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CONTRACT: C204013 TIP PROJECT: R-5752

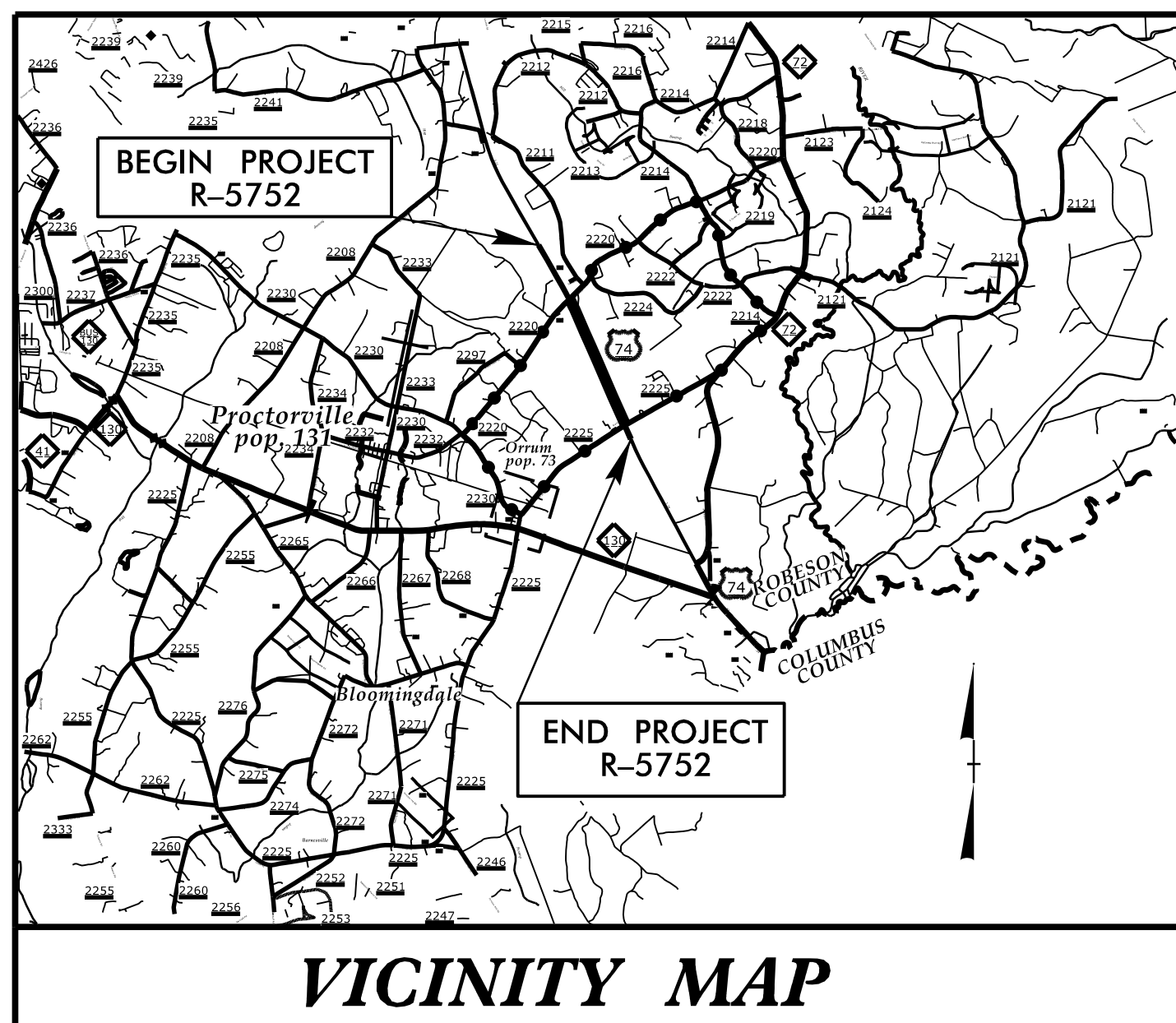
| | | | |
|-----------------|-----------------------------|----------------|--------------|
| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
| N.C. | R-5752 | | |
| STATE PROJ. NO. | F. A. PROJ. NO. | DESCRIPTION | |
| 53088.1.FD1 | HSIP-0074 (170) | P.E. | |
| 53088.2.1 | HSIP-0074 (170) | RW & UTILITIES | |
| 53088.3.1 | HSIP-0074 (170) | CONST. | |
| | | | |
| | | | |

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

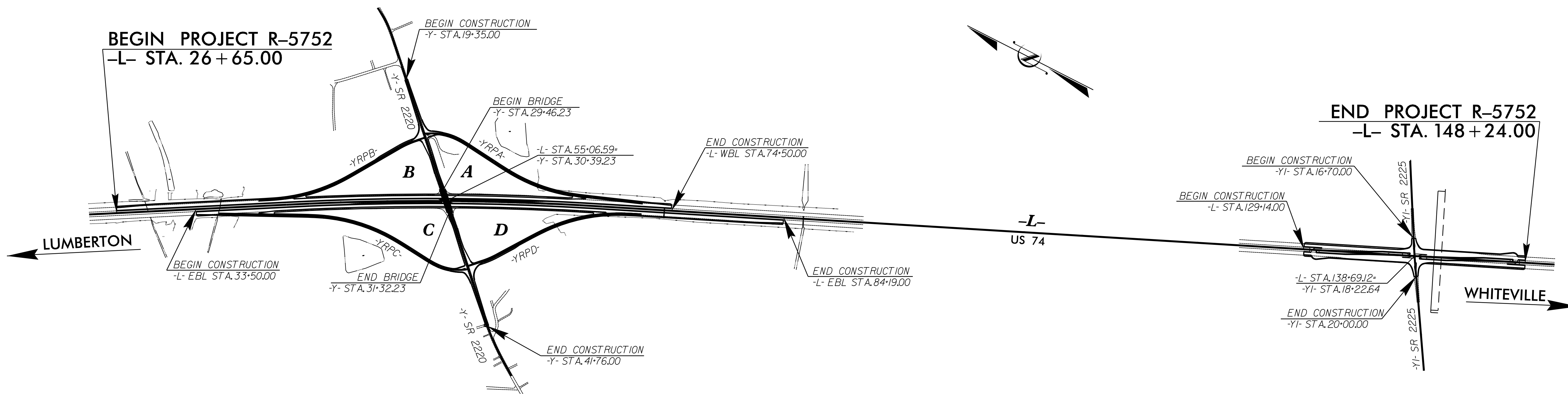
ROBESON COUNTY

LOCATION: US 74 AT SR 2220 (BROADRIDGE ROAD) - CONVERT AT GRADE INTERSECTION TO INTERCHANGE AND US 74 AT SR 2225 (CREEK ROAD) - CONVERT AT GRADE INTERSECTION TO DIRECTIONAL CROSSOVER

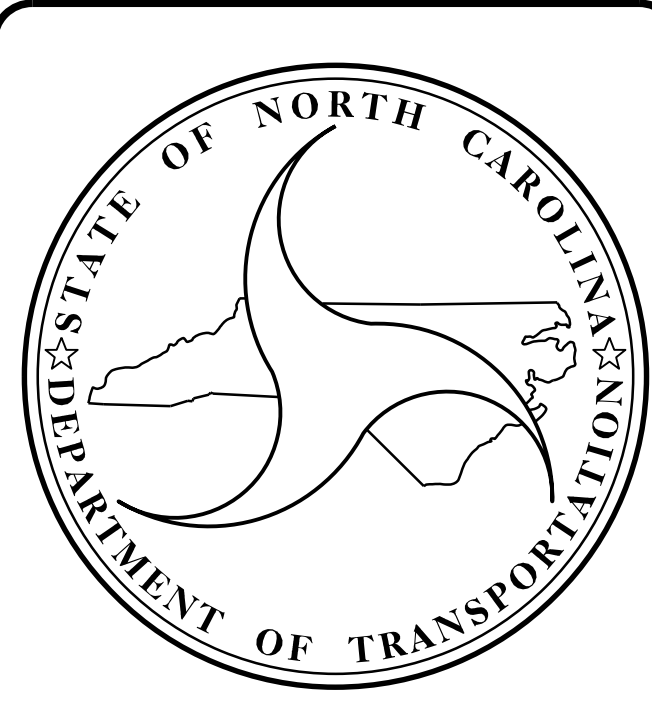
TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURE AND SIGNING



—••••— OFF-SITE DETOUR ROUTE



STRUCTURE



DESIGN DATA

| | | |
|--|---|--------|
| ADT 2018 | = | 10,100 |
| ADT 2038 | = | 16,400 |
| DHV | = | 9 % |
| D | = | 55 % |
| T | = | 20 % * |
| V | = | 75 MPH |
| * TTST = 17 DUAL 3 | | |
| FUNC CLASS = INTERSTATE STATEWIDE TIER | | |


PROJECT LENGTH

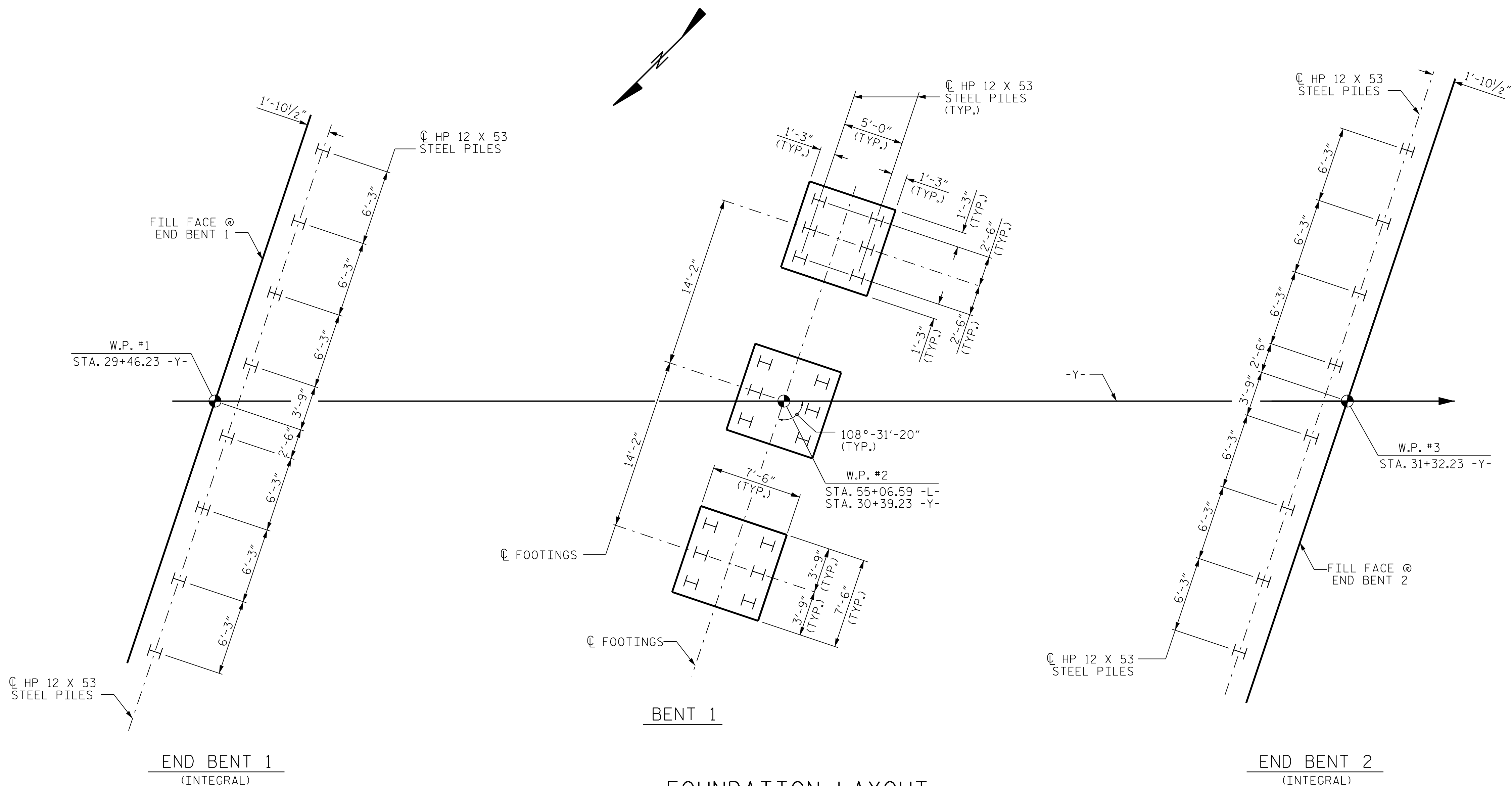
| | | |
|-------------------------------------|---|-------------|
| LENGTH ROADWAY TIP PROJECT R-5752 | = | 1.452 MILES |
| LENGTH STRUCTURE TIP PROJECT R-5752 | = | 0.000 MILES |
| TOTAL LENGTH OF TIP PROJECT R-5752 | = | 1.452 MILES |

Prepared in the Office of:
DIVISION OF HIGHWAYS
STRUCTURES MANAGEMENT UNIT
1000 BIRCH RIDGE DR.
RALEIGH, N.C. 27610

2012 STANDARD SPECIFICATIONS

LETTING DATE : October 17, 2017

| | |
|---|--|
| DAVID J. CLOGGO, P.E. PROJECT ENGINEER |  CDM SMITH 5400 Glenwood Avenue, Suite 400 Raleigh, NC 27612-3228 NC COA No. F-1255 |
| JOSH B. TAYLOR, P.E. PROJECT DESIGN ENGINEER | |



FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO PILE CENTERLINE AT THE BOTTOM OF CAPS OR FOOTINGS.
 PILES ARE HP 12 X 53 STEEL PILES FOR FOOTINGS AT BENT 1.
 ALL PILES ARE VERTICAL.

NOTES

- FOR PILES, SEE GEOTECHNICAL SPECIAL PROVISIONS AND SECTION 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT END BENTS 1 & 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 110 TONS PER PILE.
- PILES AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 100 TONS PER PILE.
- DRIVE PILES AT END BENTS 1 & 2 TO A REQUIRED DRIVING RESISTANCE OF 183 TONS PER PILE.
- DRIVE PILES AT BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 167 TONS PER PILE.
- TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- OBSERVE A 4 MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT TO WITHIN 2 FT OF FINISHED GRADE BEFORE BEGINNING END BENT CONSTRUCTION AT END BENTS 1 & 2. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SPECIAL PROVISIONS.

PROJECT NO. R-5752
ROBESON COUNTY
 STATION: 30+39.23 -Y-
 SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE OVER US-74
 ON SR 2220
 BETWEEN SR 2211
 AND SR 2297

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-02 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 24 |

CDM Smith
 CDM SMITH
 5400 Glenwood Avenue, Suite 400
 Raleigh, NC 27612-3228
 NC COA No. F-1255

7/10/2017
 SEAL
 33698
 ENGINEER
 JOSHUA B. TAYLOR

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

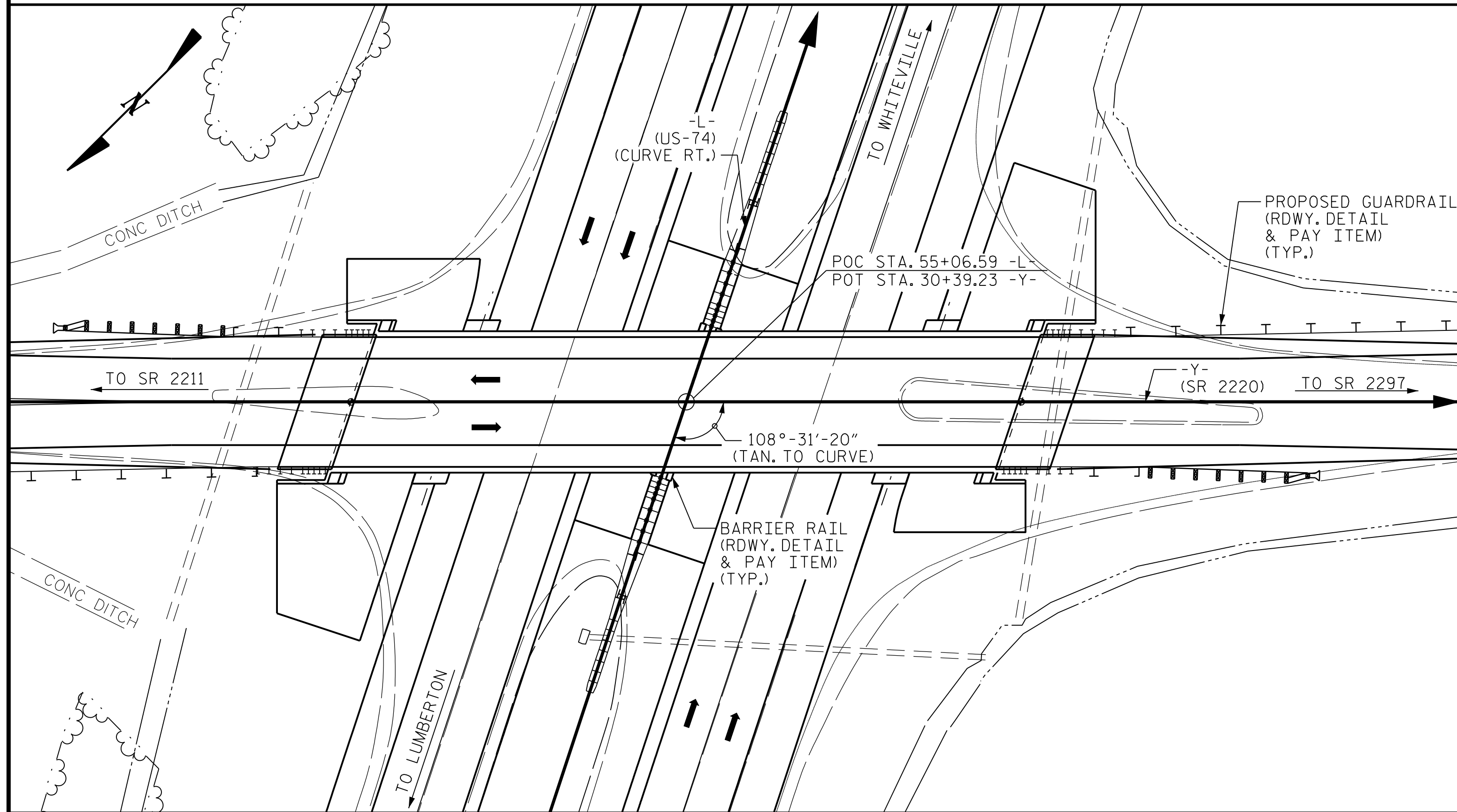
DRAWN BY : A.L. STROUD DATE : 03/17
 CHECKED BY : J.B. TAYLOR DATE : 03/17
 DESIGN ENGINEER : J.B. TAYLOR DATE : 03/17

DWG. No.

TOTAL BILL OF MATERIAL

| | FOUNDATION EXCAVATION | PDA TESTING | REINFORCED CONCRETE DECK SLAB | GROOVING BRIDGE FLOORS | CLASS A CONCRETE | BRIDGE APPROACH SLABS | REINFORCING STEEL | SPIRAL COLUMN REINFORCING STEEL | 54" PRESTRESSED CONCRETE GIRDERS | PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES | HP 12 X 53 STEEL PILES | | PILE REDRIVES | CONCRETE BARRIER RAIL | 4" SLOPE PROTECTION | ELASTOMERIC BEARINGS | |
|----------------|-----------------------|-------------|-------------------------------|------------------------|------------------|-----------------------|-------------------|---------------------------------|----------------------------------|---|------------------------|-----|---------------|-----------------------|---------------------|----------------------|----------|
| | LUMP SUM | EACH | SQ. FT. | SQ. FT. | CU. YDS | LUMP SUM | LBS. | LBS. | NO. | LIN. FT. | EACH | NO. | LIN. FT. | EACH | LIN. FT. | SQ. YDS. | LUMP SUM |
| SUPERSTRUCTURE | | | 7,301 | 7,014 | | | | | 8 | 730.50 | | | | 368.48 | | | LUMP SUM |
| END BENT 1 | | | | | 47.3 | | 6,307 | | | | 8 | 8 | 440 | 4 | | 445 | |
| BENT 1 | LUMP SUM | | | | 55.9 | | 8,296 | 2,001 | | | 18 | 18 | 990 | 9 | | | |
| END BENT 2 | | | | | 47.3 | | 6,307 | | | | 8 | 8 | 440 | 4 | | 430 | |
| TOTAL | LUMP SUM | 1 | 7,301 | 7,014 | 150.5 | LUMP SUM | 20,910 | 2,001 | 8 | 730.50 | 34 | 34 | 1,870 | 17 | 368.48 | 875 | LUMP SUM |

B.M. #2: RR SPIKE IN BASE OF 18" PINE; 93.40' LEFT OF STA. 85+08.46 -L-, EL. 109.00.



LOCATION SKETCH

NOTES

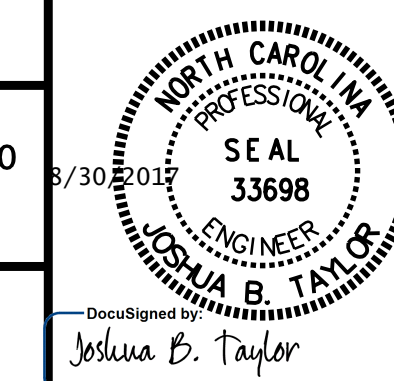
- ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
- THIS BRIDGE IS LOCATED IN SEISMIC ZONE 2.
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
- FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.
- THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
- PRESTRESSED CONCRETE DECK PANELS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
- REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
- THE ELEVATIONS AND CLEARANCES SHOWN ON THE PLANS AT THE POINTS OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATION(S) ON THE PROPOSED PAVEMENT AND CHECK THE CLEARANCE. REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.
- THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPliced WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.
- NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.
- FOR MAINTENANCE OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.
- FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

PROJECT NO. R-5752
ROBESON COUNTY
 STATION: 30+39.23 -Y-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE OVER US-74
 ON SR 2220
 BETWEEN SR 2211
 AND SR 2297

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



CDM Smith
 CDM SMITH
 5400 Glenwood Avenue, Suite 400
 Raleigh, NC 27612-3228
 NC COA No. F-1255

DRAWN BY : G.R. COLS DATE : 03/16
 CHECKED BY : J.B. TAYLOR DATE : 03/17
 DESIGN ENGINEER : J.B. TAYLOR DATE : 03/17
 DWG. No.

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

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

LOAD FACTORS: _____

| | | | |
|----------------------------|-------------|----------|----------|
| DESIGN LOAD RATING FACTORS | LIMIT STATE | ϕ_c | ϕ_w |
| | STRENGTH I | 1.25 | 1.50 |
| | SERVICE III | 1.00 | 1.00 |

| LEVEL | VEHICLE | WEIGHT (W) (TONS) | CONTROLLING LOAD RATING | MINIMUM RATING FACTORS (RF) | TONS = W X RF | STRENGTH I LIMIT STATE | | | | | | | | | | SERVICE III LIMIT STATE | | | | | COMMENT NUMBER | | | |
|--------------------|------------|-------------------|-------------------------|-----------------------------|---------------|------------------------|---------------------------|---------------|------|-----------------|-------------------------------------|---------------------------|---------------|------|-----------------|-------------------------------------|------------------|---------------------------|---------------|------|----------------|-----------------|-------------------------------------|--|
| | | | | | | MOMENT | | | | | SHEAR | | | | | MOMENT | | | | | | | | |
| | | | | | | LIVELOAD FACTORS | DISTRIBUTION FACTORS (DF) | RATING FACTOR | SPAN | GIRDER LOCATION | DISTANCE FROM LEFT END OF SPAN (ft) | DISTRIBUTION FACTORS (DF) | RATING FACTOR | SPAN | GIRDER LOCATION | DISTANCE FROM LEFT END OF SPAN (ft) | LIVELOAD FACTORS | DISTRIBUTION FACTORS (DF) | RATING FACTOR | SPAN | | GIRDER LOCATION | DISTANCE FROM LEFT END OF SPAN (ft) | |
| DESIGN LOAD RATING | HL-93(Inv) | N/A | ① | 1.13 | -- | 1.75 | 0.9 | 1.38 | A | EL | 44.95 | 1.06 | 1.21 | A | I | 63.21 | 0.80 | 0.82 | 1.13 | A | I | 44.95 | | |
| | HL-93(0pr) | N/A | -- | 1.61 | -- | 1.35 | 0.9 | 1.79 | A | EL | 44.95 | 1.06 | 1.61 | A | I | 72.34 | N/A | -- | -- | -- | -- | -- | | |
| | HS-20(Inv) | 36.000 | ② | 1.55 | 55.800 | 1.75 | 0.9 | 1.90 | A | EL | 44.95 | 1.06 | 1.61 | A | I | 72.34 | 0.80 | 0.82 | 1.55 | A | I | 44.95 | | |
| | HS-20(0pr) | 36.000 | -- | 2.13 | 76.680 | 1.35 | 0.9 | 2.47 | A | EL | 44.95 | 1.06 | 2.13 | A | I | 72.34 | N/A | -- | -- | -- | -- | -- | | |
| LEGAL LOAD RATING | SV | SNSH | 13.500 | -- | 3.66 | 49.410 | 1.40 | 0.9 | 5.62 | A | EL | 44.95 | 1.06 | 5.29 | A | I | 72.34 | 0.80 | 0.82 | 3.66 | A | I | 44.95 | |
| | | SNGARBS2 | 20.000 | -- | 2.66 | 53.200 | 1.40 | 0.9 | 4.07 | A | EL | 44.95 | 1.06 | 3.70 | A | I | 72.34 | 0.80 | 0.82 | 2.66 | A | I | 44.95 | |
| | | SNAGRIS2 | 22.000 | -- | 2.48 | 54.560 | 1.40 | 0.9 | 3.80 | A | EL | 44.95 | 1.06 | 3.42 | A | I | 72.34 | 0.80 | 0.82 | 2.48 | A | I | 44.95 | |
| | | SNCOTTS3 | 27.250 | -- | 1.81 | 49.323 | 1.40 | 0.9 | 2.78 | A | EL | 44.95 | 1.06 | 2.52 | A | I | 72.34 | 0.80 | 0.82 | 1.81 | A | I | 44.95 | |
| | | SNAGGRS4 | 34.925 | -- | 1.49 | 52.038 | 1.40 | 0.9 | 2.28 | A | EL | 44.95 | 1.06 | 1.98 | A | I | 72.34 | 0.80 | 0.82 | 1.49 | A | I | 44.95 | |
| | | SNS5A | 35.550 | -- | 1.46 | 51.903 | 1.40 | 0.9 | 2.24 | A | EL | 44.95 | 1.06 | 2.00 | A | I | 72.34 | 0.80 | 0.82 | 1.46 | A | I | 44.95 | |
| | | SNS6A | 39.950 | -- | 1.33 | 53.134 | 1.40 | 0.9 | 2.04 | A | EL | 44.95 | 1.06 | 1.81 | A | I | 17.56 | 0.80 | 0.82 | 1.33 | A | I | 44.95 | |
| | SNS7B | 42.000 | -- | 1.26 | 52.920 | 1.40 | 0.9 | 1.94 | A | EL | 44.95 | 1.06 | 1.76 | A | I | 17.56 | 0.80 | 0.82 | 1.26 | A | I | 44.95 | | |
| | TTST | TNAGRIT3 | 33.000 | -- | 1.62 | 53.460 | 1.40 | 0.9 | 2.48 | A | EL | 44.95 | 1.06 | 2.15 | A | I | 72.34 | 0.80 | 0.82 | 1.62 | A | I | 44.95 | |
| | | TNT4A | 33.075 | -- | 1.62 | 53.582 | 1.40 | 0.9 | 2.49 | A | EL | 44.95 | 1.06 | 2.28 | A | I | 72.34 | 0.80 | 0.82 | 1.62 | A | I | 44.95 | |
| | | TNT6A | 41.600 | -- | 1.31 | 54.496 | 1.40 | 0.9 | 2.02 | A | EL | 44.95 | 1.06 | 1.87 | A | I | 72.34 | 0.80 | 0.82 | 1.31 | A | I | 44.95 | |
| | | TNT7A | 42.000 | -- | 1.32 | 55.440 | 1.40 | 0.9 | 2.02 | A | EL | 44.95 | 1.06 | 1.84 | A | I | 17.56 | 0.80 | 0.82 | 1.32 | A | I | 44.95 | |
| | | TNT7B | 42.000 | -- | 1.35 | 56.700 | 1.40 | 0.9 | 2.07 | A | EL | 44.95 | 1.06 | 1.72 | A | I | 17.56 | 0.80 | 0.82 | 1.35 | A | I | 44.95 | |
| | | TNAGRIT4 | 43.000 | -- | 1.29 | 55.470 | 1.40 | 0.9 | 1.98 | A | EL | 44.95 | 1.06 | 1.70 | A | I | 72.34 | 0.80 | 0.82 | 1.29 | A | I | 44.95 | |
| TNAGT5A | | 45.000 | -- | 1.22 | 54.900 | 1.40 | 0.9 | 1.88 | A | EL | 44.95 | 1.06 | 1.62 | A | I | 72.34 | 0.80 | 0.82 | 1.22 | A | I | 44.95 | | |
| TNAGT5B | 45.000 | ③ | 1.21 | 54.450 | 1.40 | 0.9 | 1.86 | A | EL | 44.95 | 1.06 | 1.59 | A | I | 17.56 | 0.80 | 0.82 | 1.21 | A | I | 44.95 | | | |

NOTES:

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

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

COMMENTS:

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

CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

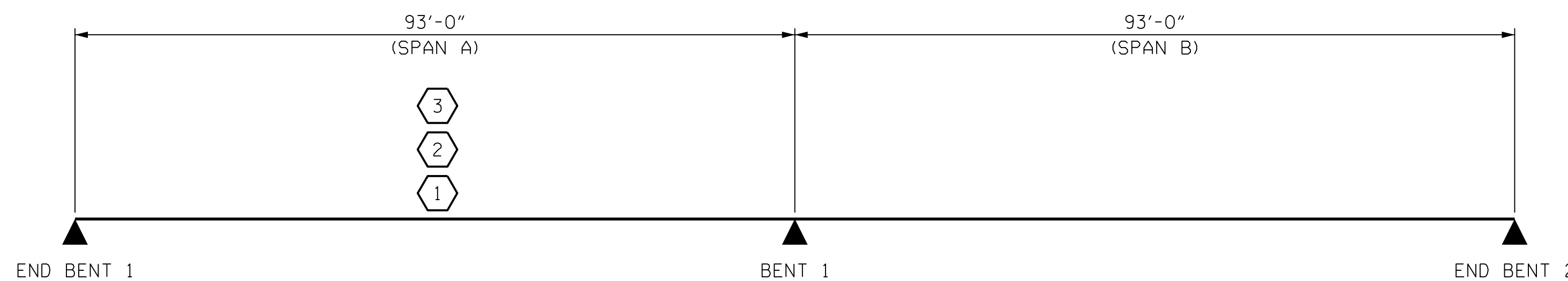
② DESIGN LOAD RATING (HS-20)

③ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. R-5752
ROBESON COUNTY
 STATION: 30+39.23 -Y-

CDM Smith
 CDM SMITH
 5400 Glenwood Avenue, Suite 400
 Raleigh, NC 27612-3228
 NC COA No. F-1255

