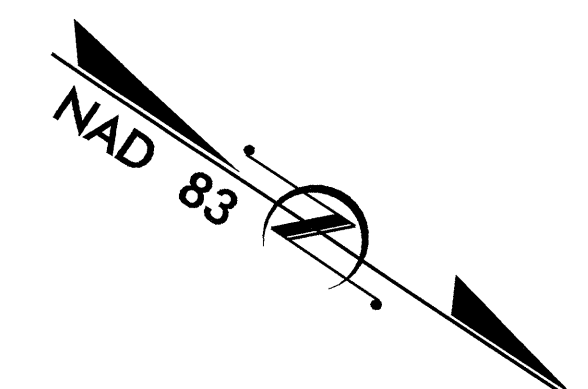
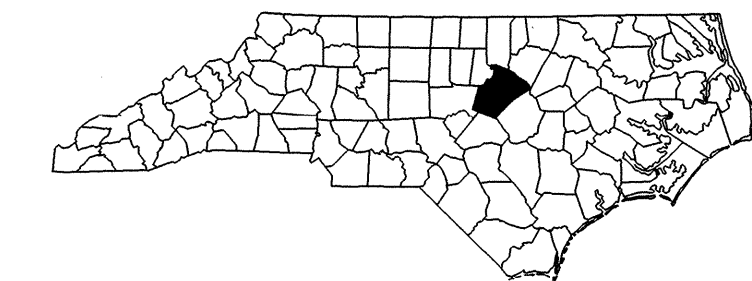
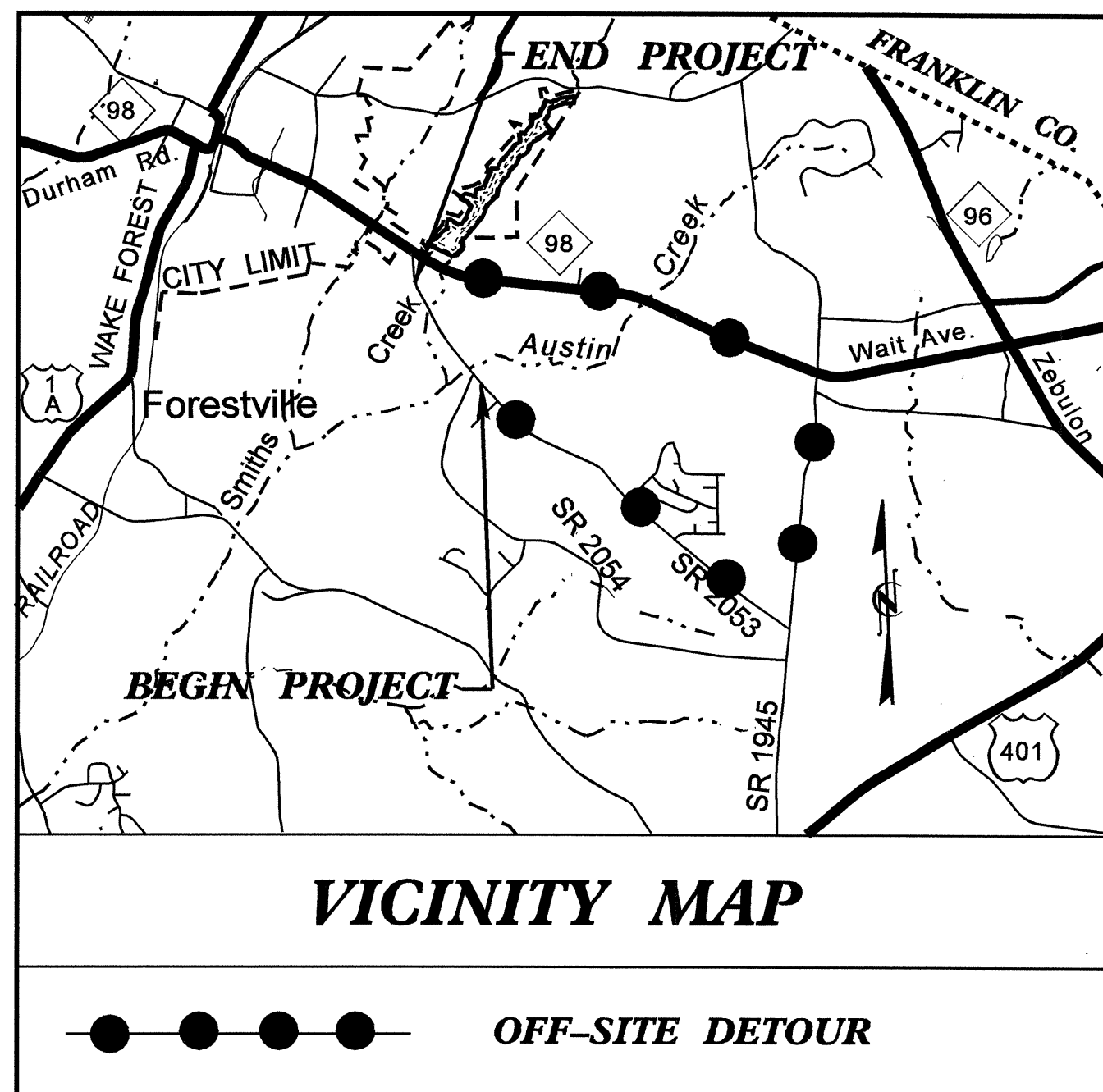


STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3919		
STATE PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION	
33353.1.1	BRZ-2053(1)	P.E.	
33353.2.1	BRZ-2053(1)	RW & UTIL.	
33353.3.1	BRZ-2053(1)	CONSTR.	

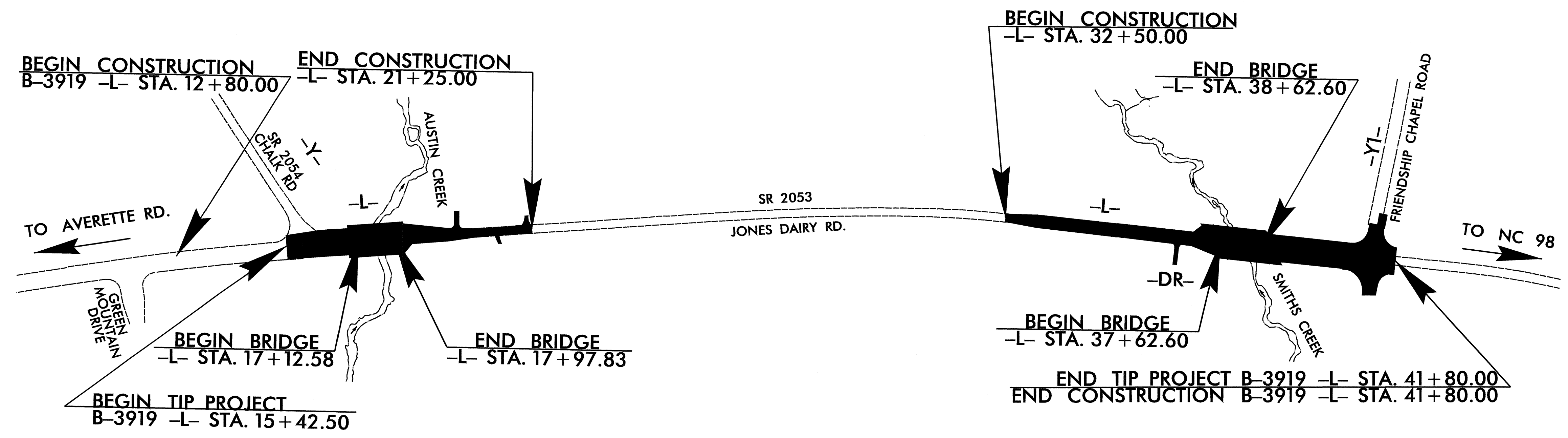
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY

**LOCATION: BRIDGE NO. 448 OVER AUSTIN CREEK AND
BRIDGE NO. 140 OVER SMITHS CREEK AND
APPROACHES ON SR 2053 (JONES DAIRY RD.)**
TYPE OF WORK: GRADING, PAVING, DRAINAGE AND STRUCTURES

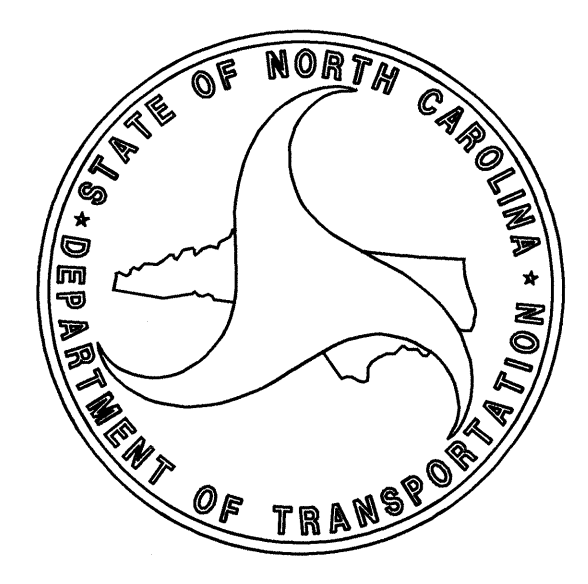


STRUCTURES



TIP PROJECT: B-3919

CONTRACT: C202232



DESIGN DATA

ADT 2008 =	8,140
ADT 2030 =	16,600
DHV =	11 %
D =	63 %
T =	4 % *
V =	55 MPH**
FUNC CLASS =	RURAL LOCAL
* (TTST 2% + DUAL 2%)	

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-3919 =	0.306
LENGTH STRUCTURES TIP PROJECT B-3919 =	0.035
TOTAL LENGTH TIP PROJECT B-3919 =	0.341 MI

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

2006 STANDARD SPECIFICATIONS

LETTING DATE:
DECEMBER 15, 2009

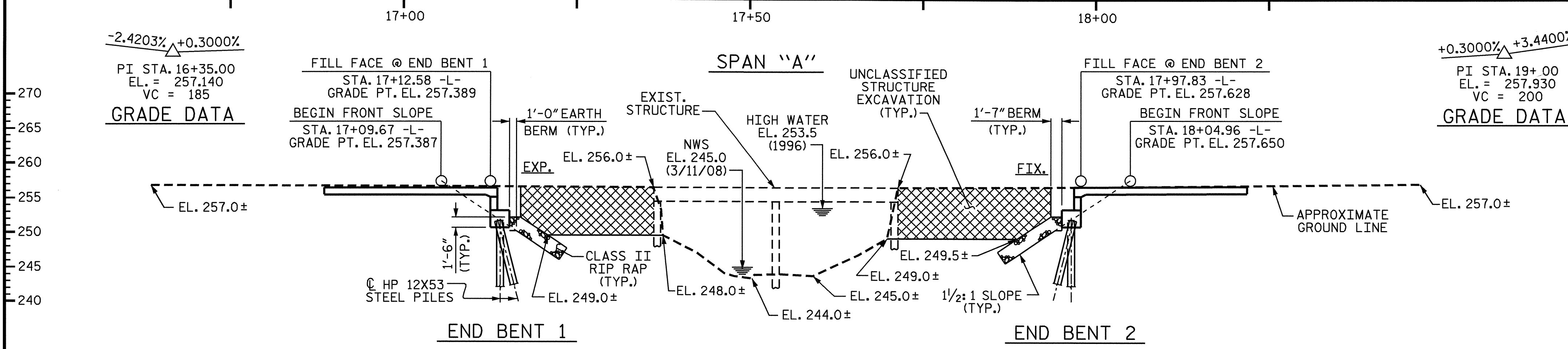
ROY GIROLAMI, PE
PROJECT ENGINEER

DAVID ANDERSON, PE
PROJECT DESIGN ENGINEER

STRUCTURE DESIGN UNIT

**DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA**

P.E.
STATE HIGHWAY DESIGN ENGINEER

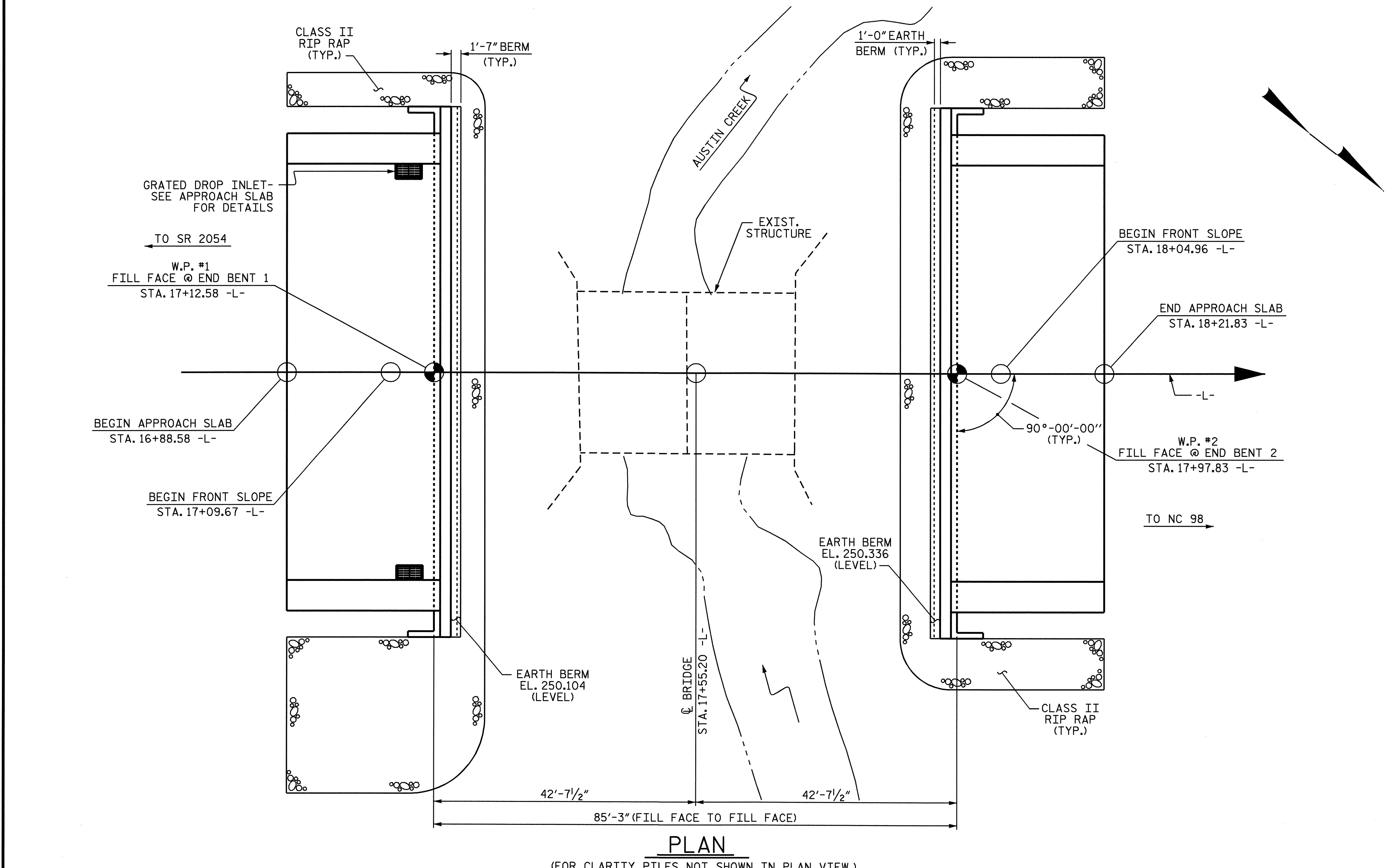


HYDRAULIC DATA

DESIGN DISCHARGE = 1180 CFS
 FREQUENCY OF DESIGN FLOOD = 25 YEARS
 DESIGN HIGH WATER ELEVATION = 252.0
 DRAINAGE AREA = 4.1 SQ. MI.
 BASIC DISCHARGE (Q100) = 2325 CFS
 BASIC HIGH WATER ELEVATION = 254.1

OVERTOPPING DATA

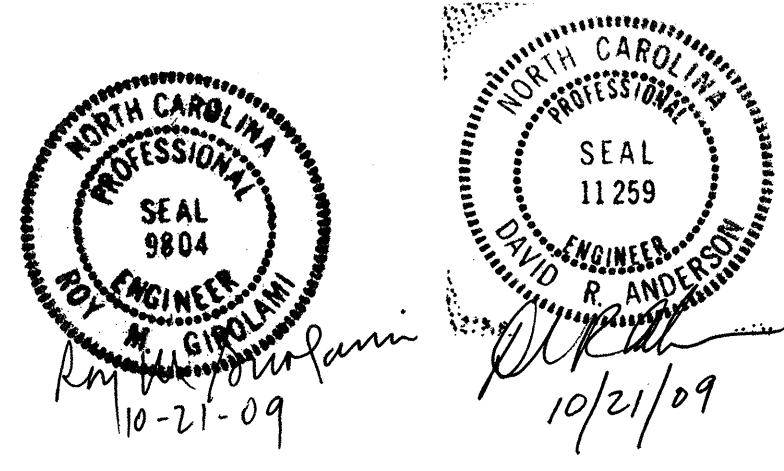
OVERTOPPING DISCHARGE = 4320 CFS.
 FREQUENCY OF OVERTOPPING FLOOD = 500+ YRS.
 OVERTOPPING FLOOD ELEVATION = 256.2



PROJECT NO. B-3919
 WAKE COUNTY
 STATION: 17+55.20 -L-
 SHEET 1 OF 3 REPLACES BRIDGE NO. 448

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

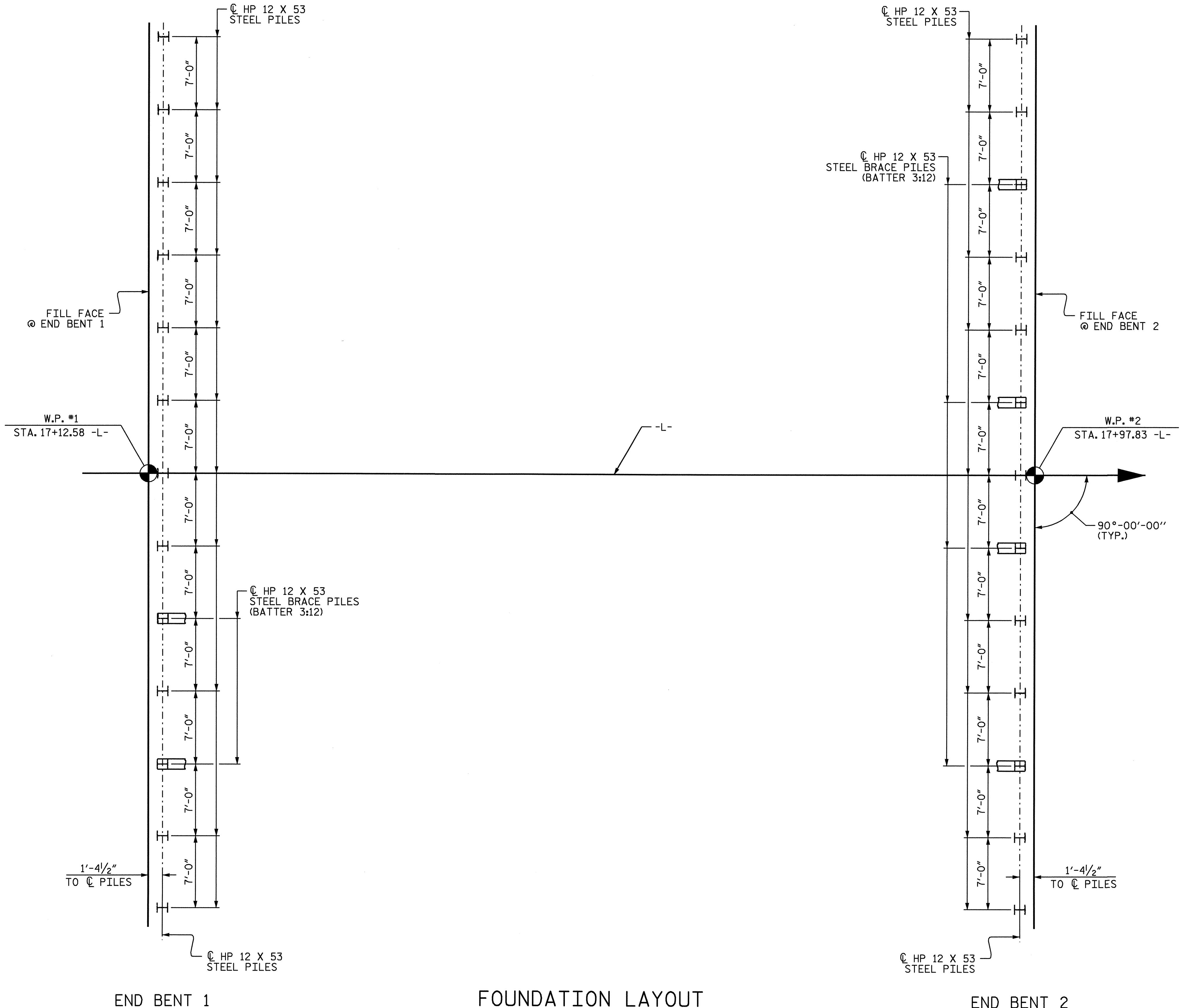
GENERAL DRAWING
 FOR BRIDGE OVER AUSTIN
 CREEK ON SR 2054
 BETWEEN SR 2054 & NC 98



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-1
1			3			TOTAL SHEETS
2			4			51

DRAWN BY: A.S. CALLAWAY/JAT DATE: 7/15/08
 CHECKED BY: D.R. ANDERSON DATE: 5/20/09

20-OCT-2009 12:14
 R:\Structures\final plans\str1\02_b3919_sd_01.gdgn
 dr\withrow



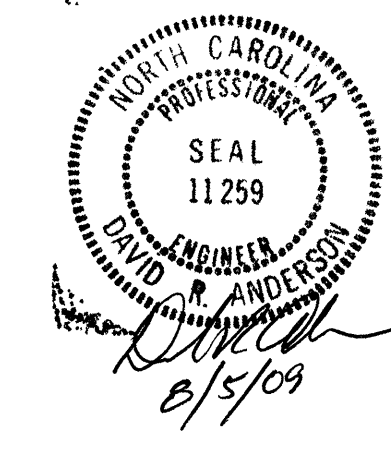
FOUNDATION LAYOUT
 (DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE)

PROJECT NO. B-3919
WAKE COUNTY
 STATION: 17+55.20 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

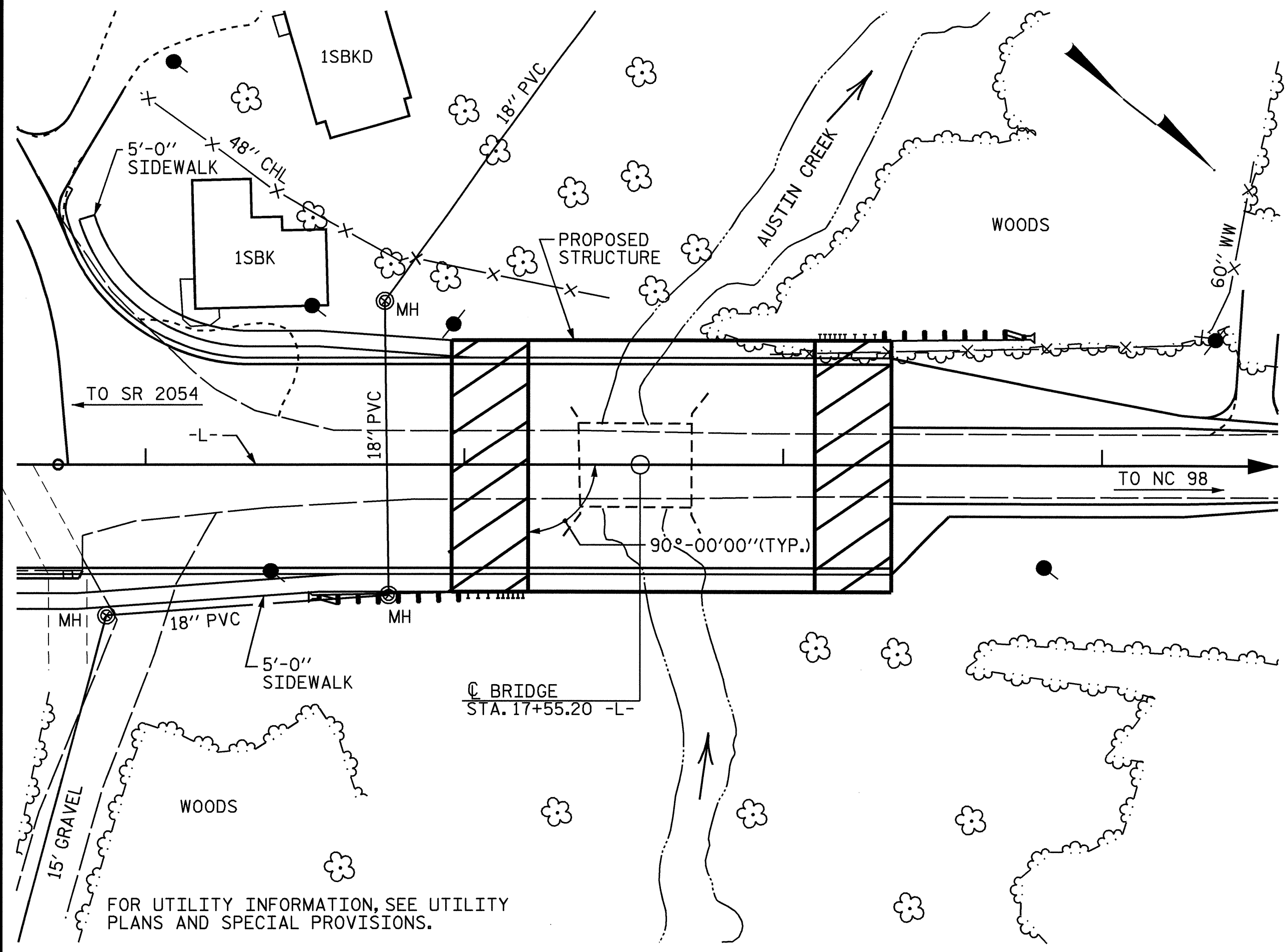
GENERAL DRAWING
 FOR BRIDGE OVER AUSTIN
 CREEK ON SR 2053
 BETWEEN SR 2054 & NC 98



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			5-2
2			4			TOTAL SHEETS 51

DRAWN BY : D.R. WITHROW DATE : 03/20/09
 CHECKED BY : D.R. ANDERSON DATE : 05/29/09

BM #2: R. R. SPIKE SET IN 30" OAK TREE, 58.16' LEFT, STA. 16+97.19 -L-, EL. 260.43'



LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
 THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS OF SEISMIC PERFORMANCE ZONE 1.
 FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
 FOR GROUT, SEE SPECIAL PROVISION "GROUT FOR STRUCTURES".
 FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
 FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
 FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
 FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.
 FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.
 REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.
 THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.
 THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS.
 THE EXISTING STRUCTURE CONSISTING OF TWO SPANS @ 18'-0", TIMBER JOISTS ON TIMBER PILES WITH VERTICAL ABUTMENT AND A CLEAR ROADWAY OF 24.2' IS TO BE REMOVED. THE EXISTING STRUCTURE IS PRESENTLY POSTED BELOW LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT. SEE SPECIAL PROVISIONS.

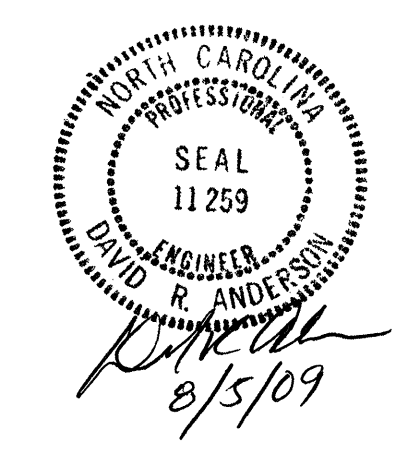
PILE EXCAVATION IS REQUIRED TO INSTALL PILES NO. 1 THROUGH NO. 6 AT END BENT 1. EXCAVATE HOLES TO ELEVATION 240.5 FT. AFTER PLACING PILES IN HOLES, DRIVE PILES TO THE REQUIRED DRIVING RESISTANCE.
 PILE EXCAVATION MAY BE REQUIRED TO INSTALL PILES NO. 7 AND NO. 8 AT END BENT 2. EXCAVATE HOLES TO ELEVATION 240.5 FT. AFTER PLACING PILES IN HOLES, DRIVE PILES TO THE REQUIRED DRIVING RESISTANCE.
 IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 25-55 FT-KIPS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT END BENT 1 AND END BENT 2. THE ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH THE PILES PROVISION.
 FOR PILES, SEE SPECIAL PROVISIONS.
 PILES AT BOTH END BENTS ARE DESIGNED FOR A FACTORED RESISTANCE OF 105 TONS PER PILE. DRIVE PILES TO A REQUIRED DRIVING RESISTANCE OF 175 TONS PER PILE.
 NO WAITING PERIOD IS REQUIRED BEFORE BEGINNING ANY WORK FOR END BENT CONSTRUCTION AFTER COMPLETION OF THE EMBANKMENT AT EACH END BENT.
 THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 30 FT. LEFT AND RIGHT OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE MEASURED AND PAID FOR AT THE CONTRACT UNIT PRICE PER CUBIC YARD FOR UNCLASSIFIED STRUCTURE EXCAVATION.
 FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.
 FOR CURING CONCRETE, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	PILE EXCAVATION (IN SOIL)	PILE EXCAVATION (NOT IN SOIL)	UNCLASSIFIED STRUCTURE EXCAVATION	CONCRETE WEARING SURFACE	GROOVING BRIDGE FLOORS	CLASS AA CONCRETE	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL	HP 12 X 53 STEEL PILES	THREE BAR METAL RAIL	RIP RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE	ELASTOMERIC BEARINGS	EVAZOTE JOINT SEALS	3'-0" X 2'-9" PRESTRESSED CONCRETE BOX BEAMS			
	LUMP SUM	LIN. FT.	LIN. FT.	CU.YDS.	SQ. FEET	SQ. FEET	CU.YDS.	CU.YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.	LIN. FT.	TONS	SQ. YARDS	LUMP SUM	LUMP SUM	NO.	LIN. FT.	
SUPERSTRUCTURE					5594	6870	50.4				1,761			144.2			LUMP SUM	LUMP SUM	27	2241.00	
END BENT 1		59	21	300				36.9		6,201		13	150		170	190					
END BENT 2				360				36.9		6,201		13	130		135	150					
TOTAL	LUMP SUM	59	21	660	5594	6870	50.4	73.8	LUMP SUM	12,402	1,761	26	280	144.2	305	340	LUMP SUM	LUMP SUM	27	2241.00	

PROJECT NO. B-3919
WAKE COUNTY
 STATION: 17+55.20 -L-

SHEET 3 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE OVER AUSTIN CREEK ON SR 2053 BETWEEN SR 2054 & NC 98

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

DRAWN BY : J.A. TILLMAN DATE : 4/30/09
 CHECKED BY : S.WANCE DATE : 6/16/09

04-AUG-2009 15:17
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 drwithrow

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

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 _L)	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 _L)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	Ⓝ1	1.03	--	1.75	0.289	1.46	A	ER	40.750	0.493	1.03	A	ER	4.075	0.80	0.289	1.11	A	ER	40.075		
	HL-93 (OPERATING)	N/A		1.33	--	1.35	0.289	1.89	A	ER	40.750	0.493	1.33	A	ER	4.075	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	Ⓝ2	1.28	46.08	1.80	0.289	2.05	A	ER	40.750	0.493	1.35	A	ER	4.075	0.80	0.289	1.60	A	ER	40.075		
	HS-20 (OPERATING)	36.000		1.81	65.16	1.35	0.289	2.74	A	ER	40.750	0.493	1.81	A	ER	4.075	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.80	51.30	1.49	0.289	5.47	A	ER	40.750	0.493	3.80	A	ER	4.075	0.80	0.289	3.70	A	ER	40.750	
		SNGAR BS2	20.000		2.68	53.60	1.49	0.289	4.03	A	ER	40.750	0.493	2.68	A	ER	4.075	0.80	0.289	2.73	A	ER	40.750	
		SNAGR IS2	22.000		2.48	54.56	1.49	0.289	3.79	A	ER	40.750	0.493	2.48	A	ER	4.075	0.80	0.289	2.56	A	ER	40.750	
		SNCOT TS3	27.250		1.90	51.78	1.49	0.289	2.72	A	ER	40.750	0.493	1.90	A	ER	4.075	0.80	0.289	1.84	A	ER	40.750	
		SNAG GRS4	34.925		1.56	54.49	1.49	0.289	2.25	A	ER	40.750	0.493	1.56	A	ER	4.075	0.80	0.289	1.53	A	ER	40.750	
		SNS5A	35.550		1.57	55.81	1.49	0.289	2.21	A	ER	40.750	0.493	1.57	A	ER	4.075	0.80	0.289	1.49	A	ER	40.750	
		SNS6A	39.950		1.42	56.73	1.49	0.289	2.02	A	ER	40.750	0.493	1.42	A	ER	4.075	0.80	0.289	1.36	A	ER	40.750	
		SNS7B	42.000		1.39	58.38	1.49	0.289	1.92	A	ER	40.750	0.493	1.39	A	ER	4.075	0.80	0.289	1.43	A	ER	40.750	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAG RIT3	33.000		1.70	56.10	1.49	0.289	2.46	A	ER	40.750	0.493	1.70	A	ER	4.075	0.80	0.289	1.66	A	ER	40.750	
		TNT4A	33.075		1.66	54.91	1.49	0.289	2.46	A	ER	40.750	0.493	1.66	A	ER	4.075	0.80	0.289	1.66	A	ER	40.750	
		TNT6A	41.600		1.47	61.15	1.49	0.289	2.01	A	ER	40.750	0.493	1.47	A	ER	4.075	0.80	0.289	1.36	A	ER	40.750	
		TNT7A	42.000		1.44	60.48	1.49	0.289	2.01	A	ER	40.750	0.493	1.44	A	ER	4.075	0.80	0.289	1.36	A	ER	40.750	
		TNT7B	42.000		1.36	57.12	1.49	0.289	2.07	A	ER	40.750	0.493	1.36	A	ER	4.075	0.80	0.289	1.40	A	ER	40.750	
		TNAG RIT4	43.000		1.32	56.76	1.49	0.289	1.98	A	ER	40.750	0.493	1.32	A	ER	4.075	0.80	0.289	1.34	A	ER	40.750	
TNAG T5A	45.000		1.31	58.95	1.49	0.289	1.87	A	ER	40.750	0.493	1.31	A	ER	4.075	0.80	0.289	1.26	A	ER	40.750			
TNAG T5B	45.000		Ⓝ3	1.26	56.70	1.49	0.289	1.85	A	ER	40.750	0.493	1.26	A	ER	4.075	0.80	0.289	1.25	A	ER	40.750		

LOAD FACTORS:

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

LEGAL LOAD RATING FACTORS	YEAR	ADTT	γ _L
	2008	205	N/A
	2028	418	1.49

NOTES:

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

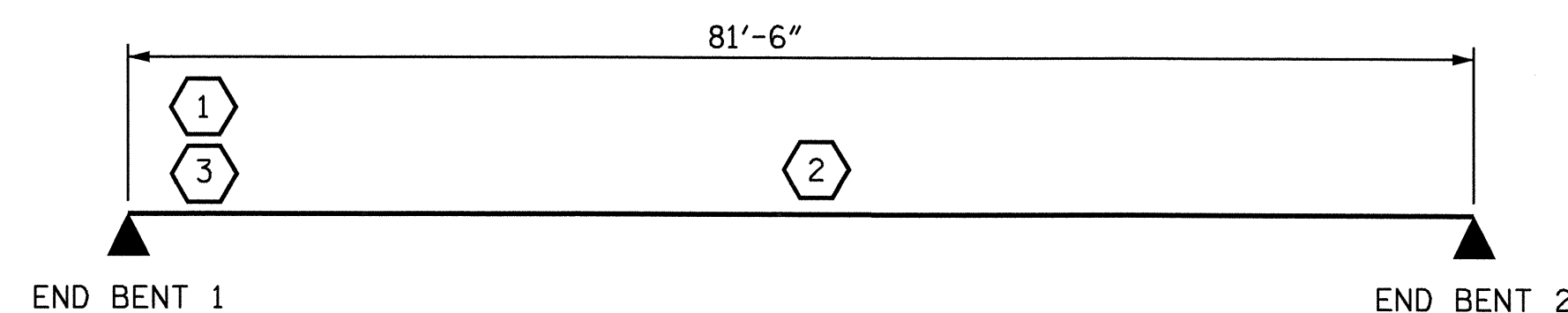
MINIMUM RATING FACTORS FOR LEGAL LOAD RATING ARE BASED ON THE STRENGTH I LIMIT STATE.

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

COMMENTS:

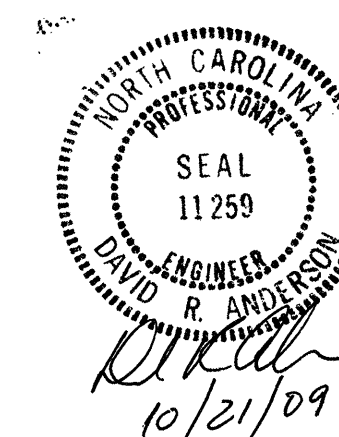
NO COMMENT.

Ⓝ	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. B-3919
WAKE COUNTY
 STATION: 17+55.20 -L-



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD LRFR SUMMARY FOR PRESTRESSED CONCRETE GIRDERS (NON-INTERSTATE TRAFFIC)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					5-4
TOTAL SHEETS					51

ASSEMBLED BY : N. Q. TRAN DATE : 6-1-09
 CHECKED BY : J. A. TILMAN DATE : 6-3-09
 DRAWN BY : MAA 1/08
 CHECKED BY : GM/DI 2/08

NOTES

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

ALL REINFORCING STEEL CAST WITH THE BOX BEAM SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE BOX BEAMS.

RECESSES FOR TRANSVERSE STRANDS SHALL BE GROUTED AFTER THE TENSIONING OF THE STRANDS.

THE 2 1/2" Ø DOWEL HOLES AT FIXED ENDS OF BOX BEAM SECTIONS SHALL BE FILLED WITH NON-SHRINK GROUT. THE 2 1/2" Ø DOWEL HOLES AT EXPANSION ENDS OF BOX BEAM SECTIONS SHALL BE FILLED WITH JOINT SEALER MATERIAL TO 1/2" ABOVE THE TOP OF DOWELS AND THEN FILLED WITH GROUT.

THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF TYPE SL LOW MODULUS SILICONE SEALANT. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE BOX BEAM UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 5900 PSI.

ALL REINFORCING STEEL IN SIDEWALK AND CONCRETE WEARING SURFACE SHALL BE EPOXY COATED.

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE BOX BEAM UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO BOX BEAM UNIT ENDS.

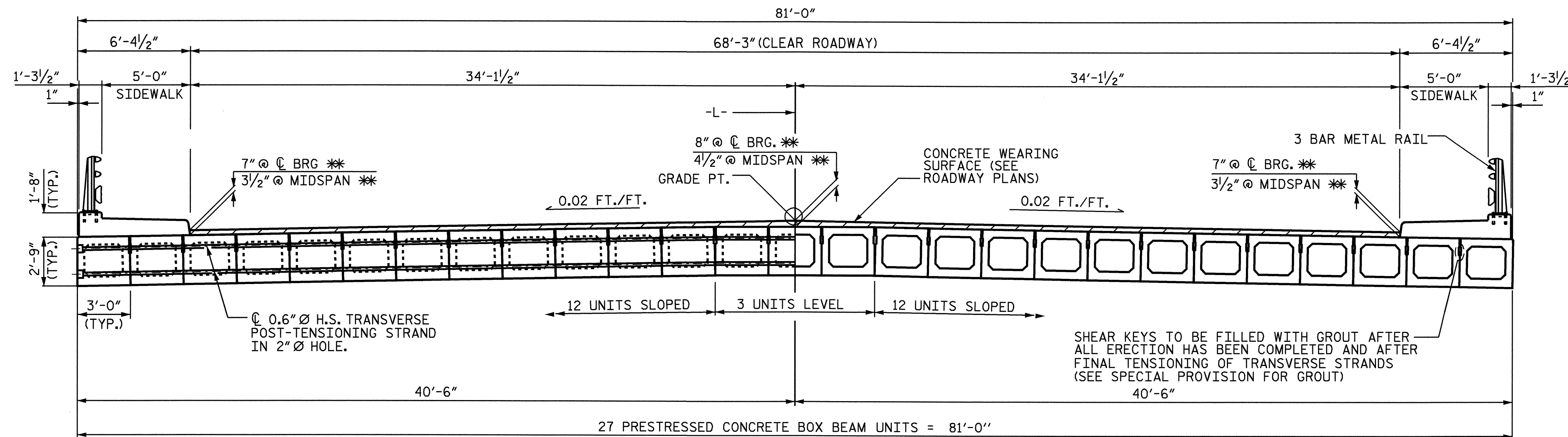
FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 3/16" AT END BENT 1 AND END BENT 2.

PLACEMENT OF THE CONCRETE WEARING SURFACE SHALL OCCUR AFTER CASTING THE SIDEWALK. THE COST OF THE REINFORCING STEEL CAST WITH THE CONCRETE WEARING SURFACE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONCRETE WEARING SURFACE. FOR CONCRETE WEARING SURFACE, SEE SPECIAL PROVISIONS.

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

THE LOCATION OF THE VOID DRAINS MAY BE SHIFTED SLIGHTLY WHERE NECESSARY TO CLEAR PRESTRESSING STRANDS OR TRANSVERSE REINFORCING STEEL.



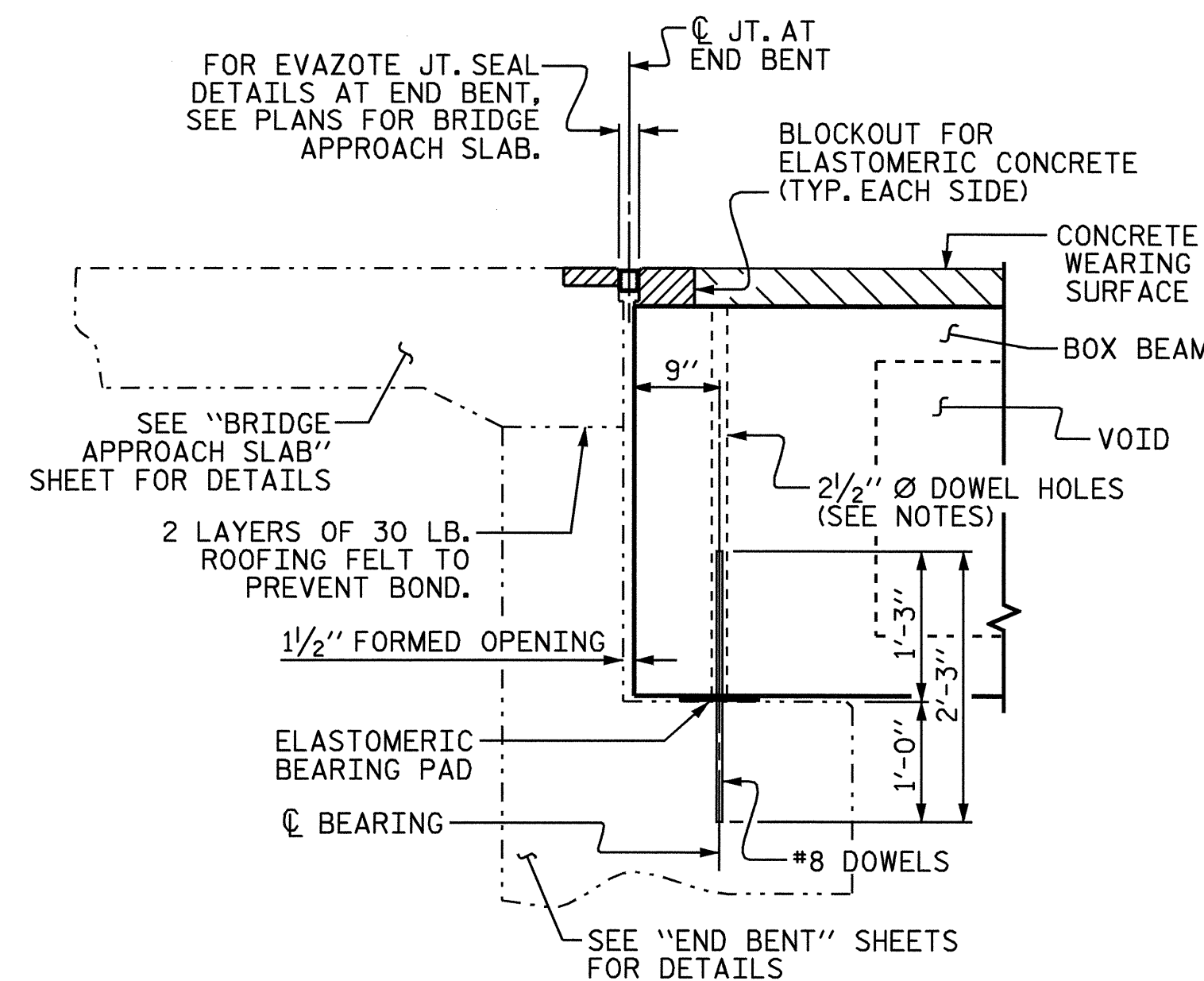
HALF SECTION AT INTERMEDIATE DIAPHRAGM

HALF SECTION THROUGH VOIDS

TYPICAL SECTION

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

FIXED END AND EXPANSION END

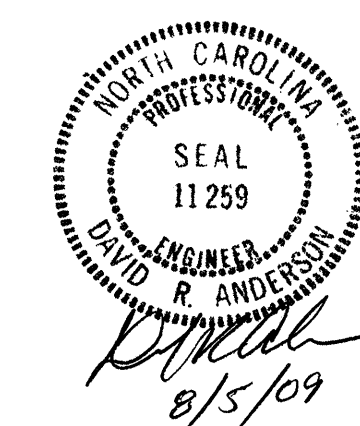


SECTION AT END BENT

PROJECT NO. B-3919
 WAKE COUNTY
 STATION: 17+55.20 -L-

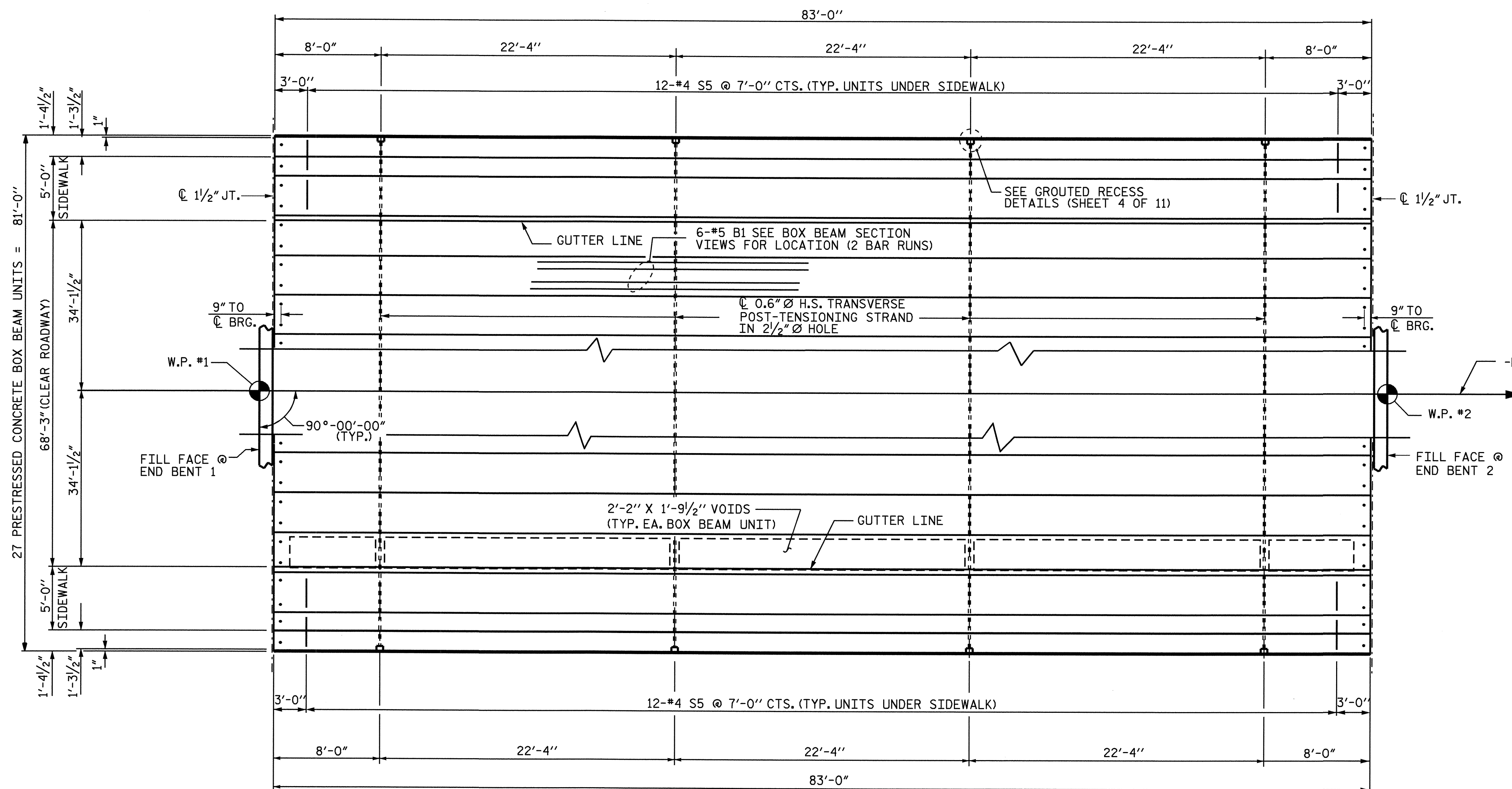
SHEET 1 OF 11

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 3'-0" X 2'-9"
 PRESTRESSED CONCRETE
 BOX BEAM UNIT

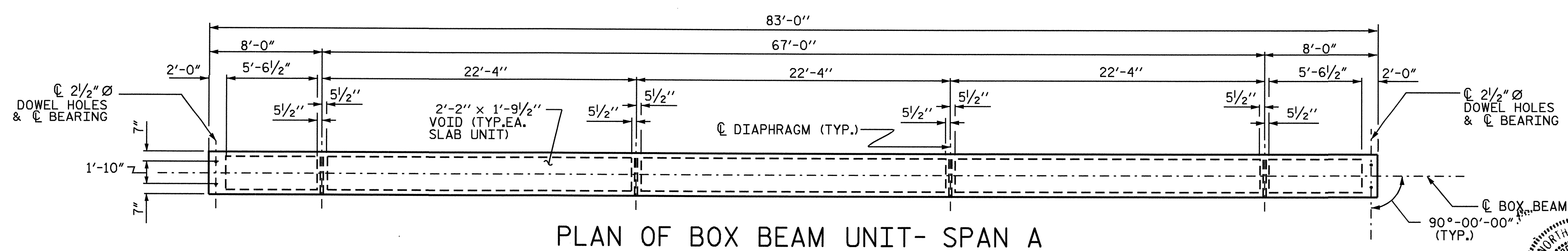


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			5
2			4			51

ASSEMBLED BY : N. Q. TRAN	DATE : 2-14-09
CHECKED BY : J.A. TILLMAN	DATE : 4-22-09
DRAWN BY : TLA 5/05	ADDED 7/11/05R
CHECKED BY : GM 6/05	REV. 5/1/06R KMM/GM



SPAN A



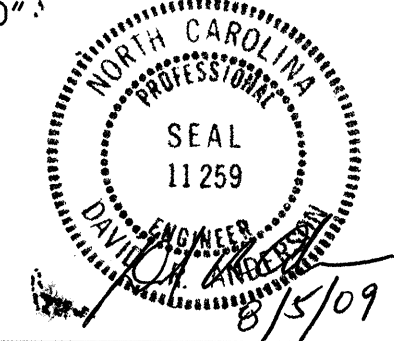
PLAN OF BOX BEAM UNIT- SPAN A

PROJECT NO. B-3919
WAKE COUNTY
 STATION: 17+55.20 -L-

SHEET 2 OF 11

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 PLAN OF SPAN A

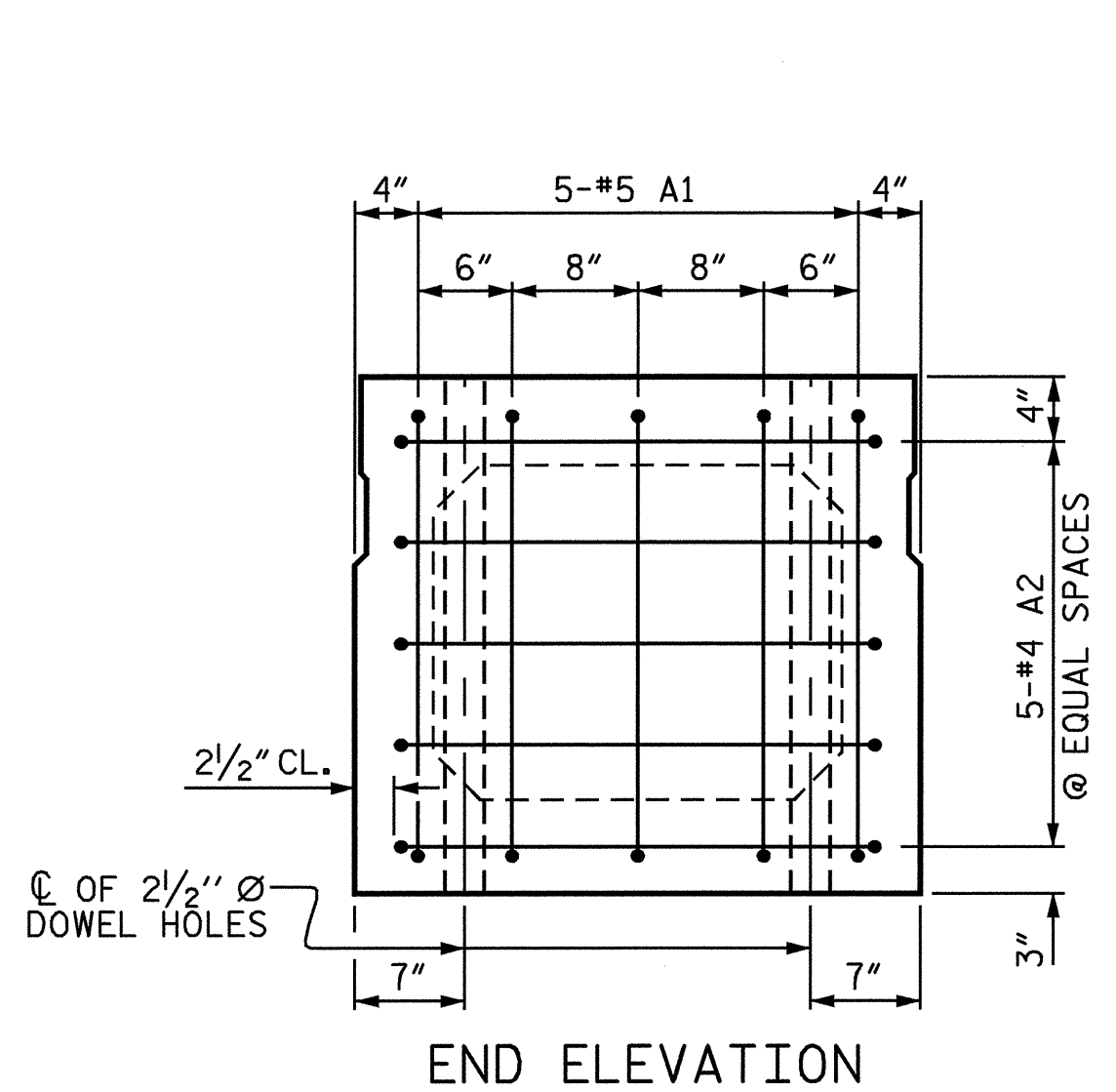


DRAWN BY : N. Q. TRAN DATE : 2-14-09
 CHECKED BY : J.A. TILLMAN DATE : 4-22-09

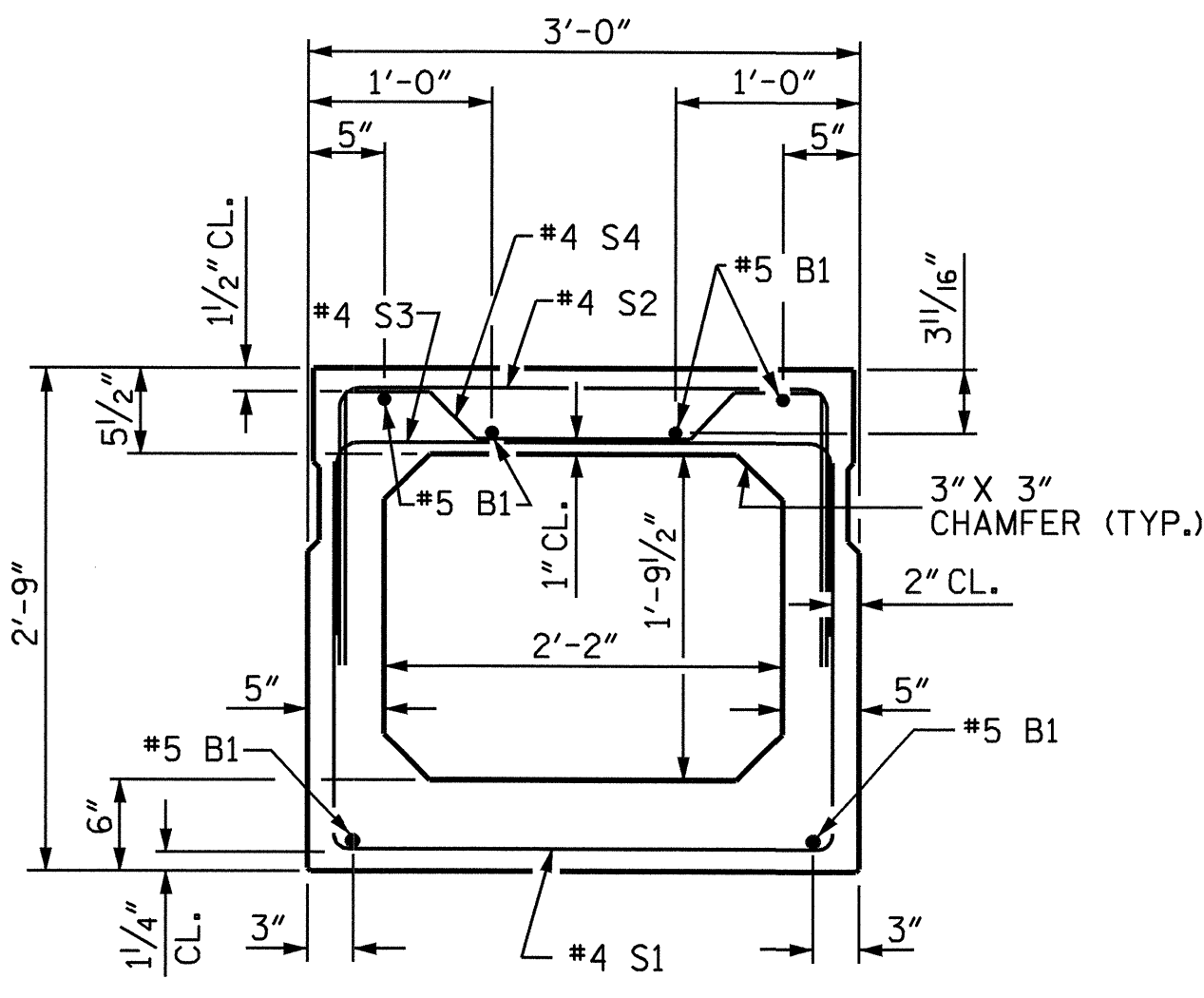
03-AUG-2009 07:46
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 drwithrow

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			5-6
2			4			TOTAL SHEETS 51

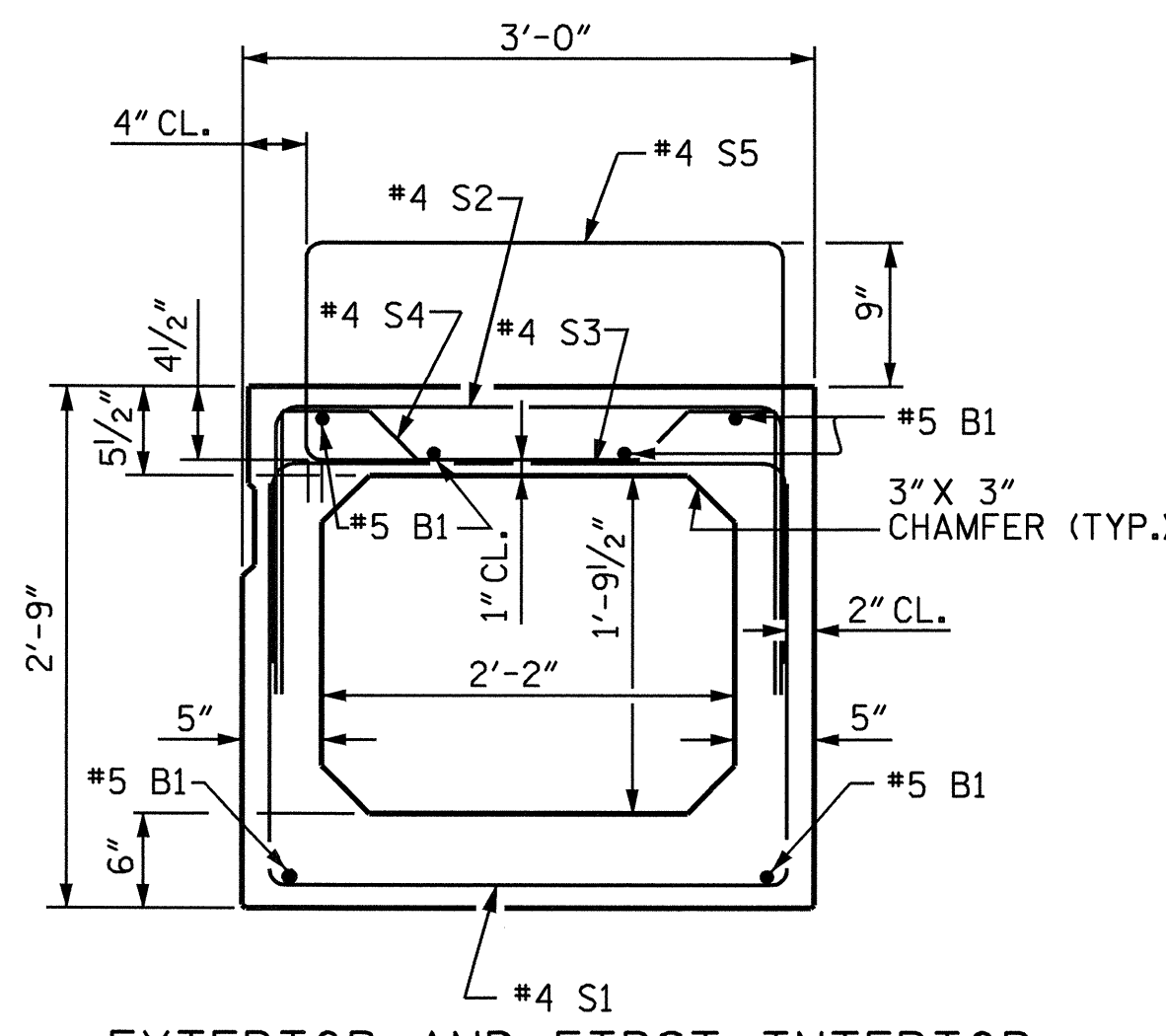
STR. #1



END ELEVATION
SHOWING PLACEMENT OF #5 & #4 "A" BARS AND LOCATION OF DOWEL HOLES.
(INTERIOR BOX BEAM SECTION SHOWN-EXTERIOR SECTION SIMILAR EXCEPT SHEAR KEY LOCATION. STRAND LAYOUT NOT SHOWN.)

