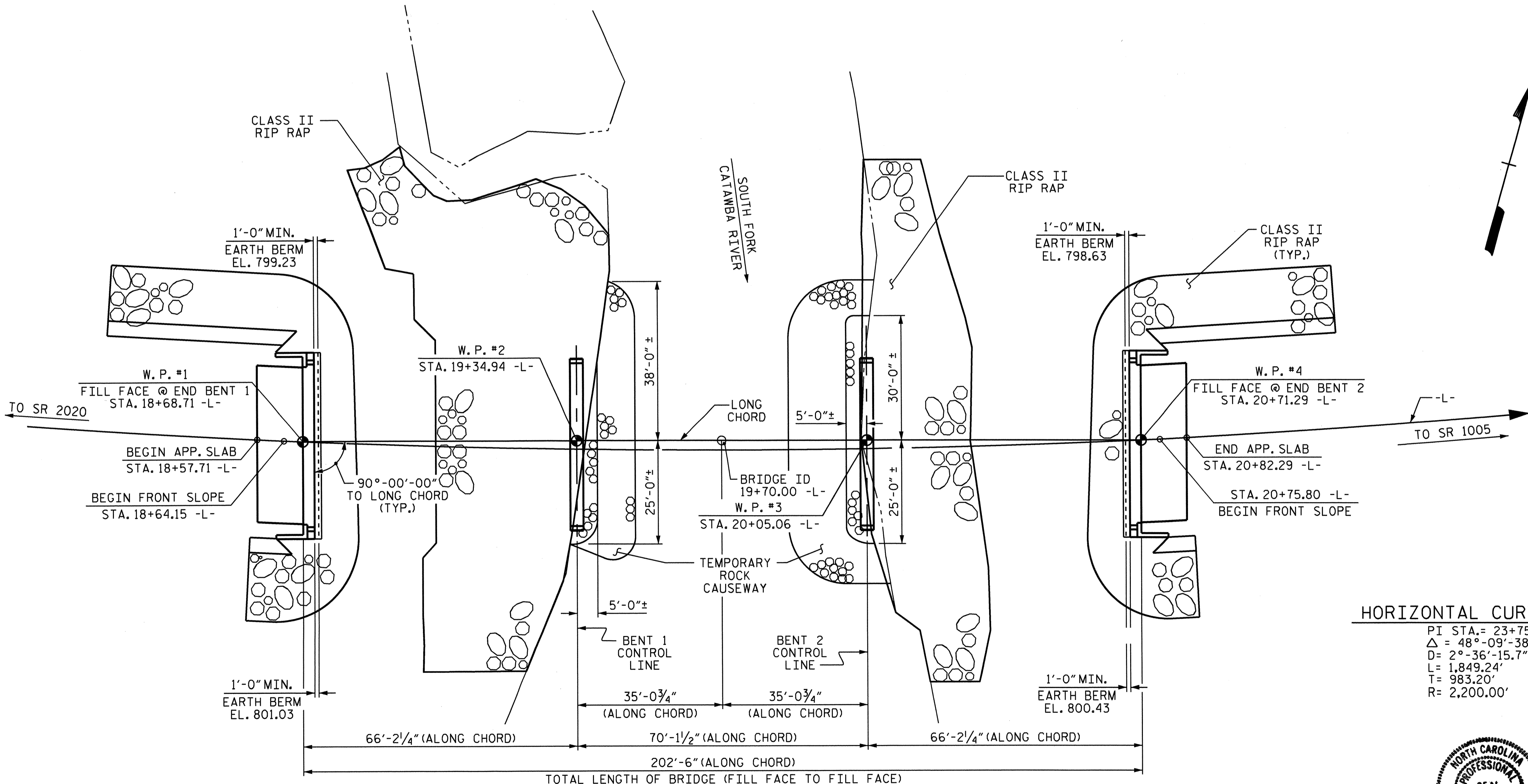
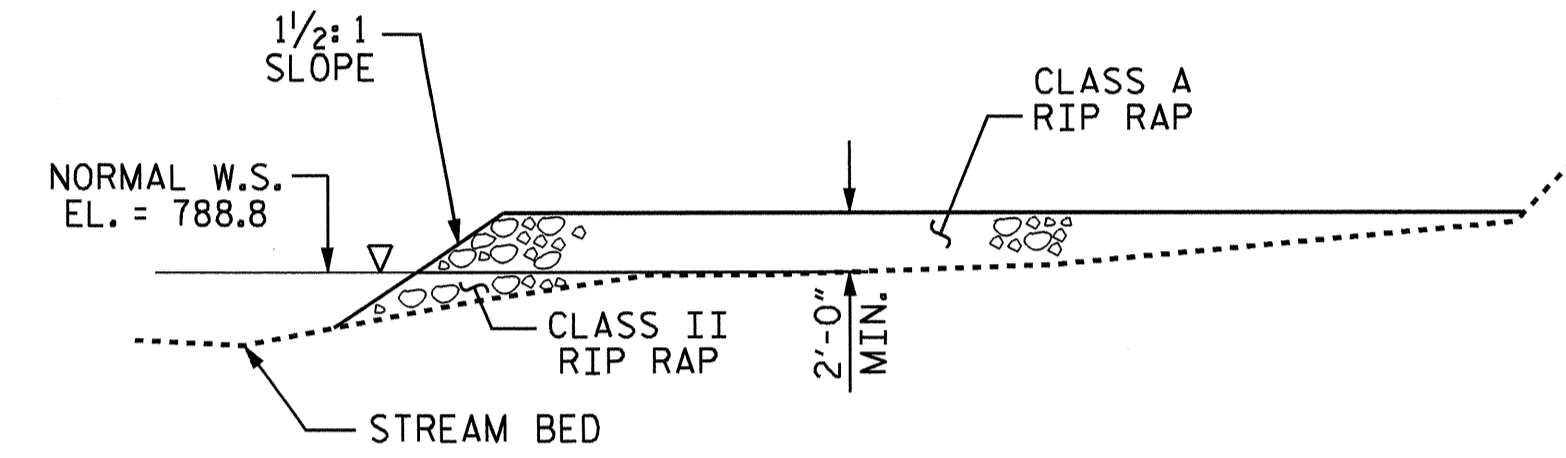
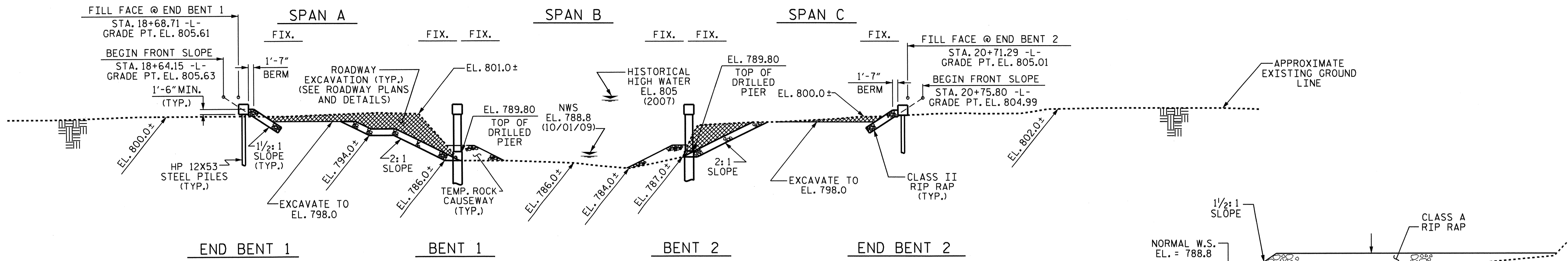




-5.8375% -0.3000%  
 STA. 16+00.00 -L-  
 EL. = 806.42  
 VC=355'  
**GRADE DATA**

810  
 800  
 790  
 780  
 770



I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. B-4458  
CATAWBA COUNTY  
 STATION: 19+70.00 -L-

**HORIZONTAL CURVE DATA**  
 PI STA. = 23+75.75 -L-  
 $\Delta = 48^\circ-09'-38.4"$  (LT)  
 D = 2°-36'-15.7"  
 L = 1,849.24'  
 T = 983.20'  
 R = 2,200.00'

SHEET 1 OF 4 REPLACES BRIDGE NO. 95

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

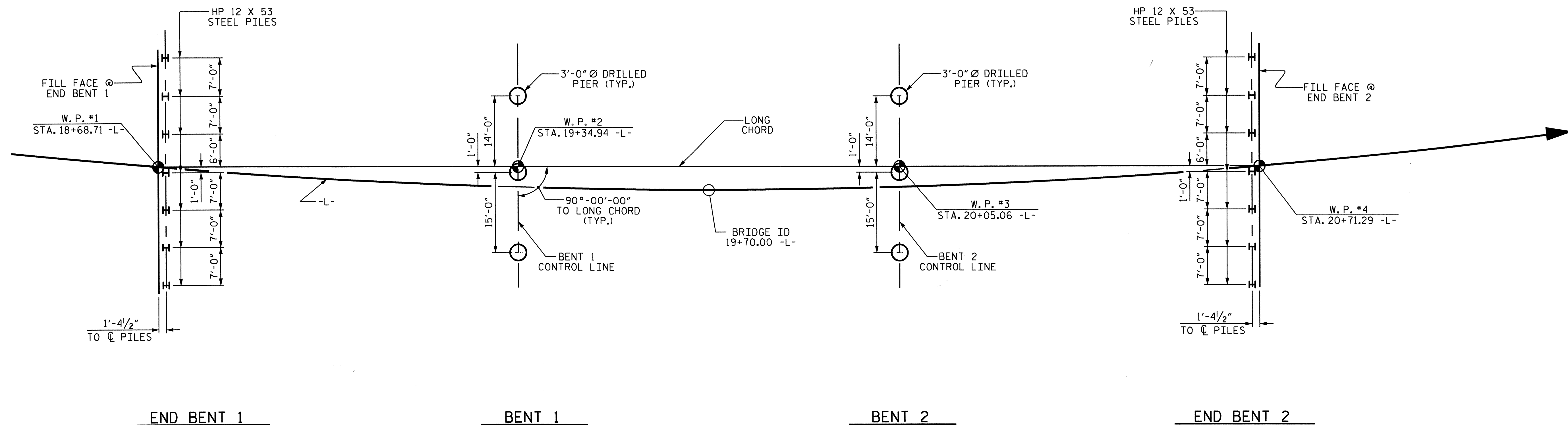
**GENERAL DRAWING**  
 FOR BRIDGE OVER SOUTH FORK  
 CATAWBA RIVER ON SR 2019  
 (ROCKY FORD RD.) BETWEEN  
 SR 2020 AND SR 1005

*Seal of Professional Engineer*  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 21638  
 LAURA E. SUTTON  
 9/17/12

WORKPOINTS 2 AND 3 ARE LOCATED ON THE LONG CHORD, SEE LONG CHORD LAYOUT FOR -L- OFFSETS AT BENTS 1 & 2.

DRAWN BY: J.D. HAWK DATE: 3/12  
 CHECKED BY: B.N. GRADY DATE: 4/12

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



### FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES AND DRILLED PIERS ARE SHOWN TO CENTERLINE OF PILES AND DRILLED PIERS.

### FOUNDATION NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 90 TONS PER PILE.

DRIVE PILES AT END BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 150 TONS PER PILE.

FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

DRILLED PIERS AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE 485 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 80 TSF.

PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT BENT 1. IF REQUIRED, DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 776.0 WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT STEEL CASINGS.

INSTALL DRILLED PIERS AT BENT 1 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 763.0; SATISFY THE REQUIRED TIP RESISTANCE AND HAVE A PENETRATION OF AT LEAST 6 FT. INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

THE SCOUR CRITICAL ELEVATION FOR BENT 1 IS ELEVATION 773.5. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

DRILLED PIERS AT BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE 480 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 80 TSF.

PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT BENT 2. IF REQUIRED, DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 776.0 WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT STEEL CASINGS.

INSTALL DRILLED PIERS AT BENT 2 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 763.0 (LT), 759.0 (CT), AND 755.0 (RT); SATISFY THE REQUIRED TIP RESISTANCE AND HAVE A PENETRATION OF AT LEAST 6 FT. INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

THE SCOUR CRITICAL ELEVATION FOR BENT 2 IS ELEVATION 770.0. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

SPT TESTING MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SPT TESTING. FOR SPT TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

SID INSPECTIONS MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SID INSPECTIONS. FOR SID INSPECTIONS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

CSL TUBES ARE REQUIRED AND CSL TESTING MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR CSL TESTING. FOR CSL TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 90 TONS PER PILE.

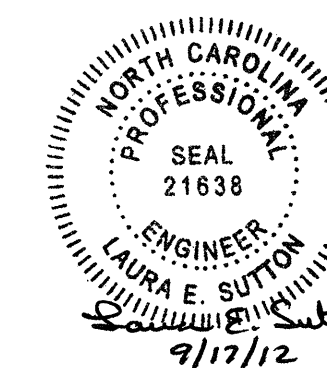
DRIVE PILES AT END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 150 TONS PER PILE.

PROJECT NO. B-4458  
CATAWBA COUNTY  
 STATION: 19+70.00 -L-

SHEET 2 OF 4

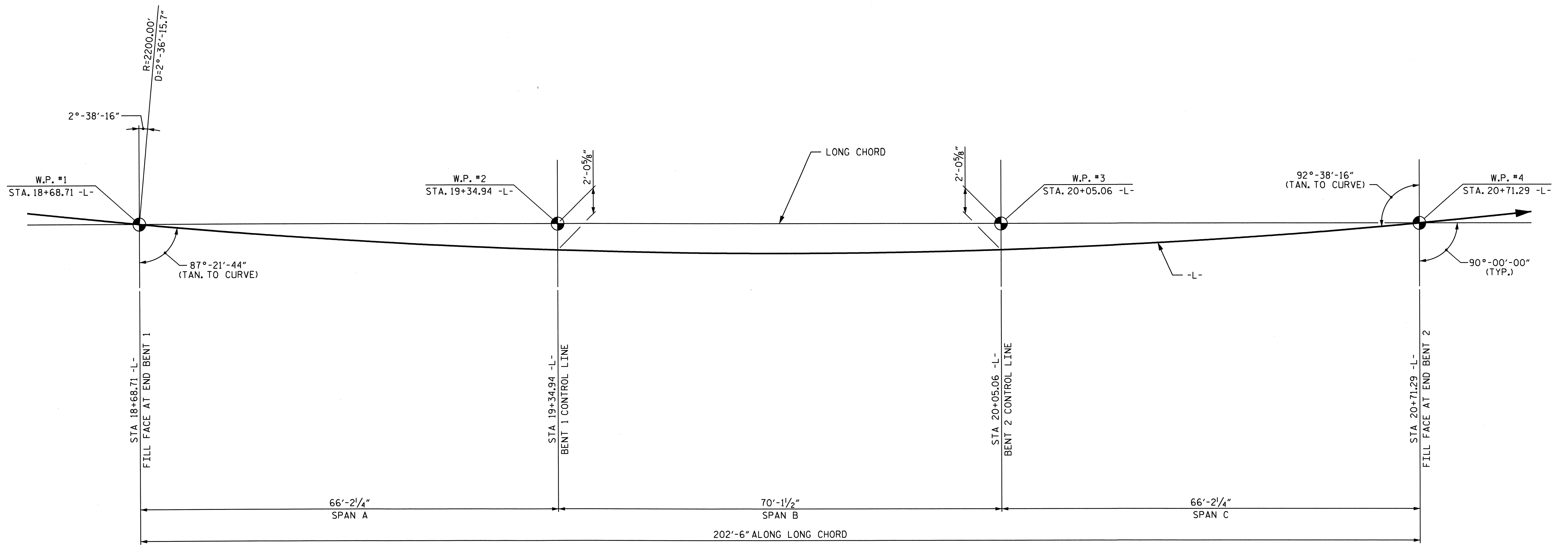
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

GENERAL DRAWING  
 FOR BRIDGE OVER SOUTH FORK  
 CATAWBA RIVER ON SR 2019  
 (ROCKY FORK RD.) BETWEEN  
 SR 2020 AND SR 1005



DRAWN BY: J.D. HAWK DATE: 3/12  
 CHECKED BY: B.N. GRADY DATE: 4/12

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



**LONG CHORD LAYOUT**

ALL BENTS ARE PARALLEL.

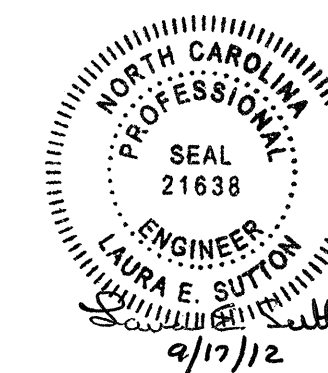
P.I. = 23+75.75  
 DELTA = 48°-09'-38.4" (LT.)  
 D = 2°-36'-15.7"  
 T = 983.20'  
 L = 1849.24'  
 R = 2200.00'

HORIZONTAL CURVE DATA -L-

PROJECT NO. B-4458  
CABARRUS COUNTY  
 STATION: 19+70.00 -L-

SHEET 3 OF 4

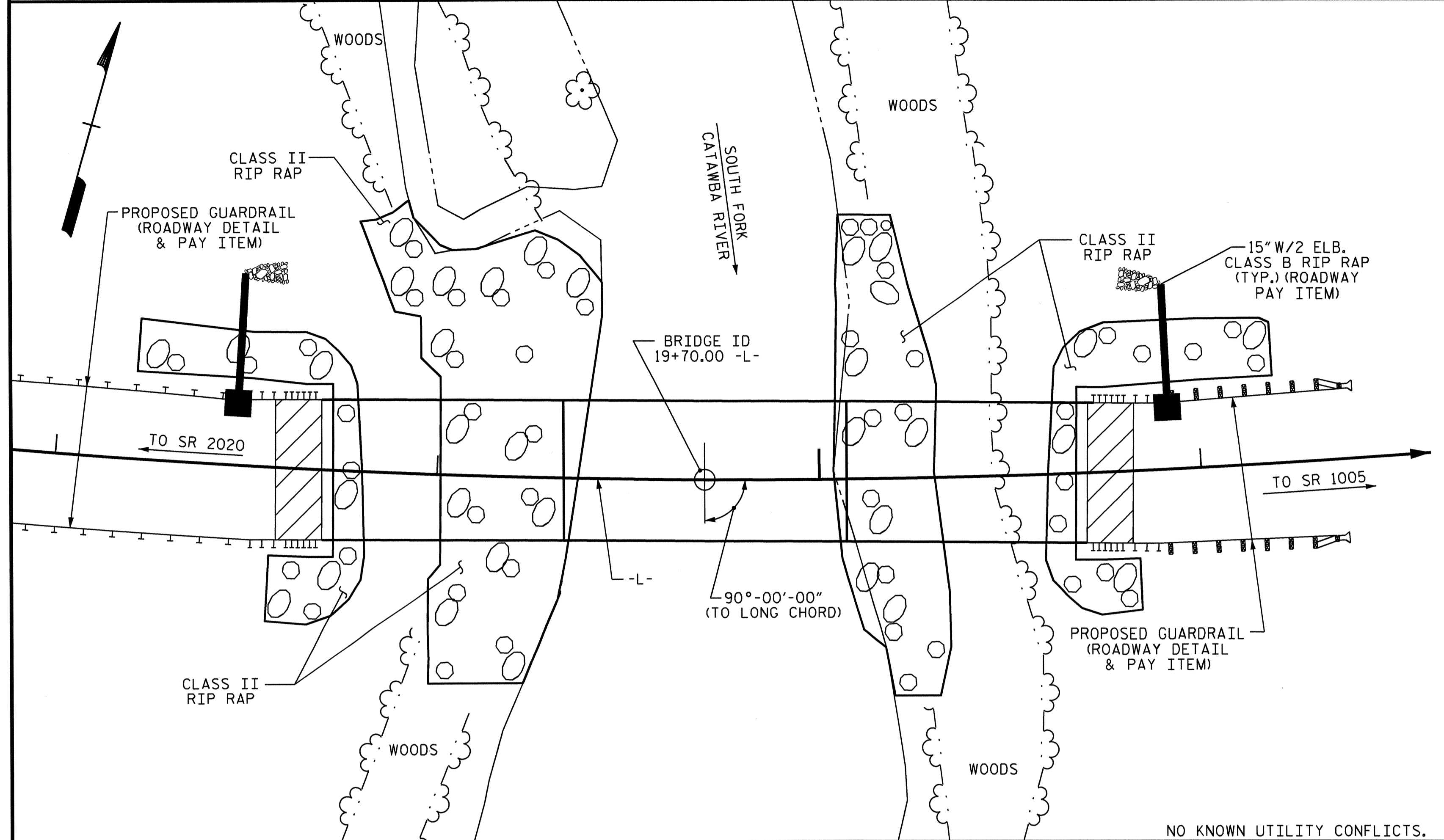
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GENERAL DRAWING  
 LONG CHORD  
 LAYOUT



DRAWN BY: L.E. SUTTON DATE: 3/05/12  
 CHECKED BY: J.D. HAWK DATE: 4/05/12

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

B.M. #1: 8 IN. SPIKE IN THE ROOT OF A TREE 763.10' LT. OF STA. 21+18.48 -L- EL. 801.32



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.  
 THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.  
 THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.  
 AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING STRUCTURE CONSISTING OF 2 @ 37'-9" SPANS, TIMBER DECK ON CONTINUOUS STEEL GIRDERS, A CLEAR ROADWAY WIDTH OF 11.3' SUPPORTED BY VERTICAL MASONRY ABUTMENT END BENTS AND STEEL CAP AND PILE BENT AND LOCATED 735 FT. ± UPSTREAM FROM PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.  
 REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.  
 THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 35 FT. EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR ROADWAY EXCAVATION. SEE ROADWAY PLANS.  
 ASPHALT WEARING SURFACE IS INCLUDED IN ROADWAY QUANTITY ON ROADWAY PLANS.

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH HEC 18, "EVALUATING SCOUR AT BRIDGES", MAY, 2001.  
 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 SPICED 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.  
 INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 19+70.00 -L-."  
 AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR "CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 19+70.00 -L-."  
 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.

| HYDRAULIC DATA                       |                 |
|--------------------------------------|-----------------|
| DESIGN DISCHARGE                     | = 12000 CFS     |
| FREQUENCY OF DESIGN FLOOD            | = 10 YEARS      |
| DESIGN HIGH WATER ELEVATION          | = 804.60        |
| DRAINAGE AREA                        | = 217.1 SQ. MI. |
| BASIC DISCHARGE (0100)               | = 26919 CFS     |
| BASIC HIGH WATER ELEVATION           | = 809.90        |
| OVERTOPPING FLOOD DATA               |                 |
| OVERTOPPING DISCHARGE                | = 12,500 CFS    |
| FREQUENCY OF OVERTOPPING FLOOD       | = 10+ YEARS     |
| OVERTOPPING FLOOD ELEVATION          | = 804.50 *      |
| * OT OCCURS AT SAG STA. 24+24.26 -L- |                 |

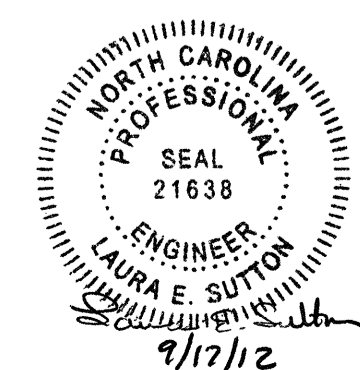
TOTAL BILL OF MATERIAL

|                | CONSTRUCTION, MAINTENANCE, AND REMOVAL OF TEMPORARY ACCESS | REMOVAL OF EXISTING STRUCTURE | 3'-0" DIA. DRILLED PIERS IN SOIL | 3'-0" DIA. DRILLED PIERS NOT IN SOIL | PERMANENT STEEL CASING FOR 3'-0" DIA. DRILLED PIER | SID INSPECTIONS | SPT TESTING | CSL TESTING | CLASS A CONCRETE | BRIDGE APPROACH SLABS | REINFORCING STEEL | SPIRAL COLUMN REINFORCING STEEL | HP 12 x 53 STEEL PILES | TWO BAR METAL RAIL | 1'-2" X 2'-11/4" CONCRETE PARAPET | RIP RAP CLASS II (2'-0" THICK) | GEOTEXTILE FOR DRAINAGE | ELASTOMERIC BEARINGS | 3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLABS |          |         |
|----------------|--|-------------------------------|----------------------------------|--------------------------------------|--|-----------------|-------------|-------------|------------------|-----------------------|-------------------|---------------------------------|------------------------|--------------------|-----------------------------------|--------------------------------|-------------------------|----------------------|--|----------|---------|
|                | LUMP SUM   | LUMP SUM                      | LIN. FT.                         | LIN. FT.                             | LIN. FT.   | EACH            | EACH        | EACH        | CU. YDS.         | LUMP SUM              | LBS.              | LBS.                            | NO.                    | LIN. FT.           | LIN. FT.                          | TONS                           | SQ. YDS.                | LUMP SUM             | NO.  | LIN. FT. |         |
| SUPERSTRUCTURE |  |                               |                                  |                                      |  |                 |             |             |                  | LUMP SUM              |                   |                                 |                        | 385.50             | 400.50                            |                                |                         | LUMP SUM             | 39   | 2600.00  |         |
| END BENT 1     |  |                               |                                  |                                      |  |                 |             |             | 16.0             |                       | 2,377             |                                 | 7                      | 245                |                                   | 200                            | 225                     |                      |  |          |         |
| BENT 1         |  |                               | 46.50                            | 34.00                                | 41.40  |                 |             |             | 20.2             |                       | 11,540            | 1,926                           |                        |                    |                                   | 444                            | 595                     |                      |  |          |         |
| BENT 2         |  |                               | 58.50                            | 34.00                                | 41.40  |                 |             |             | 20.1             |                       | 12,138            | 2,113                           |                        |                    |                                   | 255                            | 345                     |                      |  |          |         |
| END BENT 2     |  |                               |                                  |                                      |  |                 |             |             | 16.0             |                       | 2,377             |                                 | 7                      | 210                |                                   | 180                            | 200                     |                      |  |          |         |
| TOTAL          | LUMP SUM   | LUMP SUM                      | 105.00                           | 68.00                                | 82.80  | 1               | 1           | 1           | 72.3             | LUMP SUM              | 28,432            | 4,039                           | 14                     | 455                | 385.50                            | 400.50                         | 1,079                   | 1,365                | LUMP SUM                                       | 39       | 2600.00 |

PROJECT NO. B-4458  
CATAWBA COUNTY  
 STATION: 19+70.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GENERAL DRAWING  
 FOR BRIDGE OVER SOUTH FORK CATAWBA RIVER ON SR 2019 (ROCKY FORD RD.) BETWEEN SR 2020 AND SR 1005



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

DRAWN BY: J.D. HAWK DATE: 3/12  
 CHECKED BY: B.N. GRADY DATE: 4/12

LOAD FACTORS:

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

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

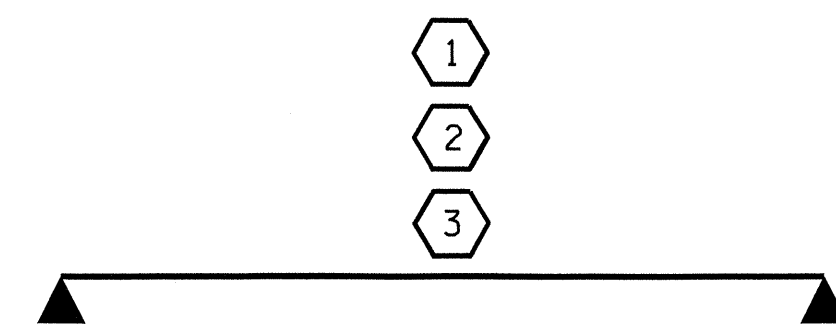
| LEVEL                    | VEHICLE    | WEIGHT (W)<br>(TONS) | CONTROLLING<br>LOAD RATING | MINIMUM<br>RATING FACTORS<br>(RF) | TONS = W X RF | STRENGTH I LIMIT STATE |                              |               |      |                 |   |                              |               |      |                 | SERVICE III LIMIT STATE                   |                     |                              |               |      | COMMENT NUMBER |                 |   |  |
|--------------------------|------------|----------------------|----------------------------|-----------------------------------|---------------|------------------------|------------------------------|---------------|------|-----------------|---|------------------------------|---------------|------|-----------------|---|---------------------|------------------------------|---------------|------|----------------|-----------------|---|--|
|                          |            |                      |                            |                                   |               | MOMENT                 |                              |               |      |                 | SHEAR                                     |                              |               |      |                 | MOMENT                                    |                     |                              |               |      |                |                 |   |  |
|                          |            |                      |                            |                                   |               | LIVELOAD<br>FACTORS    | DISTRIBUTION<br>FACTORS (DF) | RATING FACTOR | SPAN | GIRDER LOCATION | DISTANCE FROM<br>LEFT END OF<br>SPAN (ft) | DISTRIBUTION<br>FACTORS (DF) | RATING FACTOR | SPAN | GIRDER LOCATION | DISTANCE FROM<br>LEFT END OF<br>SPAN (ft) | LIVELOAD<br>FACTORS | DISTRIBUTION<br>FACTORS (DF) | RATING FACTOR | SPAN |                | GIRDER LOCATION | DISTANCE FROM<br>LEFT END OF<br>SPAN (ft) |  |
| DESIGN<br>LOAD<br>RATING | HL-93(InV) | N/A                  | <b>1</b>                   | 1.018                             | --            | 1.75                   | 0.274                        | 1.05          | 65'  | EL              | 32  | 0.513                        | 1.2           | 65'  | EL              | 6.4                                       | 0.80                | 0.274                        | <b>1.02</b>   | 65'  | EL             | <b>32</b>       |   |  |
|                          | HL-93(OpR) | N/A                  | --                         | 1.358                             | --            | 1.35                   | 0.274                        | 1.36          | 65'  | EL              | 32  | 0.513                        | 1.56          | 65'  | EL              | 6.4                                       | N/A                 | --                           | --            | --   | --             | --              |   |  |
|                          | HS-20(InV) | 36.000               | <b>2</b>                   | 1.306                             | 47.014        | 1.75                   | 0.274                        | 1.34          | 65'  | EL              | 32  | 0.513                        | 1.48          | 65'  | EL              | 6.4                                       | 0.80                | 0.274                        | <b>1.31</b>   | 65'  | EL             | <b>32</b>       |   |  |
|                          | HS-20(OpR) | 36.000               | --                         | 1.742                             | 62.706        | 1.35                   | 0.274                        | 1.74          | 65'  | EL              | 32  | 0.513                        | 1.92          | 65'  | EL              | 6.4                                       | N/A                 | --                           | --            | --   | --             | --              |   |  |
| LEGAL<br>LOAD<br>RATING  | SV         | SNSH                 | 13,500                     | --                                | 2.868         | 38.725                 | 1.4                          | 0.274         | 3.69 | 65'             | EL  | 32                           | 0.513         | 4.33 | 65'             | EL  | 6.4                 | 0.80                         | 0.274         | 2.87 | 65'            | EL              | 32  |  |
|                          |            | SNGARBS2             | 20,000                     | --                                | 2.171         | 43.424                 | 1.4                          | 0.274         | 2.79 | 65'             | EL  | 32                           | 0.513         | 3.11 | 65'             | EL  | 6.4                 | 0.80                         | 0.274         | 2.17 | 65'            | EL              | 32  |  |
|                          |            | SNAGRIS2             | 22,000                     | --                                | 2.071         | 45.552                 | 1.4                          | 0.274         | 2.66 | 65'             | EL  | 32                           | 0.513         | 2.89 | 65'             | EL  | 6.4                 | 0.80                         | 0.274         | 2.07 | 65'            | EL              | 32  |  |
|                          |            | SNCOTTS3             | 27,250                     | --                                | 1.428         | 38.924                 | 1.4                          | 0.274         | 1.84 | 65'             | EL  | 32                           | 0.513         | 2.17 | 65'             | EL  | 6.4                 | 0.80                         | 0.274         | 1.43 | 65'            | EL              | 32  |  |
|                          |            | SNAGGRS4             | 34,925                     | --                                | 1.206         | 42.136                 | 1.4                          | 0.274         | 1.55 | 65'             | EL  | 32                           | 0.513         | 1.81 | 65'             | EL  | 6.4                 | 0.80                         | 0.274         | 1.21 | 65'            | EL              | 32  |  |
|                          |            | SNS5A                | 35,550                     | --                                | 1.179         | 41.911                 | 1.4                          | 0.274         | 1.52 | 65'             | EL  | 32                           | 0.513         | 1.85 | 65'             | EL  | 6.4                 | 0.80                         | 0.274         | 1.18 | 65'            | EL              | 32  |  |
|                          |            | SNS6A                | 39,950                     | --                                | 1.087         | 43.43                  | 1.4                          | 0.274         | 1.4  | 65'             | EL  | 32                           | 0.513         | 1.69 | 65'             | EL  | 6.4                 | 0.80                         | 0.274         | 1.09 | 65'            | EL              | 32  |  |
|                          | SNS7B      | 42,000               | --                         | 1.035                             | 43.489        | 1.4                    | 0.274                        | 1.33          | 65'  | EL              | 32  | 0.513                        | 1.67          | 65'  | EL              | 6.4                                       | 0.80                | 0.274                        | 1.04          | 65'  | EL             | 32              |   |  |
|                          | TTST       | TNAGRIT3             | 33,000                     | --                                | 1.327         | 43.8                   | 1.4                          | 0.274         | 1.71 | 65'             | EL  | 32                           | 0.513         | 2.01 | 65'             | EL  | 6.4                 | 0.80                         | 0.274         | 1.33 | 65'            | EL              | 32  |  |
|                          |            | TNT4A                | 33,075                     | --                                | 1.335         | 44.142                 | 1.4                          | 0.274         | 1.72 | 65'             | EL  | 32                           | 0.513         | 1.95 | 65'             | EL  | 6.4                 | 0.80                         | 0.274         | 1.33 | 65'            | EL              | 32  |  |
|                          |            | TNT6A                | 41,600                     | --                                | 1.096         | 45.613                 | 1.4                          | 0.274         | 1.41 | 65'             | EL  | 32                           | 0.513         | 1.8  | 65'             | EL  | 6.4                 | 0.80                         | 0.274         | 1.10 | 65'            | EL              | 32  |  |
|                          |            | TNT7A                | 42,000                     | --                                | 1.105         | 46.4                   | 1.4                          | 0.274         | 1.42 | 65'             | EL  | 32                           | 0.513         | 1.74 | 65'             | EL  | 6.4                 | 0.80                         | 0.274         | 1.10 | 65'            | EL              | 32  |  |
|                          |            | TNT7B                | 42,000                     | --                                | 1.15          | 48.298                 | 1.4                          | 0.274         | 1.48 | 65'             | EL  | 32                           | 0.513         | 1.62 | 65'             | EL  | 6.4                 | 0.80                         | 0.274         | 1.15 | 65'            | EL              | 32  |  |
|                          |            | TNAGRIT4             | 43,000                     | --                                | 1.089         | 46.815                 | 1.4                          | 0.274         | 1.4  | 65'             | EL  | 32                           | 0.513         | 1.57 | 65'             | EL  | 6.4                 | 0.80                         | 0.274         | 1.09 | 65'            | EL              | 32  |  |
| TNAGT5A                  |            | 45,000               | --                         | 1.024                             | 46.084        | 1.4                    | 0.274                        | 1.32          | 65'  | EL              | 32  | 0.513                        | 1.57          | 65'  | EL              | 6.4                                       | 0.80                | 0.274                        | 1.02          | 65'  | EL             | 32              |   |  |
| TNAGT5B                  | 45,000     | <b>3</b>             | 1.01                       | 45.431                            | 1.4           | 0.274                  | 1.3                          | 65'           | EL   | 32              | 0.513                                     | 1.49                         | 65'           | EL   | 6.4             | 0.80                                      | 0.274               | <b>1.01</b>                  | 65'           | EL   | <b>32</b>      |                 |   |  |

NOTES:

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

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

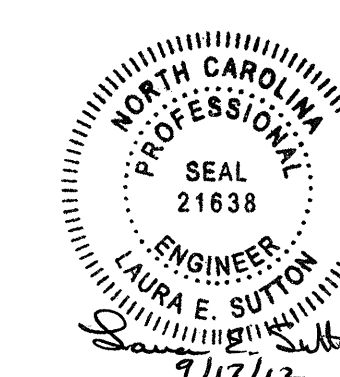
|  |                            |
|--|----------------------------|
| #  | CONTROLLING LOAD RATING    |
| 1  | DESIGN LOAD RATING (HL-93) |
| 2  | DESIGN LOAD RATING (HS-20) |
| 3  | LEGAL LOAD RATING **       |
| ** SEE CHART FOR VEHICLE TYPE  |                            |
| GIRDER LOCATION  |    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



LRFR SUMMARY  
FOR SPANS 'A' & 'C'

PROJECT NO. B-4458  
CATAWBA COUNTY  
 STATION: 19+70.00 -L-

SHEET 1 OF 2



|   |     |       |     |     |       |
|---|-----|-------|-----|-----|-------|
| STATE OF NORTH CAROLINA<br>DEPARTMENT OF TRANSPORTATION<br>RALEIGH                          |     |       |     |     |       |
| STANDARD<br>LRFR SUMMARY FOR<br>65' CORED SLAB UNIT<br>90° SKEW<br>(NON-INTERSTATE TRAFFIC) |     |       |     |     |       |
| REVISIONS   |     |       |     |     |       |
| NO.   | BY: | DATE: | NO. | BY: | DATE: |
| 1   |     |       | 3   |     |       |
| 2   |     |       | 4   |     |       |
| SHEET NO.   |     |       |     |     | S-5   |
| TOTAL SHEETS  |     |       |     |     | 25    |

ASSEMBLED BY : L.E. SUTTON DATE : 4/02/12  
 CHECKED BY : B.N. GRADY DATE : 4/03/12  
 DRAWN BY : CVC 6/10  
 CHECKED BY : DNS 6/10

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

| LEVEL                    | VEHICLE    | WEIGHT (W)<br>(TONS) | CONTROLLING<br>LOAD RATING | MINIMUM<br>RATING FACTORS<br>(RF) | TONS = W X RF | STRENGTH I LIMIT STATE |                              |               |      |                 |   |                              |               |      |                 | SERVICE III LIMIT STATE                   |                     |                              |               |      | COMMENT NUMBER |                 |   |  |
|--------------------------|------------|----------------------|----------------------------|-----------------------------------|---------------|------------------------|------------------------------|---------------|------|-----------------|---|------------------------------|---------------|------|-----------------|---|---------------------|------------------------------|---------------|------|----------------|-----------------|---|--|
|                          |            |                      |                            |                                   |               | MOMENT                 |                              |               |      |                 | SHEAR                                     |                              |               |      |                 | MOMENT                                    |                     |                              |               |      |                |                 |   |  |
|                          |            |                      |                            |                                   |               | LIVELOAD<br>FACTORS    | DISTRIBUTION<br>FACTORS (DF) | RATING FACTOR | SPAN | GIRDER LOCATION | DISTANCE FROM<br>LEFT END OF<br>SPAN (ft) | DISTRIBUTION<br>FACTORS (DF) | RATING FACTOR | SPAN | GIRDER LOCATION | DISTANCE FROM<br>LEFT END OF<br>SPAN (ft) | LIVELOAD<br>FACTORS | DISTRIBUTION<br>FACTORS (DF) | RATING FACTOR | SPAN |                | GIRDER LOCATION | DISTANCE FROM<br>LEFT END OF<br>SPAN (ft) |  |
| DESIGN<br>LOAD<br>RATING | HL-93(InV) | N/A                  | 1                          | 1.006                             | --            | 1.75                   | 0.273                        | 1.03          | 70'  | EL              | 34.5                                      | 0.507                        | 1.32          | 70'  | EL              | 6.9                                       | 0.80                | 0.273                        | 1.01          | 70'  | EL             | 34.5            |   |  |
|                          | HL-93(0pr) | N/A                  | --                         | 1.341                             | --            | 1.35                   | 0.273                        | 1.34          | 70'  | EL              | 34.5                                      | 0.507                        | 1.72          | 70'  | EL              | 6.9                                       | N/A                 | --                           | --            | --   | --             | --              |   |  |
|                          | HS-20(InV) | 36.000               | 2                          | 1.306                             | 47.02         | 1.75                   | 0.273                        | 1.34          | 70'  | EL              | 34.5                                      | 0.507                        | 1.65          | 70'  | EL              | 6.9                                       | 0.80                | 0.273                        | 1.31          | 70'  | EL             | 34.5            |   |  |
|                          | HS-20(0pr) | 36.000               | --                         | 1.74                              | 62.64         | 1.35                   | 0.273                        | 1.74          | 70'  | EL              | 34.5                                      | 0.507                        | 2.14          | 70'  | EL              | 6.9                                       | N/A                 | --                           | --            | --   | --             | --              |   |  |
| LEGAL<br>LOAD<br>RATING  | SV         | SNSH                 | 13.500                     | --                                | 2.917         | 39.379                 | 1.4                          | 0.273         | 3.75 | 70'             | EL  | 34.5                         | 0.507         | 4.87 | 70'             | EL  | 6.9                 | 0.80                         | 0.273         | 2.92 | 70'            | EL              | 34.5                                      |  |
|                          |            | SNGARBS2             | 20.000                     | --                                | 2.187         | 43.741                 | 1.4                          | 0.273         | 2.81 | 70'             | EL  | 34.5                         | 0.507         | 3.47 | 70'             | EL  | 6.9                 | 0.80                         | 0.273         | 2.19 | 70'            | EL              | 34.5                                      |  |
|                          |            | SNAGRIS2             | 22.000                     | --                                | 2.077         | 45.69                  | 1.4                          | 0.273         | 2.67 | 70'             | EL  | 34.5                         | 0.507         | 3.23 | 70'             | EL  | 6.9                 | 0.80                         | 0.273         | 2.08 | 70'            | EL              | 34.5                                      |  |
|                          |            | SNCOTTS3             | 27.250                     | --                                | 1.452         | 39.565                 | 1.4                          | 0.273         | 1.87 | 70'             | EL  | 34.5                         | 0.507         | 2.43 | 70'             | EL  | 6.9                 | 0.80                         | 0.273         | 1.45 | 70'            | EL              | 34.5                                      |  |
|                          |            | SNAGGRS4             | 34.925                     | --                                | 1.218         | 42.554                 | 1.4                          | 0.273         | 1.57 | 70'             | EL  | 34.5                         | 0.507         | 2.03 | 70'             | EL  | 6.9                 | 0.80                         | 0.273         | 1.22 | 70'            | EL              | 34.5                                      |  |
|                          |            | SNS5A                | 35.550                     | --                                | 1.191         | 42.346                 | 1.4                          | 0.273         | 1.53 | 70'             | EL  | 34.5                         | 0.507         | 2.06 | 70'             | EL  | 6.9                 | 0.80                         | 0.273         | 1.19 | 70'            | EL              | 34.5                                      |  |
|                          |            | SNS6A                | 39.950                     | --                                | 1.095         | 43.747                 | 1.4                          | 0.273         | 1.41 | 70'             | EL  | 34.5                         | 0.507         | 1.88 | 70'             | EL  | 6.9                 | 0.80                         | 0.273         | 1.10 | 70'            | EL              | 34.5                                      |  |
|                          | TTST       | TNAGRIT3             | 33.000                     | --                                | 1.336         | 44.087                 | 1.4                          | 0.273         | 1.72 | 70'             | EL  | 34.5                         | 0.507         | 2.23 | 70'             | EL  | 6.9                 | 0.80                         | 0.273         | 1.34 | 70'            | EL              | 34.5                                      |  |
|                          |            | TNT4A                | 33.075                     | --                                | 1.342         | 44.401                 | 1.4                          | 0.273         | 1.72 | 70'             | EL  | 34.5                         | 0.507         | 2.17 | 70'             | EL  | 6.9                 | 0.80                         | 0.273         | 1.34 | 70'            | EL              | 34.5                                      |  |
|                          |            | TNT6A                | 41.600                     | --                                | 1.1           | 45.746                 | 1.4                          | 0.273         | 1.41 | 70'             | EL  | 34.5                         | 0.507         | 1.98 | 70'             | EL  | 6.9                 | 0.80                         | 0.273         | 1.10 | 70'            | EL              | 34.5                                      |  |
|                          |            | TNT7A                | 42.000                     | --                                | 1.106         | 46.462                 | 1.4                          | 0.273         | 1.42 | 70'             | EL  | 34.5                         | 0.507         | 1.94 | 70'             | EL  | 6.9                 | 0.80                         | 0.273         | 1.11 | 70'            | EL              | 34.5                                      |  |
|                          |            | TNT7B                | 42.000                     | --                                | 1.147         | 48.18                  | 1.4                          | 0.273         | 1.47 | 70'             | EL  | 34.5                         | 0.507         | 1.8  | 70'             | EL  | 6.9                 | 0.80                         | 0.273         | 1.15 | 70'            | EL              | 34.5                                      |  |
|                          |            | TNAGRIT4             | 43.000                     | --                                | 1.089         | 46.838                 | 1.4                          | 0.273         | 1.4  | 70'             | EL  | 34.5                         | 0.507         | 1.74 | 70'             | EL  | 6.9                 | 0.80                         | 0.273         | 1.09 | 70'            | EL              | 34.5                                      |  |
|                          |            | TNAGT5A              | 45.000                     | --                                | 1.026         | 46.175                 | 1.4                          | 0.273         | 1.32 | 70'             | EL  | 34.5                         | 0.507         | 1.74 | 70'             | EL  | 6.9                 | 0.80                         | 0.273         | 1.03 | 70'            | EL              | 34.5                                      |  |
| TNAGT5B                  | 45.000     | 3                    | 1.013                      | 45.579                            | 1.4           | 0.273                  | 1.3                          | 70'           | EL   | 34.5            | 0.507                                     | 1.66                         | 70'           | EL   | 6.9             | 0.80                                      | 0.273               | 1.01                         | 70'           | EL   | 34.5           |                 |   |  |

LOAD FACTORS:

