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TIP PROJECT: R-5516

CONTRACT: 203955

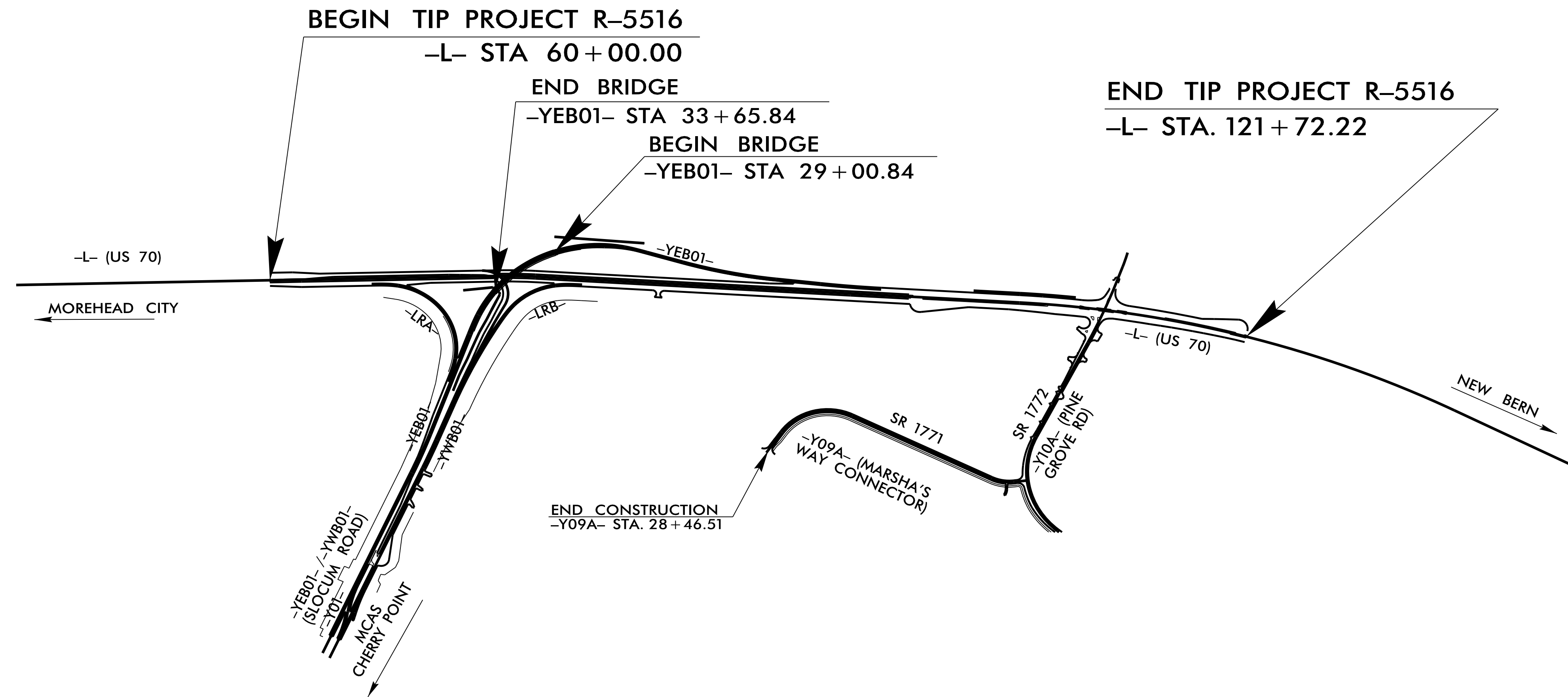
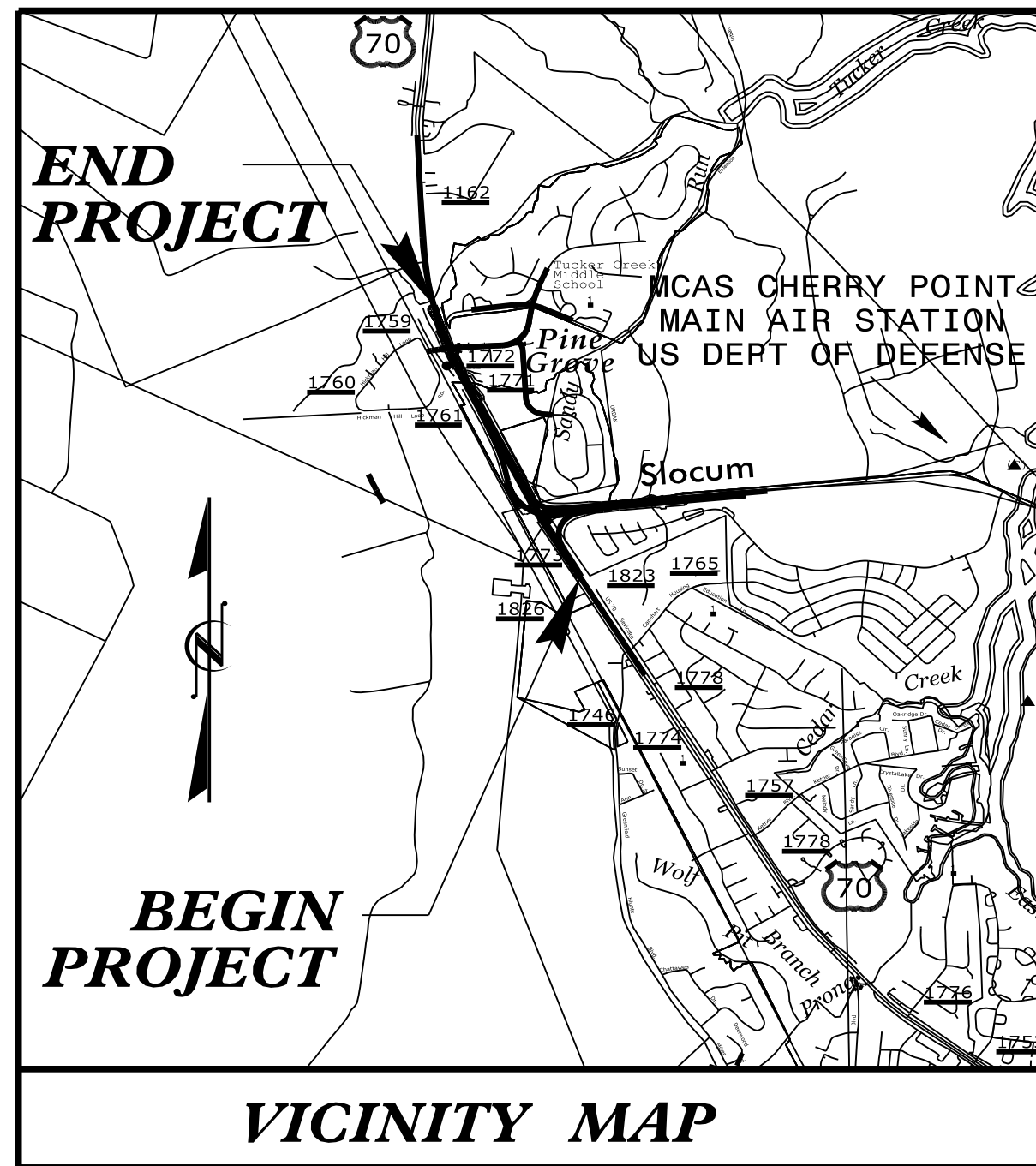
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CRAVEN COUNTY

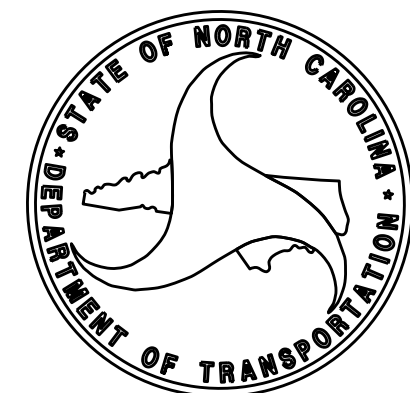
LOCATION: INTERCHANGE FROM US 70 TO SLOCUM ROAD AT CHERRY POINT MILITARY BASE

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5516		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
45492.1.1	NHS-0070(154)	PE	
45492.2.1	NHS-0070(154)	R/W /UTILITIES	
45492.3.1	NHS-0070(154)	CONSTRUCTION	



STRUCTURES



DESIGN DATA

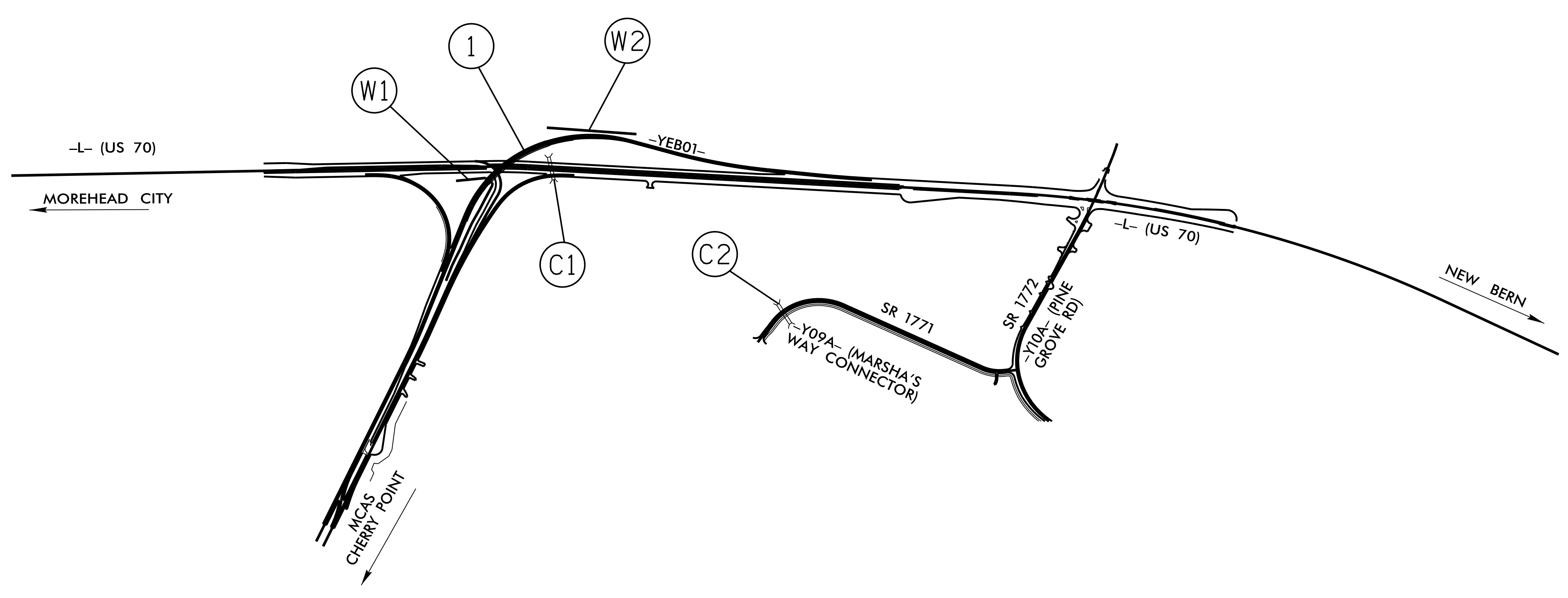
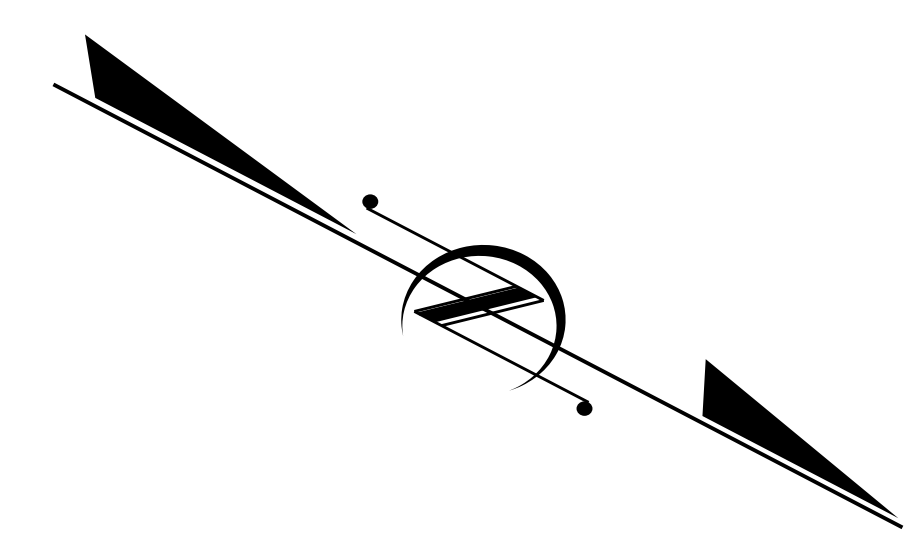
ADT 2017	=	32,900
ADT 2040	=	38,100
K	=	10 %
D	=	70 %
T	=	12 % *
V	=	60 MPH
* TTST 2 % DUAL 10%		
FUNC CLASS =		
PRINCIPAL ARTERIAL		
STATEWIDE TIER		

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-5516	=	1.169 MILES
LENGTH STRUCTURE TIP PROJECT R-5516	=	0.088 MILES
TOTAL LENGTH TIP PROJECT R-5516	=	1.257 MILES

Prepared in the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610
2012 STANDARD SPECIFICATIONS

LETTING DATE:
JUNE 20, 2017



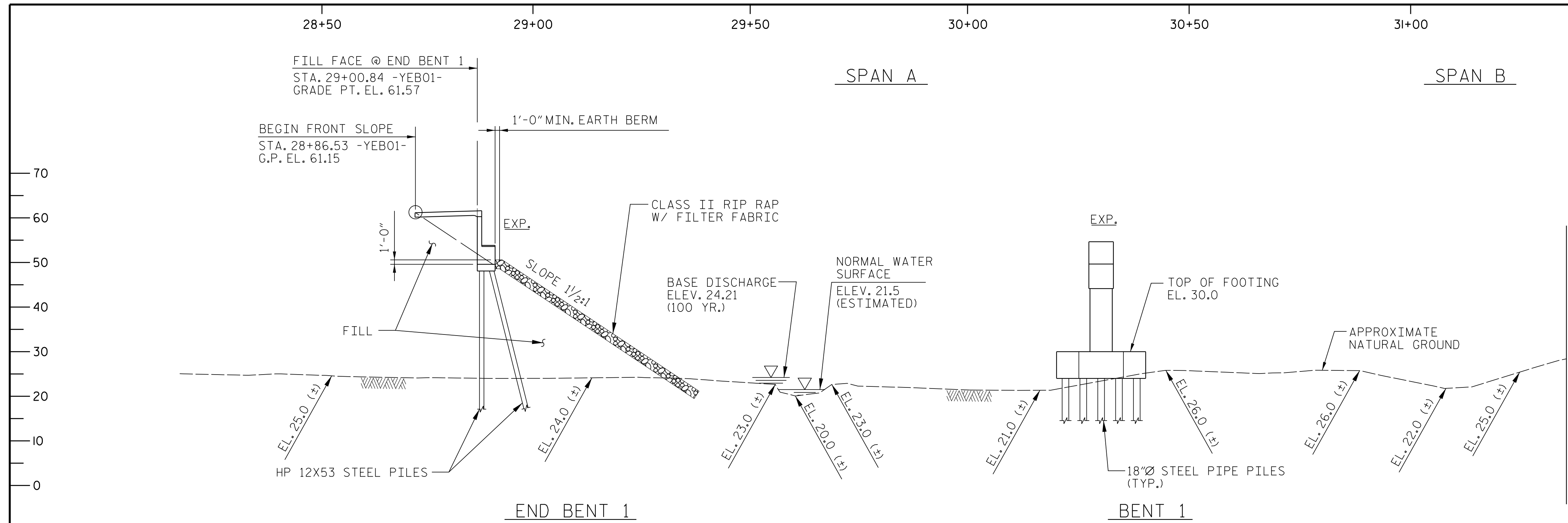
INDEX			
STR.	STATION	DESCRIPTION	SHEETS
1	32+25.84 YEB01-	BRIDGE ON US 70 FLYOVER TO SLOCUM ROAD OVER US 70 INTERCHANGE	S-1 THRU S-51
C1	78+08.84 -L-	SINGLE 6' X 5' CULVERT EXTENSION	C1-1 THRU C1-7
C2	26+94.23 -Y09A-	SINGLE 10' X 7' RCBC	C2-1 THRU C2-6
W1	9+50.00 -W1-	MSE RETAINING WALL 1	W-1 THRU W-4
W2	9+92.00 -W2-	MSE RETAINING WALL 2	W-1 THRU W-4

PROJECT NO. R-5516
CRAVEN COUNTY
 STATION: _____

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

INDEX

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



GRADE DATA -YEB01-

(+)-4.0000% (-)-4.0000%

PI 31+94.00
EL. = 73.94
V.C. = 815'

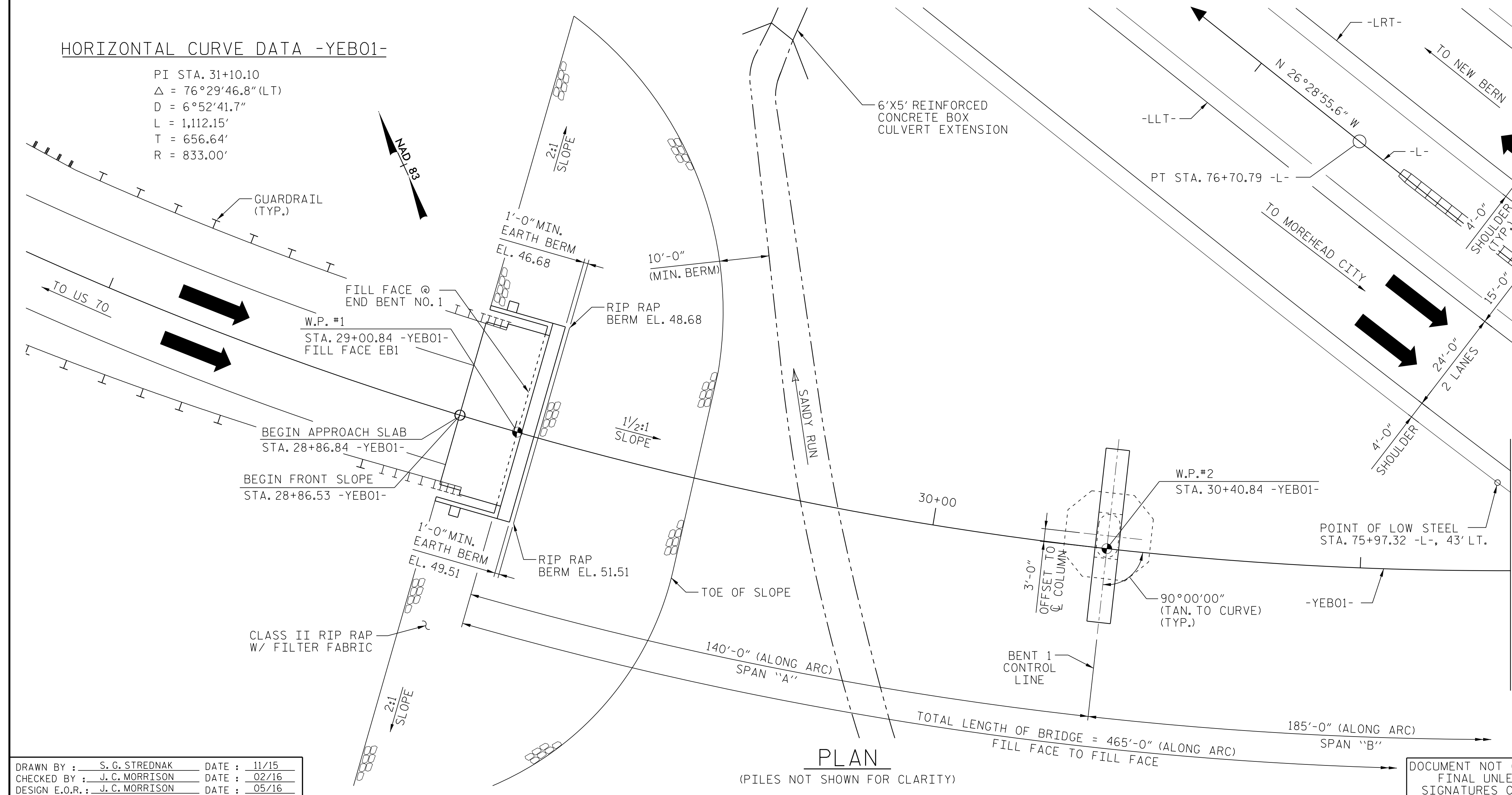
HYDROGRAPHIC DATA*	
DESIGN DISCHARGE	120 CFS
FREQUENCY OF DESIGN FLOOD	50 YR.
DESIGN HIGH WATER ELEVATION	23.4
DRAINAGE AREA	321 AC.
BASE DISCHARGE (Q100)	150 CFS
BASE HIGH WATER ELEVATION	23.8
OVERTOPPING DISCHARGE	415 CFS
OVERTOPPING ELEVATION	29.2

* BASED ON HYDROGRAPHIC DATA COMPUTED AT CULVERT -L- STA. 78+08

OVERTOPPING OCCURS AT -L- STA. 79+00.

HORIZONTAL CURVE DATA -YEB01-

PI STA. 31+10.10
 $\Delta = 76^\circ 29' 46.8''$ (LT)
 $D = 6^\circ 52' 41.7''$
 $L = 1,112.15'$
 $T = 656.64'$
 $R = 833.00'$



PROJECT NO. R-5516
CRAVEN COUNTY
 STATION: 32+25.84 -YEB01-
75+13.29 -L-
 SHEET 1 OF 6 BRIDGE NO. 240270

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 AECOM License No. F-0342

4/12/2017

NORTH CAROLINA PROFESSIONAL SEAL
 JOHN C. MORRISON
 ENGINEER
 SEAL 030474

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			51
2			4			

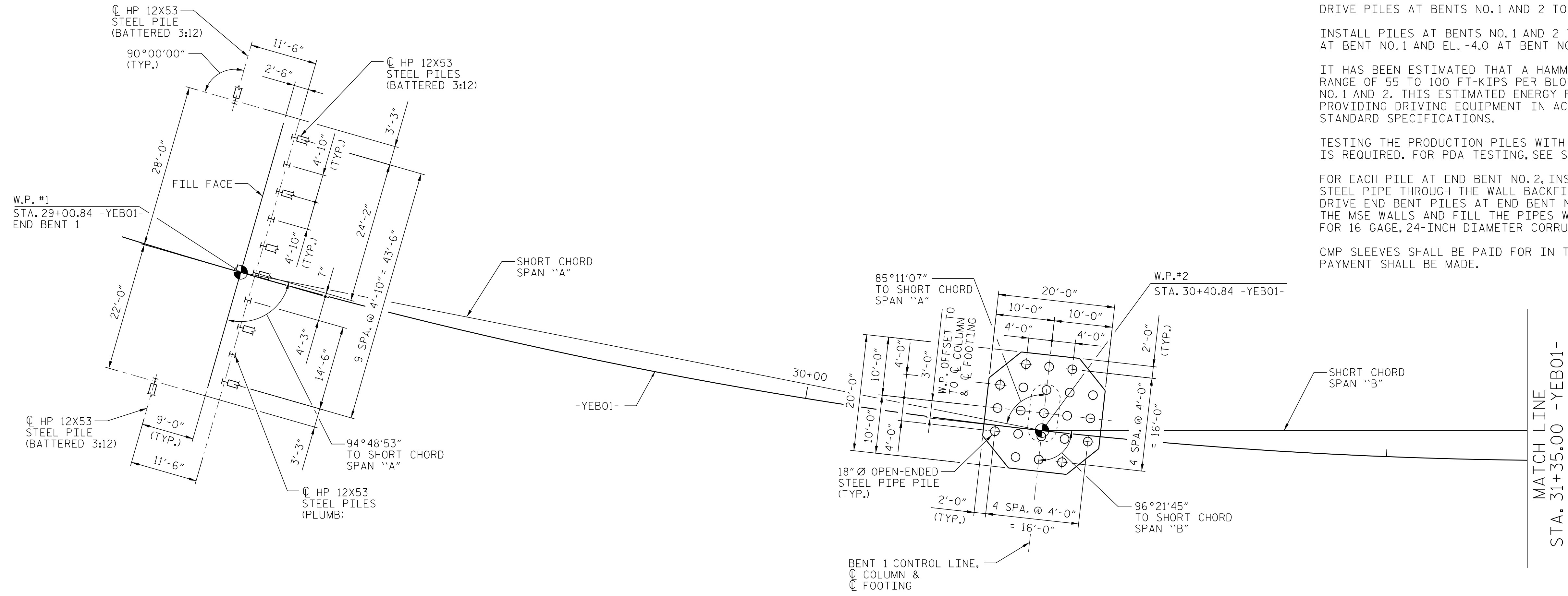
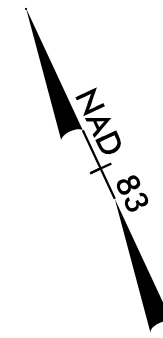
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DRAWN BY : S.G. STREDNAK DATE : 11/15
 CHECKED BY : J.C. MORRISON DATE : 02/16
 DESIGN E.O.R. : J.C. MORRISON DATE : 05/16

DATE: 4/12/2017
TIME: 2:45:23 PM

USER: jmorriso
DGN: R:\632444-Syncum_Road\400_Technical\408_Structure\Code\401_015_503_R5516_SKU_001.dgn



END BENT 1

BENT 1

FOUNDATION LAYOUT

(DIMENSIONS LOCATING PILES ARE SHOWN TO THE CENTERLINE OF PILES)

NOTES:

- FOR END BENTS, THE PILE DIMENSIONS SHOWN ARE TO THE CENTERLINE OF THE PILES AT THE BOTTOM OF CAP.
- FOR PILES, SEE GEOTECHNICAL SPECIAL PROVISIONS AND SECTION 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT END BENT NO.1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 100 AND 105 TONS PER PILE, RESPECTIVELY.
- DRIVE PILES AT END BENTS NO.1 AND 2 TO A REQUIRED DRIVING RESISTANCE OF 170 AND 175 TONS PER PILE, RESPECTIVELY.
- PILES AT BENTS NO.1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 215 TONS PER PILE.
- DRIVE PILES AT BENTS NO.1 AND 2 TO A REQUIRED DRIVING RESISTANCE OF 290 TONS.
- INSTALL PILES AT BENTS NO.1 AND 2 TO A TIP ELEVATION NO HIGHER THAN EL. -1.0 AT BENT NO.1 AND EL. -4.0 AT BENT NO.2, RESPECTIVELY.
- IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 55 TO 100 FT-KIPS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT BENTS NO.1 AND 2. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.
- TESTING THE PRODUCTION PILES WITH PDA DURING DRIVING, RESTRIKING, OR REDRIVING IS REQUIRED. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

FOR EACH PILE AT END BENT NO.2, INSTALL A 16 GAGE, 24-INCH DIAMETER CORRUGATED STEEL PIPE THROUGH THE WALL BACKFILLING ZONE DURING MSE WALL CONSTRUCTION. DRIVE END BENT PILES AT END BENT NO.2 THROUGH THE PILES AFTER COMPLETION OF THE MSE WALLS AND FILL THE PIPES WITH SAND BEFORE END BENT CAP CONSTRUCTION. FOR 16 GAGE, 24-INCH DIAMETER CORRUGATED STEEL PIPES, SEE MSE WALL PLANS.

CMP SLEEVES SHALL BE PAID FOR IN THE COST OF STEEL PILES, AND NO SEPARATE PAYMENT SHALL BE MADE.

PROJECT NO. R-5516
CRAVEN COUNTY
 STATION: 32+25.84 -YEB01-
75+13.29 -L-
 SHEET 3 OF 6

AECOM
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4/12/2017

NORTH CAROLINA PROFESSIONAL SEAL
 030474
 ENGINEER
 JOHN C. MORRISON

DocuSigned by:
 John C. Morrison
 A2FDE142C2F248

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING

BRIDGE ON US 70 FLYOVER TO
 SLOCUM ROAD OVER US 70 INTERCHANGE

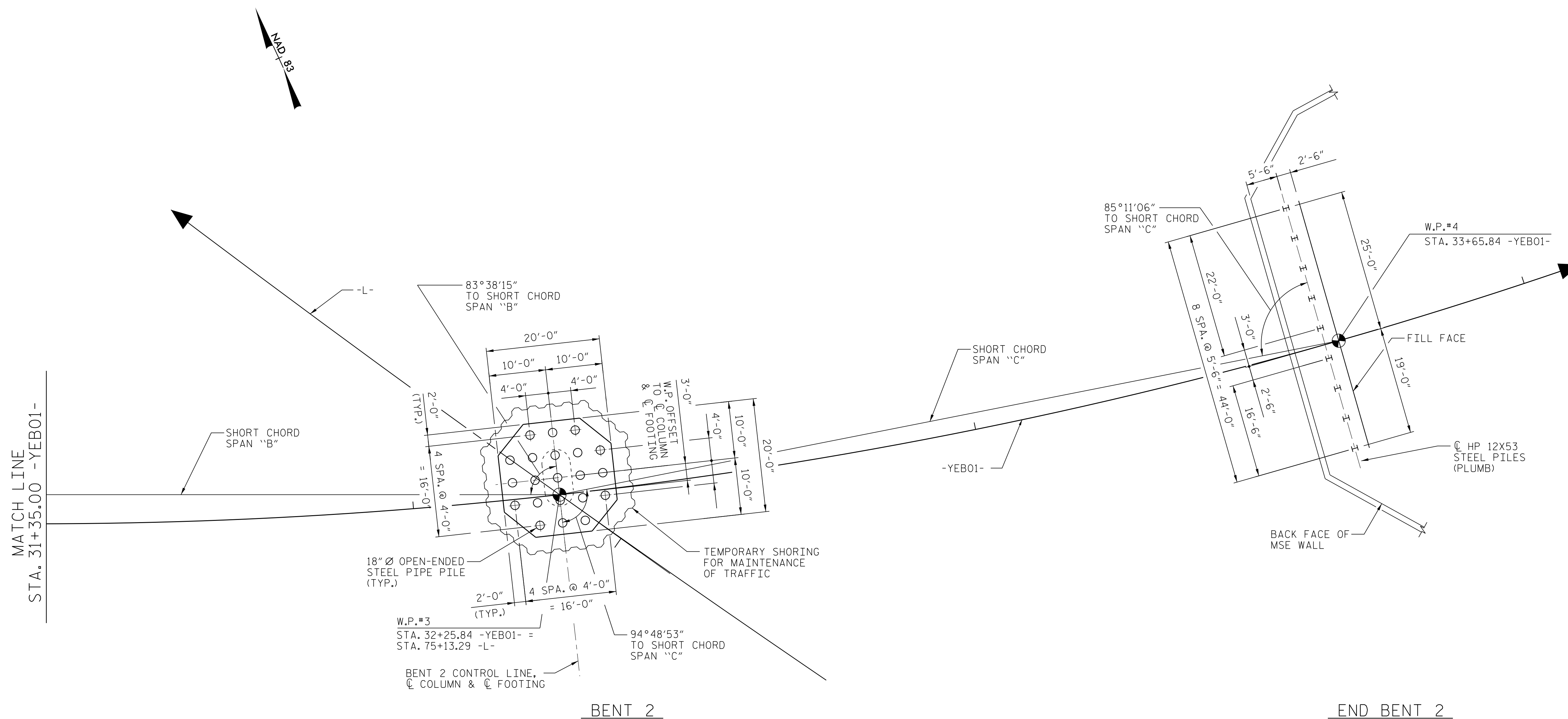
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-03
1			3			TOTAL SHEETS
2			4			51

DRAWN BY :	S. G. STREDNAK	DATE :	10/15
CHECKED BY :	J. C. MORRISON	DATE :	03/16
DESIGN E.O.R. :	J. C. MORRISON	DATE :	05/16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NOTES:

FOR FOUNDATION NOTES, SEE "GENERAL DRAWING" SHEET 3 OF 6.



FOUNDATION LAYOUT

(DIMENSIONS LOCATING PILES ARE SHOWN TO THE CENTERLINE OF PILES)

PROJECT NO. R-5516

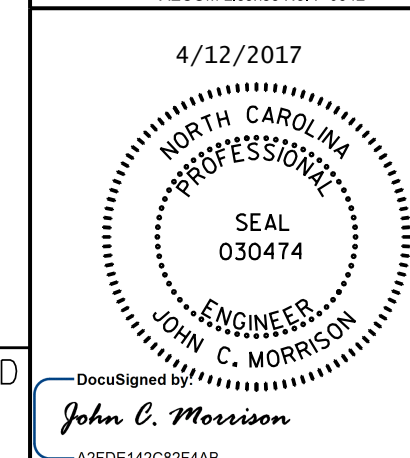
CRAVEN COUNTY

STATION: 32+25.84 -YEB01-
75+13.29 -L-

SHEET 4 OF 6



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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON US 70 FLYOVER TO
SLOCUM ROAD OVER US 70 INTERCHANGE

REVISIONS

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

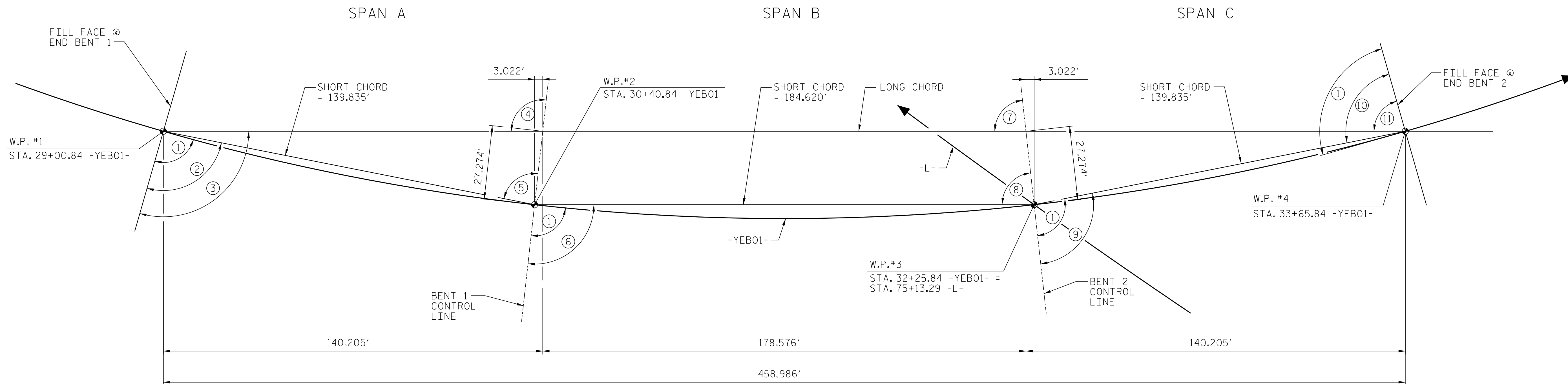
SHEET NO.
S-04
TOTAL SHEETS
51

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DRAWN BY : S. G. STREDNAK DATE : 10/15
CHECKED BY : J. C. MORRISON DATE : 03/16
DESIGN E.O.R. : J. C. MORRISON DATE : 05/16

DATE: 4/7/2017
TIME: 2:45:59 PM

USER: pwr1593
DGN: R:\63284\4-Sigum_Road\MO_Technical\08_Structure\Cada\01_020_S04_R5516_SML_G004.dgn



LONG CHORD LAYOUT
(END BENTS AND BENTS ARE RADIAL TO -YEB01-)

HORIZONTAL CURVE DATA -YEB01-

PI STA. 31+10.10
 $\Delta = 76^\circ 29' 46.8''$ (LT)
 $D = 6^\circ 52' 41.7''$
 $L = 1,112.15'$
 $T = 656.64'$
 $R = 833.00'$

ANGLES	
①	90°00'00" (TAN. TO CURVE)
②	94°48'53"
③	105°59'31"
④	96°21'45"
⑤	85°11'07"
⑥	96°21'45"
⑦	83°38'15"
⑧	83°38'15"
⑨	94°48'53"
⑩	85°11'07"
⑪	74°00'28"

PROJECT NO. R-5516
CRAVEN COUNTY
 STATION: 32+25.84 -YEB01-
75+13.29 -L-
 SHEET 5 OF 6

DRAWN BY : S. G. STREDNAK DATE : 08/15
 CHECKED BY : J. C. MORRISON DATE : 11/15
 DESIGN E.O.R. : J. C. MORRISON DATE : 05/16

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4/12/2017

NORTH CAROLINA
 PROFESSIONAL
 SEAL
 030474
 ENGINEER
 JOHN C. MORRISON

DocuSigned by:
 John C. Morrison
A2FDE142C82F4A8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

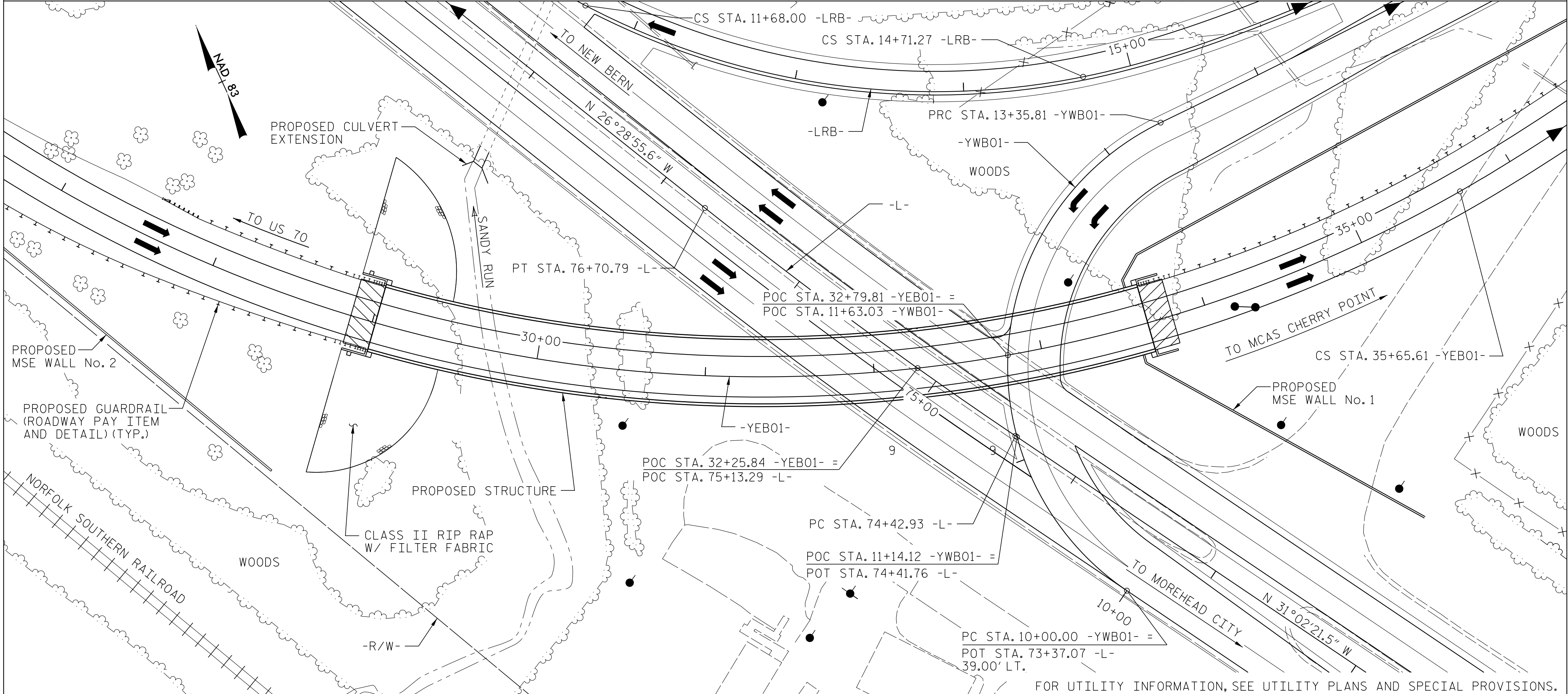
GENERAL DRAWING

BRIDGE ON US 70 FLYOVER TO
 SLOCUM ROAD OVER US 70 INTERCHANGE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-05
1			3			TOTAL SHEETS
2			4			51

DATE: 4/12/2017 TIME: 2:46:18 PM
 USER: jmorriso D:\6352444_Syncum_Road\400_Technical\408_Structure\Cadd\401_025_S05_P5516_SML\GD05.dgn

BENCH MARK: BM#8 - R/R SPIKE SET IN LIGHT POLE ID#129M02, -L- STA. 70+55.80, 137.2' LEFT
 N 871980 E 1783179, ELEV. = 28.88', NAVD 1988



LOCATION SKETCH

NOTES:

- ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
- THIS BRIDGE IS DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
- THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
- THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC-18 - EVALUATING SCOUR AT BRIDGES".
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.
- FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
- THE ELEVATIONS AND CLEARANCES SHOWN ON THE PLANS AT THE POINT OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATIONS ON THE EXISTING 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.
- FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.
- REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
- NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.
- ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50 AND PAINTED IN ACCORDANCE WITH SYSTEM 1 OF ARTICLE 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.
- FOR FOUNDATION NOTES, SEE "FOUNDATION LAYOUT" SHEET.
- 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.
- FOR INTERIOR BENTS 1 AND 2, ONLY PARTIAL GALVANIZING OF THE PILES IS REQUIRED. SEE BENT SHEETS FOR REQUIRED GALVANIZED LENGTHS. PAYMENT FOR PARTIALLY GALVANIZED PILES WILL BE MADE UNDER THE CONTRACT UNIT PRICE FOR GALVANIZED STEEL PILES.

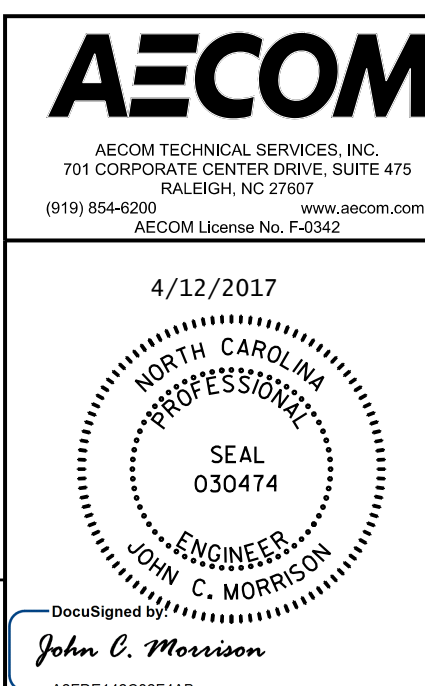
TOTAL BILL OF MATERIAL

	FOUNDATION EXCAVATION AT BENT	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	STRUCTURAL STEEL (APPROX.)	PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES	PILE DRIVING EQUIPMENT SETUP FOR PP 18X0.50 GALVANIZED STEEL PILES	HP 12x53 STEEL PILES		PP 18x0.50 GALVANIZED STEEL PILES		PILE REDRIVES	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION
											NO.	LIN. FT.	NO.	LIN. FT.			
SUPERSTRUCTURE	LUMP SUM	EA.	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	EA.	EA.	NO.	LIN. FT.	NO.	LIN. FT.	EA.	LIN. FT.	SO. YD.
END BENT NO. 1			19091	17126				887,980								962.32	
BENT NO. 1					58.4		7546		12		12	1260			6		
BENT NO. 2					171.1		33535		21				21	1680	12		
END BENT NO. 2	LUMP SUM				177.2		33790		21				21	1630	11		
TOTAL	LUMP SUM	2	19091	17126	461.8	LUMP SUM	82025	887,980	21	42	21	2250	42	3310	34	962.32	80

	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	DISC BEARINGS	EXPANSION JOINT SEALS
SUPERSTRUCTURE				
END BENT NO. 1	923	1025		
BENT NO. 1				
BENT NO. 2				
END BENT NO. 2				
TOTAL	923	1025	LUMP SUM	LUMP SUM

DRAWN BY: S.G. STREDNAK DATE: 04/17
 CHECKED BY: N.K. BROWN DATE: 04/17
 DESIGN E.O.R.: J.C. MORRISON DATE: 04/17

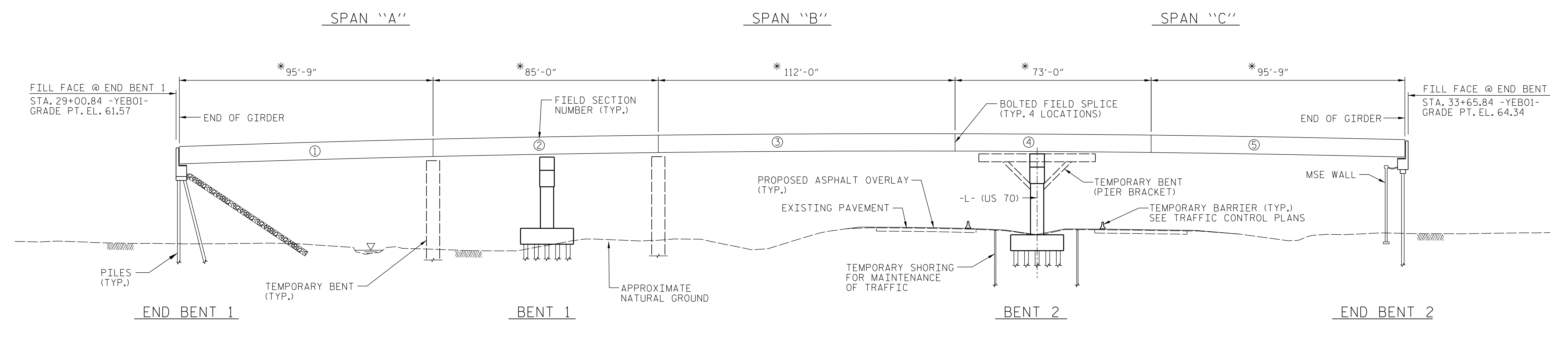
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PROJECT NO. R-5516
 CRAVEN COUNTY
 STATION: 32+25.84 -YEB01-
 75+13.29 -L-
 SHEET 6 OF 6

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			51
2			4			

USER: pnc1593; P:\0321454_S\Team Room\A00_Technical\08_Structural\04\030_S06_R5516_SML\0006.dgn
 DATE: 4/17/2017 TIME: 2:46:44 PM



SECTION ALONG -YEB01-
 (SECTIONS AT BENT AND END BENTS ARE AT RIGHT ANGLES)

* FIELD SECTION LENGTHS SHOWN ARE MEASURED ALONG -YEB01-.
 ACTUAL FIELD SECTION LENGTHS VARY BY GIRDER.

ERECTION NOTES

THE FIRST TWO GIRDERS SHALL BE ERECTED TOGETHER AND ALL CROSSFRAMES SHALL BE INSTALLED BETWEEN THE ERECTED GIRDER SECTIONS PRIOR TO RELEASING THE GIRDERS. THE CROSSFRAMES BETWEEN EACH ADDITIONAL ERECTED GIRDER SHALL BE INSTALLED PRIOR TO ITS RELEASE.

THE STRUCTURAL STEEL SHALL BE SUPPORTED DURING ERECTION IN ITS CAMBERED POSITION. ONE EXTERIOR GIRDER AND ITS ADJACENT INTERIOR GIRDER SHALL BE ERECTED WITH ALL DIAPHRAGMS, CROSSFRAMES AND LATERAL BRACING BETWEEN GIRDERS IN PLACE AND ALL BOLTS TIGHTENED PRIOR TO RELEASE OF THE GIRDERS. THE REMAINING GIRDERS SHALL THEN BE ERECTED WITH DIAPHRAGMS CONNECTING THE GIRDER TO THE ADJACENT ERECTED GIRDER AND ALL BOLTS TIGHTENED BEFORE RELEASING THE GIRDER.

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

THE CONTRACTOR MAY SUBMIT ALTERNATE ERECTION METHODS. PLANS FOR SUCH ERECTION METHODS SHALL BE APPROVED BY THE ENGINEER.

PLACEMENT OF TEMPORARY BENT(S) OR TEMPORARY BENT BRACKETS, IF USED, SHALL BE COORDINATED WITH TRAFFIC PHASING REQUIREMENTS. SEE TRAFFIC CONTROL PLANS. THE CONTRACTOR SHALL ENSURE ADEQUATE CLEARANCES ARE PROVIDED BETWEEN TEMPORARY BENTS OR TEMPORARY BENT BRACKETS AND EDGE OF TRAVEL LANE.

TEMPORARY BENT(S), IF USED, SHALL SUPPORT ALL GIRDERS IN THE TYPICAL SECTION AND REMAIN IN PLACE UNTIL ALL CROSSFRAMES AND LATERAL BRACING ARE IN PLACE AND HIGH STRENGTH BOLTS ARE TIGHTENED.

METHOD OF TEMPORARY BENT REMOVAL SHALL UNIFORMLY APPLY THE STRUCTURAL STEEL WEIGHT TO THE GIRDERS AND DIAPHRAGMS.

THE CONTRACTOR IS RESPONSIBLE FOR DESIGNING ANY TEMPORARY BENTS. THE DESIGN SHALL FOLLOW THE AASHTO DESIGN GUIDE SPECIFICATIONS FOR BRIDGE TEMPORARY WORKS, 1995, INCLUDING 2008 INTERIM REVISIONS, AND SHALL BE COMPLETED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NORTH CAROLINA. THE CONTRACTOR SHALL SUBMIT SIGNED AND SEALED CALCULATIONS AND WORKING DRAWINGS FOR APPROVAL BY THE ENGINEER. WORKING DRAWINGS SHALL INCLUDE PLANS FOR TEMPORARY BENT(S), ERECTION SEQUENCE AND TEMPORARY BENT REMOVAL.

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

FOR TEMPORARY BENTS, SEE SPECIAL PROVISIONS.

PROJECT NO. R-5516
CRAVEN COUNTY
 STATION: 32+25.84 -YEB01-
75+13.29 -L-

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4/12/2017

NORTH CAROLINA
 PROFESSIONAL
 SEAL
 030474
 ENGINEER
 JOHN C. MORRISON

DocuSigned by
 John C. Morrison
 A2FDE142C82F4A8

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

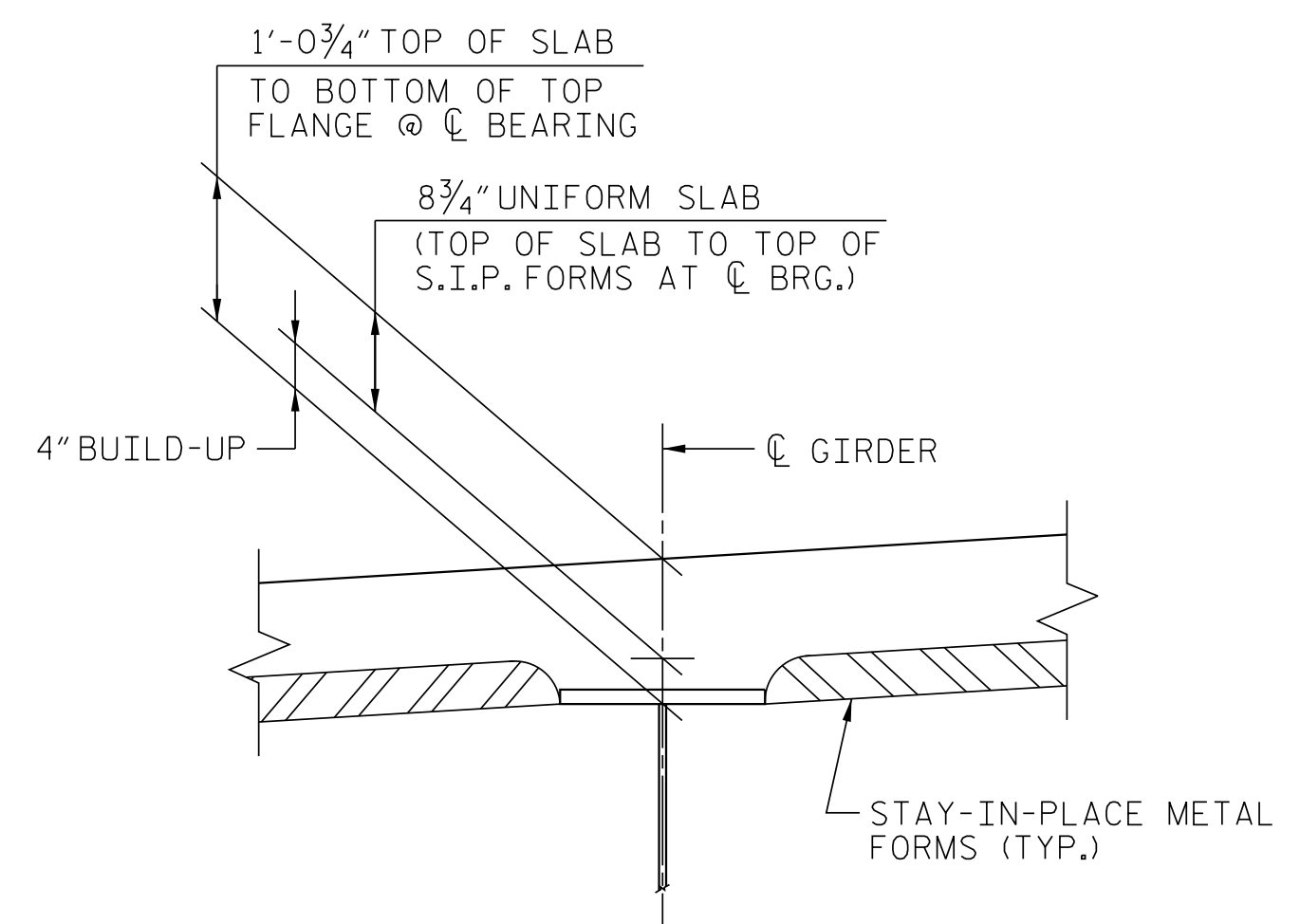
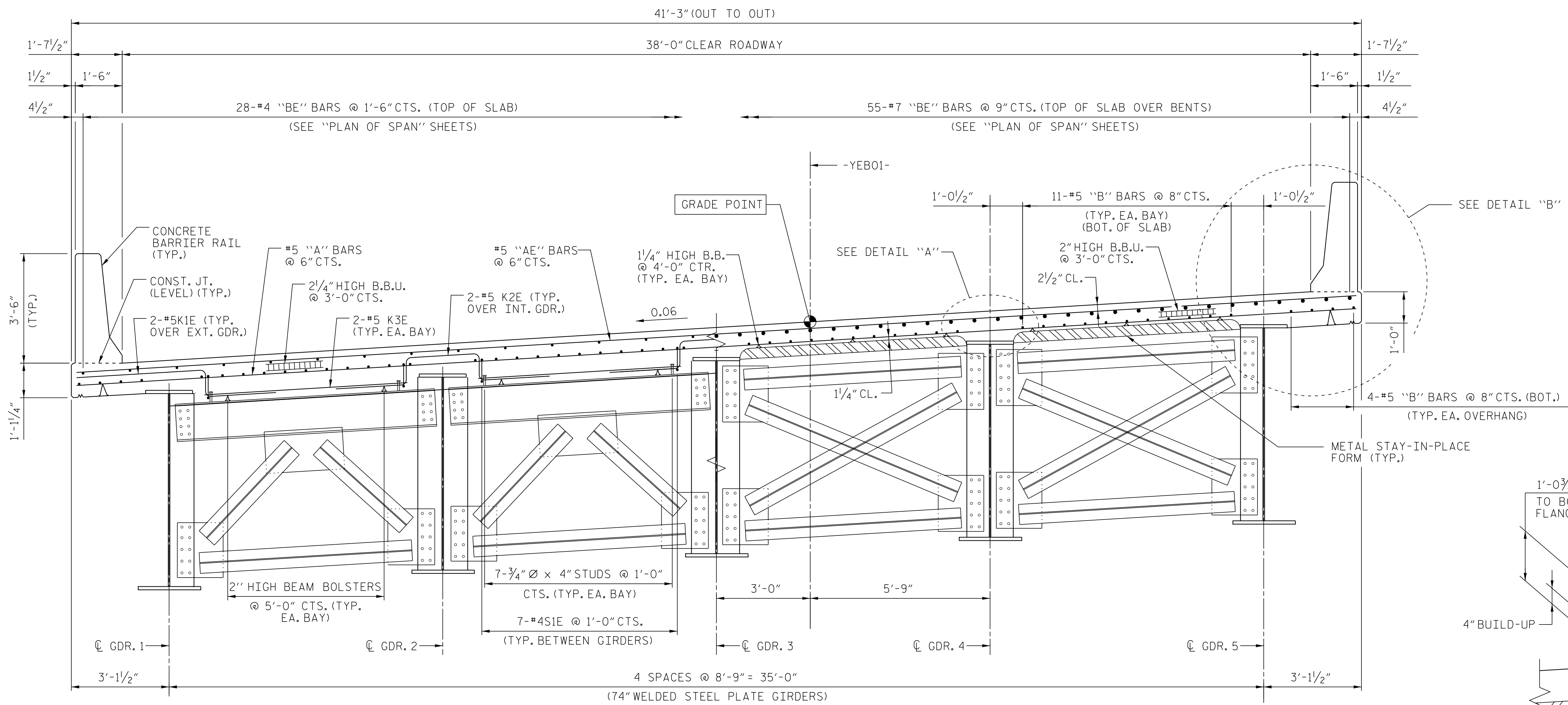
GIRDER ERECTION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-08
1			3			TOTAL SHEETS
2			4			51

DRAWN BY : S. G. STREDNAK DATE : 03/16
 CHECKED BY : J. C. MORRISON DATE : 03/16
 DESIGN E.O.R. : J. C. MORRISON DATE : 05/16

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HALF SECTION AT END BENT DIAPHRAGMS

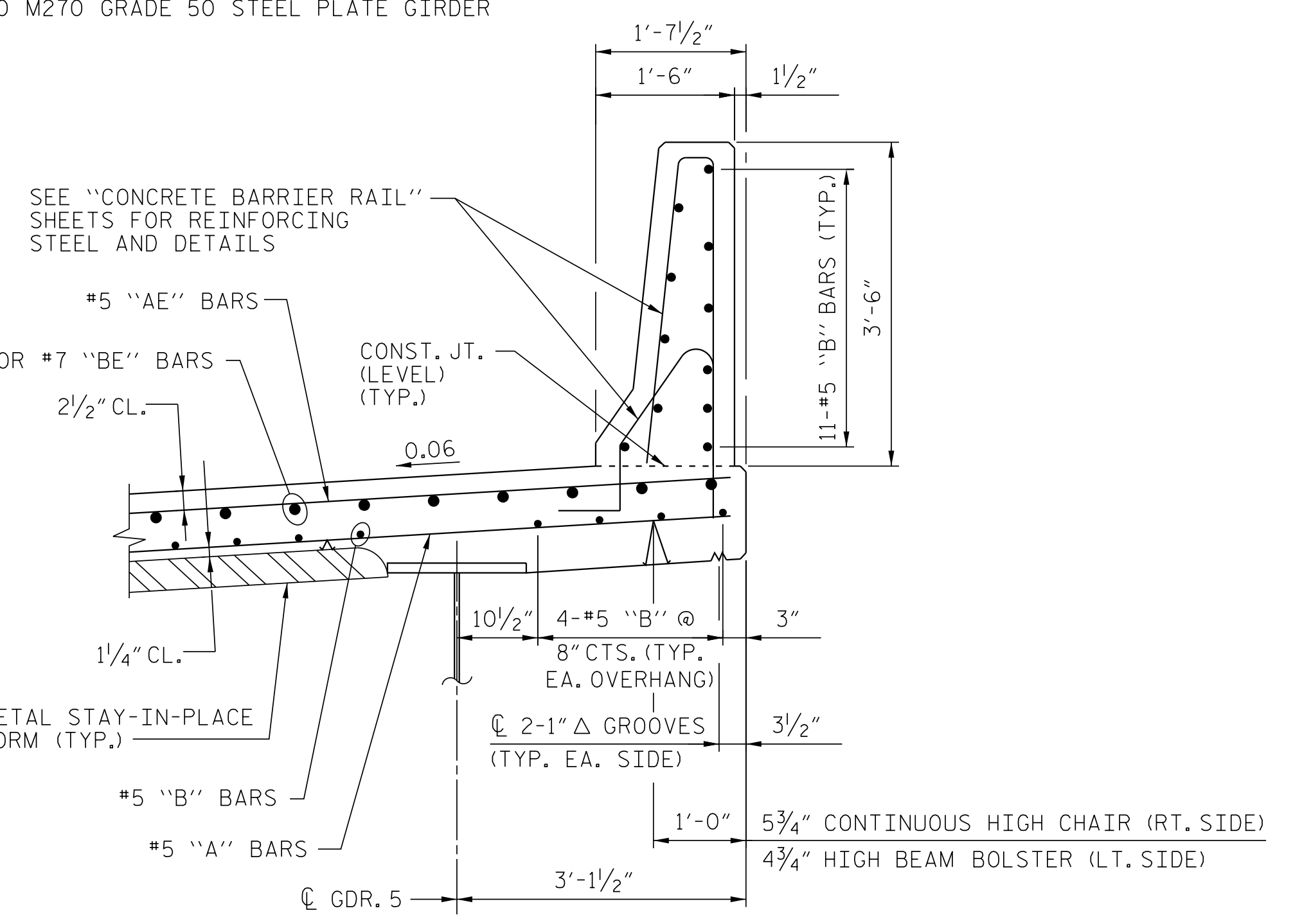
HALF SECTION AT BENT 1 & 2 CROSSFRAMES

TYPICAL SECTION 3-SPAN CONTINUOUS, COMPOSITE, AASHTO M270 GRADE 50 STEEL PLATE GIRDER

DETAIL "A"

NOTES

- ALL HORIZONTAL DIMENSIONS ARE RADIAL. #5 "A" AND #5 "AE" BARS IN THE SLAB ARE TO BE PLACED ON RADIAL LINES.
- STRUCTURAL STEEL ERECTION IN A CONTINUOUS UNIT SHALL BE COMPLETE BEFORE FALSEWORK OR FORMS ARE PLACED ON THE UNIT.
- PROVIDE 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF 'A' BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) AT 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 2 1/2" ABOVE THE TOP OF THE REMOVABLE FORM.
- METAL STAY-IN-PLACE FORMS AND FALSEWORK SHALL NOT BE WELDED TO GIRDER FLANGES IN THE ZONES REQUIRING CHАРY V-NOTCH TEST. SEE "STRUCTURAL STEEL DETAILS" SHEET.
- PREVIOUSLY CAST CONCRETE IN CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.
- BARRIER RAIL 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 3000 PSI.
- THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN METAL STAY-IN-PLACE FORM SUPPORTS OR FORMS AND GIRDER STIFFENER OR CONNECTOR PLATES. THE PROPOSAL SHALL BE INDICATED, AS APPROPRIATE, ON EITHER STEEL WORKING DRAWINGS OR THE METAL STAY-IN-PLACE FORM WORKING DRAWINGS.
- THE CONTRACTOR SHALL ADJUST THE GIRDER BUILD-UPS AS NECESSARY TO INCORPORATE A MAXIMUM PERMISSIBLE VARIATION IN DISC BEARING DEPTH OF 1/2". SEE SPECIAL PROVISION FOR DISC BEARINGS.



DETAIL "B" (RT. OVERHANG SHOWN, LT. OVERHANG SIMILAR)

PROJECT NO. R-5516
CRAVEN COUNTY
STATION: 32+25.84 -YEB01-
75+13.29 -L-
SHEET 1 OF 2

AECOM
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4/12/2017

NORTH CAROLINA PROFESSIONAL SEAL
SEAL 030474
ENGINEER JOHN C. MORRISON
John C. Morrison
AZFDE142CRZF4AB

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION AND DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			51
2			4			

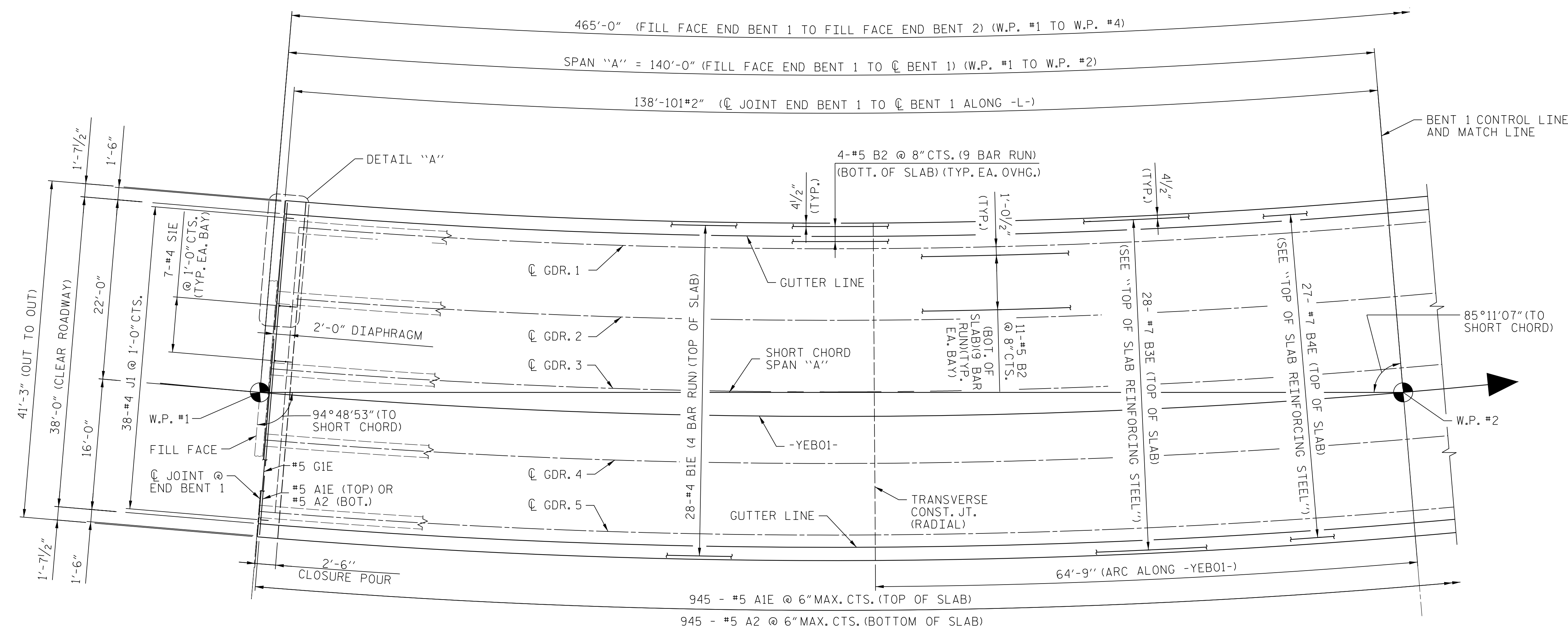
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CHECKED BY : J. C. MORRISON DATE : 10/15
DESIGN E.O.R. : J. C. MORRISON DATE : 05/16

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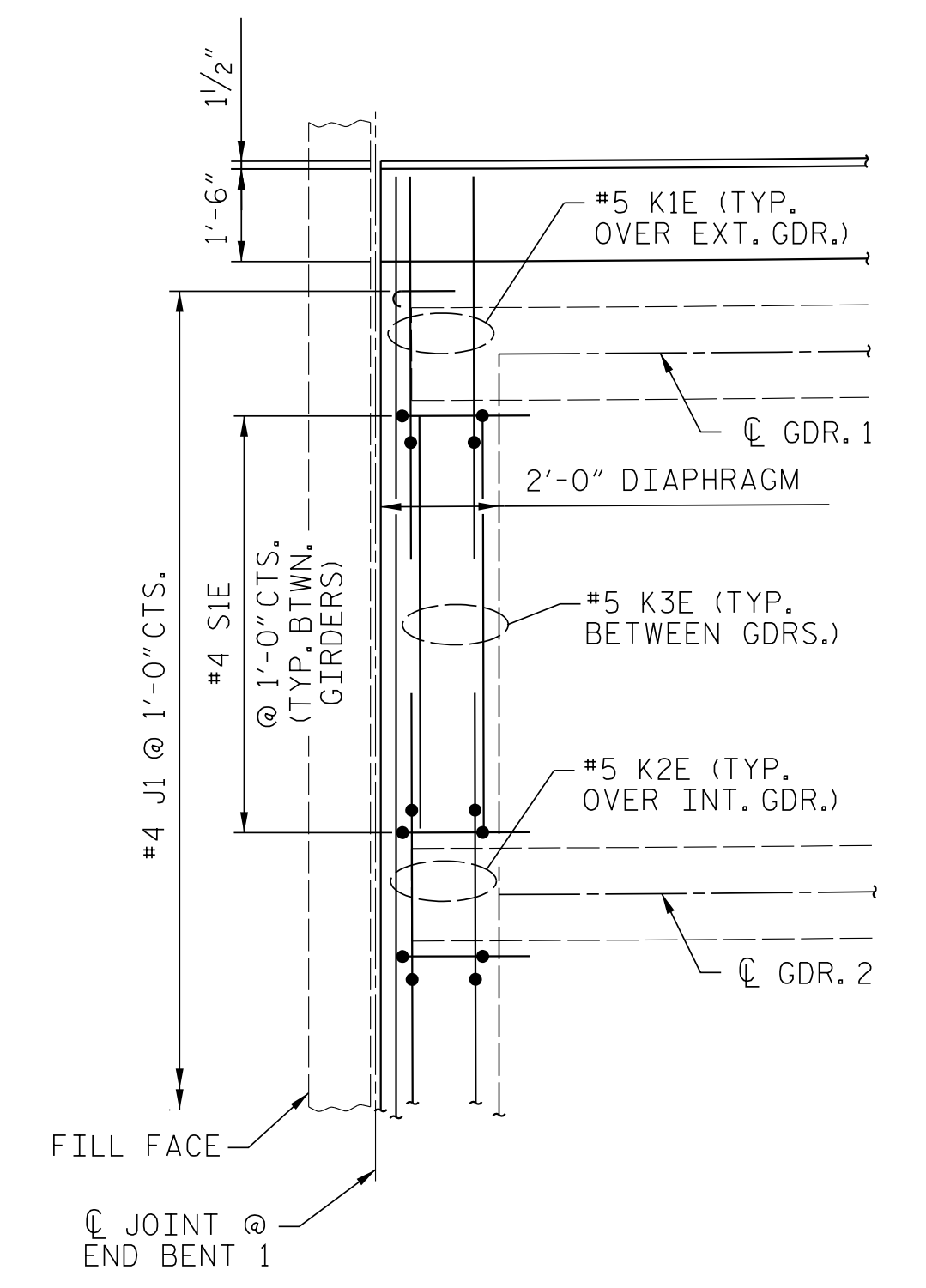
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NOTES

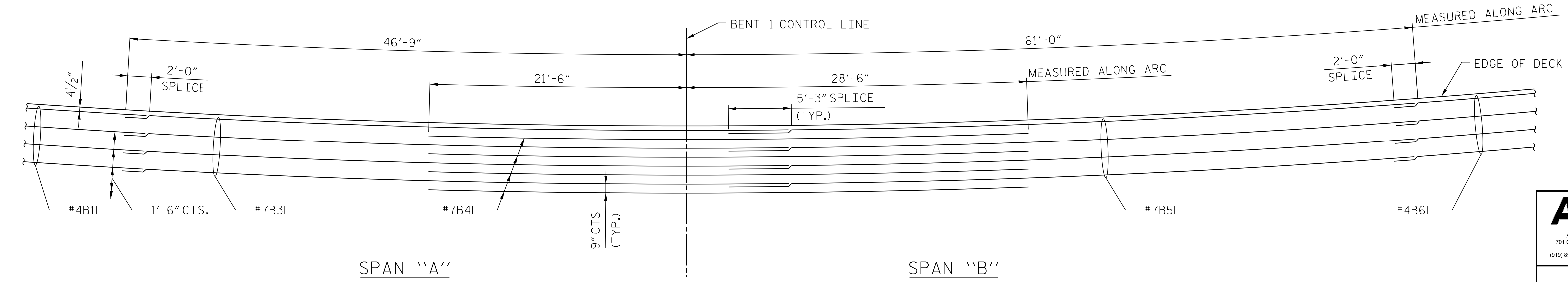
FOR CONCRETE BARRIER RAIL DETAILS, SEE "CONCRETE BARRIER RAIL" SHEET.
 FOR TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB DETAIL, SEE SUPERSTRUCTURE "TYPICAL SECTION AND DETAILS" SHEET 2 OF 2.
 TRANSVERSE CONSTRUCTION JOINTS MAY BE SHIFTED SLIGHTLY, IF NECESSARY, TO PROVIDE 2" MINIMUM CLEARANCE TO "A" BARS.