DRAWN BY: A.L. STROUD DATE: 03/17
 CHECKED BY: J.B. TAYLOR DATE: 03/17
 DESIGN ENGINEER: J.B. TAYLOR DATE: 03/17

DWG. No. _____

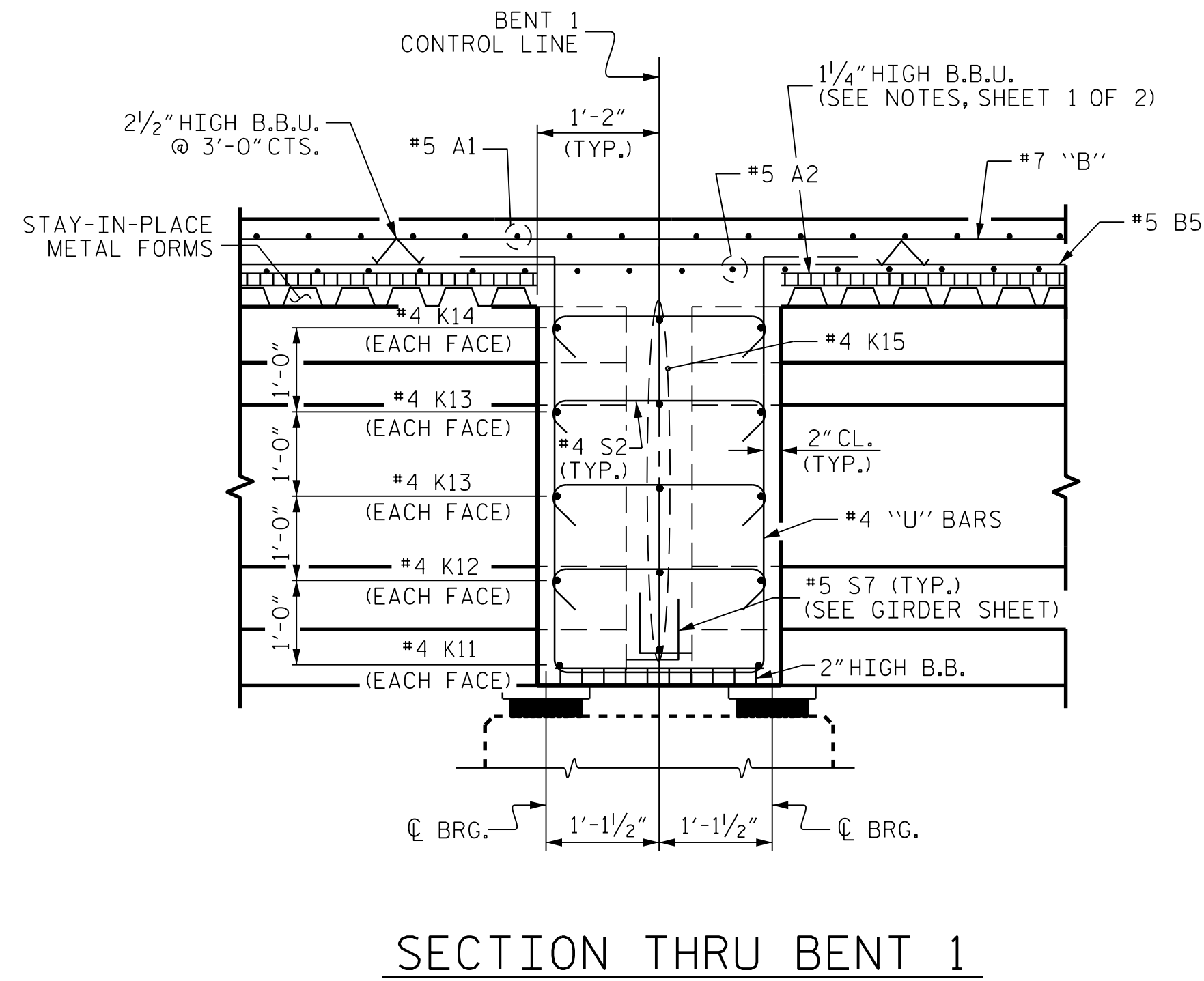
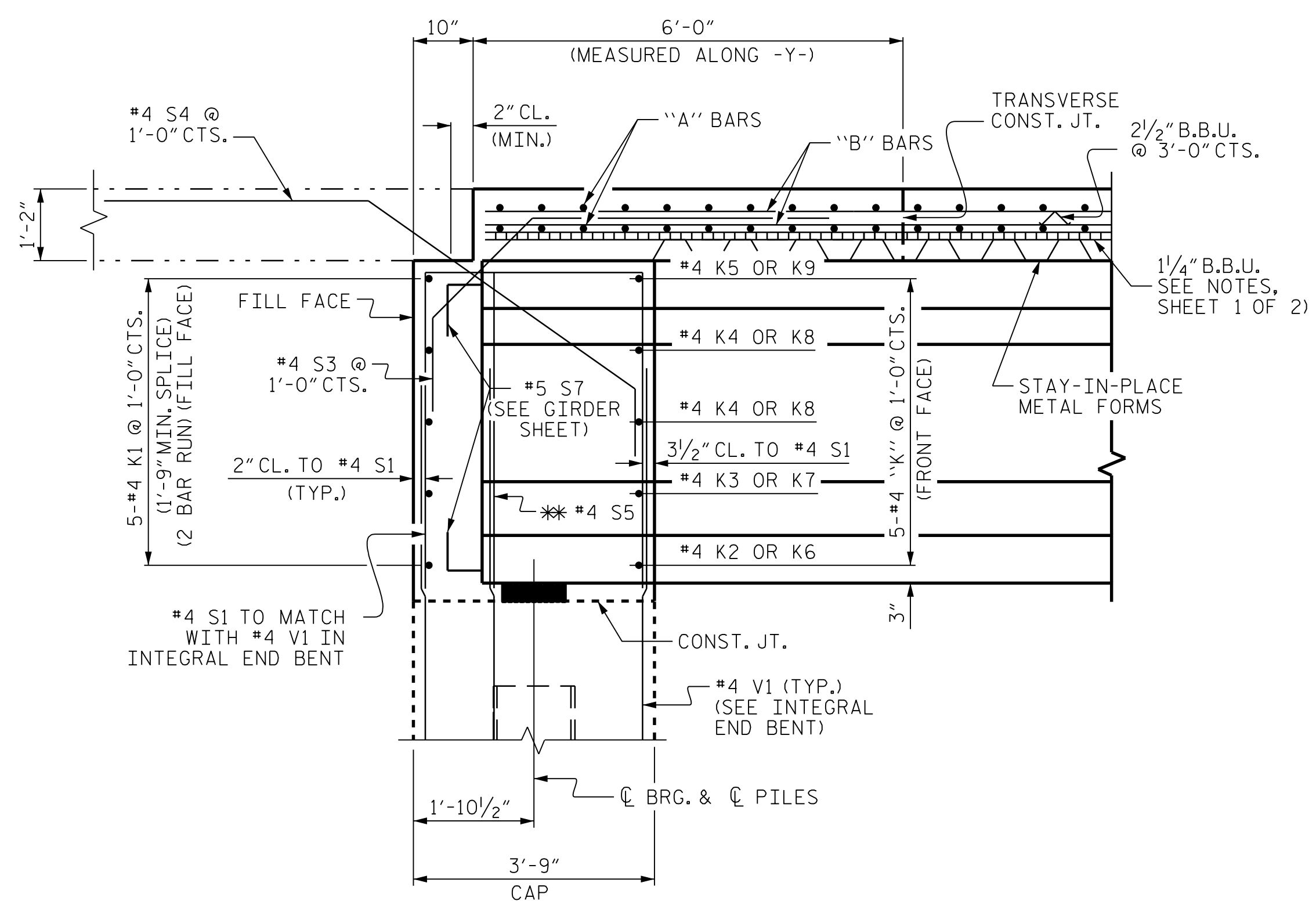
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL
 33698
 JOSHUA B. TAYLOR
 7/10/2017

Joshua B. Taylor

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

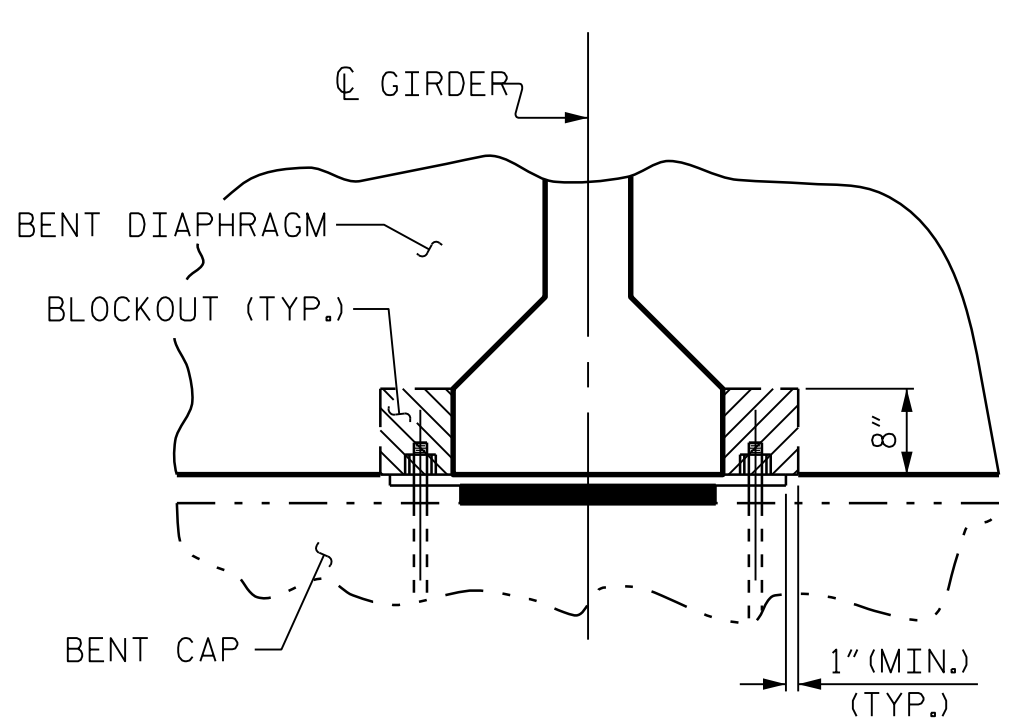
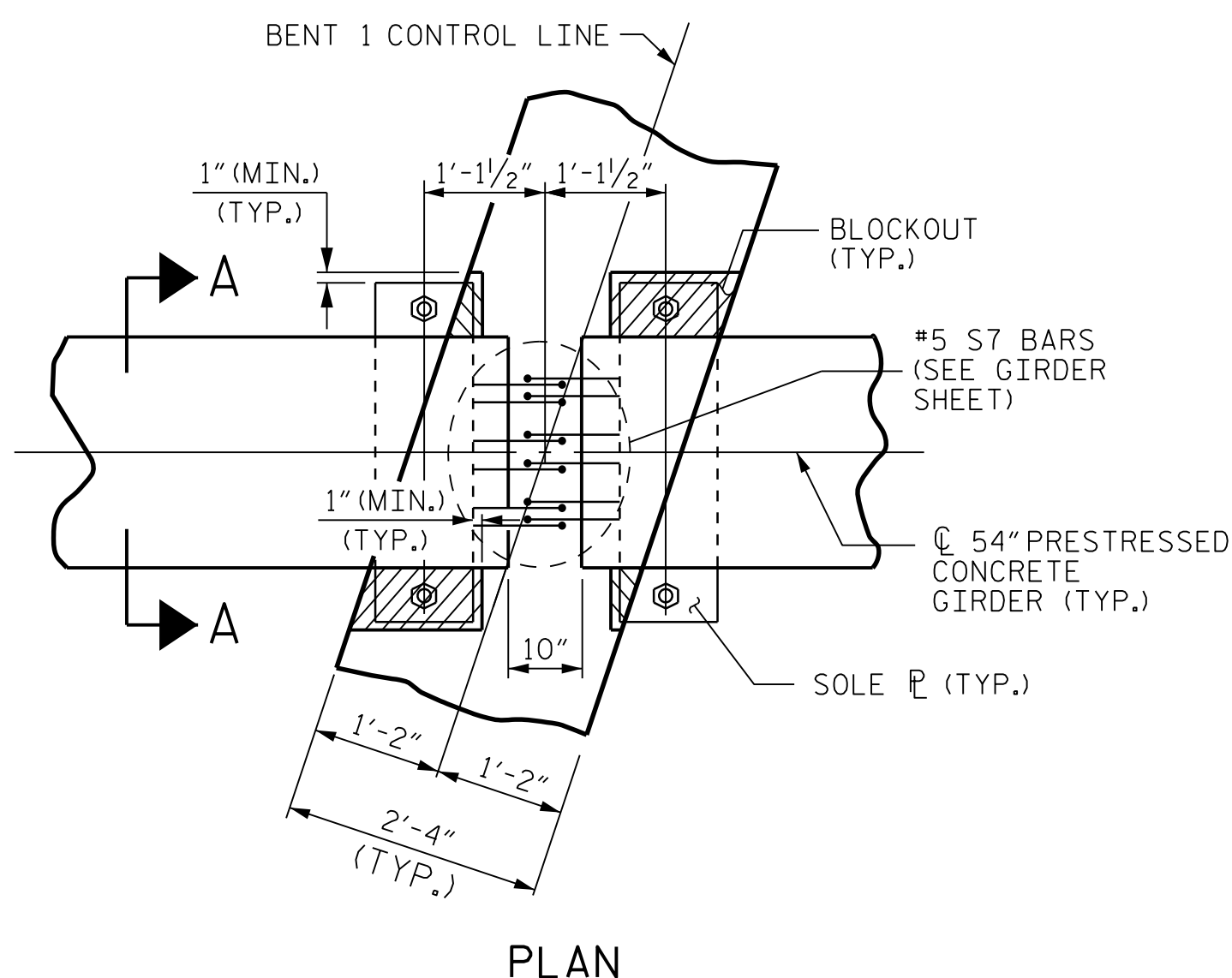
| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-04 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 24 |



SECTION THRU INTEGRAL END BENT

* THE TOP SURFACE OF THE END BENT CAP AND LOWER WINGS, EXCLUDING THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4"

** #4 S5 LOCATED AT OUTSIDE OF INTEGRAL END BENT DIAPHRAGM. SEE PLAN OF SPANS AND TYPICAL SECTION FOR PLACEMENT DETAILS.



BENT DIAPHRAGM BLOCK-OUT DETAIL

PROJECT NO. R-5752
ROBESON COUNTY
 STATION: 30+39.23 -Y-
 SHEET 2 OF 2

| | | | | | |
|--|-----|-------|-----|-----|-------|
| STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH | | | | | |
| SUPERSTRUCTURE TYPICAL SECTION DETAILS | | | | | |
| SHEET NO. S-06 | | | | | |
| REVISIONS | | | | | |
| NO. | BY: | DATE: | NO. | BY: | DATE: |
| 1 | | | 3 | | |
| 2 | | | 4 | | |
| TOTAL SHEETS 24 | | | | | |

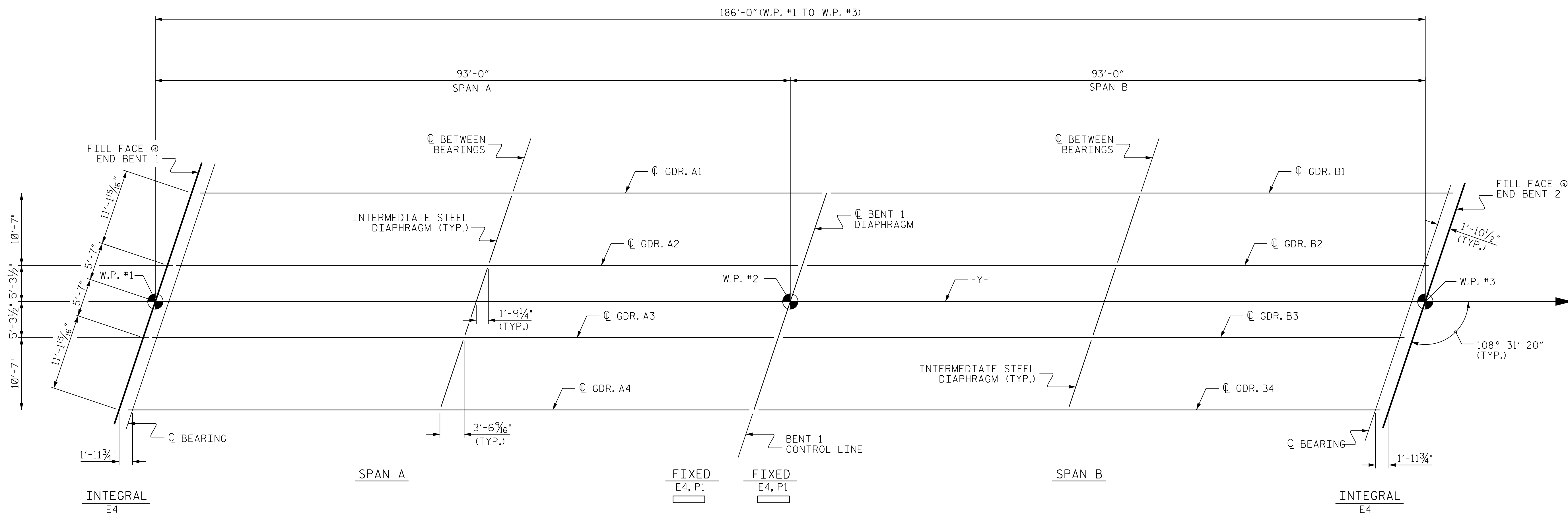
CDM Smith
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 5400 Glenwood Avenue, Suite 400
 Raleigh, NC 27612-3228
 NC COA No. F-1255

7/16/2017
 SEAL
 33698
 ENGINEER
 JOSHUA B. TAYLOR

DocuSigned by:
 Joshua B. Taylor

DWG. No. _____
 DRAWN BY: A.L. STROUD DATE: 03/17
 CHECKED BY: J.B. TAYLOR DATE: 03/17
 DESIGN ENGINEER: J.B. TAYLOR DATE: 03/17

FILE: c:\edman\taylor\p\02317197\001_001_85752_SMU_TSD_006_770517.dgn
 DATE: 7/10/2017 2:09:35 PM



FRAMING PLAN

| DEAD LOAD DEFLECTION TABLE | | | | | | | | | | | | | | | | | | | | | | |
|---|---------------|-------|-------|--------|-------|--------|-------|--------|-------|-------|------|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| SPANS A & B | | | | | | | | | | | | | | | | | | | | | | |
| | GIRDERS 1 & 4 | | | | | | | | | | | GIRDERS 2 & 3 | | | | | | | | | | |
| | BRG. | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | BRG. | BRG. | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | BRG. |
| CAMBER (GIRDER ALONE IN PLACE) ↑ | 0 | 0.063 | 0.120 | 0.164 | 0.192 | 0.201 | 0.192 | 0.164 | 0.120 | 0.063 | 0 | 0 | 0.063 | 0.120 | 0.164 | 0.192 | 0.201 | 0.192 | 0.164 | 0.120 | 0.063 | 0 |
| * DEFLECTION DUE TO SUPERIMPOSED D.L. ↓ | 0 | 0.041 | 0.079 | 0.108 | 0.127 | 0.134 | 0.127 | 0.108 | 0.079 | 0.041 | 0 | 0 | 0.044 | 0.086 | 0.119 | 0.140 | 0.147 | 0.140 | 0.119 | 0.086 | 0.044 | 0 |
| FINAL CAMBER ↑ | 0 | 1/4" | 1/2" | 11/16" | 3/4" | 13/16" | 3/4" | 11/16" | 1/2" | 1/4" | 0 | 0 | 1/4" | 3/8" | 9/16" | 5/8" | 5/8" | 5/8" | 9/16" | 3/8" | 1/4" | 0 |

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

PROJECT NO. R-5752
ROBESON COUNTY
 STATION: 30+39.23 -Y-

FILE: c:\edmm\jaylor\p\0217197\001_017_85752_SMU_PP_009_770512.dgn
 DATE: 7/10/2017 2:10:41 PM

CDM Smith
 CDM SMITH
 5400 Glenwood Avenue, Suite 400
 Raleigh, NC 27612-3228
 NC COA No. F-1255

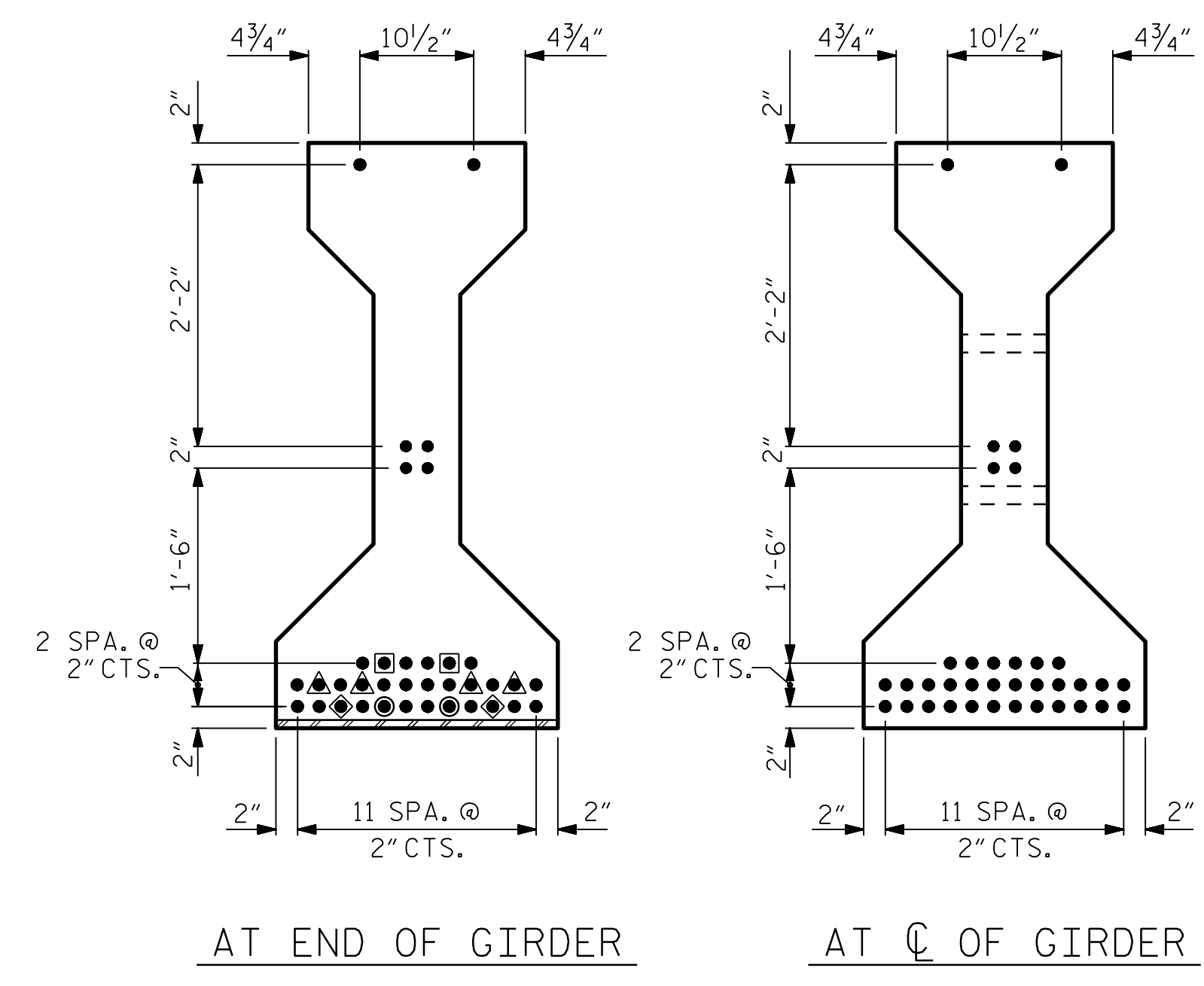
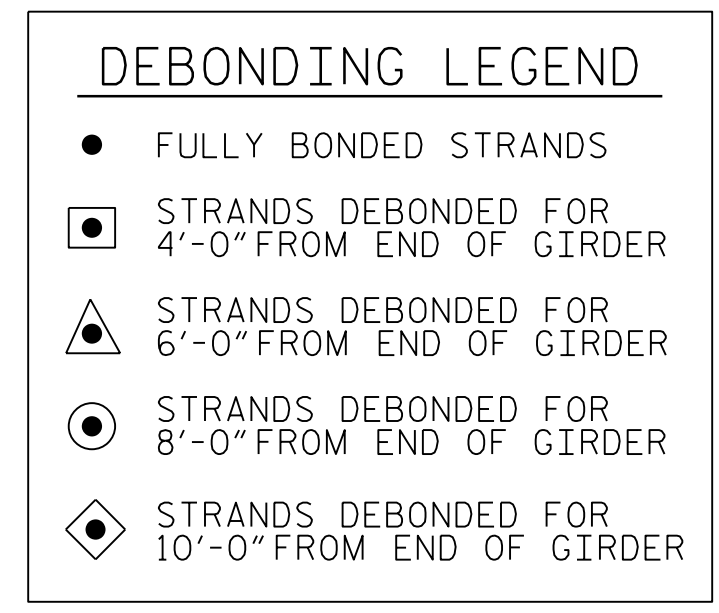
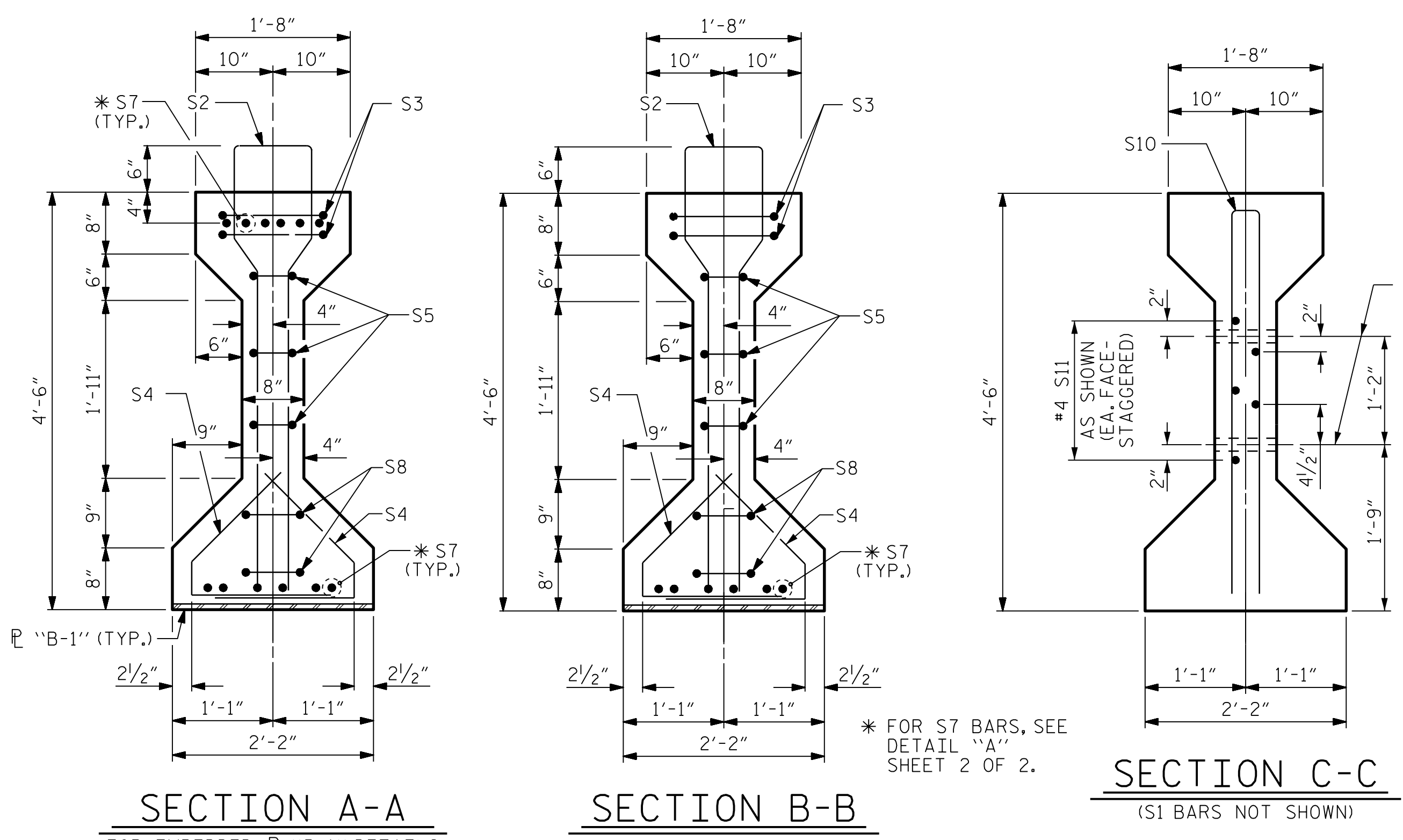
DRAWN BY: A.L. STROUD DATE: 03/17
 CHECKED BY: J.B. TAYLOR DATE: 03/17
 DESIGN ENGINEER: J.B. TAYLOR DATE: 03/17

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7/10/2017
 SEAL
 33698
 ENGINEER
 JOSHUA B. TAYLOR
 Joshua B. Taylor

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
**FRAMING PLAN
 AND DEAD LOAD
 DEFLECTIONS**

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-9 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 24 |



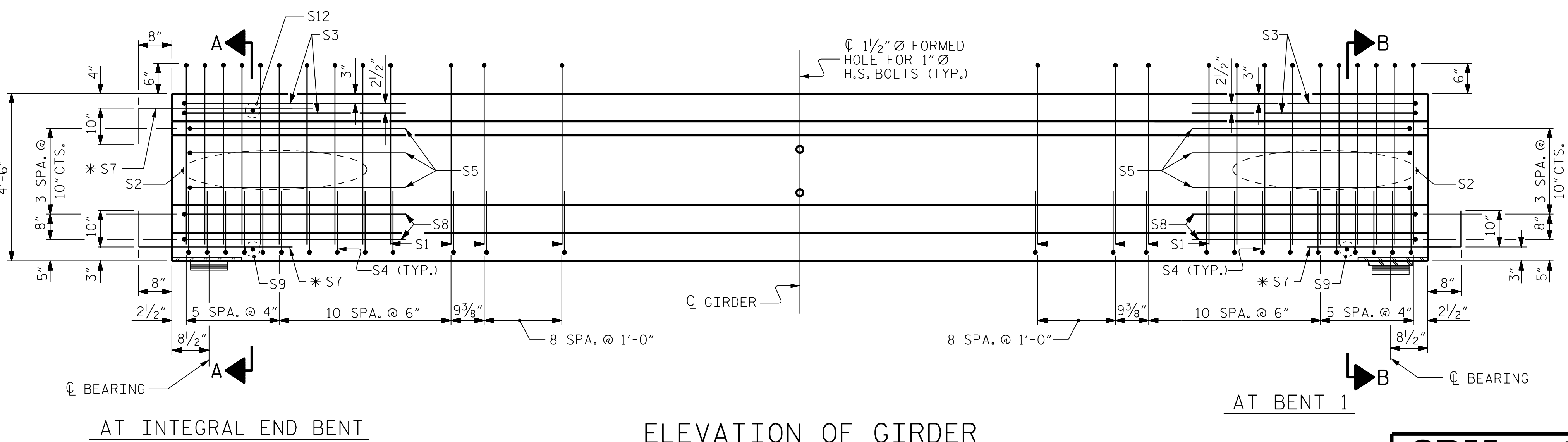
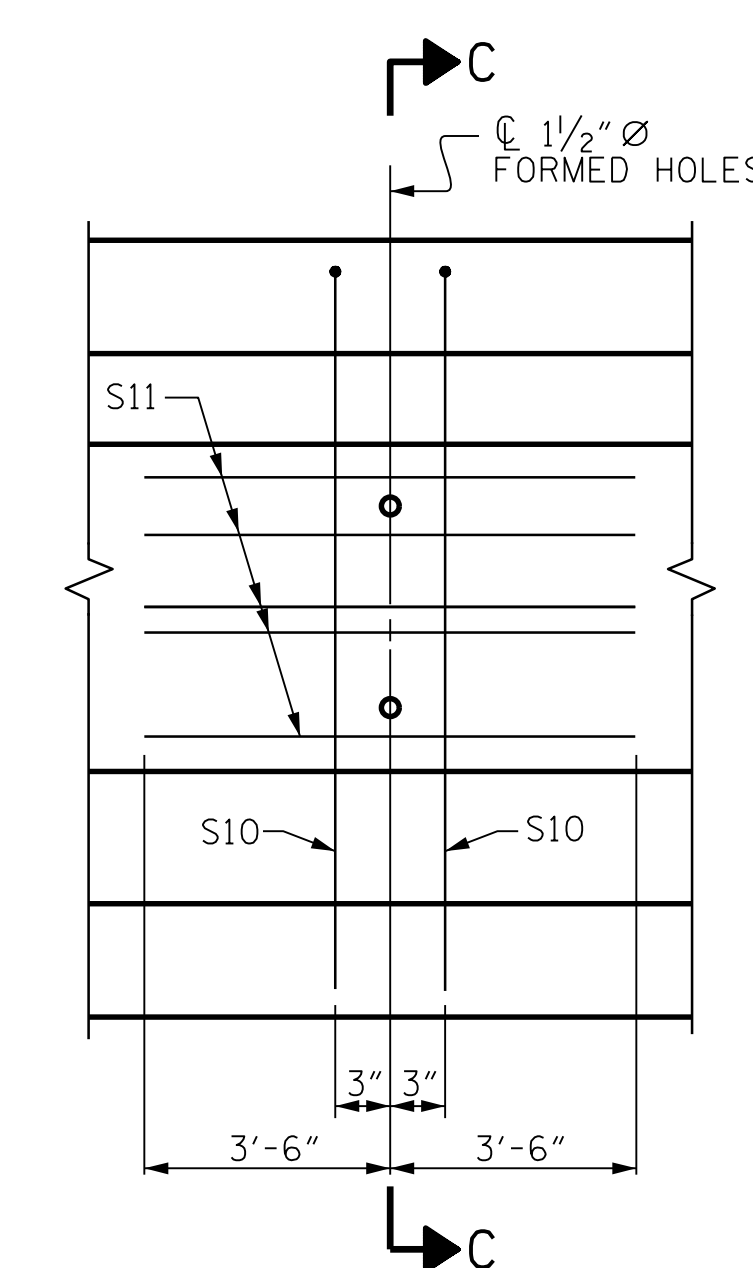
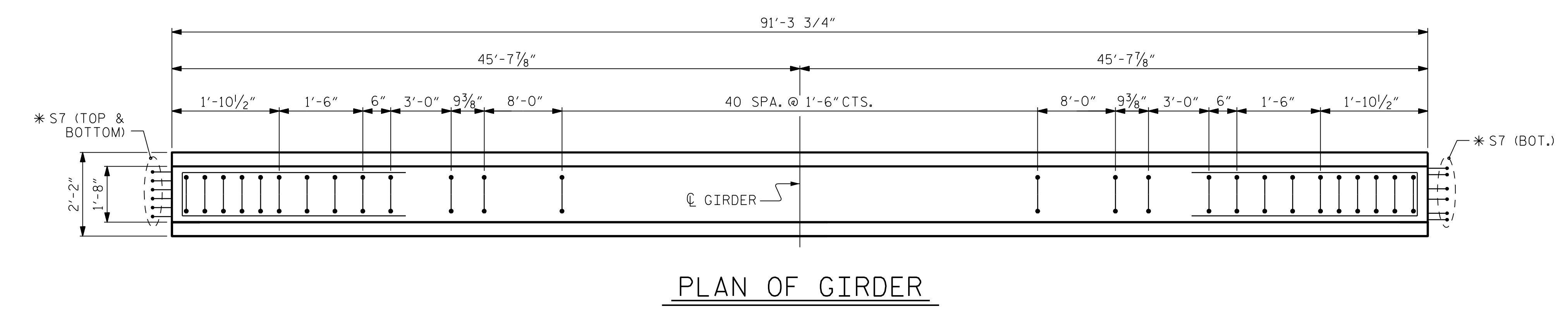
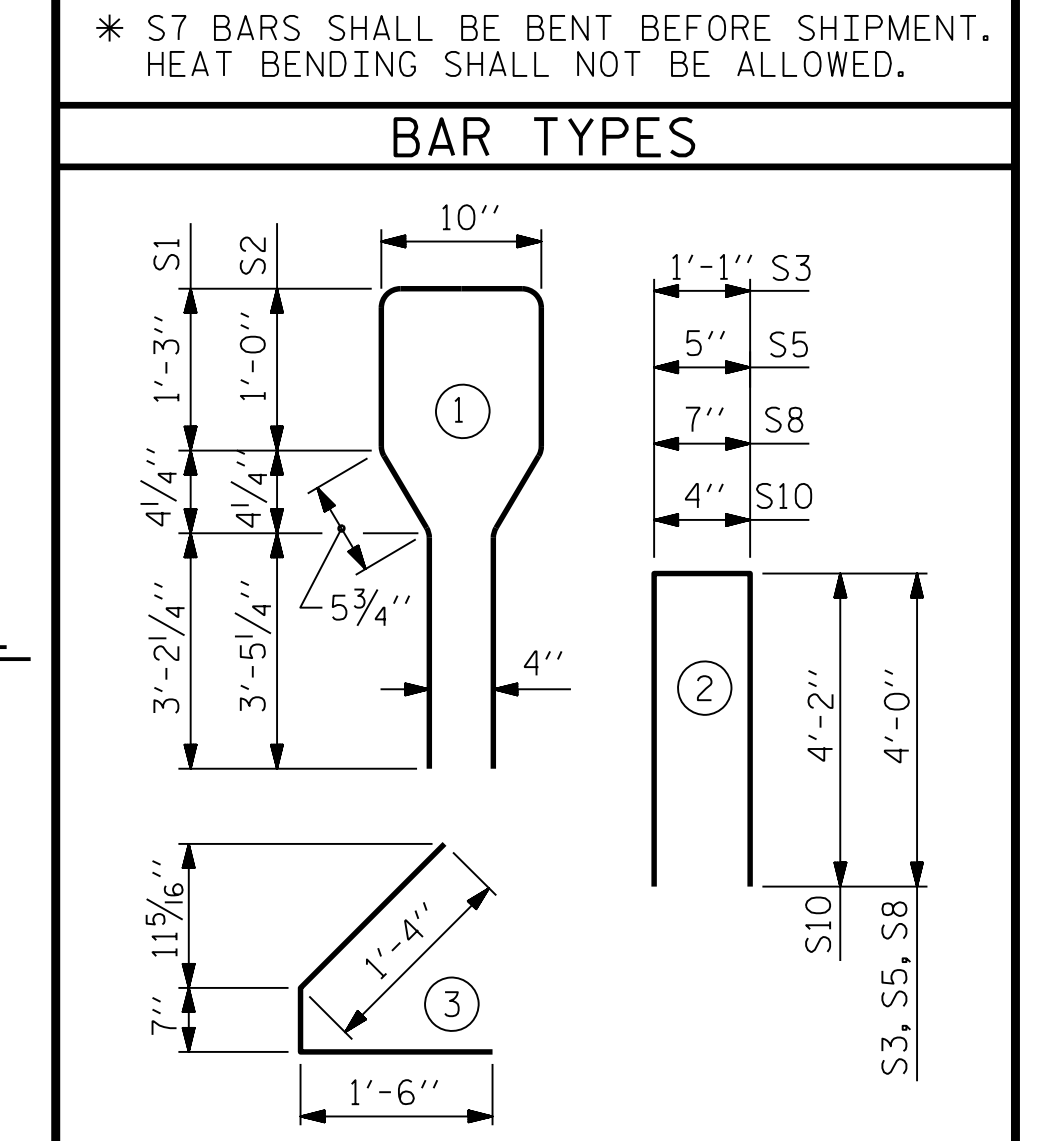
0.6" Ø L. R. GRADE 270 STRANDS

| AREA (SQUARE INCHES) | ULTIMATE STRENGTH (LBS. PER STRAND) | APPLIED PRESTRESS (LBS. PER STRAND) |
|----------------------|-------------------------------------|-------------------------------------|
| 0.217 | 58,600 | 43,950 |

