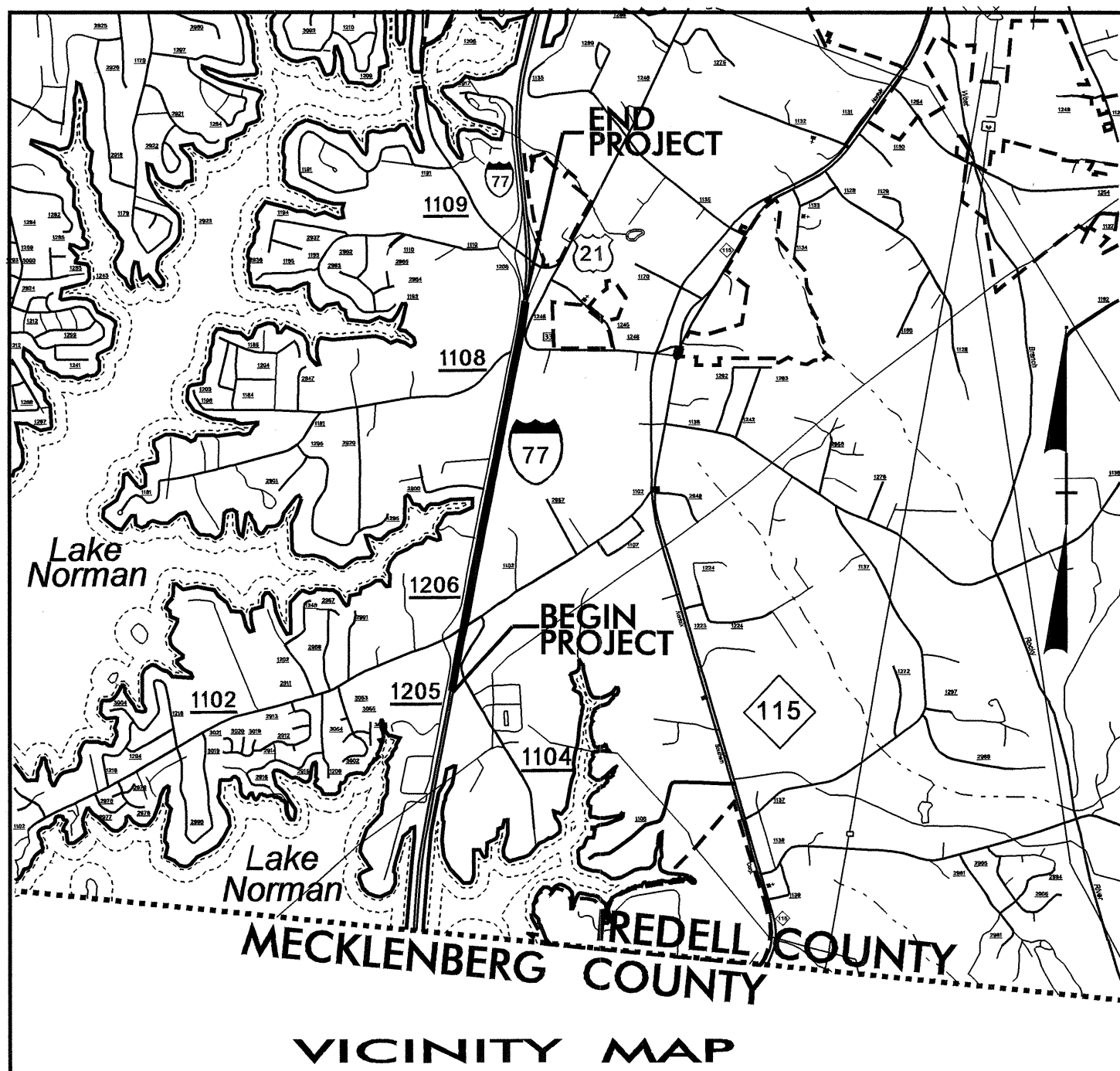


CONTRACT: C201208 TIP PROJECT I-4411



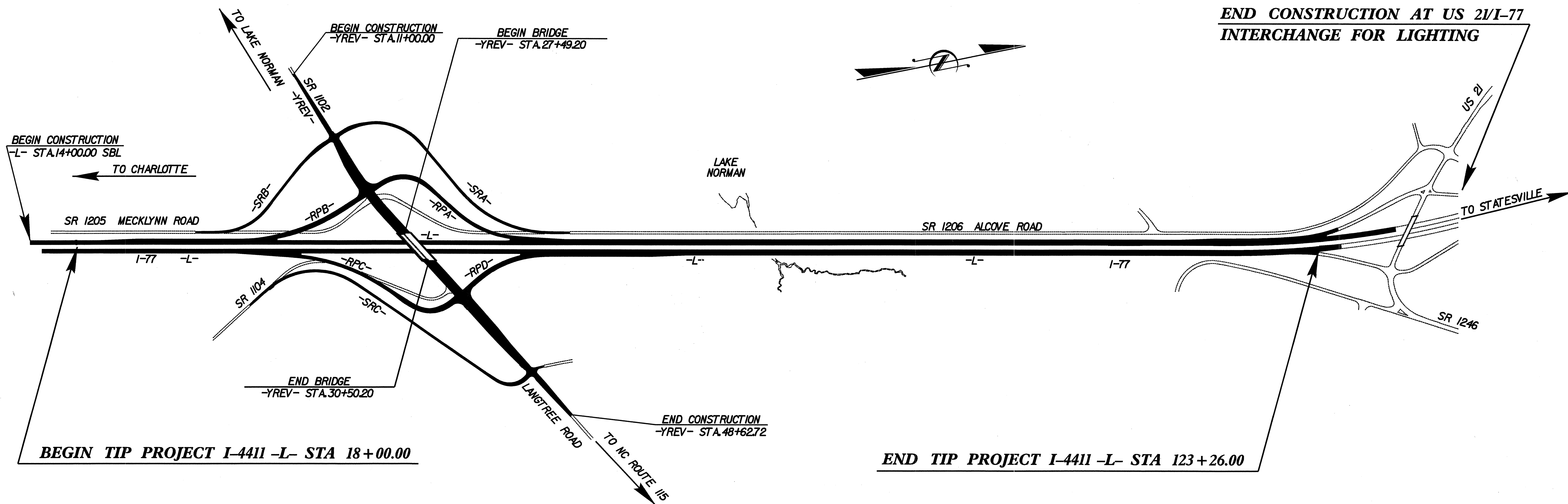
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
IREDELL COUNTY

**LOCATION: PROPOSED INTERCHANGE AT EXISTING
I-77 AND SR 1102 GRADE SEPARATION**

**TYPE OF WORK: GRADING, PAVING, DRAINAGE, LIGHTING,
SIGNING, STRUCTURE, AND SIGNALS**

| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|-----------------|-----------------------------|-------------|--------------|
| N.C. | I-4411 | | |
| STATE PROJ. NO. | F.A. PROJ. NO. | DESCRIPTION | |
| 35604.1.1 | | PE | |
| 35604.2.1 | | R/W, UTL. | |
| 35604.3.1 | | CONST. | |
| | | | |
| | | | |

STRUCTURES



**END CONSTRUCTION AT US 21/I-77
INTERCHANGE FOR LIGHTING**



DESIGN DATA

| | |
|------------|----------|
| ADT 2008 = | 85,100 |
| ADT 2025 = | 115,600 |
| DHV = | 11 % |
| D = | 60 % |
| T = | 29 %* |
| V = | 70 MPH |
| * TTST 21% | DUAL 8 % |

FUNCTIONAL CLASSIFICATION
RURAL PRINCIPAL ARTERIAL - INTERSTATE

PROJECT LENGTH

| | |
|---|---------------|
| TOTAL LENGTH OF ROADWAY TIP PROJECT I-4411 | = 1.994 MILES |
|---|---------------|

Prepared In the Office of:
DIVISION OF HIGHWAYS
2002 STANDARD SPECIFICATIONS

| | |
|------------------------------------|---|
| LETTING DATE : January 16, 2007 | B.S. COX, PE PROJECT ENGINEER |
| | T.J. BEACH, PE PROJECT DESIGN ENGINEER |

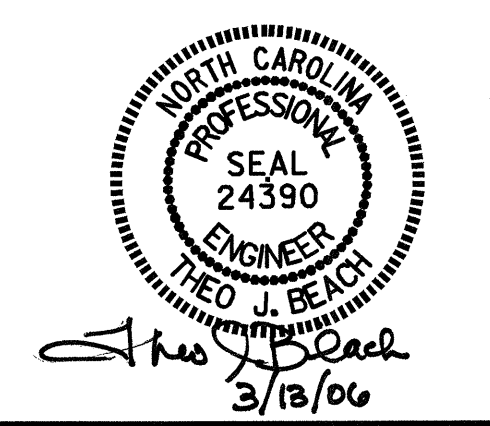
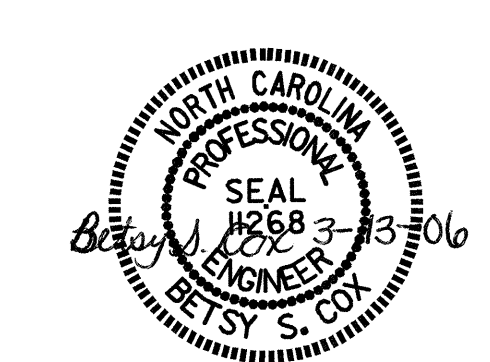
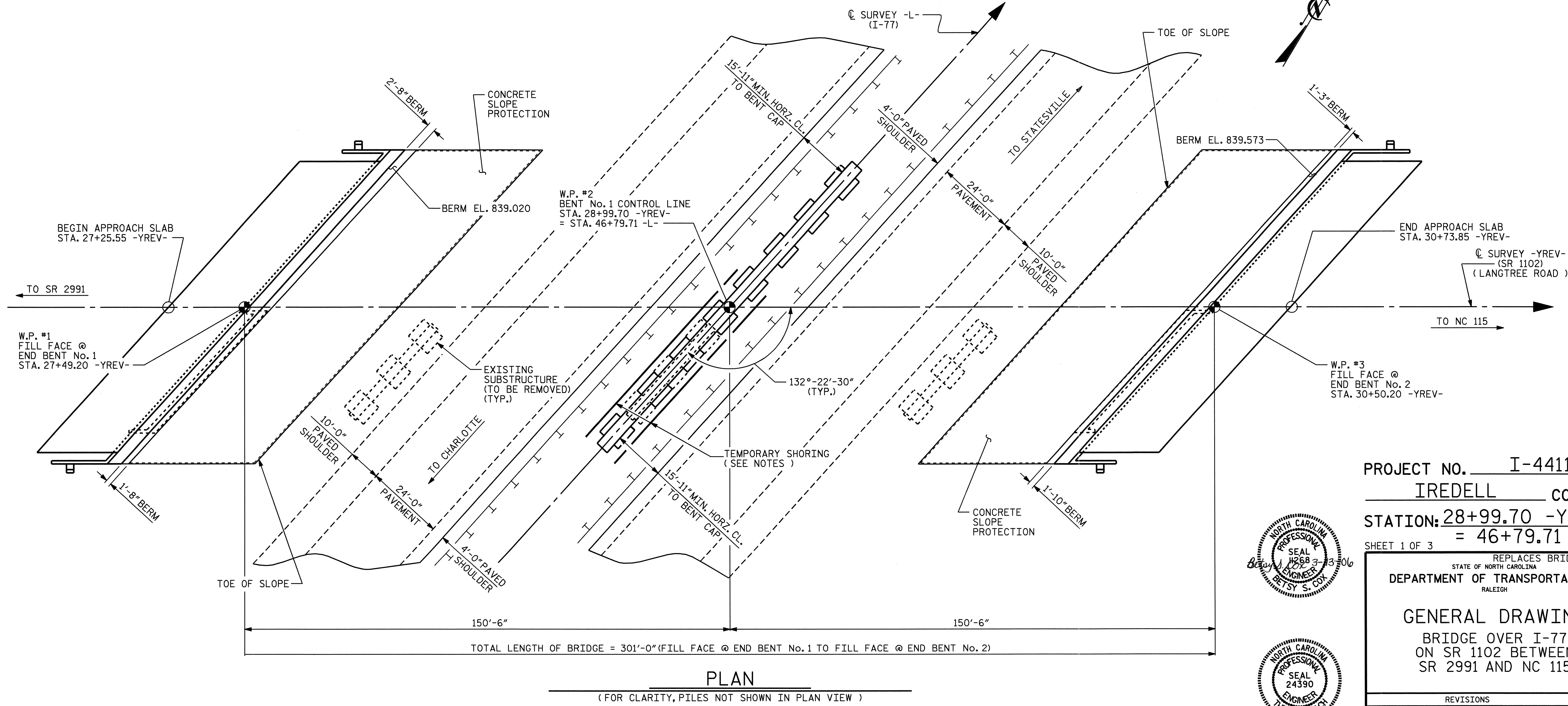
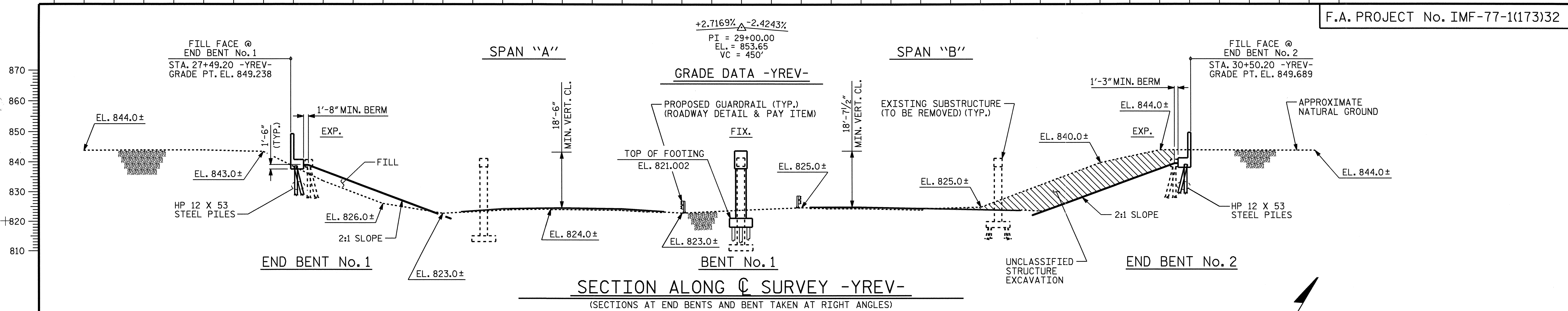
STRUCTURE DESIGN UNIT
1000 BIRCH RIDGE DR.
RALEIGH, N.C. 27610

Gregory R. Perfetti
6.24.05

**DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA**

P.E.
STATE DESIGN ENGINEER
**DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION**

APPROVED _____ DATE _____
DIVISION ADMINISTRATOR

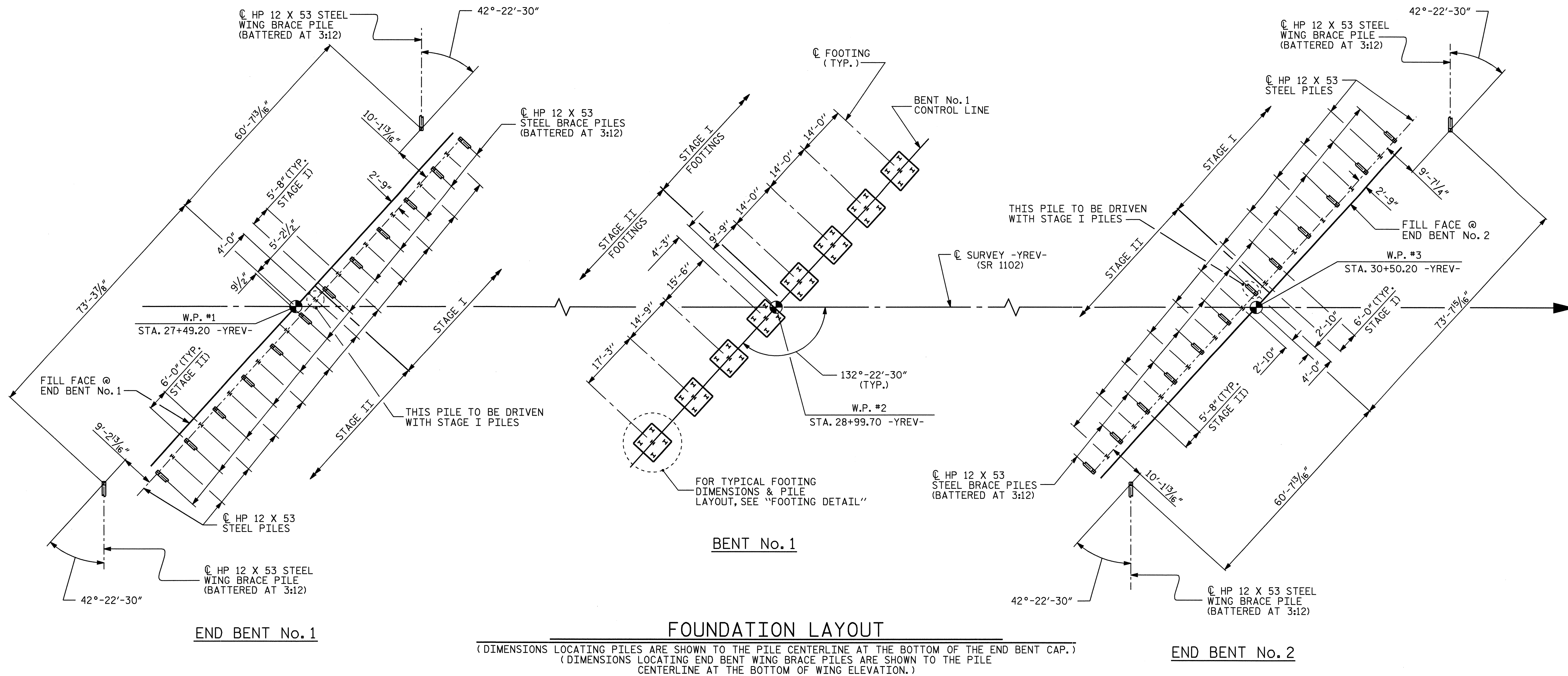


PROJECT NO. I-4411
IREDELL COUNTY
 STATION: 28+99.70 -YREV-
 = 46+79.71 -L-
 SHEET 1 OF 3

REPLACES BRIDGE No. 28
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 BRIDGE OVER I-77
 ON SR 1102 BETWEEN
 SR 2991 AND NC 115

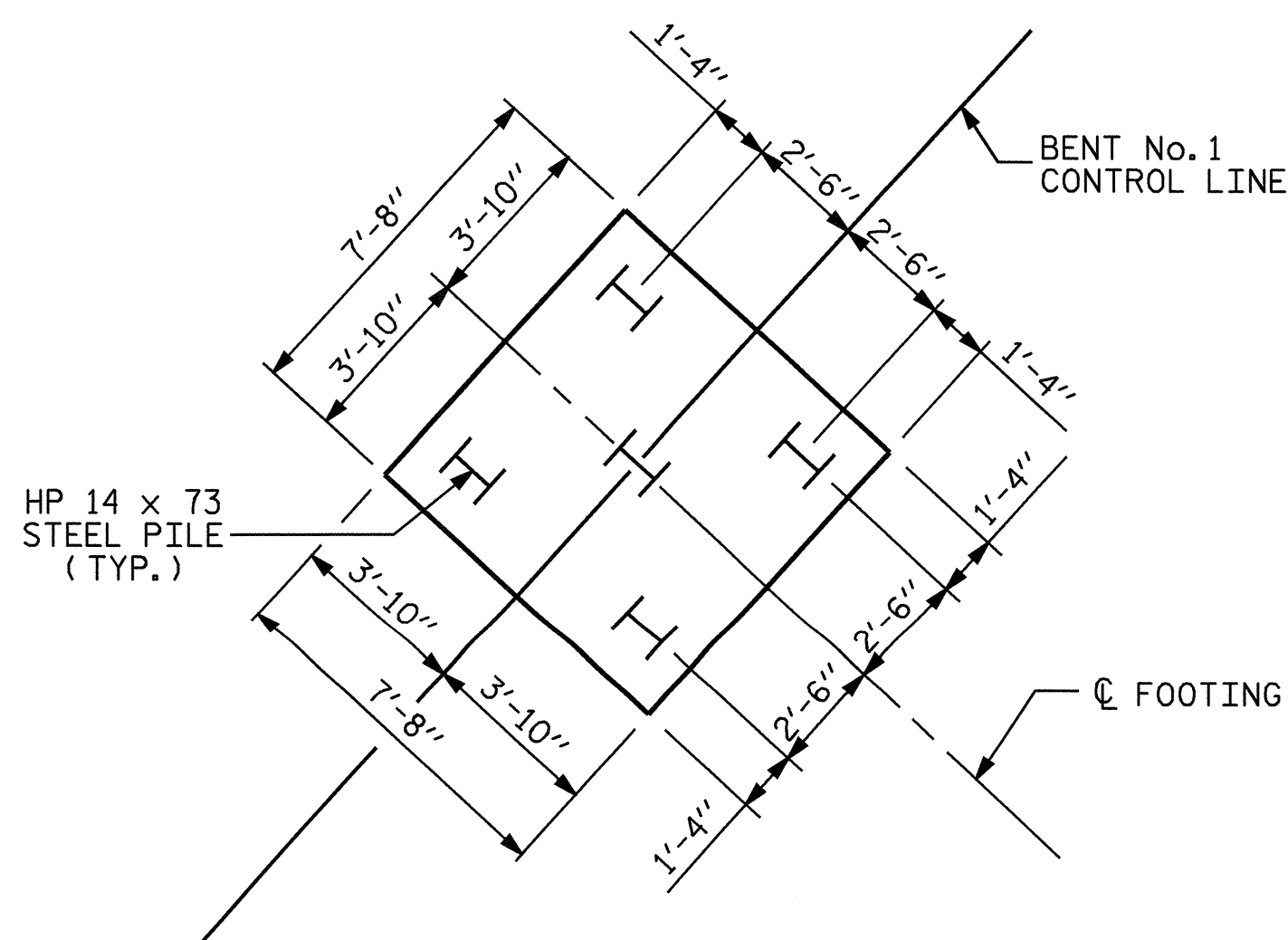
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|-----------|-----|-------|-----|-----|-------|--------------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | |
| 1 | | | 3 | | | TOTAL SHEETS 42 |
| 2 | | | 4 | | | |

DRAWN BY : P.C. BREWER DATE : 2/11/05
 CHECKED BY : M. BRITT DATE : 3/4/05



FOUNDATION LAYOUT

(DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE AT THE BOTTOM OF THE END BENT CAP.)
 (DIMENSIONS LOCATING END BENT WING BRACE PILES ARE SHOWN TO THE PILE CENTERLINE AT THE BOTTOM OF WING ELEVATION.)

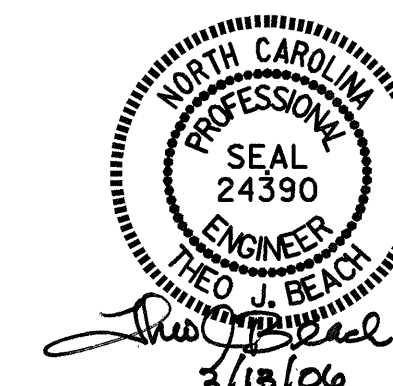


FOOTING DETAIL

(DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE AT THE BOTTOM OF THE FOOTING.)

NOTES:

- DRIVE PILES AT BENT No.1 TO A MINIMUM BEARING CAPACITY OF 100 TONS EACH.
- DRIVE PILES AT END BENT No.1 AND END BENT No.2 TO A MINIMUM BEARING CAPACITY OF 60 TONS EACH.
- STEEL PILE POINTS ARE REQUIRED FOR STEEL PILES AT BENT No.1. SEE STEEL PILE POINTS SPECIAL PROVISION.
- WHEN DRIVING PILES, DO NOT EXCEED THE MAXIMUM BLOW COUNT.
- TESTING PILES WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING OR REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. SEE PILE DRIVING ANALYZER SPECIAL PROVISION.
- IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 35,000 TO 60,000 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT BENT No.1. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM ARTICLE 450-6 OF THE STANDARD SPECIFICATIONS.
- THE CONTRACTOR MUST OBSERVE A 1 MONTH WAITING PERIOD BEFORE BEGINNING ANY WORK FOR THE END BENT CONSTRUCTION AFTER COMPLETION OF THE EMBANKMENT AT EACH END BENT.
- FOR STEEL H PILES, SEE SPECIAL PROVISIONS.
- NOTES CONTINUED ON SHEET 3 OF 3.



PROJECT NO. I-4411
IREDELL COUNTY
 STATION: 46+79.71 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 BRIDGE OVER I-77
 ON SR 1102 BETWEEN
 SR 2991 AND NC 115

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-2 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 42 |

DRAWN BY: P.C. BREWER DATE: 2/11/05
 CHECKED BY: M. BRITT DATE: 3/10/05

TOTAL BILL OF MATERIAL

| | REMOVAL OF EXISTING STRUCTURE | FOUNDATION EXCAVATION | UNCLASSIFIED STRUCTURE EXCAVATION | REINFORCED CONCRETE DECK SLAB | GROOVING BRIDGE FLOORS | CLASS A CONCRETE | BRIDGE APPROACH SLABS | REINFORCING STEEL | SPIRAL COLUMN REINFORCING STEEL | STRUCTURAL STEEL | HP 12 x 53 STEEL PILES | HP 14 x 73 STEEL PILES | STEEL PILE POINTS | TWO BAR METAL RAIL | 1'-2" X 2'-6" CONCRETE PARAPET | 4" SLOPE PROTECTION | POT BEARINGS | ELASTOMERIC BEARINGS | EVAZOTE JOINT SEALS | PDA TESTING | PDA ASSISTANCE | | |
|----------------|-------------------------------|-----------------------|-----------------------------------|-------------------------------|------------------------|------------------|-----------------------|-------------------|---------------------------------|------------------|------------------------|------------------------|-------------------|--------------------|--------------------------------|---------------------|--------------|----------------------|---------------------|-------------|----------------|------|---|
| | LUMP SUM | LUMP SUM | CU. YDS. | SQ. FT. | SQ. FT. | CU. YDS. | LUMP SUM | LBS. | LBS. | APPROX. LBS. | No. | LIN. FT. | No. | LIN. FT. | EACH | LIN. FT. | SQ. YDS. | LUMP SUM | LUMP SUM | LUMP SUM | EACH | EACH | |
| SUPERSTRUCTURE | | | | 27,010 | 31,794 | | LUMP SUM | | | 889,800 | | | | 579.0 | 596.36 | | LUMP SUM | LUMP SUM | LUMP SUM | | | | |
| END BENT No. 1 | | | | | | 128.6 | | 16,258 | | | 25 | 1500.0 | | | | 585 | | | | | | | |
| BENT No. 1 | | LUMP SUM | | | | 198.0 | | 27,083 | 3,726 | | | 40 | 1,400 | 40 | | | | | | | | | |
| END BENT No. 2 | | | 1,763 | | | 126.8 | | 16,234 | | | 25 | 1375.0 | | | | 610 | | | | | | | |
| TOTAL | LUMP SUM | LUMP SUM | 1,763 | 27,010 | 31,794 | 453.4 | LUMP SUM | 59,575 | 3,726 | 889,800 | 50 | 2875.0 | 40 | 1,400 | 40 | 579.0 | 596.36 | 1,195 | LUMP SUM | LUMP SUM | LUMP SUM | 1 | 1 |

NOTES: (CONTINUED FROM SHEET 2 OF 3)

ASSUMED LIVE LOAD = HS 20 OR ALTERNATE LOADING.

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

THIS BRIDGE HAS BEEN DESIGNED BY THE STRENGTH DESIGN METHOD AS SPECIFIED IN AASHTO STANDARD SPECIFICATIONS.

STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W OR GRADE HPS 70W OR GRADE HPS 100W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-7 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS. SEE "STRUCTURAL STEEL DETAILS" SHEETS.

FOR HIGH PERFORMANCE STEEL, SEE SPECIAL PROVISIONS.

AFTER SERVING AS A TEMPORARY STRUCTURE THE EXISTING STRUCTURE CONSISTING OF 4 SPANS, 1 AT 60'-0", 2 AT 86'-0", AND 1 AT 60'-0", WITH A CLEAR ROADWAY WIDTH OF 30'-0" CONSISTING OF REINFORCED CONCRETE DECK ON STEEL BEAMS AND SUBSTRUCTURE CONSISTING OF REINFORCED CONCRETE CAP ON CONCRETE PILES AT END BENTS, REINFORCED CONCRETE POST AND BEAM ON SPREAD FOOTING AT INTERIOR BENTS No. 1 AND No. 2, AND REINFORCED CONCRETE POST AND BEAM ON PILE FOOTING AT INTERIOR BENT No. 3 AND LOCATED AT THE SITE OF THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT. SEE SPECIAL PROVISION FOR REMOVAL OF EXISTING STRUCTURE.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

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

REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.

THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS/DOWELS IN PLACE OF ANCHOR BOLTS/DOWELS. SEE SPECIAL PROVISION FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS.

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

FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 55 FT. LEFT AND 55 FT. RIGHT OF CENTERLINE PROPOSED ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE MEASURED AND PAID FOR AS UNCLASSIFIED STRUCTURE EXCAVATION.

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 A.

FOR FALSEWORK AND FORMS OVER OR ADJACENT TO TRAFFIC, SEE SPECIAL PROVISIONS.

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."

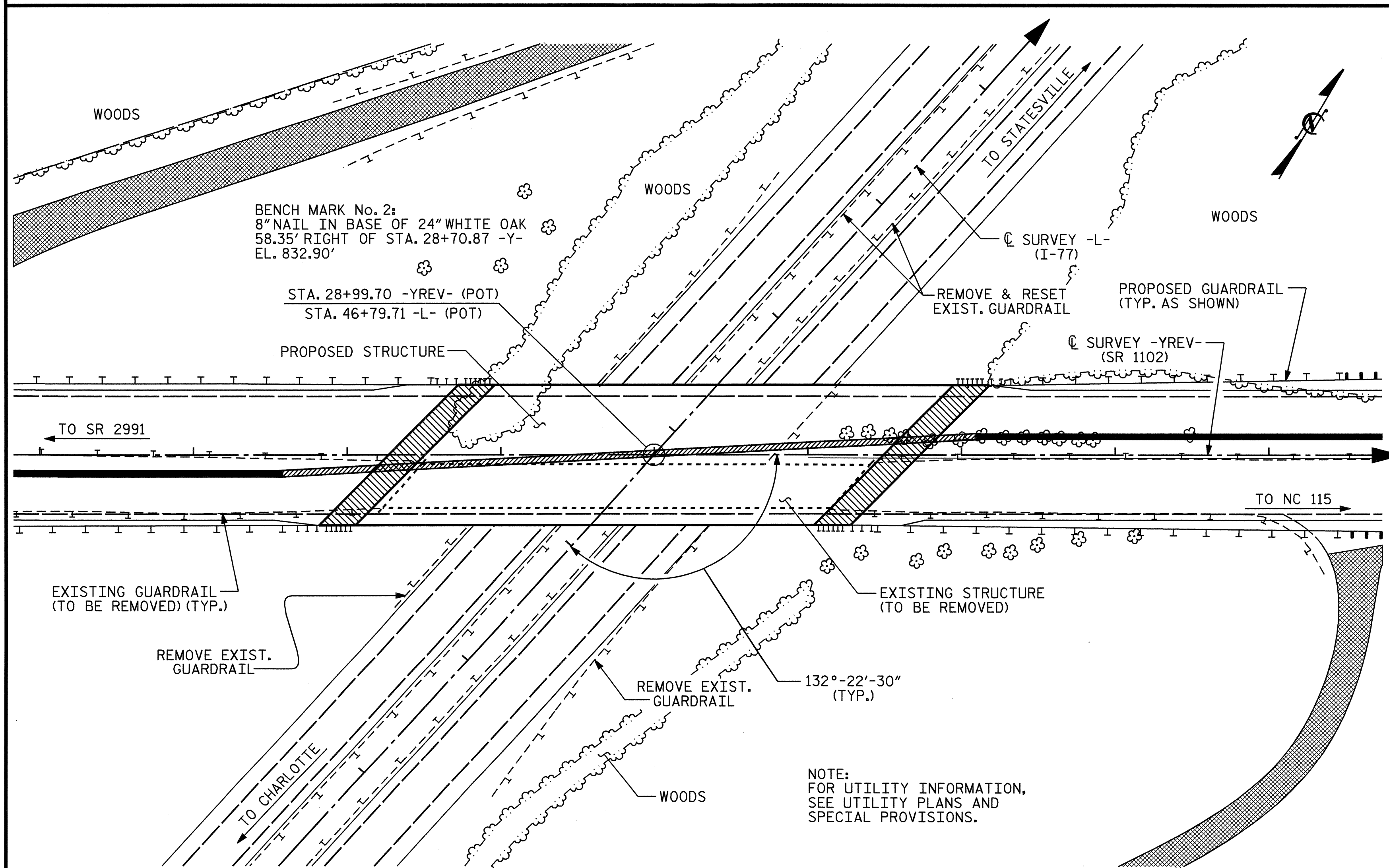
THE USE OF NEEDLE BEAMS TO SUPPORT THE DECK SLAB WILL ONLY BE ALLOWED IN THE ACUTE CORNERS OF THE SLAB.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

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



LOCATION SKETCH

DRAWN BY : P.C. BREWER DATE : 2/11/05
 CHECKED BY : M. BRITT DATE : 3/11/05

09-MAR-2006 14:59
 R:\Structures\I4411\str1\pbrewer\Microstation\I4411.sd.00.01.dgn
 MBRITT

PROJECT NO. I-4411
IREDELL COUNTY
 STATION: 46+79.71 -L-

SHEET 3 OF 3

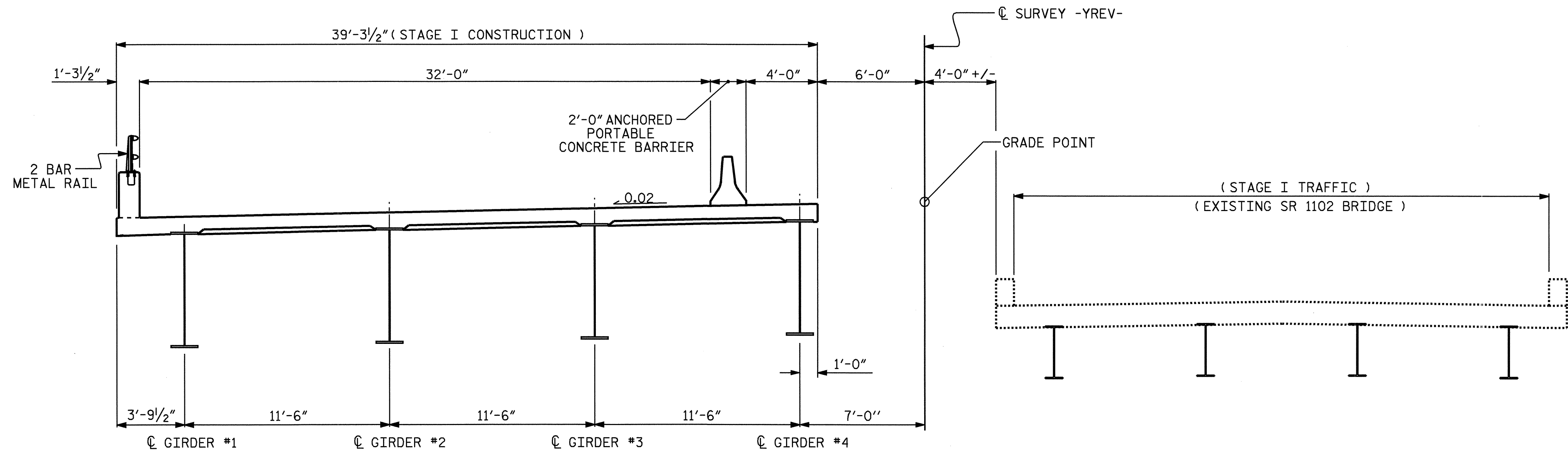
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING

BRIDGE OVER I-77
 ON SR 2991 AND NC 115

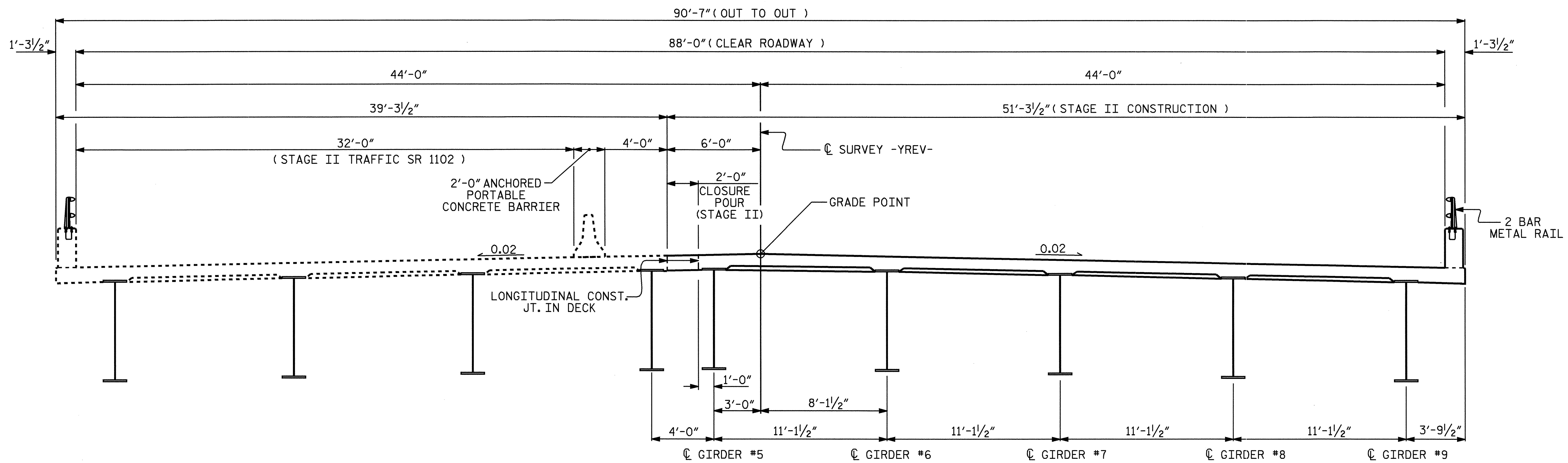


| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|-----------------|
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| 1 | | | 3 | | | TOTAL SHEETS 42 |
| 2 | | | 4 | | | |



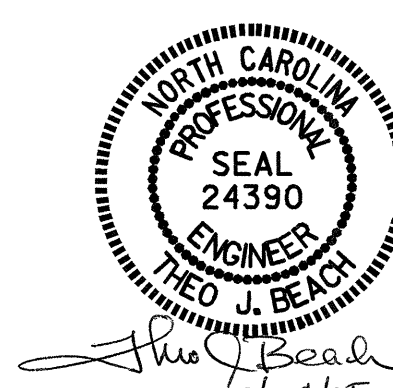
STAGE I CONSTRUCTION

SEE TRAFFIC CONTROL PLANS FOR LOCATION AND PAY LIMITS OF THE ANCHORED PORTABLE CONCRETE BARRIER



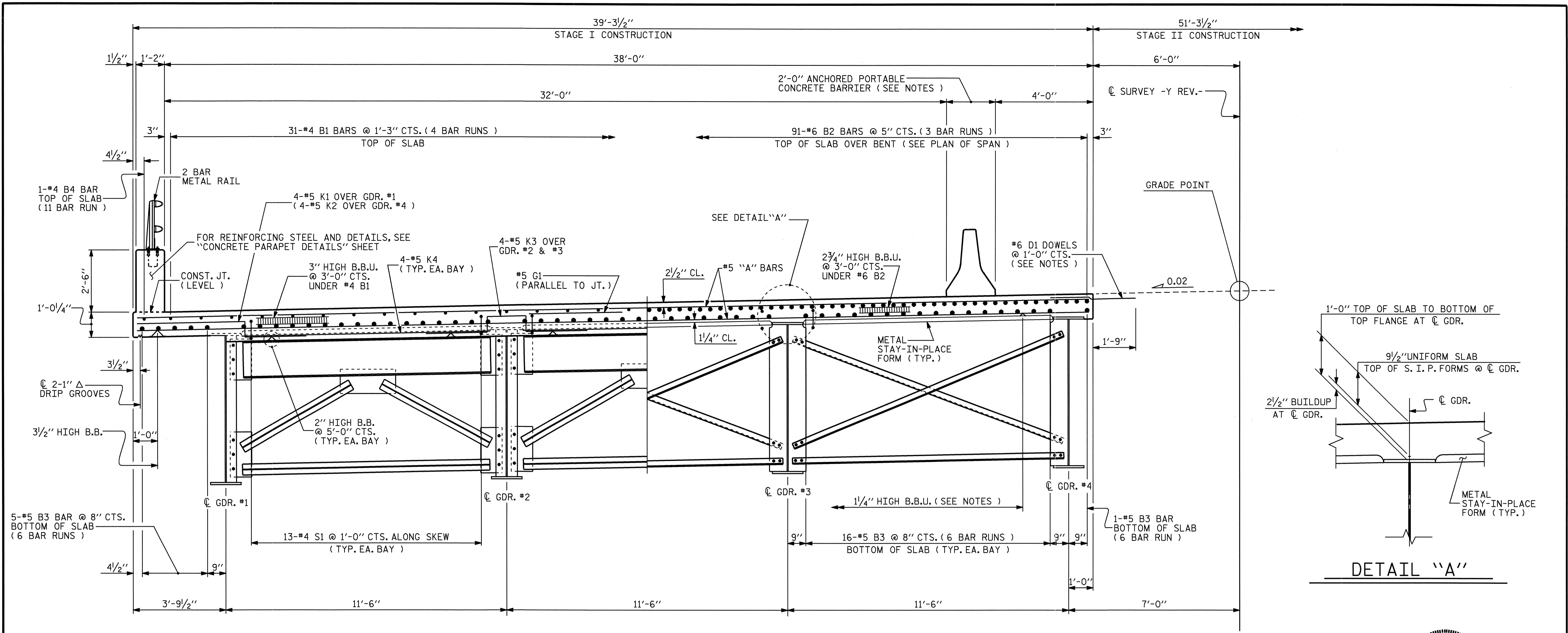
STAGE II CONSTRUCTION

PROJECT NO. I-4411
IREDELL COUNTY
 STATION: 46+79.71 -L-

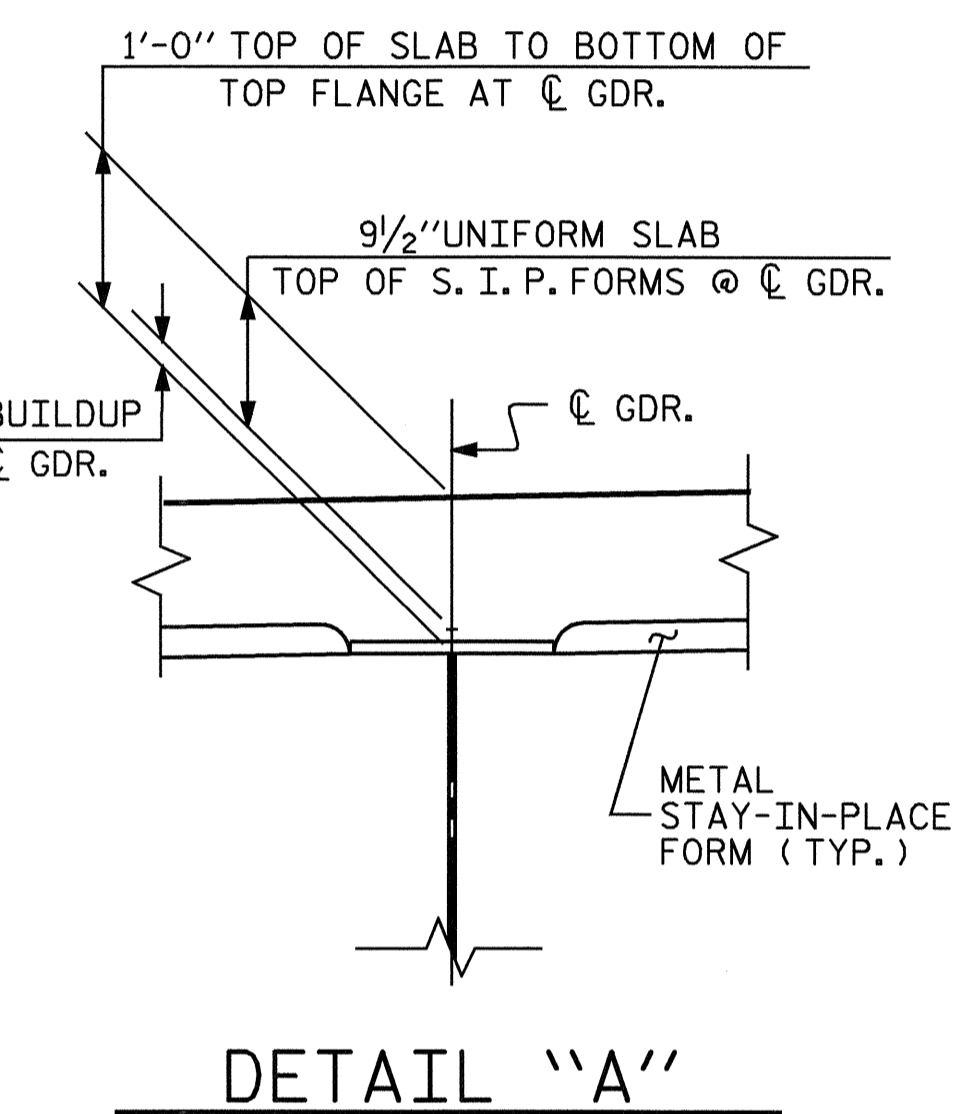


| STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH | | | | | | SHEET NO. S-4 |
|--|-----|-------|-----|-----|-------|--------------------|
| CONSTRUCTION SEQUENCE | | | | | | TOTAL SHEETS 42 |
| REVISIONS | | | | | | SHEET NO. S-4 |
| NO. | BY: | DATE: | NO. | BY: | DATE: | |
| 1 | | | 3 | | | TOTAL SHEETS 42 |
| 2 | | | 4 | | | |

DRAWN BY : S.B. WILLIAMS DATE : 7-8-04
 CHECKED BY : MIKE BRITT DATE : 3-15-05



TYPICAL SECTION
(STAGE I CONSTRUCTION)



NOTES

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

*6 D1 DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE TOP SLAB REINFORCING STEEL.

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

PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

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

STRUCTURAL STEEL ERECTION IN A CONTINUOUS UNIT SHALL BE COMPLETE BEFORE FALSEWORK OR FORMS ARE PLACED ON THE UNIT.

"G" BARS MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.

SEE TRAFFIC CONTROL PLANS FOR LOCATION AND PAY LIMITS OF THE ANCHORED PORTABLE CONCRETE BARRIER.

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

ALL REINFORCING STEEL IN PARAPETS SHALL BE EPOXY COATED.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 2 1/2" AT END BENTS. FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

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

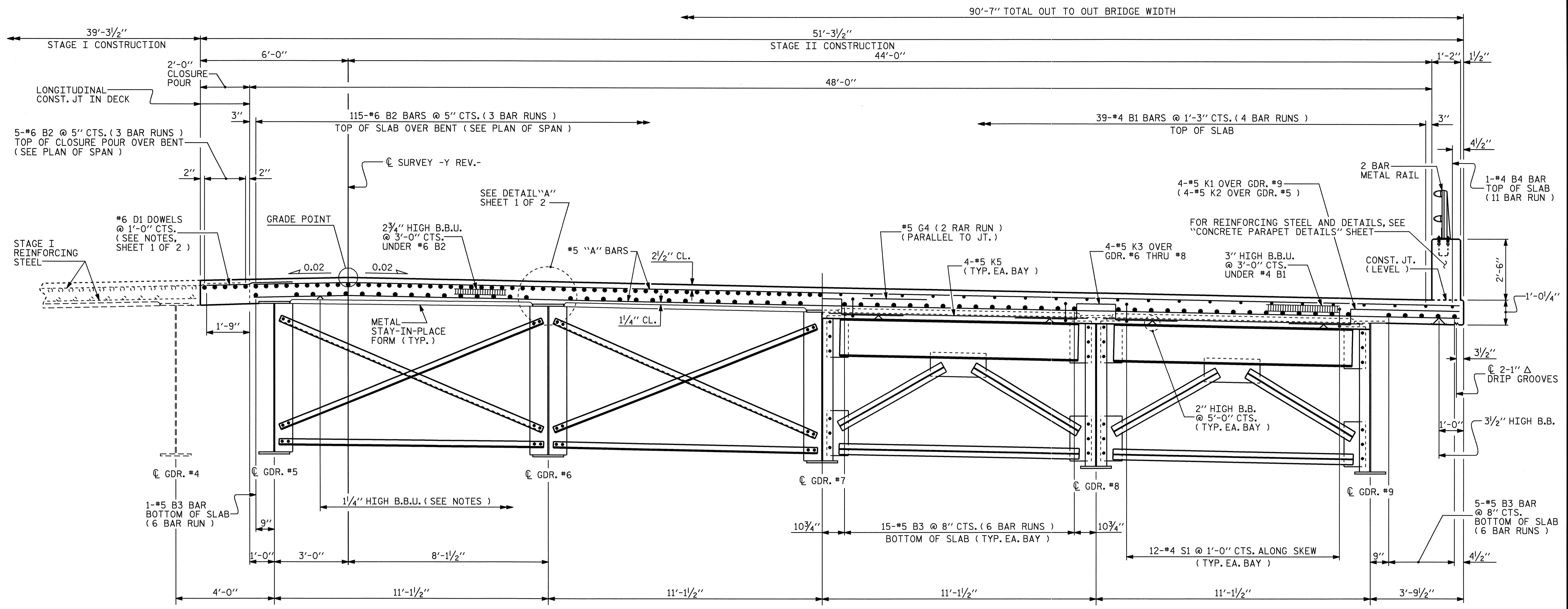
PROJECT NO. I-4411
IREDELL COUNTY
STATION: 46+79.71 -L-
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTIONS

| REVISIONS | | | | | | SHEET NO. | |
|-----------|-----|-------|-----|-----|-------|--------------|--|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-5 | |
| 1 | | | 3 | | | TOTAL SHEETS | |
| 2 | | | 4 | | | 42 | |

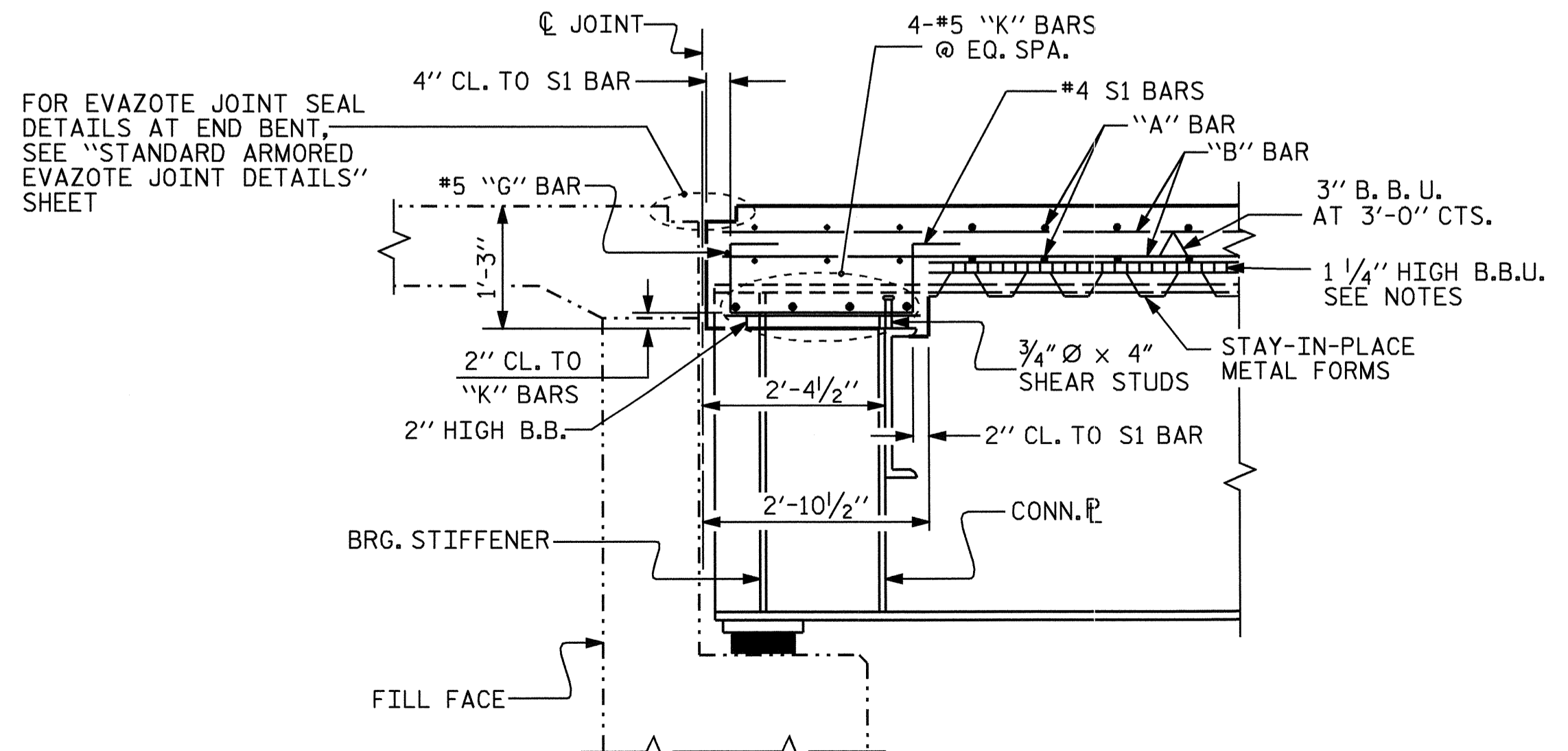
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CHECKED BY: T.J. BEACH DATE: 1-05



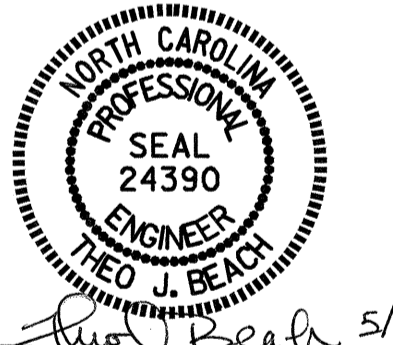
HALF-SECTION @ INTERMEDIATE DIAPHRAGM

HALF-SECTION @ END BENT DIAPHRAGM

TYPICAL SECTION
(STAGE II CONSTRUCTION)



SECTION THRU END BENT DIAPHRAGM
(SECTION TAKEN NORMAL TO FILL FACE)



Theo J. Beach 5/24/05

PROJECT NO. I-4411
IREDELL COUNTY
 STATION: 46+79.71 -L-

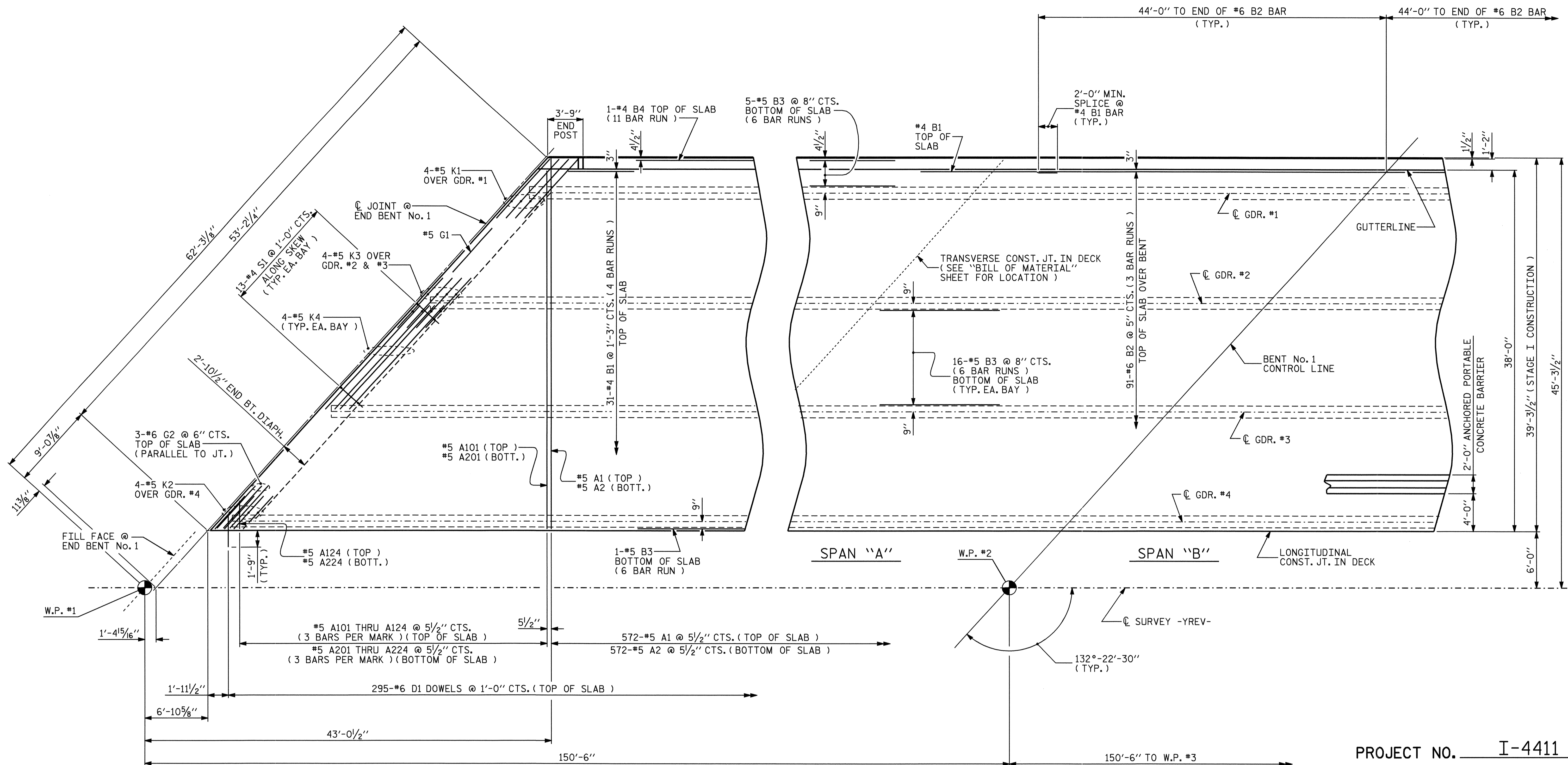
SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 TYPICAL SECTIONS

| REVISIONS | | | | | | SHEET NO. | |
|-----------|-----|-------|-----|-----|-------|--------------|--|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-6 | |
| 1 | | | 3 | | | TOTAL SHEETS | |
| 2 | | | 4 | | | 42 | |

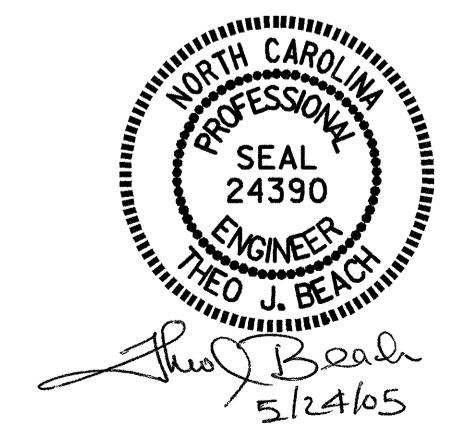
DRAWN BY: MIKE BRITT DATE: 10-21-04
 CHECKED BY: T.J. BEACH DATE: 1-05



**PARTIAL PLAN OF SPANS
(STAGE I CONSTRUCTION)**

NOTES

- #6 D1 DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE TOP SLAB REINFORCING STEEL. THE #6 D1 DOWELS SHALL EXTEND 1'-9" INTO STAGE II CLOSURE POUR.
- FOR REINFORCING STEEL IN PARAPET, SEE "CONCRETE PARAPET DETAILS" SHEET.
- #6 G2 BARS ARE IN THE ACUTE CORNER ONLY.



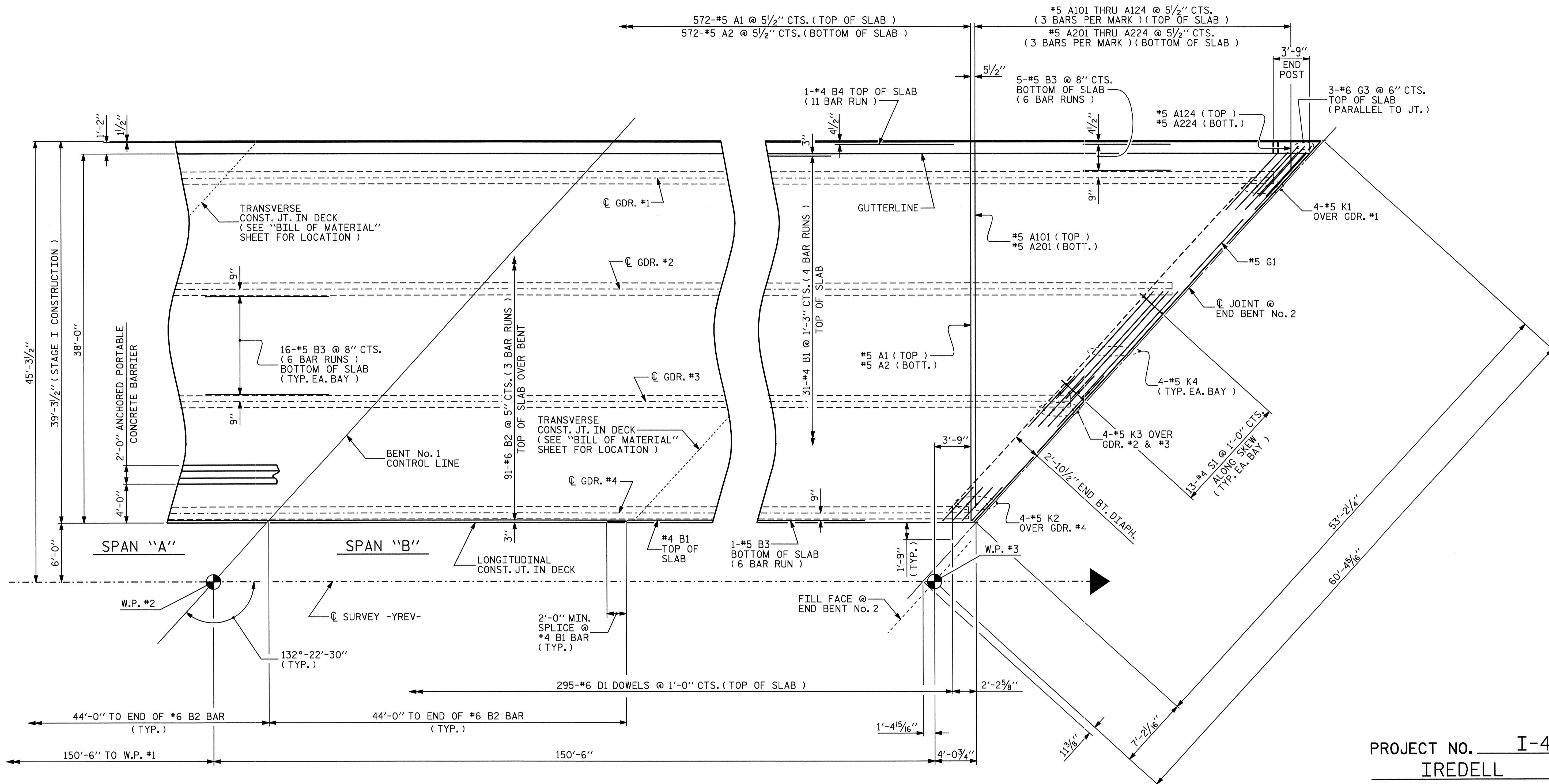
PROJECT NO. I-4411
IREDELL COUNTY
 STATION: 46+79.71 -L-

SHEET 1 OF 2

| STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH | | | | | |
|--|-----|-------|-----|-----|-------|
| SUPERSTRUCTURE PLAN OF SPANS (STAGE I) | | | | | |
| REVISIONS | | | | | |
| NO. | BY: | DATE: | NO. | BY: | DATE: |
| 1 | | | 3 | | |
| 2 | | | 4 | | |

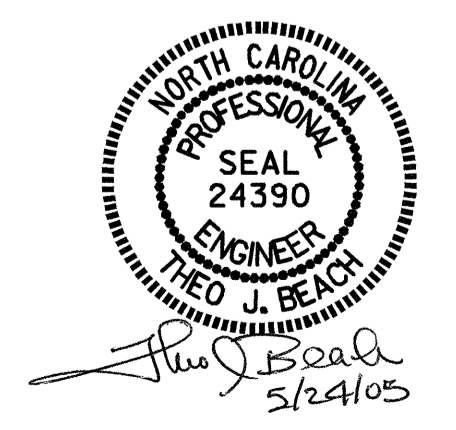
SHEET NO.
S-7
TOTAL SHEETS
42

DRAWN BY: MIKE BRITT DATE: 10-26-04
 CHECKED BY: T.J. BEACH DATE: 1-05



**PARTIAL PLAN OF SPANS
(STAGE I CONSTRUCTION)**

- NOTES**
- #6 D1 DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE TOP SLAB REINFORCING STEEL. THE #6 D1 DOWELS SHALL EXTEND 1'-9" INTO STAGE II CLOSURE POUR.
 - FOR REINFORCING STEEL IN PARAPET, SEE "CONCRETE PARAPET DETAILS" SHEET.
 - #6 G3 BARS ARE IN THE ACUTE CORNER ONLY.

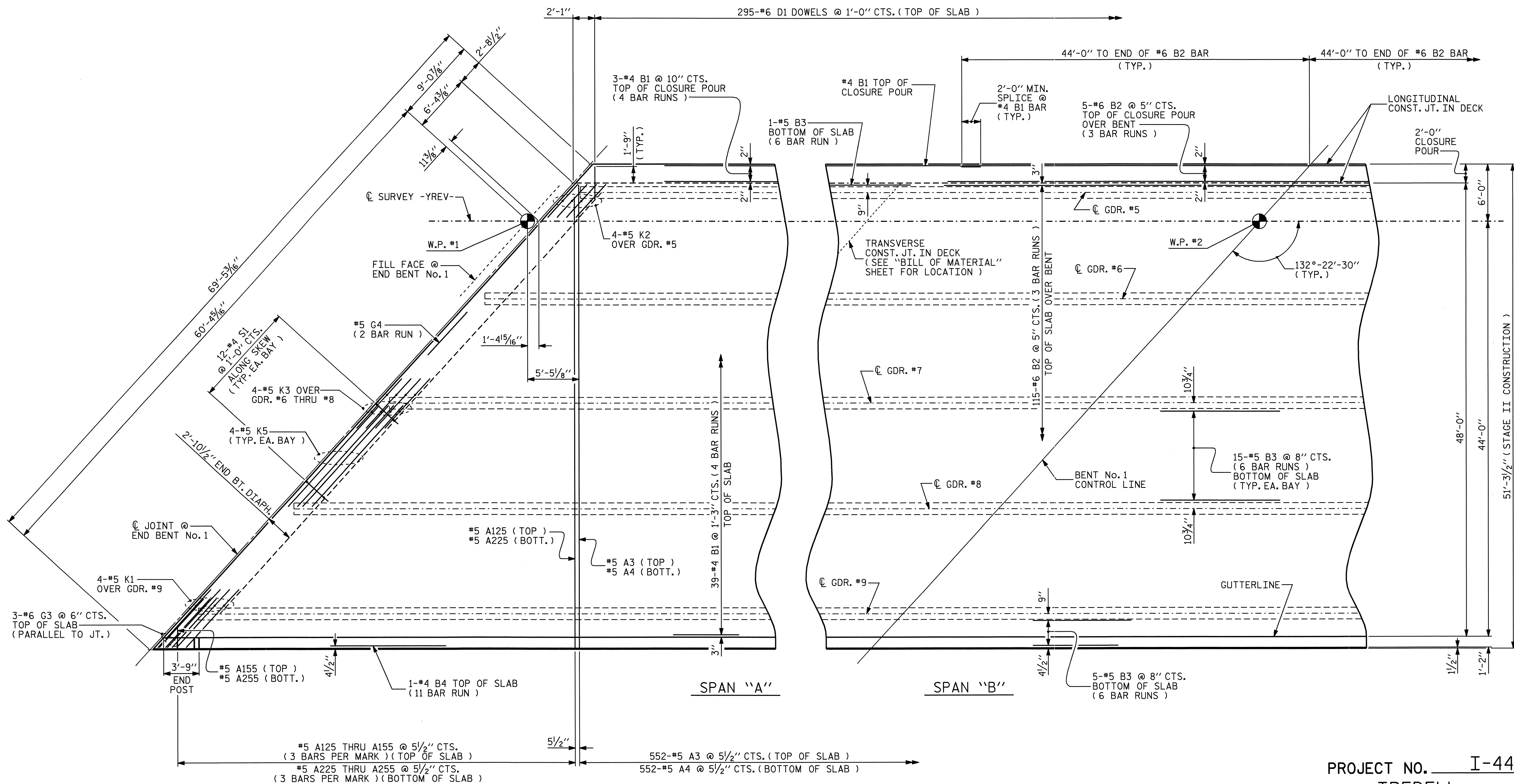


PROJECT NO. I-4411
IREDELL COUNTY
 STATION: 46+79.71 -L-

SHEET 2 OF 2

| REVISIONS | | | | | | SHEET NO. | |
|-----------|-----|-------|-----|-----|-------|--------------|----|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-8 | |
| 1 | | | 3 | | | TOTAL SHEETS | 42 |
| 2 | | | 4 | | | | |

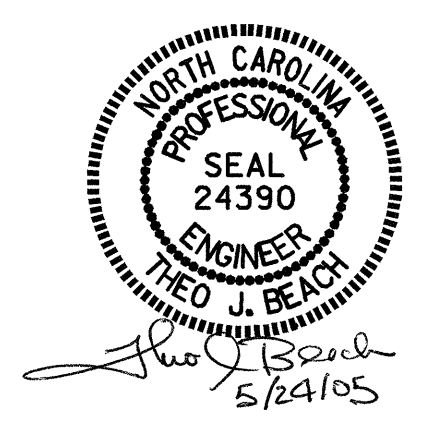
DRAWN BY: MIKE BRITT DATE: 10-26-04
 CHECKED BY: T.J. BEACH DATE: 1-05



PARTIAL PLAN OF SPANS
(STAGE II CONSTRUCTION)

NOTES

- #6 D1 DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE TOP SLAB REINFORCING STEEL. THE #6 D1 DOWELS SHALL EXTEND 1'-9" INTO STAGE II CLOSURE POUR.
- FOR REINFORCING STEEL IN PARAPET, SEE "CONCRETE PARAPET DETAILS" SHEET.
- #6 G3 BARS ARE IN THE ACUTE CORNER ONLY.



