

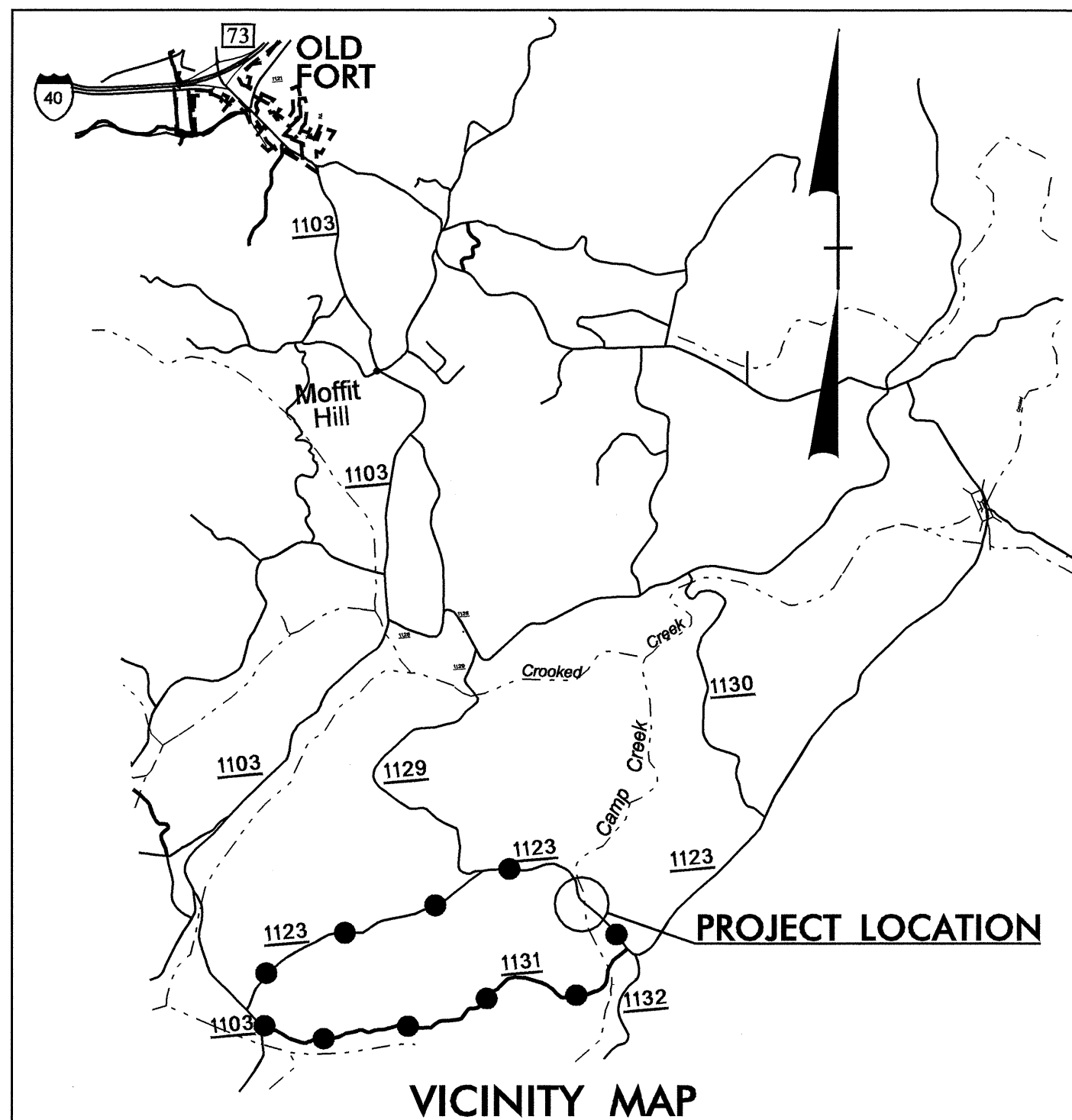
|                 |                             |                |              |
|-----------------|-----------------------------|----------------|--------------|
| STATE           | STATE PROJECT REFERENCE NO. | SHEET NO.      | TOTAL SHEETS |
| N.C.            | B-4193                      |                |              |
| STATE PROJ. NO. | F.A. PROJ. NO.              | DESCRIPTION    |              |
| 33540.1.1       | BRZ-1123(10)                | PE             |              |
| 33540.2.1       | BRZ-1123(10)                | RW & UTILITIES |              |
| 33540.3.1       | BRZ-1123(10)                | CONSTRUCTION   |              |

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

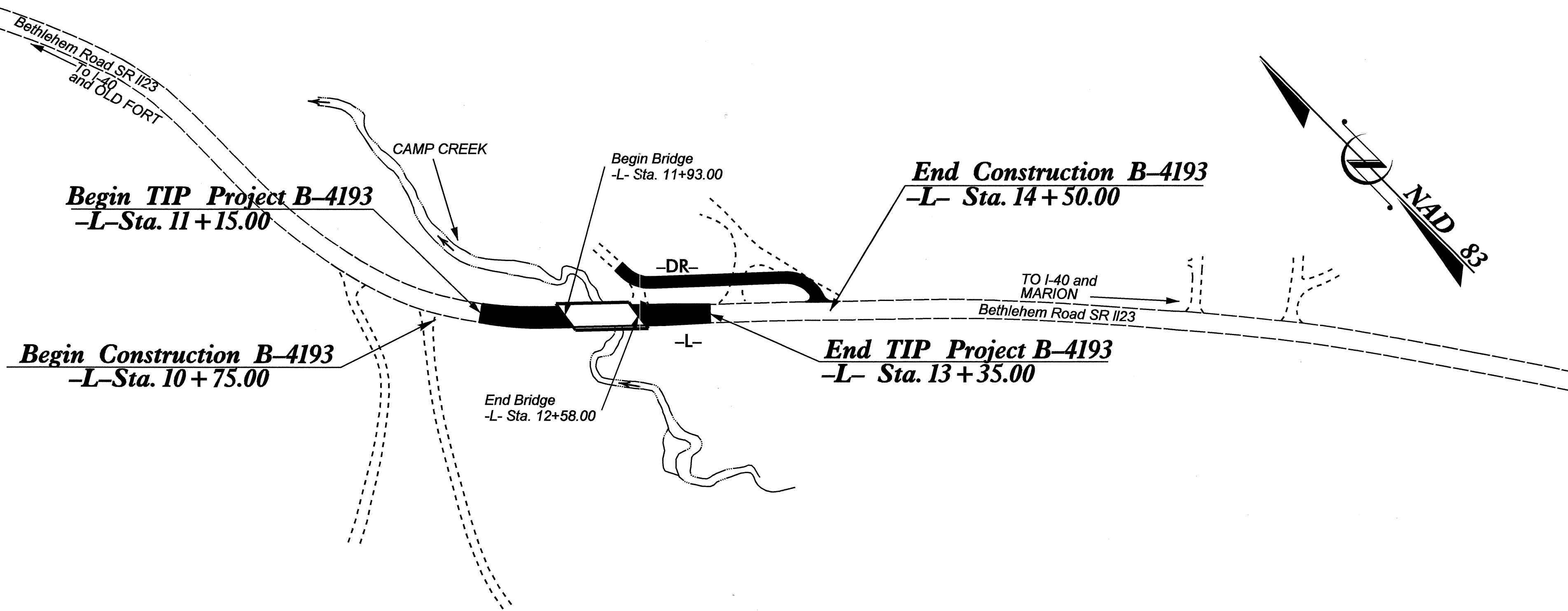
***McDOWELL COUNTY***

**LOCATION:** Bridge #51 over Camp Creek and Approaches on SR 1123,  
Bethlehem Road

**TYPE OF WORK:** Grading, Paving, Drainage, Guardrail and Structure

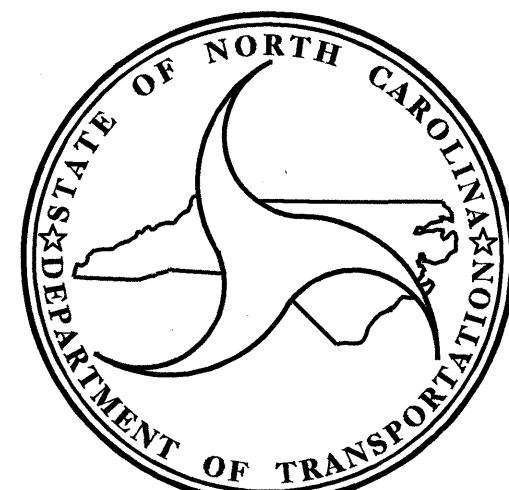


**STRUCTURE**



**TIP PROJECT: B-4193**

**CONTRACT: C201870**



**DESIGN DATA**

ADT 2006 = 400 vpd  
ADT 2025 = 700 vpd  
DHV = 10 %  
D ÷ 60 %  
T = 5 % \*  
\*\*V = 30 MPH  
\* TTST 2% \* DUAL 3%

**PROJECT LENGTH**

Length Roadway TIP Project B-4193 = 0.030 Miles  
Length Structures TIP Project B-4193 = 0.012 Miles  
Total Length TIP Project B-4193 = 0.042 Miles

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

2006 STANDARD SPECIFICATIONS

**LETTING DATE:**  
JULY 15, 2008

Q. H. NGUYEN, PE  
PROJECT ENGINEER

J. R. DUGGINS, JR, PE  
PROJECT DESIGN ENGINEER

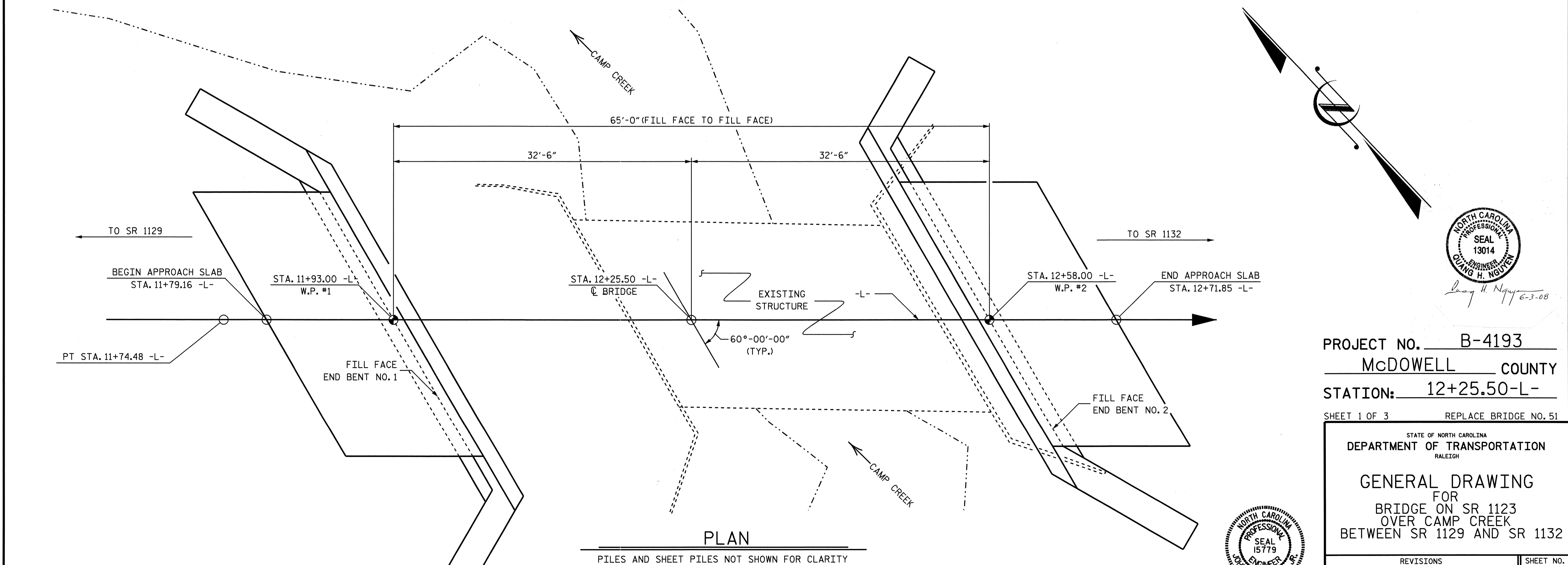
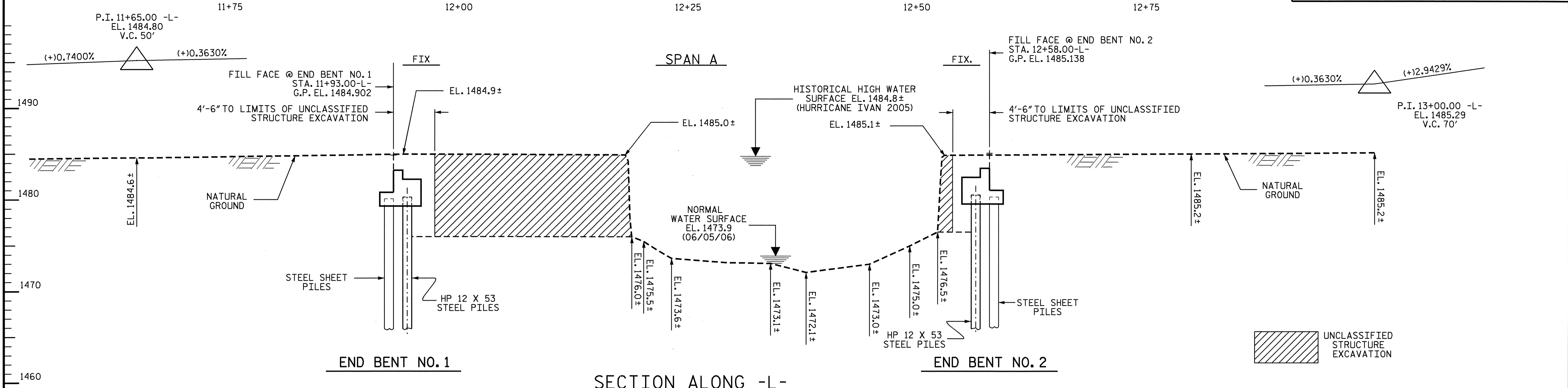
**STRUCTURE DESIGN UNIT**  
1000 BIRCH RIDGE DRIVE  
RALEIGH, NC 27610

DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER  
DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION

APPROVED  
DIVISION ADMINISTRATOR      DATE

06-JUN-2008 15:08  
\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$DCN\$  
jlamberT



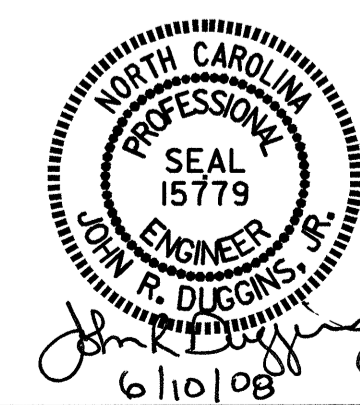
Quang H. Nguyen 6-3-08

PROJECT NO. B-4193  
McDOWELL COUNTY  
 STATION: 12+25.50-L-

SHEET 1 OF 3 REPLACE BRIDGE NO. 51

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**  
 FOR  
 BRIDGE ON SR 1123  
 OVER CAMP CREEK  
 BETWEEN SR 1129 AND SR 1132



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

DRAWN BY: A.L. FIGUEROA DATE: 04-03-08  
 CHECKED BY: J.R. DUGGINS DATE: 04-07-08

NOTES

DRIVE PILES AT END BENT No. 1 TO A REQUIRED BEARING CAPACITY OF 100 TONS PER PILE. THE REQUIRED BEARING CAPACITY IS EQUAL TO THE ALLOWABLE BEARING CAPACITY WITH A MINIMUM FACTOR OF SAFETY OF TWO. THE ALLOWABLE BEARING CAPACITY FOR PILES AT END BENT No. 1 IS 50 TONS PER PILE.

DRIVE PILES AT END BENT No. 2 TO A REQUIRED BEARING CAPACITY OF 100 TONS PER PILE. THE REQUIRED BEARING CAPACITY IS EQUAL TO THE ALLOWABLE BEARING CAPACITY WITH A MINIMUM FACTOR OF SAFETY OF TWO. THE ALLOWABLE BEARING CAPACITY FOR PILES AT END BENT No. 2 IS 50 TONS PER PILE.

STEEL PILE POINTS WITH TEETH ARE REQUIRED FOR STEEL PILES AT END BENTS No 1 AND 2. SEE SECTIONS 450 OF THE STANDARD SPECIFICATIONS.

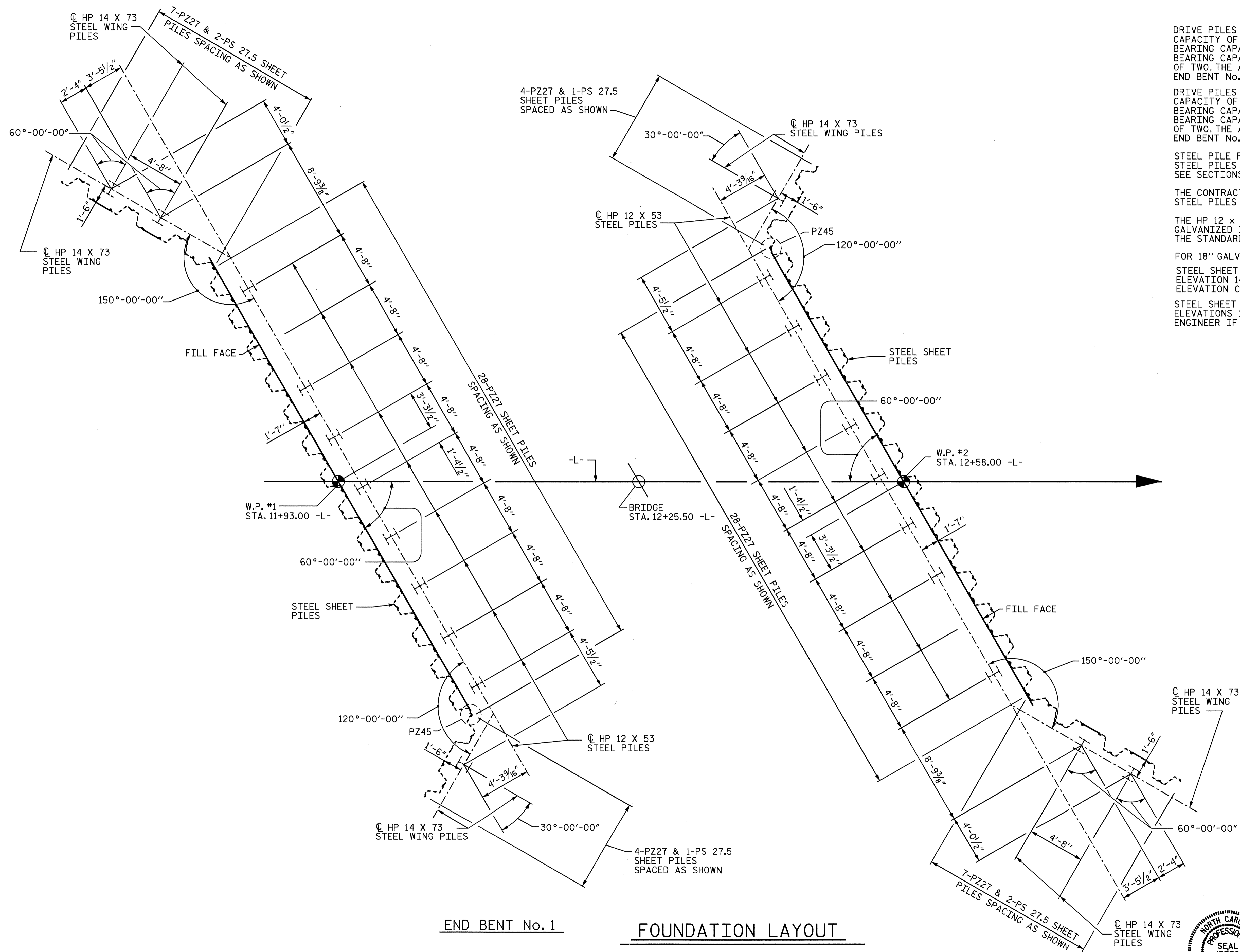
THE CONTRACTOR SHALL INSTALL THE HP 12 x 53 AND HP 14 x 73 STEEL PILES PRIOR TO DRIVING THE SHEET PILES.

THE HP 12 x 53 AND HP 14 x 73 STEEL PILES SHALL BE GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

FOR 18" GALVANIZED STEEL SHEET PILES. SEE SPECIAL PROVISIONS.

STEEL SHEET PILES AT END BENT No. 1 SHALL BE DRIVEN TO ELEVATION 1462.0. PLEASE NOTIFY THE ENGINEER IF THIS ELEVATION CANNOT BE OBTAINED.

STEEL SHEET PILES AT END BENT No. 2 SHALL BE DRIVEN TO ELEVATIONS 1462.0 LEFT AND 1450.0 RIGHT. PLEASE NOTIFY THE ENGINEER IF THESE ELEVATIONS CANNOT BE OBTAINED.



END BENT No. 1

FOUNDATION LAYOUT

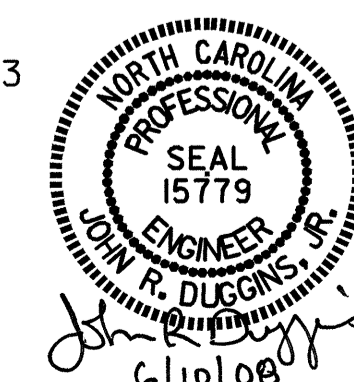
END BENT No. 2

PROJECT NO. B-4193  
McDOWELL COUNTY  
 STATION: 12+25.50 -L-

SHEET 2 OF 3

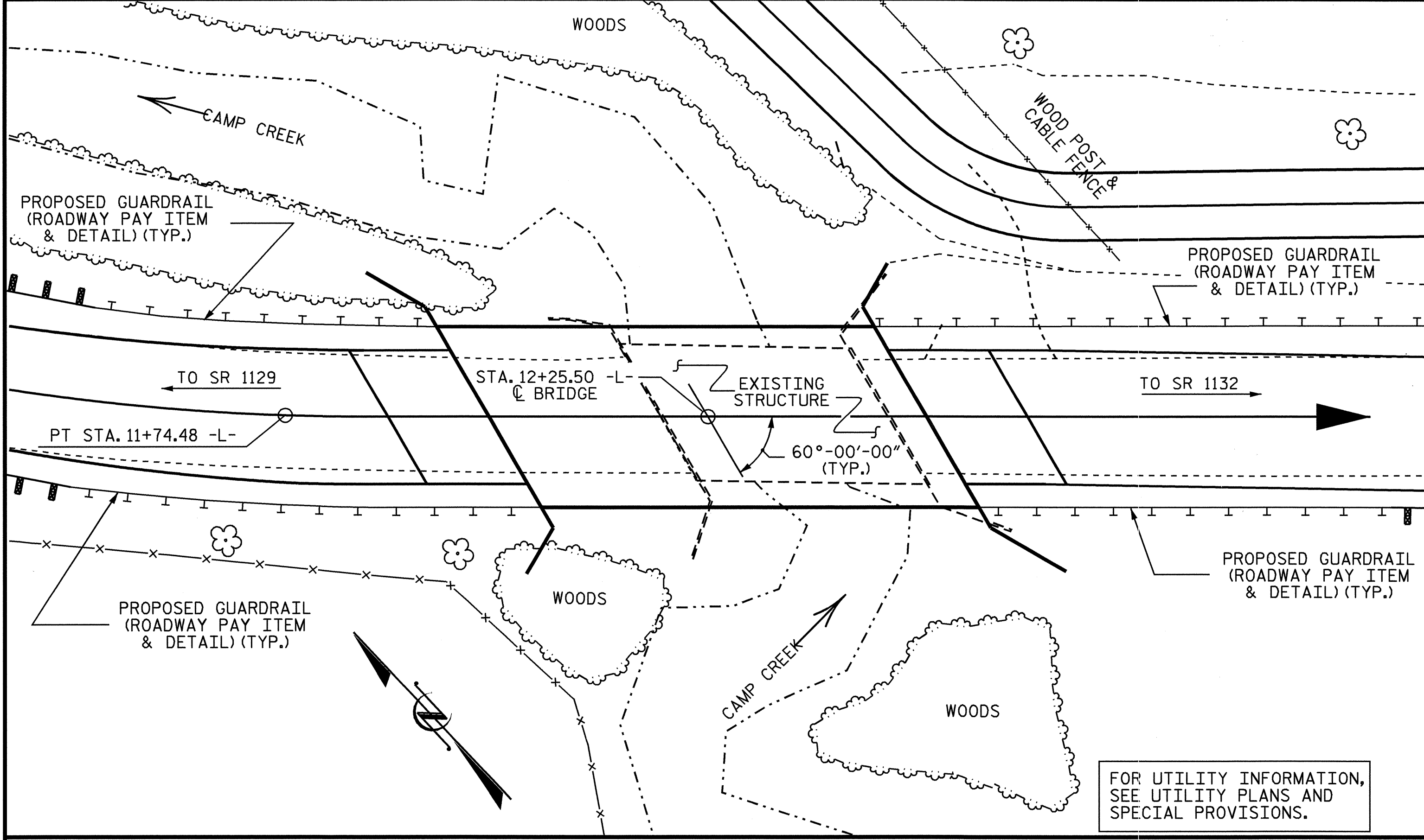
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

GENERAL DRAWING  
 FOR BRIDGE ON SR 1123  
 OVER CAMP CREEK  
 BETWEEN SR 1129 AND SR 1132



DRAWN BY: M. POOLE \ DAH DATE: 03-08  
 CHECKED BY: J.R. DUGGINS DATE: 03-08

| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | TOTAL SHEETS |
| 1         |     |       | 3   |     |       | 5-2          |
| 2         |     |       | 4   |     |       | 17           |



LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HS 20 OR ALTERNATE LOADING, EXCEPT THAT THE BOX BEAMS HAVE BEEN DESIGNED FOR HS 25.  
 FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.  
 FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.  
 THIS BRIDGE HAS BEEN DESIGNED BY THE STRENGTH DESIGN METHOD AS SPECIFIED IN AASHTO STANDARD SPECIFICATIONS.  
 THE EXISTING STRUCTURE CONSISTING OF 1 SPAN AT 34'-8" WITH A TIMBER DECK ON STEEL I-BEAMS SUPERSTRUCTURE AND A CLEAR ROADWAY WIDTH OF 19'-2" ON A SUBSTRUCTURE CONSISTING OF A TIMBER CAP ON TIMBER PILES END BENTS AND LOCATED AT THE PROPOSED STRUCTURE LOCATION SHALL BE REMOVED. SEE SPECIAL PROVISIONS FOR REMOVAL OF EXISTING STRUCTURE.  
 REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT 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 (SEE SHEET 1 OF 3) SHALL BE EXCAVATED FOR A DISTANCE OF APPROXIMATELY 20 FEET TO EACH SIDE OF CENTERLINE AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION.  
 THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.  
 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 SCOUR CRITICAL ELEVATION FOR END BENT NO.1 AND NO.2 IS ELEVATION 1465.0. THE SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.  
 THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO STANDARD SPECIFICATIONS FOR SEISMIC DESIGN OF HIGHWAY BRIDGES FOR SEISMIC PERFORMANCE CATEGORY B.  
 THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLE OF REINFORCING STEEL AS FOLLOWING: 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 SAMPLE OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST BE SPLICES WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS.  
 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 COST 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 12+25.50 -L-".  
 FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.  
 FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.  
 THIS BRIDGE SHALL BE CONSTRUCTED USING TOP-DOWN CONSTRUCTION METHODS. THE USE OF A TEMPORARY CAUSEWAY OR WORK BRIDGE IS NOT PERMITTED.  
 FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.  
 FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.  
 FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

HYDRAULIC DATA

DESIGN DISCHARGE\_\_\_\_\_ = 1,100 C.F.S.  
 FREQUENCY OF DESIGN FLOOD\_\_\_\_\_ = 25 YRS.  
 DESIGN HIGH WATER ELEVATION\_\_\_\_\_ = 1,479.2 FT.  
 DRAINAGE AREA\_\_\_\_\_ = 3.8 SQ. MI.  
 BASIC DISCHARGE (Q100)\_\_\_\_\_ = 1,700 C.F.S.  
 BASIC HIGH WATER ELEVATION\_\_\_\_\_ = 1,480.6 FT.

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE\_\_\_\_\_ = 3,500 C.F.S.  
 FREQUENCY OF OVERTOPPING FLOOD\_\_\_\_\_ = 500 YRS.  
 OVERTOPPING FLOOD ELEVATION\_\_\_\_\_ = 1,484.8 FT.

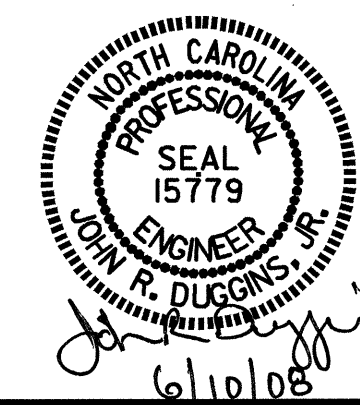
TOTAL BILL OF MATERIAL

|                | REMOVAL OF EXISTING STRUCTURE | UNCLASSIFIED STRUCTURE EXCAVATION | CLASS A CONCRETE | BRIDGE APPROACH SLABS | REINFORCING STEEL | HP 12 X 53 GALVANIZED STEEL PILES |          | HP 14 X 73 GALVANIZED STEEL PILES |          | STEEL PILES POINTS | 18" GALVANIZED STEEL SHEET PILES | CONCRETE BARRIER RAIL | ELASTOMERIC BEARINGS | 3'-0" X 2'-3" PRESTRESSED CONCRETE BOX BEAMS |          |
|----------------|-------------------------------|-----------------------------------|------------------|-----------------------|-------------------|-----------------------------------|----------|-----------------------------------|----------|--------------------|----------------------------------|-----------------------|----------------------|--|----------|
|                | LUMP SUM                      | LUMP SUM                          | CU. YARDS        | LUMP SUM              | LBS               | NO.                               | LIN. FT. | NO.                               | LIN. FT. | EACH               | SQ. FT.                          | LIN. FT.              | LUMP SUM             | NO.  | LIN. FT. |
| SUPERSTRUCTURE | LUMP SUM                      |                                   |                  | LUMP SUM              |                   |                                   |          |                                   |          |                    |                                  | 124.80                | LUMP SUM             | 10   | 624.01   |
| END BENT NO. 1 |                               | LUMP SUM                          | 25.2             |                       | 3864              | 9                                 | 180      | 3                                 | 60       | 12                 | 1410                             |                       |                      |  |          |
| END BENT NO. 2 |                               | LUMP SUM                          | 25.2             |                       | 3866              | 9                                 | 180      | 3                                 | 60       | 12                 | 1410                             |                       |                      |  |          |
| TOTAL          | LUMP SUM                      | LUMP SUM                          | 50.4             | LUMP SUM              | 7730              | 18                                | 360      | 6                                 | 120      | 24                 | 2820                             | 124.80                | LUMP SUM             | 10   | 624.01   |

PROJECT NO. B-4193  
MCDOWELL COUNTY  
 STATION: 12+25.50-L-

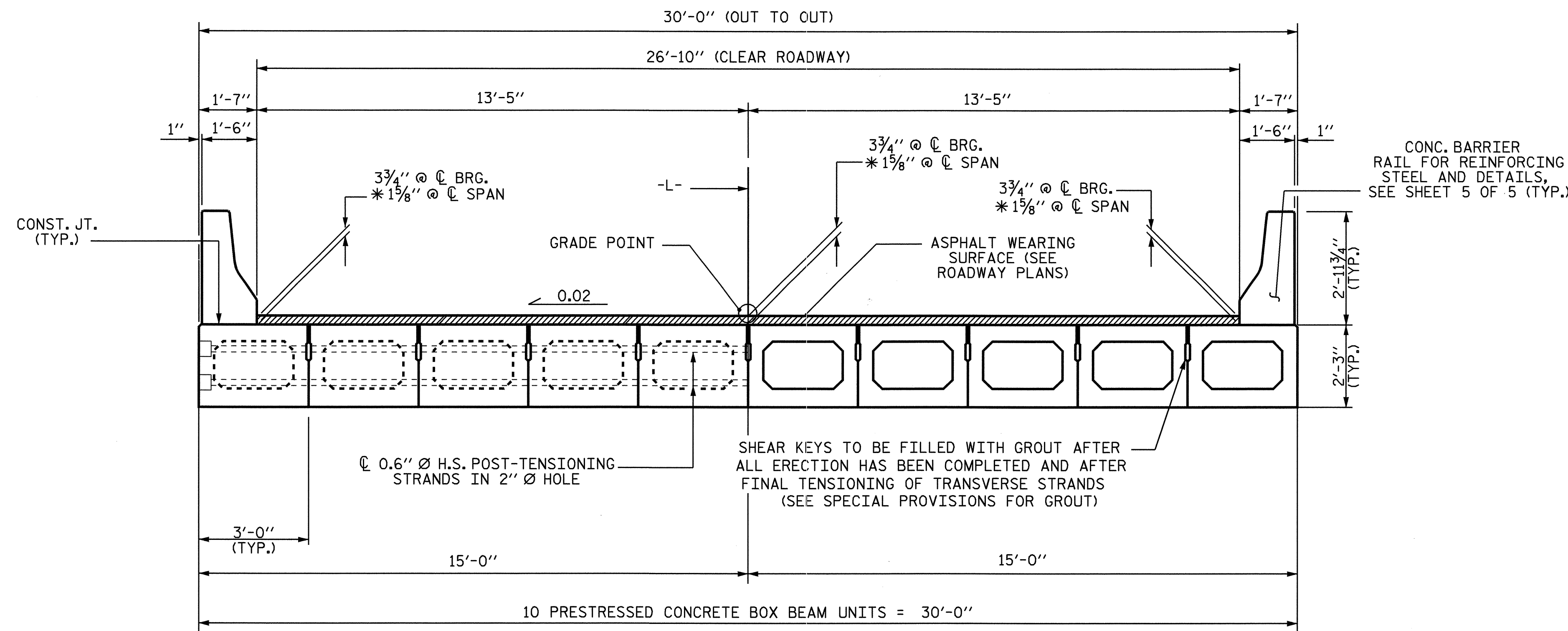
SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GENERAL DRAWING  
 FOR  
 BRIDGE ON SR 1123  
 OVER CAMP CREEK  
 BETWEEN SR 1129 AND SR 1132



| REVISIONS |     |       |     |     |       | SHEET NO.       |
|-----------|-----|-------|-----|-----|-------|-----------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: |                 |
| 1         |     |       | 3   |     |       | 5-3             |
| 2         |     |       | 4   |     |       | TOTAL SHEETS 17 |