REINFORCING STEEL FOR ONE GIRDER

| BAR | NUMBER | SIZE | TYPE | LENGTH | WEIGHT |
|-----|--------|------|------|--------|--------|
| S1 | 71 | #4 | 1 | 10'-8" | 506 |
| S2 | 18 | #6 | 1 | 10'-8" | 288 |
| S3 | 4 | #4 | 2 | 9'-1" | 24 |
| S4 | 100 | #4 | 3 | 3'-5" | 228 |
| S5 | 6 | #4 | 2 | 8'-5" | 34 |
| *S7 | 18 | #5 | STR | 3'-8" | 69 |
| S8 | 4 | #4 | 2 | 8'-7" | 23 |
| S9 | 2 | #3 | STR | 1'-10" | 1 |
| S10 | 2 | #5 | 2 | 8'-8" | 18 |
| S11 | 5 | #4 | STR | 7'-0" | 23 |
| S12 | 1 | #3 | STR | 1'-4" | 1 |

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



ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

| REINFORCING STEEL | 7,500 PSI CONCRETE | 0.6" Ø L. R. STRANDS |
|-------------------|--------------------|----------------------|
| LB. | C.Y. | No. |
| 1217 | 18.5 | 36 |

GIRDERS REQUIRED

| NUMBER | LENGTH | TOTAL LENGTH |
|--------|--------|--------------|
| SPAN A | 4 | 91.31 |
| SPAN B | 4 | 91.31 |
| TOTAL | 8 | 730.50 |

PROJECT NO. R-5752
ROBESON COUNTY
 STATION: 30+39.23 -Y-
 SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 AASHTO TYPE IV
 PRESTRESSED CONCRETE GIRDER
 CONTINUOUS FOR LIVE LOAD
 SPANS A & B

REVISIONS

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

SHEET NO. **S-10**
 TOTAL SHEETS **24**

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 NC COA No. F-1255

DRAWN BY: A.L. STROUD DATE: 03/17
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 DESIGN ENGINEER: J.B. TAYLOR DATE: 03/17

DWG. No.

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7/10/2017

SEAL
 33698
 ENGINEER
 JOSHUA B. TAYLOR

DocuSigned by: Joshua B. Taylor

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 DATE: 7/10/2017 2:10:59 PM

STRUCTURAL STEEL NOTES

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

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

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

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

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

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

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

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

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

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

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

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

PRESTRESSED CONCRETE GIRDER NOTES

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

EMBEDDED PLATE "B-1" SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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

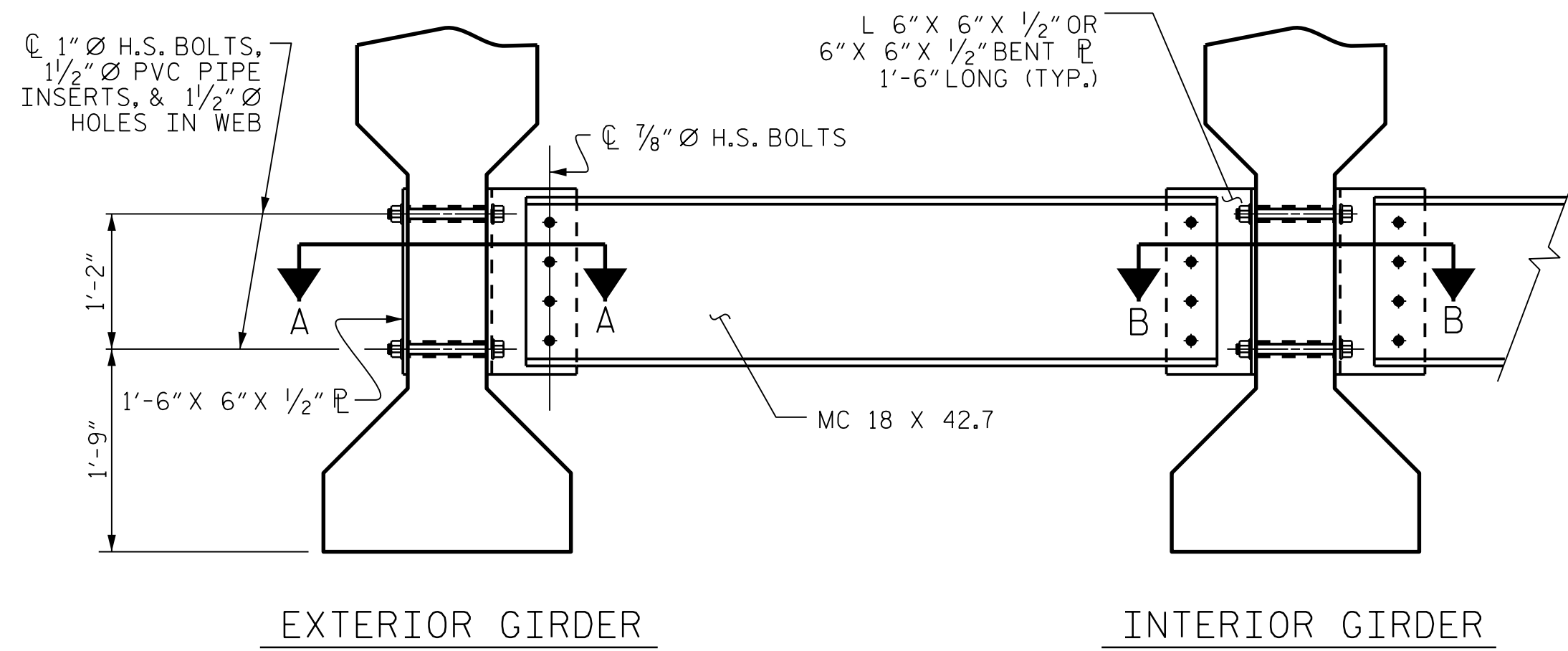
AT ENDS OF GIRDERS TO BE EMBEDDED IN CONCRETE DIAPHRAGMS OR END WALLS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER ENDS. OTHERWISE, PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6000 PSI.

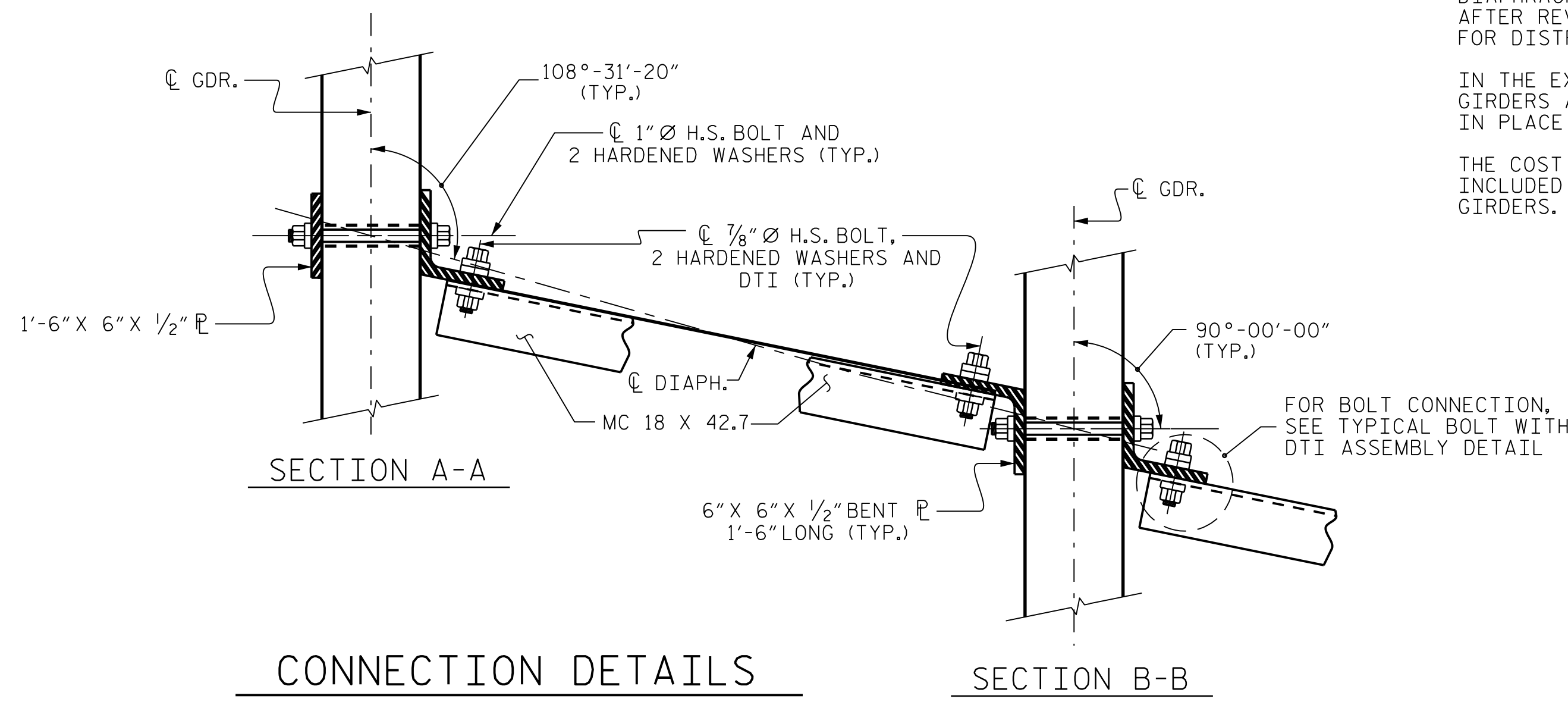
DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

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

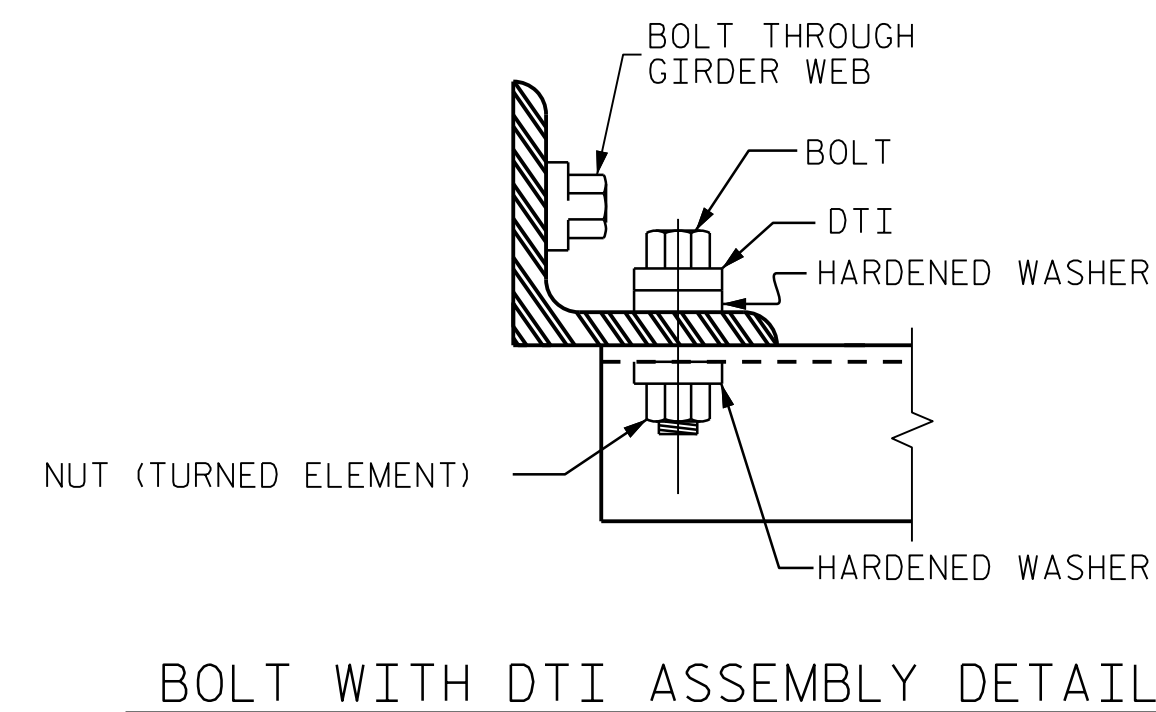
FOR EMBEDDED CLIPS FOR PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS.



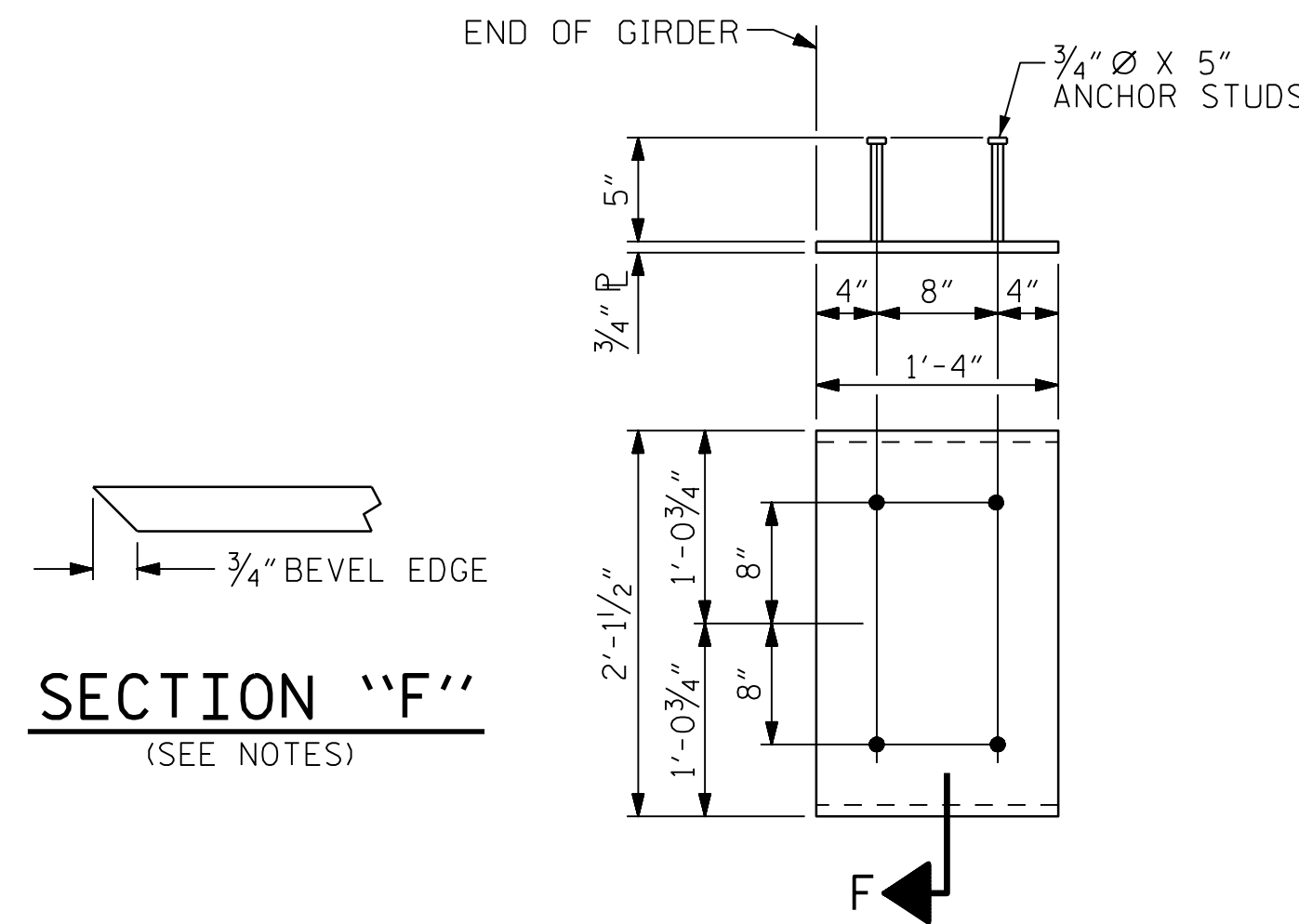
PART SECTION AT INTERMEDIATE DIAPHRAGM



CONNECTION DETAILS

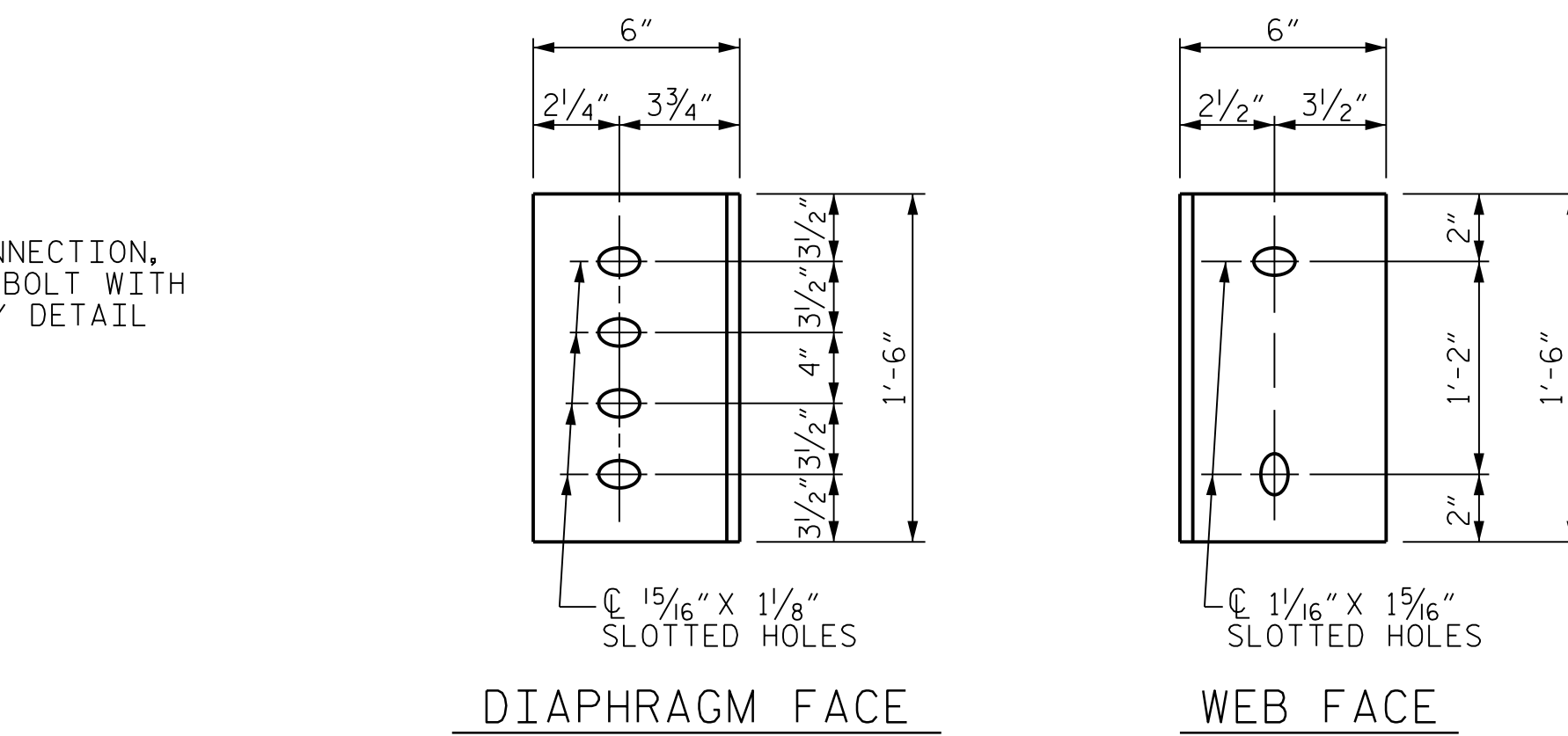


BOLT WITH DTI ASSEMBLY DETAIL



EMBEDDED PLATE "B-1" DETAILS

(2 REQ'D PER GIRDER)



CONNECTOR PLATE DETAILS

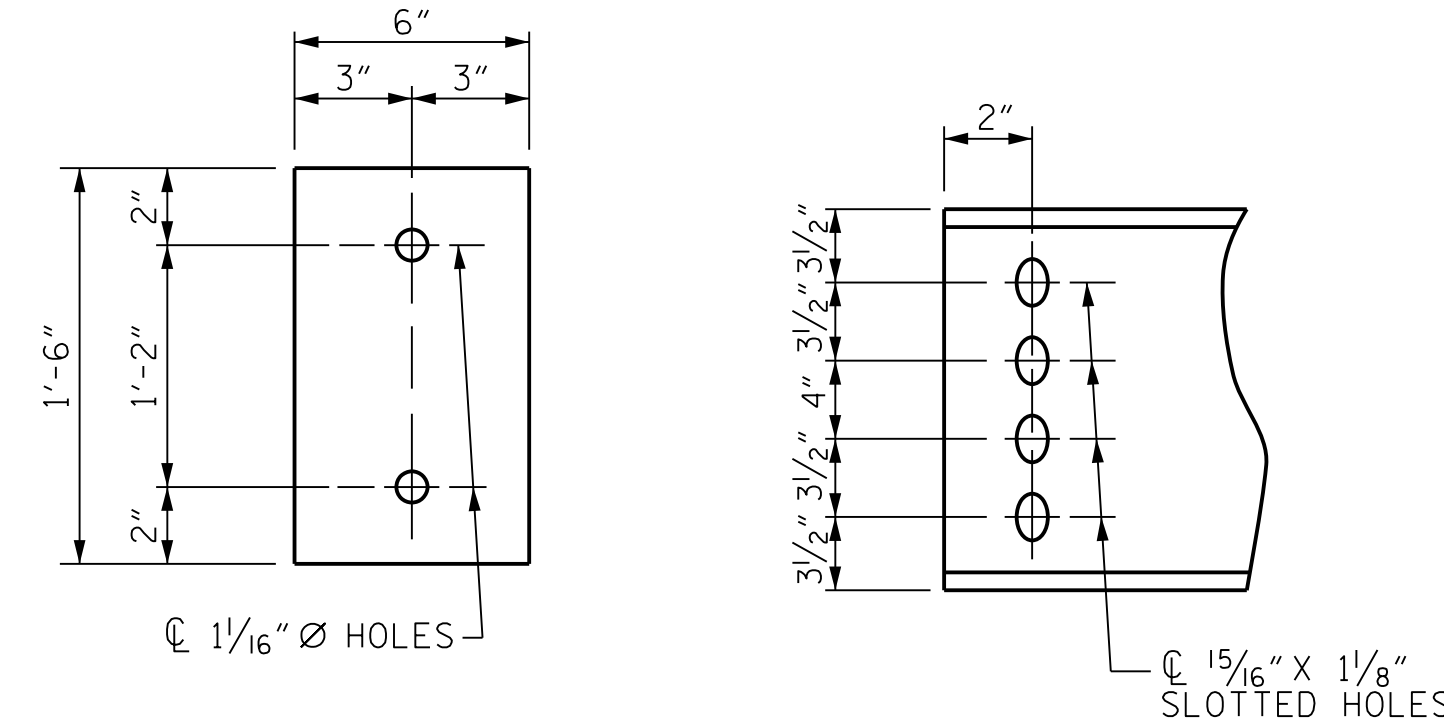
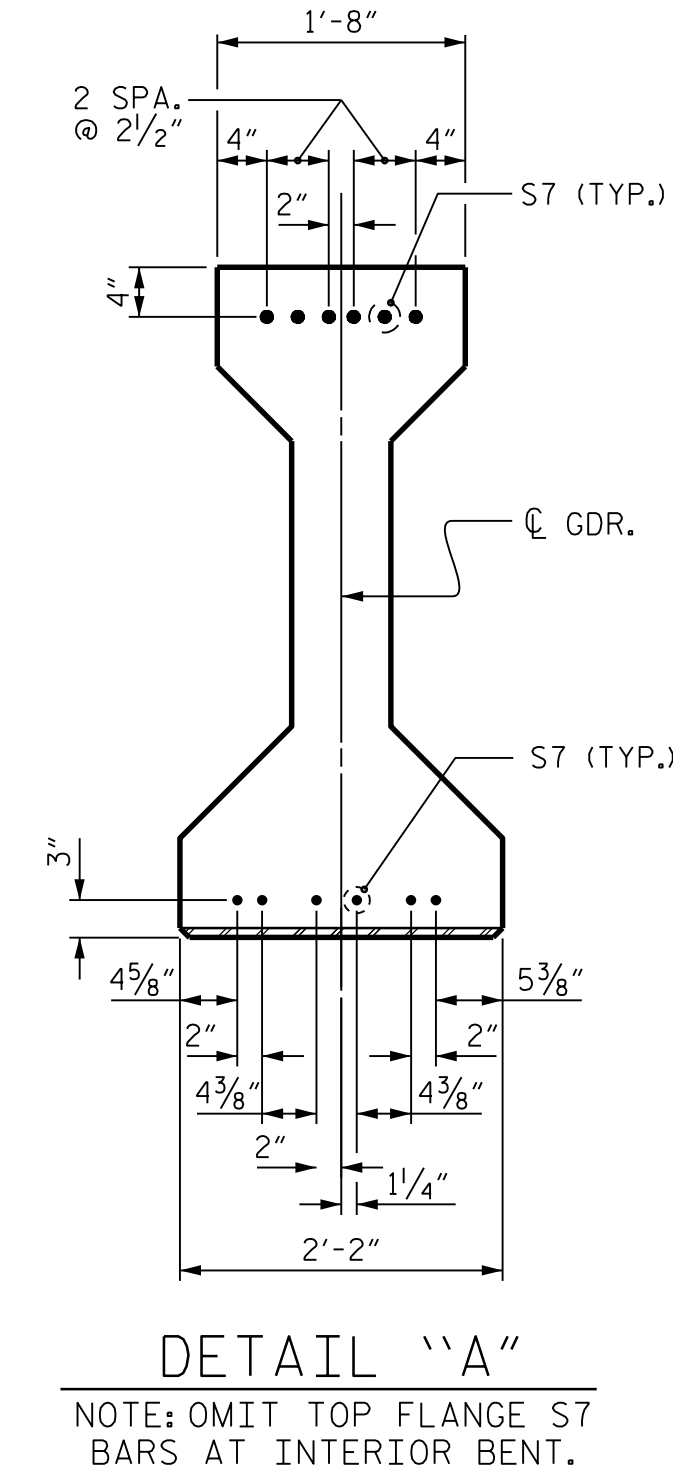


PLATE DETAILS CHANNEL END



DETAIL "A"
NOTE: OMIT TOP FLANGE S7 BARS AT INTERIOR BENT.

