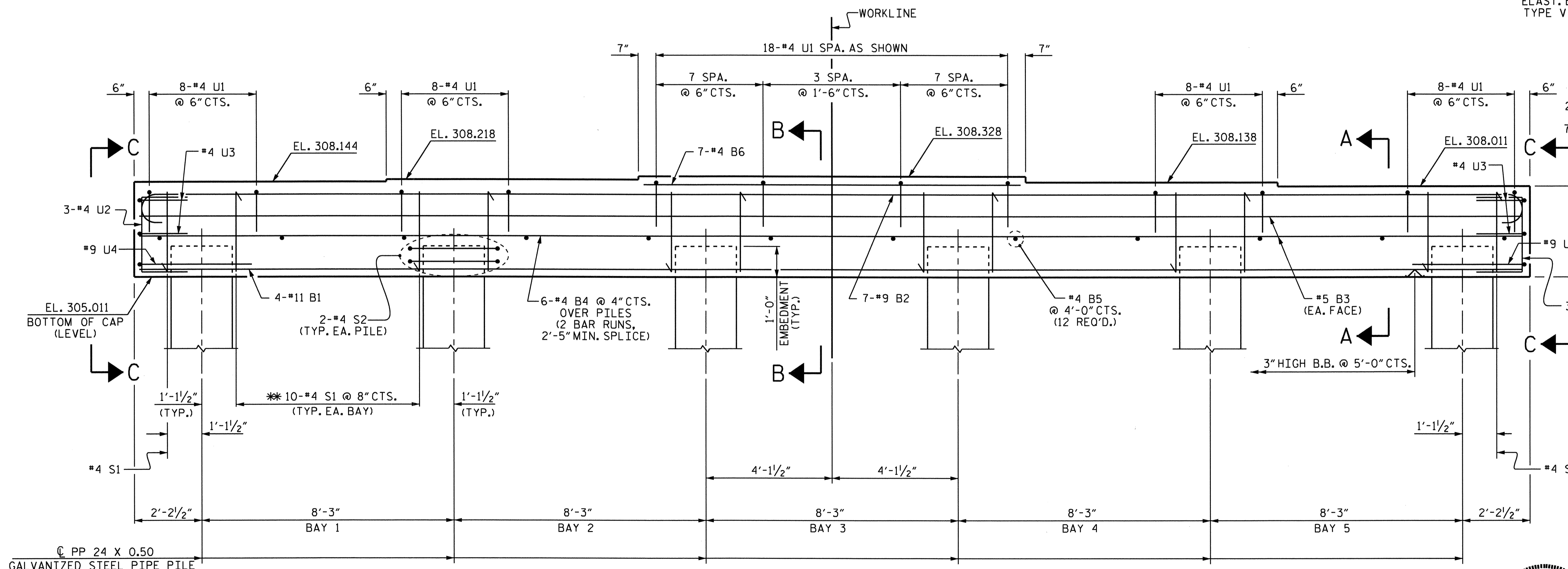


**PLAN**



**DETAIL "A"**

TYP. EA. GDR. (PIPE PILE NOT SHOWN)



**ELEVATION**

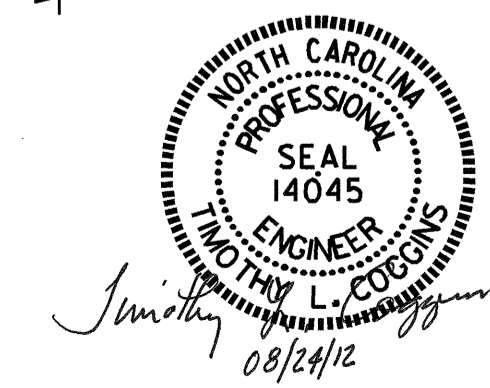
\* INVERT ALTERNATE STIRRUPS

PROJECT NO. U-4444B  
CUMBERLAND COUNTY  
 STATION: 172+95.63 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 BENT #1

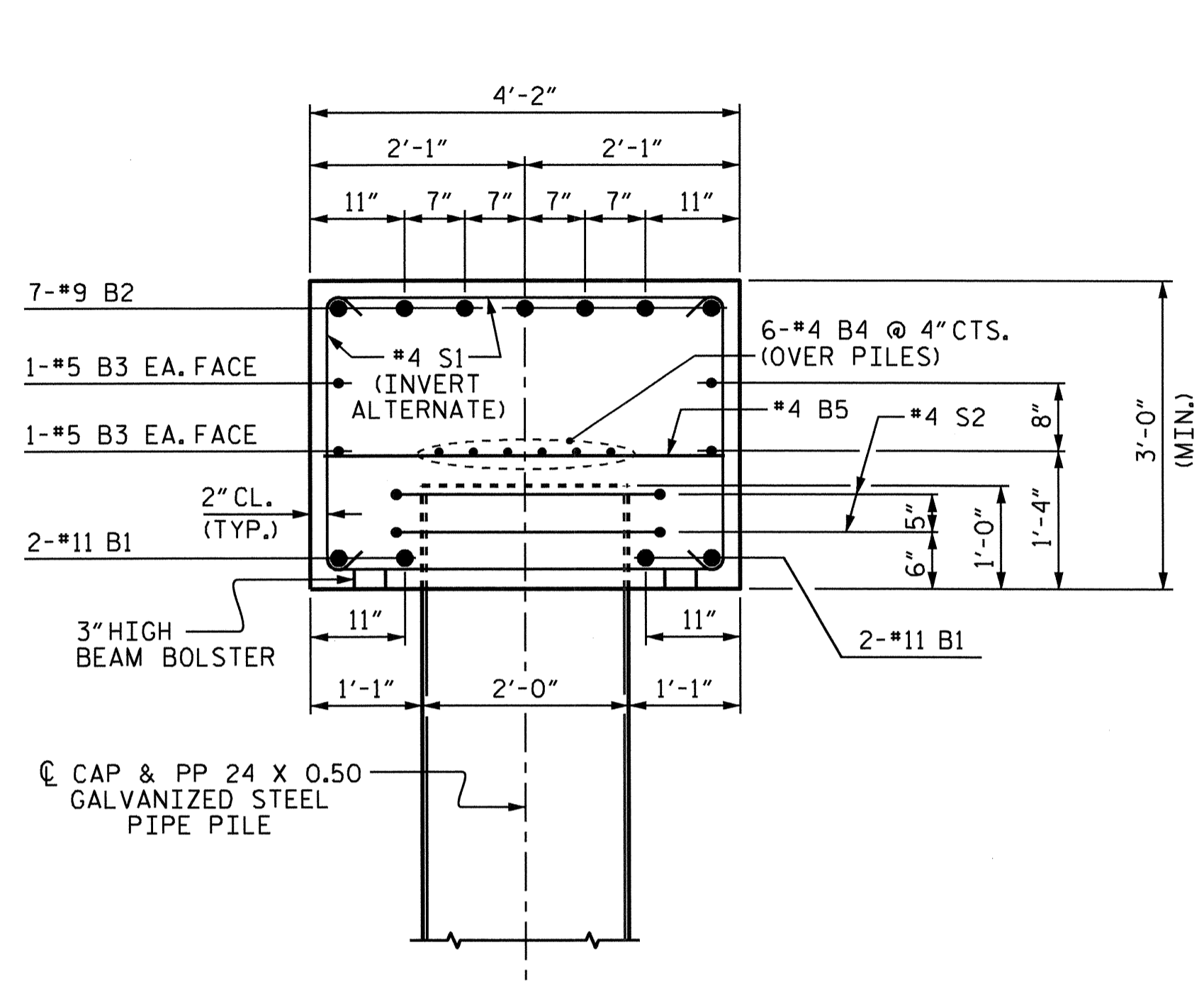


| REVISIONS |     |       |     |     |       | SHEET NO.<br>S-23  |
|-----------|-----|-------|-----|-----|-------|--------------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: |                    |
| 1         |     |       | 3   |     |       | TOTAL SHEETS<br>30 |
| 2         |     |       | 4   |     |       |                    |

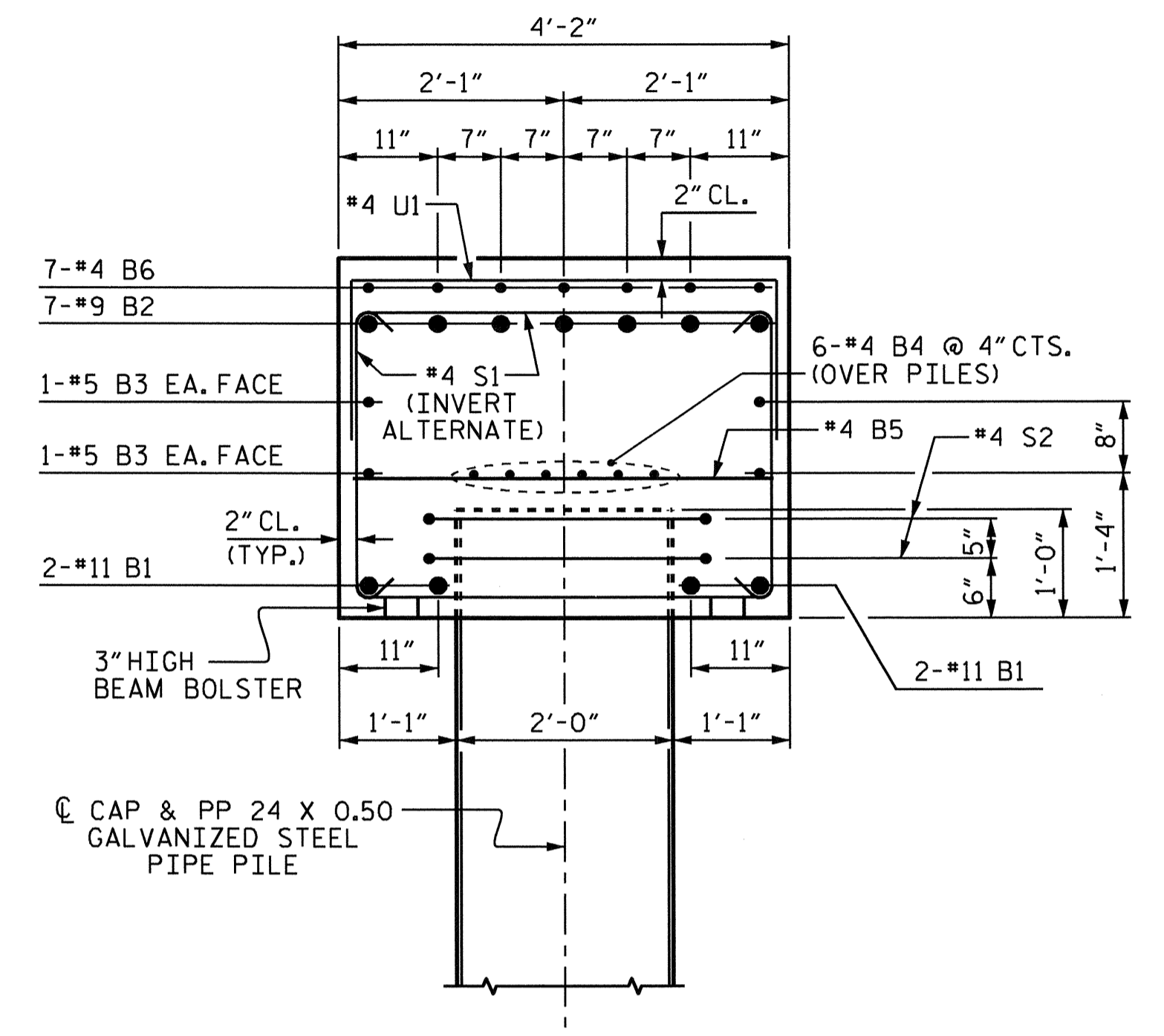
DRAWN BY : T.L. AVERETTE DATE : 1-12-12  
 CHECKED BY : M.L. RORIE DATE : 1-17-12

24-AUG-2012 10:09  
 R:\TIP\Projects-U\U4444B\Structures\Plans\Final Plans\U4444b.sd.b\*.01.dgn  
 tcoggins

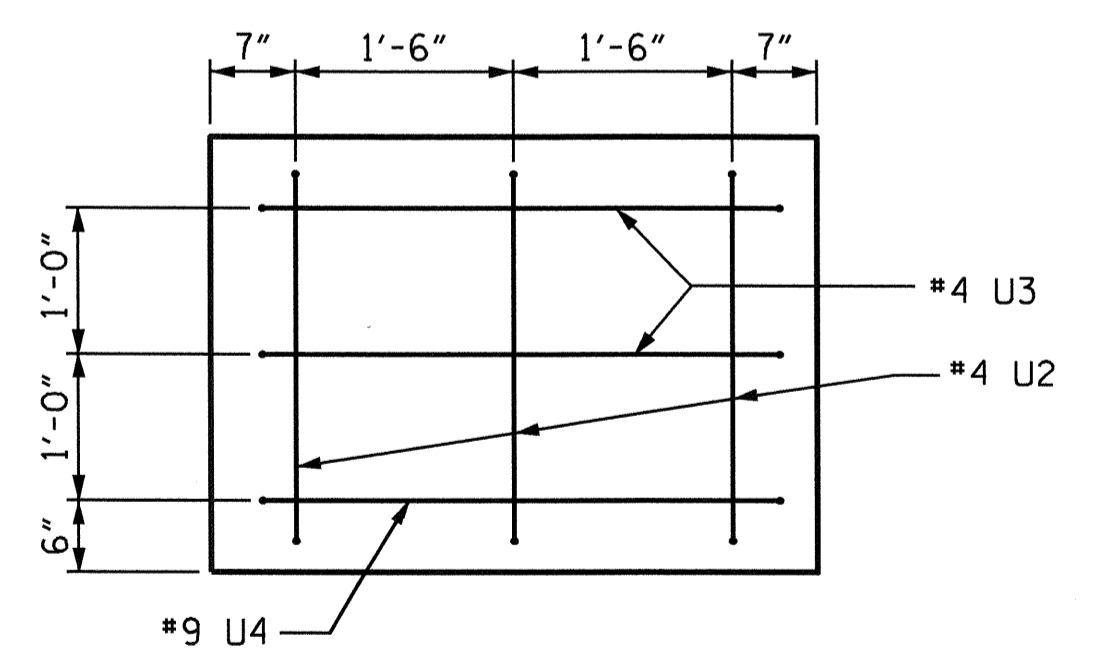
STR. #1



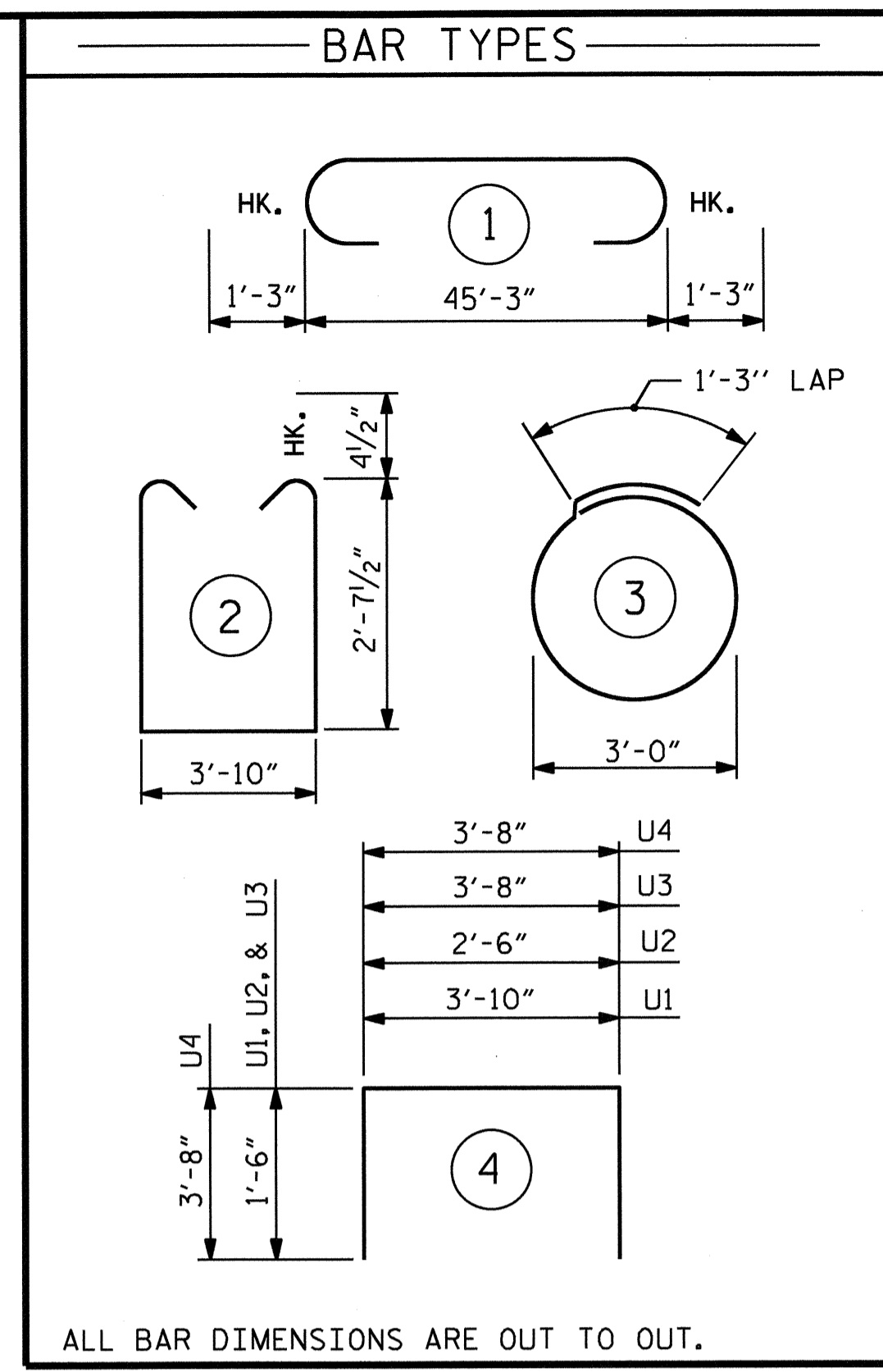
SECTION A-A



SECTION B-B



VIEW C-C



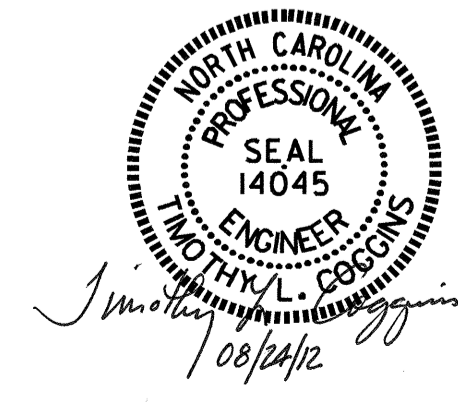
| BILL OF MATERIAL                    |     |      |      |         |                |
|-------------------------------------|-----|------|------|---------|----------------|
| BENT #1                             |     |      |      |         |                |
| BAR                                 | NO. | SIZE | TYPE | LENGTH  | WEIGHT         |
| B1                                  | 4   | #11  | STR  | 45'-4"  | 963            |
| B2                                  | 7   | #9   | 1    | 47'-9"  | 1136           |
| B3                                  | 4   | #5   | STR  | 45'-4"  | 189            |
| B4                                  | 12  | #4   | STR  | 23'-11" | 192            |
| B5                                  | 12  | #4   | STR  | 3'-10"  | 31             |
| B6                                  | 7   | #4   | STR  | 12'-4"  | 58             |
| S1                                  | 52  | #4   | 2    | 9'-10"  | 342            |
| S2                                  | 12  | #4   | 3    | 10'-8"  | 86             |
| U1                                  | 50  | #4   | 4    | 6'-10"  | 228            |
| U2                                  | 6   | #4   | 4    | 5'-6"   | 22             |
| U3                                  | 4   | #4   | 4    | 6'-8"   | 18             |
| U4                                  | 2   | #9   | 4    | 11'-0"  | 75             |
| REINFORCING STEEL                   |     |      |      |         | 3,340 LBS.     |
| CLASS A CONCRETE BREAKDOWN          |     |      |      |         |                |
| POUR #1 CAP                         |     |      |      |         | ▲ 21.7 CU. YD. |
| TOTAL CLASS A CONCRETE              |     |      |      |         | ▲ 21.7 CU. YD. |
| PP 24 X 0.50 GALVANIZED STEEL PILES |     |      |      |         |                |
| NO. 6                               |     |      |      |         | 450 LIN. FT.   |
| PIPE PILE PLATES                    |     |      |      |         | EA. 6          |
| PILE REDRIVES                       |     |      |      |         | EA. 3          |

ALL BAR DIMENSIONS ARE OUT TO OUT.

▲ CONCRETE DISPLACED BY THE FILLED 24" STEEL PIPE PILES HAS BEEN DEDUCTED FROM THE QUANTITY OF CLASS "A" CONCRETE FOR THE BENT CAP.

DRAWN BY : I.L. AVERETTE DATE : 1-12-12  
 CHECKED BY : M.L. RORIE DATE : 1-17-12

24-AUG-2012 10:09  
 R:\TIP\Projects-U\U4444B\Structures\Plans\Final Plans\U4444b\_sd\_b\*.01.dgn  
 tcoggins



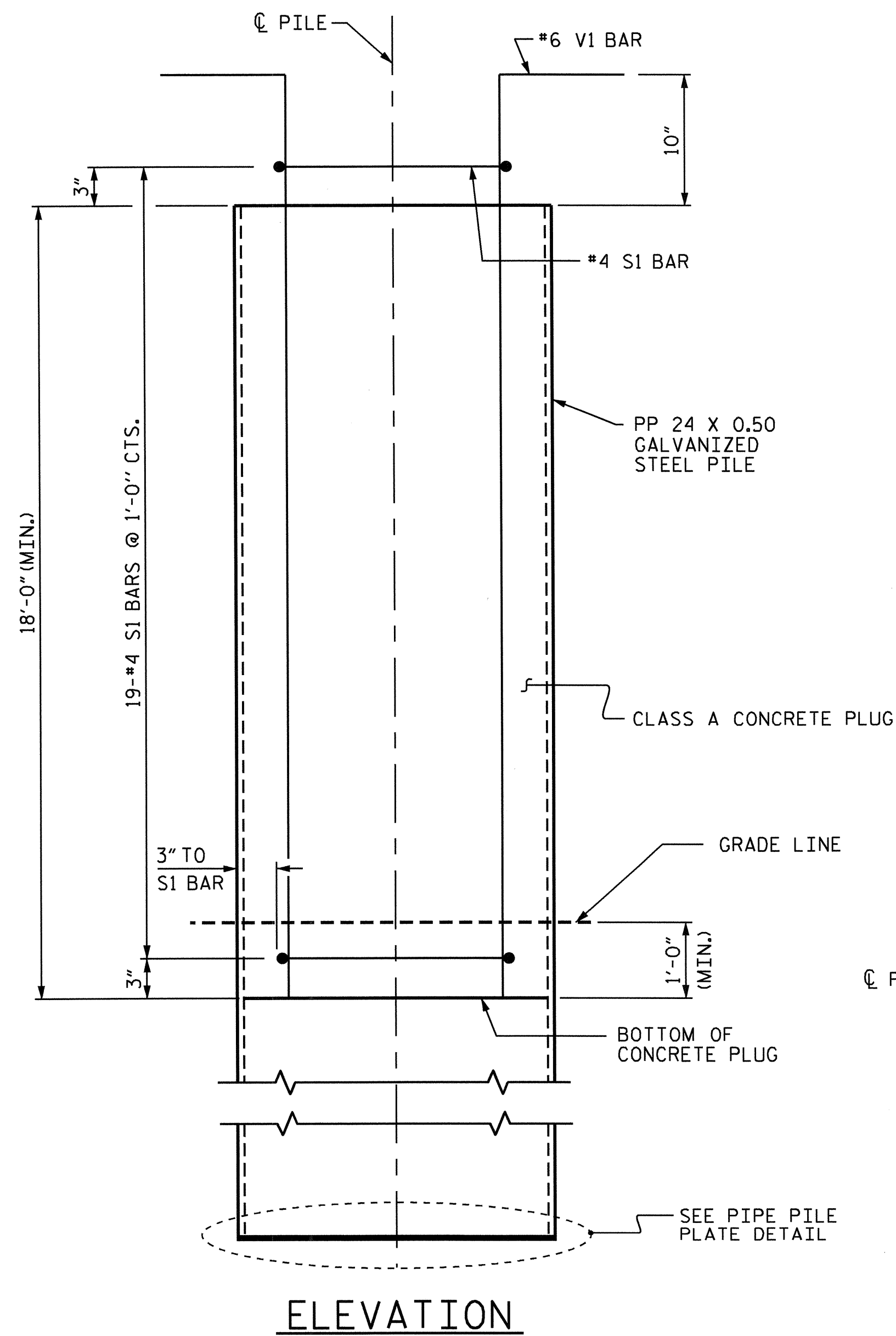
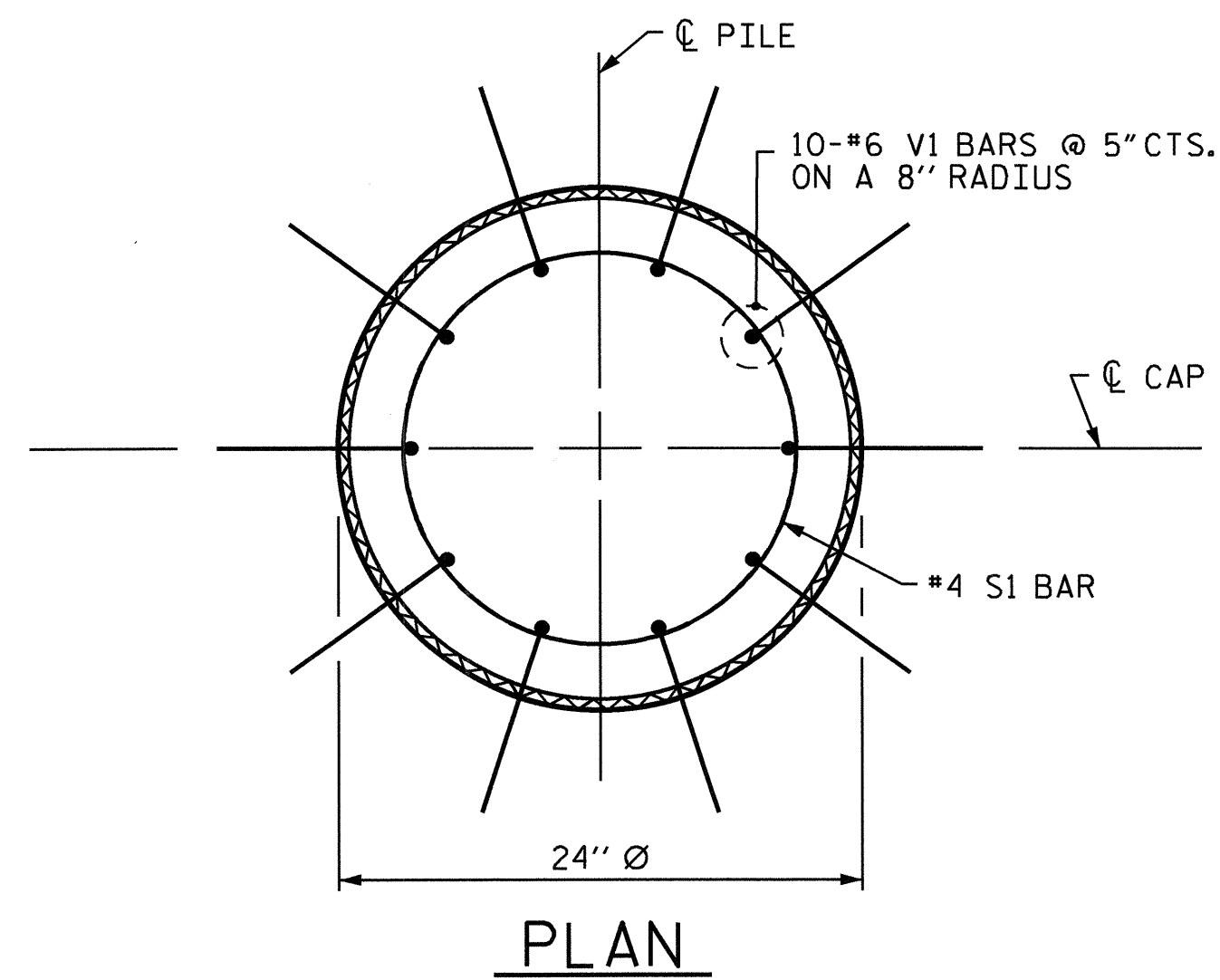
PROJECT NO. U-4444B  
 CUMBERLAND COUNTY  
 STATION: 172+95.63 -L-

SHEET 2 OF 2

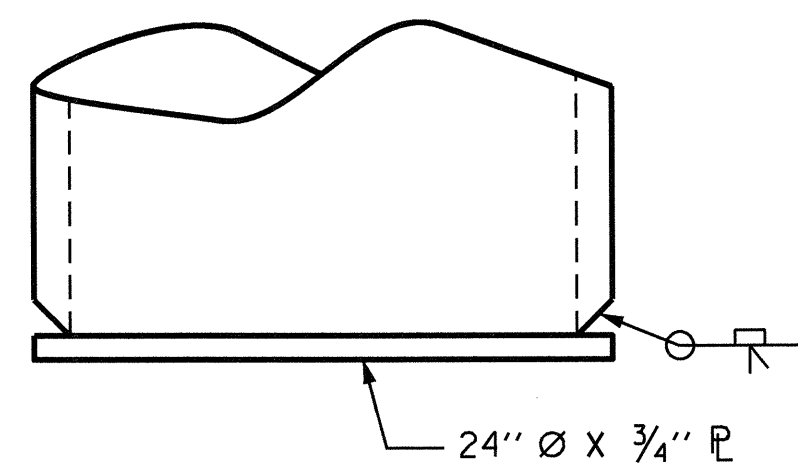
| STATE OF NORTH CAROLINA<br>DEPARTMENT OF TRANSPORTATION<br>RALEIGH |     |       |     |     |                 |
|--|-----|-------|-----|-----|-----------------|
| SUBSTRUCTURE<br>BENT #1  |     |       |     |     |                 |
| REVISIONS  |     |       |     |     | SHEET NO.       |
| NO.  | BY: | DATE: | NO. | BY: | DATE:           |
| 1  |     |       | 3   |     |                 |
| 2  |     |       | 4   |     |                 |
|  |     |       |     |     | S-24            |
|  |     |       |     |     | TOTAL SHEETS 30 |

STR. #1

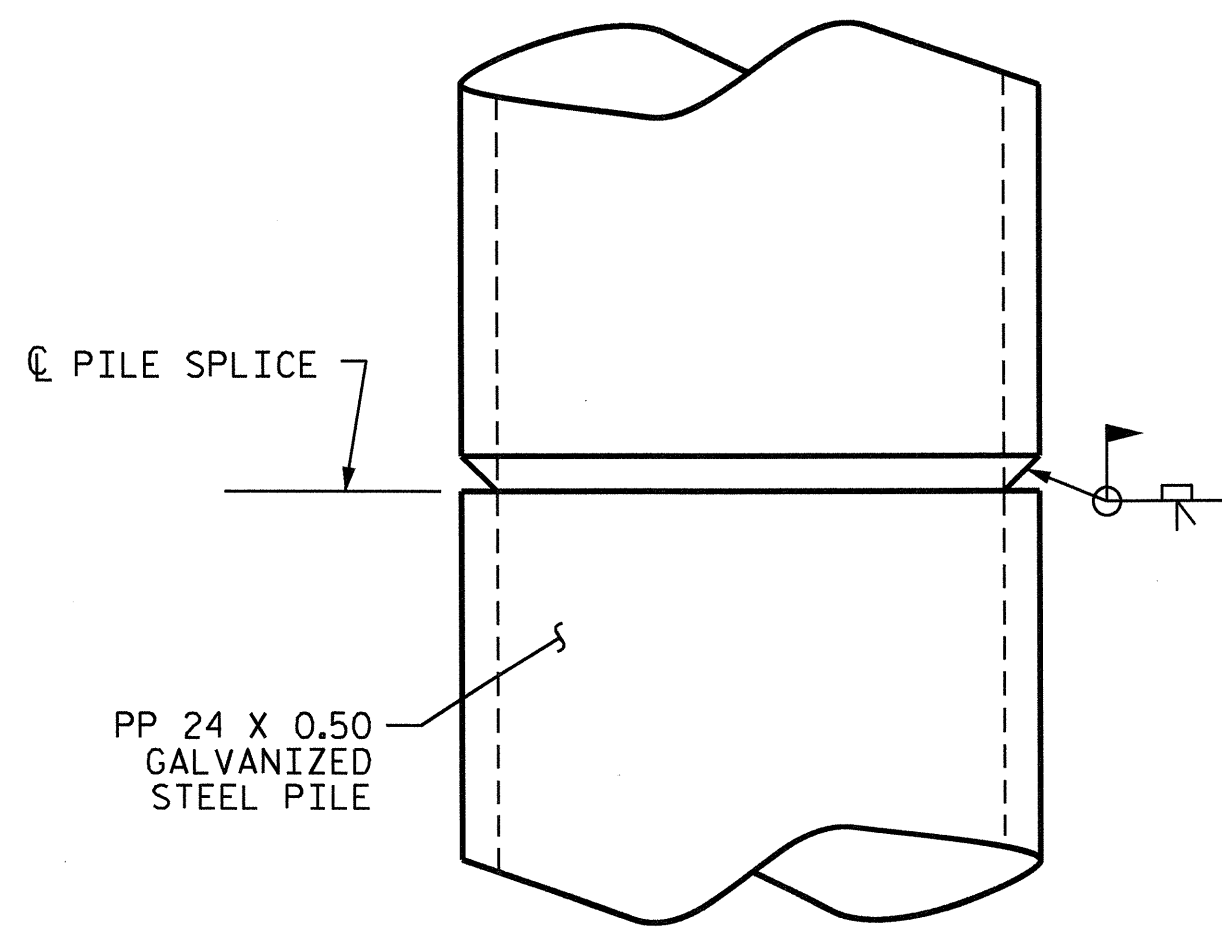




**PP 24 X 0.50 GALVANIZED STEEL PILE**  
 EXTEND PLUG TO 1'-0" MINIMUM BELOW GRADE, AS NECESSARY  
 (CLOSED END)



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.