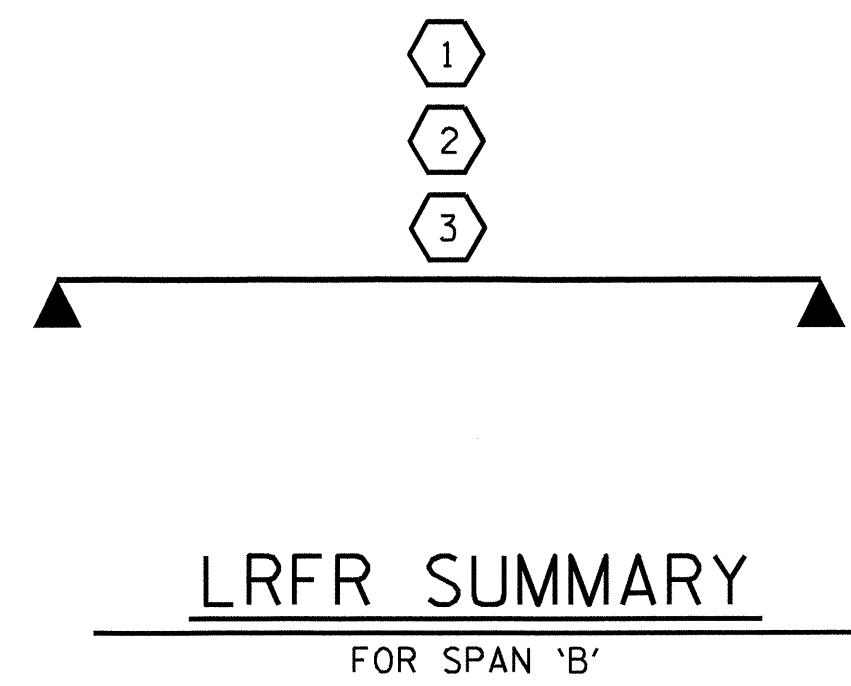
|                                     |             |               |               |
|-------------------------------------|-------------|---------------|---------------|
| DESIGN<br>LOAD<br>RATING<br>FACTORS | LIMIT STATE | $\gamma_{DC}$ | $\gamma_{DW}$ |
|                                     | STRENGTH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

NOTES:

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

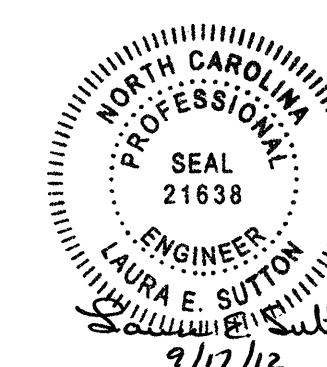
ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

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



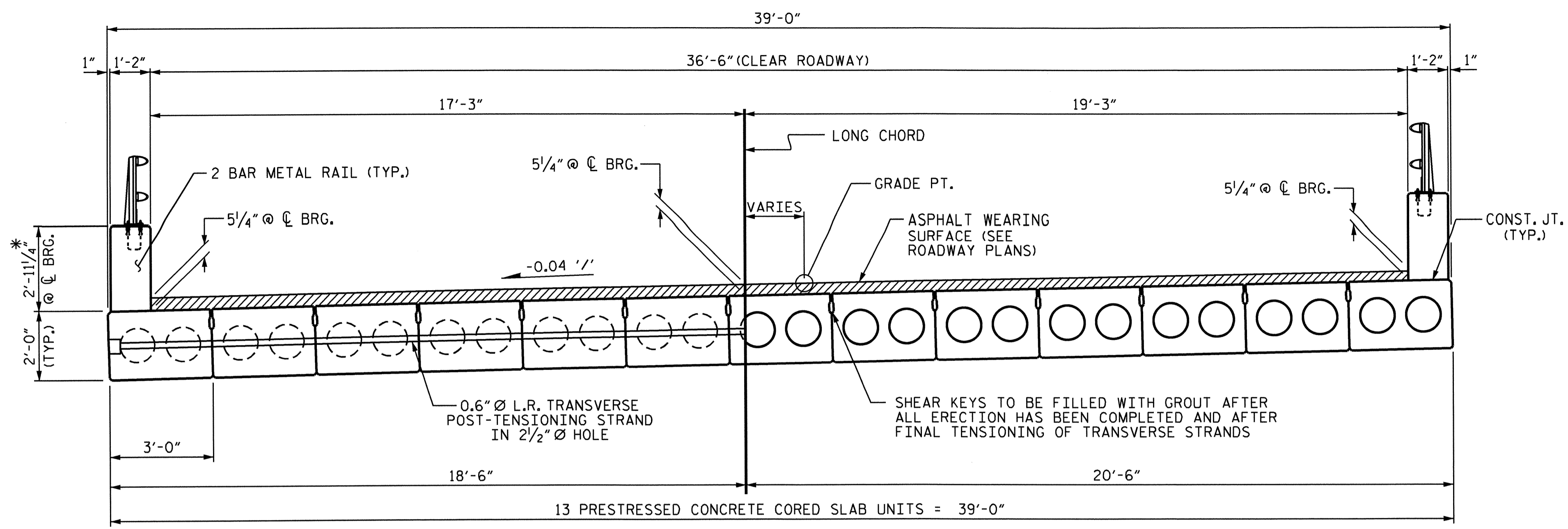
PROJECT NO. B-4458  
CATAWBA COUNTY  
 STATION: 19+70.00 -L-

SHEET 2 OF 2



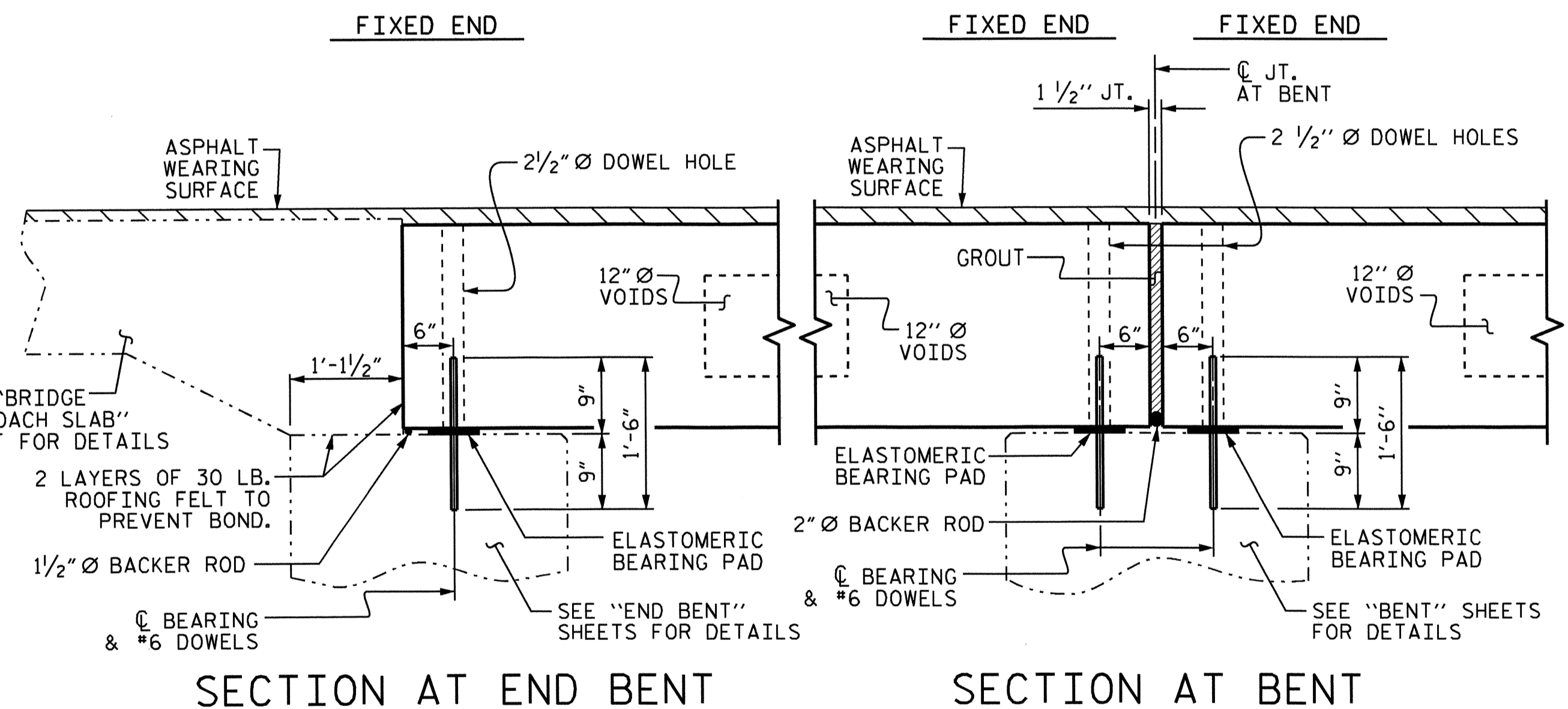
|   |     |       |     |     |                 |
|---|-----|-------|-----|-----|-----------------|
| STATE OF NORTH CAROLINA<br>DEPARTMENT OF TRANSPORTATION<br>RALEIGH                          |     |       |     |     |                 |
| STANDARD<br>LRFR SUMMARY FOR<br>70' CORED SLAB UNIT<br>90° SKEW<br>(NON-INTERSTATE TRAFFIC) |     |       |     |     |                 |
| REVISIONS   |     |       |     |     |                 |
| NO.   | BY: | DATE: | NO. | BY: | DATE:           |
| 1   |     |       | 3   |     |                 |
| 2   |     |       | 4   |     |                 |
| SHEET NO. S-6   |     |       |     |     | TOTAL SHEETS 25 |

ASSEMBLED BY : L.E. SUTTON DATE : 4/02/12  
 CHECKED BY : B.N. GRADY DATE : 4/03/12  
 DRAWN BY : CVC 6/10  
 CHECKED BY : DNS 6/10

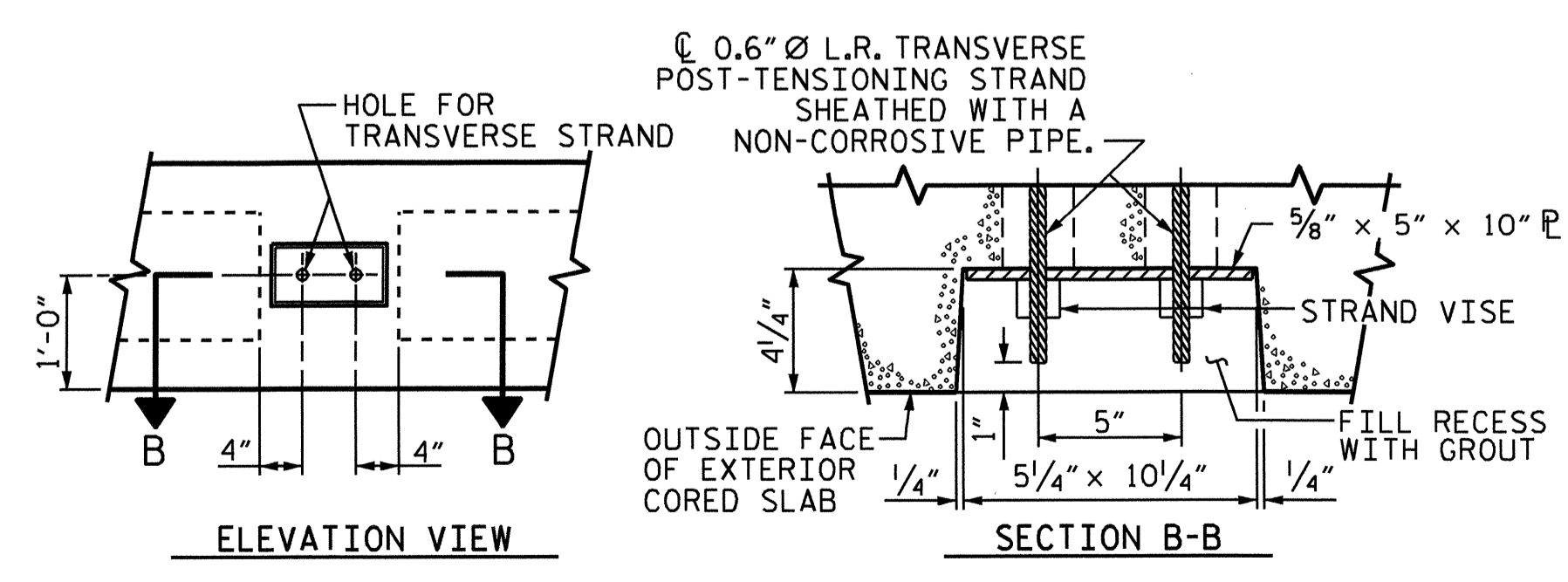


HALF SECTION AT INTERMEDIATE DIAPHRAGMS  
 TYPICAL SECTION  
 HALF SECTION THROUGH VOIDS

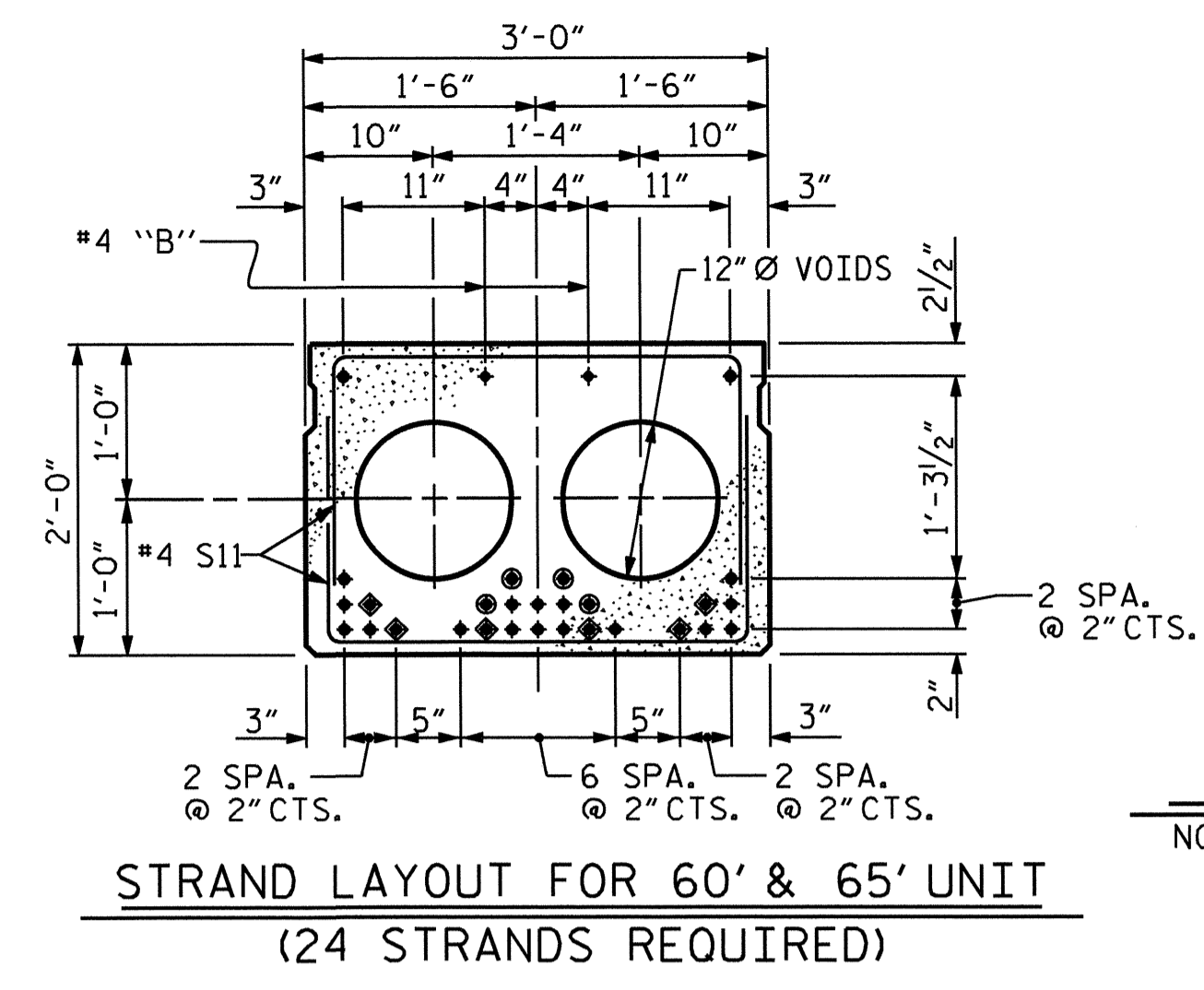
\* - THE MAXIMUM PARAPET HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE PARAPET AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE PARAPET FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR PARAPET HEIGHT DETAILS AND ASPHALT THICKNESS, SEE THE "SECTION THRU PARAPET" DETAIL ON "END POSTS & PARAPET DETAILS" SHEET.



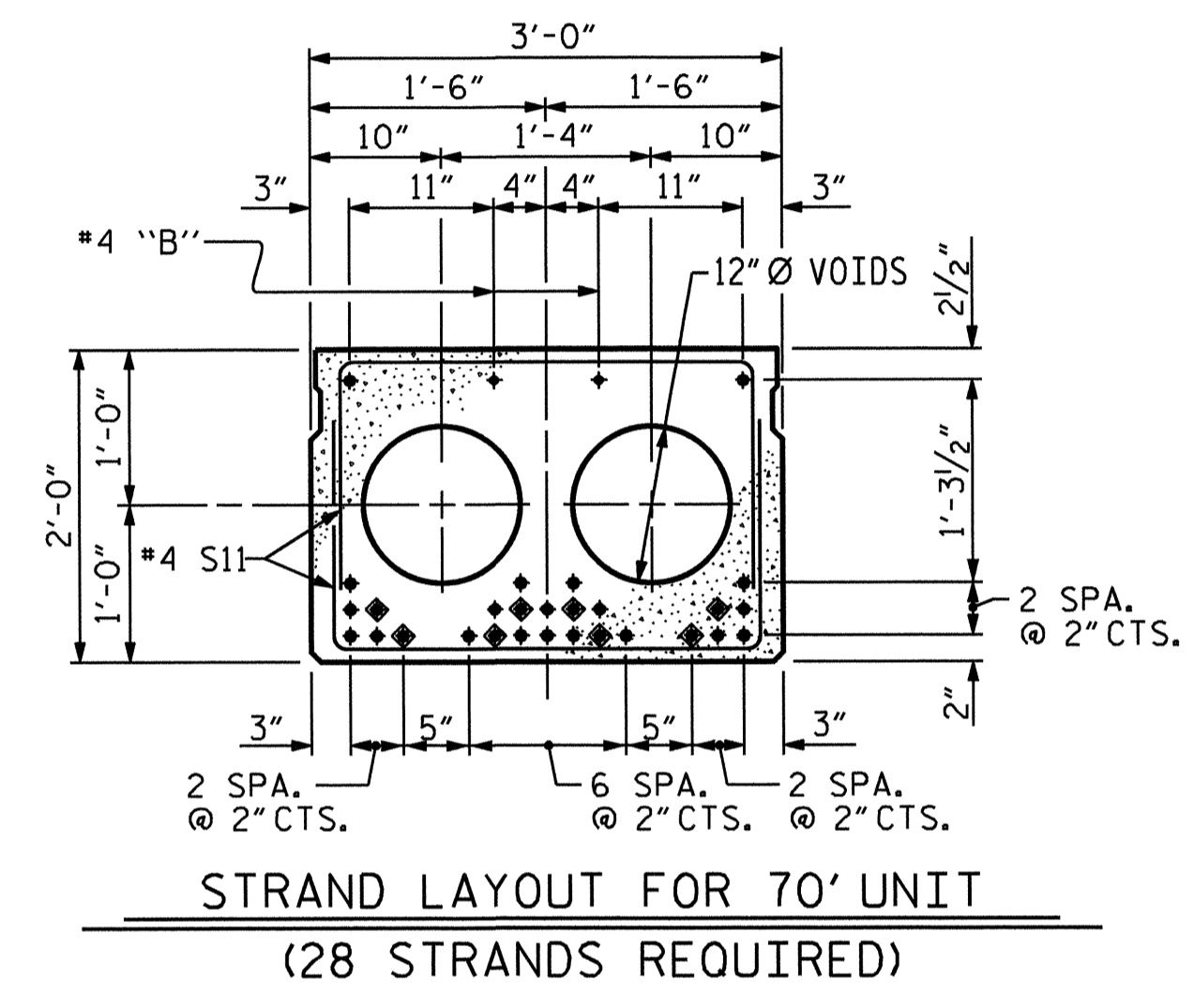
SECTION AT END BENT  
 SECTION AT BENT



ELEVATION VIEW  
 SECTION B-B  
 GROUTED RECESS AT END OF POST-TENSIONED STRAND OF CORED SLABS



STRAND LAYOUT FOR 60' & 65' UNIT  
 (24 STRANDS REQUIRED)

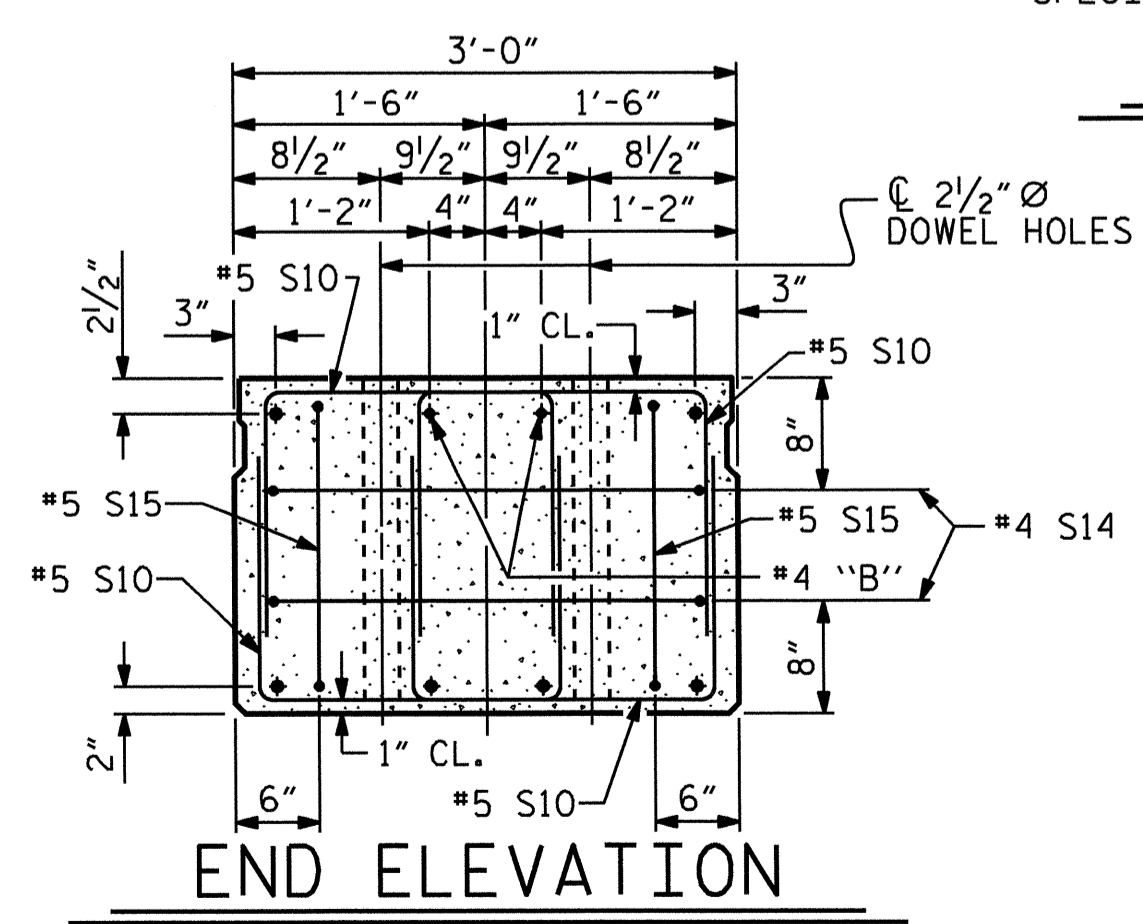


STRAND LAYOUT FOR 70' UNIT  
 (28 STRANDS REQUIRED)

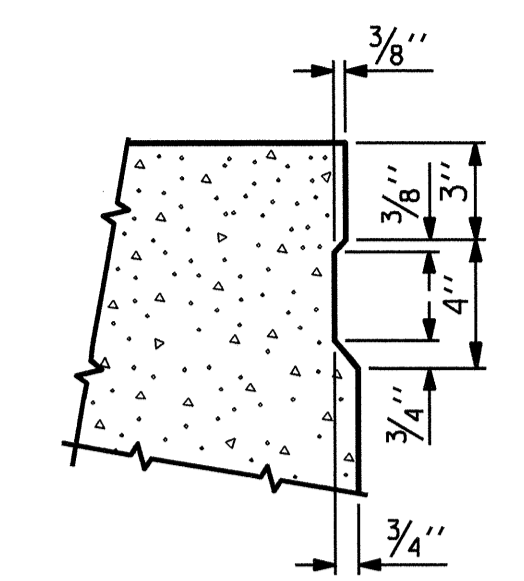
INTERIOR SLAB SECTION  
 0.6" Ø LOW RELAXATION

- ◆ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 12'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.
- OPTIONAL FULL LENGTH DEBONDED STRANDS. THESE STRANDS ARE NOT REQUIRED. IF THE FABRICATOR CHOOSES TO INCLUDE THESE STRANDS IN THE CORED SLAB UNIT, THE STRANDS SHALL BE DEBONDED FOR THE FULL LENGTH OF THE UNIT AT NO ADDITIONAL COST. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

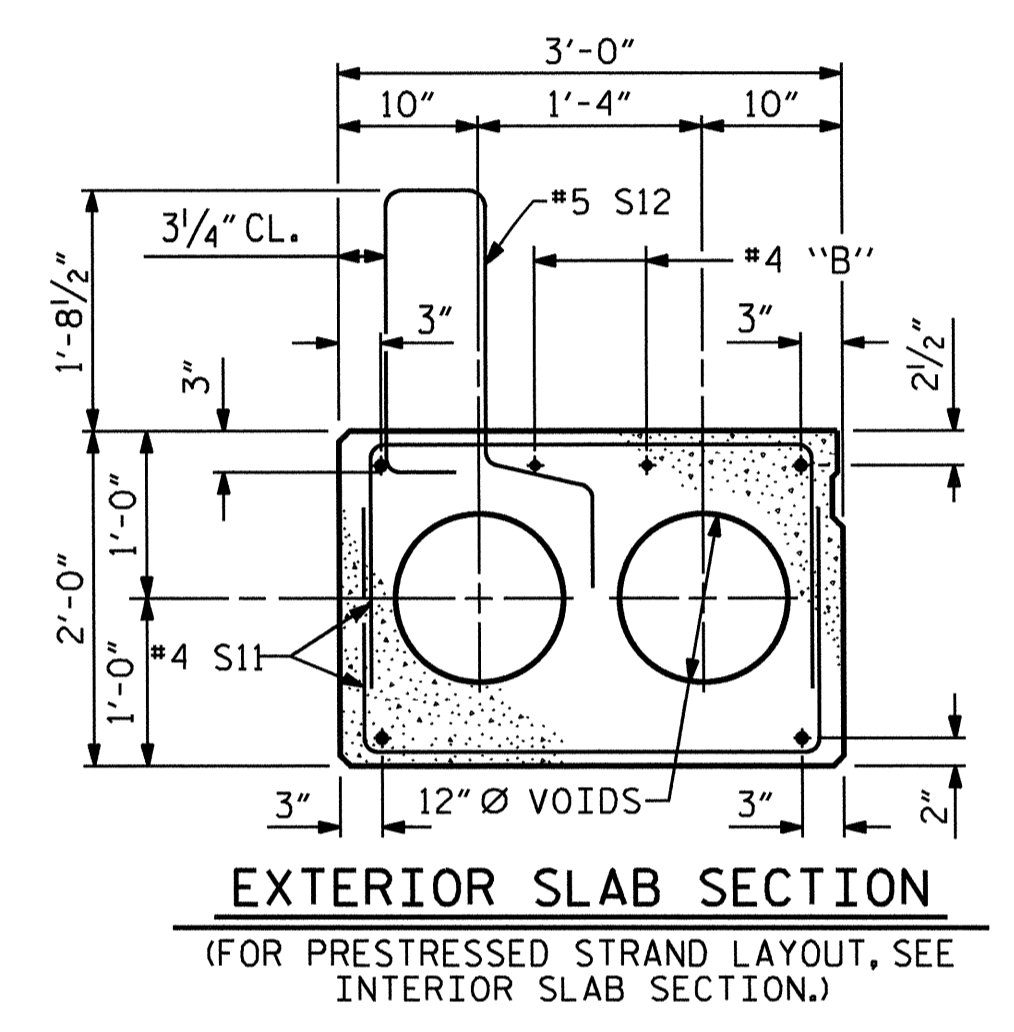
DEBONDING LEGEND



END ELEVATION  
 SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES. (STRAND LAYOUT NOT SHOWN.)  
 INTERIOR SLAB UNIT SHOWN-EXTERIOR SLAB UNIT SIMILAR EXCEPT SHEAR KEY LOCATION.



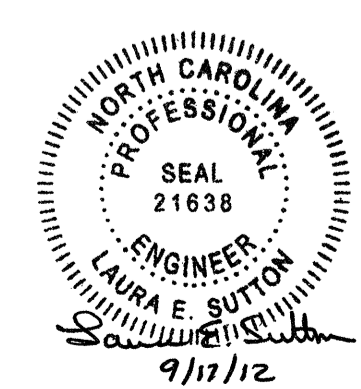
SHEAR KEY DETAIL  
 NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR CORED SLABS.



EXTERIOR SLAB SECTION  
 (FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION.)

|                           |               |
|---------------------------|---------------|
| ASSEMBLED BY : B.N. GRADY | DATE : 2/2012 |
| CHECKED BY : M. ALI       | DATE : 3/2012 |
| DRAWN BY : MAA 6/10       | REV. 12/11    |
| CHECKED BY : MKT 7/10     | MAA/AAC       |

11-JUL-2012 09:45  
 R:\Structures\Plans\B4458.SD\_CS.01.dgn  
 LSUTTON



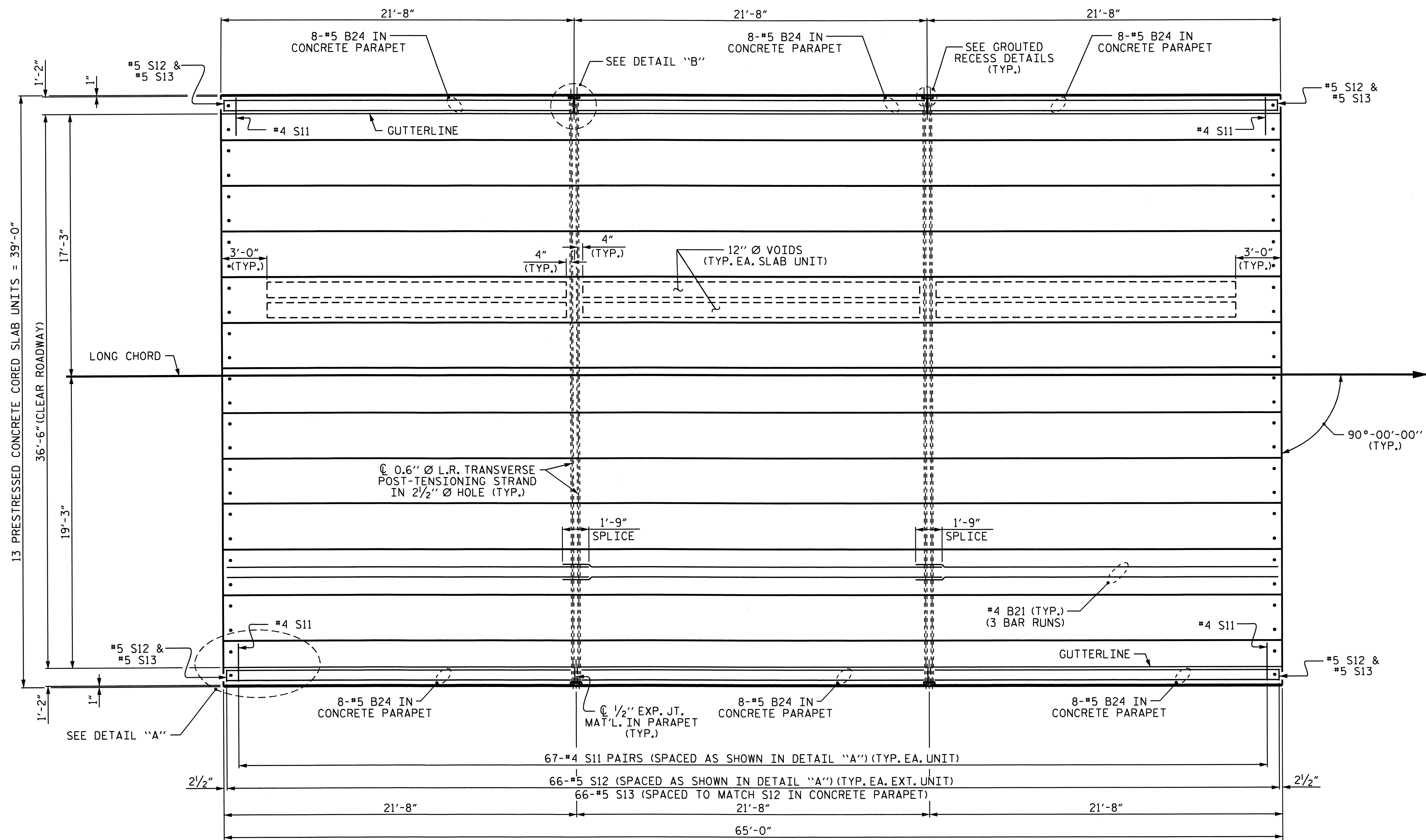
PROJECT NO. B-4458  
 CATAWBA COUNTY  
 STATION: 19+70.00 -L-

SHEET 1 OF 4  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 3'-0" X 2'-0"  
 PRESTRESSED CONCRETE  
 CORED SLAB UNIT  
 90° SKEW

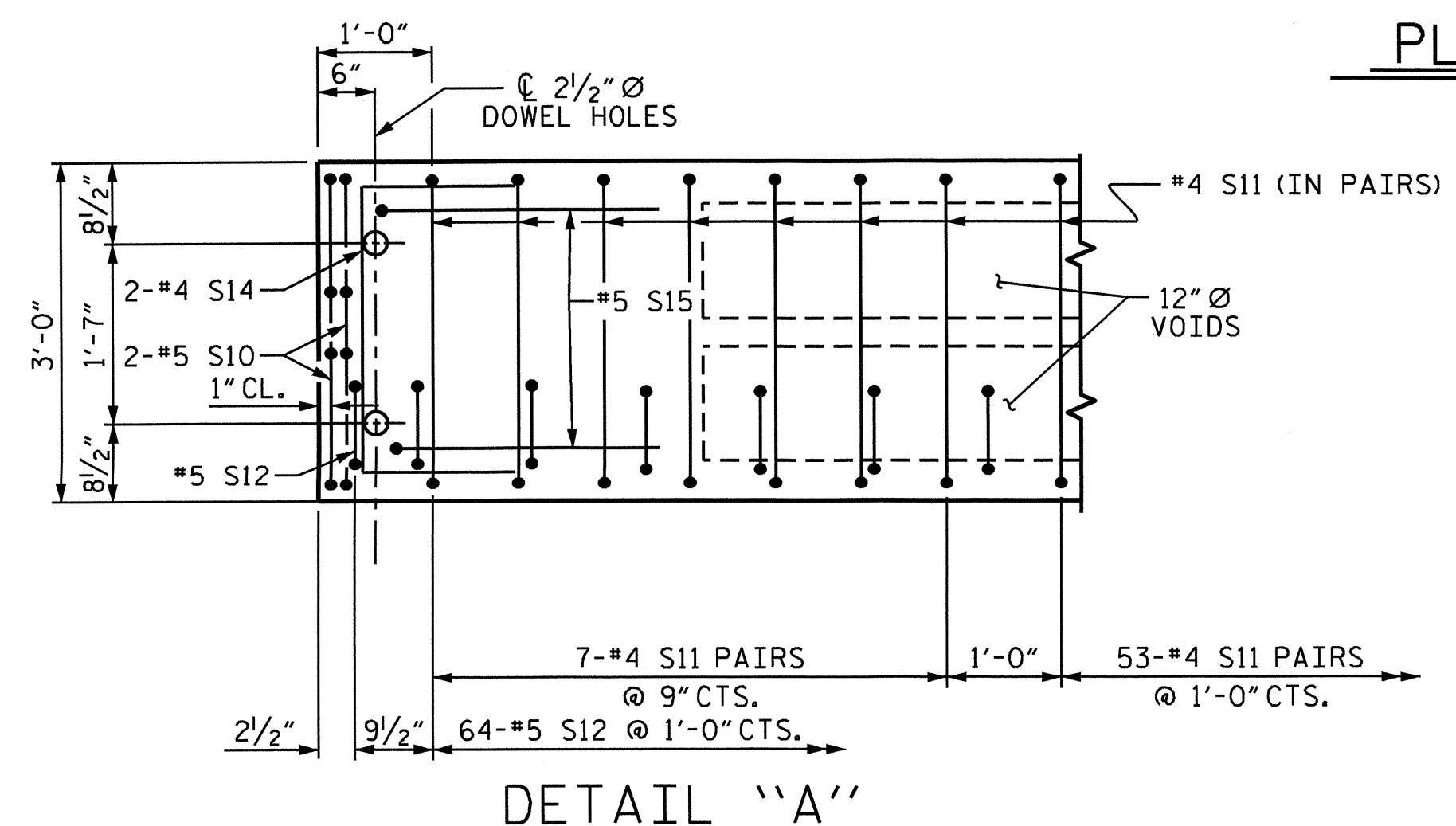
| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-7          |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |
| 2         |     |       | 4   |     |       | 25           |

STD. NO. 24PCS4\_39\_90S



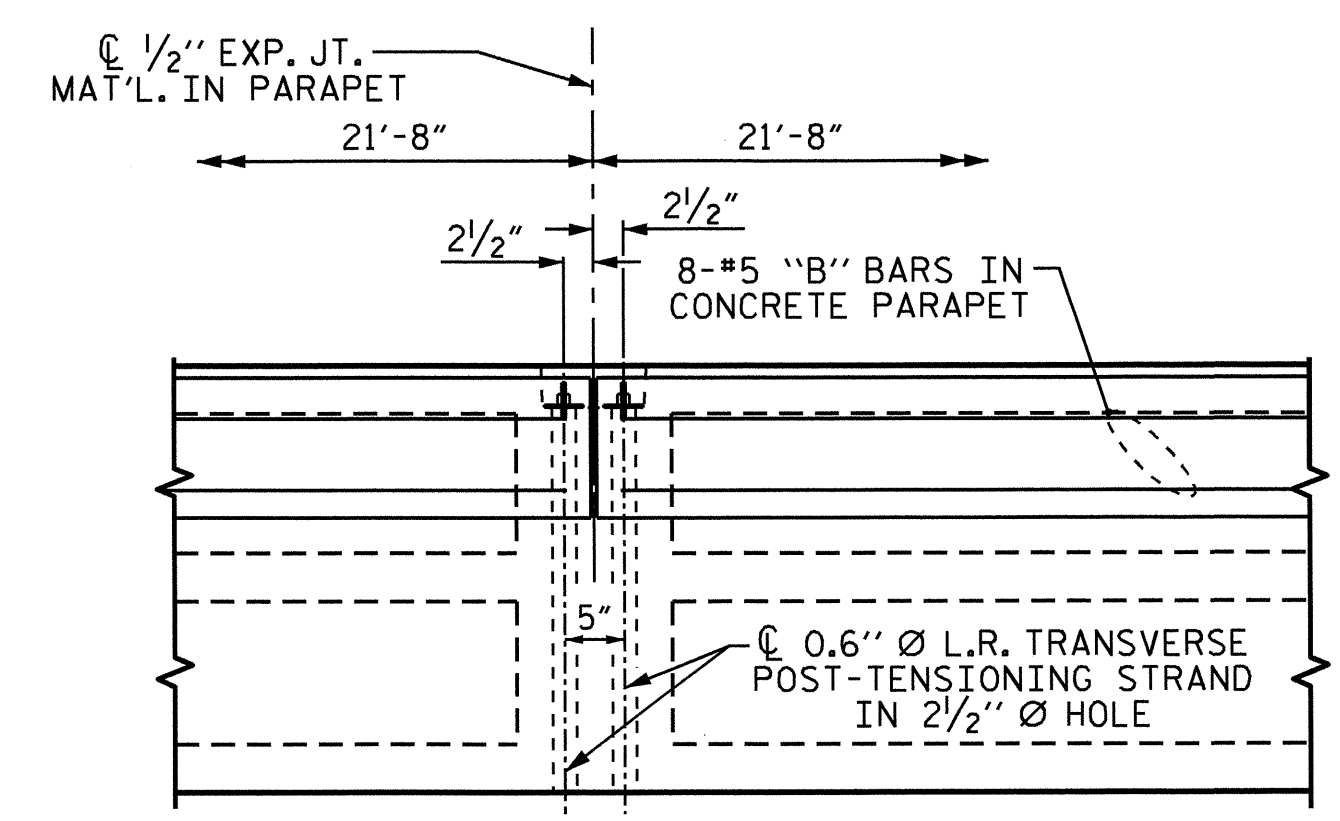


PLAN OF UNIT



DETAIL "A"

NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S12 BARS.