DRAWN BY : A.L. FIGUEROA DATE : 04-03-08  
 CHECKED BY : J.R. DUGGINS DATE : 04-07-08



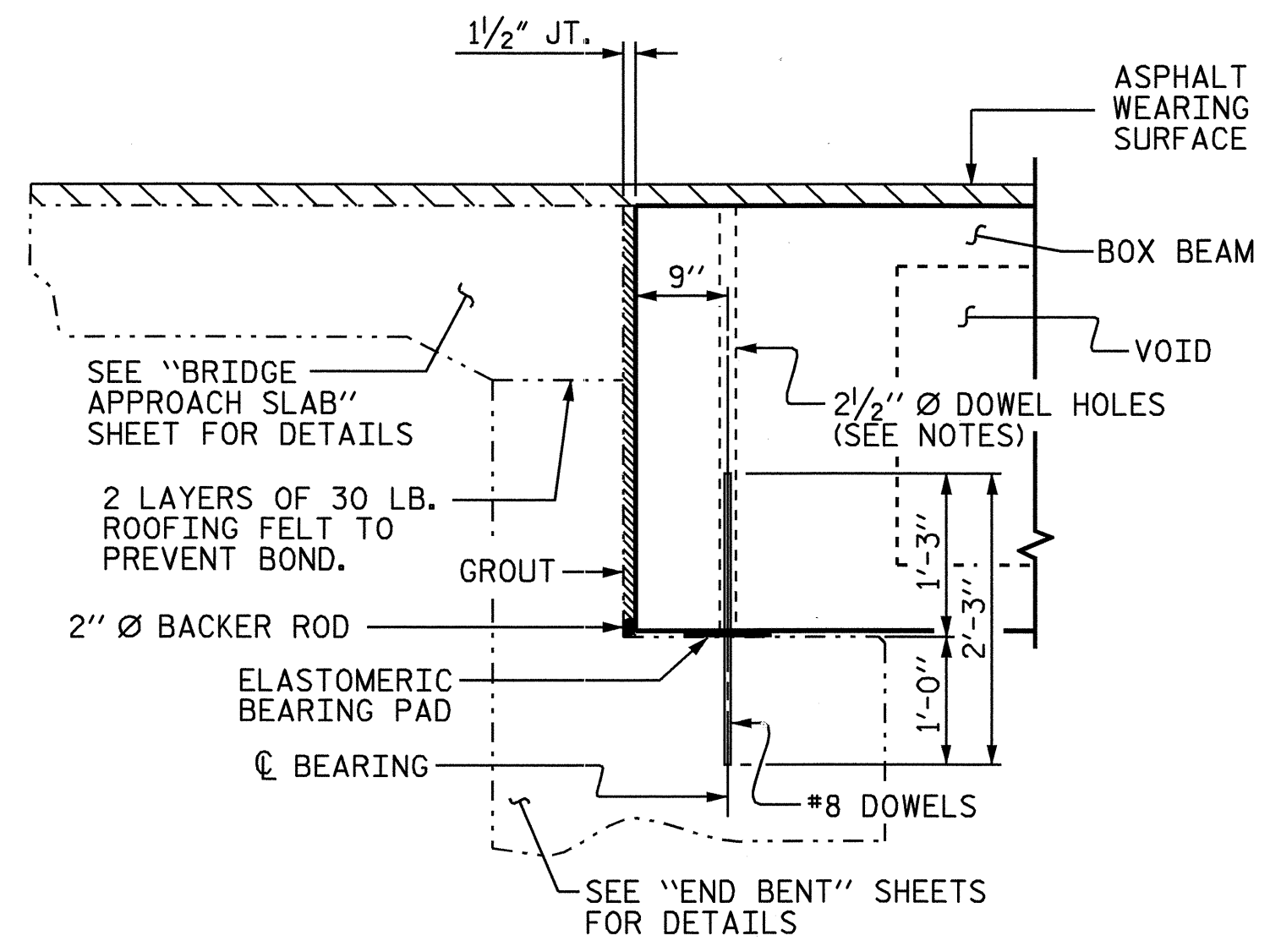
HALF SECTION @ INTERMEDIATE DIAPHRAGM      HALF SECTION @ VOIDS

**TYPICAL SECTION**

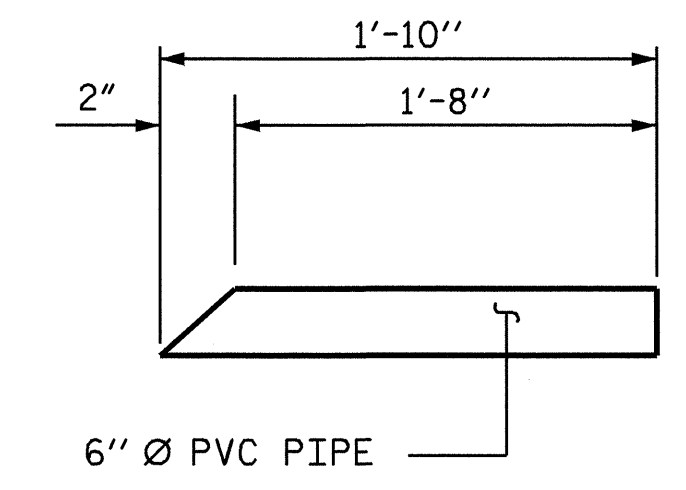
\* BASED ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATIONS

**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 BOX BEAM SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE BOX BEAMS.
- RECESSES FOR TRANSVERSE STRANDS SHALL BE GROUTED AFTER THE TENSIONING OF THE STRANDS.
- THE 2 1/2" Ø DOWEL HOLES AT FIXED ENDS OF BOX BEAM SECTIONS SHALL BE FILLED WITH NON-SHRINK GROUT.
- THE 2" Ø BACKER ROD SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.
- THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE BOX BEAM UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4000 PSI.
- ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.
- PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE BOX BEAM UNIT ENDS.
- APPLY EPOXY PROTECTIVE COATING TO BOX BEAM UNIT ENDS.
- VERTICAL GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A VERTICAL CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.
- THE LOCATION OF THE VOID DRAINS MAY BE SHIFTED SLIGHTLY WHERE NECESSARY TO CLEAR PRESTRESSING STRANDS OR TRANSVERSE REINFORCING STEEL.
- WHEN BOX BEAMS ARE CAST, A POSITIVE HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDEWAYS. THIS SYSTEM SHALL BE DESIGNED TO BE LEFT IN PLACE UNTIL THE CONCRETE HAS REACHED RELEASE STRENGTH. AT LEAST THREE WEEKS PRIOR TO CASTING BOX BEAMS, 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.
- FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.



**SECTION AT END BENT**



**DRAIN DETAIL**

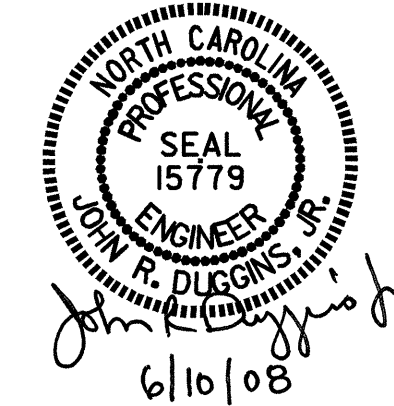
(3 DRAINS REQUIRED)

PROJECT NO. B-4193  
McDOWELL COUNTY  
 STATION: 12+25.50 -L-

SHEET 1 OF 5

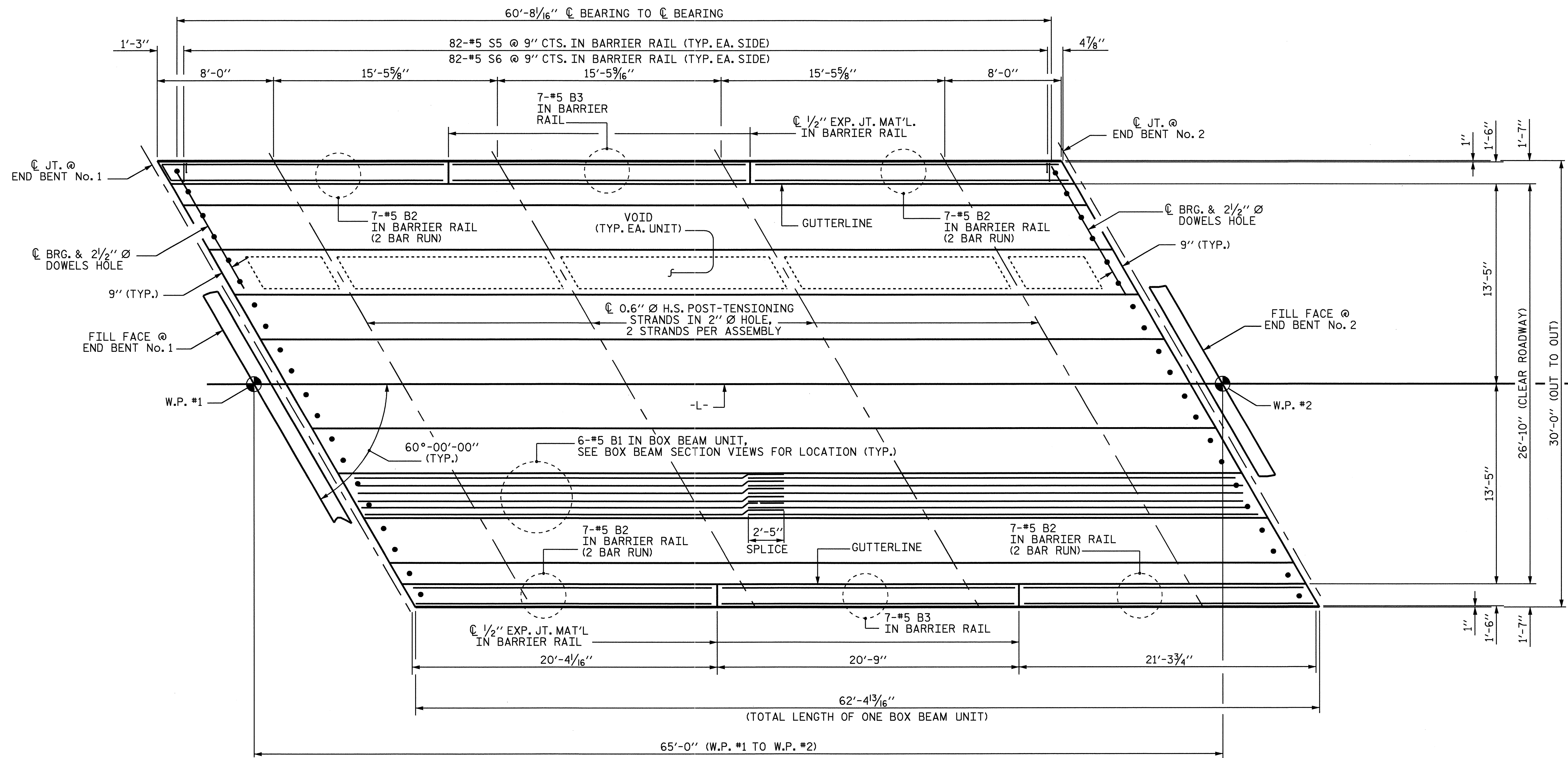
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

3'-0" X 2'-3"  
 PRESTRESSED CONCRETE  
 BOX BEAM UNIT

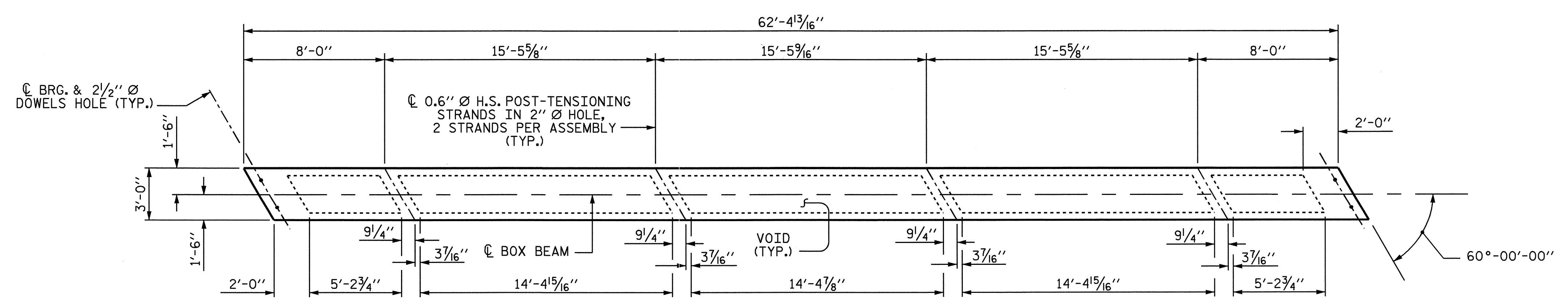


|                            |                    |
|----------------------------|--------------------|
| ASSEMBLED BY : M. POOLE    | DATE : 10/07       |
| CHECKED BY : J. R. DUGGINS | DATE : 03-08       |
| DRAWN BY : TLA 5/05        | ADDED 7/11/05R     |
| CHECKED BY : GM 6/05       | REV. 5/1/06 TLA/GM |

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



PLAN OF SPAN A



PLAN OF BOX BEAM UNIT

FOR REINFORCING STEEL, SEE PLAN OF BOX BEAM, SHEET 3 OF 5.  
DIMENSIONS ARE TO THEORETICAL ACUTE CORNERS AND DO NOT ACCOUNT FOR ANY CHAMFERS THAT MAY BE REQUIRED.

PROJECT NO. B-4193  
McDOWELL COUNTY  
STATION: 12+25.50 -L-

SHEET 2 OF 5

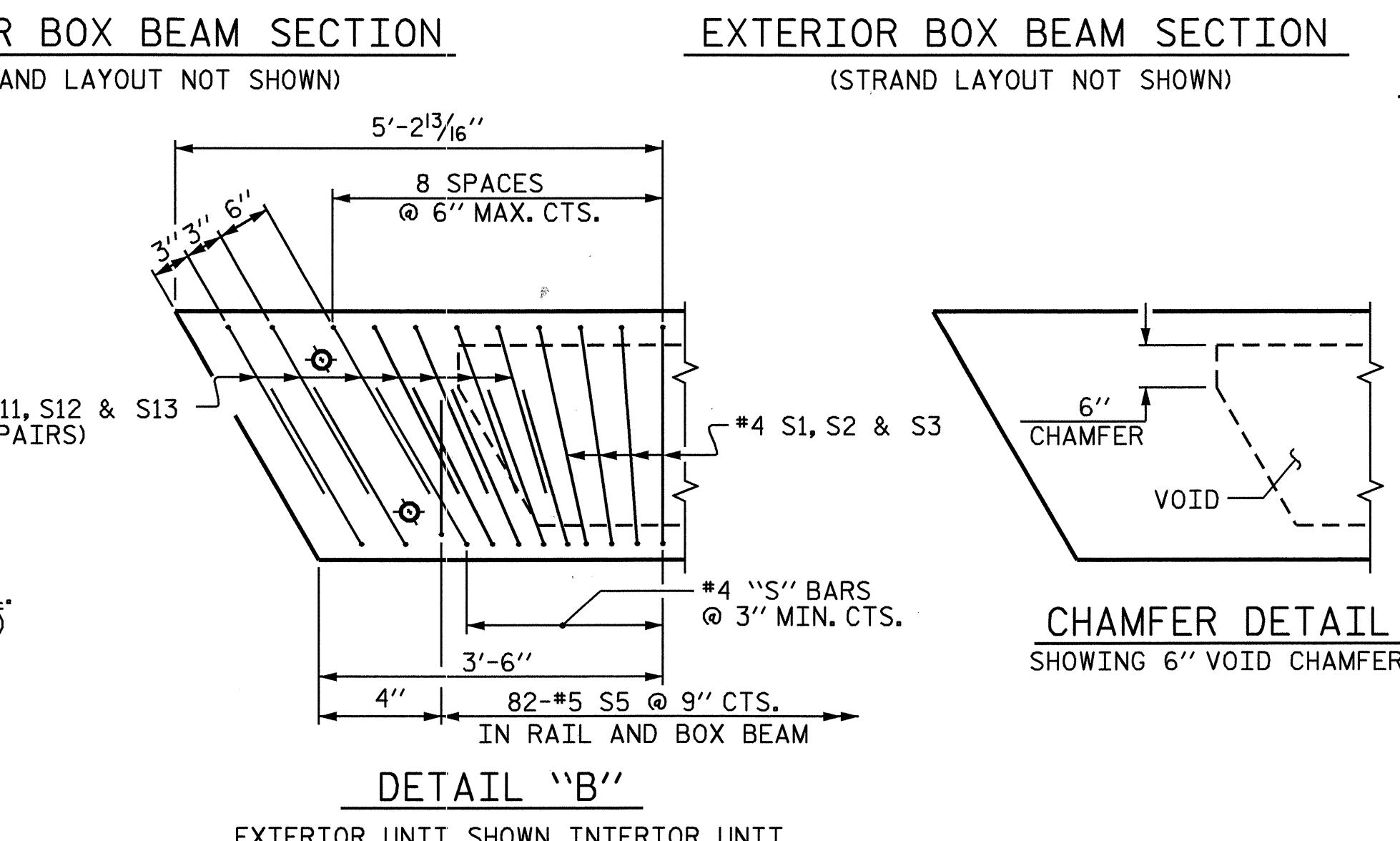
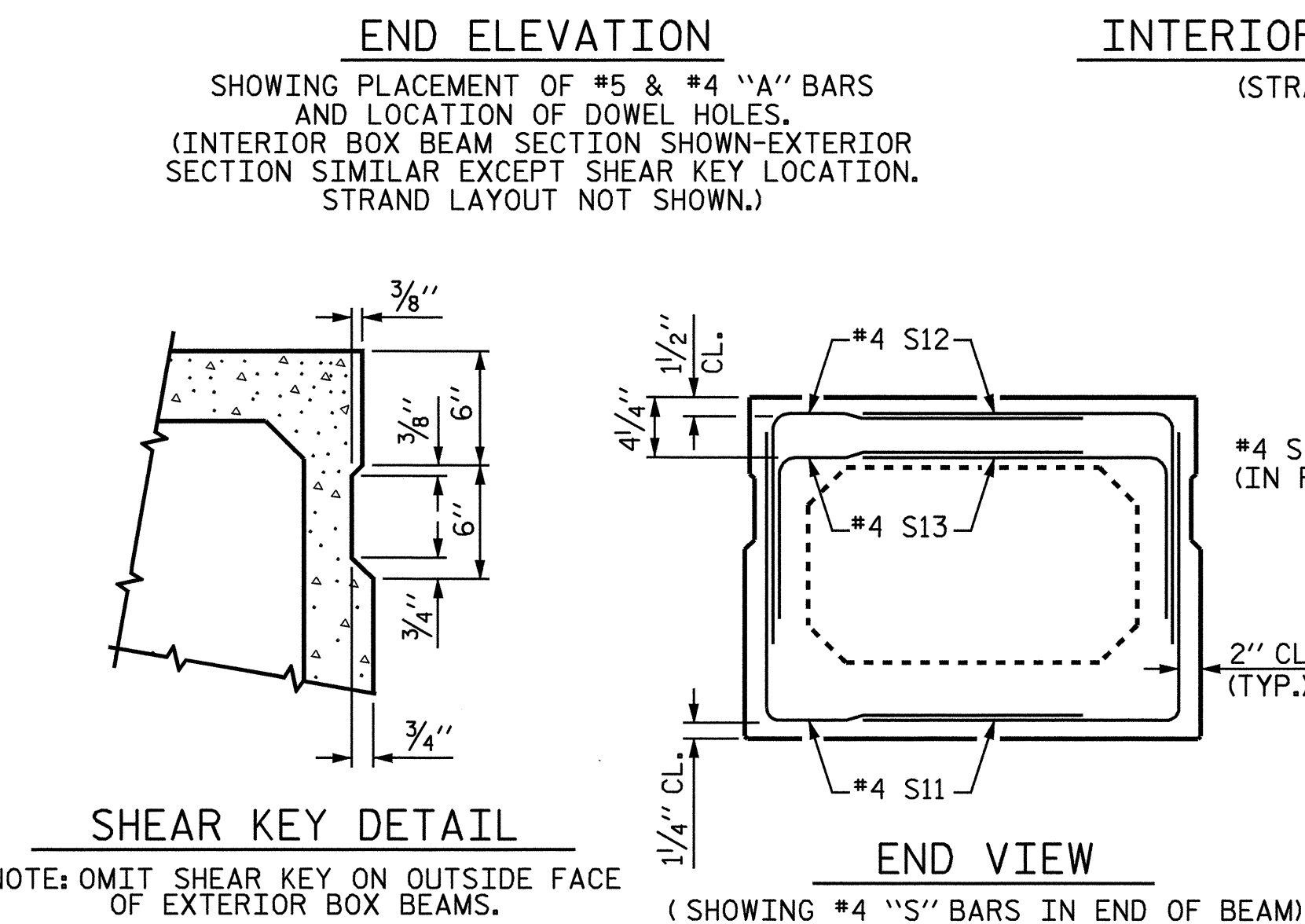
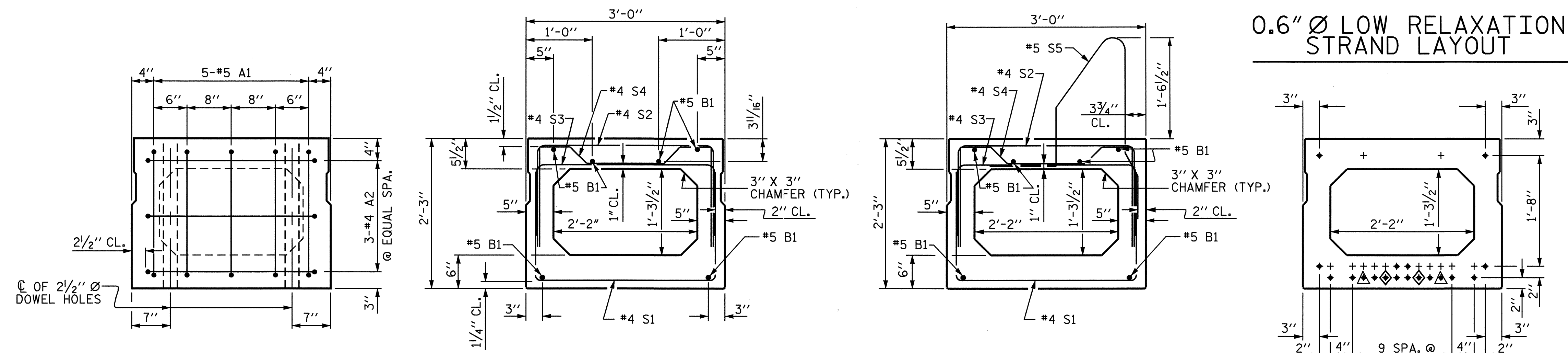
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

PLAN OF SPAN A



DRAWN BY: M. POOLE DATE: 10/07  
CHECKED BY: D. HODGE DATE: 03-08

| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | 3-5          |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |
| 2         |     |       | 4   |     |       | 17           |

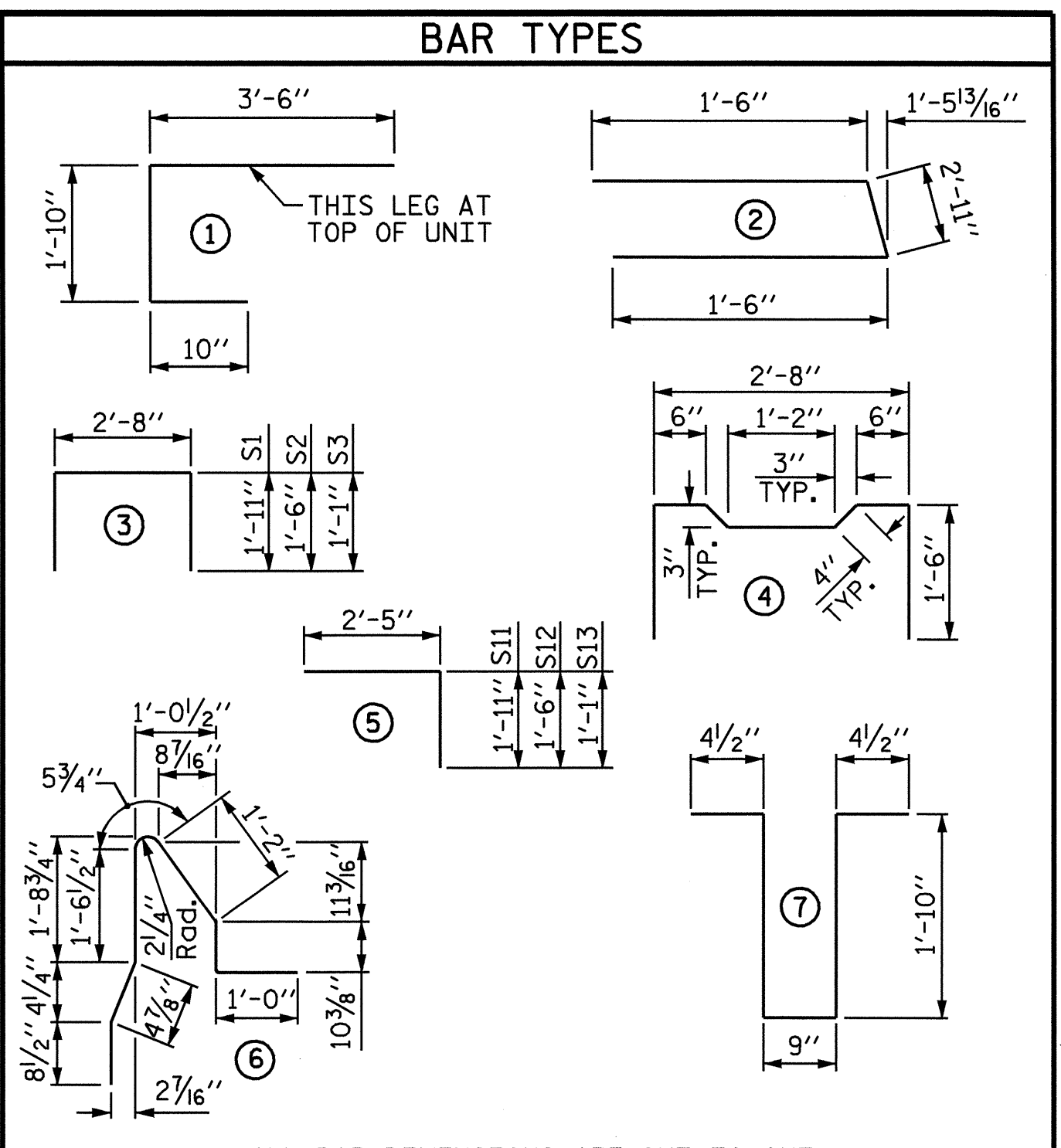


**DEBONDING LEGEND**

- FULLY BONDED STRANDS
- ▲ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ◆ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER

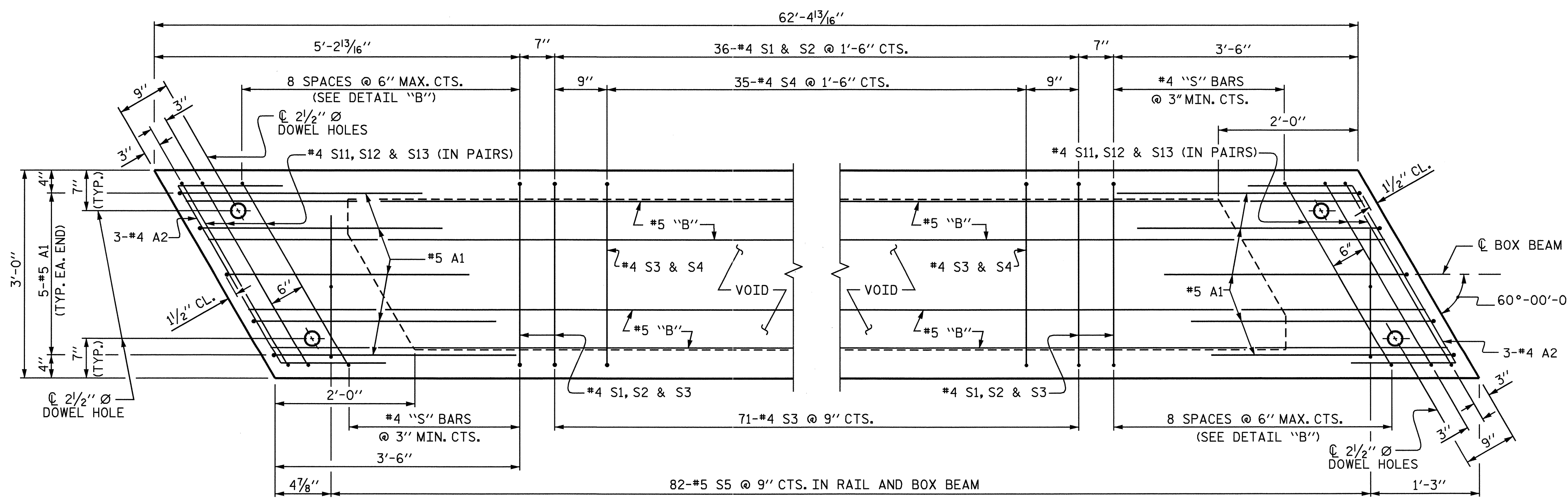
**GRADE 270 STRANDS**

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



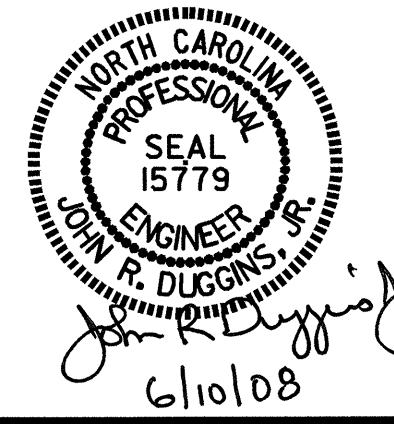
**BILL OF MATERIAL FOR ONE BOX BEAM SECTION**

| BAR NUMBER                  | SIZE | TYPE   | EXTERIOR UNIT |               | INTERIOR UNIT |               |
|-----------------------------|------|--------|---------------|---------------|---------------|---------------|
|                             |      |        | LENGTH        | WEIGHT        | LENGTH        | WEIGHT        |
| A1                          | 10   | #5     | 6'-2"         | 64            | 6'-2"         | 64            |
| A2                          | 22   | #4     | 5'-11"        | 87            | 5'-11"        | 87            |
| B1                          | 12   | #5 STR | 32'-3"        | 404           | 32'-3"        | 404           |
| K1                          | 12   | #4     | 5'-2"         | 41            | 5'-2"         | 41            |
| K2                          | 8    | #4 STR | 2'-11"        | 16            | 2'-11"        | 16            |
| S1                          | 44   | #4     | 6'-6"         | 191           | 6'-6"         | 191           |
| S2                          | 44   | #4     | 5'-8"         | 167           | 5'-8"         | 167           |
| S3                          | 79   | #4     | 4'-10"        | 255           | 4'-10"        | 255           |
| S4                          | 35   | #4     | 5'-10"        | 136           | 5'-10"        | 136           |
| S11                         | 28   | #4     | 4'-4"         | 81            | 4'-4"         | 81            |
| S12                         | 28   | #4     | 3'-11"        | 73            | 3'-11"        | 73            |
| S13                         | 28   | #4     | 3'-6"         | 65            | 3'-6"         | 65            |
| * S5                        | 82   | #5     | 6'-2"         | 527           | --            | --            |
| REINFORCING STEEL           |      |        |               | 1580 LBS.     |               | 1580 LBS.     |
| * EPOXY COATED REINF. STEEL |      |        |               | 527 LBS.      |               |               |
| 5000 P.S.I. CONCRETE        |      |        |               | 10.1 CU. YDS. |               | 10.1 CU. YDS. |
| 0.6" Ø L.R. STRANDS         |      |        |               | No. 18        |               | No. 18        |



ASSEMBLED BY : M. POOLE DATE : 10-07  
 CHECKED BY : D. HODGE DATE : 03-08  
 DRAWN BY : TLA 5/05  
 CHECKED BY : GM 6/05

DATE : 7/11/05  
 REV. 5/1/06  
 TLA/GM

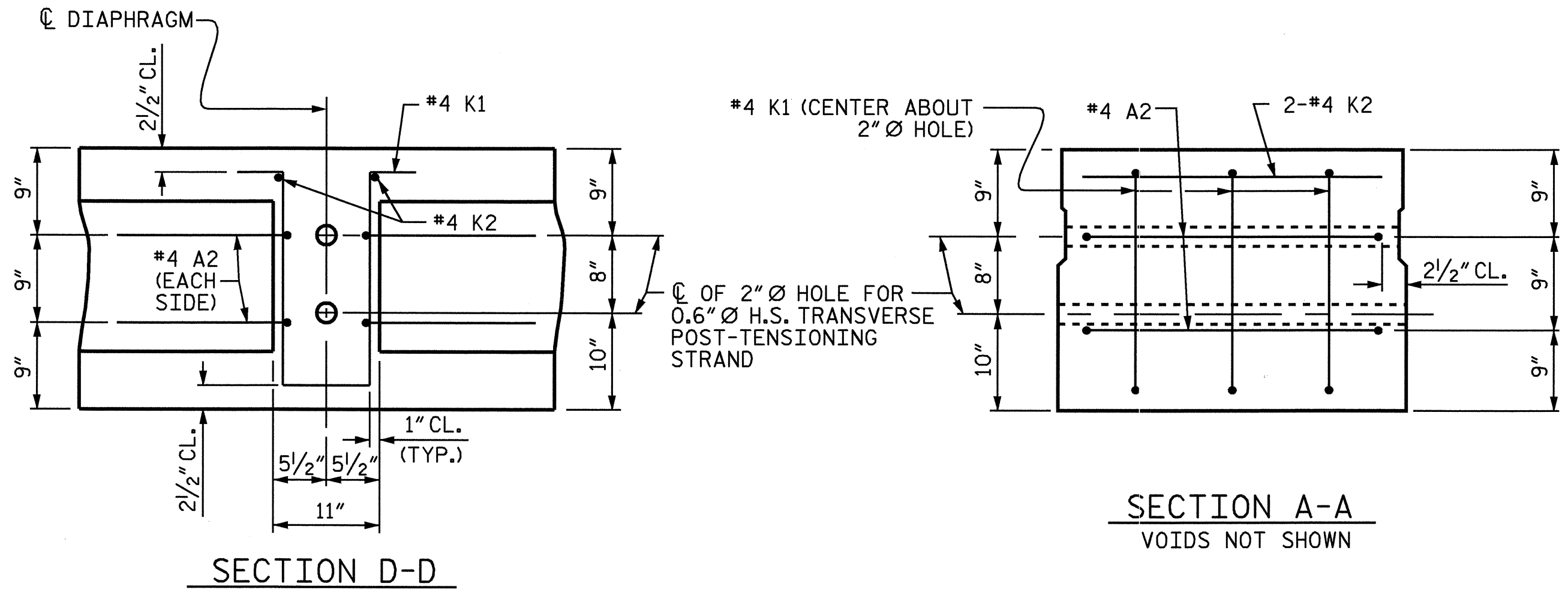
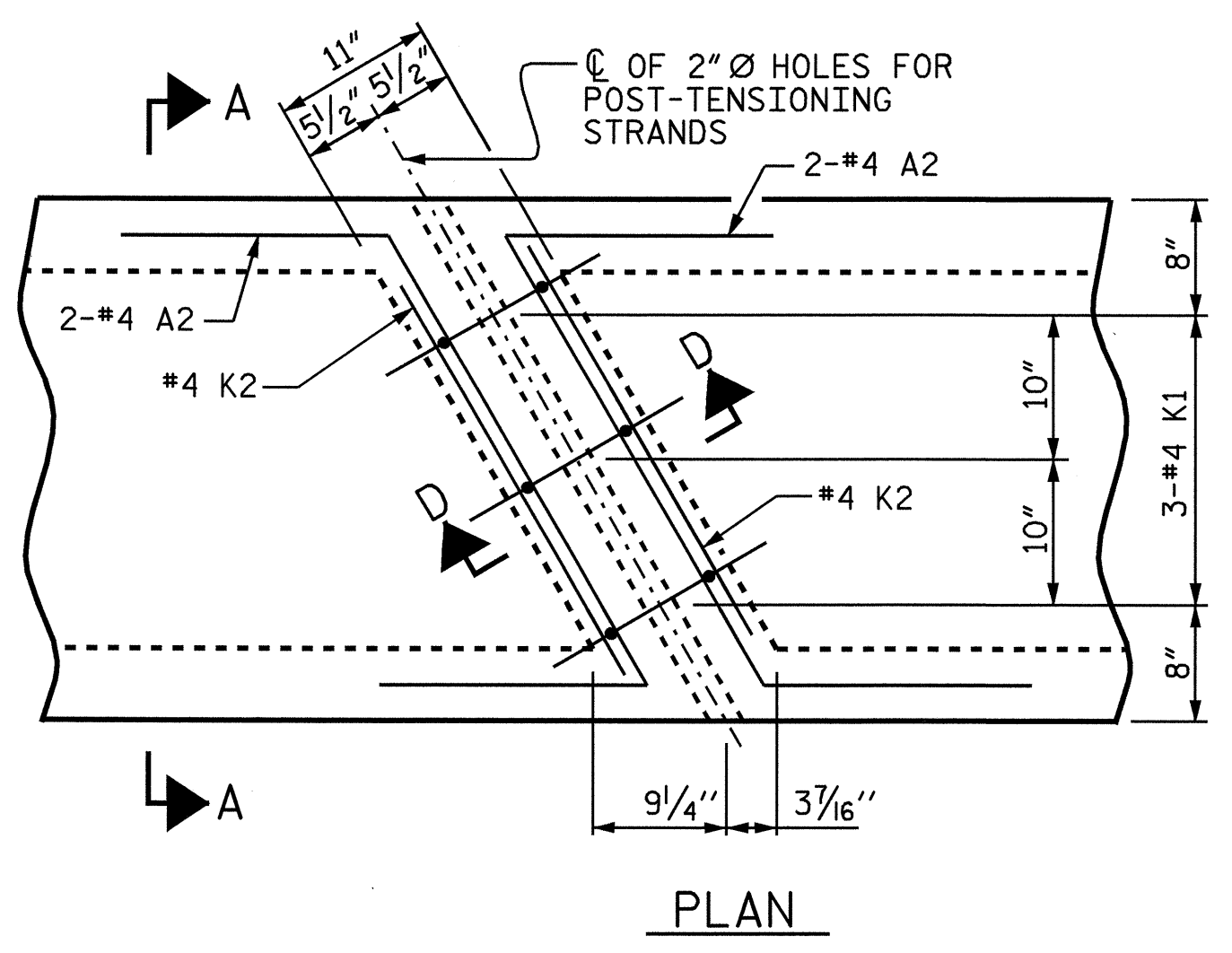