PROJECT NO. I-4411
IREDELL COUNTY
STATION: 46+79.71 -L-

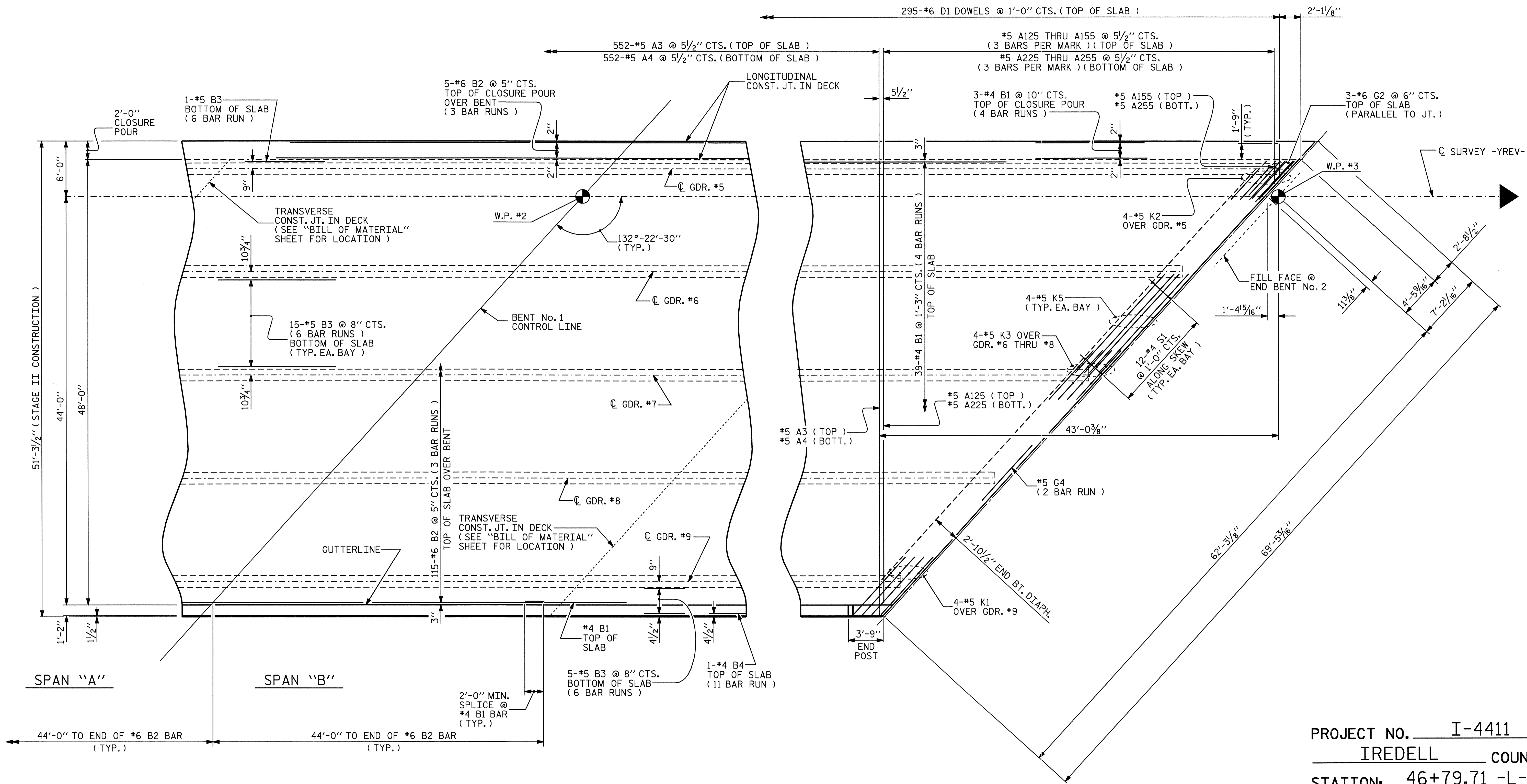
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPANS
(STAGE II)

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-9 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 42 |

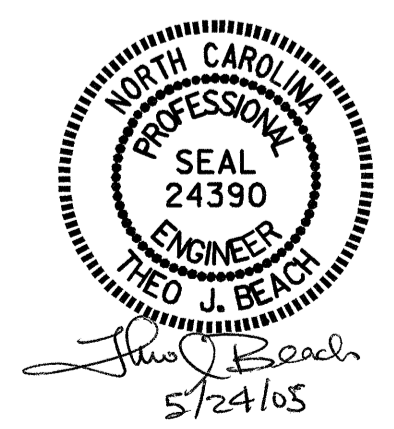
DRAWN BY : MIKE BRITT DATE : 10-27-04
CHECKED BY : T.J. BEACH DATE : 1-05



PARTIAL PLAN OF SPANS
(STAGE II CONSTRUCTION)

NOTES

- *6 D1 DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE TOP SLAB REINFORCING STEEL. THE *6 D1 DOWELS SHALL EXTEND 1'-9" INTO STAGE II CLOSURE POUR.
- FOR REINFORCING STEEL IN PARAPET, SEE "CONCRETE PARAPET DETAILS" SHEET.
- *6 G2 BARS ARE IN THE ACUTE CORNER ONLY.



PROJECT NO. I-4411
IREDELL COUNTY
 STATION: 46+79.71 -L-

SHEET 2 OF 2

| | | | | | |
|--|-----|-------|-----|-----|-----------|
| STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH | | | | | |
| SUPERSTRUCTURE PLAN OF SPANS (STAGE II) | | | | | |
| REVISIONS | | | | | SHEET NO. |
| NO. | BY: | DATE: | NO. | BY: | DATE: |
| 1 | | | 3 | | |
| 2 | | | 4 | | |
| TOTAL SHEETS | | | | | 5-10 |
| | | | | | 42 |

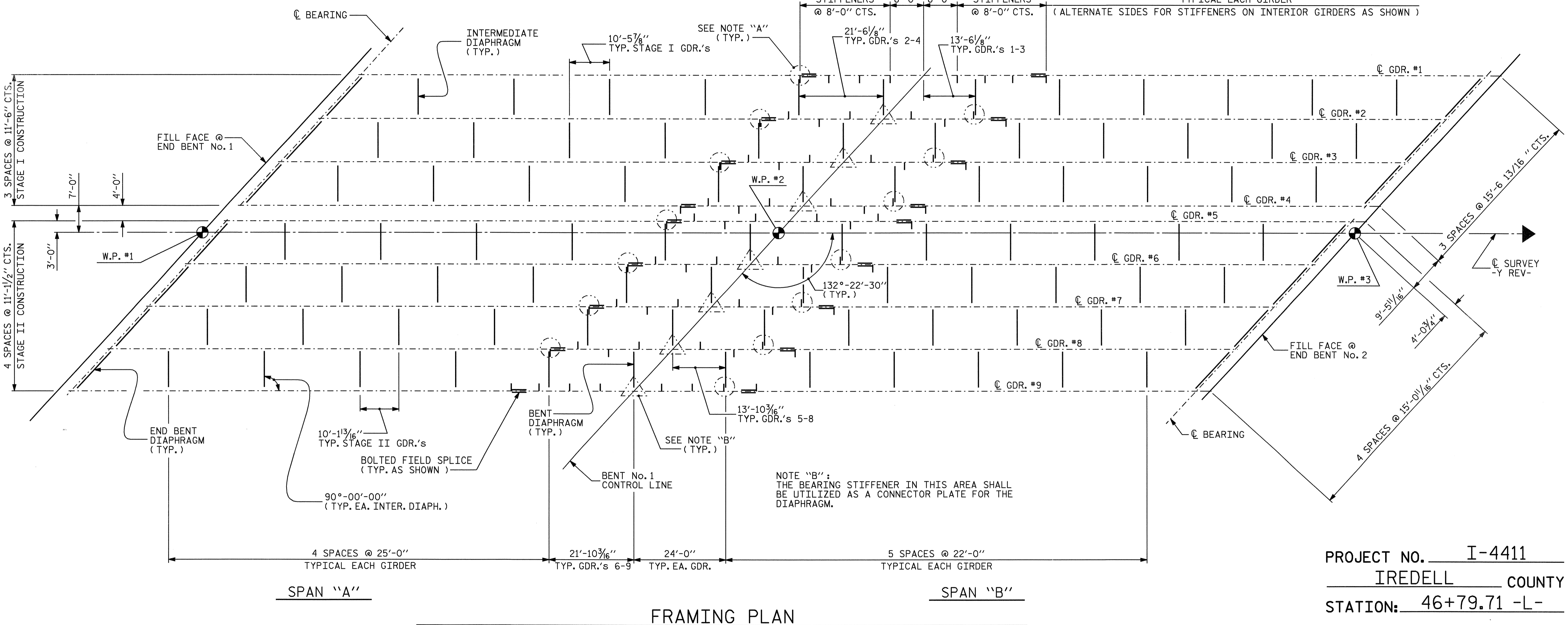
DRAWN BY : MIKE BRITT DATE : 10-28-04
 CHECKED BY : T.J. BEACH DATE : 1-05

NOTE "A":
 THE INTERMEDIATE STIFFENER IN THIS AREA SHALL BE UTILIZED AS A CONNECTOR PLATE FOR THE DIAPHRAGM. THE DIAPHRAGM SHALL BE CONNECTED TO THE STIFFENER ON THE SIDE CLOSEST TO THE END BENT.

E1, P2 (GDR.'s #1 THRU #4)
 E1, P1 (GDR.'s #5 THRU #9)
 EXPANSION

E1, P3 (GDR.'s #1 THRU #4)
 E1, P2 (GDR.'s #5 THRU #9)
 EXPANSION

PB1, M1
 FIXED



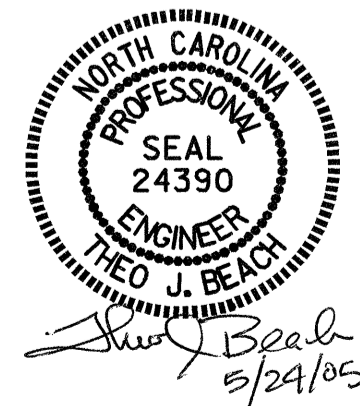
PROJECT NO. I-4411
IREDELL COUNTY
 STATION: 46+79.71 -L-

FRAMING PLAN

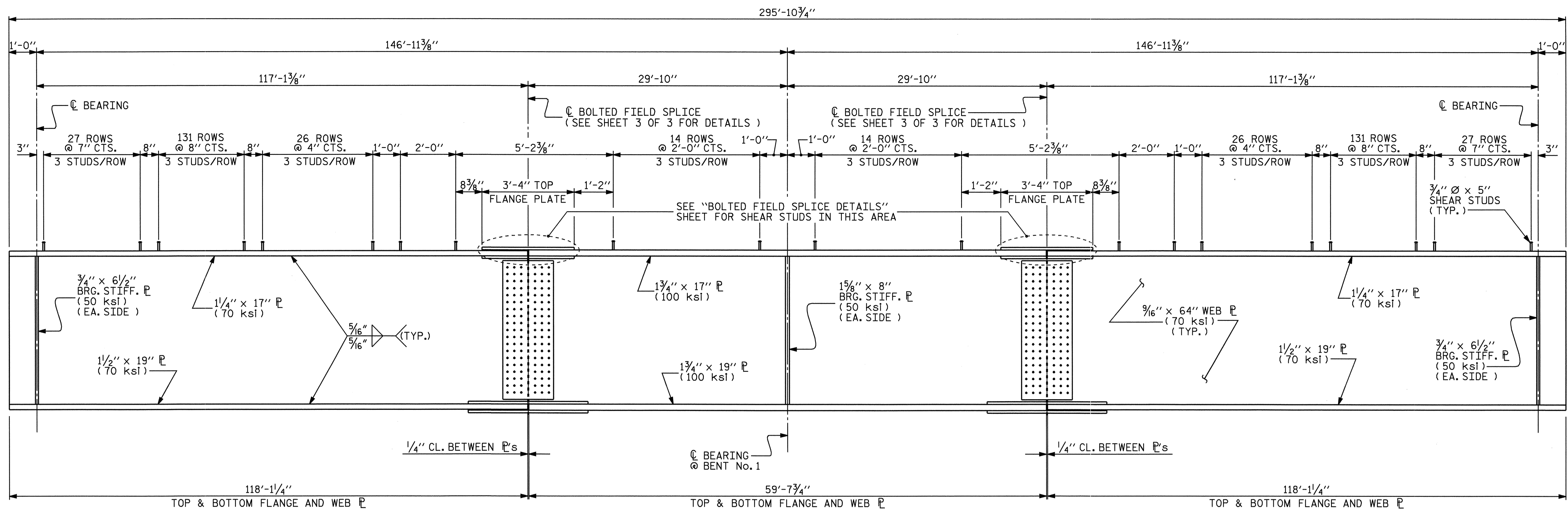
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 FRAMING PLAN

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-11 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 42 |



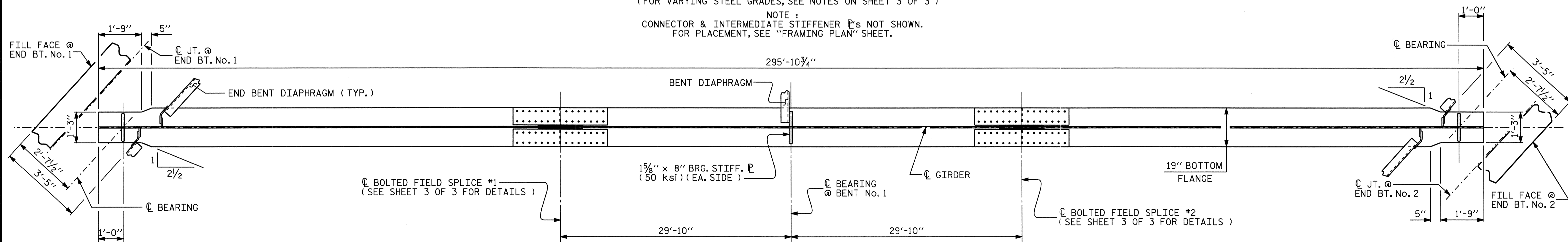
DRAWN BY : MIKE BRITT DATE : 12-13-04
 CHECKED BY : T.J. BEACH DATE : 1-05



ELEVATION OF GIRDER

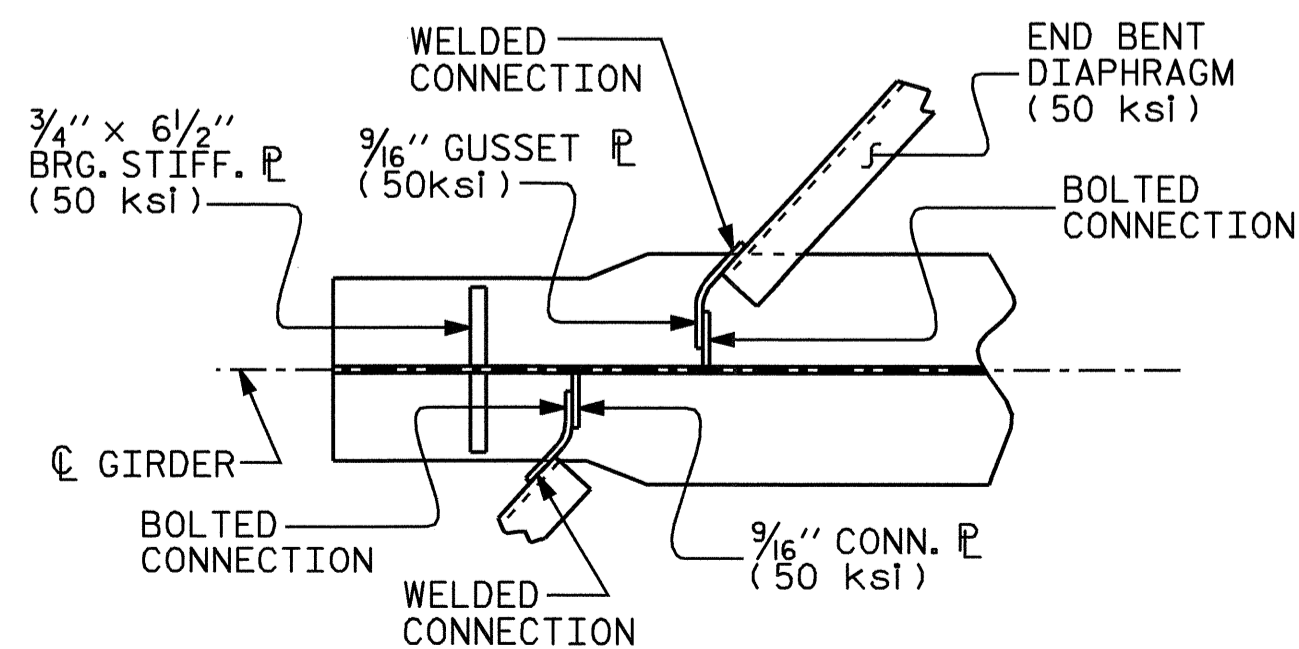
(FOR VARYING STEEL GRADES, SEE NOTES ON SHEET 3 OF 3)

NOTE:
CONNECTOR & INTERMEDIATE STIFFENER P's NOT SHOWN.
FOR PLACEMENT, SEE "FRAMING PLAN" SHEET.



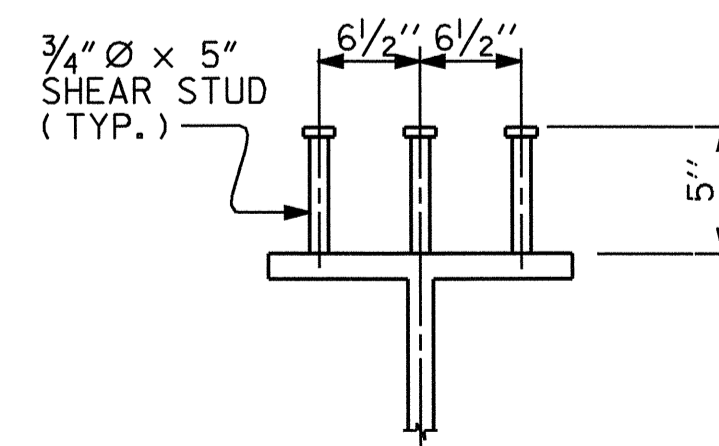
BOTTOM FLANGE DETAIL

(INTERMEDIATE DIAPHRAGMS NOT SHOWN)



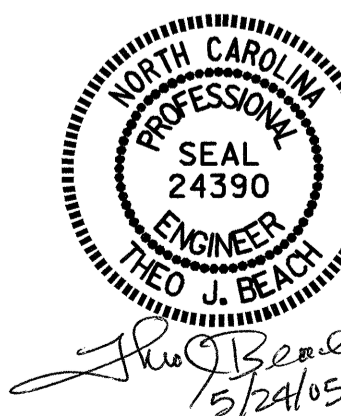
CONNECTOR P DETAIL

(EACH END SIMILAR)



SHEAR STUD DETAIL

TYPICAL EXCEPT AT TOP FLANGE SPLICE P
SEE "BOLTED FIELD SPLICE DETAILS" SHEET
FOR SHEAR STUDS IN THIS AREA



PROJECT NO. I-4411
IREDELL COUNTY
STATION: 46+79.71 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

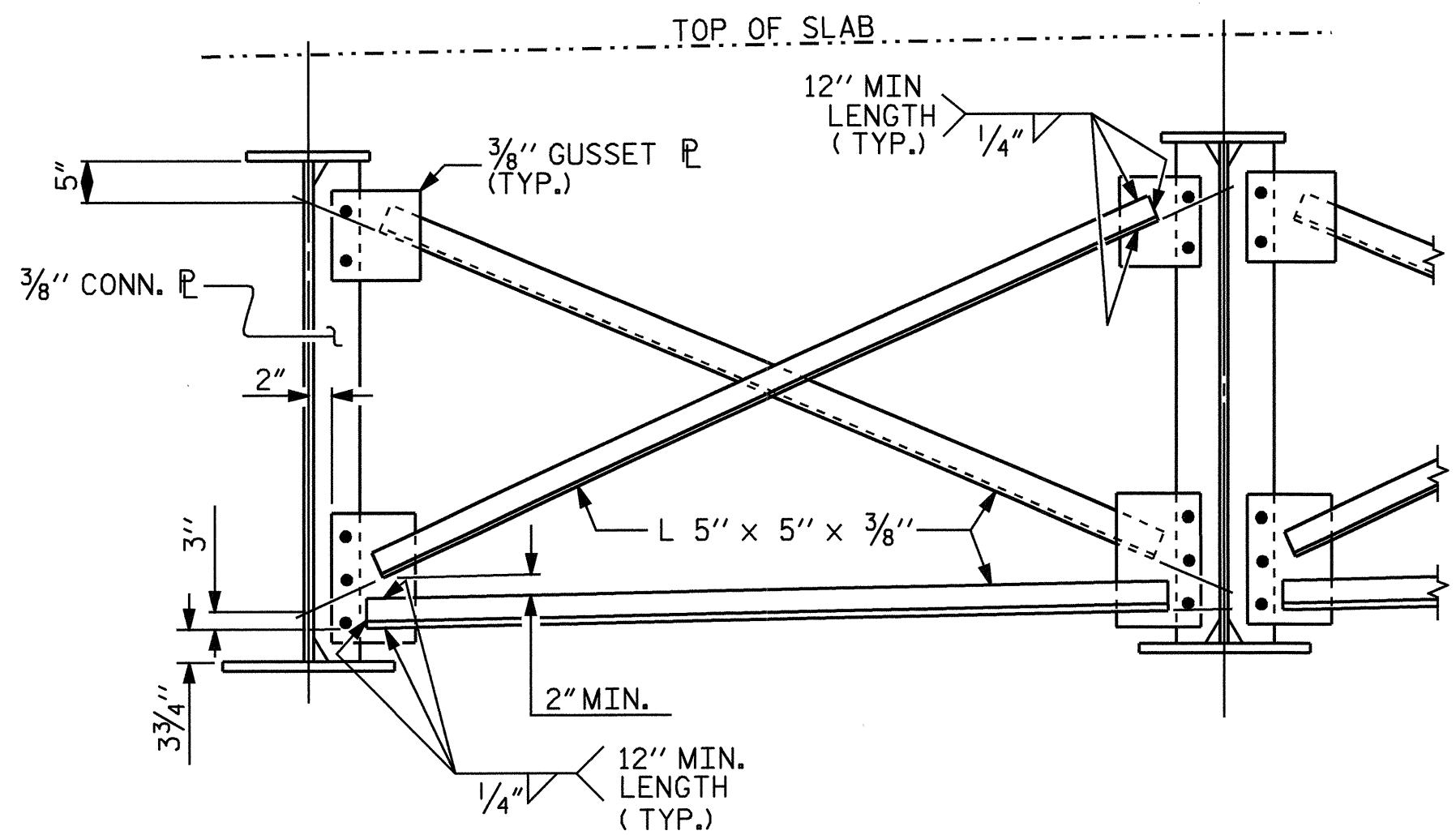
SUPERSTRUCTURE
STRUCTURAL STEEL
DETAILS

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | 5-12 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 42 |

DRAWN BY: MIKE BRITT DATE: 12-14-04
CHECKED BY: T.J. BEACH DATE: 1-05

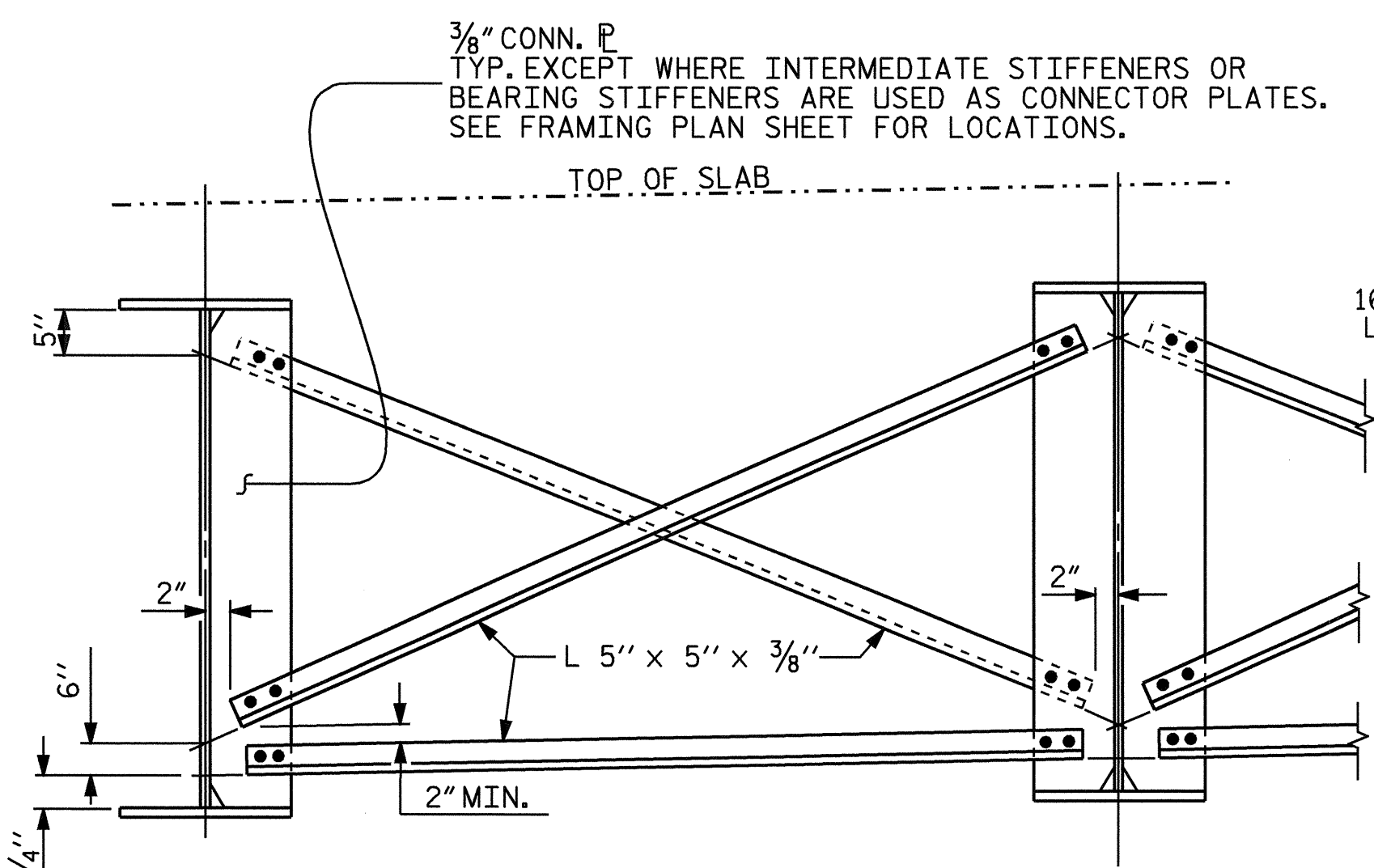
15-MAR-2005 07:23
W:\squad\1\8\WORK\I4411\str1\MBritt\I4411.ed.SS.dgn
mbr111

STR. #1



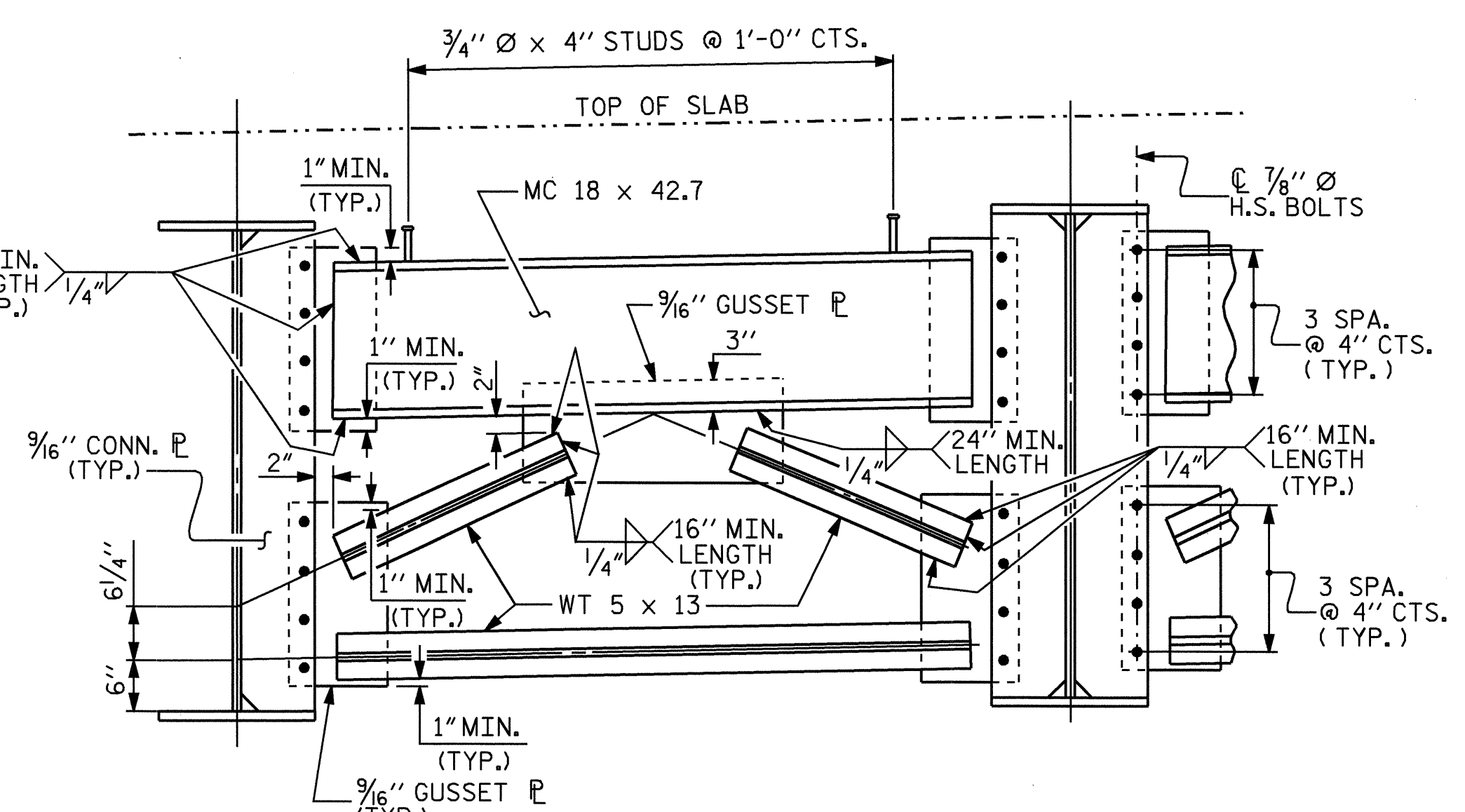
OPTIONAL INTERMEDIATE DIAPHRAGM

(SEE NOTES, SHEET 3 OF 3)

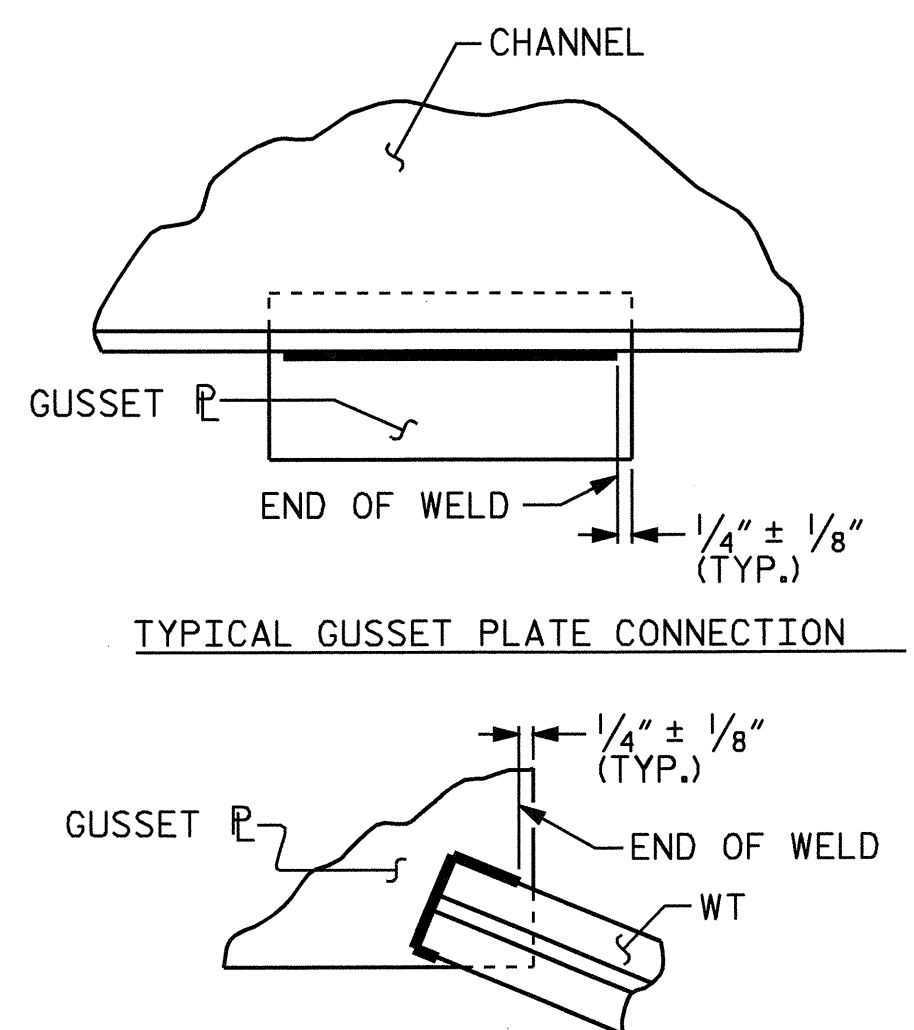


TYPICAL INTERMEDIATE AND BENT DIAPHRAGM

USE 3/16" THICK PLATES WHERE INTERMEDIATE STIFFENERS ARE USED AS CONNECTOR PLATE FOR INTERMEDIATE DIAPHRAGMS.
USE 1/8" THICK PLATE WHERE BEARING STIFFENERS ARE USED AS CONNECTOR PLATE FOR BENT DIAPHRAGM.

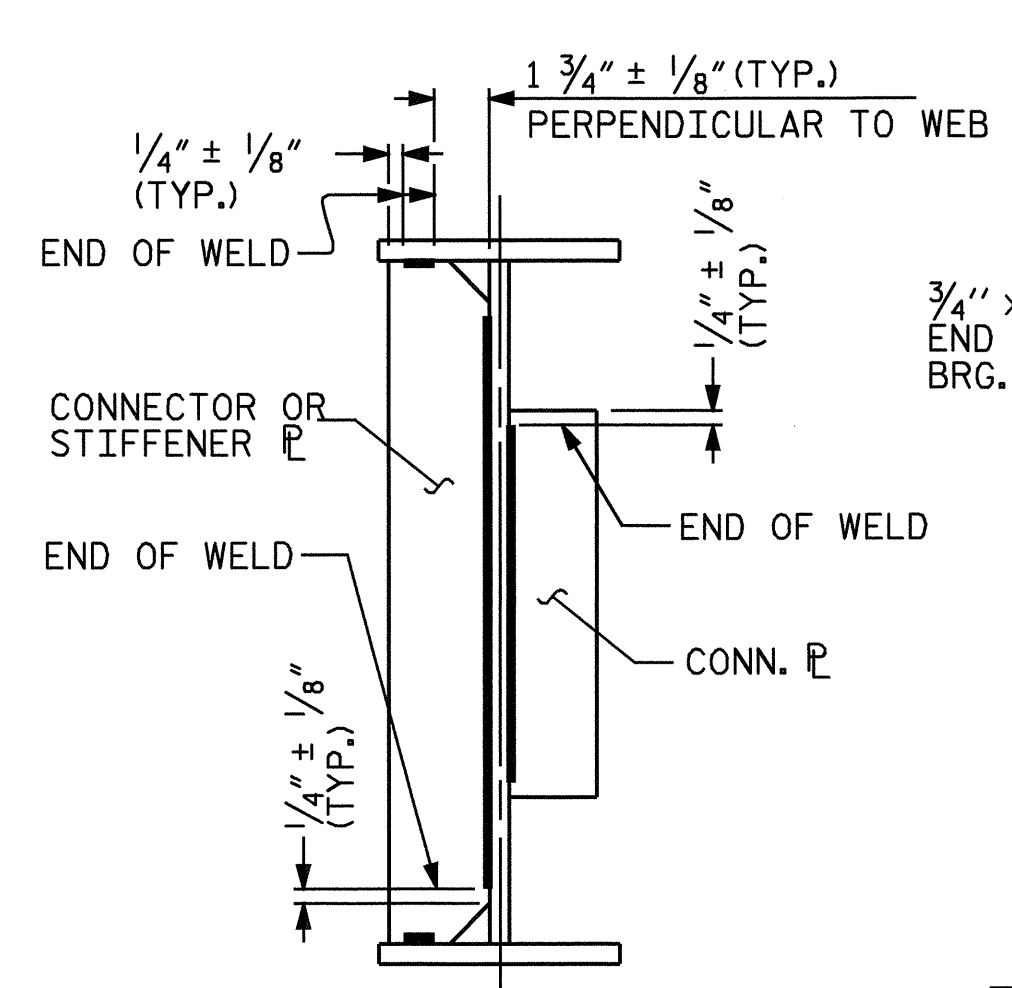


TYPICAL END BENT DIAPHRAGM



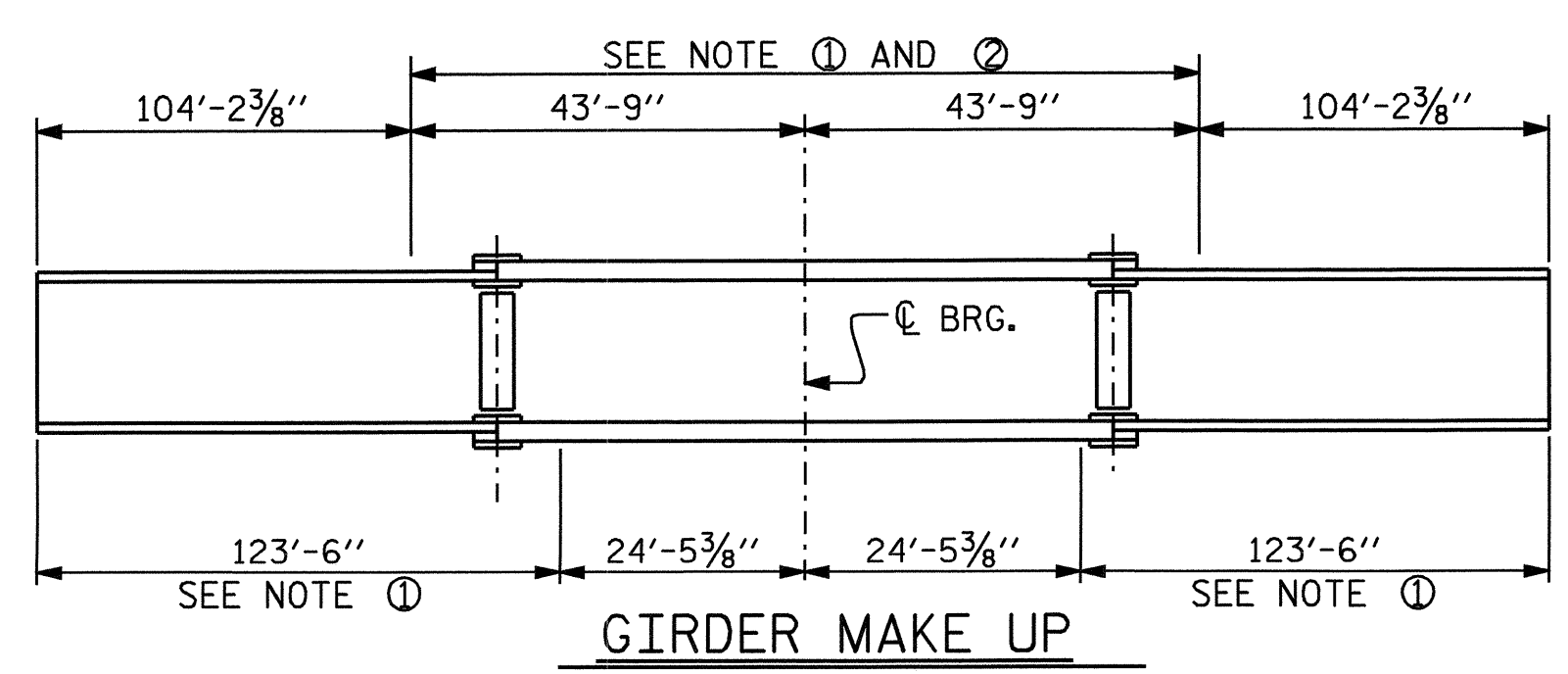
TYPICAL GUSSET PLATE CONNECTION

TYPICAL "TEE" TO GUSSET PLATE CONNECTION



TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS

WELD TERMINATION DETAILS

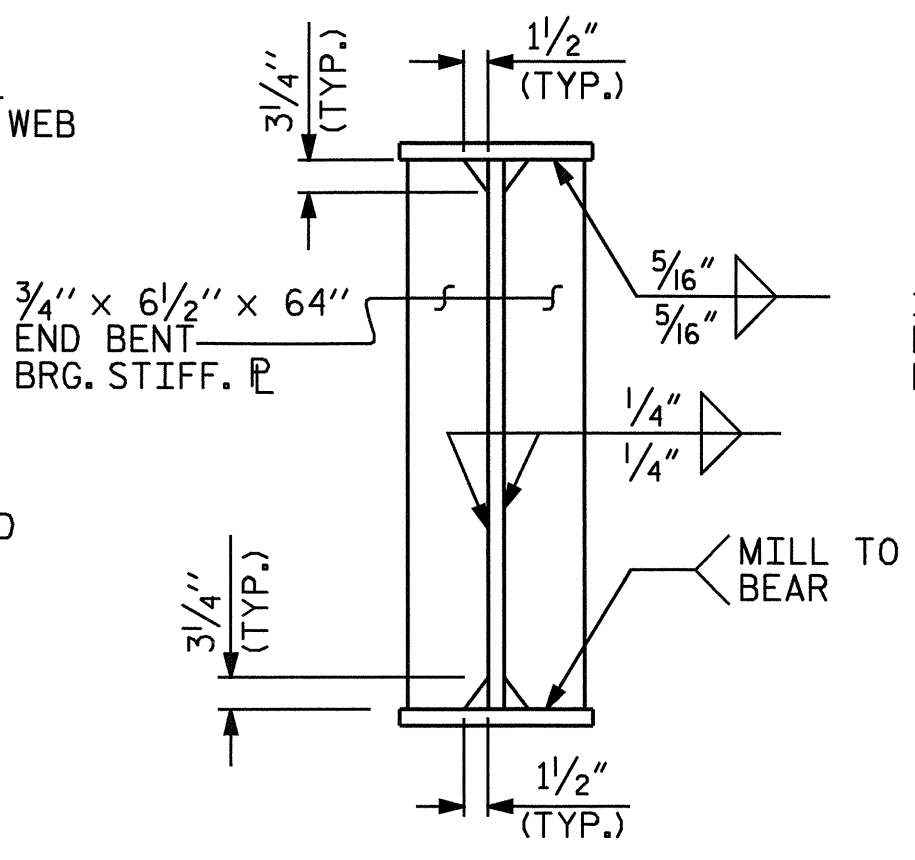


GIRDER MAKE UP

NOTE ① : CHАРY V-NOTCH TESTS ARE REQUIRED FOR ALL TOP OR BOTTOM FLANGE PLATES WHICH FALL WITHIN THESE LIMITS, ALL WEB PLATES, AND ALL SPLICE PLATES. IF A PERMITTED SHOP FLANGE SPLICE IS NOT USED, CHАРY V-NOTCH TESTS WILL BE REQUIRED FOR THE ENTIRE FLANGE PLATE. FOR CHАРY V-NOTCH TESTS, SEE ARTICLE 1072-9 OF THE STANDARD SPECIFICATIONS AND THE SPECIAL PROVISIONS.

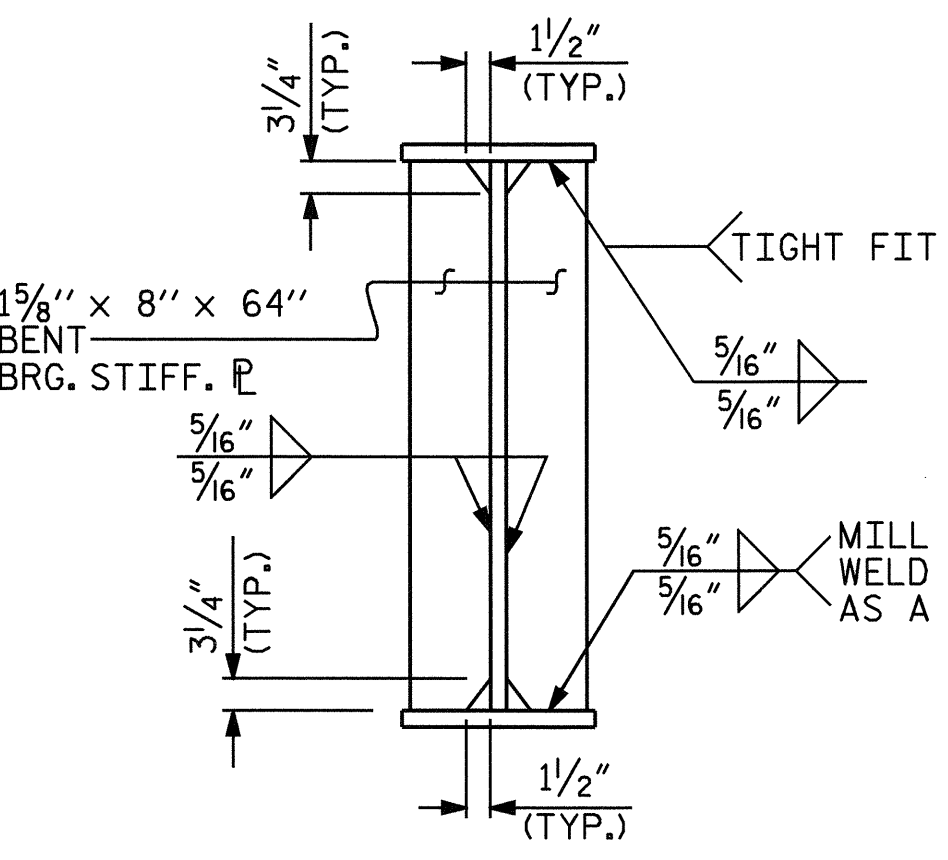
NOTE ② : NO WELDING OF FORMS OR FALSEWORK TO THE TOP FLANGE WILL BE PERMITTED IN THIS REGION

CHАРY V-NOTCH TESTS FOR CONTINUOUS PLATE GIRDERS



BEARING STIFFENER

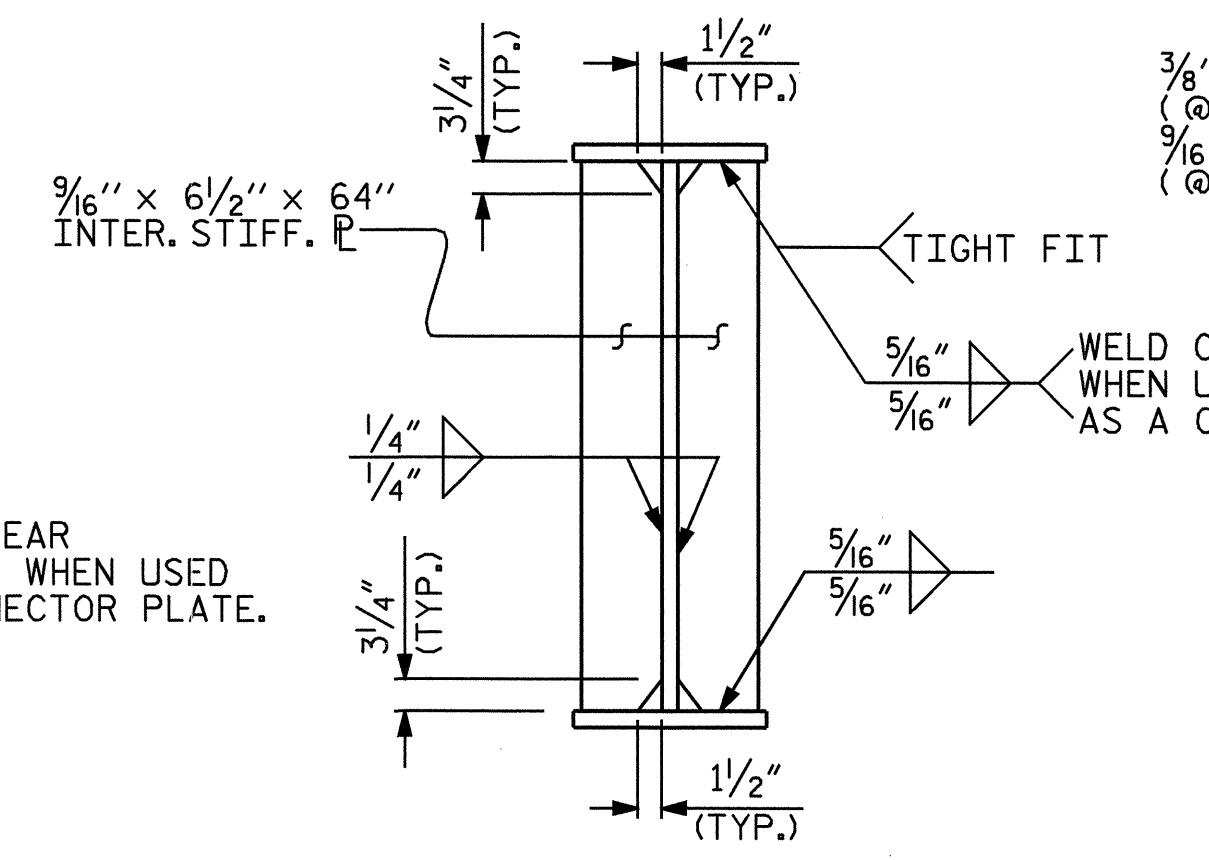
(AT END BENTS)



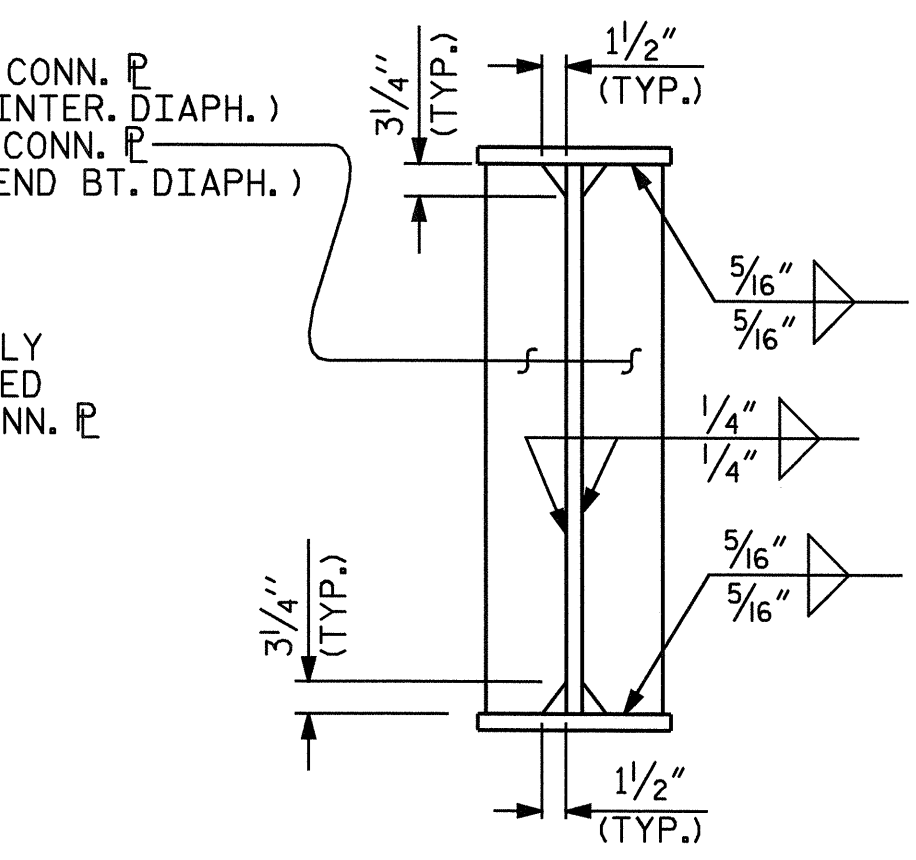
BEARING STIFFENER

(AT BENT No.1)

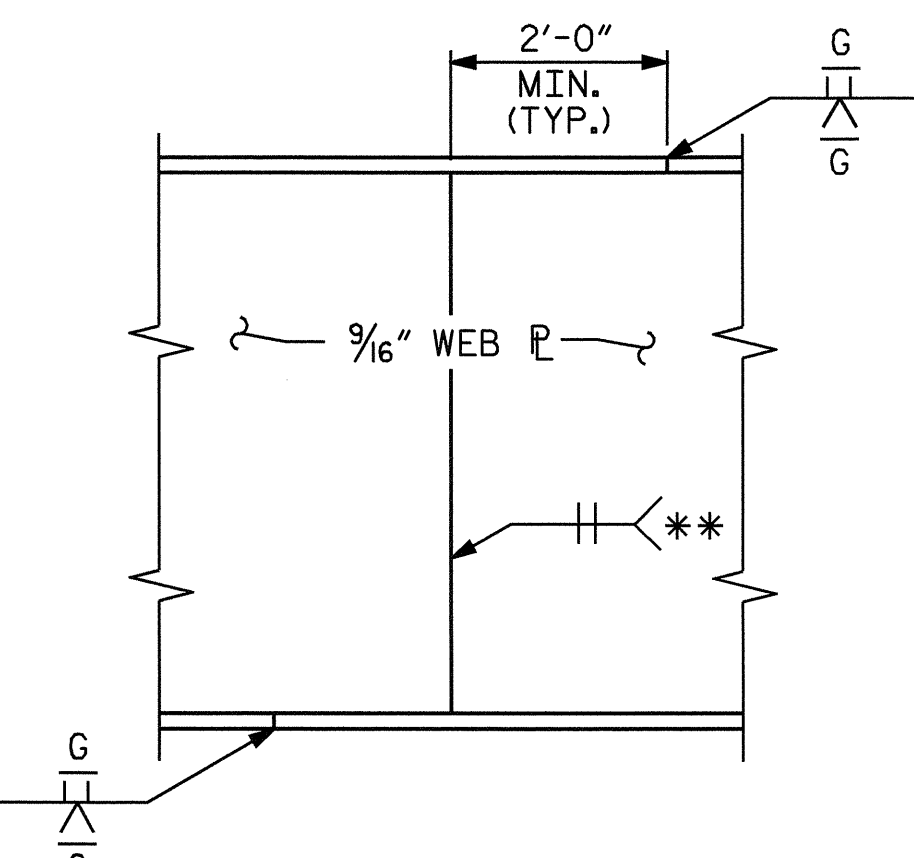
NOTE : WHEN USED AS A CONNECTOR PLATE, THE BEARING STIFFENER MAY REQUIRE COPING IF WIDER THAN BOTTOM FLANGE TO AVOID INTERFERENCE WITH THE ANCHOR BOLTS.



INTERMEDIATE STIFFENER

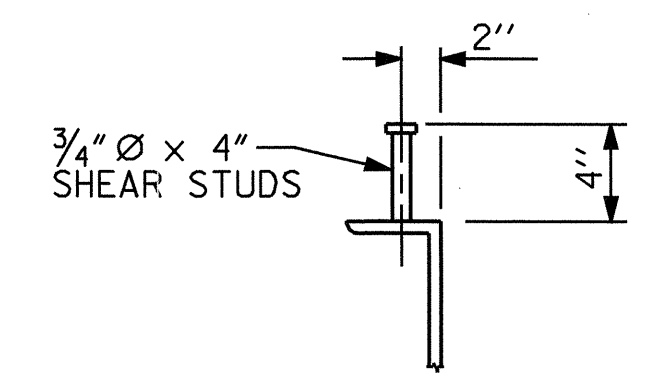


CONNECTOR PLATE



PERMISSIBLE SHOP FLANGE & WEB SPLICE

** GRIND SMOOTH AND FLUSH ON OUTSIDE OF EXTERIOR GIRDER



SHEAR STUD DETAILS

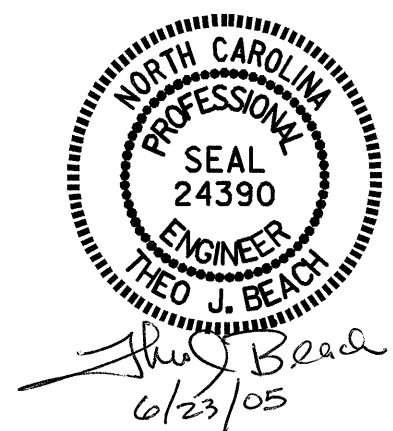
(TYP. EA. END BENT DIAPHRAGM)

PROJECT NO. I-4411
IREDELL COUNTY
STATION: 46+79.71 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
STRUCTURAL STEEL
DETAILS



| REVISIONS | | | | | | SHEET NO. | |
|-----------|-----|-------|-----|-----|-------|--------------|--|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-13 | |
| 1 | | | 3 | | | TOTAL SHEETS | |
| 2 | | | 4 | | | 42 | |

DRAWN BY : MIKE BRITT DATE : 12-16-04
CHECKED BY : T.J. BEACH DATE : 1-05

STRUCTURAL STEEL NOTES :

THE STEEL USED FOR THE 1 3/4" THICK TOP & BOTTOM FLANGE PLATES SHALL BE HPS 100W.

THE STEEL USED FOR THE 1/4" AND 1/2" THICK TOP & BOTTOM FLANGE 3/16" WEB PLATE AND ALL BOLTED FIELD SPLICE PLATES SHALL BE HPS 70W AND BE PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-7 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

ALL REMAINING STRUCTURAL STEEL USED SHALL BE AASHTO M270 GRADE 50W.

FOR HIGH PERFORMANCE STEEL, SEE SPECIAL PROVISIONS.

ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL, UNLESS OTHERWISE NOTED.

ALL FIELD CONNECTIONS TO BE 7/8" DIA. HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.

BEARING STIFFENERS ARE TO BE PLACED NORMAL TO THE WEB OF THE GIRDER AND SHALL BE PLUMB.

A CHARPY V-NOTCH TEST IS REQUIRED FOR GIRDER MEMBERS AS INDICATED ON THE PLANS. SEE SPECIAL PROVISIONS.

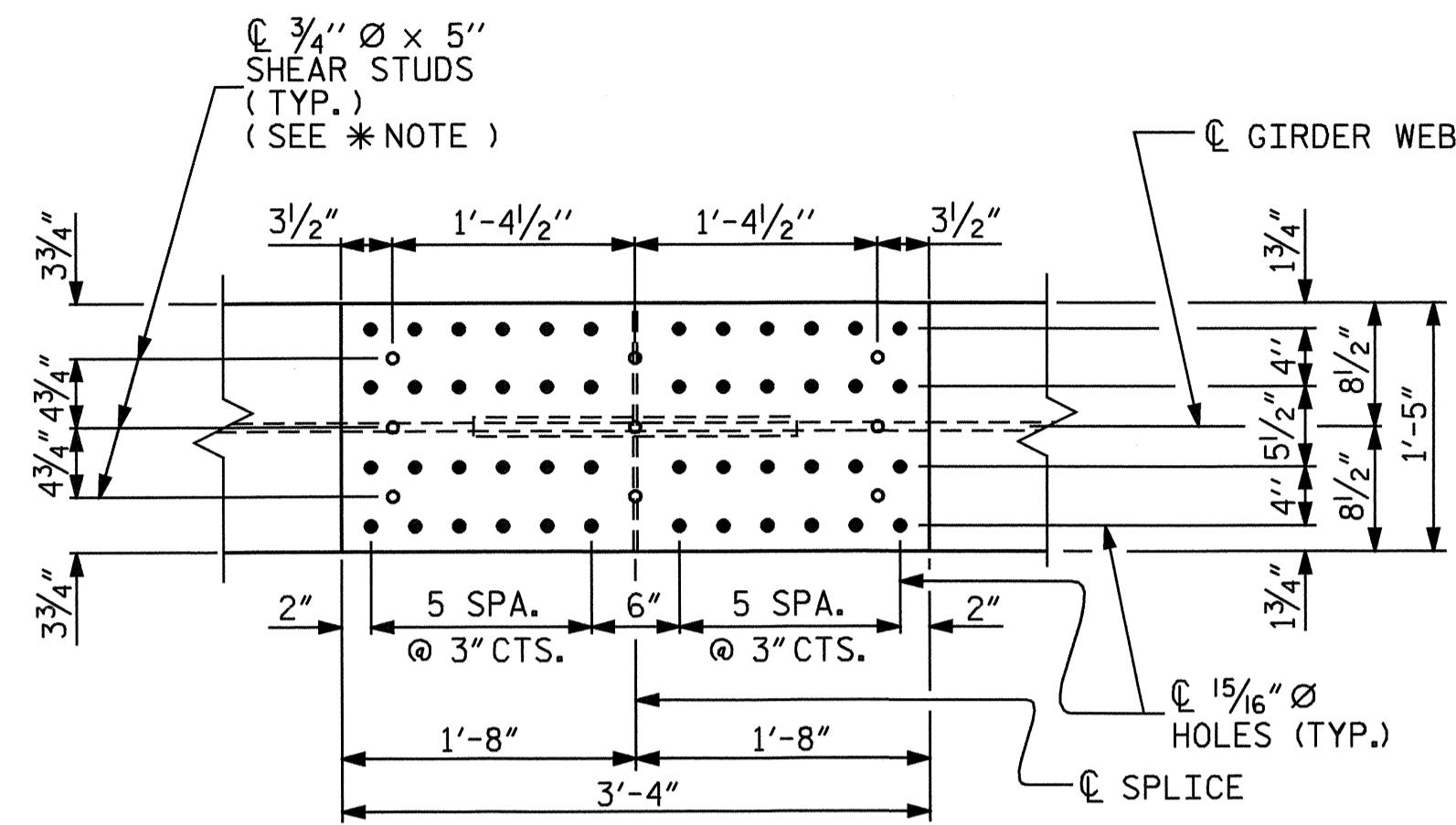
SHOP SPLICES ARE PERMITTED TO LIMIT THE MAXIMUM REQUIRED FLANGE PIECE LENGTHS TO 45 FEET FOR THE HPS 100W AND TO 60 FEET FOR THE HPS 70W AND WEB PIECE LENGTHS TO 45 FEET. PERMITTED FLANGE AND WEB SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION NOR WITHIN 15 FEET OF INTERMEDIATE BEARINGS OF CONTINUOUS UNITS. KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES. KEEP 6" MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.

STUDS ON GIRDERS MAY BE SHIFTED UP TO 1" IF NECESSARY TO CLEAR FLANGE SPLICE WELD.

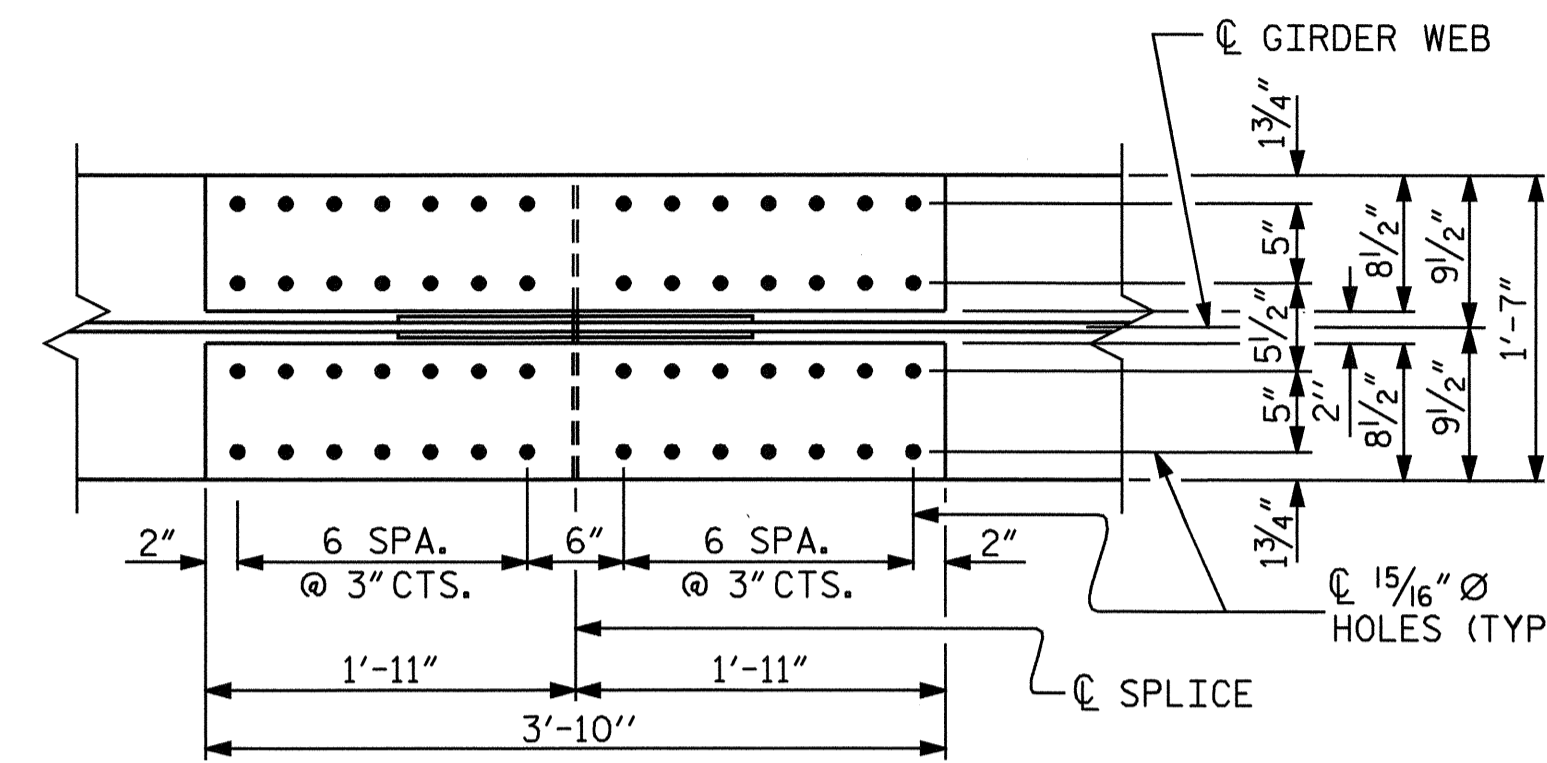
END OF GIRDERS SHALL BE PLUMB.

AT THE CONTRACTOR'S OPTION, THE INTERMEDIATE DIAPHRAGM WITH THE WELDED GUSSET PLATES MAY BE USED IN LIEU OF THE INTERMEDIATE DIAPHRAGM WITH BOLTED ANGLES AT NO ADDITIONAL COST TO THE DEPARTMENT.

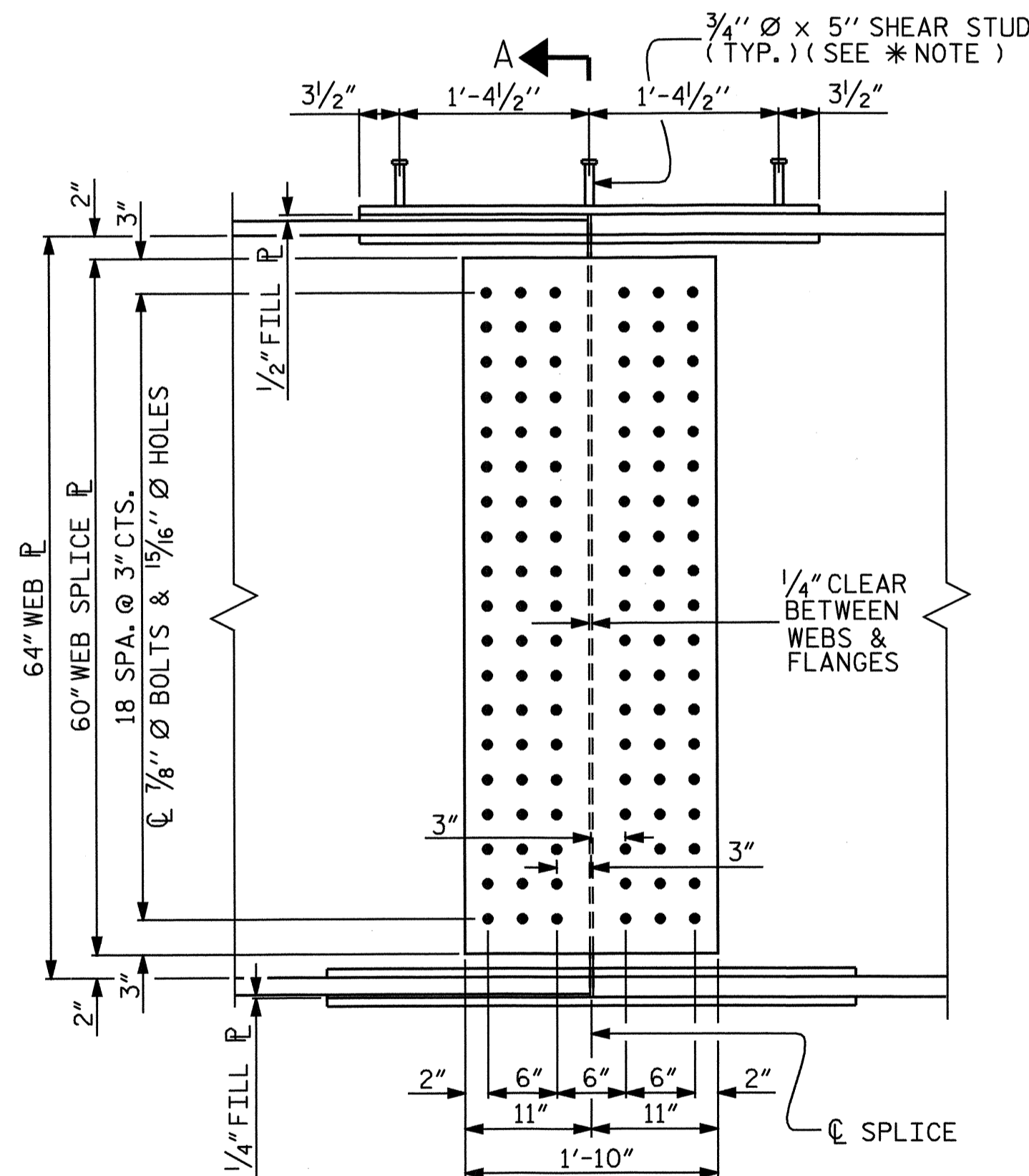
TENSION ON THE AASHTO M164 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-10 OF THE STANDARD SPECIFICATIONS.



PLAN (TOP OF TOP FLANGE)

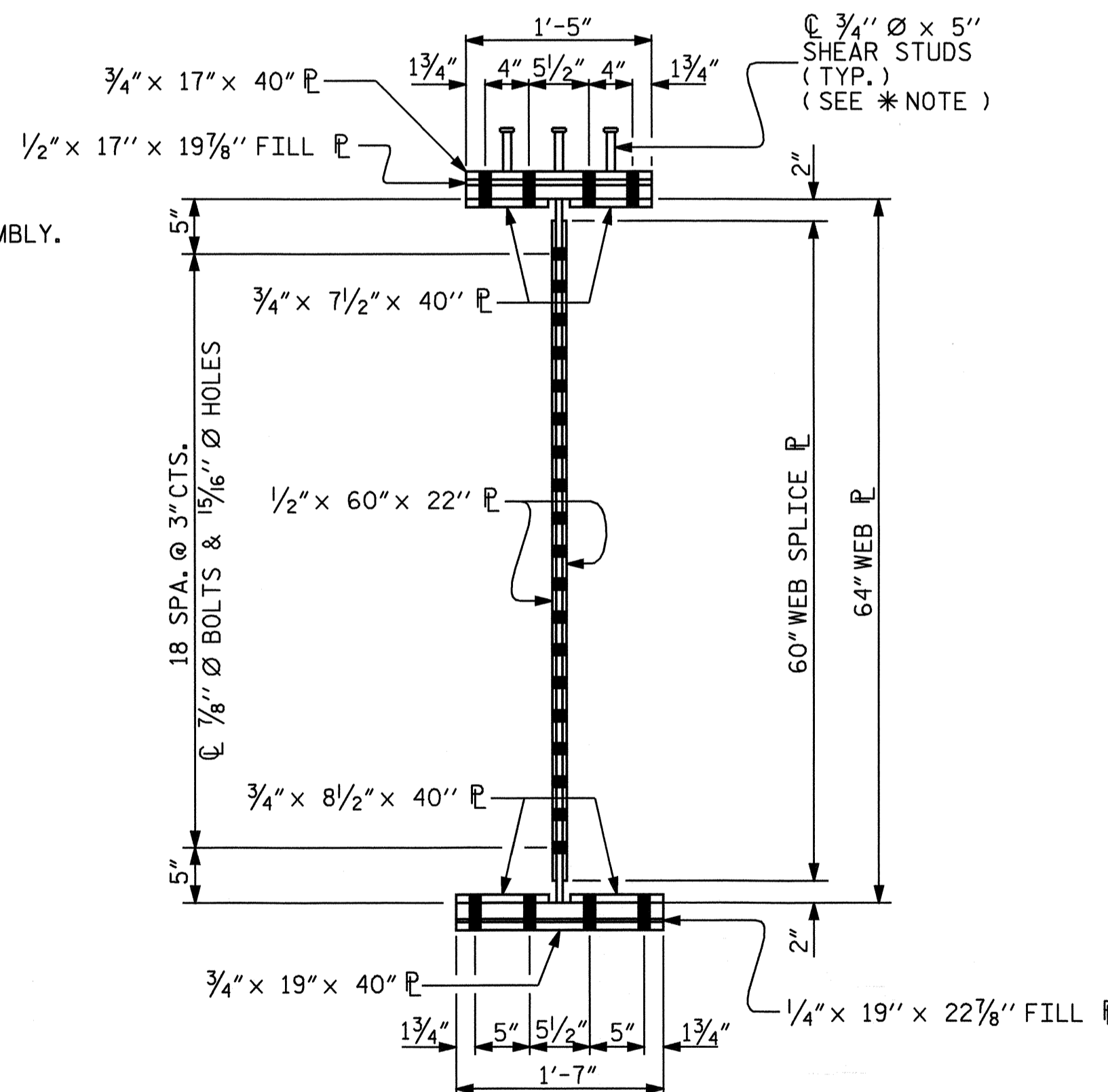


PLAN (TOP OF BOTTOM FLANGE)

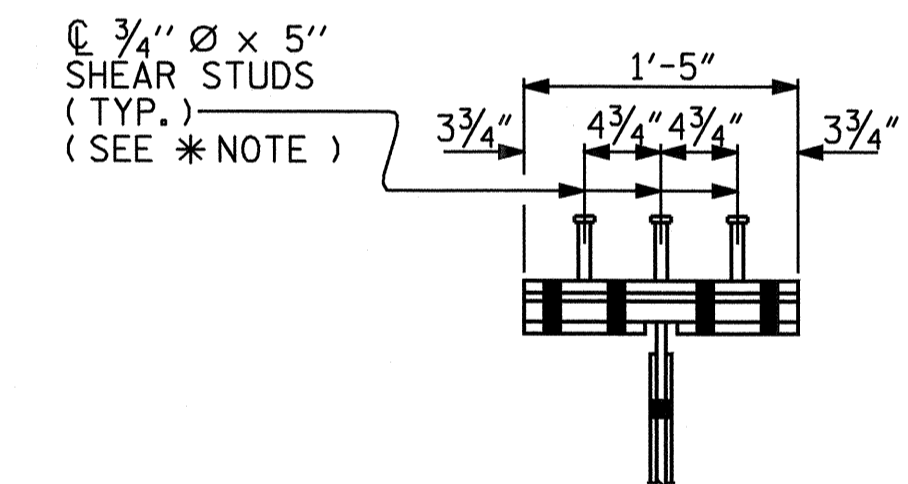


ELEVATION

* NOTE: SHEAR STUDS ARE TO BE SHOP WELDED ON TOP OF PLATE BEFORE FIELD ASSEMBLY.