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

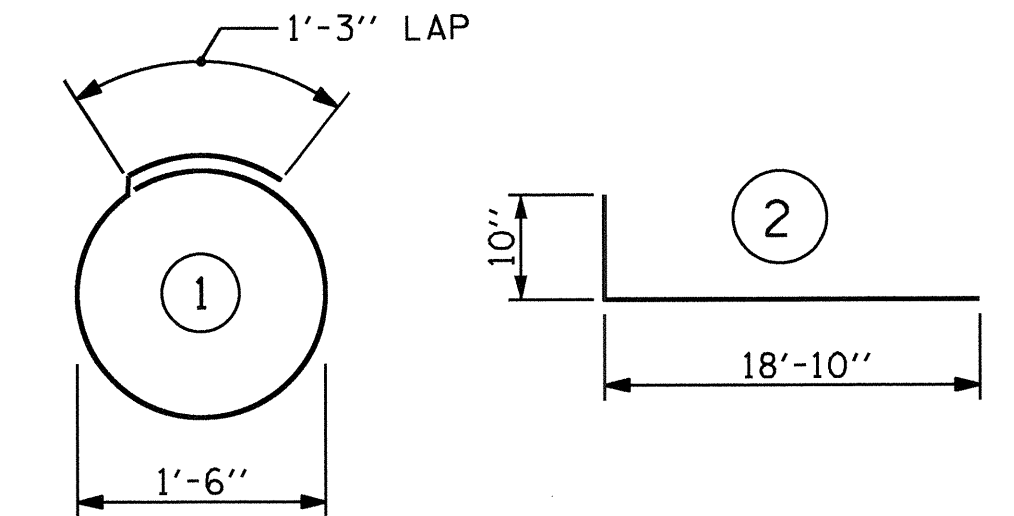
THE REINFORCING STEEL, CLASS A CONCRETE, AND GALVANIZING ARE CONSIDERED INCIDENTAL TO THE CONTRACT UNIT PRICE BID PER LINEAR FOOT FOR PP 24 X 0.50 GALVANIZED STEEL PILES.

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

| BAR                 | NO. | SIZE | TYPE | LENGTH | WEIGHT  |
|---------------------|-----|------|------|--------|---------|
| S1                  | 19  | #4   | 1    | 6'-0"  | 76      |
| V1                  | 10  | #6   | 2    | 19'-8" | 295     |
| REINFORCING STEEL = |     |      |      |        | 371 lbs |

|                     |        |
|---------------------|--------|
| CLASS A CONCRETE    |        |
| 18'-0" MINIMUM PLUG | 1.9 CY |

**BAR TYPES**

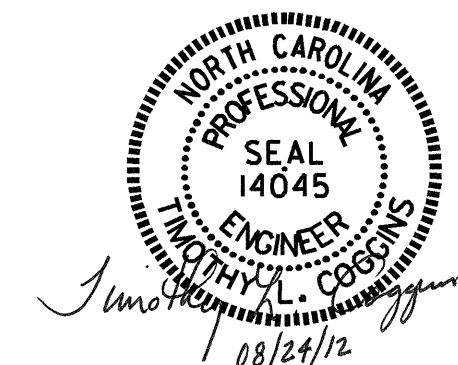


ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT NO. U-4444B  
CUMBERLAND COUNTY  
 STATION: 172+95.63 -L-

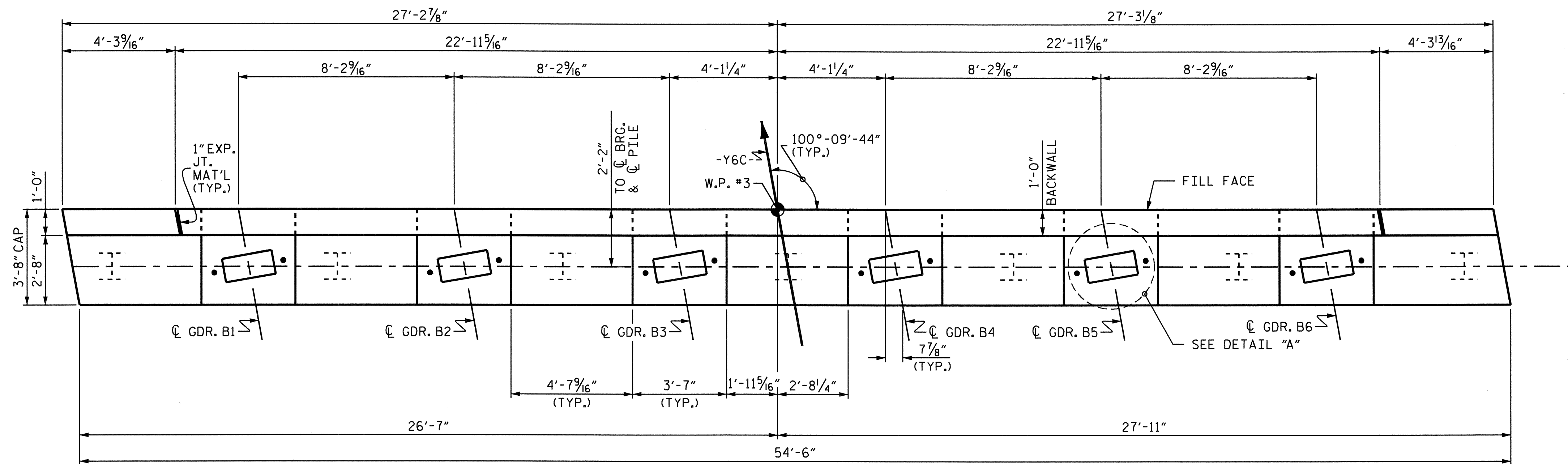
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**24" STEEL PIPE PILE**



|                              |                      |
|------------------------------|----------------------|
| ASSEMBLED BY : T.L. AVERETTE | DATE : 1-12-11       |
| CHECKED BY : M.L. RORIE      | DATE : 1-17-12       |
| DRAWN BY : TLA 8/05          | ADDED 10/1/05        |
| CHECKED BY : GM 9/05         | REV. 5/1/06R MAA/KMM |
|                              | REV. 10/1/11 MAA/GM  |

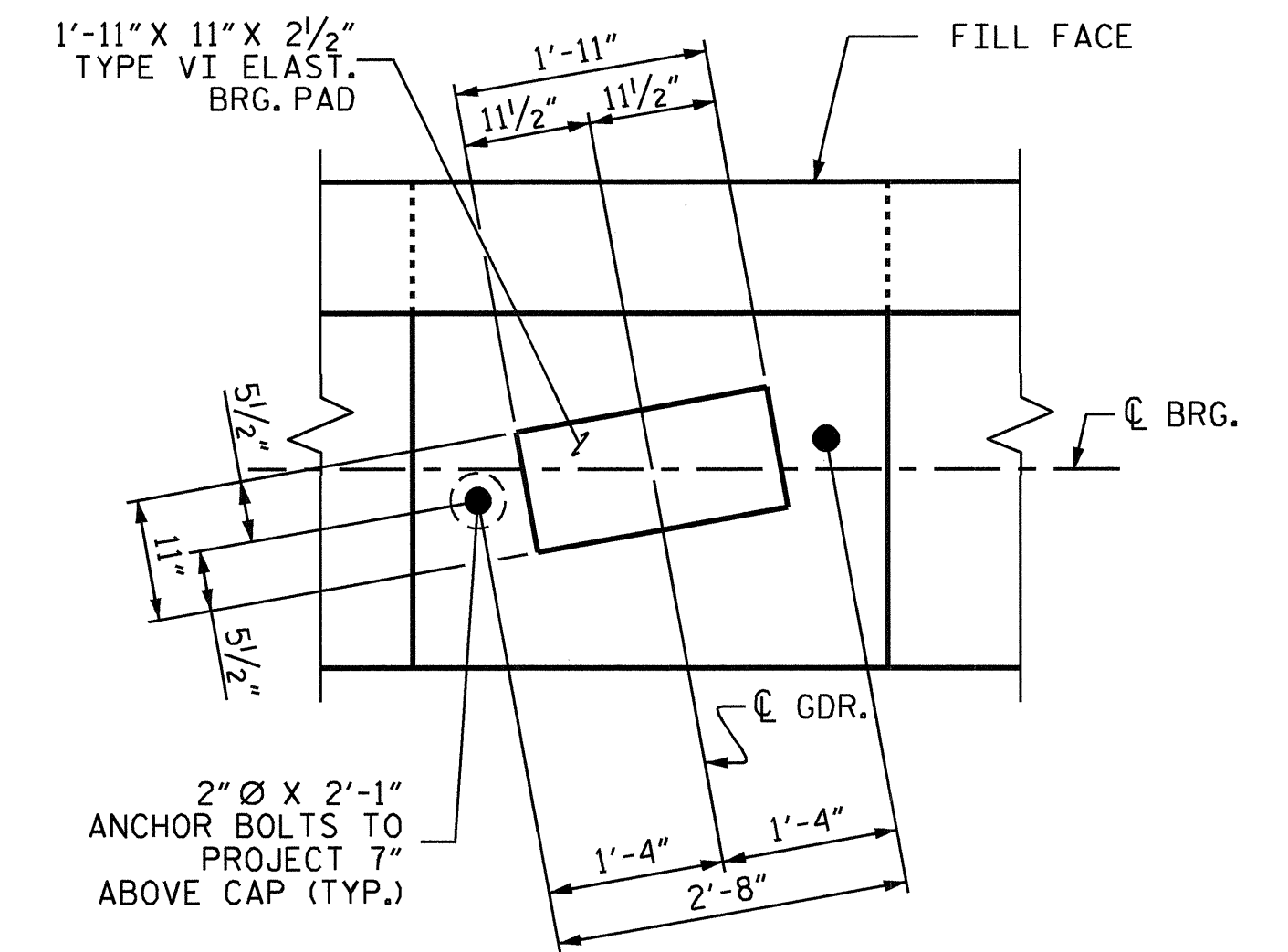
| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-25         |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |
| 2         |     |       | 4   |     |       | 30           |



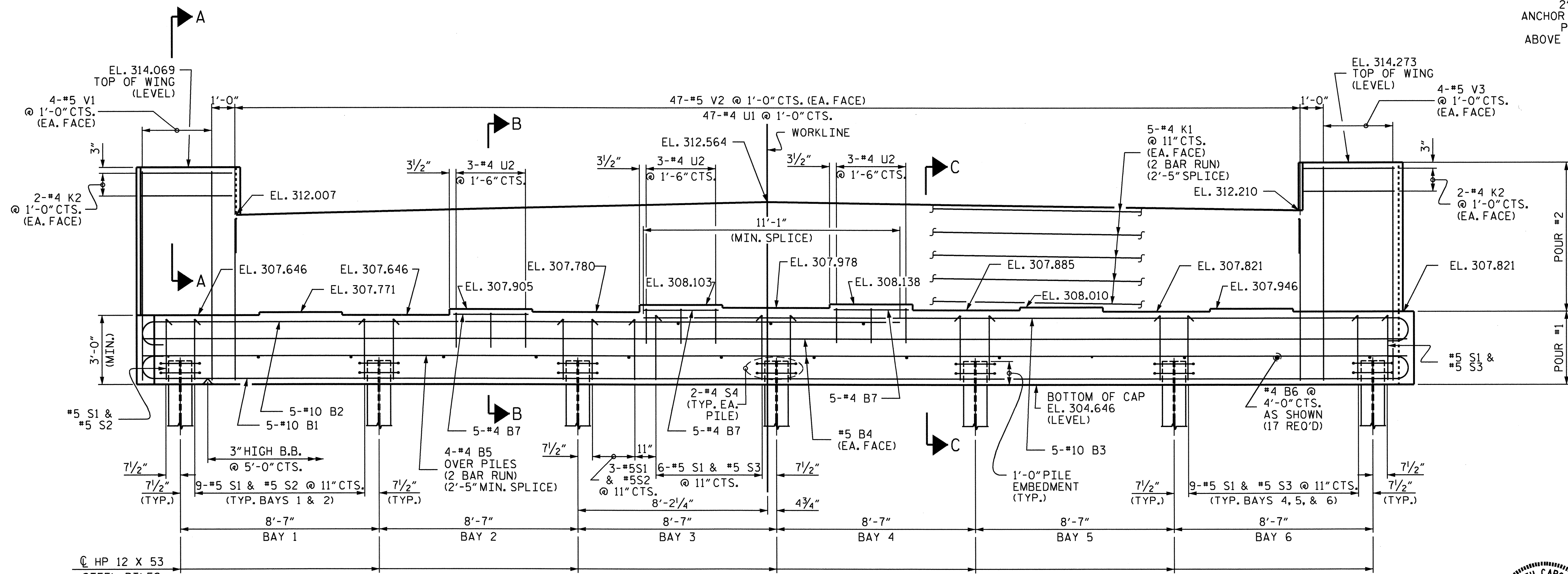
PLAN

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.  
 BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.  
 THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.  
 THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.



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



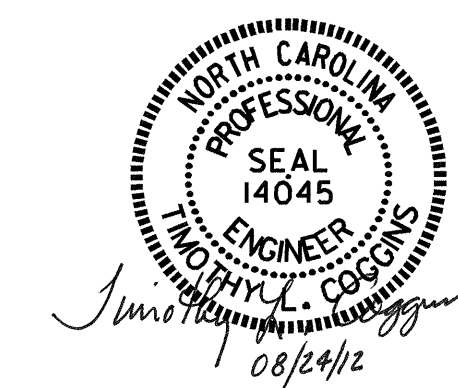
ELEVATION

PROJECT NO. U-4444B  
 CUMBERLAND COUNTY  
 STATION: 172+95.63 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

END BENT #2

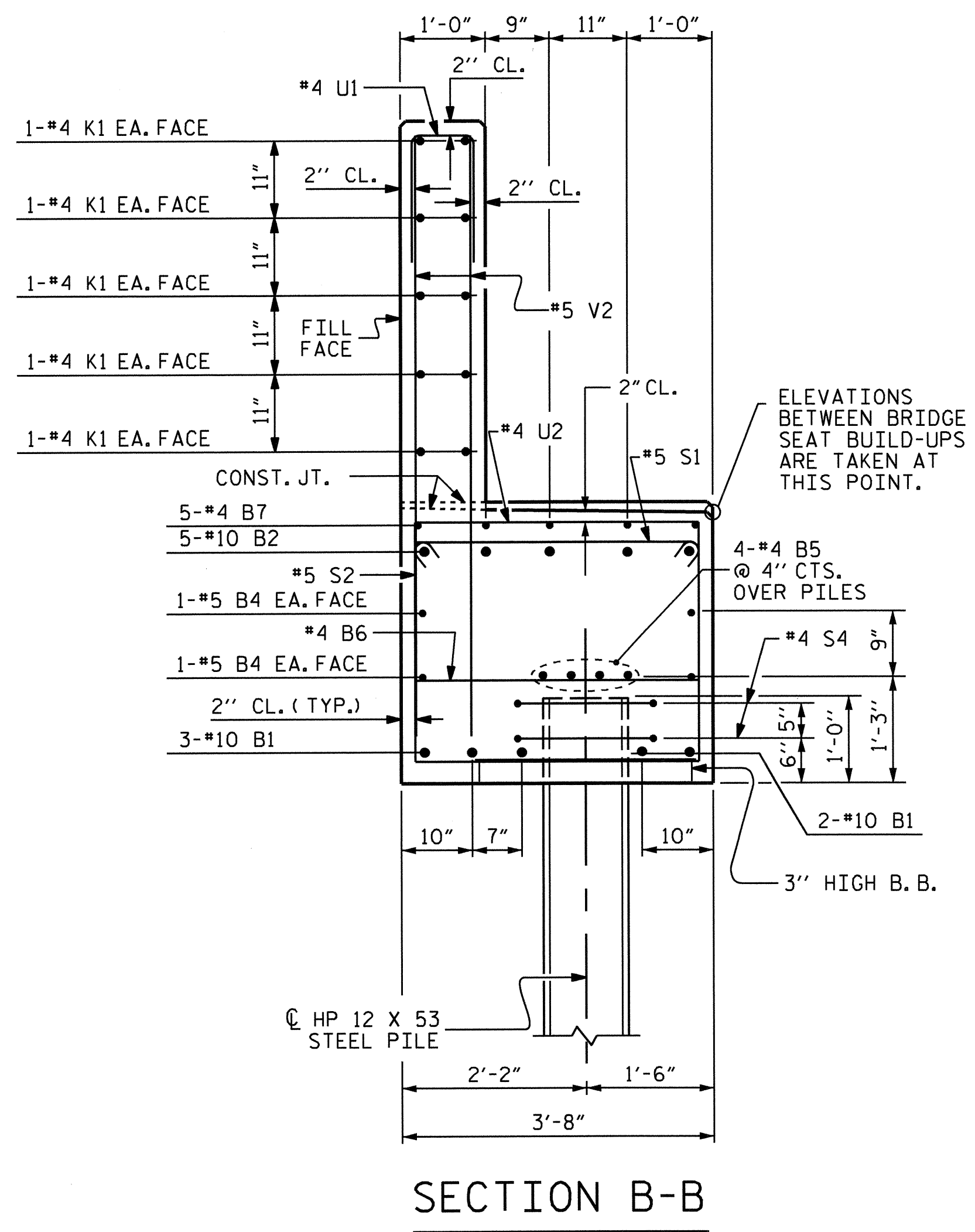


DRAWN BY: A. M. LEE DATE: 12/2011  
 CHECKED BY: B. L. GREEN DATE: 1/2012

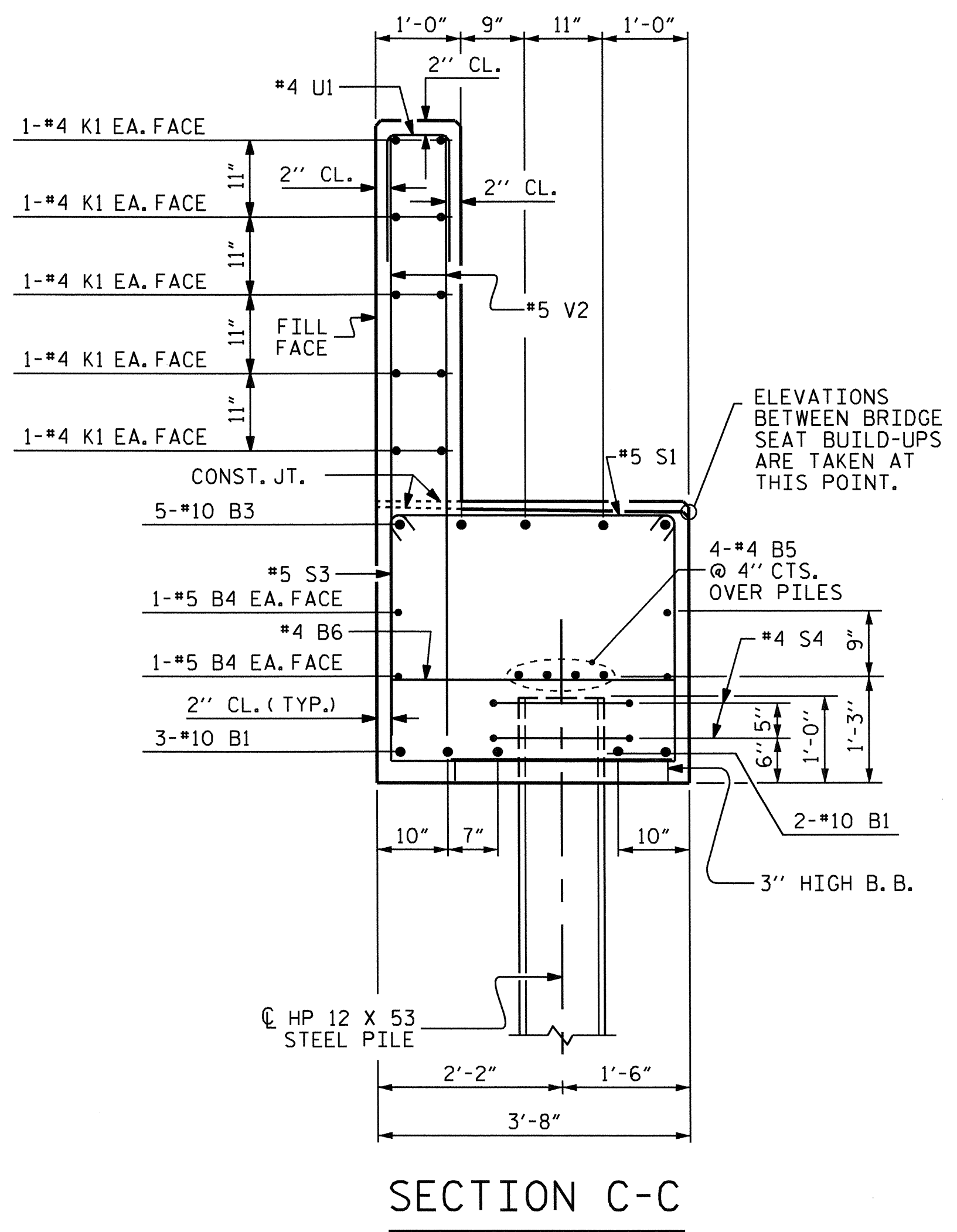
24-AUG-2012 10:00  
 R:\TIP\Projects-U\U4444B\structures\Plans\Final Plans\U4444b.ed.e2.01.dgn  
 tcoggins

| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-26         |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |
| 2         |     |       | 4   |     |       | 30           |

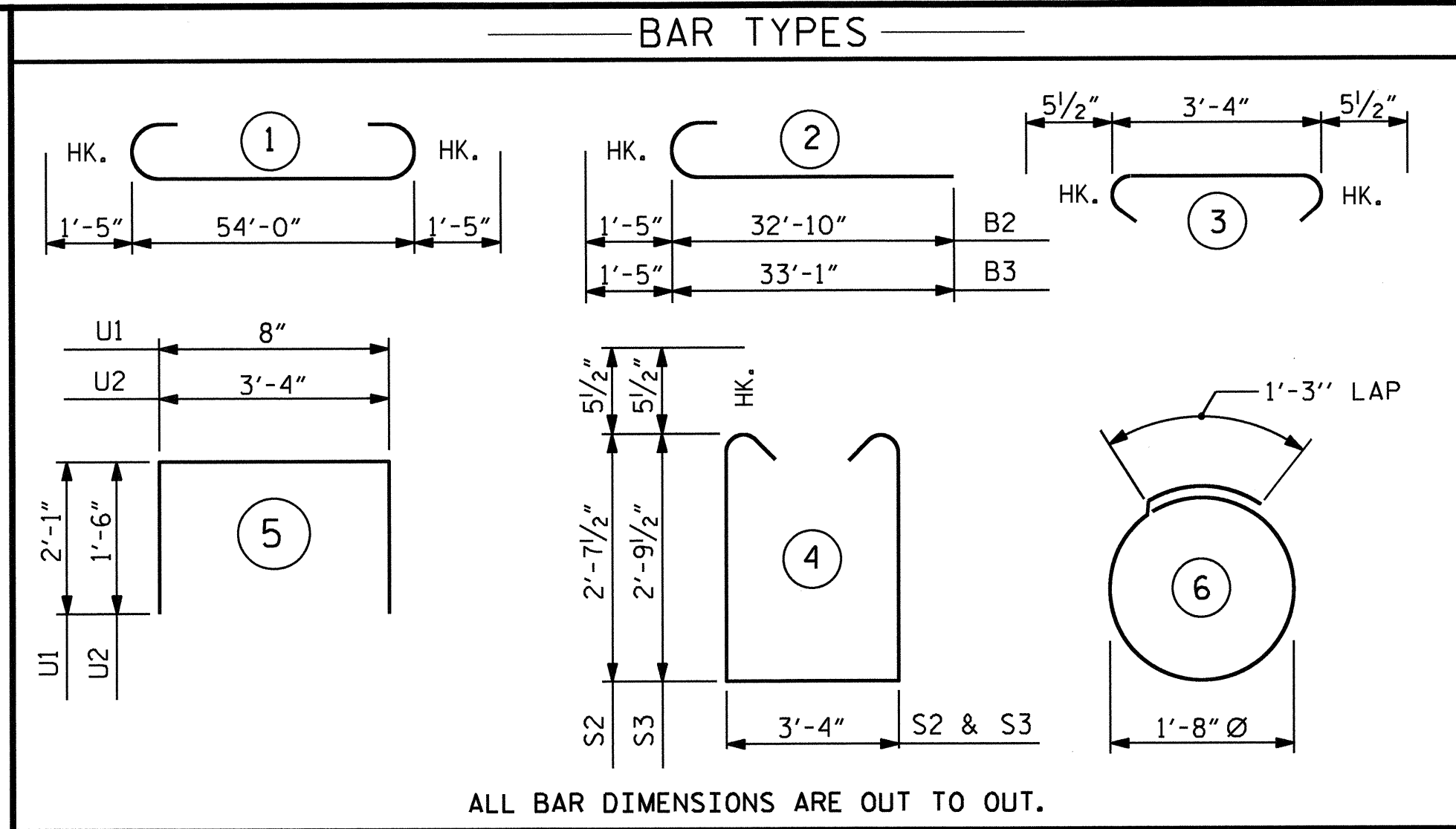
STR #1



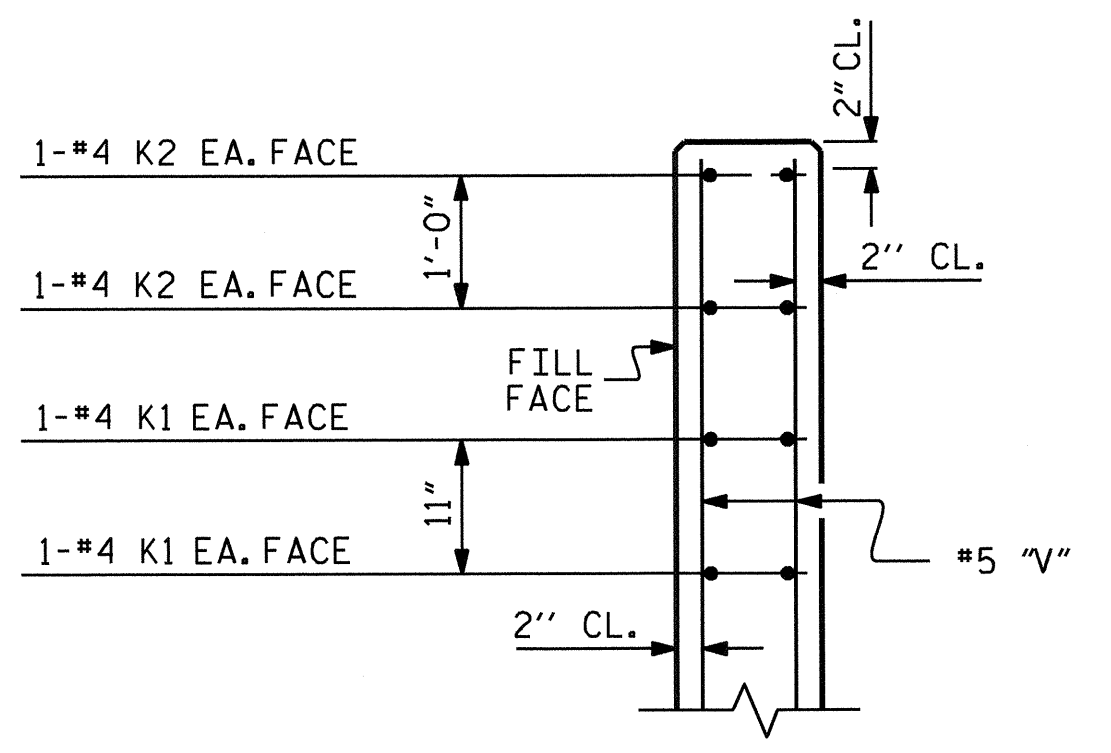
SECTION B-B



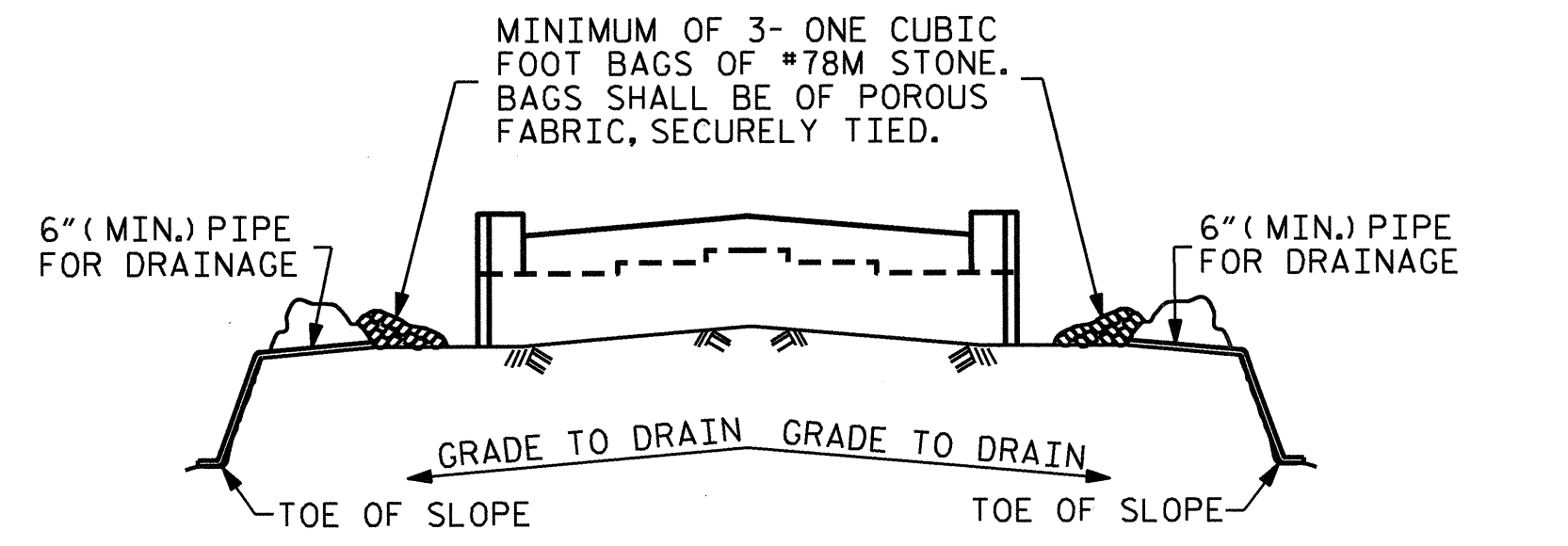
SECTION C-C



SECTION A-A



| BILL OF MATERIAL             |     |      |      |               |        |
|------------------------------|-----|------|------|---------------|--------|
| END BENT #2                  |     |      |      |               |        |
| BAR                          | NO. | SIZE | TYPE | LENGTH        | WEIGHT |
| B1                           | 5   | #10  | 1    | 56'-10"       | 1223   |
| B2                           | 5   | #10  | 2    | 34'-3"        | 737    |
| B3                           | 5   | #10  | 2    | 34'-6"        | 742    |
| B4                           | 4   | #5   | STR  | 54'-0"        | 225    |
| B5                           | 8   | #4   | STR  | 28'-4"        | 151    |
| B6                           | 17  | #4   | STR  | 3'-4"         | 38     |
| B7                           | 15  | #4   | STR  | 3'-3"         | 33     |
| K1                           | 20  | #4   | STR  | 28'-4"        | 379    |
| K2                           | 8   | #4   | STR  | 3'-11"        | 21     |
| S1                           | 56  | #5   | 3    | 4'-3"         | 248    |
| S2                           | 22  | #5   | 4    | 9'-6"         | 218    |
| S3                           | 34  | #5   | 4    | 9'-10"        | 349    |
| S4                           | 14  | #4   | 6    | 6'-6"         | 61     |
| U1                           | 47  | #4   | 5    | 4'-10"        | 152    |
| U2                           | 9   | #4   | 5    | 6'-4"         | 38     |
| V1                           | 8   | #5   | STR  | 9'-1"         | 76     |
| V2                           | 94  | #5   | STR  | 7'-0"         | 686    |
| V3                           | 8   | #5   | STR  | 9'-3"         | 77     |
| TOTAL REINFORCING STEEL      |     |      |      | 5454 LBS.     |        |
| CLASS A CONCRETE BREAKDOWN   |     |      |      |               |        |
| POUR #1 (CAP)                |     |      |      | 24.1 CU. YDS. |        |
| POUR #2 (BACKWALL & WINGS)   |     |      |      | 9.6 CU. YDS.  |        |
| TOTAL CLASS A CONCRETE       |     |      |      | 33.7 CU. YDS. |        |
| HP 12 X 53 STEEL PILES NO. 7 |     |      |      | 595 LIN. FT.  |        |
| PILE REDRIVES                |     |      |      | 4 EACH        |        |



MINIMUM OF 3- ONE CUBIC FOOT BAGS OF #78M STONE. BAGS SHALL BE OF POROUS FABRIC, SECURELY TIED.