PROJECT NO. R-5752
ROBESON COUNTY
STATION: 30+39.23 -Y-

SHEET 2 OF 2

| | | | | | |
|--|-----|-------|-----|--------------|-------|
| STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH STANDARD | | | | | |
| CONTINUOUS FOR LIVE LOAD DETAILS & INTERMEDIATE STEEL DIAPHRAGMS | | | | | |
| REVISIONS | | | | | |
| NO. | BY: | DATE: | NO. | BY: | DATE: |
| 1 | | | 3 | | |
| 2 | | | 4 | | |
| | | | | SHEET NO. | S-11 |
| | | | | TOTAL SHEETS | 24 |

CDM Smith
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Raleigh, NC 27612-3228
NC COA No. F-1255

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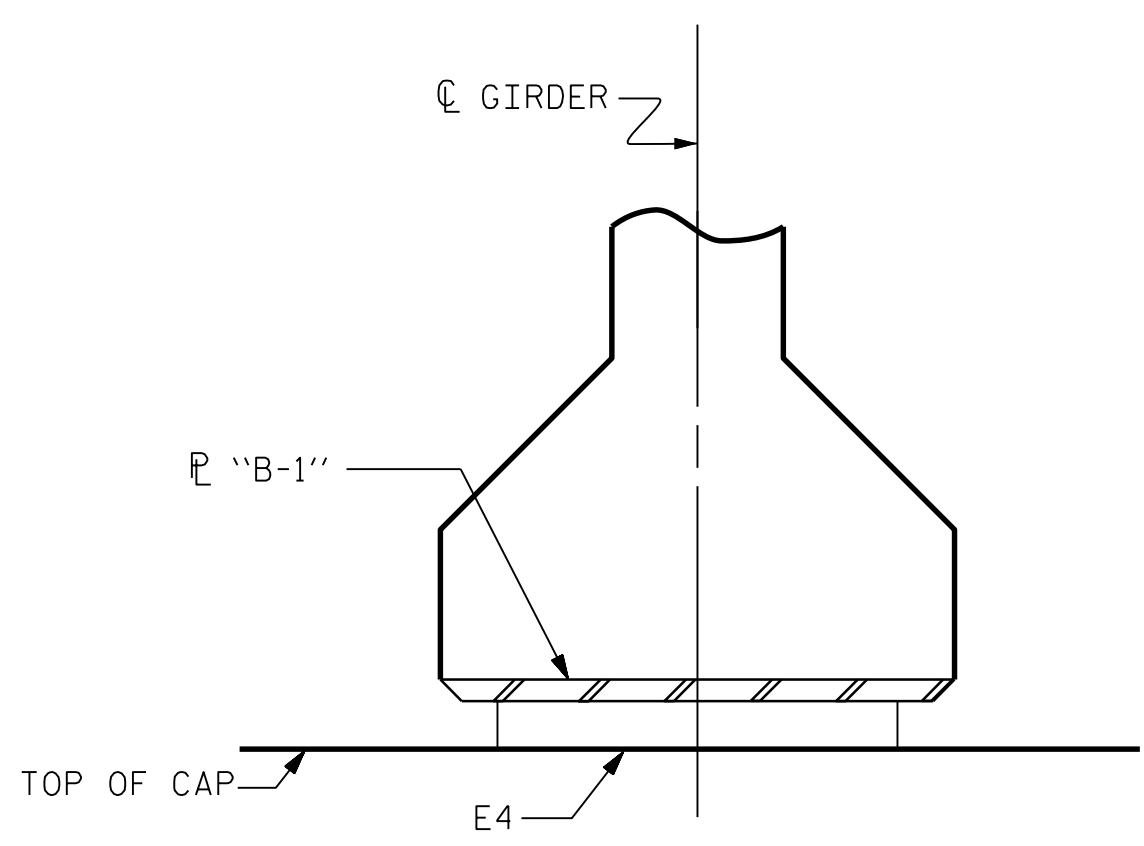
PROFESSIONAL SEAL
33698
ENGINEER
JOSHUA B. TAYLOR

Joshua B. Taylor

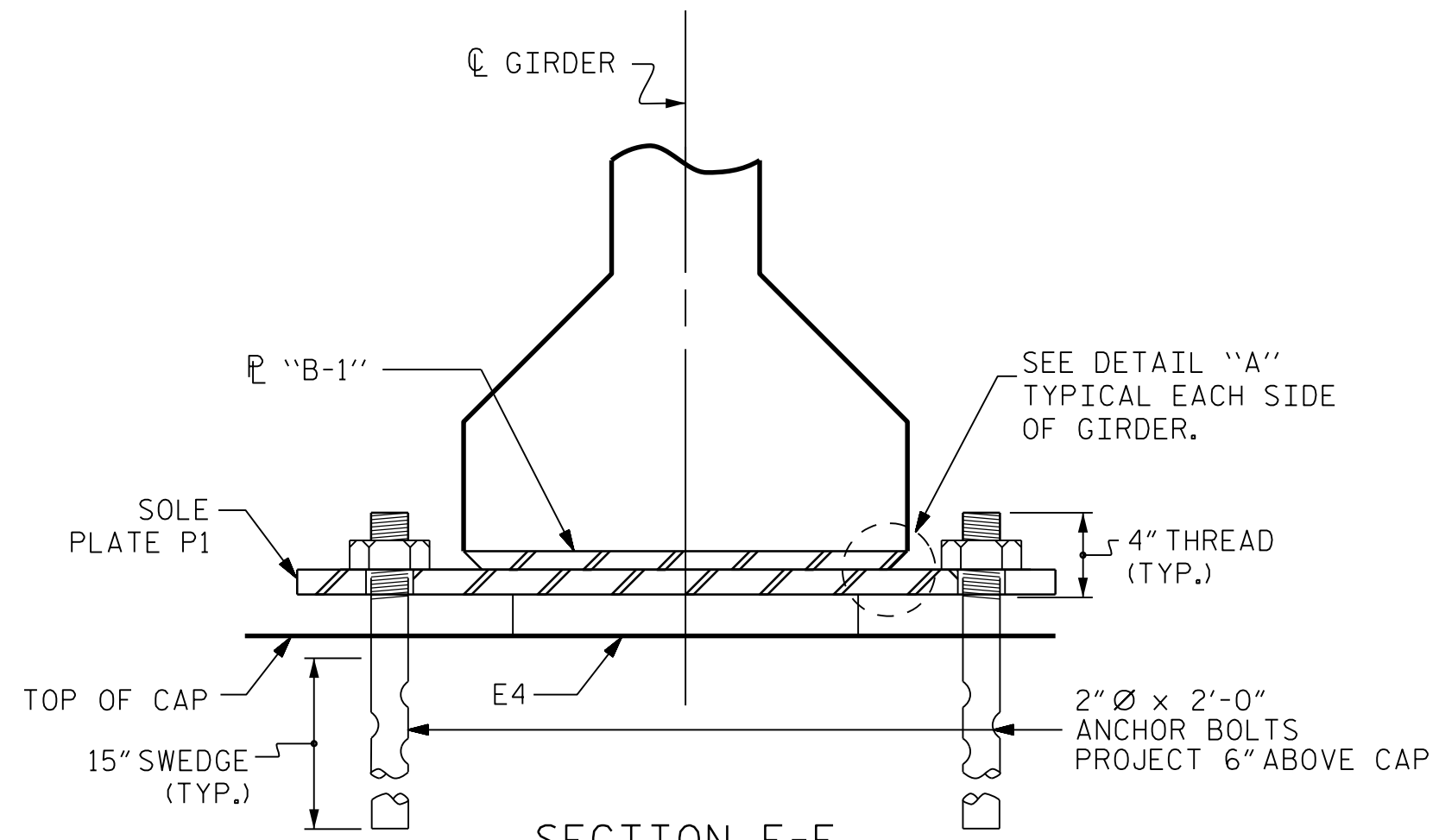
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CHECKED BY : J.B. TAYLOR DATE : 03/17
DESIGN ENGINEER : J.B. TAYLOR DATE : 03/17

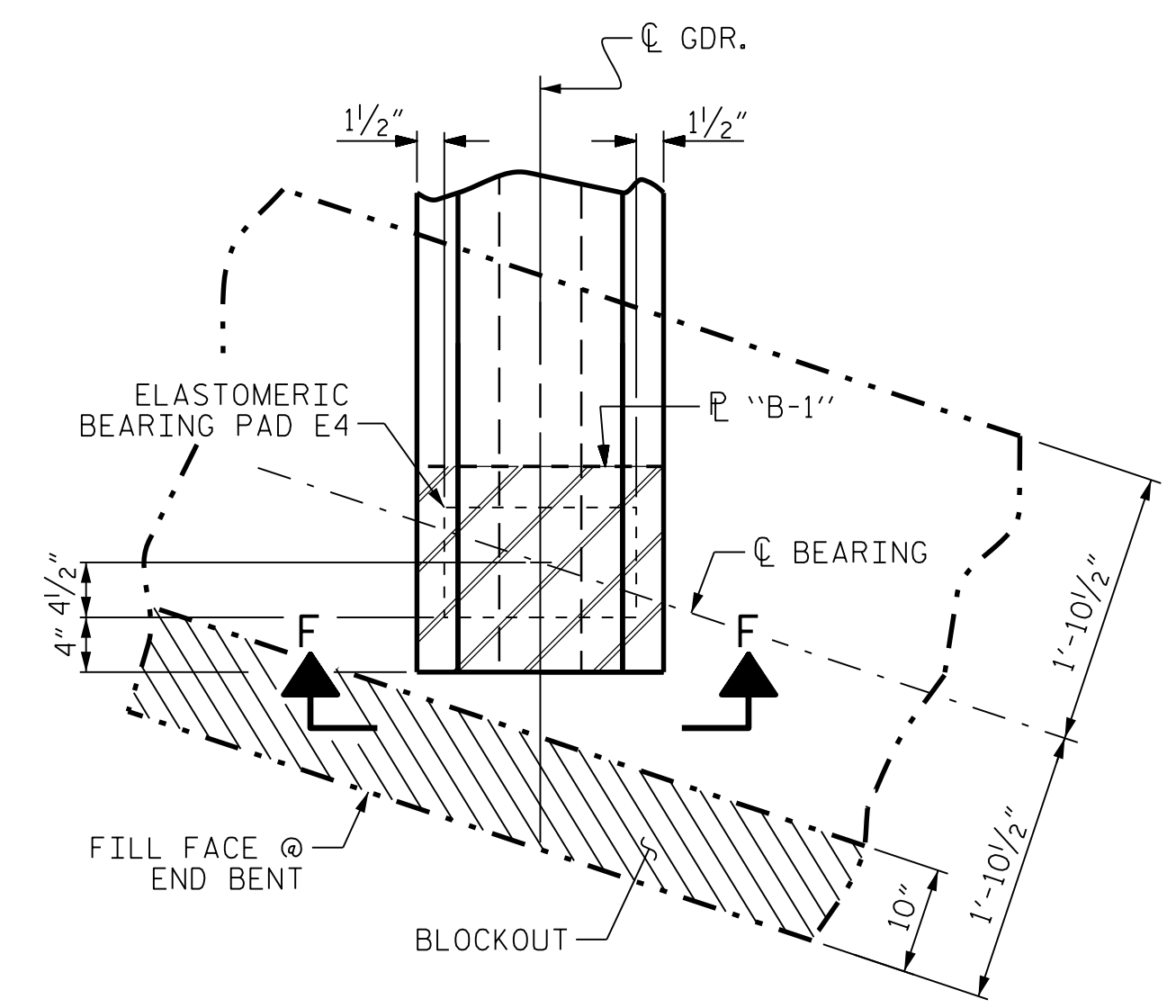
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| CHECKED BY : | VAP | 3/95 | REV. 5/1/06RR | KMM/GM |
| | | | REV. 10/1/11 | MAA/GM |



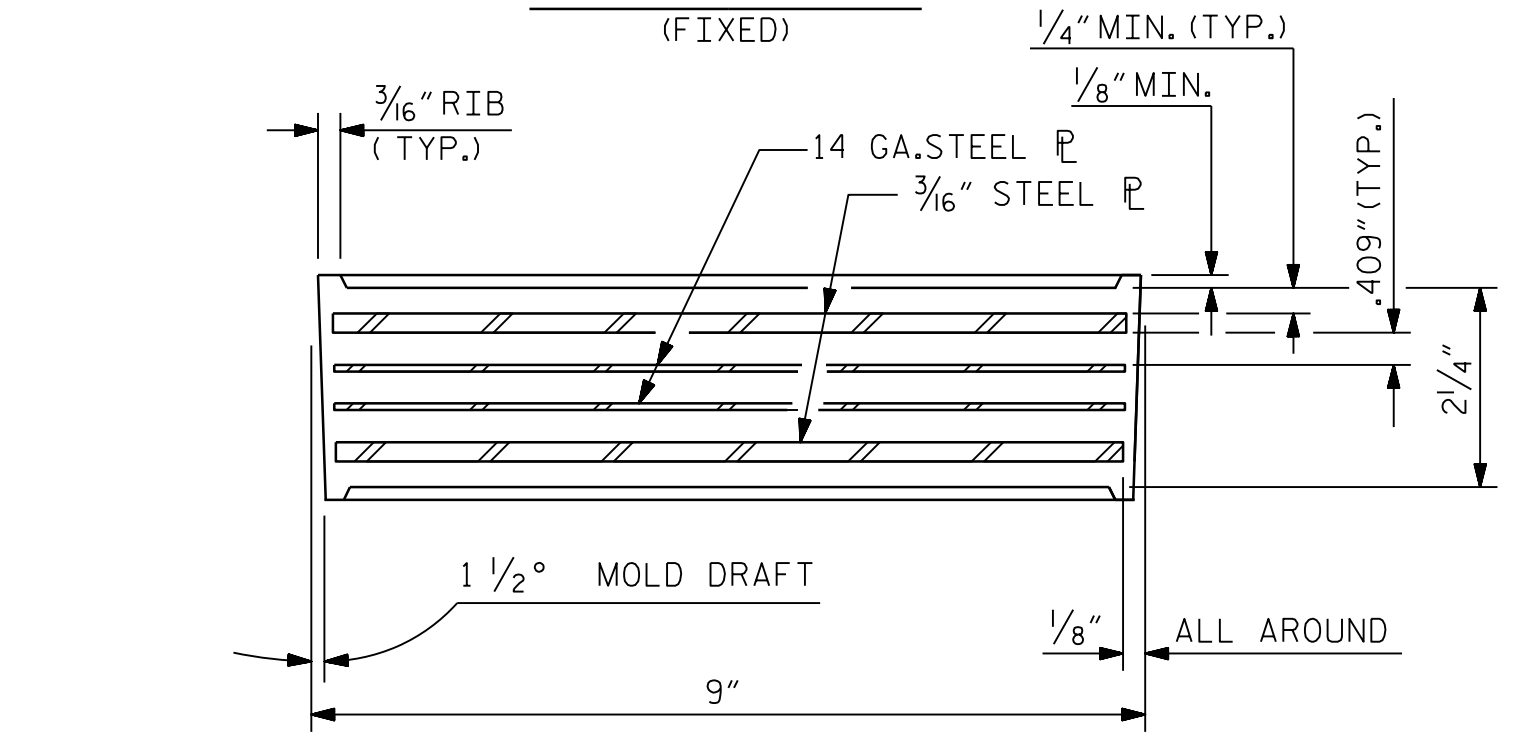
SECTION F-F
(AT INTEGRAL END BENT)



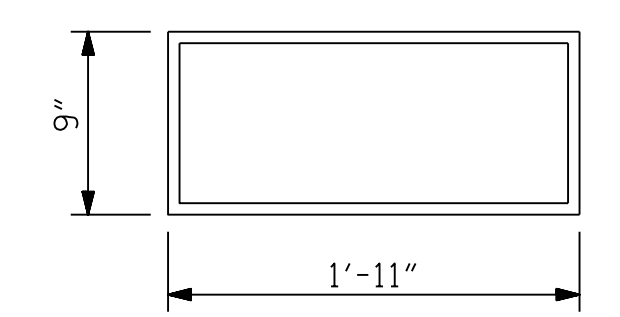
SECTION E-E
(FIXED)



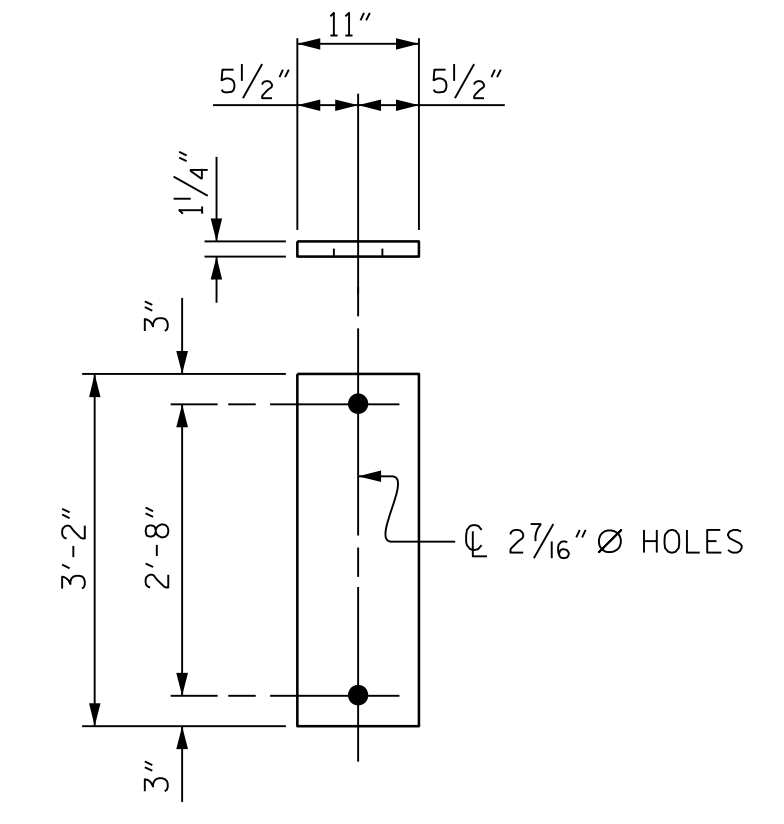
TYPICAL PLAN @ END BENT
(INTEGRAL)
E4 (8 REQ'D)



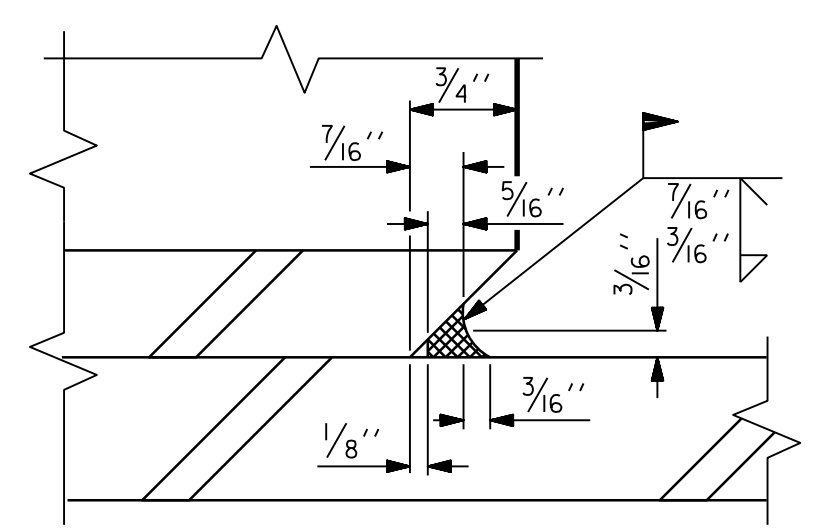
TYPICAL SECTION OF ELASTOMERIC BEARING PAD E4



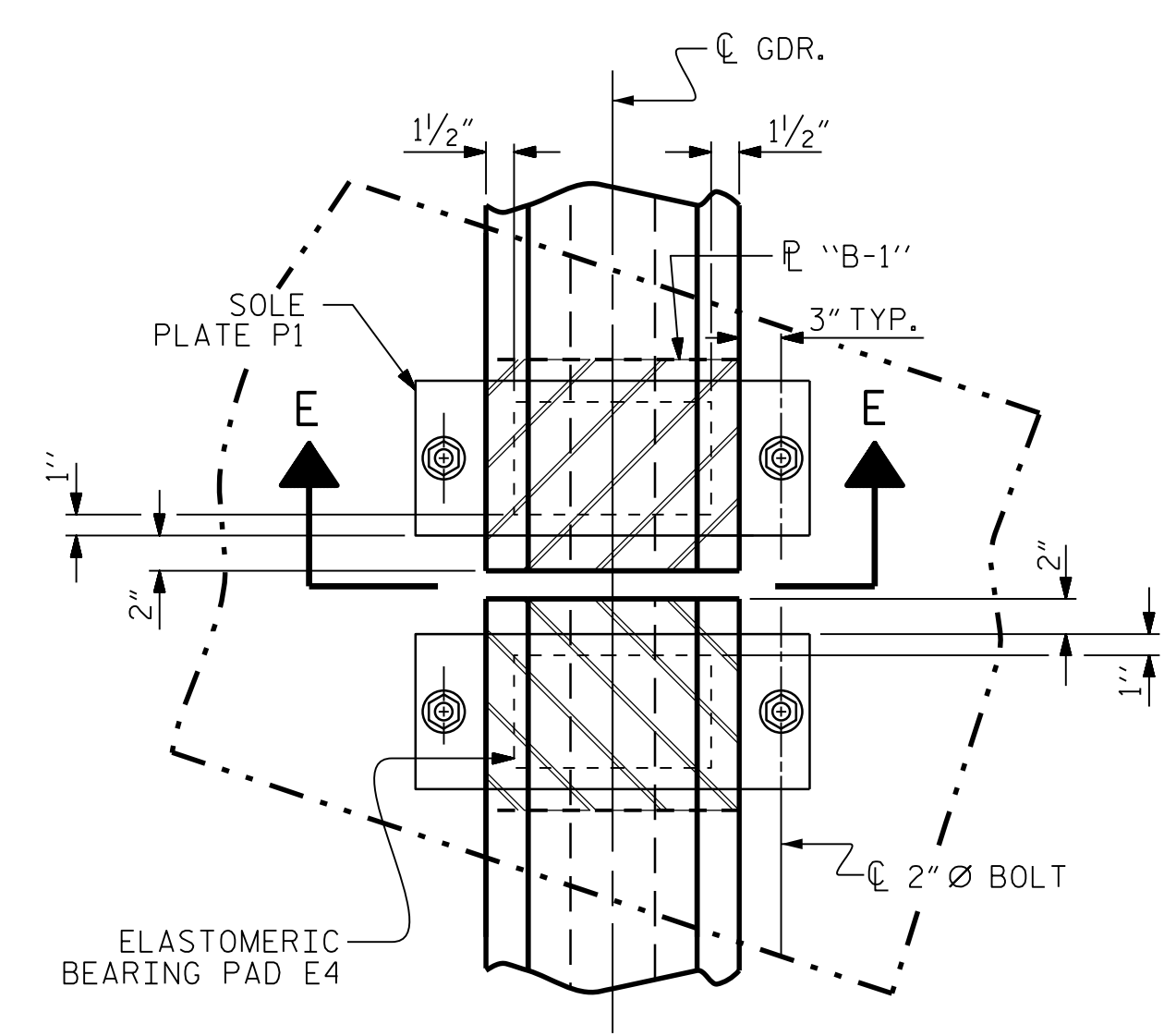
PLAN VIEW OF ELASTOMERIC BEARING PAD E4
TYPE V



P 1
(FIXED)
(8 REQ'D)
SOLE PLATE DETAILS



DETAIL "A"



TYPICAL PLAN @ BENT 1
E4 (8 REQ'D)

NOTES

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF 1/2 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

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

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

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

SOLE PLATE "P1", BOLTS, NUTS, AND WASHERS SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

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

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

| -- LOAD RATINGS -- | |
|--------------------|------------------------|
| TYPE V | MAX.D.L.+L.L. 365 K |

PROJECT NO. R-5752
ROBESON COUNTY
 STATION: 30+39.23 -Y-

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

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7/10/2017

SEAL
33698
ENGINEER
JOSHUA B. TAYLOR

DocuSigned by:
Joshua B. Taylor

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 NC COA No. F-1255

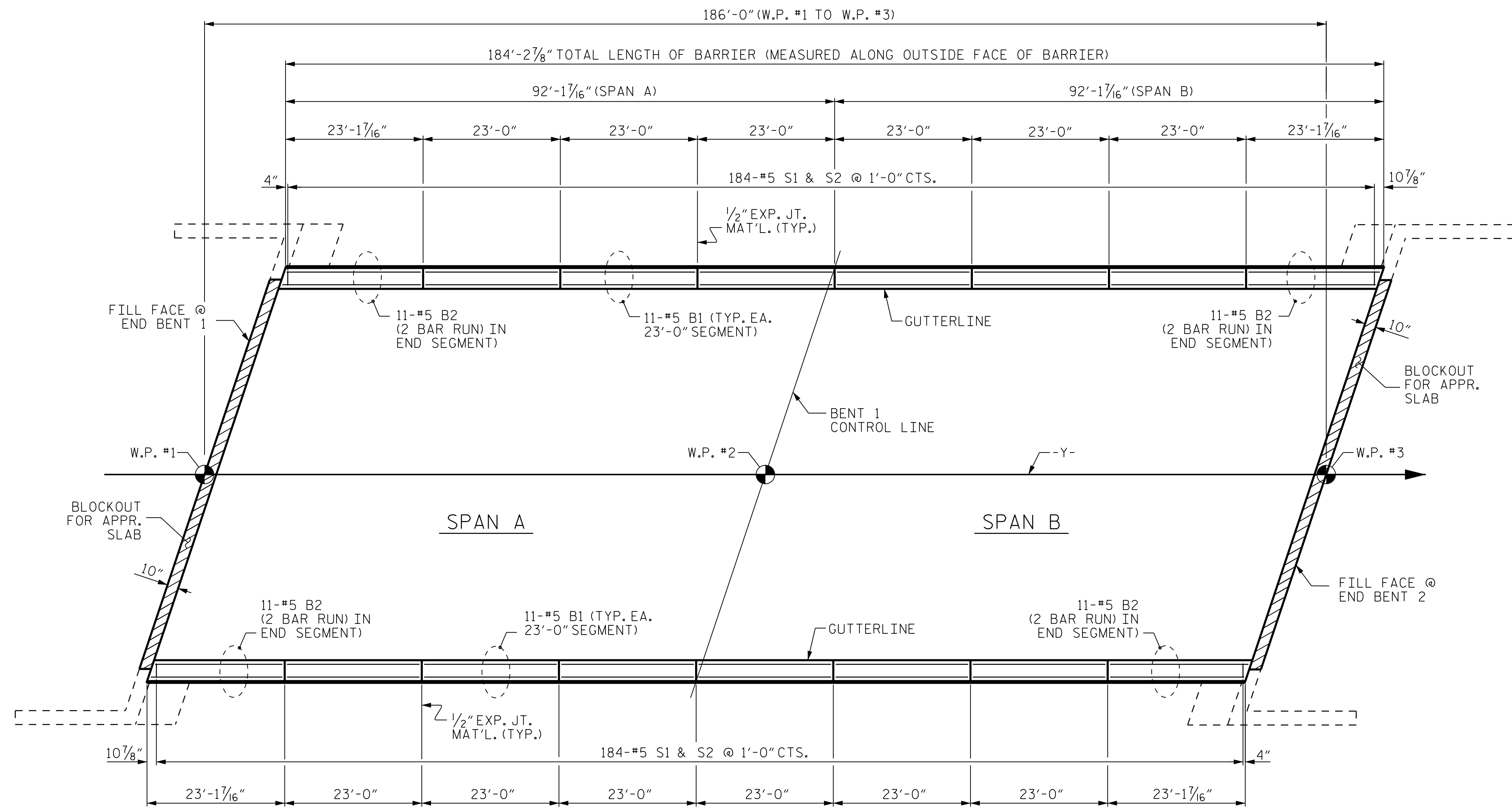
DRAWN BY: A.L. STROUD DATE: 03/17
 CHECKED BY: J.B. TAYLOR DATE: 03/17
 DESIGN ENGINEER: J.B. TAYLOR DATE: 03/17

DWG. No.

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-12 |
| 1 | | | 3 | | | TOTAL SHEETS |
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DRAWN BY: EEM 2/97
 CHECKED BY: VAP 2/97
 REV. 10/1/11 MAA/GM
 REV. 6/13 AAC/MAA
 REV. 1/15 MAA/TMG



PLAN OF CONCRETE BARRIER RAIL

ALL DIMENSIONS ARE MEASURED ALONG OUTSIDE FACE OF BARRIER RAIL.

PROJECT NO. R-5752
ROBESON COUNTY
 STATION: 30+39.23 -Y-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE

CONCRETE
 BARRIER RAIL

REVISIONS

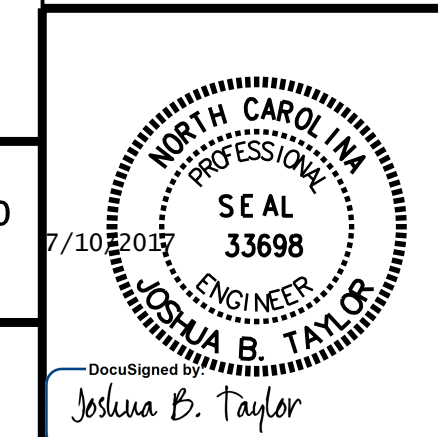
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|-----|-----|-------|-----|-----|-------|-----------------|
| 1 | | | 3 | | | S-13 |
| 2 | | | 4 | | | TOTAL SHEETS 24 |