PROJECT NO. B-4193  
 McDOWELL COUNTY  
 STATION: 12+25.50 -L-  
 SHEET 3 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

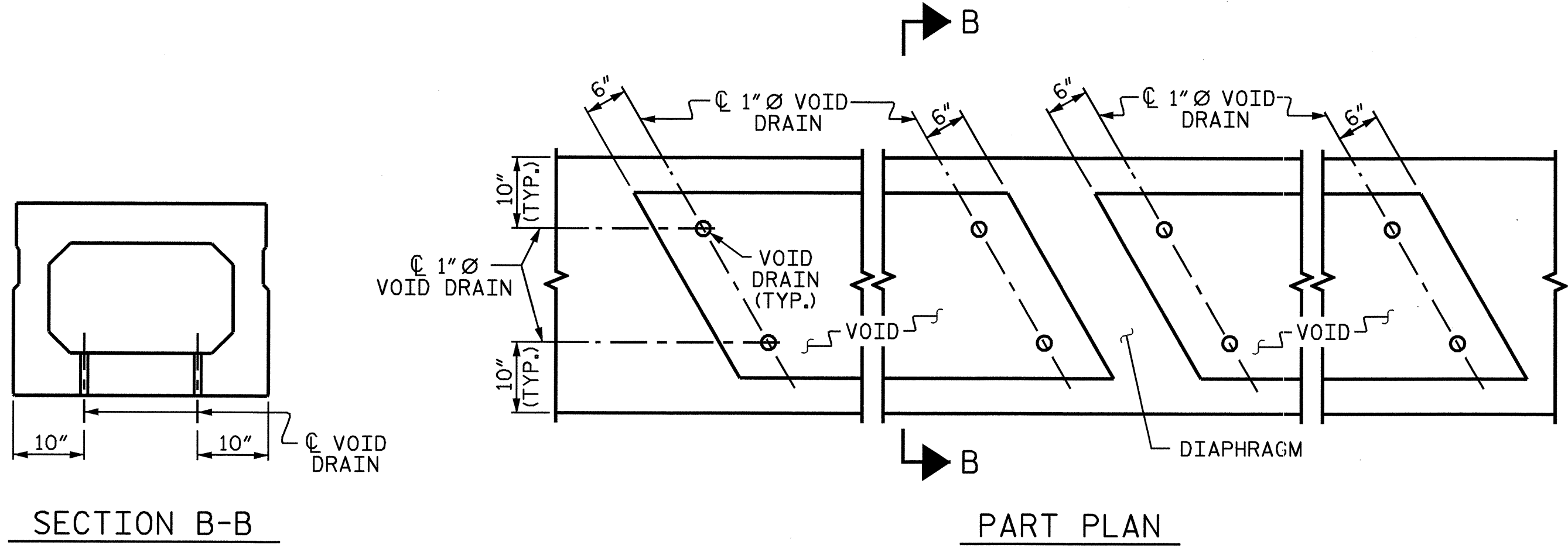
**3'-0" X 2'-3" PRESTRESSED CONCRETE BOX BEAM UNIT SPAN A**

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

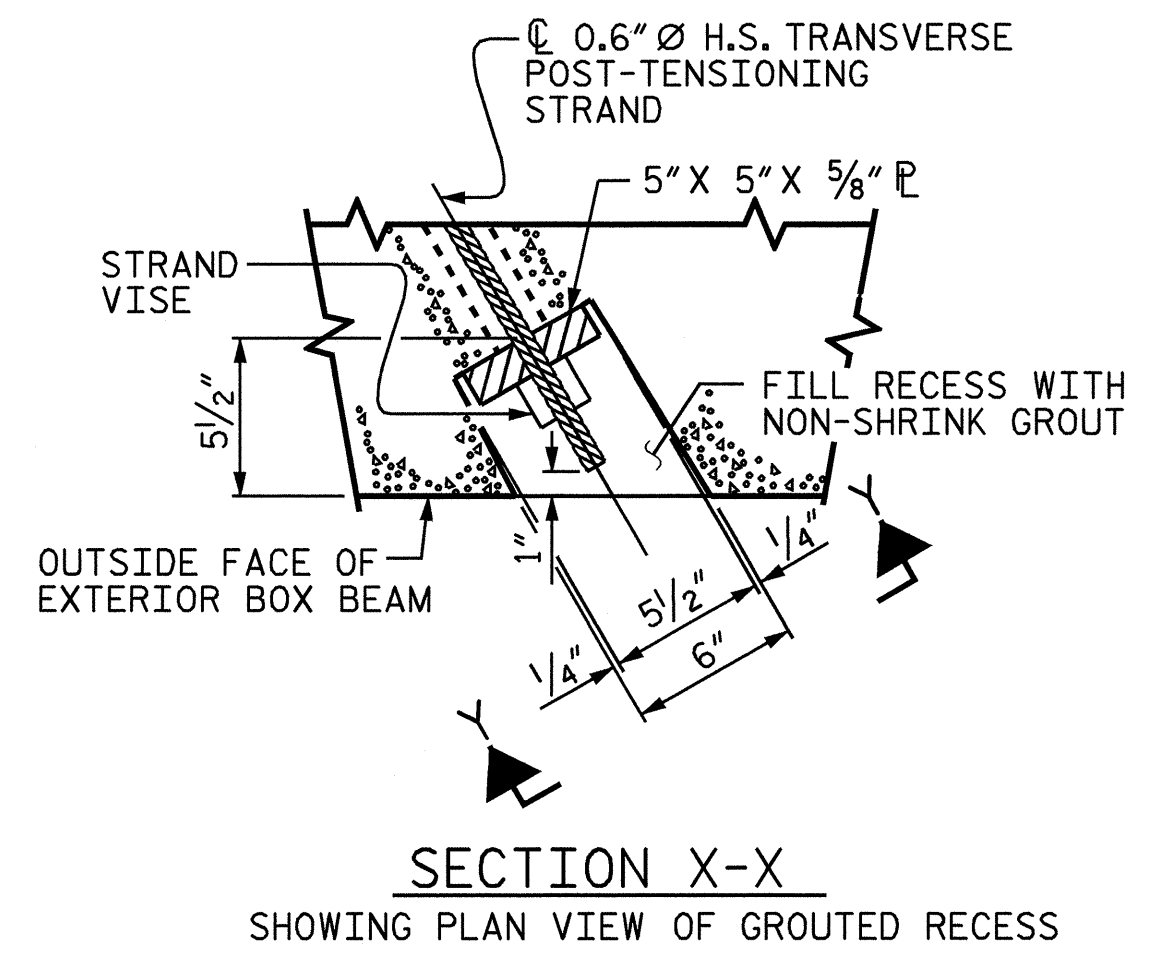
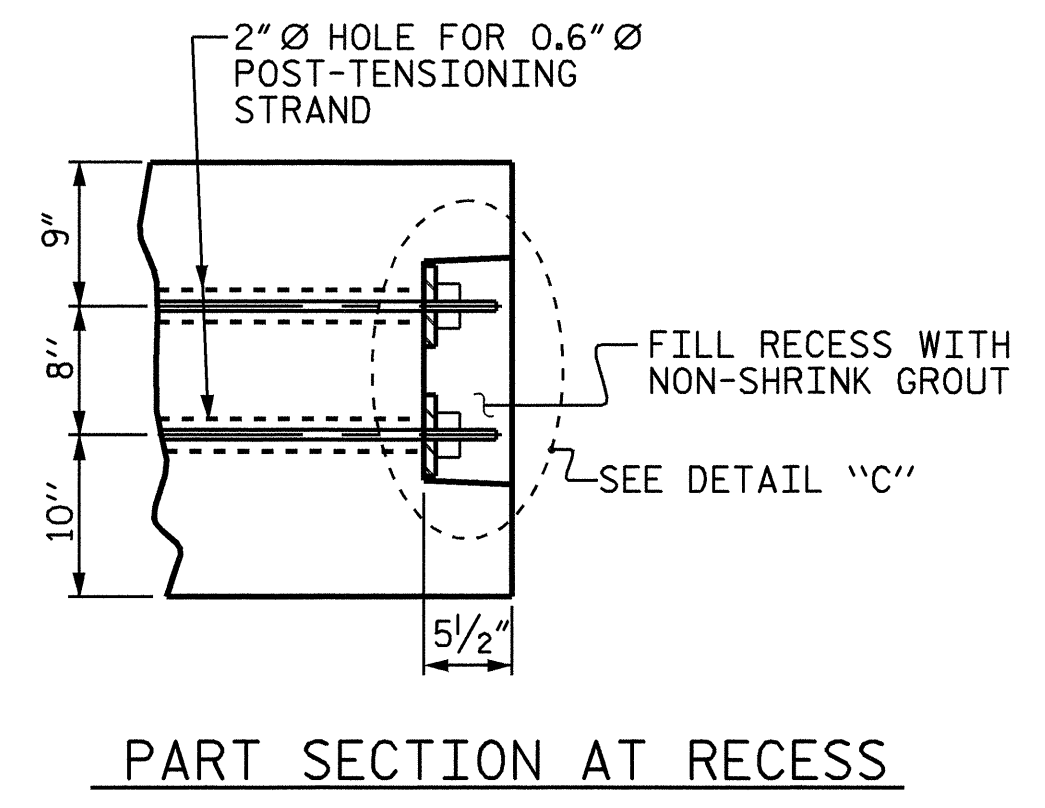
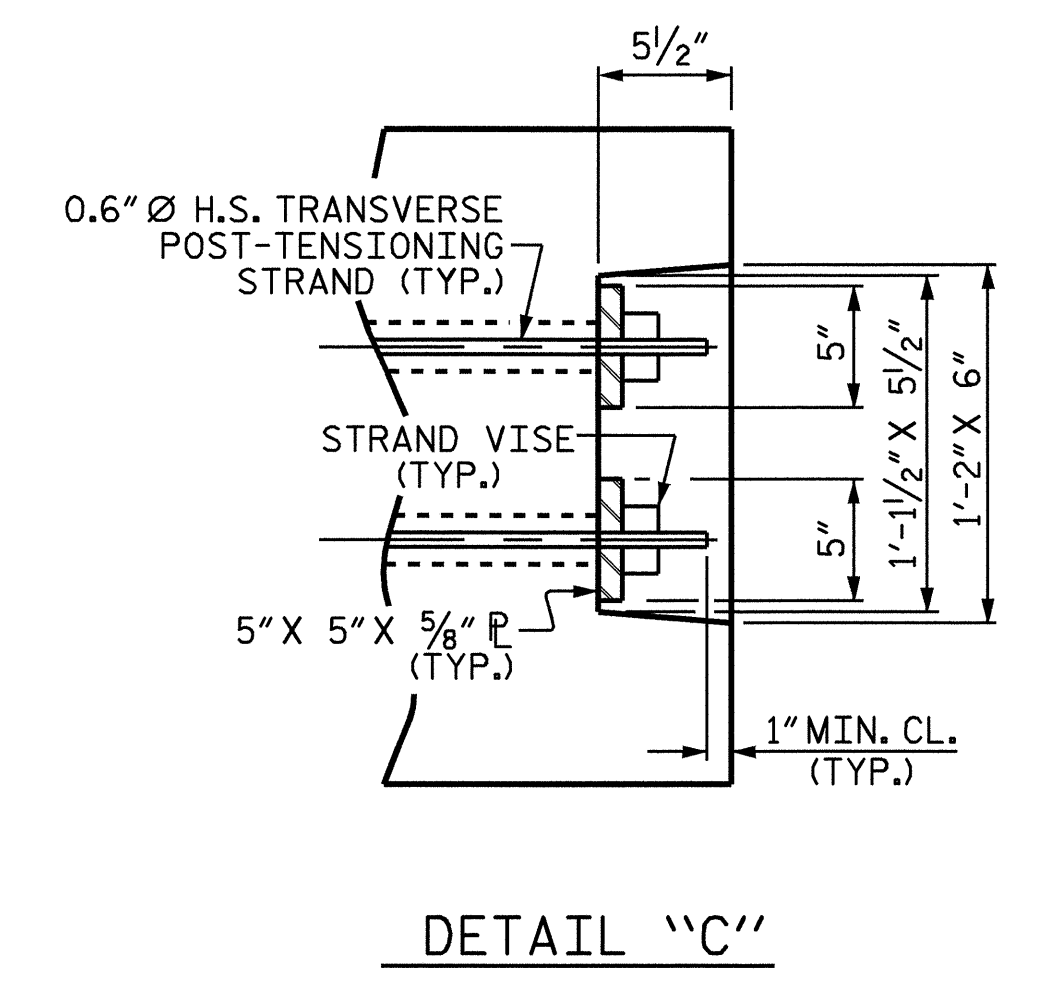
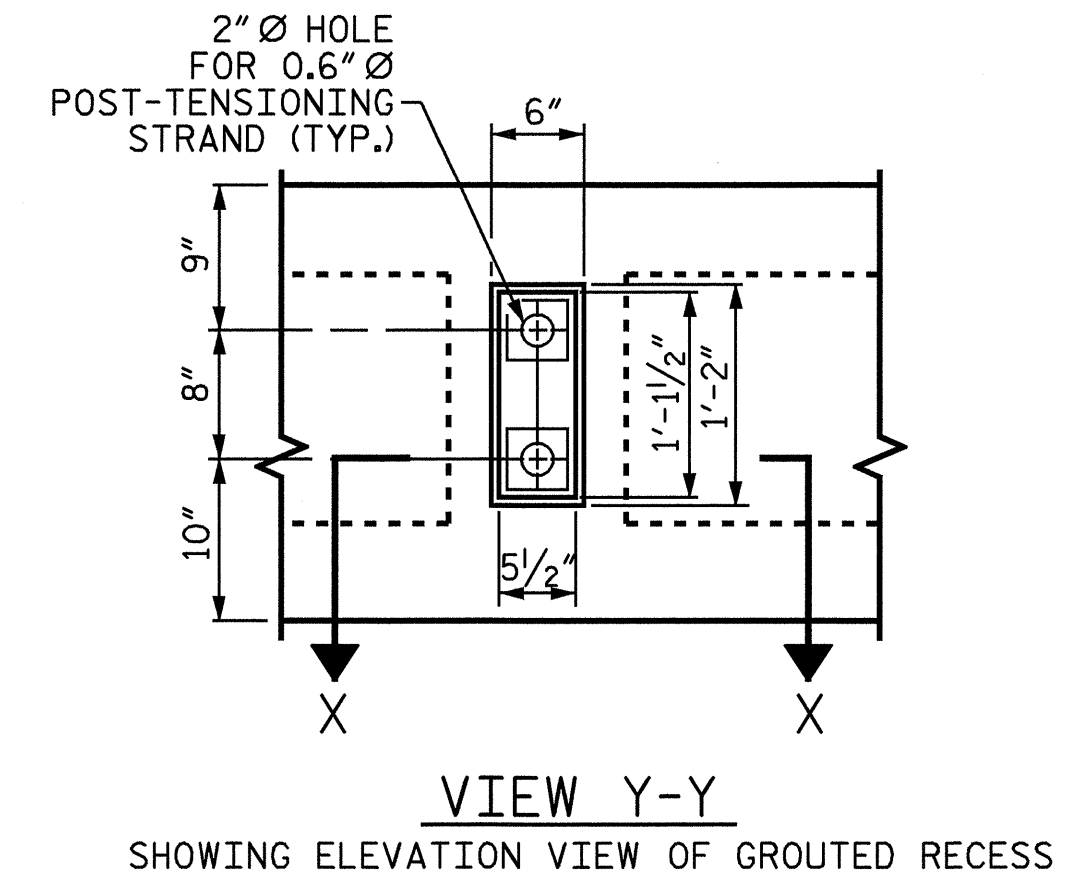


**DOUBLE DIAPHRAGM DETAILS**

#4 "S" BARS NOT SHOWN. #4 "S" BARS MAY BE SHIFTED SLIGHTLY TO CLEAR 2" Ø HOLE.



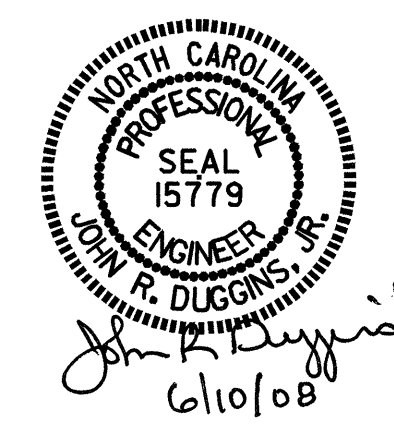
**VOID DRAIN DETAILS**  
(DIMENSIONS SHOWN ARE TYPICAL FOR EACH VOID)



**GROUDED RECESS DETAIL AT  
END OF POST-TENSIONED STRANDS  
OF EXTERIOR BOX BEAM**

PROJECT NO. B-4193  
McDOWELL COUNTY  
STATION: 12+25.50 -L-  
SHEET 4 OF 5

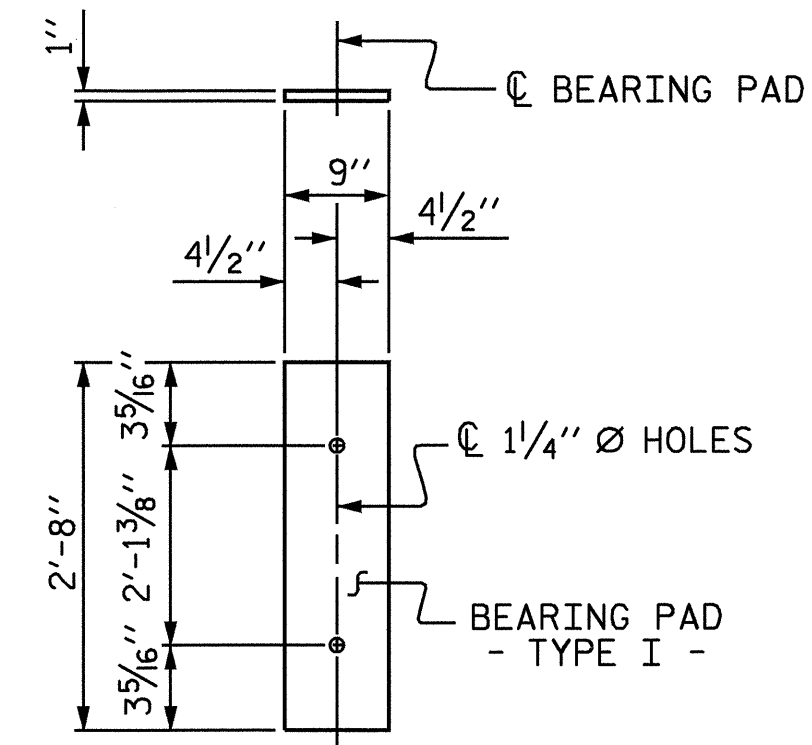
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
3'-0" X 2'-3"  
PRESTRESSED CONCRETE  
BOX BEAM UNIT



|                         |                    |
|-------------------------|--------------------|
| ASSEMBLED BY : M. POOLE | DATE : 10/07       |
| CHECKED BY : D. HODGE   | DATE : 03-08       |
| DRAWN BY : TLA 5/05     | ADDED 7/11/05      |
| CHECKED BY : GM 6/05    | REV. 5/1/06 TLA/GM |

| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | 5-7          |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |
| 2         |     |       | 4   |     |       | 17           |



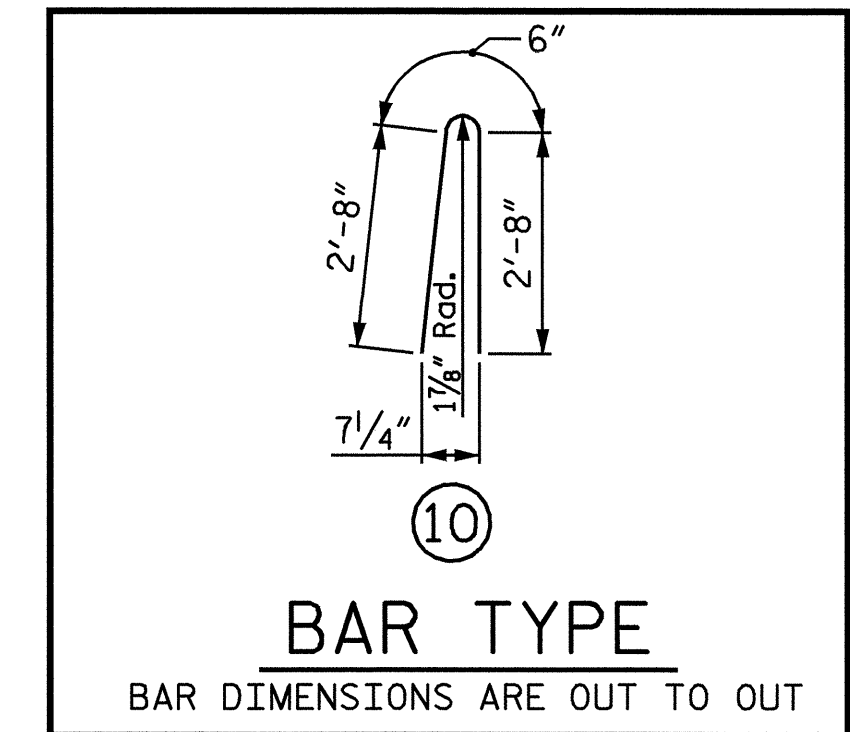


**FIXED END**  
(TYPE I - 20 REQ'D)  
**ELASTOMERIC BEARING DETAILS**

| DEAD LOAD DEFLECTION AND CAMBER            |                    |
|--|--------------------|
|  | 3'-0" x 2'-3"      |
|  | 0.6" Ø L.R. STRAND |
| CAMBER (BEAM ALONE IN PLACE) ↑             | 2 9/16"            |
| DEFLECTION DUE TO SUPERIMP. DEAD LOAD ** ↓ | 7/16"              |
| FINAL CAMBER ↑                             | 2 1/8"             |

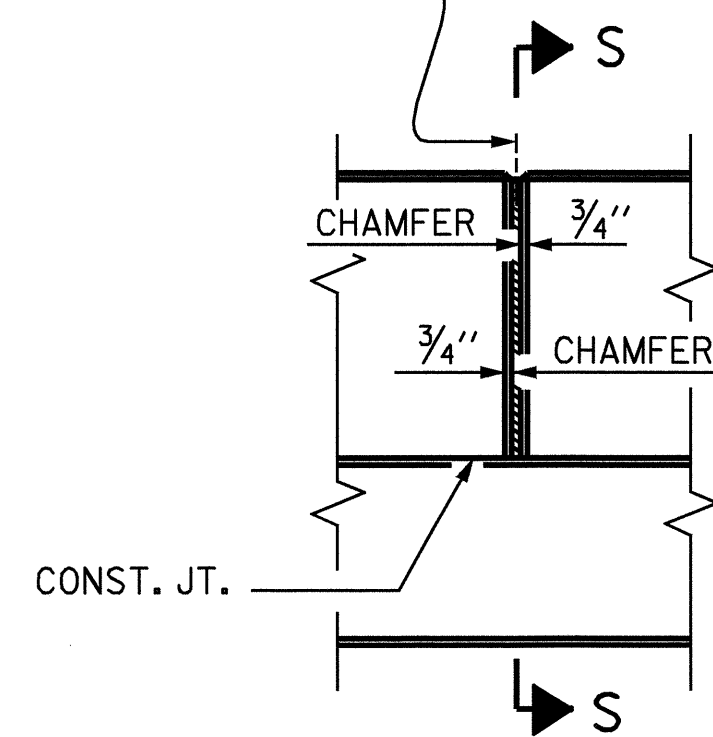
\*\* INCLUDES FUTURE WEARING SURFACE

| BOX BEAM UNITS REQUIRED |        |              |              |
|-------------------------|--------|--------------|--------------|
|                         | NUMBER | LENGTH       | TOTAL LENGTH |
| EXTERIOR B.B.           | 2      | 62'-4 13/16" | 124'-9 5/8"  |
| INTERIOR B.B.           | 8      | 62'-4 13/16" | 499'-2 1/2"  |
| TOTAL                   | 10     | 62'-4 13/16" | 624'-0 1/8"  |

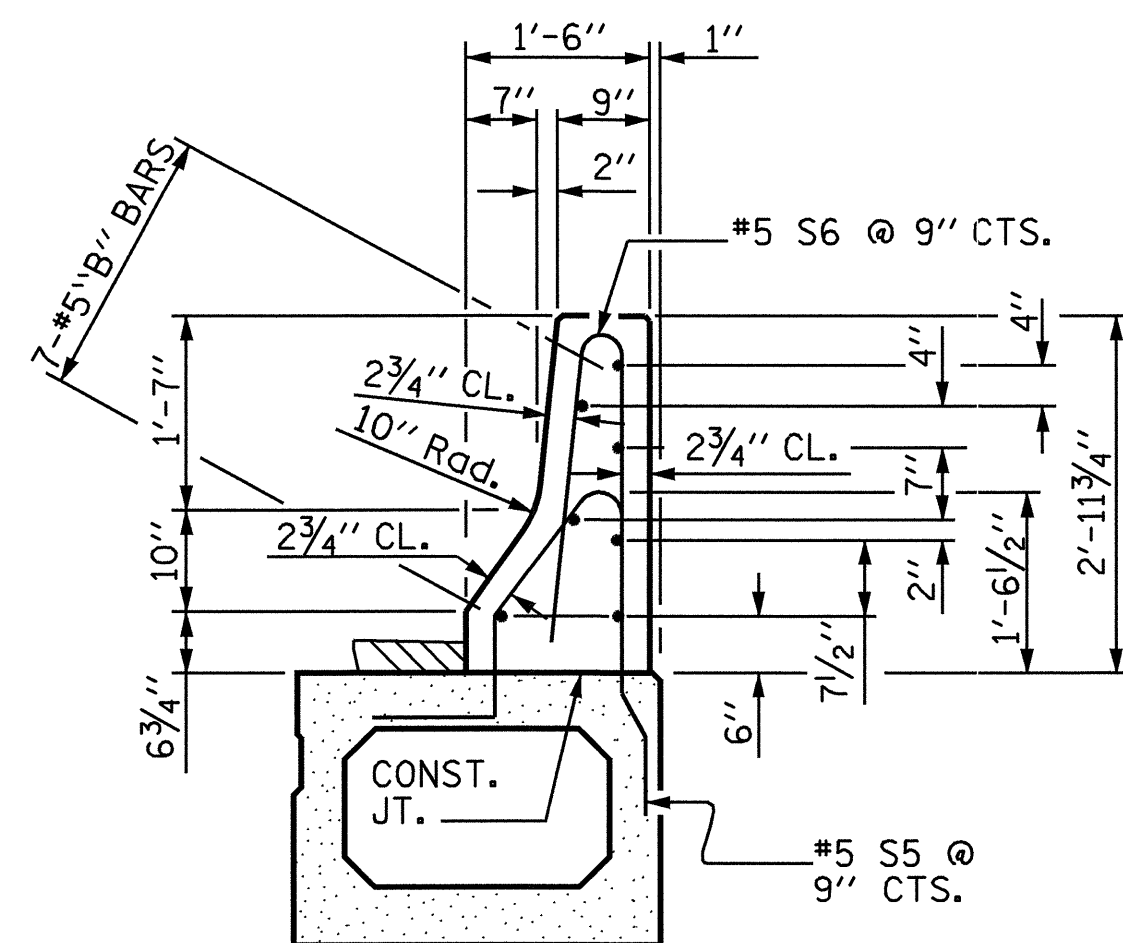


| BILL OF MATERIAL FOR CONCRETE BARRIER RAIL    |     |      |      |        |        |
|---|-----|------|------|--------|--------|
| BAR   | NO. | SIZE | TYPE | LENGTH | WEIGHT |
| *B2   | 56  | #5   | STR  | 12'-1" | 706    |
| *B3   | 14  | #5   | STR  | 20'-4" | 297    |
| *S6   | 164 | #5   | 10   | 5'-10" | 998    |
| * EPOXY COATED REINFORCING STEEL LBS. 2001    |     |      |      |        |        |
| CLASS AA CONCRETE CU.YDS. 14.7                |     |      |      |        |        |
| TOTAL LIN. FT. OF CONCRETE BARRIER RAIL 124.8 |     |      |      |        |        |

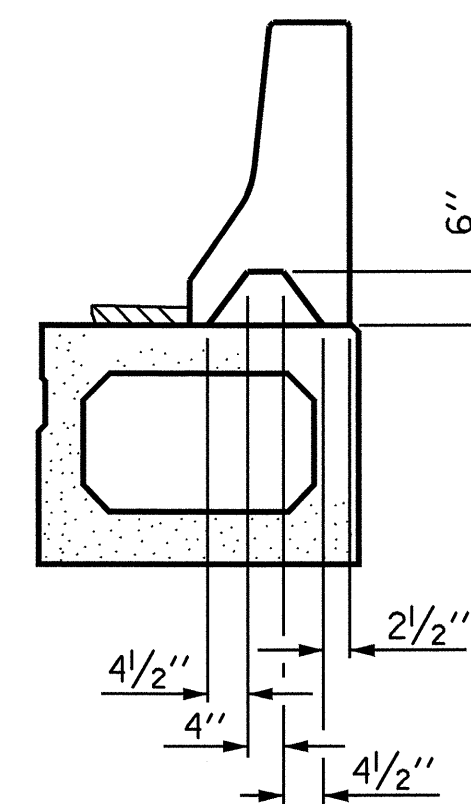
1/2" EXP. JT. MAT'L HELD IN PLACE WITH GALVANIZED NAILS. (NOTE: OMIT EXP. JT. MAT'L WHEN SLIP FORM IS USED)



**ELEVATION AT EXPANSION JOINTS**



**SECTION THRU RAIL**



**SECTION S-S**

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

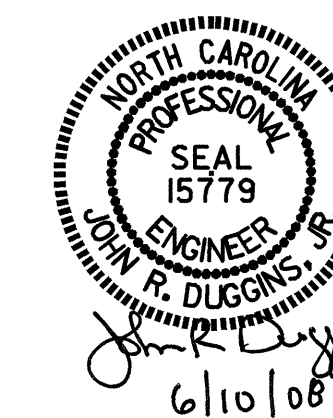
**BARRIER RAIL DETAILS**

PROJECT NO. B-4193  
McDOWELL COUNTY  
STATION: 12+25.50 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

3'-0" X 2'-3"  
PRESTRESSED CONCRETE  
BOX BEAM UNIT  
DETAILS



|                         |                    |
|-------------------------|--------------------|
| ASSEMBLED BY : M. POOLE | DATE : 10/07       |
| CHECKED BY : D. HODGE   | DATE : 03-08       |
| DRAWN BY : TLA 5/05     | ADDED 7/11/05R     |
| CHECKED BY : GM 6/05    | REV. 5/1/06 TLA/GM |

| REVISIONS |     |       |     |     |       | SHEET NO.       |
|-----------|-----|-------|-----|-----|-------|-----------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: |                 |
| 1         |     |       | 3   |     |       | S-8             |
| 2         |     |       | 4   |     |       | TOTAL SHEETS 17 |

NOTES

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

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

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 1/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