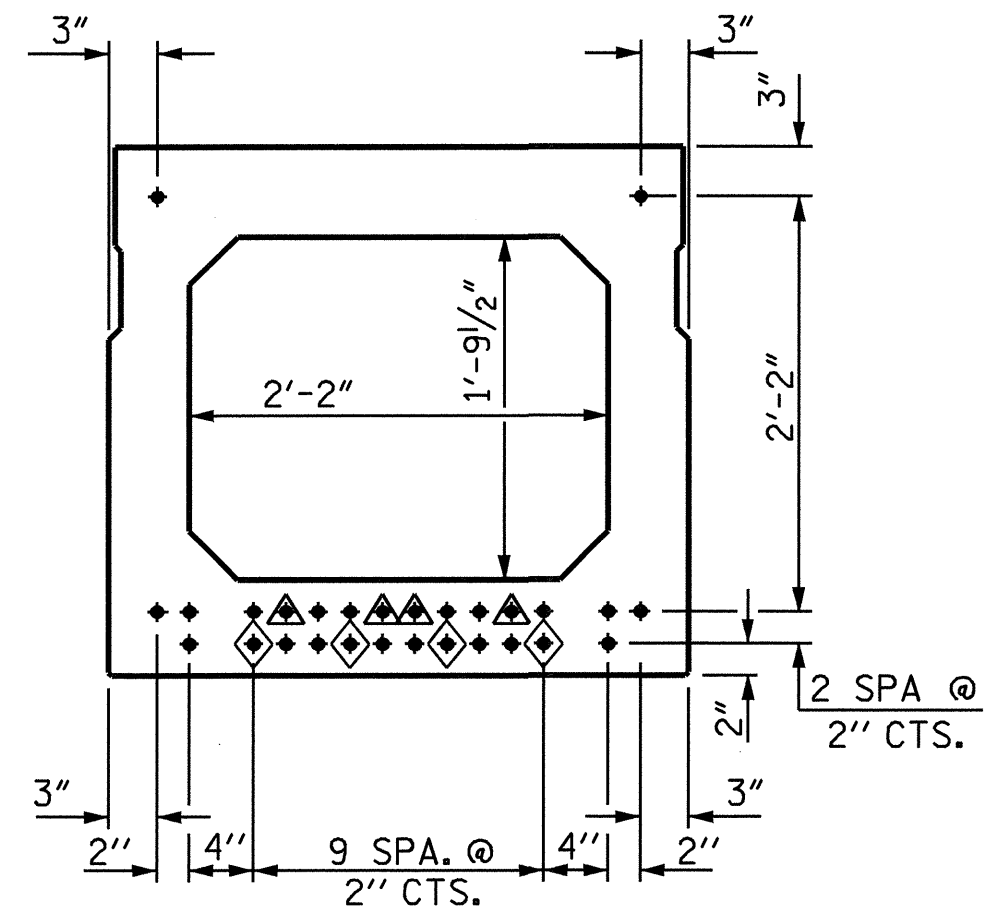


INTERIOR BOX BEAM SECTION
(STRAND LAYOUT NOT SHOWN)



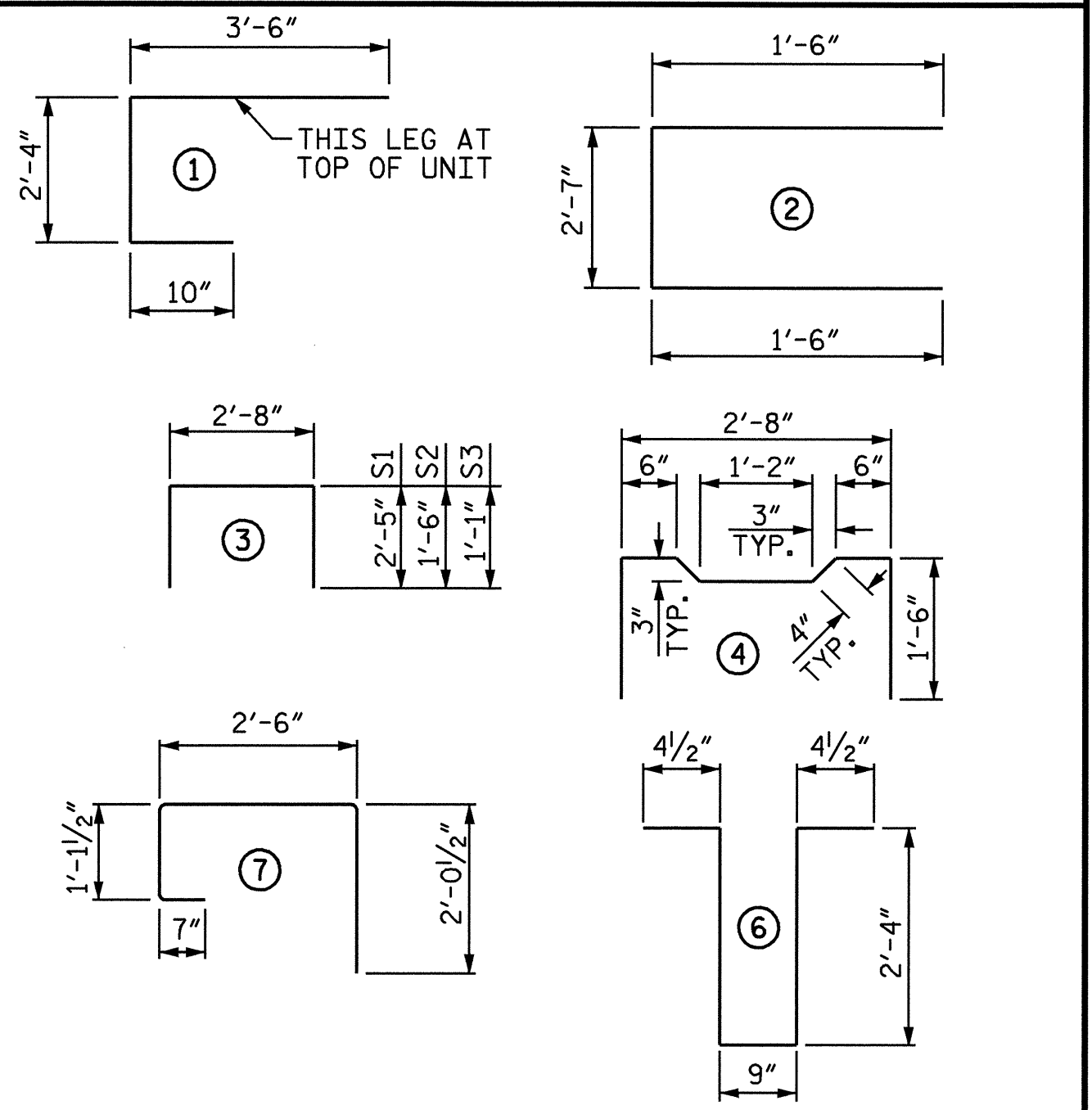
EXTERIOR AND FIRST INTERIOR BOX BEAM SECTION
(STRAND LAYOUT NOT SHOWN)

0.6" Ø LOW RELAXATION STRAND LAYOUT



TYPICAL STRAND LOCATION
(28 STRANDS REQUIRED)
(INTERIOR BOX BEAM SECTION SHOWN-EXTERIOR SECTION SIMILAR EXCEPT SHEAR KEY LOCATION)

BAR TYPES

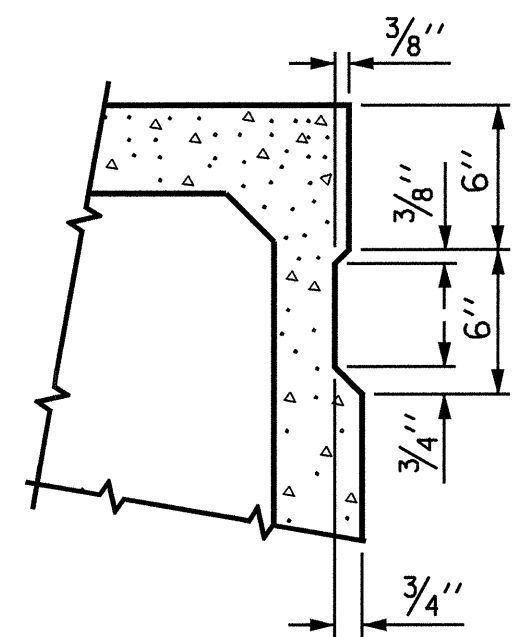


ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR ONE BOX BEAM SECTION

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
A1	10	#5	1	6'-8"	70	6'-8"	70
A2	34	#4	2	5'-7"	127	5'-7"	127
B1	12	#5	STR	42'-10"	536	42'-10"	536
K1	12	#4	6	6'-2"	49	6'-2"	49
K2	8	#4	STR	2'-7"	14	2'-7"	14
S1	67	#4	3	7'-6"	336	7'-6"	336
S2	67	#4	3	5'-8"	254	5'-8"	254
S3	117	#4	3	4'-10"	378	4'-10"	378
S4	50	#4	4	5'-10"	195	5'-10"	195
*S5	12	#4	7	6'-3"	50	**6'-3"	**50
REINFORCING STEEL				1,959 LBS.		1,959 LBS.	
*EPOXY COATED REIN. STEEL				50 LBS.		**50 LBS.	
7500 P.S.I. CONCRETE				13.5 CU. YDS.		13.5 CU. YDS.	
0.6" Ø L.R. STRANDS				No. 28		No. 28	

**FIRST INTERIOR BOX BEAM UNITS ONLY.



SHEAR KEY DETAIL

NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR BOX BEAMS.

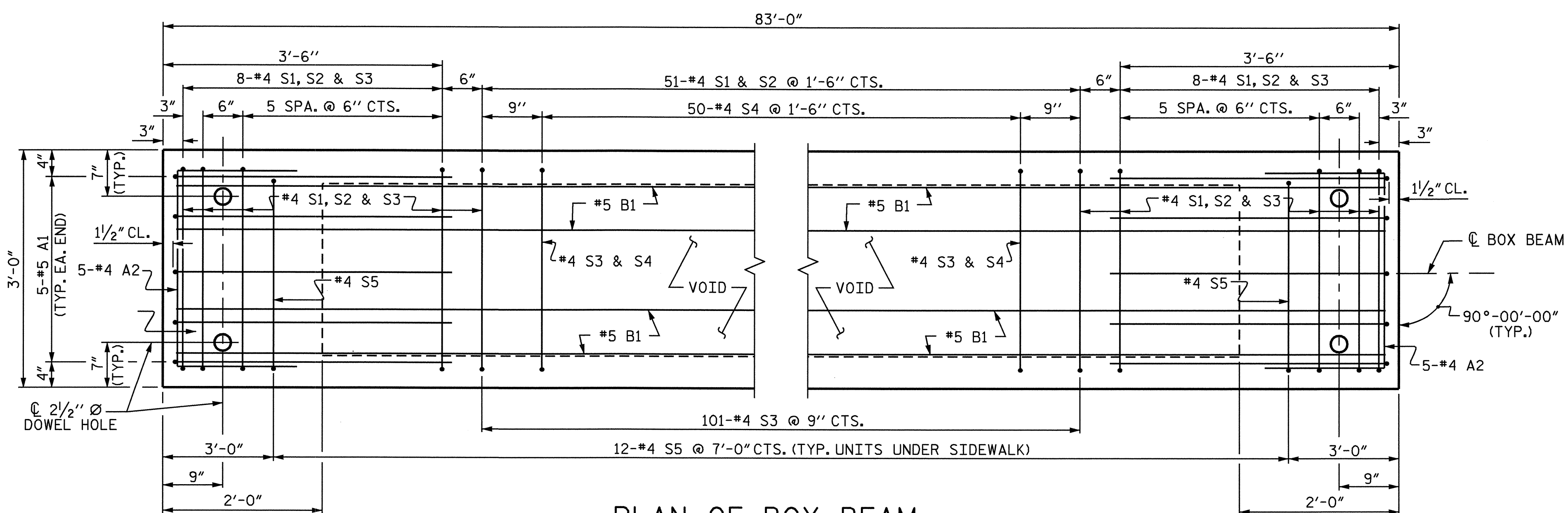
DEBONDING LEGEND

- FULLY BONDED STRANDS
- △ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ◊ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER

BOND SHALL BE BROKEN ON STRANDS AS SHOWN FOR THE SPECIFIED LENGTH FROM EACH END OF THE BOX BEAM. SEE STANDARD SPECIFICATIONS ARTICLE 1078-7.

GRADE 270 STRANDS

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



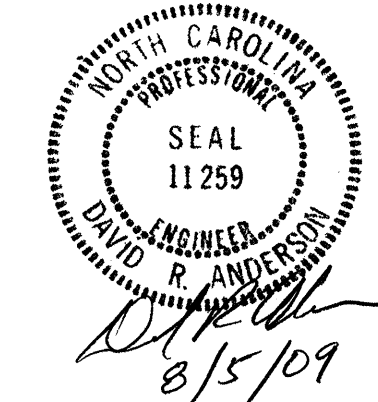
PLAN OF BOX BEAM

EXTERIOR UNIT AND FIRST INTERIOR UNIT SHOWN. OTHER INTERIOR UNITS SIMILAR EXCEPT OMIT #4 S5 BARS. FOR LOCATION OF DIAPHRAGMS, SEE PLAN OF SPANS. FOR REINFORCING STEEL IN DIAPHRAGMS, SEE DIAPHRAGM DETAILS.

PROJECT NO. B-3919
WAKE COUNTY
STATION: 17+55.20 -L-

SHEET 3 OF 11

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
3'-0" X 2'-9"
PRESTRESSED CONCRETE
BOX BEAM UNIT
SPAN "A"

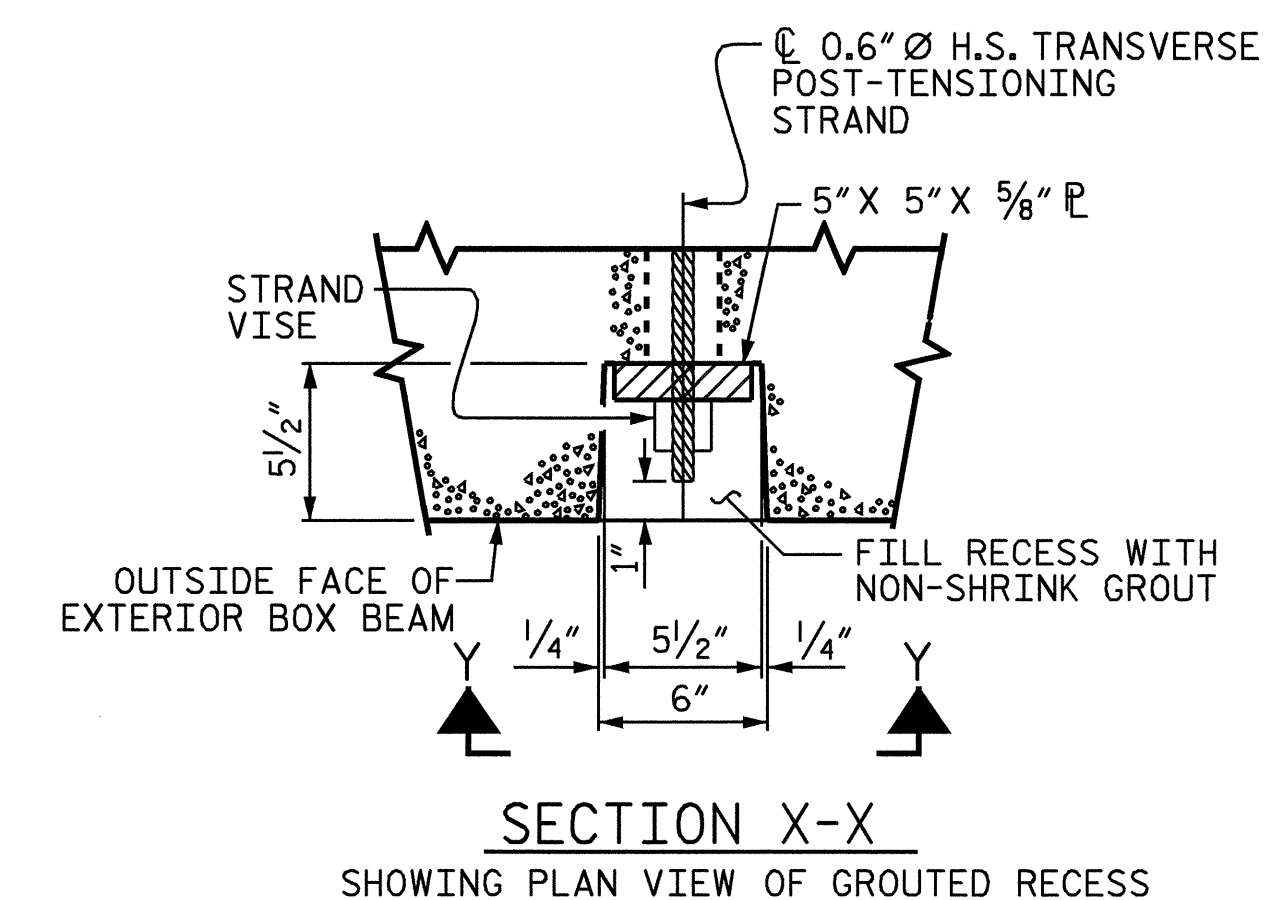
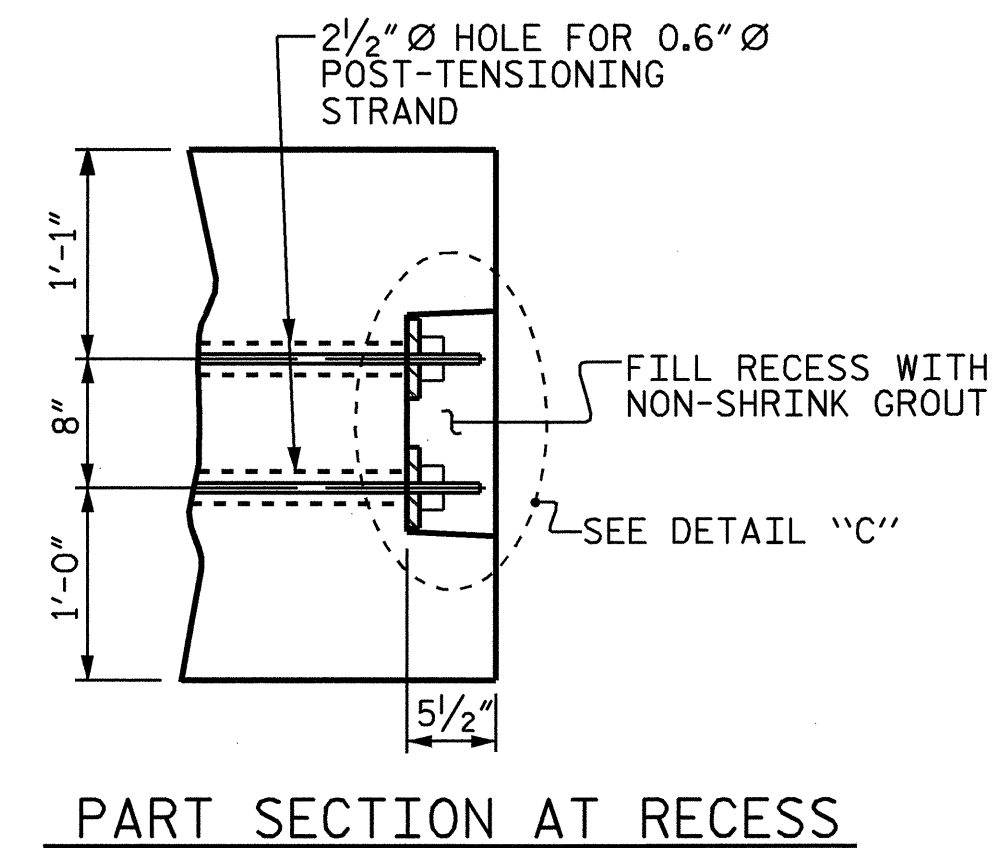
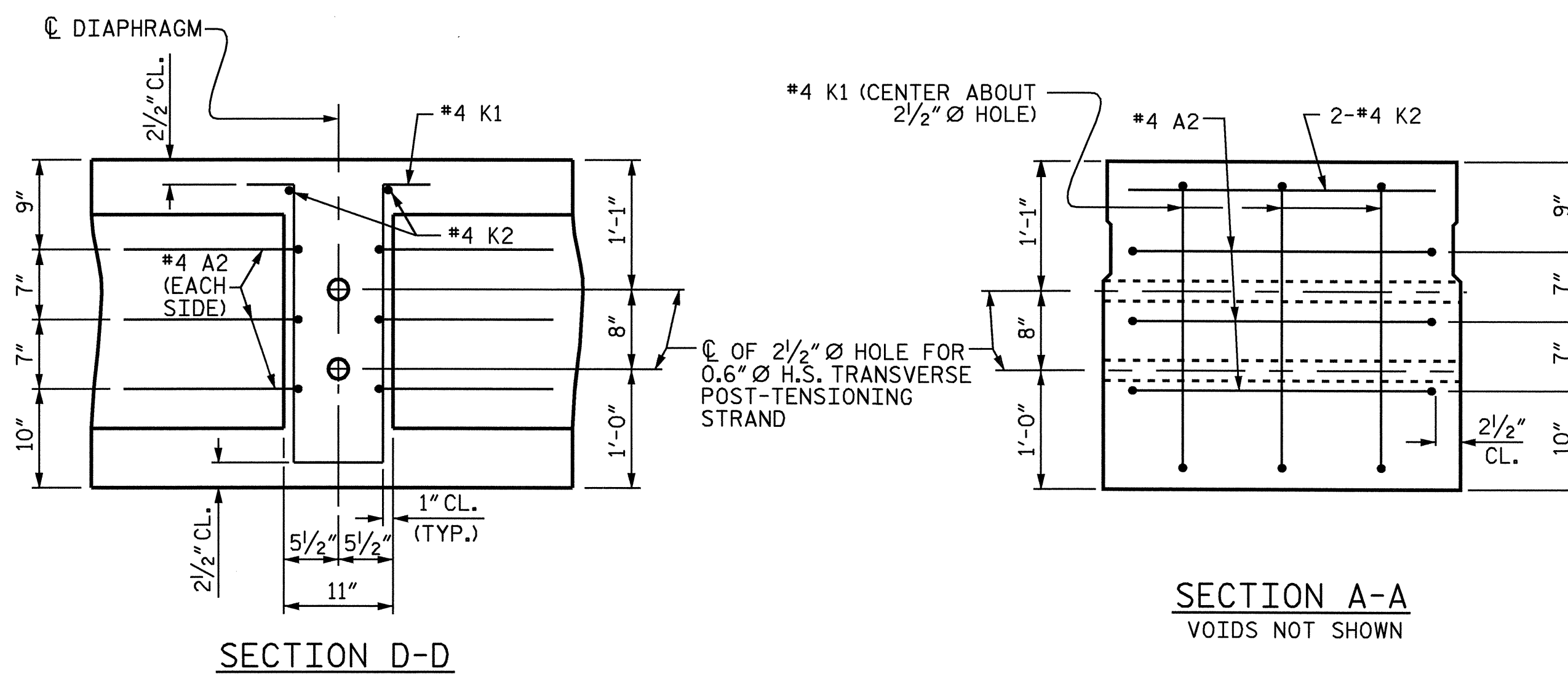
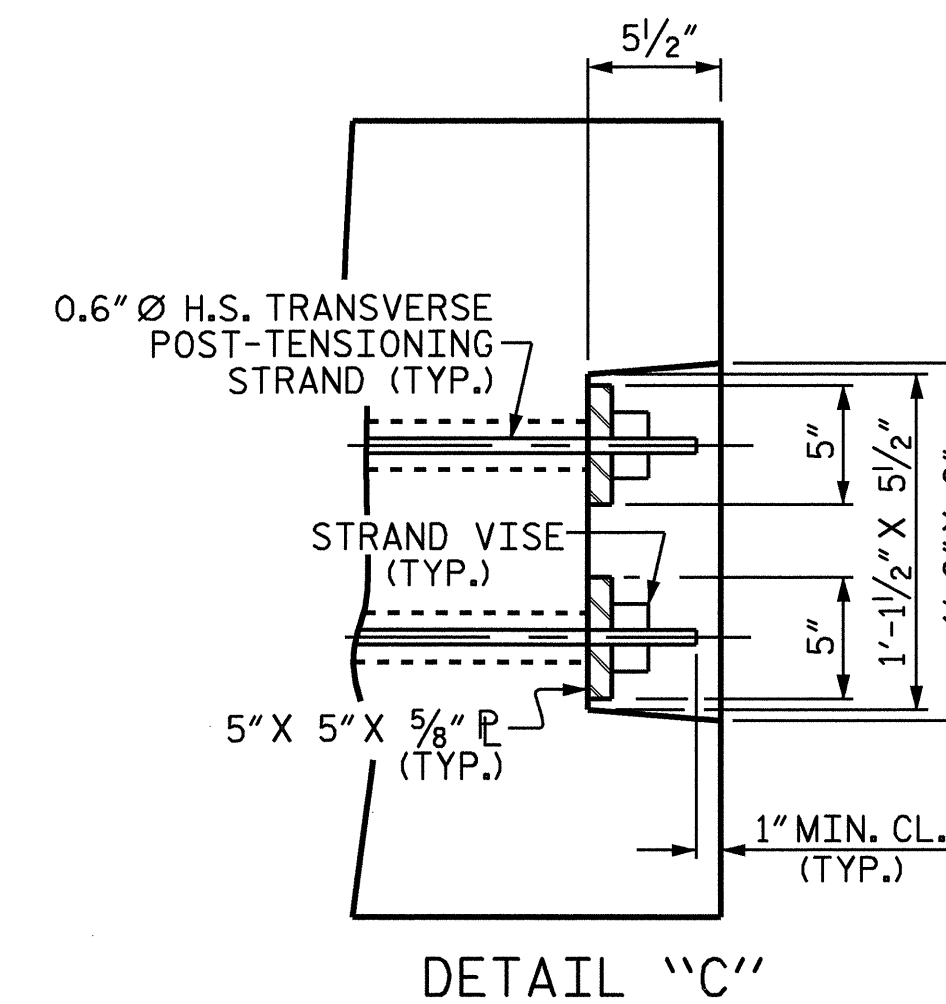
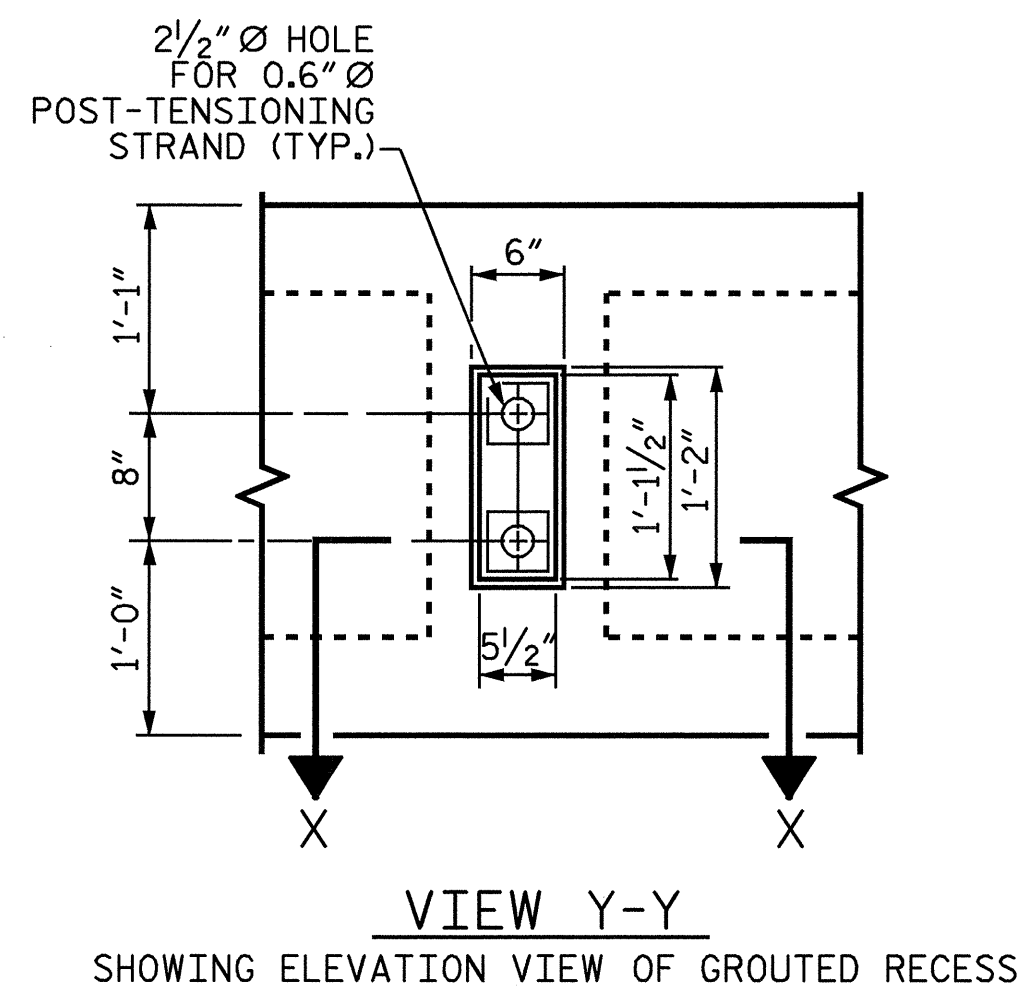
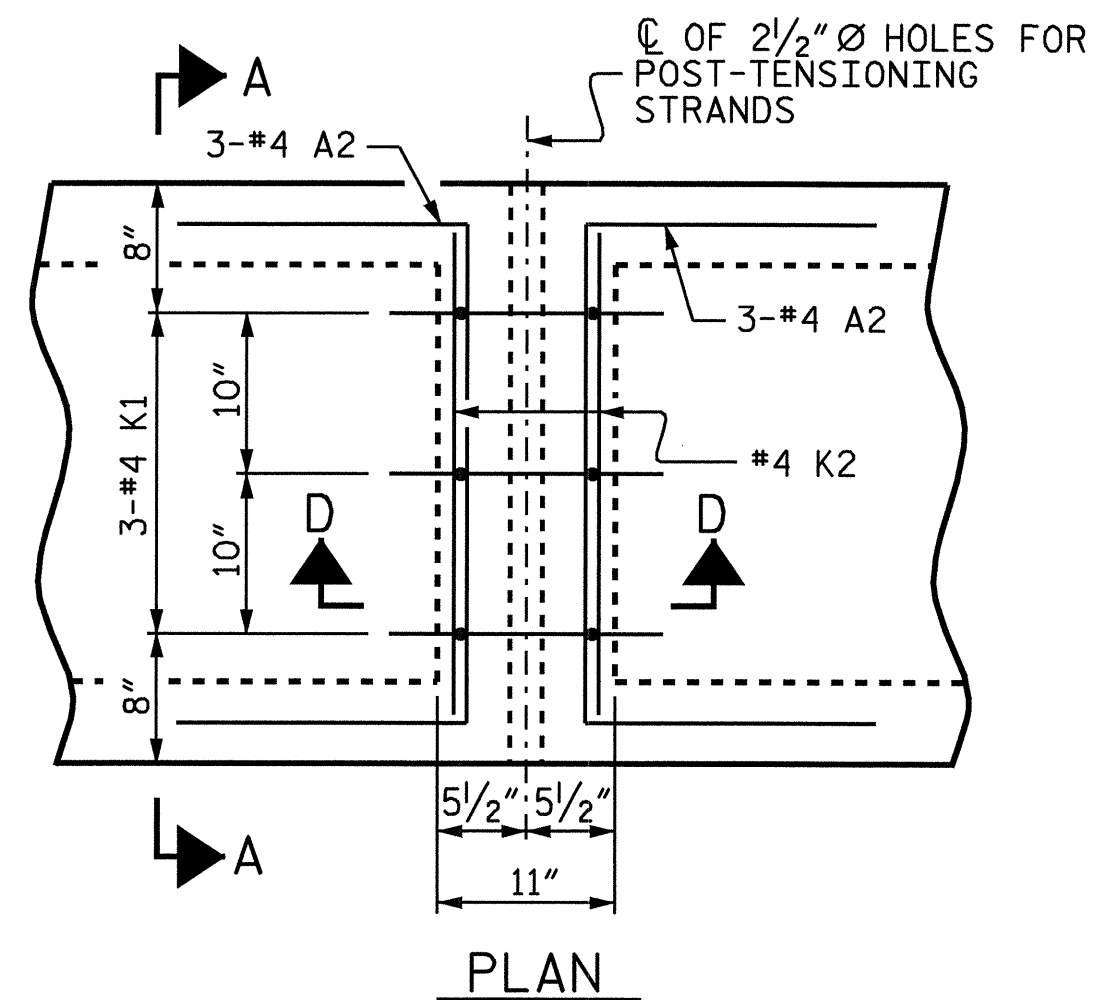


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-7
1			3			TOTAL SHEETS
2			4			51

STR. 1 STD. NO. PCBB4

ASSEMBLED BY: N.Q. TRAN DATE: 2-09
CHECKED BY: J.A. TILLMAN DATE: 4-22-09
DRAWN BY: TLA 5/05
CHECKED BY: GM 6/05

ADDED 7/11/05 TLA/GM
REV. 5/1/06
07-JUL-2009 09:07
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danderson



DOUBLE DIAPHRAGM DETAILS

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

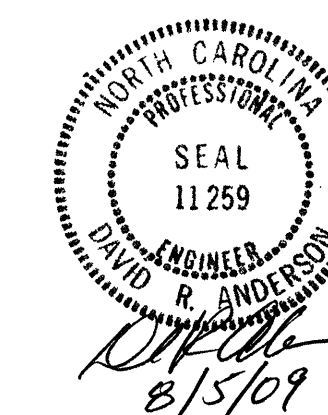
GROUDED RECESS DETAIL AT END OF POST-TENSIONED STRANDS OF EXTERIOR BOX BEAM

DEAD LOAD DEFLECTION AND CAMBER	
	3'-0" x 2'-9"
	0.6" Ø L.R. STRAND
	SPAN "A"
CAMBER (BEAM ALONE IN PLACE) ↑	4 ³ / ₁₆ "
DEFLECTION DUE TO CONCRETE WEARING SURFACE ↓	0 ¹¹ / ₁₆ "
FINAL CAMBER ↑	3 ¹ / ₂ "

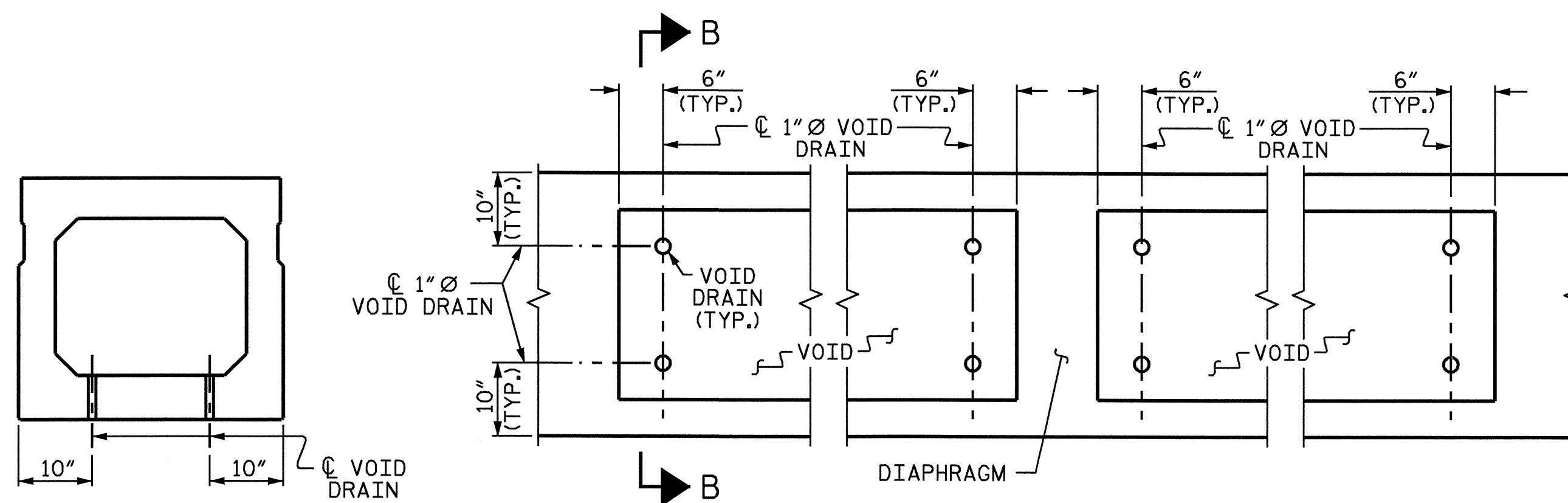
PROJECT NO. B-3919
WAKE COUNTY
 STATION: 17+55.20 -L-

SHEET 4 OF 11

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 3'-0" X 2'-9"
 PRESTRESSED CONCRETE
 BOX BEAM UNIT



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			51

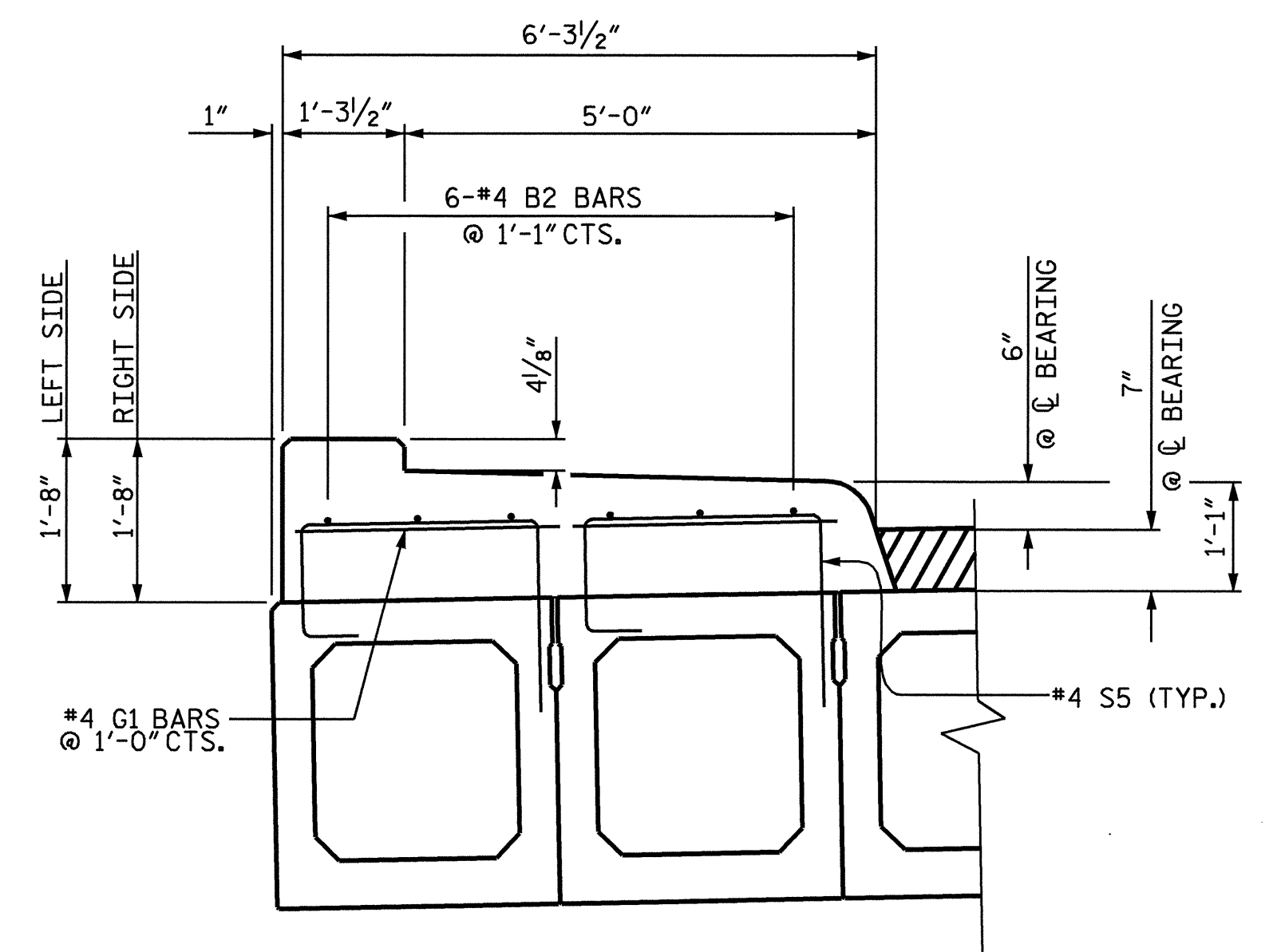
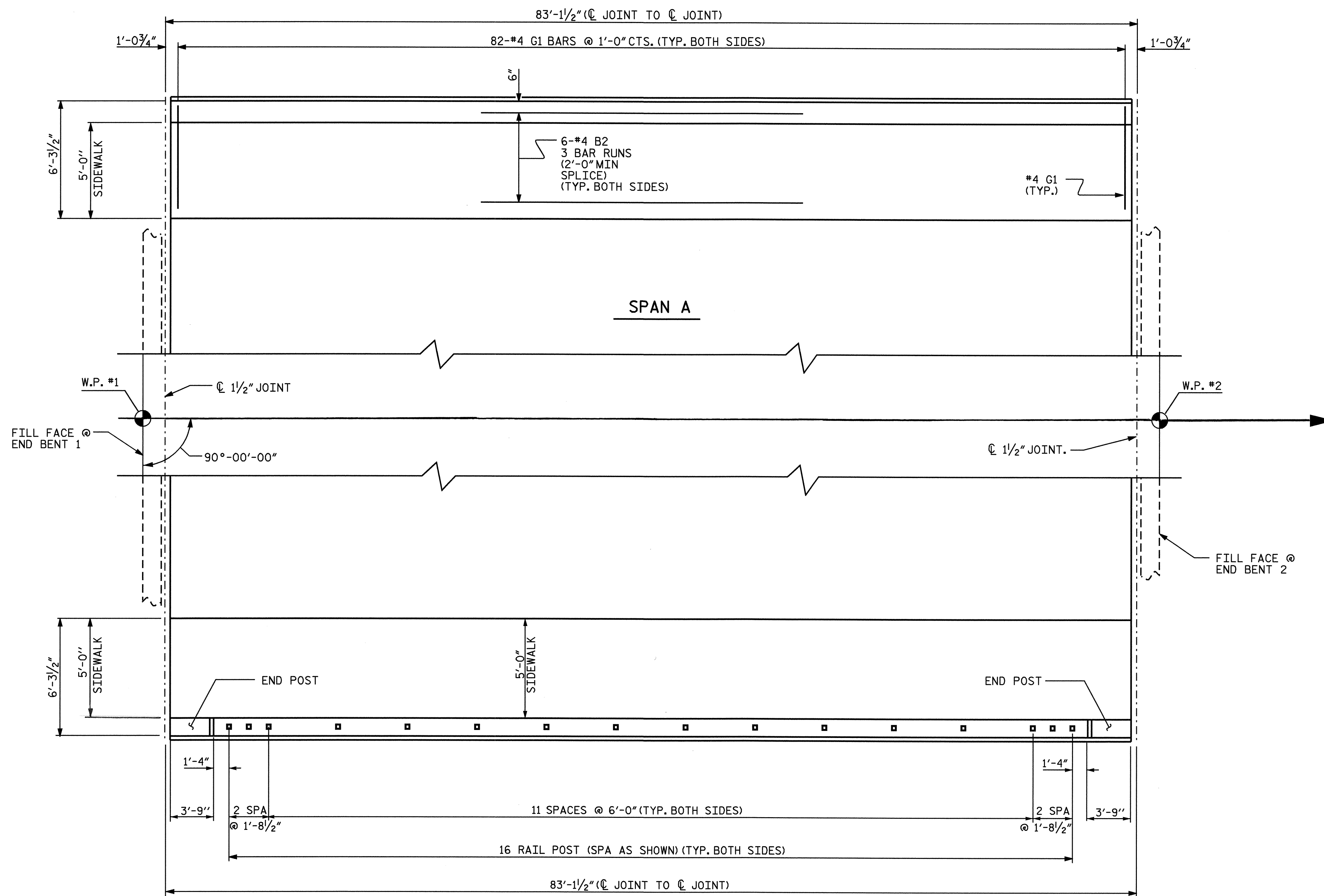


VOID DRAIN DETAILS

(DIMENSIONS SHOWN ARE TYPICAL FOR EACH VOID)

ASSEMBLED BY : N.Q. TRAN DATE : 2-09
 CHECKED BY : J.A. TILLMAN DATE : 4-22-09
 DRAWN BY : TLA 5/05
 CHECKED BY : GM 6/05

ADDED 7/11/05
 REV. 5/1/06 TLA/GM



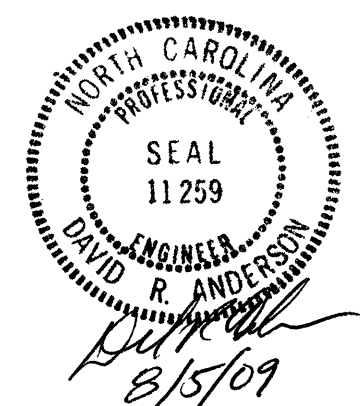
SECTION THRU SIDEWALK

BILL OF MATERIAL FOR SIDEWALK					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B2	36	#4	STR	28'-10"	693
*G1	164	#4	STR	5'-9"	630
* EPOXY COATED REINFORCING STEEL				LBS.	1323
CLASS AA CONCRETE				CU.YDS.	48.7

PROJECT NO. B-3919
WAKE COUNTY
 STATION: 17+55.20 -L-

SHEET 5 OF 11

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 RAIL POST SPACINGS
 AND SIDEWALK DETAILS

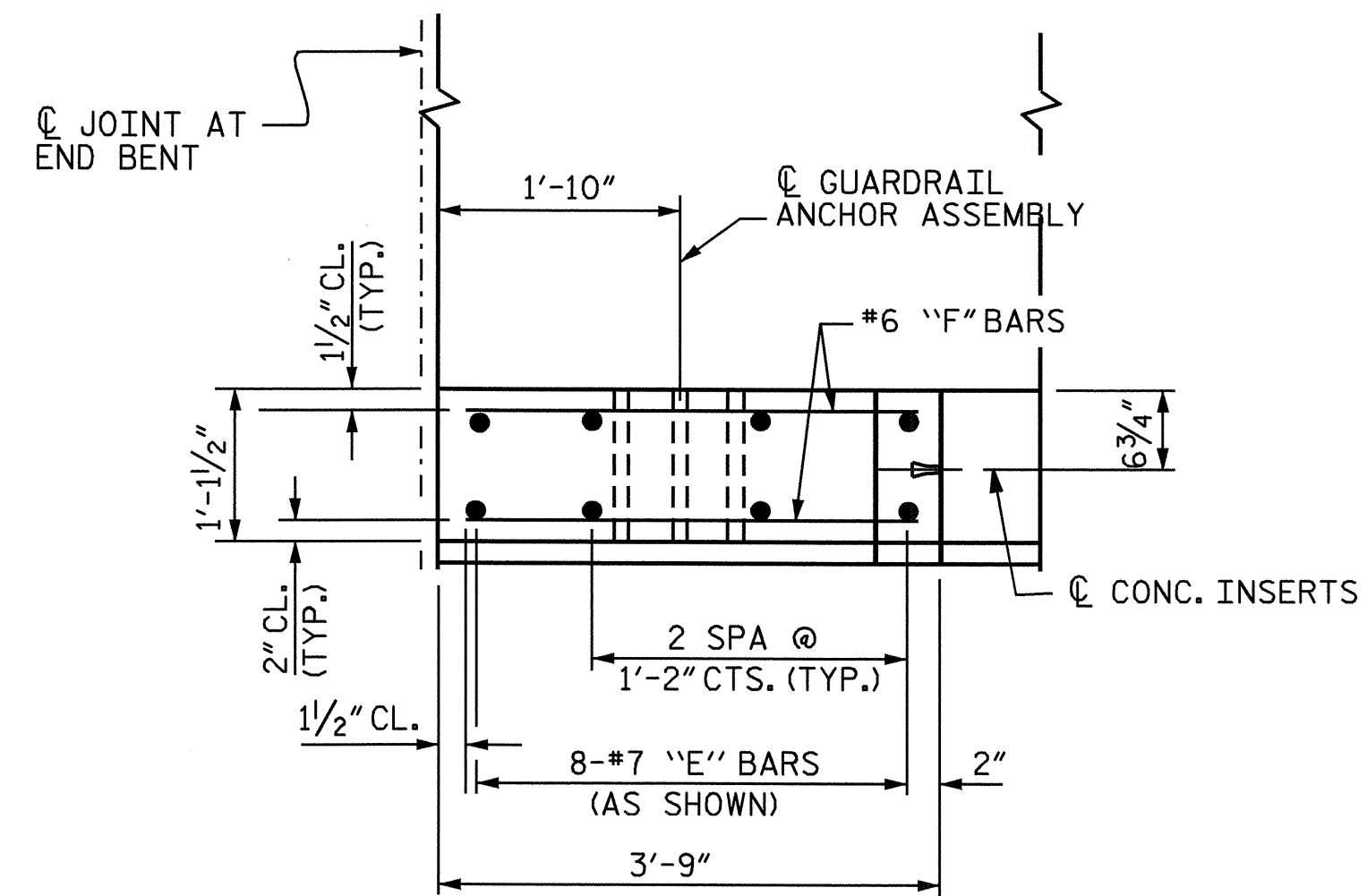


REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	5-9	
1			3			TOTAL	51
2			4			SHEETS	

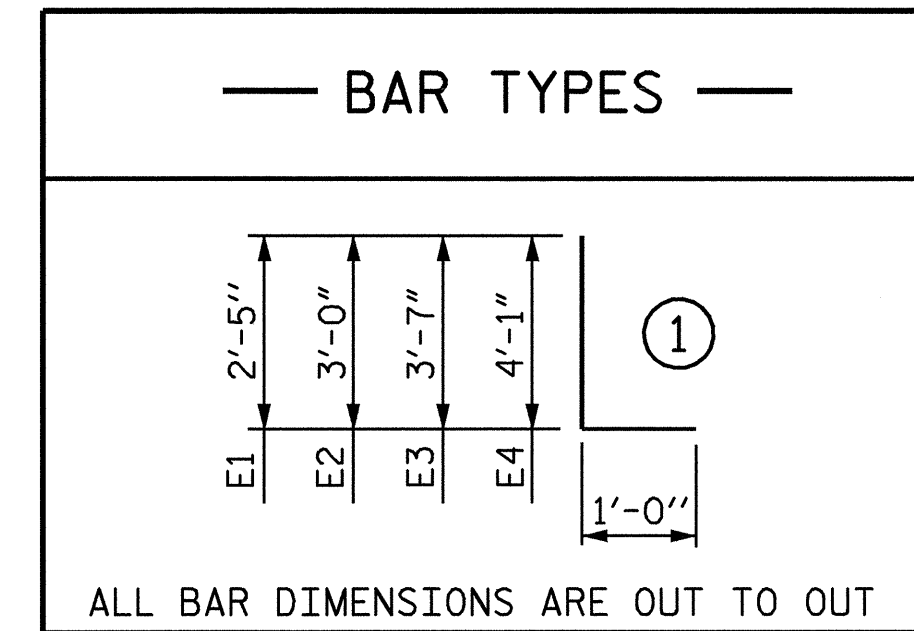
ASSEMBLED BY : N. Q. TRAN DATE : 2-09
 CHECKED BY : J.A. TILLMAN DATE : 4-22-09

08-JUN-2009 13:48
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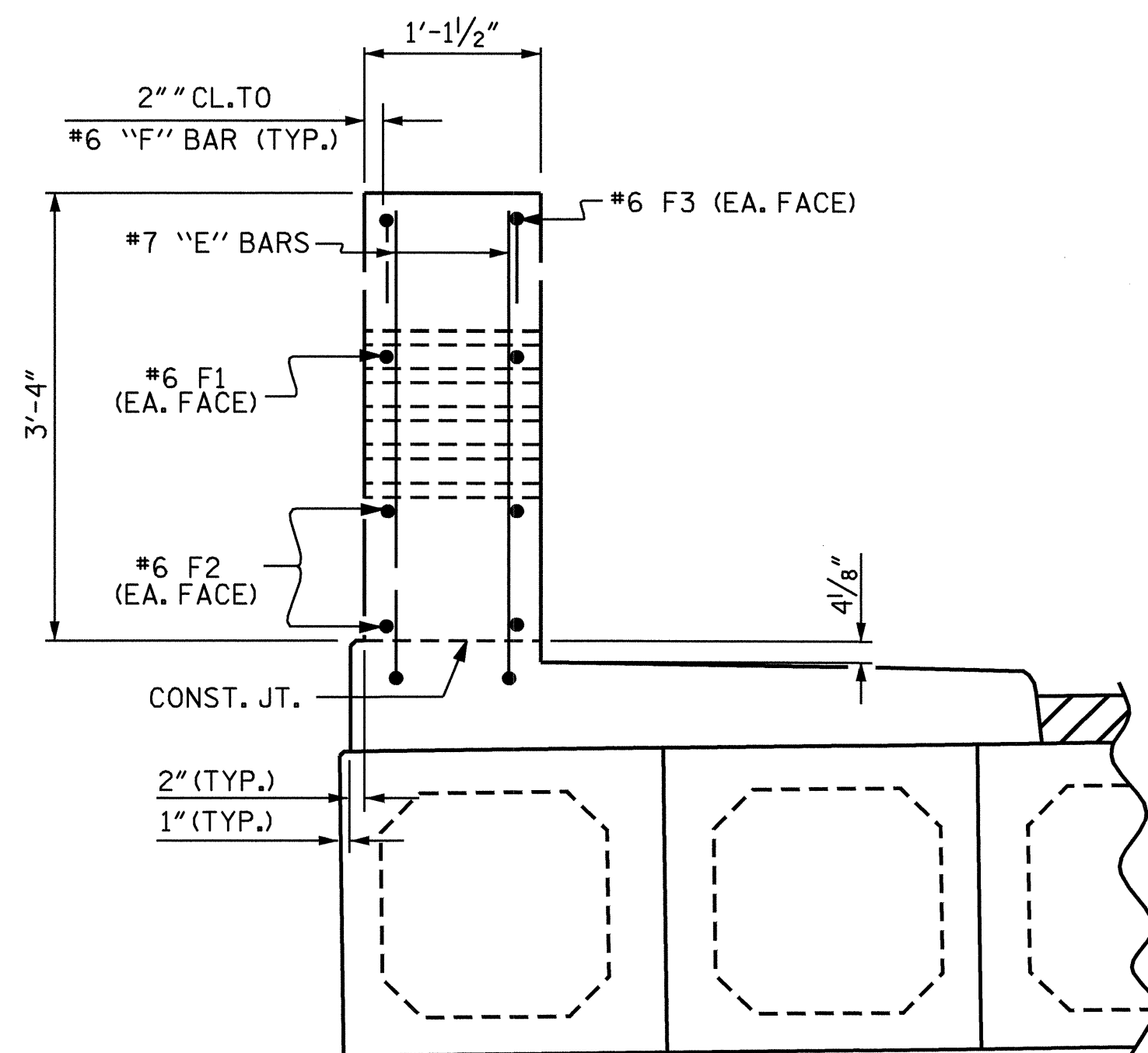
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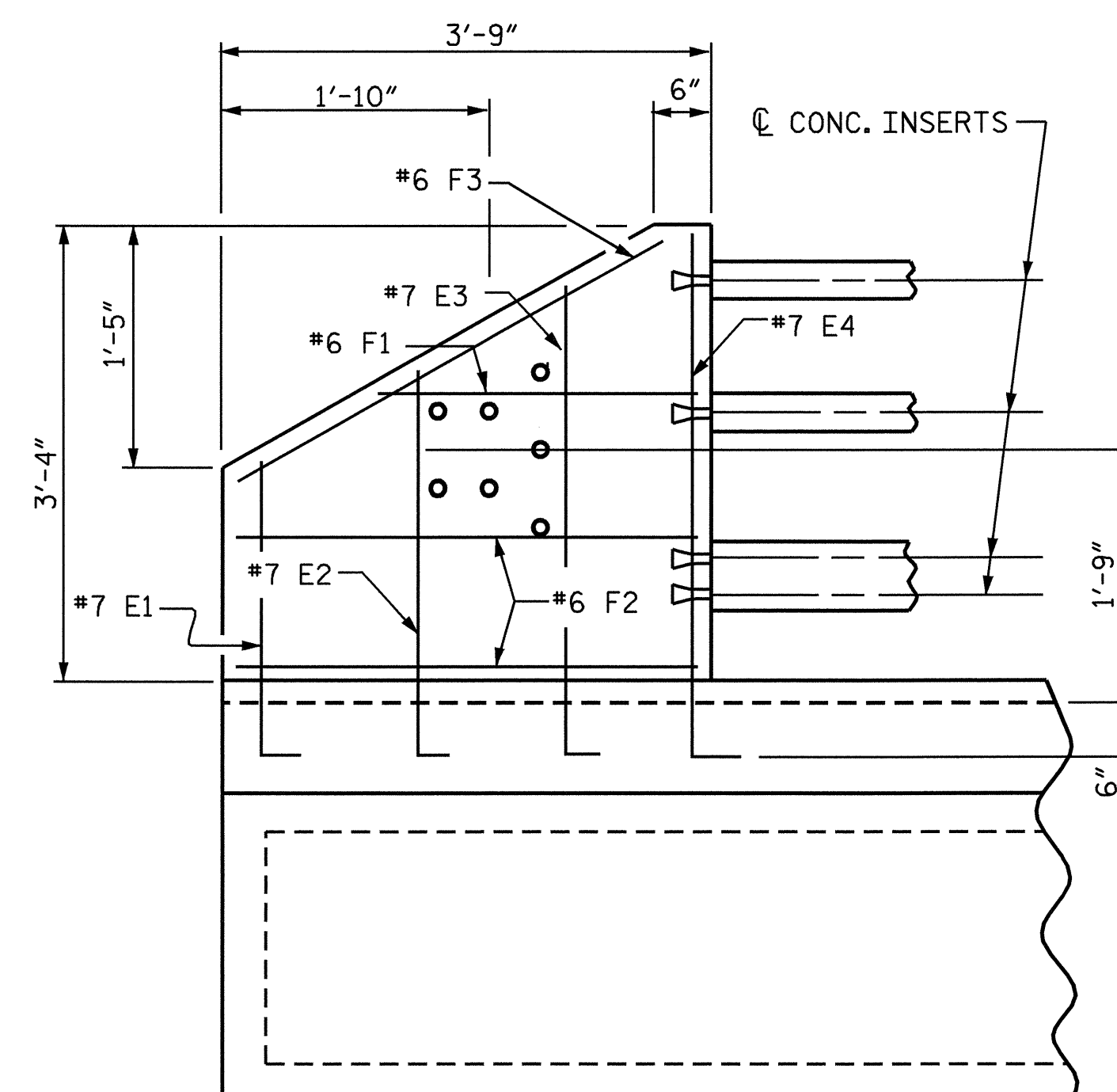
PLAN OF END POST



BILL OF MATERIAL FOR END POSTS					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*E1	8	# 7	1	3'-5"	56
*E2	8	# 7	1	4'-0"	65
*E3	8	# 7	1	4'-7"	75
*E4	8	# 7	1	5'-1"	83
*F1	8	# 6	STR	3'-1"	37
*F2	16	# 6	STR	3'-4"	80
*F3	8	# 6	STR	3'-6"	42
* EPOXY COATED REINFORCING STEEL LBS.					438
CLASS AA CONCRETE				CU.YDS.	1.7



END VIEW



ELEVATION

COMBINED TOTALS FOR SIDEWALK & END POSTS		
* EPOXY COATED REINFORCING STEEL LBS.		1,761
CLASS AA CONCRETE		CU.YDS. 50.4

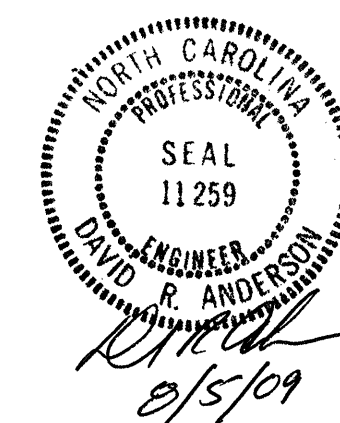
END POST DETAILS

PROJECT NO. B-3919
 WAKE COUNTY
 STATION: 17+55.20 -L-

SHEET 6 OF 11

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

3 BAR METAL RAIL
 END POST DETAILS

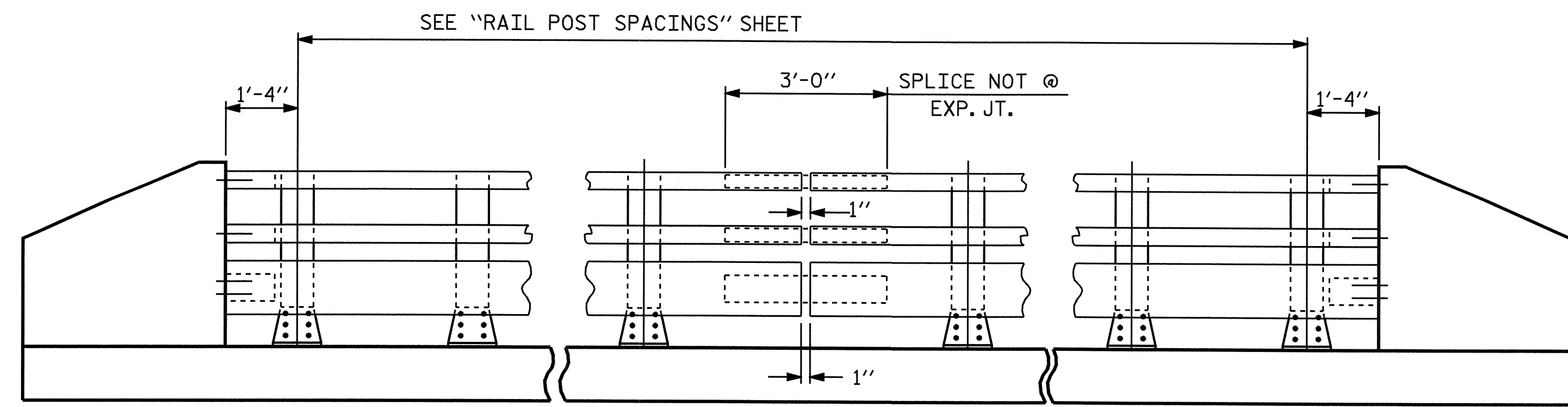


REVISIONS						SHEET NO. 5-10
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 51
2			4			

ASSEMBLED BY : N. Q. TRAN DATE : 2-09
 CHECKED BY : J.A. TILLMAN DATE : 4-22-09

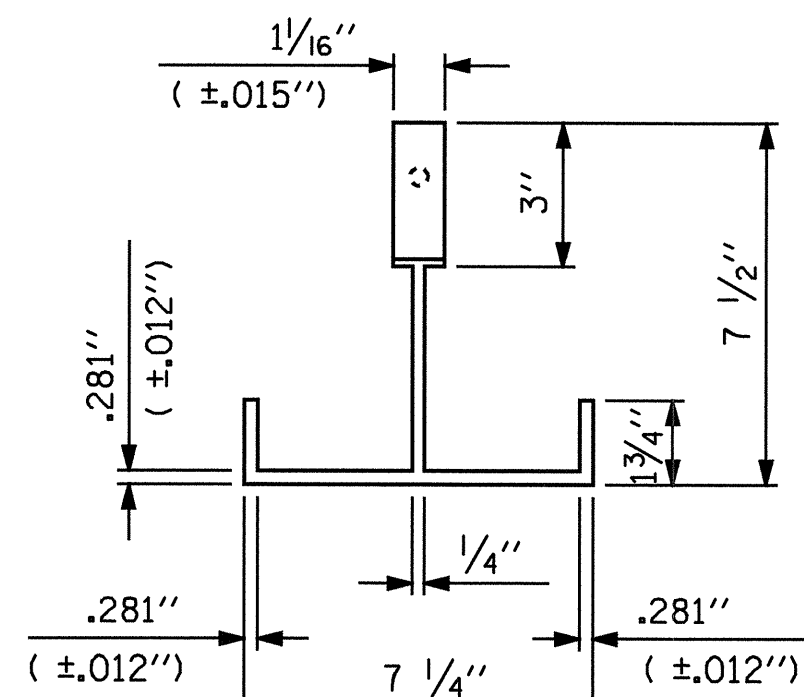
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 danderson

STR.1

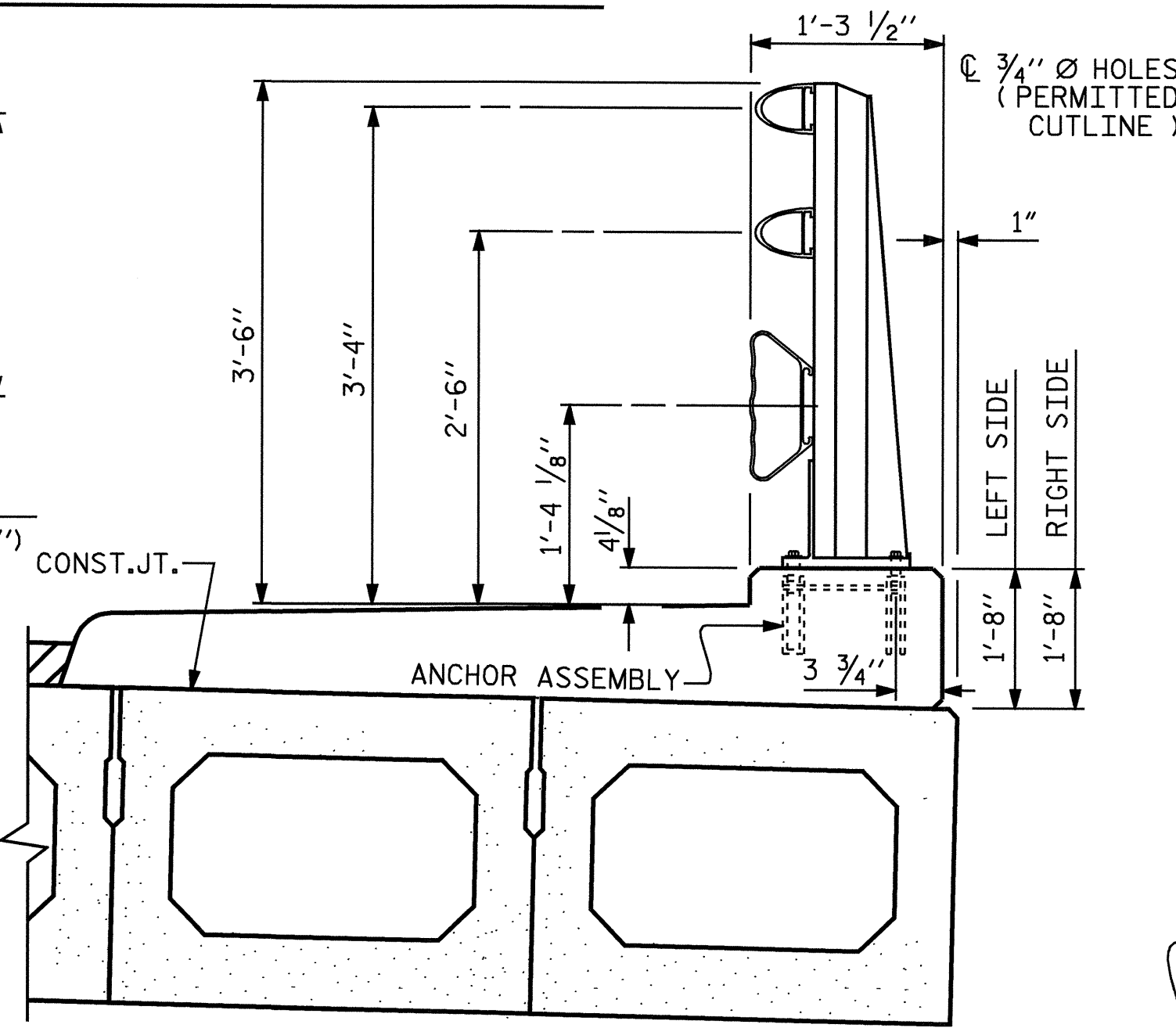


NOTE:
FOR ATTACHMENT OF METAL RAIL TO END
POST, SEE SHEET 9 OF 11.