PLAN OF SPAN "A"
 (ALL DIMENSIONS RADIAL UNLESS NOTED)



DETAIL "A"



TOP OF SLAB REINFORCING STEEL

PROJECT NO. R-5516
CRAVEN COUNTY
 STATION: 32+25.84 -YEB01-
75+13.29 -L-
 SHEET 1 OF 3

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4/12/2017
 NORTH CAROLINA PROFESSIONAL SEAL
 SEAL 030474
 ENGINEER JOHN C. MORRISON

DocuSigned by:
 John C. Morrison
 A2FDE142C2F248B

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE					
PLAN OF SPAN "A"					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-11					TOTAL SHEETS 51

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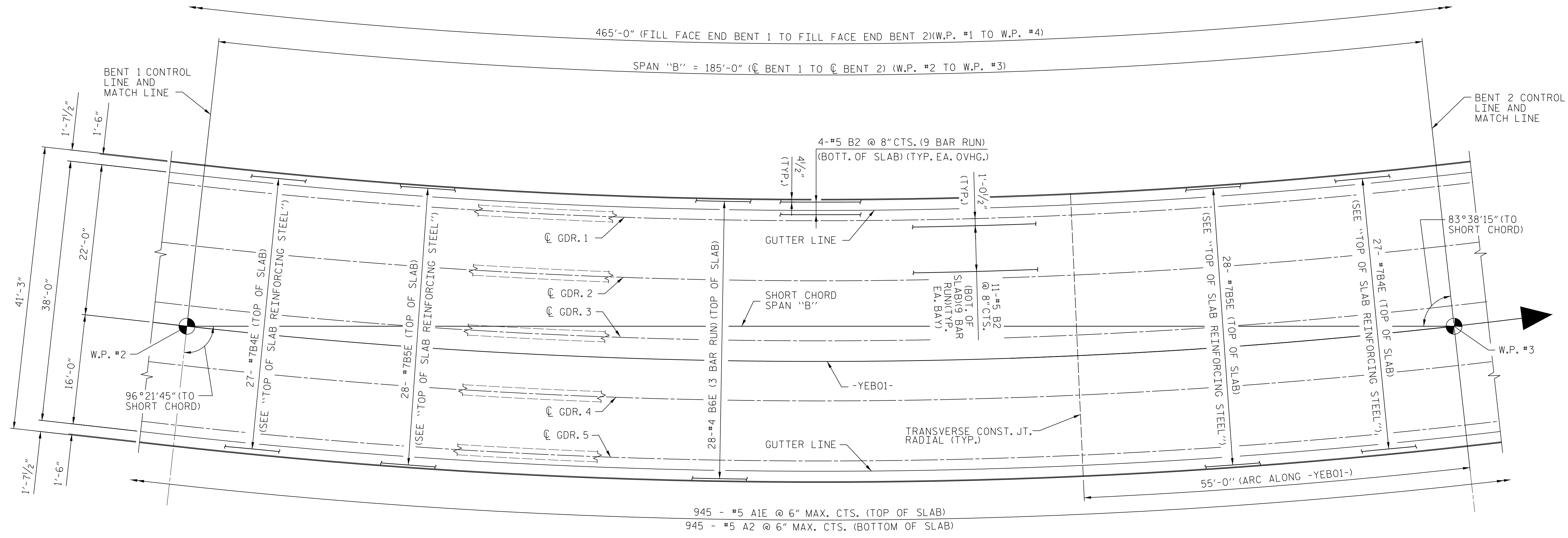
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PLAN OF SPAN "B"
(ALL DIMENSIONS RADIAL UNLESS NOTED)

PROJECT NO. R-5516
CRAVEN COUNTY
 STATION: 32+25.84 -YEB01-
75+13.29 -L-
 SHEET 2 OF 3

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4/12/2017

NORTH CAROLINA
 PROFESSIONAL
 SEAL
 030474
 ENGINEER
 JOHN C. MORRISON

DocuSigned by
 John C. Morrison
 A2FDE142C82F4A8

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN "B"

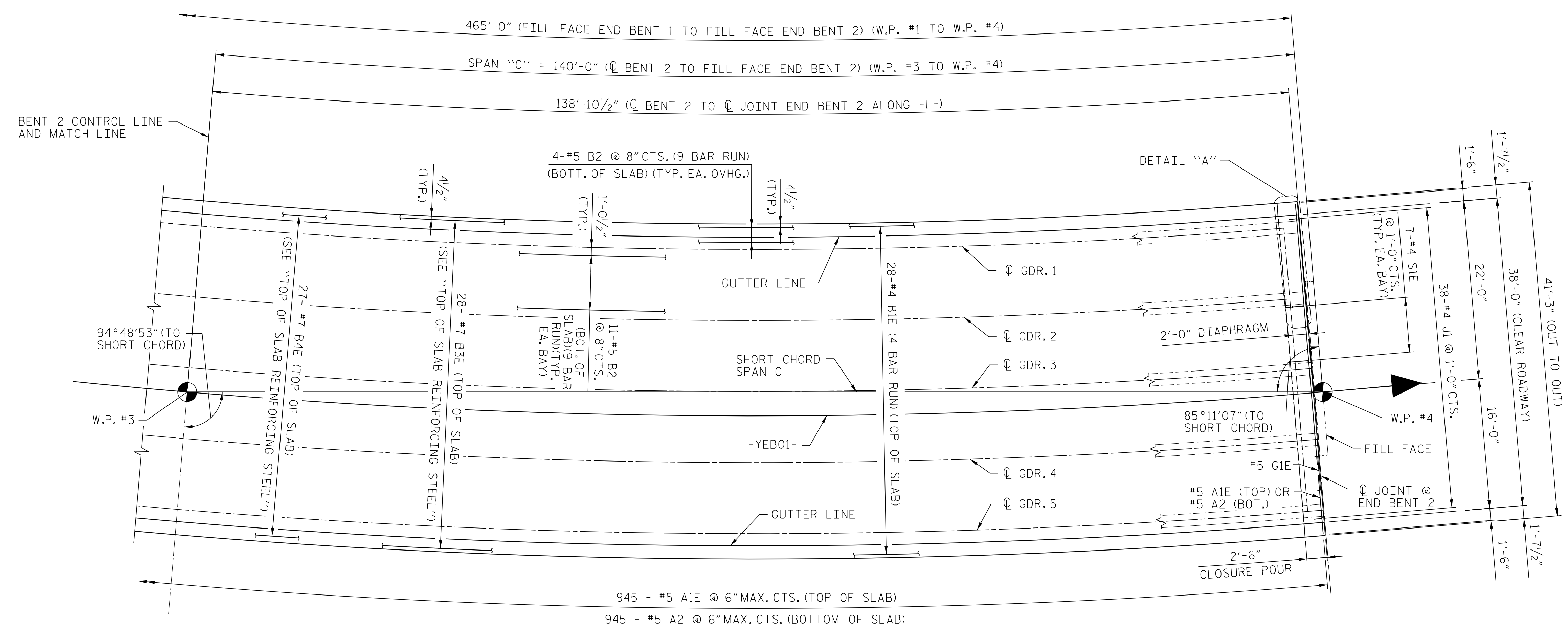
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
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2			4			

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 CHECKED BY : J. C. MORRISON DATE : 03/16
 DESIGN E.O.R. : J. C. MORRISON DATE : 05/16

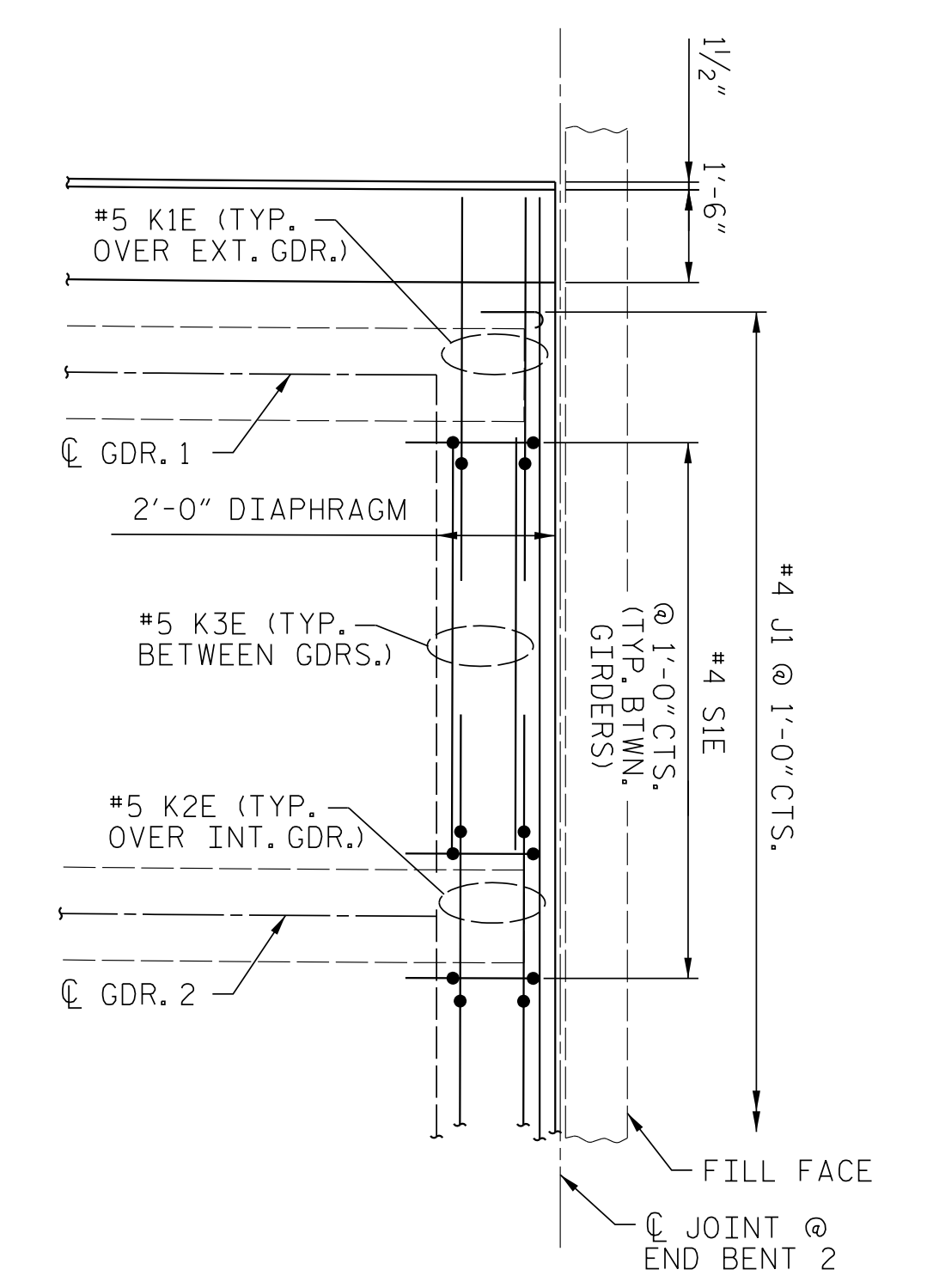
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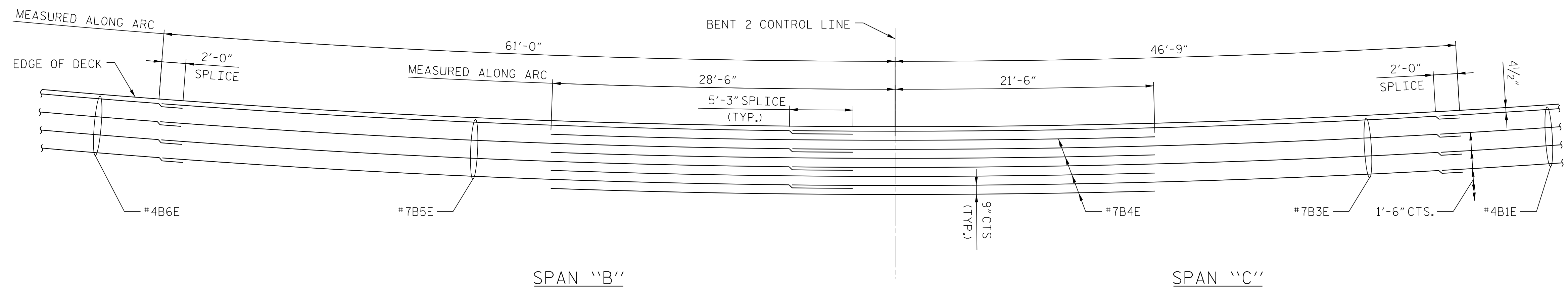
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DGN: R:\632444_5\geom Road\400_Technical\408_Structure\Coord\065_S13_R5516_SML_P503.dgn



PLAN OF SPAN "C"
(ALL DIMENSIONS RADIAL UNLESS NOTED)



DETAIL "A"



TOP OF SLAB REINFORCING STEEL

PROJECT NO. R-5516
 CRAVEN COUNTY
 STATION: 32+25.84 -YEB01-
 75+13.29 -L-
 SHEET 3 OF 3

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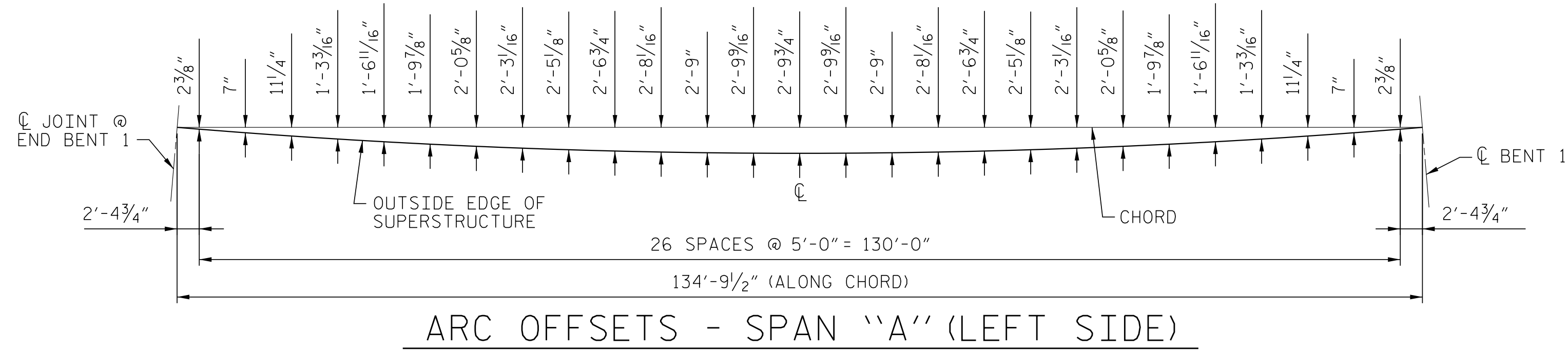
4/12/2017
 NORTH CAROLINA PROFESSIONAL SEAL
 030474
 ENGINEER
 JOHN C. MORRISON

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PLAN OF SPAN "C"

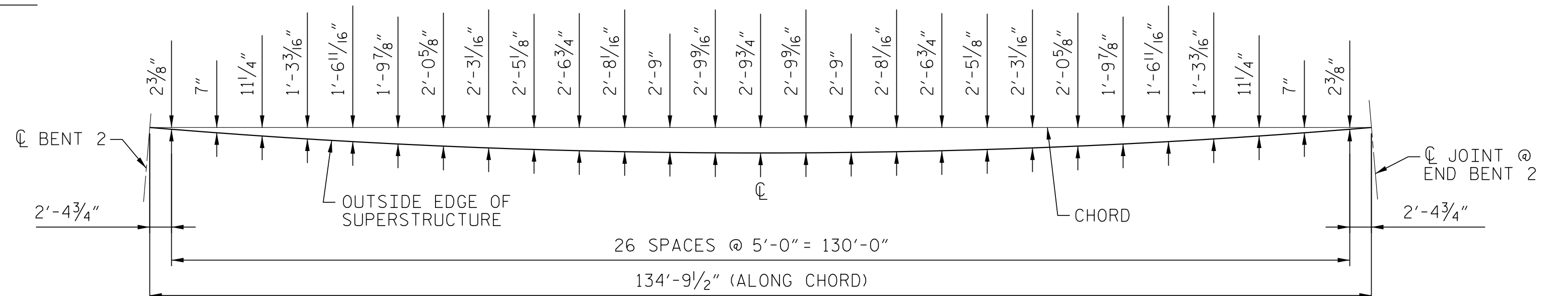
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			51

DRAWN BY: S. G. STREDNAK DATE: 03/16
 CHECKED BY: J. C. MORRISON DATE: 03/16
 DESIGN E.O.R.: J. C. MORRISON DATE: 05/16

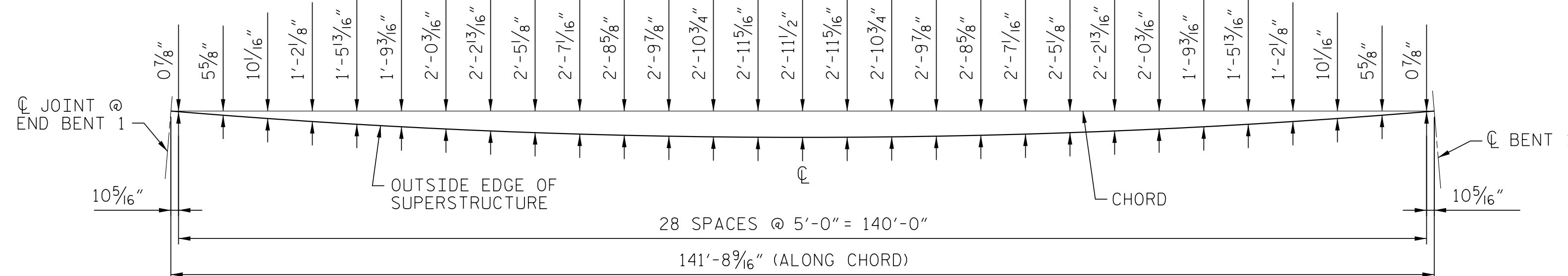
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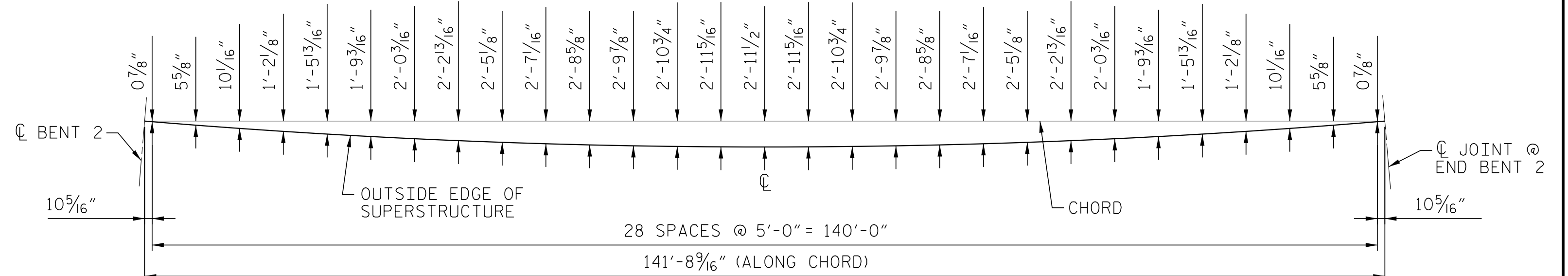
ARC OFFSETS - SPAN "A" (LEFT SIDE)



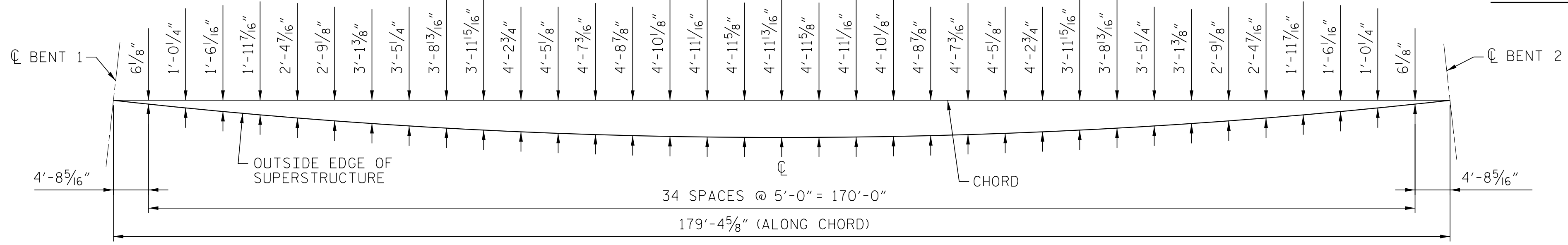
ARC OFFSETS - SPAN "C" (LEFT SIDE)



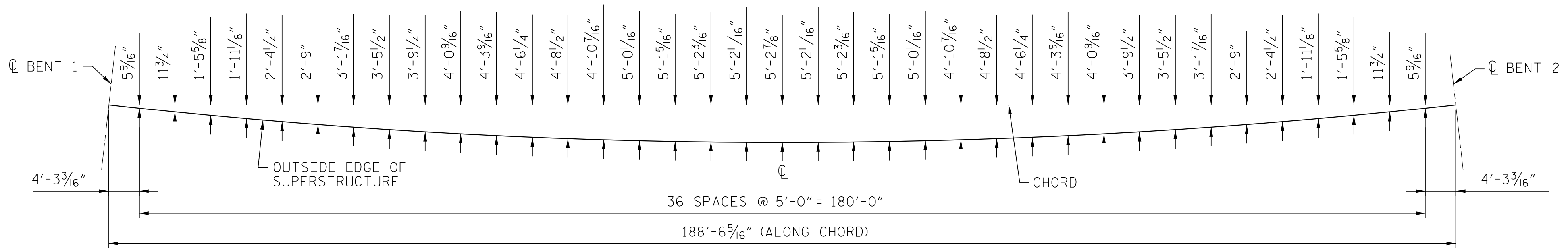
ARC OFFSETS - SPAN "A" (RIGHT SIDE)



ARC OFFSETS - SPAN "C" (RIGHT SIDE)



ARC OFFSETS - SPAN "B" (LEFT SIDE)



ARC OFFSETS - SPAN "B" (RIGHT SIDE)

PROJECT NO. R-5516
CRAVEN COUNTY
 STATION: 32+25.84 -YEB01-
75+13.29 -L-



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE ARC OFFSETS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. <u>S-14</u>					TOTAL SHEETS <u>51</u>

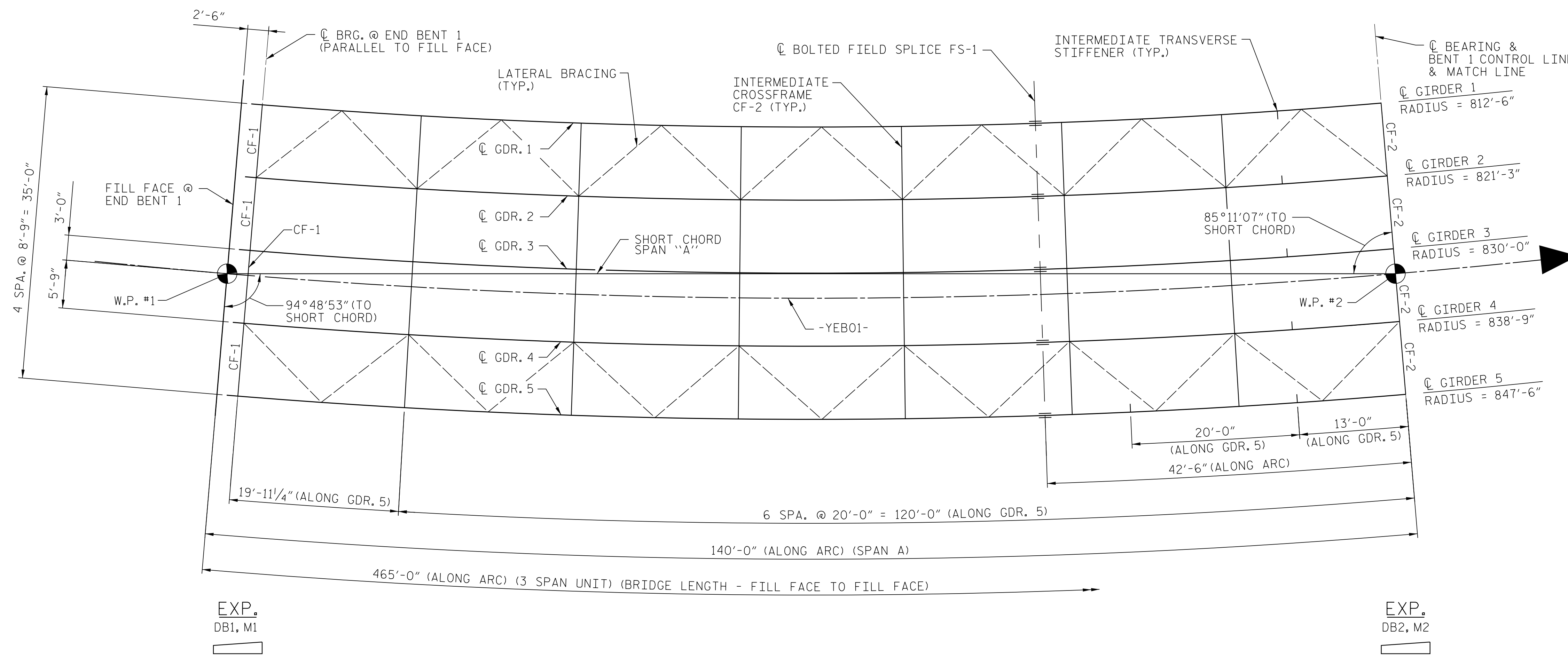
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DRAWN BY : N. K. BROWN DATE : 03/16
 CHECKED BY : J. C. MORRISON DATE : 03/16
 DESIGN E.O.R. : J. C. MORRISON DATE : 05/16

NOTES

- ALL DIMENSIONS SHOWN ARE HORIZONTAL.
- ALL INTERMEDIATE CROSSFRAMES ARE RADIAL TO -YEB01-.
- SEE "STRUCTURAL STEEL DETAILS" SHEETS FOR CONNECTOR PLATE, BEARING STIFFENER, AND FIELD SPLICE DETAILS.



FRAMING PLAN - SPAN "A"

(ALL DIMENSIONS RADIAL UNLESS NOTED)

PROJECT NO. R-5516
CRAVEN COUNTY
 STATION: 32+25.84 -YEB01-
75+13.29 -L-
 SHEET 1 OF 3

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4/12/2017

SEAL
 030474
 ENGINEER
 JOHN C. MORRISON

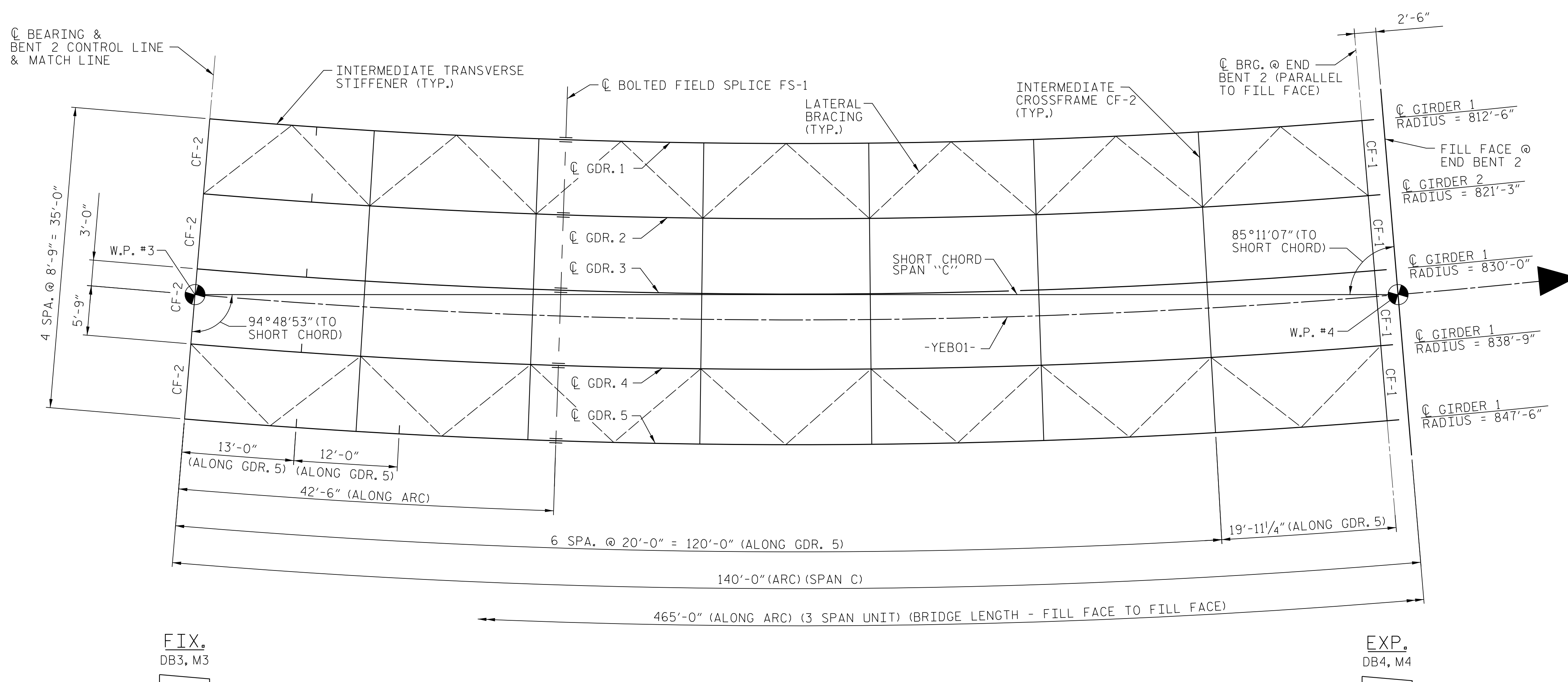
DocuSigned by:
 John C. Morrison
 A2FDE142C82F4A8

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE					
FRAMING PLAN SPAN "A"					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-15					TOTAL SHEETS 51

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FRAMING PLAN - SPAN "C"
(ALL DIMENSIONS RADIAL UNLESS NOTED)

FIX.
DB3, M3

EXP.
DB4, M4

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 CHECKED BY : J. C. MORRISON DATE : 03/16
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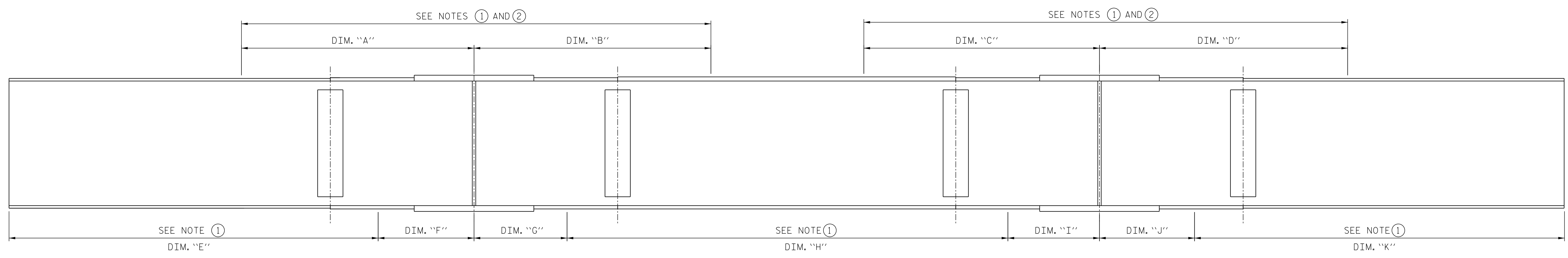
4/12/2017

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 030474
 ENGINEER
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DocuSigned by
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 A2FDE142C82F4A8

PROJECT NO. R-5516
CRAVEN COUNTY
 STATION: 32+25.84 -YEB01-
75+13.29 -L-
 SHEET 3 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE					
FRAMING PLAN SPAN "C"					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS
					51



SPAN "A"

SPAN "B"

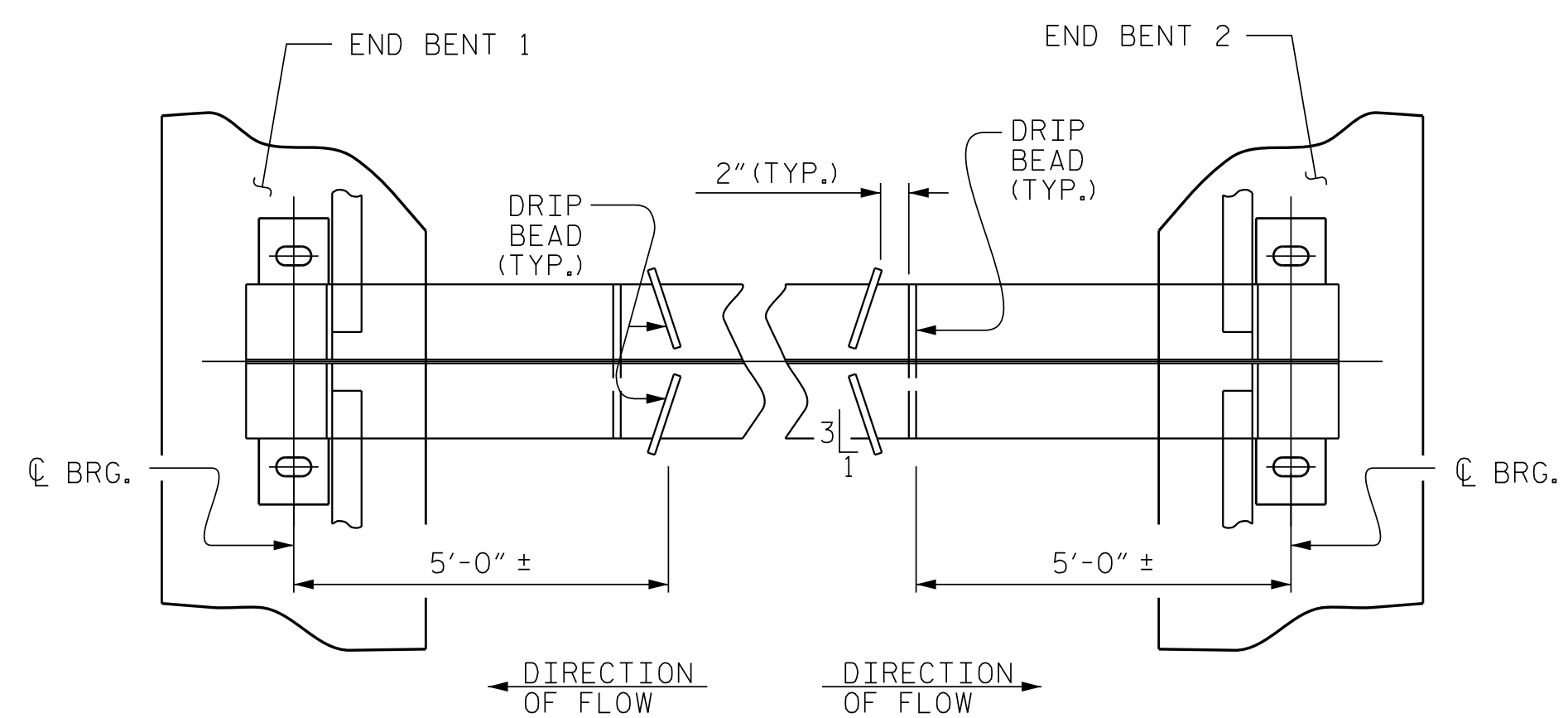
SPAN "C"

GIRDER MAKE-UP

CHARPY V - NOTCH TESTS FOR CONTINUOUS PLATE GIRDERS

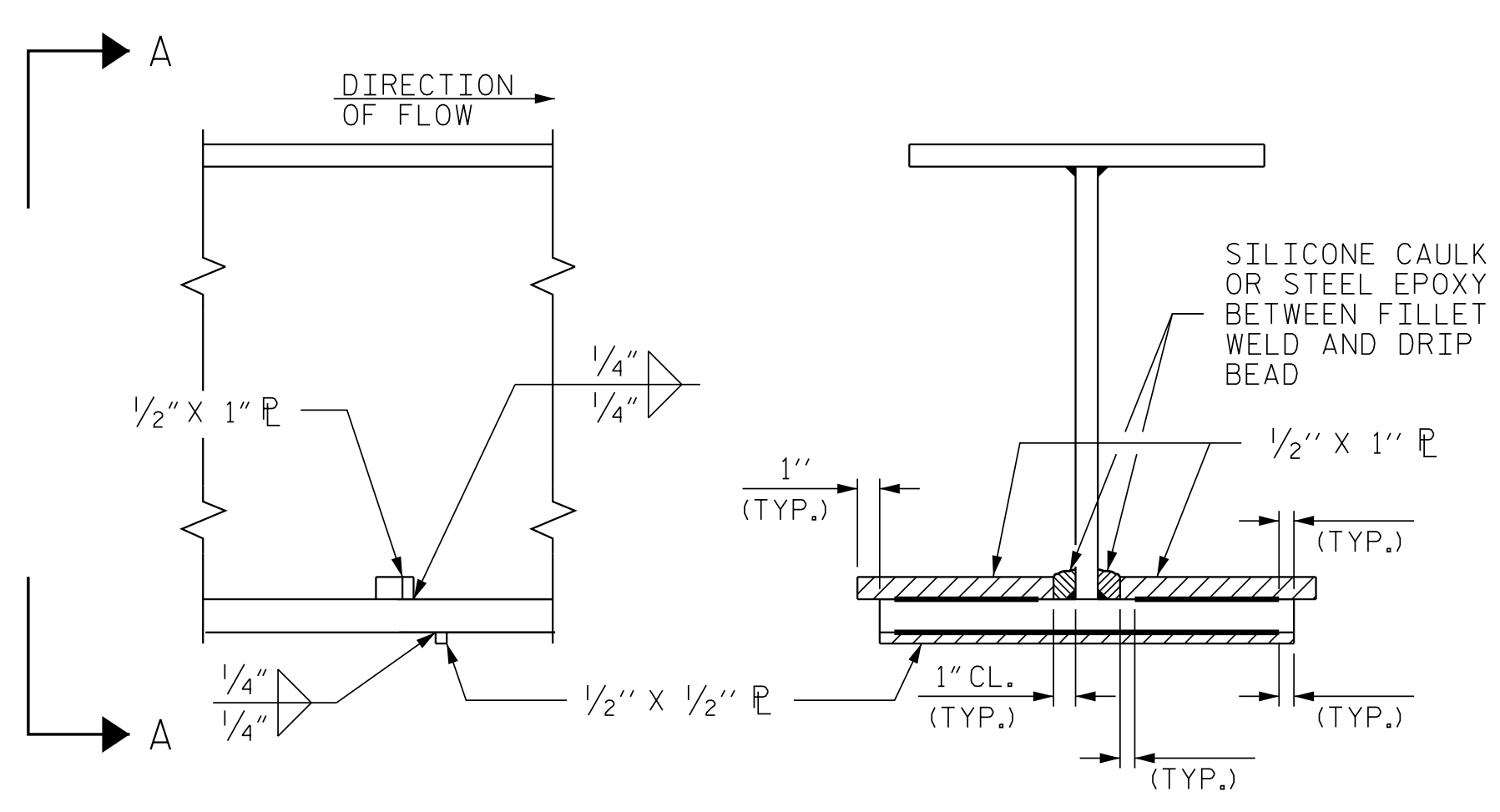
CHARPY V-NOTCH NOTES:

1. CHARPY 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, CHARPY V-NOTCH TESTS WILL BE REQUIRED FOR THE ENTIRE FLANGE PLATE. FOR CHARPY V-NOTCH TESTS, SEE ARTICLE 1072-9 OF THE STANDARD SPECIFICATIONS.
2. NO WELDING OF FORMS OR FALSEWORK TO THE TOP FLANGE WILL BE PERMITTED IN THIS REGION.



PART PLAN - BOTTOM FLANGE

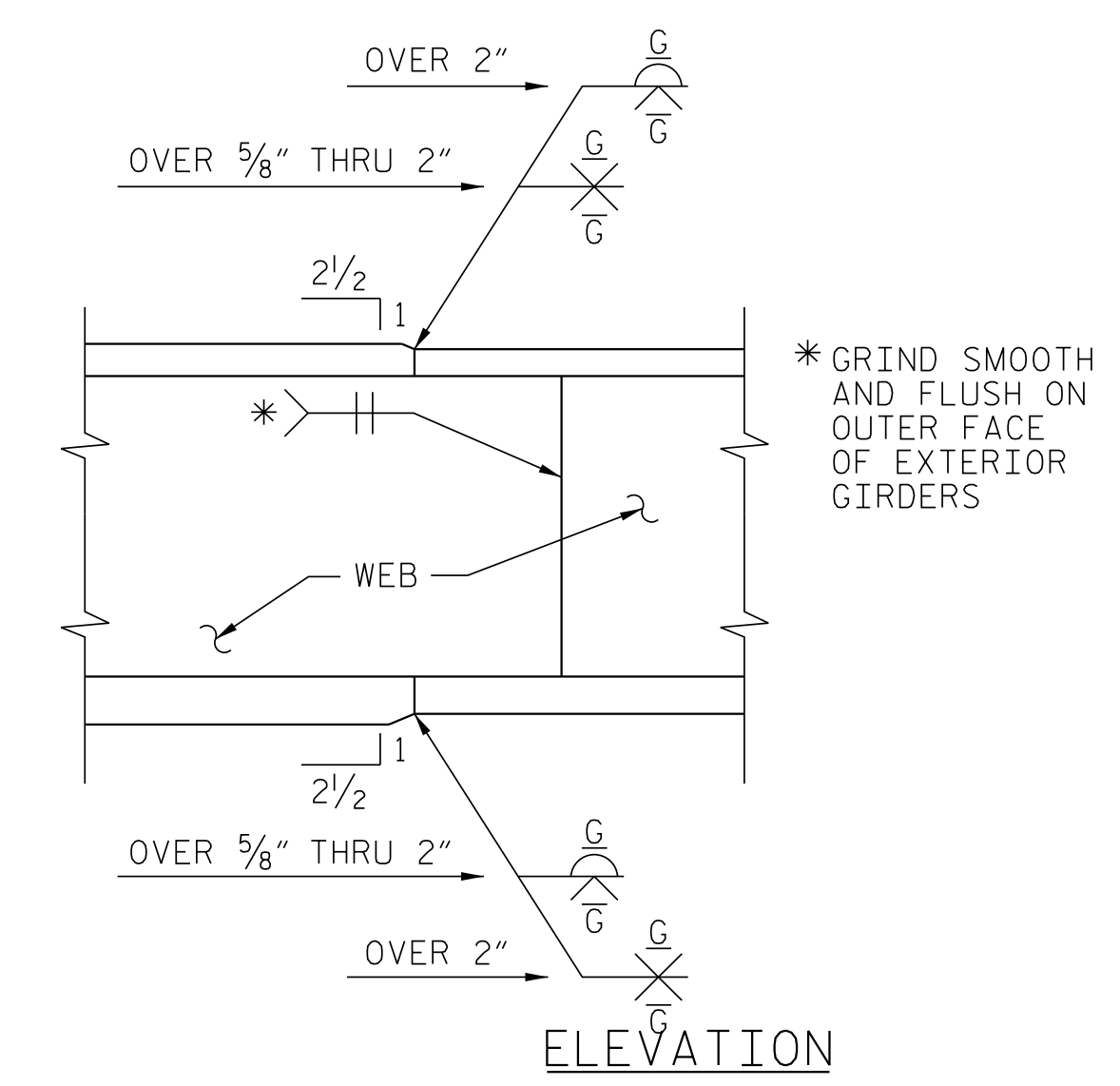
GIRDER	A	B	C	D	E	F	G	H	I	J	K
1	69'-11 ⁵ / ₈ "	72'-1 ¹ / ₂ "	71'-11 ¹ / ₂ "	69'-11 ⁵ / ₈ "	110'-11 ³ / ₈ "	28'-11 ⁷ / ₈ "	28'-2 ¹³ / ₁₆ "	131'-9"	28'-2 ⁷ / ₈ "	28'-6"	111'-5 ¹ / ₄ "
2	66'-2 ⁵ / ₁₆ "	63'-2 ¹ / ₈ "	63'-1 ⁵ / ₁₆ "	66'-1"	109'-3 ⁵ / ₁₆ "	29'-1 ¹¹ / ₁₆ "	28'-4 ³ / ₁₆ "	129'-4 ⁵ / ₁₆ "	28'-6 ¹³ / ₁₆ "	28'-9 ³ / ₄ "	109'-7 ⁷ / ₈ "
3	60'-11 ⁵ / ₁₆ "	58'-2 ⁷ / ₁₆ "	58'-1 ⁵ / ₁₆ "	60'-11 ⁵ / ₁₆ "	107'-4 ⁷ / ₁₆ "	29'-7 ¹ / ₂ "	28'-8 ⁷ / ₈ "	126'-9 ³ / ₈ "	28'-10 ³ / ₁₆ "	29'-5 ⁵ / ₁₆ "	107'-6 ⁷ / ₁₆ "
4	58'-9 ⁹ / ₁₆ "	57'-6 ¹ / ₁₆ "	57'-4 ⁵ / ₈ "	58'-10 ³ / ₈ "	107'-1 ¹³ / ₁₆ "	28'-4 ¹ / ₂ "	27'-5 ⁵ / ₁₆ "	127'-2 ¹ / ₁₆ "	27'-8 ³ / ₄ "	28'-1 ⁵ / ₁₆ "	107'-4 ³ / ₈ "
5	62'-8"	67'-4 ¹ / ₄ "	67'-3 ¹ / ₁₆ "	63'-0 ⁹ / ₁₆ "	106'-0 ⁵ / ₈ "	28'-0 ¹ / ₁₆ "	26'-7"	127'-0 ¹ / ₂ "	26'-9 ⁷ / ₈ "	27'-6 ¹ / ₁₆ "	106'-6 ¹ / ₄ "



SECTION

VIEW A-A

DRIP BEAD DETAILS



TYPICAL FLANGE AND WEB BUTT JOINT

PROJECT NO. R-5516
CRAVEN COUNTY
 STATION: 32+25.84 -YEB01-
75+13.29 -L-
 SHEET 2 OF 5

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 NORTH CAROLINA PROFESSIONAL SEAL
 SEAL 030474
 ENGINEER
 JOHN C. MORRISON

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE

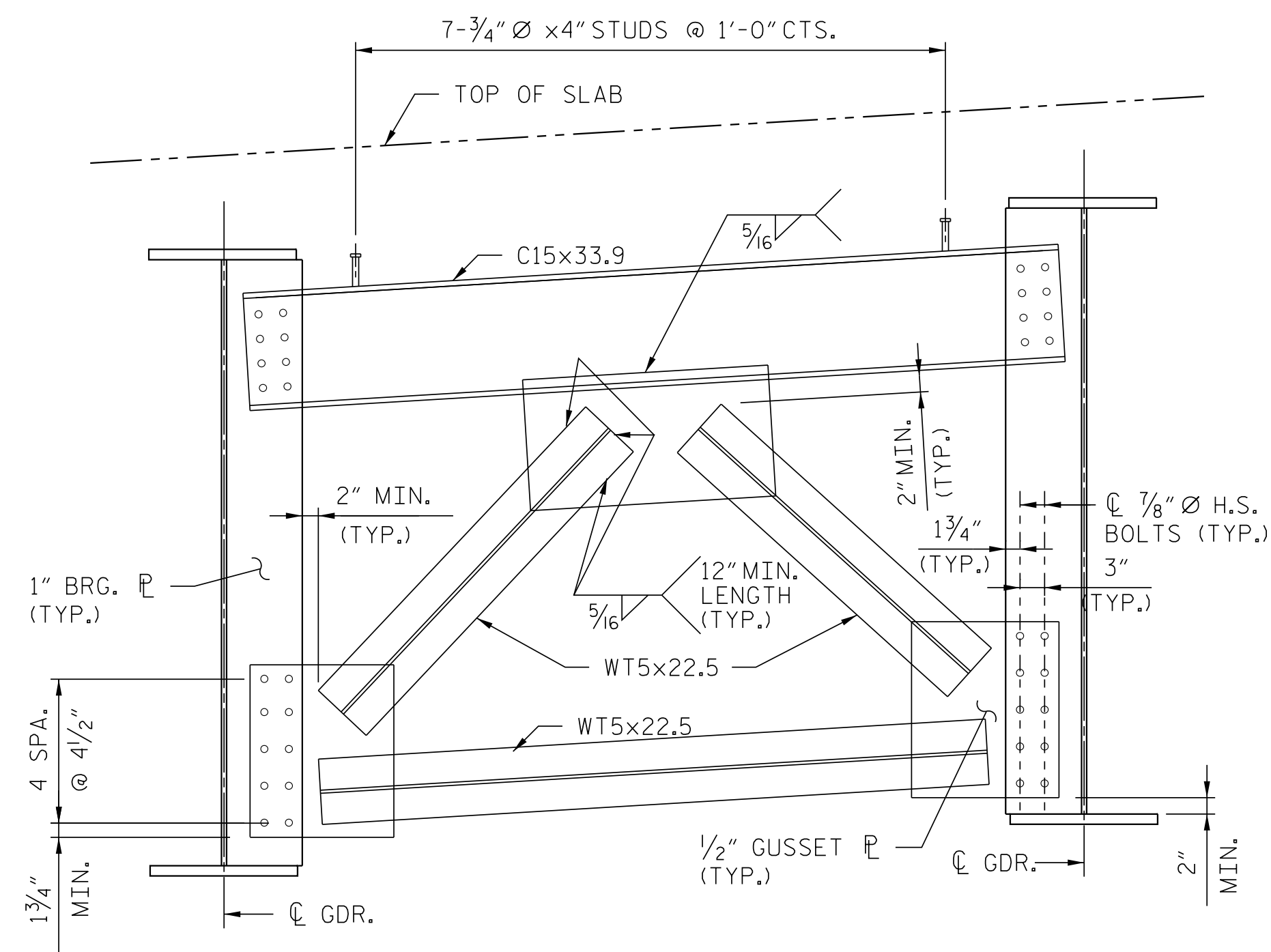
STRUCTURAL STEEL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
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2			4			

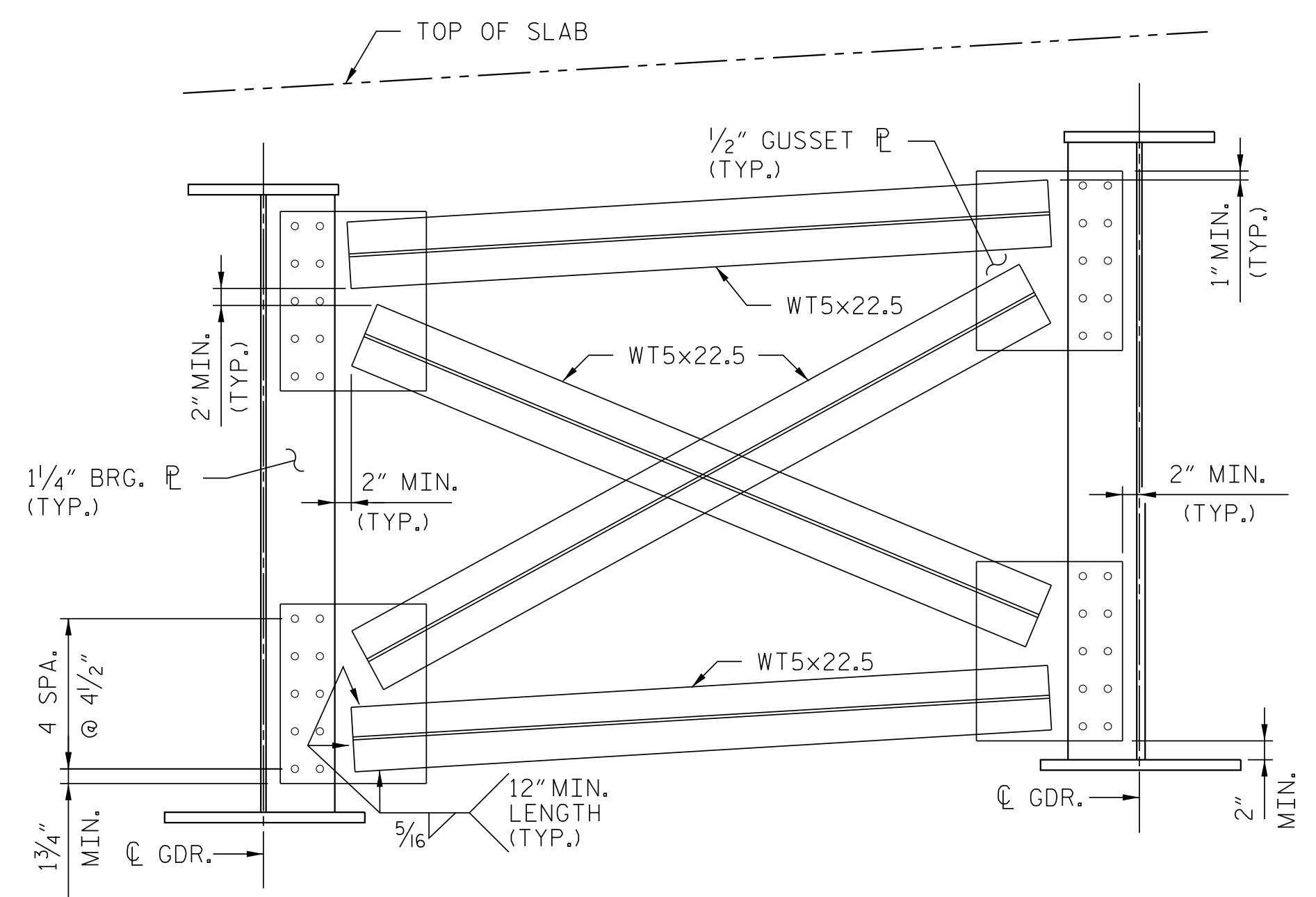
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 CHECKED BY : J. C. MORRISON DATE : 03/16
 DESIGN E.O.R. : J. C. MORRISON DATE : 05/16

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TYPICAL INTERMEDIATE CROSSFRAME (CF-1)



TYPICAL BENT CROSSFRAME (CF-2)

NOTES:

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50 AND PAINTED IN ACCORDANCE WITH SYSTEM 1 OF ARTICLE 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

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

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

BEARING STIFFENERS MAY REQUIRE COPING IF WIDER THAN BOTTOM FLANGE.

ENDS OF GIRDERS SHALL BE PLUMB.

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

TENSION ON THE ASTM A325 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-8 OF THE STANDARD SPECIFICATIONS.

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

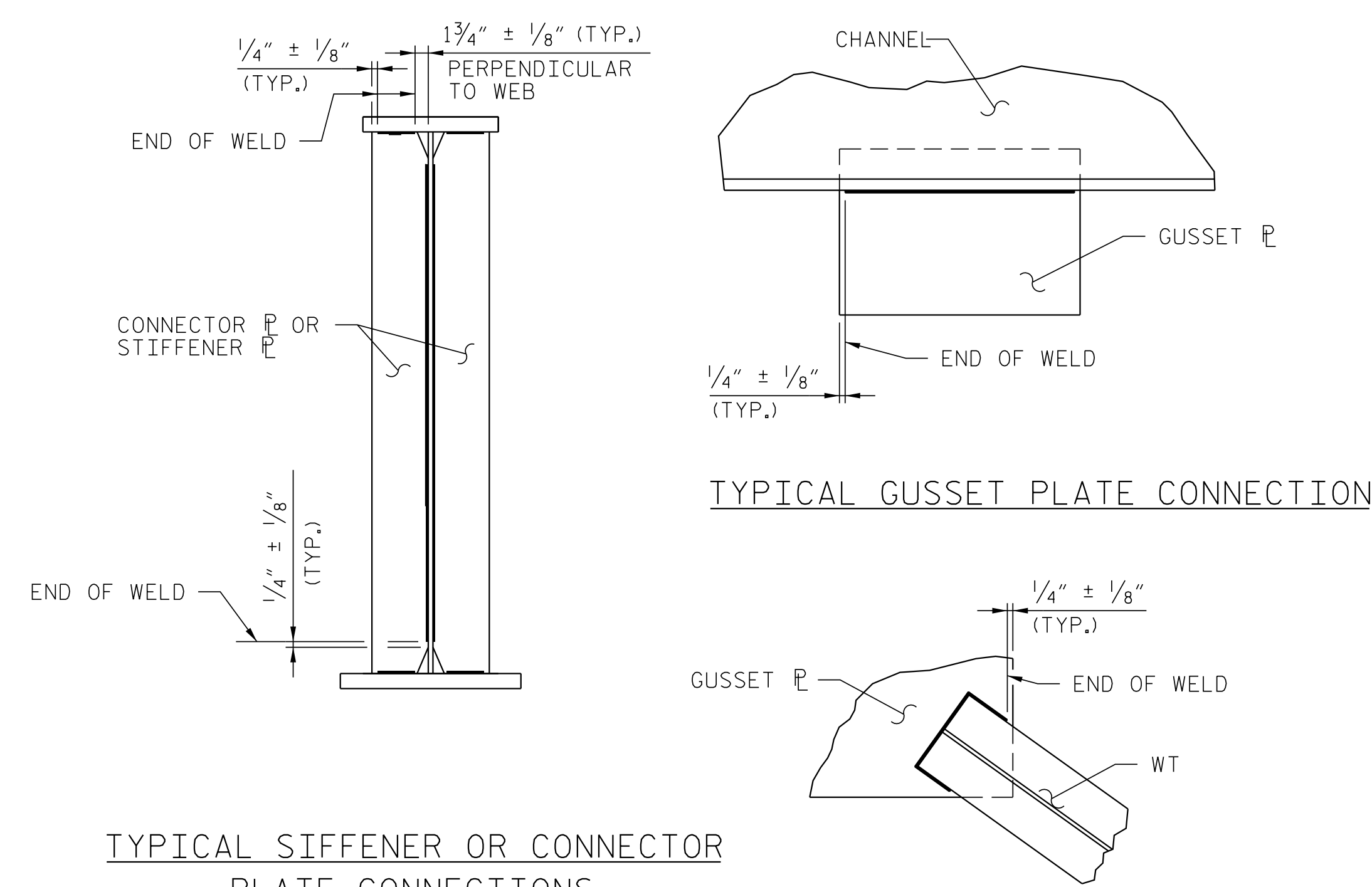
PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION (NOR WITHIN 15 FEET OF INTERMEDIATE BEARINGS OF CONTINUOUS UNITS). KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES. KEEP 6" MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.

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.

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

PAINT THE CONTACT SURFACES OF ALL BOLTED CONNECTIONS WITH PRIMER ONLY. IN ADDITION, THE OUTSIDE SURFACES OF SPLICE PLATES ARE TO BE PRIMED ONLY AT THE TIME OF INSTALLATION. TOP COATS TO BE APPLIED IN THE FIELD TO THE OUTSIDE SURFACES OF SPLICE PLATES.

FABRICATOR SHALL DETAIL DIAPHRAGM MEMBERS AND CONNECTIONS FOR NO-LOAD FIT-UP.

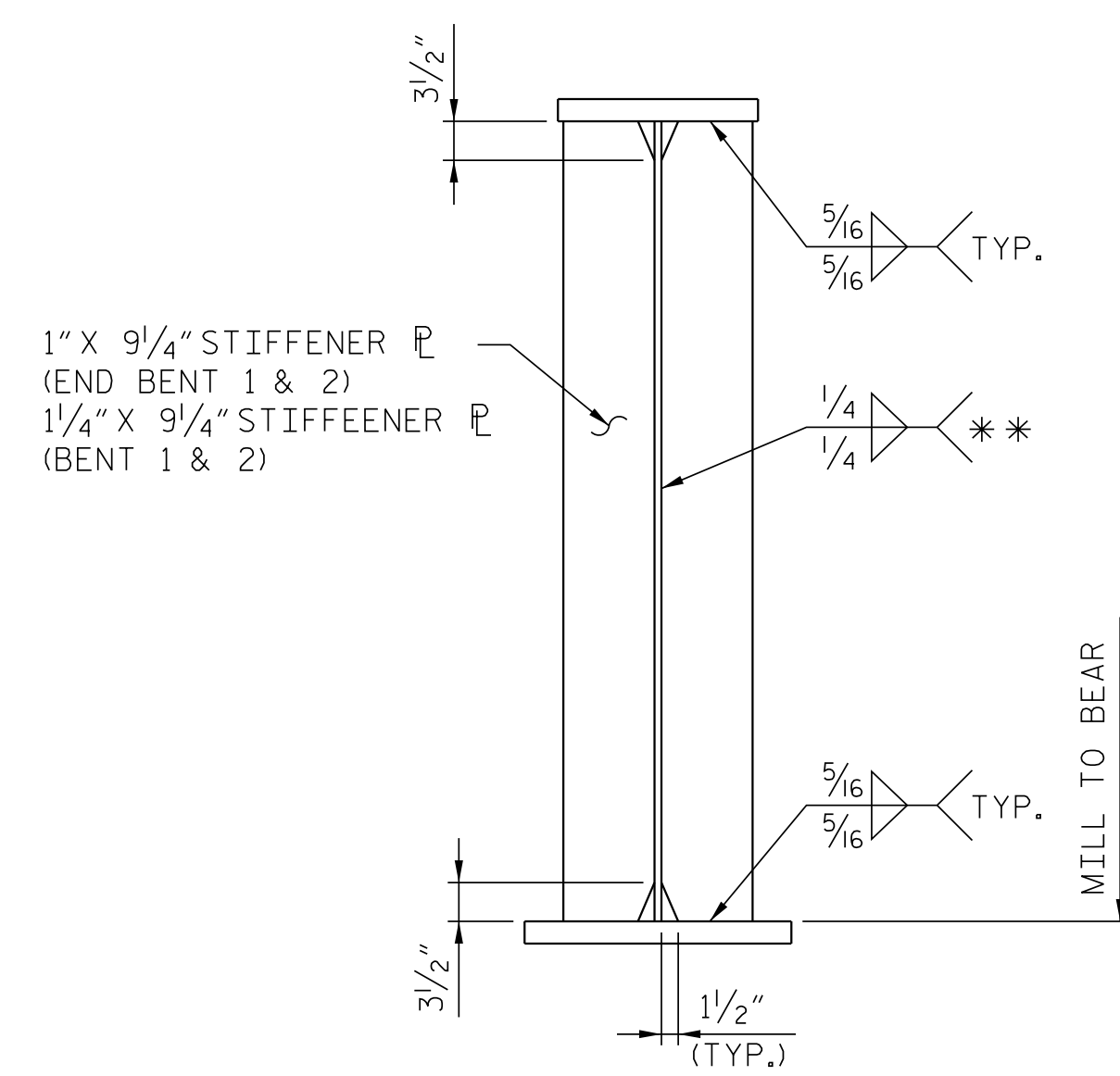


TYPICAL GUSSET PLATE CONNECTION

TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS
(INTERIOR GIRDER SHOWN, HOLES NOT SHOWN)

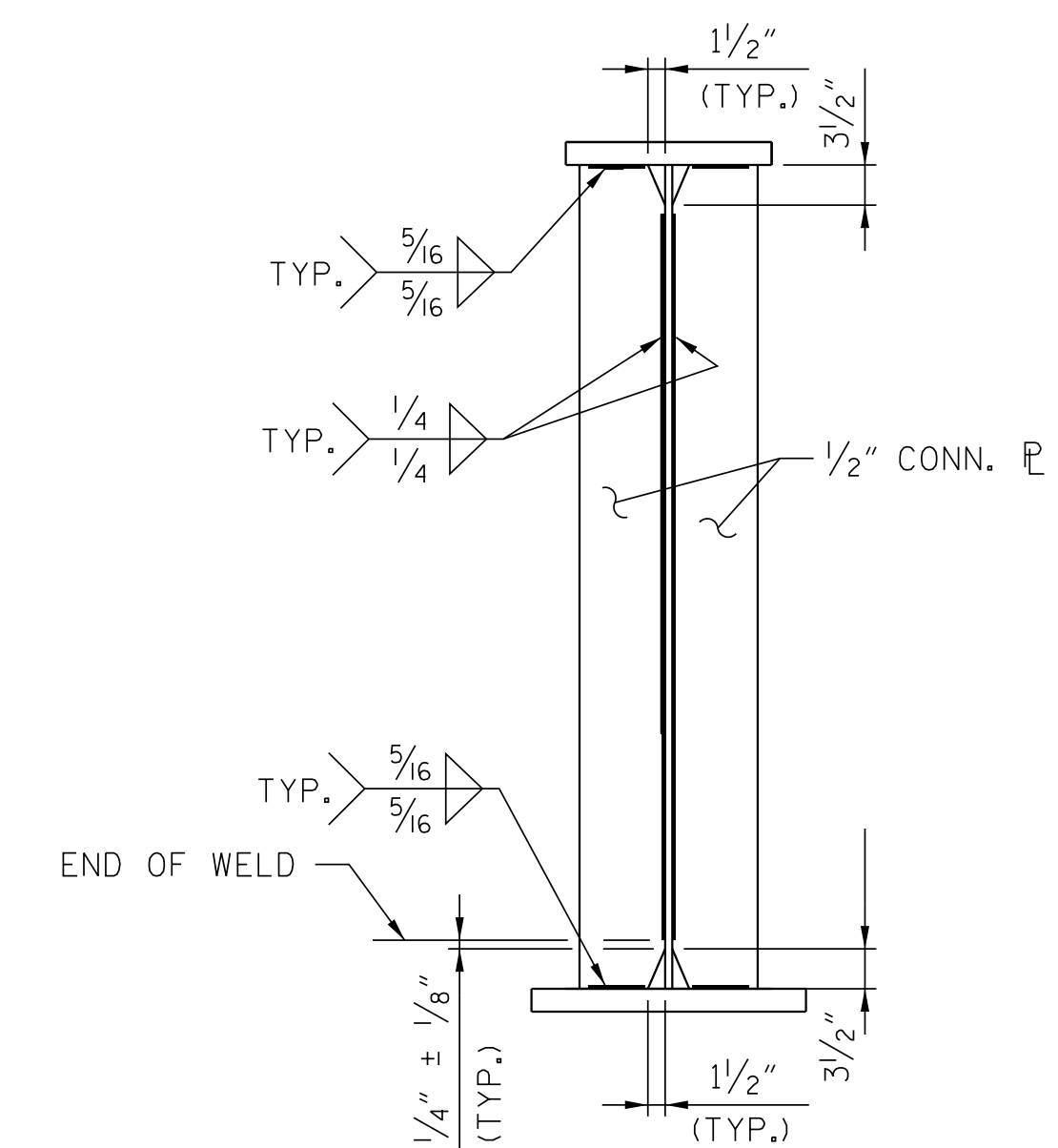
TYPICAL ANGLE TO GUSSET PLATE CONNECTION

WELD TERMINATION DETAILS

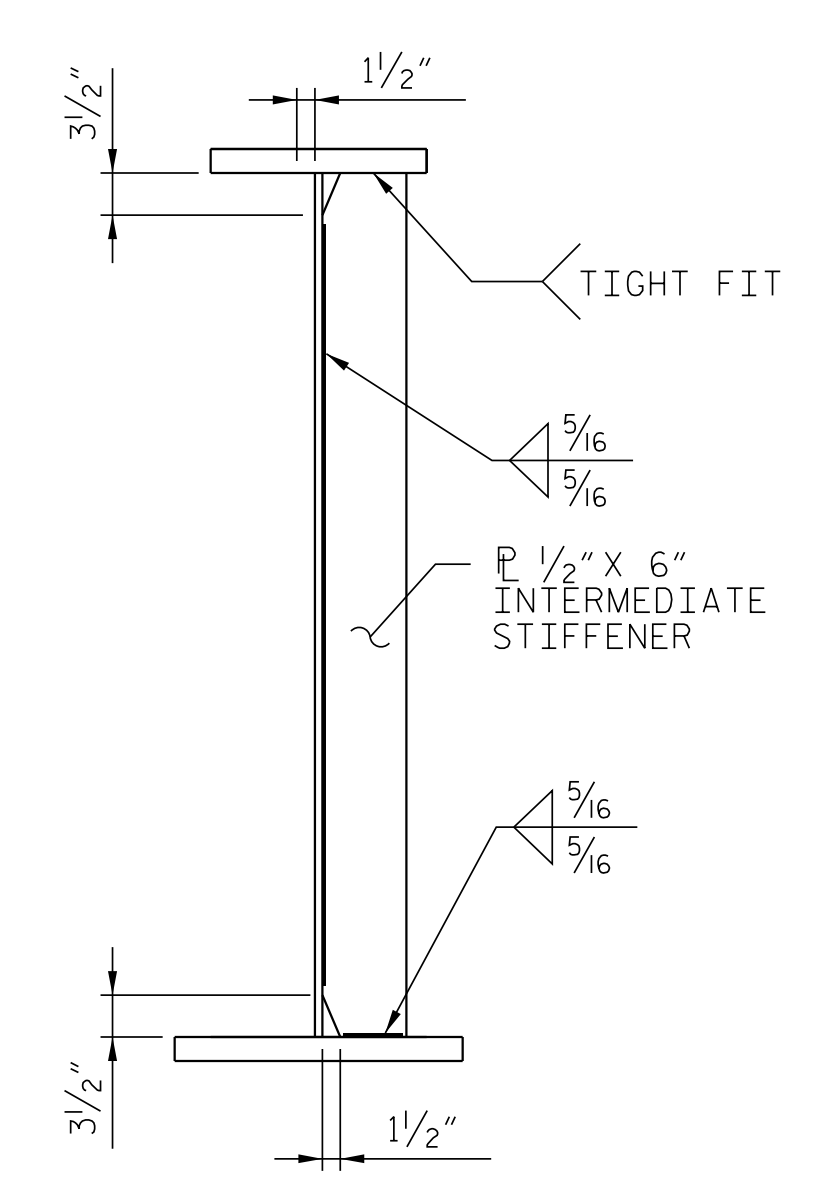


BEARING STIFFENER DETAIL

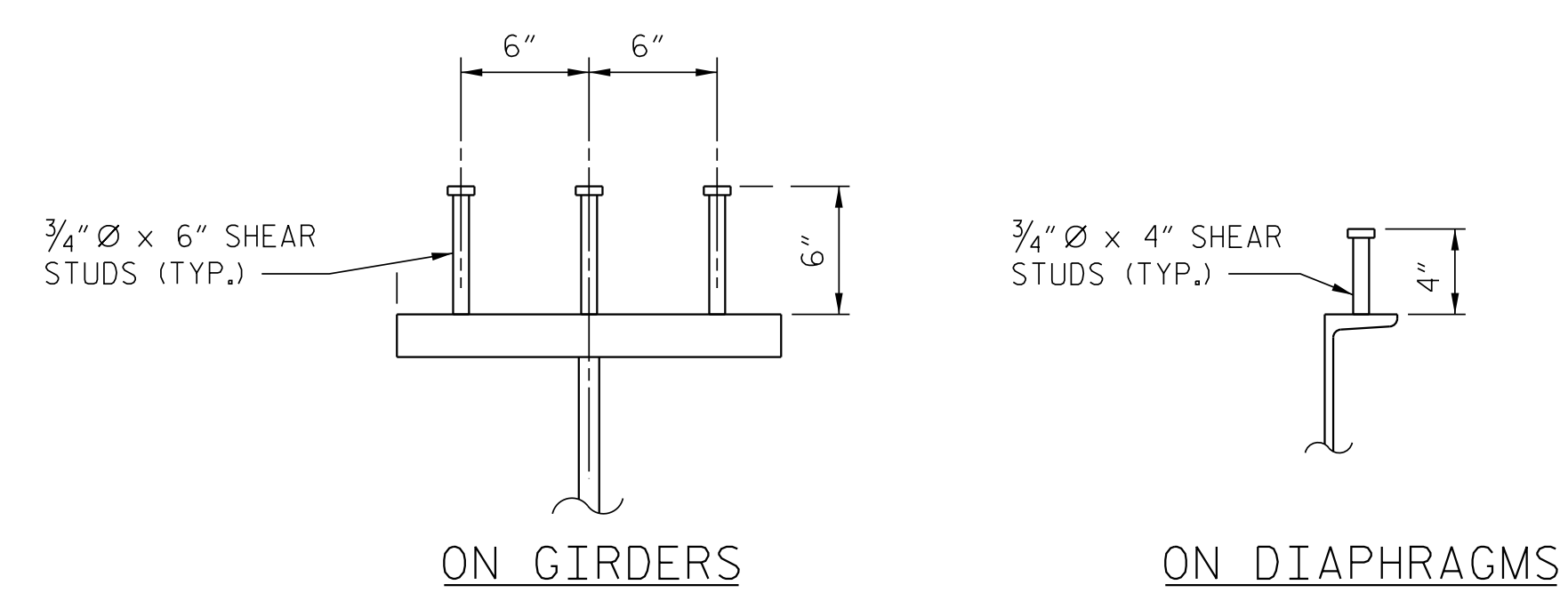
** PER BRIDGE WELDING CODE FIG 2.3(C) BEVEL IF NECESSARY.



CONNECTOR PLATE DETAIL



INTERMEDIATE STIFFENER DETAIL



SHEAR STUD DETAILS

PROJECT NO. R-5516
CRAVEN COUNTY
 STATION: 32+25.84 -YEB01-
75+13.29 -L-
 SHEET 3 OF 5

AECOM
 AECOM TECHNICAL SERVICES, INC.
 701 CORPORATE CENTER DRIVE, SUITE 475
 RALEIGH, NC 27607
 (919) 854-6200 www.aecom.com
 AECOM License No. F-0342

4/12/2017

NORTH CAROLINA PROFESSIONAL SEAL 030474

ENGINEER JOHN C. MORRISON

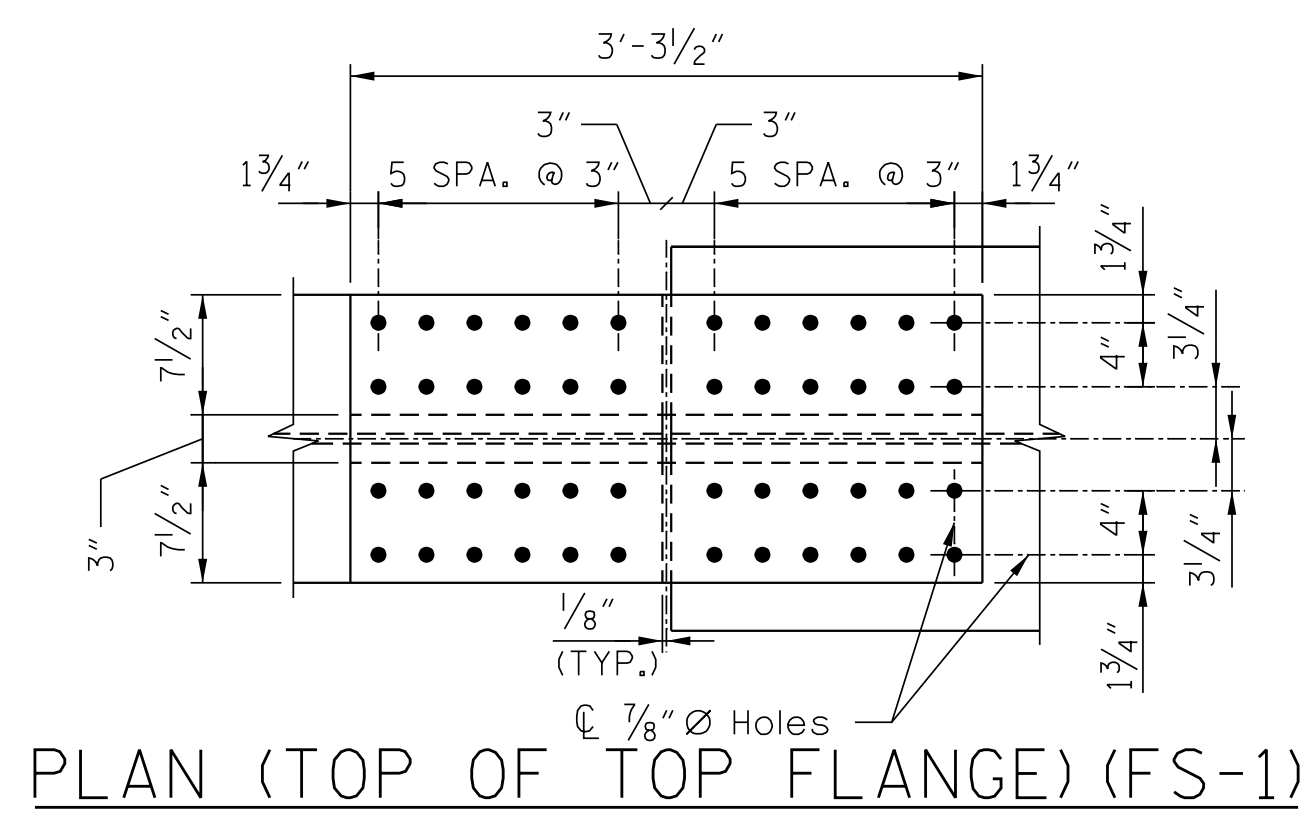
DocuSigned by: John C. Morrison A2FDE142C82F4A8

STATE OF NORTH CAROLINA					
DEPARTMENT OF TRANSPORTATION					
RALEIGH					
SUPERSTRUCTURE					
STRUCTURAL STEEL DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-20					TOTAL SHEETS 51

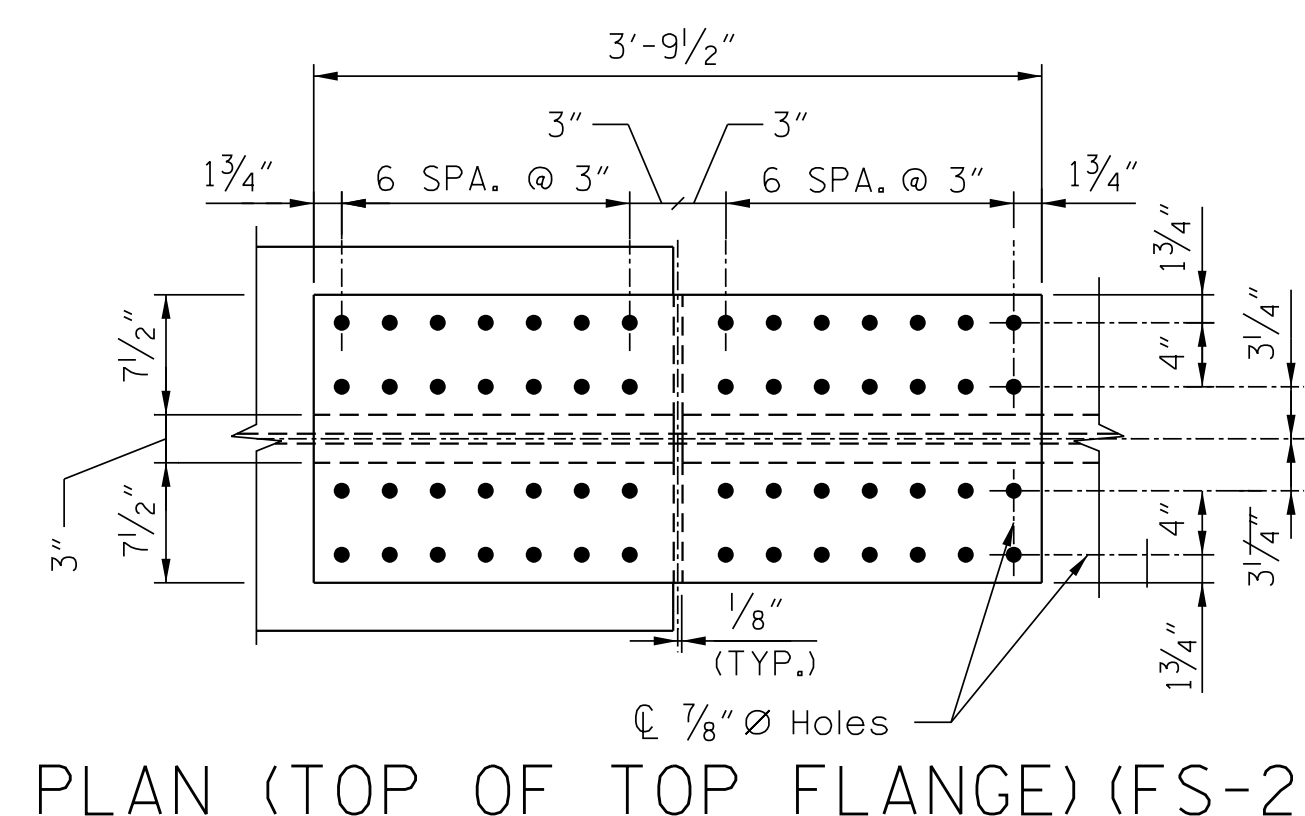
DRAWN BY : N. K. BROWN DATE : 03/16
 CHECKED BY : J. C. MORRISON DATE : 03/16
 DESIGN E.O.R. : J. C. MORRISON DATE : 05/16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DATE: 4/7/2017 TIME: 3:01:14 PM
 USER: jmorris@aec.com Path: \\001-Structural\001-Structural\001-000_5200_05516_SML_S03.dgn

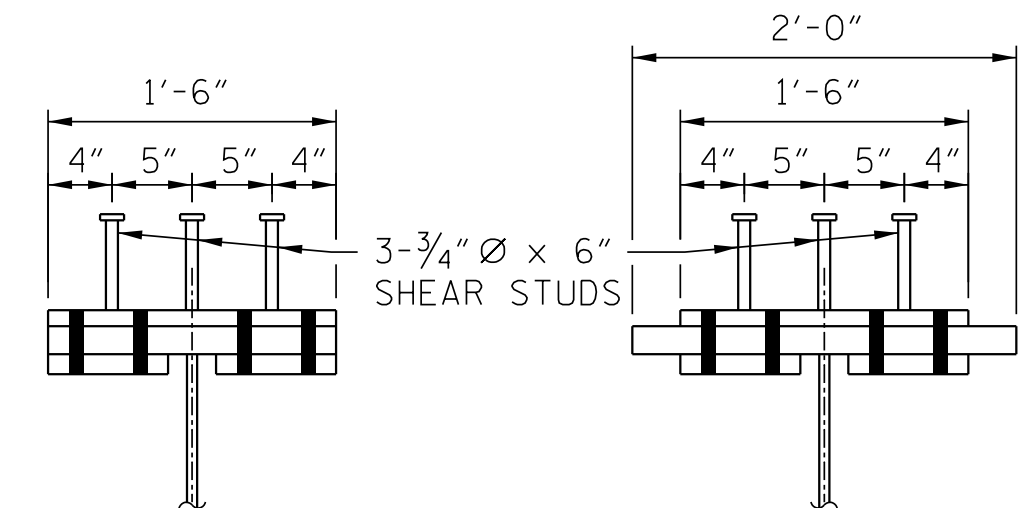


PLAN (TOP OF TOP FLANGE) (FS-1)

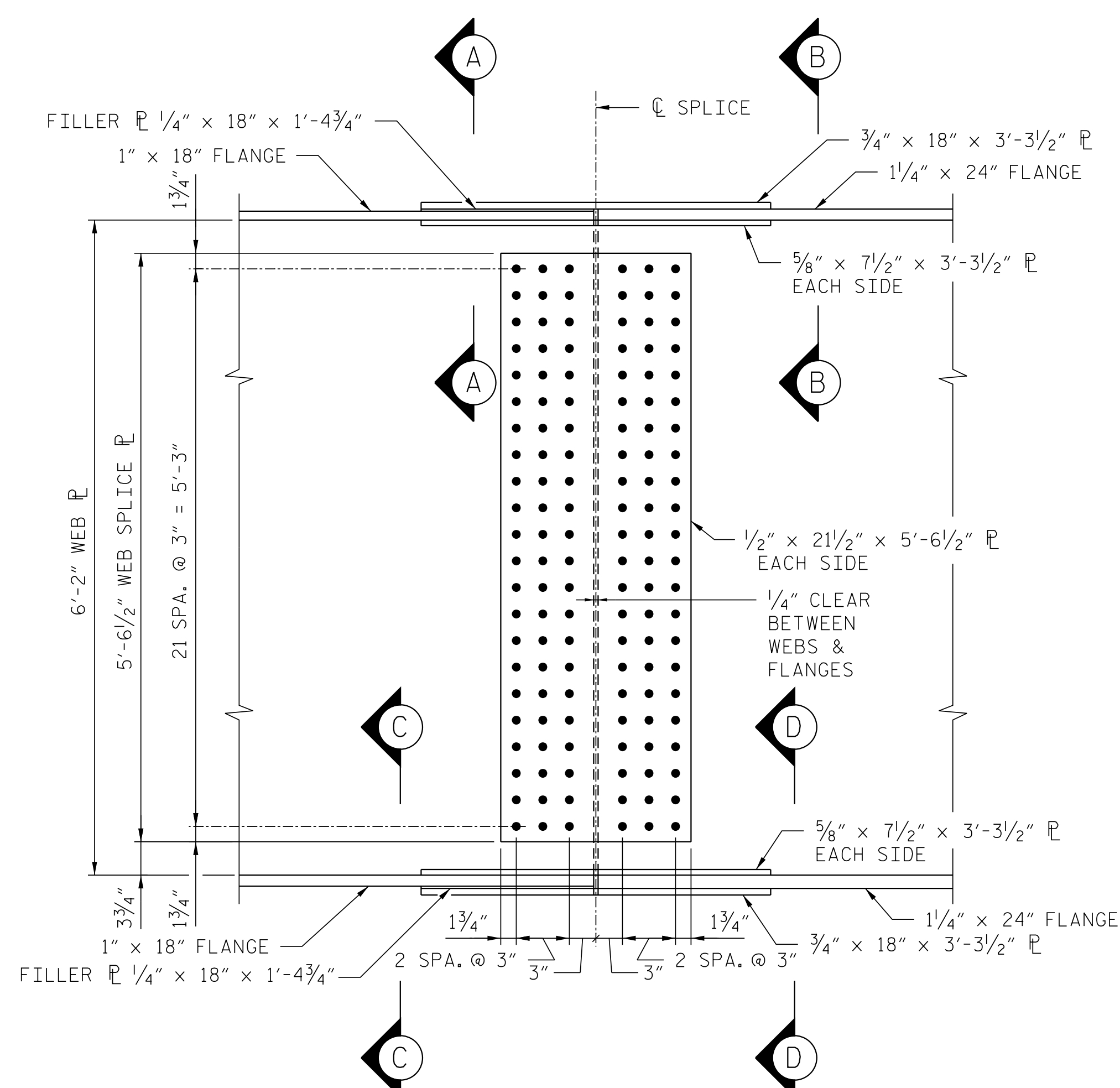


PLAN (TOP OF TOP FLANGE) (FS-2)

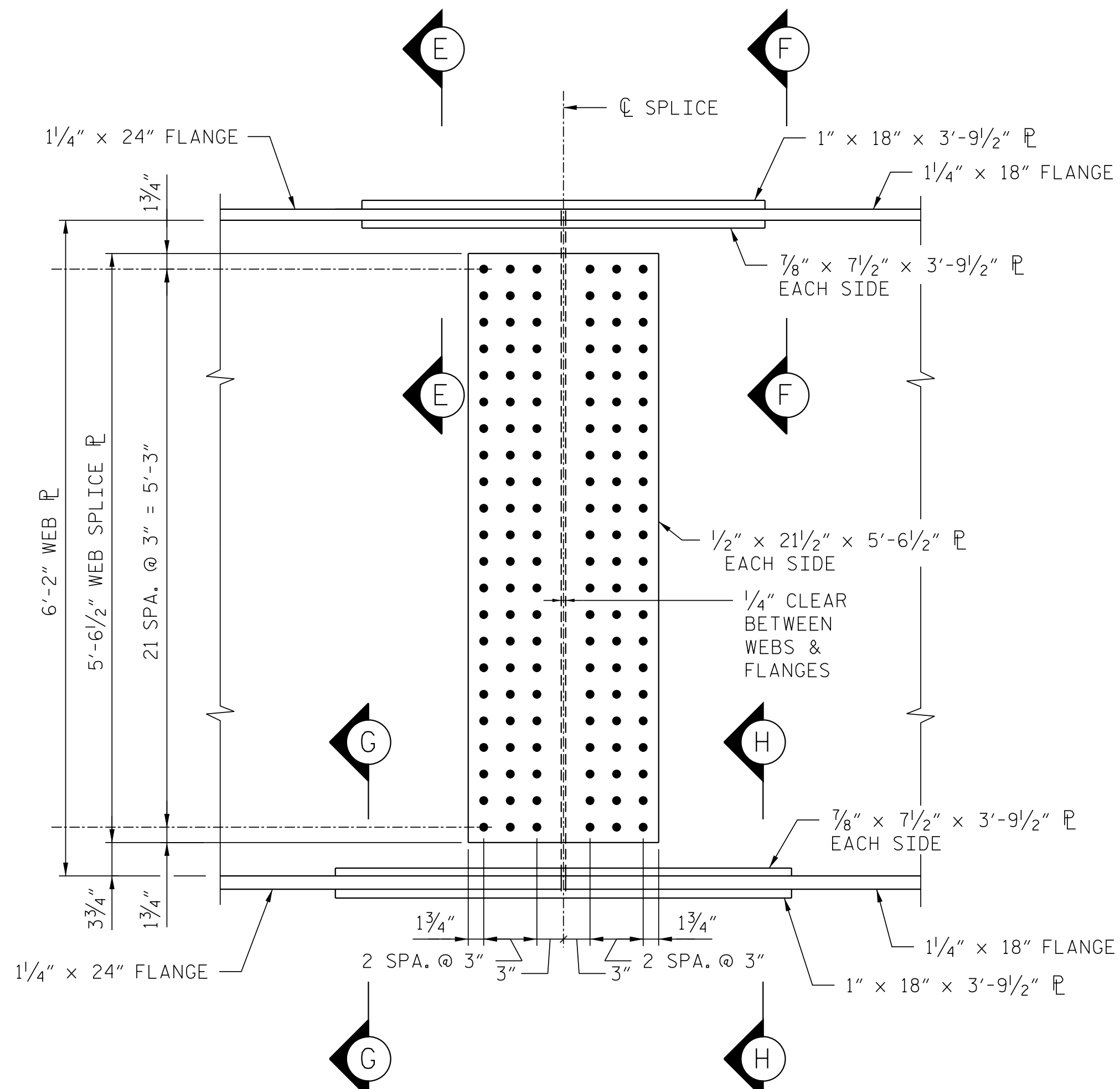
NOTE:
SHEAR CONNECTORS ARE
TO BE SHOP WELDED
ON TOP PLATE BEFORE
FIELD ASSEMBLY.