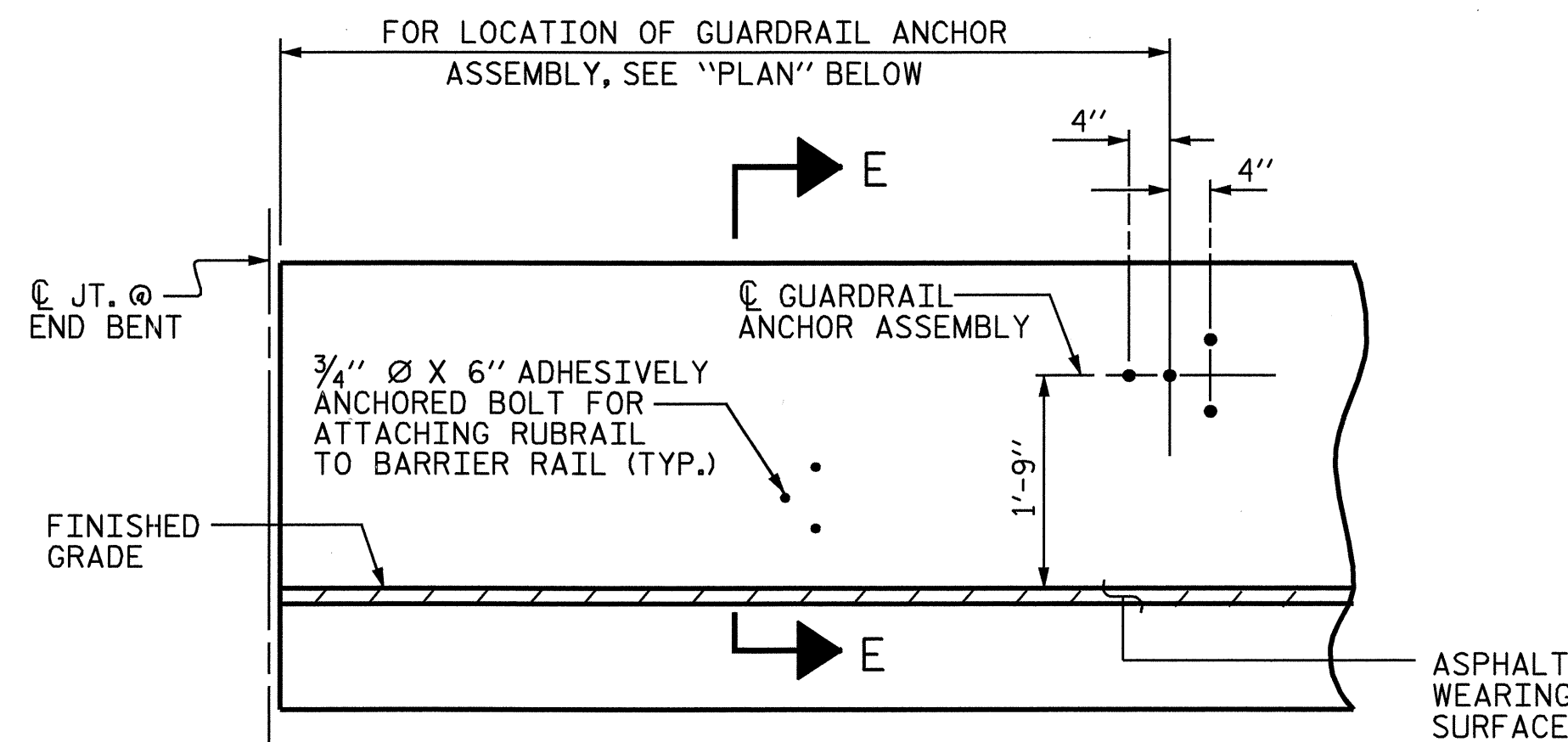
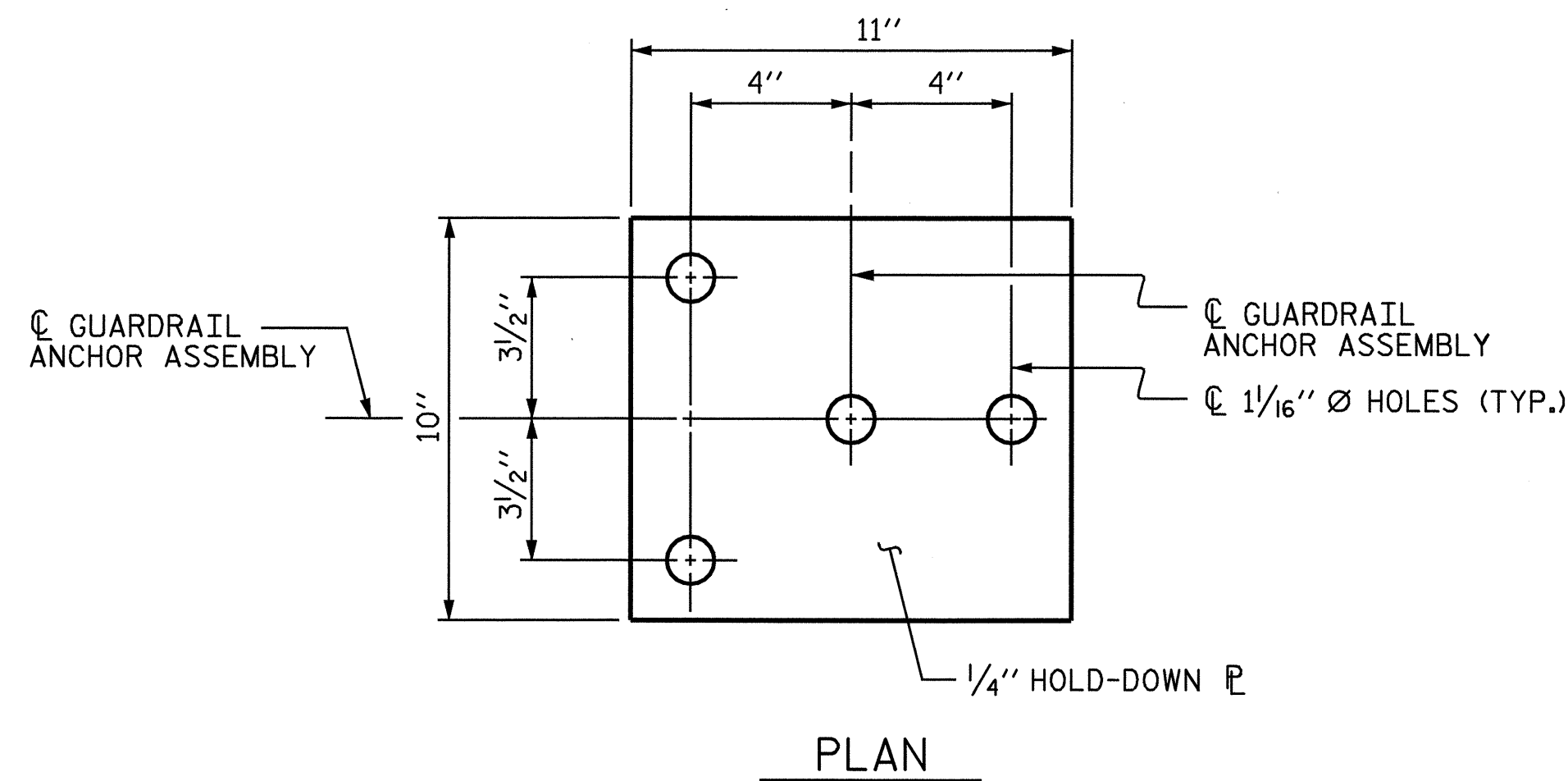
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

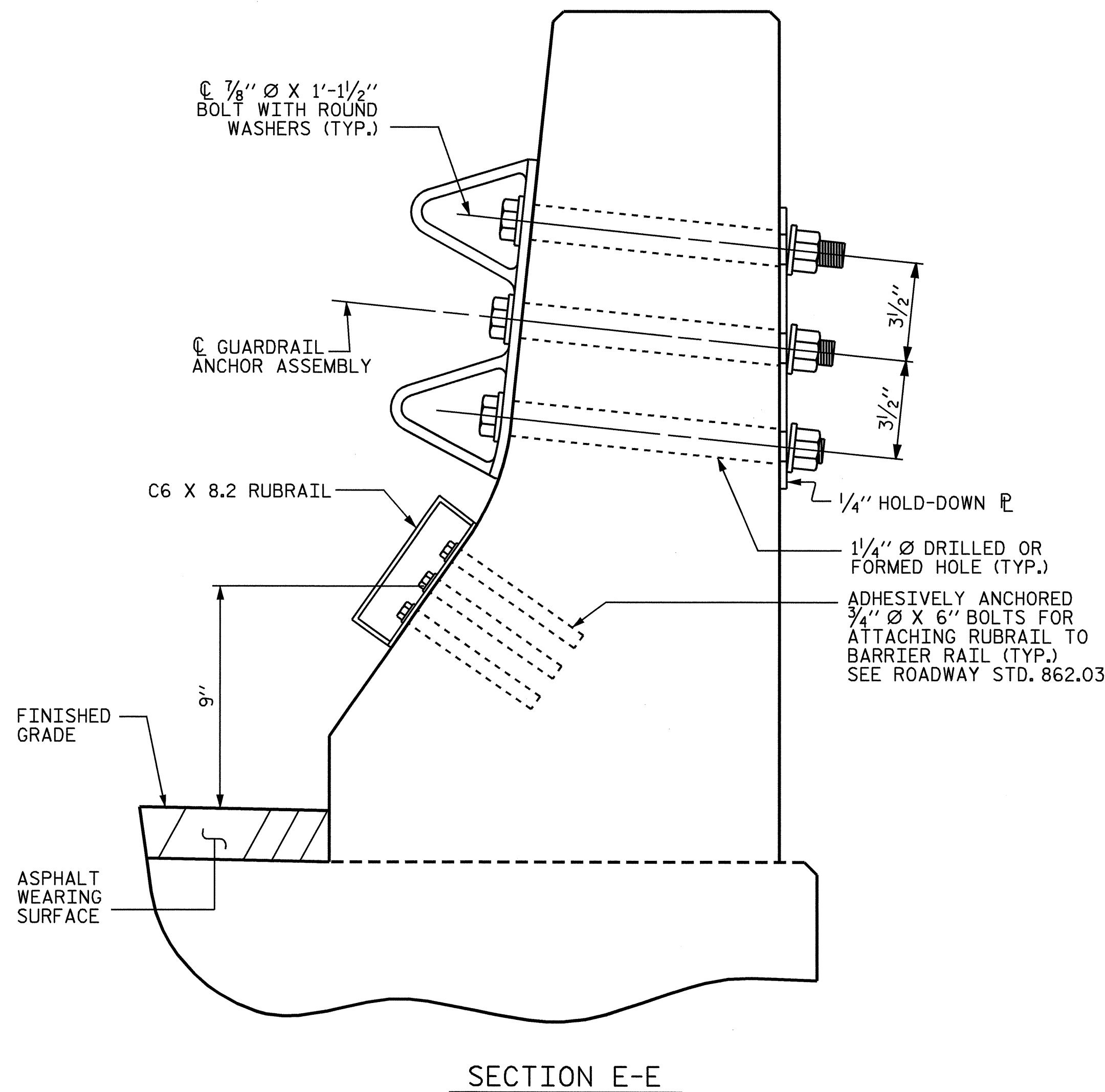
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

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

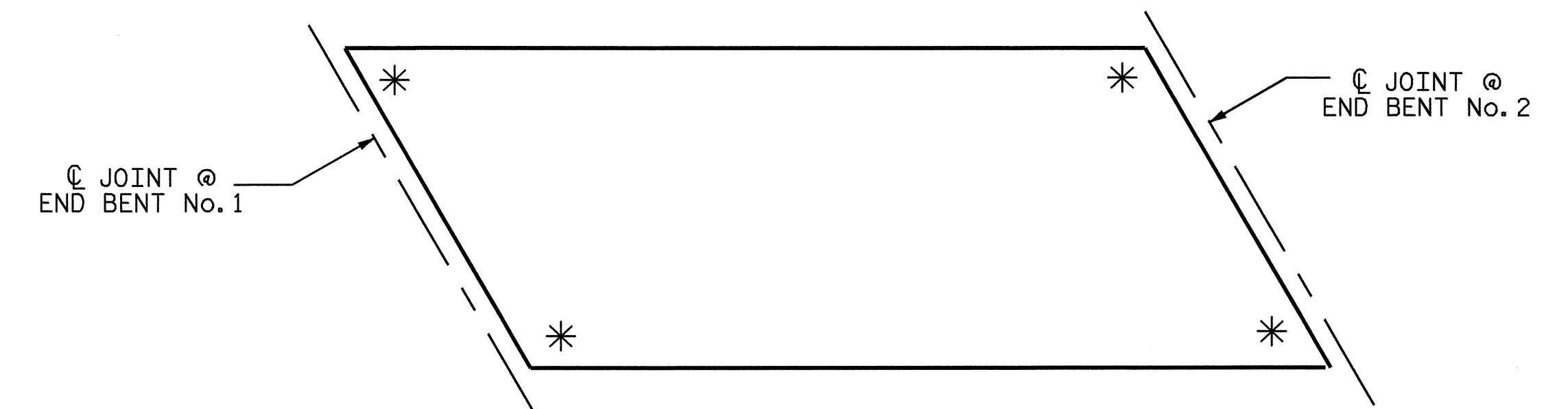
THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SPECIAL PROVISIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS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



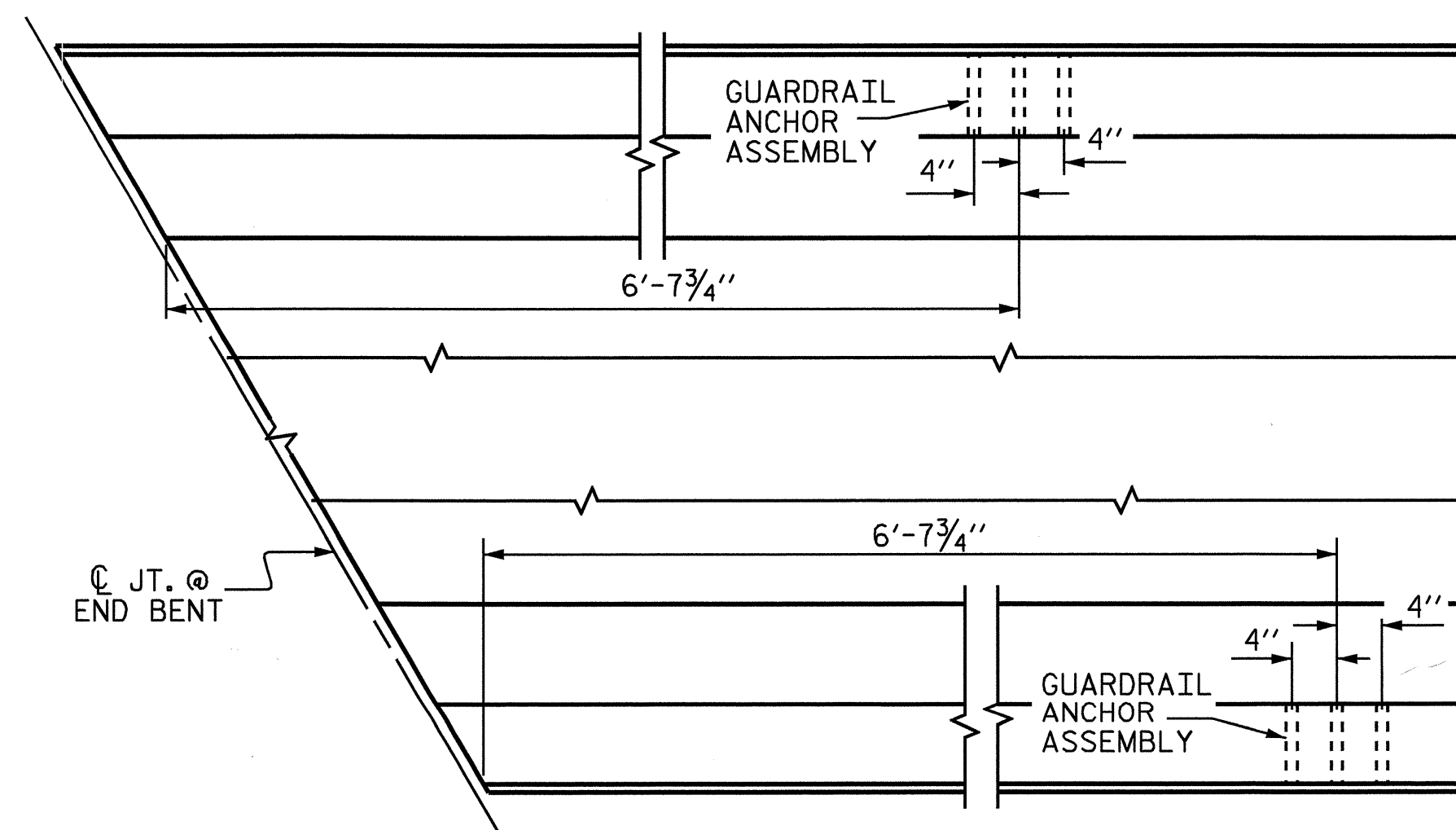
ELEVATION  
FOR LOCATION OF RUBRAIL, SEE ROADWAY STD. 862.03



SECTION E-E  
GUARDRAIL ANCHOR ASSEMBLY DETAILS



SKETCH SHOWING POINTS OF ATTACHMENTS  
\* DENOTES GUARDRAIL ANCHOR ASSEMBLY



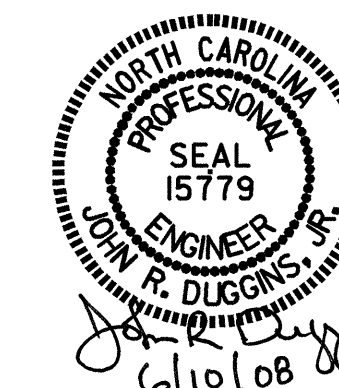
PLAN  
LOCATION OF ANCHORS FOR GUARDRAIL

END BENT #1 SHOWN, END BENT #2 SIMILAR.

PROJECT NO. B-4193  
McDOWELL COUNTY  
STATION: 12+25.50 -L-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

GUARDRAIL ANCHORAGE  
FOR BARRIER RAIL



|                         |                      |
|-------------------------|----------------------|
| ASSEMBLED BY : M. POOLE | DATE : 03-08         |
| CHECKED BY : D. HODGE   | DATE : 03-08         |
| DRAWN BY : TLA 5/06     | ADDED 5/1/06R KMM/GM |
| CHECKED BY : GM 5/06    |                      |

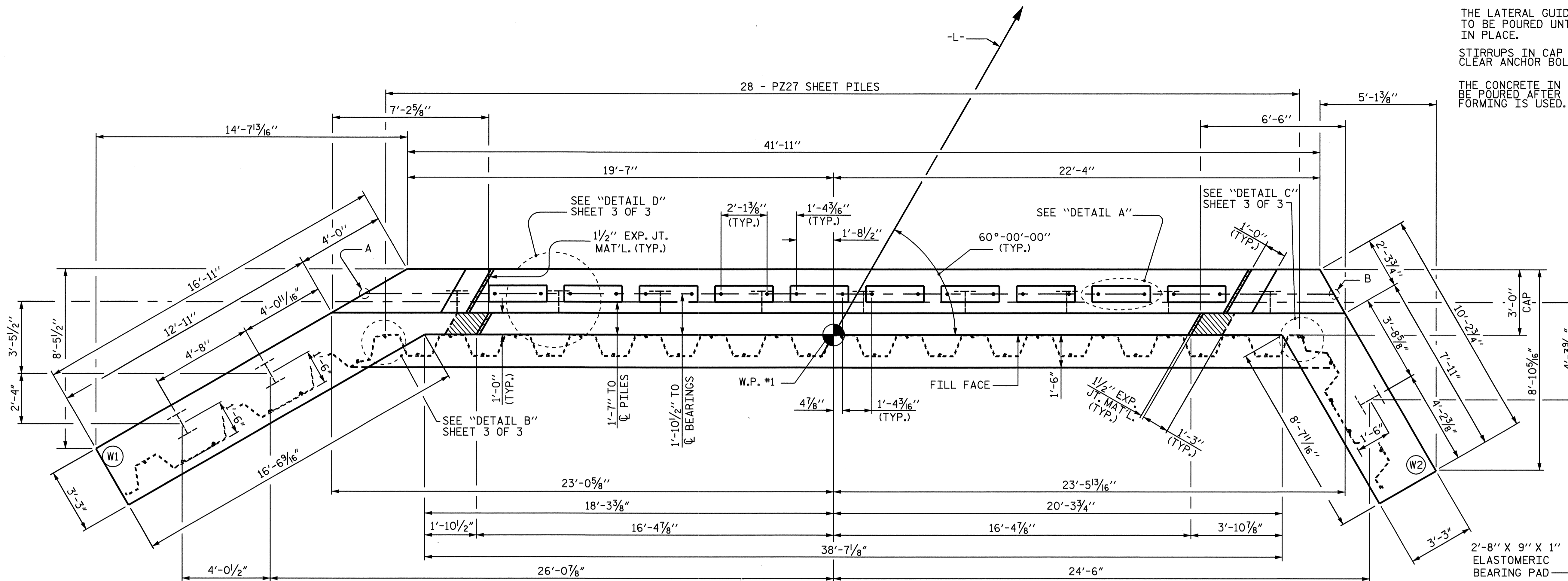
| REVISIONS |     |       |     |     |       | TOTAL SHEETS |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: |              |
| 1         |     |       | 3   |     |       | 17           |
| 2         |     |       | 4   |     |       | 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

NOTES

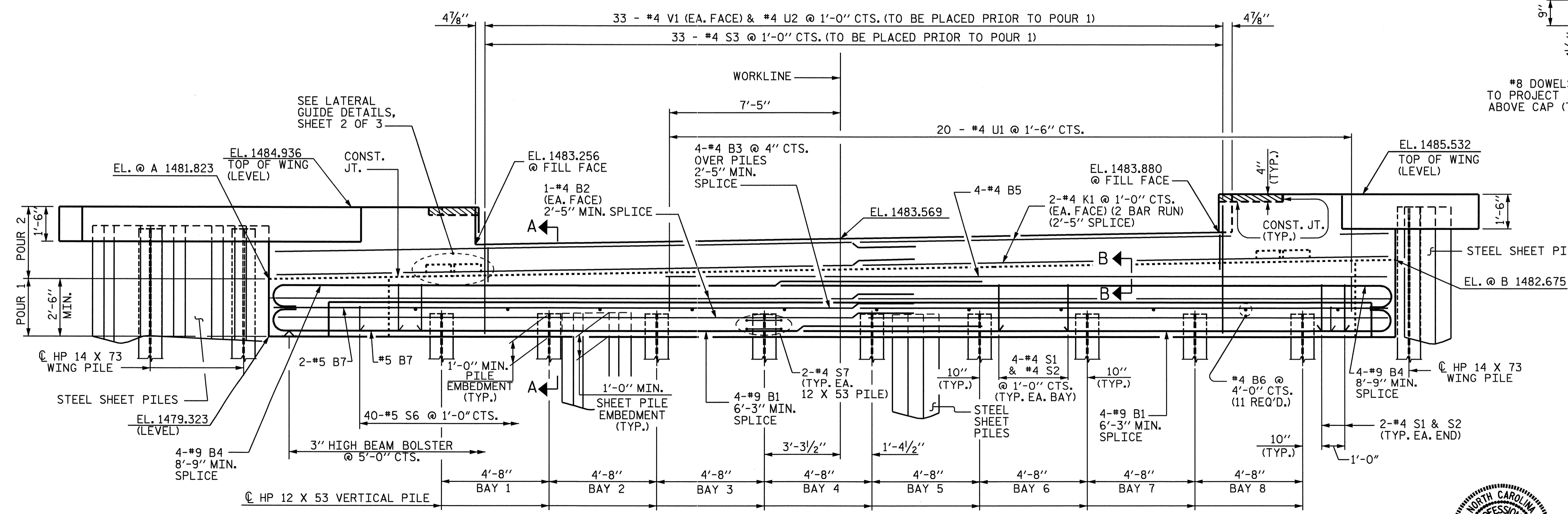
THE LATERAL GUIDE AT THE ENDS OF CAP ARE NOT TO BE POURED UNTIL AFTER BOX BEAM UNITS ARE IN PLACE.

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

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE BARRIER RAILS ARE CAST, IF SLIP FORMING IS USED.

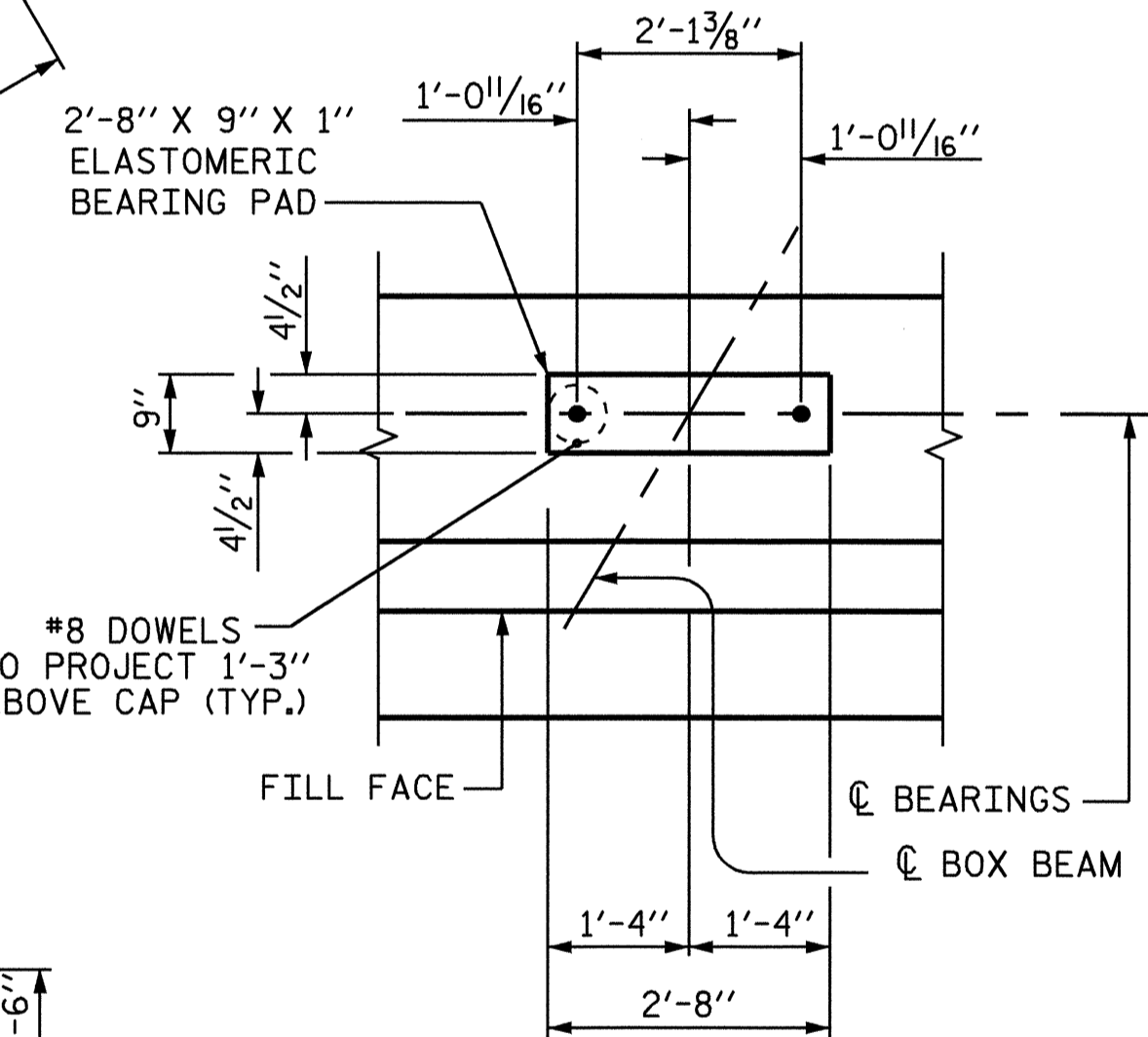


PLAN



ELEVATION

NOT ALL SHEET PILES SHOWN FOR CLARITY



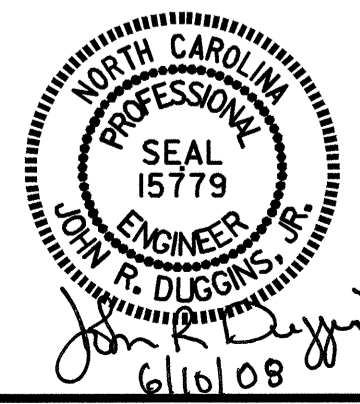
DETAIL A

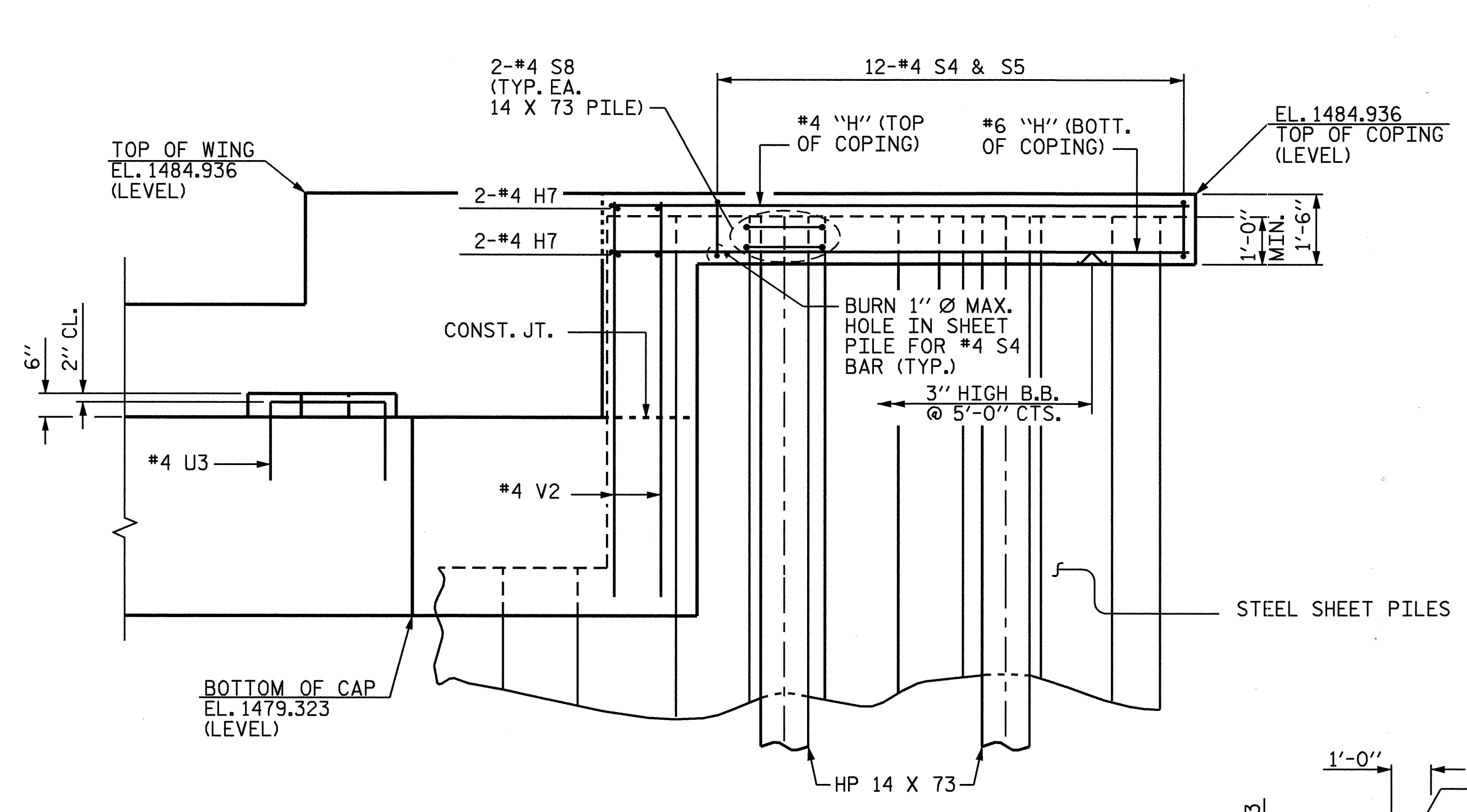
PROJECT NO. B-4193  
 McDOWELL COUNTY  
 STATION: 12+25.50 -L-

SHEET 1 OF 3

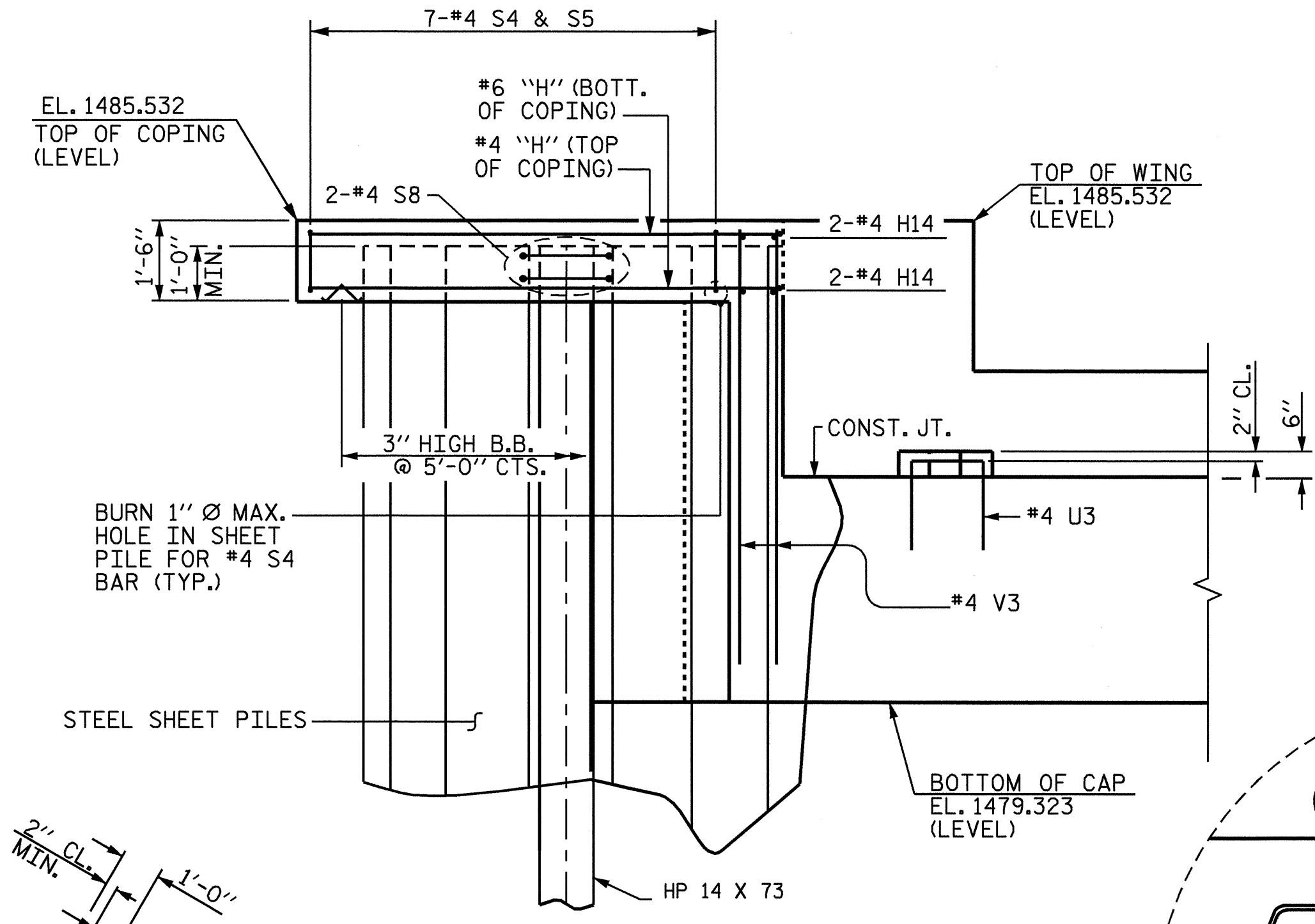
|  |     |       |     |     |                    |
|--|-----|-------|-----|-----|--------------------|
| STATE OF NORTH CAROLINA<br>DEPARTMENT OF TRANSPORTATION<br>RALEIGH |     |       |     |     |                    |
| SUBSTRUCTURE<br>END BENT No. 1                                     |     |       |     |     |                    |
| REVISIONS  |     |       |     |     |                    |
| NO.  | BY: | DATE: | NO. | BY: | DATE:              |
| 1  |     |       | 3   |     |                    |
| 2  |     |       | 4   |     |                    |
|  |     |       |     |     | SHEET NO.<br>S-10  |
|  |     |       |     |     | TOTAL SHEETS<br>17 |