SECTION A-A

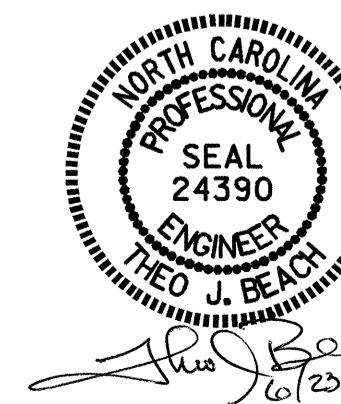


SHEAR STUD DETAIL FOR TOP FLANGE SPLICE PLATE

BOLTED FIELD SPLICE DETAILS

(BOLTED FIELD SPLICE #1 SHOWN, BOLTED FIELD SPLICE #2 SIMILAR)

NOTE: ALL BOLTED FIELD SPLICE PLATES (WEB, TOP FLANGE, BOTTOM FLANGE AND FILL PLATES) SHALL BE 70 ksi GRADE STEEL.



PROJECT NO. I-4411
IREDELL COUNTY
 STATION: 46+79.71 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 STRUCTURAL STEEL
 DETAILS

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-14 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 42 |

DRAWN BY: MIKE BRITT DATE: 12-17-04
 CHECKED BY: T.J. BEACH DATE: 1-05

23-JUN-2005 15:10
 R:\STRUCT\I4411\str1\MBRITT\I4F122.DGN
 mbritt

NOTES

FOR ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.
 THE 2" Ø PIPE SLEEVE SHALL BE CUT FROM SCHEDULE 40 PVC PLASTIC PIPE. THE PVC PLASTIC PIPE SHALL MEET THE REQUIREMENTS OF ASTM D1785.
 THE PAYMENT FOR THE PIPE SLEEVES AND 4"Ø x 1'-6 1/4" STANDARD PIPE ASSEMBLY SHALL BE INCLUDED IN THE SEVERAL PAY ITEMS.

FOR AASHTO M270 GRADE 50W STRUCTURAL STEEL, SOLE PLATE SHALL BE AASHTO M270 GRADE 50W AND SHALL NOT BE GALVANIZED. ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

THE CLOSURE PLATE AND STANDARD PIPE NEED NOT BE GALVANIZED.

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

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

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FOLLOWING PROCEDURES TO ACCOMMODATE GIRDER TRANSLATION AND END ROTATION :

1. ONCE THE DECK HAS CURED, THE GIRDERS SHALL BE JACKED AND THE ANCHOR BOLTS, SOLE PLATE AND ELASTOMERIC BEARING SLOTS SHALL BE CENTERED AS NEARLY AS PRACTICAL ABOUT THE BEARING STIFFENER. THIS OPERATION SHALL BE PERFORMED AT APPROXIMATELY 60° F.
2. AFTER CENTERING THE SLOTS AND ANCHOR BOLTS, THE SOLE PLATES SHALL BE FIELD WELDED TO THE GIRDER FLANGES AND ANCHOR BOLTS GROUTED.

THE CONTRACTOR MAY PROPOSE ALTERNATE METHODS PROVIDED DETAILS ARE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL.

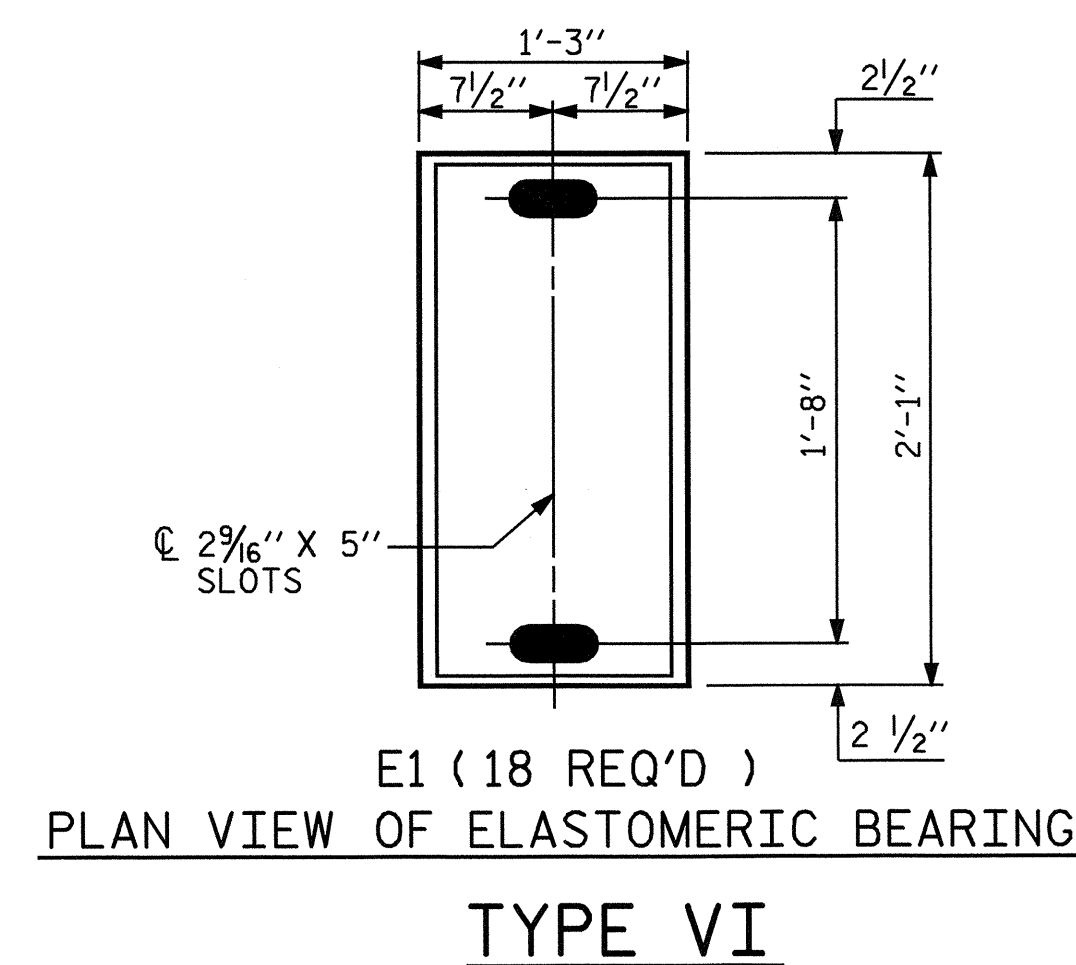
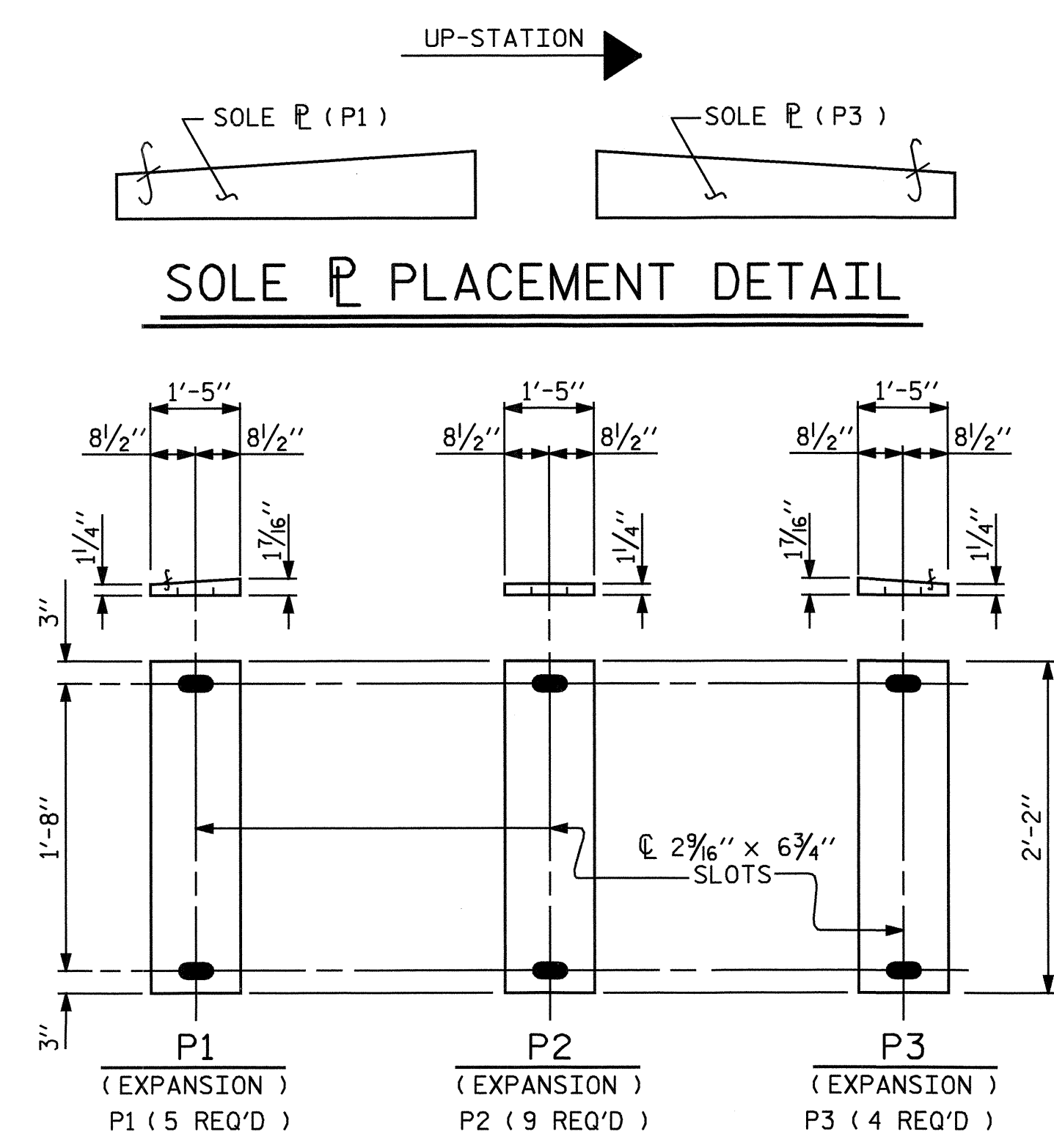
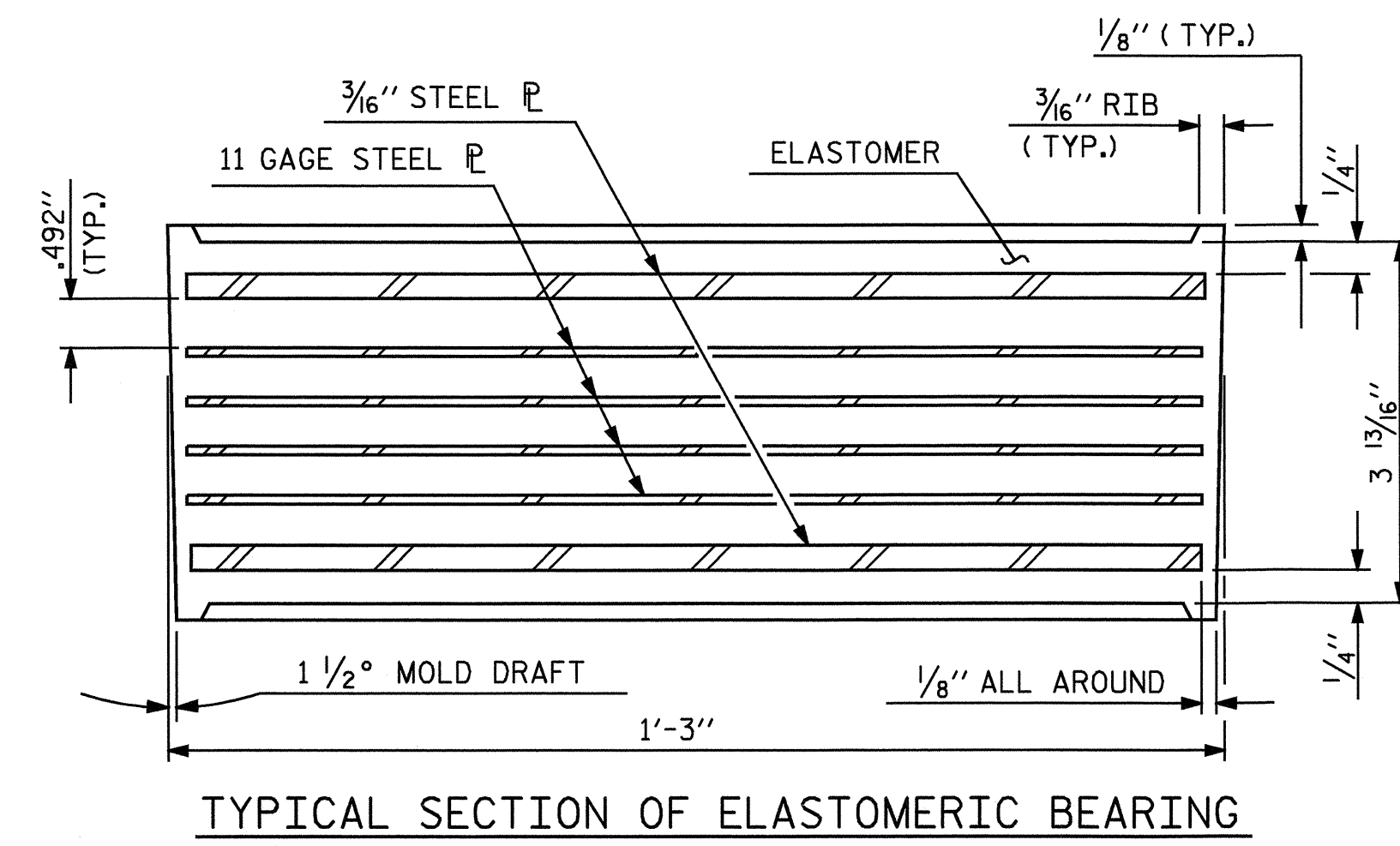
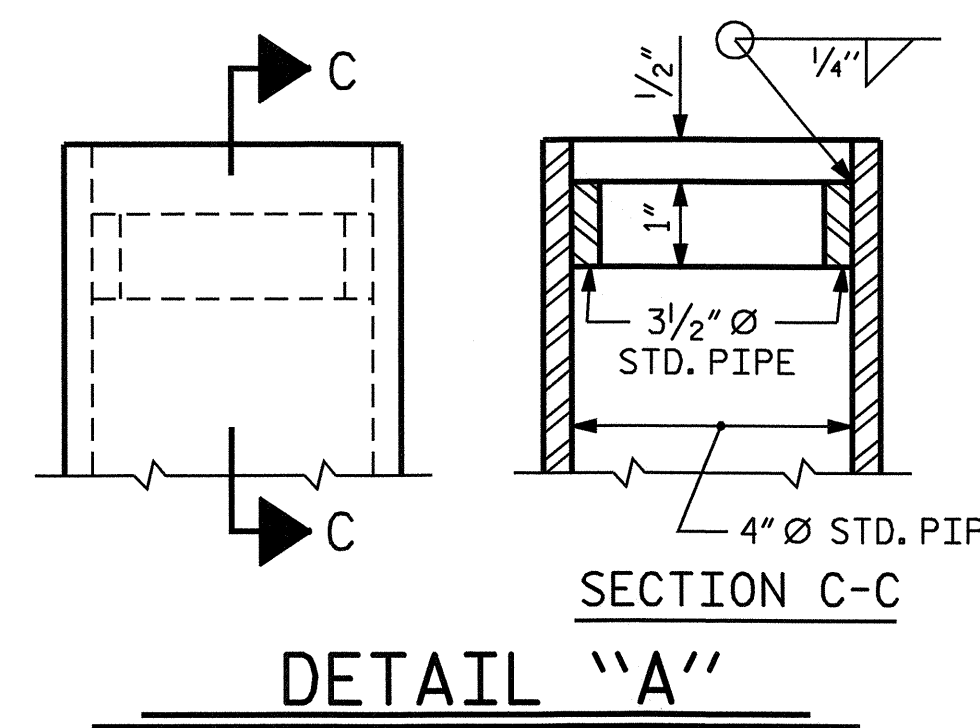
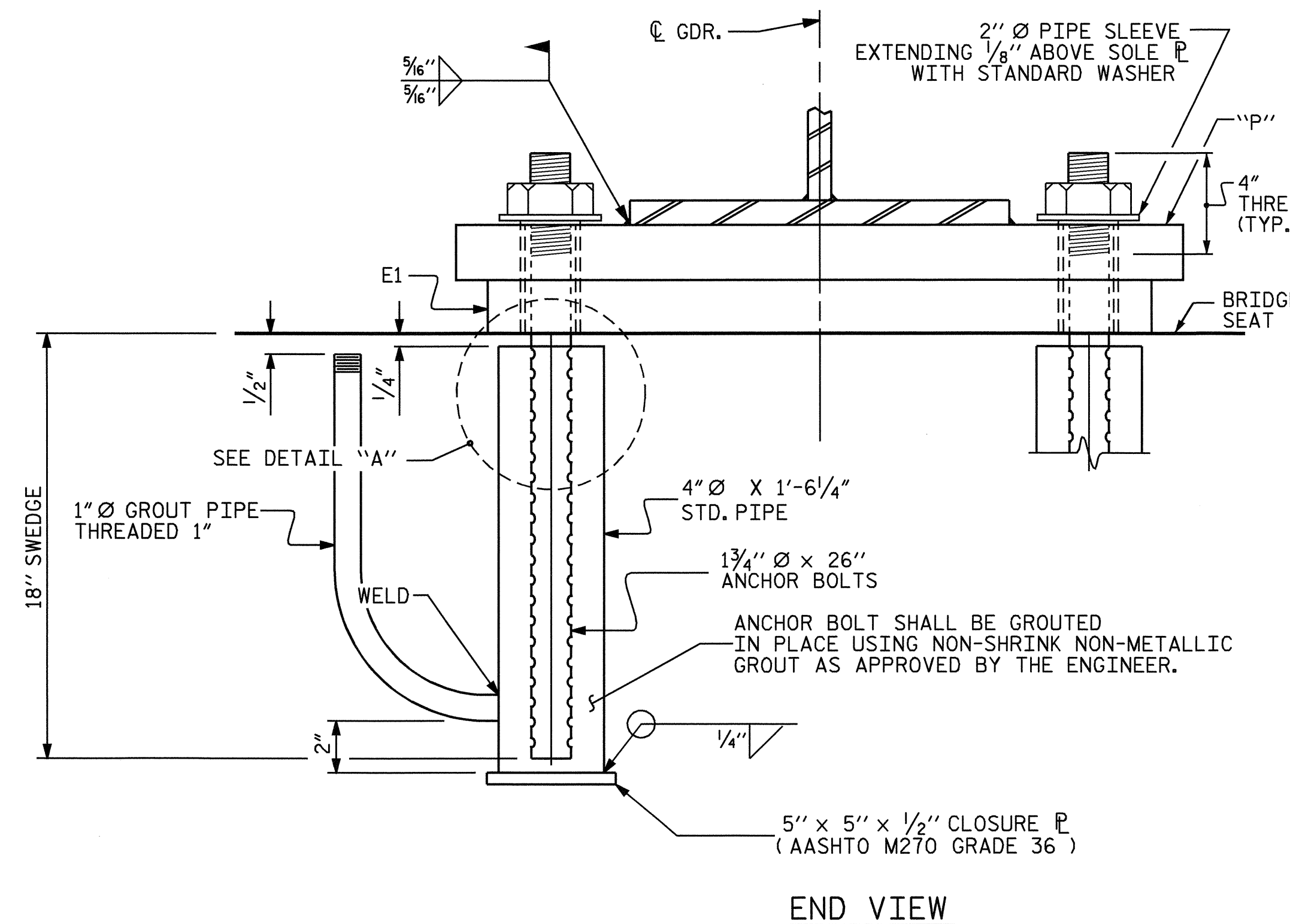
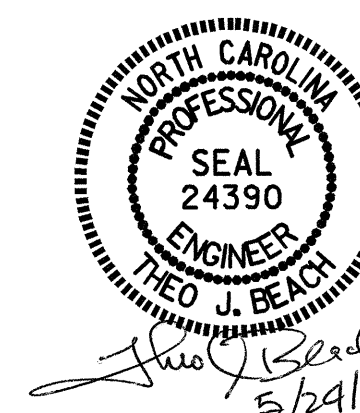
| -LOAD RATINGS- | |
|----------------|----------------|
| | MAX.D.L.+ L.L. |
| TYPE VI | 262 k |

PROJECT NO. I-4411
IREDELL COUNTY
 STATION: 46+79.71 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
ELASTOMERIC BEARING
DETAILS
 (STEEL SUPERSTRUCTURE)

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

1996
S-15
TOTAL SHEETS
42



SOLE PLATE DETAILS ("P")

TYPE VI

| | |
|---------------------------|-----------------------|
| ASSEMBLED BY : MIKE BRITT | DATE : 12-20-04 |
| CHECKED BY : T.J. BEACH | DATE : 1-05 |
| DRAWN BY : EEM 10/95 | REV. 8/16/99 MAB/LES |
| CHECKED BY : PEK 10/95 | REV. 10/17/00 RWW/LES |
| | REV. 7/10/01 LES/RDR |

NOTES

FOR POT BEARINGS, SEE SPECIAL PROVISIONS.

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

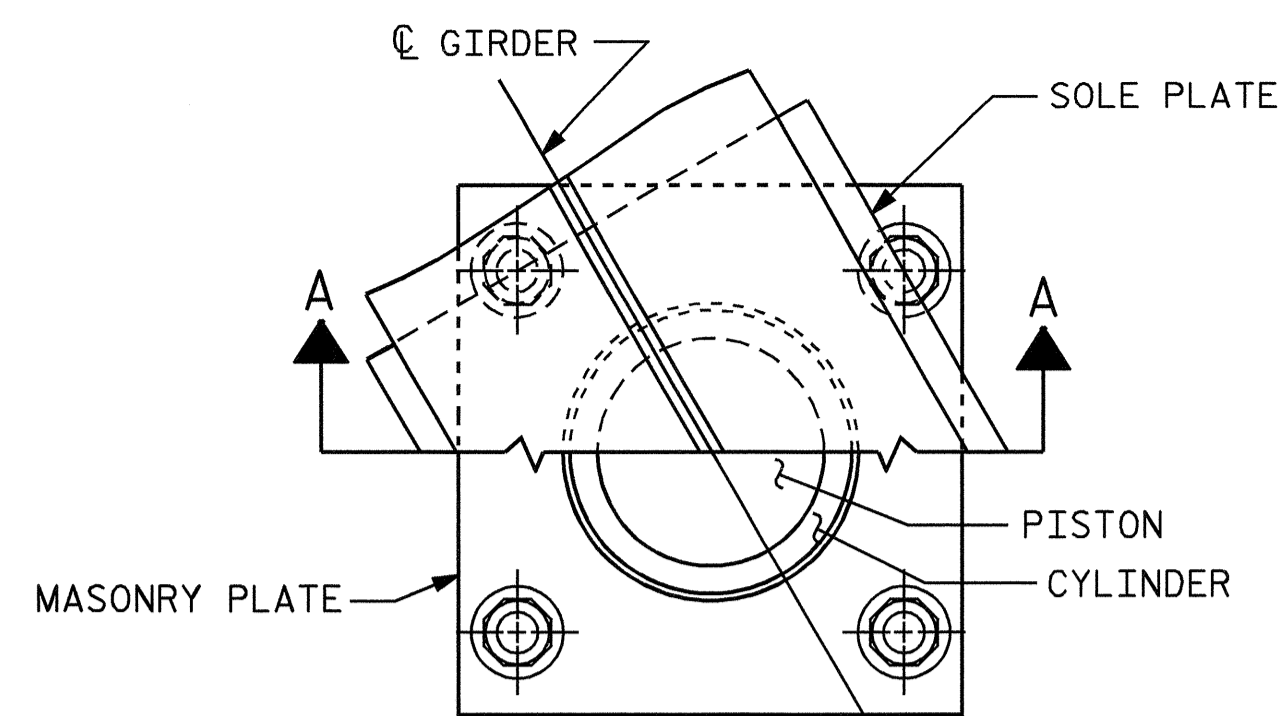
WHEN WELDING THE SOLE PLATE TO THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE BEARING DOES NOT EXCEED 250°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE TFE OR ELASTOMER.

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

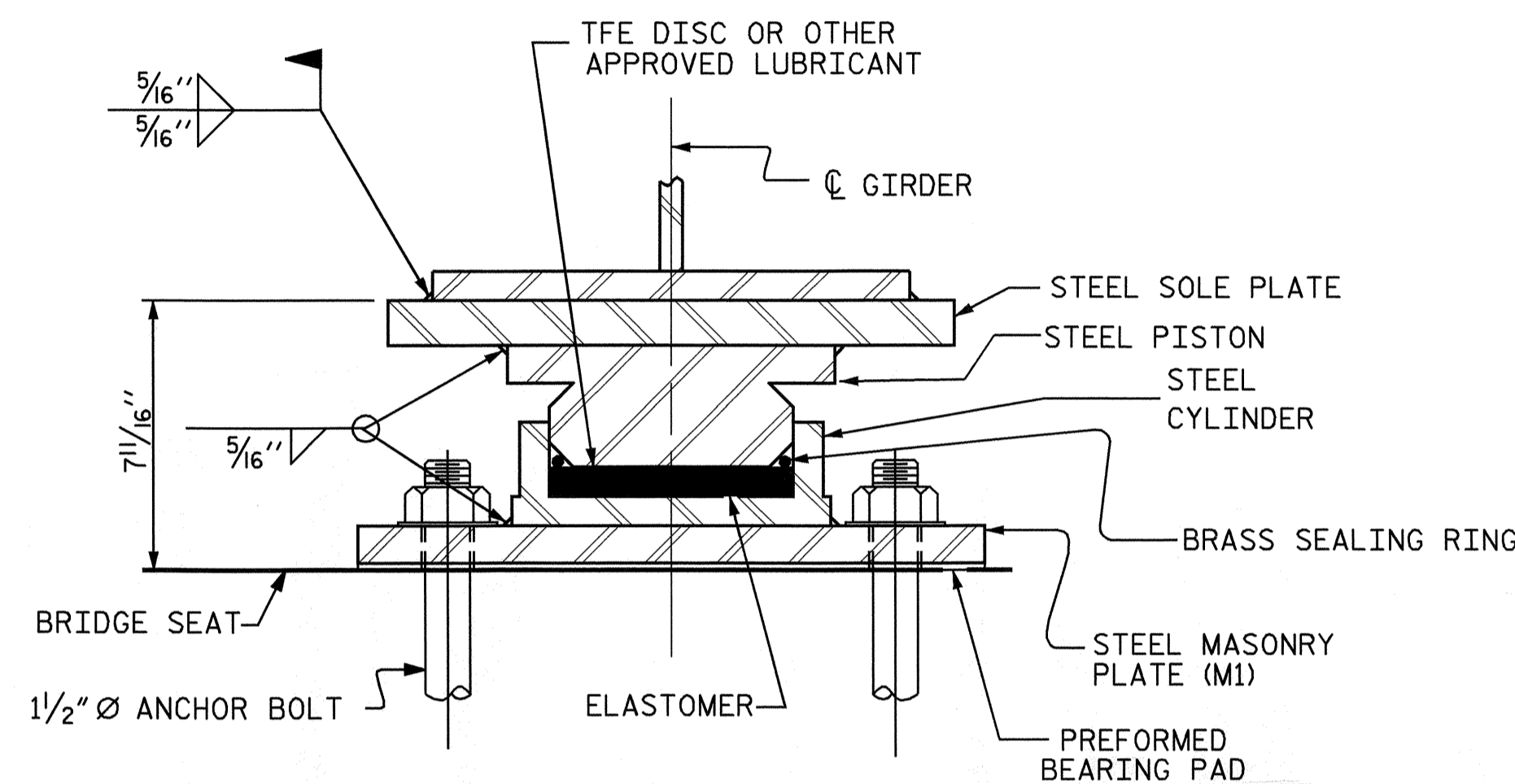
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

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



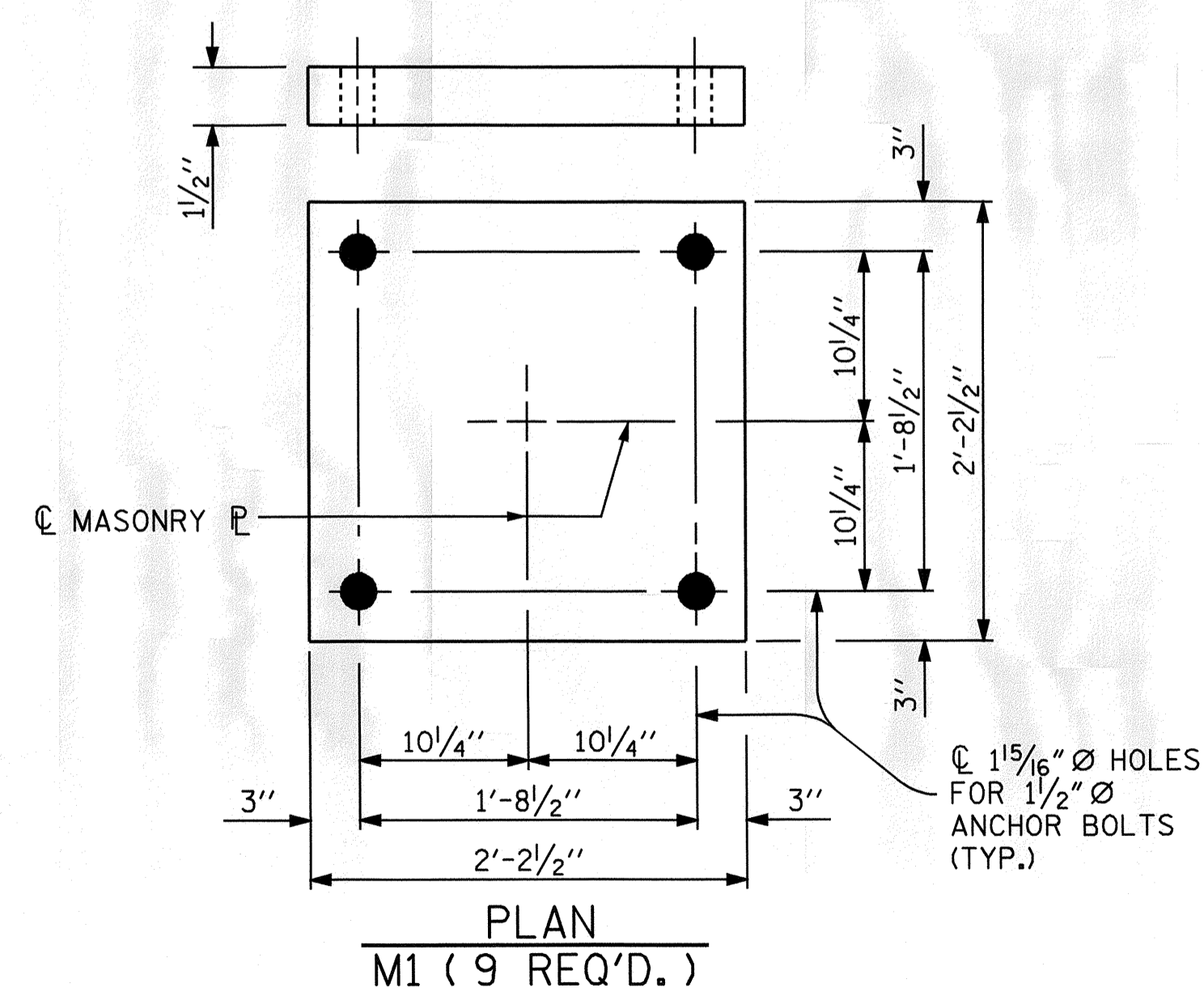
CUT-AWAY PLAN



SECTION A-A

PB1, FIXED
(9 REQ'D.)

POT BEARING DETAILS

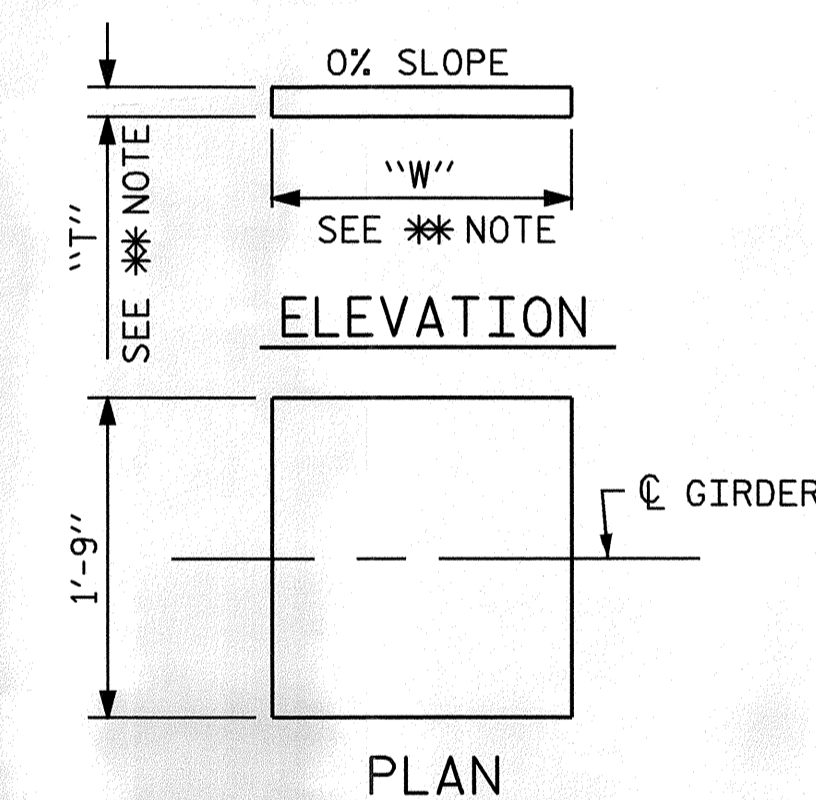


PLAN
M1 (9 REQ'D.)

MASONRY PLATE DETAILS

| BEARING | LOCATION | VERTICAL LOAD (KIPS) | | | LATERAL LOAD (KIPS) |
|---------|------------|----------------------|-------|-------|---------------------|
| | | DEAD | LIVE | TOTAL | |
| PB1 | BENT No. 1 | 443 K | 151 K | 594 K | 89 K |

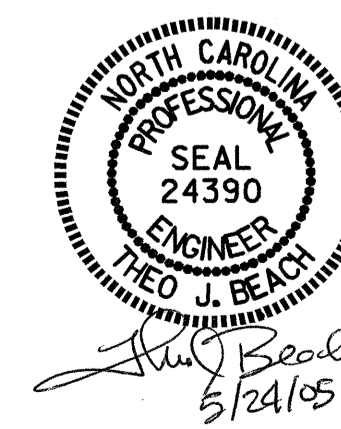
INCREASING STATIONS →



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

SOLE PLATE DETAILS

PROJECT NO. I-4411
IREDELL COUNTY
 STATION: 46+79.71 -L-



| | | | | | | |
|--|-----|-------|-----|-----|-------|--------------------|
| STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH | | | | | | SHEET NO. 5-16 |
| STANDARD POT BEARING DETAILS | | | | | | |
| REVISIONS | | | | | | TOTAL SHEETS 42 |
| NO. | BY: | DATE: | NO. | BY: | DATE: | |
| 1 | | | 3 | | | |
| 2 | | | 4 | | | |

| | |
|---------------------------|-----------------------|
| ASSEMBLED BY : MIKE BRITT | DATE : 12-20-04 |
| CHECKED BY : T.J. BEACH | DATE : 1-05 |
| DRAWN BY : RWW 8/99 | REV. 10/17/00 RWW/LES |
| CHECKED BY : LES 8/99 | REV. 7/10/01 LES/RDR |
| | REV. 5/7/03 RWW/JTE |

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

Table for GIRDER #1 showing deflection values for SPAN 'A' and SPAN 'B' across various points from 0 to 0.95. Rows include TWENTIETH POINTS, DEFLECTION DUE TO WEIGHT OF GIRDER, DEFLECTION DUE TO WEIGHT OF SLAB, DEFLECTION DUE TO WEIGHT OF PARAPET & 2 BAR RAIL, TOTAL DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, and REQUIRED CAMBER.

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

Table for GIRDER #2 showing deflection values for SPAN 'A' and SPAN 'B' across various points from 0 to 0.95. Rows include TWENTIETH POINTS, DEFLECTION DUE TO WEIGHT OF GIRDER, DEFLECTION DUE TO WEIGHT OF SLAB, DEFLECTION DUE TO WEIGHT OF PARAPET & 2 BAR RAIL, TOTAL DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, and REQUIRED CAMBER.

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

Table for GIRDER #3 showing deflection values for SPAN 'A' and SPAN 'B' across various points from 0 to 0.95. Rows include TWENTIETH POINTS, DEFLECTION DUE TO WEIGHT OF GIRDER, DEFLECTION DUE TO WEIGHT OF SLAB, DEFLECTION DUE TO WEIGHT OF PARAPET & 2 BAR RAIL, TOTAL DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, and REQUIRED CAMBER.

* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS. ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "REQUIRED CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM). DEFLECTIONS ARE TAKEN AT TWENTIETH POINTS BETWEEN BEARINGS.

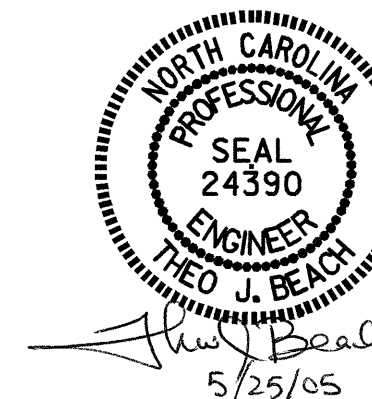
NOTE: SLOPE FOR ZERO CAMBER BASELINES VARY.

PROJECT NO. I-4411
IREDELL COUNTY
STATION: 46+79.71 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
DEAD LOAD DEFLECTIONS



DRAWN BY: MIKE BRITT DATE: 5-19-05
CHECKED BY: T.J. BEACH DATE: 5-25-05

Table with columns for REVISIONS (NO., BY, DATE) and SHEET NO. (S-17, TOTAL SHEETS 42).

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

Table for GIRDER #7, showing deflection values for SPAN 'A' and SPAN 'B'. Rows include TWENTIETH POINTS, DEFLECTION DUE TO WEIGHT OF GIRDER, DEFLECTION DUE TO WEIGHT OF SLAB, DEFLECTION DUE TO WEIGHT OF PARAPET & 2 BAR RAIL, TOTAL DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, and REQUIRED CAMBER.

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

Table for GIRDER #8, showing deflection values for SPAN 'A' and SPAN 'B'. Rows include TWENTIETH POINTS, DEFLECTION DUE TO WEIGHT OF GIRDER, DEFLECTION DUE TO WEIGHT OF SLAB, DEFLECTION DUE TO WEIGHT OF PARAPET & 2 BAR RAIL, TOTAL DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, and REQUIRED CAMBER.

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

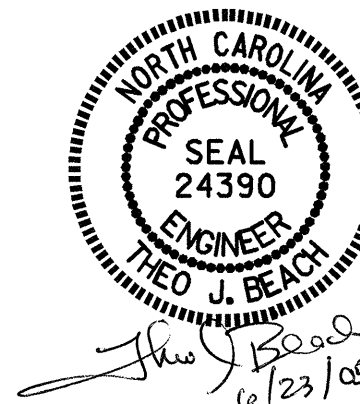
Table for GIRDER #9, showing deflection values for SPAN 'A' and SPAN 'B'. Rows include TWENTIETH POINTS, DEFLECTION DUE TO WEIGHT OF GIRDER, DEFLECTION DUE TO WEIGHT OF SLAB, DEFLECTION DUE TO WEIGHT OF PARAPET & 2 BAR RAIL, TOTAL DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, and REQUIRED CAMBER.

* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS. ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "REQUIRED CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM). DEFLECTIONS ARE TAKEN AT TWENTIETH POINTS BETWEEN BEARINGS.

NOTE: SLOPE FOR ZERO CAMBER BASELINES VARY.

PROJECT NO. I-4411
IREDELL COUNTY
STATION: 46+79.71 -L-

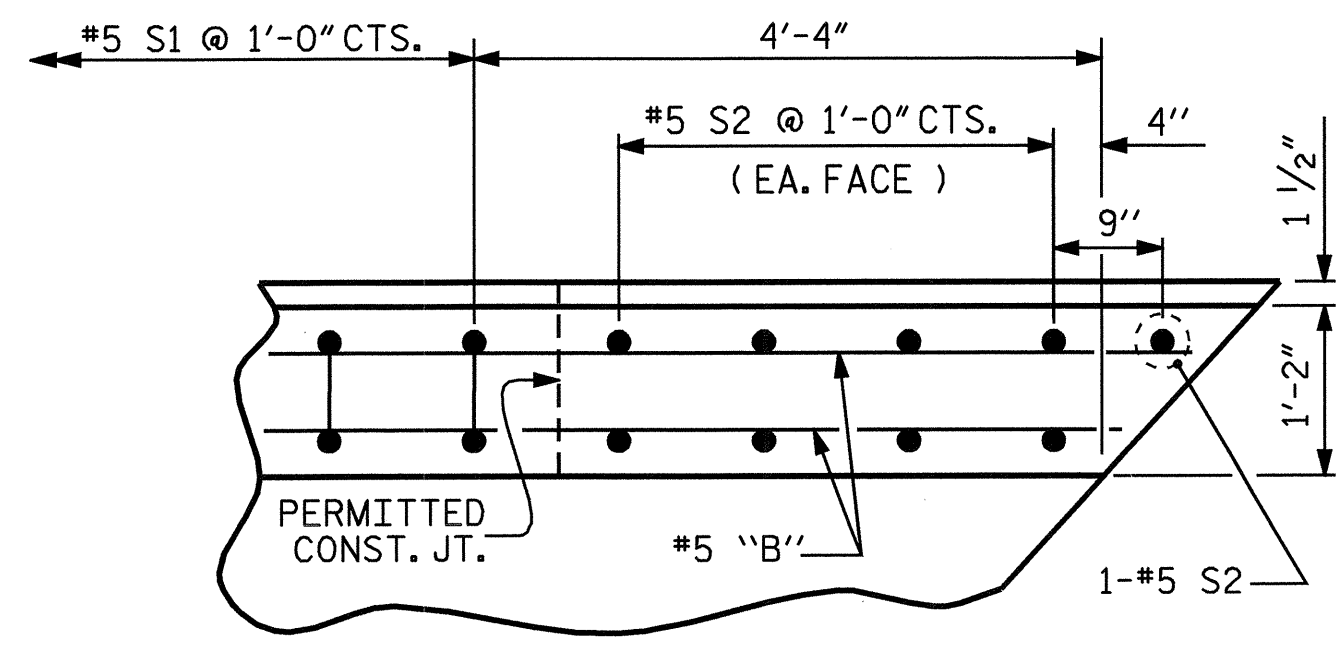
SHEET 3 OF 3



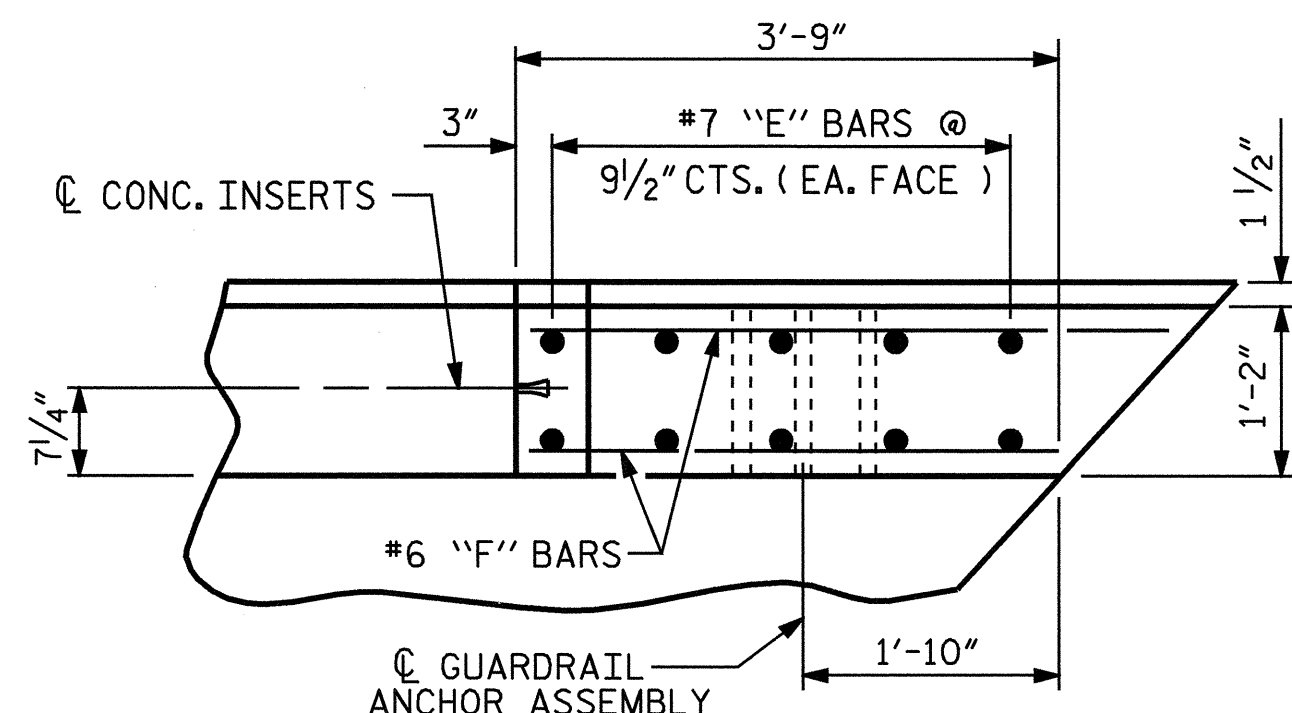
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
DEAD LOAD
DEFLECTIONS

| REVISIONS | | | | | | SHEET NO. | |
|-----------|-----|-------|-----|-----|-------|-----------------|--|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-19 | |
| 1 | | | 3 | | | TOTAL SHEETS 42 | |
| 2 | | | 4 | | | | |

DRAWN BY: MIKE BRITT DATE: 5-24-05
CHECKED BY: T.J. BEACH DATE: 5-25-05



PLAN OF PARAPET

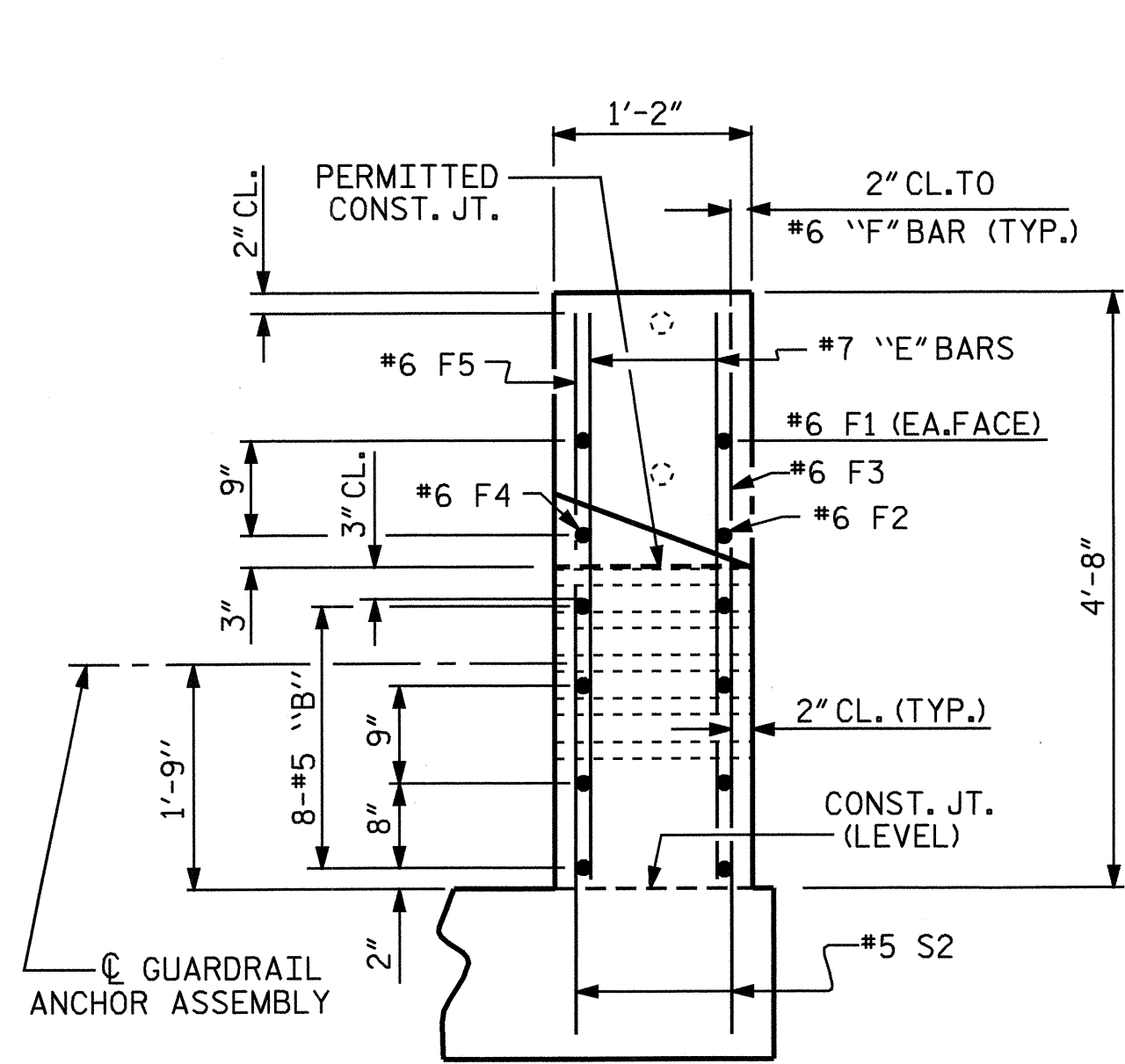


PLAN OF END POST

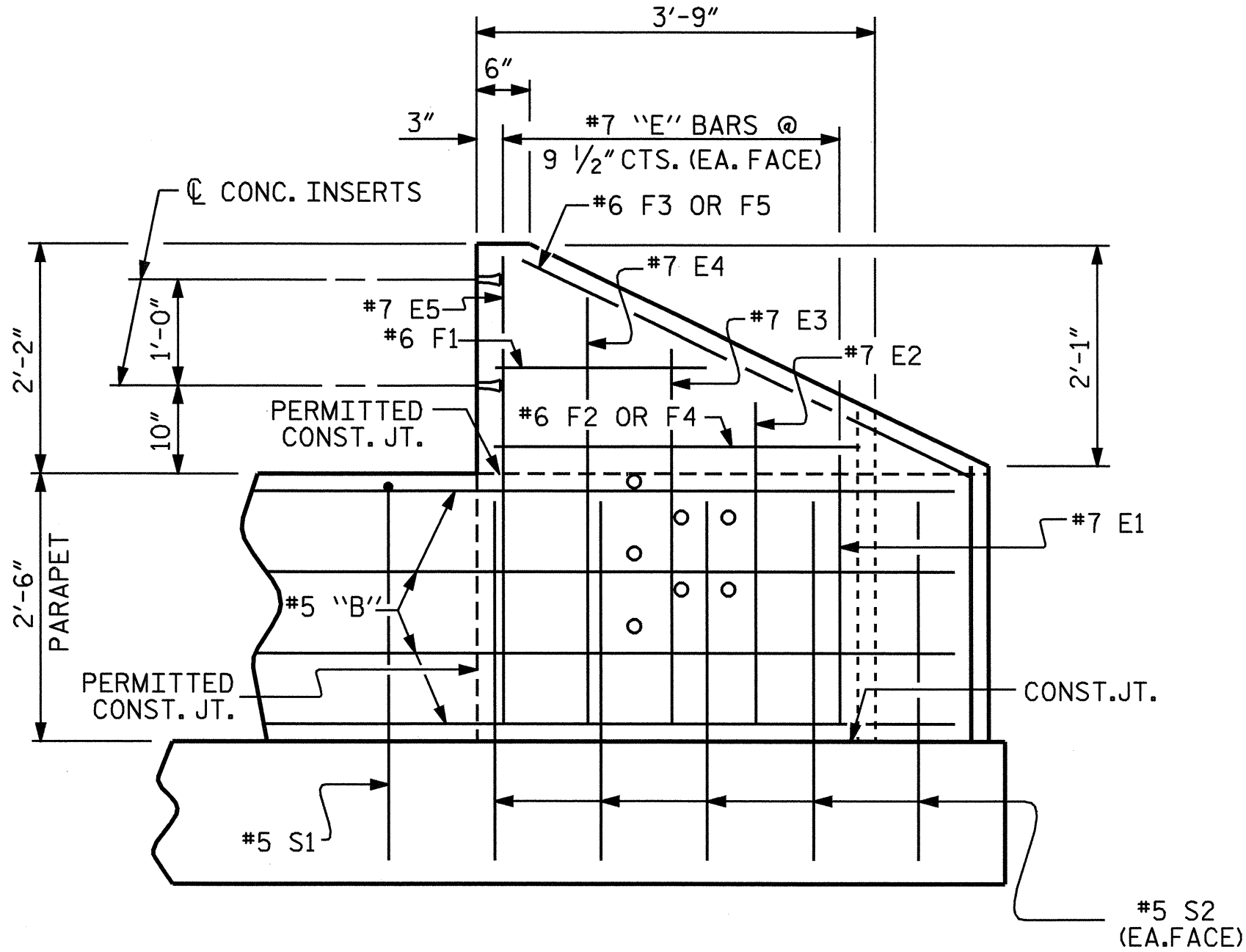
| BAR TYPE | BILL OF MATERIAL | | | | | | | | | | | |
|----------|-----------------------------------|------|------|--------|--------|------------------------------------|---------------------------------|------|--------|--------|--------|-------------|
| | FOR STAGE I CONCRETE PARAPET ONLY | | | | | FOR STAGE II CONCRETE PARAPET ONLY | | | | | | |
| | BAR No. | SIZE | TYPE | LENGTH | WEIGHT | BAR No. | SIZE | TYPE | LENGTH | WEIGHT | | |
| | *B1 | 24 | #5 | STR. | 52'-1" | 1304 | *B1 | 24 | #5 | STR. | 52'-1" | 1304 |
| | *B2 | 24 | #5 | STR. | 51'-8" | 1293 | *B2 | 24 | #5 | STR. | 51'-8" | 1293 |
| | *E1 | 4 | #7 | STR. | 2'-6" | 20 | *E1 | 4 | #7 | STR. | 2'-6" | 20 |
| | *E2 | 4 | #7 | STR. | 3'-0" | 25 | *E2 | 4 | #7 | STR. | 3'-0" | 25 |
| | *E3 | 4 | #7 | STR. | 3'-6" | 29 | *E3 | 4 | #7 | STR. | 3'-6" | 29 |
| | *E4 | 4 | #7 | STR. | 4'-0" | 33 | *E4 | 4 | #7 | STR. | 4'-0" | 33 |
| | *E5 | 4 | #7 | STR. | 4'-4" | 35 | *E5 | 4 | #7 | STR. | 4'-4" | 35 |
| | *F1 | 4 | #6 | STR. | 2'-0" | 12 | *F1 | 4 | #6 | STR. | 2'-0" | 12 |
| | *F2 | 2 | #6 | STR. | 3'-10" | 12 | *F2 | 2 | #6 | STR. | 3'-10" | 12 |
| | *F3 | 2 | #6 | STR. | 4'-8" | 14 | *F3 | 2 | #6 | STR. | 4'-8" | 14 |
| | *F4 | 2 | #6 | STR. | 2'-10" | 9 | *F4 | 2 | #6 | STR. | 2'-10" | 9 |
| | *F5 | 2 | #6 | STR. | 3'-6" | 11 | *F5 | 2 | #6 | STR. | 3'-6" | 11 |
| | *S1 | 289 | #5 | 1 | 7'-0" | 2110 | *S1 | 289 | #5 | 1 | 7'-0" | 2110 |
| | *S2 | 18 | #5 | STR. | 3'-0" | 56 | *S2 | 18 | #5 | STR. | 3'-0" | 56 |
| | *EPOXY COATED REINFORCING STEEL | | | | | 4,963 LBS. | *EPOXY COATED REINFORCING STEEL | | | | | 4,963 LBS. |
| | CLASS AA CONCRETE | | | | | 32.7 C.Y. | CLASS AA CONCRETE | | | | | 32.7 C.Y. |
| | STAGE I CONCRETE PARAPET | | | | | 298.18 L.F. | STAGE II CONCRETE PARAPET | | | | | 298.18 L.F. |

BAR DIMENSIONS ARE OUT TO OUT

* THESE BARS ARE EPOXY COATED



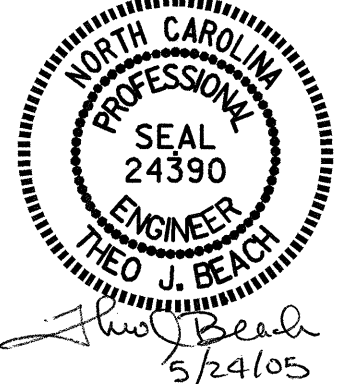
END VIEW



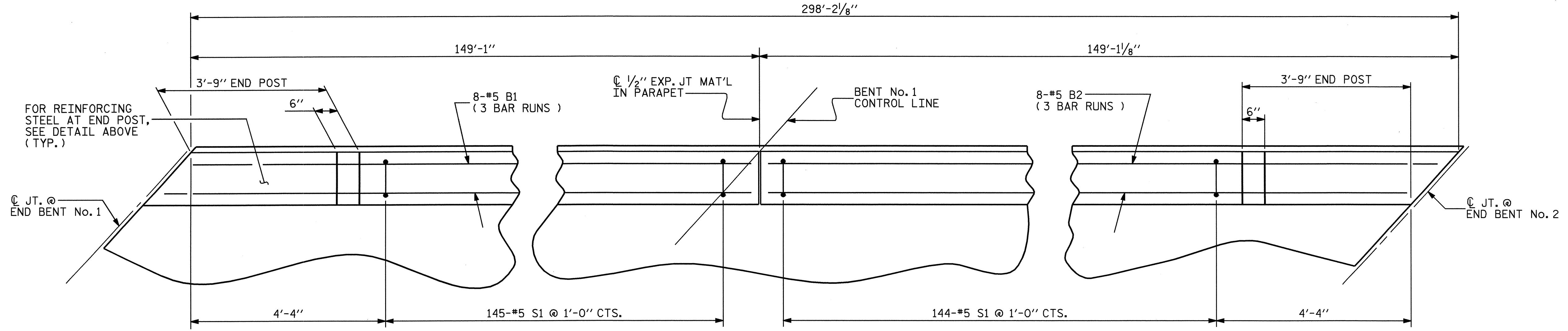
ELEVATION

PARAPET AND END POST FOR TWO BAR RAIL

| TOTAL QUANTITIES | | |
|--------------------------------------|-------------|--|
| STAGE I CONCRETE PARAPET | 298.18 L.F. | |
| STAGE II CONCRETE PARAPET | 298.18 L.F. | |
| TOTAL 1'-2" x 2'-6" CONCRETE PARAPET | 596.36 L.F. | |



PROJECT NO. I-4411
 IREDELL COUNTY
 STATION: 46+79.71 -L-



PLAN OF PARAPET

(STAGE I PARAPET SHOWN, STAGE II PARAPET SIMILAR)

DRAWN BY: MIKE BRITT DATE: 10-29-04
 CHECKED BY: T.J. BEACH DATE: 1-05

24-MAY-2005 10:01
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 tbeach

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-20 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 42 |

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.

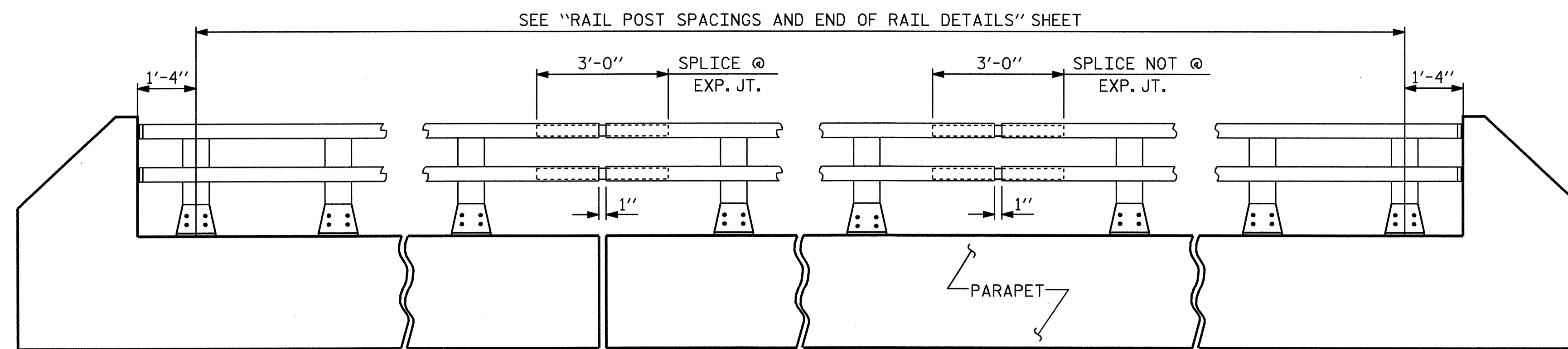
SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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.