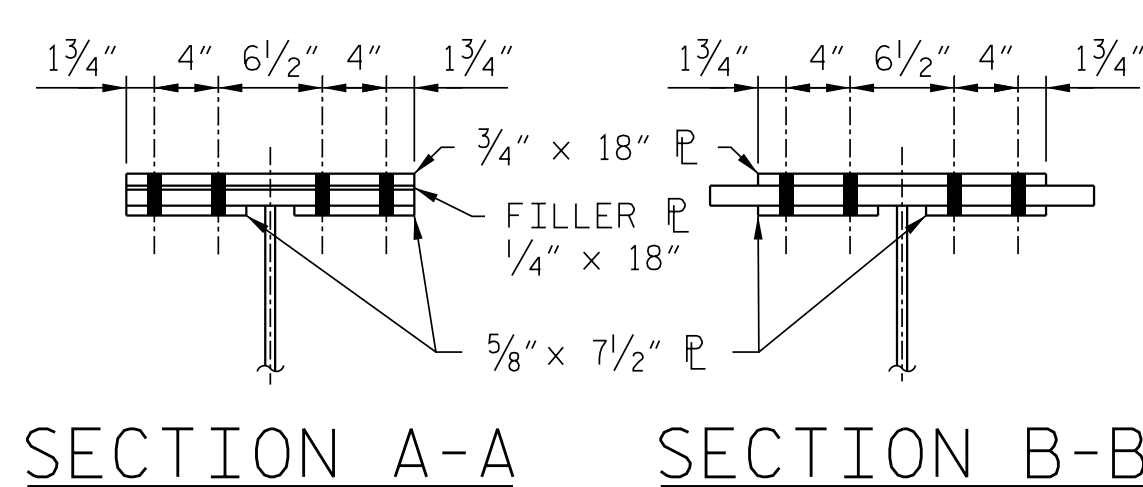
SHEAR STUD DETAIL
FOR TOP FLANGE SPLICE PLATE



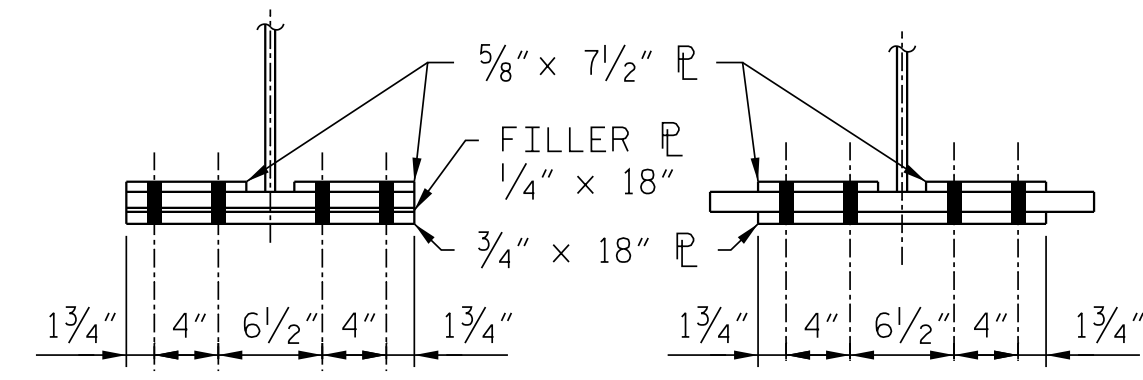
ELEVATION (FS-1)



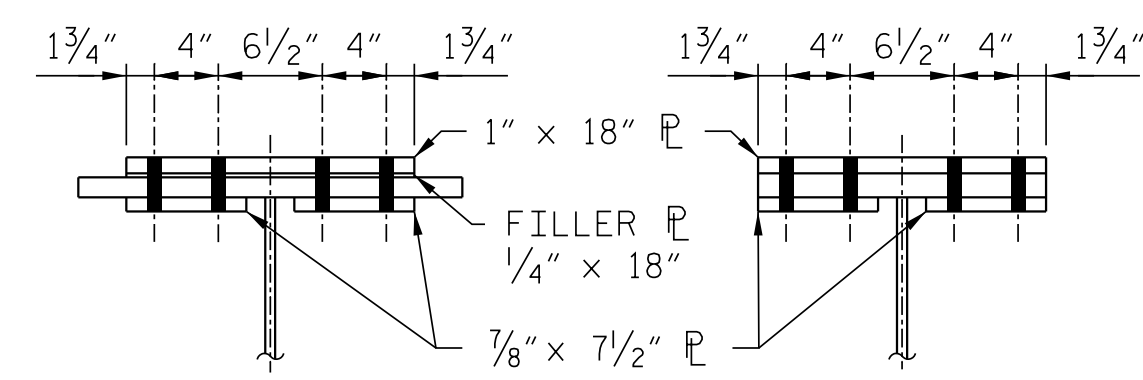
ELEVATION (FS-2)



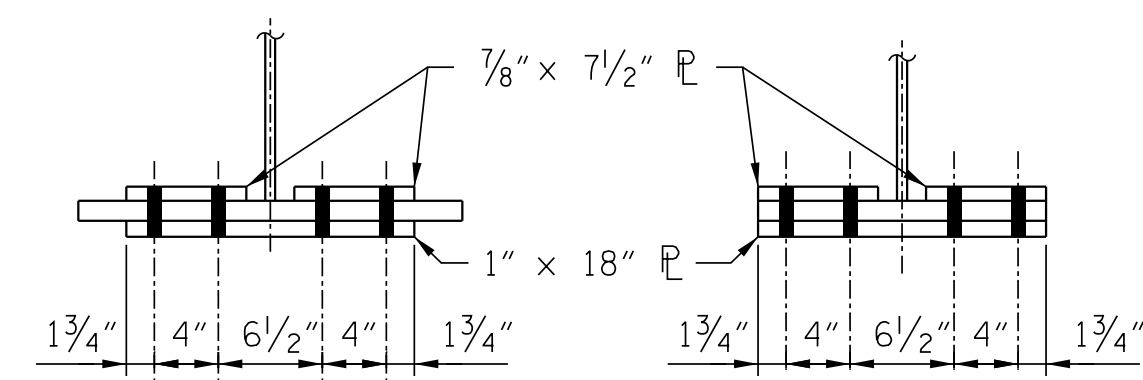
SECTION A-A SECTION B-B



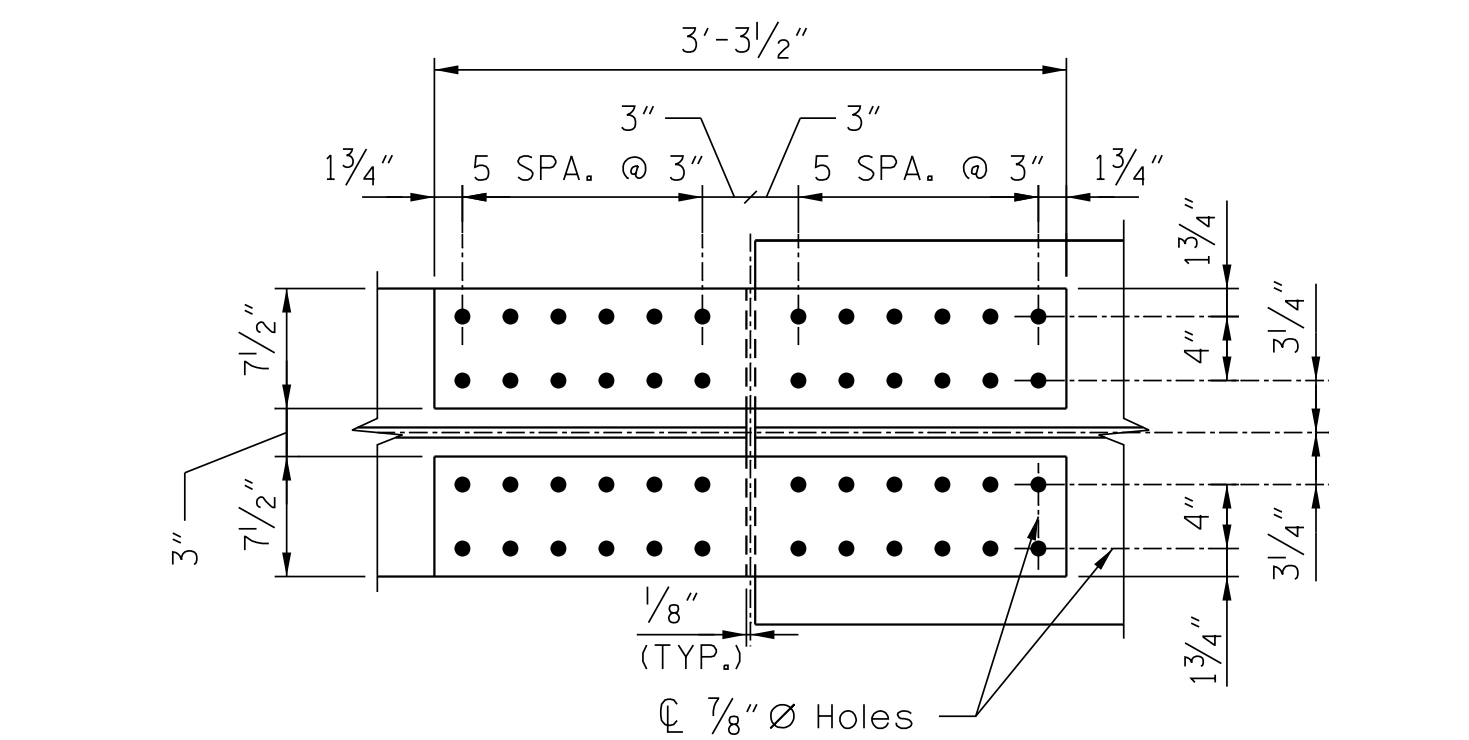
SECTION C-C SECTION D-D



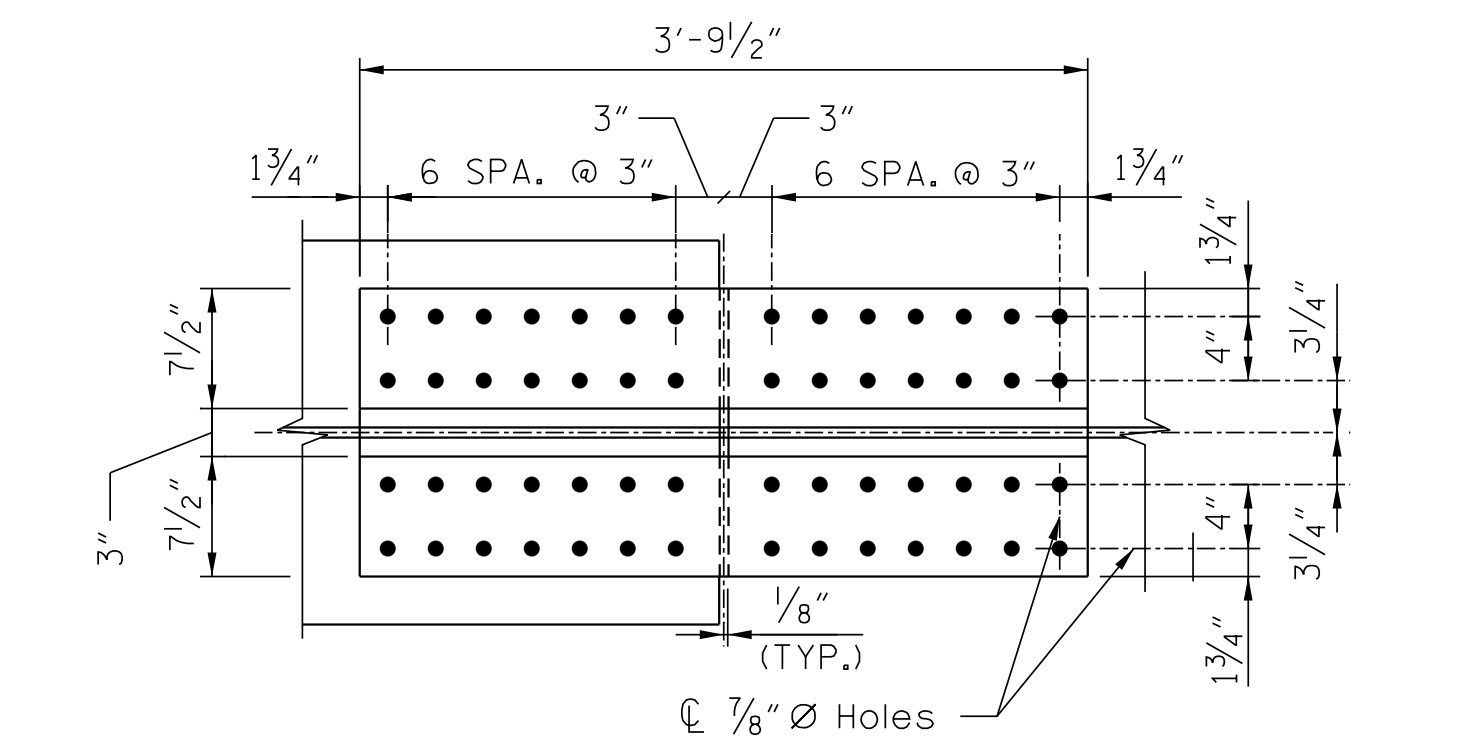
SECTION E-E SECTION F-F



SECTION G-G SECTION H-H



PLAN (BOTTOM OF TOP FLANGE) (FS-1)



PLAN (BOTTOM OF TOP FLANGE) (FS-2)

BOLTED FIELD SPLICES

PROJECT NO. R-5516
CRAVEN COUNTY
 STATION: 32+25.84 -YEB01-
75+13.29 -L-
 SHEET 4 OF 5

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4/12/2017
 NORTH CAROLINA
 PROFESSIONAL SEAL
 030474
 JOHN C. MORRISON
 ENGINEER

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL
 DETAILS

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

SHEET NO. S-21
 TOTAL SHEETS 51

DRAWN BY : N. K. BROWN DATE : 03/16
 CHECKED BY : J. C. MORRISON DATE : 03/16
 DESIGN E.O.R. : J. C. MORRISON DATE : 05/16

DOCUMENT NOT CONSIDERED
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 SIGNATURES COMPLETED

DATE: 4/7/2017 TIME: 3:01:53 PM
 USER: jrcf@aec.com Path: \\001-Structural\001-Structural\001-005_S21_R5516_SML_S504.dgn

NOTES

LATERAL BRACING ASSEMBLY SHALL COMPLY WITH SECTION 1072 OF THE STANDARD SPECIFICATIONS.

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50 AND PAINTED IN ACCORDANCE WITH SYSTEM 1 OF ARTICLE 442-8 OF THE STANDARD SPECIFICATIONS.

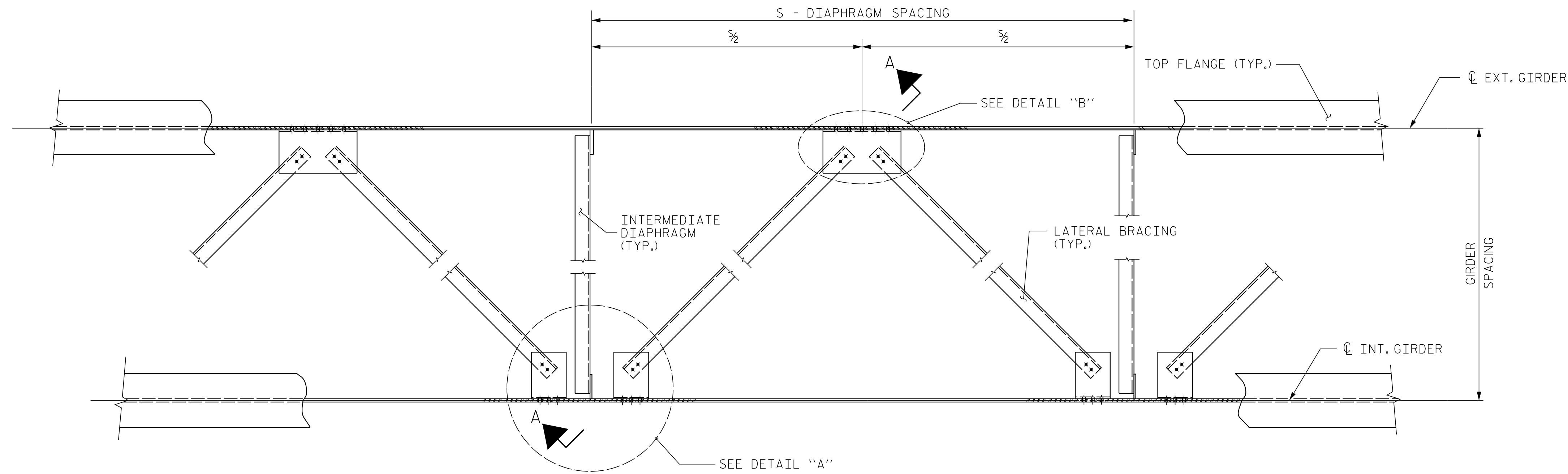
TENSION ON THE ASTM A325 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL BOLTED CONNECTIONS SHALL BE 7/8" Ø HIGH STRENGTH BOLTS.

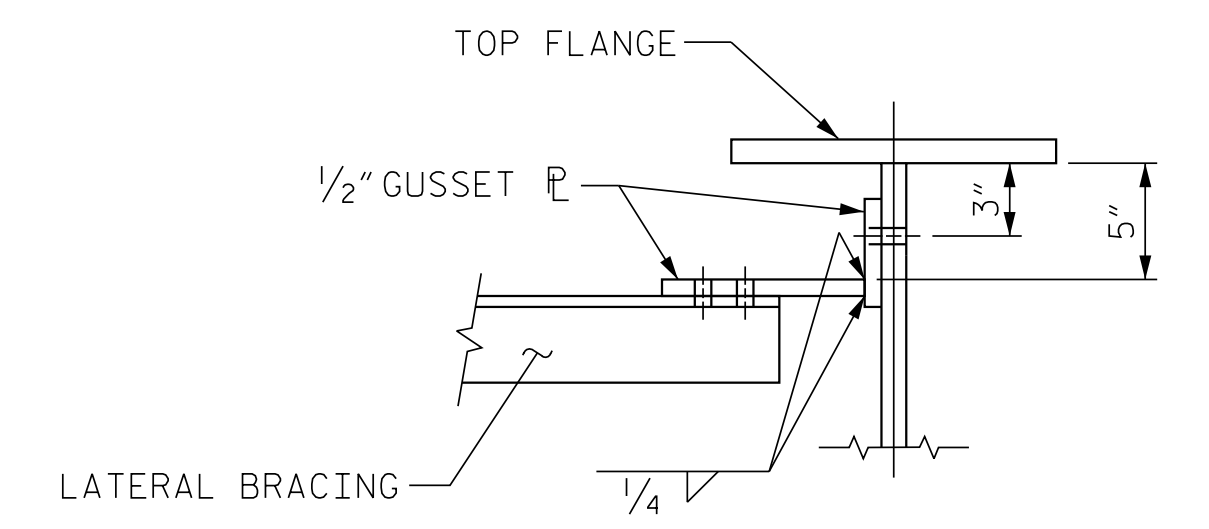
THE CONTRACTOR HAS THE OPTION TO CLIP THE PROTRUDING CORNERS OF THE GUSSET PLATES, AT NO ADDITIONAL COST TO THE DEPARTMENT.

BENT GUSSET PLATES OR ROLLED ANGLE SHAPES MAY BE SUBSTITUTED FOR THE WELDED GUSSET PLATES DETAILED IF APPROVED BY THE ENGINEER, AT NO ADDITIONAL COST TO THE DEPARTMENT.

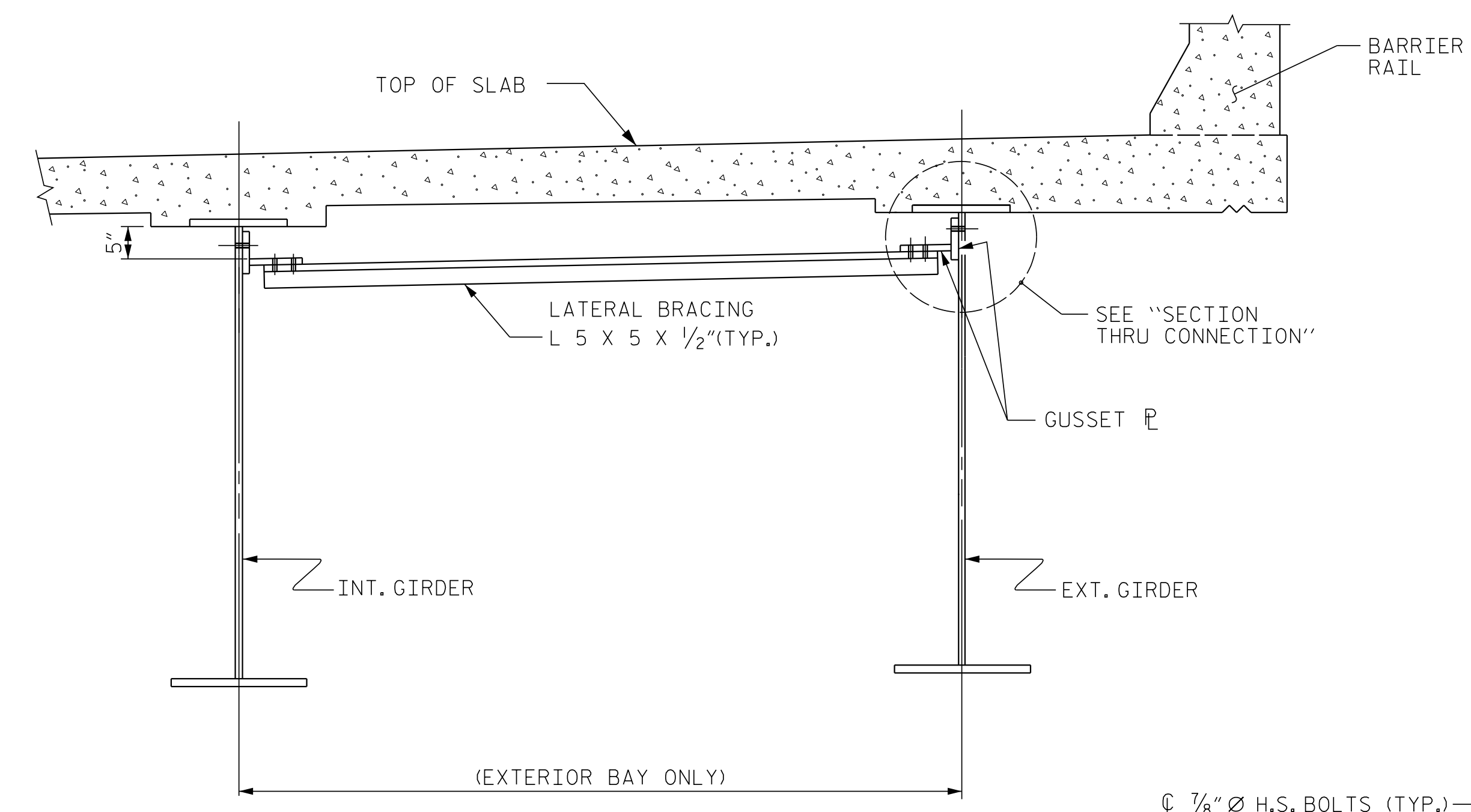
INSTALL THE LATERAL BRACING AFTER ERECTING THE EXTERIOR GIRDER AND THE ADJACENT INTERIOR GIRDER AND INSTALLING THE INTERMEDIATE DIAPHRAGMS.



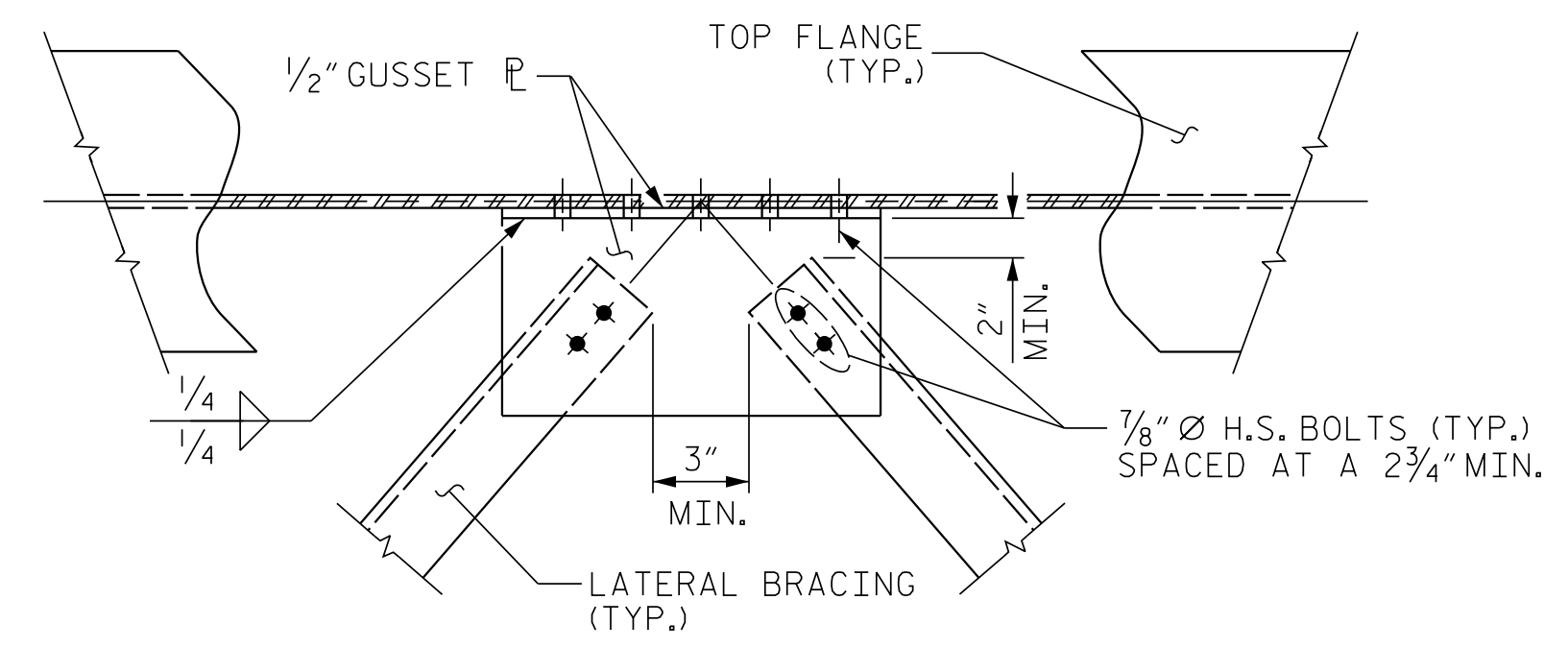
PART PLAN - NEAR TOP FLANGE LATERAL BRACING
(THROUGHOUT EXTERIOR BAYS ONLY)



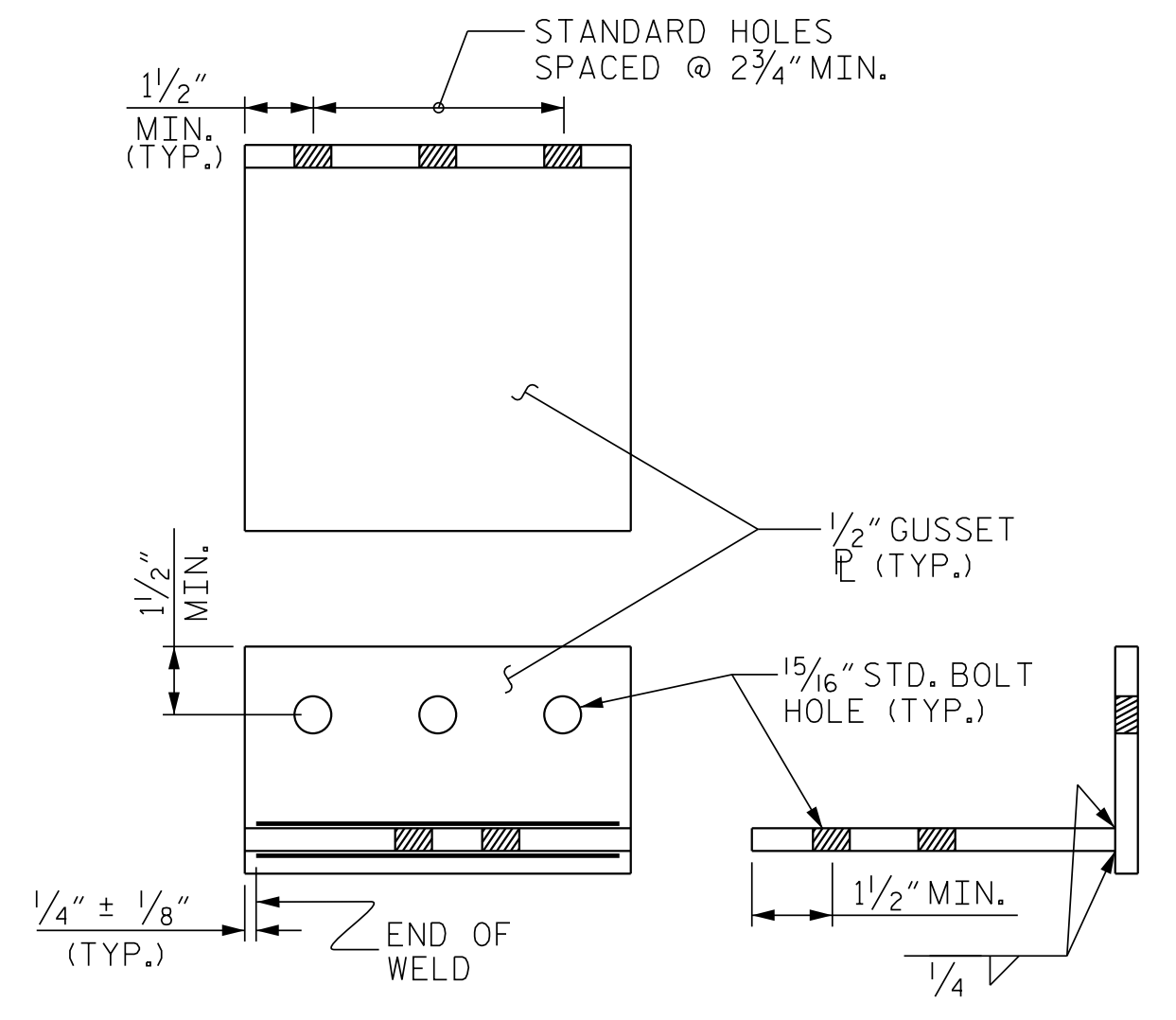
SECTION THRU CONNECTION



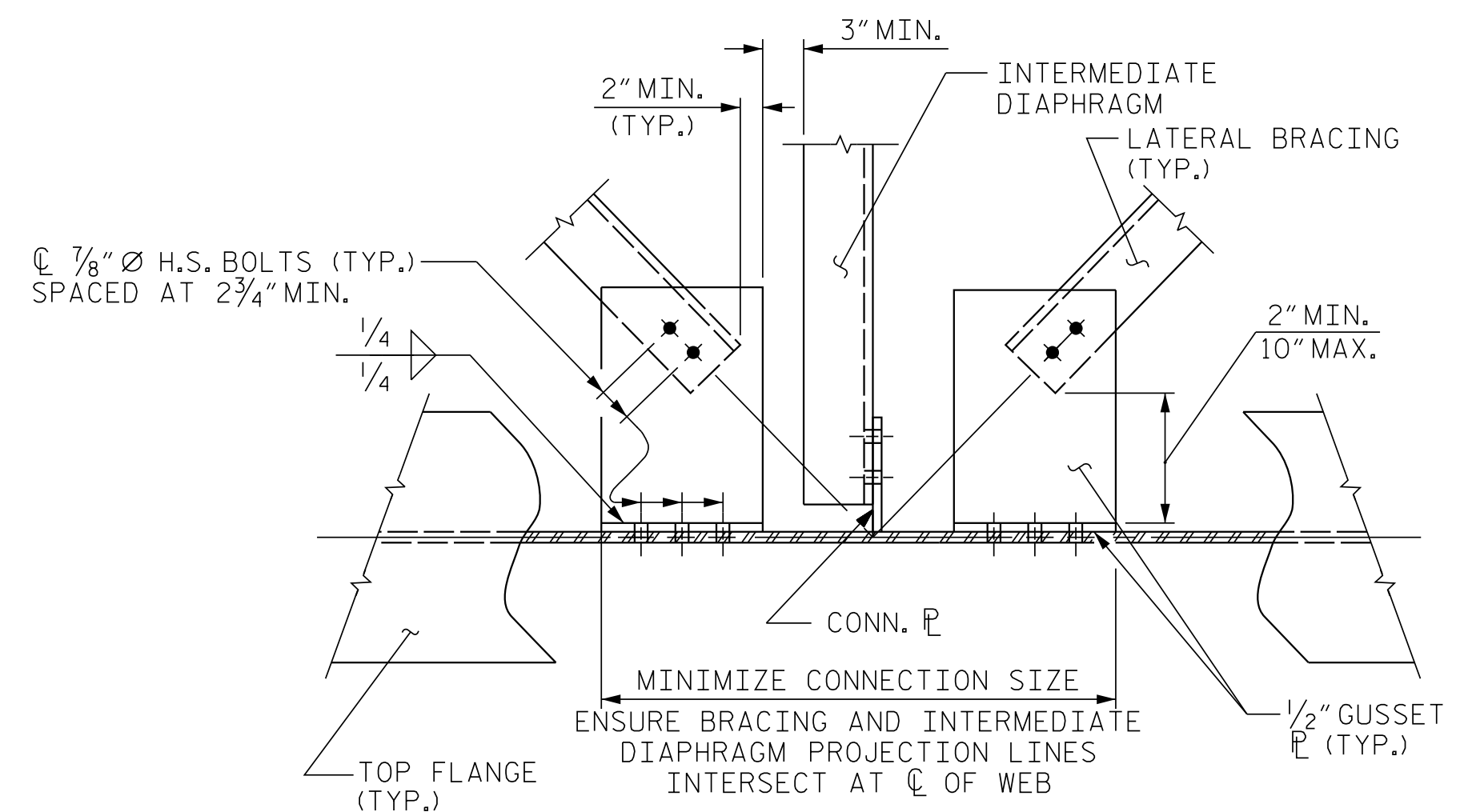
SECTION A-A



DETAIL "B"



CONNECTION DETAIL



DETAIL "A"

PROJECT NO. R-5516
CRAVEN COUNTY
 STATION: 32+25.84 -YEB01-
75+13.29 -L-
 SHEET 5 OF 5

		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH	
		STANDARD LATERAL BRACING	
4/12/2017 		REVISIONS NO. BY: DATE: NO. BY: DATE:	
ASSEMBLED BY : N. K. BROWN DATE : 03/16 CHECKED BY : J. C. MORRISON DATE : 05/16		SHEET NO. S-22 TOTAL SHEETS 51	
DRAWN BY : WMC 6/11 CHECKED BY : GM 6/11		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

DATE: 4/7/2017 TIME: 3:02:53 PM
 USER: R:\60324\44_Singam_Road\400_Technical\408_Structure\Coord\401_10_522_P5516_3MULSS05.dgn

NOTES

FOR DISC BEARINGS, SEE SPECIAL PROVISIONS.

ALL BEARING PLATES SHALL BE AASHTO M270 GRADE 50.

AT ALL POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS SHALL BE FINGER-TIGHTENED PLUS 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 URETHANE DISC.

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

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

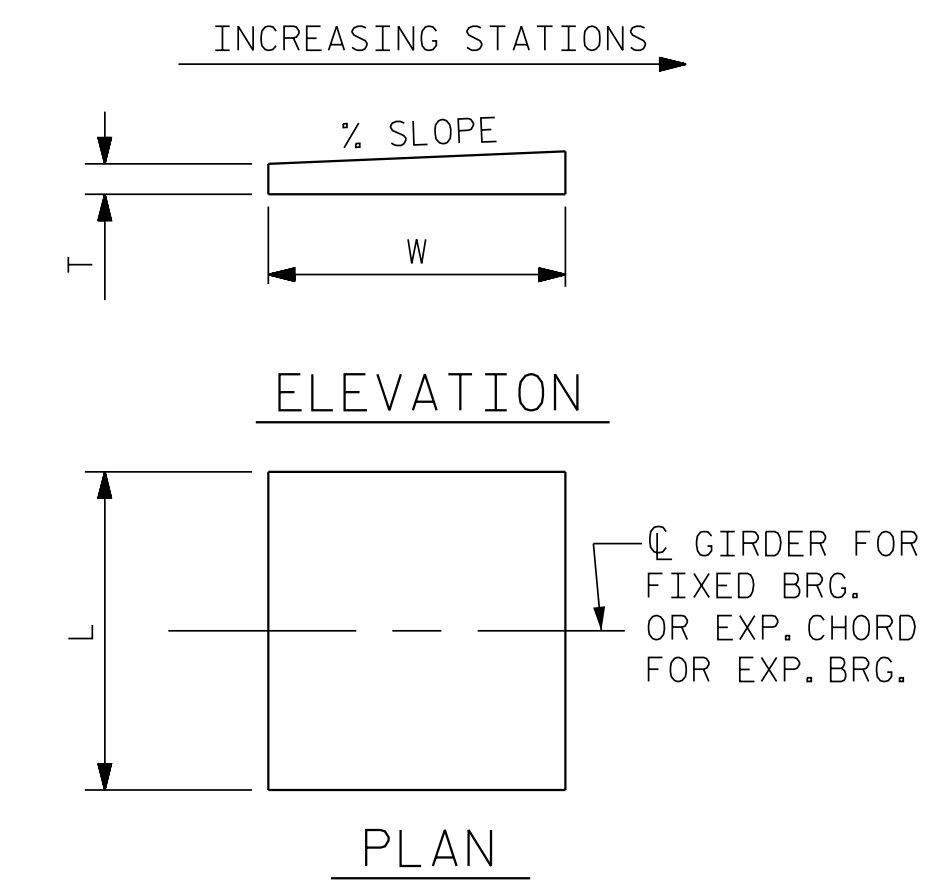
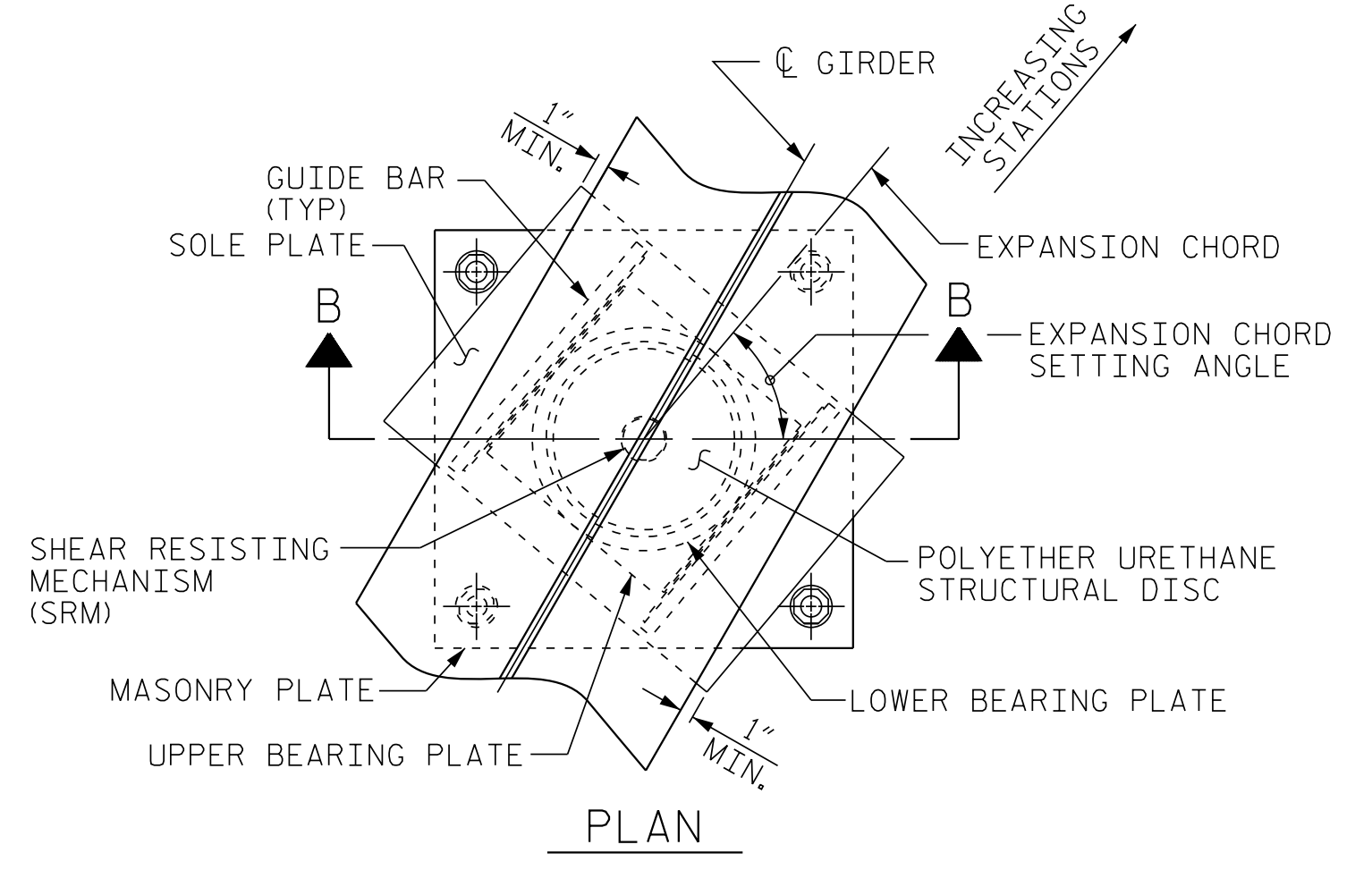
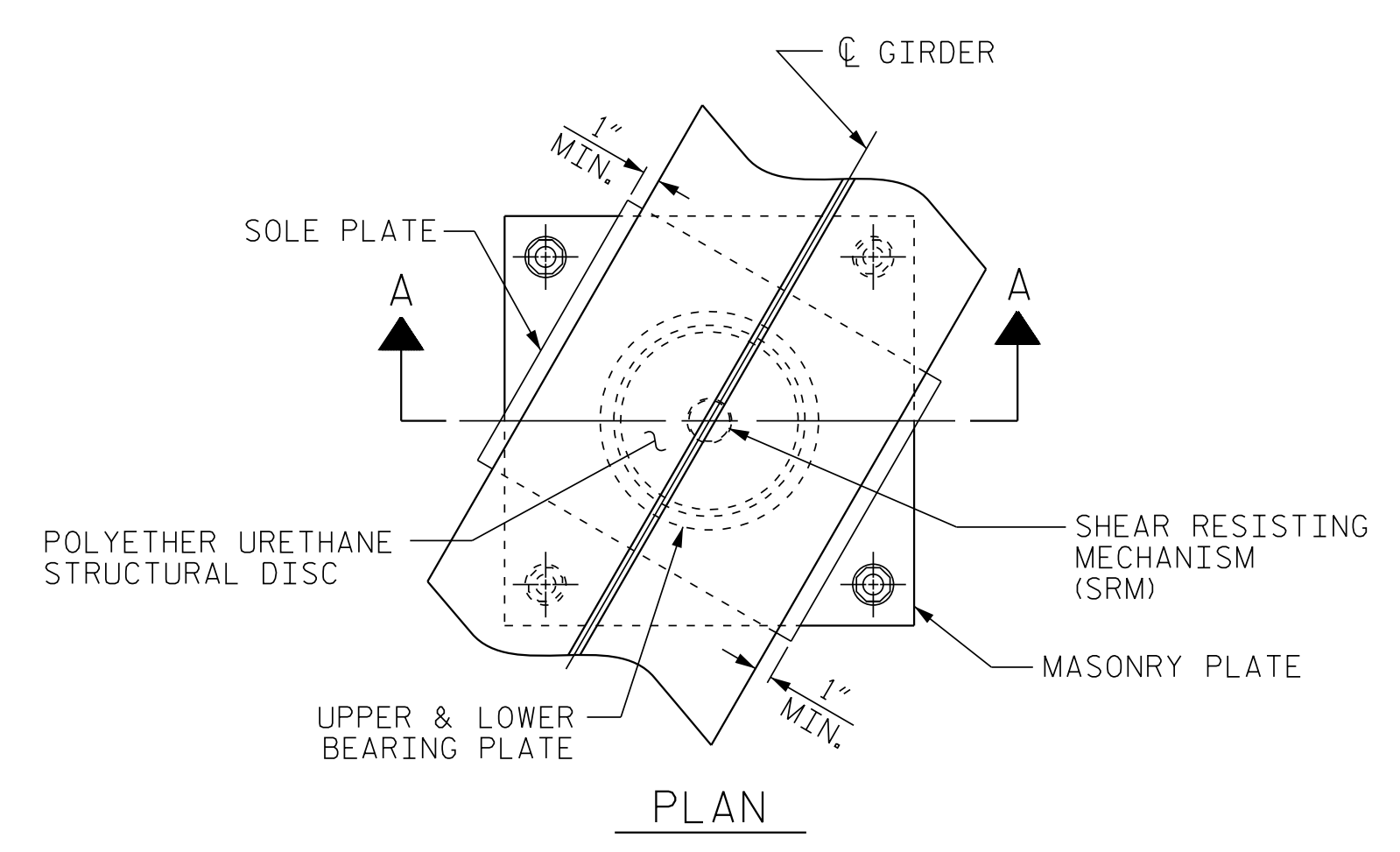
SOLE PLATES SHOULD BE WELDED TO GIRDER FLANGES AND ANCHOR BOLTS SHOULD BE GROUTED BEFORE FALSEWORK IS PLACED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

FOR ATTACHMENT OF THE STAINLESS STEEL SHEETS TO THE STEEL SOLE PLATE AND GUIDE BARS, AS WELL AS THE TOP AND SIDE PTFE SHEETS TO THE STEEL UPPER BEARING PLATE, SEE SPECIAL PROVISIONS.

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

THE MINIMUM ROTATIONAL CAPACITY FOR ALL BEARINGS SHALL BE 0.02 RADIAN.



NOTE:
DIMENSIONS "L", "W", AND "T" SHALL BE DETERMINED BY THE BEARING MANUFACTURER. SET DIMENSION "L" SUCH THAT THE MINIMUM EDGE DISTANCE TO THE GIRDER FLANGE IS 1".

SOLE PLATE DETAILS

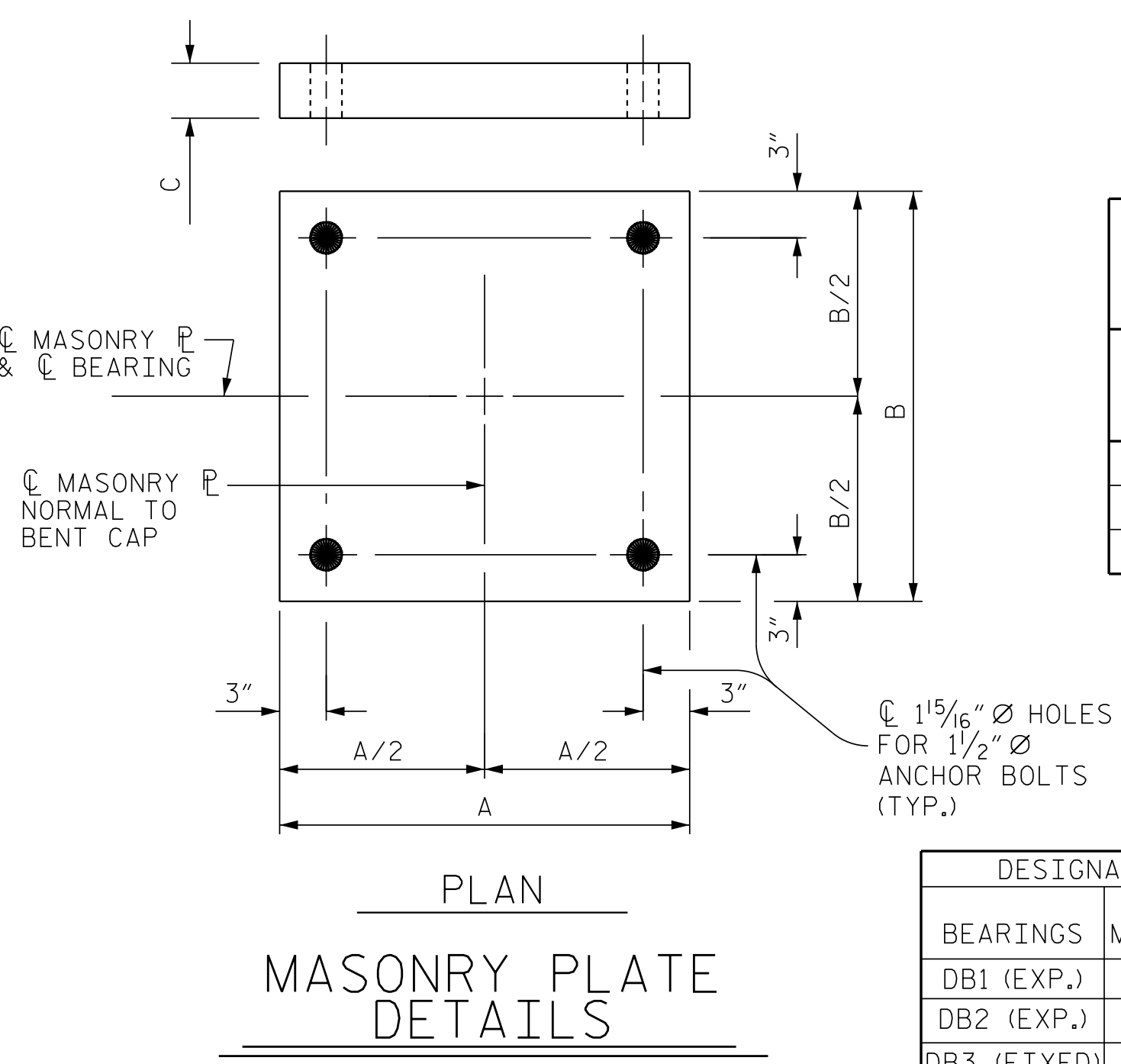
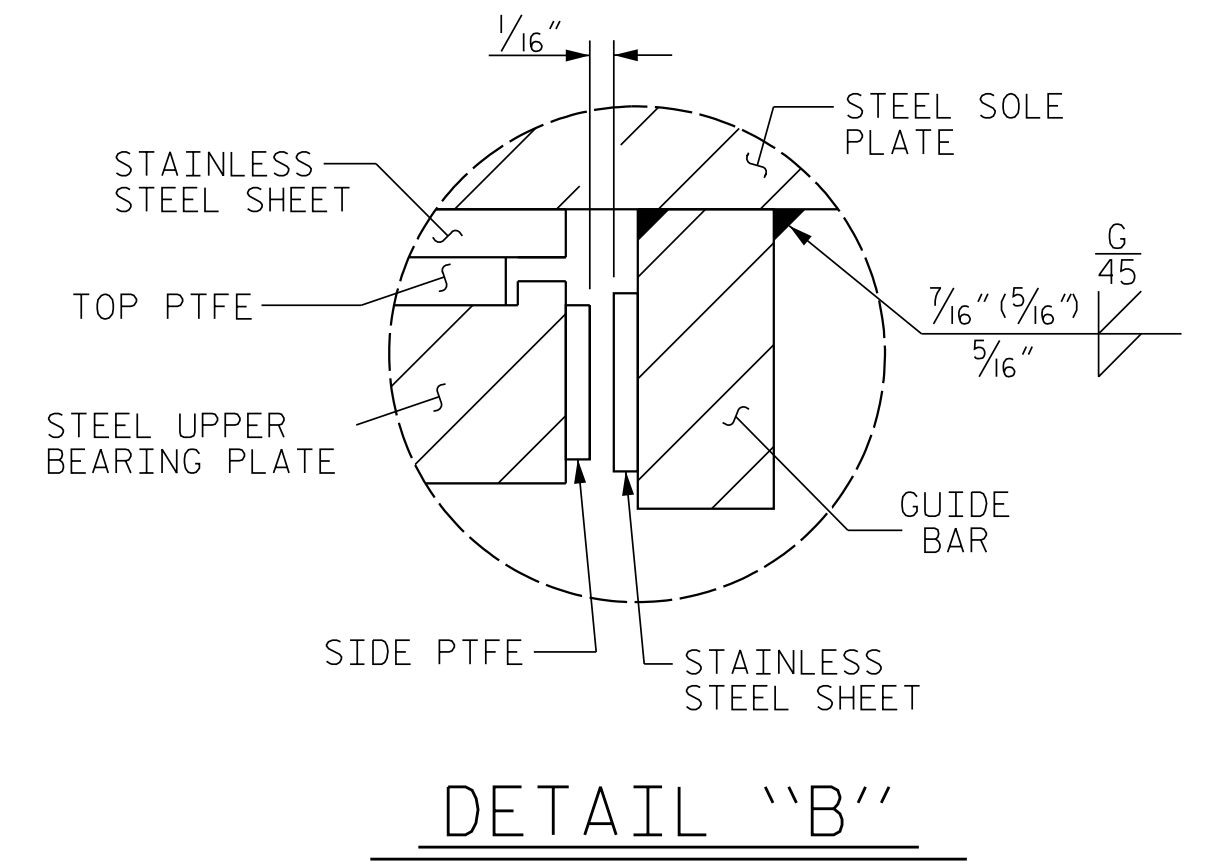
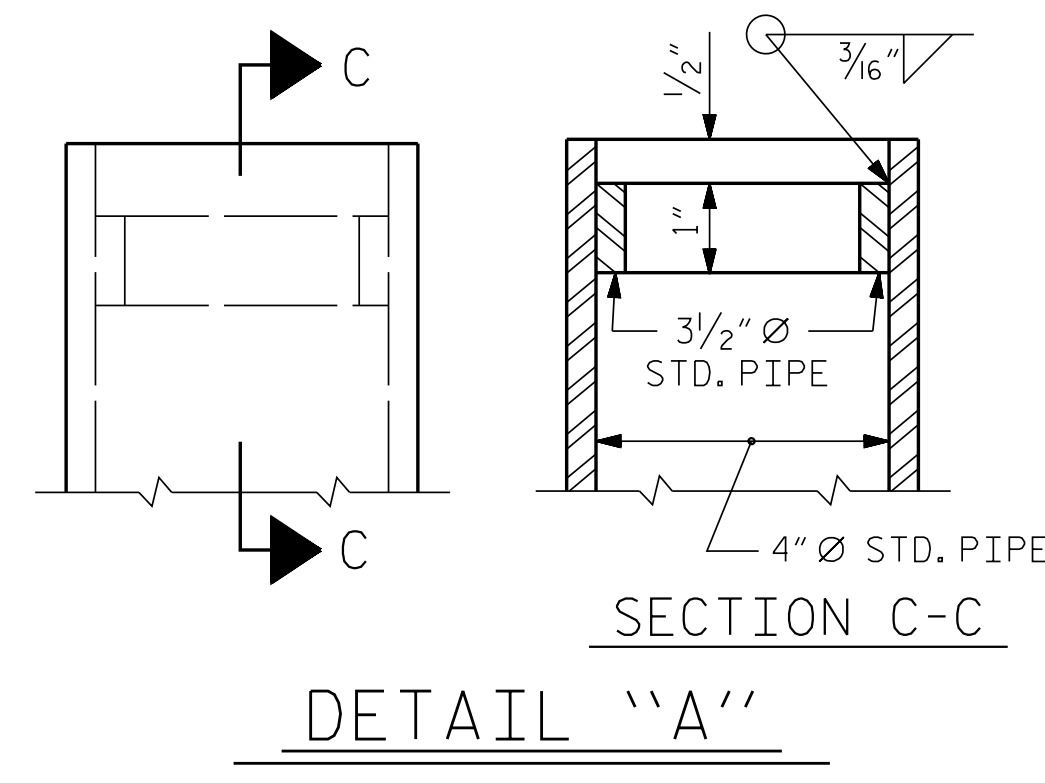
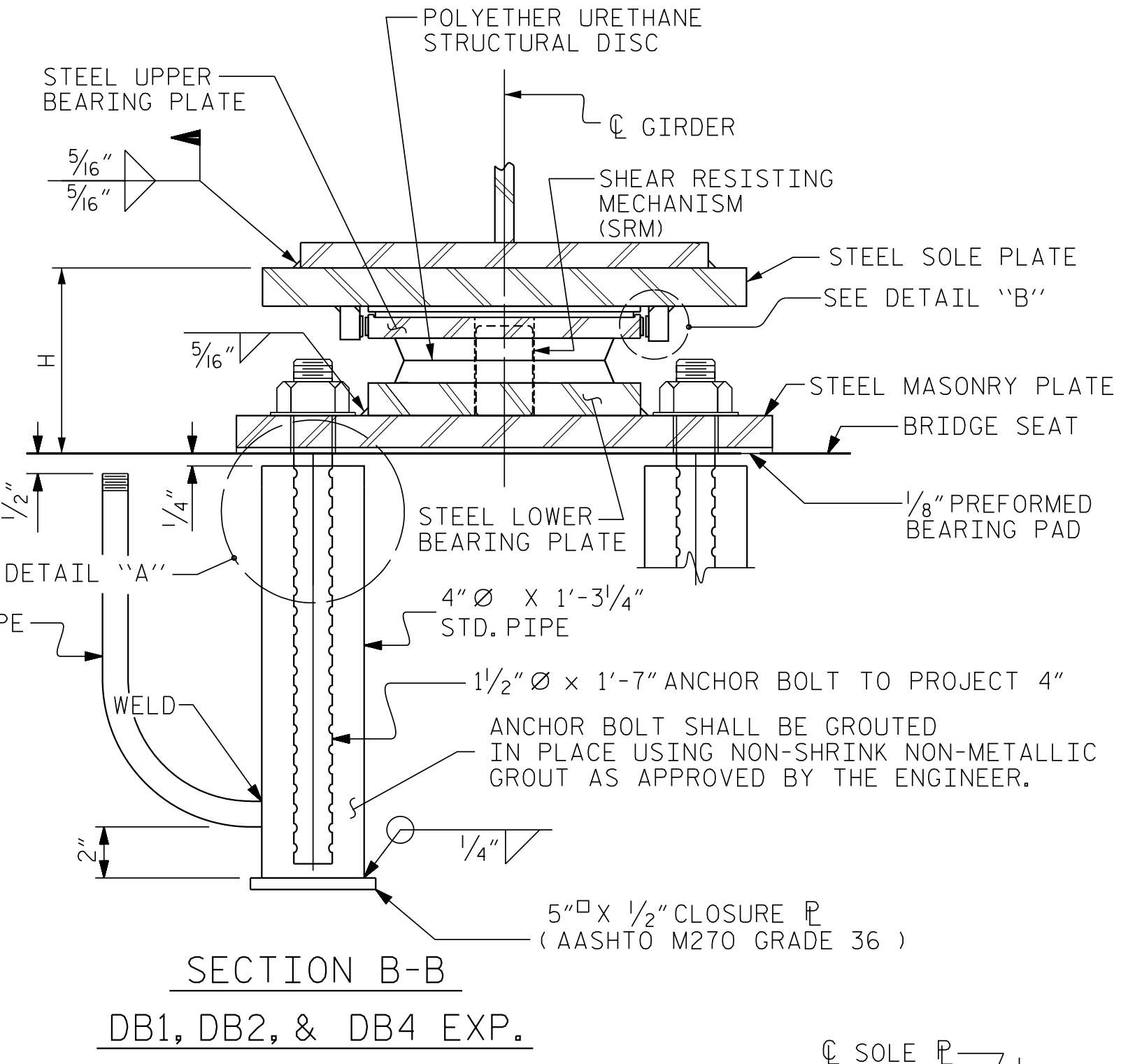
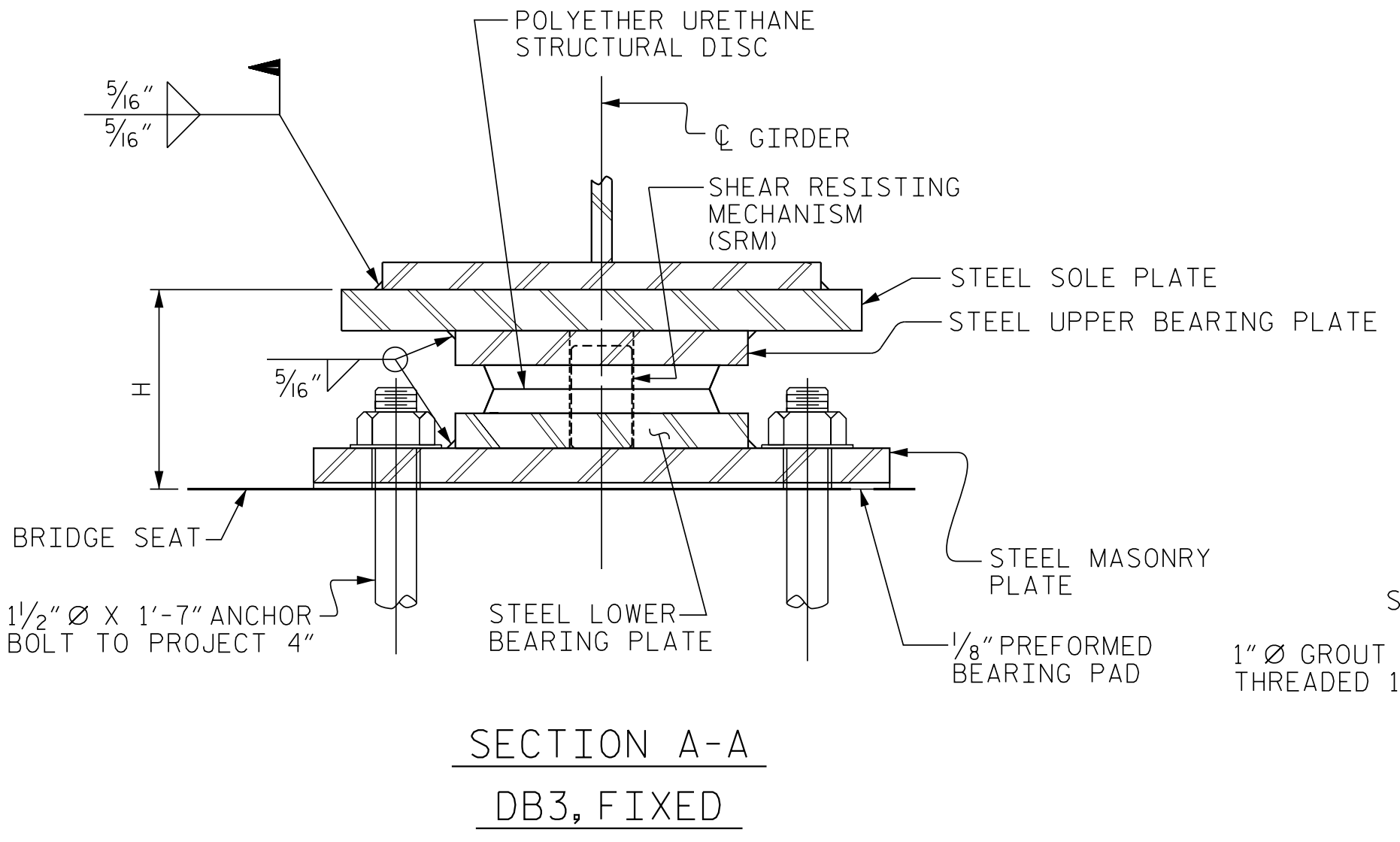
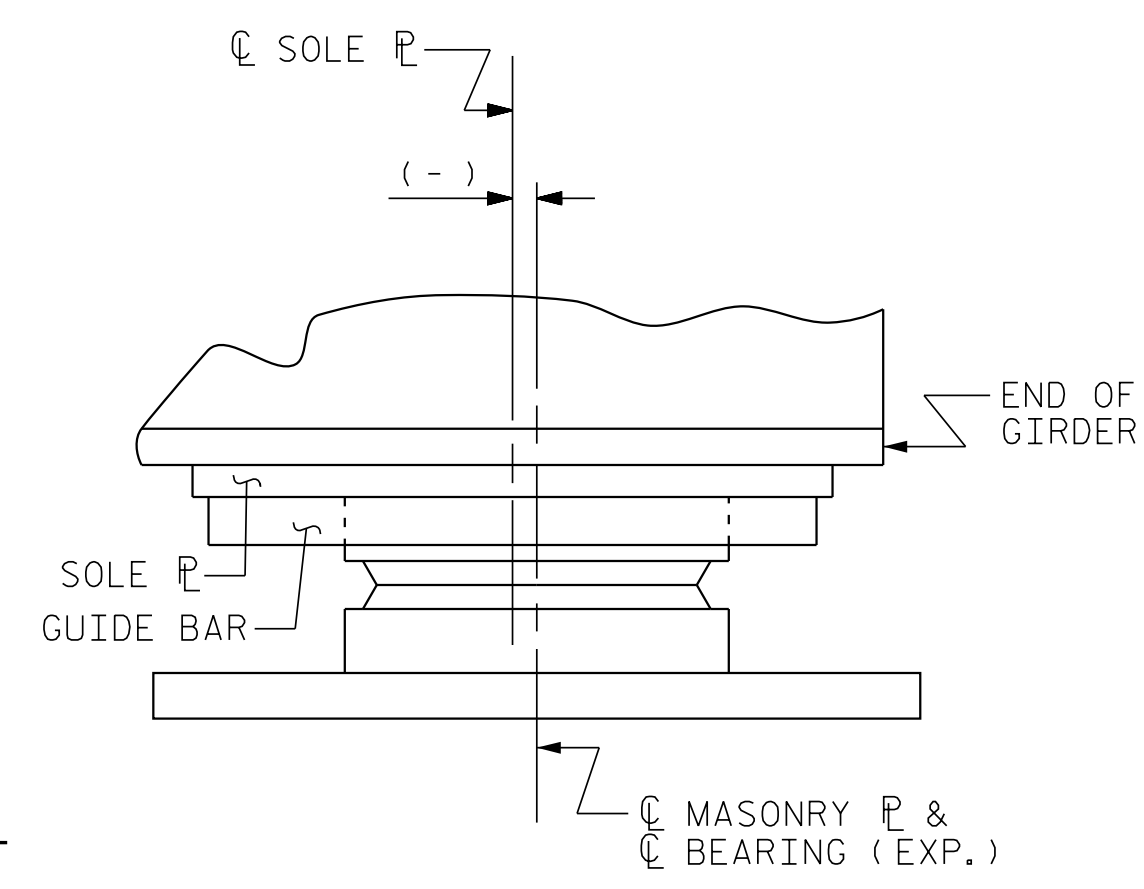


PLATE SETTING DATA
(EXPANSION DISC BEARINGS)

LOCATION	TEMPERATURE AT TIME OF SETTING			*
	45° F	60° F	90° F	
DB1 (EXP.)	-3/8"	0	3/4"	-1/4"
DB2 (EXP.)	-1/4"	0	7/16"	1/16"
DB4 (EXP.)	-1/16"	0	5/16"	-1/4"

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

TEMPERATURE SETTING DETAIL



GIRDER	LOCATION		
	EB 1	BENT 1	EB 2
1	101°15'55"	96°21'45"	85°05'49"
2	101°15'52"	96°21'45"	85°05'52"
3	101°15'48"	96°21'45"	85°05'56"
4	101°15'45"	96°21'45"	85°05'59"
5	101°15'42"	96°21'45"	85°06'02"

DESIGNATIONS	LOCATION	NUMBER OF BEARINGS	DIMENSIONS				LOADS AND MOVEMENT					
			BEARING H (IN.)	MASONRY PLATE A (IN.)	SOLE PLATE B (IN.)	SOLE PLATE C (IN.)	UNFACTORED VERTICAL LOAD (KIPS) DEAD	UNFACTORED VERTICAL LOAD (KIPS) LIVE	FACTORED HORIZONTAL LOAD (KIPS)	ONE-WAY MOVEMENT (IN.)		
DB1 (EXP.)	M1 EB 1	5	5 1/2"	25 1/2"	25 1/2"	3/4"	2.853%	86	12	109	38	2 1/2"
DB2 (EXP.)	M2 BENT 1	5	7 5/8"	32 1/2"	32 1/2"	1"	1.503%	351	48	211	126	1 1/16"
DB3 (FIXED)	M3 BENT 2	5	6 3/8"	26 1/2"	26 1/2"	1"	-0.313%	351	48	211	126	-
DB4 (EXP.)	M4 EB 2	5	5 1/2"	25 1/2"	25 1/2"	3/4"	-1.662%	86	12	109	38	1 1/16"

PROJECT NO. R-5516
CRAVEN COUNTY
STATION: 32+25.84 -YEB01-
75+13.29 -L-

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4/12/2017
NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL 030474
JOHN C. MORRISON

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
DISC BEARING DETAILS

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

SHEET NO. **S-23**
TOTAL SHEETS 51

ASSEMBLED BY : S. G. STREDAK DATE : 08/15
CHECKED BY : J. C. MORRISON DATE : 05/16
DRAWN BY : TMG 08/13 REV.
CHECKED BY : EXP 10/13 REV.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DATE: 4/7/2017 TIME: 3:05:56 PM
USER: jmorriso D:\60329454_Sincum_Road\MO_Technical\08_Structure\040401\15_521_R5516_SML_B001.dgn

NOTE:
FABRICATOR SHALL DETAIL DIAPHRAGM MEMBERS AND CONNECTIONS FOR NO-LOAD FIT-UP.