ELEVATION

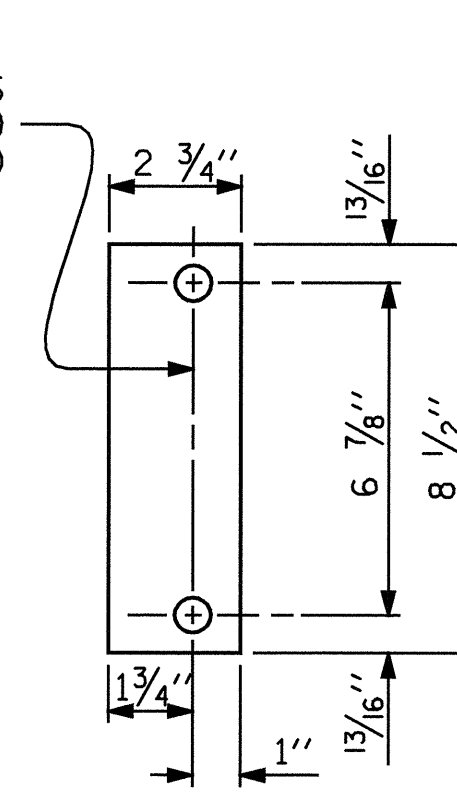


PLAN

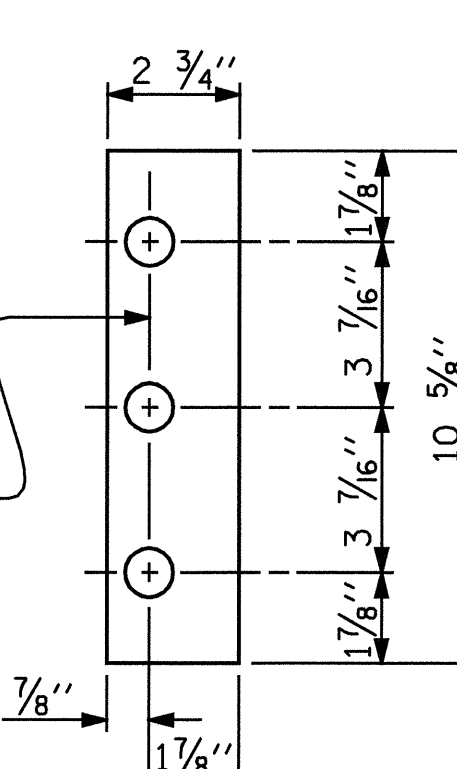


SECTION THRU RAIL

FOR ANCHOR ASSEMBLY, SEE SHEET 9 OF 11.

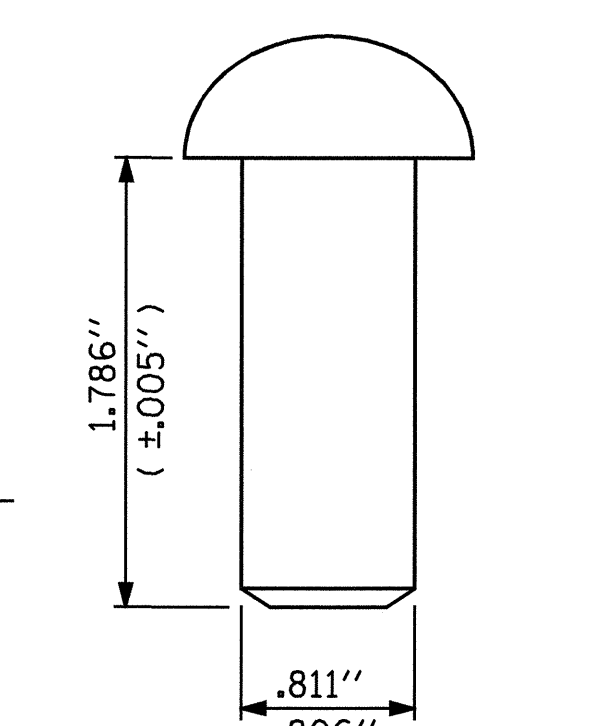


REAR PLATE

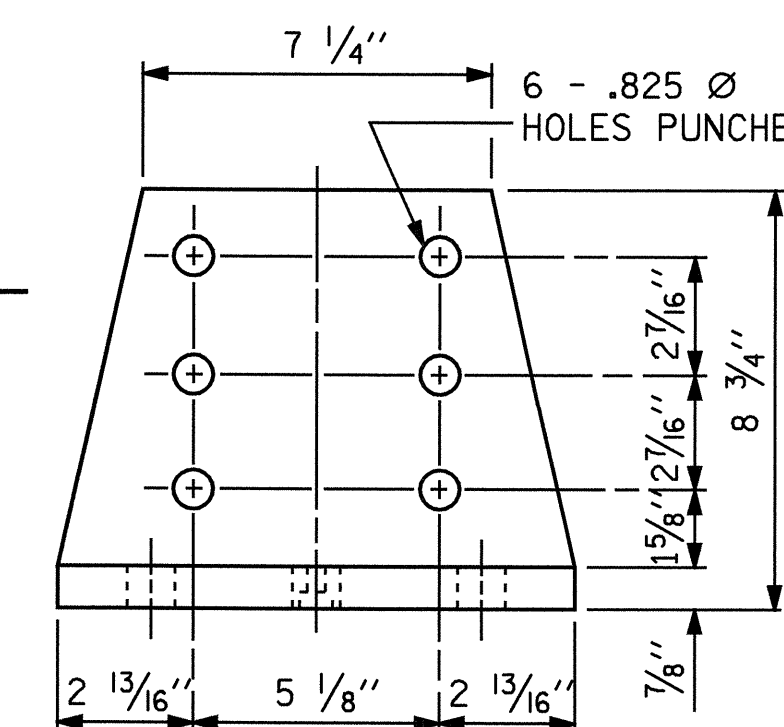


FRONT PLATE
SHIM DETAILS

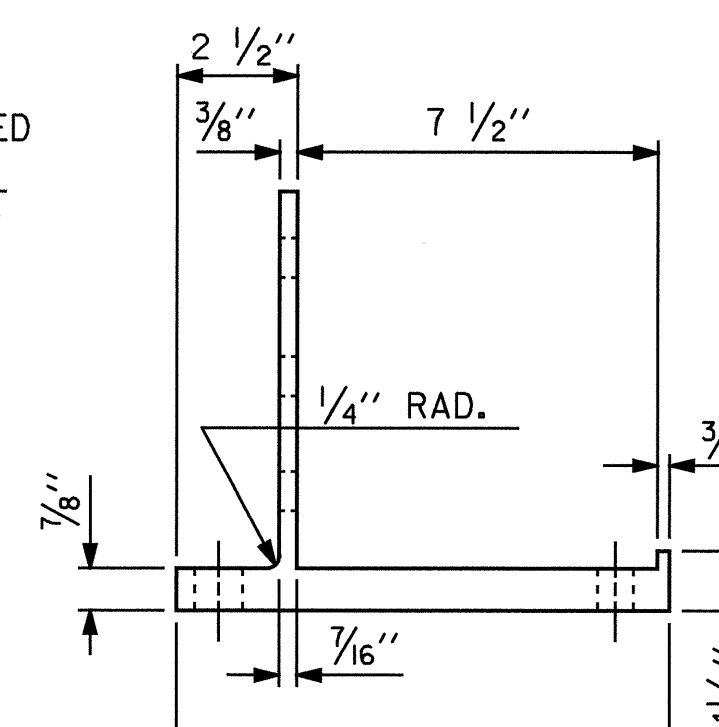
NOTE:
SHIMS MAY BE CUT ALONG PERMITTED CUTLINE OR
SLOTTED TO EDGE OF PLATE TO FACILITATE PLACEMENT.



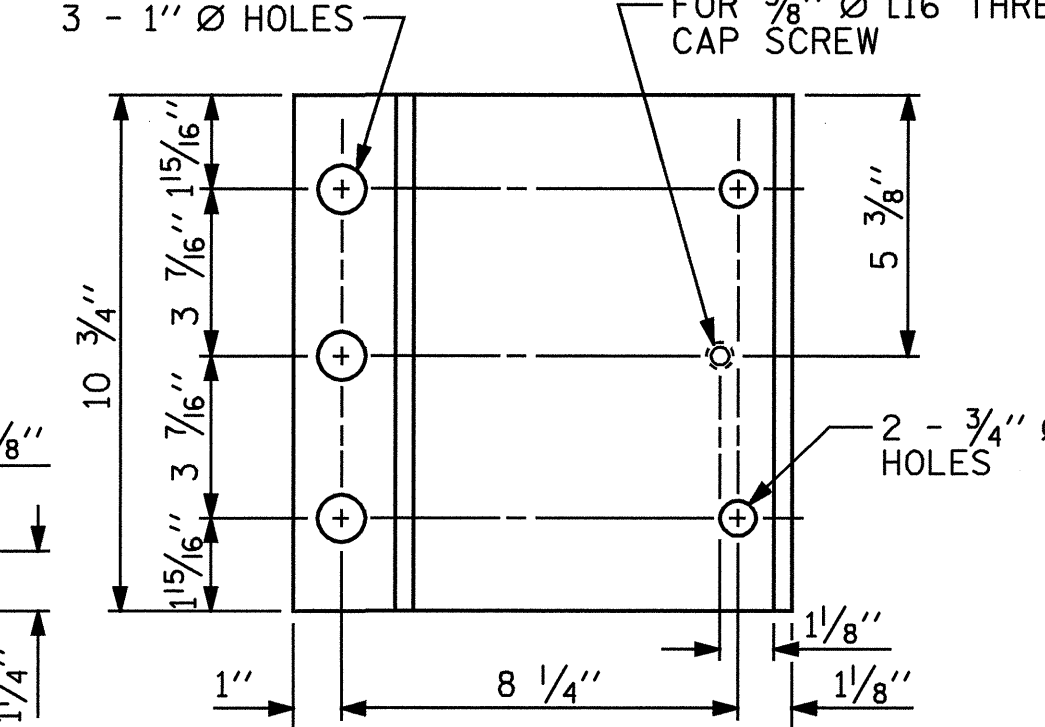
RIVET DETAIL



FRONT ELEVATION

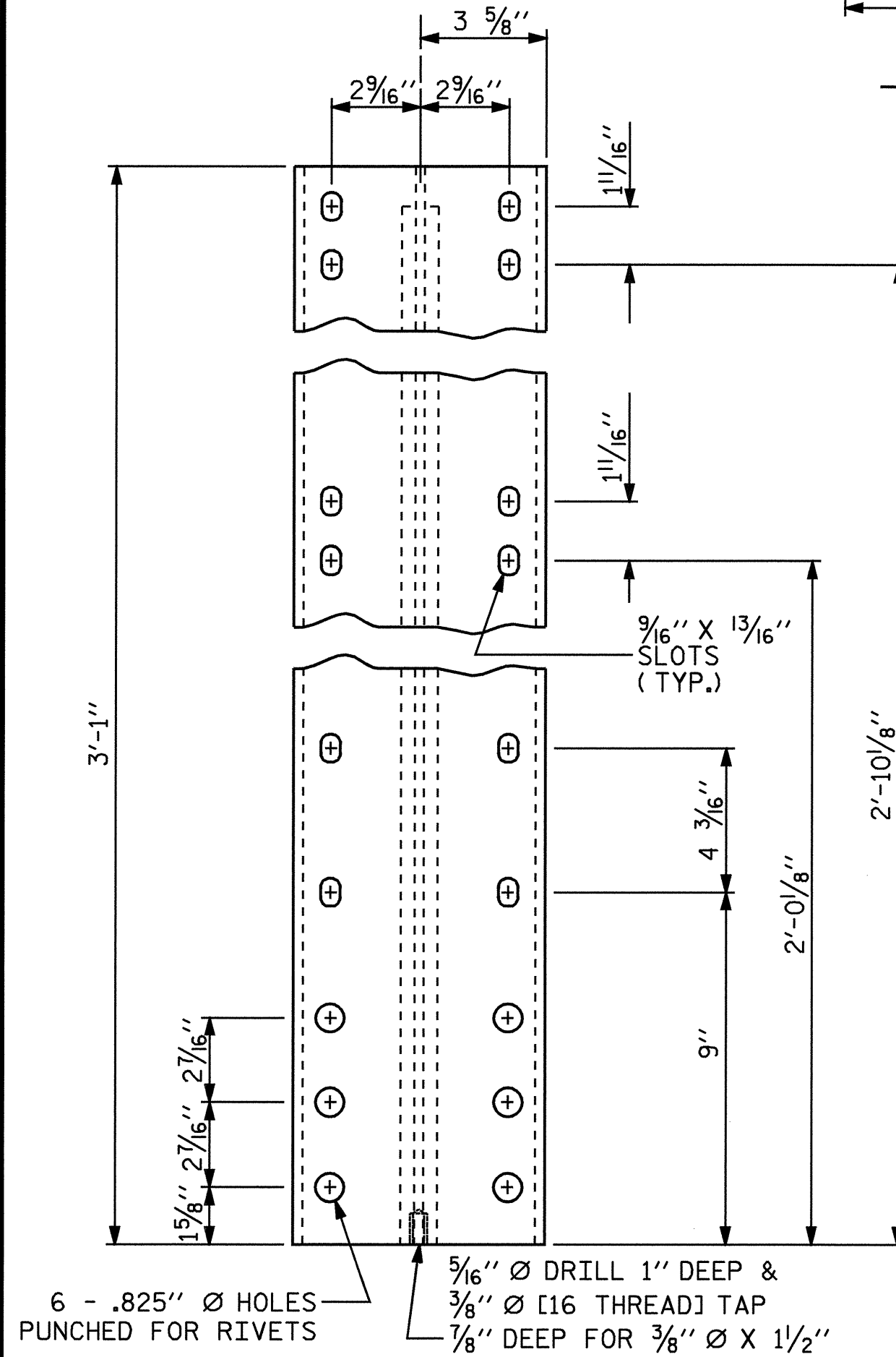


SIDE ELEVATION

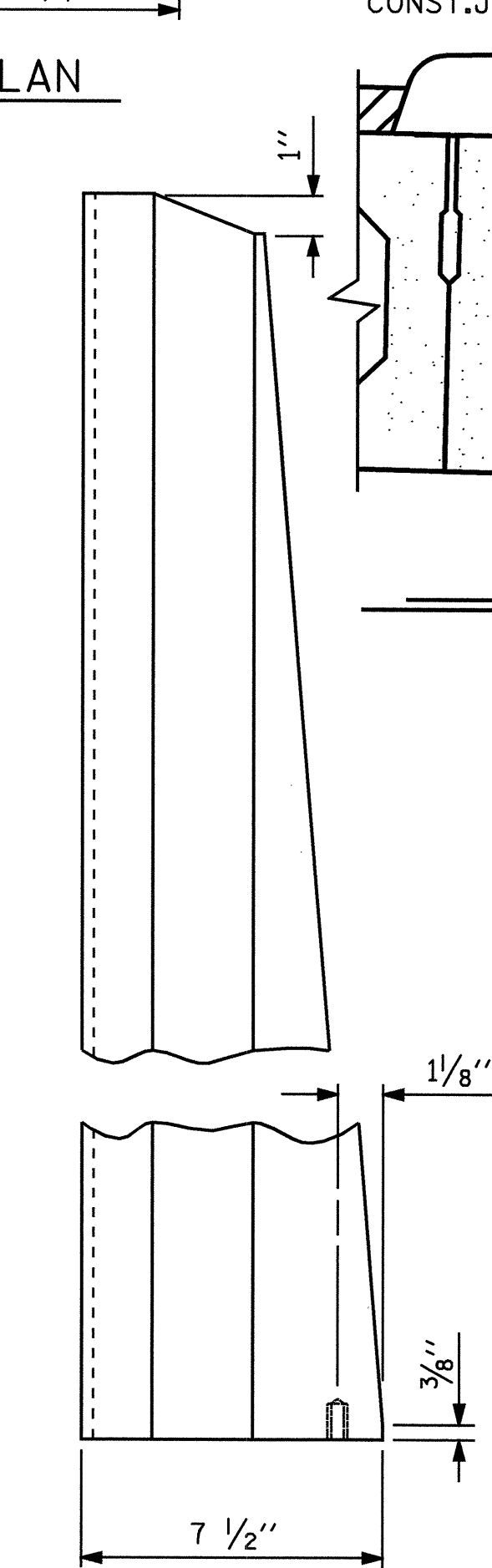


PLAN

POST BASE DETAILS



FRONT ELEVATION



SIDE ELEVATION

DETAILS OF POST

PAY LENGTH = 144.2 LIN.FT.

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 B221 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. PLACE ONE JOINT SPLICE JUST BEYOND THE 3RD RAIL POST FROM EACH END, TYPICALLY 14' FROM THE END. PLACE OTHER JOINTS AS NEEDED.

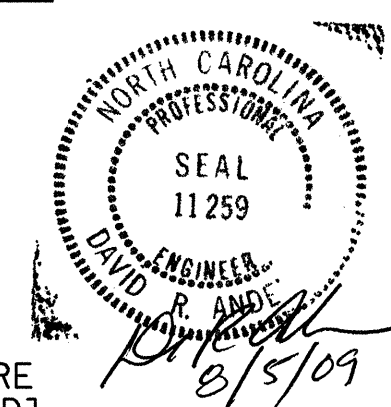
FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE SHEET 9 OF 11. CAP SCREWS SHALL BE ASTM F593 ALLOY 305 STAINLESS STEEL. WASHERS FOR RAIL ATTACHMENT SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL. CERTIFIED MILL REPORTS ARE REQUIRED 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 REMAIN VISIBLE AFTER RAIL PLACEMENT. SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

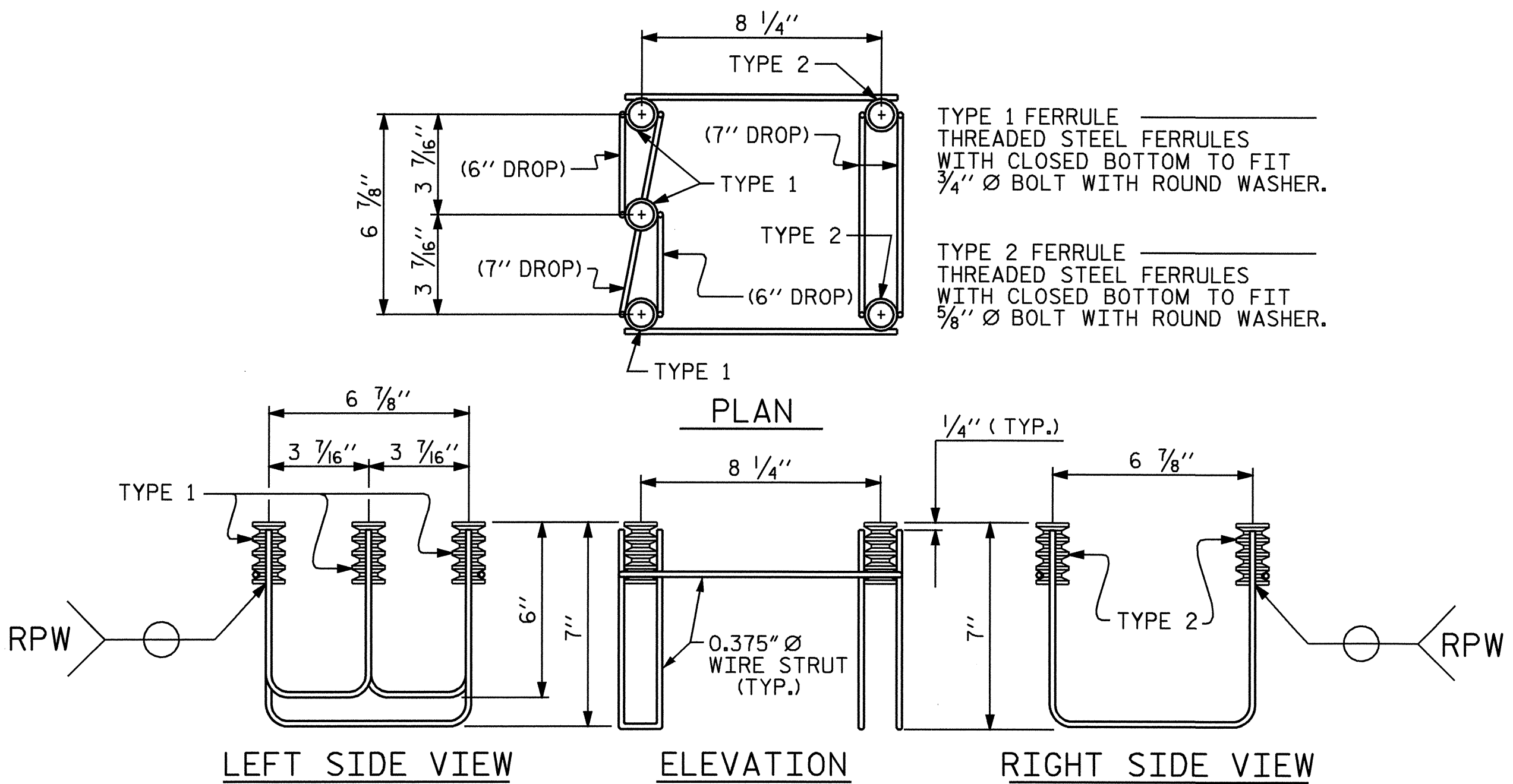
ALLOY 6351-T5 MAY BE SUBSTITUTED FOR ALLOY 6061-T6 WHERE APPLICABLE. MINOR VARIATIONS IN DETAILS OF METAL RAIL WILL BE CONSIDERED. DETAILS OF SUCH VARIATIONS, IF DESIRED, SHALL BE SUBMITTED FOR APPROVAL.



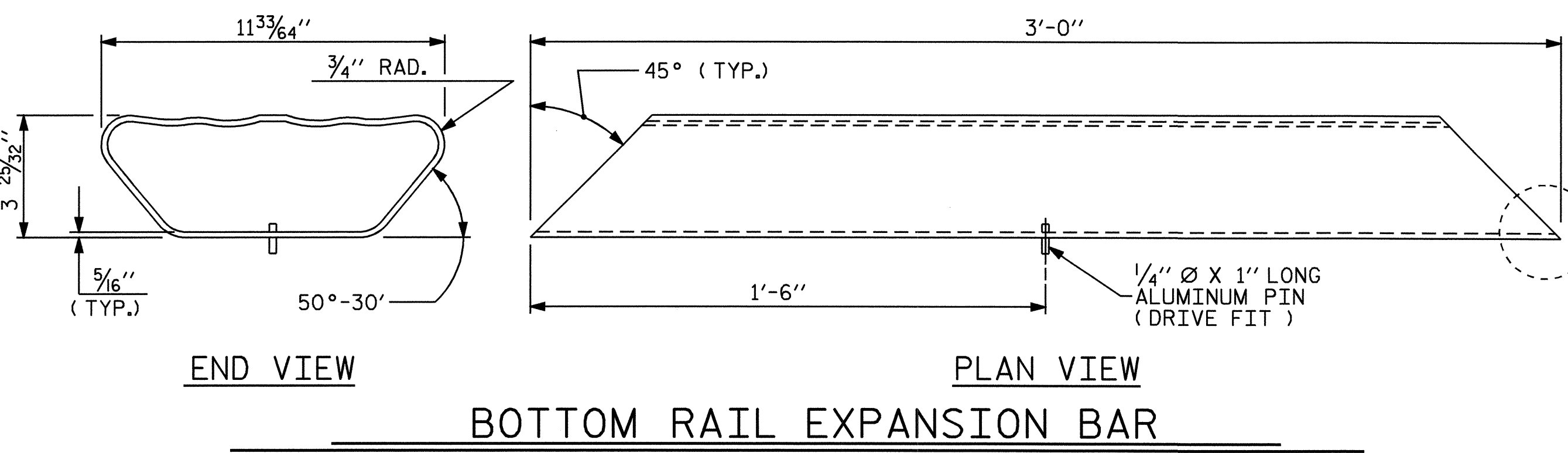
PROJECT NO. B-3919
WAKE COUNTY
STATION: 17+55.20 -L-
SHEET 7 OF 11

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

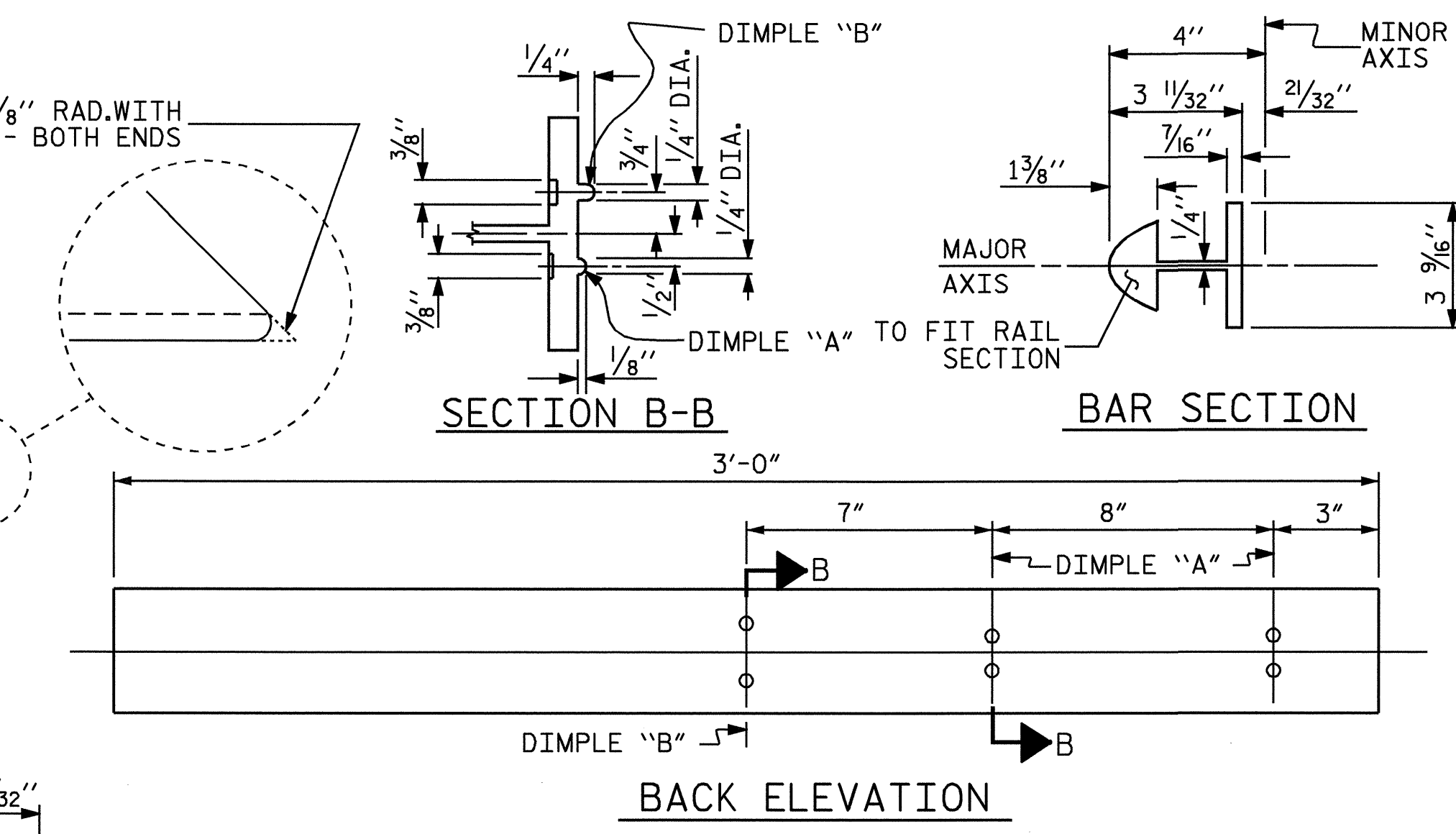
ASSEMBLED BY: N. Q. TRAN	DATE: 2-09
CHECKED BY: J.A. TILLMAN	DATE: 4-22-09
DRAWN BY: JMB	1/88
CHECKED BY: GGH	1/88
REV. 10/17/00	RWW/LES
REV. 5/7/03	RWW/JTE
REV. 5/1/06	TLA/GM



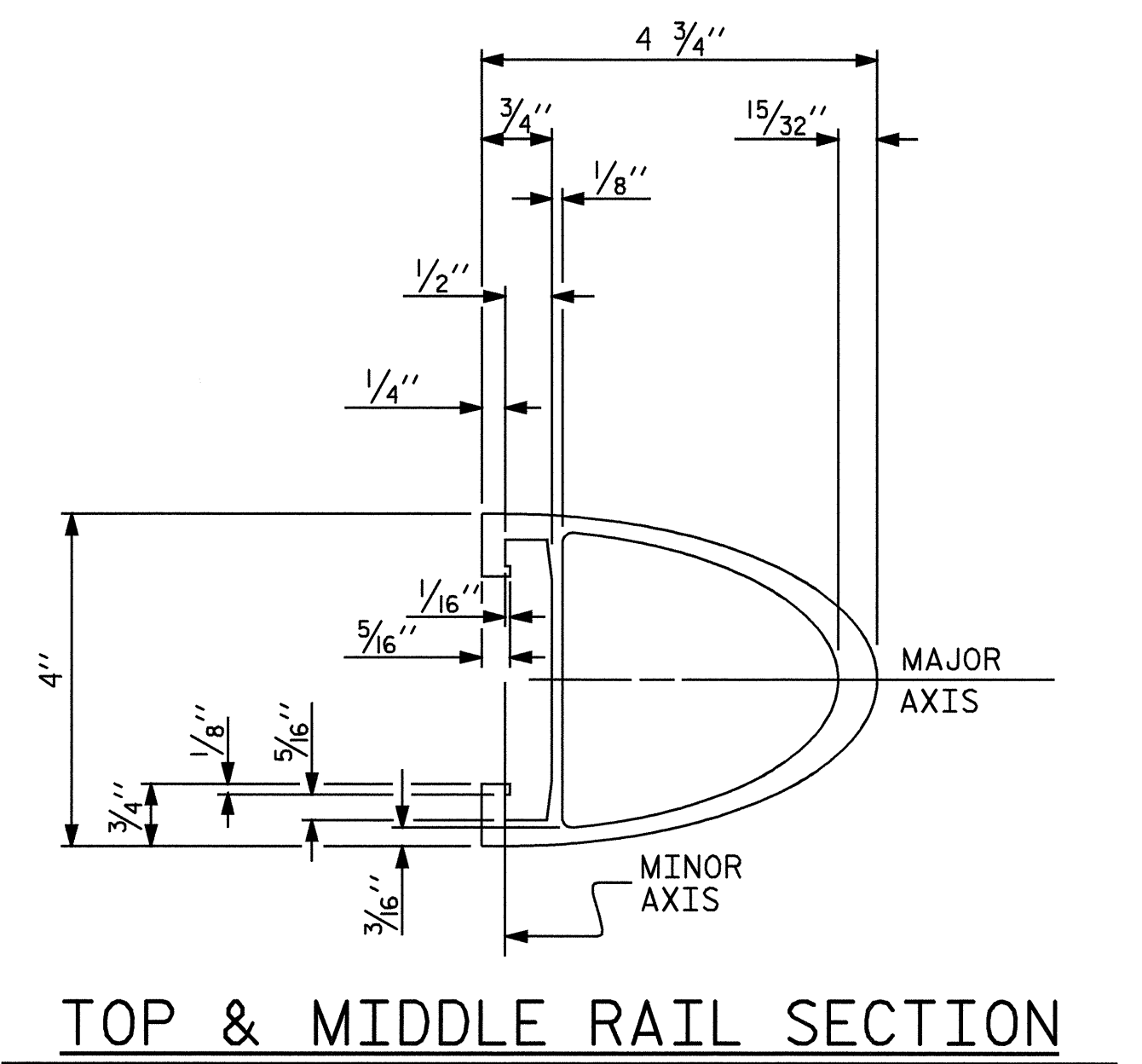
5-BOLT METAL RAIL ANCHOR ASSEMBLY
(32 ASSEMBLIES REQUIRED)



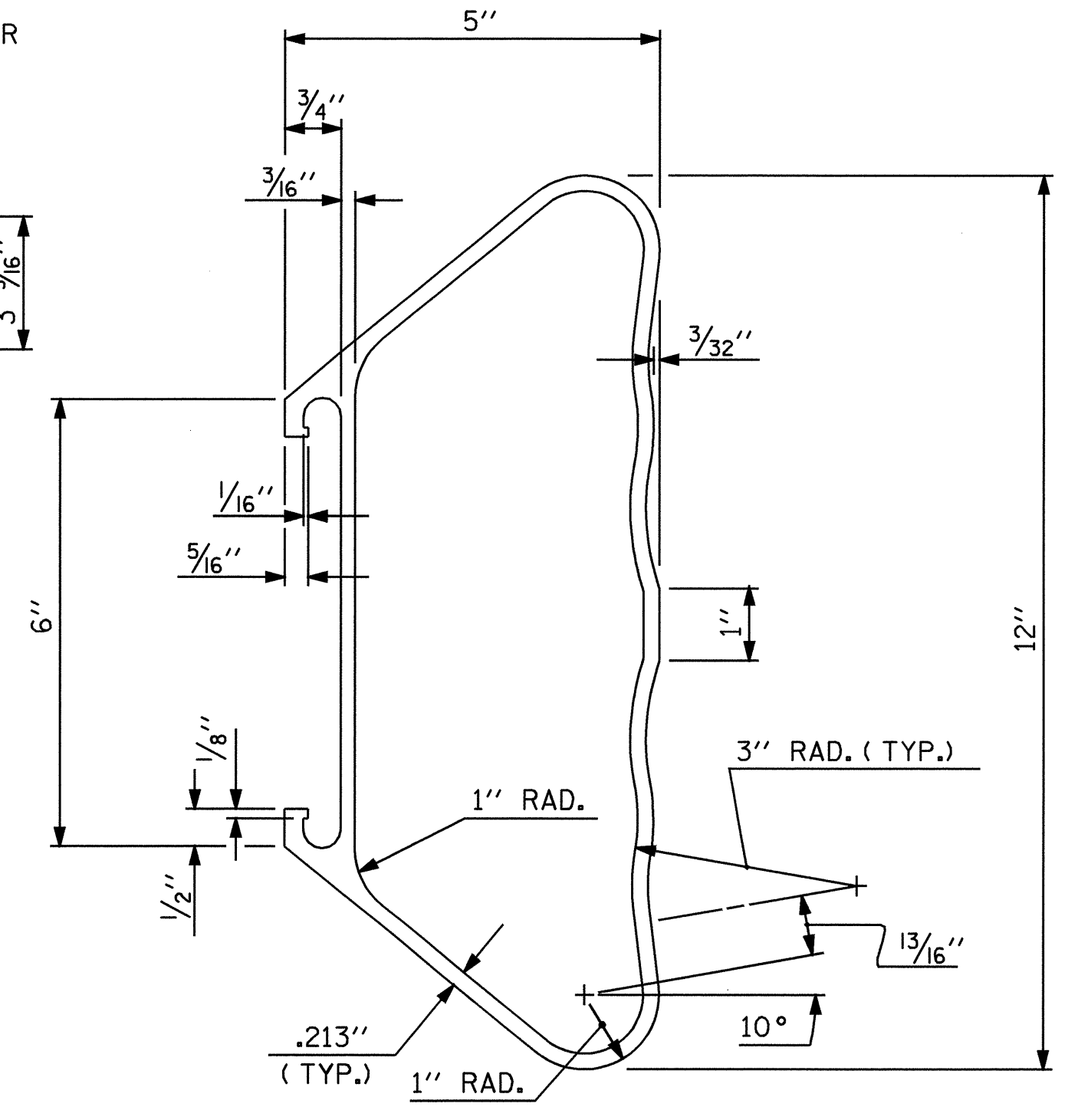
BOTTOM RAIL EXPANSION BAR



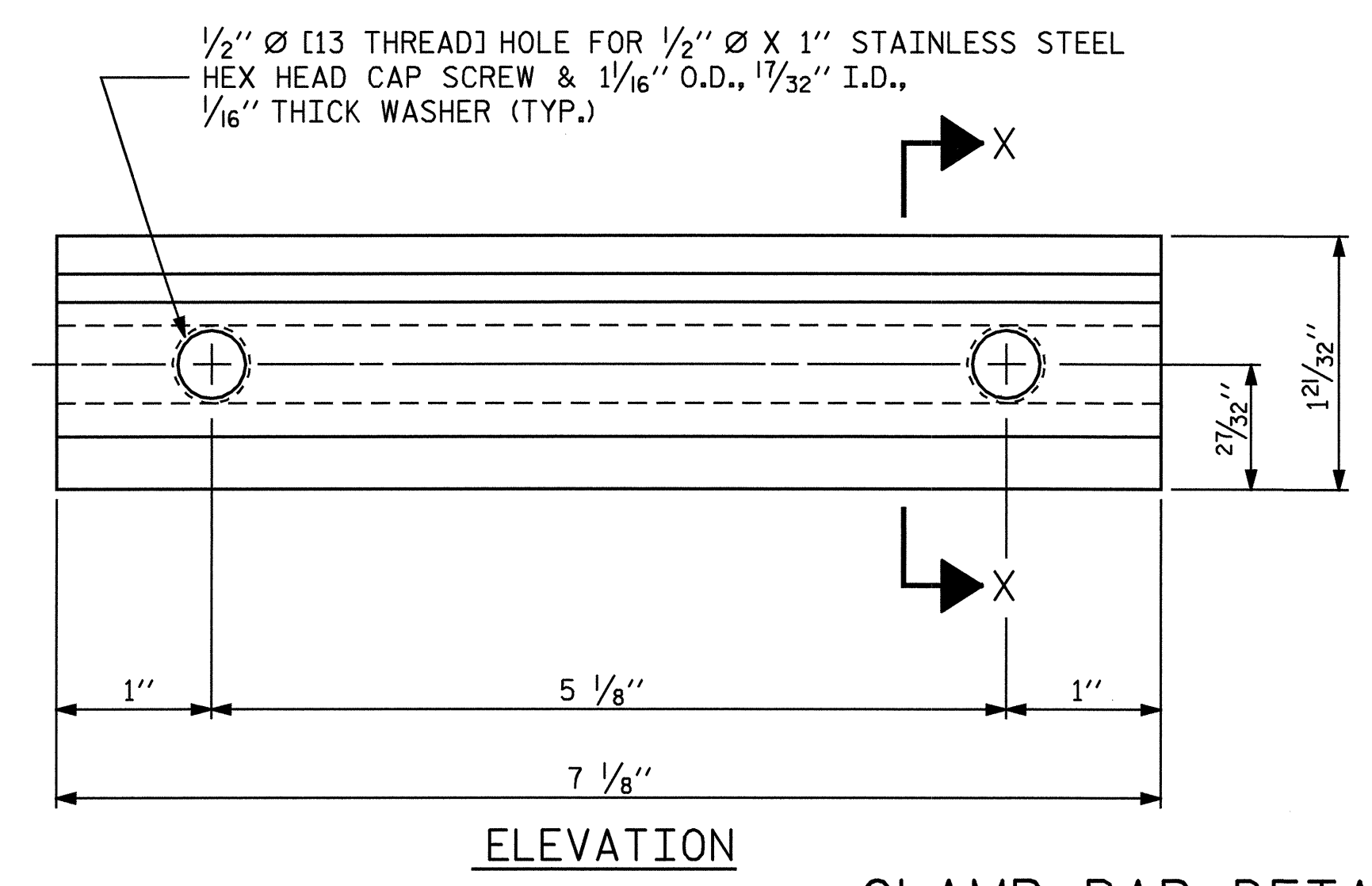
TOP & MIDDLE RAIL EXPANSION BAR



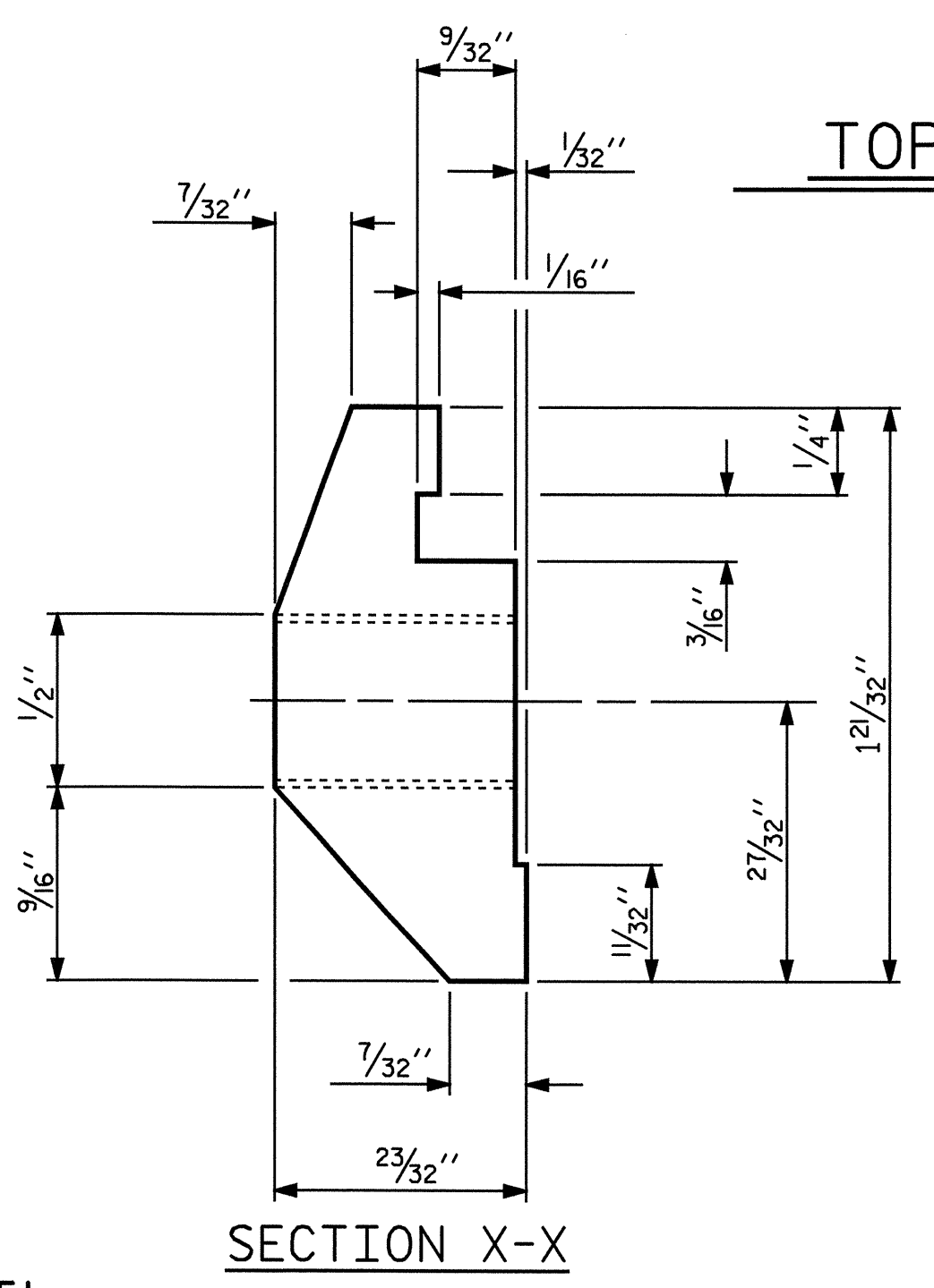
TOP & MIDDLE RAIL SECTION



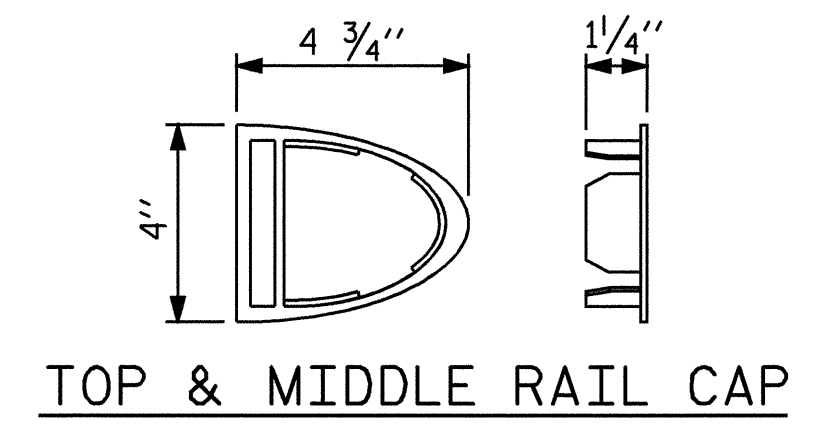
BOTTOM RAIL SECTION



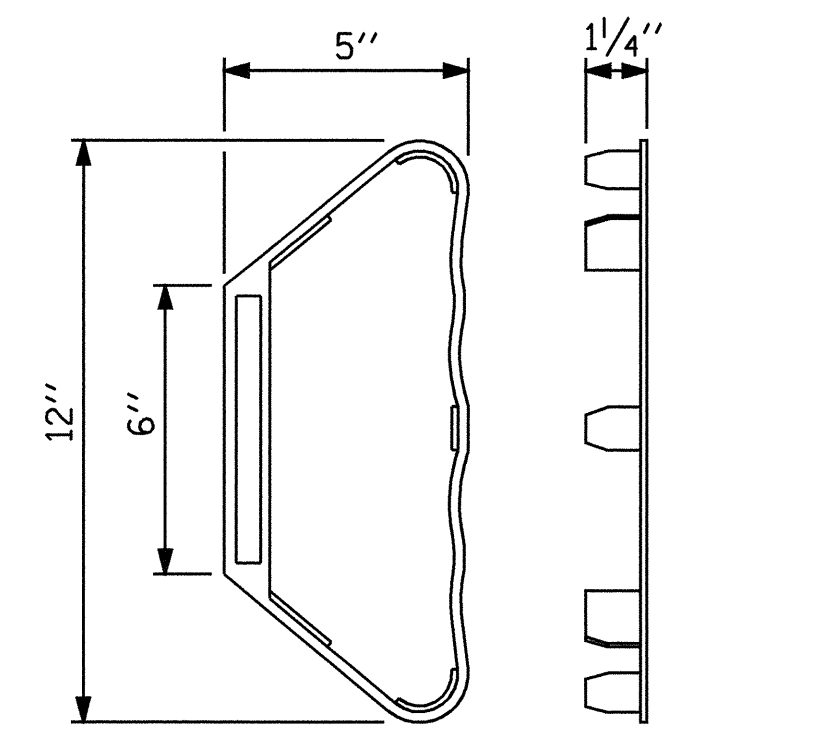
CLAMP BAR DETAIL
(6 REQUIRED PER POST)



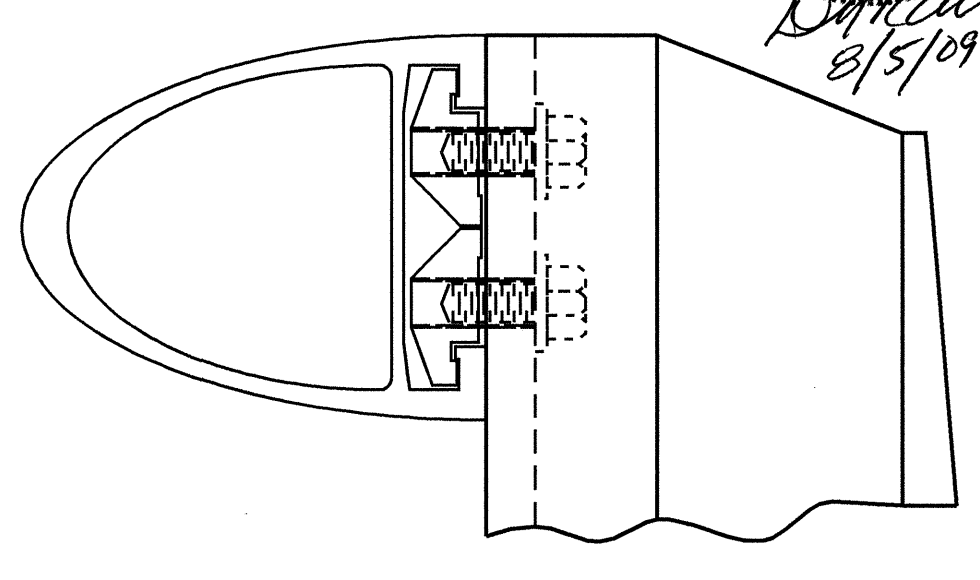
SECTION X-X



TOP & MIDDLE RAIL CAP



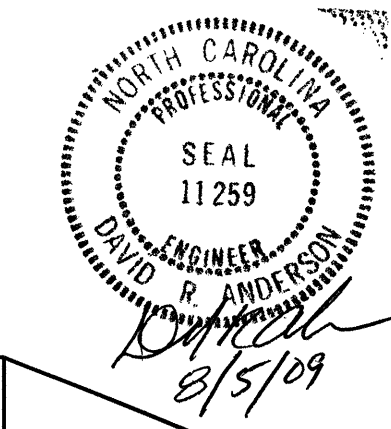
BOTTOM RAIL CAP



CLAMP ASSEMBLY
(TOP RAIL SHOWN
(MIDDLE & BOTTOM RAIL ARE SIMILAR))

- NOTES**
STRUCTURAL CONCRETE ANCHOR ASSEMBLY
- THE STRUCTURAL CONCRETE ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- 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 AND 1 3/4" FOR 5/8" FERRULES.
 - 3 - 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.
 - 2 - 5/8" Ø X 2 1/4" 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 5/8" Ø X 2 1/4" 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.
 - 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.
 - THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.
 - 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.
 - BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

ASSEMBLED BY :	N. Q. TRAN	DATE :	2-09
CHECKED BY :	J.A. TILLMAN	DATE :	4-22-09
DRAWN BY :	JMB 1/88	REV. 10/17/00	RWW/LES
CHECKED BY :	GGH 1/88	REV. 5/7/03	RWW/JTE
		REV. 5/1/06	TLA/GM



PROJECT NO. B-3919
WAKE COUNTY
STATION: 17+55.20 -L-
SHEET 8 OF 11

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD 3 BAR METAL RAIL					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. 5-12
					TOTAL SHEETS 51

NOTES

METAL RAIL TO END POST CONNECTION

- THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
 - 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.
 - 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. WASHERS FOR RAIL ATTACHMENT SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.
 - STANDARD CLAMP BARS (SEE SHEET 8 OF 11).

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 3 BAR METAL RAIL.

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.

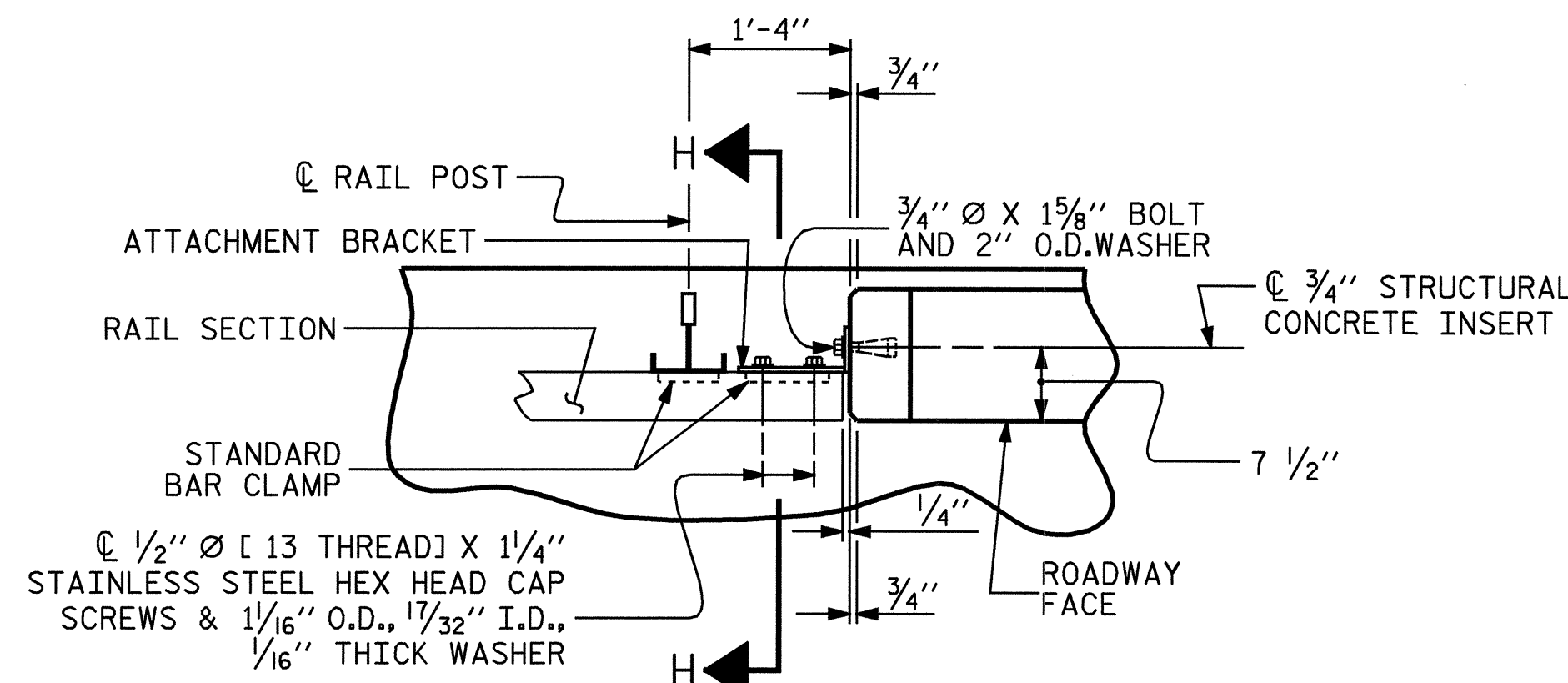
THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø X 1 1/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" Ø X 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT 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. SEE SPECIAL PROVISIONS.

NOTES

STRUCTURAL CONCRETE INSERT

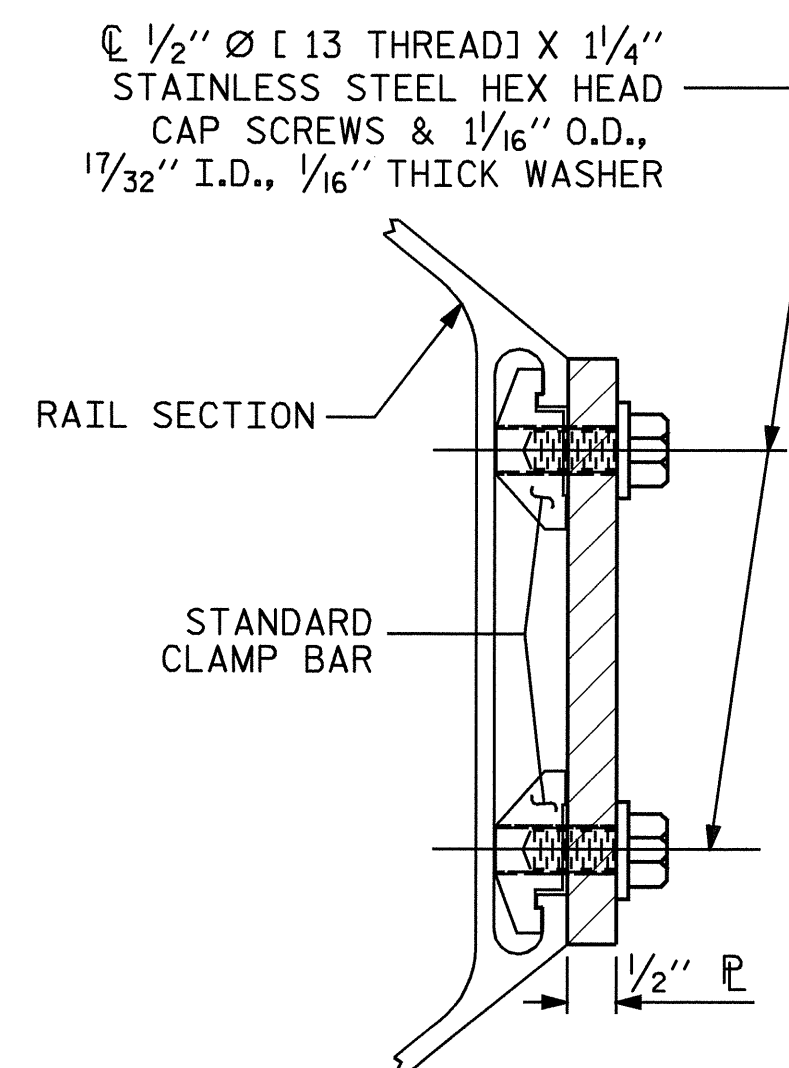
THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:

- FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1 1/2".
- 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.
- 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 1/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.



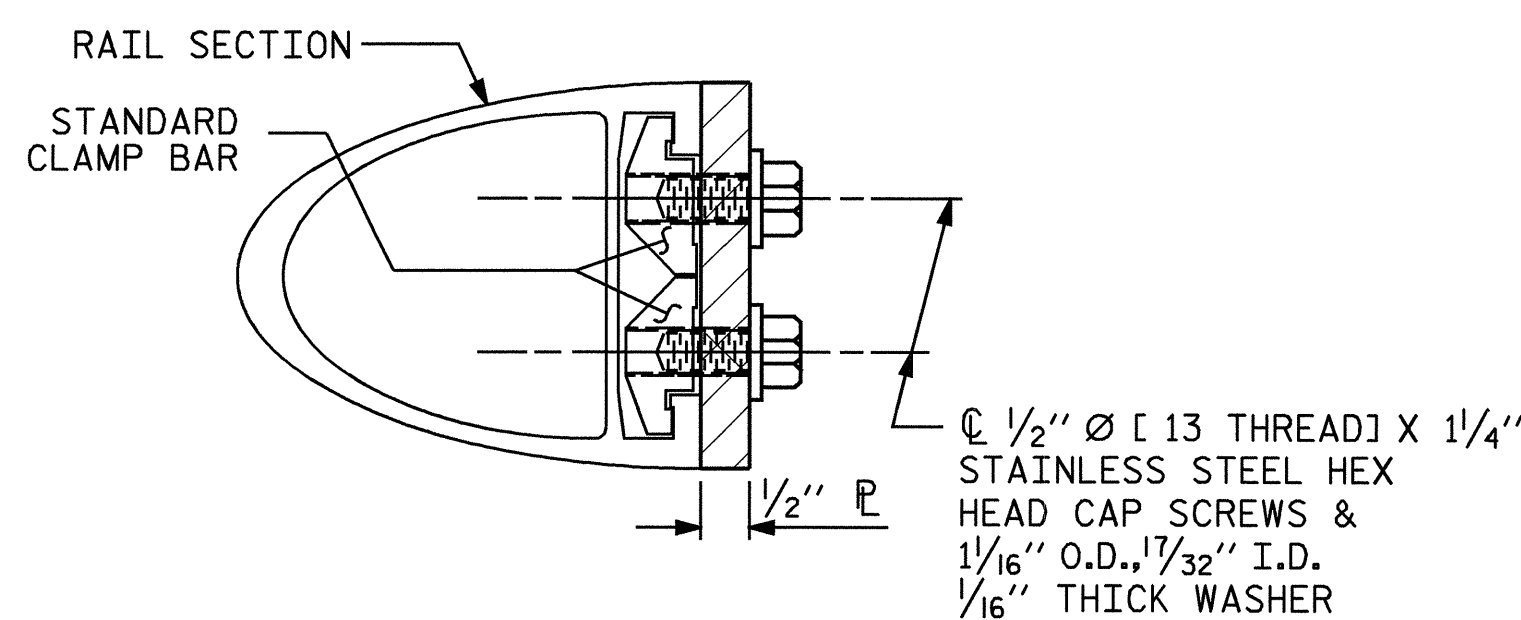
PLAN OF RAIL AND END POST

(STIFFENER ON 1/2" P NOT SHOWN FOR CLARITY)



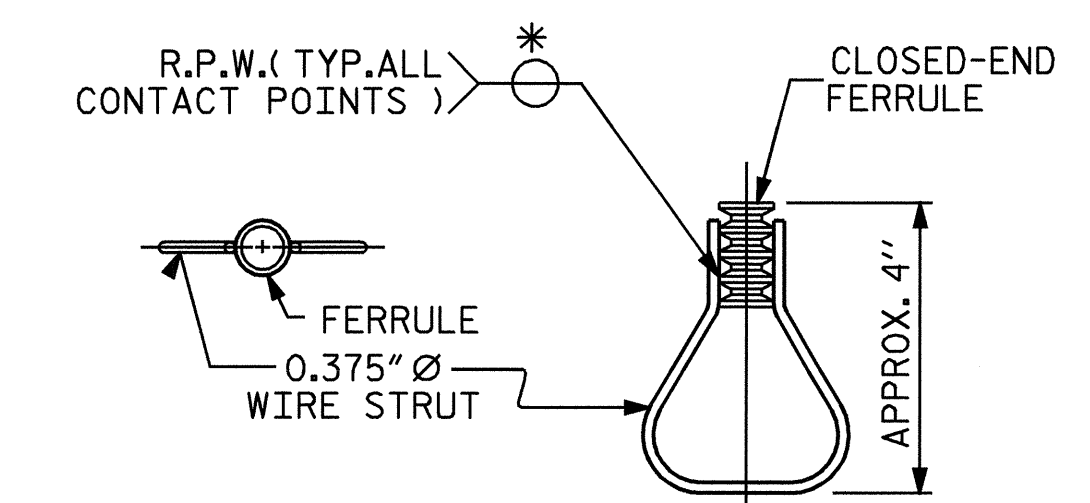
SECTION H-H

(FOR BOTTOM RAIL)



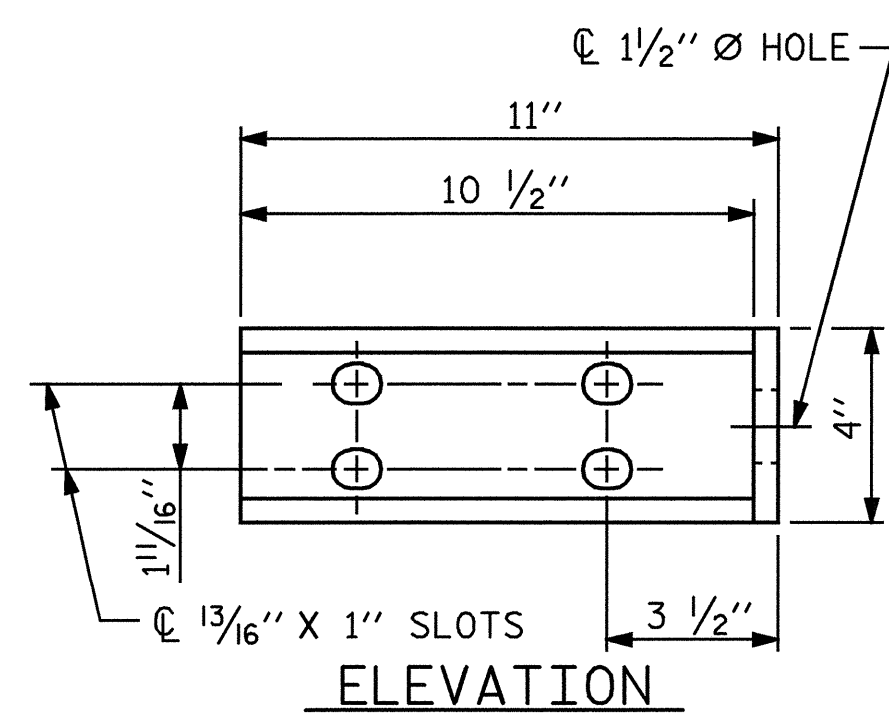
SECTION H-H

(FOR TOP & MIDDLE RAIL)

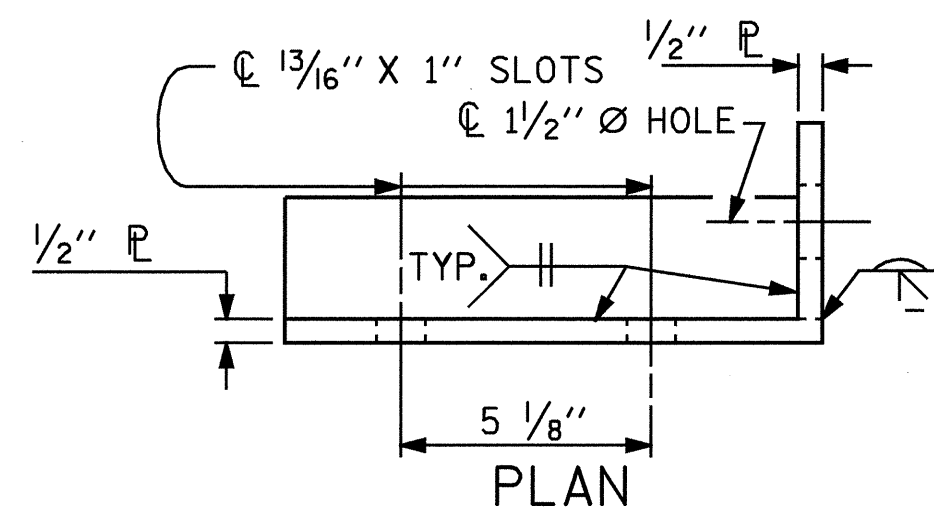


PLAN ELEVATION STRUCTURAL CONCRETE INSERT

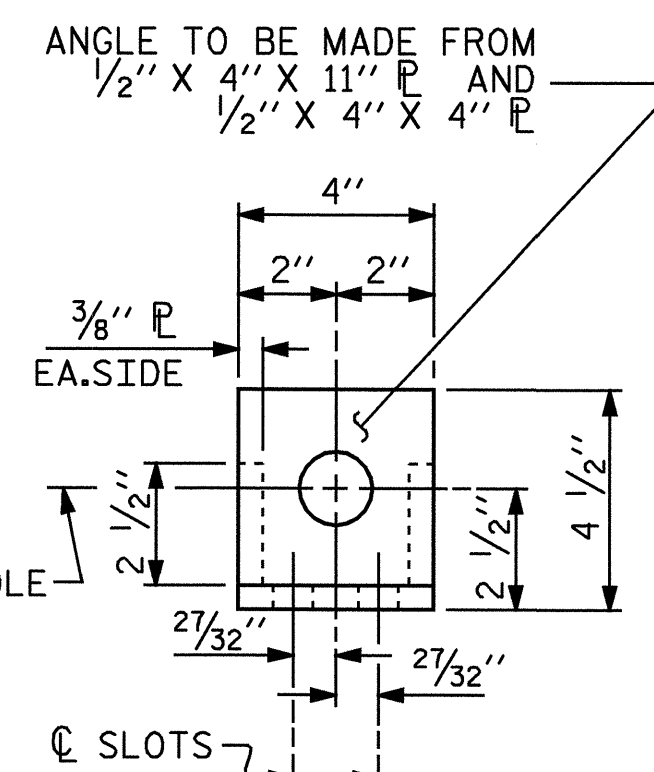
* EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.