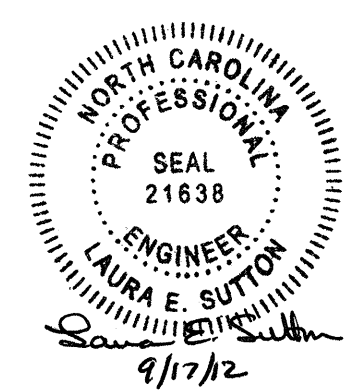
DETAIL "B"

\*4 S11 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO GROUDED RECESS AND 2 1/2" Ø TRANSVERSE POST-TENSIONING STRAND HOLES

PROJECT NO. B-4458  
CATAWBA COUNTY  
 STATION: 19+70.00 -L-

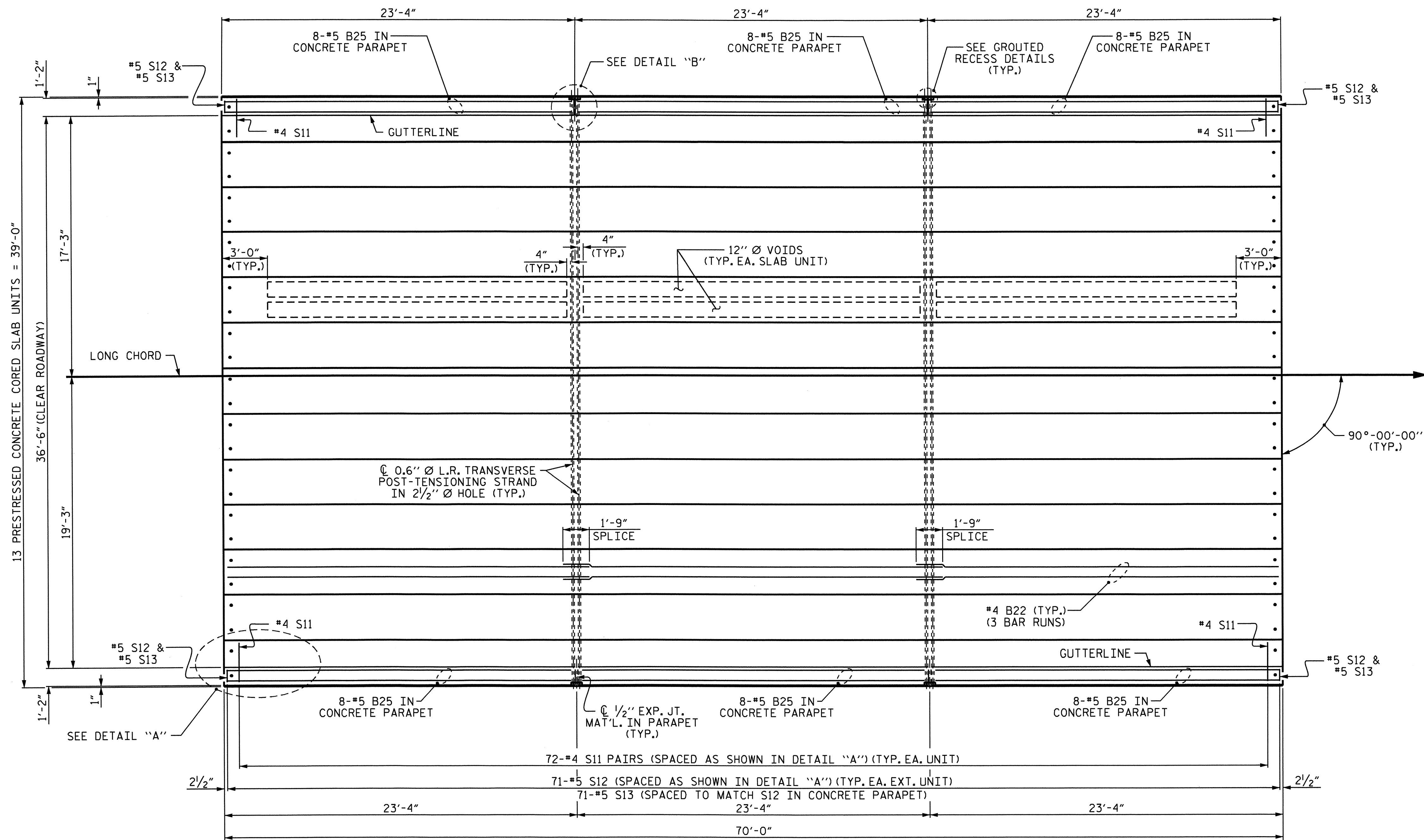
SHEET 2 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 PLAN OF 65' UNIT  
 36'-6" CLEAR ROADWAY  
 90° SKEW  
 (SPANS A & C)

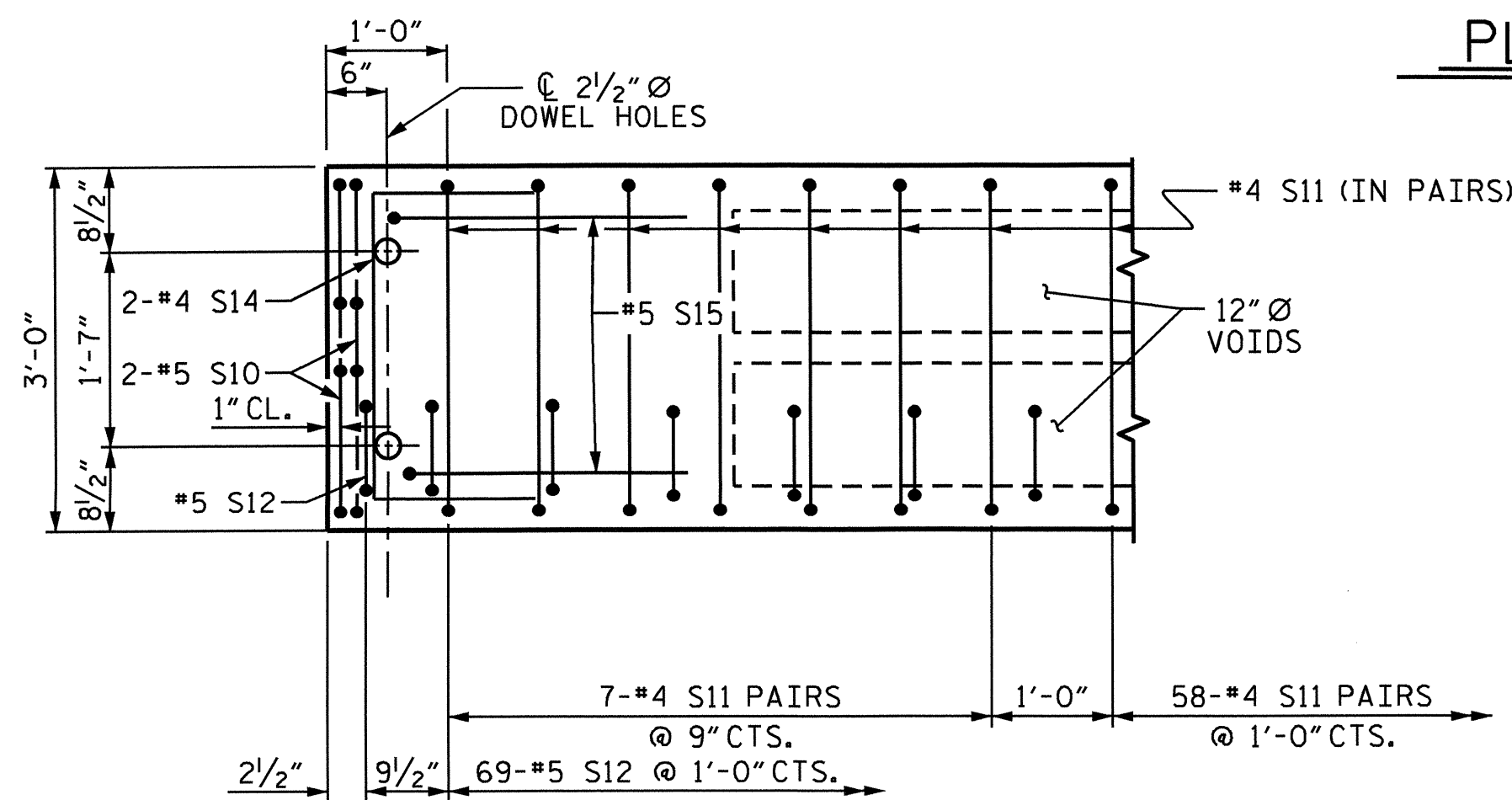


| REVISIONS |     |       |     |     |       | SHEET NO.    |  |
|-----------|-----|-------|-----|-----|-------|--------------|--|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | TOTAL SHEETS |  |
| 1         |     |       | 3   |     |       | S-8          |  |
| 2         |     |       | 4   |     |       | 25           |  |

DRAWN BY: B.N. GRADY DATE: 2/2012  
 CHECKED BY: M. ALI DATE: 3/2012

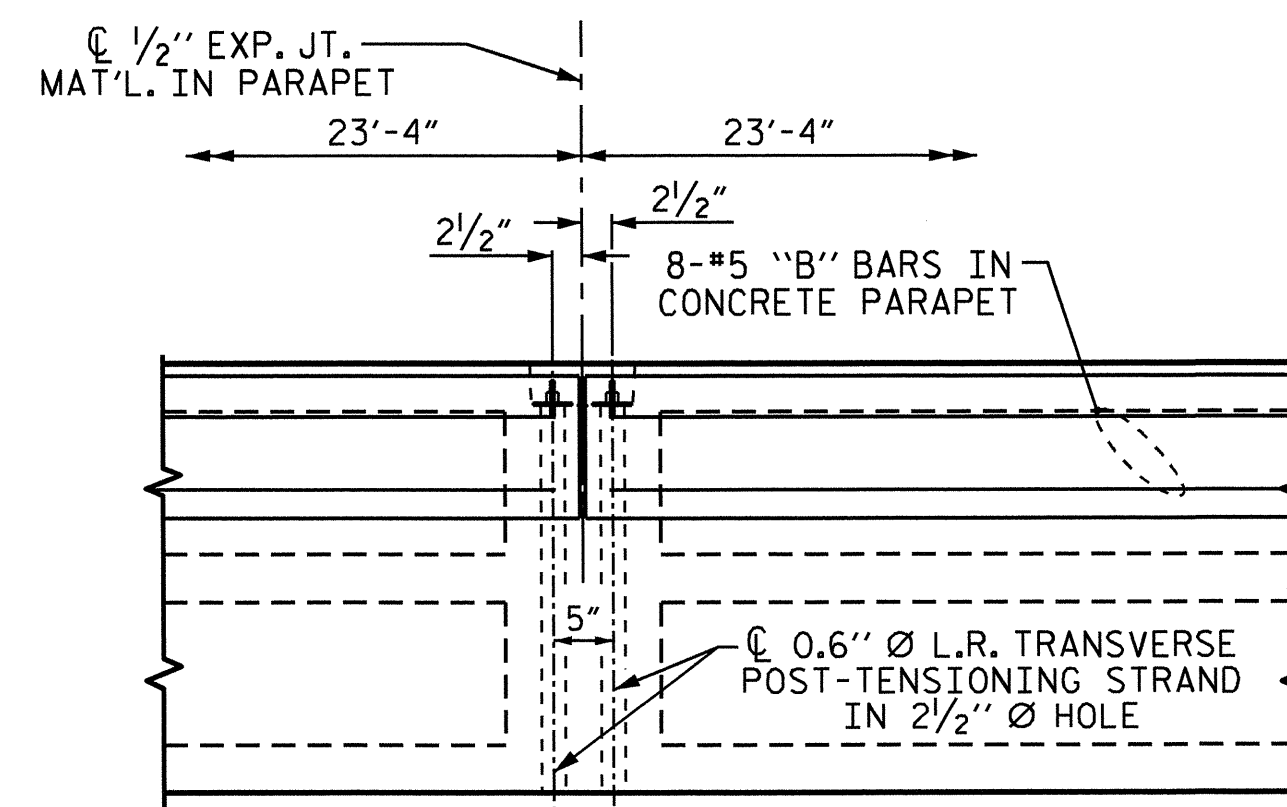


PLAN OF UNIT



DETAIL "A"

NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S12 BARS.



DETAIL "B"

#4 S11 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO GROUDED RECESS AND 2 1/2" Ø TRANSVERSE POST-TENSIONING STRAND HOLES

DRAWN BY : B.N. GRADY DATE : 2/2012  
 CHECKED BY : M. ALI DATE : 3/2012

11-JUL-2012 09:45  
 R:\Structures\Plans\B4458.SD.CS.01.dgn  
 LSUTTON

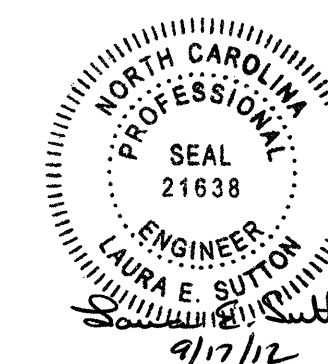
PROJECT NO. B-4458  
 CATAWBA COUNTY  
 STATION: 19+70.00 -L-

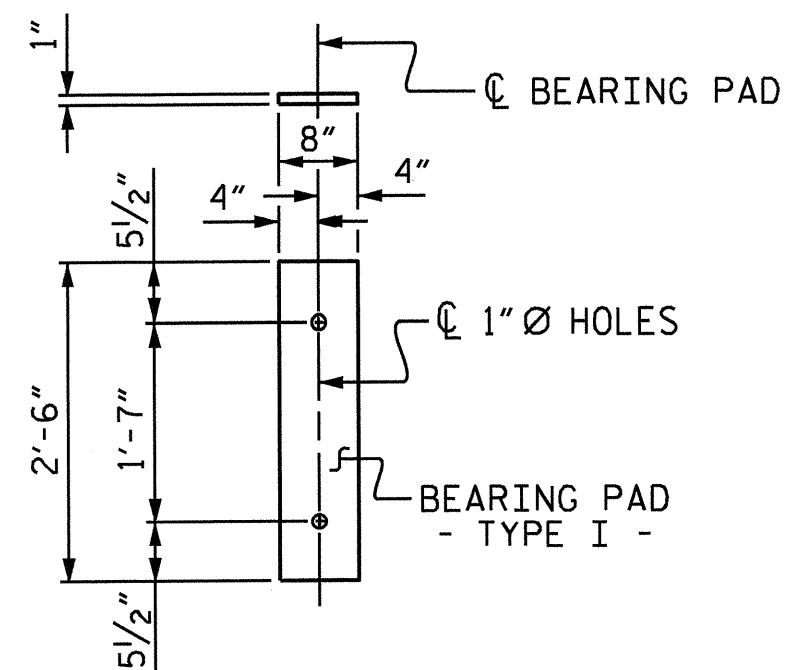
SHEET 3 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

PLAN OF 70' UNIT  
 36'-6" CLEAR ROADWAY  
 90° SKEW  
 (SPAN B)

| REVISIONS |     |       |     |     |       | SHEET NO.    |  |
|-----------|-----|-------|-----|-----|-------|--------------|--|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | TOTAL SHEETS |  |
| 1         |     |       | 3   |     |       | S-9          |  |
| 2         |     |       | 4   |     |       | 25           |  |





FIXED END  
(TYPE I - 78 REQ'D)

**ELASTOMERIC BEARING DETAILS**

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

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

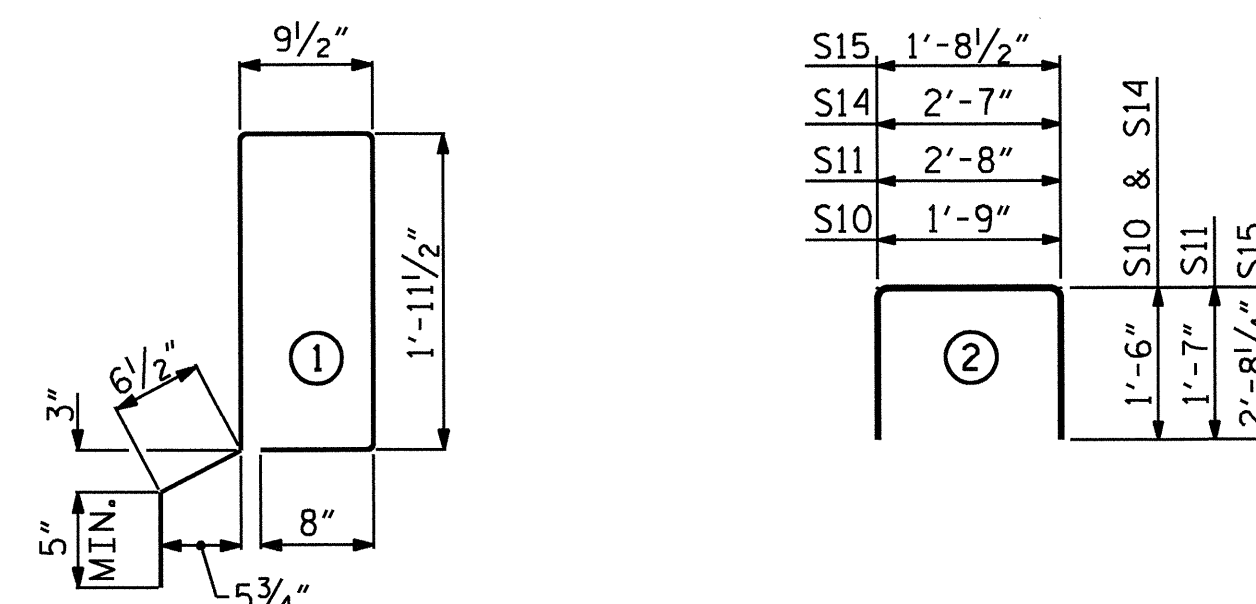
| CORED SLABS REQUIRED |        |        |              |
|----------------------|--------|--------|--------------|
|                      | NUMBER | LENGTH | TOTAL LENGTH |
| 65' UNIT             |        |        |              |
| EXTERIOR C.S.        | 4      | 65'-0" | 260'-0"      |
| INTERIOR C.S.        | 22     | 65'-0" | 1430'-0"     |
| 70' UNIT             |        |        |              |
| EXTERIOR C.S.        | 2      | 70'-0" | 140'-0"      |
| INTERIOR C.S.        | 11     | 70'-0" | 770'-0"      |
| TOTAL                | 39     |        | 2600'-0"     |

| DEAD LOAD DEFLECTION AND CAMBER            |  | 3'-0" x 2'-0"      |
|--|--|--------------------|
| 60' & 65' CORED SLAB UNIT                  |  | 0.6" Ø L.R. STRAND |
| CAMBER ( SLAB ALONE IN PLACE )             |  | 3 3/8" ↑           |
| DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD** |  | 1/2" ↓             |
| FINAL CAMBER                               |  | 2 7/8" ↑           |
| 70' CORED SLAB UNIT                        |  | 0.6" Ø L.R. STRAND |
| CAMBER ( SLAB ALONE IN PLACE )             |  | 4 5/16" ↑          |
| DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD** |  | 1 3/16" ↓          |
| FINAL CAMBER                               |  | 3 1/2" ↑           |

\*\* INCLUDES FUTURE WEARING SURFACE

| GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT |                                      |                        |
|--|--------------------------------------|------------------------|
|  | ASPHALT OVERLAY THICKNESS @ MID-SPAN | RAIL HEIGHT @ MID-SPAN |
| 65' UNITS                                  | 2 3/8"                               | 2'-8 3/8"              |
| 70' UNITS                                  | 1 3/4"                               | 2'-7 3/4"              |

**BAR TYPES**



ALL BAR DIMENSIONS ARE OUT TO OUT.

**BILL OF MATERIAL FOR ONE 65' CORED SLAB UNIT**

|                                  |        | EXTERIOR UNIT |      | INTERIOR UNIT |        |         |        |
|----------------------------------|--------|---------------|------|---------------|--------|---------|--------|
| BAR                              | NUMBER | SIZE          | TYPE | LENGTH        | WEIGHT | LENGTH  | WEIGHT |
| B21                              | 6      | #4            | STR  | 22'-10"       | 92     | 22'-10" | 92     |
| S10                              | 8      | #5            | 2    | 4'-9"         | 40     | 4'-9"   | 40     |
| S11                              | 134    | #4            | 2    | 5'-10"        | 522    | 5'-10"  | 522    |
| *S12                             | 66     | #5            | 1    | 6'-4"         | 436    |         |        |
| S14                              | 4      | #4            | 2    | 5'-7"         | 15     | 5'-7"   | 15     |
| S15                              | 4      | #5            | 2    | 7'-1"         | 30     | 7'-1"   | 30     |
| REINFORCING STEEL                |        |               |      | LBS.          | 699    |         | 699    |
| * EPOXY COATED REINFORCING STEEL |        |               |      | LBS.          | 436    |         |        |
| 6000 P.S.I. CONCRETE             |        |               |      | CU. YDS.      | 11.0   |         | 11.0   |
| 0.6" Ø L.R. STRANDS              |        |               |      | No.           | 24     |         | 24     |

|                                  |        | EXTERIOR UNIT |      | INTERIOR UNIT |        |        |        |
|----------------------------------|--------|---------------|------|---------------|--------|--------|--------|
| BAR                              | NUMBER | SIZE          | TYPE | LENGTH        | WEIGHT | LENGTH | WEIGHT |
| B22                              | 6      | #4            | STR  | 24'-6"        | 98     | 24'-6" | 98     |
| S10                              | 8      | #5            | 2    | 4'-9"         | 40     | 4'-9"  | 40     |
| S11                              | 144    | #4            | 2    | 5'-10"        | 561    | 5'-10" | 561    |
| *S12                             | 71     | #5            | 1    | 6'-4"         | 469    |        |        |
| S14                              | 4      | #4            | 2    | 5'-7"         | 15     | 5'-7"  | 15     |
| S15                              | 4      | #5            | 2    | 7'-1"         | 30     | 7'-1"  | 30     |
| REINFORCING STEEL                |        |               |      | LBS.          | 744    |        | 744    |
| * EPOXY COATED REINFORCING STEEL |        |               |      | LBS.          | 469    |        |        |
| 7000 P.S.I. CONCRETE             |        |               |      | CU. YDS.      | 11.8   |        | 11.8   |
| 0.6" Ø L.R. STRANDS              |        |               |      | No.           | 28     |        | 28     |

**BILL OF MATERIAL FOR ONE 70' CORED SLAB UNIT**

**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 CAST WITH THE CORED SLAB SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE CORED SLABS.

RECESSES FOR TRANSVERSE STRANDS SHALL BE GROUTED AFTER THE TENSIONING OF THE STRANDS.

THE 2 1/2" Ø DOWEL HOLES AT FIXED ENDS OF SLAB SECTIONS SHALL BE FILLED WITH NON-SHRINK GROUT.

THE BACKER RODS SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER, SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.

WHEN CORED SLABS ARE CAST, AN INTERNAL HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDWAYS. AT LEAST SIX WEEKS PRIOR TO CASTING CORED SLABS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. IN ADDITION TO STRUCTURAL DETAILS, LOCATION AND SPACING OF THE HOLD-DOWNS SHALL BE INDICATED.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE CORED SLAB UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN THE REQUIRED STRENGTH SHOWN IN THE "CONCRETE RELEASE STRENGTH" TABLE.

ALL REINFORCING STEEL IN CONCRETE PARAPETS SHALL BE EPOXY COATED.

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE CORED SLAB UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

TRANSVERSE POST TENSIONING OF THE CORED SLAB UNITS SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

MAINTAIN A SYMMETRIC TENSION FORCE BETWEEN EACH PAIR OF TRANSVERSE POST TENSIONING STRANDS IN THE DIAPHRAGM.

THE #4 S11 STIRRUPS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO THE GROUTED RECESS.

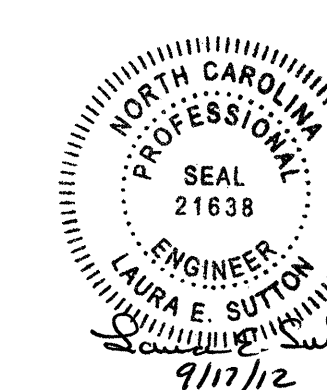
FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

**CONCRETE RELEASE STRENGTH**

| UNIT            | PSI  |
|-----------------|------|
| 60' & 65' UNITS | 4800 |
| 70' UNITS       | 5500 |

PROJECT NO. B-4458  
CATAWBA COUNTY  
 STATION: 19+70.00 -L-

SHEET 4 OF 4

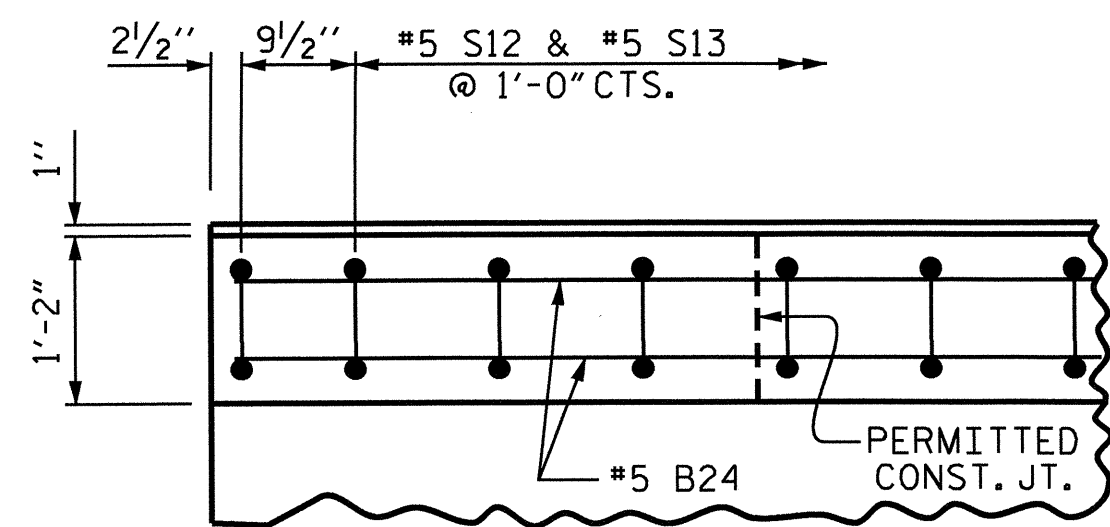


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 3'-0" X 2'-0"  
 PRESTRESSED CONCRETE  
 CORED SLAB UNIT  
 90° SKEW

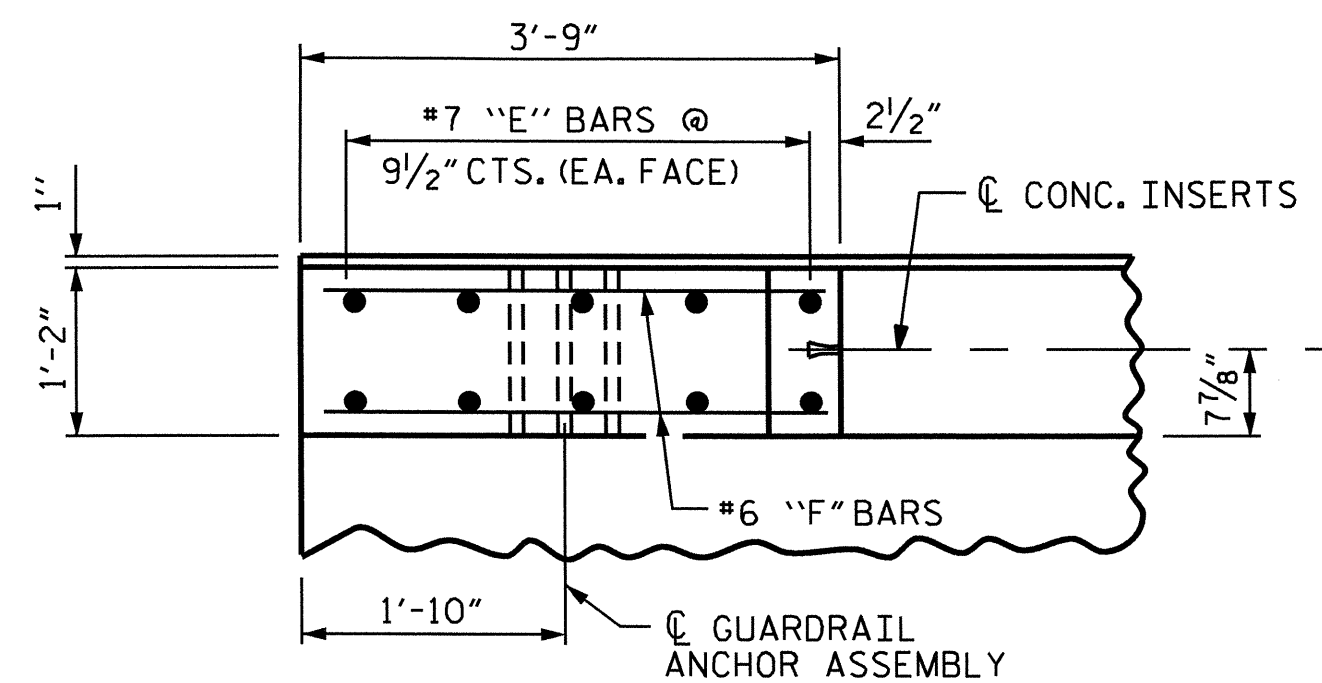
| REVISIONS |     |       |     | SHEET NO. |       |
|-----------|-----|-------|-----|-----------|-------|
| NO.       | BY: | DATE: | NO. | BY:       | DATE: |
| 1         |     |       | 3   |           |       |
| 2         |     |       | 4   |           |       |

|              |      |
|--------------|------|
| TOTAL SHEETS | S-10 |
| 25           |      |

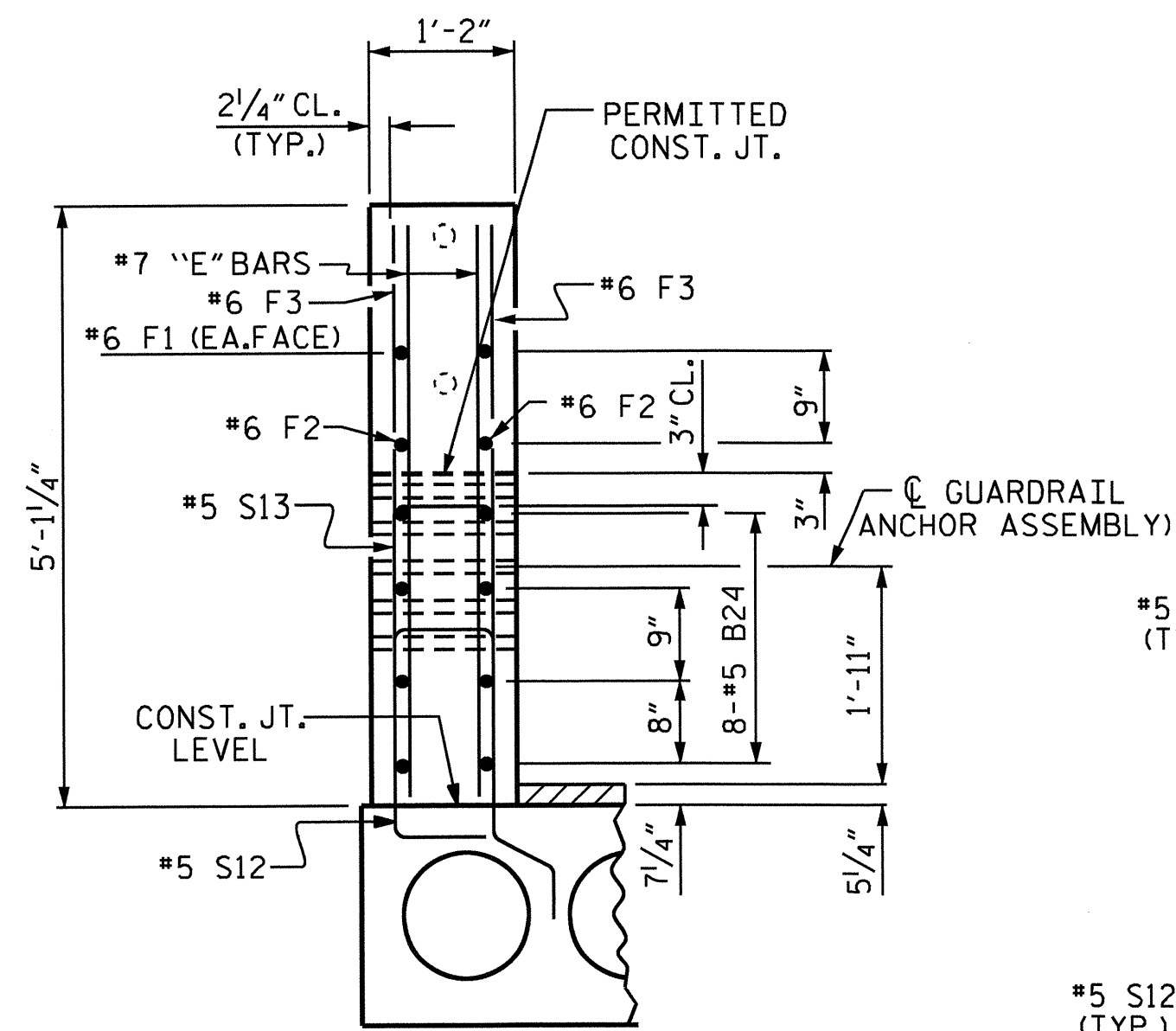
|                           |                    |
|---------------------------|--------------------|
| ASSEMBLED BY : B.N. GRADY | DATE : 2/2012      |
| CHECKED BY : M. ALI       | DATE : 3/2012      |
| DRAWN BY : MAA 6/10       | REV. 12/11 MAA/AAC |
| CHECKED BY : MKT 7/10     |                    |



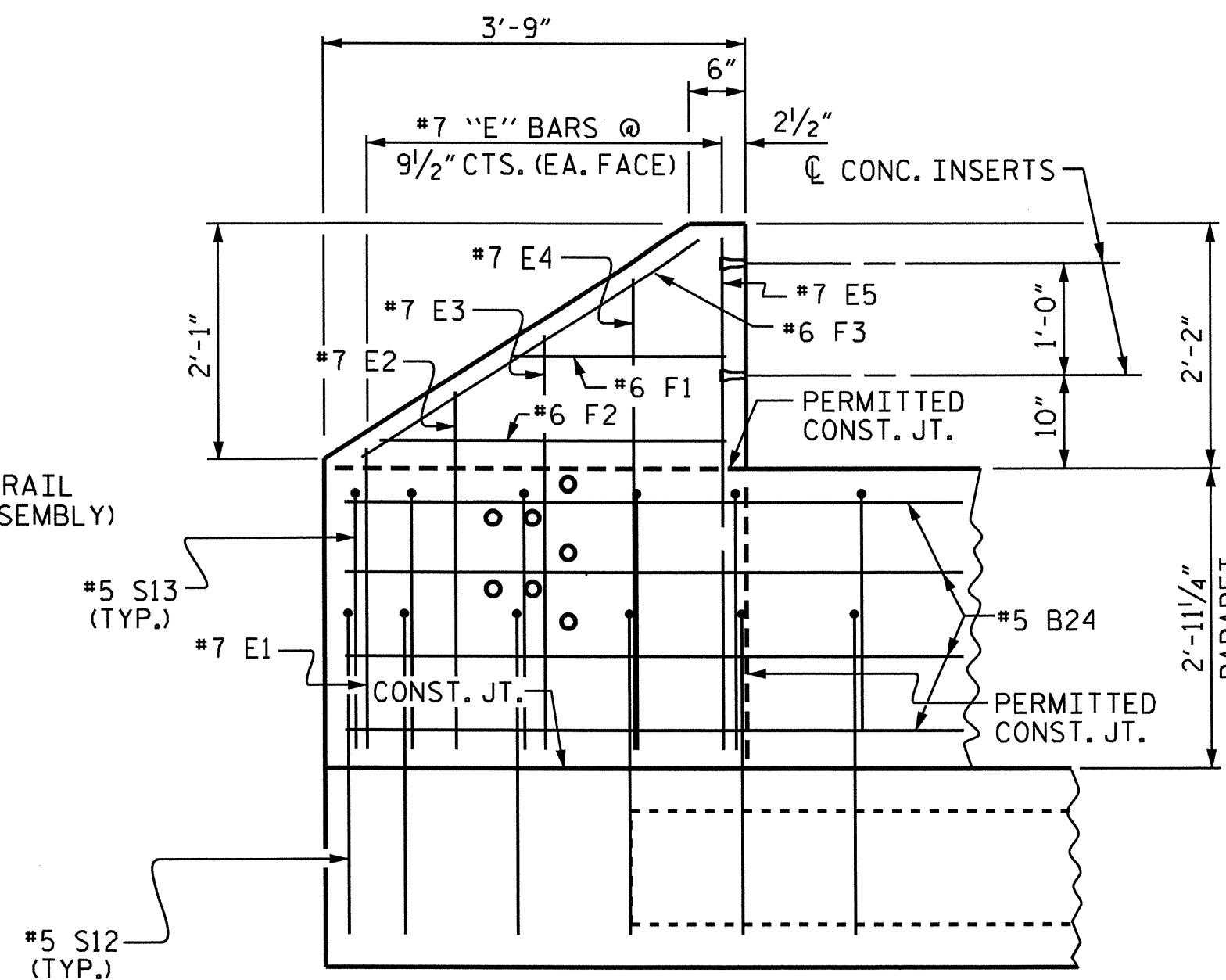
PLAN OF PARAPET



PLAN OF END POST

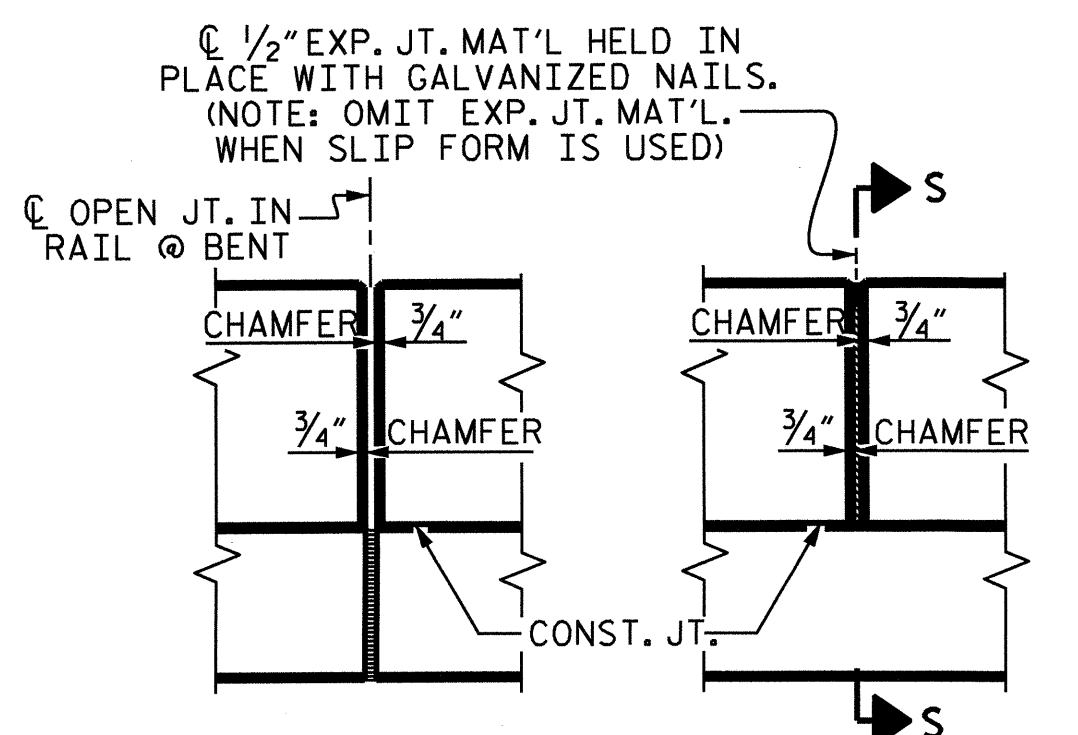


END VIEW

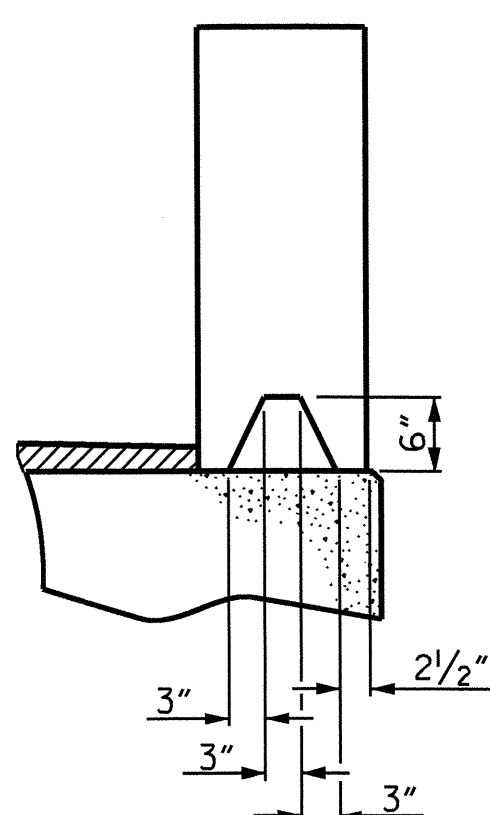


ELEVATION

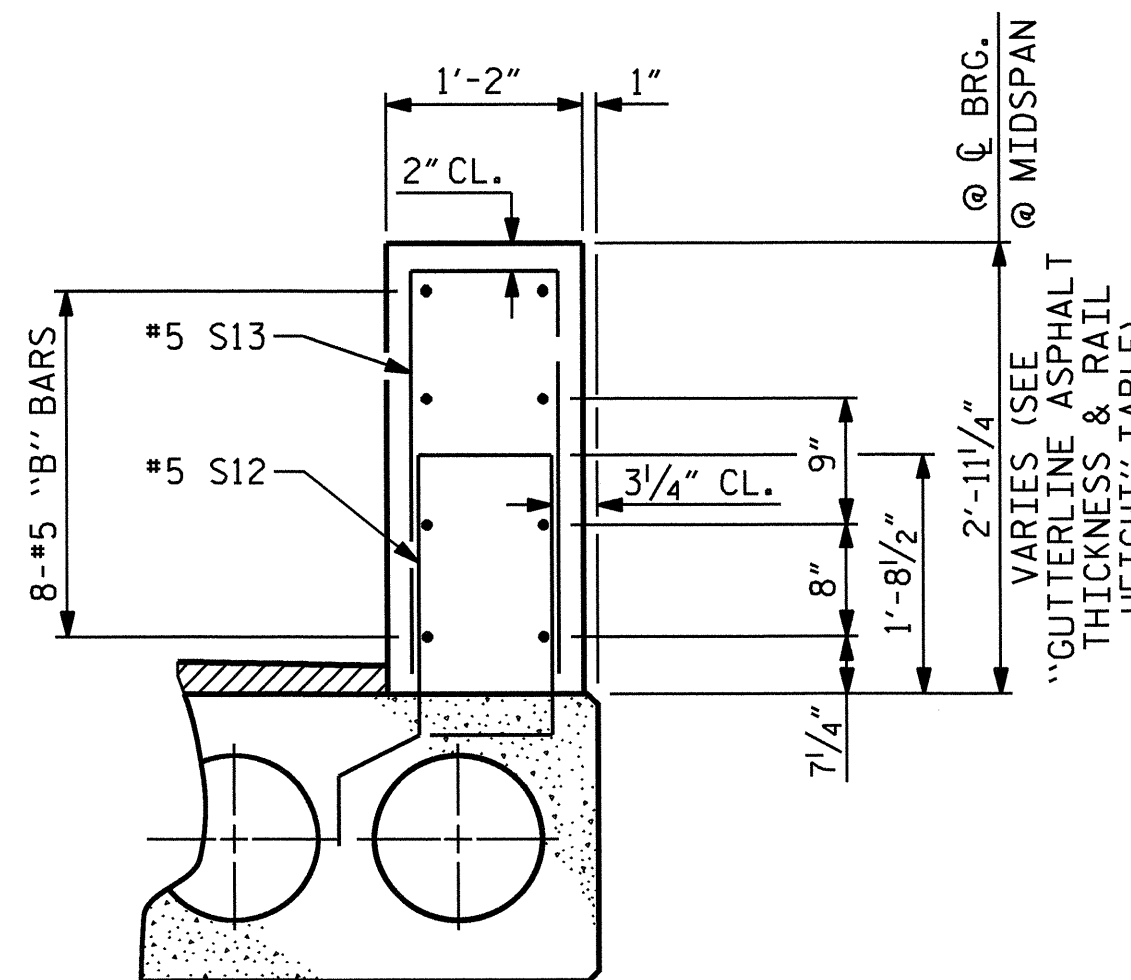
PARAPET AND END POST FOR TWO-BAR RAIL



ELEVATION AT EXPANSION JOINTS



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



SECTION THRU PARAPET

PARAPET DETAILS

— BAR TYPES —

ALL BAR DIMENSIONS ARE OUT TO OUT

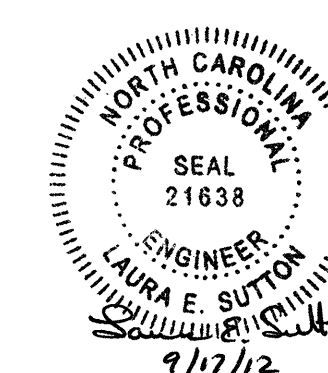
| BILL OF MATERIAL FOR PARAPETS AND END POSTS |     |      |      |         |             |
|---|-----|------|------|---------|-------------|
| BAR   | NO. | SIZE | TYPE | LENGTH  | WEIGHT      |
| * B24                                       | 96  | #5   | STR  | 21'-3"  | 2128        |
| * B25                                       | 48  | #5   | STR  | 22'-11" | 1147        |
| * E1  | 8   | #7   | STR  | 2'-10"  | 46          |
| * E2  | 8   | #7   | STR  | 3'-4"   | 55          |
| * E3  | 8   | #7   | STR  | 3'-10"  | 63          |
| * E4  | 8   | #7   | STR  | 4'-5"   | 72          |
| * E5  | 8   | #7   | STR  | 4'-9"   | 78          |
| * F1  | 8   | #6   | STR  | 1'-10"  | 22          |
| * F2  | 8   | #6   | STR  | 3'-0"   | 36          |
| * F3  | 8   | #6   | STR  | 3'-8"   | 44          |
| * S13                                       | 406 | #5   | 1    | 5'-8"   | 2400        |
| * EPOXY COATED REINF. STEEL = 6091 LBS      |     |      |      |         |             |
| CLASS AA CONCRETE                           |     |      |      |         | 49.4 C.Y.   |
| 1'-2" X 2'-11 1/4" CONCRETE PARAPET         |     |      |      |         | 400.50 L.F. |

NOTES

- ALL REINFORCING STEEL IN THE PARAPETS AND END POSTS SHALL BE EPOXY COATED.
- #5 S12 BARS ARE INCLUDED IN THE BILL OF MATERIAL FOR CORED SLAB UNITS.
- GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT A SPACING OF 8 FT. TO 10 FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.
- THE 1/2" EXPANSION JOINT IN THE PARAPET MAY BE SHIFTED SLIGHTLY IN ORDER TO MAINTAIN A 2" MINIMUM CLEARANCE TO THE #5 S12 & #5 S13 BARS.

PROJECT NO. B-4458  
CATAWBA COUNTY  
 STATION: 19+70.00 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 END POSTS  
 &  
 PARAPET DETAILS



| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-11         |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |
| 2         |     |       | 4   |     |       | 25           |

DRAWN BY: B.N. GRADY DATE: 2/2012  
 CHECKED BY: M. ALI DATE: 3/2012

**NOTES**

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

**ALUMINUM RAILS**

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

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

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

**GALVANIZED STEEL RAILS**

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

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

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

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

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

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

**GENERAL NOTES**

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

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

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

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

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

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

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

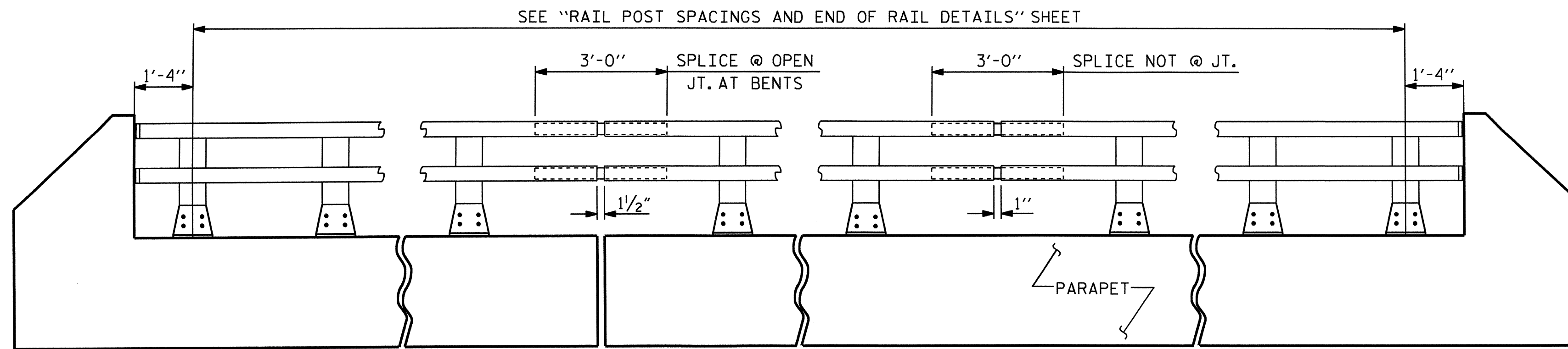
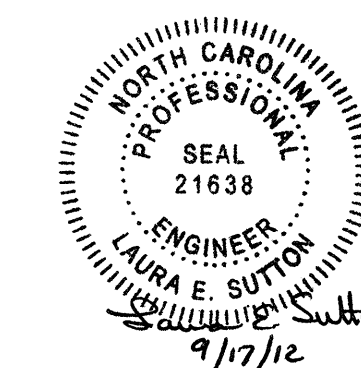
PAY LENGTH = 385.50 LIN. FT.