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 NC COA No. F-1255

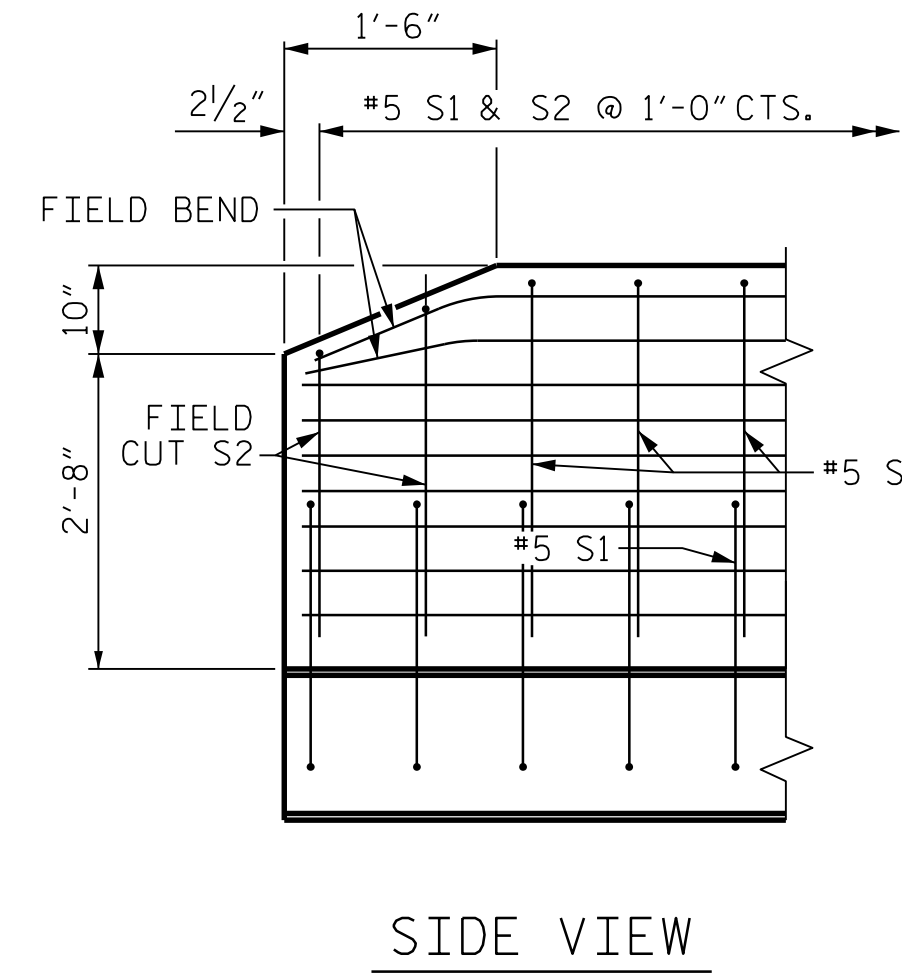
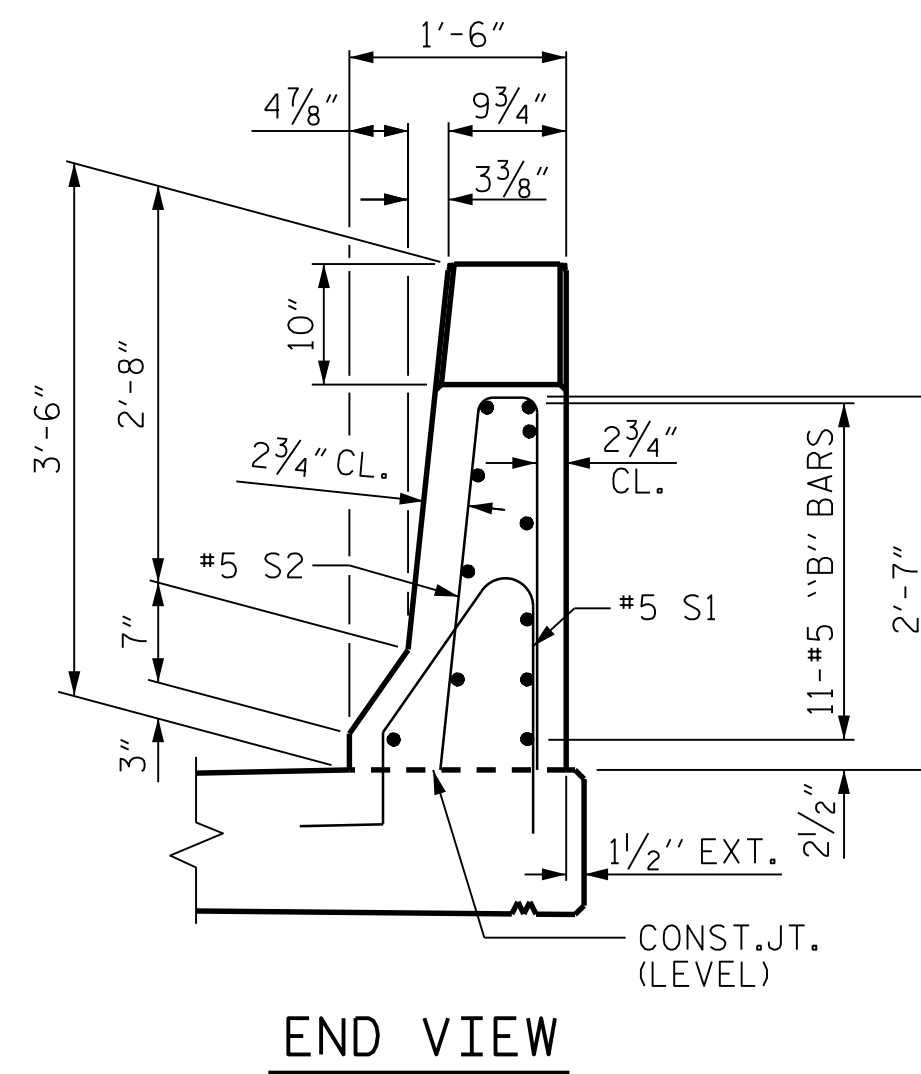
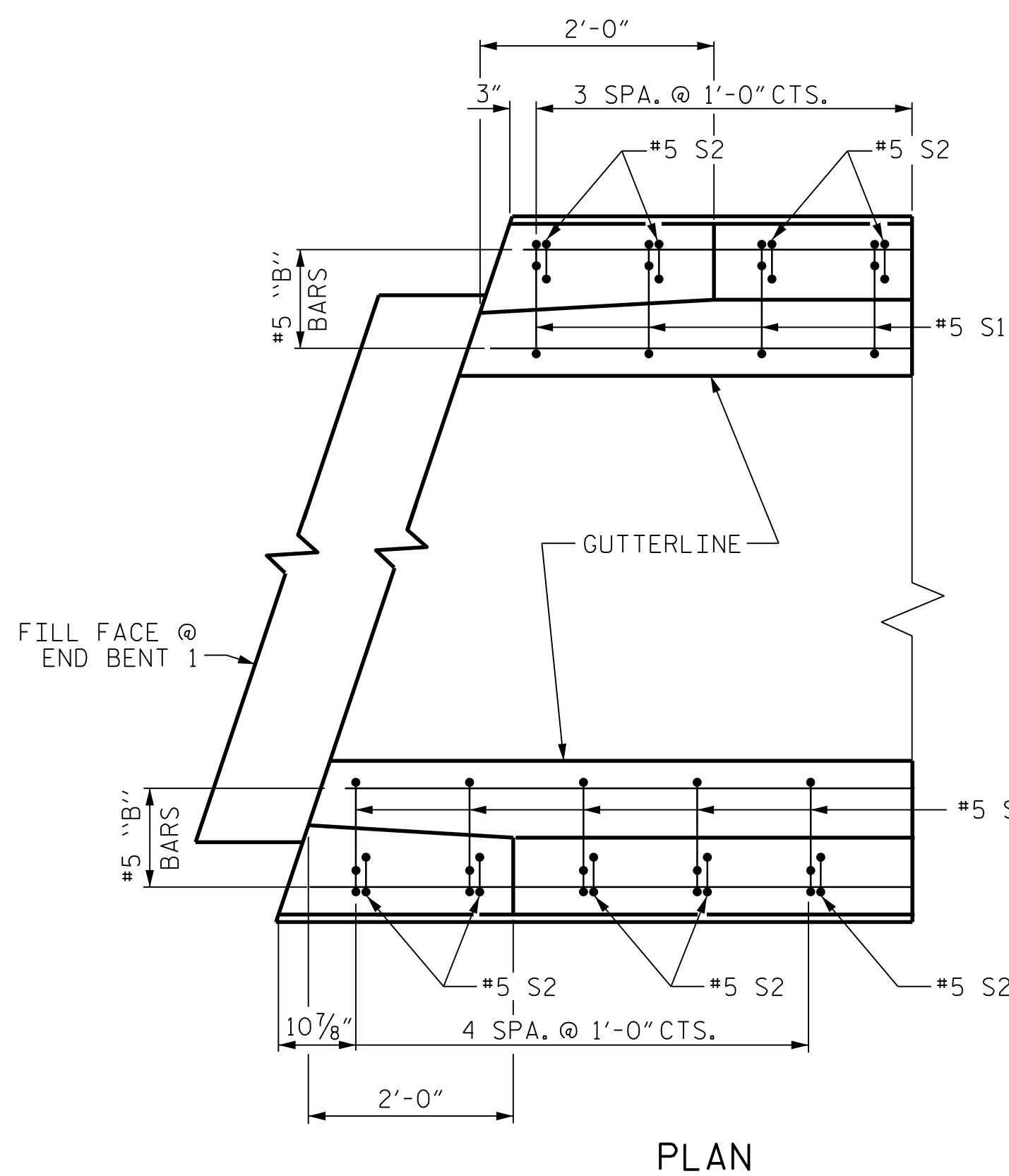
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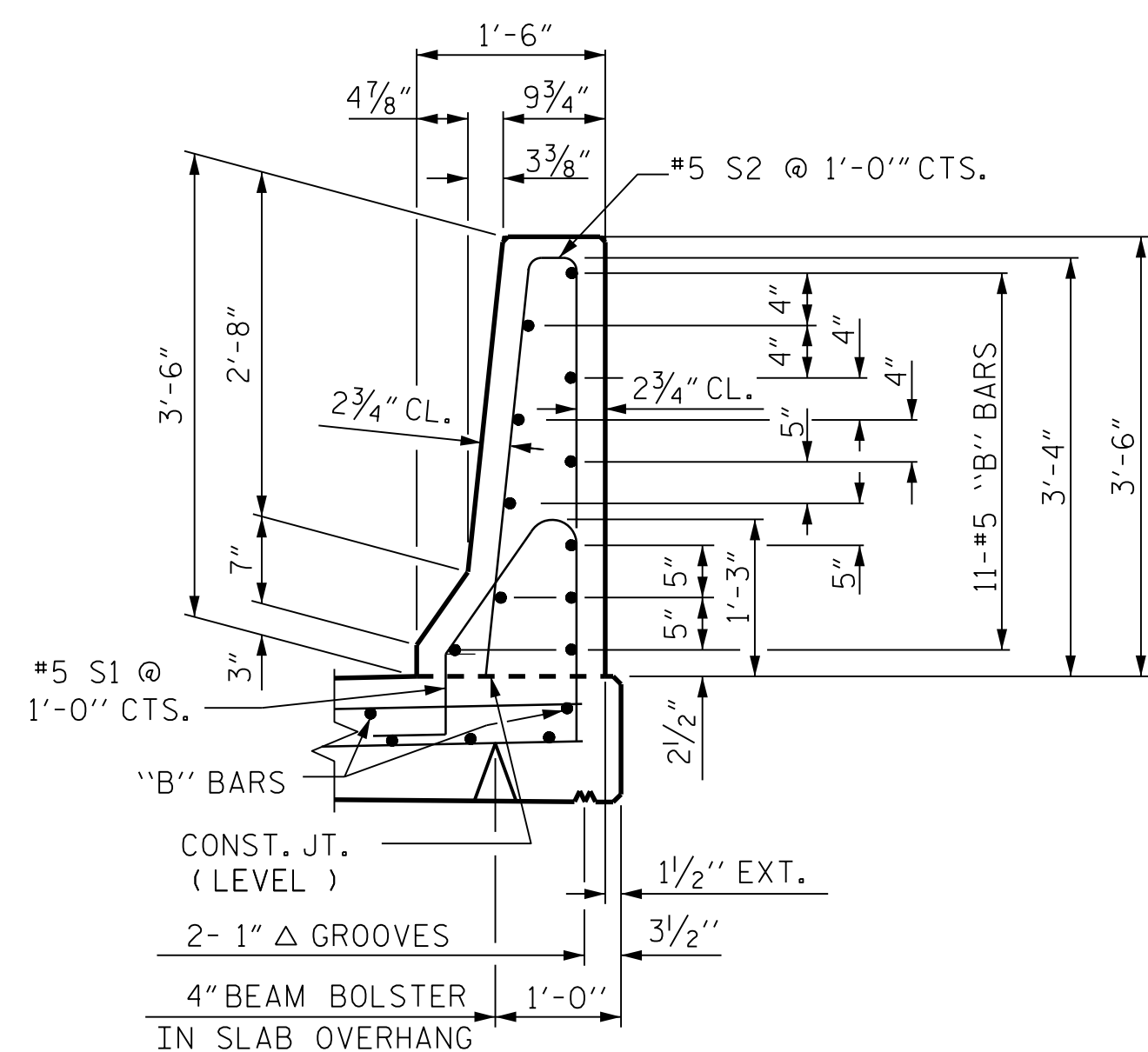
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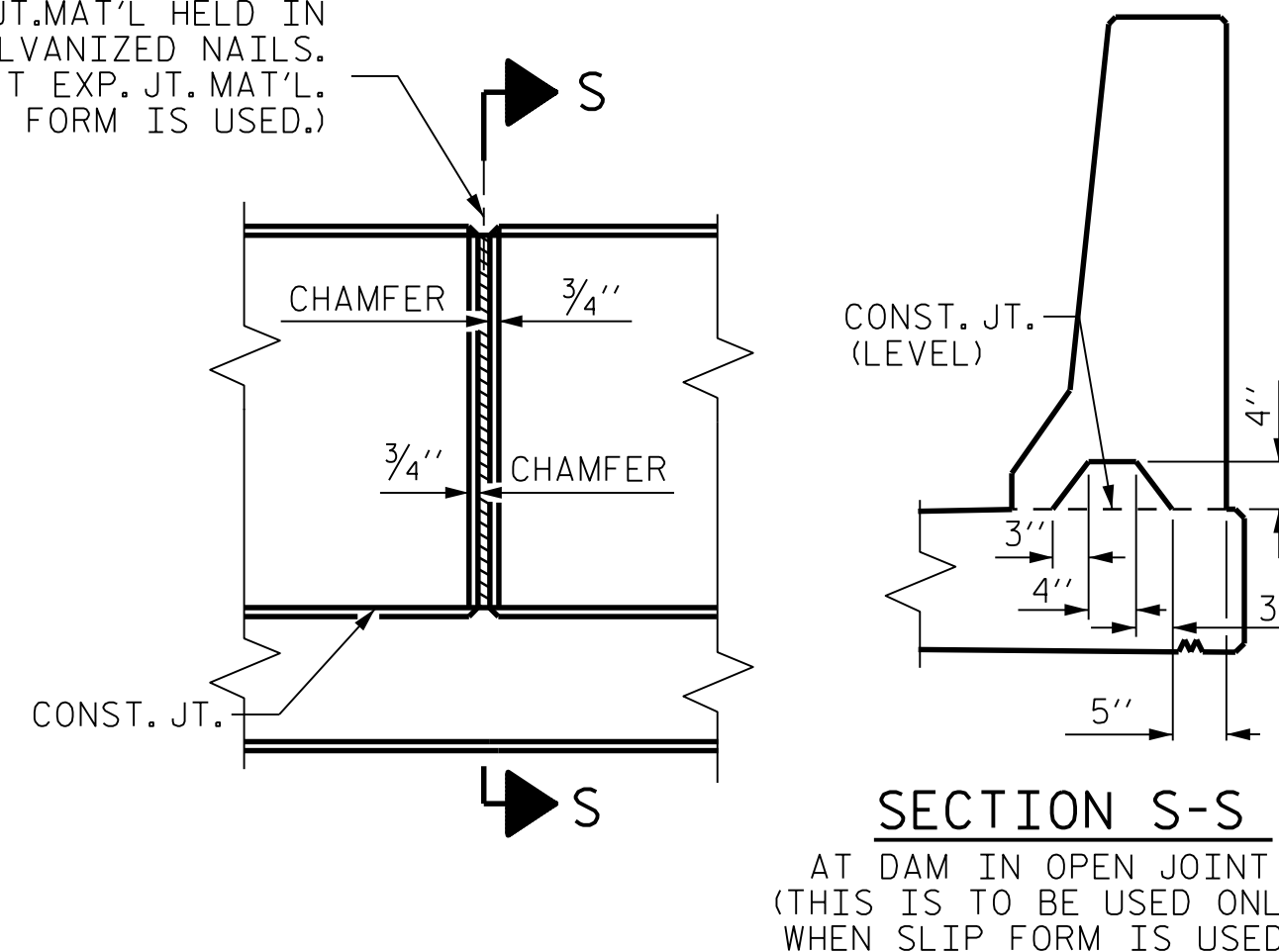
DocuSigned by:
 Joshua B. Taylor



END OF RAIL DETAILS



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



BARRIER RAIL DETAILS

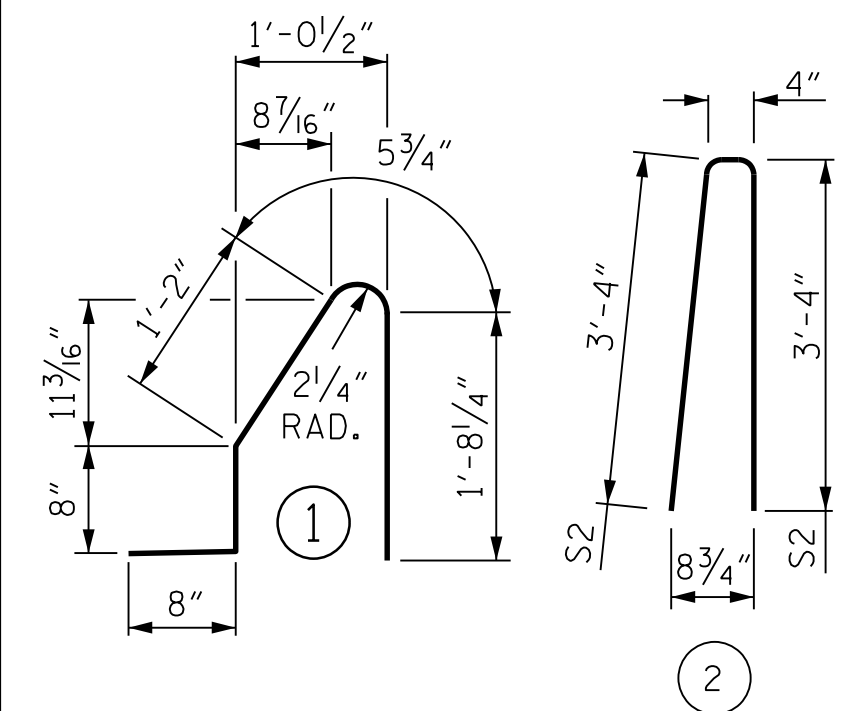
NOTES

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|------|-----|------|------|--------|--------|
| * B1 | 132 | #5 | STR | 22'-8" | 3121 |
| * B2 | 88 | #5 | STR | 13'-4" | 1224 |
| * S1 | 368 | #5 | 1 | 4'-8" | 1791 |
| * S2 | 368 | #5 | 2 | 7'-0" | 2687 |

| | |
|----------------------------------|-----------------|
| * EPOXY COATED REINFORCING STEEL | 8822 LBS. |
| CLASS AA CONCRETE | 50.0 CU. YDS. |
| CONCRETE BARRIER RAIL | 368.48 LIN. FT. |

PROJECT NO. R-5752
ROBESON COUNTY
 STATION: 30+39.23 -Y-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 CONCRETE
 BARRIER RAIL

REVISIONS

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

SHEET NO.
S-14
 TOTAL SHEETS
24

CDM Smith
 CDM SMITH
 5400 Glenwood Avenue, Suite 400
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 NC COA No. F-1255

DWG. No.
 DRAWN BY: A.L. STROUD DATE: 03/17
 CHECKED BY: J.B. TAYLOR DATE: 03/17
 DESIGN ENGINEER: J.B. TAYLOR DATE: 03/17

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3/30/2017
 SEAL
 33698
 ENGINEER
 JOSHUA B. TAYLOR

Joshua B. Taylor

NOTES

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

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

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

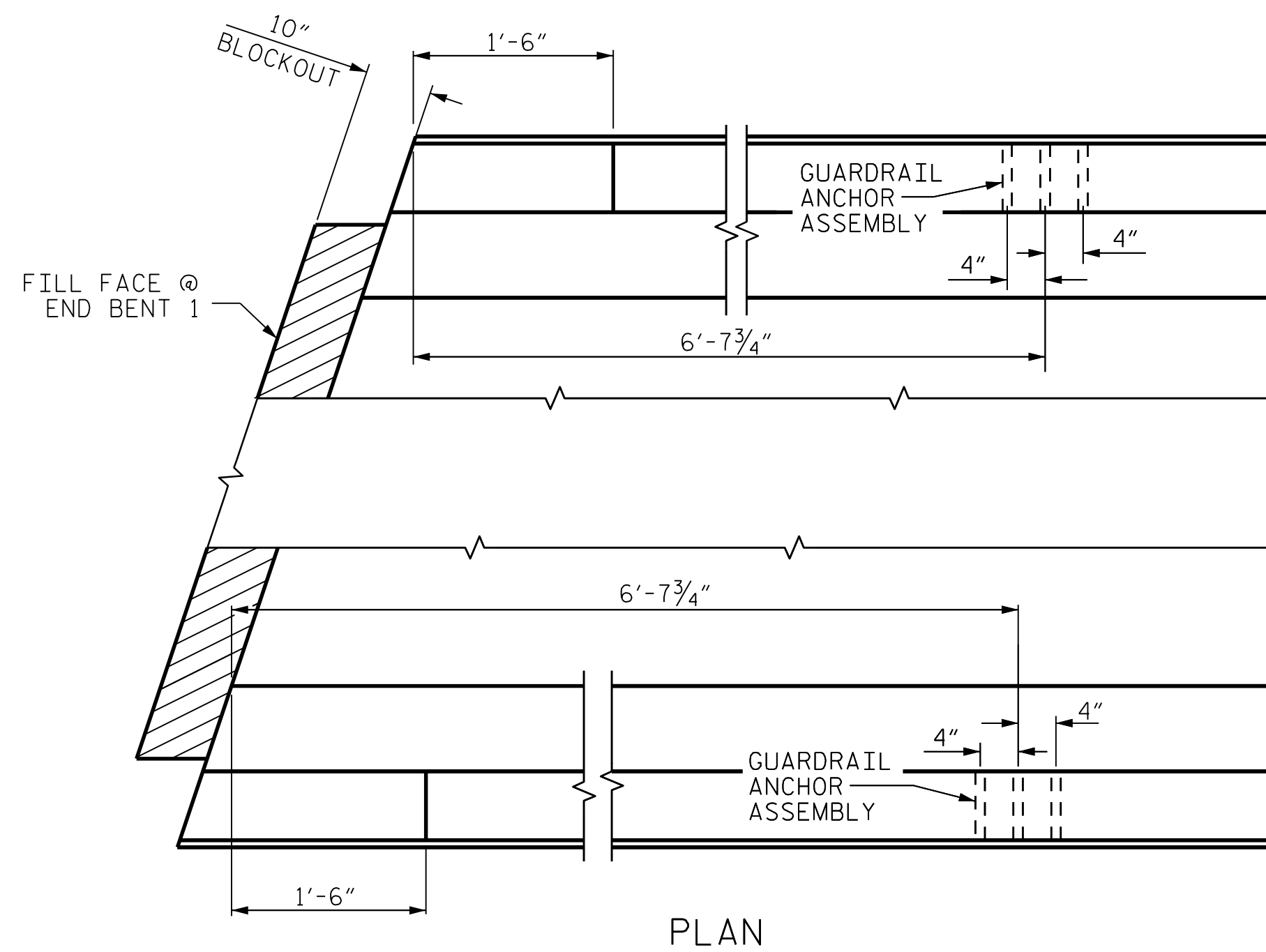
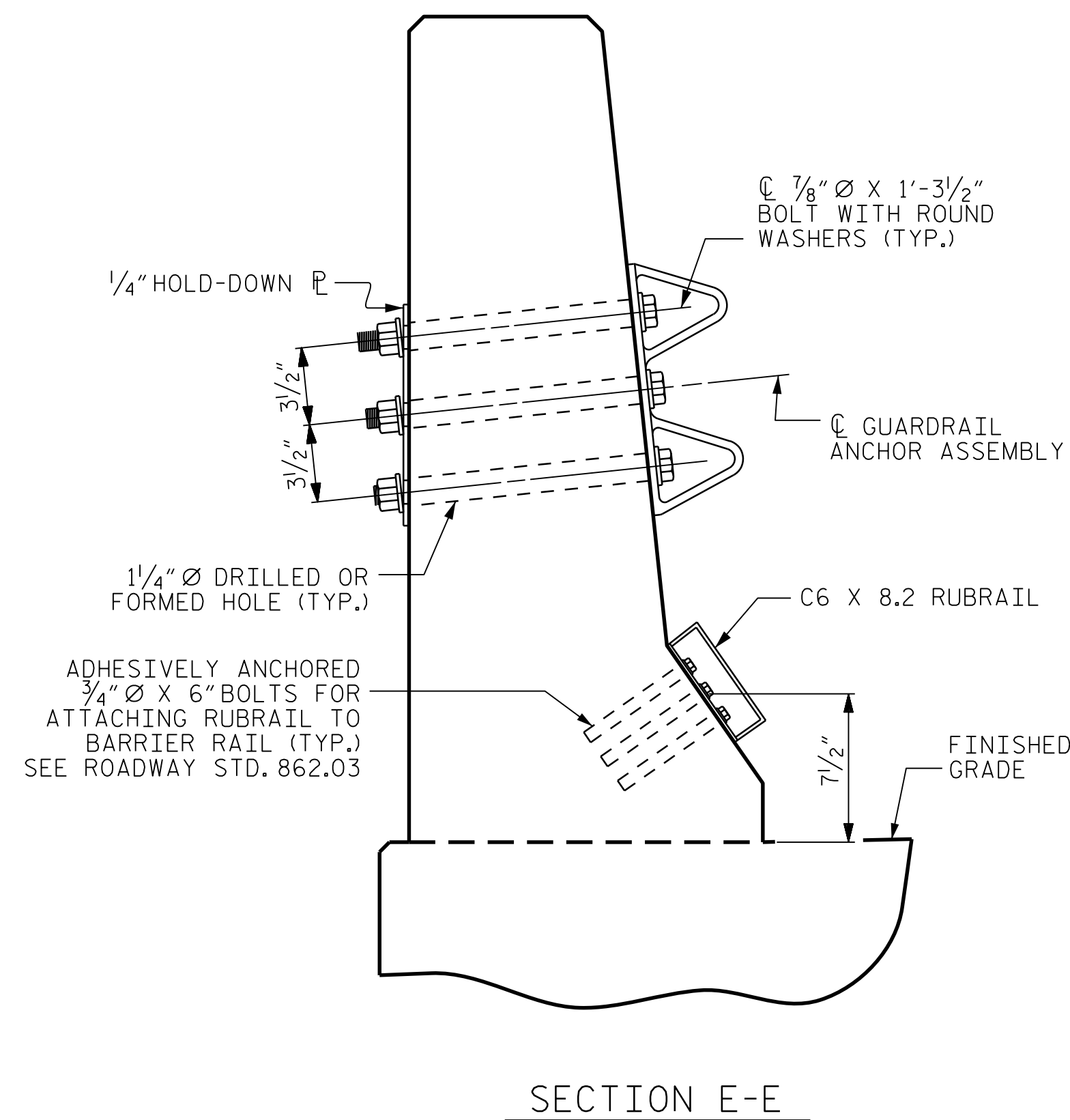
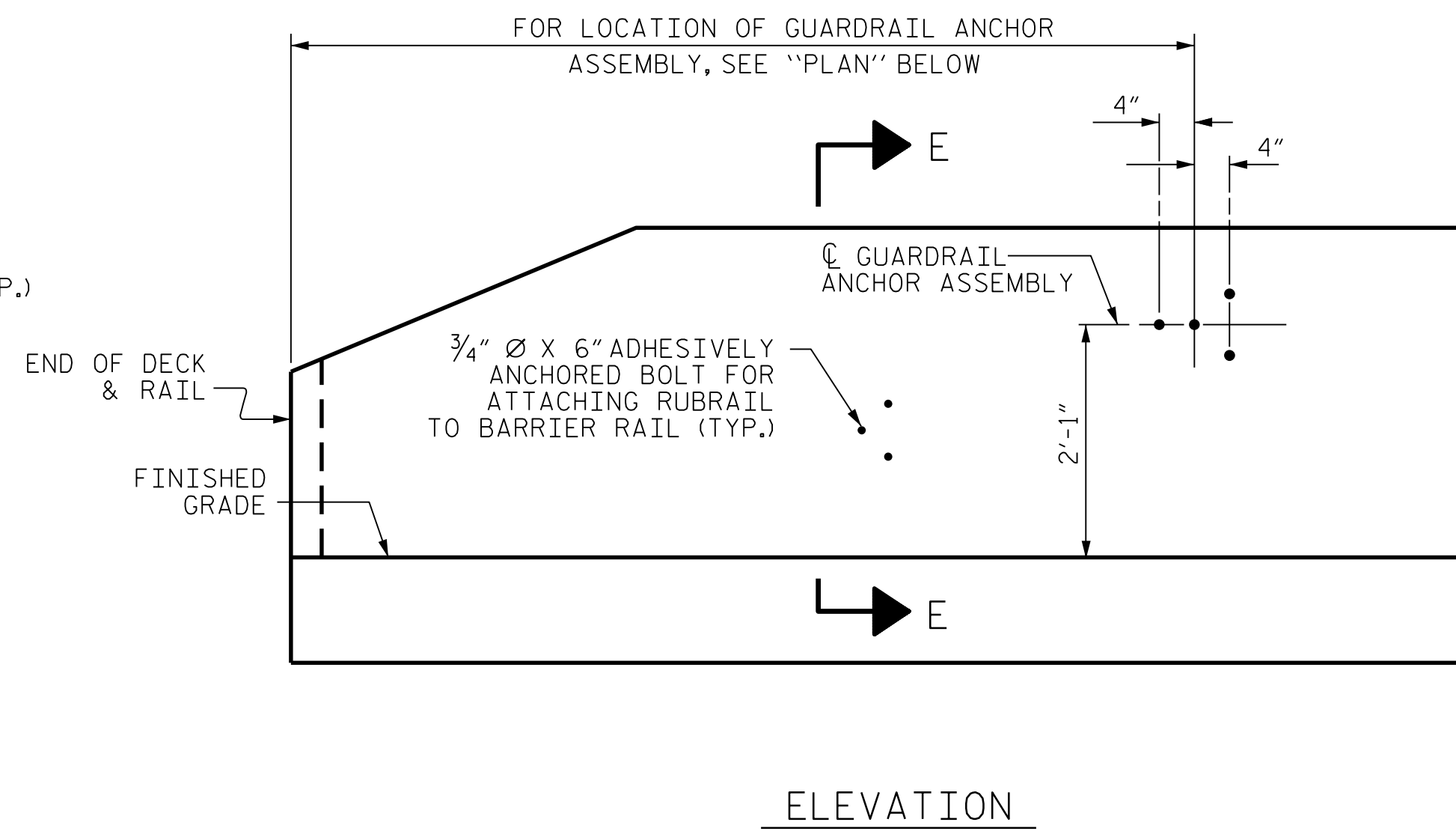
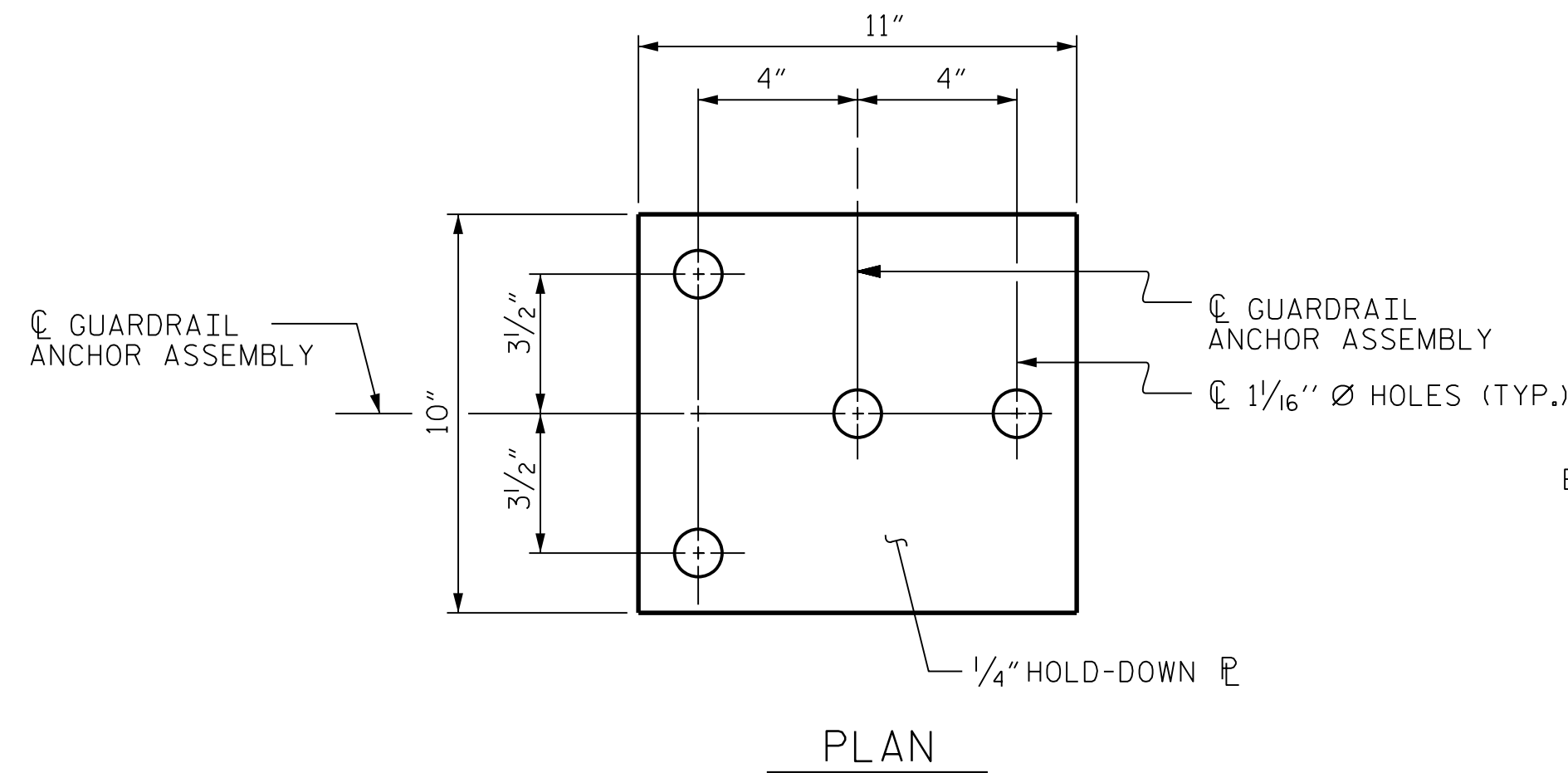
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

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

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



SKETCH SHOWING POINTS OF ATTACHMENTS
* DENOTES GUARDRAIL ANCHOR ASSEMBLY

LOCATION OF ANCHORS FOR GUARDRAIL
END BENT 1 SHOWN, END BENT 2 SIMILAR.