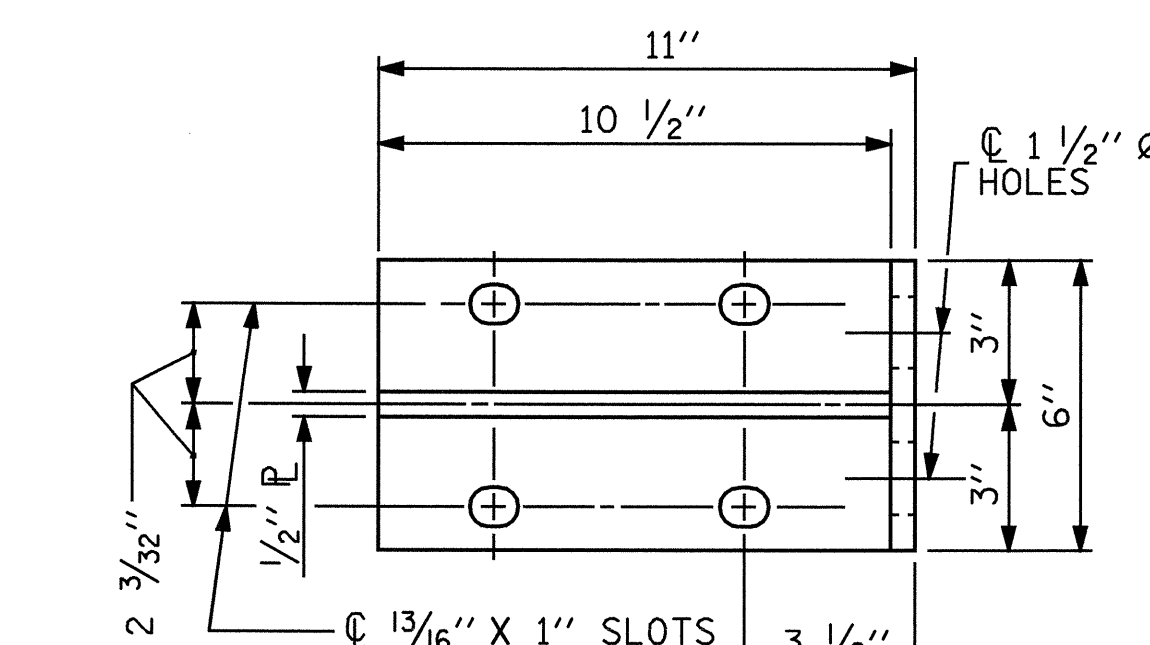
ELEVATION



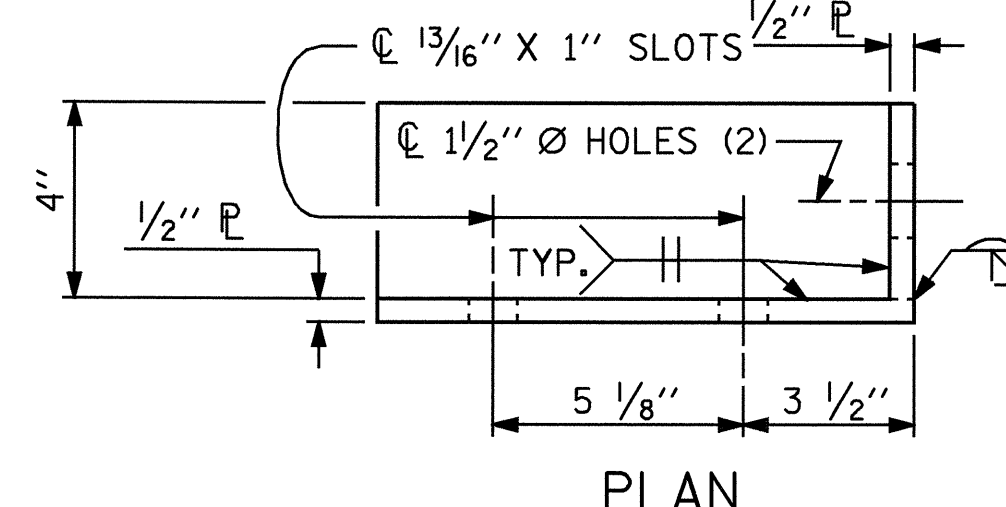
PLAN



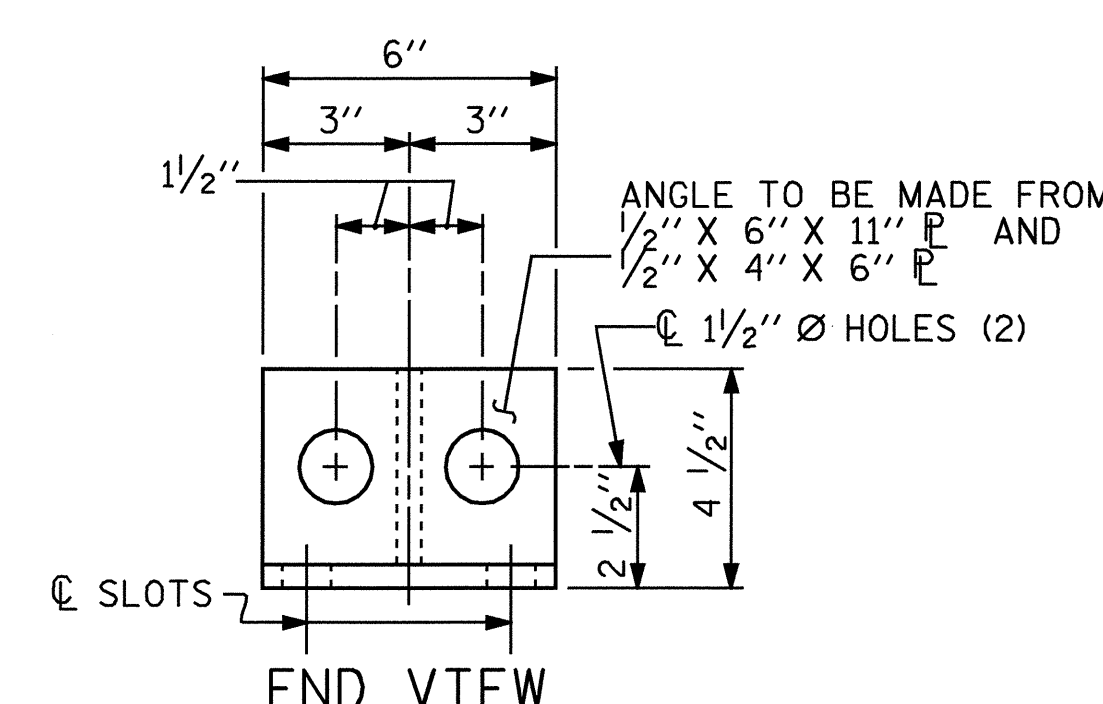
END VIEW (FIX. AND EXP.)



ELEVATION



PLAN



END VIEW

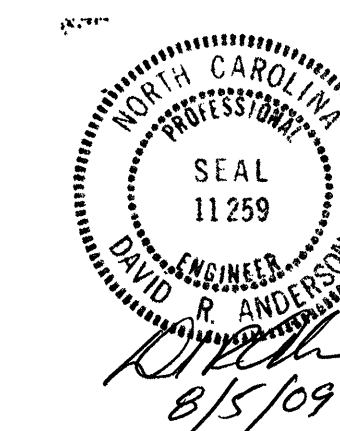
DETAILS FOR ATTACHMENT BRACKET

(BOTTOM RAIL ONLY)

DETAILS FOR ATTACHMENT BRACKET

(TOP & MIDDLE RAIL ONLY)

ASSEMBLED BY :	N. Q. TRAN	DATE :	2-09
CHECKED BY :	J.A. TILLMAN	DATE :	4-22-09
DRAWN BY :	JMB 1/88	REV. 10/17/00	RWW/LES
CHECKED BY :	GGH 1/88	REV. 5/7/03	RWW/JTE
		REV. 5/1/06	TLA/GM



PROJECT NO. B-3919
WAKE COUNTY
STATION: 17+55.20-L-

SHEET 9 OF 11

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD 3 BAR METAL RAIL					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. 5-13 TOTAL SHEETS 51

NOTES

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

THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M11.

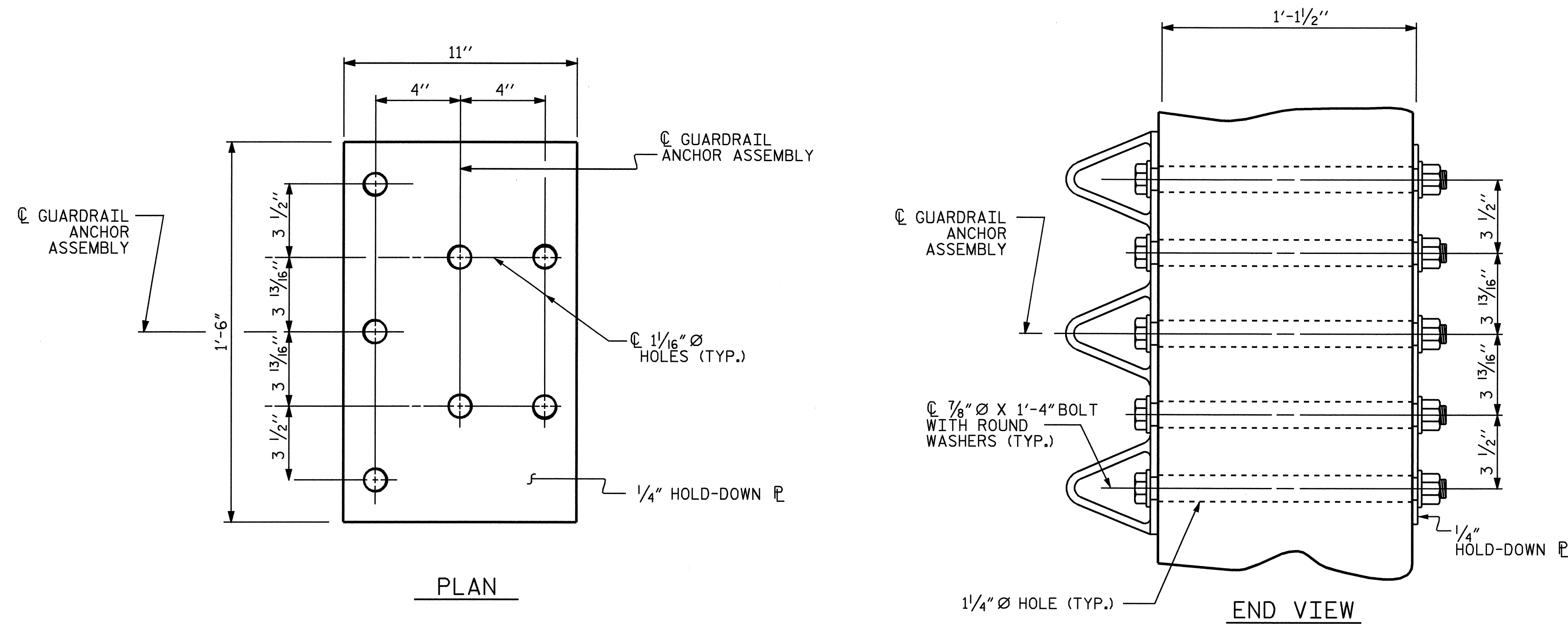
BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS.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

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

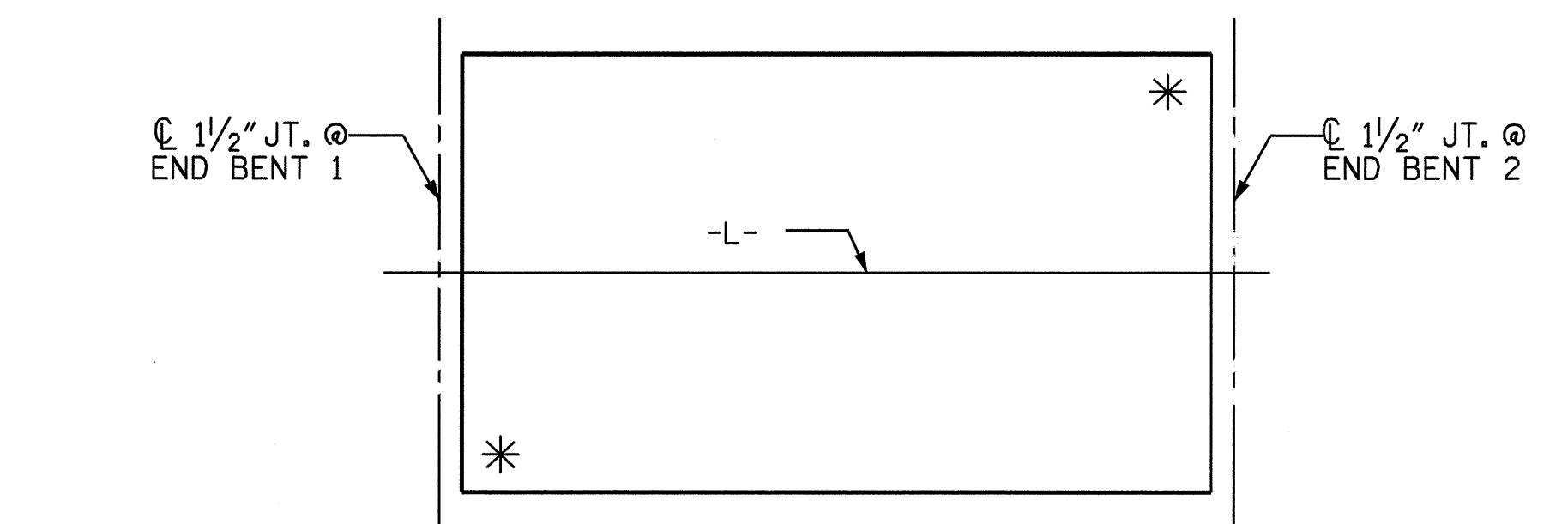
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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

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

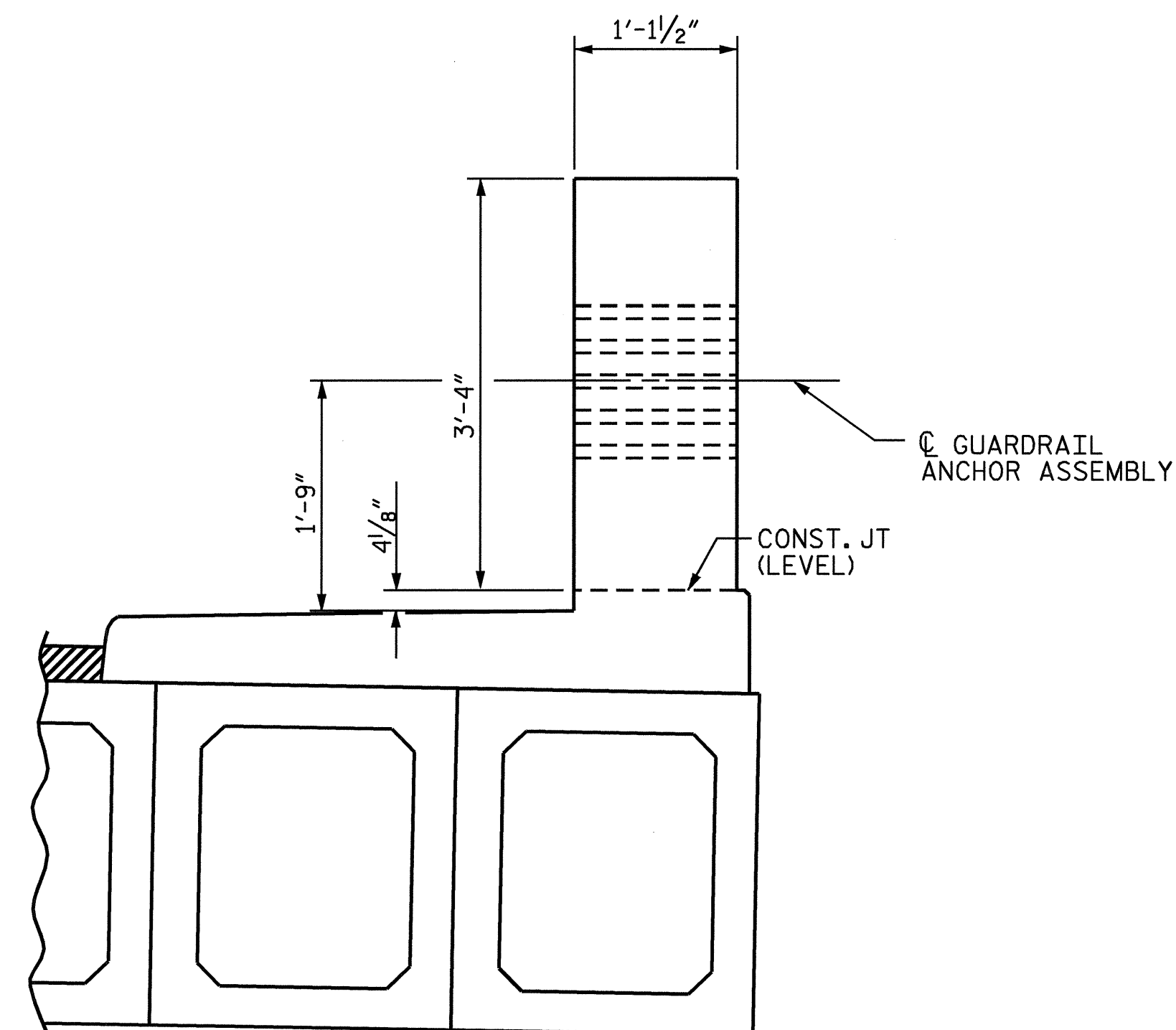


PLAN
GUARDRAIL ANCHOR ASSEMBLY DETAILS

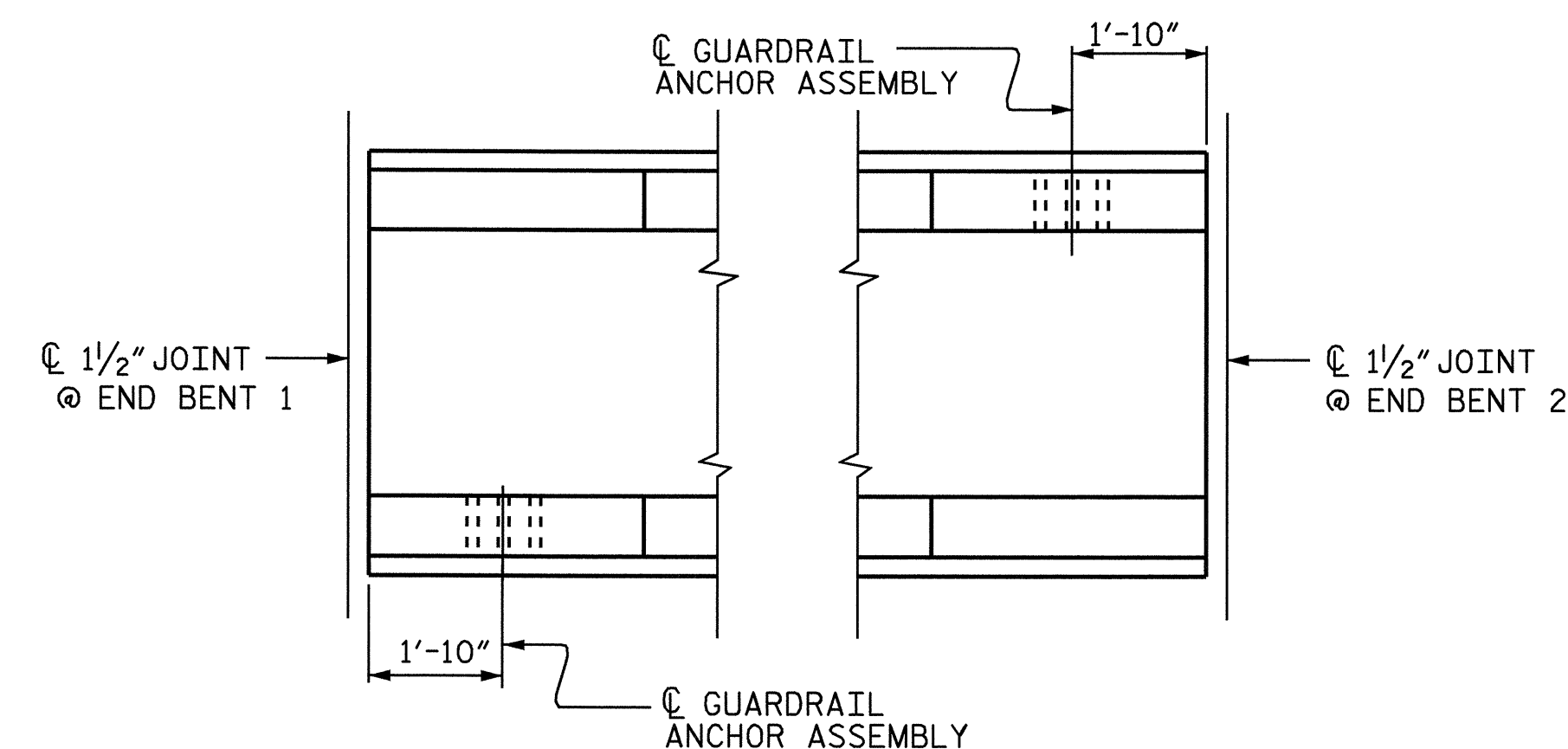


SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT



END VIEW

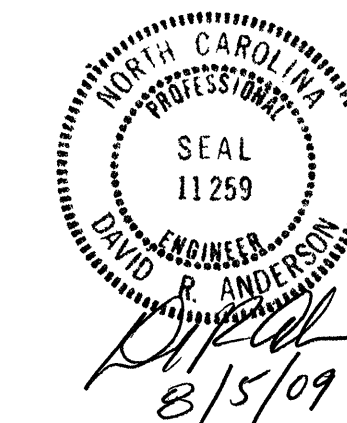


PLAN

LOCATION OF GUARDRAIL ANCHOR AT END POST

ASSEMBLED BY :	N. Q. TRAN	DATE :	2-09
CHECKED BY :	J.A. TILLMAN	DATE :	4-22-09
DRAWN BY :	WJH 4/89	REV. 10/17/00	RWW/LES
CHECKED BY :	FCJ 5/89	REV. 5/7/03	RWW/JTE
		REV. 5/1/06	TLA/GM

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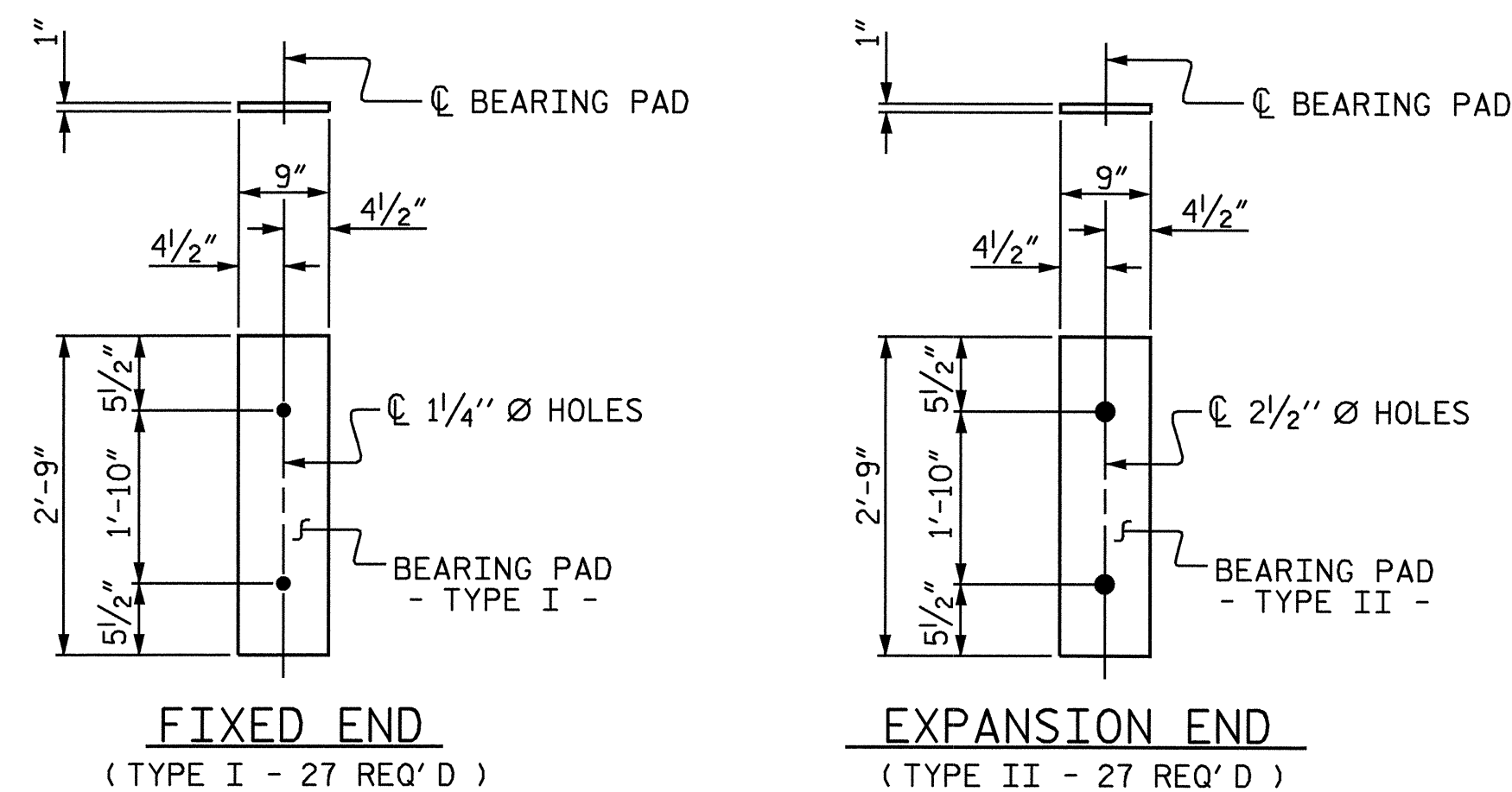


PROJECT NO. B-3919
WAKE COUNTY
STATION: 17+55.20 -L-

SHEET 10 OF 11

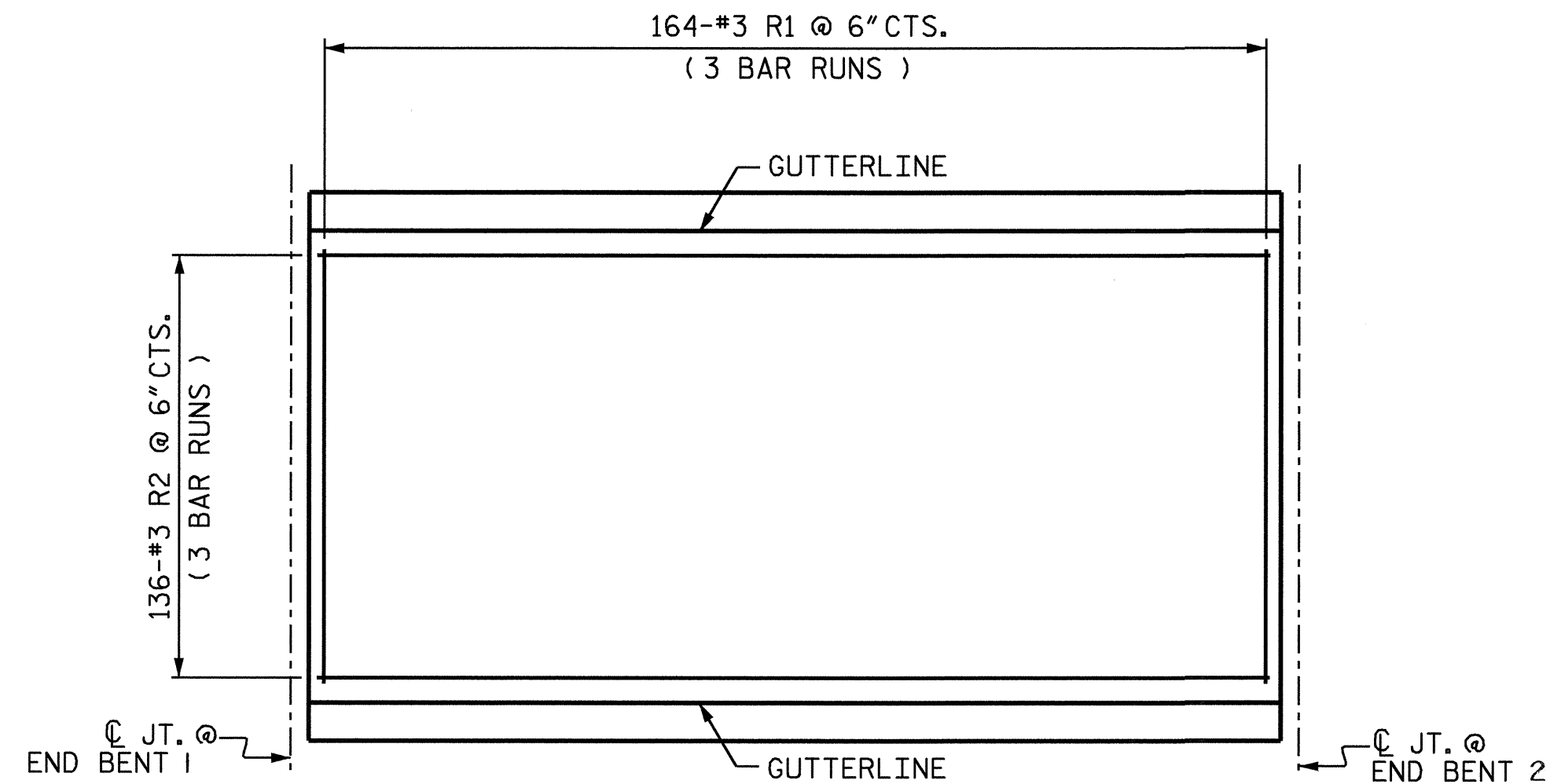
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH STANDARD GUARDRAIL ANCHORAGE DETAILS FOR METAL RAIL					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
TOTAL SHEETS					51

STR. 1 STD. NO. BMR8



ELASTOMERIC BEARING DETAILS

NOTE: ELASTOMERIC BEARING SHALL BE 60 DUROMETER HARDNESS



PLAN SHOWING CONCRETE WEARING SURFACE REINFORCING STEEL

BILL OF MATERIAL FOR CONCRETE WEARING SURFACE

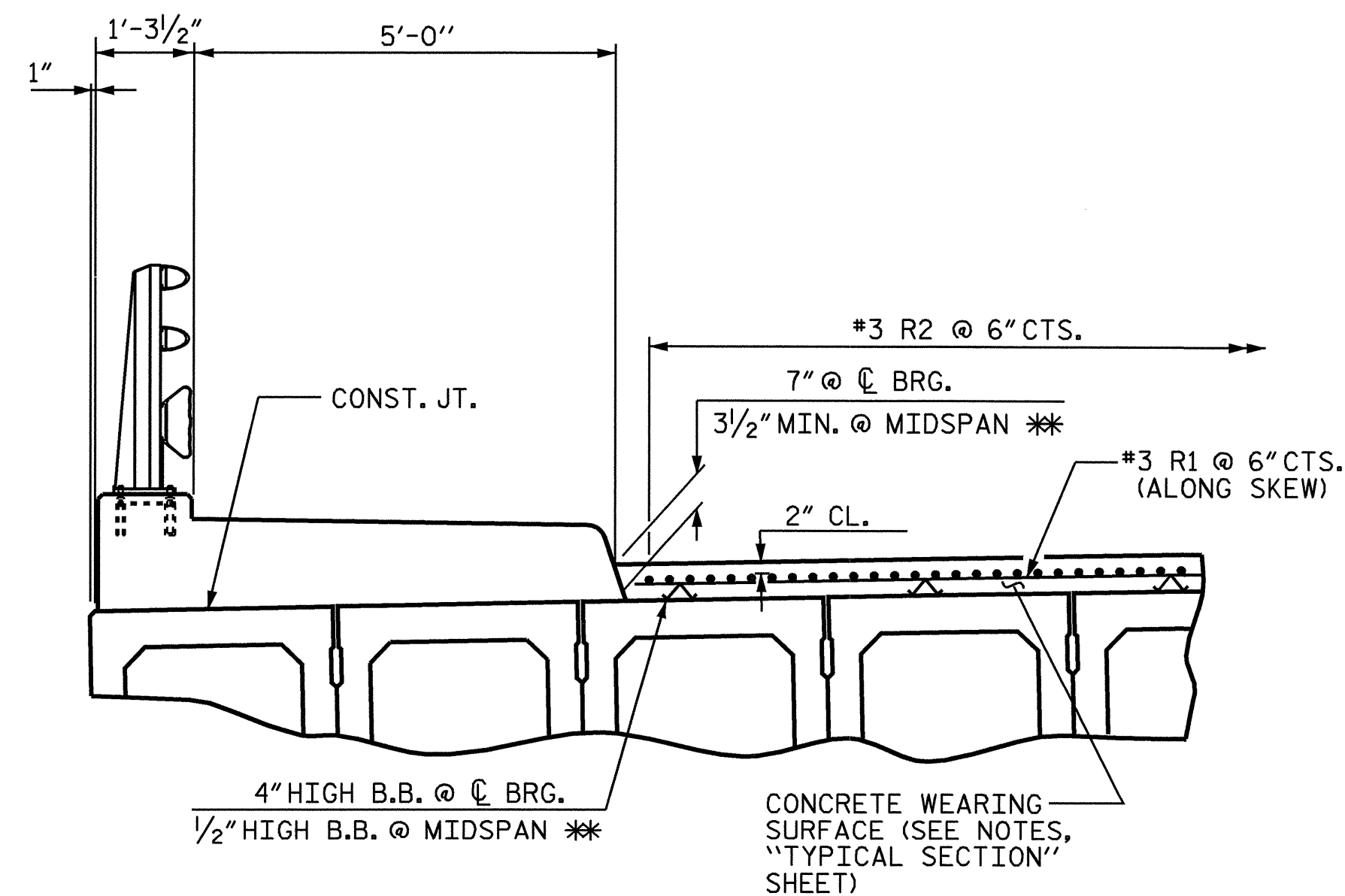
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*R1	492	#3	STR	23'-5"	4332
*R2	408	#3	STR	28'-0"	4295
*EPOXY COATED REINFORCING STEEL				LBS.	8627
CONCRETE WEARING SURFACE				SQ. FT.	5594

BOX BEAM UNITS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
SPAN A			
EXTERIOR	2	83'-0"	166'-0"
INTERIOR	25	83'-0"	2075'-0"
TOTAL	27		2241'-0"

SPLICE LENGTH CHART

BAR SIZE	EPOXY COATED
#3	1'-3"



REINFORCING FOR CONCRETE WEARING SURFACE

*BASED ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATIONS

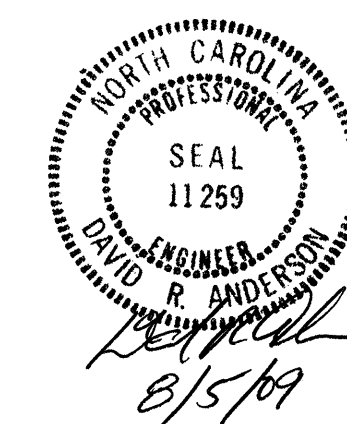
GROOVING BRIDGE FLOORS

APPROACH SLABS	1543 SQ.FT.
BRIDGE DECK	5327 SQ.FT.
TOTAL	6870 SQ.FT.

PROJECT NO. B-3919
WAKE COUNTY
 STATION: 17+55.20-L-

SHEET 11 OF 11

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 3'-0" X 2'-9"
 PRESTRESSED CONCRETE
 BOX BEAM UNIT DETAILS



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

ASSEMBLED BY : N. Q. TRAN DATE : 2-09
 CHECKED BY : J.A. TILLMAN DATE : 4-22-09

07-JUL-2009 09:26
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 danderson

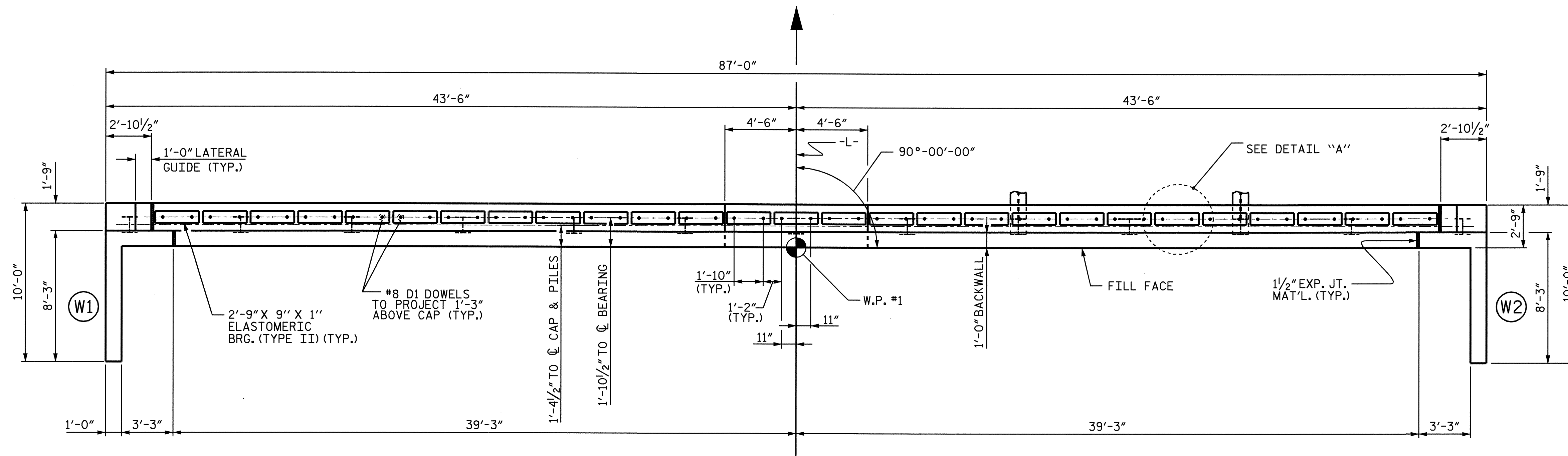
STR. 1

NOTES:

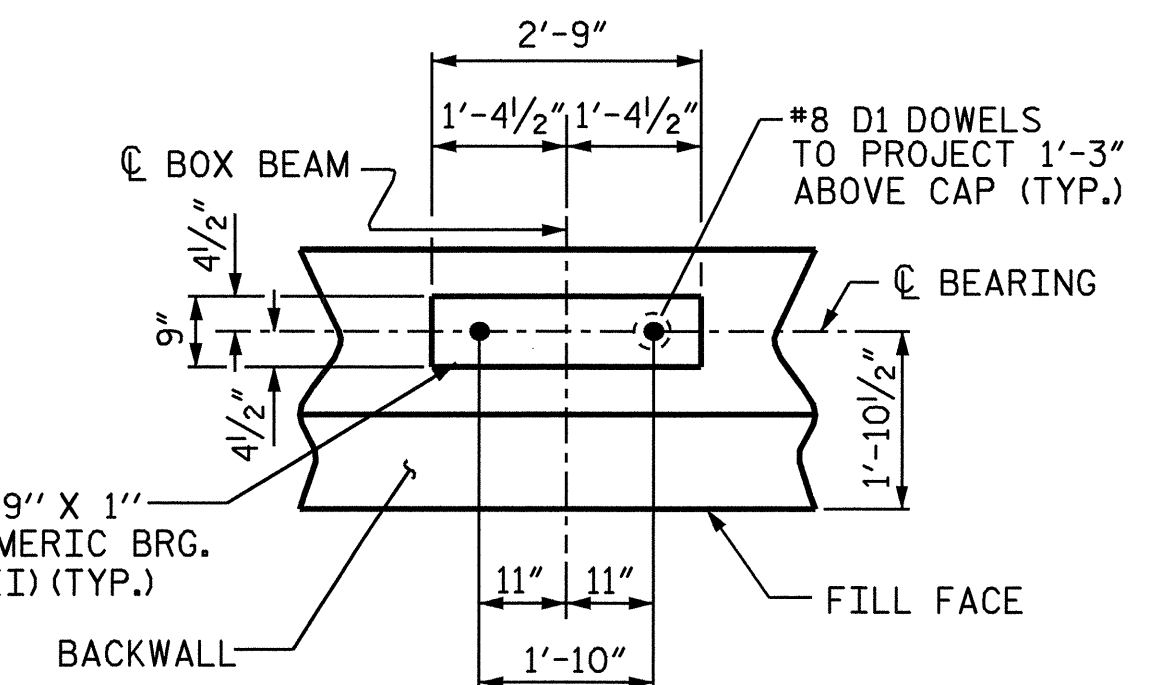
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

THE LATERAL GUIDES AT EACH END OF THE CAP ARE NOT TO BE POURED UNTIL AFTER THE BOX BEAM UNITS ARE IN PLACE.

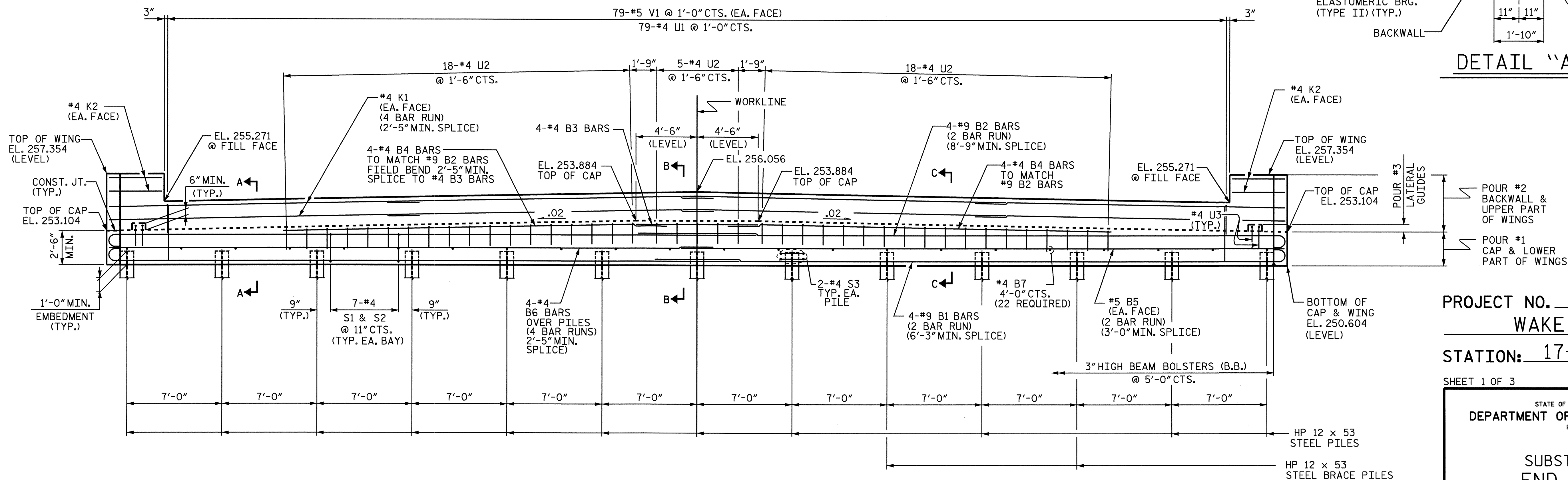
THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.



PLAN



DETAIL "A"



ELEVATION

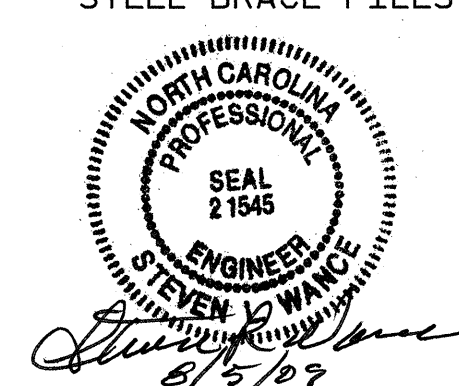
PROJECT NO. B-3919
 WAKE COUNTY
 STATION: 17+55.20 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

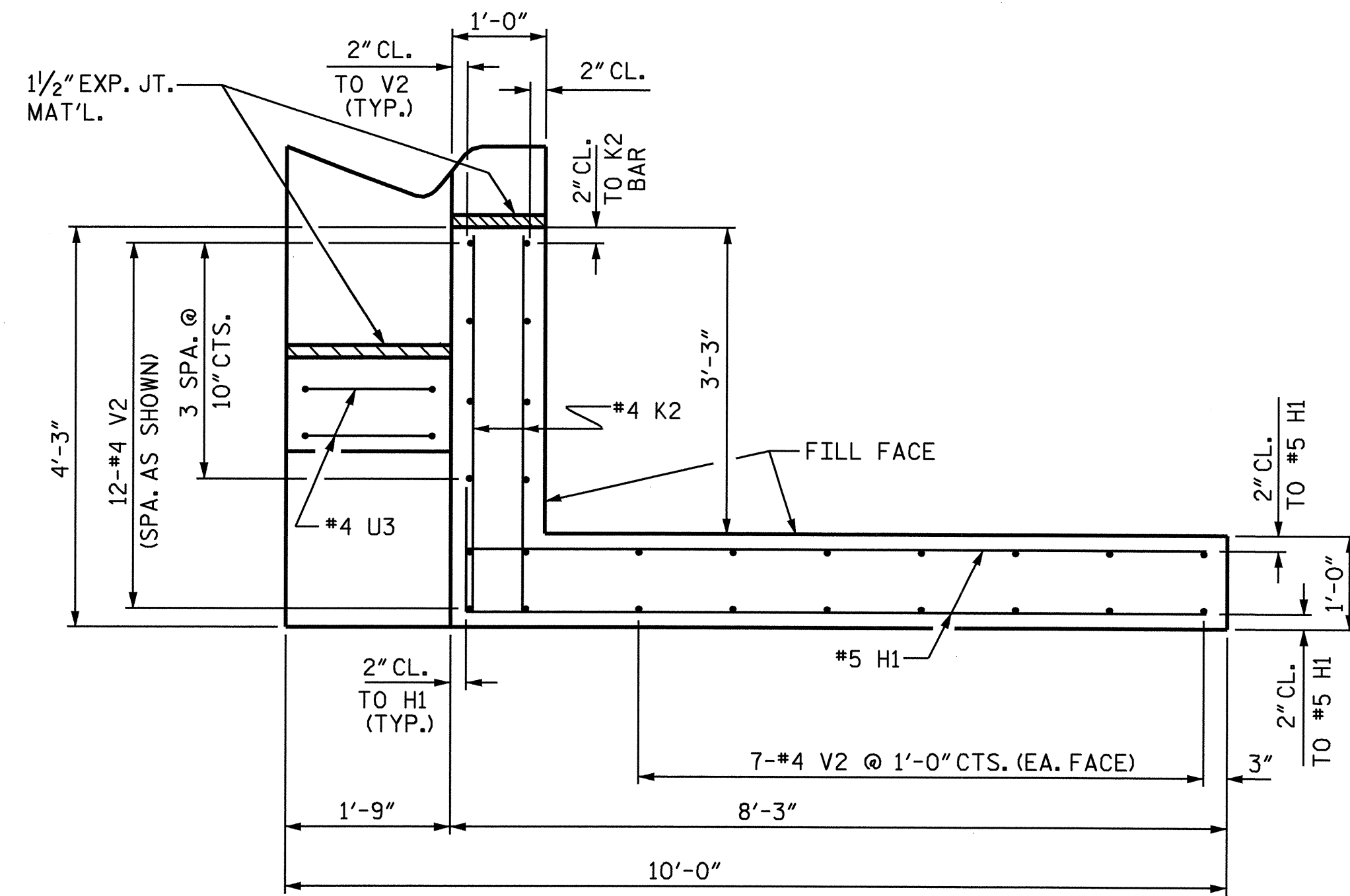
**SUBSTRUCTURE
 END BENT 1**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			5-16
2			4			51

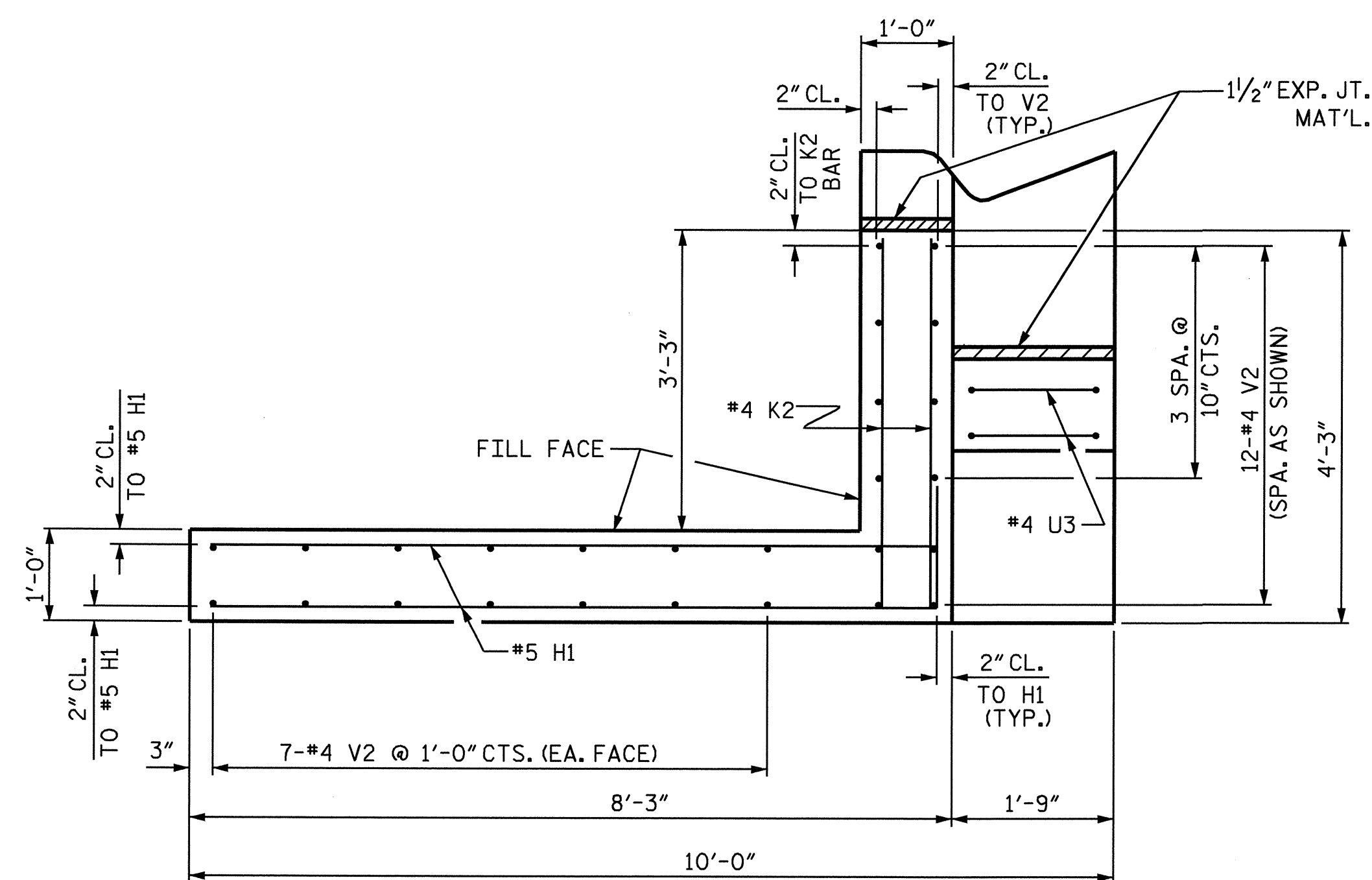


DRAWN BY: S.L. WANCE DATE: 04-06-09
 CHECKED BY: J.A. TILLMAN DATE: 04-13-09

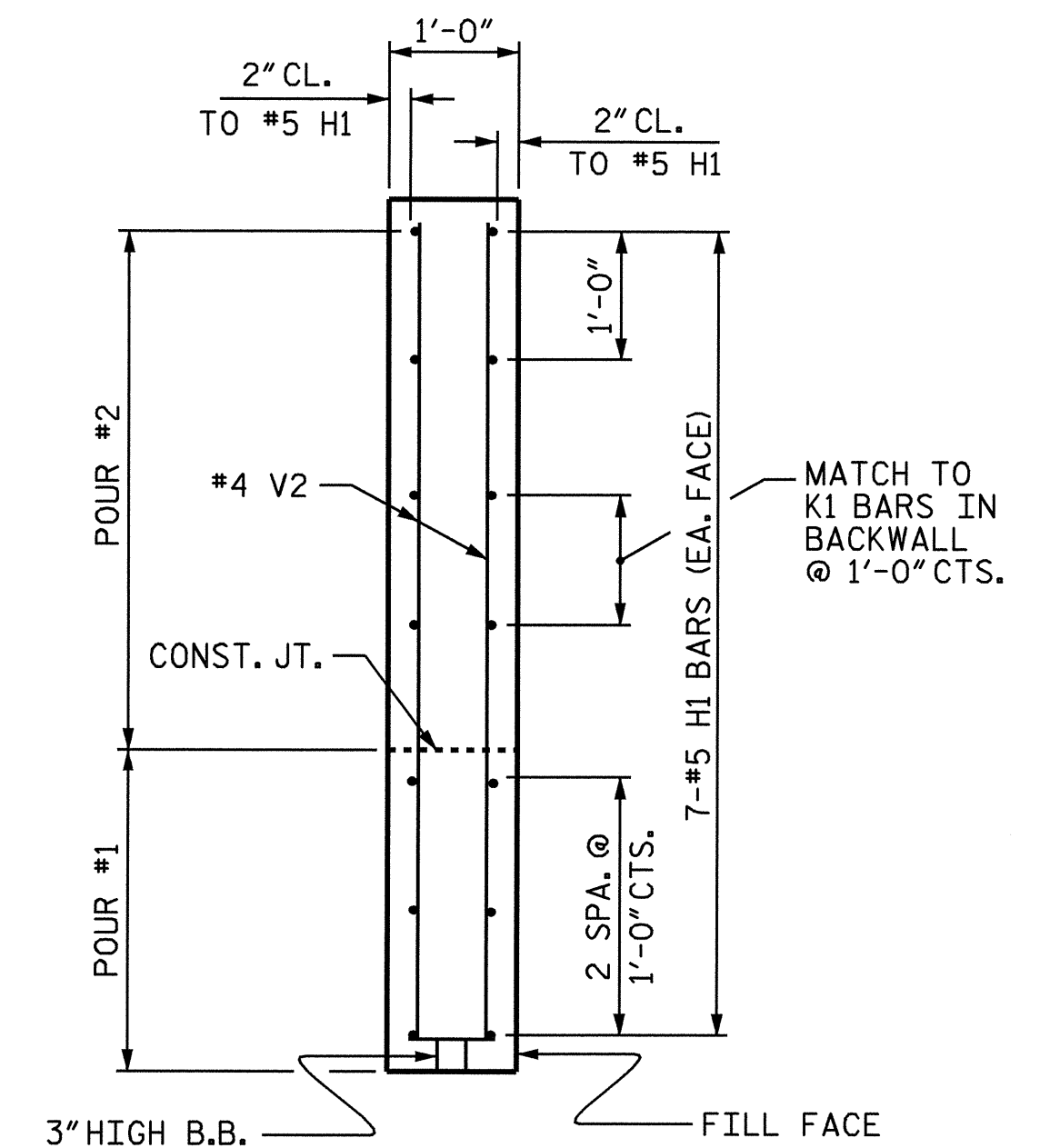
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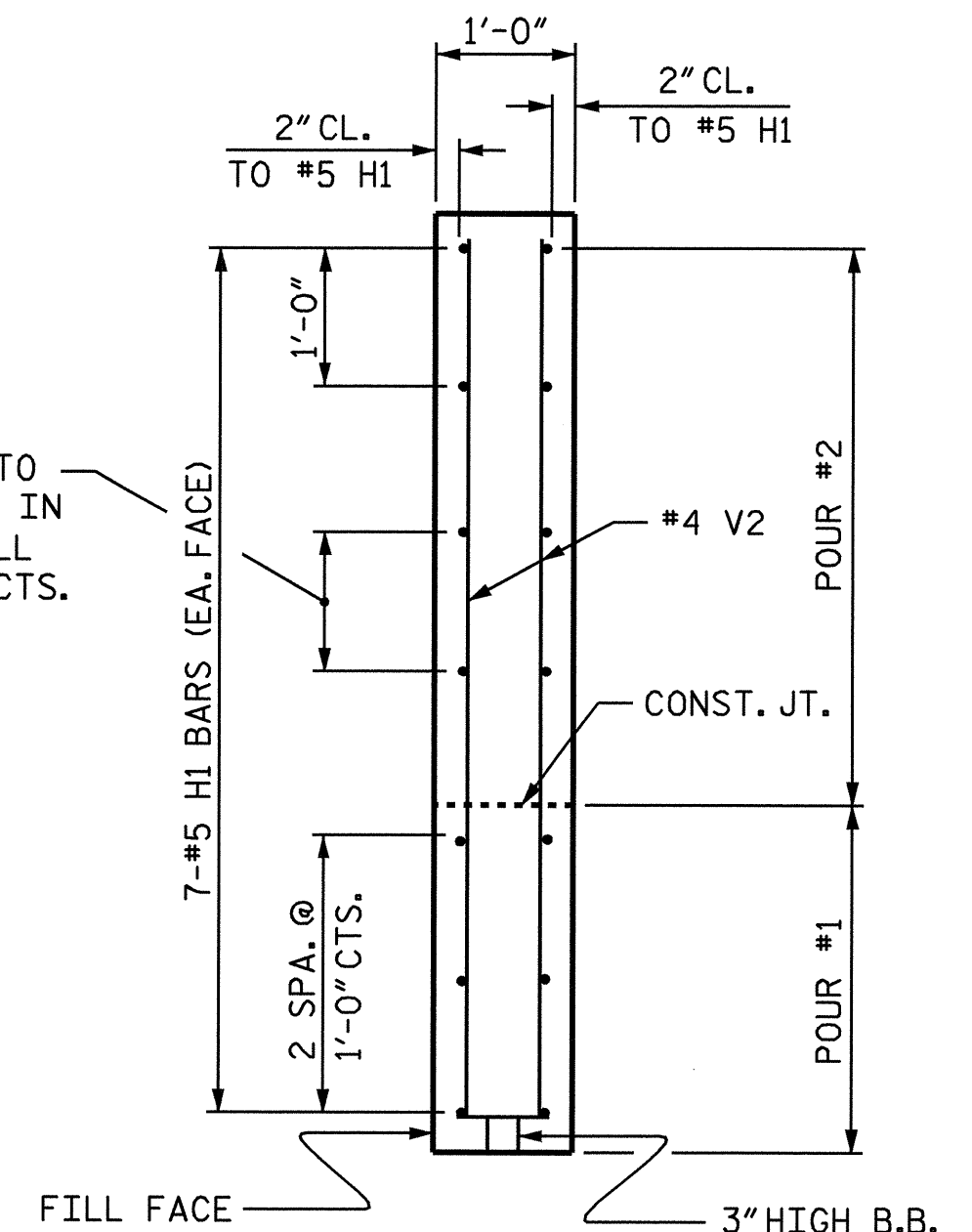
PLAN OF WING (W1)



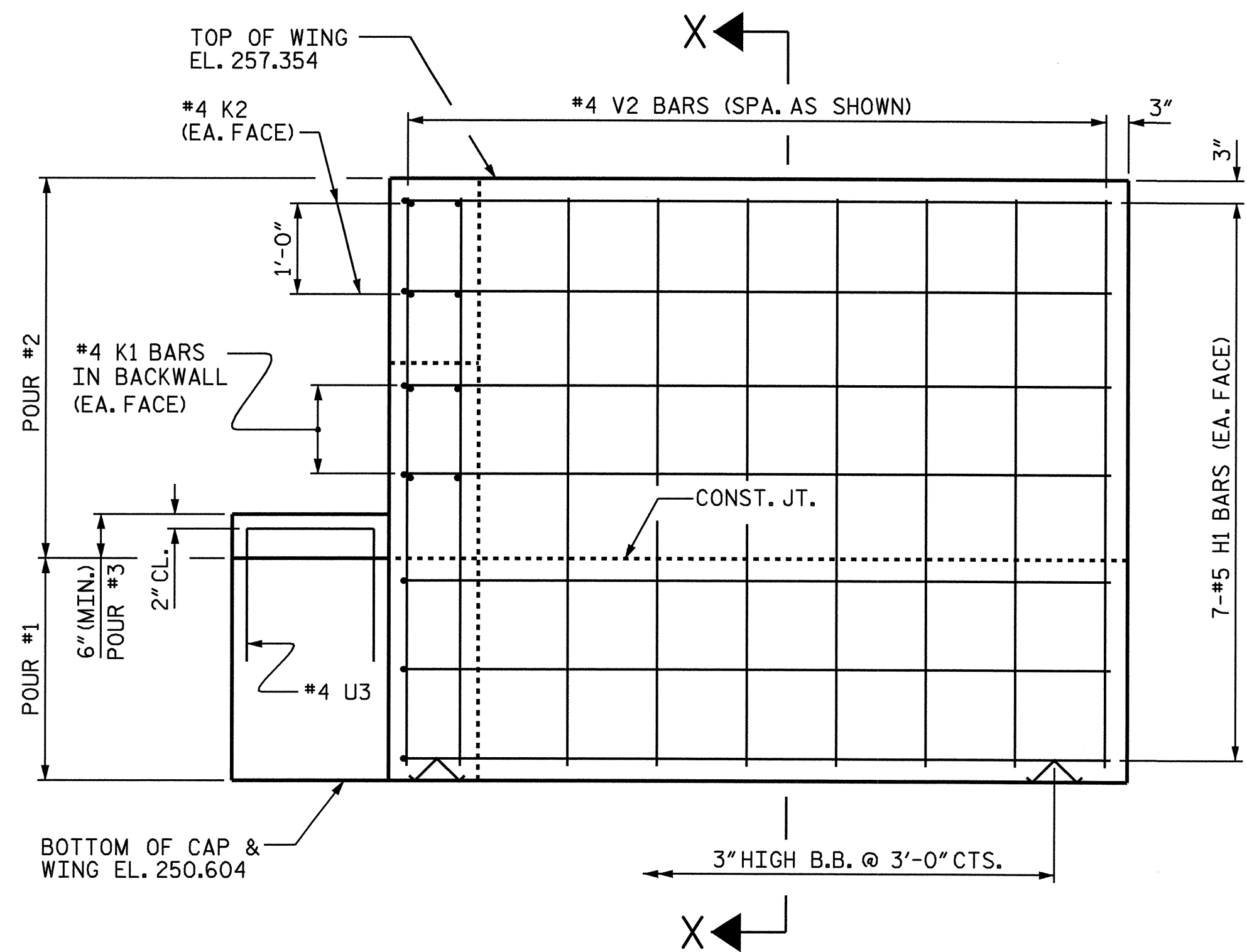
PLAN OF WING (W2)



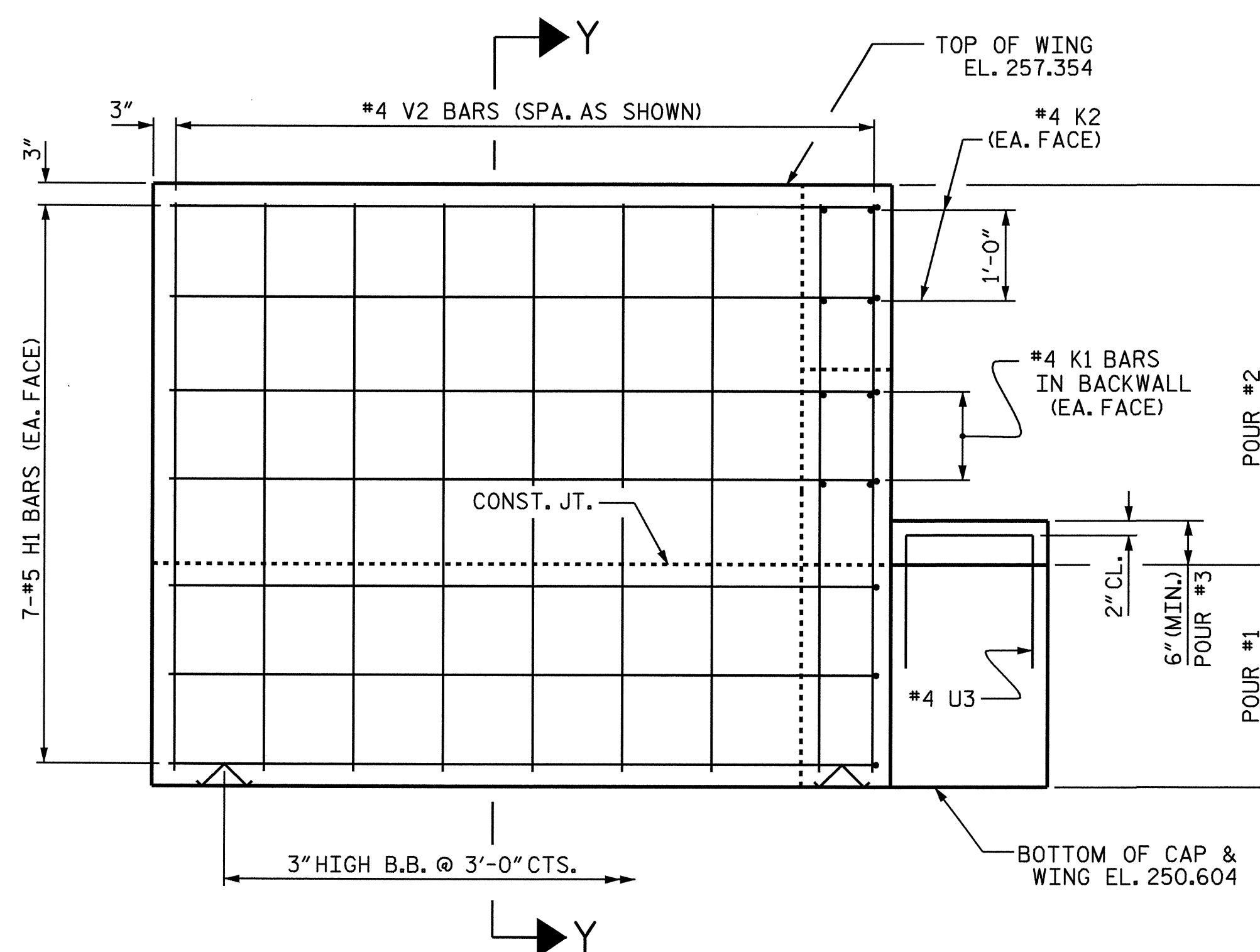
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

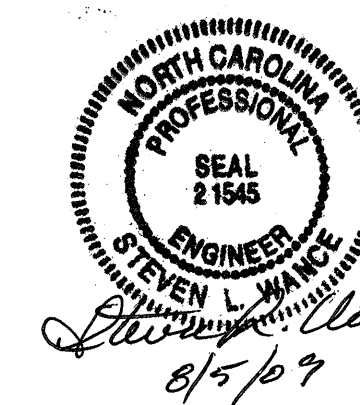
MATCH TO #4 K1 BARS IN BACKWALL @ 1'-0" CTS.