PROJECT NO. B-4458  
CATAWBA COUNTY  
 STATION: 19+70.00 -L-

SHEET 1 OF 2

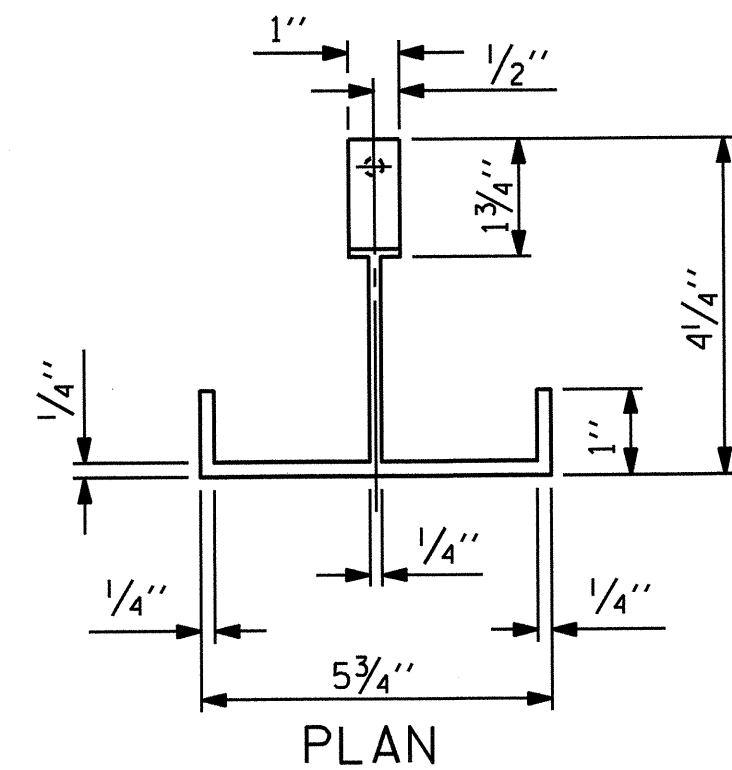
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 2 BAR METAL RAIL

| REVISIONS |     |       |     |     |       | SHEET NO.    |  |
|-----------|-----|-------|-----|-----|-------|--------------|--|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | TOTAL SHEETS |  |
| 1         |     |       | 3   |     |       | S-12         |  |
| 2         |     |       | 4   |     |       | 25           |  |

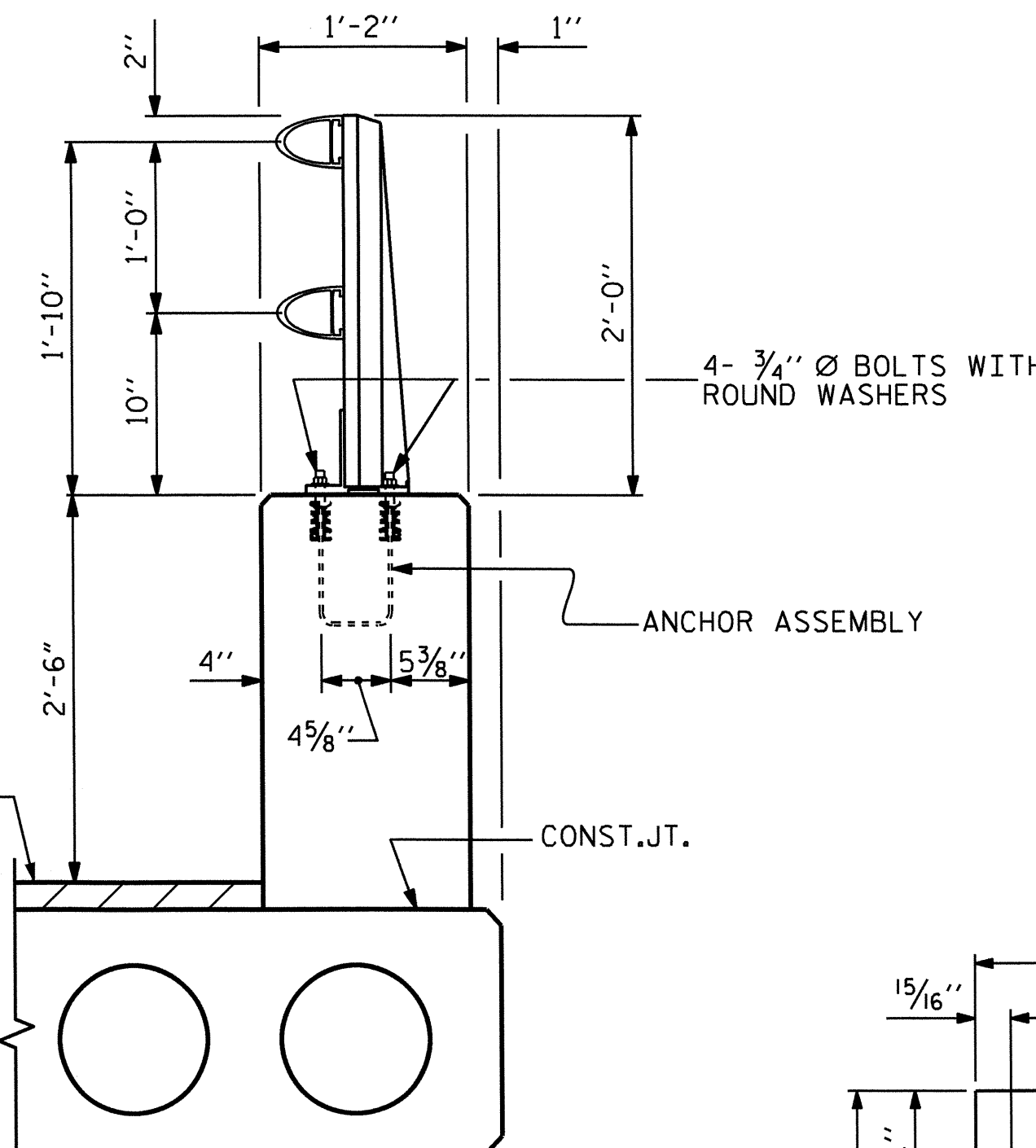


**ELEVATION**

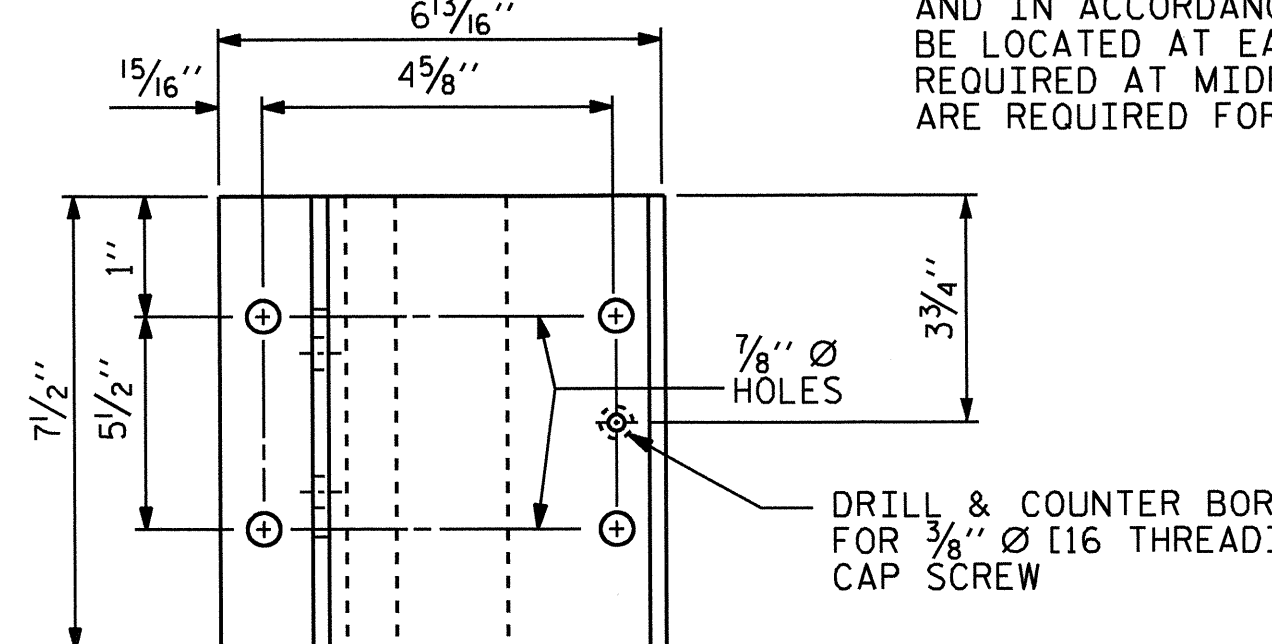
NOTE: FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR2.



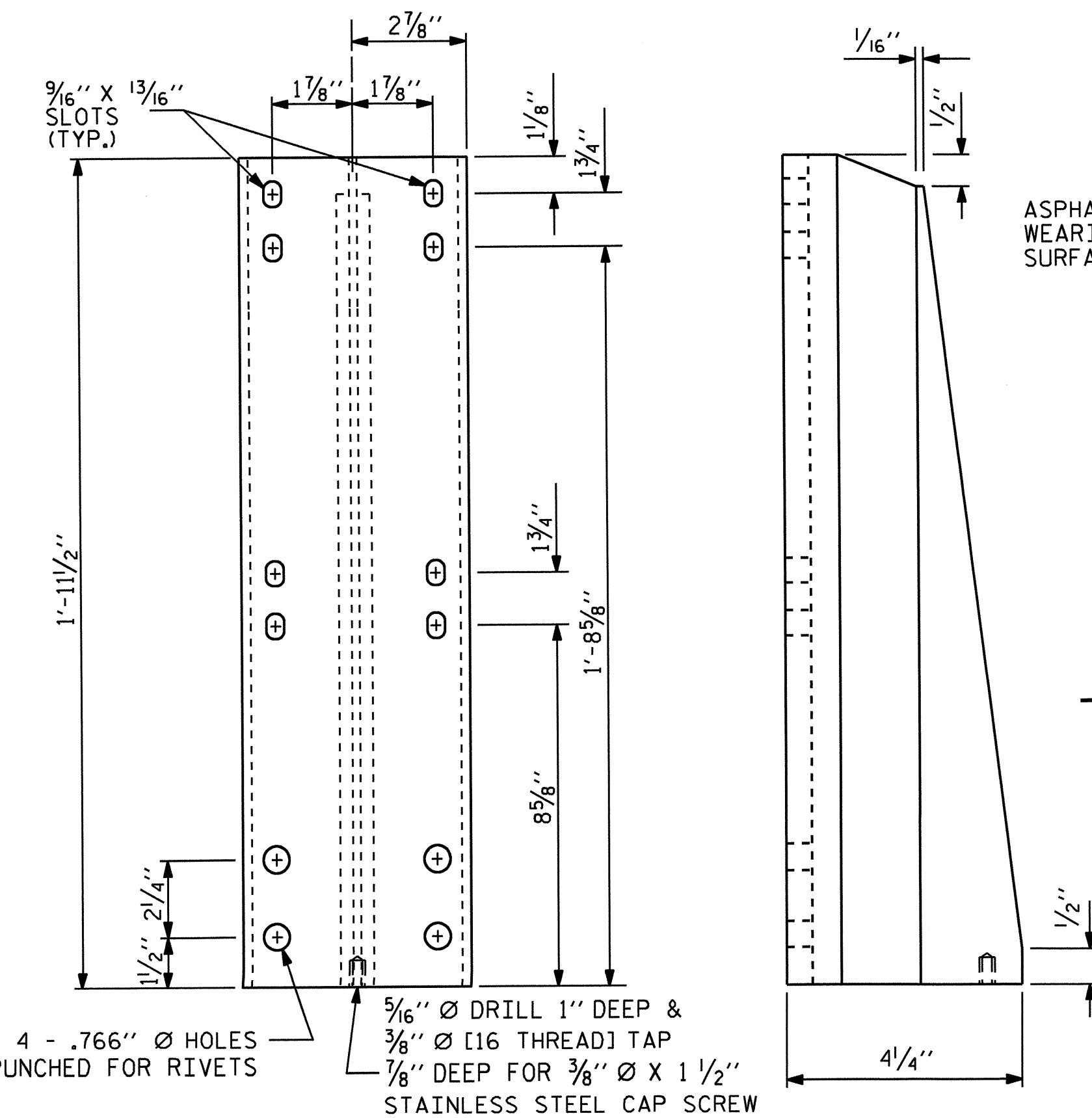
**PLAN**



**SECTION THRU PARAPET AND RAIL**



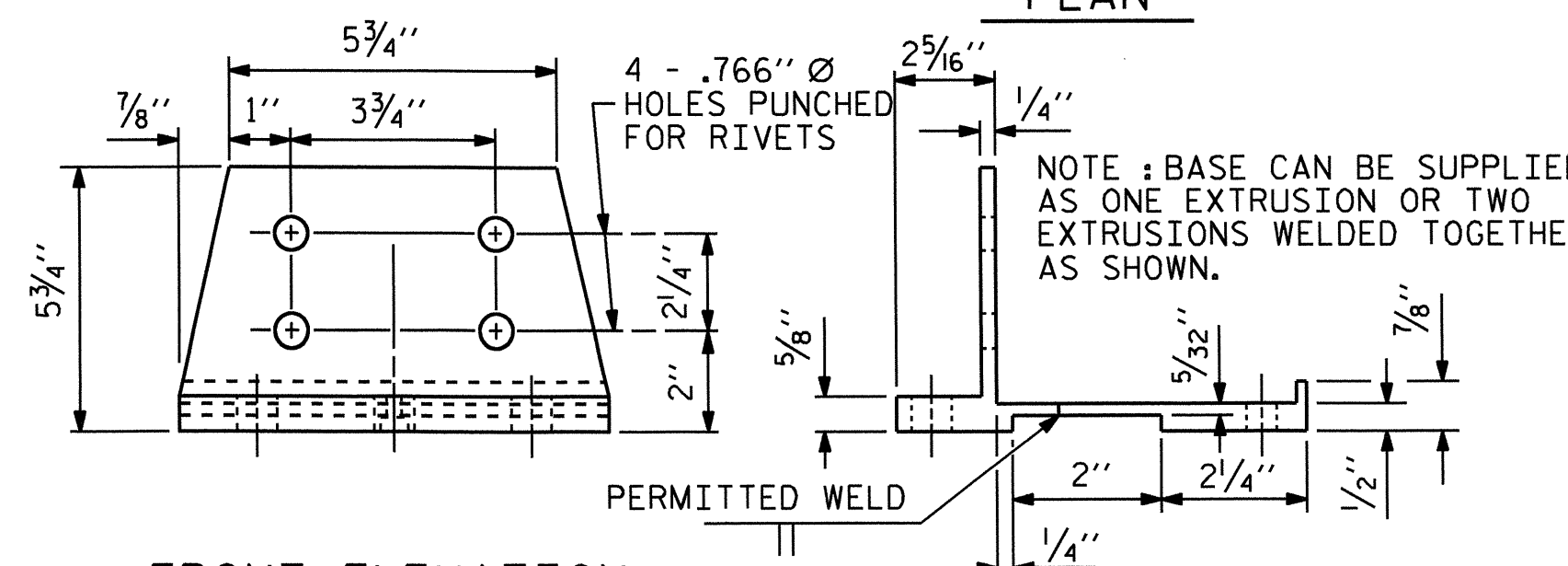
**PLAN**



**FRONT ELEVATION**

**SIDE ELEVATION**

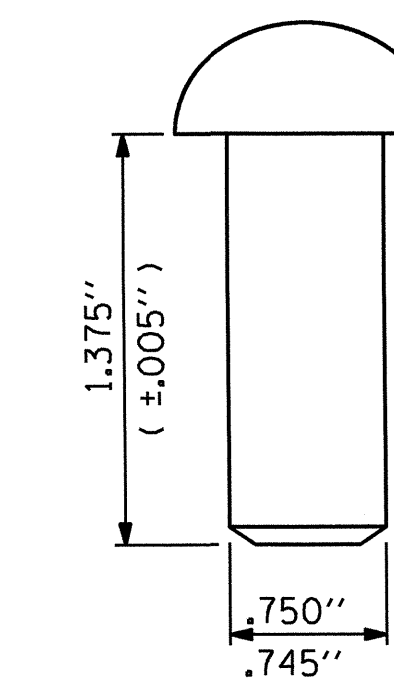
**DETAILS OF POST**



**FRONT ELEVATION**

**SIDE ELEVATION**

**POST BASE DETAILS**



**RIVET DETAIL**

|                          |                      |
|--------------------------|----------------------|
| ASSEMBLED BY: B.N. GRADY | DATE: 2/2012         |
| CHECKED BY: M. ALI       | DATE: 3/2012         |
| DRAWN BY: EEM 6/94       | REV. 5/7/03R RWW/JTE |
| CHECKED BY: RGW 6/94     | REV. 5/1/06 TLA/GM   |
|                          | REV. 10/1/11 MAA/GM  |

NOTES

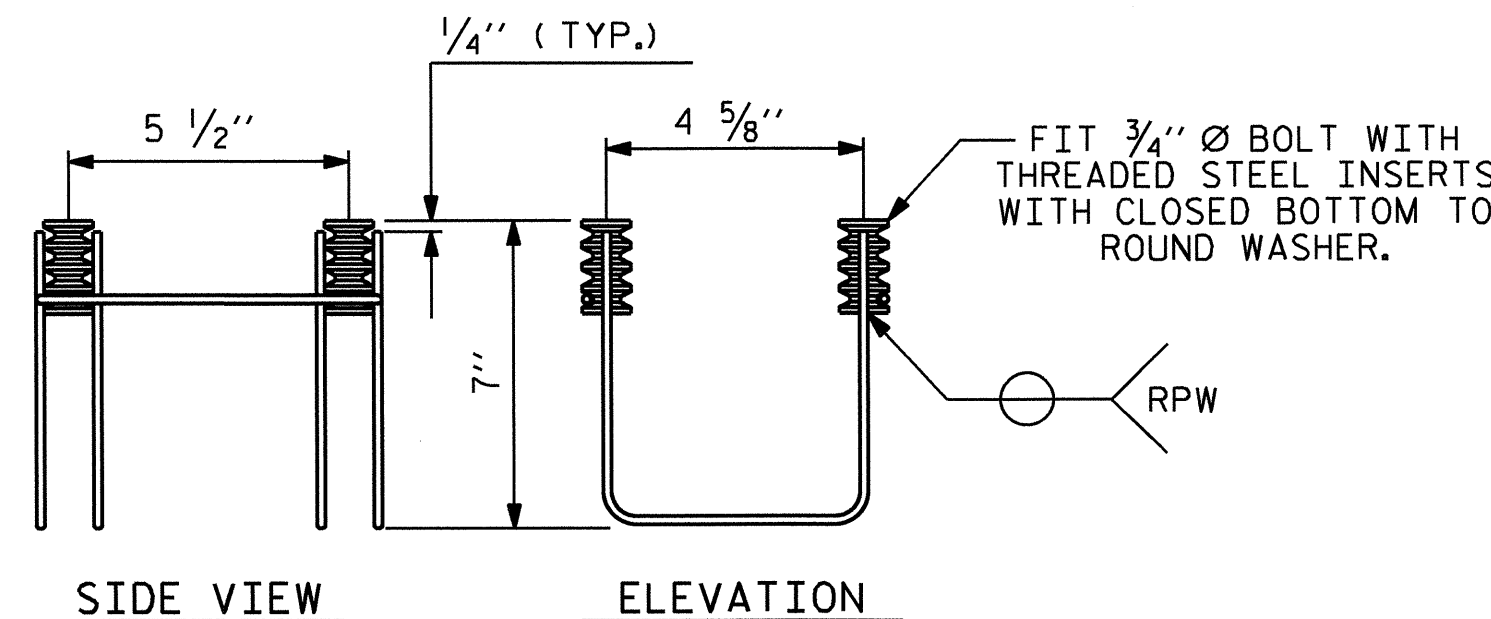
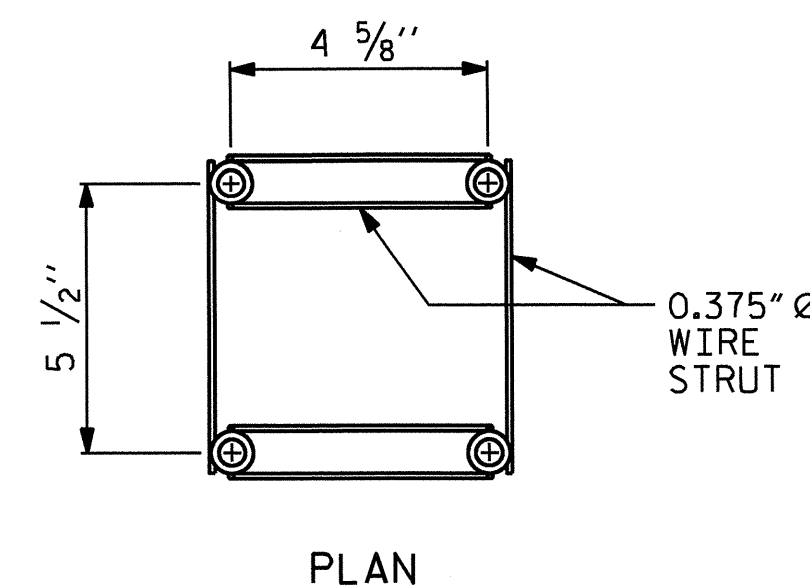
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.
- B. 4 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 2 1/2" GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.
- C. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 1/6" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.
- D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.
- E. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.
- F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

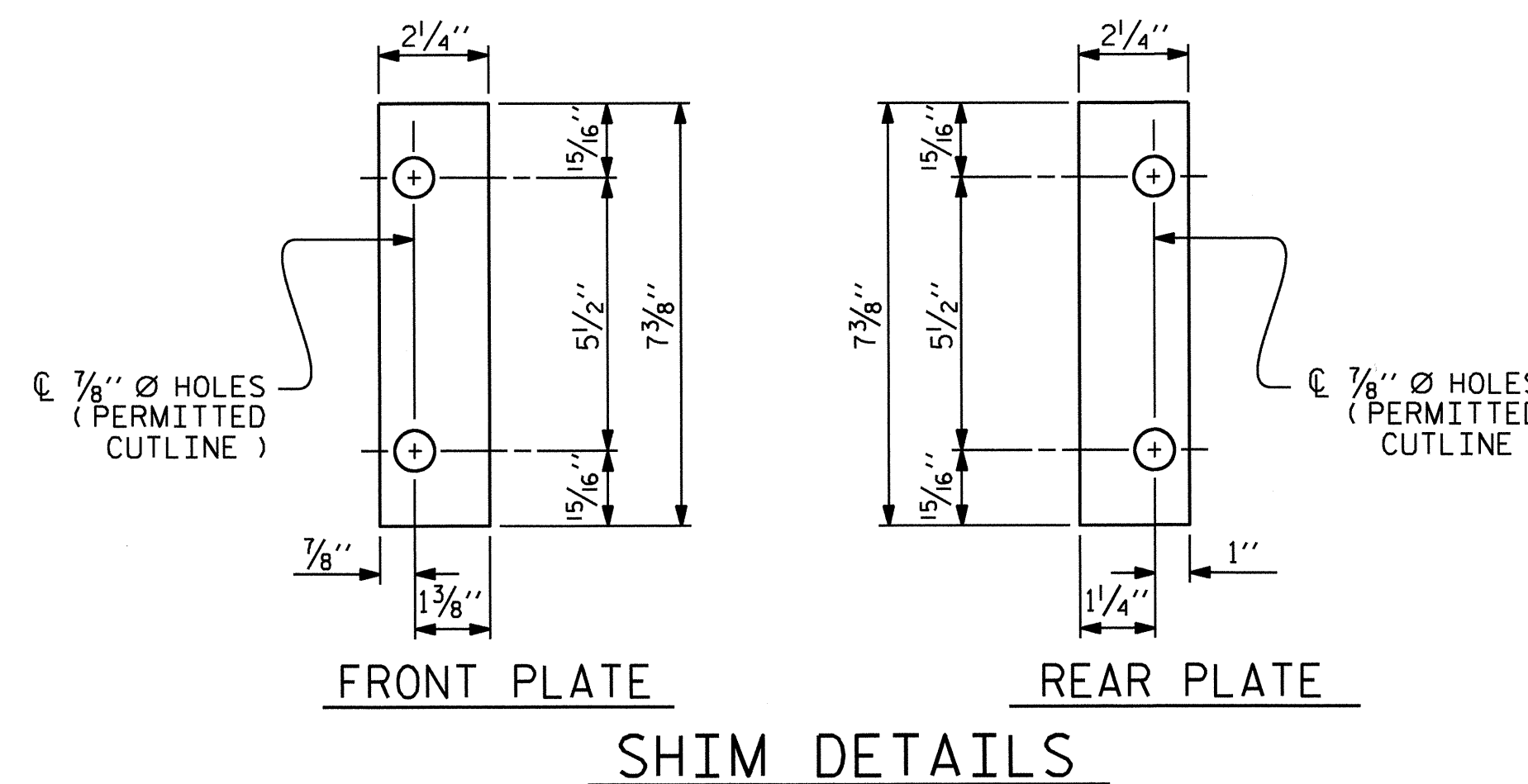
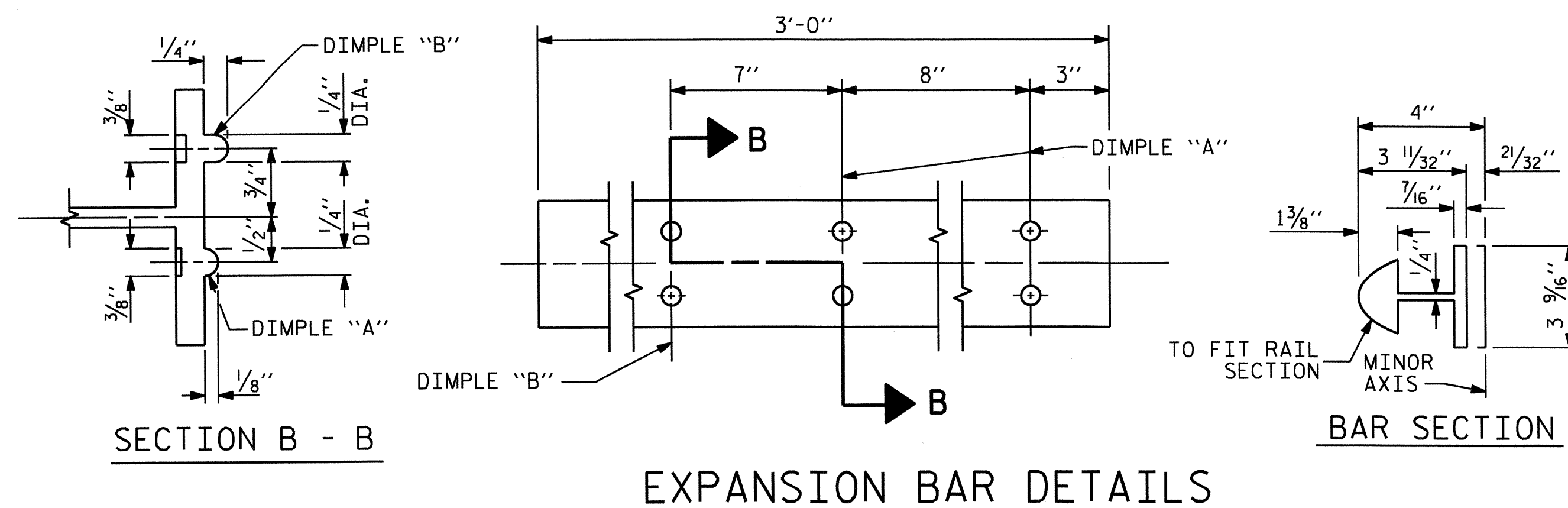
THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE METAL RAIL ANCHOR ASSEMBLY. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE THE STANDARD SPECIFICATIONS.

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

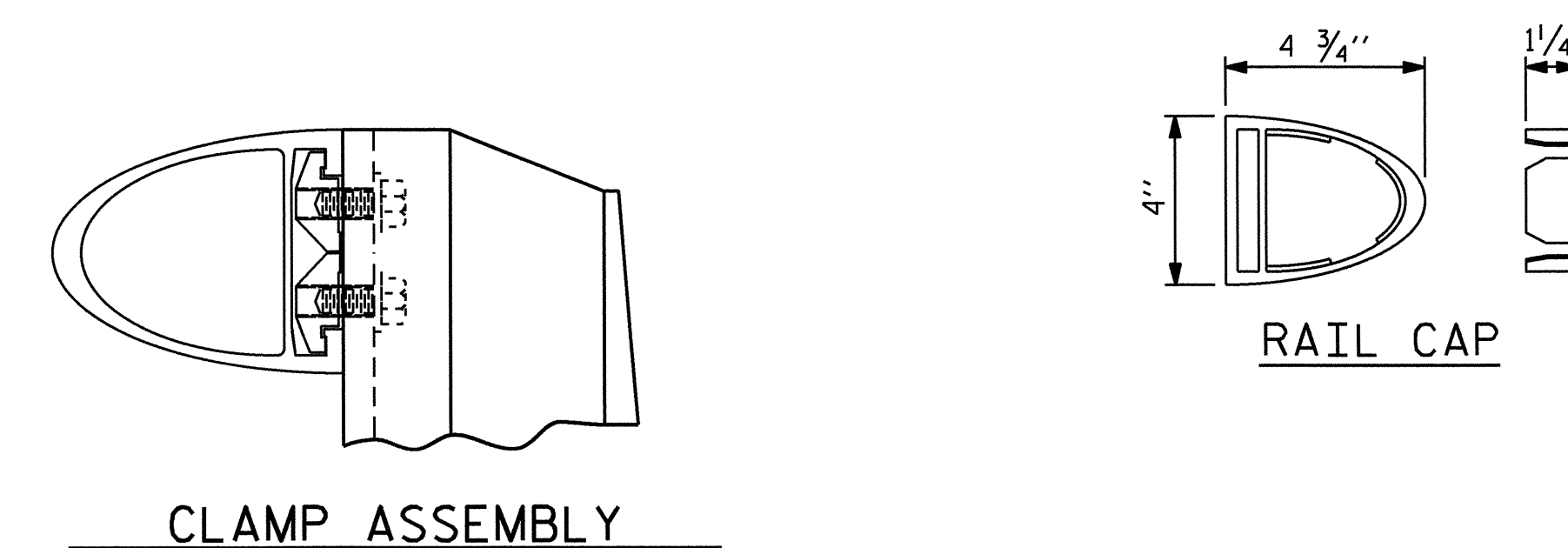
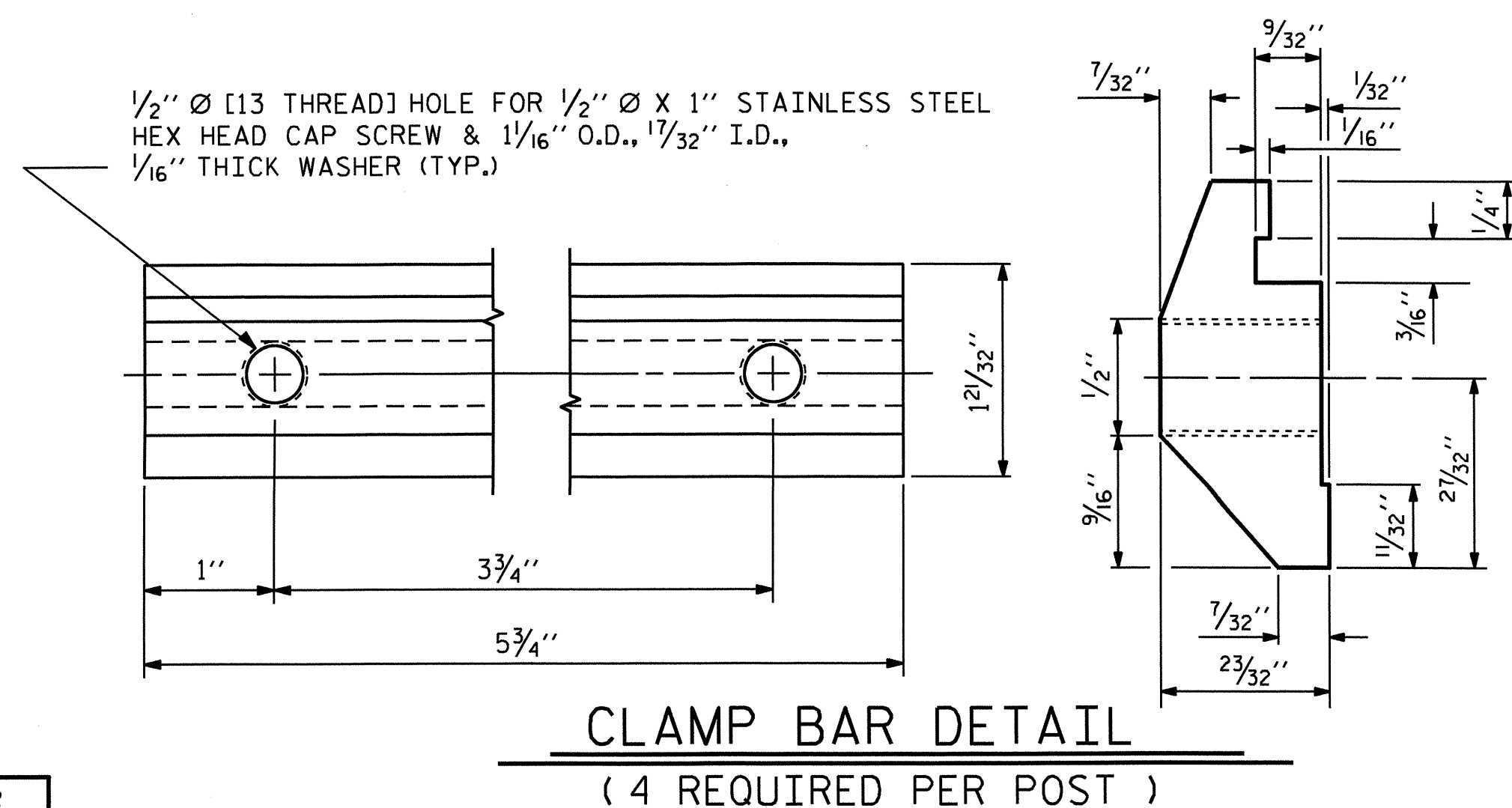
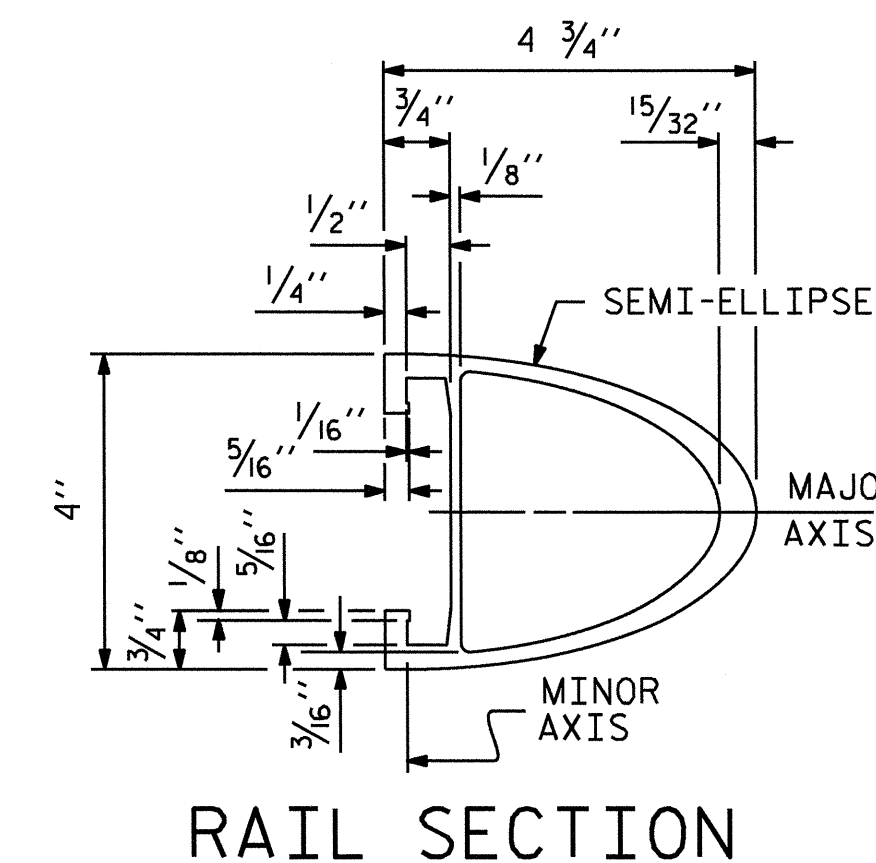


4-BOLT METAL RAIL ANCHOR ASSEMBLY

( 66 ASSEMBLIES REQUIRED )



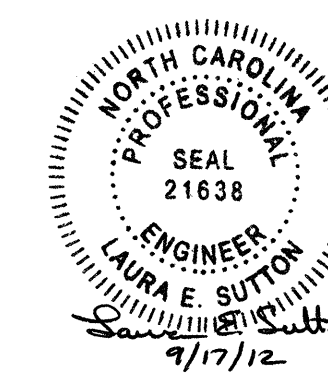
NOTE : SHIMS MAY BE CUT ALONG PERMITTED OUTLINE OR SLOTTED TO EDGE OF PLATE TO FACILITATE PLACEMENT.



PROJECT NO. B-4458  
 CATAWBA COUNTY  
 STATION: 19+70.00 -L-

SHEET 2 OF 2

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

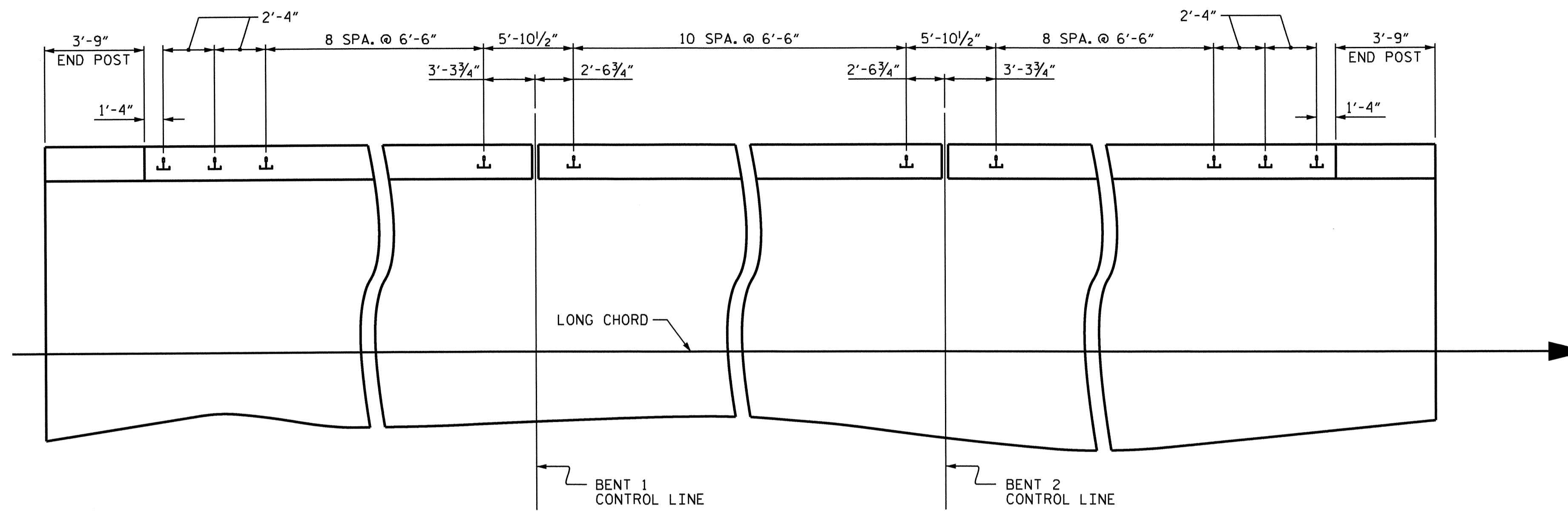


| REVISIONS |     |       |     |     | SHEET NO. |
|-----------|-----|-------|-----|-----|-----------|
| NO.       | BY: | DATE: | NO. | BY: | DATE:     |
| 1         |     |       | 3   |     |           |
| 2         |     |       | 4   |     |           |

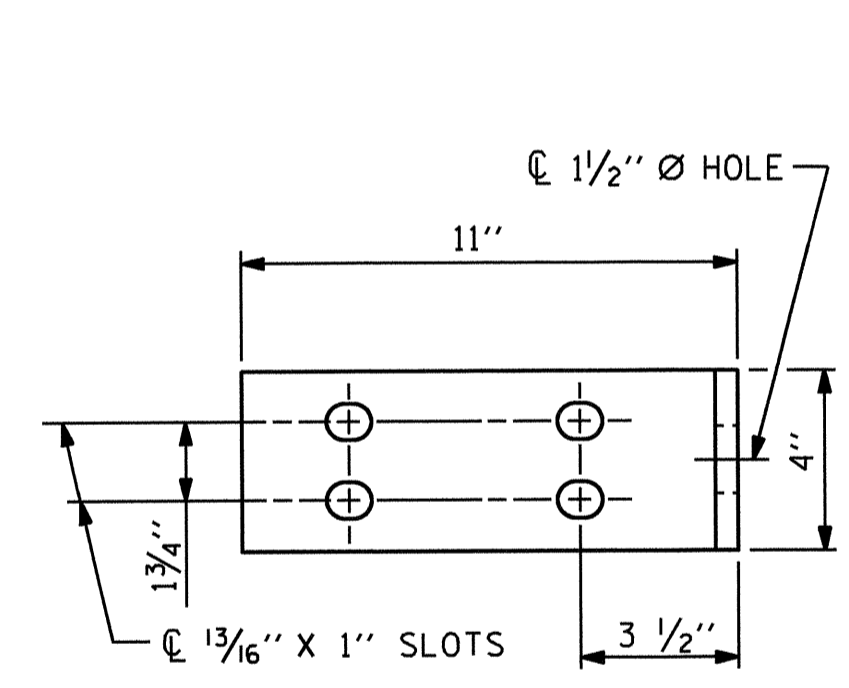
S-13  
 TOTAL SHEETS  
 25

STD. NO. BMR4

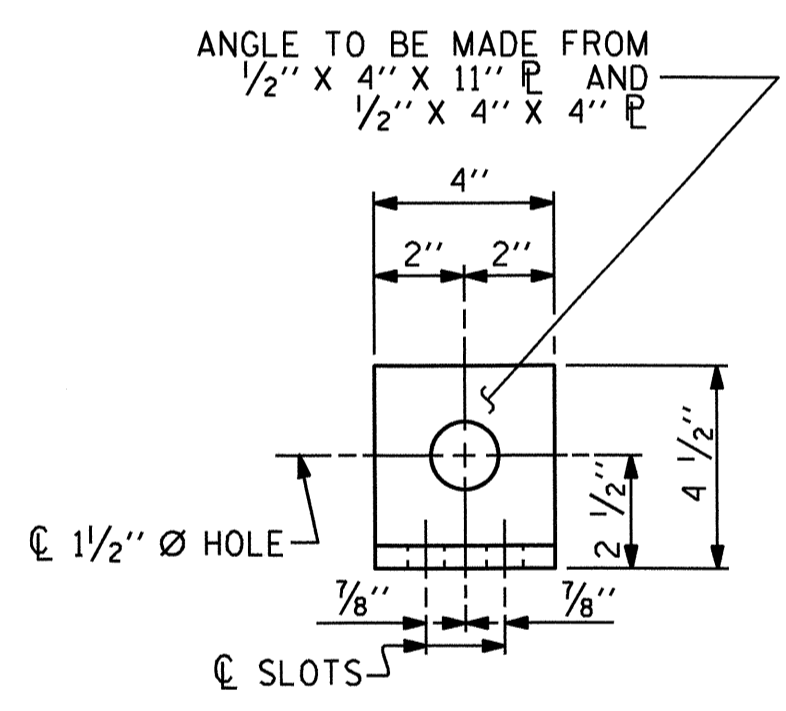
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| ASSEMBLED BY : B.N. GRADY | DATE : 2/2012        |
| CHECKED BY : M. ALI       | DATE : 3/2012        |
| DRAWN BY : EEM 6/94       | REV. 8/16/99 MAB/LES |
| CHECKED BY : RGW 6/94     | REV. 5/1/06R KMM/GM  |
|                           | REV. 10/1/11 MAA/GM  |



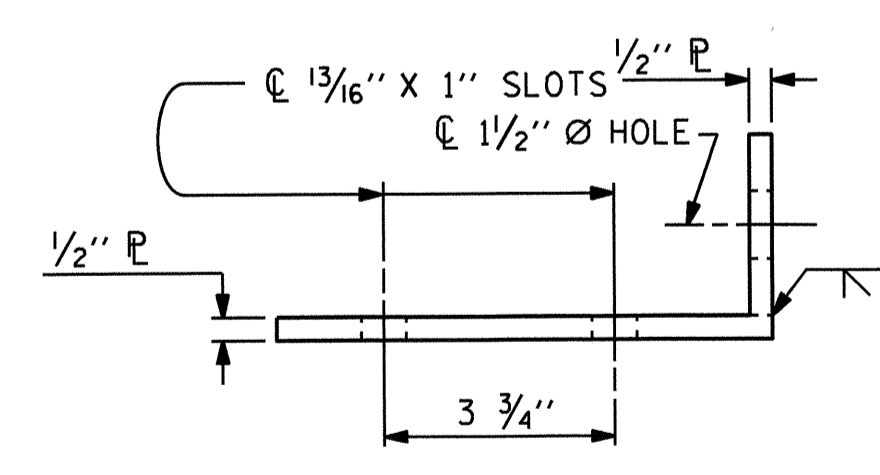
**PLAN OF RAIL POST SPACINGS**  
LEFT SIDE SHOWN, RIGHT SIDE SIMILAR



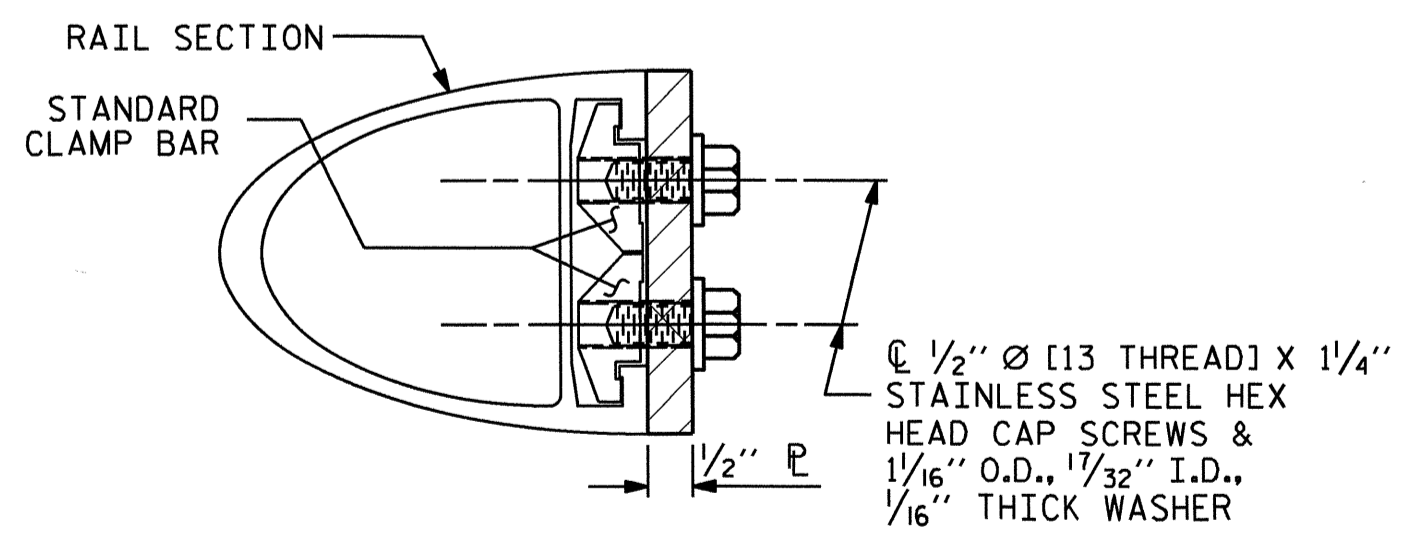
**ELEVATION**



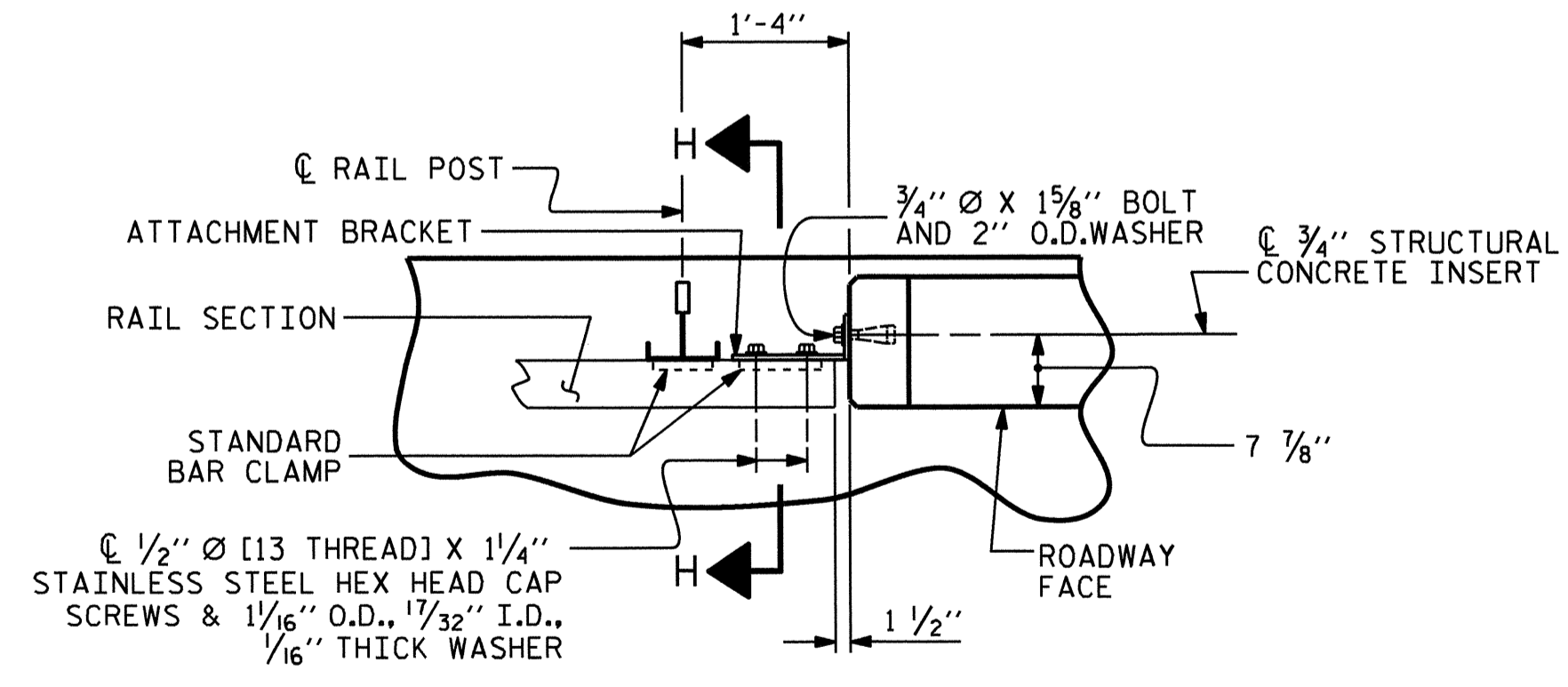
**END VIEW**



**TOP VIEW**



**SECTION H-H**



**PLAN - RAIL AND END POST**

**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 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

**NOTES**

**METAL RAIL TO END POST CONNECTION**

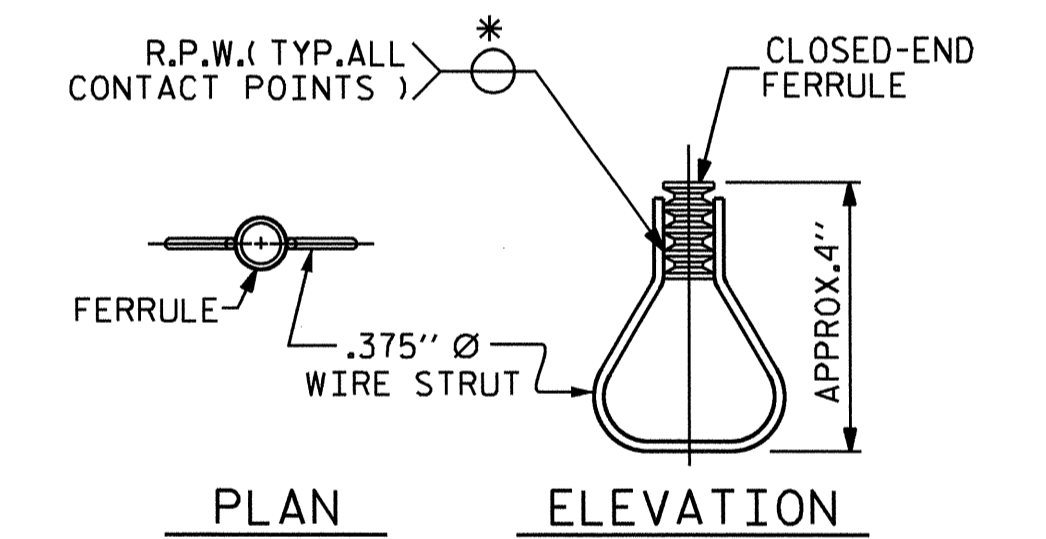
- THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
  - B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 5/8" BOLT SHALL HAVE N. C. THREADS.
  - C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60° F.
  - D. STANDARD CLAMP BARS (SEE METAL RAIL SHEET).
  - E. 1/2" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 1 OR 2 BAR METAL RAILS.