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
ORDINATES	SPAN "A"																				
	GIRDER 5																				
TWENTIETH POINTS	BRG.	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	BRG.
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.010	0.018	0.027	0.034	0.039	0.041	0.043	0.044	0.043	0.040	0.036	0.030	0.024	0.018	0.013	0.007	0.004	0.001	0.000	0.000
* DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.042	0.080	0.118	0.149	0.172	0.188	0.199	0.205	0.204	0.198	0.182	0.159	0.134	0.108	0.083	0.057	0.037	0.021	0.009	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.004	0.008	0.012	0.015	0.017	0.018	0.019	0.019	0.019	0.018	0.017	0.014	0.011	0.009	0.006	0.004	0.002	0.001	0.000	0.000
TOTAL DL DEFLECTION	0.000	0.056	0.106	0.157	0.198	0.228	0.247	0.261	0.268	0.266	0.256	0.235	0.203	0.169	0.135	0.102	0.068	0.043	0.023	0.009	0.000
VERTICAL CURVE ORDINATE	0.000	0.044	0.084	0.118	0.148	0.174	0.195	0.211	0.223	0.230	0.232	0.230	0.223	0.211	0.195	0.174	0.148	0.118	0.084	0.044	0.000
REQUIRED CAMBER	0	1 3/16"	2 1/4"	3 5/16"	4 3/16"	4 13/16"	5 5/16"	5 11/16"	5 7/8"	5 5/16"	5 7/8"	5 9/16"	5 7/8"	4 9/16"	3 15/16"	3 5/16"	2 5/8"	1 15/16"	1 1/4"	5/8"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
ORDINATES	SPAN "B"																				
	GIRDER 1																				
TWENTIETH POINTS	BRG.	1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	BRG.
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.002	0.006	0.013	0.019	0.027	0.034	0.039	0.044	0.047	0.048	0.047	0.044	0.039	0.033	0.026	0.019	0.012	0.006	0.002	0.000
* DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.002	0.009	0.021	0.040	0.058	0.079	0.095	0.109	0.118	0.122	0.121	0.114	0.102	0.087	0.067	0.048	0.029	0.014	0.005	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.001	0.002	0.005	0.007	0.010	0.013	0.015	0.017	0.018	0.018	0.018	0.017	0.015	0.013	0.010	0.008	0.005	0.003	0.001	0.000
TOTAL DL DEFLECTION	0.000	0.005	0.017	0.039	0.066	0.095	0.126	0.149	0.170	0.183	0.188	0.186	0.175	0.156	0.133	0.103	0.075	0.046	0.023	0.008	0.000
VERTICAL CURVE ORDINATE	0.000	0.080	0.151	0.214	0.269	0.315	0.353	0.382	0.403	0.416	0.420	0.416	0.403	0.382	0.353	0.315	0.269	0.214	0.151	0.080	0.000
REQUIRED CAMBER	0	1"	2"	3 1/16"	4"	4 15/16"	5 3/4"	6 3/8"	6 7/8"	7 3/16"	7 5/16"	7 1/4"	6 15/16"	6 7/16"	5 13/16"	5"	4 1/8"	3 1/8"	2 1/16"	1 1/16"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
ORDINATES	SPAN "B"																				
	GIRDER 2																				
TWENTIETH POINTS	BRG.	1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	BRG.
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.003	0.007	0.014	0.022	0.030	0.038	0.045	0.050	0.053	0.054	0.053	0.050	0.044	0.038	0.030	0.021	0.014	0.007	0.002	0.000
* DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.001	0.009	0.023	0.044	0.063	0.087	0.106	0.121	0.132	0.137	0.135	0.128	0.116	0.097	0.077	0.054	0.034	0.016	0.005	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.001	0.003	0.005	0.008	0.011	0.014	0.017	0.019	0.020	0.020	0.020	0.019	0.017	0.014	0.011	0.008	0.005	0.003	0.001	0.000
TOTAL DL DEFLECTION	0.000	0.005	0.019	0.042	0.074	0.104	0.139	0.168	0.190	0.205	0.211	0.208	0.197	0.177	0.149	0.118	0.083	0.053	0.026	0.008	0.000
VERTICAL CURVE ORDINATE	0.000	0.080	0.151	0.214	0.269	0.315	0.353	0.382	0.403	0.416	0.420	0.416	0.403	0.382	0.353	0.315	0.269	0.214	0.151	0.080	0.000
REQUIRED CAMBER	0	1"	2 1/16"	3 1/16"	4 1/8"	5"	5 7/8"	6 5/8"	7 1/8"	7 7/16"	7 9/16"	7 1/2"	7 3/16"	6 11/16"	6"	5 3/16"	4 1/4"	3 3/16"	2 1/8"	1 1/16"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
ORDINATES	SPAN "B"																				
	GIRDER 3																				
TWENTIETH POINTS	BRG.	1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	BRG.
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.003	0.008	0.016	0.024	0.034	0.042	0.049	0.055	0.059	0.060	0.059	0.055	0.049	0.042	0.032	0.024	0.015	0.008	0.003	0.000
* DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.001	0.009	0.027	0.047	0.068	0.094	0.114	0.132	0.144	0.150	0.148	0.141	0.125	0.107	0.083	0.060	0.036	0.018	0.006	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.001	0.003	0.006	0.009	0.012	0.015	0.018	0.020	0.022	0.022	0.022	0.020	0.018	0.015	0.012	0.009	0.006	0.003	0.001	0.000
TOTAL DL DEFLECTION	0.000	0.005	0.020	0.049	0.080	0.114	0.151	0.181	0.207	0.225	0.232	0.229	0.216	0.192	0.164	0.127	0.093	0.057	0.029	0.010	0.000
VERTICAL CURVE ORDINATE	0.000	0.080	0.151	0.214	0.269	0.315	0.353	0.382	0.403	0.416	0.420	0.416	0.403	0.382	0.353	0.315	0.269	0.214	0.151	0.080	0.000
REQUIRED CAMBER	0	1"	2 1/16"	3 3/16"	4 3/16"	5 1/8"	6 1/16"	6 3/4"	7 5/16"	7 11/16"	7 13/16"	7 3/4"	7 7/16"	6 7/8"	6 3/16"	5 5/16"	4 5/16"	3 1/4"	2 3/16"	1 1/16"	0

* INCLUDES SLAB, BUILD-UP AND STAY-IN-PLACE METAL FORMS.

CAMBER NOTES:

1. ALL DEFLECTIONS AND CAMBER VALUES SHOWN ARE IN INCHES (DECIMAL FORM), EXCEPT FOR "REQUIRED CAMBER" GIVEN IN INCHES (FRACTIONAL FORM).

PROJECT NO. R-5516
CRAVEN COUNTY

STATION: 32+25.84 -YEB01-
75+13.29 -L-

SHEET 2 OF 4

DRAWN BY : N. K. BROWN DATE : 03/16
CHECKED BY : J. C. MORRISON DATE : 03/16
DESIGN E.O.R. : J. C. MORRISON DATE : 05/16

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

GIRDER DEFLECTIONS
AND CAMBER SCHEDULES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			51

DATE: 4/7/2017
TIME: 3:06:51 PM

USER: jrc1503
D:\N:\R\6032444_5\ncdm_Road\MO_Technical\MOB_Structure\Cadd\MO_L25_S25_R5516_SML_DLO2.dgn

NOTE:
FABRICATOR SHALL DETAIL DIAPHRAGM MEMBERS AND CONNECTIONS FOR NO-LOAD FIT-UP.

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
ORDINATES	SPAN "B"																				
	GIRDER 4																				
TWENTIETH POINTS	BRG.	1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	BRG.
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.003	0.009	0.018	0.027	0.036	0.046	0.054	0.061	0.065	0.066	0.064	0.060	0.054	0.046	0.036	0.026	0.016	0.009	0.003	0.000
* DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.001	0.010	0.025	0.049	0.073	0.100	0.125	0.143	0.156	0.162	0.161	0.153	0.137	0.116	0.090	0.065	0.039	0.019	0.006	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.001	0.003	0.006	0.010	0.013	0.017	0.020	0.022	0.024	0.024	0.024	0.022	0.020	0.017	0.013	0.010	0.006	0.003	0.001	0.000
TOTAL DL DEFLECTION	0.000	0.005	0.022	0.049	0.086	0.122	0.163	0.199	0.226	0.245	0.252	0.249	0.235	0.211	0.179	0.139	0.101	0.061	0.031	0.010	0.000
VERTICAL CURVE ORDINATE	0.000	0.080	0.151	0.214	0.269	0.315	0.353	0.382	0.403	0.416	0.420	0.416	0.403	0.382	0.353	0.315	0.269	0.214	0.151	0.080	0.000
REQUIRED CAMBER	0	1"	2 1/16"	3 3/16"	4 1/4"	5 1/4"	6 3/16"	7"	7 9/16"	7 15/16"	8 1/16"	8"	7 11/16"	7 1/8"	6 3/8"	5 7/16"	4 7/16"	3 5/16"	2 3/16"	1 1/16"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
ORDINATES	SPAN "B"																				
	GIRDER 5																				
TWENTIETH POINTS	BRG.	1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	BRG.
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.004	0.010	0.018	0.029	0.040	0.050	0.060	0.066	0.071	0.072	0.070	0.066	0.059	0.050	0.039	0.028	0.019	0.009	0.003	0.000
* DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.000	0.009	0.029	0.051	0.076	0.107	0.133	0.154	0.168	0.176	0.174	0.165	0.147	0.126	0.097	0.070	0.044	0.020	0.007	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.001	0.003	0.007	0.011	0.015	0.018	0.022	0.024	0.026	0.026	0.026	0.024	0.022	0.018	0.014	0.011	0.007	0.003	0.001	0.000
TOTAL DL DEFLECTION	0.000	0.005	0.022	0.054	0.091	0.131	0.175	0.215	0.244	0.265	0.274	0.270	0.255	0.228	0.194	0.150	0.109	0.070	0.032	0.011	0.000
VERTICAL CURVE ORDINATE	0.000	0.080	0.151	0.214	0.269	0.315	0.353	0.382	0.403	0.416	0.420	0.416	0.403	0.382	0.353	0.315	0.269	0.214	0.151	0.080	0.000
REQUIRED CAMBER	0	1"	2 1/16"	3 3/16"	4 5/16"	5 3/8"	6 5/16"	7 3/16"	7 3/4"	8 3/16"	8 5/16"	8 1/4"	7 7/8"	7 5/16"	6 9/16"	5 9/16"	4 9/16"	3 7/16"	2 3/16"	1 1/16"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
ORDINATES	SPAN "C"																				
	GIRDER 1																				
TWENTIETH POINTS	BRG.	2.05	2.10	2.15	2.20	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	BRG.
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.000	0.001	0.004	0.007	0.011	0.015	0.019	0.024	0.027	0.031	0.032	0.032	0.032	0.030	0.028	0.024	0.019	0.013	0.007	0.000
* DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.002	0.006	0.014	0.024	0.036	0.050	0.063	0.076	0.087	0.098	0.102	0.103	0.101	0.096	0.088	0.076	0.060	0.041	0.022	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.000	0.001	0.002	0.003	0.005	0.006	0.008	0.010	0.012	0.013	0.013	0.013	0.013	0.013	0.011	0.010	0.008	0.005	0.003	0.000
TOTAL DL DEFLECTION	0.000	0.002	0.008	0.020	0.034	0.052	0.071	0.090	0.110	0.126	0.142	0.147	0.148	0.146	0.139	0.127	0.110	0.087	0.059	0.032	0.000
VERTICAL CURVE ORDINATE	0.000	0.044	0.084	0.118	0.148	0.174	0.195	0.211	0.223	0.230	0.232	0.230	0.223	0.211	0.195	0.174	0.148	0.118	0.084	0.044	0.000
REQUIRED CAMBER	0	9/16"	1 1/8"	1 11/16"	2 3/16"	2 11/16"	3 3/16"	3 5/8"	4"	4 1/4"	4 1/2"	4 1/2"	4 7/16"	4 5/16"	4"	3 5/8"	3 1/8"	2 7/16"	1 11/16"	1 5/16"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
ORDINATES	SPAN "C"																				
	GIRDER 2																				
TWENTIETH POINTS	BRG.	2.05	2.10	2.15	2.20	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	BRG.
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.000	0.001	0.004	0.007	0.012	0.016	0.021	0.026	0.030	0.034	0.035	0.036	0.035	0.033	0.031	0.027	0.021	0.015	0.008	0.000
* DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.002	0.007	0.015	0.026	0.039	0.055	0.069	0.084	0.096	0.109	0.114	0.115	0.113	0.107	0.098	0.086	0.069	0.047	0.024	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.000	0.001	0.002	0.003	0.005	0.007	0.009	0.011	0.013	0.014	0.015	0.015	0.015	0.014	0.013	0.011	0.009	0.006	0.003	0.000
TOTAL DL DEFLECTION	0.000	0.002	0.009	0.021	0.036	0.056	0.078	0.099	0.121	0.139	0.157	0.164	0.166	0.163	0.154	0.142	0.124	0.099	0.068	0.035	0.000
VERTICAL CURVE ORDINATE	0.000	0.044	0.084	0.118	0.148	0.174	0.195	0.211	0.223	0.230	0.232	0.230	0.223	0.211	0.195	0.174	0.148	0.118	0.084	0.044	0.000
REQUIRED CAMBER	0	9/16"	1 1/8"	1 11/16"	2 3/16"	2 3/4"	3 1/4"	3 3/4"	4 1/8"	4 7/16"	4 11/16"	4 3/4"	4 11/16"	4 1/2"	4 3/16"	3 13/16"	3 1/4"	2 5/8"	1 13/16"	1 5/16"	0

* INCLUDES SLAB, BUILD-UP AND STAY-IN-PLACE METAL FORMS.

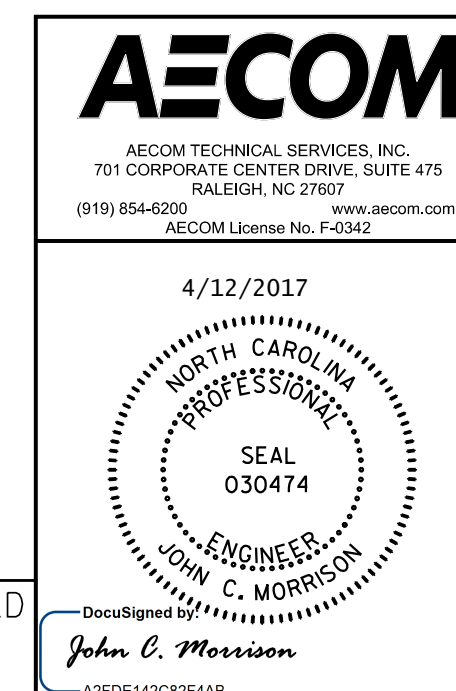
CAMBER NOTES:

1. ALL DEFLECTIONS AND CAMBER VALUES SHOWN ARE IN INCHES (DECIMAL FORM), EXCEPT FOR "REQUIRED CAMBER" GIVEN IN INCHES (FRACTIONAL FORM).

PROJECT NO. R-5516
CRAVEN COUNTY
 STATION: 32+25.84 -YEB01-
75+13.29 -L-
 SHEET 3 OF 4

DRAWN BY : N. K. BROWN DATE : 03/16
 CHECKED BY : J. C. MORRISON DATE : 03/16
 DESIGN E.O.R. : J. C. MORRISON DATE : 05/16

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE

GIRDER DEFLECTIONS
 AND CAMBER SCHEDULES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			51
2			4			

DATE: 4/12/2017 TIME: 3:06:53 PM
 USER: jcm/1454 DOB: R:\6032\454_Sigum Road\MOI_Technical\MOI_Structure\Cada\MOI_30_S26_R5516_SML_D103.dgn

NOTE:
FABRICATOR SHALL DETAIL DIAPHRAGM MEMBERS AND CONNECTIONS FOR NO-LOAD FIT-UP.

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
ORDINATES	SPAN "C"																				
	GIRDER 3																				
TWENTIETH POINTS	BRG.	2.05	2.10	2.15	2.20	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	BRG.
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.000	0.001	0.004	0.008	0.013	0.017	0.023	0.028	0.033	0.036	0.038	0.039	0.038	0.036	0.034	0.029	0.023	0.016	0.008	0.000
* DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.002	0.007	0.016	0.028	0.044	0.059	0.075	0.091	0.107	0.118	0.125	0.125	0.123	0.117	0.108	0.094	0.074	0.051	0.027	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.000	0.001	0.002	0.004	0.006	0.008	0.010	0.012	0.014	0.016	0.016	0.016	0.016	0.015	0.014	0.012	0.010	0.007	0.004	0.000
TOTAL DL DEFLECTION	0.000	0.002	0.009	0.022	0.040	0.063	0.084	0.108	0.131	0.154	0.170	0.179	0.180	0.177	0.168	0.156	0.135	0.107	0.074	0.039	0.000
VERTICAL CURVE ORDINATE	0.000	0.044	0.084	0.118	0.148	0.174	0.195	0.211	0.223	0.230	0.232	0.230	0.223	0.211	0.195	0.174	0.148	0.118	0.084	0.044	0.000
REQUIRED CAMBER	0	3/16"	1/8"	1 1/16"	2 1/4"	2 7/8"	3 3/8"	3 3/16"	4 1/4"	4 5/8"	4 3/16"	4 7/8"	4 3/16"	4 1 1/16"	4 3/8"	3 5/16"	3 3/8"	2 1 1/16"	1 7/8"	1"	0

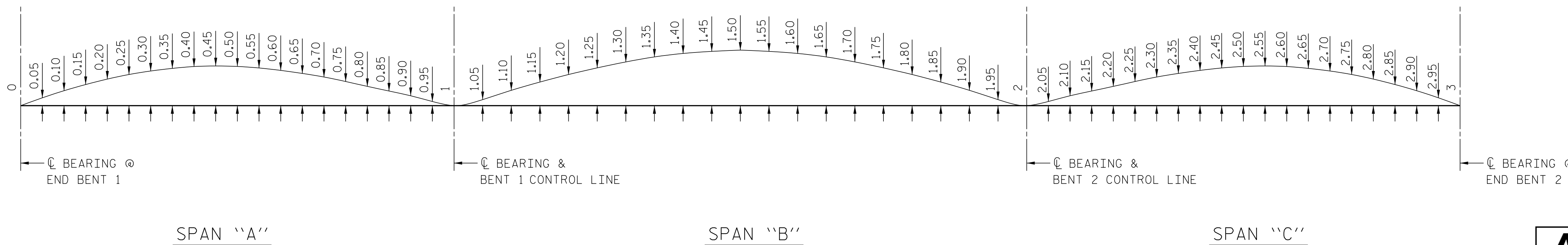
DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
ORDINATES	SPAN "C"																				
	GIRDER 4																				
TWENTIETH POINTS	BRG.	2.05	2.10	2.15	2.20	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	BRG.
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.000	0.001	0.004	0.008	0.013	0.018	0.024	0.029	0.035	0.039	0.041	0.041	0.041	0.039	0.036	0.031	0.025	0.017	0.009	0.000
* DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.002	0.007	0.017	0.030	0.047	0.063	0.080	0.098	0.115	0.127	0.134	0.136	0.134	0.127	0.117	0.102	0.080	0.056	0.029	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.000	0.001	0.002	0.004	0.006	0.008	0.011	0.013	0.015	0.017	0.018	0.018	0.018	0.017	0.016	0.014	0.011	0.007	0.004	0.000
TOTAL DL DEFLECTION	0.000	0.002	0.009	0.023	0.042	0.066	0.089	0.115	0.140	0.165	0.183	0.193	0.195	0.193	0.183	0.169	0.147	0.116	0.080	0.042	0.000
VERTICAL CURVE ORDINATE	0.000	0.044	0.084	0.118	0.148	0.174	0.195	0.211	0.223	0.230	0.232	0.230	0.223	0.211	0.195	0.174	0.148	0.118	0.084	0.044	0.000
REQUIRED CAMBER	0	3/16"	1/8"	1 1/16"	2 5/16"	2 7/8"	3 1/16"	3 5/16"	4 3/8"	4 3/4"	5"	5 1/16"	5"	4 7/8"	4 9/16"	4 1/8"	3 3/16"	2 1 3/16"	1 5/16"	1 1/16"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
ORDINATES	SPAN "C"																				
	GIRDER 5																				
TWENTIETH POINTS	BRG.	2.05	2.10	2.15	2.20	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	BRG.
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.000	0.001	0.004	0.008	0.013	0.019	0.025	0.031	0.036	0.041	0.043	0.044	0.044	0.042	0.039	0.034	0.027	0.019	0.010	0.000
* DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.002	0.007	0.017	0.031	0.049	0.067	0.085	0.104	0.121	0.137	0.144	0.146	0.145	0.138	0.127	0.111	0.089	0.061	0.032	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.000	0.001	0.002	0.004	0.006	0.009	0.011	0.014	0.016	0.018	0.019	0.019	0.019	0.018	0.017	0.015	0.012	0.008	0.004	0.000
TOTAL DL DEFLECTION	0.000	0.002	0.009	0.023	0.043	0.068	0.095	0.121	0.149	0.173	0.196	0.206	0.209	0.208	0.198	0.183	0.160	0.128	0.088	0.046	0.000
VERTICAL CURVE ORDINATE	0.000	0.044	0.084	0.118	0.148	0.174	0.195	0.211	0.223	0.230	0.232	0.230	0.223	0.211	0.195	0.174	0.148	0.118	0.084	0.044	0.000
REQUIRED CAMBER	0	3/16"	1/8"	1 1/16"	2 5/16"	2 7/8"	3 1/2"	4"	4 7/16"	4 1 3/16"	5 1/8"	5 1/4"	5 3/16"	5"	4 1 1/16"	4 5/16"	3 1 1/16"	2 1 5/16"	2 1/16"	1 1/16"	0

* INCLUDES SLAB, BUILD-UP AND STAY-IN-PLACE METAL FORMS.

CAMBER NOTES:

1. ALL DEFLECTIONS AND CAMBER VALUES SHOWN ARE IN INCHES (DECIMAL FORM), EXCEPT FOR "REQUIRED CAMBER" GIVEN IN INCHES (FRACTIONAL FORM).



SCHEMATIC CAMBER ORDINATES

FOR CAMBER VALUES AT 20TH POINTS, SEE TABLES.
SLOPE FOR THE ZERO CAMBER BASE LINE VARIES

PROJECT NO. R-5516
CRAVEN COUNTY
STATION: 32+25.84 -YEB01-
75+13.29 -L-
SHEET 4 OF 4

AECOM
AECOM TECHNICAL SERVICES, INC.
701 CORPORATE CENTER DRIVE, SUITE 475
RALEIGH, NC 27607
(919) 854-6200 www.aecom.com
AECOM License No. F-0342

4/12/2017
NORTH CAROLINA PROFESSIONAL SEAL
030474
ENGINEER
JOHN C. MORRISON

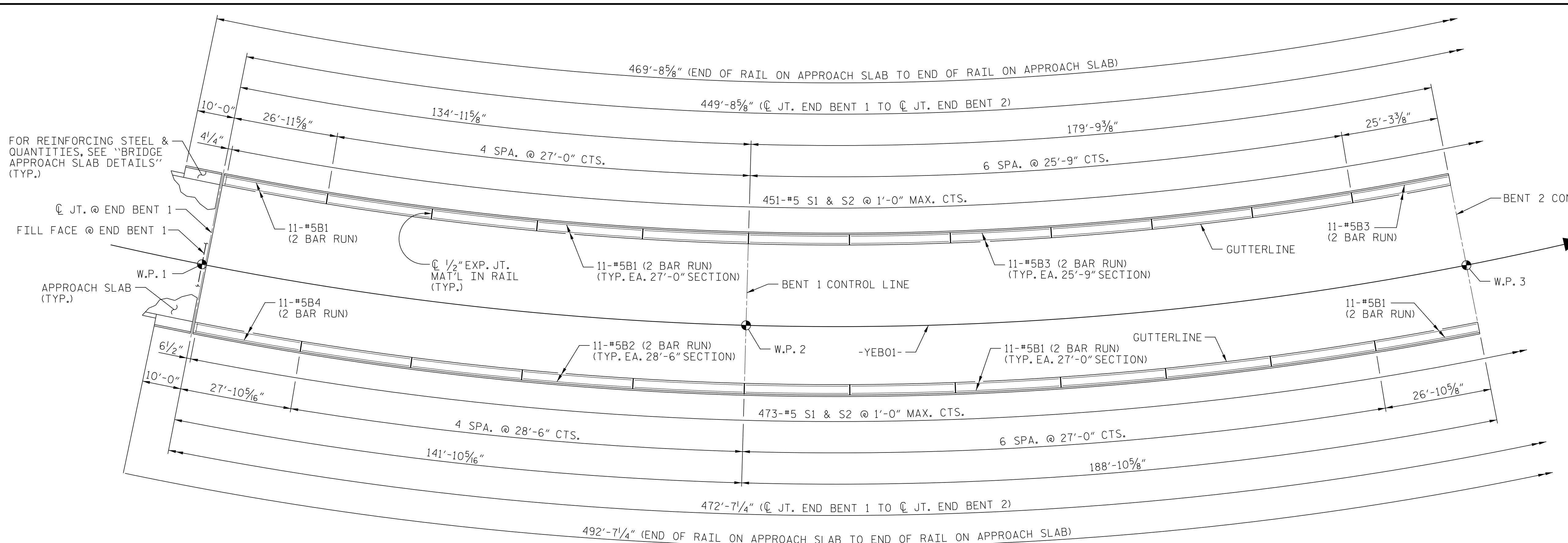
DocuSigned by:
John C. Morrison
A2FDE142C82F4A8

STATE OF NORTH CAROLINA					
DEPARTMENT OF TRANSPORTATION					
RALEIGH					
SUPERSTRUCTURE					
GIRDER DEFLECTIONS AND CAMBER SCHEDULES					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-27					
TOTAL SHEETS 51					

DRAWN BY : N. K. BROWN DATE : 03/16
CHECKED BY : J. C. MORRISON DATE : 03/16
DESIGN E.O.R. : J. C. MORRISON DATE : 05/16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DATE: 4/7/2017 TIME: 3:06:56 PM
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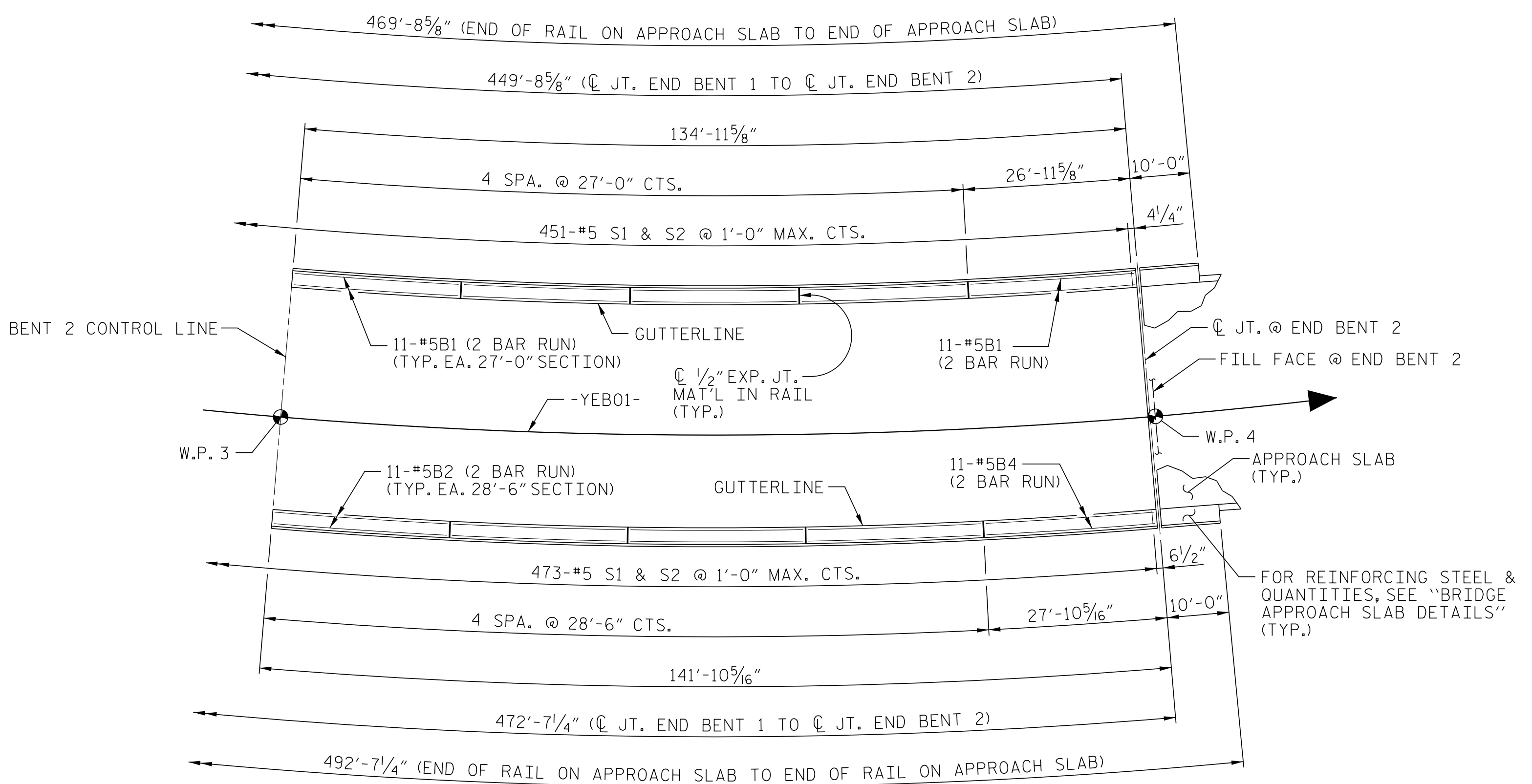


SPAN "A"

SPAN "B"

NOTES

- ALL DIMENSIONS ARE ARC DIMENSIONS GIVEN ALONG OUTSIDE FACES OF RAIL.
- #5 S1 & S2 BARS MAY BE SHIFTED AS NECESSARY TO CLEAR EXPANSION JOINTS IN RAILS.
- FOR ADDITIONAL NOTES, SEE SHEET 2 OF 2.



SPAN "C"

PLAN OF BARRIER RAIL

DRAWN BY : S. G. STREDNAK DATE : 09/15
 CHECKED BY : N. K. BROWN DATE : 10/15
 DESIGN E.O.R. : J. C. MORRISON DATE : 05/16

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

AECOM
 AECOM TECHNICAL SERVICES, INC.
 701 CORPORATE CENTER DRIVE, SUITE 475
 RALEIGH, NC 27607
 (919) 854-6200 www.aecom.com
 AECOM License No. F-0342

4/12/2017
 NORTH CAROLINA
 PROFESSIONAL
 SEAL
 030474
 ENGINEER
 JOHN C. MORRISON

PROJECT NO. R-5516
CRAVEN COUNTY
 STATION: 32+25.84 -YEB01-
75+13.29 -L-
 SHEET 1 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE CONCRETE BARRIER RAIL					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-28					TOTAL SHEETS 51

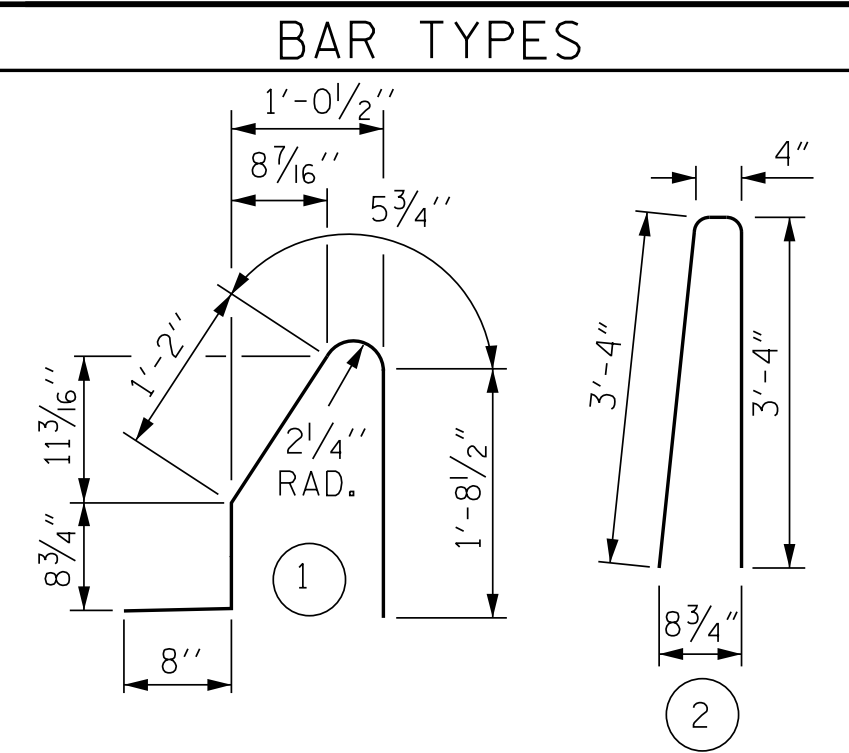
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 USER: jmorriso
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NOTES

THE BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN 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.



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	187	#5	STR	14'-7"	2844
* B2	88	#5	STR	15'-4"	1407
* B3	77	#5	STR	13'-11"	1118
* B4	22	#5	STR	15'-0"	344

* S1	924	#5	1	4'-9"	4578
* S2	924	#5	2	7'-0"	6746

- * EPOXY COATED REINFORCING STEEL 17037 LBS.
- * CLASS AA CONCRETE 6783.4 CU. YDS.
- CONCRETE BARRIER RAIL SUPERSTRUCTURE 922.32 LIN. FT.

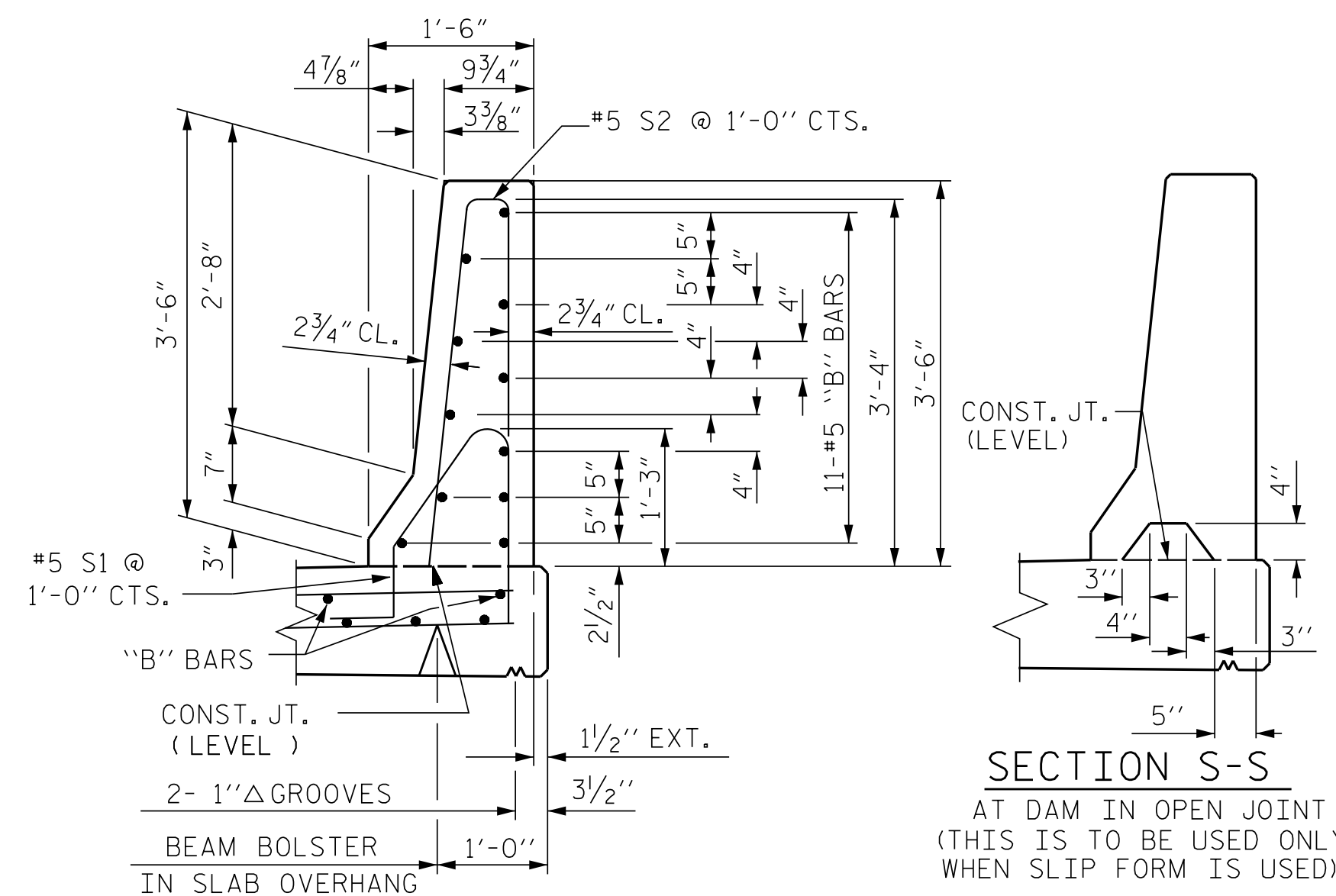
* THE QUANTITIES FOR BARRIER RAIL ON APPROACH SLABS IS NOT INCLUDED, FOR BARRIER RAIL ON APPROACH SLABS, SEE "BRIDGE APPROACH SLAB DETAILS"

PROJECT NO. R-5516

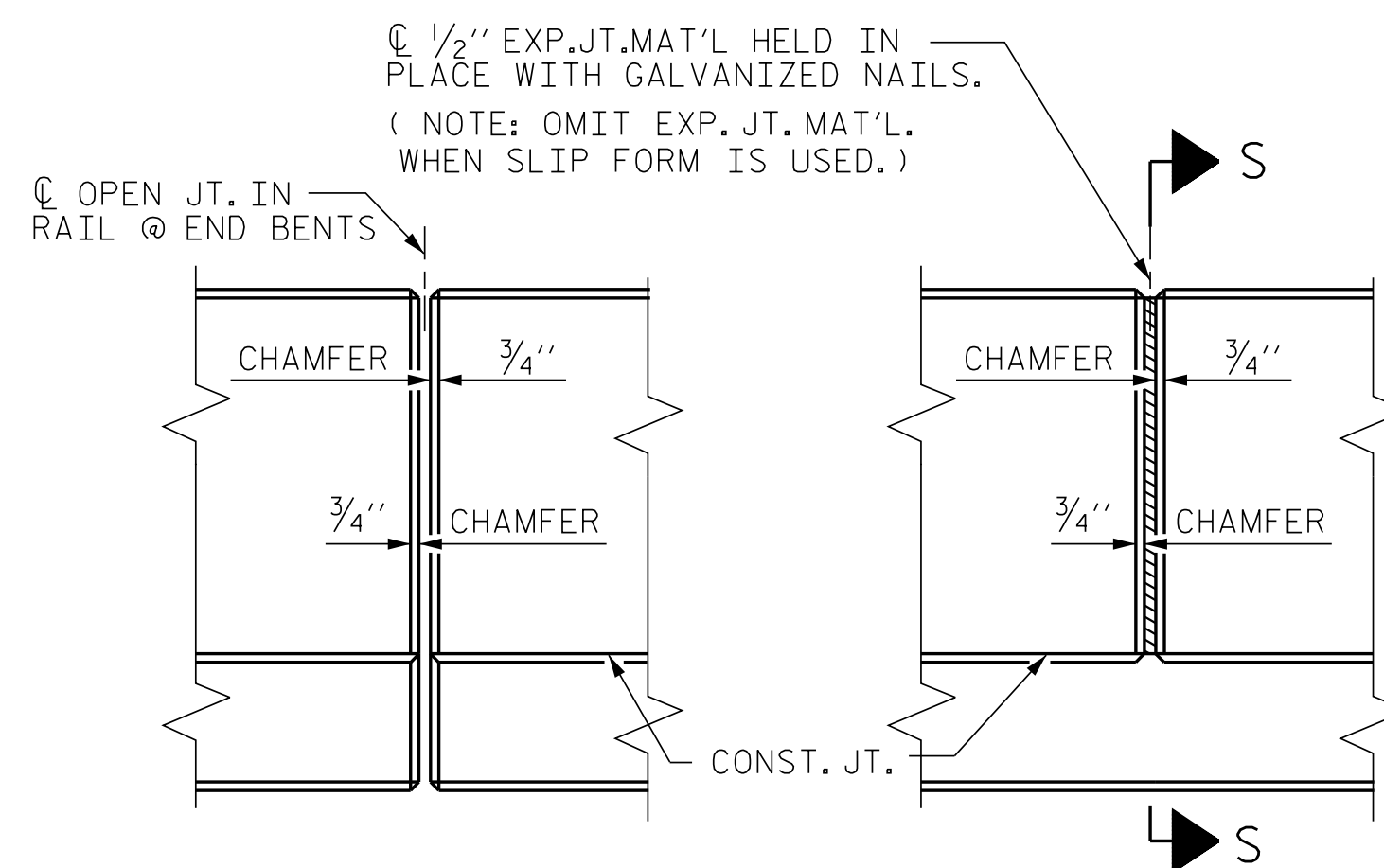
CRAVEN COUNTY

STATION: 32+25.84 -YEBO1-
75+13.29 -L-

SHEET 2 OF 2



SECTION THRU RAIL



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

ASSEMBLED BY : SGS	DATE : 09/15	
CHECKED BY : JCM	DATE : 09/15	
DRAWN BY : ARB 5/87	REV. 10/1/11	MAA/GM
CHECKED BY : SJD 9/87	REV. 7/12	MAA/GM
	REV. 6/13	MAA/GM

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4/12/2017

NORTH CAROLINA PROFESSIONAL SEAL 030474

ENGINEER JOHN C. MORRISON

DocuSigned by: John C. Morrison A3FDE14202FA4B

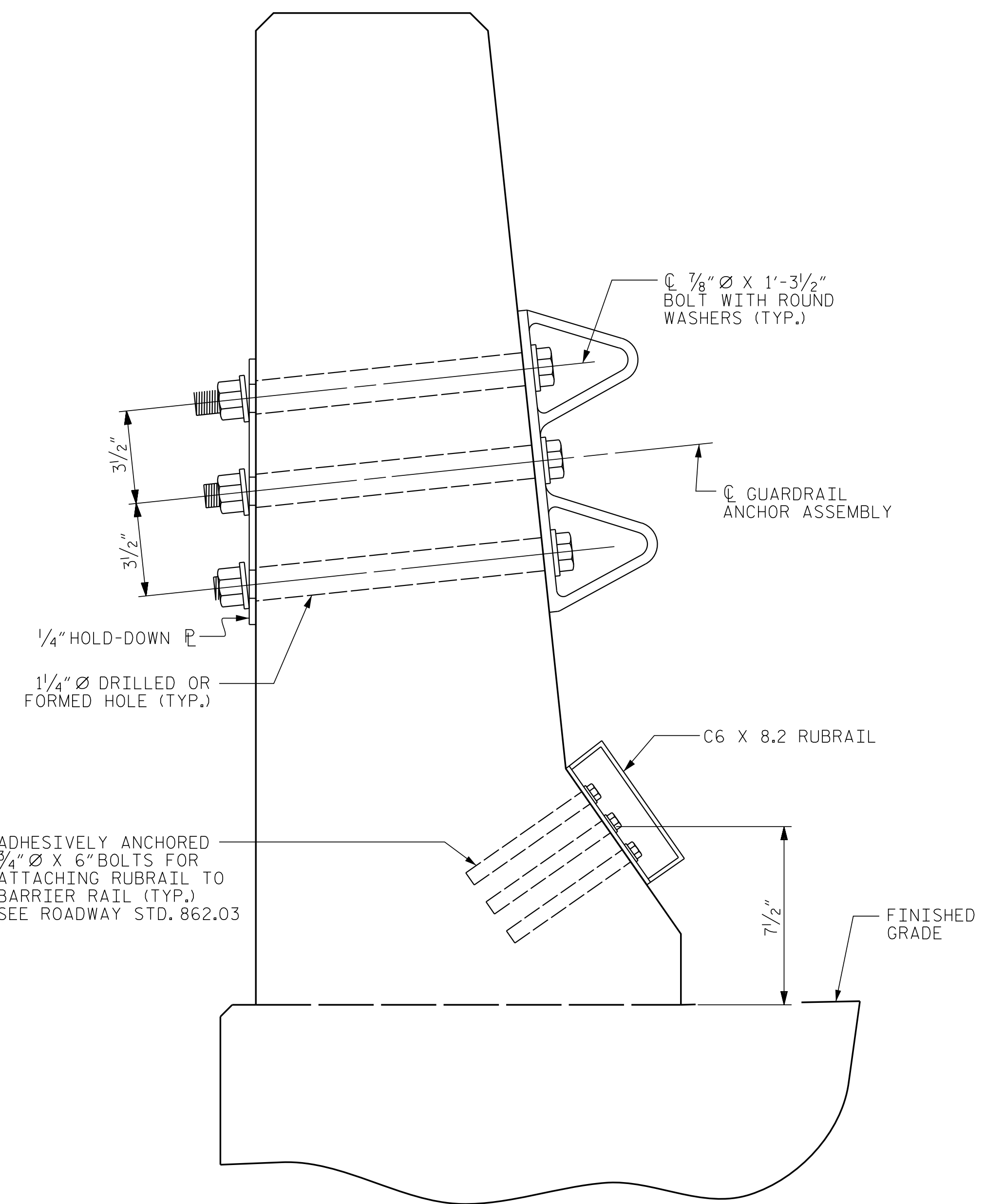
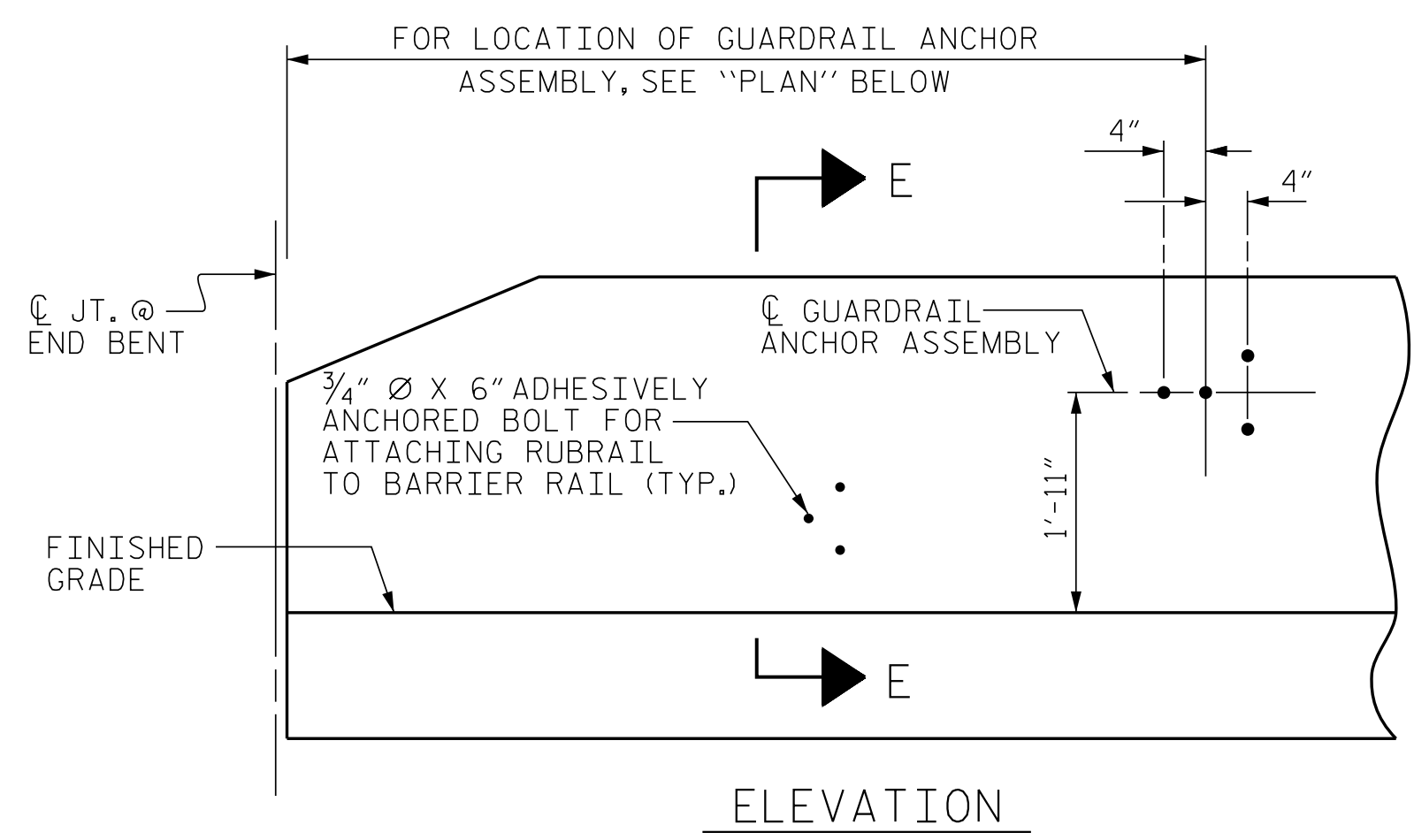
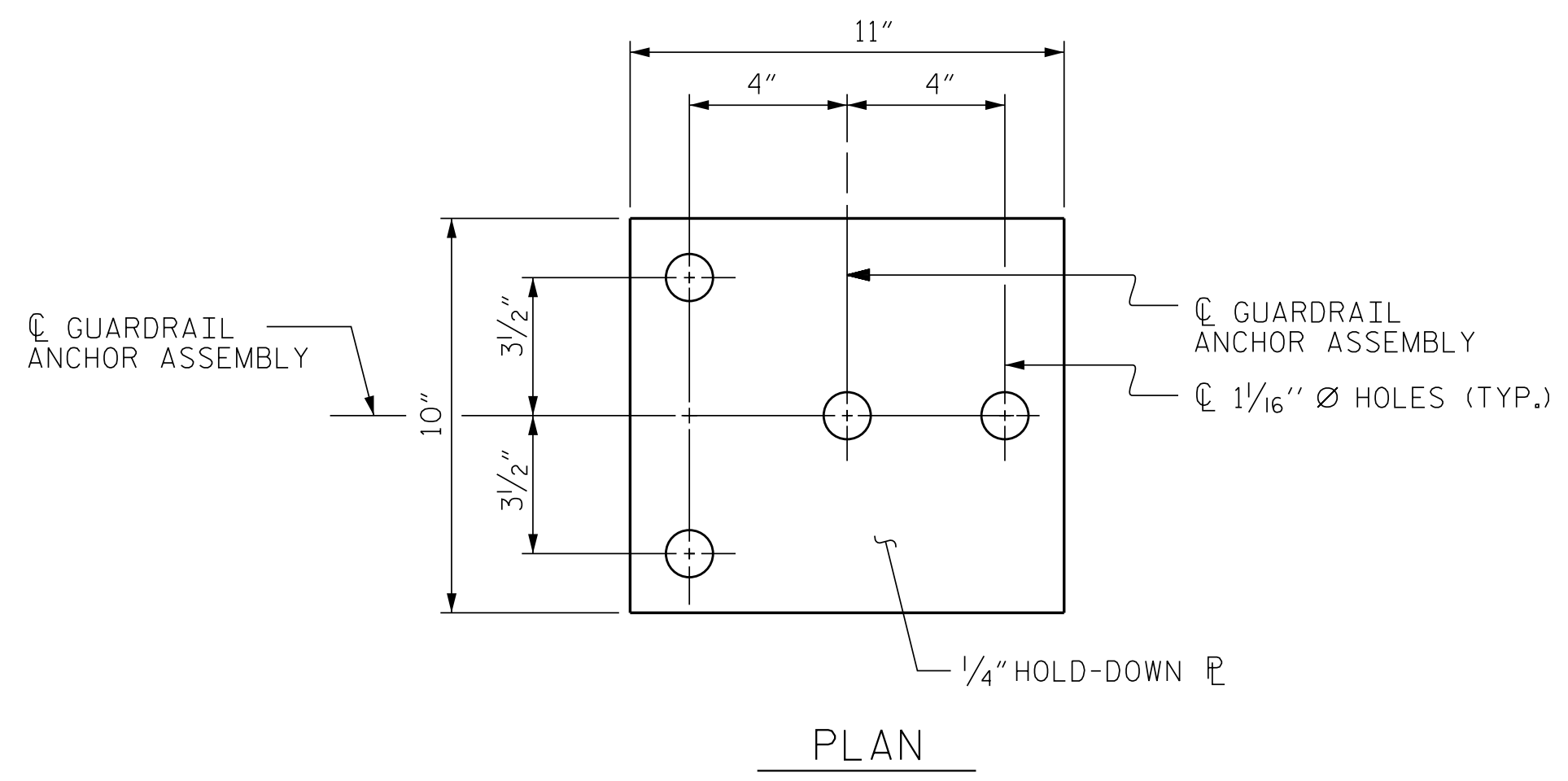
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
CONCRETE BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			51
2			4			

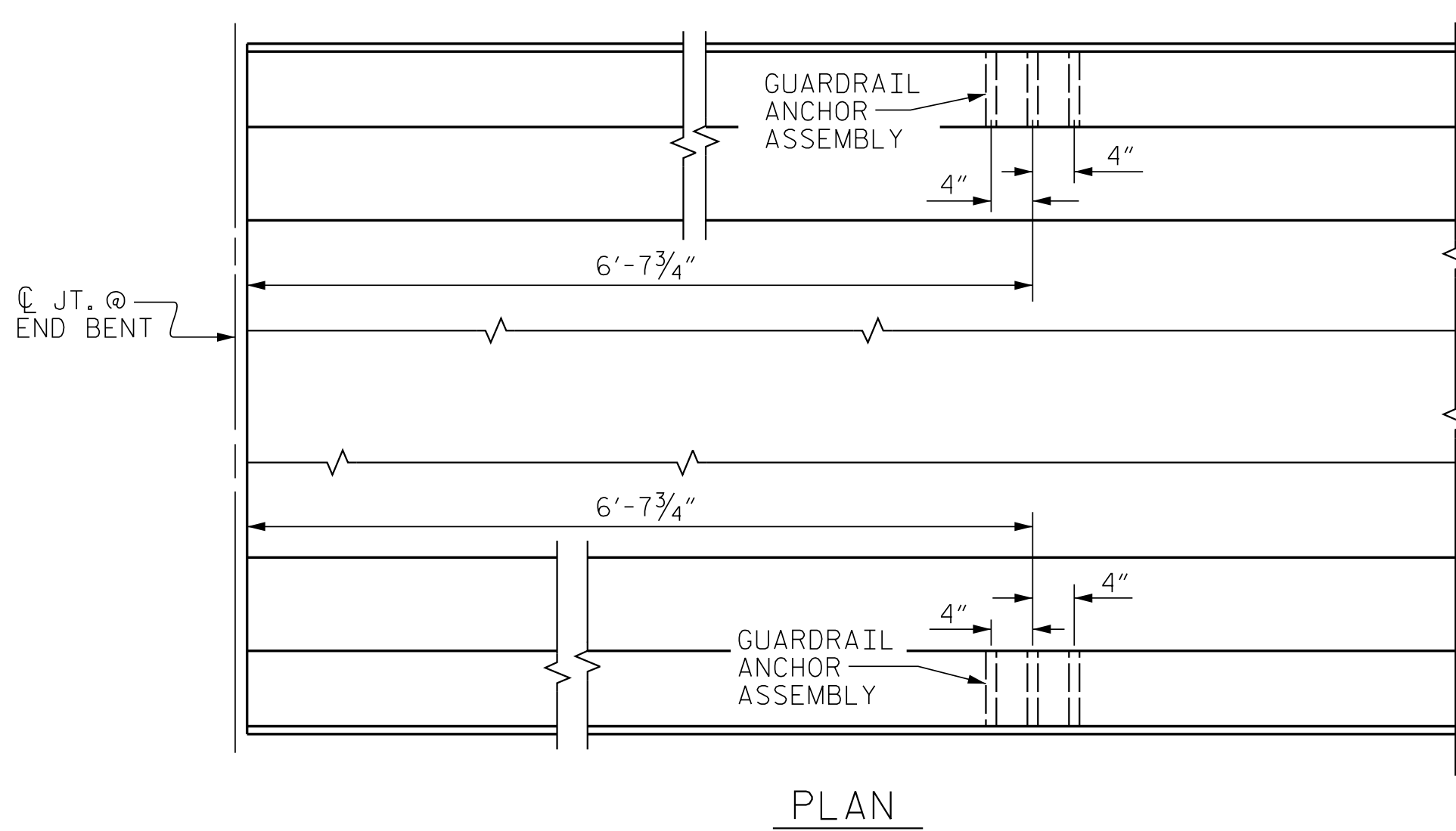
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NOTES

- 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 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.

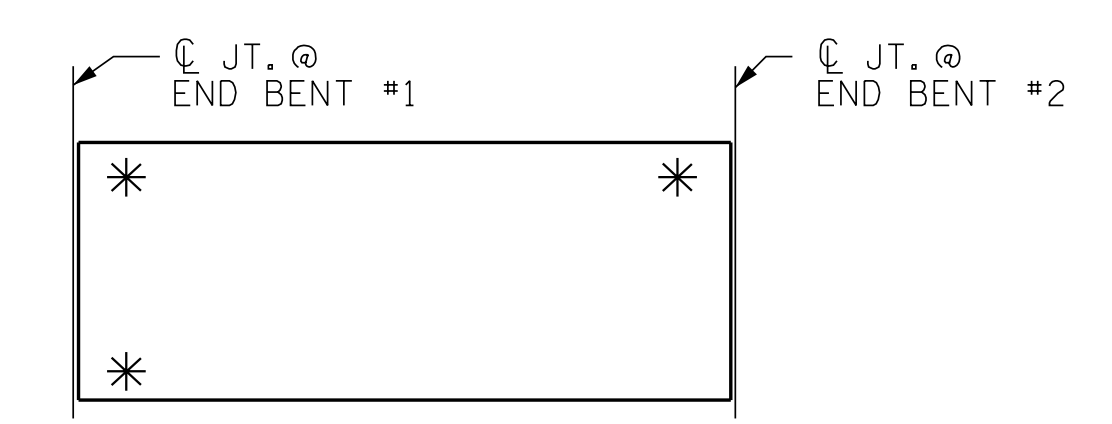


SECTION E-E
GUARDRAIL ANCHOR ASSEMBLY DETAILS



LOCATION OF ANCHORS FOR GUARDRAIL

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



SKETCH SHOWING POINTS OF ATTACHMENTS

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. R-5516
CRAVEN COUNTY
 STATION: 32+25.84 -YEBO1-
75+13.29 -L-

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4/12/2017

NORTH CAROLINA PROFESSIONAL SEAL 030474
 ENGINEER JOHN C. MORRISON

DocuSigned by: John C. Morrison
 A3FDE142C82F44B...

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-30					TOTAL SHEETS 51
STD. NO. GRA2 (SHT 3)					

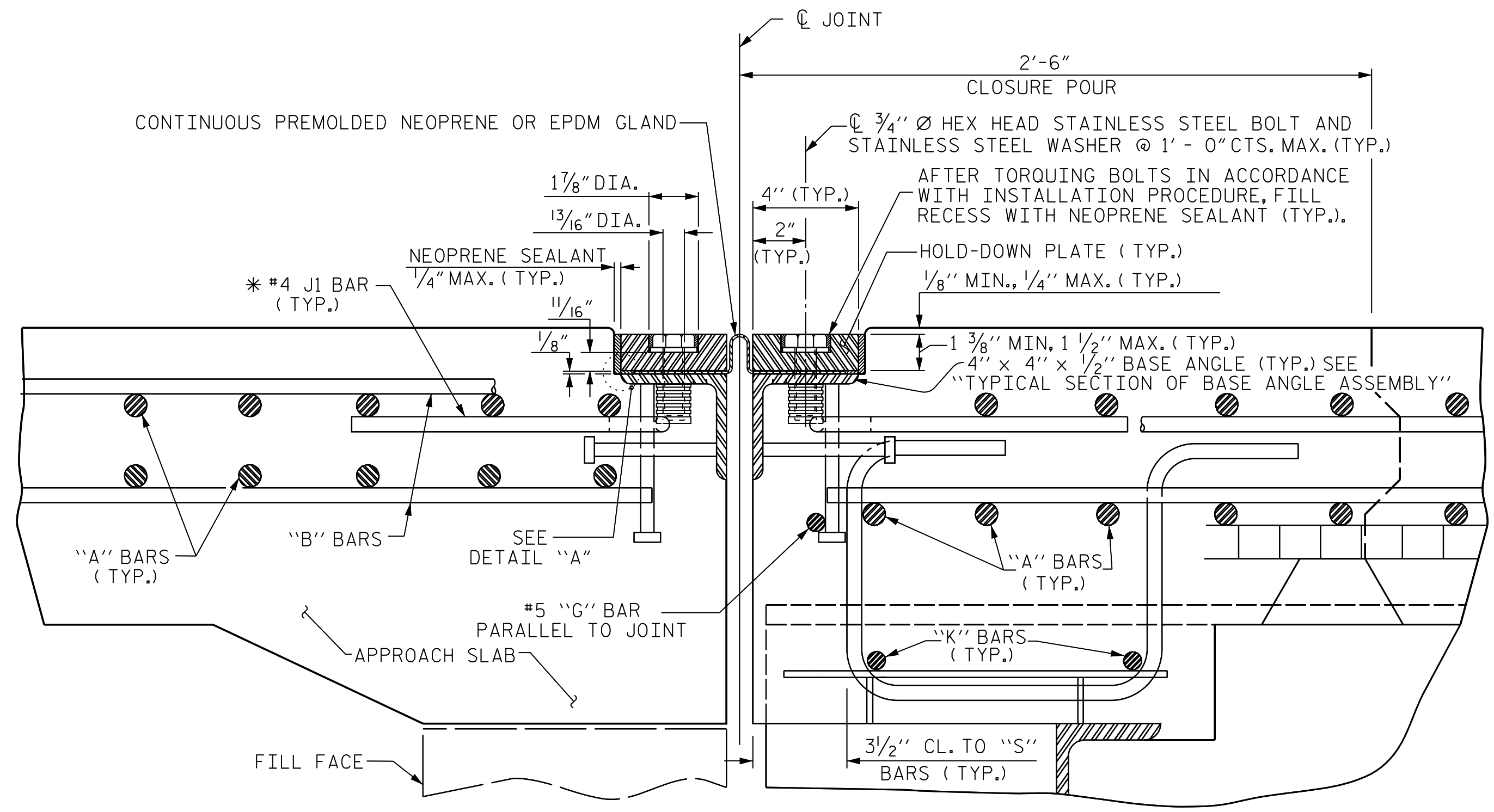
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ASSEMBLED BY : S. G. STREDNAK	DATE : 04/17
CHECKED BY : J. C. MORRISON	DATE : 04/17
DRAWN BY : TLA	5/06
CHECKED BY : GM	5/06
REV. 10/1/11	MAA/GM
REV. 7/12	MAA/GM
REV. 6/13	MAA/GM

INSTALLATION PROCEDURE

GENERAL NOTES



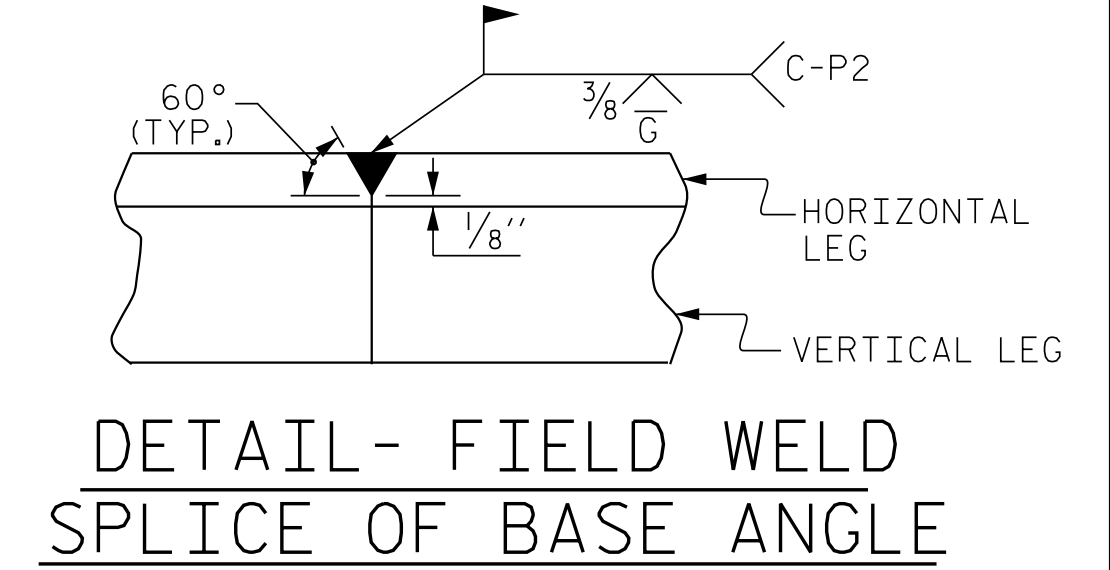
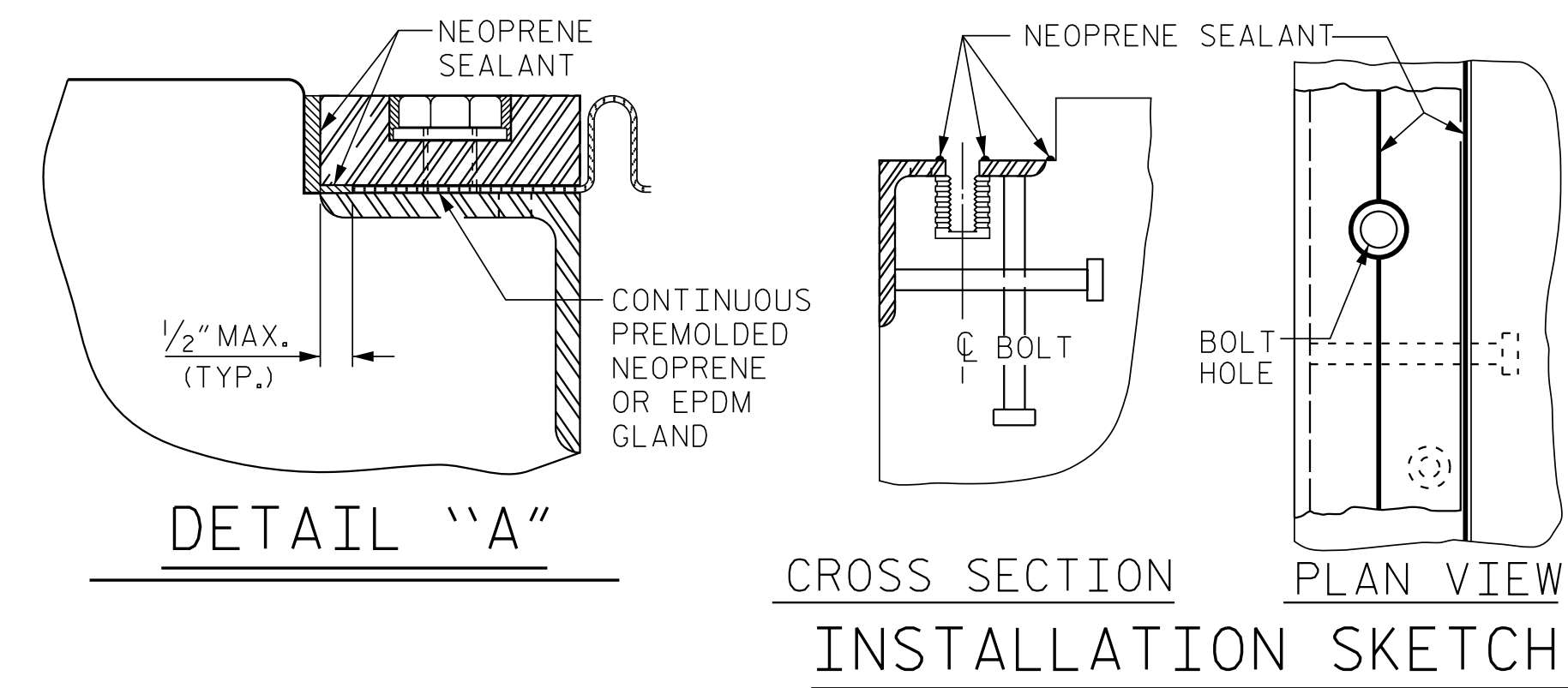
EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- STEEL SUPERSTRUCTURE

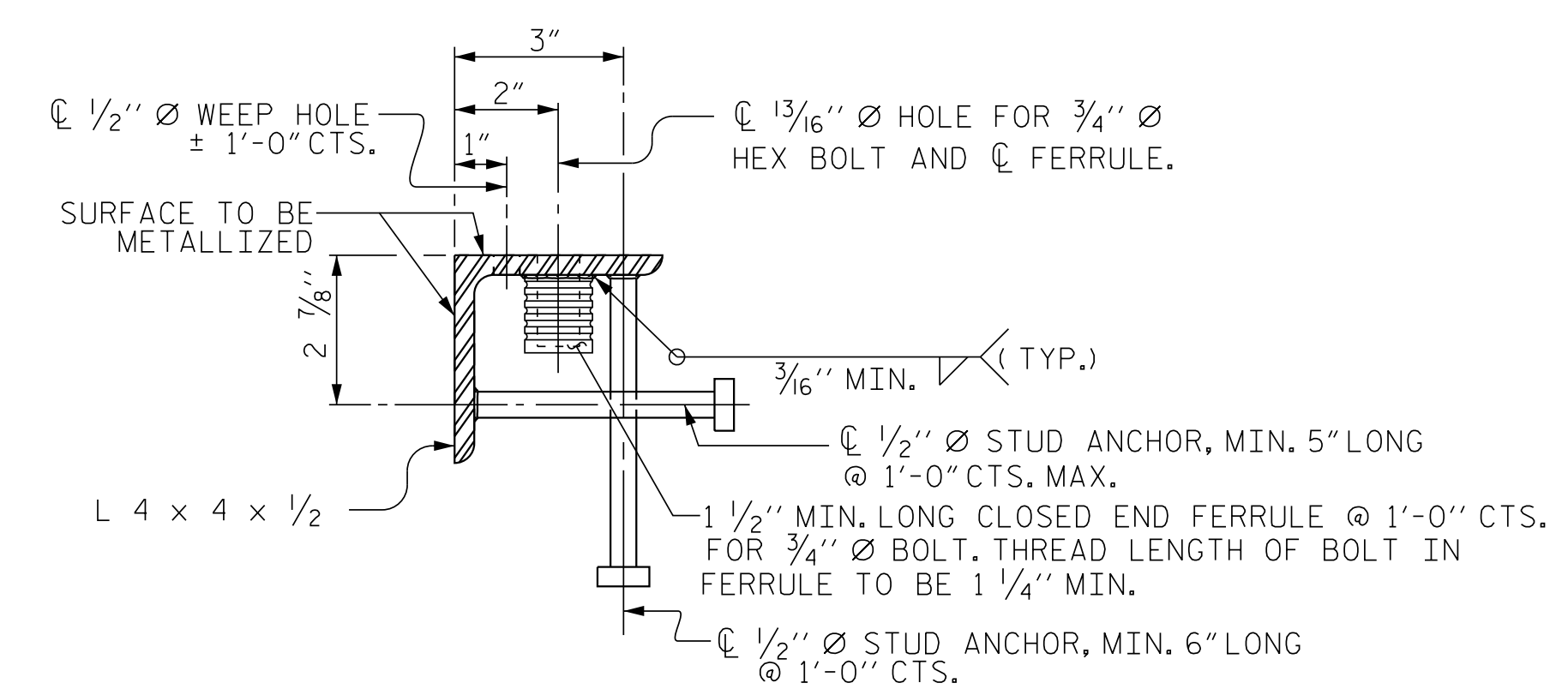
* THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.