PROJECT NO. B-3919
 WAKE COUNTY
 STATION: 17+55.20 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT 1



8/5/09

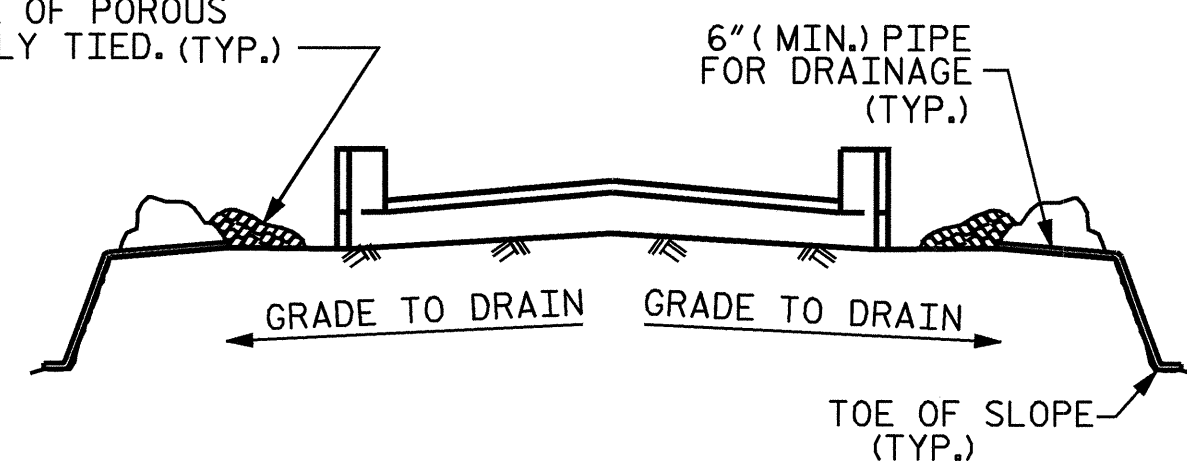
DRAWN BY: S.L. WANCE DATE: 04-07-09
 CHECKED BY: J.A. TILLMAN DATE: 04-13-09

03-AUG-2009 09:10
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-17
2			4			TOTAL SHEETS
						51

STR. #1

MINIMUM OF 3- ONE CUBIC FOOT BAGS OF #78M STONE. BAGS SHALL BE OF POROUS FABRIC, SECURELY TIED. (TYP.)

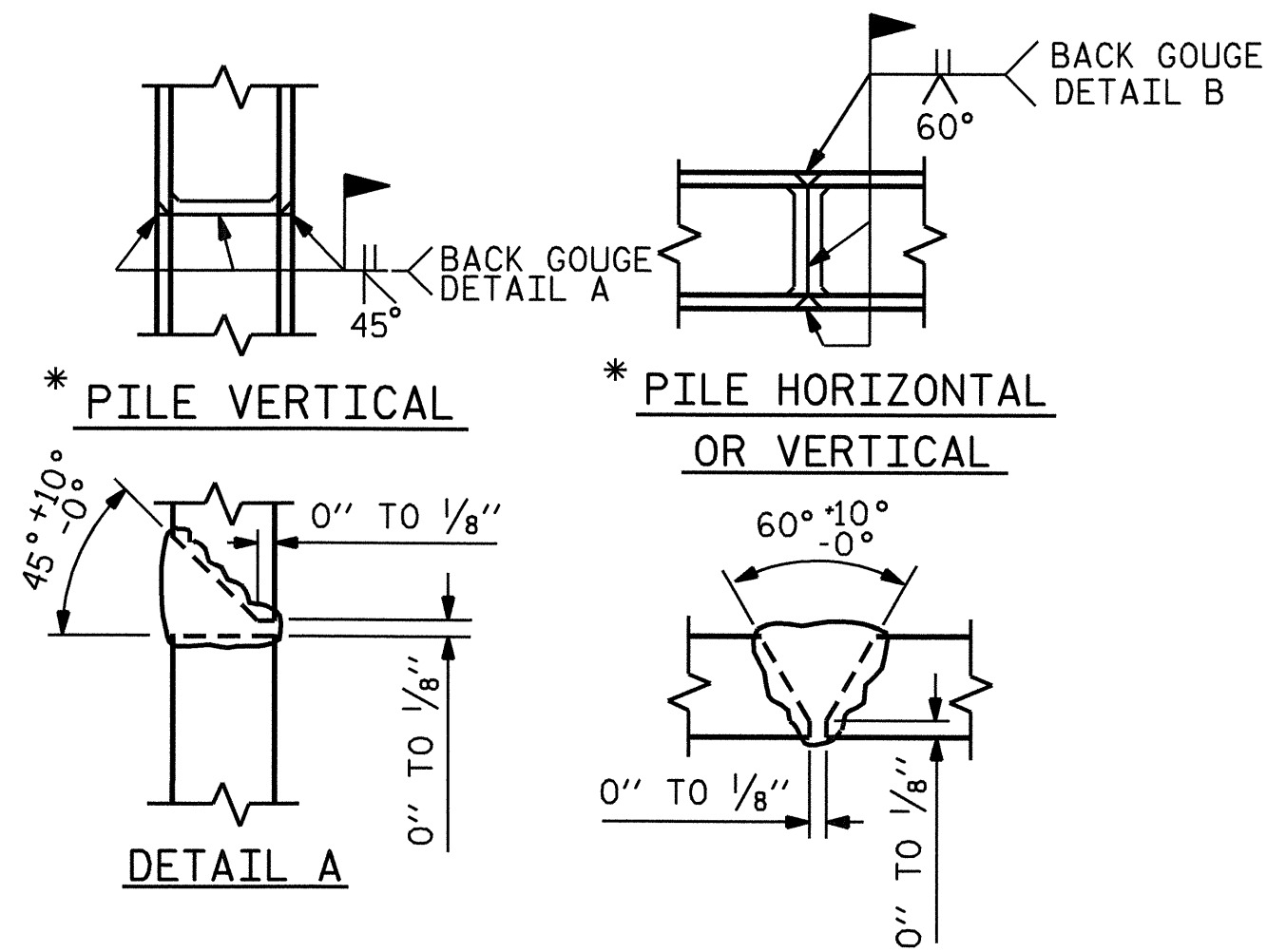


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

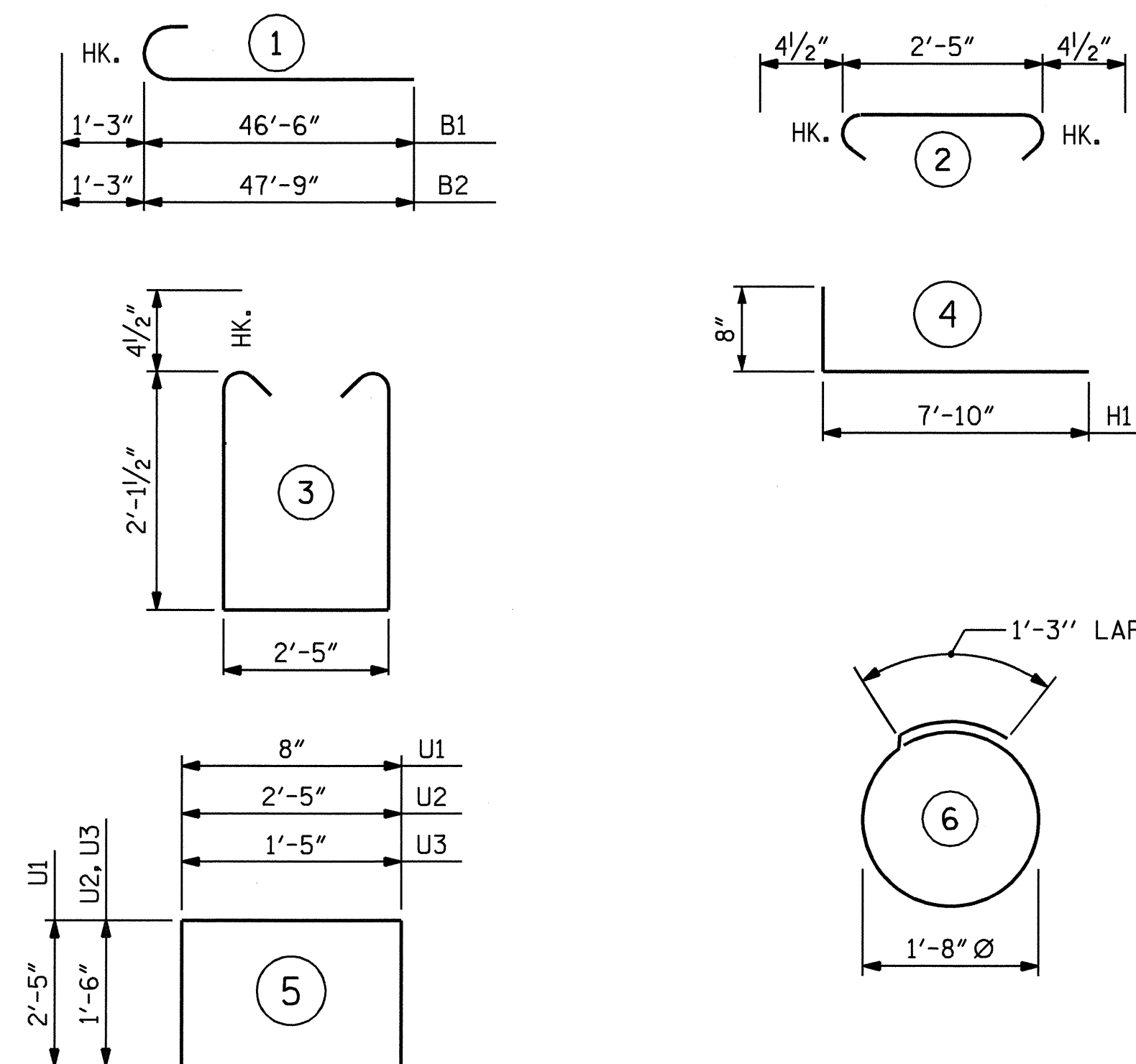
TEMPORARY DRAINAGE AT END BENT



* POSITION OF PILE DURING WELDING. DETAIL B

PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 1

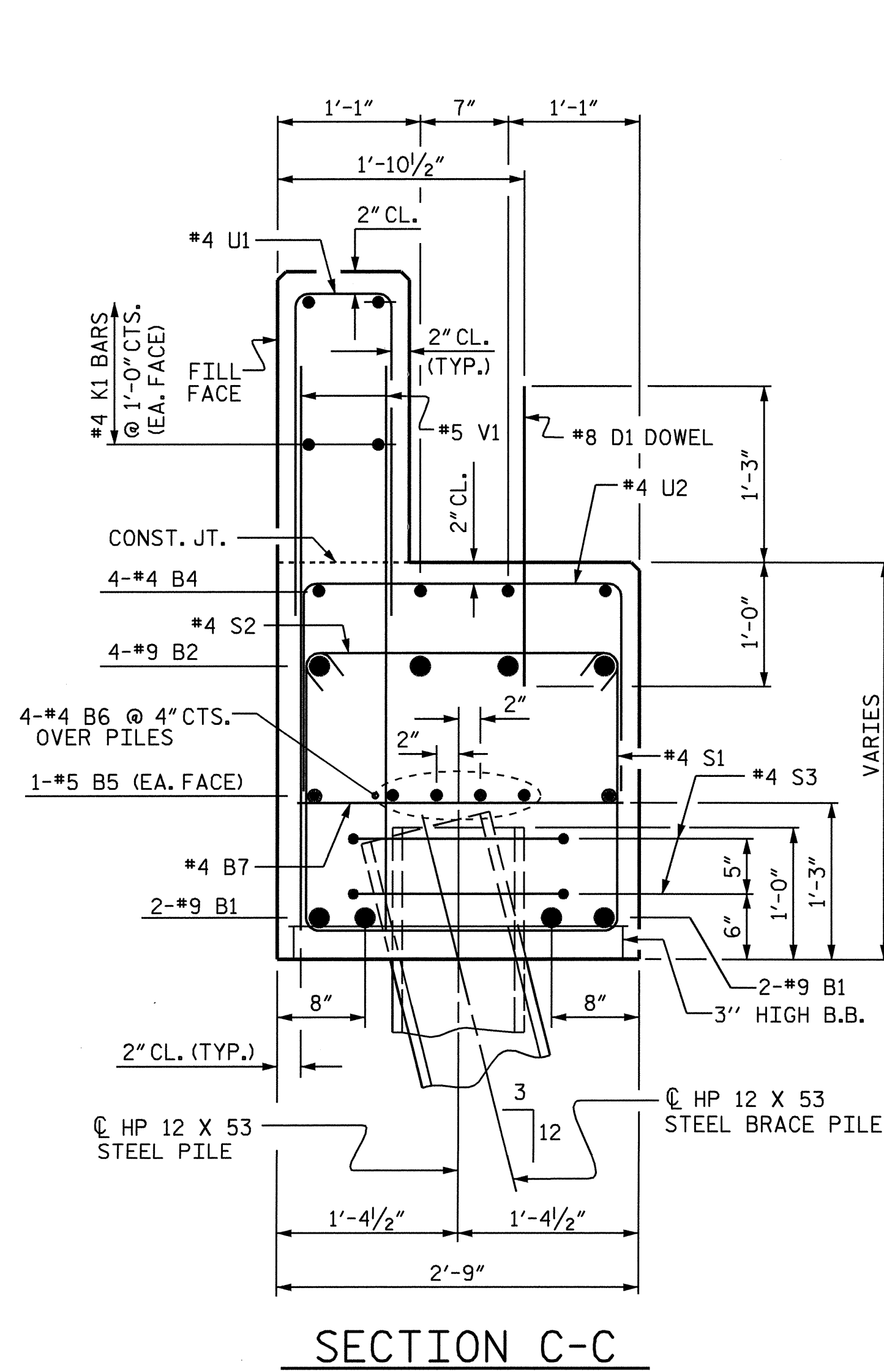
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	47'-9"	1299
B2	8	#9	1	49'-0"	1333
B3	4	#4	STR	8'-10"	24
B4	8	#4	STR	28'-3"	151
B5	4	#5	STR	44'-10"	187
B6	16	#4	STR	23'-6"	251
B7	22	#4	STR	2'-5"	36
D1	54	#8	STR	2'-3"	324
H1	28	#5	4	8'-6"	248
K1	16	#4	STR	23'-8"	253
K2	8	#4	STR	3'-11"	21
S1	84	#4	3	7'-5"	416
S2	84	#4	2	3'-2"	178
S3	26	#4	6	6'-6"	113
U1	79	#4	5	5'-6"	290
U2	41	#4	5	5'-5"	148
U3	4	#4	5	4'-5"	12
V1	158	#5	STR	4'-3"	700
V2	52	#4	STR	6'-3"	217

REINFORCING STEEL LBS 6201

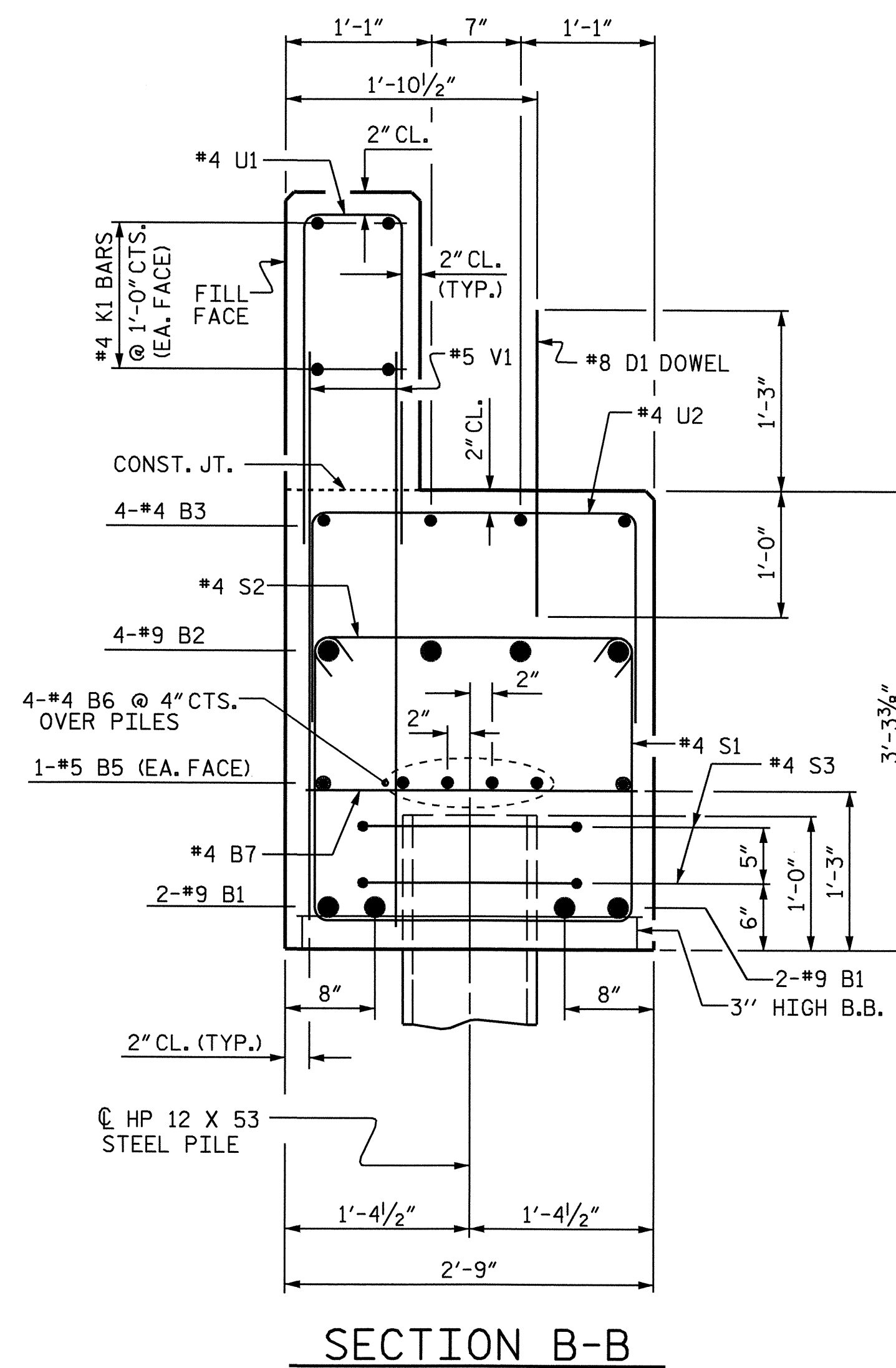
CLASS A CONCRETE BREAKDOWN:

POUR 1 (CAP & LOWER PART OF WINGS)	C.Y.	27.3
POUR 2 (BACKWALL & UPPER PART OF WINGS)	C.Y.	9.5
POUR 3 (LATERAL GUIDES)	C.Y.	0.1
TOTAL CLASS A CONCRETE	C.Y.	36.9

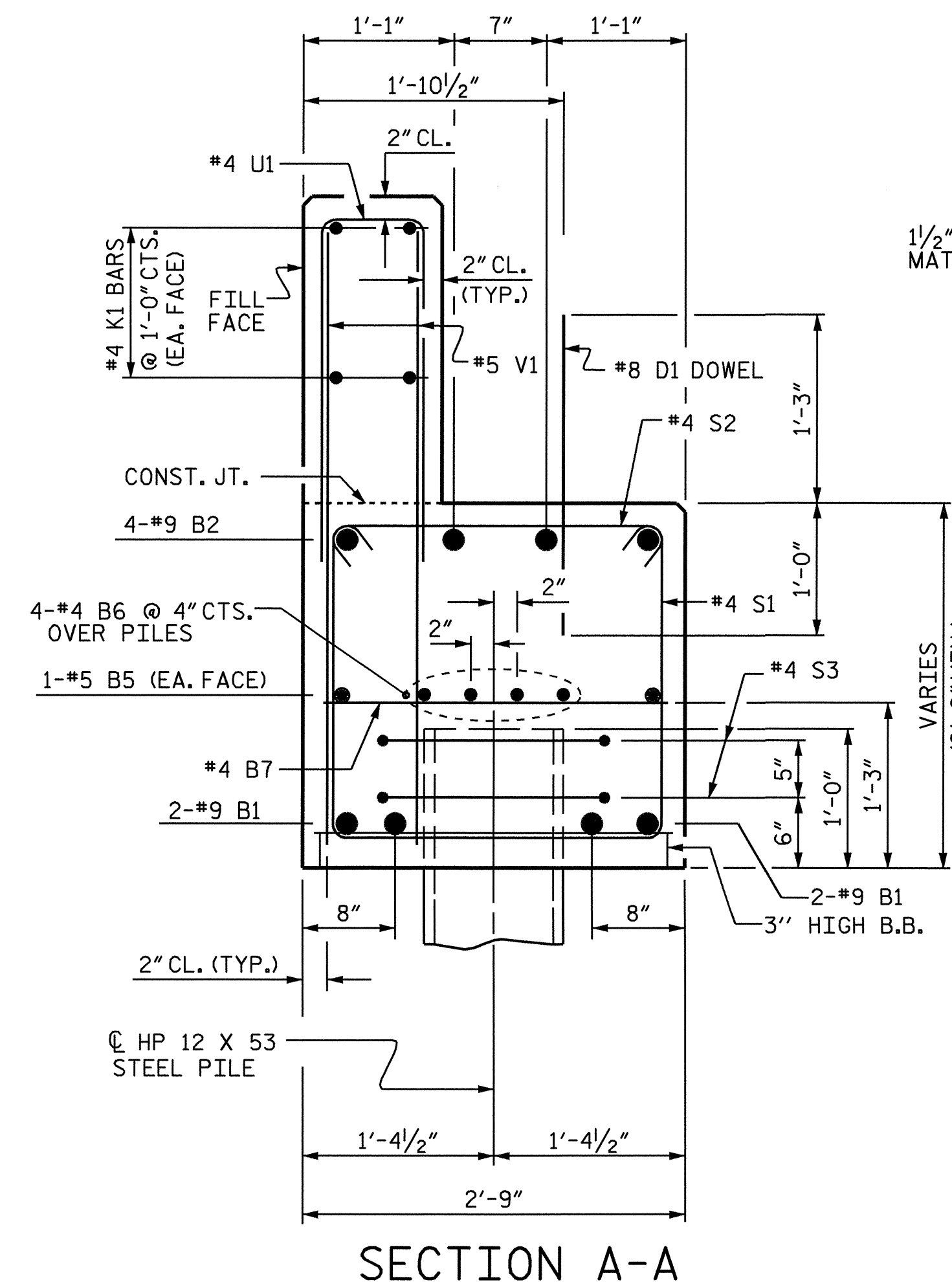
HP 12 X 53 STEEL PILES NO. = 13 LIN. FT. = 150
 PILE EXCAV. (IN SOIL) LIN. FT. = 59
 PILE EXCAV. (NOT IN SOIL) LIN. FT. = 21



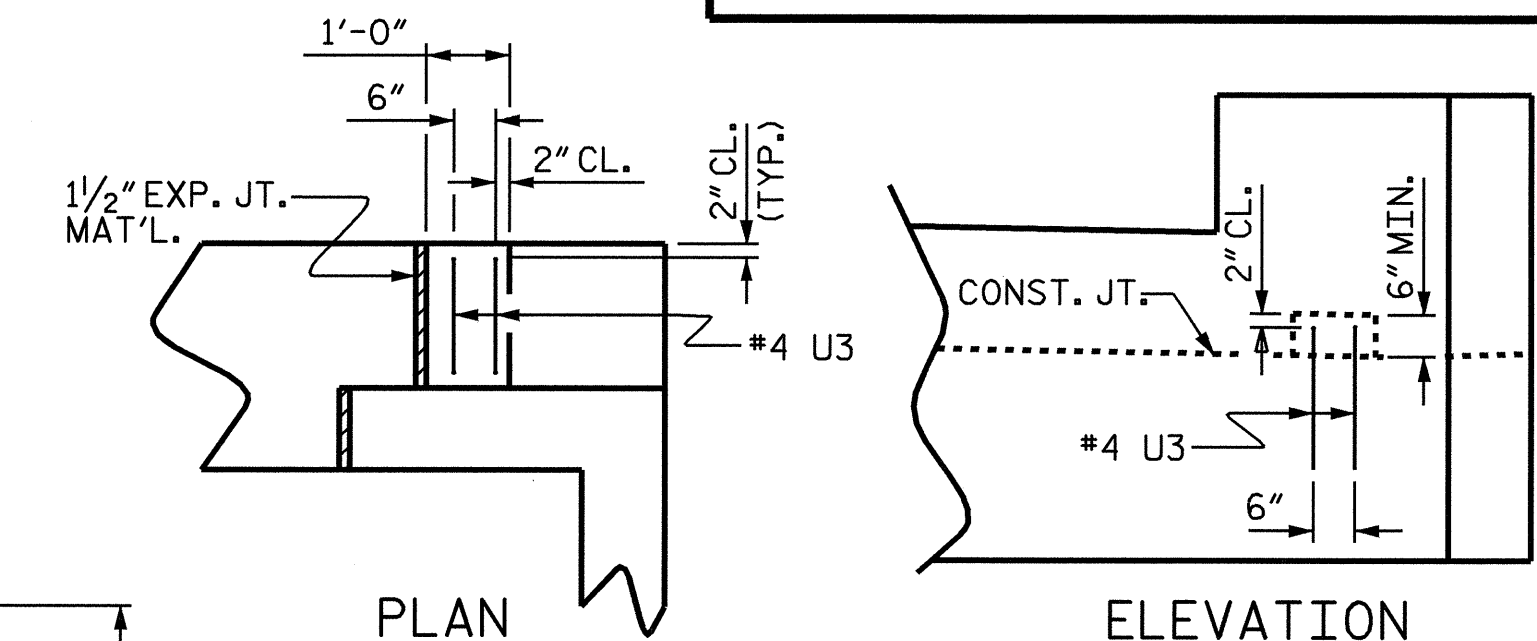
SECTION C-C



SECTION B-B



SECTION A-A



LATERAL GUIDE DETAILS

(RIGHT LATERAL GUIDE SHOWN, LEFT LATERAL GUIDE SIMILAR)

PROJECT NO. B-3919
 WAKE COUNTY
 STATION: 17+55.20 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE END BENT 1

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	5-18	
1			3			TOTAL SHEETS	
2			4			51	

Professional Engineer Seal
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 21545
 STEVEN V. WALKER
 10/21/09

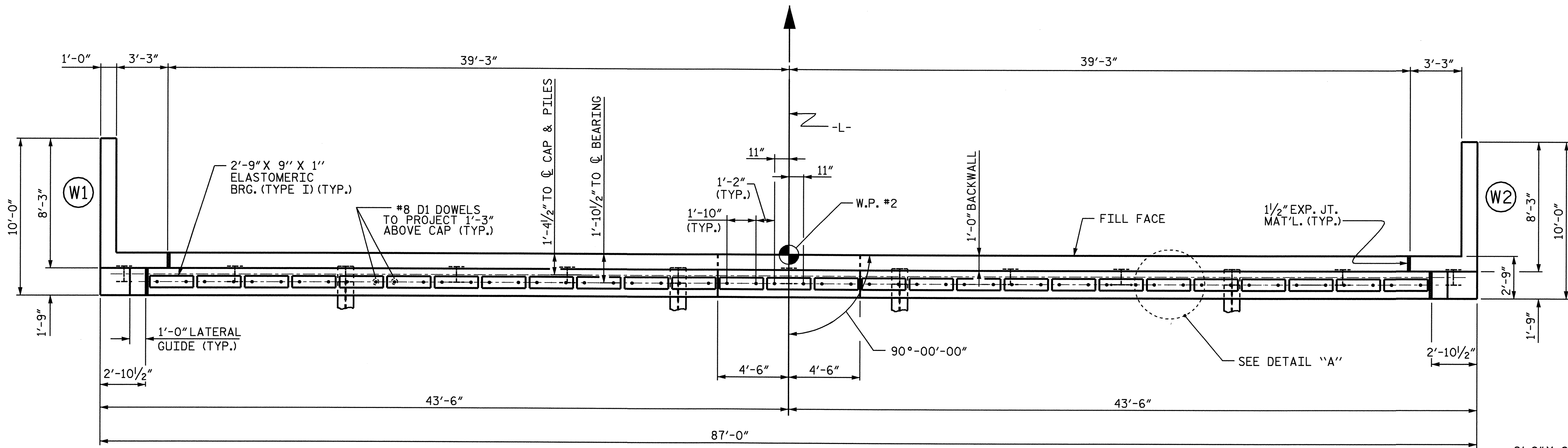
DRAWN BY: S.L. WANCE DATE: 04-07-09
 CHECKED BY: J.A. TILLMAN DATE: 04-13-09

NOTES:

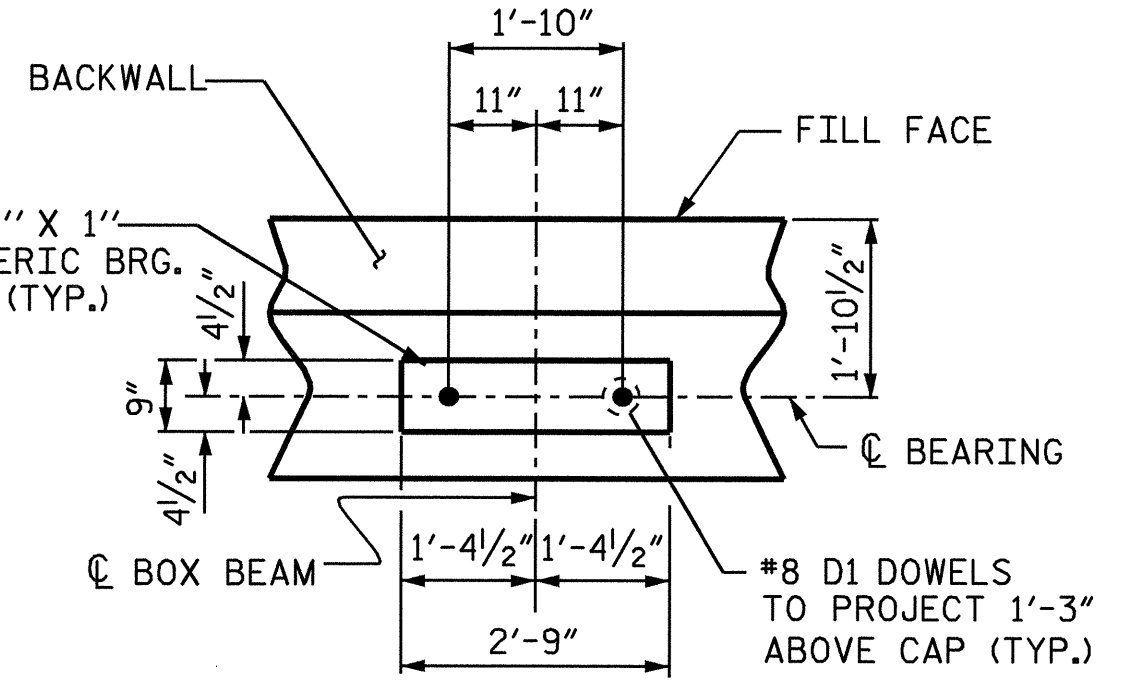
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

THE LATERAL GUIDES AT EACH END OF THE CAP ARE NOT TO BE POURED UNTIL AFTER THE BOX BEAM UNITS ARE IN PLACE.

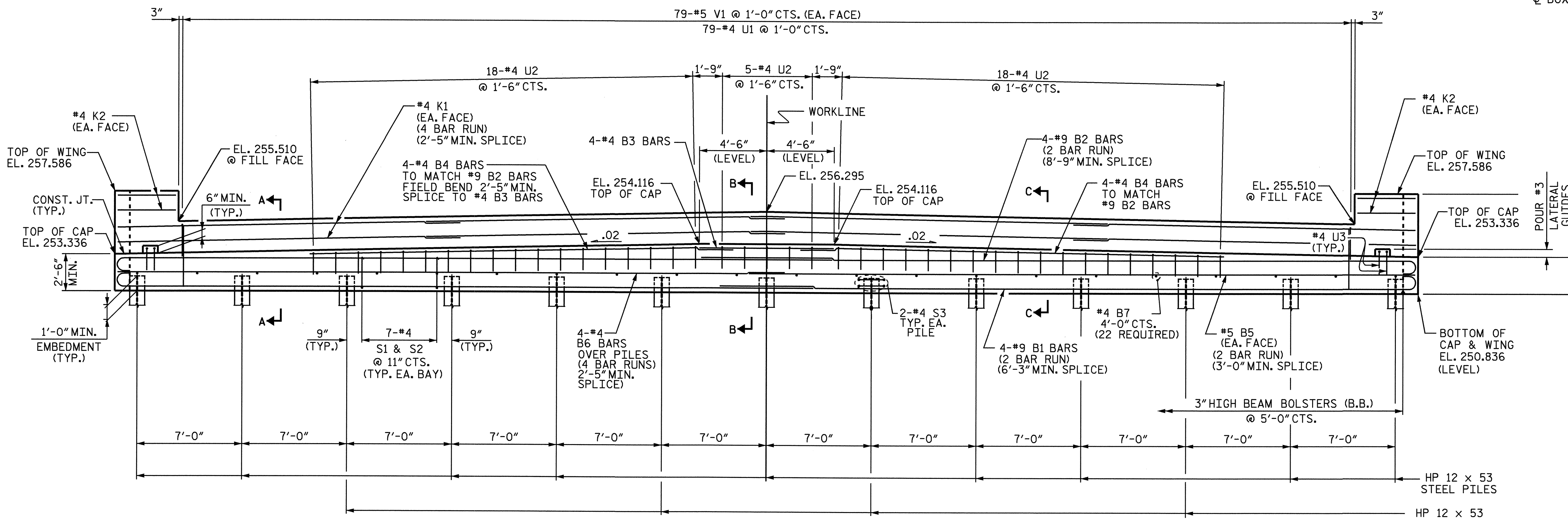
THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.



PLAN



DETAIL "A"



ELEVATION

PROJECT NO. B-3919
 WAKE COUNTY
 STATION: 17+55.20 -L-

SHEET 1 OF 3

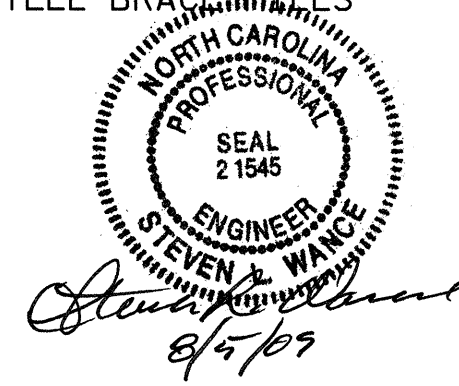
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 END BENT 2**

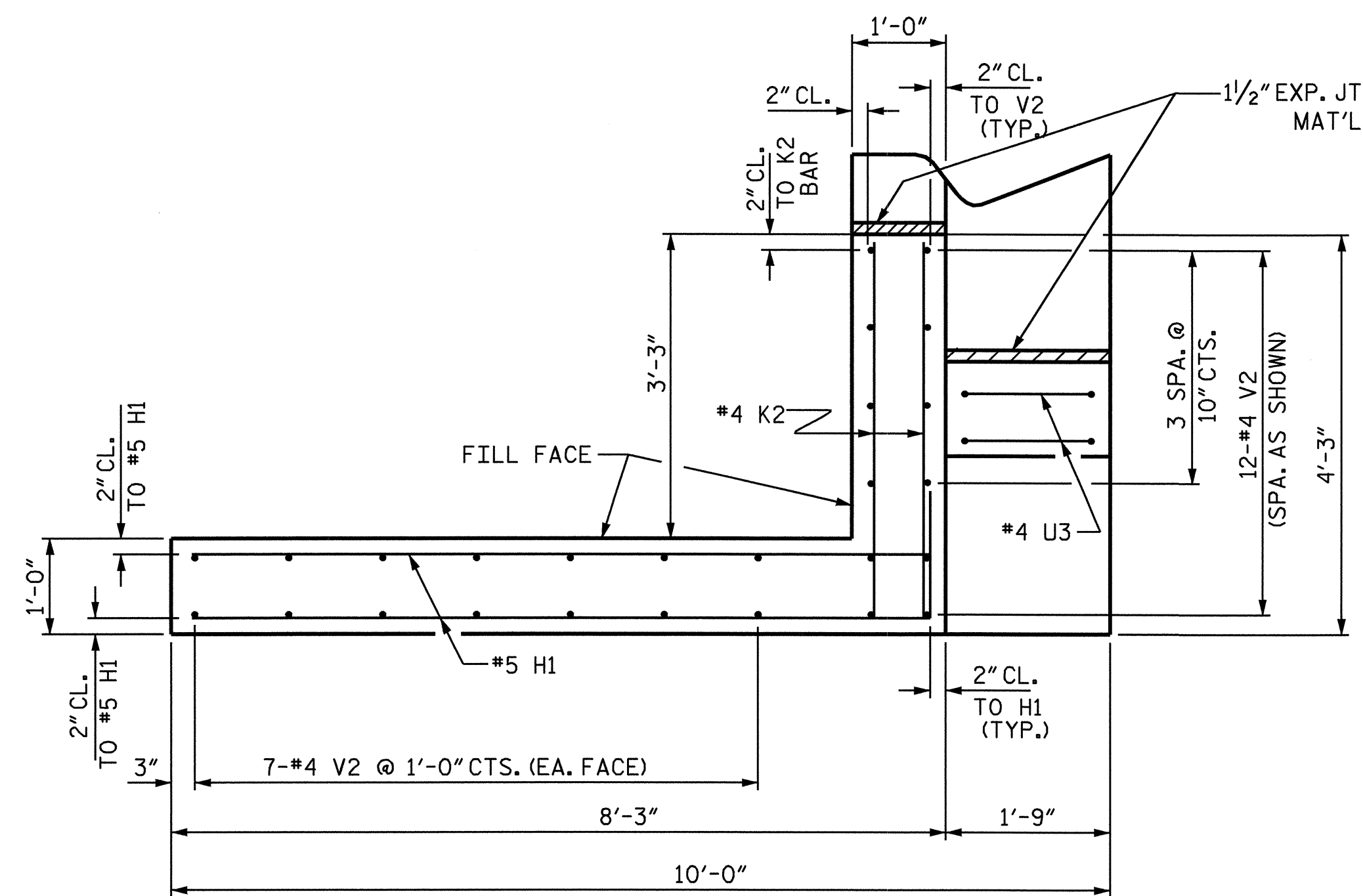
REVISIONS						SHEET NO. S-19
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 51
2			4			

DRAWN BY: S.L. WANCE DATE: 04-06-09
 CHECKED BY: J.A. TILLMAN DATE: 04-13-09

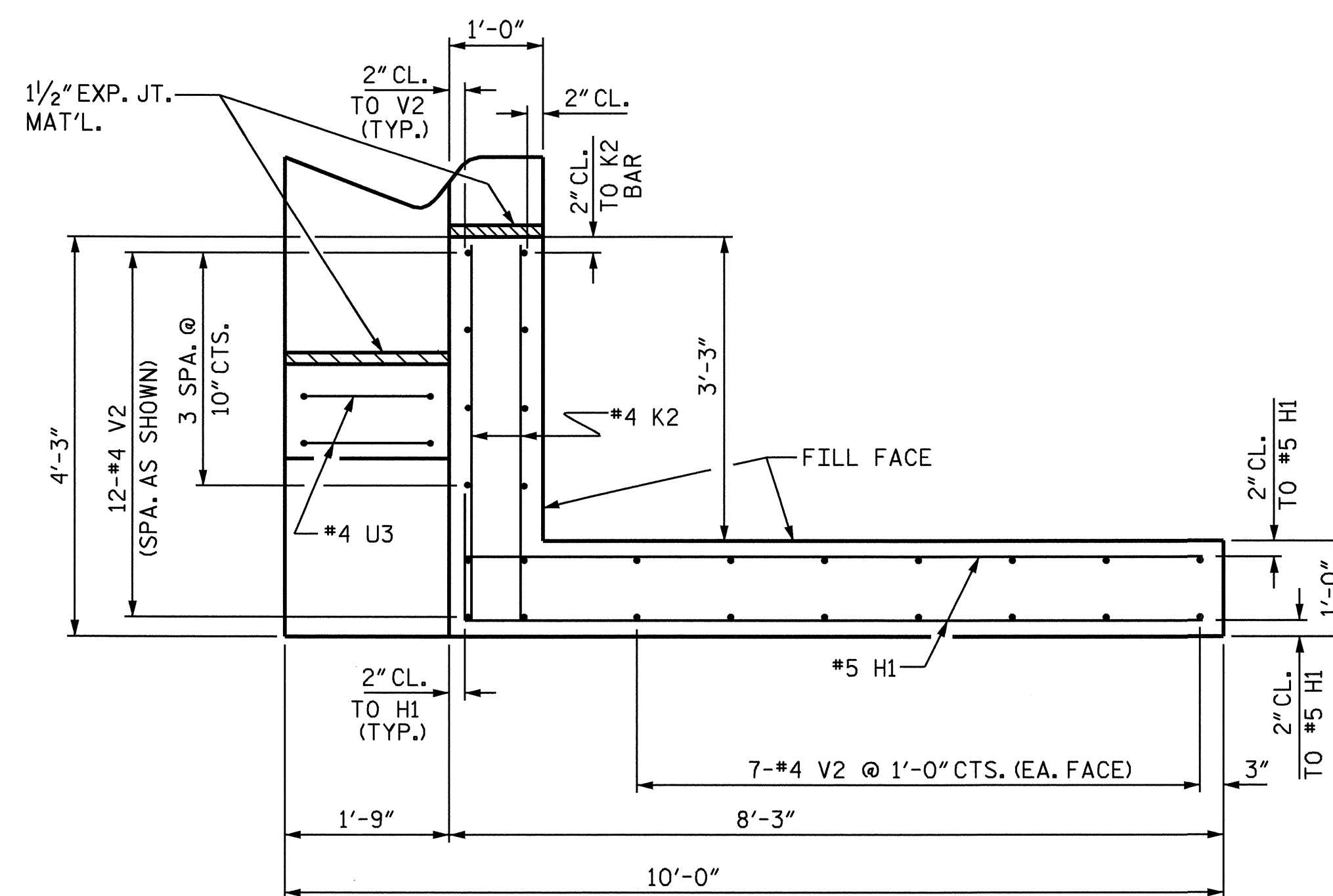
03-AUG-2009 10:28
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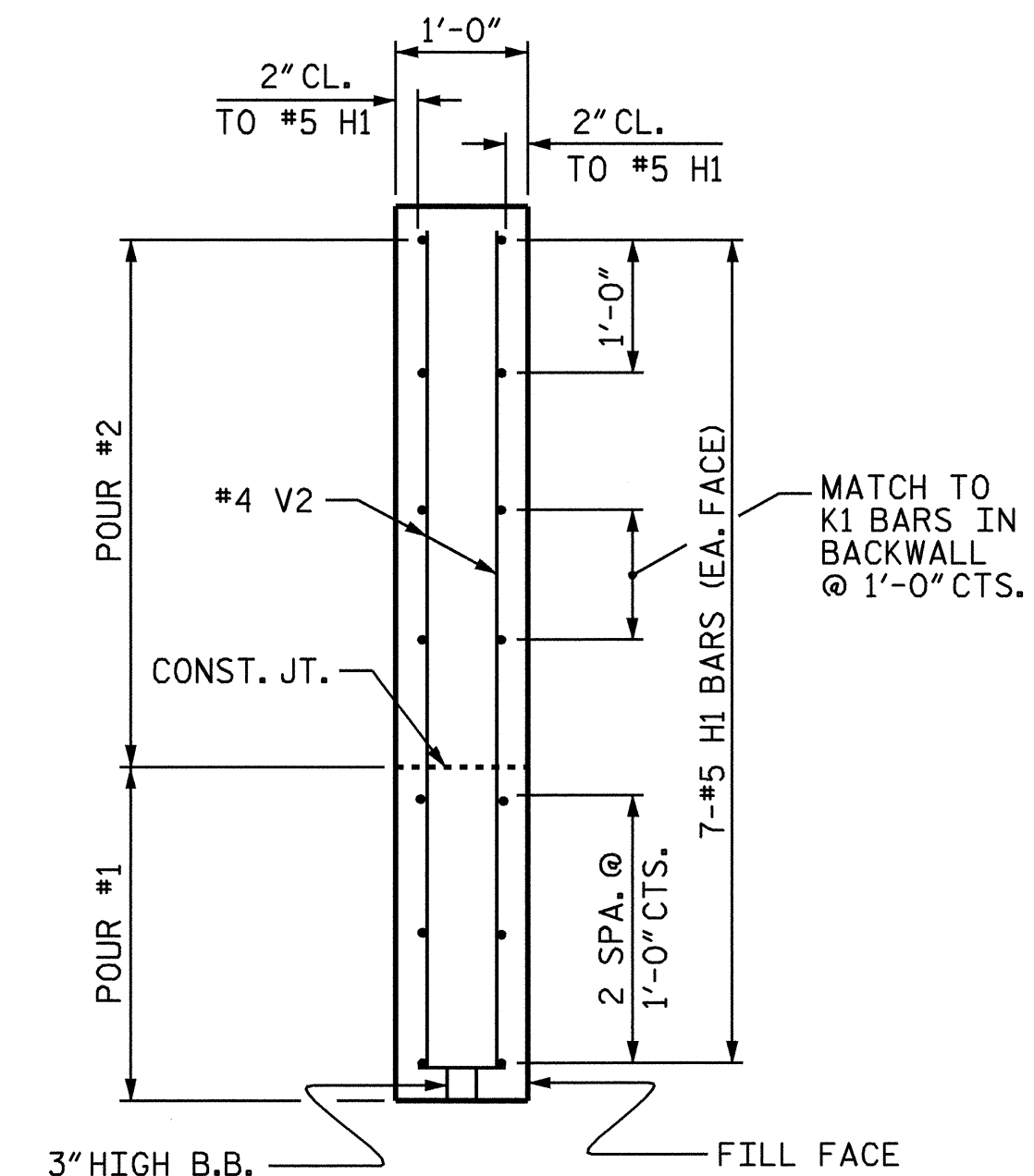
STR. #1



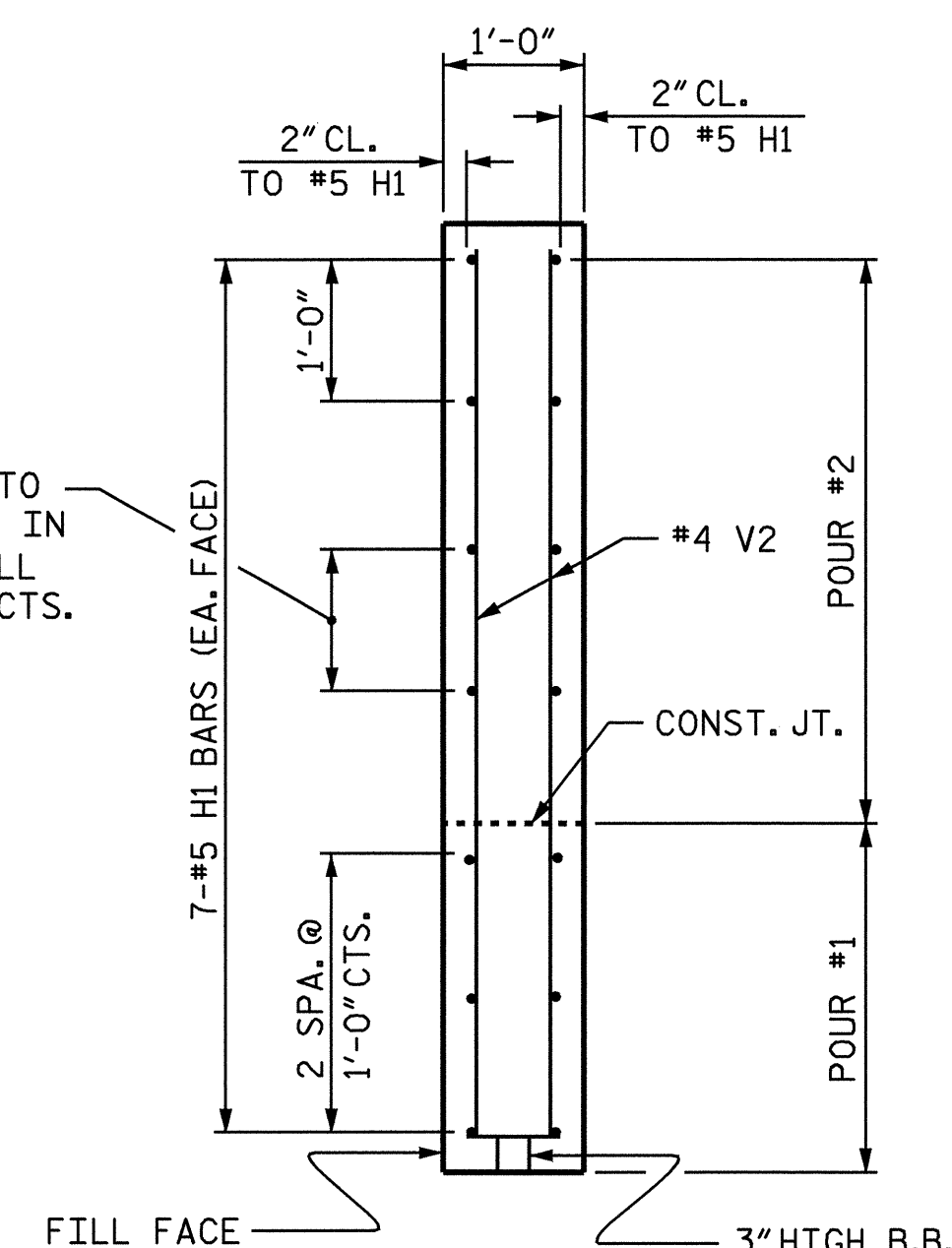
PLAN OF WING (W1)



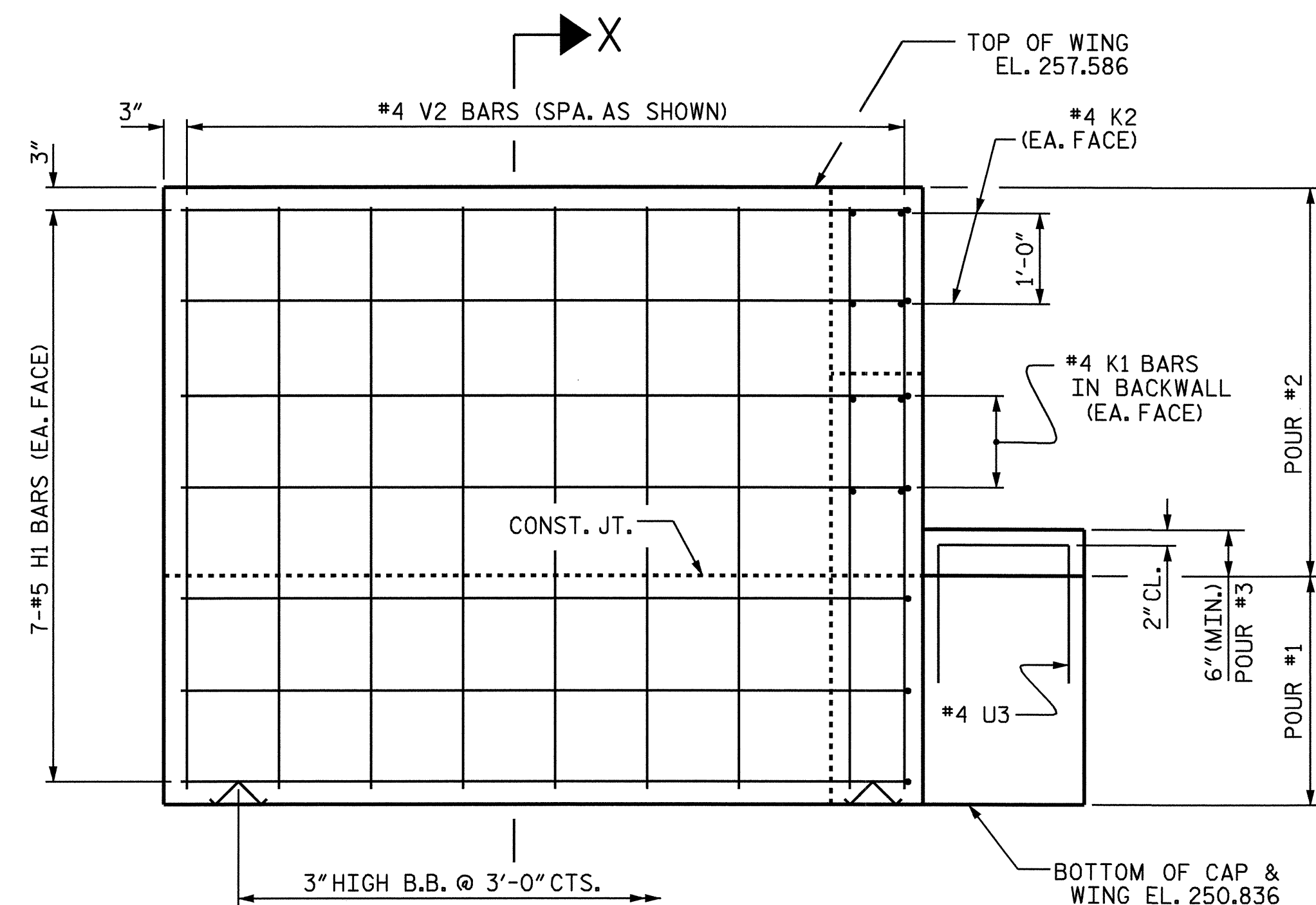
PLAN OF WING (W2)



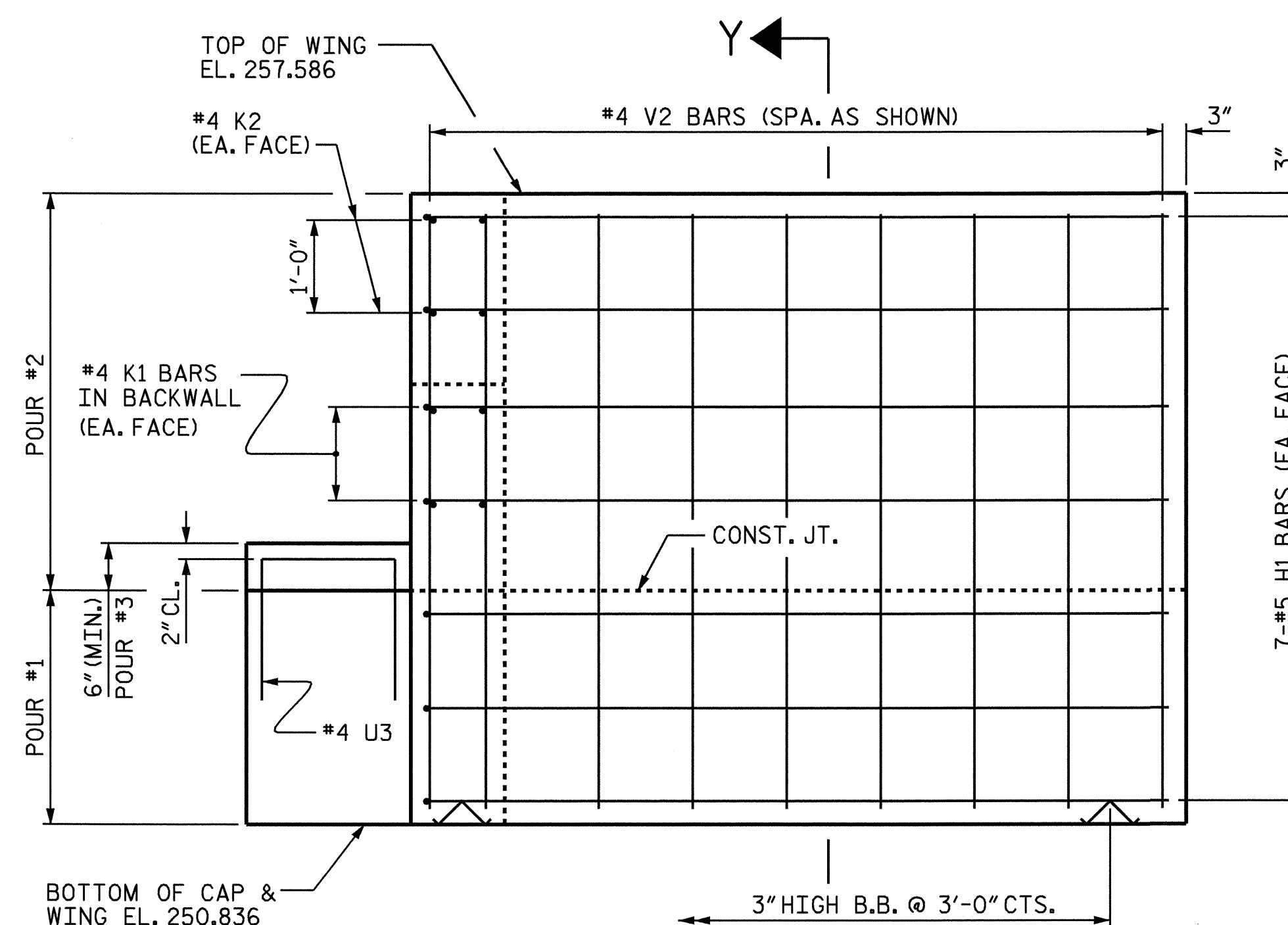
SECTION Y-Y



SECTION X-X



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

MATCH TO K1 BARS IN BACKWALL @ 1'-0" CTS.

PROJECT NO. B-3919
 WAKE COUNTY
 STATION: 17+55.20 -L-

SHEET 2 OF 3



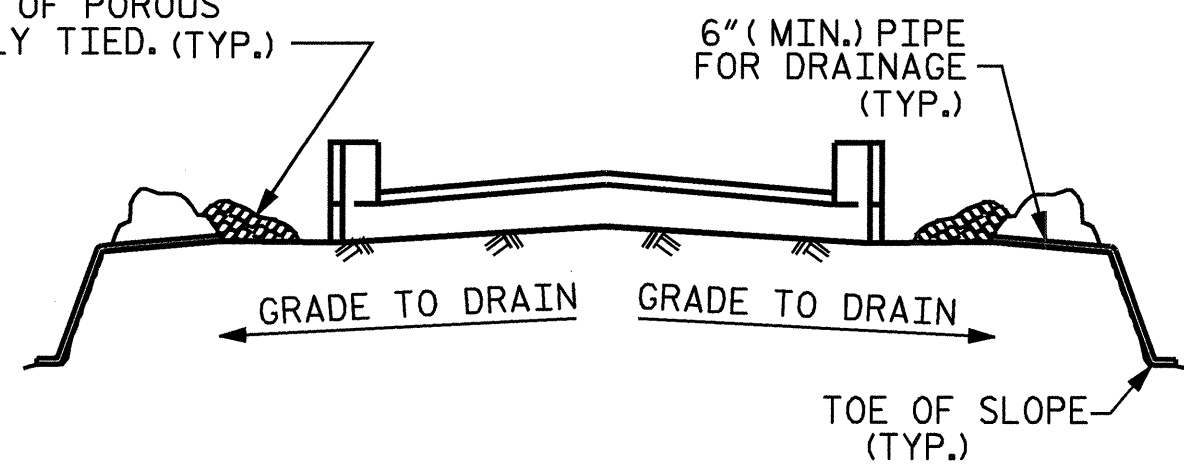
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT 2					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-20
					TOTAL SHEETS 51

DRAWN BY: S.L. WANCE DATE: 04-07-09
 CHECKED BY: J.A. TILLMAN DATE: 04-13-09

03-AUG-2009 10:50
 RA:\Structures\Final plans\str1\05.b3919.ed.01.eb.dgn
 drwithrow

STR. #1

MINIMUM OF 3- ONE CUBIC FOOT BAGS OF #78M STONE. BAGS SHALL BE OF POROUS FABRIC, SECURELY TIED. (TYP.)