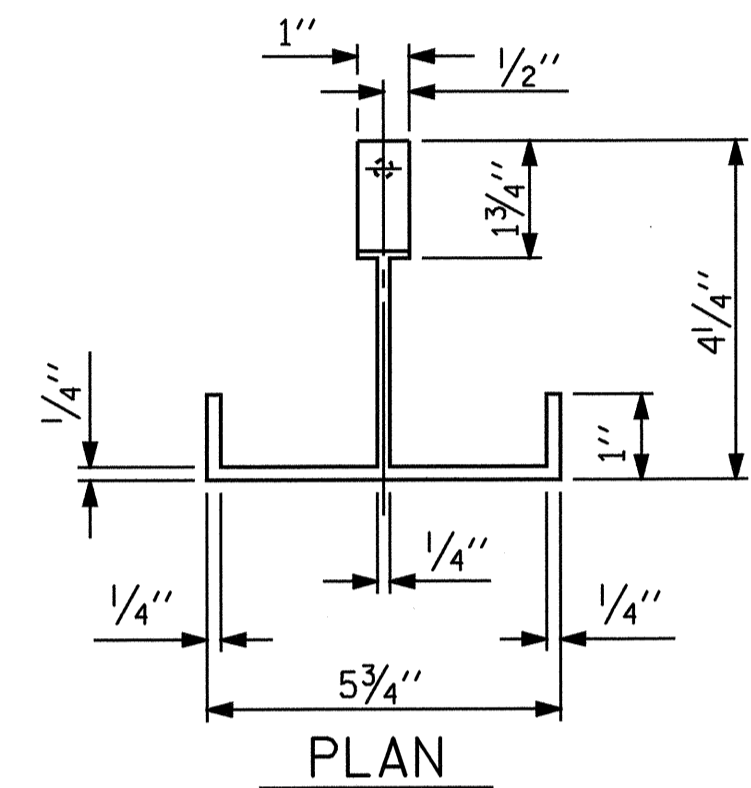
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT A SPACING OF 8 FT. TO 10 FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR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

PAY LENGTH = $\frac{579.00 \text{ LIN. FT.}}{2}$
(TOTAL FOR BOTH STAGES)

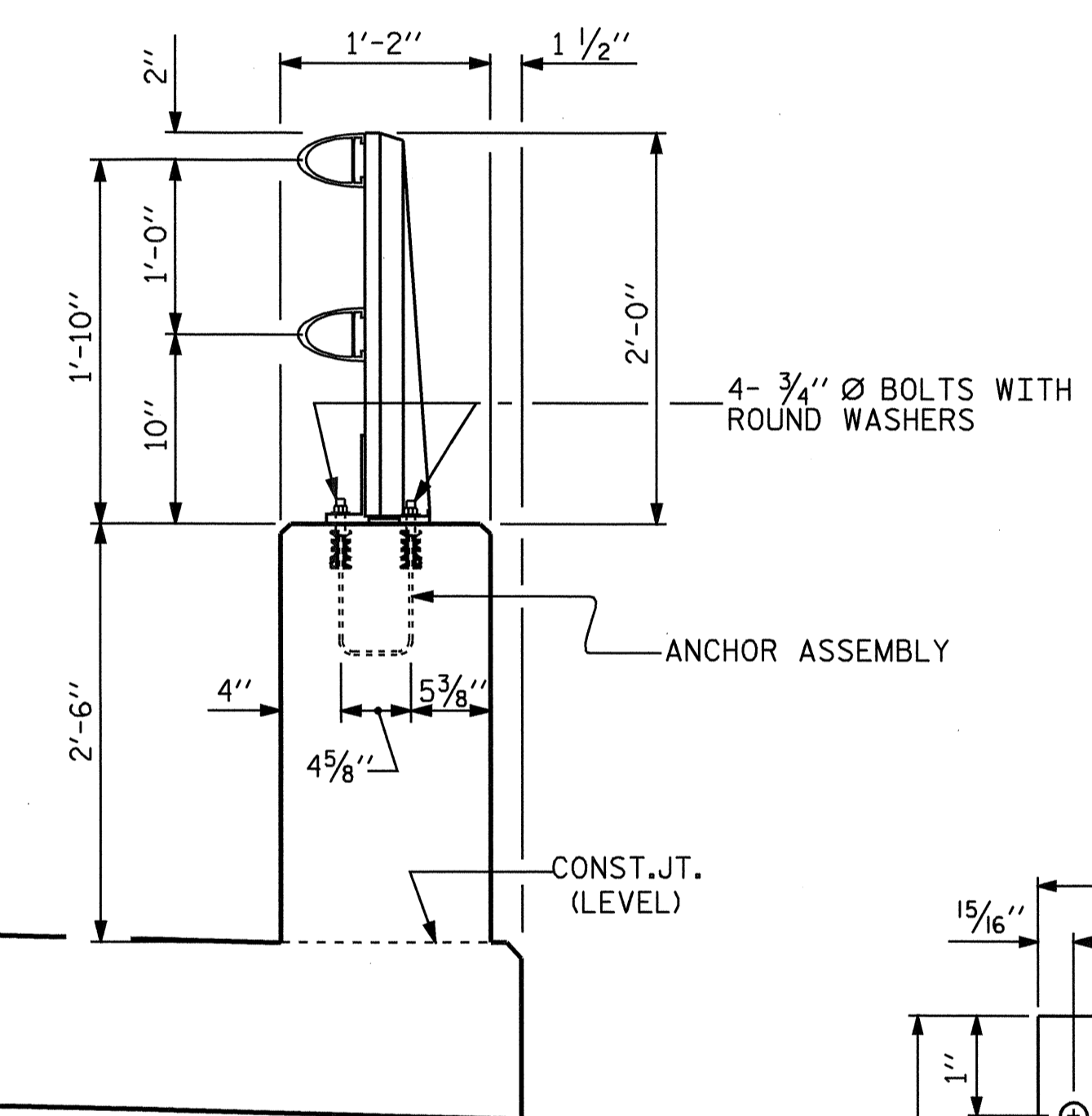


ELEVATION

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

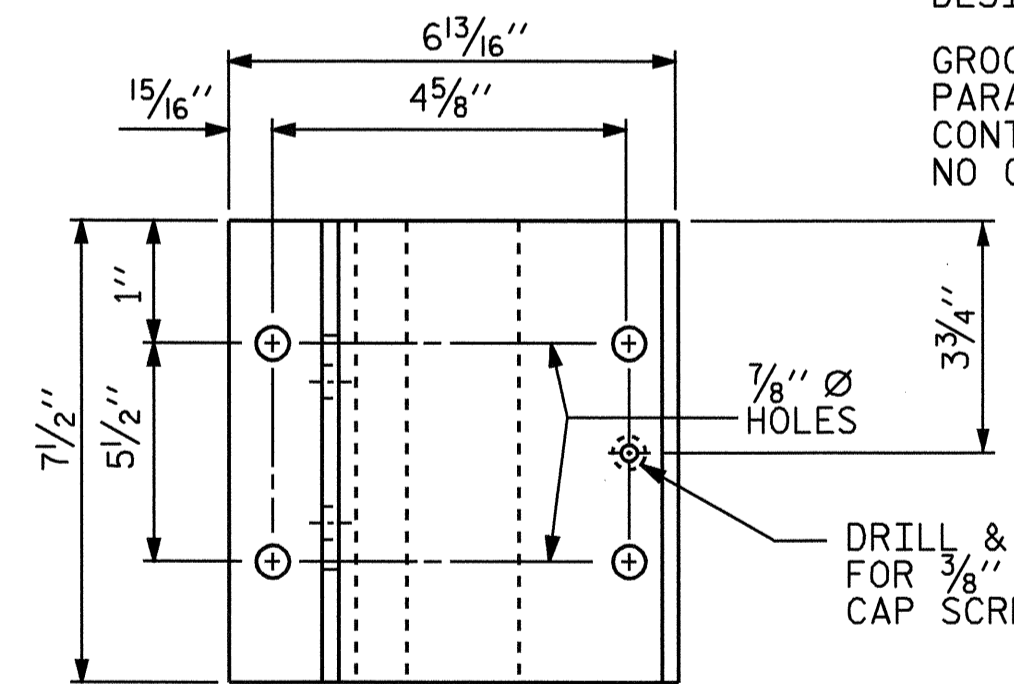
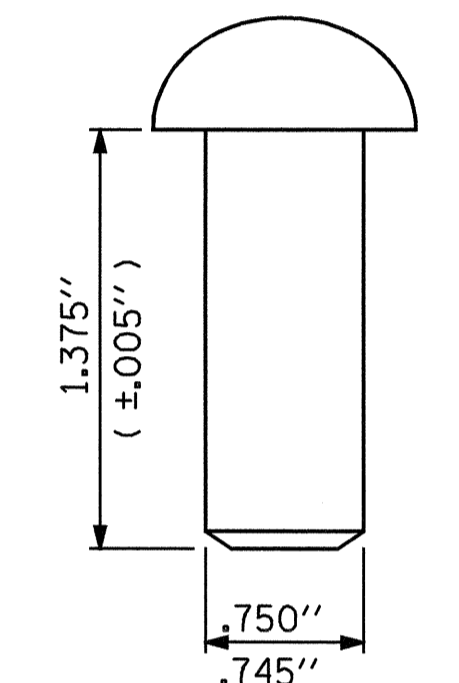


PLAN

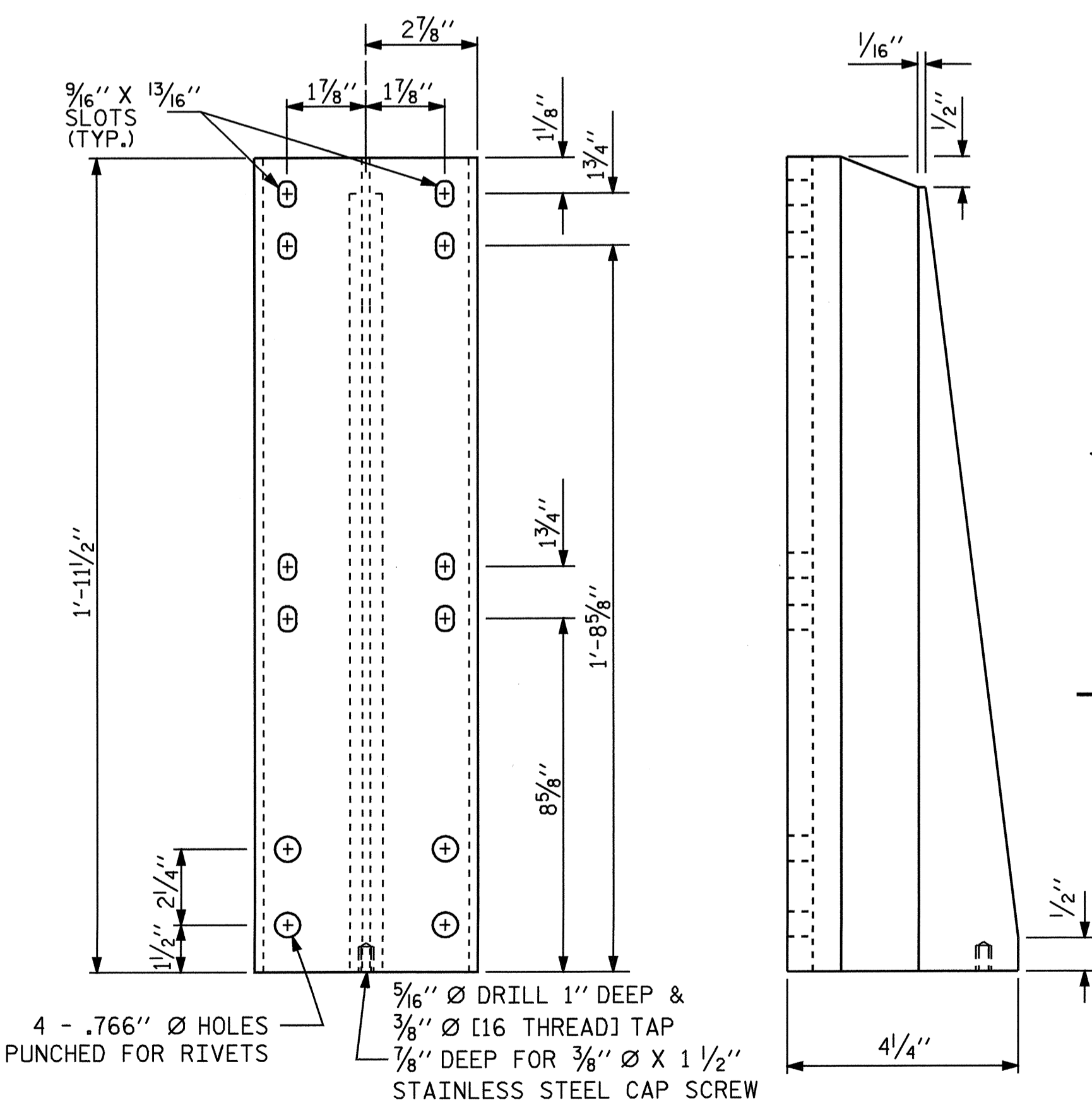


SECTION THRU PARAPET AND RAIL

RIVET DETAIL



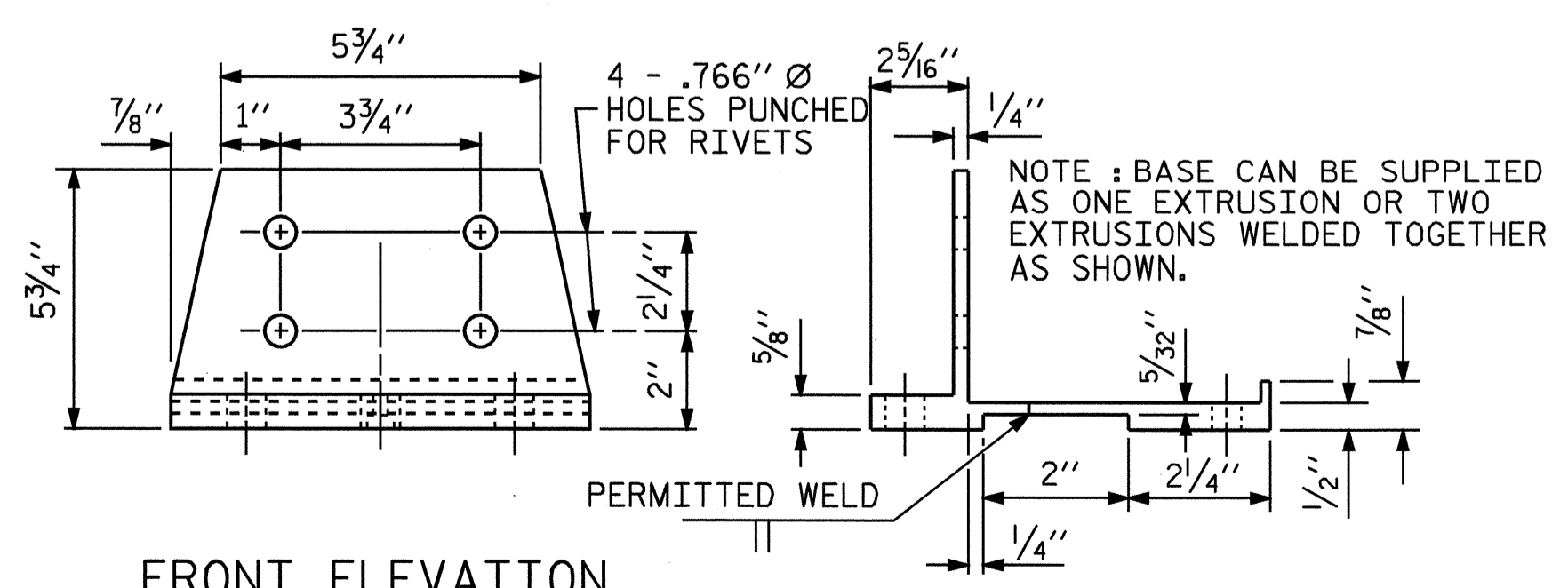
PLAN



FRONT ELEVATION

SIDE ELEVATION

DETAILS OF POST

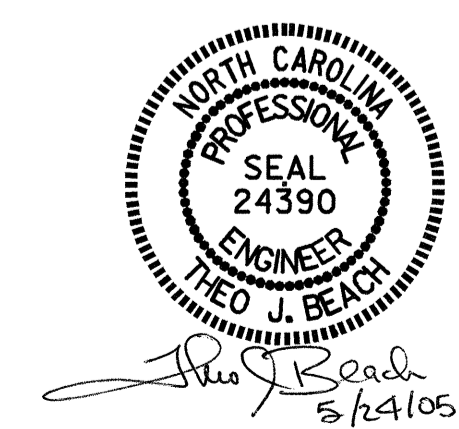


FRONT ELEVATION

SIDE ELEVATION

POST BASE DETAILS

ASSEMBLED BY : MIKE BRITT DATE : 10-29-04
CHECKED BY : T.J. BEACH DATE : 1-05
DRAWN BY : EEM 6/94 REV. 8/16/99 RWW/LES
CHECKED BY : RGW 6/94 REV. 10/17/00 LES/RDR
REV. 5/7/03 RWW/JTE



PROJECT NO. I-4411
IREDELL COUNTY
STATION: 46+79.71 -L-

SHEET 1 OF 2

| | | | | | |
|------------------------------|-----|-------|------|-----|-------|
| STATE OF NORTH CAROLINA | | | | | |
| DEPARTMENT OF TRANSPORTATION | | | | | |
| RALEIGH | | | | | |
| STANDARD | | | | | |
| 2 BAR METAL RAIL | | | | | |
| JUNE | | | 1994 | | |
| REVISIONS | | | | | |
| NO. | BY: | DATE: | NO. | BY: | DATE: |
| 1 | | | 3 | | |
| 2 | | | 4 | | |
| SHEET NO. | | | | | S-21 |
| TOTAL SHEETS | | | | | 42 |

24-MAY-2005 10:02
RASTRUCT02\4411\str\1\MBr\1\I4411.dwg
tbeach

NOTES

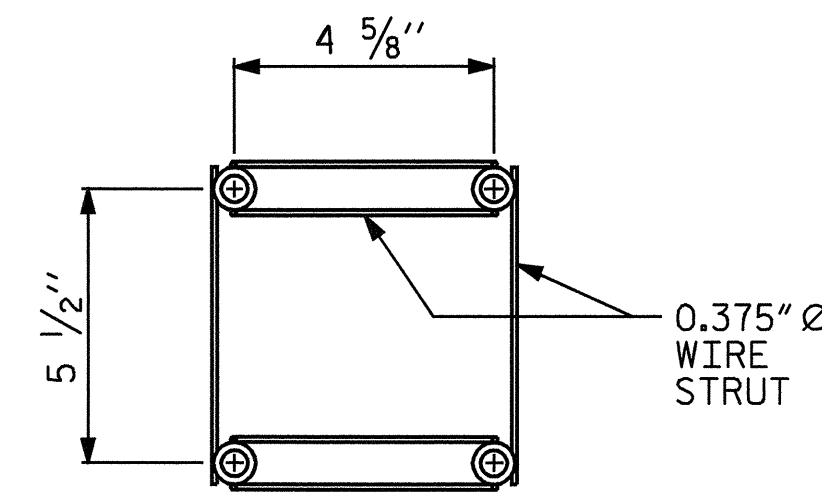
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

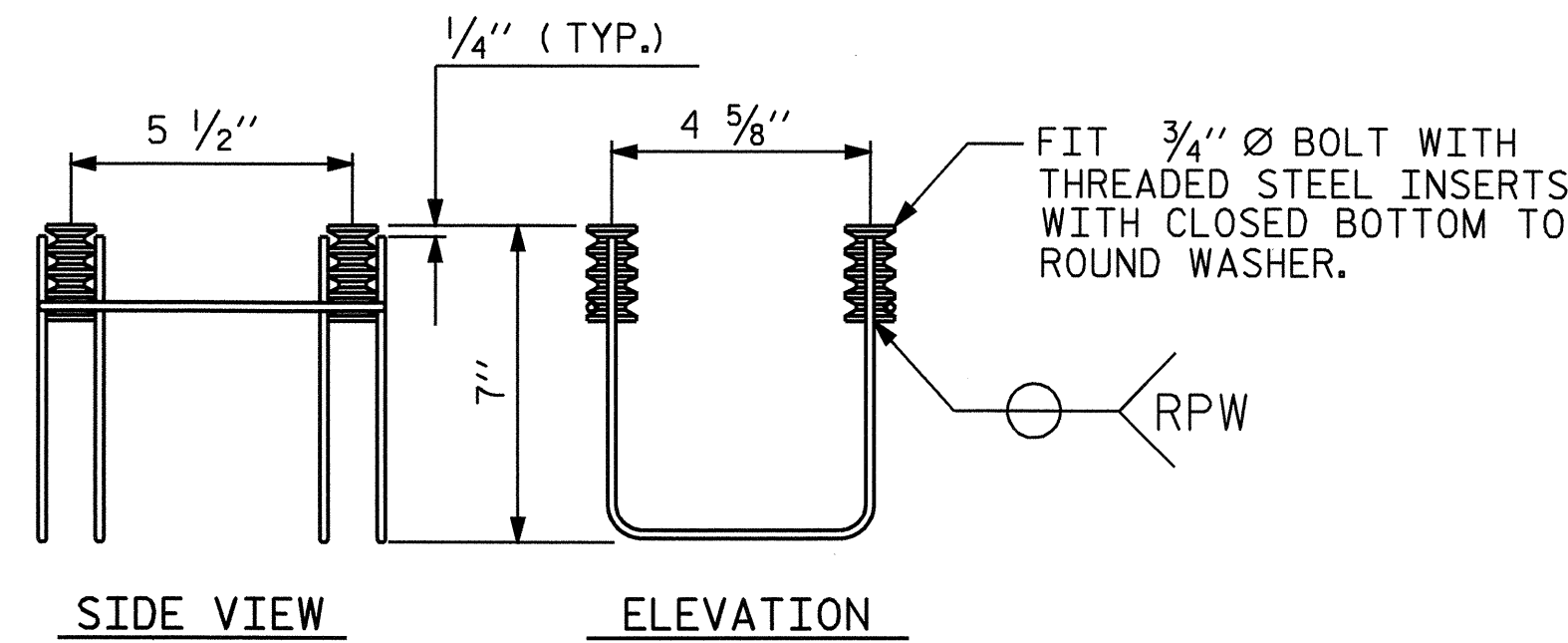
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.
- B. 4 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT 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, AT HIS OPTION, MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN LIEU OF THE METAL RAIL ANCHOR ASSEMBLY. THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS REQUIRED. SEE SPECIAL PROVISIONS FOR "ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS".

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



PLAN



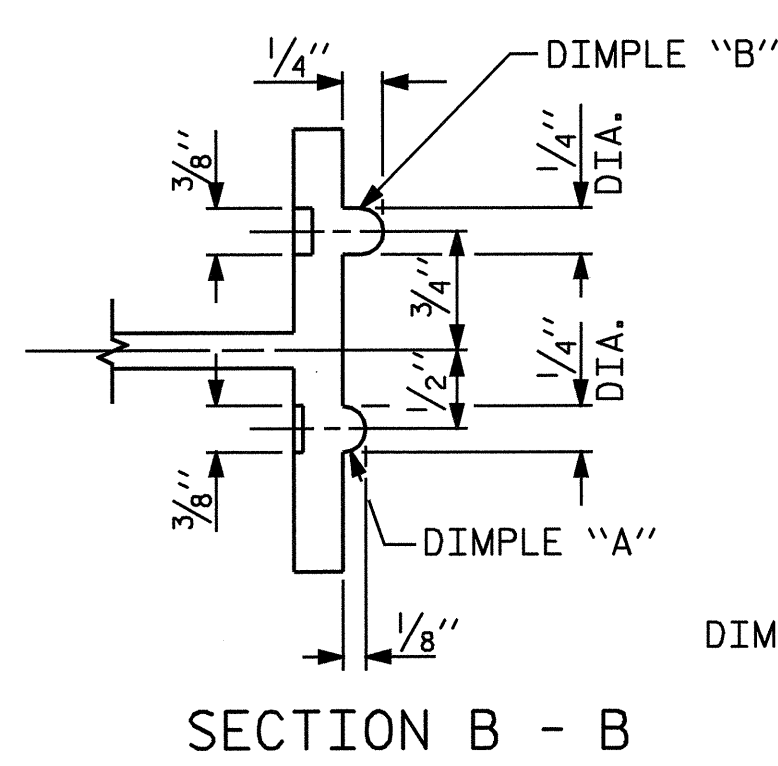
SIDE VIEW

ELEVATION

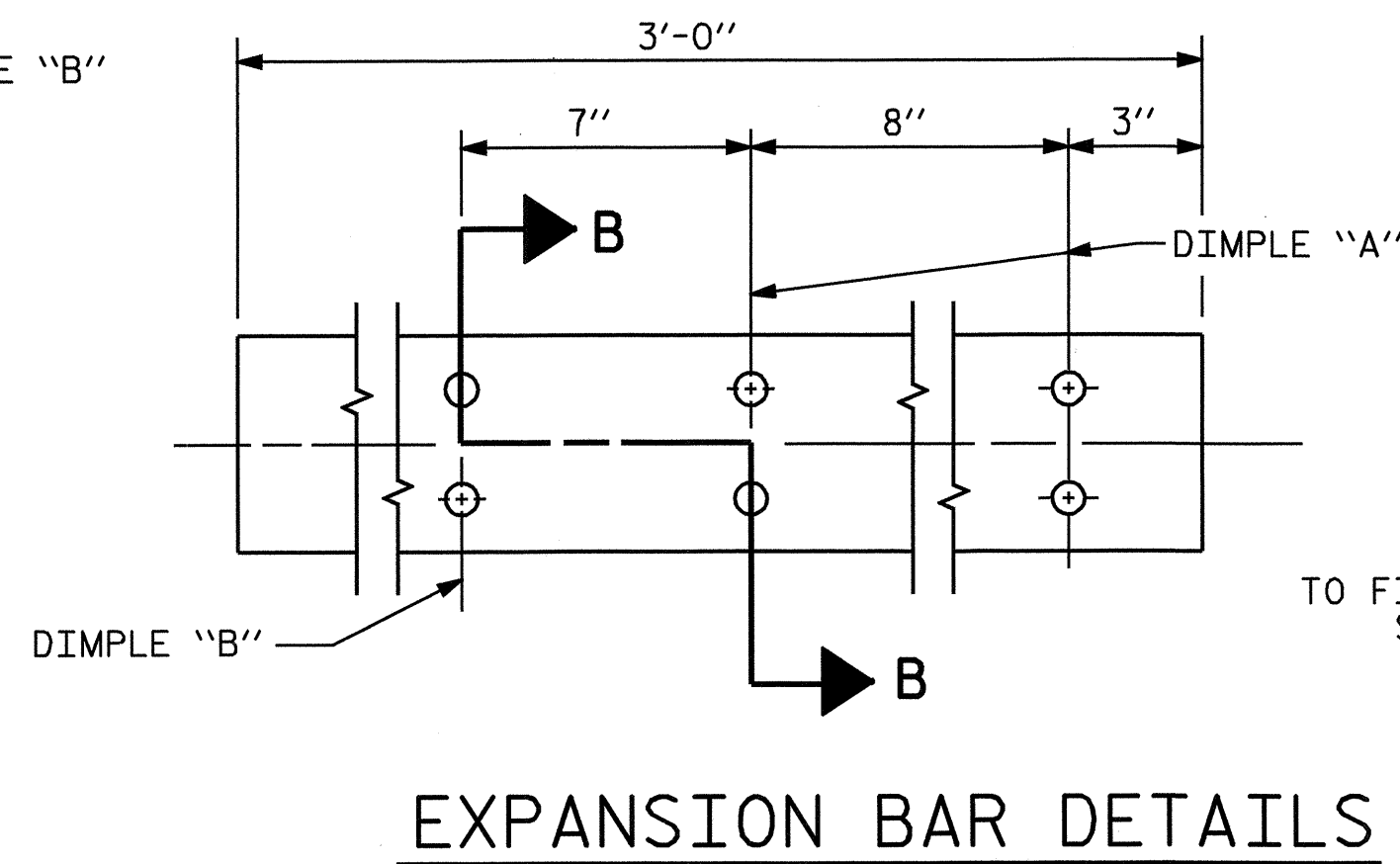
MINIMUM LENGTH OF THREADS IN INSERT (FERRULE) : 1 3/4"

4-BOLT METAL RAIL ANCHOR ASSEMBLY

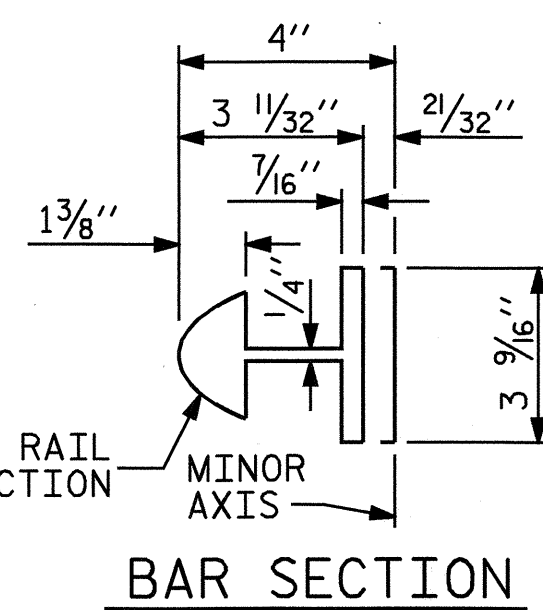
92 ASSEMBLIES REQUIRED
(TOTAL FOR BOTH STAGES)



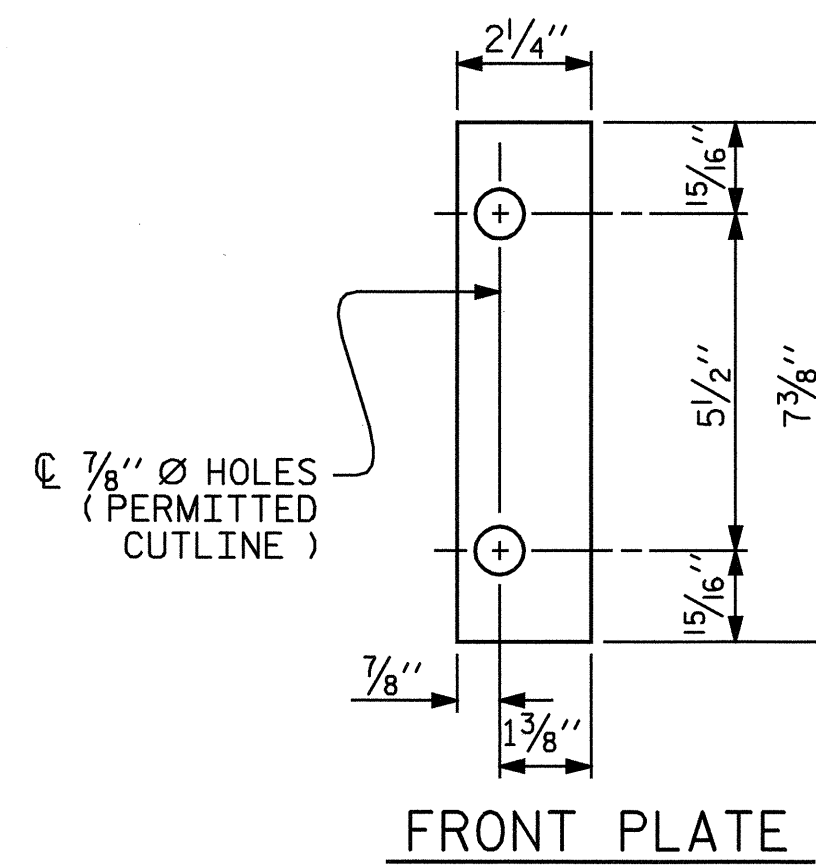
SECTION B - B



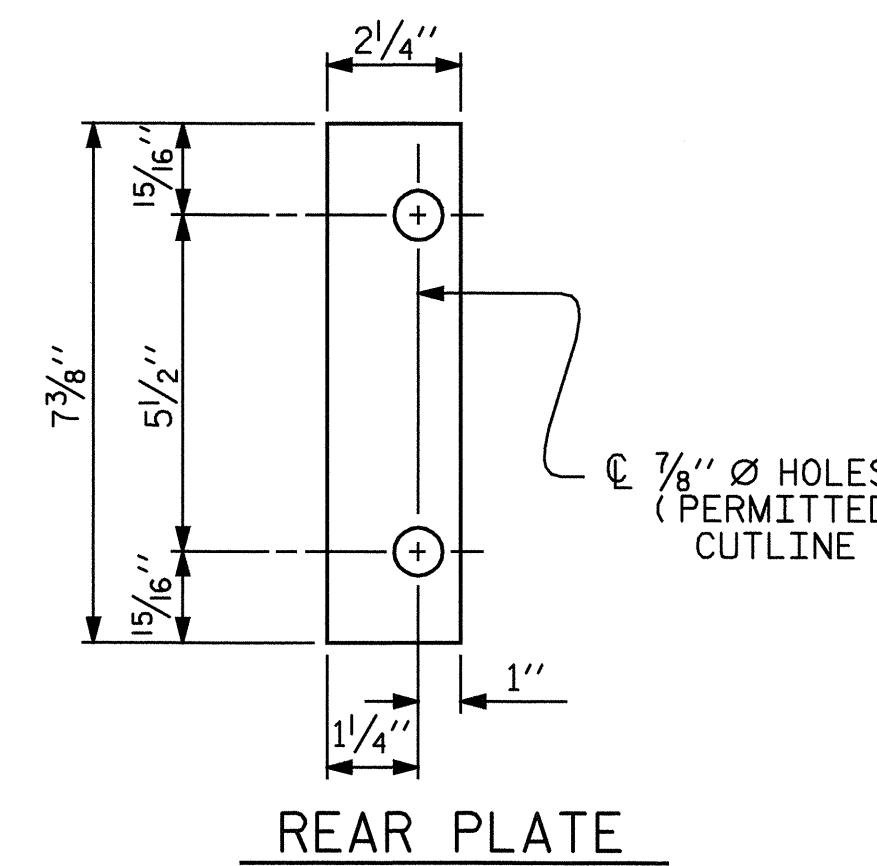
EXPANSION BAR DETAILS



BAR SECTION



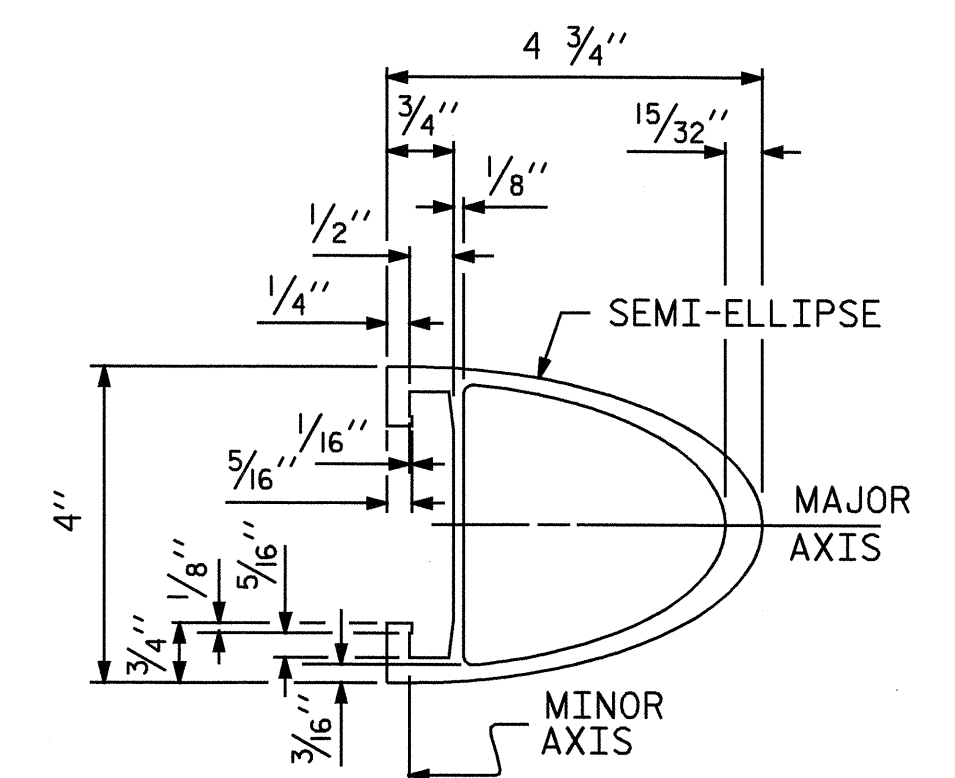
FRONT PLATE



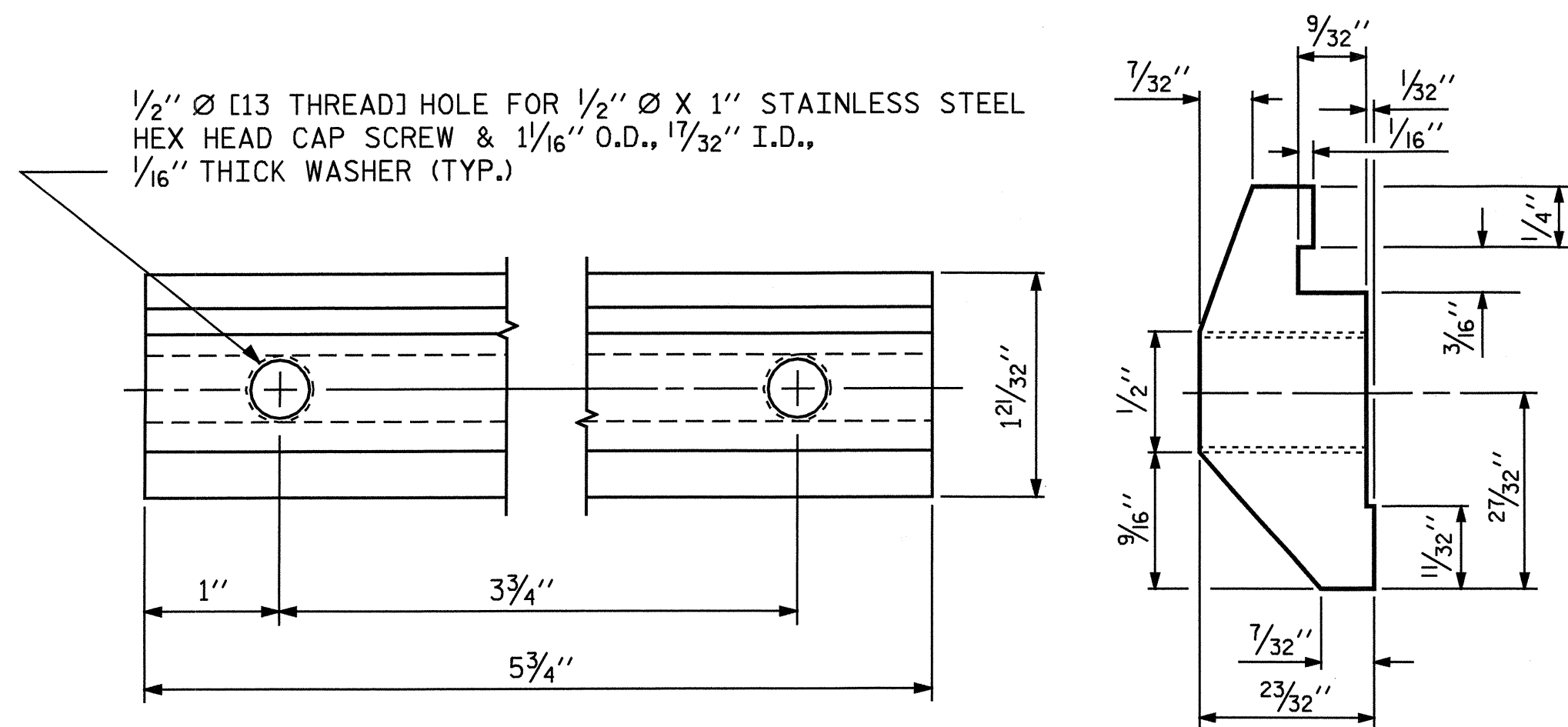
REAR PLATE

SHIM DETAILS

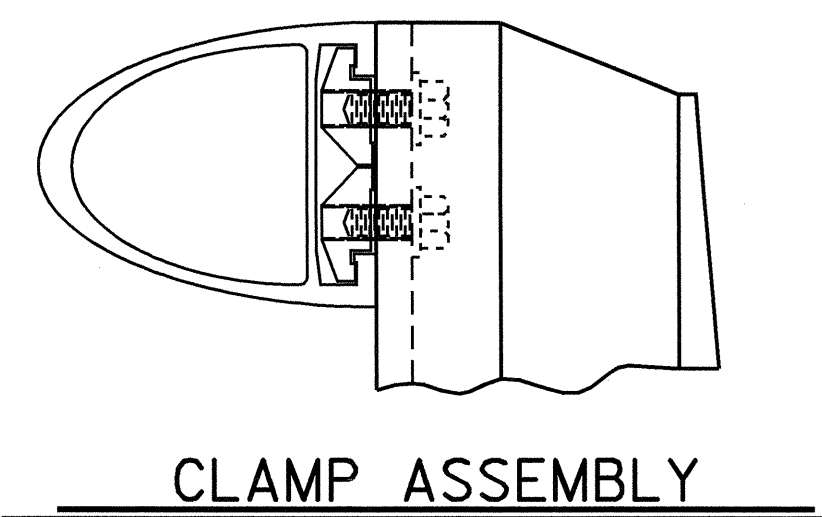
NOTE : SHIMS MAY BE CUT ALONG PERMITTED CUTLINE OR SLOTTED TO EDGE OF PLATE TO FACILITATE PLACEMENT.



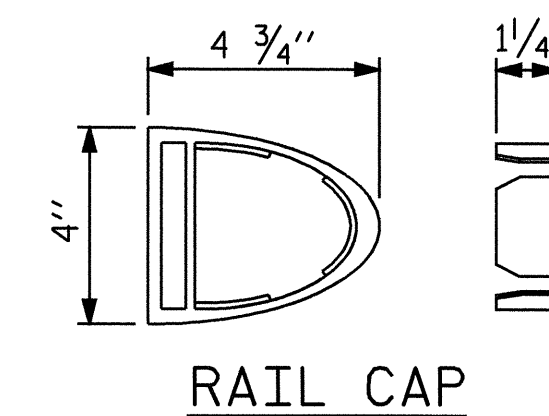
RAIL SECTION



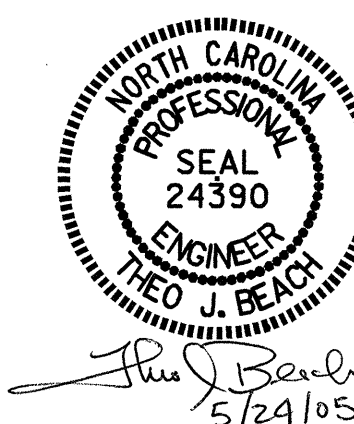
CLAMP BAR DETAIL
(4 REQUIRED PER POST)



CLAMP ASSEMBLY



RAIL CAP



PROJECT NO. I-4411
IREDELL COUNTY
STATION: 46+79.71 -L-

SHEET 2 OF 2

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

| | | | |
|----------------|-----|-------|-----------------|
| JUNE | | 1994 | |
| REVISIONS | | | |
| NO. | BY: | DATE: | NO. |
| 1 | | | 3 |
| 2 | | | 4 |
| SHEET NO. S-22 | | | TOTAL SHEETS 42 |

| | |
|---------------------------|----------------------|
| ASSEMBLED BY : MIKE BRITT | DATE : 10-29-04 |
| CHECKED BY : T.J. BEACH | DATE : 1-05 |
| DRAWN BY : EEM 6/94 | REV. 2/6/97 EEM/RGW |
| CHECKED BY : RGW 6/94 | REV. 8/16/99 MAB/LES |
| | REV. 5/7/03 RWW/JTE |

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 1/2".
 - B. 1 - 3/4" Ø X 15/8" 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 15/8" 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

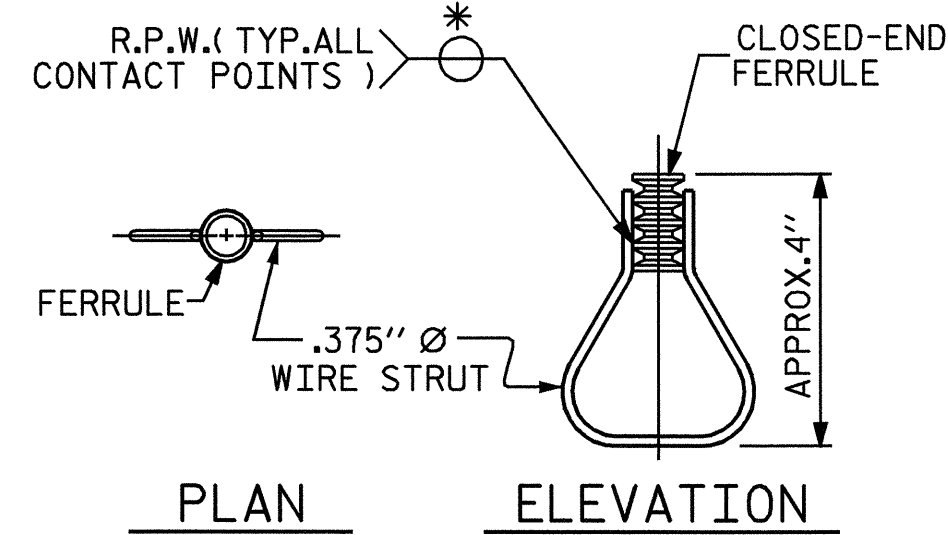
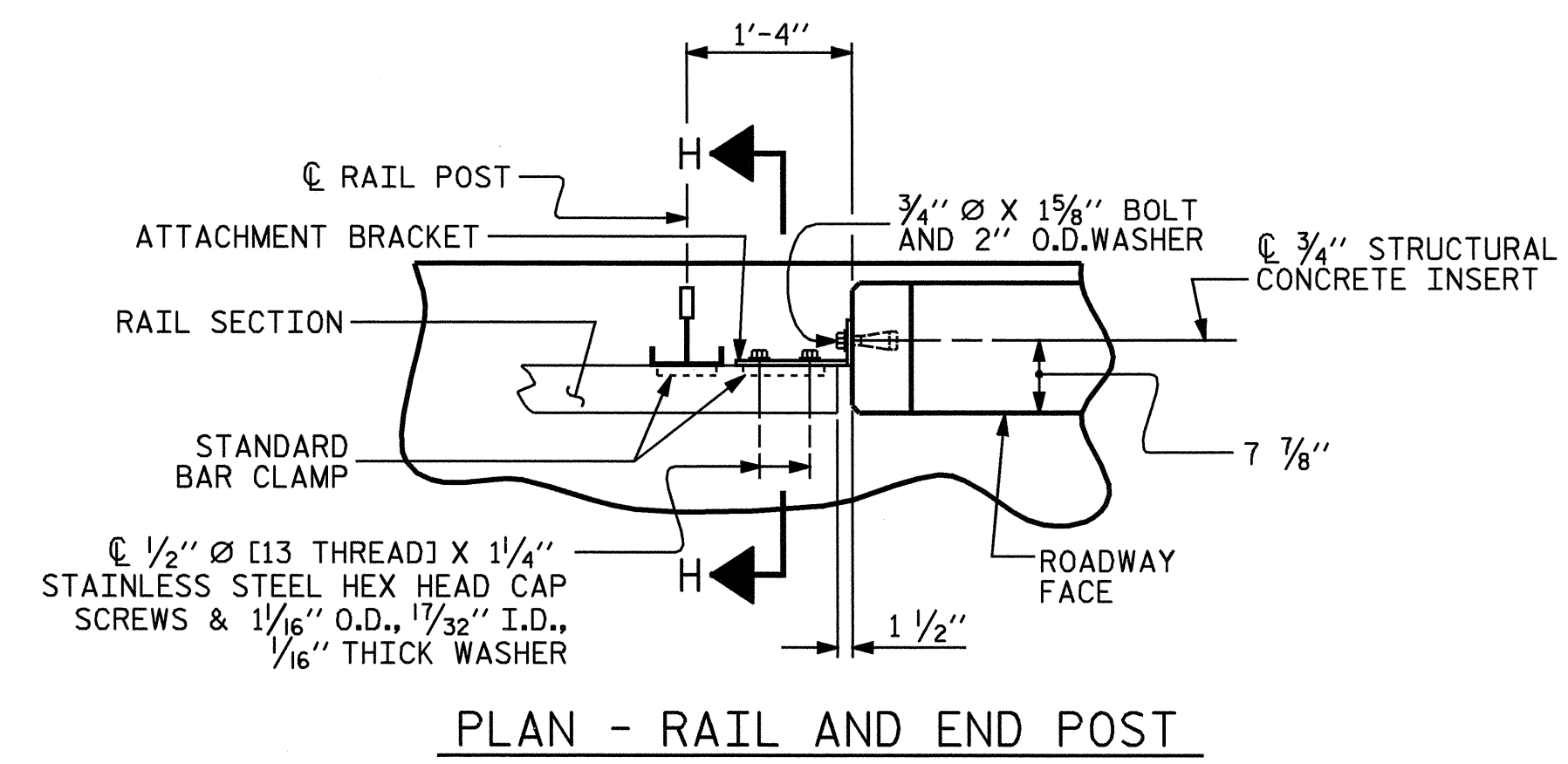
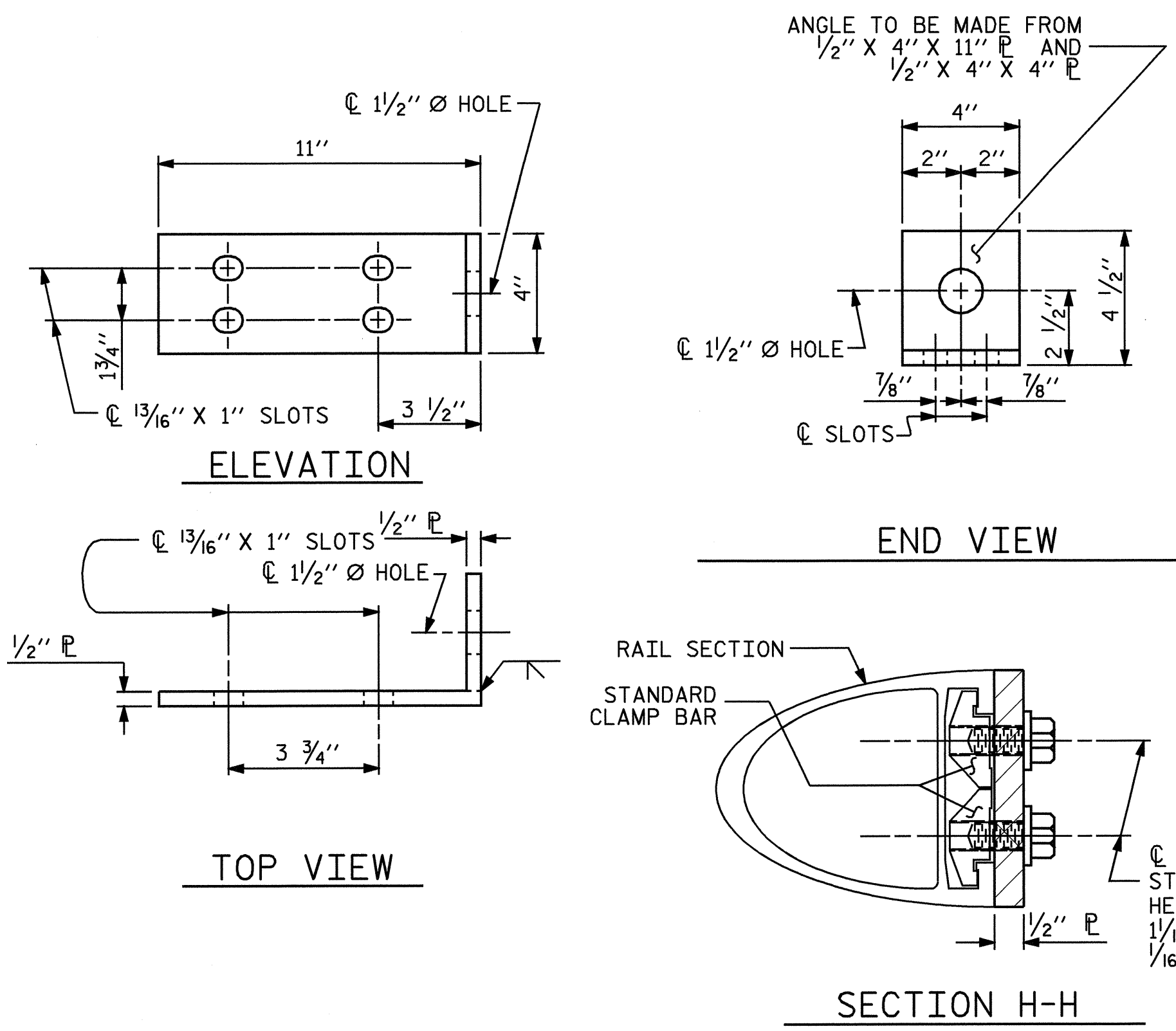
- THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
 - B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 15/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 15/8" 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.

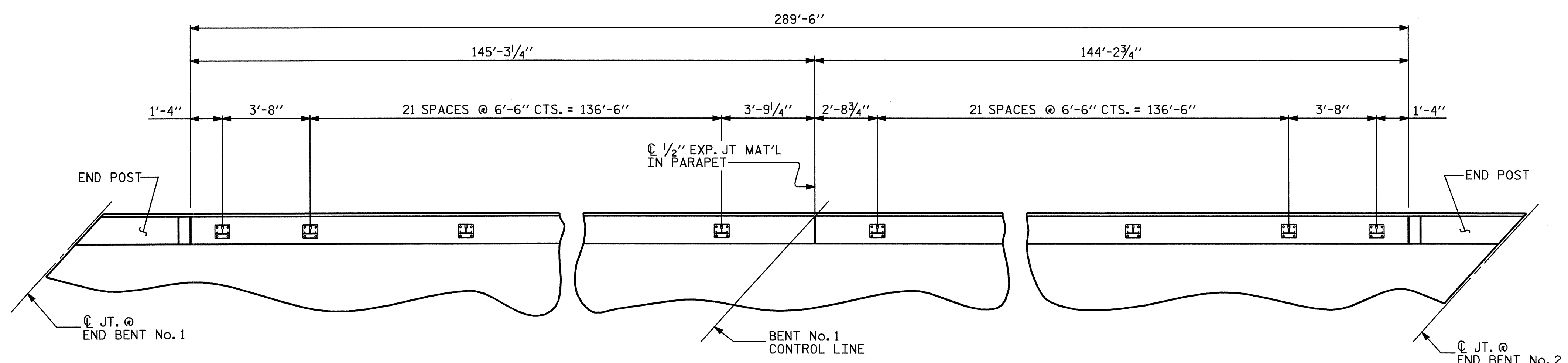
THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø X 15/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" Ø X 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE 3/4" Ø X 15/8" BOLT SHALL APPLY TO THE 3/4" Ø X 6 1/2" BOLT. SEE SPECIAL PROVISIONS FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



STRUCTURAL CONCRETE INSERT

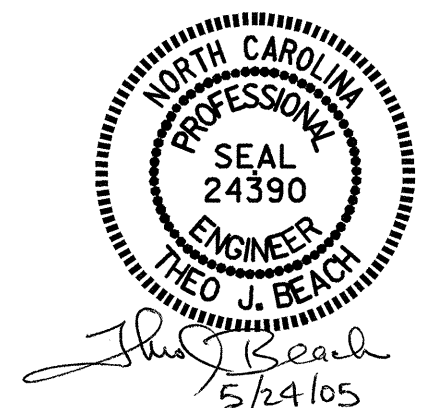
* EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.

DETAILS FOR ATTACHING METAL RAIL TO END POST



RAIL POST SPACING
 (STAGE I PARAPET SHOWN, STAGE II PARAPET SIMILAR)

PROJECT NO. I-4411
IREDELL COUNTY
 STATION: 46+79.71 -L-



| | | | | | |
|------------------------------|-----|-------|-----|-----|-----------------|
| STATE OF NORTH CAROLINA | | | | | |
| DEPARTMENT OF TRANSPORTATION | | | | | |
| RALEIGH | | | | | |
| STANDARD | | | | | |
| RAIL POST SPACINGS | | | | | |
| AND | | | | | |
| END OF RAIL DETAILS | | | | | |
| DECEMBER | | | | | 1988 |
| REVISIONS | | | | | |
| NO. | BY: | DATE: | NO. | BY: | DATE: |
| 1 | | | 3 | | |
| 2 | | | 4 | | |
| | | | | | SHEET NO. S-23 |
| | | | | | TOTAL SHEETS 42 |

| | |
|---------------------------|-----------------------|
| ASSEMBLED BY : MIKE BRITT | DATE : 10-29-04 |
| CHECKED BY : T.J. BEACH | DATE : 1-05 |
| DRAWN BY : FCJ 1/88 | REV. 8/16/99 RWW/LES |
| CHECKED BY : CRK 3/89 | REV. 10/17/00 LES/RDR |
| | REV. 5/17/03 RWW/JTE |

NOTES

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

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

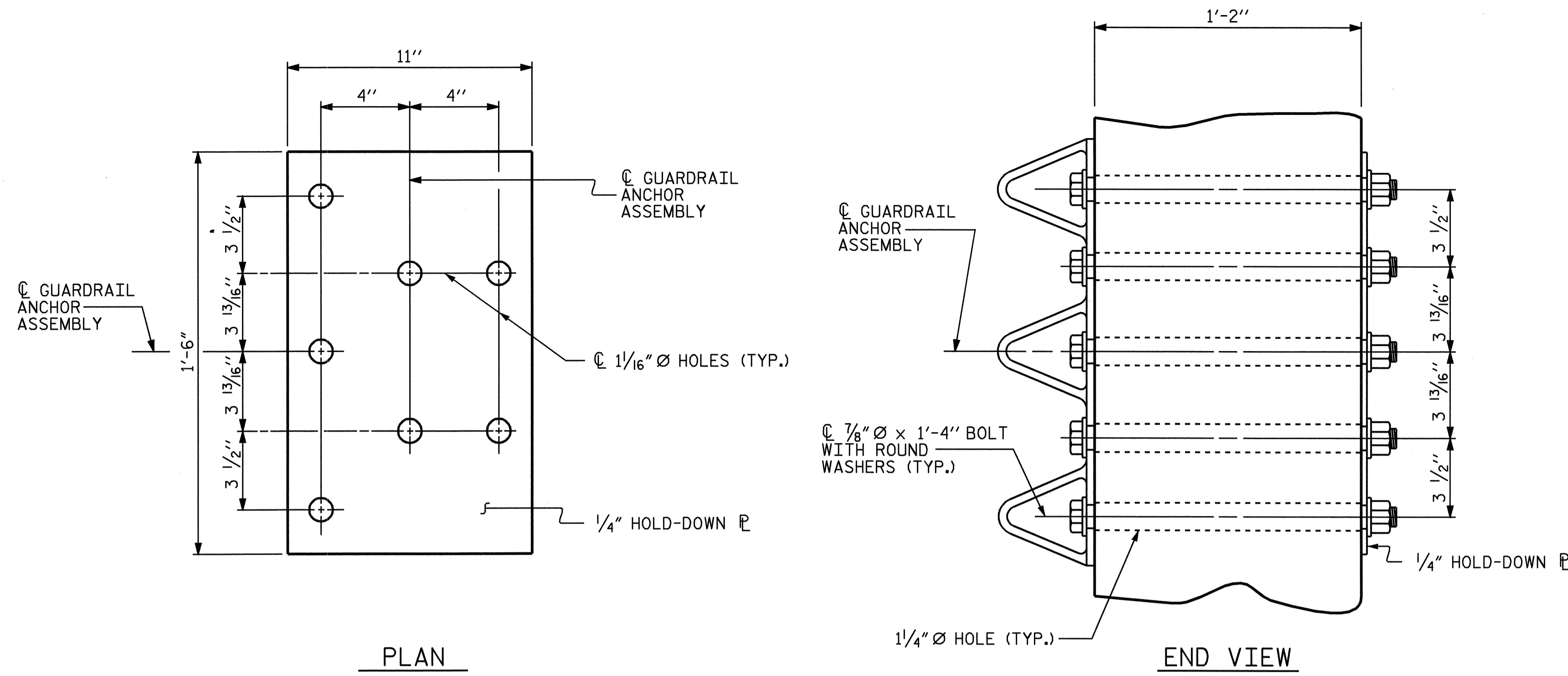
BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS.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

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

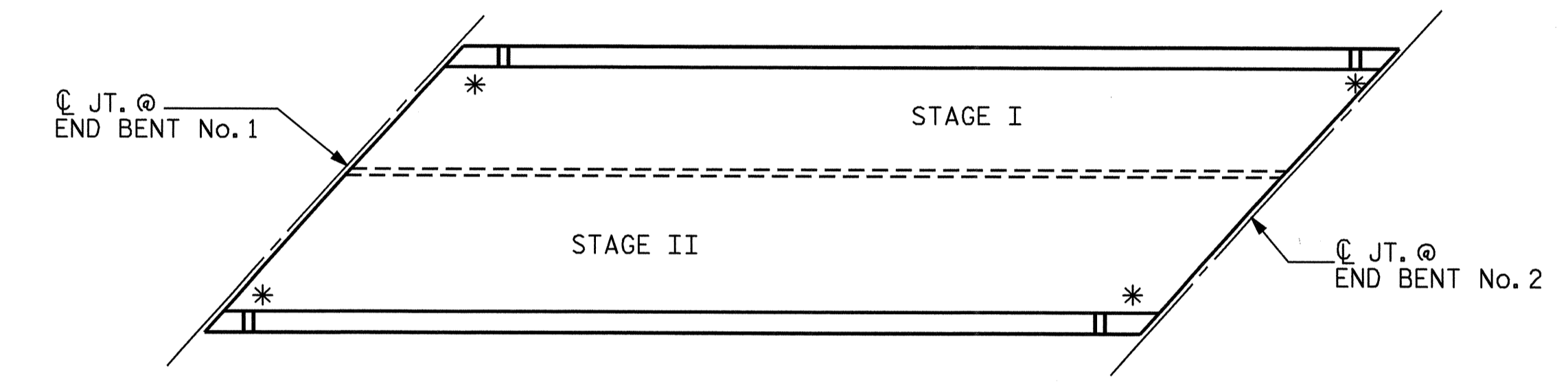
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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

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

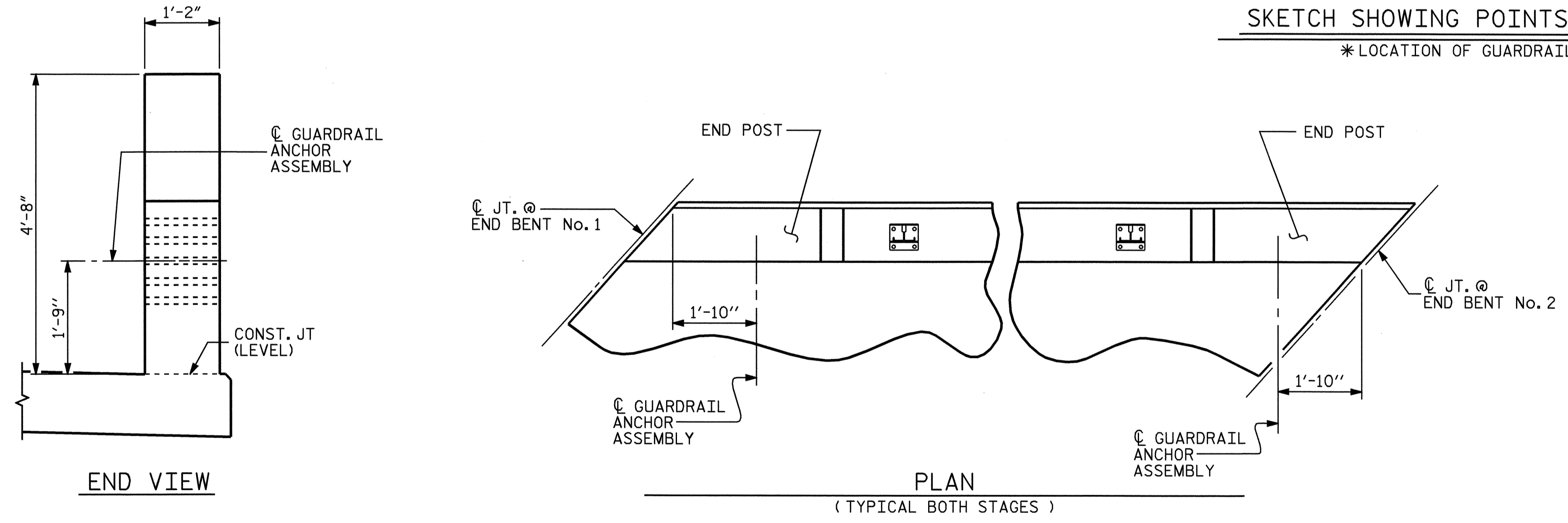


GUARDRAIL ANCHOR ASSEMBLY DETAILS



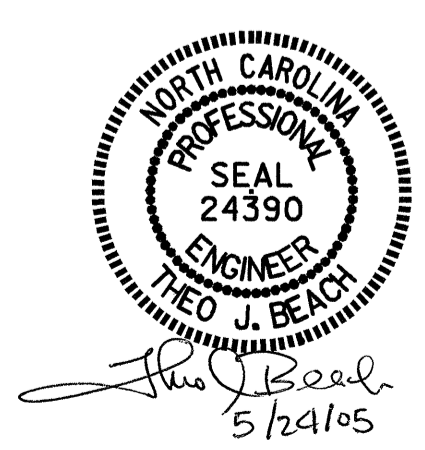
SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT



LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. I-4411
IREDELL COUNTY
 STATION: 46+79.71 -L-



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

JUNE 1994

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

STD. NO. BMR8 SHEET NO. S-24 TOTAL SHEETS 42 STR. #1

| | |
|---------------------------|-----------------------|
| ASSEMBLED BY : MIKE BRITT | DATE : 11-1-04 |
| CHECKED BY : T.J. BEACH | DATE : 1-05 |
| DRAWN BY : EEM 6/94 | REV. 8/16/99 RWW/LES |
| CHECKED BY : RGW 6/94 | REV. 10/17/00 RWW/LES |
| | REV. 5/7/03 RWW/JTE |

NOTES

ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL STUD ANCHORS SHALL CONFORM TO AASHTO M169 GRADES 1010 THRU 1020 OR APPROVED EQUAL.

STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON THE PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.

UPON COMPLETION OF SHOP FABRICATION, THE ENTIRE ANCHOR ASSEMBLY SHALL BE METALLIZED TO A MINIMUM THICKNESS OF 6 MILS. THE 1/2" Ø STUD ANCHORS AND ANCHOR TABS NEED NOT BE METALLIZED. SEE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).

ANCHOR ASSEMBLY SHALL BE MADE CONTINUOUS THE LENGTH OF THE JOINT FROM GUTTER TO GUTTER. FOR FIELD SPLICES AT ALL CROWN BREAK POINTS, THE ENDS OF THE STEEL ANGLES SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE. FINISHED FIELD WELDS SHALL BE GRIND SMOOTH AND COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

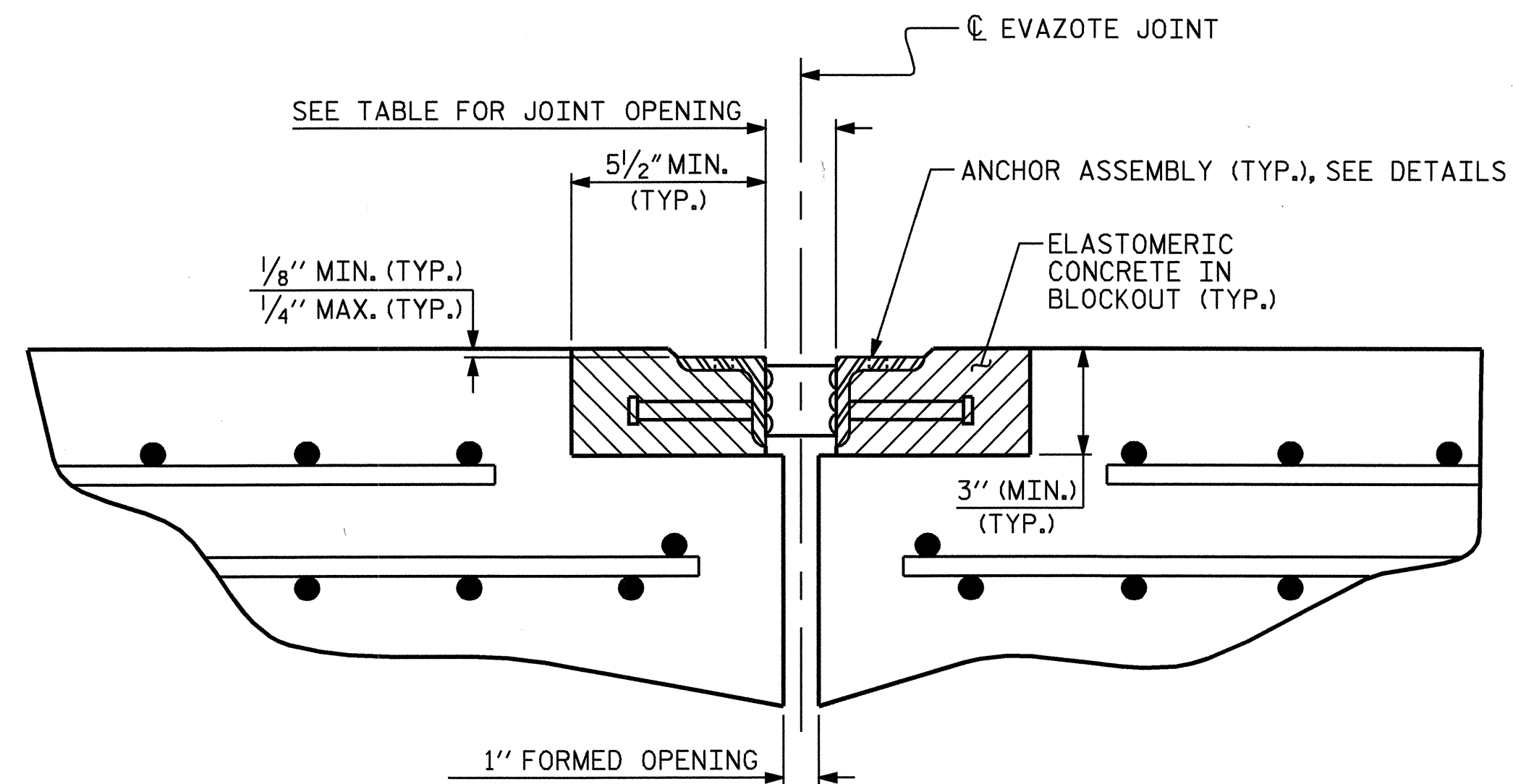
ANCHOR ASSEMBLY SEGMENTS SHALL NOT BE LESS THAN 12 FEET NOR MORE THAN 20 FEET IN LENGTH. SHORTER SEGMENTS MAY BE USED AT THE EDGE OF ROADWAY OR AT POINTS OF STAGED CONSTRUCTION.

THE ANCHOR ASSEMBLY SHALL BE SECURED AND LEVELED AS SHOWN IN THE "ARMORED JOINT ANCHOR ASSEMBLY DETAILS". NO SUBMITTALS ARE REQUIRED FOR 3/8" Ø EXPANSION ANCHORS, NUTS OR WASHERS. THE CONTRACTOR MAY SUBMIT FOR APPROVAL AN ALTERNATE METHOD OF ALIGNING AND LEVELING THE ANGLES. THE ALTERNATE METHOD SHALL NOT INCLUDE ANY WELDING TO THE OUTSIDE FACE OF THE ANGLES.

AFTER THE ELASTOMERIC CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE ANY EXCESS CONCRETE THAT COMES THROUGH THE WEEP HOLES AND THOROUGHLY CLEAN THE ANGLES. ANY DAMAGED STEEL SHALL BE COATED WITH A MINIMUM OF 4 MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

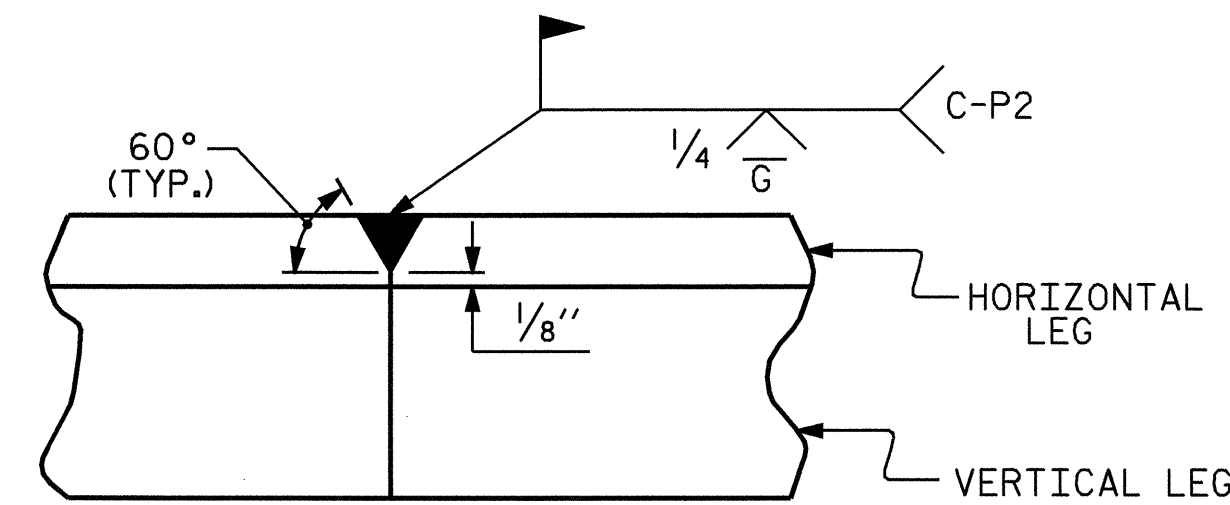
SEE SPECIAL PROVISIONS FOR EVAZOTE JOINT SEALS.

SEE SPECIAL PROVISIONS FOR ELASTOMERIC CONCRETE.

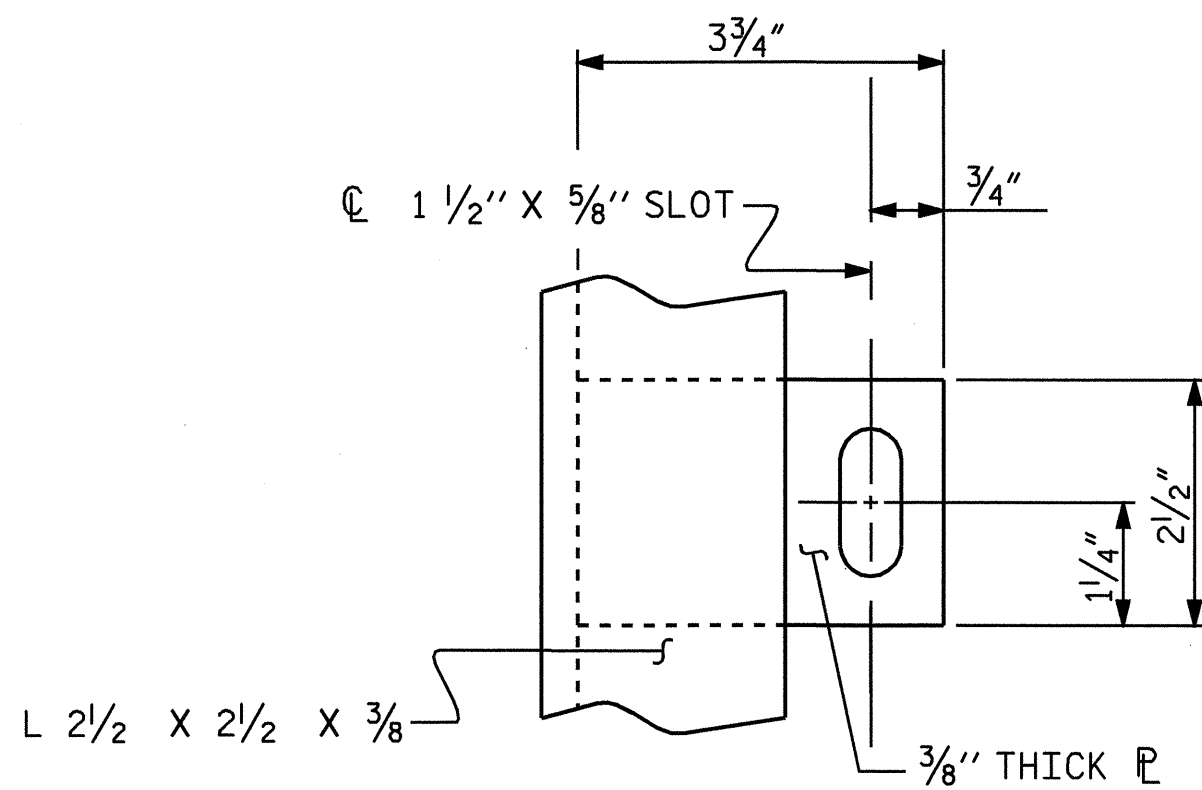


ARMORED JOINT DETAILS

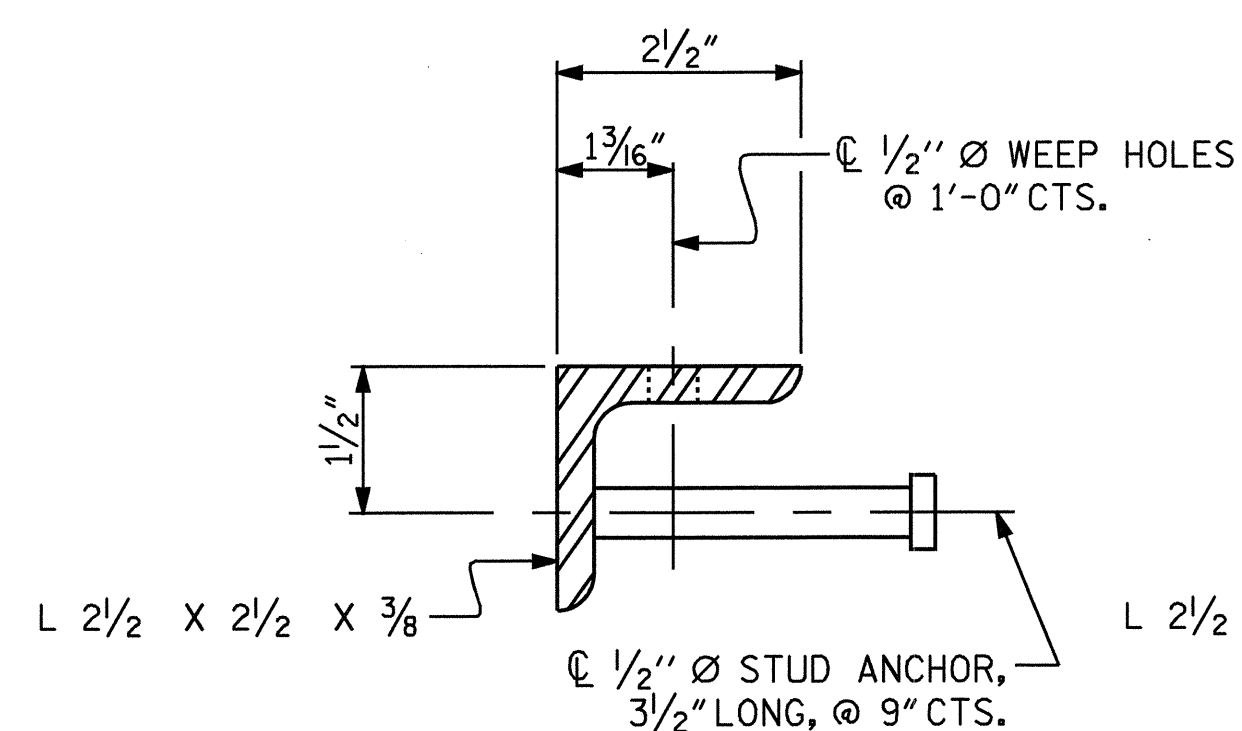
SECTION NORMAL TO JOINT AT BENT



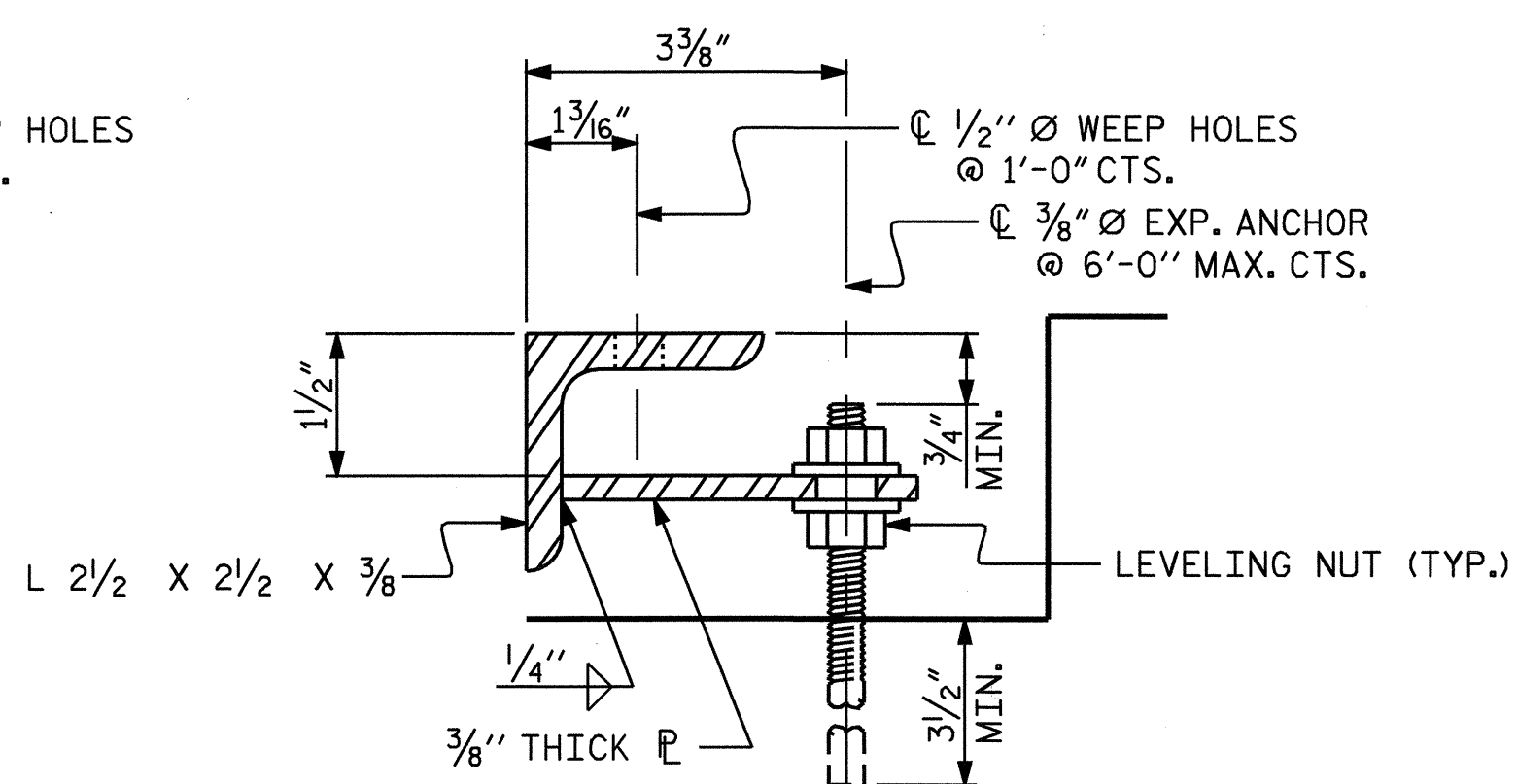
DETAIL- FIELD WELD SPLICE OF ANGLE



PLAN VIEW OF TAB



SECTION VIEW OF STUD



SECTION VIEW OF TAB

ARMORED JOINT ANCHOR ASSEMBLY DETAILS

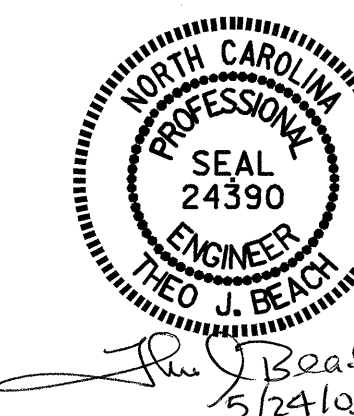
| END BENT No. | SKEW ANGLE | NOMINAL UNCOMPRESSED SEAL WIDTH | TOTAL MOVEMENT (ALONG C RDWY) | PERPENDICULAR JOINT OPENING AT 45° F | PERPENDICULAR JOINT OPENING AT 60° F | PERPENDICULAR JOINT OPENING AT 90° F |
|--------------|--------------|---------------------------------|-------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| 1 | 132°-22'-30" | 2 1/2" | 1 1/8" | 2 1/16" | 1 1/8" | 1 9/16" |
| 2 | 132°-22'-30" | 2 1/2" | 1 1/8" | 2 1/16" | 1 1/8" | 1 9/16" |

TOTAL MOVEMENT IS CALCULATED ALONG THE CENTERLINE OF ROADWAY. JOINT OPENINGS ARE MEASURED PERPENDICULAR TO THE JOINT.

| END BENT No. | STAGE I | | STAGE II | |
|--------------|----------------------------------|-----------------------------|----------------------------------|-----------------------------|
| | ELASTOMERIC CONCRETE * (CU. FT.) | TOTAL LENGTH OF ANGLE (FT.) | ELASTOMERIC CONCRETE * (CU. FT.) | TOTAL LENGTH OF ANGLE (FT.) |
| 1 | 11.8 | 102'-10 1/2" | 15.5 | 135'-4 3/8" |
| 2 | 11.8 | 102'-10 1/2" | 15.5 | 135'-4 3/8" |

* BASED ON THE MINIMUM BLOCKOUT SHOWN.