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

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

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

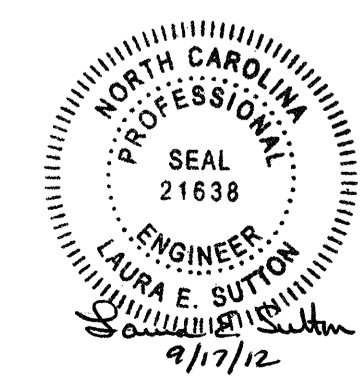


**STRUCTURAL CONCRETE INSERT**

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

PROJECT NO. B-4458  
CATAWBA COUNTY  
STATION: 19+70.00 -L-

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



|                           |                     |
|---------------------------|---------------------|
| ASSEMBLED BY : B.N. GRADY | DATE : 2/2012       |
| CHECKED BY : M. ALI       | DATE : 3/2012       |
| DRAWN BY : FCJ 1/88       | REV. 5/7/03 RWW/JTE |
| CHECKED BY : CRK 3/89     | REV. 5/1/06 TLA/GM  |
|                           | REV. 10/1/11 MAA/GM |

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

| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | TOTAL SHEETS |
| 1         |     |       | 3   |     |       | S-14         |
| 2         |     |       | 4   |     |       | 25           |

NOTES

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

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

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

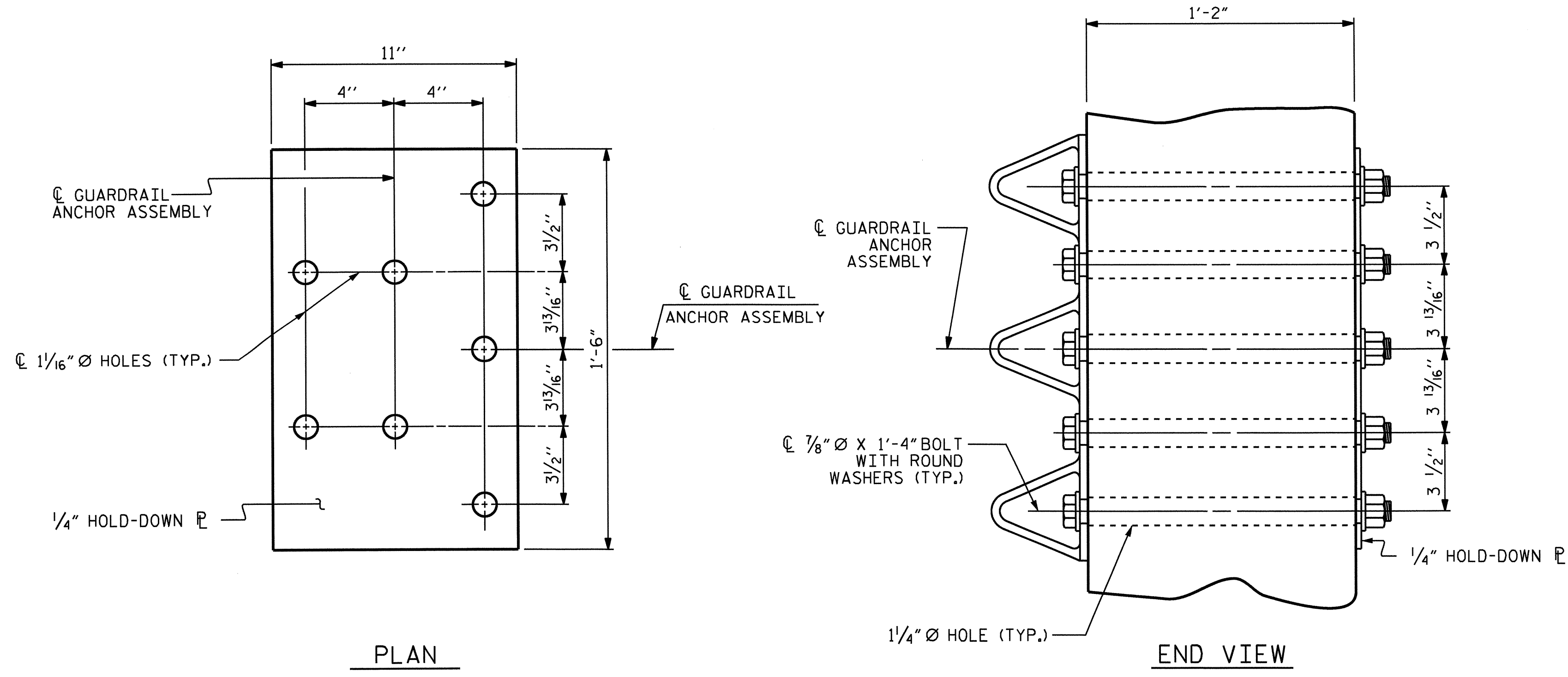
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

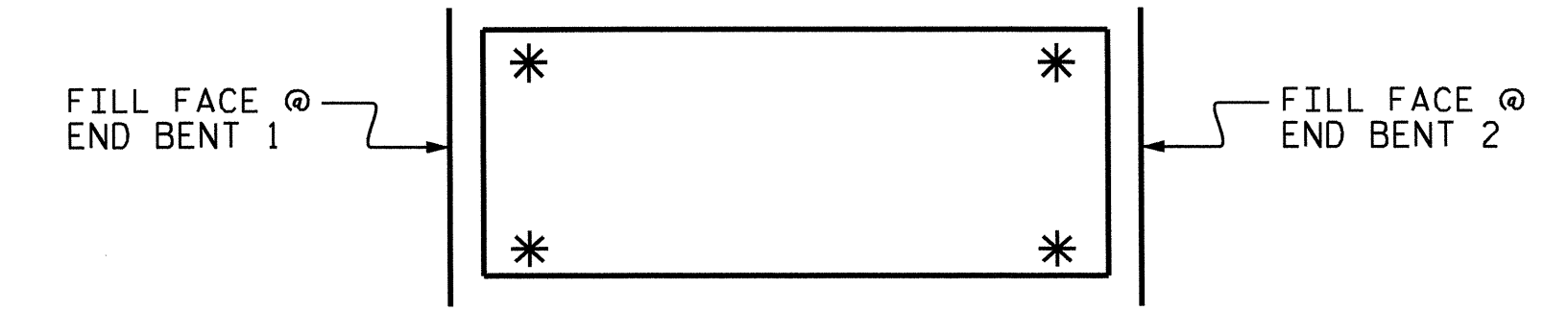
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

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



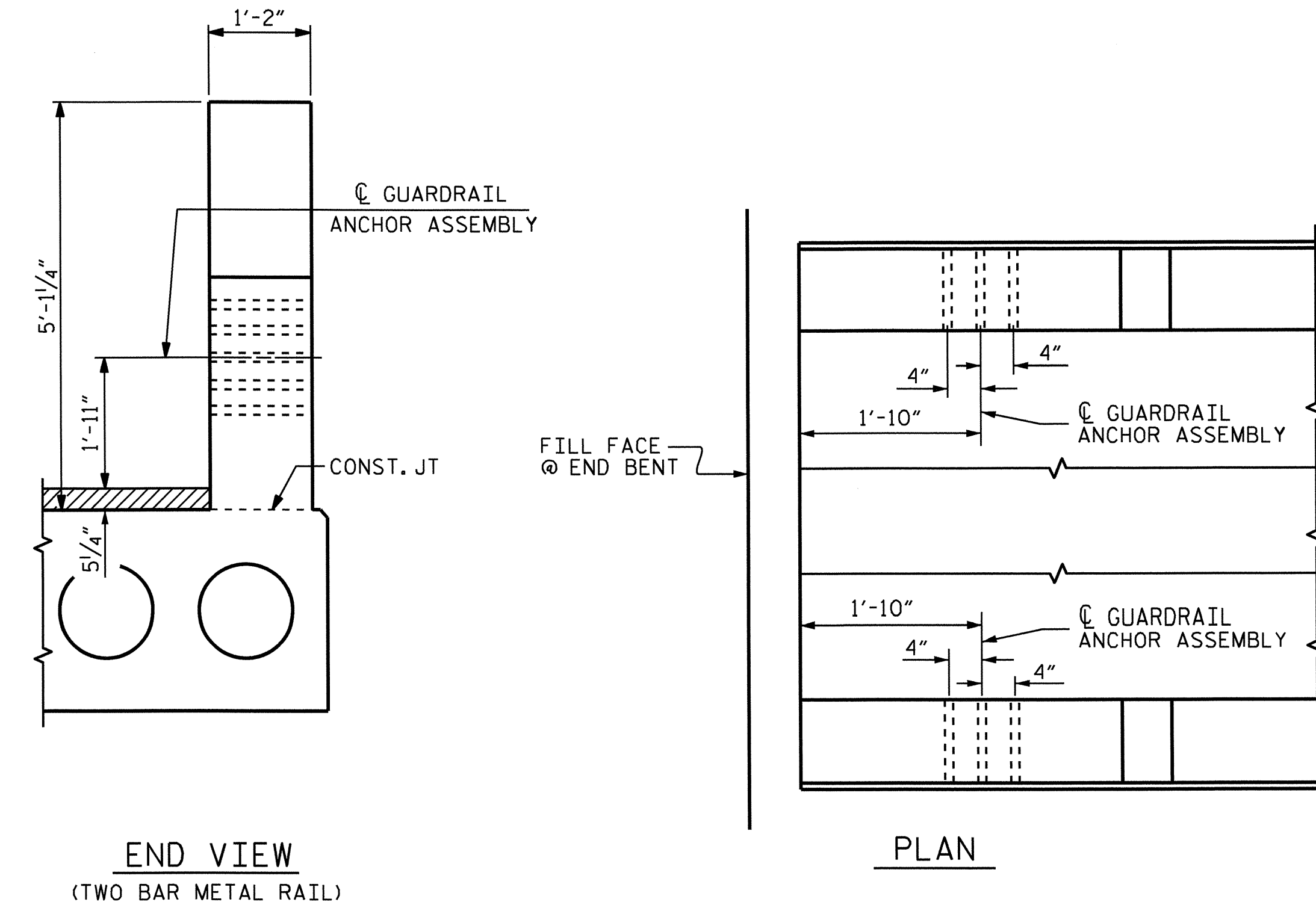
PLAN  
END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS



SKETCH SHOWING POINTS OF ATTACHMENT

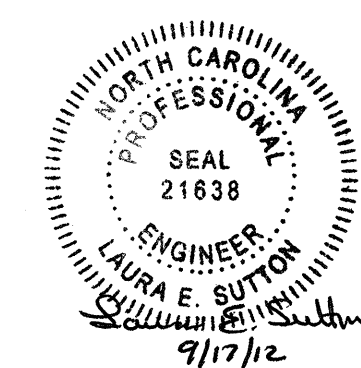
\* LOCATION OF GUARDRAIL ATTACHMENT



END VIEW (TWO BAR METAL RAIL)  
PLAN  
LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. B-4458  
CATAWBA COUNTY  
 STATION: 19+70.00 -L-

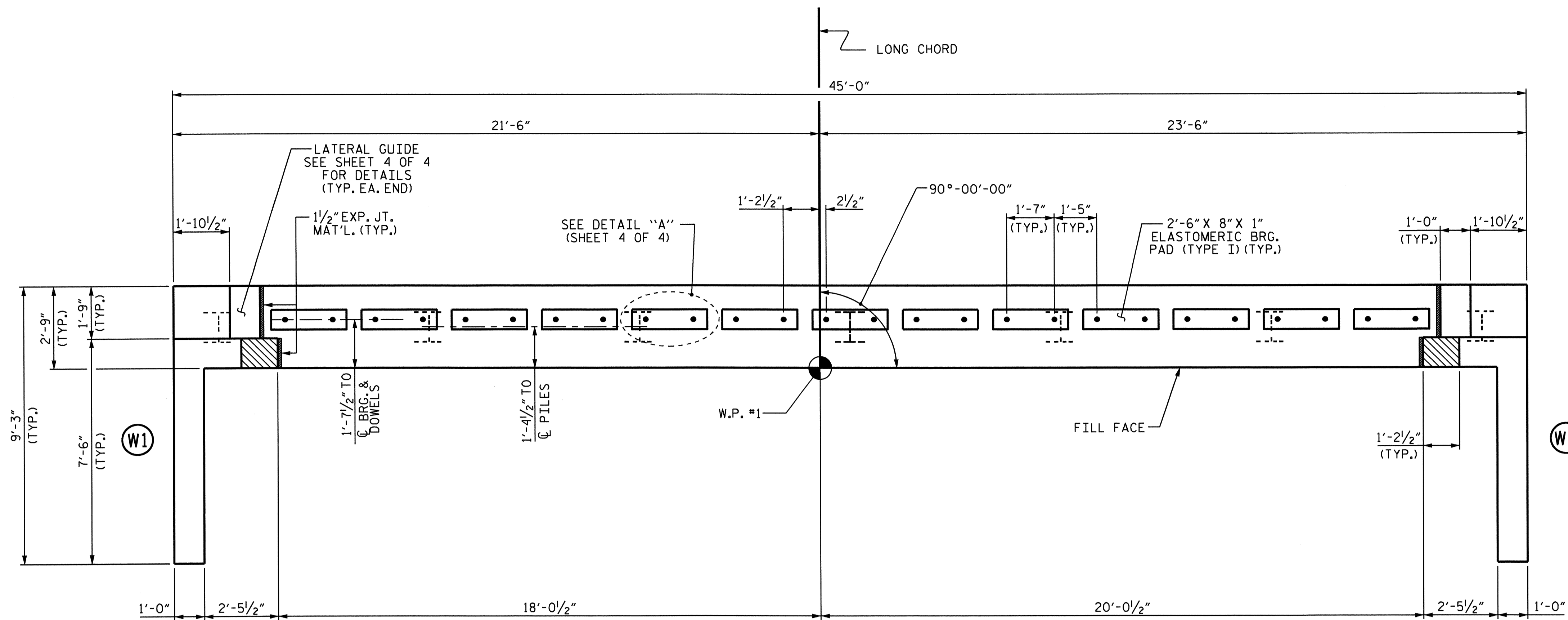
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 GUARDRAIL ANCHORAGE  
 DETAILS  
 FOR METAL RAILS



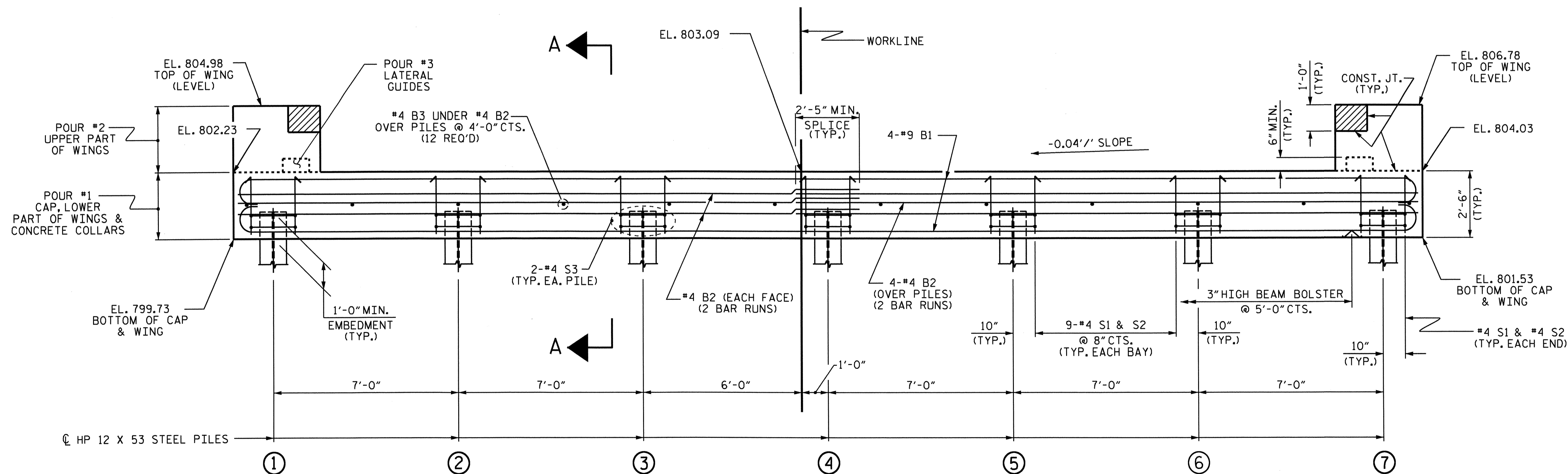
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|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | TOTAL SHEETS |
| 1         |     |       | 3   |     |       | S-15         |
| 2         |     |       | 4   |     |       | 25           |

|                           |               |
|---------------------------|---------------|
| ASSEMBLED BY : B.N. GRADY | DATE : 2/2012 |
| CHECKED BY : M. ALI       | DATE : 3/2012 |
| DRAWN BY : MAA 5/10       | ADDED 5/6/10  |
| CHECKED BY : GM 5/10      | REV. 10/1/11  |
|                           | REV. 12/5/11  |
|                           | MAA/GM        |
|                           | MAA/GM        |





PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY.  
 FOR SECTION A-A, SEE SHEET 4 OF 4.  
 CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.  
 SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

THE LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE CONCRETE PARAPET IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

THE CONTRACTOR HAS THE OPTION TO OMIT THE LATERAL GUIDE IF APPROVED BY THE ENGINEER.

TOP OF PILE ELEVATIONS

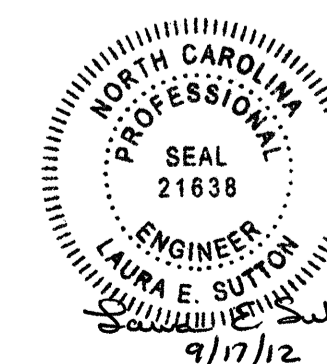
|   |        |
|---|--------|
| ① | 800.79 |
| ② | 801.07 |
| ③ | 801.35 |
| ④ | 801.63 |
| ⑤ | 801.91 |
| ⑥ | 802.19 |
| ⑦ | 802.47 |

PROJECT NO. B-4458  
CATAWBA COUNTY  
 STATION: 19+70.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT 1

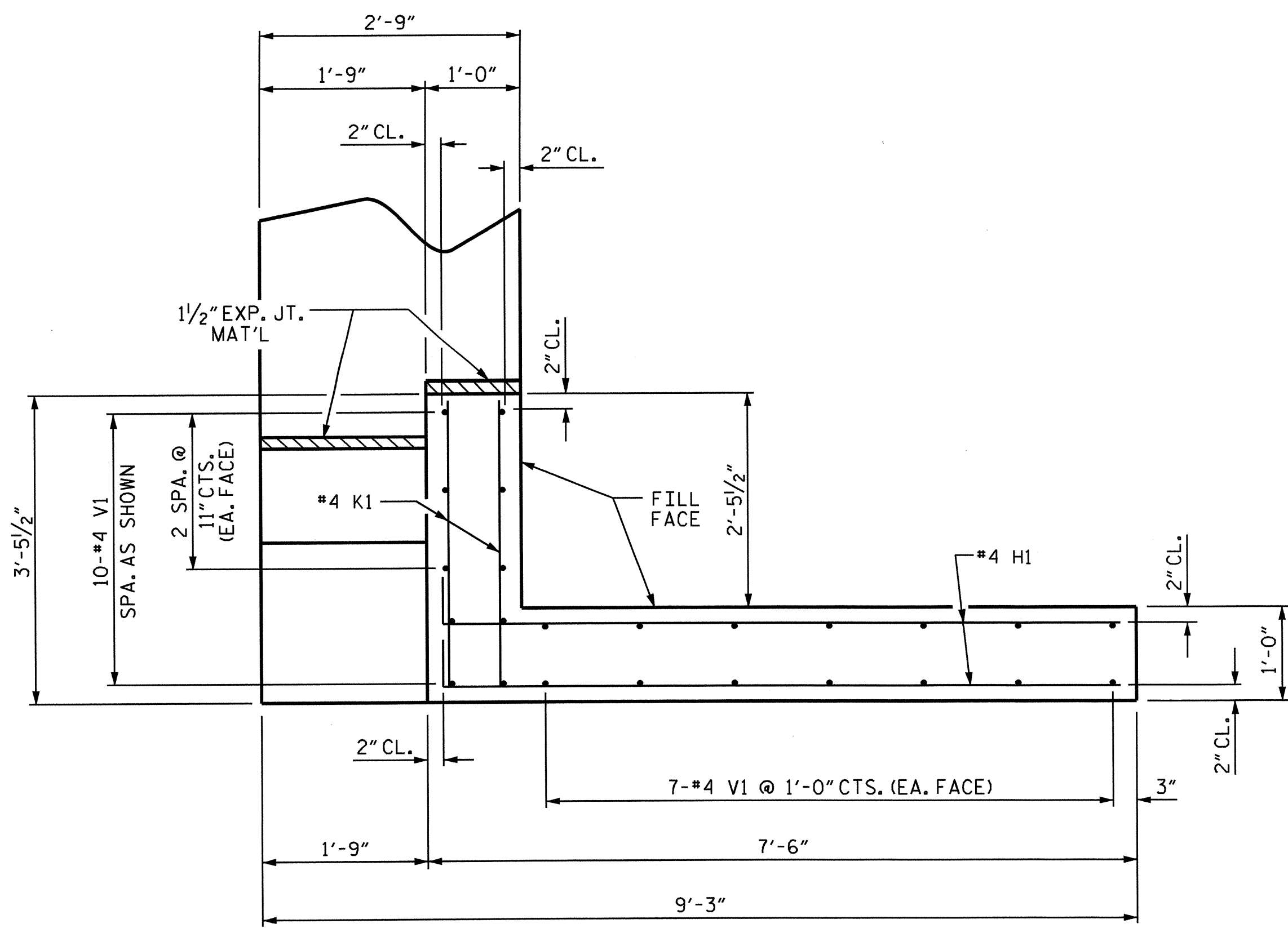


DRAWN BY: B.C. HUNT DATE: 11/2011  
 CHECKED BY: J.P. ADAMS DATE: 12/2011

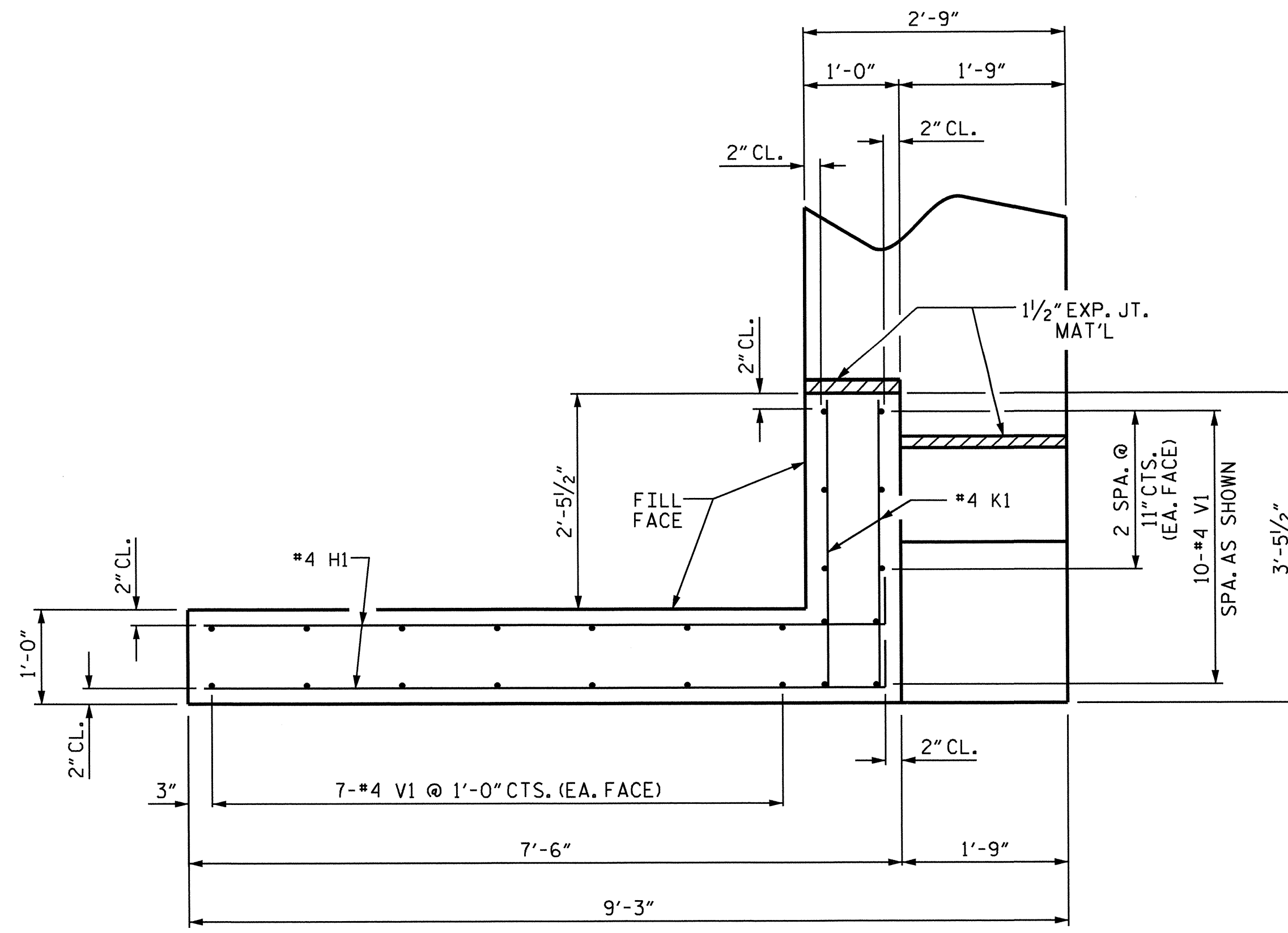
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 LSUTTON

| REVISIONS |     |       |     |     |       | SHEET NO.    |  |
|-----------|-----|-------|-----|-----|-------|--------------|--|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | TOTAL SHEETS |  |
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| 2         |     |       | 4   |     |       | 25           |  |

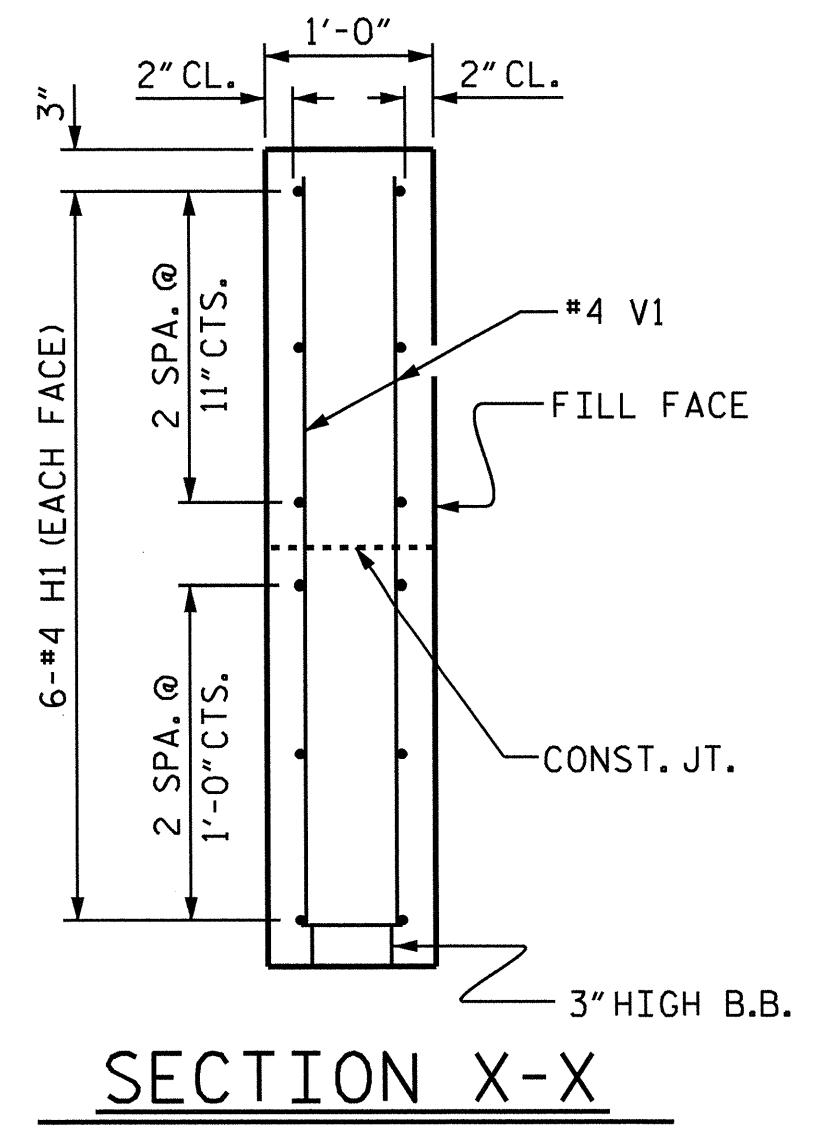




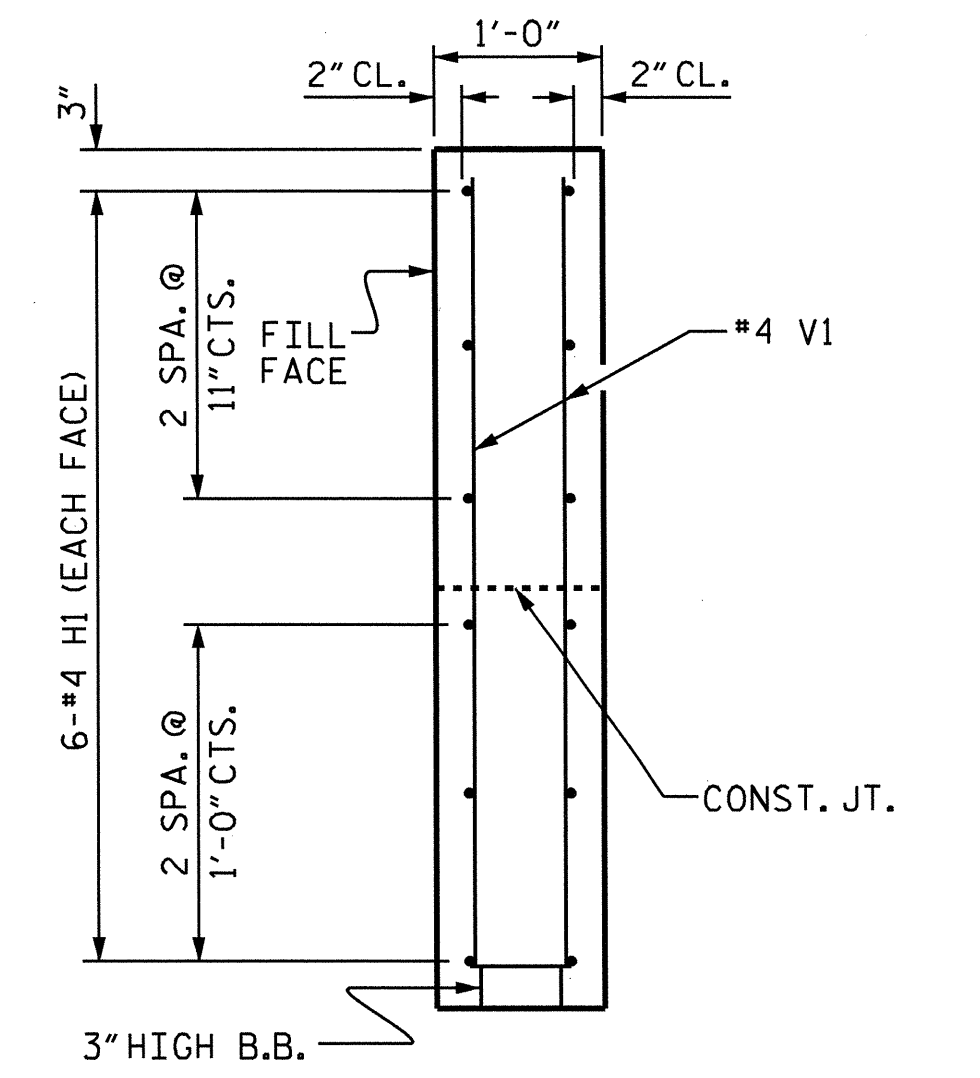
PLAN OF WING (W1)



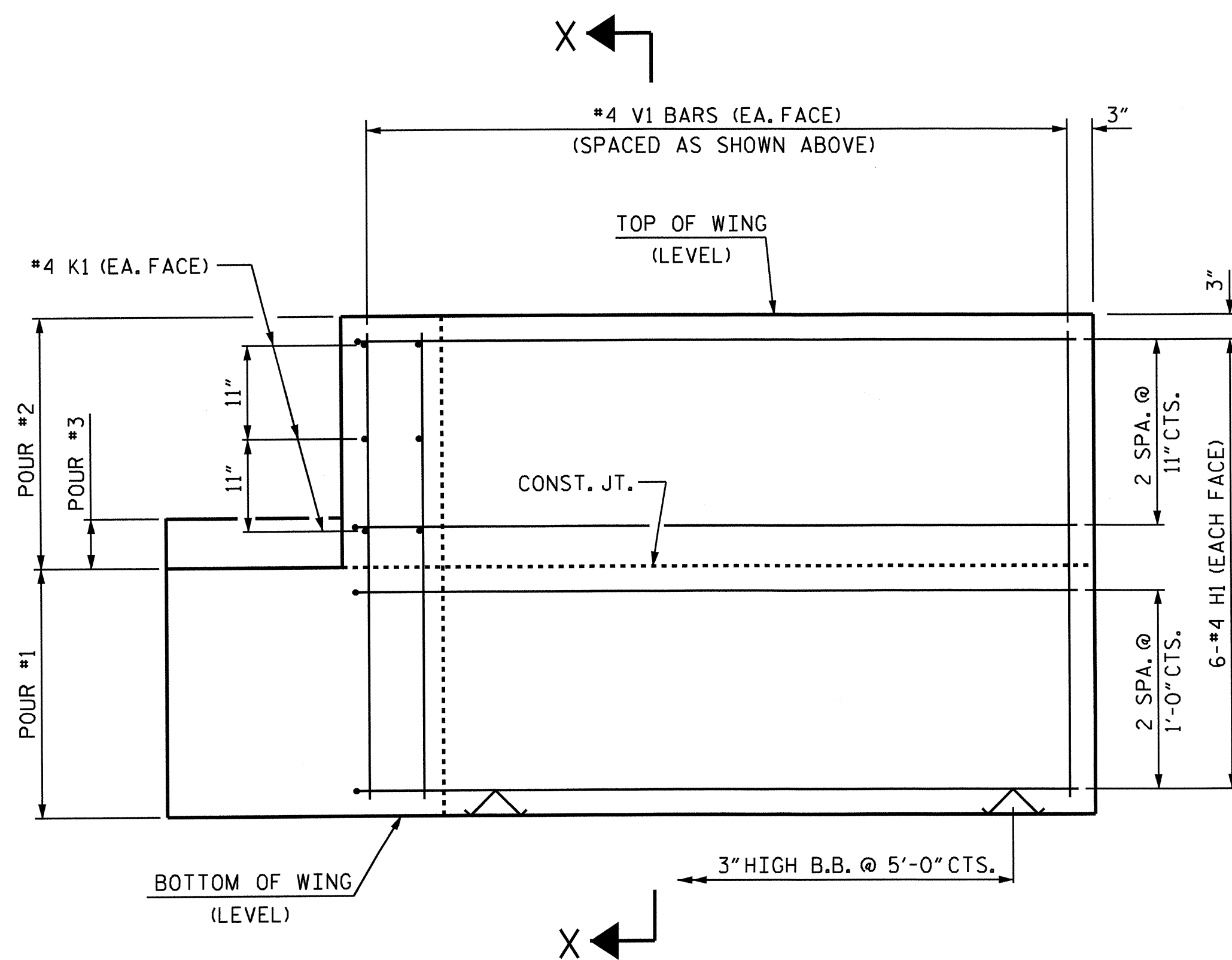
PLAN OF WING (W2)



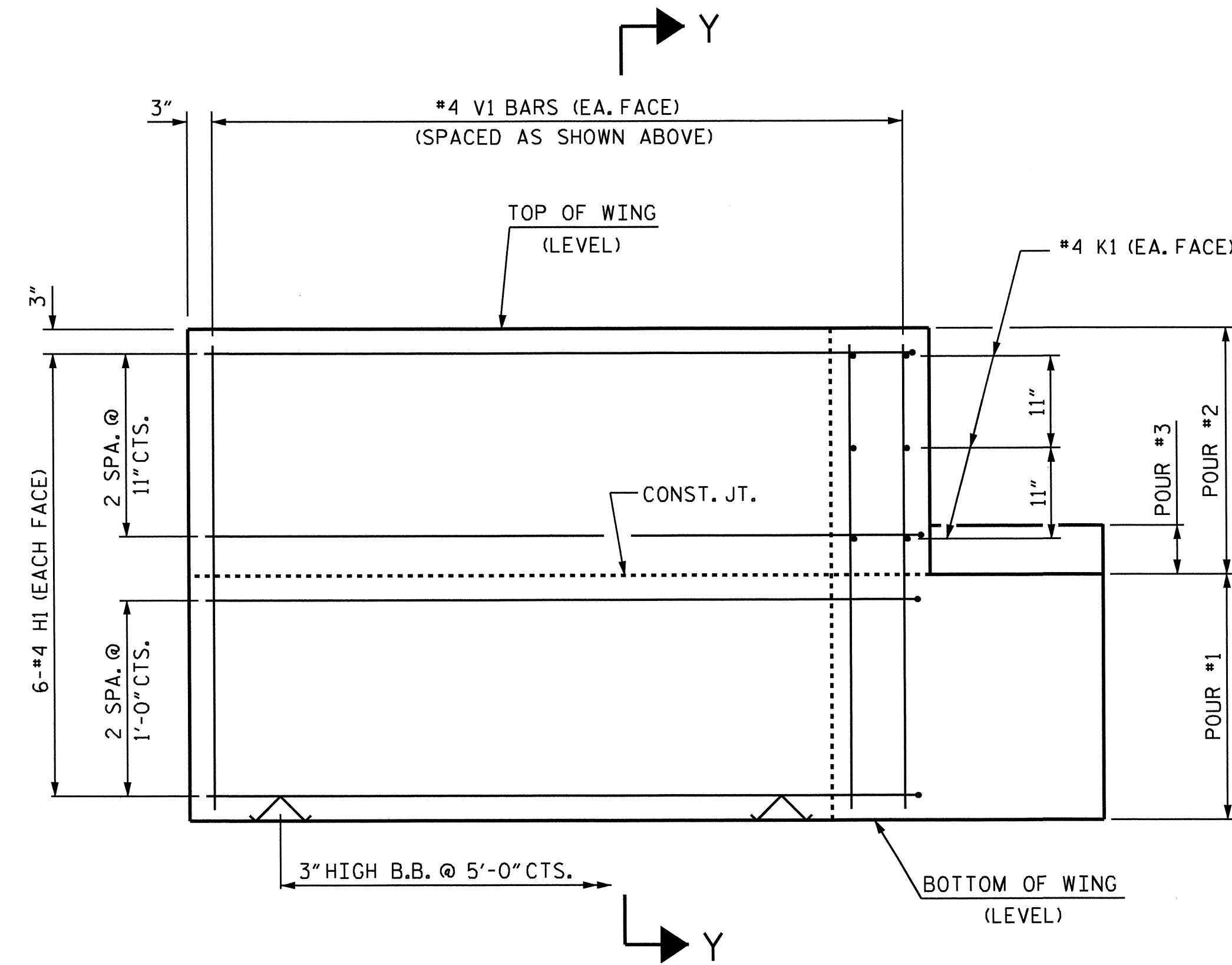
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W1)