6" (MIN.) PIPE FOR DRAINAGE

6" (MIN.) PIPE FOR DRAINAGE

GRADE TO DRAIN GRADE TO DRAIN

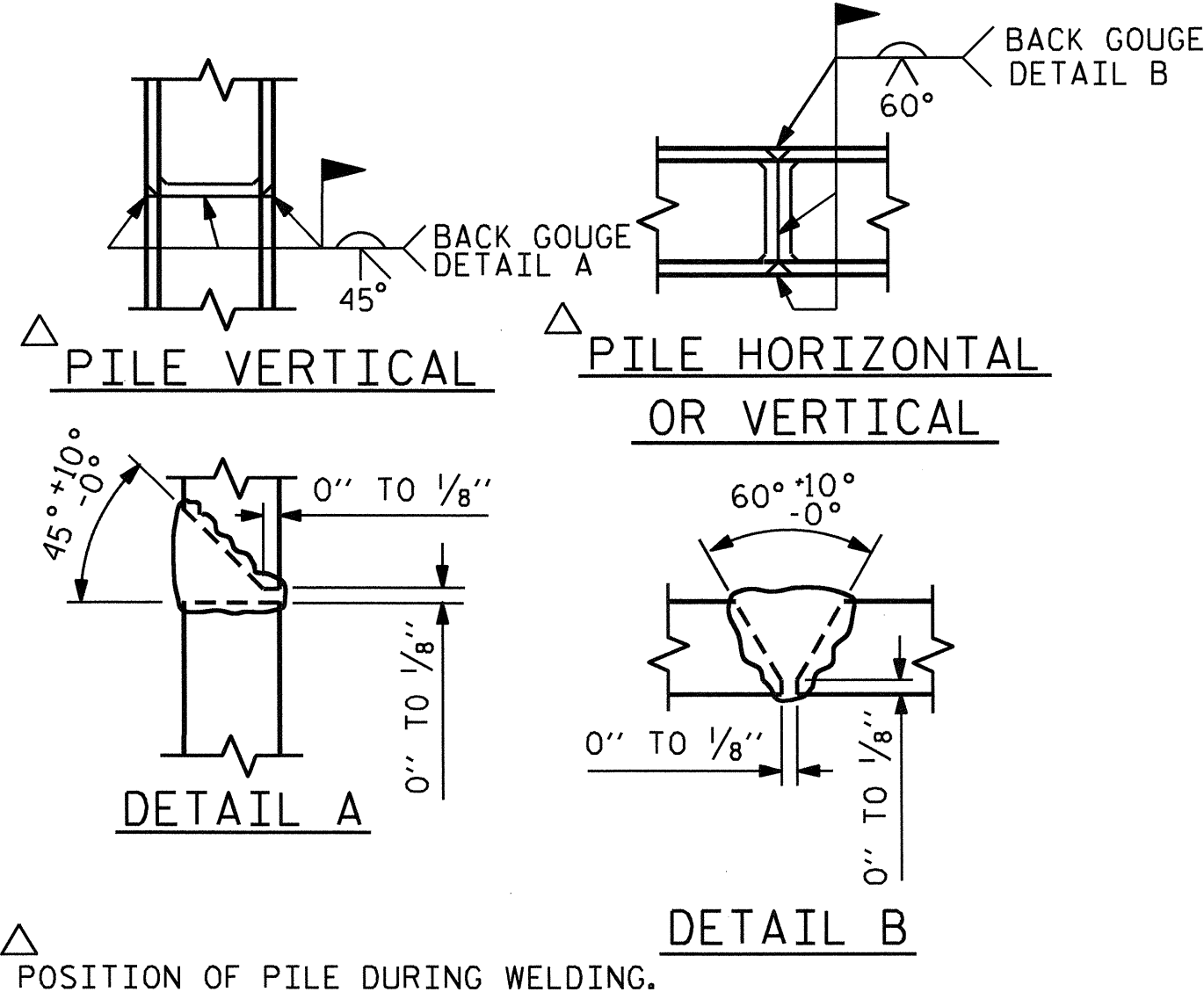
TOE OF SLOPE TOE OF SLOPE

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.

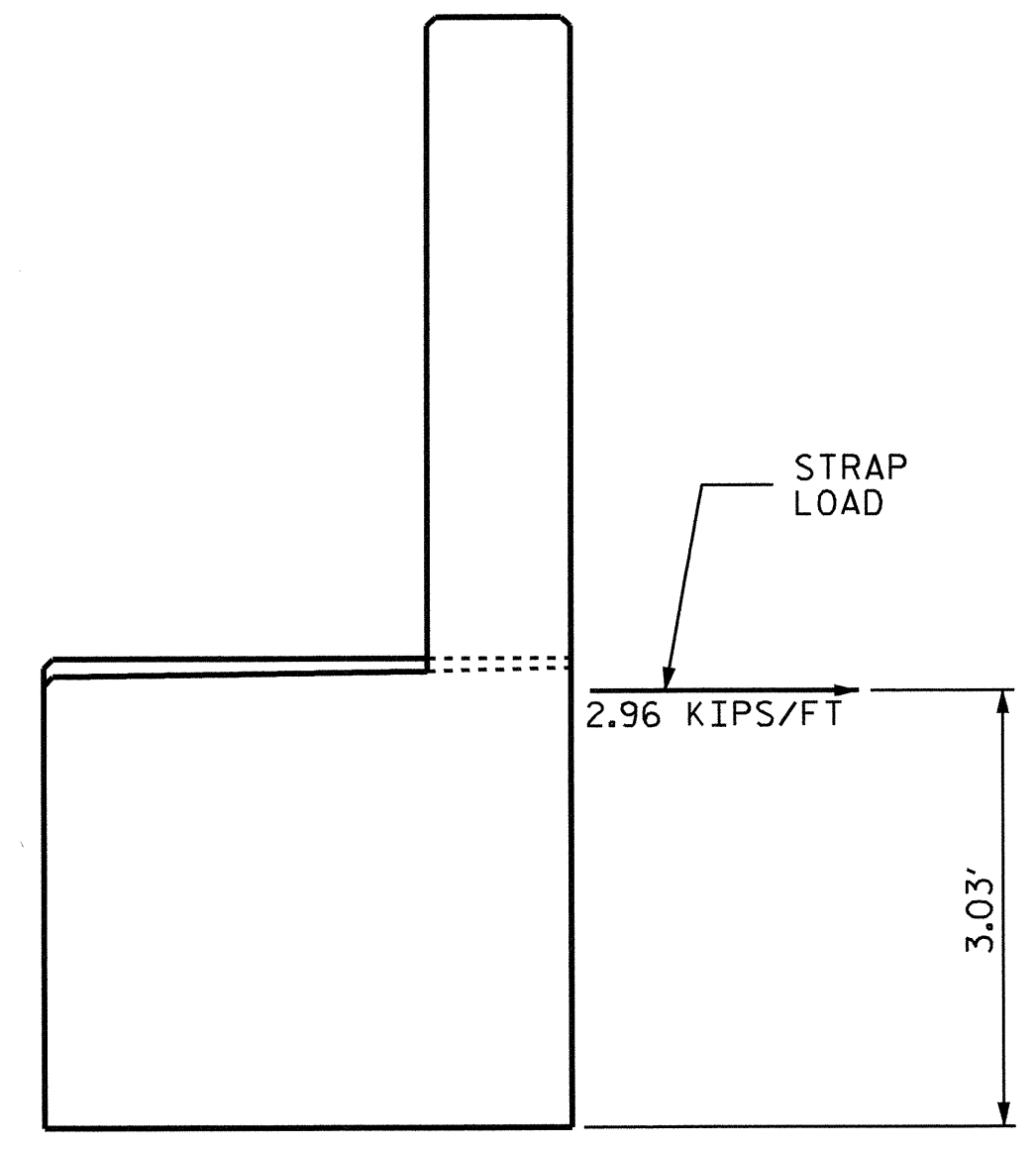
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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



STRAP LOAD DETAIL

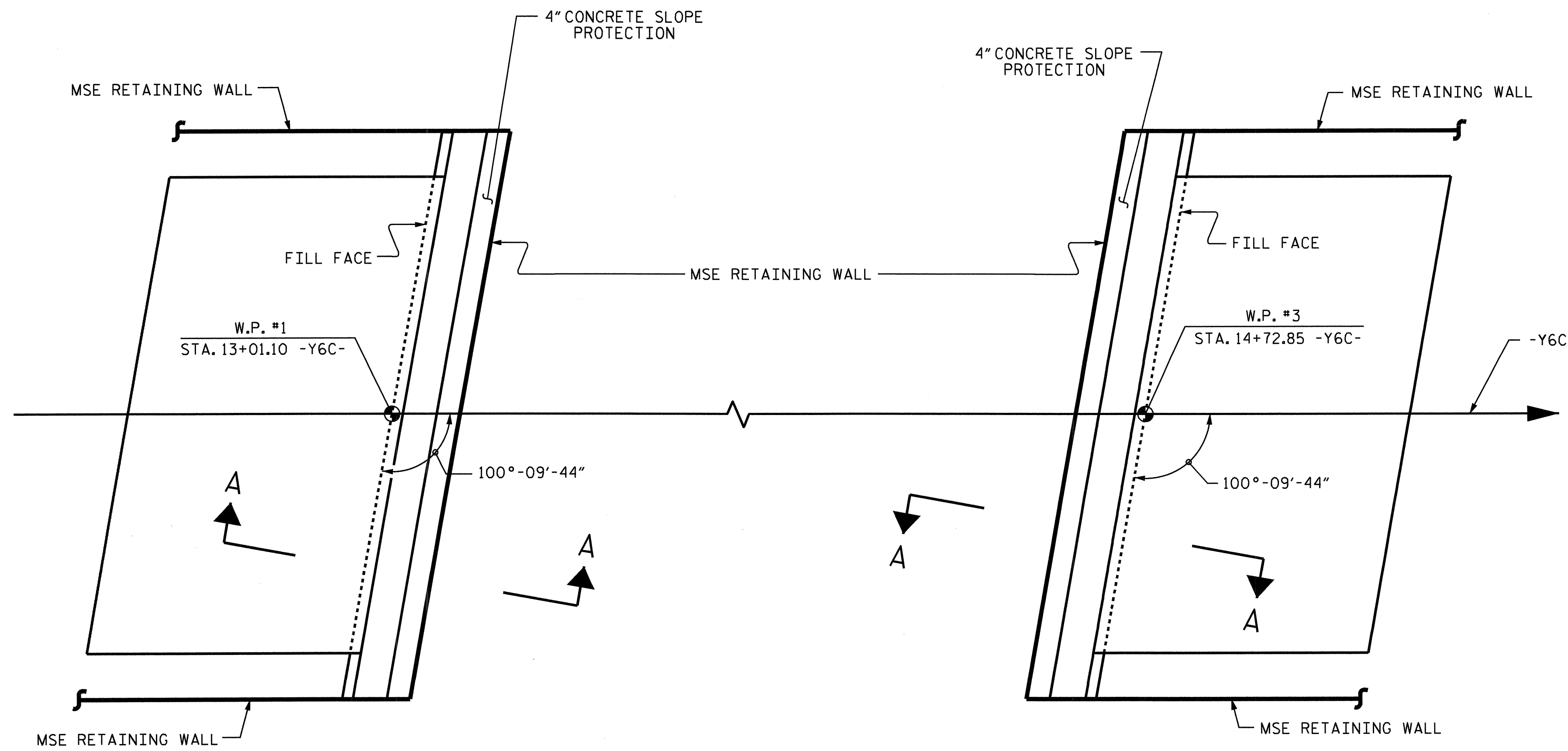
SEE MSE WALL SHEET 9 OF 12.



PROJECT NO. U-4444B  
 CUMBERLAND COUNTY  
 STATION: 172+95.63 -L-

| STATE OF NORTH CAROLINA      |     |       |     |     |                 |
|------------------------------|-----|-------|-----|-----|-----------------|
| DEPARTMENT OF TRANSPORTATION |     |       |     |     |                 |
| RALEIGH                      |     |       |     |     |                 |
| SUBSTRUCTURE                 |     |       |     |     |                 |
| END BENT #2                  |     |       |     |     |                 |
| REVISIONS                    |     |       |     |     | SHEET NO.       |
| NO.                          | BY: | DATE: | NO. | BY: | DATE:           |
| 1                            |     |       | 3   |     |                 |
| 2                            |     |       | 4   |     |                 |
|                              |     |       |     |     | S-27            |
|                              |     |       |     |     | TOTAL SHEETS 30 |

DRAWN BY: A. M. LEE DATE: 12/2011  
 CHECKED BY: B. L. GREEN DATE: 1/2012



PLAN OF SLOPE PROTECTION

**GENERAL NOTES**

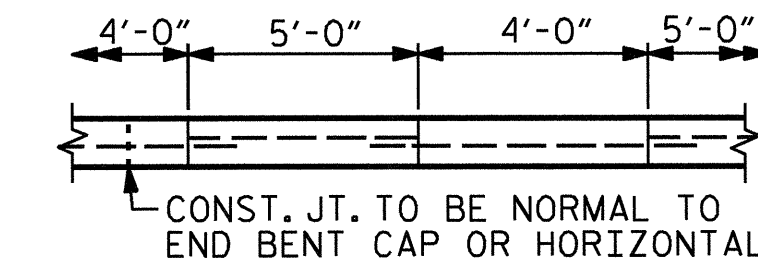
SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT.

THE SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6" X 6" - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL BE POURED IN 5' STRIPS AS SHOWN IN THE "POURING DETAIL" WITH 2'-0" LONG #4 BARS PLACED ALONG THE SLOPE BETWEEN STRIPS AT 1'-6" MAXIMUM SPACING. SLOPE PROTECTION MAY BE POURED IN ALTERNATE 4' AND 5' STRIPS AS SHOWN IN THE "OPTIONAL POURING DETAIL" WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6".

PAYMENT FOR THE SLOPE PROTECTION, THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR MSE RETAINING WALLS.

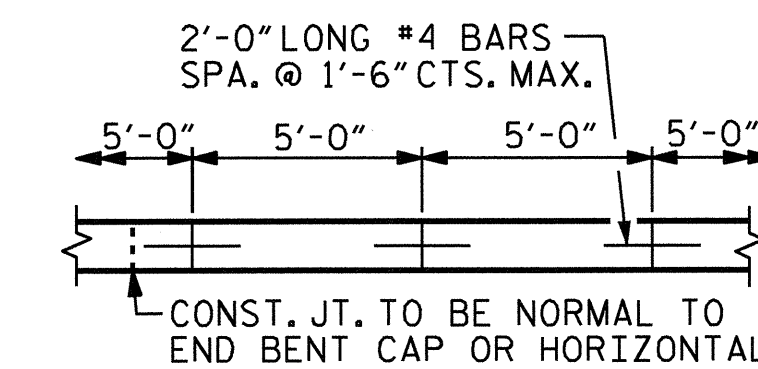
| BRIDGE @<br>STA. 172+95.63 -L- | 4" INCH<br>SLOPE PROTECTION | *<br>WELDED WIRE FABRIC<br>60 INCHES WIDE |
|--------------------------------|-----------------------------|---|
|                                | SQUARE YARDS                | APPROX. L.F.                              |
| END BENT 1                     | 15                          | 30  |
| END BENT 2                     | 15                          | 30  |

\* QUANTITY SHOWN IS BASED ON 5' POURS.

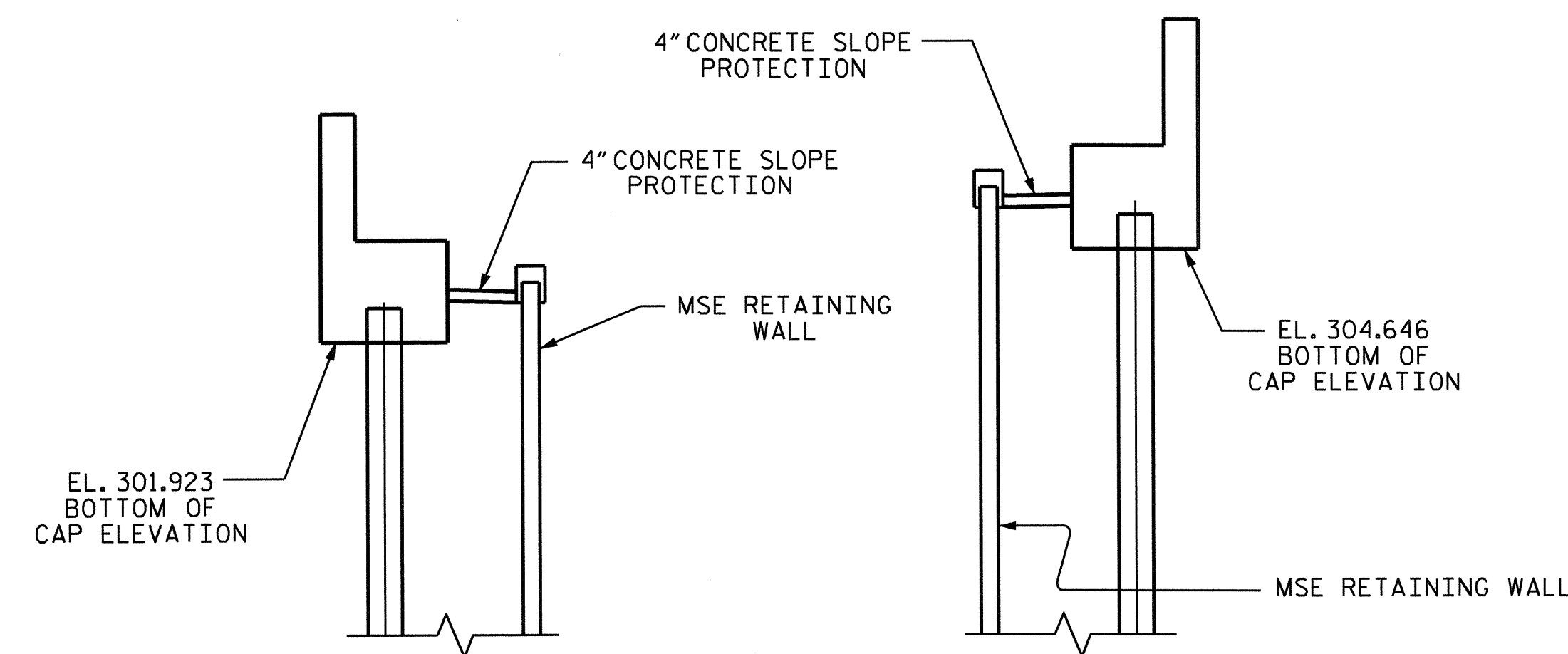


POUR A 4'-0" STRIP FIRST.

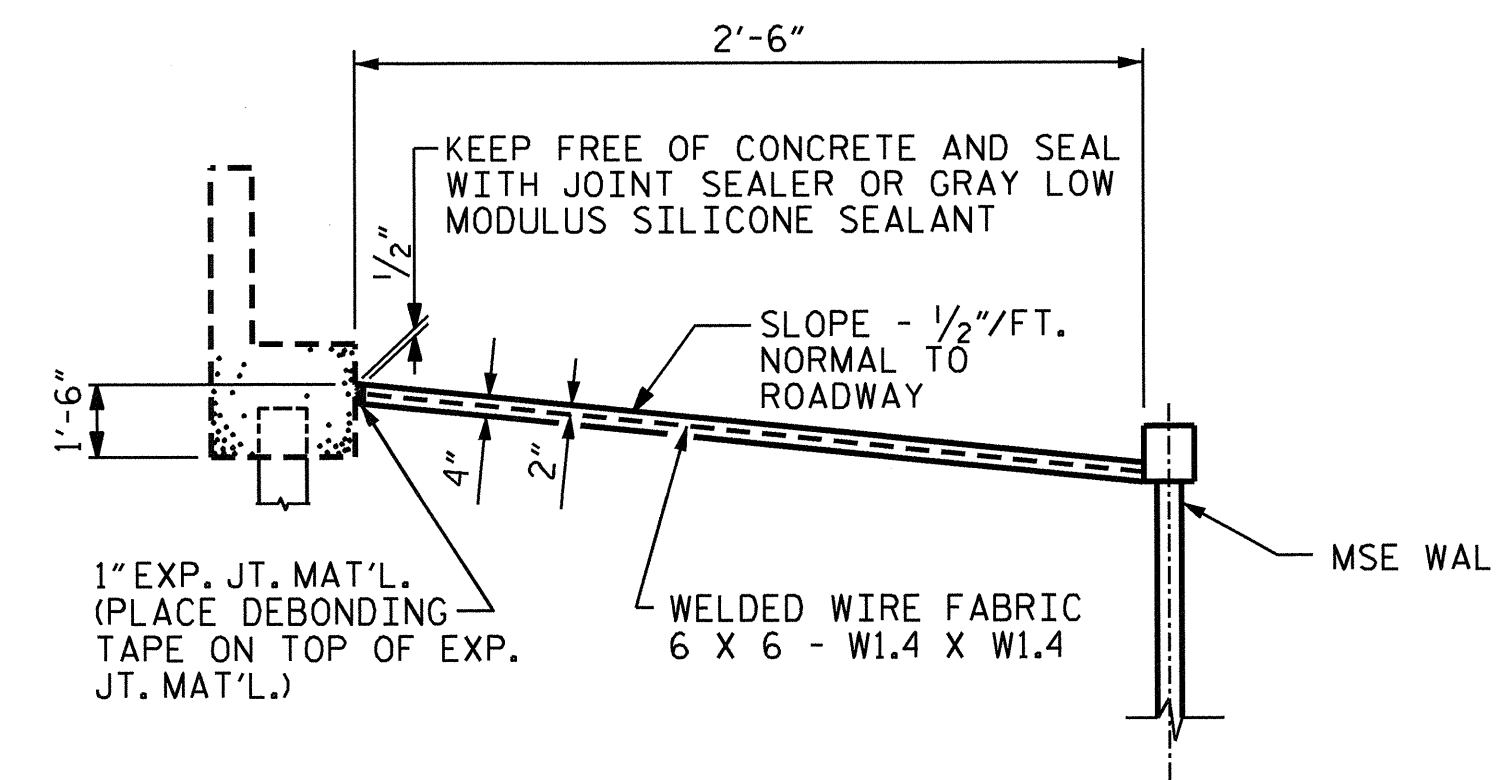
OPTIONAL POURING DETAIL



POURING DETAIL



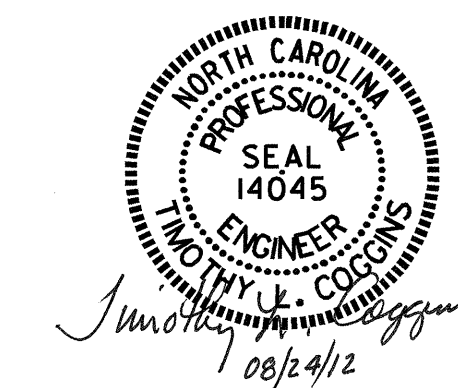
ELEVATION VIEW



SECTION A-A

PROJECT NO. U-4444B  
CUMBERLAND COUNTY  
 STATION: 172+95.63 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SLOPE PROTECTION  
 DETAILS @ MSE WALL



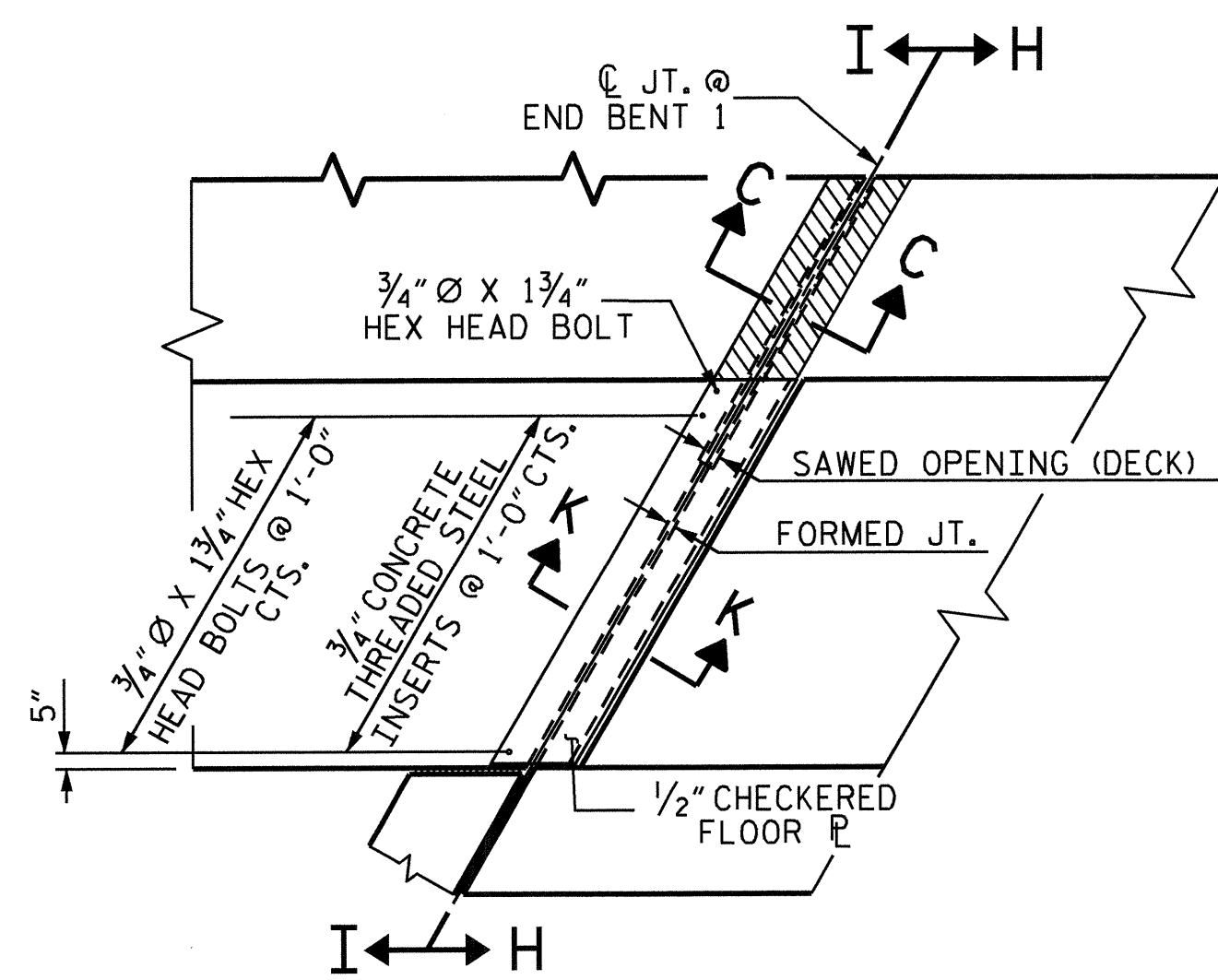
DRAWN BY : PEGGY PARISI DATE : 2-24-12  
 CHECKED BY : T. L. AVERETTE DATE : 7-2-12

24-AUG-2012 09:59  
 R:\TIP\Projects-U\U4444B\structures\Plans\Final Plans\U4444B.sd.sp\_01.dgn  
 tcoggins