DRAWN BY: M. POOLE DATE: 02-08  
 CHECKED BY: J. R. DUGGINS DATE: 02-08

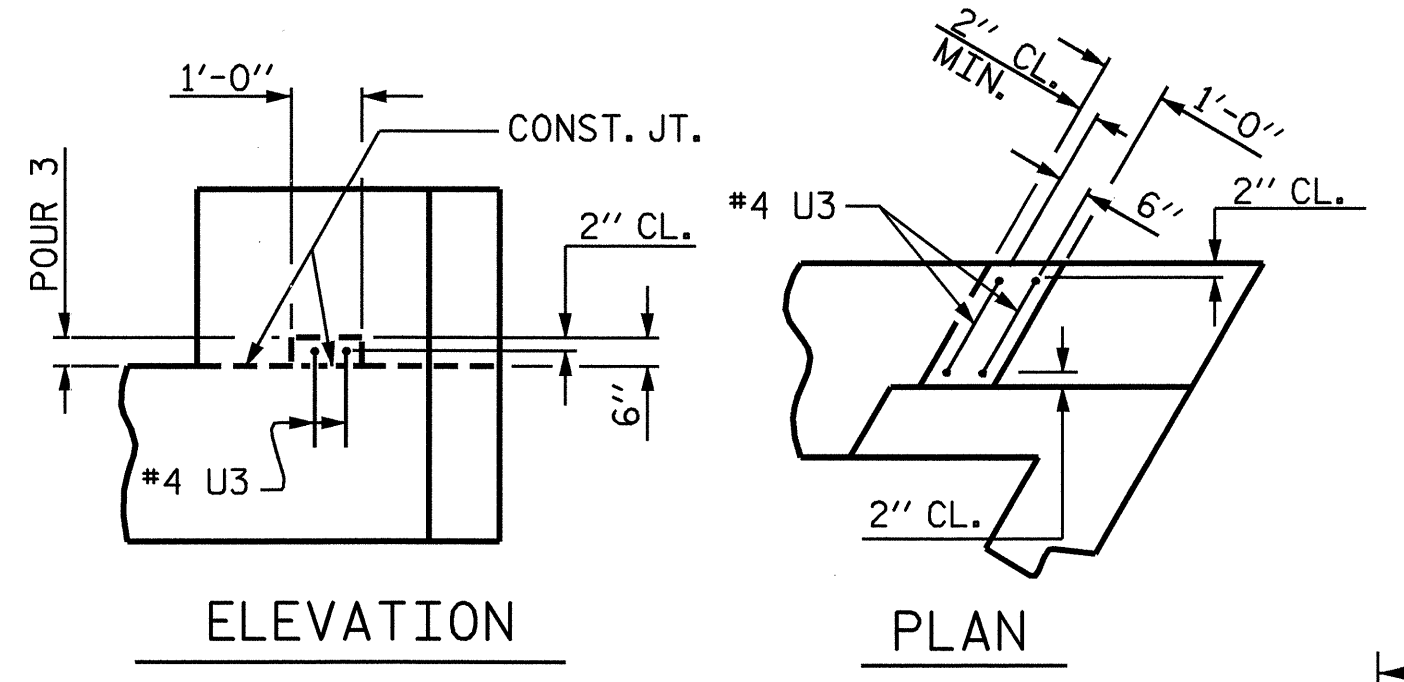




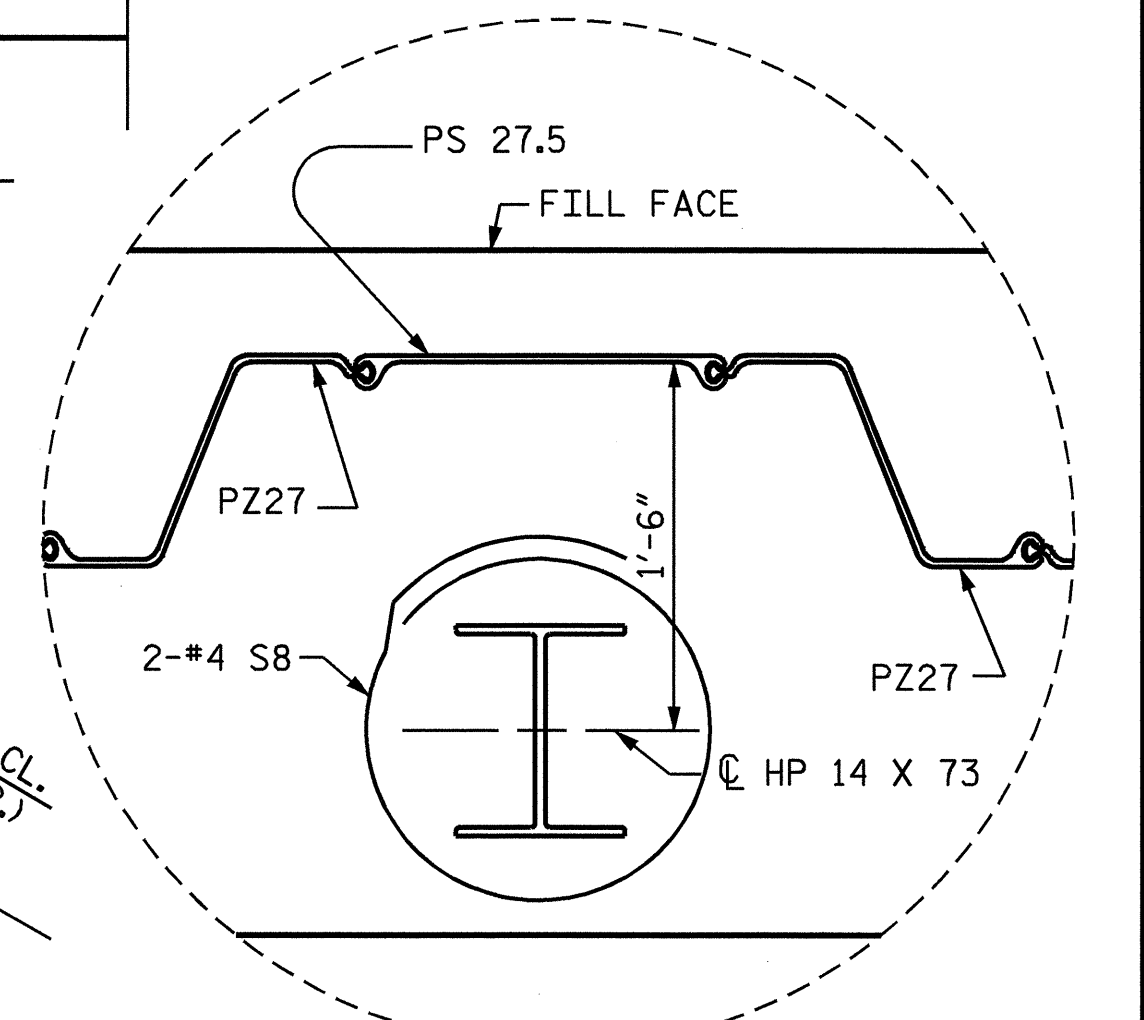
ELEVATION - W1



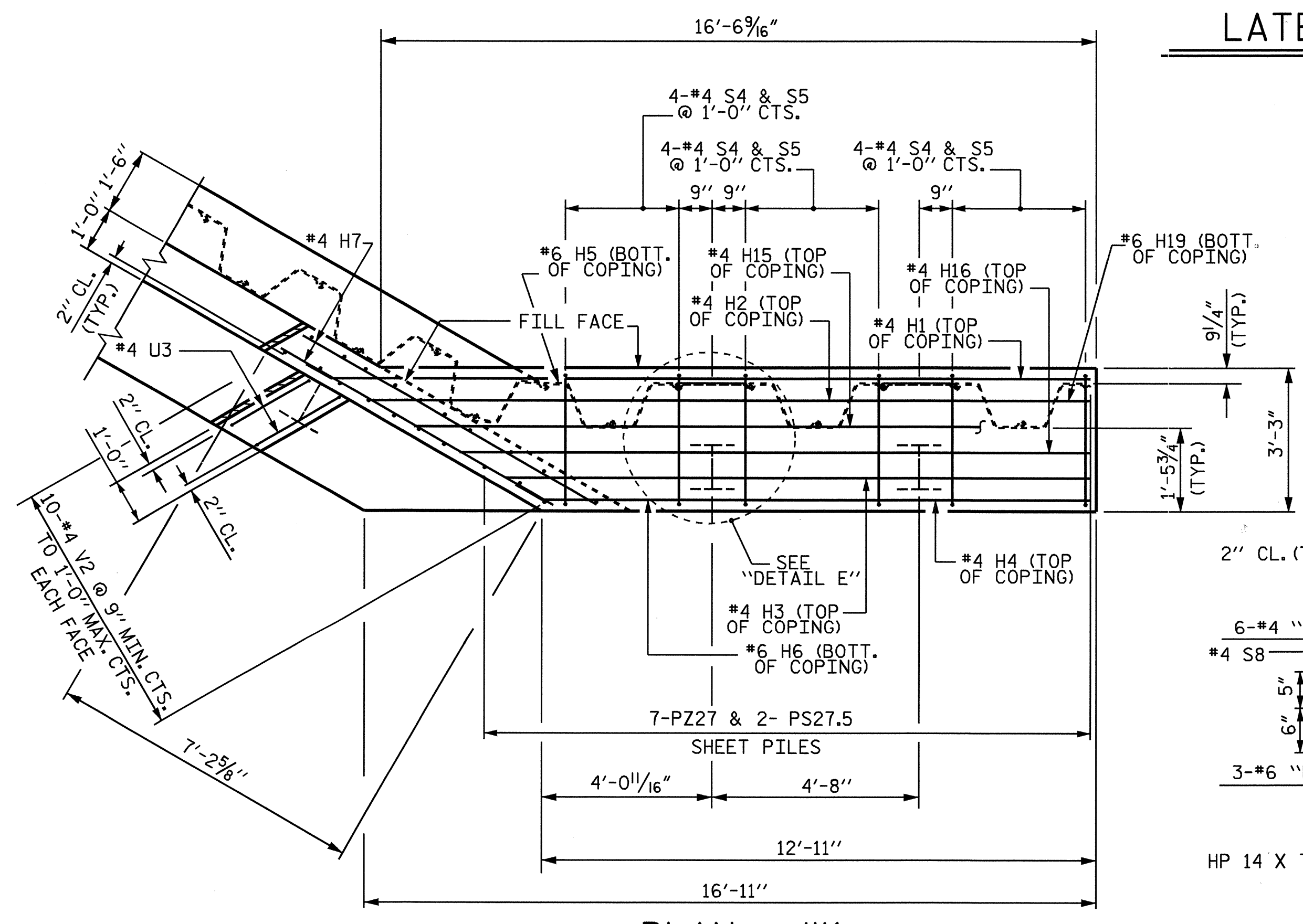
ELEVATION - W2



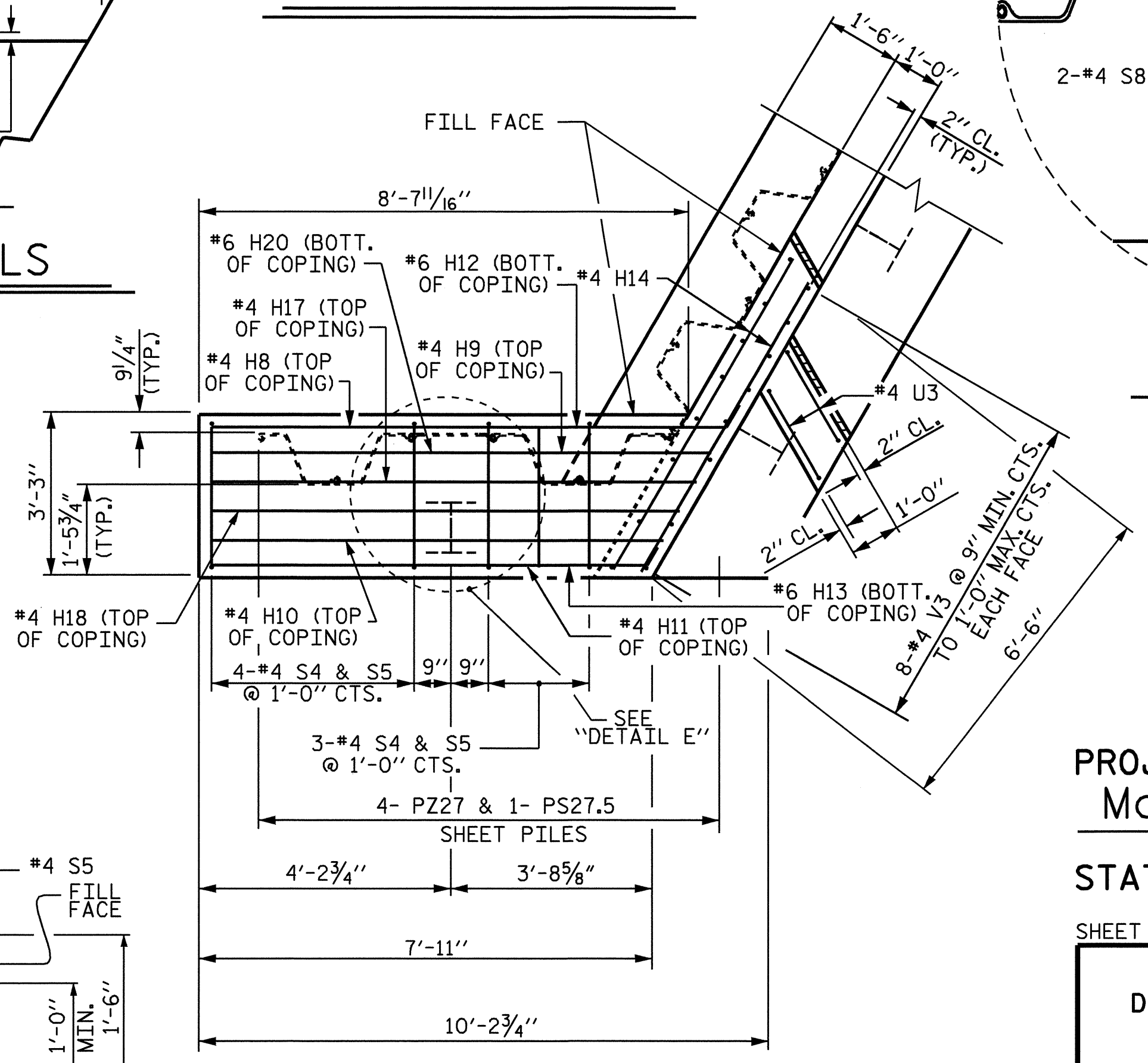
LATERAL GUIDE DETAILS



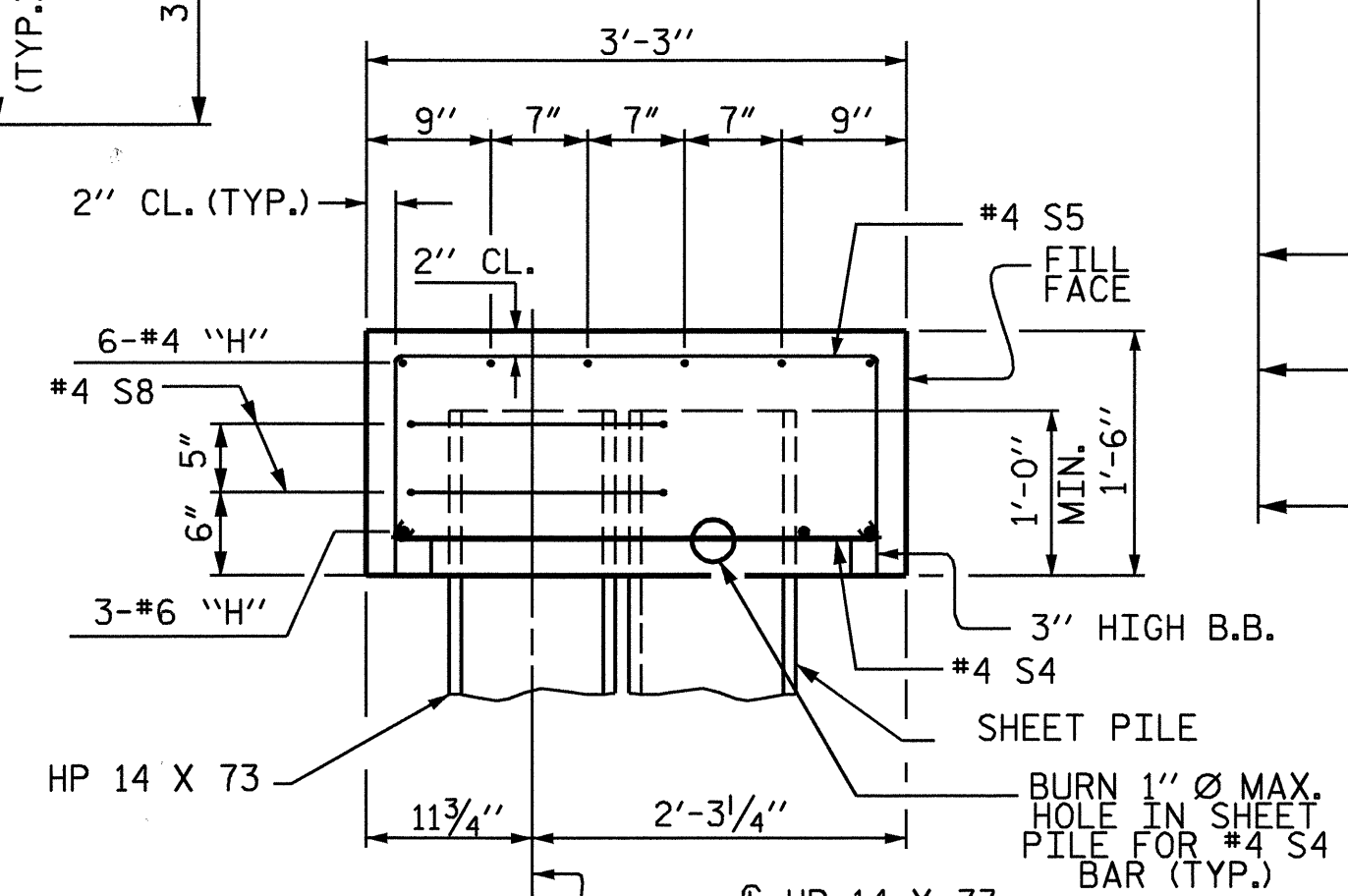
DETAIL E



PLAN - W1



PLAN - W2

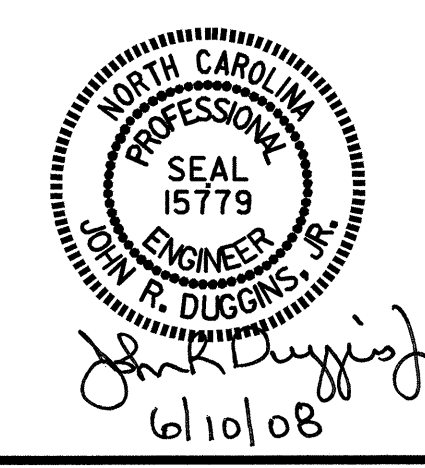


SECTION THRU COPING

PROJECT NO. B-4193  
McDOWELL COUNTY  
 STATION: 12+25.50 -L-

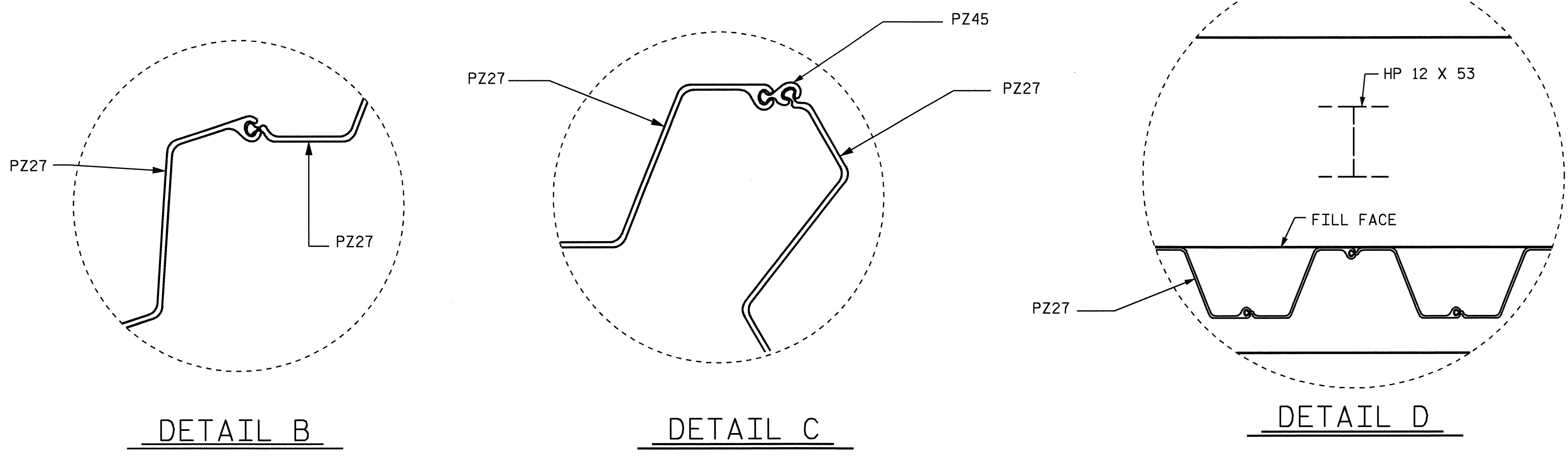
SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT No. 1



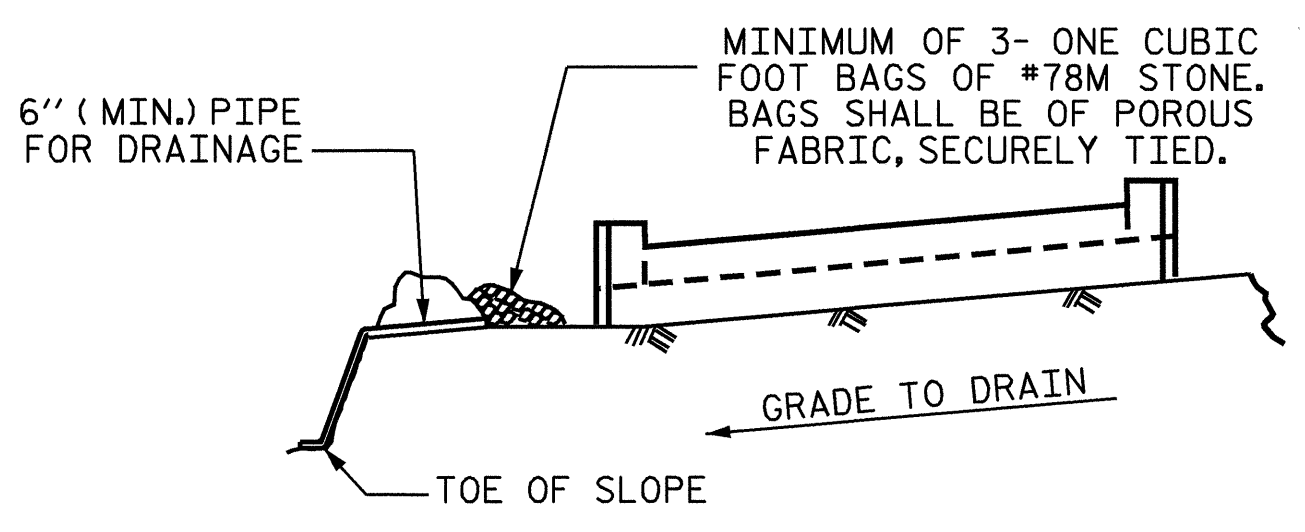
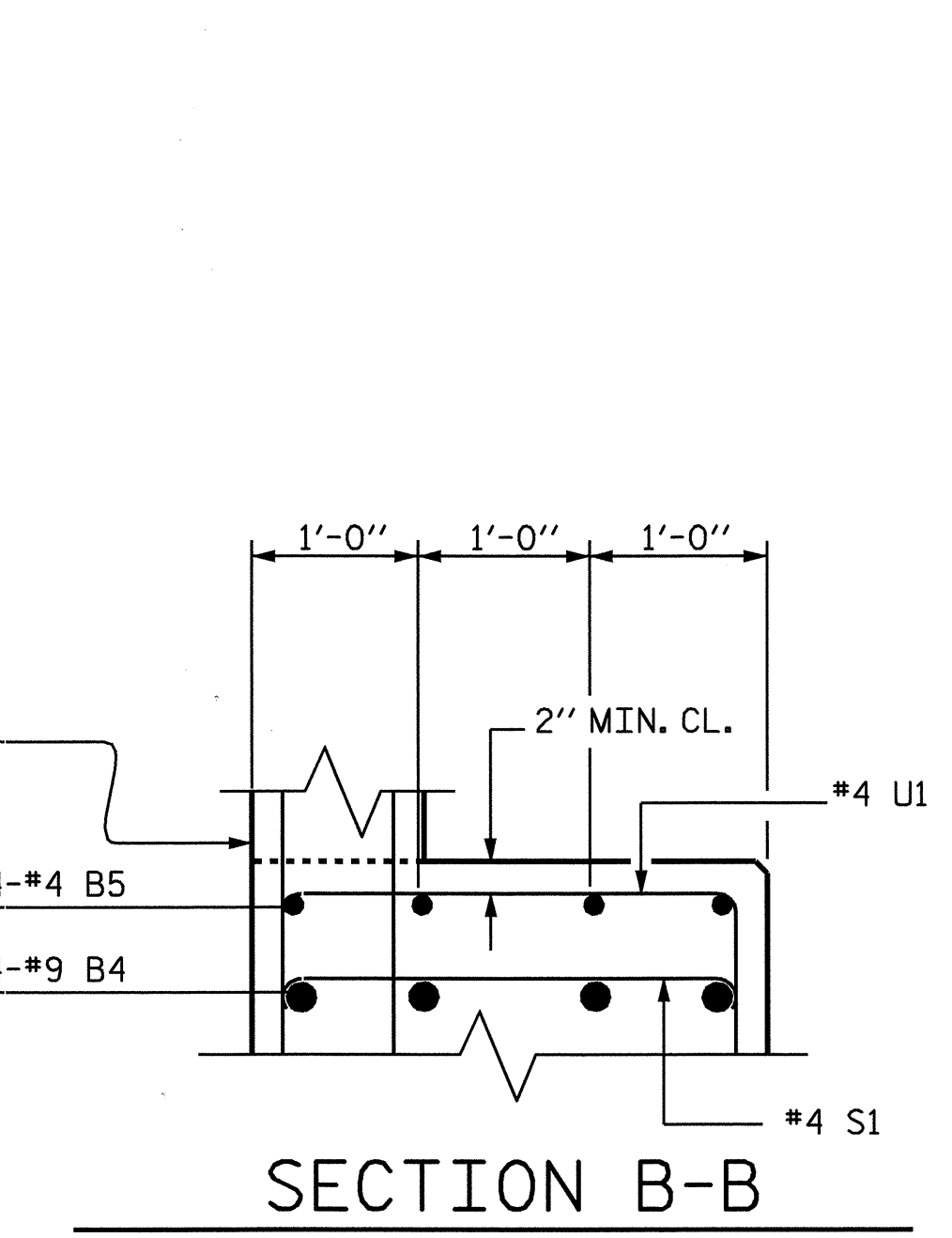
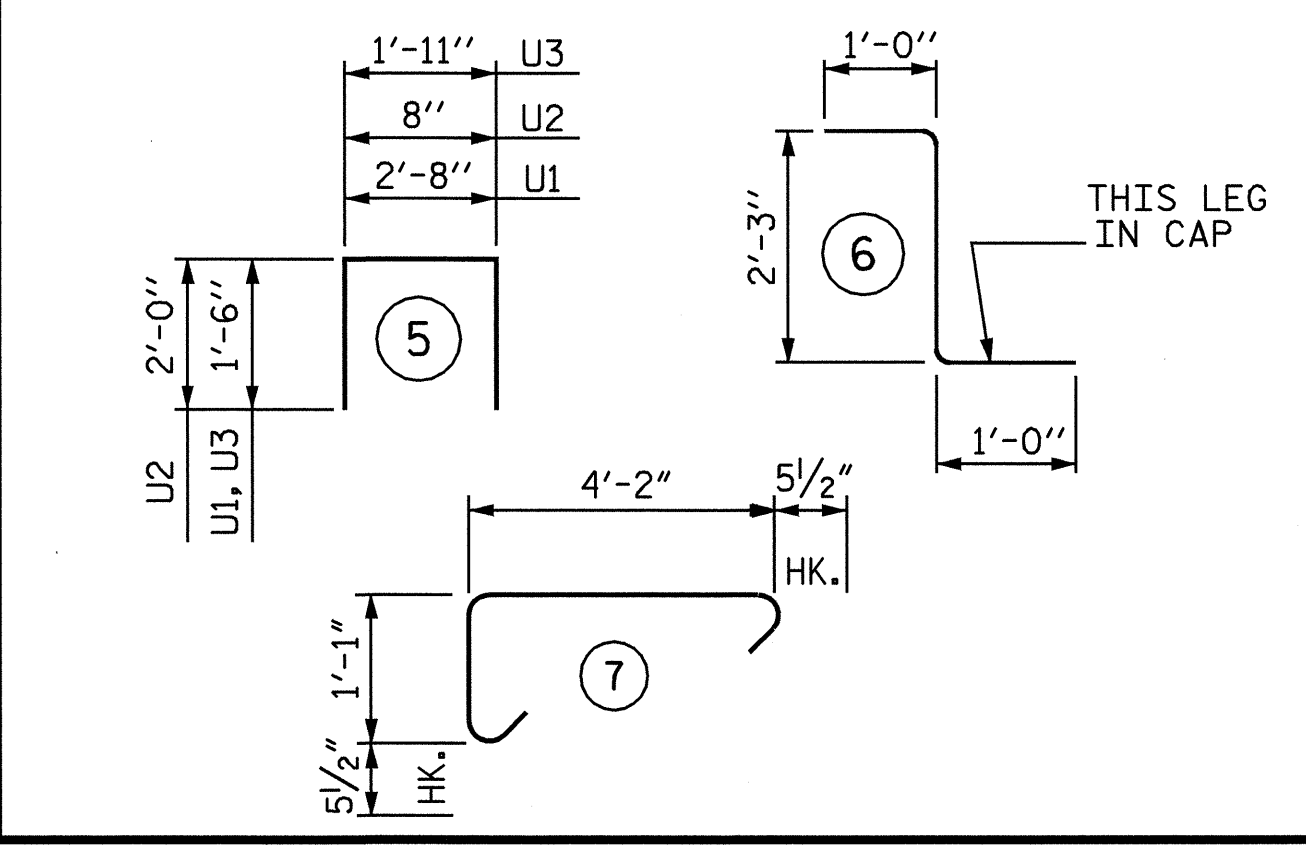
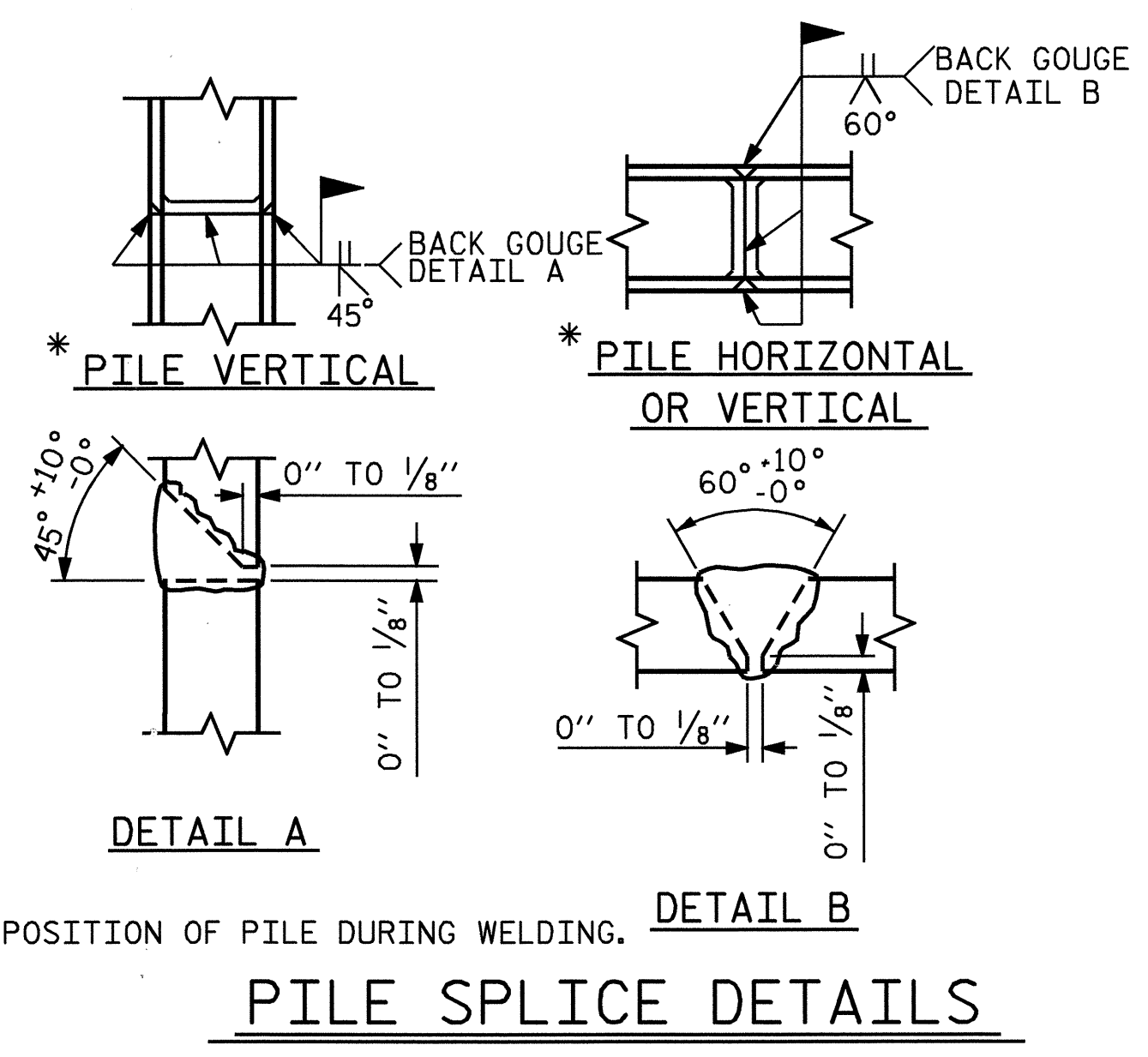
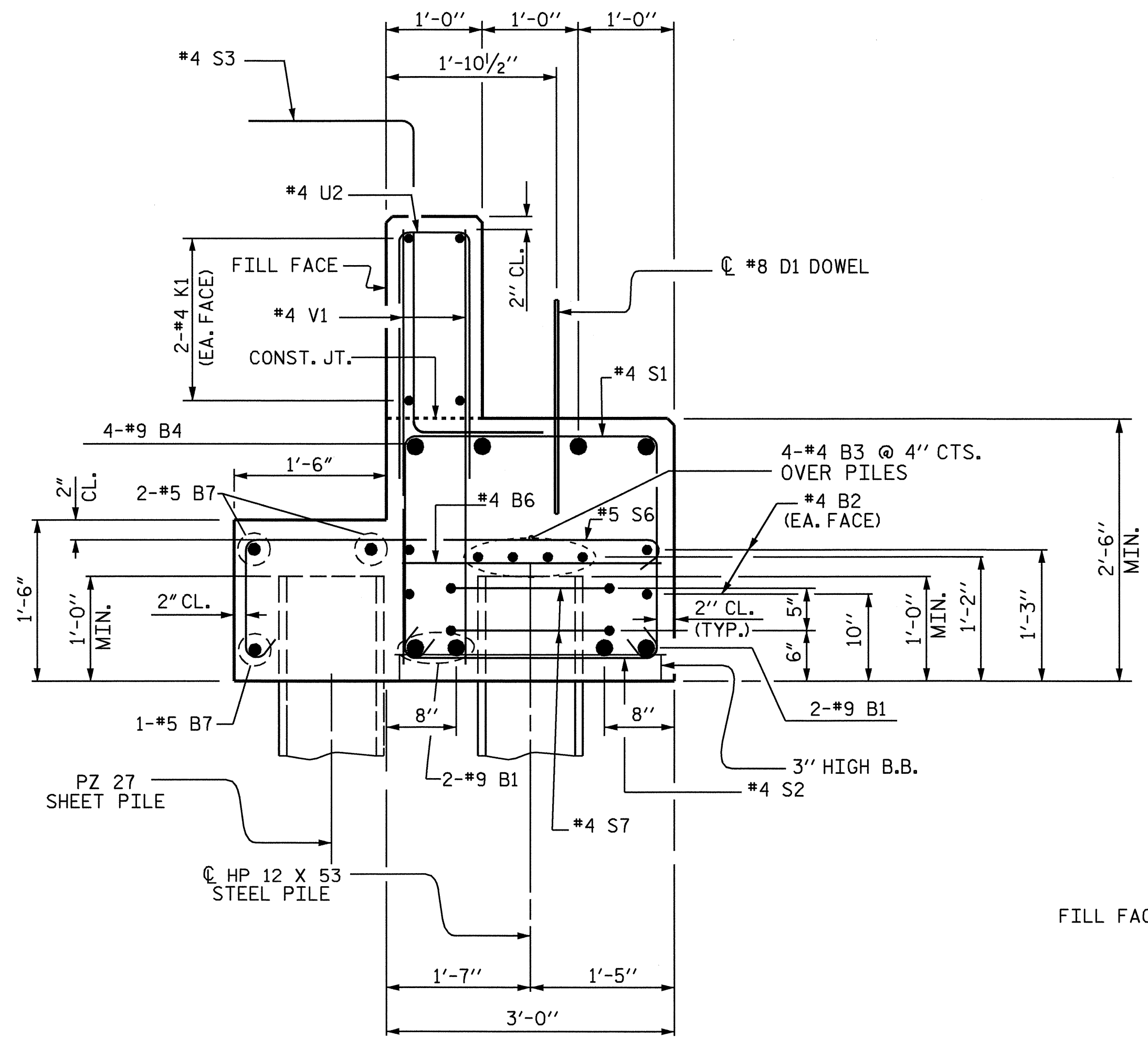
DRAWN BY: M. POOLE DATE: 02-08  
 CHECKED BY: J. R. DUGGINS DATE: 02-08

| REVISIONS |     |       |     |     |       | SHEET NO. |    |
|-----------|-----|-------|-----|-----|-------|-----------|----|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-11      |    |
| 1         |     |       | 3   |     |       | TOTAL     | 17 |
| 2         |     |       | 4   |     |       | SHEETS    |    |