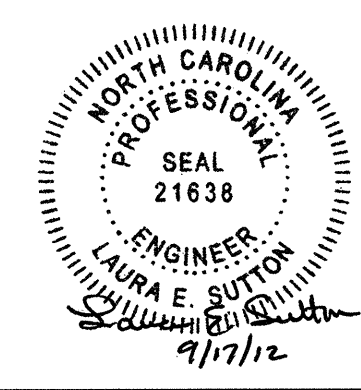
ELEVATION OF WING (W2)

WING DETAILS

PROJECT NO. B-4458  
 CATAWBA COUNTY  
 STATION: 19+70.00 -L-  
 SHEET 3 OF 4

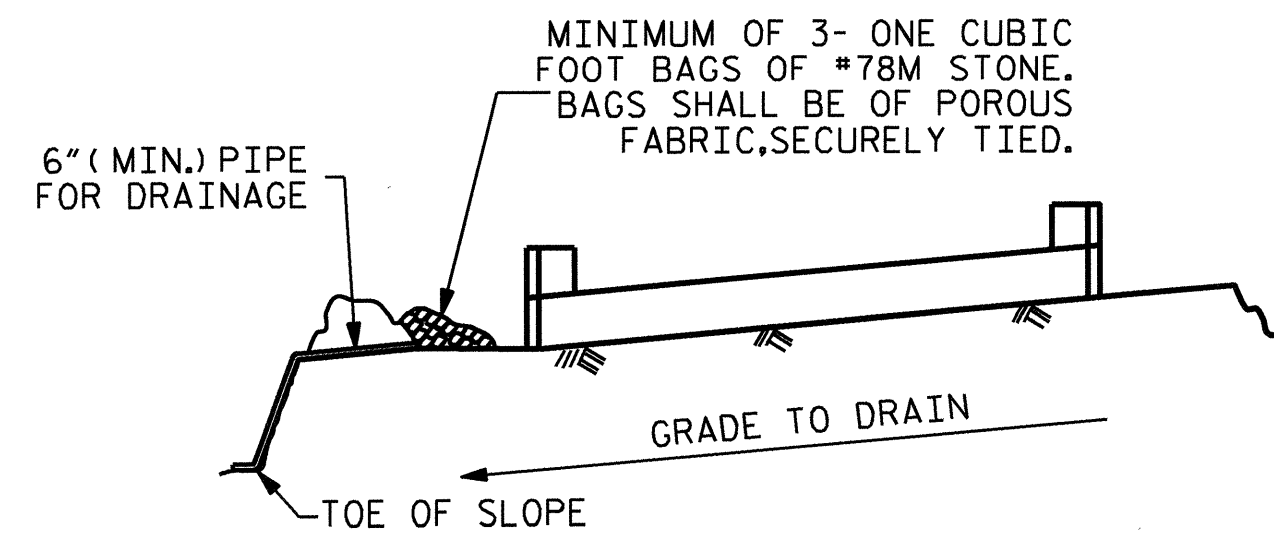
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT  
 WING DETAILS

| REVISIONS |     |       |     |     |       | SHEET NO.    |  |
|-----------|-----|-------|-----|-----|-------|--------------|--|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-18         |  |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |  |
| 2         |     |       | 4   |     |       | 25           |  |



DRAWN BY: B.C. HUNT DATE: 11/2011  
 CHECKED BY: J.P. ADAMS DATE: 12/2011

11-JUL-2012 09:44  
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 LSUTTON

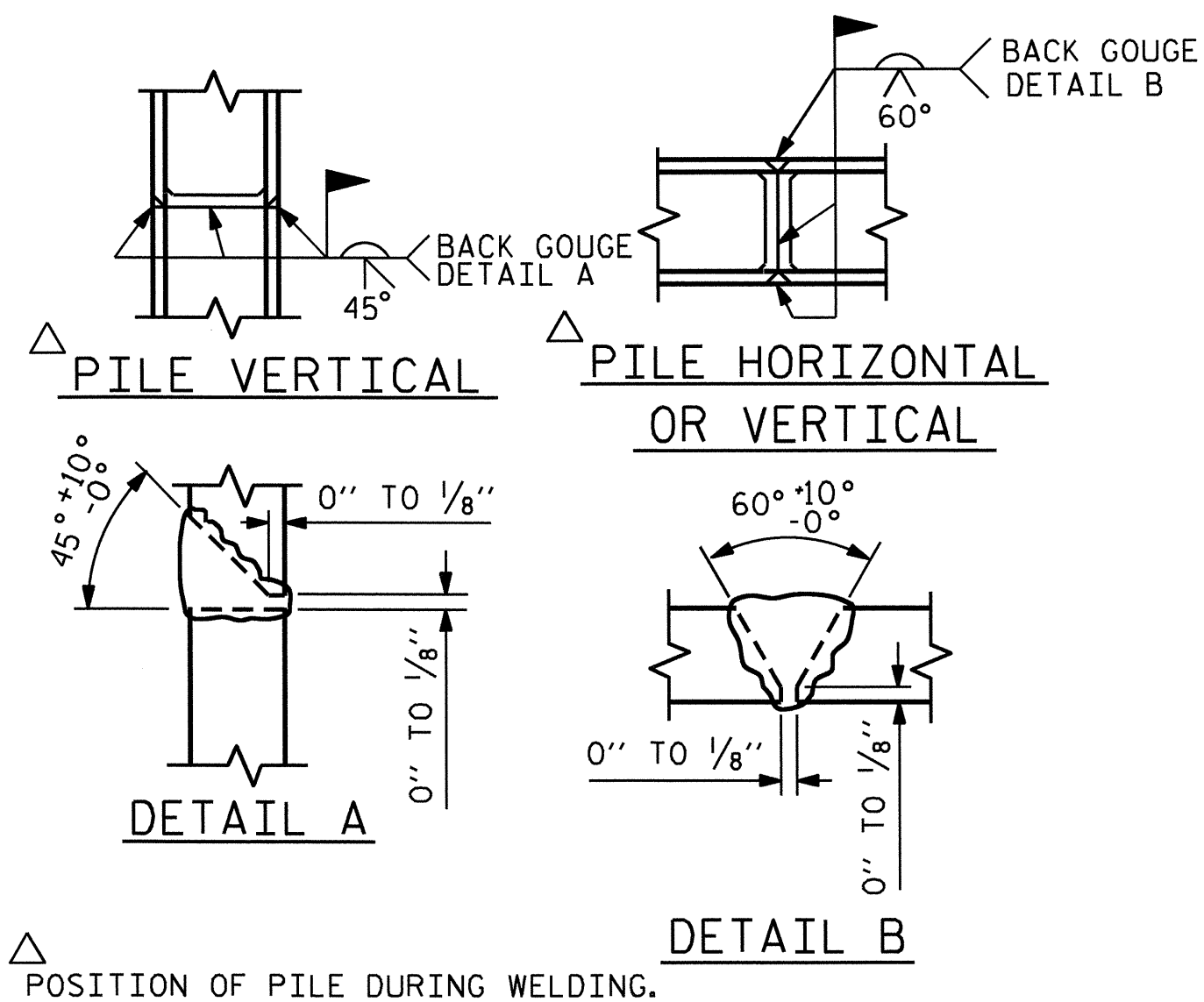


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

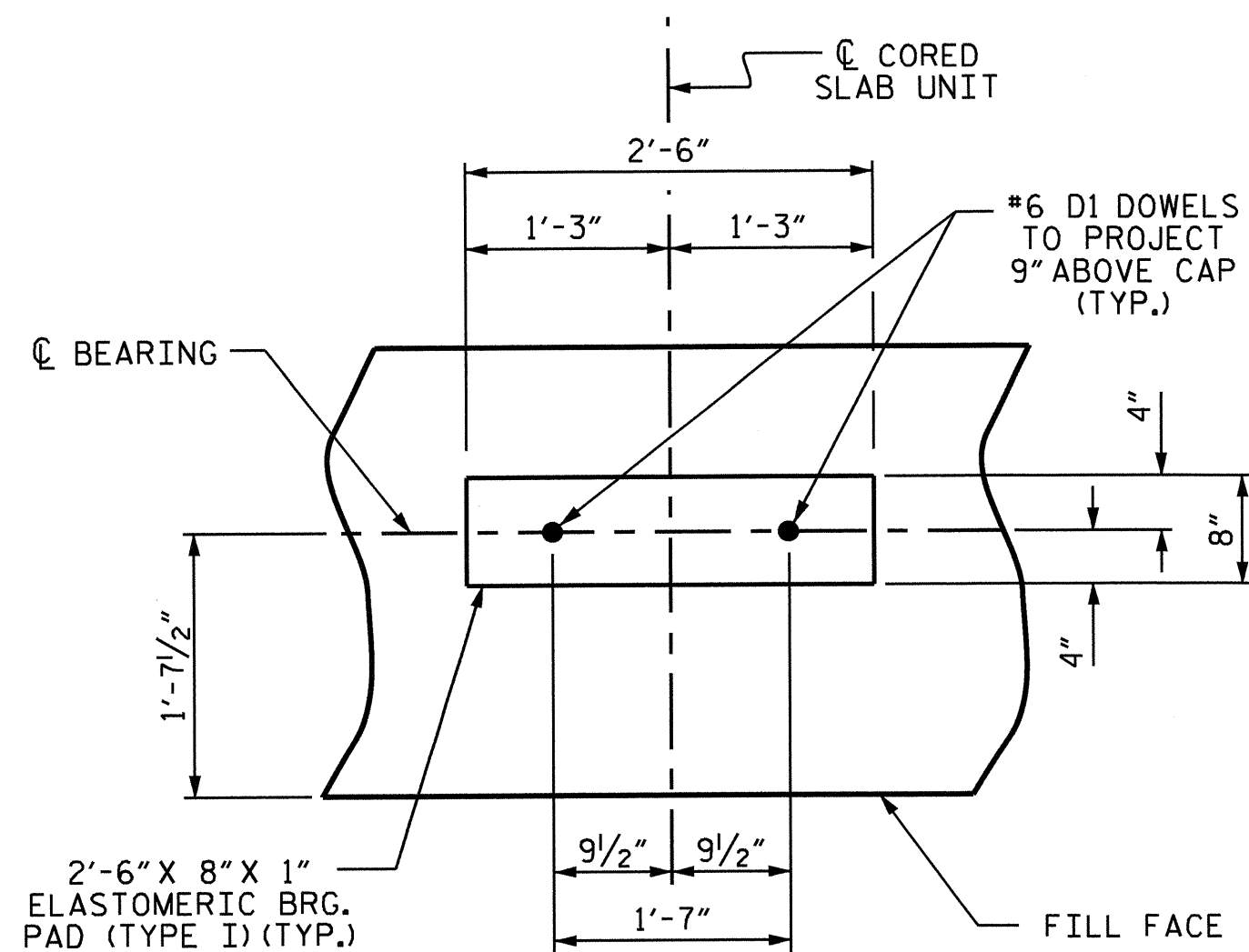
### TEMPORARY DRAINAGE AT END BENT



### PILE SPLICE DETAILS

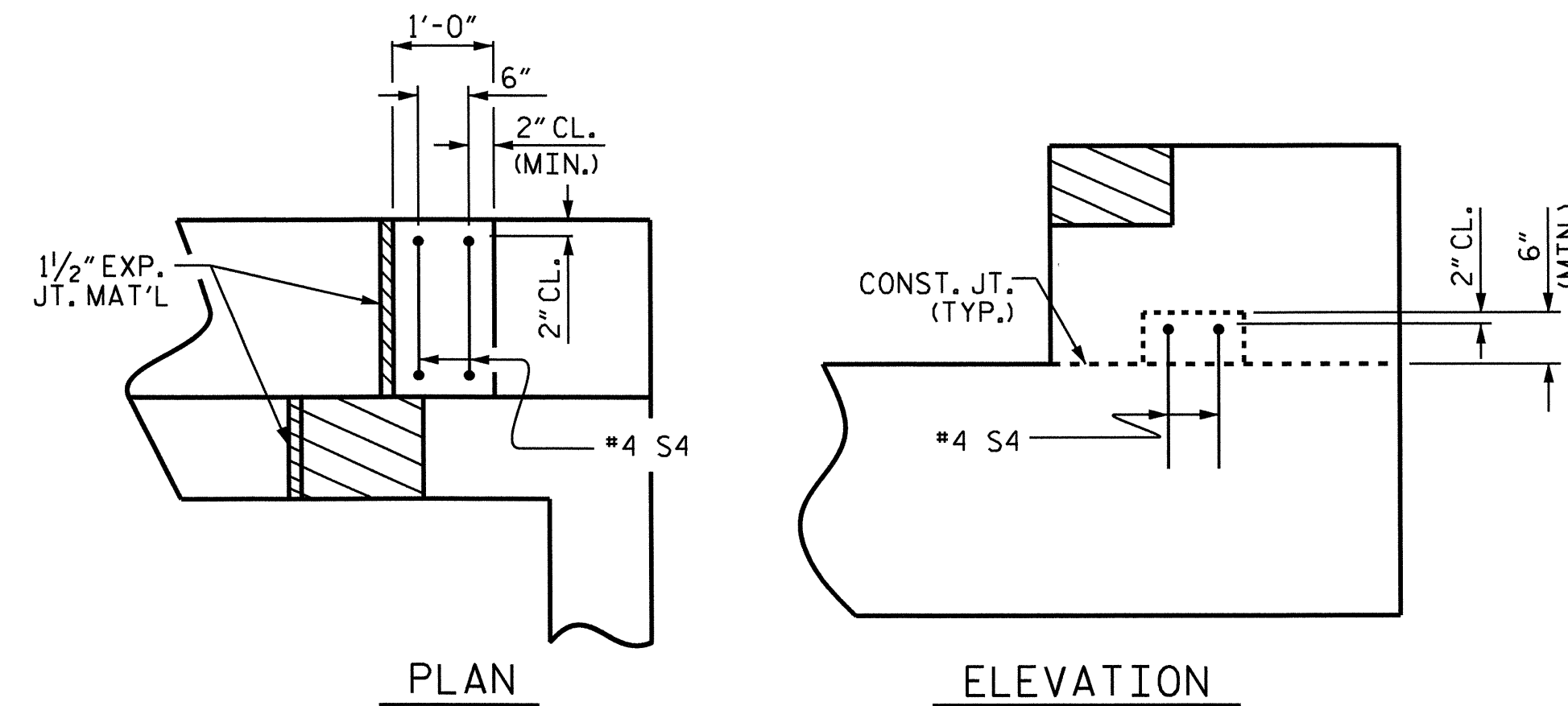
| BILL OF MATERIAL FOR ONE END BENT             |     |      |      |        |           |
|---|-----|------|------|--------|-----------|
| BAR   | NO. | SIZE | TYPE | LENGTH | WEIGHT    |
| B1  | 8   | #9   |      | 47'-0" | 1278      |
| B2  | 16  | #4   | STR  | 23'-7" | 252       |
| B3  | 12  | #4   | STR  | 2'-5"  | 19        |
| D1  | 26  | #6   | STR  | 1'-6"  | 59        |
| H1  | 24  | #4   |      | 7'-10" | 126       |
| K1  | 12  | #4   | STR  | 3'-1"  | 25        |
| S1  | 56  | #4   |      | 7'-5"  | 277       |
| S2  | 56  | #4   |      | 3'-2"  | 118       |
| S3  | 14  | #4   |      | 6'-6"  | 61        |
| S4  | 4   | #4   |      | 4'-5"  | 12        |
| V1  | 48  | #4   | STR  | 4'-8"  | 150       |
| REINFORCING STEEL (FOR ONE END BENT)          |     |      |      |        | LBS. 2377 |
| CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT) |     |      |      |        |           |
| POUR #1 CAP, LOWER PART OF WINGS & COLLARS    |     |      |      |        | 13.9 C.Y. |
| POUR #2 UPPER PART OF WINGS                   |     |      |      |        | 2.0 C.Y.  |
| POUR #3 LATERAL GUIDES                        |     |      |      |        | 0.1 C.Y.  |
| TOTAL CLASS A CONCRETE                        |     |      |      |        | 16.0 C.Y. |

| BAR TYPES   |   |
|---|---|
| END BENT 1<br>HP 12 X 53 STEEL PILES<br>NO: 7<br>LIN. FT. = 245 | END BENT 2<br>HP 12 X 53 STEEL PILES<br>NO: 7<br>LIN. FT. = 210 |



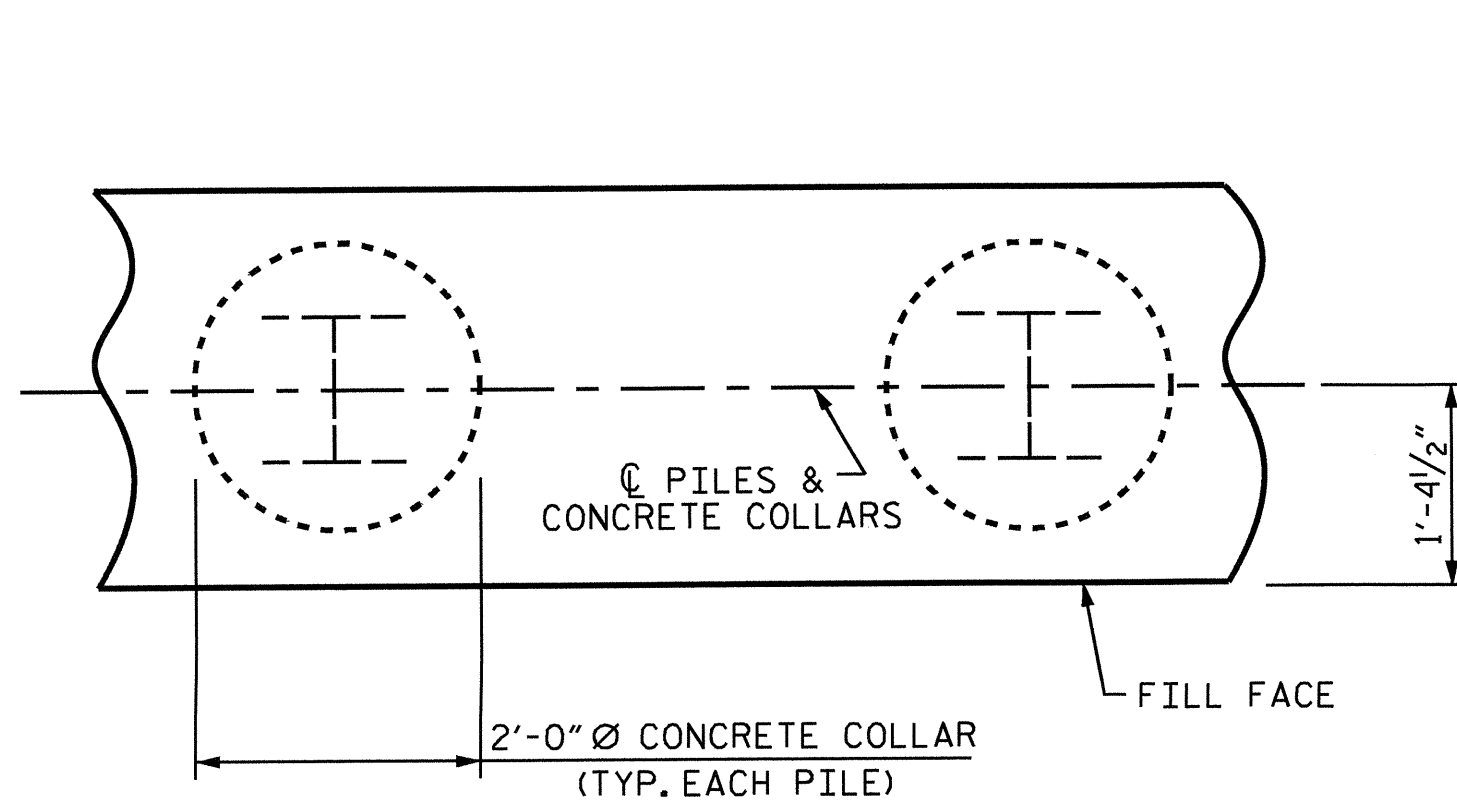
### DETAIL "A"

(END BENT 1 SHOWN, END BENT 2 SIMILAR BY ROTATION)



### LATERAL GUIDE DETAILS

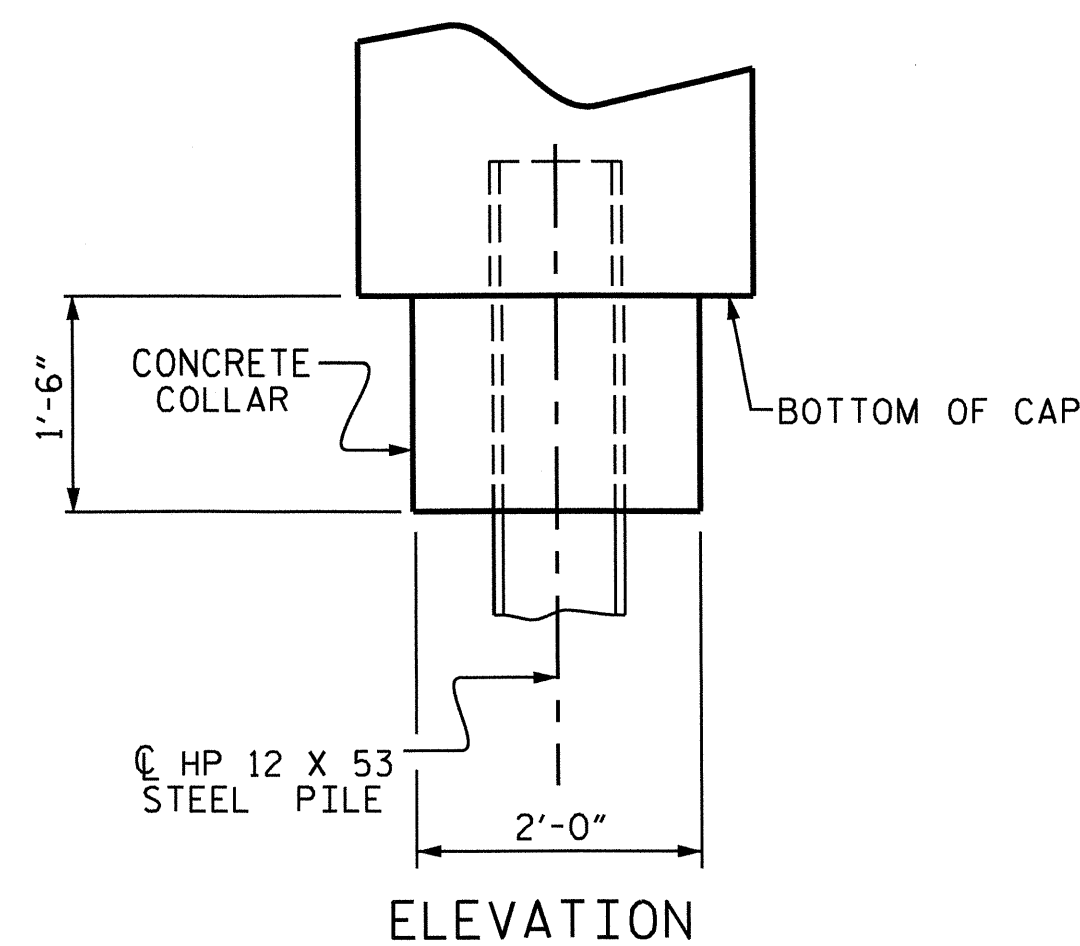
(RIGHT LATERAL GUIDE SHOWN, LEFT END SIMILAR)



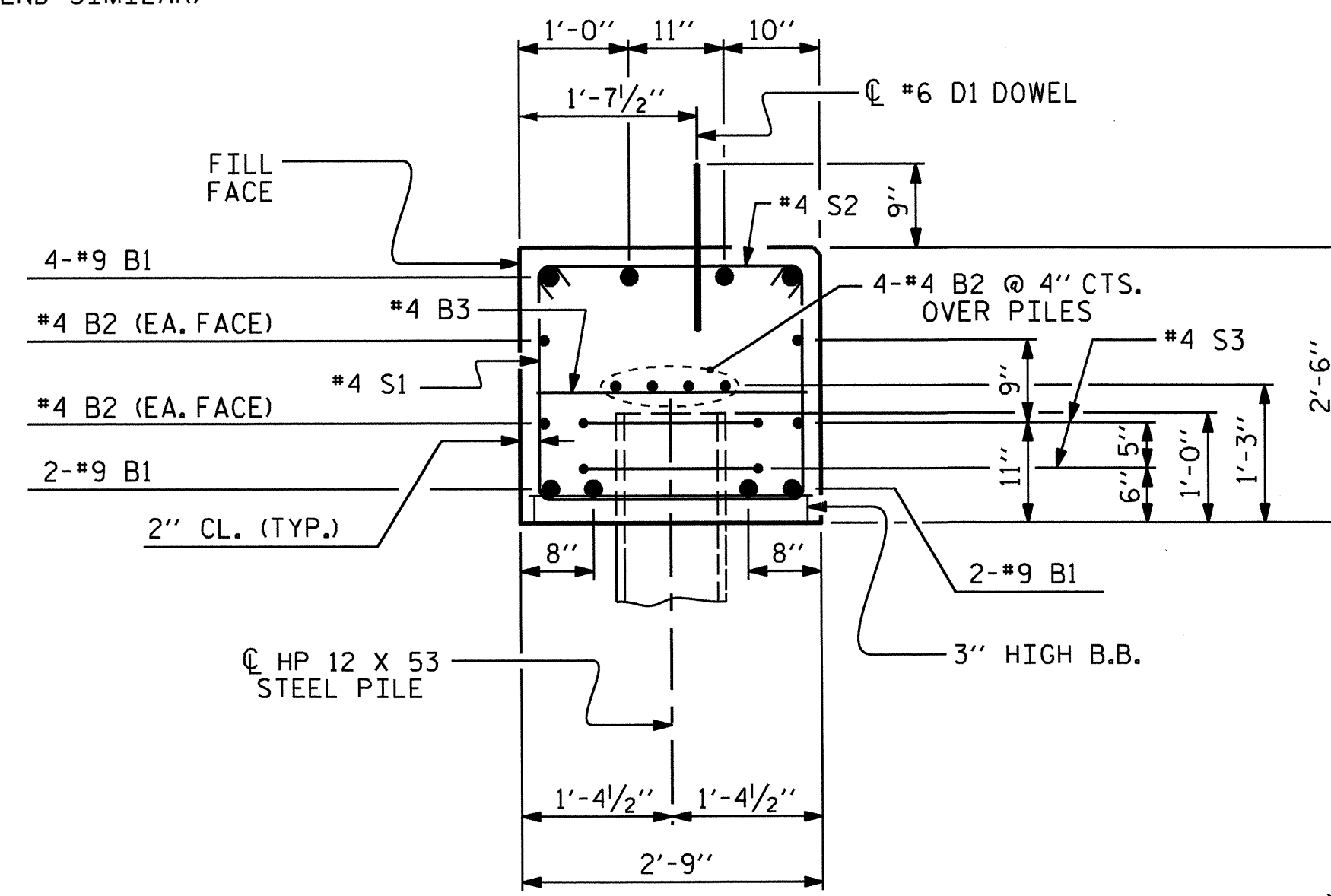
### PLAN

### CORROSION PROTECTION FOR STEEL PILES DETAIL

(END BENT 1 SHOWN, END BENT 2 SIMILAR BY ROTATION)



### ELEVATION



### SECTION A-A

(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")

PROJECT NO. B-4458  
CATAWBA COUNTY  
STATION: 19+70.00 -L-

SHEET 4 OF 4

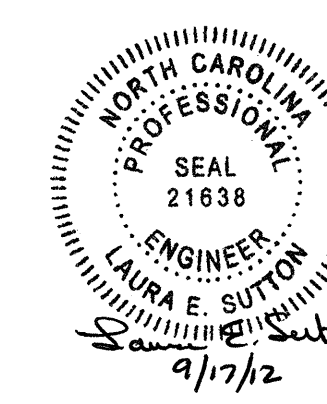
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE

END BENT 1 & 2  
DETAILS

### REVISIONS

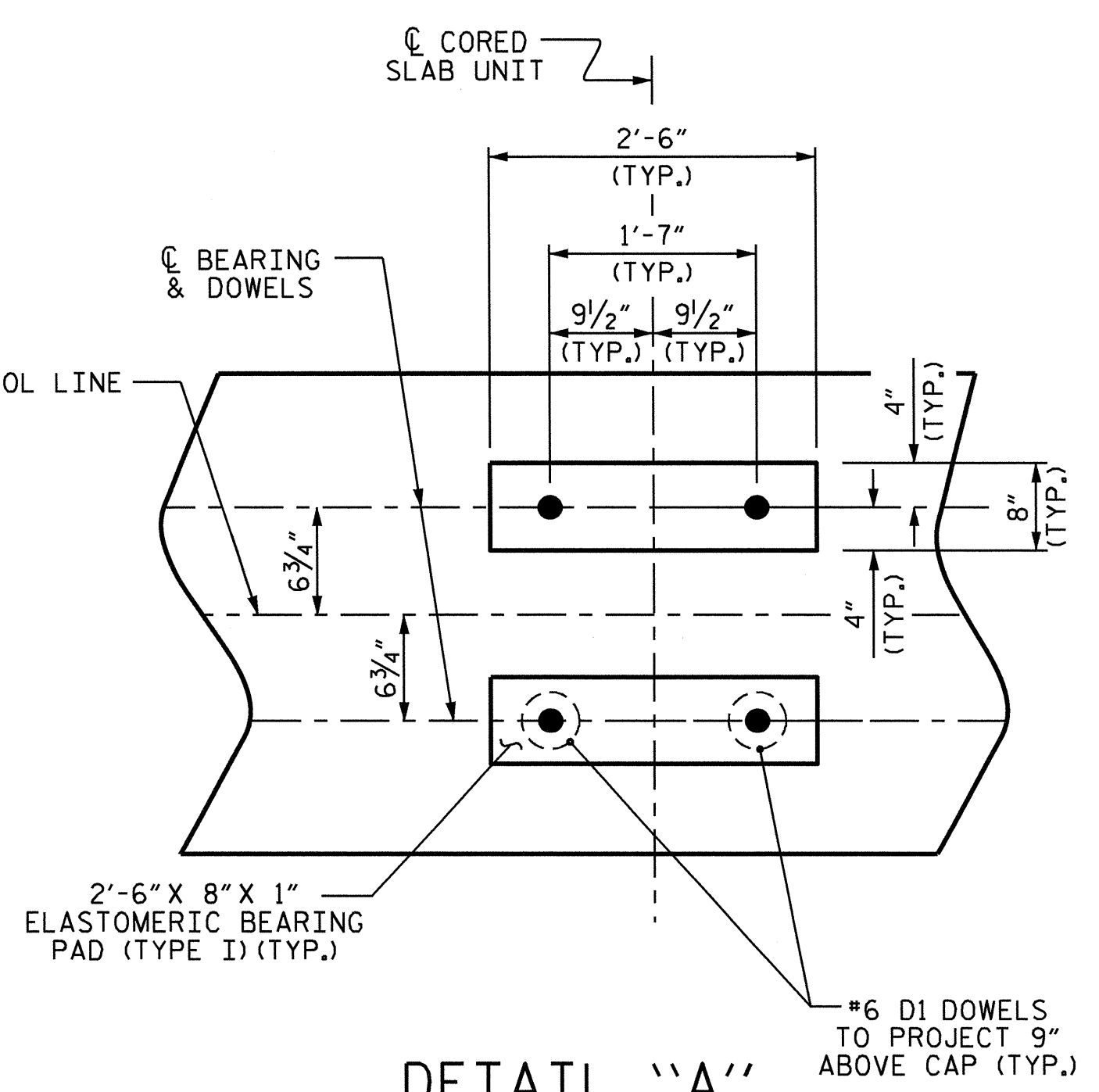
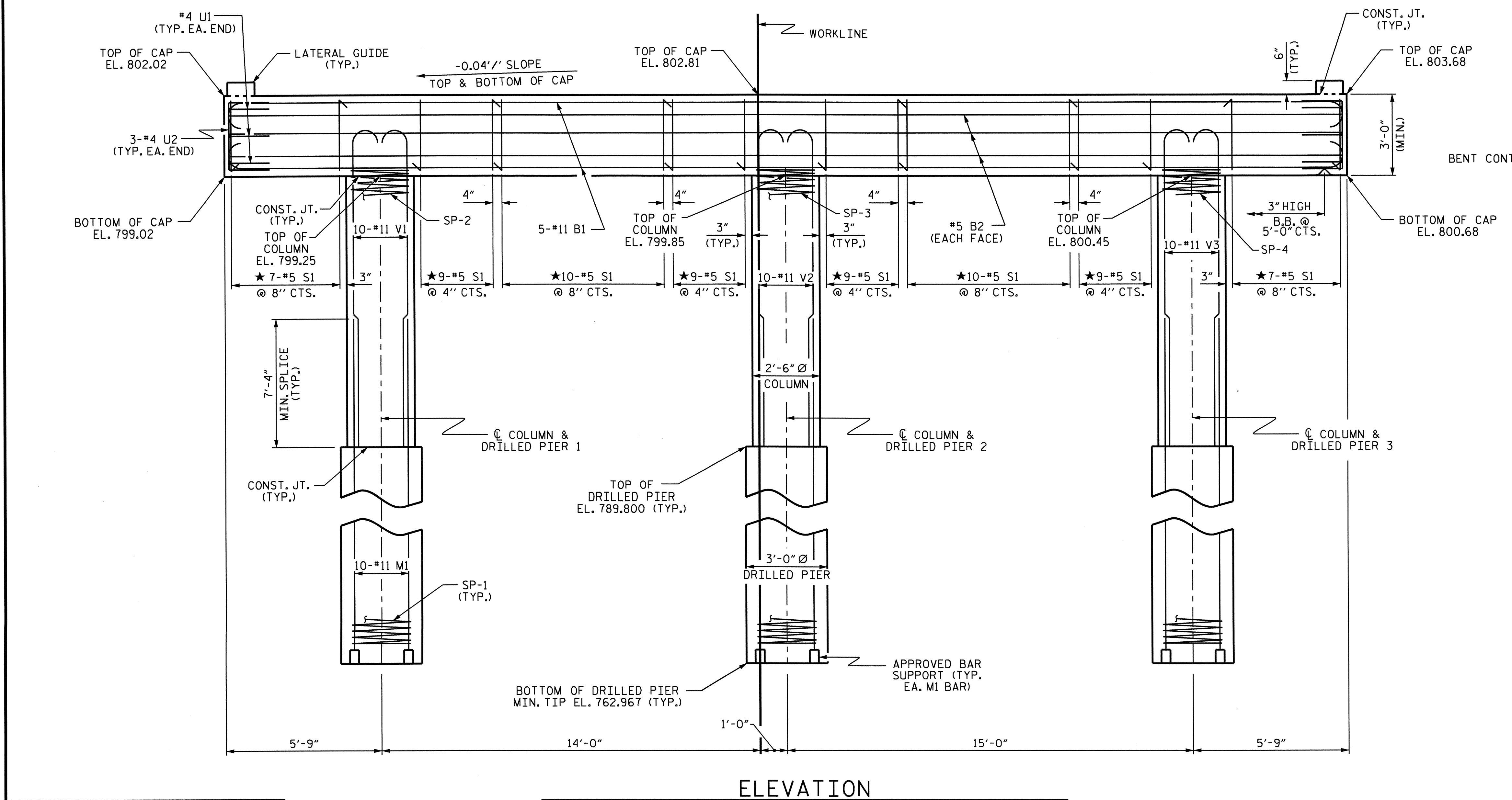
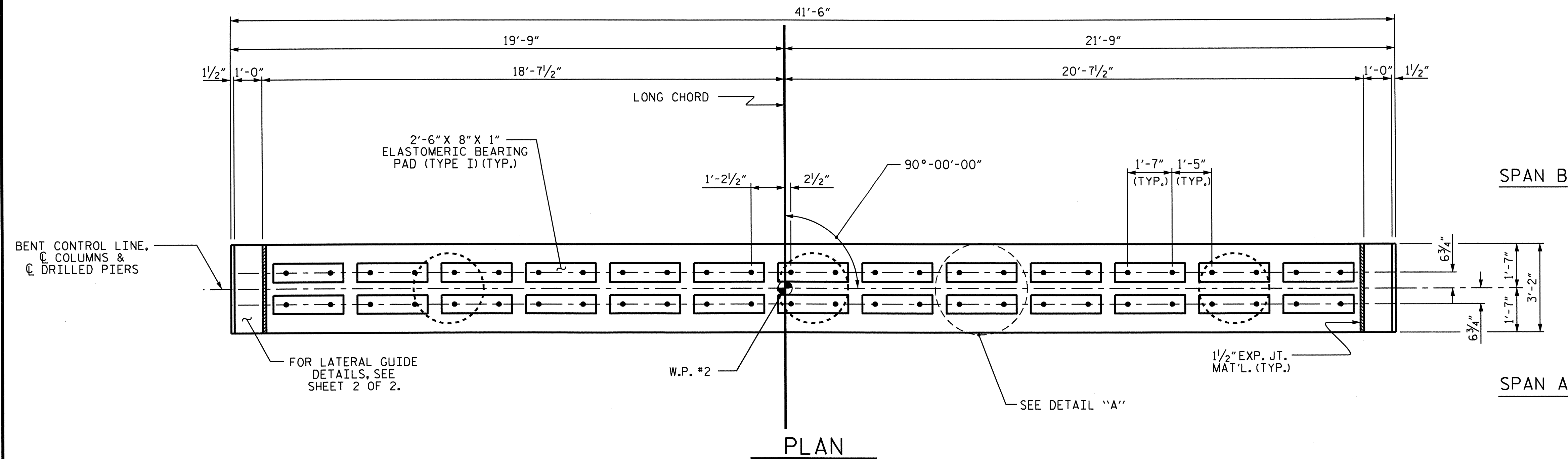
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|-----|-----|-------|-----|-----|-------|-----------------|
| 1   |     |       | 3   |     |       | S-19            |
| 2   |     |       | 4   |     |       | TOTAL SHEETS 25 |



DRAWN BY: B.C. HUNT DATE: 11/2011  
CHECKED BY: J.P. ADAMS DATE: 12/2011

**NOTES**

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.
- HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
- FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL."
- THE LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.
- ★ INVERT ALTERNATE STIRRUPS.
- DRILLED PIERS SHALL BE TERMINATED ONE FOOT ± ABOVE NORMAL WATER SURFACE ELEVATION FOR SHAFTS LOCATED IN WATER.
- THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.
- THE CONTRACTOR HAS THE OPTION TO OMIT THE LATERAL GUIDE IF APPROVED BY THE ENGINEER.



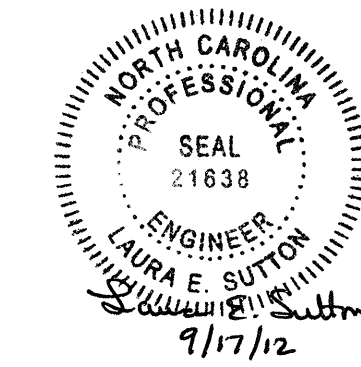
**DETAIL "A"**

(DIMENSIONS ARE TYPICAL EACH BEARING)

PROJECT NO. **B-4458**  
 CATAWBA COUNTY  
 STATION: **19+70.00 -L-**

SHEET 1 OF 2

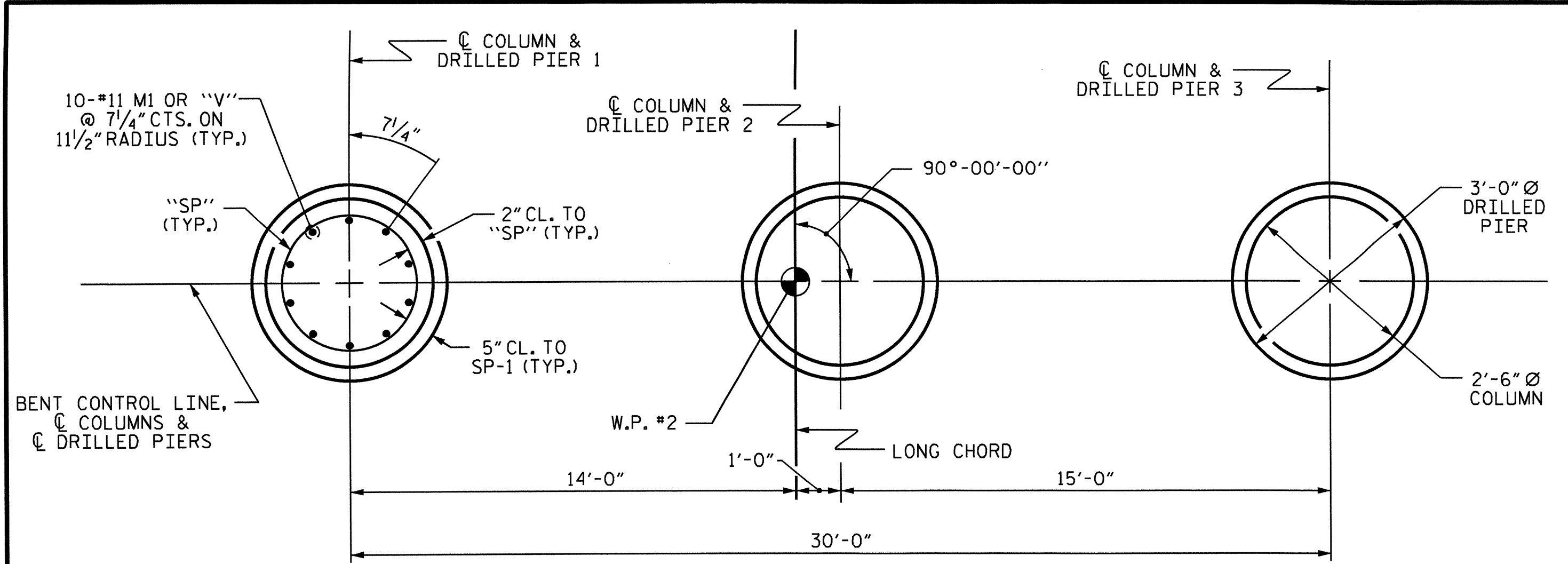
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
**BENT 1**



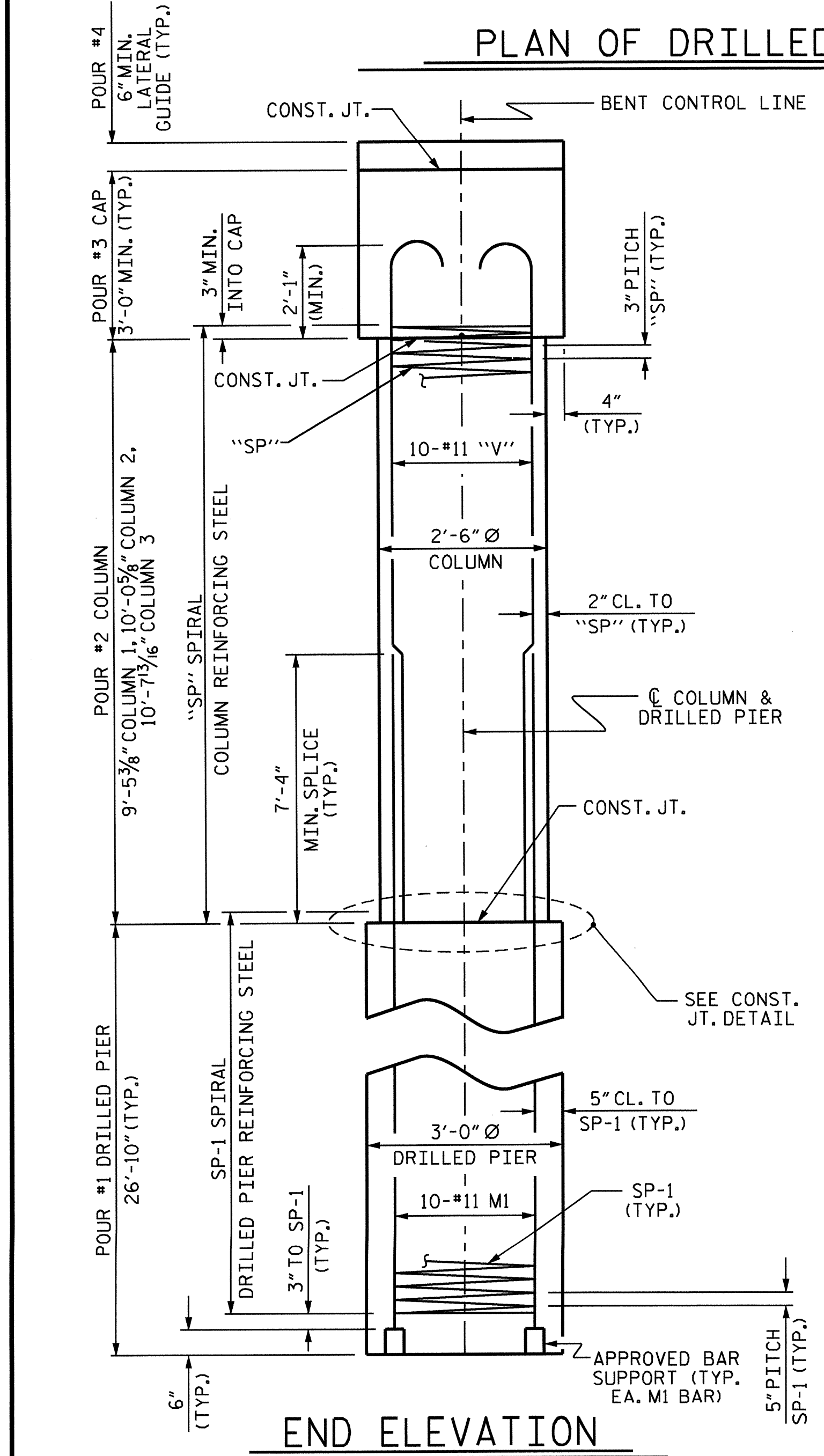
| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-20         |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |
| 2         |     |       | 4   |     |       | 25           |

DRAWN BY: **B.C. HUNT** DATE: **11/2011**  
 CHECKED BY: **J.P. ADAMS** DATE: **12/2011**

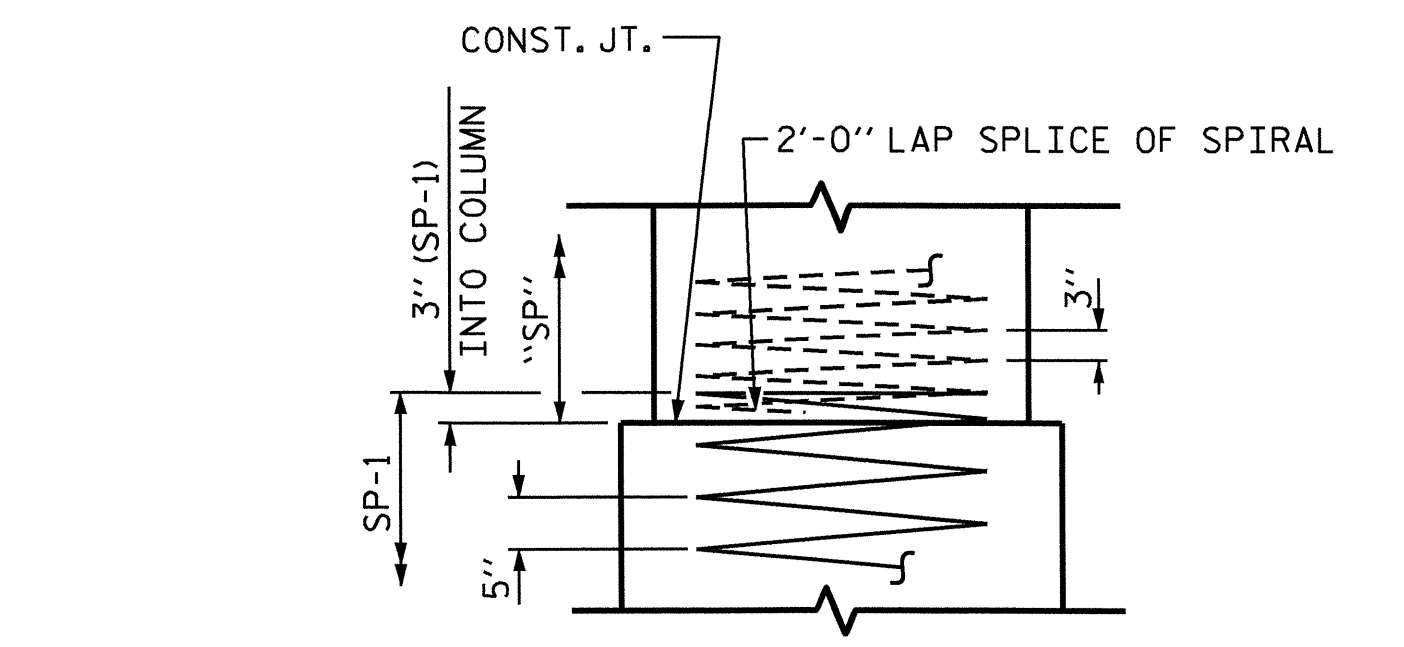
DIMENSIONS & REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER UNLESS OTHERWISE NOTED.