GUARDRAIL ANCHOR ASSEMBLY DETAILS

PROJECT NO. R-5752
ROBESON COUNTY
STATION: 30+39.23 -Y-

| | | | | | |
|--|-----|-------|-----|-----|--------------------|
| STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH | | | | | |
| STANDARD GUARDRAIL ANCHORAGE FOR BARRIER RAIL | | | | | |
| REVISIONS | | | | | |
| NO. | BY: | DATE: | NO. | BY: | DATE: |
| 1 | | | 3 | | |
| 2 | | | 4 | | |
| SHEET NO. S-15 | | | | | TOTAL SHEETS 24 |

CDM Smith
CDM SMITH
5400 Glenwood Avenue, Suite 400
Raleigh, NC 27612-3228
NC COA No. F-1255

DRAWN BY: A.L. STROUD DATE: 03/17
CHECKED BY: J.B. TAYLOR DATE: 03/17
DESIGN ENGINEER: J.B. TAYLOR DATE: 03/17

DWG. No. _____

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

3/30/2017
SEAL
33698
ENGINEER
JOSHUA B. TAYLOR
Joshua B. Taylor

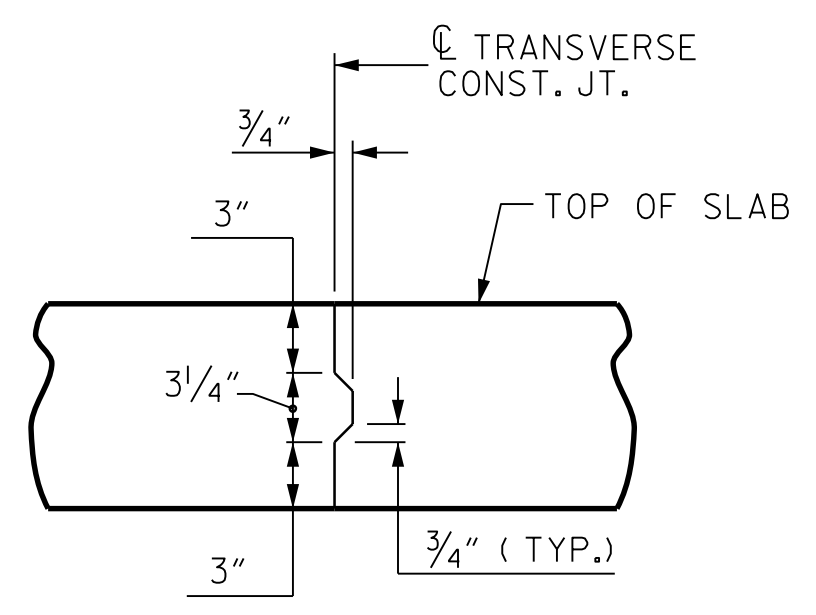
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SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

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

GROOVING BRIDGE FLOORS

| | |
|----------------|---------------------|
| APPROACH SLABS | 946 SO.FT. |
| BRIDGE DECK | 6,068 SO.FT. |
| TOTAL | 7,014 SO.FT. |

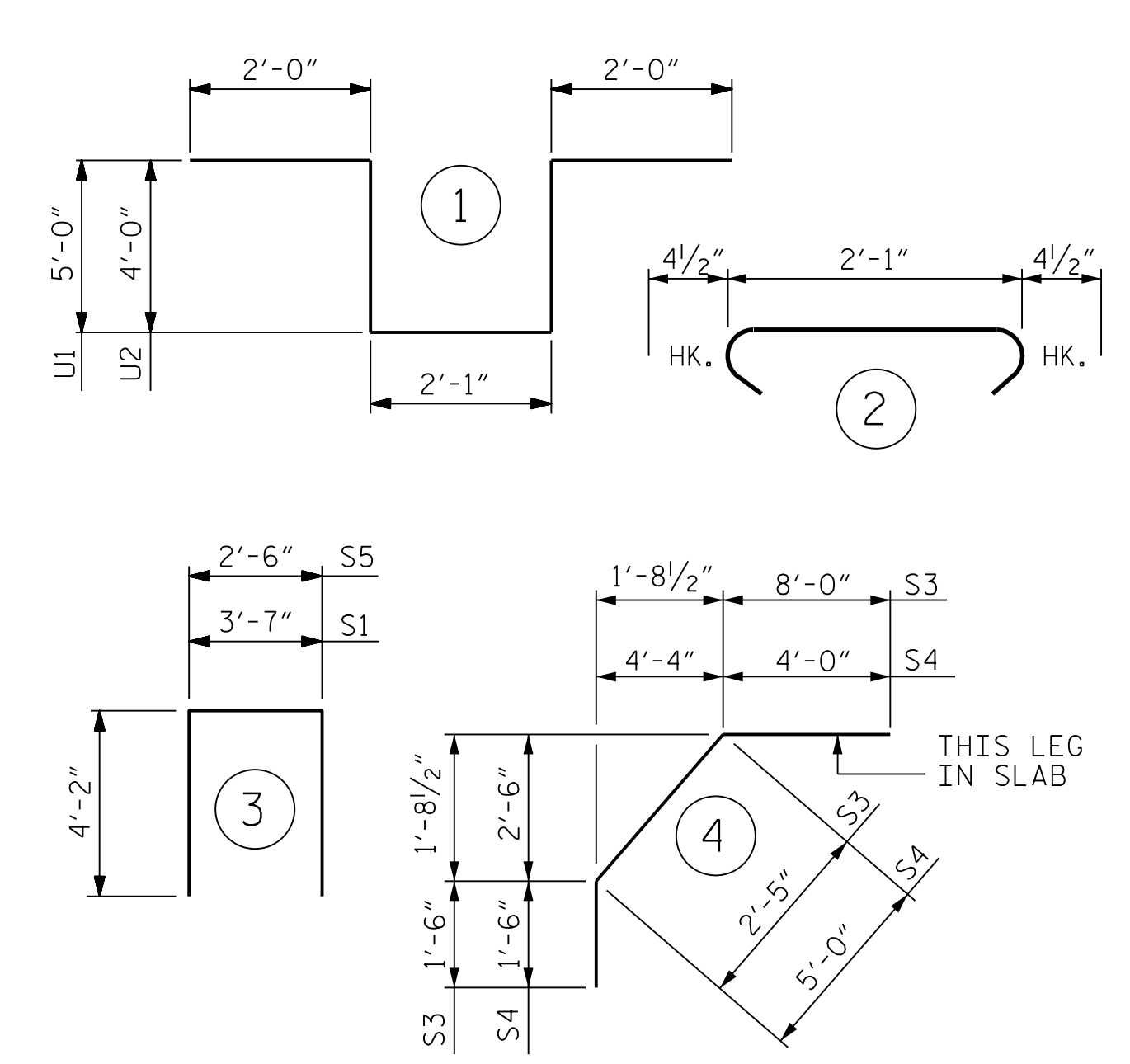


TRANSVERSE CONSTRUCTION JOINT DETAIL

REINFORCING STEEL

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|-------------------------------|-----|------|------|---------|------------|
| * A1 | 373 | #5 | STR | 38'-11" | 15140 |
| A2 | 373 | #5 | STR | 38'-11" | 15140 |
| * A101 | 4 | #5 | STR | 36'-7" | 153 |
| * A102 | 4 | #5 | STR | 33'-11" | 142 |
| * A103 | 4 | #5 | STR | 31'-2" | 130 |
| * A104 | 4 | #5 | STR | 28'-5" | 119 |
| * A105 | 4 | #5 | STR | 25'-8" | 107 |
| * A106 | 4 | #5 | STR | 22'-11" | 96 |
| * A107 | 4 | #5 | STR | 20'-3" | 84 |
| * A108 | 4 | #5 | STR | 17'-6" | 73 |
| * A109 | 4 | #5 | STR | 14'-9" | 62 |
| * A110 | 4 | #5 | STR | 12'-0" | 50 |
| * A111 | 4 | #5 | STR | 9'-3" | 39 |
| * A112 | 4 | #5 | STR | 6'-6" | 27 |
| * A113 | 4 | #5 | STR | 3'-9" | 16 |
| * A114 | 4 | #5 | STR | 1'-1" | 5 |
| A201 | 4 | #5 | STR | 36'-7" | 153 |
| A202 | 4 | #5 | STR | 33'-11" | 142 |
| A203 | 4 | #5 | STR | 31'-2" | 130 |
| A204 | 4 | #5 | STR | 28'-5" | 119 |
| A205 | 4 | #5 | STR | 25'-9" | 107 |
| A206 | 4 | #5 | STR | 22'-11" | 96 |
| A207 | 4 | #5 | STR | 20'-3" | 84 |
| A208 | 4 | #5 | STR | 17'-6" | 73 |
| A209 | 4 | #5 | STR | 14'-9" | 62 |
| A210 | 4 | #5 | STR | 12'-0" | 50 |
| A211 | 4 | #5 | STR | 9'-3" | 39 |
| A212 | 4 | #5 | STR | 6'-6" | 27 |
| A213 | 4 | #5 | STR | 3'-9" | 16 |
| A214 | 4 | #5 | STR | 1'-1" | 5 |
| * B1 | 108 | #4 | STR | 23'-8" | 1708 |
| * B2 | 54 | #7 | STR | 36'-0" | 3974 |
| * B3 | 26 | #7 | STR | 28'-0" | 1488 |
| * B4 | 108 | #7 | STR | 18'-8" | 4120 |
| B5 | 200 | #5 | STR | 47'-8" | 9943 |
| K1 | 20 | #4 | STR | 20'-5" | 273 |
| K2 | 6 | #4 | STR | 8'-6" | 34 |
| K3 | 6 | #4 | STR | 9'-9" | 39 |
| K4 | 12 | #4 | STR | 10'-1" | 81 |
| K5 | 6 | #4 | STR | 9'-1" | 36 |
| K6 | 4 | #4 | STR | 2'-4" | 6 |
| K7 | 4 | #4 | STR | 2'-9" | 7 |
| K8 | 8 | #4 | STR | 3'-1" | 16 |
| K9 | 4 | #4 | STR | 2'-7" | 7 |
| K11 | 6 | #4 | STR | 7'-3" | 29 |
| K12 | 6 | #4 | STR | 9'-9" | 39 |
| K13 | 12 | #4 | STR | 10'-1" | 81 |
| K14 | 6 | #4 | STR | 9'-1" | 36 |
| K15 | 10 | #4 | STR | 18'-0" | 120 |
| S1 | 62 | #4 | 3 | 11'-11" | 494 |
| S2 | 102 | #4 | 2 | 2'-10" | 193 |
| * S3 | 62 | #4 | 4 | 11'-11" | 494 |
| * S4 | 62 | #4 | 4 | 10'-6" | 435 |
| S5 | 4 | #4 | 3 | 10'-10" | 29 |
| U1 | 21 | #4 | 1 | 16'-1" | 226 |
| U2 | 6 | #4 | 1 | 14'-1" | 56 |
| REINFORCING STEEL = | | | | | 27,988 LBS |
| * EPOXY COATED REINF. STEEL = | | | | | 28,462 LBS |

BAR TYPES

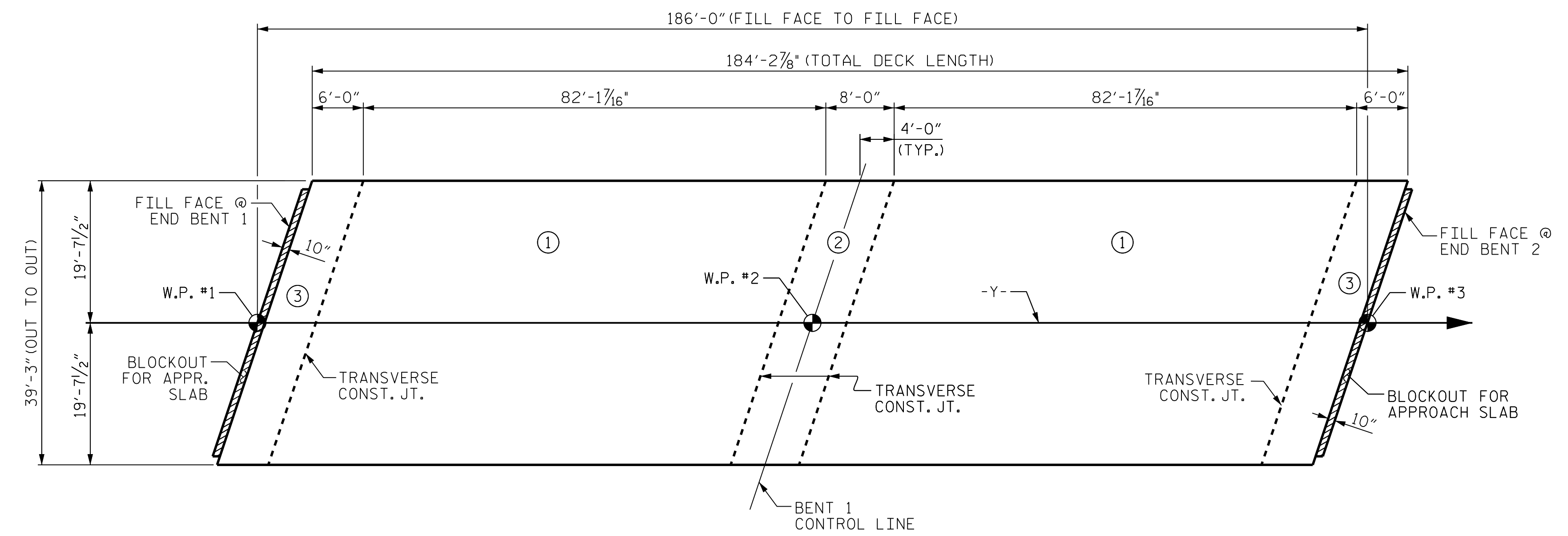


ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

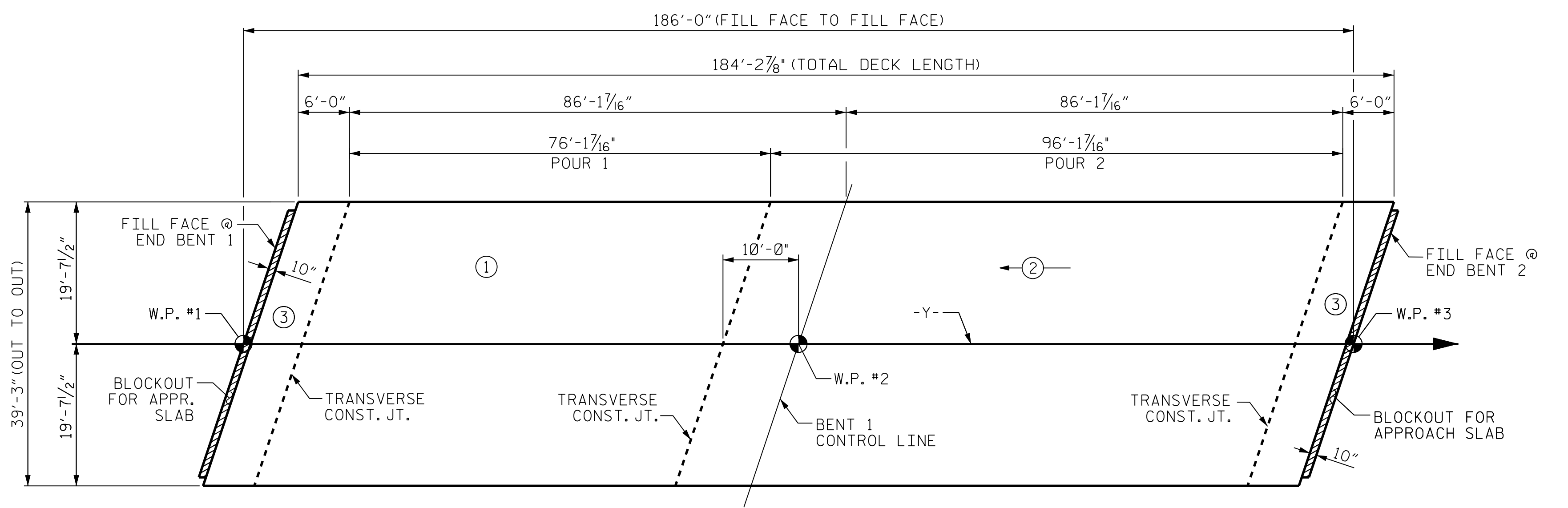
| | CLASS AA CONCRETE (CU. YDS.) | REINFORCING STEEL (LBS.) | EPOXY COATED REINFORCING STEEL (LBS.) |
|-----------------|-----------------------------------|-------------------------------|--|
| POUR 1 | 102.1 | | |
| POUR 2 | 138.9 | | |
| POUR 3 | 72.9 | | |
| TOTAL ** | 313.9 | 27,988 | 28,462 |

** QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED



OPTIONAL POURING SEQUENCE

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



POURING SEQUENCE AND LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ. FT. = 7,301)

← ② → INDICATES POUR NUMBER AND DIRECTION.

CDM Smith
 CDM SMITH
 5400 Glenwood Avenue, Suite 400
 Raleigh, NC 27612-3228
 NC COA No. F-1255

DRAWN BY: A.L. STROUD DATE: 03/17
 CHECKED BY: J.B. TAYLOR DATE: 03/17
 DESIGN ENGINEER: J.B. TAYLOR DATE: 03/17

DWG. No.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 JOSHUA B. TAYLOR
 33698

DocuSigned by: Joshua B. Taylor

PROJECT NO. R-5752
 ROBESON COUNTY
 STATION: 30+39.23 -Y-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE BILL OF MATERIAL AND POURING SEQUENCE

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|-----------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-16 |
| 1 | | | 3 | | | TOTAL SHEETS 24 |
| 2 | | | 4 | | | |

NOTES

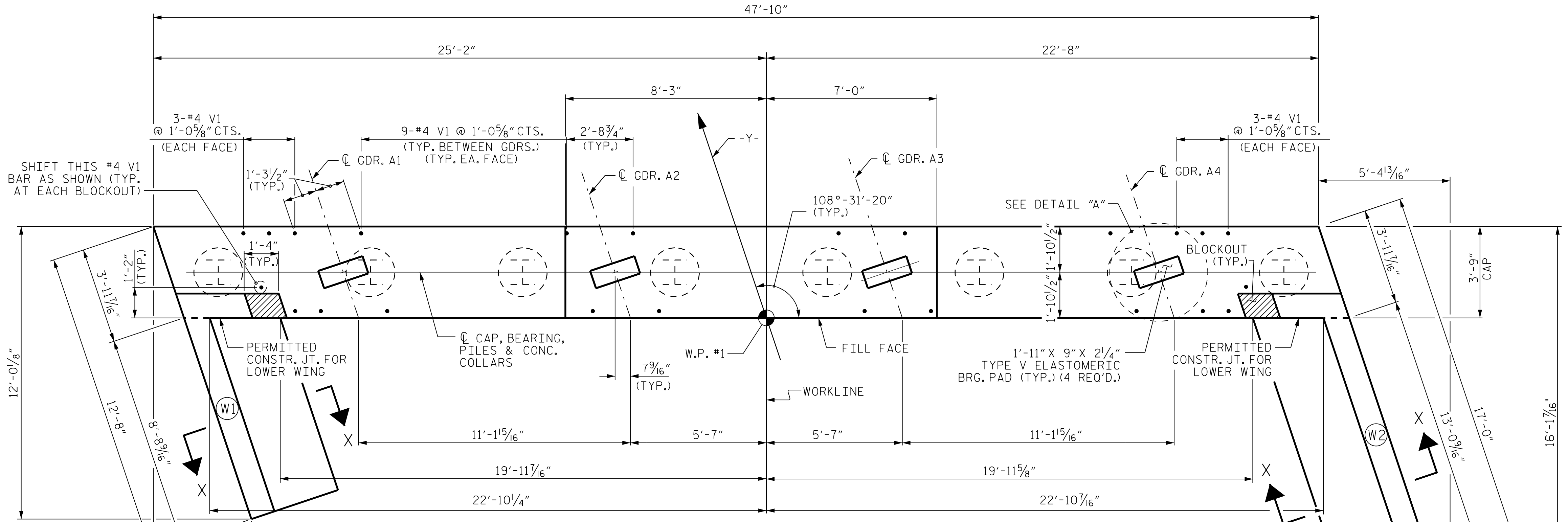
THE CONCRETE IN BLOCKOUTS SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

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.

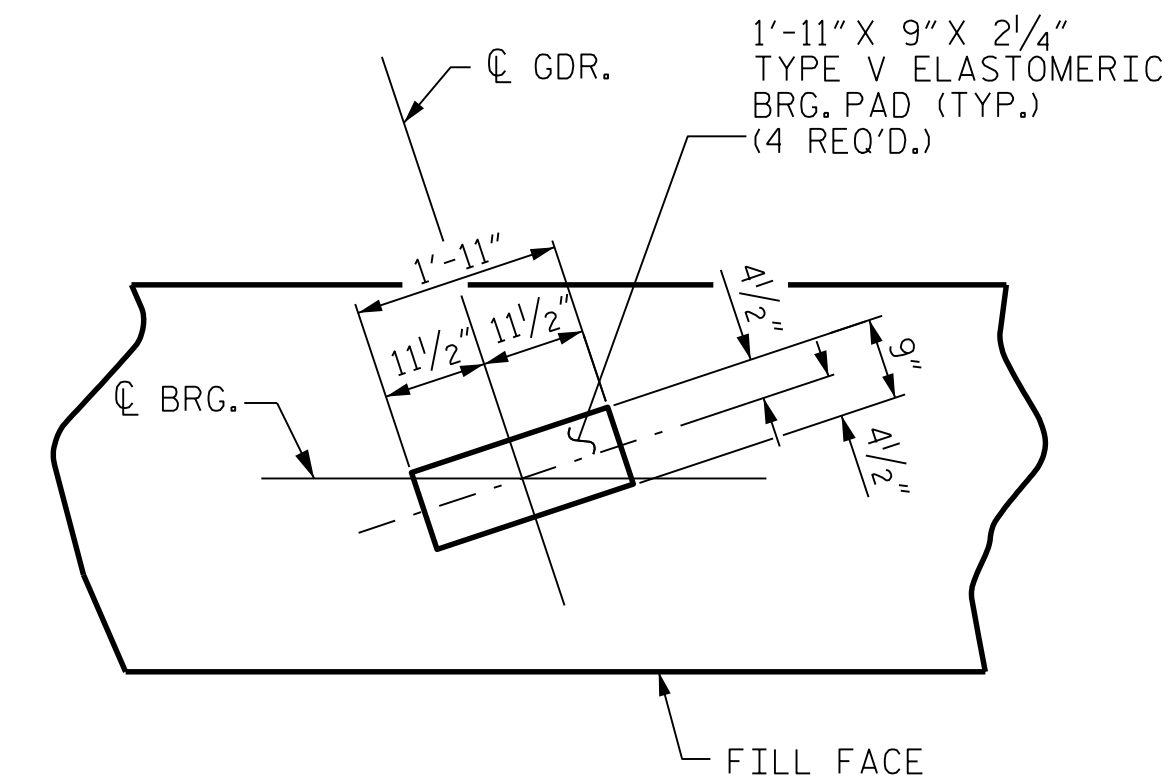
FOR PILE SPlice DETAILS, SEE SHEET 4 OF 4.

FOR SECTIONS A-A & X-X, SEE SHEET 4 OF 4.

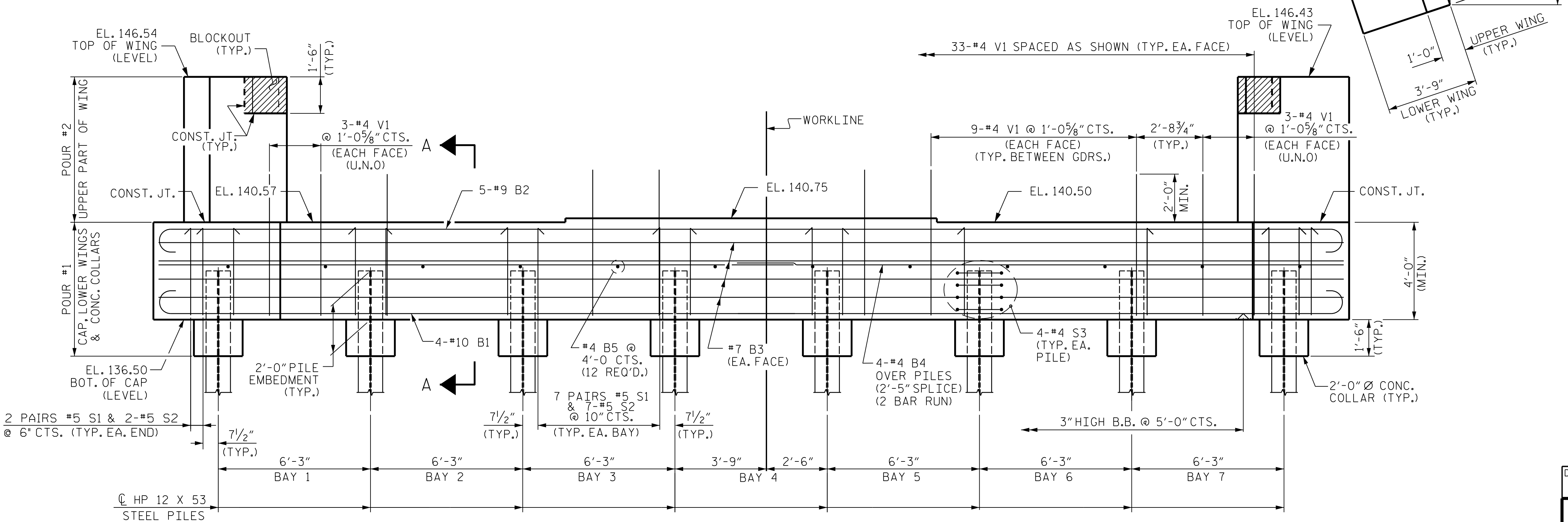
THE TOP SURFACE OF THE END BENT CAP AND LOWER WINGS, EXCLUDING THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".



PLAN



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



ELEVATION

WING WALLS NOT SHOWN FOR CLARITY

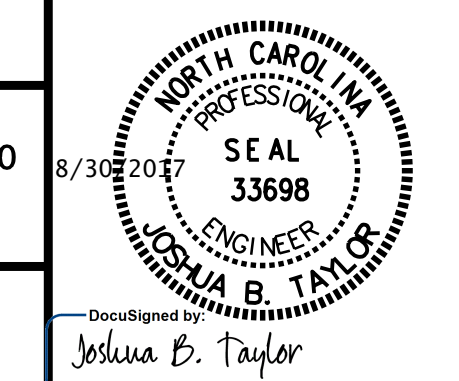
PROJECT NO. R-5752
ROBESON COUNTY
 STATION: 30+39.23 -Y-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

END BENT 1
 (INTEGRAL)

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

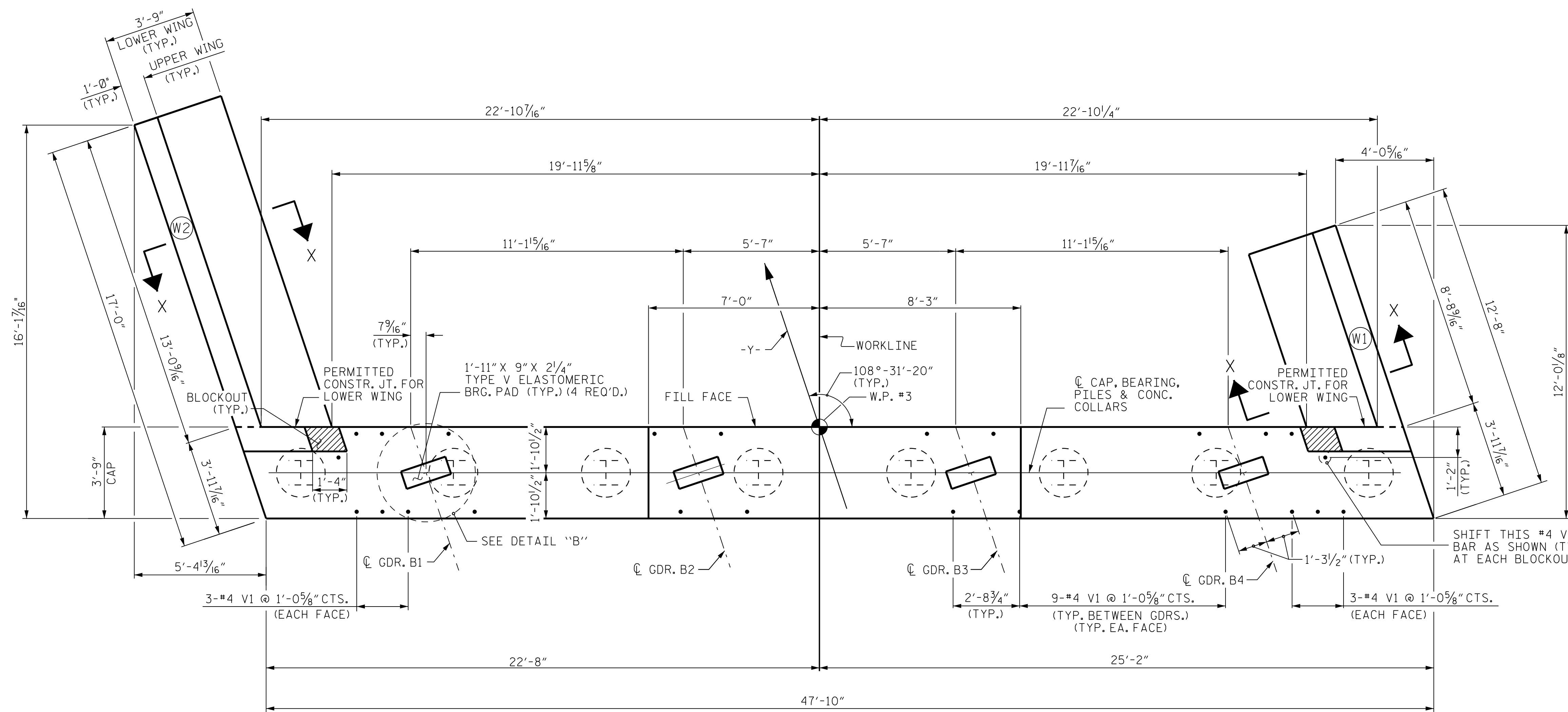


CDM Smith
 CDM SMITH
 5400 Glenwood Avenue, Suite 400
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 NC COA No. F-1255

DRAWN BY: A.L. STROUD DATE: 03/17
 CHECKED BY: J.B. TAYLOR DATE: 03/17
 DESIGN ENGINEER: J.B. TAYLOR DATE: 03/17

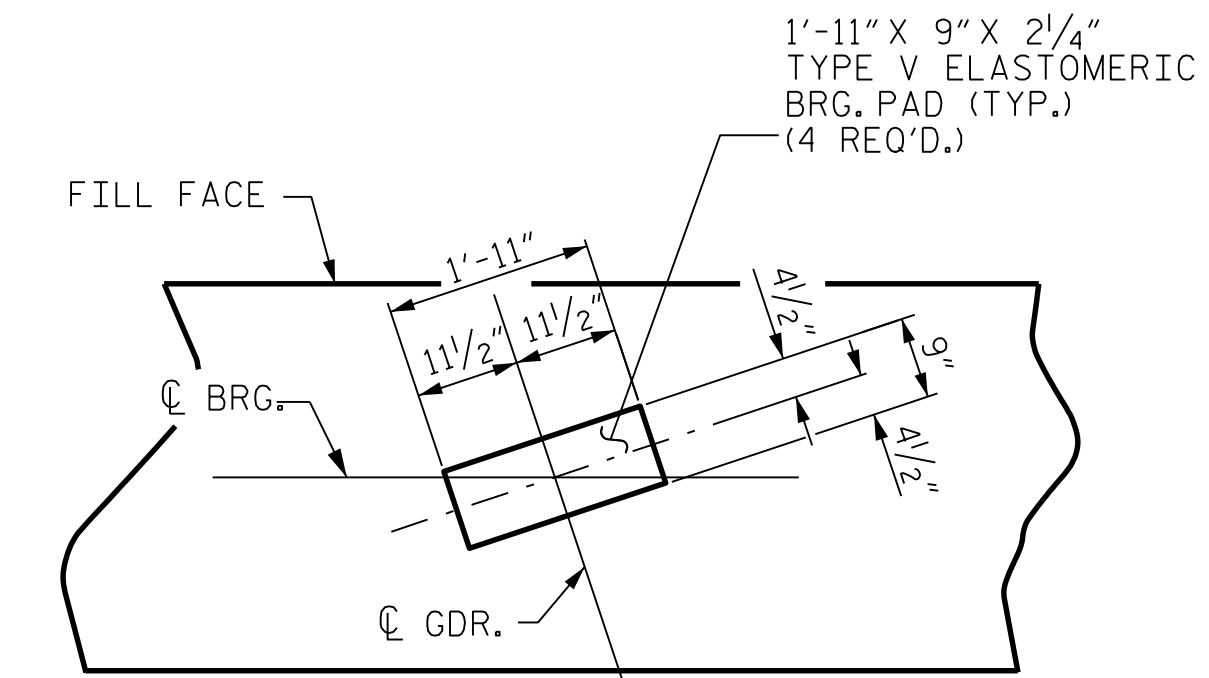
DWG. No.

| REVISIONS | | | |
|-----------|-----|-------|---------------------------|
| NO. | BY: | DATE: | SHEET NO. |
| 1 | | | <u>S-17</u> |
| 2 | | | TOTAL SHEETS <u>24</u> |

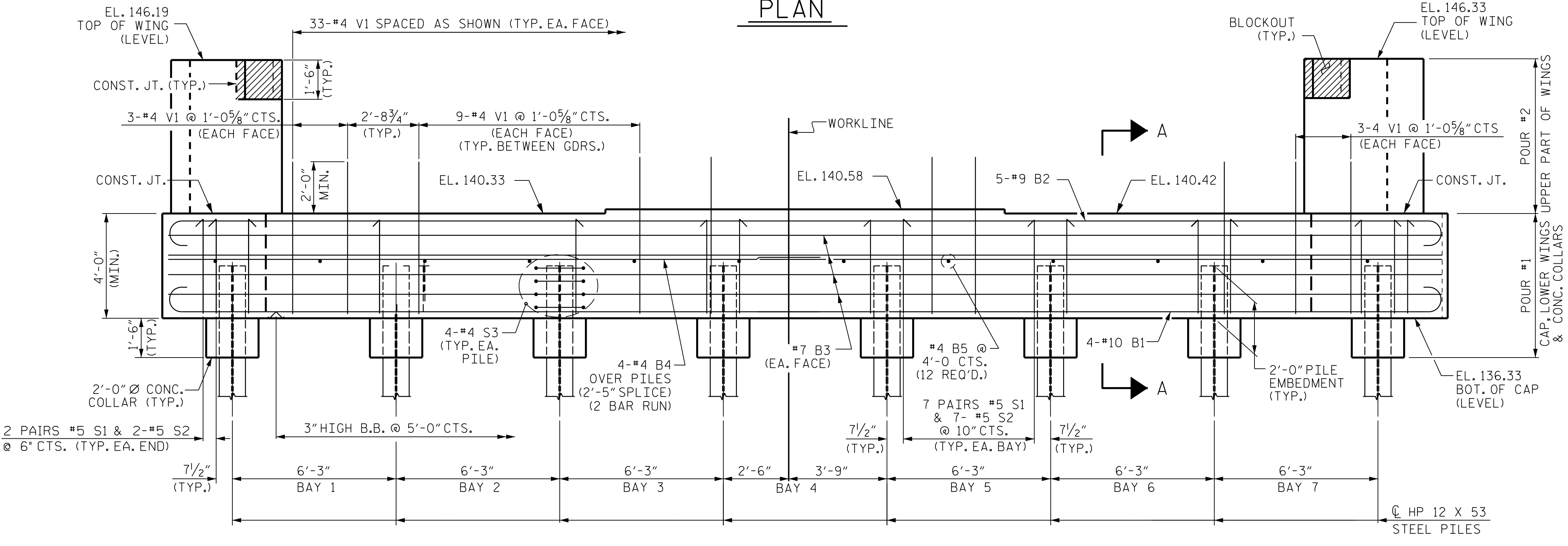


PLAN

- NOTES**
- THE CONCRETE IN BLOCKOUTS SHALL BE Poured AFTER THE BARRIER RAIL IS 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.
 - FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.
 - FOR SECTIONS A-A & X-X, SEE SHEET 4 OF 4.
 - THE TOP SURFACE OF THE END BENT CAP AND LOWER WINGS, EXCLUDING THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".