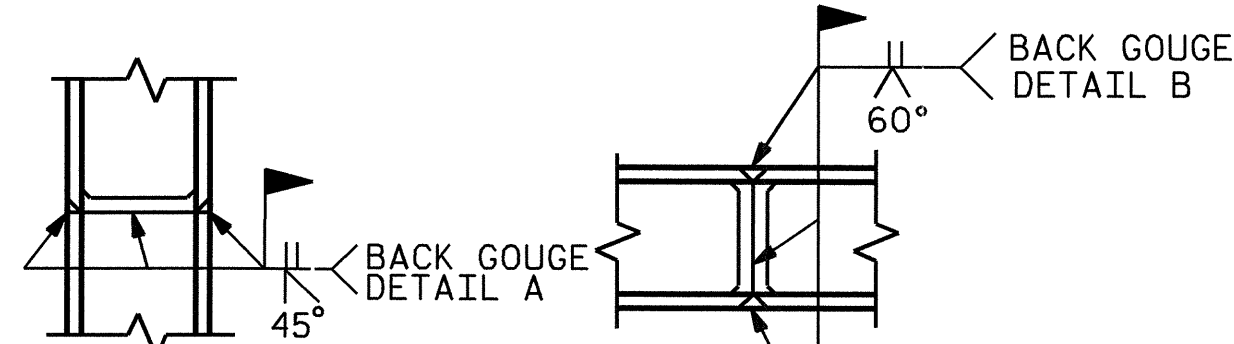


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

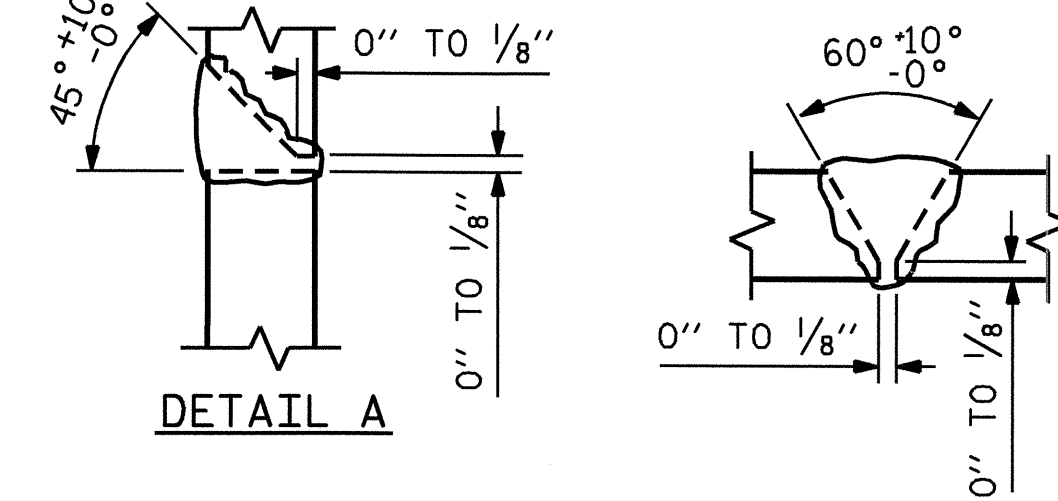
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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



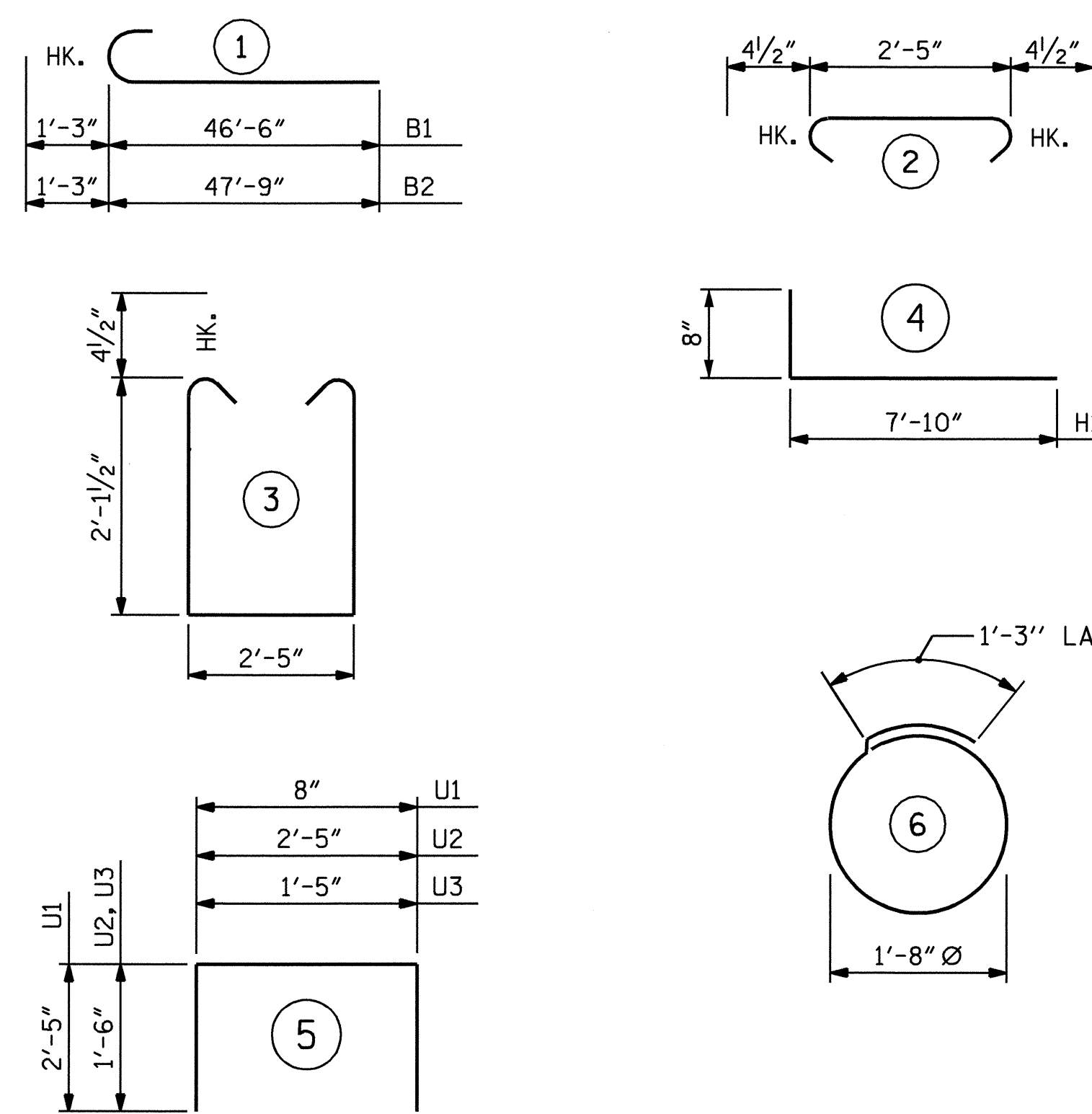
* PILE VERTICAL * PILE HORIZONTAL OR VERTICAL



* POSITION OF PILE DURING WELDING. DETAIL B

PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 2

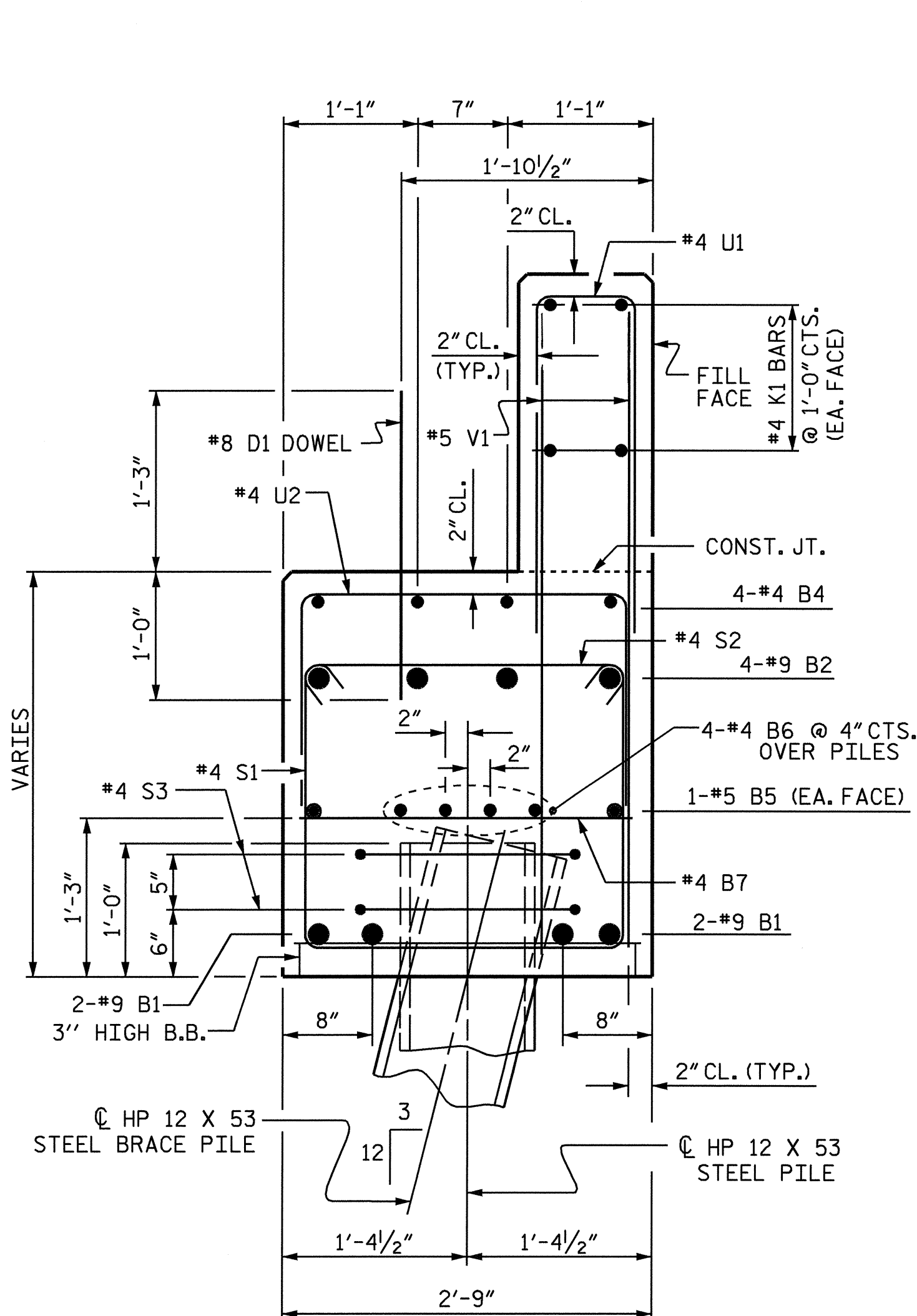
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	47'-9"	1299
B2	8	#9	1	49'-0"	1333
B3	4	#4	STR	8'-10"	24
B4	8	#4	STR	28'-3"	151
B5	4	#5	STR	44'-10"	187
B6	16	#4	STR	23'-6"	251
B7	22	#4	STR	2'-5"	36
D1	54	#8	STR	2'-3"	324
H1	28	#5	4	8'-6"	248
K1	16	#4	STR	23'-8"	253
K2	8	#4	STR	3'-11"	21
S1	84	#4	3	7'-5"	416
S2	84	#4	2	3'-2"	178
S3	26	#4	6	6'-6"	113
U1	79	#4	5	5'-6"	290
U2	41	#4	5	5'-5"	148
U3	4	#4	5	4'-5"	12
V1	158	#5	STR	4'-3"	700
V2	52	#4	STR	6'-3"	217

REINFORCING STEEL LBS 6201

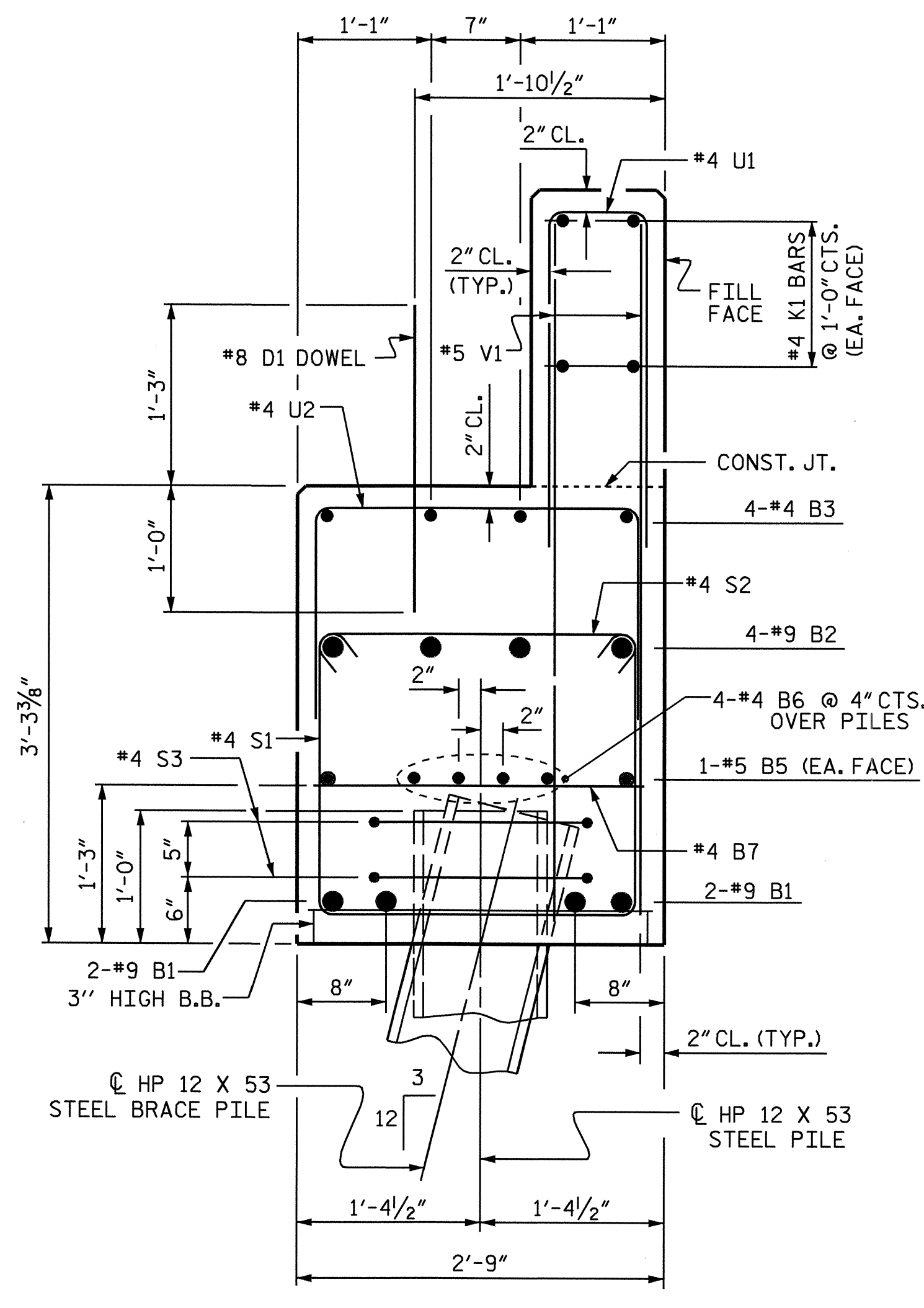
CLASS A CONCRETE BREAKDOWN:

POUR 1 (CAP & LOWER PART OF WINGS)	C.Y.	27.3
POUR 2 (BACKWALL & UPPER PART OF WINGS)	C.Y.	9.5
POUR 3 (LATERAL GUIDES)	C.Y.	0.1
TOTAL CLASS A CONCRETE	C.Y.	36.9

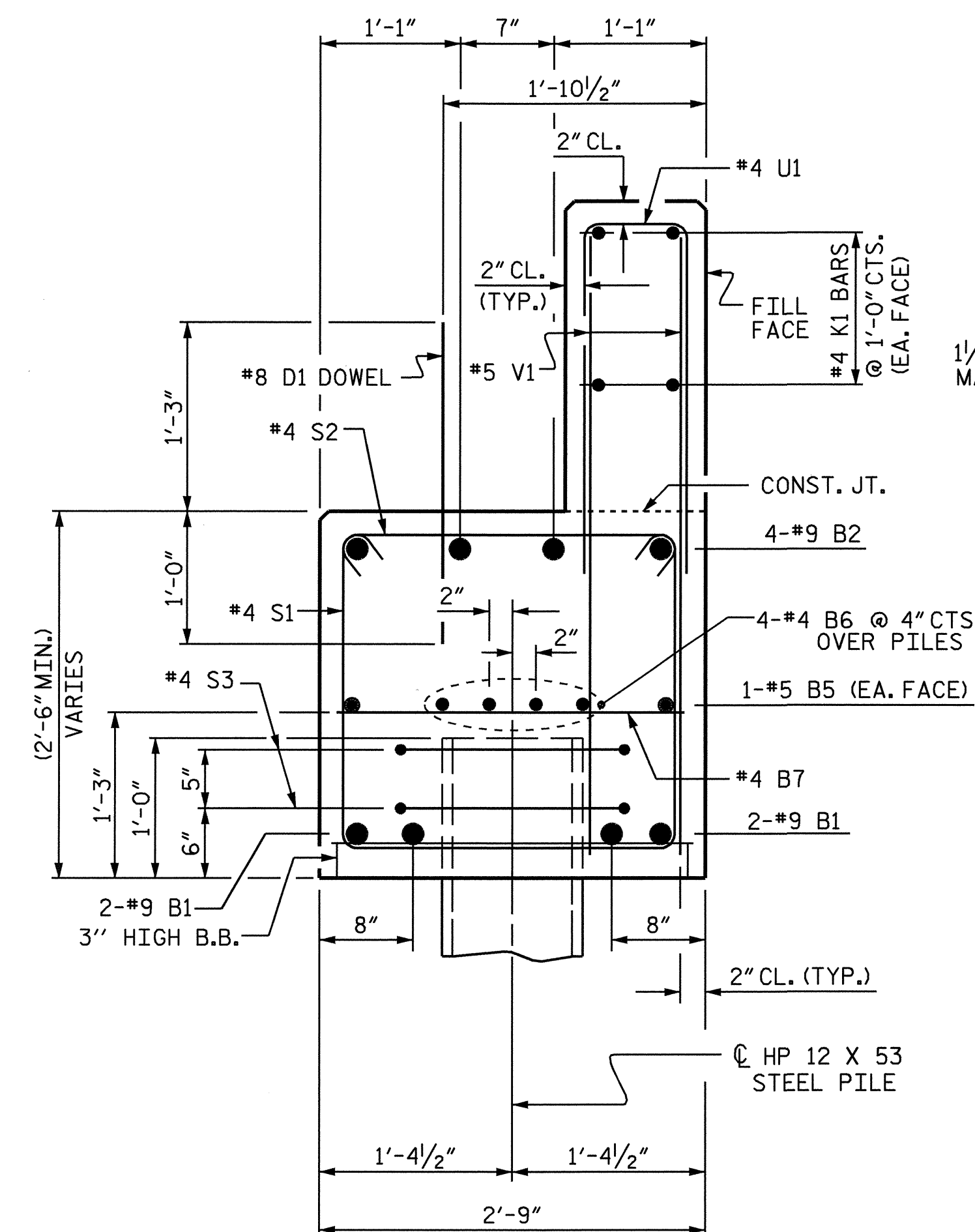
HP 12 X 53 STEEL PILES NO. = 13 LIN. FT. = 130



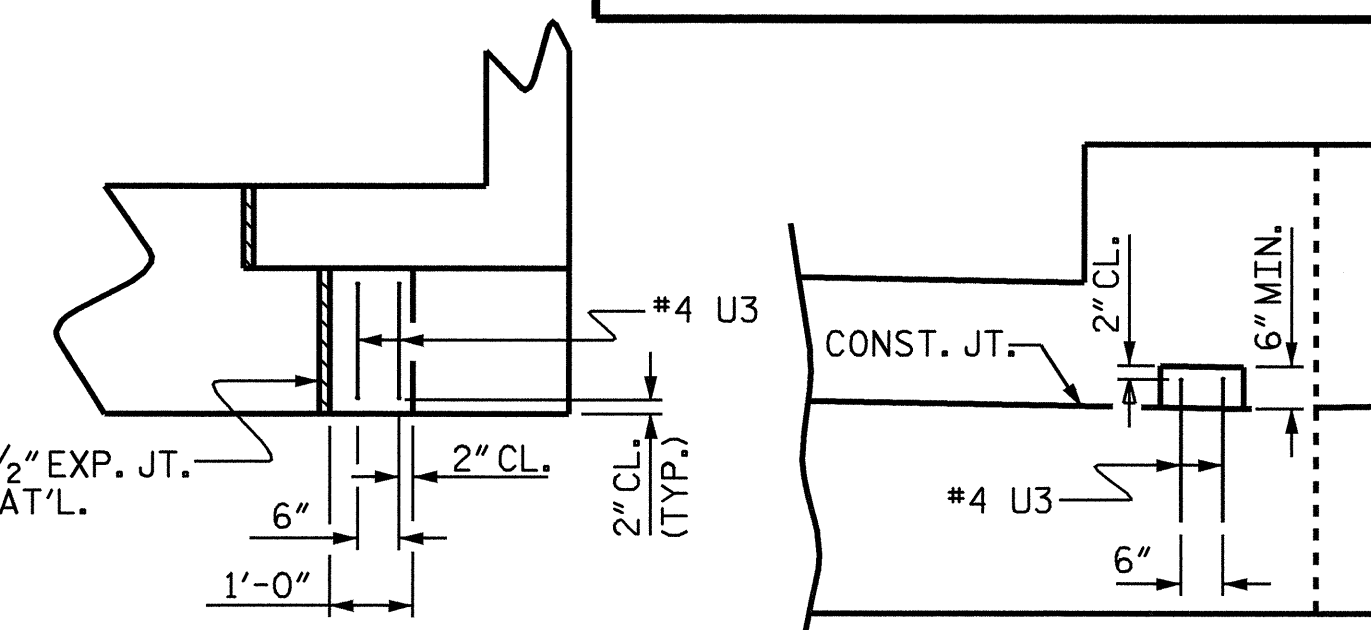
SECTION C-C



SECTION B-B



SECTION A-A



LATERAL GUIDE DETAILS

(RIGHT LATERAL GUIDE SHOWN, LEFT LATERAL GUIDE SIMILAR)

PROJECT NO. B-3919
WAKE COUNTY
STATION: 17+55.20 -L-

SHEET 3 OF 3

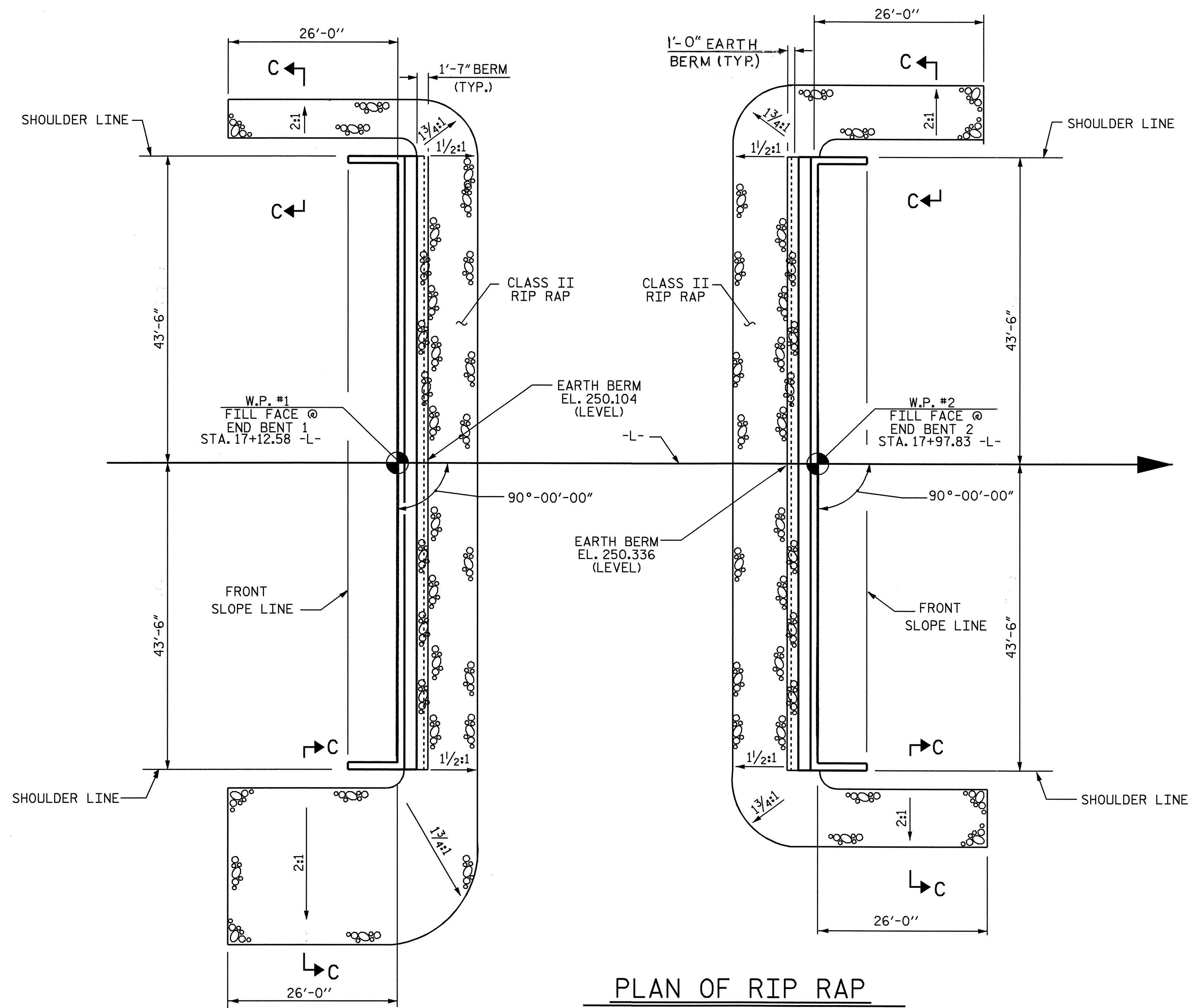
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
END BENT 2



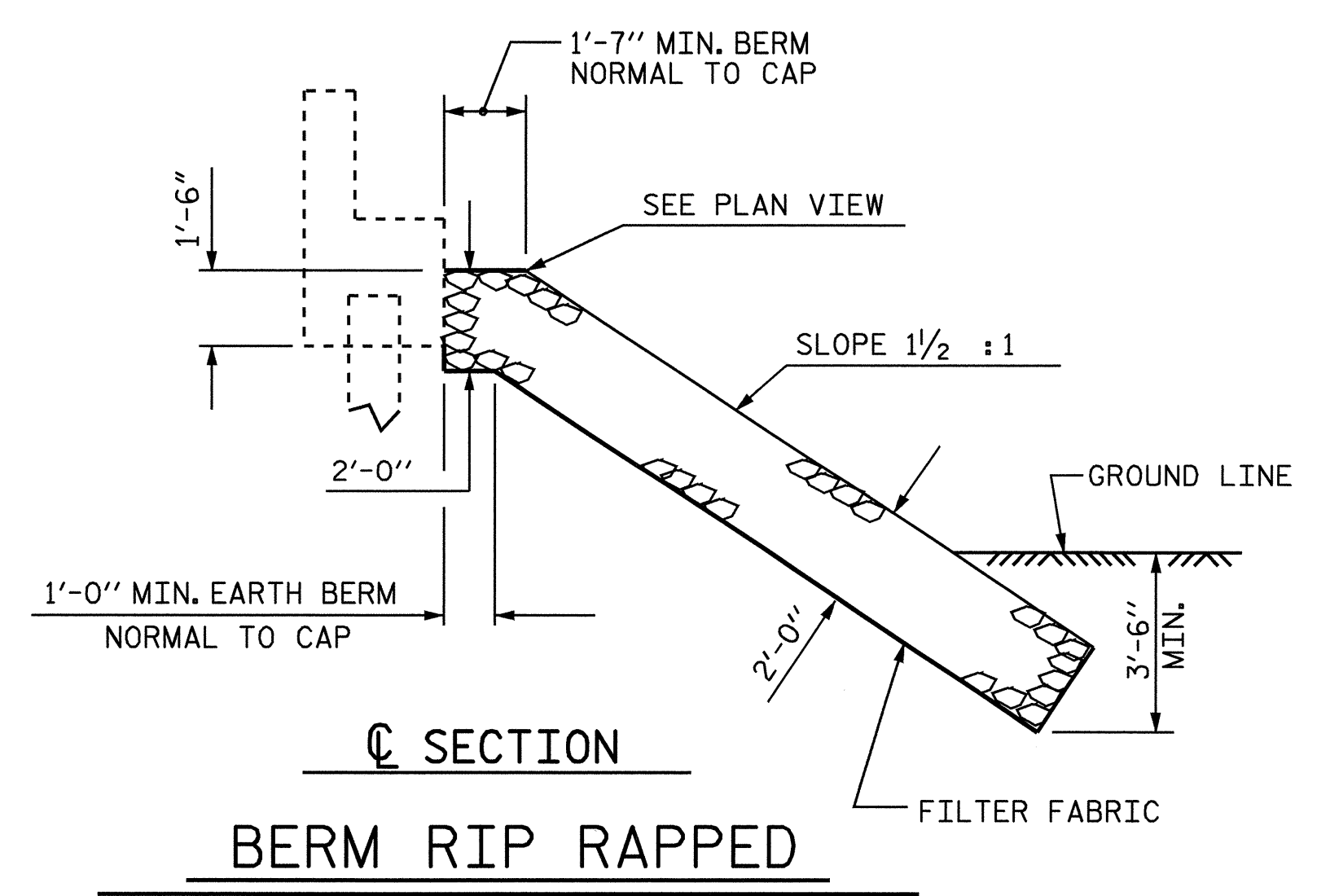
Steven L. Wance
10/2/09

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	9-21	
1			3			TOTAL SHEETS	
2			4			51	

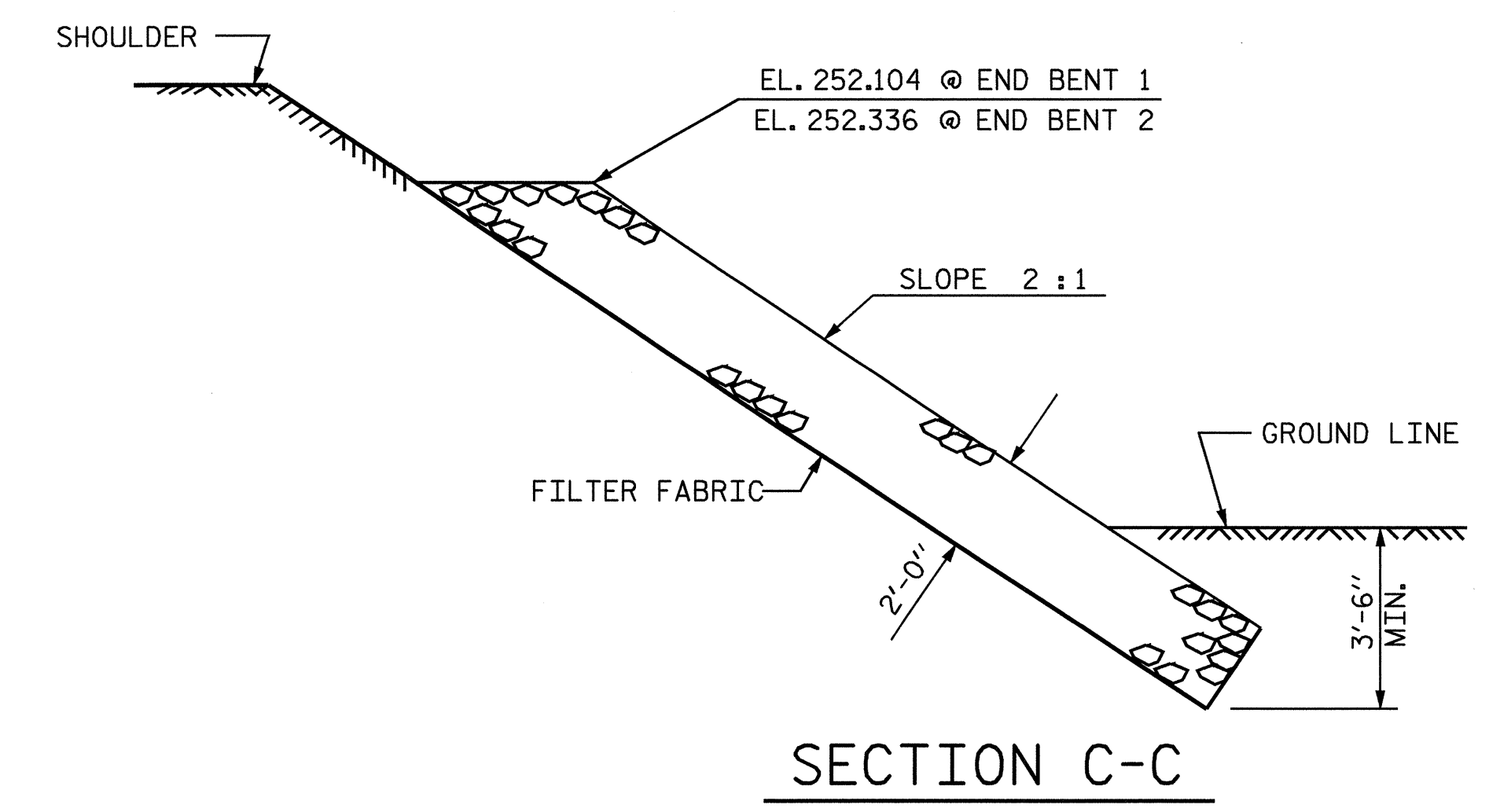
DRAWN BY: S.L. WANCE DATE: 04-07-09
CHECKED BY: J.A. TILLMAN DATE: 04-13-09



PLAN OF RIP RAP



SECTION
BERM RIP RAPPED



SECTION C-C

NOTE: FILTER FABRIC SHALL BE PLACED UNDER ENTIRE AREA OF RIP RAP

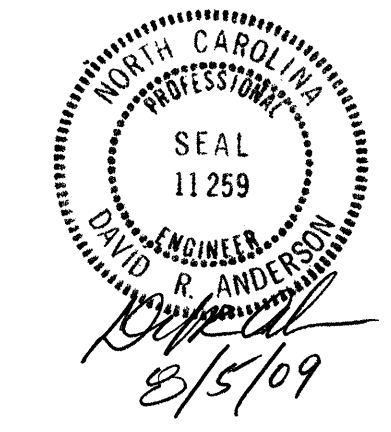
ESTIMATED QUANTITIES		
BRIDGE @ STA. 17+55.20 -L-	RIP RAP CLASS II	FILTER FABRIC FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	170	190
END BENT 2	135	150

PROJECT NO. B-3919
WAKE COUNTY
 STATION: 17+55.20 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

RIP RAP DETAILS

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



DRAWN BY: N. Q. TRAN DATE: 2-8-09
 CHECKED BY: J. A. TILLMAN DATE: 2-28-09

10-JUN-2009 12:31
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 danderson

NOTES

FOR REINFORCED BRIDGE APPROACH FILL INCLUDING FABRIC, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, 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 6" COMP. A.B.C. SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB AND SHALL EXTEND 1'-0" OUTSIDE OF EACH EDGE OF THE APPROACH SLAB.

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

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

FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 3 1/16".

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

APPROACH SLABS SHALL BE POURED AFTER CONCRETE OVERLAY IS POURED.

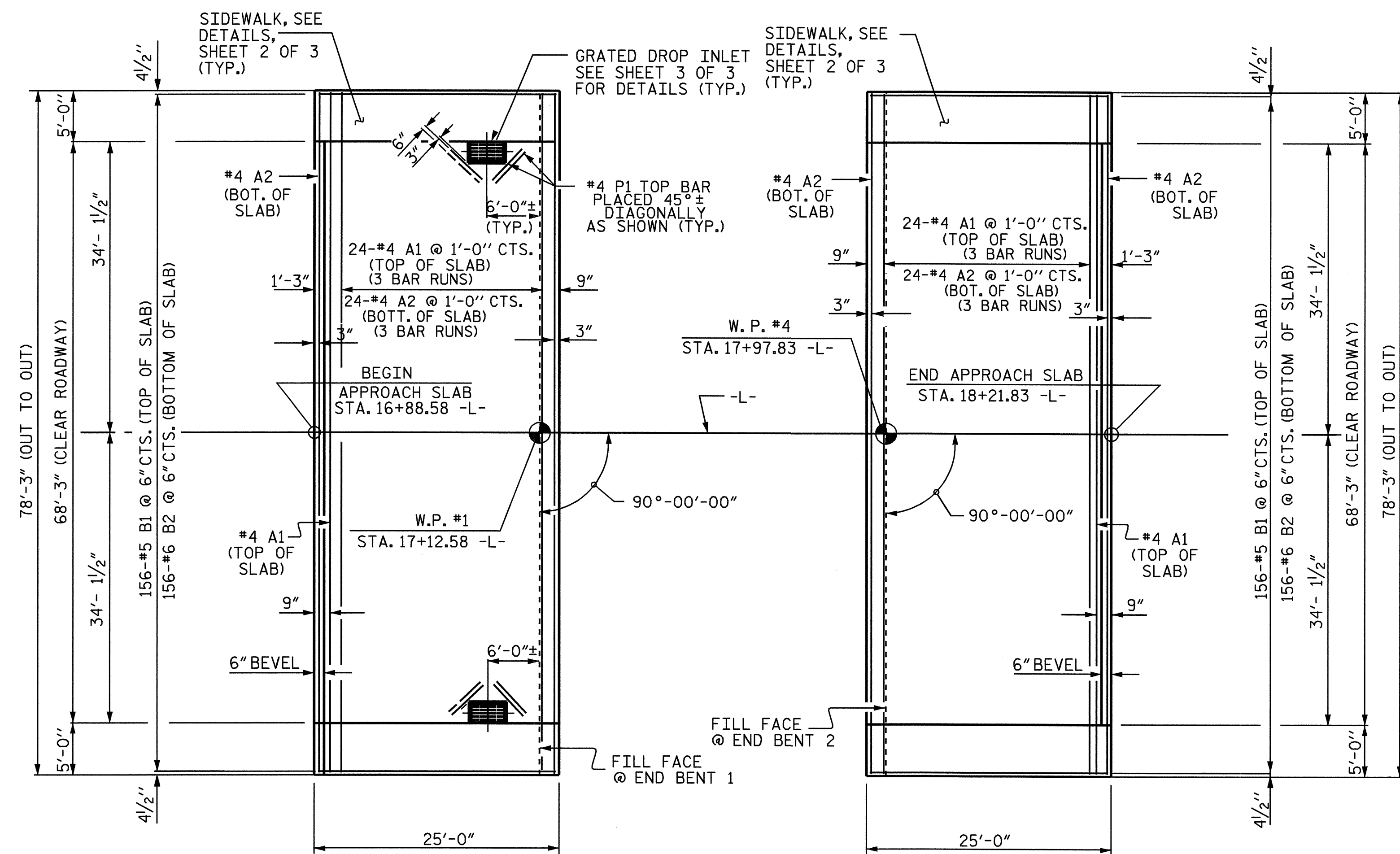
THE JOINT SHALL BE SAWED AFTER THE CASTING OF THE PARAPET AND END POST.

BILL OF MATERIAL

AT END BENT 1					AT END BENT 2						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	75	#4	STR	27'-3"	1365	*A1	75	#4	STR	27'-3"	1365
A2	78	#4	STR	27'-2"	1415	A2	78	#4	STR	27'-2"	1415
*B1	156	#5	STR	23'-7"	3837	*B1	156	#5	STR	23'-7"	3837
B2	156	#6	STR	24'-8"	5780	B2	156	#6	STR	24'-8"	5780
*B3	8	#4	STR	24'-8"	132	*B3	8	#4	STR	24'-8"	132
*D1	32	#4	STR	1'-0"	21	*D1	32	#4	STR	1'-0"	21
*G1	50	#4	STR	4'-6"	150	*G1	50	#4	STR	4'-6"	150
*P1	8	#4	STR	4'-0"	21						
REINFORCING STEEL	LBS.	7195	REINFORCING STEEL	LBS.	7195						
*EPOXY COATED REINFORCING STEEL	LBS.	5526	*EPOXY COATED REINFORCING STEEL	LBS.	5505						
CLASS AA CONCRETE SLAB	C. Y.	73.2	CLASS AA CONCRETE SLAB	C. Y.	73.2						
2 SIDEWALKS	C. Y.	7.2	2 SIDEWALKS	C. Y.	7.2						
TOTAL :	C. Y.	80.4	TOTAL :	C. Y.	80.4						

BAR SPLICE CHART

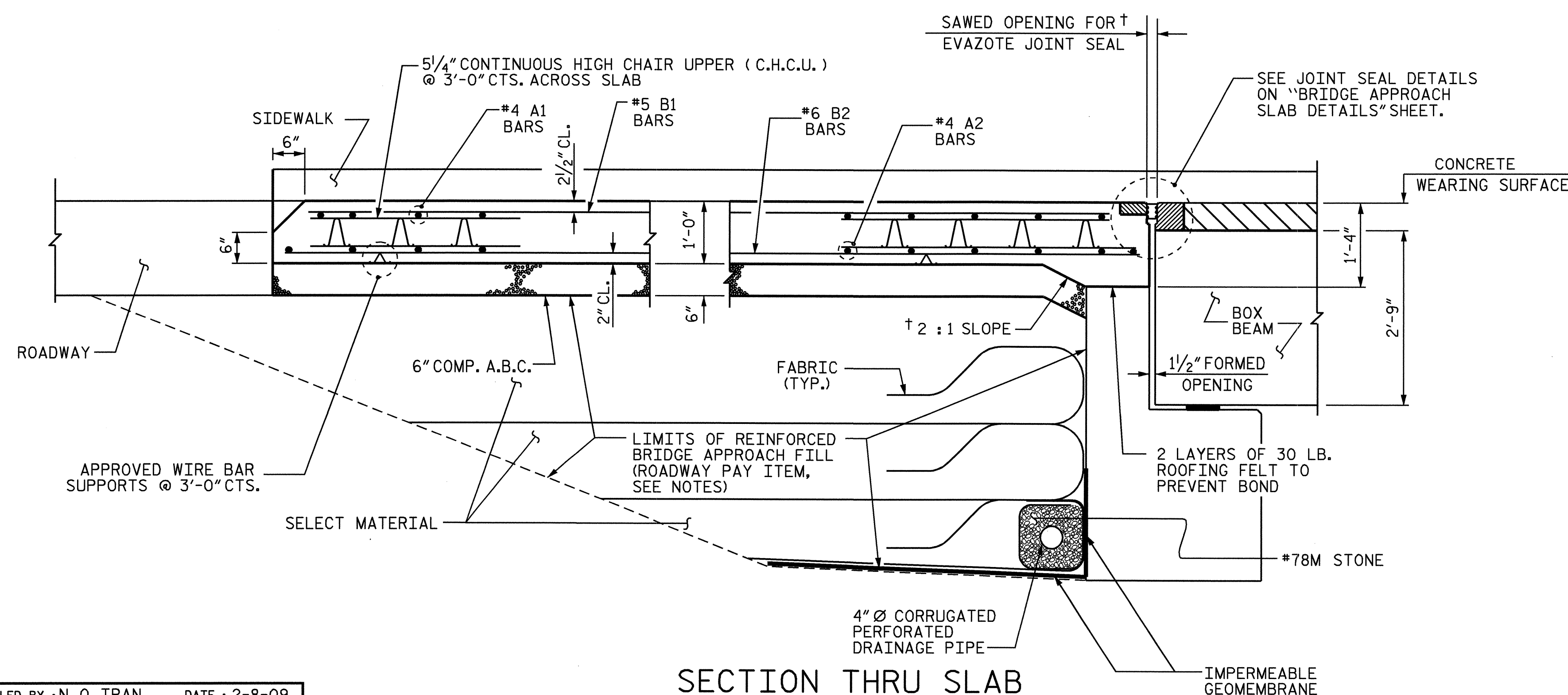
BAR	SPLICE LENGTH
#4 A1	2'-0"
#4 A2	1'-9"



AT END BENT 1

AT END BENT 2

PLAN FOR APPROACH SLAB



SECTION THRU SLAB

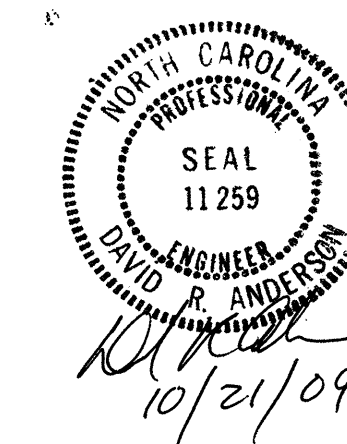
PROJECT NO. B-3919
WAKE COUNTY
 STATION: 17+55.20 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

BRIDGE APPROACH SLAB
 FOR
 PRESTRESSED CONCRETE
 BOX BEAM

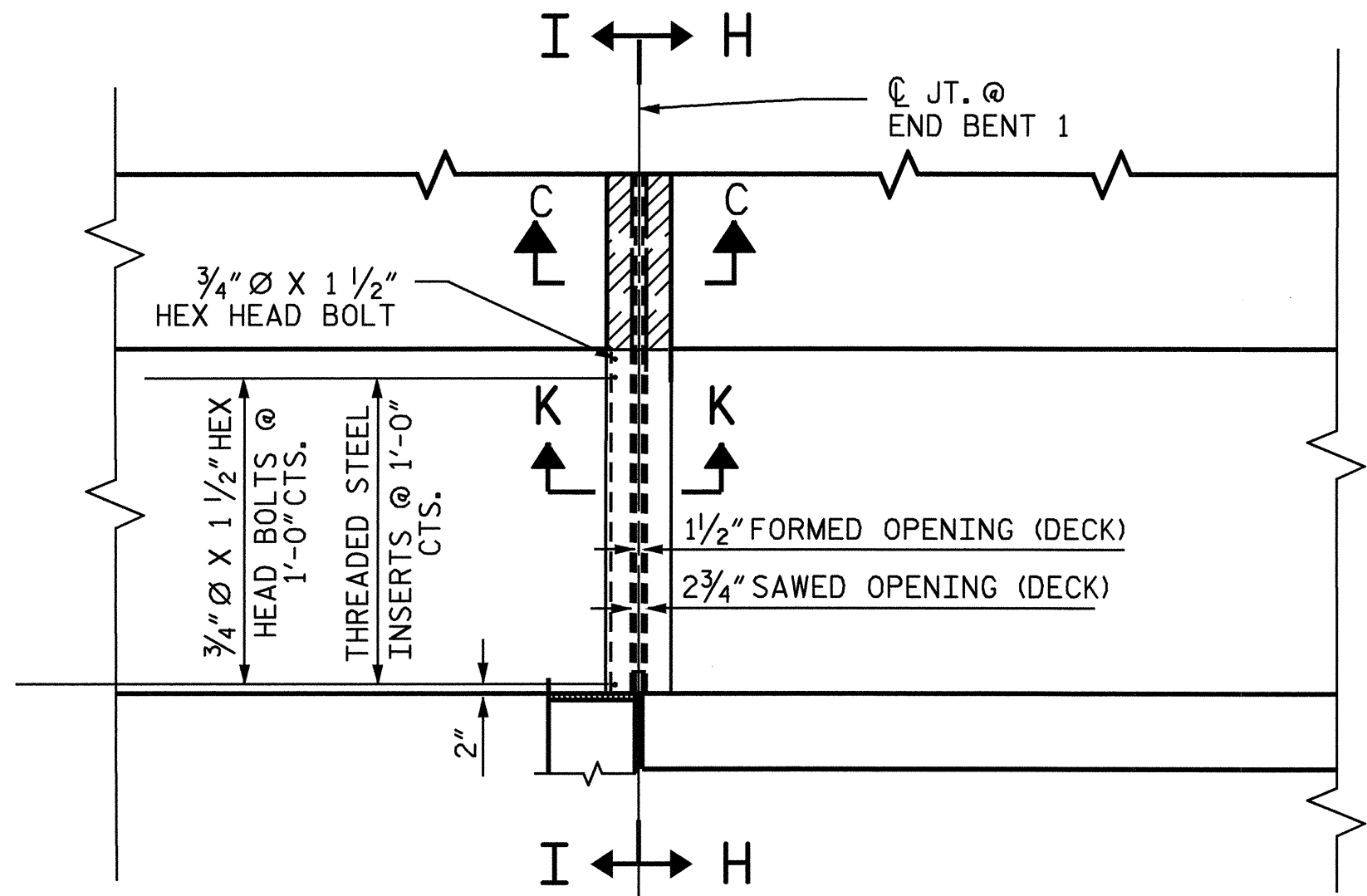
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			5-23
2			4			51



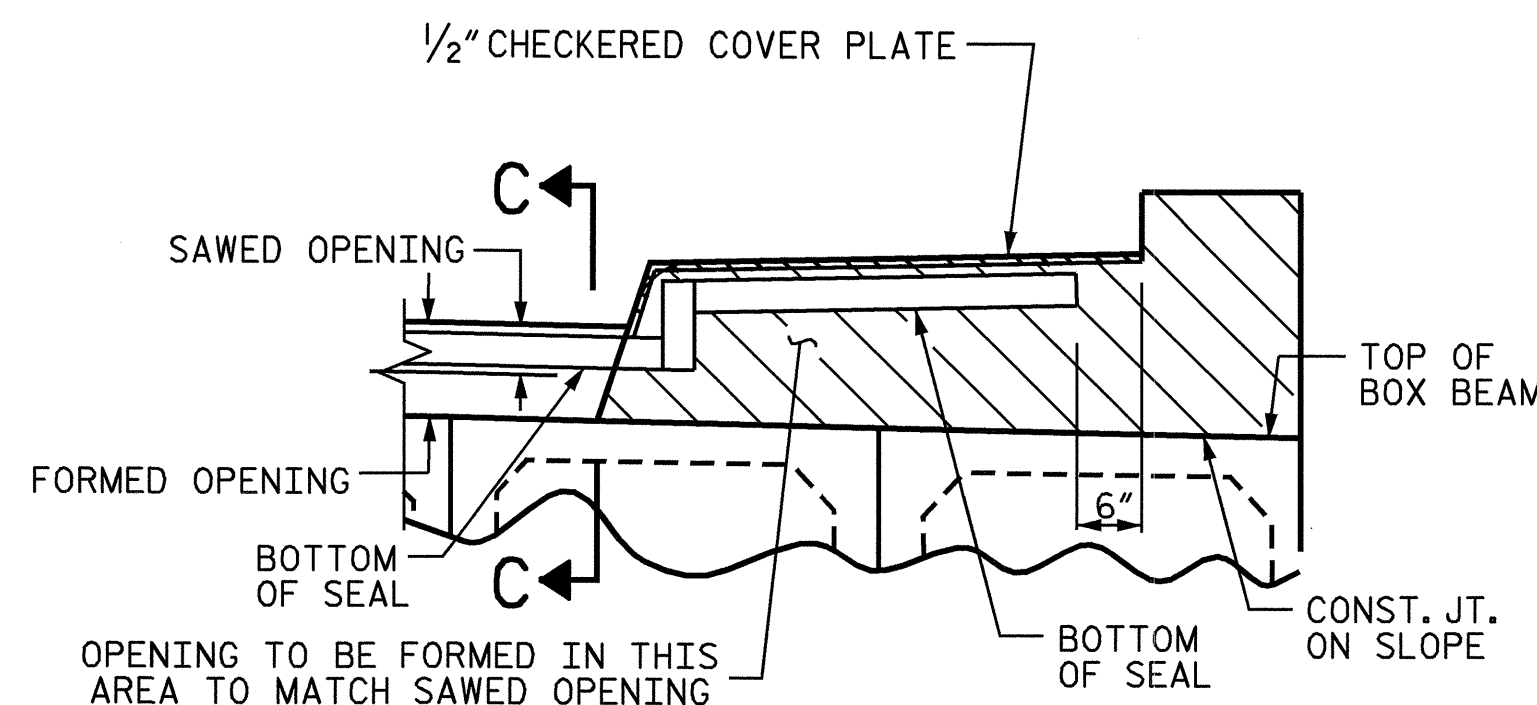
ASSEMBLED BY : N. Q. TRAN DATE : 2-8-09
 CHECKED BY : J. A. TILLMAN DATE : 2-25-09

20-OCT-2009 11:52
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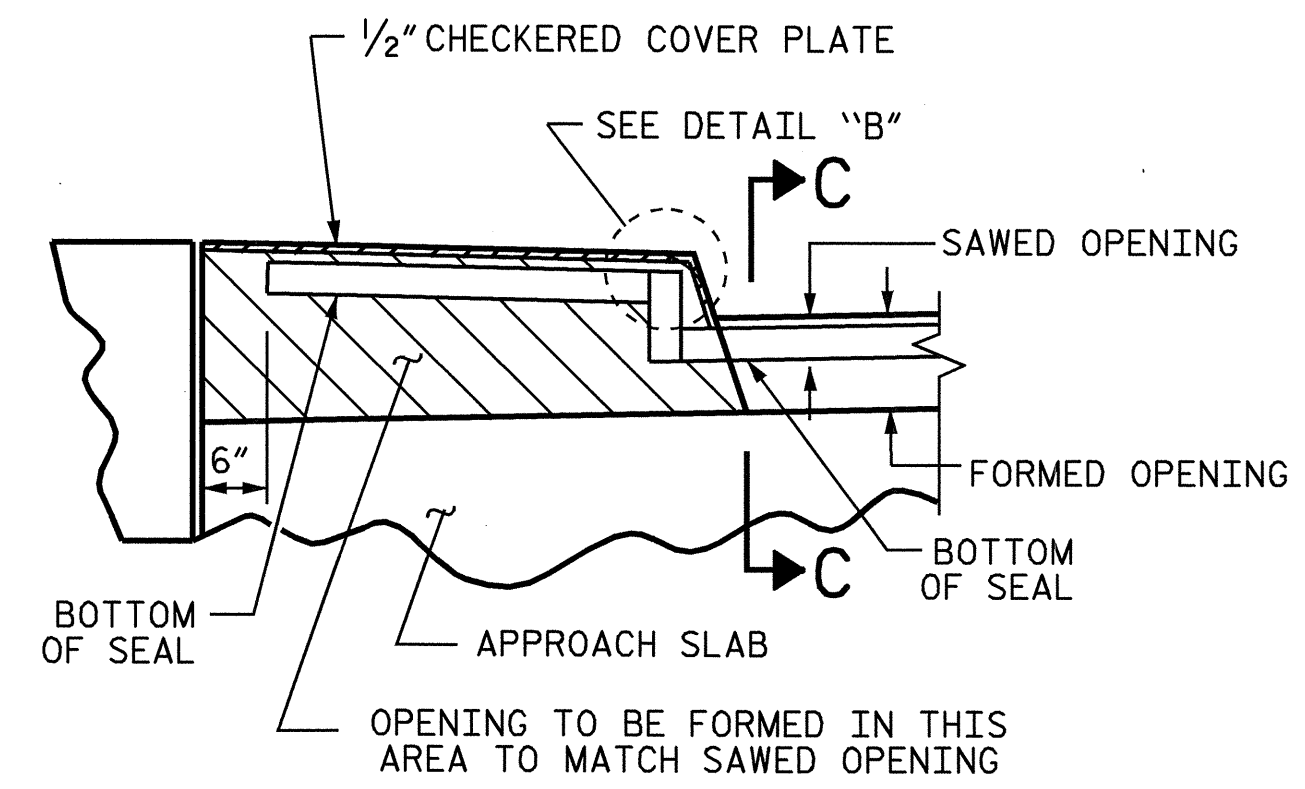
STR. #1



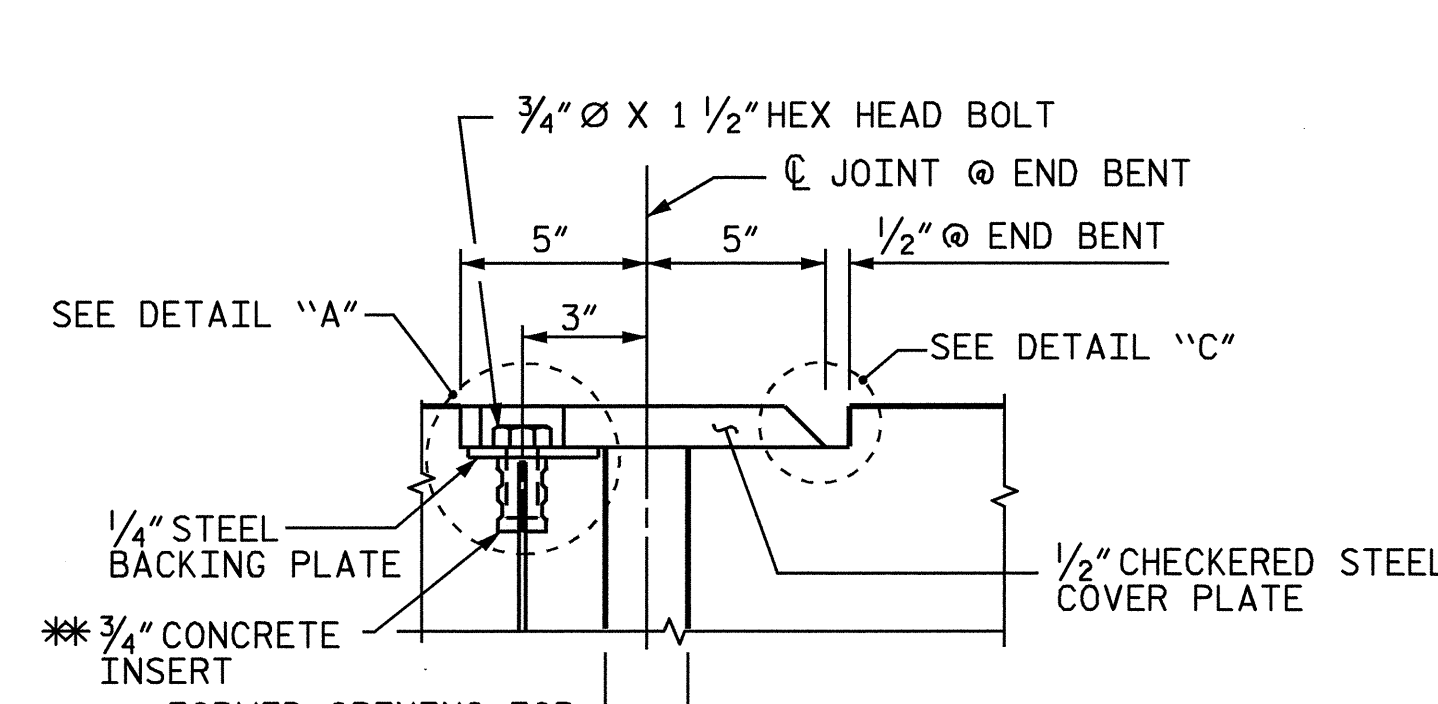
PLAN VIEW OF EVAZOTE JOINT SEAL @ END BENT FOR SIDEWALK



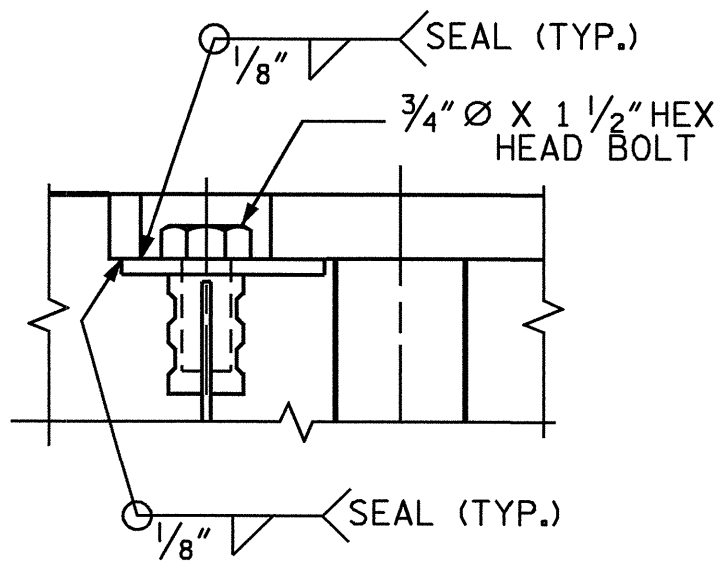
SECTION H-H



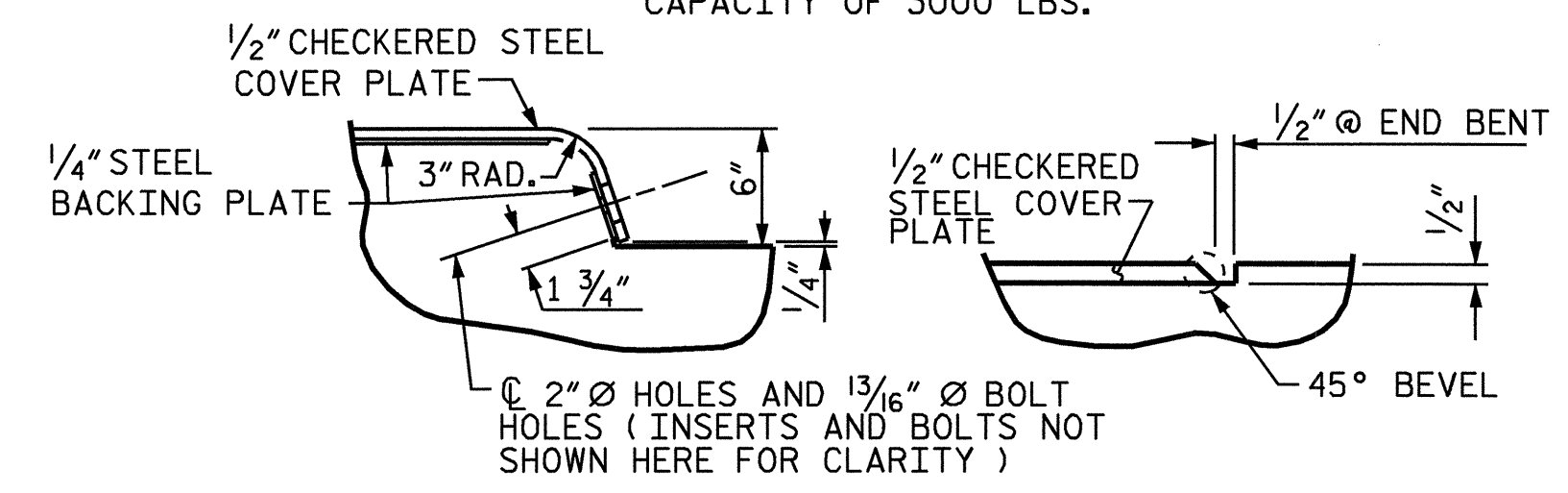
SECTION I-I



SECTION K-K



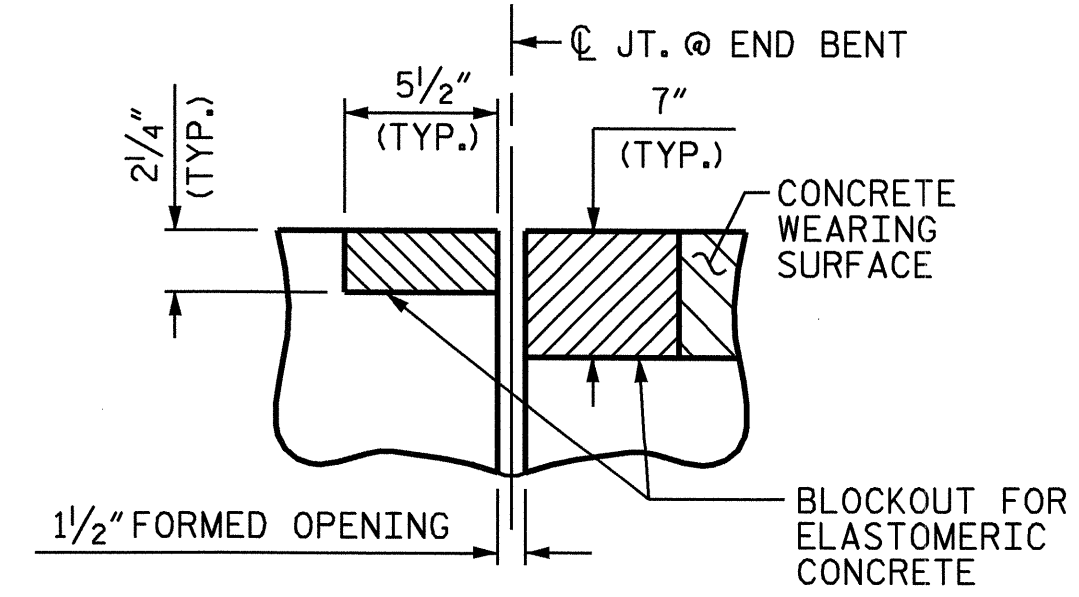
DETAIL "A"



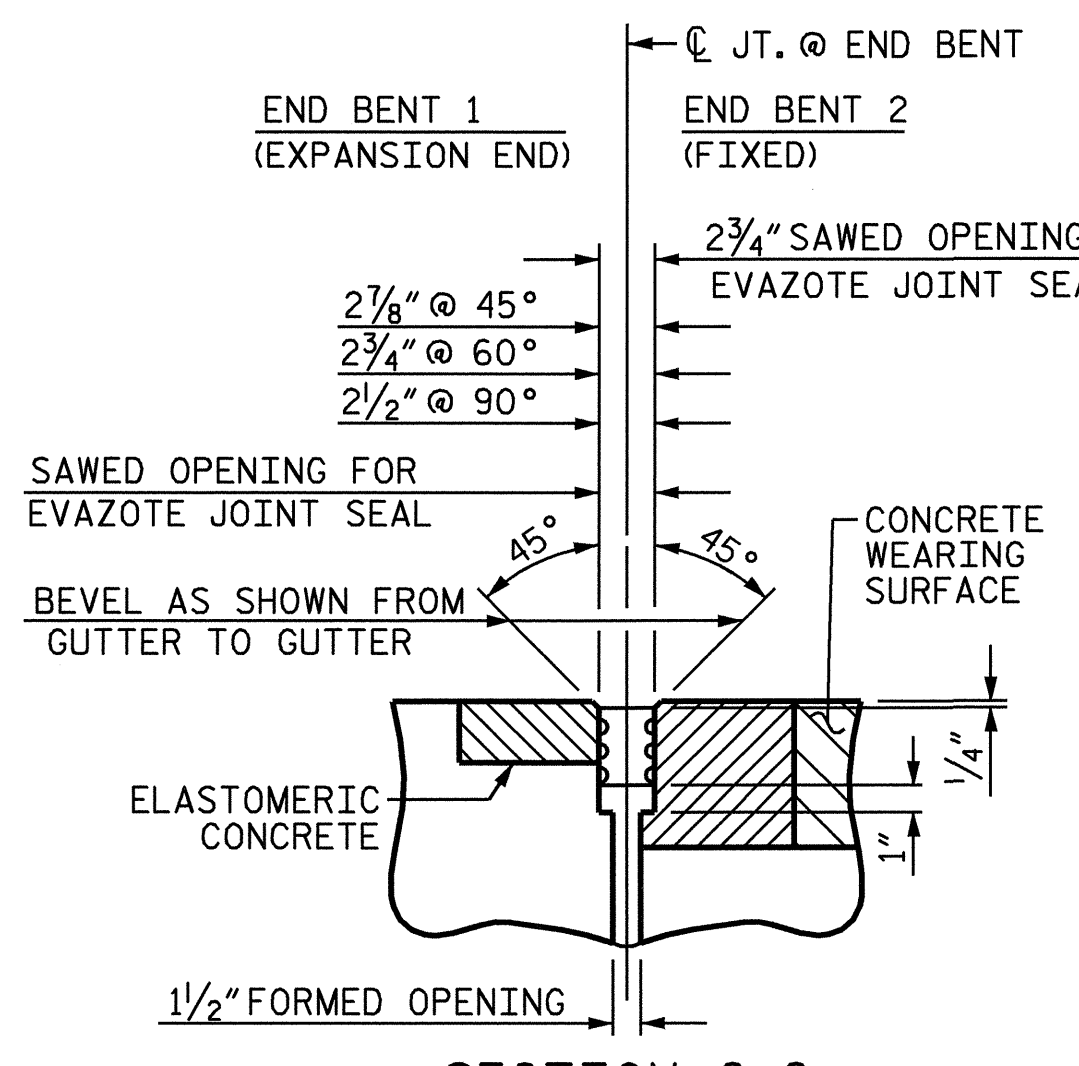
DETAIL "B"

DETAIL "C"

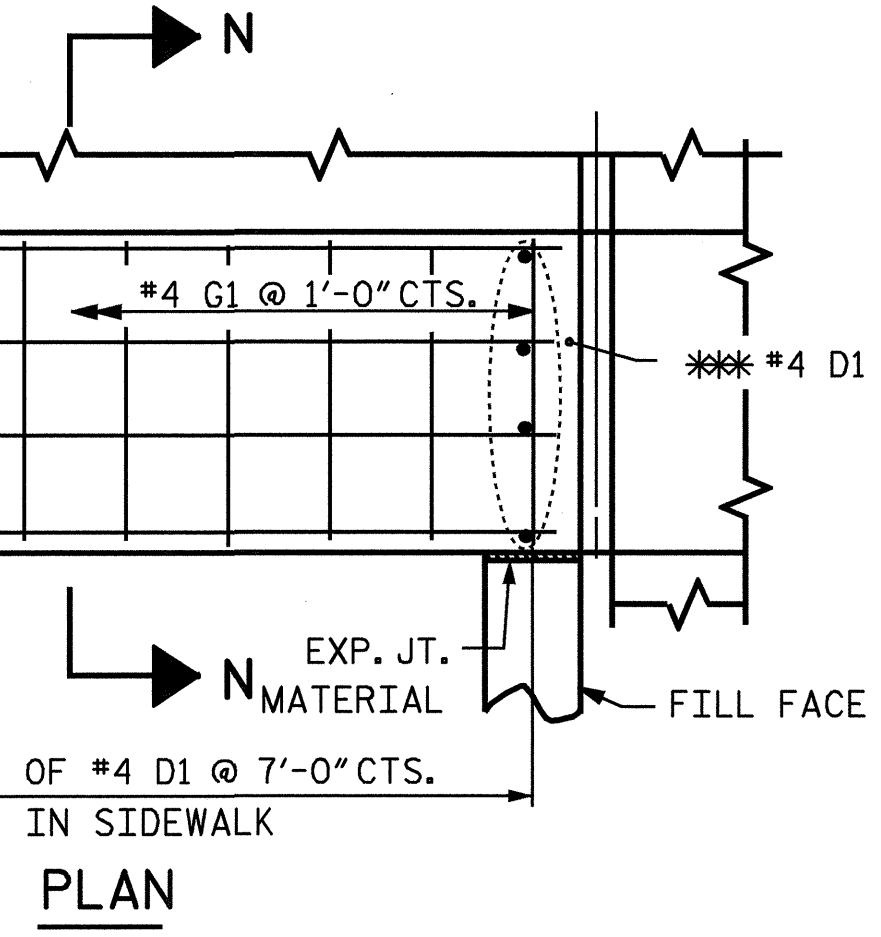
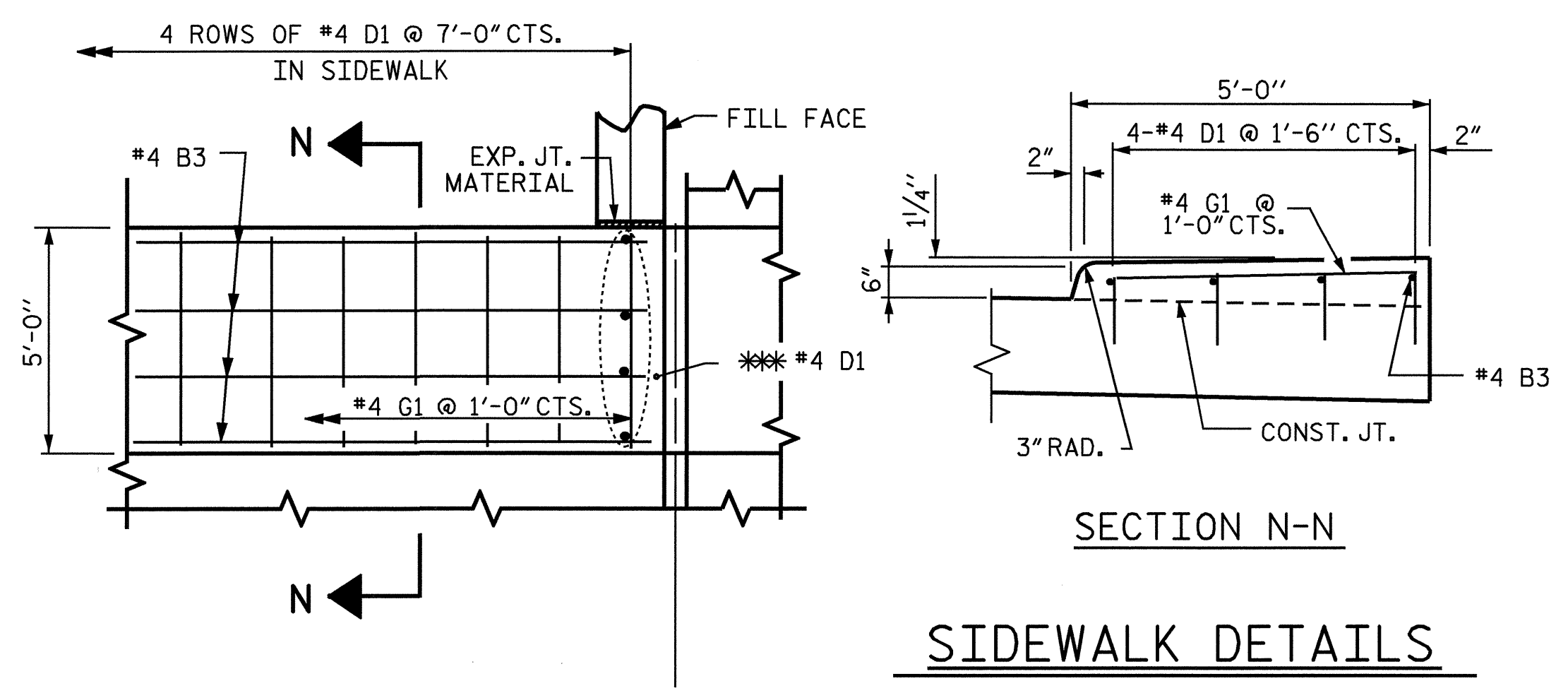
JOINT SEAL DETAILS @ END BENT



SECTION C-C
EVAZOTE JOINT SEAL
(PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS)



SECTION C-C
EVAZOTE JOINT SEAL



DETAILS OF SIDEWALK ON APPROACH SLAB

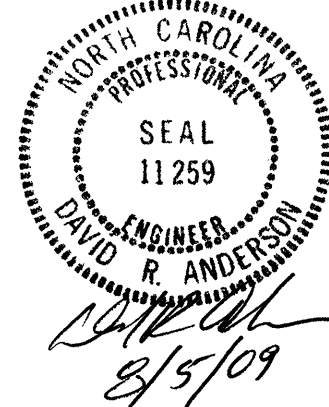
ELASTOMERIC CONCRETE	
END BENT	ELASTOMERIC CONCRETE * (CU. FT.)
1	27.7
2	27.7
TOTAL	55.4

* BASED ON THE MINIMUM BLOCKOUT SHOWN.