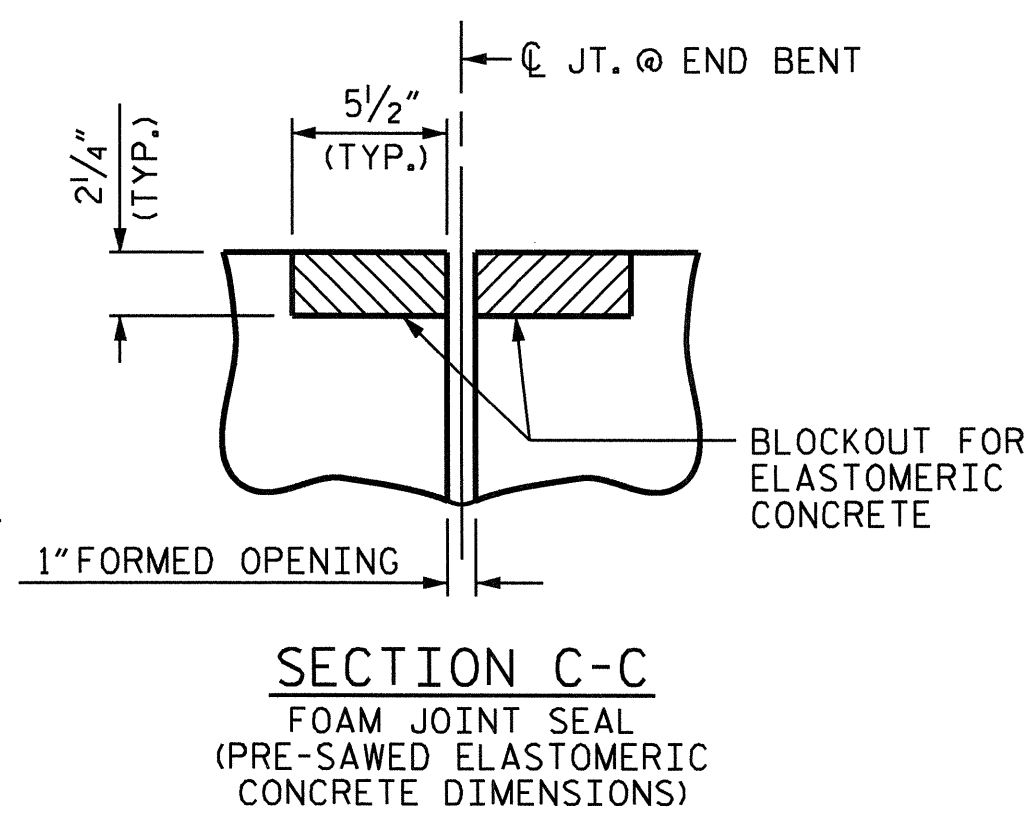
| REVISIONS |     |       |     |     |       | SHEET NO.<br>S-28<br>TOTAL SHEETS<br>30 |
|-----------|-----|-------|-----|-----|-------|---|
| NO.       | BY: | DATE: | NO. | BY: | DATE: |   |
| 1         |     |       | 3   |     |       |   |
| 2         |     |       | 4   |     |       |   |

STR. #1

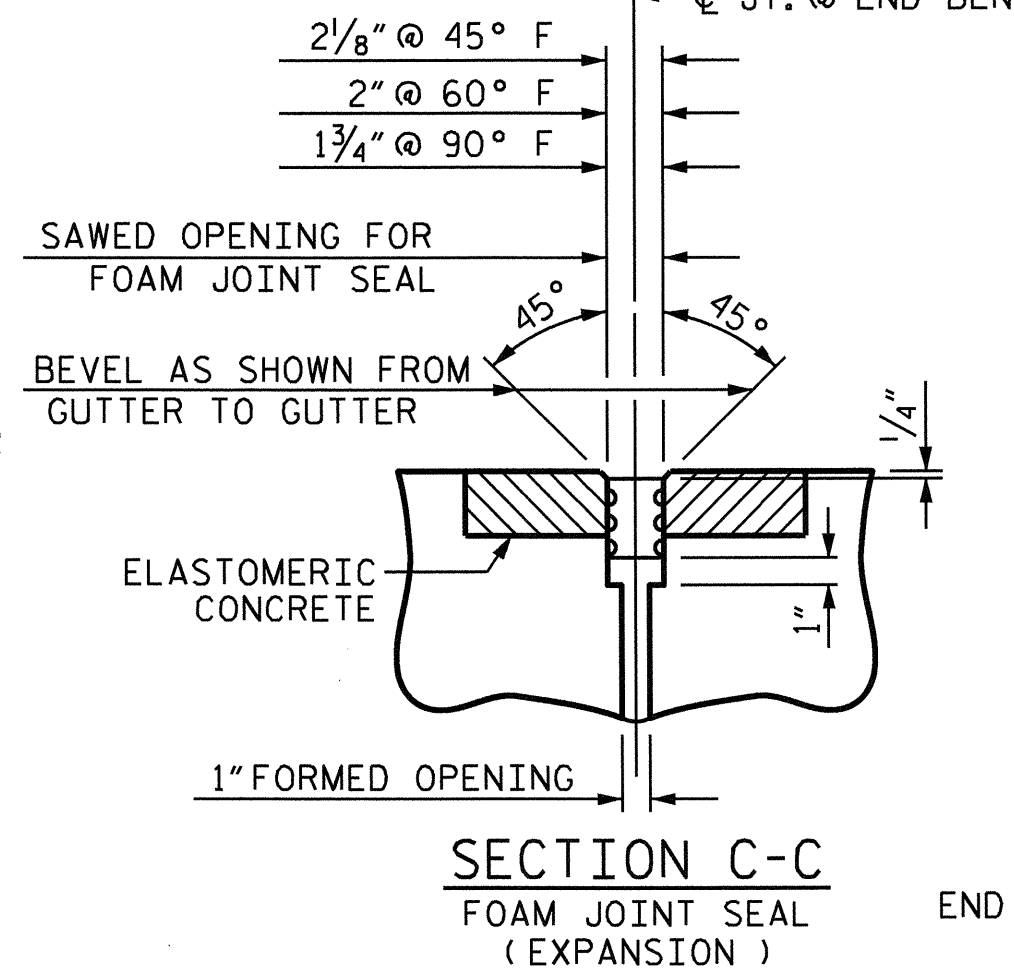




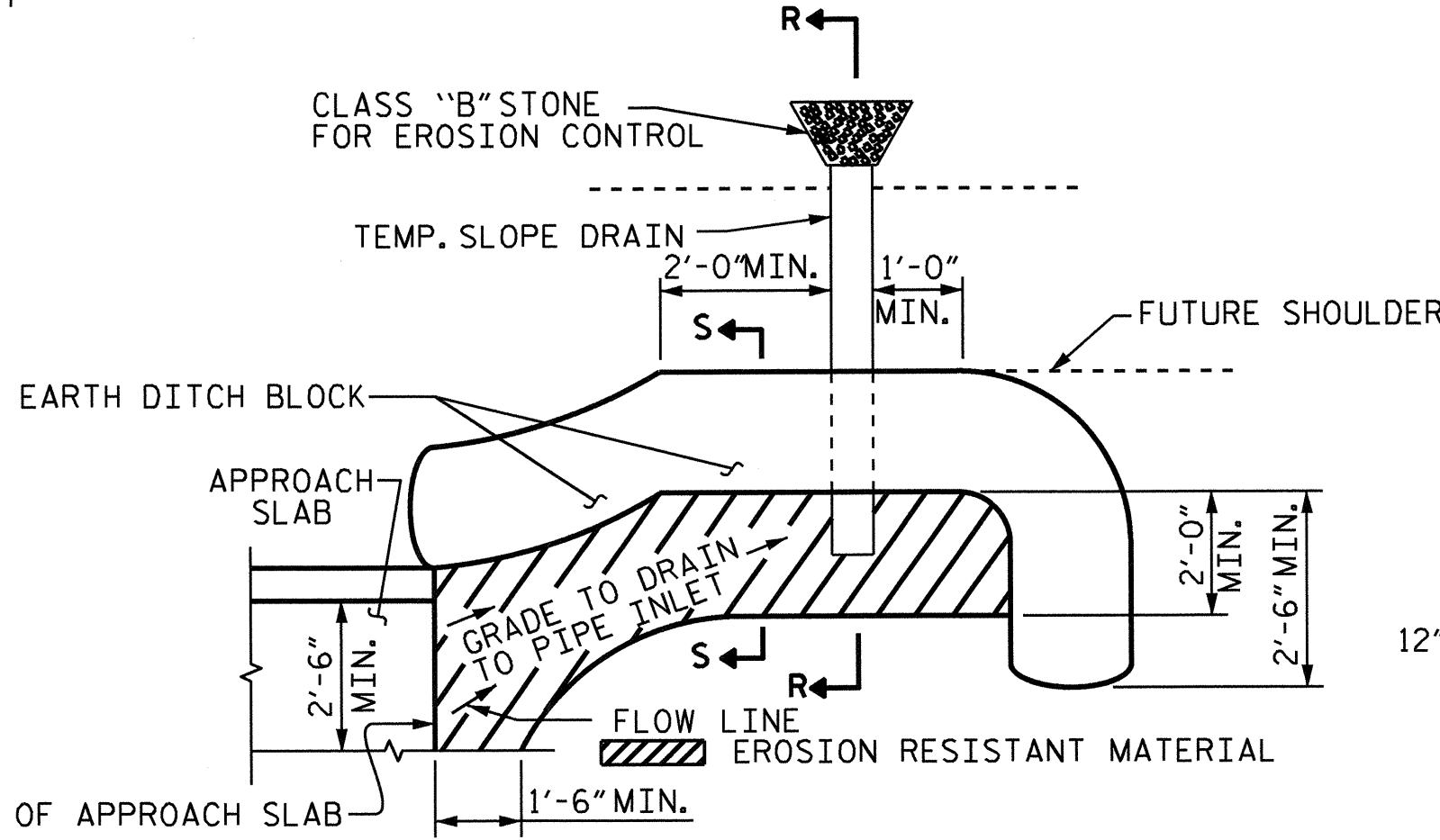
PLAN VIEW OF FOAM JOINT SEAL @ END BENT FOR SIDEWALK



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



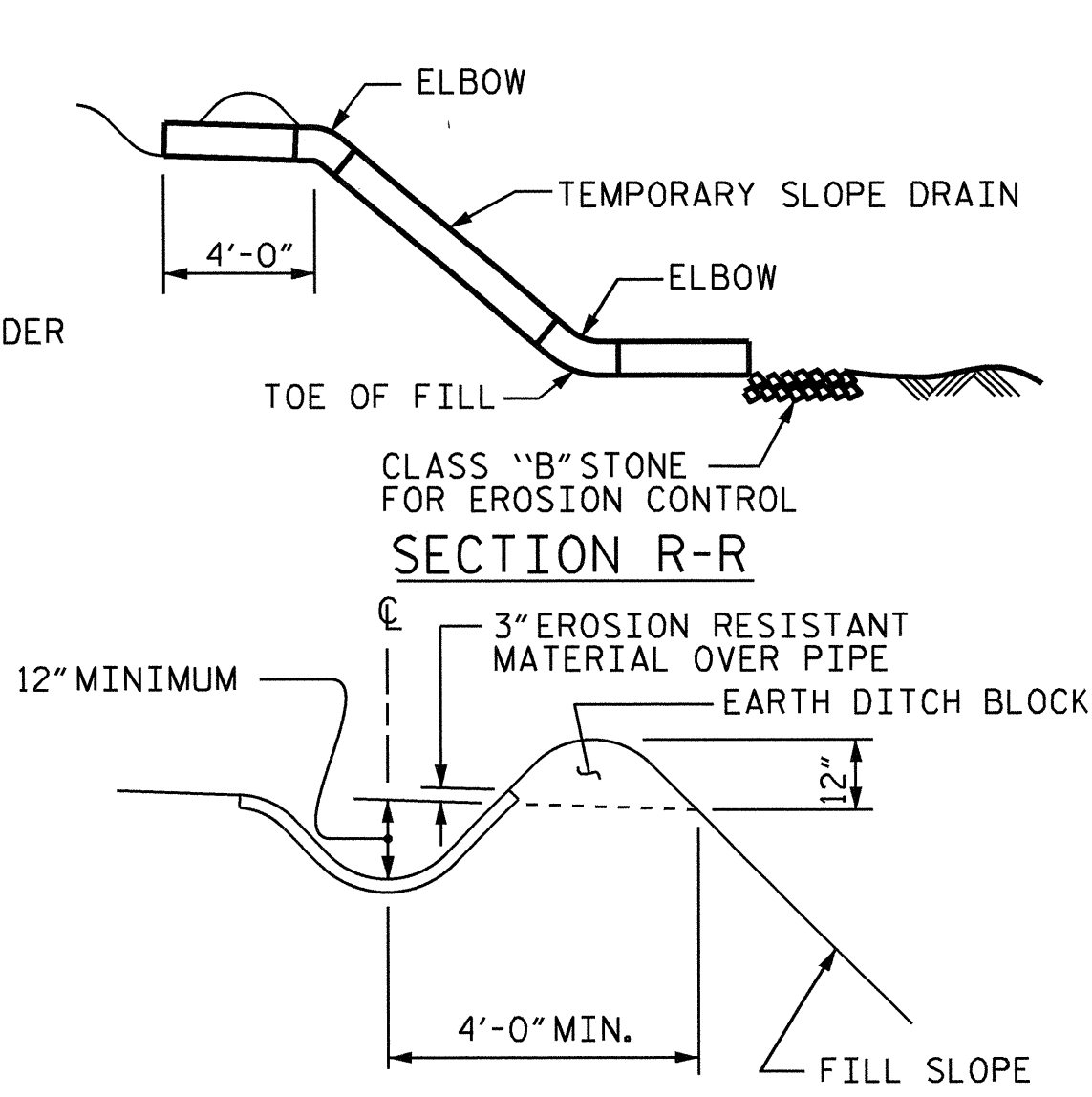
SECTION C-C  
FOAM JOINT SEAL  
(EXPANSION)



PLAN VIEW

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

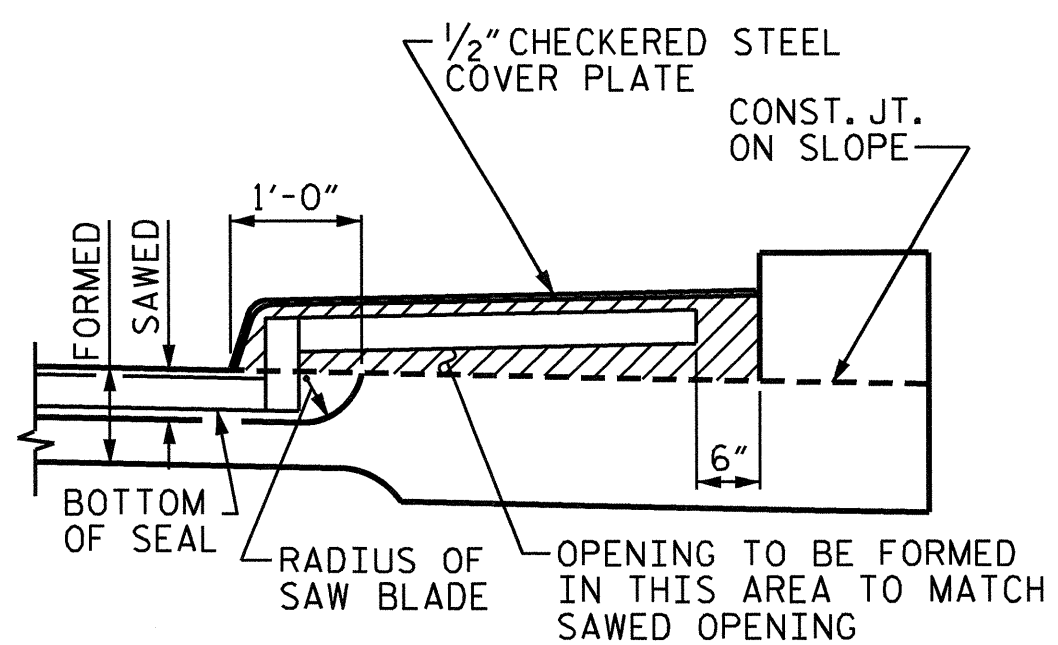


SECTION S-S

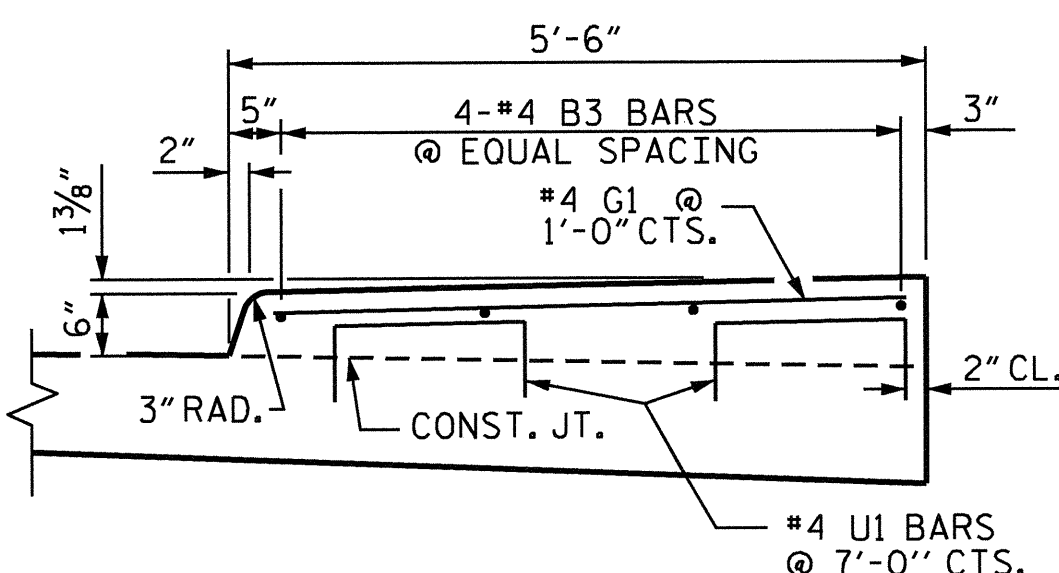
THE STEEL PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 OR APPROVED EQUAL. AFTER FABRICATION, THE PLATES SHALL BE COMMERCIALY BLAST CLEANED AND EITHER COATED WITH A MINIMUM THICKNESS OF 4 MILS (DRY) OF ZINC-RICH PAINT, GALVANIZED OR METALLIZED TO A MINIMUM THICKNESS OF 6 MILS IN ACCORDANCE WITH THE STANDARD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

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

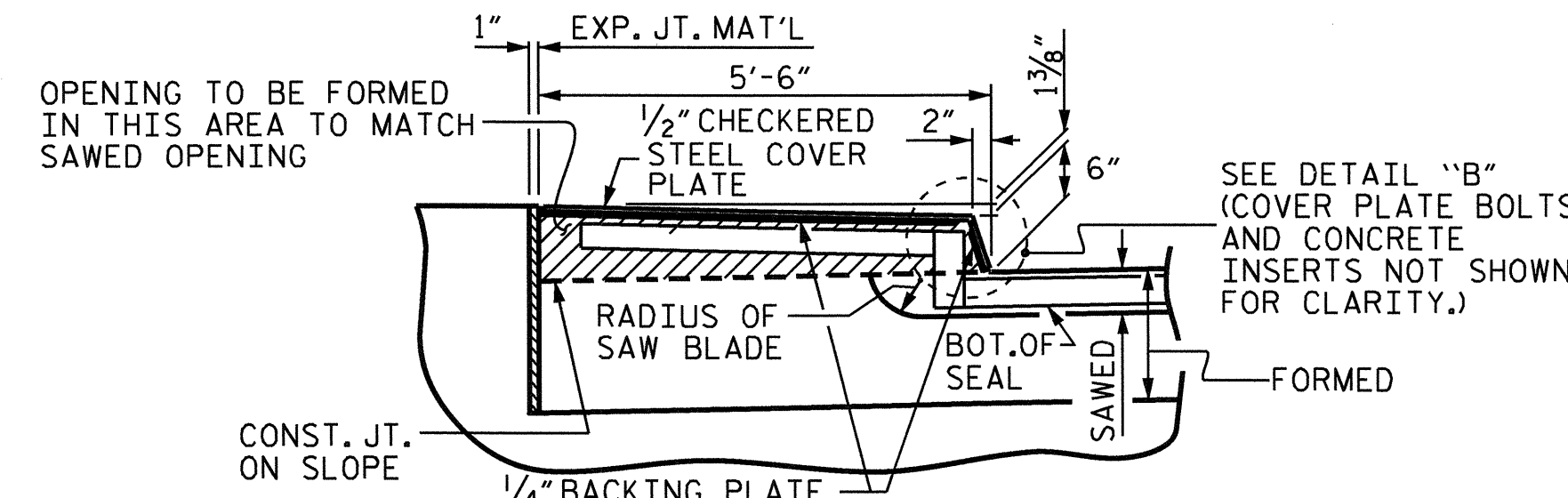
NO SEPARATE PAYMENT WILL BE MADE FOR FURNISHING AND INSTALLING THE COVER PLATE. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE LUMP SUM PRICE FOR "FOAM JOINT SEALS".



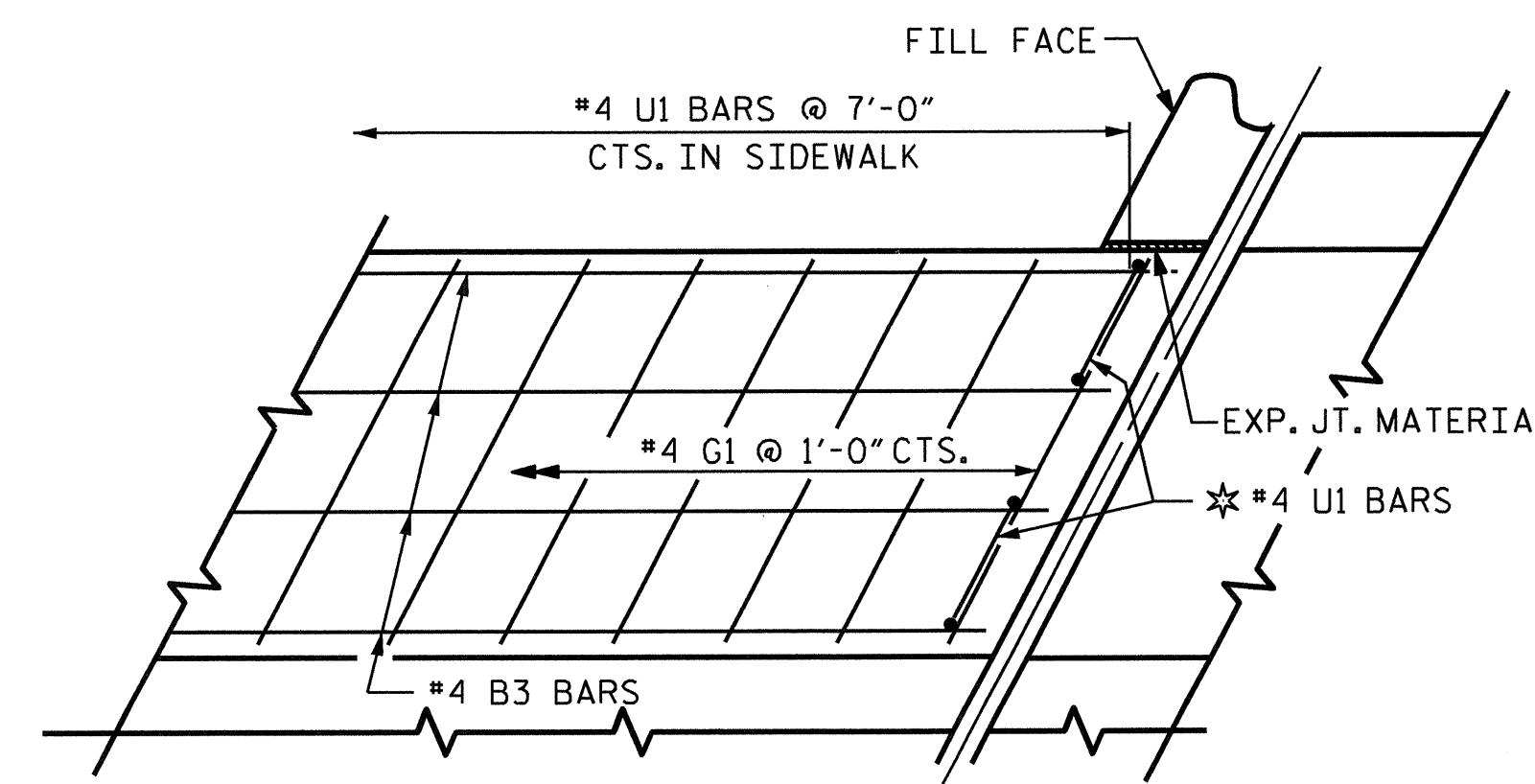
SECTION H-H



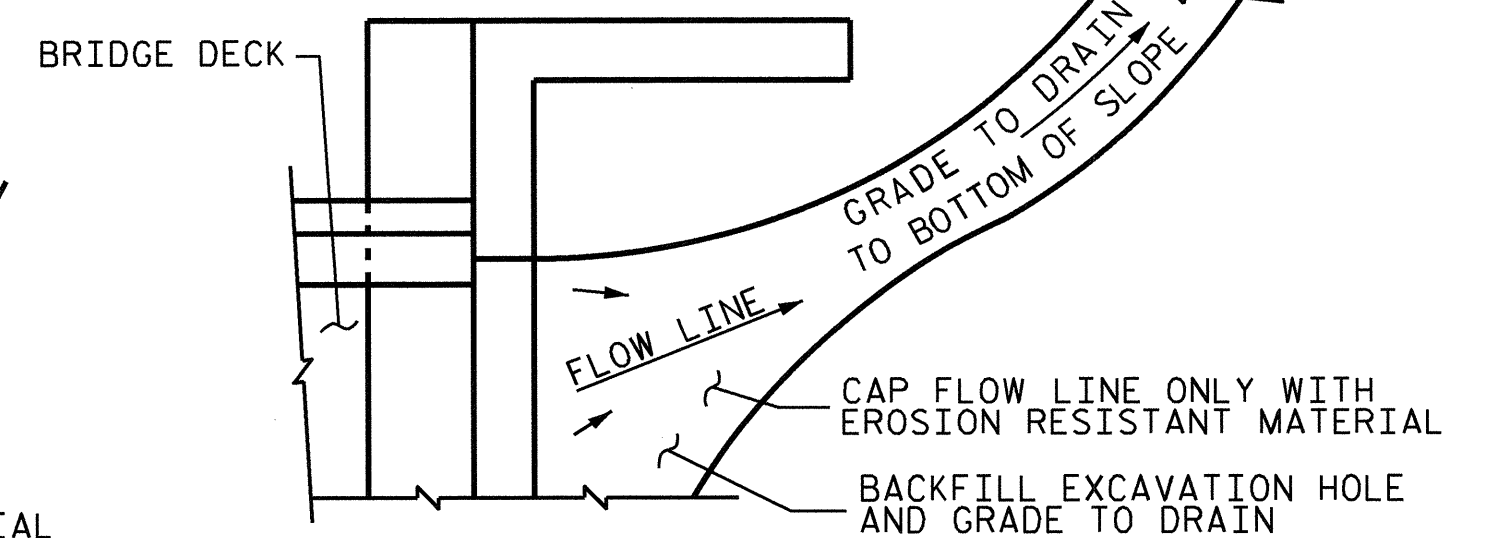
SECTION N-N  
SIDEWALK DETAILS



SECTION I-I

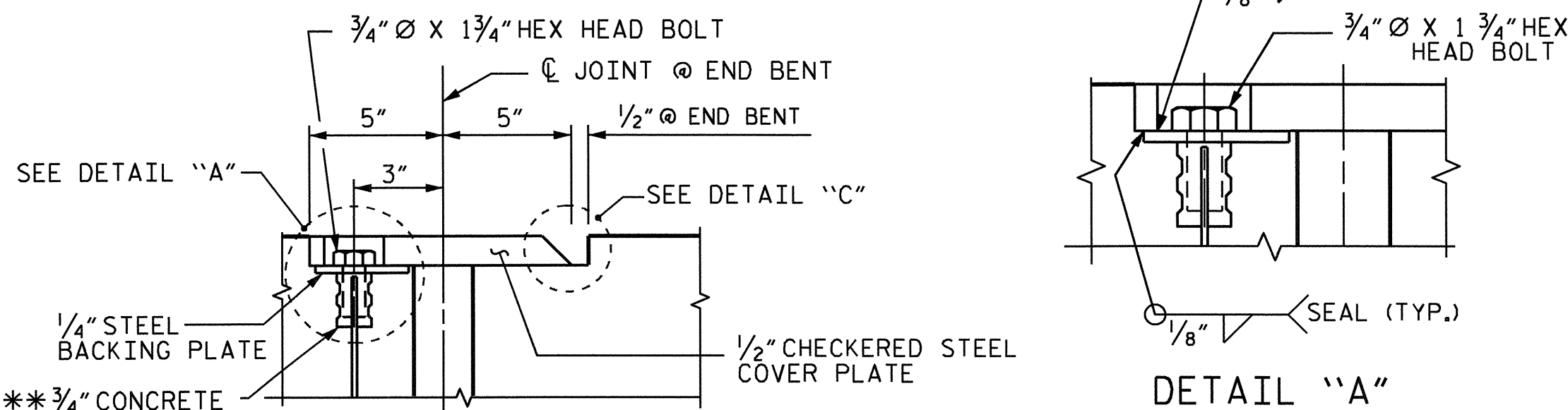


\* THESE BARS ARE TO BE PLACED AFTER THE SAWING OF THE JOINT. THE HOLES SHALL BE DRILLED AND THE DOWELS GROUTED INTO PLACE.