### BILL OF MATERIAL

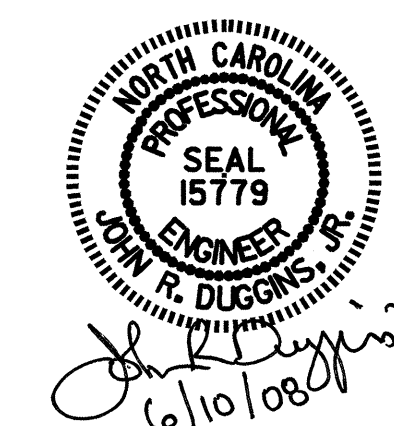
| BAR TYPES         |     |      |      | END BENT No. 1 |        |  |
|-------------------|-----|------|------|----------------|--------|--|
| BAR NO.           | NO. | SIZE | TYPE | LENGTH         | WEIGHT |  |
| B1                | 8   | 9    | 1    | 28'-4"         | 771    |  |
| B2                | 8   | 4    | STR  | 25'-2"         | 134    |  |
| B3                | 8   | 4    | STR  | 24'-2"         | 129    |  |
| B4                | 4   | 4    | 1    | 29'-7"         | 805    |  |
| B5                | 4   | 4    | STR  | 29'-6"         | 79     |  |
| B6                | 1   | 5    | STR  | 2'-8"          | 20     |  |
| B7                | 3   | 4    | STR  | 41'-5"         | 130    |  |
| D1                | 20  | 8    | STR  | 2'-3"          | 120    |  |
| H1                | 1   | 4    | 4    | 18'-7"         | 12     |  |
| H2                | 1   | 4    | STR  | 16'-9"         | 11     |  |
| H3                | 1   | 4    | STR  | 15'-8"         | 9      |  |
| H4                | 4   | 4    | 4    | 15'-8"         | 32     |  |
| H5                | 1   | 4    | 4    | 14'-9"         | 20     |  |
| H6                | 6   | 6    | 4    | 13'-9"         | 19     |  |
| H7                | 4   | 4    | STR  | 7'-0"          | 7      |  |
| H8                | 4   | 4    | 4    | 10'-0"         | 7      |  |
| H9                | 1   | 4    | STR  | 9'-0"          | 6      |  |
| H10               | 4   | 4    | STR  | 7'-11"         | 5      |  |
| H11               | 1   | 4    | 4    | 8'-3"          | 6      |  |
| H12               | 1   | 4    | 4    | 8'-4"          | 13     |  |
| H13               | 1   | 6    | 4    | 8'-3"          | 12     |  |
| H14               | 4   | 4    | STR  | 6'-3"          | 17     |  |
| H15               | 1   | 4    | 4    | 15'-8"         | 10     |  |
| H16               | 1   | 4    | STR  | 14'-8"         | 10     |  |
| H17               | 1   | 4    | STR  | 8'-8"          | 6      |  |
| H18               | 4   | 4    | STR  | 8'-4"          | 6      |  |
| H19               | 1   | 6    | STR  | 14'-6"         | 22     |  |
| H20               | 1   | 6    | STR  | 8'-4"          | 13     |  |
| K1                | 8   | 4    | STR  | 25'-2"         | 134    |  |
| S1                | 36  | 4    | 3    | 6'-11"         | 166    |  |
| S2                | 36  | 4    | 2    | 3'-5"          | 82     |  |
| S3                | 33  | 4    | 6    | 4'-3"          | 94     |  |
| S4                | 19  | 4    | 2    | 3'-8"          | 47     |  |
| S5                | 19  | 4    | 3    | 5'-11"         | 75     |  |
| S6                | 40  | 5    | 7    | 6'-2"          | 257    |  |
| S7                | 18  | 4    | 8    | 6'-6"          | 78     |  |
| S8                | 6   | 4    | 8    | 7'-7"          | 30     |  |
| U1                | 20  | 4    | 5    | 5'-8"          | 76     |  |
| U2                | 33  | 4    | 5    | 4'-8"          | 103    |  |
| U3                | 4   | 4    | 5    | 4'-11"         | 13     |  |
| V1                | 66  | 4    | STR  | 3'-6"          | 154    |  |
| V2                | 20  | 4    | STR  | 5'-3"          | 70     |  |
| V3                | 16  | 4    | STR  | 5'-10"         | 62     |  |
| REINFORCING STEEL |     |      |      | 3864           | LBS.   |  |



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.

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PROJECT NO. B-4193  
McDOWELL COUNTY  
 STATION: 12+25.50 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT No. 1

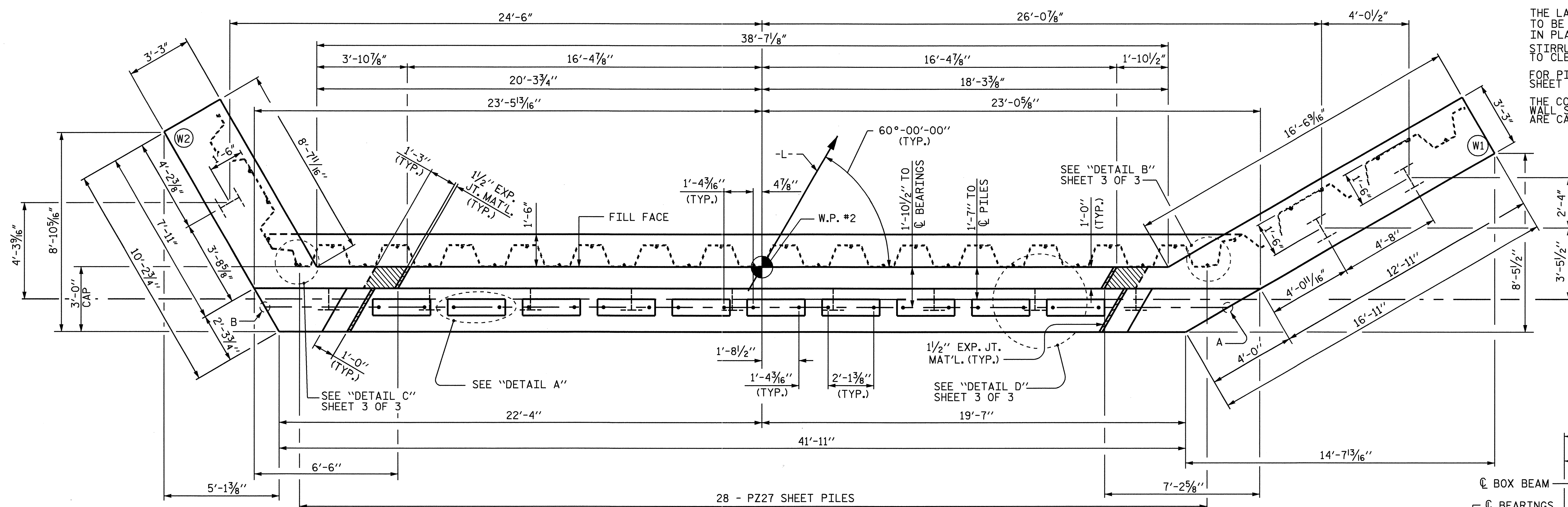
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|-----------|-----|-------|-----|-----|-------|-----------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: |                 |
| 1         |     |       | 3   |     |       | 3-12            |
| 2         |     |       | 4   |     |       | TOTAL SHEETS 17 |

DRAWN BY : M. POOLE DATE : 02-08  
 CHECKED BY : J.R. DUGGINS DATE : 02-08

10-JUN-2008 15:02  
 Z:\Structures\B4193\mpoole\B4193.sd.E1.01.dgn  
 mpoole

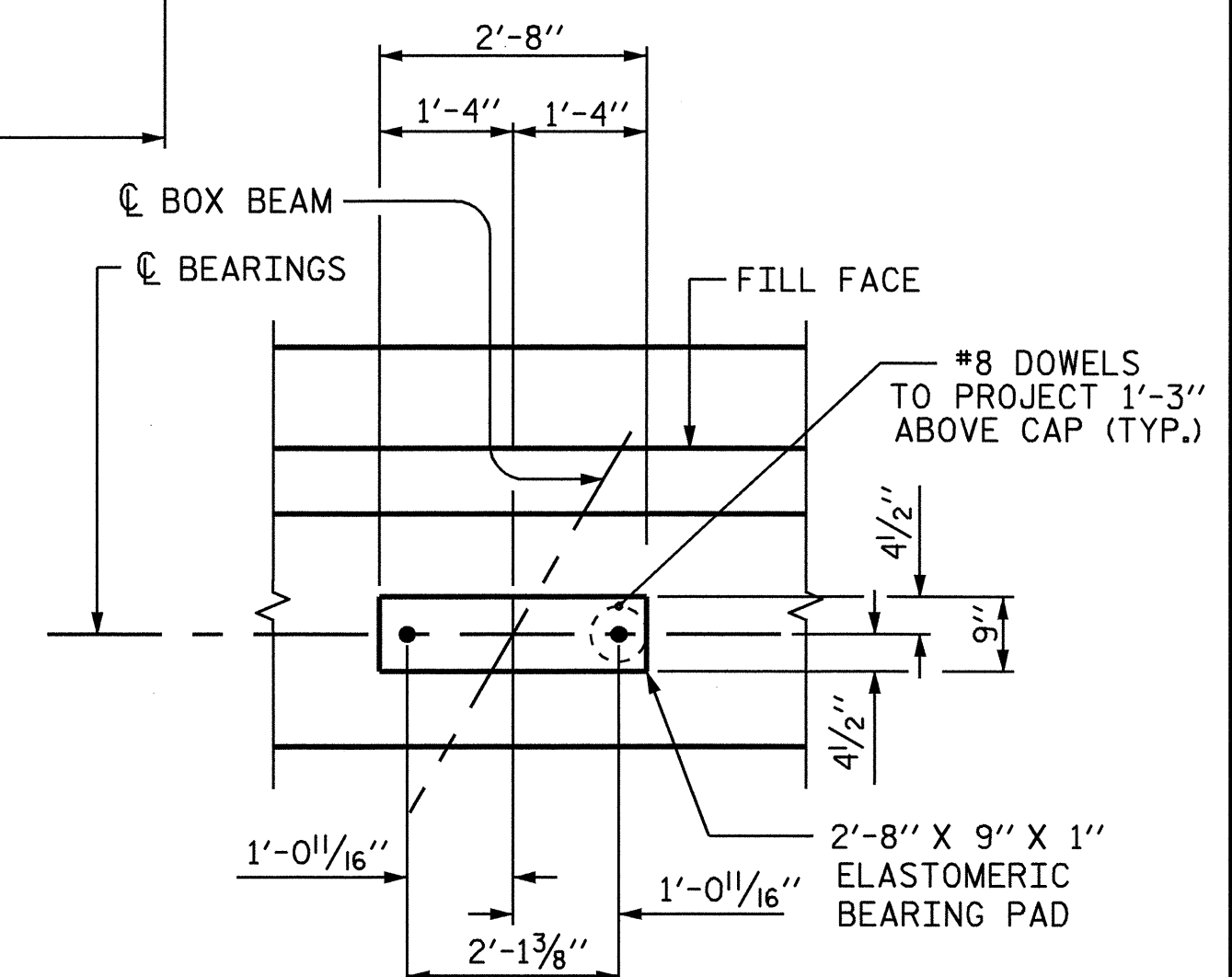
**NOTES**

THE LATERAL GUIDE AT THE ENDS OF CAP ARE NOT TO BE POURED UNTIL AFTER BOX BEAM UNITS ARE IN PLACE.  
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.  
FOR PILE SPLICE DETAILS, SEE END BENT No. 1, SHEET 3 OF 3.  
THE CONCRETE IN THE SHADEED AREA OF THE WING WALL SHALL BE POURED AFTER THE BARRIER RAILS ARE CAST, IF SLIP FORMING IS USED.

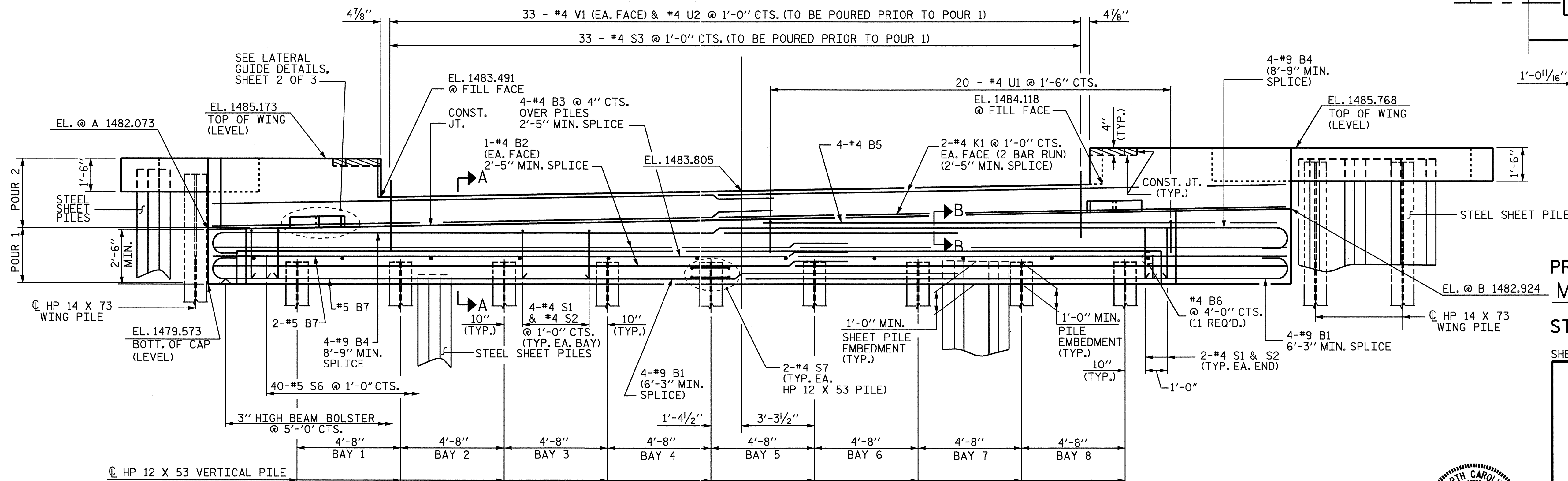


**PLAN**

WORKLINE



**DETAIL A**



**ELEVATION**

NOT ALL SHEET PILES SHOWN FOR CLARITY

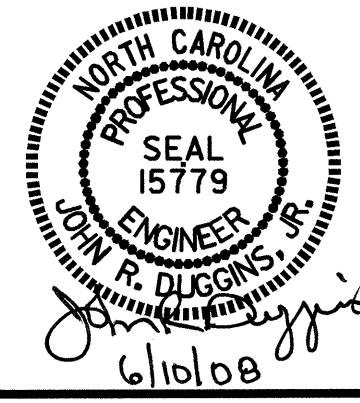
PROJECT NO. B-4193  
MCDOWELL COUNTY  
STATION: 12+25.50 -L-

SHEET 1 OF 3

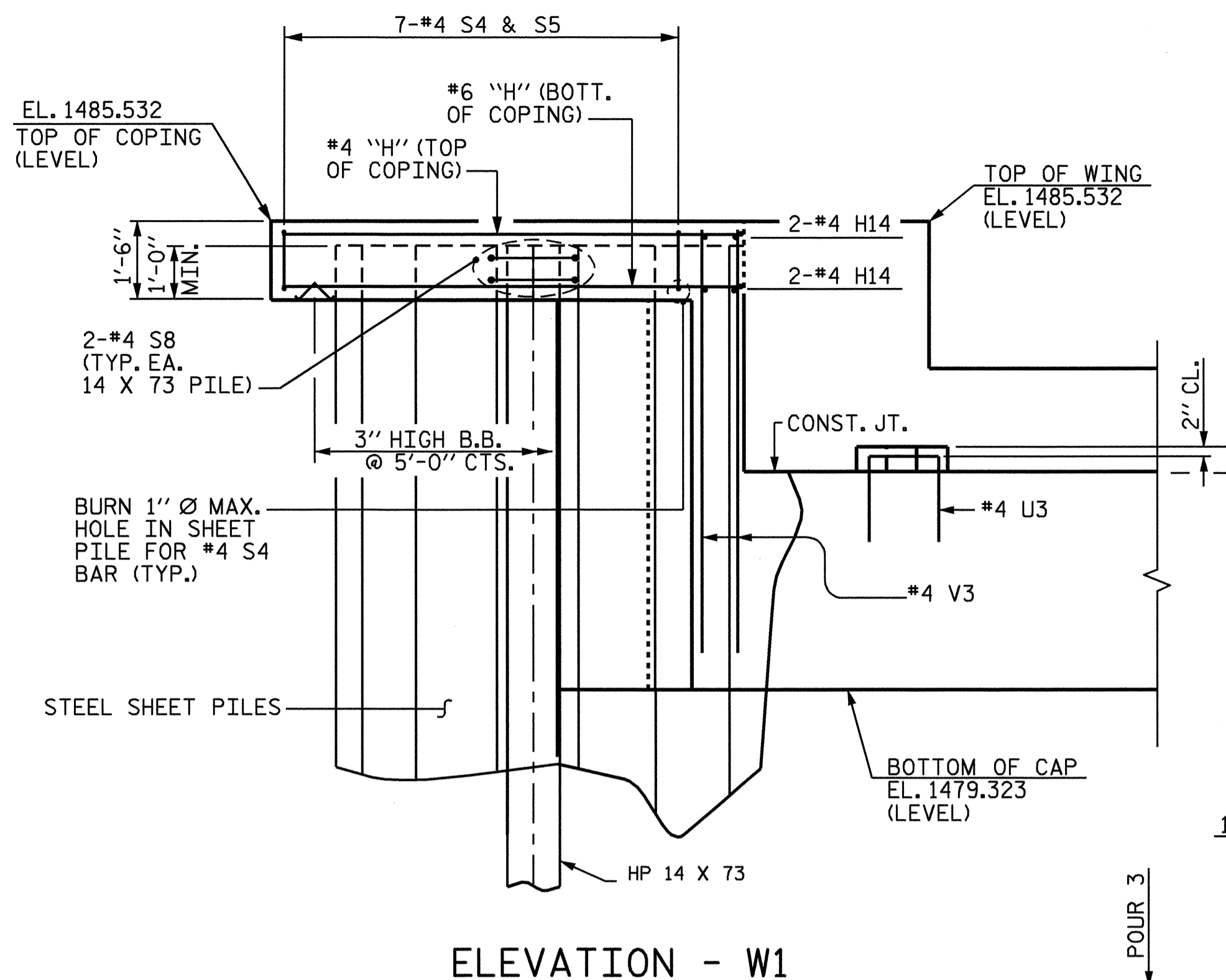
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**SUBSTRUCTURE  
END BENT No. 2**

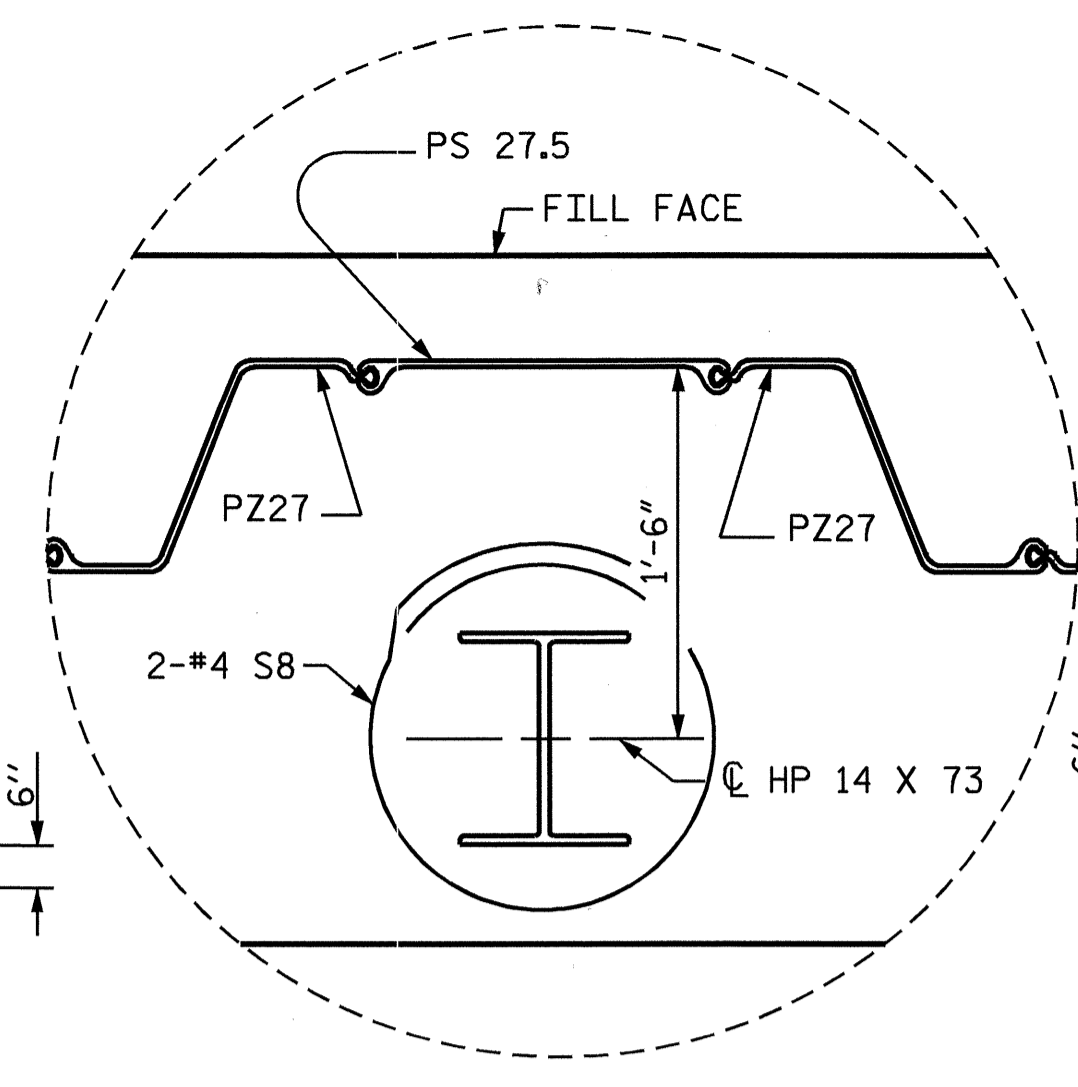
| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-13         |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |
| 2         |     |       | 4   |     |       | 17           |



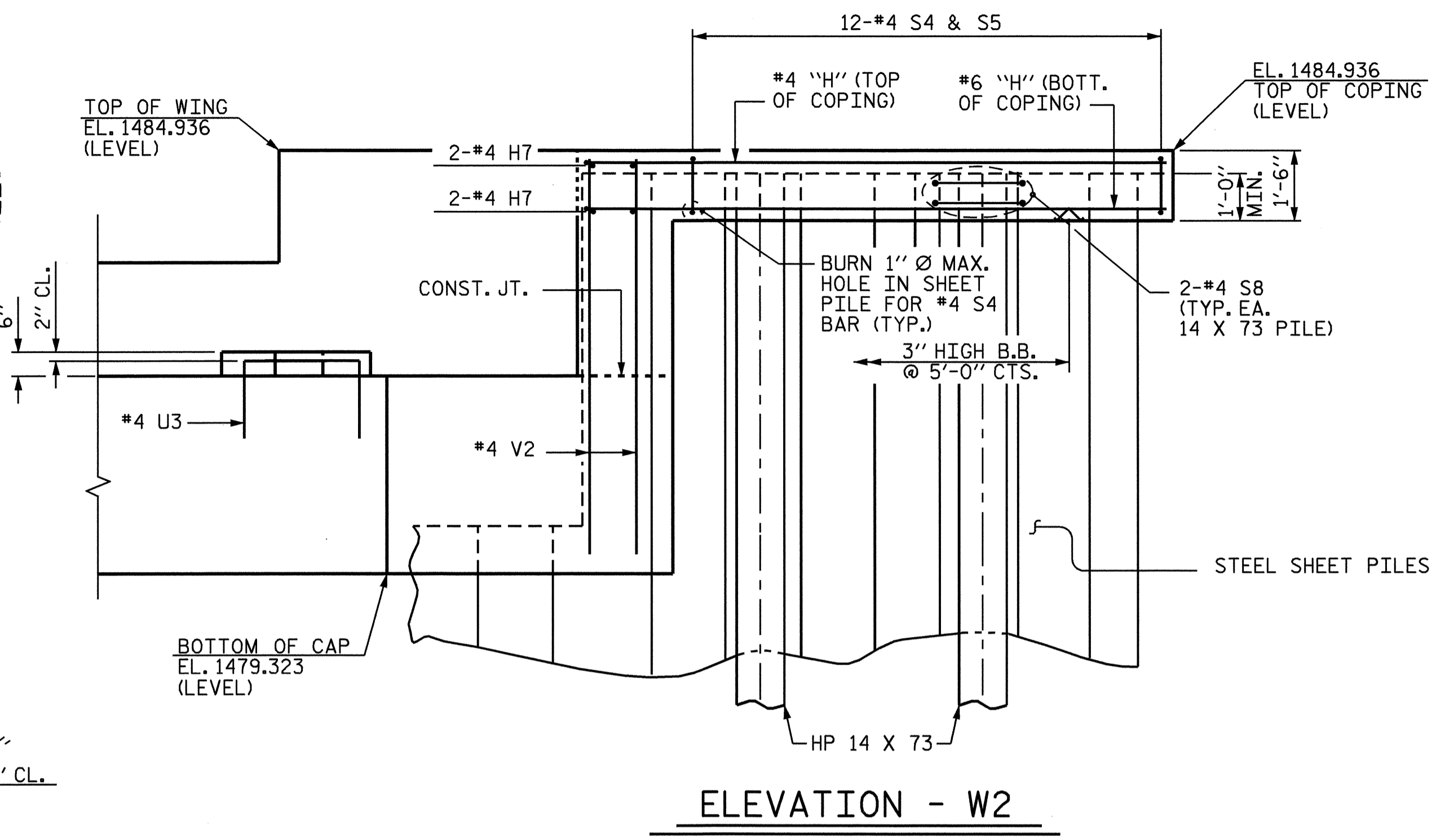
DRAWN BY: M. POOLE DATE: 02-08  
CHECKED BY: J. R. DUGGINS DATE: 02-08