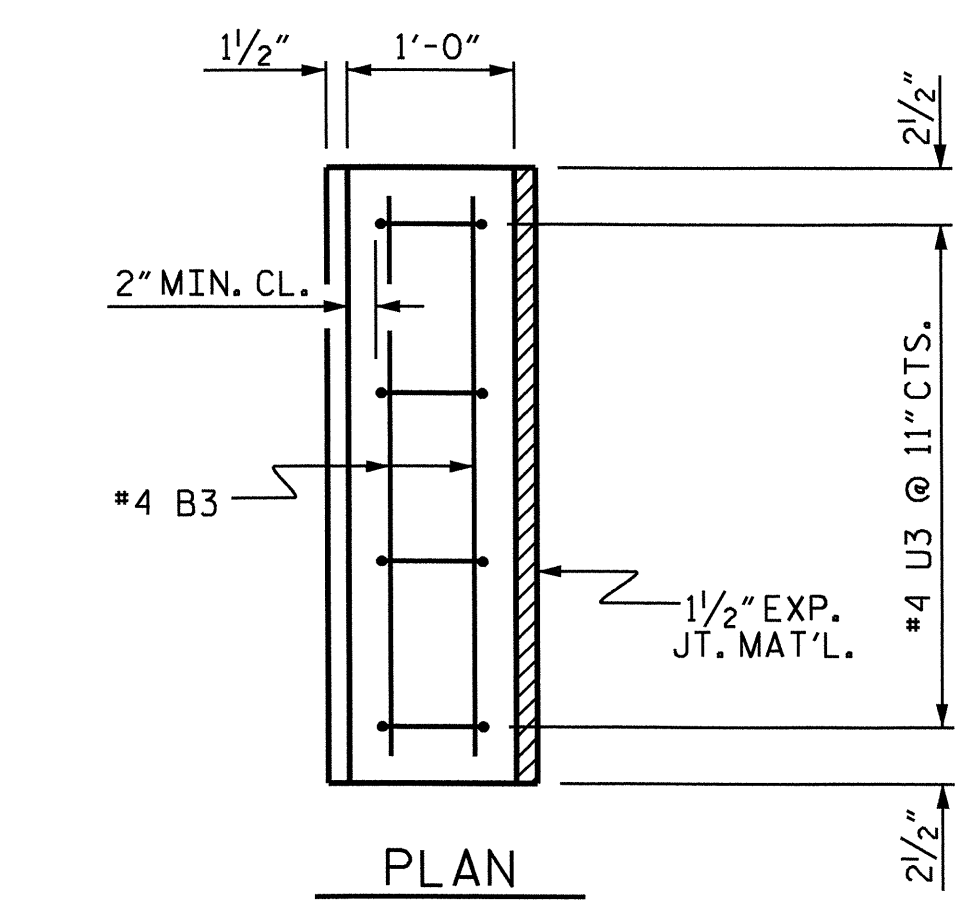
PLAN OF DRILLED PIERS & COLUMNS



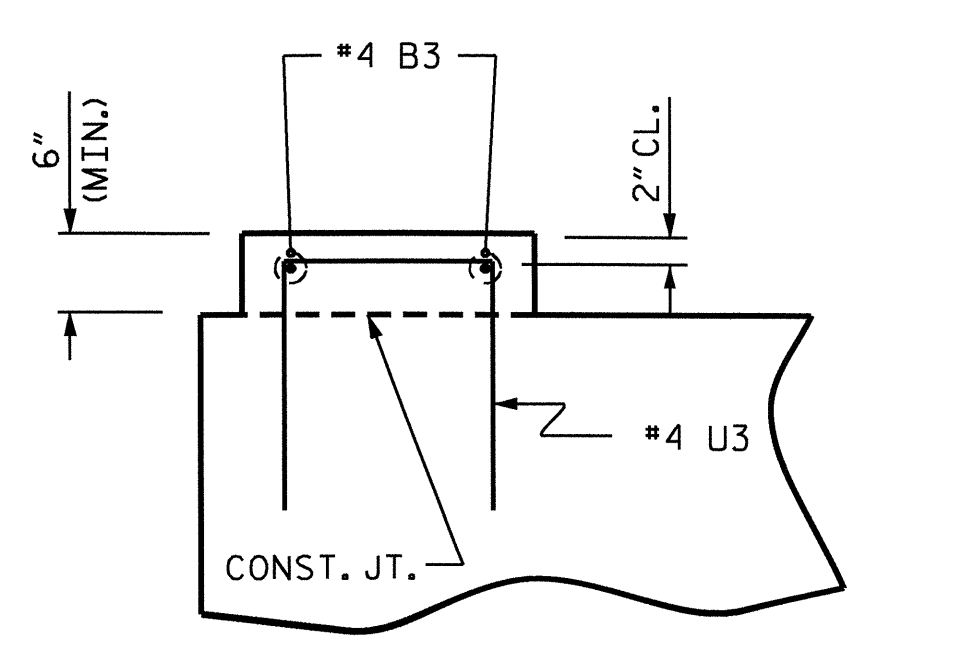
END ELEVATION



CONSTRUCTION JOINT DETAIL

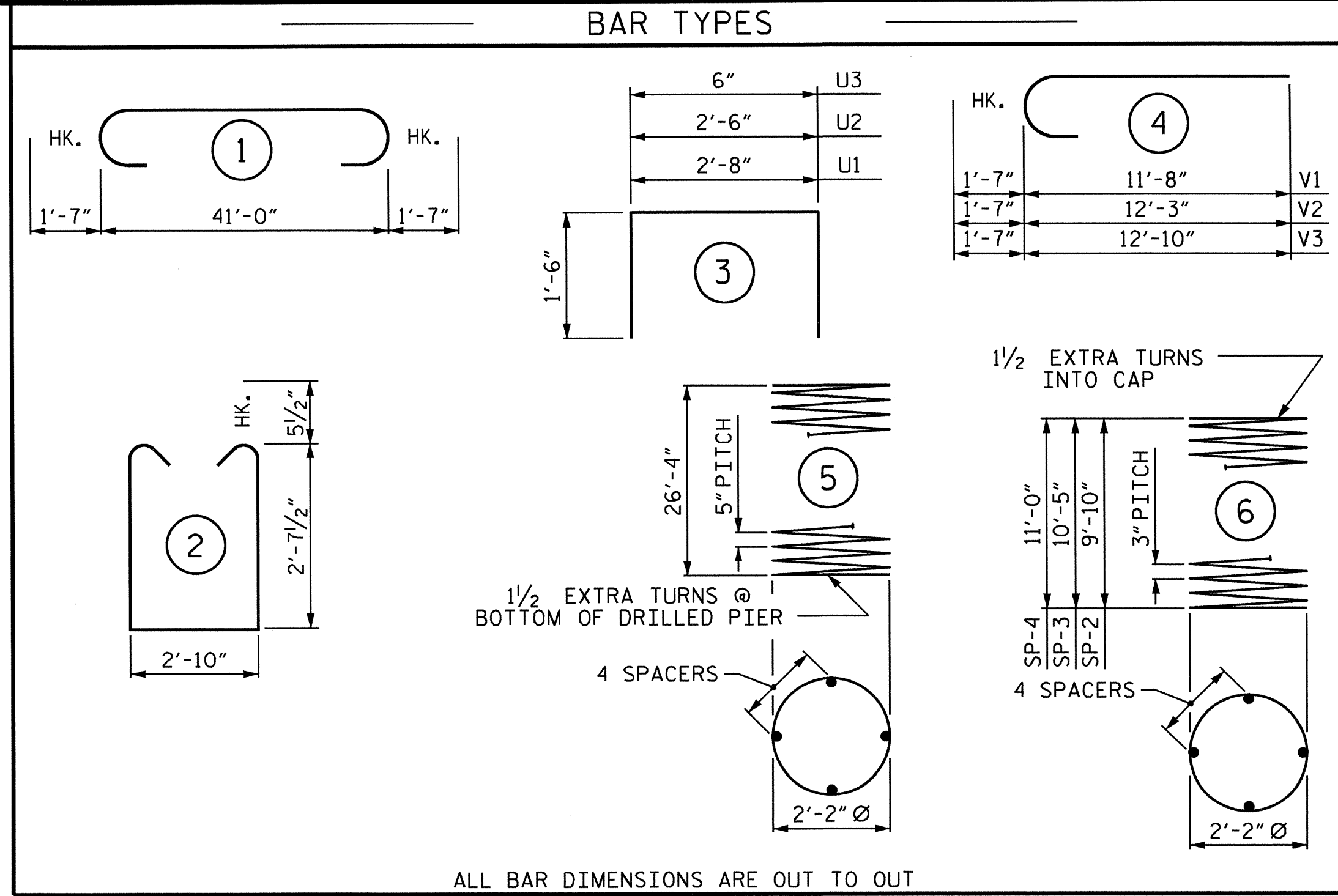


PLAN

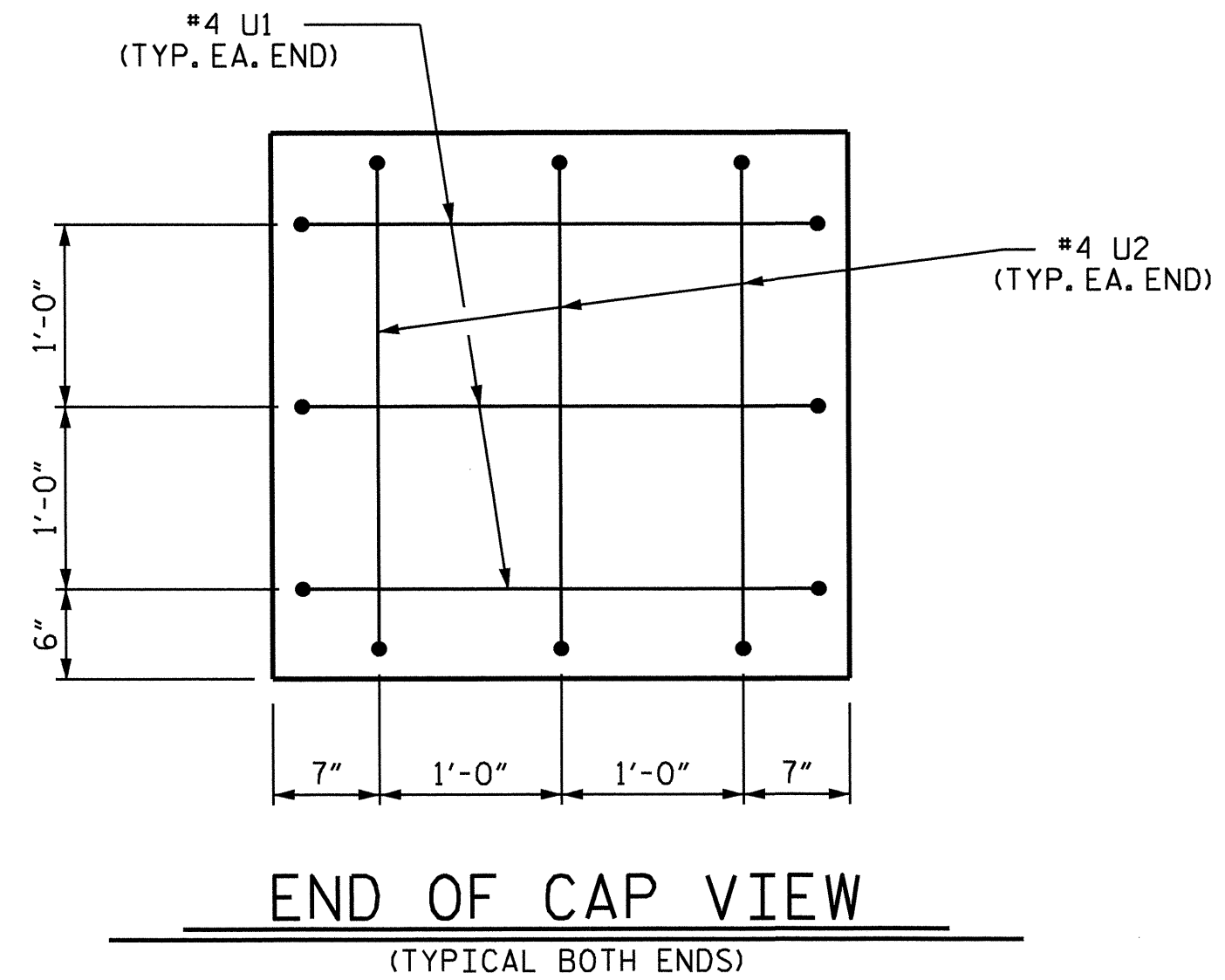


ELEVATION

LATERAL GUIDE DETAILS  
(LEFT LATERAL GUIDE SHOWN, RIGHT SIDE SIMILAR)

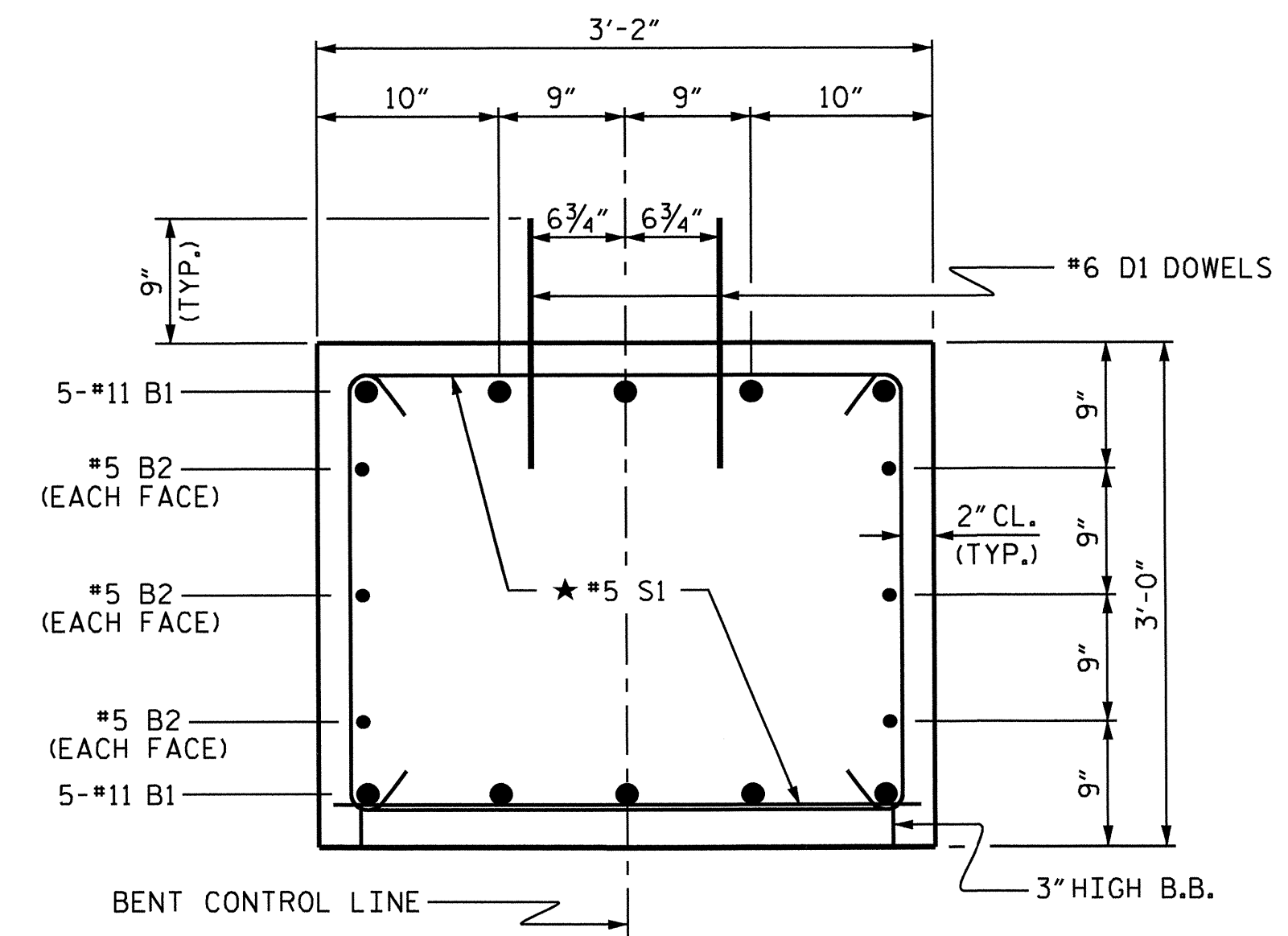


ALL BAR DIMENSIONS ARE OUT TO OUT



END OF CAP VIEW

(TYPICAL BOTH ENDS)



SECTION THRU CAP

\*INVERT ALTERNATE STIRRUPS

| BILL OF MATERIAL   |     |      |      |          |             |
|--|-----|------|------|----------|-------------|
| BENT 1   |     |      |      |          |             |
| BAR  | NO. | SIZE | TYPE | LENGTH   | WEIGHT      |
| B1   | 10  | #11  |      | 44'-2"   | 2347        |
| B2   | 6   | #5   | STR  | 41'-2"   | 258         |
| B3   | 4   | #4   | STR  | 2'-10"   | 8           |
| D1   | 52  | #6   | STR  | 1'-6"    | 117         |
| M1   | 30  | #11  | STR  | 36'-11"  | 5884        |
| S1   | 70  | #5   |      | 9'-0"    | 657         |
| U1   | 6   | #4   |      | 5'-8"    | 23          |
| U2   | 6   | #4   |      | 5'-6"    | 22          |
| U3   | 8   | #4   |      | 3'-6"    | 19          |
| V1   | 10  | #11  |      | 13'-3"   | 704         |
| V2   | 10  | #11  |      | 13'-10"  | 735         |
| V3   | 10  | #11  |      | 14'-5"   | 766         |
| REINFORCING STEEL  |     |      |      |          | LBS. 11,540 |
| SP-1   | 3   | *    | 5    | 430'-8"  | 1348        |
| SP-2   | 1   | **   | 6    | 272'-10" | 182         |
| SP-3   | 1   | **   | 6    | 288'-5"  | 193         |
| SP-4   | 1   | **   | 6    | 304'-0"  | 203         |
| SPIRAL COLUMN REINFORCING STEEL  |     |      |      |          | LBS. 1,926  |
| * THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR         |     |      |      |          |             |
| ** THE SP-2, 3 & 4 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR |     |      |      |          |             |
| CLASS A CONCRETE BREAKDOWN   |     |      |      |          |             |
| POUR #2 (COLUMNS)  |     |      |      | C.Y.     | 5.5         |
| POUR #3 (CAP)  |     |      |      | C.Y.     | 14.6        |
| POUR #4 (LATERAL GUIDES)   |     |      |      | C.Y.     | 0.1         |
| TOTAL CLASS A CONCRETE   |     |      |      | C.Y.     | 20.2        |
| DRILLED PIERS  |     |      |      |          |             |
| DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)  |     |      |      | C.Y.     | 21.1        |
| 3'-0" Ø DRILLED PIER IN SOIL   |     |      |      | LIN. FT. | 46.50       |
| 3'-0" Ø DRILLED PIER NOT IN SOIL   |     |      |      | LIN. FT. | 34.00       |
| PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIER  |     |      |      | LIN. FT. | 41.40       |
| CSL TUBES  |     |      |      | LIN. FT. | 340.00      |

PROJECT NO. B-4458  
 CATAWBA COUNTY  
 STATION: 19+70.00 -L-  
 SHEET 2 OF 2

| STATE OF NORTH CAROLINA<br>DEPARTMENT OF TRANSPORTATION<br>RALEIGH |     |       |     |     |                 |
|--|-----|-------|-----|-----|-----------------|
| SUBSTRUCTURE   |     |       |     |     |                 |
| BENT 1   |     |       |     |     |                 |
| REVISIONS  |     |       |     |     | SHEET NO.       |
| NO.  | BY: | DATE: | NO. | BY: | DATE:           |
| 1  |     |       | 3   |     |                 |
| 2  |     |       | 4   |     |                 |
|  |     |       |     |     | S-21            |
|  |     |       |     |     | TOTAL SHEETS 25 |



DRAWN BY: B.C. HUNT DATE: 11/2011  
 CHECKED BY: J.P. ADAMS DATE: 12/2011

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 LSUTTON

**NOTES**

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

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

FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL."

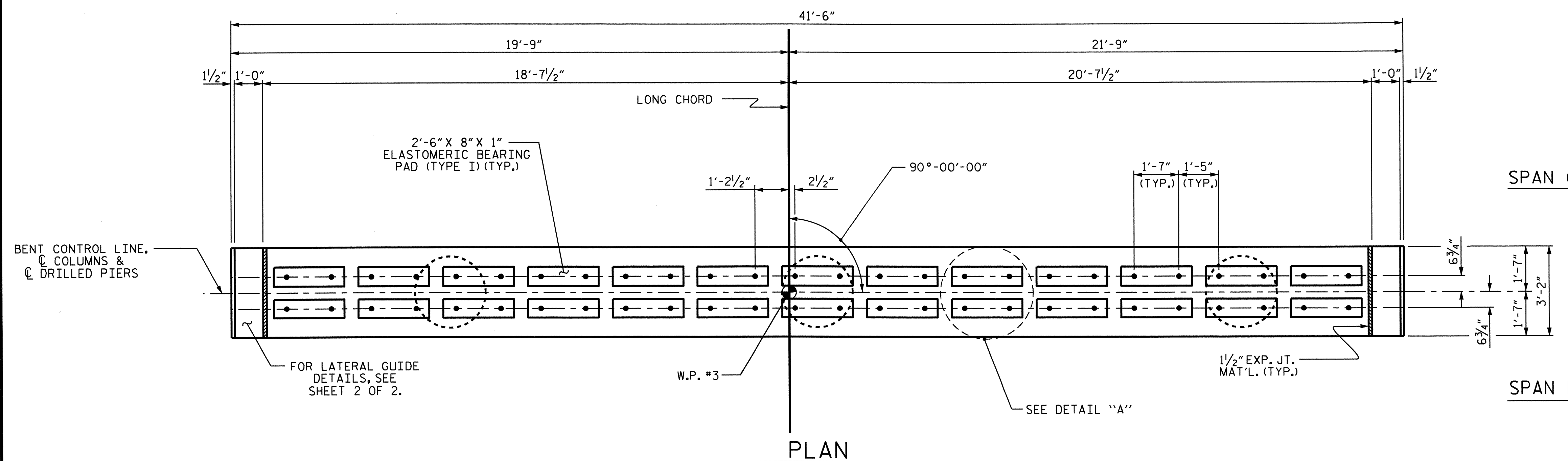
THE LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.

★ INVERT ALTERNATE STIRRUPS.

DRILLED PIERS SHALL BE TERMINATED ONE FOOT ± ABOVE NORMAL WATER SURFACE ELEVATION FOR SHAFTS LOCATED IN WATER.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

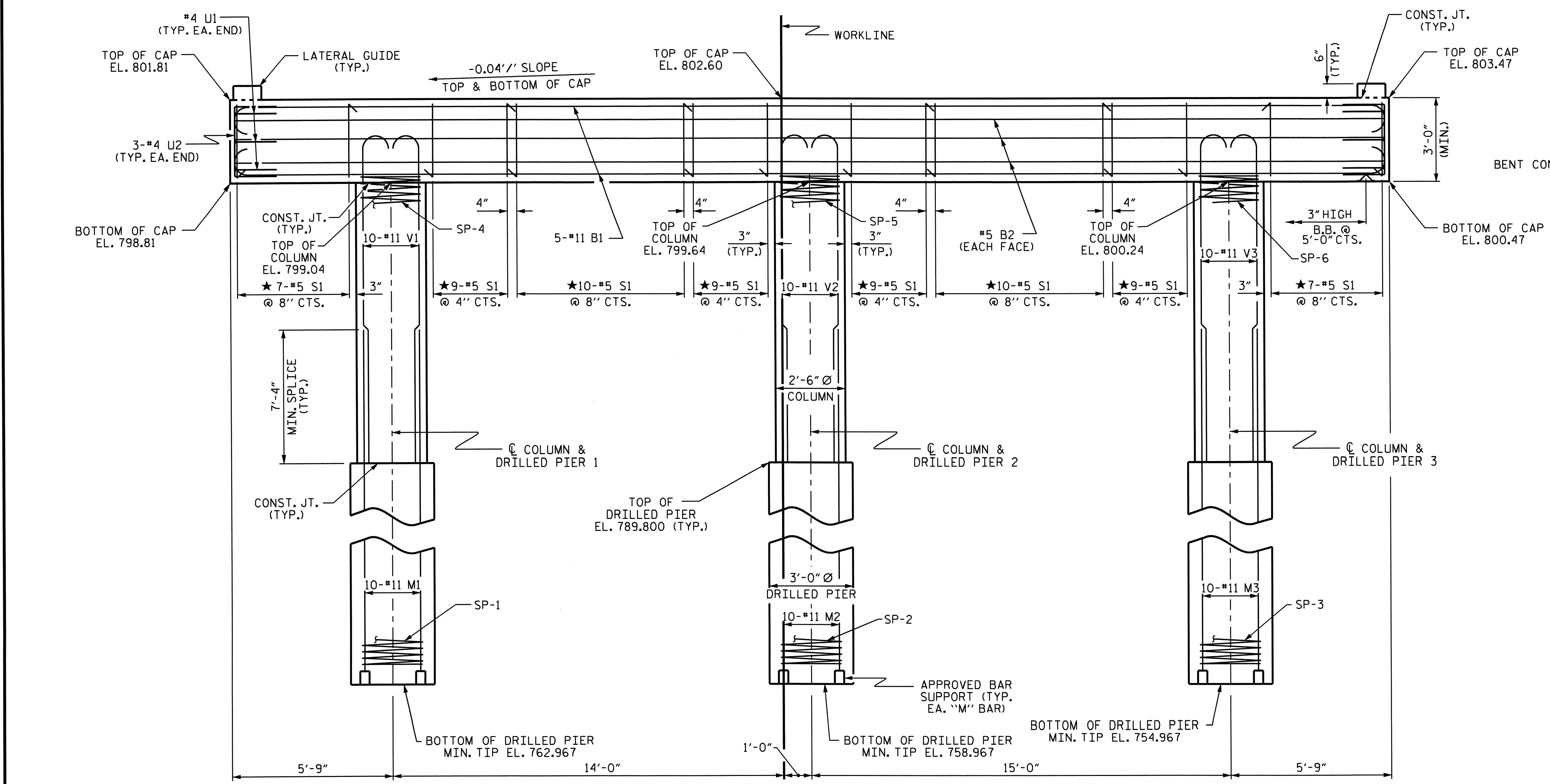
THE CONTRACTOR HAS THE OPTION TO OMIT THE LATERAL GUIDE IF APPROVED BY THE ENGINEER.



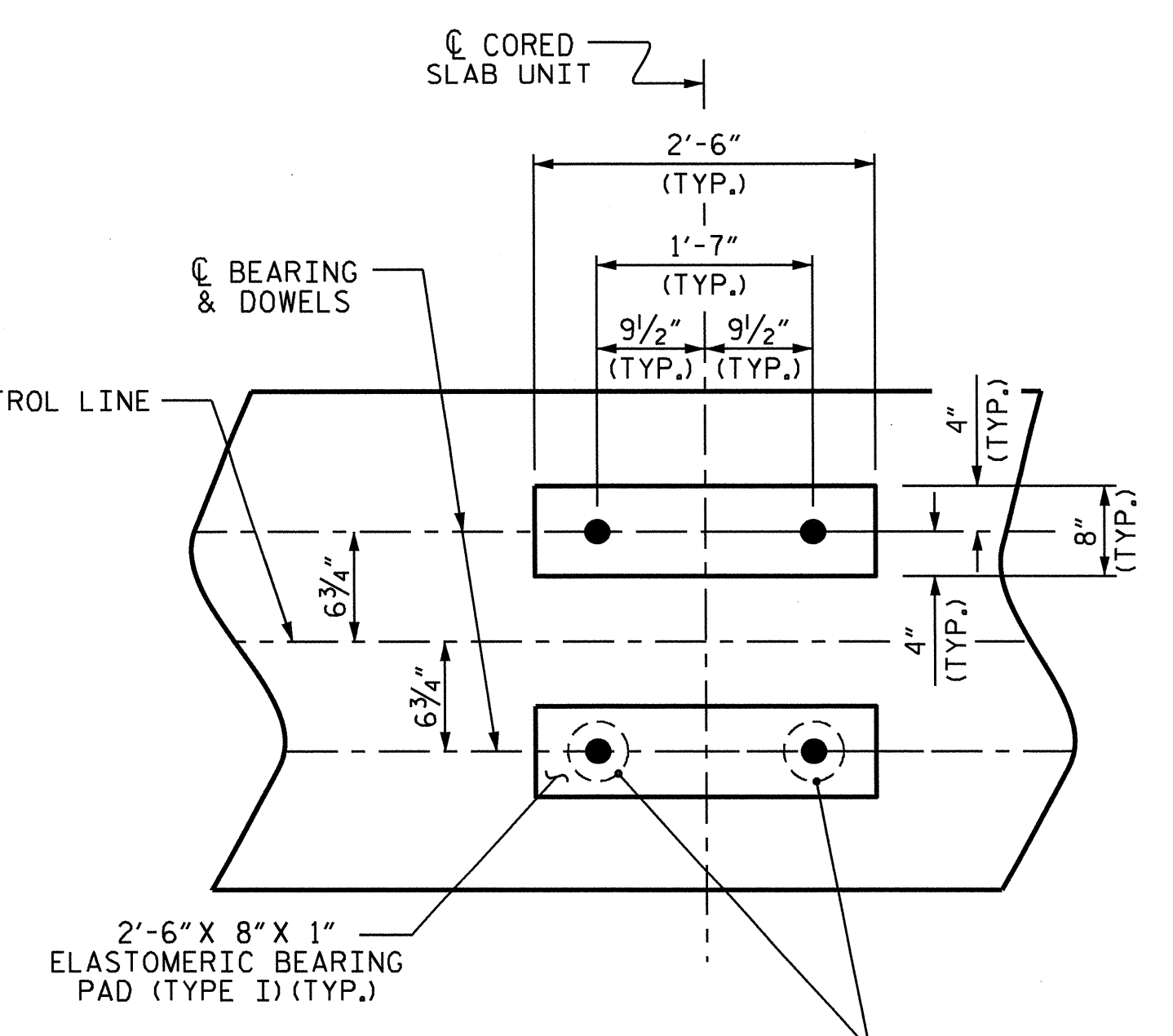
**PLAN**

SPAN C

SPAN B



**ELEVATION**



**DETAIL "A"**

(DIMENSIONS ARE TYPICAL EACH BEARING)

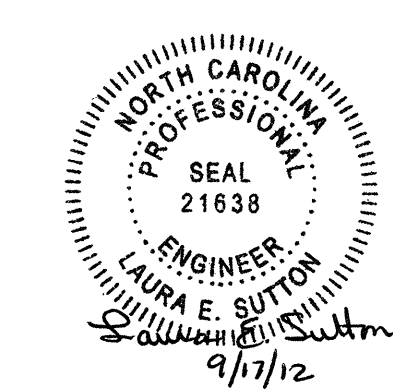
PROJECT NO. B-4458  
 CATAWBA COUNTY  
 STATION: 19+70.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE

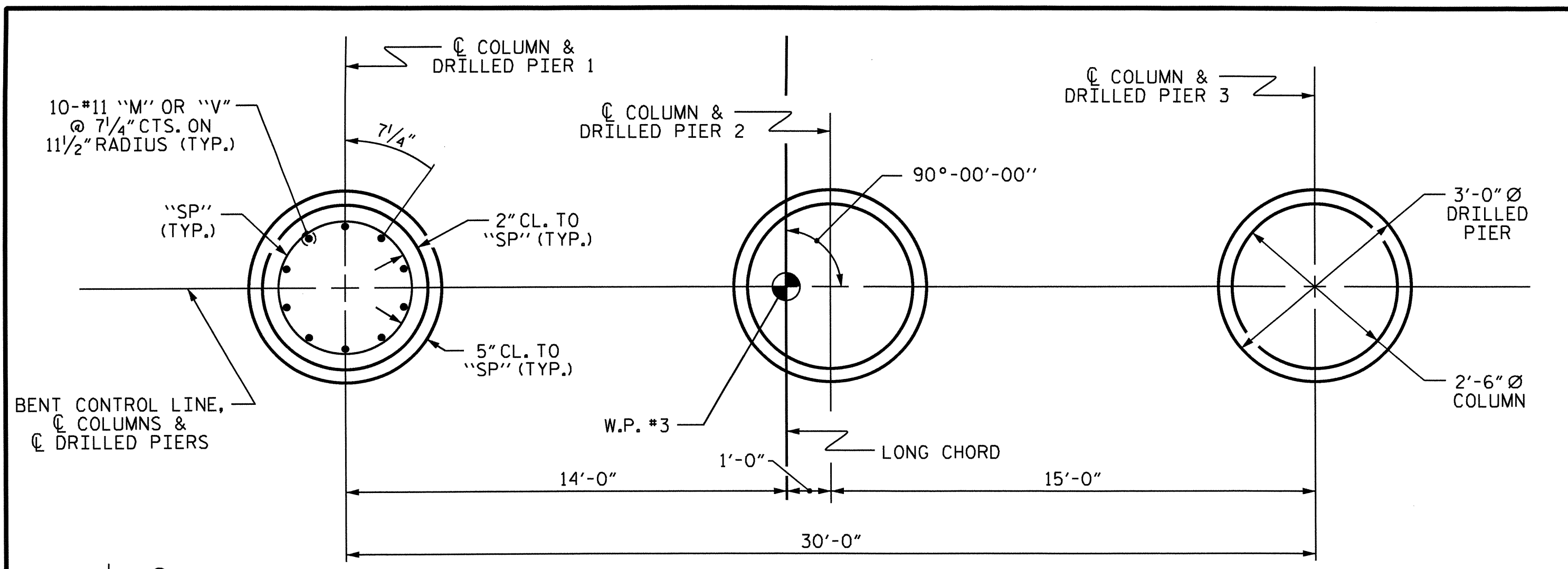
BENT 2



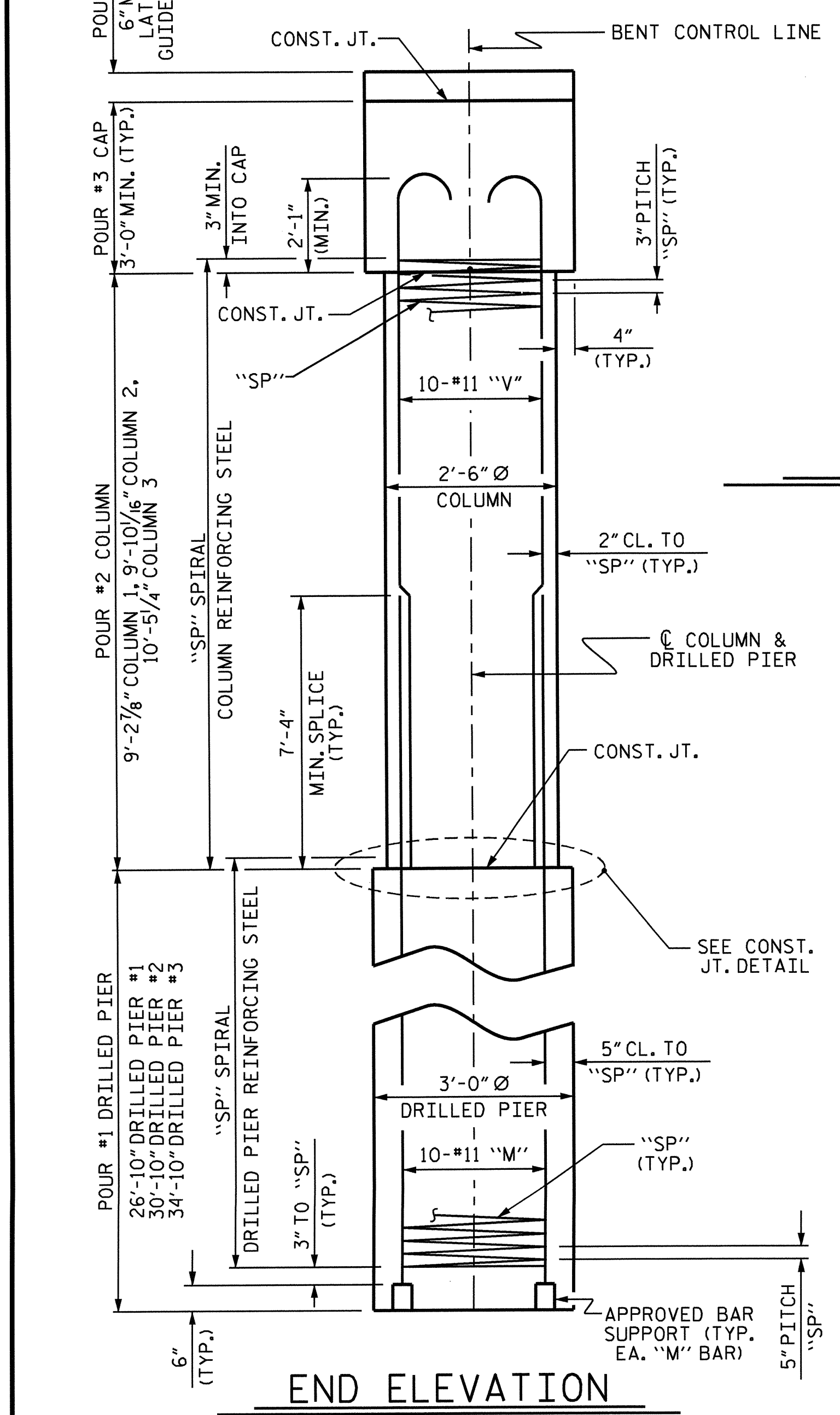
| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-22         |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |
| 2         |     |       | 4   |     |       | 25           |

DRAWN BY: B.C. HUNT DATE: 11/2011  
 CHECKED BY: J.P. ADAMS DATE: 12/2011

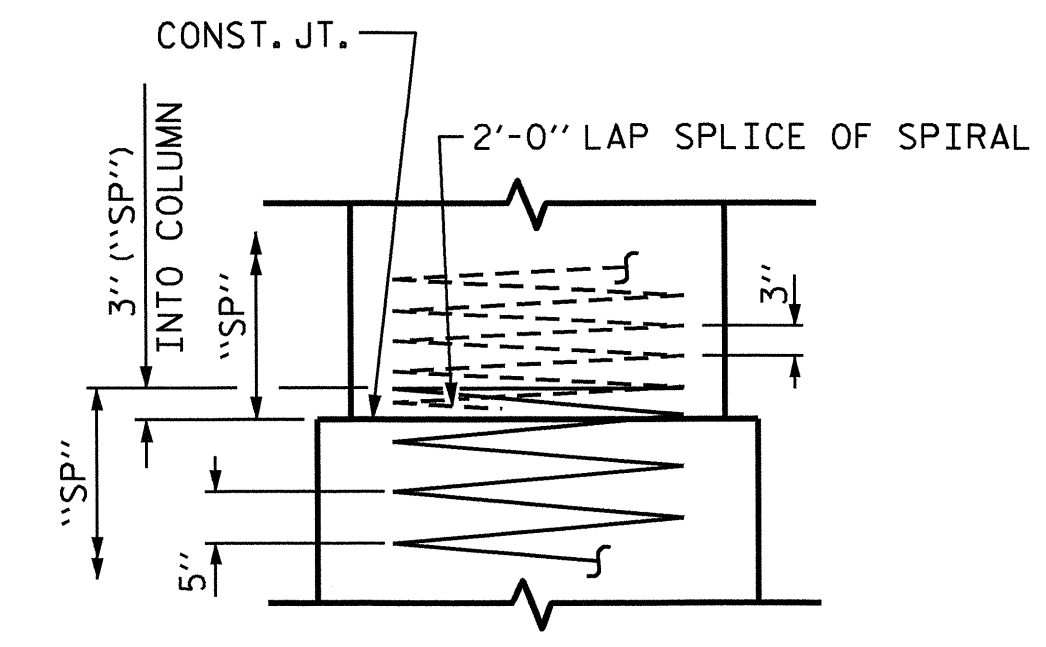
DIMENSIONS & REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER UNLESS OTHERWISE NOTED.