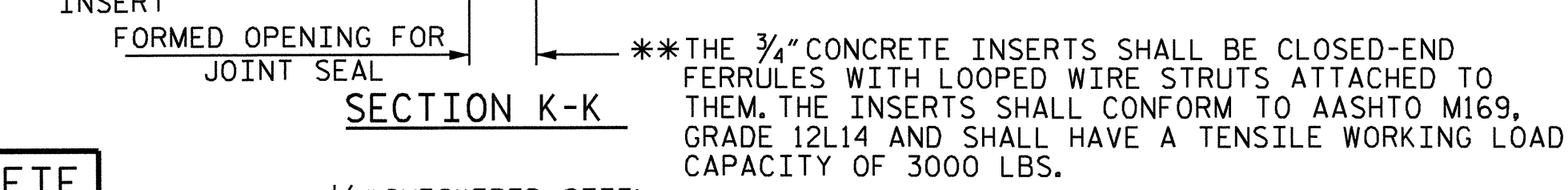


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

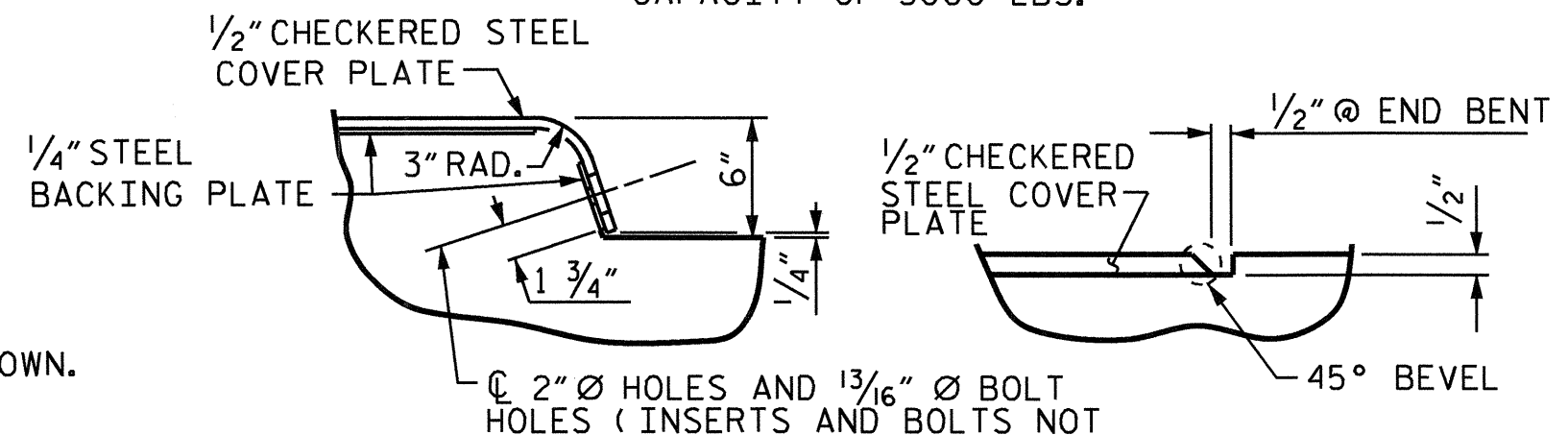
TEMPORARY DRAINAGE DETAIL



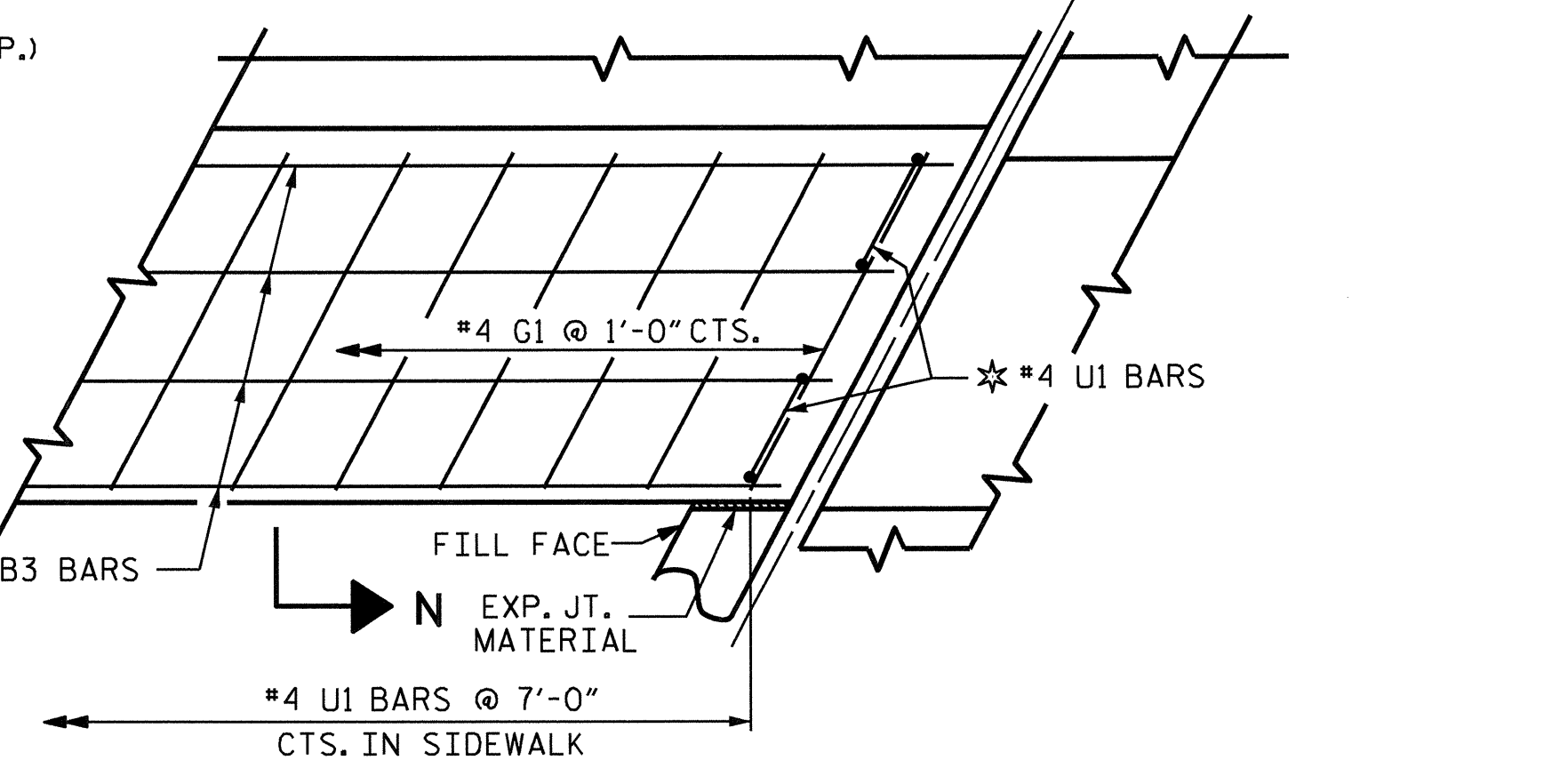
DETAIL "A"



SECTION K-K



DETAIL "B" DETAIL "C"  
JOINT SEAL DETAILS @ END BENT

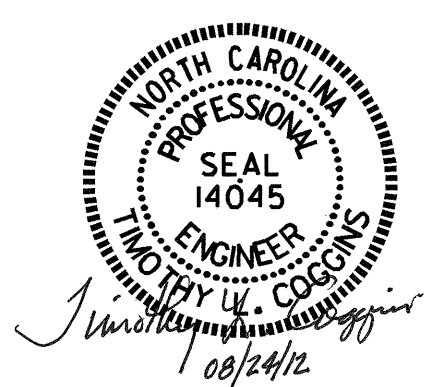


PLAN  
DETAILS OF SIDEWALK ON APPROACH SLAB

| ELASTOMERIC CONCRETE |                                  |
|----------------------|----------------------------------|
| END BENT NO.         | ELASTOMERIC CONCRETE * (CU. FT.) |
| 1                    | 5.9                              |
| 2                    | 5.9                              |
| TOTAL                | 11.8                             |

\* BASED ON THE MINIMUM BLOCKOUT SHOWN.

ASSEMBLED BY : M.D.PISO DATE : 12-21-11  
 CHECKED BY : P.A.PARISI DATE : 1-19-12  
 DRAWN BY : FCJ 11/88 REV. 5/7/03 RWW/JTE  
 CHECKED BY : ARB 11/88 REV. 5/1/06RRR MAA/KMM  
 REV. 10/1/11 MAA/GM

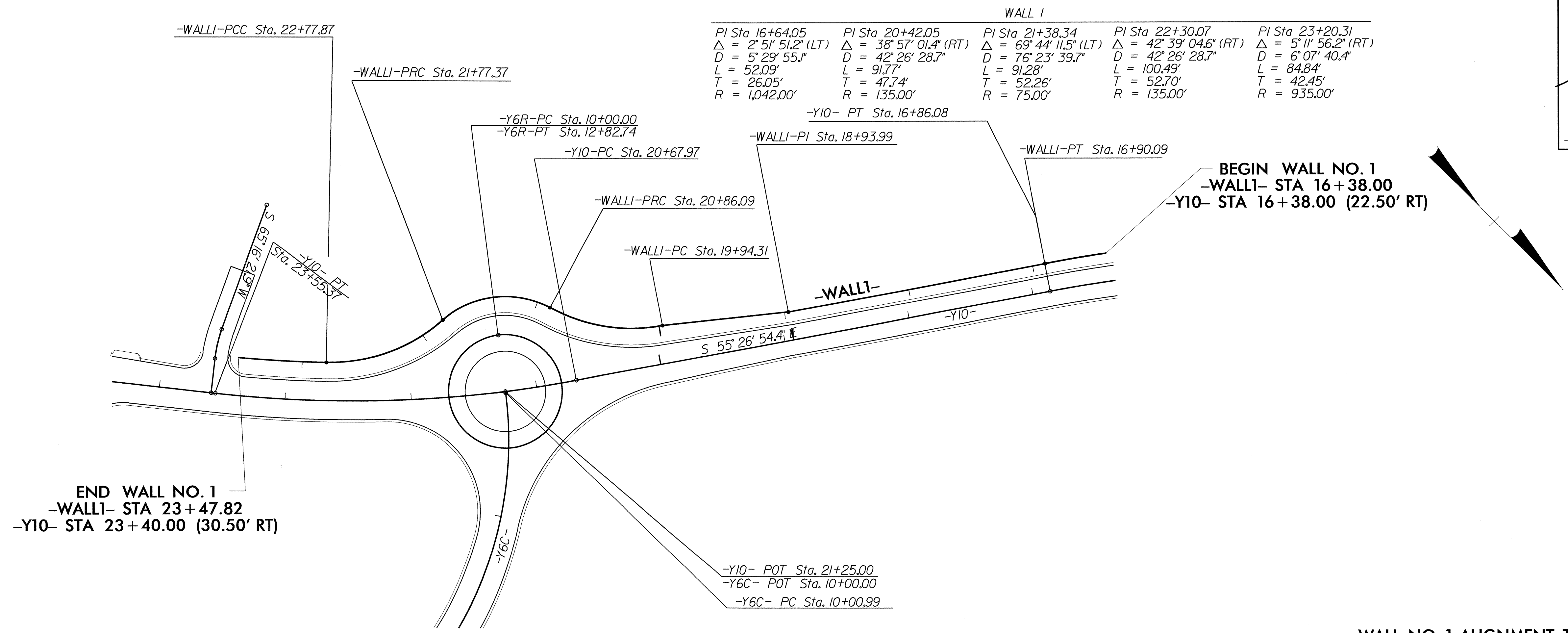


PROJECT NO. U-4444B  
 CUMBERLAND COUNTY  
 STATION: 172+95.63 -L-

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

GEOTECHNICAL ENGINEER ENGINEER

SIGNATURE DATE



RETAINING WALL NO. 1 PLAN

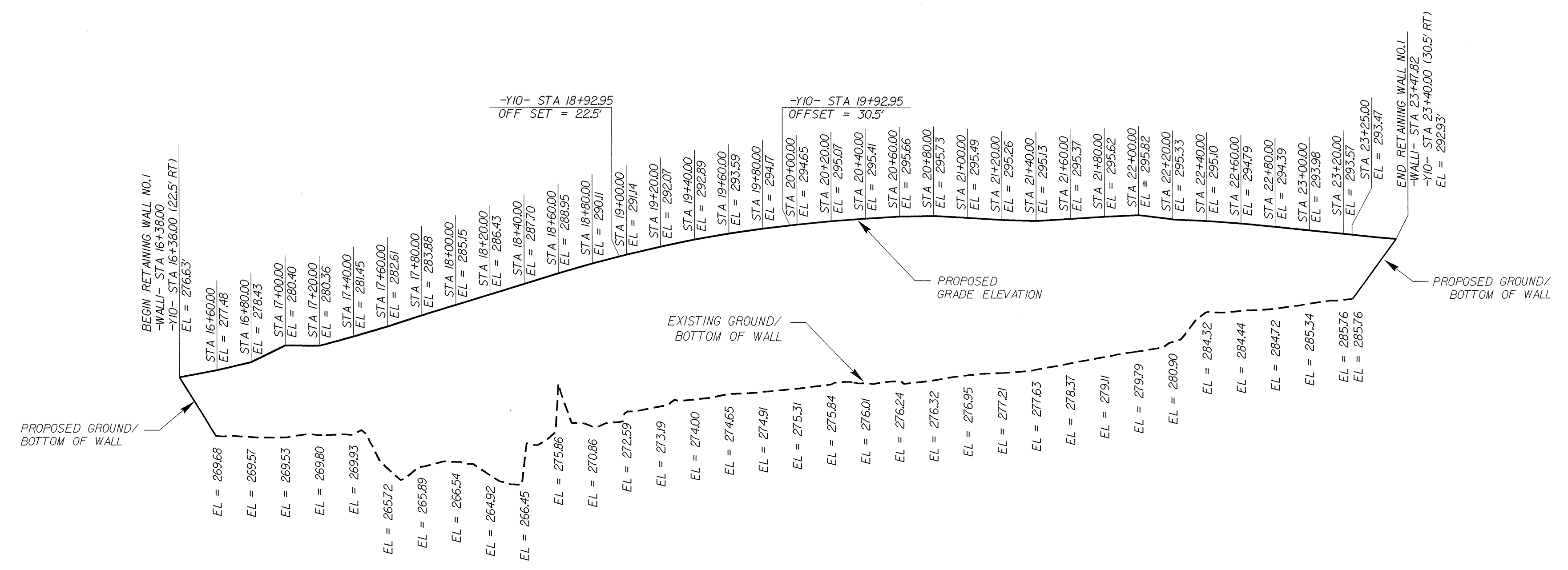
N.T.S.

WALL NO. 1 ALIGNMENT TABLE

| CHAIN | STATION      | OFFSET    | WALL STATION |
|-------|--------------|-----------|--------------|
| -Y10- | POT 16+38.00 | 22.50' RT | POT 16+38.00 |
| -Y10- | PT 16+86.08  | 22.50' RT | PT 16+90.09  |
| -Y10- | POT 18+92.95 | 22.50' RT | PI 18+93.99  |
| -Y10- | POT 19+92.95 | 30.50' RT | PC 19+94.31  |
| -Y10- | POC 20+78.05 | 60.15' RT | PRC 20+86.09 |
| -Y10- | POC 21+69.99 | 61.57' RT | PRC 21+77.37 |
| -Y10- | POC 22+67.80 | 30.50' RT | PCC 22+77.87 |
| -Y10- | POC 23+40.00 | 30.50' RT | PT 23+47.82  |

END WALL NO. 1  
-WALLI- STA 23+47.82  
-Y10- STA 23+40.00 (30.50' RT)

BEGIN WALL NO. 1  
-WALLI- STA 16+38.00  
-Y10- STA 16+38.00 (22.50' RT)



N.T.S.

| MSE WALL QUANTITY (SQ. FEET) |           |
|------------------------------|-----------|
| MSE RETAINING WALL NO. 1     | 10,450 SF |

PROJECT NO.: U-4444B  
CUMBERLAND COUNTY  
STATION: 16+40 -Y10- RT  
SHEET 1 OF 12

**GEOTECHNICAL ENGINEERING UNIT**

EASTERN REGIONAL OFFICE  
 WESTERN REGIONAL OFFICE

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

| REVISIONS |    |      |     |    |      | SHEET NO.<br>12 |
|-----------|----|------|-----|----|------|-----------------|
| NO.       | BY | DATE | NO. | BY | DATE |                 |
| 1         |    |      | 3   |    |      | 12              |
| 2         |    |      | 4   |    |      |                 |

|                         |               |
|-------------------------|---------------|
| PREPARED BY: T.T. ZAN   | DATE: 07/2012 |
| REVIEWED BY: J.R. BATTS | DATE: 07/2012 |

**BEGIN WALL NO. 2**  
-WALL2- STA 24+45.00  
-Y10- STA 24+00.00 (29.50' LT)

| WALL 2                             |                                     |                                    |
|------------------------------------|-------------------------------------|------------------------------------|
| PI Sta 25+36.93                    | PI Sta 27+06.74                     | PI Sta 27+76.21                    |
| $\Delta = 10^\circ 33' 27.0"$ (LT) | $\Delta = 107^\circ 00' 36.6"$ (RT) | $\Delta = 16^\circ 39' 56.3"$ (RT) |
| D = 5' 45' 30.1"                   | D = 98' 47' 09.0"                   | D = 2' 13' 14.4"                   |
| L = 183.34'                        | L = 108.33'                         | L = 78.53'                         |
| T = 91.93'                         | T = 78.40'                          | T = 39.55'                         |
| R = 995.00'                        | R = 58.00'                          | R = 270.00'                        |

**END WALL NO. 2 / BEGIN WALL NO. 7**  
-WALL2- STA 29+04.28  
-Y6C- 12+96.18 (27.42' RT)  
-L- STA 172+53.11 (78.34' LT)

**END WALL NO. 7**  
-Y6C- STA 13+06.01 (27.42' LT)  
-L- STA 173+10.86 (71.48' RT)

**RETAINING WALL NO. 2 & WALL NO. 7 PLAN**

N.T.S.

**WALL NO. 2 ALIGNMENT TABLE**

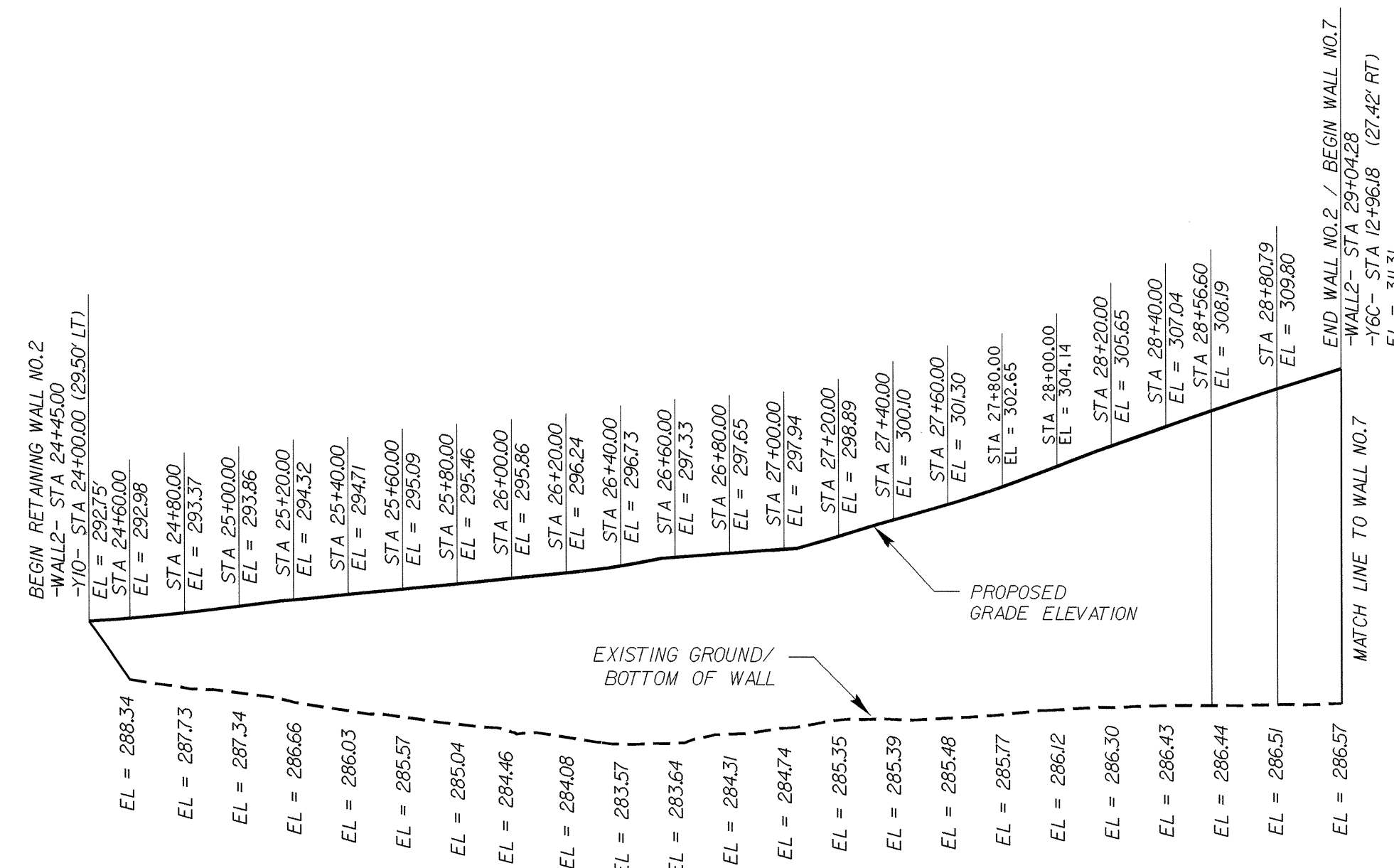
| CHAIN | STATION      | OFFSET    | WALL STATION |
|-------|--------------|-----------|--------------|
| -Y10- | POT 24+00.00 | 29.50' LT | PC 24+45.00  |
| -Y10- | PT 23+55.37  | 30.50' LT | POC 24+89.65 |
| -Y10- | POC 22+20.85 | 30.50' LT | PRC 26+28.34 |
| -Y6C- | POC 11+19.86 | 30.50' RT | PCC 27+36.67 |
| -Y6C- | PT 12+07.12  | 30.50' RT | PT 28+15.20  |
| -Y6C- | POT 12+48.52 | 30.50' RT | PI 28+56.60  |
| -Y6C- | POT 12+72.52 | 27.42' RT | PI 28+80.79  |
| -Y6C- | POT 12+96.18 | 27.42' RT | POT 29+04.28 |

**WALL NO. 7 ENVELOPE TABLE**

| POINT | -Y6C-    |            | -L-       |            | ELEVATION     |
|-------|----------|------------|-----------|------------|---------------|
|       | STATION  | OFFSET     | STATION   | OFFSET     |               |
| A     | 12+96.18 | 27.42'± RT | 172+53.11 | 78.34'± LT | 311.3±        |
| B     | 12+97.20 | 27.42'± RT | 172+53.30 | 77.34'± LT | 311.3±/303.8± |
| C     | 13+03.30 | 27.42'± RT | 172+54.44 | 71.35'± LT | 303.8±        |
| D     | 13+06.01 | 27.42'± LT | 173+09.61 | 78.48'± LT | 311.7±        |
| E     | 13+07.03 | 27.42'± LT | 173+09.79 | 77.48'± LT | 311.7±/303.8± |
| F     | 13+13.13 | 27.42'± LT | 173+10.86 | 71.48'± LT | 303.8±        |

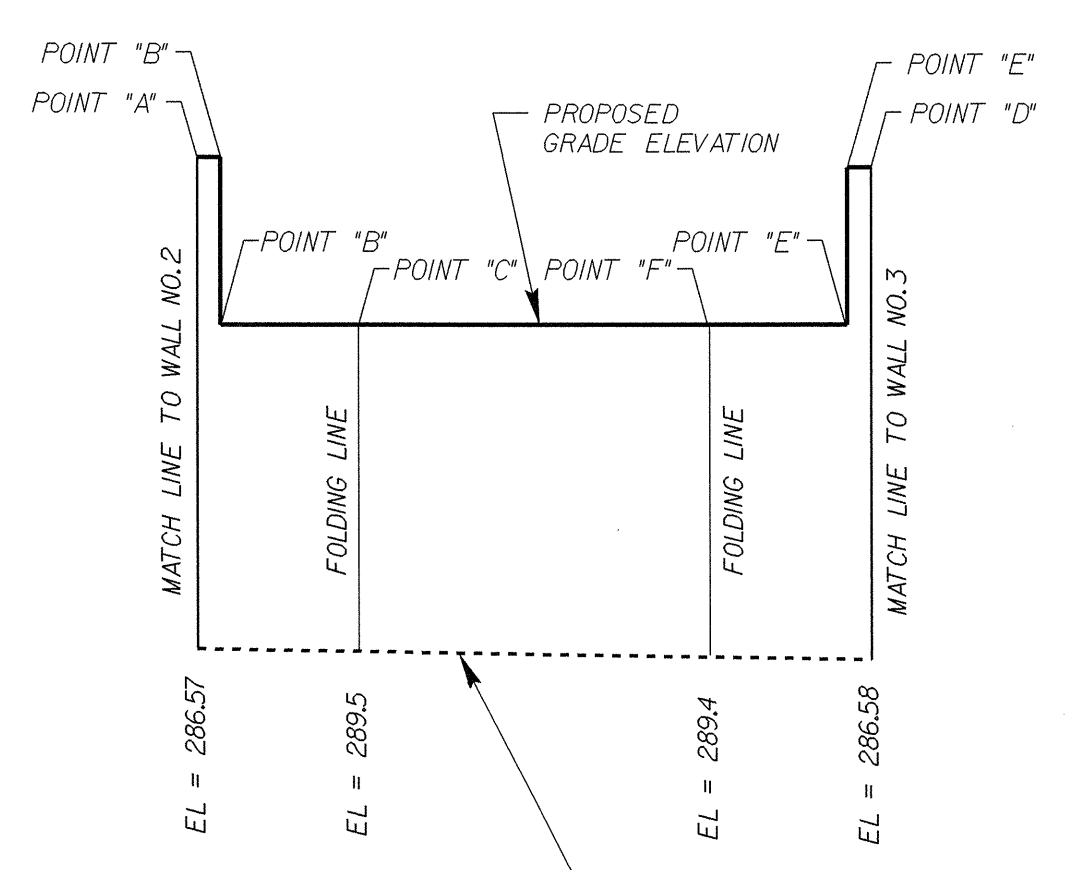
**MSE WALL QUANTITIES**  
(SQUARE FEET)

|                          |          |
|--------------------------|----------|
| MSE RETAINING WALL NO. 2 | 6,470 SF |
| MSE RETAINING WALL NO. 7 | 1,080 SF |



**RETAINING WALL NO. 2 ELEVATION**

N.T.S.



**RETAINING WALL NO. 7 ELEVATION**

N.T.S.

**PROJECT NO.:** U-4444B  
**CUMBERLAND COUNTY**  
**STATION:** 24+00 -Y10- LT & 13+01.10 -Y6C-  
SHEET 2 OF 12

**GEOTECHNICAL ENGINEERING UNIT**

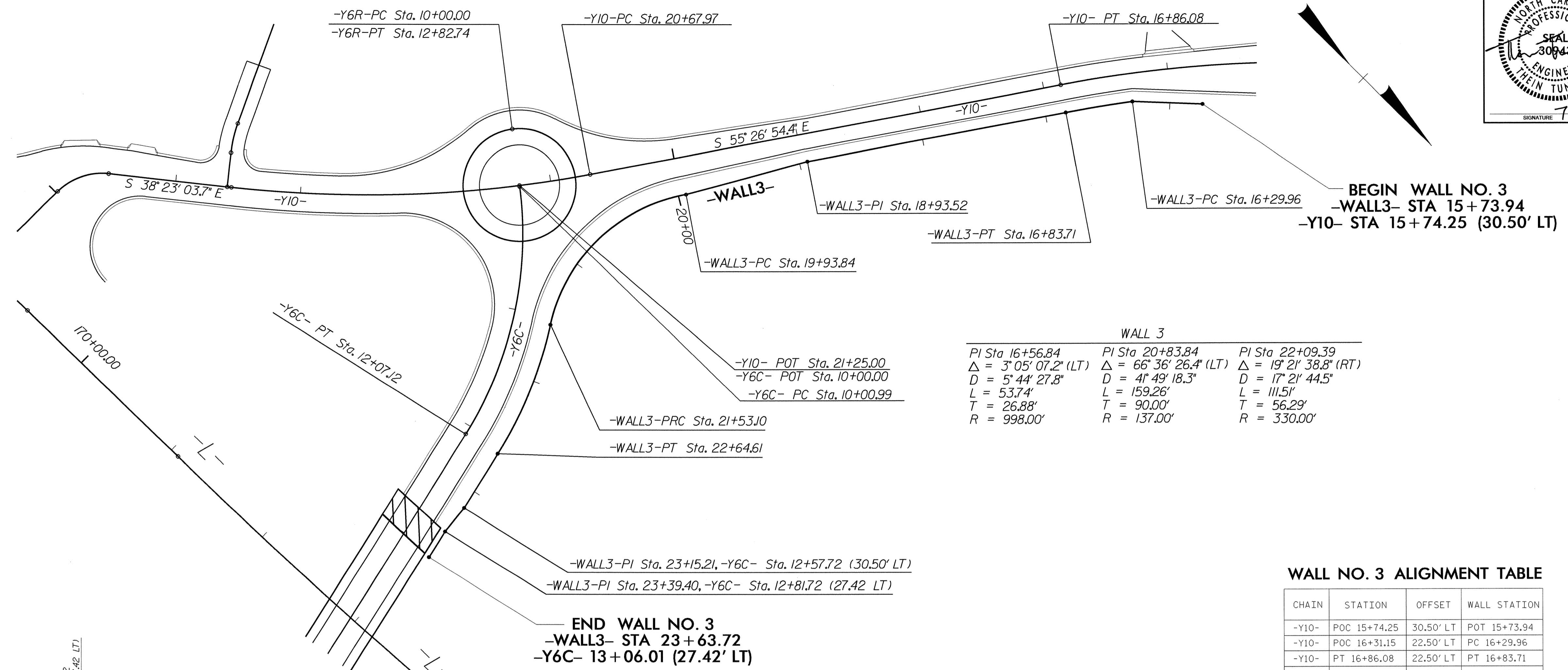
EASTERN REGIONAL OFFICE  
 WESTERN REGIONAL OFFICE

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**RETAINING WALL NO. 2 & NO. 7 PLANS & ELEVATIONS**

| REVISIONS |    |      |     |    |      | SHEET NO.<br>W-2 |
|-----------|----|------|-----|----|------|------------------|
| NO.       | BY | DATE | NO. | BY | DATE |                  |
| 1         |    |      | 3   |    |      | TOTAL SHEETS     |
| 2         |    |      | 4   |    |      | 12               |





**WALL 3**

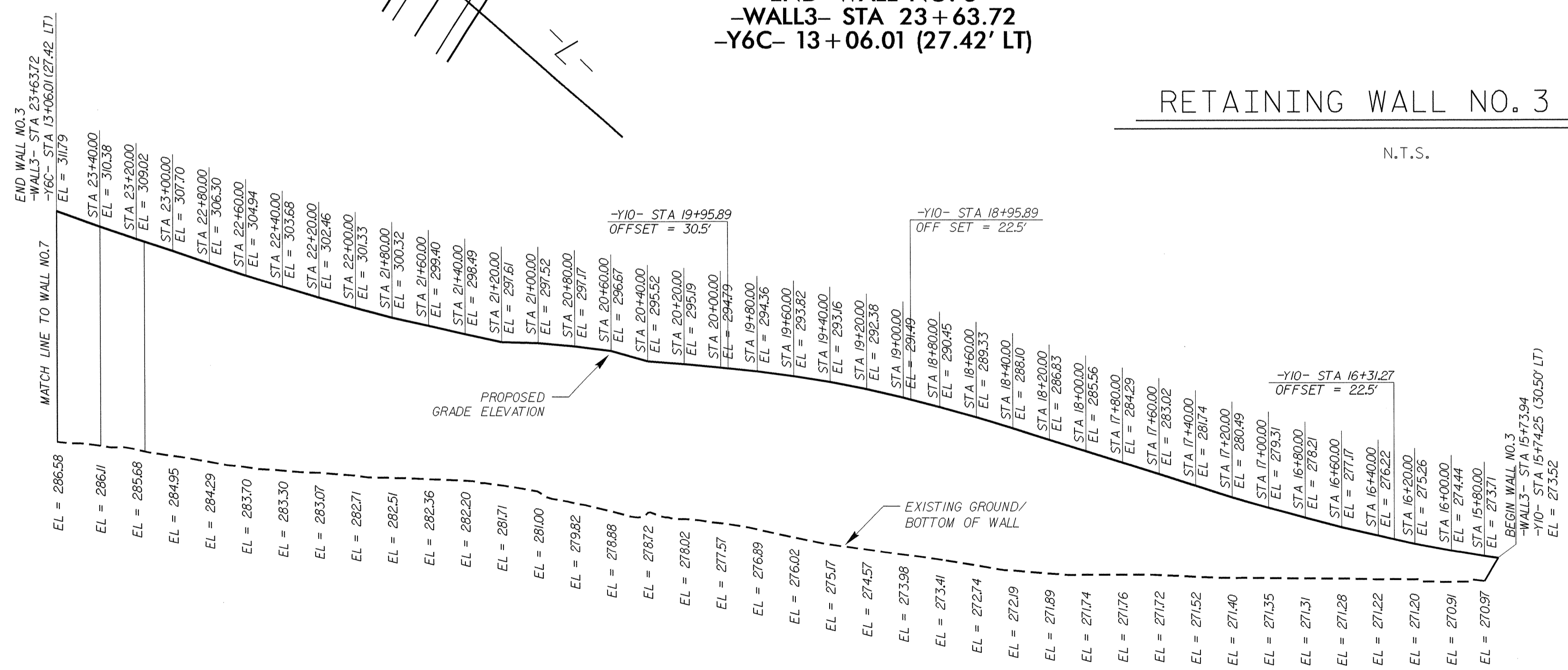
|                                   |                                    |                                    |
|-----------------------------------|------------------------------------|------------------------------------|
| PI Sta 16+56.84                   | PI Sta 20+83.84                    | PI Sta 22+09.39                    |
| $\Delta = 3^{\circ}05'07.2"$ (LT) | $\Delta = 66^{\circ}36'26.4"$ (LT) | $\Delta = 19^{\circ}21'38.8"$ (RT) |
| D = 5'44'27.8"                    | D = 41'49'18.3"                    | D = 17'21'44.5"                    |
| L = 53.74'                        | L = 159.26'                        | L = 111.51'                        |
| T = 26.88'                        | T = 90.00'                         | T = 56.29'                         |
| R = 998.00'                       | R = 137.00'                        | R = 330.00'                        |