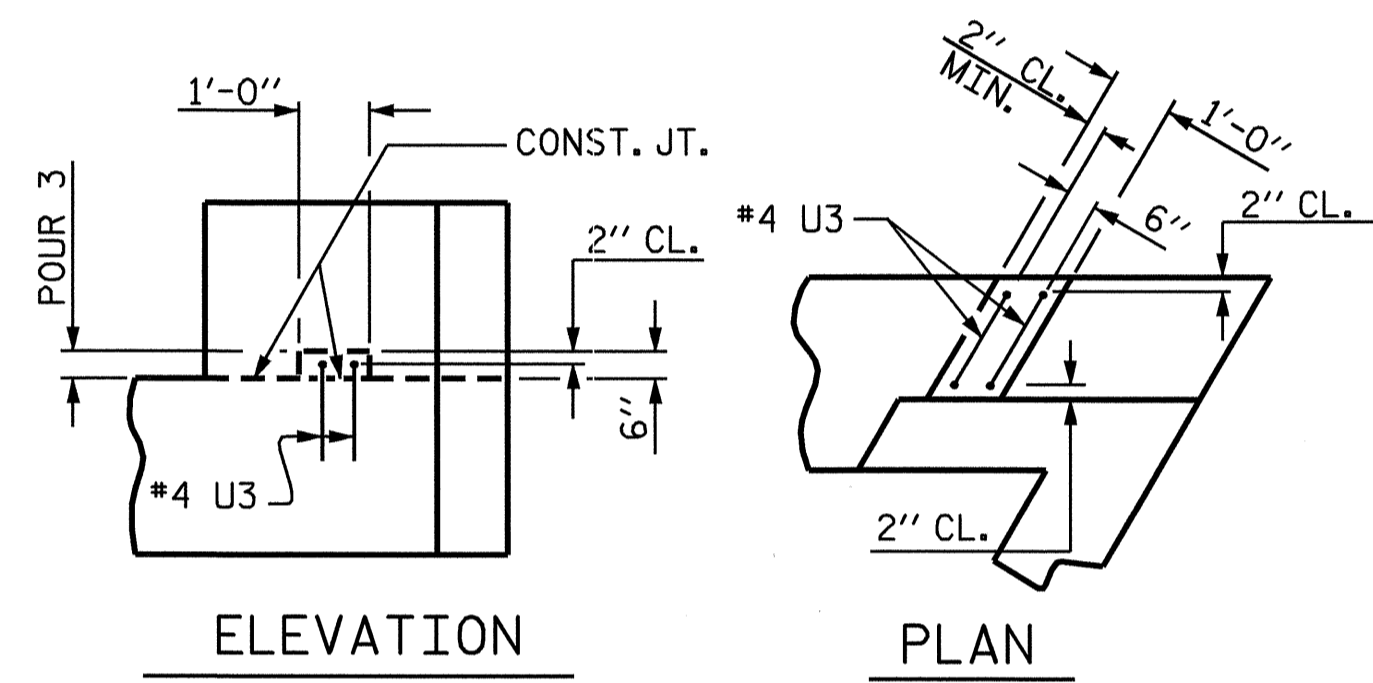
ELEVATION - W1



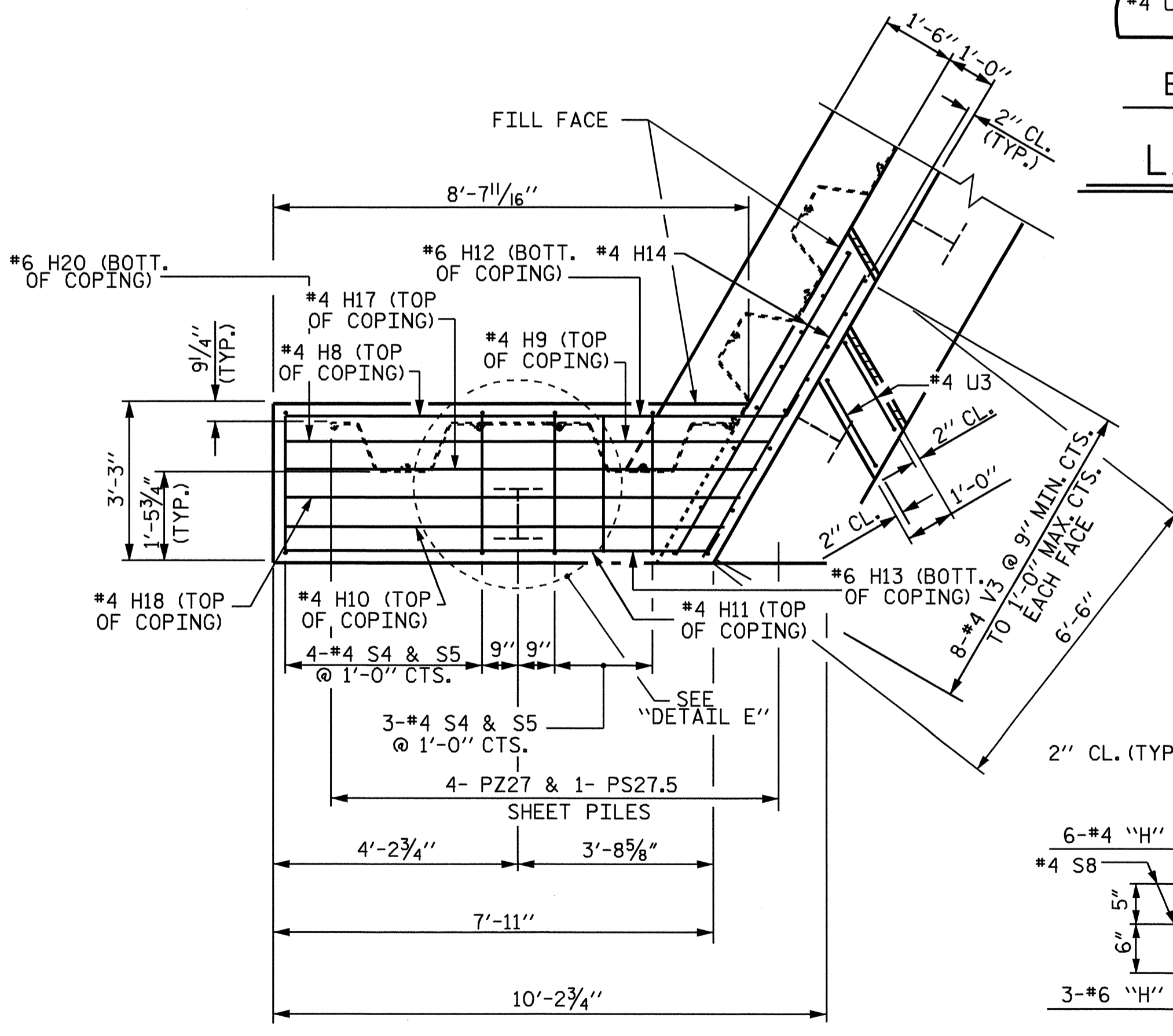
DETAIL E



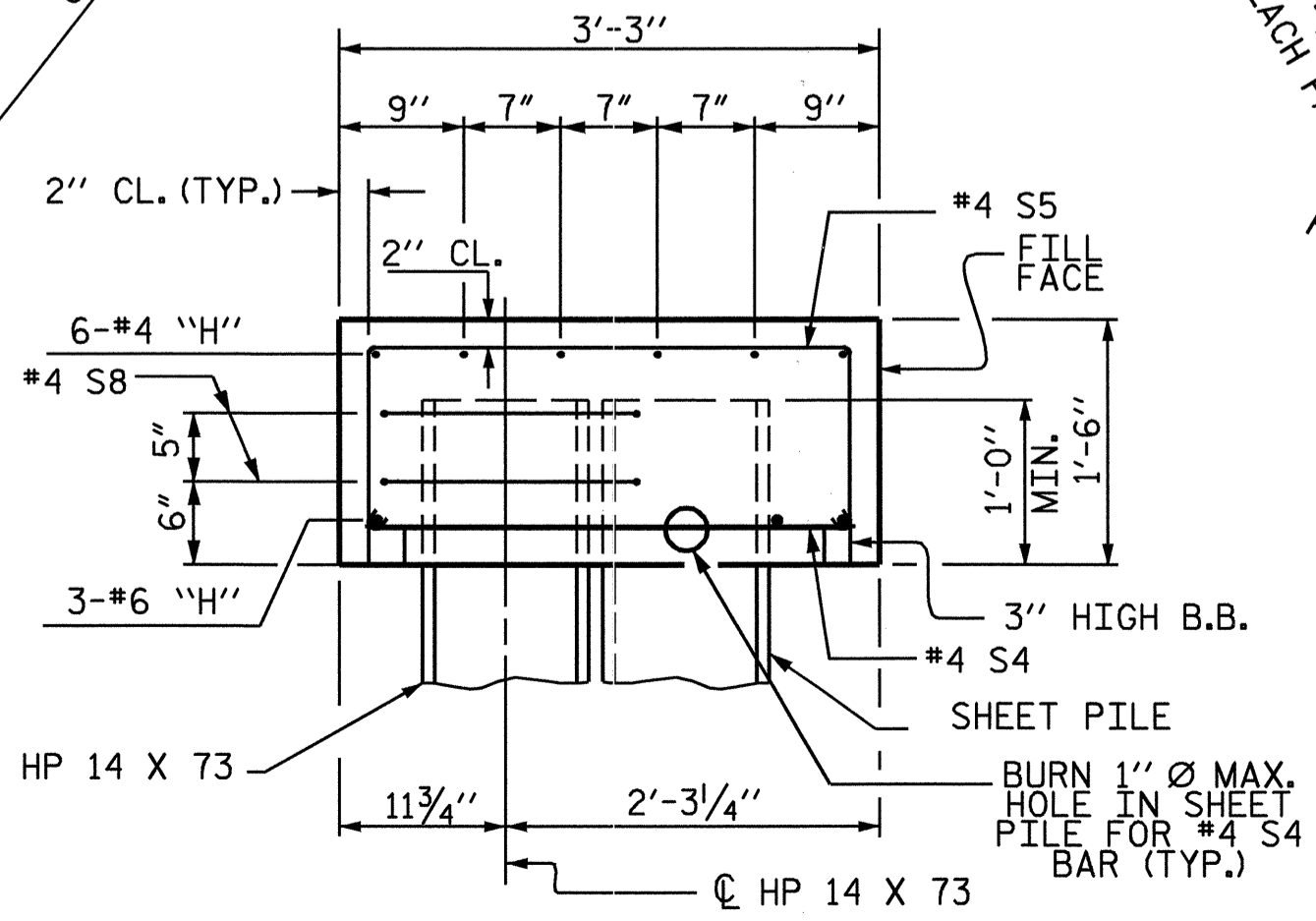
ELEVATION - W2



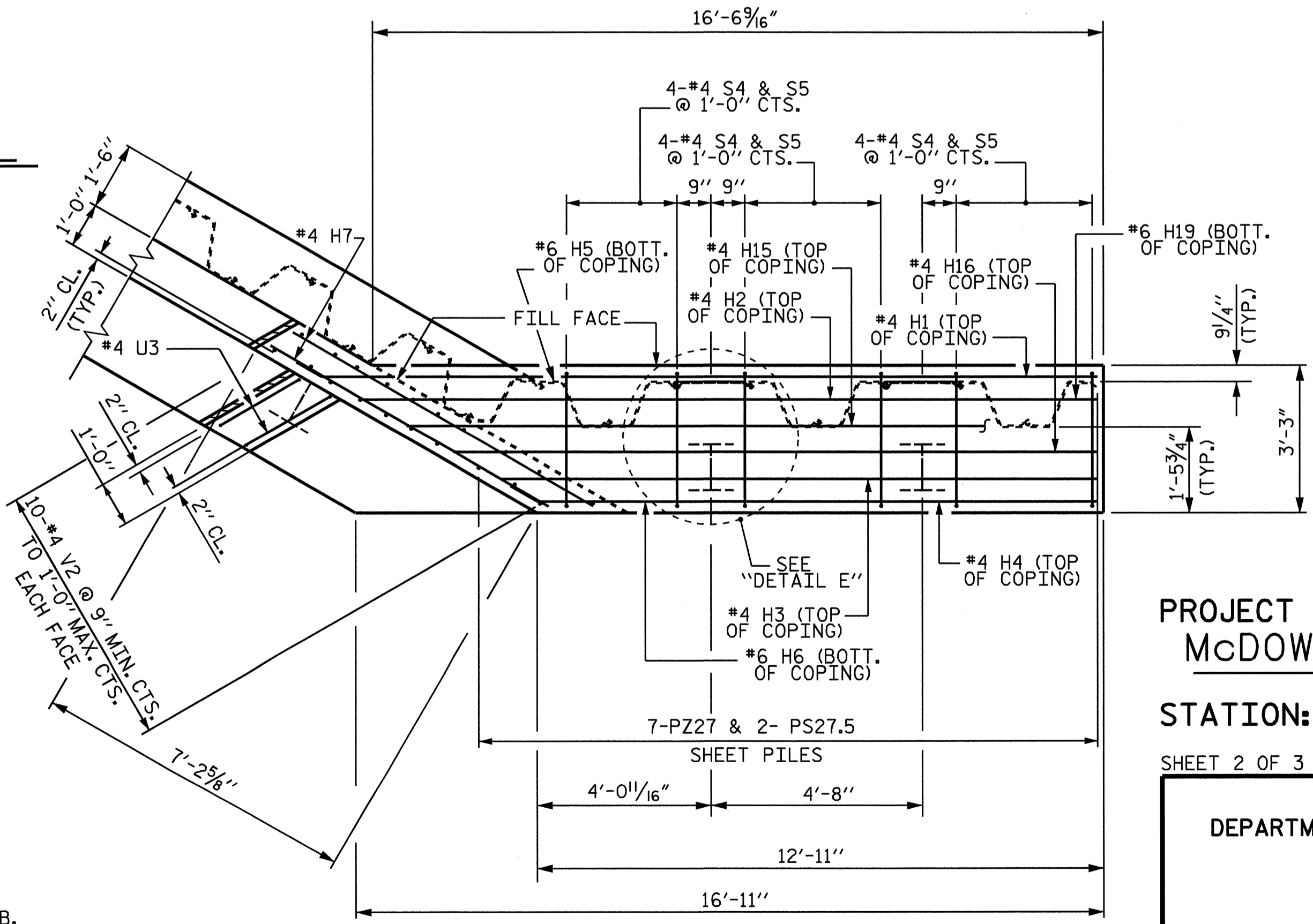
LATERAL GUIDE DETAILS



PLAN - W1



SECTION THRU COPING



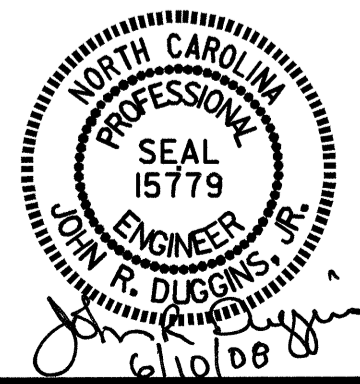
PLAN - W2

PROJECT NO. B-4193  
 McDowell COUNTY  
 STATION: 12+25.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

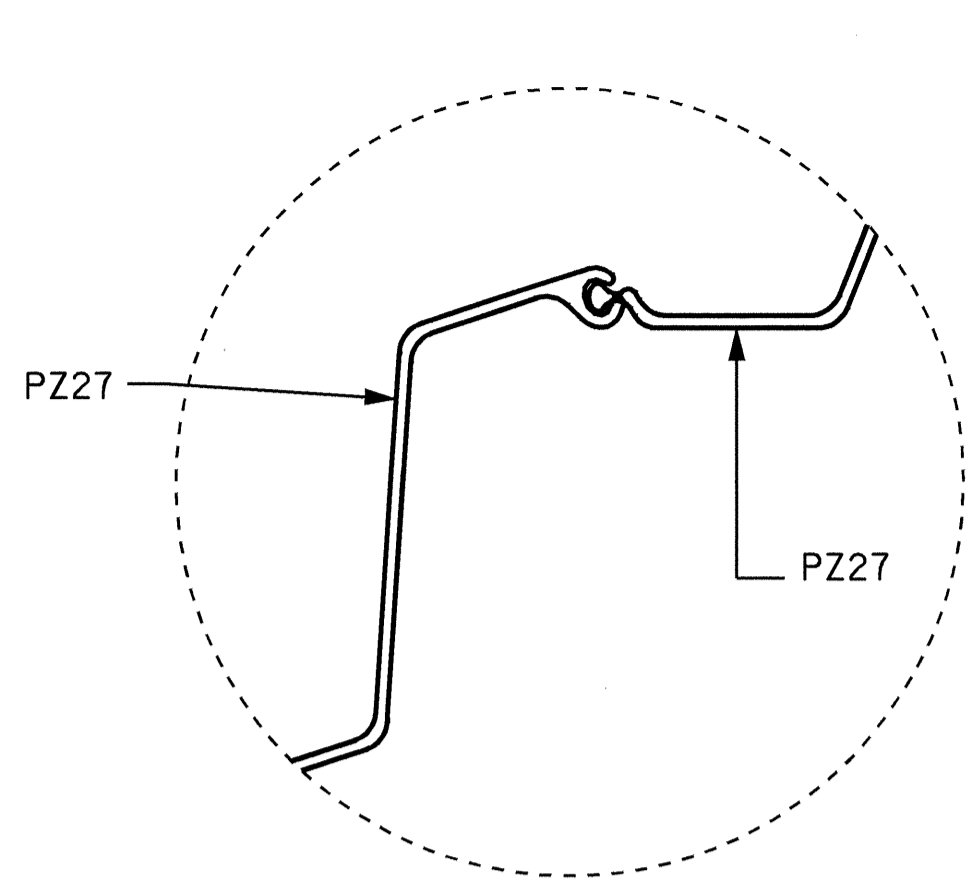
SUBSTRUCTURE  
 END BENT No. 2



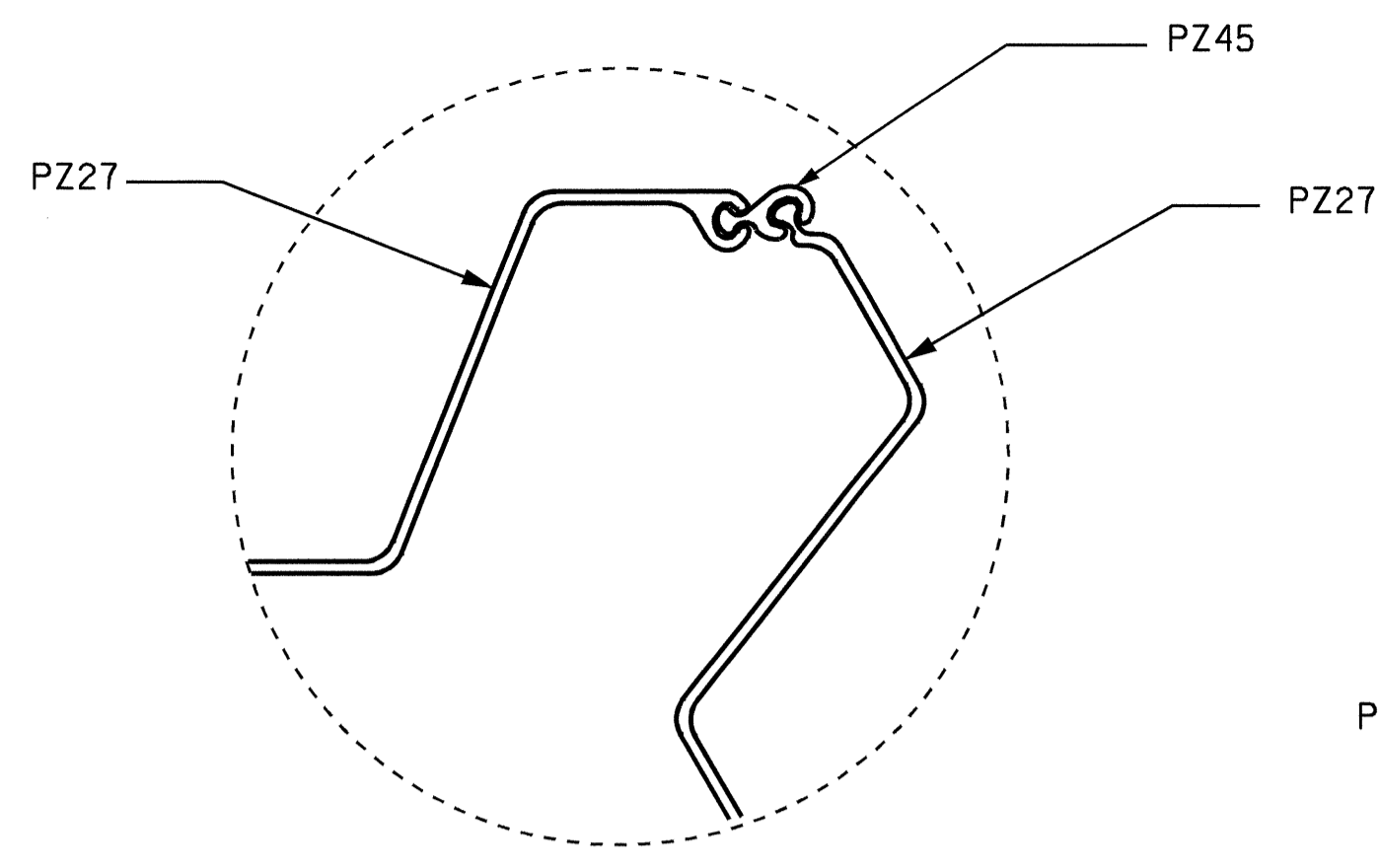
DRAWN BY: M. POOLE DATE: 02-08  
 CHECKED BY: J. R. DUGGINS DATE: 02-08

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 mipoole

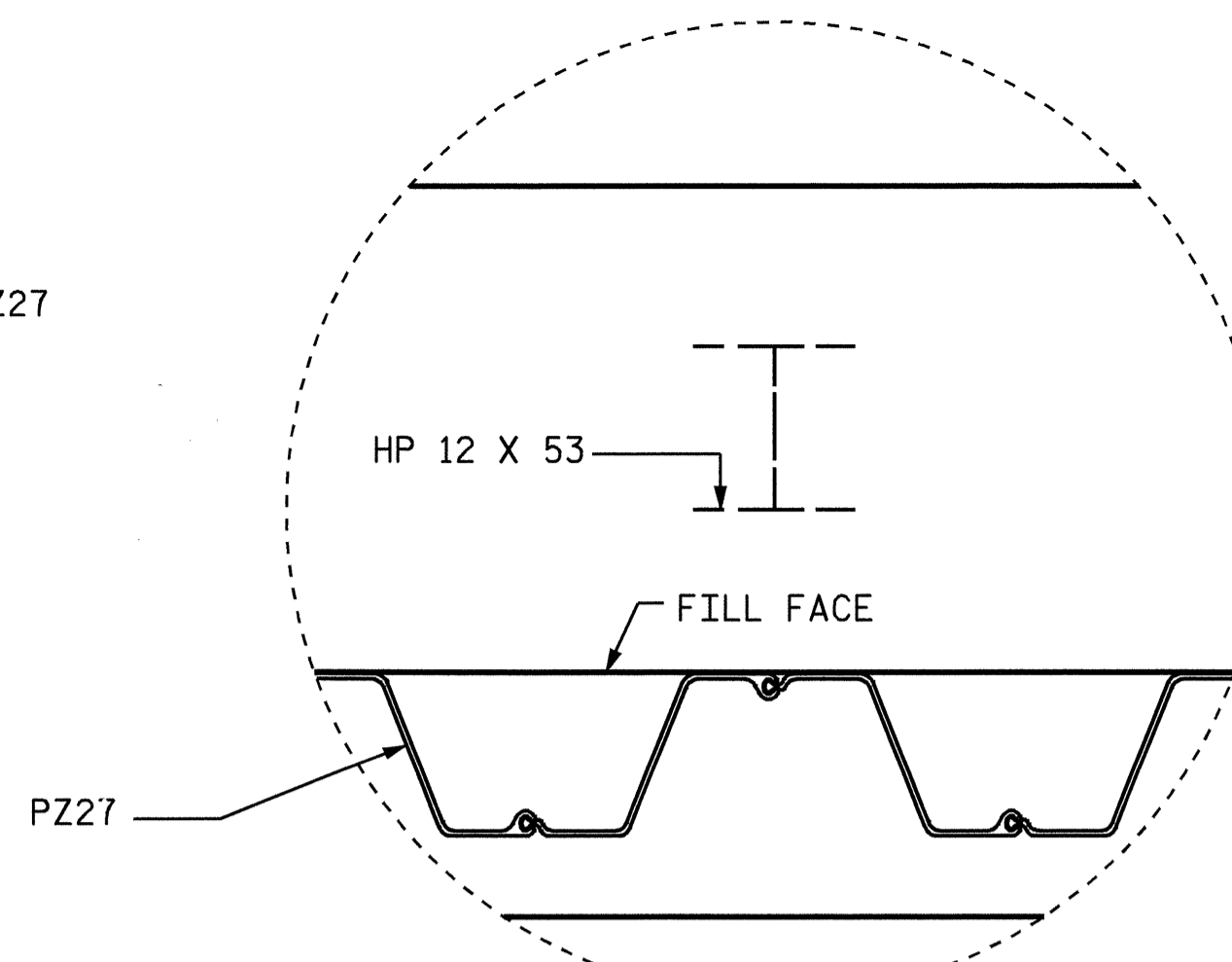
| REVISIONS |     |       |     |     |       | SHEET NO.    |  |
|-----------|-----|-------|-----|-----|-------|--------------|--|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-14         |  |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |  |
| 2         |     |       | 4   |     |       | 17           |  |



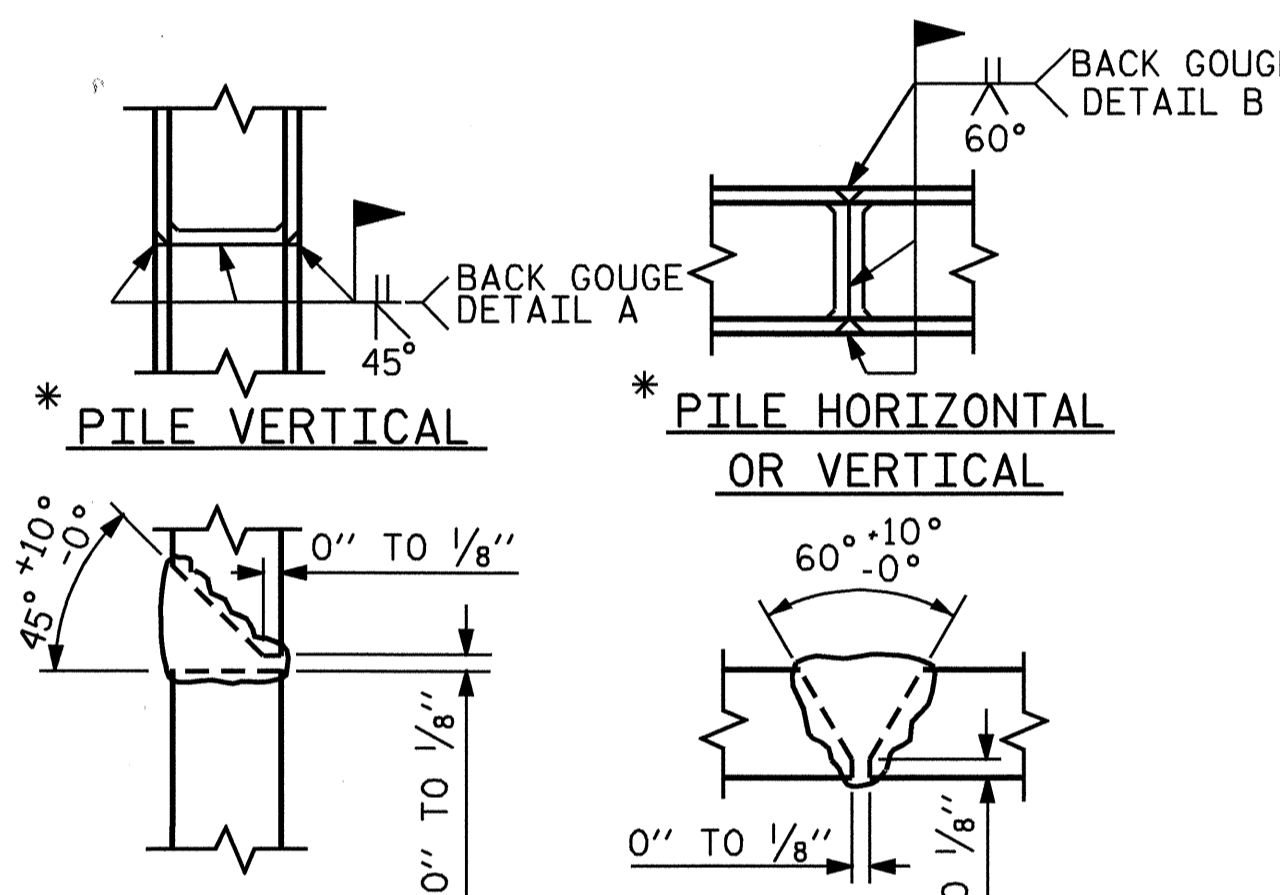
DETAIL B



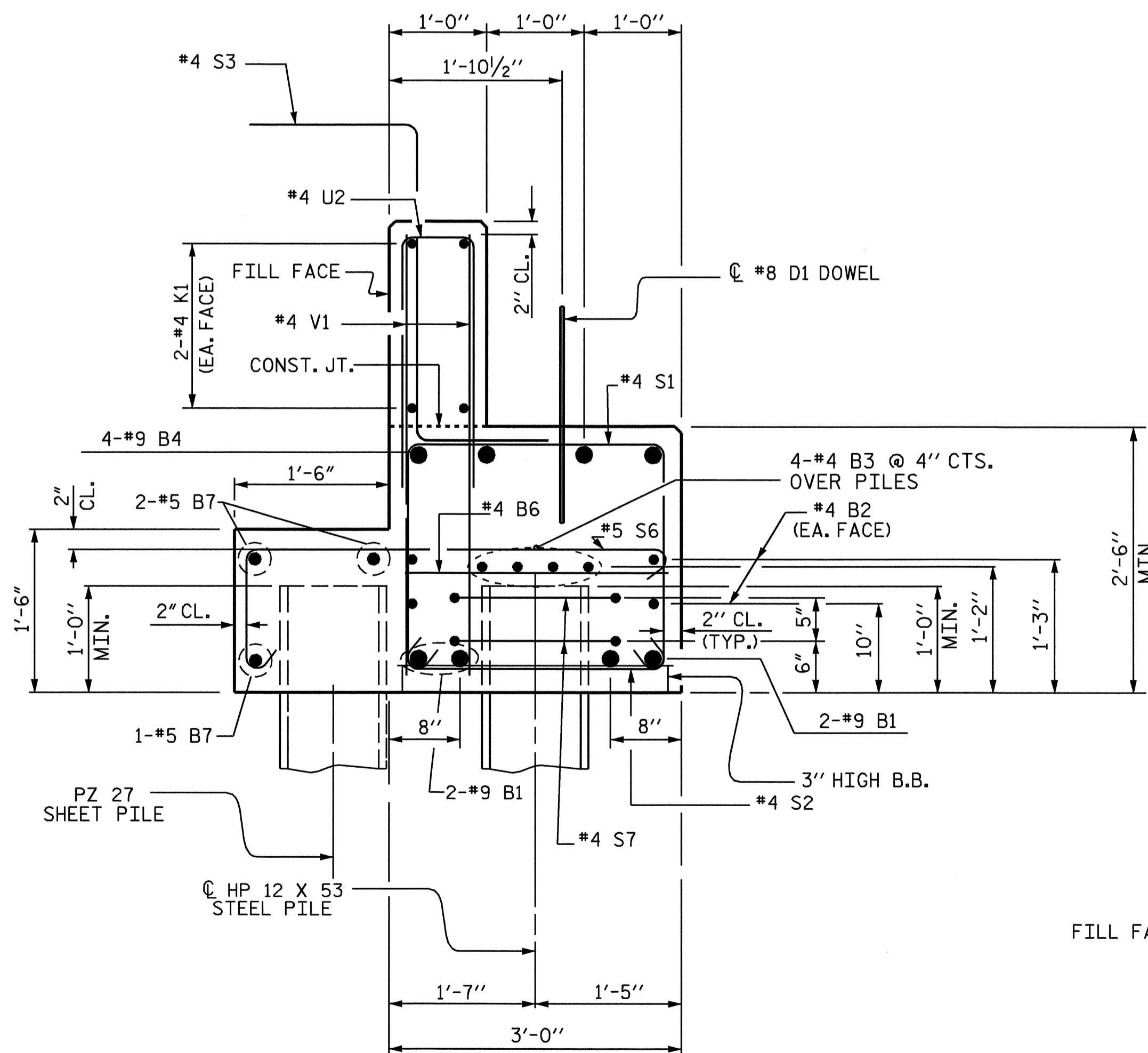
DETAIL C



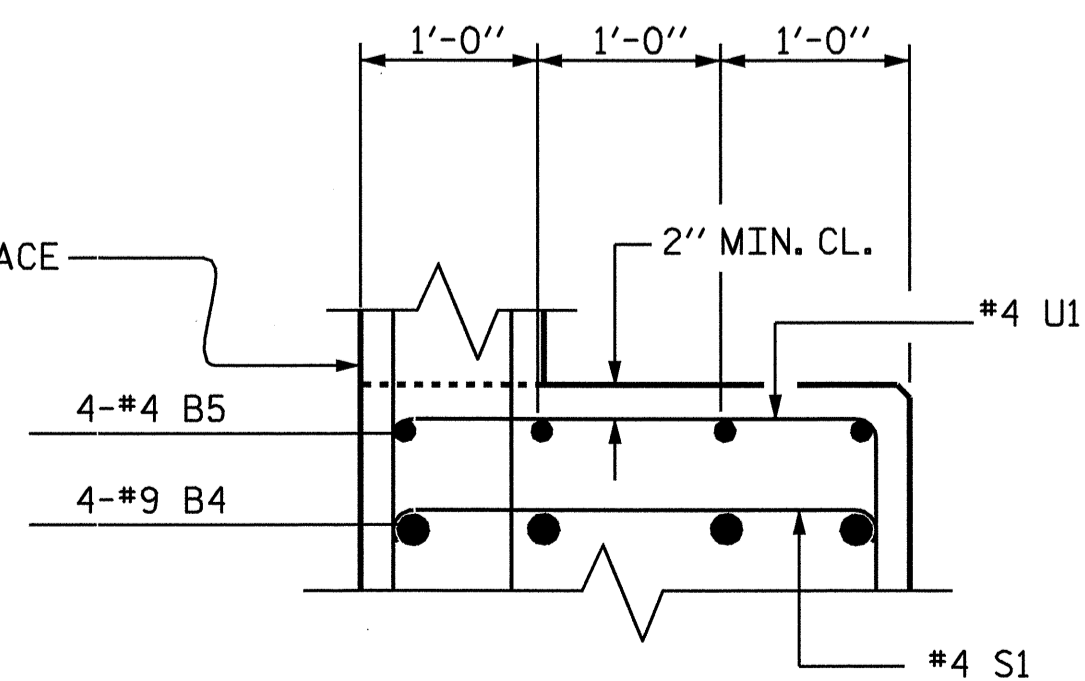
DETAIL D



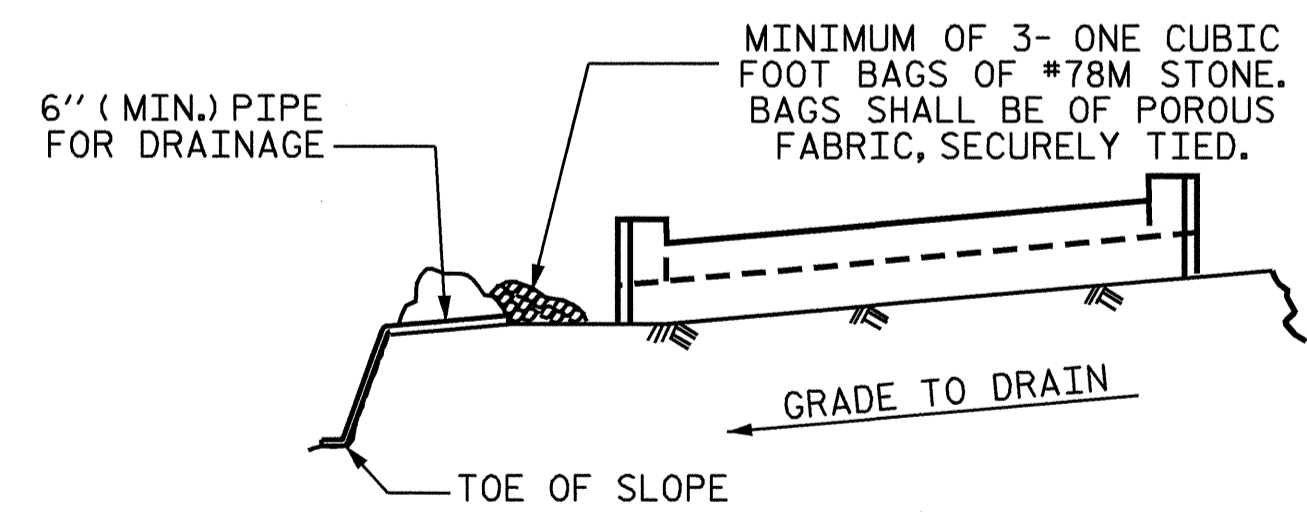
DETAIL A  
POSITION OF PILE DURING WELDING.  
DETAIL B  
PILE SPLICE DETAILS



SECTION A-A



SECTION B-B

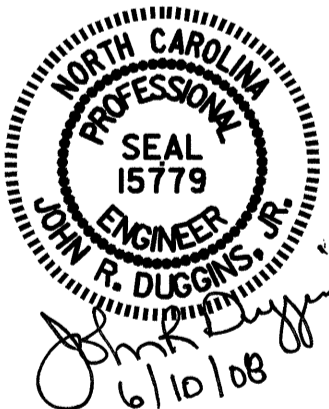


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TEMPORARY DRAINAGE AT END BENT



PROJECT NO. B-4193  
McDOWELL COUNTY  
 STATION: 12+25.50 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT No. 2

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

BILL OF MATERIAL

| BAR TYPES |     | END BENT No. 2 |      |        |        |
|-----------|-----|----------------|------|--------|--------|
| BAR NO.   | NO. | SIZE           | TYPE | LENGTH | WEIGHT |
| B1        | 8   | 9              | 1    | 28'-4" | 771    |
| B2        | 8   | 8              | STR  | 25'-2" | 134    |
| B3        | 4   | 4              | STR  | 24'-2" | 129    |
| B4        | 8   | 4              | 1    | 29'-7" | 805    |
| B5        | 4   | 4              | STR  | 29'-6" | 79     |
| B6        | 11  | 3              | STR  | 2'-8"  | 20     |
| B7        | 3   | 5              | STR  | 41'-5" | 130    |
| D1        | 20  | 8              | STR  | 2'-3"  | 120    |
| H1        | 1   | 4              | 4    | 18'-7" | 12     |
| H2        | 1   | 4              | STR  | 16'-9" | 11     |
| H3        | 1   | 4              | 4    | 13'-8" | 9      |
| H4        | 1   | 4              | 4    | 13'-3" | 9      |
| H5        | 1   | 4              | 4    | 14'-3" | 20     |
| H6        | 1   | 4              | 4    | 7'-0"  | 19     |
| H7        | 1   | 4              | STR  | 10'-0" | 7      |
| H8        | 1   | 4              | 4    | 9'-0"  | 6      |
| H9        | 1   | 4              | STR  | 7'-11" | 6      |
| H10       | 1   | 4              | 4    | 8'-3"  | 6      |
| H11       | 1   | 4              | 4    | 8'-3"  | 13     |
| H12       | 1   | 4              | 4    | 8'-4"  | 12     |
| H13       | 1   | 6              | 6    | 8'-3"  | 17     |
| H14       | 1   | 4              | STR  | 6'-3"  | 10     |
| H15       | 1   | 4              | STR  | 15'-8" | 6      |
| H16       | 1   | 4              | STR  | 14'-8" | 6      |
| H17       | 1   | 4              | STR  | 8'-8"  | 6      |
| H18       | 1   | 4              | STR  | 8'-4"  | 6      |
| H19       | 1   | 6              | STR  | 14'-6" | 22     |
| H20       | 1   | 6              | STR  | 8'-4"  | 13     |
| K1        | 8   | 4              | STR  | 25'-2" | 134    |
| S1        | 36  | 4              | 3    | 6'-11" | 166    |
| S2        | 36  | 4              | 3    | 3'-5"  | 82     |
| S3        | 33  | 4              | 3    | 4'-3"  | 94     |
| S4        | 33  | 4              | 3    | 4'-3"  | 47     |
| S5        | 19  | 4              | 3    | 5'-11" | 75     |
| S6        | 40  | 5              | 5    | 6'-6"  | 257    |
| S7        | 18  | 6              | 8    | 6'-6"  | 78     |
| S8        | 6   | 4              | 8    | 7'-9"  | 30     |
| U1        | 20  | 4              | 5    | 5'-8"  | 76     |
| U2        | 33  | 4              | 5    | 4'-8"  | 103    |
| U3        | 4   | 4              | 5    | 4'-11" | 13     |
| V1        | 66  | 4              | STR  | 3'-6"  | 154    |
| V2        | 20  | 4              | STR  | 5'-10" | 78     |
| V3        | 16  | 4              | STR  | 5'-3"  | 56     |

REINFORCING STEEL 3866 LBS.