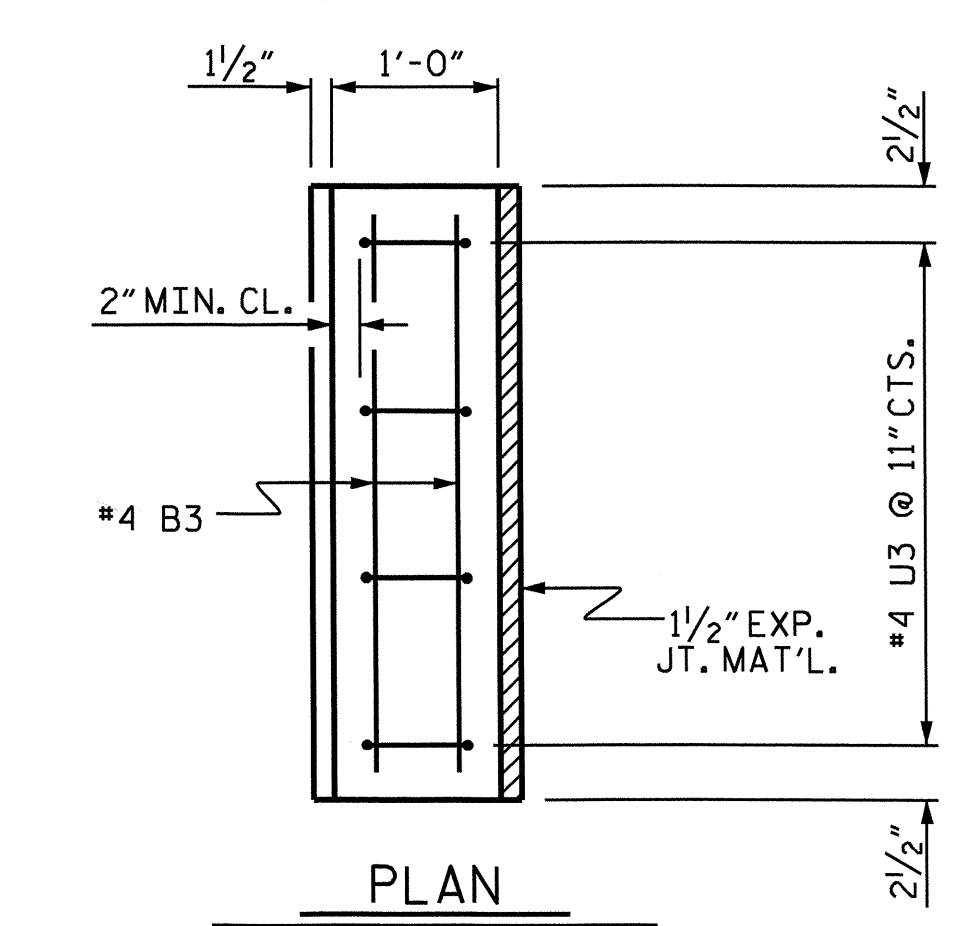
PLAN OF DRILLED PIERS & COLUMNS



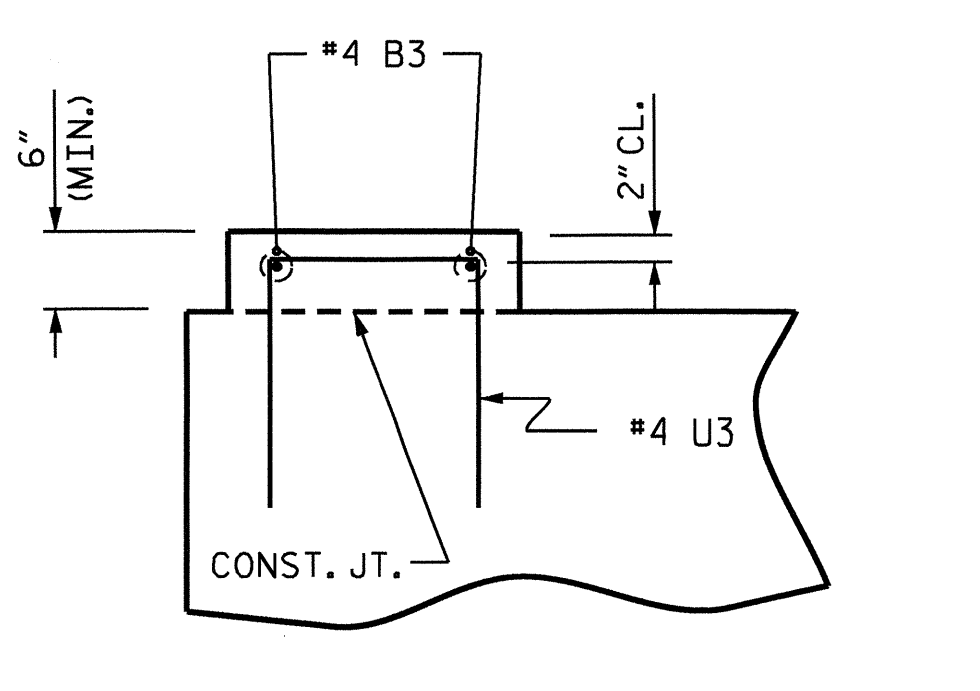
END ELEVATION



CONSTRUCTION JOINT DETAIL



PLAN



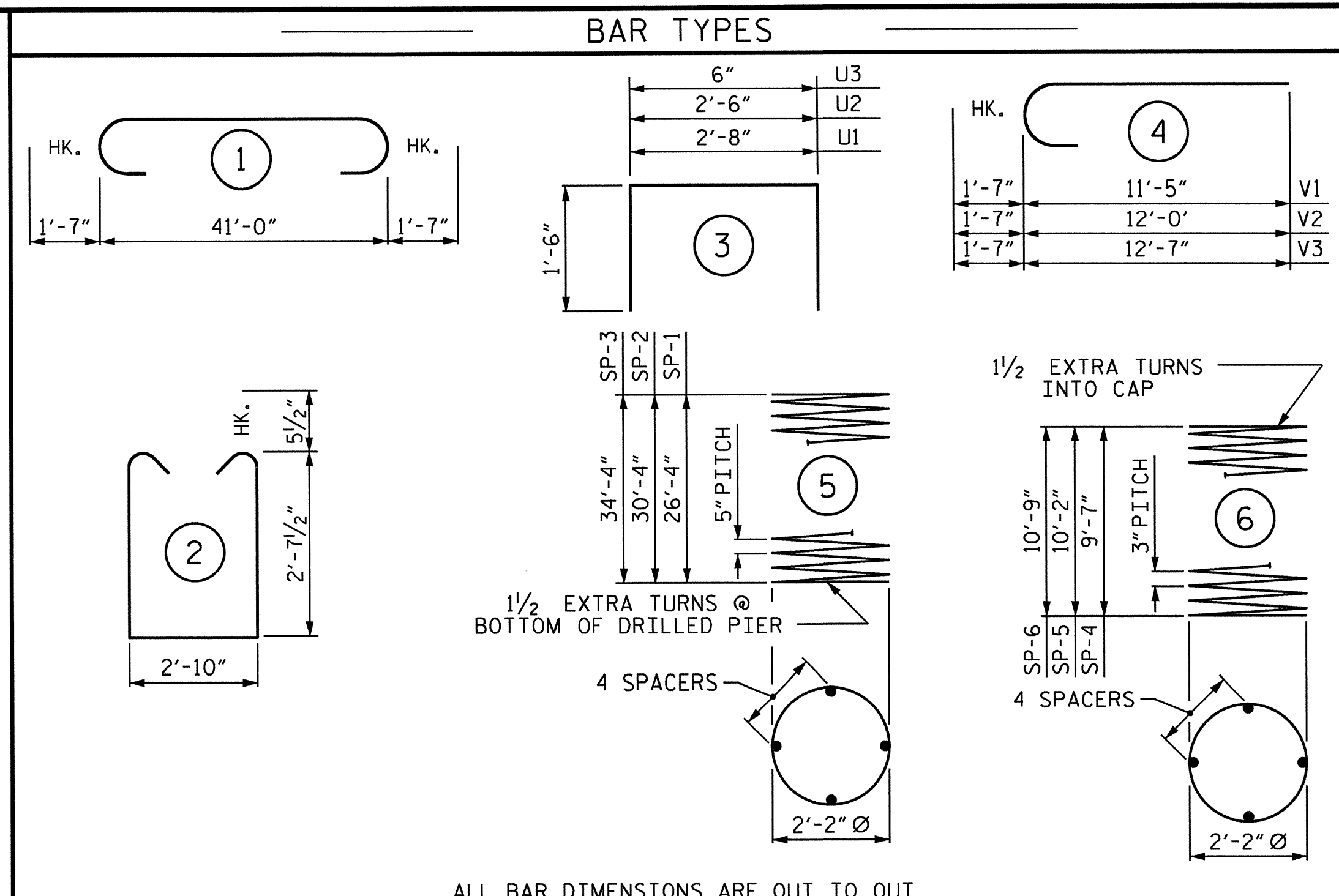
ELEVATION

LATERAL GUIDE DETAILS

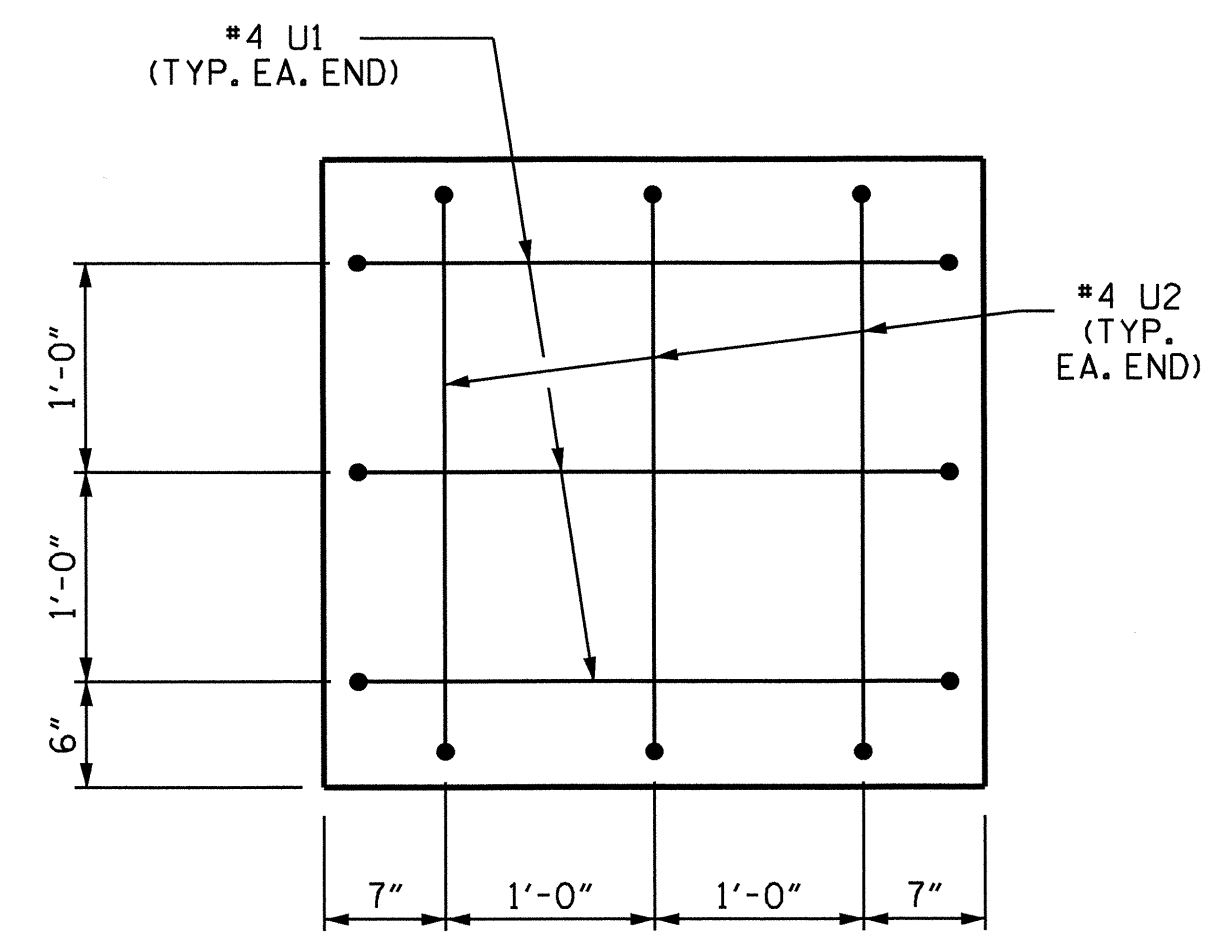
(LEFT LATERAL GUIDE SHOWN, RIGHT SIDE SIMILAR)

DRAWN BY : B.C. HUNT DATE : 11/2011  
 CHECKED BY : J.P. ADAMS DATE : 12/2011

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 LSUTTON

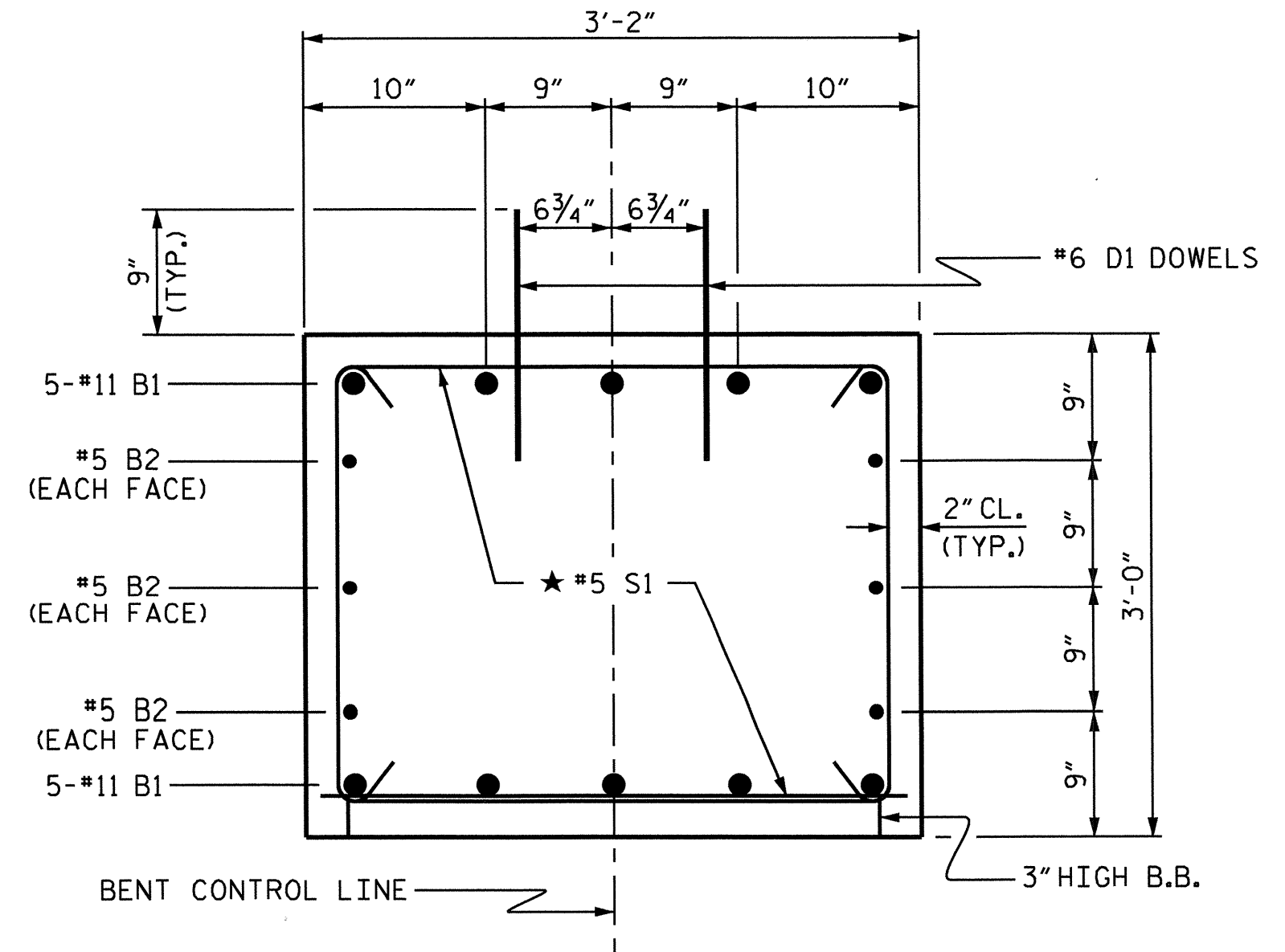


ALL BAR DIMENSIONS ARE OUT TO OUT



END OF CAP VIEW

(TYPICAL BOTH ENDS)



SECTION THRU CAP

\*INVERT ALTERNATE STIRRUPS

| BILL OF MATERIAL                |     |      |      |         |             |
|---------------------------------|-----|------|------|---------|-------------|
| BENT 2                          |     |      |      |         |             |
| BAR                             | NO. | SIZE | TYPE | LENGTH  | WEIGHT      |
| B1                              | 10  | #11  | 1    | 44'-2"  | 2347        |
| B2                              | 6   | #5   | STR  | 41'-2"  | 258         |
| B3                              | 4   | #4   | STR  | 2'-10"  | 8           |
| D1                              | 52  | #6   | STR  | 1'-6"   | 117         |
| M1                              | 10  | #11  | STR  | 36'-11" | 1961        |
| M2                              | 10  | #11  | STR  | 40'-11" | 2174        |
| M3                              | 10  | #11  | STR  | 44'-11" | 2386        |
| S1                              | 70  | #5   | 2    | 9'-0"   | 657         |
| U1                              | 6   | #4   | 3    | 5'-8"   | 23          |
| U2                              | 6   | #4   | 3    | 5'-6"   | 22          |
| U3                              | 8   | #4   | 3    | 3'-6"   | 19          |
| V1                              | 10  | #11  | 4    | 13'-0"  | 691         |
| V2                              | 10  | #11  | 4    | 13'-7"  | 722         |
| V3                              | 10  | #11  | 4    | 14'-2"  | 753         |
| REINFORCING STEEL               |     |      |      |         | LBS. 12,138 |
| SP-1                            | 1   | *    | 5    | 430'-8" | 449         |
| SP-2                            | 1   | *    | 5    | 494'-7" | 516         |
| SP-3                            | 1   | *    | 5    | 558'-6" | 583         |
| SP-4                            | 1   | **   | 6    | 266'-1" | 178         |
| SP-5                            | 1   | **   | 6    | 281'-8" | 188         |
| SP-6                            | 1   | **   | 6    | 298'-0" | 199         |
| SPIRAL COLUMN REINFORCING STEEL |     |      |      |         | LBS. 2,113  |

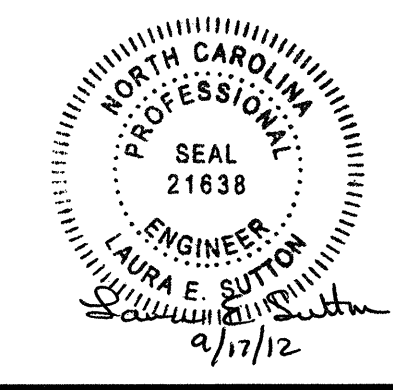
\* THE SP-1, 2, & 3 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR  
 \*\* THE SP-4, 5, & 6 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR

| CLASS A CONCRETE BREAKDOWN |      |      |
|----------------------------|------|------|
| POUR #2 (COLUMNS)          | C.Y. | 5.4  |
| POUR #3 (CAP)              | C.Y. | 14.6 |
| POUR #4 (LATERAL GUIDES)   | C.Y. | 0.1  |
| TOTAL CLASS A CONCRETE     | C.Y. | 20.1 |

| DRILLED PIERS                                   |          |        |
|---|----------|--------|
| DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)   | C.Y.     | 24.2   |
| 3'-0" Ø DRILLED PIER IN SOIL                    | LIN. FT. | 58.50  |
| 3'-0" Ø DRILLED PIER NOT IN SOIL                | LIN. FT. | 34.00  |
| PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIER | LIN. FT. | 41.40  |
| CSL TUBES                                       | LIN. FT. | 388.00 |

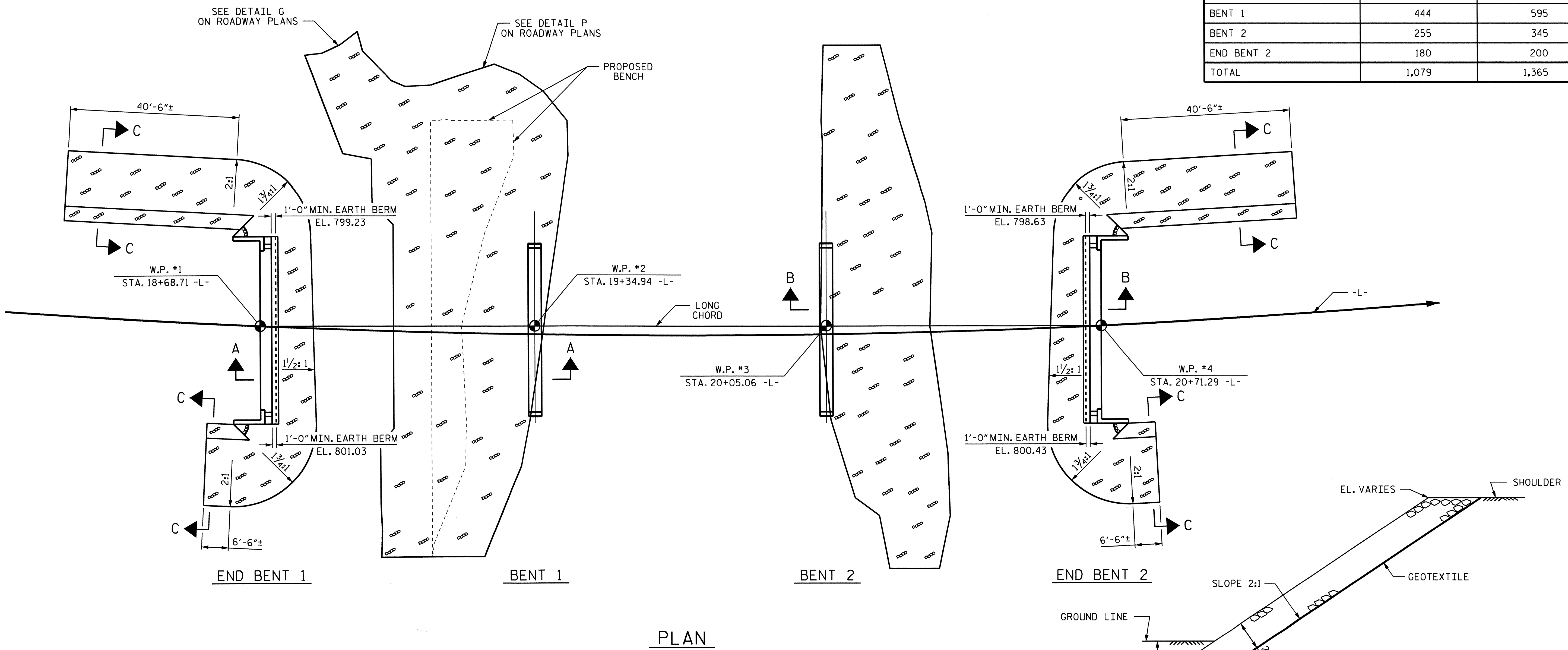
PROJECT NO. B-4458  
 CATAWBA COUNTY  
 STATION: 19+70.00 -L-

| STATE OF NORTH CAROLINA<br>DEPARTMENT OF TRANSPORTATION<br>RALEIGH |     |       |     |     |                    |
|--|-----|-------|-----|-----|--------------------|
| SUBSTRUCTURE   |     |       |     |     |                    |
| BENT 2   |     |       |     |     |                    |
| REVISIONS  |     |       |     |     | SHEET NO.          |
| NO.  | BY: | DATE: | NO. | BY: | DATE:              |
| 1  |     |       | 3   |     |                    |
| 2  |     |       | 4   |     |                    |
|  |     |       |     |     | TOTAL SHEETS<br>25 |

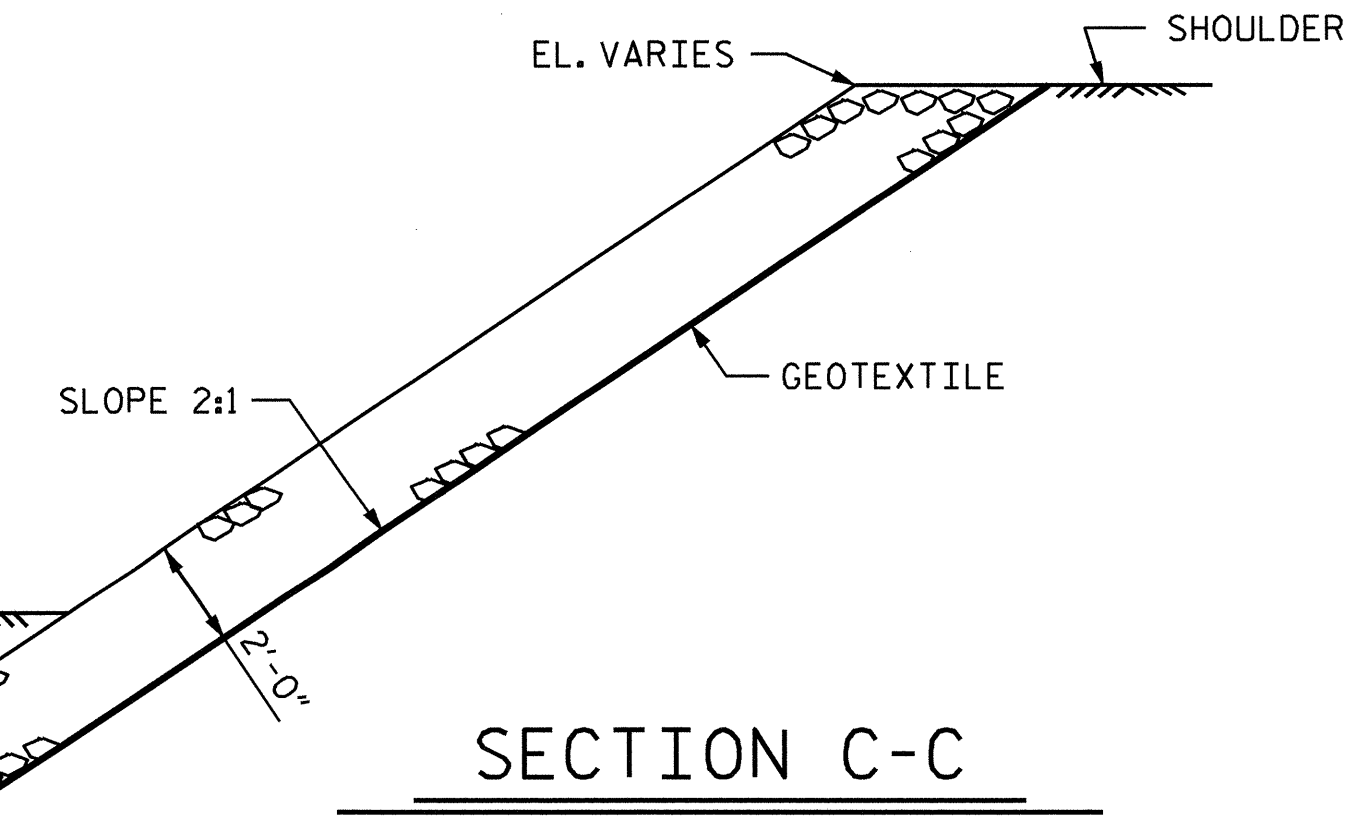




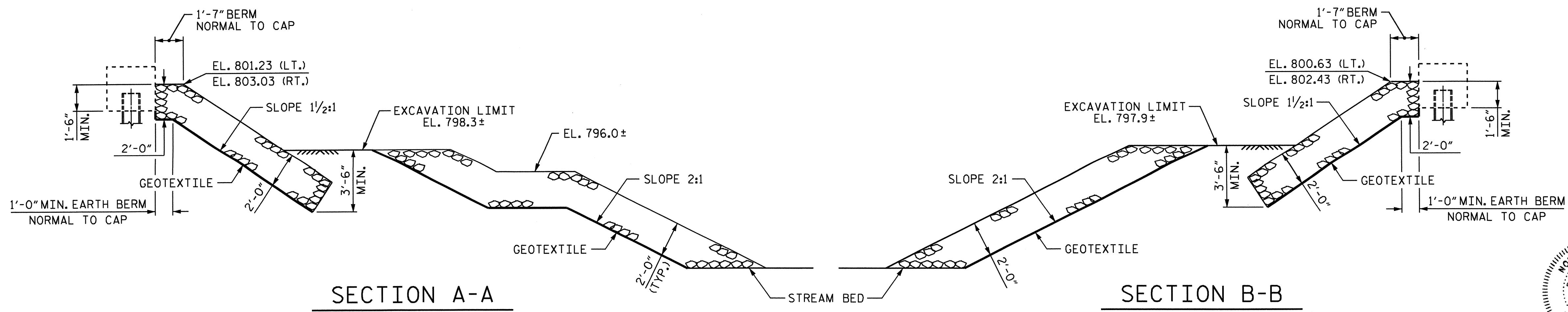
| ESTIMATED QUANTITIES          |                                      |                            |
|-------------------------------|--------------------------------------|----------------------------|
| BRIDGE @<br>STA. 19+70.00 -L- | RIP RAP<br>CLASS II<br>(2'-0" THICK) | GEOTEXTILE<br>FOR DRAINAGE |
|                               | TONS                                 | SQUARE YARDS               |
| END BENT 1                    | 200                                  | 225                        |
| BENT 1                        | 444                                  | 595                        |
| BENT 2                        | 255                                  | 345                        |
| END BENT 2                    | 180                                  | 200                        |
| <b>TOTAL</b>                  | <b>1,079</b>                         | <b>1,365</b>               |



PLAN



SECTION C-C

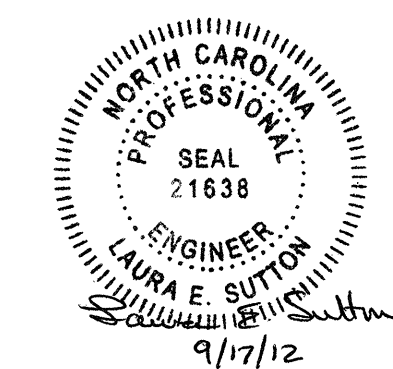


PROJECT NO. B-4458  
CATAWBA COUNTY  
 STATION: 19+70.00 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

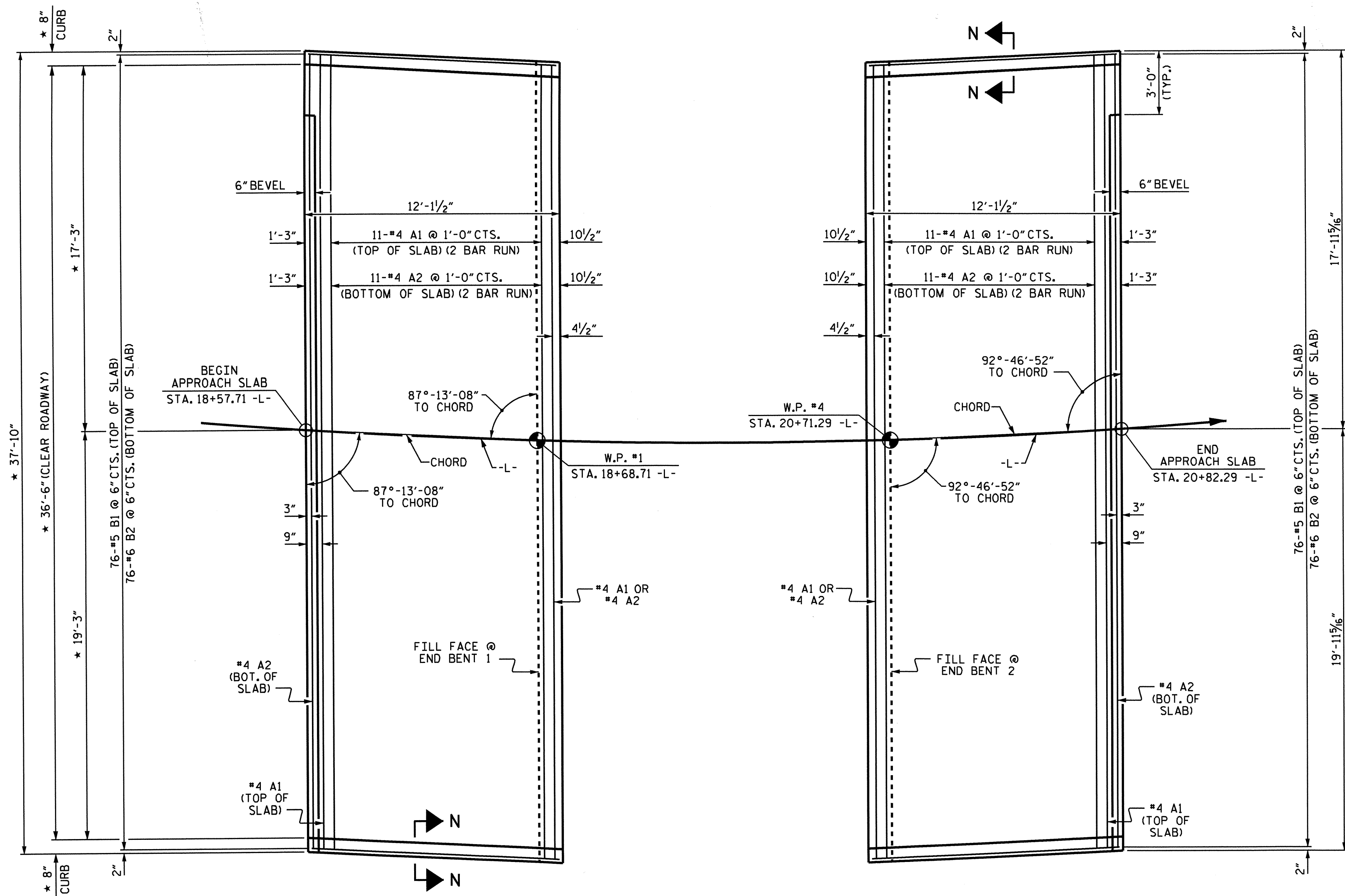
**RIP RAP DETAILS**

| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-24         |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |
| 2         |     |       | 4   |     |       | 25           |



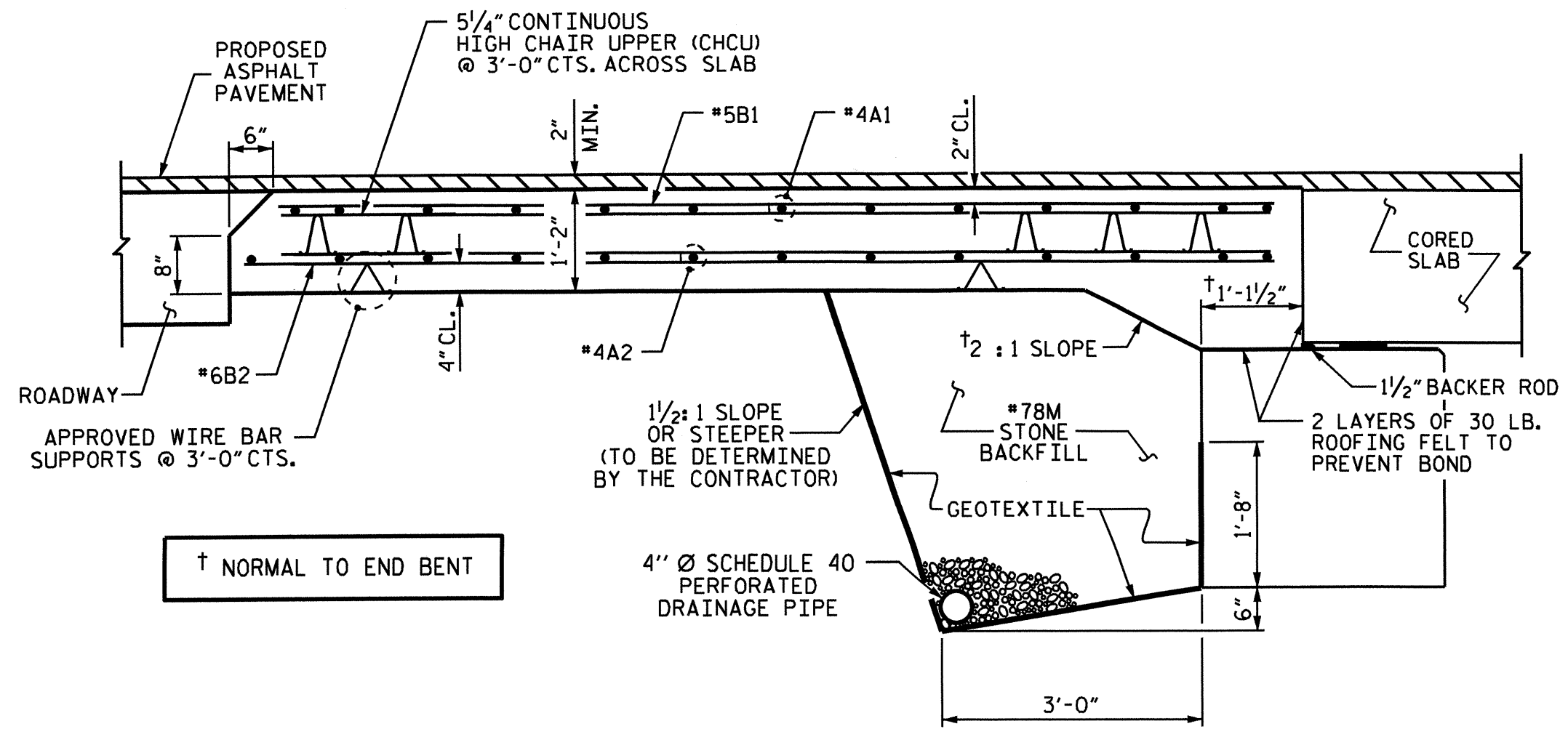
DRAWN BY : J.D. HAWK DATE : 3/12  
 CHECKED BY : B.N. GRADY DATE : 4/12

01-AUG-2012 14:57  
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 lsutton



PLAN @ END BENT 1 PLAN @ END BENT 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS  
\* RADIAL DIMENSIONS (ARC OFFSETS ARE NEGLIGIBLE)



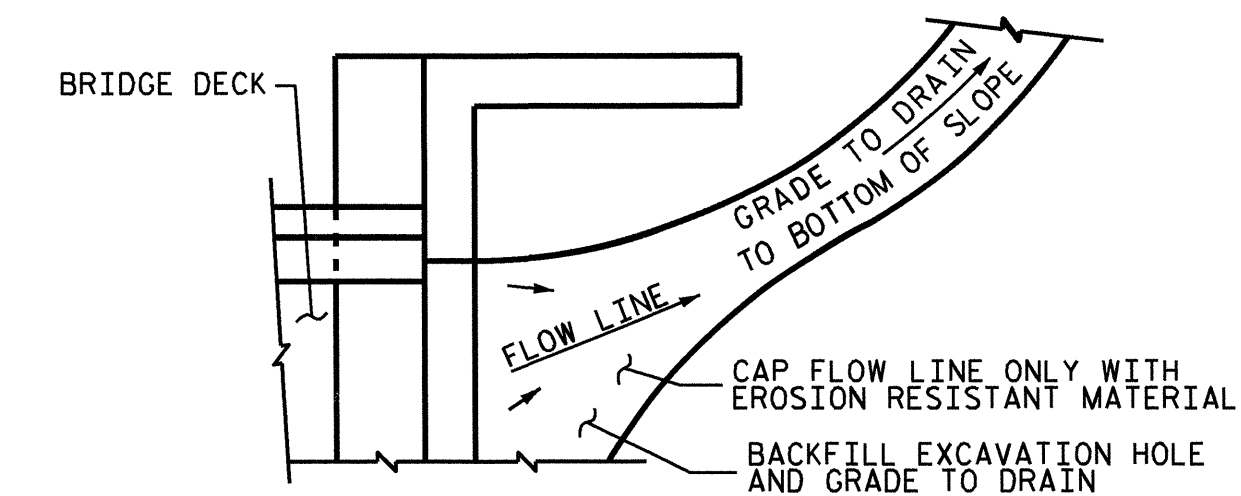
SECTION THRU SLAB

DRAWN BY: L.E. SUTTON DATE: 5/09/12  
CHECKED BY: J.P. ADAMS DATE: 5/14/12

11-JUL-2012 09:44  
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LSUTTON

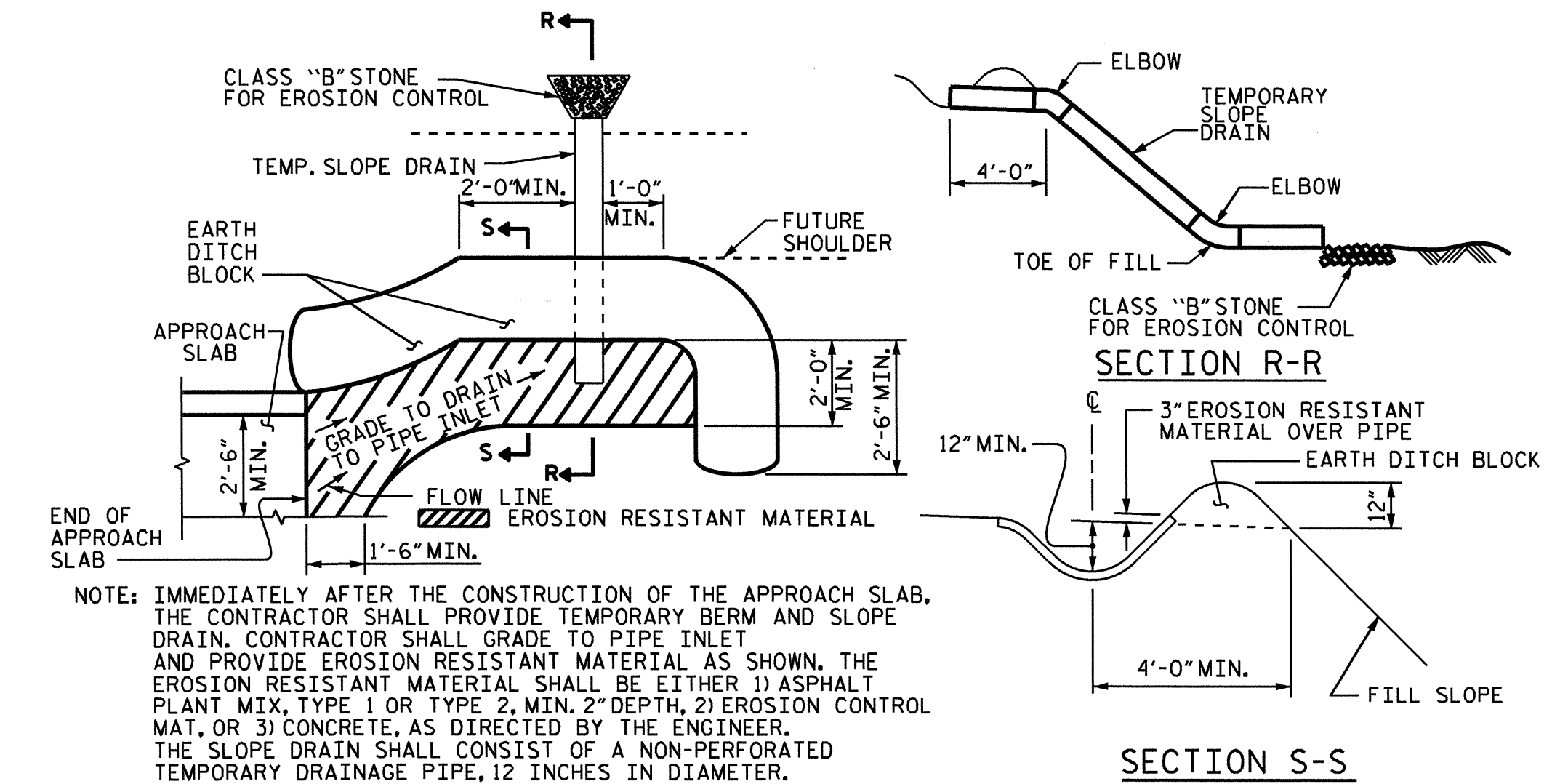
NOTES

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 4" Ø DRAINAGE PIPE, AND #78M STONE BACKFILL, SEE ROADWAY PLANS.  
GEOTEXTILE SHALL BE TYPE 1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.  
#78M STONE BACKFILL (CLASS V SELECT MATERIAL) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.  
#78M STONE BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.  
FOR THE 4" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.  
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.  
APPROACH SLAB GROOVING IS NOT REQUIRED.



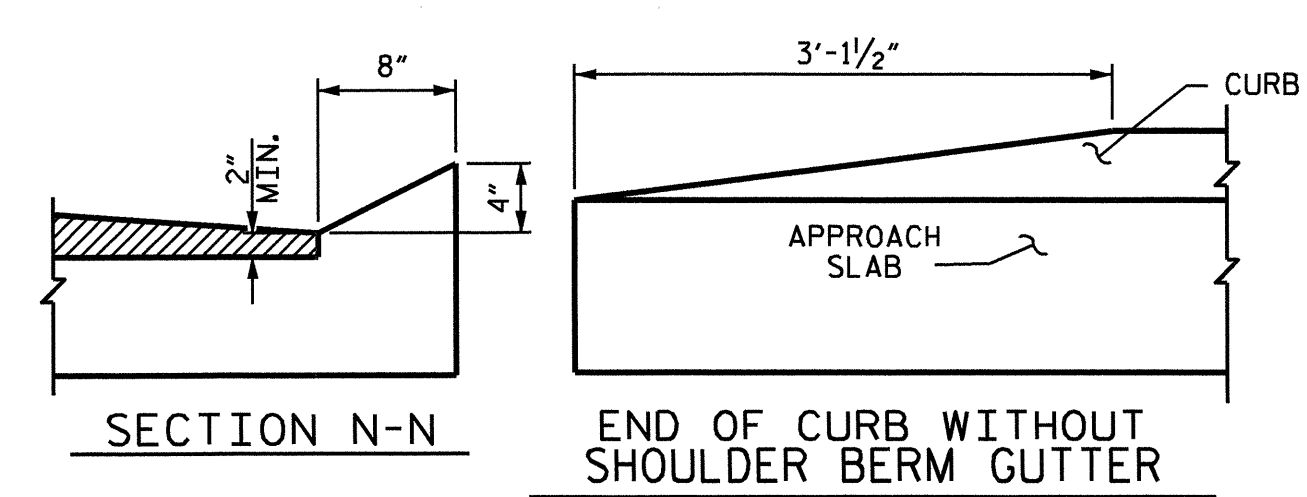
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL



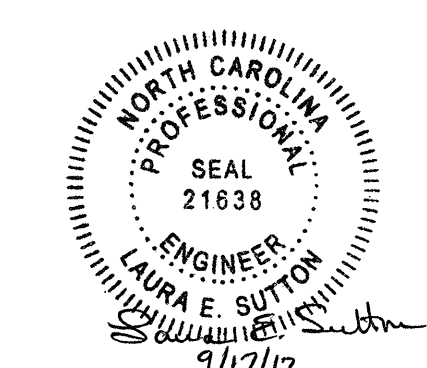
TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



CURB DETAILS

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



| BILL OF MATERIAL                 |     |      |      |         |            |
|----------------------------------|-----|------|------|---------|------------|
| APPROACH SLAB AT EB 1            |     |      |      |         |            |
| BAR                              | NO. | SIZE | TYPE | LENGTH  | WEIGHT     |
| *A1                              | 26  | #4   | STR  | 19'-11" | 346        |
| A2                               | 26  | #4   | STR  | 19'-10" | 344        |
| *B1                              | 76  | #5   | STR  | 11'-2"  | 885        |
| B2                               | 76  | #6   | STR  | 11'-8"  | 1332       |
| REINFORCING STEEL                |     |      |      |         | LBS. 1676  |
| * EPOXY COATED REINFORCING STEEL |     |      |      |         | LBS. 1231  |
| CLASS AA CONCRETE                |     |      |      |         | C. Y. 23.6 |

| APPROACH SLAB AT EB 2            |     |      |      |         |            |
|----------------------------------|-----|------|------|---------|------------|
| BAR                              | NO. | SIZE | TYPE | LENGTH  | WEIGHT     |
| *A1                              | 26  | #4   | STR  | 19'-11" | 346        |
| A2                               | 26  | #4   | STR  | 19'-10" | 344        |
| *B1                              | 76  | #5   | STR  | 11'-2"  | 885        |
| B2                               | 76  | #6   | STR  | 11'-8"  | 1332       |
| REINFORCING STEEL                |     |      |      |         | LBS. 1676  |
| * EPOXY COATED REINFORCING STEEL |     |      |      |         | LBS. 1231  |
| CLASS AA CONCRETE                |     |      |      |         | C. Y. 23.6 |

PROJECT NO. B-4458  
CATAWBA COUNTY  
STATION: 19+70.00 -L-

| STATE OF NORTH CAROLINA<br>DEPARTMENT OF TRANSPORTATION<br>RALEIGH                                     |     |       |     |     |                    |
|--|-----|-------|-----|-----|--------------------|
| BRIDGE APPROACH SLAB<br>FOR PRESTRESSED CONCRETE<br>CORED SLAB UNIT<br>(SUB-REGIONAL TIER)<br>90° SKEW |     |       |     |     |                    |
| REVISIONS  |     |       |     |     | SHEET NO.          |
| NO.  | BY: | DATE: | NO. | BY: | DATE:              |
| 1  |     |       | 3   |     |                    |
| 2  |     |       | 4   |     |                    |
|  |     |       |     |     | TOTAL SHEETS<br>25 |

## 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 2012 "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. FINISHES 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