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



ELEVATION
WING WALLS NOT SHOWN FOR CLARITY

PROJECT NO. R-5752
ROBESON COUNTY
 STATION: 30+39.23 -Y-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT 2
 (INTEGRAL)

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

TOTAL SHEETS: **24**
S-18

CDM Smith
 CDM SMITH
 5400 Glenwood Avenue, Suite 400
 Raleigh, NC 27612-3228
 NC COA No. F-1255

DRAWN BY : A.L. STROUD DATE : 03/17
 CHECKED BY : J.B. TAYLOR DATE : 03/17
 DESIGN ENGINEER : J.B. TAYLOR DATE : 03/17

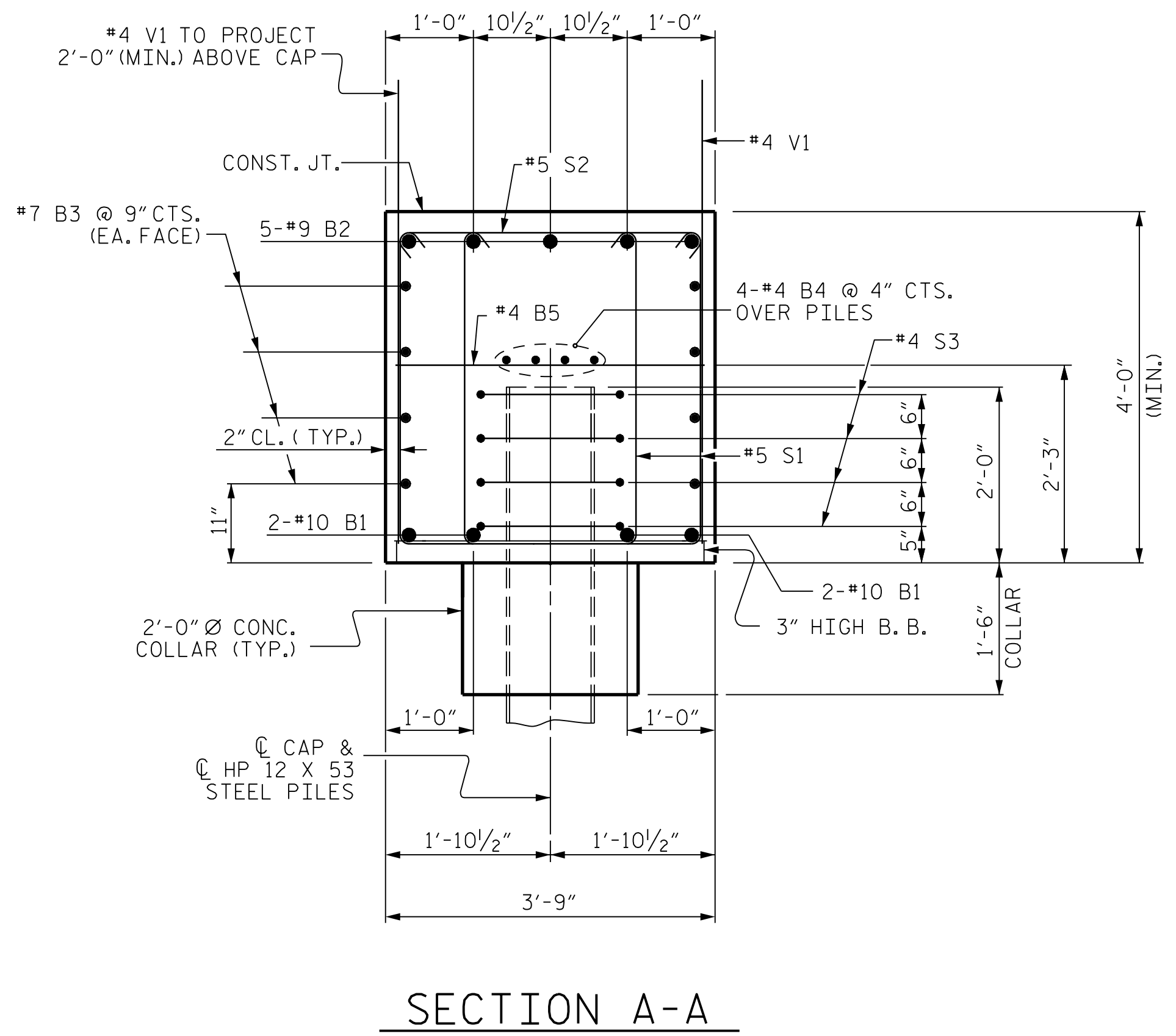
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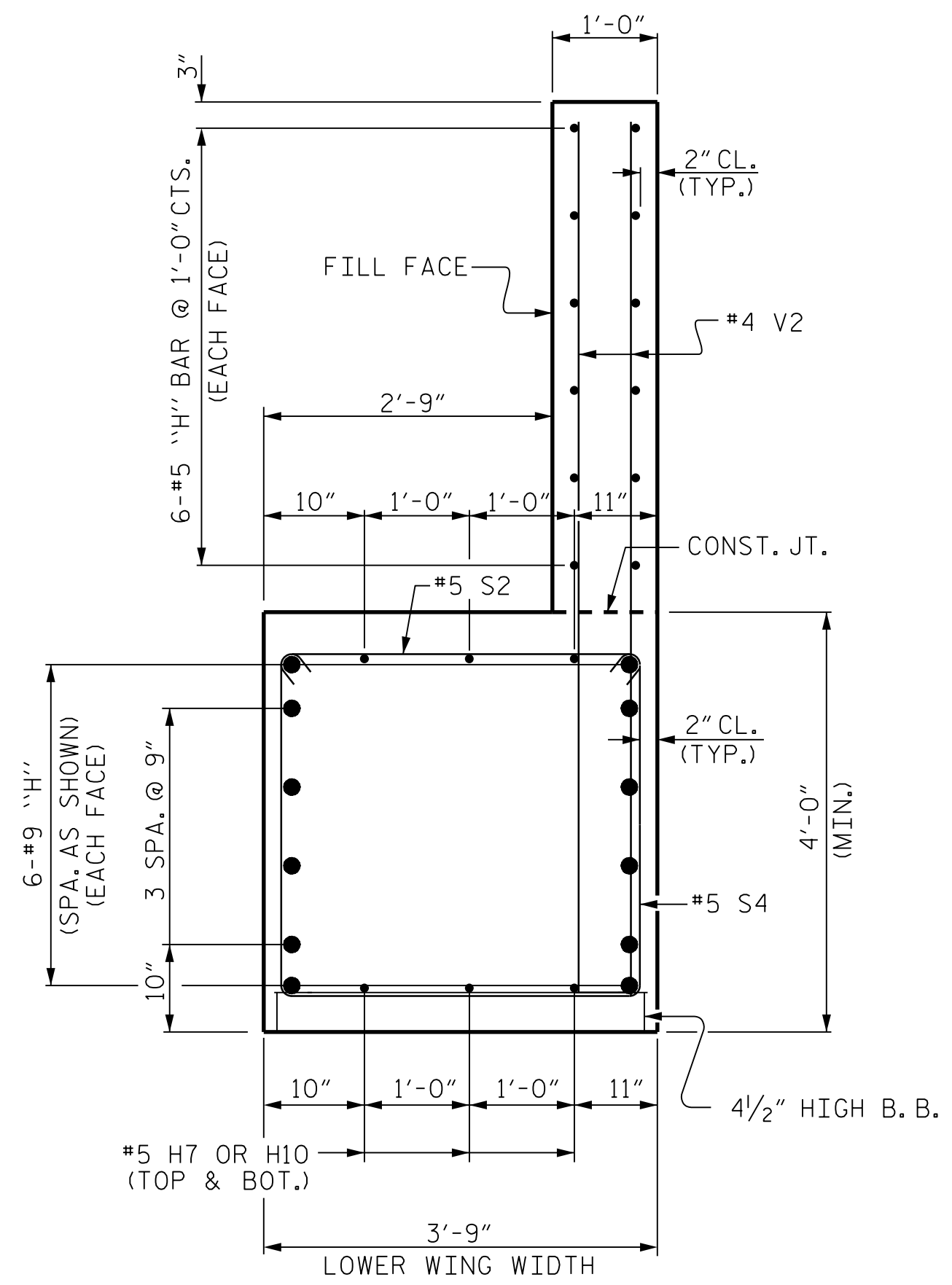
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL
33698
 JOSHUA B. TAYLOR
 8/30/2013

DocuSigned by:
 Joshua B. Taylor

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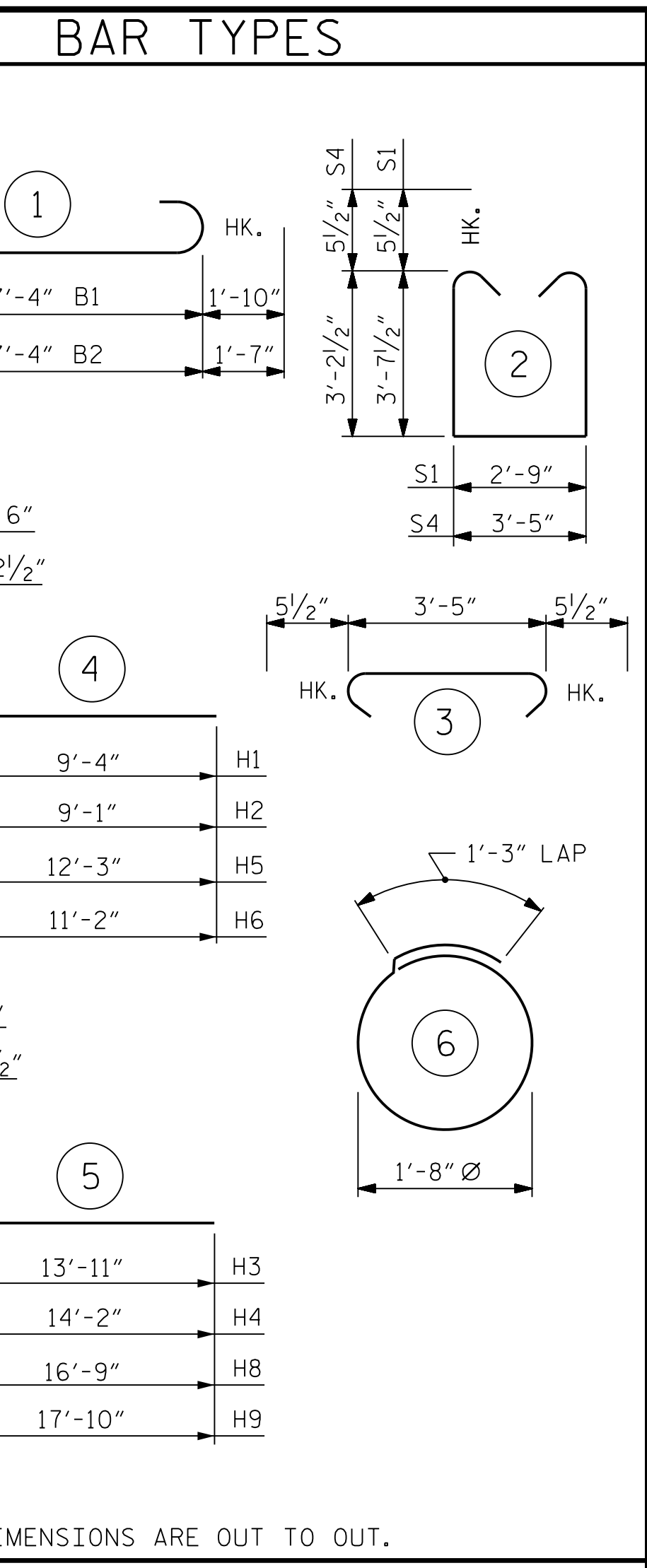


SECTION A-A

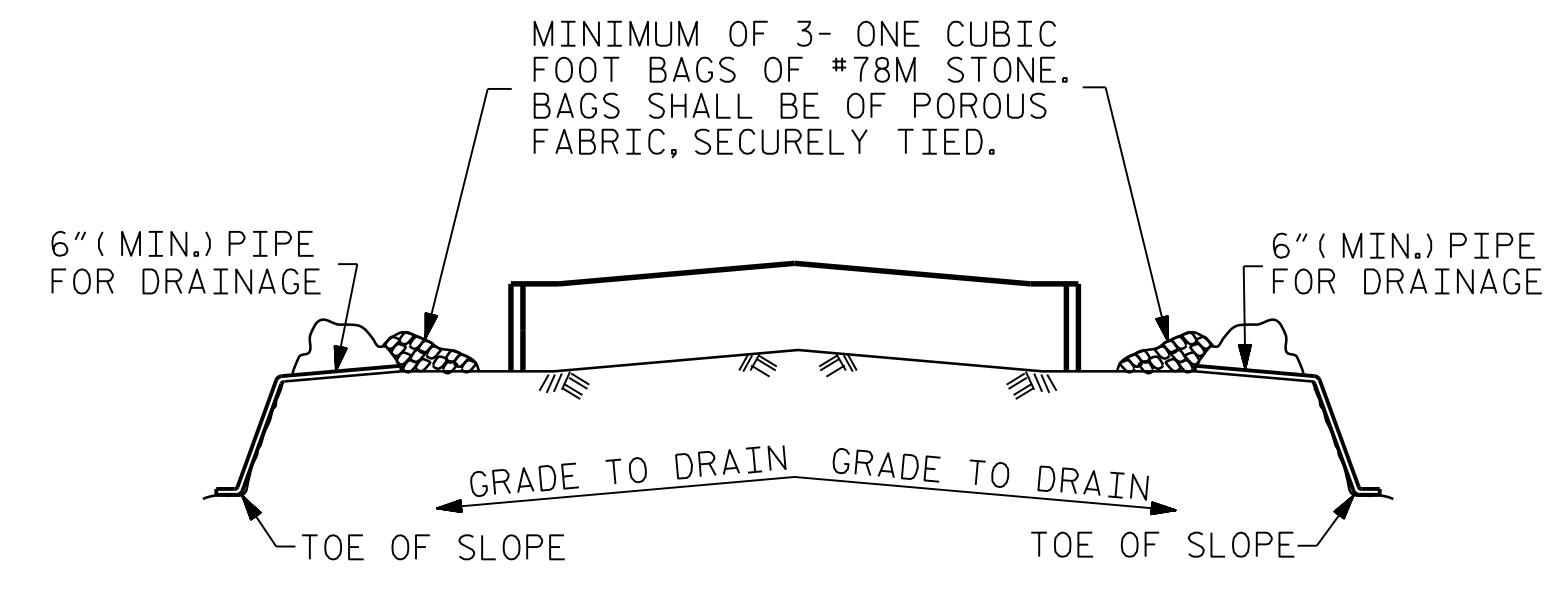


SECTION X-X

| BILL OF MATERIAL FOR ONE END BENT (2 REQUIRED) | | | | | |
|---|-----|------|------|---------|--------------|
| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
| B1 | 4 | #10 | 1 | 51'-0" | 878 |
| B2 | 5 | #9 | 1 | 50'-6" | 859 |
| B3 | 8 | #7 | STR | 47'-6" | 777 |
| B4 | 8 | #4 | STR | 25'-0" | 134 |
| B5 | 12 | #4 | STR | 3'-5" | 27 |
| | | | | | |
| H1 | 6 | #5 | 4 | 10'-0" | 63 |
| H2 | 6 | #5 | 4 | 9'-9" | 61 |
| H3 | 6 | #5 | 5 | 14'-7" | 91 |
| H4 | 6 | #5 | 5 | 14'-10" | 93 |
| H5 | 6 | #9 | 4 | 13'-10" | 282 |
| H6 | 6 | #9 | 4 | 12'-9" | 260 |
| H7 | 6 | #5 | STR | 10'-0" | 63 |
| H8 | 6 | #9 | 5 | 18'-4" | 374 |
| H9 | 6 | #9 | 5 | 19'-5" | 396 |
| H10 | 6 | #5 | STR | 15'-6" | 97 |
| | | | | | |
| K1 | 24 | #4 | STR | 3'-9" | 60 |
| | | | | | |
| S1 | 106 | #5 | 2 | 10'-11" | 1207 |
| S2 | 75 | #5 | 3 | 4'-4" | 339 |
| S3 | 32 | #4 | 6 | 6'-6" | 139 |
| S4 | 22 | #5 | 2 | 10'-9" | 247 |
| | | | | | |
| V1 | 66 | #4 | STR | 6'-1" | 268 |
| V2 | 93 | #4 | STR | 9'-8" | 601 |
| | | | | | |
| REINFORCING STEEL = 6,307 LBS | | | | | |
| CLASS A CONCRETE: | | | | | |
| POUR #1: CAP, LOWER WINGS & COLLARS = 40.7 C.Y. | | | | | |
| POUR #2: UPPER WINGS = 6.6 C.Y. | | | | | |
| TOTAL = 47.3 C.Y. | | | | | |
| | | | | | |
| HP 12 X 53 STEEL PILES : | | | | | |
| No. 8 | | | | | LIN. FT. 440 |
| PILE REDRIVES | | | | | EA. 4 |
| PILE DRIVING EQUIP. SETUP | | | | | EA. 8 |



ALL BAR DIMENSIONS ARE OUT TO OUT.

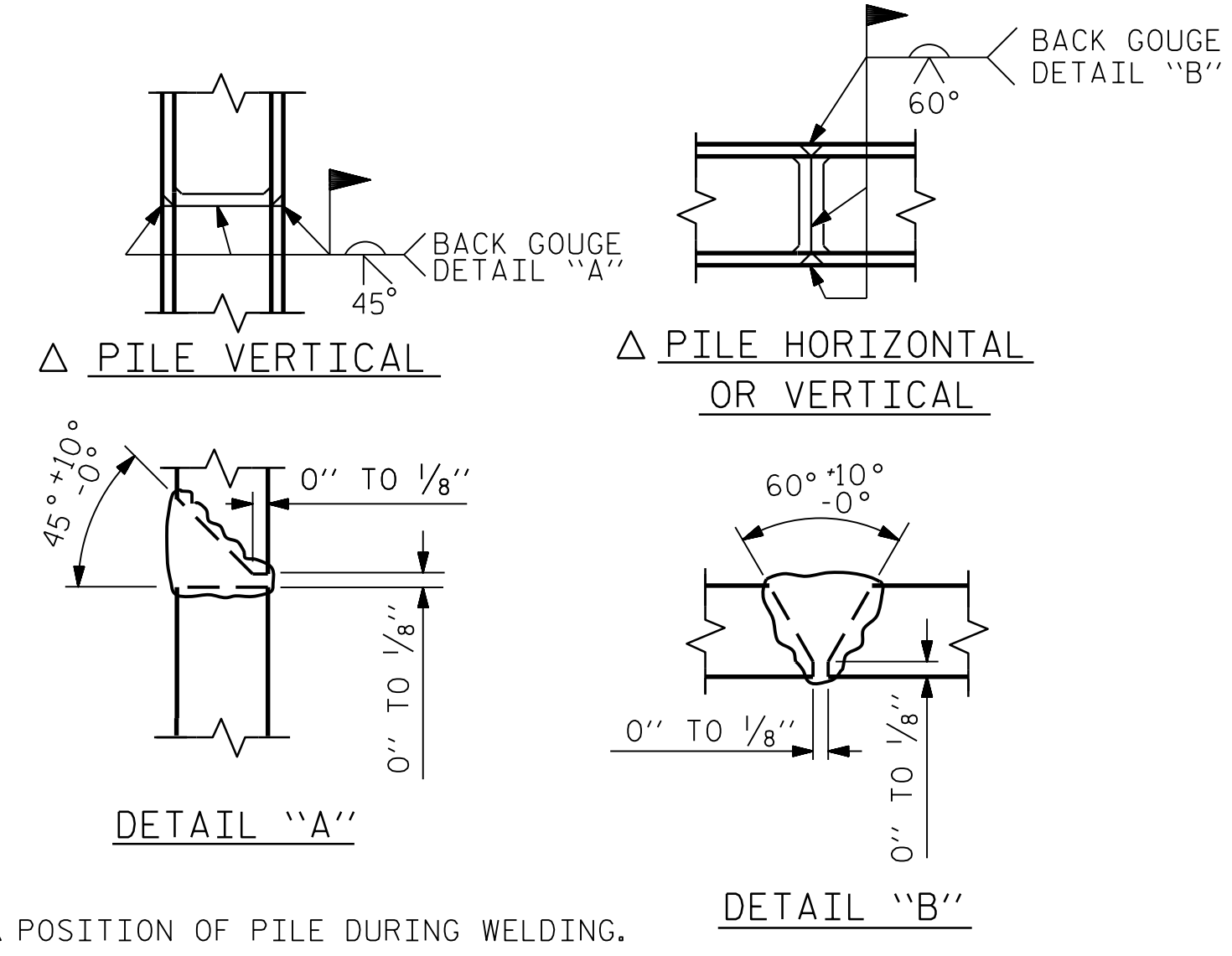


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

TEMPORARY DRAINAGE AT END BENT



PILE SPLICE DETAILS

PROJECT NO. R-5752
ROBESON COUNTY
 STATION: 30+39.23 -Y-
 SHEET 4 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENTS 1 & 2
 (INTEGRAL)
 DETAILS

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

SHEET NO. **S-20**
 TOTAL SHEETS **24**

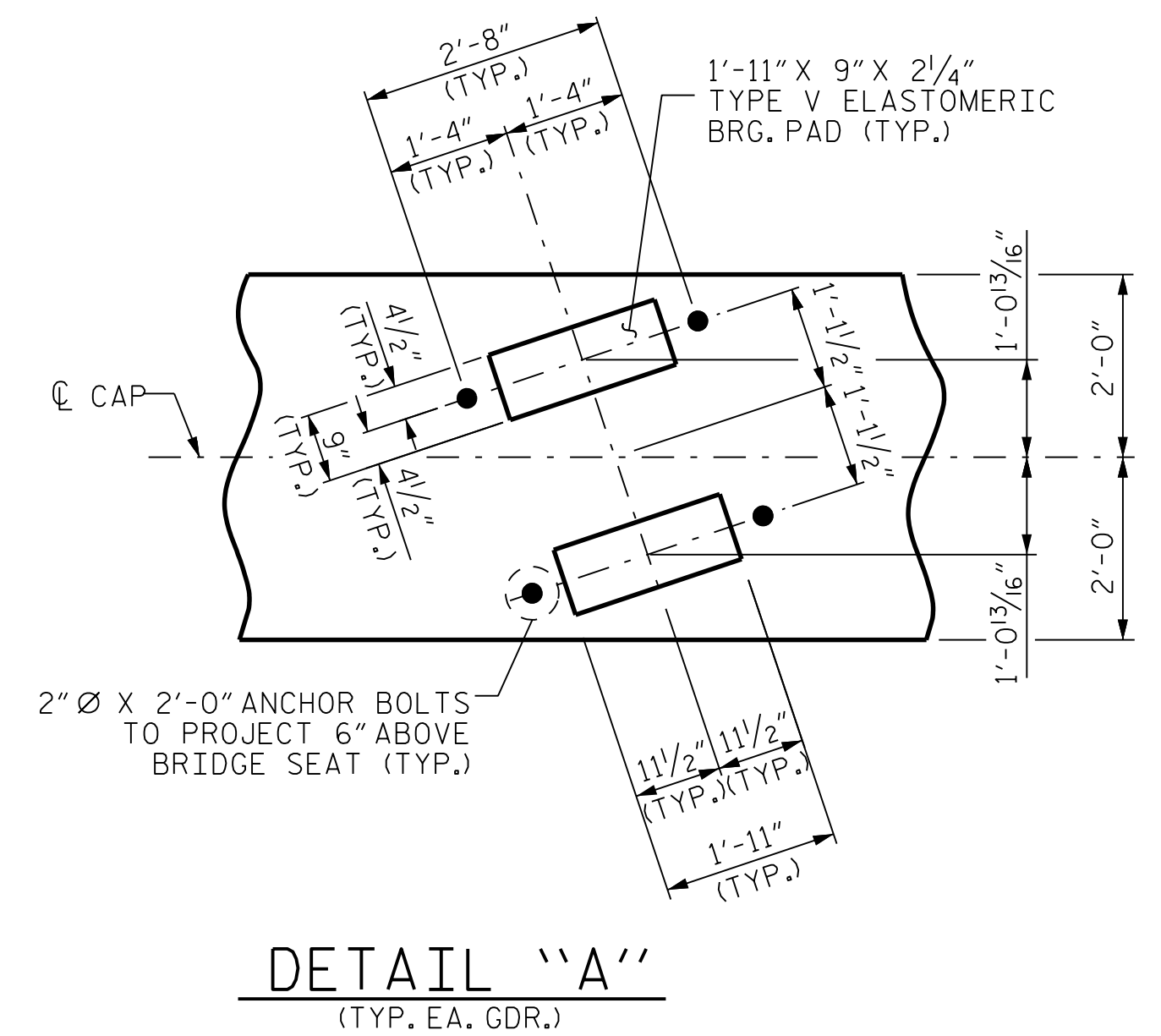
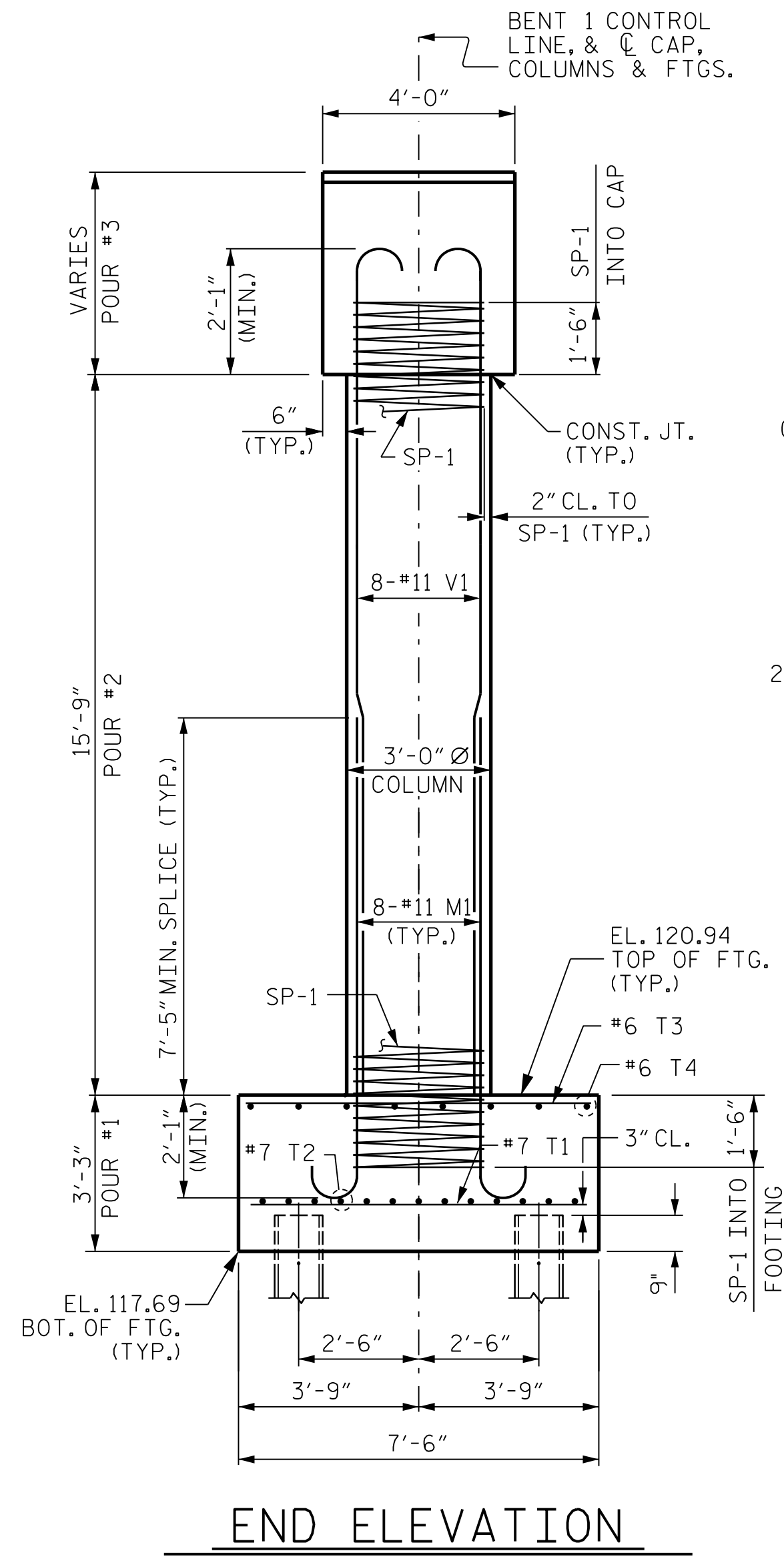
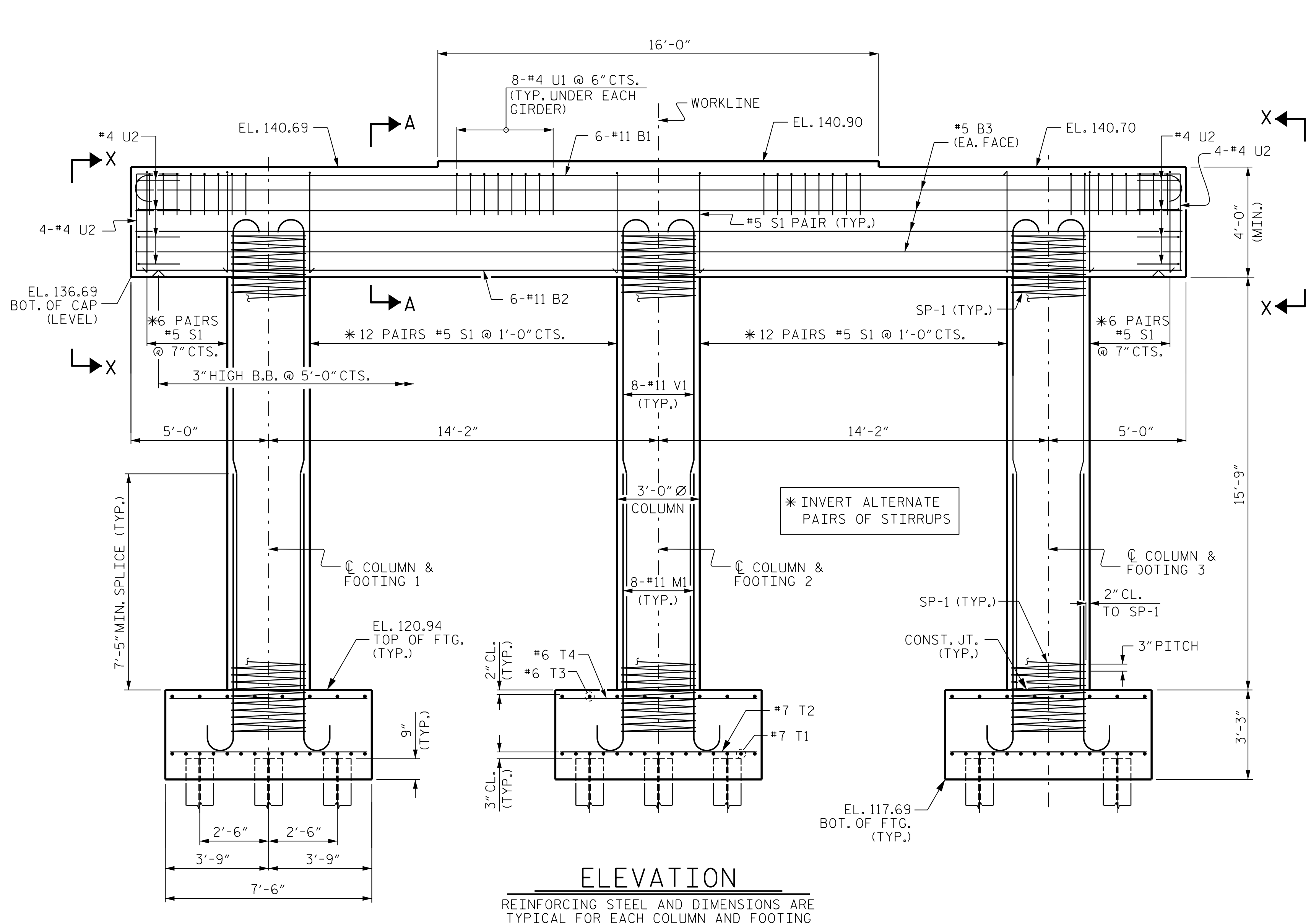
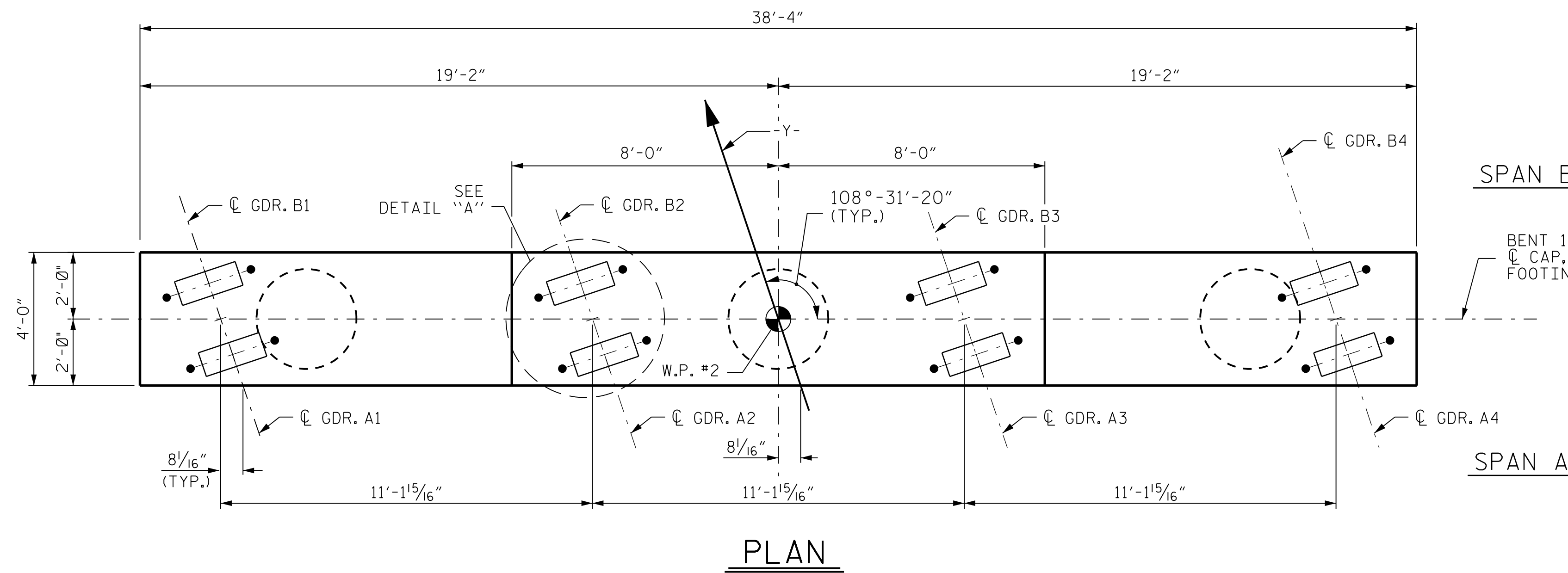
CDM Smith
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 5400 Glenwood Avenue, Suite 400
 Raleigh, NC 27612-3228
 NC COA No. F-1255