PROJECT NO. I-4411
IREDELL COUNTY
 STATION: 46+79.71 -L-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

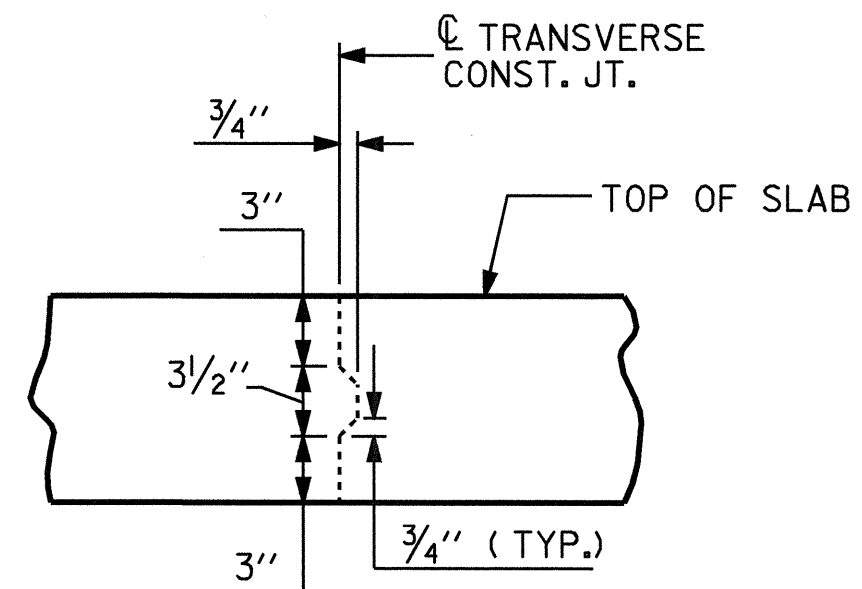
STANDARD
 ARMORED EVAZOTE
 JOINT DETAILS

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-25 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 42 |

| | |
|---------------------------|-----------------------|
| ASSEMBLED BY : MIKE BRITT | DATE : 11-2-04 |
| CHECKED BY : T.J. BEACH | DATE : 1-05 |
| DRAWN BY : EEM 1/96 | REV. 10/17/00 RWW/LES |
| CHECKED BY : RGW 1/96 | REV. 7/10/01 LES/RDR |
| | REV. 5/7/03R RWW/JTE |

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

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



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

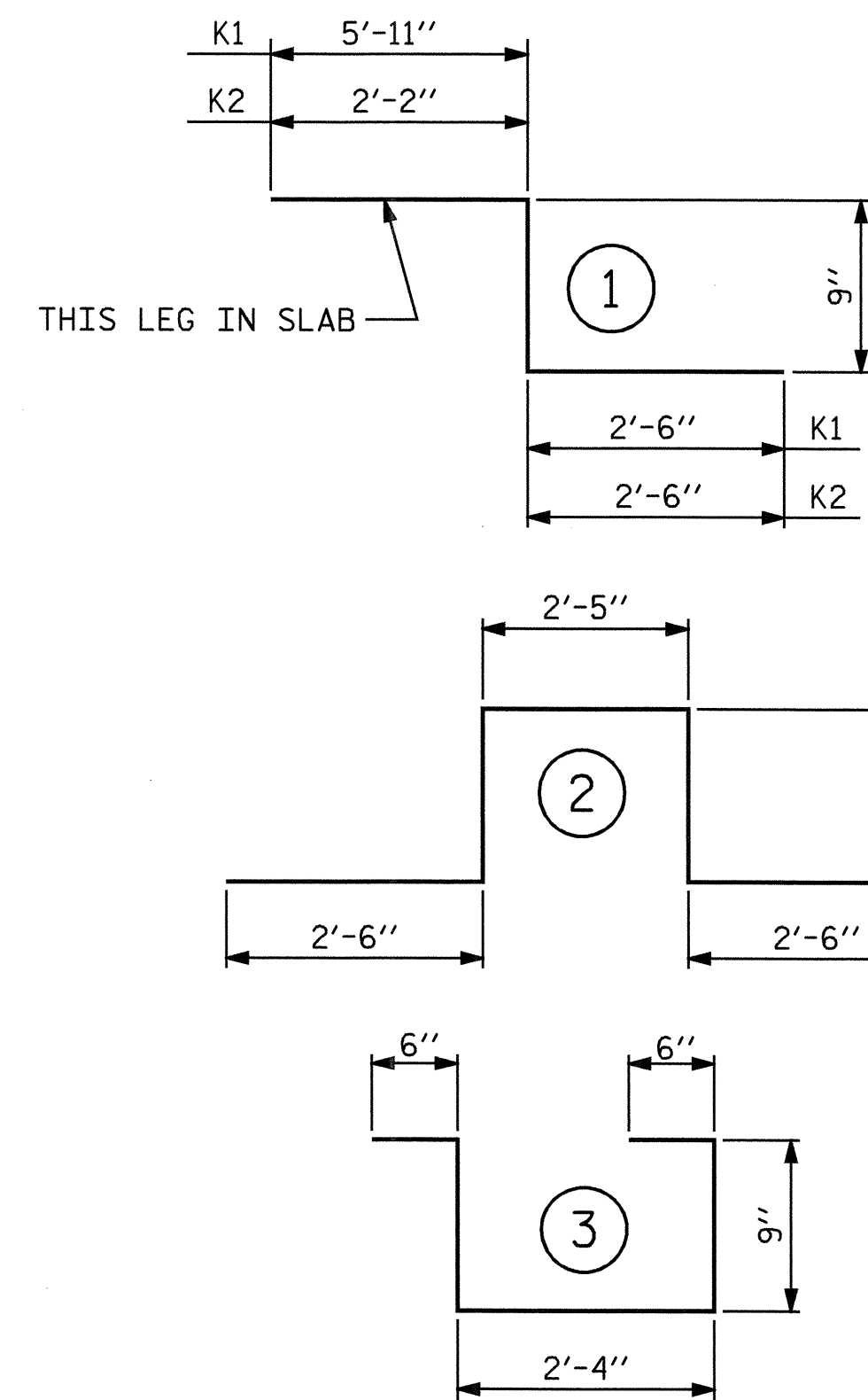
| CLASS AA CONCRETE BREAKDOWN (STAGE I) | |
|---------------------------------------|----------------|
| POUR #1 | 114.2 CU. YDS. |
| POUR #2 | 137.4 CU. YDS. |
| POUR #3 | 137.9 CU. YDS. |
| TOTAL | 389.5 CU. YDS. |

| CLASS AA CONCRETE BREAKDOWN (STAGE II) | |
|--|----------------|
| POUR #1 | 142.8 CU. YDS. |
| POUR #2 | 172.7 CU. YDS. |
| POUR #3 | 172.5 CU. YDS. |
| 2'-0" CLOSURE POUR | 22.1 CU. YDS. |
| TOTAL | 510.1 CU. YDS. |

BILL OF MATERIAL

| SPAN "A" & "B" FOR STAGE I | | | | | SPAN "A" & "B" FOR STAGE II | | | | | | |
|---------------------------------|------|------|--------|---------|-----------------------------|------|------|--------|--------|---------|-------|
| BAR No. | SIZE | TYPE | LENGTH | WEIGHT | BAR No. | SIZE | TYPE | LENGTH | WEIGHT | | |
| *A1 | 572 | #5 | STR. | 38'-11" | 23218 | *A3 | 552 | #5 | STR. | 48'-11" | 28163 |
| A2 | 572 | #5 | STR. | 38'-11" | 23218 | A4 | 552 | #5 | STR. | 48'-11" | 28163 |
| *B1 | 248 | #4 | STR. | 28'-3" | 4680 | B2 | 360 | #6 | STR. | 31'-4" | 16943 |
| B2 | 273 | #6 | STR. | 31'-4" | 12848 | B3 | 396 | #5 | STR. | 51'-5" | 21237 |
| B3 | 324 | #5 | STR. | 51'-5" | 17375 | B4 | 11 | #4 | STR. | 28'-11" | 212 |
| *B4 | 11 | #4 | STR. | 28'-11" | 212 | D1 | 295 | #6 | STR. | 3'-6" | 1551 |
| REINFORCING STEEL | | | | | 43,638 LBS. | | | | | | |
| *EPOXY COATED REINFORCING STEEL | | | | | 46,571 LBS. | | | | | | |
| * THESE BARS ARE EPOXY COATED | | | | | | | | | | | |
| REINFORCING STEEL | | | | | 54,253 LBS. | | | | | | |
| *EPOXY COATED REINFORCING STEEL | | | | | 59,338 LBS. | | | | | | |

BAR TYPES

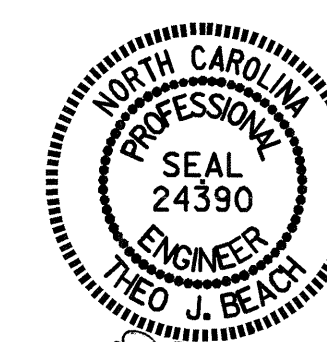


ALL BAR DIMENSIONS ARE OUT TO OUT

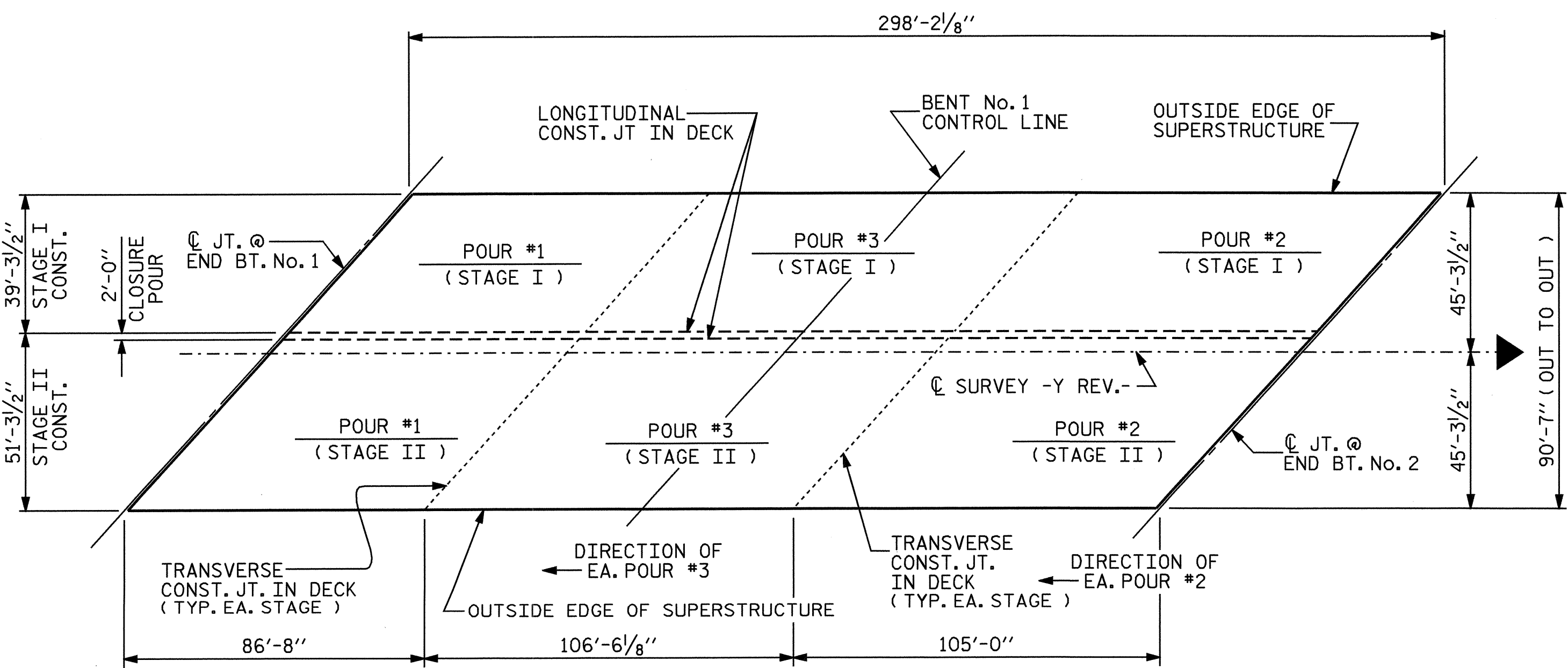
SUPERSTRUCTURE BILL OF MATERIAL

| | CLASS AA CONCRETE (CU. YDS.) | REINFORCING STEEL (LBS.) | EPOXY COATED REINFORCING STEEL (LBS.) |
|----------|------------------------------|--------------------------|---------------------------------------|
| STAGE I | 389.5 | 43,638 | 46,571 |
| STAGE II | 510.1 | 54,253 | 59,338 |
| TOTALS** | 899.6 | 97,891 | 105,909 |

** QUANTITIES FOR CONCRETE PARAPET ARE NOT INCLUDED



PROJECT NO. I-4411
IREDELL COUNTY
STATION: 46+79.71 -L-

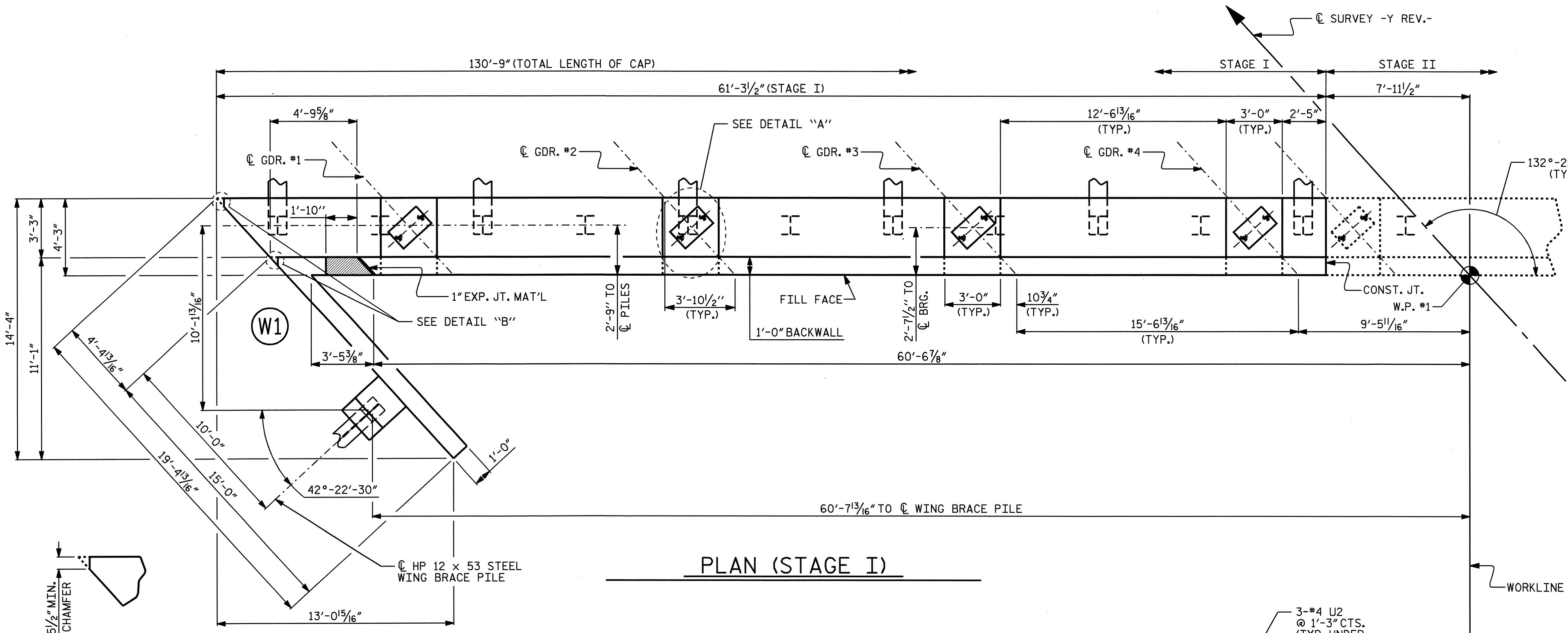


CONCRETE POURING SEQUENCE AND LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ. FT. = 27,010)

| GROOVING BRIDGE FLOORS | |
|------------------------|---------------|
| APPROACH SLABS | 6,602 SQ.FT. |
| BRIDGE DECK | 25,192 SQ.FT. |
| TOTAL | 31,794 SQ.FT. |

| | |
|---------------------------|----------------------|
| ASSEMBLED BY : MIKE BRITT | DATE : 11-2-04 |
| CHECKED BY : T.J. BEACH | DATE : 1-05 |
| DRAWN BY : JMB 5/87 | REV. 6/1/94 EEM/GRP |
| CHECKED BY : SJD 9/87 | REV. 8/16/99 RWW/LES |

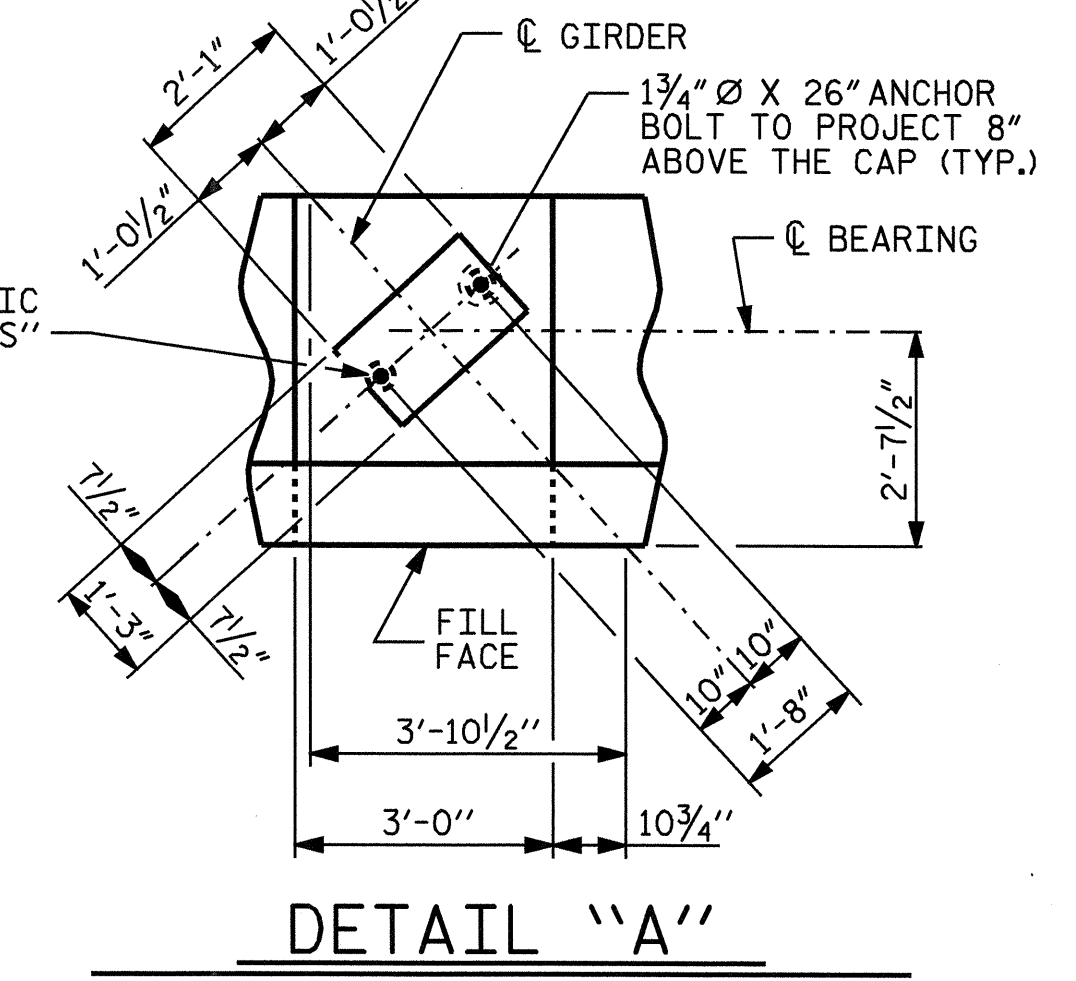
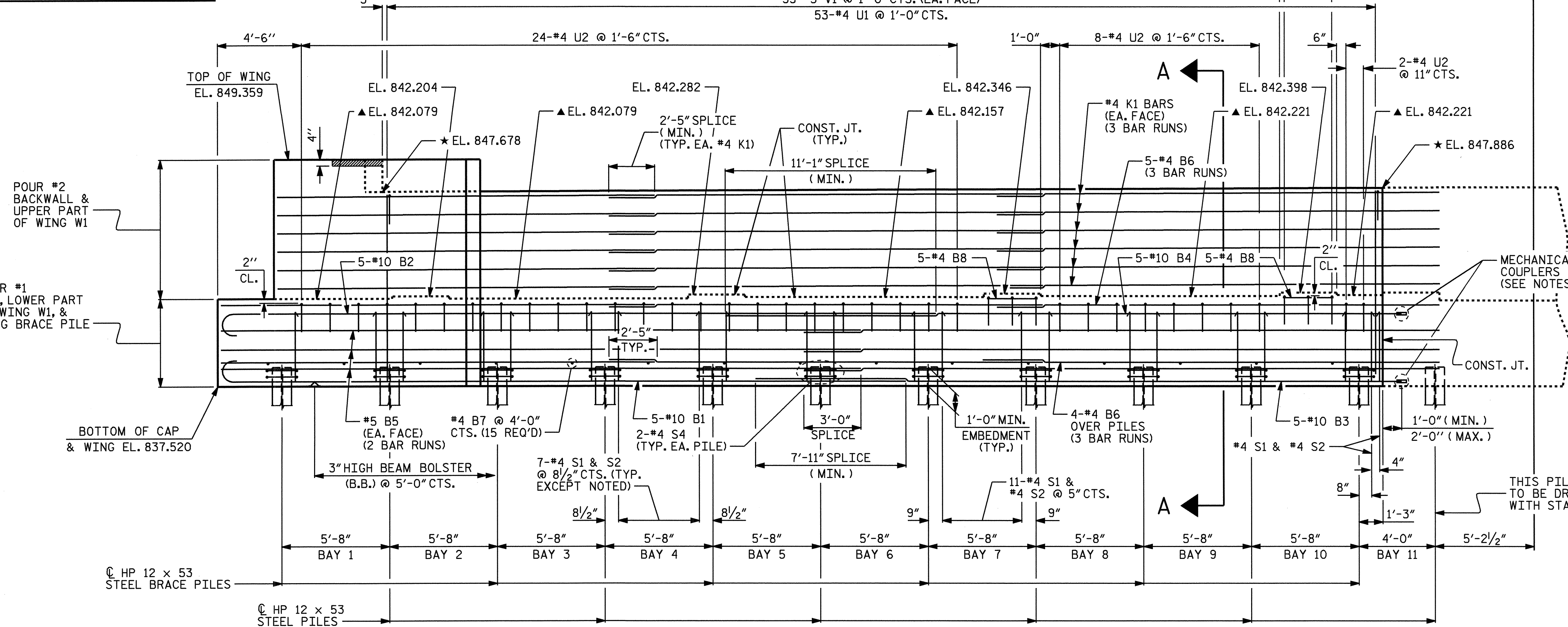
| OCTOBER | | 1987 | |
|-----------|-----|-------|-----------------|
| REVISIONS | | | |
| NO. | BY: | DATE: | SHEET NO. |
| 1 | | 3 | S-26 |
| 2 | | 4 | TOTAL SHEETS 42 |



NOTES:

- ▲ FOR LOCATION OF ELEVATIONS BETWEEN BUILDUPS, SEE SECTION A-A ON SHEET 4 OF 4.
- ★ THIS ELEVATION TAKEN ON FILL FACE OF BACKWALL.
- STIRRUPS AND U2 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- #5 "V" BARS IN BACKWALL SHALL BE PLACED 2" CLEAR FROM TOP OF BACKWALL.
- BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
- EPOXY COAT THE END BENT CAP AFTER ADJUSTMENTS ARE MADE TO BEARINGS AND ANCHOR BOLTS ARE GROUTED.
- FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.
- THE TOP SURFACE OF THE END BENT CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.
- THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE PARAPET AND END POST ARE CAST IF SLIP FORMING IS USED.
- THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.
- THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LENGTHS OF THE #10 B3 AND #10 B4 BARS AT THE STAGED CONSTRUCTION JOINT MAY NEED TO BE ADJUSTED DUE TO THE TYPE OF MECHANICAL BUTT SPLICE CHOSEN BY THE CONTRACTOR. NO ADDITIONAL PAYMENT WILL BE MADE FOR ANY ADJUSTMENTS REQUIRED.
- MECHANICAL COUPLERS SHALL BE USED TO JOIN THE #10 B3 AND #10 B4 BARS IN STAGE I WITH THE #10 B9 AND #10 B10 BARS IN STAGE II. THE LOCATION OF THE COUPLERS SHALL BE STAGGERED ON ALTERNATING BARS BY 1 FOOT AND THE BARS SHALL BE CUT ACCORDINGLY TO ALLOW A MINIMUM OF 1'-0" AND A MAXIMUM OF 2'-0" EXTENSION INTO STAGE II CONSTRUCTION.
- FOR MECHANICAL COUPLERS, SEE MECHANICAL BUTT SPLICES FOR REINFORCING STEEL SPECIAL PROVISIONS.
- THE #5 B5, #4 B6, AND #4 K1 BARS SHALL EXTEND 3'-0" PAST THE CONSTRUCTION JOINT.

DETAIL "B"

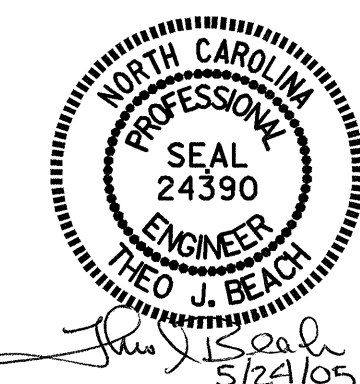


PROJECT NO. I-4411
 IREDELL COUNTY
 STATION: 46+79.71 -L-
 SHEET 1 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT No. 1
 (STAGE I)

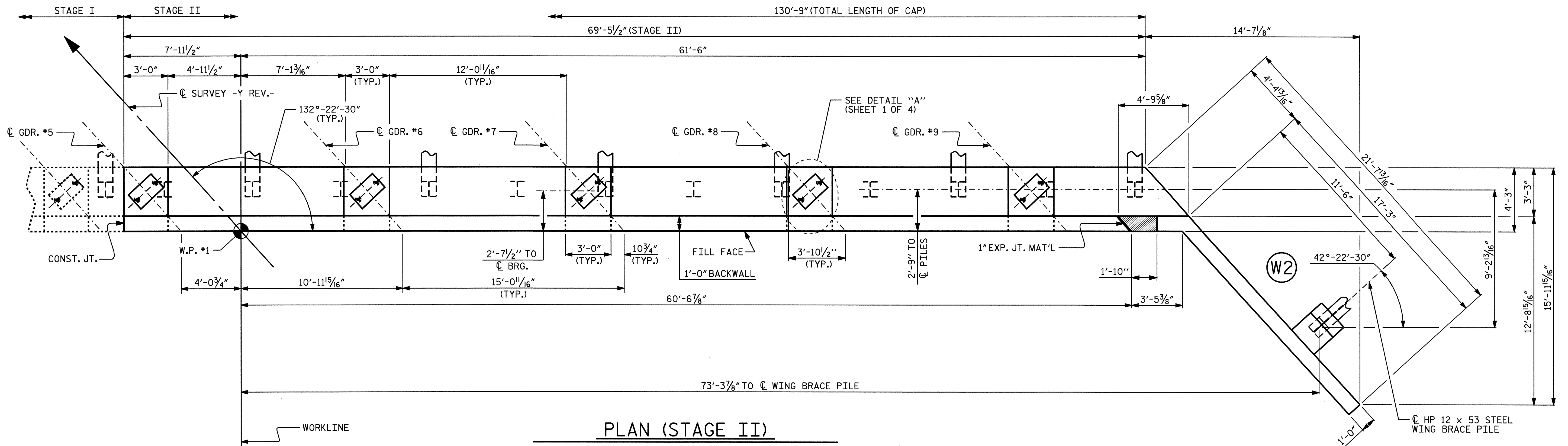
| REVISIONS | | | | SHEET NO. | |
|-----------|-----|-------|-----|-----------|-------|
| NO. | BY: | DATE: | NO. | BY: | DATE: |
| 1 | | | 3 | | |
| 2 | | | 4 | | |

TOTAL SHEETS: 42
 SHEET NO.: S-27

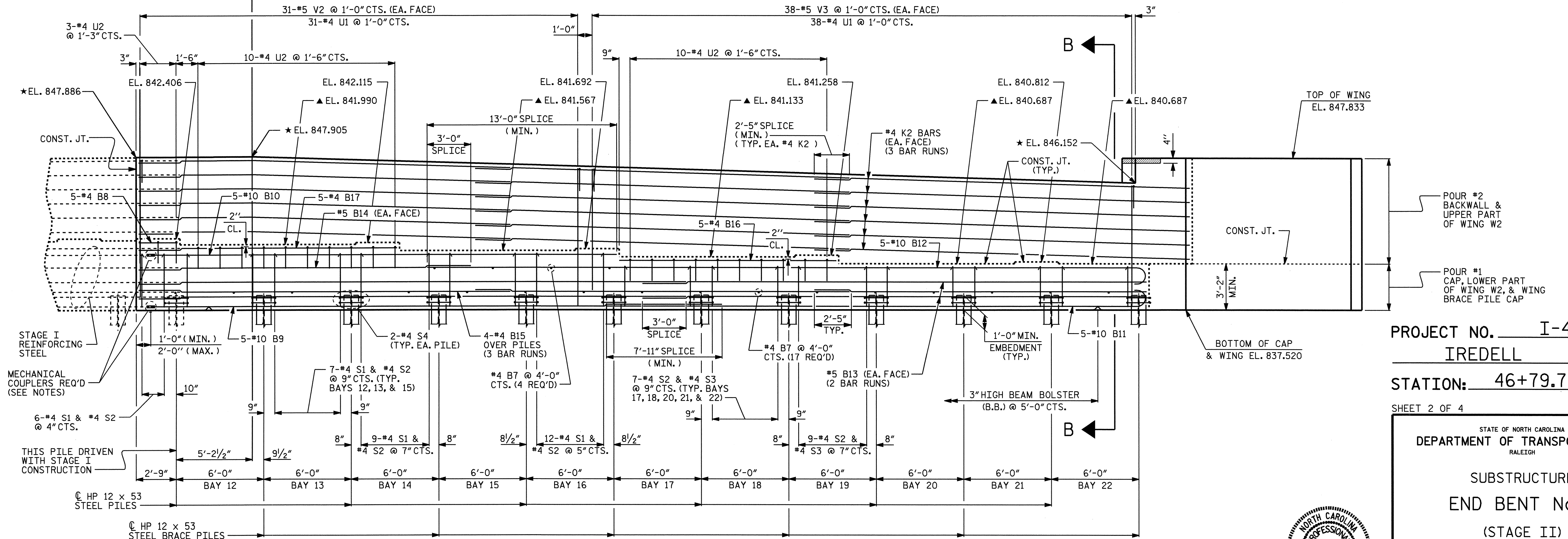


DRAWN BY: P.C. BREWER DATE: 1/12/05
 CHECKED BY: S.B. WILLIAMS DATE: 1/25/05

24-MAY-2005 10:08
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 tbeach



PLAN (STAGE II)



ELEVATION (STAGE II)

(FOR CLARITY, WING BRACE PILE NOT SHOWN)

PROJECT NO. I-4411

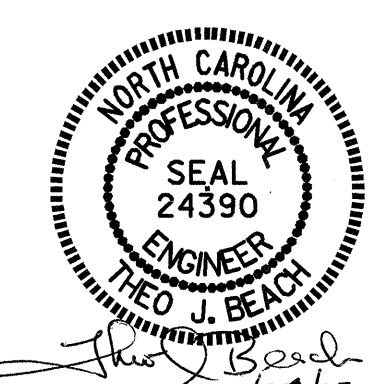
IREDELL COUNTY

STATION: 46+79.71 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 1
(STAGE II)

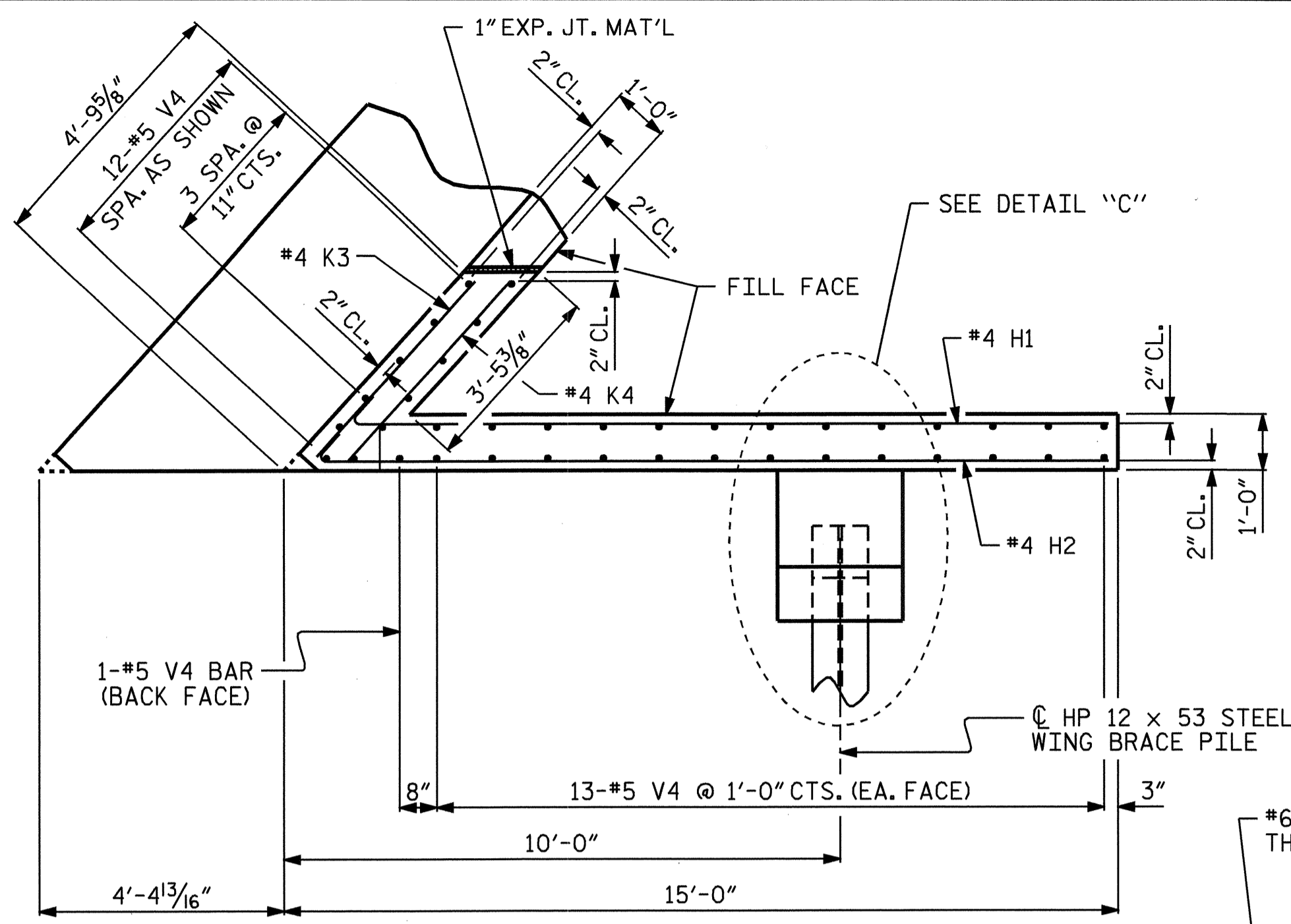


| REVISIONS | | | | | | SHEET NO. | |
|-----------|-----|-------|-----|-----|-------|--------------|--|
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| 1 | | | 3 | | | TOTAL SHEETS | |
| 2 | | | 4 | | | 42 | |

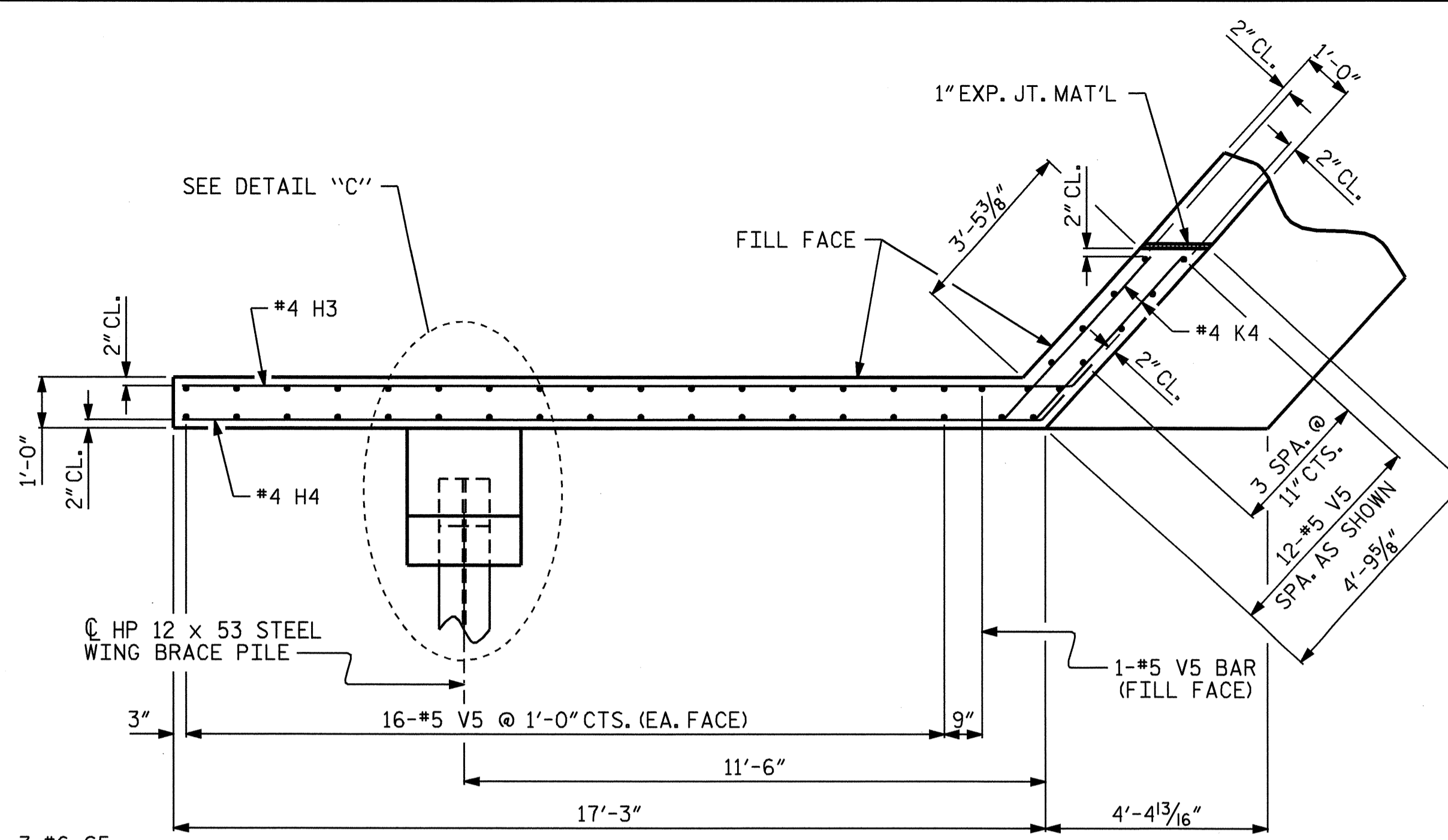
DRAWN BY: P.C. BREWER DATE: 1/13/05
CHECKED BY: S.B. WILLIAMS DATE: 1/25/05

24-MAY-2005 10:08
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tbeach

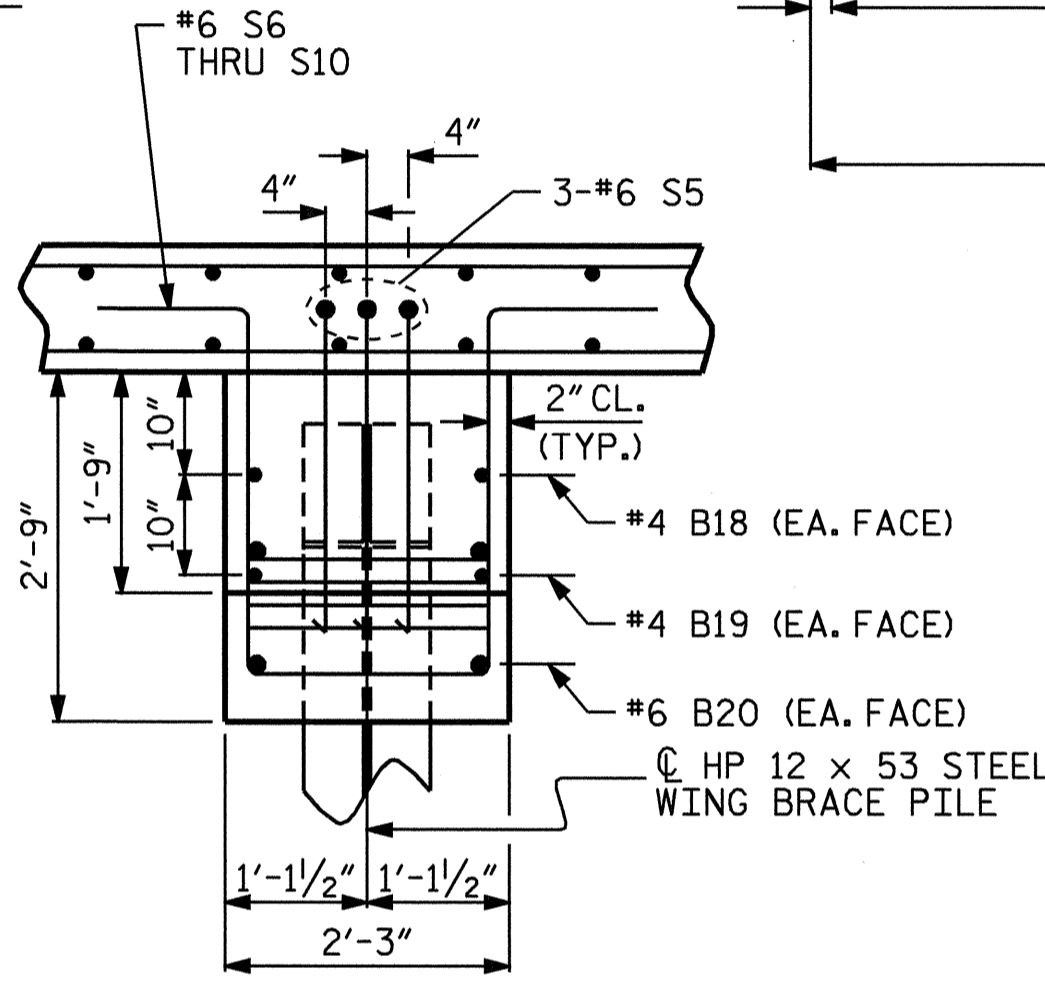
STR. #1



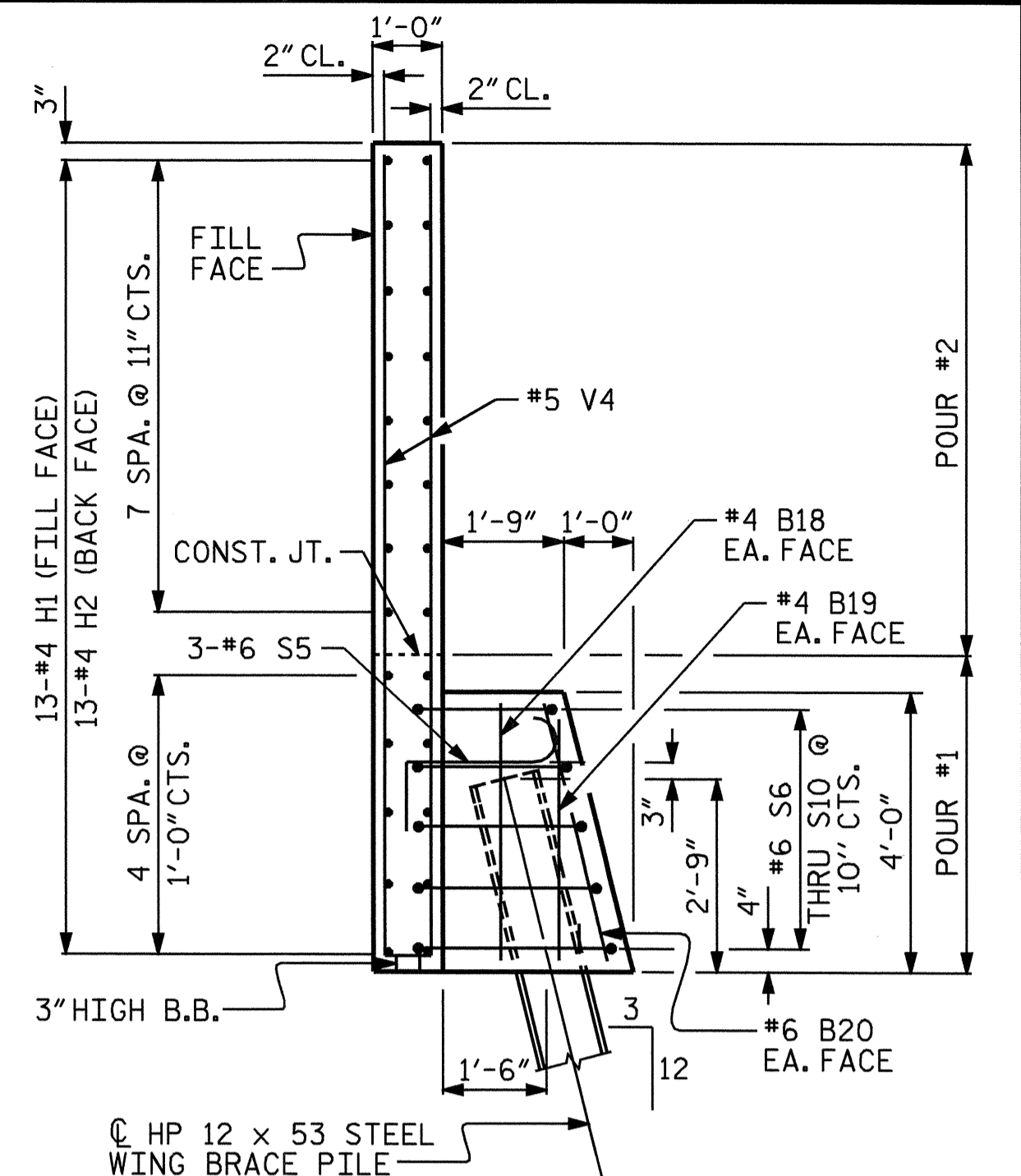
PLAN OF WING (W1)
STAGE I



PLAN OF WING (W2)
STAGE II

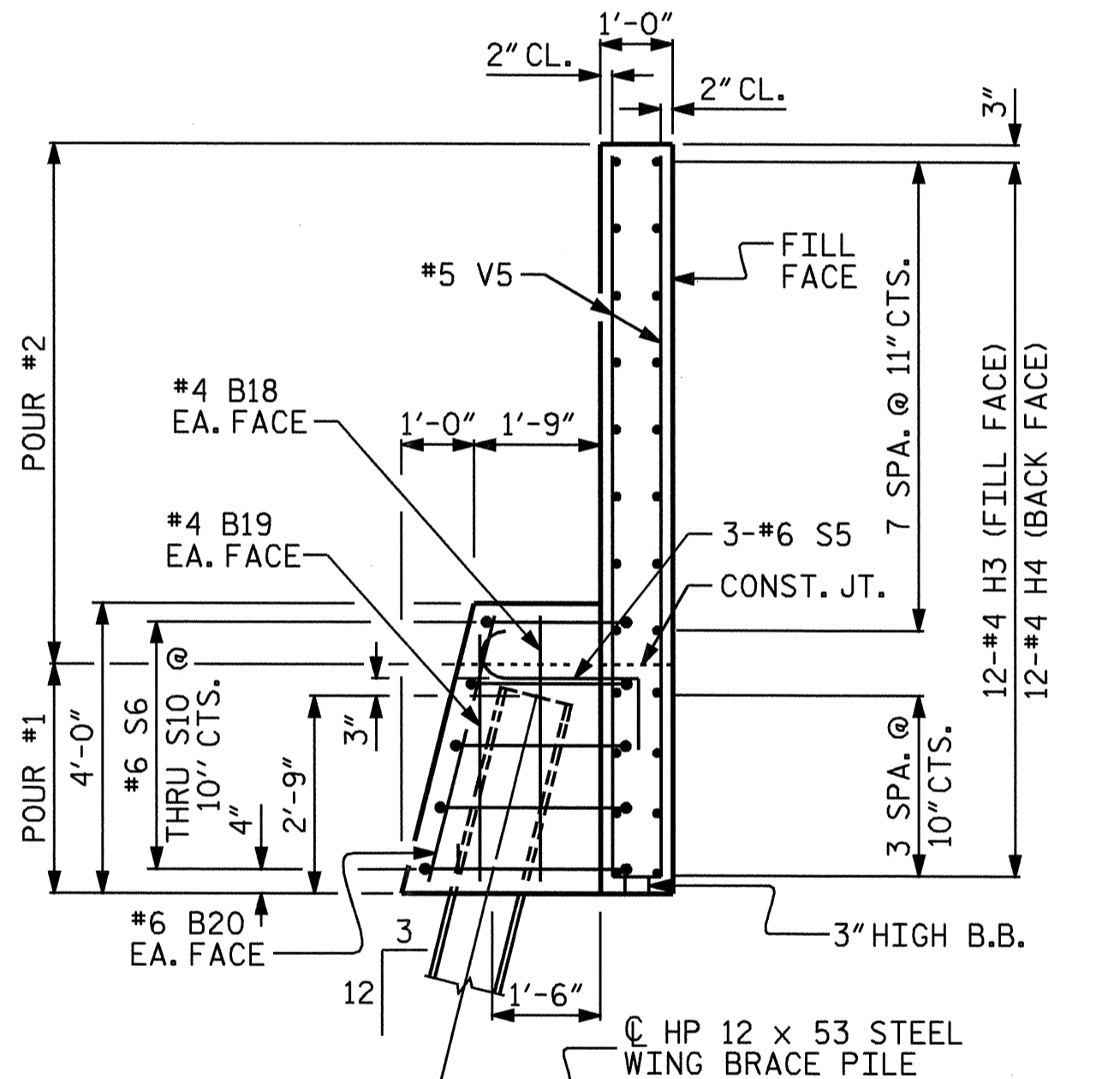


DETAIL "C"

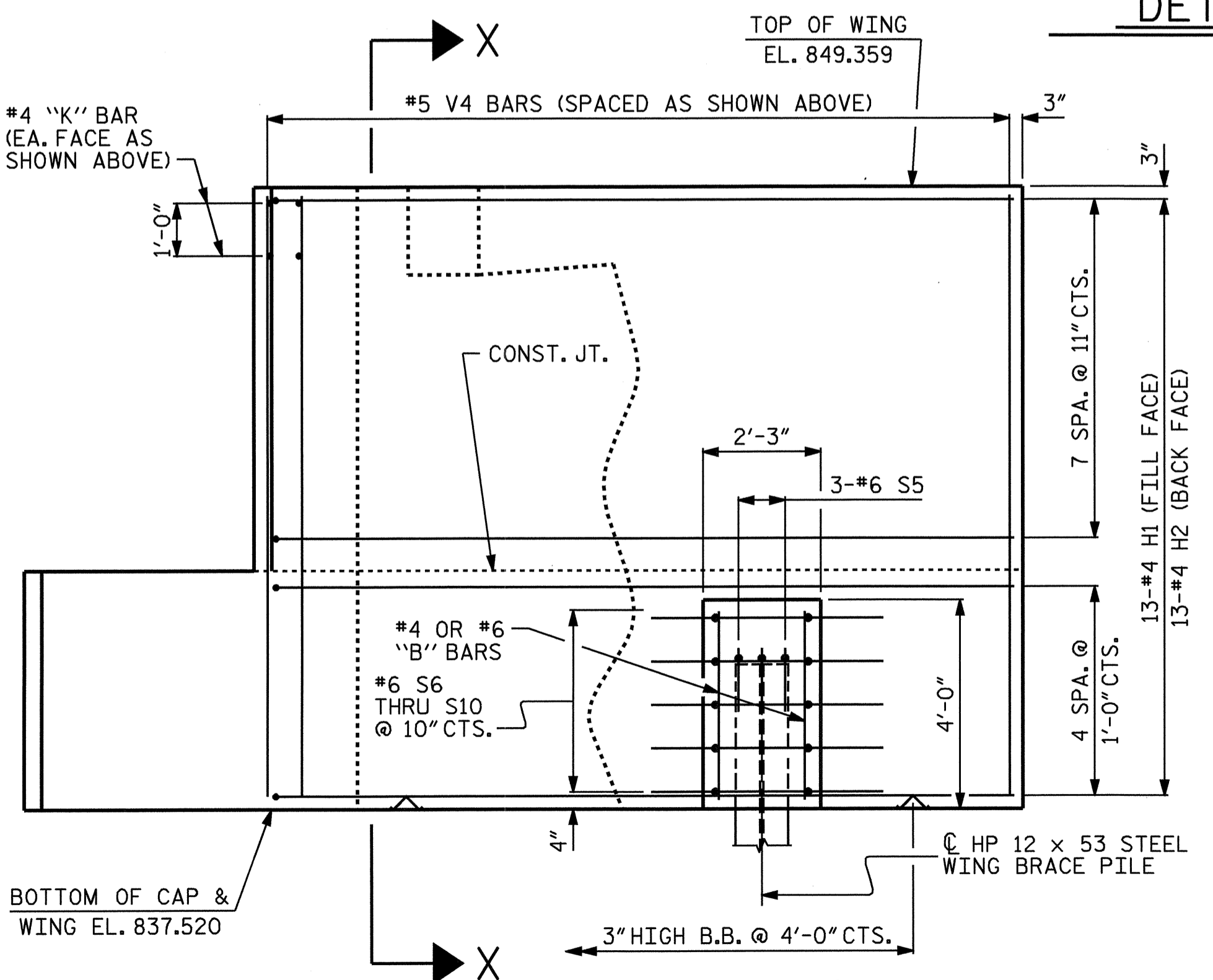


SECTION X-X

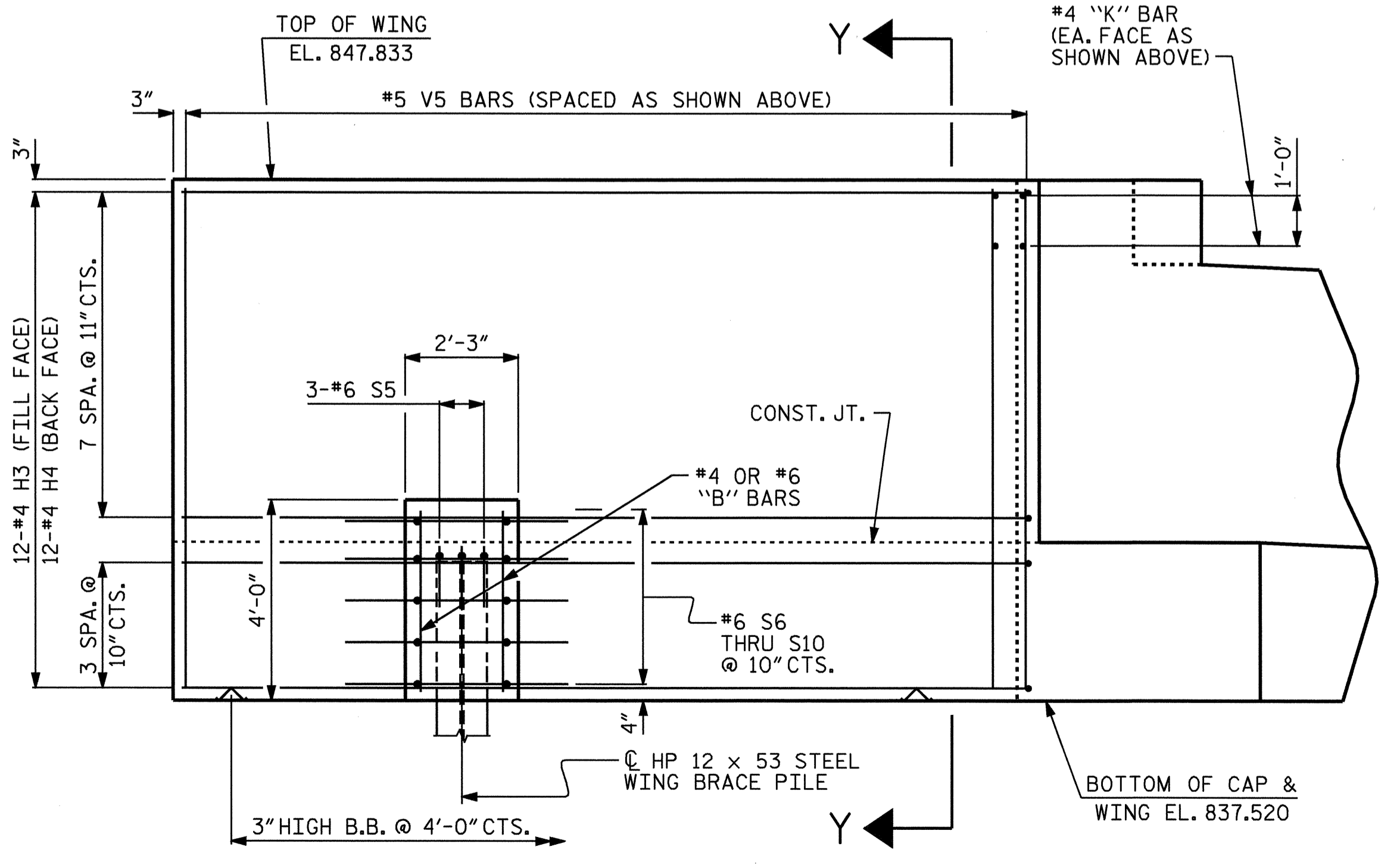
NOTE:
AT THE CONTRACTOR'S OPTION, THE
CONSTRUCTION JOINT IN THE WING
BRACE PILE CAP MAY BE A PERMITTED
CONSTRUCTION JOINT.