**WALL NO. 3 ALIGNMENT TABLE**

| CHAIN | STATION      | OFFSET    | WALL STATION |
|-------|--------------|-----------|--------------|
| -Y10- | POC 15+74.25 | 30.50' LT | POT 15+73.94 |
| -Y10- | POC 16+31.15 | 22.50' LT | PC 16+29.96  |
| -Y10- | PT 16+86.08  | 22.50' LT | PT 16+83.71  |
| -Y10- | POT 18+95.89 | 22.50' LT | PI 18+93.52  |
| -Y10- | POT 19+95.89 | 30.50' LT | PC 19+93.84  |
| -Y6C- | POC 11+05.75 | 30.50' LT | PRC 21+53.10 |
| -Y6C- | POT 12+07.12 | 30.50' LT | PT 22+64.61  |
| -Y6C- | POT 12+57.72 | 30.50' LT | PI 23+15.21  |
| -Y6C- | POT 12+81.72 | 27.42' LT | PI 23+39.40  |
| -Y6C- | POT 13+06.01 | 27.42' LT | POT 23+63.72 |

**MSE WALL QUANTITY**  
(SQUARE FEET)

|                          |           |
|--------------------------|-----------|
| MSE RETAINING WALL NO. 3 | 12,500 SF |
|--------------------------|-----------|



**PROJECT NO.:** U-4444B  
**CUMBERLAND COUNTY**  
**STATION:** 15+80 -Y10- LT  
 SHEET 3 OF 12

**GEOTECHNICAL ENGINEERING UNIT**  
 EASTERN REGIONAL OFFICE  
 WESTERN REGIONAL OFFICE

**STATE OF NORTH CAROLINA**  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**RETAINING WALL NO. 3 PLAN & ELEVATION**

| REVISIONS |    |      |     |    |      | SHEET NO.    |
|-----------|----|------|-----|----|------|--------------|
| NO.       | BY | DATE | NO. | BY | DATE | W-3          |
| 1         |    |      | 3   |    |      | TOTAL SHEETS |
| 2         |    |      | 4   |    |      | 12           |

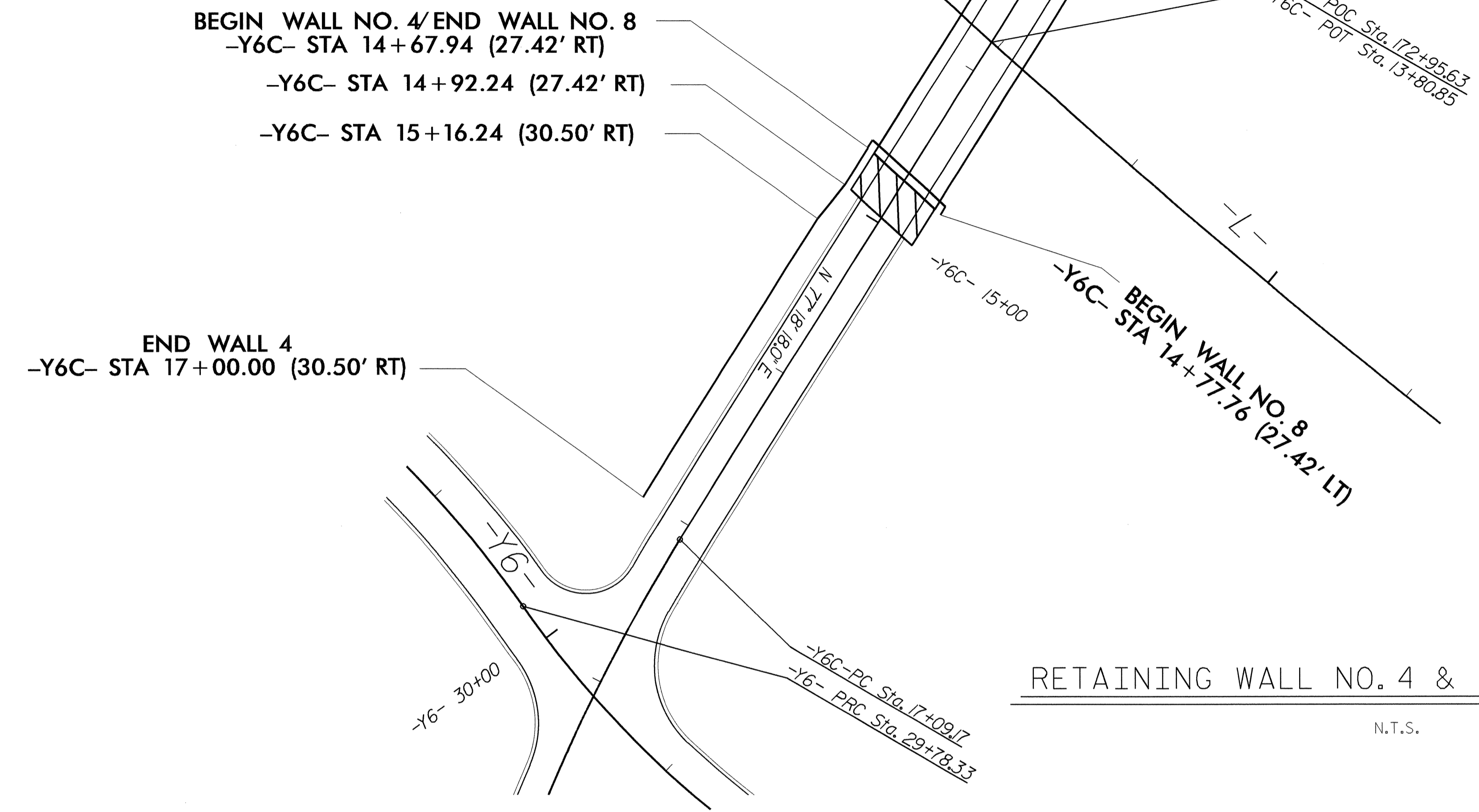
GEOTECHNICAL ENGINEER

ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 30943

7/20/12

SIGNATURE DATE



RETAINING WALL NO. 4 & WALL NO. 8 PLAN

N.T.S.

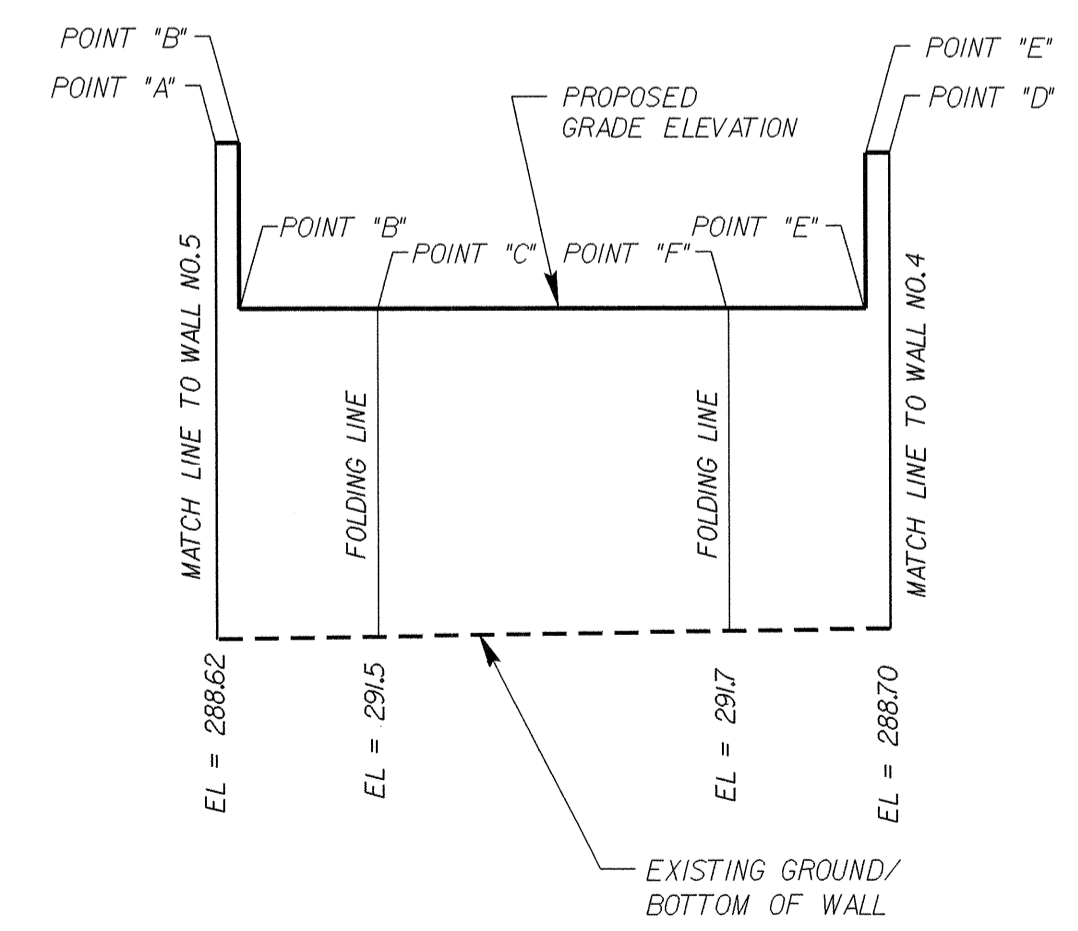
WALL NO. 4 ALIGNMENT TABLE

| CHAIN | STATION  | OFFSET    |
|-------|----------|-----------|
| -Y6C- | 14+67.94 | 27.42' RT |
| -Y6C- | 14+92.24 | 27.42' RT |
| -Y6C- | 15+16.24 | 30.50' RT |
| -Y6C- | 17+00.00 | 30.50' RT |

WALL NO. 8 WALL ENVELOPE TABLE

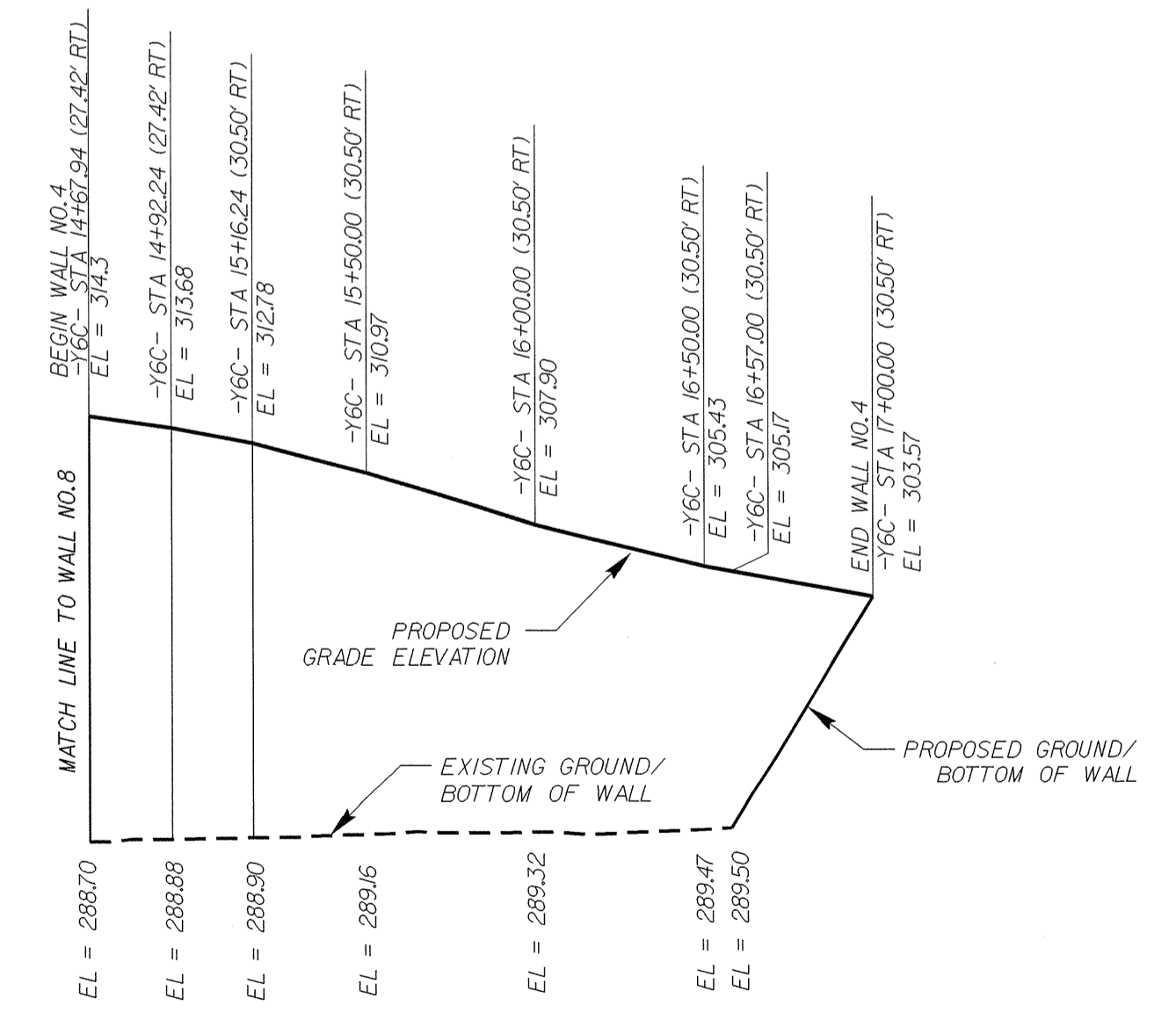
| POINT | -Y6C-    |            | -L-       |            | ELEVATION     |
|-------|----------|------------|-----------|------------|---------------|
|       | STATION  | OFFSET     | STATION   | OFFSET     |               |
| A     | 14+77.76 | 27.42'± LT | 173+39.02 | 90.73'± RT | 314.1±        |
| B     | 14+76.75 | 27.42'± LT | 173+38.85 | 89.73'± RT | 314.1±/306.5± |
| C     | 14+70.65 | 27.42'± LT | 173+37.83 | 83.72'± RT | 306.5±        |
| D     | 14+67.94 | 27.42'± RT | 172+84.20 | 90.57'± RT | 314.3±        |
| E     | 14+66.92 | 27.42'± RT | 172+84.02 | 89.57'± RT | 314.3±/306.5± |
| F     | 14+60.82 | 27.42'± RT | 172+82.94 | 83.57'± RT | 306.5±        |

| MSE WALL QUANTITIES (SQUARE FEET) |          |
|-----------------------------------|----------|
| MSE RETAINING WALL NO. 4          | 4,420 SF |
| MSE RETAINING WALL NO. 8          | 1,060 SF |



RETAINING WALL NO. 8 ELEVATION

N.T.S.



RETAINING WALL NO. 4 ELEVATION

N.T.S.

PROJECT NO.: U-4444B  
 CUMBERLAND COUNTY  
 STATION: 14+70 -Y6C- RT & 14+72.85 -Y6C-  
 SHEET 4 OF 12

GEOTECHNICAL ENGINEERING UNIT

EASTERN REGIONAL OFFICE  
 WESTERN REGIONAL OFFICE

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

RETAINING WALL NO. 4 & NO. 8 PLANS & ELEVATIONS

| REVISIONS |    |      |     |    |      | SHEET NO.<br>W-4<br>TOTAL SHEETS<br>12 |
|-----------|----|------|-----|----|------|--|
| NO.       | BY | DATE | NO. | BY | DATE |  |
| 1         |    |      | 3   |    |      |  |
| 2         |    |      | 4   |    |      |  |

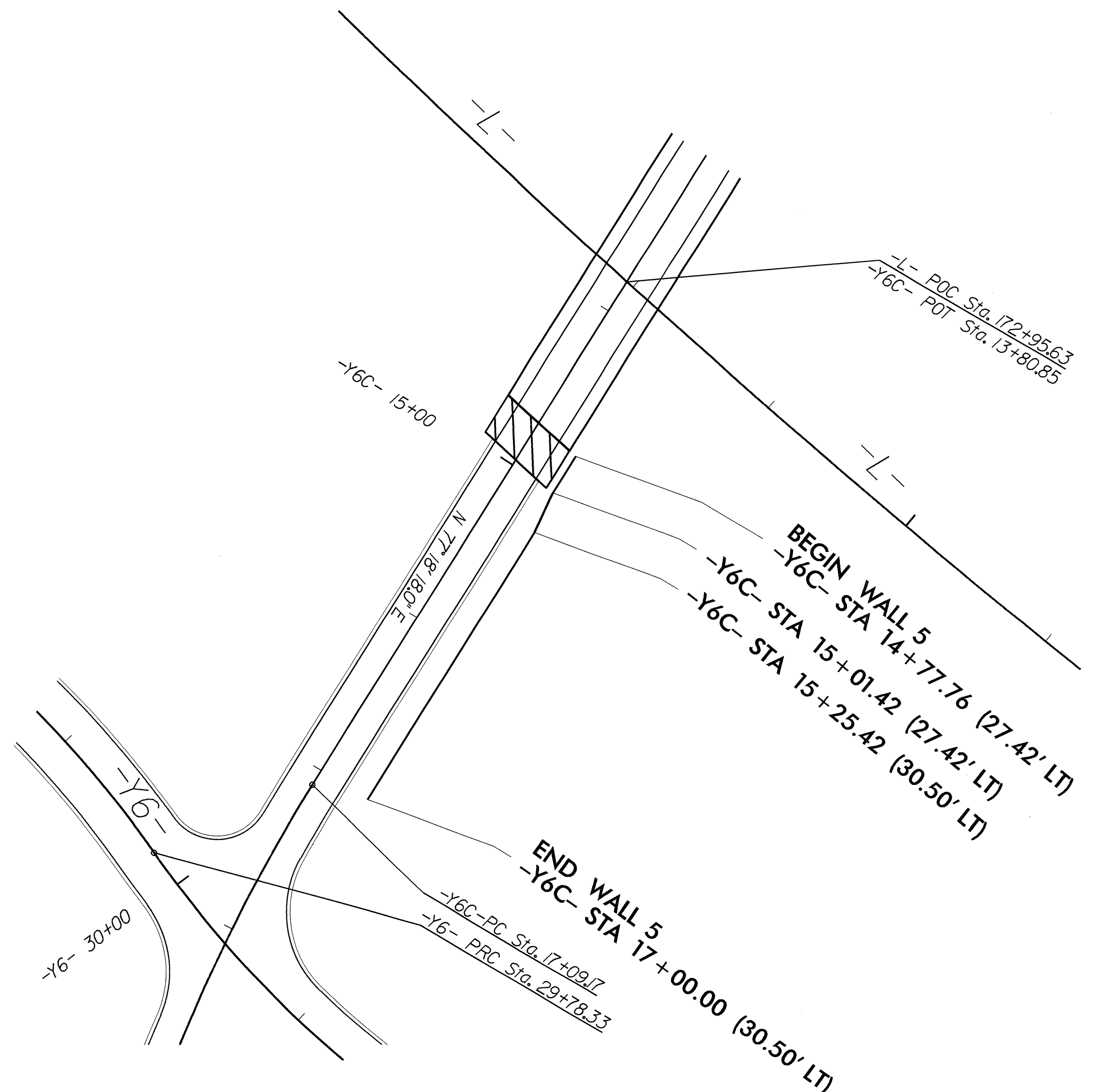
GEOTECHNICAL ENGINEER

ENGINEER

SEAL 30943

7/20/12

SIGNATURE DATE SIGNATURE DATE



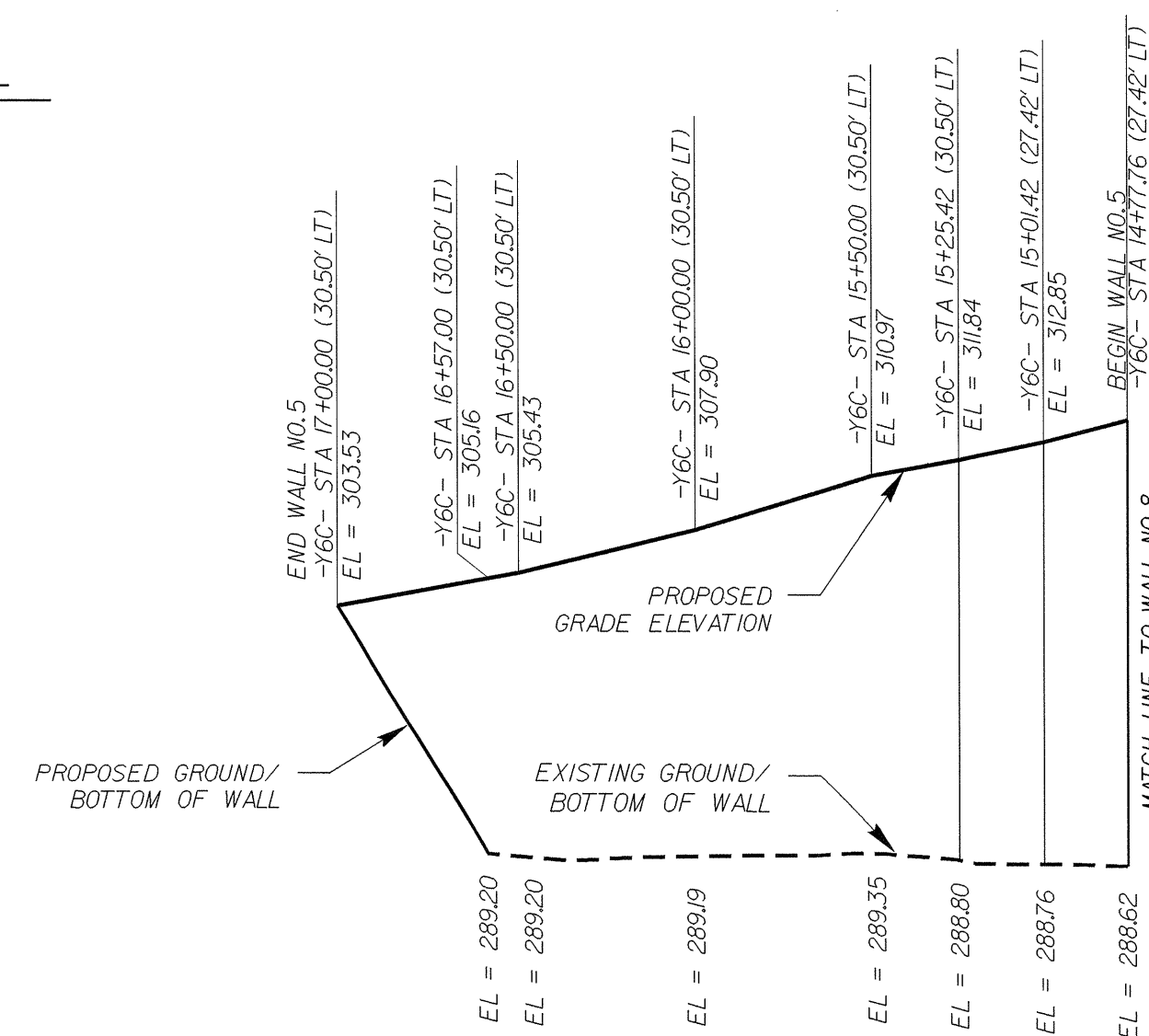
RETAINING WALL NO. 5 PLAN

N.T.S.

WALL NO. 5 ALIGNMENT TABLE

| CHAIN | STATION  | OFFSET    |
|-------|----------|-----------|
| -Y6C- | 14+77.76 | 27.42' LT |
| -Y6C- | 15+01.42 | 27.42' LT |
| -Y6C- | 15+25.42 | 30.50' LT |
| -Y6C- | 17+00.00 | 30.50' LT |

| MSE WALL QUANTITY<br>(SQUARE FEET) |          |
|------------------------------------|----------|
| MSE RETAINING WALL NO. 5           | 4,160 SF |



RETAINING WALL NO. 5 ELEVATION

N.T.S.

PROJECT NO.: U-4444B  
 CUMBERLAND COUNTY  
 STATION: 14+80 -Y6C- LT  
 SHEET 5 OF 12

PREPARED BY: T.T. ZAN DATE: 07/2012  
 REVIEWED BY: J.R. BATTS DATE: 07/2012

GEOTECHNICAL ENGINEERING UNIT

EASTERN REGIONAL OFFICE  
 WESTERN REGIONAL OFFICE

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

RETAINING WALL NO. 5  
 PLAN & ELEVATION

| REVISIONS |    |      |     |    |      | SHEET NO.    |
|-----------|----|------|-----|----|------|--------------|
| NO.       | BY | DATE | NO. | BY | DATE | TOTAL SHEETS |
| 1         |    |      | 3   |    |      | W-5          |
| 2         |    |      | 4   |    |      | 12           |

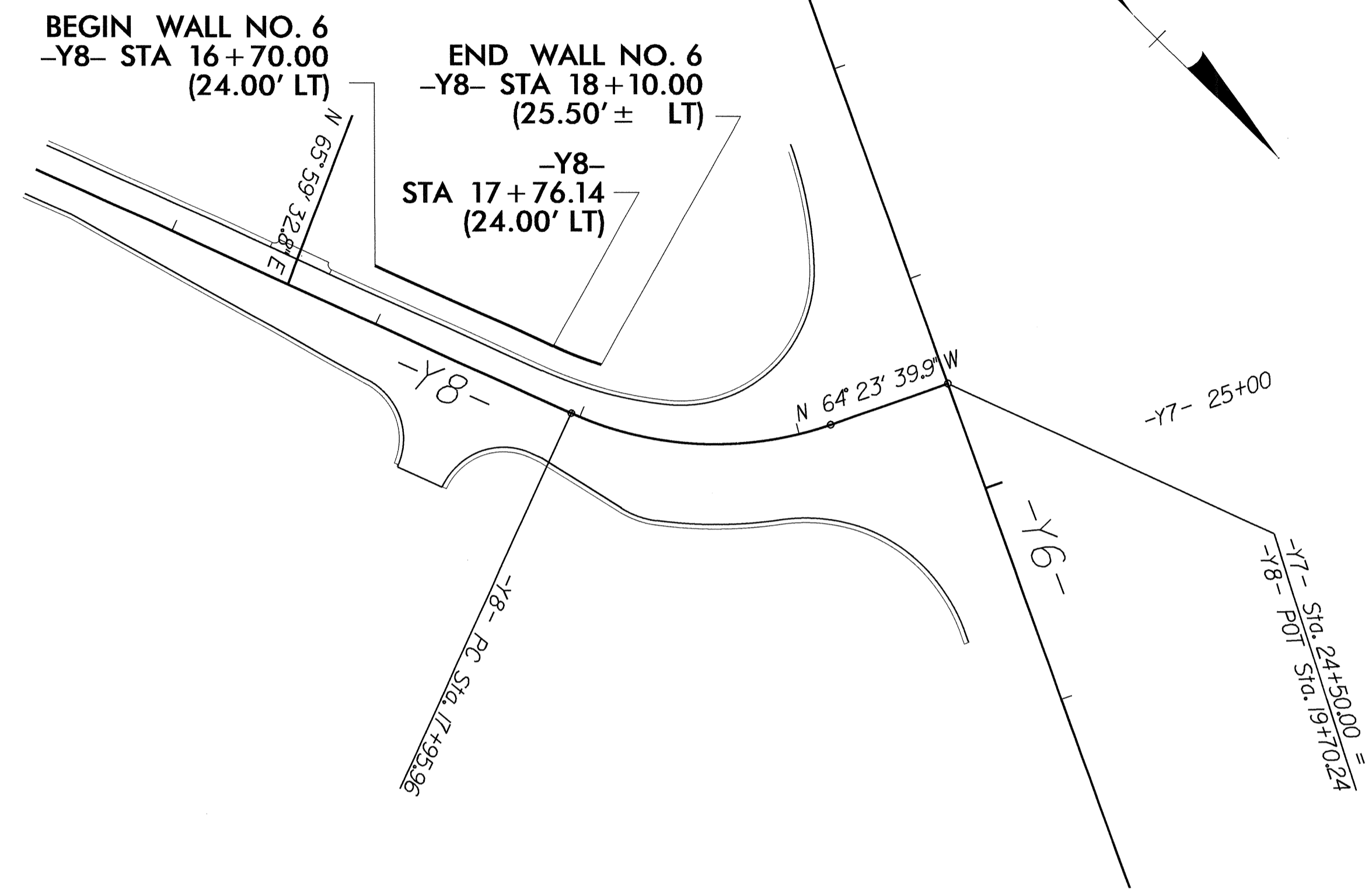
GEOTECHNICAL ENGINEER

ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 30943

7/20/12

SIGNATURE DATE SIGNATURE DATE



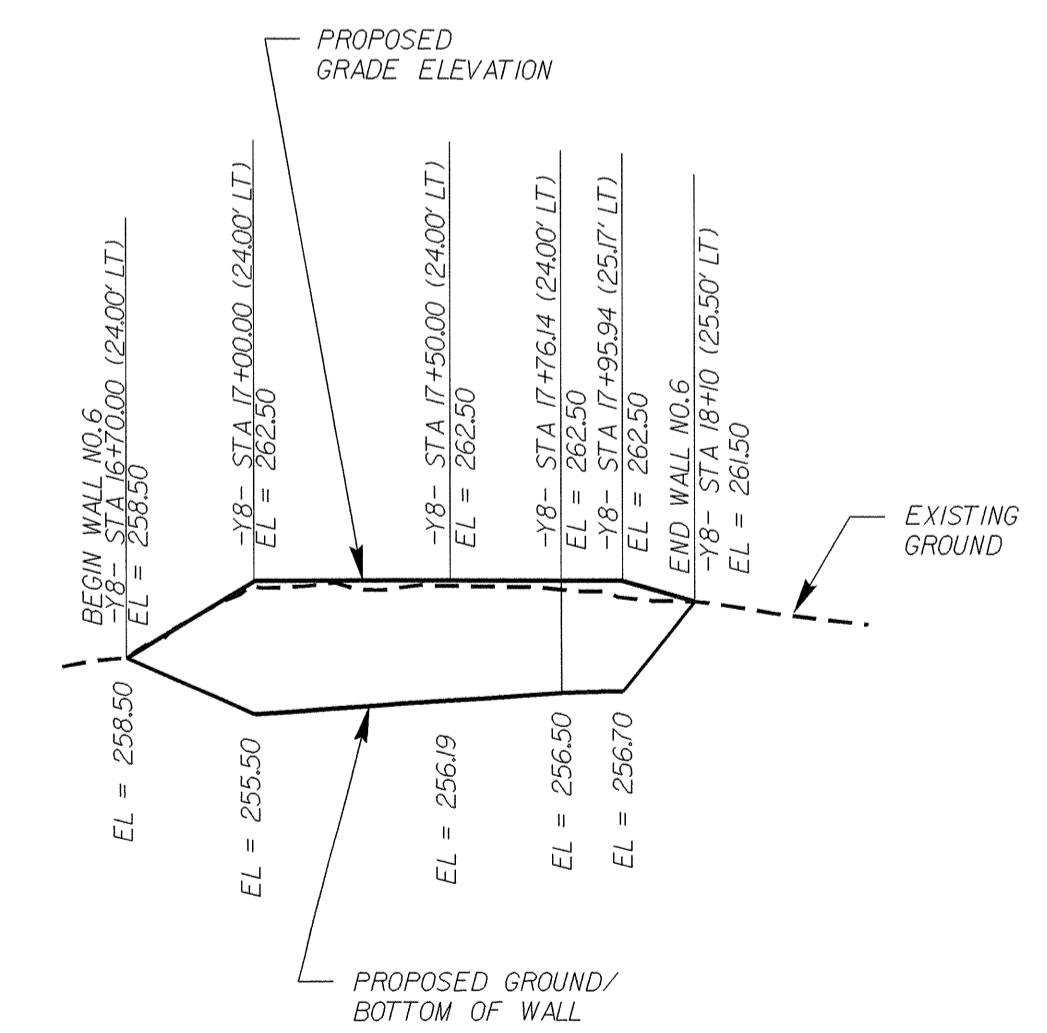
RETAINING WALL NO. 6 PLAN

N.T.S.