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

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



MOVEMENT AND SETTING AT JOINT					
END BENT NO.	SKEW ANGLE	TOTAL MOVEMENT (ALONG CL RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
1	90°	1 13/16"	2 3/16"	1 7/8"	1 3/8"
2	90°	1 13/16"	2 3/16"	1 7/8"	1 3/8"



TYPICAL SECTION OF BASE ANGLE ASSEMBLY

PROJECT NO. R-5516
CRAVEN COUNTY
 STATION: 32+25.84 -YEBO1-
75+13.29 -L-
 SHEET 1 OF 2

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 RALEIGH, NC 27607
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 AECOM License No. F-03052

4/12/2017
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 030474
 JOHN C. MORRISON

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD

EXPANSION JOINT SEAL DETAILS

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

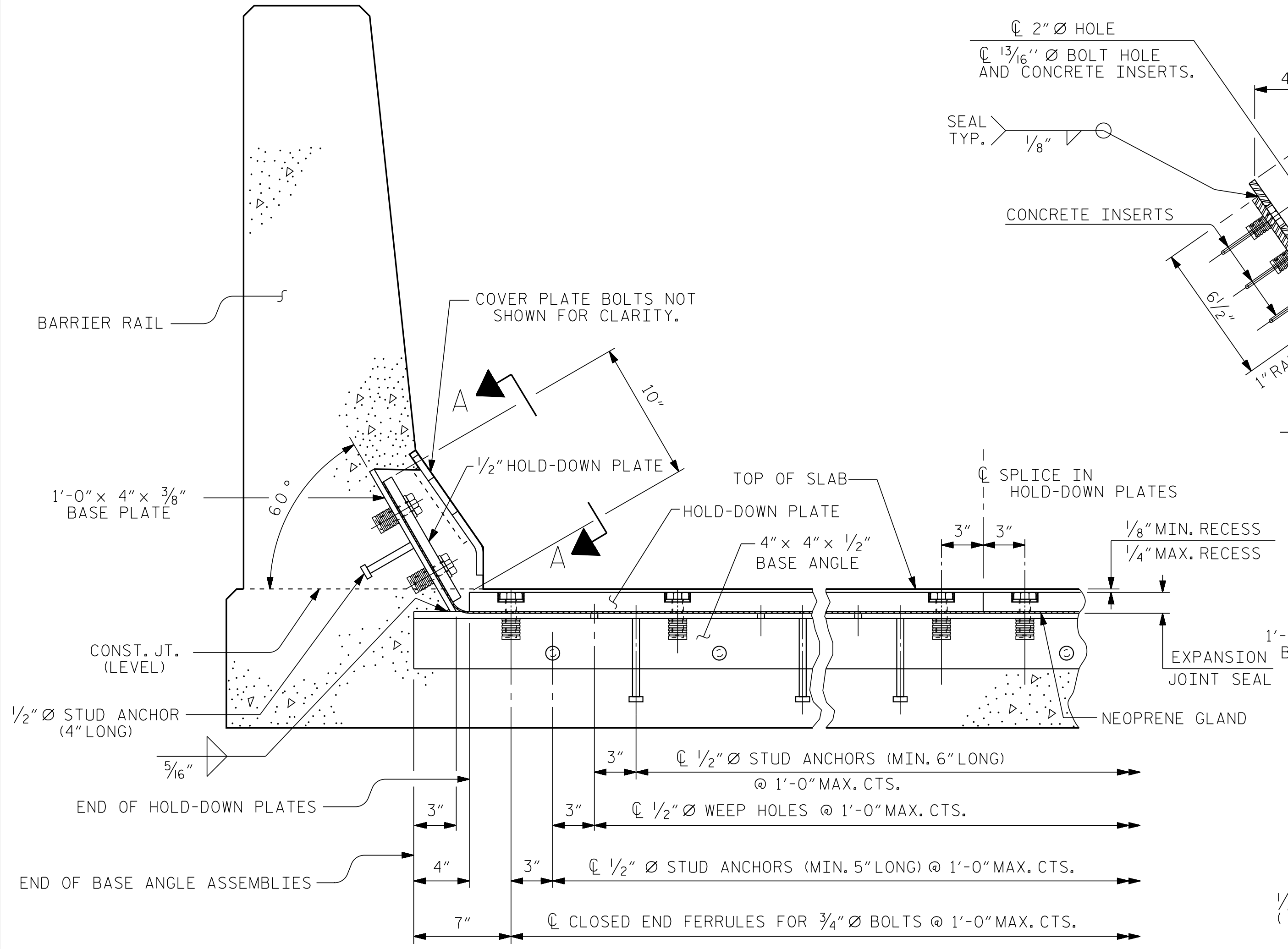
SHEET NO. S-31
 TOTAL SHEETS 51

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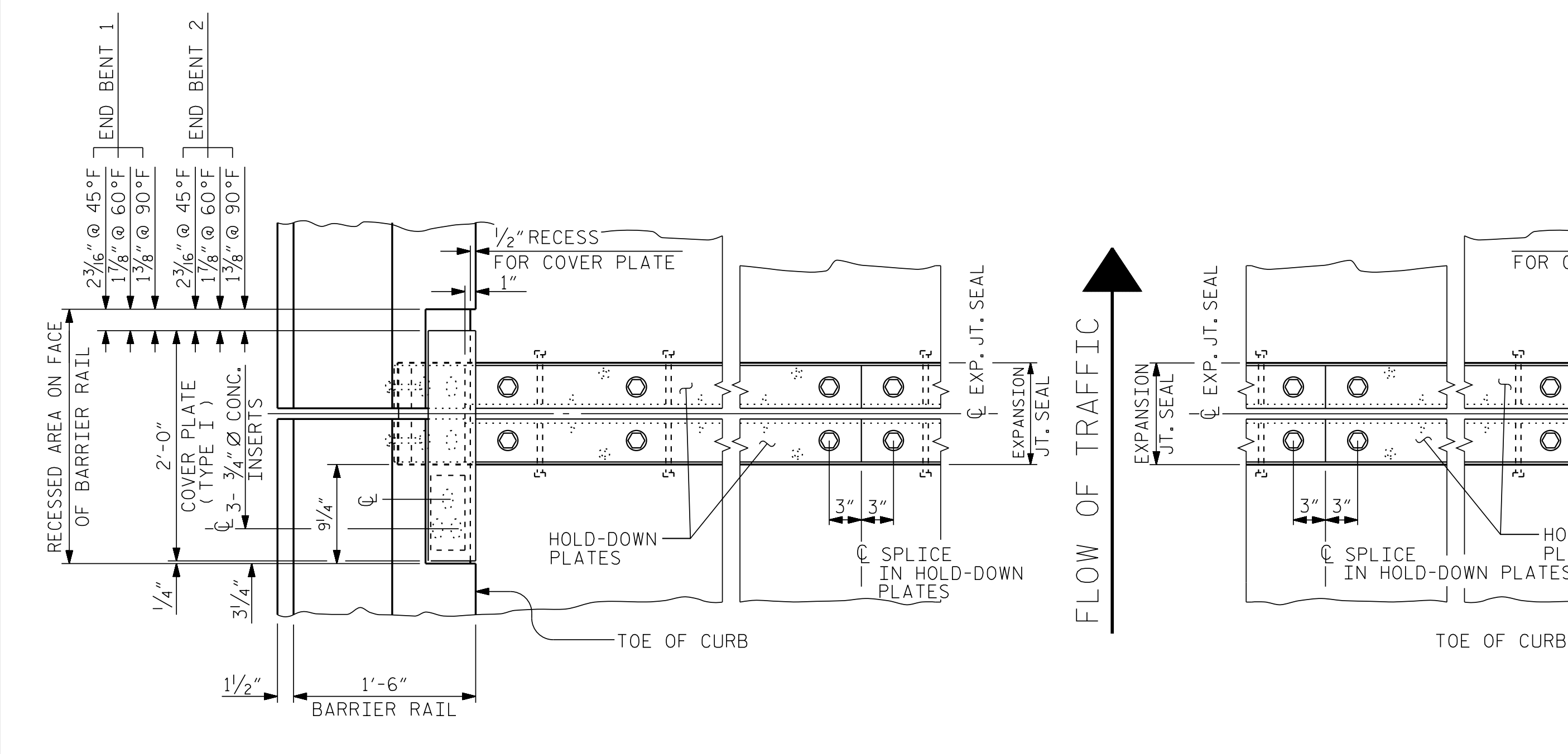
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USER: jrc1563
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ASSEMBLED BY : SGS	DATE : 09/15
CHECKED BY : JCM	DATE : 09/15
DRAWN BY : REK	9/87
CHECKED BY : CRK	10/87
REV. 5/7/03R	RWW/JTE
REV. 5/1/06R	TLA/GM
REV. 10/1/11	MAA/GM

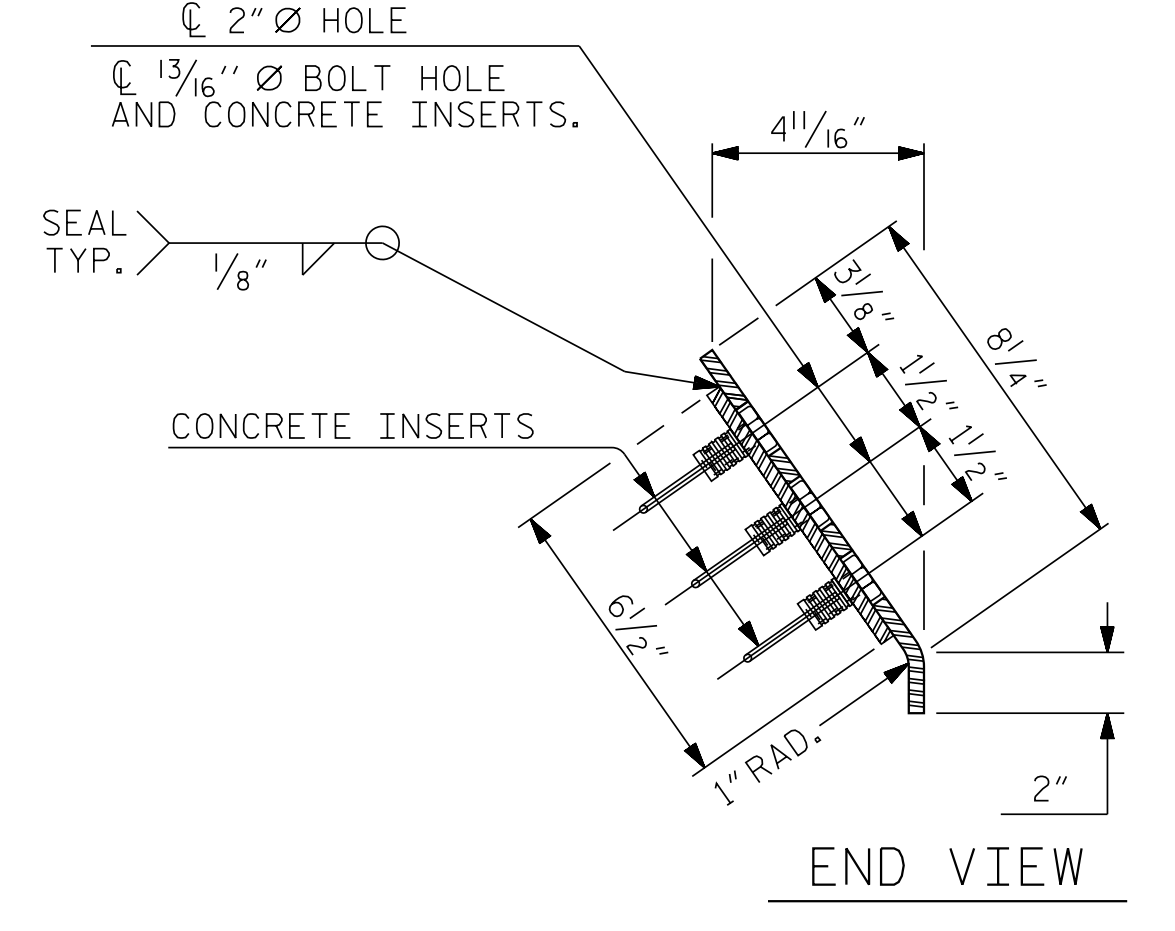


SECTION THRU RAIL NORMAL TO JOINT

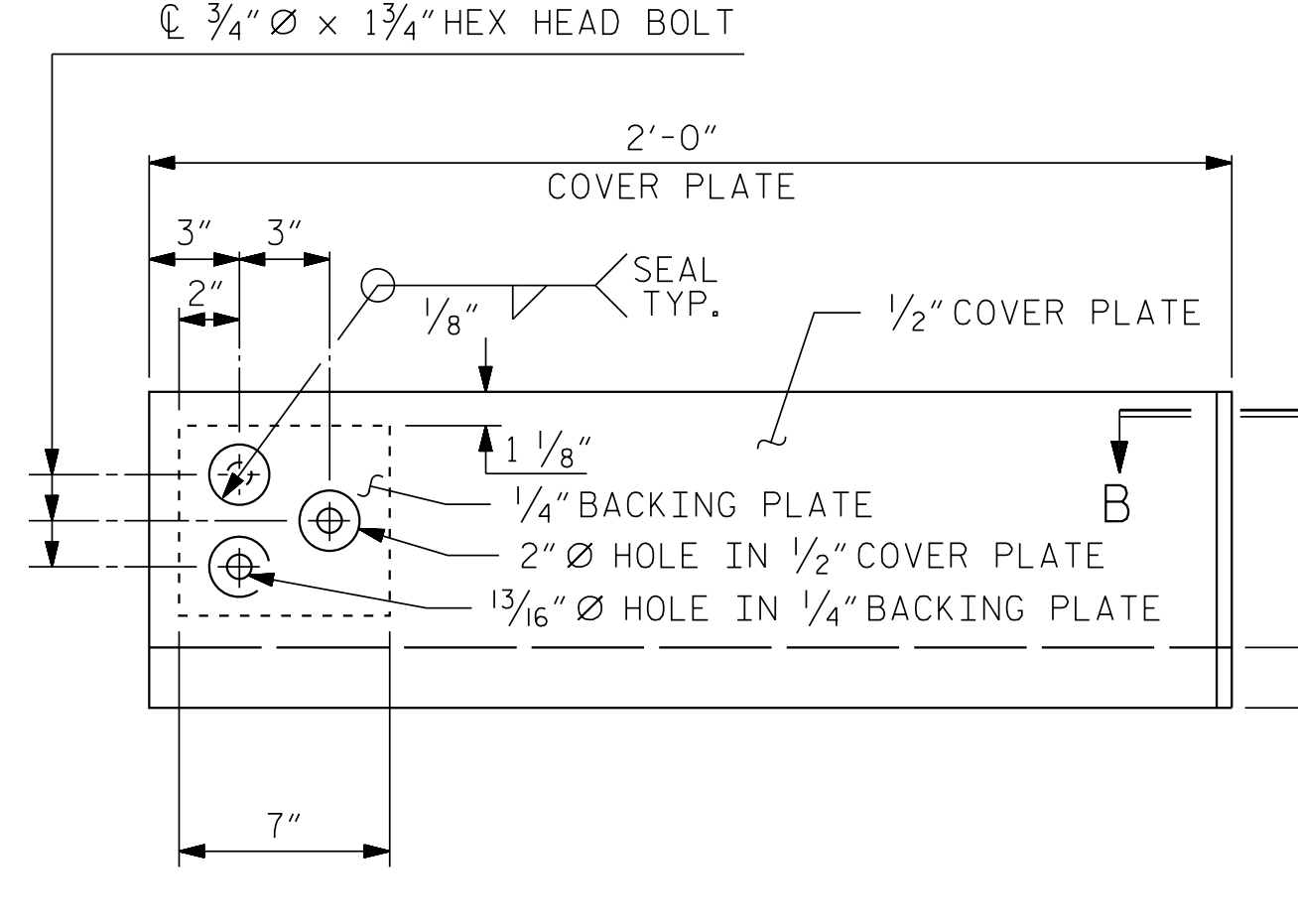


PLAN OF EXPANSION JOINT SEAL

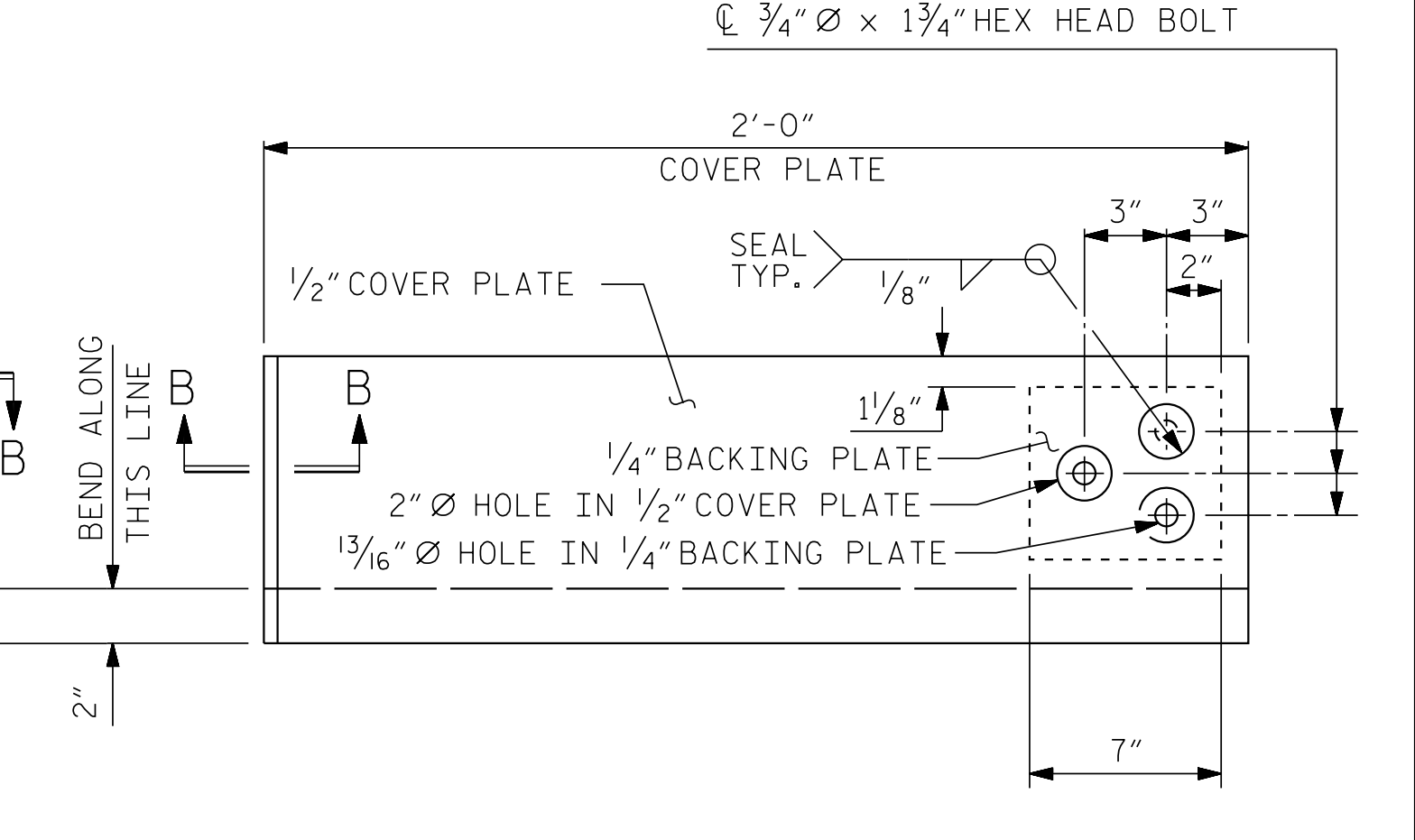
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CHECKED BY : JCM	DATE : 09/15
DRAWN BY : REK 9/87	REV. 10/1/11 MAA/GM
CHECKED BY : CRK 10/87	REV. 7/12 MAA/GM
	REV. 6/13 MAA/GM



END VIEW

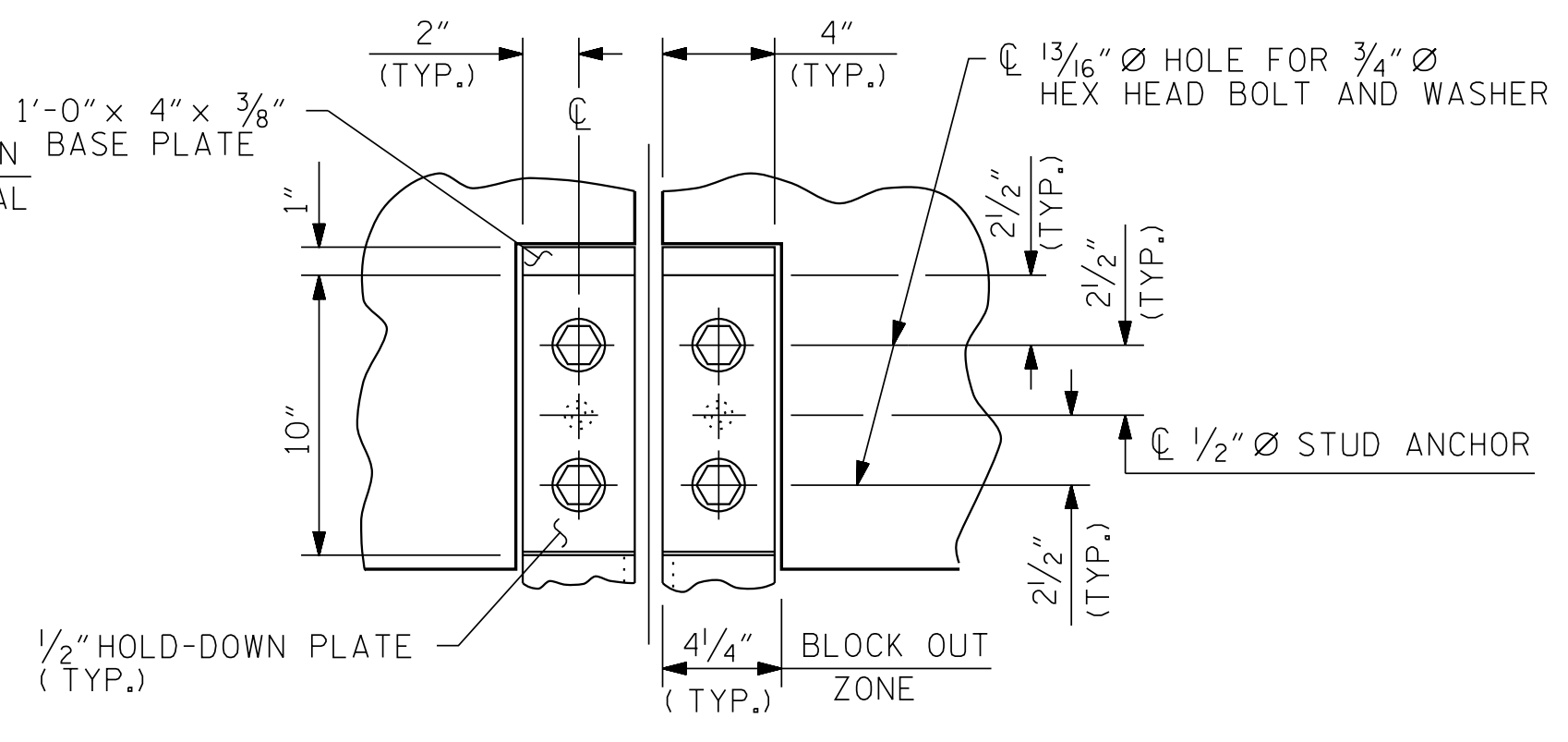


TYPE I - ELEVATION VIEW

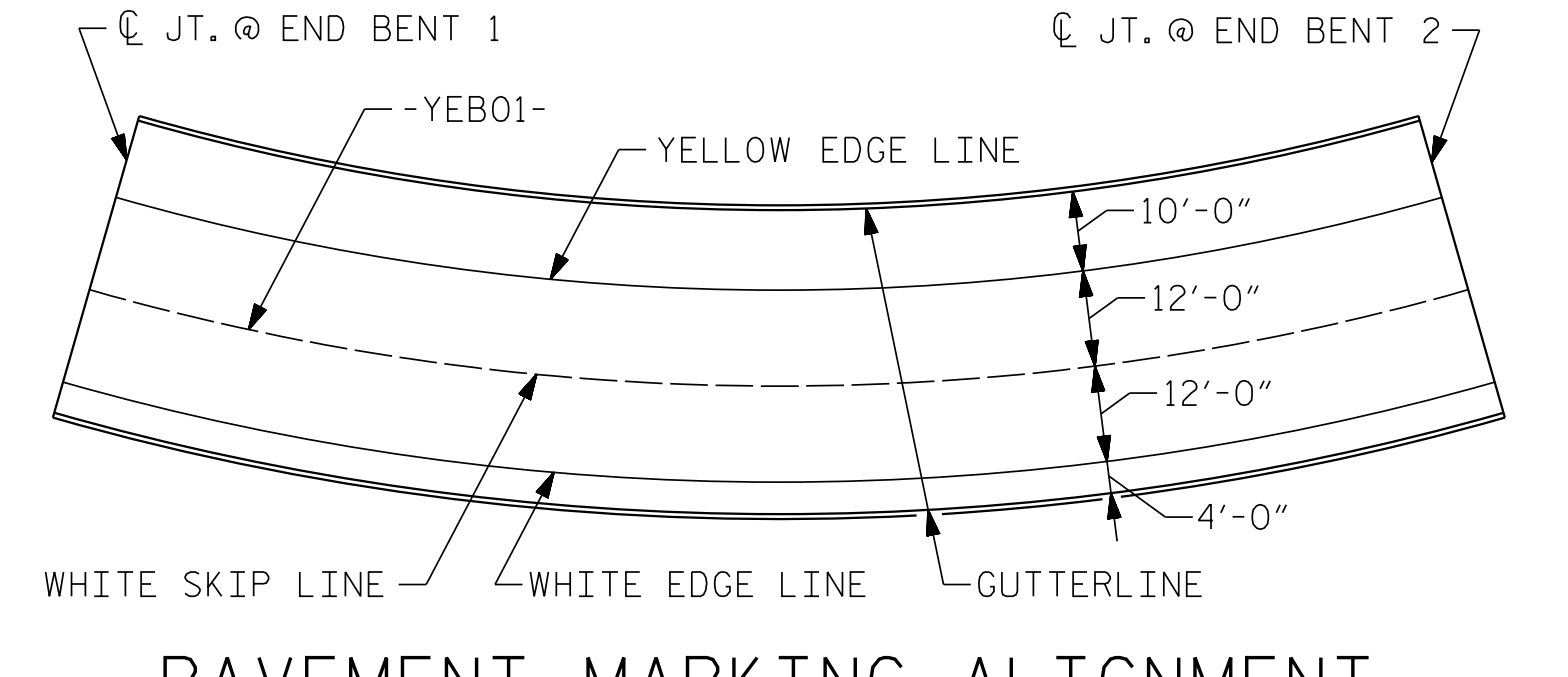


TYPE II - ELEVATION VIEW

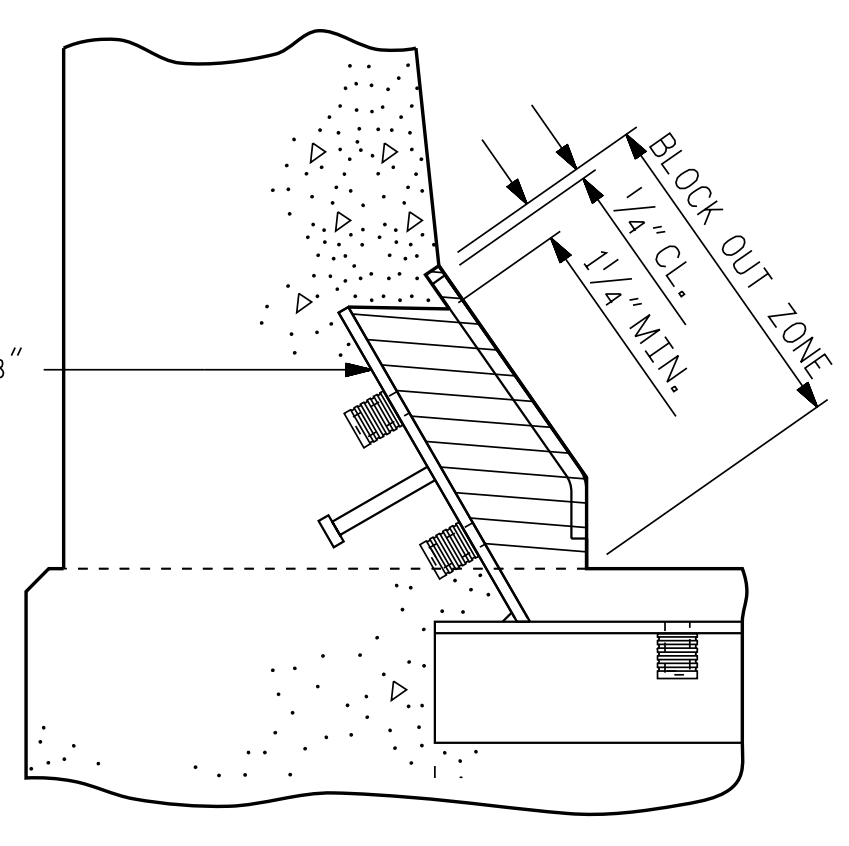
COVER PLATE DETAILS



SECTION A - A

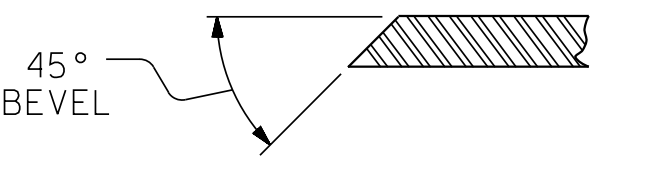


PAVEMENT MARKING ALIGNMENT

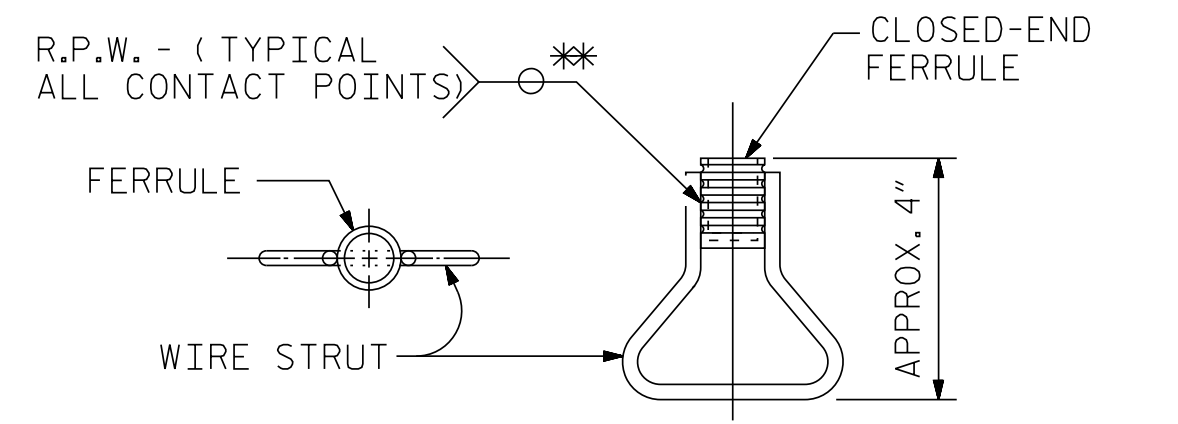


BLOCK OUT DETAIL

SEE "SECTION A - A" FOR OTHER DETAILS.



SECTION B - B



CONCRETE INSERT

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

PROJECT NO. R-5516

CRAVEN COUNTY

STATION: 32+25.84 -YEB01-
75+13.29 -L-

SHEET 2 OF 2

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4/12/2017
NORTH CAROLINA PROFESSIONAL SEAL 030474
ENGINEER JOHN C. MORRISON

DocuSigned by: John C. Morrison
A2FDE142C83F4B8

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH STANDARD					
EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-32					TOTAL SHEETS 51
STD. NO. EJS2 (SHT 1B)					

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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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"			

— SUPERSTRUCTURE BILL OF MATERIAL —

SPANS	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
"A", "B" AND "C"		66,891	64,563
POUR 1	89.2		
POUR 2	242.3		
POUR 3	238.1		
POUR 4	9.7		
**TOTALS	579.3	66,891	64,563

**QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED.

GROOVING BRIDGE FLOORS

APPROACH SLABS	1,003	SO.FT.
BRIDGE DECK	16,123	SO.FT.
TOTAL	17,126	SO.FT.

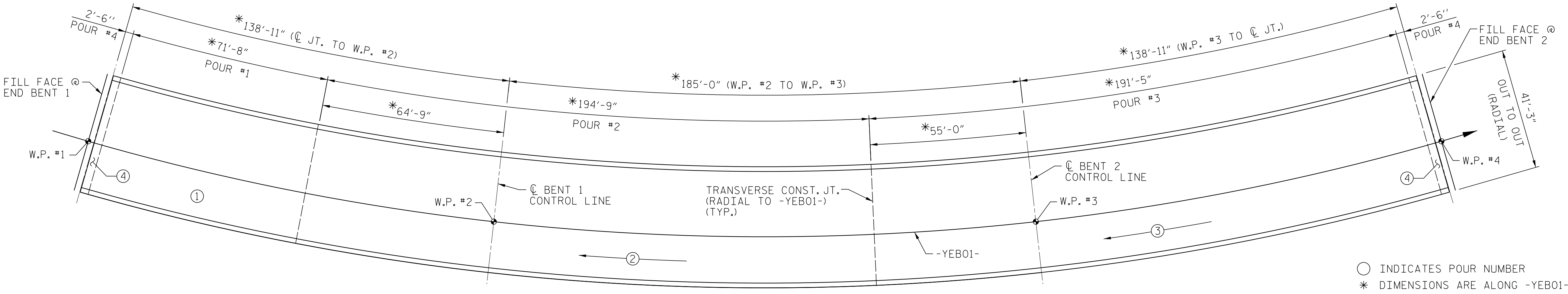
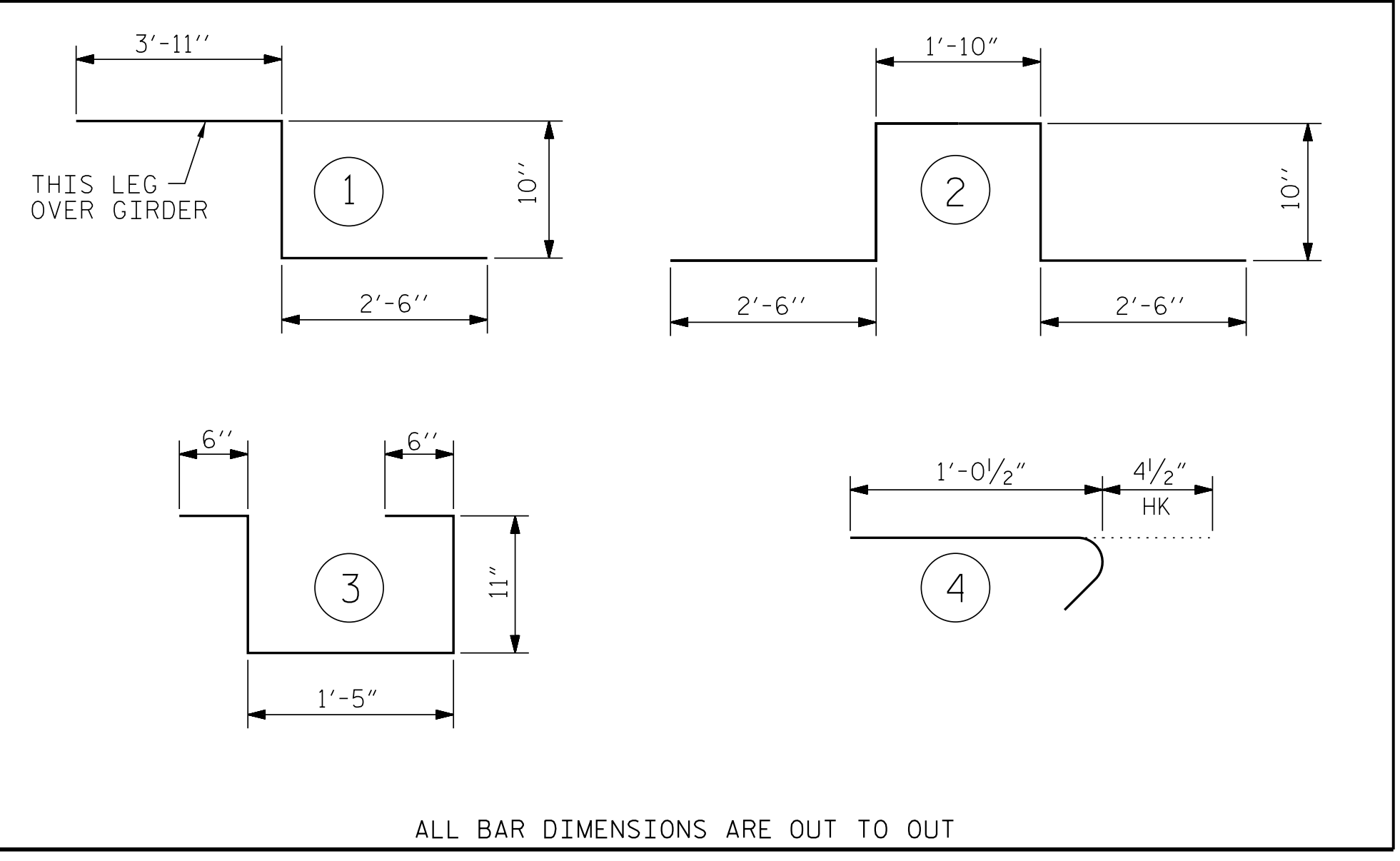
⊗ QUANTITY IS FOR BOTH APPROACH SLABS

REINFORCING BAR SCHEDULE

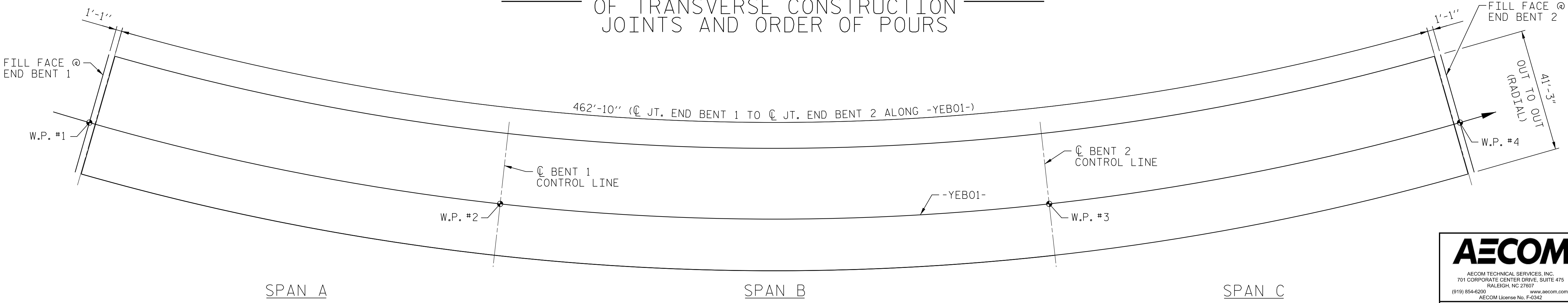
SPANS "A", "B" AND "C"					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1E	945	#5	STR	40'-11"	40,329
A2	945	#5	STR	40'-11"	40,329
B1E	224	#4	STR	25'-3"	3,778
B2	468	#5	STR	54'-5"	26,562
B3E	56	#7	STR	60'-0"	6,868
B4E	54	#7	STR	50'-0"	5,519
B5E	56	#7	STR	53'-0"	6,067
B6E	84	#4	STR	25'-0"	1,403
G1E	2	#5	STR	40'-11"	85
J1E	76	#4	(4)	1'-5"	72
K1E	8	#5	(1)	7'-3"	60
K2E	12	#5	(2)	8'-6"	106
K3E	16	#5	STR	7'-0"	117
S1E	56	#4	(3)	4'-3"	159
REINFORCING STEEL					66,891
EPOXY COATED REINFORCING STEEL					64,563

"E" DENOTES EPOXY COATED REINFORCING STEEL.

BAR TYPES



SKETCH SHOWING LOCATION OF TRANSVERSE CONSTRUCTION JOINTS AND ORDER OF POURS

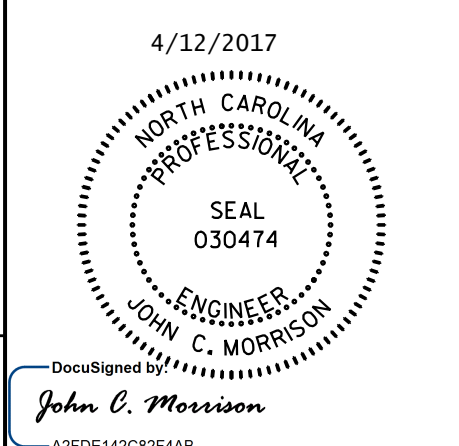


LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ. FT. = 19,091)

NOTE:
NO DECK POUR SHALL BE PLACED WHERE A POUR IN AN ADJACENT SPAN IS NOT OBTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.

○ INDICATES POUR NUMBER
* DIMENSIONS ARE ALONG -YEB01-

PROJECT NO. R-5516
CRAVEN COUNTY
STATION: 32+25.84 -YEB01-
75+13.29 -L-



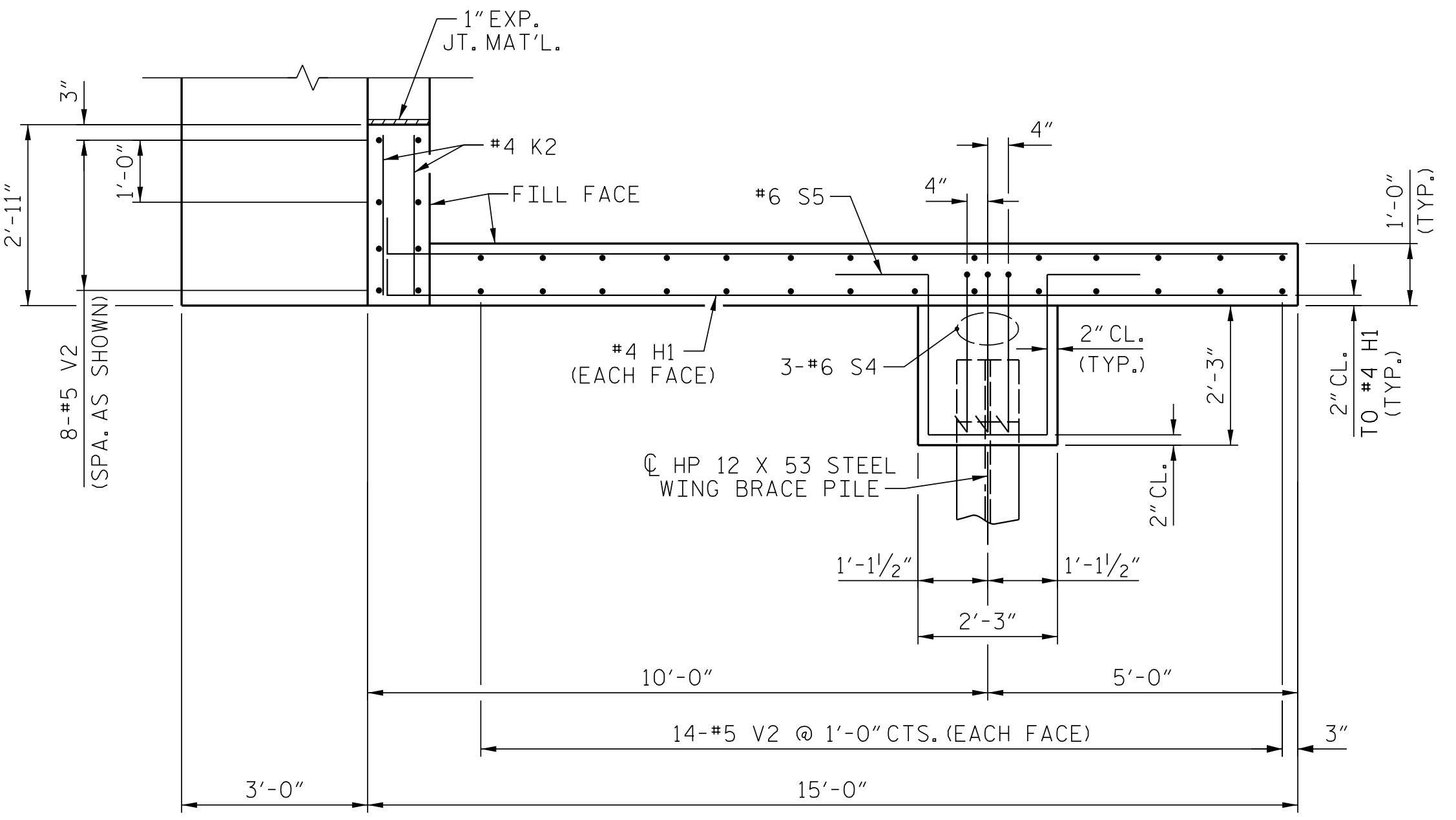
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			51

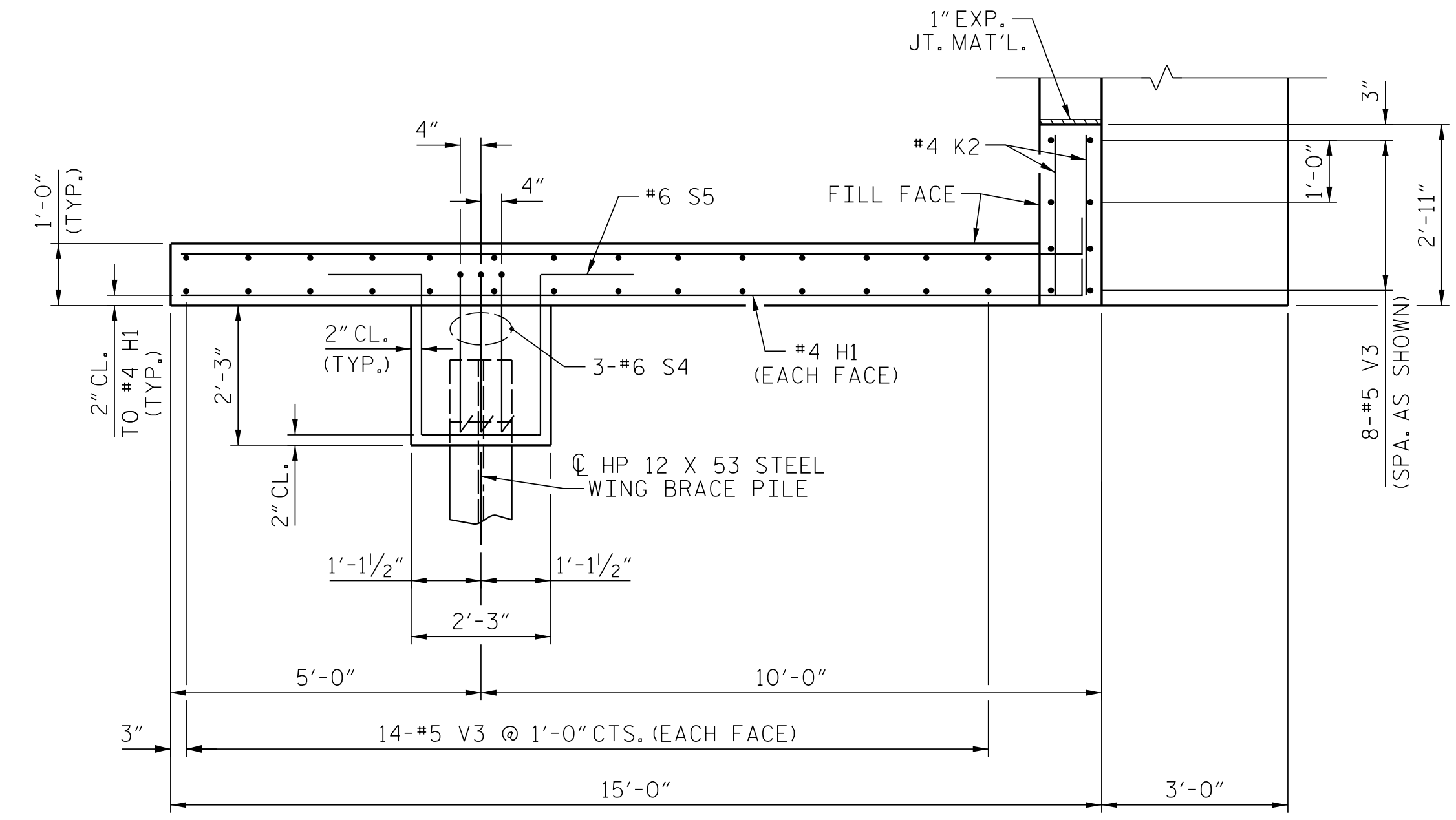
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CHECKED BY : NKB DATE : 10/15
DESIGN E.O.R. : JCM DATE : 02/16

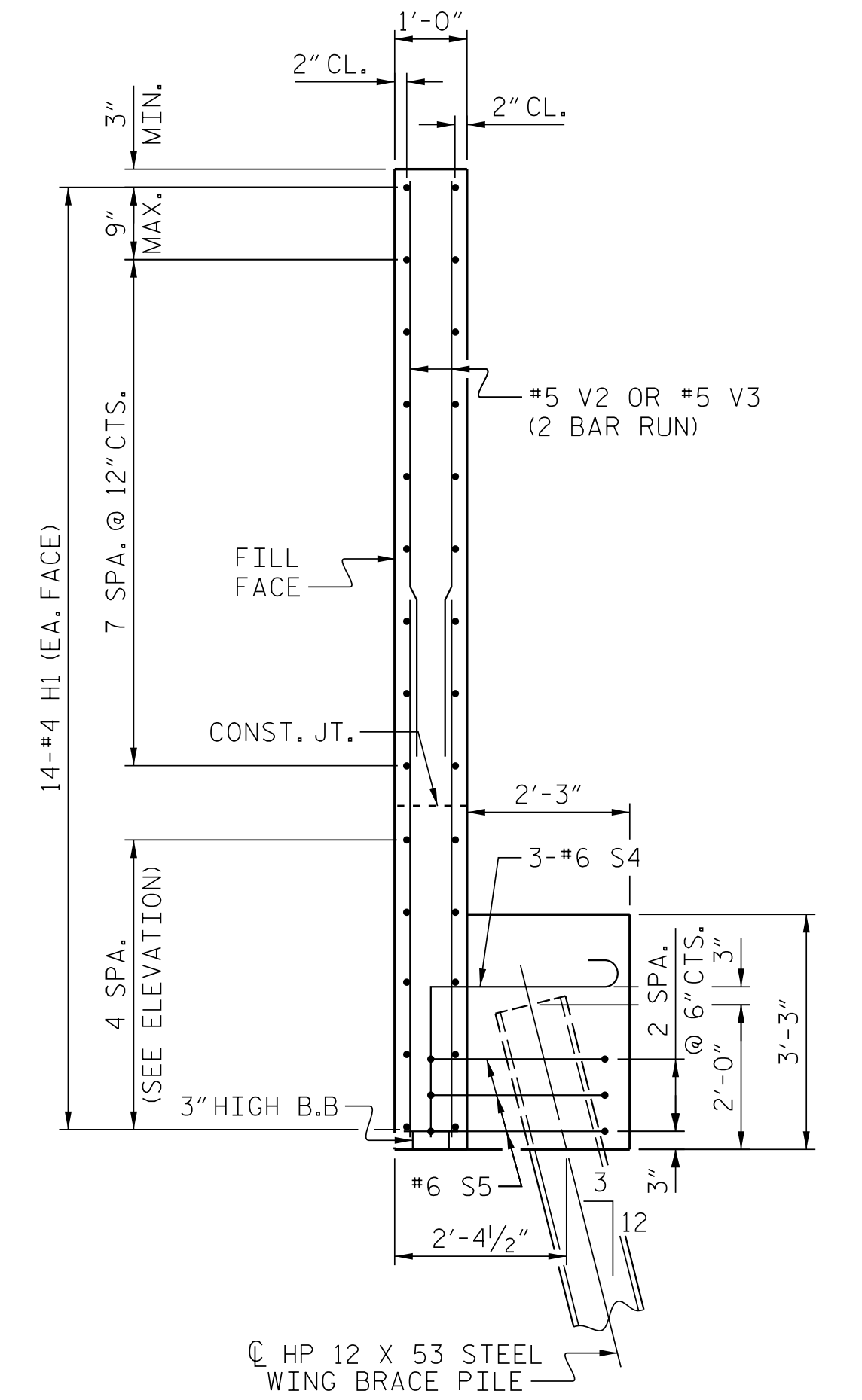
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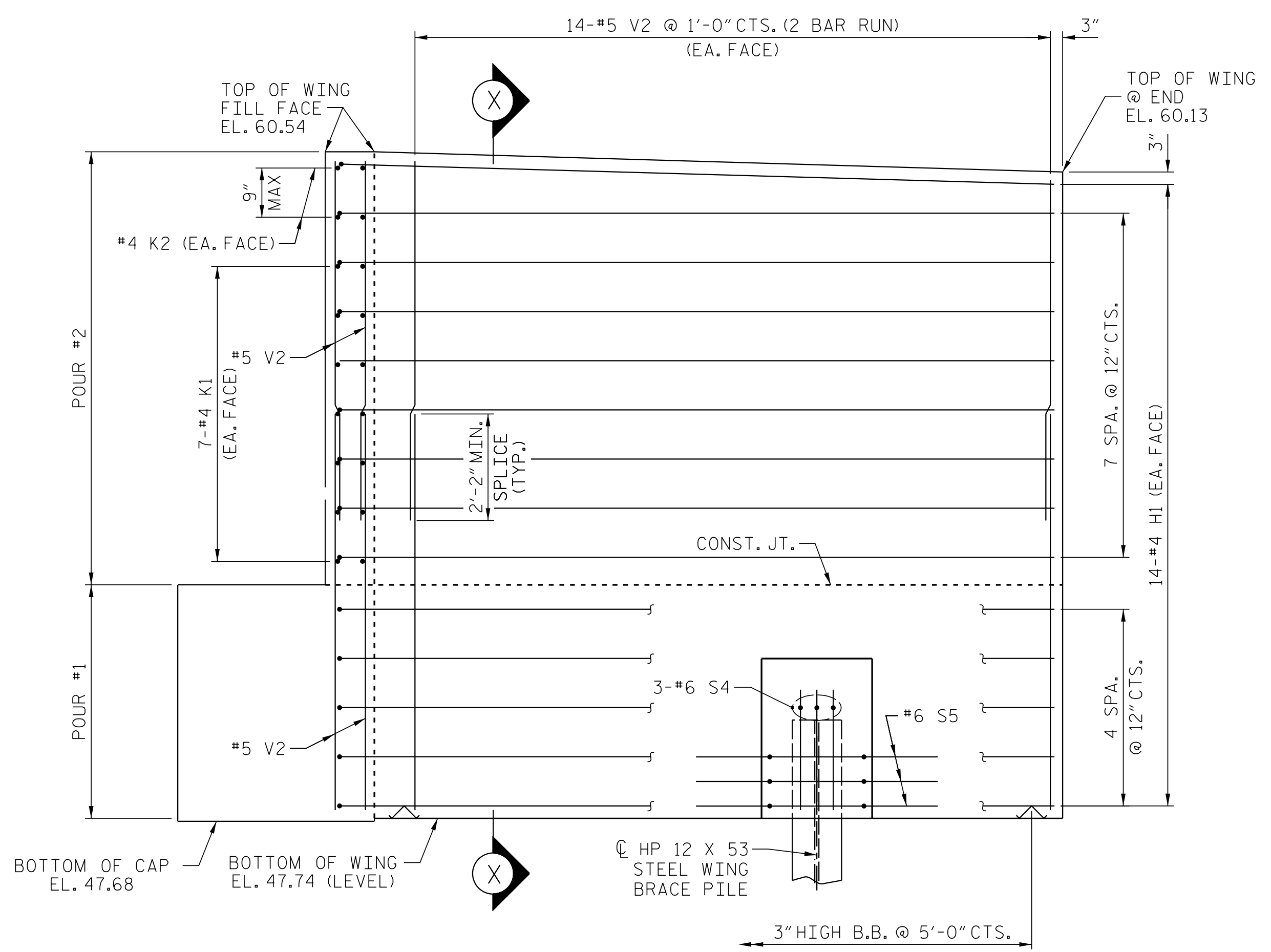
PLAN OF WING (W1)



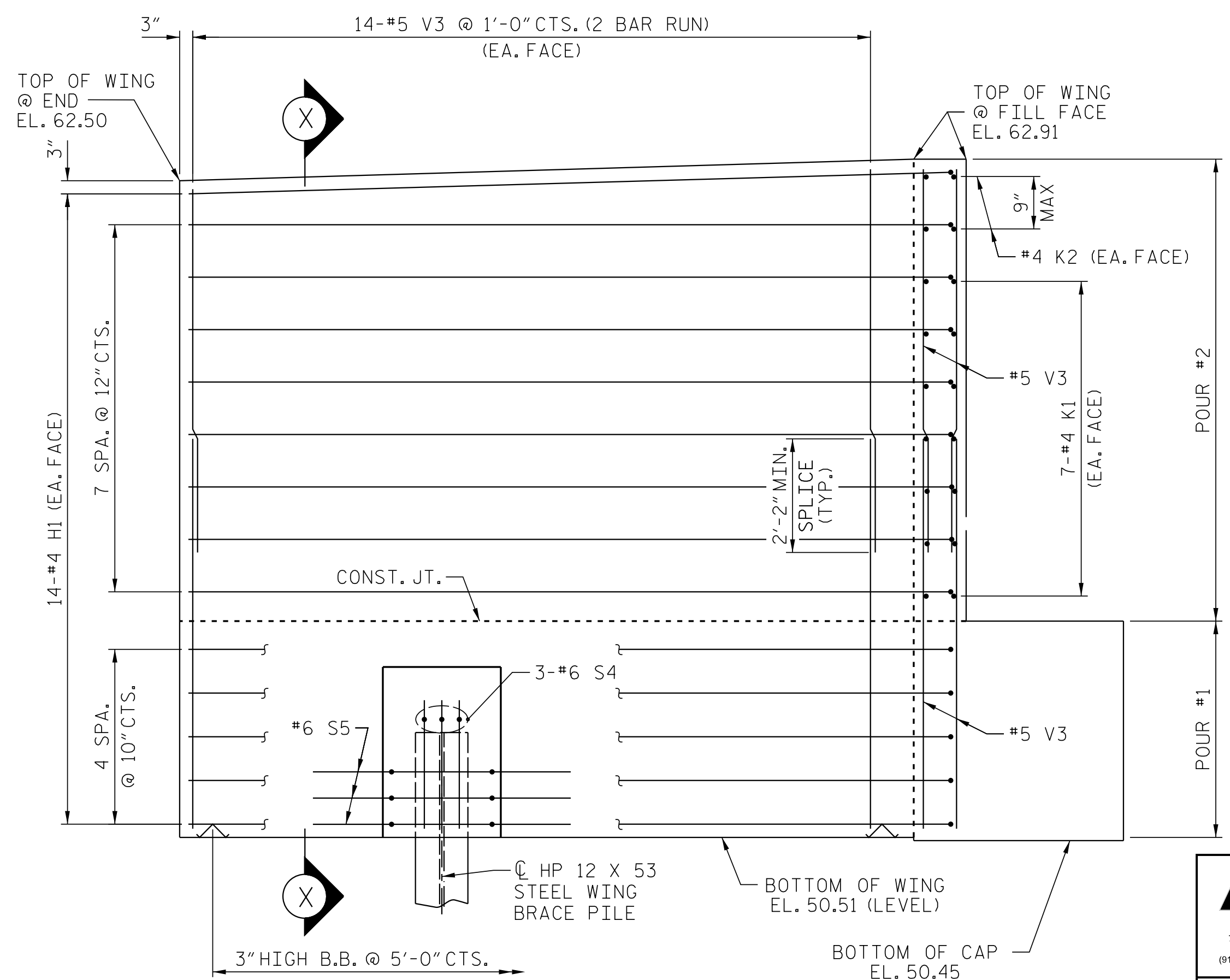
PLAN OF WING (W2)



SECTION X-X

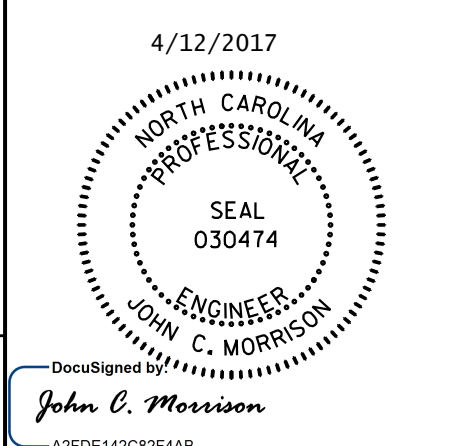


ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

PROJECT NO. R-5516
 CRAVEN COUNTY
 STATION: 32+25.84 -YEB01-
 75+13.29 -L-
 SHEET 2 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE

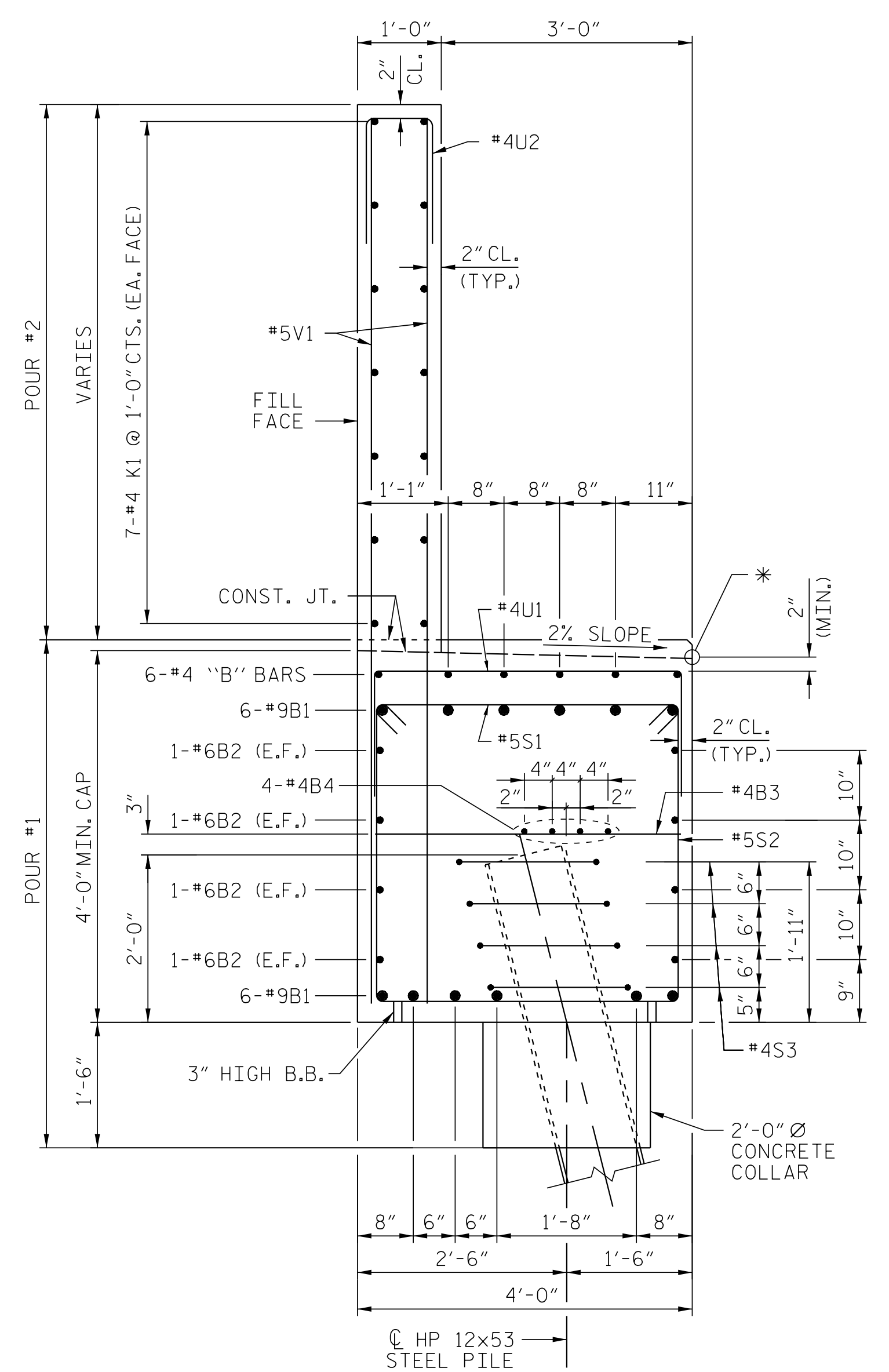
END BENT 1
 SECTIONS & DETAILS

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-35	
1			3			TOTAL SHEETS	
2			4			51	

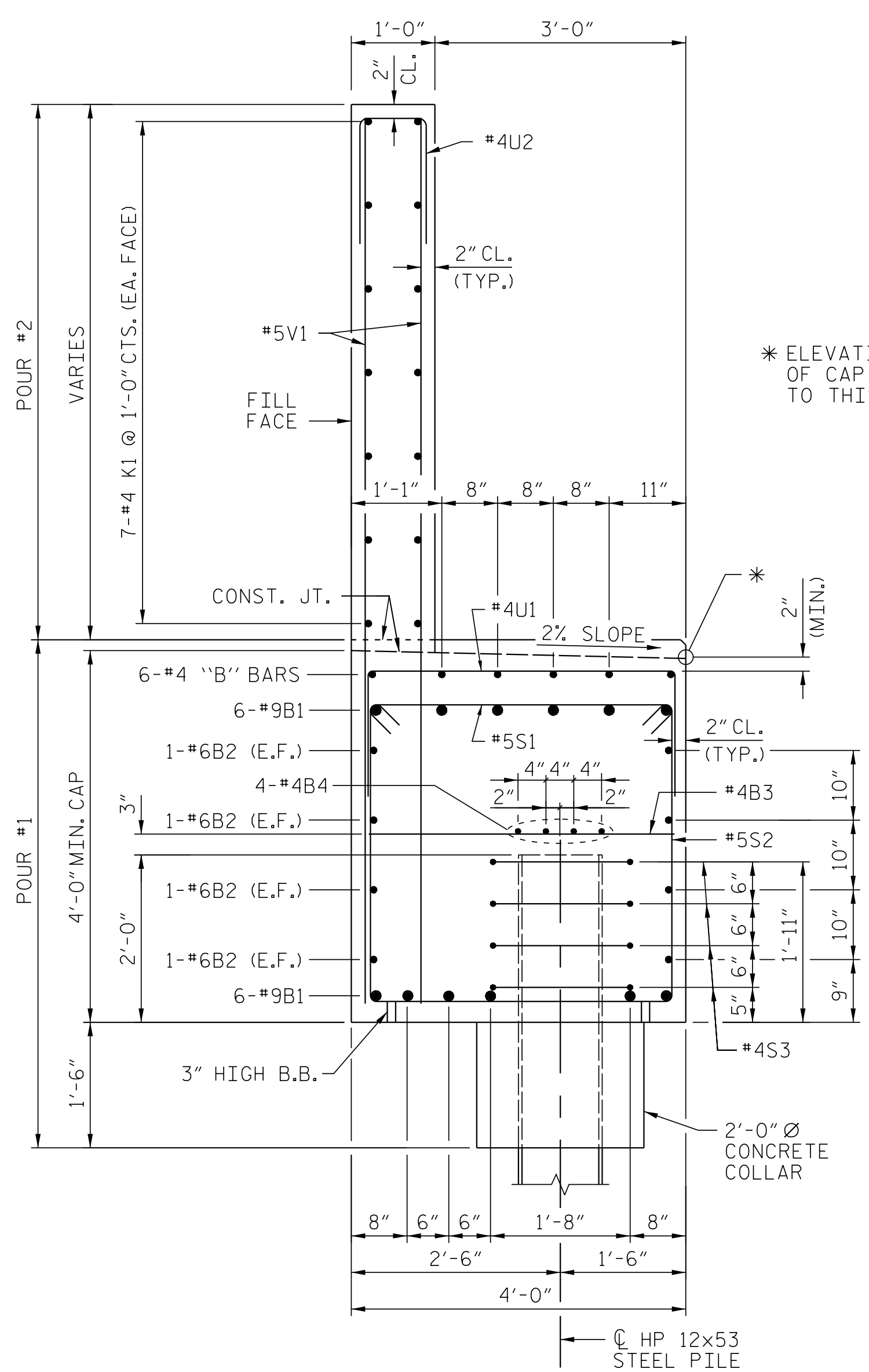
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 CHECKED BY: JCM DATE: 03/16
 DESIGN E.O.R.: JCM DATE: 03/16

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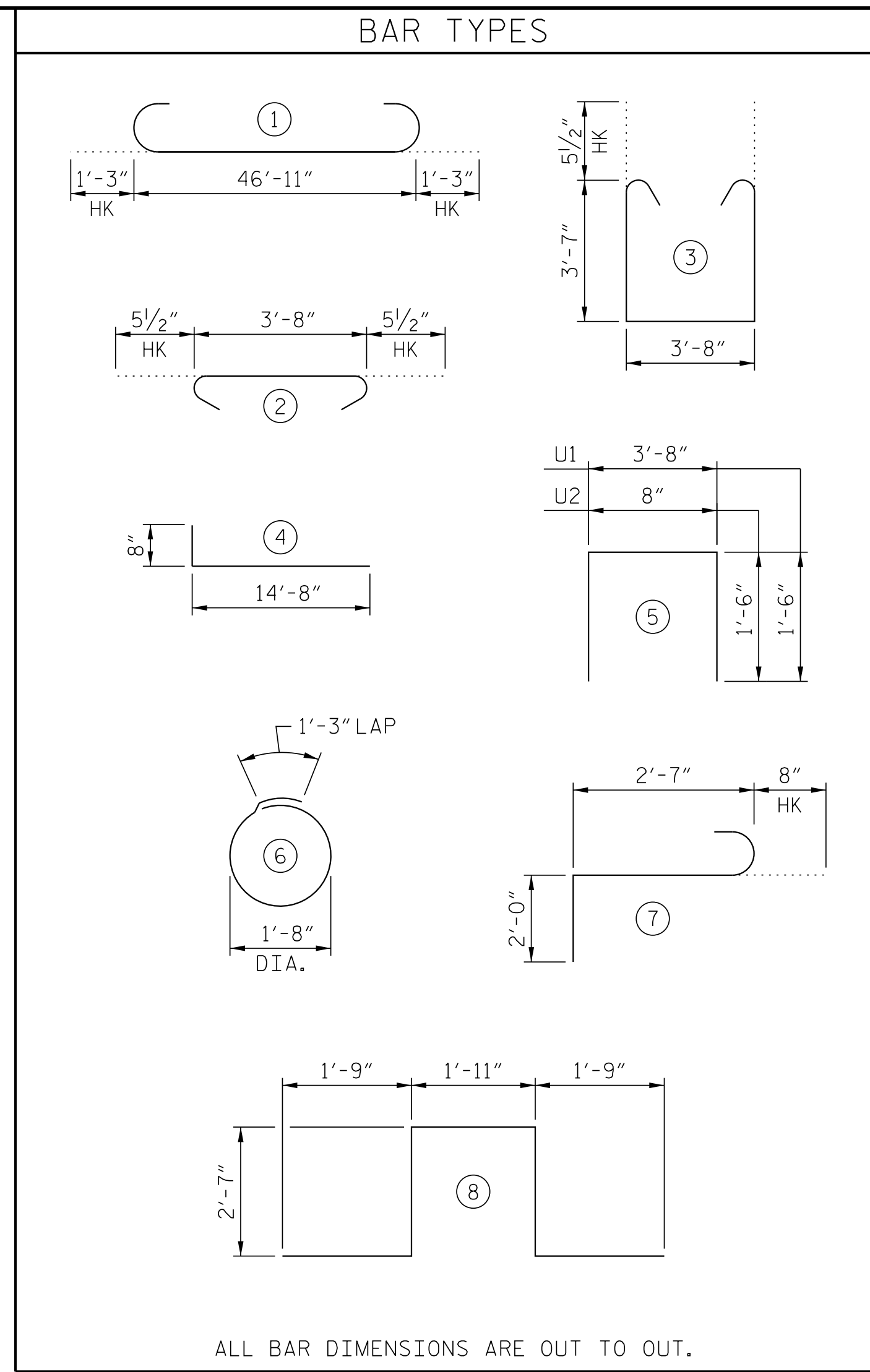


SECTION "A-A"



SECTION "B-B"

* ELEVATIONS FOR TOP OF CAP ARE SHOWN TO THIS POINT

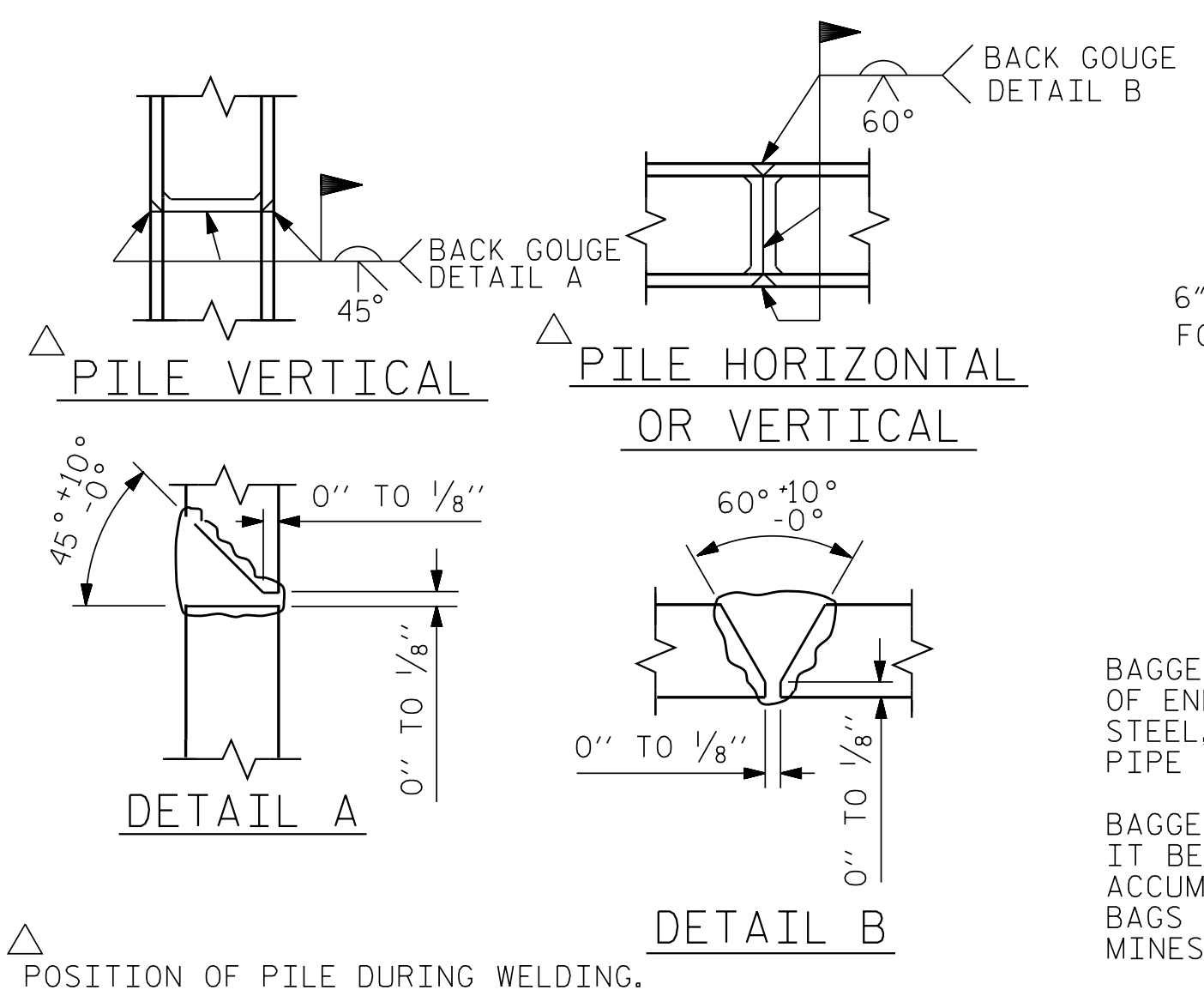


ALL BAR DIMENSIONS ARE OUT TO OUT.

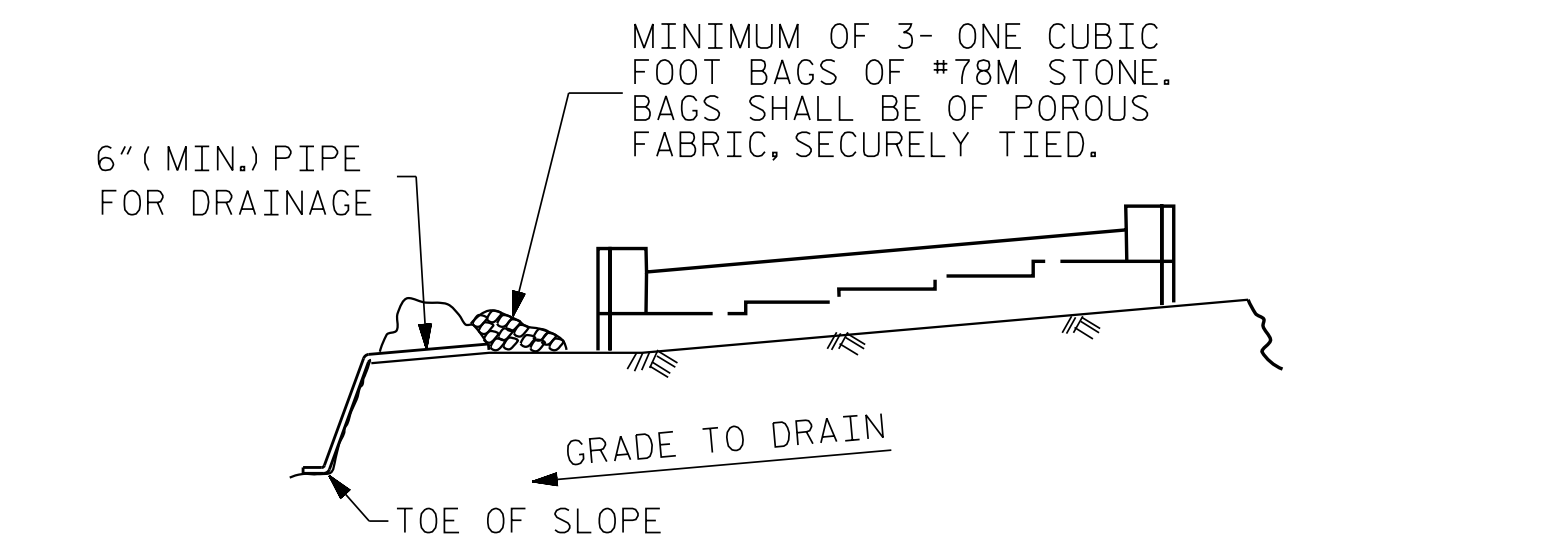
BILL OF MATERIAL					
END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#9	①	49'-5"	2016
B2	8	#6	STR	47'-0"	565
B3	12	#4	STR	3'-8"	29
B4	8	#4	STR	24'-9"	132
B5	6	#4	STR	12'-0"	48
B6	24	#4	STR	7'-0"	112
H1	56	#4	④	15'-4"	574
K1	28	#4	STR	24'-9"	463
K2	8	#4	STR	2'-7"	14
S1	65	#5	②	4'-7"	311
S2	65	#5	③	11'-9"	797
S3	40	#4	⑥	6'-6"	174
S4	6	#4	⑦	5'-3"	21
S5	6	#4	⑧	10'-7"	42
U1	28	#4	⑤	6'-8"	125
U2	41	#4	⑤	3'-8"	100
V1	82	#5	STR	10'-11"	934
V2	72	#5	STR	7'-4"	551
V3	72	#5	STR	7'-2"	538
TOTAL REINFORCING STEEL				LBS.	7546
END BENT 1 TOTAL QUANTITIES					
CLASS A CONCRETE					
POUR 1 (COLLARS, CAP & LOWER WING)				C.Y.	38.0
POUR 2 (BACKWALL & UPPER WING)				C.Y.	20.4
TOTAL				C.Y.	58.4
HP 12x53 STEEL PILES				NO.	12
				LIN. FT.	1260
PIPE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES				NO.	12

DATE: 4/11/2017 TIME: 5:55:59 PM

USER: pwr1503; DN: P:\6329444_5\acum Road\400_Technical\408_Structure\Collar\40_LBO_536_R5516_SML_EB03.dgn



PILE SPLICE DETAILS

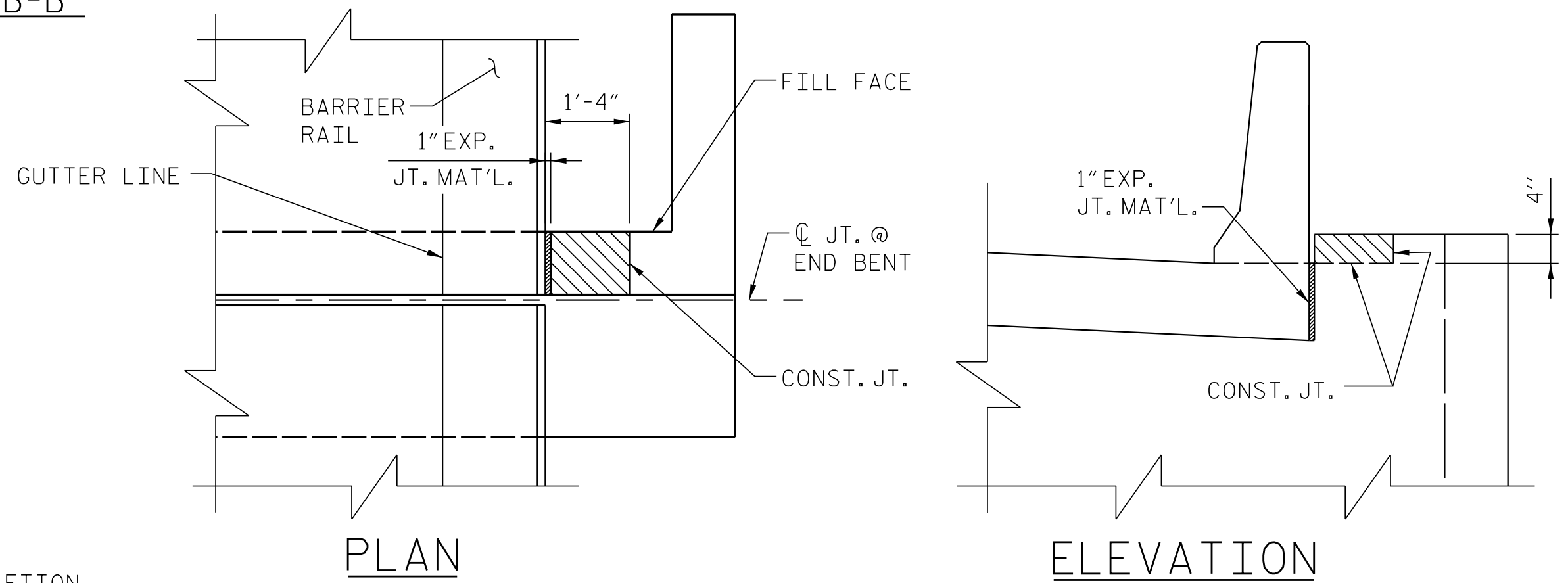


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

TEMPORARY DRAINAGE AT END BENT



BLOCKOUT IN WINGWALL DETAILS

PROJECT NO. R-5516
CRAVEN COUNTY
 STATION: 32+25.84 -YEB01-
75+13.29 -L-
 SHEET 3 OF 3

AECOM
 AECOM TECHNICAL SERVICES, INC.
 701 CORPORATE CENTER DRIVE, SUITE 475
 RALEIGH, NC 27607
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 AECOM License No. F-0342

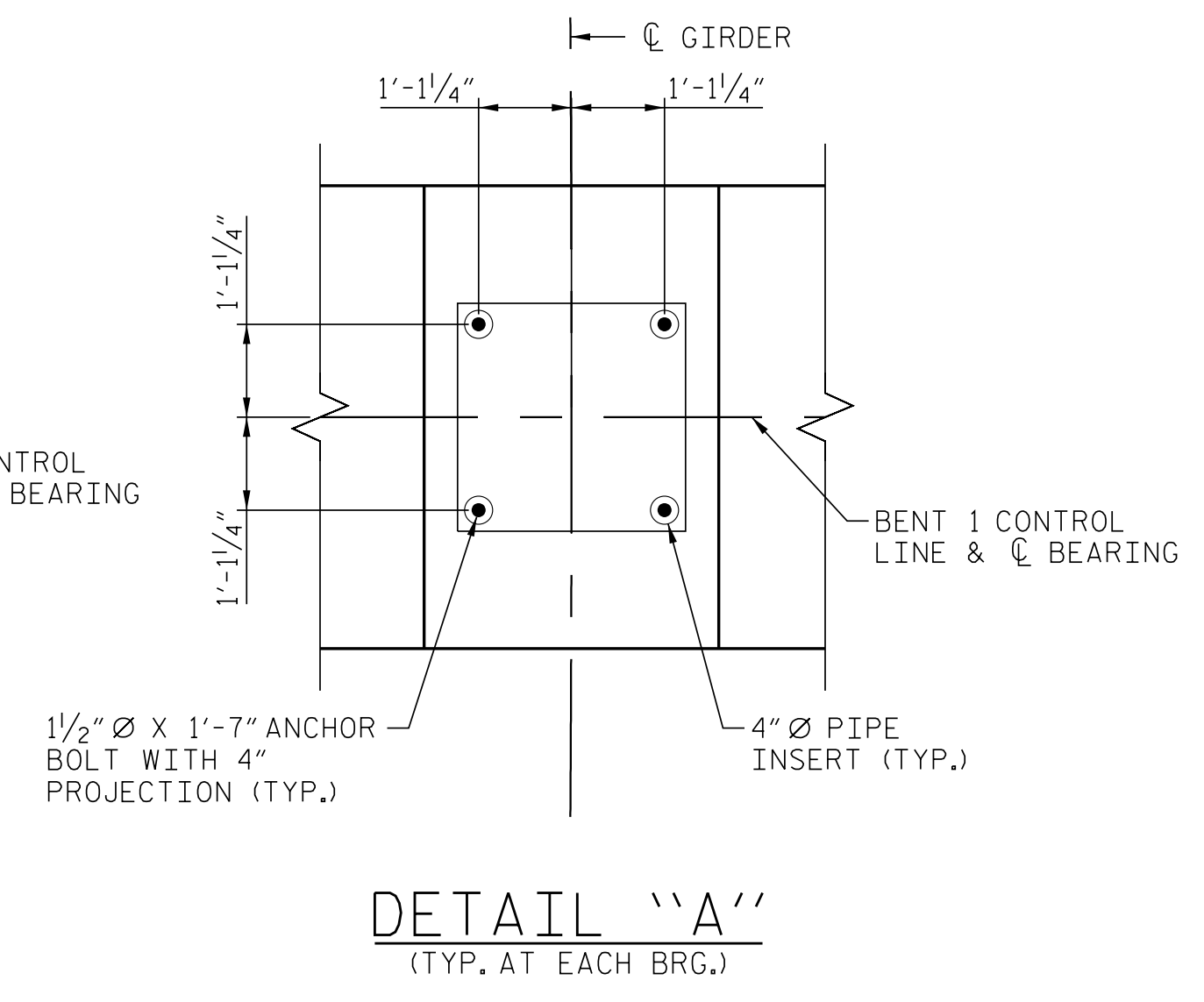
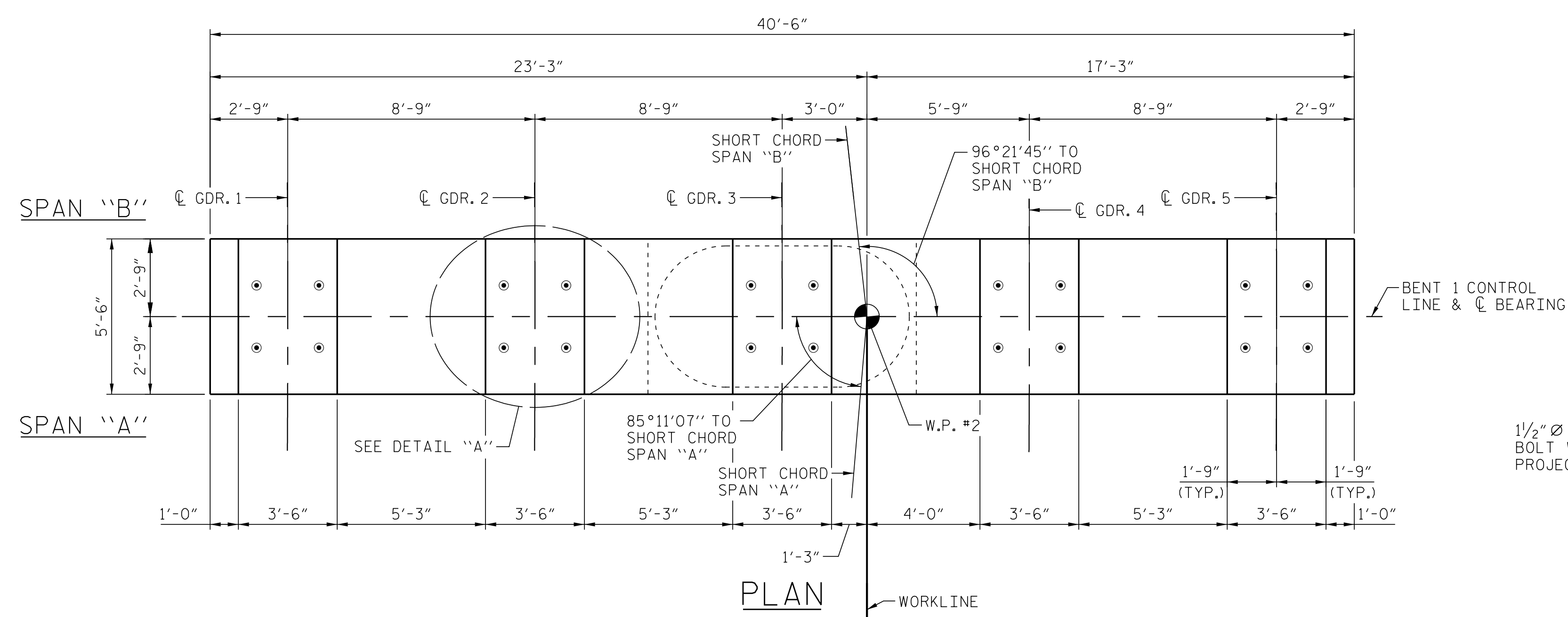
4/12/2017
 NORTH CAROLINA PROFESSIONAL SEAL
 030474
 ENGINEER
 JOHN C. MORRISON

DocuSigned by:
 John C. Morrison
 A2FDE142C82F48B

STATE OF NORTH CAROLINA					
DEPARTMENT OF TRANSPORTATION					
RALEIGH					
SUBSTRUCTURE					
END BENT 1					
SECTIONS & DETAILS					
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS
					51

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY: MKT DATE: 04/17
 CHECKED BY: JCM DATE: 04/17
 DESIGN E.O.R.: JCM DATE: 04/17



NOTES:

STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS AND PIPE INSERTS.

"T" BARS IN TOP OF FOOTING MAY BE SHIFTED AS NECESSARY TO CLEAR M1 BARS IN FOOTING.

HOOKS ON M1 BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

FOR PILE SPLICE DETAILS, SEE "PIPE PILE" SHEET.

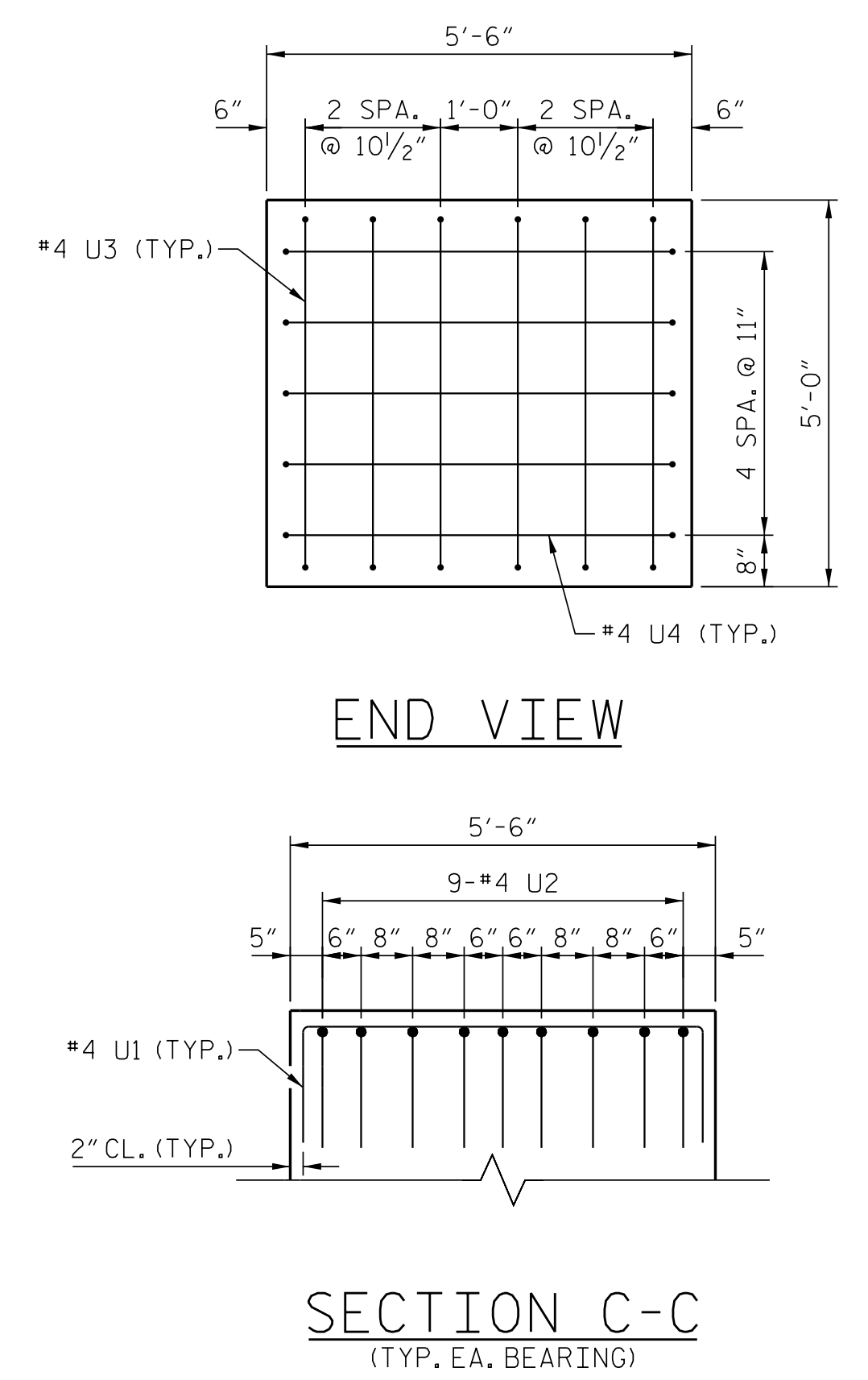
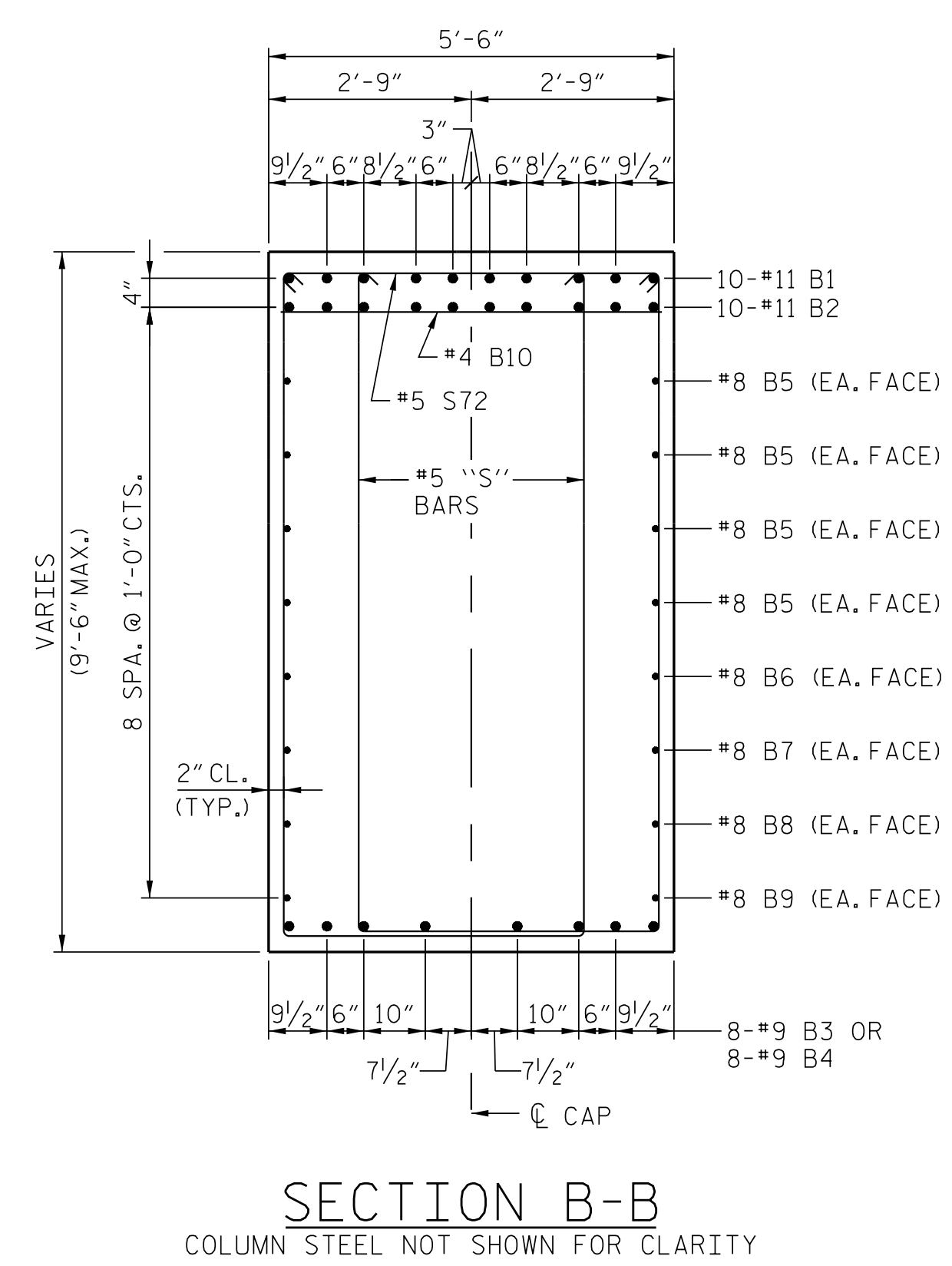
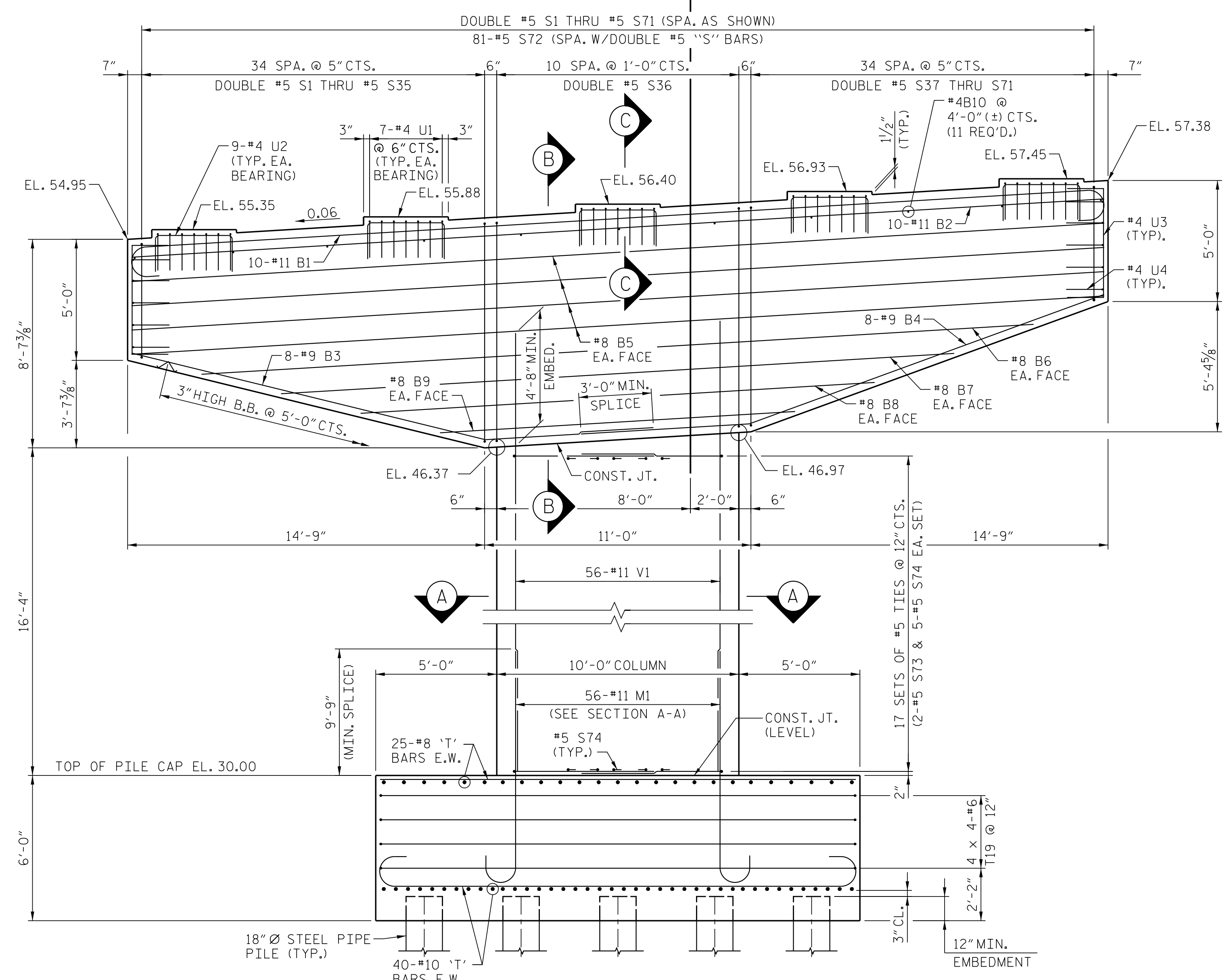
DETAILED DRAWINGS FOR FALSEWORK AND FORMS FOR THIS HAMMERHEAD BENT CAP SHALL BE SUBMITTED, SEE SHEET SN.

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

GALVANIZE THE TOP OF EACH PILE A MINIMUM OF 24 FEET, GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

FOR SECTION A-A, SEE SHEET 2 OF 3.

FOR MASS CONCRETE, SEE SPECIAL PROVISIONS.



PROJECT NO. R-5516
CRAVEN COUNTY
 STATION: 32+25.84 -YEB01-
75+13.29 -L-
 SHEET 1 OF 3

AECOM
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 701 CORPORATE CENTER DRIVE, SUITE 475
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 (919) 854-6200 www.aecom.com
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4/12/2017
 NORTH CAROLINA PROFESSIONAL SEAL
 030474
 JOHN C. MORRISON
 ENGINEER

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE

BENT 1
 PLAN AND ELEVATION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			51
2			4			

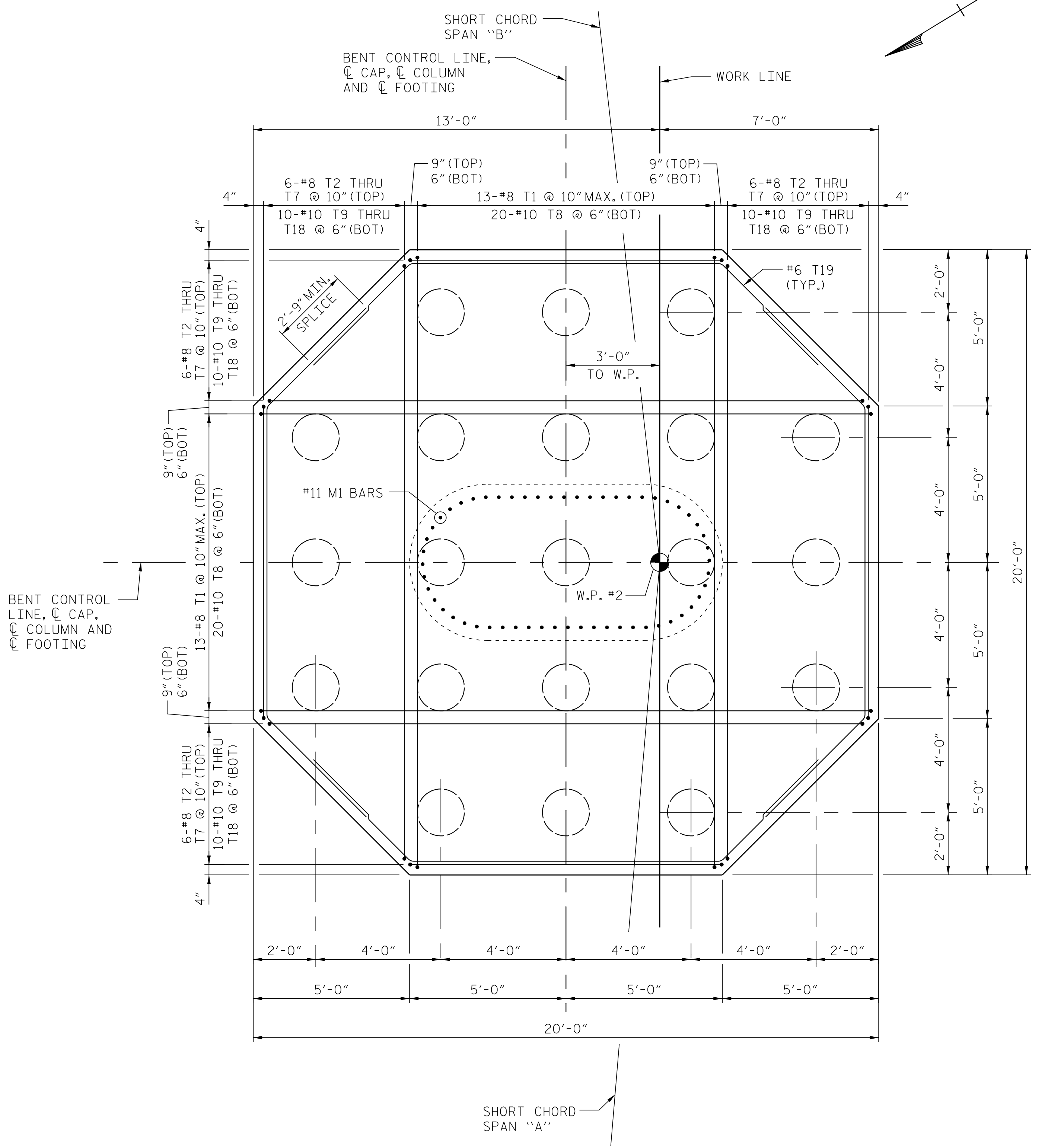
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 DESIGN E.O.R. : JCM DATE : 2/16

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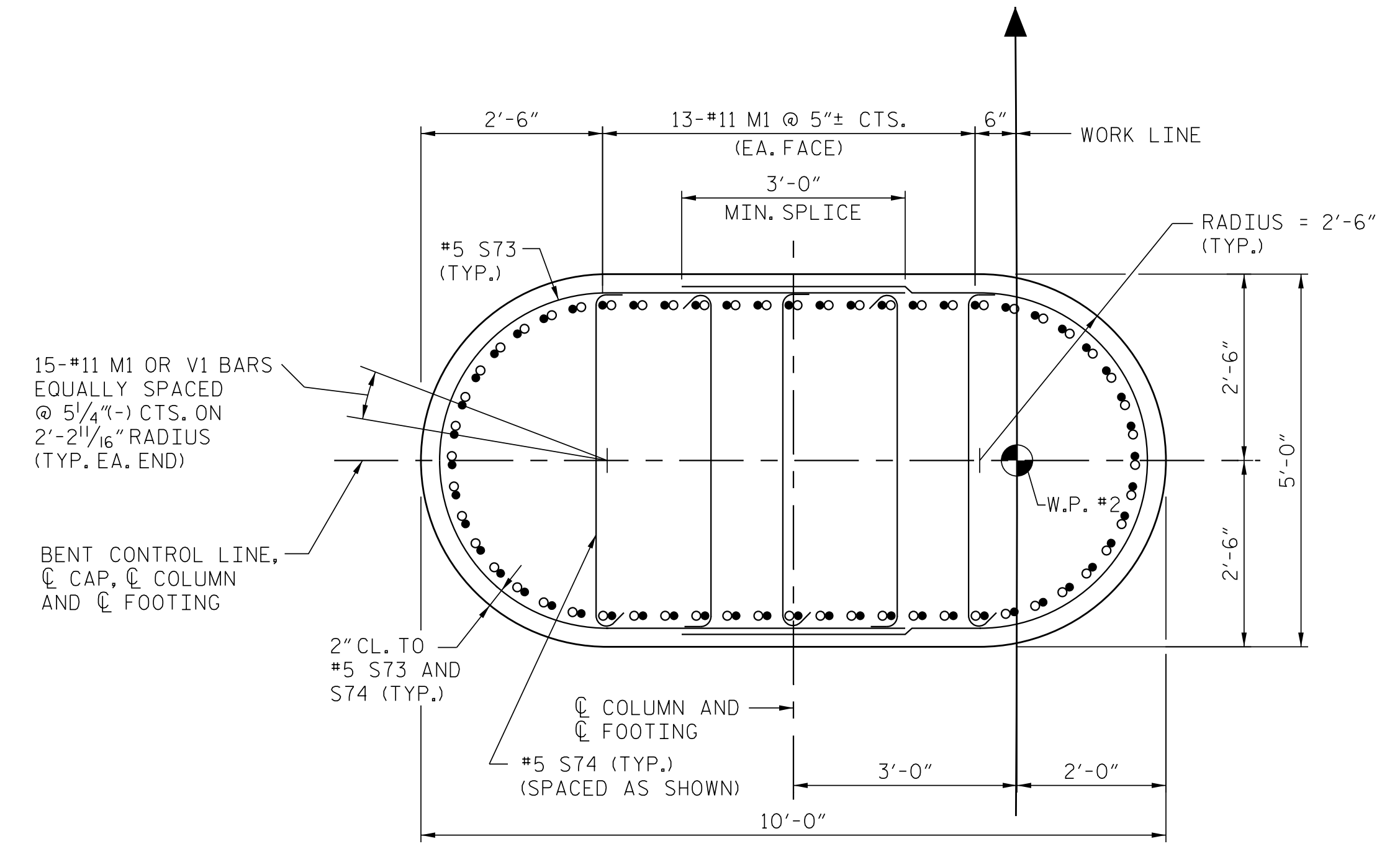
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DATE: 4/12/2017
TIME: 5:23:00 PM

USER: jcm1503
DN: /c=US/e=jcm1503@ncdot.com



FOOTING PLAN



SECTION A-A

- = M1 BAR
- = V1 BAR

DRAWN BY : SGS DATE : 2/16
 CHECKED BY : JCM DATE : 2/16
 DESIGN E.O.R. : JCM DATE : 2/16

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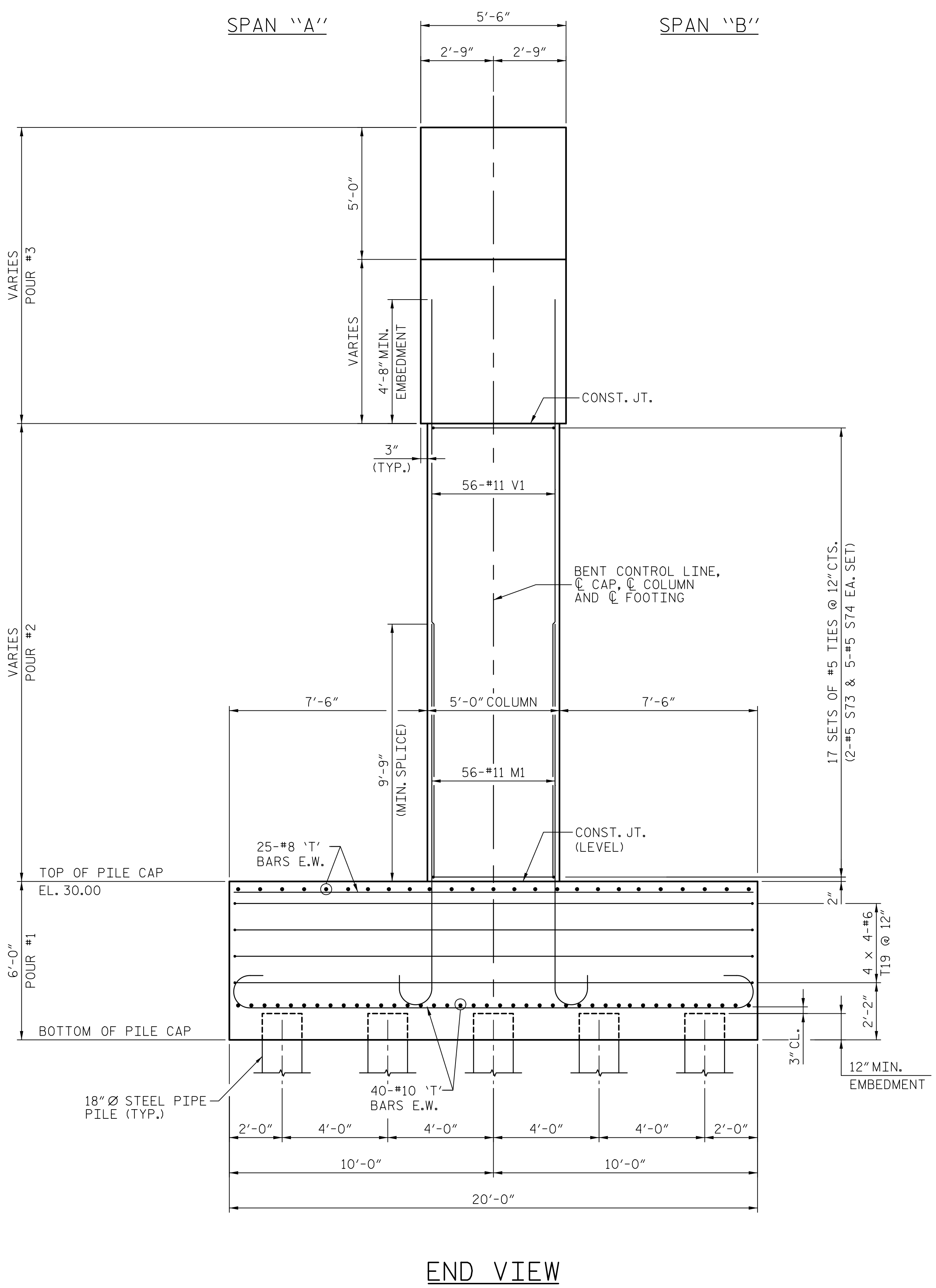
4/12/2017
 NORTH CAROLINA
 PROFESSIONAL
 SEAL
 030474
 ENGINEER
 JOHN C. MORRISON

DocuSigned by
 John C. Morrison
 A2FDE142C82F4A8

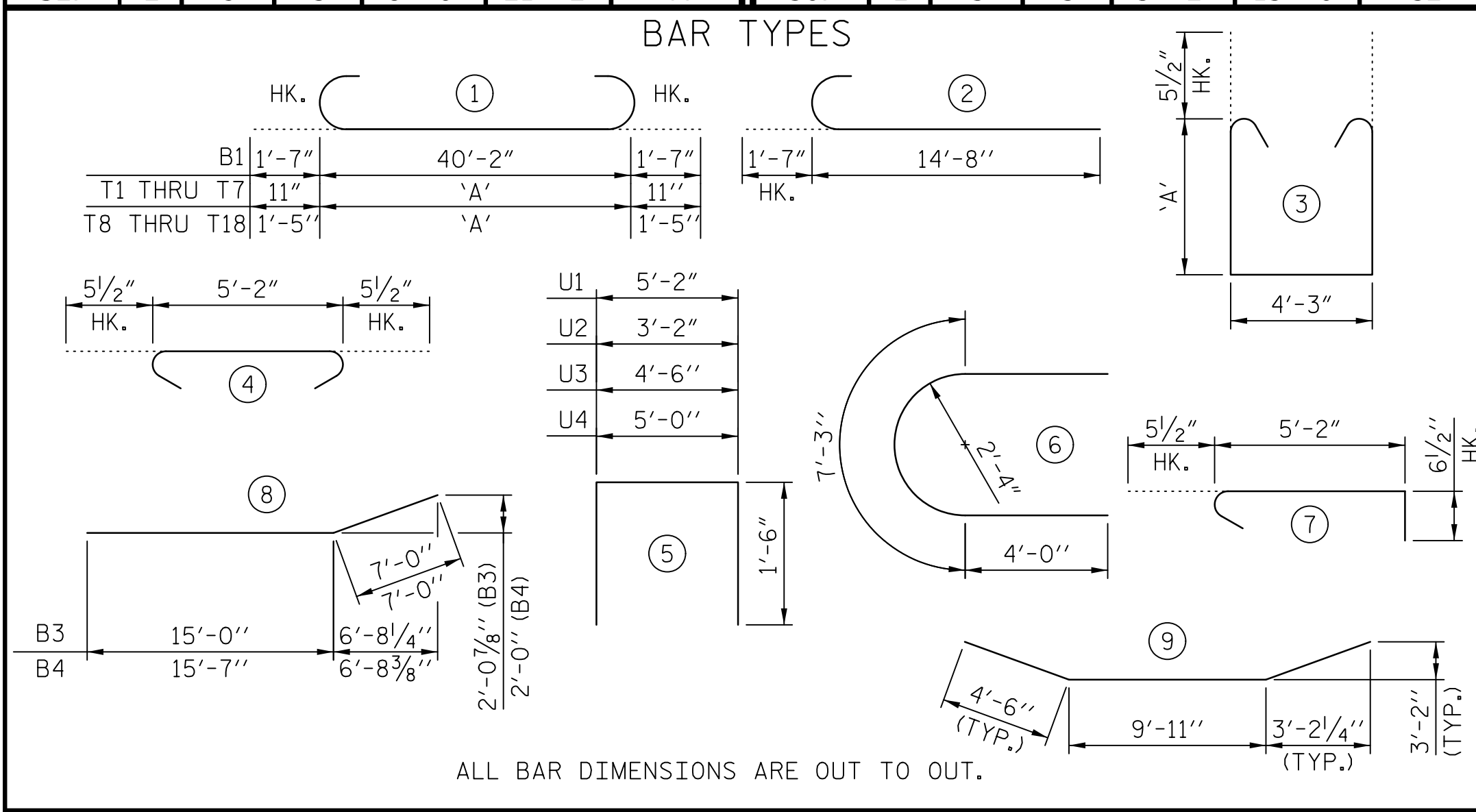
PROJECT NO. R-5516
 CRAVEN COUNTY
 STATION: 32+25.84 -YEB01-
 75+13.29 -L-
 SHEET 2 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
BENT 1 SECTIONS AND DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-38					TOTAL SHEETS 51

DATE: 4/7/2017
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BILL OF MATERIAL																					
BENT 1																					
BAR	NO.	SIZE	TYPE	DIM. 'A'	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	DIM. 'A'	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	DIM. 'A'	LENGTH	WEIGHT	
B1	10	11	1	-	43' - 4"	2302	S28	2	5	3	8' - 2"	21' - 6"	45	S68	2	5	3	5' - 1"	15' - 4"	32	
B2	10	11	STR	-	40' - 3"	2138	S29	2	5	3	8' - 4"	21' - 10"	46	S69	2	5	3	4' - 11"	15' - 0"	31	
B3	8	9	8	-	22' - 0"	598	S30	2	5	3	8' - 5"	22' - 0"	46	S70	2	5	3	4' - 10"	14' - 10"	31	
B4	8	9	8	-	22' - 7"	614	S31	2	5	3	8' - 7"	22' - 4"	47	S71	2	5	3	4' - 8"	14' - 6"	30	
B5	8	8	STR	-	40' - 3"	860	S32	2	5	3	8' - 8"	22' - 6"	47	S72	81	5	4	-	5' - 9"	486	
B6	2	8	STR	-	34' - 5"	184	S33	2	5	3	8' - 10"	22' - 10"	48	S73	34	5	6	-	15' - 3"	541	
B7	2	8	STR	-	27' - 10"	149	S34	2	5	3	8' - 11"	23' - 0"	48	S74	85	5	7	-	6' - 2"	547	
B8	2	8	STR	-	21' - 3"	113	S35	2	5	3	9' - 1"	23' - 4"	49	T1	26	8	1	19' - 6"	21' - 4"	1481	
B9	2	8	STR	-	14' - 8"	78	S36	22	5	3	9' - 2"	23' - 6"	539	T2	4	8	1	9' - 11"	11' - 9"	125	
B10	11	4	STR	-	5' - 2"	38	S37	2	5	3	9' - 1"	23' - 4"	49	T3	4	8	1	11' - 8"	13' - 6"	144	
M1	56	11	2	-	16' - 3"	4835	S38	2	5	3	9' - 0"	23' - 2"	48	T4	4	8	1	13' - 6"	15' - 4"	164	
S1	2	5	3	4' - 8"	14' - 6"	30	S39	2	5	3	8' - 10"	22' - 10"	48	T5	4	8	1	15' - 4"	17' - 2"	183	
S2	2	5	3	4' - 10"	14' - 10"	31	S40	2	5	3	8' - 8"	22' - 6"	47	T6	4	8	1	17' - 2"	19' - 0"	203	
S3	2	5	3	4' - 11"	15' - 0"	31	S41	2	5	3	8' - 7"	22' - 4"	47	T7	4	8	1	18' - 11"	20' - 9"	222	
S4	2	5	3	5' - 1"	15' - 4"	32	S42	2	5	3	8' - 5"	22' - 0"	46	T8	40	10	1	19' - 6"	22' - 4"	3844	
S5	2	5	3	5' - 2"	15' - 6"	32	S43	2	5	3	8' - 4"	21' - 10"	46	T9	4	10	1	9' - 11"	12' - 9"	219	
S6	2	5	3	5' - 4"	15' - 10"	33	S44	2	5	3	8' - 2"	21' - 6"	45	T10	4	10	1	10' - 11"	13' - 9"	237	
S7	2	5	3	5' - 5"	16' - 0"	33	S45	2	5	3	8' - 0"	21' - 2"	44	T11	4	10	1	11' - 11"	14' - 9"	254	
S8	2	5	3	5' - 7"	16' - 4"	34	S46	2	5	3	7' - 11"	21' - 0"	44	T12	4	10	1	12' - 11"	15' - 9"	271	
S9	2	5	3	5' - 8"	16' - 6"	34	S47	2	5	3	7' - 9"	20' - 8"	43	T13	4	10	1	13' - 11"	16' - 9"	288	
S10	2	5	3	5' - 10"	16' - 10"	35	S48	2	5	3	7' - 8"	20' - 6"	43	T14	4	10	1	14' - 11"	17' - 9"	306	
S11	2	5	3	6' - 0"	17' - 2"	36	S49	2	5	3	7' - 6"	20' - 2"	42	T15	4	10	1	15' - 11"	18' - 9"	323	
S12	2	5	3	6' - 1"	17' - 4"	36	S50	2	5	3	7' - 5"	20' - 0"	42	T16	4	10	1	16' - 11"	19' - 9"	340	
S13	2	5	3	6' - 3"	17' - 8"	37	S51	2	5	3	7' - 3"	19' - 8"	41	T17	4	10	1	17' - 11"	20' - 9"	357	
S14	2	5	3	6' - 4"	17' - 10"	37	S52	2	5	3	7' - 2"	19' - 6"	41	T18	4	10	1	18' - 11"	21' - 9"	374	
S15	2	5	3	6' - 6"	18' - 2"	38	S53	2	5	3	7' - 0"	19' - 2"	40	T19	16	6	9	-	18' - 11"	455	
S16	2	5	3	6' - 8"	18' - 6"	39	S54	2	5	3	6' - 10"	18' - 10"	39	U1	35	4	5	-	8' - 2"	191	
S17	2	5	3	6' - 9"	18' - 8"	39	S55	2	5	3	6' - 9"	18' - 8"	39	U2	45	4	5	-	6' - 2"	185	
S18	2	5	3	6' - 10"	18' - 10"	39	S56	2	5	3	6' - 7"	18' - 4"	38	U3	12	4	5	-	7' - 6"	60	
S19	2	5	3	7' - 0"	19' - 2"	40	S57	2	5	3	6' - 6"	18' - 2"	38	U4	10	4	5	-	8' - 0"	53	
S20	2	5	3	7' - 2"	19' - 6"	41	S58	2	5	3	6' - 4"	17' - 10"	37	V1	56	11	STR	-	21' - 9"	6471	
S21	2	5	3	7' - 3"	19' - 8"	41	S59	2	5	3	6' - 3"	17' - 8"	37								
S22	2	5	3	7' - 4"	19' - 10"	41	S60	2	5	3	6' - 1"	17' - 4"	36								
S23	2	5	3	7' - 6"	20' - 2"	42	S61	2	5	3	6' - 0"	17' - 2"	36								
S24	2	5	3	7' - 8"	20' - 6"	43	S62	2	5	3	5' - 10"	16' - 10"	35								
S25	2	5	3	7' - 9"	20' - 8"	43	S63	2	5	3	5' - 9"	16' - 8"	35								
S26	2	5	3	7' - 11"	21' - 0"	44	S64	2	5	3	5' - 7"	16' - 4"	34								
S27	2	5	3	8' - 0"	21' - 2"	44	S65	2	5	3	5' - 5"	16' - 0"	33								
							S66	2	5	3	5' - 4"	15' - 10"	33								
							S67	2	5	3	5' - 2"	15' - 6"	32								



TOTAL REINFORCING STEEL		
LBS.		33535

BENT 1 TOTAL QUANTITIES		
CLASS A CONCRETE		
POUR 1 (FOOTING)	C.Y.	77.8
POUR 2 (COLUMN)	C.Y.	27.6
POUR 3 (CAP)	C.Y.	65.7
TOTAL	C.Y.	171.1

18" Ø STEEL PIPE PILES	NO.	21
PILE REDRIVES	EA.	12
PILE DRIVING EQUIPMENT SETUP FOR 18" DIA. STEEL PIPE PILES	NO.	21

PROJECT NO. R-5516

CRAVEN COUNTY

STATION: 32+25.84 -YEB01-
75+13.29 -L-

SHEET 3 OF 3

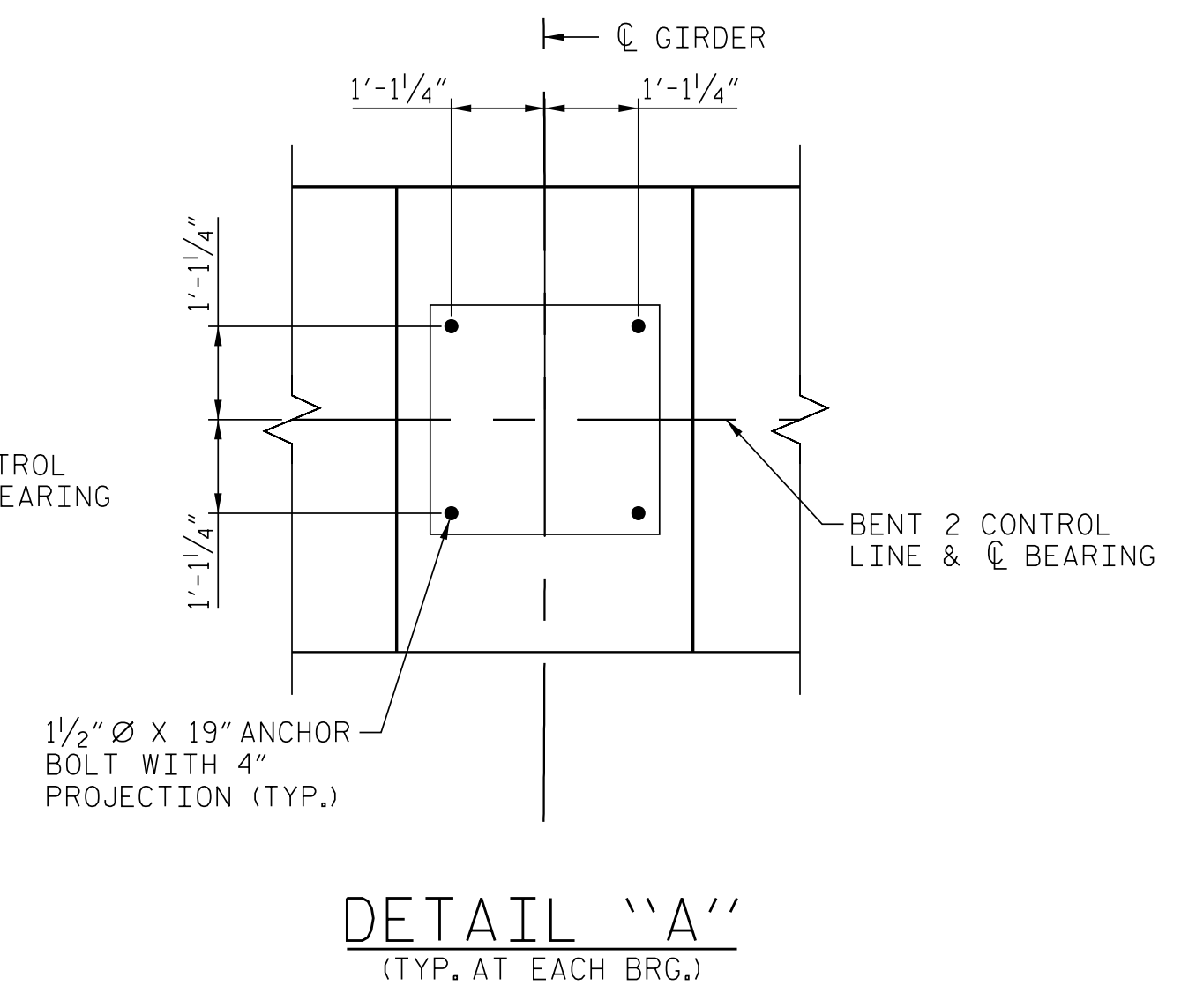
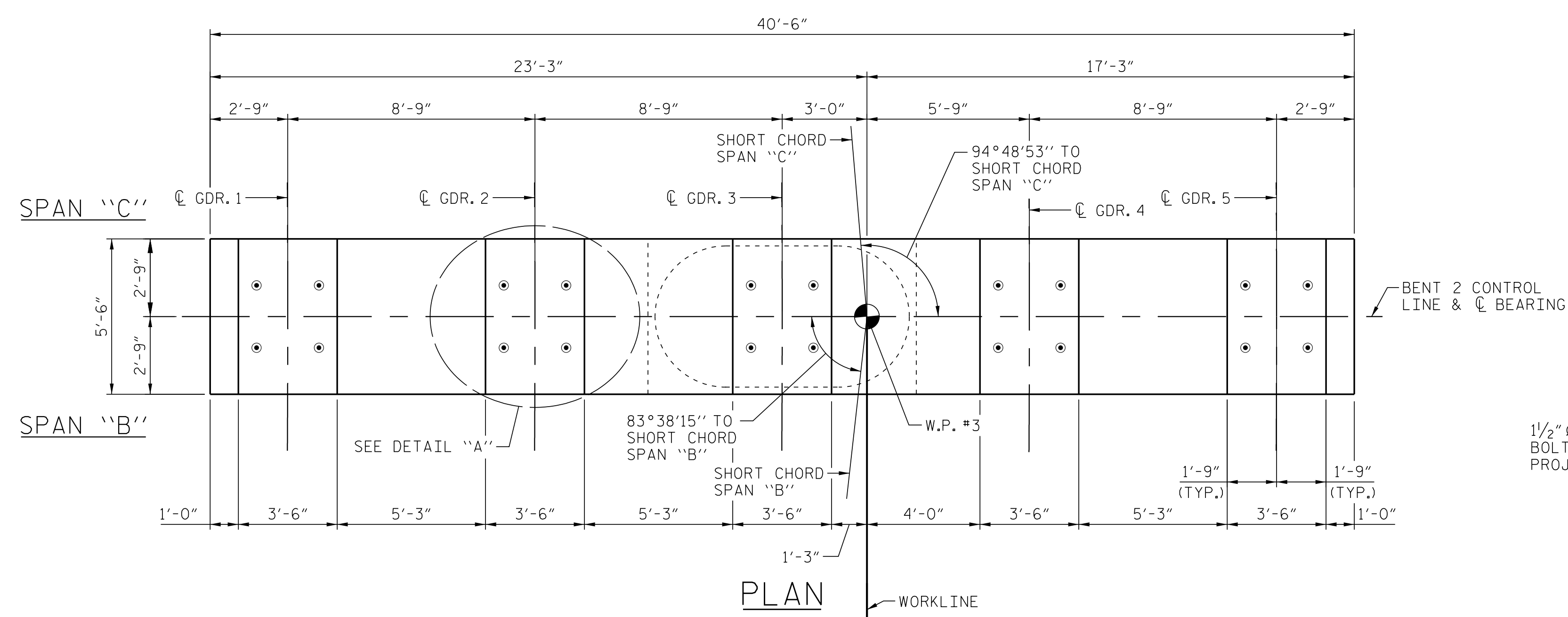
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 CHECKED BY : JCM DATE : 4/17
 DESIGN E.O.R. : JCM DATE : 4/17

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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 AECOM TECHNICAL SERVICES, INC.
 701 CORPORATE CENTER DRIVE, SUITE 475
 RALEIGH, NC 27607
 (919) 854-6200 www.aecom.com
 AECOM License No. F-0342

4/12/2017
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 030474
 JOHN C. MORRISON

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-39
1			3			TOTAL SHEETS
2			4			51



NOTES:

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

T BARS IN TOP OF FOOTING MAY BE SHIFTED AS NECESSARY TO CLEAR M1 BARS IN FOOTING.

HOOKS ON M1 BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

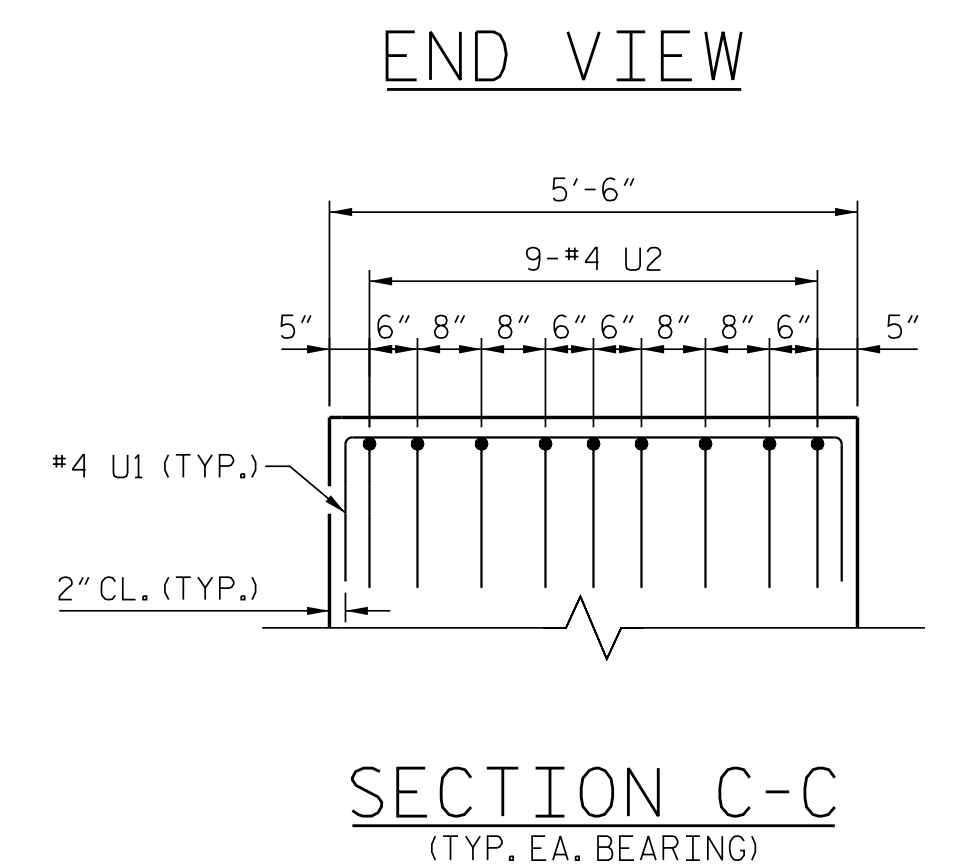
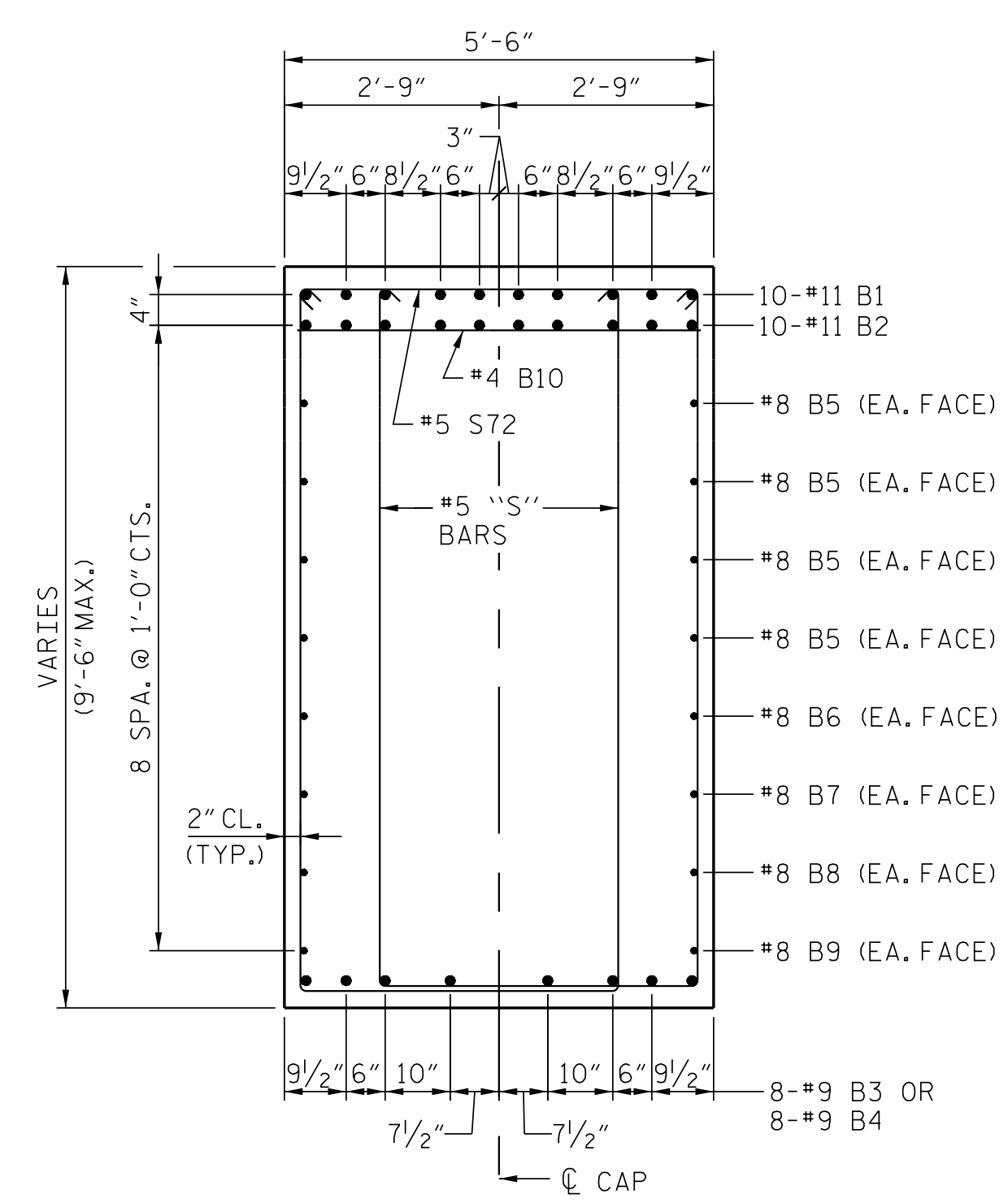
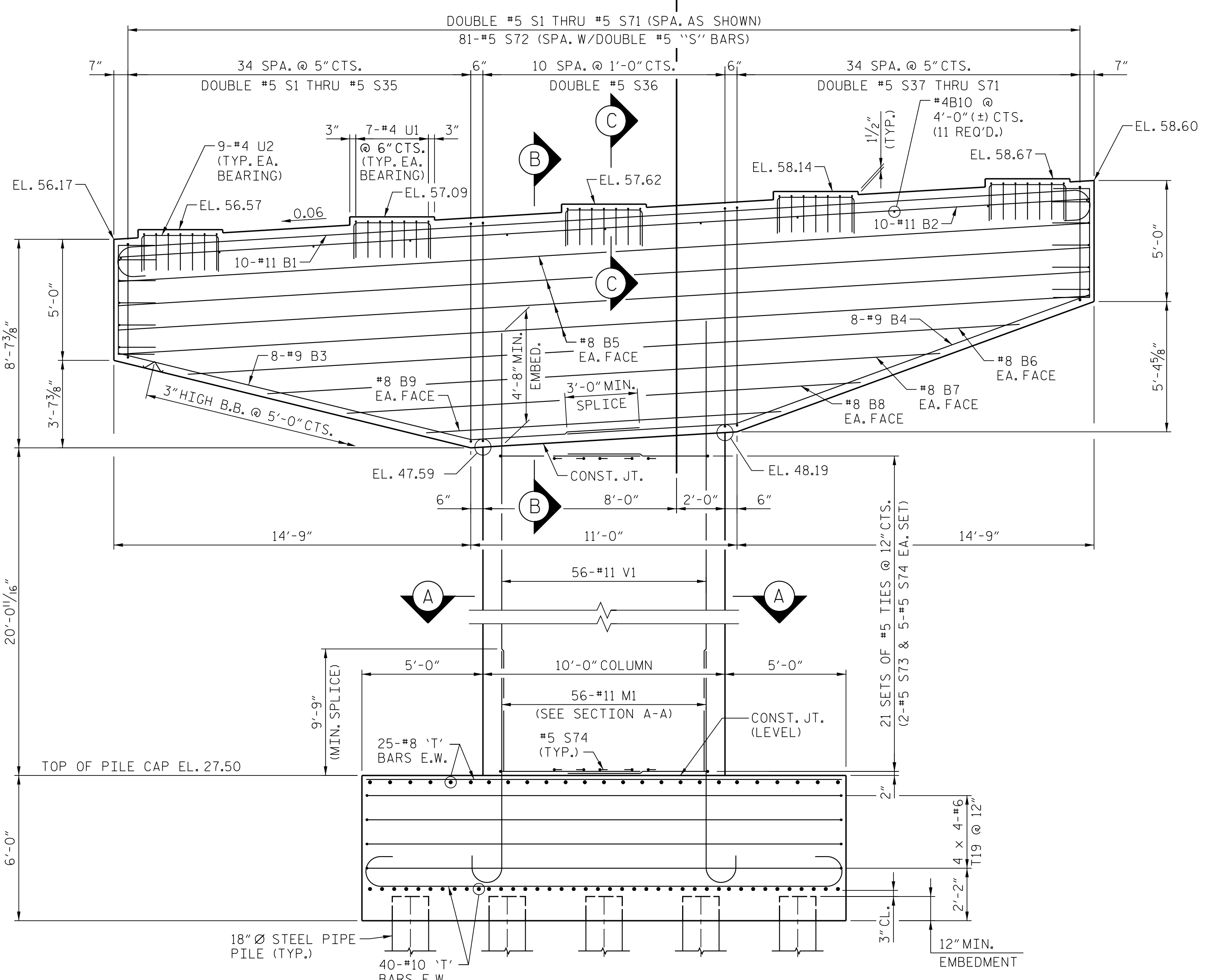
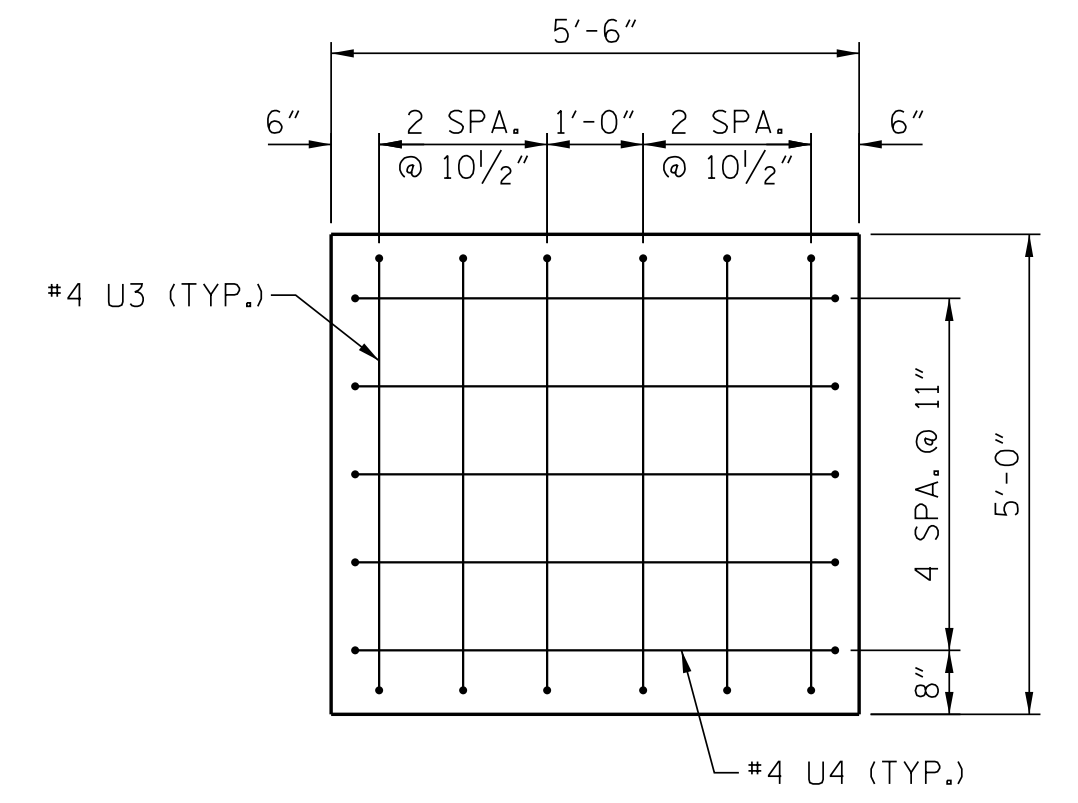
FOR PILE SPLICE DETAILS, SEE "PIPE PILE" SHEET.

DETAILED DRAWINGS FOR FALSEWORK AND FORMS FOR THIS HAMMERHEAD BENT CAP SHALL BE SUBMITTED, SEE SHEET SN.

GALVANIZE THE TOP OF EACH PILE A MINIMUM 24 FEET, GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

FOR SECTION A-A, SEE SHEET 2 OF 3.

FOR MASS CONCRETE, SEE SPECIAL PROVISIONS.



PROJECT NO. R-5516

CRAVEN COUNTY

STATION: 32+25.84 -YEB01-
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SHEET 1 OF 3

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4/12/2017

NORTH CAROLINA PROFESSIONAL SEAL 030474

ENGINEER JOHN C. MORRISON

DocuSigned by: John C. Morrison AZFDE142CRZF4AB

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 2
PLAN AND ELEVATION

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

SHEET NO. **S-40**

TOTAL SHEETS **51**

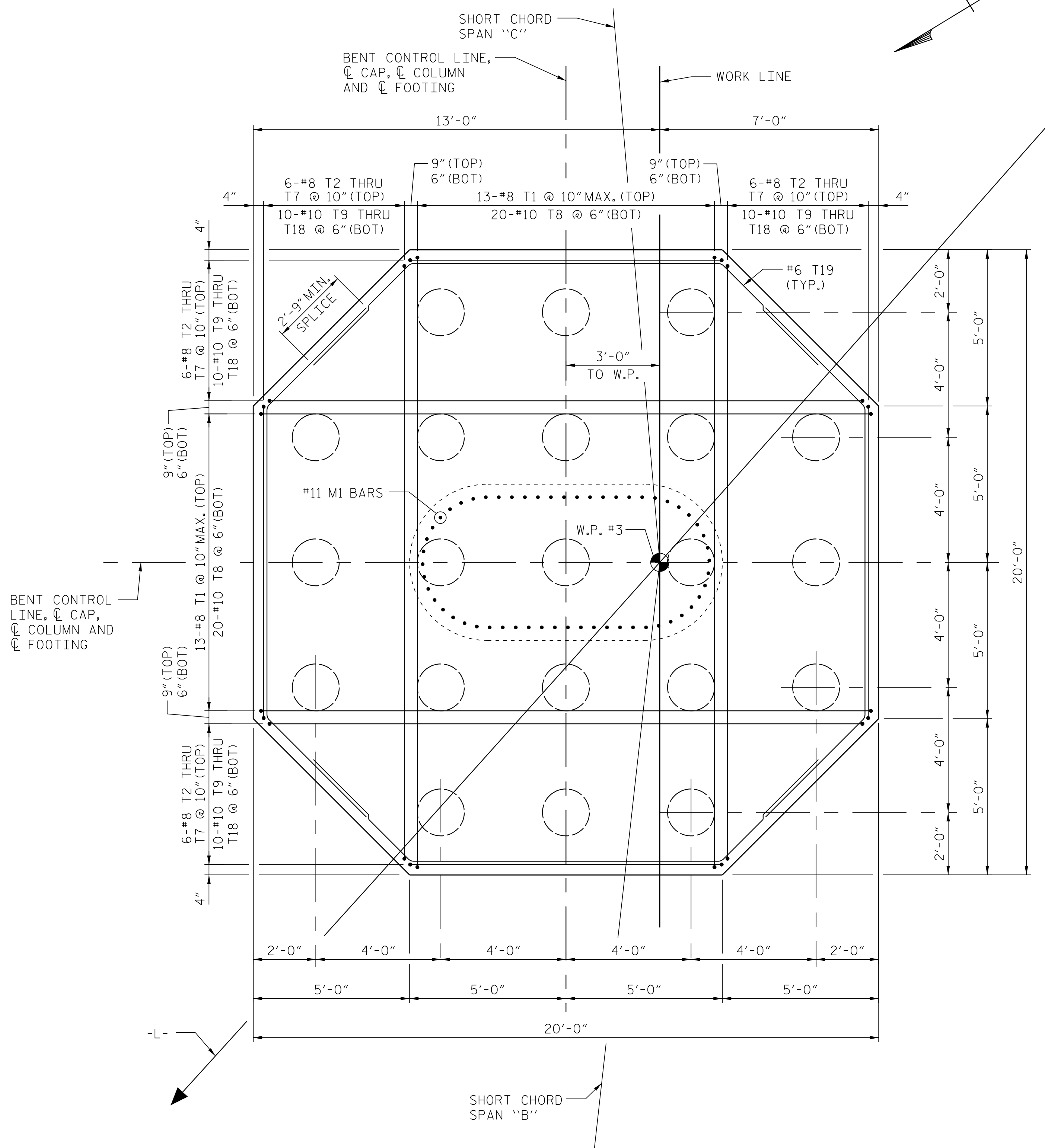
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CHECKED BY : JCM DATE : 2/16
DESIGN E.O.R. : JCM DATE : 2/16

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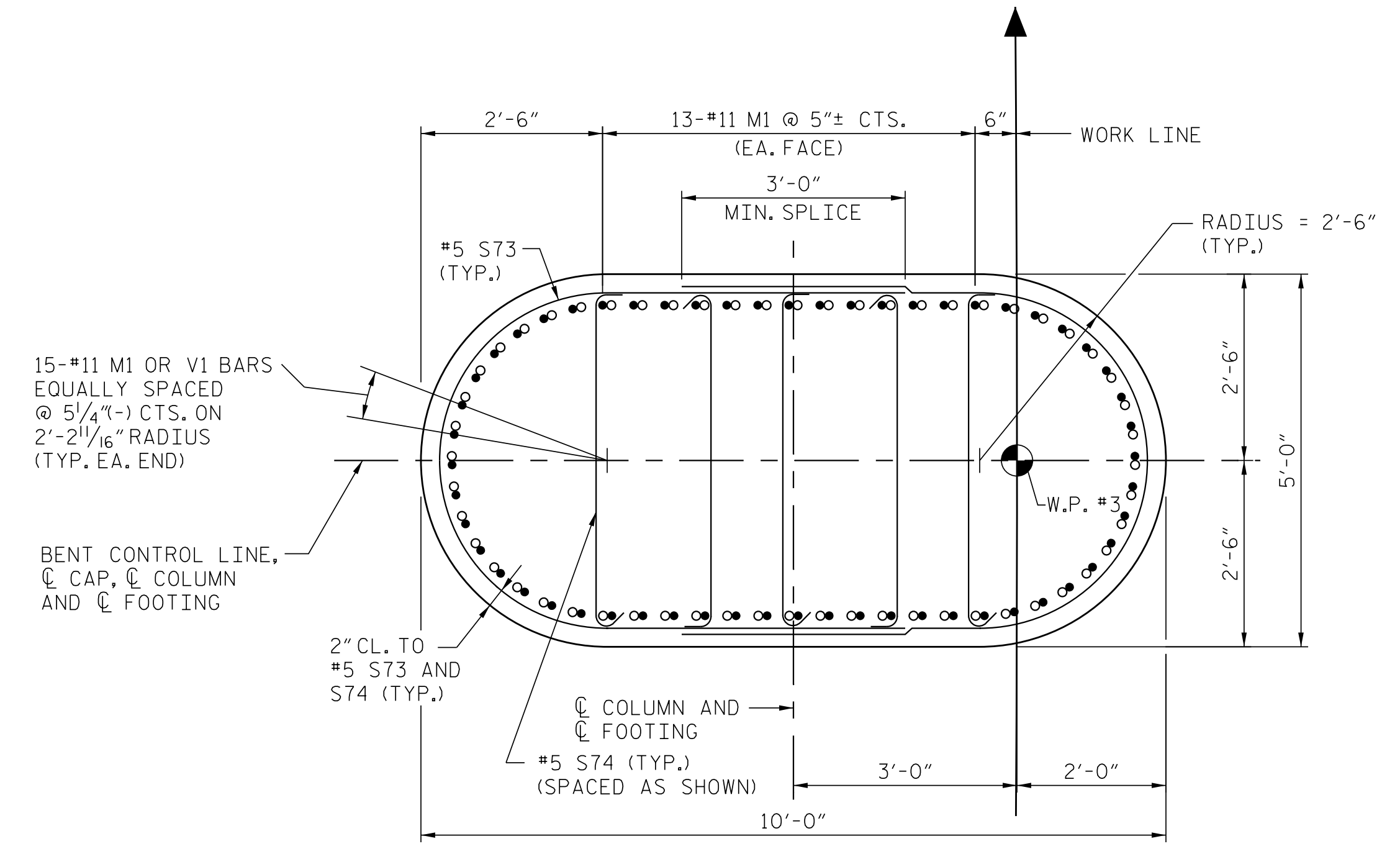
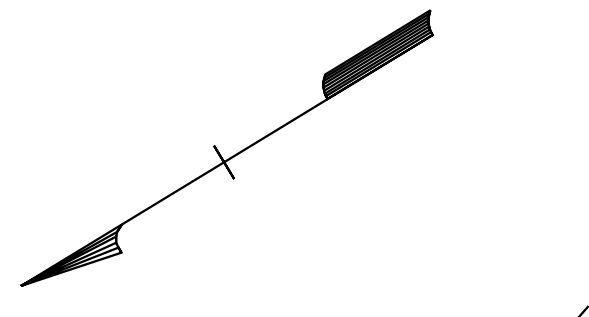
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DATE: 4/12/2017
TIME: 5:24:40 PM

USER: Proj1606
DGN: R:\6329444_5\ncm_Road\400_Technical\408_Structure\Cada\401_205_S41_R5516_5M\LB202.dgn



FOOTING PLAN



SECTION A-A

- = M1 BAR
- = V1 BAR

DRAWN BY :	SGS	DATE :	2/16
CHECKED BY :	JCM	DATE :	2/16
DESIGN E.O.R.:	JCM	DATE :	2/16

DOCUMENT NOT CONSIDERED
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4/12/2017

NORTH CAROLINA
PROFESSIONAL
SEAL
030474
ENGINEER
JOHN C. MORRISON

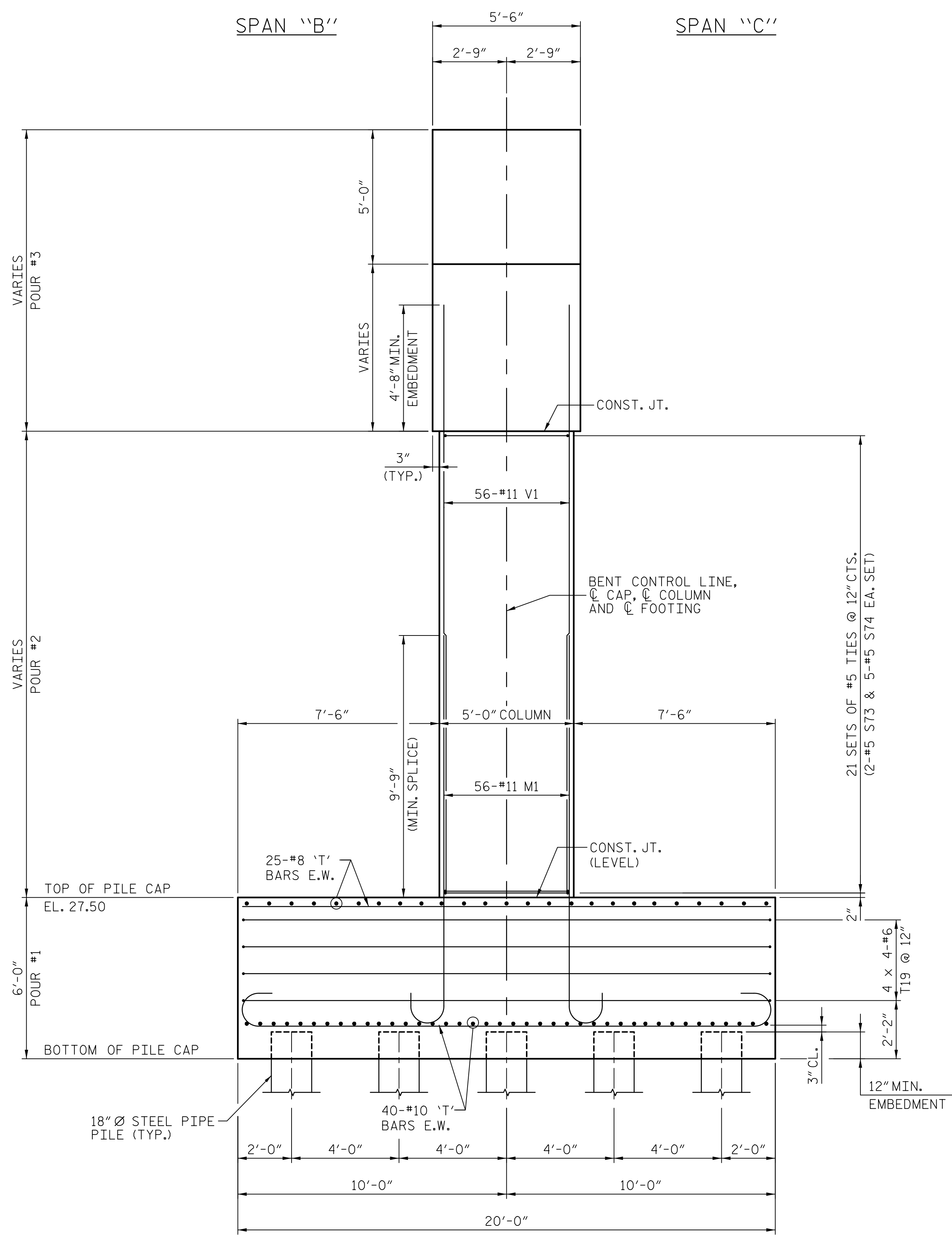
DocuSigned by
John C. Morrison
A2FDE142C82F4A8

PROJECT NO. R-5516
CRAVEN COUNTY
STATION: 32+25.84 -YEB01-
75+13.29 -L-
SHEET 2 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
BENT 2 SECTIONS AND DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-41					TOTAL SHEETS 51

DATE: 4/7/2017
TIME: 4:52:40 PM

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END VIEW

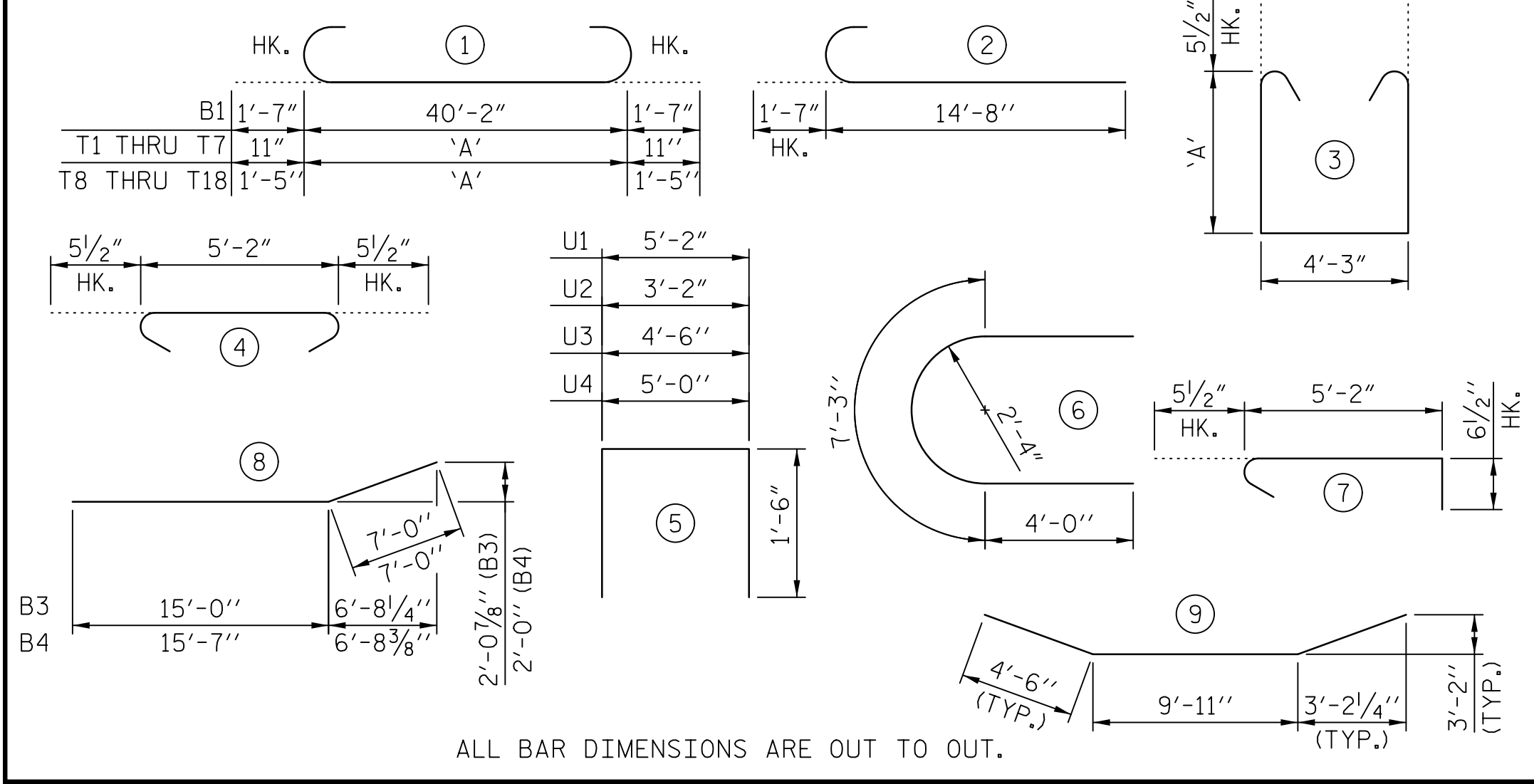
DRAWN BY : SGS DATE : 4/17
 CHECKED BY : JCM DATE : 4/17
 DESIGN E.O.R. : JCM DATE : 4/17

BILL OF MATERIAL

BENT 2

BAR NO.	SIZE	TYPE	DIM. 'A'	LENGTH	WEIGHT	BAR NO.	SIZE	TYPE	DIM. 'A'	LENGTH	WEIGHT	BAR NO.	SIZE	TYPE	DIM. 'A'	LENGTH	WEIGHT			
B1	10	11	1	-	43' 4"	2302	S28	2	5	3	8' - 2"	21' 6"	45	S68	2	5	3	5' - 1"	15' 4"	32
B2	10	11	STR	-	40' 3"	2138	S29	2	5	3	8' - 4"	21' 10"	46	S69	2	5	3	4' - 11"	15' 0"	31
B3	8	9	8	-	22' 0"	598	S30	2	5	3	8' - 5"	22' 0"	46	S70	2	5	3	4' - 10"	14' 10"	31
B4	8	9	8	-	22' 7"	614	S31	2	5	3	8' - 7"	22' 4"	47	S71	2	5	3	4' - 8"	14' 6"	30
B5	8	8	STR	-	40' 3"	860	S32	2	5	3	8' - 8"	22' 6"	47	S72	81	5	4	-	5' 9"	486
B6	2	8	STR	-	34' 5"	184	S33	2	5	3	8' - 10"	22' 10"	48	S73	42	5	6	-	15' 3"	668
B7	2	8	STR	-	27' 10"	149	S34	2	5	3	8' - 11"	23' 0"	48	S74	105	5	7	-	6' 2"	675
B8	2	8	STR	-	21' 3"	113	S35	2	5	3	9' - 1"	23' 4"	49	T1	26	8	1	19' - 6"	21' 4"	1481
B9	2	8	STR	-	14' 8"	78	S36	22	5	3	9' - 2"	23' 6"	539	T2	4	8	1	9' - 11"	11' 9"	125
B10	11	4	STR	-	5' 2"	38	S37	2	5	3	9' - 1"	23' 4"	49	T3	4	8	1	11' - 8"	13' 6"	144
M1	56	11	2	-	16' 3"	4835	S38	2	5	3	9' - 0"	23' 2"	48	T4	4	8	1	13' - 6"	15' 4"	164
S1	2	5	3	4' - 8"	14' 6"	30	S40	2	5	3	8' - 8"	22' 6"	47	T5	4	8	1	15' - 4"	17' 2"	183
S2	2	5	3	4' - 10"	14' 10"	31	S41	2	5	3	8' - 7"	22' 4"	47	T6	4	8	1	17' - 2"	19' 0"	203
S3	2	5	3	4' - 11"	15' 0"	31	S42	2	5	3	8' - 5"	22' 0"	46	T7	4	8	1	18' - 11"	20' 9"	222
S4	2	5	3	5' - 1"	15' 4"	32	S43	2	5	3	8' - 4"	21' 10"	46	T8	40	10	1	19' - 6"	22' 4"	3844
S5	2	5	3	5' - 2"	15' 6"	32	S44	2	5	3	8' - 2"	21' 6"	45	T9	4	10	1	9' - 11"	12' 9"	219
S6	2	5	3	5' - 4"	15' 10"	33	S45	2	5	3	8' - 0"	21' 2"	44	T10	4	10	1	10' - 11"	13' 9"	237
S7	2	5	3	5' - 5"	16' 0"	33	S46	2	5	3	7' - 11"	21' 0"	44	T11	4	10	1	11' - 11"	14' 9"	254
S8	2	5	3	5' - 7"	16' 4"	34	S47	2	5	3	7' - 9"	20' 8"	43	T12	4	10	1	12' - 11"	15' 9"	271
S9	2	5	3	5' - 8"	16' 6"	34	S48	2	5	3	7' - 8"	20' 6"	43	T13	4	10	1	13' - 11"	16' 9"	288
S10	2	5	3	5' - 10"	16' 10"	35	S49	2	5	3	7' - 6"	20' 2"	42	T14	4	10	1	14' - 11"	17' 9"	306
S11	2	5	3	6' - 0"	17' 2"	36	S50	2	5	3	7' - 5"	20' 0"	42	T15	4	10	1	15' - 11"	18' 9"	323
S12	2	5	3	6' - 1"	17' 4"	36	S51	2	5	3	7' - 3"	19' 8"	41	T16	4	10	1	16' - 11"	19' 9"	340
S13	2	5	3	6' - 3"	17' 8"	37	S52	2	5	3	7' - 2"	19' 6"	41	T17	4	10	1	17' - 11"	20' 9"	357
S14	2	5	3	6' - 4"	17' 10"	37	S53	2	5	3	7' - 0"	19' 2"	40	T18	4	10	1	18' - 11"	21' 9"	374
S15	2	5	3	6' - 6"	18' 2"	38	S54	2	5	3	6' - 10"	18' 10"	39	T19	16	6	9	-	18' 11"	455
S16	2	5	3	6' - 8"	18' 6"	39	S55	2	5	3	6' - 9"	18' 8"	39	U1	35	4	5	-	8' 2"	191
S17	2	5	3	6' - 9"	18' 8"	39	S56	2	5	3	6' - 7"	18' 4"	38	U2	45	4	5	-	6' 2"	185
S18	2	5	3	6' - 10"	18' 10"	39	S57	2	5	3	6' - 6"	18' 2"	38	U3	12	4	5	-	7' 6"	60
S19	2	5	3	7' - 0"	19' 2"	40	S58	2	5	3	6' - 4"	17' 10"	37	U4	10	4	5	-	8' 0"	53
S20	2	5	3	7' - 2"	19' 6"	41	S59	2	5	3	6' - 3"	17' 8"	37	V1	56	11	STR	-	21' 9"	6471
S21	2	5	3	7' - 3"	19' 8"	41	S60	2	5	3	6' - 1"	17' 4"	36	TOTAL REINFORCING STEEL LBS. 33790						
S22	2	5	3	7' - 4"	19' 10"	41	S61	2	5	3	6' - 0"	17' 2"	36	BENT 2 TOTAL QUANTITIES						
S23	2	5	3	7' - 6"	20' 2"	42	S62	2	5	3	5' - 10"	16' 10"	35	CLASS A CONCRETE						
S24	2	5	3	7' - 8"	20' 6"	43	S63	2	5	3	5' - 9"	16' 8"	35	POUR 1 (FOOTING) C.Y. 77.8						
S25	2	5	3	7' - 9"	20' 8"	43	S64	2	5	3	5' - 7"	16' 4"	34	POUR 2 (COLUMN) C.Y. 33.7						
S26	2	5	3	7' - 11"	21' 0"	44	S65	2	5	3	5' - 5"	16' 0"	33	POUR 3 (CAP) C.Y. 65.7						
S27	2	5	3	8' - 0"	21' 2"	44	S66	2	5	3	5' - 4"	15' 10"	33	TOTAL C.Y. 177.2						
							S67	2	5	3	5' - 2"	15' 6"	32	18" Ø STEEL PIPE PILES NO. 21						
													LIN. FT. 1630							
													PILE REDRIVES EA. 12							
													PILE DRIVING EQUIPMENT SETUP FOR 18" DIA. STEEL PIPE PILES NO. 21							

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT NO. R-5516
 CRAVEN COUNTY
 STATION: 32+25.84 -YEB01-
 75+13.29 -L-
 SHEET 3 OF 3

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4/12/2017
 NORTH CAROLINA PROFESSIONAL SEAL
 030474
 ENGINEER
 JOHN C. MORRISON

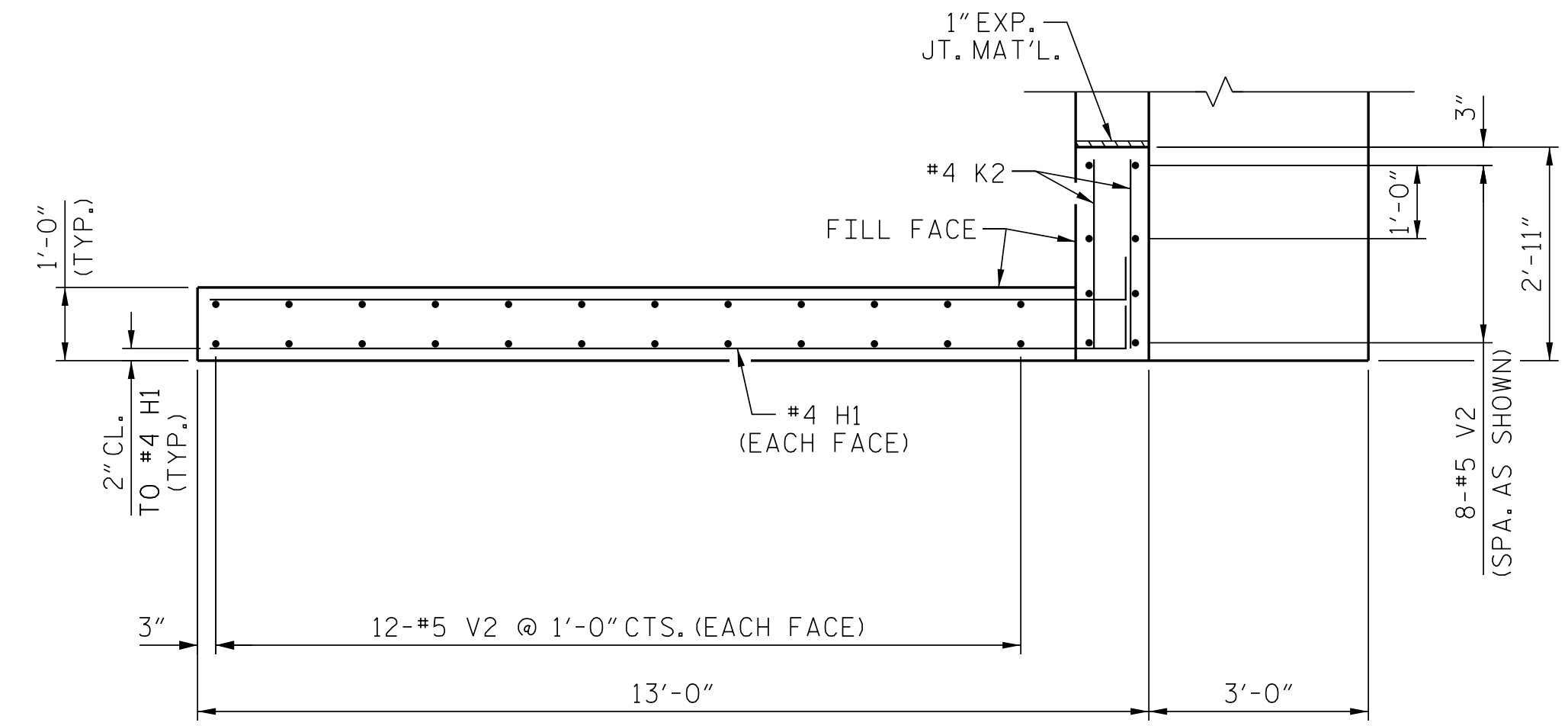
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE

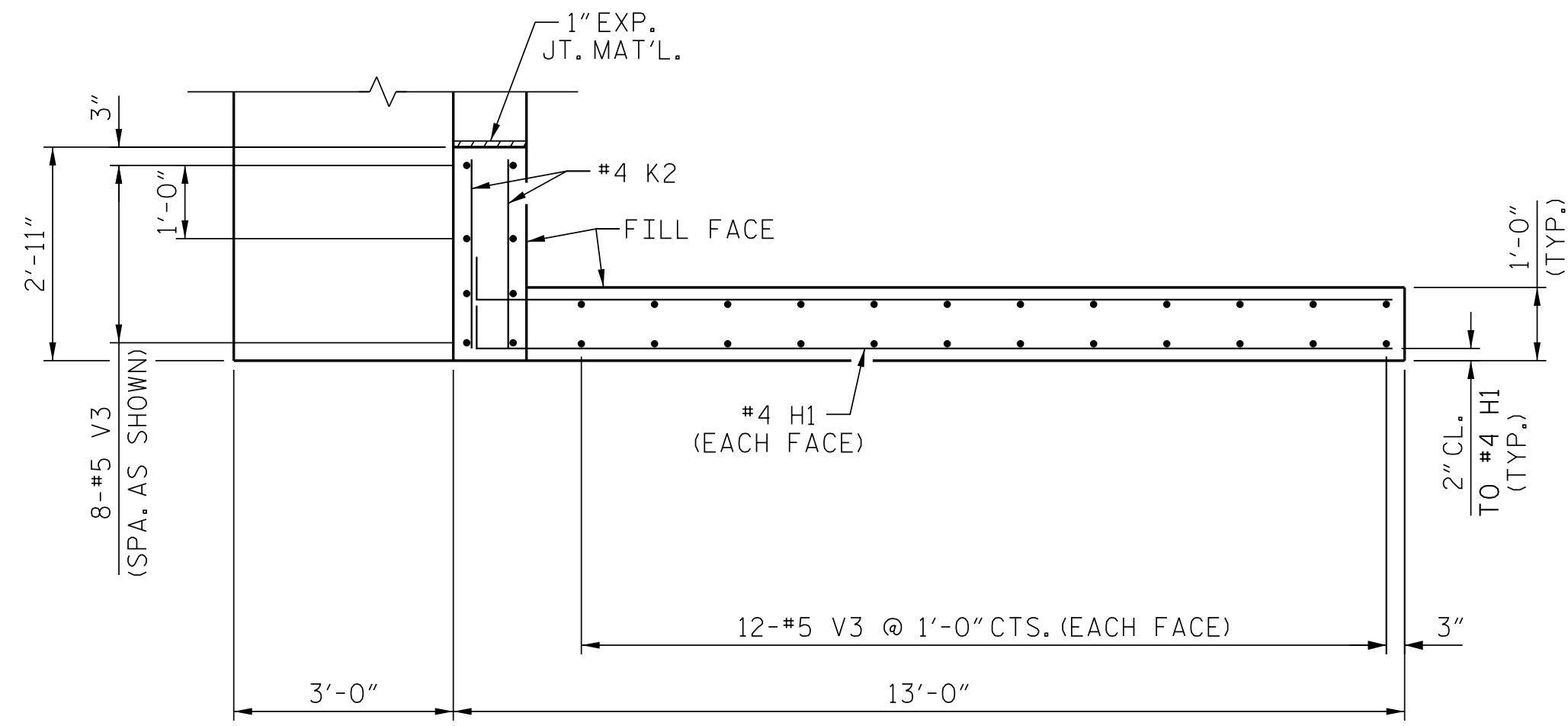
BENT 2
 SECTIONS AND DETAILS

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-42	
1			3			TOTAL SHEETS 51	
2			4				

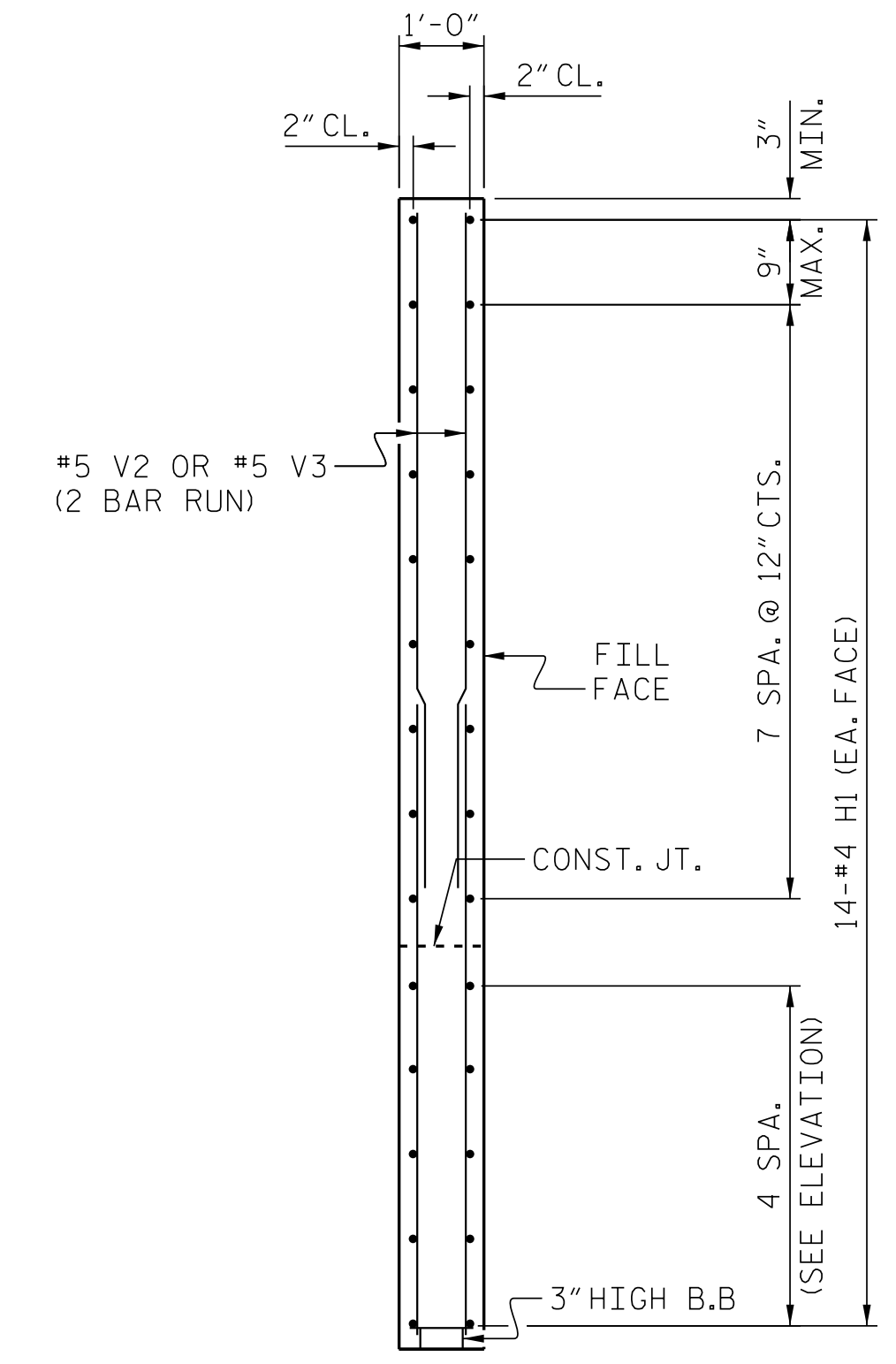
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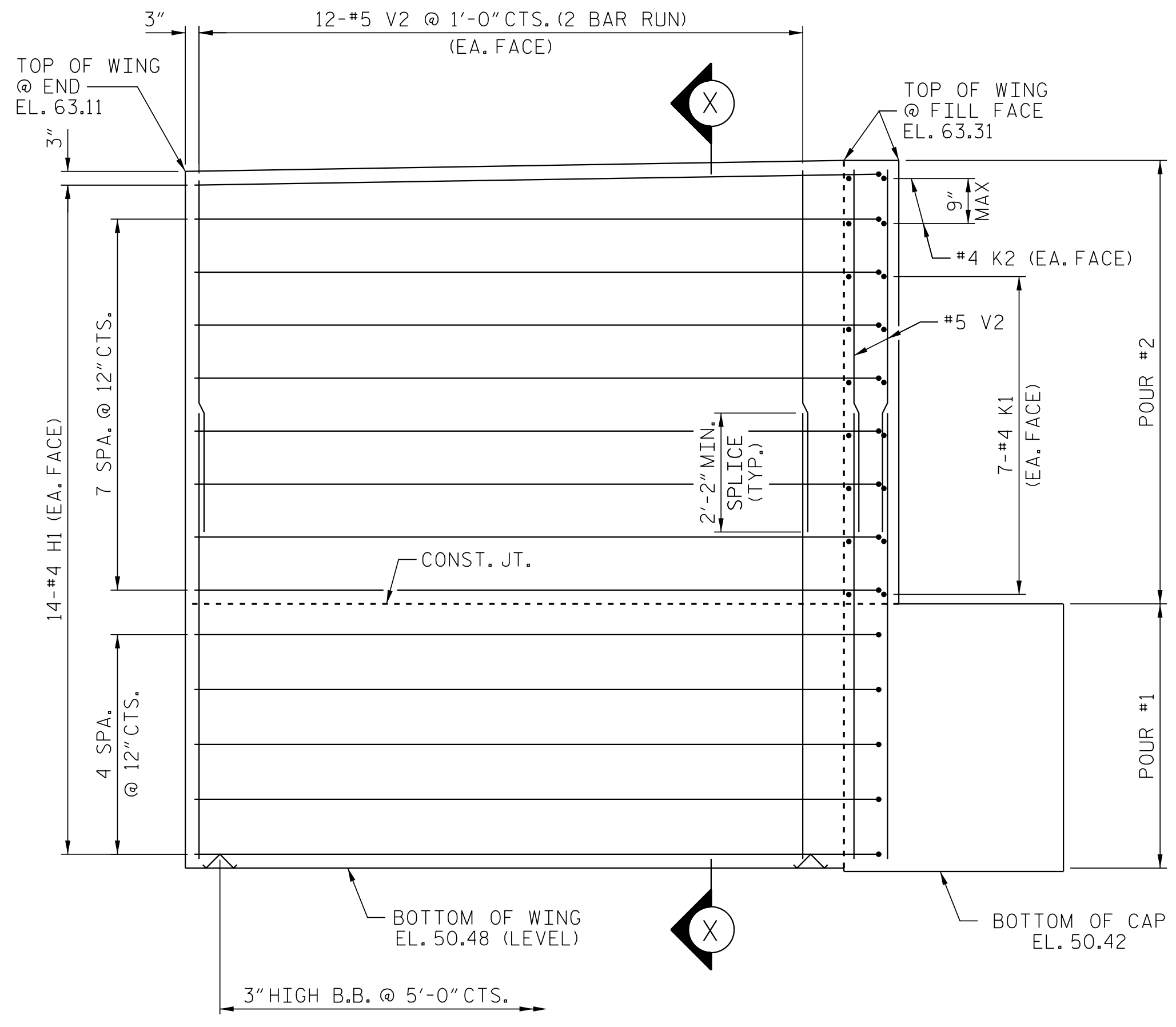
PLAN OF WING (W1)



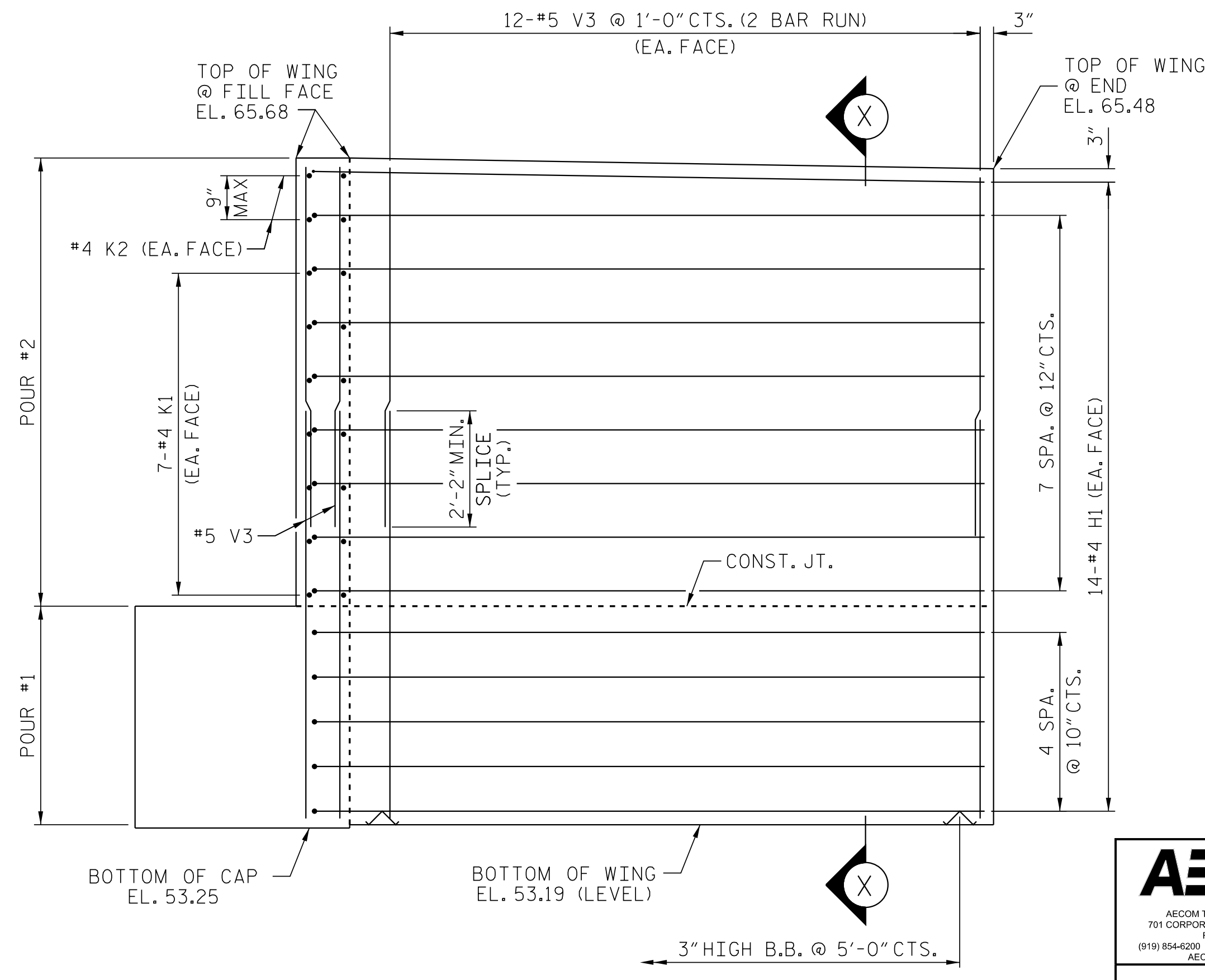
PLAN OF WING (W2)



SECTION X-X

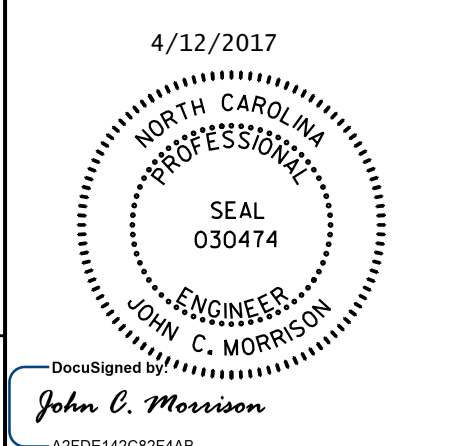


ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

PROJECT NO. R-5516
CRAVEN COUNTY
 STATION: 32+25.84 -YEB01-
75+13.29 -L-
 SHEET 2 OF 3

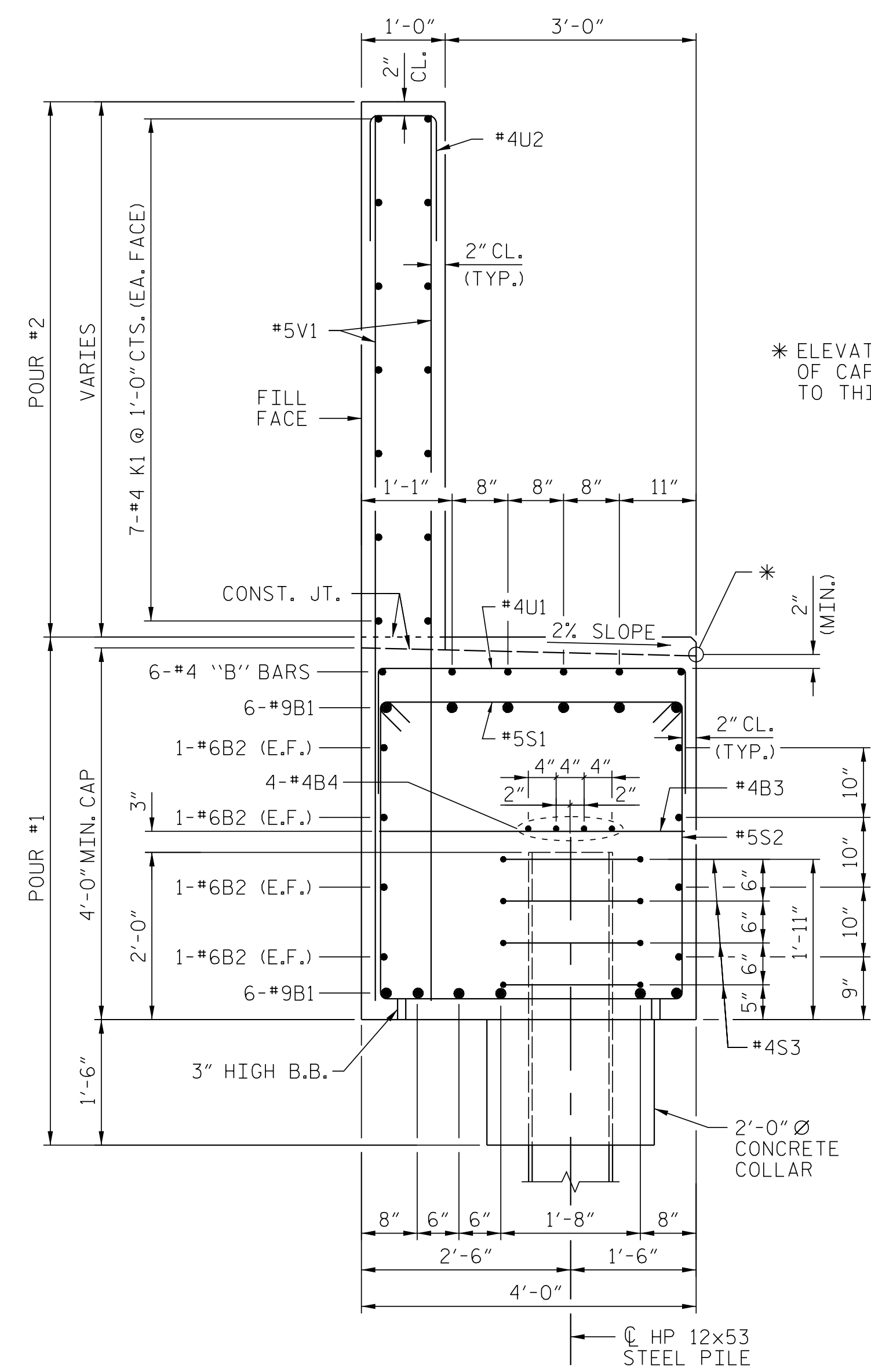


STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
END BENT 2 SECTIONS & DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-44
					TOTAL SHEETS 51

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 CHECKED BY : JCM DATE : 03/16
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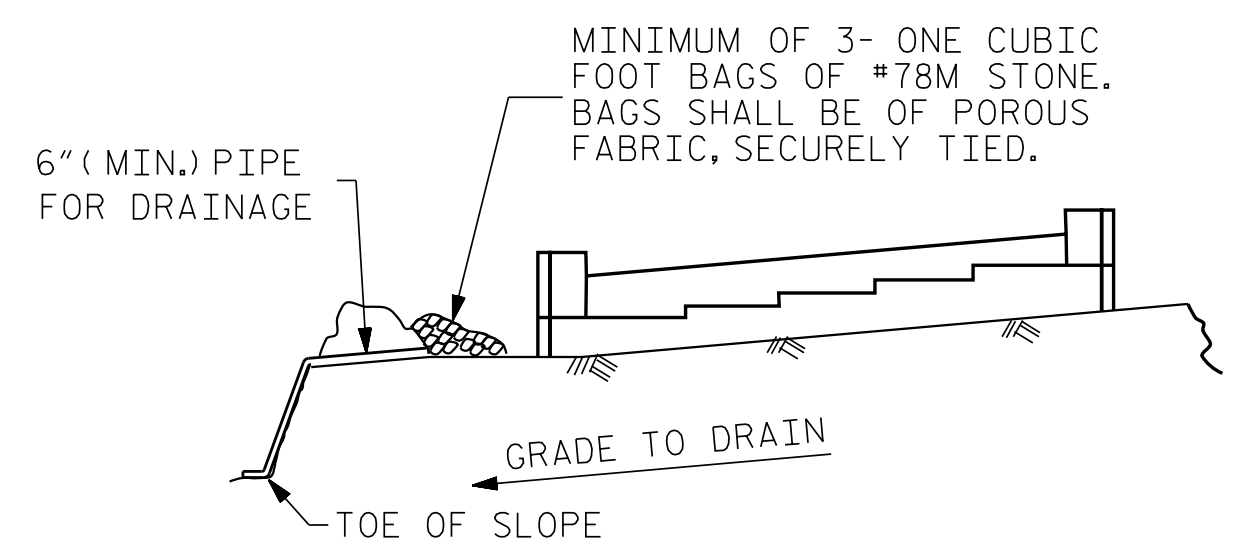


* ELEVATIONS FOR TOP OF CAP ARE SHOWN TO THIS POINT

DATE: 4/11/2017 TIME: 5:47:35 PM

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SECTION "A-A"



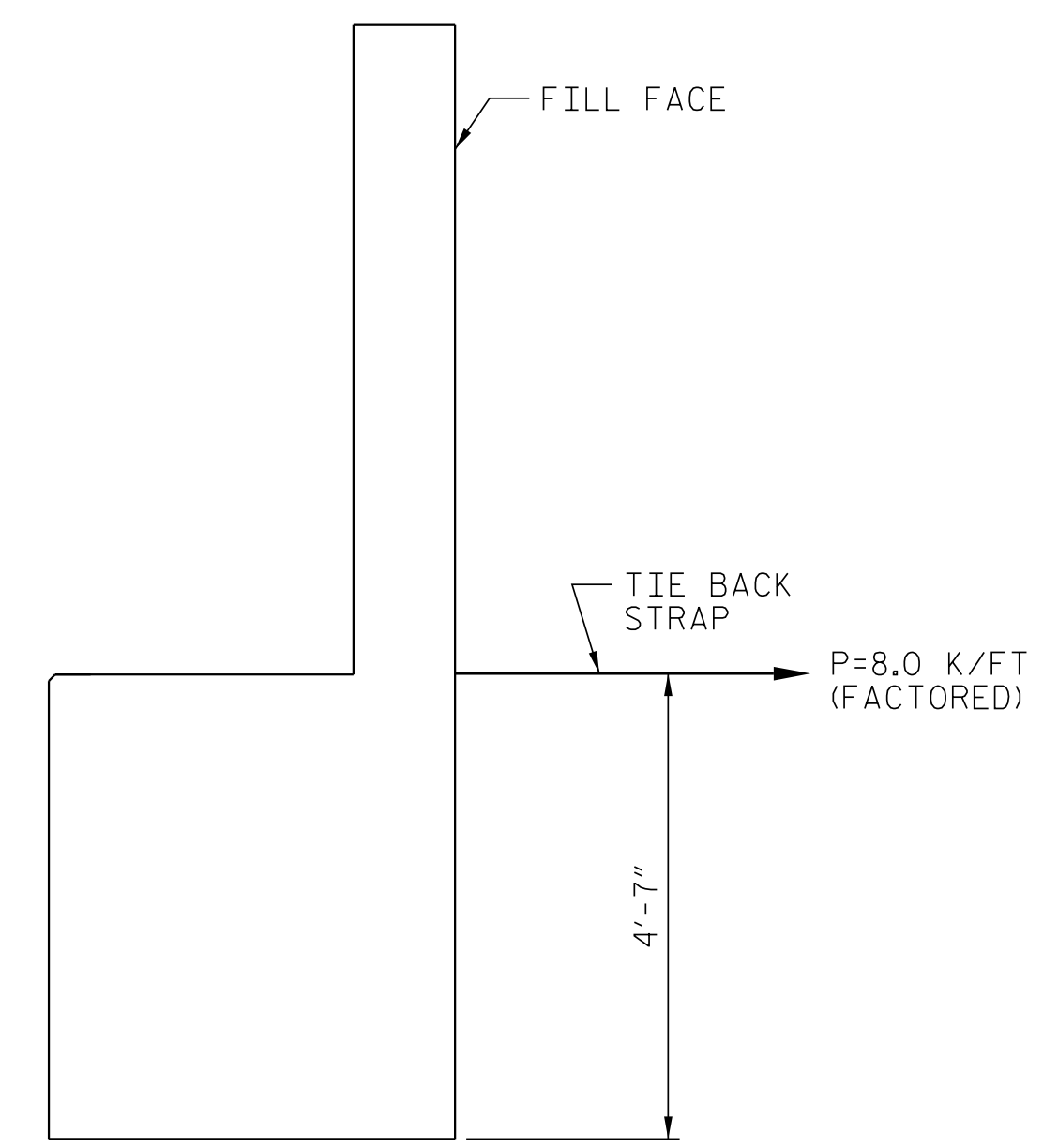
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

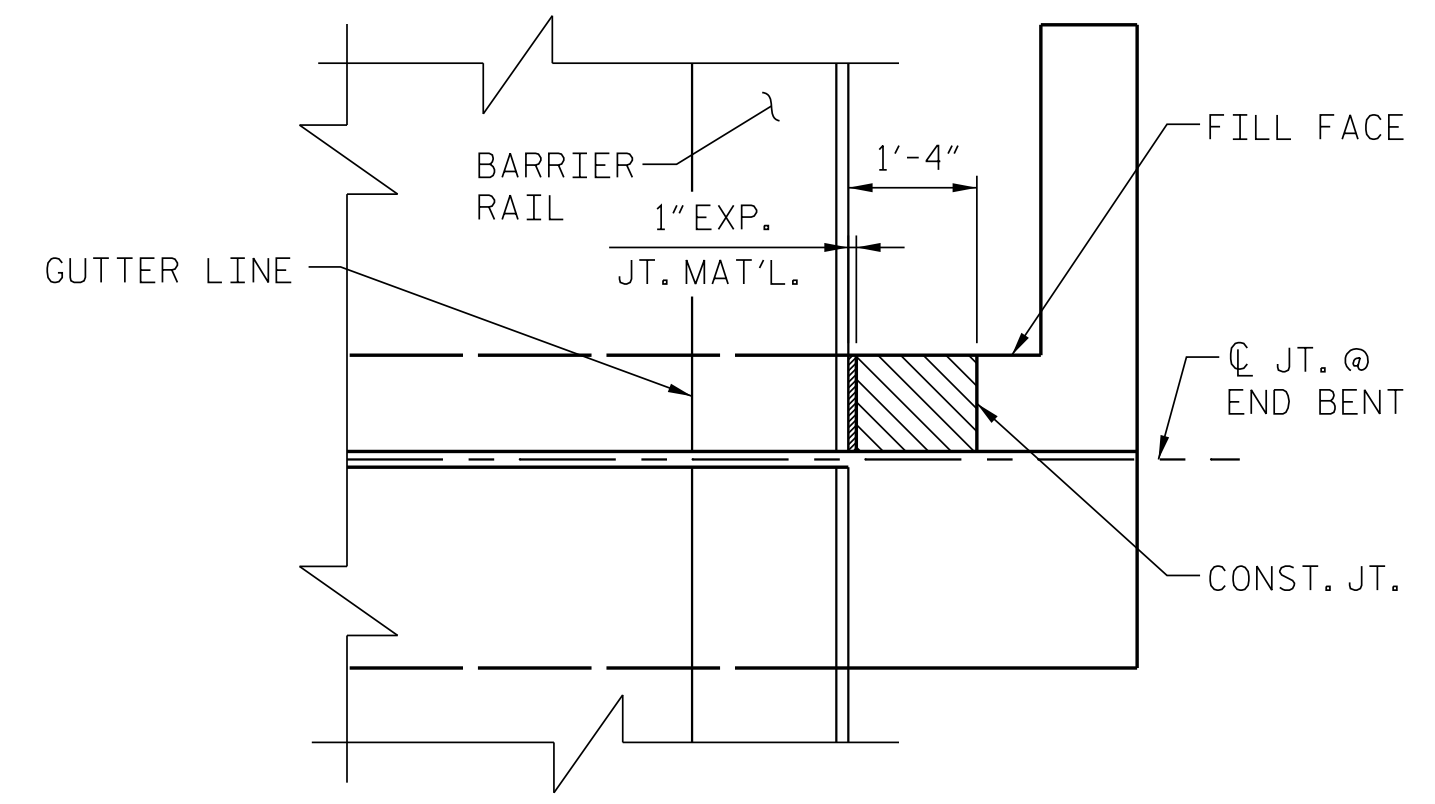
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

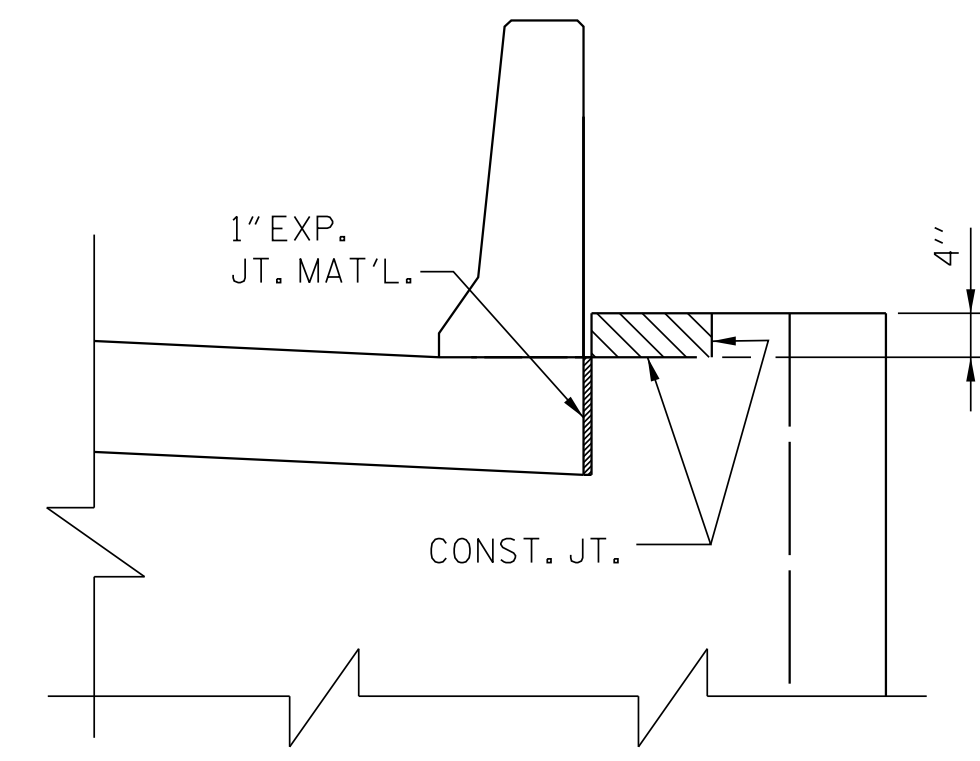
DRAWN BY : MKT DATE : 04/17
 CHECKED BY : JCM DATE : 04/17
 DESIGN E.O.R. : JCM DATE : 04/17



TIE BACK DETAILS
(RESTRAINT FOR END BENT 2)



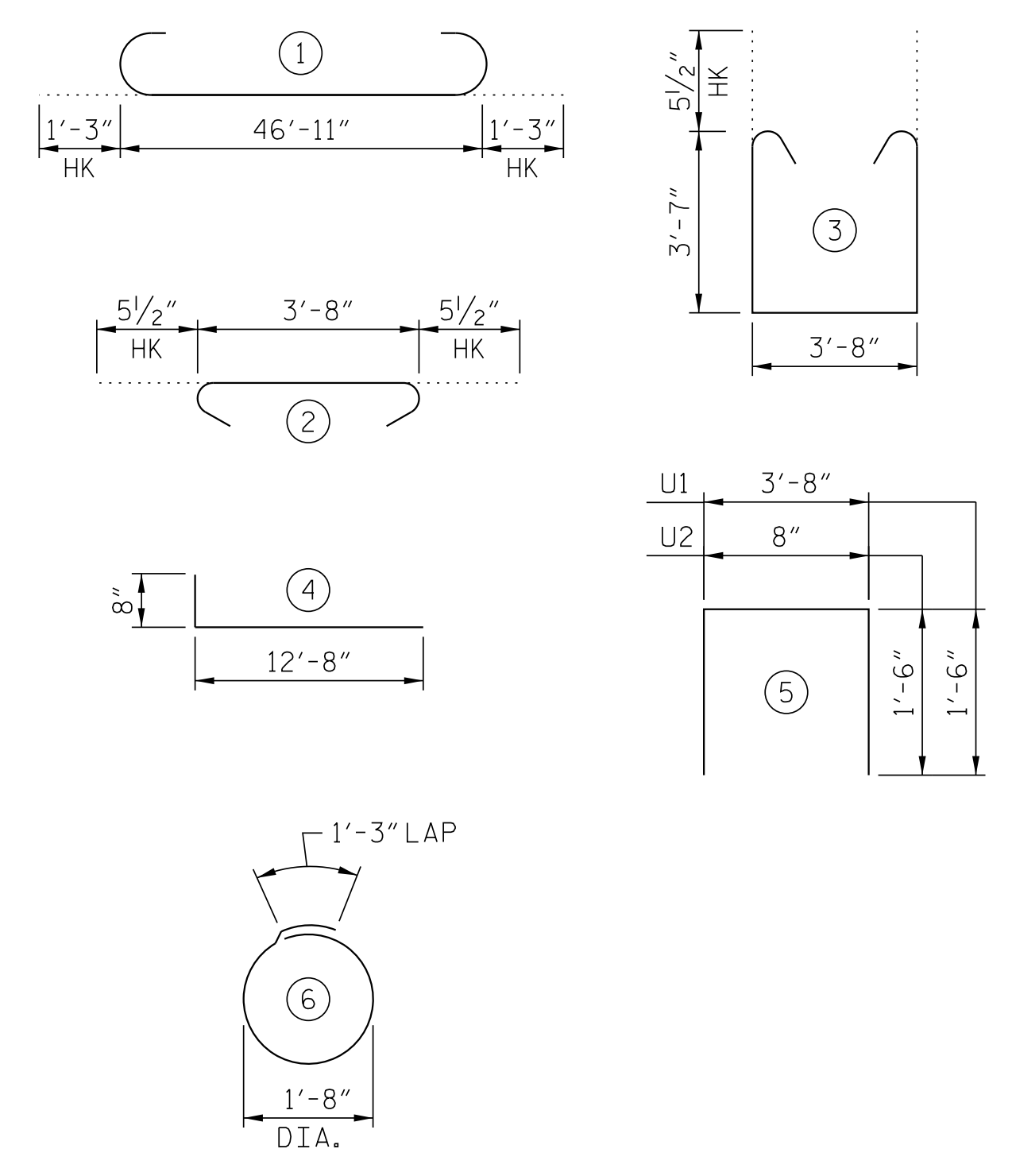
PLAN



ELEVATION

BLOCKOUT IN WINGWALL DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

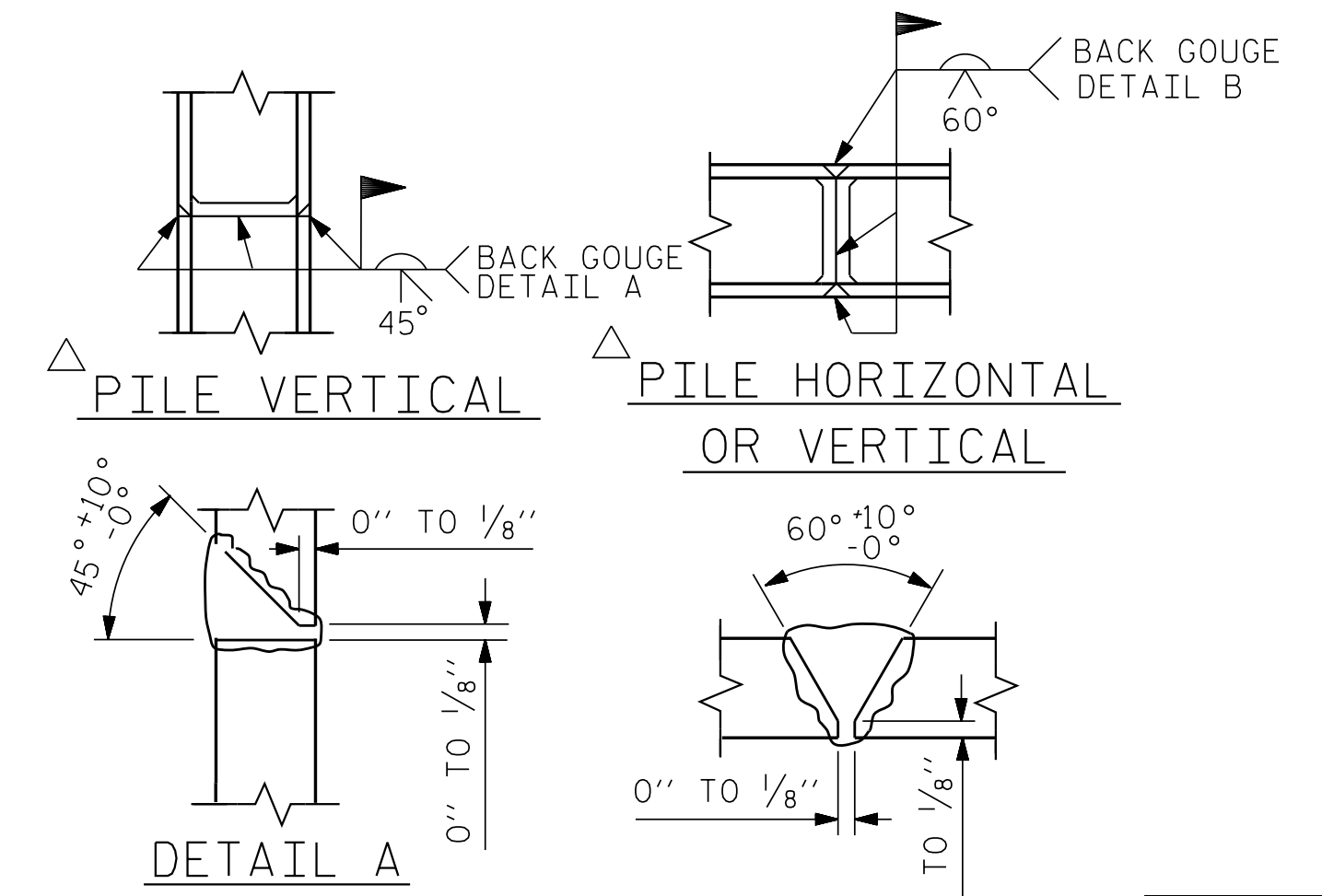
END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#9	①	49'-5"	2016
B2	8	#6	STR	47'-0"	565
B3	12	#4	STR	3'-8"	29
B4	8	#4	STR	24'-9"	132
B5	6	#4	STR	12'-0"	48
B6	24	#4	STR	7'-0"	112
H1	56	#4	④	13'-4"	499
K1	28	#4	STR	24'-9"	463
K2	8	#4	STR	2'-7"	14
S1	58	#5	②	4'-7"	277
S2	58	#5	③	11'-9"	711
S3	36	#4	⑥	6'-6"	156
U1	28	#4	⑤	6'-8"	125
U2	41	#4	⑤	3'-8"	100
V1	82	#5	STR	10'-11"	934
V2	64	#5	STR	7'-5"	495
V3	64	#5	STR	7'-2"	478

TOTAL REINFORCING STEEL LBS. 7154

END BENT 2 TOTAL QUANTITIES

CLASS A CONCRETE	
POUR 1 (COLLARS, CAP & LOWER WING) C.Y.	36.0
POUR 2 (BACKWALL & UPPER WING) C.Y.	19.1
TOTAL C.Y.	55.1
HP 12x53 STEEL PILES NO.	9
PIPE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES LIN. FT.	990
	NO. 12



PILE SPLICE DETAILS

POSITION OF PILE DURING WELDING.

PROJECT NO. R-5516
 CRAVEN COUNTY
 STATION: 32+25.84 -YEB01-
 75+13.29 -L-
 SHEET 3 OF 3

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4/12/2017

NORTH CAROLINA PROFESSIONAL SEAL 030474
 JOHN C. MORRISON
 ENGINEER

DocuSign by John C. Morrison
 A2FDE142C2F4AB

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

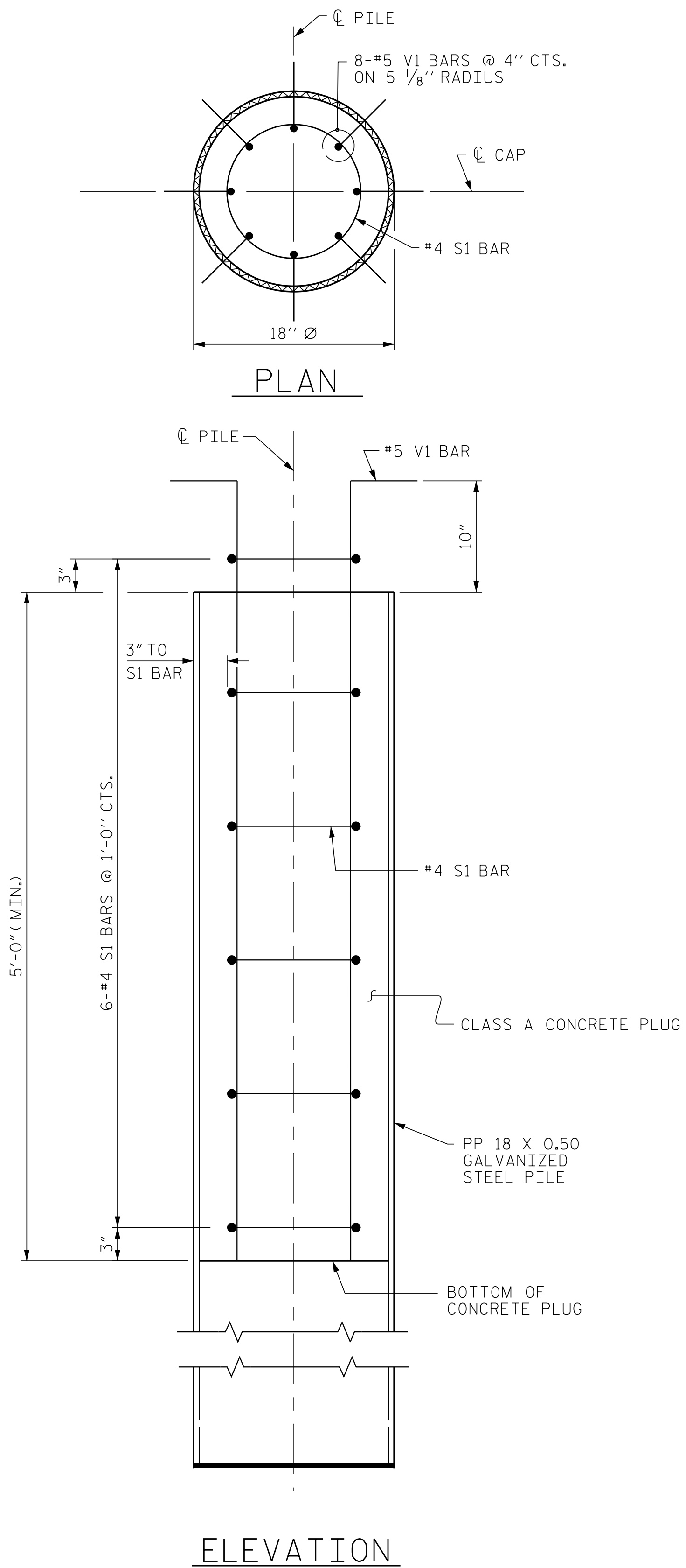
SUBSTRUCTURE

END BENT 2 SECTIONS & DETAILS

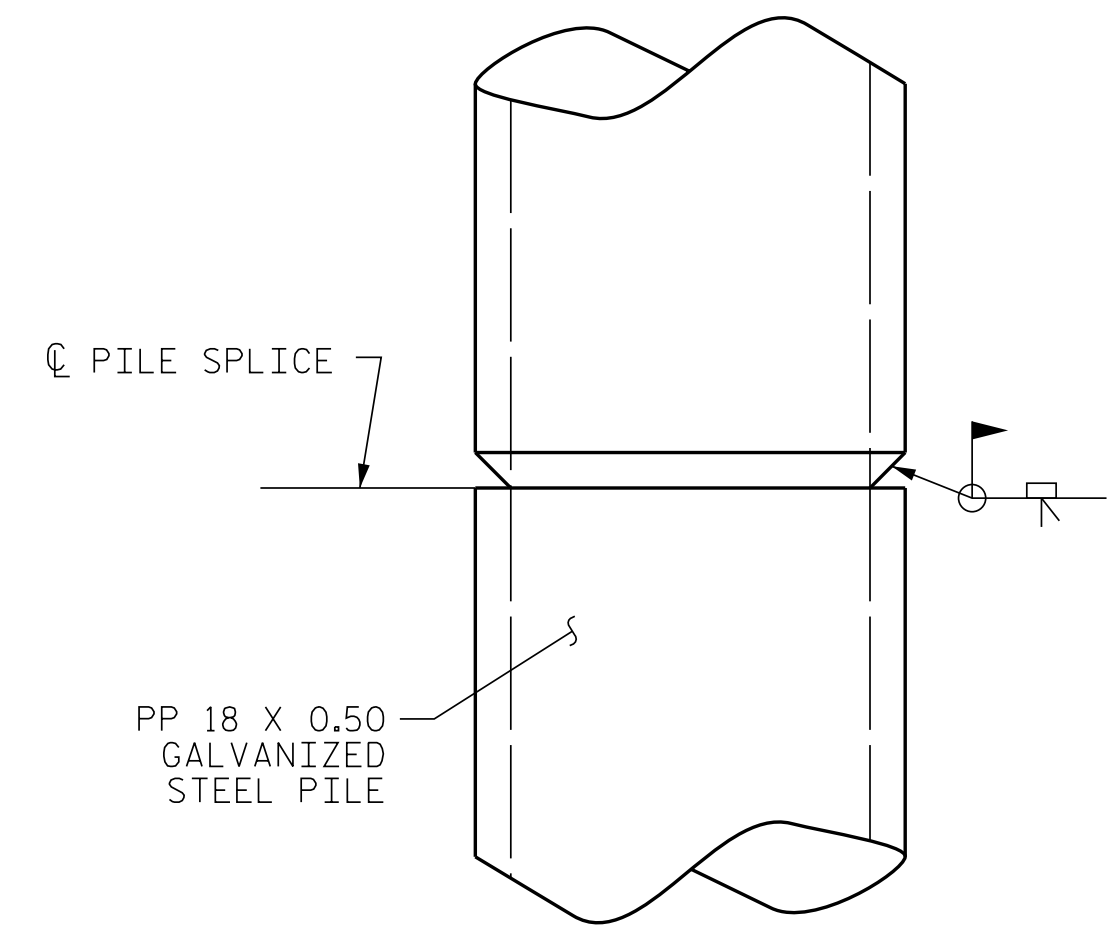
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-45
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 DN: R6632454_Sigum



PP 18 X 0.50 GALVANIZED STEEL PILE
(OPEN END)



PIPE PILE SPLICE DETAIL

NOTES

PIPE PILES SHALL BE IN ACCORDANCE WITH SECTION 1084 OF THE STANDARD SPECIFICATIONS.

SEE GENERAL NOTES AND BENT SHEETS FOR GALVANIZING REQUIREMENTS. GALVANIZE STEEL PIPE PILES IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

PIPE PILE PLATES, IF REQUIRED, SHALL BE IN ACCORDANCE WITH SECTION 450 OF THE STANDARD SPECIFICATIONS.

REMOVE AND REPLACE OR REPAIR TO THE SATISFACTION OF THE ENGINEER PILES THAT ARE DAMAGED, DEFORMED OR COLLAPSED DURING INSTALLATION OR DRIVING.

PILE SPLICES SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS AND AWS D1.1.

FOR OPEN END PIPE PILES, REMOVE ENOUGH SOIL AND WATER FROM INSIDE THE PILES TO CONSTRUCT THE CONCRETE PLUG WITHOUT FOULING THE CONCRETE.

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

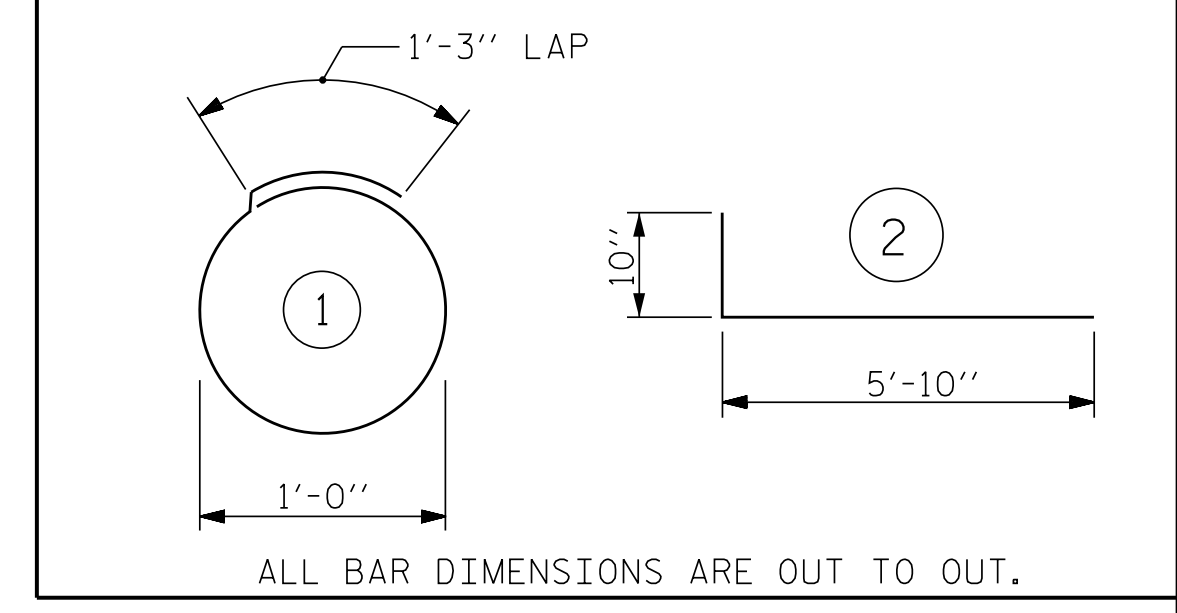
THE REINFORCING STEEL, CLASS A CONCRETE, AND GALVANIZING ARE CONSIDERED INCIDENTAL TO THE CONTRACT UNIT PRICE BID PER LINEAR FOOT FOR PP 18 X 0.50 GALVANIZED STEEL PILES.