SECTION Y-Y



ELEVATION OF WING (W1)
STAGE I



ELEVATION OF WING (W2)
STAGE II

PROJECT NO. I-4411
IREDELL COUNTY
STATION: 46+79.71 -L-

SHEET 3 OF 4

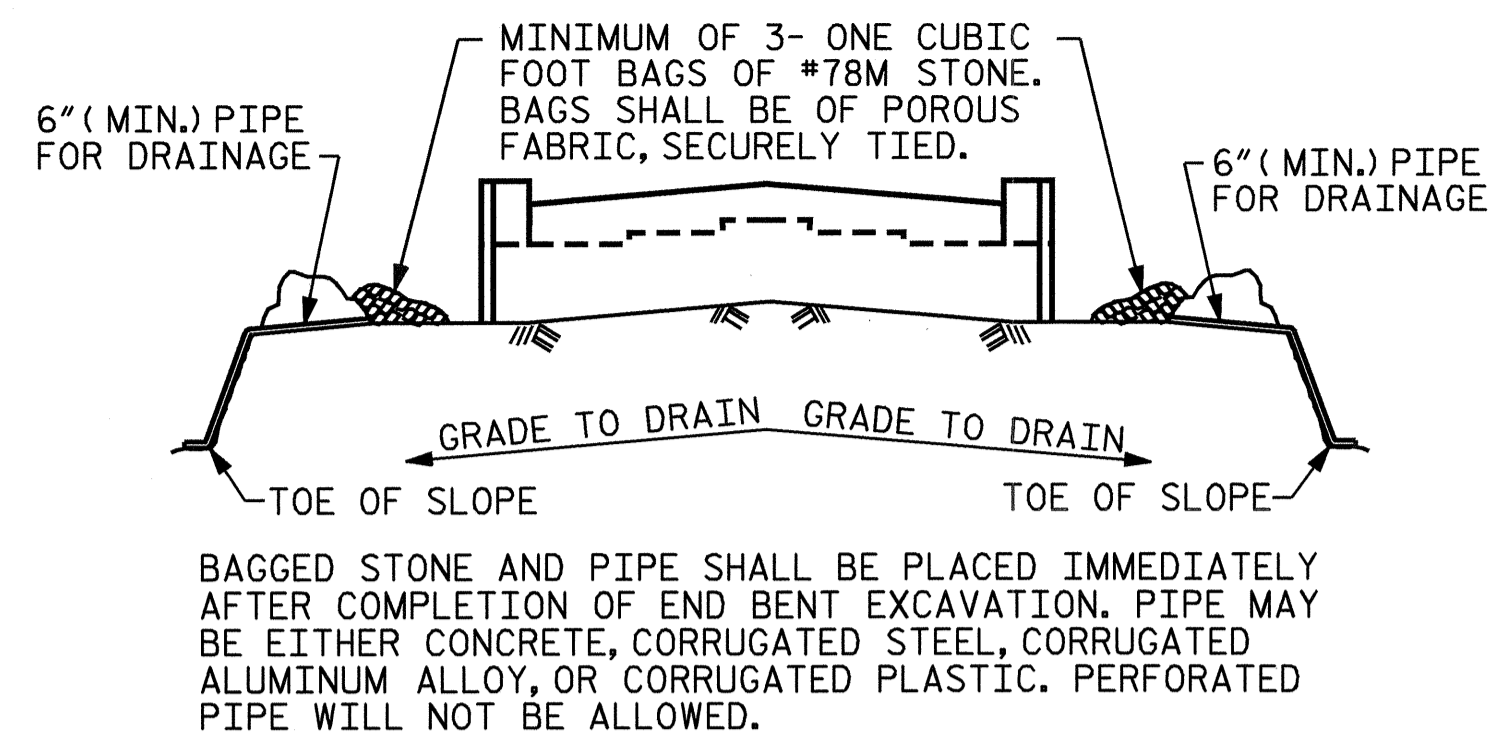
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
END BENT No. 1



| REVISIONS | | | | | | SHEET NO. | |
|-----------|-----|-------|-----|-----|-------|-----------|----|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-29 | |
| 1 | | | 3 | | | TOTAL | 42 |
| 2 | | | 4 | | | SHEETS | |

DRAWN BY: P.C. BREWER DATE: 1/13/05
CHECKED BY: S.B. WILLIAMS DATE: 1/25/05

24-MAY-2005 10:09
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tbeach

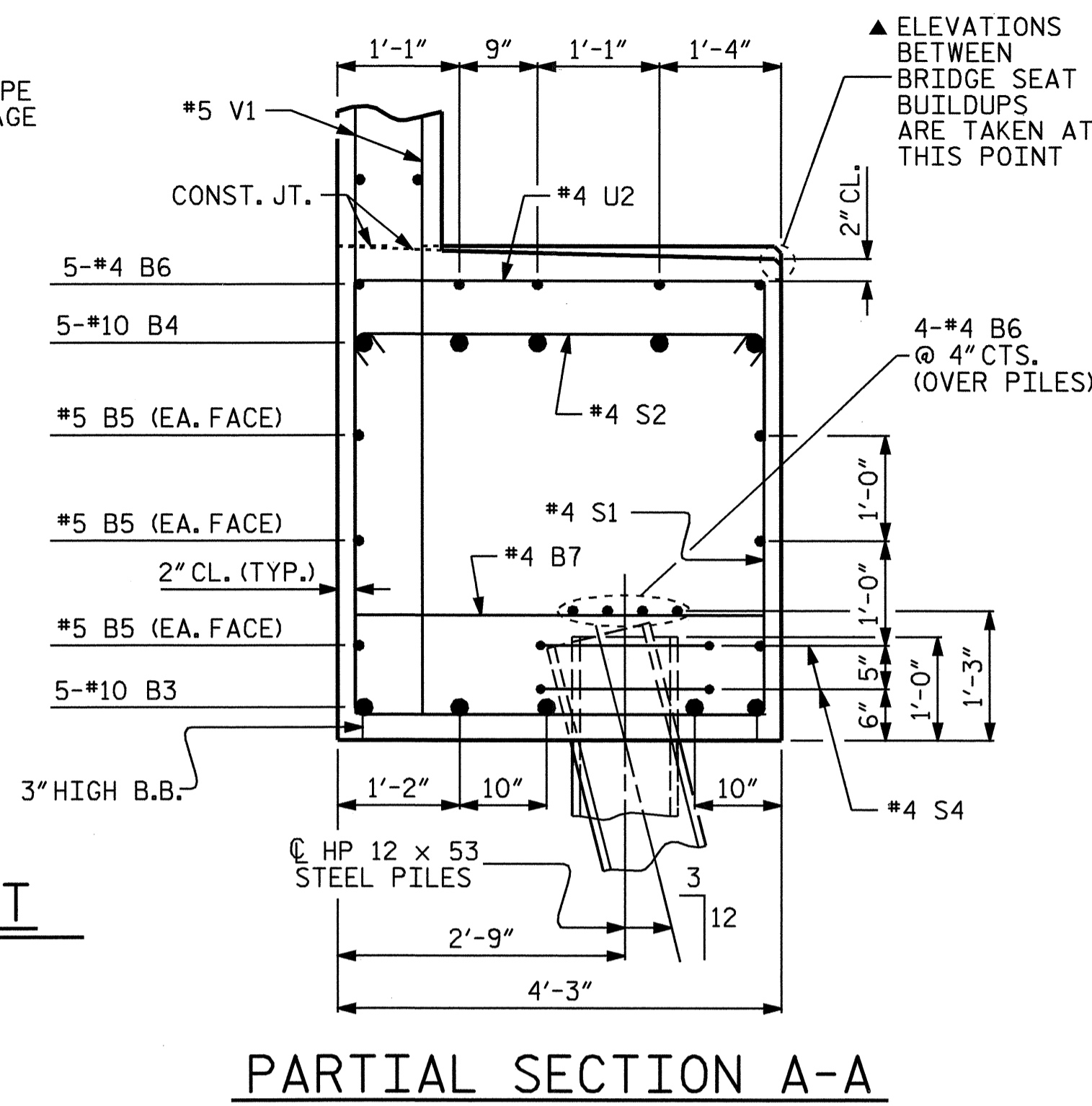


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

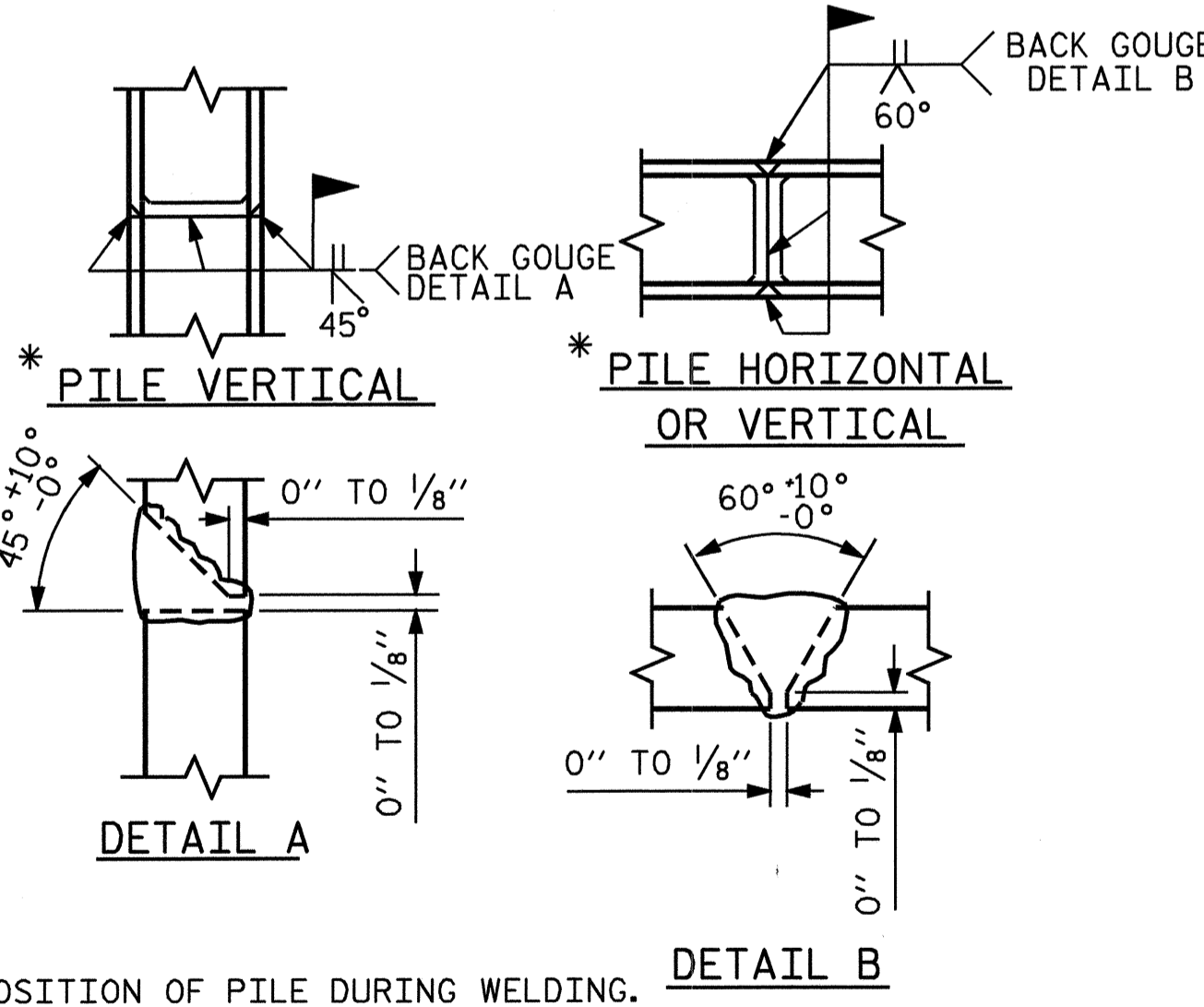
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETEIORATED AND LOST THEIR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

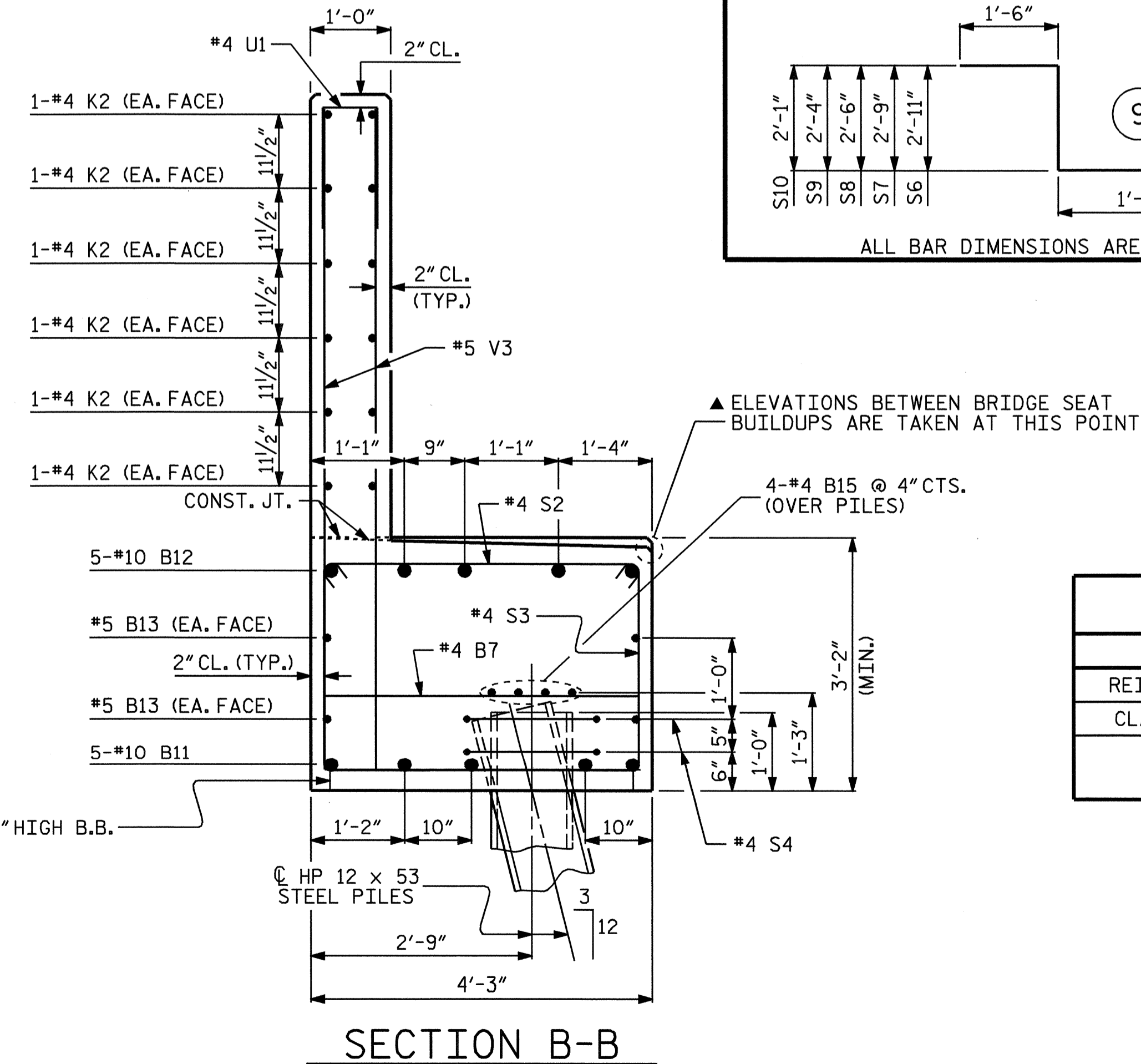
TEMPORARY DRAINAGE AT END BENT



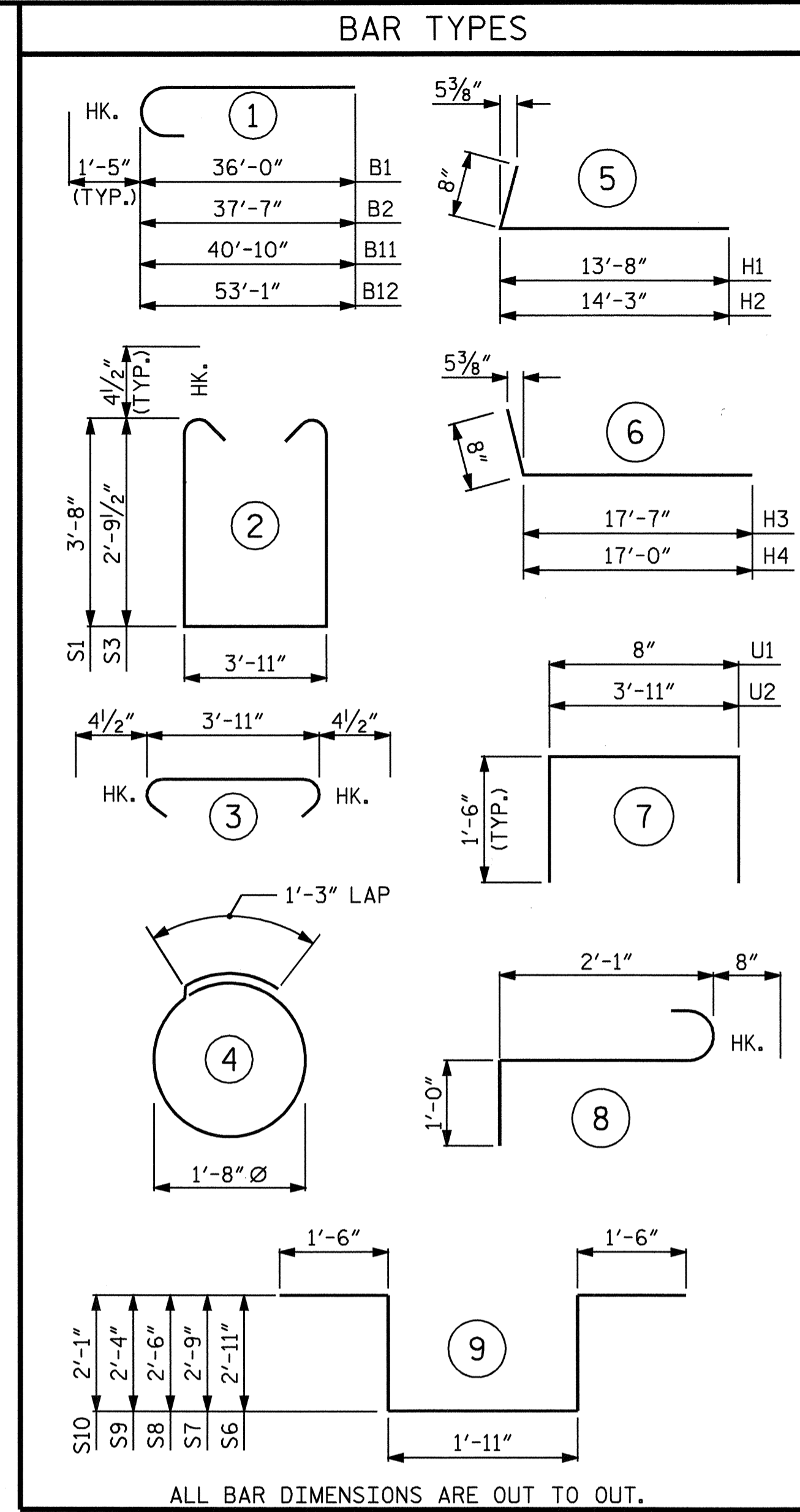
PARTIAL SECTION A-A



PILE SPLICE DETAILS



SECTION B-B



BILL OF MATERIAL

END BENT No. 1

| STAGE I | | | | | STAGE II | | | | | | |
|--|-----|------|------|---------|---------------|--|-----|------|------|---------|---------------|
| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT | BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
| B1 | 5 | 10 | 1 | 37'-5" | 805 | B7 | 21 | 4 | STR | 3'-11" | 55 |
| B2 | 5 | 10 | 1 | 39'-0" | 839 | B8 | 5 | 4 | STR | 2'-8" | 9 |
| B3 | 5 | 10 | STR | 35'-0" | 753 | B9 | 5 | 10 | STR | 39'-2" | 843 |
| B4 | 5 | 10 | STR | 36'-7" | 787 | B10 | 5 | 10 | STR | 31'-11" | 687 |
| B5 | 12 | 5 | STR | 33'-7" | 420 | B11 | 5 | 10 | 1 | 42'-3" | 909 |
| B6 | 27 | 4 | STR | 23'-1" | 416 | B12 | 5 | 10 | 1 | 54'-6" | 1173 |
| B7 | 15 | 4 | STR | 3'-11" | 39 | B13 | 8 | 5 | STR | 38'-1" | 318 |
| B8 | 10 | 4 | STR | 2'-8" | 18 | B14 | 2 | 5 | STR | 23'-0" | 48 |
| B18 | 2 | 4 | STR | 3'-8" | 5 | B15 | 12 | 4 | STR | 26'-0" | 208 |
| B19 | 2 | 4 | STR | 3'-5" | 5 | B16 | 5 | 4 | STR | 14'-10" | 50 |
| B20 | 2 | 6 | STR | 3'-9" | 11 | B17 | 5 | 4 | STR | 17'-8" | 59 |
| | | | | | | B18 | 2 | 4 | STR | 3'-8" | 5 |
| | | | | | | B19 | 2 | 4 | STR | 3'-5" | 5 |
| | | | | | | B20 | 2 | 6 | STR | 3'-9" | 11 |
| H1 | 13 | 4 | 5 | 14'-4" | 124 | H3 | 12 | 4 | 6 | 18'-3" | 146 |
| H2 | 13 | 4 | 5 | 14'-11" | 130 | H4 | 12 | 4 | 6 | 17'-8" | 142 |
| | | | | | | K2 | 36 | 4 | STR | 26'-0" | 625 |
| | | | | | | K4 | 4 | 4 | STR | 4'-4" | 12 |
| | | | | | | S1 | 76 | 4 | 2 | 12'-0" | 385 |
| | | | | | | S2 | 76 | 4 | 3 | 4'-8" | 237 |
| | | | | | | S4 | 22 | 4 | 4 | 6'-6" | 96 |
| | | | | | | S5 | 3 | 6 | 8 | 3'-9" | 17 |
| | | | | | | S6 | 1 | 6 | 9 | 10'-9" | 16 |
| | | | | | | S7 | 1 | 6 | 9 | 10'-5" | 16 |
| | | | | | | S8 | 1 | 6 | 9 | 9'-11" | 15 |
| | | | | | | S9 | 1 | 6 | 9 | 9'-7" | 14 |
| | | | | | | S10 | 1 | 6 | 9 | 9'-1" | 14 |
| | | | | | | S8 | 1 | 6 | 9 | 9'-11" | 15 |
| | | | | | | S9 | 1 | 6 | 9 | 9'-7" | 14 |
| | | | | | | S10 | 1 | 6 | 9 | 9'-1" | 14 |
| | | | | | | U1 | 53 | 4 | 7 | 3'-8" | 130 |
| | | | | | | U2 | 40 | 4 | 7 | 6'-11" | 185 |
| | | | | | | U1 | 69 | 4 | 7 | 3'-8" | 169 |
| | | | | | | U2 | 23 | 4 | 7 | 6'-11" | 106 |
| | | | | | | V2 | 62 | 5 | STR | 9'-4" | 604 |
| | | | | | | V3 | 76 | 5 | STR | 8'-2" | 647 |
| | | | | | | V5 | 45 | 5 | STR | 9'-10" | 462 |
| REINFORCING STEEL | | | | | 7,796 LBS | REINFORCING STEEL | | | | | 8,462 LBS |
| CLASS A CONCRETE BREAKDOWN: | | | | | | CLASS A CONCRETE BREAKDOWN: | | | | | |
| POUR #1 (CAP & LOWER PART OF WING & WING BRACE PILE CAP) | | | | | 46.9 CU. YDS. | POUR #1 (CAP & LOWER PART OF WING & WING BRACE PILE CAP) | | | | | 45.7 CU. YDS. |
| POUR #2 (BACKWALL & UPPER PART OF WING) | | | | | 15.9 CU. YDS. | POUR #2 (BACKWALL & UPPER PART OF WING) | | | | | 20.1 CU. YDS. |
| TOTAL: | | | | | 62.8 CU. YDS. | TOTAL: | | | | | 65.8 CU. YDS. |
| HP 12 X 53 STEEL PILES | | | | | | HP 12 X 53 STEEL PILES | | | | | |
| No. 13 780.0 LIN. FT. | | | | | | No. 12 720.0 LIN. FT. | | | | | |

TOTAL QUANTITIES (END BENT No. 1)

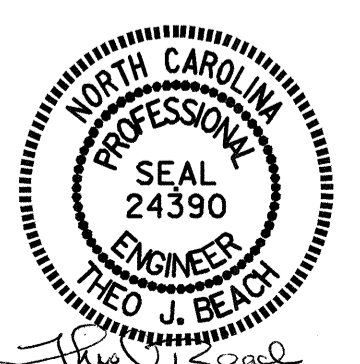
| ITEM | STAGE I | STAGE II | TOTAL |
|------------------------|-----------------------|-----------------------|------------------------|
| REINFORCING STEEL | 7,796 LBS. | 8,462 LBS. | 16,258 LBS. |
| CLASS A CONCRETE | 62.8 CU. YDS. | 65.8 CU. YDS. | 128.6 CU. YDS. |
| HP 12 x 53 STEEL PILES | No. 13 LIN. FT. 780.0 | No. 12 LIN. FT. 720.0 | No. 25 LIN. FT. 1500.0 |

PROJECT NO. I-4411

IREDELL COUNTY

STATION: 46+79.71 -L-

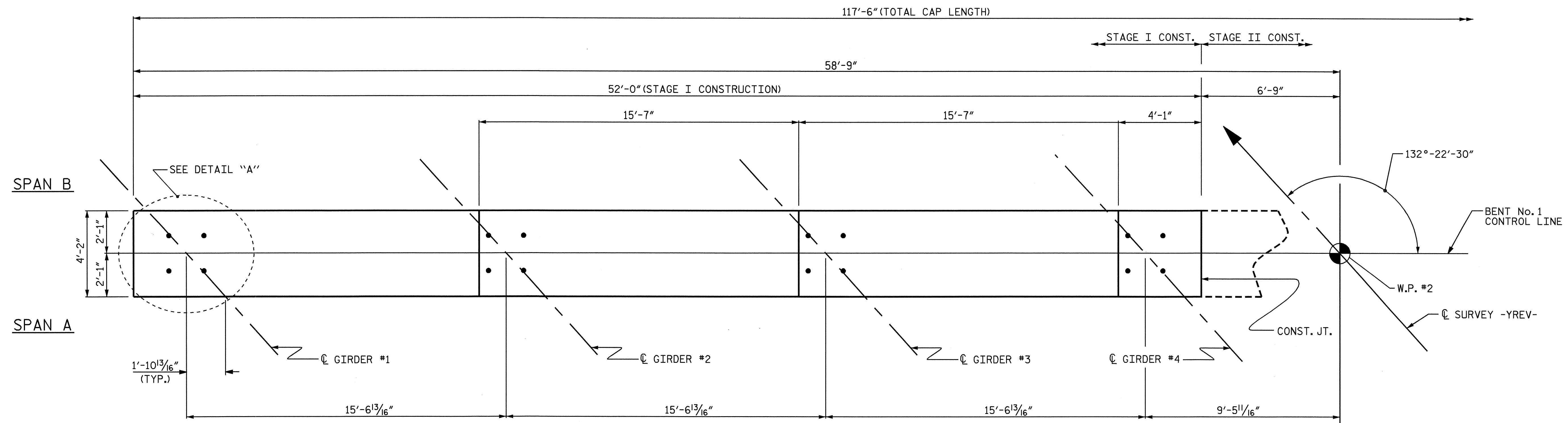
SHEET 4 OF 4



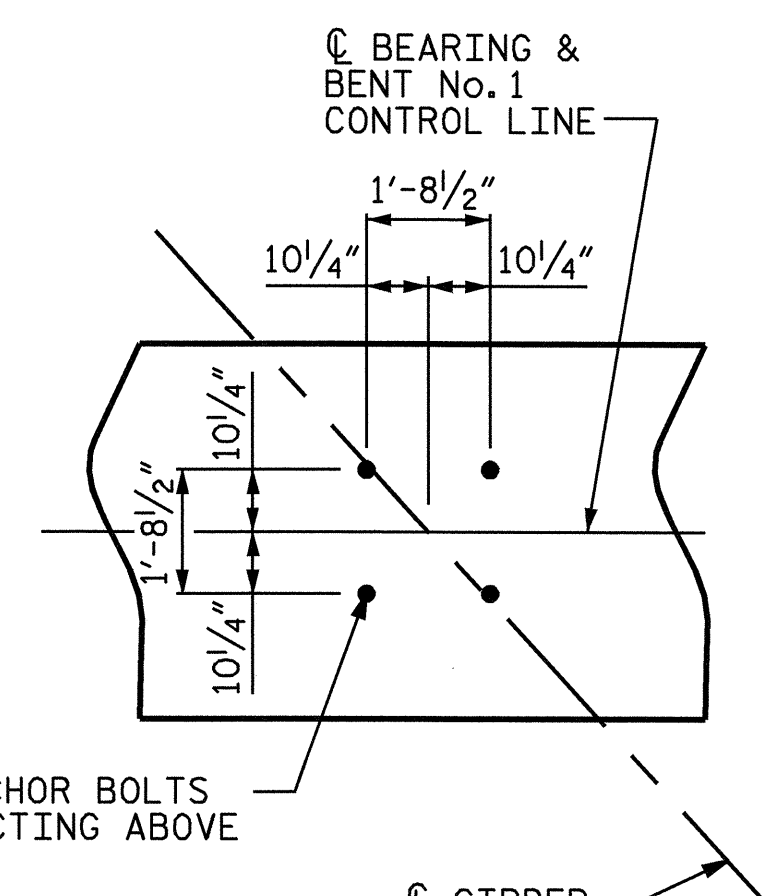
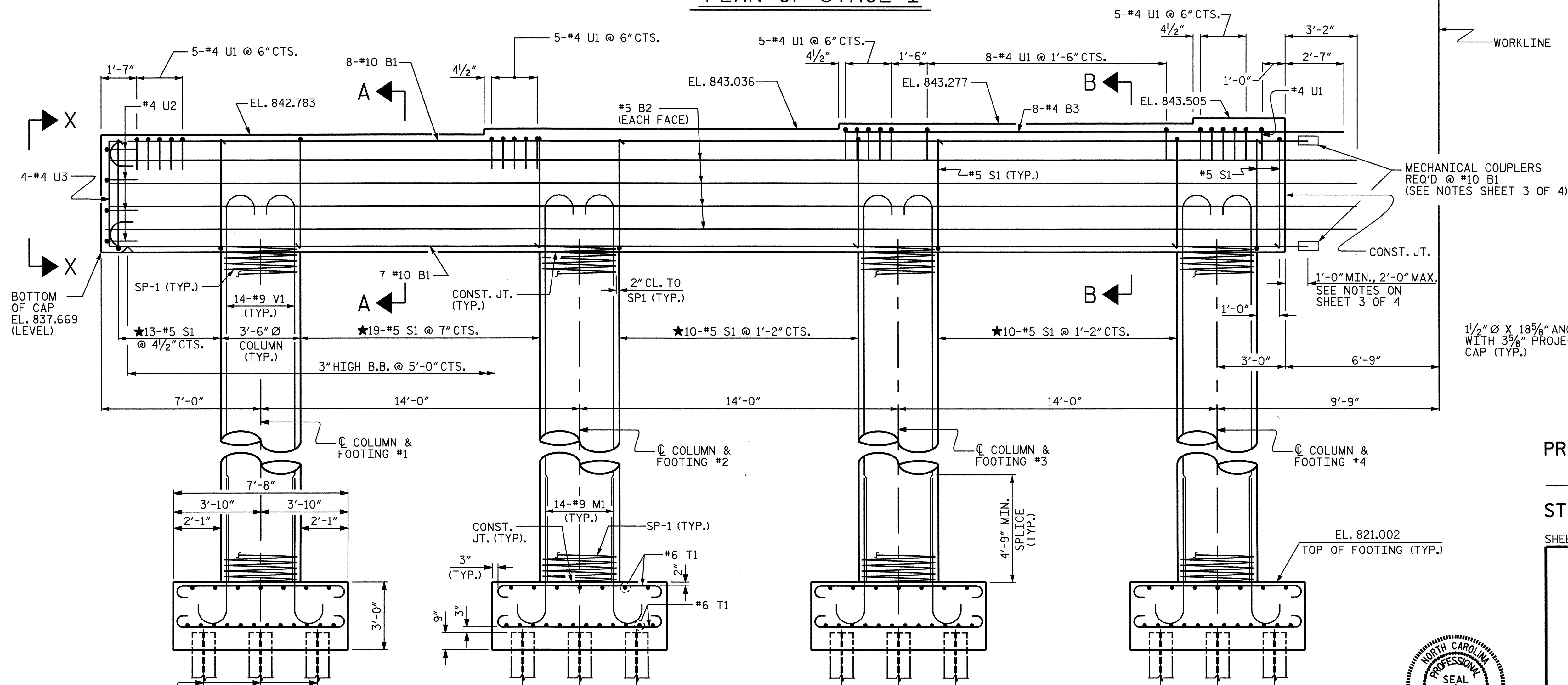
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 1

| REVISIONS | | | | | | SHEET NO. | |
|-----------|-----|-------|-----|-----|-------|-----------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-30 | TOTAL SHEETS |
| 1 | | | 3 | | | | 42 |
| 2 | | | 4 | | | | 42 |



PLAN OF STAGE I



DETAIL "A"
(TYPICAL EACH GIRDER)

ELEVATION OF STAGE I

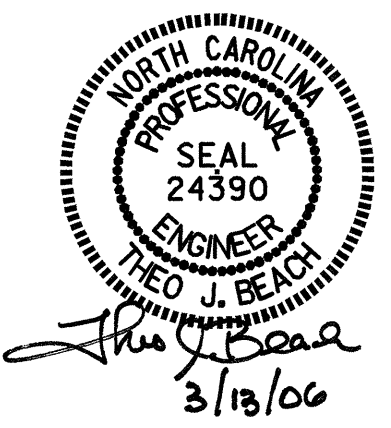
DIMENSIONS & REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN AND FOOTING

PROJECT NO. I-4411
IREDELL COUNTY
 STATION: 46+79.71 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 BENT No. 1
 STAGE I

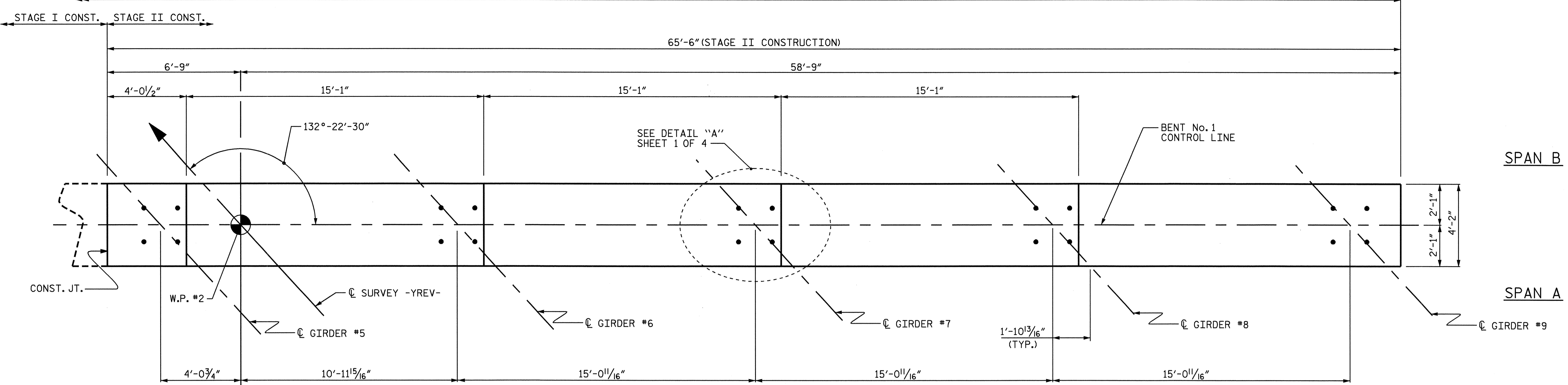


DRAWN BY : SBW/AKP DATE : 02/06
 CHECKED BY : BNG/TJB DATE : 02/06

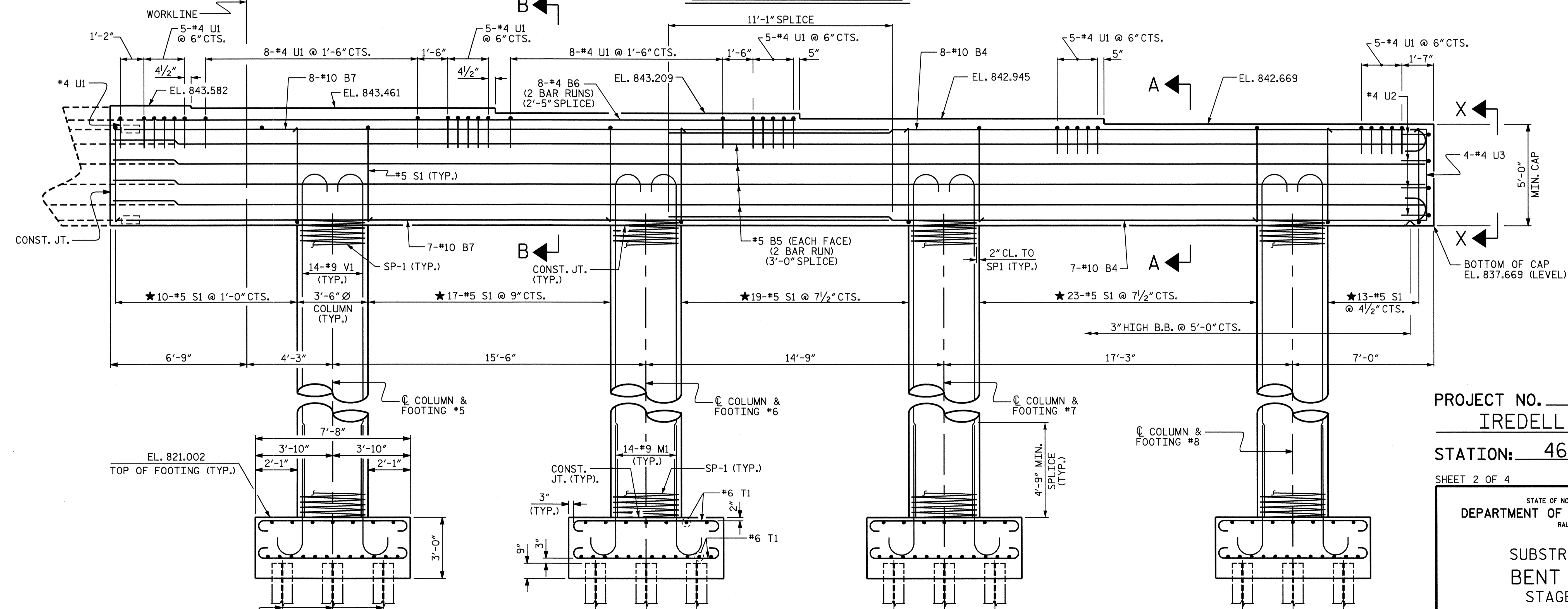
| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-31 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 42 |

01-MAR-2006 14:40
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 tbeach

117'-6" (TOTAL CAP LENGTH)

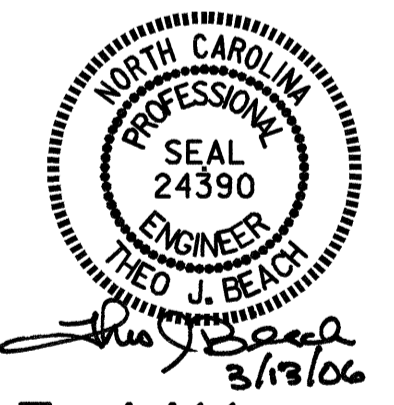


PLAN OF STAGE II



ELEVATION OF STAGE II

DIMENSIONS & REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN AND FOOTING



PROJECT NO. I-4411
IREDELL COUNTY
 STATION: 46+79.71 -L-
 SHEET 2 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 BENT No. 1
 STAGE II

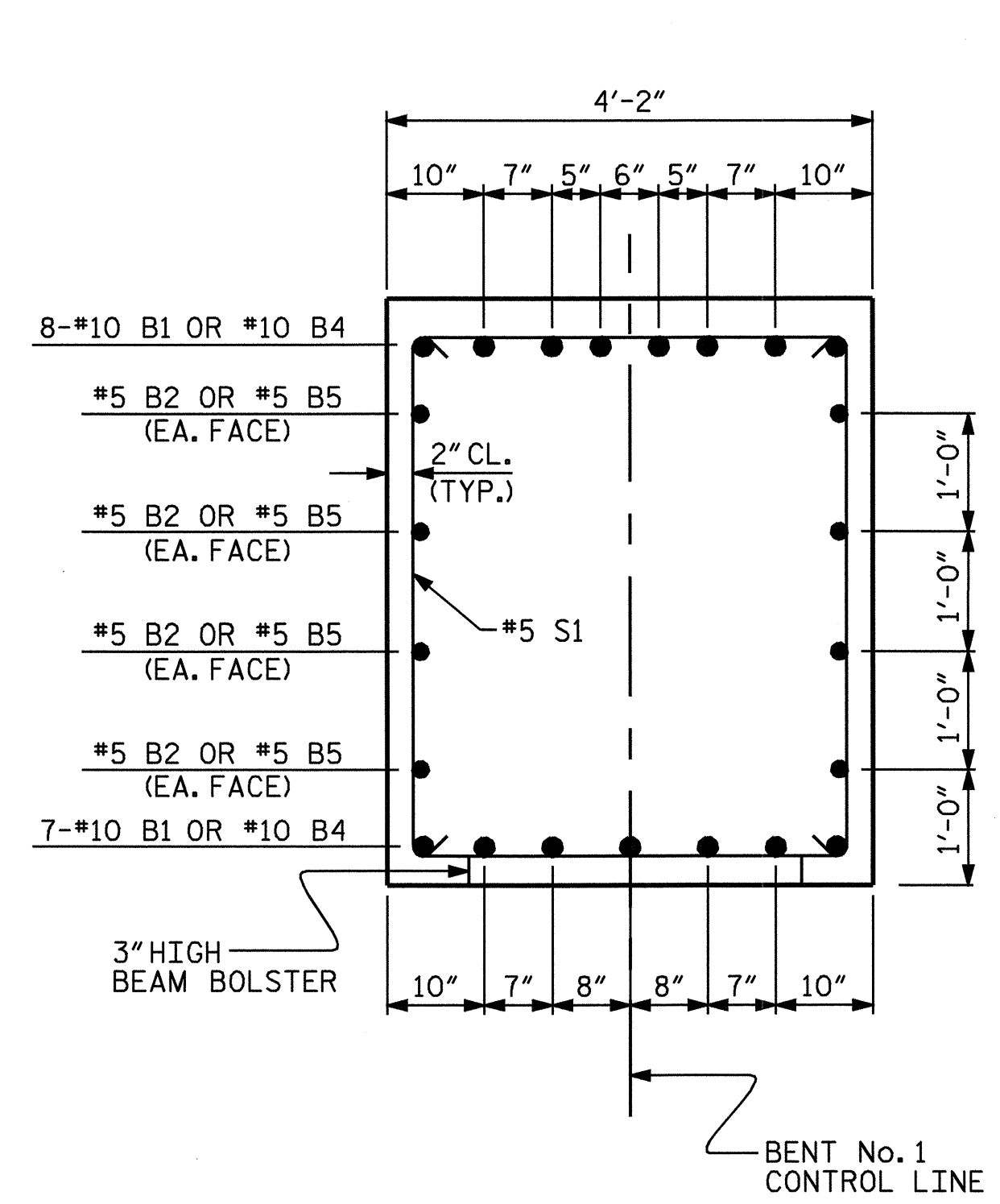
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| REVISIONS | | | | | | SHEET NO. S-32 |
|-----------|-----|-------|-----|-----|-------|--------------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | |
| 1 | | | 3 | | | TOTAL SHEETS 42 |
| 2 | | | 4 | | | |

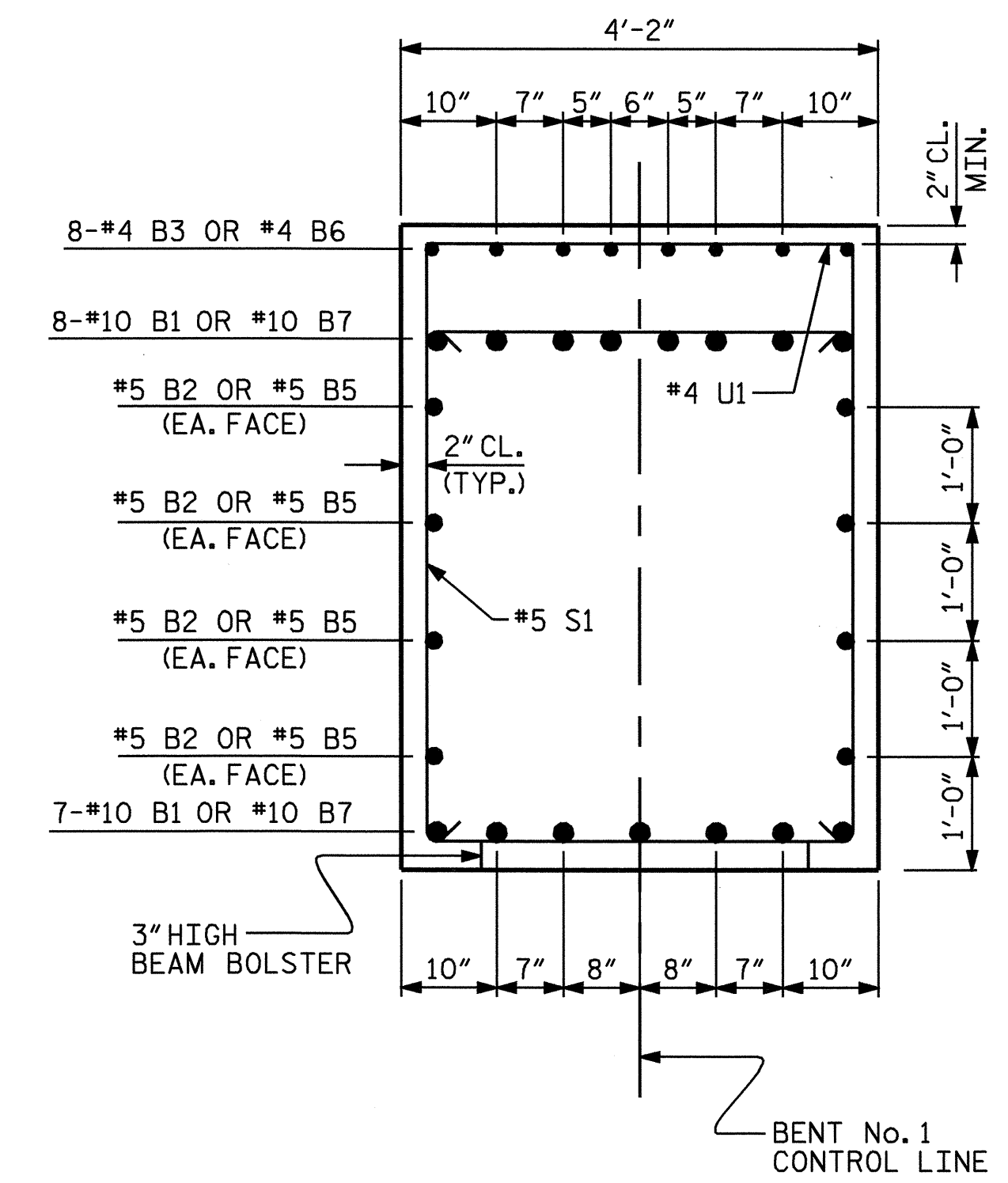
01-MAR-2006 14:40
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 tbeach

NOTES

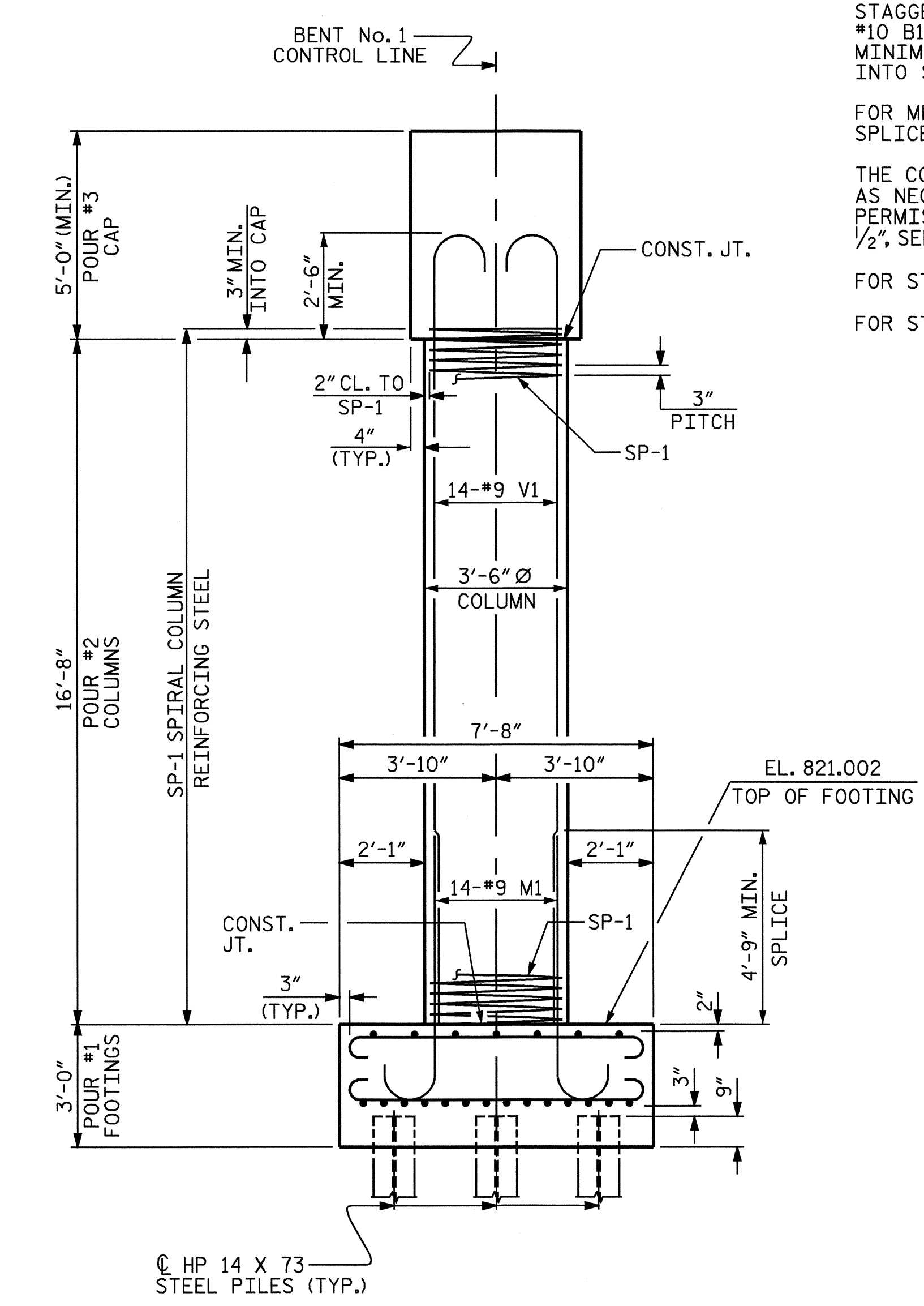
- STIRRUPS AND U1 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
- ★ INVERT ALTERNATE STIRRUPS AS SHOWN.
- MECHANICAL COUPLERS SHALL BE USED TO JOIN THE #10 B1 BARS IN STAGE I WITH THE #10 B7 BARS IN STAGE II. THE LOCATION OF THE COUPLERS SHALL BE STAGGERED ON ALTERNATING BARS BY 1 FOOT AND THE #10 B1 BARS SHALL BE CUT ACCORDINGLY TO ALLOW A MINIMUM OF 1'-0" AND A MAXIMUM OF 2'-0" EXTENSION INTO STAGE II CONSTRUCTION.
- FOR MECHANICAL COUPLERS, SEE MECHANICAL BUTT SPLICES FOR REINFORCING STEEL SPECIAL PROVISIONS.
- THE CONTRACTOR SHALL ADJUST THE GIRDER BUILDUPS AS NECESSARY TO INCORPORATE A MAXIMUM PERMISSIBLE VARIATION IN POT BEARING DEPTH OF 1/2". SEE SPECIAL PROVISION FOR POT BEARINGS.
- FOR STEEL PILE POINTS, SEE SPECIAL PROVISIONS.
- FOR STEEL H PILES, SEE SPECIAL PROVISIONS.



SECTION A-A

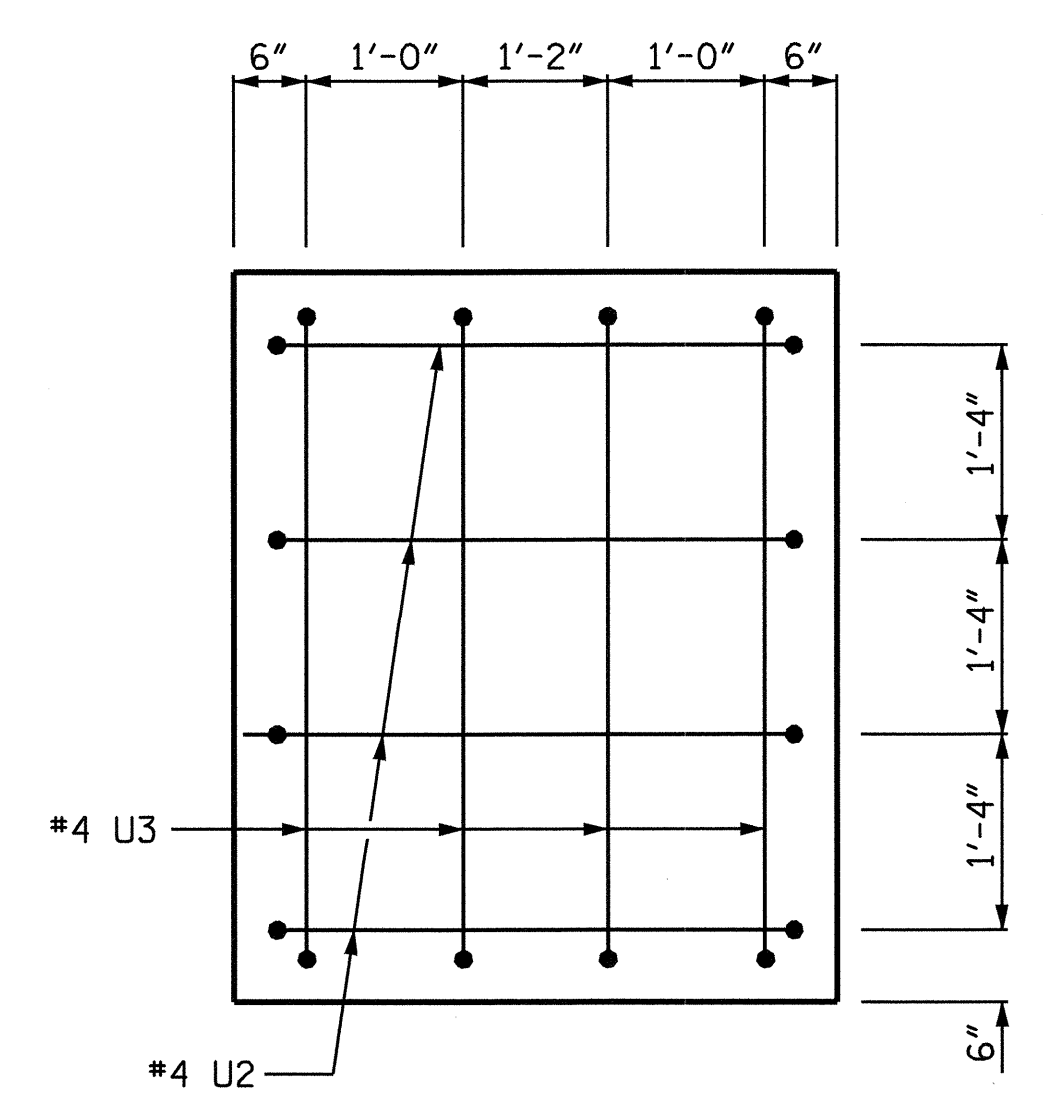


SECTION B-B

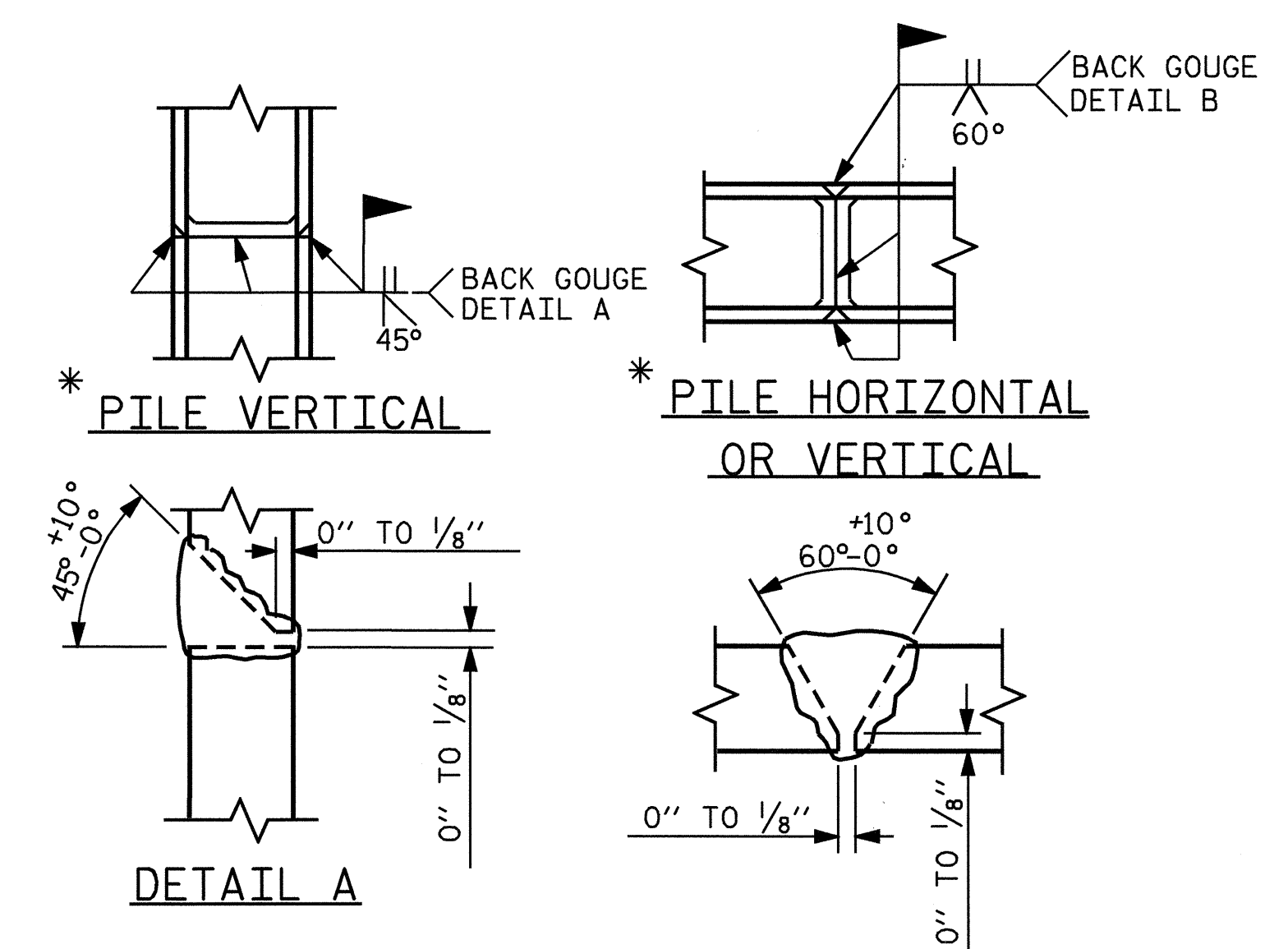


END ELEVATION

REINFORCING STEEL, DIMENSIONS, & DETAILS ARE TYPICAL FOR EACH COLUMN & FOOTING UNLESS OTHERWISE NOTED.



VIEW X-X



* POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

PROJECT NO. I-4411
IREDELL COUNTY
 STATION: 46+79.71 -L-

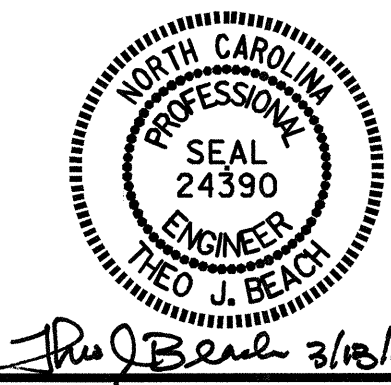
SHEET 3 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

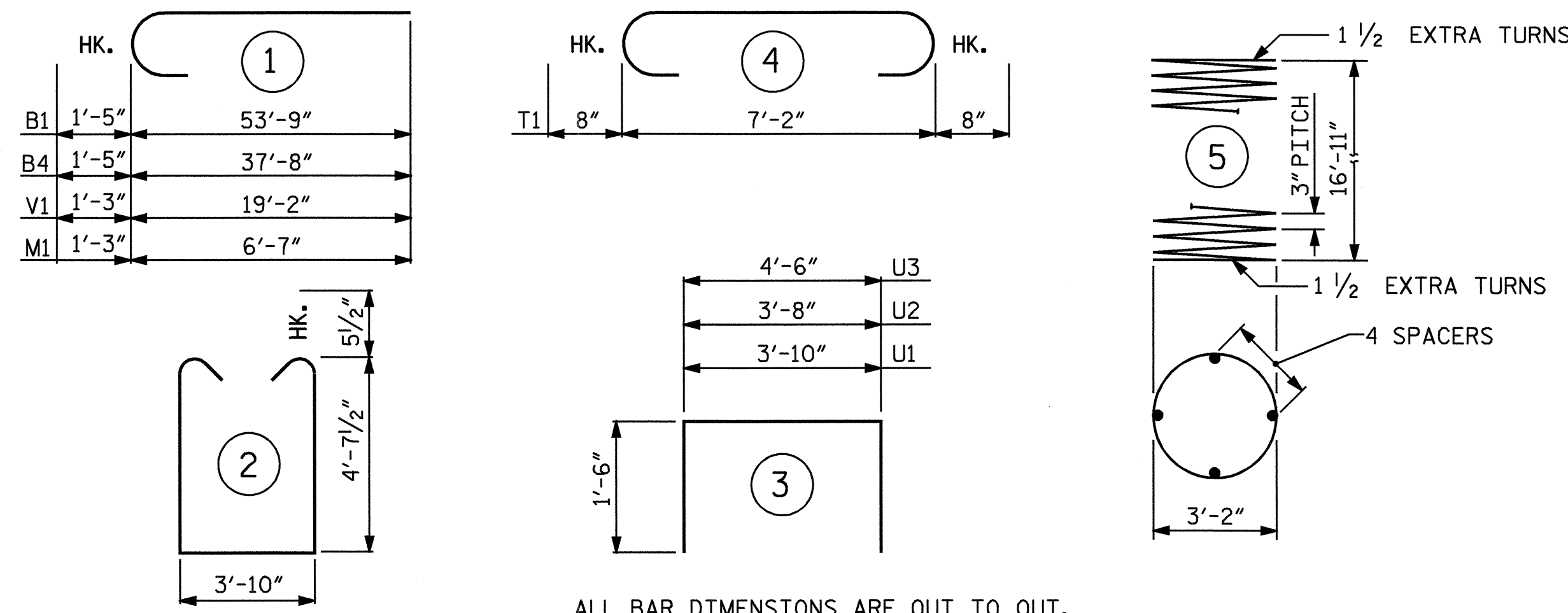
SUBSTRUCTURE
 BENT No. 1

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|-----------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-33 |
| 1 | | | 3 | | | TOTAL SHEETS 42 |
| 2 | | | 4 | | | |

DRAWN BY: SBW/AKP DATE: 02/06
 CHECKED BY: BNG/TJB DATE: 02/06



BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT No. 1 (STAGE I)

| BAR NO. | SIZE | TYPE | LENGTH | WEIGHT | |
|---------|------|------|--------|--------|------|
| B1 | 15 | #10 | 1 | 55'-2" | 3561 |
| B2 | 8 | #5 | STR | 55'-0" | 459 |
| B3 | 8 | #4 | STR | 22'-1" | 118 |
| M1 | 56 | #9 | 1 | 7'-10" | 1491 |
| S1 | 54 | #5 | 2 | 14'-0" | 789 |
| T1 | 160 | #6 | 4 | 8'-6" | 2043 |
| U1 | 29 | #4 | 3 | 6'-10" | 132 |
| U2 | 4 | #4 | 3 | 6'-8" | 18 |
| U3 | 4 | #4 | 3 | 7'-6" | 20 |
| V1 | 56 | #9 | 1 | 20'-5" | 3887 |

REINFORCING STEEL 12,518 LBS.

SP-1 4 * 5 697'-4" 1863

SPIRAL COLUMN REINFORCING STEEL 1863 LBS.

* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

| | |
|-------------------------|--------|
| CLASS A CONCRETE (C.Y.) | |
| POUR #1 (FOOTINGS) | = 26.1 |
| POUR #2 (COLUMNS) | = 23.8 |
| POUR #3 (CAP) | = 43.3 |
| TOTAL | = 93.2 |

HP 14 X 73 STEEL PILES
No. 20 L.F. = 800

STEEL PILE POINTS = 20

BILL OF MATERIAL

BENT No. 1 (STAGE II)

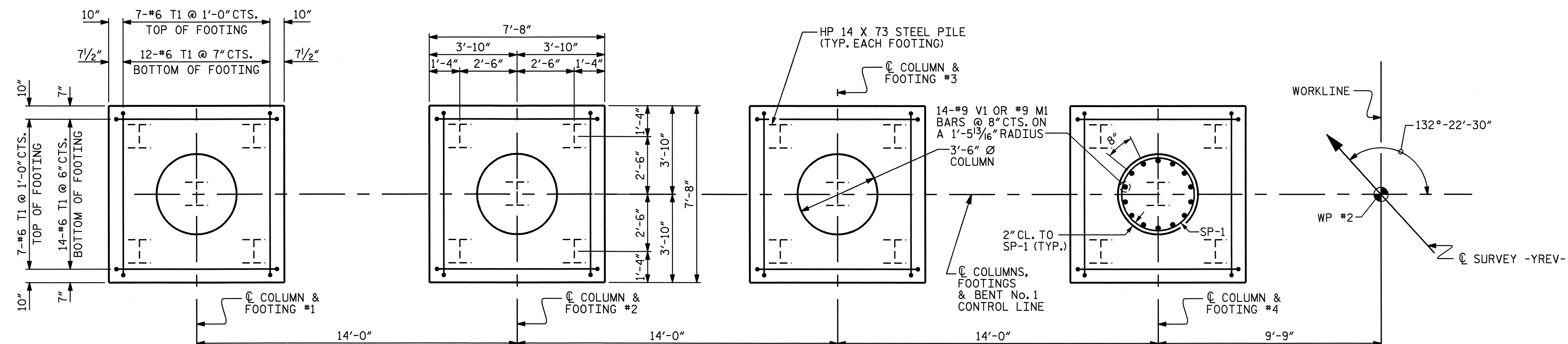
| BAR NO. | SIZE | TYPE | LENGTH | WEIGHT | |
|---------|------|------|--------|--------|------|
| B4 | 15 | #10 | 1 | 39'-1" | 2523 |
| B5 | 16 | #5 | STR | 34'-1" | 569 |
| B6 | 16 | #4 | STR | 18'-2" | 194 |
| B7 | 15 | #10 | STR | 37'-8" | 2431 |
| M1 | 56 | #9 | 1 | 7'-10" | 1491 |
| S1 | 82 | #5 | 2 | 14'-0" | 1197 |
| T1 | 160 | #6 | 4 | 8'-6" | 2043 |
| U1 | 42 | #4 | 3 | 6'-10" | 192 |
| U2 | 4 | #4 | 3 | 6'-8" | 18 |
| U3 | 4 | #4 | 3 | 7'-6" | 20 |
| V1 | 56 | #9 | 1 | 20'-5" | 3887 |

REINFORCING STEEL 14,565 LBS.

SP-1 4 * 5 697'-4" 1863

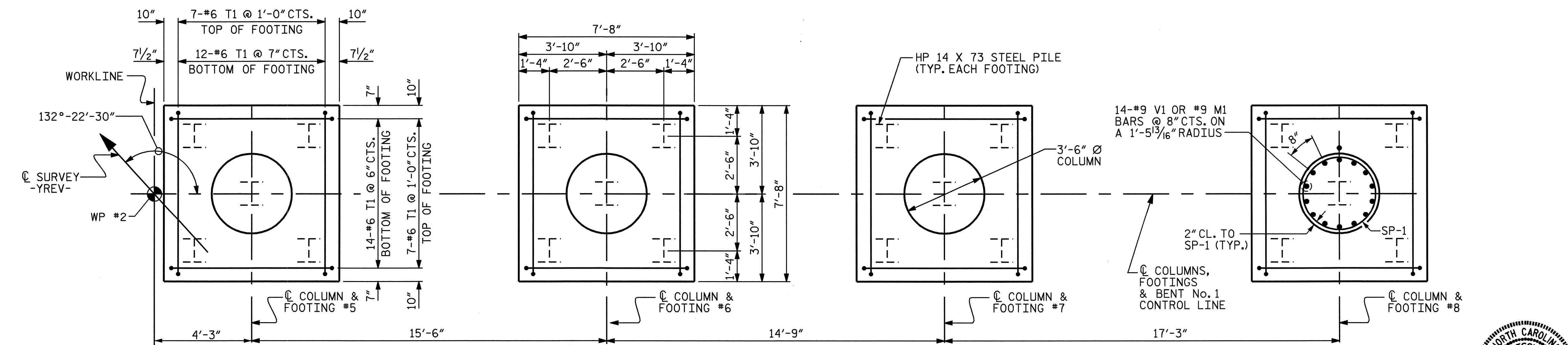
SPIRAL COLUMN REINFORCING STEEL 1863 LBS.

* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.



PLAN OF FOOTINGS & COLUMNS (STAGE I)

(REINFORCING STEEL, DIMENSIONS & DETAILS ARE TYPICAL FOR EACH COLUMN & FOOTING)



PLAN OF FOOTINGS & COLUMNS (STAGE II)

(REINFORCING STEEL, DIMENSIONS & DETAILS ARE TYPICAL FOR EACH COLUMN & FOOTING)

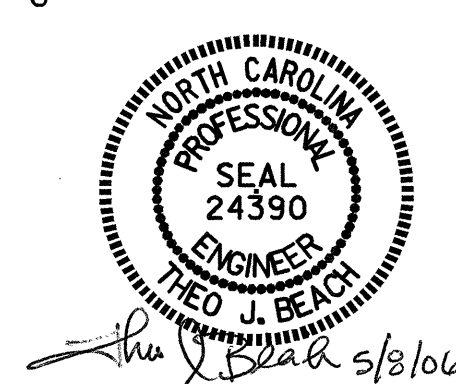
| BENT No. 1 TOTAL QUANTITIES | |
|---------------------------------|--------------|
| REINFORCING STEEL | =27,083 LBS. |
| SPIRAL COLUMN REINFORCING STEEL | =3,726 LBS. |
| CLASS A CONCRETE | =198.0 C.Y. |
| HP 14 X 73 STEEL PILES | |
| No. 40 | L.F. = 1400 |
| STEEL PILE POINTS | = 40 |

PROJECT NO. I-4411
IREDELL COUNTY
STATION: 46+79.71 -L-

SHEET 4 OF 4

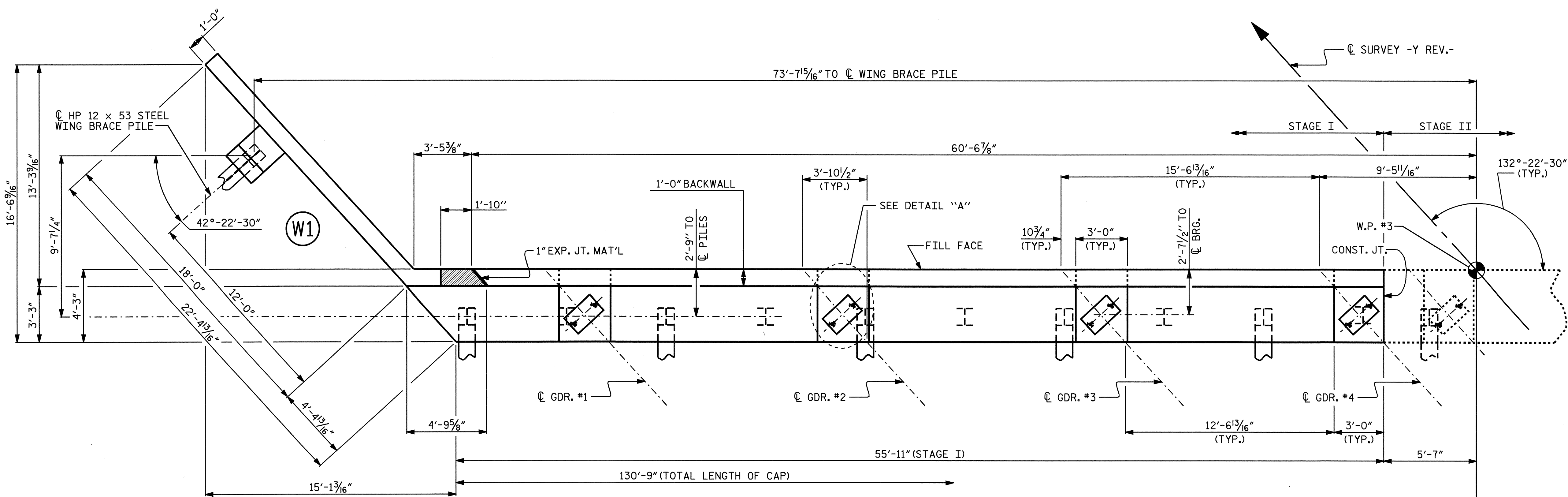
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT No. 1

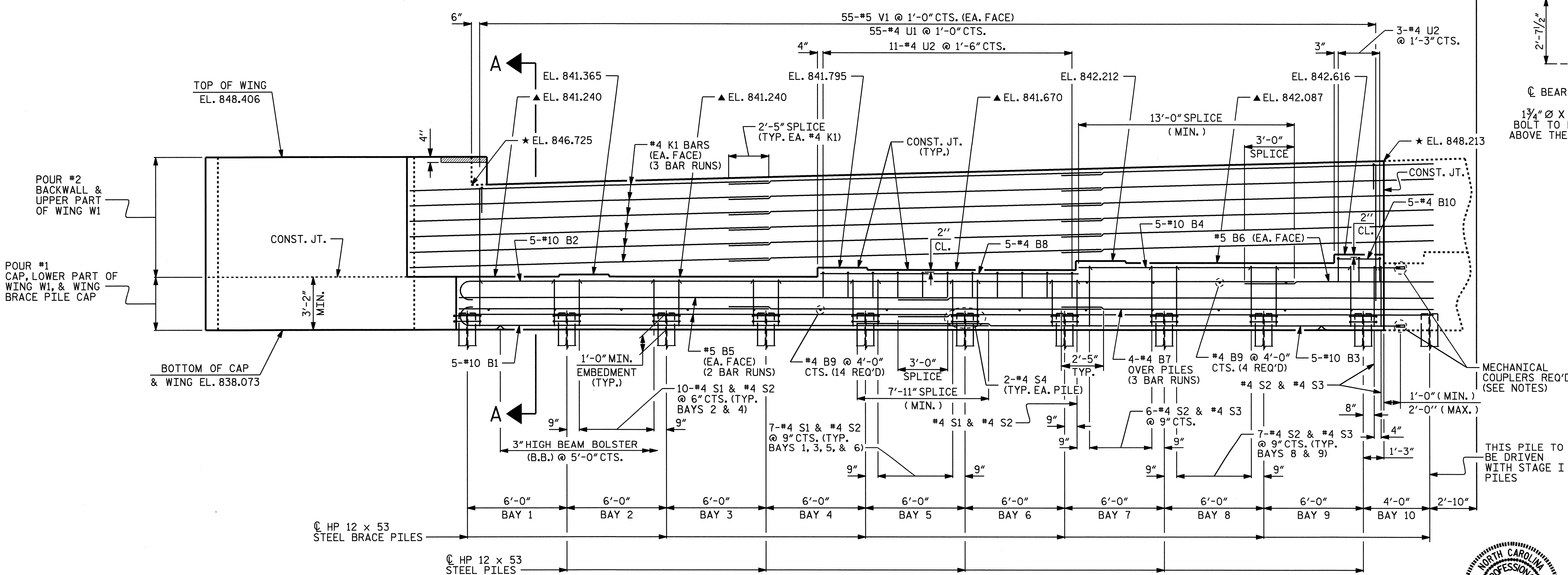


DRAWN BY: SBW/AKP DATE: 02/06
CHECKED BY: BNG/TJB DATE: 02/06

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-34 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 42 |



PLAN (STAGE I)

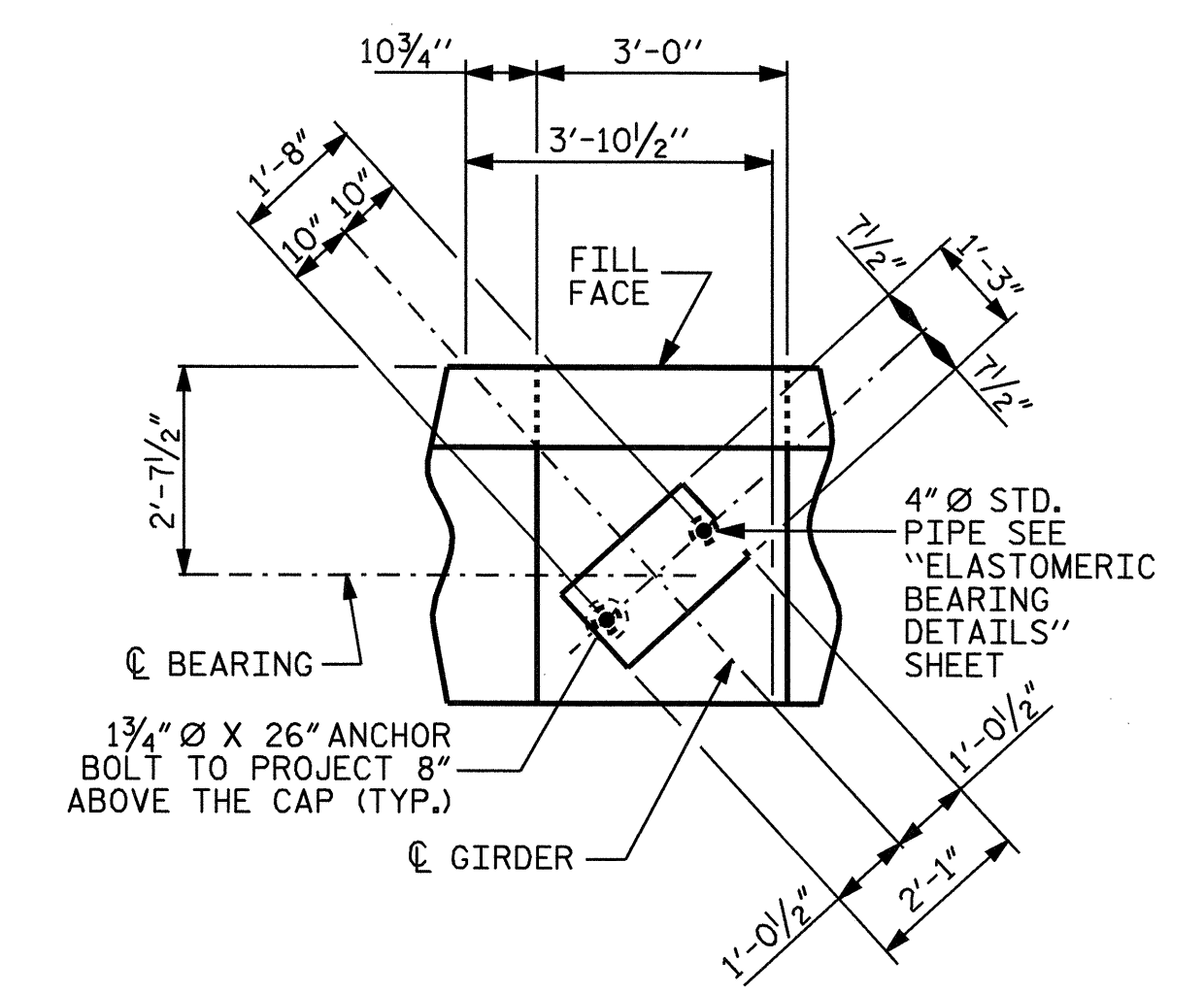


ELEVATION (STAGE I)
(FOR CLARITY, WING BRACE PILE NOT SHOWN)

NOTES:

- ▲ FOR LOCATION OF ELEVATIONS BETWEEN BUILDUPS, SEE SECTION A-A ON SHEET 4 OF 4.
- ★ THIS ELEVATION TAKEN ON FILL FACE OF BACKWALL.
- STIRRUPS AND U2 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- #5 "V" BARS IN BACKWALL SHALL BE PLACED 2" CLEAR FROM TOP OF BACKWALL.
- BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
- EPOXY COAT THE END BENT CAP AFTER ADJUSTMENTS ARE MADE TO BEARINGS AND ANCHOR BOLTS ARE GROUTED.
- FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.
- THE TOP SURFACE OF THE END BENT CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.
- THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE PARAPET AND END POST ARE CAST IF SLIP FORMING IS USED.
- THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

NOTES CONTINUED ON SHEET 2 OF 4.



DETAIL "A"

PROJECT NO. I-4411
 IREDELL COUNTY
 STATION: 46+79.71 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

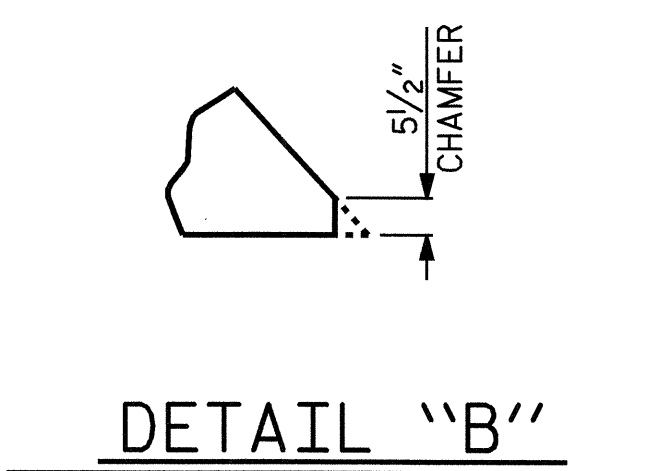
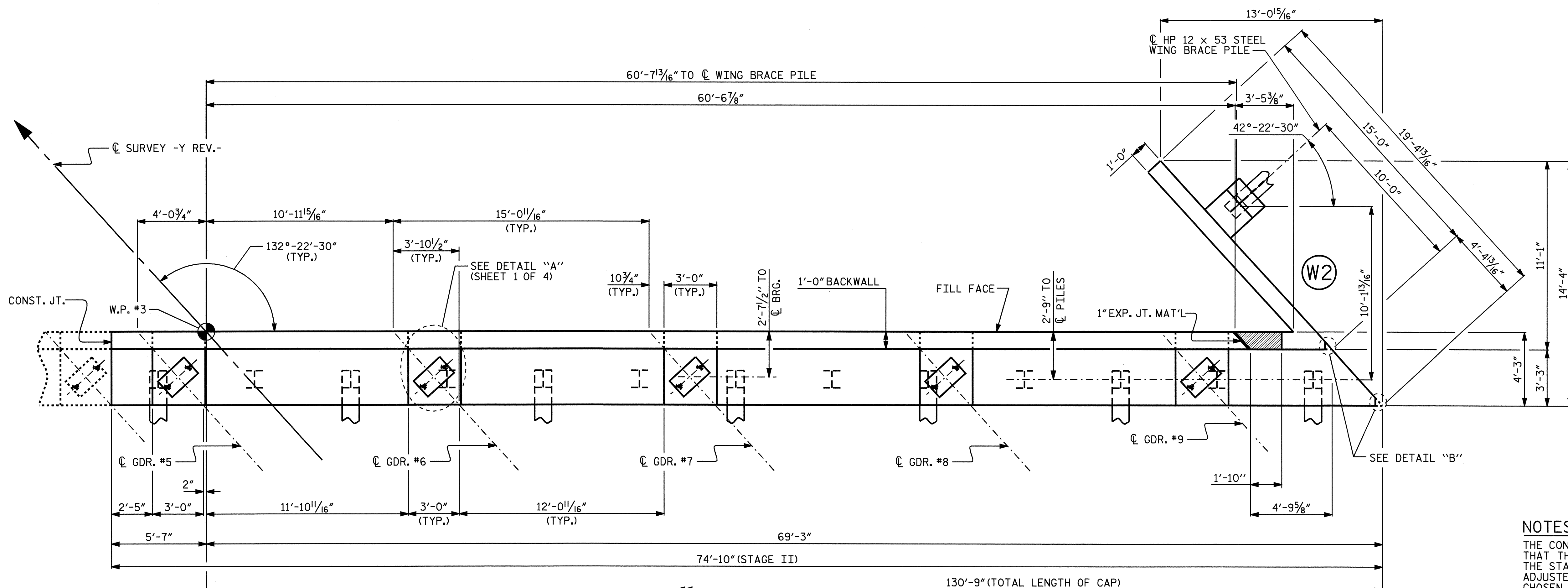
SUBSTRUCTURE
 END BENT No. 2
 (STAGE I)

| REVISIONS | | | | | | SHEET NO. | |
|-----------|-----|-------|-----|-----|-------|--------------|--|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-35 | |
| 1 | | | 3 | | | TOTAL SHEETS | |
| 2 | | | 4 | | | 42 | |



DRAWN BY: P.C. BREWER DATE: 1/21/05
 CHECKED BY: S.B. WILLIAMS DATE: 1/26/05

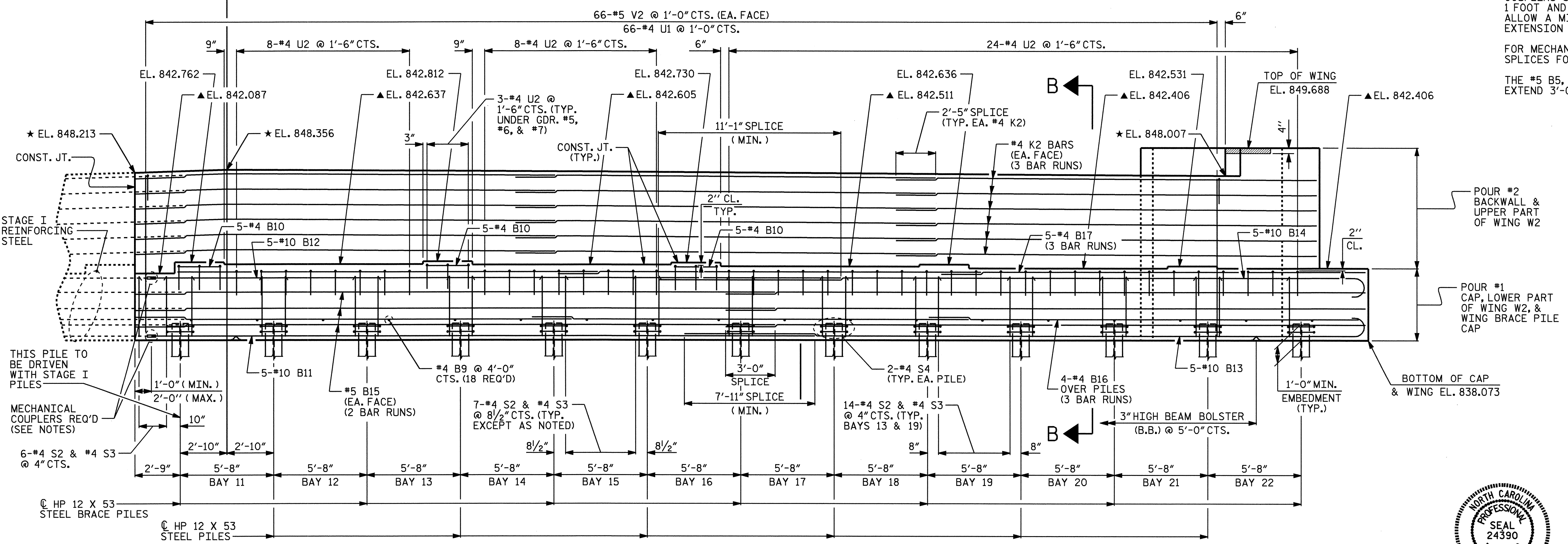
24-MAY-2005 10:14
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 tbeach



NOTES: (NOTE CONTINUED FROM SHEET 1 OF 4)
 THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LENGTHS OF THE #10 B3 AND #10 B4 BARS AT THE STAGED CONSTRUCTION JOINT MAY NEED TO BE ADJUSTED DUE TO THE TYPE OF MECHANICAL BUTT SPLICE CHOSEN BY THE CONTRACTOR. NO ADDITIONAL PAYMENT WILL BE MADE FOR ANY ADJUSTMENTS REQUIRED.

MECHANICAL COUPLERS SHALL BE USED TO JOIN THE #10 B3 AND #10 B4 BARS IN STAGE I WITH THE #10 B11 AND #10 B12 BARS IN STAGE II. THE LOCATION OF THE COUPLERS SHALL BE STAGGERED ON ALTERNATING BARS BY 1 FOOT AND THE BARS SHALL BE CUT ACCORDINGLY TO ALLOW A MINIMUM OF 1'-0" AND A MAXIMUM OF 2'-0" EXTENSION INTO STAGE II CONSTRUCTION.

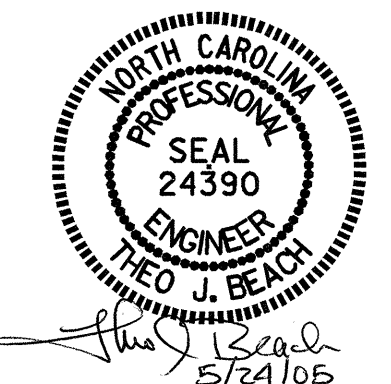
FOR MECHANICAL COUPLERS, SEE MECHANICAL BUTT SPLICES FOR REINFORCING STEEL SPECIAL PROVISIONS.
 THE #5 B5, #5 B6, #4 B7 AND #4 K1 BARS SHALL EXTEND 3'-0" PAST THE CONSTRUCTION JOINT.



ELEVATION (STAGE II)
 (FOR CLARITY, WING BRACE PILE NOT SHOWN)

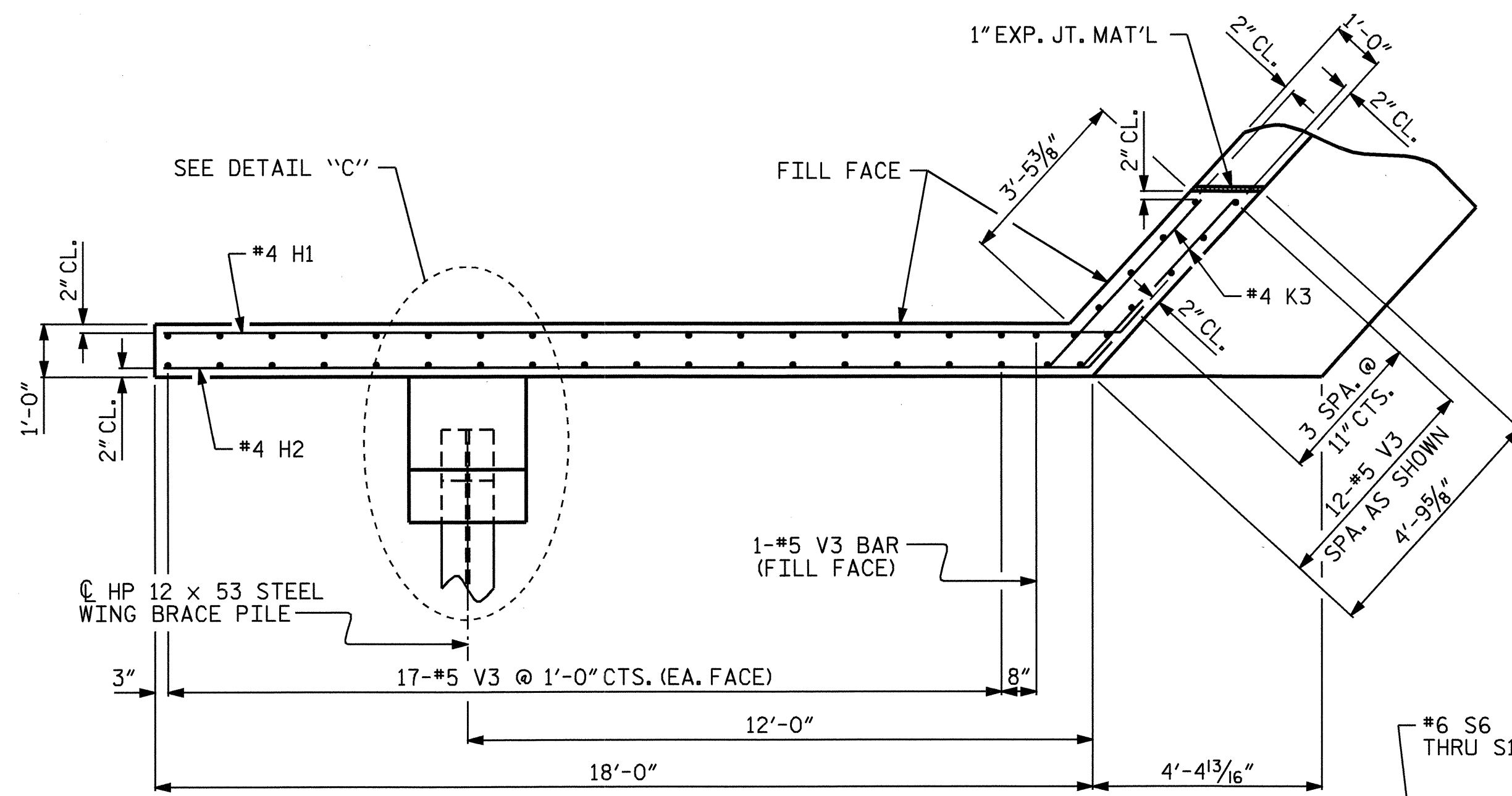
PROJECT NO. I-4411
 IREDELL COUNTY
 STATION: 46+79.71 -L-

SHEET 2 OF 4
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT No. 2
 (STAGE II)

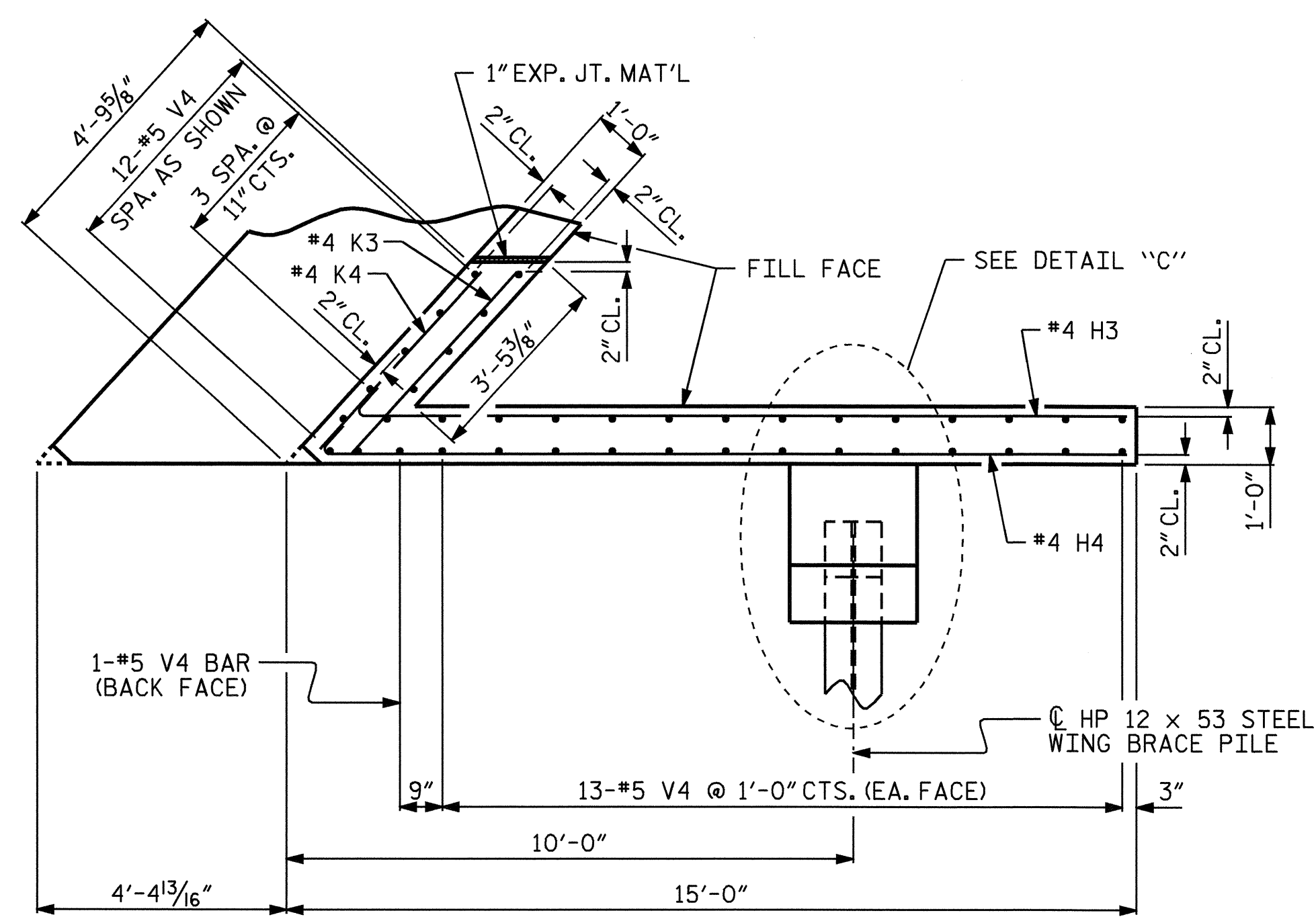


DRAWN BY: P.C. BREWER DATE: 1/21/05
 CHECKED BY: S.B. WILLIAMS DATE: 1/26/05

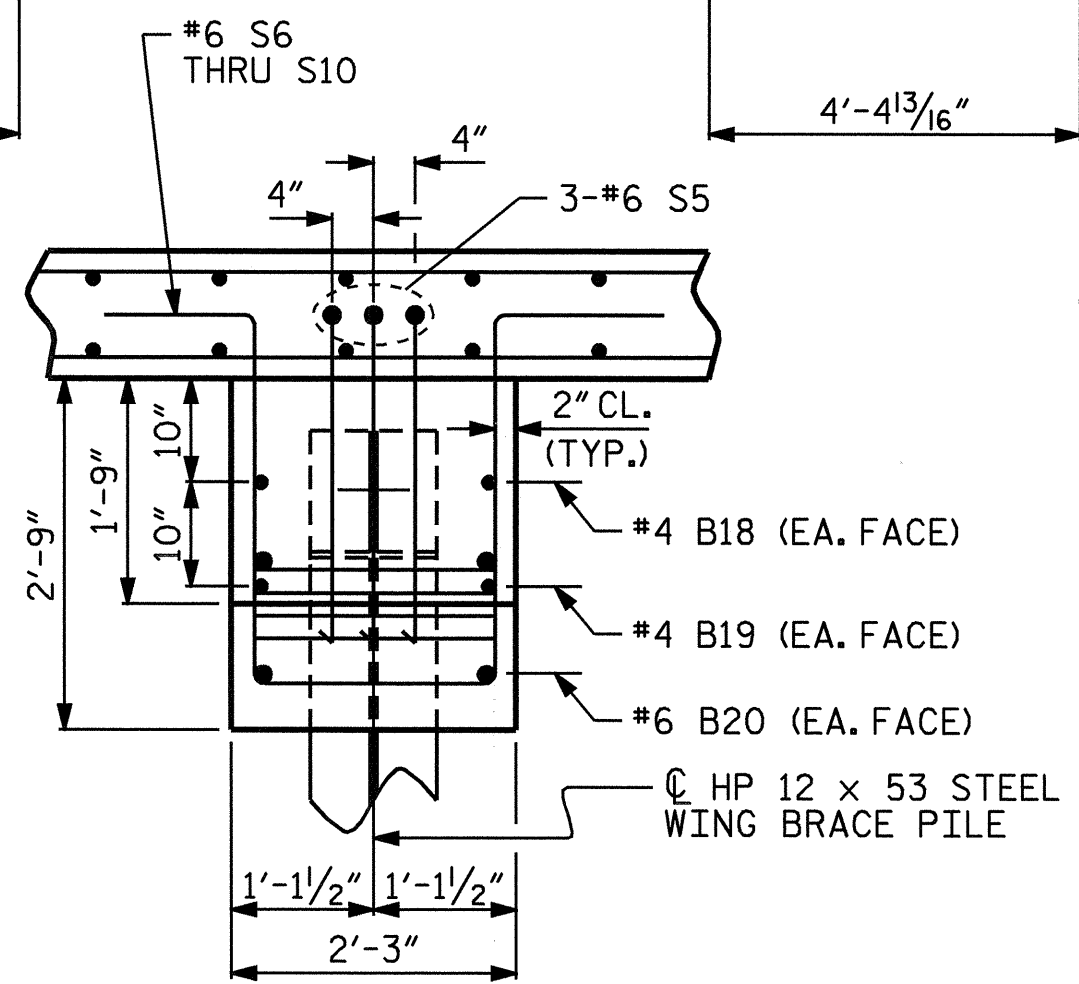
| REVISIONS | | | | | | SHEET NO. | |
|-----------|-----|-------|-----|-----|-------|--------------|--|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-36 | |
| 1 | | | 3 | | | TOTAL SHEETS | |
| 2 | | | 4 | | | 42 | |



PLAN OF WING (W1)
STAGE I

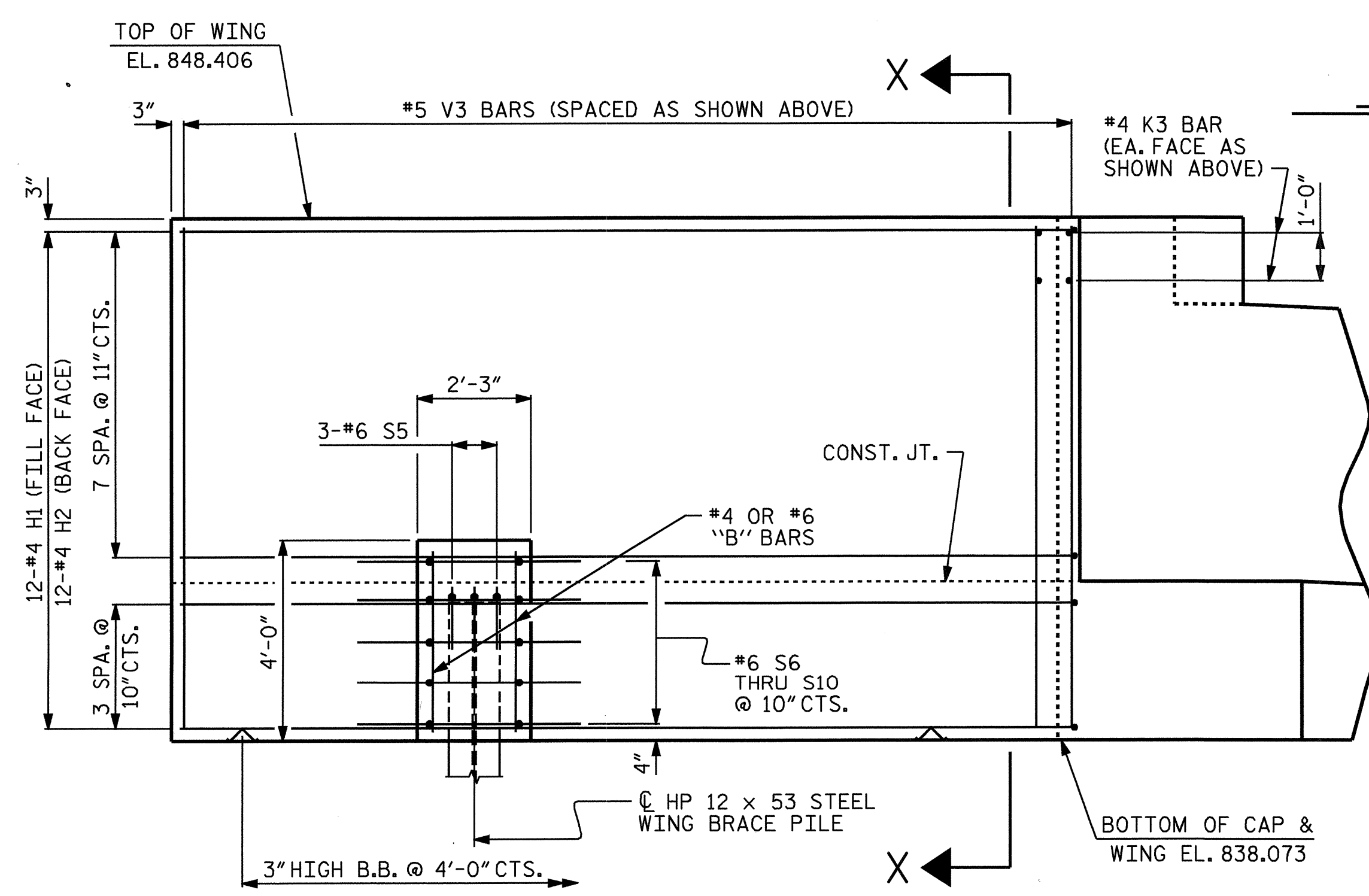


PLAN OF WING (W2)
STAGE II

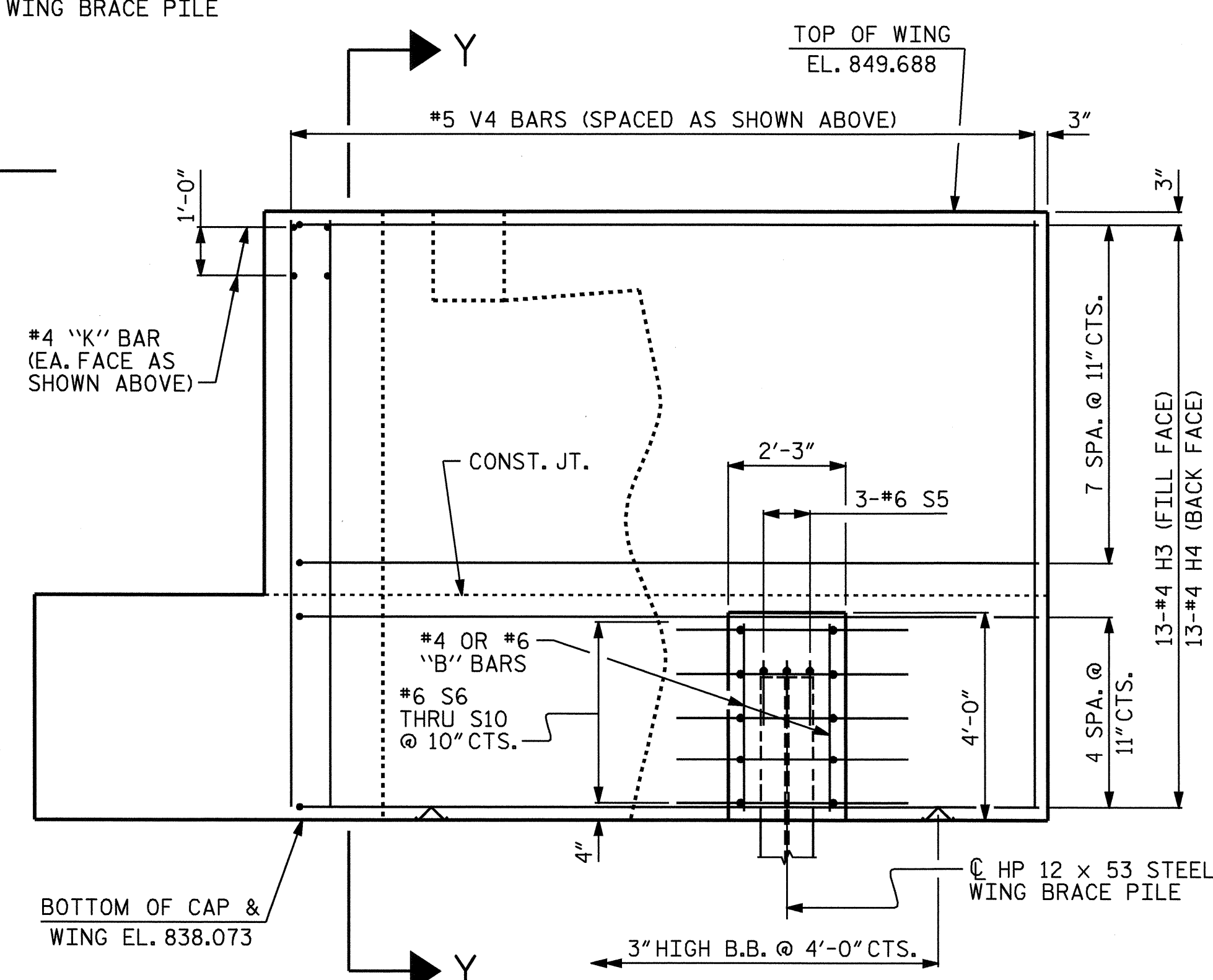


DETAIL "C"

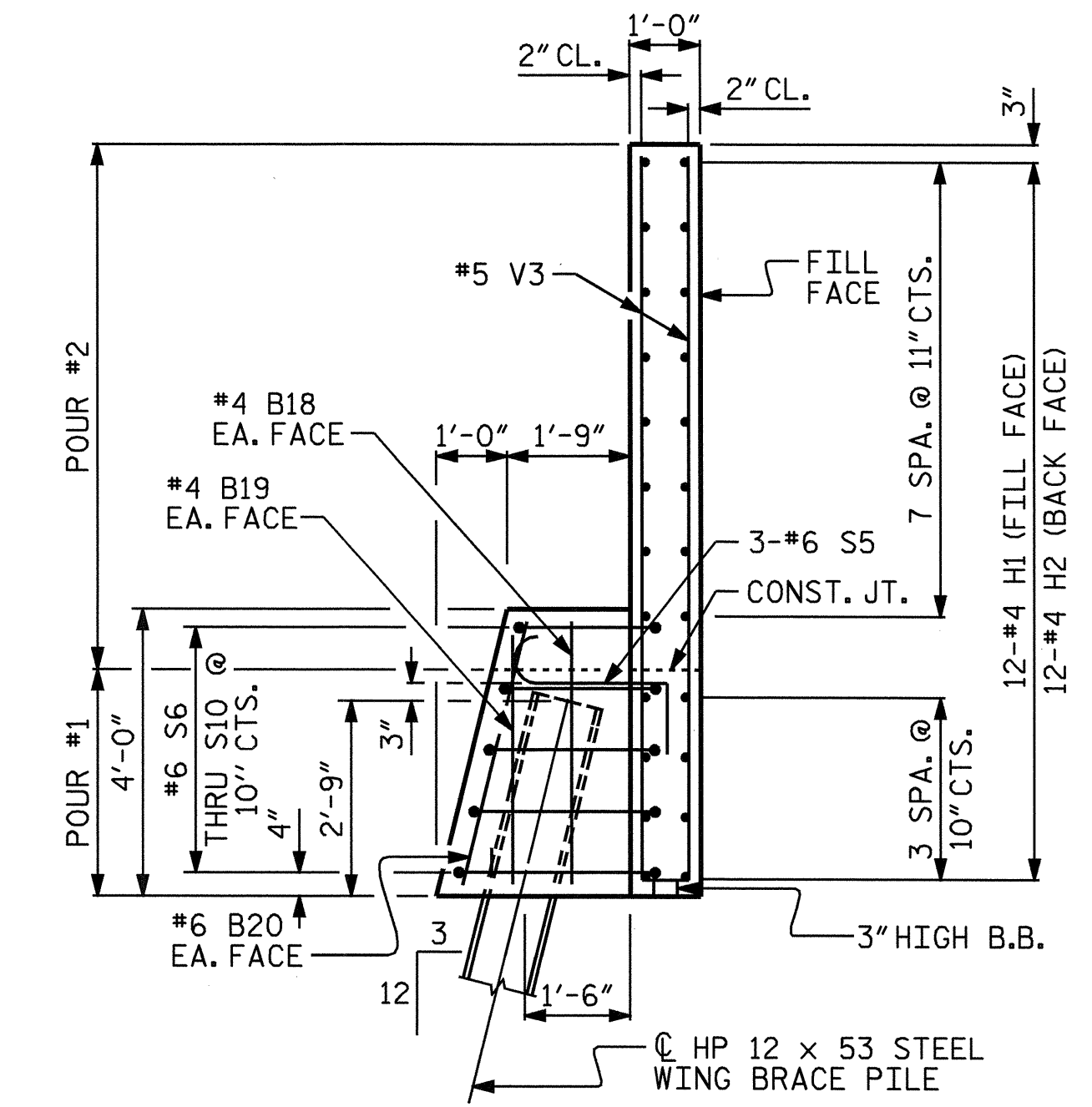
NOTE:
AT THE CONTRACTOR'S OPTION, THE CONSTRUCTION JOINT IN THE WING BRACE PILE CAP MAY BE A PERMITTED CONSTRUCTION JOINT.



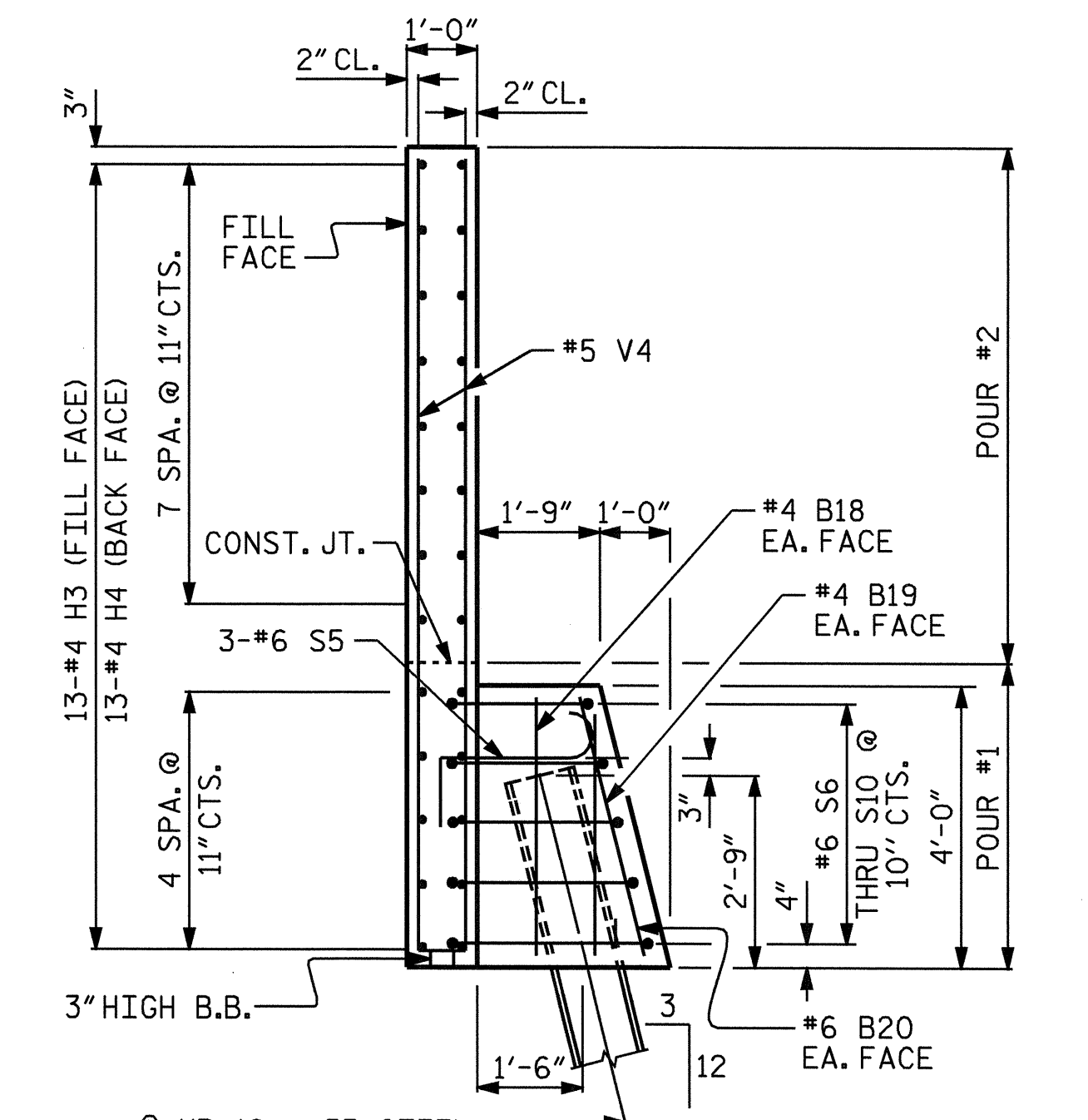
ELEVATION OF WING (W1)
STAGE I



ELEVATION OF WING (W2)
STAGE II



SECTION X-X



SECTION Y-Y

PROJECT NO. I-4411
IREDELL COUNTY
STATION: 46+79.71 -L-
SHEET 3 OF 4

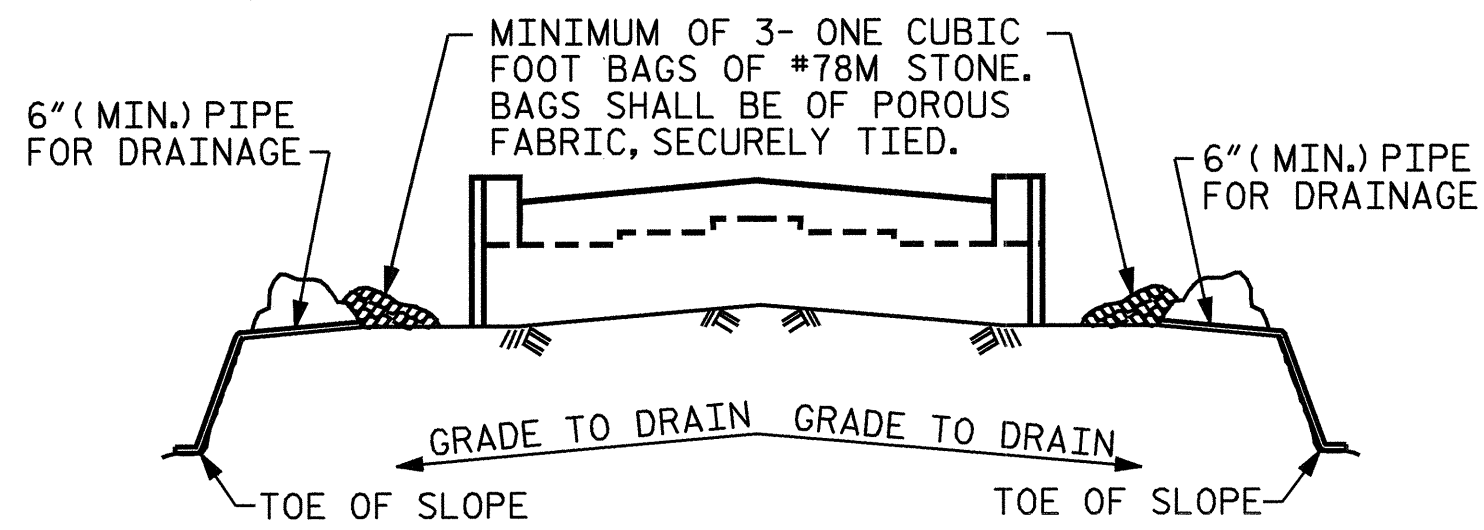
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
END BENT No. 2



| REVISIONS | | | | | | SHEET NO. | |
|-----------|-----|-------|-----|-----|-------|--------------|----|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-37 | |
| 1 | | | 3 | | | TOTAL SHEETS | 42 |
| 2 | | | 4 | | | | |

DRAWN BY: P.C. BREWER DATE: 1/21/05
CHECKED BY: S.B. WILLIAMS DATE: 1/26/05

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tbeach

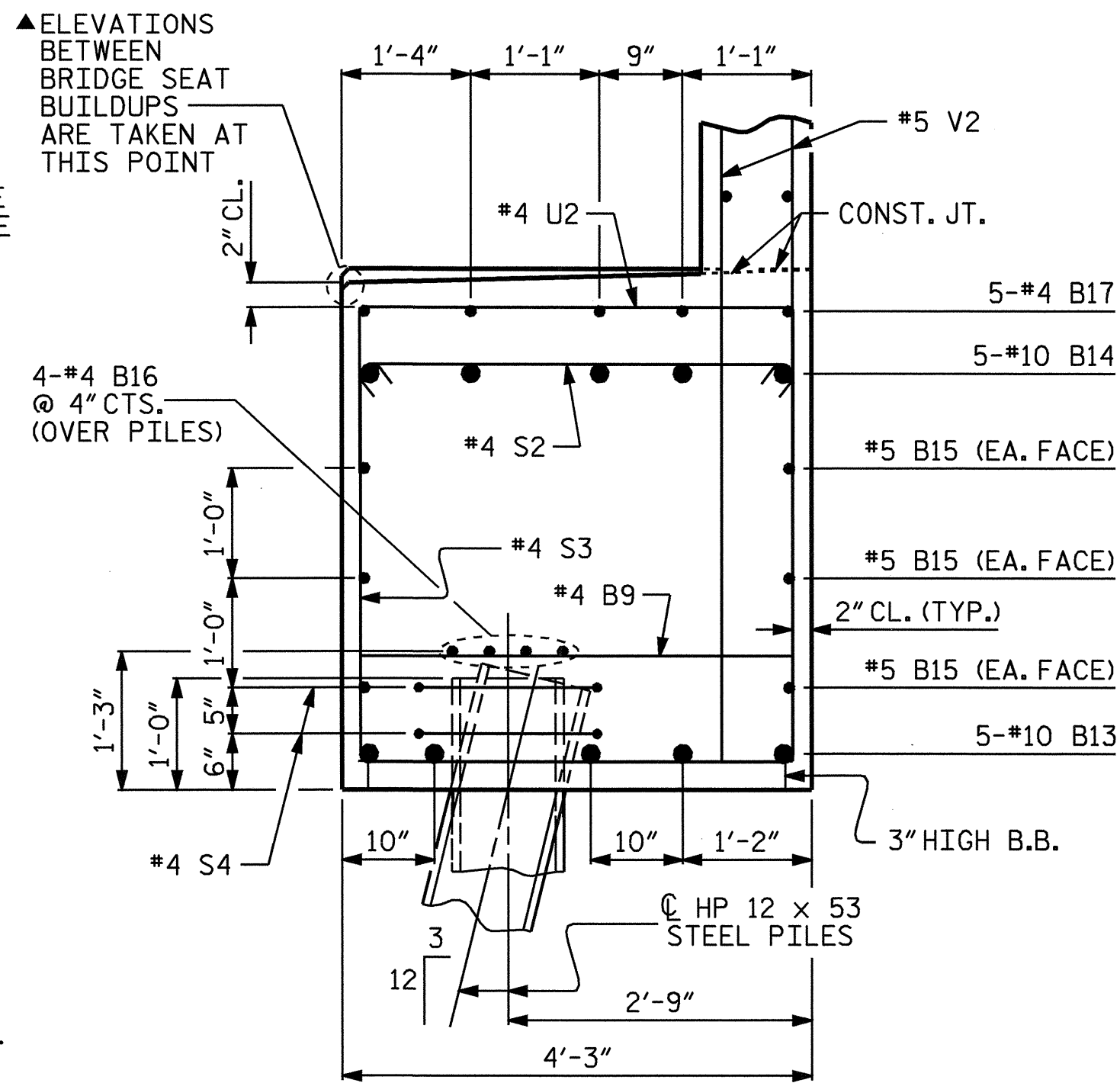


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

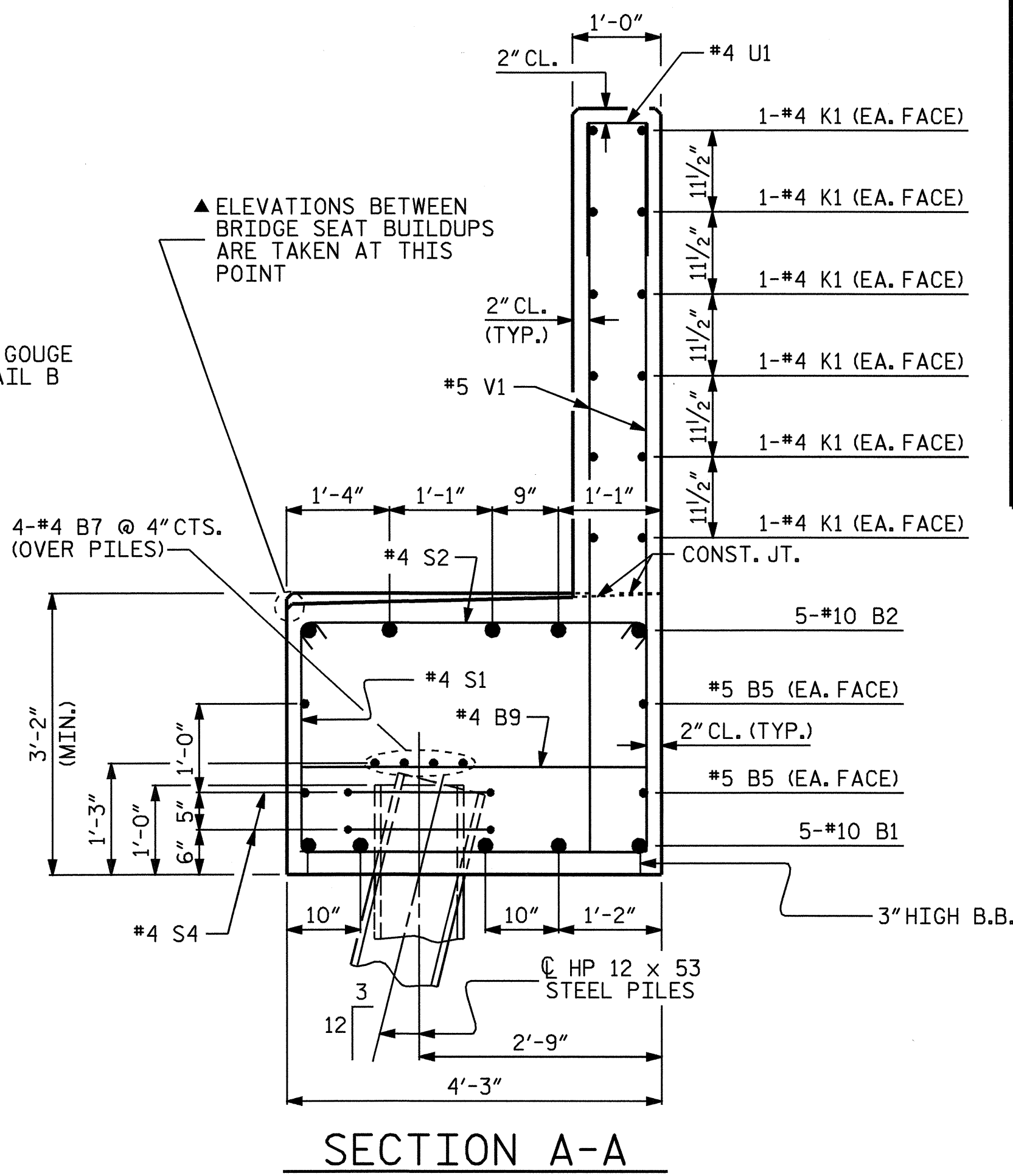
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

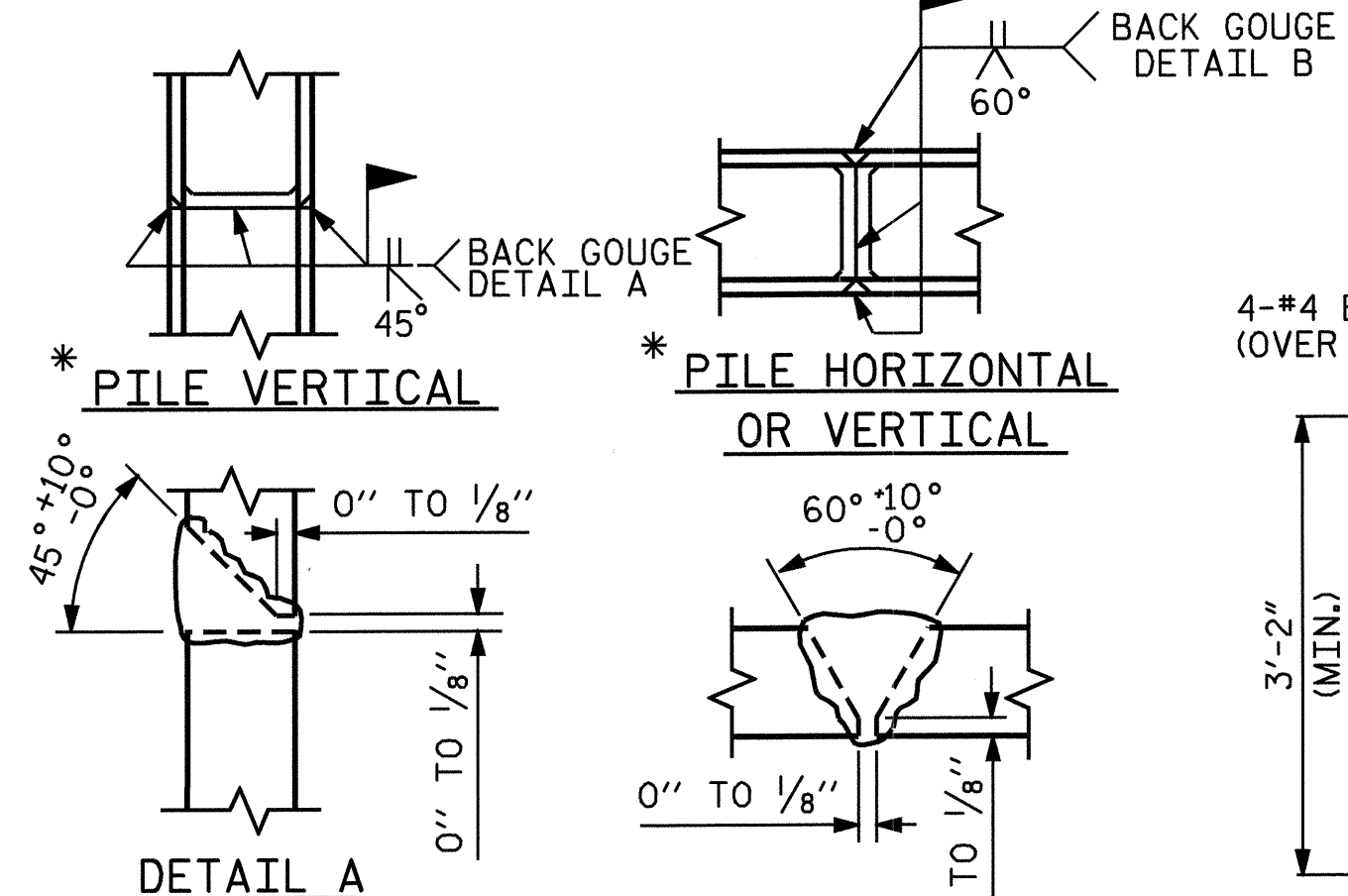
TEMPORARY DRAINAGE AT END BENT



PARTIAL SECTION B-B

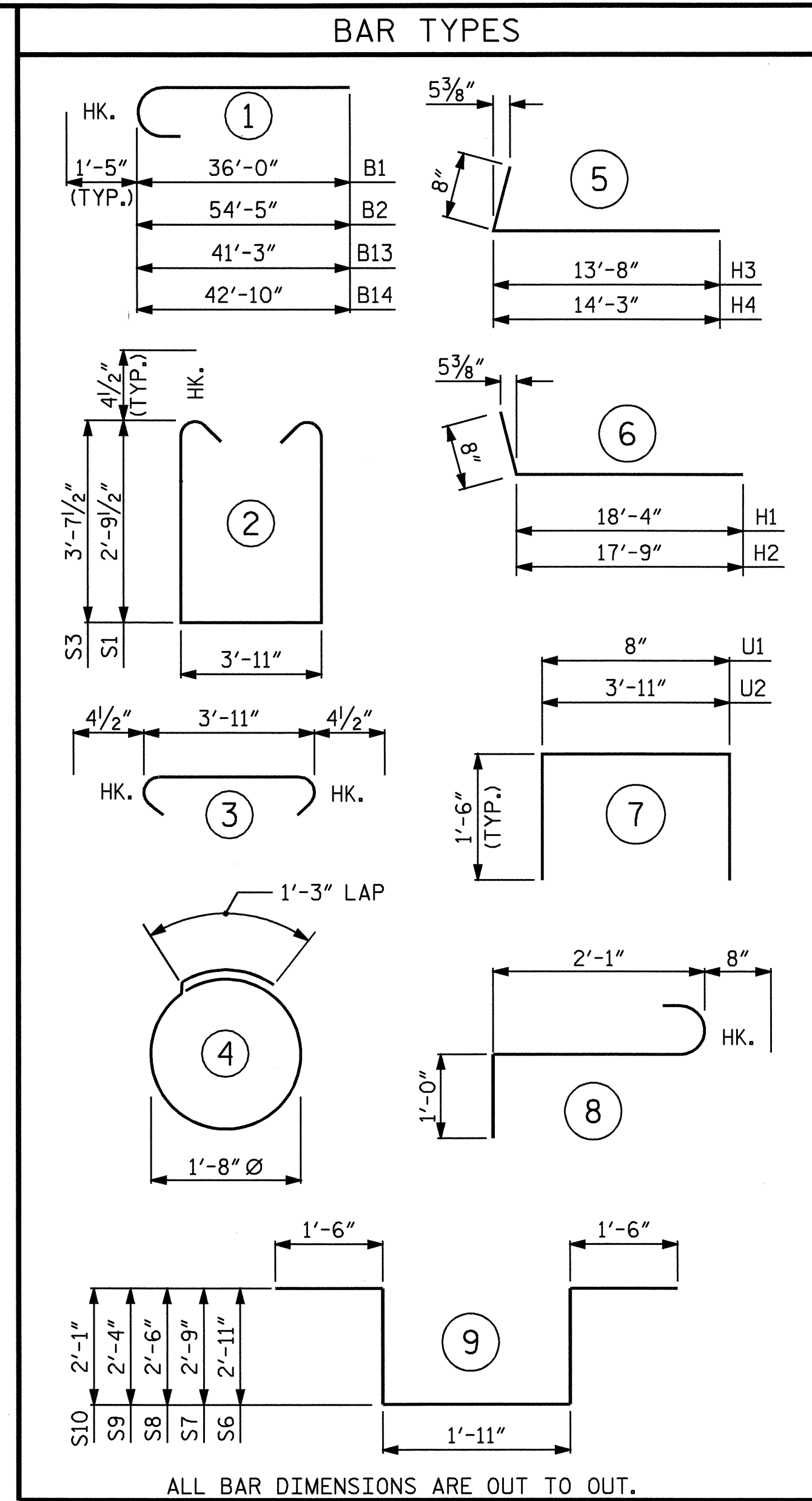


SECTION A-A



* POSITION OF PILE DURING WELDING.

PILE SPICE DETAILS



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT No. 2

| STAGE I | | | | STAGE II | | | | | | | |
|---|-----|------|------|----------|----------------------|---|-----|------|------|---------|----------------------|
| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT | BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
| B1 | 5 | 10 | 1 | 37'-5" | 805 | B9 | 18 | 4 | STR | 3'-11" | 47 |
| B2 | 5 | 10 | 1 | 55'-10" | 1201 | B10 | 15 | 4 | STR | 2'-8" | 27 |
| B3 | 5 | 10 | STR | 33'-9" | 726 | B11 | 5 | 10 | STR | 40'-3" | 866 |
| B4 | 5 | 10 | STR | 20'-4" | 437 | B12 | 5 | 10 | STR | 41'-10" | 900 |
| B5 | 8 | 5 | STR | 32'-10" | 274 | B13 | 5 | 10 | 1 | 42'-8" | 918 |
| B6 | 2 | 5 | STR | 11'-5" | 24 | B14 | 5 | 10 | 1 | 44'-3" | 952 |
| B7 | 12 | 4 | STR | 22'-6" | 180 | B15 | 12 | 5 | STR | 38'-10" | 486 |
| B8 | 5 | 4 | STR | 15'-7" | 52 | B16 | 12 | 4 | STR | 26'-6" | 212 |
| B9 | 18 | 4 | STR | 3'-11" | 47 | B17 | 15 | 4 | STR | 25'-8" | 257 |
| B10 | 5 | 4 | STR | 2'-8" | 9 | B18 | 2 | 4 | STR | 3'-8" | 5 |
| B18 | 2 | 4 | STR | 3'-8" | 5 | B19 | 2 | 4 | STR | 3'-5" | 5 |
| B19 | 2 | 4 | STR | 3'-5" | 5 | B20 | 2 | 6 | STR | 3'-9" | 11 |
| B20 | 2 | 6 | STR | 3'-9" | 11 | | | | | | |
| H1 | 12 | 4 | 6 | 19'-0" | 152 | H3 | 13 | 4 | 5 | 14'-4" | 124 |
| H2 | 12 | 4 | 6 | 18'-5" | 148 | H4 | 13 | 4 | 5 | 14'-11" | 130 |
| K1 | 36 | 4 | STR | 22'-6" | 541 | K2 | 36 | 4 | STR | 25'-6" | 613 |
| K3 | 4 | 4 | STR | 4'-4" | 12 | K3 | 2 | 4 | STR | 4'-4" | 6 |
| | | | | | | K4 | 2 | 4 | STR | 4'-1" | 5 |
| S1 | 49 | 4 | 2 | 10'-3" | 336 | S2 | 104 | 4 | 3 | 4'-8" | 324 |
| S2 | 71 | 4 | 3 | 4'-8" | 221 | S3 | 104 | 4 | 2 | 11'-11" | 828 |
| S3 | 22 | 4 | 2 | 11'-11" | 175 | S4 | 26 | 4 | 4 | 6'-6" | 113 |
| S4 | 20 | 4 | 4 | 6'-6" | 87 | S5 | 3 | 6 | 8 | 3'-9" | 17 |
| S5 | 3 | 6 | 8 | 3'-9" | 17 | S6 | 1 | 6 | 9 | 10'-9" | 16 |
| S6 | 1 | 6 | 9 | 10'-9" | 16 | S7 | 1 | 6 | 9 | 10'-5" | 16 |
| S7 | 1 | 6 | 9 | 10'-5" | 16 | S8 | 1 | 6 | 9 | 9'-11" | 15 |
| S8 | 1 | 6 | 9 | 9'-11" | 15 | S9 | 1 | 6 | 9 | 9'-7" | 14 |
| S9 | 1 | 6 | 9 | 9'-7" | 14 | S10 | 1 | 6 | 9 | 9'-1" | 14 |
| S10 | 1 | 6 | 9 | 9'-1" | 14 | | | | | | |
| | | | | | | U1 | 66 | 4 | 7 | 3'-8" | 162 |
| | | | | | | U2 | 49 | 4 | 7 | 6'-11" | 226 |
| | | | | | | | | | | | |
| | | | | | | V2 | 132 | 5 | STR | 9'-6" | 1308 |
| | | | | | | V4 | 39 | 5 | STR | 11'-2" | 454 |
| | | | | | | | | | | | |
| REINFORCING STEEL | | | | | 7,163 LBS | REINFORCING STEEL | | | | | 9,071 LBS |
| CLASS A CONCRETE BREAKDOWN: | | | | | | CLASS A CONCRETE BREAKDOWN: | | | | | |
| POUR #1 (CAP & LOWER PART OF WING & WING BRACE PILE CAP) | | | | | 35.7 CU. YDS. | POUR #1 (CAP & LOWER PART OF WING & WING BRACE PILE CAP) | | | | | 54.6 CU. YDS. |
| POUR #2 (BACKWALL & UPPER PART OF WING) | | | | | 17.6 CU. YDS. | POUR #2 (BACKWALL & UPPER PART OF WING) | | | | | 18.9 CU. YDS. |
| TOTAL: | | | | | 53.3 CU. YDS. | TOTAL: | | | | | 73.5 CU. YDS. |
| HP 12 X 53 STEEL PILES | | | | | | HP 12 X 53 STEEL PILES | | | | | |
| No. 12 | | | | | 660.0 LIN. FT. | No. 13 | | | | | 715.0 LIN. FT. |

TOTAL QUANTITIES (END BENT No. 2)

| ITEM | STAGE I | STAGE II | TOTAL |
|------------------------|--------------------------|--------------------------|---------------------------|
| REINFORCING STEEL | 7,163 LBS. | 9,071 LBS. | 16,234 LBS. |
| CLASS A CONCRETE | 53.3 CU. YDS. | 73.5 CU. YDS. | 126.8 CU. YDS. |
| HP 12 x 53 STEEL PILES | No. 12 LIN. FT. 660.0 | No. 13 LIN. FT. 715.0 | No. 25 LIN. FT. 1375.0 |

PROJECT NO. I-4411
IREDELL COUNTY
 STATION: 46+79.71 -L-

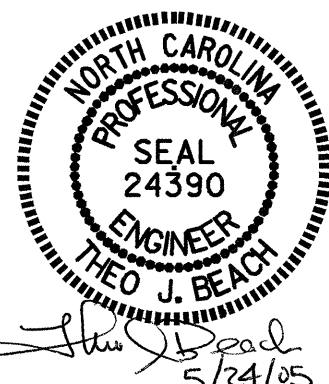
SHEET 4 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
END BENT No. 2

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

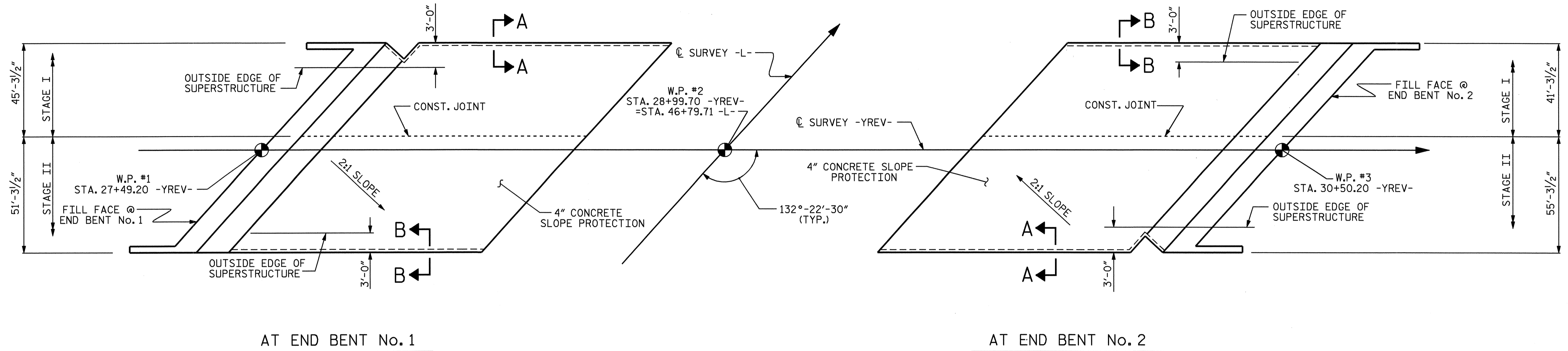
SHEET NO. S-38
 TOTAL SHEETS 42



GENERAL NOTES

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

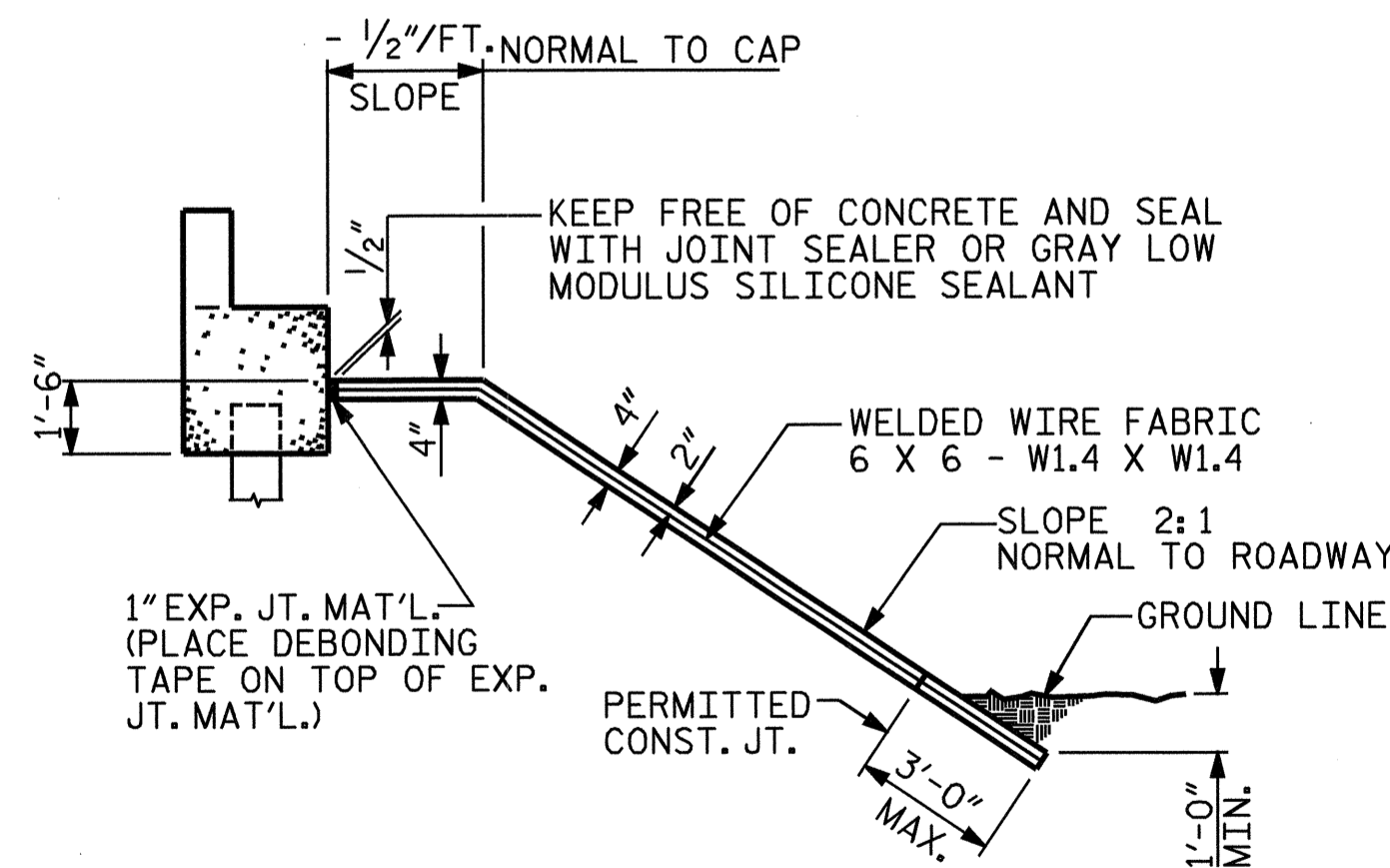
SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL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



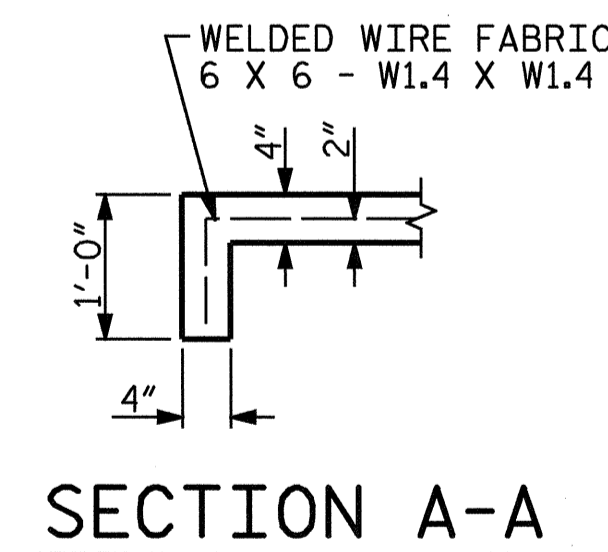
PLAN
(SEE GENERAL DRAWING FOR BERM WIDTHS AND ELEVATIONS)

| BRIDGE @ STATION 46+79.71-L- | 4 INCH SLOPE PROTECTION (SQUARE YARDS) | | | * WELDED WIRE FABRIC 60 INCHES WIDE (APPROX. L.F.) | | |
|---------------------------------|--|----------|-------|--|----------|-------|
| | STAGE I | STAGE II | TOTAL | STAGE I | STAGE II | TOTAL |
| END BENT 1 | 275 | 310 | 585 | 495 | 558 | 1053 |
| END BENT 2 | 260 | 350 | 610 | 468 | 630 | 1098 |

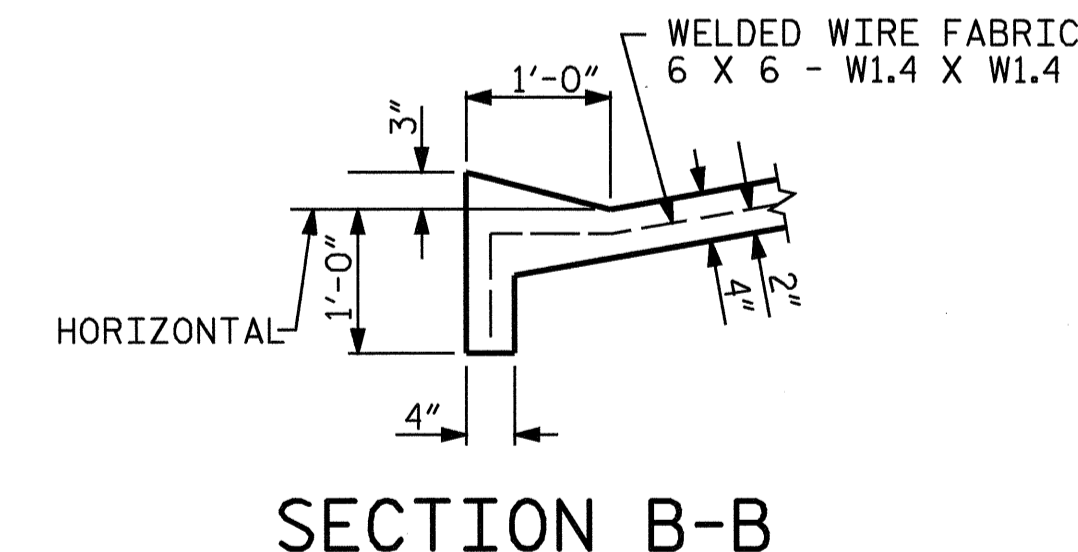
* QUANTITY SHOWN IS BASED ON 5' POURS.



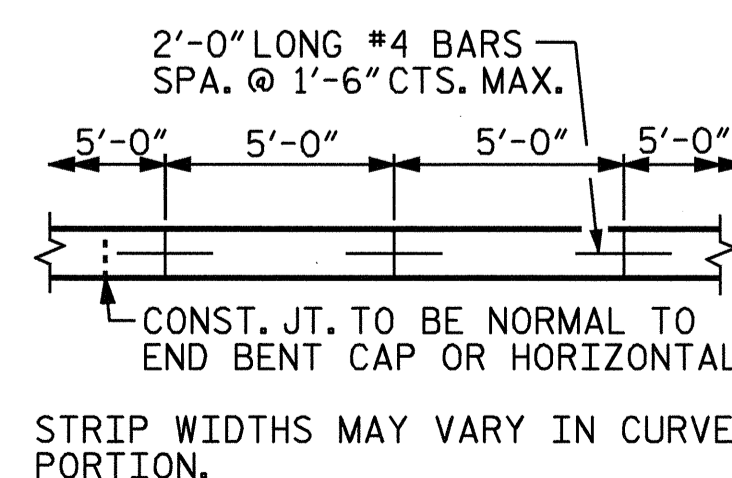
SECTION ALONG Q ROADWAY WHEN DITCH IS NOT PROVIDED



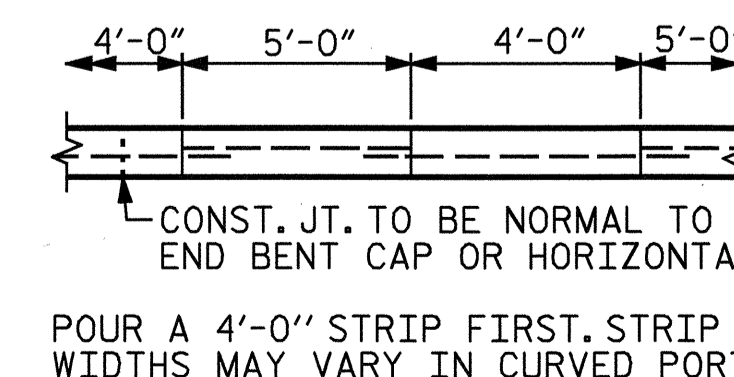
SECTION A-A



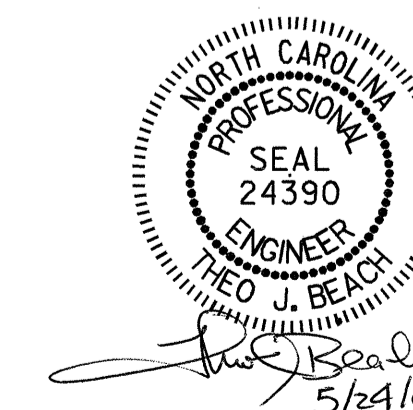
SECTION B-B



POURING DETAIL



OPTIONAL POURING DETAIL

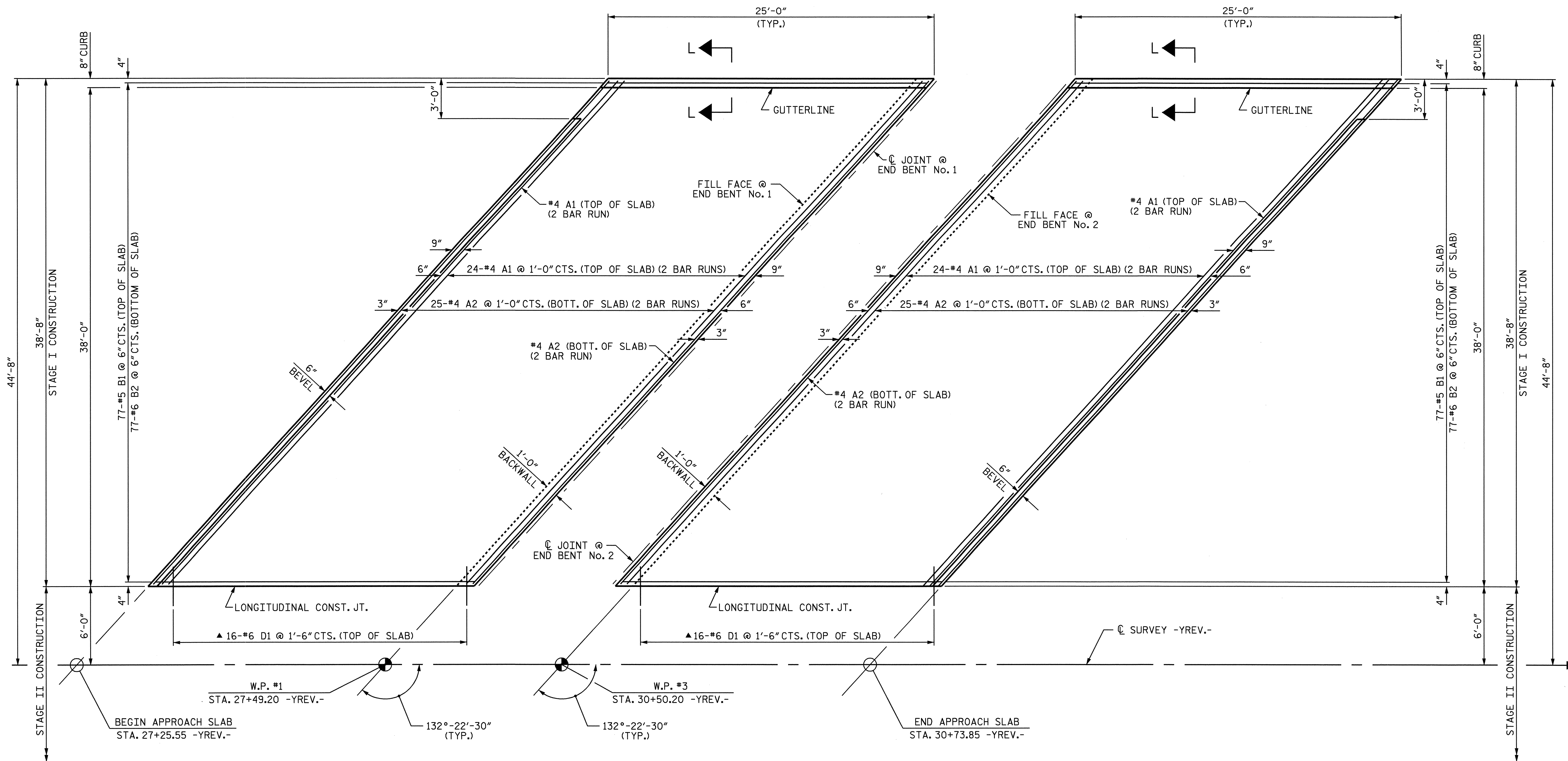


PROJECT NO. I-4411
IREDELL COUNTY
STATION: 46+79.71-L-

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

| |
|--------------------|
| SHEET NO. S-39 |
| TOTAL SHEETS 42 |

ASSEMBLED BY : S.B. WILLIAMS DATE : 11-04
CHECKED BY : T.J. BEACH DATE : 2-05
DRAWN BY : ELR 5/92 REV. 10/17/00 LES/RDR
CHECKED BY : GRP 6/92 REV. 7/10/01 LES/RDR
REV. 5/7/03 RWW/JTE



END BENT No. 1

END BENT No. 2

PLAN OF APPROACH SLABS

(STAGE I)

FOR SECTION L-L, SEE SHEET 3 OF 3

▲ THE #6 D1 BARS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE #4 A1 BARS, AND SHALL PROJECT 1'-6" INTO STAGE II CONSTRUCTION.

| BILL OF MATERIAL (STAGE I) | | | | | | |
|----------------------------------|-----|------|------|---------|--------|------|
| FOR ONE APPROACH SLAB (2 REQ'D) | | | | | | |
| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT | |
| *A1 | 50 | #4 | STR | 27'-0" | 902 | |
| A2 | 52 | #4 | STR | 26'-10" | 932 | |
| *B1 | 77 | #5 | STR | 23'-4" | 1874 | |
| B2 | 77 | #6 | STR | 24'-6" | 2834 | |
| *D1 | 16 | #6 | STR | 3'-0" | 72 | |
| REINFORCING STEEL | | | | | LBS. | 3766 |
| * EPOXY COATED REINFORCING STEEL | | | | | LBS. | 2848 |
| CLASS AA CONCRETE | | | | | C. Y. | 36.5 |

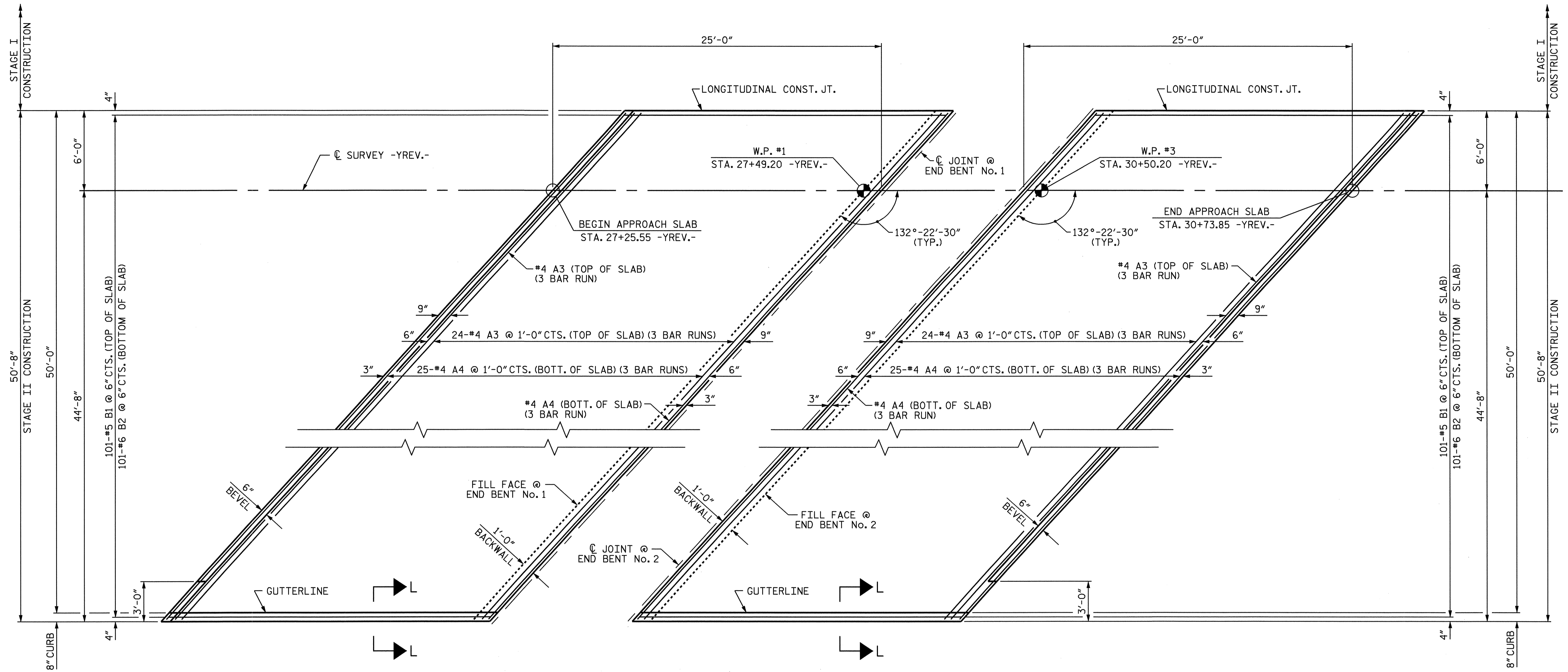
PROJECT NO. I-4411
IREDELL COUNTY
 STATION: 46+79.71 -L-

SHEET 1 OF 3
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
BRIDGE APPROACH SLAB
STAGE I



| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-40 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 42 |

DRAWN BY : B.N. GRADY DATE : 6/05
 CHECKED BY : T.J. BEACH DATE : 11/05



END BENT No. 1

END BENT No. 2

PLAN OF APPROACH SLABS

(STAGE II)

FOR SECTION L-L, SEE SHEET 3 OF 3

| BILL OF MATERIAL (STAGE II) | | | | | |
|----------------------------------|-----|------|------|---------|--------|
| FOR ONE APPROACH SLAB (2 REQ'D) | | | | | |
| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
| *A3 | 75 | #4 | STR | 24'-1" | 1207 |
| A4 | 78 | #4 | STR | 23'-11" | 1246 |
| *B1 | 101 | #5 | STR | 23'-4" | 2458 |
| B2 | 101 | #6 | STR | 24'-6" | 3717 |
| REINFORCING STEEL | | | | LBS. | 4963 |
| * EPOXY COATED REINFORCING STEEL | | | | LBS. | 3665 |
| CLASS AA CONCRETE | | | | C. Y. | 47.8 |

PROJECT NO. I-4411
IREDELL COUNTY
 STATION: 46+79.71 -L-

SHEET 2 OF 3

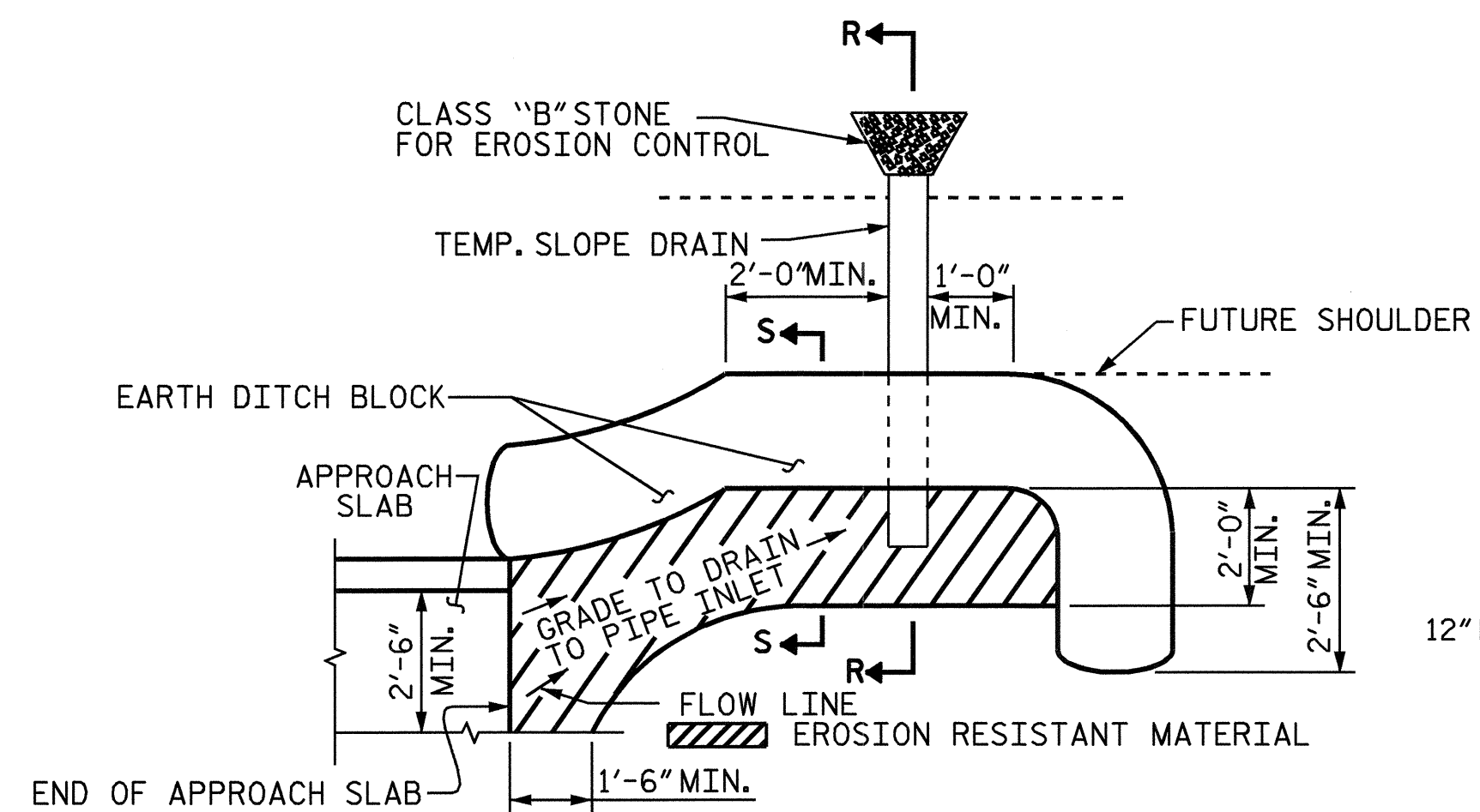
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
BRIDGE APPROACH SLAB
STAGE II



| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|-----------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-41 |
| 1 | | | 3 | | | TOTAL SHEETS 42 |
| 2 | | | 4 | | | |

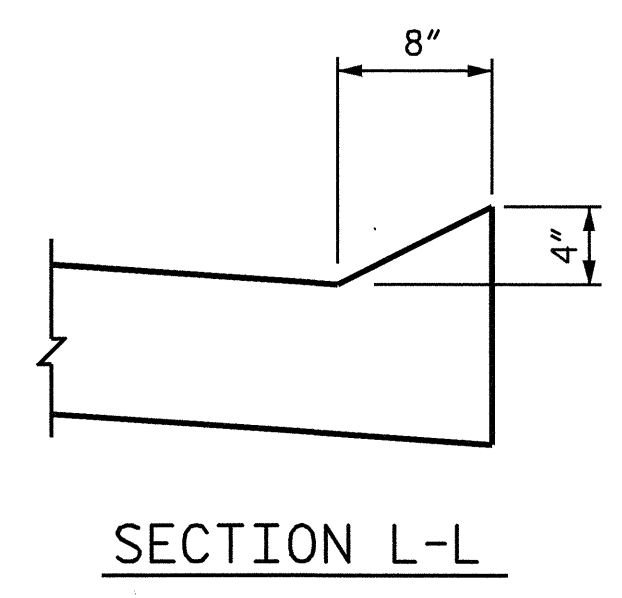
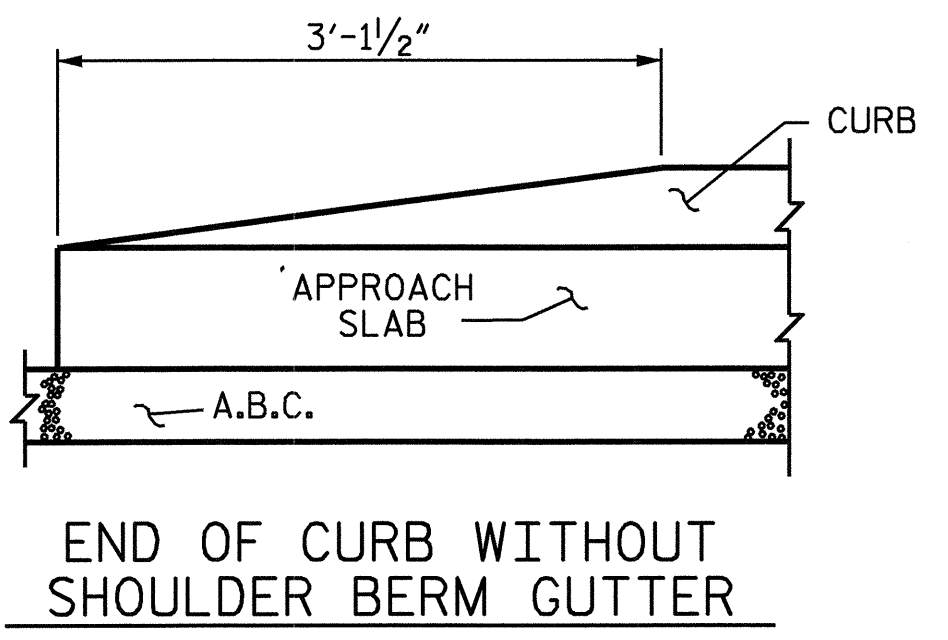
DRAWN BY : B.N. GRADY DATE : 6/05
 CHECKED BY : T.J. BEACH DATE : 11/05

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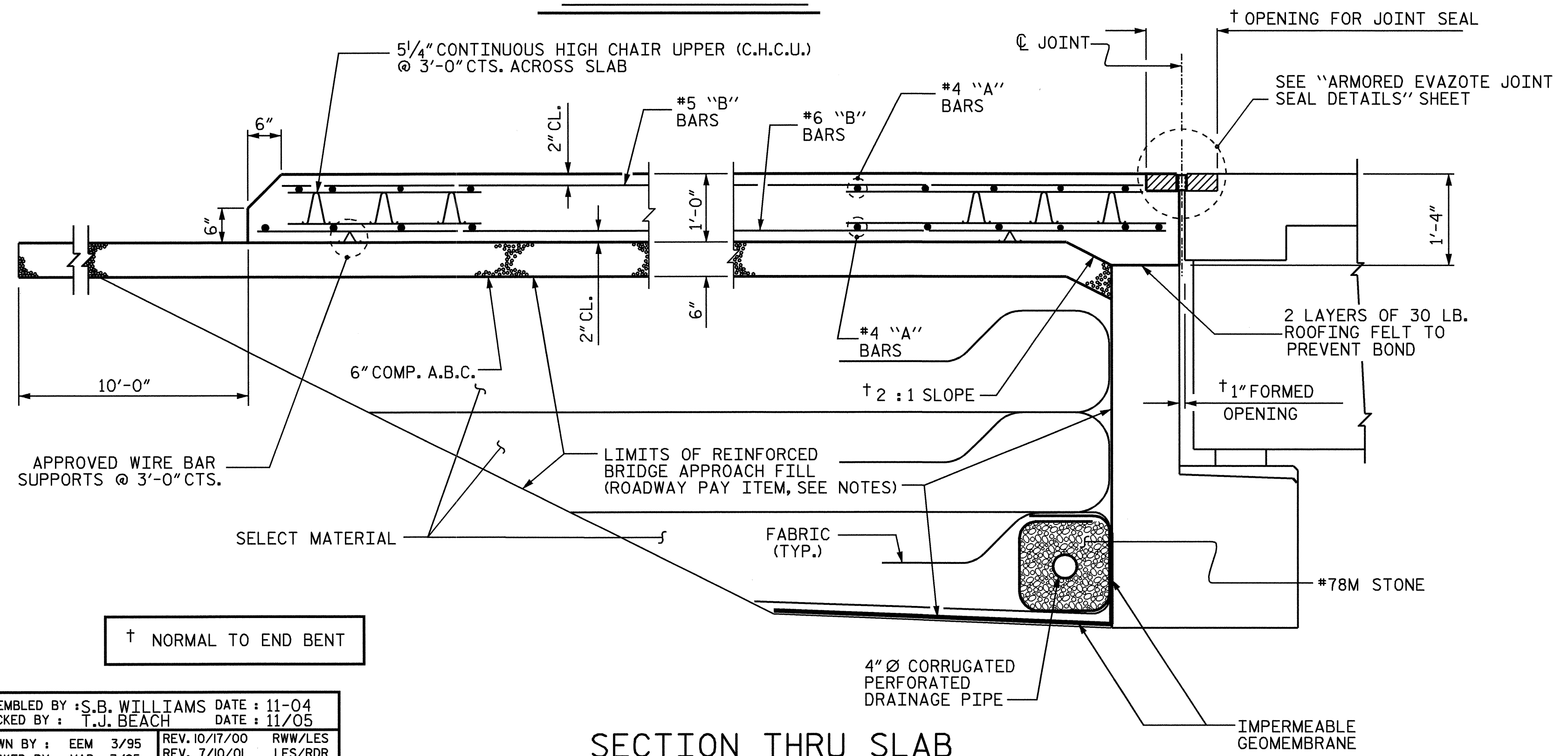


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 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.

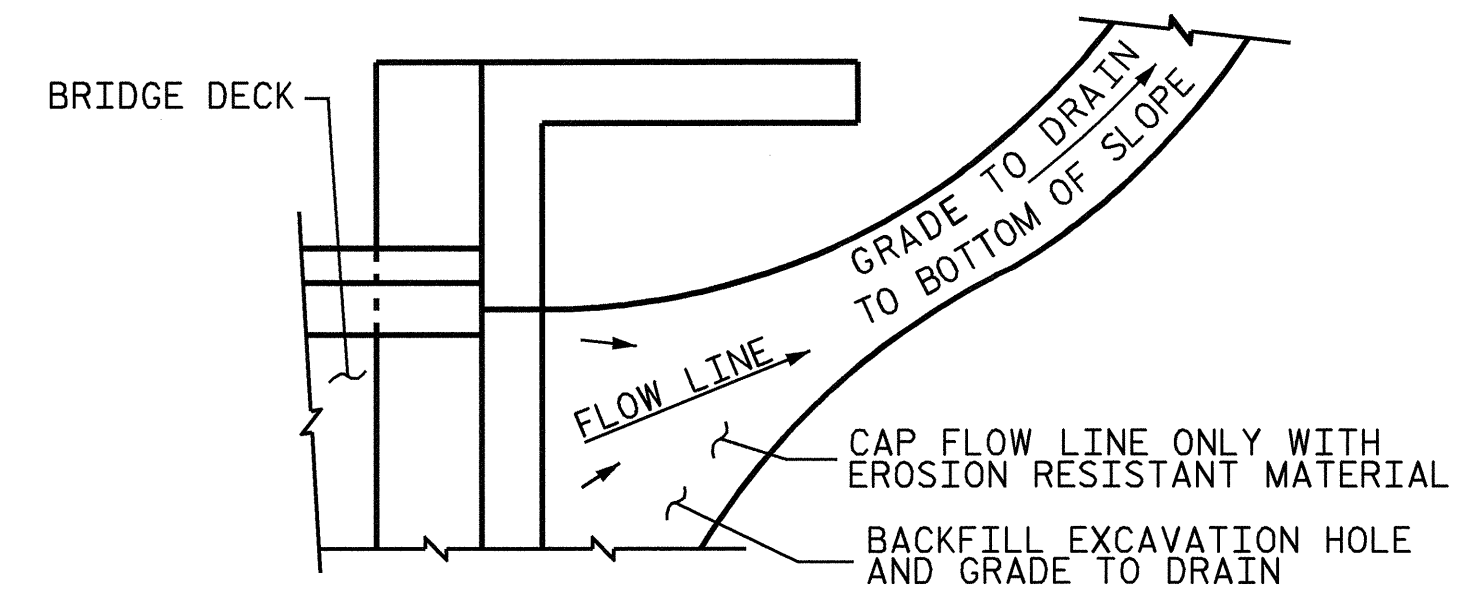
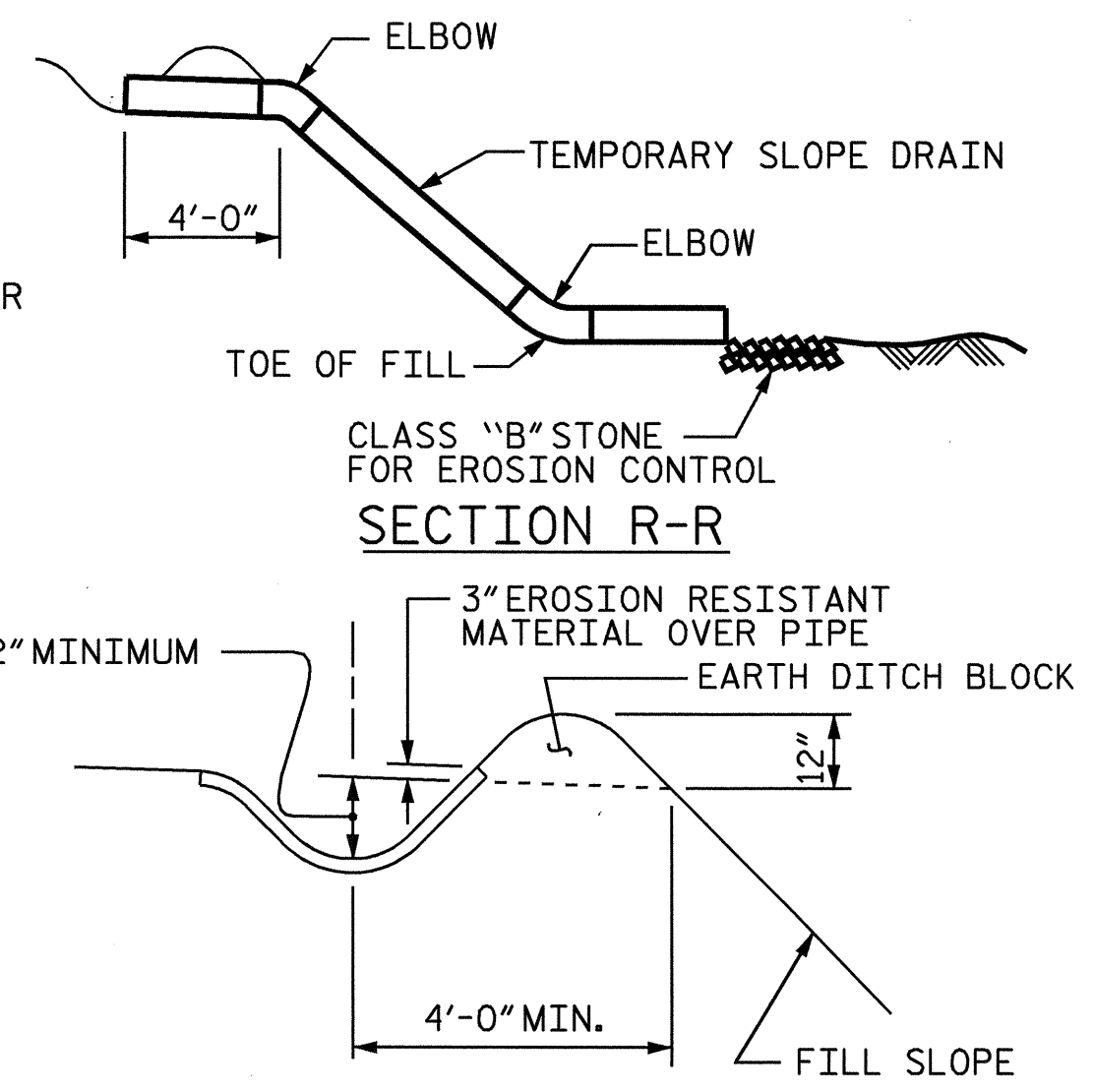
PLAN VIEW
 SECTION S-S
 TEMPORARY BERM AND SLOPE DRAIN DETAILS
 (TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



CURB DETAILS

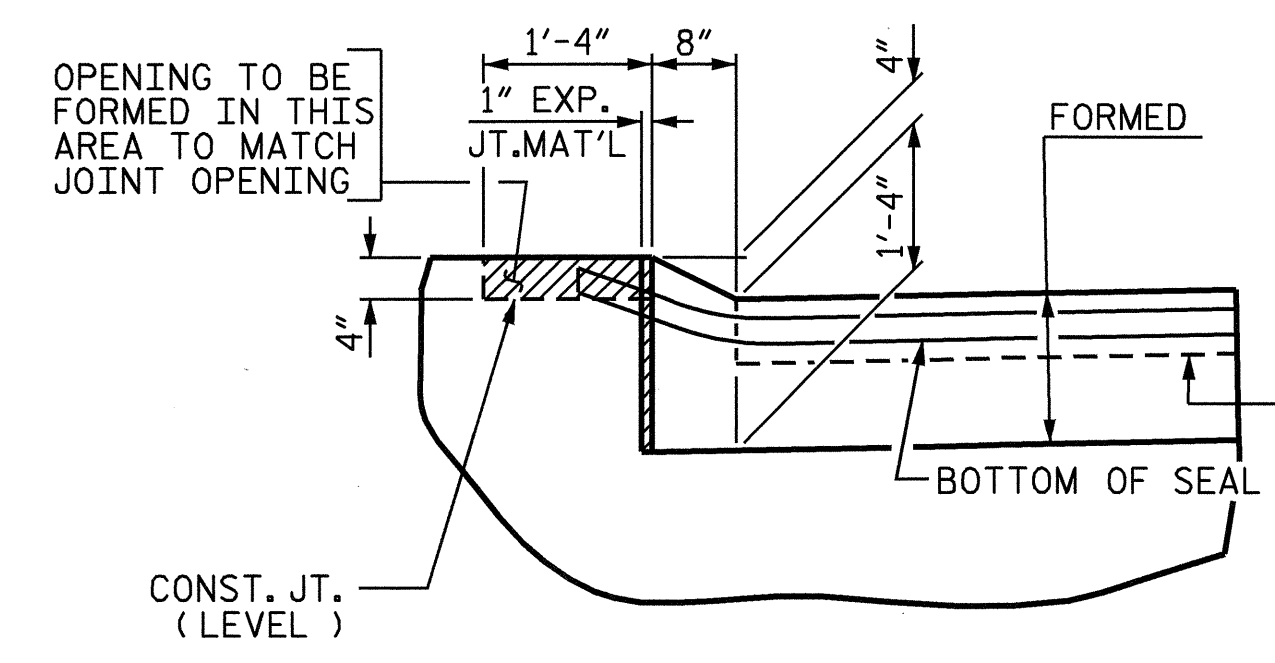


SECTION THRU SLAB

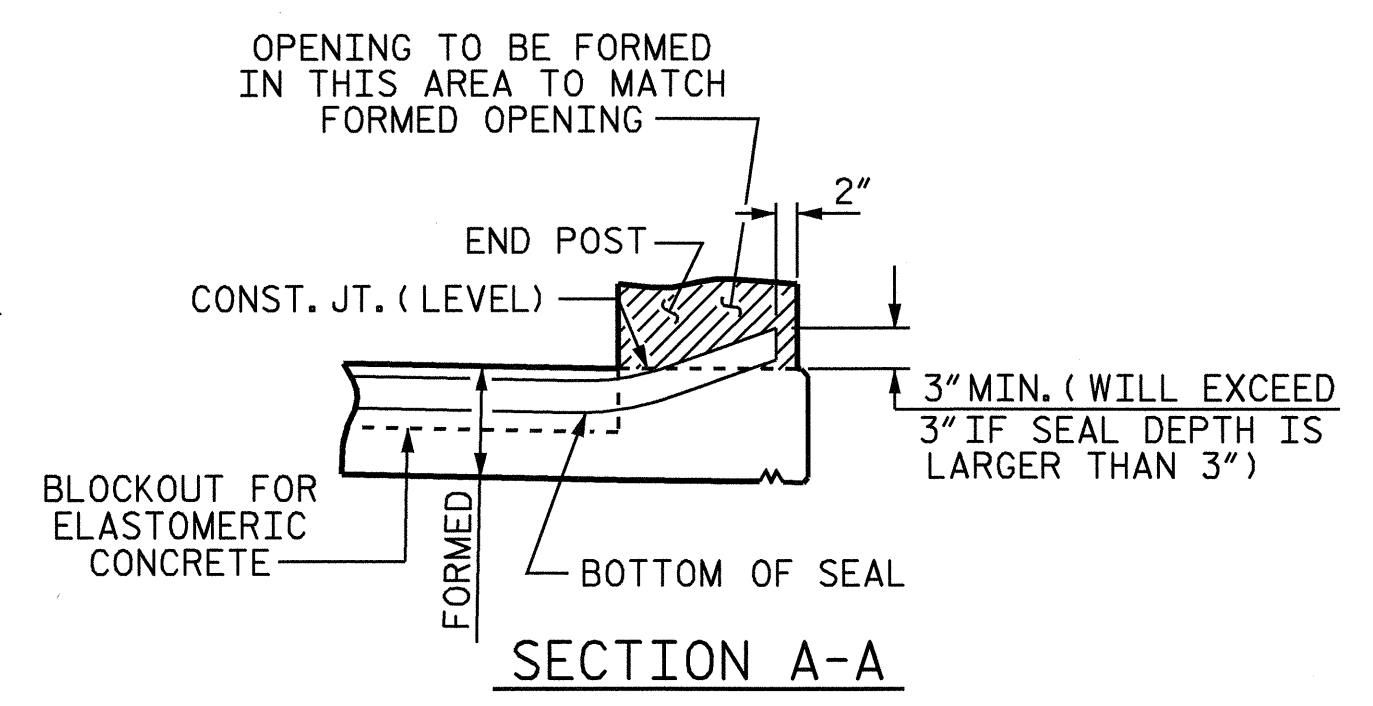


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

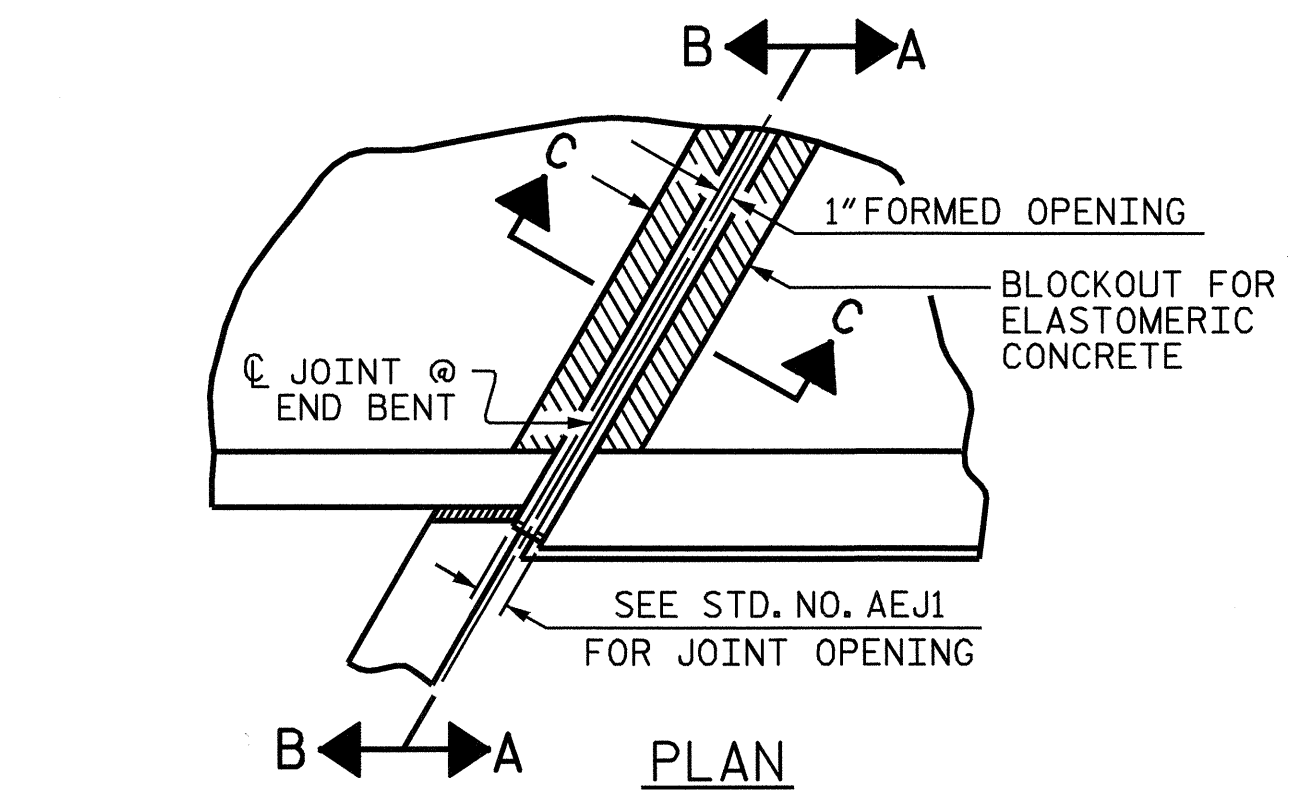
TEMPORARY DRAINAGE DETAIL



SECTION B-B



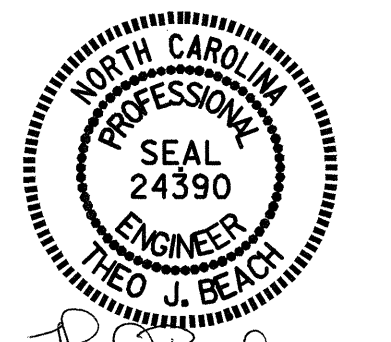
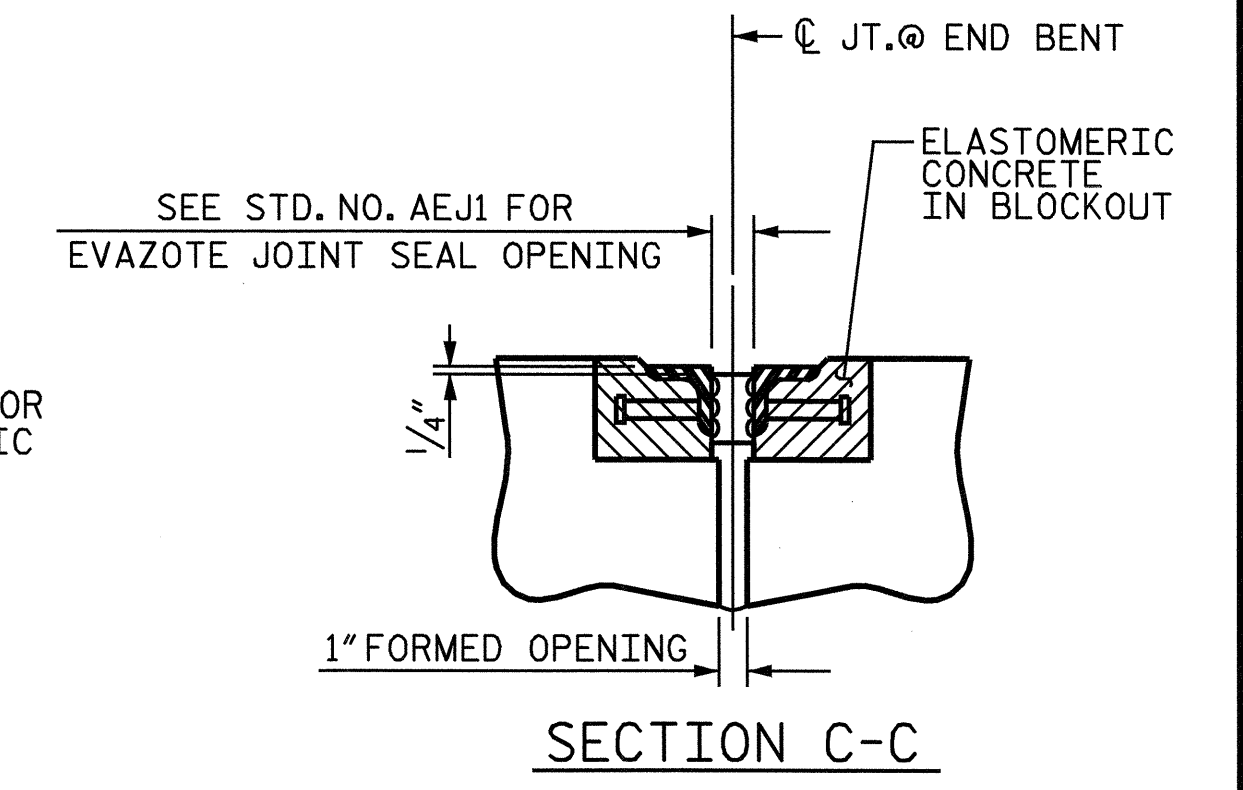
SECTION A-A



JOINT SEAL DETAILS @ END BENT
 (ARMORED EVAZOTE JOINT SEAL)

NOTES

APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.
 FOR REINFORCED BRIDGE APPROACH FILL INCLUDING FABRIC, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, AND SELECT MATERIAL, SEE ROADWAY PLANS.
 TEMPORARY DRAINAGE AND TEMPORARY BERM AND SLOPE DRAINS WILL BE PAID FOR UNDER THE LUMP SUM PRICE FOR BRIDGE APPROACH SLAB.
 AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.
 THE 6" COMP. A.B.C. SHALL EXTEND 10'-0" BEYOND THE END OF THE APPROACH SLAB AND 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 SHALL EXTEND 1'-0" BEYOND THE END OF THE APPROACH SLAB AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB.
 THE CONTRACTOR MAY USE 5" CLASS "A" CONCRETE BASE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE CONCRETE BASE SHALL EXTEND 1'-0" BEYOND THE END OF THE APPROACH SLAB AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB. THE CONCRETE SHALL BE FINISHED TO A SMOOTH SURFACE AND A LAYER OF 30 LB ROOFING FELT SHALL BE PLACED BETWEEN THE CONCRETE BASE AND THE APPROACH SLAB TO PREVENT BOND. THE APPROACH SLAB SHALL NOT BE CAST UNTIL THE CONCRETE BASE HAS REACHED AN AGE OF THREE CURING DAYS.
 FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.
 THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 2 1/2".

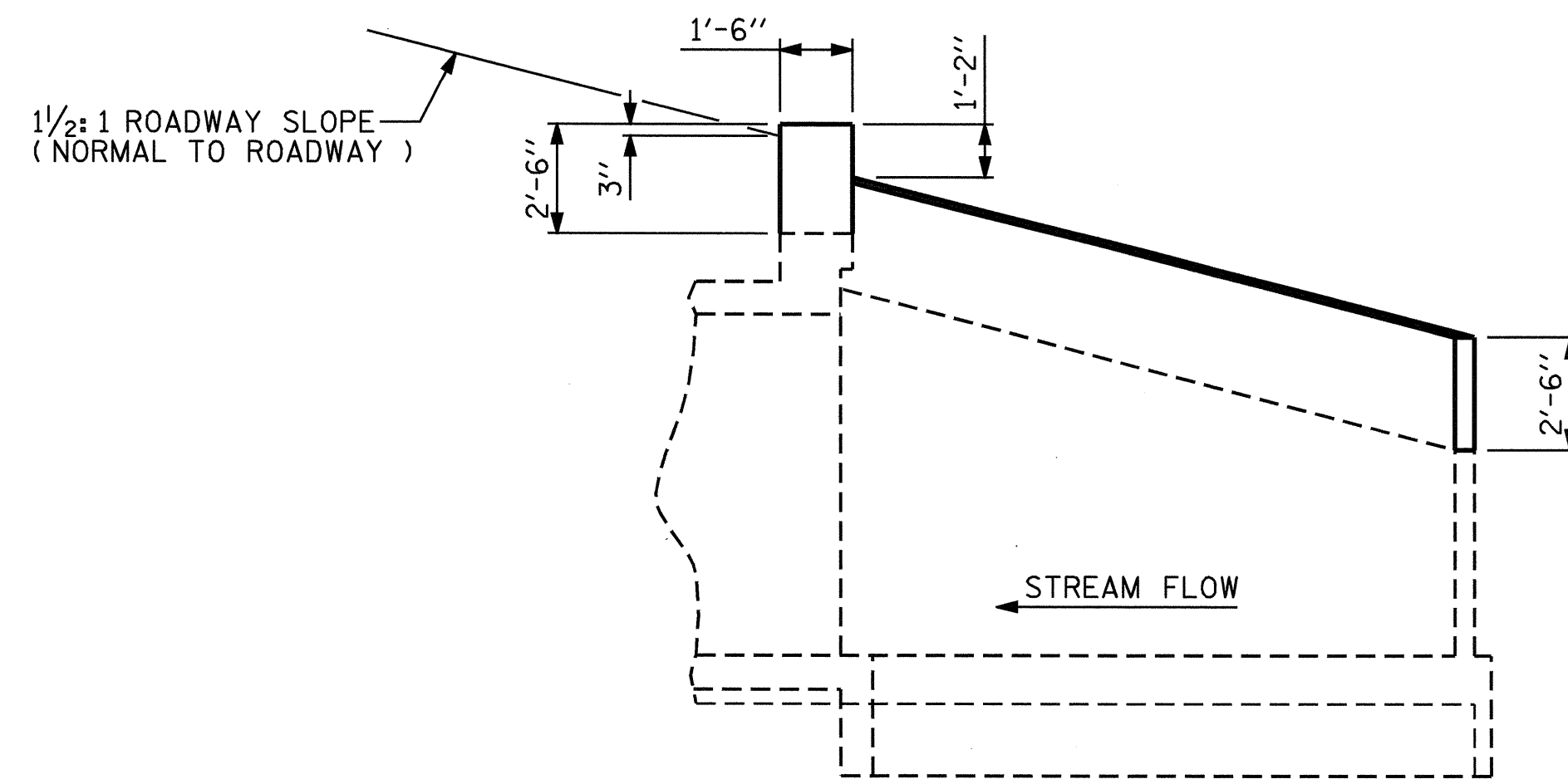


PROJECT NO. I-4411
 IREDELL COUNTY
 STATION: 46+79.71 -L-

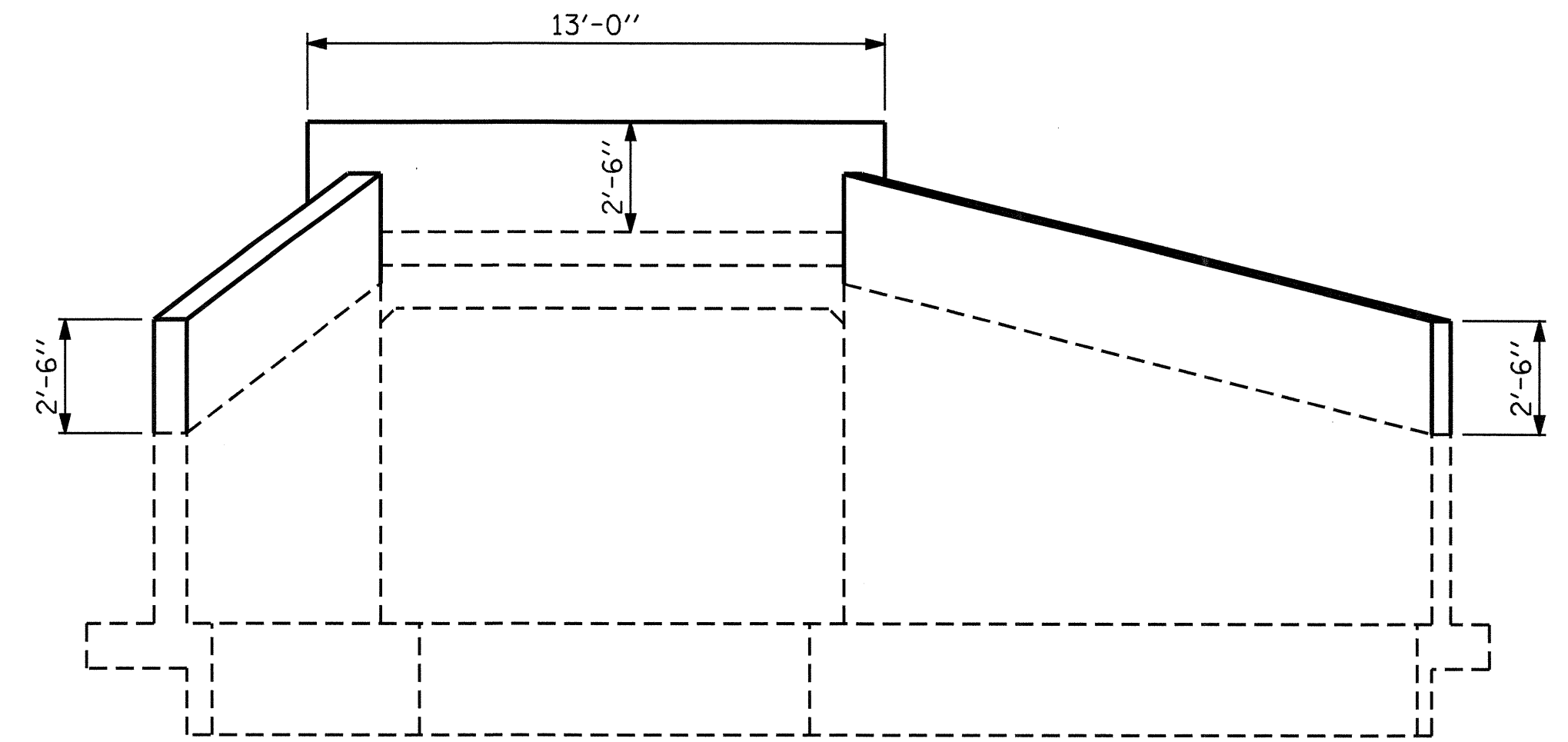
SHEET 3 OF 3

| | | | | | |
|--|-----|-------|-----|-----|-----------------|
| STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH | | | | | |
| STANDARD BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT | | | | | |
| REVISIONS | | | | | |
| NO. | BY: | DATE: | NO. | BY: | DATE: |
| 1 | | | 3 | | |
| 2 | | | 4 | | |
| SHEET NO. S-42 | | | | | TOTAL SHEETS 42 |

| | |
|-----------------------------|-----------------------|
| ASSEMBLED BY: S.B. WILLIAMS | DATE: 11-04 |
| CHECKED BY: T.J. BEACH | DATE: 11/05 |
| DRAWN BY: EEM 3/95 | REV. 10/17/00 RWW/LES |
| CHECKED BY: VAP 3/95 | REV. 7/10/01 LES/RDR |
| | REV. 5/7/03R RWW/JTE |

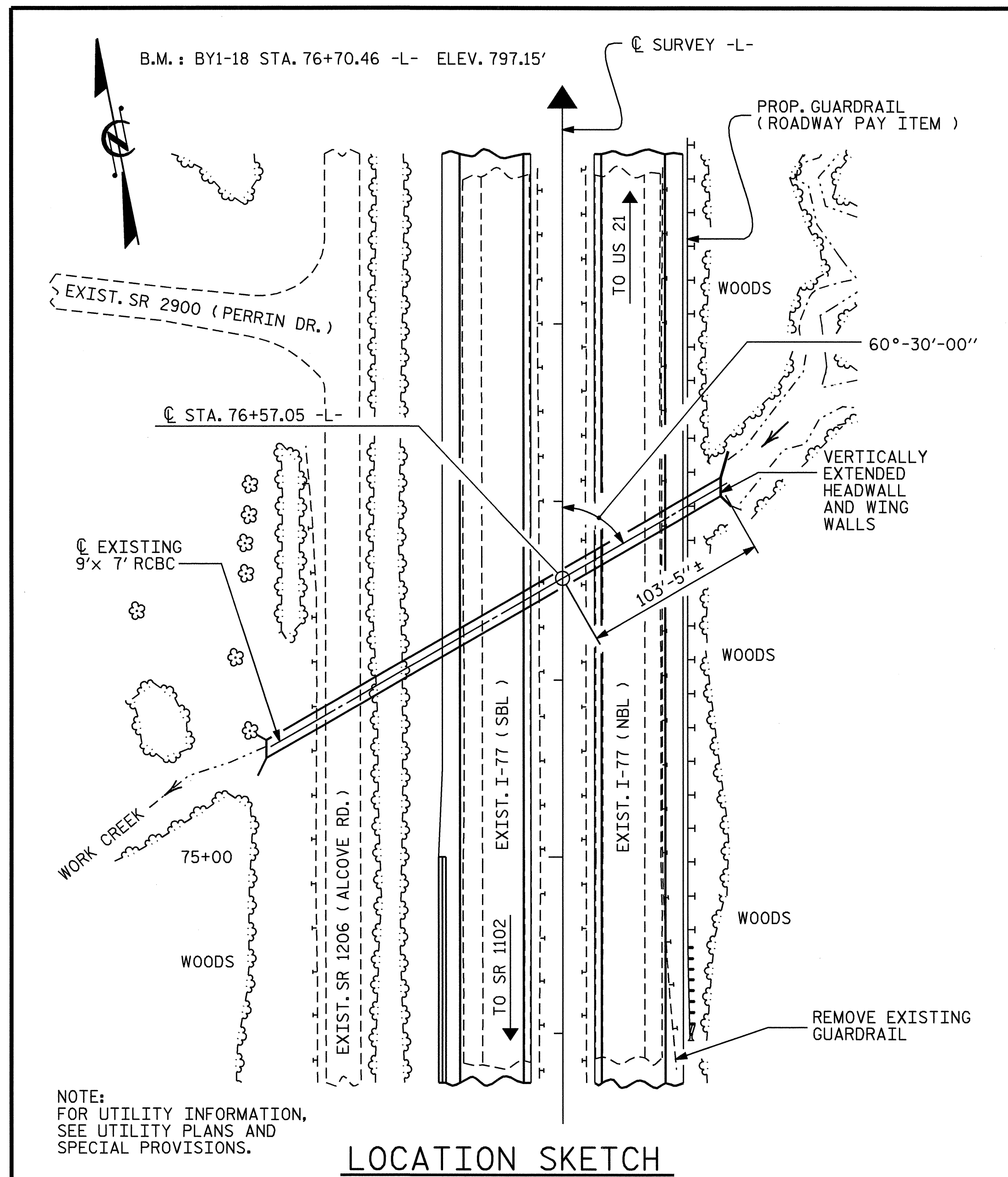


CULVERT SECTION NORMAL TO ROADWAY



END ELEVATION NORMAL TO SKEW

(INLET END)



LOCATION SKETCH

NOTE:
FOR UTILITY INFORMATION,
SEE UTILITY PLANS AND
SPECIAL PROVISIONS.

| REINFORCING BAR SCHEDULE | | | | | | |
|--------------------------|-----|------|------|--------|--------|------|
| BAR | No. | SIZE | TYPE | LENGTH | WEIGHT | |
| ▲ D1 | 34 | #4 | STR. | 3'-4" | 76 | |
| D2 | 2 | #4 | STR. | 3'-2" | 4 | |
| ▲ D3 | 4 | #4 | STR. | 2'-2" | 6 | |
| H1 | 2 | #4 | STR. | 12'-8" | 17 | |
| H2 | 5 | #4 | STR. | 7'-8" | 26 | |
| H3 | 5 | #4 | STR. | 14'-1" | 47 | |
| V1 | 16 | #4 | STR. | 2'-4" | 25 | |
| REINFORCING STEEL | | | | | 201 | LBS. |
| CLASS A CONCRETE | | | | | 3.7 | C.Y. |

▲ ADHESIVELY ANCHORED DOWELS

NOTES :

ALL REINFORCING STEEL SHALL BE GRADE 60.
FOR SETTING OF ADHESIVELY ANCHORED DOWELS,
SEE SPECIAL PROVISION FOR "ADHESIVELY ANCHORED
ANCHOR BOLTS OR DOWELS".

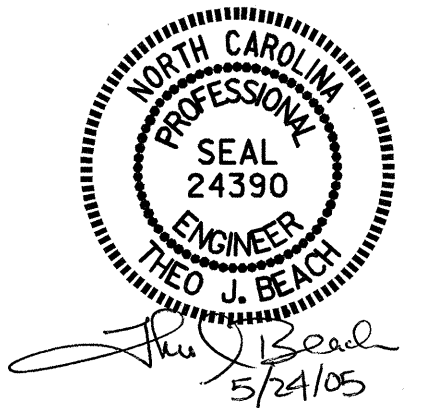
HYDRAULIC DATA

| | |
|-----------------------------|----------------------|
| DESIGN DISCHARGE | = 422 CFS |
| FREQUENCY OF DESIGN FLOOD | = 50 yrs. |
| DESIGN HIGH WATER ELEVATION | = 761.48' |
| DRAINAGE AREA | = 0.6 m ² |
| BASIC DISCHARGE (Q100) | = 505 CFS |
| BASIC HIGH WATER ELEVATION | = 762.32' |

OVERTOPPING FLOOD DATA

| | |
|--------------------------------|-------------|
| OVERTOPPING DISCHARGE | = N/A |
| FREQUENCY OF OVERTOPPING FLOOD | = 500+ yrs. |
| OVERTOPPING FLOOD ELEVATION | = 776.68' |

NOTE : OVERTOPPING FLOOD IS GREATER
THAN 500+ YEAR EVENT.



PROJECT NO. I-4411
IREDELL COUNTY
STATION: 76+57.05 -L-

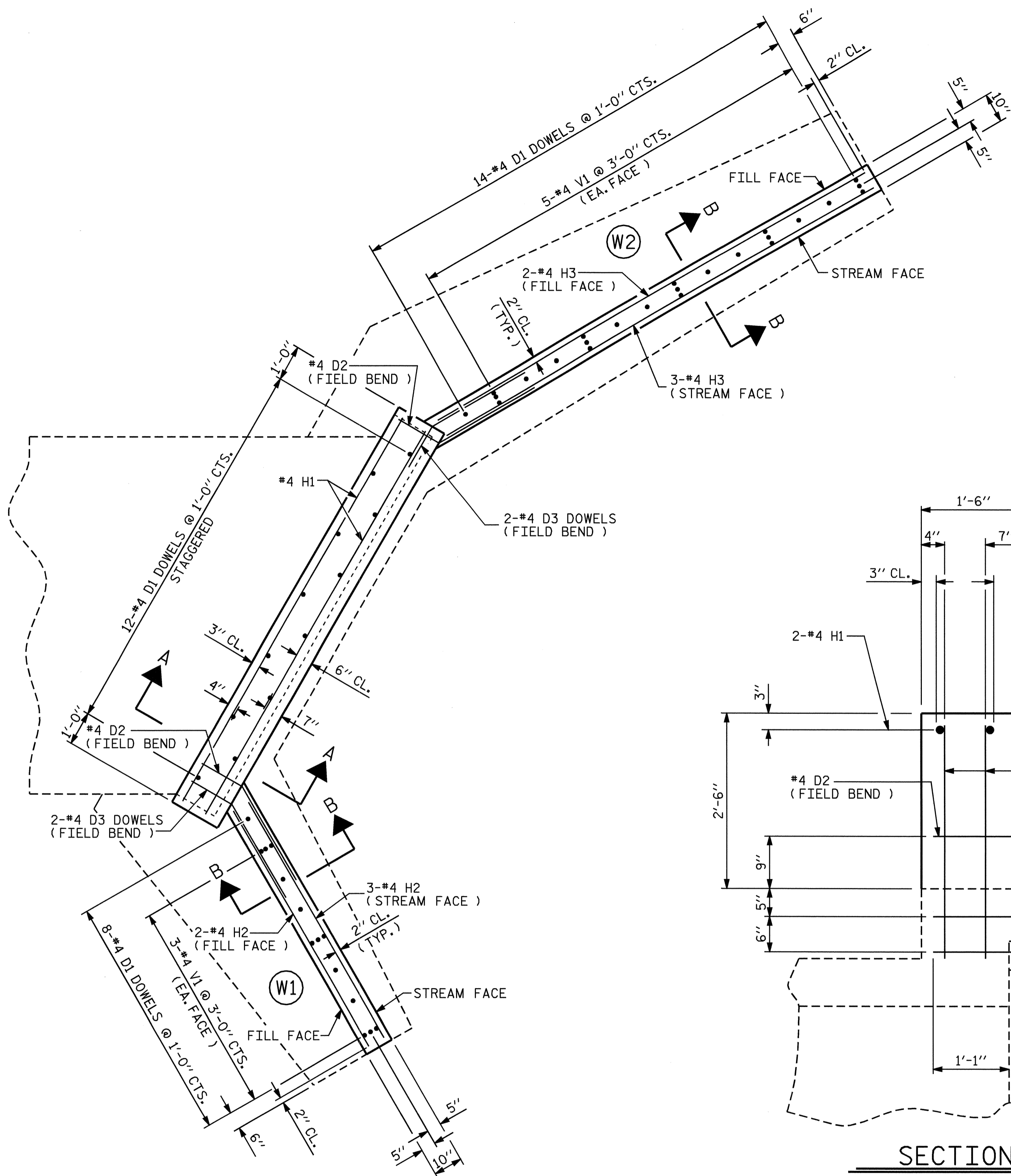
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

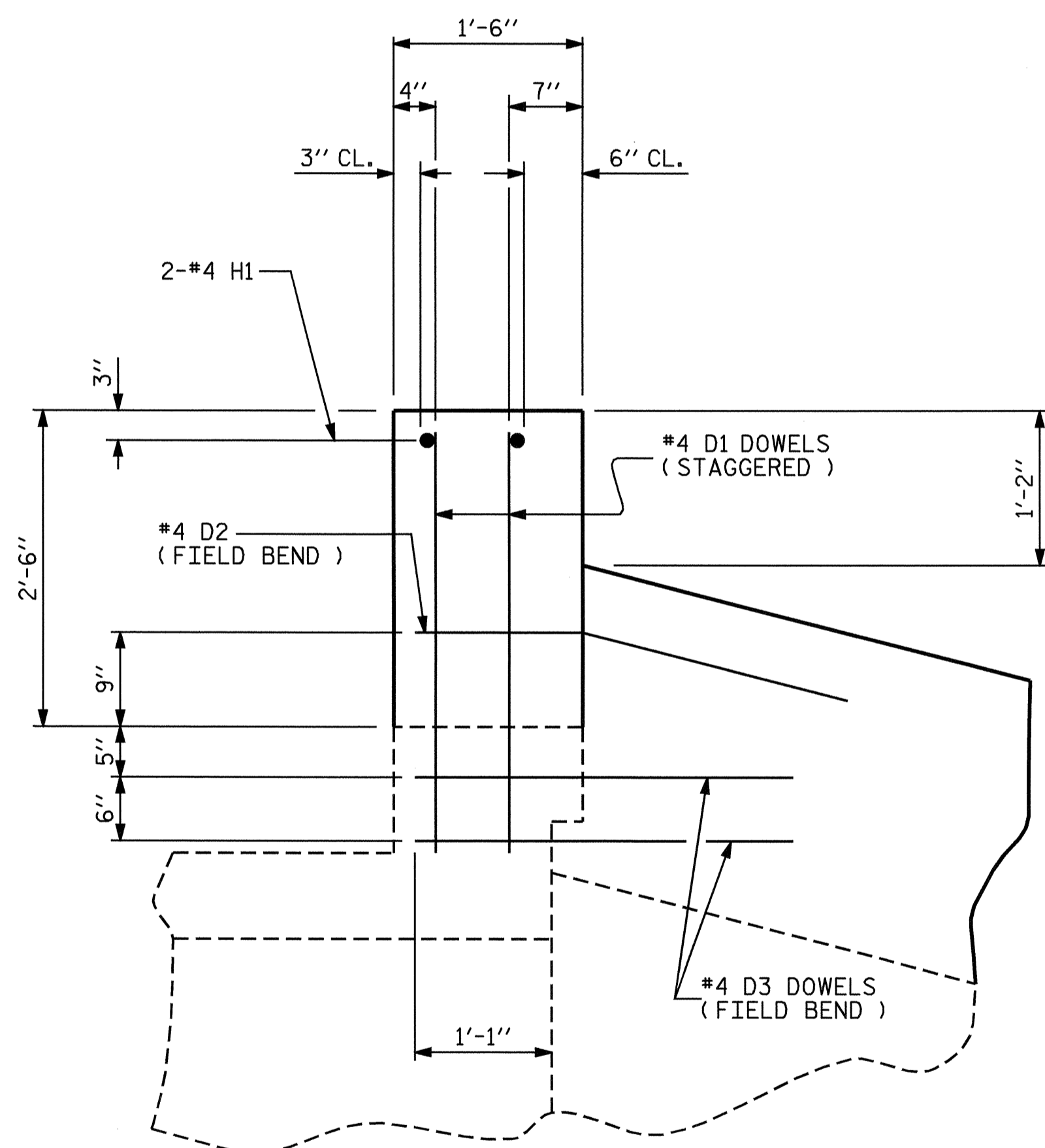
CULVERT HEADWALL
AND WING WALL
VERTICAL EXTENSION

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

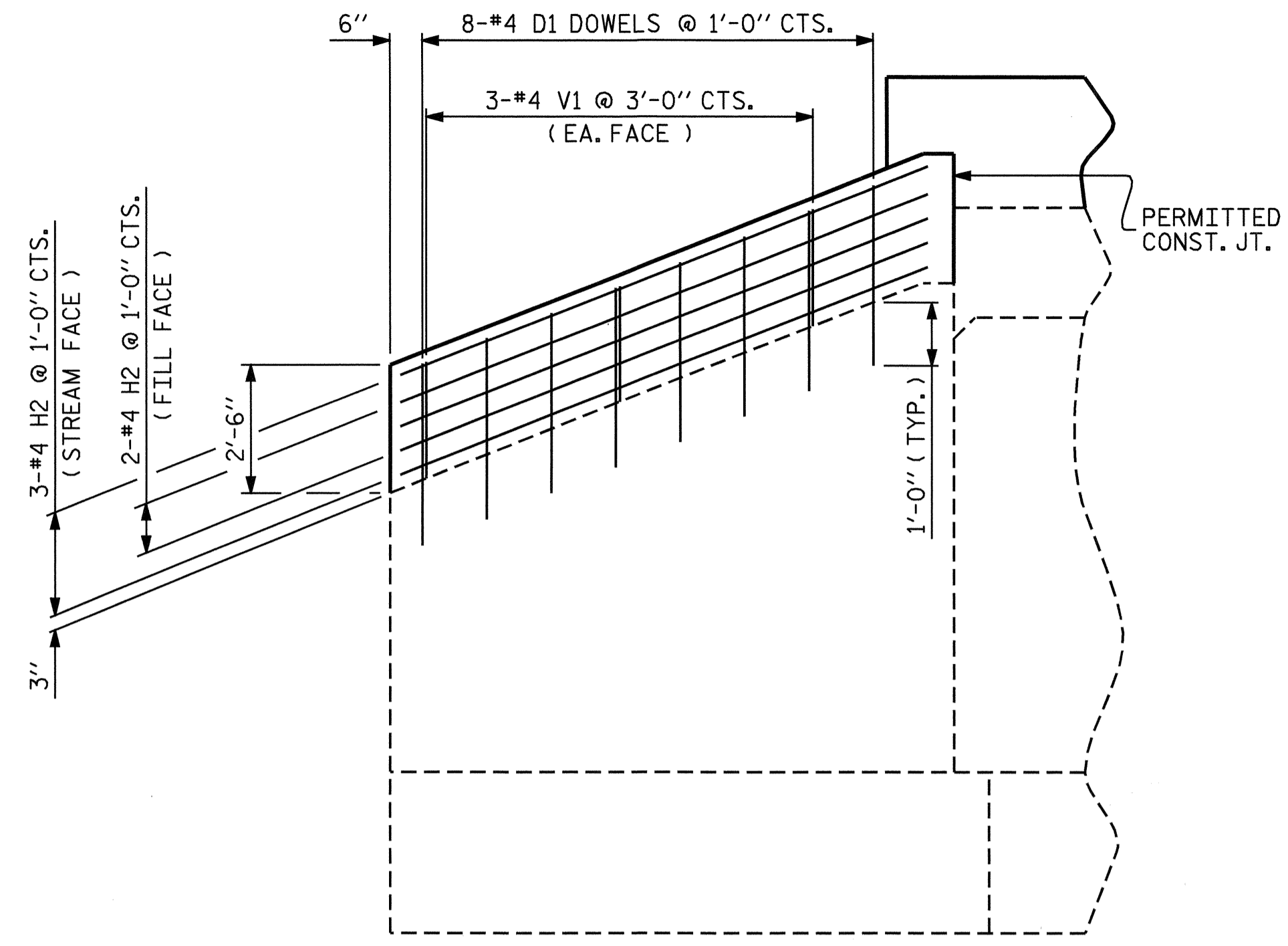
DRAWN BY : MIKE BRITT DATE : 10-1-04
CHECKED BY : P.C. BREWER DATE : 10-5-04



PLAN

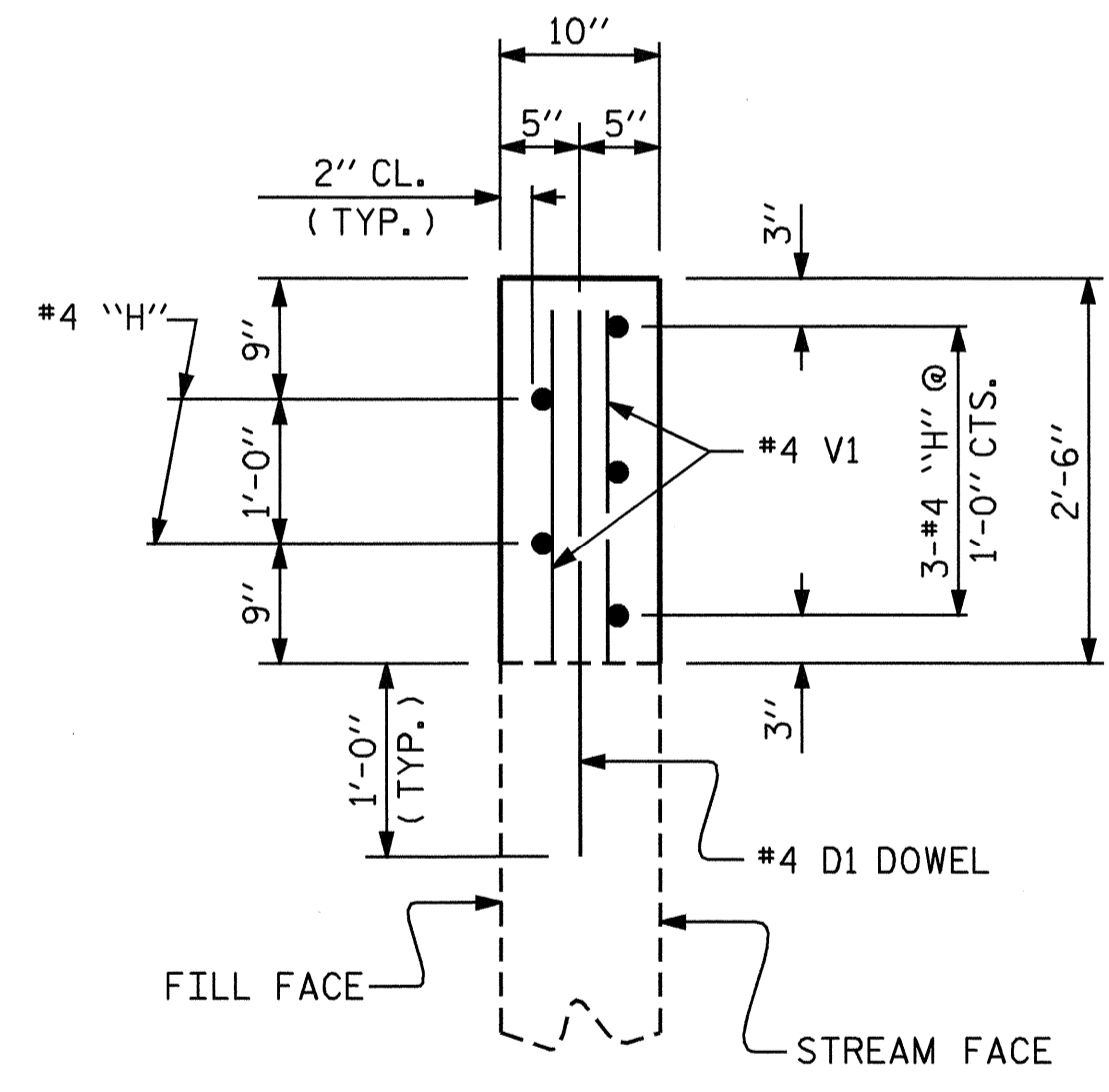


SECTION A-A



ELEVATION

(WING W1 SHOWN, WING W2 SIMILAR)



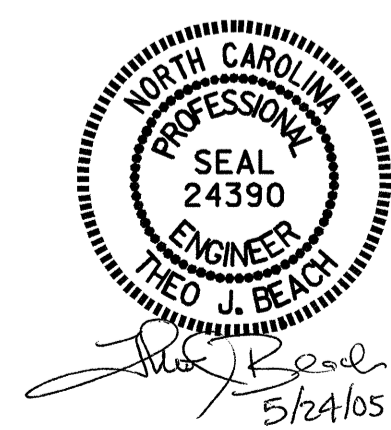
SECTION B-B

PROJECT NO. I-4411
IREDELL COUNTY
 STATION: 76+57.05 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

CULVERT HEADWALL
 AND WING WALL
 VERTICAL EXTENSION



DRAWN BY: MIKE BRITT DATE: 10-1-04
 CHECKED BY: P.C. BREWER DATE: 10-5-04

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

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 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