WALL NO. 6 ALIGNMENT TABLE

| CHAIN | STATION  | OFFSET    |
|-------|----------|-----------|
| -Y8-  | 16+70.00 | 24.00' LT |
| -Y8-  | 17+00.00 | 24.00' LT |
| -Y8-  | 17+50.00 | 24.00' LT |
| -Y8-  | 17+76.14 | 24.00' LT |
| -Y8-  | 17+95.94 | 25.17' LT |
| -Y8-  | 18+10.00 | 25.50' LT |

| ESTIMATED QUANTITY |   |
|--------------------|---|
| RETAINING WALL NO. | SOLDIER PILE RETAINING WALL (SQUARE FEET) |
| 6                  | 830                                       |



RETAINING WALL NO. 6 ELEVATION

N.T.S.

PROJECT NO.: U-4444B  
 CUMBERLAND COUNTY  
 STATION: 17+00 -Y8- LT  
 SHEET 6 OF 12

PREPARED BY: T.T. ZAN DATE: 07/2012  
 REVIEWED BY: J.R. BATTS DATE: 07/2012

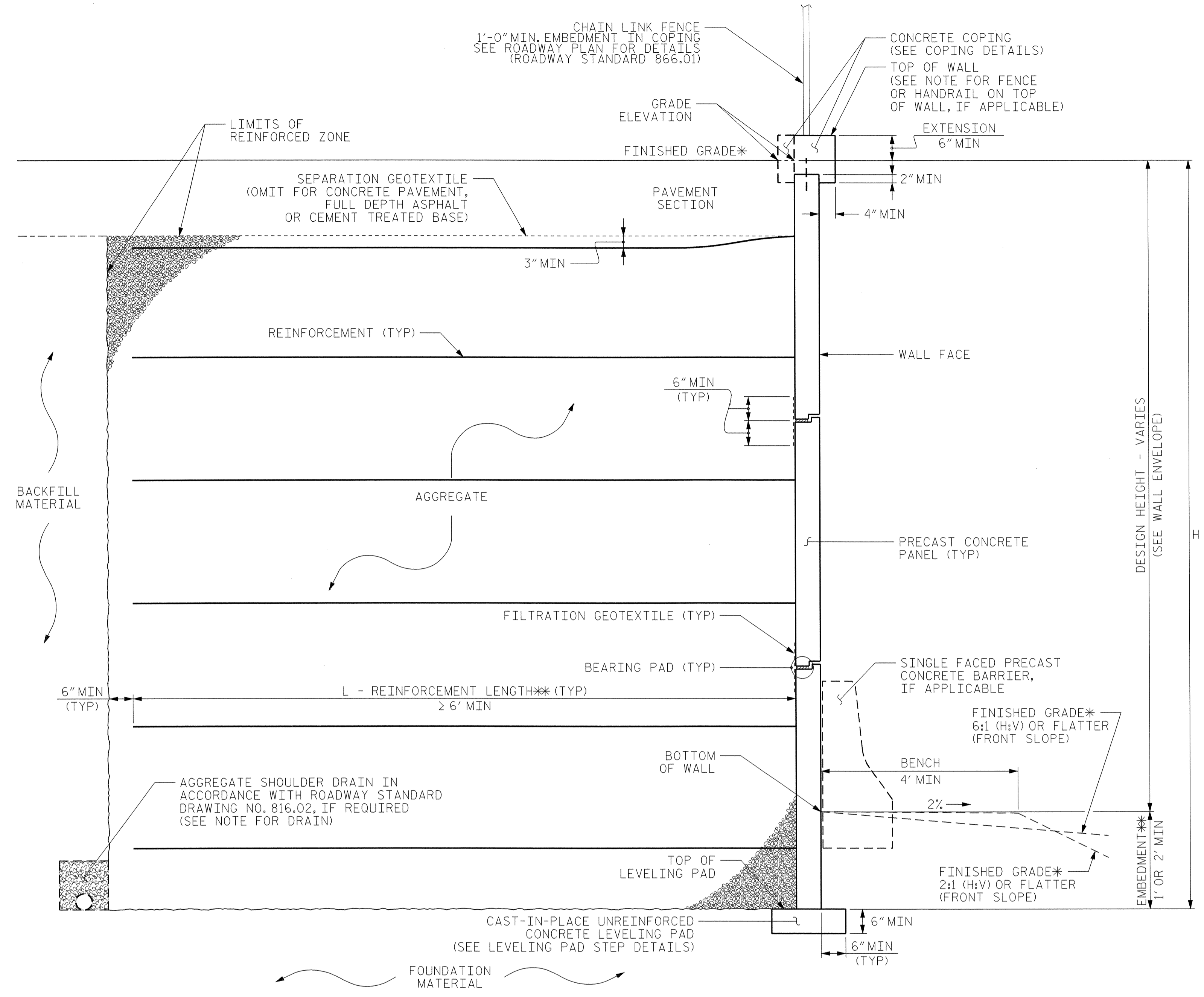
GEOTECHNICAL ENGINEERING UNIT

EASTERN REGIONAL OFFICE  
 WESTERN REGIONAL OFFICE

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

RETAINING WALL NO. 6  
 PLAN & ELEVATION

| REVISIONS |    |      |     |    |      | SHEET NO.       |
|-----------|----|------|-----|----|------|-----------------|
| NO.       | BY | DATE | NO. | BY | DATE |                 |
| 1         |    |      | 3   |    |      | W-6             |
| 2         |    |      | 4   |    |      | TOTAL SHEETS 12 |



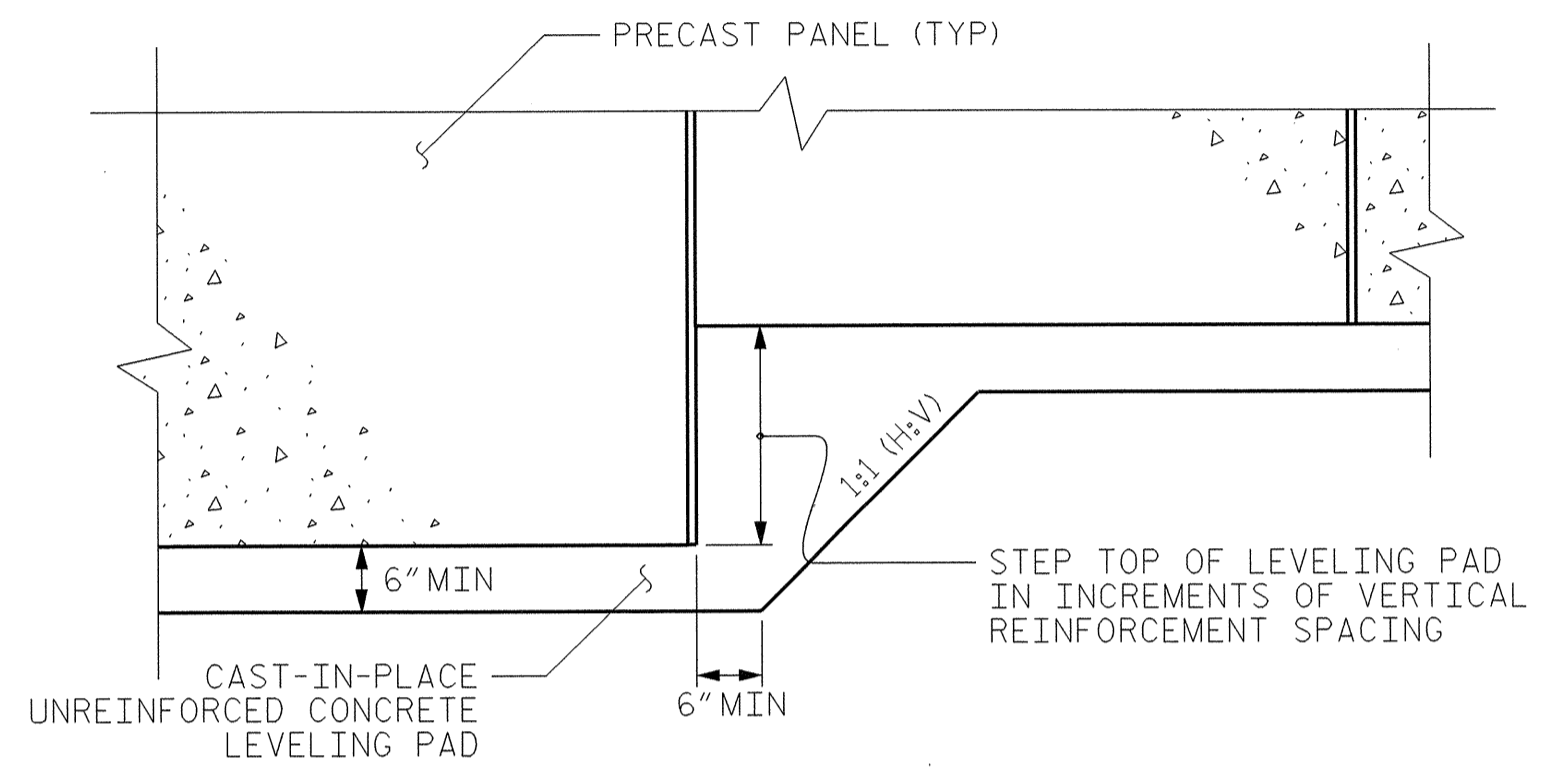
**MSE WALL WITH PRECAST PANELS - TYPICAL SECTION NO. 1**

\*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.  
 \*\*SEE MSE RETAINING WALLS PROVISION FOR EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.



**COPING DETAILS**

AT THE CONTRACTOR'S OPTION, CONNECT COPING TO PANELS WITH DOWELS OR EXTEND COPING DOWN BACK OF PANELS.  
 \*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.



**PRECAST CONCRETE PANELS**

**LEVELING PAD STEP DETAILS**

- USE MSE WALL TYPICAL SECTION & DETAIL NO.1 FOR:
- WALL NO. 1: FROM -WALL1- STA. 16+38.00 TO STA. 19+92.95
  - WALL NO. 1: FROM -WALL1- STA. 22+67.80 TO STA. 23+47.82
  - WALL NO. 2: FROM -WALL2- STA. 24+45.00 TO STA. 29+04.28
  - WALL NO. 3: FROM -WALL3- STA. 15+73.94 TO STA. 23+63.72
  - WALL NO.4: FROM -Y6C- STA. 14+67.94 TO STA. 17+00.00
  - WALL NO. 5: FROM -Y6C- STA. 14+77.76 TO STA. 17+00.00
  - WALL NO. 7: FROM -Y6C- STA. 12+96.18 TO STA. 13+03.30
  - WALL NO. 7: FROM -Y6C- STA. 13+06.01 TO STA. 13+13.13
  - WALL NO. 8: FROM -Y6C- STA. 14+60.82 TO STA. 14+67.94
  - WALL NO. 8: FROM -Y6C- STA. 14+70.65 TO STA. 14+77.76

**PROJECT NO.:** U-4444B  
**CUMBERLAND COUNTY**  
**STATION:** AS SHOWN IN PLAN  
 SHEET 7 OF 12

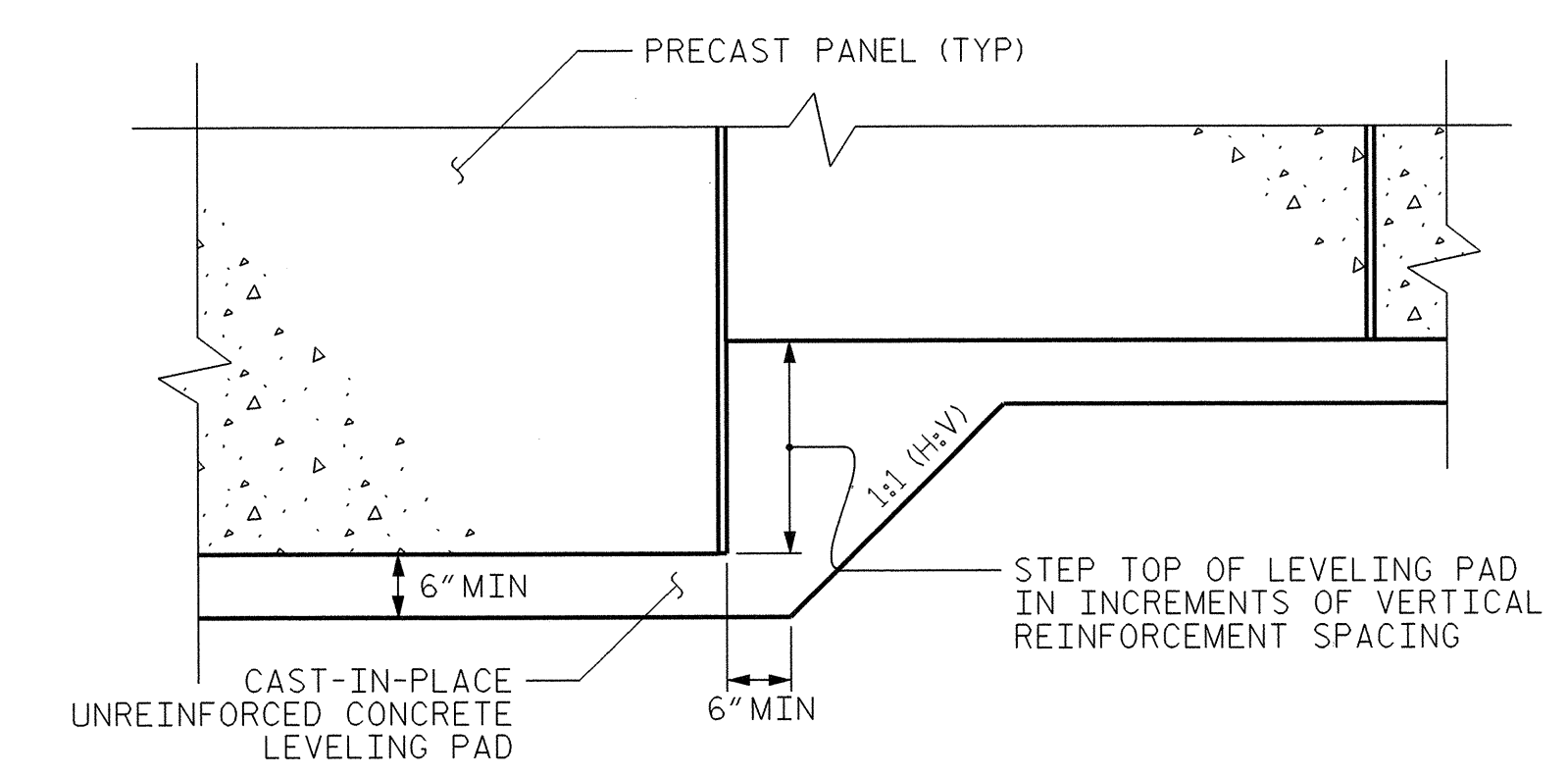
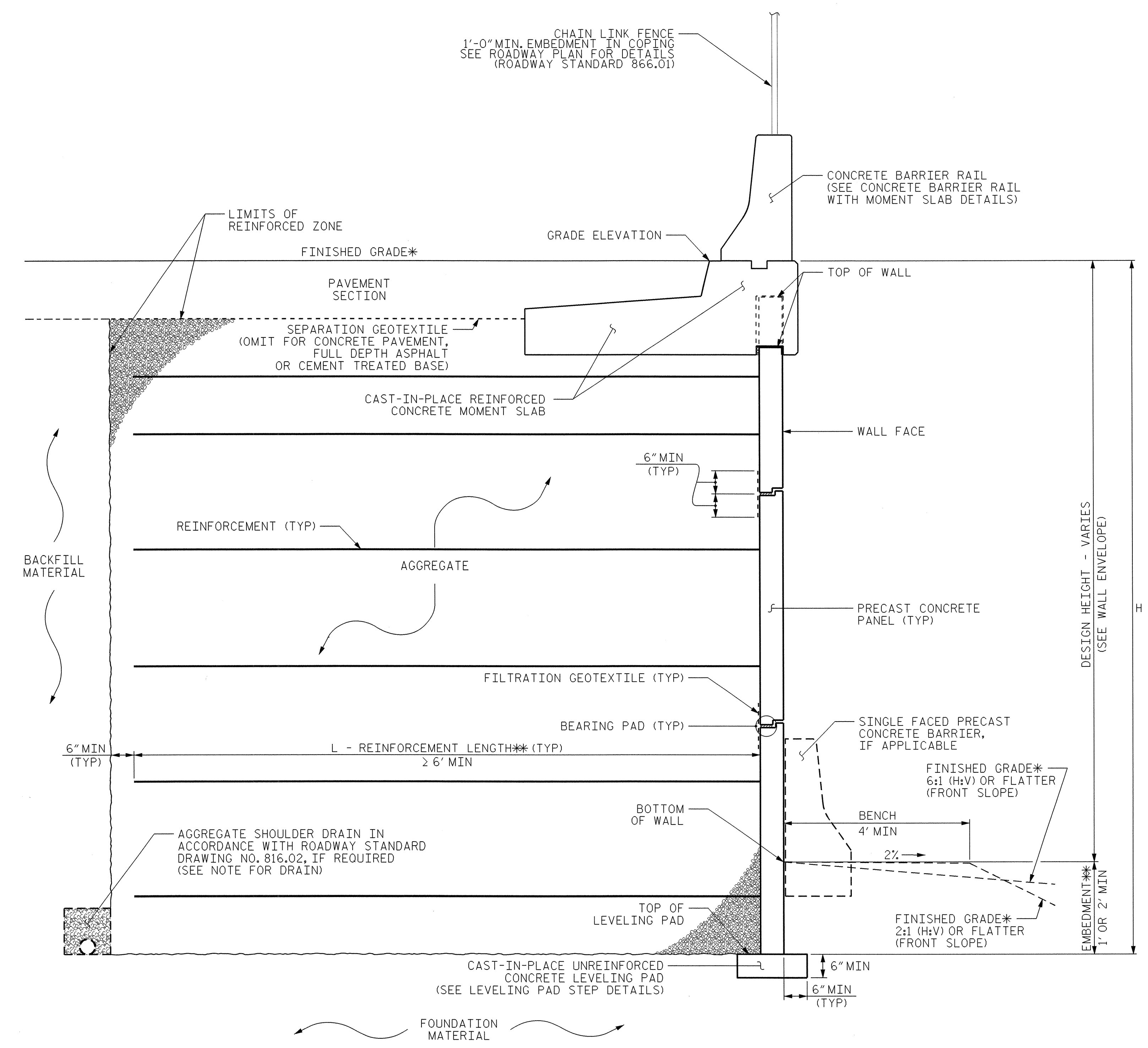
**GEOTECHNICAL ENGINEERING UNIT**

EASTERN REGIONAL OFFICE  
 WESTERN REGIONAL OFFICE

**STATE OF NORTH CAROLINA**  
**DEPARTMENT OF TRANSPORTATION**  
**RALEIGH**

**MSE RETAINING WALL TYPICAL SECTION & DETAIL NO. 1**

| REVISIONS |    |      |     |    |      | SHEET NO.    |
|-----------|----|------|-----|----|------|--------------|
| NO.       | BY | DATE | NO. | BY | DATE | TOTAL SHEETS |
| 1         |    |      | 3   |    |      | 6-7          |
| 2         |    |      | 4   |    |      | 12           |



PRECAST CONCRETE PANELS  
 LEVELING PAD STEP DETAILS

USE MSE WALL TYPICAL SECTION & DETAIL NO. 2 FOR:  
 WALL NO. 1: FROM -WALL1- STA. 19+92.95 TO STA. 22+67.80

**MSE WALL WITH PRECAST PANELS - TYPICAL SECTION NO. 2**

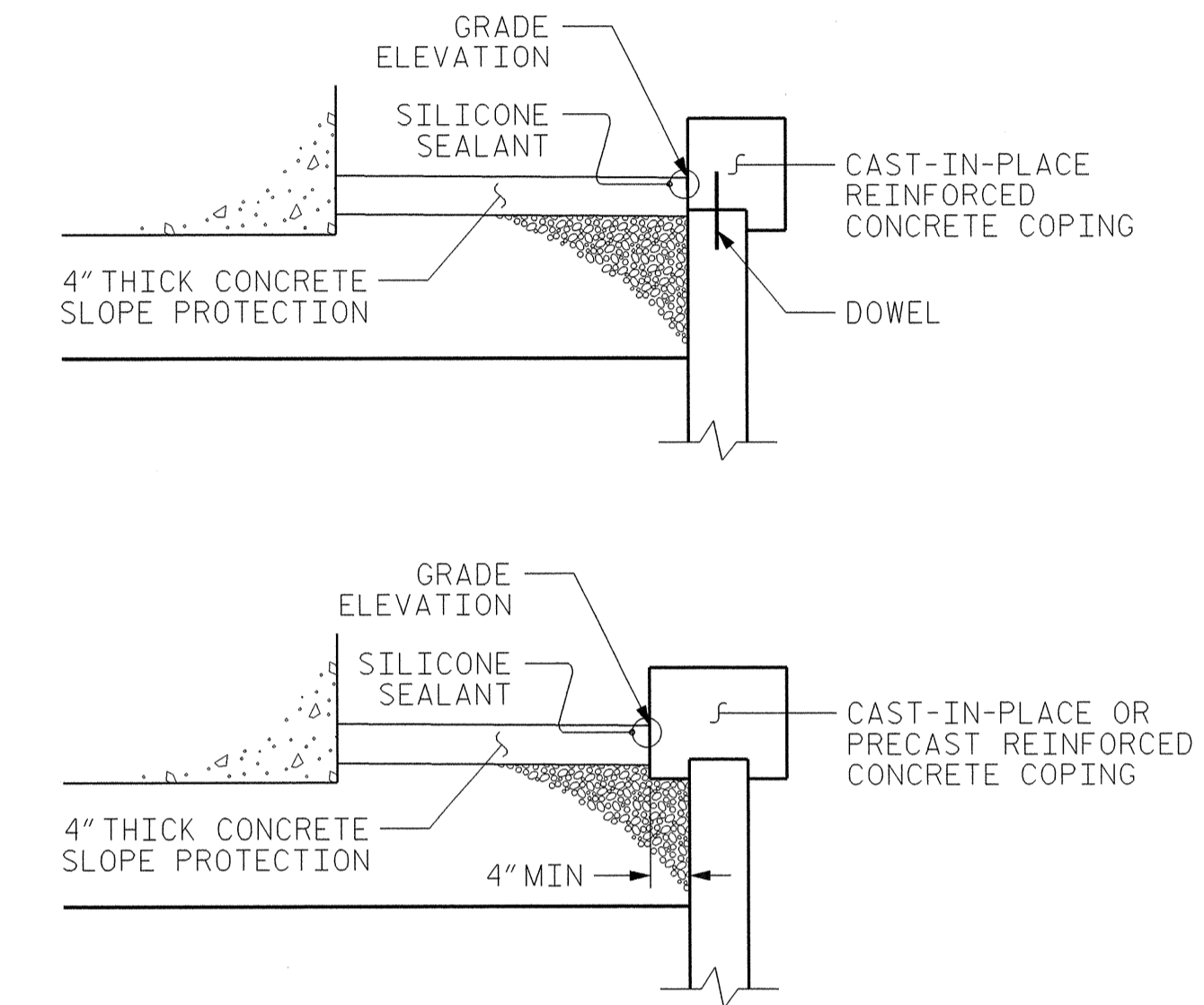
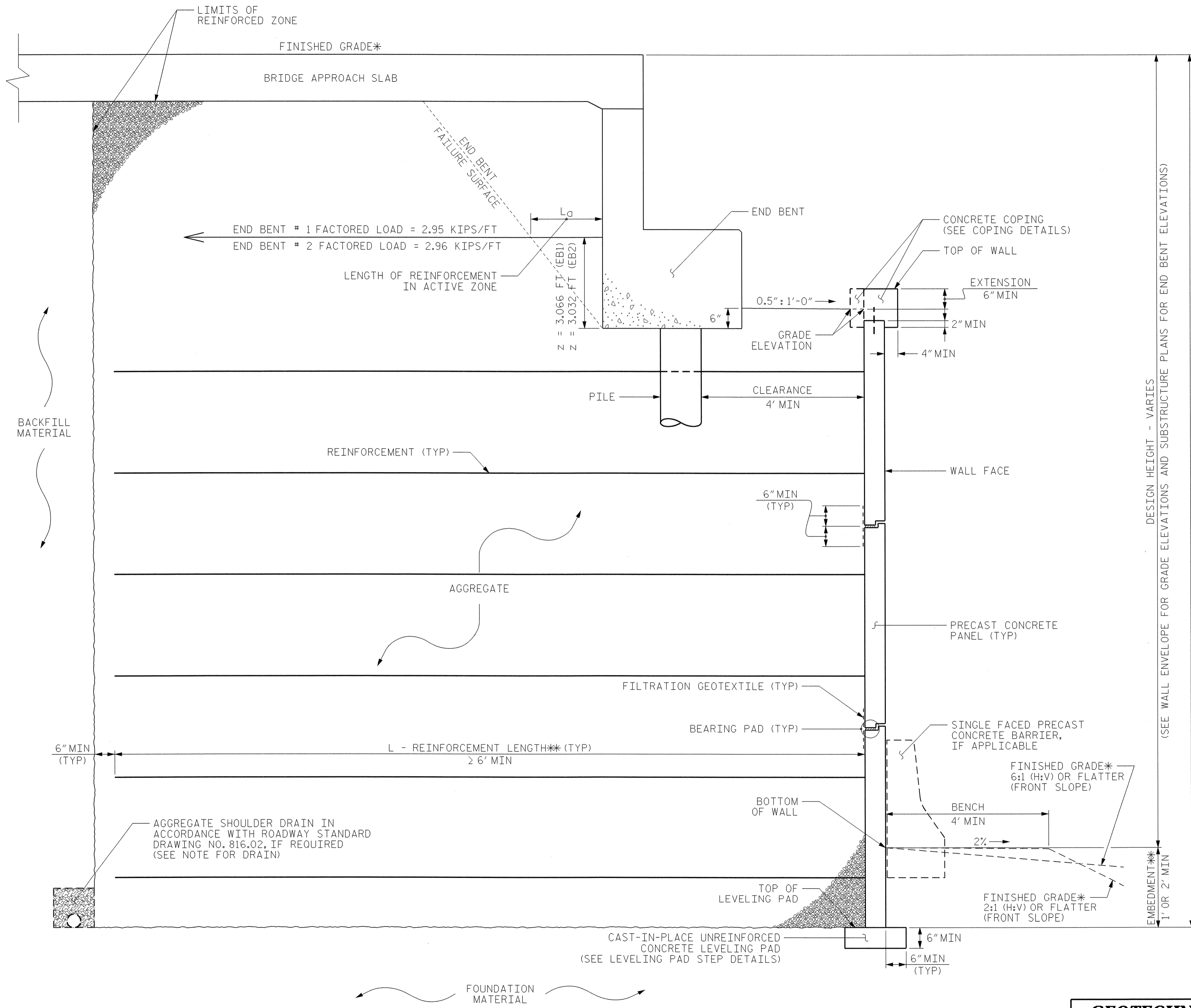
\*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.  
 \*\*SEE MSE RETAINING WALLS PROVISION FOR EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.

PROJECT NO.: U-4444B  
 CUMBERLAND COUNTY  
 STATION: AS SHOWN IN PLAN  
 SHEET 8 OF 12

PREPARED BY: T.T. ZAN DATE: 07/2012  
 REVIEWED BY: J.R. BATTS DATE: 07/2012

**GEOTECHNICAL ENGINEERING UNIT**  
 EASTERN REGIONAL OFFICE  
 WESTERN REGIONAL OFFICE  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

| REVISIONS |    |      |     |    |      | SHEET NO.    |
|-----------|----|------|-----|----|------|--------------|
| NO.       | BY | DATE | NO. | BY | DATE | W-8          |
| 1         |    |      | 3   |    |      | TOTAL SHEETS |
| 2         |    |      | 4   |    |      | 12           |



**COPING DETAILS**

AT THE CONTRACTOR'S OPTION, CONNECT COPING TO PANELS WITH DOWELS OR EXTEND COPING DOWN BACK OF PANELS.

USE MSE WALL TYPICAL SECTION & DETAIL NO. 3 FOR:  
 WALL NO. 7: FROM -Y6C- STA. 13+03.30 TO STA. 13+13.13  
 WALL NO. 8: FROM -Y6C- STA. 14+70.65 TO STA. 14+60.82

**MSE ABUTMENT WALL WITH PRECAST PANELS - TYPICAL SECTION 3**

\*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.  
 \*\*SEE MSE RETAINING WALLS PROVISION FOR EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.

PREPARED BY: T.T. ZAN DATE: 07/2012  
 REVIEWED BY: J.R. BATTS DATE: 07/2012

**GEOTECHNICAL ENGINEERING UNIT**  
 EASTERN REGIONAL OFFICE  
 WESTERN REGIONAL OFFICE  
**STATE OF NORTH CAROLINA**  
**DEPARTMENT OF TRANSPORTATION**  
**RALEIGH**

**PROJECT NO.:** U-4444B  
**CUMBERLAND COUNTY**  
**STATION:** AS SHOWN IN PLAN  
 SHEET 9 OF 12

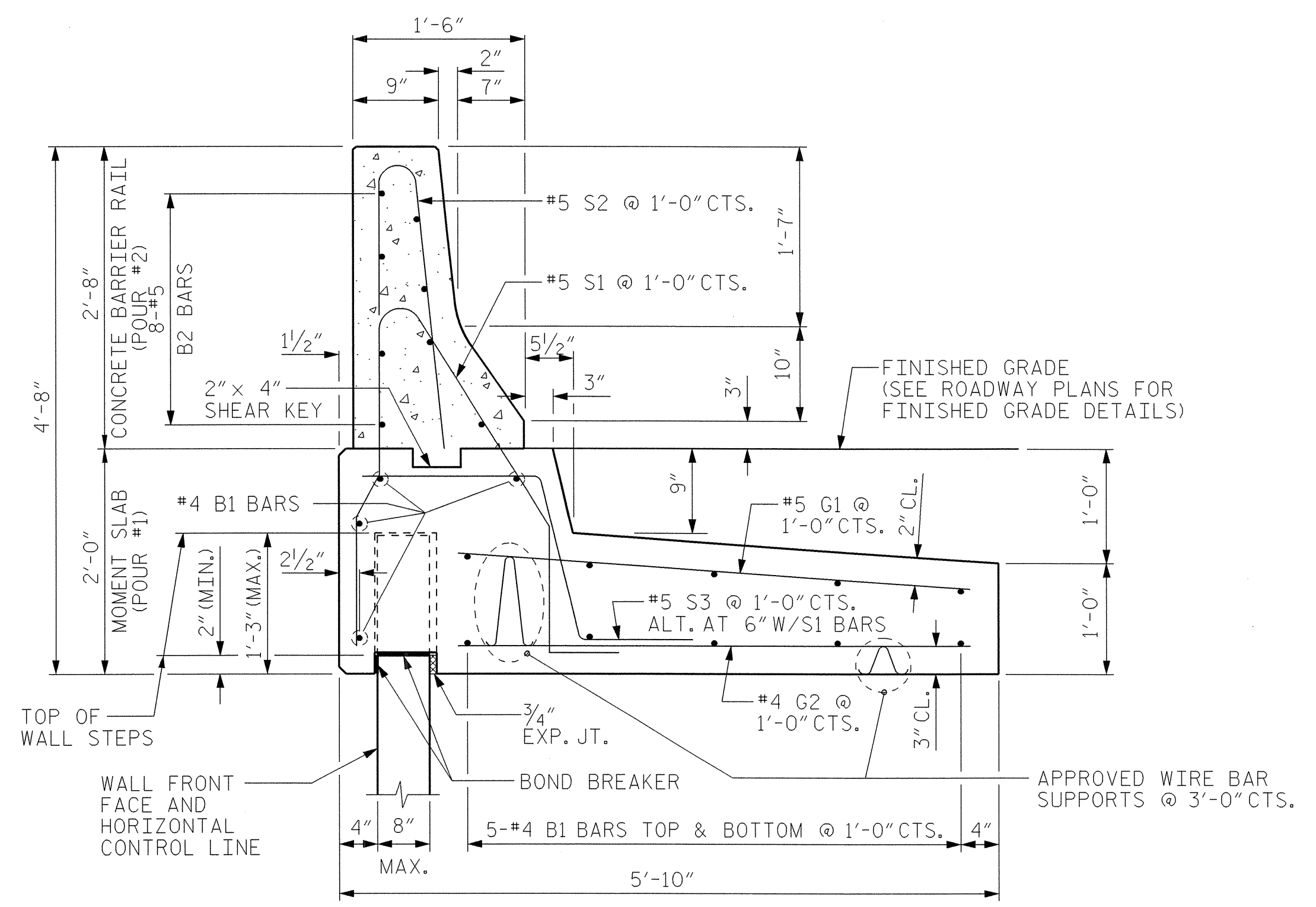
**MSE RETAINING WALL TYPICAL SECTION & DETAIL NO. 3**

| REVISIONS |    |      |     |    |      | SHEET NO. |
|-----------|----|------|-----|----|------|-----------|
| NO.       | BY | DATE | NO. | BY | DATE |           |
| 1         |    |      | 3   |    |      | W-9       |
| 2         |    |      | 4   |    |      | 12        |

GEOTECHNICAL ENGINEER ENGINEER

**SEAL**  
30943  
NORTH CAROLINA PROFESSIONAL ENGINEER  
THEIR UN ZIN

7/22/12  
SIGNATURE DATE SIGNATURE DATE



CONCRETE BARRIER RAIL WITH MOMENT SLAB

**NOTES:**

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

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

EXPANSION JOINTS SHALL BE PLACED IN THE BARRIER RAIL AND MOMENT SLAB AT A MAXIMUM SPACING OF 30'.

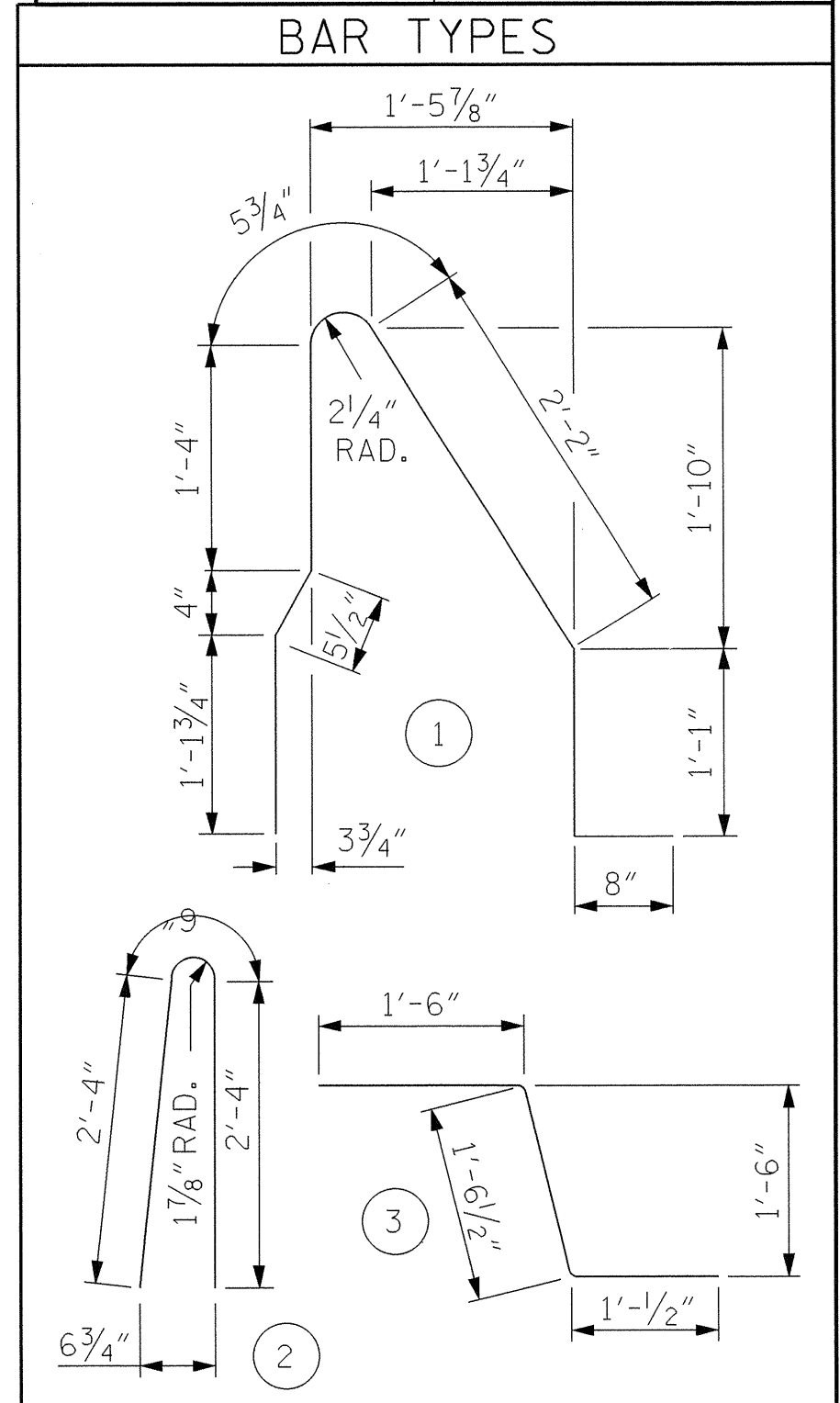
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED SURFACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MID-POINT OF BARRIER RAIL SEGMENTS LESS THAN 20' IN LENGTH.

THE BARRIER RAIL SHALL NOT BE CAST UNTIL THE MOMENT SLAB HAS ATTAINED AN AGE OF THREE CURING DAYS OR A MINIMUM COMPRESSIVE STRENGTH OF 2,000 PSI. IN ADDITION, NO FILL MATERIAL, ASPHALT, OR CONSTRUCTION EQUIPMENT IS ALLOWED ON THE MOMENT SLAB PRIOR TO SATISFYING THE MINIMUM CONCRETE CURING AND STRENGTH REQUIREMENTS.

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

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

CONCRETE BARRIER RAIL WITH MOMENT SLAB  
PAY LENGTH = 275 LIN FT



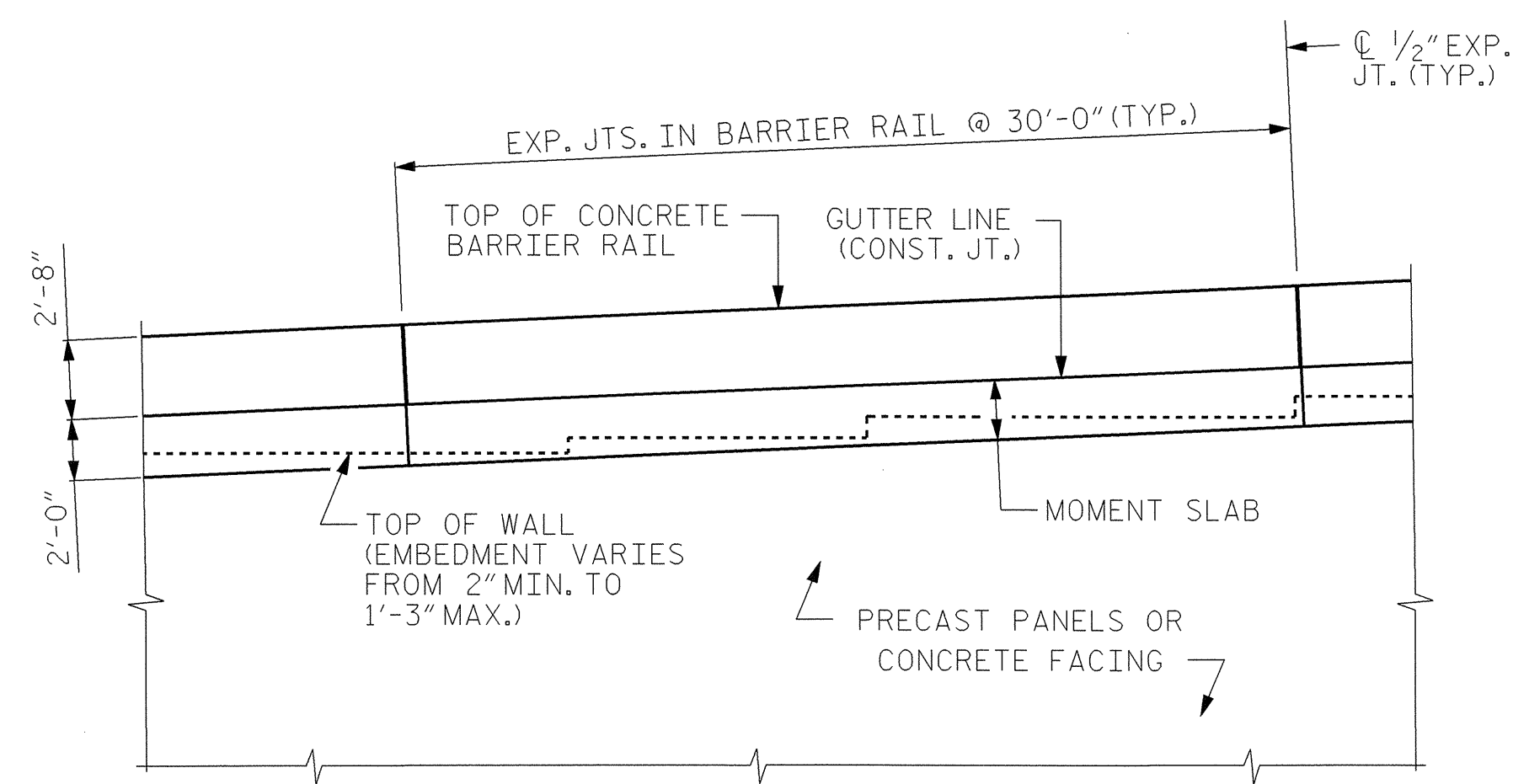
ALL BAR DIMENSIONS ARE OUT TO OUT

**BILL OF MATERIAL**

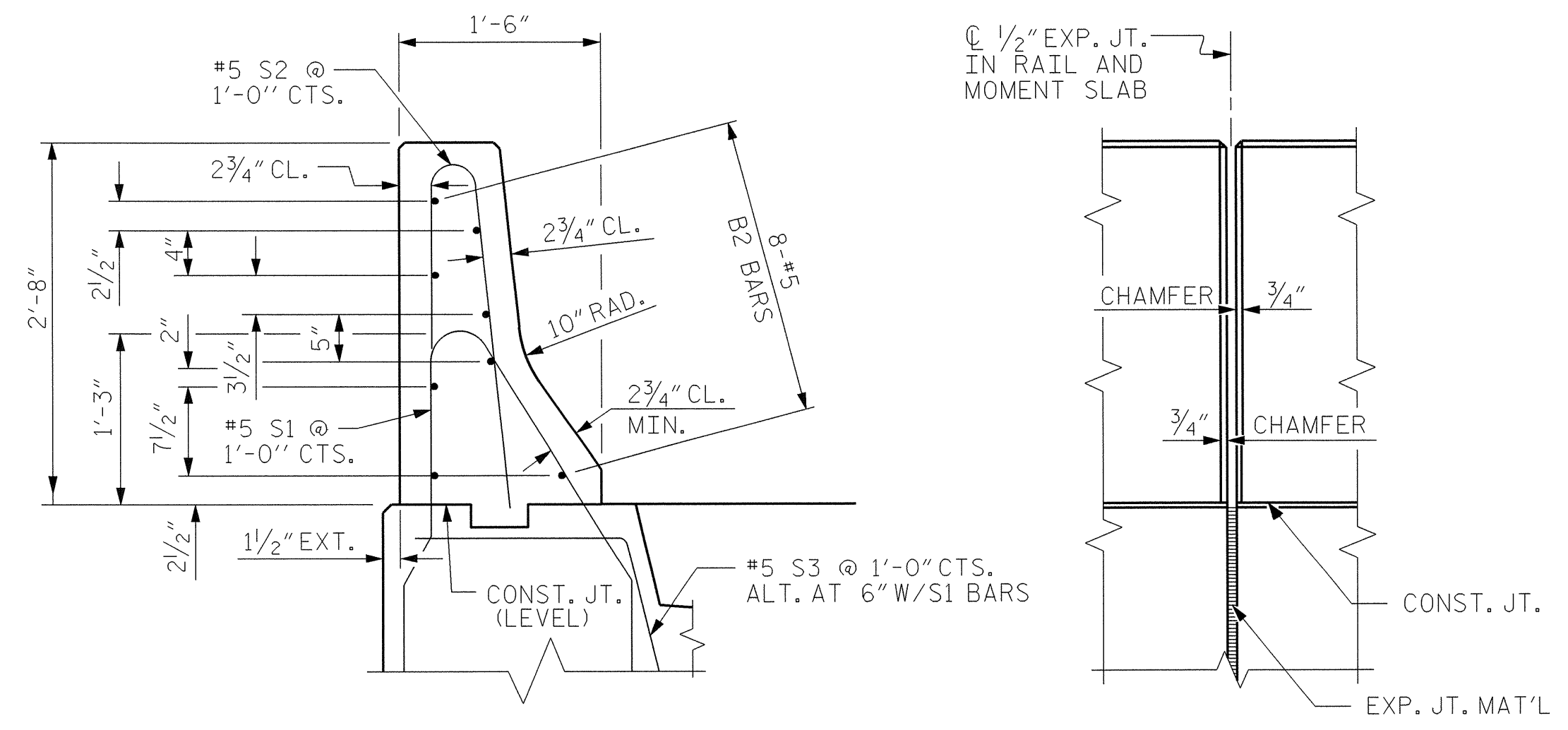
FOR ONE 30'-0" SECTION OF CONCRETE BARRIER RAIL WITH MOMENT SLAB

| BAR  | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|------|-----|------|------|--------|--------|
| B1   | 14  | #4   | STR  | 29'-7" | 277    |
| * B2 | 8   | #5   | STR  | 29'-7" | 247    |
| G1   | 31  | #5   | STR  | 4'-4"  | 140    |
| G2   | 31  | #4   | STR  | 4'-4"  | 90     |
| * S1 | 31  | #5   | 1    | 7'-3"  | 234    |
| * S2 | 31  | #5   | 2    | 5'-2"  | 167    |
| S3   | 30  | #5   | 3    | 4'-1"  | 128    |

|  |           |
|--|-----------|
| REINFORCING STEEL                      | 635 LB    |
| * EPOXY COATED REINFORCING STEEL       | 648 LB    |
| CLASS AA CONCRETE BARRIER RAIL         | 3.1 CY    |
| CLASS A CONCRETE MOMENT SLAB           | 9.1 CY    |
| CONCRETE BARRIER RAIL WITH MOMENT SLAB | 30 LIN FT |



CONCRETE BARRIER RAIL WITH MOMENT SLAB - PARTIAL ELEVATION



SECTION THRU RAIL

ELEV. @ EXP. JOINTS

BARRIER RAIL DETAILS

**PROJECT NO.:** U-4444B  
**CUMBERLAND COUNTY**  
**STATION:** AS SHOWN IN PLAN

SHEET 10 OF 12

**CONCRETE BARRIER RAIL WITH MOMENT SLAB FOR PRECAST PANELS AND CONCRETE FACING**

| REVISIONS |    |      |     |    |      | SHEET NO.<br>W-10 |
|-----------|----|------|-----|----|------|-------------------|
| NO.       | BY | DATE | NO. | BY | DATE |                   |
| 1         |    |      | 3   |    |      | TOTAL SHEETS      |
| 2         |    |      | 4   |    |      |                   |

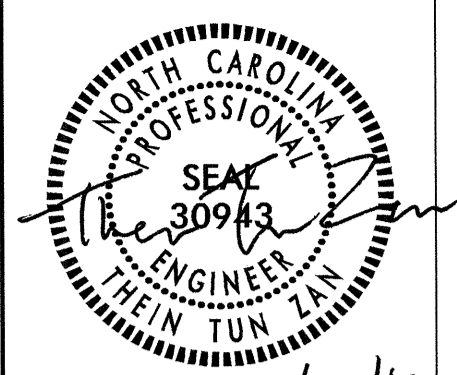
PREPARED BY: T.T. ZAN DATE: 07/2012  
REVIEWED BY: J.R. BATTS DATE: 07/2012

**GEOTECHNICAL ENGINEERING UNIT**

EASTERN REGIONAL OFFICE  
 WESTERN REGIONAL OFFICE

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH



|   |  |
|---|--|
| GEOTECHNICAL<br>ENGINEER<br><br>SIGNATURE <u>7/20/12</u> DATE | ENGINEER<br><br><br><br><br>SIGNATURE _____ DATE _____ |
|---|--|

**NOTES:**

FOR MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALLS, SEE MECHANICALLY STABILIZED EARTH RETAINING WALLS PROVISION.

FOR STEEL BEAM GUARDRAIL, SEE ROADWAY PLANS AND SECTION 862 OF THE STANDARD SPECIFICATIONS.

FOR SINGLE FACED PRECAST CONCRETE BARRIER, SEE ROADWAY PLANS AND SECTION 857 OF THE STANDARD SPECIFICATIONS.

A CONCRETE BARRIER RAIL WITH MOMENT SLAB IS REQUIRED ABOVE RETAINING WALL NO.1 FROM -WALL1- STA.19+92.95 TO STA.22+67.80. SEE PLANS FOR CONCRETE BARRIER RAIL WITH MOMENT SLAB DETAILS.

A FENCE IS REQUIRED ON TOP OF RETAINING WALL NO.1 THROUGH WALL NO.5, WALL NO.7 AND WALL NO.8. SEE ROADWAY PLANS FOR FENCE ATTACHMENT DETAILS.

USE AN MSE WALL SYSTEM WITH PRECAST CONCRETE PANELS THAT MEET SECTION 1077 OF THE STANDARD SPECIFICATIONS FOR RETAINING WALL NO.1 THROUGH WALL NO.5, WALL NO.7 AND WALL NO.8.

CAST-IN-PLACE REINFORCED CONCRETE COPING IS REQUIRED FOR RETAINING WALL NO.1 THROUGH WALL NO.5, WALL NO.7 AND WALL NO.8.

A DRAIN IS NOT REQUIRED FOR RETAINING WALL NO.1 THROUGH WALL NO.5, WALL NO.7 AND WALL NO.8.

BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALL NO.1 THROUGH WALL NO.5, WALL NO.7 AND WALL NO.8, SURVEY WALL LOCATIONS AND SUBMIT A REVISED WALL PROFILE VIEW (WALL ENVELOPE) FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THE REVISED WALL ENVELOPE IS ACCEPTED.

DESIGN RETAINING WALL NO.1 THROUGH WALL NO.5, WALL NO.7 AND WALL NO.8 FOR THE FOLLOWING:

- 1) H = DESIGN HEIGHT + EMBEDMENT
- 2) DESIGN LIFE = 100 YEARS
- 3) MAXIMUM FACTORED VERTICAL STRESS ON FOUNDATION MATERIAL = 6,000 LB/SF
- 4) AGGREGATE PARAMETERS:

| AGGREGATE TYPE* | UNIT WEIGHT<br>( $\gamma$ )<br>LB/CF | FRICTION ANGLE<br>( $\phi$ )<br>DEGREES | COHESION<br>(c)<br>LB/SF |
|-----------------|--------------------------------------|---|--------------------------|
| COARSE          | 110                                  | 38                                      | 0                        |
| FINE            | 125                                  | 34                                      | 0                        |

\*SEE MSE RETAINING WALLS PROVISION FOR COARSE AND FINE AGGREGATE MATERIAL REQUIREMENTS.

5) IN-SITU ASSUMED MATERIAL PARAMETERS:

| MATERIAL TYPE | UNIT WEIGHT<br>( $\gamma$ )<br>LB/CF | FRICTION ANGLE<br>( $\phi$ )<br>DEGREES | COHESION<br>(c)<br>LB/SF |
|---------------|--------------------------------------|---|--------------------------|
| BACKFILL      | 120                                  | 30                                      | 0                        |
| FOUNDATION    | 120                                  | 30                                      | 0                        |

DESIGN RETAINING WALL NO.1 THROUGH WALL NO.5, WALL NO.7 AND WALL NO.8 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

DESIGN REINFORCEMENT CONNECTED TO END BENT CAPS FOR FACTORED LOAD AND LENGTH OF REINFORCEMENT IN ACTIVE ZONE (L<sub>a</sub>) SHOWN. CAST REINFORCEMENT CONNECTORS INTO CAP BACKWALL FOR END BENT NO.1. LOCATED AT -Y6C- STA.13+01.10. MAINTAIN A CLEARANCE OF AT LEAST 3" BETWEEN CONNECTORS AND REINFORCING STEEL IN CAP.

DESIGN REINFORCEMENT CONNECTED TO END BENT CAPS FOR FACTORED LOAD AND LENGTH OF REINFORCEMENT IN ACTIVE ZONE (L<sub>a</sub>) SHOWN. CAST REINFORCEMENT CONNECTORS INTO CAP BACKWALL FOR END BENT NO.2. LOCATED AT -Y6C- STA.14+72.85. MAINTAIN A CLEARANCE OF AT LEAST 3" BETWEEN CONNECTORS AND REINFORCING STEEL IN CAP.

EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO.1 THROUGH WALL NO.5, WALL NO.7 AND WALL NO.8.

FOUNDATIONS FOR END BENT NO.1 LOCATED AT -Y6C- STA.13+01.10 MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO.7. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

FOUNDATIONS FOR END BENT NO.2 LOCATED AT -Y6C- STA.14+72.85 MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO.8. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALL NO.1 THROUGH WALL NO.5, WALL NO.7 AND WALL NO.8 UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.

**PROJECT NO.:** U-4444B  
**CUMBERLAND COUNTY**  
**STATION:** AS SHOWN IN PLAN

SHEET 11 OF 12

**RETAINING WALL NO. 1 - NO. 5  
 WALL NO. 7 & NO. 8  
 MSE RETAINING WALL NOTES**

**REVISIONS**

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

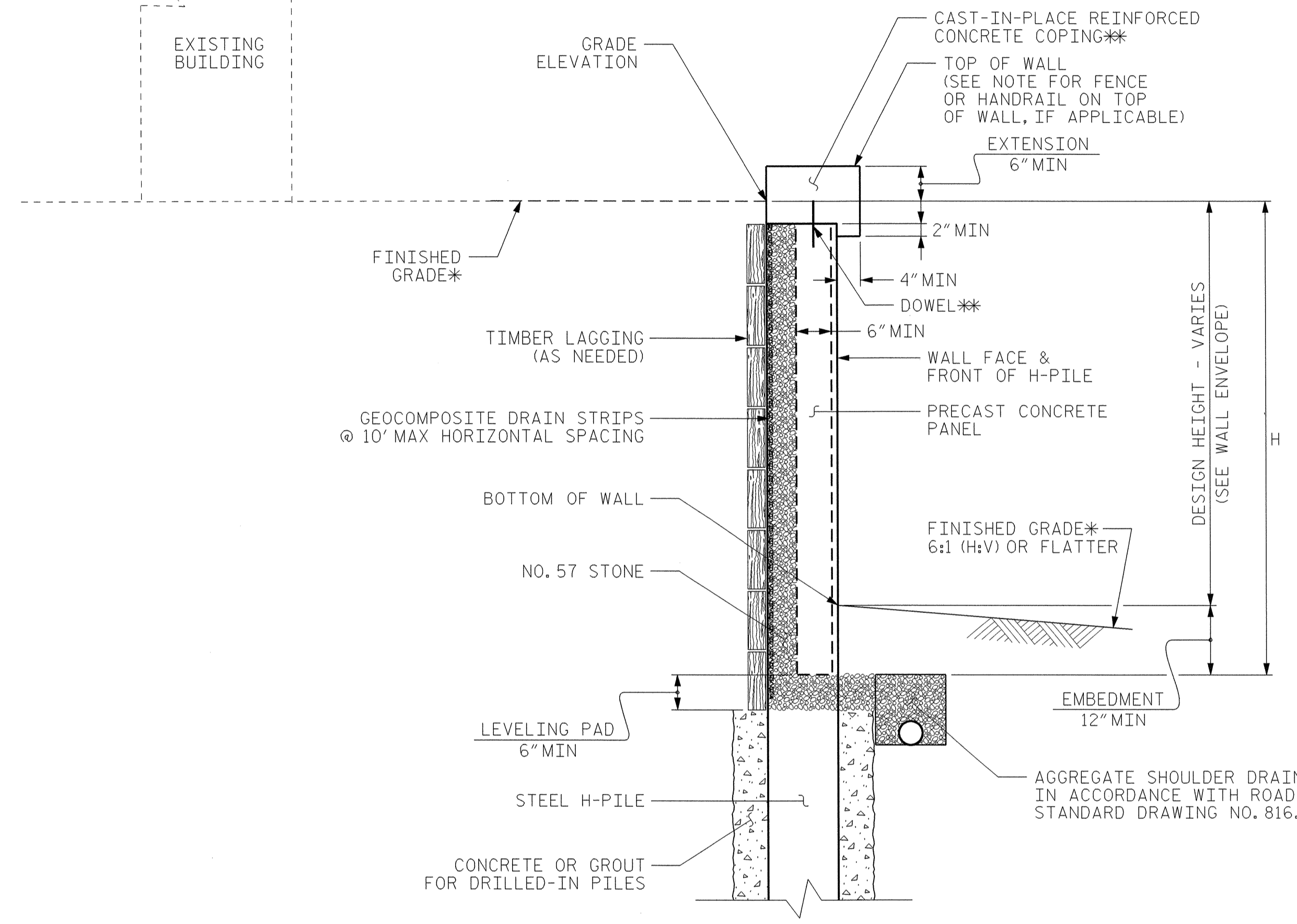
SHEET NO.  
W-11  
TOTAL SHEETS  
12

**GEOTECHNICAL ENGINEERING UNIT**

EASTERN REGIONAL OFFICE  
 WESTERN REGIONAL OFFICE

**STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH**

|                         |               |
|-------------------------|---------------|
| PREPARED BY: T.T. ZAN   | DATE: 07/2012 |
| REVIEWED BY: J.R. BATTS | DATE: 07/2012 |



**SOLDIER PILE WALL WITH PRECAST PANEL - TYPICAL SECTION**

\*SEE ROADWAY PLANS FOR FINISHED GRADE AND DITCH DETAILS.  
 \*\*AT THE CONTRACTOR'S OPTION, EXTEND COPING DOWN BACK OF PANELS AT LEAST 2" INSTEAD OF USING DOWELS.

N.T.S.

**NOTES:**

- FOR SOLDIER PILE RETAINING WALLS, SEE SOLDIER PILE RETAINING WALLS PROVISION.
- FOR FENCE OR HANDRAIL, SEE ROADWAY PLANS.
- PAINT PILES GRAY TO MATCH CONCRETE FOR RETAINING WALL NO. 6.
- DRILLED-IN H-PILES ARE REQUIRED FOR RETAINING WALL NO. 6.
- USE A SOLDIER PILE RETAINING WALL WITH PRECAST CONCRETE PANELS THAT MEET SECTION 1077 OF THE STANDARD SPECIFICATIONS FOR RETAINING WALL NO. 6.
- BEFORE BEGINNING SOLDIER PILE WALL DESIGN FOR RETAINING WALL NO. 6, SURVEY WALL LOCATION AND SUBMIT A REVISED WALL PROFILE VIEW (WALL ENVELOPE) FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THE REVISED WALL ENVELOPE IS ACCEPTED.
- DESIGN RETAINING WALL NO. FOR THE FOLLOWING:
  - 1) H = DESIGN HEIGHT + EMBEDMENT
  - 2) DESIGN LIFE = 75 YEARS
  - 3) IN-SITU ASSUMED MATERIAL PARAMETERS:
    - UNIT WEIGHT,  $\gamma$  = 120 LB/CF
    - FRICTION ANGLE,  $\phi$  = 30 DEGREES
    - COHESION,  $c$  = 0 LB/SF

**PROJECT NO.:** U-4444B  
**CUMBERLAND COUNTY**  
**STATION:** AS SHOWN IN PLAN  
 SHEET 12 OF 12

PREPARED BY: T.T. ZAN  
 REVIEWED BY: J.R. BATTS  
 DATE: 07/2012  
 DATE: 07/2012

**GEOTECHNICAL ENGINEERING UNIT**  
 EASTERN REGIONAL OFFICE  
 WESTERN REGIONAL OFFICE  
**STATE OF NORTH CAROLINA**  
**DEPARTMENT OF TRANSPORTATION**  
**RALEIGH**

| REVISIONS |    |      |     |    |      | SHEET NO. |
|-----------|----|------|-----|----|------|-----------|
| NO.       | BY | DATE | NO. | BY | DATE |           |
| 1         |    |      | 3   |    |      | W-12      |
| 2         |    |      | 4   |    |      | 12        |

RETAINING WALL NO. 6  
SOLDIER PILE WALL  
TYPICAL SECTION & NOTES

## 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<br>OF TIMBER | ----- | 375 LBS. PER SQ. IN.             |
| EQUIVALENT FLUID PRESSURE OF EARTH              | ----- | 30 LBS. PER CU. FT.<br>(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

JANUARY, 1990

STD. NO. SN