CLASS A CONCRETE BREAKDOWN

|                                    |                  |
|------------------------------------|------------------|
| POUR 1 - CAP AND COPING            | 19.6 C.Y.        |
| POUR 2 - BACKWALL WINGS AND COPING | 5.5 C.Y.         |
| POUR 3 - LATERAL GUIDES            | 0.1 C.Y.         |
| <b>CLASS A CONCRETE TOTAL</b>      | <b>25.2 C.Y.</b> |

HP 12 x 53 GALVANIZED STEEL PILES

|       |               |
|-------|---------------|
| NO. 9 | 180 LIN. FEET |
|-------|---------------|

HP 14 x 73 GALVANIZED STEEL PILES

|       |              |
|-------|--------------|
| NO. 3 | 60 LIN. FEET |
|-------|--------------|

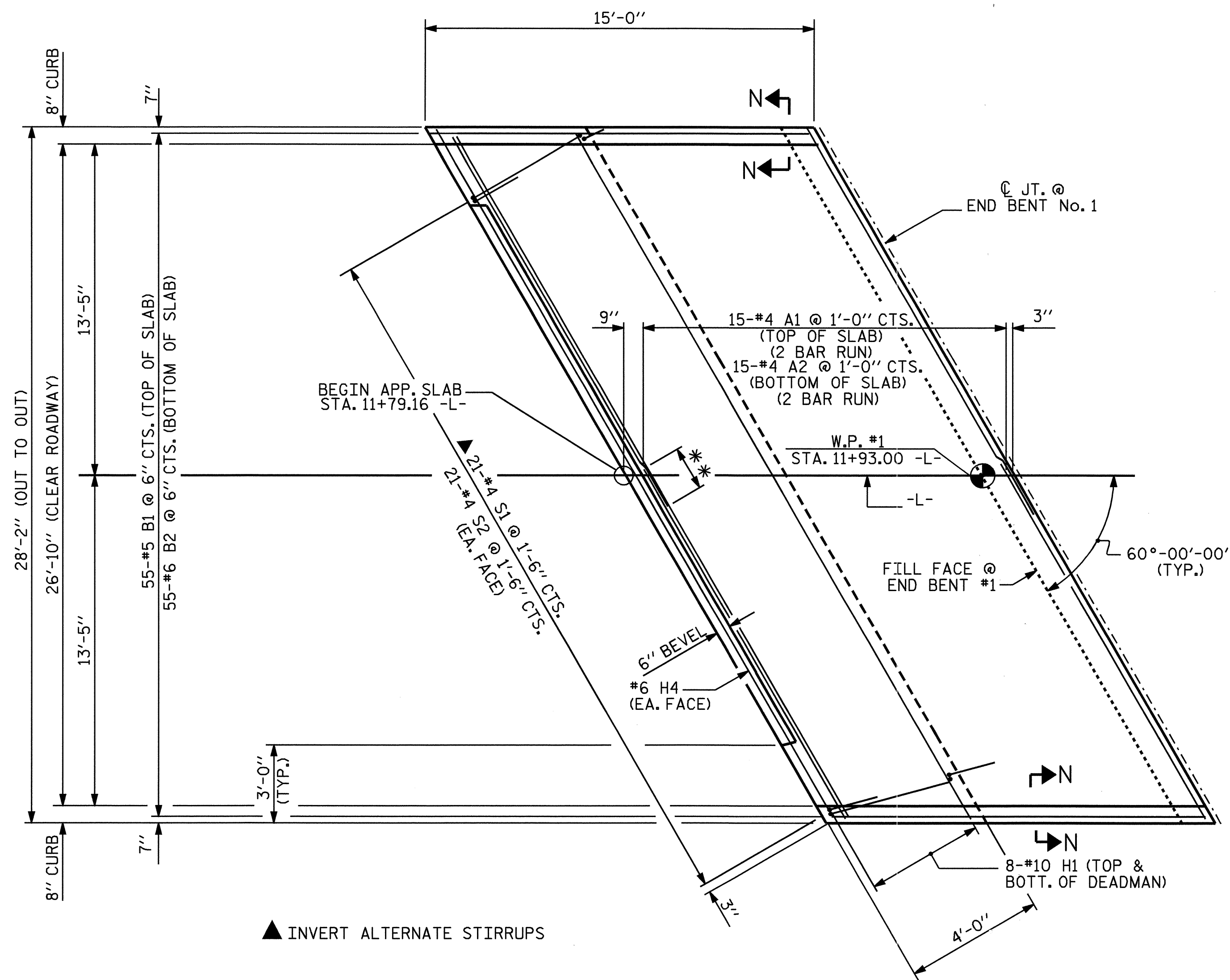
18" STEEL SHEET PILES

|                |  |
|----------------|--|
| NO. PS27.5 = 3 |  |
| NO. PZ27 = 39  |  |
| NO. PZ45 = 1   |  |

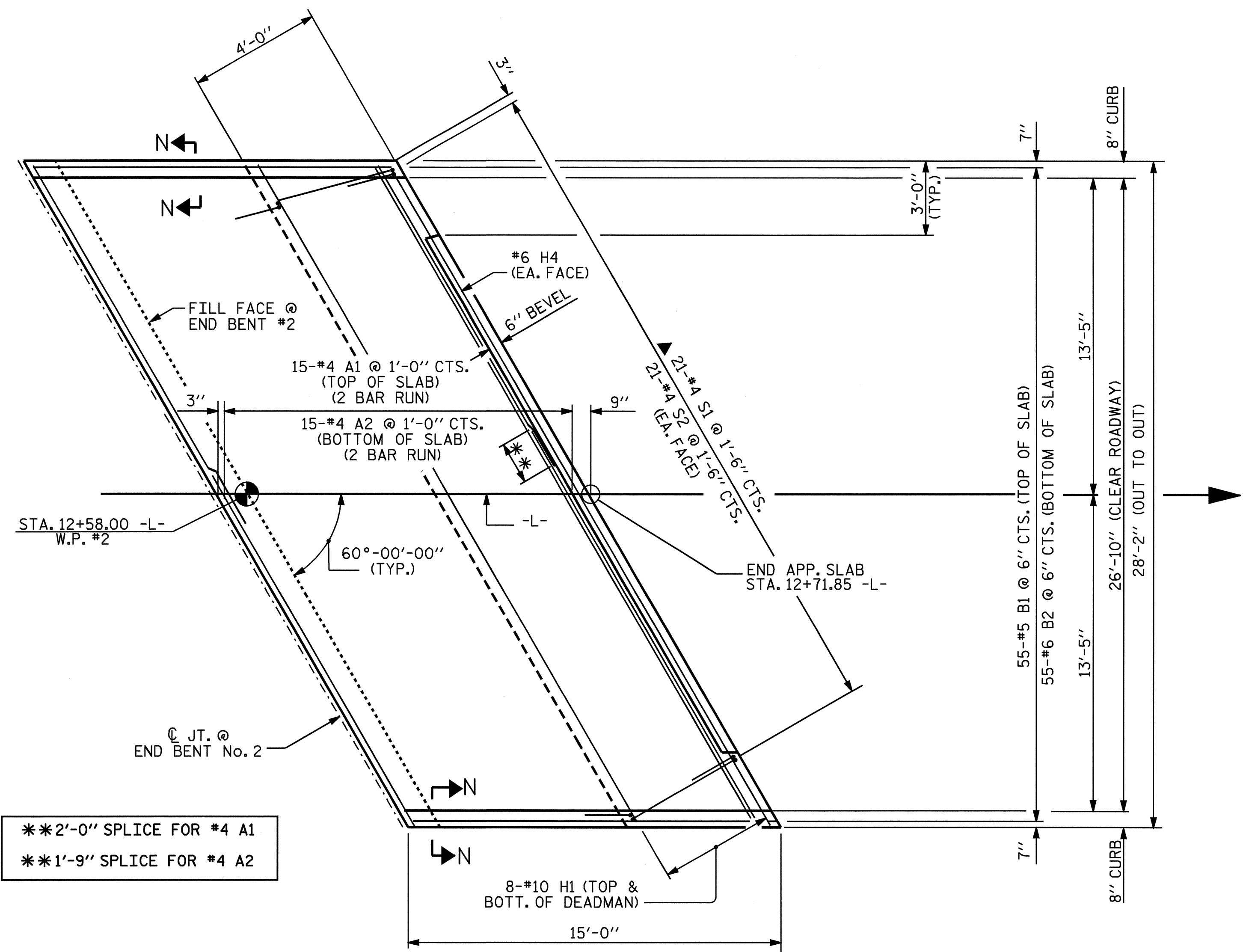
TOTAL NO. = 43 1410 SQ. FT.

DRAWN BY: M. POOLE DATE: 02-08  
 CHECKED BY: J.R. DUGGINS DATE: 02-08

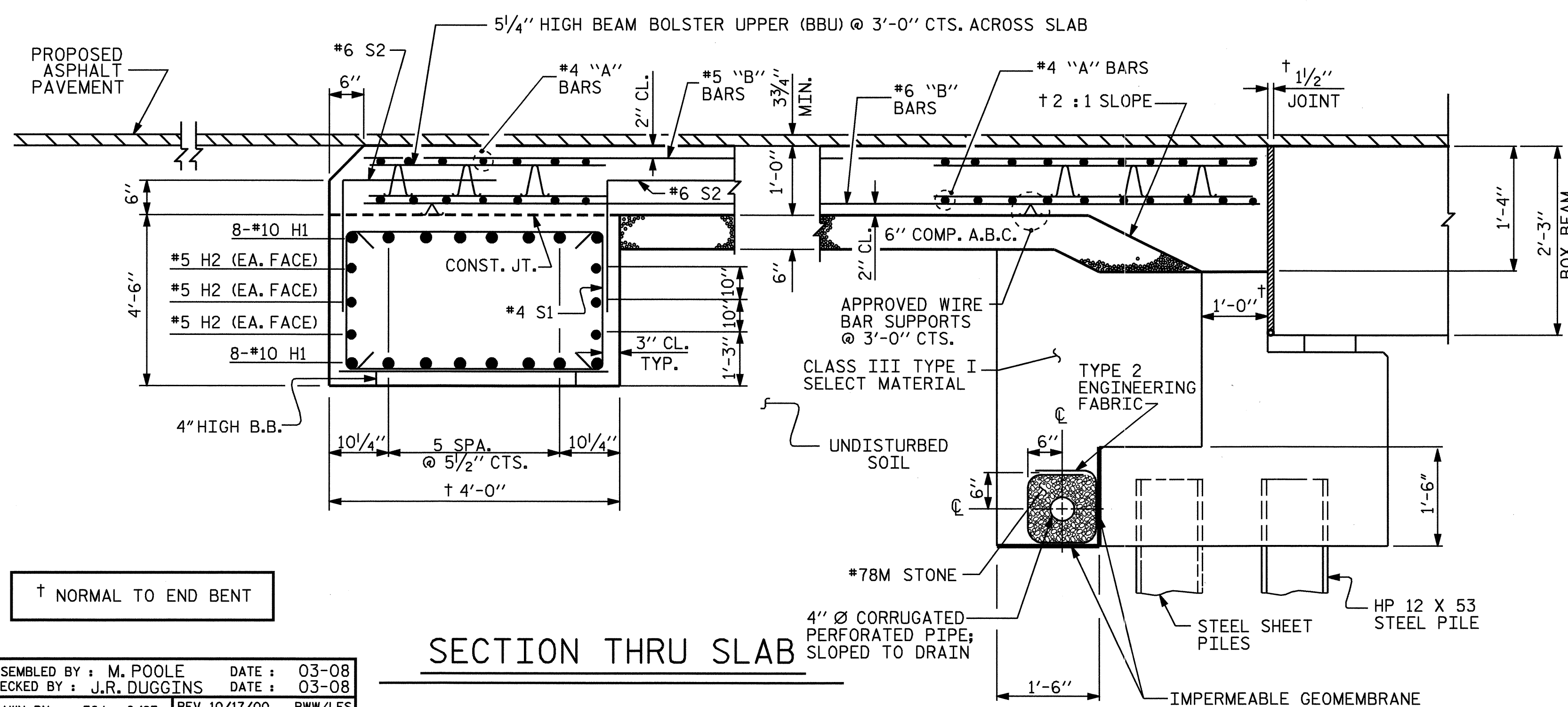




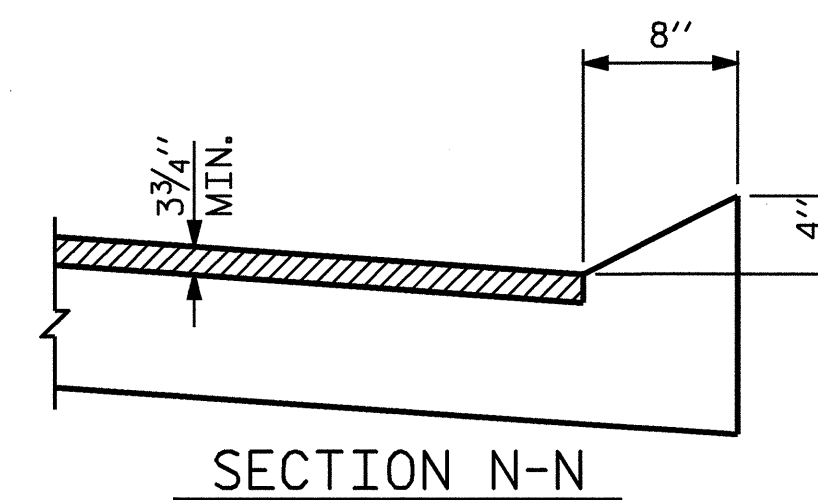
PLAN @ END BENT NO. 1



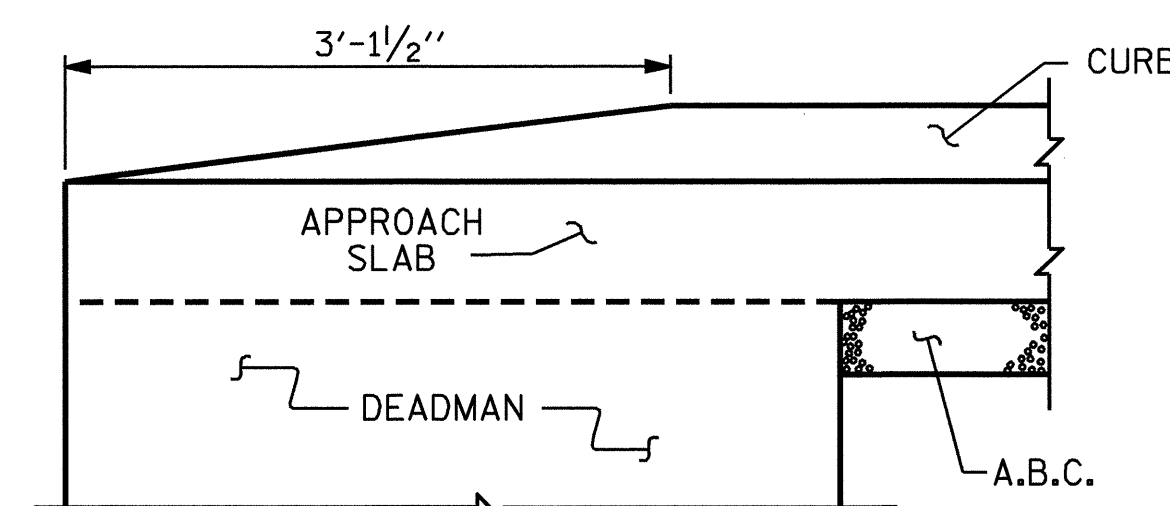
PLAN @ END BENT NO. 2



SECTION THRU SLAB



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER CURB DETAILS

PROJECT NO. B-4193  
MCDOWELL COUNTY  
 STATION: 12+25.50 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

BRIDGE APPROACH SLAB  
 FOR FLEXIBLE PAVEMENT



*John R. Duggins*  
 6/10/08

ASSEMBLED BY : M. POOLE DATE : 03-08  
 CHECKED BY : J.R. DUGGINS DATE : 03-08  
 DRAWN BY : FCJ 6/87 REV. 10/17/00 RWW/LES  
 CHECKED BY : EGA 6/87 REV. 7/10/01 LES/RDR  
 REV. 5/7/03R RWW/JTE

| REVISIONS |     |       |     |     |       | SHEET NO.    |  |
|-----------|-----|-------|-----|-----|-------|--------------|--|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | S-16         |  |
| 1         |     |       | 3   |     |       | TOTAL SHEETS |  |
| 2         |     |       | 4   |     |       | 17           |  |

**NOTES**

TEMPORARY DRAINAGE AND TEMPORARY BERM AND SLOPE DRAINS WILL BE PAID FOR UNDER THE LUMP SUM PRICE FOR BRIDGE APPROACH SLABS.

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

THE 6" COMP. A.B.C. SHALL EXTEND 1'-0" OUTSIDE OF EACH EDGE OF SLAB.

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

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

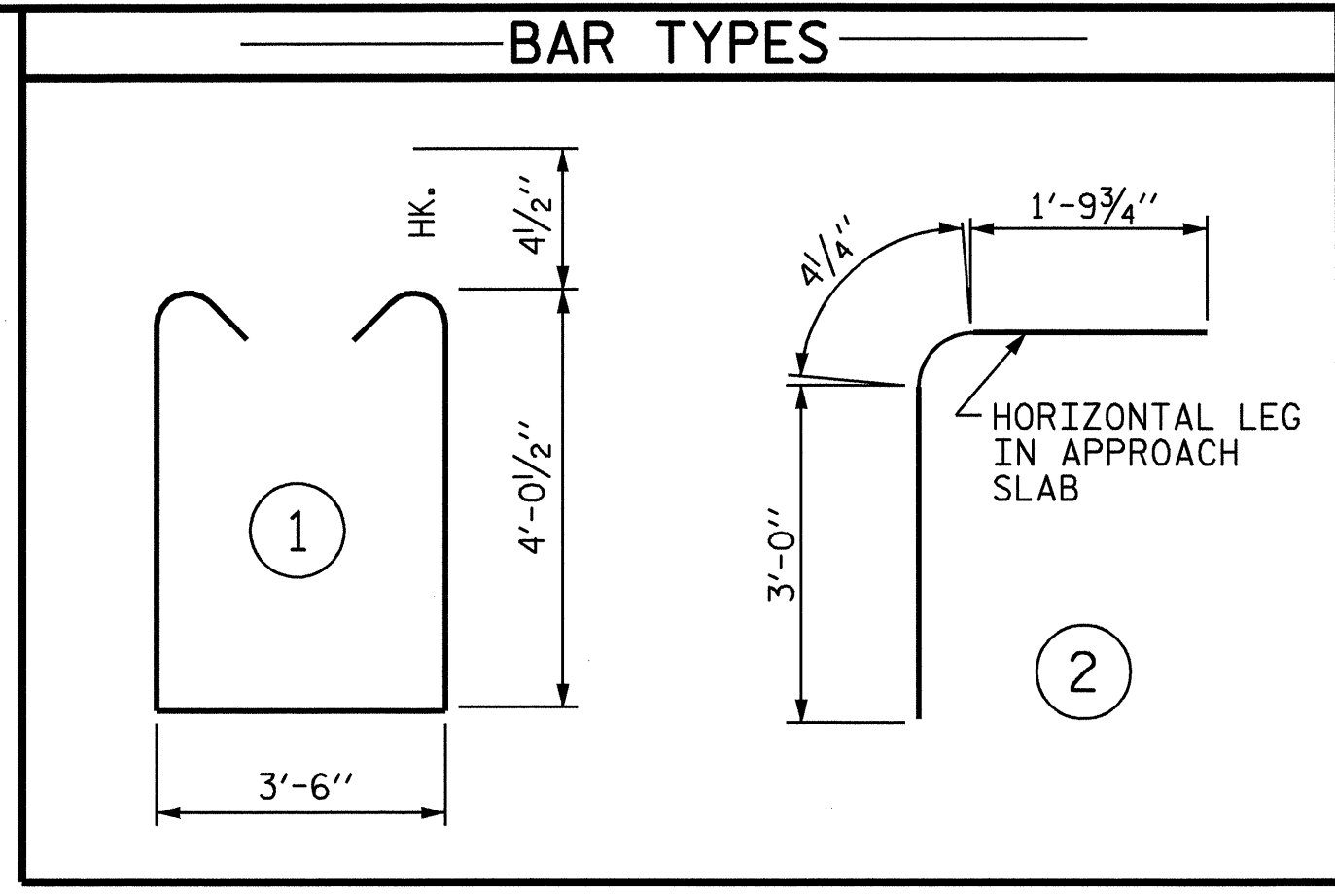
FOR JOINT DETAILS, SEE "PRESTRESSED CONCRETE BOX BEAM UNIT" SHEETS.

THE JOINT AT THE END BENT SHALL BE SEALED AS SOON AS PRACTICAL AFTER THE CONSTRUCTION OF THE APPROACH SLABS.

APPROACH SLAB GROOVING IS NOT REQUIRED.

CONCRETE AND REINFORCING STEEL IN DEADMAN TO BE PAID FOR UNDER LUMP SUM PRICE BID FOR BRIDGE APPROACH SLABS.

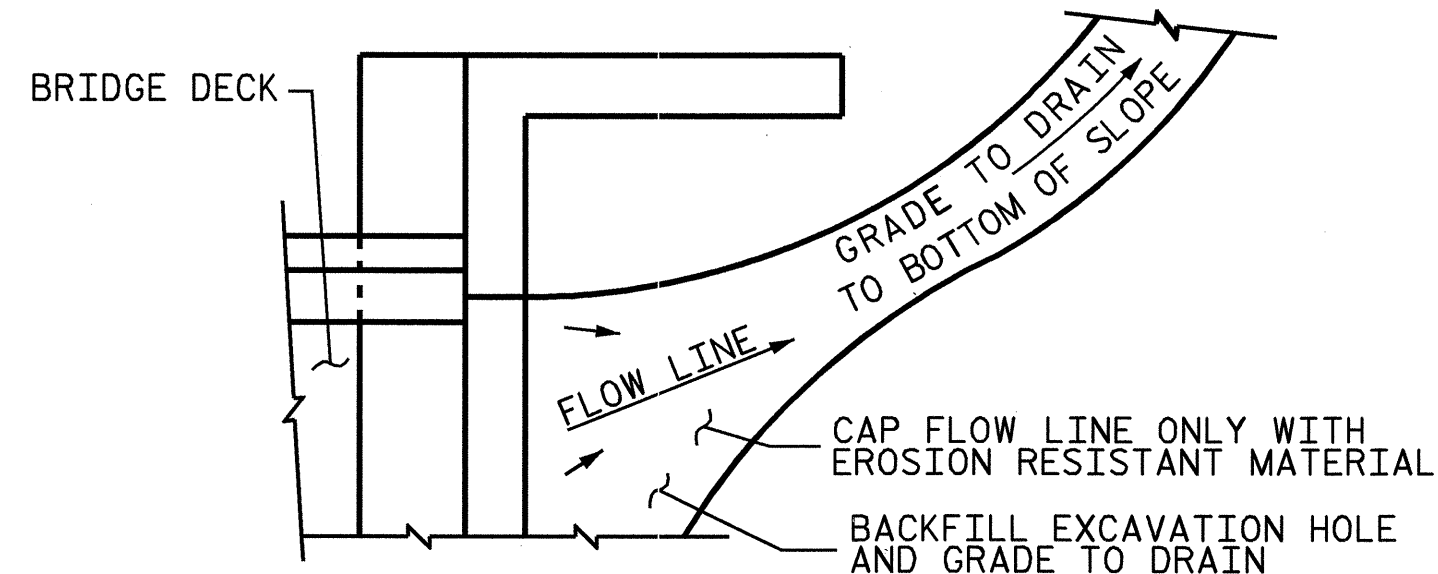
IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, TYPE 2 ENGINEERING FABRIC, SELECT MATERIAL, 6" COMP. A.B.C. & #78M STONE SHALL BE PAID FOR UNDER LUMP SUM PRICE BID FOR BRIDGE APPROACH SLABS.



ALL BAR DIMENSIONS ARE OUT TO OUT

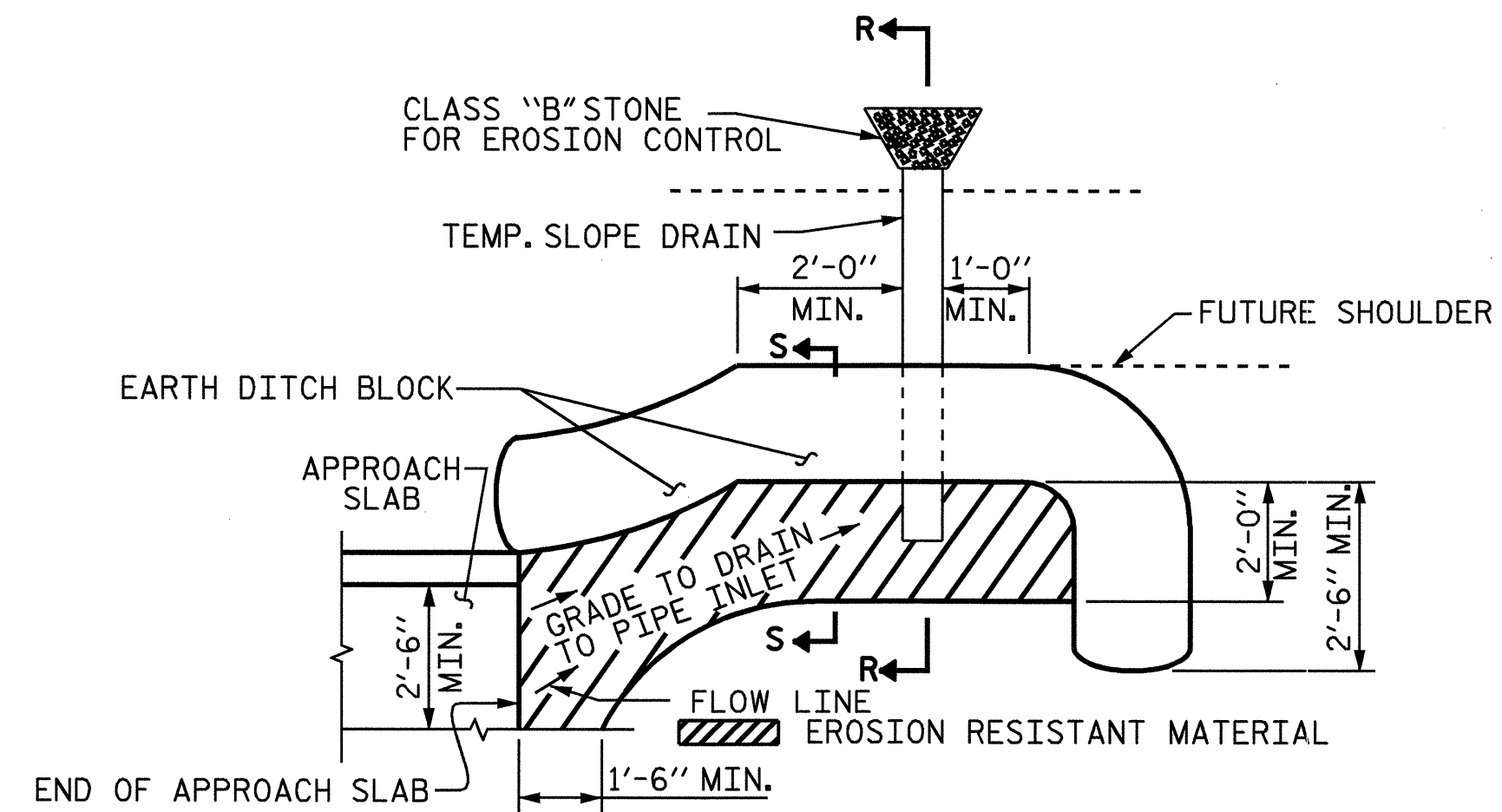
| BILL OF MATERIAL                |               |       |       |        |        |                                 |                                 |       |      |        |        |      |      |
|---------------------------------|---------------|-------|-------|--------|--------|---------------------------------|---------------------------------|-------|------|--------|--------|------|------|
| APPROACH SLAB AT END BENT No. 1 |               |       |       |        |        | APPROACH SLAB AT END BENT No. 2 |                                 |       |      |        |        |      |      |
| BAR                             | NO.           | SIZE  | TYPE  | LENGTH | WEIGHT | BAR                             | NO.                             | SIZE  | TYPE | LENGTH | WEIGHT |      |      |
| *A1                             | 30            | #4    | STR   | 17'-2" | 344    | *A1                             | 30                              | #4    | STR  | 17'-2" | 344    |      |      |
| A2                              | 30            | #4    | STR   | 17'-0" | 341    | A2                              | 30                              | #4    | STR  | 17'-0" | 341    |      |      |
| *B1                             | 55            | #5    | STR   | 14'-2" | 813    | *B1                             | 55                              | #5    | STR  | 14'-2" | 813    |      |      |
| B2                              | 55            | #6    | STR   | 14'-8" | 1212   | B2                              | 55                              | #6    | STR  | 14'-8" | 1212   |      |      |
| H1                              | 16            | #10   | STR   | 32'-2" | 2215   | H1                              | 16                              | #10   | STR  | 32'-2" | 2215   |      |      |
| H2                              | 6             | #5    | STR   | 32'-2" | 201    | H2                              | 6                               | #5    | STR  | 32'-2" | 201    |      |      |
| S1                              | 21            | #4    | 1     | 12'-4" | 173    | S1                              | 21                              | #4    | 1    | 12'-4" | 173    |      |      |
| S2                              | 42            | #6    | 2     | 4'-2"  | 263    | S2                              | 42                              | #6    | 2    | 4'-2"  | 263    |      |      |
| REINFORCING STEEL               |               |       |       |        | LBS.   | 4405                            | REINFORCING STEEL               |       |      |        |        | LBS. | 4405 |
| *EPOXY COATED REINFORCING STEEL |               |       |       |        | LBS.   | 1157                            | *EPOXY COATED REINFORCING STEEL |       |      |        |        | LBS. | 1157 |
| CLASS AA CONCRETE BREAKDOWN     |               |       |       |        |        | CLASS AA CONCRETE BREAKDOWN     |                                 |       |      |        |        |      |      |
| POUR 1                          | DEADMAN       | C. Y. | 21.8  |        |        | POUR 1                          | DEADMAN                         | C. Y. | 21.8 |        |        |      |      |
| POUR 2                          | APPROACH SLAB | C. Y. | 18.9  |        |        | POUR 2                          | APPROACH SLAB                   | C. Y. | 18.9 |        |        |      |      |
| TOTAL CLASS AA CONCRETE         |               |       | C. Y. | 40.7   |        |                                 | TOTAL CLASS AA CONCRETE         |       |      | C. Y.  | 40.7   |      |      |

\* THESE BARS ARE EPOXY COATED



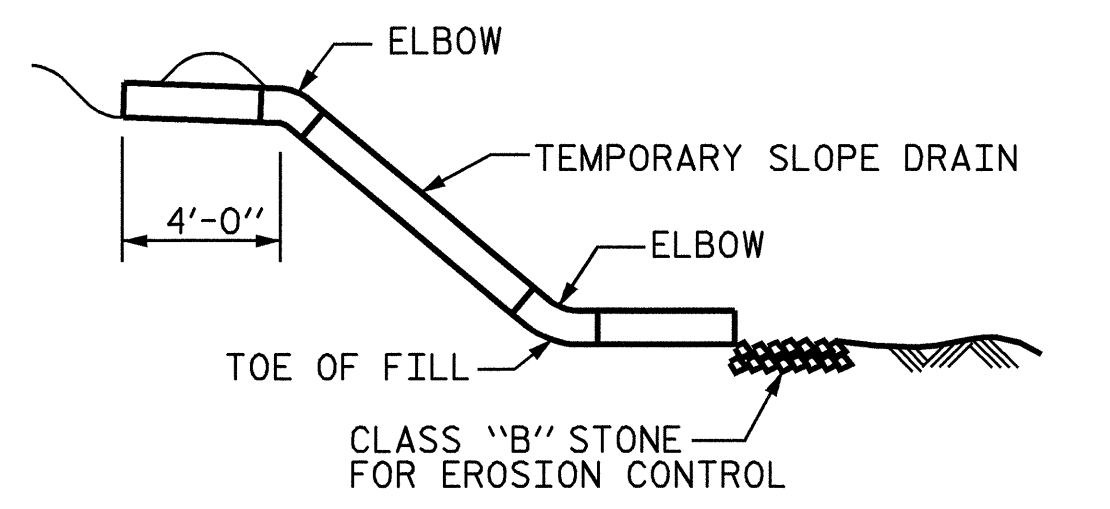
IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT TO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

TEMPORARY DRAINAGE DETAIL

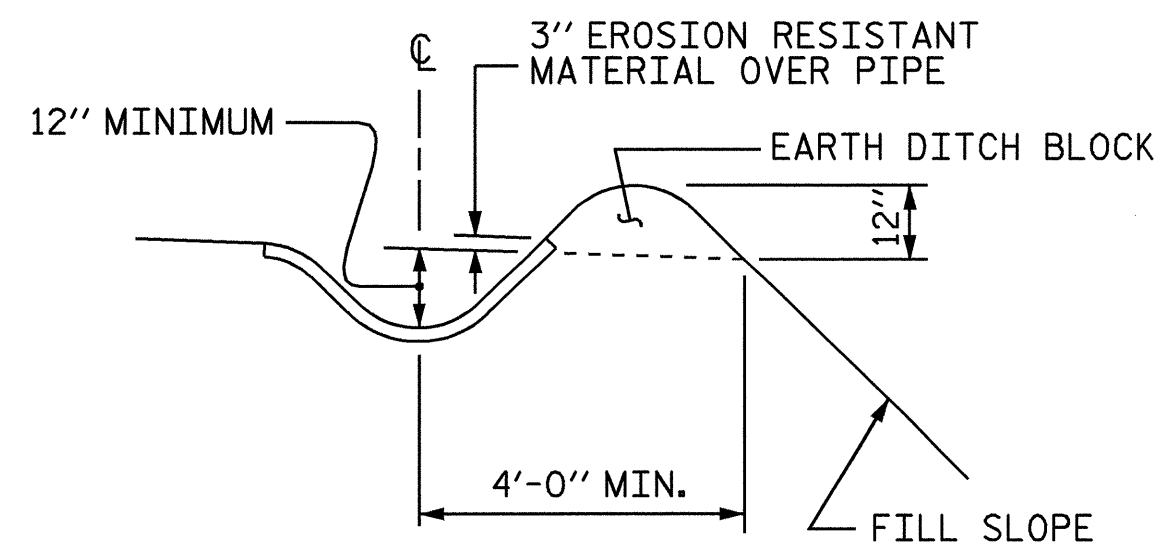


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

PLAN VIEW



SECTION R-R



SECTION S-S

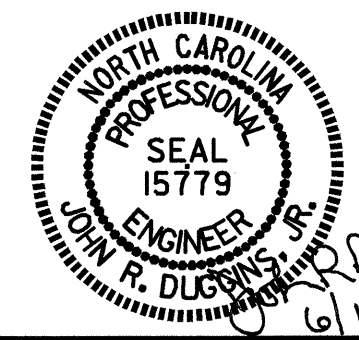
**TEMPORARY BERM AND SLOPE DRAIN DETAILS**

PROJECT NO. B-4193  
McDOWELL COUNTY  
 STATION: 12+25.50 -L-

SHEET 2 OF 2

|  |     |       |     |     |           |
|--|-----|-------|-----|-----|-----------|
| STATE OF NORTH CAROLINA<br>DEPARTMENT OF TRANSPORTATION<br>RALEIGH |     |       |     |     |           |
| BRIDGE APPROACH<br>SLAB DETAILS                                    |     |       |     |     |           |
| REVISIONS  |     |       |     |     | SHEET NO. |
| NO.  | BY: | DATE: | NO. | BY: | DATE:     |
| 1  |     |       | 3   |     |           |
| 2  |     |       | 4   |     |           |
| TOTAL SHEETS   |     |       |     |     | 17        |

|                |              |               |         |
|----------------|--------------|---------------|---------|
| ASSEMBLED BY : | M. POOLE     | DATE :        | 03-08   |
| CHECKED BY :   | J.R. DUGGINS | DATE :        | 03-08   |
| DRAWN BY :     | FCJ 11/88    | REV. 8/16/99  | MAB/LES |
| CHECKED BY :   | ARB 11/88    | REV. 10/17/00 | RWW/LES |
|                |              | REV. 5/7/03   | RWW/JTE |



## 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 2002 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; CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP; AND CLASS S SHALL BE USED FOR UNDERWATER FOOTING SEALS.

### 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 WITH THE EXCEPTION OF #2 BARS WHICH MAY BE FABRICATED FROM COLD DRAWN STEEL WIRE. 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.

PLACEMENT OF BEAM OR GIRDER MEMBERS ON TRUCKS FOR HAULING SHALL BE DONE IN COMPLIANCE WITH LIMITS SHOWN ON SKETCHES PROVIDED TO THE MATERIALS AND TEST UNIT APPROVED BY THE STRUCTURE DESIGN UNIT DATED MAY 8, 1991. THESE SKETCHES PRIMARILY LIMIT THE UNSUPPORTED CANTILEVER LENGTH OF MEMBERS. WHEN THE CONTRACTOR WISHES TO PLACE MEMBERS ON TRUCKS NOT IN ACCORDANCE WITH THESE LIMITS, TO SHIP BY RAIL, TO ATTACH SHIPPING RESTRAINTS TO THE MEMBERS OR TO INVERT MEMBERS, HE SHALL SUBMIT A SKETCH FOR APPROVAL PRIOR TO SHIPPING. SEE ALSO ARTICLE 1072-11.

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

### HANDRAILS AND POSTS:

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

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

### SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN