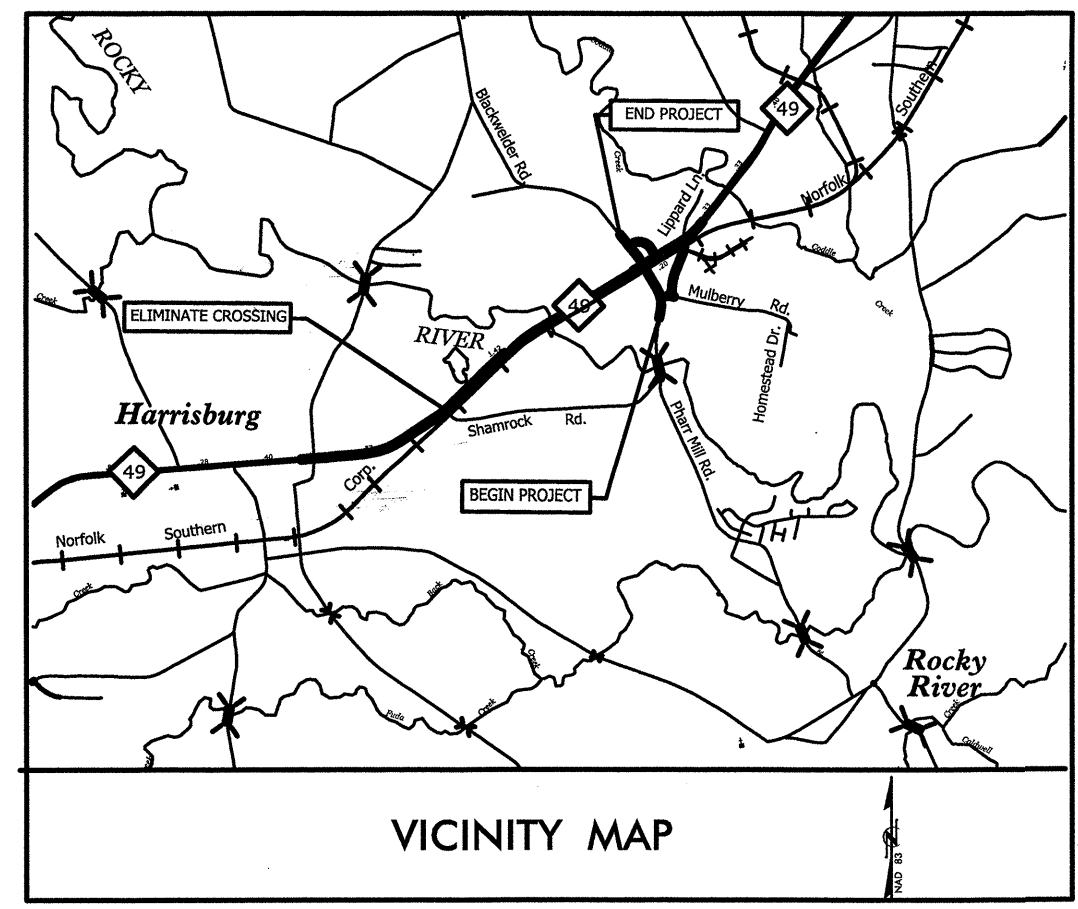


DCN: 0053DEL_P10a2

TIP PROJECT: P-5208B

CONTRACT: C203145



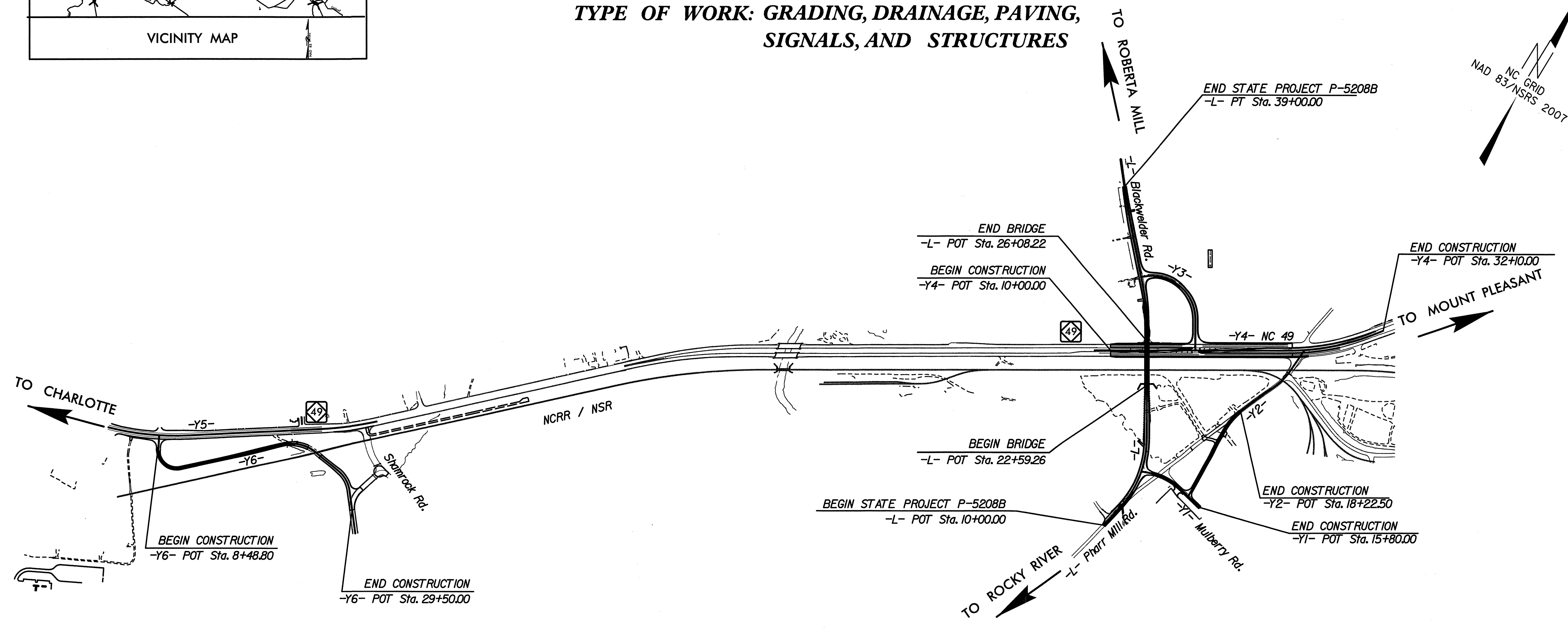
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
CABARRUS COUNTY

LOCATION: PHARR MILL ROAD /BLACKWELDER ROAD GRADE SEPARATION OVER NCRR /NS

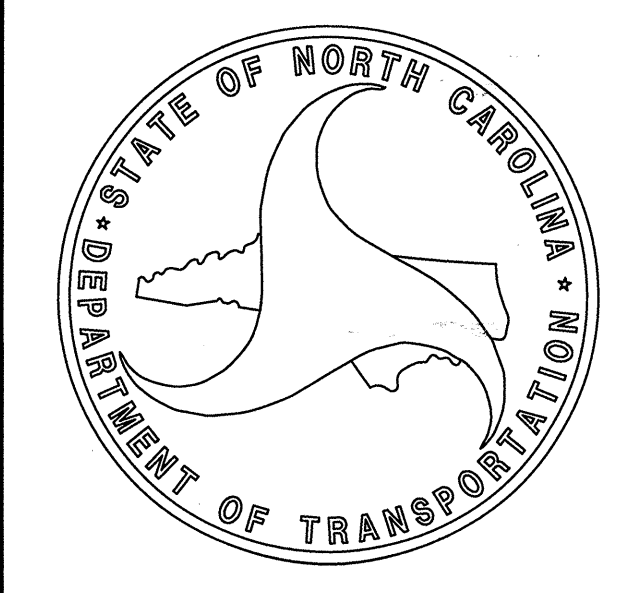
TYPE OF WORK: GRADING, DRAINAGE, PAVING, SIGNALS, AND STRUCTURES



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	P-5208B	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
50000.1.STR05T1B	FRA-FR-HSR-0006-10-01-00	PE, Util.	
50000.1.STR06T3	FRA-FR-HSR-0006-10-01-00	PE, Util.	
43219.2.STR09P5208		ROW	
50000.3.STR02T4D		Util. - Construction	



NCDOT RAIL DIVISION CONTACT: SANDRA STEPNEY, P.E.



DESIGN DATA

ADT 2013 =	3,500
ADT 2035 =	11,200
DHV =	10 %
D =	75 %
T =	1 % *
V =	50 MPH
* TTST =	2% DUAL
FUNC CL =	RURAL LOCAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT P-5208B =	0.483 MILE
LENGTH STRUCTURE TIP PROJECT P-5208B =	0.066 MILE
TOTAL LENGTH TIP PROJECT P-5208B =	0.549 MILE

URS
Prepared By:
URS Corporation - North Carolina
1600 Perimeter Park Drive
Morrisville, North Carolina 27560
TELEPHONE (919) 461-1100 FAX (919) 461-1415
NC LICENSE # C-2243

Prepared For:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610
2012 STANDARD SPECIFICATIONS

LETTING DATE:
APRIL 16, 2013

JOHN SLOAN, PE
PROJECT ENGINEER

STRUCTURAL ENGINEER

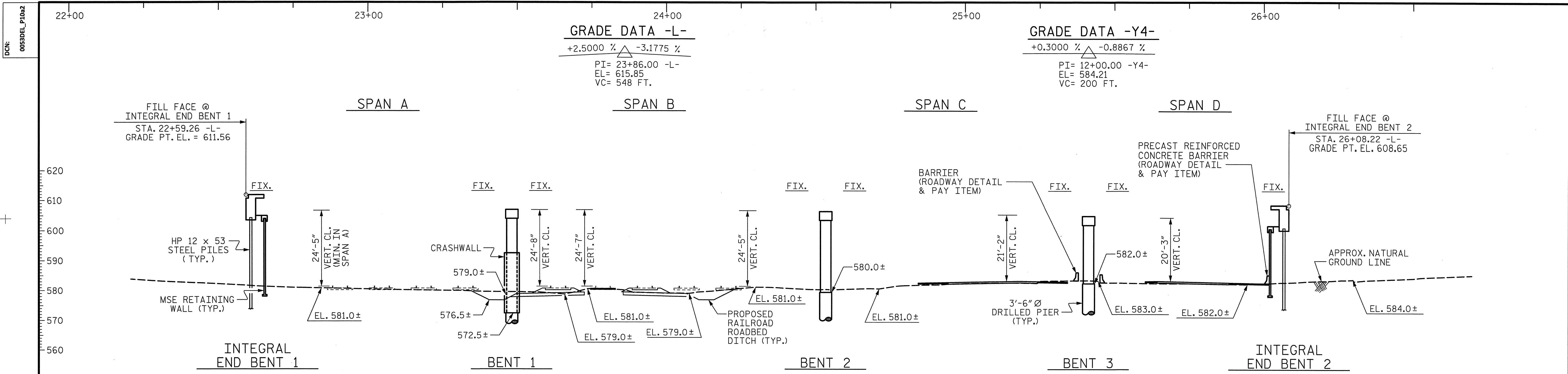
Seal: NORTH CAROLINA PROFESSIONAL SEAL 035062 ENGINEER JOHN E. SLOAN

Signature: *John Sloan* 1/29/13 P.E.

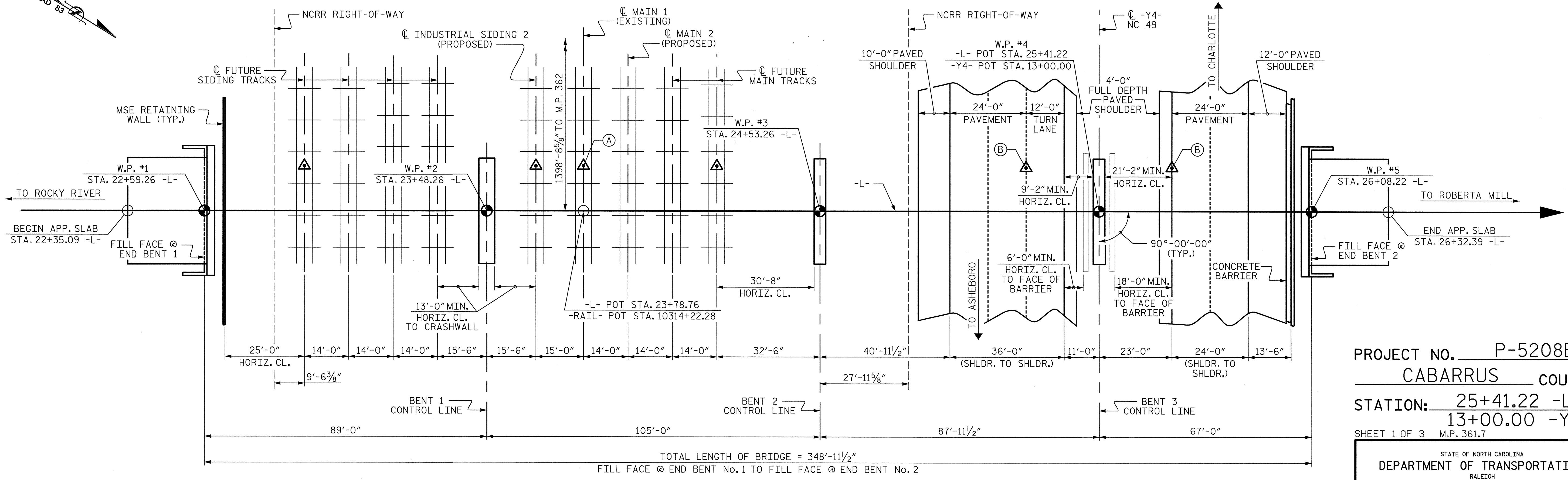
Seal: STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

NC DEPARTMENT OF TRANSPORTATION
RAIL DIVISION
PLANNING AND DEVELOPMENT

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Kyle.compton



SECTION ALONG -L-



PLAN

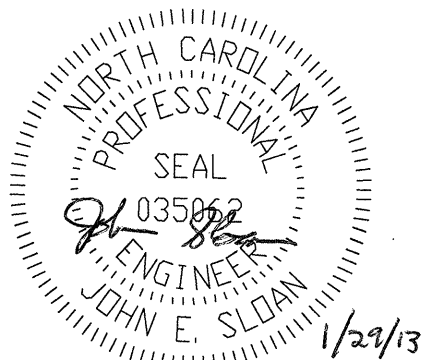
- (A) STATION 10314+37.49
T/R EL. 581.37
- (B) STATION 12+84.79
EL. 583.45

PILES ARE NOT SHOWN IN PLAN VIEW
 POINT OF MINIMUM VERTICAL CLEARANCE
 (FOR RAIL TRACKS, VERTICAL CLEARANCE
 HAS BEEN CALCULATED 5'-6" FROM
 CENTERLINE OF TRACK)

TOTAL LENGTH OF BRIDGE = 348'-11 1/2"
 FILL FACE @ END BENT No. 1 TO FILL FACE @ END BENT No. 2

PROJECT NO. P-5208B
 CABARRUS COUNTY
 STATION: 25+41.22 -L-
13+00.00 -Y4-
 SHEET 1 OF 3 M.P. 361.7

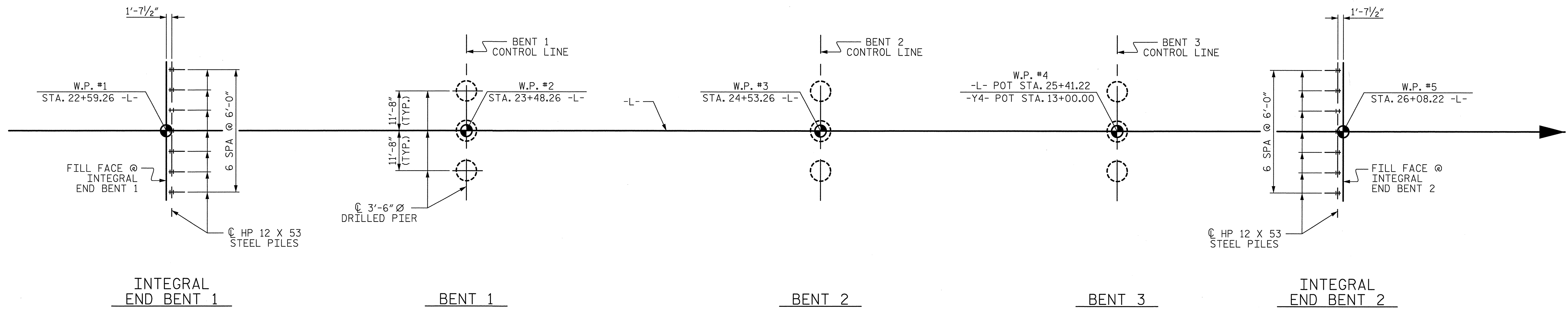
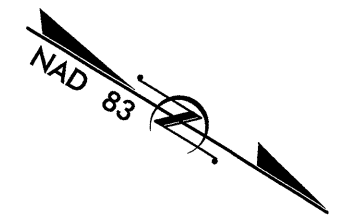
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING
 BRIDGE ON PHARR MILL ROAD
 /BLACKWELDER ROAD OVER
 NC 49 AND NCCR/NS



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

S-1
 TOTAL SHEETS
 48

DRAWN BY : M. K. TOM DATE : 10/23/12
 CHECKED BY : J. E. SLOAN DATE : 11/5/12



FOUNDATION LAYOUT
(DIMENSIONS LOCATING PILES ARE SHOWN TO C PILES)

NOTES:

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT INTEGRAL END BENTS No. 1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 115 TONS PER PILE.

DRIVE PILES AT INTEGRAL END BENTS No. 1 AND 2 TO A REQUIRED DRIVING RESISTANCE OF 195 TONS PER PILE.

STEEL H-PILES POINTS ARE REQUIRED FOR STEEL H-PILES AT INTEGRAL END BENTS No. 1 AND 2. FOR STEEL PILES POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 45 TO 65 FT-KIPS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT INTEGRAL END 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 PILES WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS (AND FOR PILE DRIVING CRITERIA, SEE PILE DRIVING CRITERIA PROVISION).

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

DRILLED PIERS AT BENTS No. 1 THROUGH 3 ARE DESIGNED FOR A FACTORED RESISTANCE OF 570 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 65 TSF.

INSTALL DRILLED PIERS AT BENT No. 1 TO A TIP ELEVATION NO HIGHER THAN 560 FT LT, 557 FT CENTER, AND 557 FT RT AND WITH THE REQUIRED TIP RESISTANCE.

INSTALL DRILLED PIERS AT BENT No. 2 TO A TIP ELEVATION NO HIGHER THAN 566 FT LT, 563 FT CENTER, AND 560 FT RT AND WITH THE REQUIRED TIP RESISTANCE.

INSTALL DRILLED PIERS AT BENT No. 3 TO A TIP ELEVATION NO HIGHER THAN 572 FT LT, 561 FT CENTER, AND 561 FT RT AND WITH THE REQUIRED TIP RESISTANCE.

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

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

FOR SETTLEMENT PLATES, SEE ROADWAY PLANS.

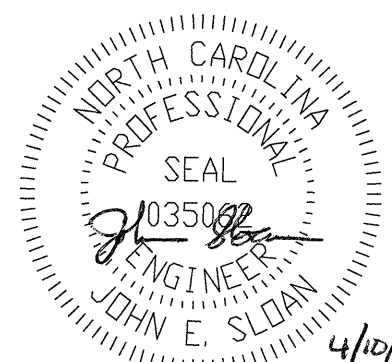
PROJECT NO. P-5208B
CABARRUS COUNTY
 STATION: 25+41.22 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 BRIDGE ON PHARR MILL ROAD
 /BLACKWELDER ROAD OVER
 NC 49 AND NCRR/NS

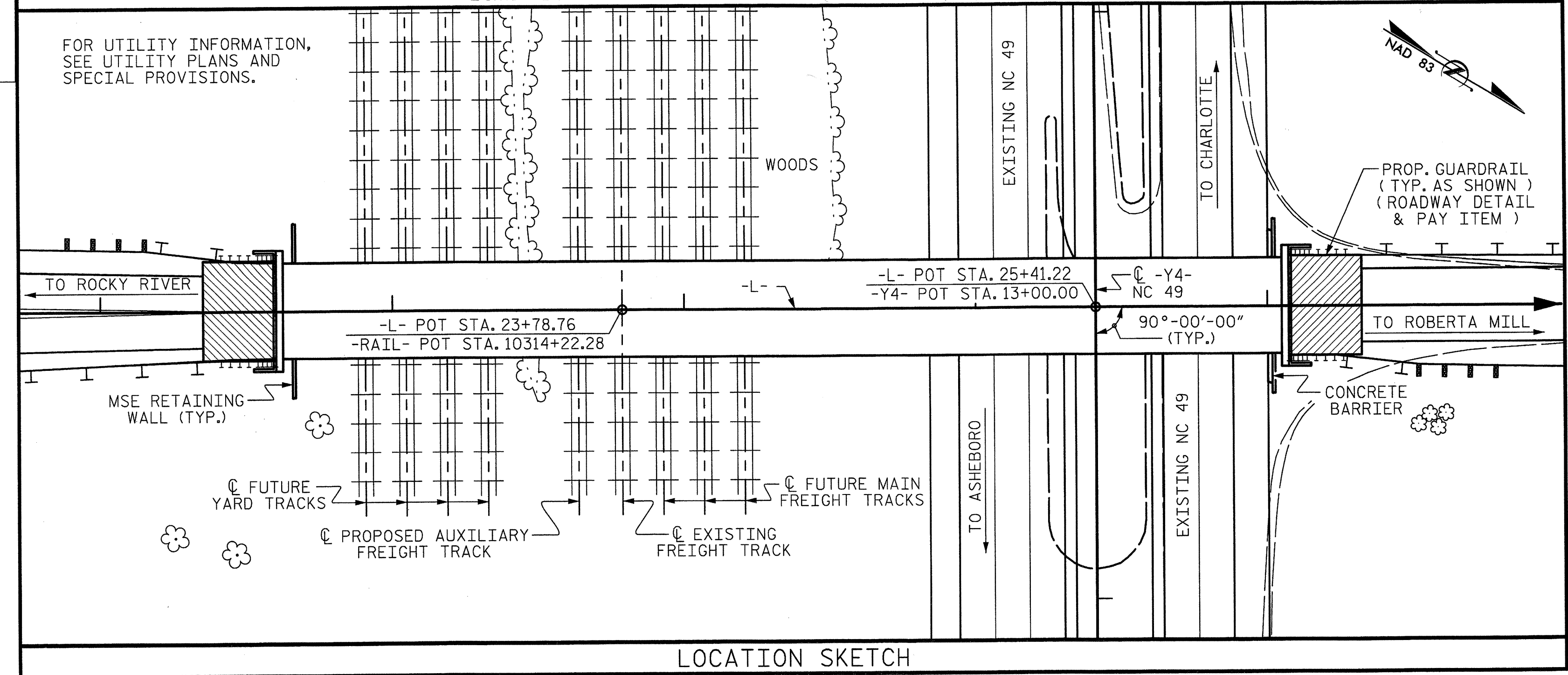
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			48



DRAWN BY : M. K. TOM DATE : 10/22/12
 CHECKED BY : J. E. SLOAN DATE : 10/23/12

DCN: 0053DEL_P10a2

B.M. #101 : ELEV 557.34' -L- 18+57.29, 3,061.08' RT



LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING
 THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR SEISMIC PERFORMANCE ZONE 1.
 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.
 THE ELEVATION(S) AND CLEARANCE(S) SHOWN ON THE PLANS AT THE POINT(S) OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATION(S) 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.
 PRESTRESSED CONCRETE DECK PANELS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
 REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
 THE RAILROAD TRACK TOP OF RAIL ELEVATIONS SHOWN ON THE PLANS ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE TOP OF RAIL ELEVATIONS AND REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.
 NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.

TOTAL BILL OF MATERIAL

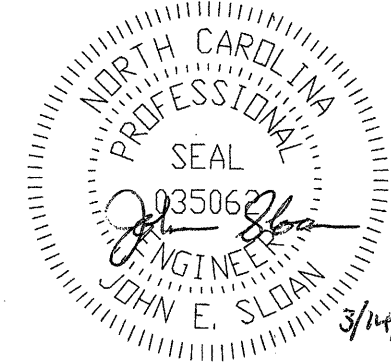
	3'-6" Ø DRILLED PIER IN SOIL	3'-6" Ø DRILLED PIER NOT IN SOIL	PDA TESTING	SID INSPECTIONS	CSL TESTING	CSL TUBES	STEEL PILE POINTS	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDERS	HP 12 X 53 STEEL PILES	CONCRETE PARAPET	TWO BAR METAL RAIL	ELASTOMERIC BEARINGS	MSE RETAINING WALLS	4" CONCRETE SLOPE PROTECTION			
	LIN. FT.	LIN. FT.	EACH	EACH	EACH	LIN. FT.	EACH	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	No.	LIN. FT.	No.	LIN. FT.	LIN. FT.	LIN. FT.	LUMP SUM	SQ. FT.	SQ. YDS.	
SUPERSTRUCTURE									12,011	11,483					16	1,378.5			694.6	679.6	LUMP SUM			
END BENT 1			1				7				20.0		3,229			7	350				2458		13.2	
BENT 1	19.5	24		1	1	192					136.3		14,284	2,940										
BENT 2	21	30		1	1	222					34.7		9,262	2,523										
BENT 3	27	25		1	1	226					32.1		8,833	2,325							2151			
END BENT 2			1				7				20.0		3,229			7	245							13.2
TOTAL	67.5	79	2	3	3	640	14	LUMP SUM	12,011	11,483	243.1	LUMP SUM	38,837	7,788	16	1,378.5	14	595	694.6	679.6	LUMP SUM	4609	26.4	

PROJECT NO. P-5208B
CABARRUS COUNTY
 STATION: 25+41.22 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 BRIDGE ON PHARR MILL ROAD
 /BLACKWELDER ROAD OVER
 NC 49 AND NCRR/NS



DRAWN BY: M. K. TOM DATE: 10/1/12
 CHECKED BY: J. E. SLOAN DATE: 11/8/12

3/14/2013
 P:\Jobs\5208B\Structures\Final Drawings\P5208B_SD_G02.dgn
 Kyle.compton

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			48

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

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ_{DC}	γ_{DW}
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.
ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.14	--	1.75	0.82	1.45	B	1	51.38	0.93	1.50	B	2	93.04	0.80	0.74	1.14	B	2	51.38		
	HL-93 (OPERATING)	N/A	--	1.88	--	1.35	0.82	1.88	B	1	51.38	0.93	1.98	B	2	93.04	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	②	1.60	57.600	1.75	0.82	2.03	A	1	43.13	0.93	2.06	B	2	93.04	0.80	0.74	1.60	B	2	51.38		
	HS-20 (OPERATING)	36.000	--	2.63	94.680	1.35	0.82	2.63	A	1	43.13	0.93	2.70	B	2	93.04	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500	--	3.82	51.570	1.40	0.82	5.90	A	1	43.13	0.93	6.59	B	2	93.04	0.80	0.74	3.82	B	2	51.38	
		SNGARBS2	20.000	--	2.76	55.200	1.40	0.82	4.32	A	1	43.13	0.93	4.58	B	2	93.04	0.80	0.74	2.76	B	2	51.38	
		SNAGRIS2	22.000	--	2.57	56.540	1.40	0.82	4.06	A	1	43.13	0.93	4.21	B	2	93.04	0.80	0.74	2.57	B	2	51.38	
		SNCOTTS3	27.250	--	1.90	51.775	1.40	0.82	2.93	A	1	43.13	0.93	3.22	B	2	93.04	0.80	0.74	1.90	B	2	51.38	
		SNAGGRS4	34.925	--	1.55	54.134	1.40	0.82	2.42	A	1	43.13	0.93	2.60	B	2	9.71	0.80	0.74	1.55	B	2	51.38	
		SNS5A	35.550	--	1.52	54.036	1.40	0.82	2.37	A	1	43.13	0.93	2.60	B	2	93.04	0.80	0.74	1.52	B	2	51.38	
		SNS6A	39.950	--	1.38	55.131	1.40	0.82	2.16	A	1	43.13	0.93	2.35	B	2	93.04	0.80	0.74	1.38	B	2	51.38	
		SNS7B	42.000	--	1.31	55.020	1.40	0.82	2.06	A	1	43.13	0.93	2.28	B	2	93.04	0.80	0.74	1.31	B	2	51.38	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000	--	1.68	55.440	1.40	0.82	2.64	A	1	43.13	0.93	2.84	B	2	93.04	0.80	0.74	1.68	B	2	51.38	
		TNT4A	33.075	--	1.68	55.566	1.40	0.82	2.64	A	1	43.13	0.93	2.78	B	2	93.04	0.80	0.74	1.68	B	2	51.38	
		TNT6A	41.600	--	1.36	56.576	1.40	0.82	2.15	A	1	43.13	0.93	2.38	B	2	93.04	0.80	0.74	1.36	B	2	51.38	
		TNT7A	42.000	--	1.36	57.120	1.40	0.82	2.16	A	1	43.13	0.93	2.34	B	2	93.04	0.80	0.74	1.36	B	2	51.38	
		TNT7B	42.000	--	1.39	58.380	1.40	0.82	2.22	A	1	43.13	0.93	2.23	B	2	93.04	0.80	0.74	1.39	B	2	51.38	
		TNAGRIT4	43.000	--	1.34	57.620	1.40	0.82	2.12	A	1	43.13	0.93	2.18	B	2	93.04	0.80	0.74	1.34	B	2	51.38	
TNAGT5A	45.000	--	1.27	57.150	1.40	0.82	2.00	A	1	43.13	0.93	2.13	B	2	93.04	0.80	0.74	1.27	B	2	51.38			
TNAGT5B	45.000	③	1.26	56.700	1.40	0.82	1.98	A	1	43.13	0.93	2.07	B	2	93.04	0.80	0.74	1.26	B	2	51.38			

③ CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

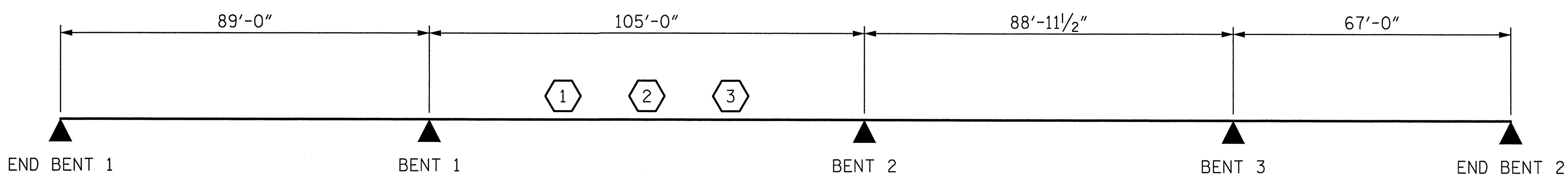
② DESIGN LOAD RATING (HS-20)

③ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

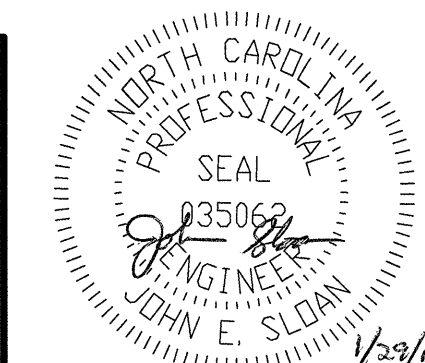
I - INTERIOR GIRDER
EL - EXTERIOR LEFT GIRDER
ER - EXTERIOR RIGHT GIRDER



LRFR SUMMARY

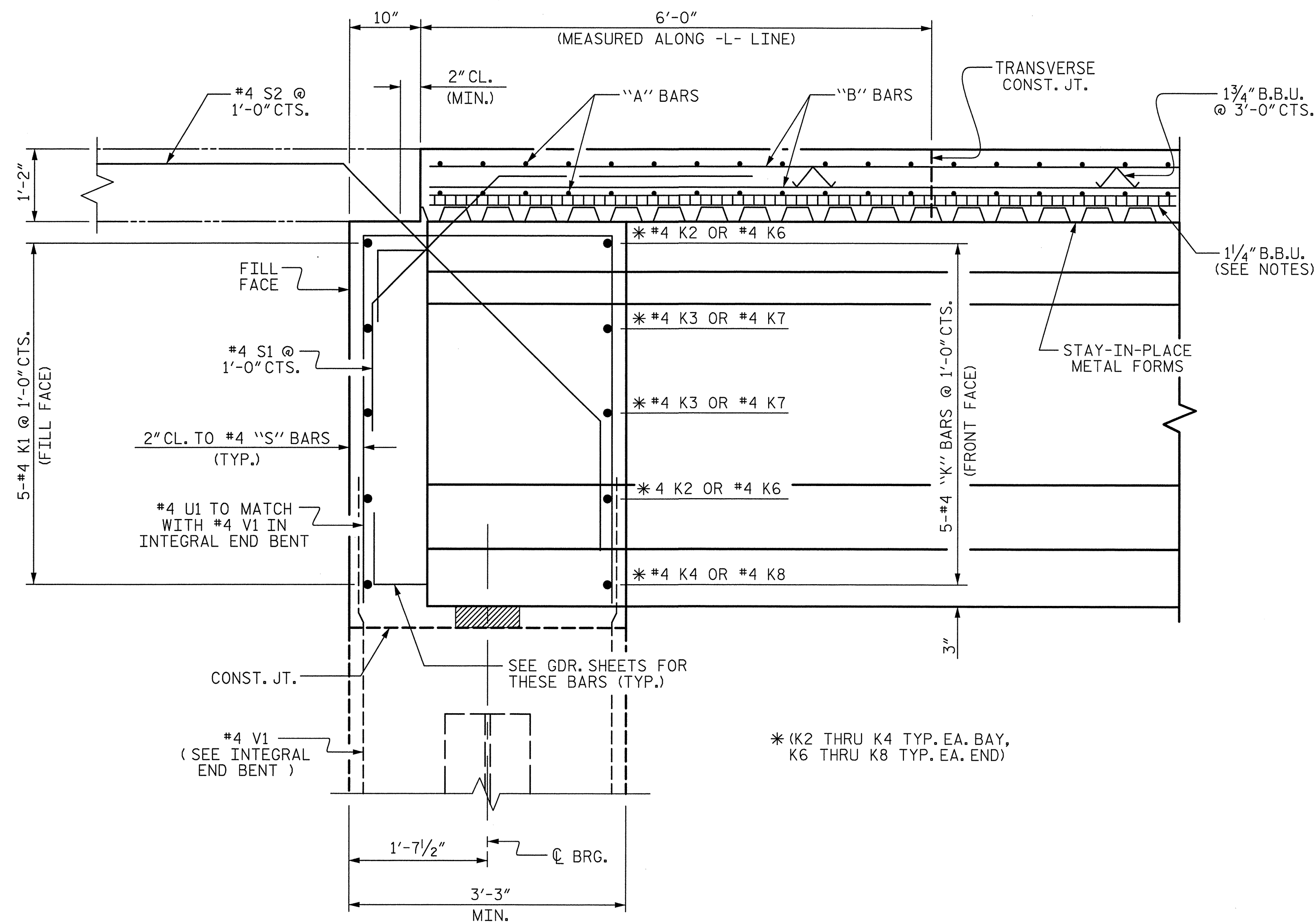
PROJECT NO. P-5208B
CABARRUS COUNTY
 STATION: 25+41.22 -L-

ASSEMBLED BY: M. K. TOM DATE: 10/2/12
 CHECKED BY: K. H. COMPTON DATE: 10/11/12
 DRAWN BY: MAA 1/08 REV. 11/2/08RR MAA/GM
 CHECKED BY: GM/DI 2/08 REV. 10/1/11 MAA/GM



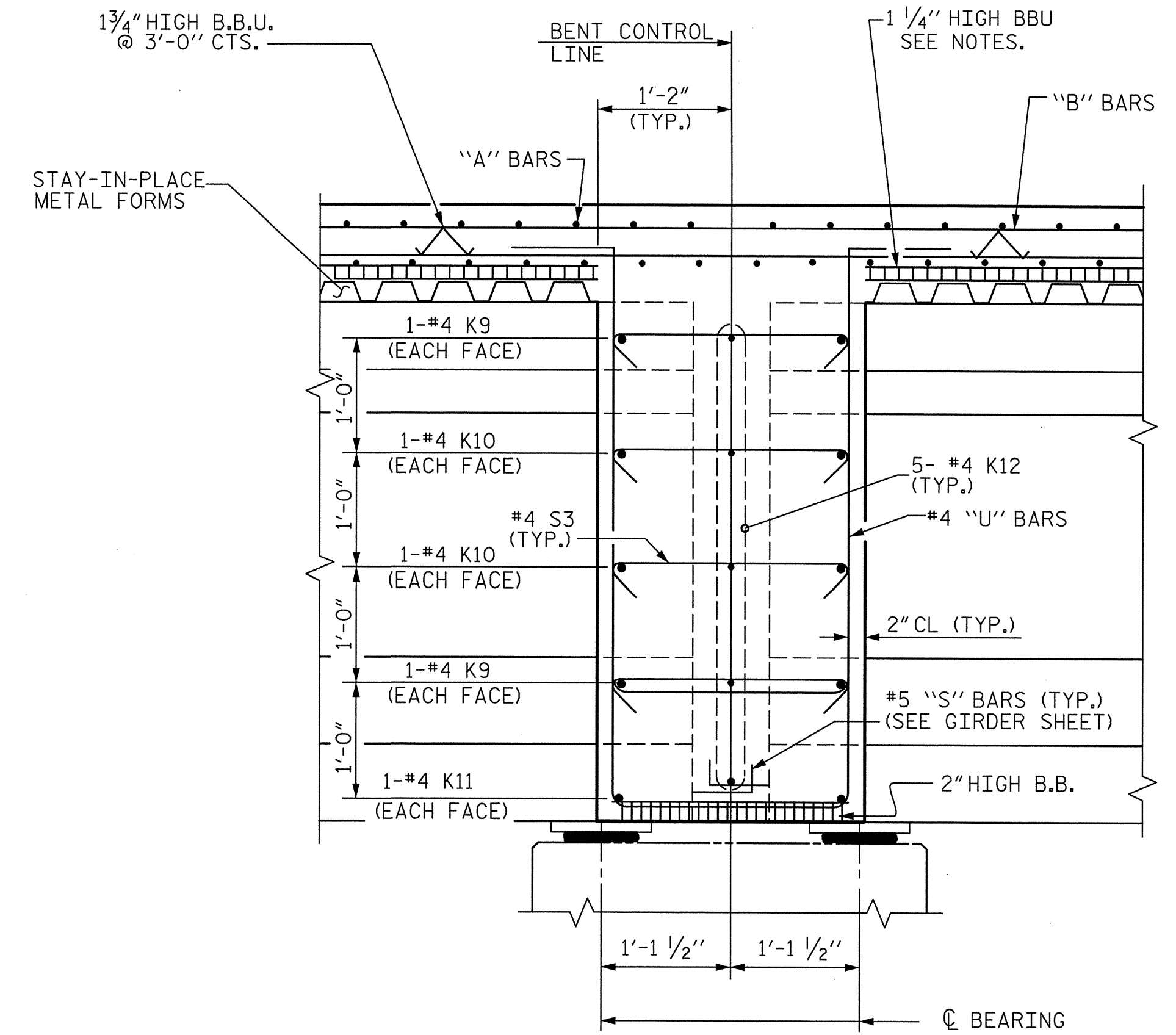
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 LRFR SUMMARY FOR
 PRESTRESSED
 CONCRETE GIRDERS
 (NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4 TOTAL SHEETS 48
1			3			
2			4			

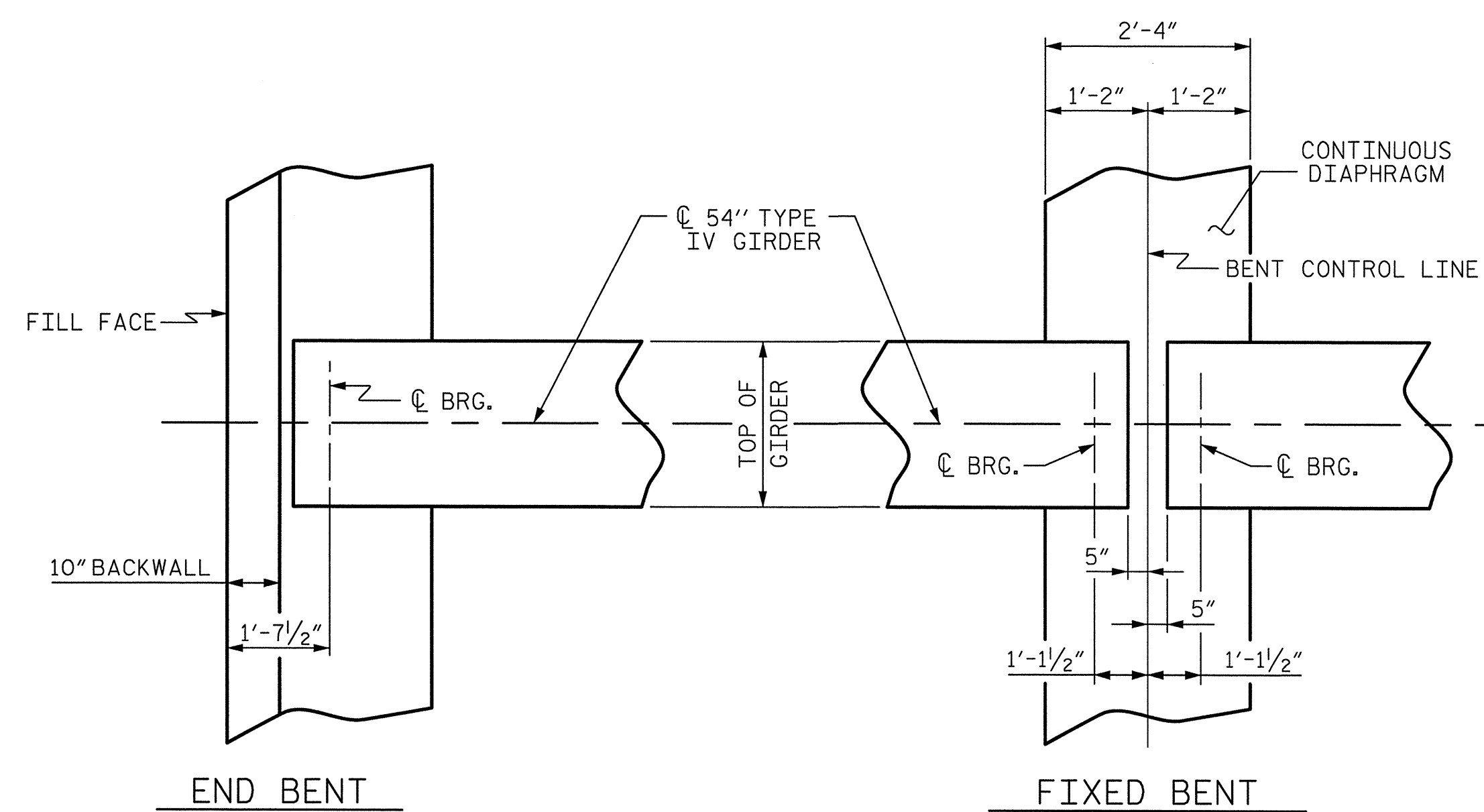


SECTION THRU INTEGRAL END BENT

#4 K5 NOT SHOWN FOR CLARITY



SECTION THRU CONTINUOUS BENT DIAPHRAGM

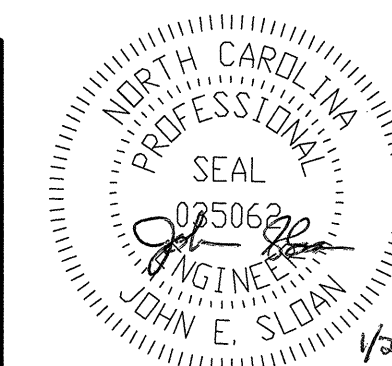


PLAN OF DIAPHRAGMS

PROJECT NO. P-5208B
 CABARRUS COUNTY
 STATION: 25+41.22 -L-

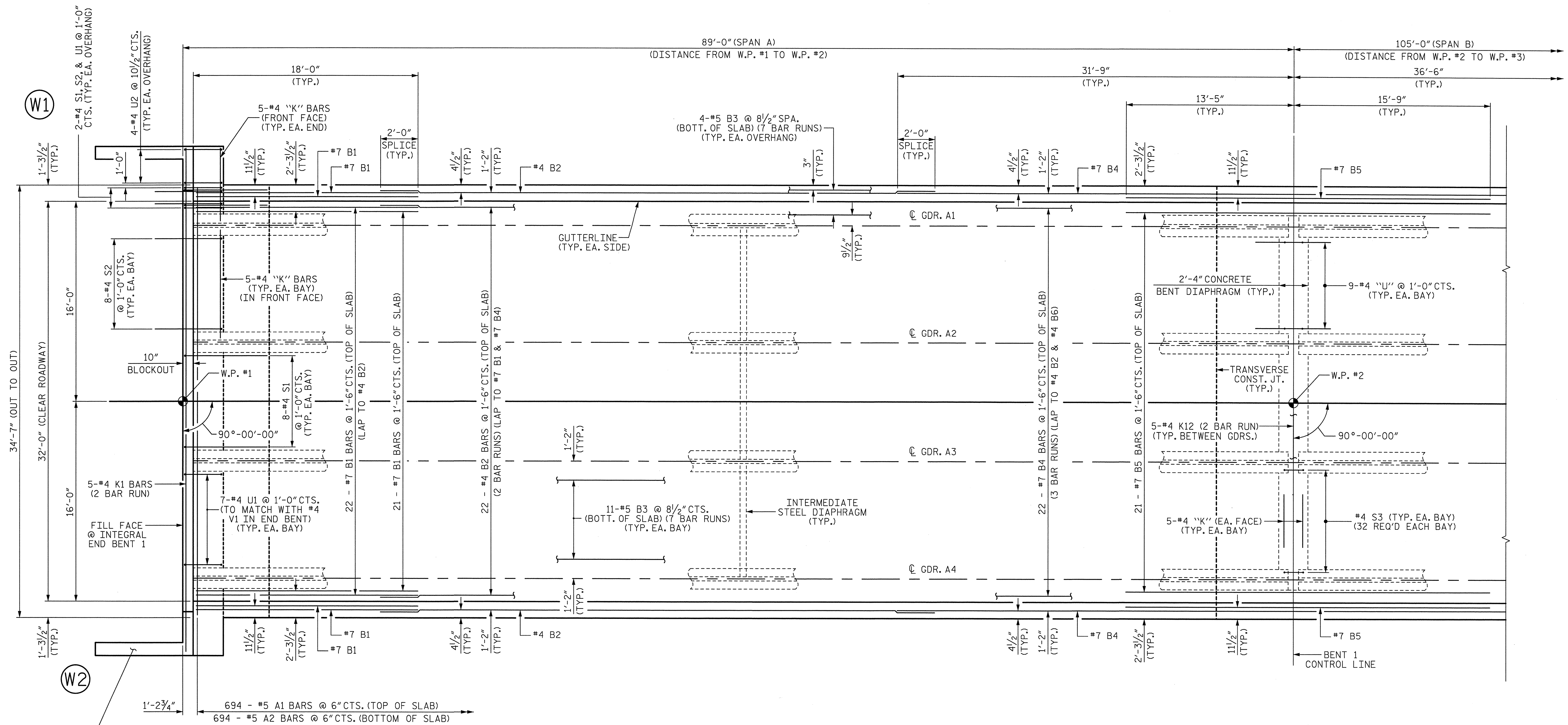
SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 TYPICAL SECTION
 DETAILS



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			48

DRAWN BY: R. L. WHITCHER DATE: 6/28/12
 CHECKED BY: M. K. TOM DATE: 7/5/12



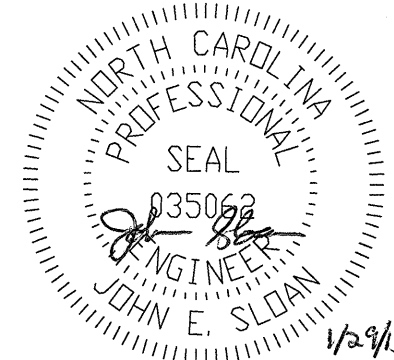
PLAN OF SPAN A

FOR POUR SEQUENCE AND LOCATION OF CONSTRUCTION JOINTS, SEE SUPERSTRUCTURE "CONCRETE DECK POUR DETAILS" SHEET.

PROJECT NO. P-5208B
CABARRUS COUNTY
 STATION: 25+41.22 -L-

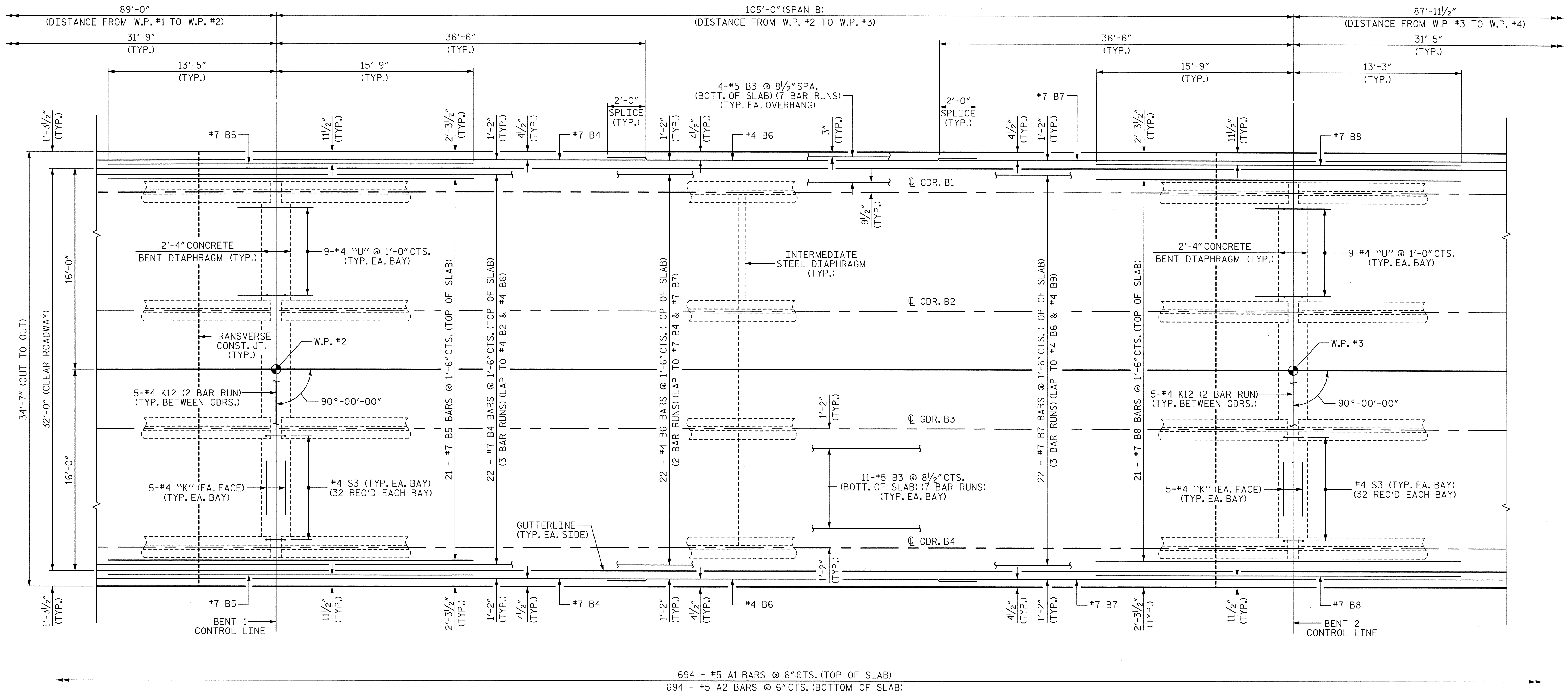
SHEET 1 OF 6

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PLAN OF SPAN
 SPAN A



DRAWN BY: R. L. WHITCHER DATE: 6/27/12
 CHECKED BY: M. K. TOM DATE: 7/5/12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			48



PLAN OF SPAN B

FOR POUR SEQUENCE AND LOCATION OF CONSTRUCTION JOINTS, SEE SUPERSTRUCTURE "CONCRETE DECK POUR DETAILS" SHEET.

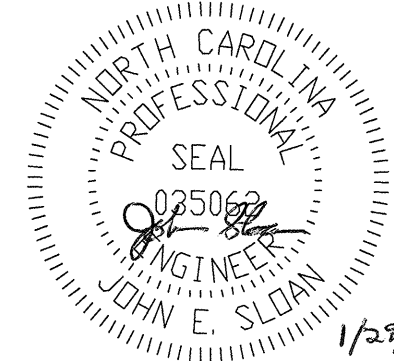
PROJECT NO. P-5208B
CABARRUS COUNTY
 STATION: 25+41.22 -L-

SHEET 2 OF 6

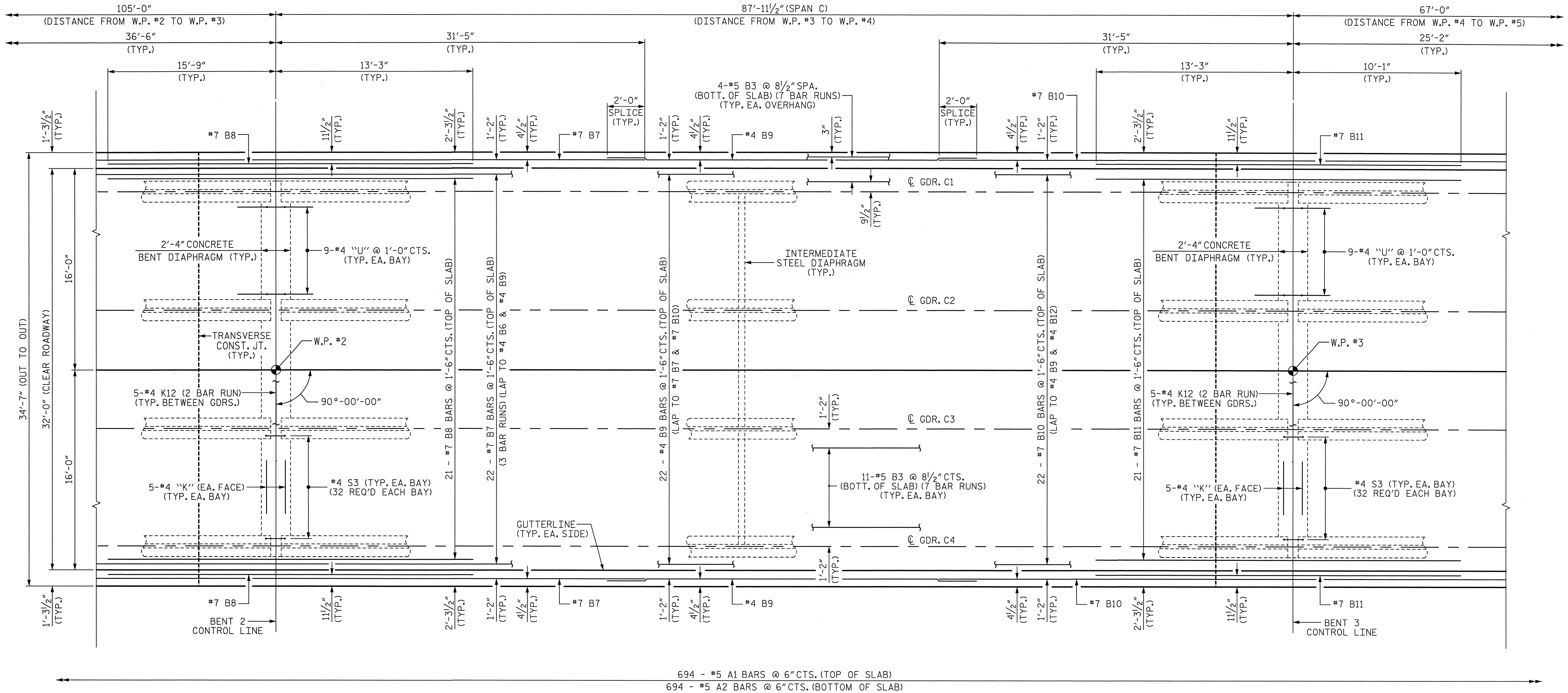
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PLAN OF SPAN
 SPAN B

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

S-8
TOTAL SHEETS
48



DRAWN BY: R. L. WHITCHER DATE: 6/27/12
 CHECKED BY: M. K. TOM DATE: 7/5/12



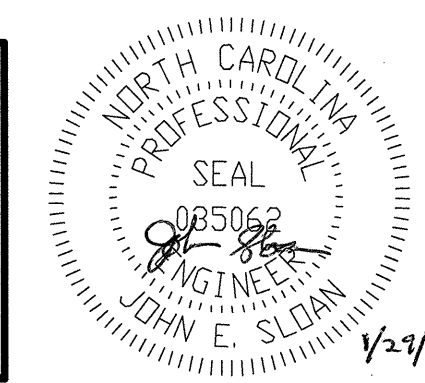
PLAN OF SPAN C

FOR POUR SEQUENCE AND LOCATION OF CONSTRUCTION JOINTS, SEE SUPERSTRUCTURE "CONCRETE DECK POUR DETAILS" SHEET.

PROJECT NO. P-5208B
CABARRUS COUNTY
 STATION: 25+41.22 -L-

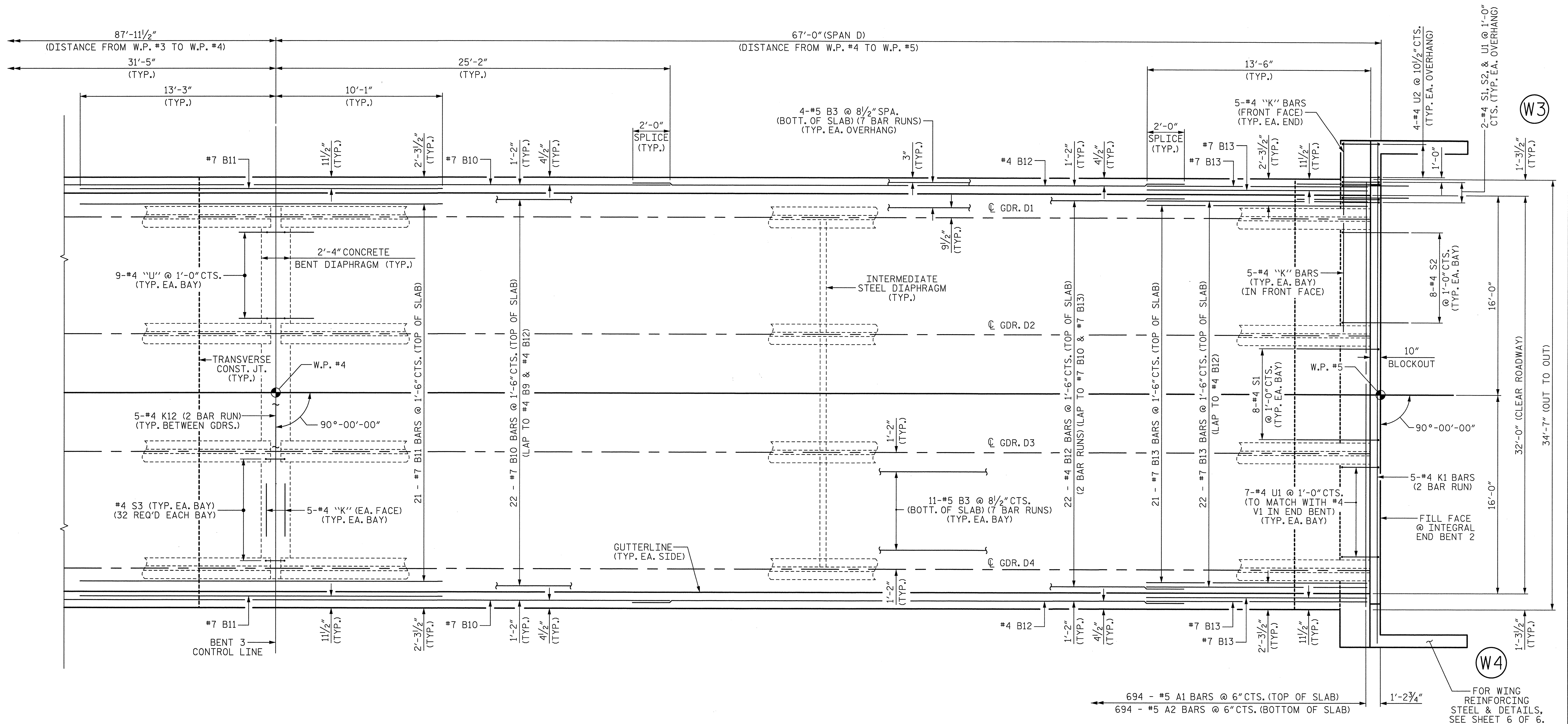
SHEET 3 OF 6

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



DRAWN BY: R. L. WHITCHER DATE: 6/27/12
 CHECKED BY: M. K. TOM DATE: 7/5/12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			48



W3

W4

PLAN OF SPAN D

FOR POUR SEQUENCE AND LOCATION OF CONSTRUCTION JOINTS, SEE SUPERSTRUCTURE "CONCRETE DECK POUR DETAILS" SHEET.

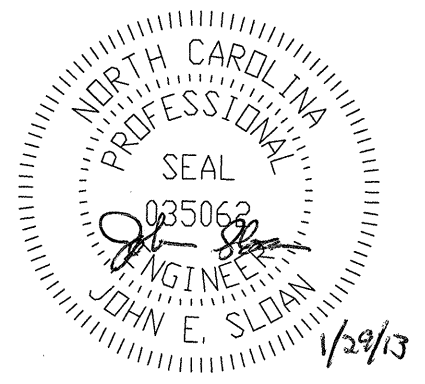
PROJECT NO. P-5208B
 CABARRUS COUNTY
 STATION: 25+41.22 -L-

SHEET 4 OF 6

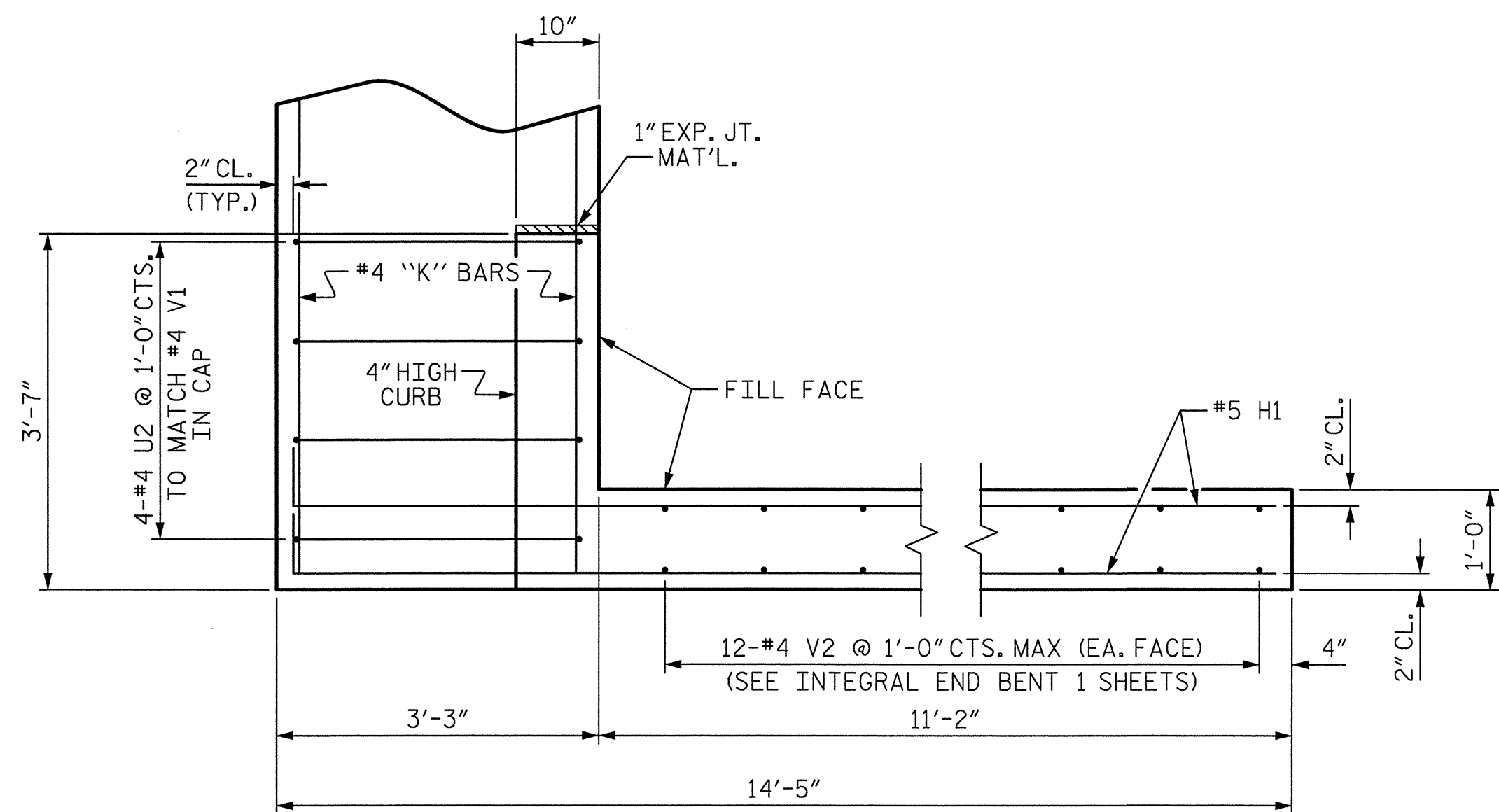
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PLAN OF SPAN
 SPAN D

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

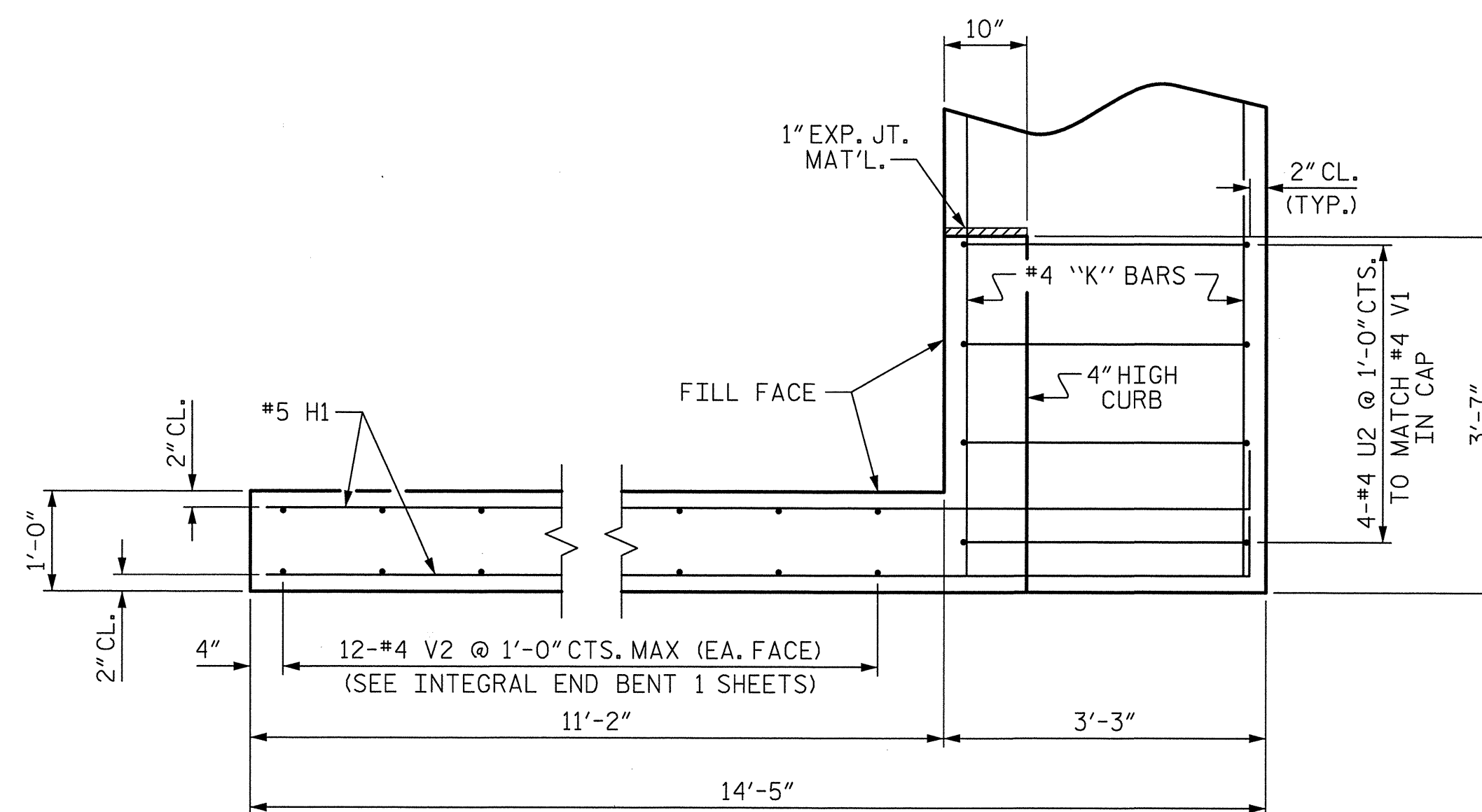
S-10
 TOTAL SHEETS
 48



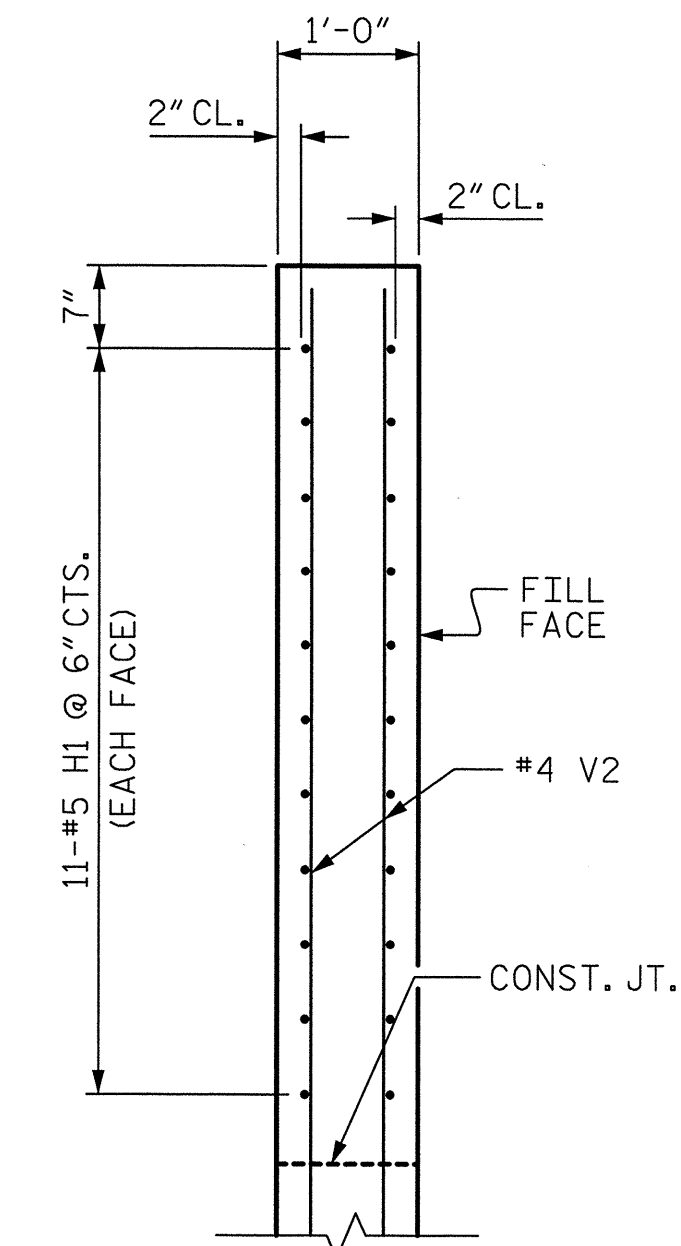
DRAWN BY: R. L. WHITCHER DATE: 6/27/12
 CHECKED BY: M. K. TOM DATE: 7/5/12



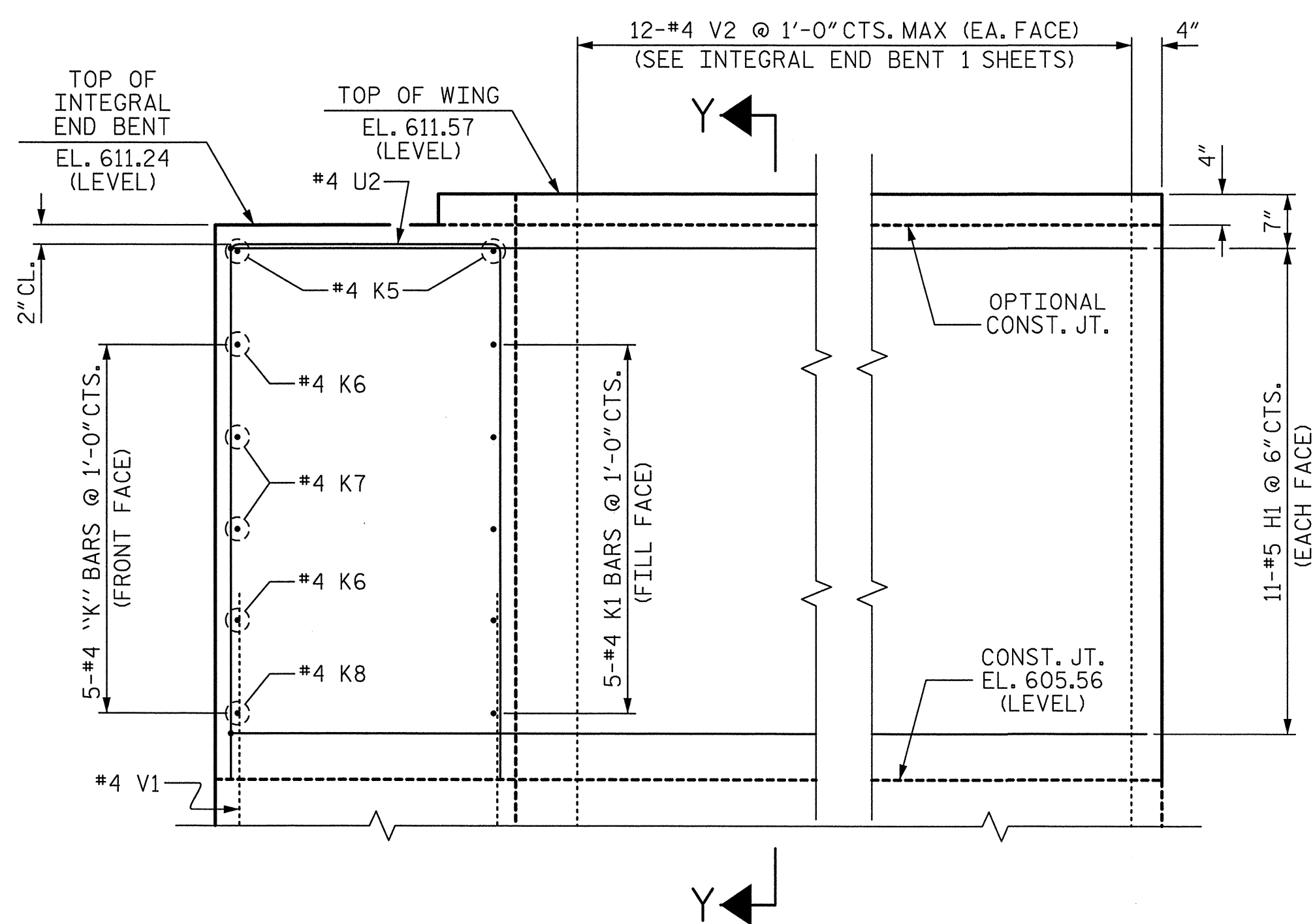
PLAN OF WING (W1)



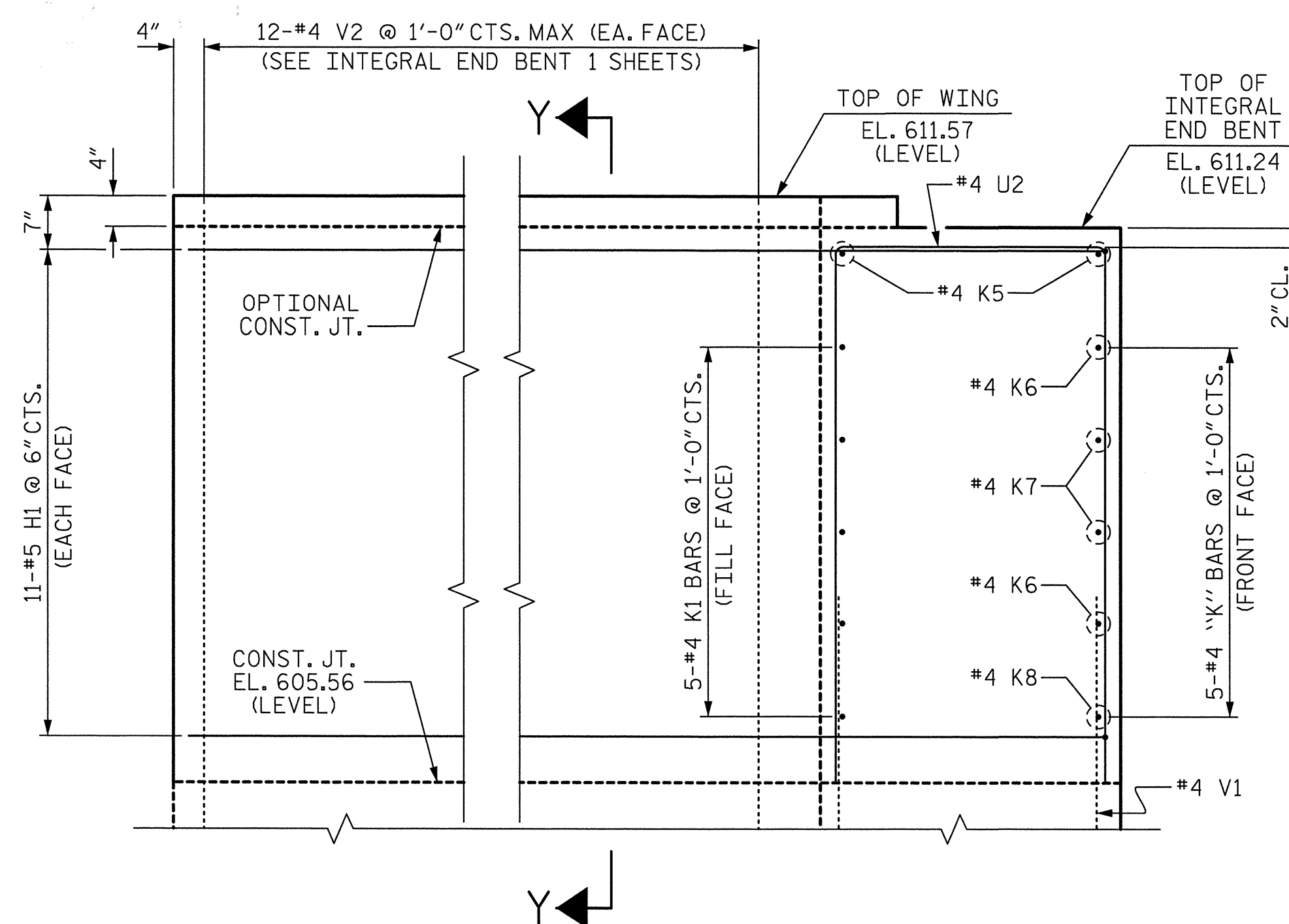
PLAN OF WING (W2)



SECTION Y-Y



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

UPPER WINGS AT INTEGRAL END BENT 1

(FOR LOWER WING REINFORCING STEEL AND DETAILS, SEE INTEGRAL END BENT 1 SHEETS)

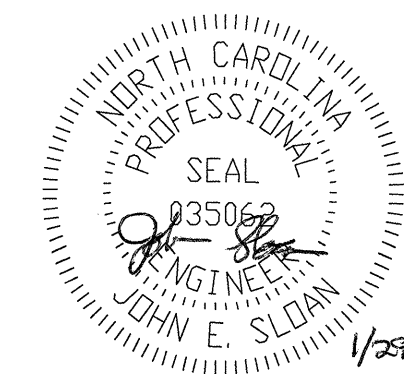
PROJECT NO. P-5208B
 CABARRUS COUNTY
 STATION: 25+41.22 -L-

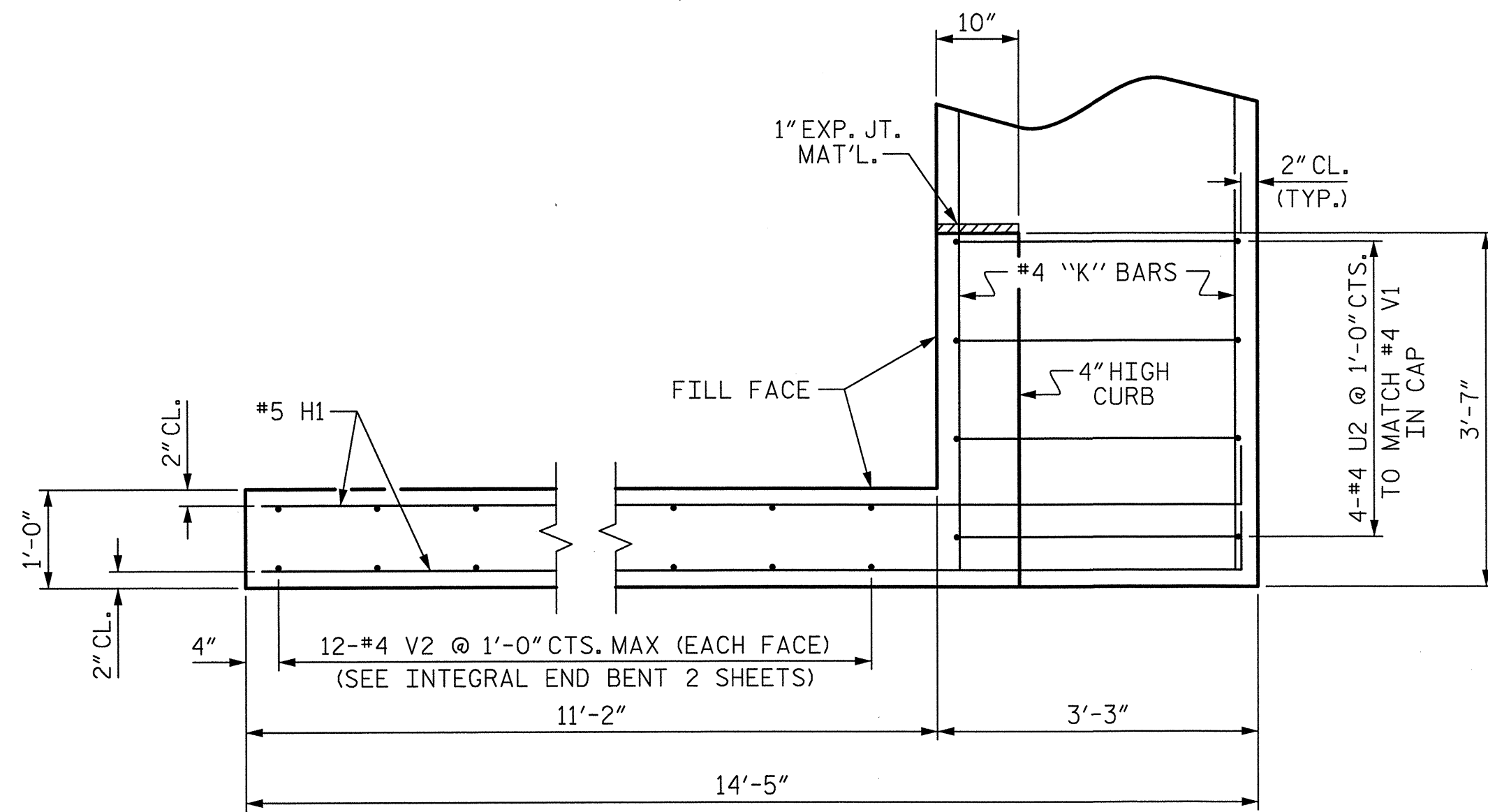
SHEET 5 OF 6

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PLAN OF SPAN
 DETAILS

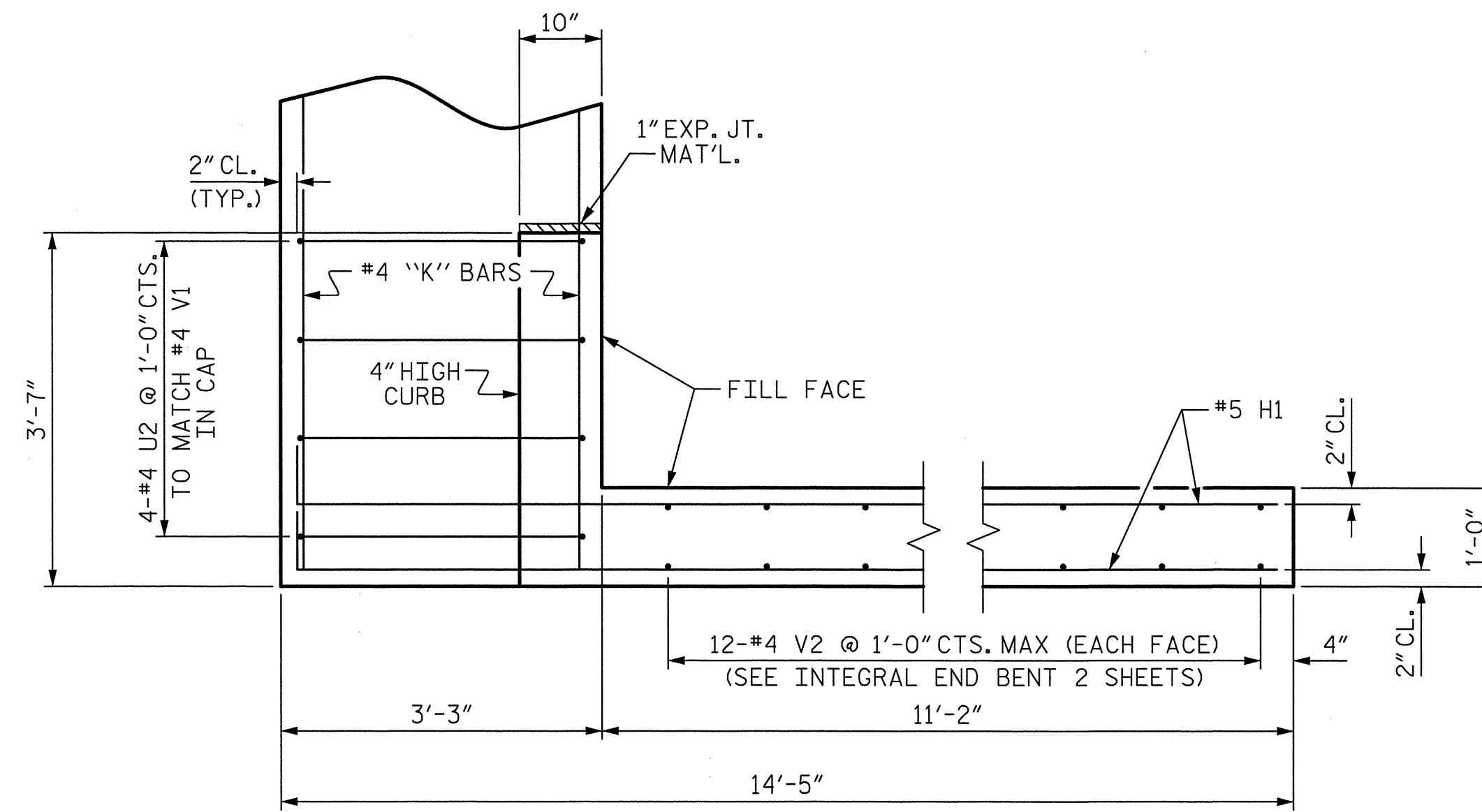
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

DRAWN BY: M. K. TOM DATE: 9/25/12
 CHECKED BY: K. H. COMPTON DATE: 10/22/12

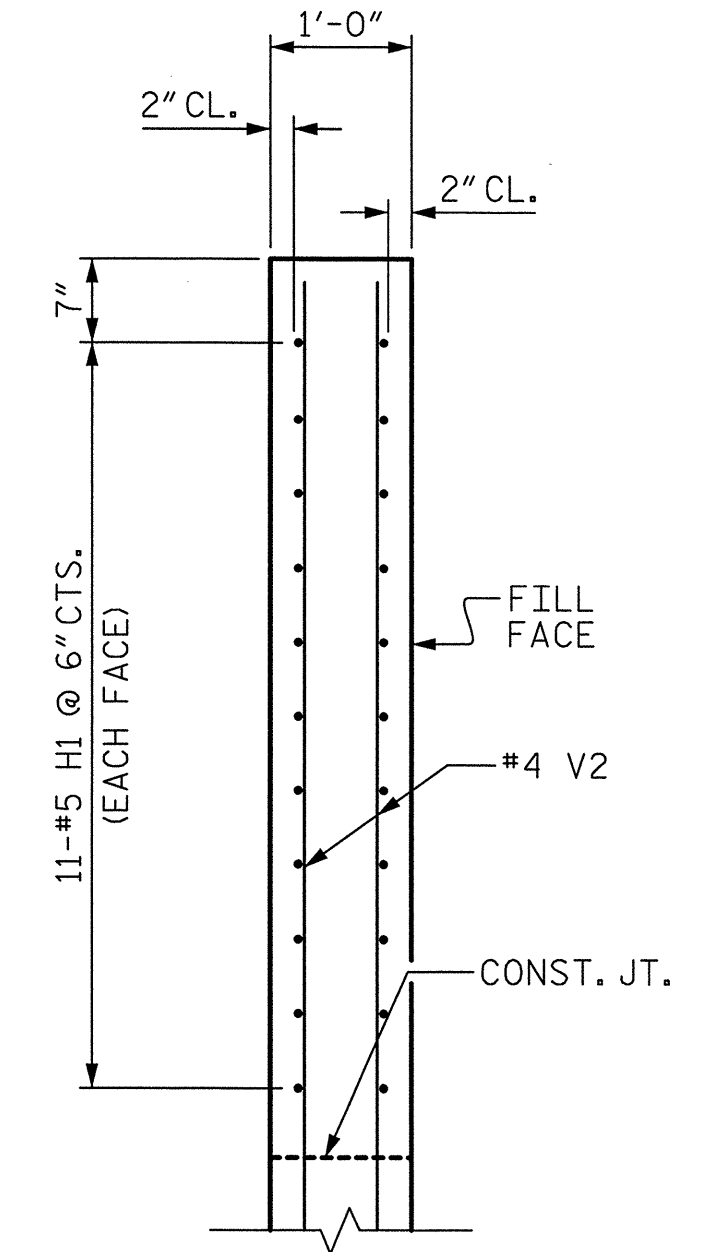




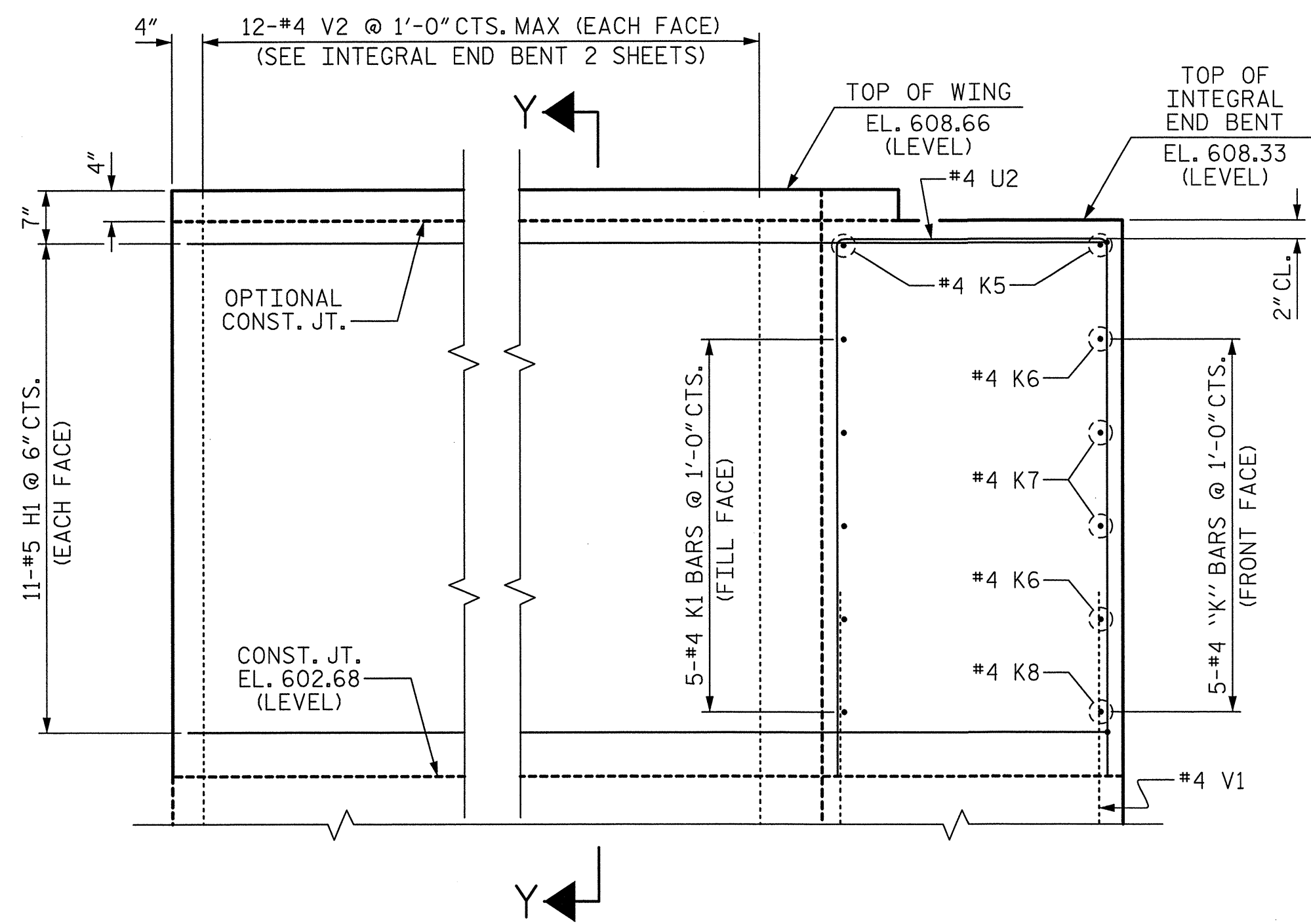
PLAN OF WING (W3)



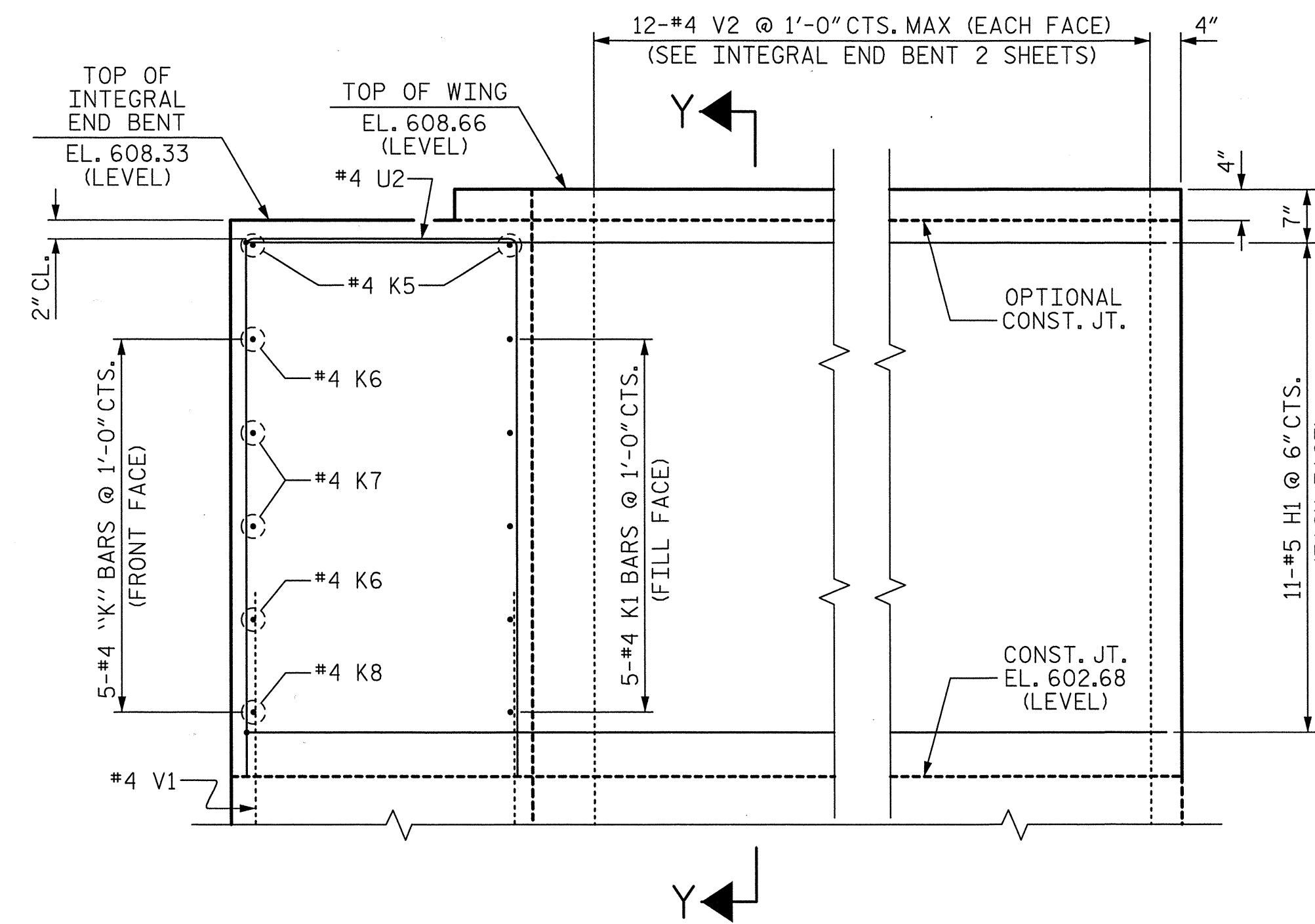
PLAN OF WING (W4)



SECTION Y-Y



ELEVATION OF WING (W3)



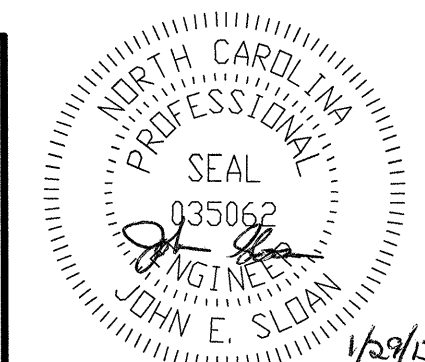
ELEVATION OF WING (W4)

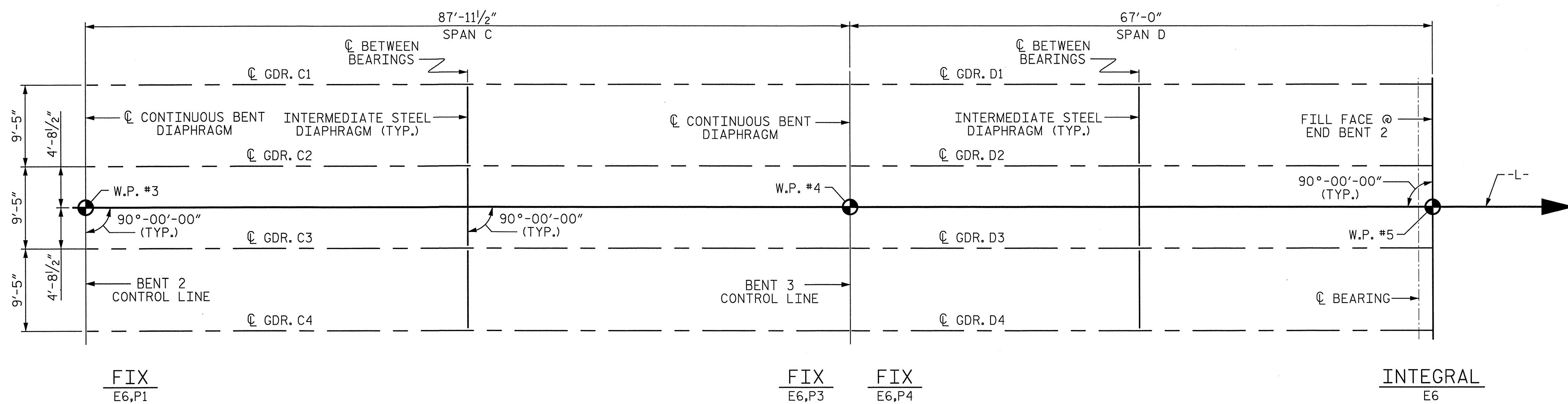
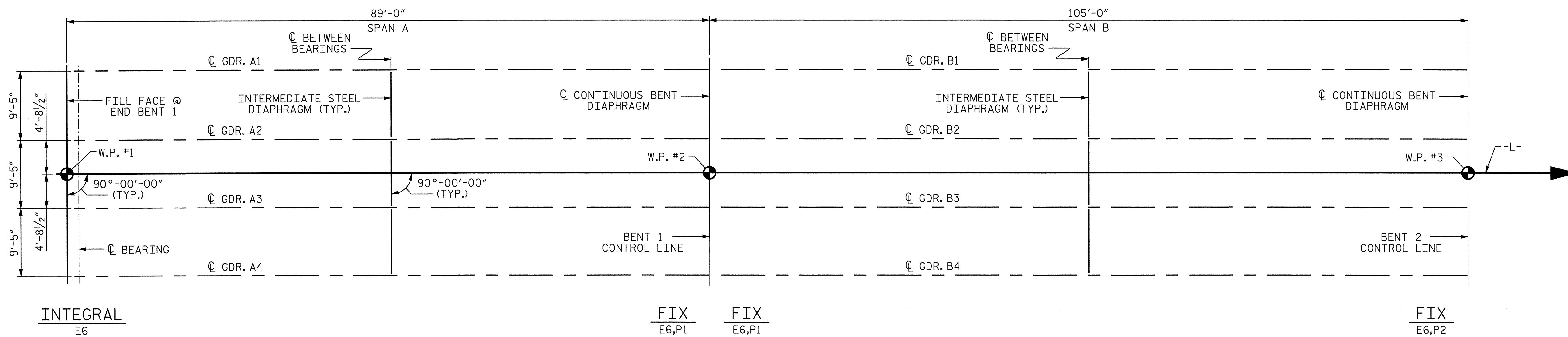
UPPER WINGS AT INTEGRAL END BENT 2
(FOR LOWER WING REINFORCING STEEL AND DETAILS, SEE INTEGRAL END BENT 2 SHEETS)

PROJECT NO. P-5208B
 CABARRUS COUNTY
 STATION: 25+41.22 -L-
 SHEET 6 OF 6

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH				
SUPERSTRUCTURE PLAN OF SPAN DETAILS				
REVISIONS				
NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	
				SHEET NO. S-12 TOTAL SHEETS 48

DRAWN BY: M. K. TOM DATE: 10/19/12
 CHECKED BY: K. H. COMPTON DATE: 10/22/12





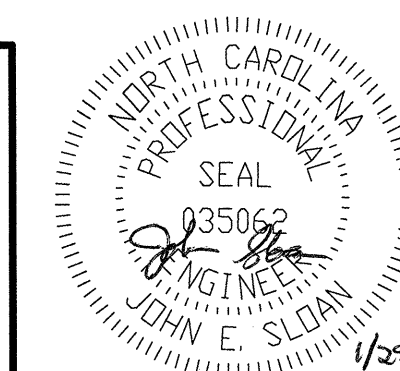
FRAMING PLAN

PROJECT NO. P-5208B
CABARRUS COUNTY
 STATION: 25+41.22 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 FRAMING PLAN

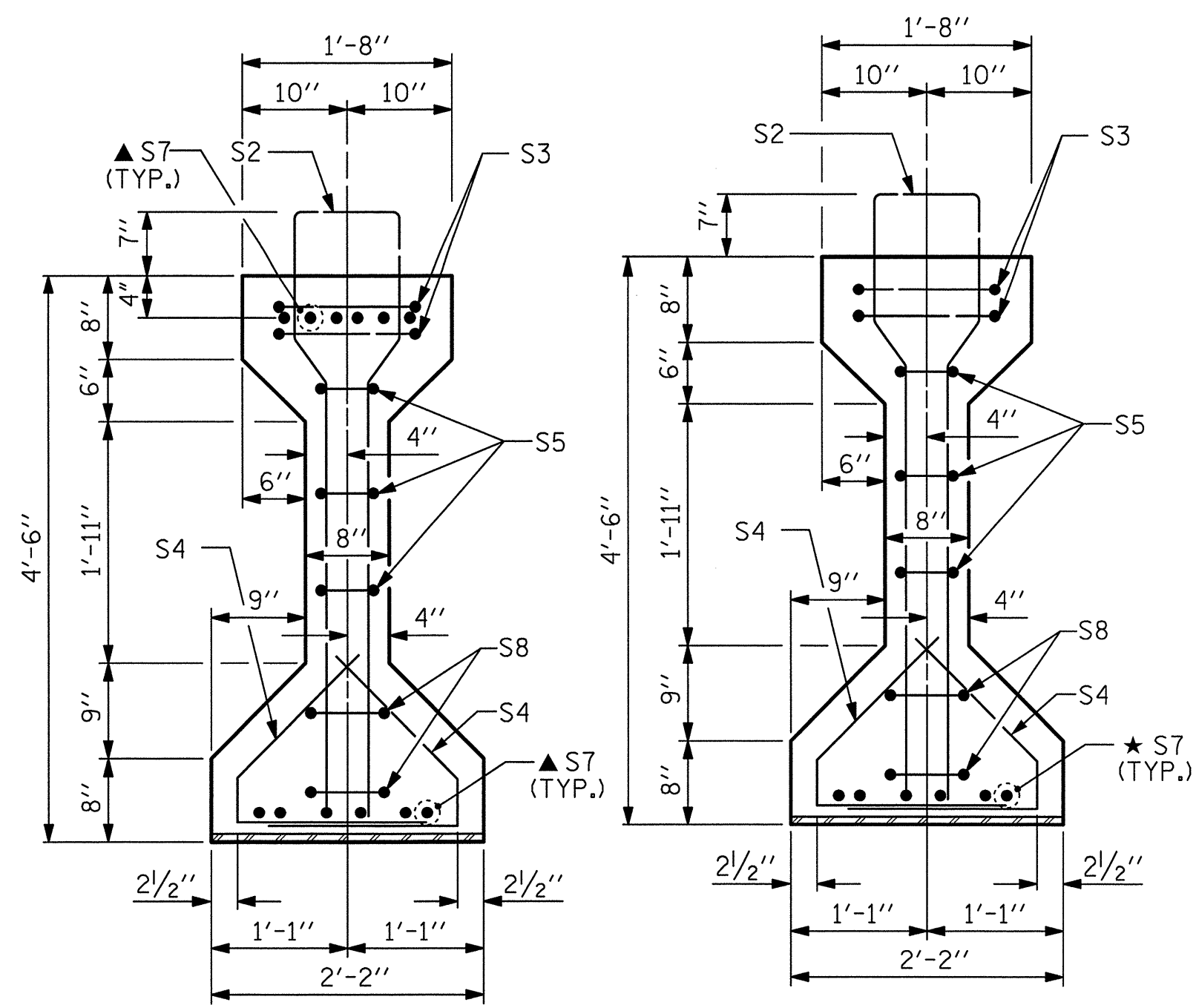
REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	

S-13
 TOTAL SHEETS
 48



DRAWN BY: K.H. COMPTON DATE: 7/3/12
 CHECKED BY: M.K. TOM DATE: 7/5/12

DCN: 0053DEL_P10a2

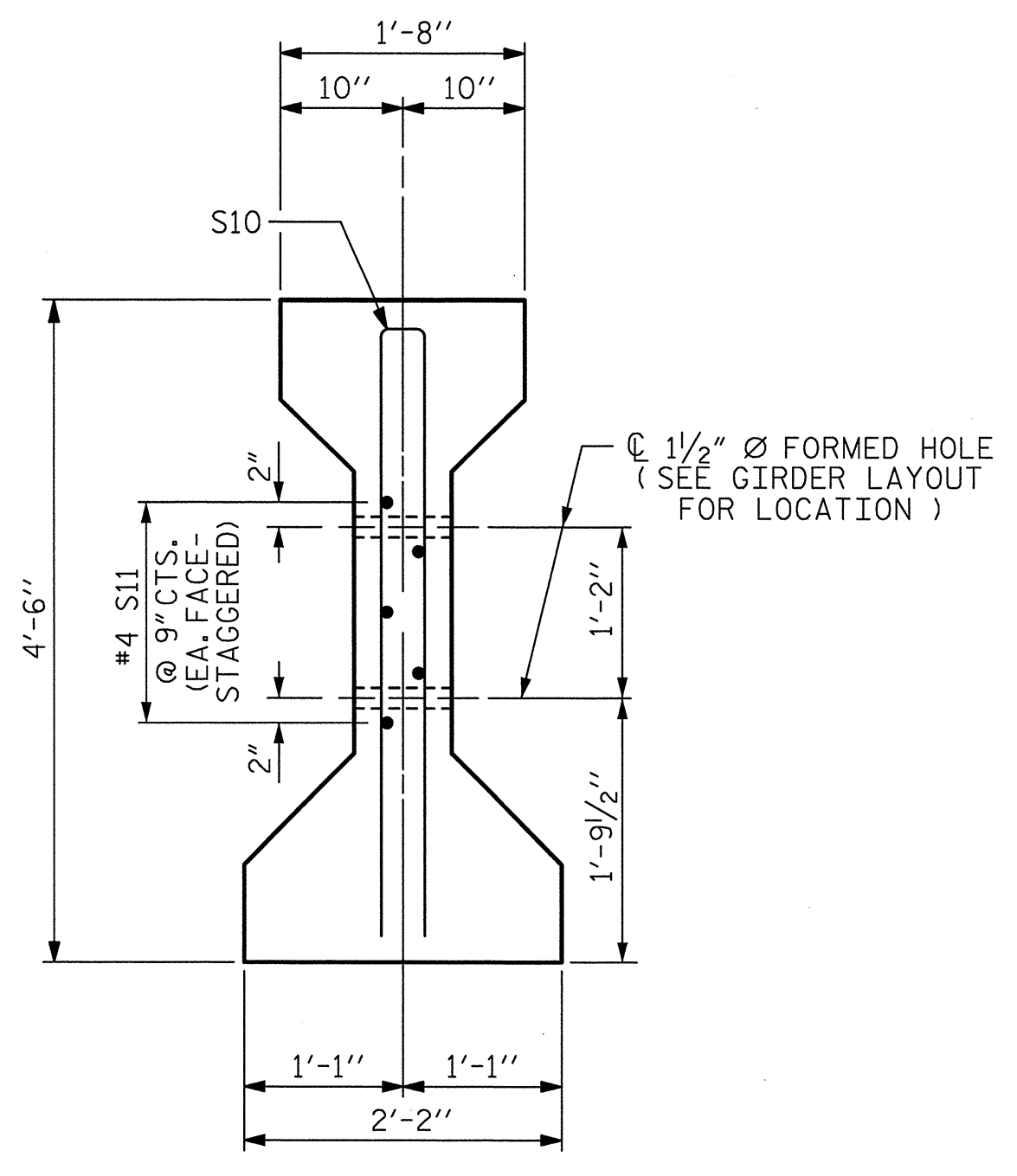


SECTION A-A
AT END BENT

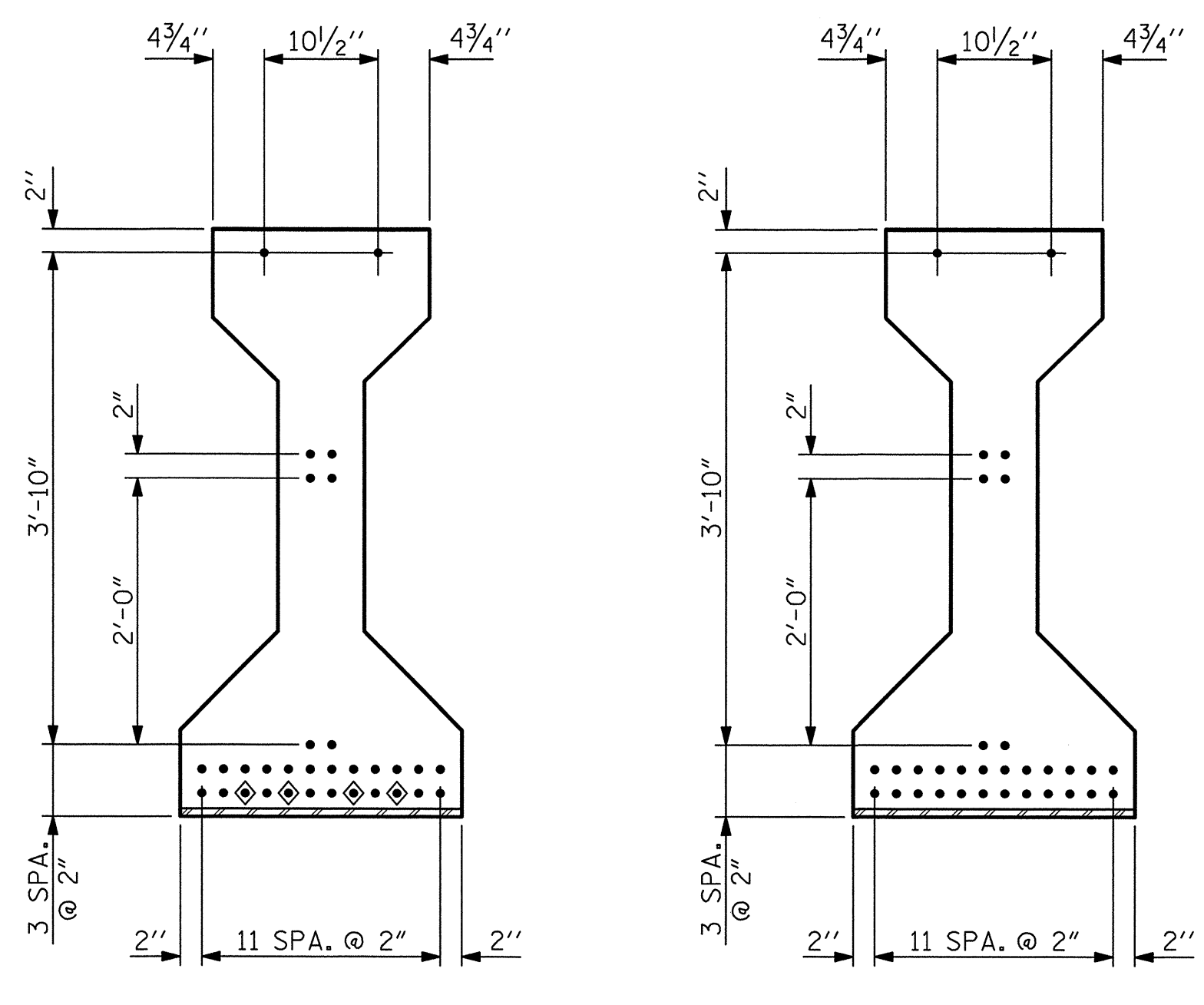
SECTION B-B
AT BENT

▲ FOR S7 BARS, SEE
DETAIL "A" OF
PRESTRESSED
CONCRETE GIRDER
CONTINUOUS FOR LIVE
LOAD DETAILS SHEET

★ FOR S7 BARS, SEE
DETAIL "B" OF
PRESTRESSED
CONCRETE GIRDER
CONTINUOUS FOR LIVE
LOAD DETAILS SHEET



SECTION C-C
(S1 BARS NOT SHOWN)



AT END OF GIRDER

AT C OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

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

0.6" Ø L. R. GRADE 270 STRANDS

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

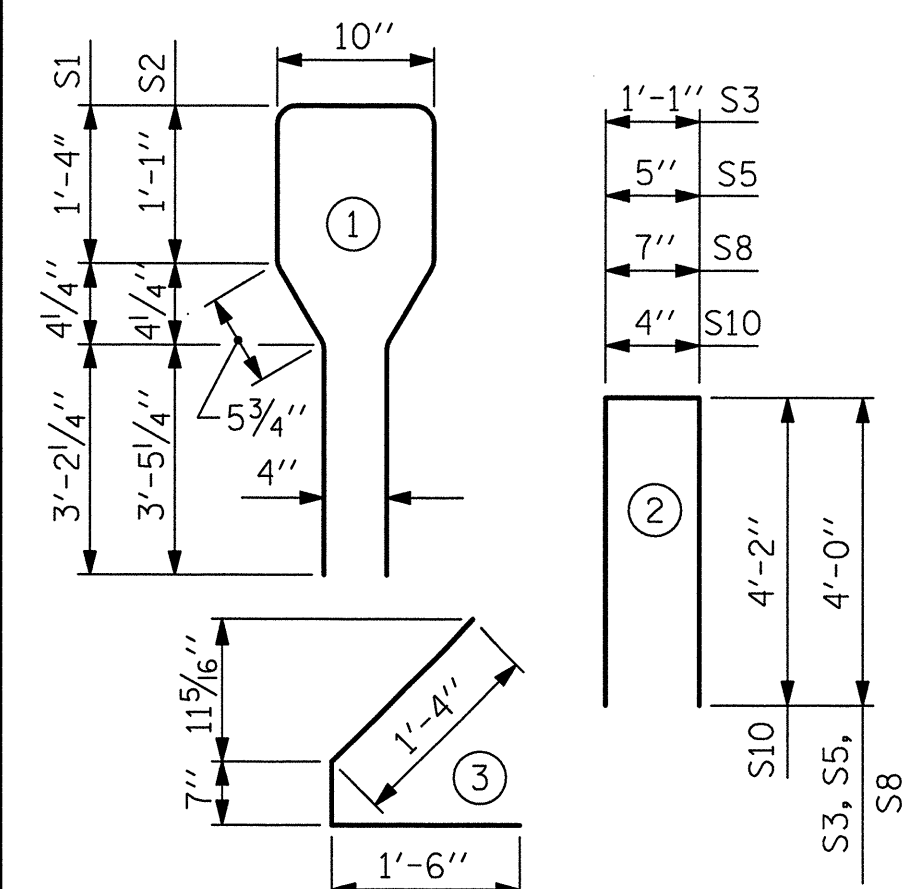
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	77	4	1	10'-10"	557
S2	18	6	1	10'-10"	293
S3	4	4	2	9'-1"	24
S4	76	4	3	3'-5"	173
S5	6	4	2	8'-5"	34
S6	1	4	STR	1'-4"	1
* S7	18	5	STR	3'-8"	69
S8	4	4	2	8'-7"	23
S9	2	3	STR	1'-10"	1
S10	2	5	2	8'-8"	18
S11	5	4	STR	7'-0"	23

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

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT

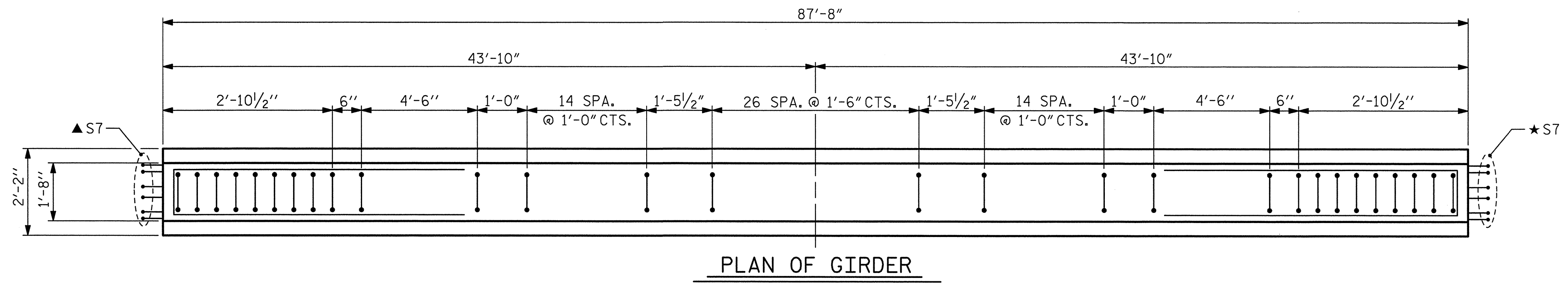


QUANTITIES FOR ONE GIRDER

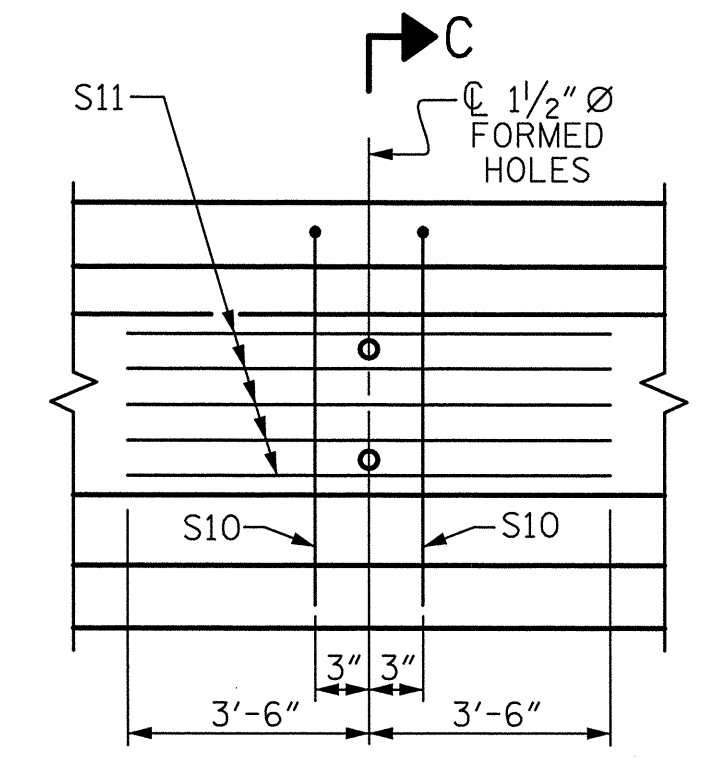
REINFORCING STEEL LB.	8000 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
1216	17.8	32

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	87.67	350.67

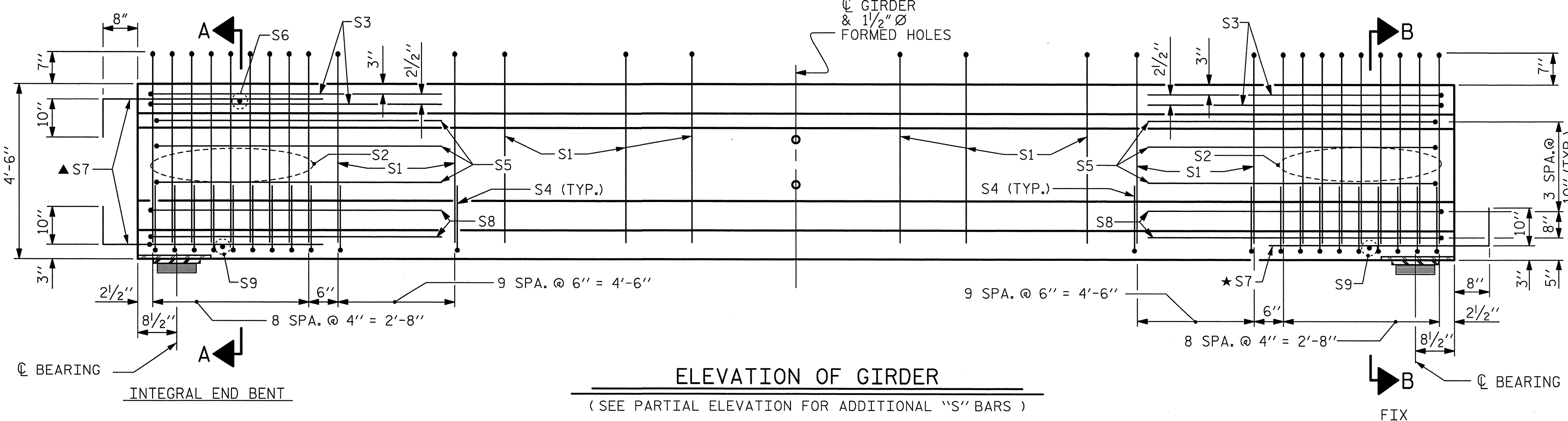


PLAN OF GIRDER



PARTIAL ELEVATION

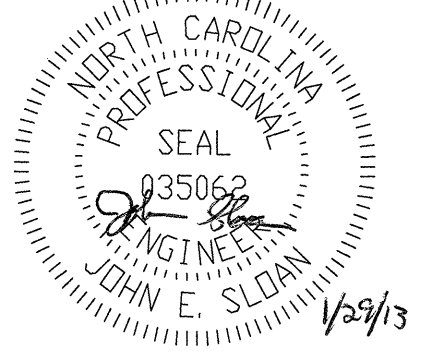
SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR ALL GIRDERS



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

ASSEMBLED BY : M. K. TOM	DATE : 6/26/12
CHECKED BY : K. H. COMPTON	DATE : 7/6/12
DRAWN BY : ELR 8/91	REV. 10/17/00R RWW/LES
CHECKED BY : GRP 8/91	REV. 5/1/06R TLA/GM
	REV. 10/1/11 MAA/GM

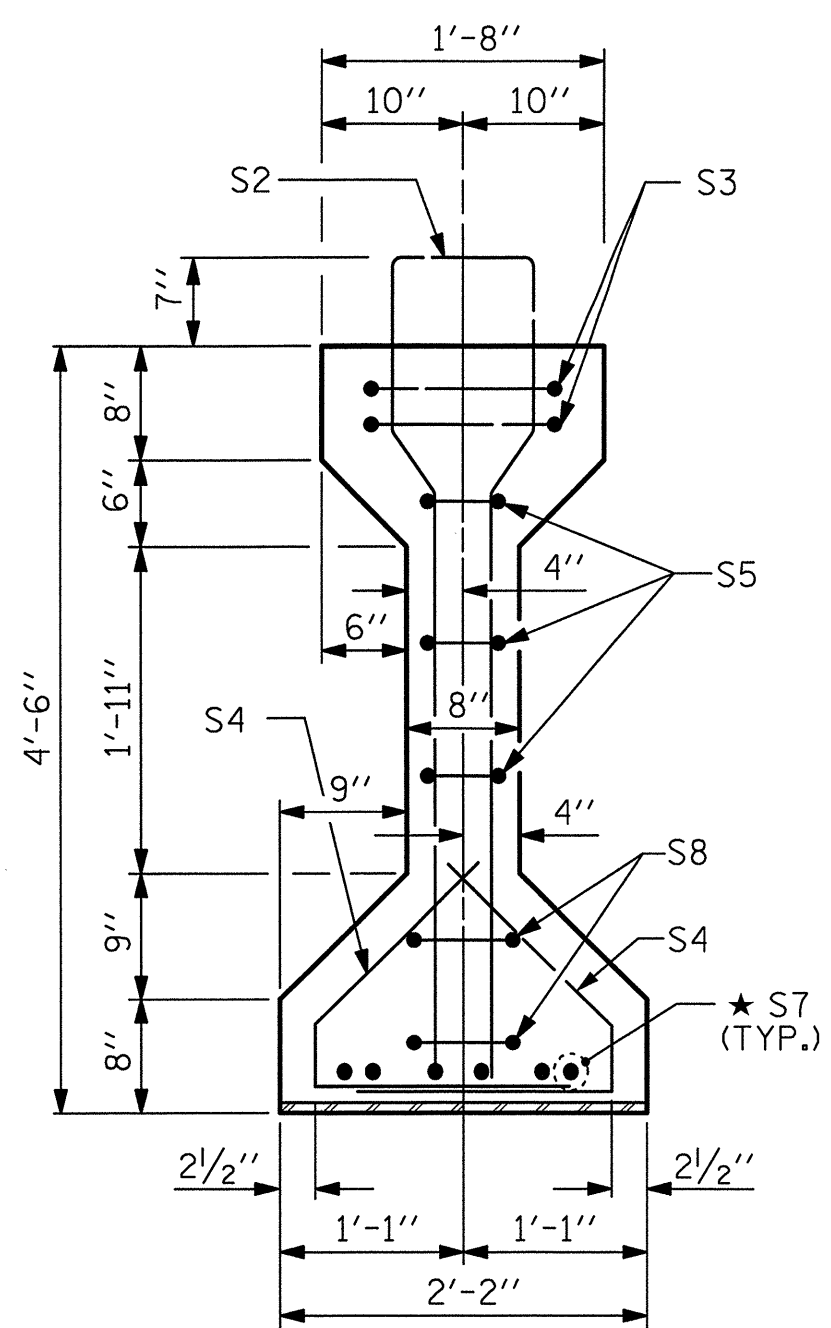


PROJECT NO. P-5208B
CABARRUS COUNTY
STATION: 25+41.22 -L-

SHEET 1 OF 5

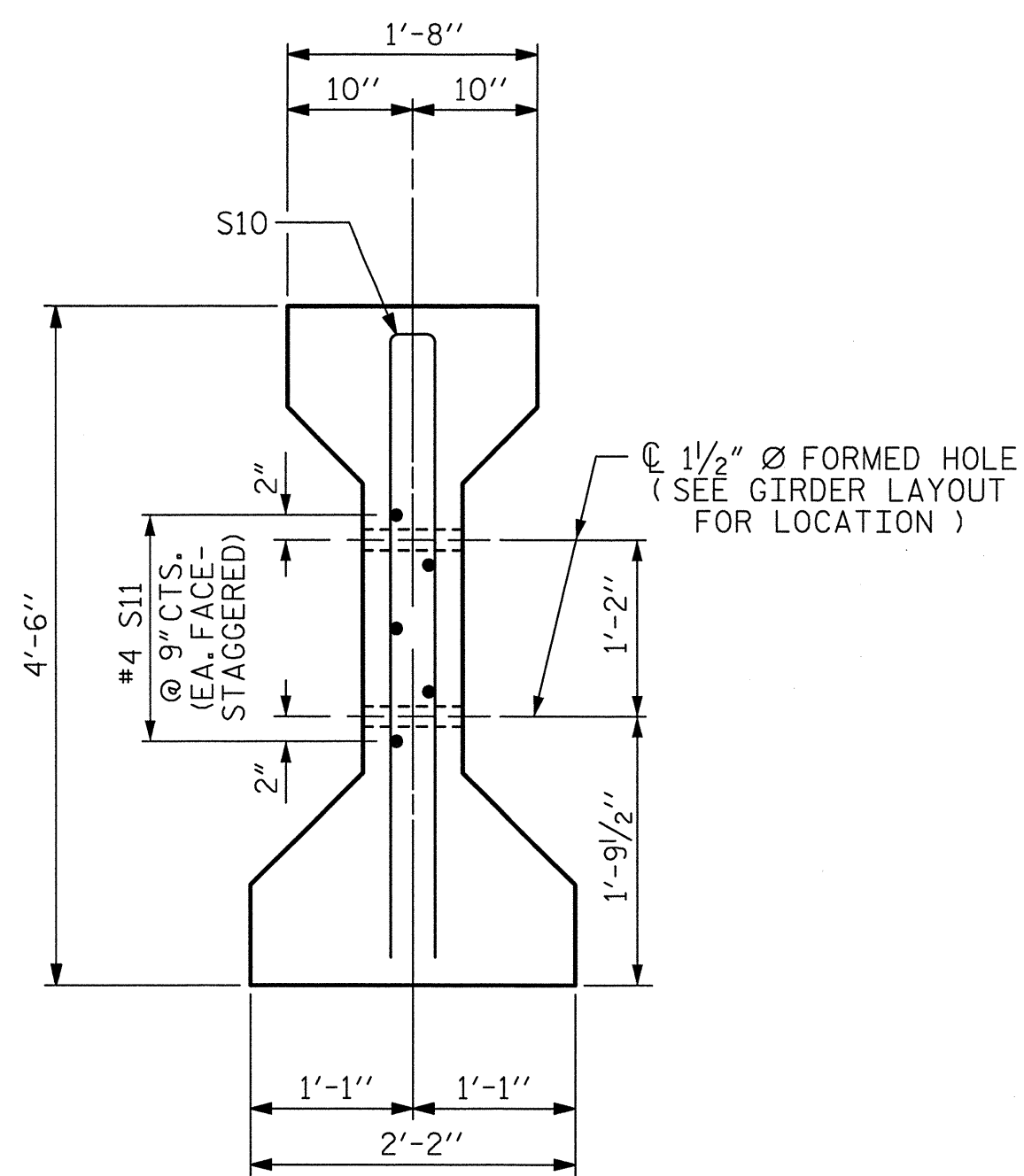
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
SPAN A

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

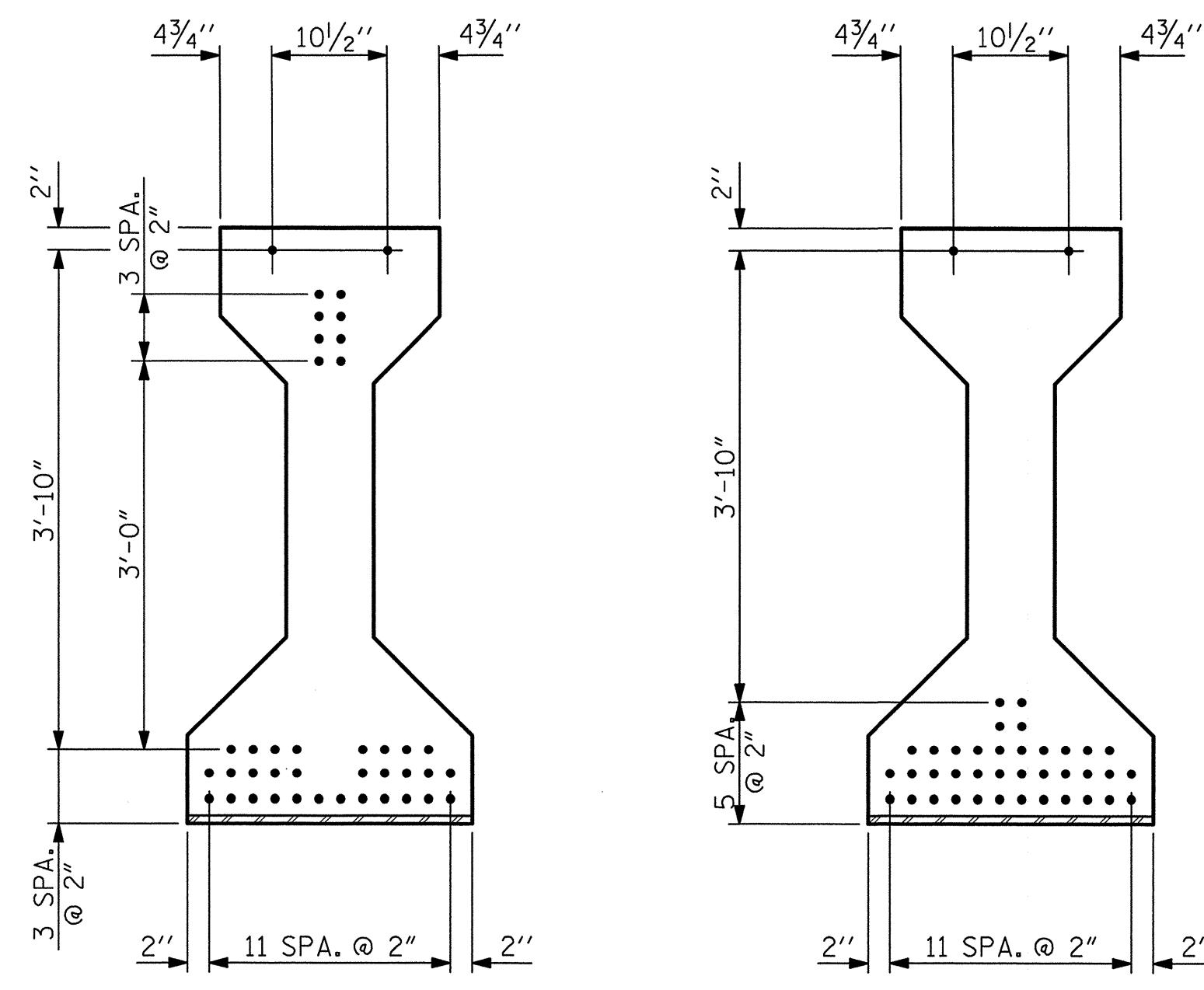


SECTION B-B
AT BENT

* FOR S7 BARS, SEE
DETAIL "B" OF
PRESTRESSED
CONCRETE GIRDER
CONTINUOUS FOR LIVE
LOAD DETAILS SHEET



SECTION C-C
(S1 BARS NOT SHOWN)



AT END OF GIRDER

AT C OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

• FULLY BONDED STRANDS

0.6" Ø L. R. GRADE 270 STRANDS

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

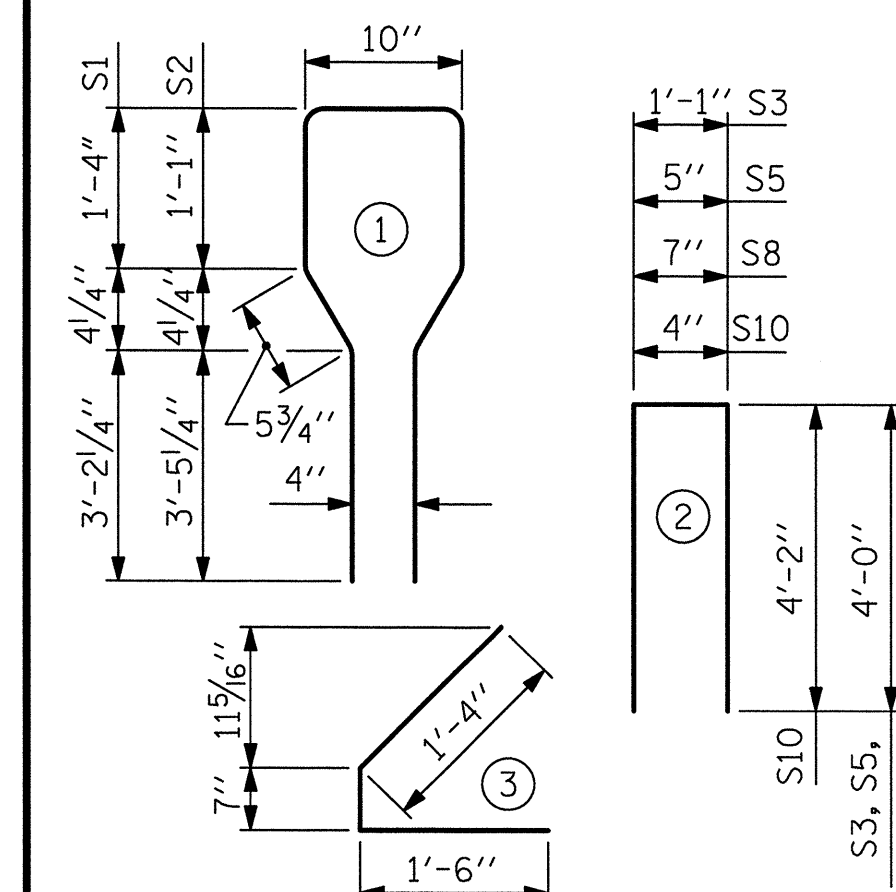
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	88	4	1	10'-10"	637
S2	18	6	1	10'-10"	293
S3	4	4	2	9'-1"	24
S4	76	4	3	3'-5"	173
S5	6	4	2	8'-5"	34
* S7	12	5	STR	3'-8"	46
S8	4	4	2	8'-7"	23
S9	2	3	STR	1'-10"	1
S10	2	5	2	8'-8"	18
S11	5	4	STR	7'-0"	23

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

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT

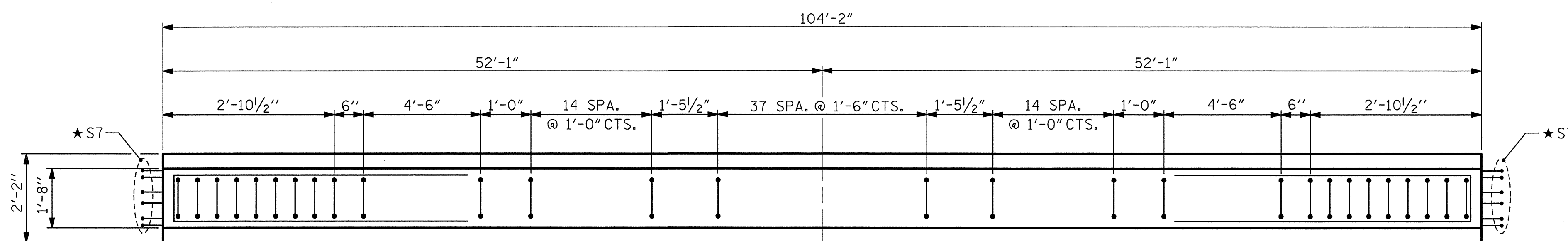


QUANTITIES FOR ONE GIRDER

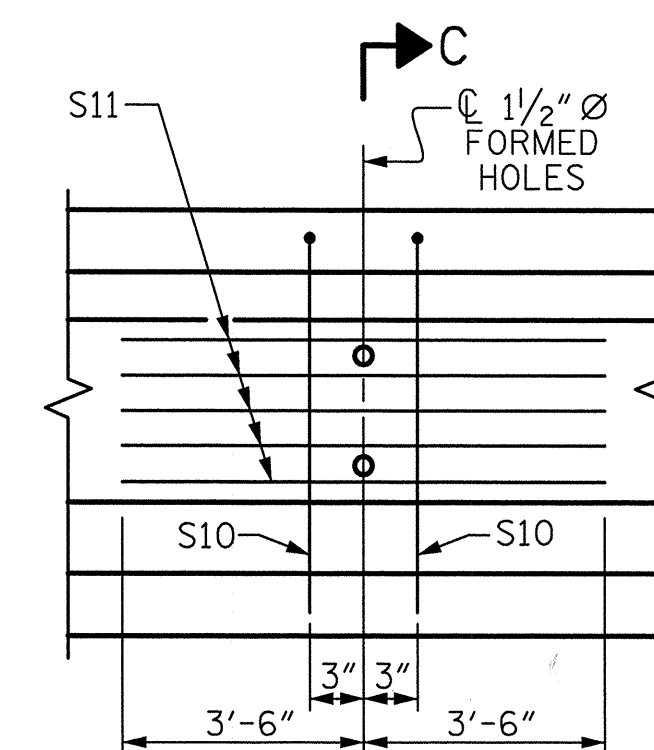
REINFORCING STEEL LB.	8000 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
1272	21.1	40

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	104.17	416.67

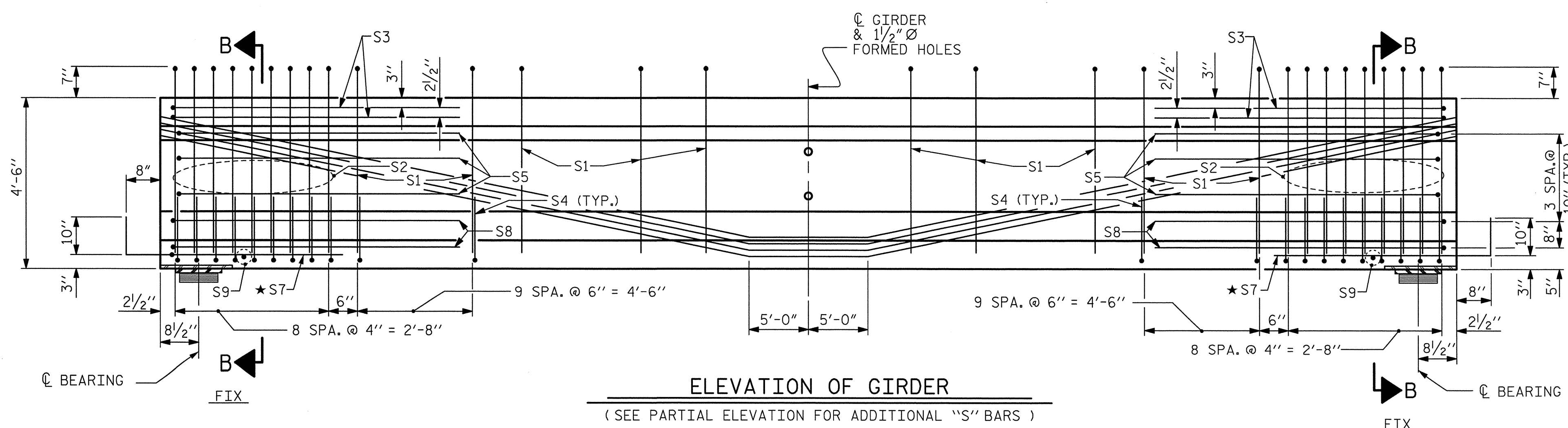


PLAN OF GIRDER



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM
REINFORCING STEEL FOR ALL GIRDERS



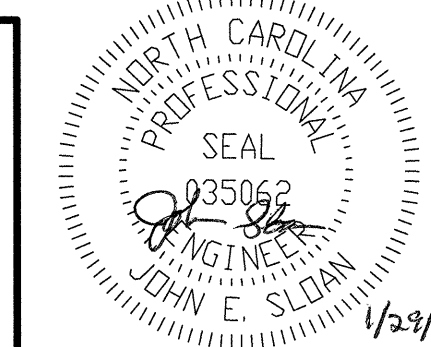
ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

NOTE

THE UPLIFT FORCE DUE TO DRAPED STANDS IS 23.5 KIPS.

ASSEMBLED BY: M. K. TOM	DATE: 6/26/12
CHECKED BY: K. H. COMPTON	DATE: 7/6/12
DRAWN BY: ELR 8/91	REV. 10/17/00R RWW/LES
CHECKED BY: GRP 8/91	REV. 5/1/06R TLA/GM
	REV. 10/1/11 MAA/GM



PROJECT NO. P-5208B

CABARRUS COUNTY

STATION: 25+41.22 -L-

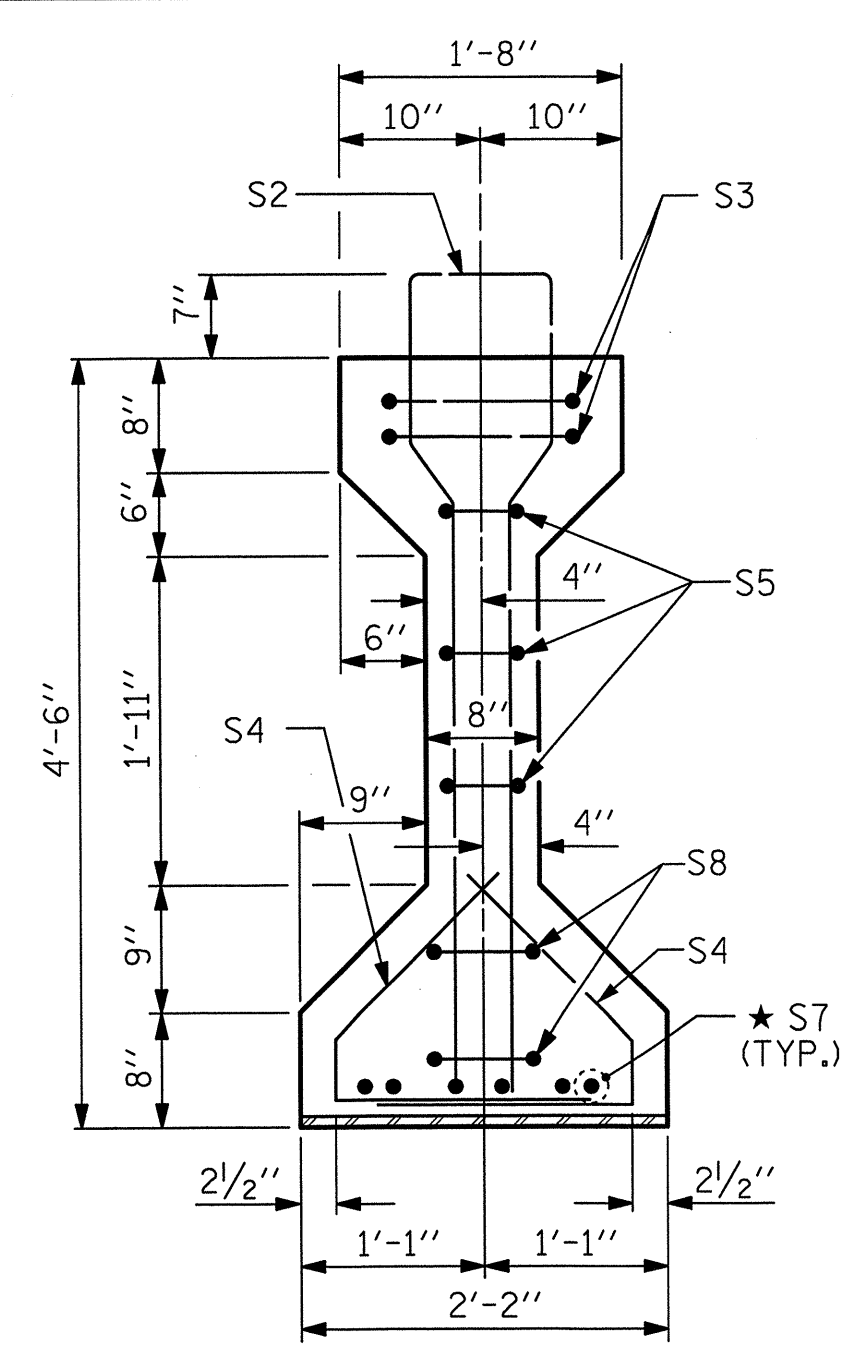
SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
SPAN B

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

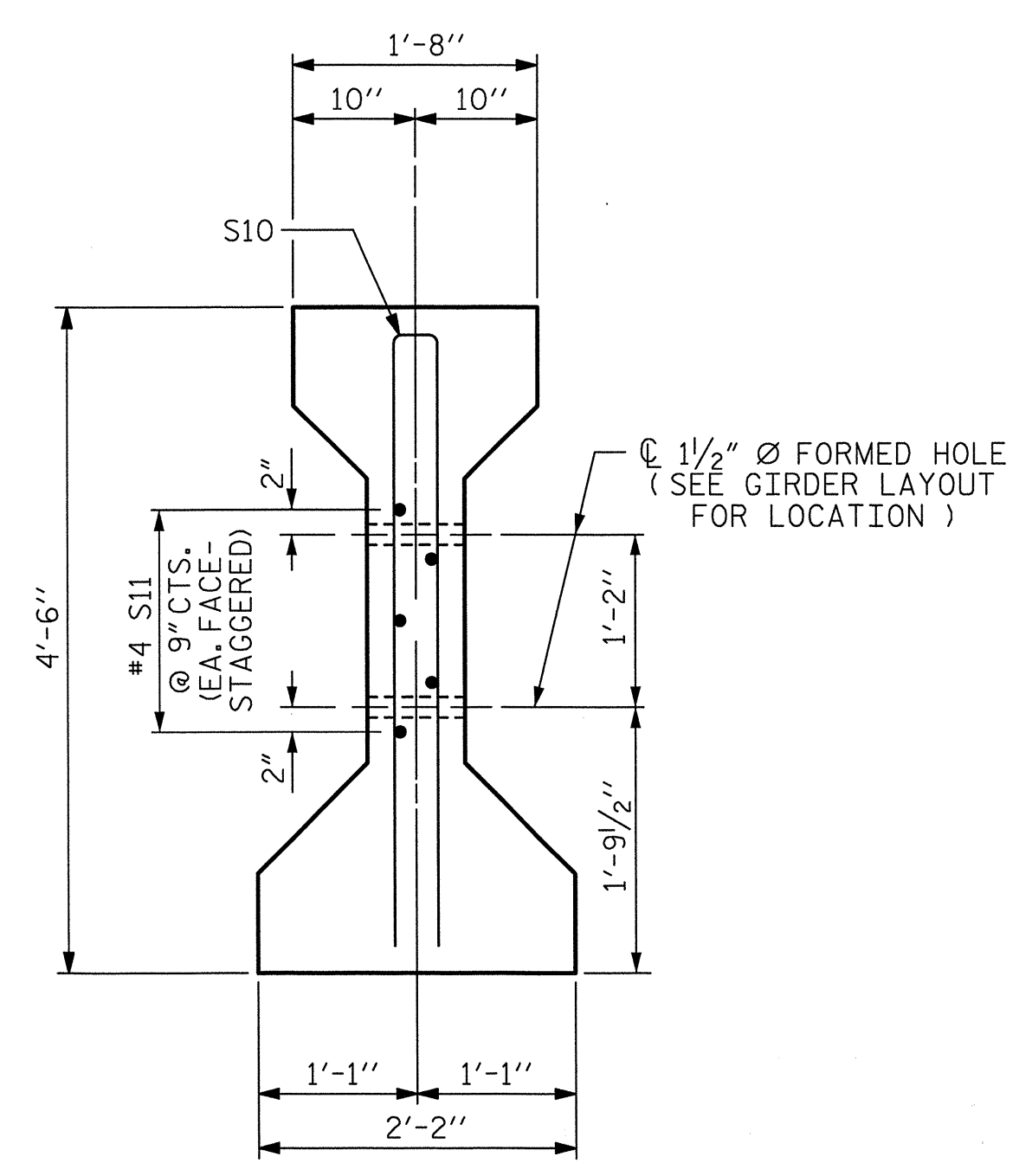
S-15	TOTAL SHEETS	48
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DCN: 0053DEL_P10a2

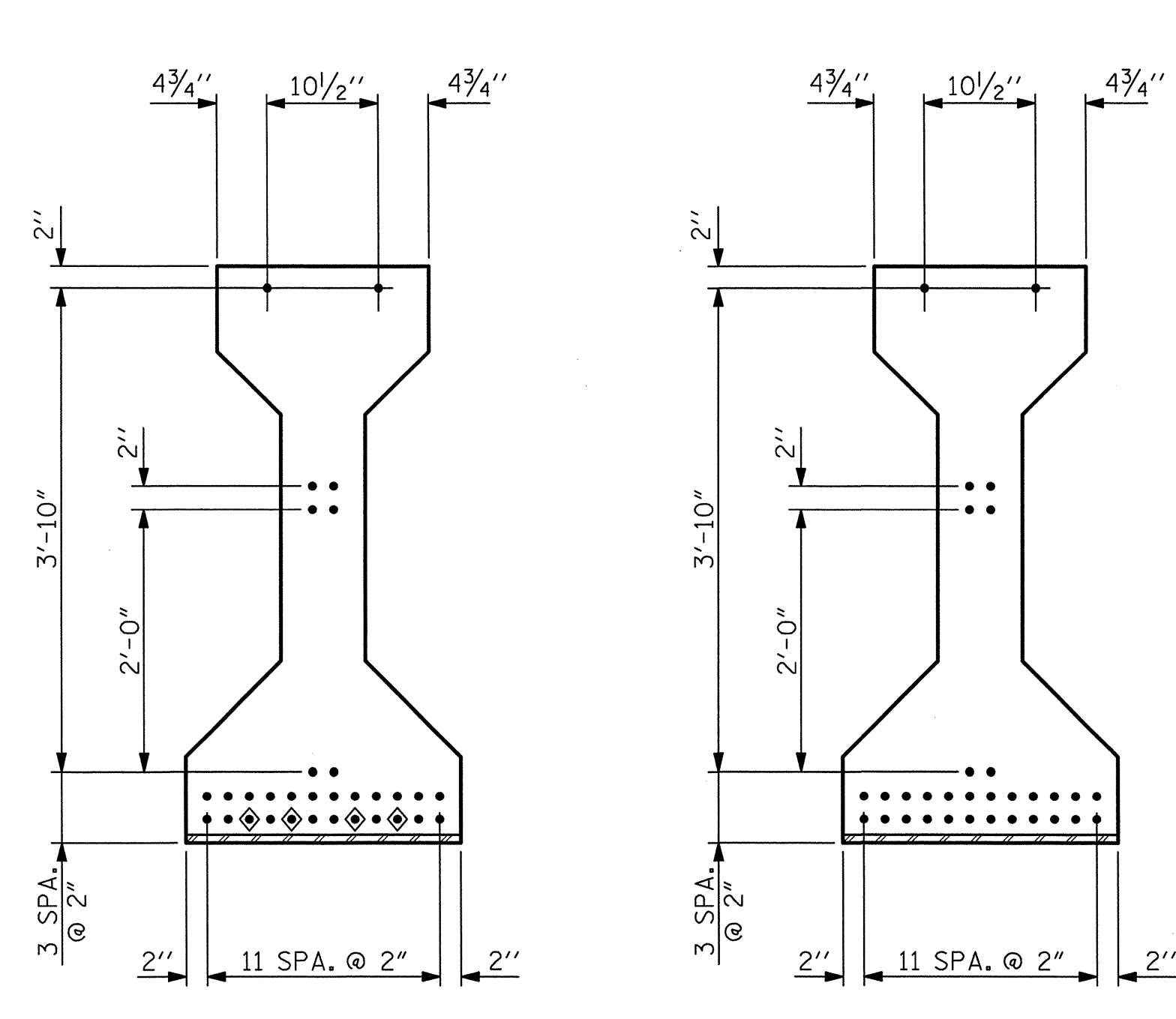


SECTION B-B
AT BENT

★ FOR S7 BARS, SEE
DETAIL "B" OF
PRESTRESSED
CONCRETE GIRDER
CONTINUOUS FOR LIVE
LOAD DETAILS SHEET



SECTION C-C
(S1 BARS NOT SHOWN)



0.6" Ø LOW RELAXATION STRAND LAYOUT

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

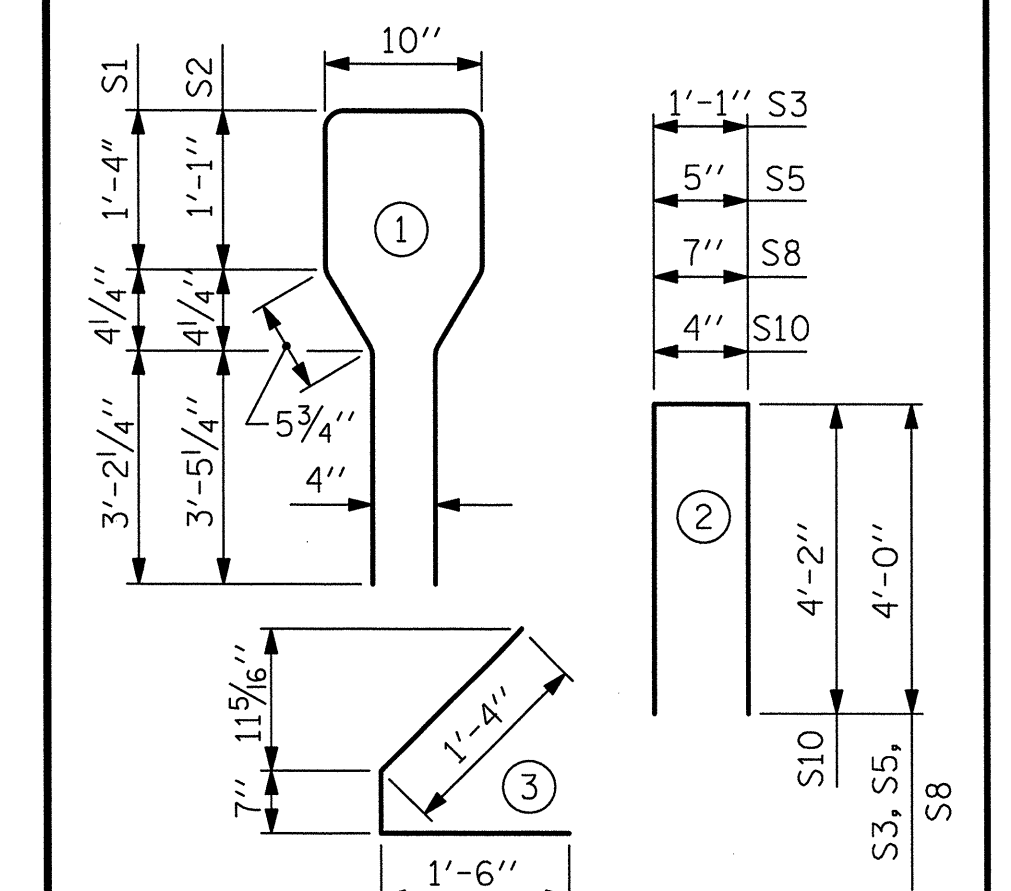
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	77	4	1	10'-10"	557
S2	18	6	1	10'-10"	293
S3	4	4	2	9'-1"	24
S4	76	4	3	3'-5"	173
S5	6	4	2	8'-5"	34
*S7	12	5	STR	3'-8"	46
S8	4	4	2	8'-7"	23
S9	2	3	STR	1'-10"	1
S10	2	5	2	8'-8"	18
S11	5	4	STR	7'-0"	23

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

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT

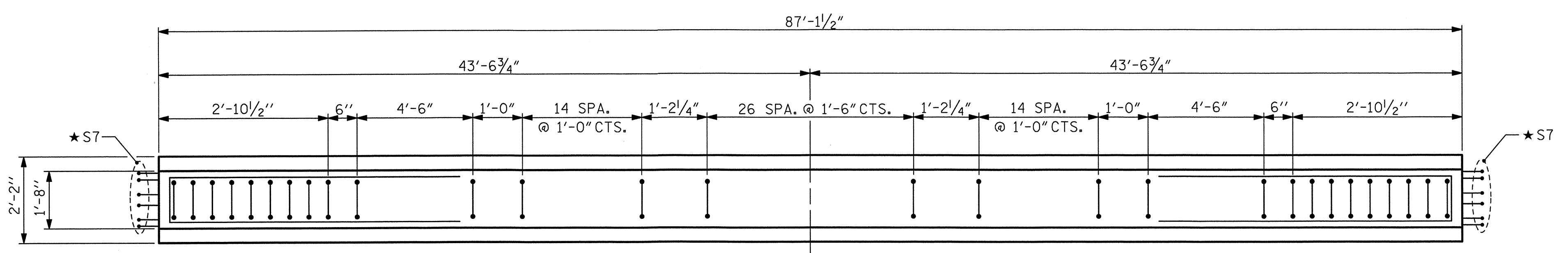


QUANTITIES FOR ONE GIRDER

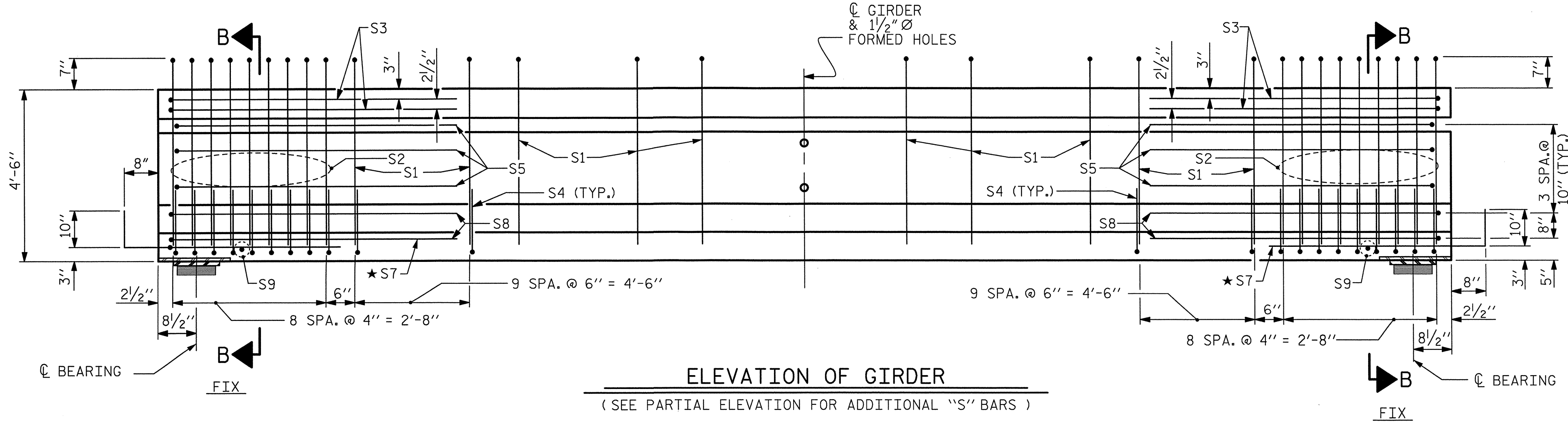
REINFORCING STEEL	8000 PSI CONCRETE	0.6" Ø L. R. STRANDS
LB.	C.Y.	No.
1192	17.7	32

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	87.13	348.50

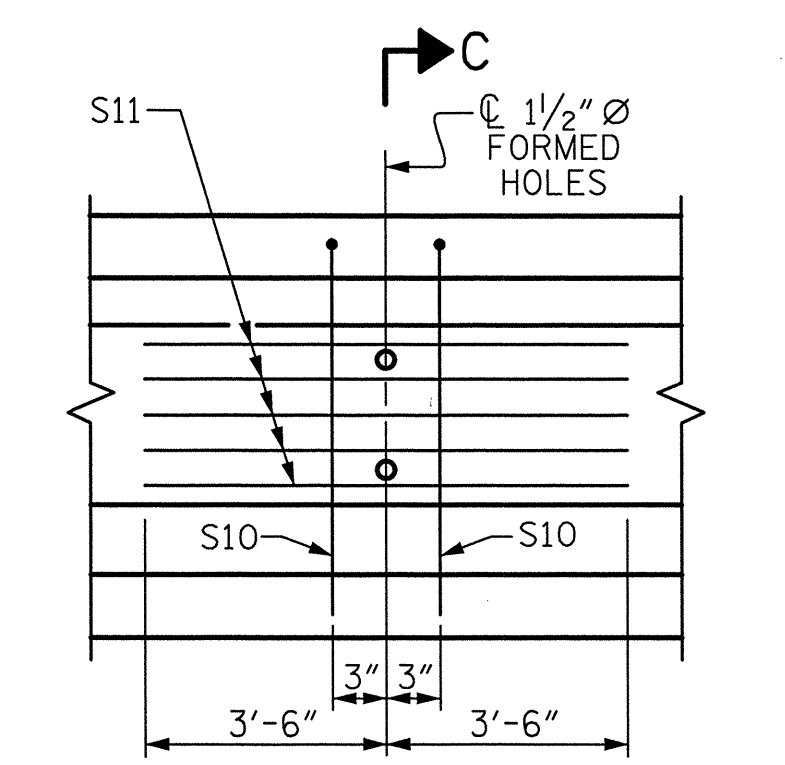


PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

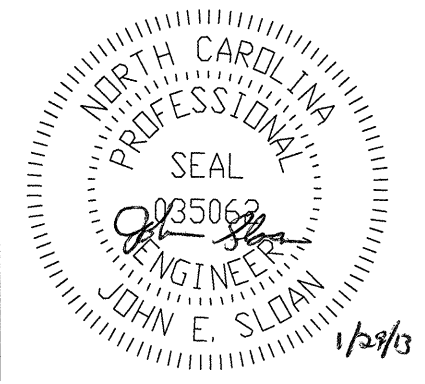


PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR ALL GIRDERS

ASSEMBLED BY : M. K. TOM	DATE : 6/26/12
CHECKED BY : K. H. COMPTON	DATE : 7/6/12
DRAWN BY : ELR 8/91	REV. 10/17/00R RWW/LES
CHECKED BY : GRP 8/91	REV. 5/1/06R TLA/GM
	REV. 10/1/11 MAA/GM

1/8/2013
P:\Jobs1\PS208B\Structures\Final Drawings\PS208B_SD.G3.dgn
kyle.compton



PROJECT NO. P-5208B
CABARRUS COUNTY
STATION: 25+41.22 -L-

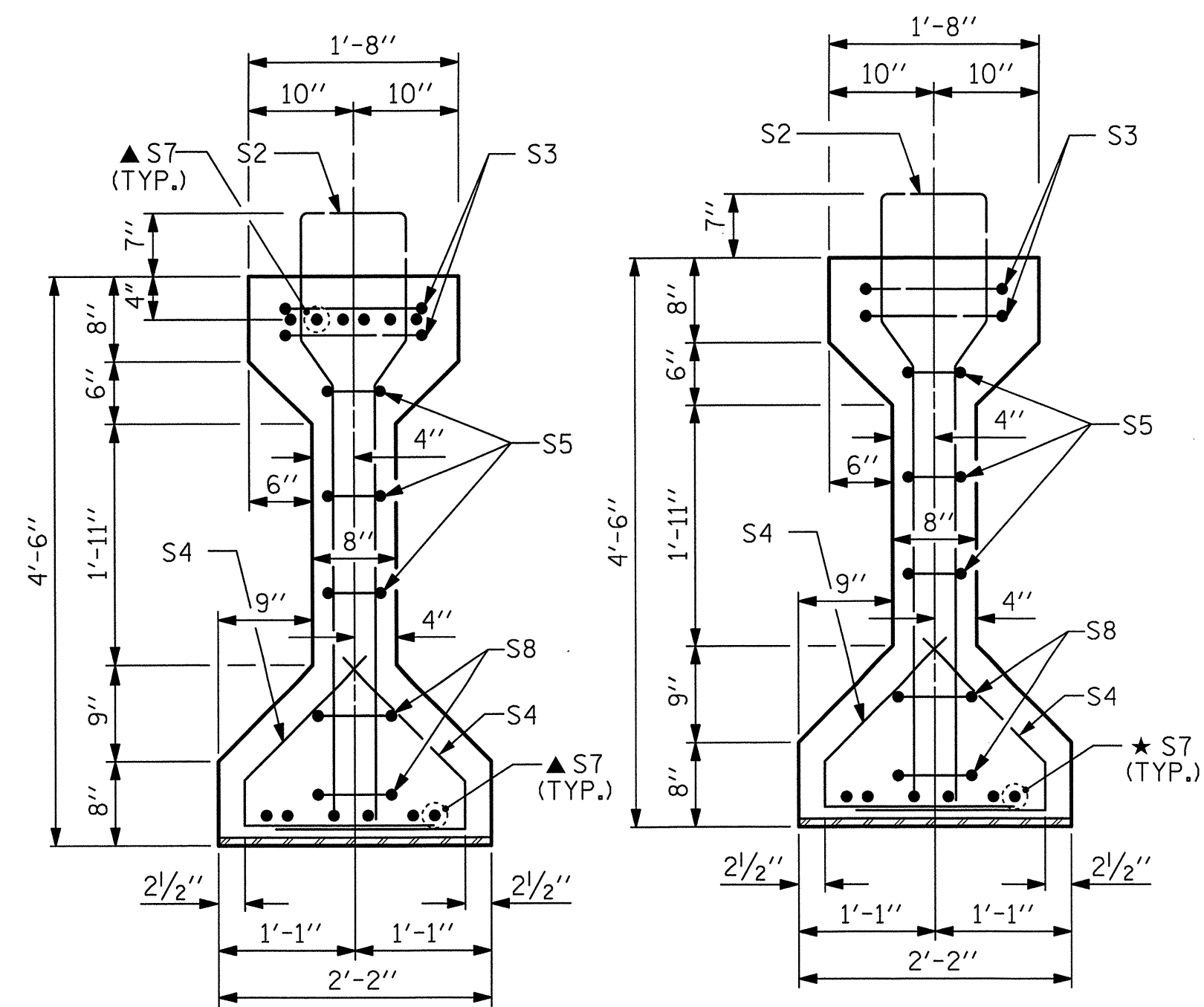
SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
SPAN C

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			48
2			4			48

STD. NO. PCG6

DCN: 003DEL_P10a2

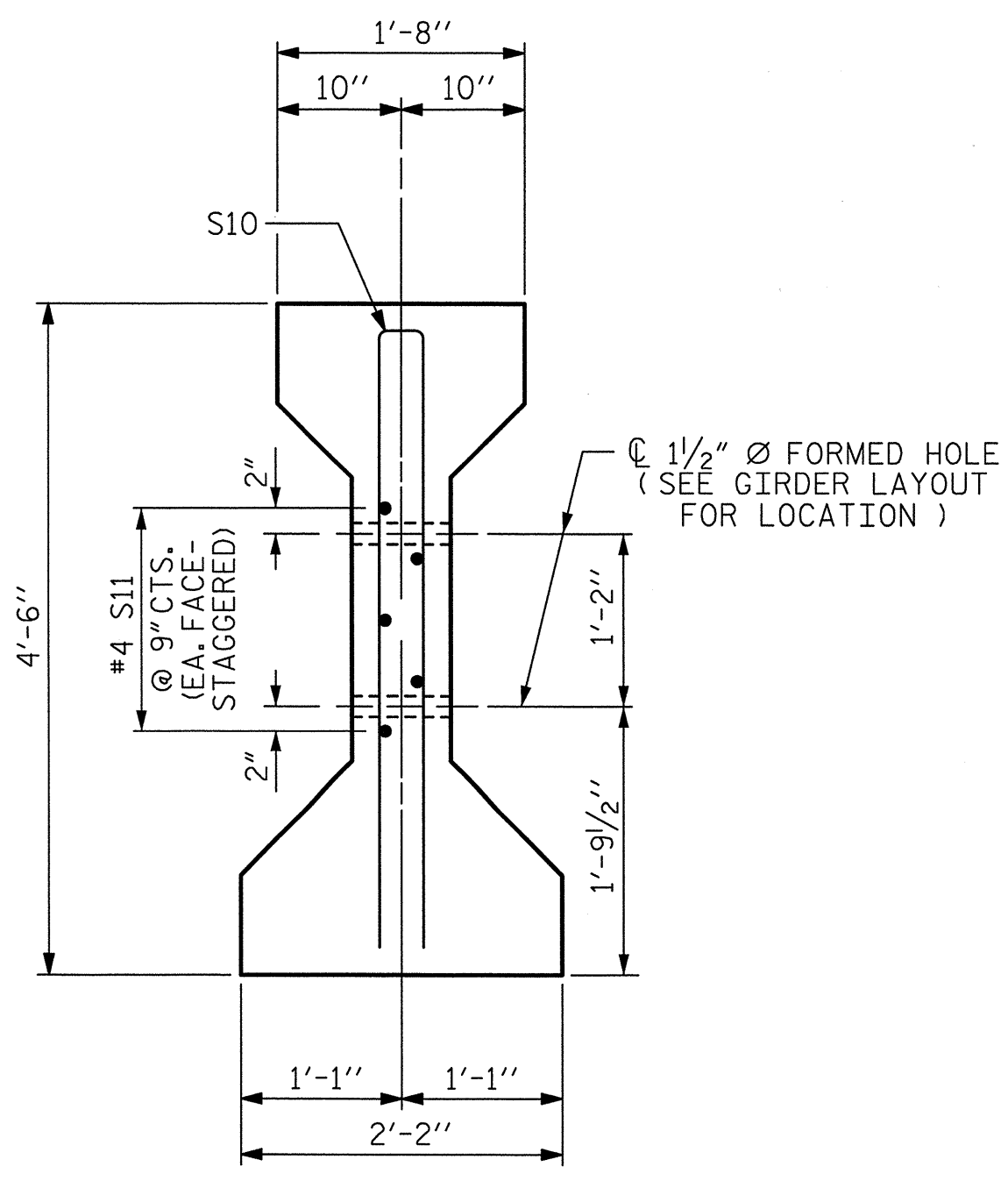


SECTION A-A
AT END BENT

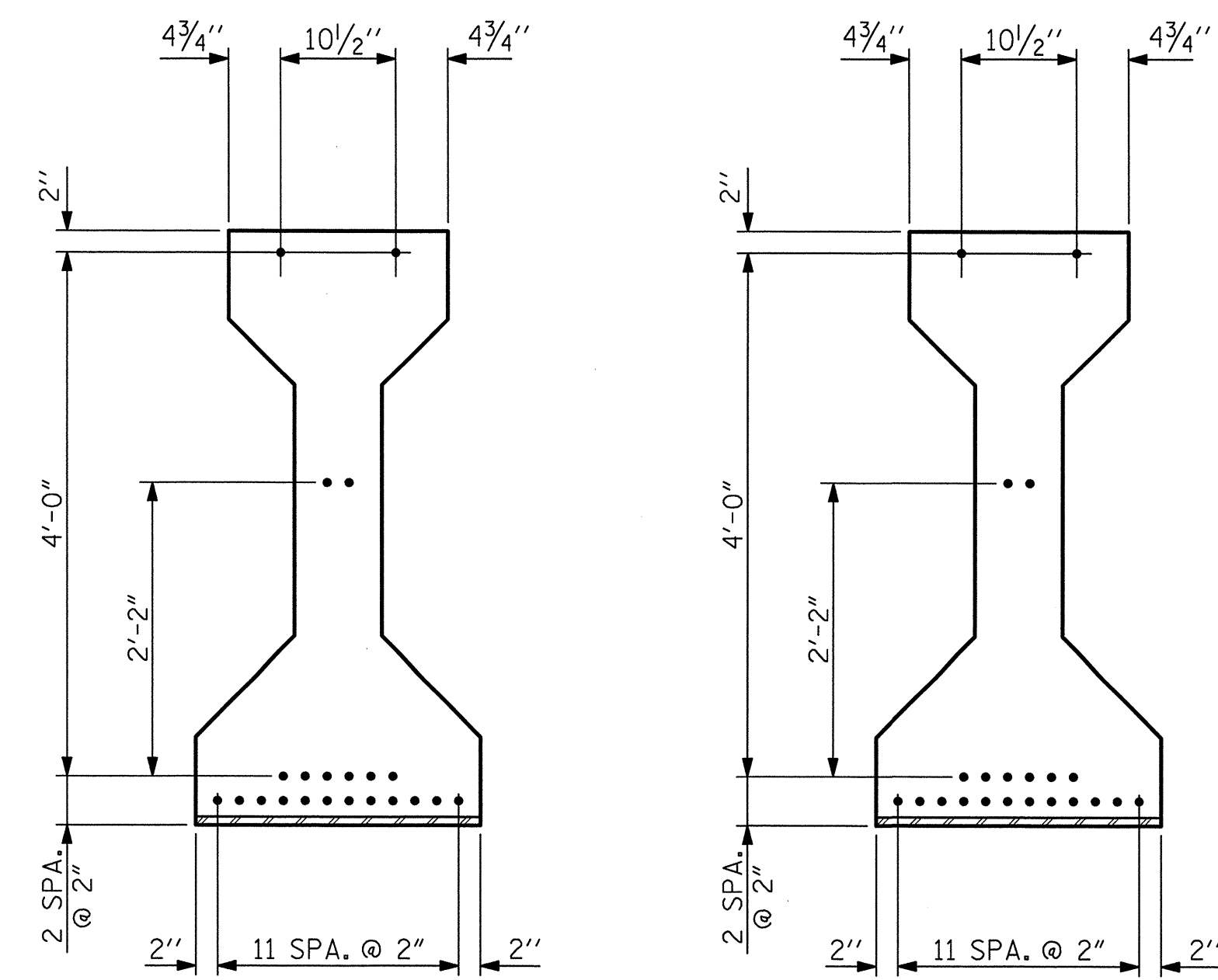
SECTION B-B
AT BENT

▲ FOR S7 BARS, SEE
DETAIL "A" OF
PRESTRESSED
CONCRETE GIRDER
CONTINUOUS FOR LIVE
LOAD DETAILS SHEET

★ FOR S7 BARS, SEE
DETAIL "B" OF
PRESTRESSED
CONCRETE GIRDER
CONTINUOUS FOR LIVE
LOAD DETAILS SHEET



SECTION C-C
(S1 BARS NOT SHOWN)

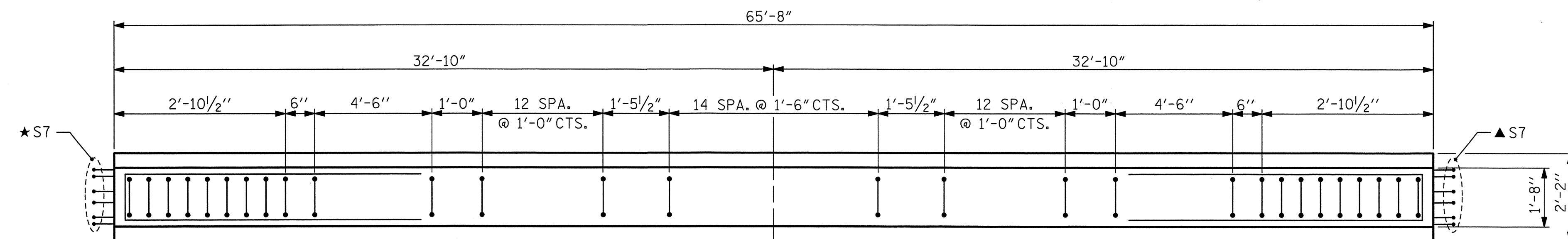


AT END OF GIRDER

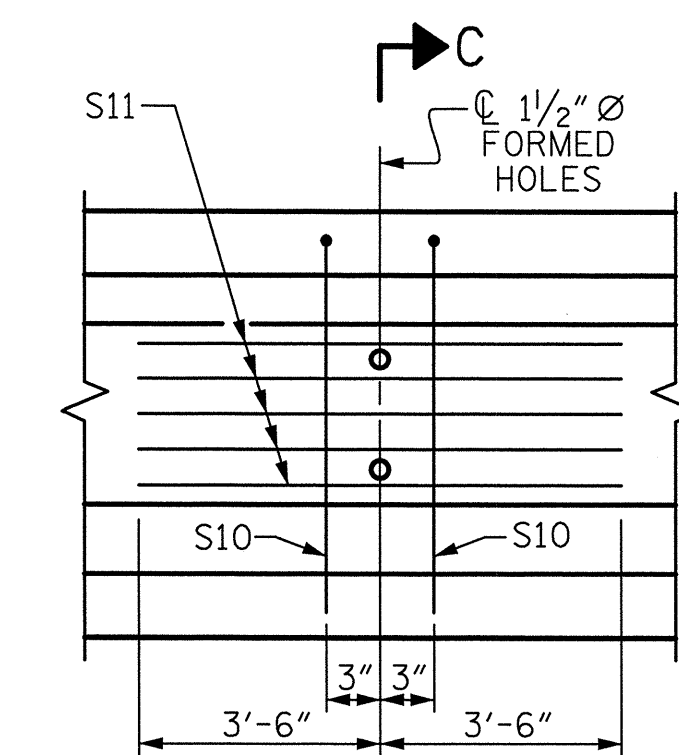
AT C OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

● FULLY BONDED STRANDS

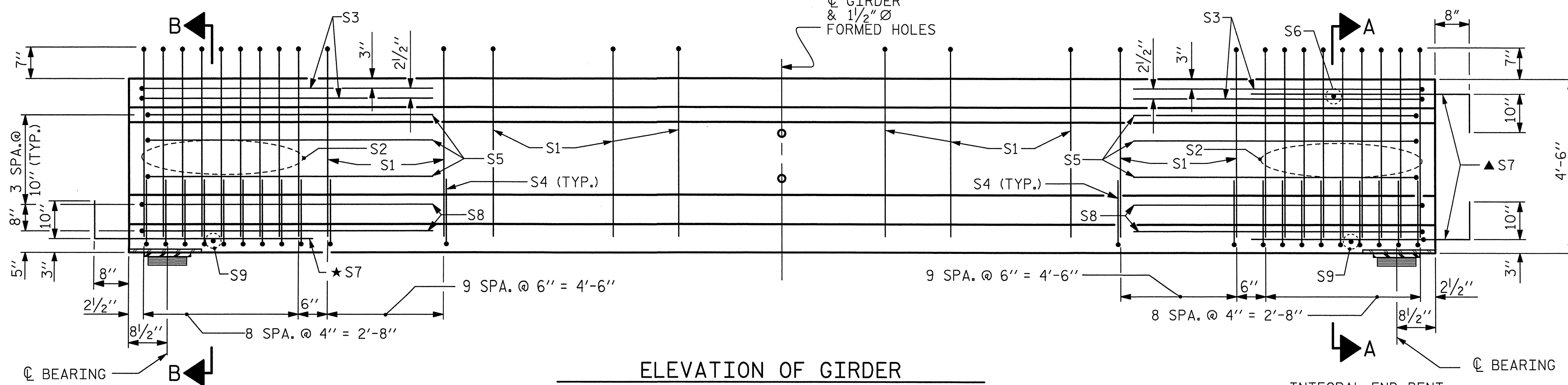


PLAN OF GIRDER



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM
REINFORCING STEEL FOR ALL GIRDERS



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

0.6" Ø L. R. GRADE 270 STRANDS

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

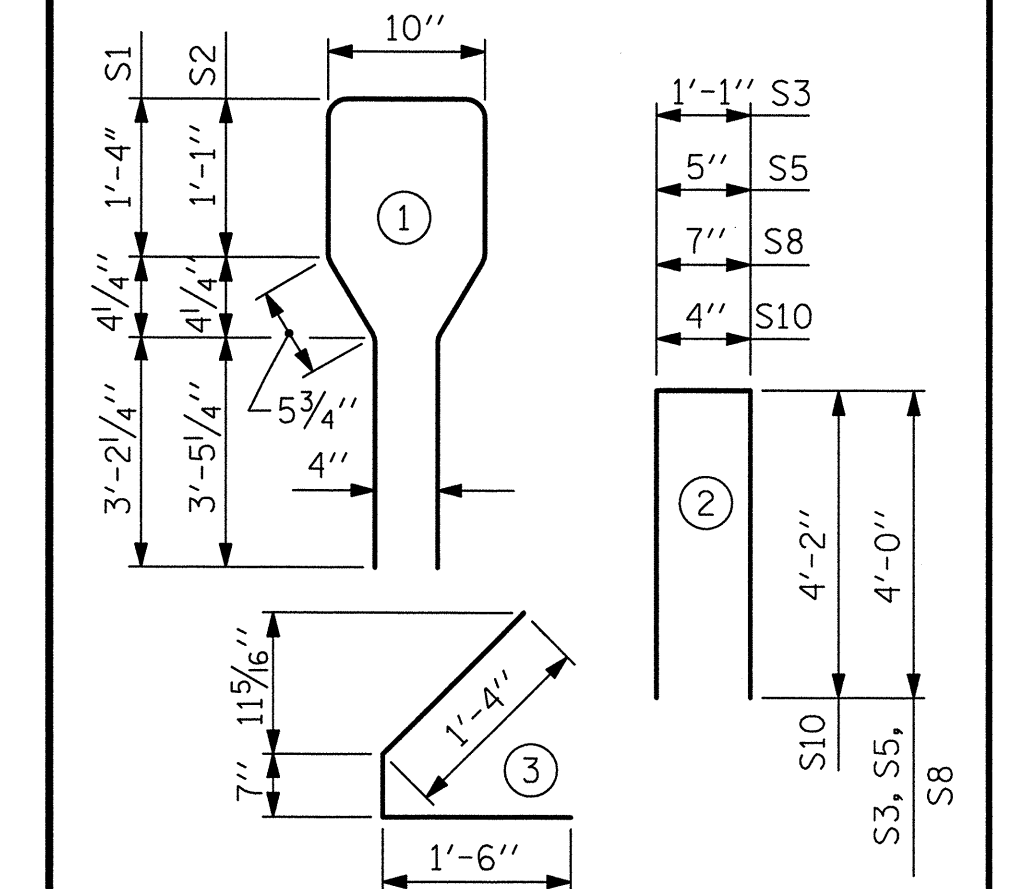
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	61	4	1	10'-10"	441
S2	18	6	1	10'-10"	293
S3	4	4	2	9'-1"	24
S4	76	4	3	3'-5"	173
S5	6	4	2	8'-5"	34
S6	1	4	STR	1'-4"	1
* S7	18	5	STR	3'-8"	69
S8	4	4	2	8'-7"	23
S9	2	3	STR	1'-10"	1
S10	2	5	2	8'-8"	18
S11	5	4	STR	7'-0"	23

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

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

REINFORCING STEEL LB.	8000 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
1100	13.3	22

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
4	65.67	262.67

PROJECT NO. P-5208B

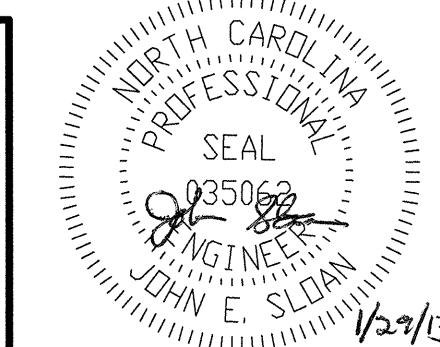
CABARRUS COUNTY

STATION: 25+41.22 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
SPAN D

ASSEMBLED BY : M. K. TOM	DATE : 6/26/12
CHECKED BY : K. H. COMPTON	DATE : 7/6/12
DRAWN BY : ELR 8/91	REV. 10/17/00R RWW/LES
CHECKED BY : GRP 8/91	REV. 5/1/06R TLA/GM
	REV. 10/1/11 MAA/GM



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

STD. NO. PCG6

NOTES

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

EMBEDDED PLATE "B-1" SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. BEVEL EDGES OF PLATE "B-1" TO GIVE CLOSE FIT BUT NOT TIGHT FIT TO STEEL CASTING FORM.

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

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

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

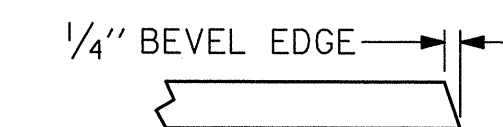
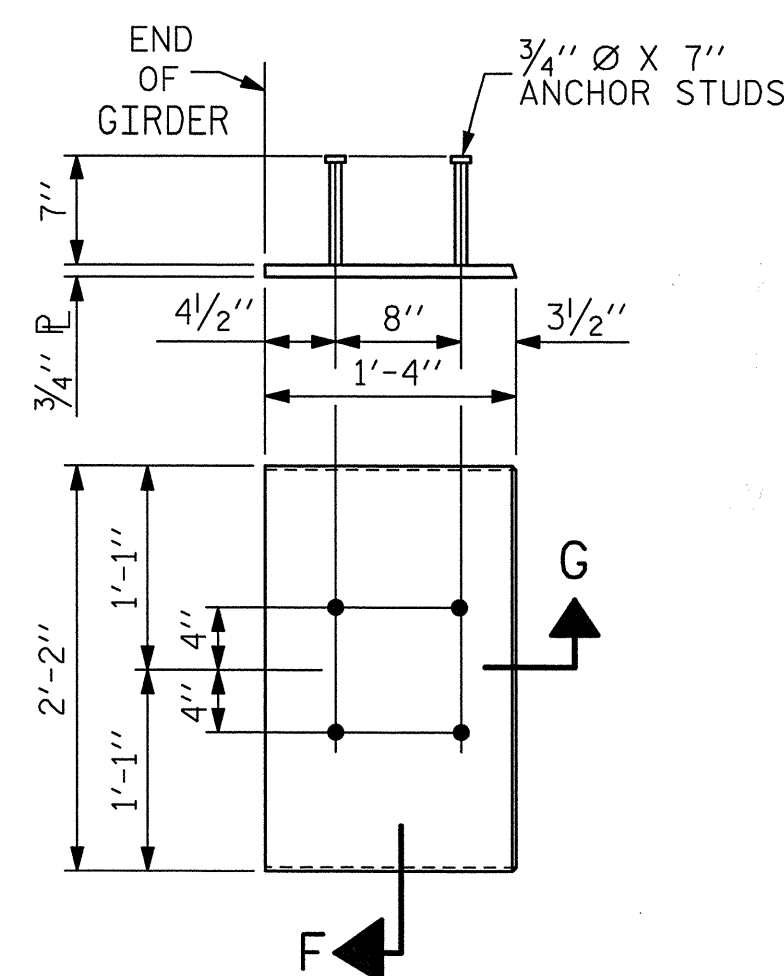
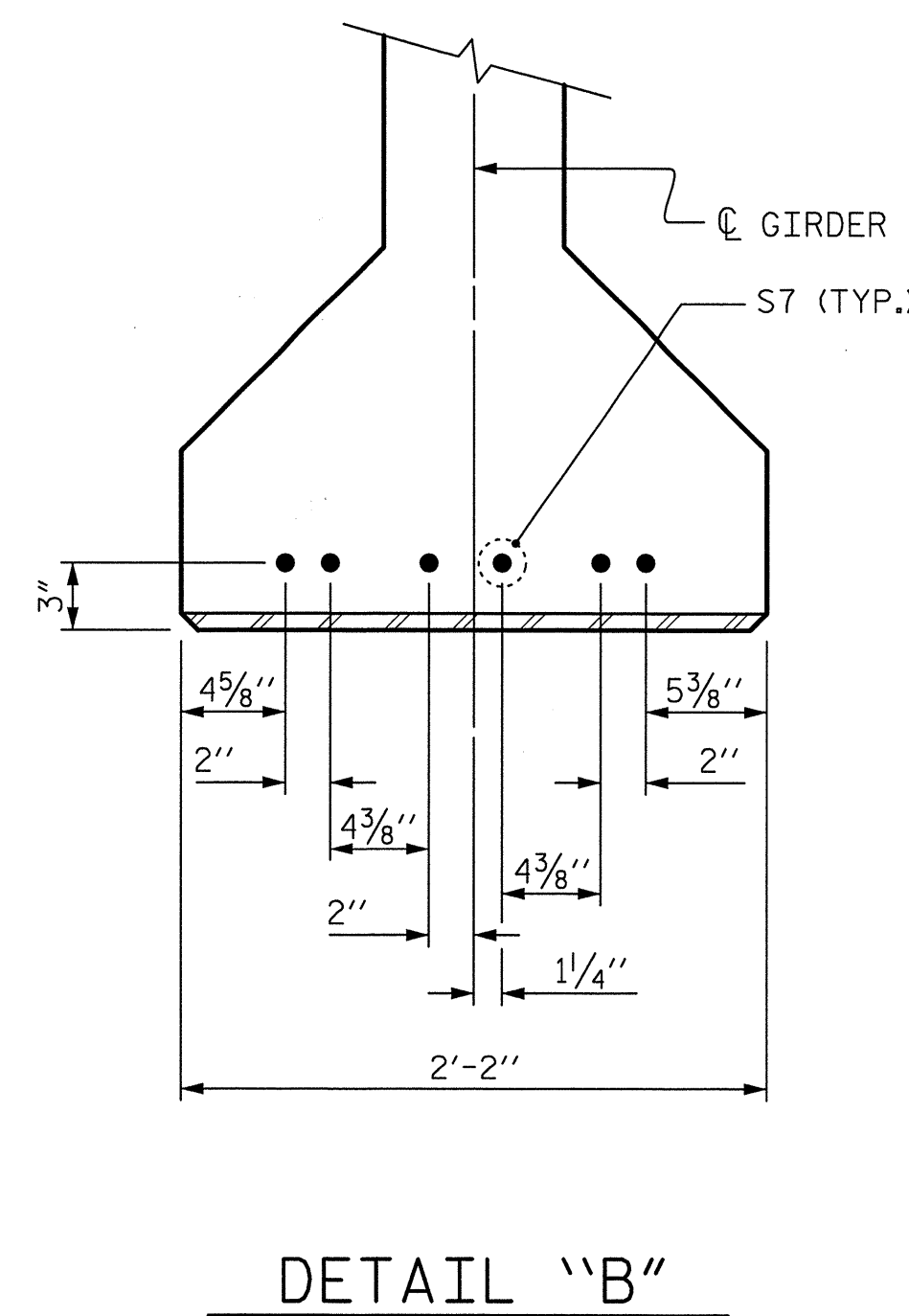
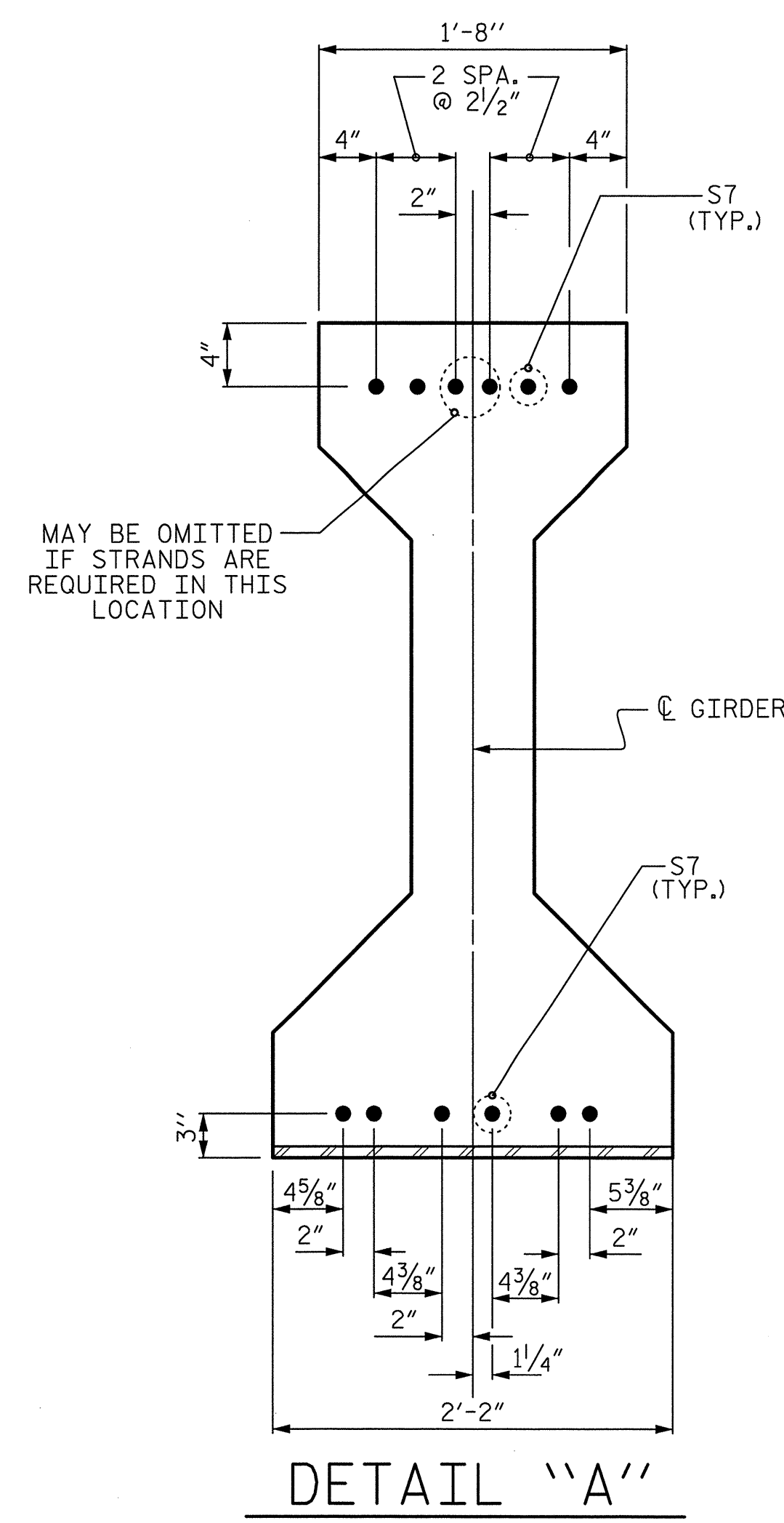
DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

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

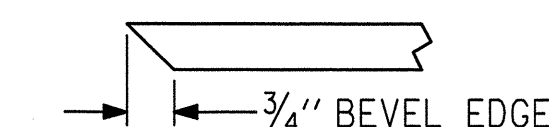
THE UPLIFT FORCE DUE TO DRAPED STRANDS IS 23.5 KIPS FOR SPAN B.

THE CONTRACTOR HAS THE OPTION TO PROVIDE, AT NO ADDITIONAL COST TO THE DEPARTMENT, 2 ADDITIONAL STRANDS AT THE TOP OF THE GIRDER TO FACILITATE TYING OF THE REINFORCING STEEL. THESE STRANDS SHALL BE PULLED TO A LOAD OF 4500 LBS.

WHEN DRAPED STRANDS ARE DETAILED, THE LONGITUDINAL LOCATION OF THE HOLD DOWN DEVICES SHALL BE WITHIN 6" OF THE LOCATION SHOWN AND THE CENTER OF GRAVITY OF THE GROUP OF DRAPED STRANDS SHALL BE LOCATED WITHIN 1/2" OF THE THEORETICAL LOCATION SHOWN.



SECTION "G"



SECTION "F"

(SEE NOTES)

DETAIL "A"

DETAIL "B"

EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE IV GIRDER

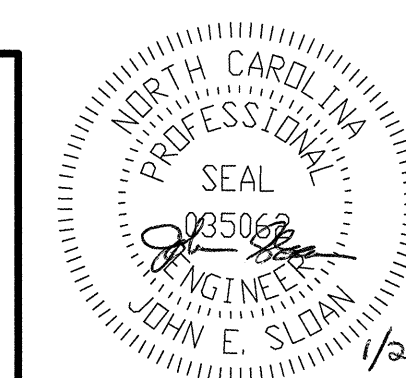
(2 REQ'D PER GIRDER)

PROJECT NO. P-5208B
 CABARRUS COUNTY
 STATION: 25+41.22 -L-

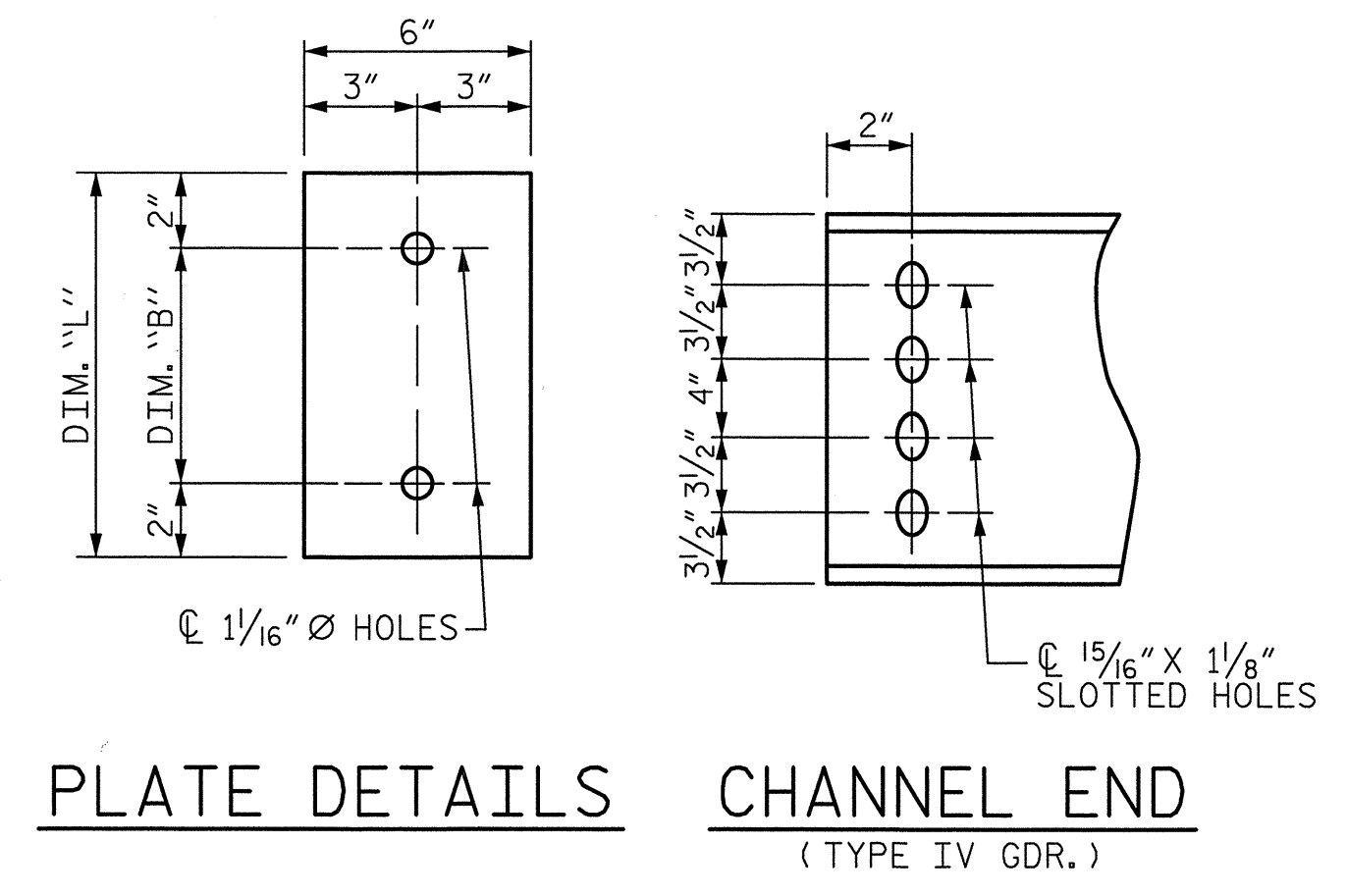
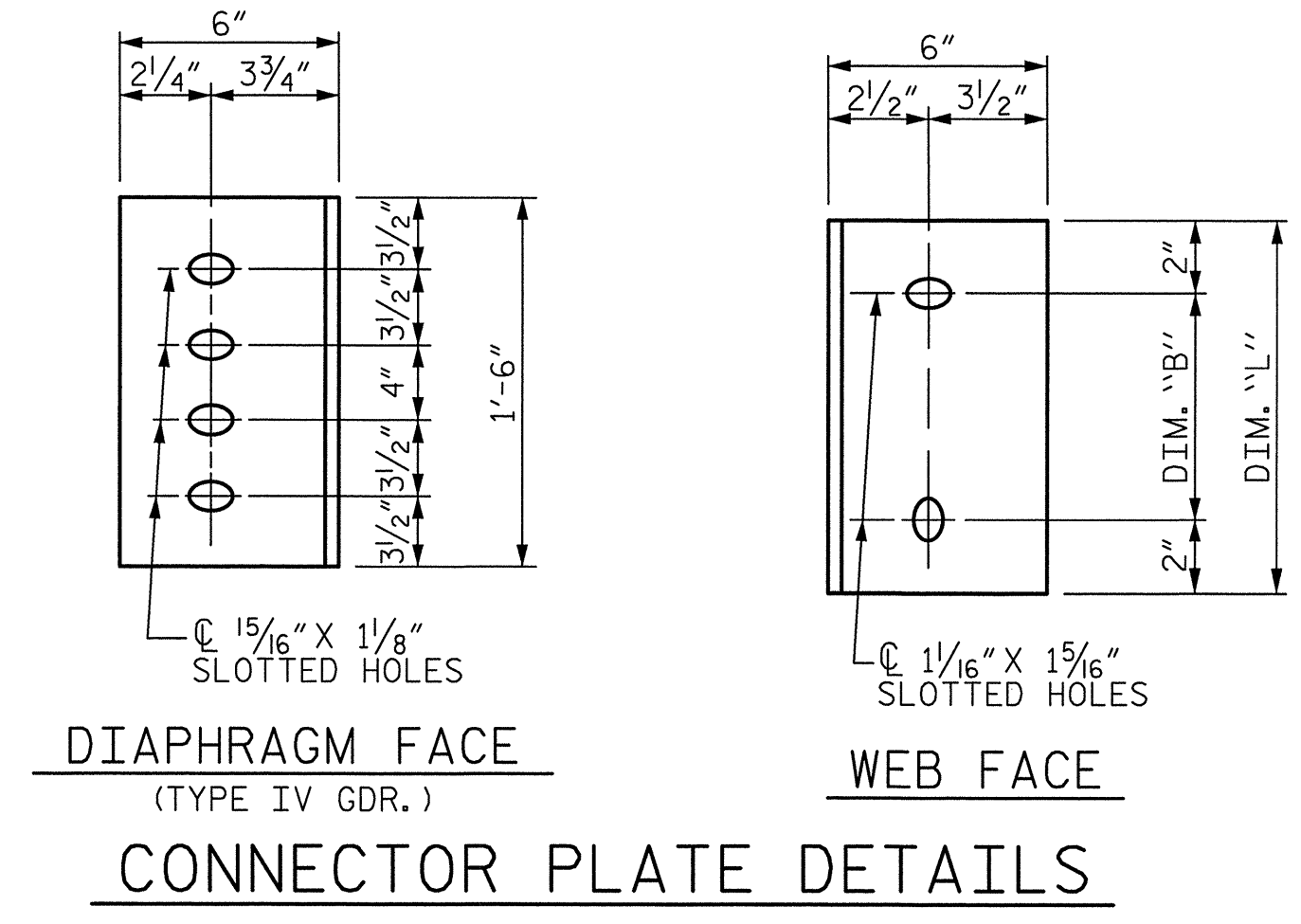
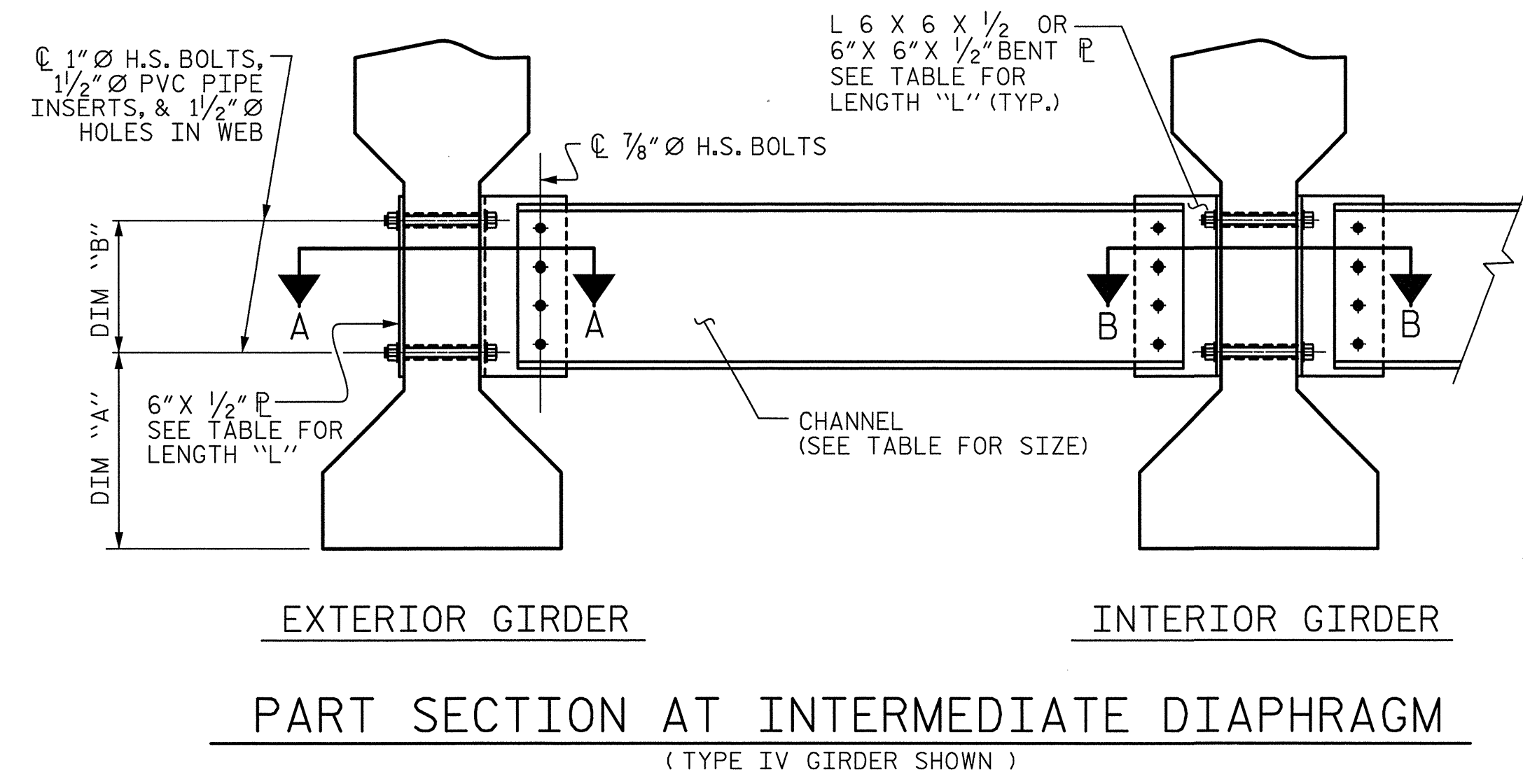
SHEET 5 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 PRESTRESSED CONCRETE GIRDER
 CONTINUOUS FOR LIVE LOAD
 DETAILS

ASSEMBLED BY : M.K. TOM	DATE : 6/26/12
CHECKED BY : K. H. COMPTON	DATE : 7/6/12
DRAWN BY : ELR 11/91	REV. 10/17/00 RWW/LES
CHECKED BY : GRP 11/91	REV. 7/10/01RR LES/RDR
	REV. 5/1/06 TLA/GM



REVISIONS					SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			48



STRUCTURAL STEEL NOTES

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

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

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

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

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

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

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

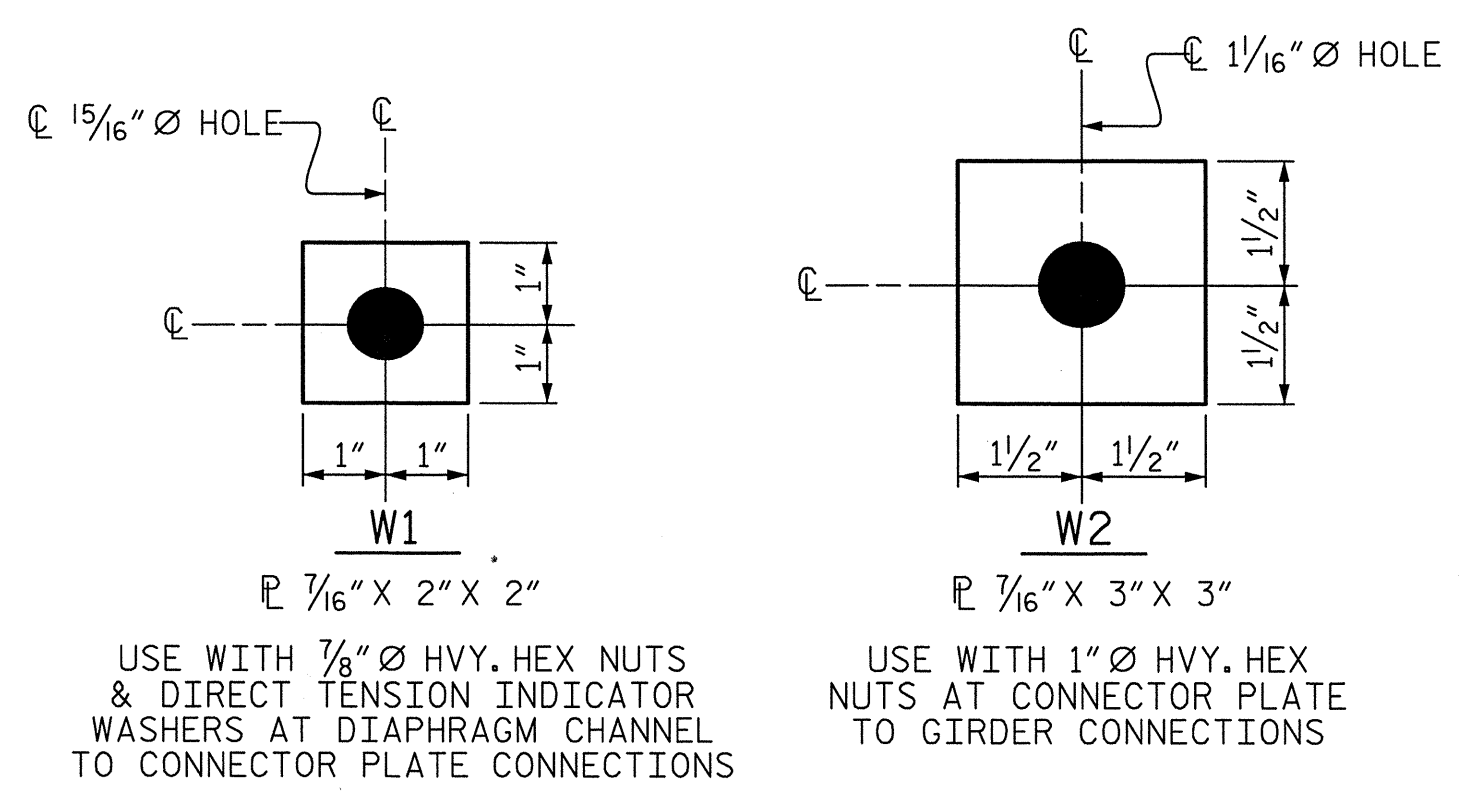
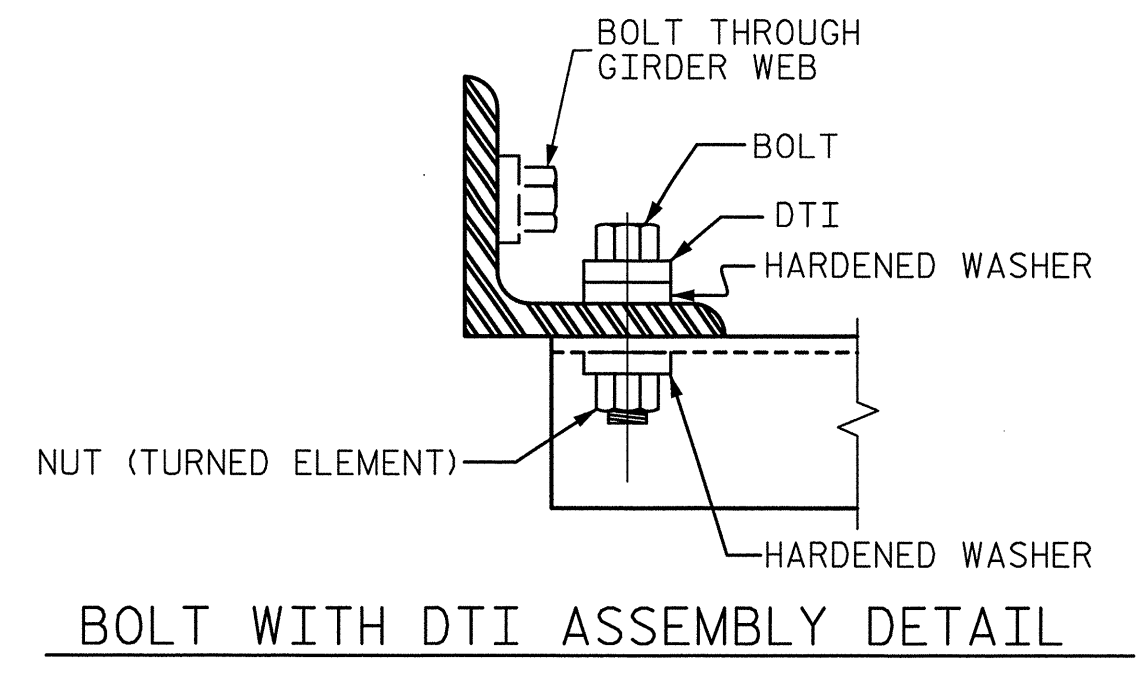
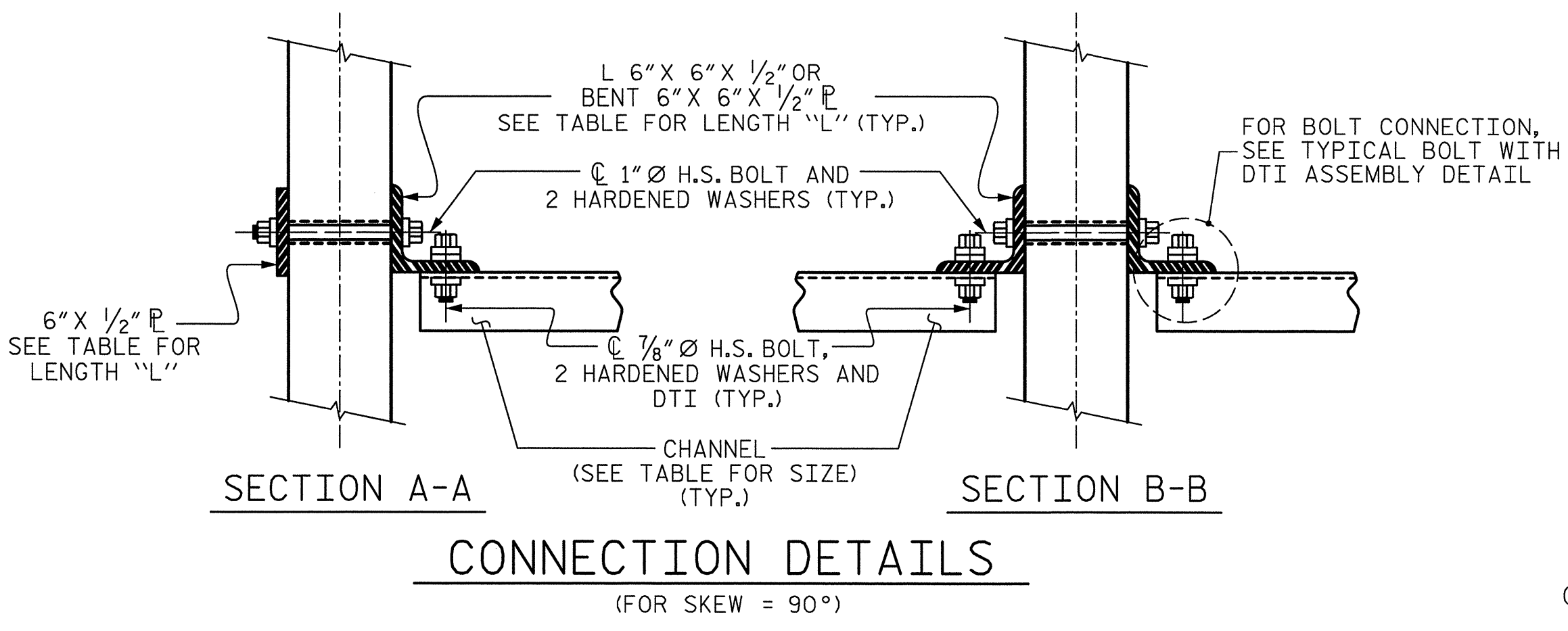
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

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

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

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



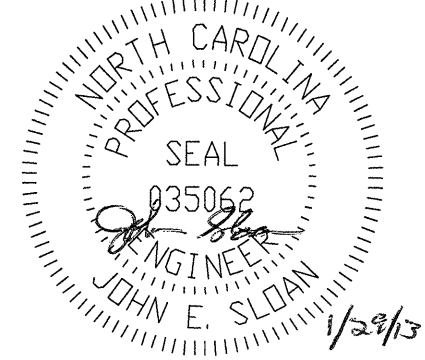
TABLE

GIRDER TYPE	CHANNEL SIZE	DIM "A"	DIM "B"	DIM "L"
IV	MC 18 x 42.7	1'-9 1/2"	1'-2"	1'-6"

PROJECT NO. P-5208B
CABARRUS COUNTY
 STATION: 25+41.22 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 INTERMEDIATE
 STEEL DIAPHRAGMS
 FOR TYPE IV
 PRESTRESSED CONCRETE
 GIRDERS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S-19
2			4			48



ASSEMBLED BY: M. K. TOM DATE: 6/26/12
 CHECKED BY: R. L. WHITCHER DATE: 9/27/12
 DRAWN BY: TLA 6/05
 CHECKED BY: VC 6/05
 ADDED: 10/21/05
 REV. 5/1/06RRR KMM/GM
 REV. 10/1/11 MAA/GM

NOTES

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

THE 2" Ø PIPE SLEEVE SHALL BE CUT FROM SCHEDULE 40 PVC PLASTIC PIPE. THE PVC PLASTIC PIPE SHALL MEET THE REQUIREMENTS OF ASTM D1785.

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

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

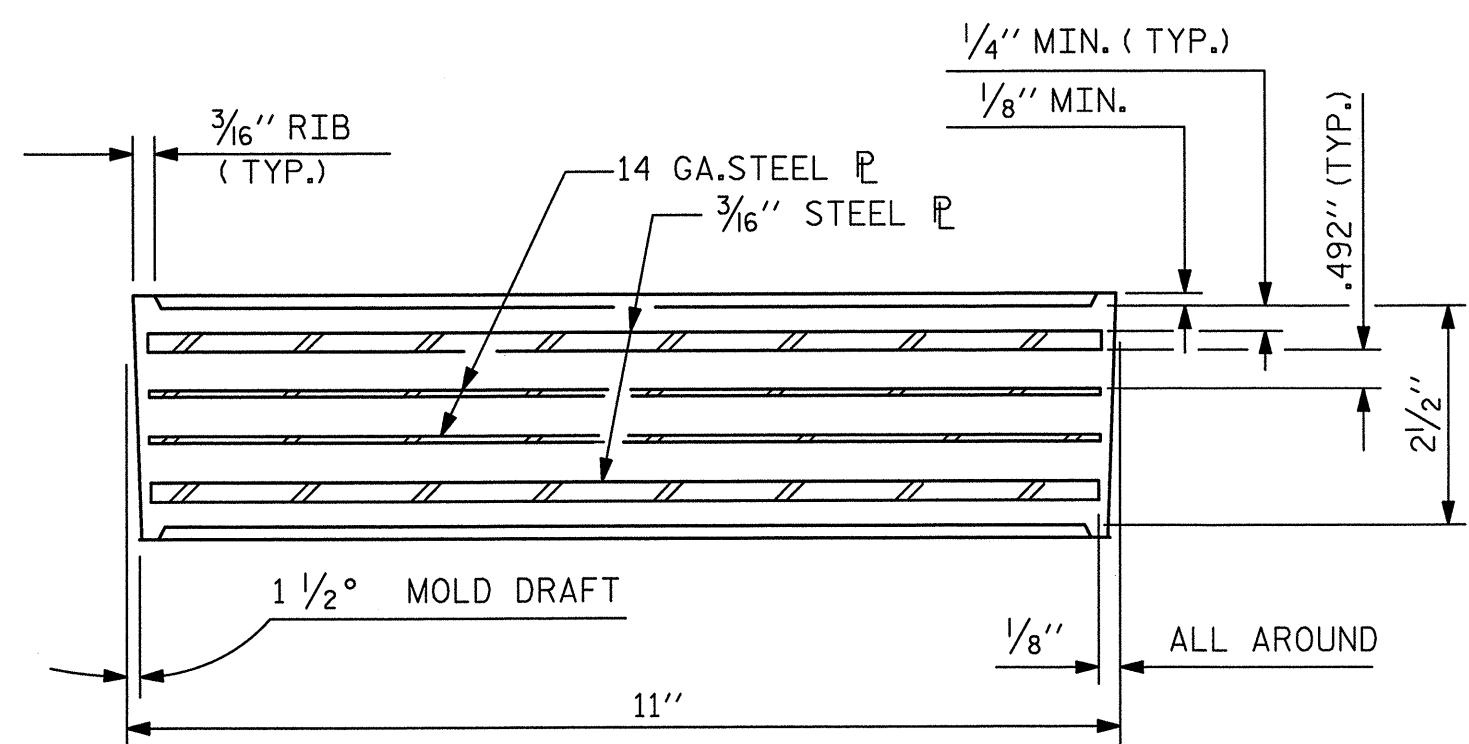
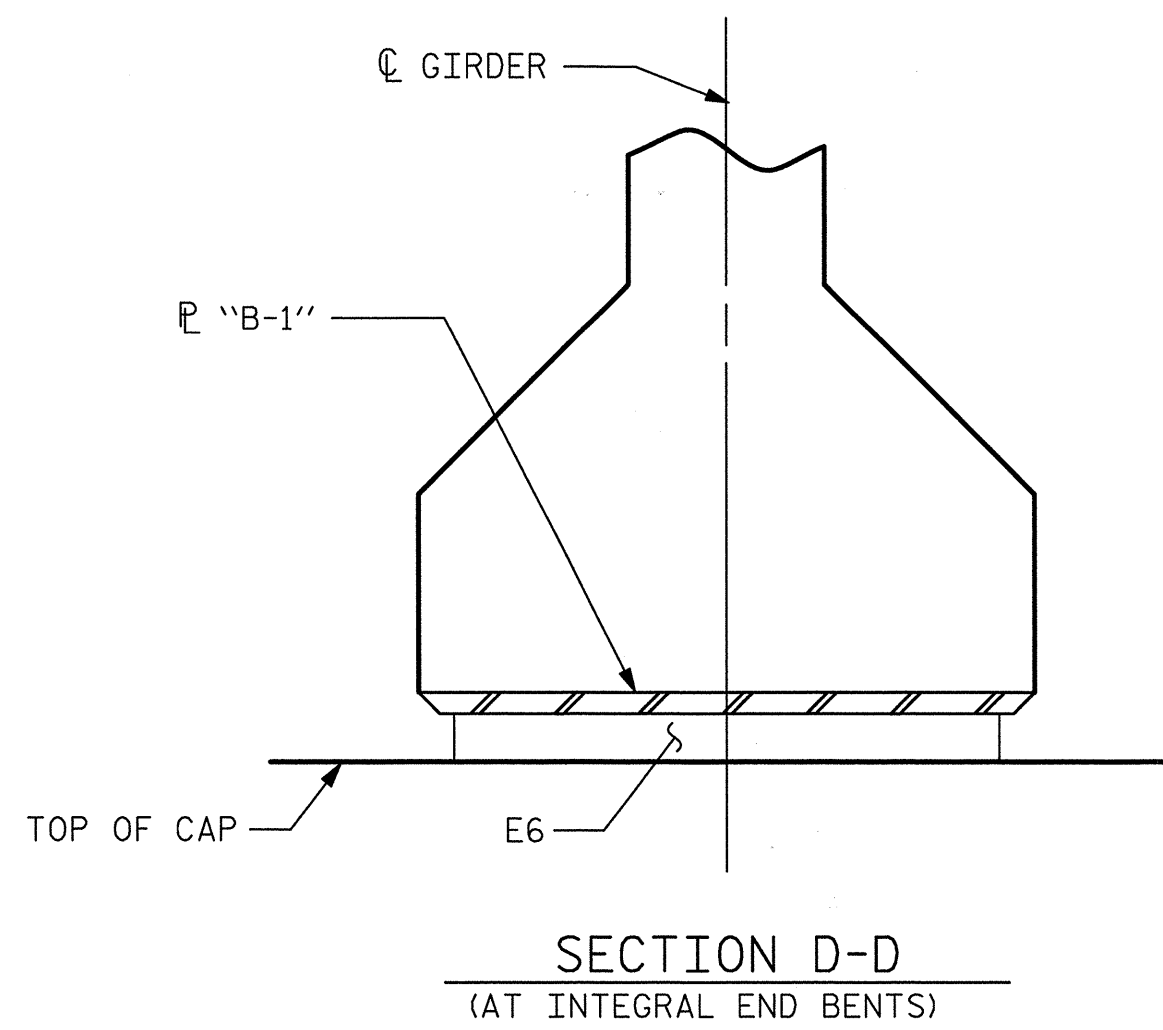
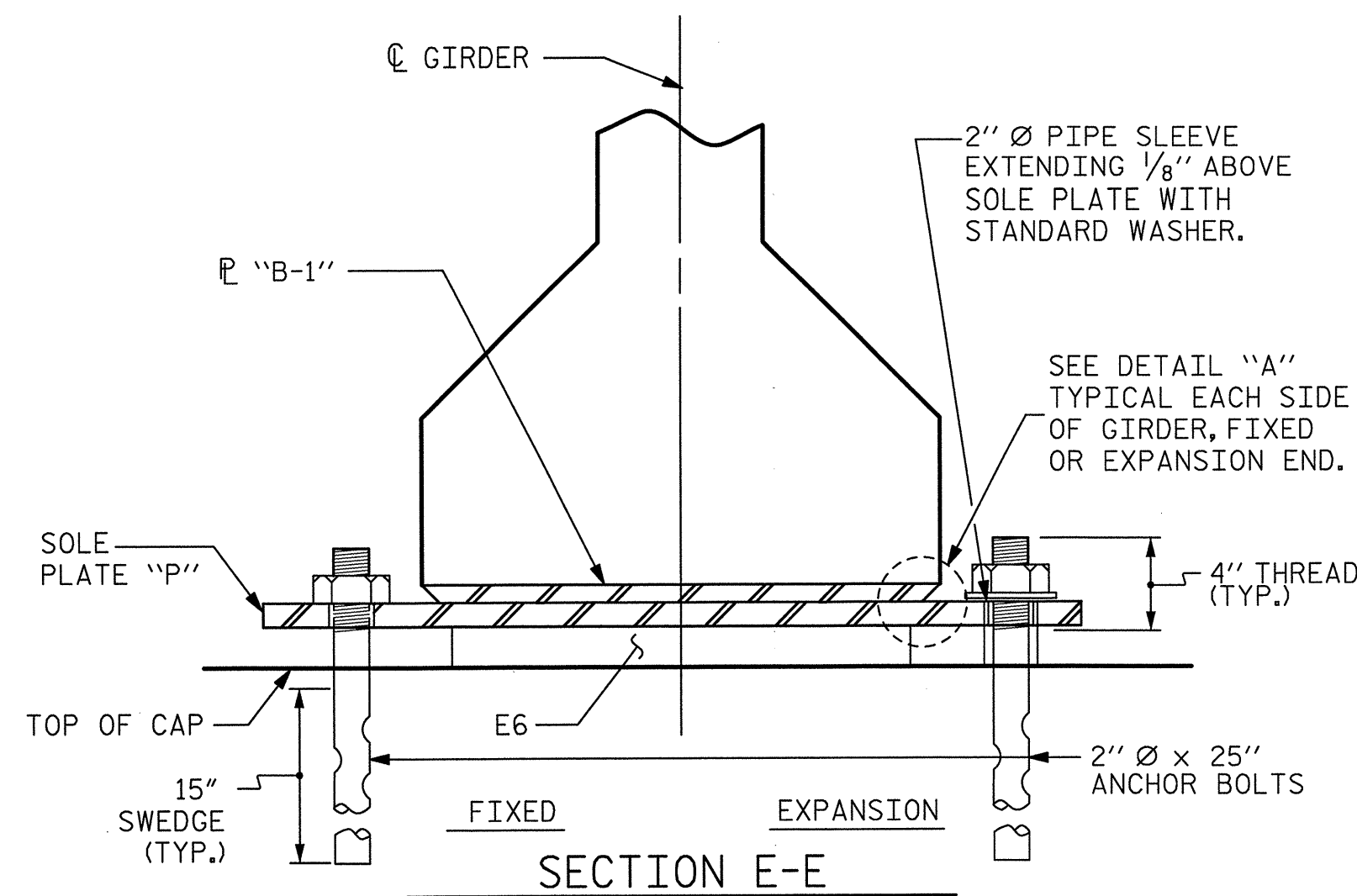
WHEN WELDING THE SOLE PLATE TO THE EMBEDDED PLATE IN THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE SOLE PLATE DOES NOT EXCEED 300°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.

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

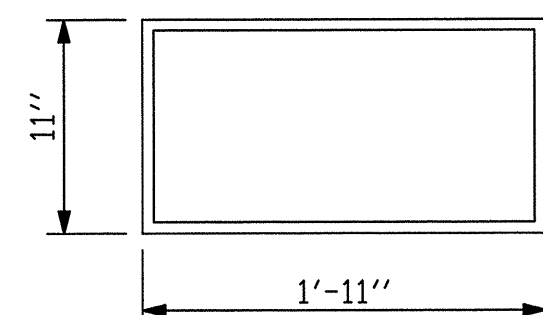
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLT, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

LOAD RATINGS	
TYPE VI	MAX. D.L.+ L.L. 211 K



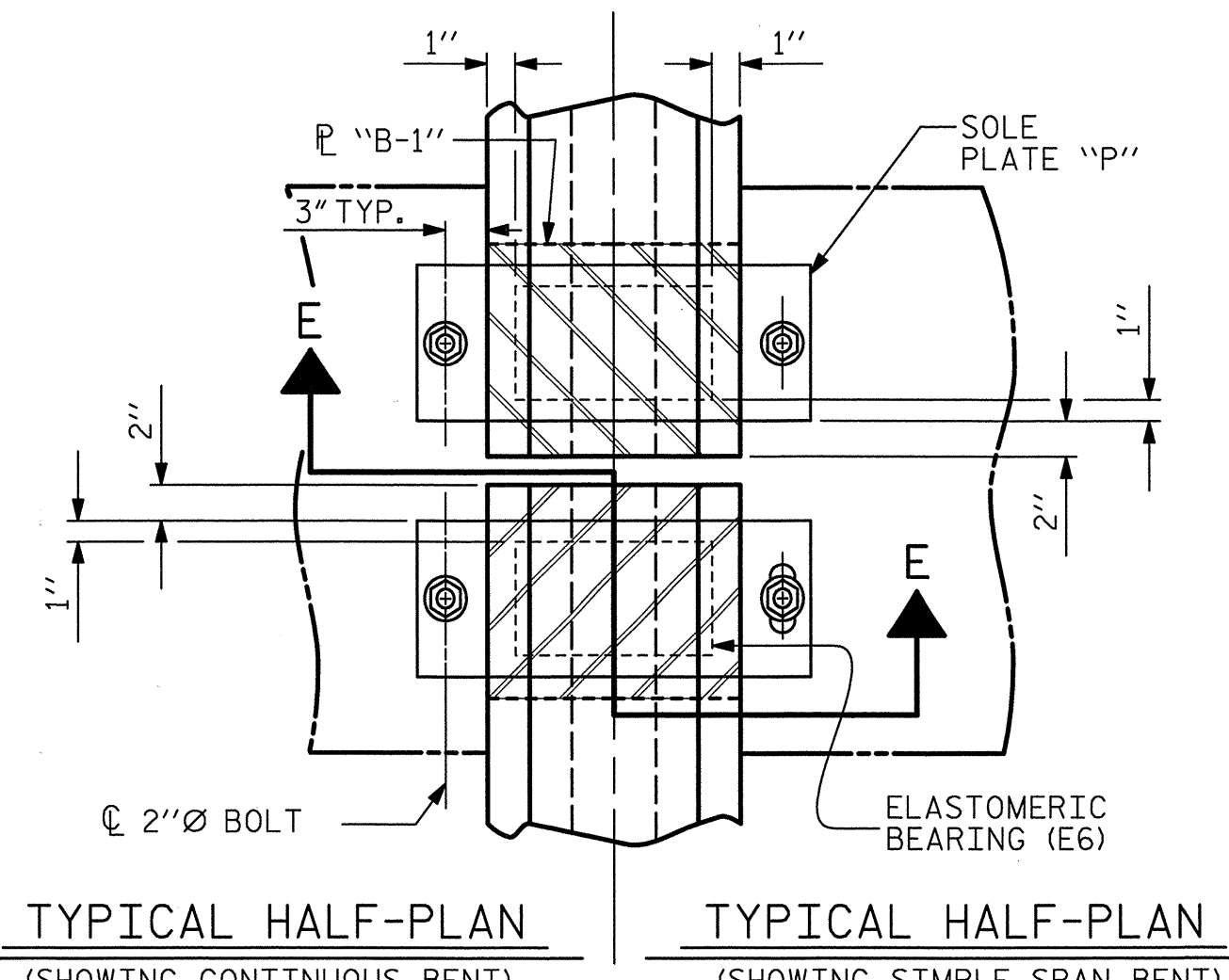
TYPICAL SECTION OF ELASTOMERIC BEARINGS



E6 (32 REQ'D)

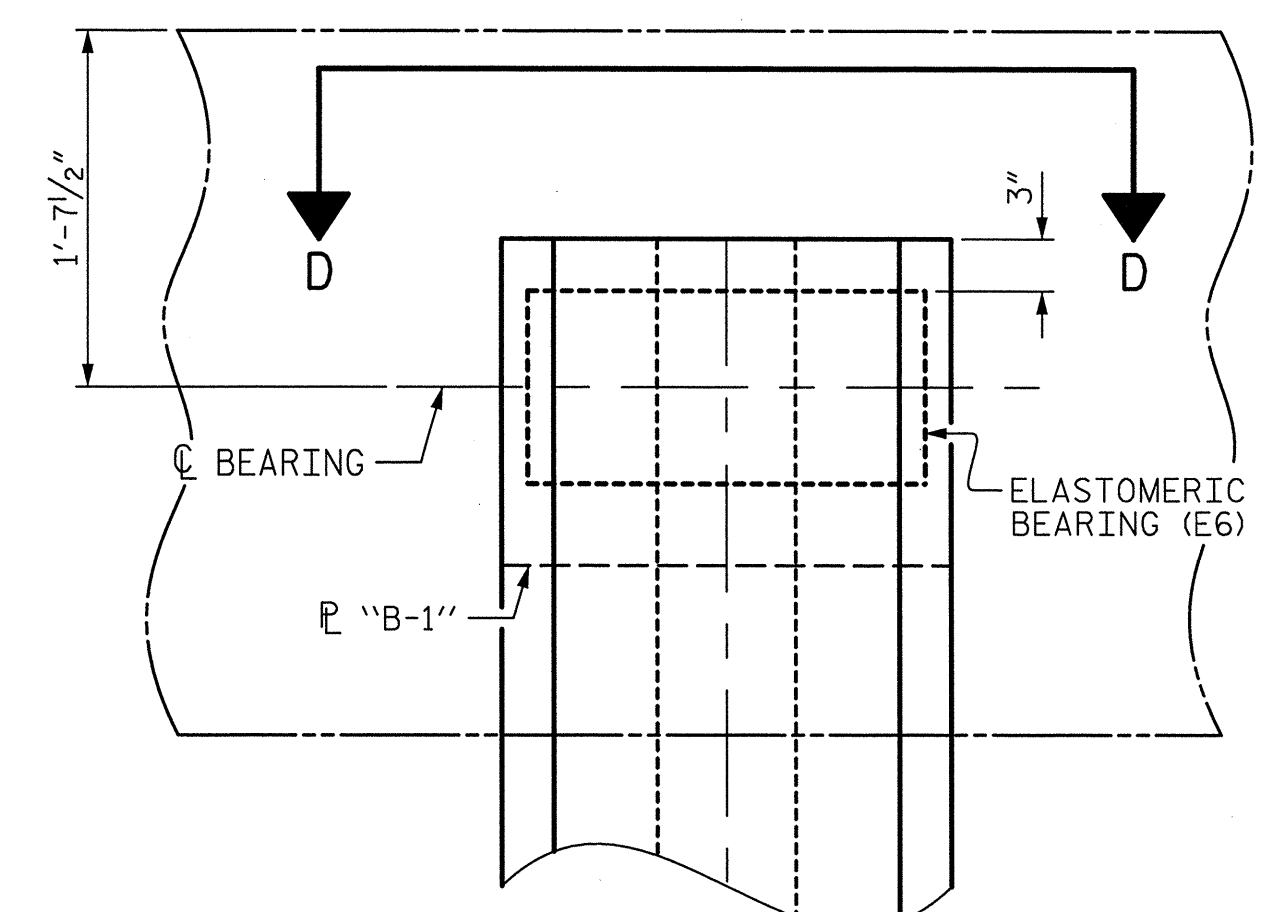
PLAN VIEW OF ELASTOMERIC BEARING

TYPE VI

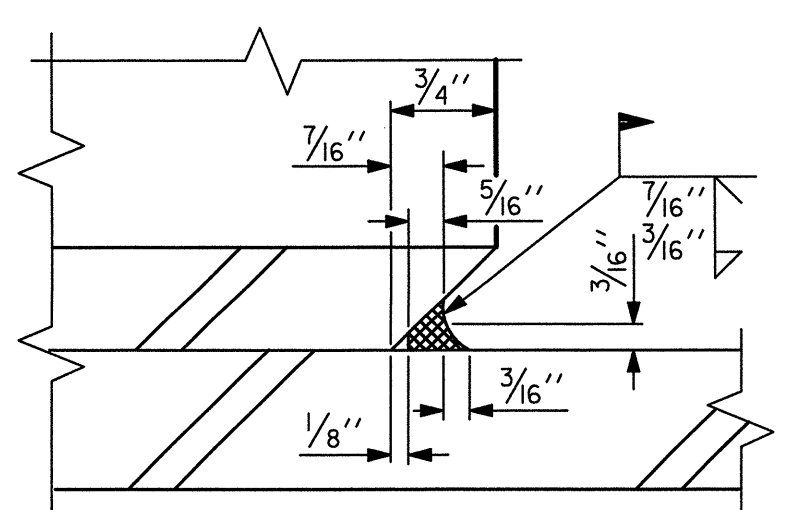


TYPICAL HALF-PLAN (SHOWING CONTINUOUS BENT)

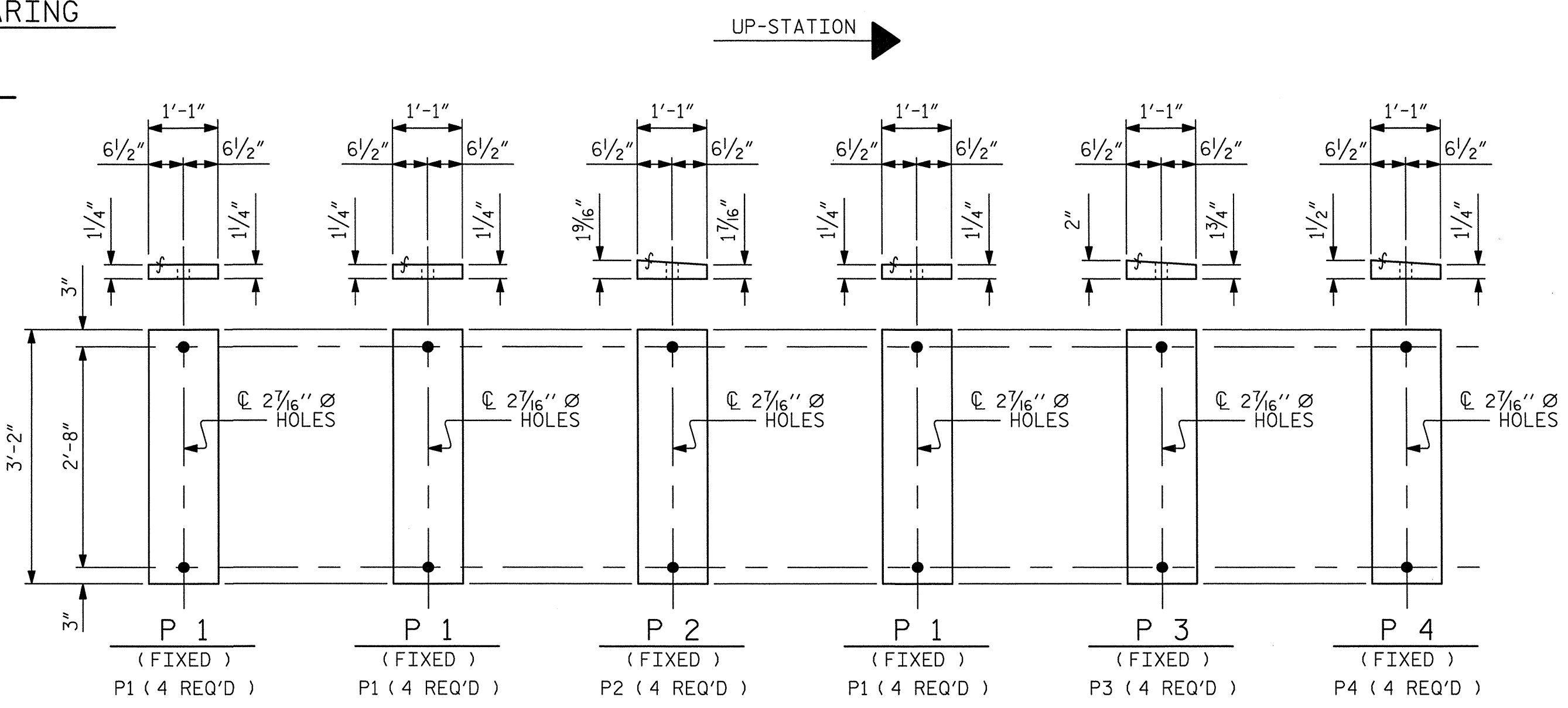
TYPICAL HALF-PLAN (SHOWING SIMPLE SPAN BENT)



PLAN VIEW AT END BENTS

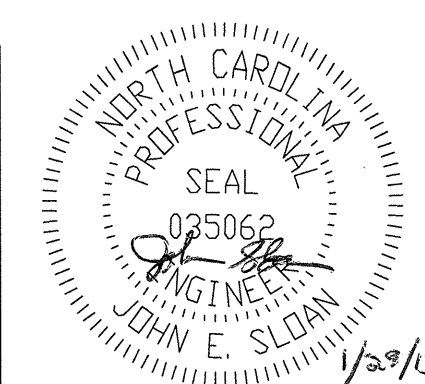
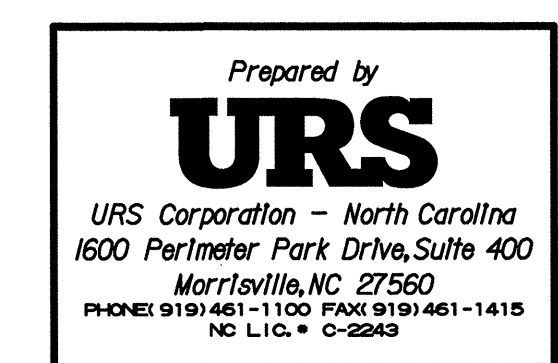


DETAIL "A"



SOLE PLATE DETAILS ("P")

ASSEMBLED BY: M. K. TOM	DATE: 7/9/12
CHECKED BY: K. H. COMPTON	DATE: 10/19/12
DRAWN BY: WJH 8/89	REV. 7/10/01 RWW/LES
CHECKED BY: CRK 8/89	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM



PROJECT NO. P-5208B
CABARRUS COUNTY
STATION: 25+41.22 -L-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH				STANDARD	
ELASTOMERIC BEARING				DETAILS	
PRESTRESSED CONCRETE GIRDER				SUPERSTRUCTURE	
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-20
					TOTAL SHEETS 48

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION	GIRDERS A1 & A4											GIRDERS A2 & A3											
TENTH POINTS	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0	
CAMBER (GIRDER ALONE IN PLACE)	↑	0.000	0.075	0.130	0.166	0.187	0.194	0.187	0.166	0.130	0.075	0.000	0.000	0.075	0.130	0.166	0.187	0.194	0.187	0.166	0.130	0.075	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.000	0.027	0.053	0.074	0.087	0.092	0.087	0.074	0.053	0.027	0.000	0.000	0.030	0.058	0.081	0.095	0.101	0.095	0.081	0.058	0.030	0.000
FINAL CAMBER	↑	0	1/16	15/16	1/8	13/16	1/4	13/16	1/8	15/16	9/16	0	0	1/16	7/8	1	1/8	1/8	1/8	1	7/8	9/16	0

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

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION	GIRDERS B1 & B4																					
TENTH POINTS	0	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	0	
CAMBER (GIRDER ALONE IN PLACE)	↑	0.000	0.063	0.119	0.168	0.211	0.248	0.278	0.303	0.320	0.330	0.334	0.330	0.320	0.303	0.278	0.248	0.211	0.168	0.119	0.063	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.000	0.027	0.055	0.082	0.108	0.130	0.150	0.165	0.176	0.183	0.185	0.183	0.176	0.165	0.150	0.130	0.108	0.082	0.055	0.027	0.000
FINAL CAMBER	↑	0	7/16	3/4	1/16	1/4	17/16	15/8	13/4	13/4	113/16	13/4	13/4	15/8	17/16	17/16	1/4	1/16	3/4	7/16	0	

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

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION	GIRDERS B2 & B3																					
TENTH POINTS	0	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	0	
CAMBER (GIRDER ALONE IN PLACE)	↑	0.000	0.063	0.119	0.168	0.211	0.248	0.278	0.303	0.320	0.330	0.334	0.330	0.320	0.303	0.278	0.248	0.211	0.168	0.119	0.063	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.000	0.029	0.060	0.090	0.118	0.143	0.163	0.180	0.192	0.200	0.202	0.200	0.192	0.180	0.163	0.143	0.118	0.090	0.060	0.029	0.000
FINAL CAMBER	↑	0	7/16	11/16	15/16	1/8	1/4	13/8	17/16	19/16	19/16	19/16	19/16	17/16	13/8	1/4	1/8	15/16	11/16	7/16	0	

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

PROJECT NO. P-5208B
CABARRUS COUNTY
STATION: 25+41.22 -L-

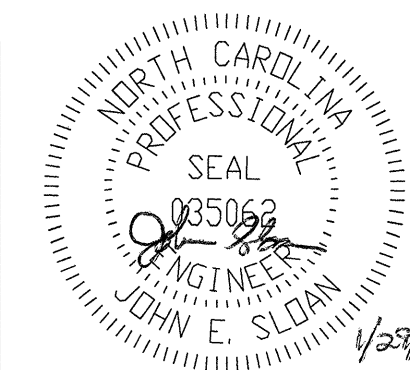
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
DEAD LOAD DEFLECTIONS
SPANS A & B

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

S-21
TOTAL SHEETS
48



DRAWN BY : M. K. TOM DATE : 7/2/12
CHECKED BY : K. H. COMPTON DATE : 10/18/12

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
0.6" Ø LOW RELAXATION	GIRDERS C1 & C4											GIRDERS C2 & C3										
TENTH POINTS	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.075	0.129	0.165	0.186	0.193	0.186	0.165	0.129	0.075	0.000	0.000	0.075	0.129	0.165	0.186	0.193	0.186	0.165	0.129	0.075	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.026	0.052	0.072	0.085	0.089	0.085	0.072	0.052	0.026	0.000	0.000	0.029	0.057	0.079	0.093	0.097	0.093	0.079	0.057	0.029	0.000
FINAL CAMBER ↑	0	1/16	1/8	1/8	1/8	1/4	3/16	1/8	1/8	1/8	0	0	1/16	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	0

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

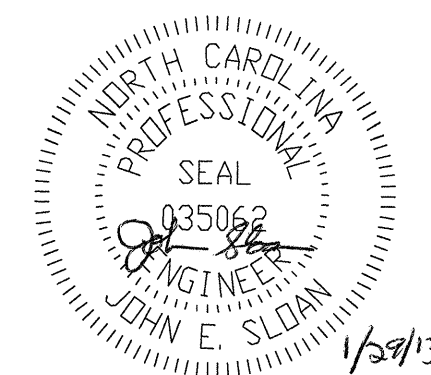
DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
0.6" Ø LOW RELAXATION	GIRDERS D1 & D4											GIRDERS D2 & D3										
TENTH POINTS	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.033	0.058	0.075	0.084	0.088	0.084	0.075	0.058	0.033	0.000	0.000	0.033	0.058	0.075	0.084	0.088	0.084	0.075	0.058	0.033	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.008	0.016	0.023	0.027	0.028	0.027	0.023	0.016	0.008	0.000	0.000	0.009	0.018	0.025	0.029	0.031	0.029	0.025	0.018	0.009	0.000
FINAL CAMBER ↑	0	5/16	1/2	5/8	11/16	11/16	11/16	5/8	1/2	5/16	0	0	5/16	1/2	5/8	11/16	11/16	11/16	5/8	1/2	5/16	0

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

PROJECT NO. P-5208B
CABARRUS COUNTY
STATION: 25+41.22 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
DEAD LOAD DEFLECTIONS
SPANS C & D



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S-22
2			4			48

DRAWN BY: M. K. TOM DATE: 7/2/12
CHECKED BY: K. H. COMPTON DATE: 10/18/12

NOTES

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

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B-221 ALLOY 6061-T6. MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING. THE BASE OF RAIL POSTS, OR ANY OTHER ALUMINUM SURFACE IN CONTACT WITH CONCRETE SHALL BE THOROUGHLY COATED WITH AN ALUMINUM IMPREGNATED CAULKING COMPOUND OF APPROVED QUALITY. MATERIAL FOR SHIMS TO BE ASTM B209 ALLOY 6061-T6.

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS: POST, POST BASES, RAILS, EXPANSION BARS AND CLAMP BARS: AASHTO M270 GRADE 36 STRUCTURAL STEEL - GALVANIZED TO AASHTO M111. RIVETS: RIVETS SHALL MEET THE REQUIREMENTS OF ASTM A502 FOR GRADE 1 RIVETS. THE CUT ENDS OF GALVANIZED STEEL RAILING, AFTER GRINDING SMOOTH SHALL BE GIVEN TWO COATS OF ZINC RICH PAINT MEETING THE REQUIREMENTS OF FEDERAL SPECIFICATION MIL-P-26915 USAF TYPE 1, OR OF FEDERAL SPECIFICATIONS TT-P-641.

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

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

GENERAL NOTES

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

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE "RAIL POST SPACING AND END OF RAIL DETAIL SHEET."

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

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

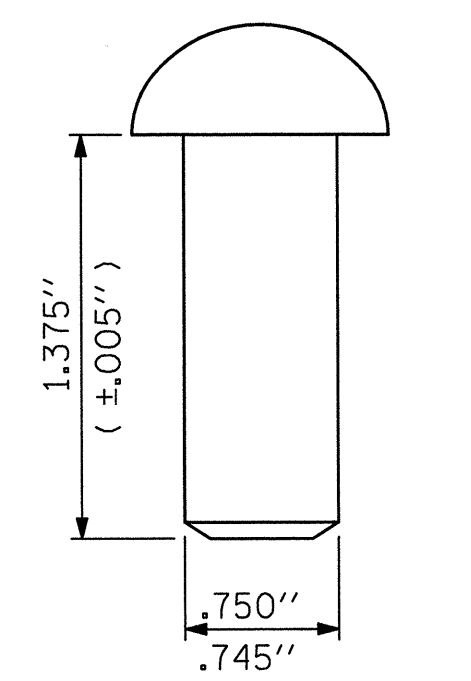
SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

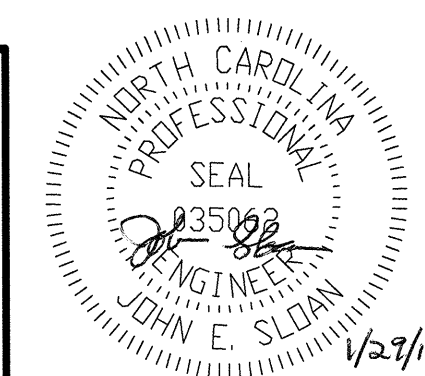
MINOR VARIATIONS IN DETAILS OF METAL RAIL WILL BE CONSIDERED. DETAILS OF SUCH VARIATIONS, IF DESIRED, SHALL BE SUBMITTED FOR APPROVAL.

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

PAY LENGTH = 694.6 LIN. FT.



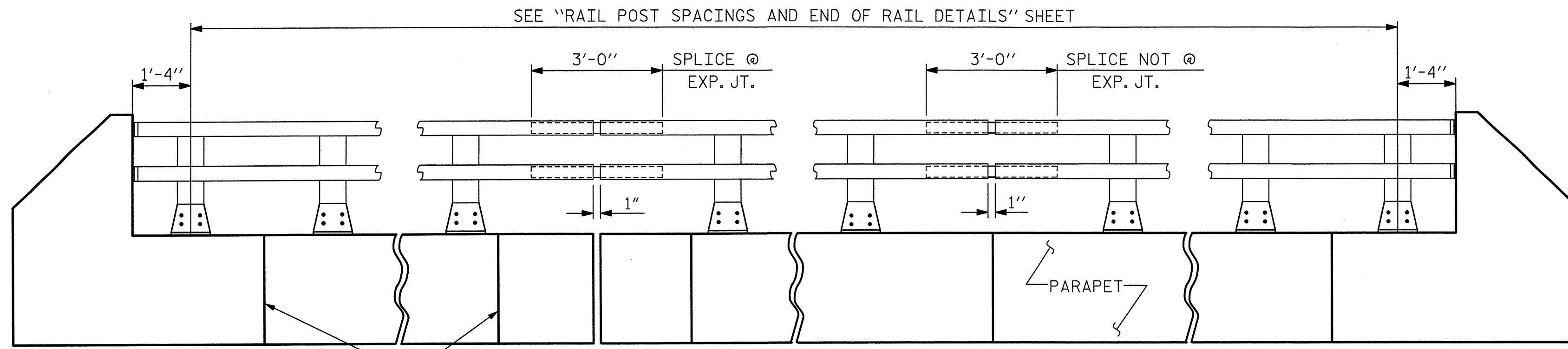
RIVET DETAIL



PROJECT NO. P-5208B
CABARRUS COUNTY
 STATION: 25+41.22 -L-

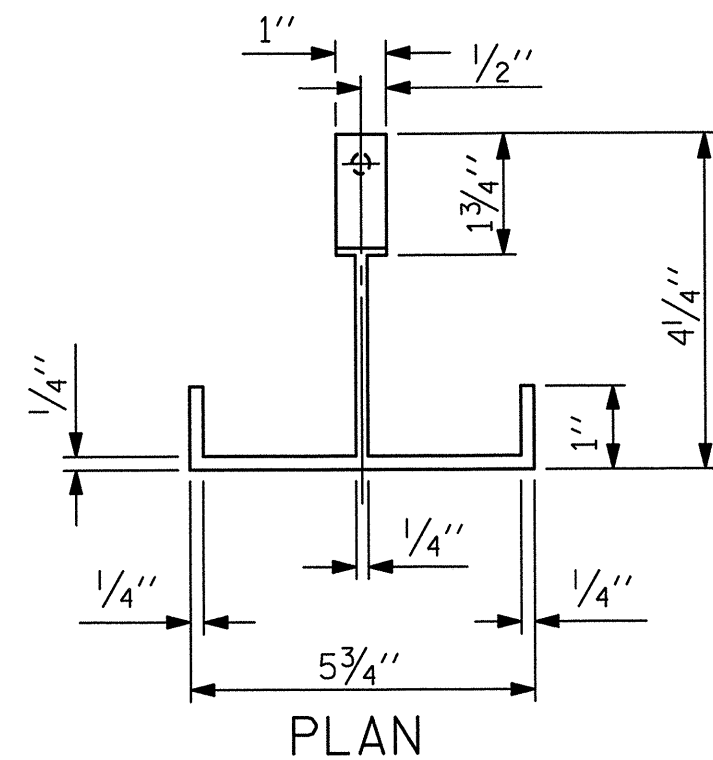
SHEET 1 OF 5
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 2 BAR METAL RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			48

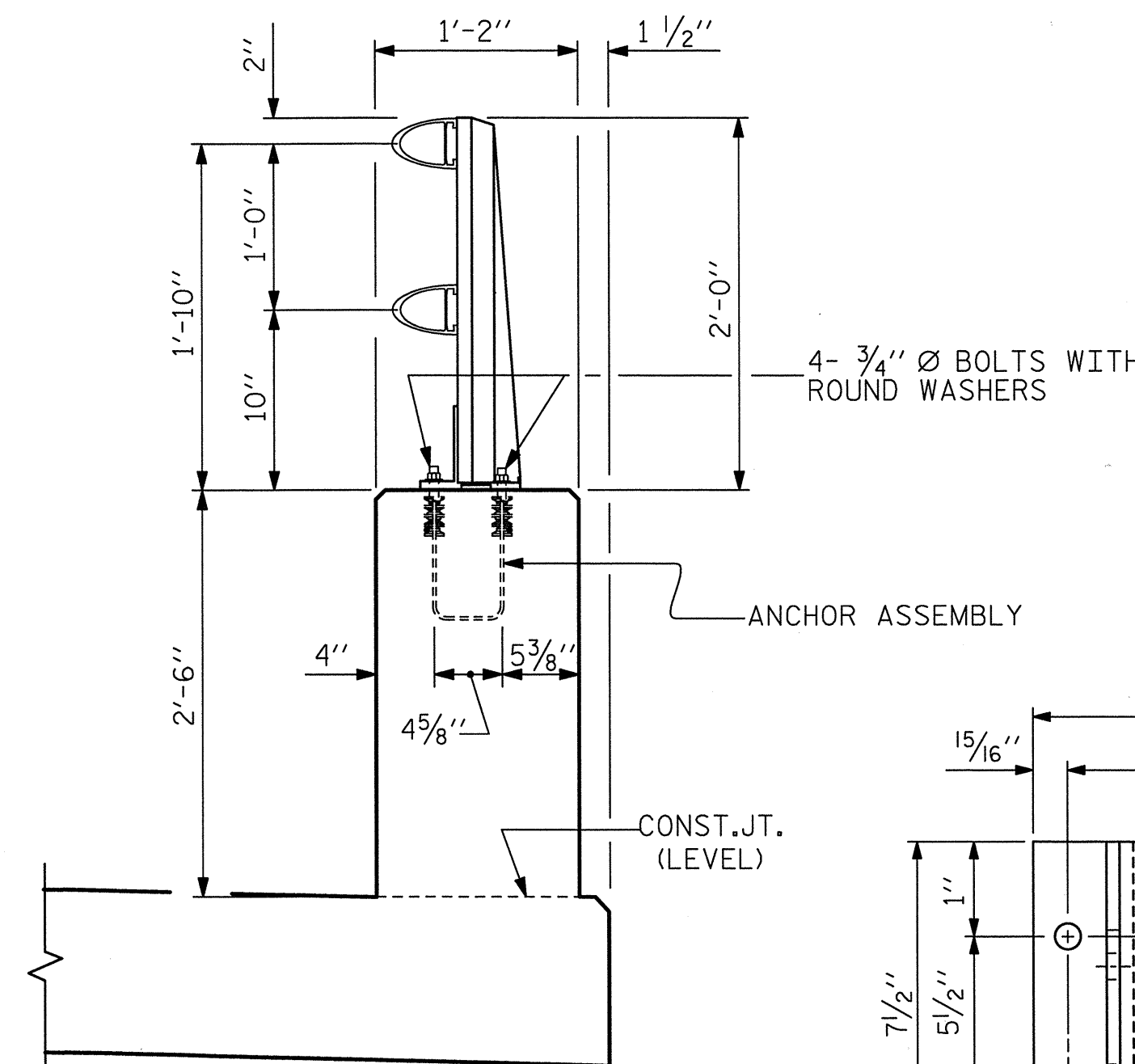


ELEVATION

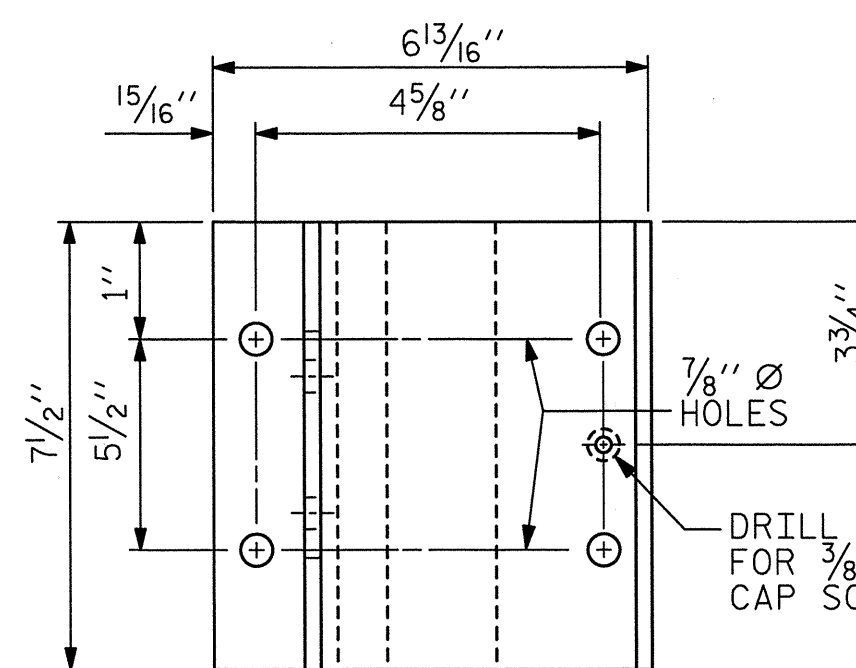
NOTE: FOR ATTACHMENT OF METAL RAIL TO END POST, SEE "RAIL POST SPACING AND END OF RAIL DETAIL SHEET."



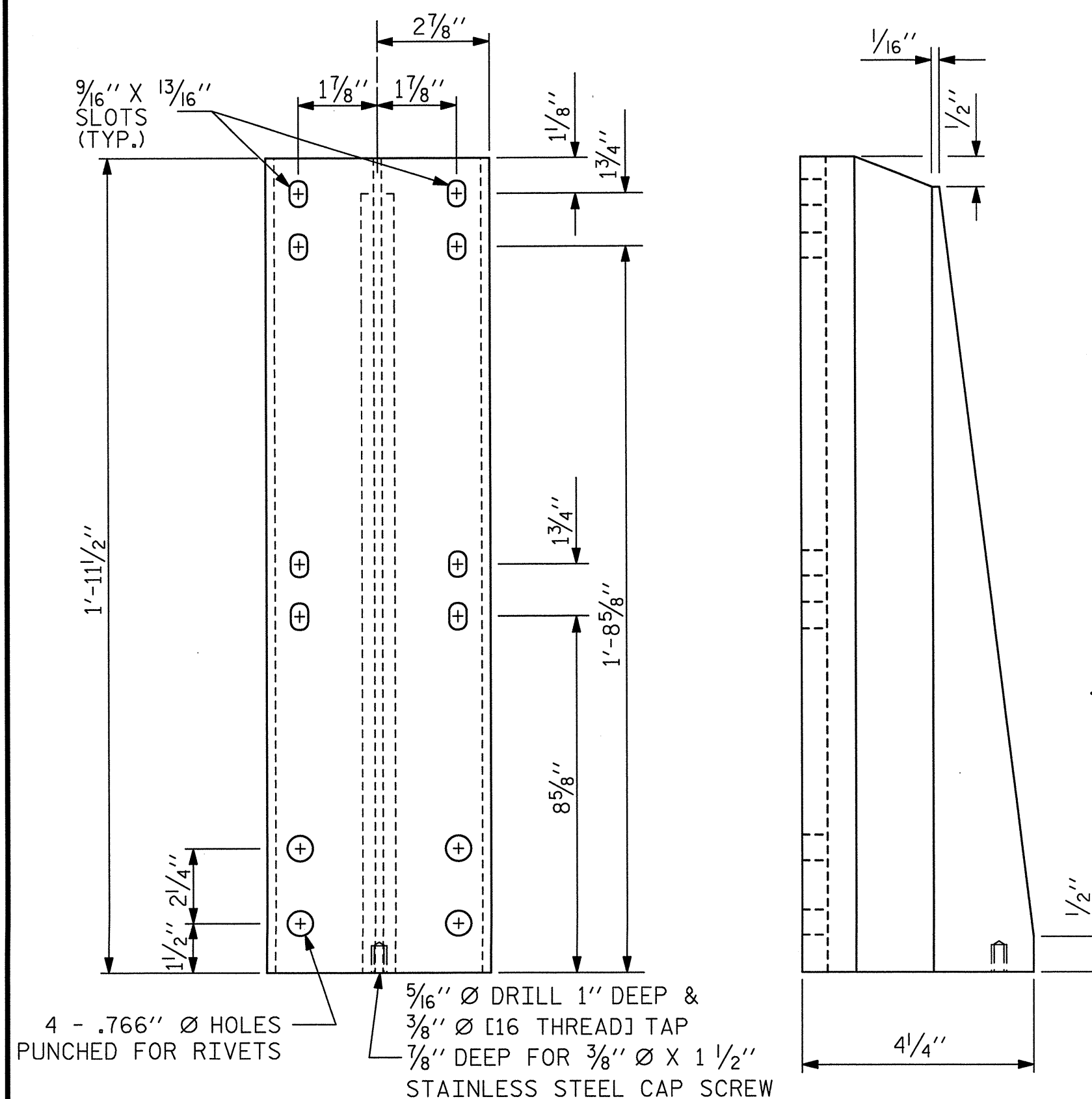
PLAN



SECTION THRU PARAPET AND RAIL



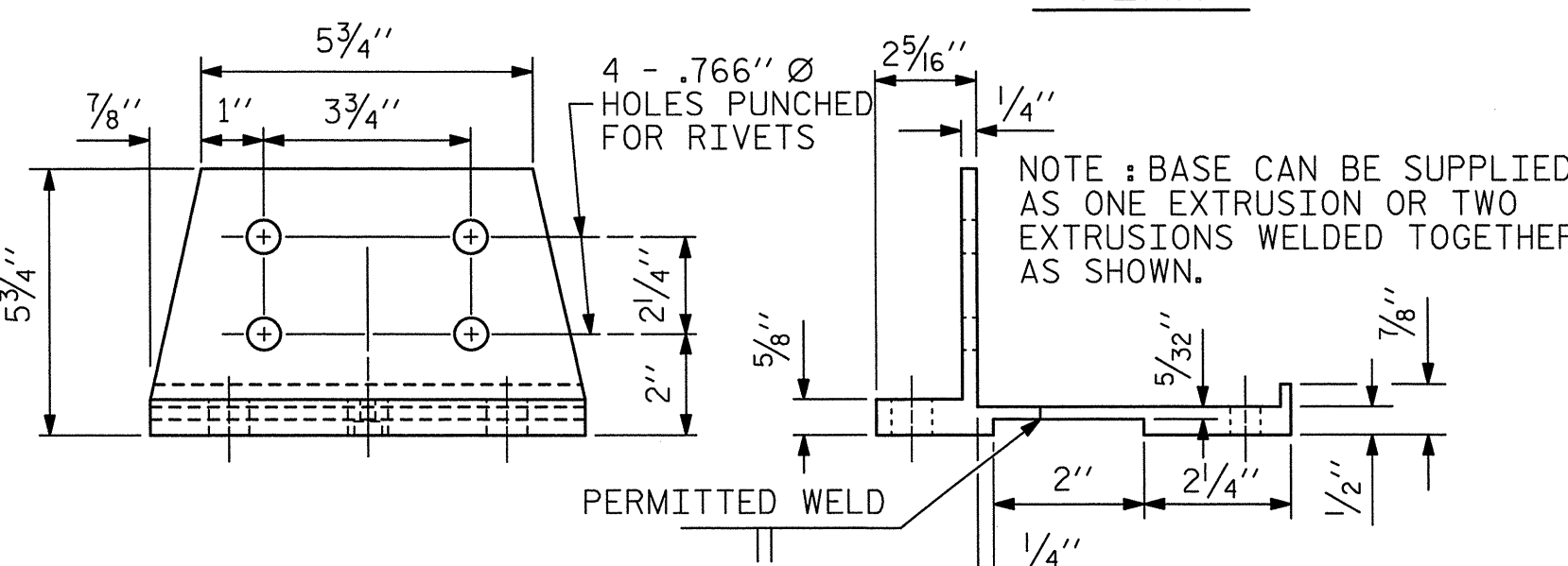
PLAN



FRONT ELEVATION

SIDE ELEVATION

DETAILS OF POST

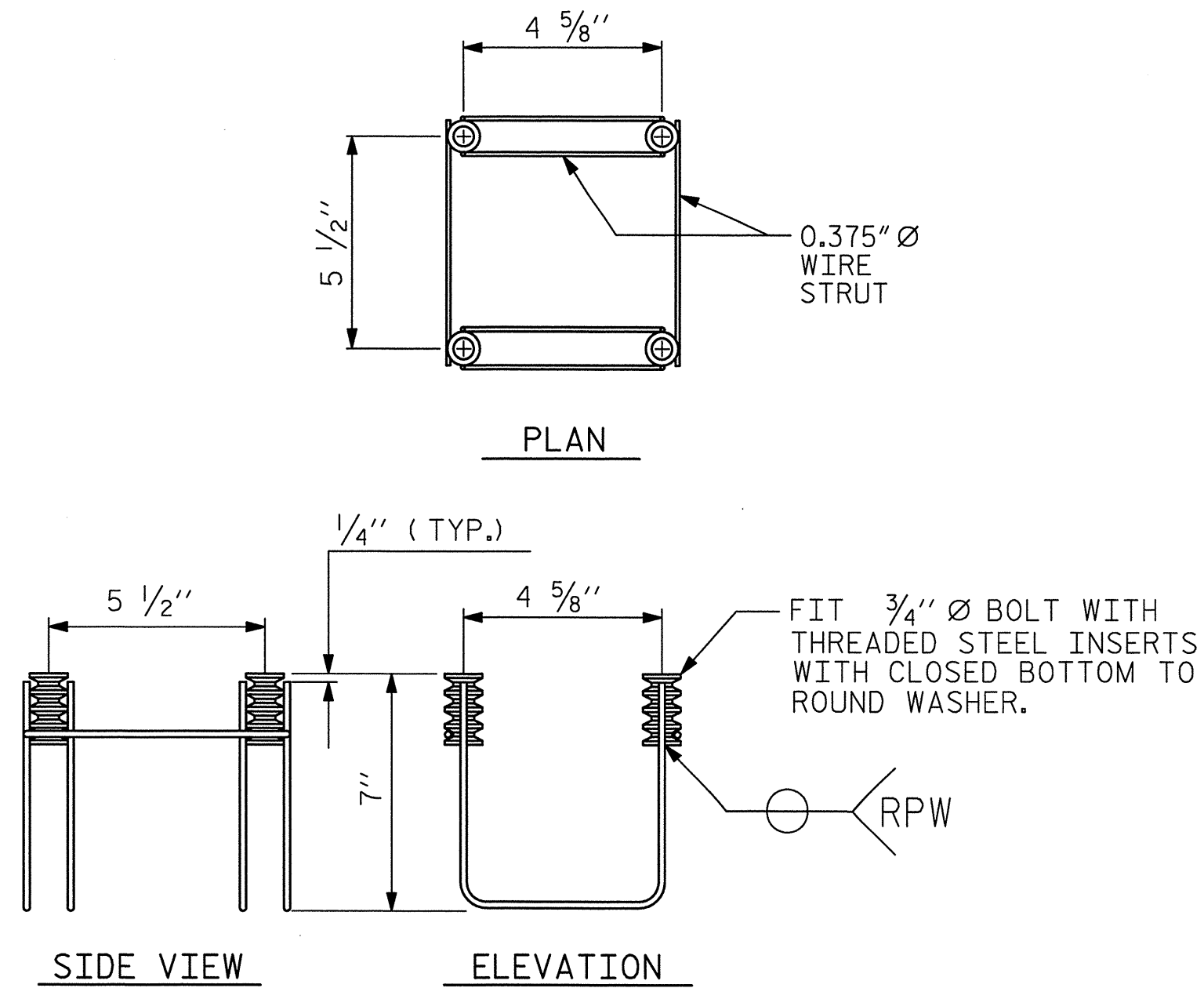


FRONT ELEVATION

SIDE ELEVATION

POST BASE DETAILS

ASSEMBLED BY: K.H. COMPTON	DATE: 10/22/12
CHECKED BY: R.L. WHITCHER	DATE: 10/24/12
DRAWN BY: EEM 6/94	REV. 5/7/03R RWW/JTE
CHECKED BY: RGW 6/94	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM



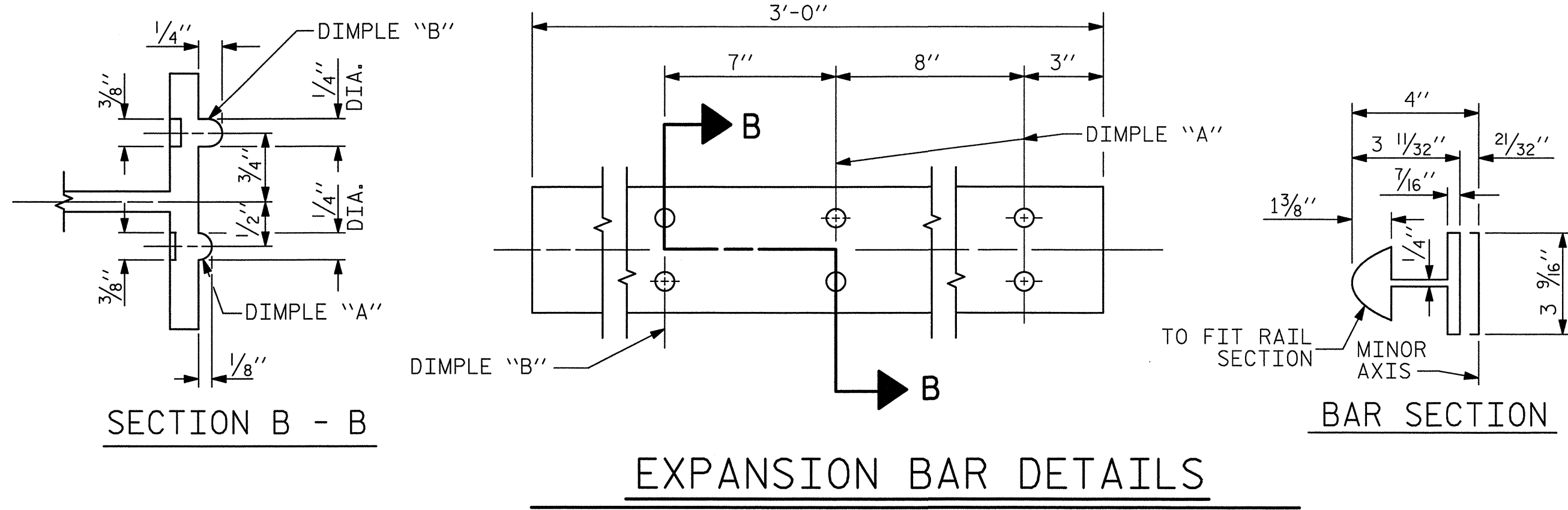
4-BOLT METAL RAIL ANCHOR ASSEMBLY

(110 ASSEMBLIES REQUIRED)

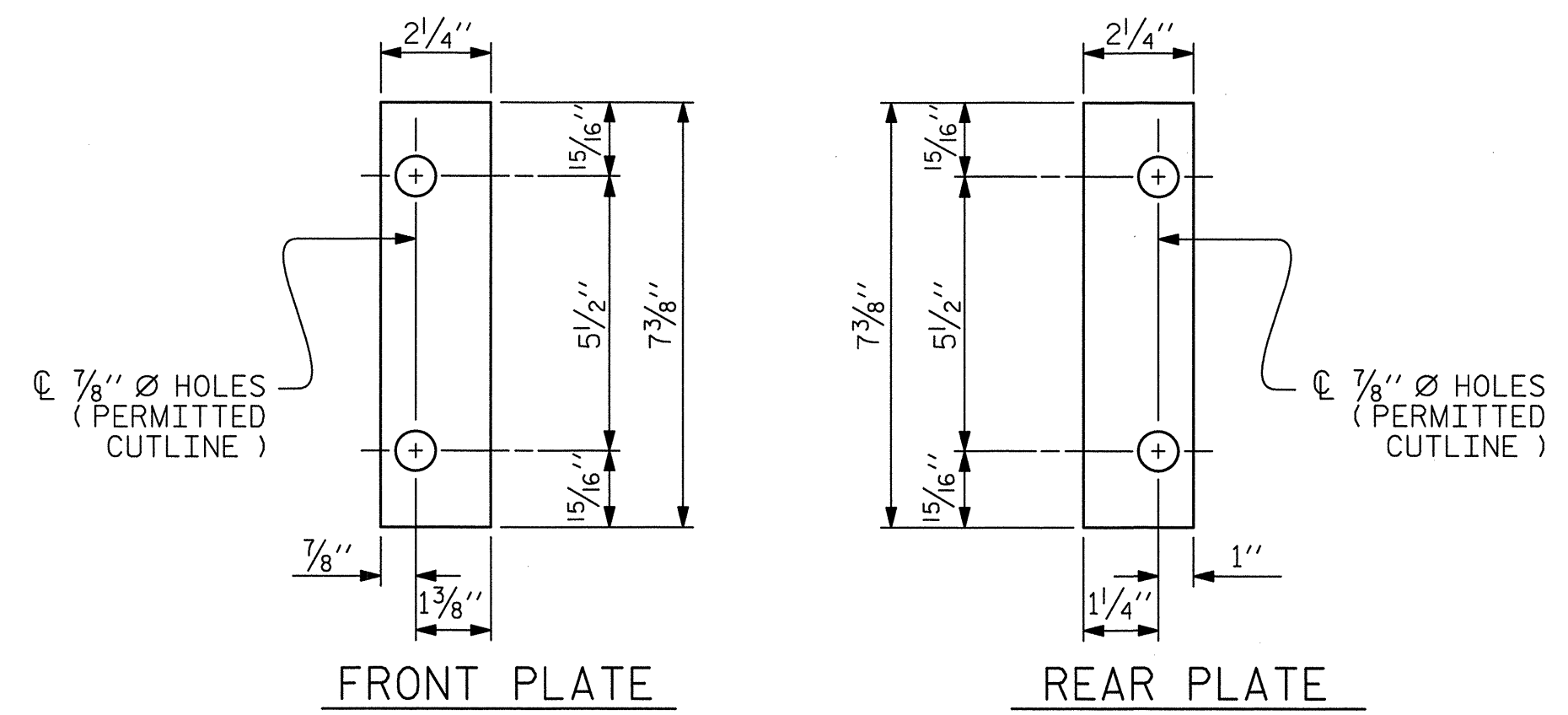
- NOTES**
- STRUCTURAL CONCRETE ANCHOR ASSEMBLY
- THE STRUCTURAL CONCRETE ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS :
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.
 - B. 4 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 2 1/2" GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.
 - C. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.
 - D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M11.
 - E. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.
 - F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

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

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

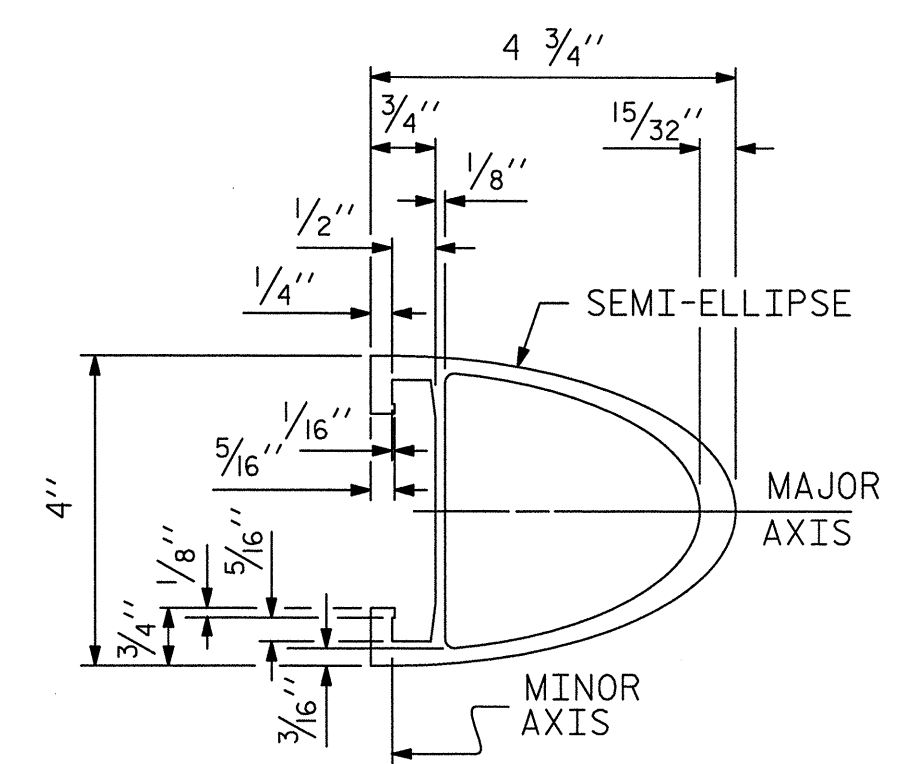


EXPANSION BAR DETAILS

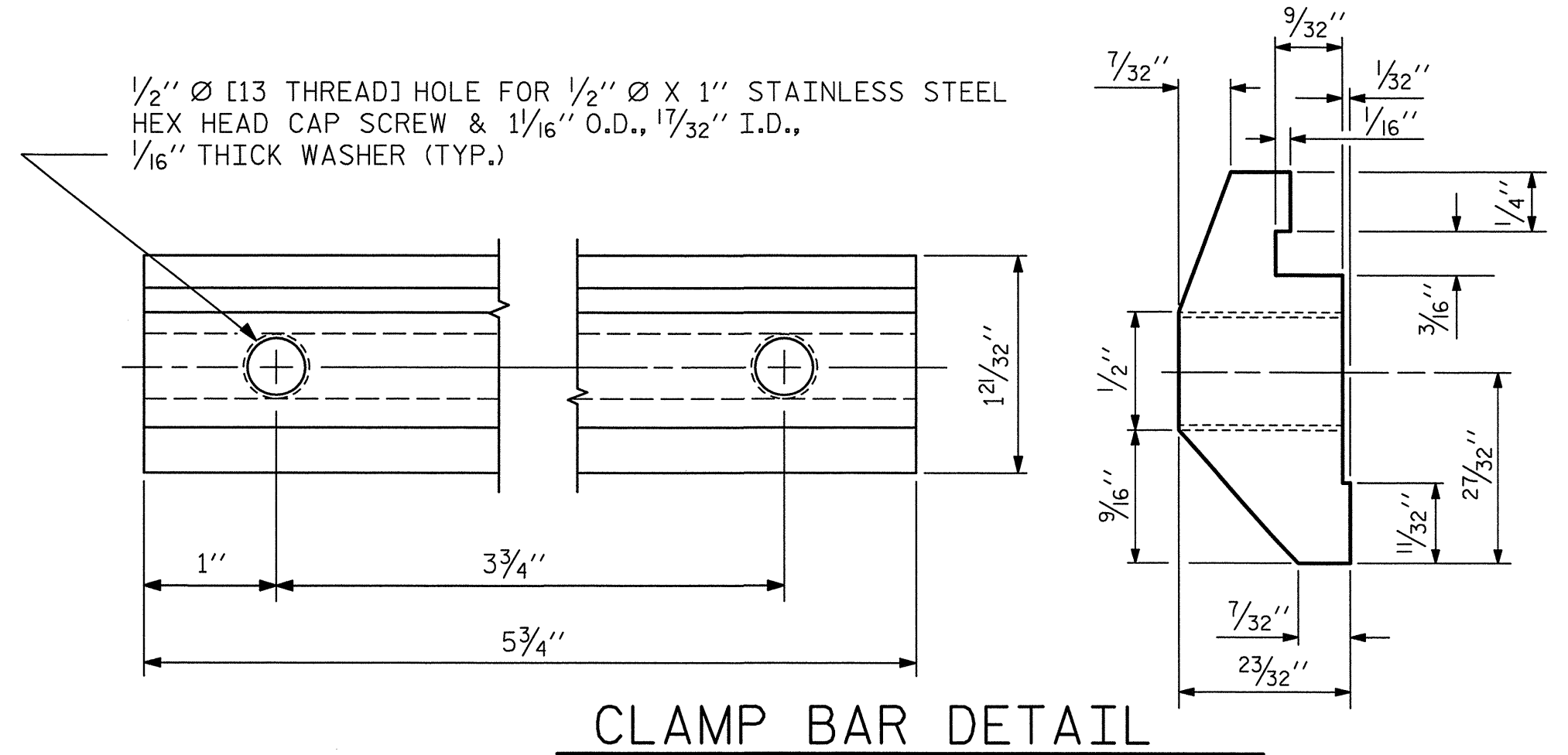


SHIM DETAILS

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

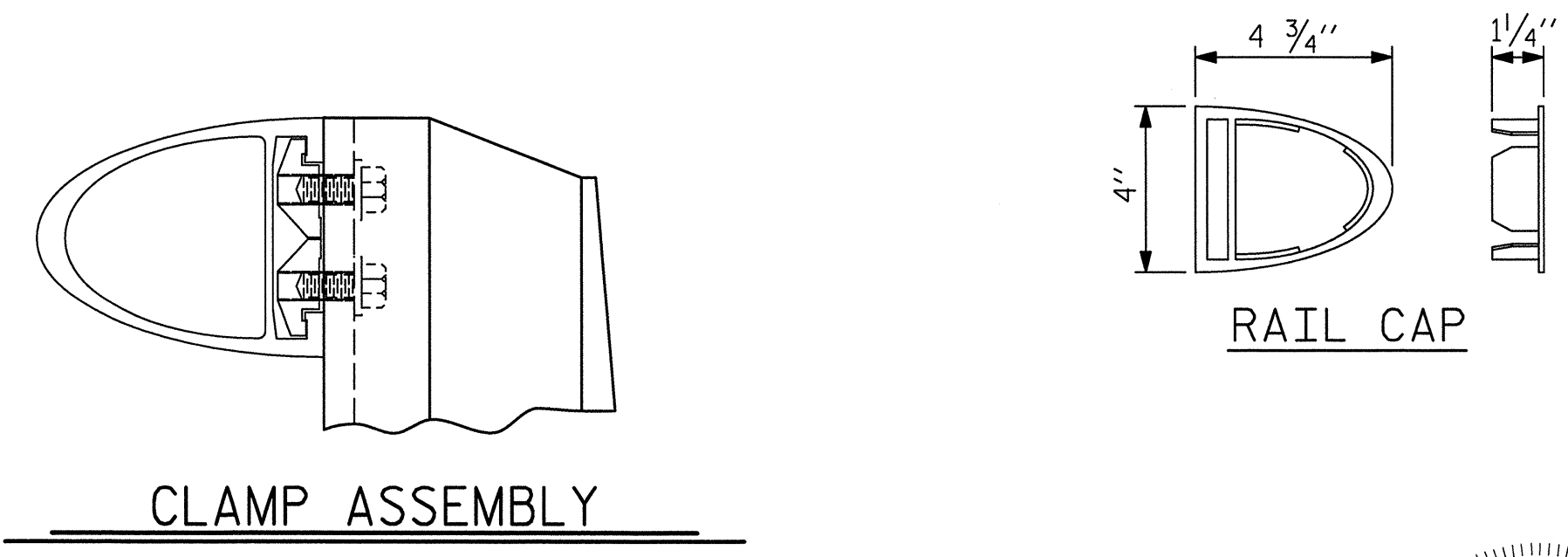


RAIL SECTION

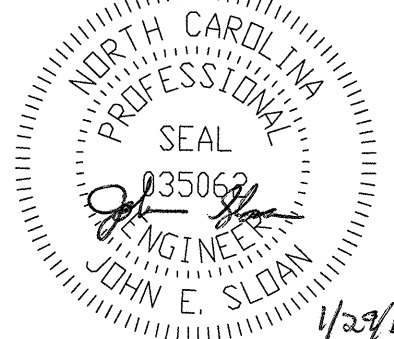


CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY



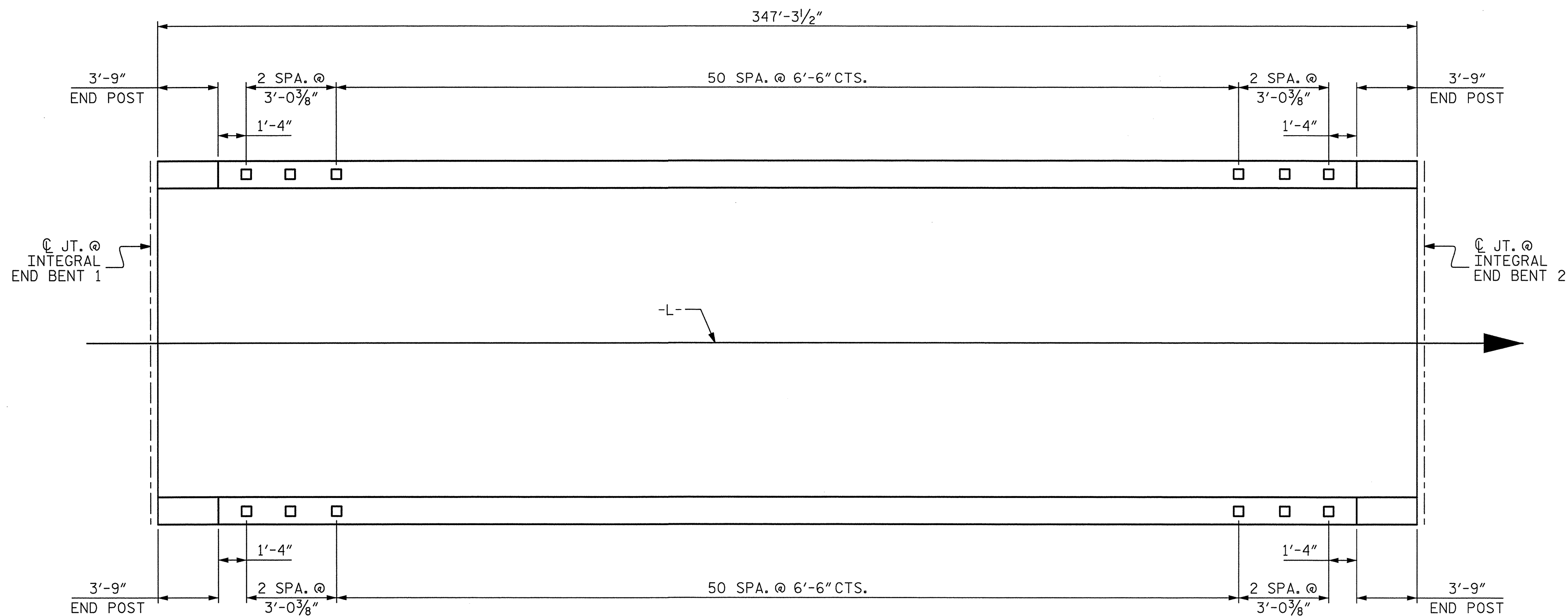
PROJECT NO. P-5208B
CABARRUS COUNTY
 STATION: 25+41.22 -L-

SHEET 2 OF 5

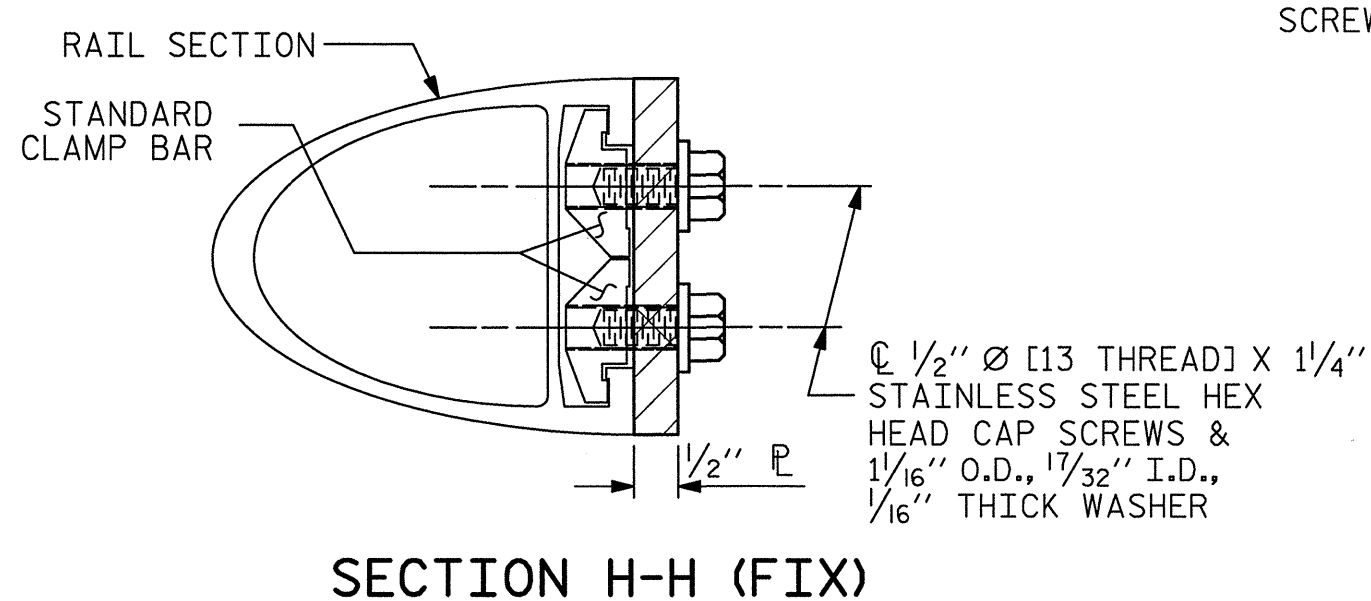
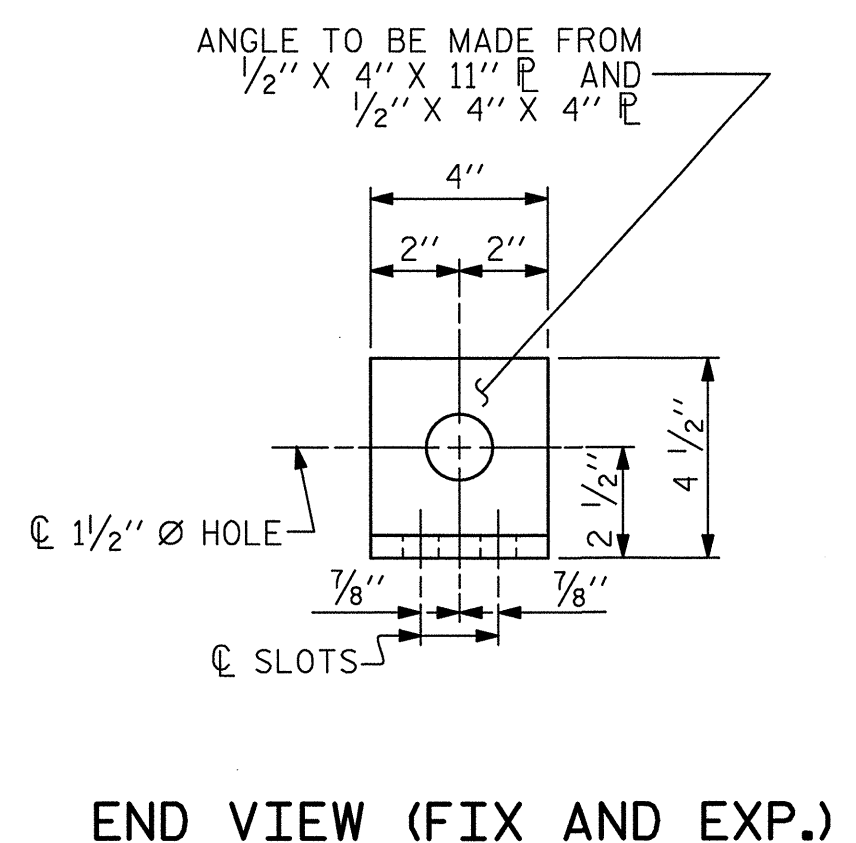
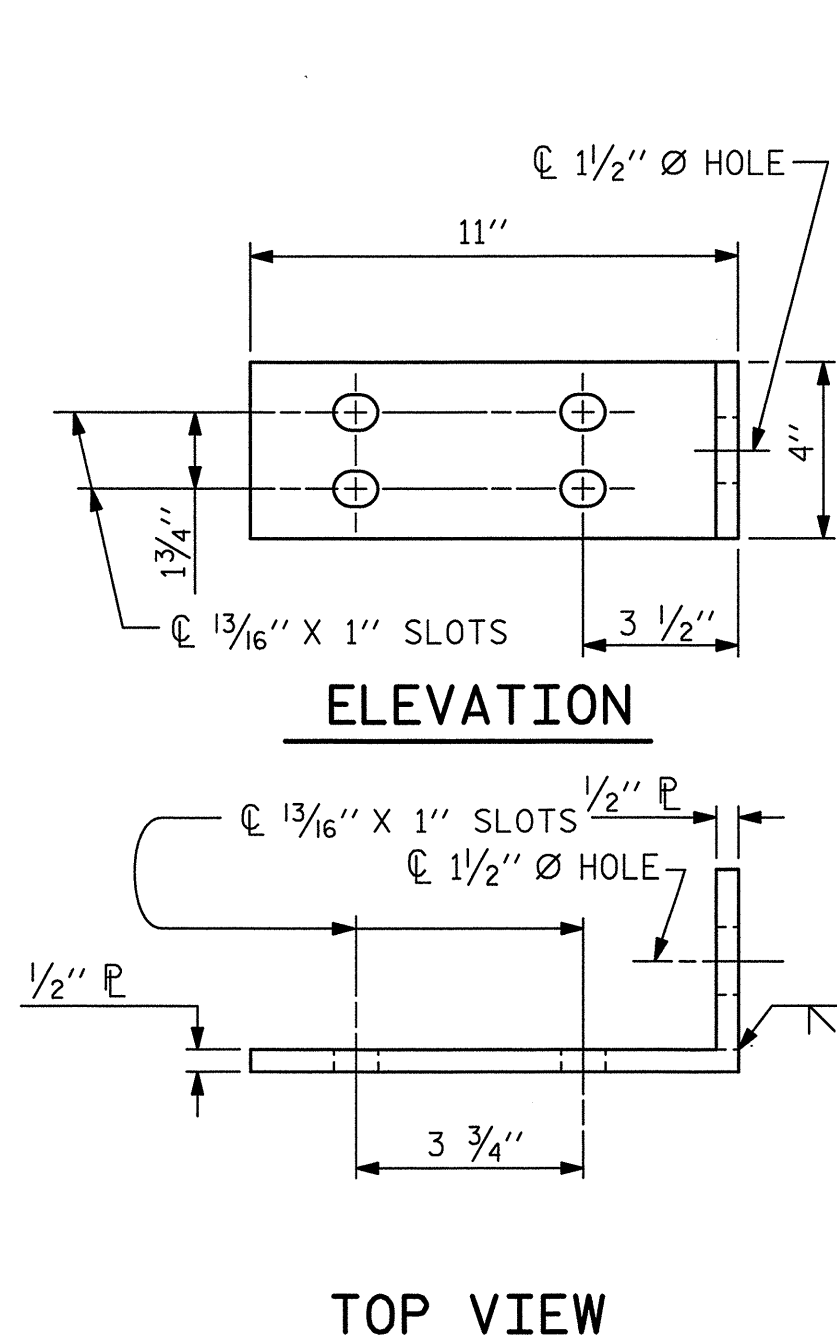
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 2 BAR METAL RAIL

REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	DATE:	TOTAL SHEETS
1			3		S-24
2			4		48

ASSEMBLED BY : K.H. COMPTON	DATE : 10/22/12
CHECKED BY : R.L. WHITCHER	DATE : 10/24/12
DRAWN BY : EEM 6/94	REV. 8/16/99 MAB/LES
CHECKED BY : RCW 6/94	REV. 5/1/06R KMM/GM
	REV. 10/1/11 MAA/GM

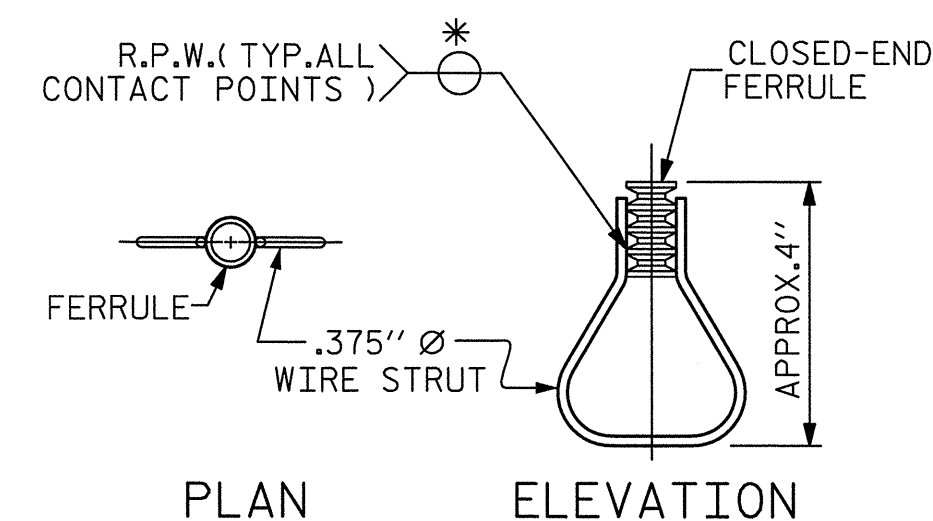
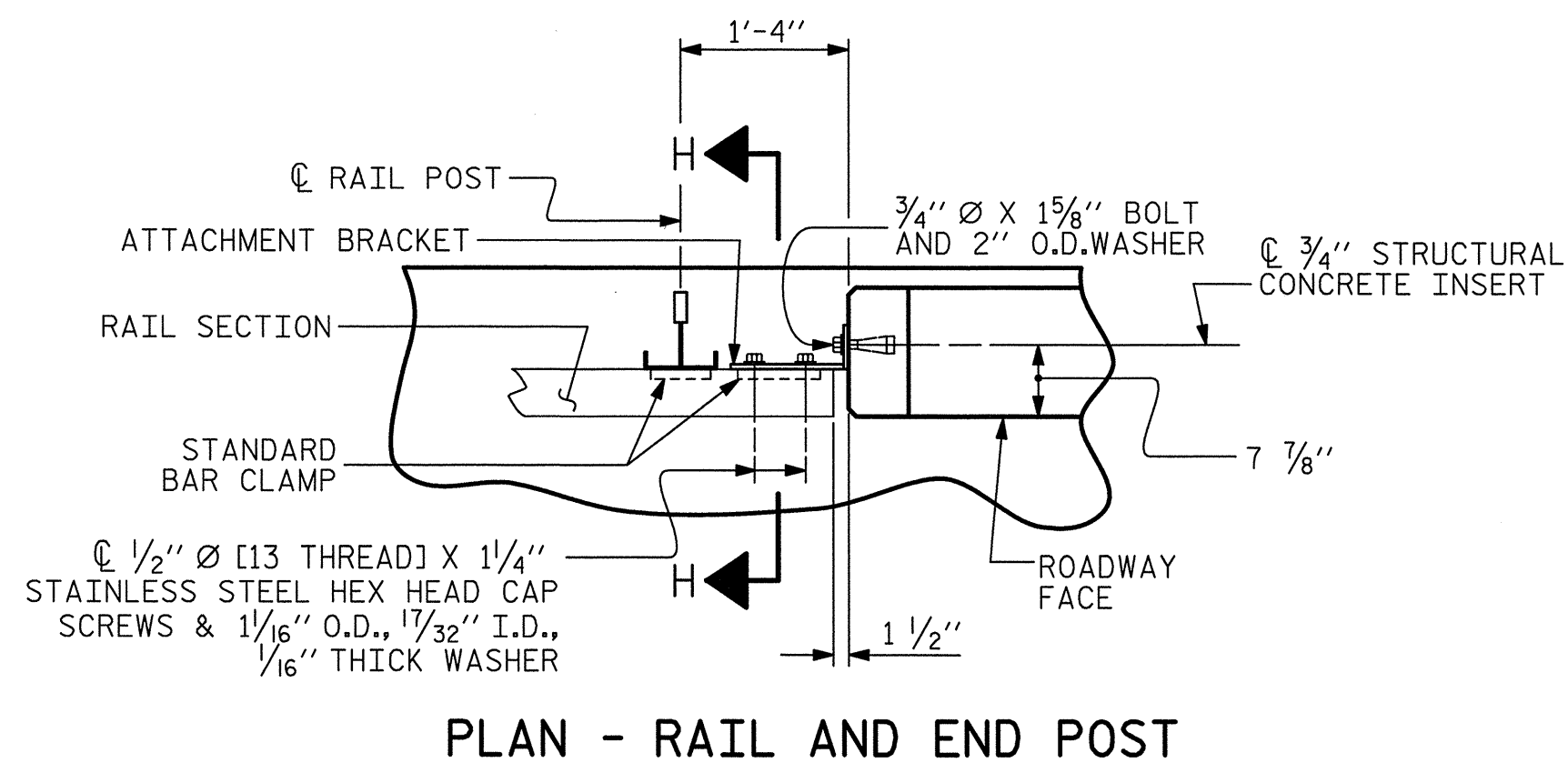


PLAN OF RAIL POST SPACINGS



FIXED

DETAILS FOR ATTACHING METAL RAIL TO END POST



STRUCTURAL CONCRETE INSERT

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

NOTES

STRUCTURAL CONCRETE INSERT

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

- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1/2".
- B. 1 - 3/4" Ø X 1 1/8" BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 1 1/8" GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)
- C. WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

NOTES

METAL RAIL TO END POST CONNECTION

THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:

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

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

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

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

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

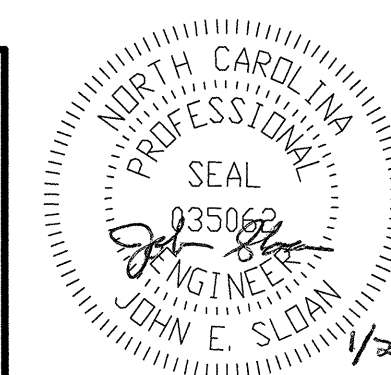
PROJECT NO. P-5208B
CABARRUS COUNTY
 STATION: 25+41.22 -L-

SHEET 3 OF 5

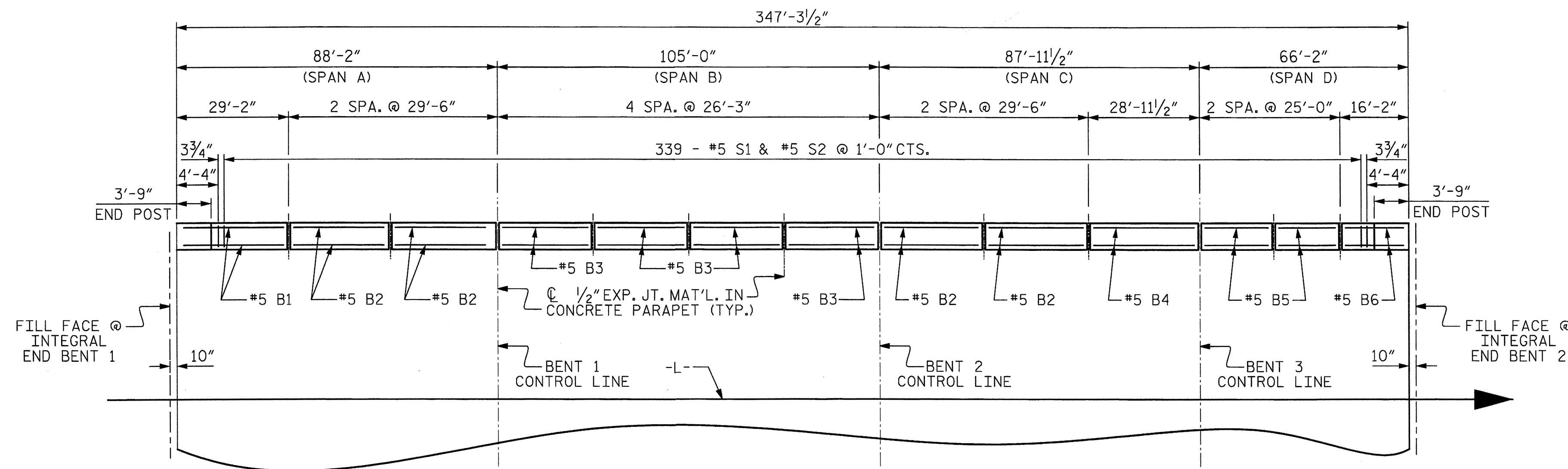
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 RAIL POST SPACINGS
 AND
 END OF RAIL DETAILS
 FOR TWO BAR METAL RAILS

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S-25
2			4			TOTAL SHEETS 48

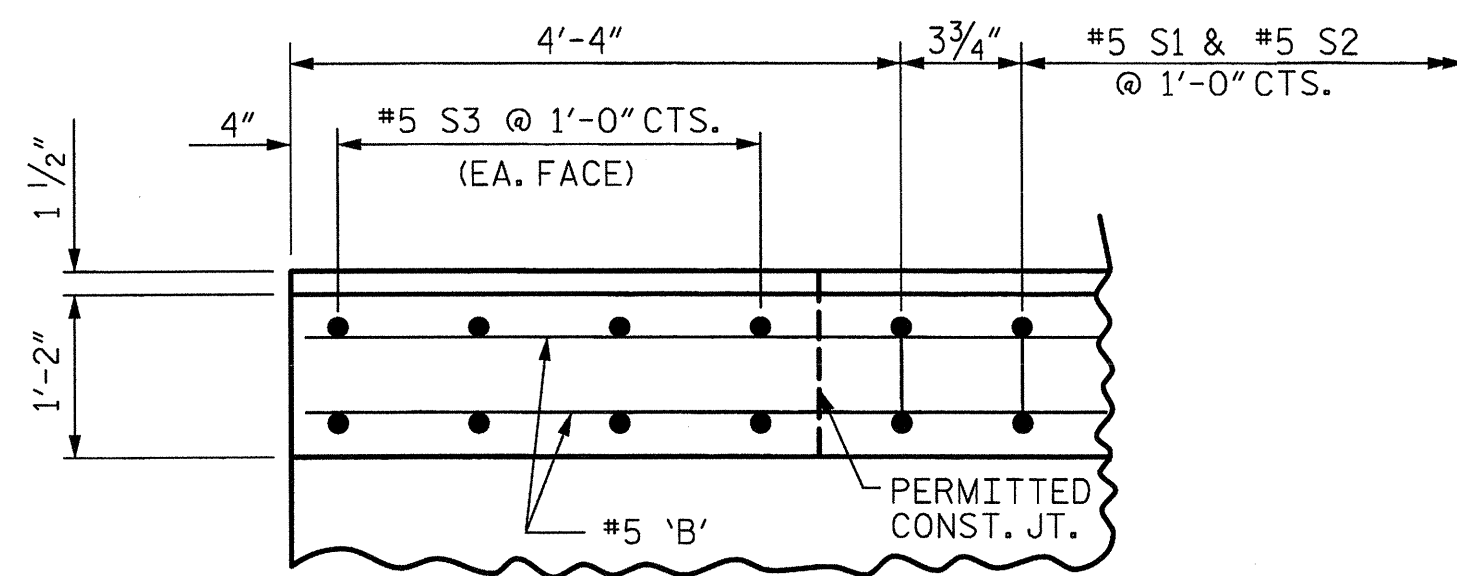


ASSEMBLED BY : K.H. COMPTON	DATE : 10/22/12
CHECKED BY : R.L. WHITCHER	DATE : 10/24/12
DRAWN BY : FCJ 1/88	REV. 5/7/03 RWW/JTE
CHECKED BY : CRK 3/89	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

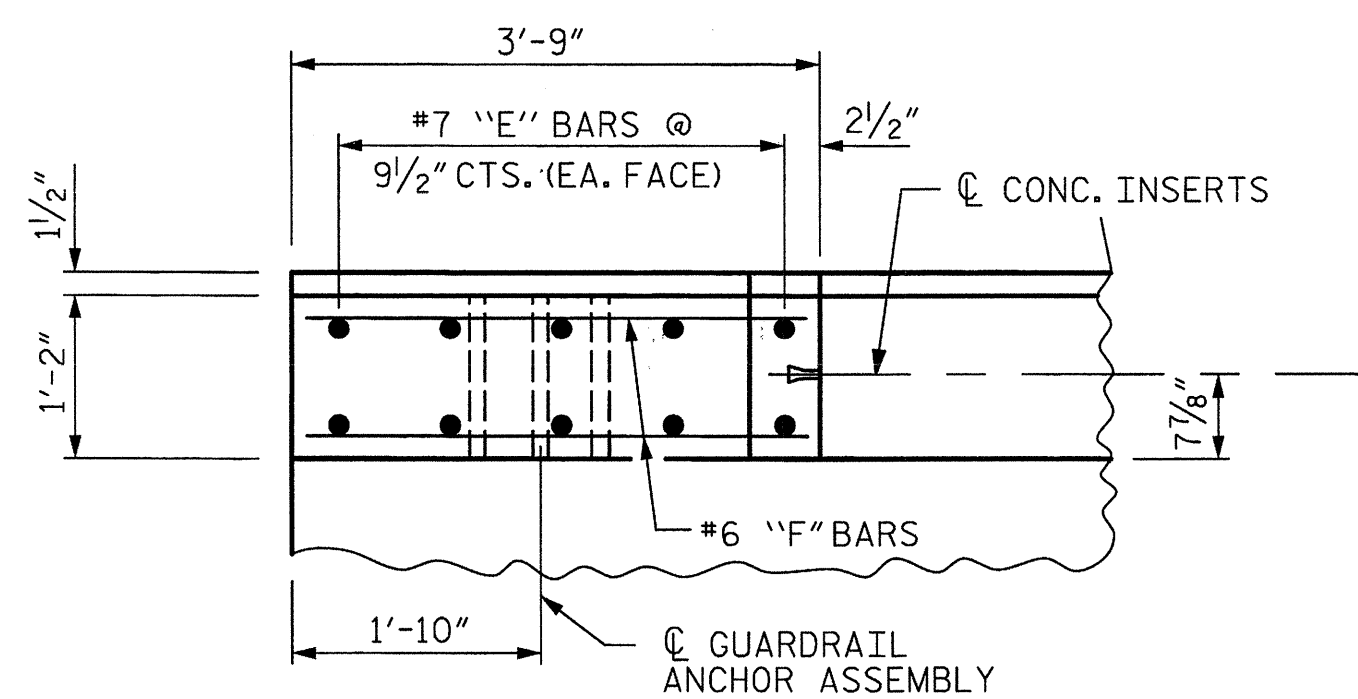


PLAN OF RAIL POST SPACINGS

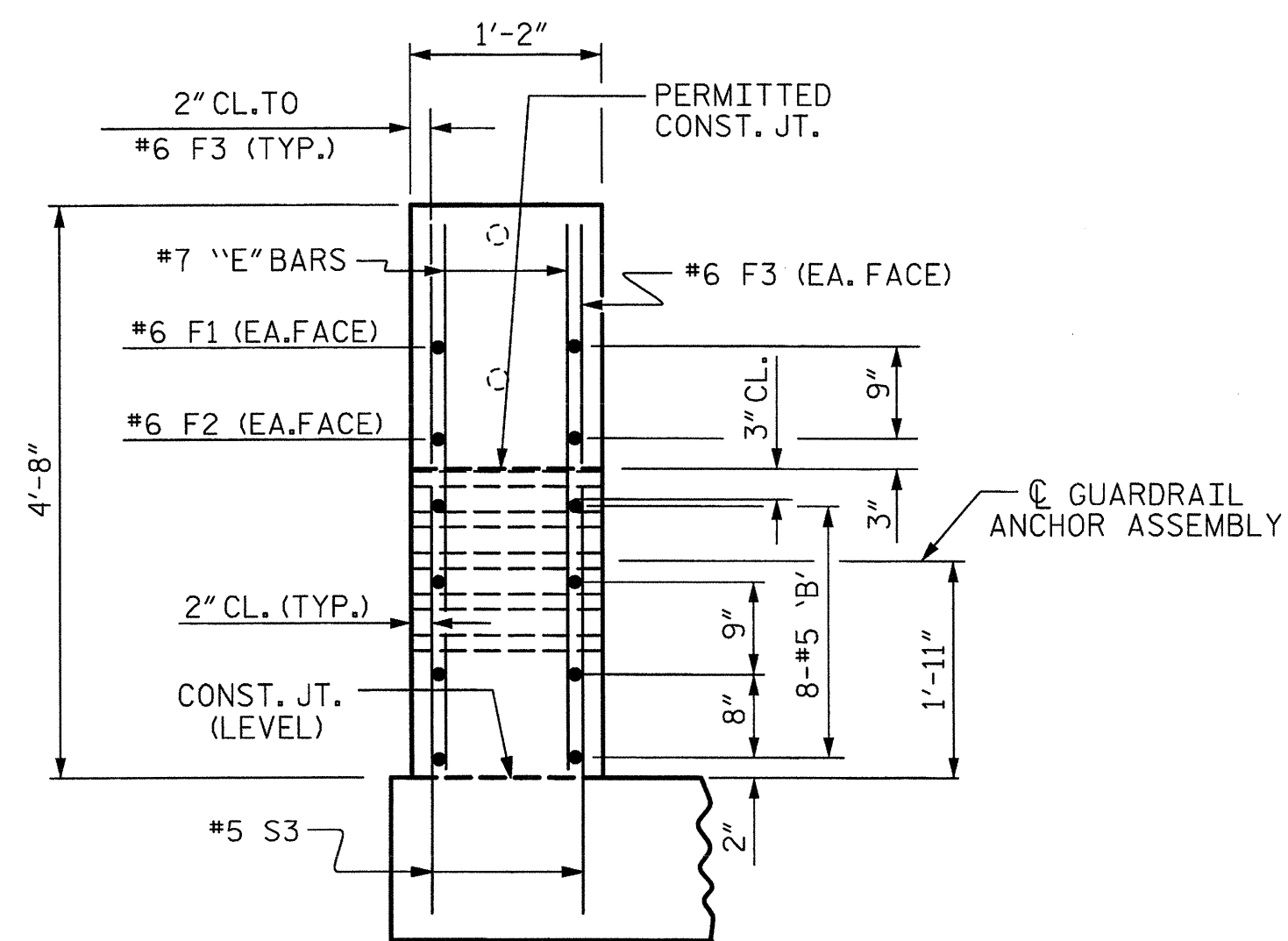
LEFT SIDE SHOWN, RIGHT SIDE SIMILAR



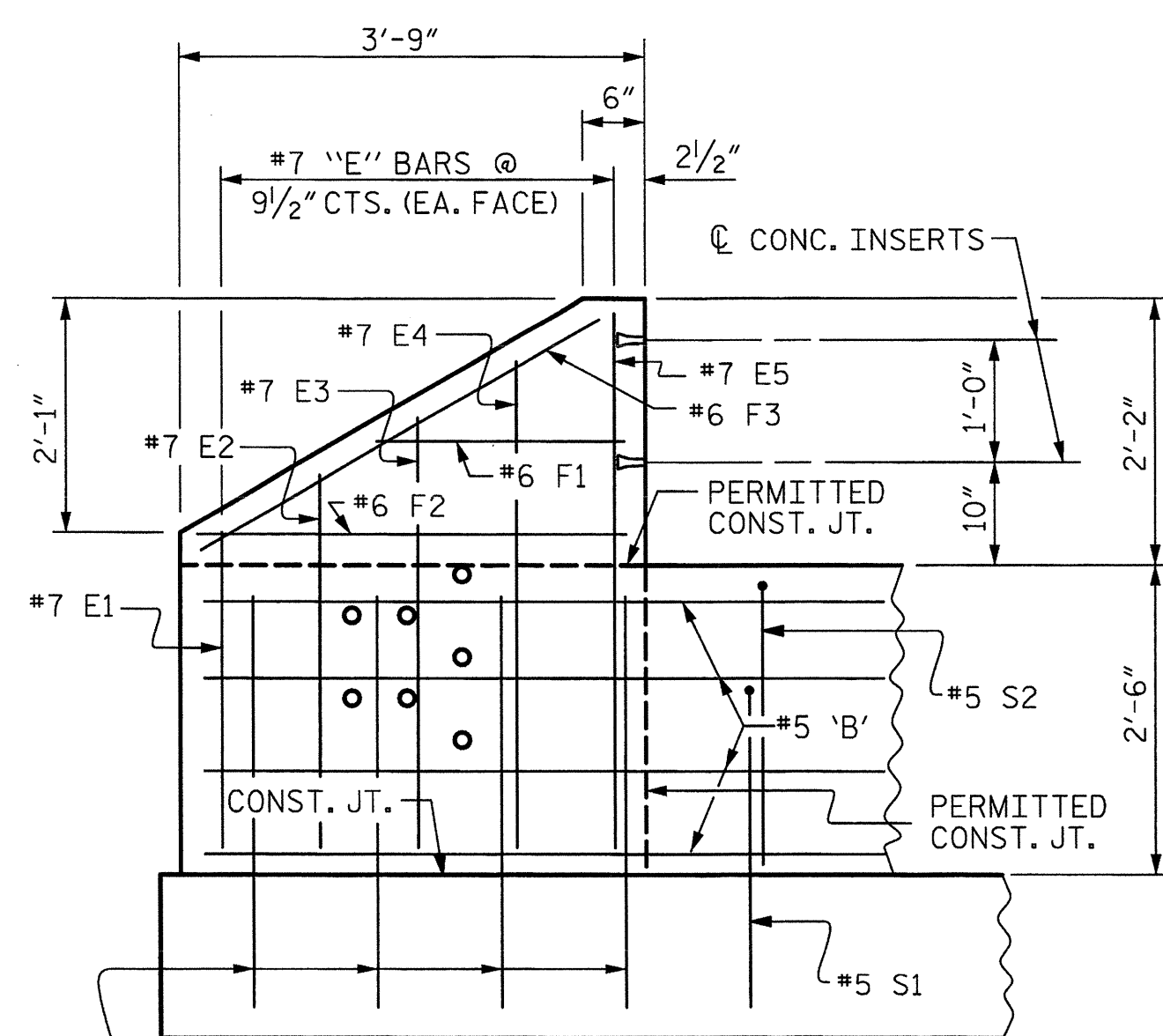
PLAN OF PARAPET



PLAN OF END POST



END VIEW



ELEVATION

PARAPET AND END POST FOR TWO BAR RAIL

BAR TYPE		TWO BAR METAL RAIL				
BILL OF MATERIAL FOR 2 PARAPETS AND 4 END POSTS						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
* B1	16	#5	STR	28'-10"	481	
* B2	64	#5	STR	29'-2"	1947	
* B3	64	#5	STR	25'-11"	1730	
* B4	16	#5	STR	28'-7"	477	
* B5	32	#5	STR	24'-8"	823	
* B6	16	#5	STR	15'-10"	264	
* E1	8	#7	STR	2'-6"	41	
* E2	8	#7	STR	3'-0"	49	
* E3	8	#7	STR	3'-6"	57	
* E4	8	#7	STR	4'-0"	65	
* E5	8	#7	STR	4'-4"	71	
* F1	8	#6	STR	1'-9"	21	
* F2	8	#6	STR	2'-11"	35	
* F3	8	#6	STR	3'-6"	42	
* S1	682	#5	1	5'-5"	3853	
* S2	682	#5	2	5'-6"	3912	
* S3	32	#5	STR	3'-0"	100	
* EPOXY COATED REINFORCING STEEL					13969 LBS.	
CLASS AA CONCRETE					75.9 CU. YDS.	
CONCRETE PARAPET					694.6 L.F.	
TWO BAR METAL RAIL					679.6 L.F.	

NOTES

THE #5 S3 BARS SHALL BE INSTALLED USING AN ADHESIVE ANCHORING SYSTEM AFTER SAWING THE JOINT. LEVEL TWO FIELD TESTING IS REQUIRED AND THE YIELD LOAD FOR THE #5 S3 BAR IS 18.6 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SPECIAL PROVISIONS.

THE #5 S1 AND #5 S2 BARS MAY BE SHIFTED SLIGHTLY IN ORDER TO MAINTAIN A 2" MINIMUM CLEARANCE TO THE 1/2" EXPANSION JOINT MATERIAL IN PARAPET.

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

FOR DETAIL OF CONCRETE INSERT, SEE "RAIL POST SPACING AND END OF RAIL DETAIL" SHEET.

FOR DETAIL OF GUARDRAIL ANCHOR ASSEMBLY, SEE "GUARDRAIL ANCHORAGE DETAILS" SHEET.

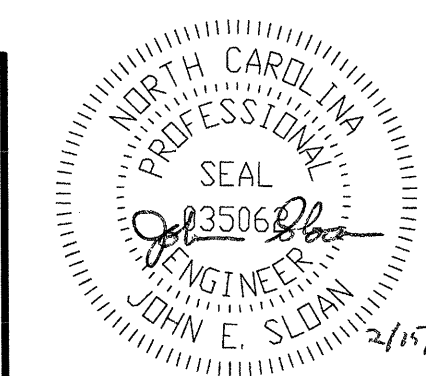
ALL BAR SUPPORTS USED IN THE PARAPET AND ALL INCIDENTAL REINFORCING STEEL SHALL BE EPOXY COATED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

PROJECT NO. P-5208B
CABARRUS COUNTY
 STATION: 25+41.22 -L-

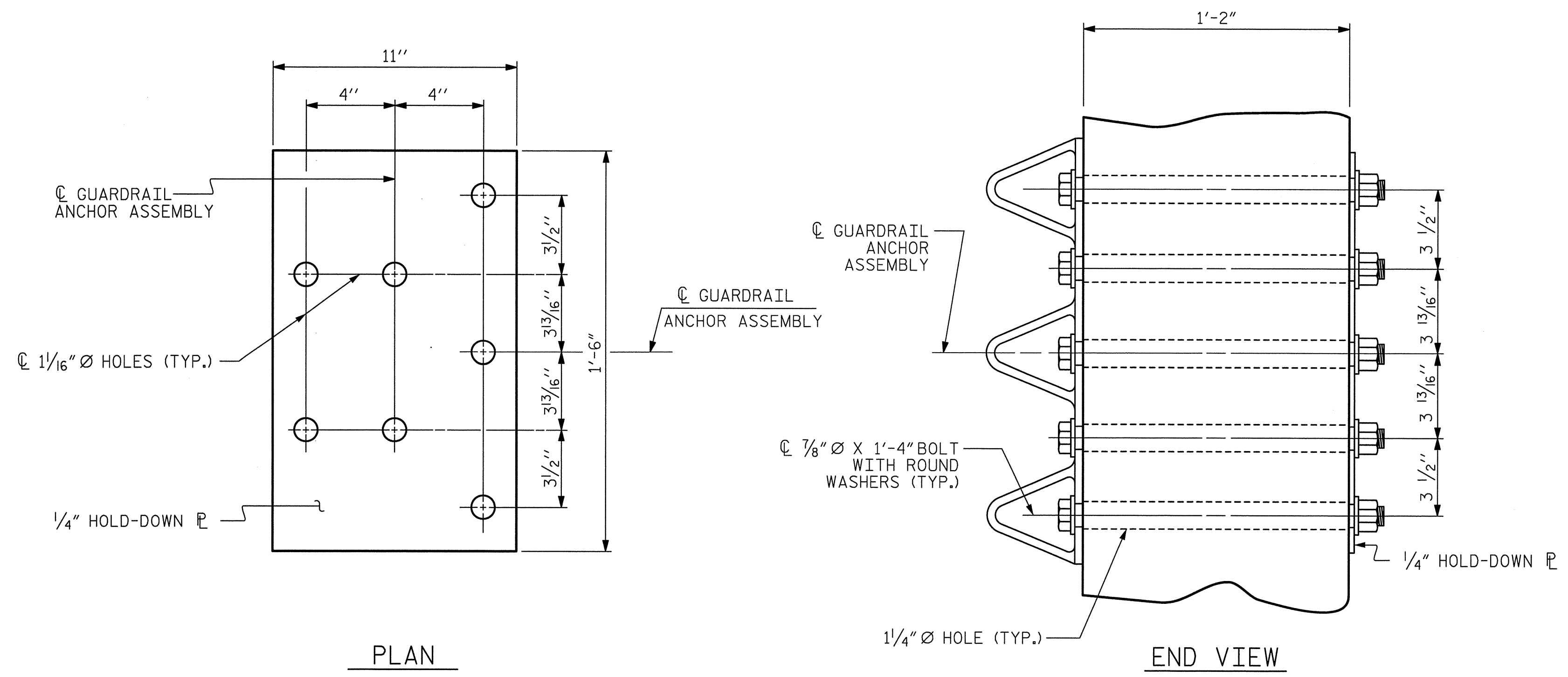
SHEET 4 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 CONCRETE PARAPET
 AND END POST
 DETAILS

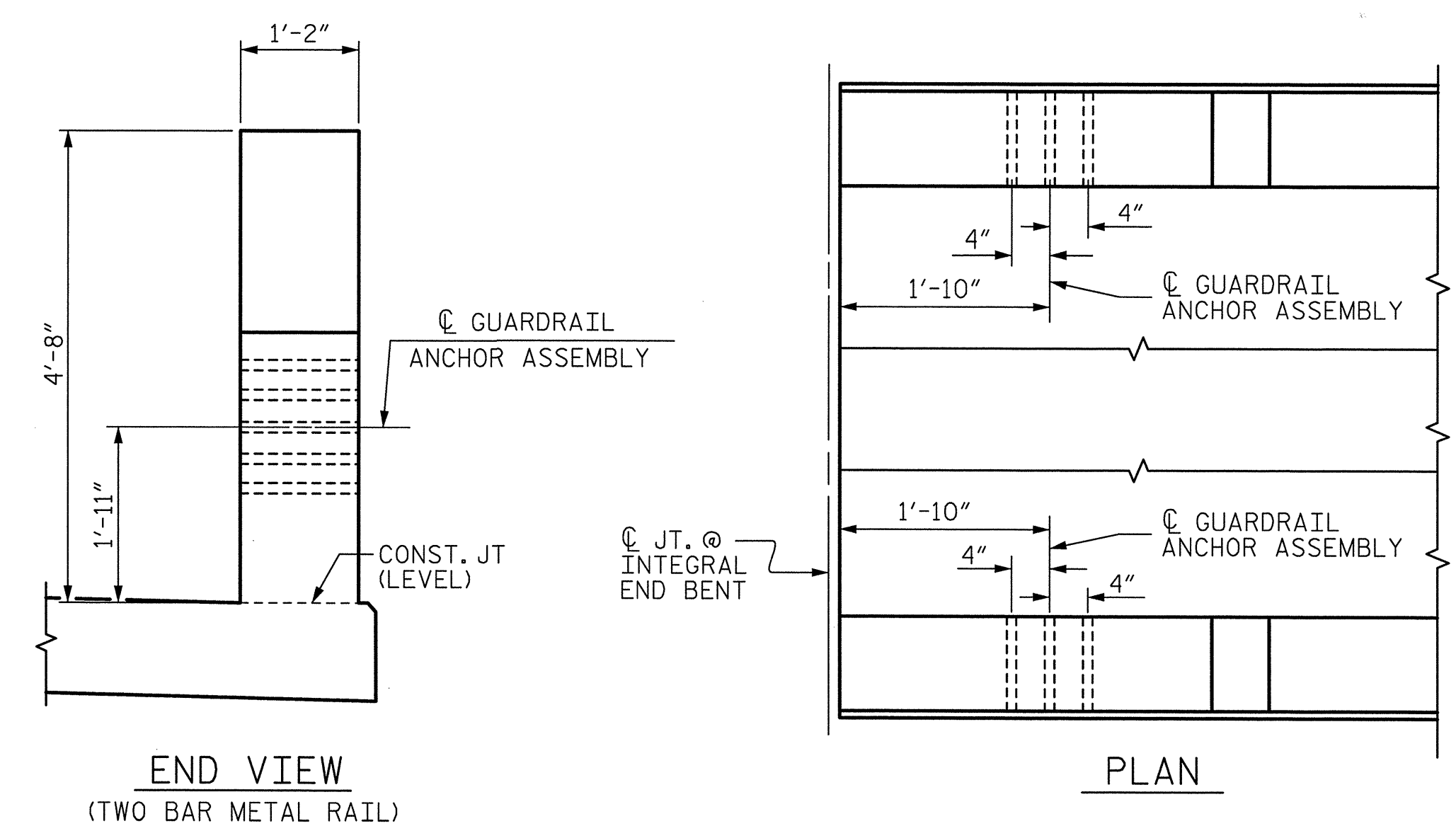
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-26
2			4			TOTAL SHEETS 48



DRAWN BY: K.H. COMPTON DATE: 10/23/12
 CHECKED BY: R.L. WHITCHER DATE: 10/24/12



GUARDRAIL ANCHOR ASSEMBLY DETAILS



LOCATION OF GUARDRAIL ANCHOR AT END POST

NOTES

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

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

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

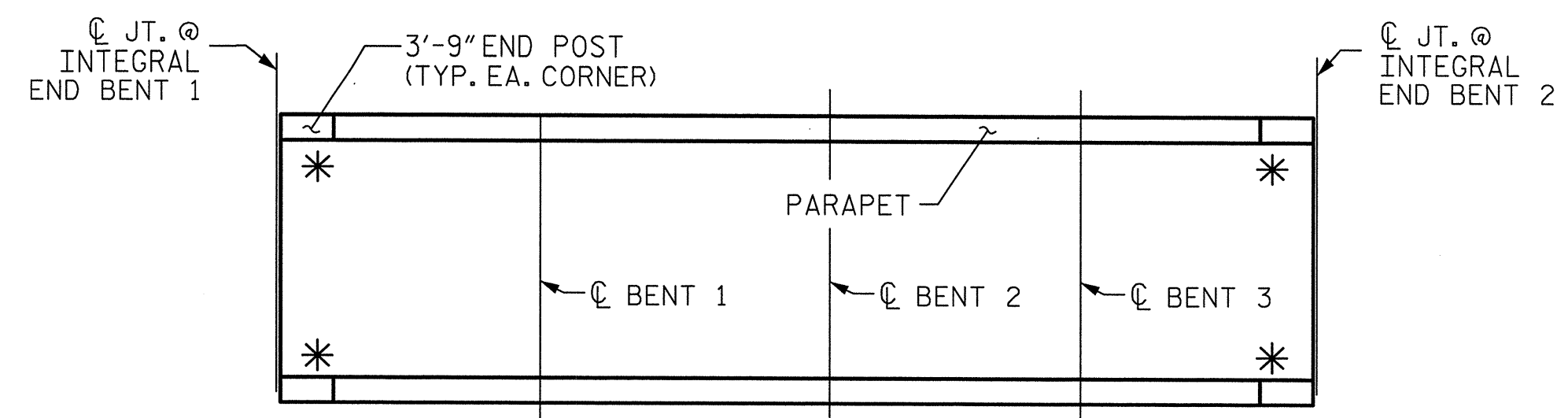
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

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

THE 1/4" \varnothing 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.



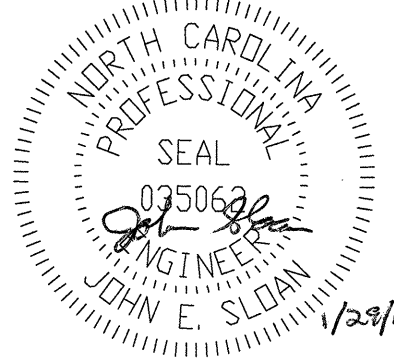
SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT

PROJECT NO. P-5208B
CABARRUS COUNTY
 STATION: 25+41.22 -L-

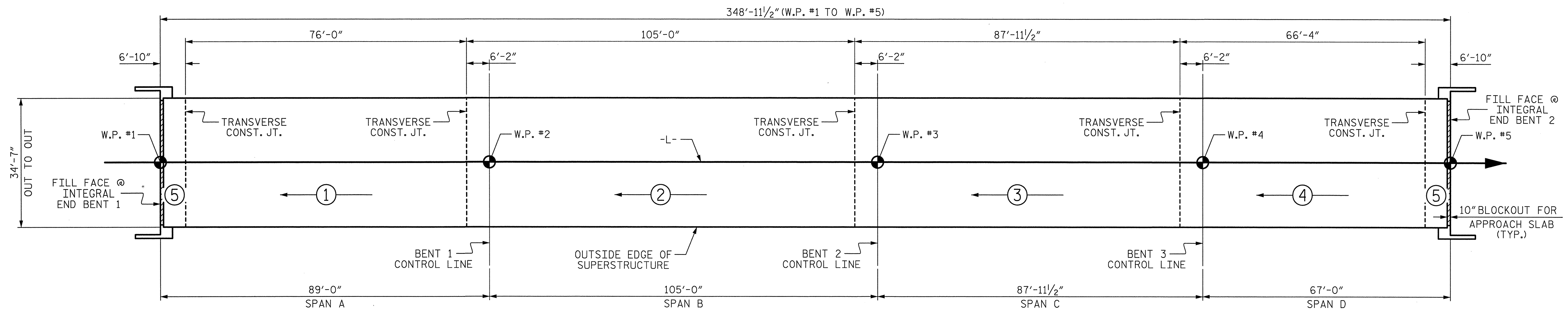
SHEET 5 OF 5

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



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			48

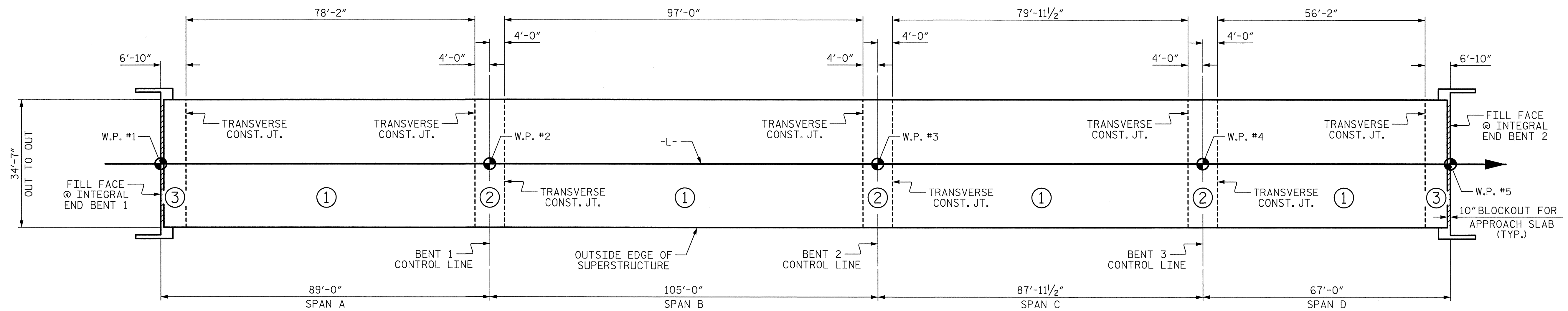
ASSEMBLED BY : K.H. COMPTON	DATE : 10/22/12
CHECKED BY : R.L. WHITCHER	DATE : 10/24/12
DRAWN BY : MAA 5/10	ADDED 5/6/10
CHECKED BY : GM 5/10	REV. 10/1/11 MAA/GM
	REV. 12/5/11 MAA/GM



POURING SEQUENCE

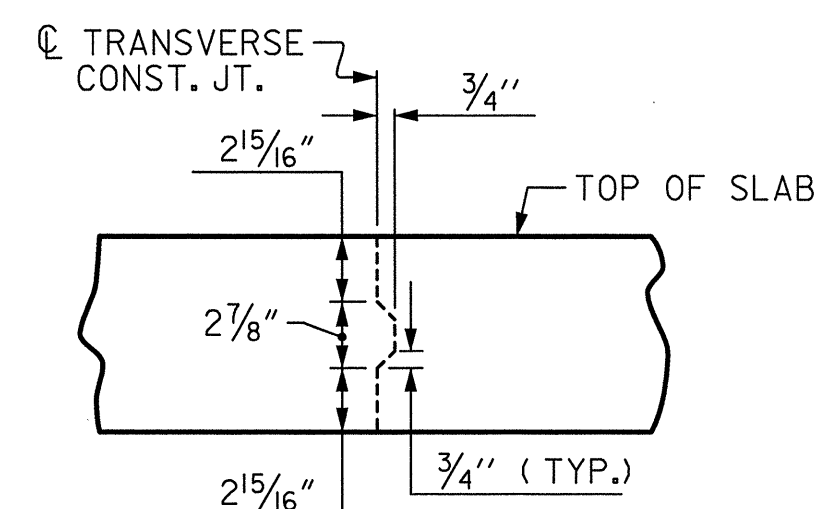
← ⑤ INDICATES POUR NUMBER AND DIRECTION OF POUR

NOTE: CONCRETE IN THE UPPER PORTION OF THE WINGS SHALL BE INCLUDED WITH THE SUPERSTRUCTURE POUR.



OPTIONAL DECK POURING DETAIL

POUR ② SHALL NOT BE STARTED UNTIL BOTH ADJACENT ① POURS REACH A MINIMUM OF 3000 PSI



TRANSVERSE CONSTRUCTION JOINT DETAIL

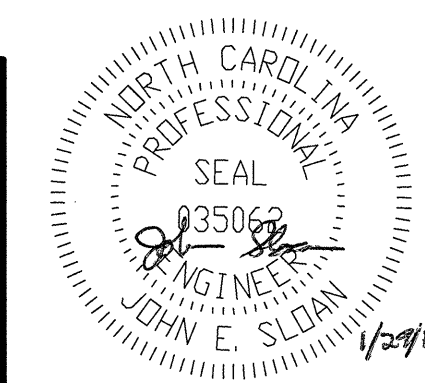
NOTE: REINFORCING STEEL IN SLAB NOT SHOWN. LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THRU JOINT

PROJECT NO. P-5208B
CABARRUS COUNTY
 STATION: 28+41.22 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 CONCRETE DECK
 POUR DETAILS

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

TOTAL SHEETS: 48

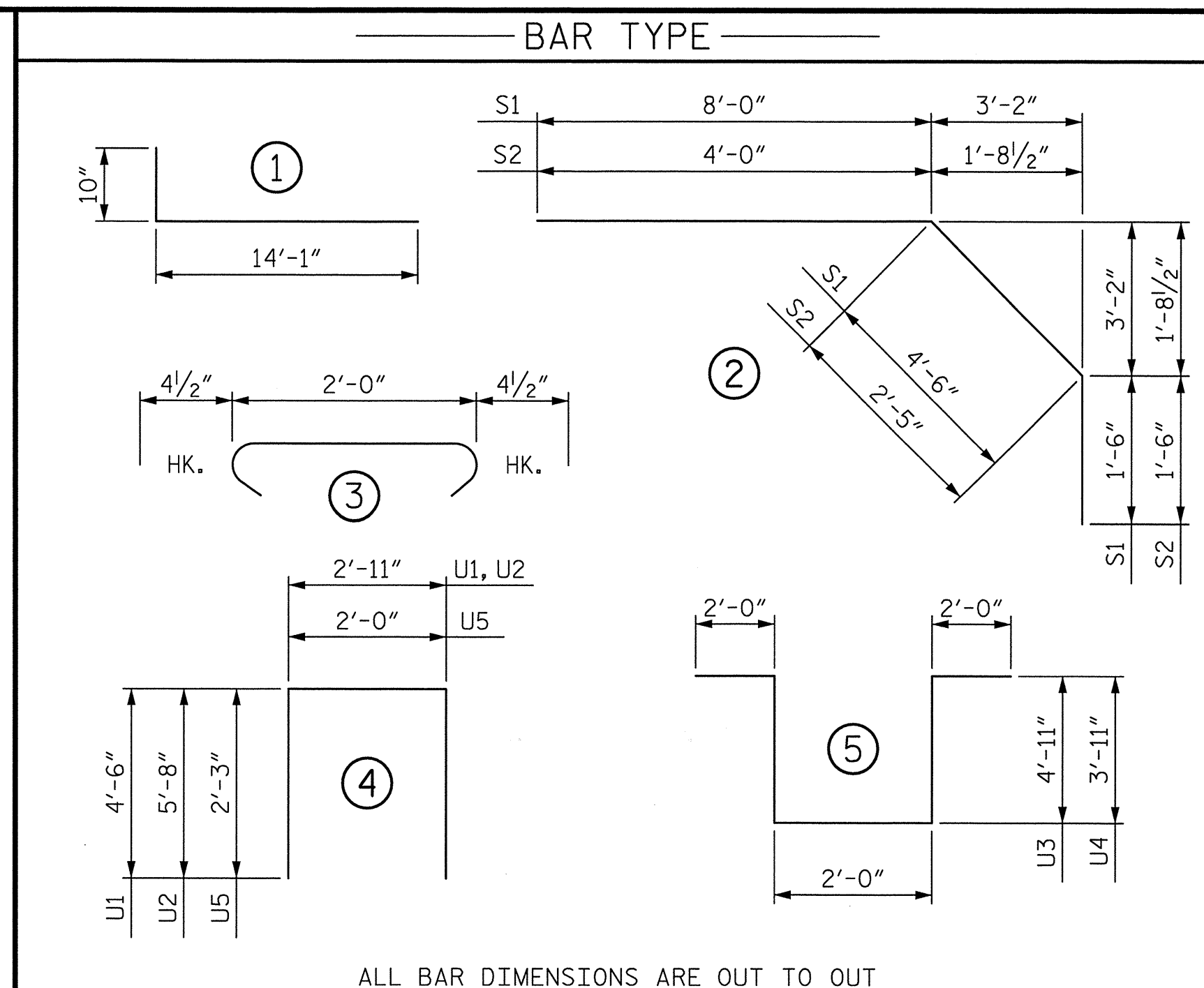


DRAWN BY: M. K. TOM DATE: 9/28/12
 CHECKED BY: K. H. COMPTON DATE: 10/25/12

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

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

GROOVING BRIDGE FLOORS	
APPROACH SLABS	1,412 SQ. FT.
BRIDGE DECK	10,071 SQ. FT.
TOTAL	11,483 SQ. FT.



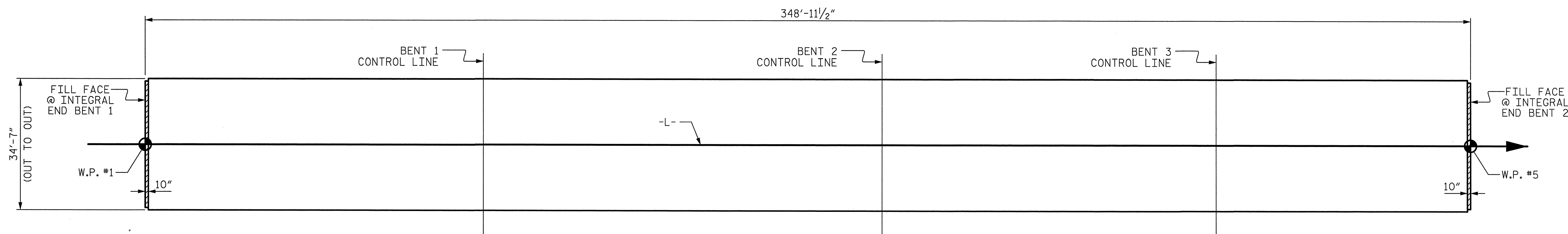
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	694	5	STR.	34'-3"	24792	K6	8	4	STR.	5'-0"	27	
A2	694	5	STR.	34'-3"	24792	K7	8	4	STR.	5'-6"	29	
						K8	4	4	STR.	4'-9"	13	
*B1	47	7	STR.	17'-10"	1713	K9	36	4	STR.	7'-5"	178	
*B2	48	4	STR.	22'-3"	713	K10	36	4	STR.	8'-5"	202	
B3	287	5	STR.	51'-5"	15391	K11	18	4	STR.	5'-9"	69	
*B4	72	7	STR.	26'-3"	3863	K12	15	4	STR.	28'-7"	286	
*B5	23	7	STR.	29'-2"	1371							
*B6	48	4	STR.	19'-0"	609	*S1	56	4	2	14'-0"	524	
*B7	72	7	STR.	26'-2"	3851	*S2	56	4	2	7'-11"	296	
*B8	23	7	STR.	29'-0"	1363	S3	288	4	3	2'-9"	529	
*B9	24	4	STR.	29'-2"	468							
*B10	24	7	STR.	56'-7"	2776	U1	50	4	4	11'-11"	398	
*B11	23	7	STR.	23'-4"	1097	U2	16	4	4	13'-9"	147	
*B12	48	4	STR.	16'-9"	537	U3	45	4	5	15'-10"	476	
*B13	47	7	STR.	13'-4"	1281	U4	18	4	5	13'-10"	166	
						U5	18	4	4	6'-6"	78	
H1	88	5	1	14'-11"	1369							
K1	20	4	STR.	21'-5"	286							
K2	12	4	STR.	7'-5"	59							
K3	12	4	STR.	8'-3"	66							
K4	6	4	STR.	6'-11"	28							
K5	4	4	STR.	2'-8"	7							
						REINFORCING STEEL						44,596 LBS.
						*EPOXY COATED REINFORCING STEEL						45,254 LBS.

SUPERSTRUCTURE BILL OF MATERIAL			
	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
POUR #1	85.7	---	---
POUR #2	128.5	---	---
POUR #3	109.3	---	---
POUR #4	84.9	---	---
POUR #5	64.9	---	---
TOTAL **	473.3	44,596	45,254

**QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED



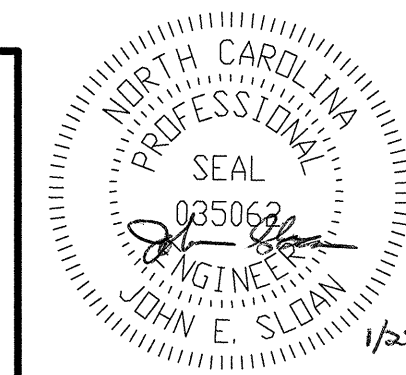
LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB
(SQ. FT. = 12,011)

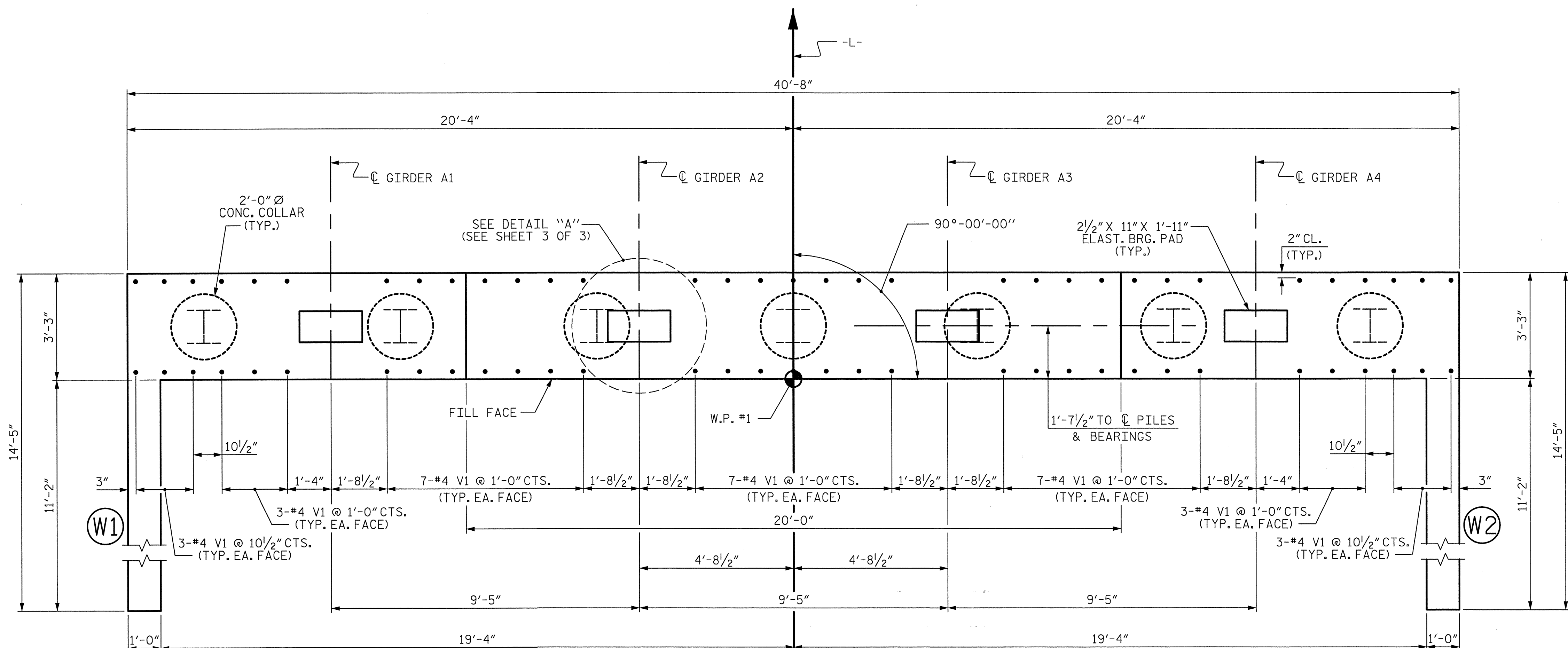
PROJECT NO. P-5208B
CABARRUS COUNTY
STATION: 25+41.22 -L-

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

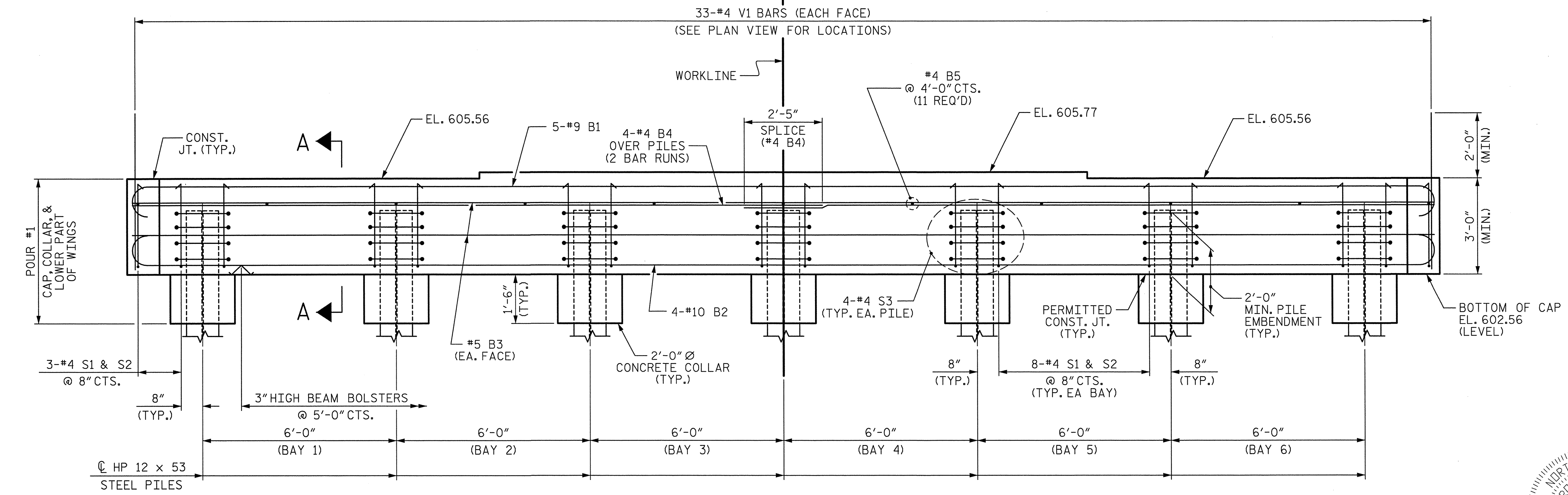
REVISIONS				SHEET NO.		
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			48

DRAWN BY : M. K. TOM DATE : 10/16/12
CHECKED BY : R. L. WHITCHER DATE : 10/30/12





PLAN



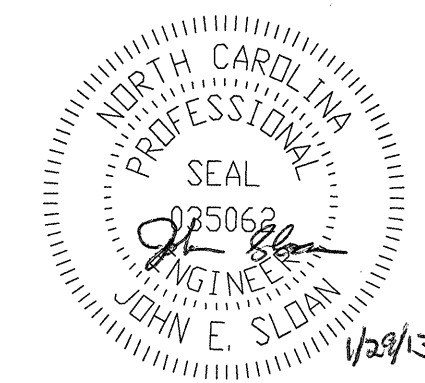
ELEVATION

NOTES:
 THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR THE REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.
 FOR SECTION A-A, SEE SHEET 3 OF 3.
 #4 V1 BARS MAY BE SHIFTED SLIGHTLY TO AVOID STIRRUPS IN CAP.

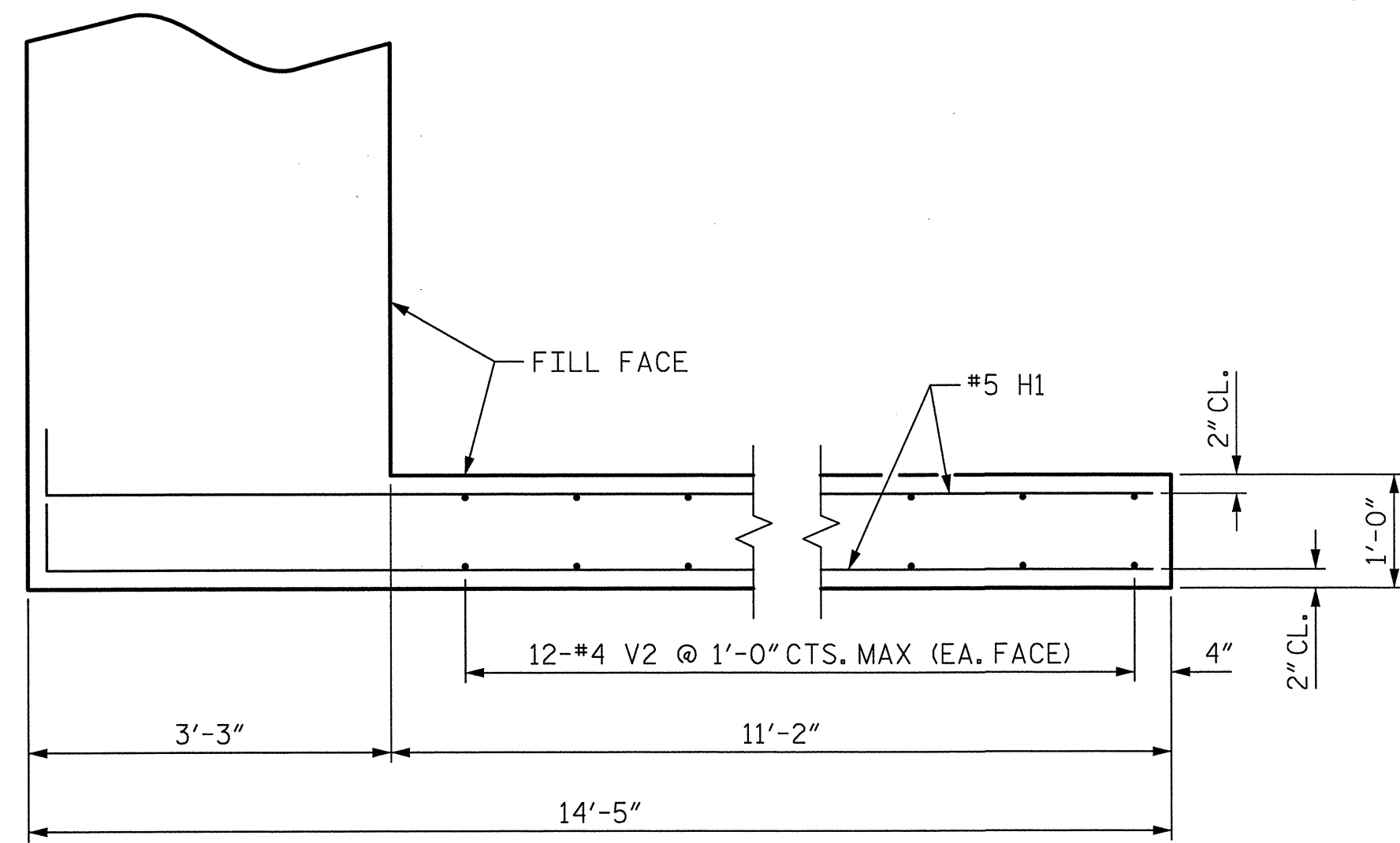


PROJECT NO. P-5208B
CABARRUS COUNTY
 STATION: 25+41.22 -L-
 SHEET 1 OF 3

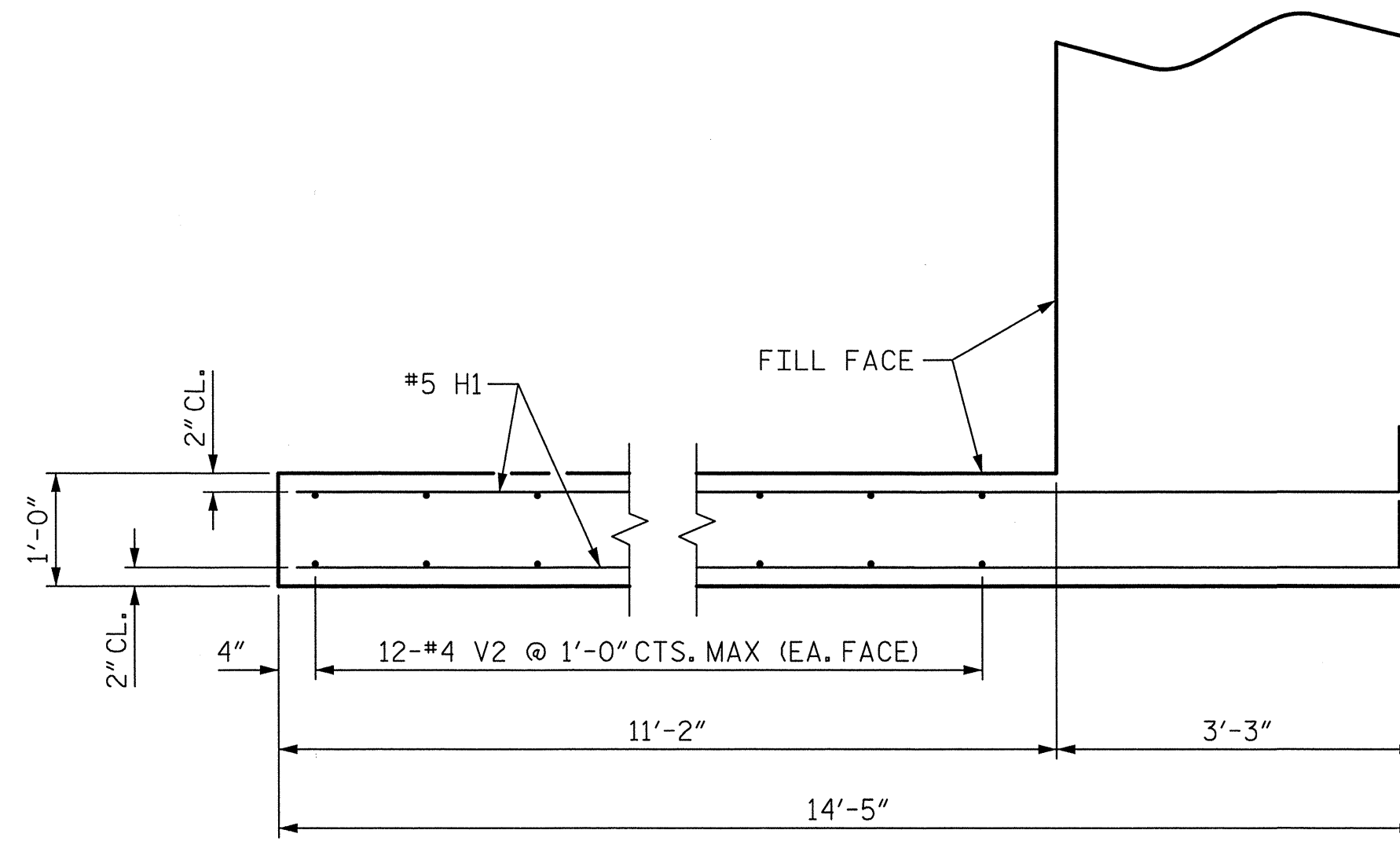
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH				SHEET NO. S-30 TOTAL SHEETS 48	
SUBSTRUCTURE INTEGRAL END BENT 1					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		



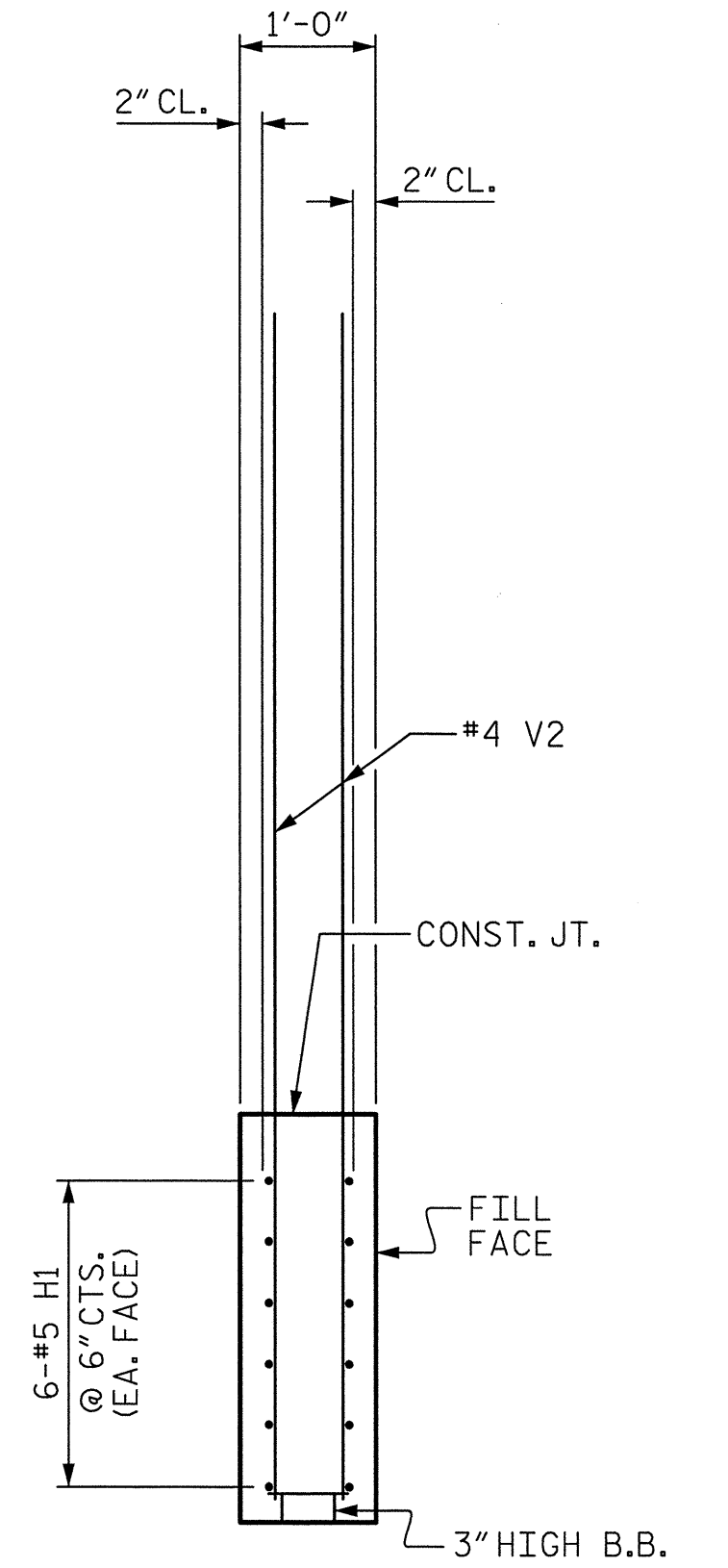
DRAWN BY: M. K. TOM DATE: 9/25/12
 CHECKED BY: K. H. COMPTON DATE: 10/10/12



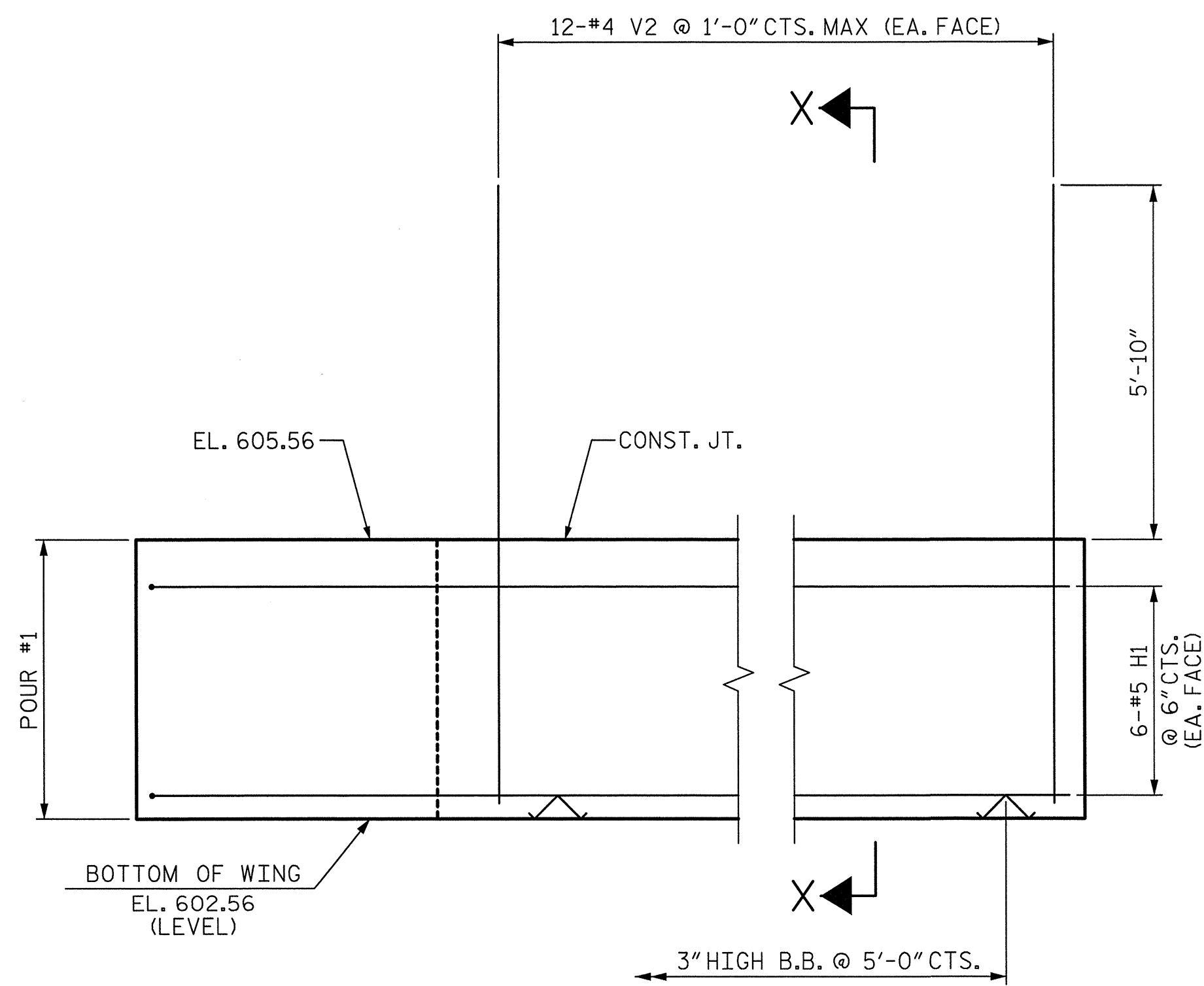
PLAN OF WING (W1)



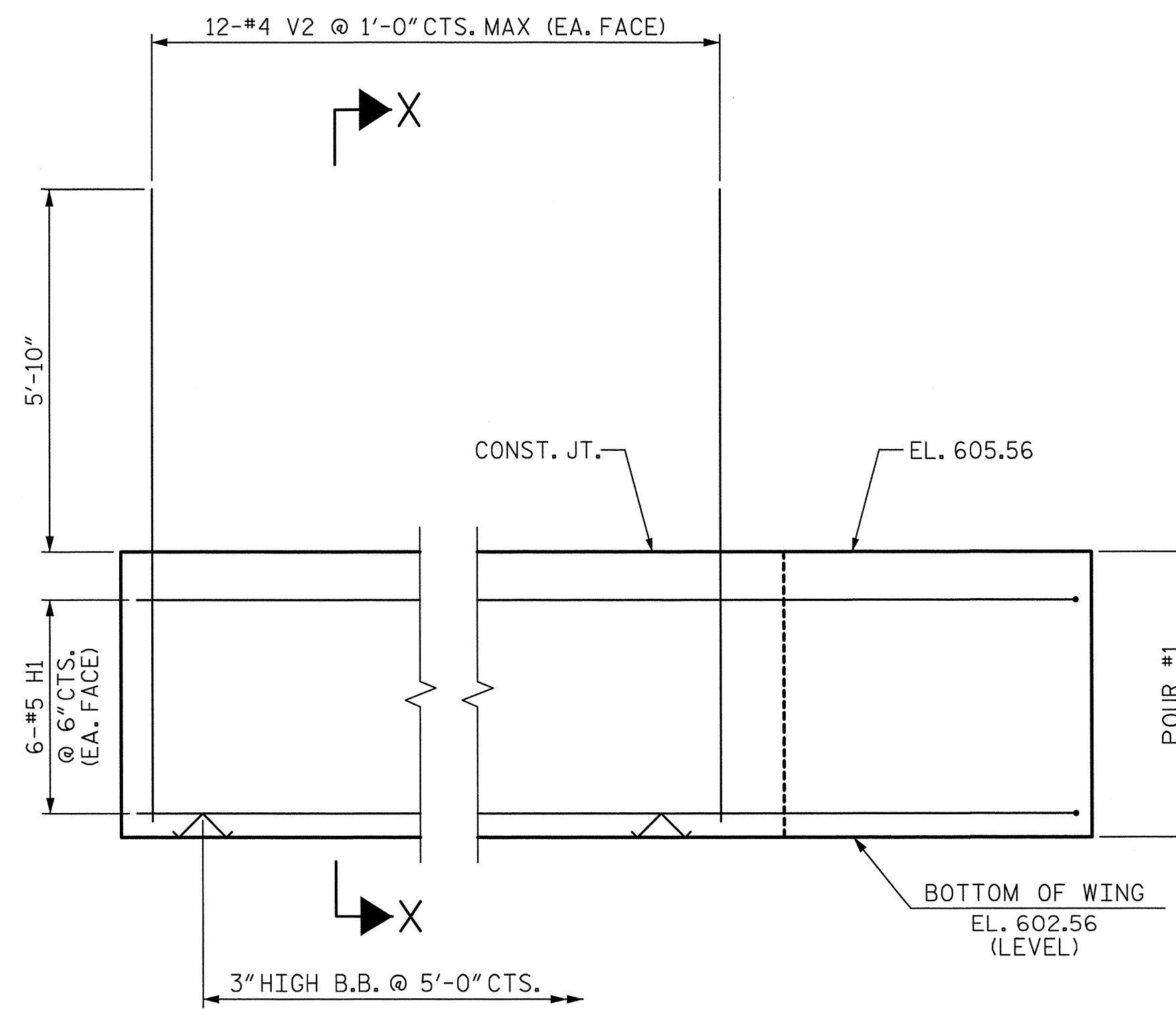
PLAN OF WING (W2)



SECTION X-X



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)



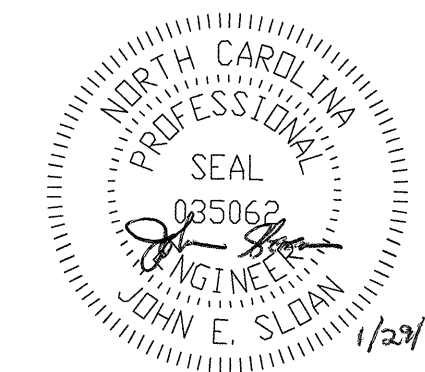
PROJECT NO. P-5208B
CABARRUS COUNTY
STATION: 25+41.22 -L-

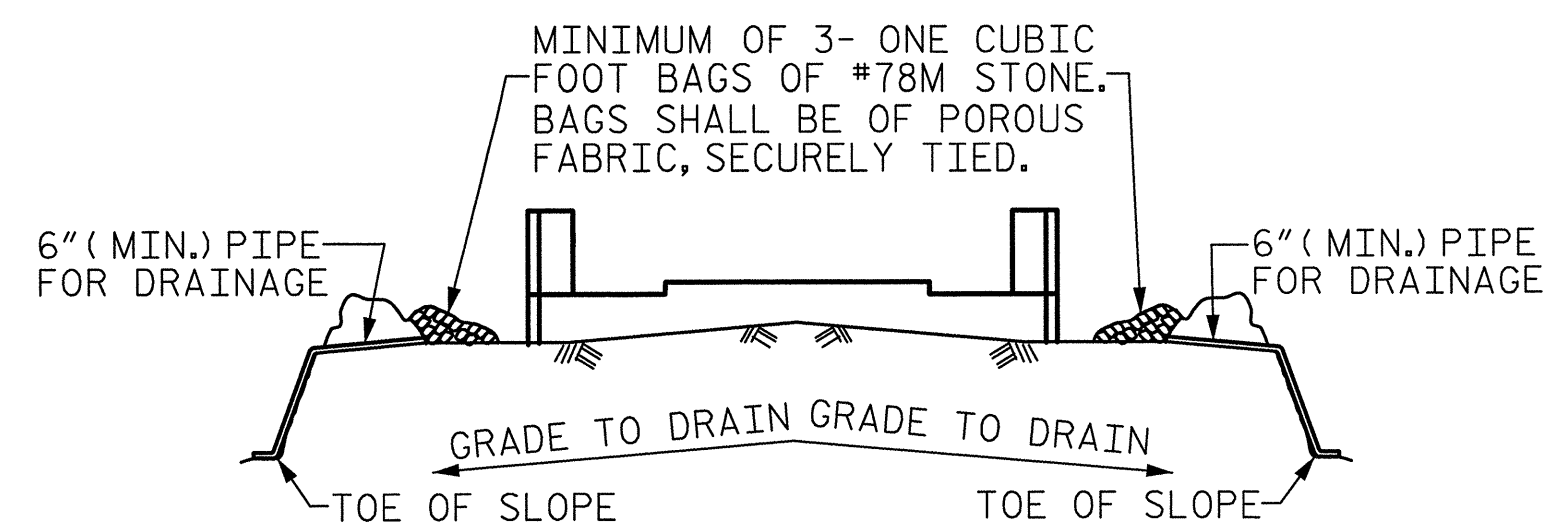
SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
INTEGRAL
END BENT 1

REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-31
					TOTAL SHEETS
					48

DRAWN BY : M. K. TOM DATE : 9/25/12
CHECKED BY : K. H. COMPTON DATE : 10/10/12



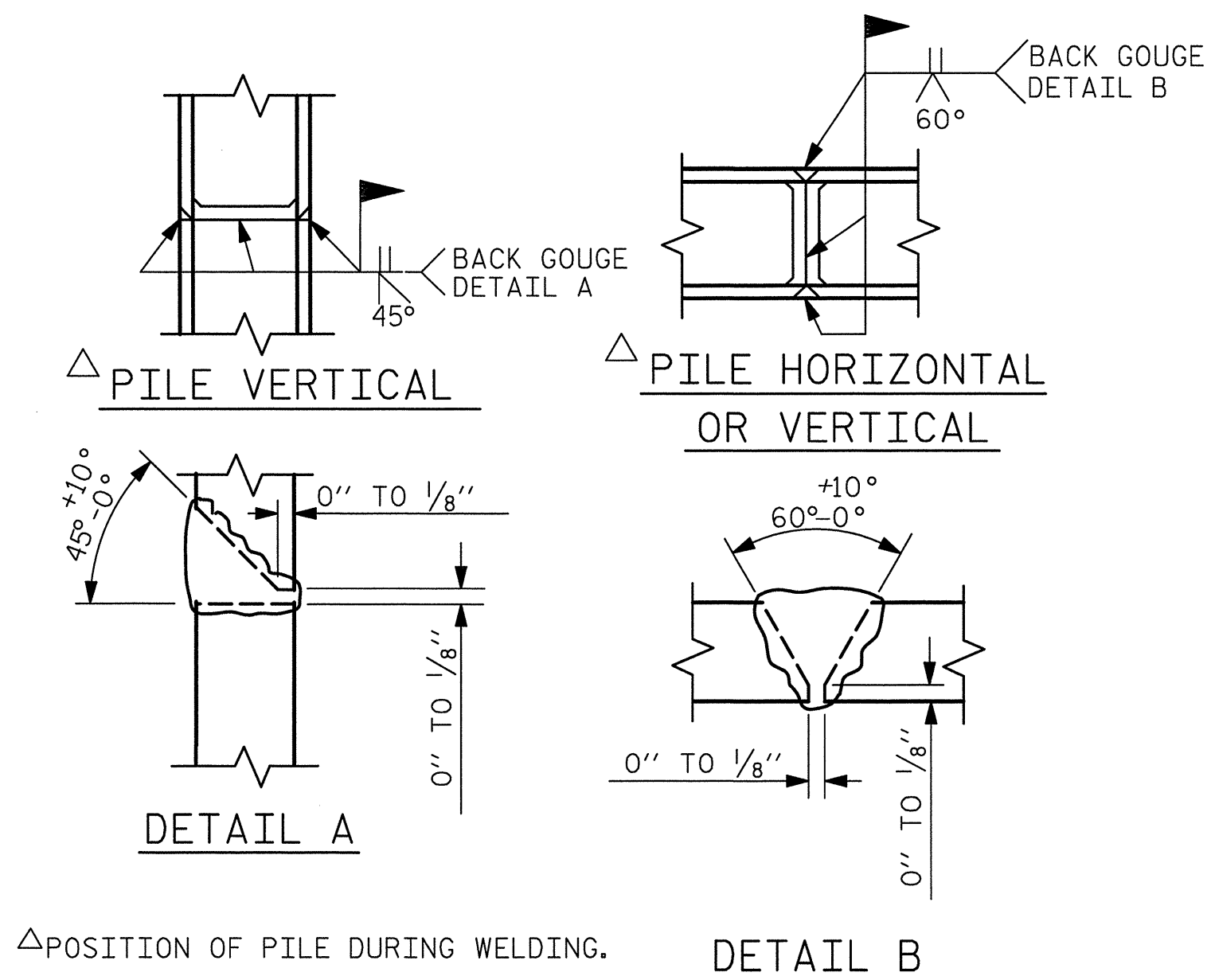


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

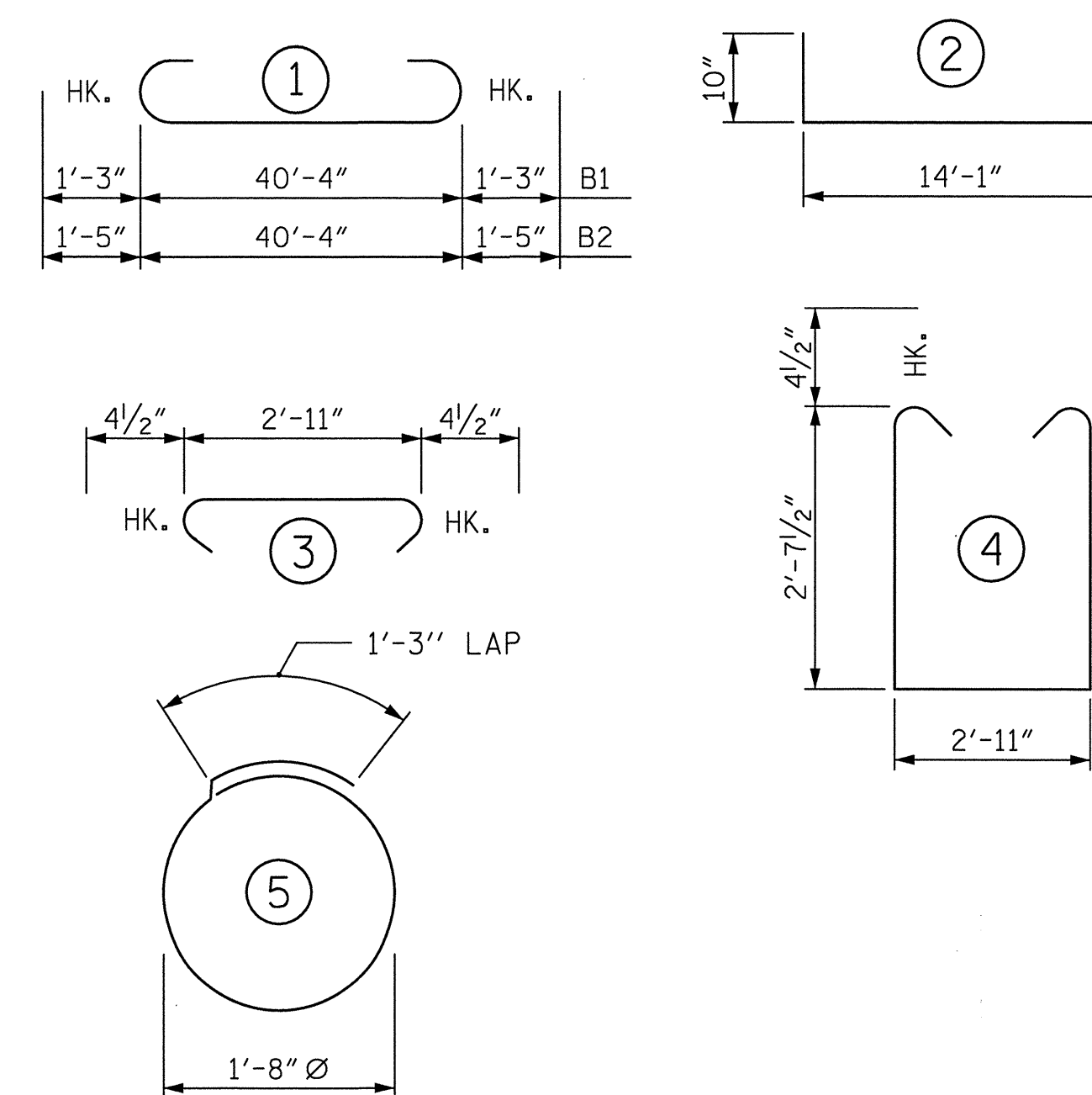
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



PILE SPLICE DETAILS

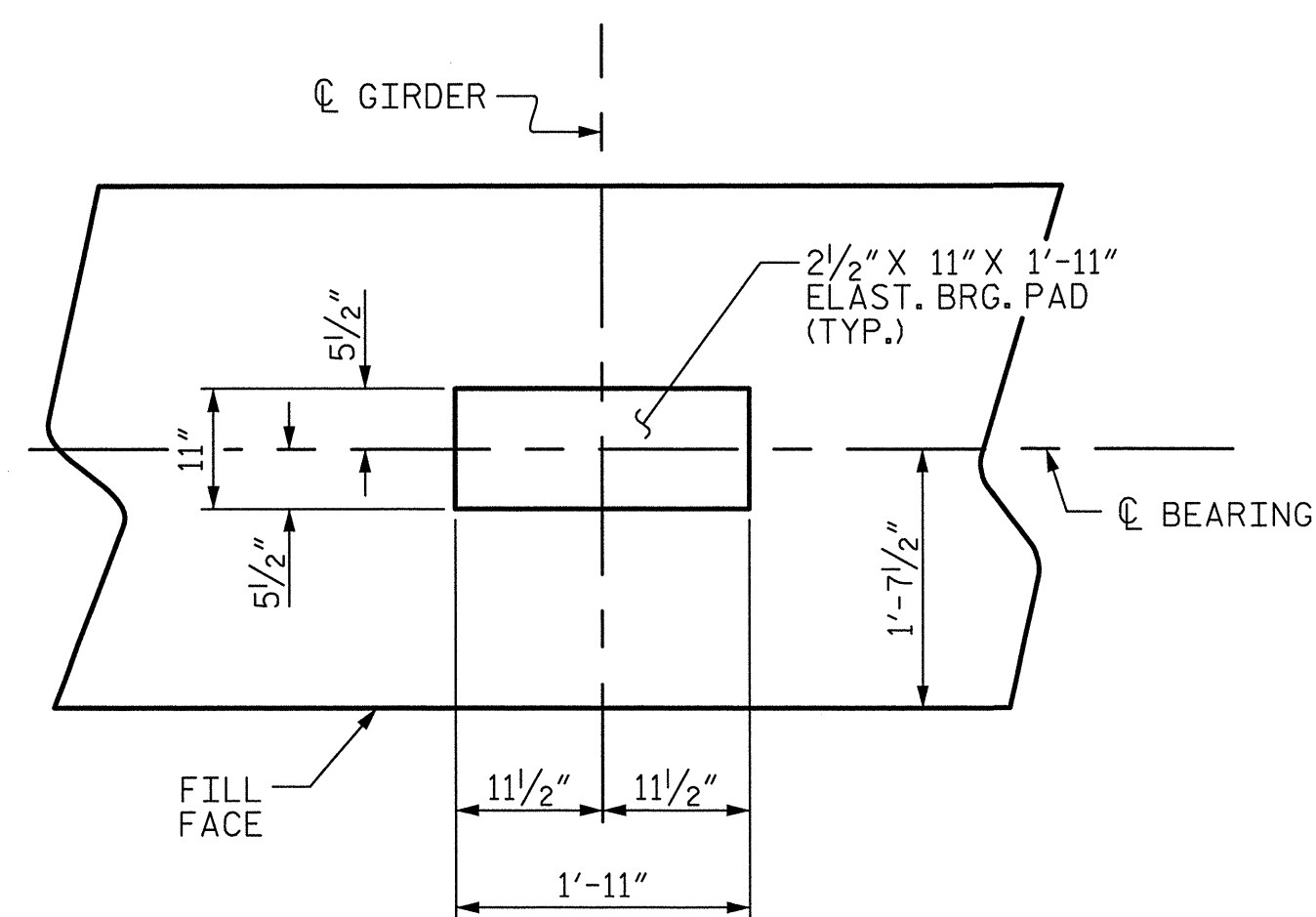
BAR TYPES



BILL OF MATERIAL

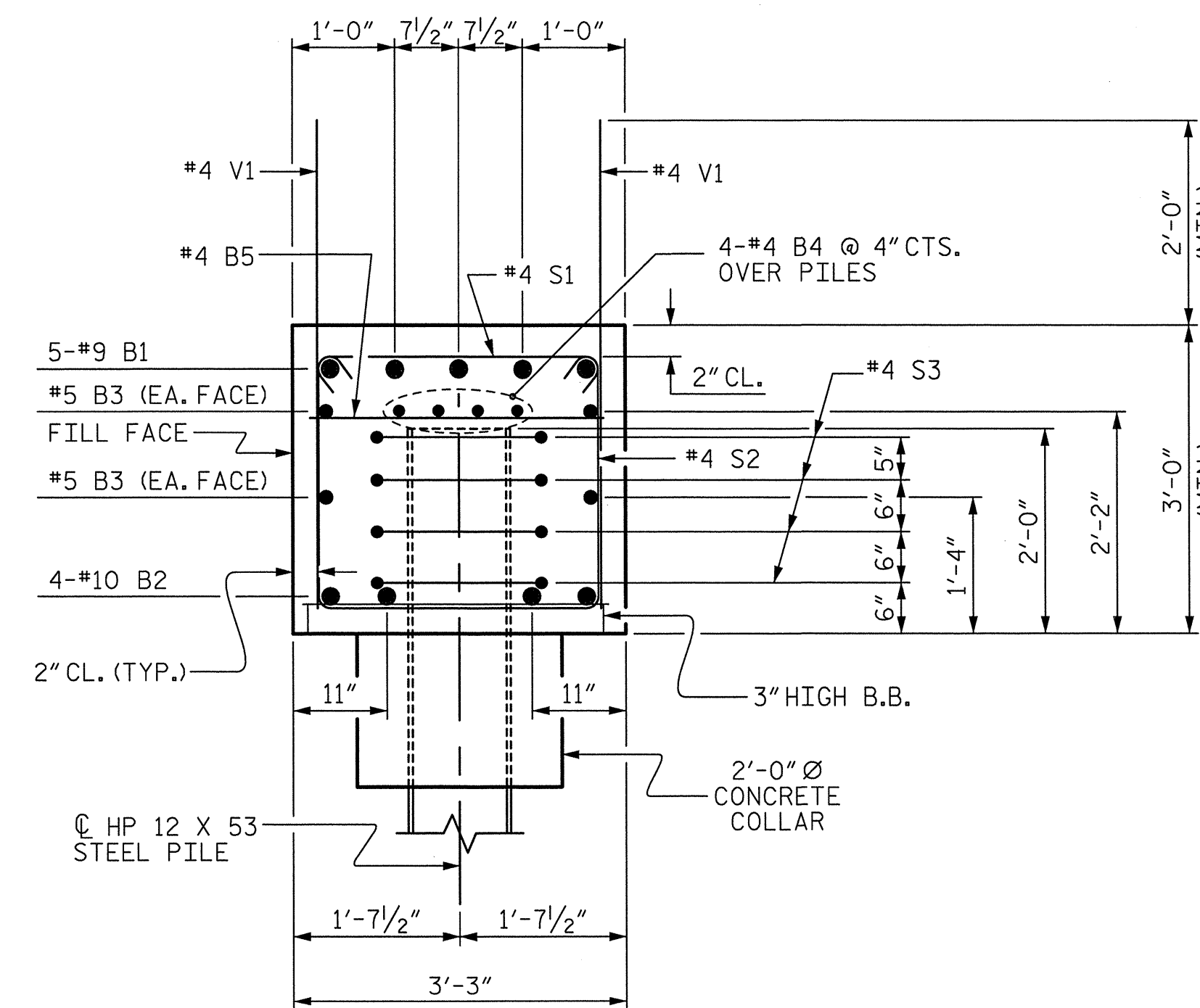
END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	9	1	42'-10"	728
B2	4	10	1	43'-2"	743
B3	4	5	STR	40'-4"	168
B4	8	4	STR	21'-4"	114
B5	11	4	STR	2'-11"	21
H1	24	5	2	14'-11"	373
S1	54	4	3	3'-8"	132
S2	54	4	4	8'-11"	322
S3	28	4	5	6'-6"	122
V1	66	4	STR	5'-2"	228
V2	48	4	STR	8'-8"	278
REINFORCING STEEL					3229 LBS.
CLASS A CONCRETE BREAKDOWN					
POUR #1 CAP, COLLAR, & LOWER PART OF WINGS					20.0 C.Y.
TOTAL CLASS A CONCRETE					20.0 C.Y.
HP 12 X 53 STEEL PILES					
No: 7					LIN. FT. = 350
STEEL PILE POINTS					No: 7



DETAIL "A"

(TYP. EA. GDR.)



SECTION A-A

PROJECT NO. P-5208B
CABARRUS COUNTY
 STATION: 25+41.22 -L-

SHEET 3 OF 3

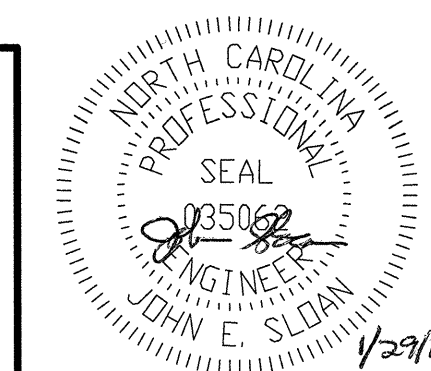
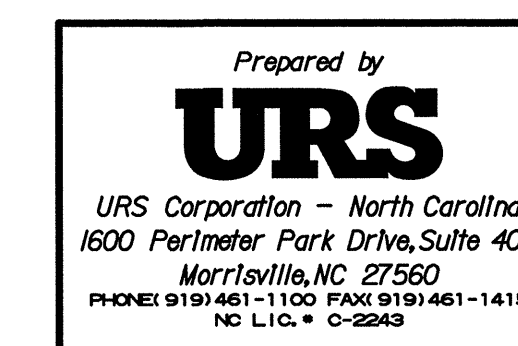
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

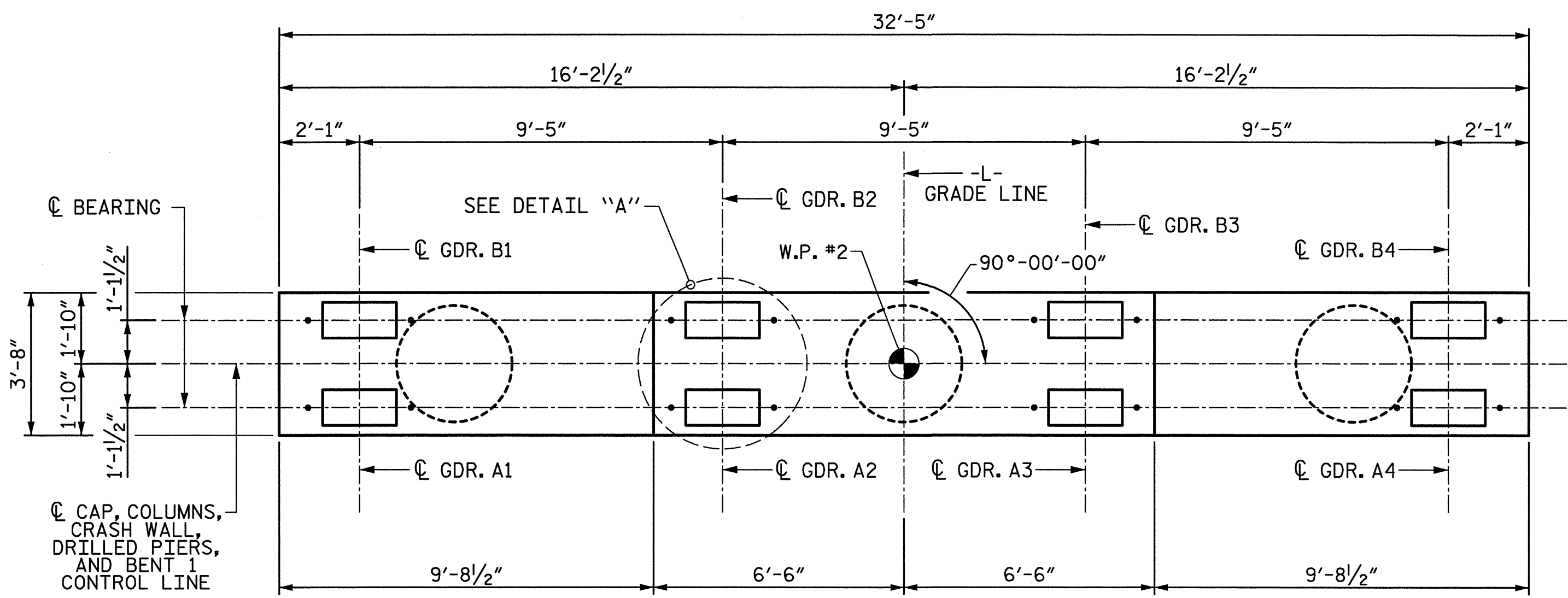
SUBSTRUCTURE
 INTEGRAL
 END BENT 1

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S-32
2			4			TOTAL SHEETS 48

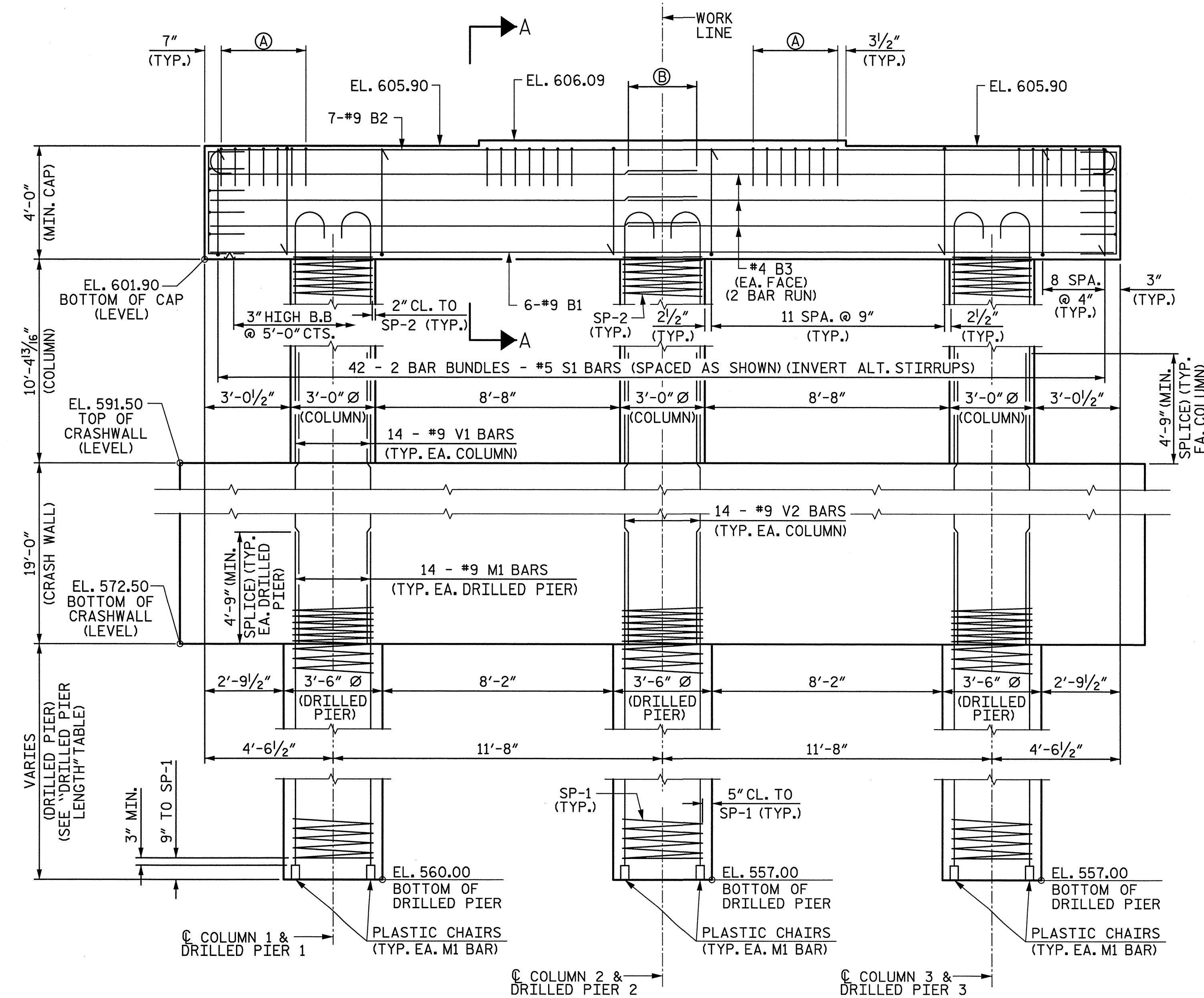
DRAWN BY : M. K. TOM DATE : 9/25/12
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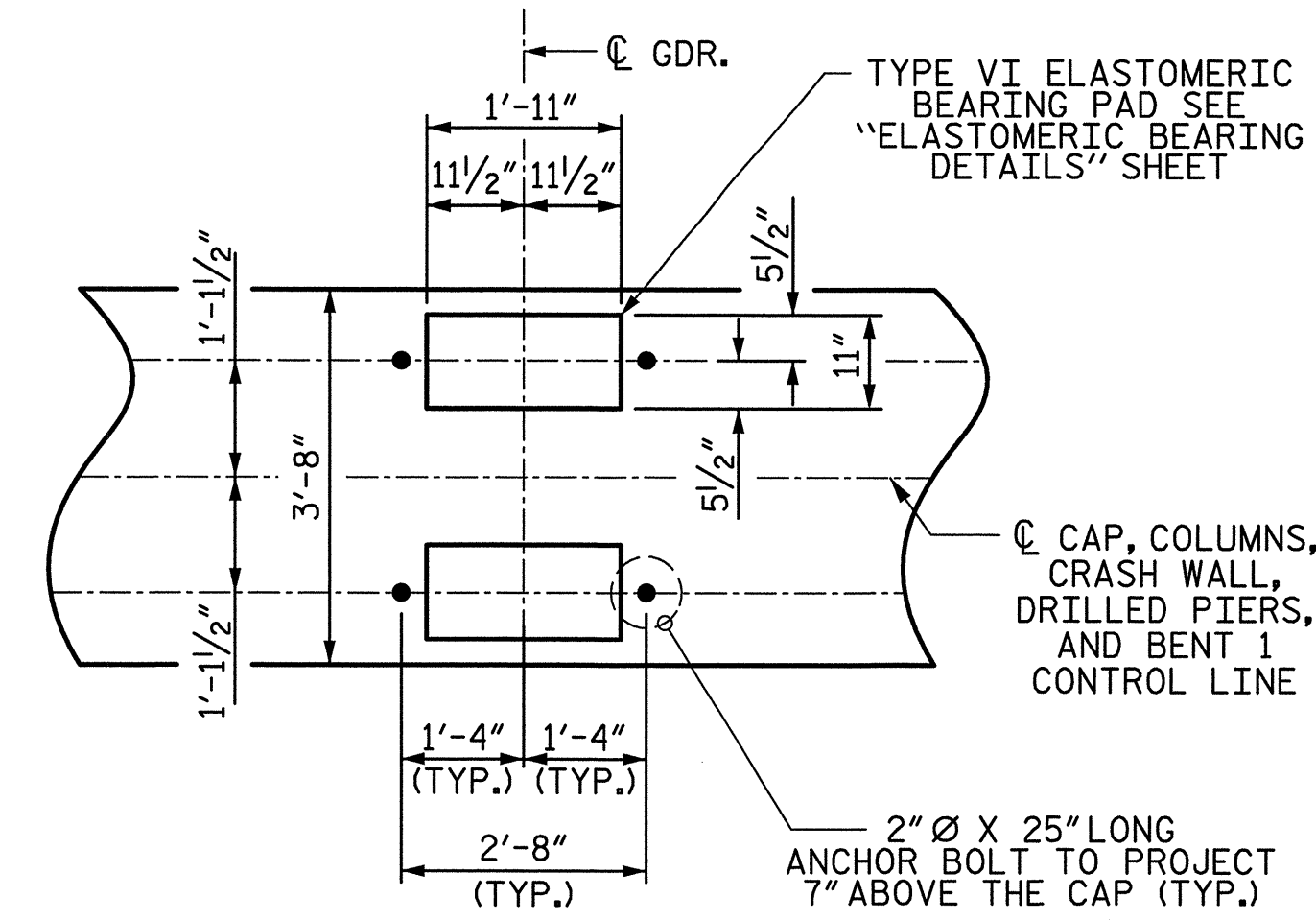
PLAN

CRASH WALL NOT SHOWN FOR CLARITY



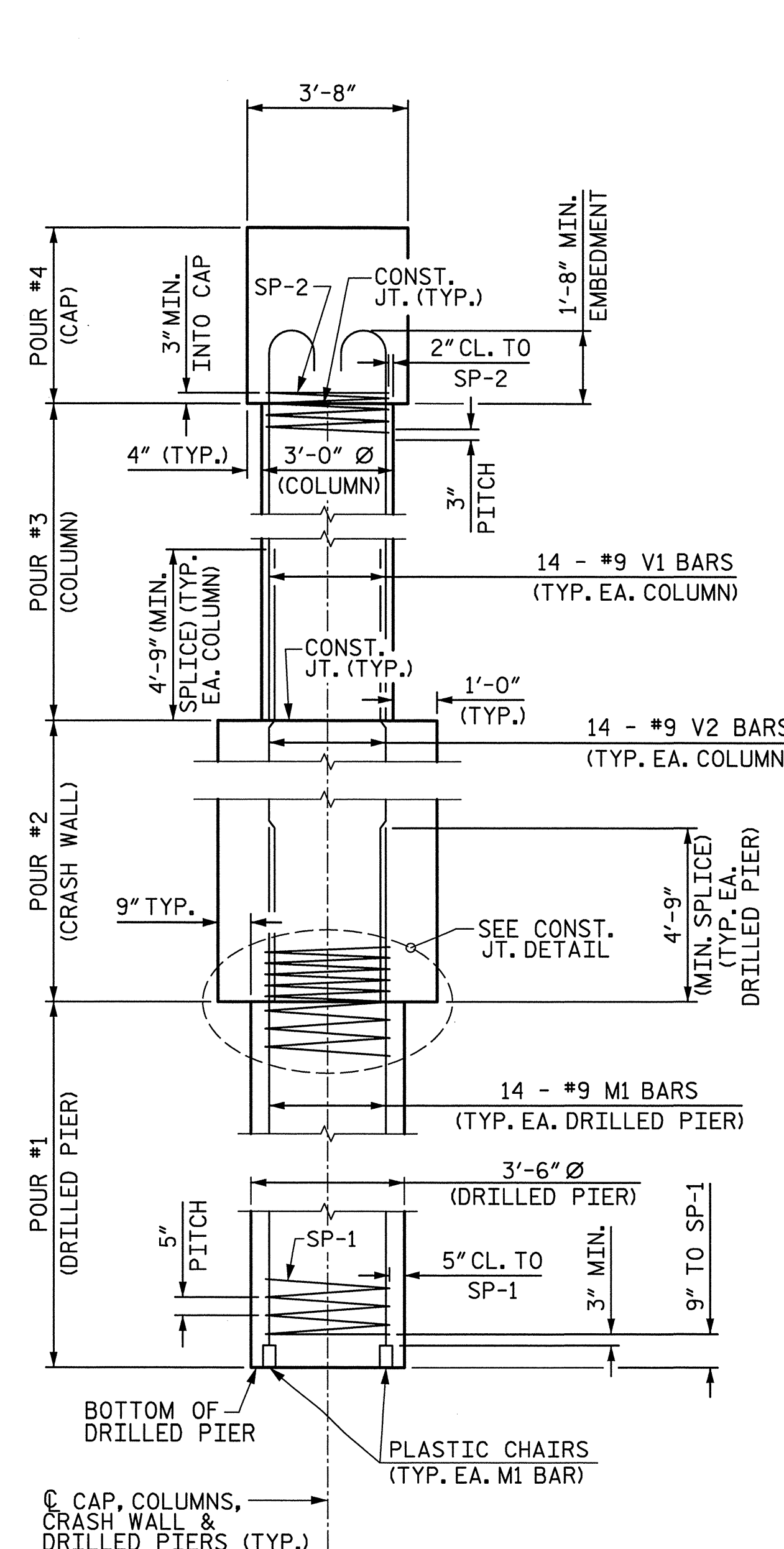
ELEVATION

CRASHWALL STEEL DETAILS NOT SHOWN FOR CLARITY



DETAIL A

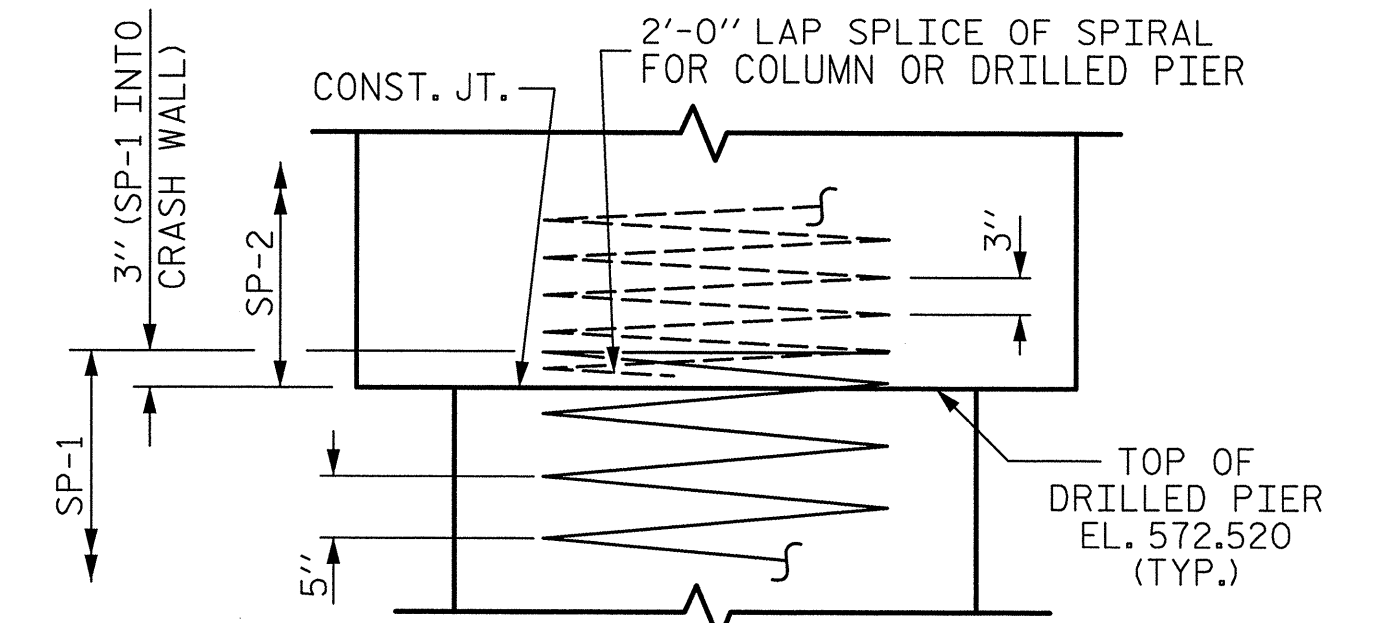
(TYP. EACH GIRDER)



END ELEVATION

NOTES:

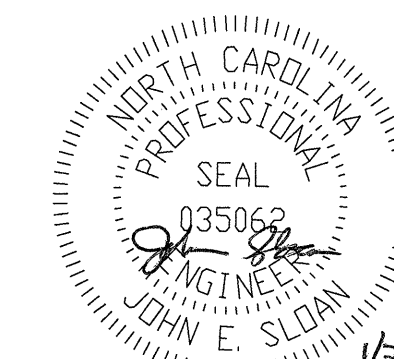
- FOR "SECTION A-A", SEE SHEET 3 OF 3.
- FOR REINFORCING BILL OF MATERIAL, SEE SHEET 3 OF 3.
- FOR "END VIEW", SEE SHEET 3 OF 3.
- FOR CRASH WALL DETAILS, SEE SHEET 2 OF 3.
- STIRRUPS & U1 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS AND COLUMN STEEL.
- HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
- ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".
- FOR ADDITIONAL NOTES, SEE "GENERAL DRAWING", SHEET 2 OF 3.



CONSTRUCTION JOINT DETAIL

DRILLED PIER LENGTH	
DRILLED PIER	LENGTH
1	12'-6"
2	15'-6"
3	15'-6"

- (A) 7-#4 U1 @ 6" CTS. (TYP. ALL SEATS)
- (B) 2'-5" - #4 B3 (MIN. SPLICE)



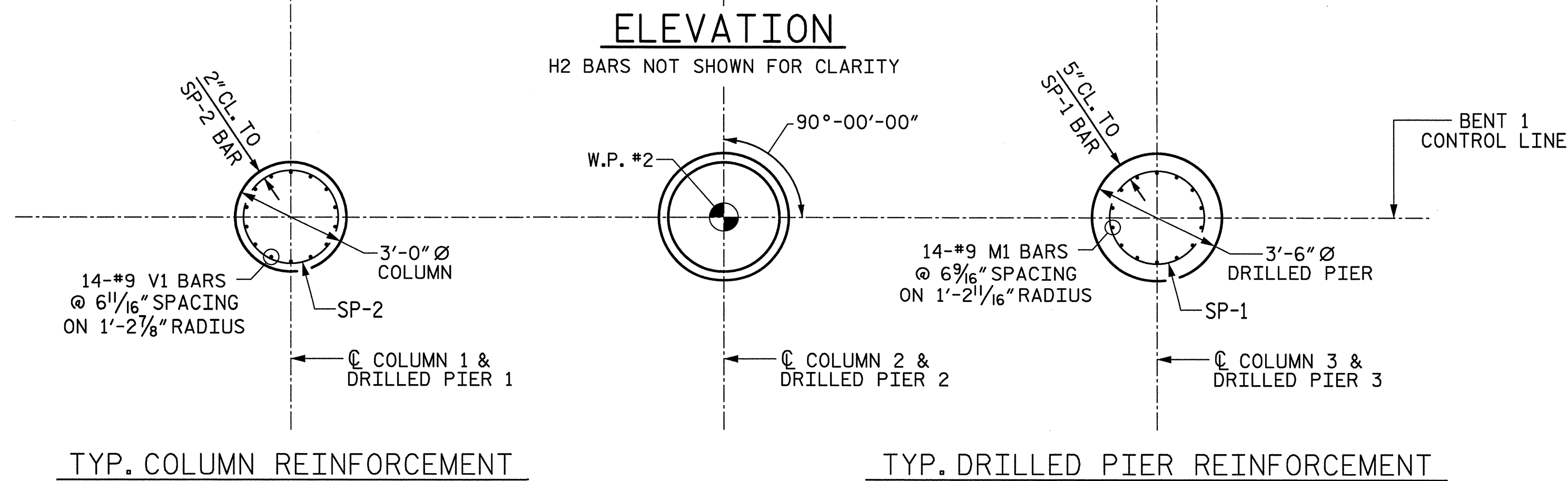
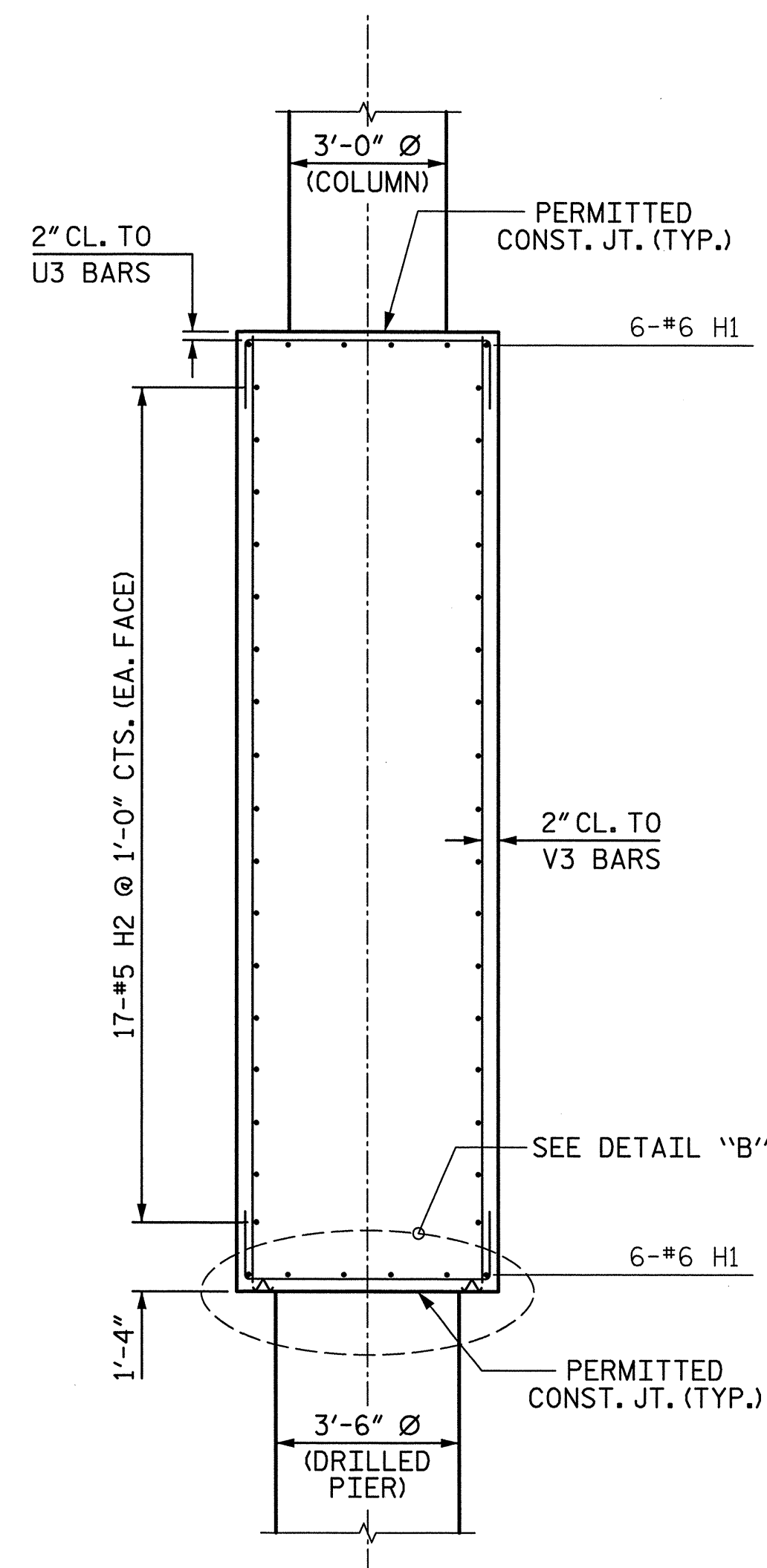
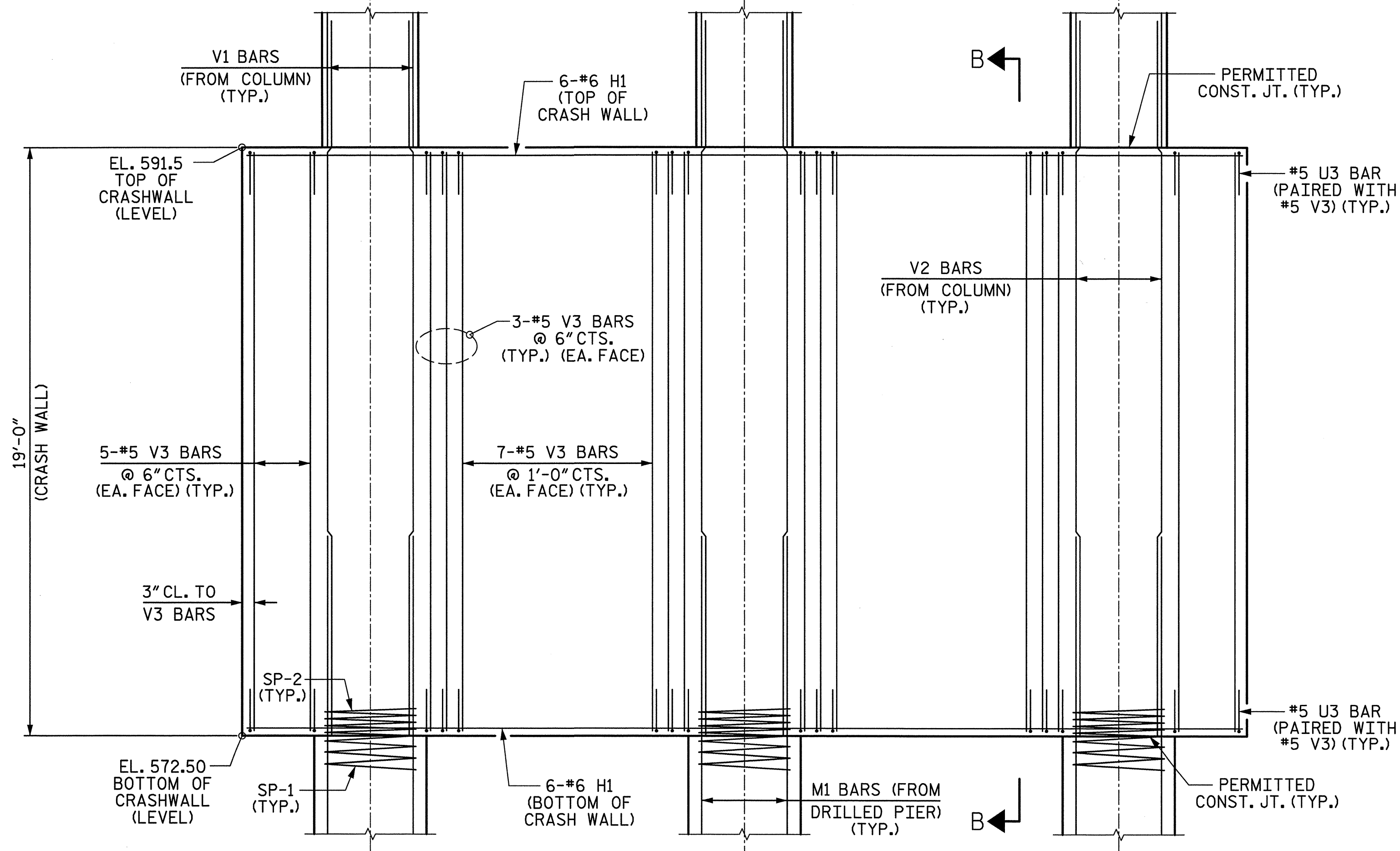
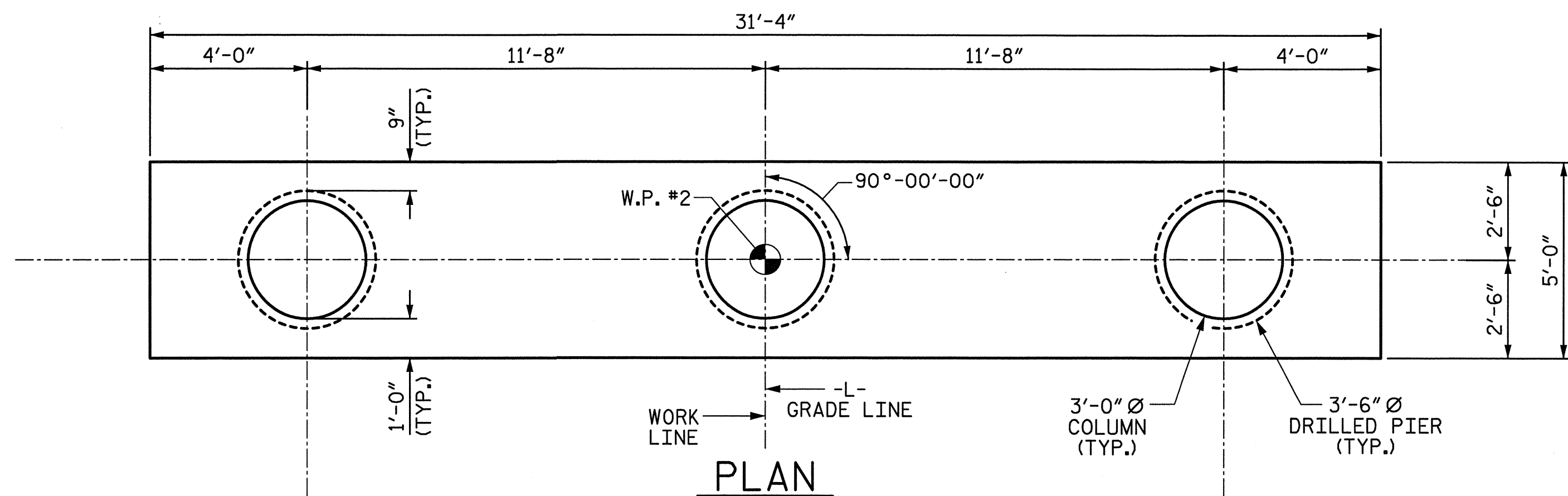
PROJECT NO. P-5208B
CABARRUS COUNTY
 STATION: 25+41.22 -L-
 SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
BENT 1

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

DRAWN BY: R. L. WHITCHER DATE: 10/12/12
 CHECKED BY: K. H. COMPTON DATE: 10/18/12

NOTES:
FOR "DETAIL B", SEE SHEET 3 OF 3.



PLAN OF DRILLED PIERS & COLUMNS

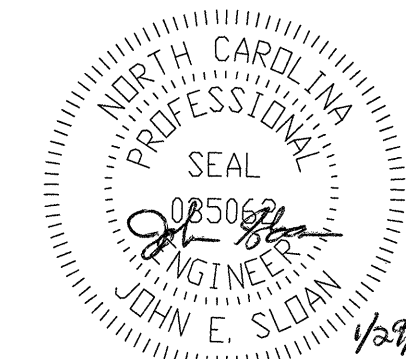
SECTION B-B

COLUMN AND SHAFT STEEL NOT SHOWN FOR CLARITY

PROJECT NO. P-5208B
CABARRUS COUNTY
STATION: 25+41.22 -L-

SHEET 2 OF 3

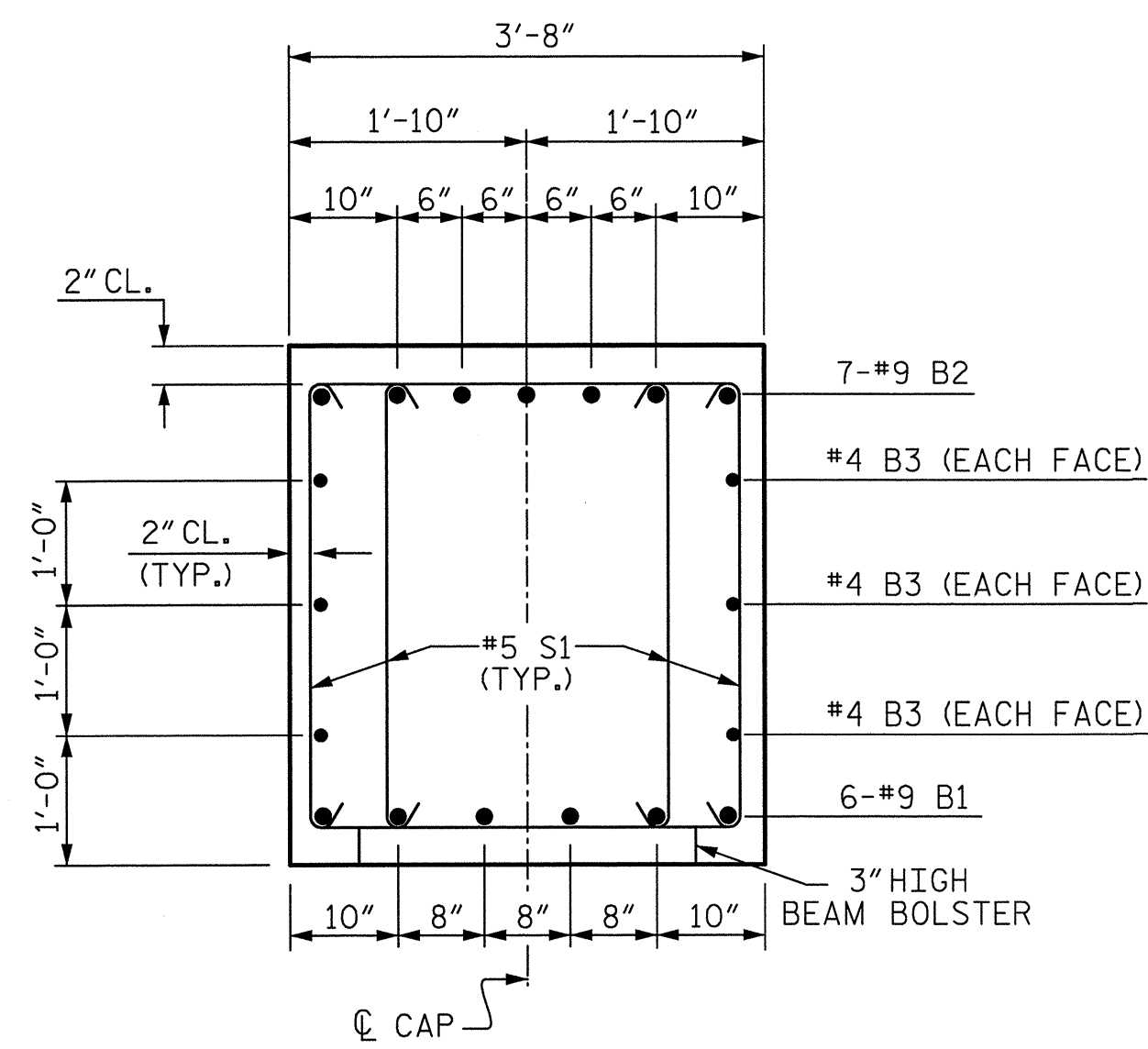
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
BENT 1



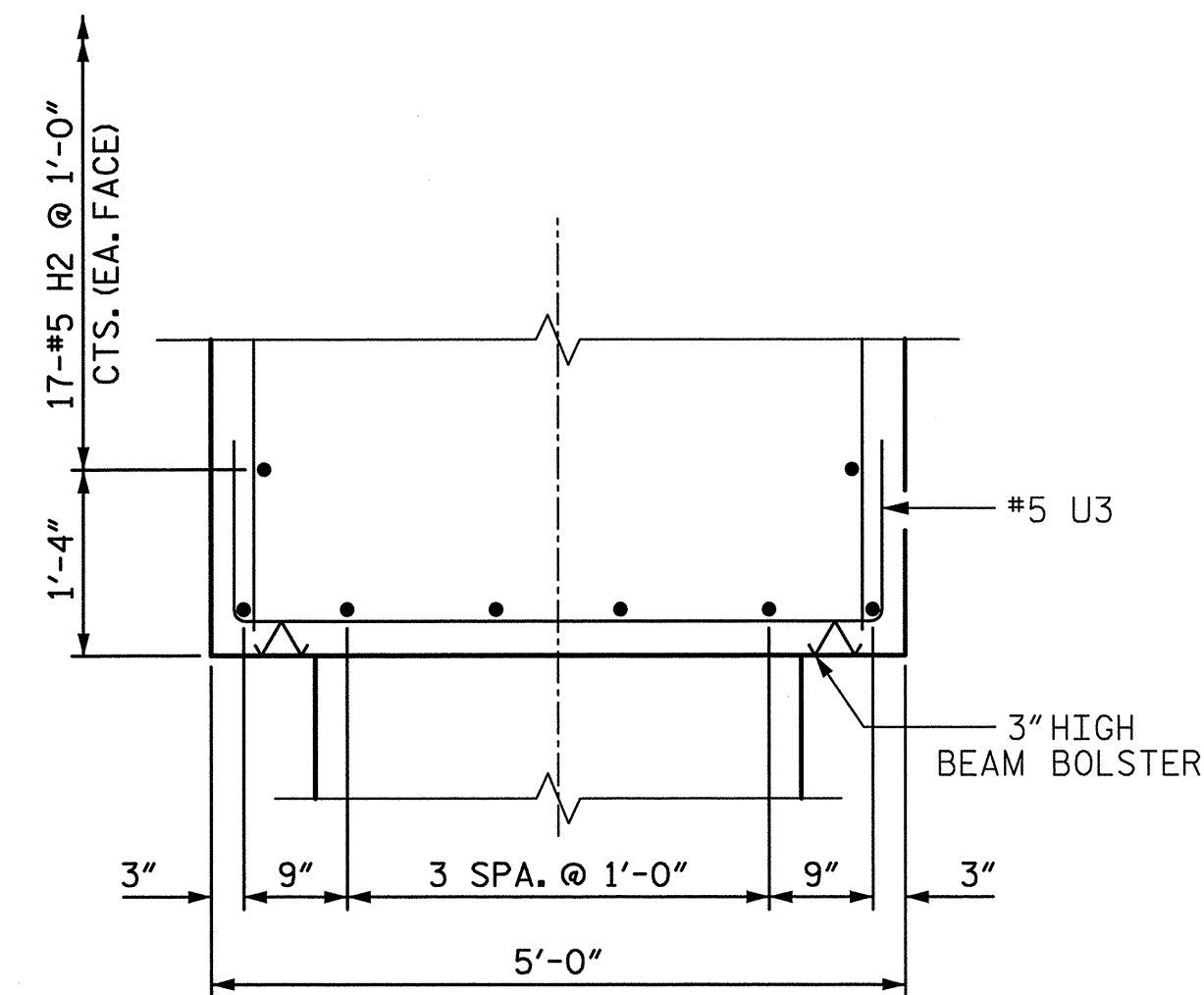
DRAWN BY: R. L. WHITCHER DATE: 10/15/12
CHECKED BY: K. H. COMPTON DATE: 10/18/12

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

S-34	TOTAL SHEETS	48
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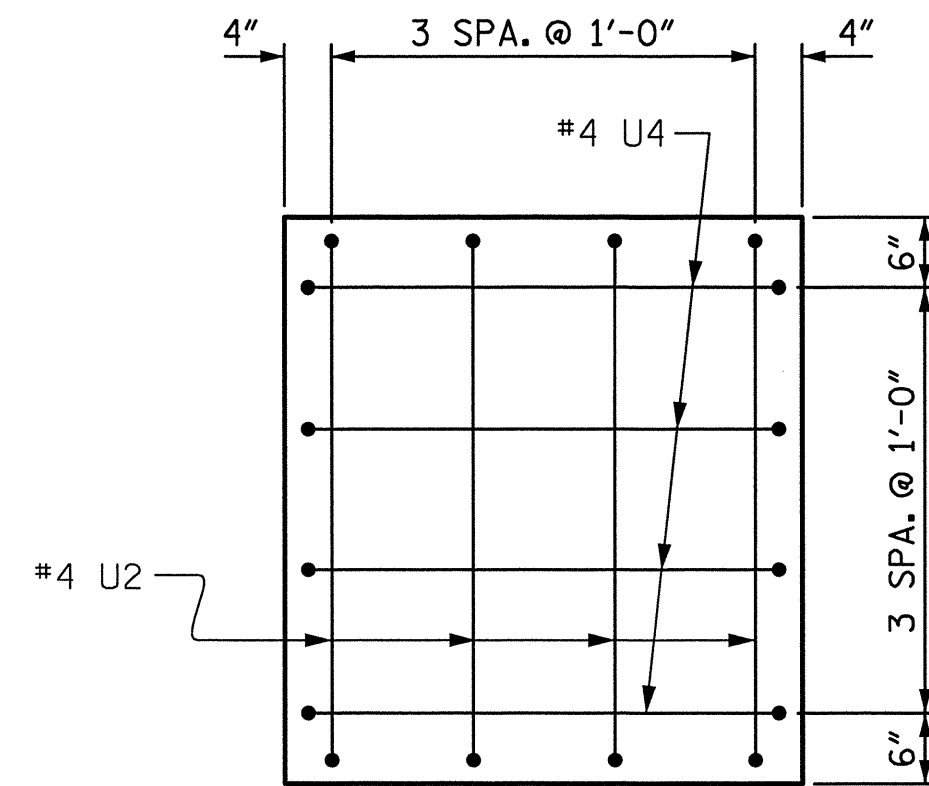


SECTION A-A



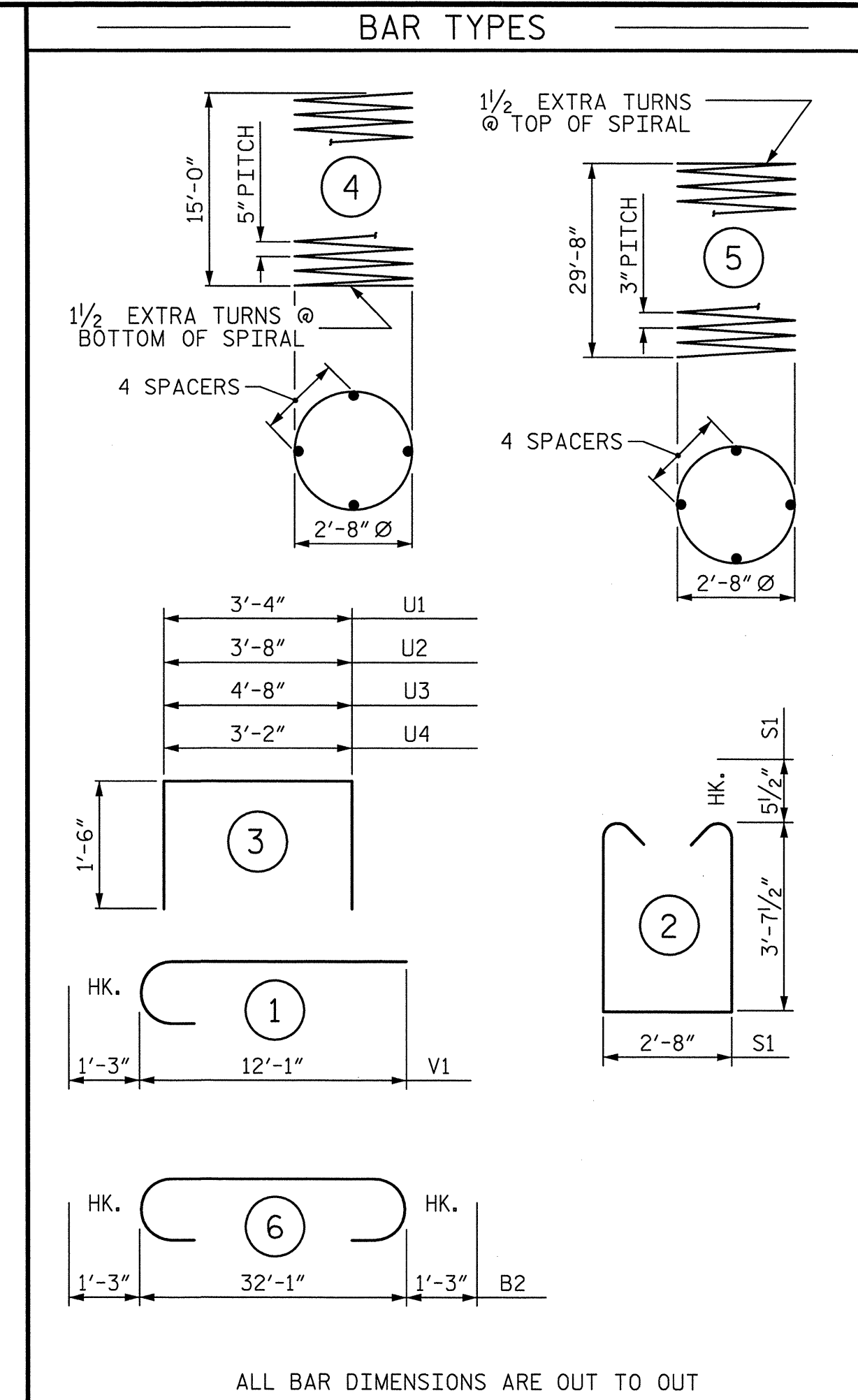
DETAIL B

TOP OF CRASH WALL SIMILAR



END VIEW

(TYP. BOTH ENDS OF CAP)



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BENT No. 1

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	6	9	STR	32'-1"	655
B2	7	9	6	34'-7"	823
B3	12	4	STR	17'-3"	138
H1	12	6	STR	31'-0"	559
H2	34	5	STR	31'-0"	1099
M1	42	9	STR	19'-9"	2820
S1	84	5	2	10'-10"	949
U1	28	4	3	6'-4"	118
U2	8	4	3	6'-8"	36
U3	64	5	3	7'-8"	512
U4	8	4	3	6'-2"	33
V1	42	9	1	13'-4"	1904
V2	42	9	STR	23'-9"	3392
V3	64	5	STR	18'-8"	1246

REINFORCING STEEL 14,284 LBS.

SP-1	3	*	4	311'-11"	976
SP-2	3	**	5	979'-11"	1964

SPIRAL COLUMN REINFORCING STEEL 2,940 LBS.

* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR

** THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN

POUR #2 (CRASH WALL)	110.2 C.Y.
POUR #3 (COLUMNS)	8.2 C.Y.
POUR #4 (CAP)	17.9 C.Y.

TOTAL CLASS A CONCRETE 136.3 C.Y.

DRILLED PIERS:

POUR #1 (DRILLED PIERS)	15.5 C.Y.
3'-6" Ø DRILLED PIERS IN SOIL	19.5 LIN. FT.
3'-6" Ø DRILLED PIERS NOT IN SOIL	24.0 LIN. FT.
CSL TUBES	192 LIN. FT.

PROJECT NO. P-5208B

CABARRUS COUNTY

STATION: 25+41.22 -L-

SHEET 3 OF 3

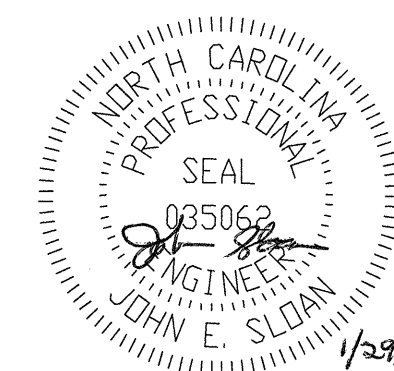
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

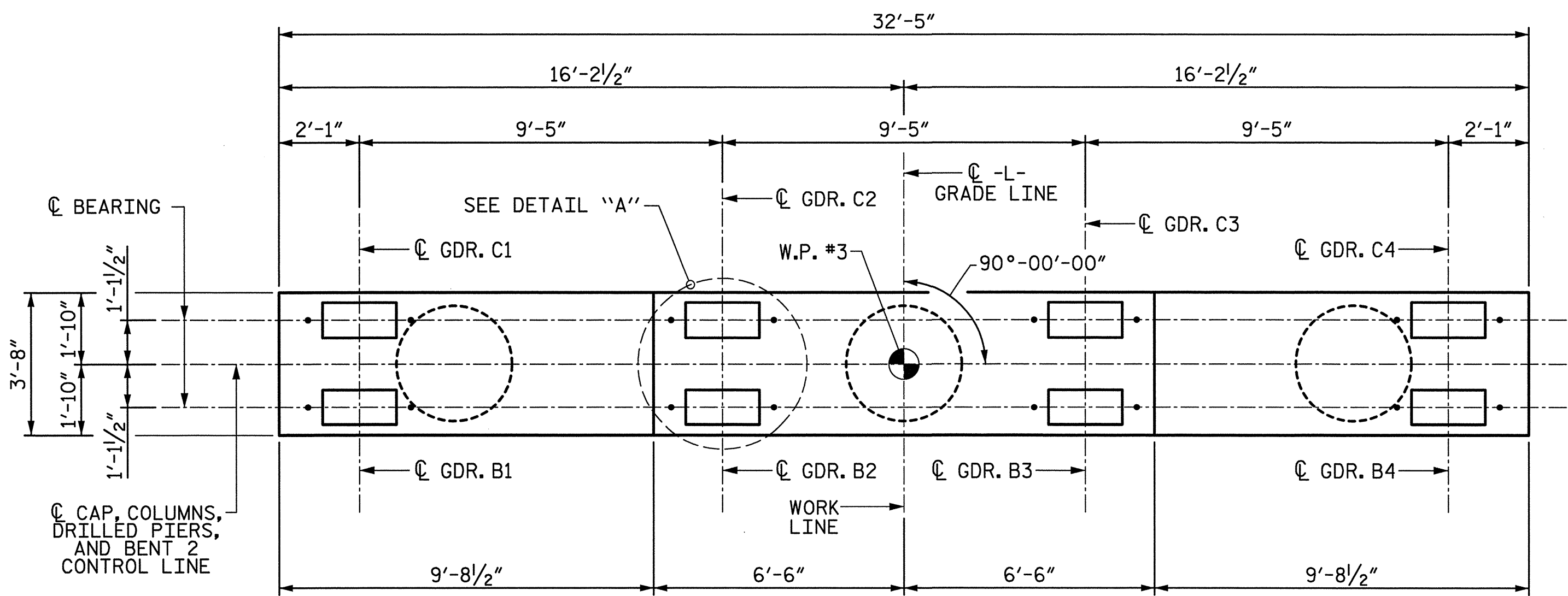
BENT 1

REVISIONS

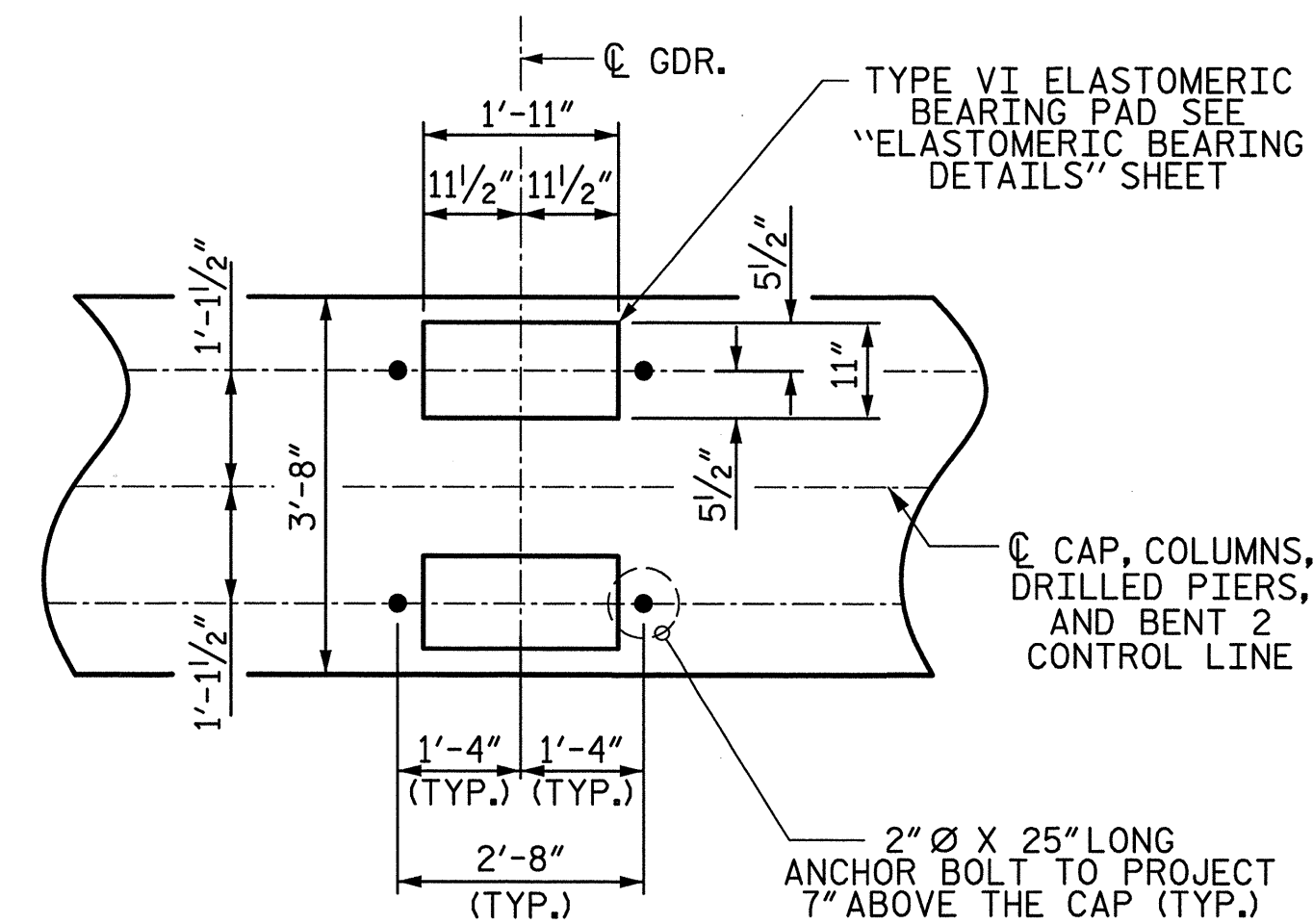
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S-35
2			4			TOTAL SHEETS 48



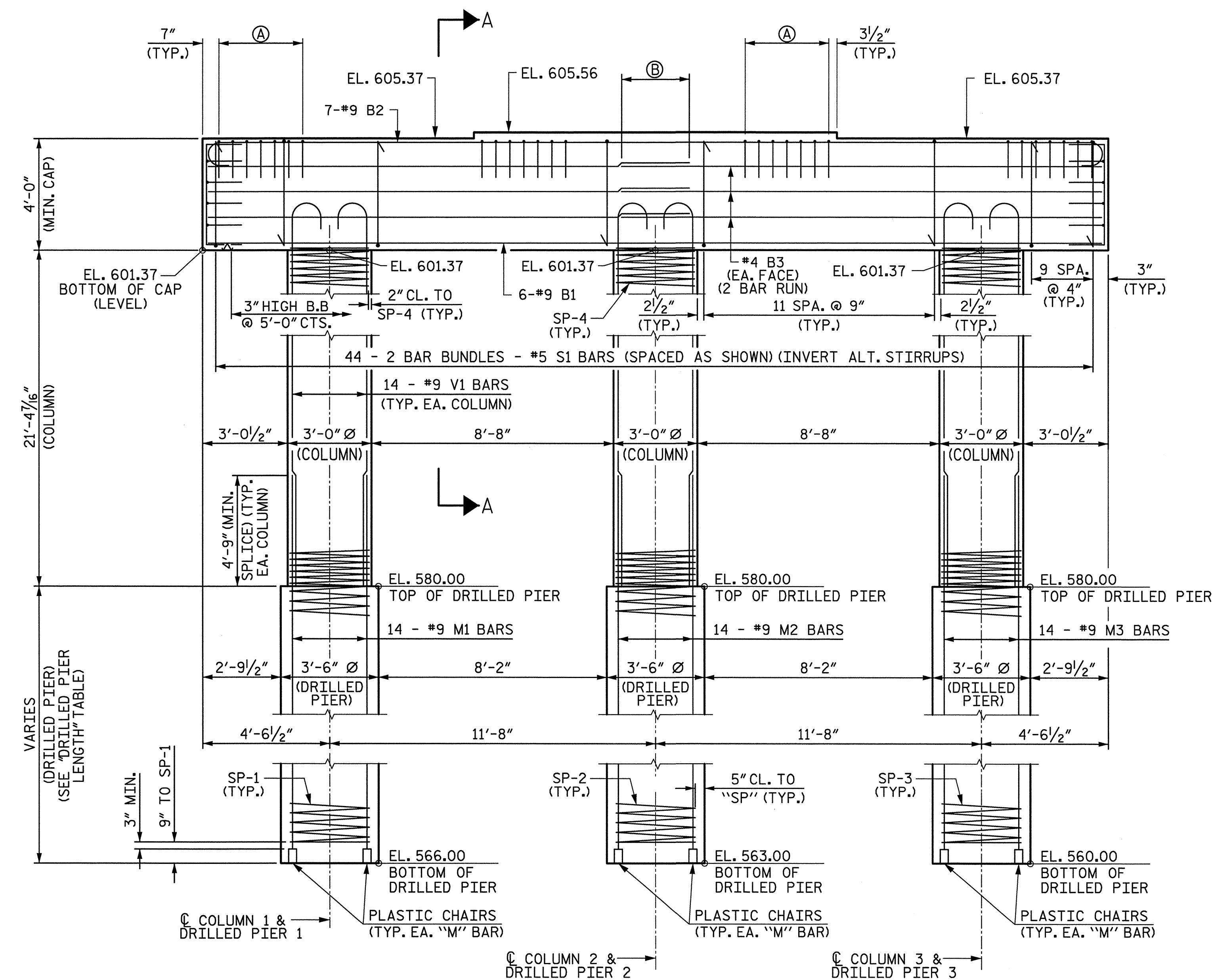
DRAWN BY : R. L. WHITCHER DATE : 10/15/12
CHECKED BY : K. H. COMPTON DATE : 10/18/12



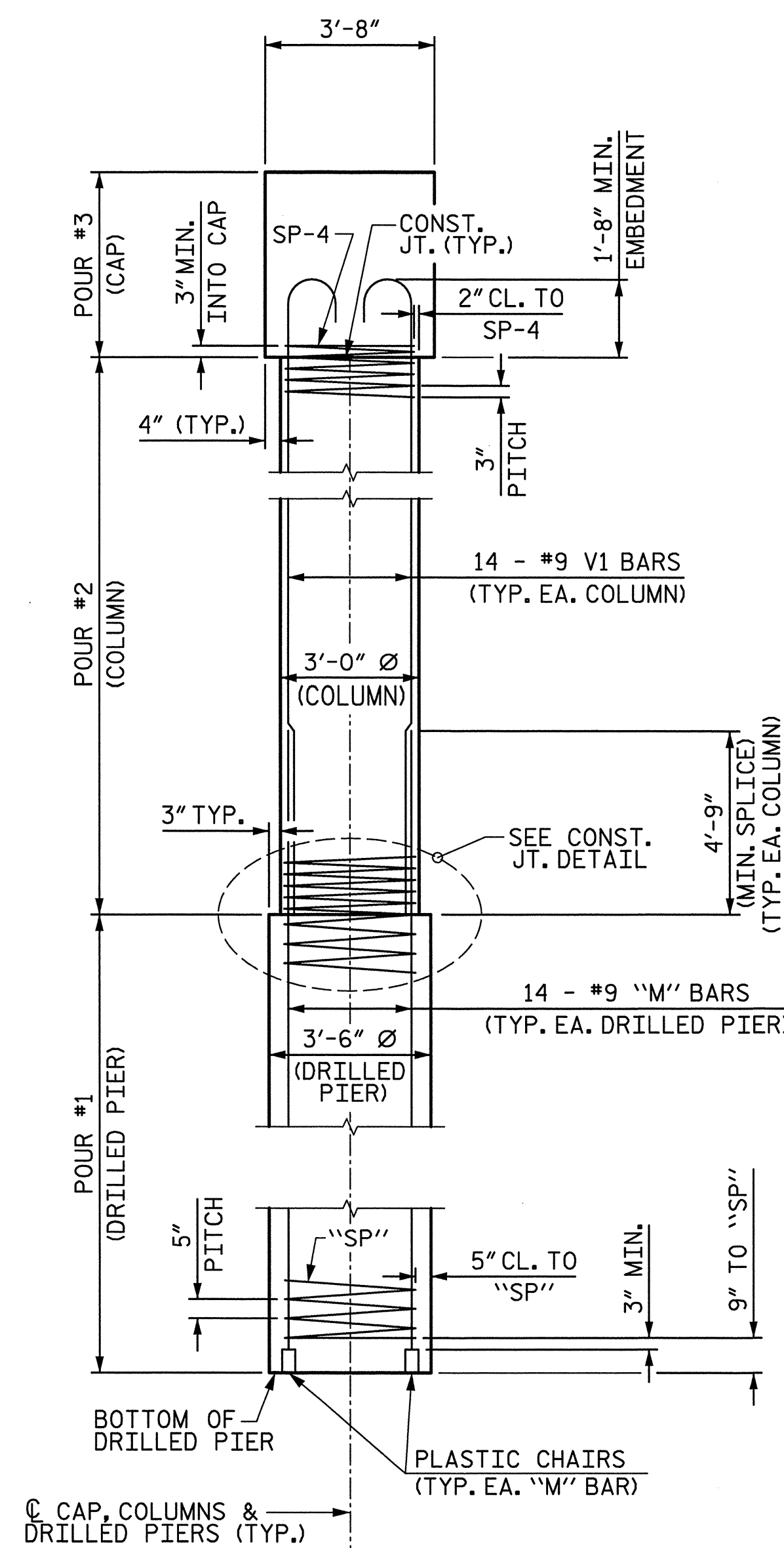
PLAN



DETAIL A
(TYP. EACH GIRDER)



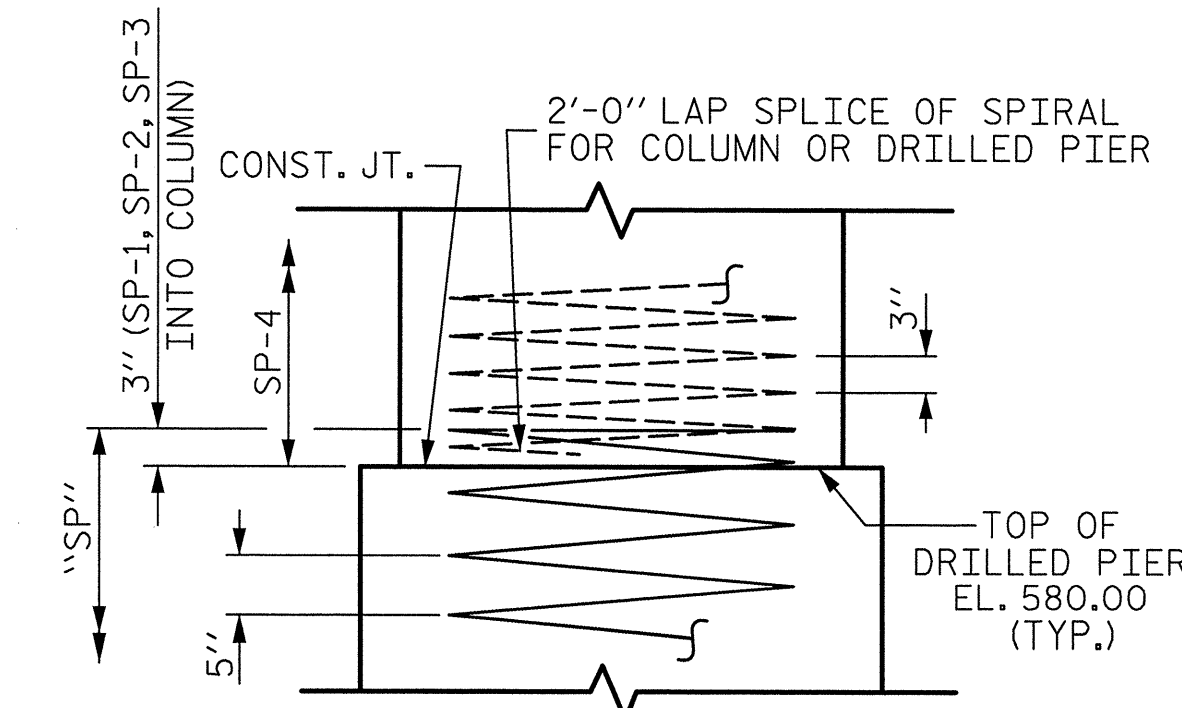
ELEVATION



END ELEVATION

NOTES:

- FOR "SECTION A-A", SEE SHEET 2 OF 2.
- FOR REINFORCING BILL OF MATERIAL, SEE SHEET 2 OF 2.
- FOR "END VIEW", SEE SHEET 2 OF 2.
- STIRRUPS & U1 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS AND COLUMN STEEL.
- HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
- ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".
- FOR ADDITIONAL NOTES, SEE "GENERAL DRAWING", SHEET 2 OF 3.

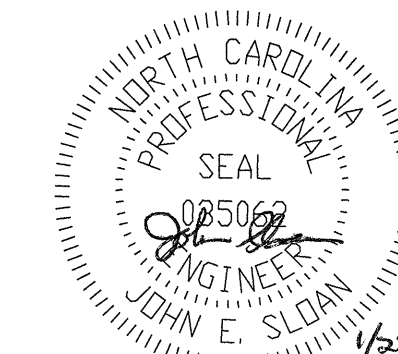


CONSTRUCTION JOINT DETAIL

DRILLED PIER LENGTH	
DRILLED PIER	LENGTH
1	14'-0"
2	17'-0"
3	20'-0"

- (A) 7-#4 U1 @ 6" CTS. (TYP. ALL SEATS)
- (B) 2'-5" - #4 B3 (MIN. SPLICE)

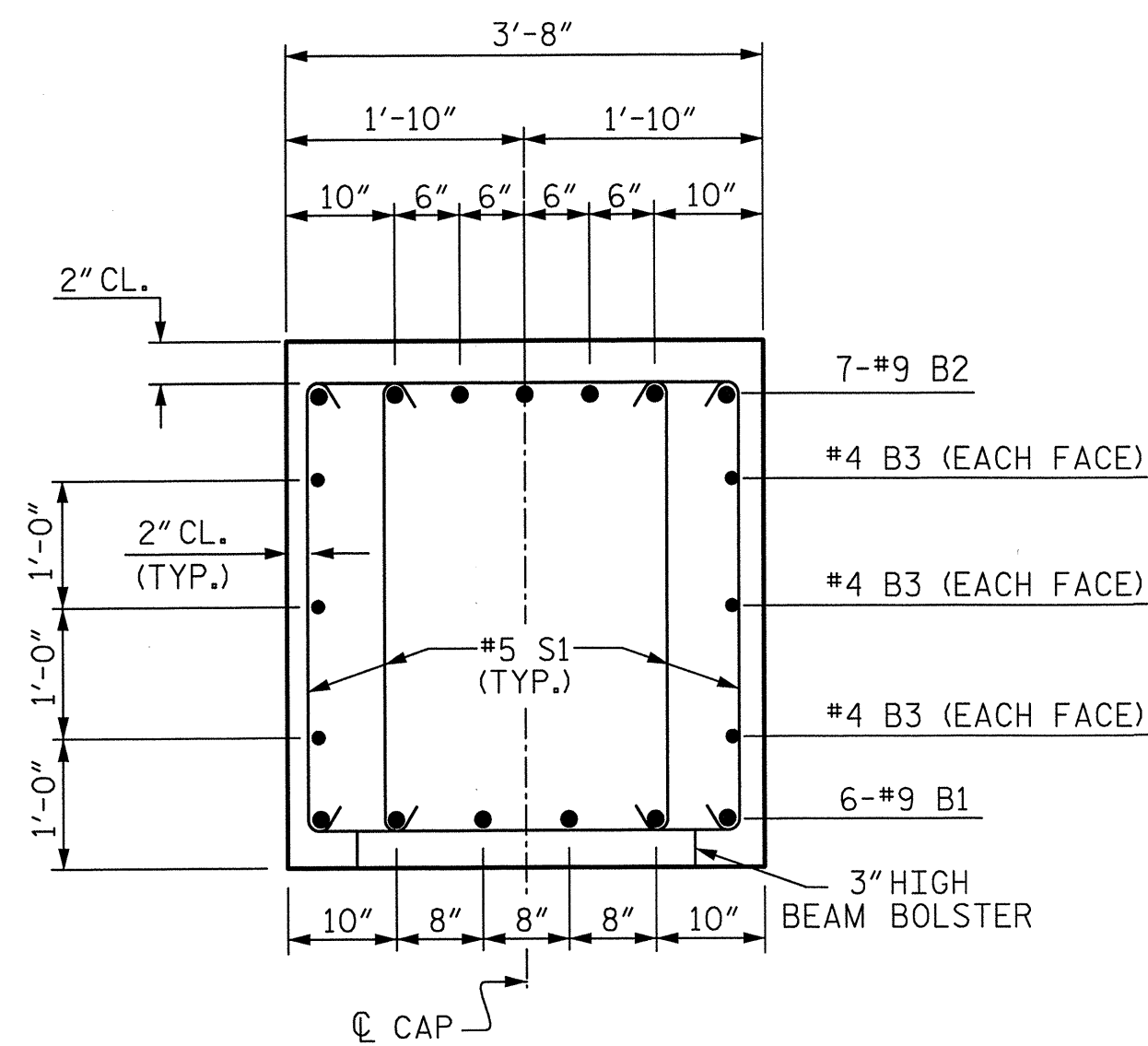
PROJECT NO. P-5208B
CABARRUS COUNTY
 STATION: 25+41.22 -L-
 SHEET 1 OF 2



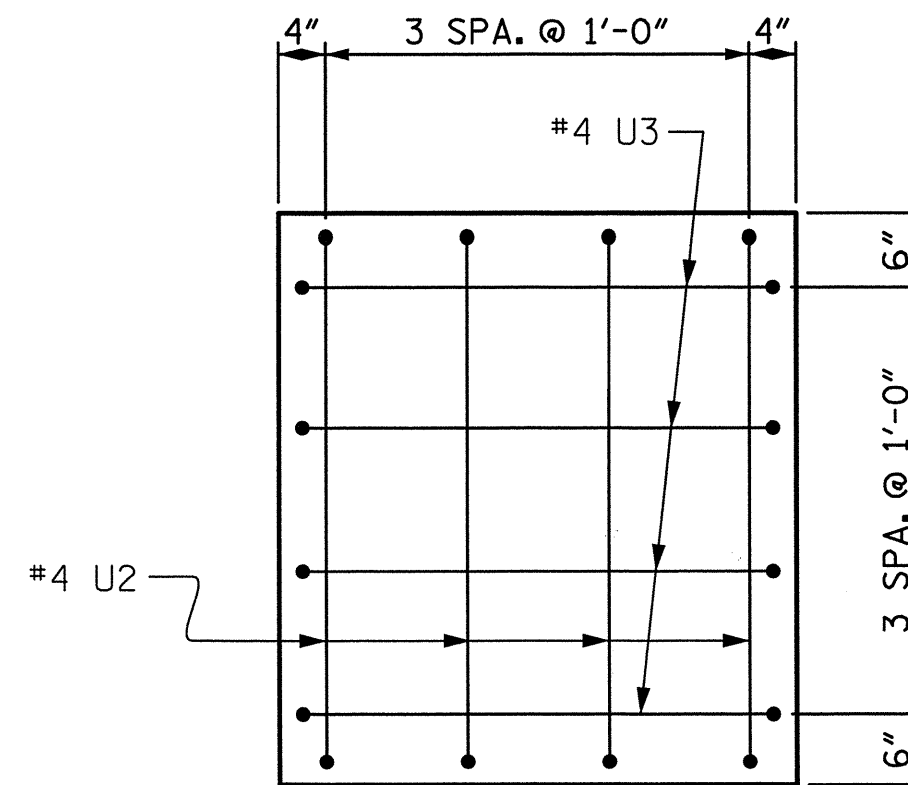
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT 2

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

DRAWN BY: R. L. WHITCHER DATE: 10/16/12
 CHECKED BY: J. E. SLOAN DATE: 11/2/12

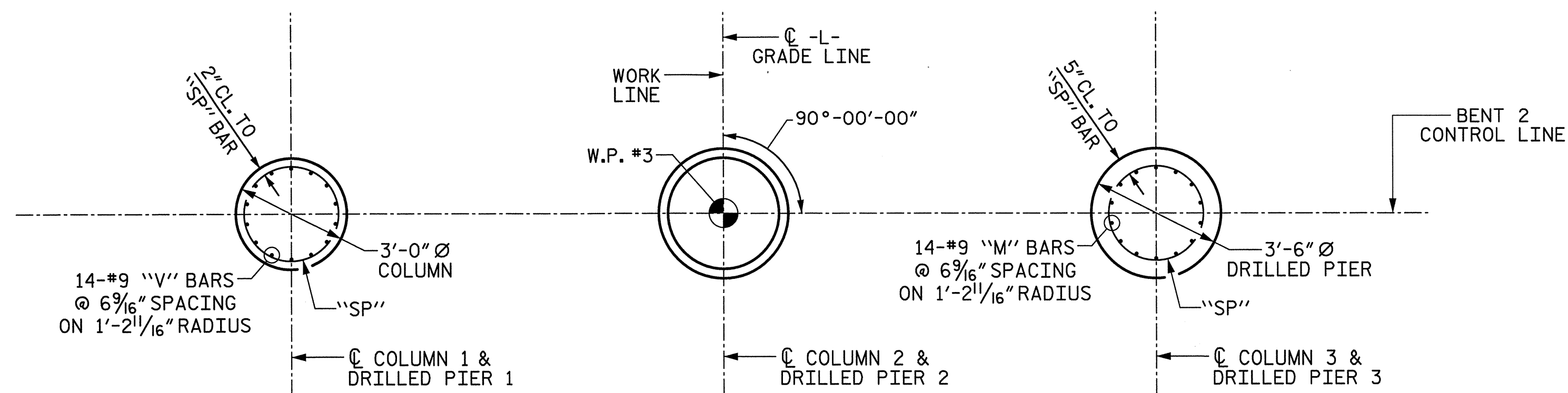


SECTION A-A



END VIEW

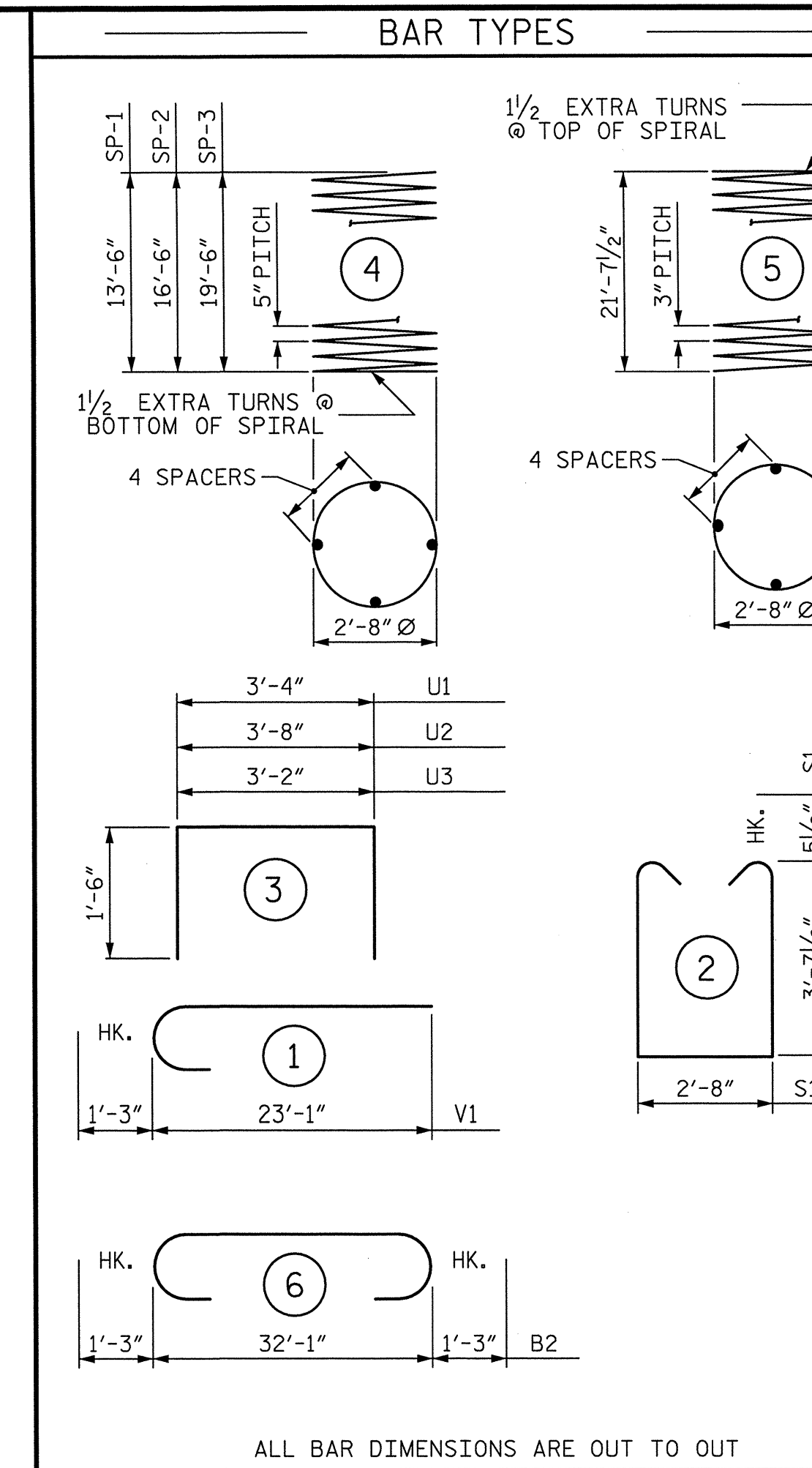
(TYP. BOTH ENDS OF CAP)



TYP. COLUMN REINFORCEMENT

TYP. DRILLED PIER REINFORCEMENT

PLAN OF DRILLED PIERS & COLUMNS



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BENT No. 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	9	STR	32'-1"	655
B2	7	9	6	34'-7"	823
B3	12	4	STR	17'-3"	138
M1	14	9	STR	18'-3"	869
M2	14	9	STR	21'-3"	1012
M3	14	9	STR	24'-3"	1154
S1	84	5	2	10'-10"	949
U1	28	4	3	6'-4"	118
U2	8	4	3	6'-8"	36
U3	8	4	3	6'-2"	33
V1	42	9	1	24'-4"	3475

REINFORCING STEEL 9,262 LBS.

SP-1	1	*	4	279'-1"	291
SP-2	1	*	4	344'-9"	360
SP-3	1	*	4	402'-3"	420
SP-4	3	**	5	724'-7"	1452

SPIRAL COLUMN REINFORCING STEEL 2,523 LBS.

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

CLASS A CONCRETE BREAKDOWN	
POUR #2 (COLUMNS)	16.8 C.Y.
POUR #3 (CAP)	17.9 C.Y.
TOTAL CLASS A CONCRETE	34.7 C.Y.

DRILLED PIERS:	
DRILLED PIER CONCRETE	
POUR #1 (DRILLED PIERS)	18.2 C.Y.
3'-6" Ø DRILLED PIERS IN SOIL	21.0 LIN. FT.
3'-6" Ø DRILLED PIERS NOT IN SOIL	30.0 LIN. FT.
CSL TUBES	222 LIN. FT.

PROJECT NO. P-5208B

CABARRUS COUNTY

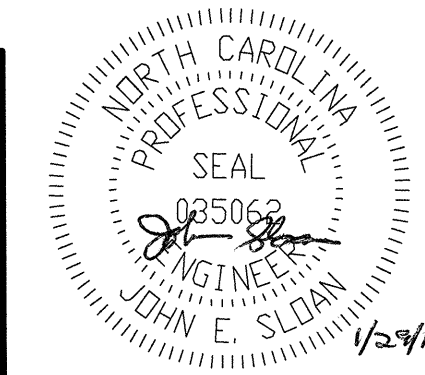
STATION: 25+41.22 -L-

SHEET 2 OF 2

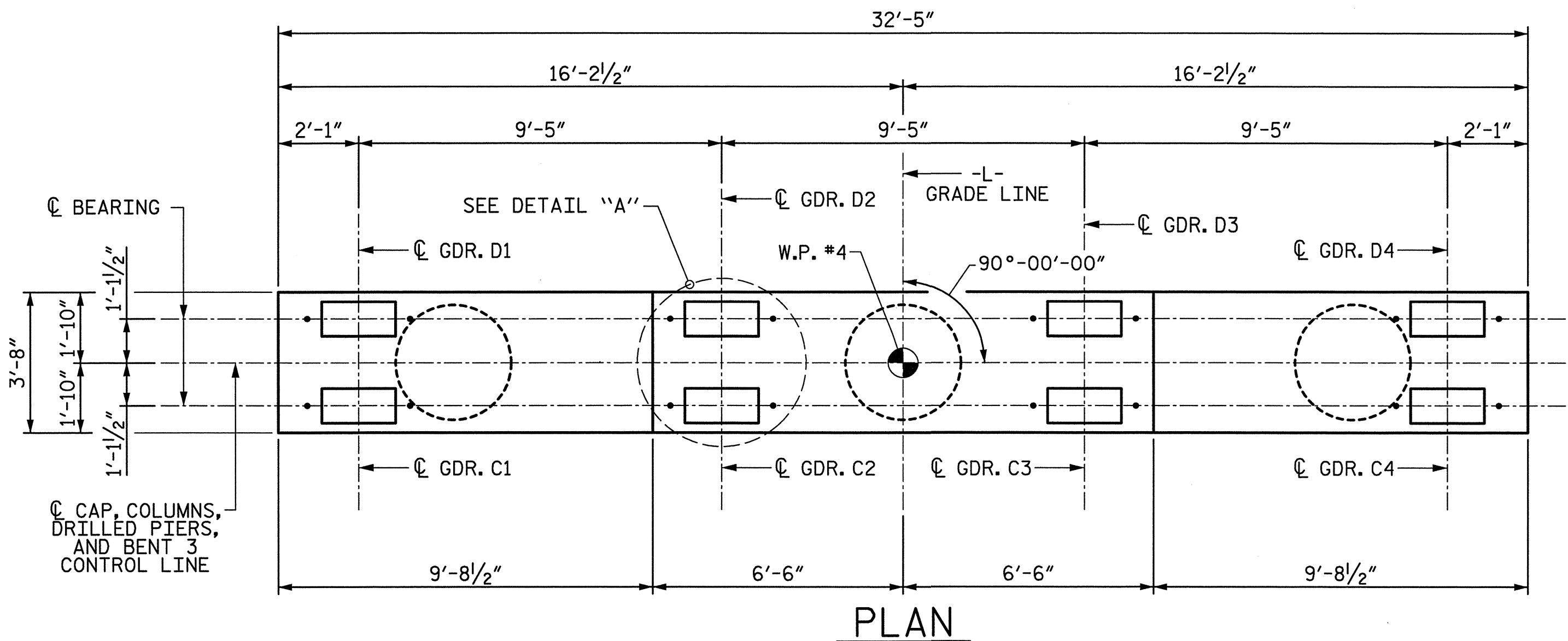
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT 2

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

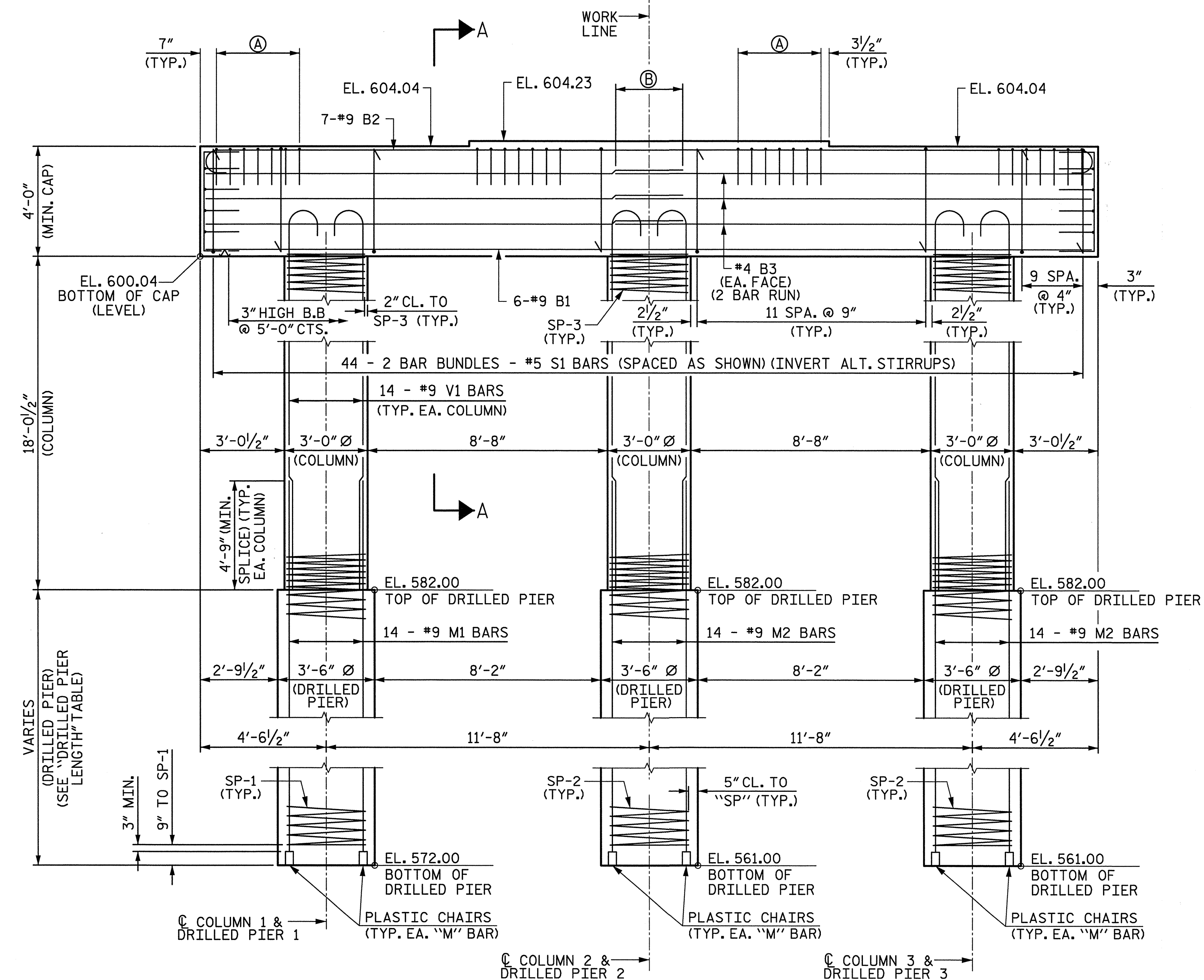
S-37
 TOTAL SHEETS
 48



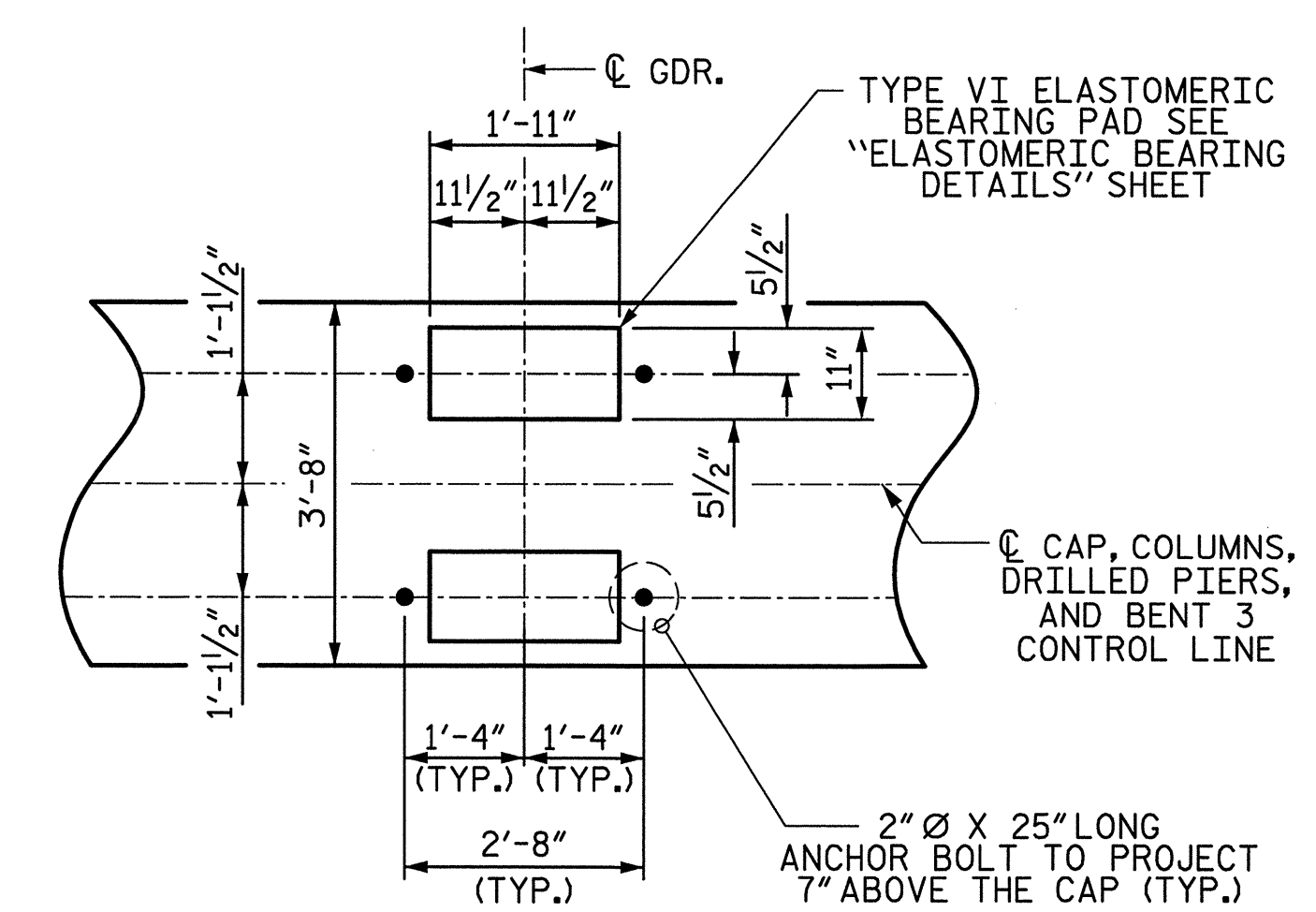
DRAWN BY: R. L. WHITCHER DATE: 10/16/12
 CHECKED BY: J. E. SLOAN DATE: 11/2/12



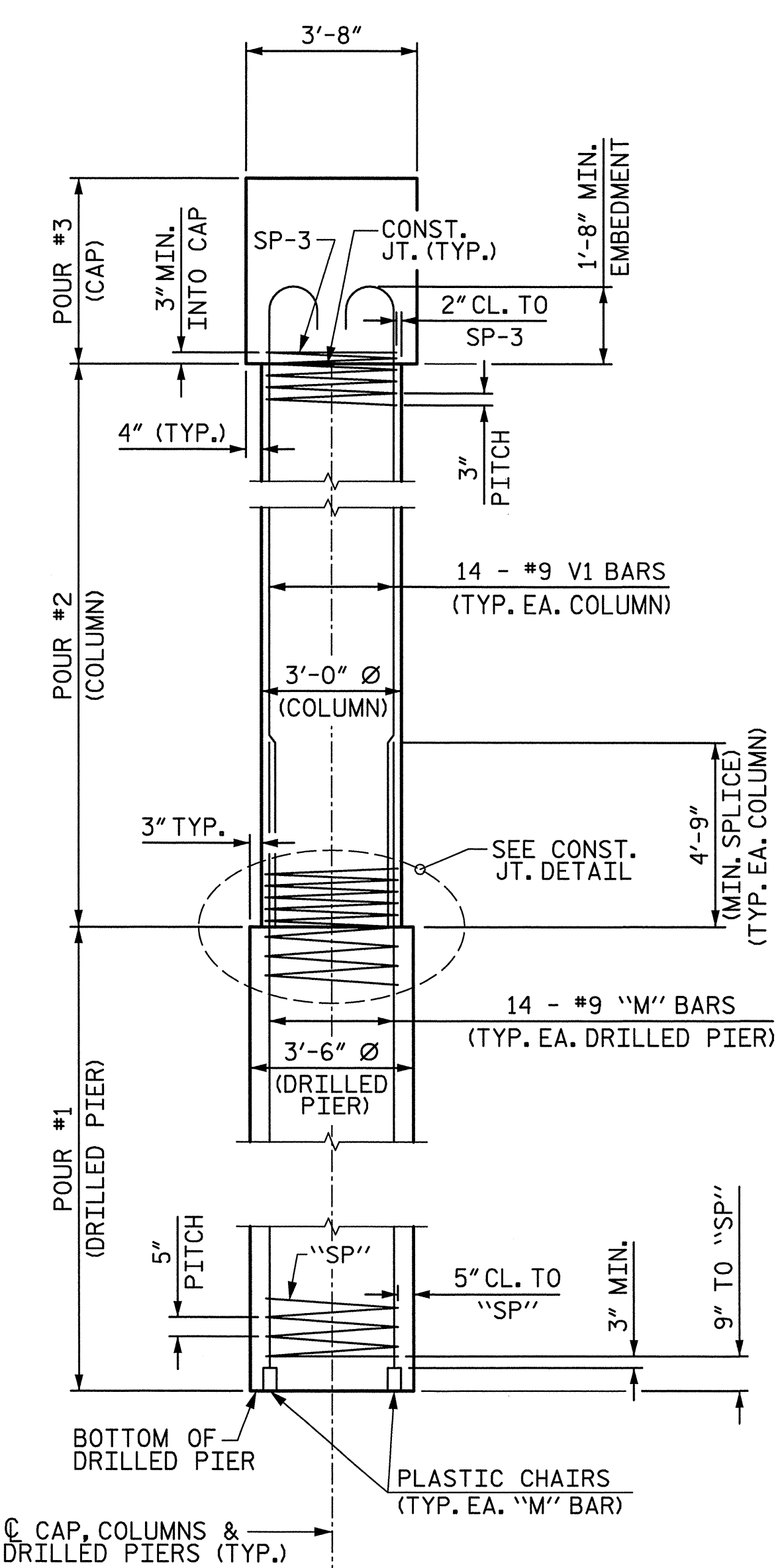
PLAN



ELEVATION



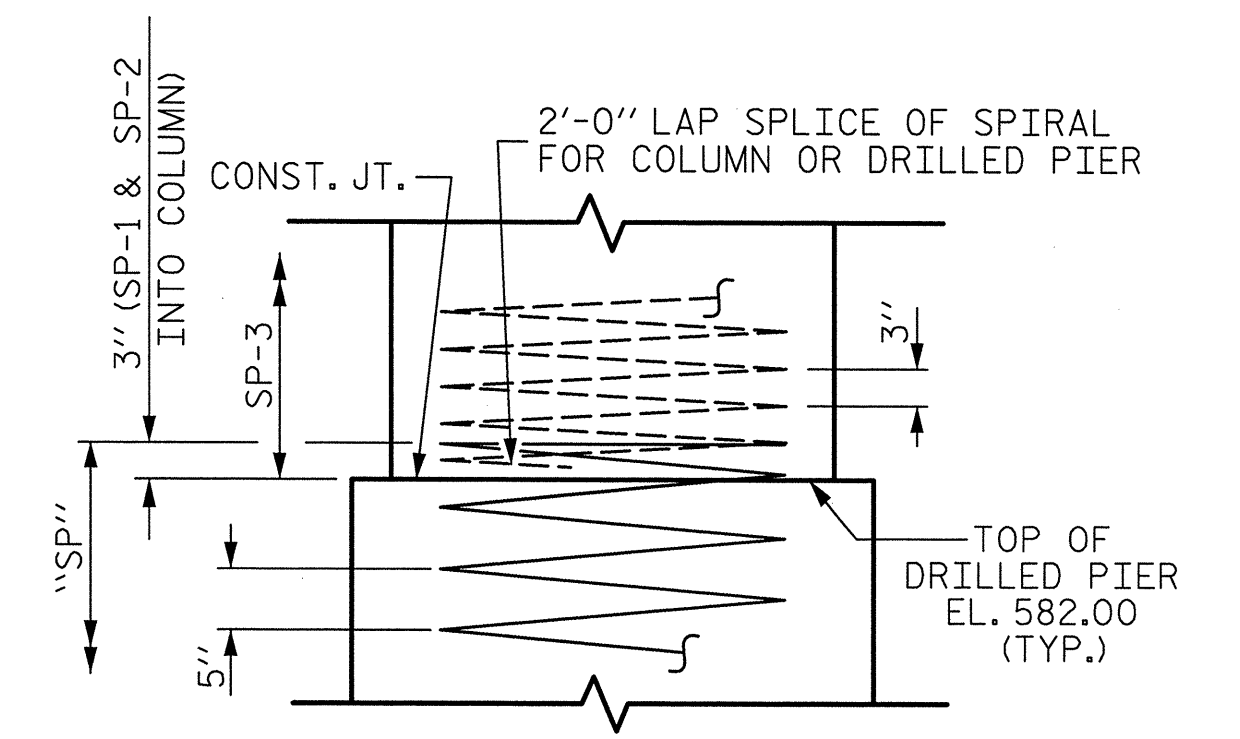
DETAIL A
(TYP. EACH GIRDER)



END ELEVATION

NOTES:

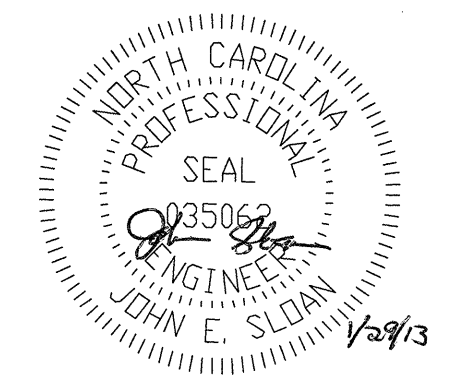
- FOR "SECTION A-A", SEE SHEET 2 OF 2.
- FOR REINFORCING BILL OF MATERIAL, SEE SHEET 2 OF 2.
- FOR "END VIEW", SEE SHEET 2 OF 2.
- STIRRUPS & U1 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS AND COLUMN STEEL.
- HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
- ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".
- FOR ADDITIONAL NOTES, SEE "GENERAL DRAWING", SHEET 2 OF 3.



CONSTRUCTION JOINT DETAIL

DRILLED PIER LENGTH	
DRILLED PIER	LENGTH
1	10'-0"
2	21'-0"
3	21'-0"

- (A) 7-#4 U1 @ 6" CTS. (TYP. ALL SEATS)
- (B) 2'-5" - #4 B3 (MIN. SPLICE)

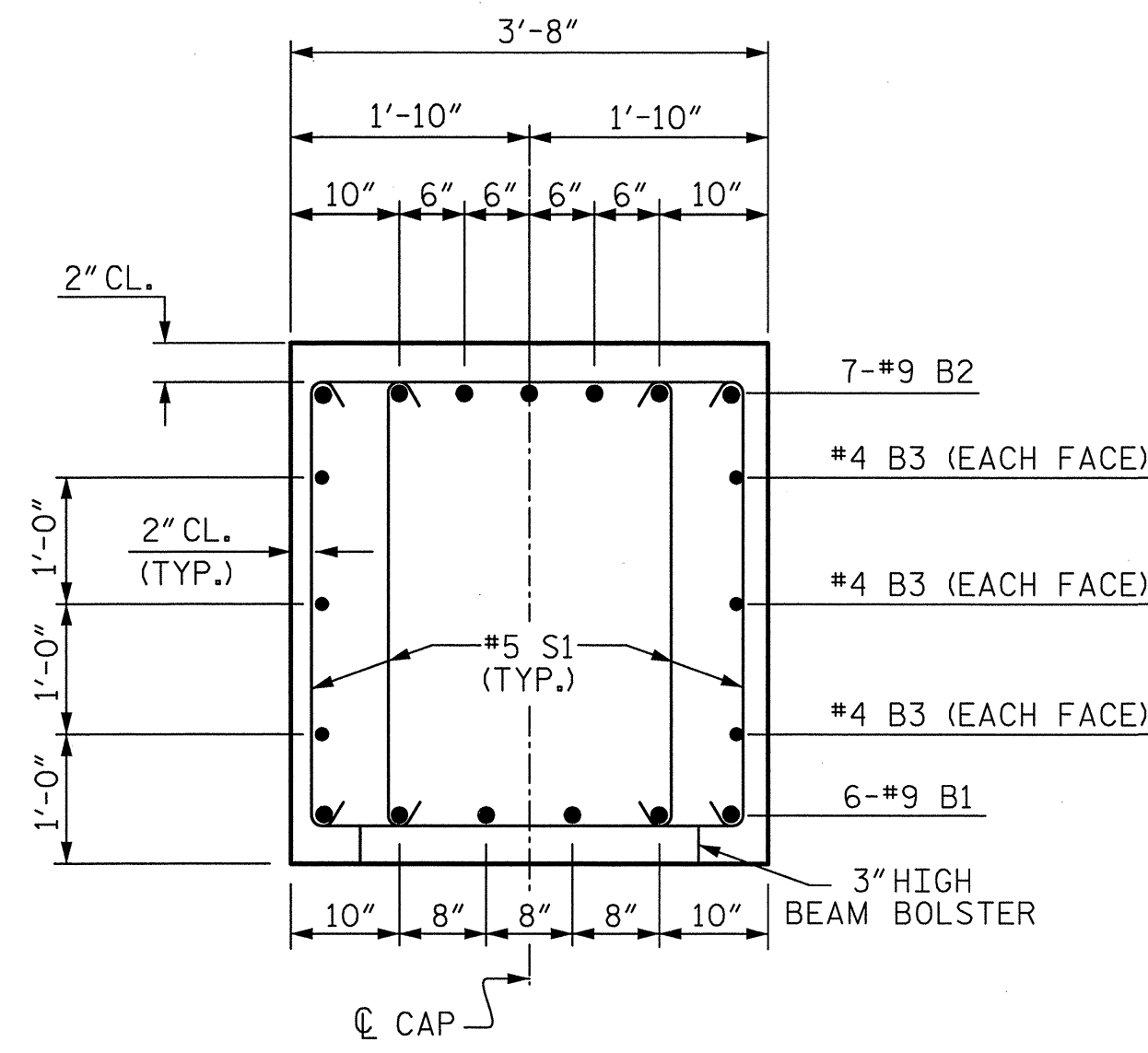


PROJECT NO. P-5208B
CABARRUS COUNTY
 STATION: 25+41.22 -L-

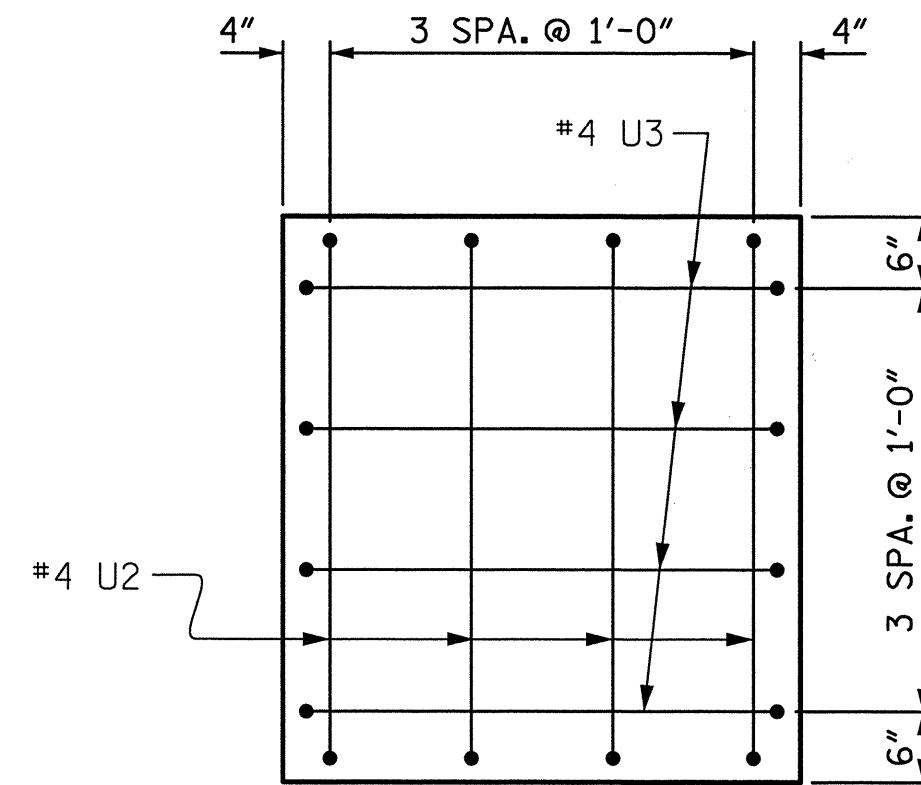
SHEET 1 OF 2
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT 3

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

DRAWN BY: R. L. WHITCHER DATE: 11/2/12
 CHECKED BY: K. H. COMPTON DATE: 11/6/12

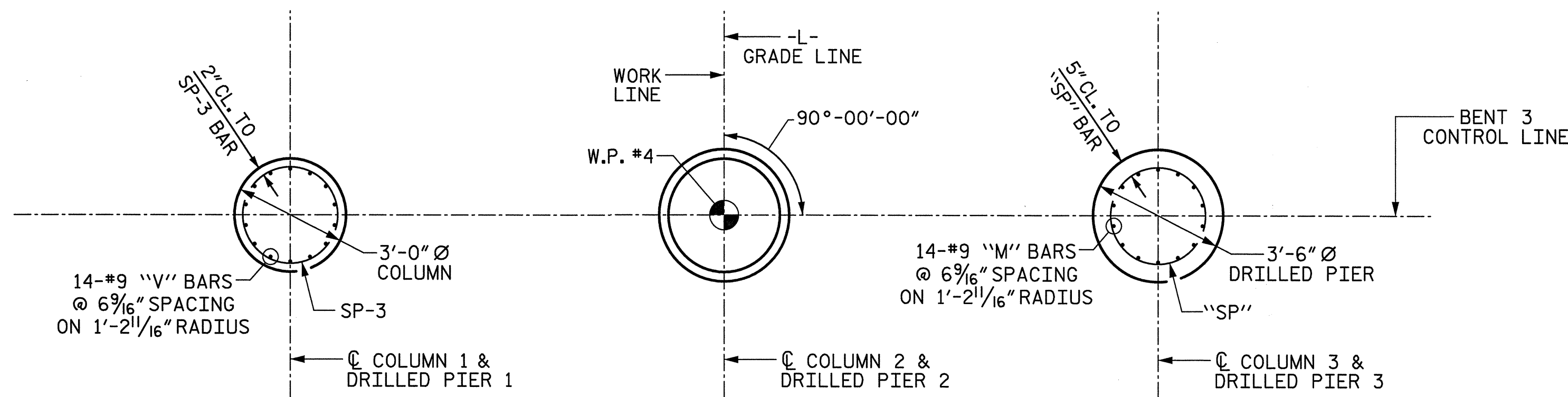


SECTION A-A



END VIEW

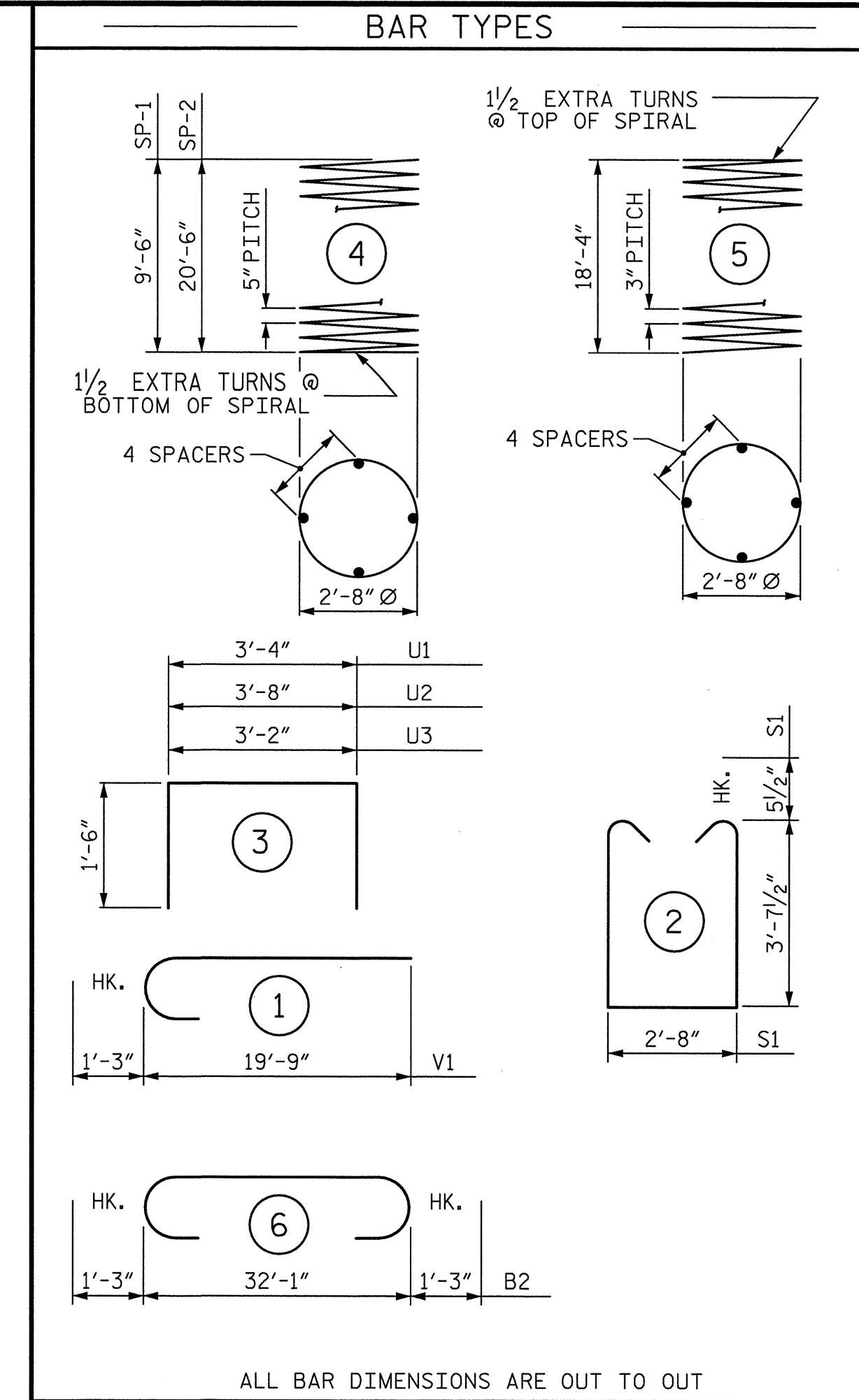
(TYP. BOTH ENDS OF CAP)



TYP. COLUMN REINFORCEMENT

TYP. DRILLED PIER REINFORCEMENT

PLAN OF DRILLED PIERS & COLUMNS



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL					
BENT No. 3					
BAR	NO.	SIZE	TYP	LENGTH	WEIGHT
B1	6	9	STR	32'-1"	655
B2	7	9	6	34'-7"	823
B3	12	4	STR	17'-3"	138
M1	14	9	STR	14'-3"	678
M2	28	9	STR	25'-3"	2404
S1	84	5	2	10'-10"	949
U1	28	4	3	6'-4"	118
U2	8	4	3	6'-8"	36
U3	8	4	3	6'-2"	33
V1	42	9	1	21'-0"	2999
REINFORCING STEEL					8,833 LBS.
SP-1	1	*	4	205'-3"	214
SP-2	2	*	4	418'-8"	873
SP-3	3	**	5	617'-7"	1238
SPIRAL COLUMN REINFORCING STEEL					2,325 LBS.
* THE SP-1, SP-2 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR					
** THE SP-3 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR					
CLASS A CONCRETE BREAKDOWN					
POUR #2 (COLUMNS)					14.2 C.Y.
POUR #3 (CAP)					17.9 C.Y.
TOTAL CLASS A CONCRETE					32.1 C.Y.
DRILLED PIERS:					
DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)					18.5 C.Y.
3'-6" Ø DRILLED PIERS IN SOIL					27 LIN. FT.
3'-6" Ø DRILLED PIERS NOT IN SOIL					25.0 LIN. FT.
CSL TUBES					226 LIN. FT.

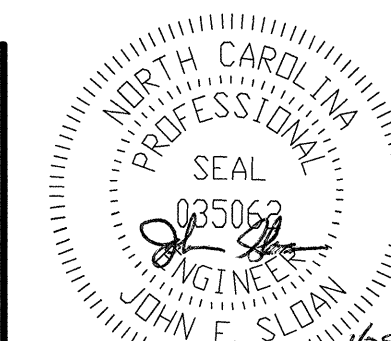
PROJECT NO. P-5208B
 CABARRUS COUNTY
 STATION: 25+41.22 -L-

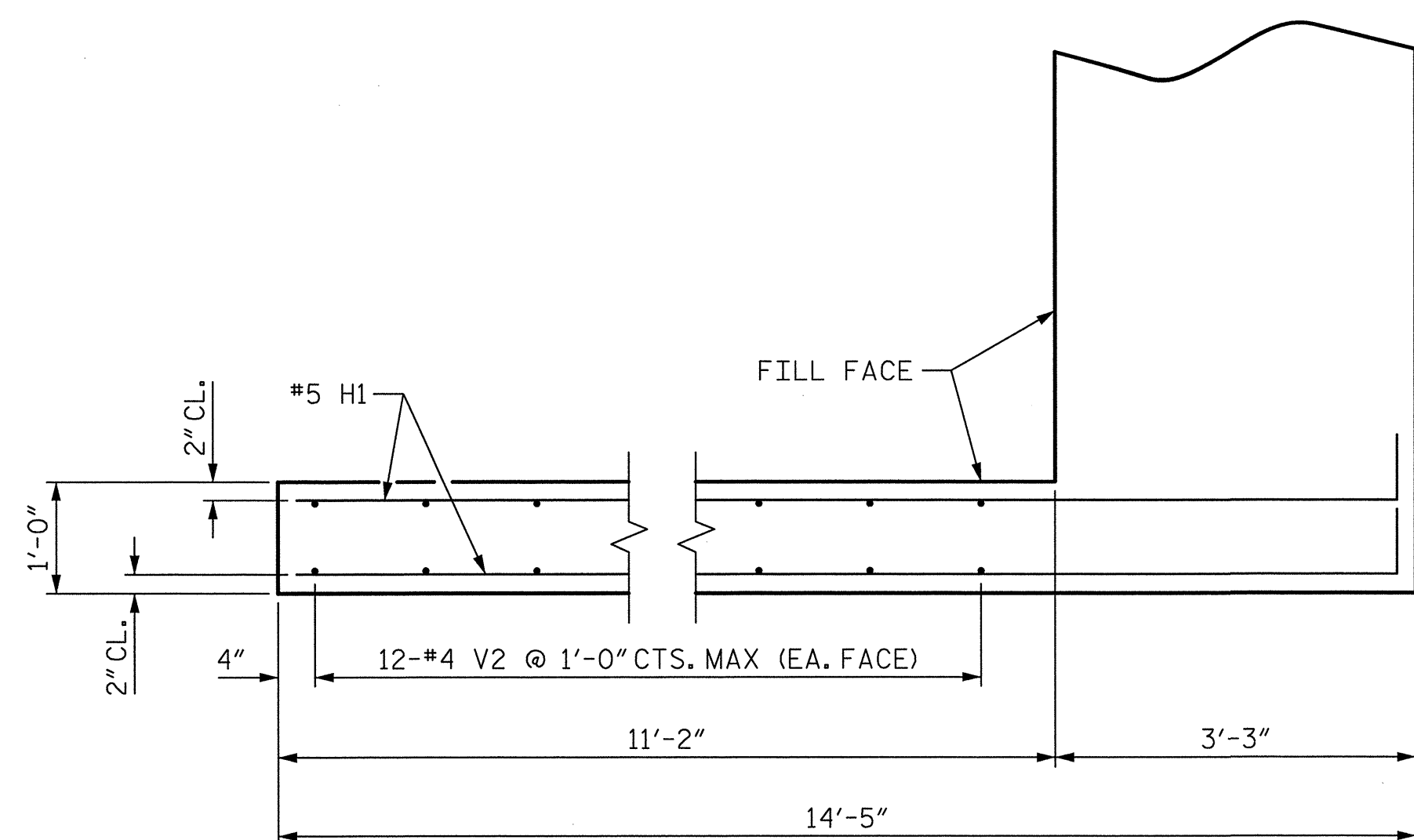
SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT 3

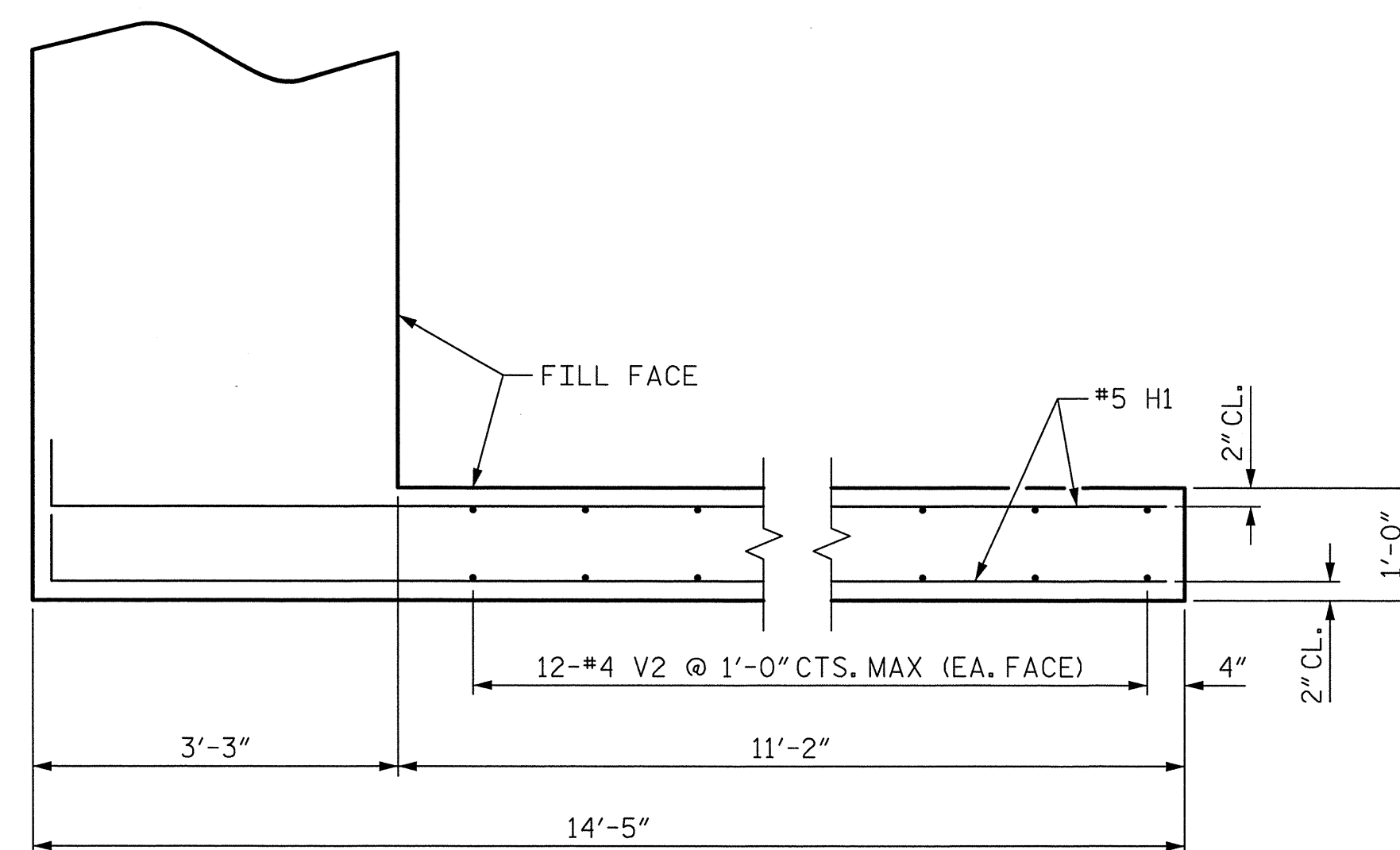
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

DRAWN BY: R. L. WHITCHER DATE: 10/16/12
 CHECKED BY: K. H. COMPTON DATE: 11/6/12

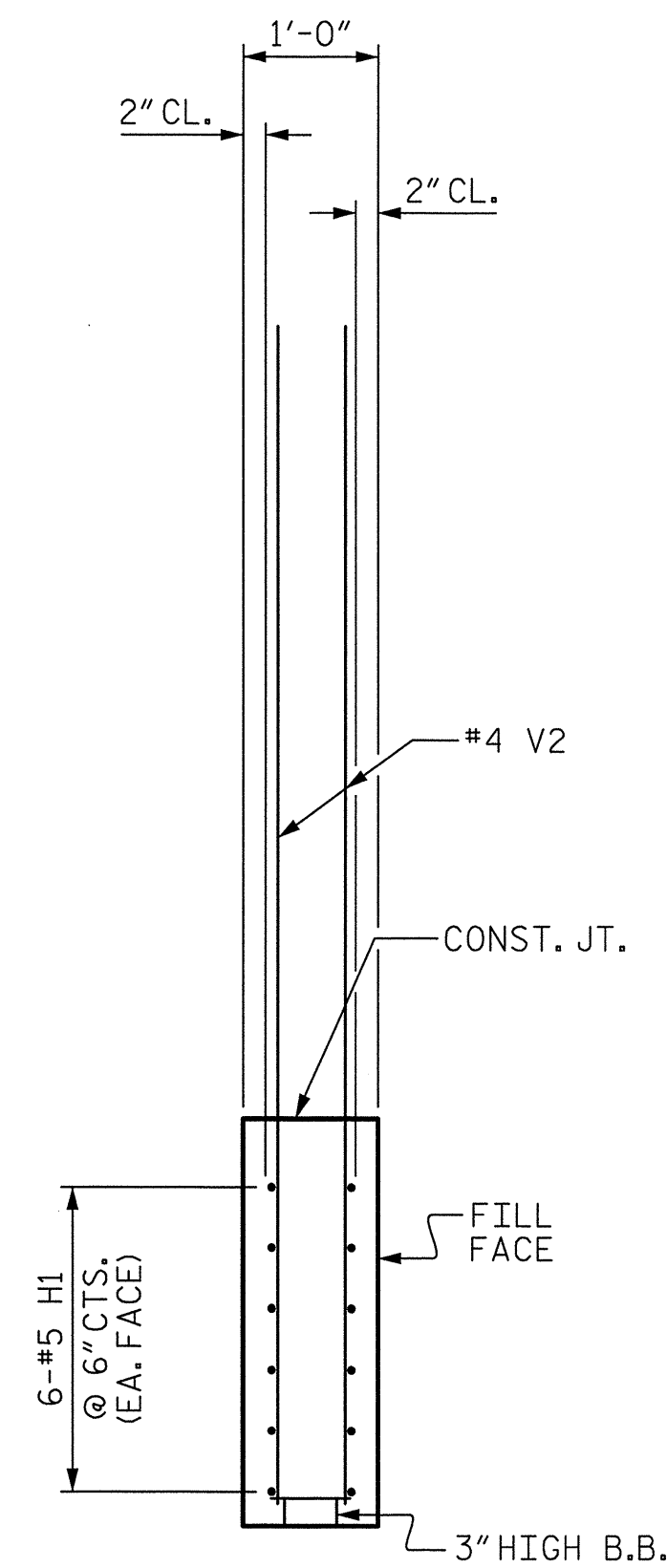




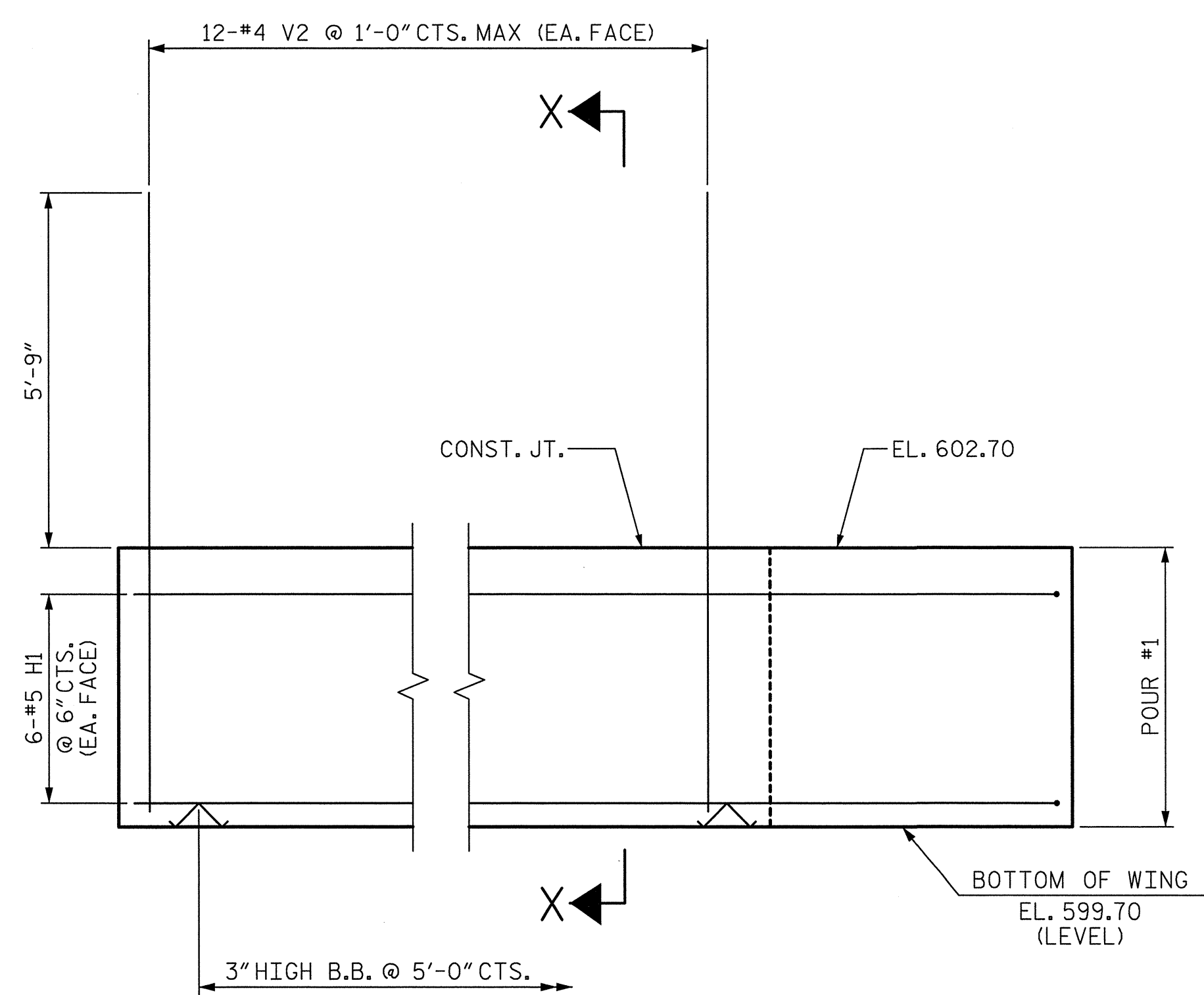
PLAN OF WING (W3)



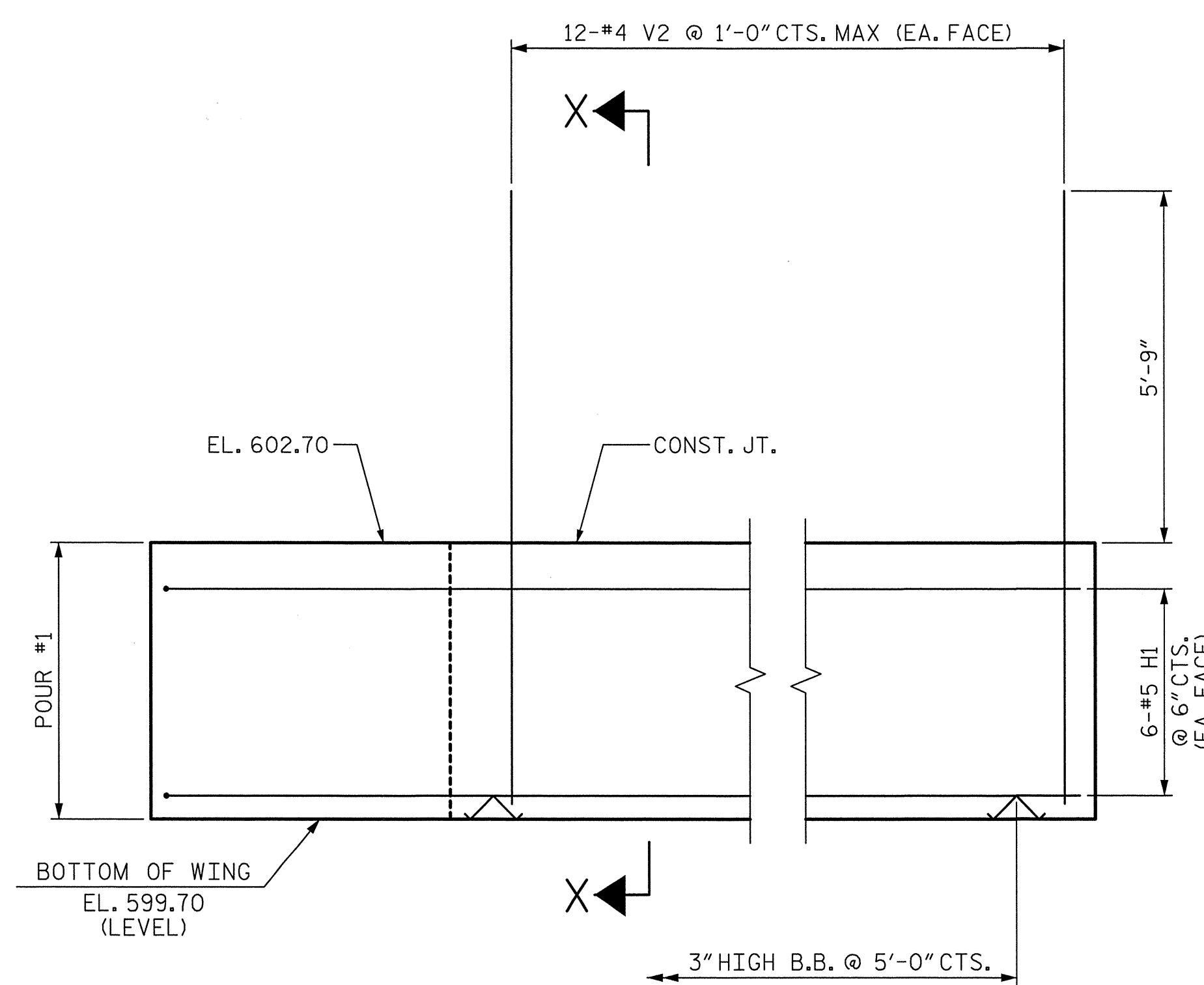
PLAN OF WING (W4)



SECTION X-X



ELEVATION OF WING (W3)



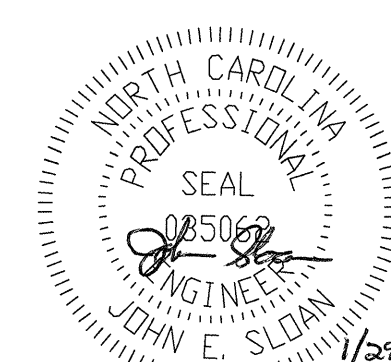
ELEVATION OF WING (W4)



PROJECT NO. P-5208B
CABARRUS COUNTY
 STATION: 25+41.22 -L-

SHEET 2 OF 3

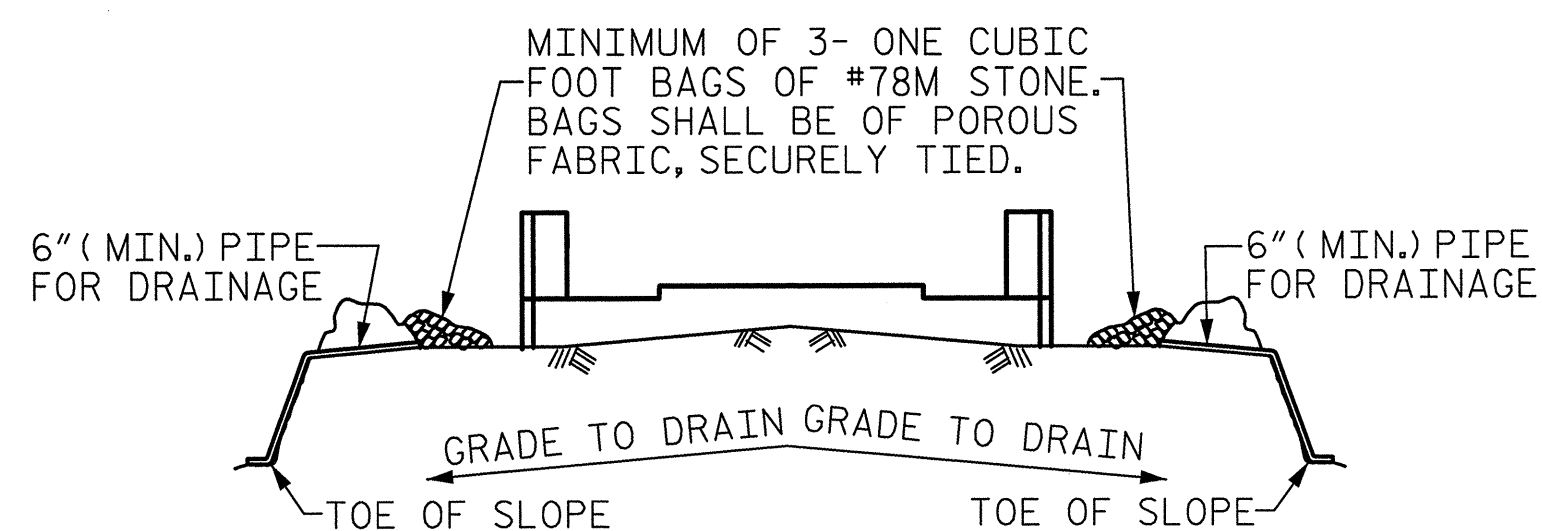
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 INTEGRAL
 END BENT 2



DRAWN BY: M. K. TOM DATE: 9/25/12
 CHECKED BY: K. H. COMPTON DATE: 10/17/12

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

S-41
TOTAL SHEETS
48

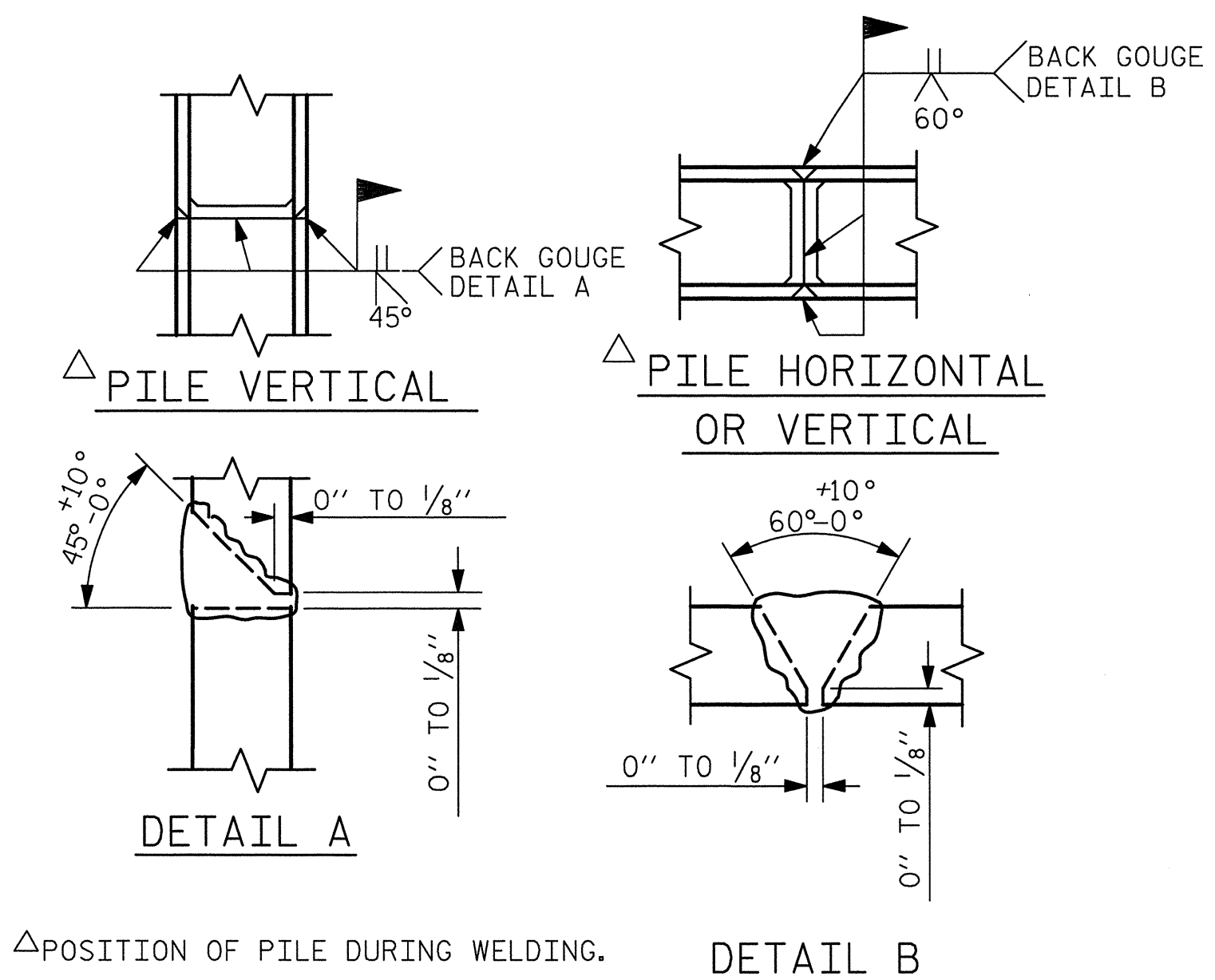


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

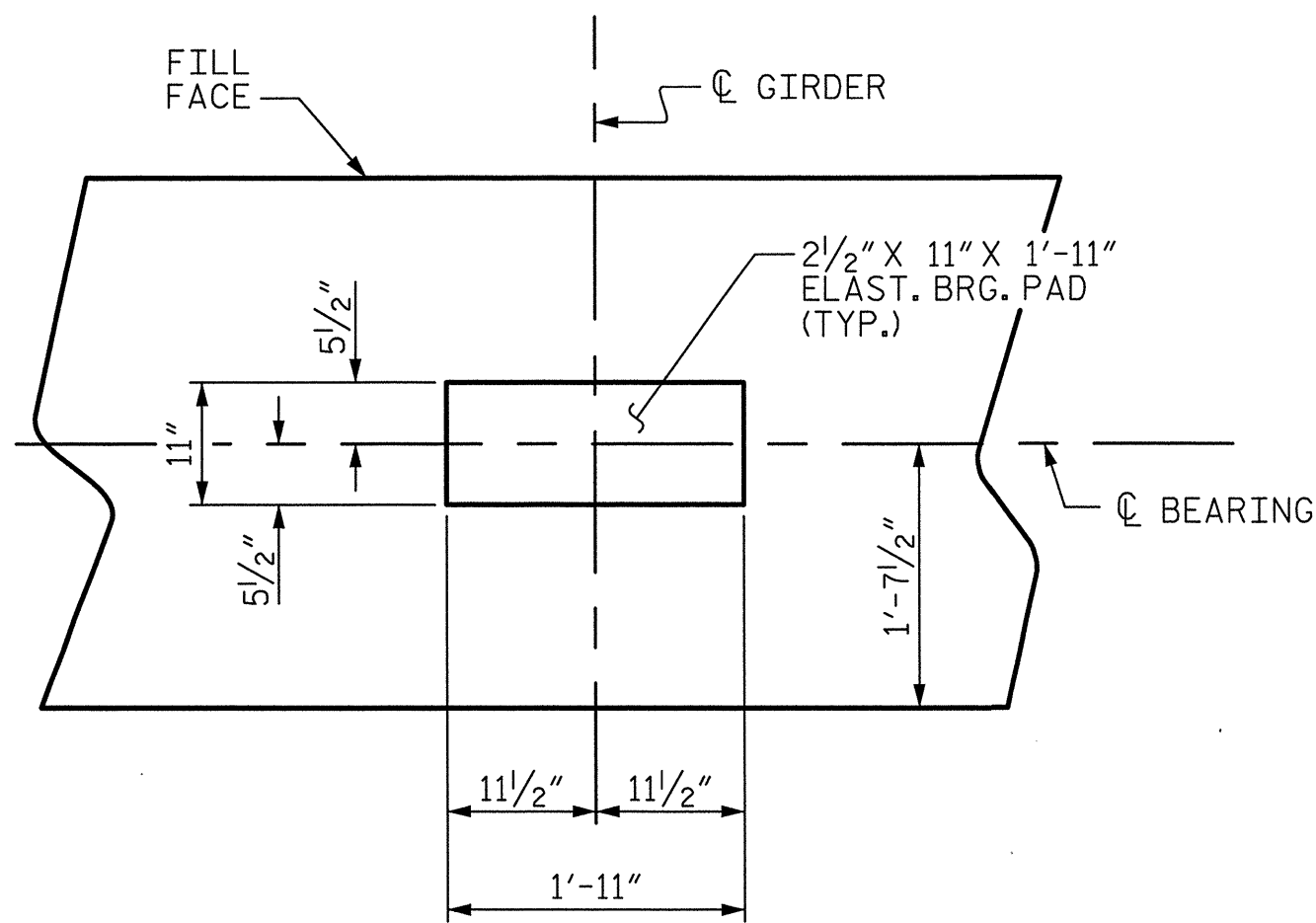
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

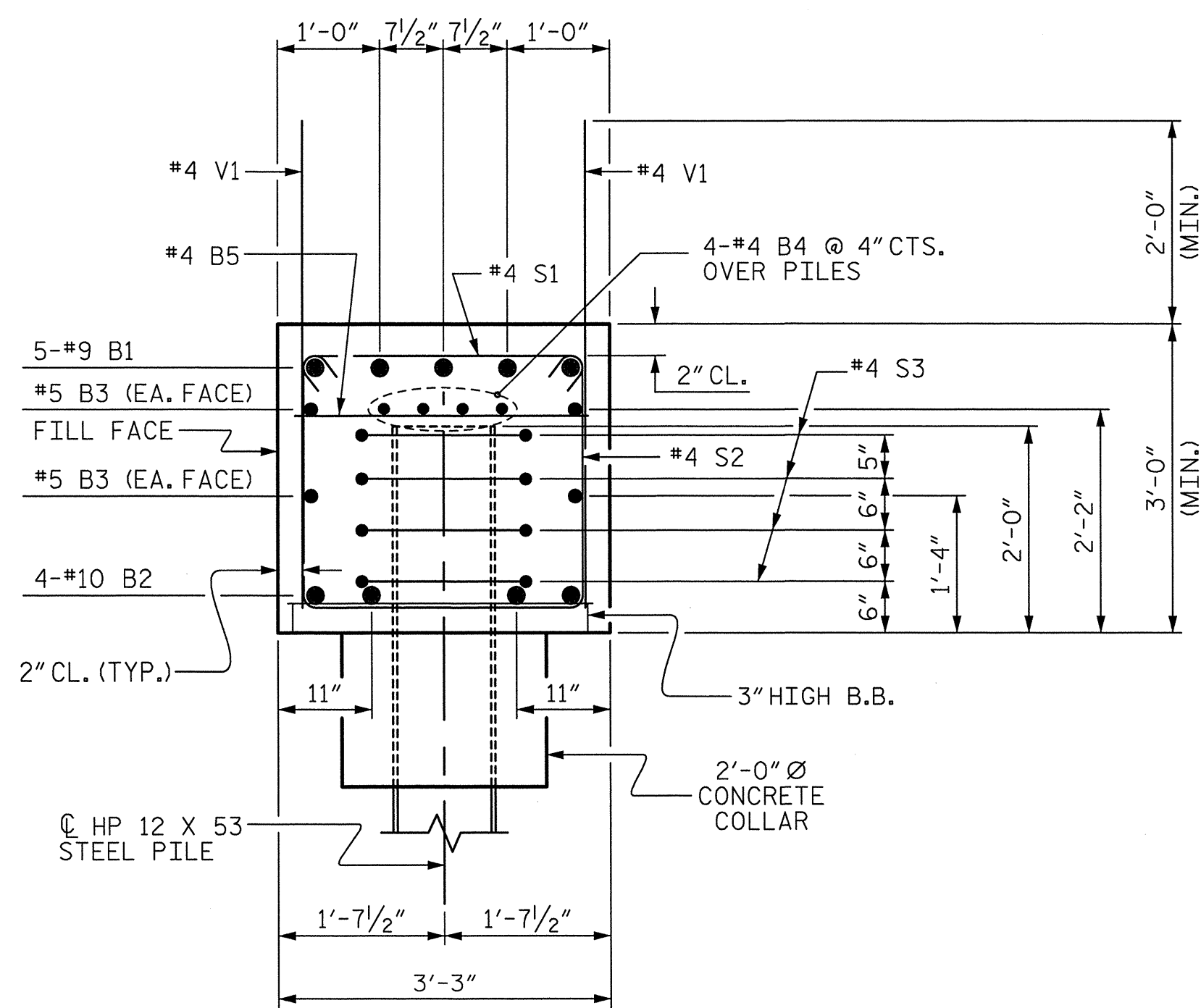
TEMPORARY DRAINAGE AT END BENT



PILE SPLICE DETAILS

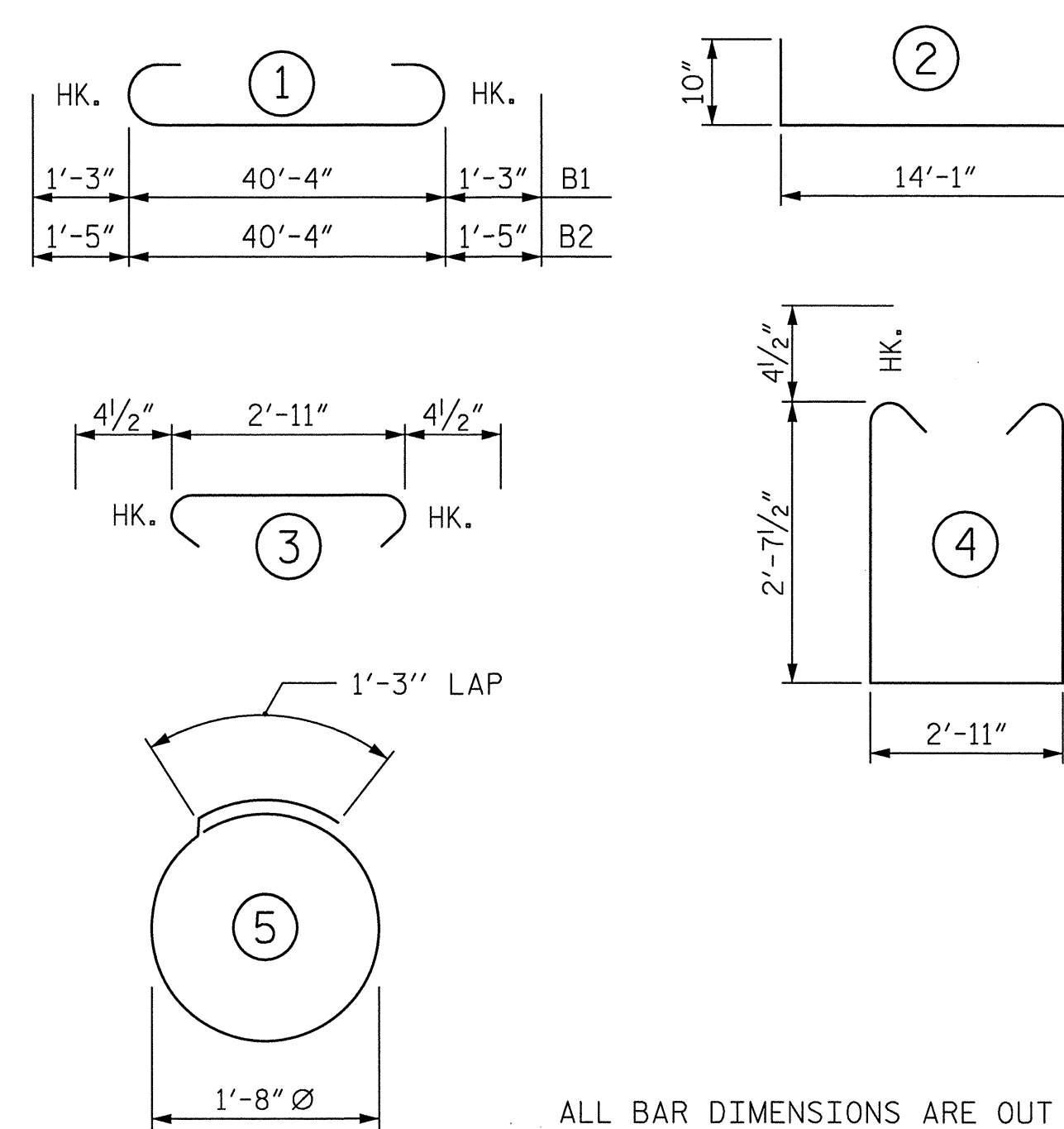


DETAIL "A"
(TYP. EA. GDR.)



SECTION A-A

BAR TYPES



BILL OF MATERIAL

END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	9	1	42'-10"	728
B2	4	10	1	43'-2"	743
B3	4	5	STR	40'-4"	168
B4	8	4	STR	21'-4"	114
B5	11	4	STR	2'-11"	21
H1	24	5	2	14'-11"	373
S1	54	4	3	3'-8"	132
S2	54	4	4	8'-11"	322
S3	28	4	5	6'-6"	122
V1	66	4	STR	5'-2"	228
V2	48	4	STR	8'-8"	278
REINFORCING STEEL					3229 LBS.
CLASS A CONCRETE BREAKDOWN					
POUR #1 CAP, COLLAR, & LOWER PART OF WINGS					20.0 C.Y.
TOTAL CLASS A CONCRETE					20.0 C.Y.
HP 12 X 53 STEEL PILES					
No: 7					LIN. FT.= 245
STEEL PILE POINTS					No: 7

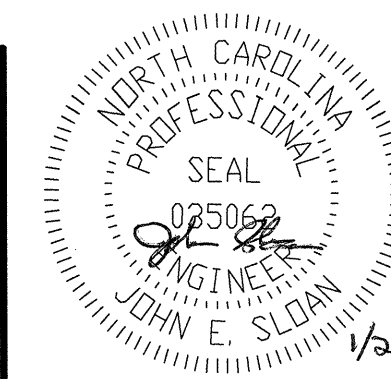
PROJECT NO. P-5208B
CABARRUS COUNTY
 STATION: 25+41.22 -L-

SHEET 3 OF 3

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

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

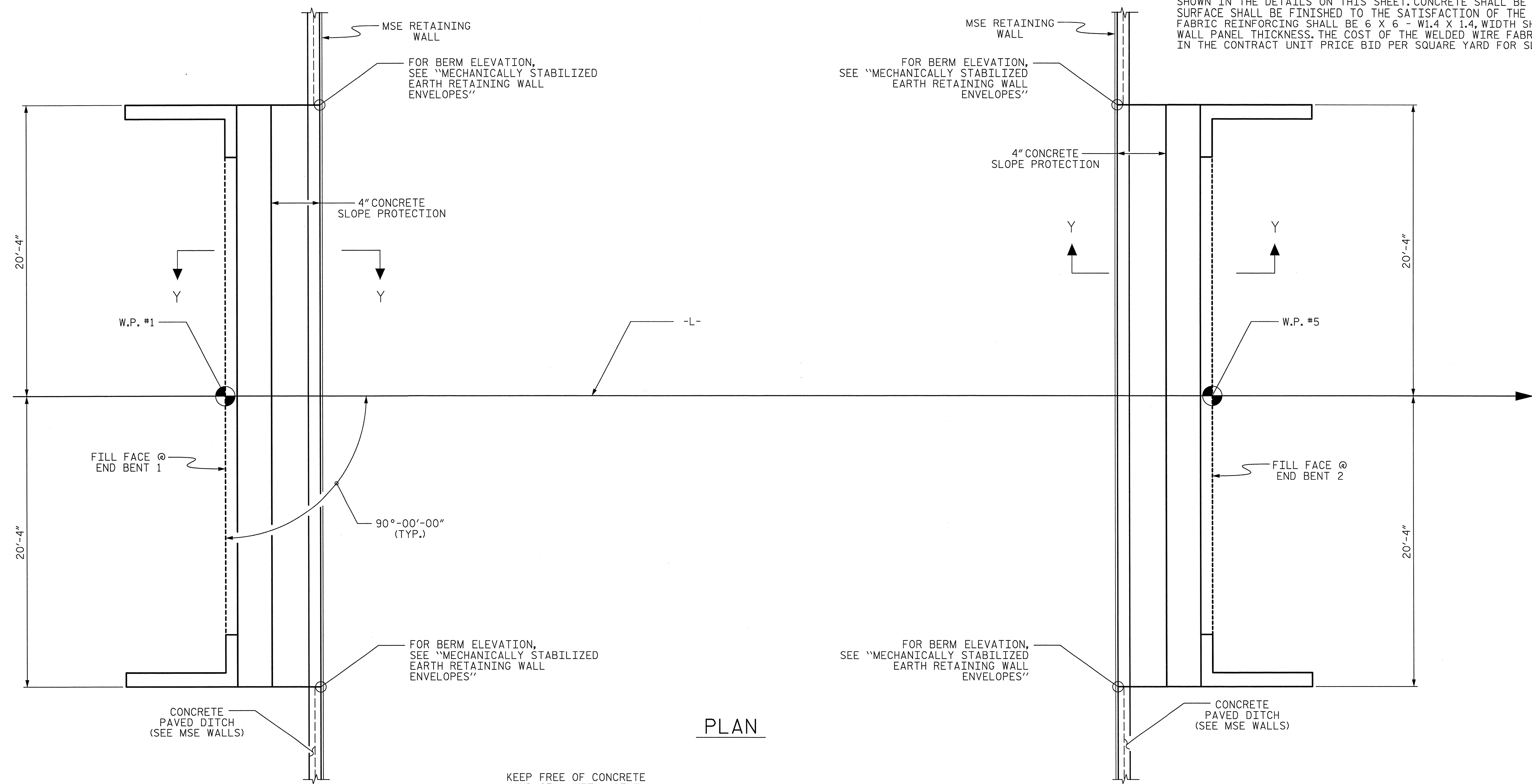
DRAWN BY : M. K. TOM DATE : 9/25/12
 CHECKED BY : K. H. COMPTON DATE : 10/17/12



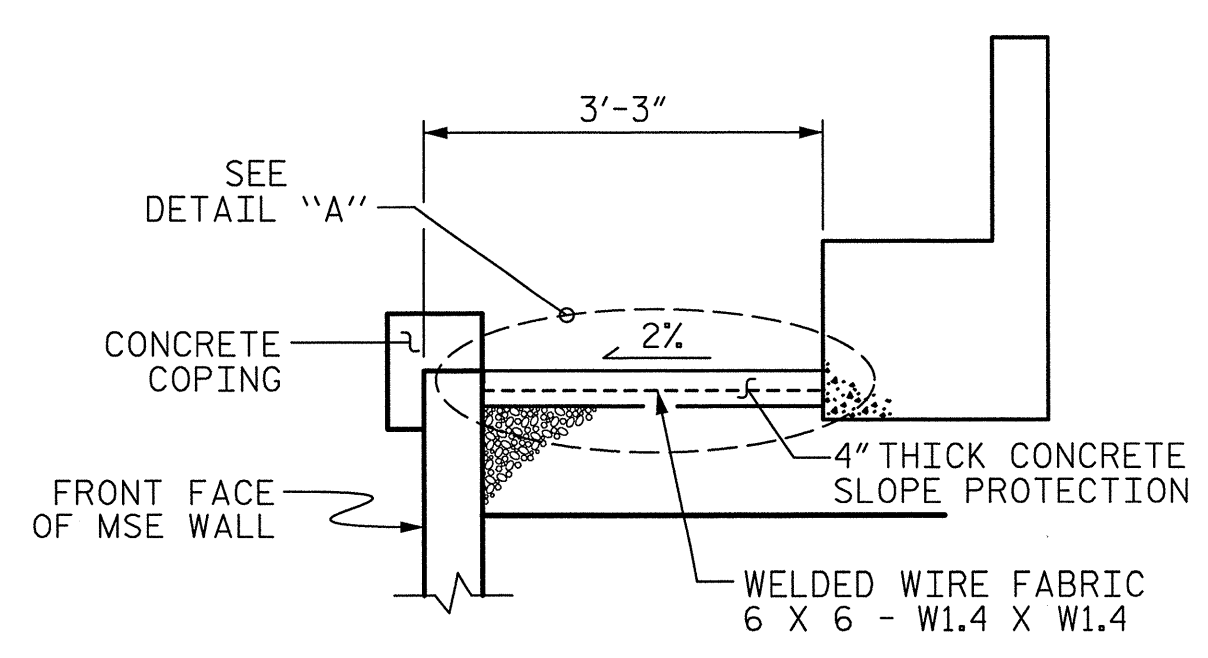
NOTES

SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS.

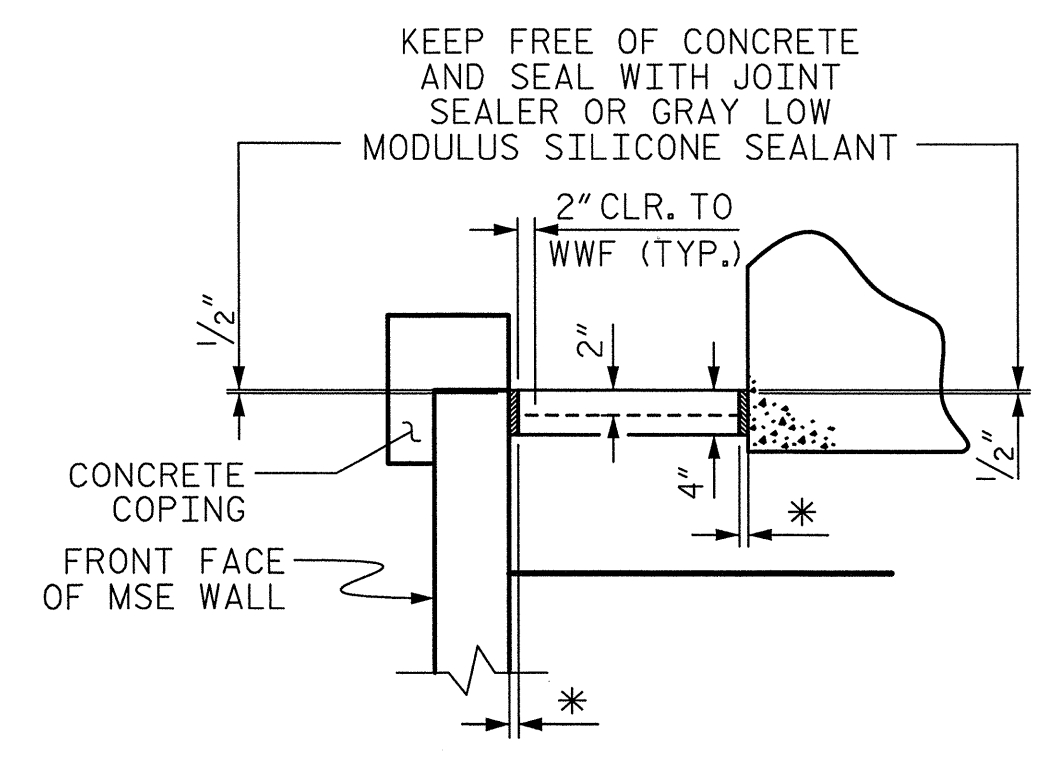
SLOPE PROTECTION SHALL CONSIST OF 4"POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FINISHED TO THE SATISFACTION OF THE ENGINEER. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X 1.4, WIDTH SHALL DEPEND UPON MSE WALL PANEL THICKNESS. THE COST OF THE WELDED WIRE FABRIC SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.



PLAN



SECTION Y-Y



DETAIL A
* 1" EXP. JT. MAT'L.
(PLACE DEBONDING TAPE ON TOP OF EXP. JT. MAT'L.)

BRIDGE @ STATION 25+41.22 -L-	4" SLOPE PROTECTION	WELDED WIRE FABRIC
	SQUARE YARDS	APPROX. L.F.
END BENT 1	13.2	40.7
END BENT 2	13.2	40.7
TOTAL	26.4	81.4

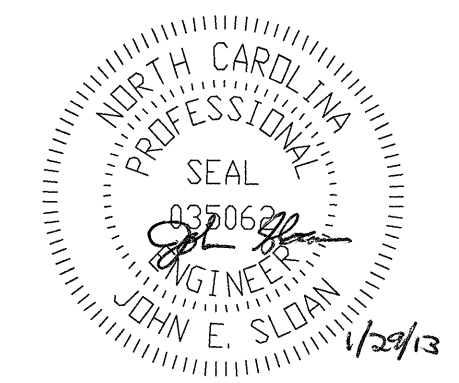
PROJECT NO. P-5208B
CABARRUS COUNTY
STATION: 25+41.22 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SLOPE PROTECTION DETAILS

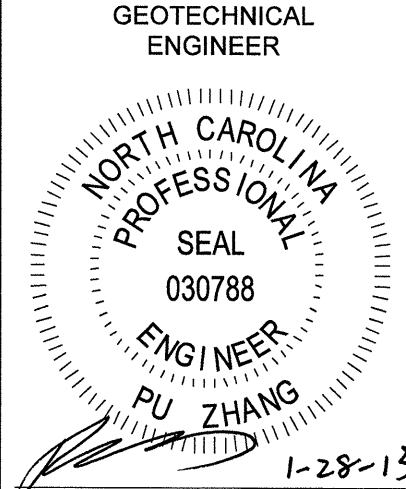
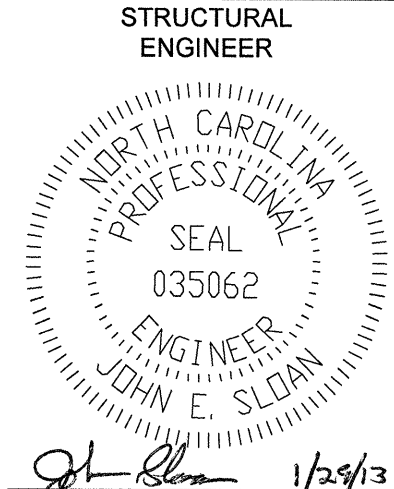
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	DATE:	TOTAL SHEETS
1			3		S-43
2			4		48

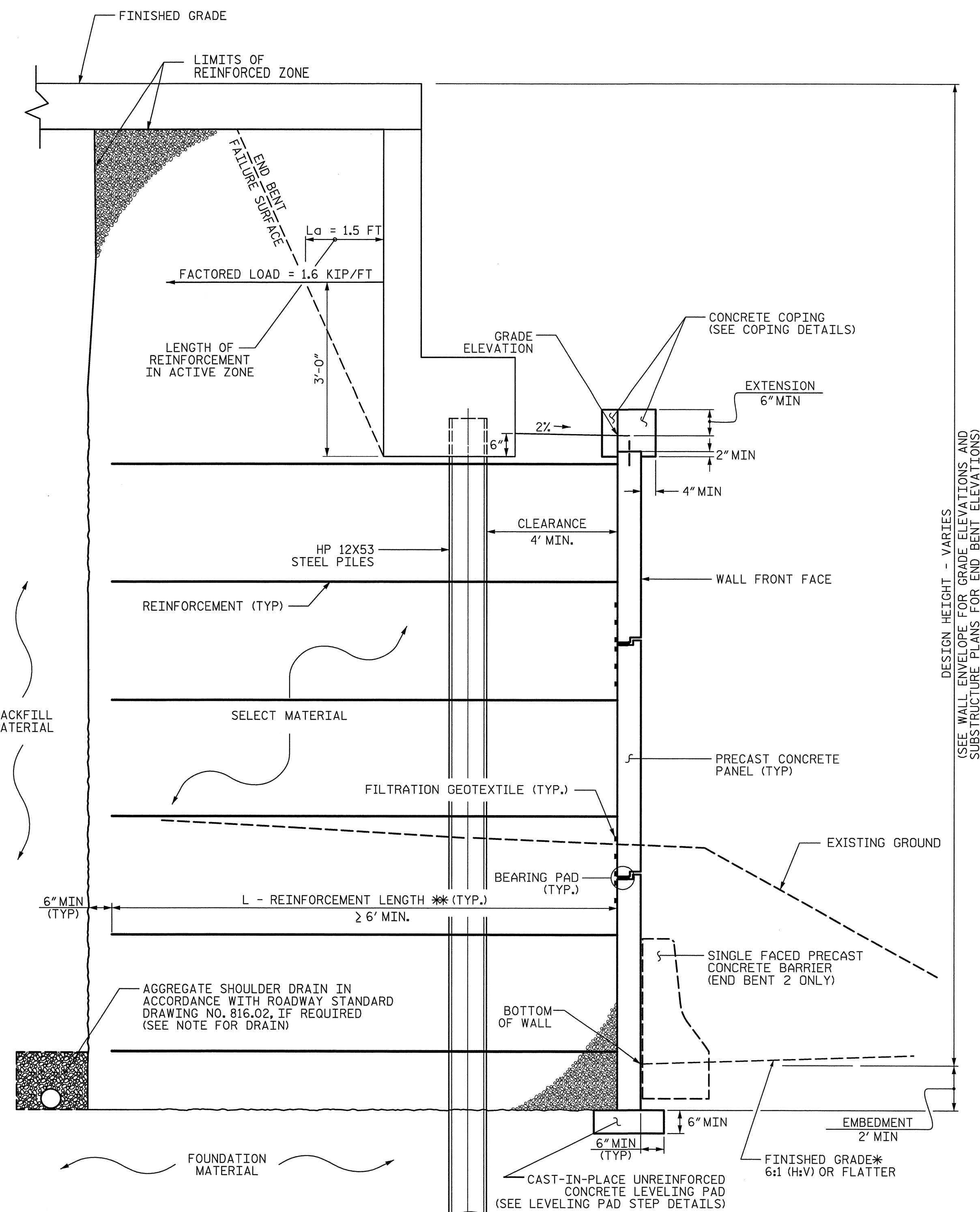
Prepared by
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PHONE: 919-461-1100 FAX: 919-461-1415
NC LIC. # C-2243



DRAWN BY : K.H. COMPTON DATE : 11/9/12
CHECKED BY : J.E. SLOAN DATE : 11/9/12

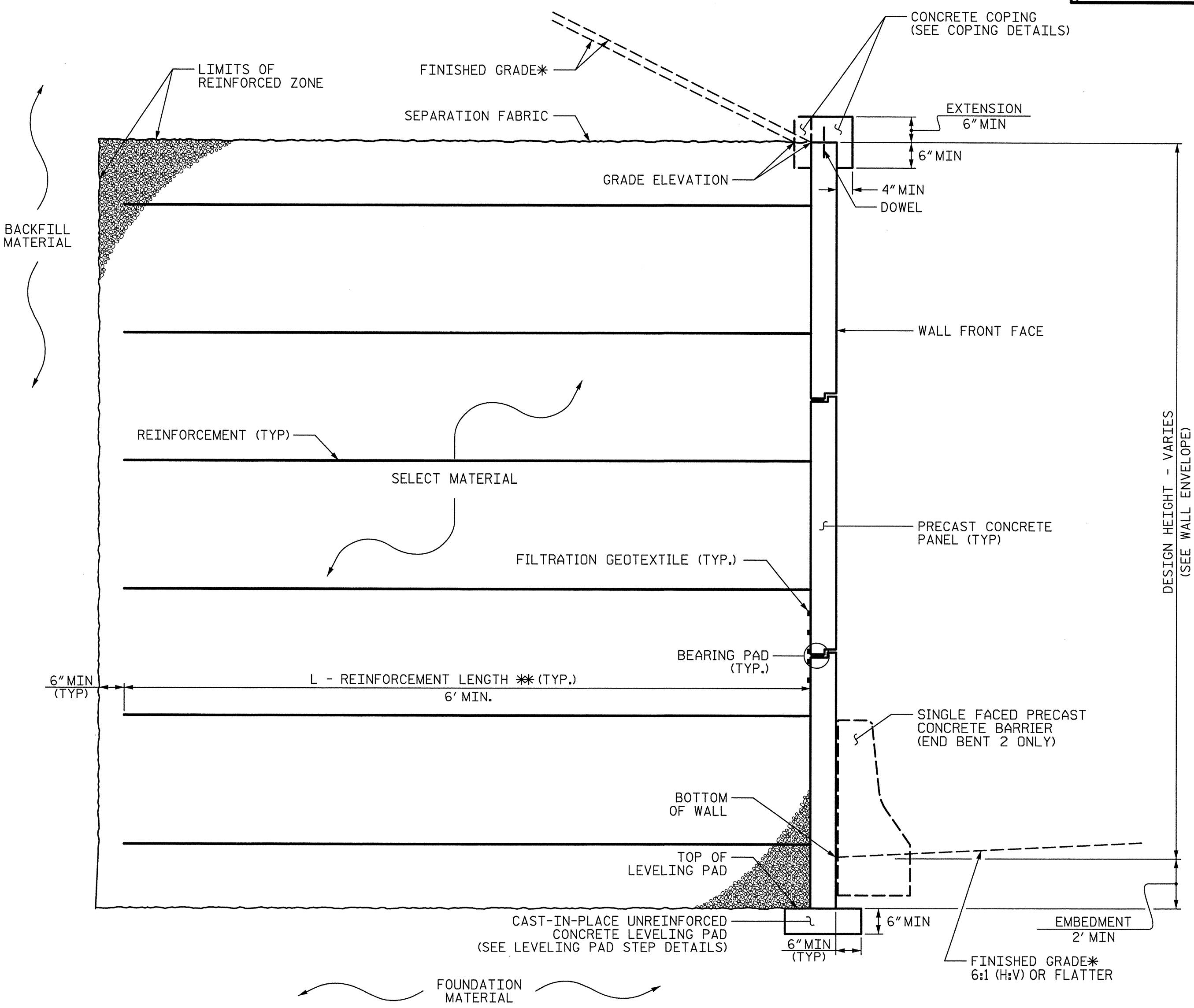
DCN: 003SDDEL_P1002

GEOTECHNICAL ENGINEER  PU ZHANG SIGNATURE DATE	STRUCTURAL ENGINEER  JOHN E. SLOAN SIGNATURE DATE
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MSE WALL WITH PRECAST PANELS TYPICAL SECTION AT BRIDGE

*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.
 **SEE MSE RETAINING WALLS PROVISION FOR EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.



MSE WALL WITH PRECAST PANELS TYPICAL SECTION

*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.
 **SEE MSE RETAINING WALLS PROVISION FOR EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.

PROJECT NO. P-5208B
 CABARRUS COUNTY
 STATION: 25+41.22 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
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MECHANICALLY STABILIZED EARTH WALLS TYPICAL SECTIONS

REVISIONS				SHEET NO.		
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			48
2			4			

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 CHECKED BY : J.E. SLOAN DATE : 11/9/12

1/8/2013
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 kyle.compton

GEOTECHNICAL ENGINEER PU ZHANG 4/10/13	STRUCTURAL ENGINEER JOHN E. SLOAN 4/19/13
---	--

NOTES:

FOR MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALLS, SEE MECHANICALLY STABILIZED EARTH RETAINING WALLS PROVISION.

FOR STEEL BEAM GUARDRAIL, SEE ROADWAY PLANS AND SECTION 862 OF THE STANDARD SPECIFICATIONS.

FOR SINGLE FACED PRECAST CONCRETE BARRIER, SEE ROADWAY PLANS AND SECTION 857 OF THE STANDARD SPECIFICATIONS.

USE COARSE AGGREGATE IN THE REINFORCED ZONES FOR RETAINING WALLS NO. 1 & NO. 2.

USE AN MSE WALL SYSTEM WITH PRECAST CONCRETE PANELS THAT MEET SECTION 1077 OF THE STANDARD SPECIFICATIONS FOR RETAINING WALL NO. 1 & NO. 2.

CAST-IN-PLACE REINFORCED CONCRETE COPING IS REQUIRED FOR RETAINING WALL NO. 1 & NO. 2.

A DRAIN IS REQUIRED FOR RETAINING WALL NO. 1 & NO. 2.

BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALL NO. 1 & NO. 2, SURVEY WALL LOCATION AND SUBMIT A REVISED WALL PROFILE VIEW (WALL ENVELOPE) FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THE REVISED WALL ENVELOPE IS ACCEPTED.

DESIGN RETAINING WALL NO. 1 & NO. 2 FOR THE FOLLOWING:

- 1) H = DESIGN HEIGHT + EMBEDMENT
- 2) DESIGN LIFE = 100 YEARS
- 3) MAXIMUM FACTORED VERTICAL STRESS ON FOUNDATION MATERIAL = 5,000 LB/SF
- 4) MINIMUM REINFORCEMENT LENGTH (L) TO WALL HEIGHT (H) RATIO = 1.2
- 5) MINIMUM EMBEDMENT = 3 FT
- 6) AGGREGATE PARAMETERS:

AGGREGATE TYPE*	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (φ) DEGREES	COHESION (c) LB/SF
COARSE	110	38	0

*SEE MSE RETAINING WALLS PROVISION FOR COARSE AND FINE AGGREGATE MATERIAL REQUIREMENTS.

7) IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (φ) DEGREES	COHESION (c) LB/SF
BACKFILL	120	30	0
FOUNDATION	120	24	0

DESIGN RETAINING WALL NO. 1 & NO. 2 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

DESIGN REINFORCEMENT CONNECTED TO END BENT CAPS FOR FACTORED LOAD AND LENGTH OF REINFORCEMENT IN ACTIVE ZONE (L_a) SHOWN. CAST REINFORCEMENT CONNECTORS INTO CAP BACKWALL FOR END BENT NO. 1 & NO. 2 LOCATED AT STATION 22+59 & 26+08. MAINTAIN A CLEARANCE OF AT LEAST 3" BETWEEN CONNECTORS AND REINFORCING STEEL IN CAP.

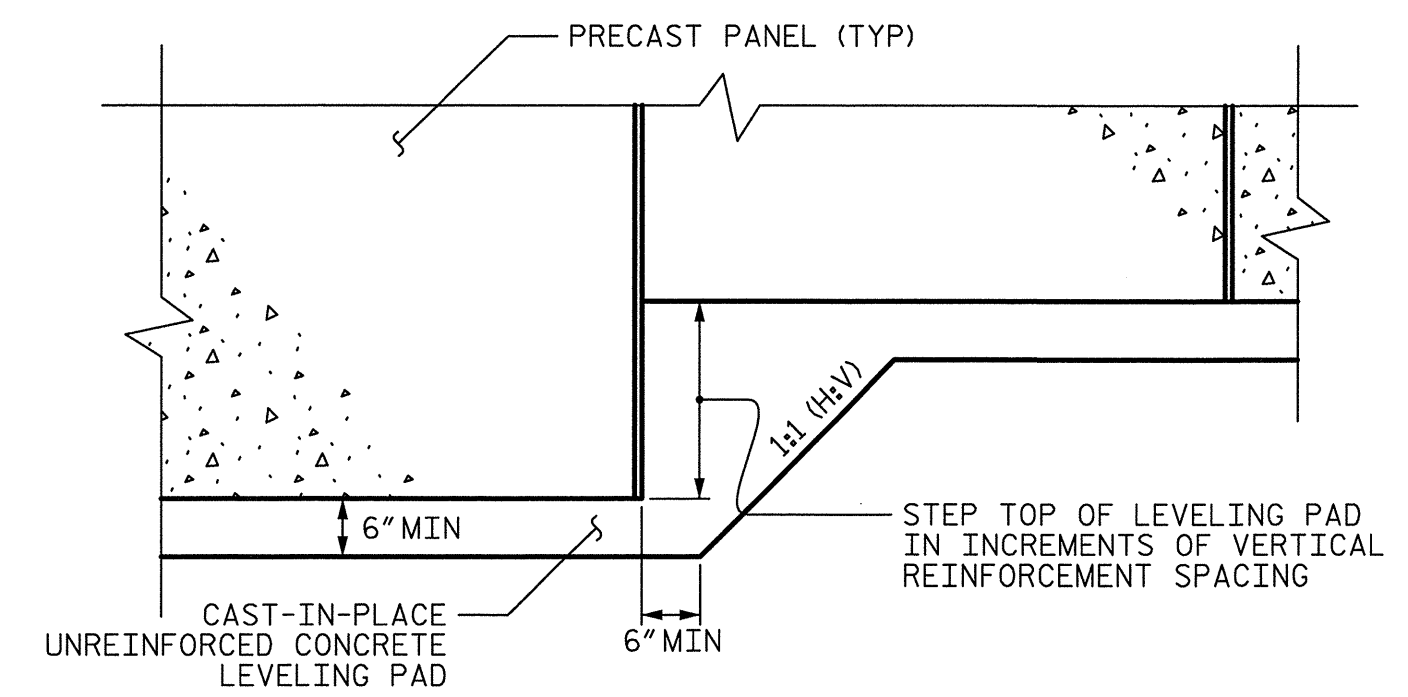
THE END BENT CAPS AND BACKWALLS ARE INTEGRAL WITH THE SUPERSTRUCTURE, AND THE ANTICIPATED THERMAL MOVEMENT OF EACH END BENT IS 3/16" IN EITHER DIRECTION. THE MSE WALL ENGINEER SHALL ACCOUNT FOR THIS THERMAL MOVEMENT IN THE MSE WALL DESIGN.

FOUNDATIONS FOR END BENT NO. 1 & NO. 2 LOCATED AT STATION 22+59 & 26+08 WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. 1 & NO. 2. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALL NO. 1 & NO. 2 UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.

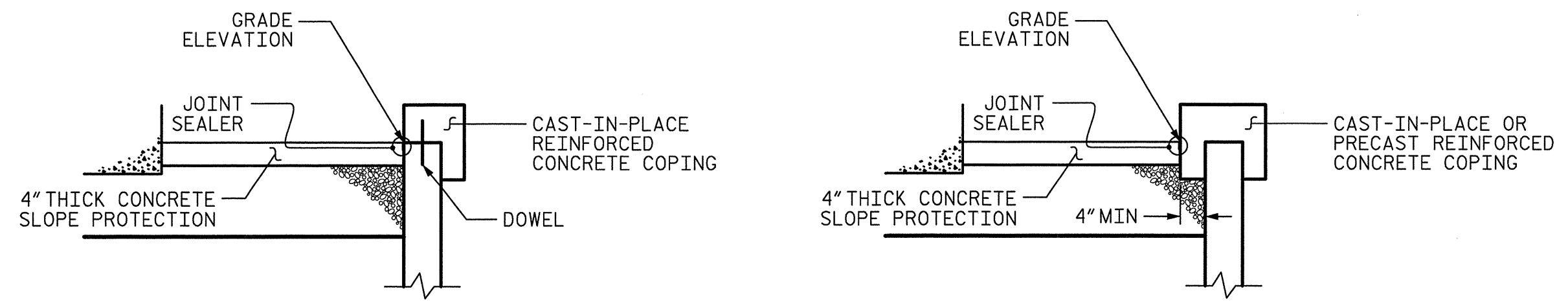
AT THE CONTRACTOR'S OPTION, "TEMPORARY SHORING FOR WALL CONSTRUCTION" MAY BE USED TO CONSTRUCT RETAINING WALL NO. 1 & NO. 2. SEE MSE RETAINING WALLS PROVISION FOR TEMPORARY SHORING FOR WALL CONSTRUCTION.

THE PRECAST CONCRETE PANELS FOR RETAINING WALL NO. 1 & NO. 2 SHALL BE RECTANGULAR IN SHAPE WITH ALL PANELS LINED UP IN THE VERTICAL DIRECTION.

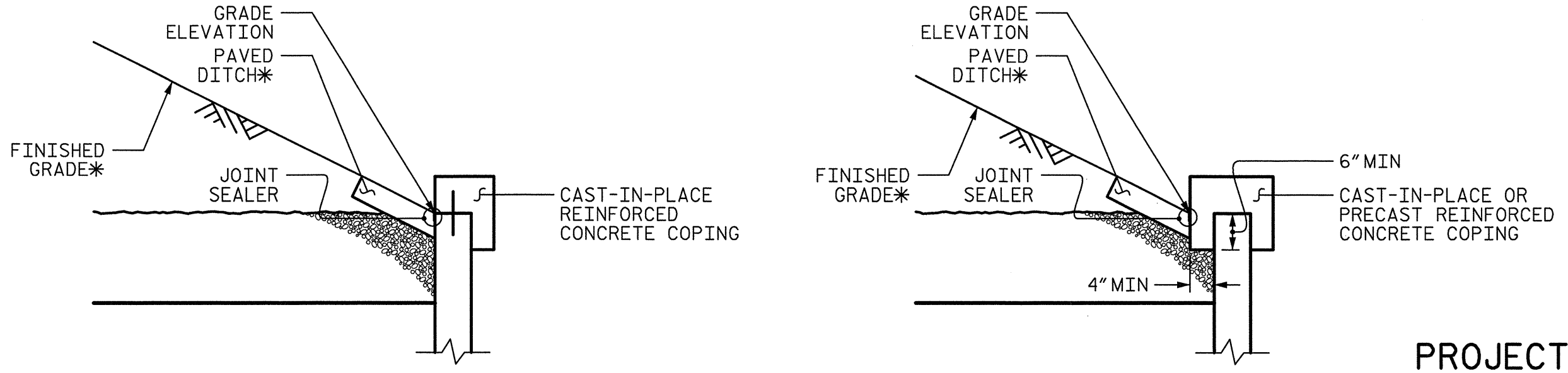


PRECAST CONCRETE PANELS

LEVELING PAD STEP DETAILS



COPING DETAILS @ BRIDGE



COPING DETAILS

AT THE CONTRACTOR'S OPTION, CONNECT COPING TO PANELS WITH DOWELS OR EXTEND COPING DOWN BACK OF PANELS.
*SEE ROADWAY PLANS FOR FINISHED GRADE AND/OR DITCH DETAILS.

MSE WALL QUANTITIES (SQUARE FEET)	
MSE RETAINING WALL NO. 1	2458
MSE RETAINING WALL NO. 2	2151

PROJECT NO. P-5208B
CABARRUS COUNTY
 STATION: 25+41.22 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
MECHANICALLY STABILIZED EARTH RETAINING WALL NOTES AND STEP DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			48
2			4			

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 NC LIC. # C-2243

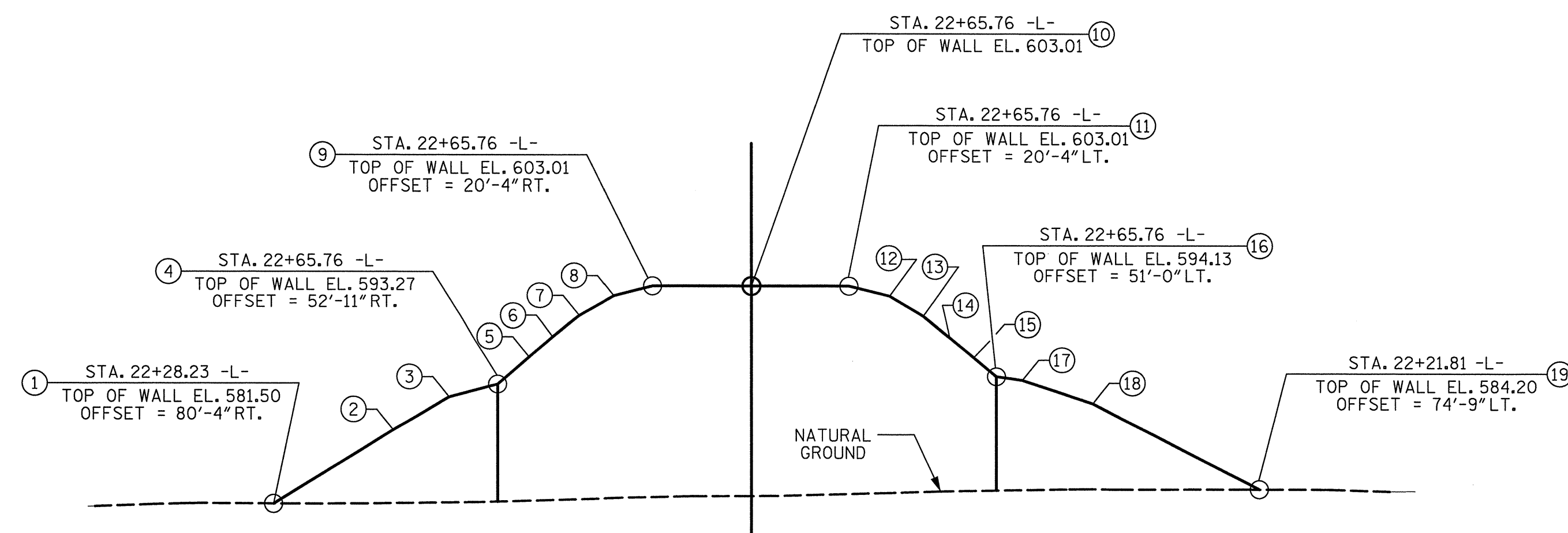
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 CHECKED BY : J.E. SLOAN DATE : 11/9/12

DCN: 005DEL_P10a2

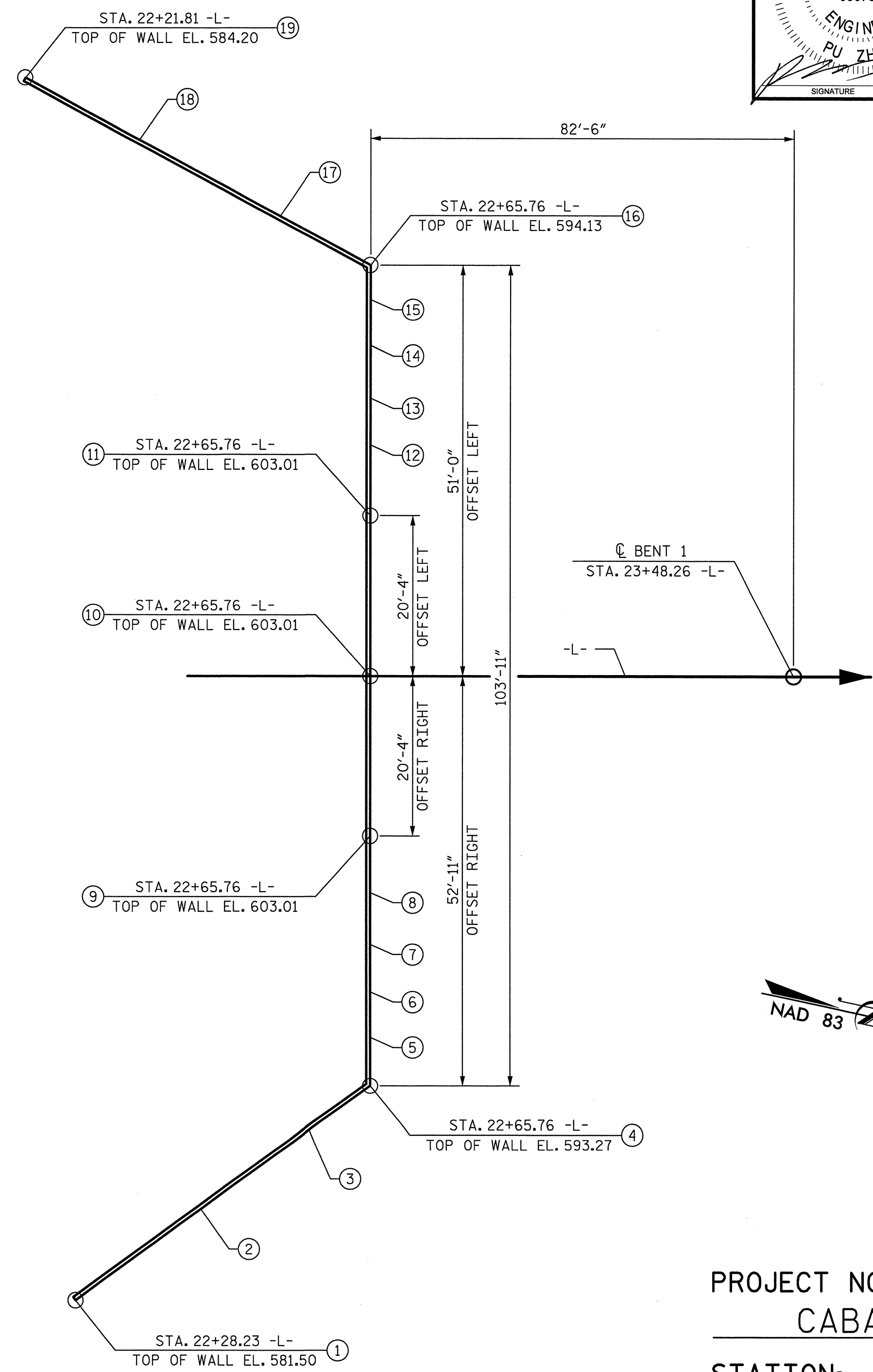
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TABLE OF STATIONS, OFFSETS, AND ELEVATIONS

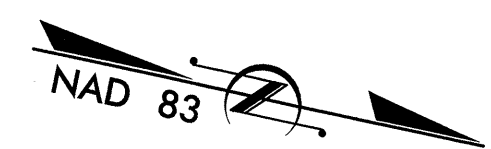
LOCATION	-L- STA.	-L- OFFSET (FT.)	TOP OF WALL ELEVATION (FT.)
1	22+28.23	80'-4" RT.	581.50
2	22+48.09	65'-10" RT.	588.83
3	22+57.65	58'-10" RT.	592.00
4	22+65.76	52'-11" RT.	593.27
5	22+65.76	46'-4" RT.	596.00
6	22+65.76	41'-4" RT.	598.00
7	22+65.76	35'-10" RT.	600.00
8	22+65.76	28'-10" RT.	602.00
9	22+65.76	20'-4" RT.	603.01
10	22+65.76	0'-0"	603.01
11	22+65.76	20'-4" LT.	603.01
12	22+65.76	28'-10" LT.	602.00
13	22+65.76	35'-10" LT.	600.00
14	22+65.76	41'-4" LT.	598.00
15	22+65.76	46'-4" LT.	596.00
16	22+65.76	51'-0" LT.	594.13
17	22+61.09	53'-6" LT.	593.75
18	22+48.09	60'-7" LT.	591.46
19	22+21.81	74'-9" LT.	584.20



WALL 1 ELEVATION VIEW (FRONT FACE)
@ END BENT 1



WALL 1 PLAN VIEW
@ END BENT 1



PROJECT NO. P-5208B
CABARRUS COUNTY
 STATION: 25+41.22 -L-
 SHEET 3 OF 4

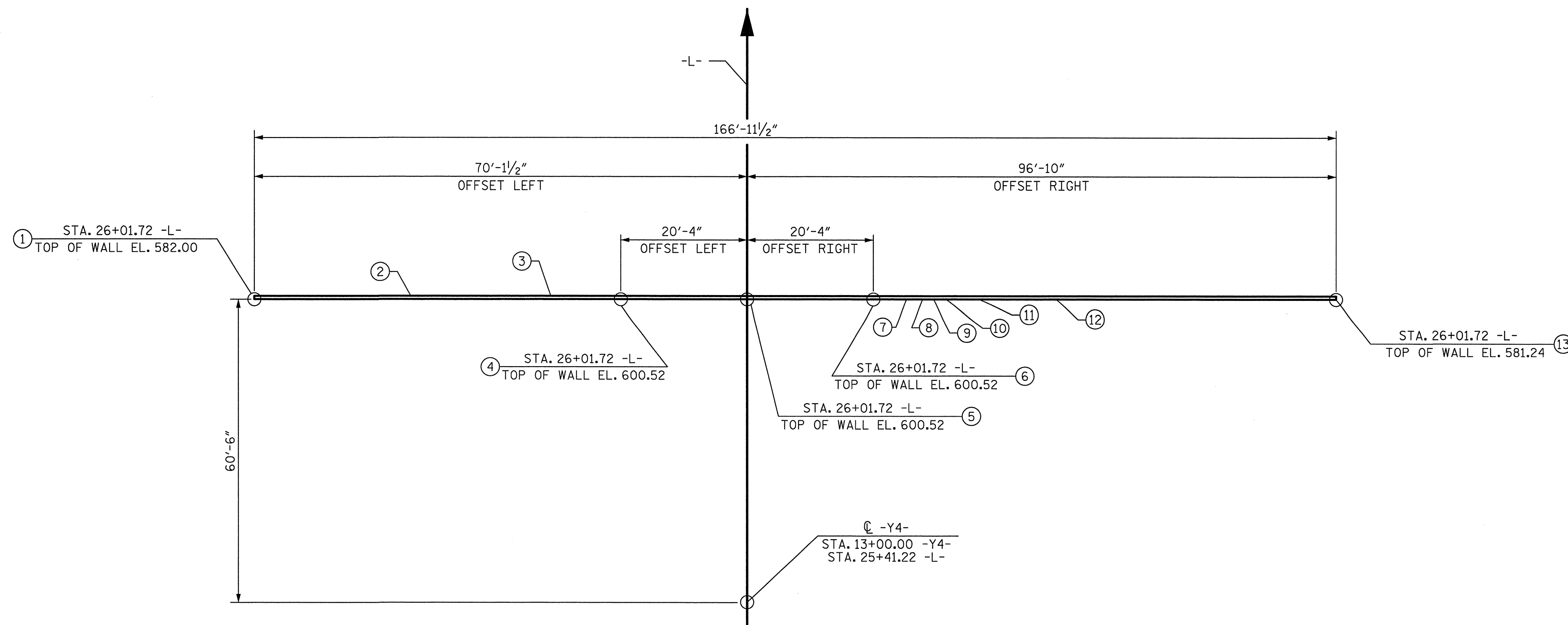
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 MECHANICALLY
 STABILIZED
 EARTH RETAINING
 WALL ENVELOPES
 END BENT 1

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

DRAWN BY : K.H. COMPTON DATE : 10/30/12
 CHECKED BY : J.E. SLOAN DATE : 11/9/12

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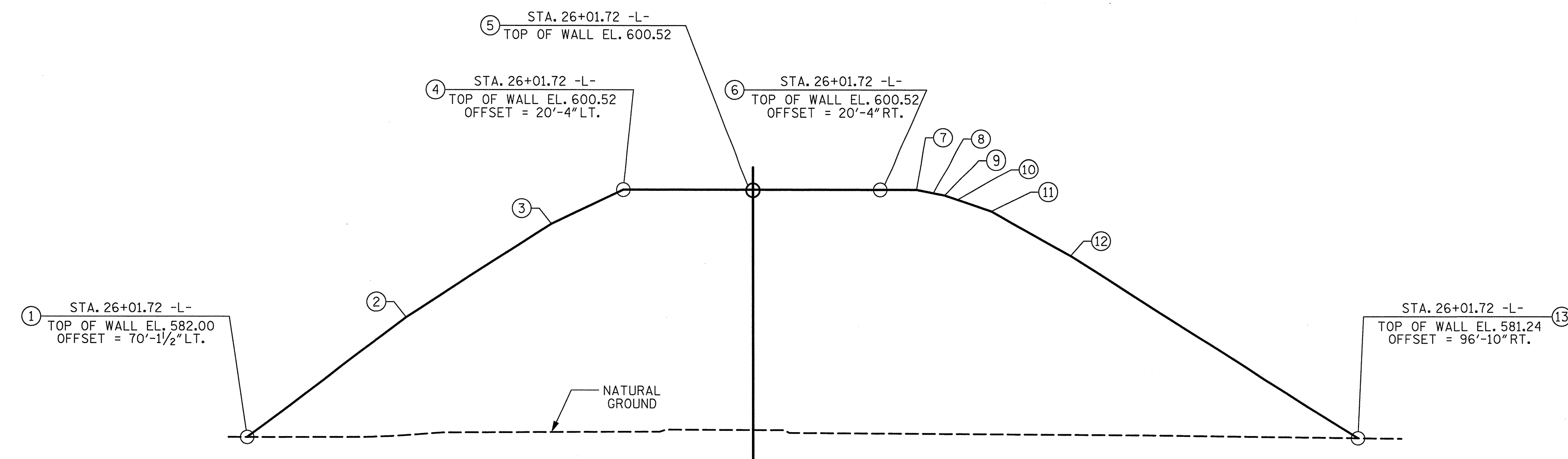
GEOTECHNICAL ENGINEER PU ZHANG SIGNATURE DATE	STRUCTURAL ENGINEER JOHN E. SLOAN SIGNATURE DATE
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WALL 2 PLAN VIEW
@ END BENT 2

TABLE OF STATIONS, OFFSETS, AND ELEVATIONS

LOCATION	-L- OFFSET (FT.)	TOP OF WALL ELEVATION (FT.)
1	70'-1 1/2" LT.	582.00
2	52'-9" LT.	590.00
3	31'-10" LT.	598.00
4	20'-4" LT.	600.52
5	0'-0"	600.52
6	20'-4" RT.	600.52
7	26'-7" RT.	600.44
8	28'-4" RT.	600.34
9	30'-3" RT.	600.16
10	32'-4" RT.	599.89
11	37'-6" RT.	598.95
12	50'-1" RT.	595.79
13	96'-10" RT.	581.24



WALL 2 ELEVATION VIEW (FRONT FACE)
@ END BENT 2

PROJECT NO. P-5208B
CABARRUS COUNTY
 STATION: 25+41.22 -L-
 SHEET 4 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

MECHANICALLY STABILIZED EARTH RETAINING WALL ENVELOPES END BENT 2

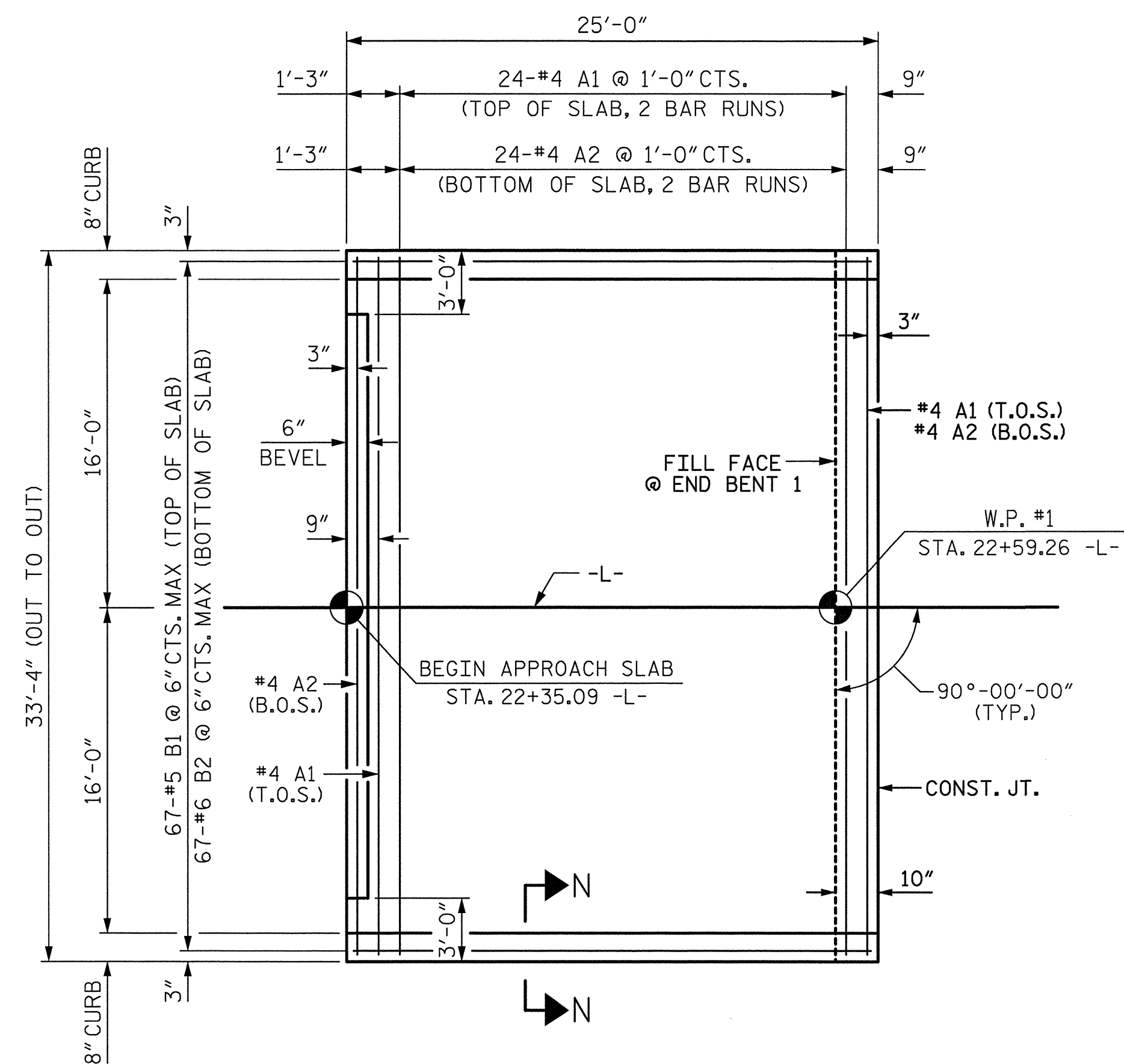
REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	

S-47
TOTAL SHEETS
48

DRAWN BY : K.H. COMPTON DATE : 10/30/12
 CHECKED BY : J.E. SLOAN DATE : 11/9/12

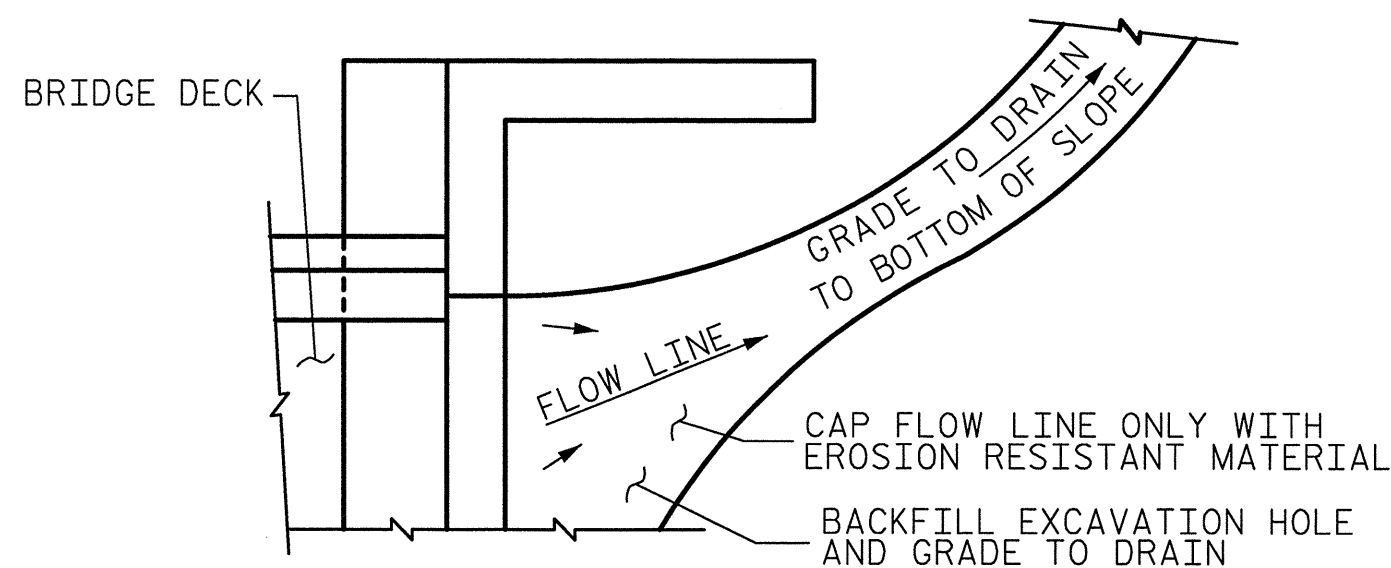
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 NO. LIC. # C-2243

DCN: 005DEL_P10a2



PLAN OF APPROACH SLABS

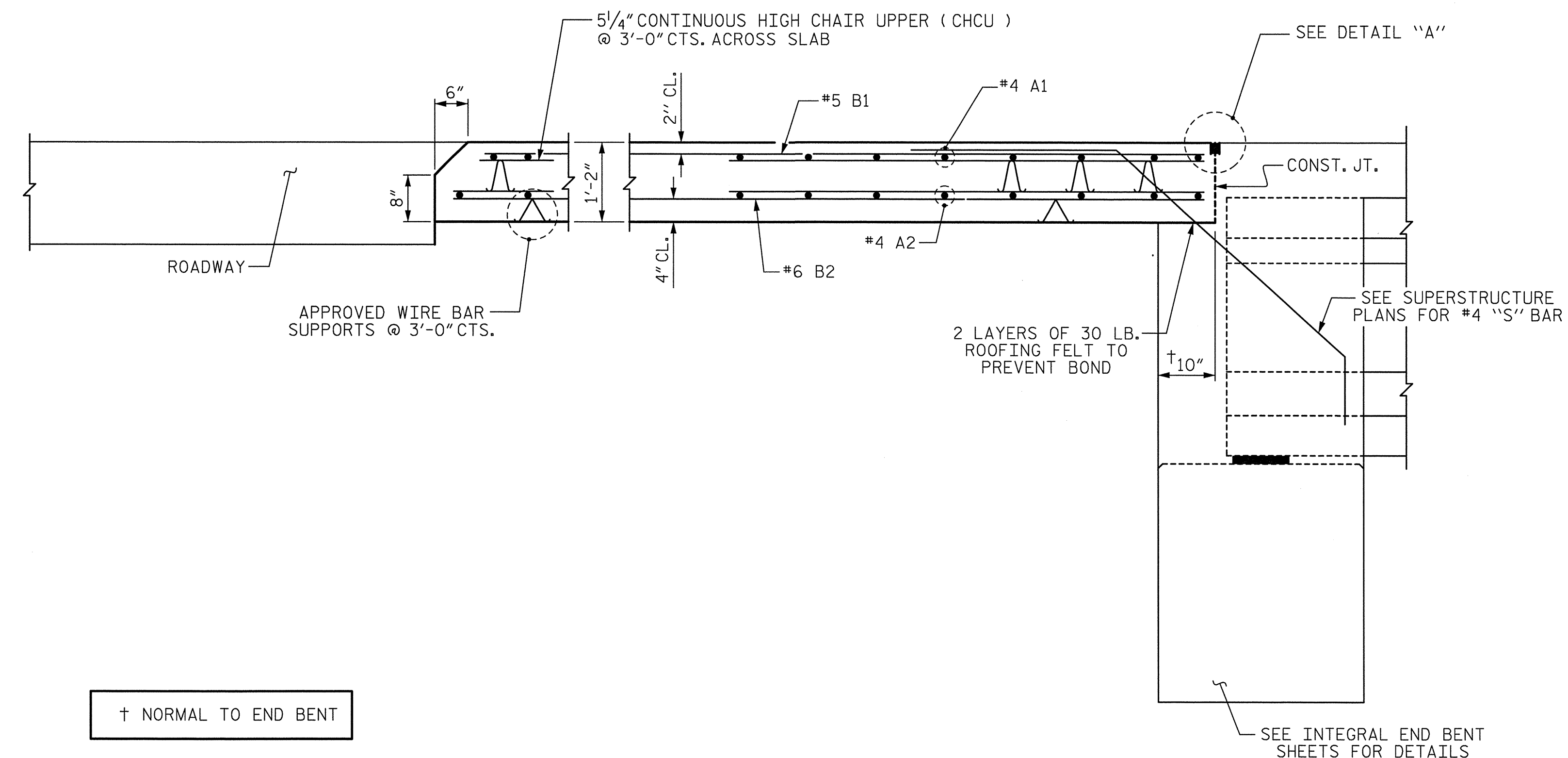
BOTH APPROACH SLABS ARE SIMILAR
 T.O.S. - DENOTES TOP OF SLAB
 B.O.S. - DENOTES BOTTOM OF SLAB



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

TEMPORARY DRAINAGE DETAIL

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



SECTION THRU SLAB

† NORMAL TO END BENT

ASSEMBLED BY : R.L. WHITCHER	DATE : 10/17/12
CHECKED BY : K.H. COMPTON	DATE : 10/22/12
DRAWN BY : TLA 10/05	ADDED 5/1/06RR KMM/GM
CHECKED BY : GM 5/06	REV. 10/1/11 MAA/GM
	REV. 12/21/11 MAA/GM

1/8/2013
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 kyle.compton

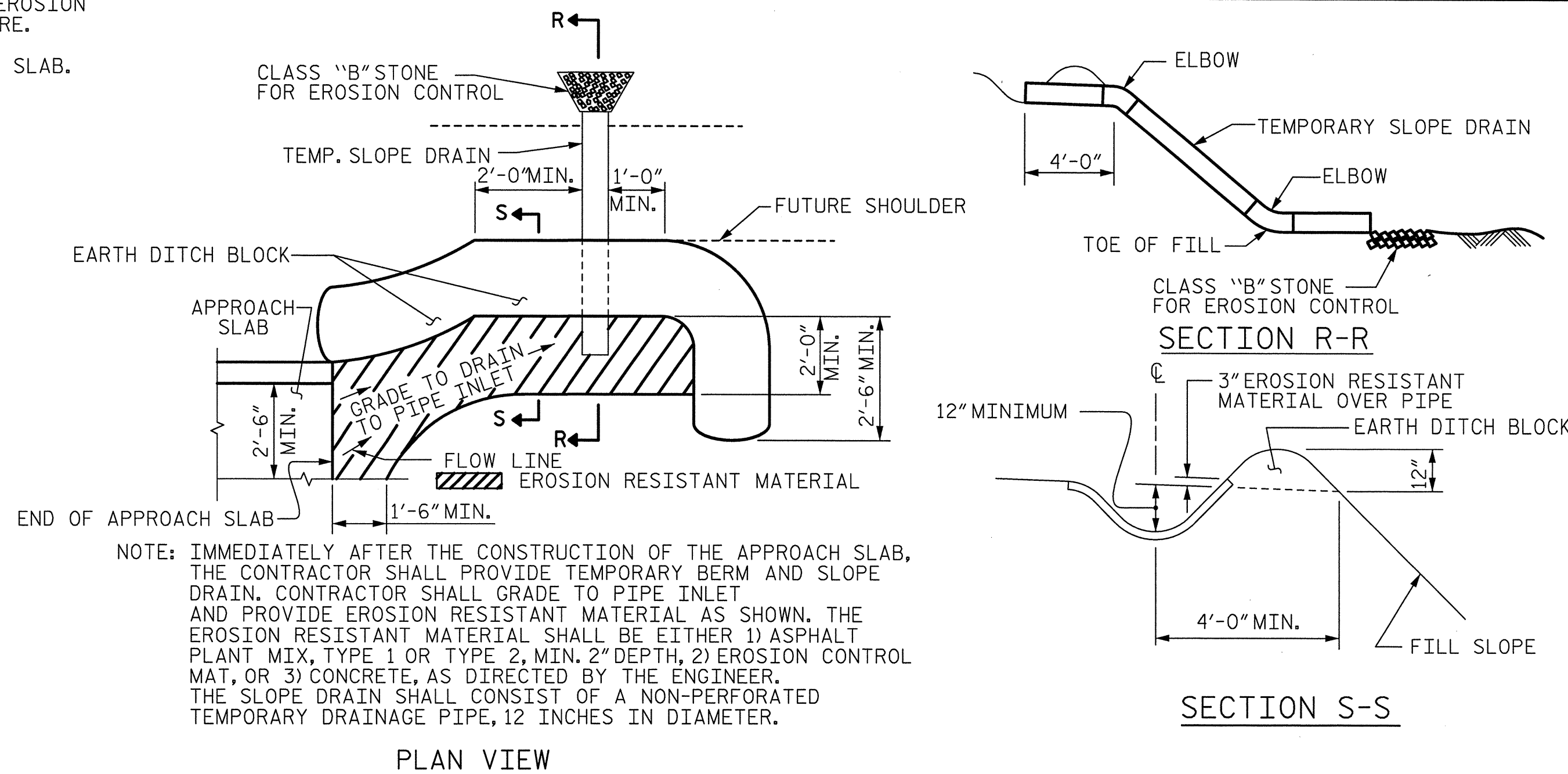
NOTES

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

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

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

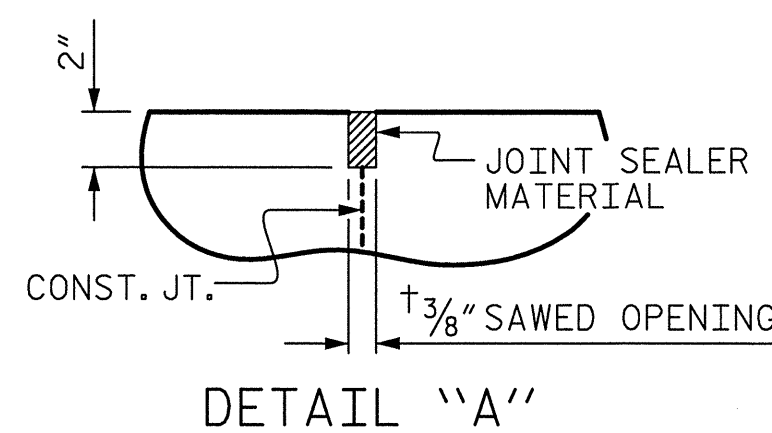
THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWED NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.



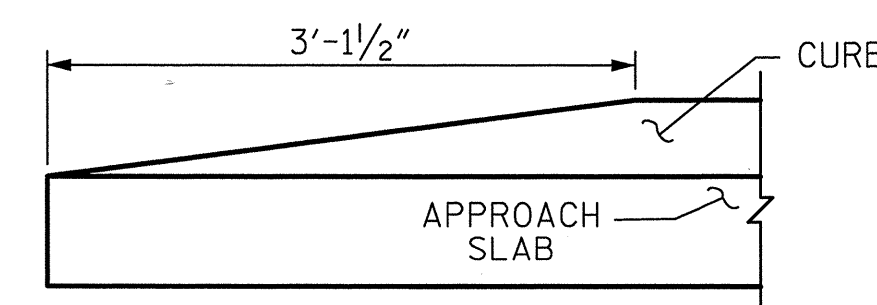
PLAN VIEW

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



DETAIL "A"



SECTION N-N

END OF CURB WITHOUT SHOULDER BERM GUTTER

BILL OF MATERIAL

FOR ONE APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	52	#4	STR	17'-6"	608
A2	52	#4	STR	17'-5"	605
* B1	67	#5	STR	24'-2"	1689
B2	67	#6	STR	24'-8"	2482

REINFORCING STEEL LBS. 3087

* EPOXY COATED REINFORCING STEEL LBS. 2297

CLASS AA CONCRETE C.Y. 36.5

PROJECT NO. P-5208B
 CABARRUS COUNTY
 STATION: 25+41.22 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 BRIDGE APPROACH SLAB
 FOR INTEGRAL ABUTMENT

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

S-48
 TOTAL SHEETS
 48

STD. NO. BAS5