BILL OF MATERIAL FOR ONE PP 18 X 0.50 GALVANIZED STEEL PILE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	6	#4	1	4'-5"	18
V1	8	#5	2	6'-8"	56
REINFORCING STEEL =				74	lbs

CLASS A CONCRETE
5'-0" MINIMUM PLUG 0.3 CY

BAR TYPES



PROJECT NO. R-5516
CRAVEN COUNTY
 STATION: 32+25.84 -YEB01-
75+13.29 -L-

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4/12/2017
 NORTH CAROLINA
 PROFESSIONAL
 SEAL
 030474
 ENGINEER
 JOHN C. MORRISON

DocuSigned by:
 John C. Morrison
 A27DE142C82F4AB

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 18" STEEL PIPE PILE

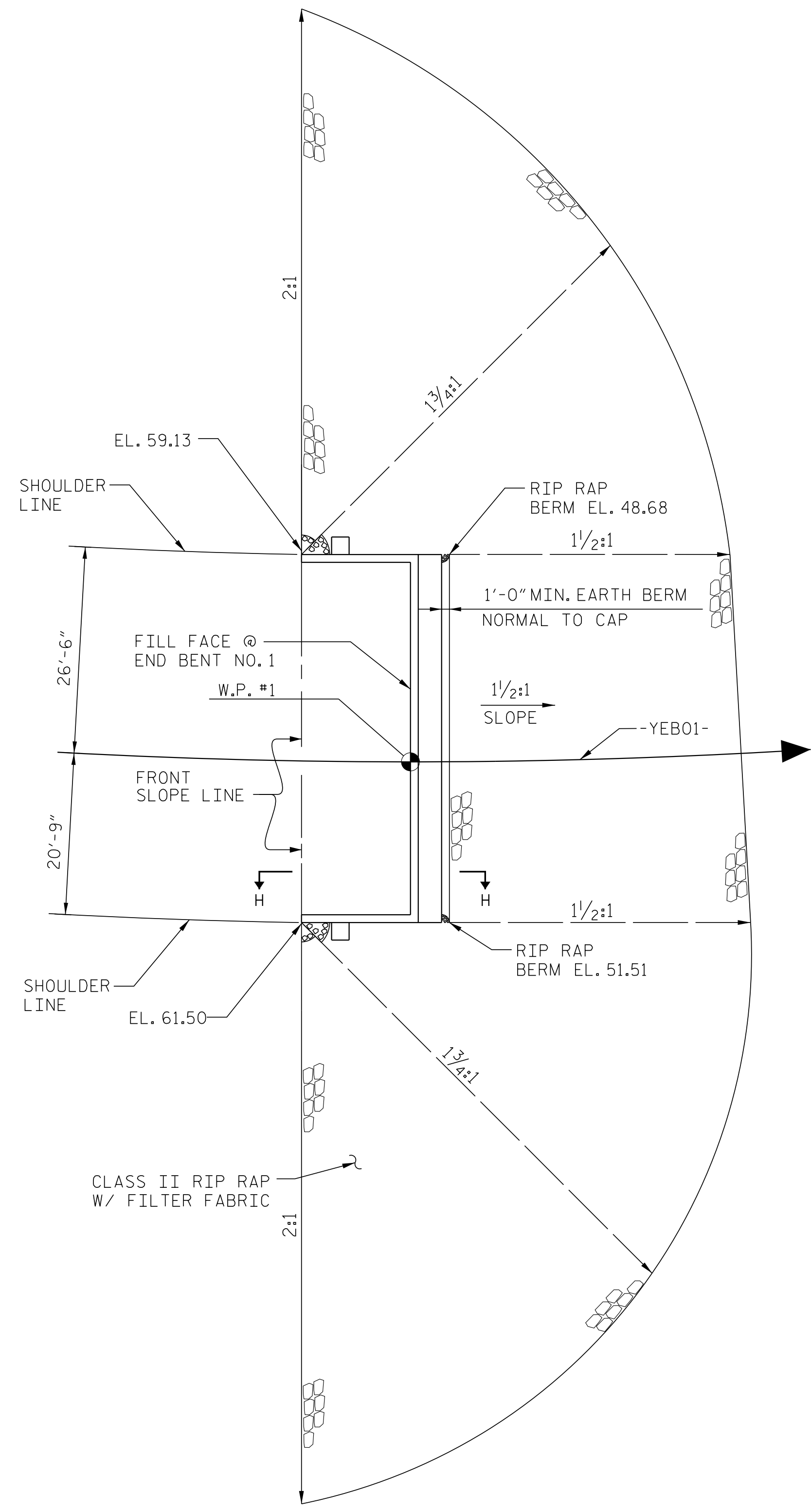
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2			4			

S-46

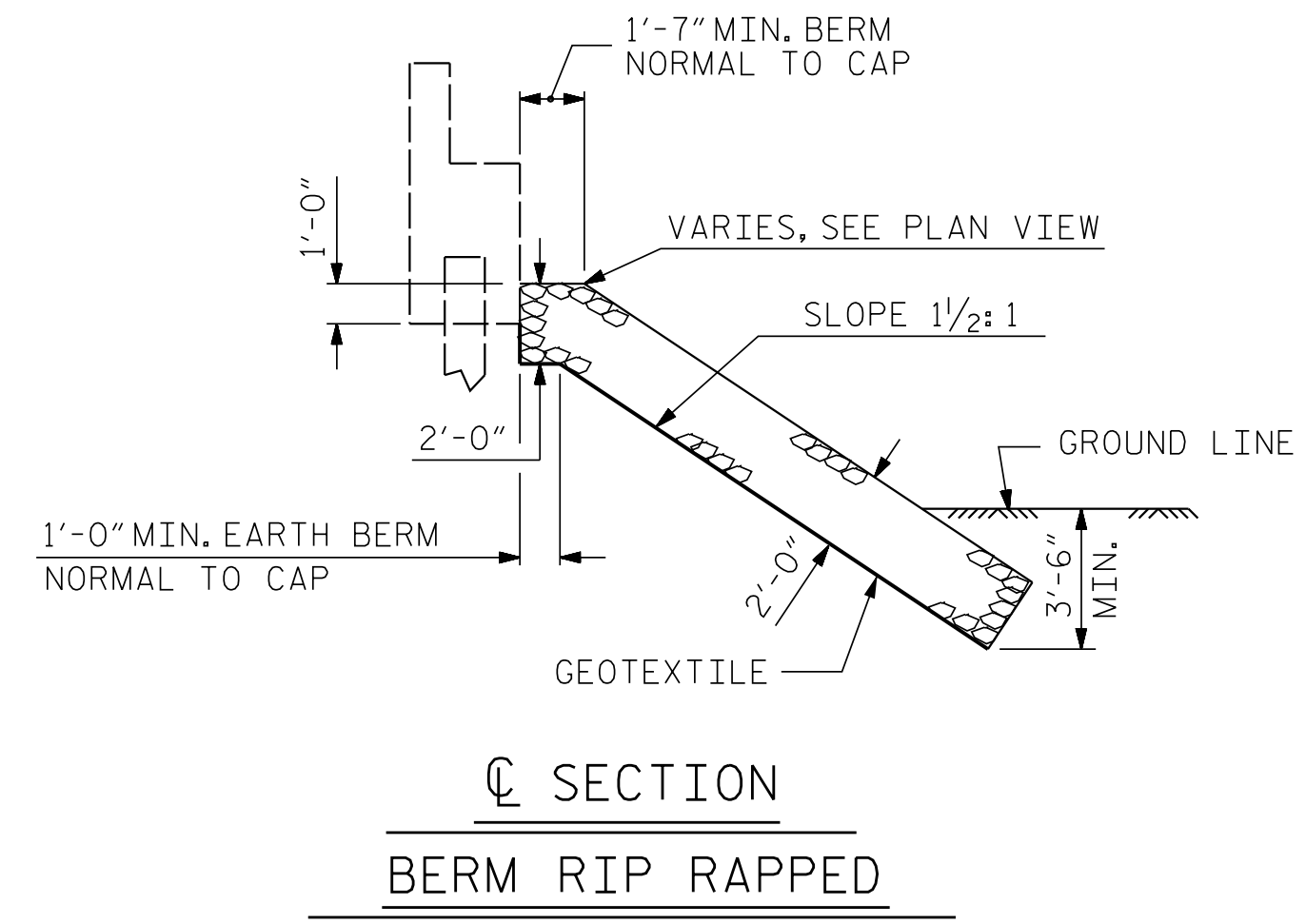
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CHECKED BY : JCM	DATE : 03/16
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CHECKED BY : LES 1/01	REV. 5/1/06R MAA/KMM
	REV. 10/1/11 MAA/GM

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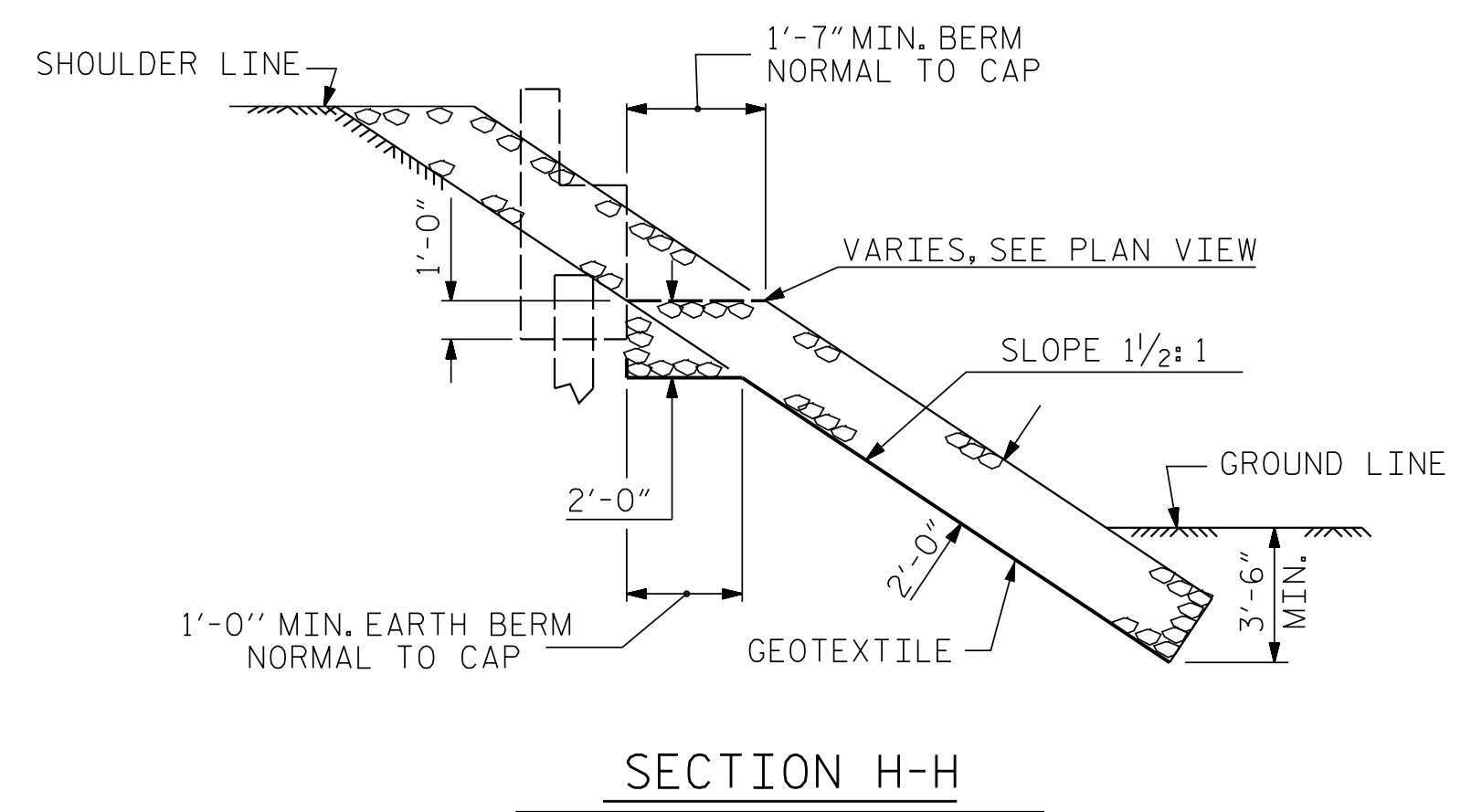
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PLAN @ END BENT 1



SECTION C-C
BERM RIP RAPPED



SECTION H-H

ESTIMATED QUANTITIES		
BRIDGE @ STA. 35+25.84 -YEB01-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	923	1025

PROJECT NO. R-5516
CRAVEN COUNTY
 STATION: 32+25.84 -YEB01-
75+13.29 -L-

ASSEMBLED BY : NKB	DATE : 03/16
CHECKED BY : JCM	DATE : 03/16
DRAWN BY : REK 1/84	REV. 5/1/06R TLA/GM
CHECKED BY : RDU 1/84	REV. 10/1/11 MAA/GM
	REV. 12/21/11 MAA/GM

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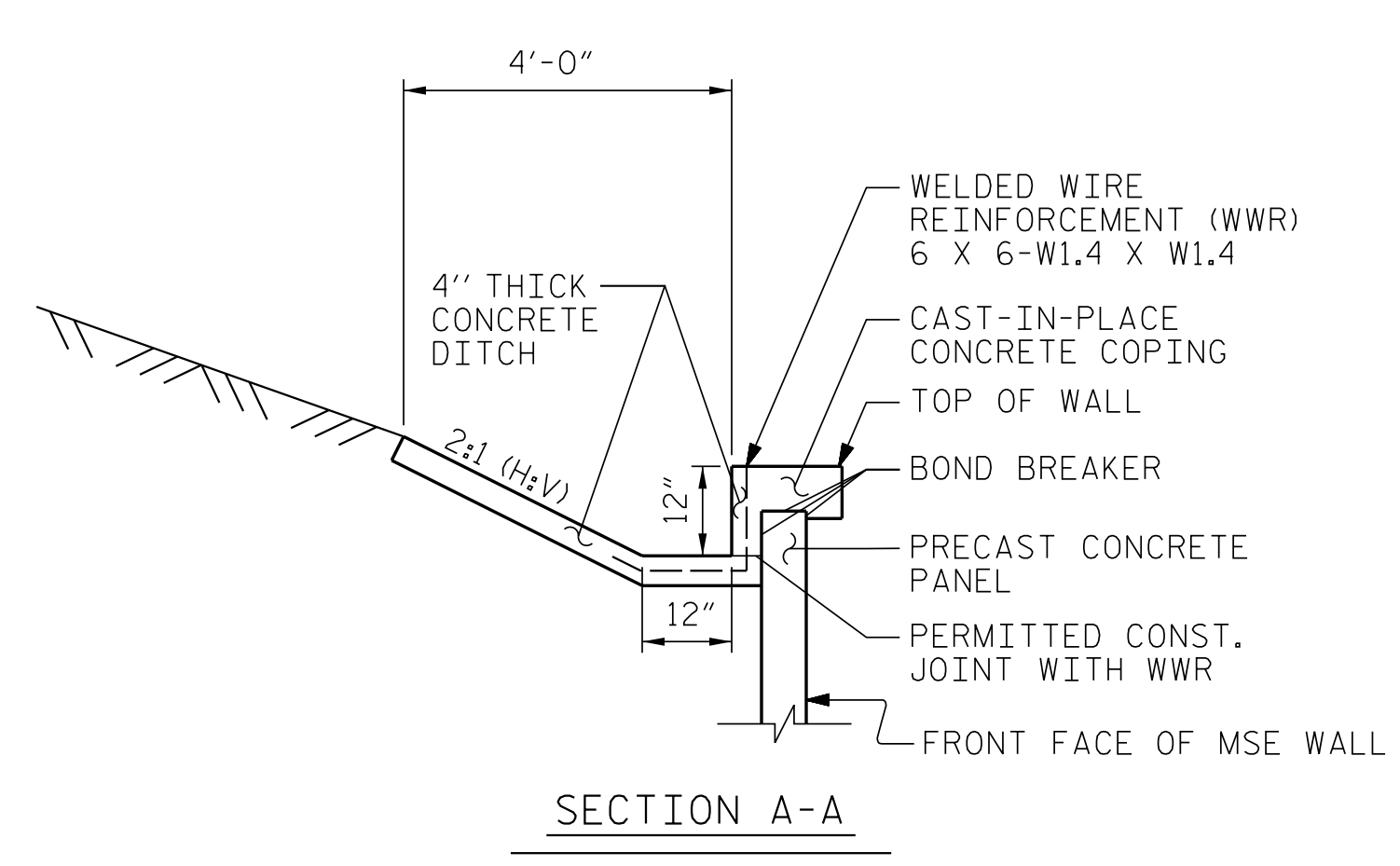
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4/12/2017

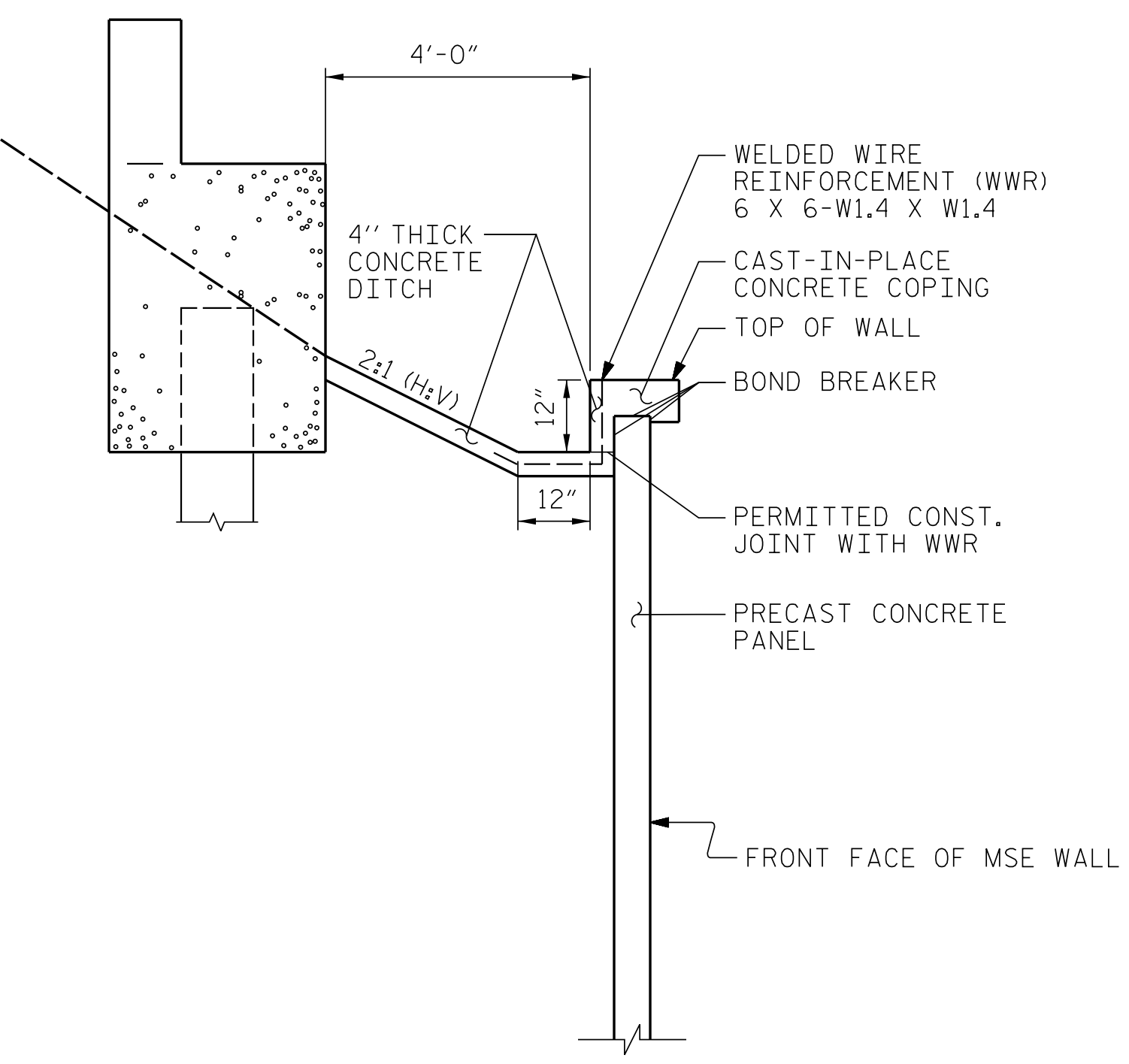
PROFESSIONAL SEAL
 JOHN C. MORRISON
 ENGINEER

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD RIP RAP DETAILS					
REVISIONS					
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1			3		
2			4		
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					TOTAL SHEETS 51

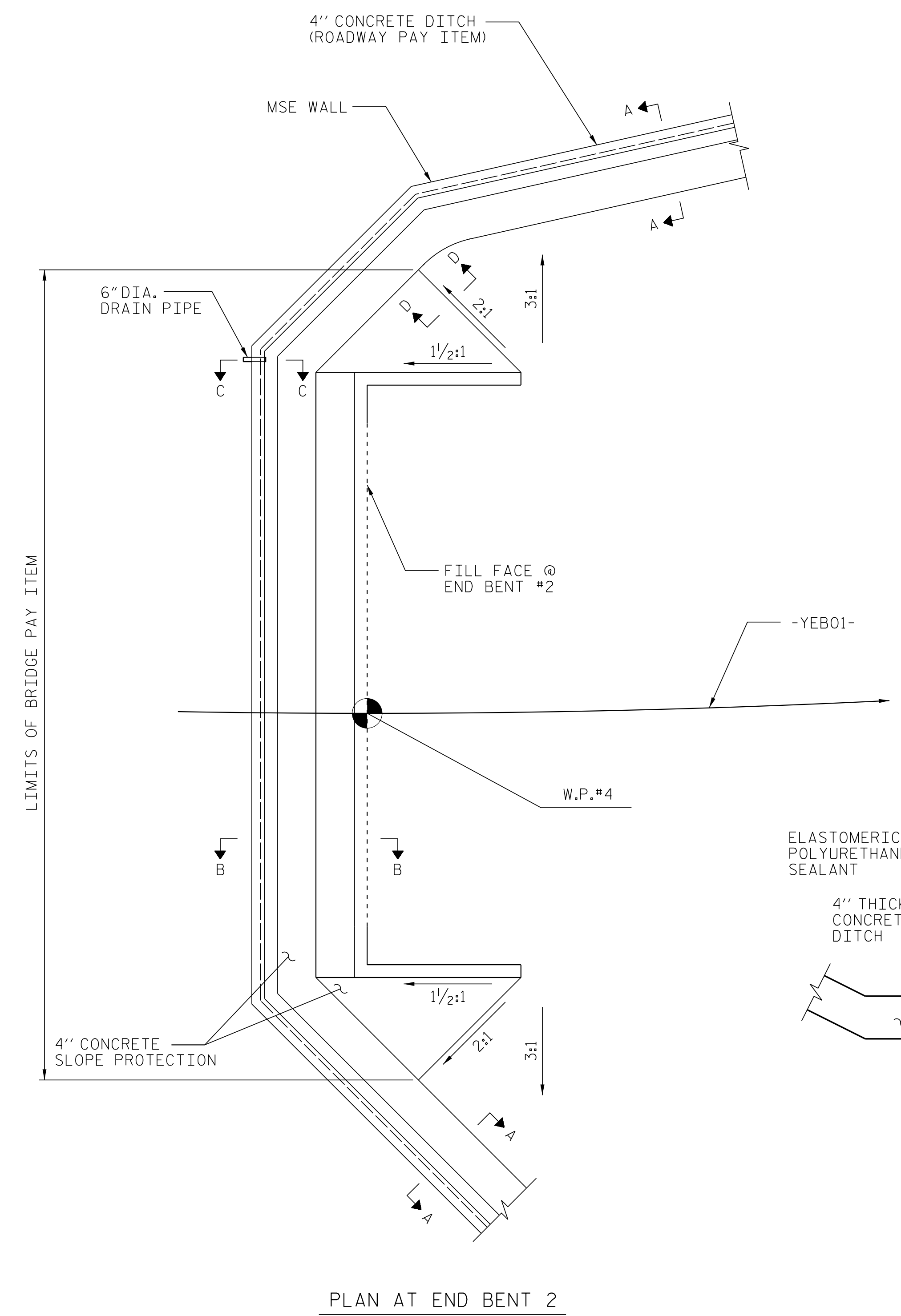
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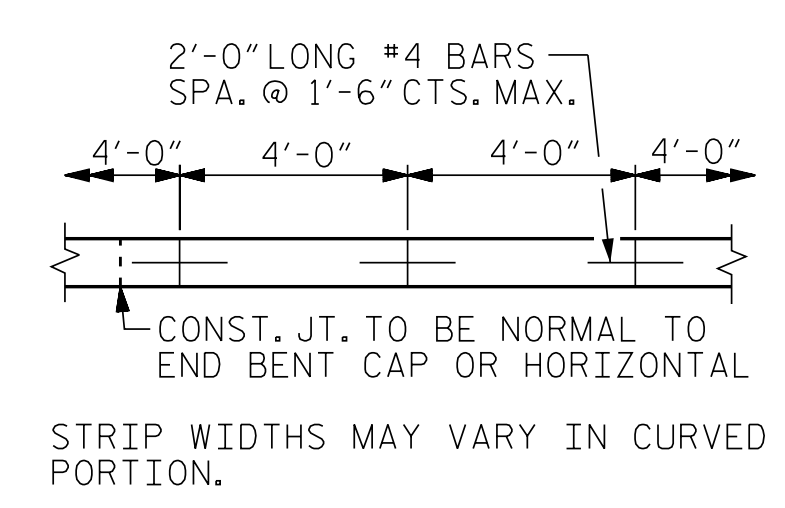
SECTION A-A



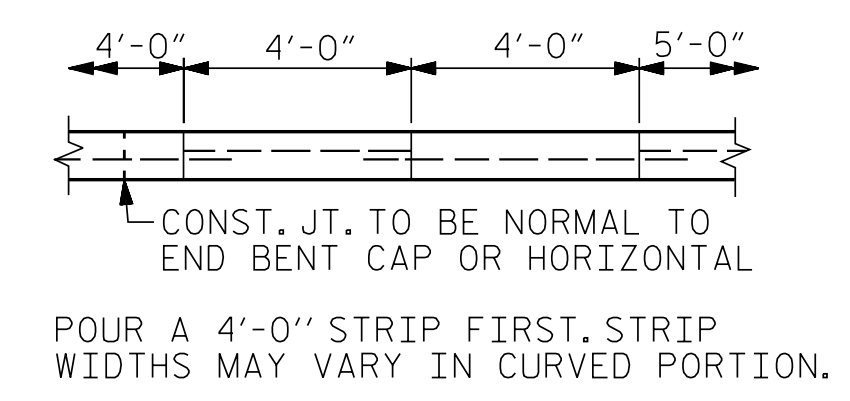
SECTION B-B



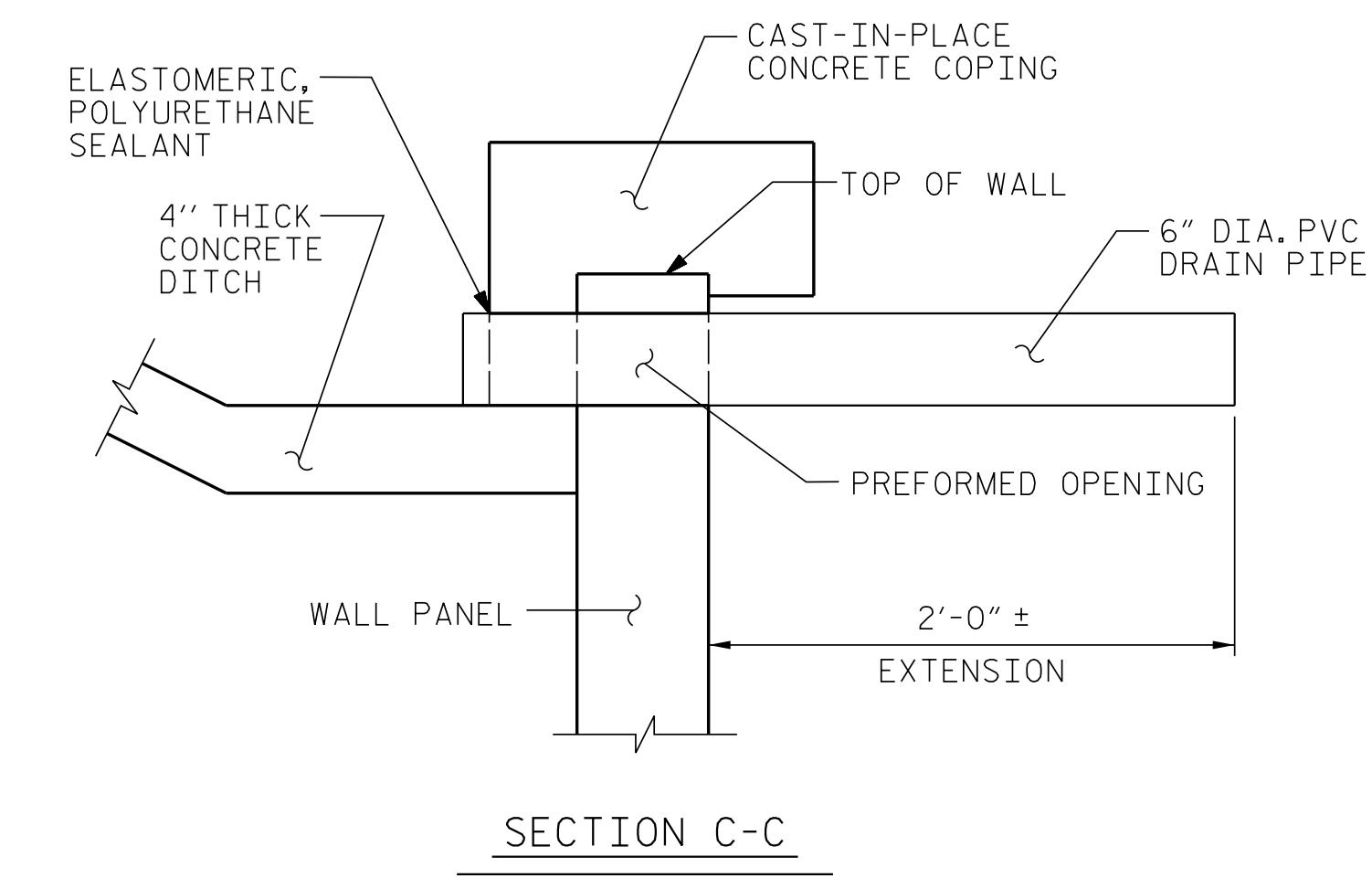
PLAN AT END BENT 2



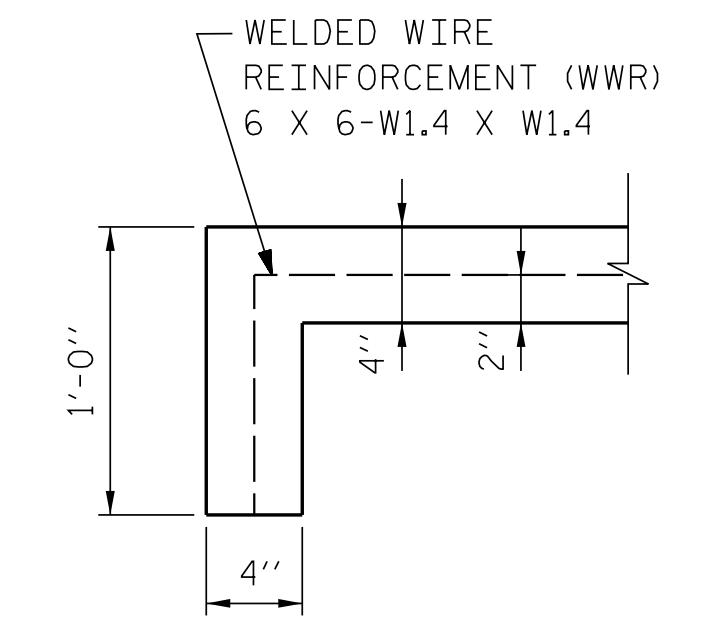
POURING DETAIL



OPTIONAL POURING DETAIL



SECTION C-C



SECTION D-D

NOTES

SLOPE PROTECTION SHALL BE PLACED UNDER THE BRIDGE END AS SHOWN IN THE DETAILS. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS. FOR BERM WIDTH, SEE GENERAL DRAWING.

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 FINISHED TO THE SATISFACTION OF THE ENGINEER. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 48" WIDE. THE COST OF THE WELDED WIRE FABRIC SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

FOR CONCRETE DITCH BEHIND MSE WALL WITH PRECAST PANELS, SEE GEU STANDARD "CONCRETE DITCH BEHIND WALL WITH BACK SLOPE FOR CONCRETE FACING AND COPING".

COORDINATE GRADING REQUIREMENTS WITH ROADWAY CROSS SECTIONS, WALL NO.1 ENVELOPE, AND BRIDGE SHEET "MSE WALL -W1-".

PERFORMED DRAINAGE OPENING SHALL CONSIST OF A MIN. 4" X 6" BLOCKOUT OR 6" DIA. PIPE AT LOW DITCH ELEVATION. STONE OR RIP RAP SHALL BE PROVIDED AT BASE OF WALL BELOW THIS DRAINAGE LOCATION.

BRIDGE @ STA. 32+25.84 -YEB01-	4 INCH SLOPE PROTECTION	WELDED WIRE FABRIC 48 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 2	80	90

PROJECT NO. R-5516
CRAVEN COUNTY
 STATION: 32+25.84 -YEB01-
75+13.29 -L-

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4/12/2017
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 030474
 JOHN C. MORRISON

DocuSigned by:
 John C. Morrison
 AZFDE142C8F4AB

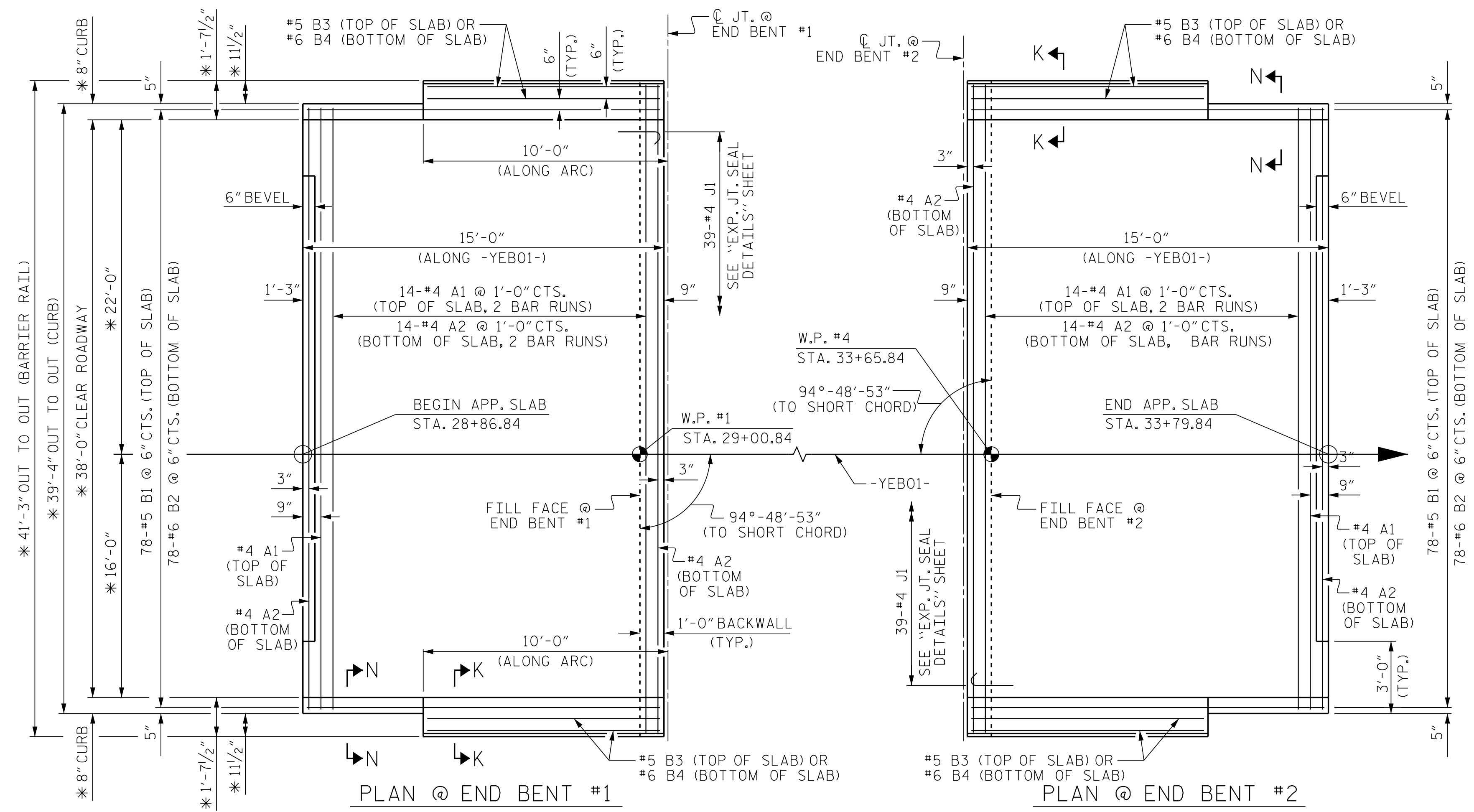
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STANDARD SLOPE PROTECTION DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-48
					TOTAL SHEETS 51

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CHECKED BY : JCM	DATE : 05/16
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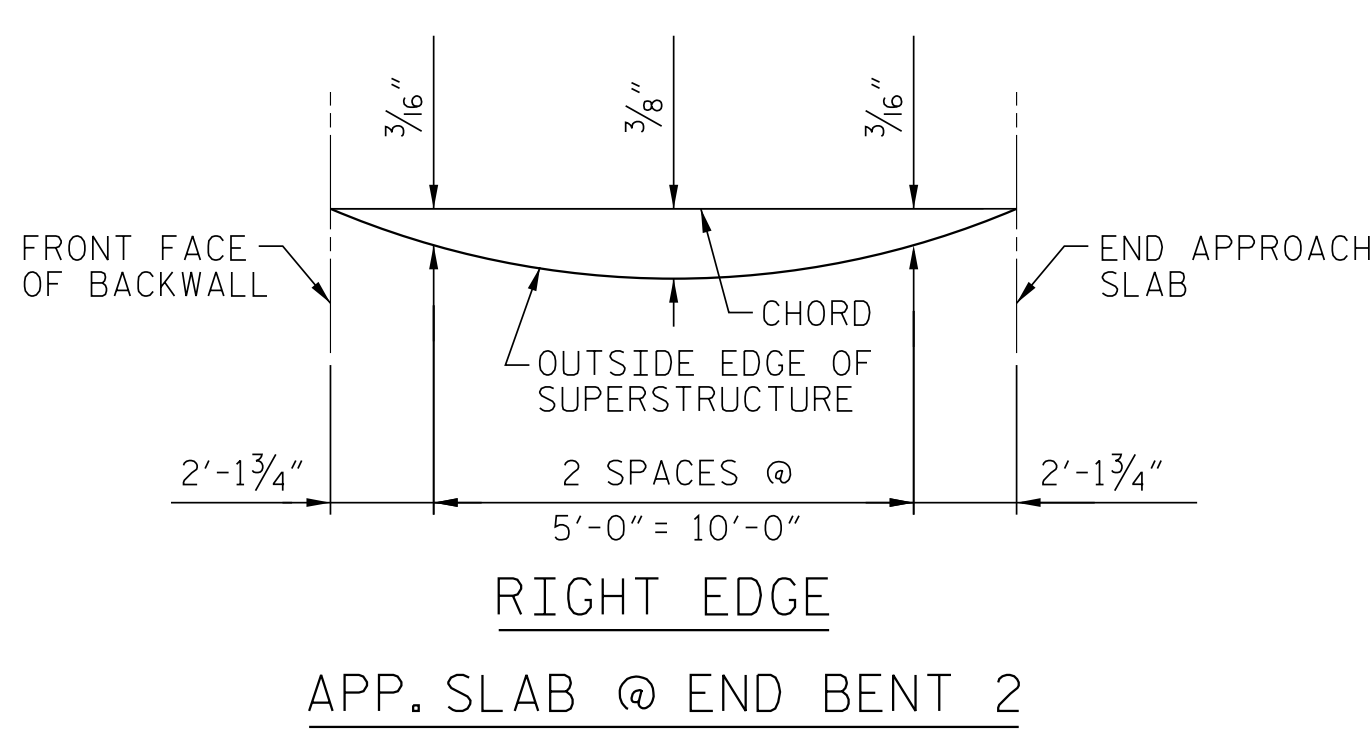
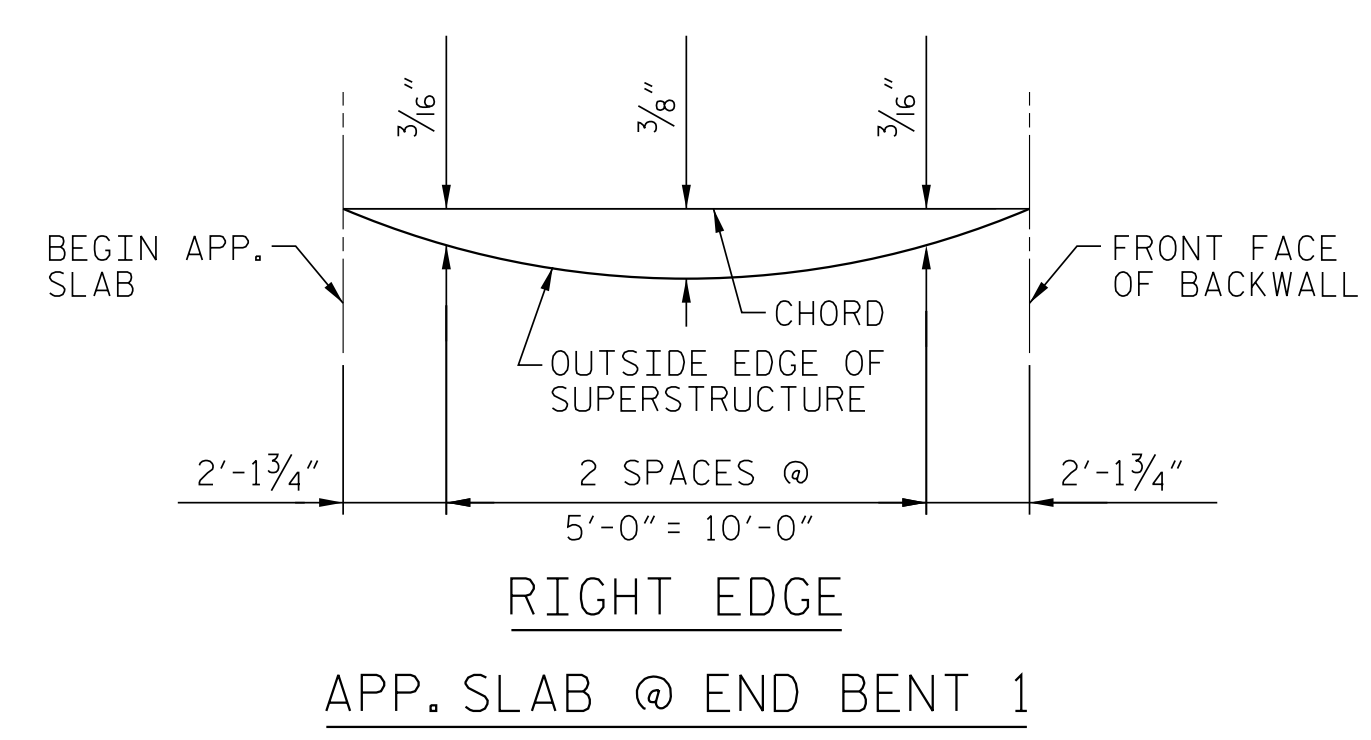
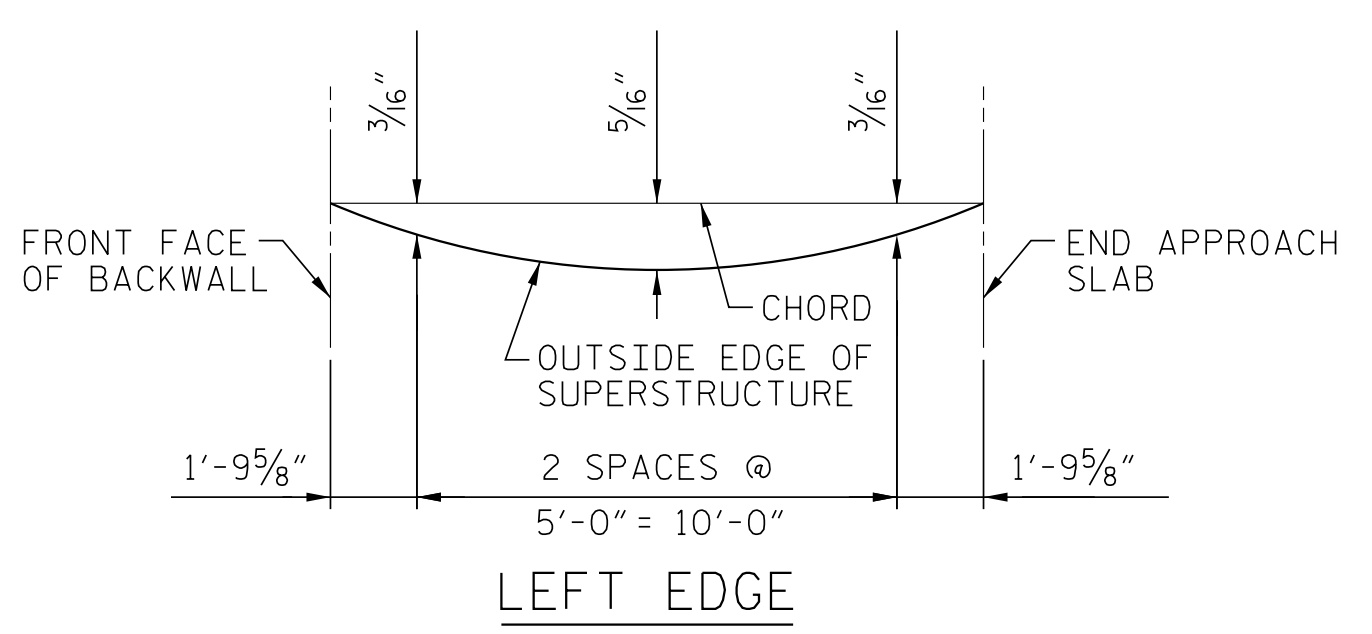
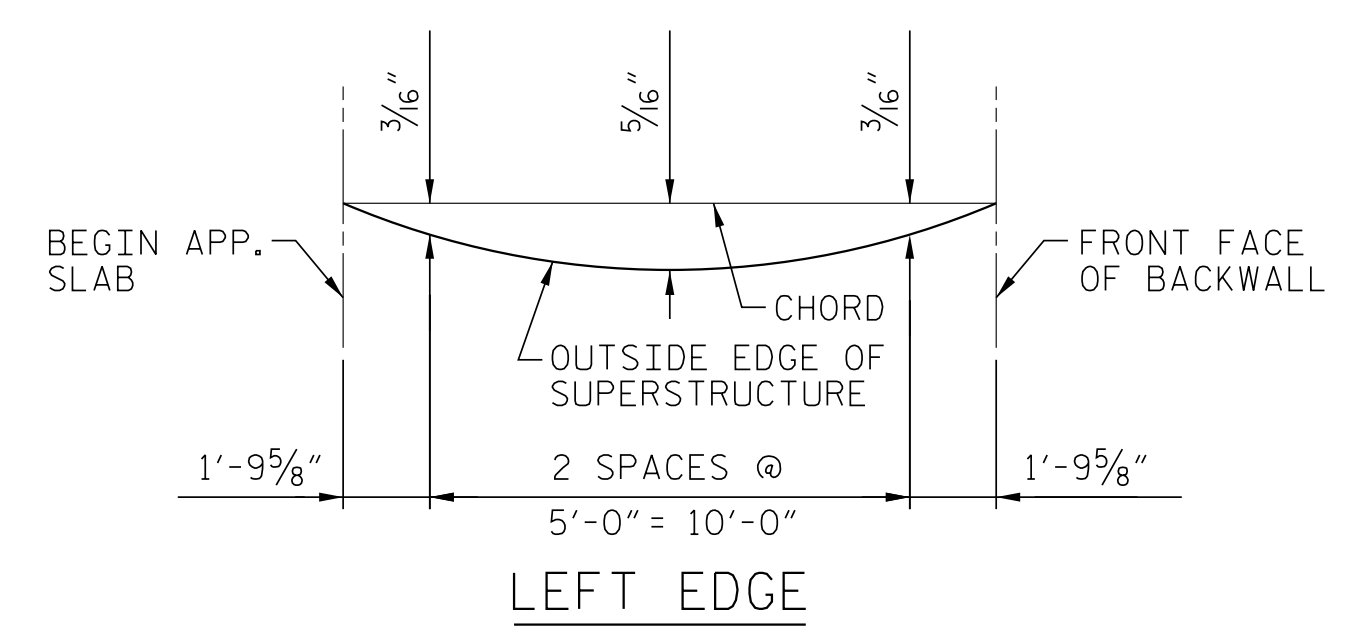
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USER: jmorris@aec.com Room: 400_Technical\408_Structure\401_245_S49_R5516_SML_A501.dgn



DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

*RADIAL DIMENSIONS



ARC OFFSETS

NOTES

APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.

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

FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.

FOR REINFORCED BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, AND SELECT MATERIAL, SEE ROADWAY PLANS.

FOR GALVANIZED REINFORCING STRAPS AND BACKFILL MATERIAL, SEE MSE WALL PLANS AND SPECIAL PROVISIONS.

BARRIER RAIL LENGTH SHOWN IS MEASURED FROM C/J JOINT ALONG BACKFACE OF RAIL.

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

BILL OF MATERIAL					
APPROACH SLAB AT EB #1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	30	#4	STR	21'-6"	426
A2	32	#4	STR	21'-4"	451
*B1	78	#5	STR	14'-2"	1153
B2	78	#6	STR	14'-8"	1719
*B3	4	#5	STR	9'-8"	41
B4	4	#6	STR	9'-8"	59
*J1	39	#4	1	1'-5"	37
REINFORCING STEEL **				LBS.	3886
* EPOXY COATED REINFORCING STEEL **				LBS.	1657
CLASS AA CONCRETE **				C. Y.	26.4
APPROACH SLAB AT EB #2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	30	#4	STR	21'-6"	426
A2	32	#4	STR	21'-4"	451
*B1	78	#5	STR	14'-2"	1153
B2	78	#6	STR	14'-8"	1719
*B3	4	#5	STR	9'-8"	41
B4	4	#6	STR	9'-8"	59
*J1	39	#4	1	1'-5"	37
REINFORCING STEEL **				LBS.	3886
* EPOXY COATED REINFORCING STEEL **				LBS.	1657
CLASS AA CONCRETE **				C. Y.	26.4
BAR TYPE					
ALL BAR DIMENSIONS ARE OUT TO OUT					

** QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED. SEE SHEET 3 OF 3.

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

PROJECT NO. R-5516
 CRAVEN COUNTY
 STATION: 32+25.84 -YEB01-
75+13.29 -L-
 SHEET 1 OF 3

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4/12/2017
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 030474
 JOHN C. MORRISON

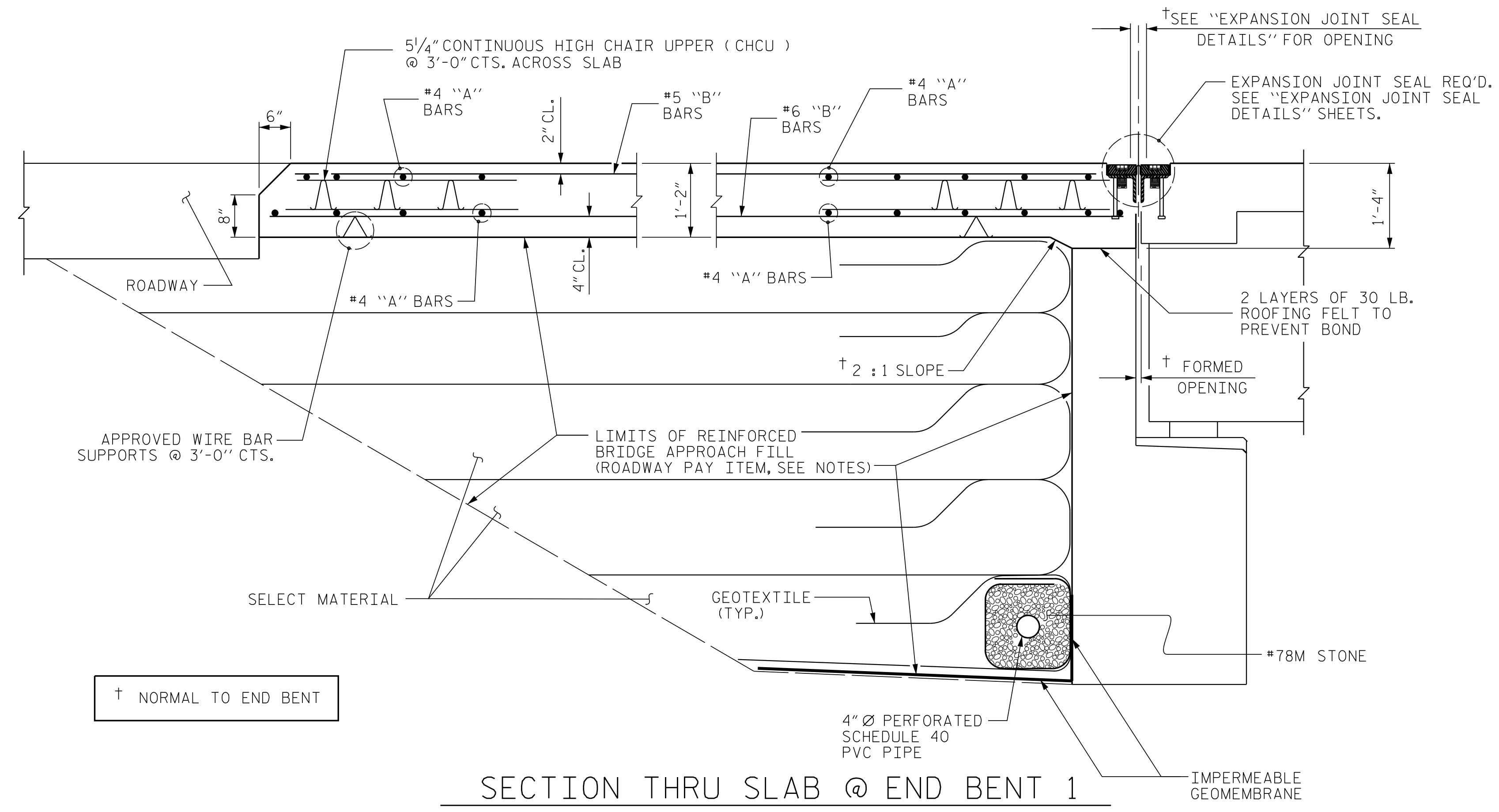
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STANDARD BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT					
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
				S-49	
				TOTAL SHEETS 51	

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CHECKED BY : JCM	DATE : 03/16
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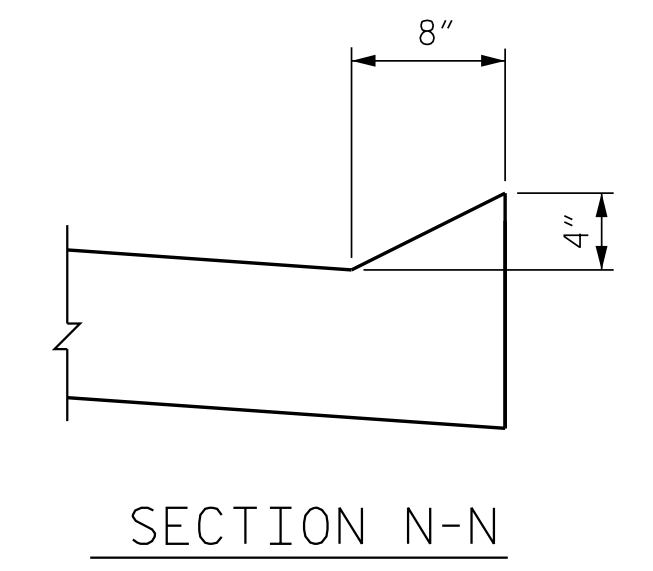
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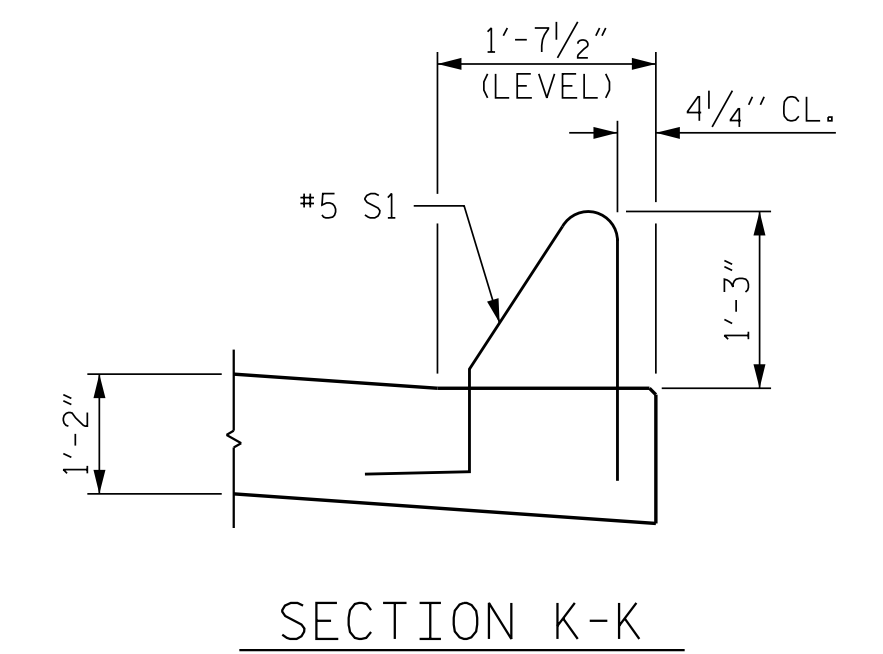
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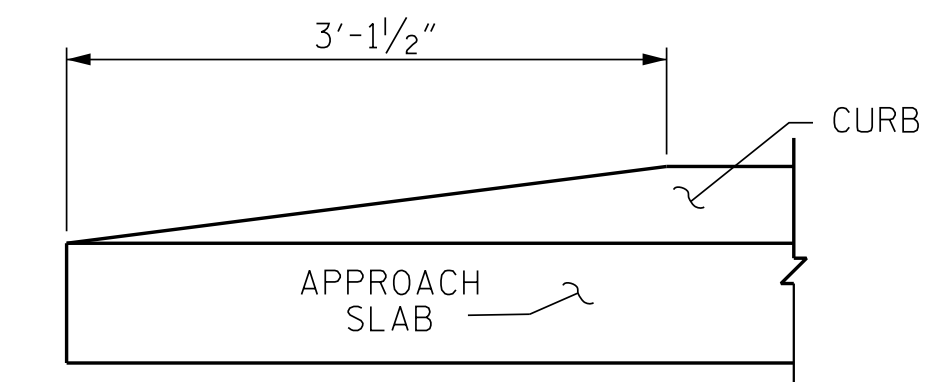
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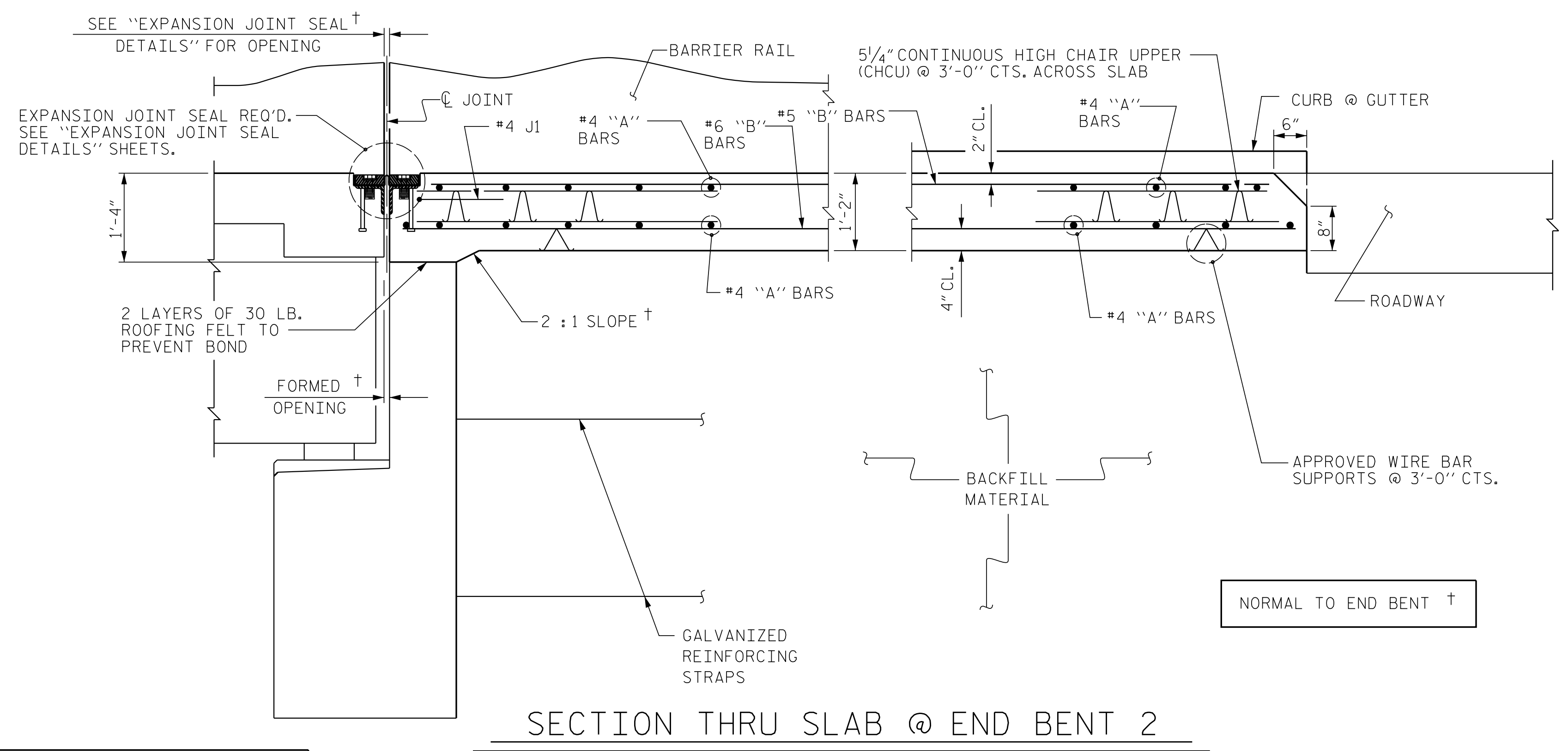
SECTION N-N



SECTION K-K



END OF CURB WITHOUT SHOULDER BERM GUTTER
CURB DETAILS



SECTION THRU SLAB @ END BENT 2

NORMAL TO END BENT †

PROJECT NO. R-5516
 CRAVEN COUNTY
 STATION: 32+25.84 -YEB01-
 75+13.29 -L-
 SHEET 2 OF 3

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 NORTH CAROLINA
 PROFESSIONAL
 SEAL
 030474
 ENGINEER
 JOHN C. MORRISON

DocuSigned by:
 John C. Morrison
 A27DE142C82F4A8

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 BRIDGE APPROACH SLAB
 FOR FLEXIBLE PAVEMENT

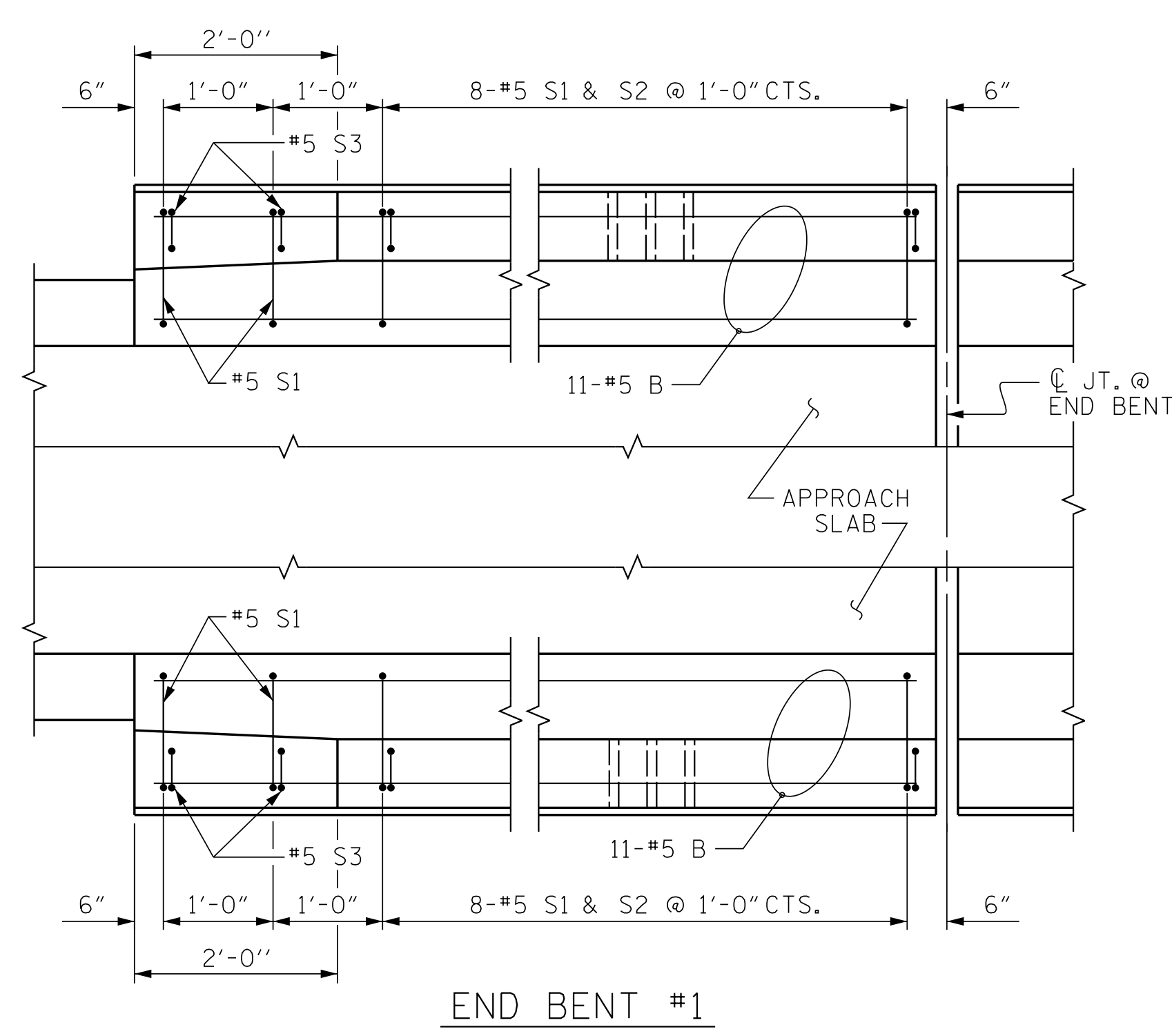
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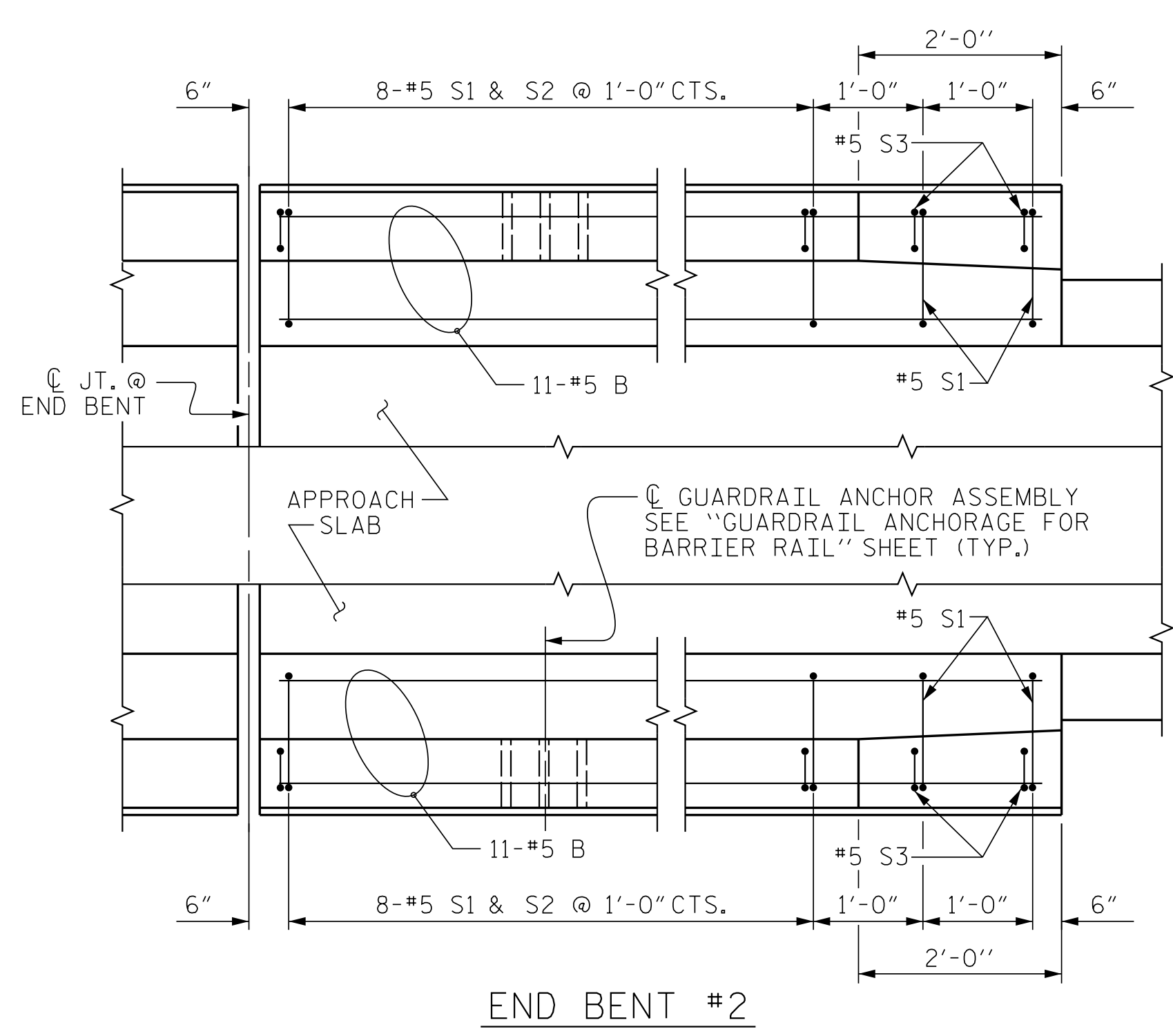
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2			4			

DATE: 4/11/2017
TIME: 5:35:08 PM

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DRAWN BY: FCJ 11/88
CHECKED BY: ARB 11/88



END BENT #1



END BENT #2

PLAN OF BARRIER RAIL

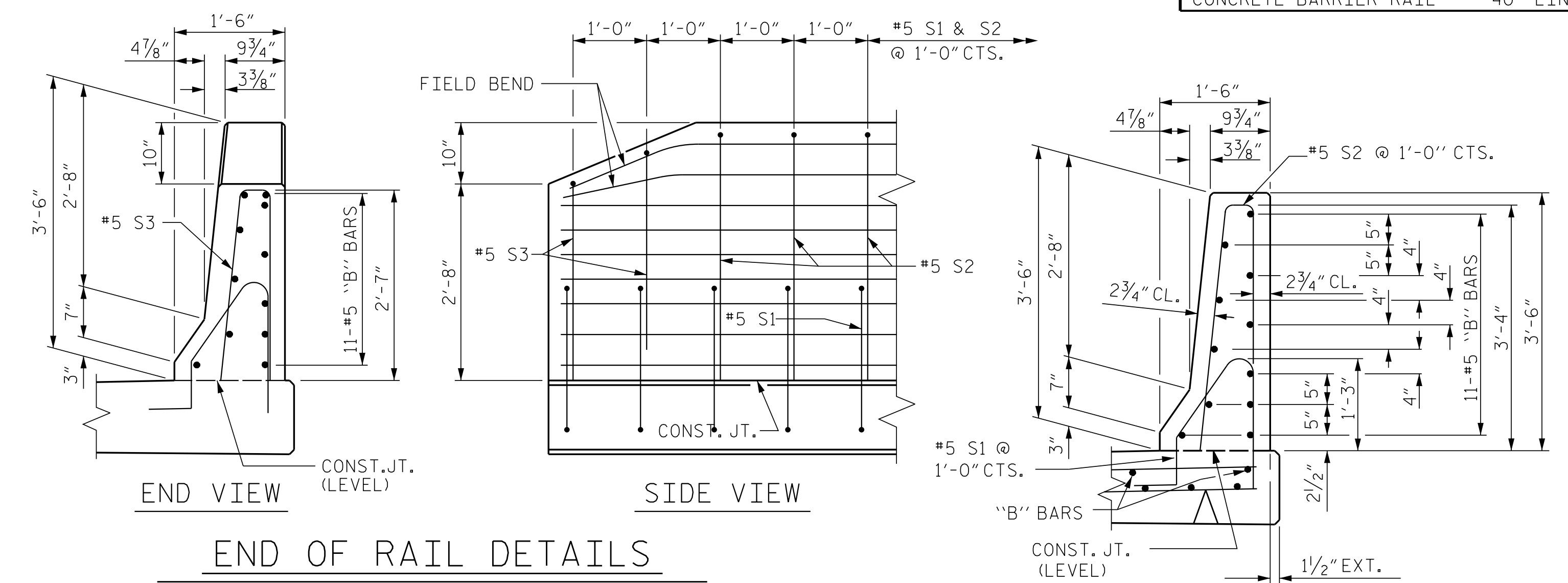
NOTES
THE COST OF THE BARRIER RAIL ON THE APPROACH SLAB SHALL BE INCLUDED IN THE LINEAR FOOT CONTRACT PRICE BID FOR "CONCRETE BARRIER RAIL".
THE BARRIER RAIL ON EACH APPROACH SLAB SHALL NOT BE CAST UNTIL ALL APPROACH SLAB CONCRETE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.
ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT

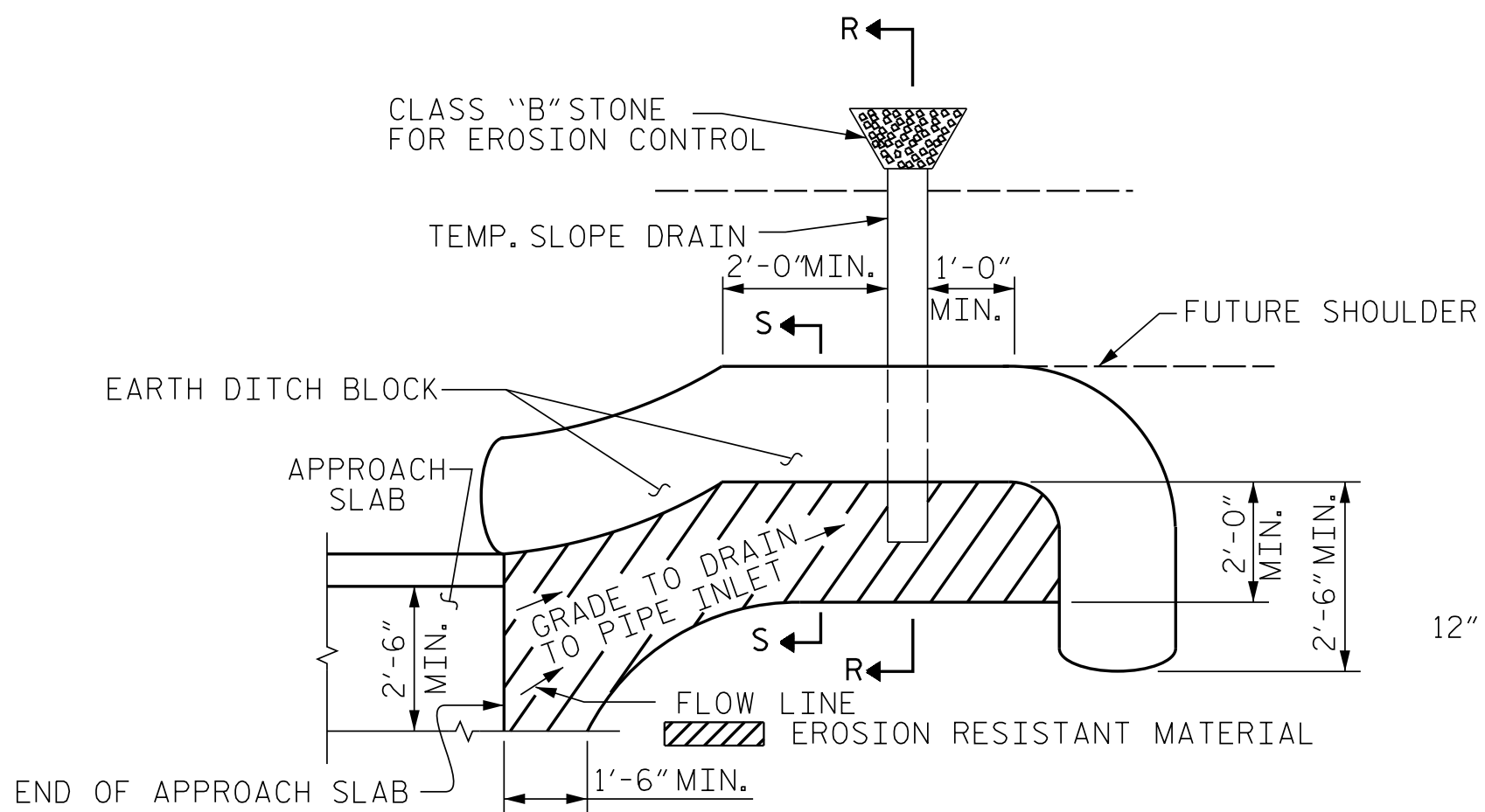
BARRIER RAIL ONLY					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B	44	#5	STR	9'-2"	421
*S1	40	#5	1	5'-1"	212
*S2	32	#5	2	7'-0"	234
*S3	8	#5	2	5'-6"	46

* EPOXY COATED REINFORCING STEEL	LBS.	913
CLASS AA CONCRETE	C. Y.	5.1
CONCRETE BARRIER RAIL	40 LIN. FT.	

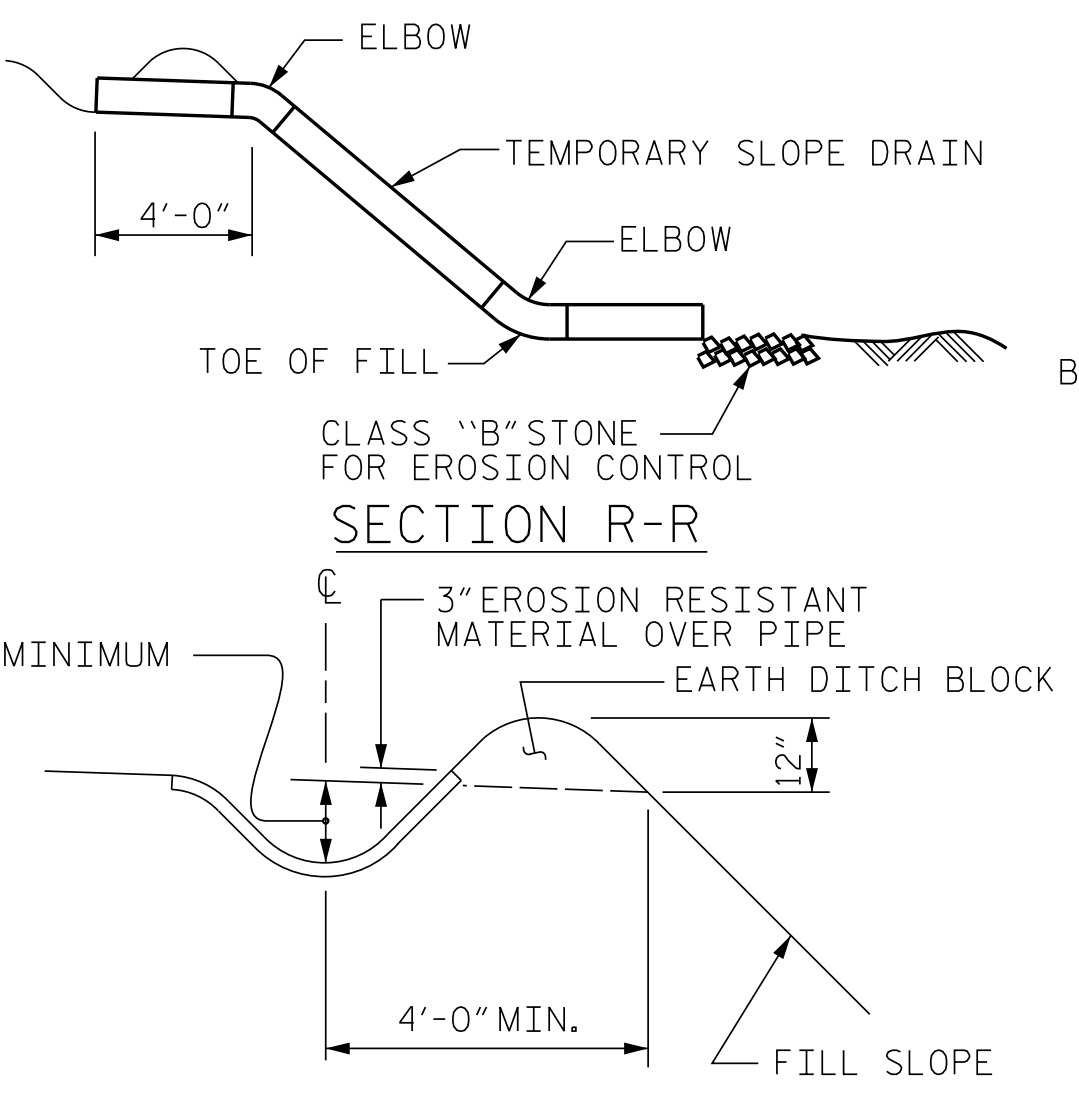


END OF RAIL DETAILS

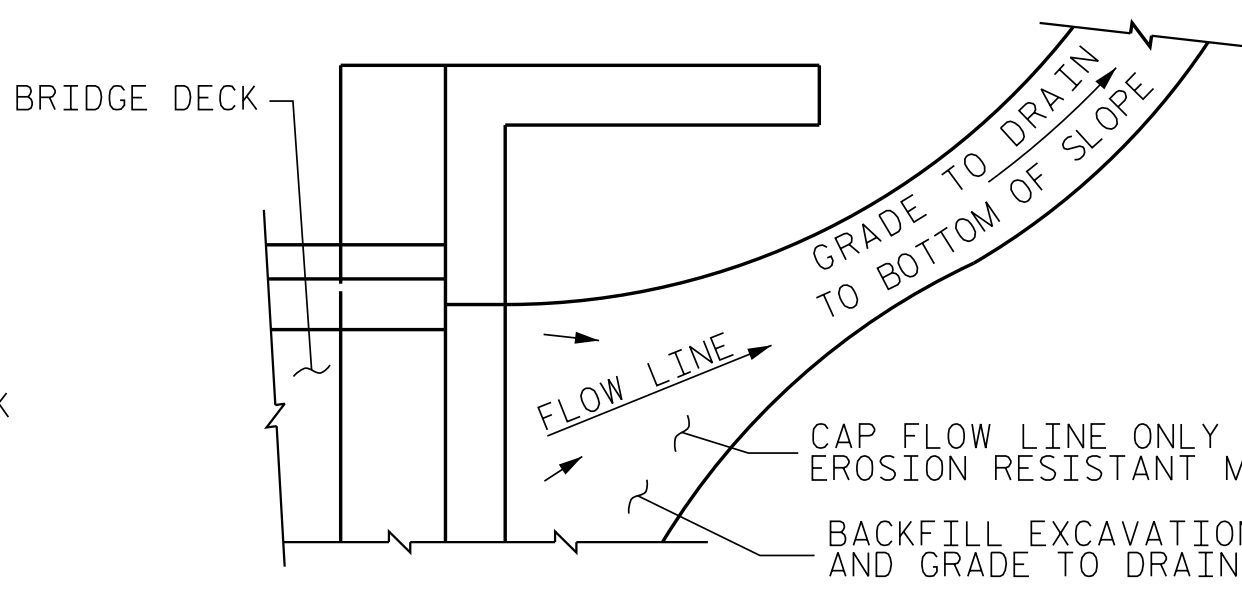
SECTION THRU RAIL



PLAN VIEW



SECTION S-S



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

PROJECT NO. R-5516
CRAVEN COUNTY
STATION: 32+25.84 -YEB01-
75+13.29 -L-
SHEET 3 OF 3

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4/12/2017
NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL 030474
JOHN C. MORRISON

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

ASSEMBLED BY : NKB	DATE : 03/16
CHECKED BY : JCM	DATE : 03/16
DRAWN BY : FCJ 11/88	REV. 10/11/11 MAA/GM
CHECKED BY : ARB 11/88	REV. 7/12 MAA/GM
	REV. 6/13 MAA/GM

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

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

SHEET NO. S-51
TOTAL SHEETS 51

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. FINS 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

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