DRAWN BY: A.L. STROUD DATE: 03/17
 CHECKED BY: J.B. TAYLOR DATE: 03/17
 DESIGN ENGINEER: J.B. TAYLOR DATE: 03/17

DWG. No. _____

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL
 3/30/2017
 33698
 JOSHUA B. TAYLOR
 ENGINEER



NOTES:
 STIRRUPS AND U1 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
 THE CONTRACTOR SHALL ALIGN THE "V" & "M" BARS AS SHOWN IN THE PLAN OF COLUMNS. HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
 FOR PILE SPLICE DETAILS, SEE SHEET 2 OF 2.
 THE TOP SURFACE AREAS OF THE BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

PROJECT NO. R-5752
 ROBESON COUNTY
 STATION: 30+39.23 -Y-

SHEET 1 OF 2

| | | | | | |
|--|-----|-------|-----|-----|-------|
| STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH | | | | | |
| SUBSTRUCTURE BENT 1 | | | | | |
| SHEET NO. S-21 | | | | | |
| TOTAL SHEETS 24 | | | | | |
| REVISIONS | | | | | |
| NO. | BY: | DATE: | NO. | BY: | DATE: |
| 1 | | | 3 | | |
| 2 | | | 4 | | |

CDM Smith
 CDM SMITH
 5400 Glenwood Avenue, Suite 400
 Raleigh, NC 27612-3228
 NC COA No. F-1255

DRAWN BY: A.L. STROUD DATE: 03/17
 CHECKED BY: J.B. TAYLOR DATE: 03/17
 DESIGN ENGINEER: J.B. TAYLOR DATE: 03/17

DWG. No. _____

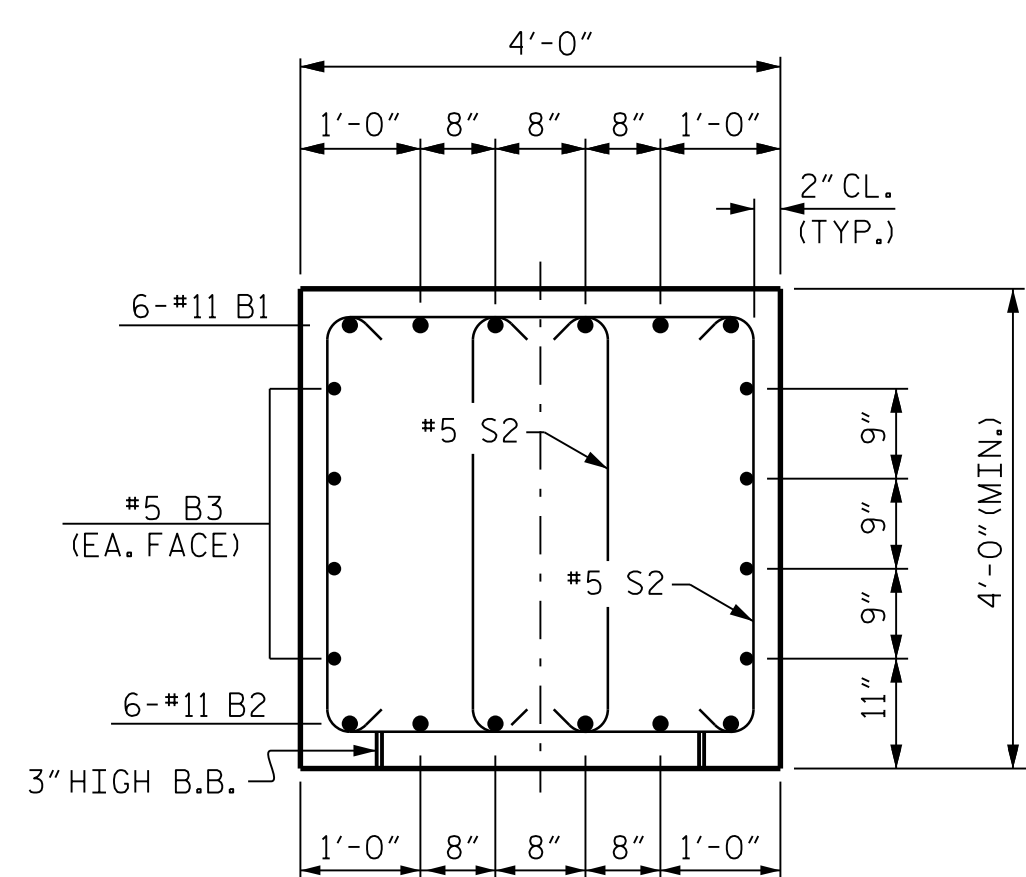
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3/30/2017

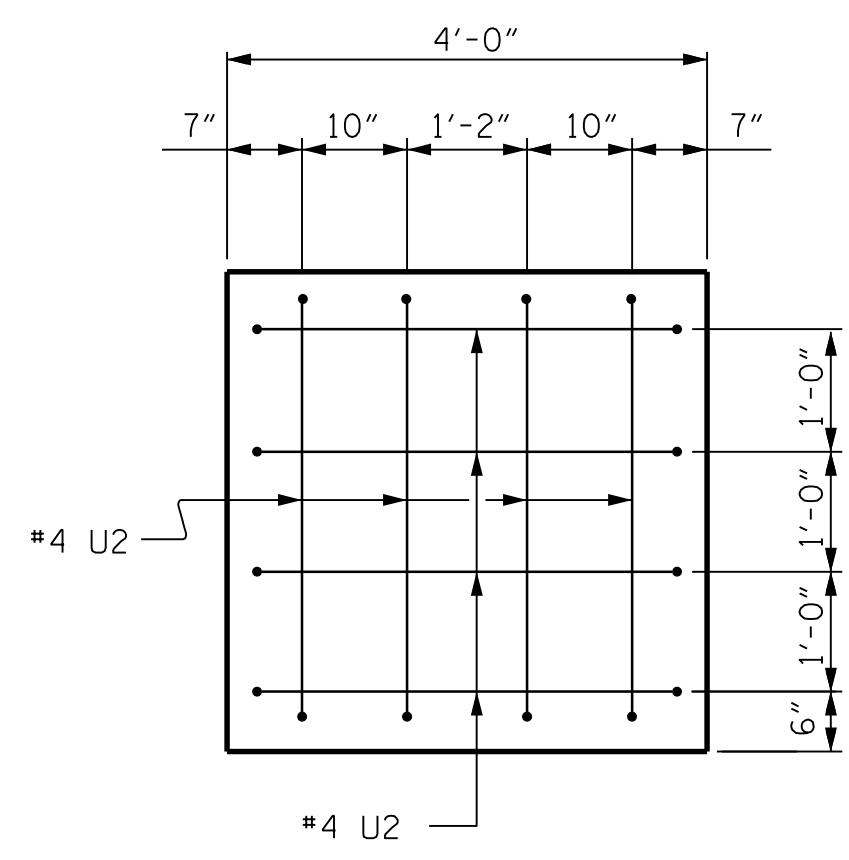
SEAL
 33698
 ENGINEER
 JOSHUA B. TAYLOR

Joshua B. Taylor

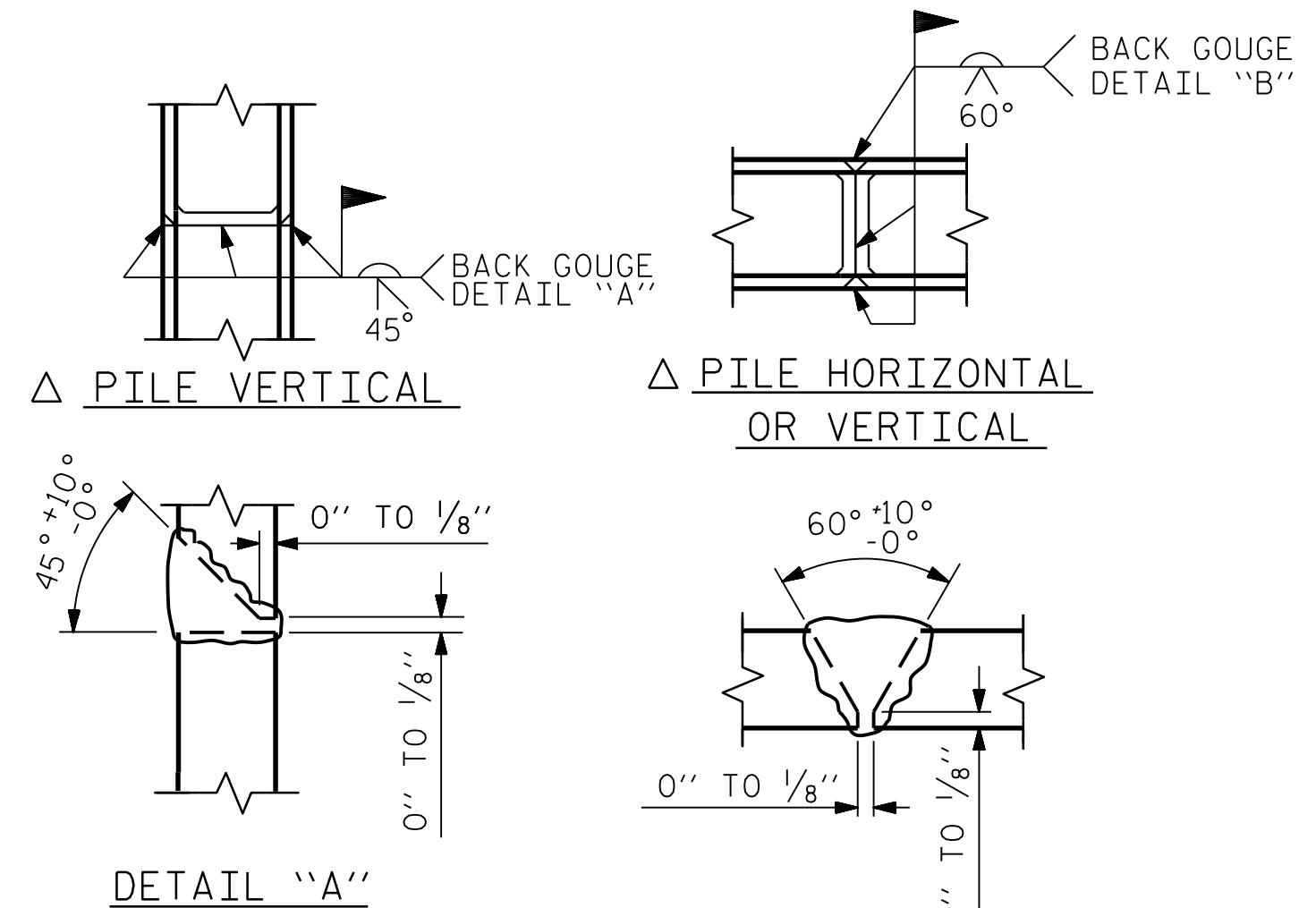
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SECTION A-A

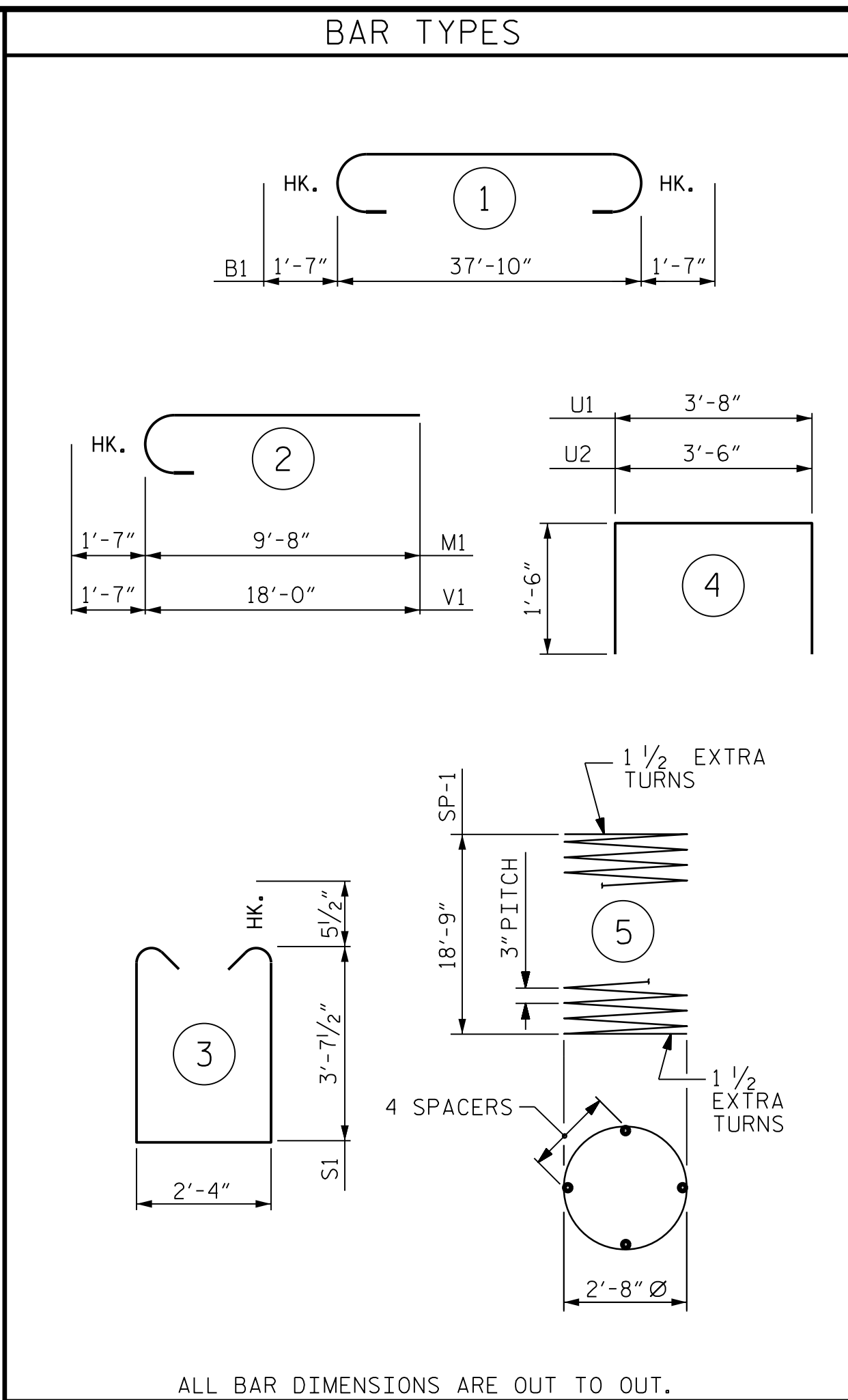


VIEW X-X



PILE SPLICE DETAILS

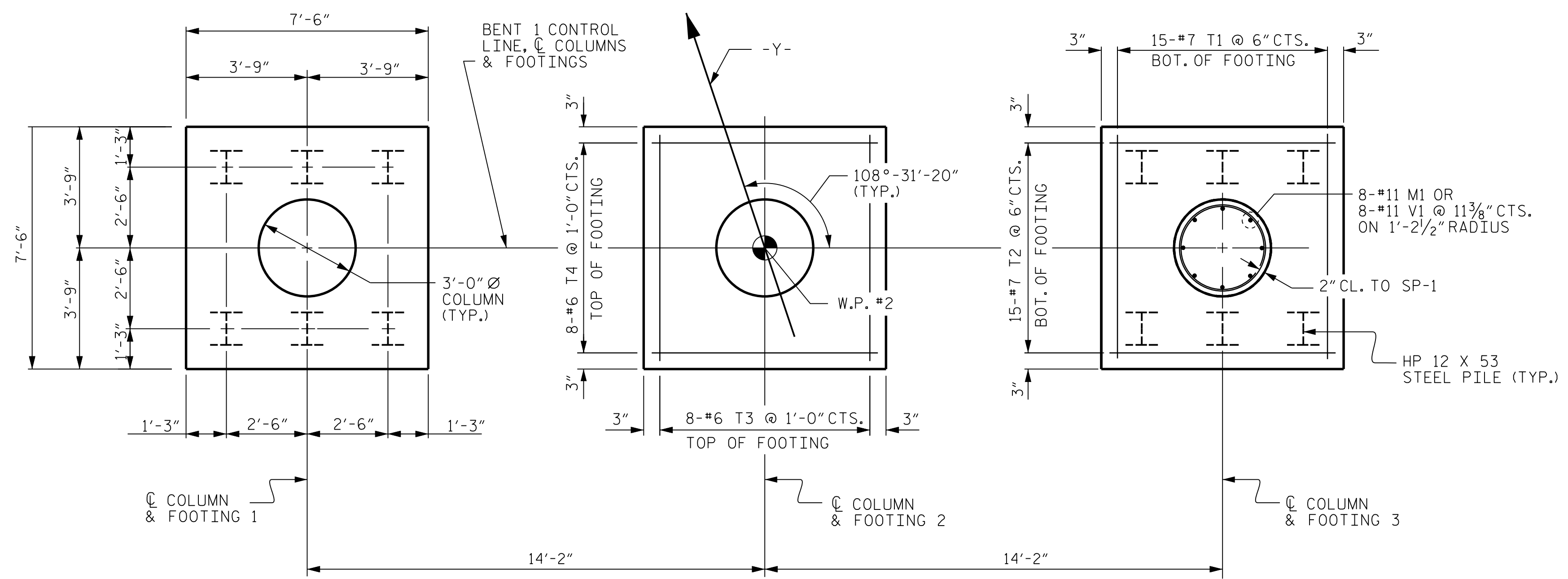
△ POSITION OF PILE DURING WELDING.



ALL BAR DIMENSIONS ARE OUT TO OUT.

| BILL OF MATERIAL | | | | | |
|-----------------------------------|-----|------|------|-----------|--------|
| BENT 1 | | | | | |
| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
| B1 | 6 | #11 | | 41'-0" | 1307 |
| B2 | 6 | #11 | STR | 38'-0" | 1211 |
| B3 | 8 | #5 | STR | 38'-0" | 317 |
| M1 | 24 | #11 | | 11'-3" | 1435 |
| S1 | 72 | #5 | | 10'-6" | 789 |
| T1 | 45 | #7 | STR | 7'-2" | 659 |
| T2 | 45 | #7 | STR | 7'-2" | 659 |
| T3 | 24 | #6 | STR | 7'-2" | 258 |
| T4 | 24 | #6 | STR | 7'-2" | 258 |
| U1 | 32 | #4 | | 6'-8" | 143 |
| U2 | 16 | #4 | | 6'-6" | 69 |
| V1 | 24 | #11 | | 19'-7" | 2497 |
| REINFORCING STEEL = | | | | 8,296 LBS | |
| SP-1 | 3 | * | 5 | 639'-9" | 2001 |
| SPIRAL COLUMN REINFORCING STEEL = | | | | 2,001 LBS | |
| CLASS A CONCRETE: | | | | | |
| POUR #1 (FOOTINGS) = | | | | C.Y. | 20.3 |
| POUR #2 (COLUMNS) = | | | | C.Y. | 12.4 |
| POUR #3 (CAP) = | | | | C.Y. | 23.2 |
| TOTAL CLASS A CONCRETE | | | | C.Y. | 55.9 |
| HP 12 X 53 STEEL PILES | | | | | |
| No. 18 | | | | LIN. FT. | 990 |
| PILE REDRIVES | | | | EA. | 9 |
| PILE DRIVING EQUIP. SETUP | | | | EA. | 18 |
| FOUNDATION EXCAVATION | | | | LUMP SUM | |

* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W-31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.



PLAN OF FOOTINGS

REINFORCING STEEL AND DIMENSIONS ARE TYPICAL FOR EACH COLUMN AND FOOTING

PROJECT NO. R-5752
ROBESON COUNTY
 STATION: 30+39.23 -Y-
 SHEET 2 OF 2

| | | | | | |
|--|-----|-------|-----|-----|-----------------|
| STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH | | | | | |
| SUBSTRUCTURE | | | | | |
| BENT 1 | | | | | |
| REVISIONS | | | | | |
| NO. | BY: | DATE: | NO. | BY: | DATE: |
| 1 | | | 3 | | |
| 2 | | | 4 | | |
| SHEET NO. S-22 | | | | | TOTAL SHEETS 24 |

CDM Smith
 CDM SMITH
 5400 Glenwood Avenue, Suite 400
 Raleigh, NC 27612-3228
 NC COA No. F-1255

CDM No. _____
 DWG. No. _____

DRAWN BY: A.L. STROUD DATE: 03/17
 CHECKED BY: J.B. TAYLOR DATE: 03/17
 DESIGN ENGINEER: J.B. TAYLOR DATE: 03/17

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 33698
 JOSHUA B. TAYLOR

DocuSigned by: Joshua B. Taylor

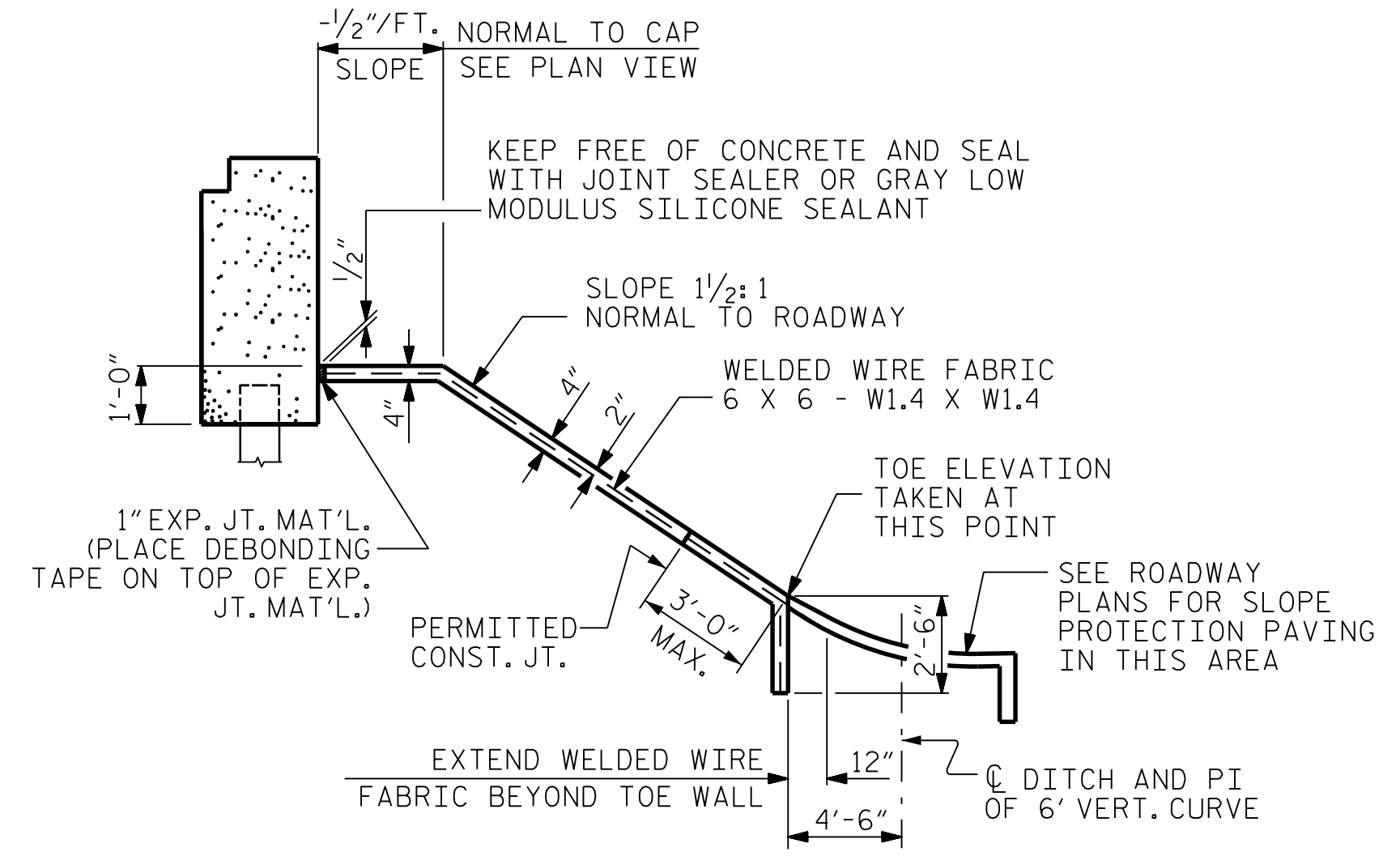
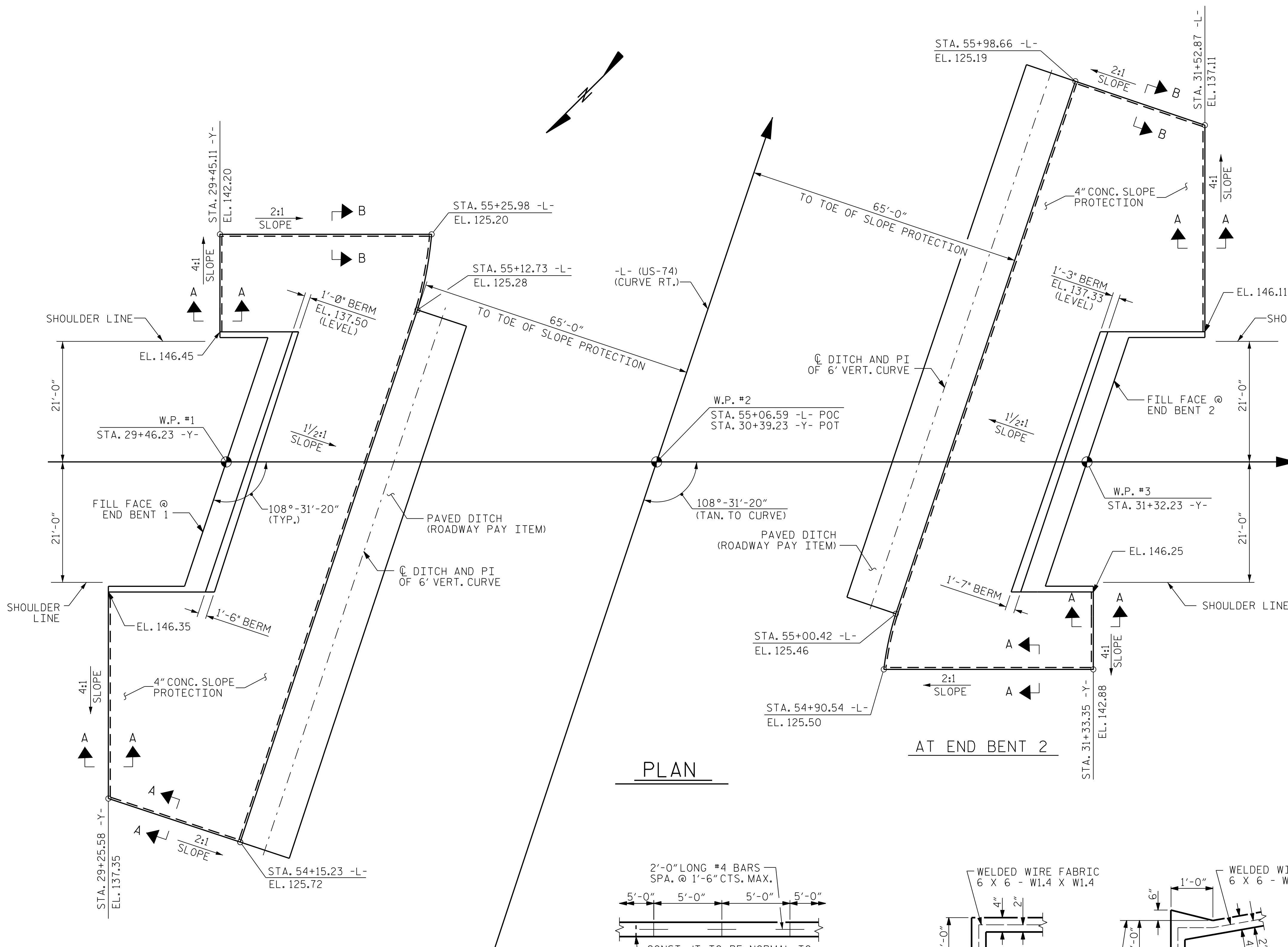
GENERAL NOTES

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

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

| BRIDGE @ STA. 30+39.23 -Y- | 4" INCH SLOPE PROTECTION SQUARE YARDS | * WELDED WIRE FABRIC 60 INCHES WIDE APPROX. L.F. |
|----------------------------|---------------------------------------|--|
| END BENT 1 | 445 | 900 |
| END BENT 2 | 430 | 860 |

* QUANTITY SHOWN IS BASED ON 5' POURS.

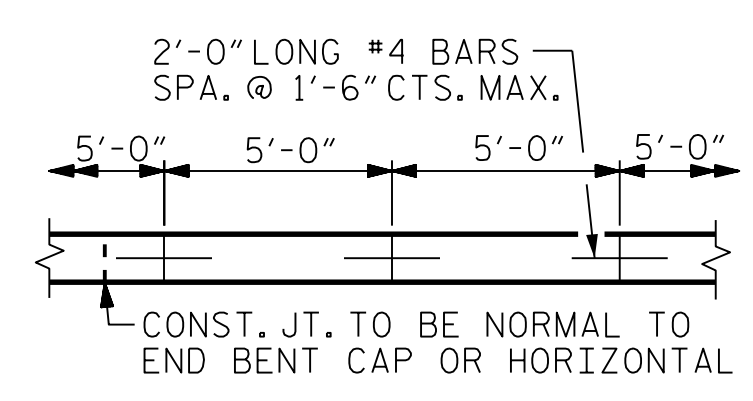


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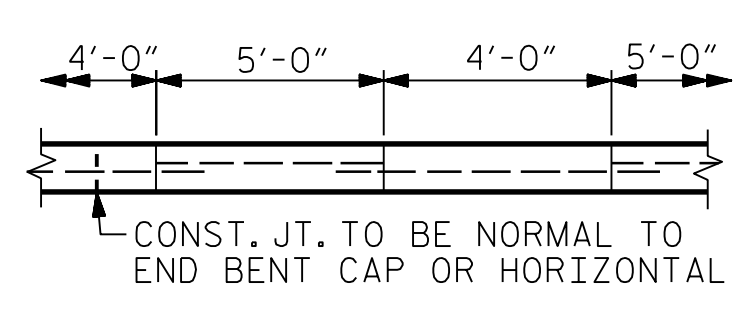
PLAN

AT END BENT 1

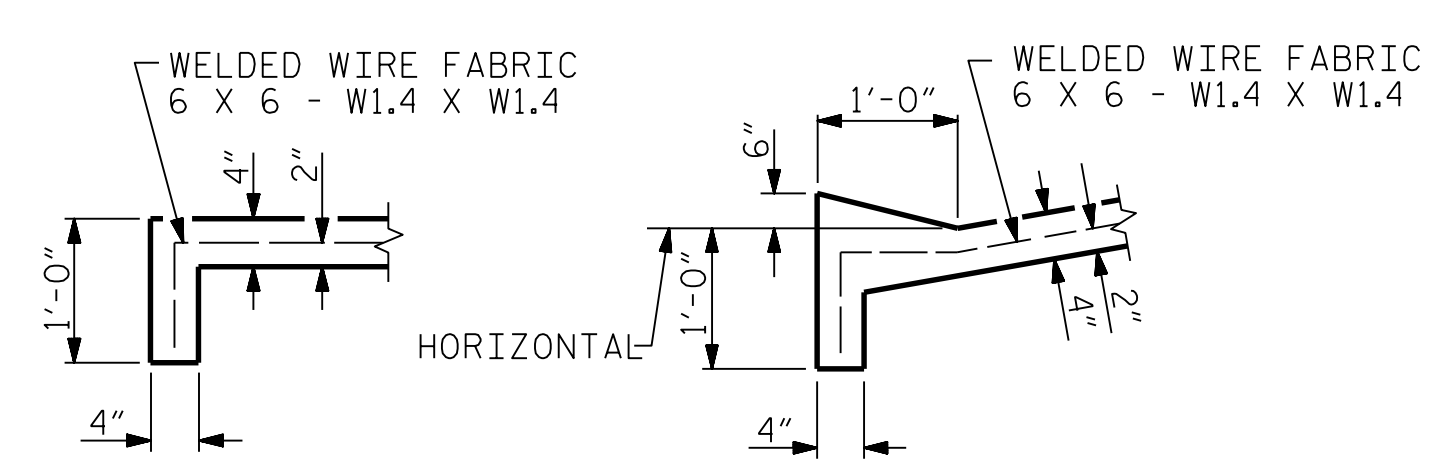
AT END BENT 2



POURING DETAIL



OPTIONAL POURING DETAIL



SECTION A-A

SECTION B-B

PROJECT NO. R-5752
ROBESON COUNTY
 STATION: 30+39.23 -Y-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 SLOPE PROTECTION
 DETAILS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

7/10/2017

SEAL
 33698
 ENGINEER
 JOSHUA B. TAYLOR

CDM Smith
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 5400 Glenwood Avenue, Suite 400
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DWG. No.

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|-----------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-23 |
| 1 | | | 3 | | | TOTAL SHEETS 24 |
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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 2012 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; AND CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP.

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1-1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 1/4" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A 1/4" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 12" INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT, ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.
ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

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

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.
METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. 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.

STANDARD NOTES