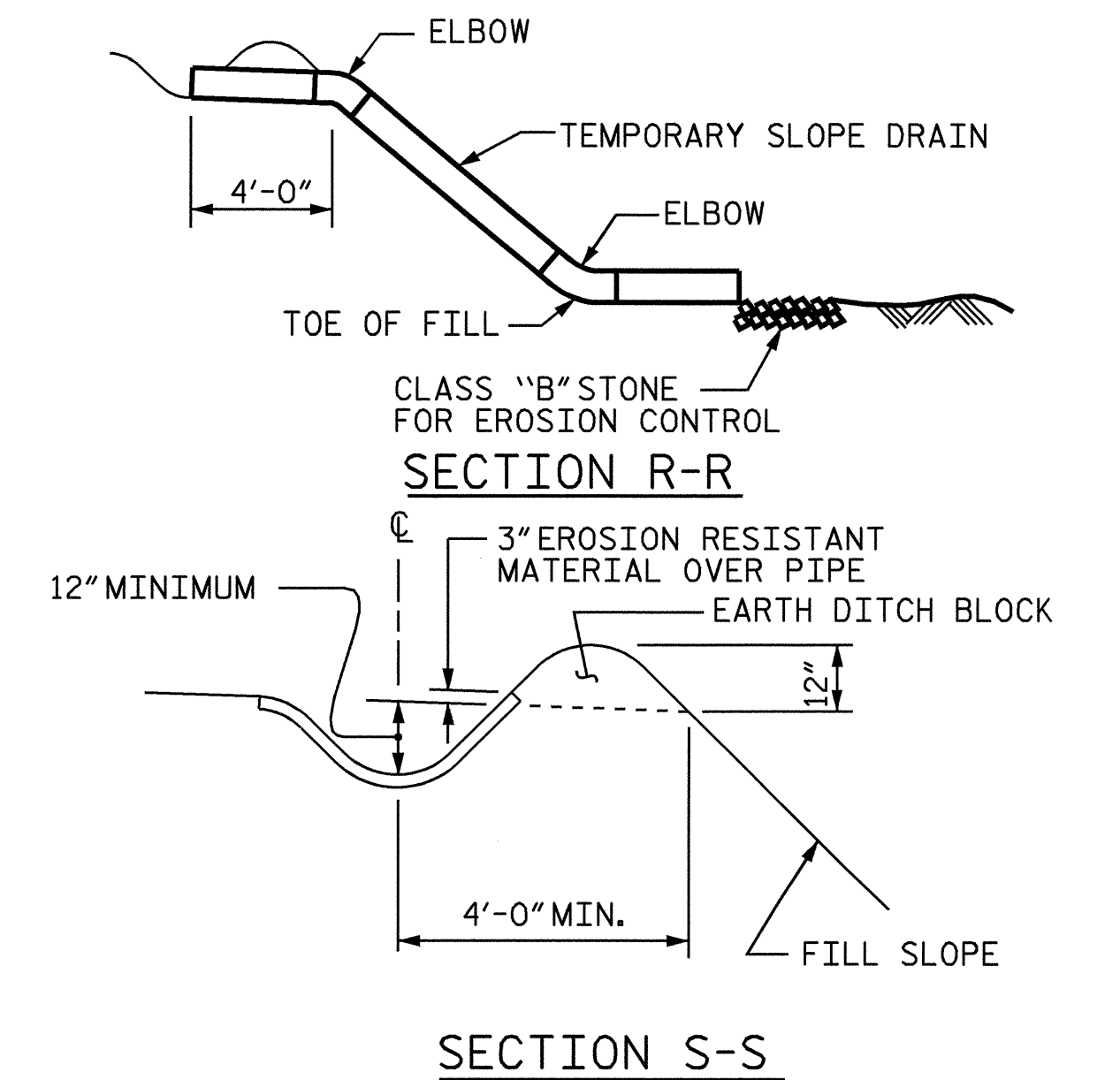
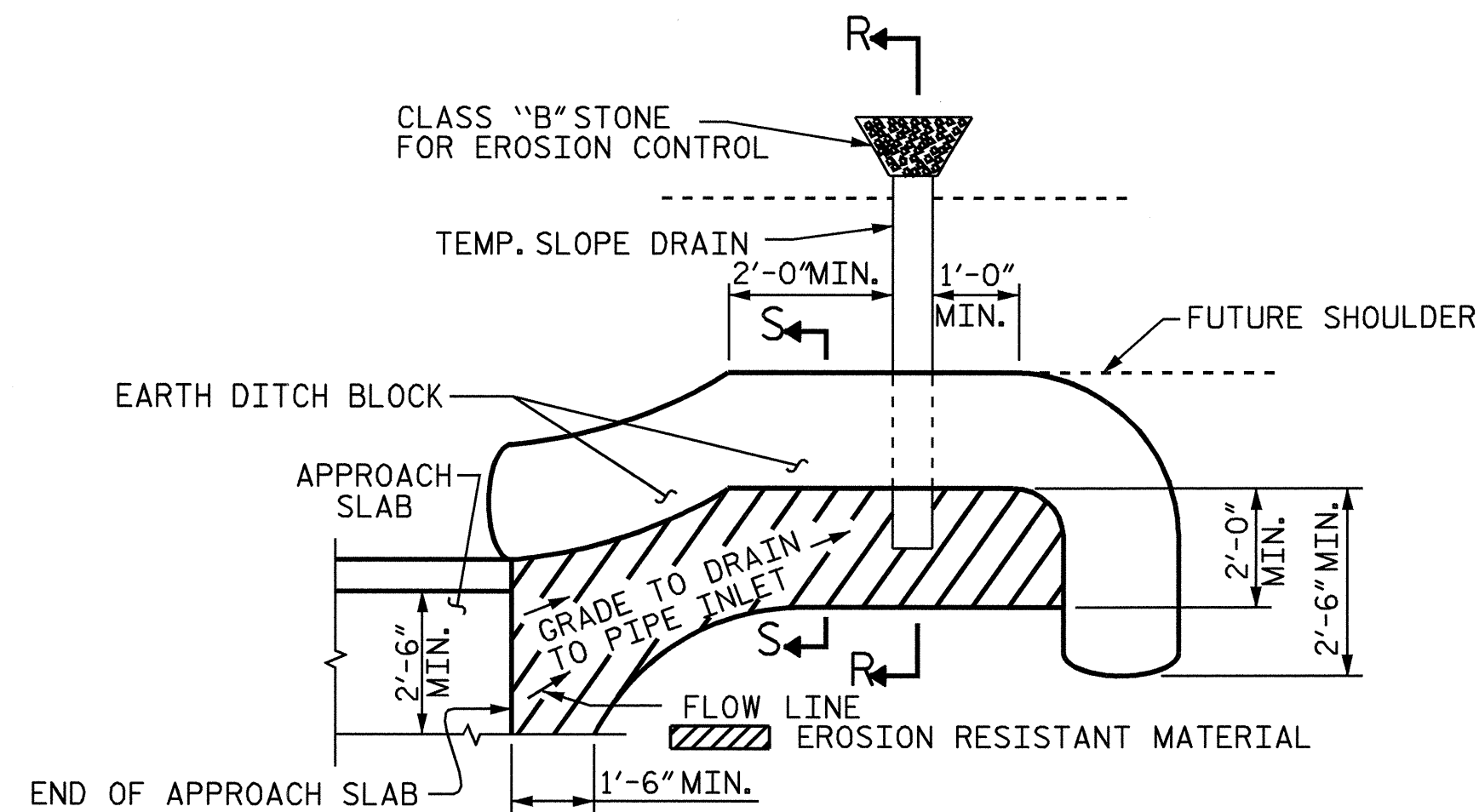
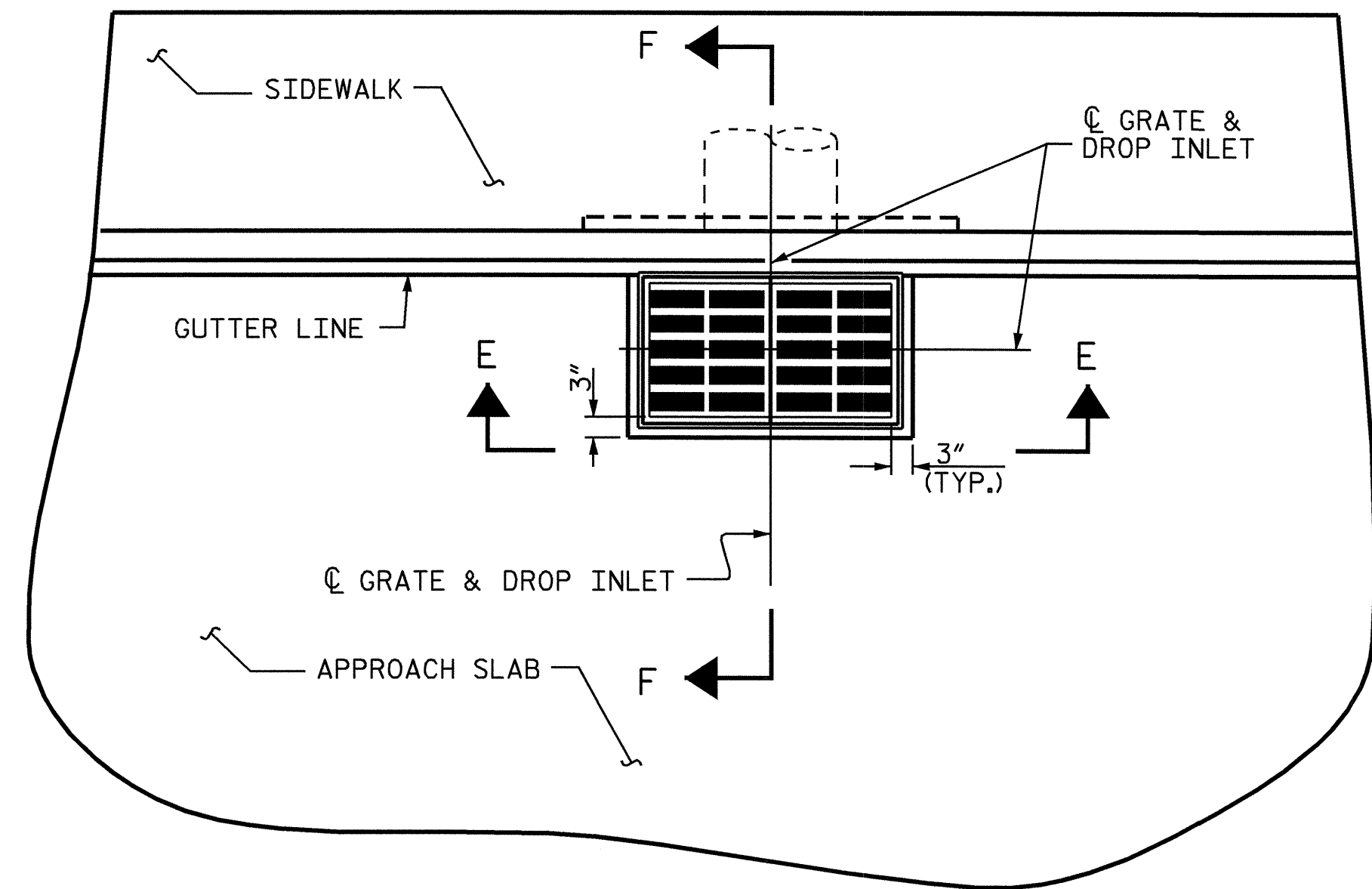
PROJECT NO. B-3919
WAKE COUNTY
STATION: 17+55.20 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO.
STANDARD BRIDGE APPROACH SLAB DETAILS						5-24
REVISIONS						TOTAL SHEETS
NO.	BY:	DATE:	NO.	BY:	DATE:	51
1			3			
2			4			



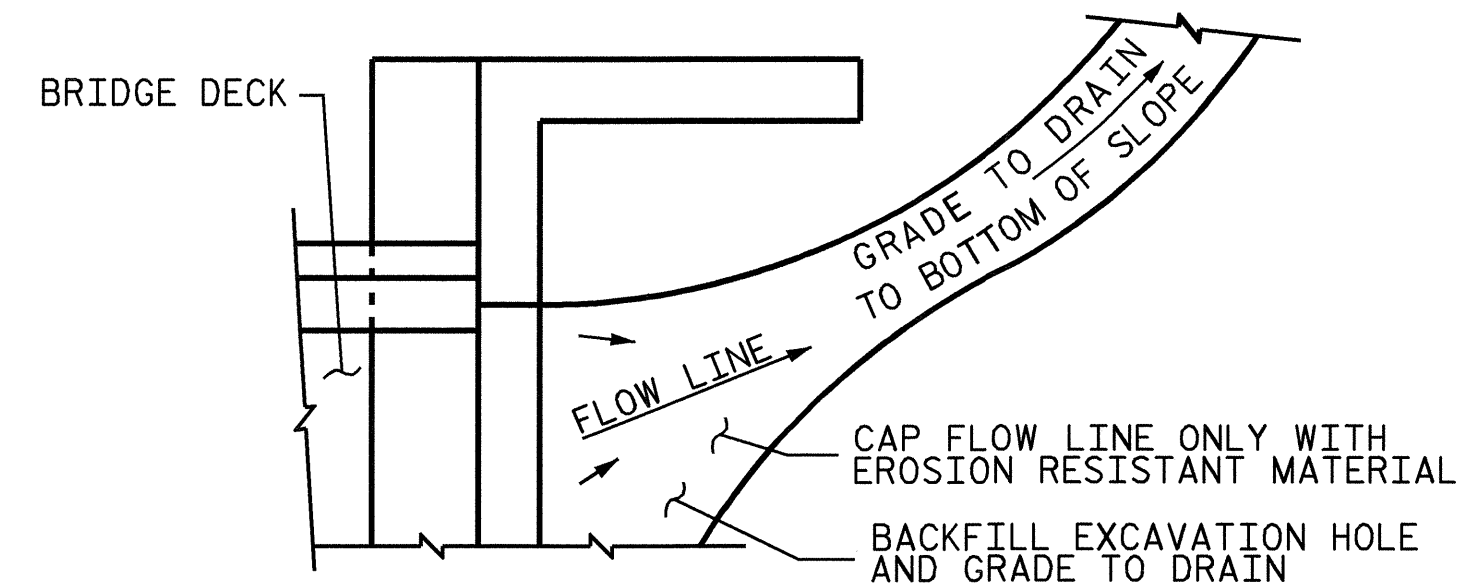
ASSEMBLED BY : N. Q. TRAN	DATE : 2-08-09
CHECKED BY : J. A. TILLMAN	DATE : 2-25-09
DRAWN BY : FCJ 11/88	REV. 10/17/00 RWW/LES
CHECKED BY : ARB 11/88	REV. 5/7/03 RWW/JTE
	REV. 5/1/06 TLA/GM



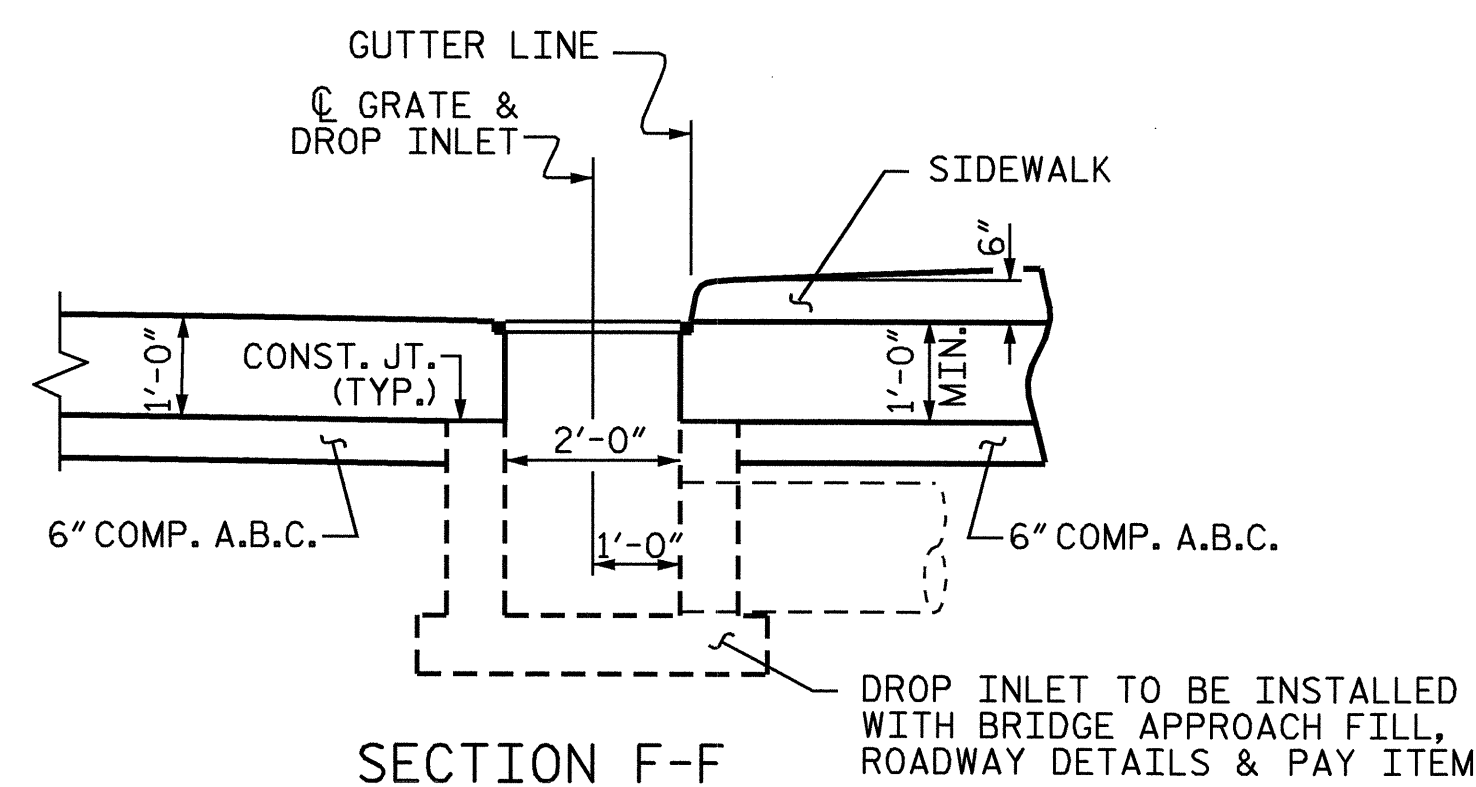
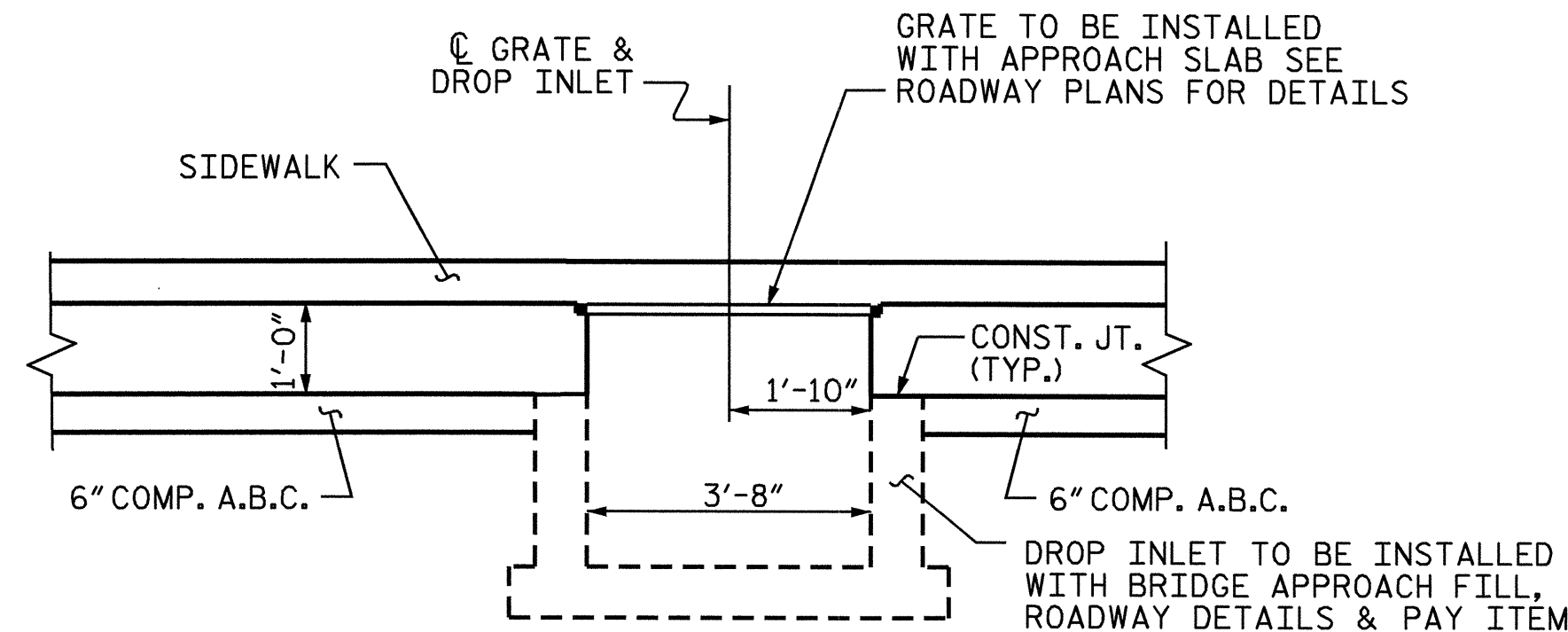
NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



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.



GRATED DROP INLET DETAILS

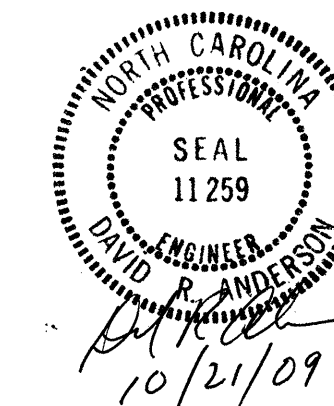
NOTE: DROP INLET AND GRATE ARE ROADWAY PAY ITEMS. SEE ROADWAY PLANS FOR DETAILS.

PROJECT NO. B-3919
WAKE COUNTY
 STATION: 17+55.20 -L-

SHEET 3 OF 3

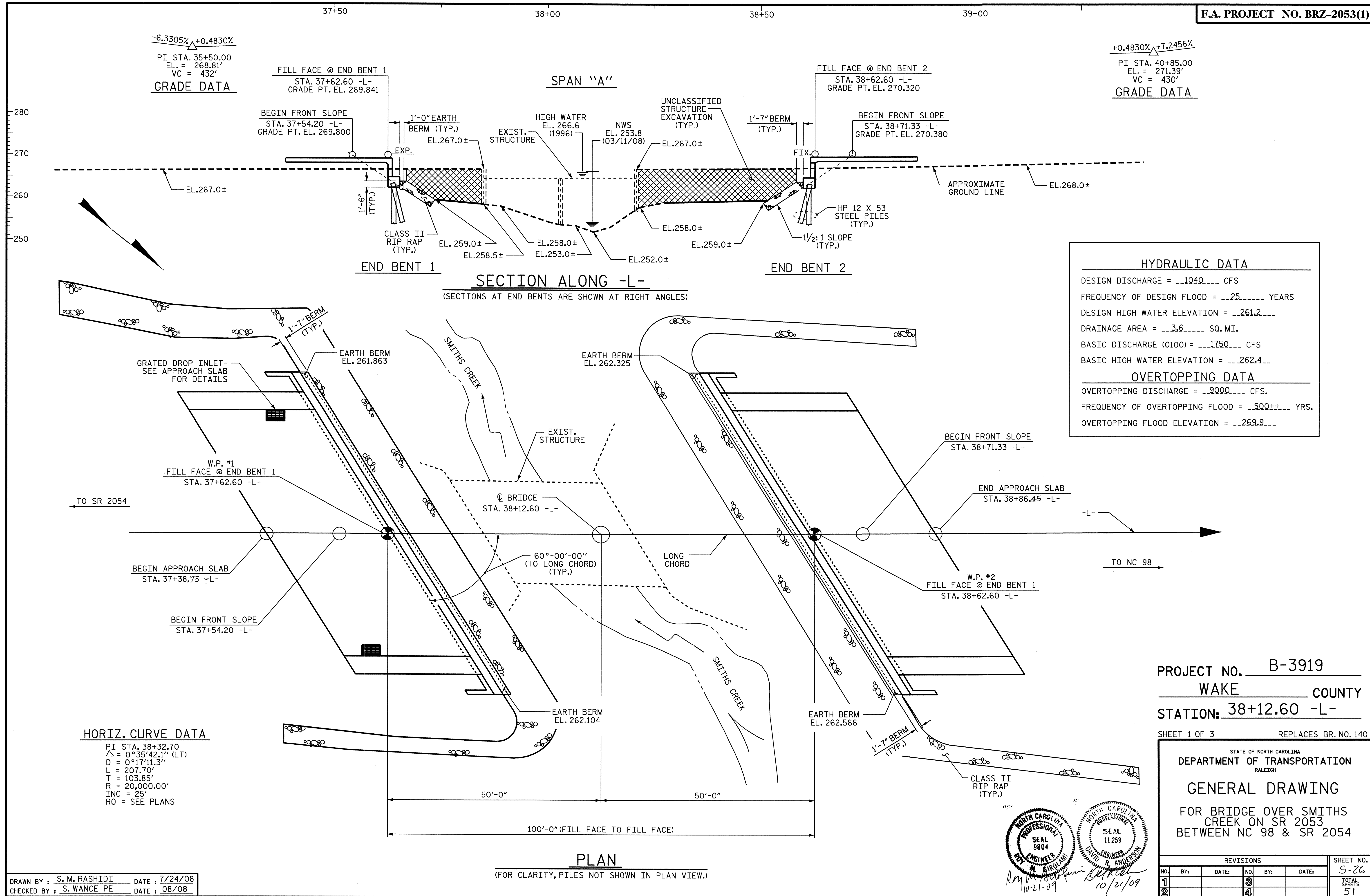
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**BRIDGE APPROACH
 SLAB DETAILS**



DRAWN BY: N. Q. TRAN DATE: 2-08-09
 CHECKED BY: J. A. TILLMAN DATE: 2-25-09

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



-6.3305% +0.4830%
 PI STA. 35+50.00
 EL. = 268.81'
 VC = 432'
GRADE DATA

+0.4830% +7.2456%
 PI STA. 40+85.00
 EL. = 271.39'
 VC = 430'
GRADE DATA

SECTION ALONG -L-
 (SECTIONS AT END BENTS ARE SHOWN AT RIGHT ANGLES)

HYDRAULIC DATA

DESIGN DISCHARGE = 1040 CFS
 FREQUENCY OF DESIGN FLOOD = 25 YEARS
 DESIGN HIGH WATER ELEVATION = 261.2
 DRAINAGE AREA = 3.6 SQ. MI.
 BASIC DISCHARGE (Q100) = 1750 CFS
 BASIC HIGH WATER ELEVATION = 262.4

OVERTOPPING DATA

OVERTOPPING DISCHARGE = 9000 CFS.
 FREQUENCY OF OVERTOPPING FLOOD = 500± YRS.
 OVERTOPPING FLOOD ELEVATION = 269.9

HORIZ. CURVE DATA
 PI STA. 38+32.70
 Δ = 0°35'42.1" (LT)
 D = 0°17'11.3"
 L = 207.70'
 T = 103.85'
 R = 20,000.00'
 INC = 25'
 RO = SEE PLANS

DRAWN BY : S. M. RASHIDI DATE : 7/24/08
 CHECKED BY : S. WANCE PE DATE : 08/08

20-OCT-2009 12:08
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PROJECT NO. B-3919
WAKE COUNTY
 STATION: 38+12.60 -L-

SHEET 1 OF 3 REPLACES BR. NO. 140

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

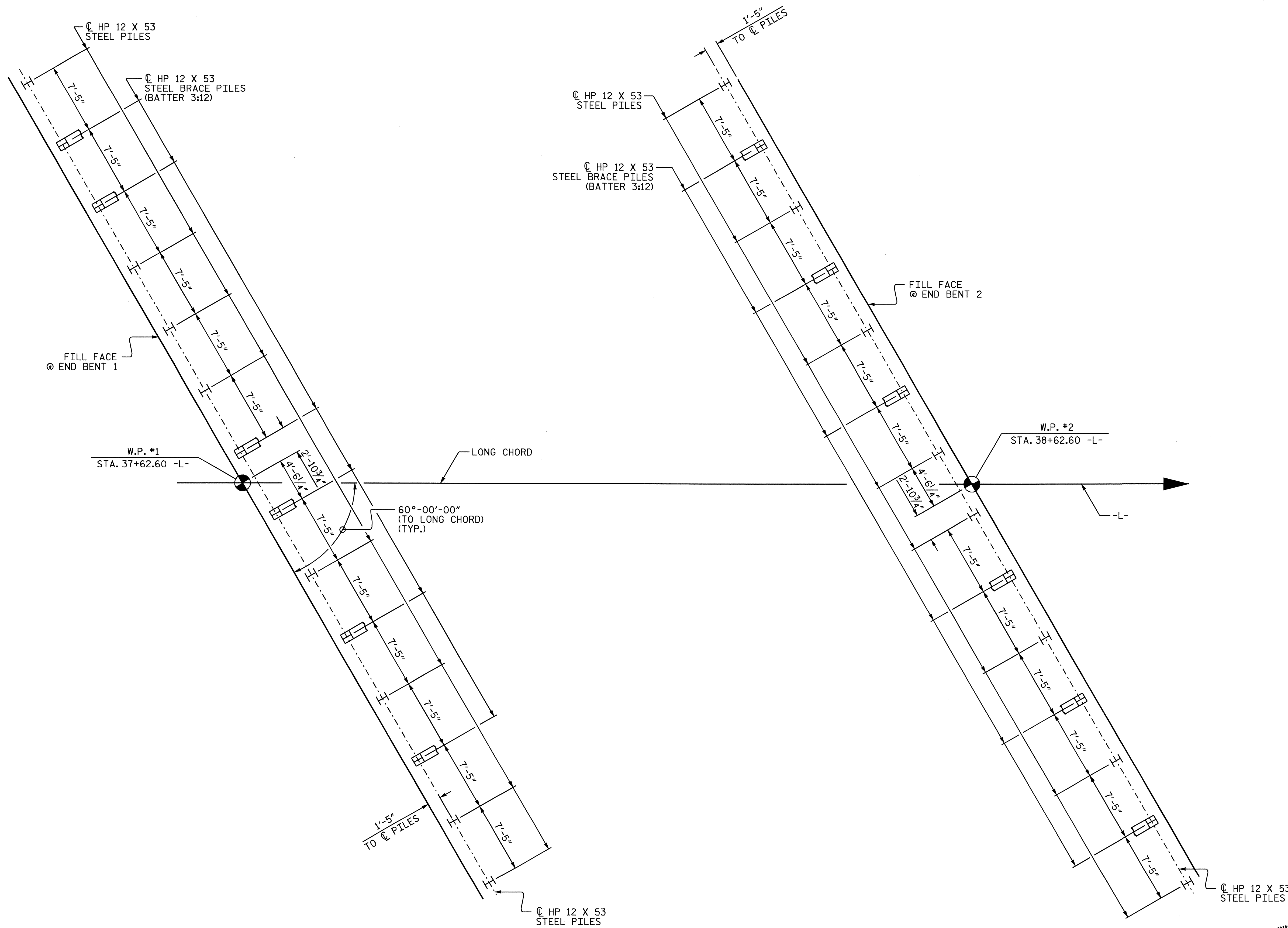
GENERAL DRAWING
 FOR BRIDGE OVER SMITHS
 CREEK ON SR 2053
 BETWEEN NC 98 & SR 2054

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			5-26
2			4			TOTAL SHEETS 51

PROFESSIONAL ENGINEER SEAL
 NORTH CAROLINA
 SEAL 9804
 ENGINEER
 DAVID R. ANDERSON
 SEAL 11259
 ENGINEER
 DAVID R. ANDERSON
 10-21-09 10/21/09

PLAN
 (FOR CLARITY, PILES NOT SHOWN IN PLAN VIEW.)

STR. #2



END BENT 1

FOUNDATION LAYOUT

(DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE)

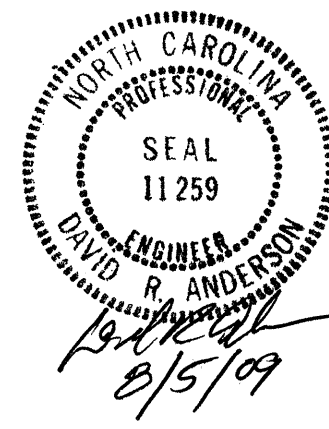
END BENT 2

PROJECT NO. B-3919
WAKE COUNTY
 STATION: 38+12.60 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE OVER SMITHS
 CREEK ON SR 2053
 BETWEEN NC 98 & SR 2054



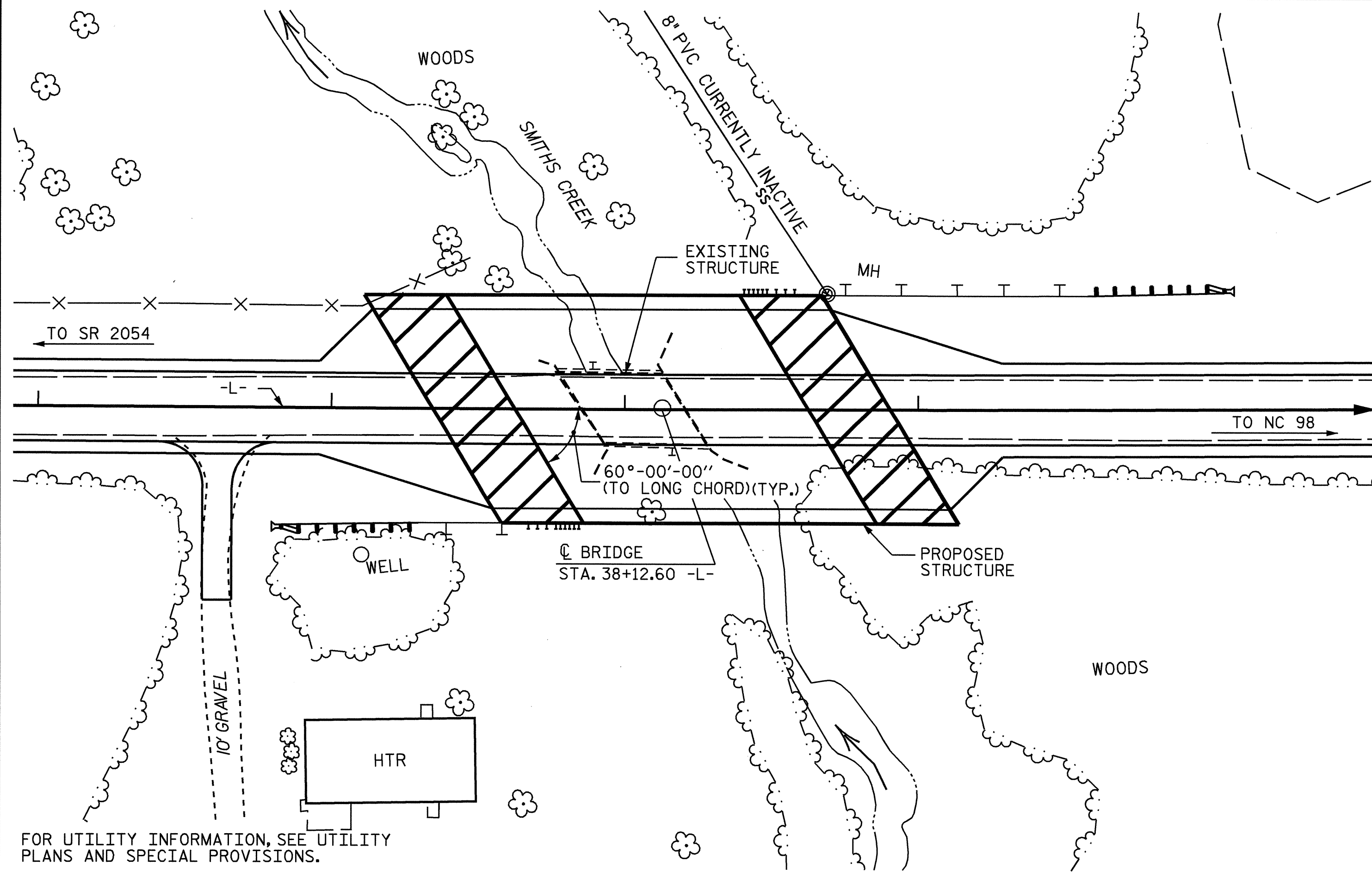
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			51
2			4			

DRAWN BY : D.R. WITHROW DATE : 03/20/09
 CHECKED BY : D.R. ANDERSON DATE : 05/29/09

04-AUG-2009 07:57
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 drwithrow

STR. #2

BM #3: R. R. SPIKE SET IN 32" PINE TREE, 48.05' RIGHT, STA. 37+36.45 -L-, EL. 263.02'.



LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
 THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR SEISMIC PERFORMANCE ZONE 1.
 FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
 FOR GROUT, SEE SPECIAL PROVISION "GROUT FOR STRUCTURES".
 FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
 FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
 FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
 FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.
 FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.
 REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.
 THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.
 THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS.
 THE EXISTING STRUCTURE CONSISTING OF TWO SPANS @ 18'-0", TIMBER JOISTS ON TIMBER PILES WITH VERTICAL ABUTMENT AND A CLEAR ROADWAY OF 24.1' IS TO BE REMOVED. THE EXISTING STRUCTURE IS PRESENTLY POSTED BELOW LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT. SEE SPECIAL PROVISIONS.

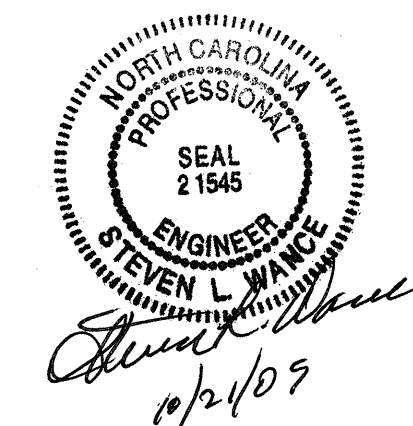
PILE EXCAVATION MAY BE REQUIRED TO INSTALL PILES NO. 4 THROUGH NO. 6 AT END BENT 1. IF REQUIRED, EXCAVATE HOLES TO ELEVATION 252 FT. AFTER PLACING PILES IN HOLES, DRIVE PILES TO THE REQUIRED DRIVING RESISTANCE.
 IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 25-55 FT-KIPS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT END BENT 1 AND END BENT 2. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH THE PILES PROVISION.
 FOR PILES, SEE SPECIAL PROVISIONS.
 PILES AT BOTH BENTS ARE DESIGNED FOR A FACTORED RESISTANCE OF 120 TONS PER PILE. DRIVE PILES TO A REQUIRED DRIVING RESISTANCE OF 200 TONS PER PILE.
 NO WAITING PERIOD IS REQUIRED BEFORE BEGINNING ANY WORK FOR END BENT CONSTRUCTION AFTER COMPLETION OF THE EMBANKMENT AT EACH END BENT.
 THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF APPROX. 30 FT. LEFT AND RIGHT OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE MEASURED AND PAID FOR AT THE CONTRACT UNIT PRICE PER CUBIC YARD FOR UNCLASSIFIED STRUCTURE EXCAVATION.
 FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.
 FOR CURING CONCRETE, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	PILE EXCAVATION (IN SOIL)	PILE EXCAVATION (NOT IN SOIL)	UNCLASSIFIED STRUCTURE EXCAVATION	CONCRETE WEARING SURFACE	GROOVING BRIDGE FLOORS	CLASS AA CONCRETE	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL	HP 12 X 53 STEEL PILES	THREE BAR METAL RAIL	RIP RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE	ELASTOMERIC BEARINGS	EVAZOTE JOINT SEALS	3'-0" X 3'-3" PRESTRESSED CONCRETE BOX BEAMS			
	LUMP SUM	LIN. FT.	LIN. FT.	CU. YDS.	SQ. FEET	SQ. FEET	CU. YDS.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.	LIN. FT.	TONS	SQ. YARDS	LUMP SUM	LUMP SUM	NO.	LIN. FT.	
SUPERSTRUCTURE					6566	7783	62.7				2,056		178.5				LUMP SUM	LUMP SUM	27	2629.69	
END BENT 1		21	9	455				45.4		7,656		14	190	190	210						
END BENT 2				950				45.4		7,656		14	460	160	180						
TOTAL	LUMP SUM	21	9	1405	6566	7783	62.7	90.8	LUMP SUM	15,312	2,056	28	650	350	390	LUMP SUM	LUMP SUM	27	2629.69		

PROJECT NO. B-3919
WAKE COUNTY
 STATION: 38+12.60 -L-

SHEET 3 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE OVER SMITHS
 CREEK ON SR 2053
 BETWEEN NC 98 & SR 2054

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			5-28
2			4			TOTAL SHEETS 51

DRAWN BY : J.A. TILLMAN DATE : 5/01/09
 CHECKED BY : S.WANCE DATE : 6/16/09

20-OCT-2009 09:34
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STR. #2

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

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	1.01	--	1.75	0.238	1.12	A	ER	48.124	0.513	1.01	A	ER	4.812	0.80	0.238	1.03	A	ER	48.124		
	HL-93 (OPERATING)	N/A		1.31	--	1.35	0.238	1.46	A	ER	48.124	0.513	1.31	A	ER	4.812	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	Ⓝ2	1.18	42.480	1.80	0.257	1.56	A	EL	48.124	0.605	1.30	A	EL	9.625	0.80	0.257	1.48	A	EL	48.124		
	HS-20 (OPERATING)	36.000		1.74	62.640	1.35	0.257	2.08	A	EL	48.124	0.605	1.74	A	EL	9.625	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.19	43.065	1.49	0.257	3.68	A	EL	48.124	0.605	3.19	A	EL	9.625	0.80	0.257	3.48	A	EL	48.124	
		SNGAR BS2	20.000		2.24	44.800	1.49	0.257	2.67	A	EL	48.124	0.605	2.24	A	EL	9.625	0.80	0.257	2.53	A	EL	48.124	
		SNAGR IS2	22.000		2.07	45.540	1.49	0.257	2.50	A	EL	48.124	0.605	2.07	A	EL	9.625	0.80	0.257	2.36	A	EL	48.124	
		SNCOT TS3	27.250		1.59	43.328	1.49	0.257	1.83	A	EL	48.124	0.605	1.59	A	EL	9.625	0.80	0.257	1.73	A	EL	48.124	
		SNAG GRS4	34.925		1.30	45.409	1.49	0.257	1.50	A	EL	48.124	0.605	1.30	A	EL	9.625	0.80	0.257	1.41	A	EL	48.124	
		SNS5A	35.550		1.31	46.571	1.49	0.257	1.47	A	EL	48.124	0.605	1.31	A	EL	9.625	0.80	0.257	1.39	A	EL	48.124	
		SNS6A	39.950		1.18	47.141	1.49	0.257	1.34	A	EL	48.124	0.605	1.18	A	EL	9.625	0.80	0.257	1.26	A	EL	48.124	
		SNS7B	42.000		1.15	48.300	1.49	0.257	1.27	A	EL	48.124	0.605	1.15	A	EL	9.625	0.80	0.257	1.20	A	EL	48.124	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAG RIT3	33.000		1.41	46.530	1.49	0.257	1.63	A	EL	48.124	0.605	1.41	A	EL	9.625	0.80	0.257	1.54	A	EL	48.124	
		TNT4A	33.075		1.39	45.981	1.49	0.257	1.63	A	EL	48.124	0.605	1.39	A	EL	9.625	0.80	0.257	1.54	A	EL	48.124	
		TNT6A	41.600		1.21	50.336	1.49	0.257	1.32	A	EL	48.124	0.605	1.21	A	EL	9.625	0.80	0.257	1.25	A	EL	48.124	
		TNT7A	42.000		1.19	49.980	1.49	0.257	1.32	A	EL	48.124	0.605	1.19	A	EL	9.625	0.80	0.257	1.25	A	EL	48.124	
		TNT7B	42.000		1.13	47.460	1.49	0.257	1.36	A	EL	48.124	0.605	1.13	A	EL	9.625	0.80	0.257	1.28	A	EL	48.124	
		TNAG RIT4	43.000		1.10	47.300	1.49	0.257	1.30	A	EL	48.124	0.605	1.10	A	EL	9.625	0.80	0.257	1.23	A	EL	48.124	
		TNAG T5A	45.000		1.08	48.600	1.49	0.257	1.23	A	EL	48.124	0.605	1.08	A	EL	9.625	0.80	0.257	1.16	A	EL	48.124	
		TNAG T5B	45.000	Ⓝ3	1.05	47.250	1.49	0.257	1.22	A	EL	48.124	0.605	1.05	A	EL	9.625	0.80	0.257	1.15	A	EL	48.124	

LOAD FACTORS:

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

LEGAL LOAD RATING FACTORS	YEAR	ADTT	γ _L
	2008	205	N/A
	2028	418	1.49

NOTES:

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

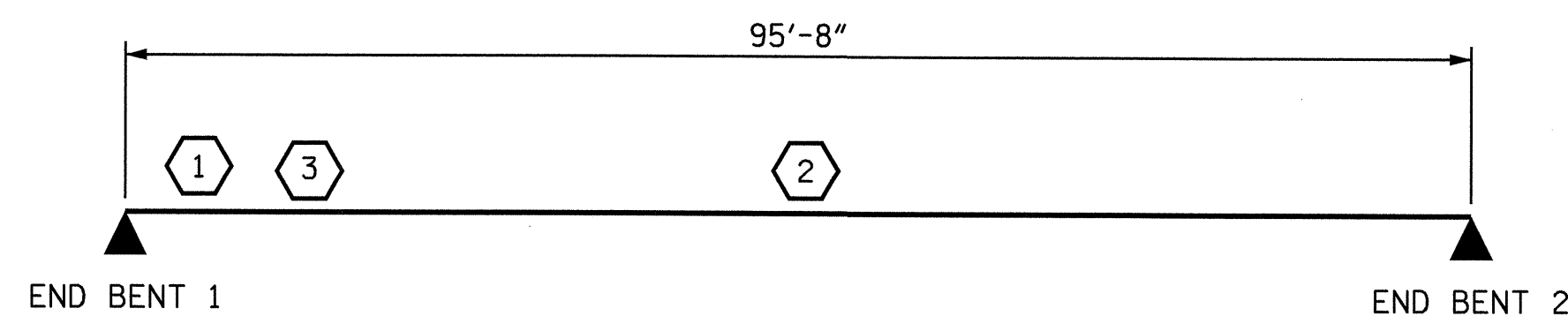
MINIMUM RATING FACTORS FOR LEGAL LOAD RATING ARE BASED ON THE STRENGTH I LIMIT STATE.

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

COMMENTS:

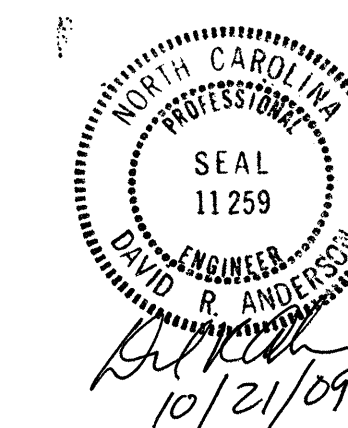
NO COMMENT.

Ⓝ 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. B-3919
WAKE COUNTY
 STATION: 38+12.60 -L-



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:	
1			3			9-29
2			4			TOTAL SHEETS 51

ASSEMBLED BY : N. Q. TRAN DATE : 6-18-09
 CHECKED BY : J. A. TILMAN DATE : 6-20-09
 DRAWN BY : MAA 1/08
 CHECKED BY : GM/DI 2/08

NOTES

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

ALL REINFORCING STEEL CAST WITH THE BOX BEAM SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE BOX BEAMS.

RECESSES FOR TRANSVERSE STRANDS SHALL BE GROUTED AFTER THE TENSIONING OF THE STRANDS.

THE 2 1/2" Ø DOWEL HOLES AT FIXED ENDS OF BOX BEAM SECTIONS SHALL BE FILLED WITH NON-SHRINK GROUT. THE 2 1/2" Ø DOWEL HOLES AT EXPANSION ENDS OF BOX BEAM SECTIONS SHALL BE FILLED WITH JOINT SEALER MATERIAL TO 1/2" ABOVE THE TOP OF DOWELS AND THEN FILLED WITH GROUT.

THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF TYPE SL LOW MODULUS SILICONE SEALANT. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE BOX BEAM UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 5800 PSI.

ALL REINFORCING STEEL IN SIDEWALK AND CONCRETE WEARING SURFACE SHALL BE EPOXY COATED.

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE BOX BEAM UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO BOX BEAM UNIT ENDS.

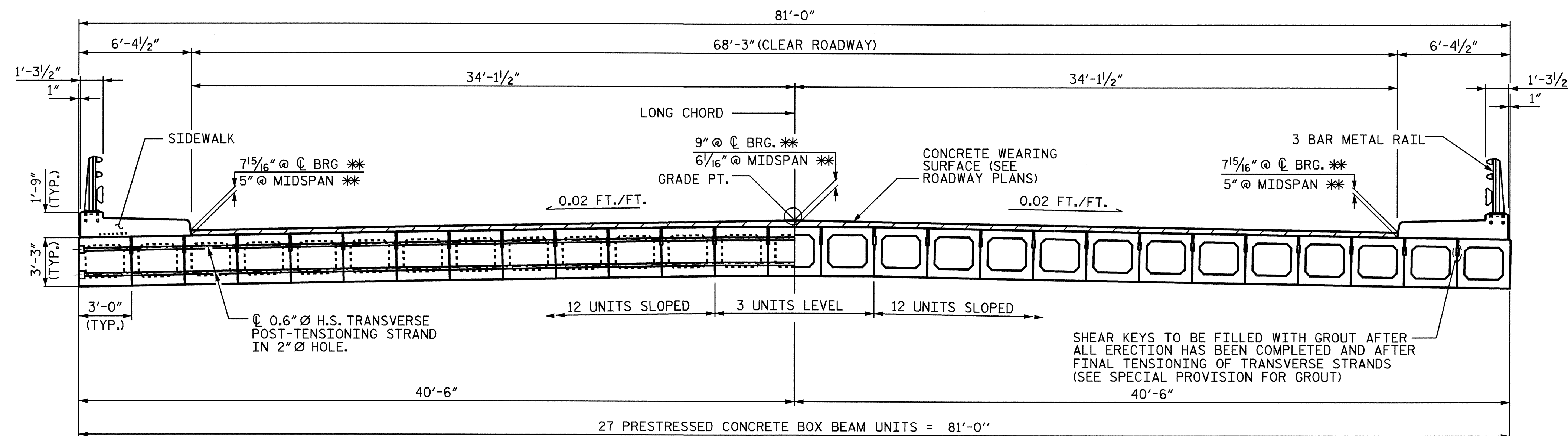
FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 3/16" AT END BENT 1 AND END BENT 2.

PLACEMENT OF THE CONCRETE WEARING SURFACE SHALL OCCUR AFTER CASTING THE SIDEWALK. THE COST OF THE REINFORCING STEEL CAST WITH THE CONCRETE WEARING SURFACE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONCRETE WEARING SURFACE. FOR CONCRETE WEARING SURFACE, SEE SPECIAL PROVISIONS.

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

THE LOCATION OF THE VOID DRAINS MAY BE SHIFTED SLIGHTLY WHERE NECESSARY TO CLEAR PRESTRESSING STRANDS OR TRANSVERSE REINFORCING STEEL.



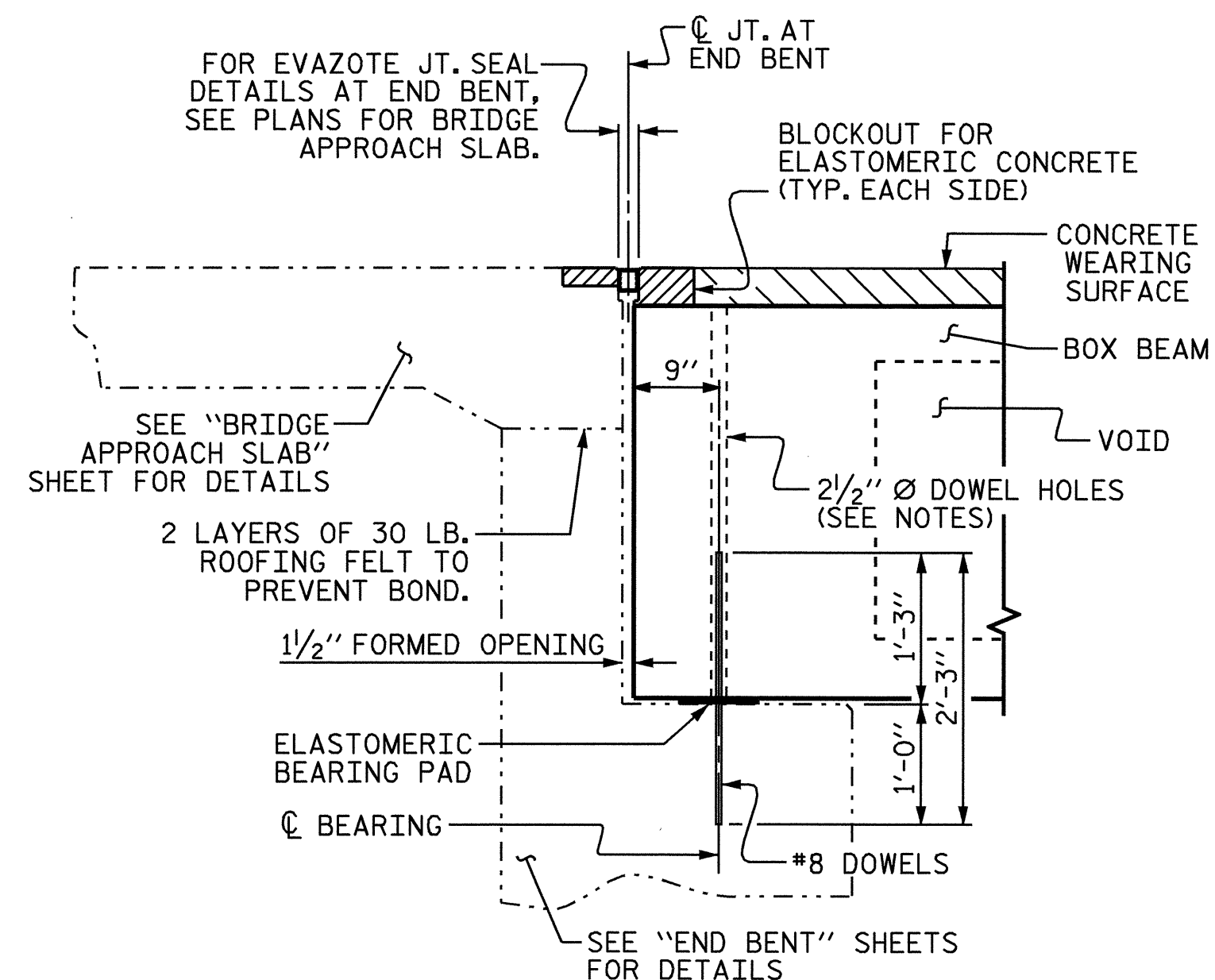
HALF SECTION AT INTERMEDIATE DIAPHRAGM

HALF SECTION THROUGH VOIDS

TYPICAL SECTION

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

FIXED END AND EXPANSION END

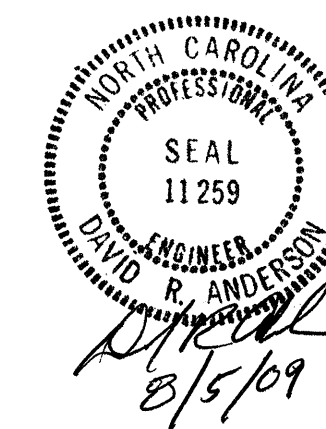


SECTION AT END BENT

PROJECT NO. B-3919
WAKE COUNTY
 STATION: 38+12.60 -L-

SHEET 1 OF 12

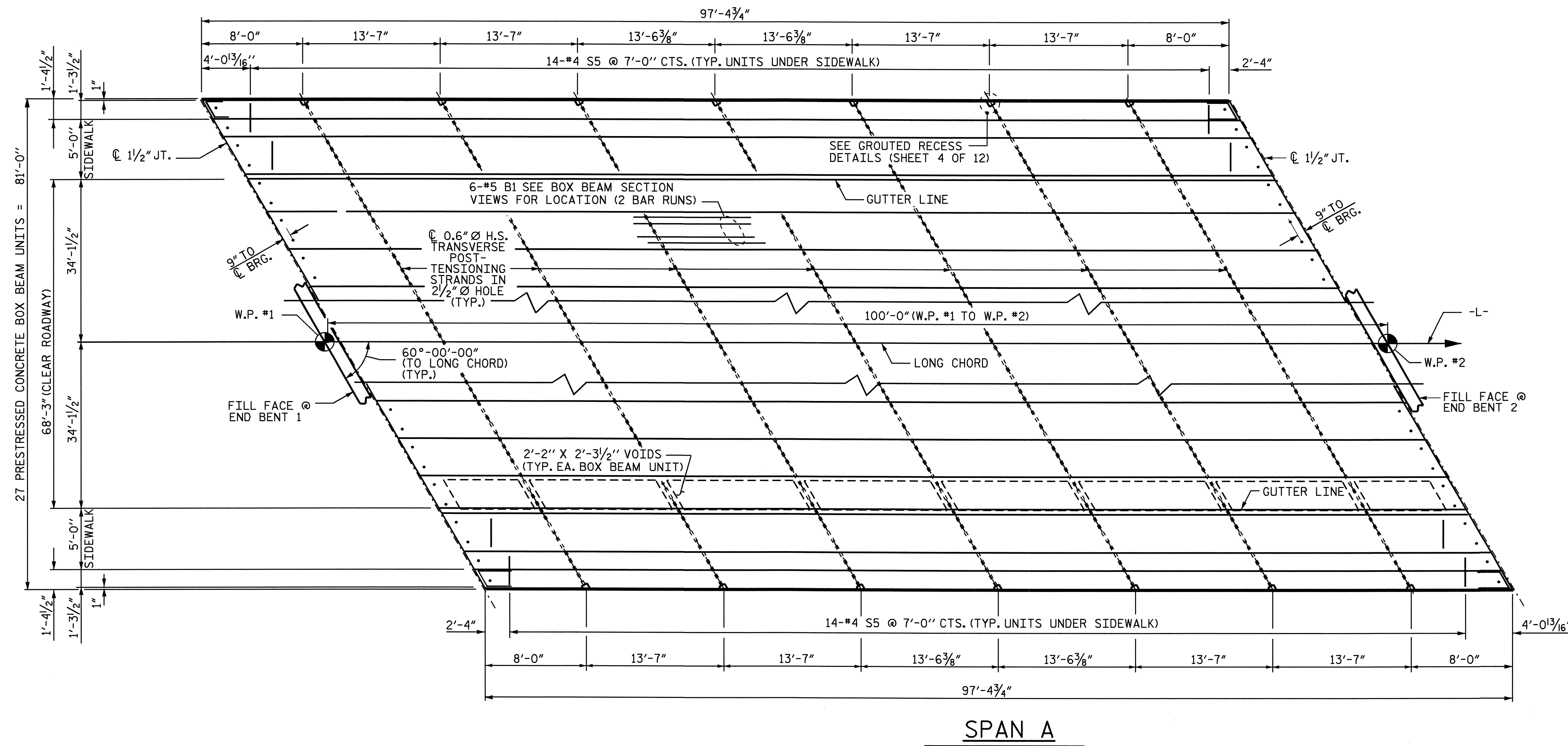
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 3'-0" X 3'-3"
 PRESTRESSED CONCRETE
 BOX BEAM UNIT



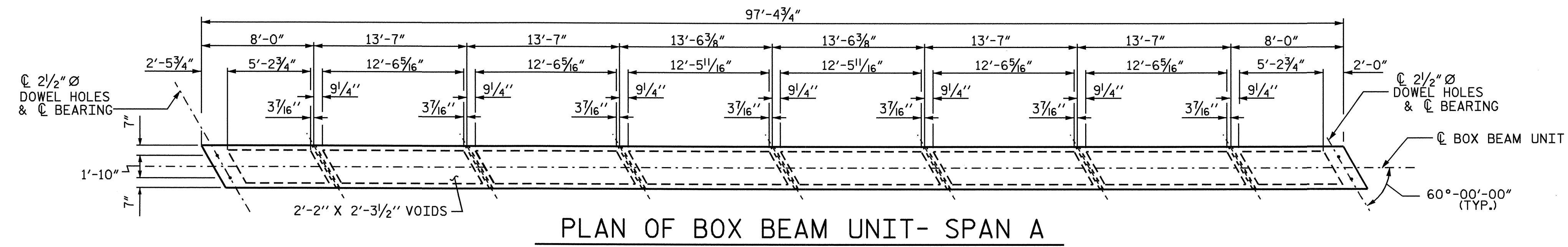
ASSEMBLED BY : N. Q. TRAN	DATE : 2-14-09
CHECKED BY : J.A. TILLMAN	DATE : 4-13-09
DRAWN BY : TLA	5/05
CHECKED BY : GM	6/05
ADDED	7/11/05R
REV.	5/1/06R
KMM/GM	

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			5-30
2			4			51

NOTE: ARC OFFSETS ARE NEGLIGIBLE.



SPAN A

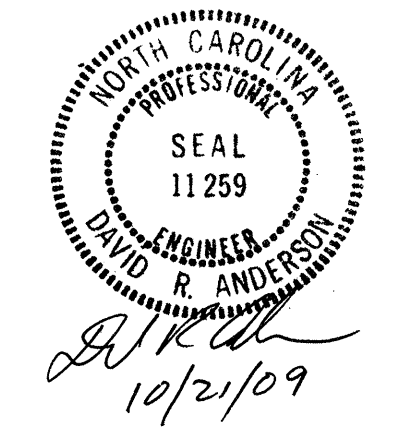


PLAN OF BOX BEAM UNIT- SPAN A

PROJECT NO. B-3919
WAKE COUNTY
 STATION: 38+12.60 -L-

SHEET 2 OF 12

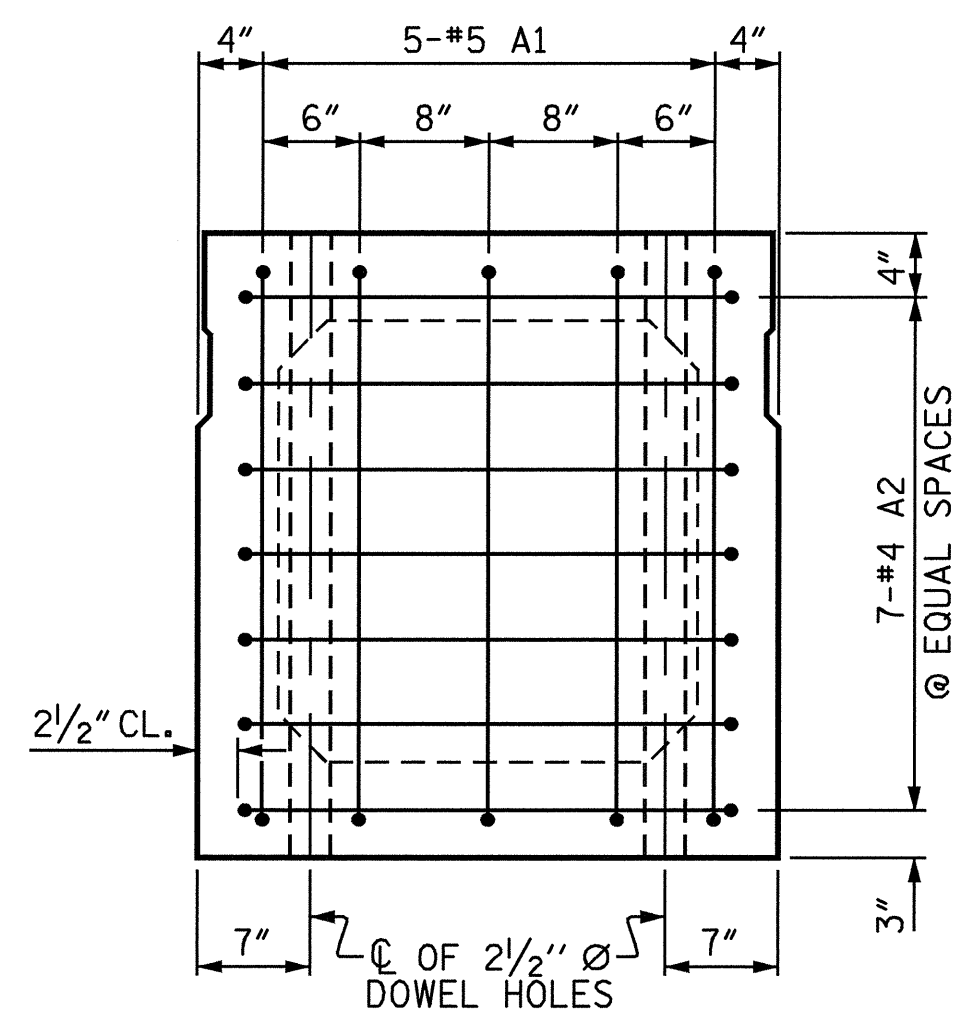
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE PLAN OF SPAN A					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 51



DRAWN BY: N. Q. TRAN DATE: 2-09
 CHECKED BY: J.A. TILLMAN DATE: 4-13-09

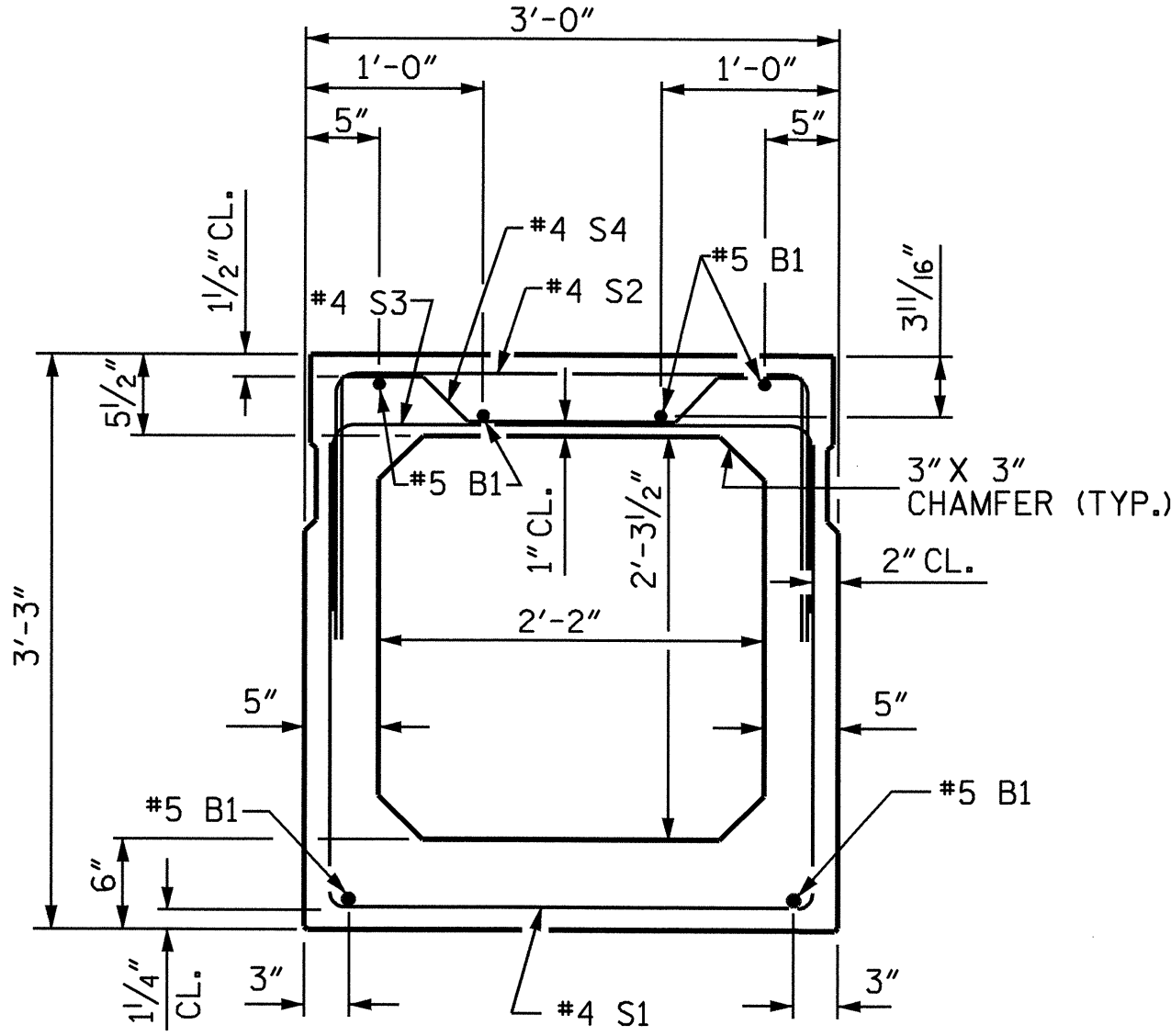
21-OCT-2009 09:59
 F:\structures\final plans\str2\10_b3919.sd.02.bb.dgn
 danderson

STR. #2



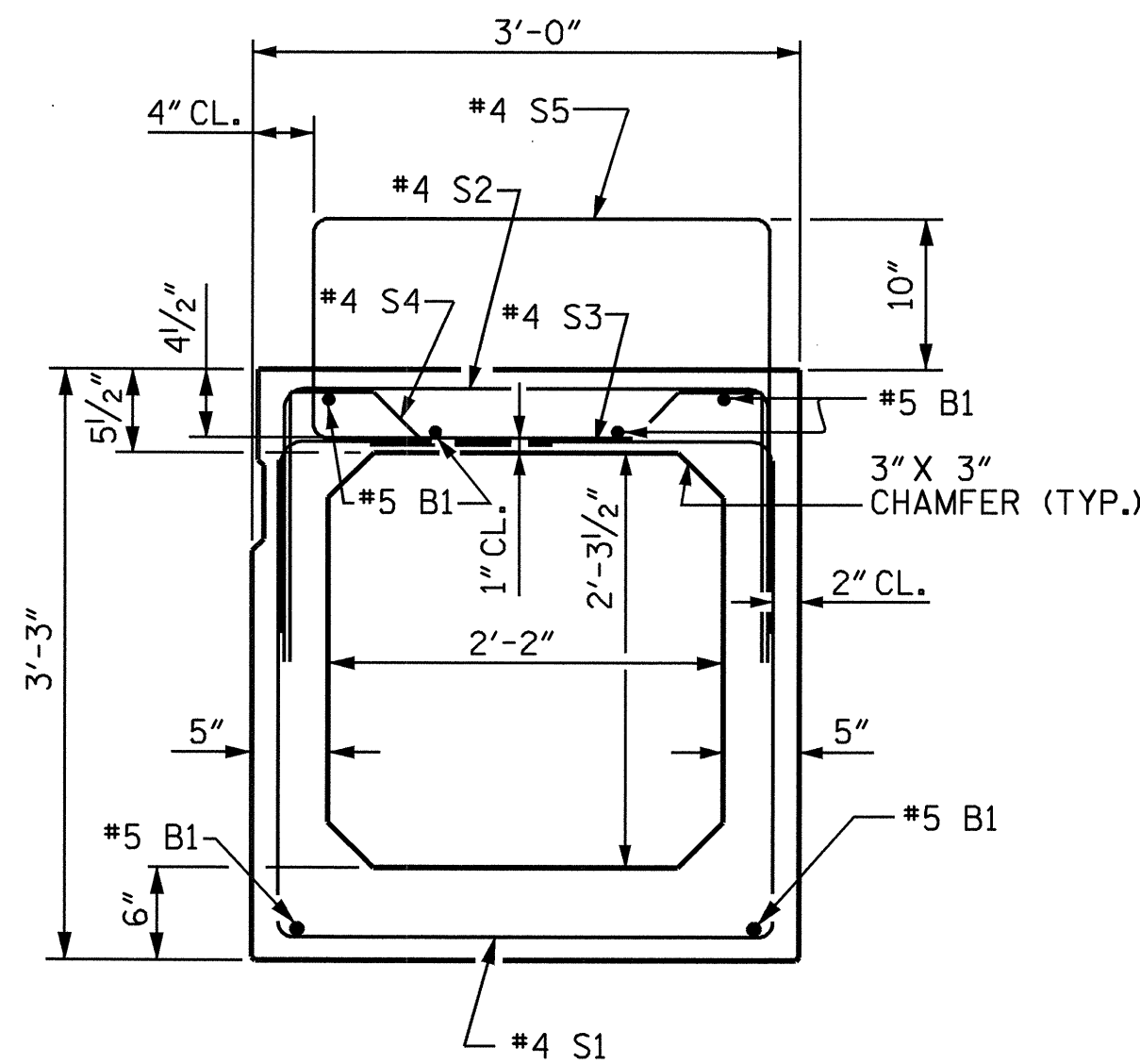
END ELEVATION

SHOWING PLACEMENT OF #5 & #4 "A" BARS AND LOCATION OF DOWEL HOLES. (INTERIOR BOX BEAM SECTION SHOWN-EXTERIOR SECTION SIMILAR EXCEPT SHEAR KEY LOCATION. STRAND LAYOUT NOT SHOWN.)



INTERIOR BOX BEAM SECTION

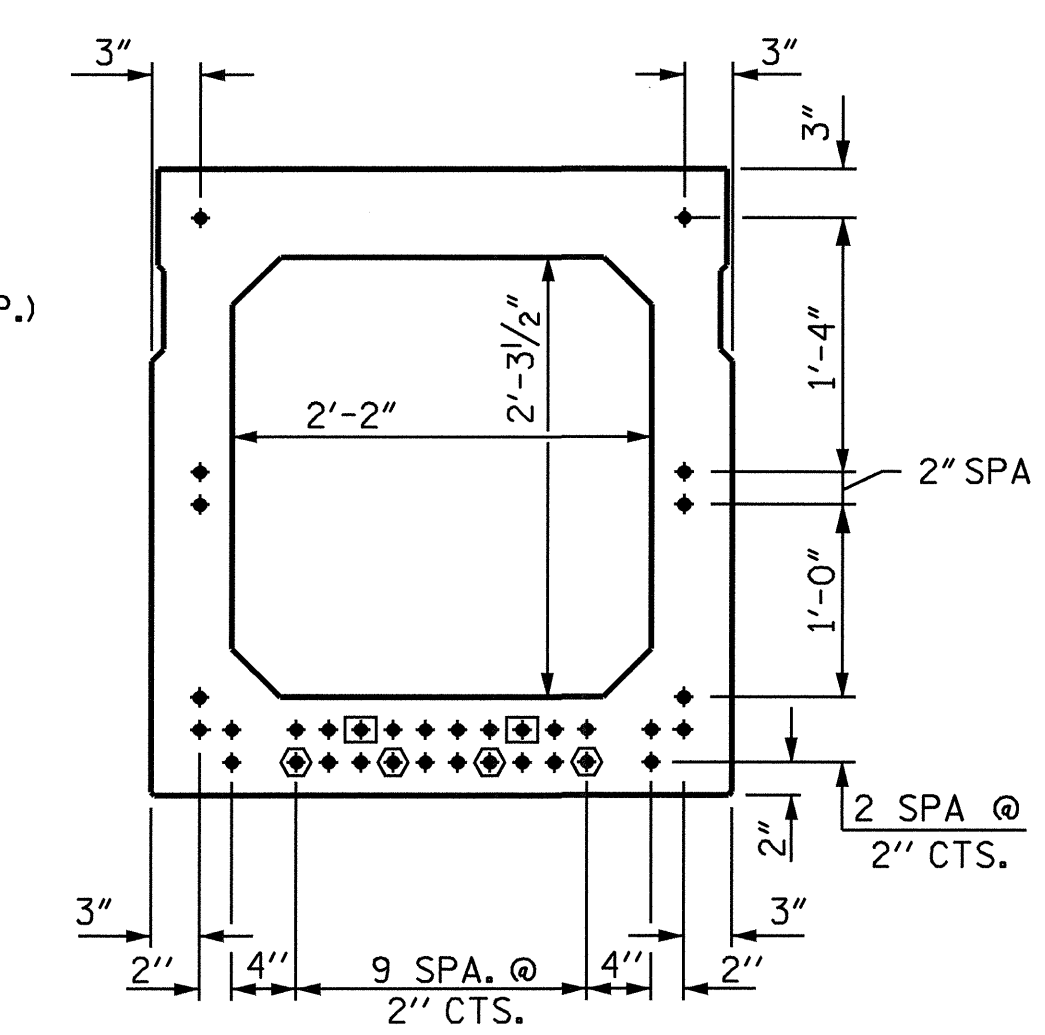
(STRAND LAYOUT NOT SHOWN)



EXTERIOR AND FIRST INTERIOR BOX BEAM SECTION

(STRAND LAYOUT NOT SHOWN)

0.6" Ø LOW RELAXATION STRAND LAYOUT



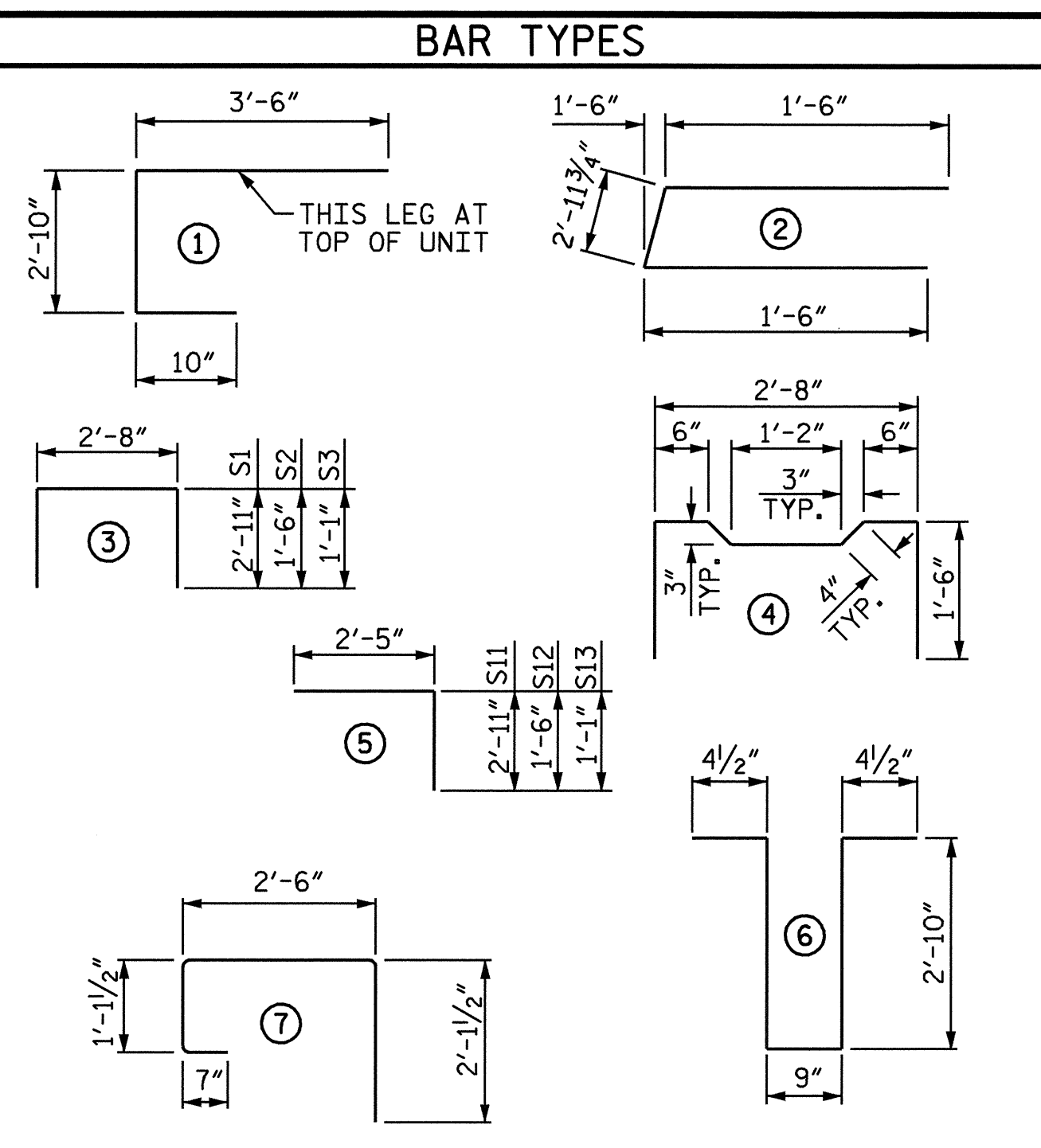
TYPICAL STRAND LOCATION

(34 STRANDS REQUIRED)
(INTERIOR BOX BEAM SECTION SHOWN-EXTERIOR SECTION SIMILAR EXCEPT SHEAR KEY LOCATION)

DEBONDING LEGEND

- FULLY BONDED STRANDS
 - ◻ STRANDS DEBONDED FOR 2'-0" FROM END OF GIRDER
 - ◐ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER
- BOND SHALL BE BROKEN ON STRANDS AS SHOWN FOR THE SPECIFIED LENGTH FROM EACH END OF THE BOX BEAM. SEE STANDARD SPECIFICATIONS ARTICLE 1078-7.

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

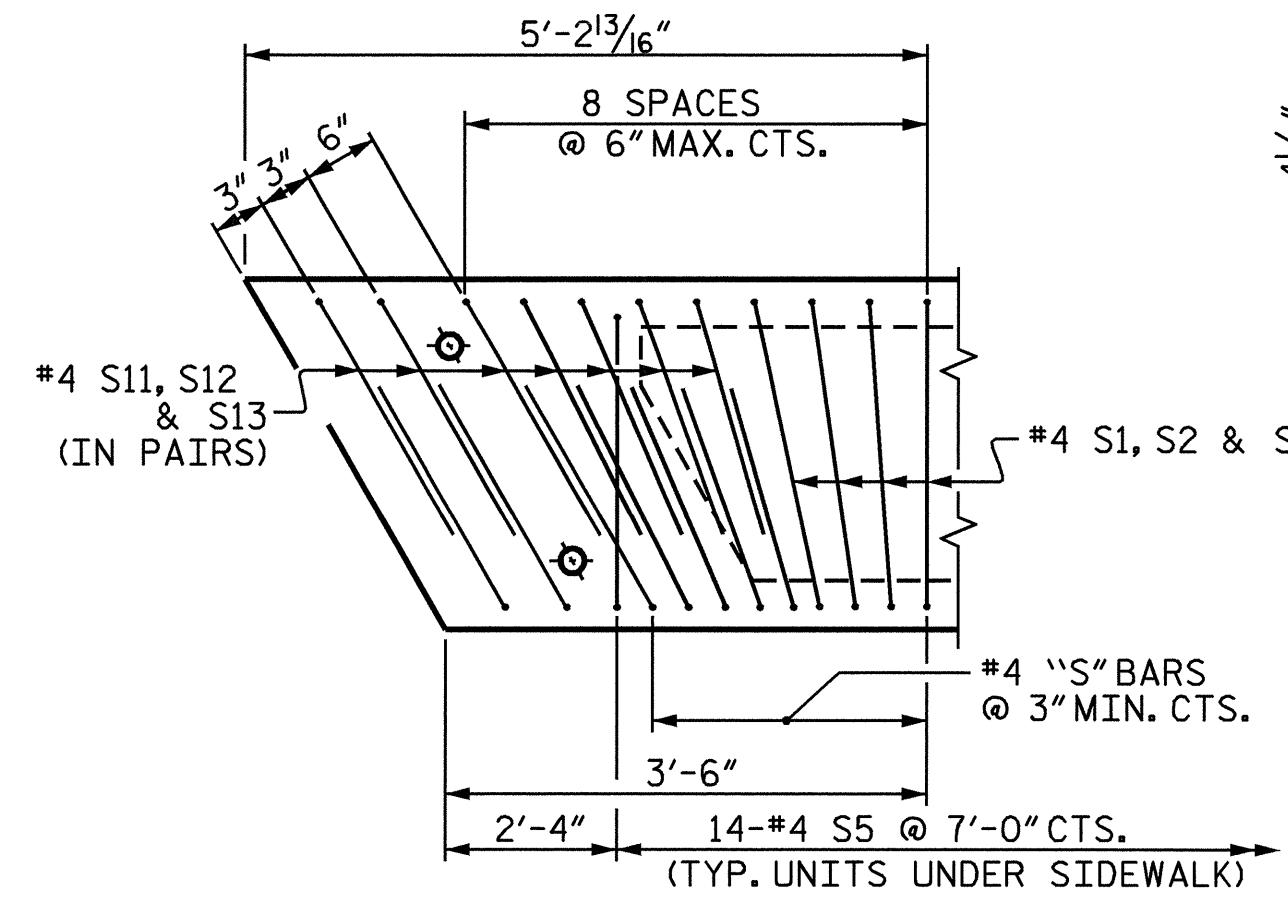


ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR ONE BOX BEAM SECTION

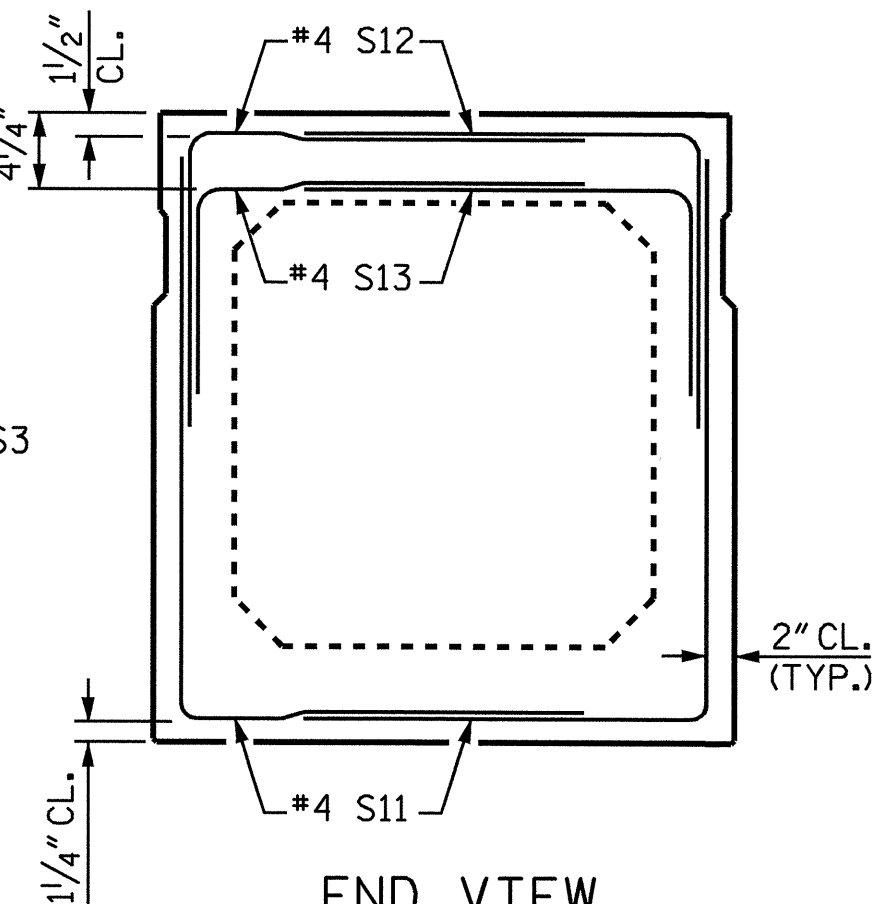
BAR NUMBER	SIZE	TYPE	EXTERIOR UNIT		INTERIOR UNIT	
			LENGTH	WEIGHT	LENGTH	WEIGHT
A1	10	#5	7'-2"	75	7'-2"	75
A2	56	#4	5'-8"	212	5'-8"	212
B1	12	#5	50'-0"	626	50'-0"	626
K1	21	#4	7'-2"	101	7'-2"	101
K2	14	#4	2'-7"	24	2'-7"	24
S1	67	#4	8'-6"	380	8'-6"	380
S2	67	#4	5'-8"	254	5'-8"	254
S3	125	#4	4'-10"	404	4'-10"	404
S4	58	#4	5'-10"	226	5'-10"	226
S11	28	#4	5'-4"	100	5'-4"	100
S12	28	#4	3'-11"	73	3'-11"	73
S13	28	#4	3'-6"	65	3'-6"	65
*S5	14	#4	6'-4"	59	**6'-4"	**59
REINFORCING STEEL			2540 LBS.		2540 LBS.	
*EPOXY COATED REINF. STEEL			59 LBS.		**59 LBS.	
7500 P.S.I. CONCRETE			17.8 CU. YDS.		17.8 CU. YDS.	
0.6" Ø L.R. STRANDS			No. 34		No. 34	

**FIRST INTERIOR BOX BEAM UNITS ONLY.



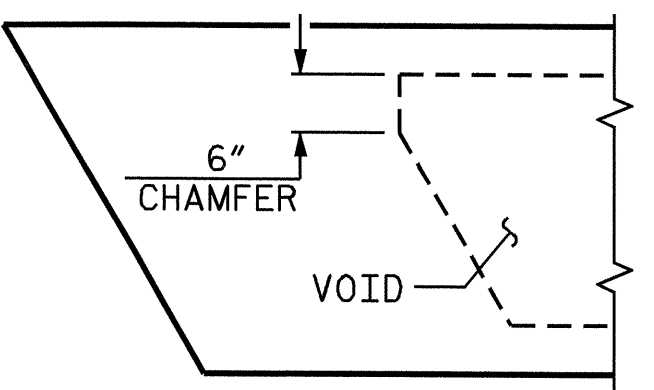
DETAIL "B"

EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT #4 S5 BARS. "B" BARS AND "A" BARS NOT SHOWN.

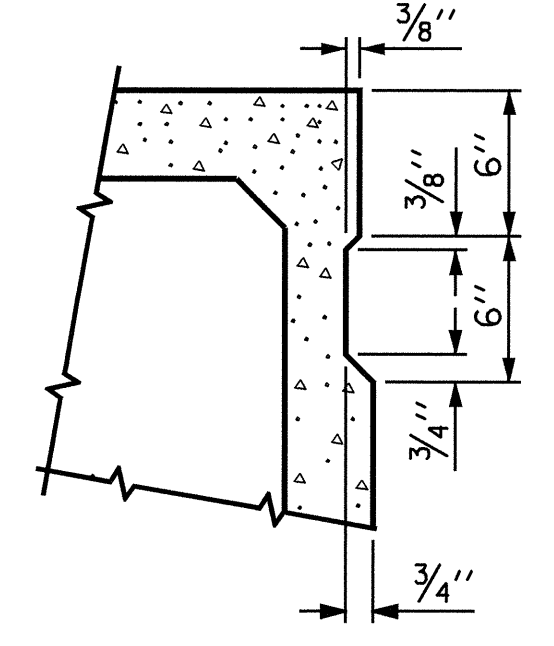


END VIEW

(SHOWING #4 "S" BARS IN END OF BEAM)

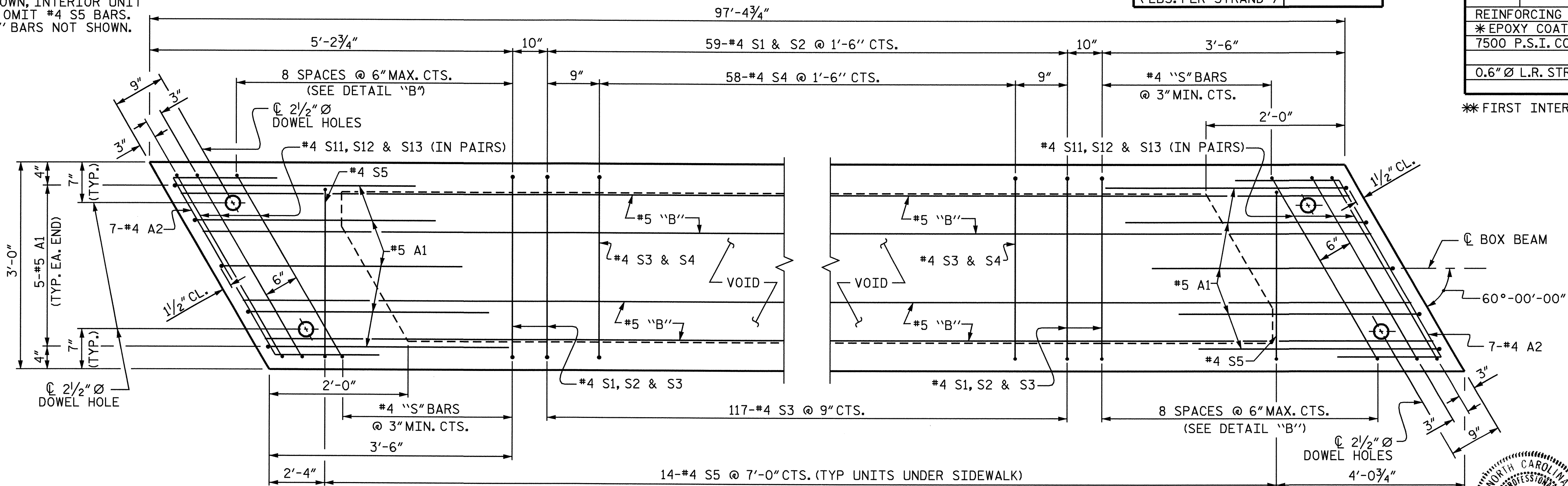


CHAMFER DETAIL
SHOWING 6" VOID CHAMFER



SHEAR KEY DETAIL

NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR BOX BEAMS.



PLAN OF BOX BEAM

EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT #4 S5 BARS. FOR LOCATION OF DIAPHRAGMS, SEE PLAN OF SPANS. FOR REINFORCING STEEL IN DIAPHRAGMS, SEE DIAPHRAGM DETAILS.

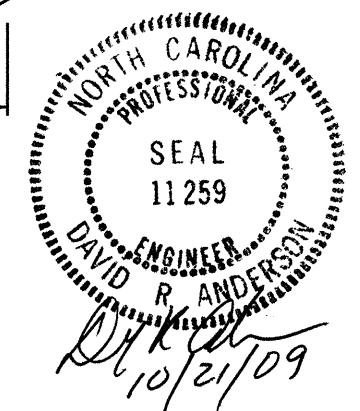
PROJECT NO. B-3919
WAKE COUNTY
 STATION: 38+12.60 -L-
 SHEET 3 OF 12

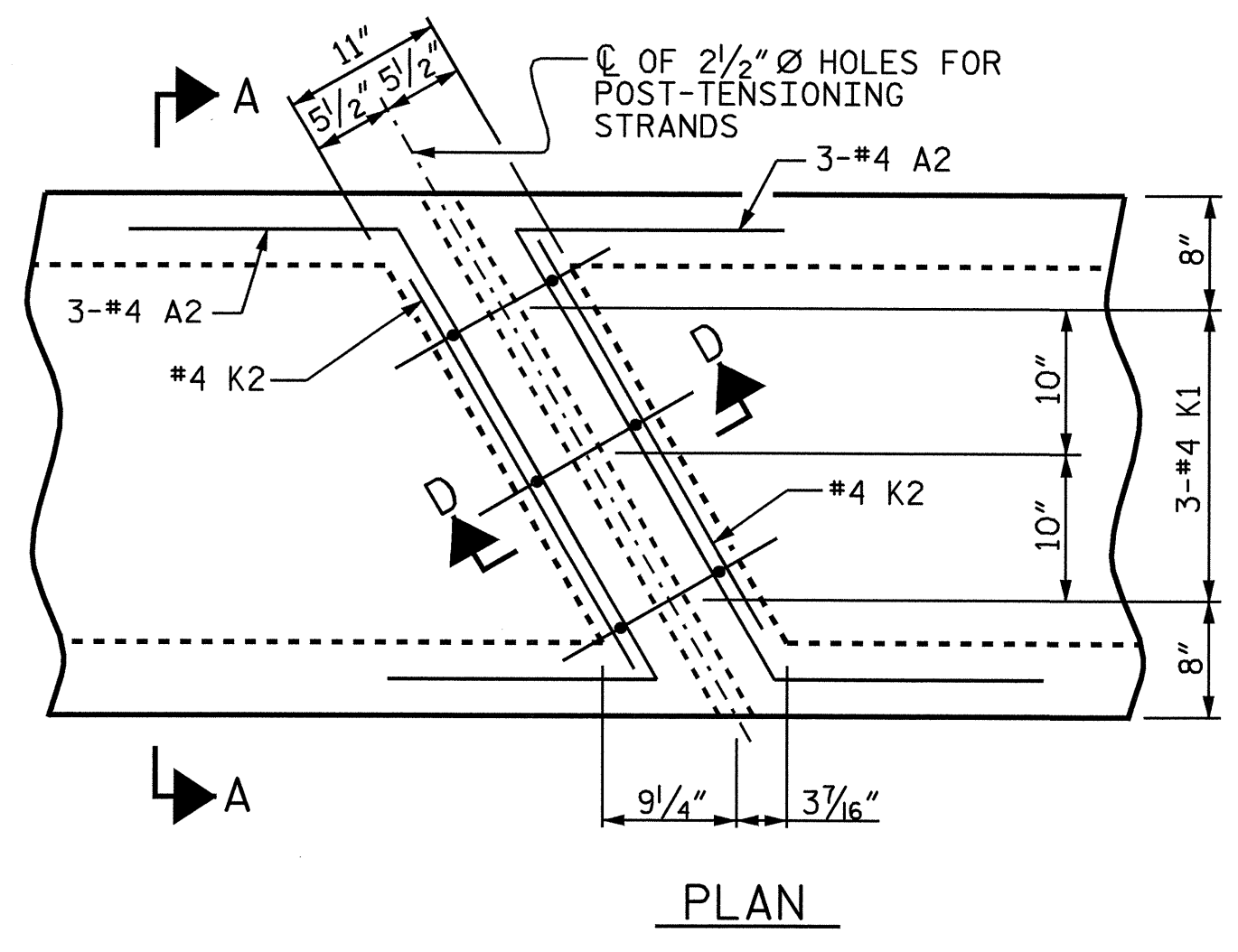
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 3'-0" X 3'-3"
 PRESTRESSED CONCRETE
 BOX BEAM UNIT
 SPAN "A"

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

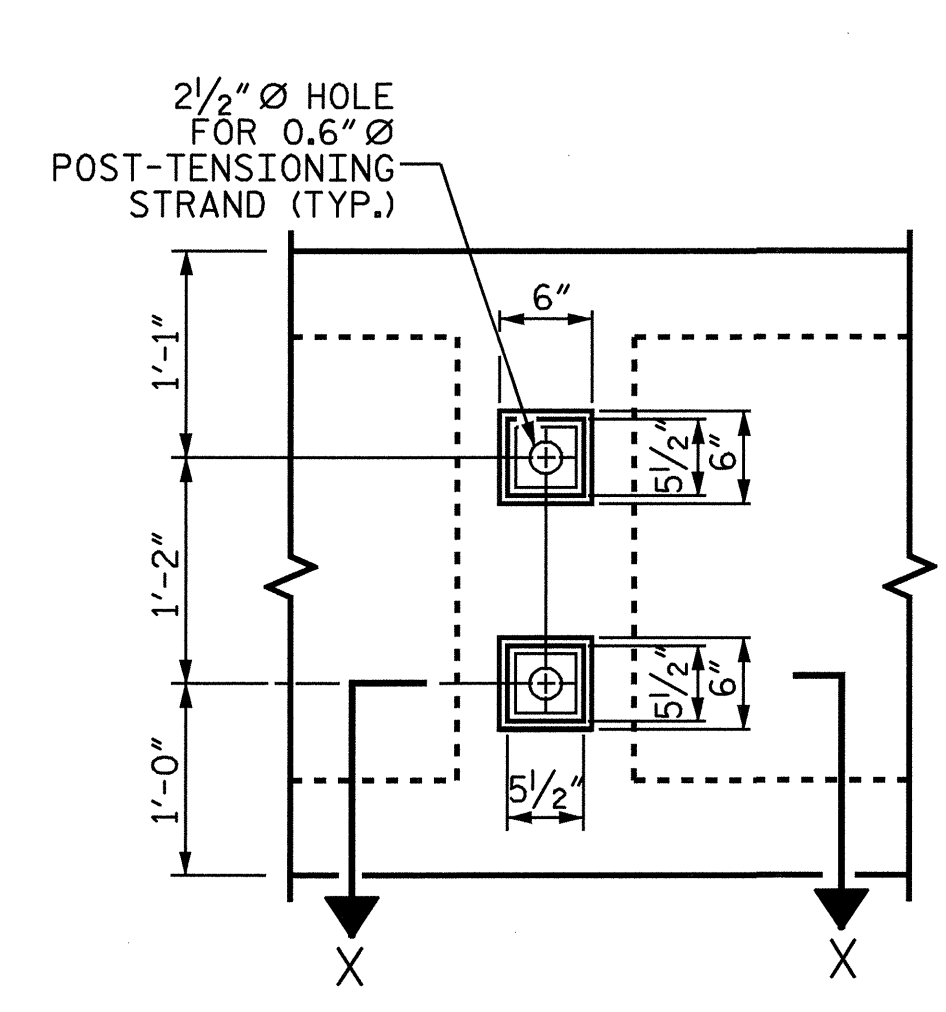
TOTAL SHEETS: 51

ASSEMBLED BY : N.Q. TRAN	DATE : 2-09
CHECKED BY : J.A. TILLMAN	DATE : 4-13-09
DRAWN BY : TLA 5/05	ADDED 7/11/05
CHECKED BY : GM 6/05	REV. 5/1/06

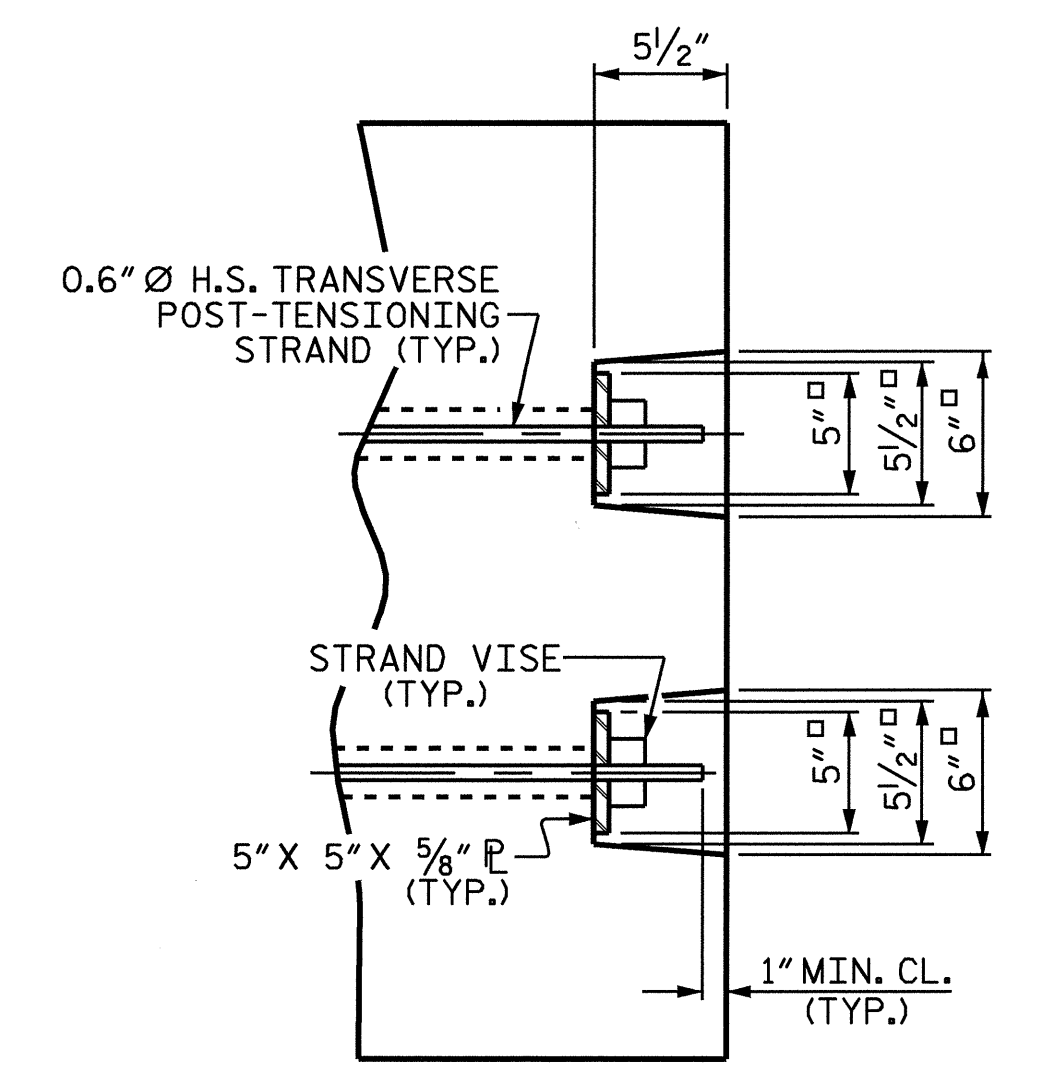




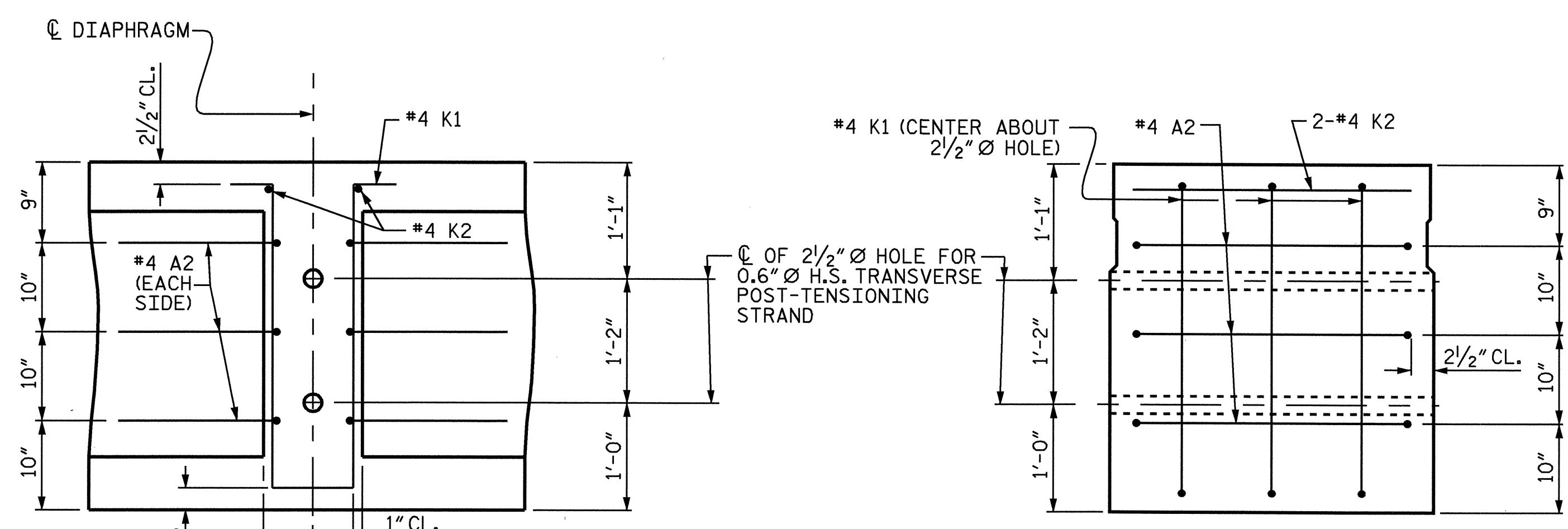
PLAN



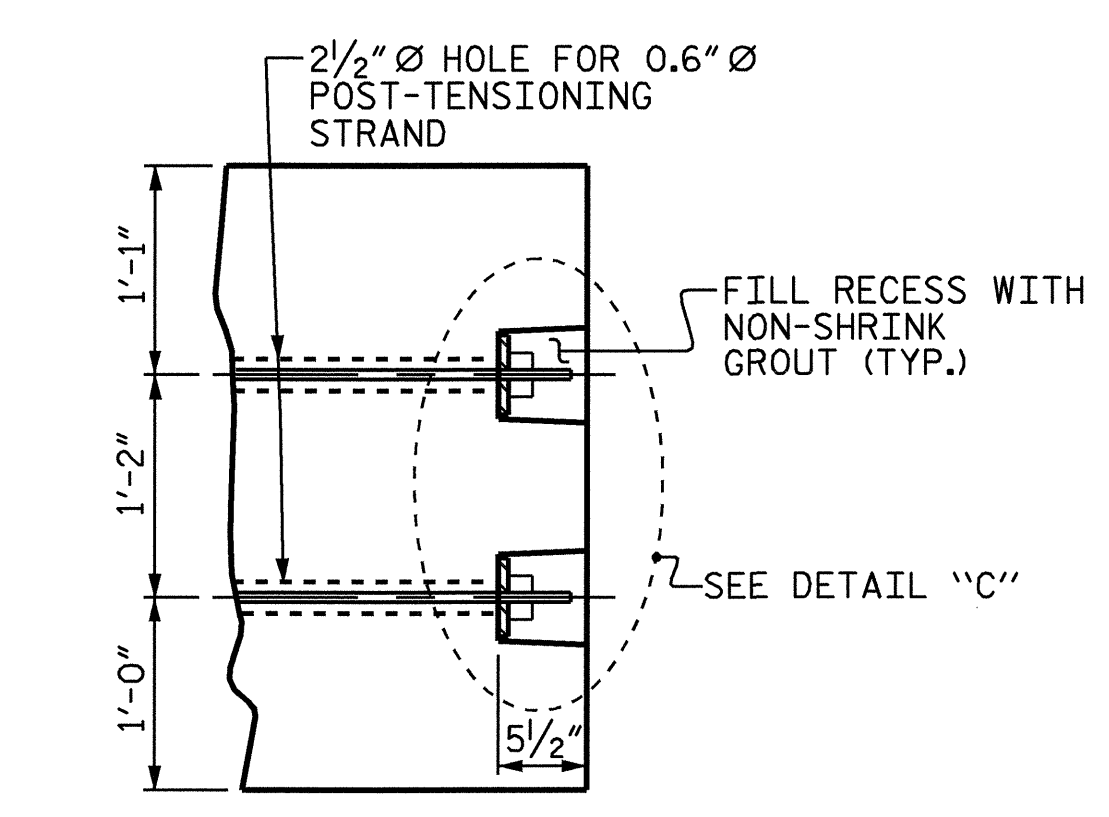
VIEW Y-Y
SHOWING ELEVATION VIEW OF GROUTED RECESS



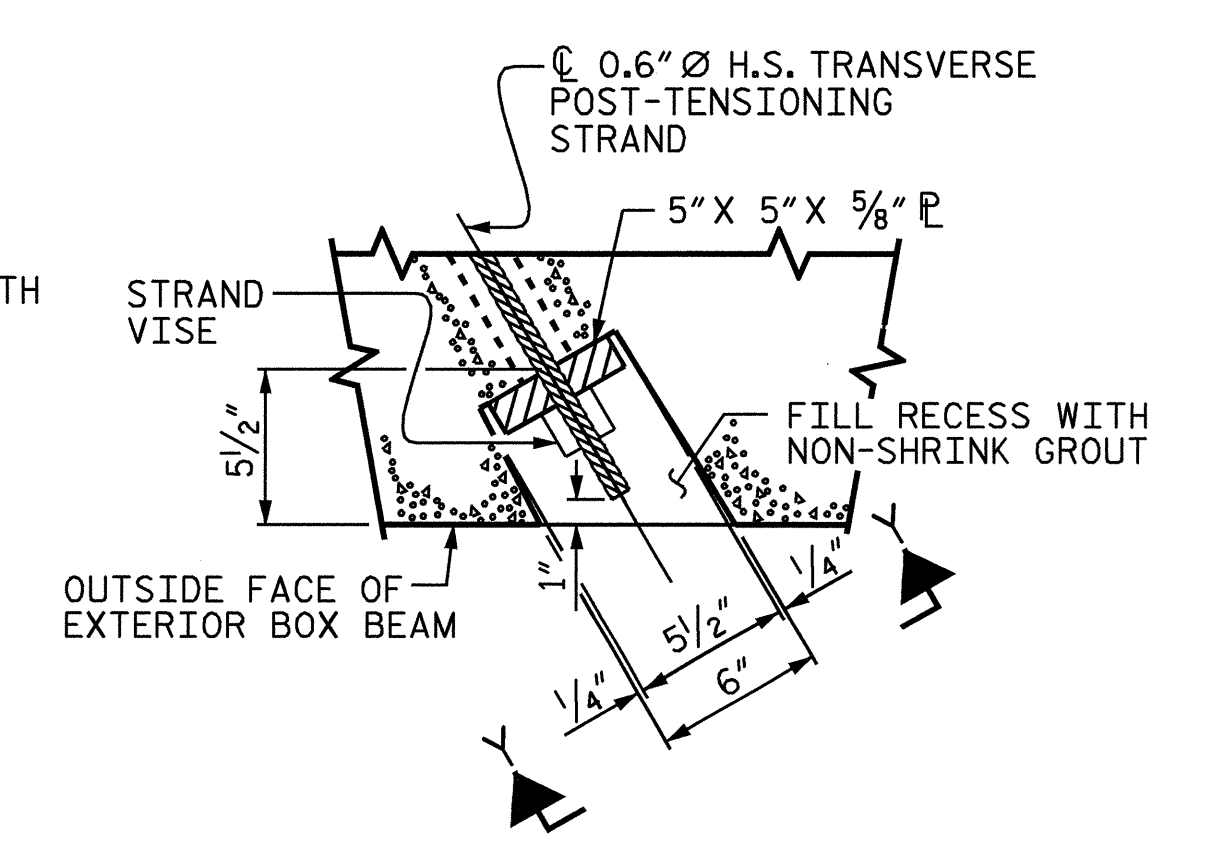
DETAIL "C"



SECTION A-A
VOIDS NOT SHOWN



PART SECTION AT RECESS



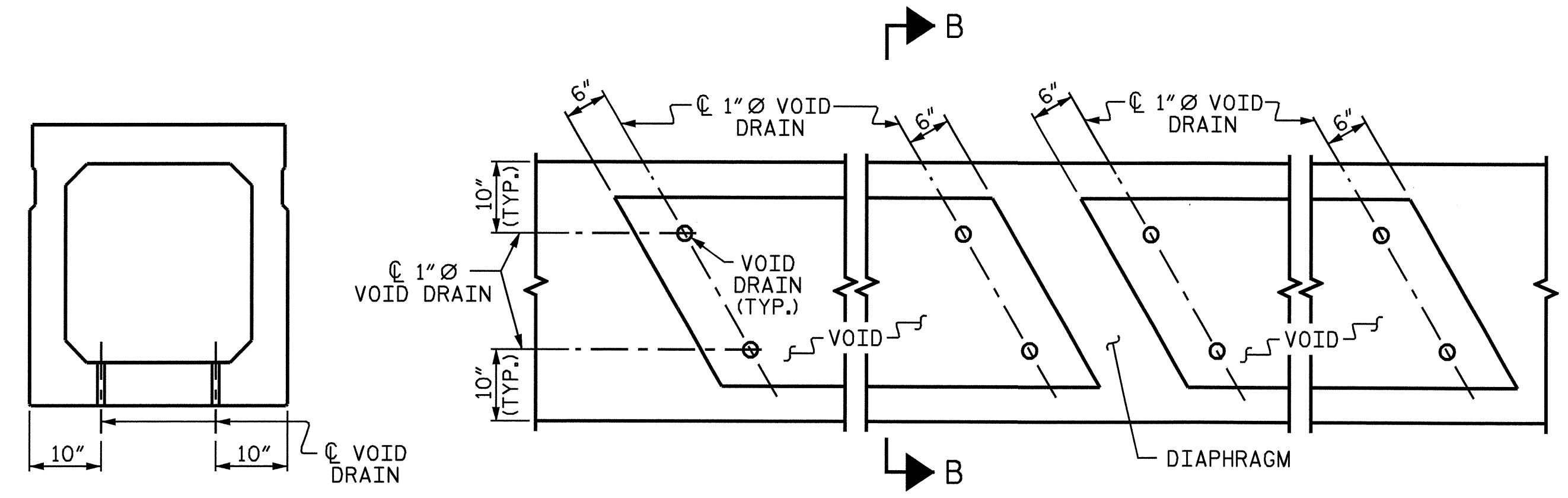
SECTION X-X

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

SECTION D-D

DOUBLE DIAPHRAGM DETAILS

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



SECTION B-B

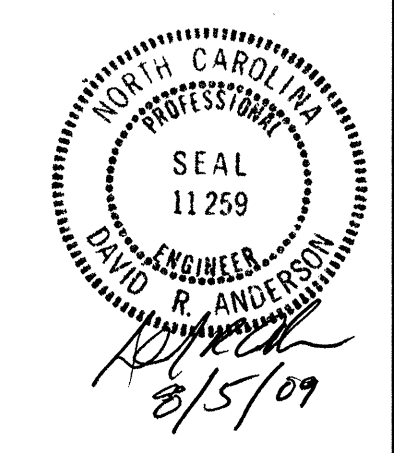
PART PLAN

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

DEAD LOAD DEFLECTION AND CAMBER	
	3'-0" x 3'-3"
	0.6" Ø L.R. STRAND
	SPAN "A"
CAMBER (BEAM ALONE IN PLACE)	4"
DEFLECTION DUE TO CONCRETE WEARING SURFACE	1/16"
FINAL CAMBER	2 5/16"

PROJECT NO. B-3919
WAKE COUNTY
STATION: 38+12.60 -L-

SHEET 4 OF 12

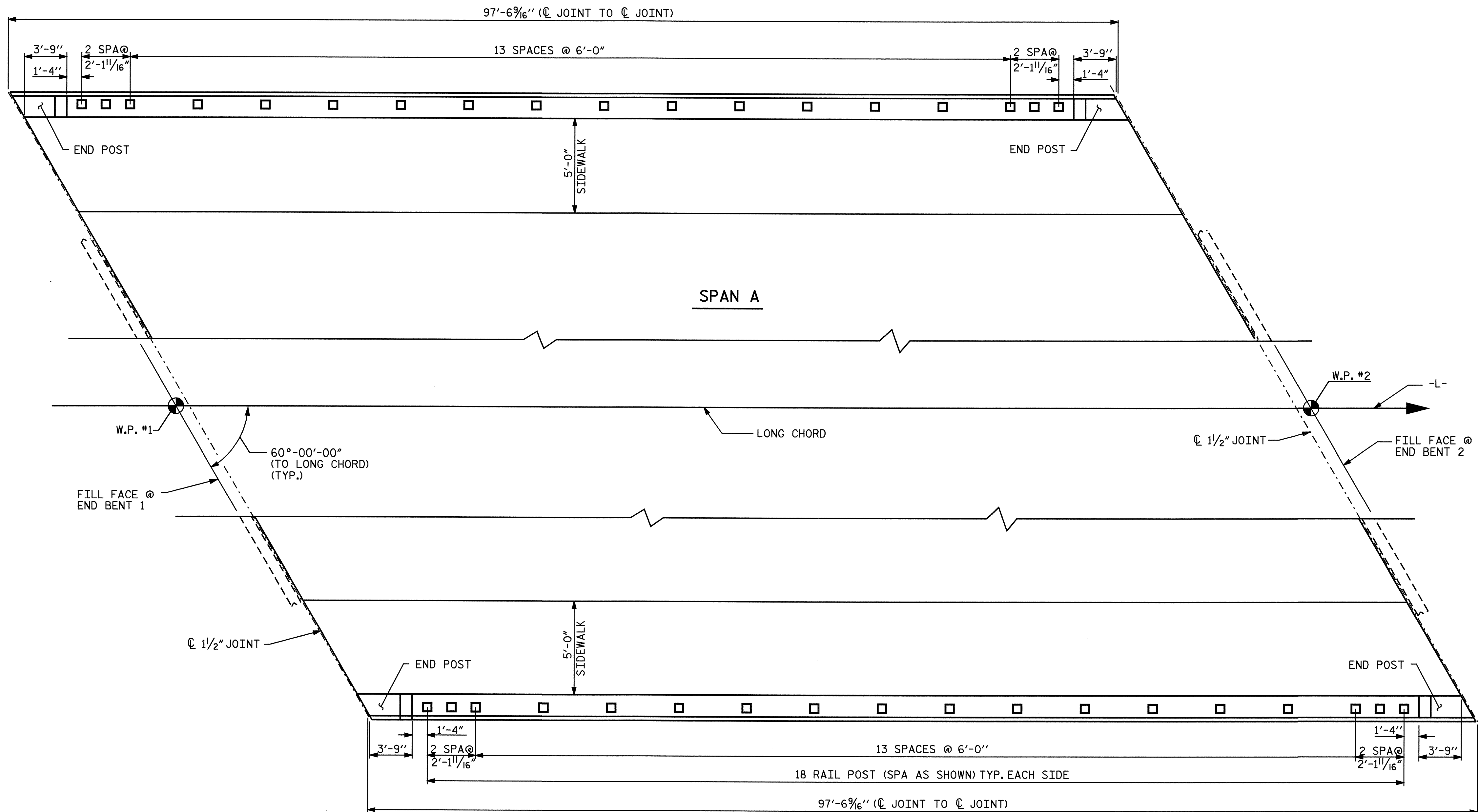


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
3'-0" X 3'-3"
PRESTRESSED CONCRETE
BOX BEAM UNIT

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

TOTAL SHEETS: 51

ASSEMBLED BY : N.Q. TRAN DATE : 2-09
CHECKED BY : J.A. TILLMAN DATE : 4-13-09
DRAWN BY : TLA 5/05
CHECKED BY : GM 6/05
ADDED 7/11/05
REV. 5/1/06 TLA/GM



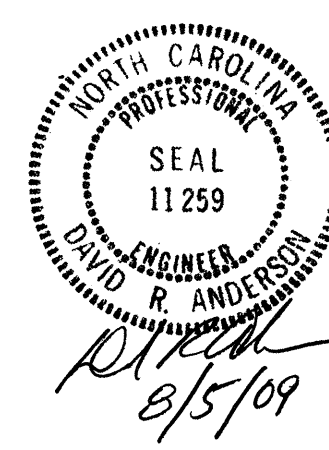
PLAN VIEW

PROJECT NO. B-3919
WAKE COUNTY
 STATION: 38+12.60 -L-

SHEET 5 OF 12

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

RAIL POST
 SPACINGS AND END
 OF RAIL DETAILS



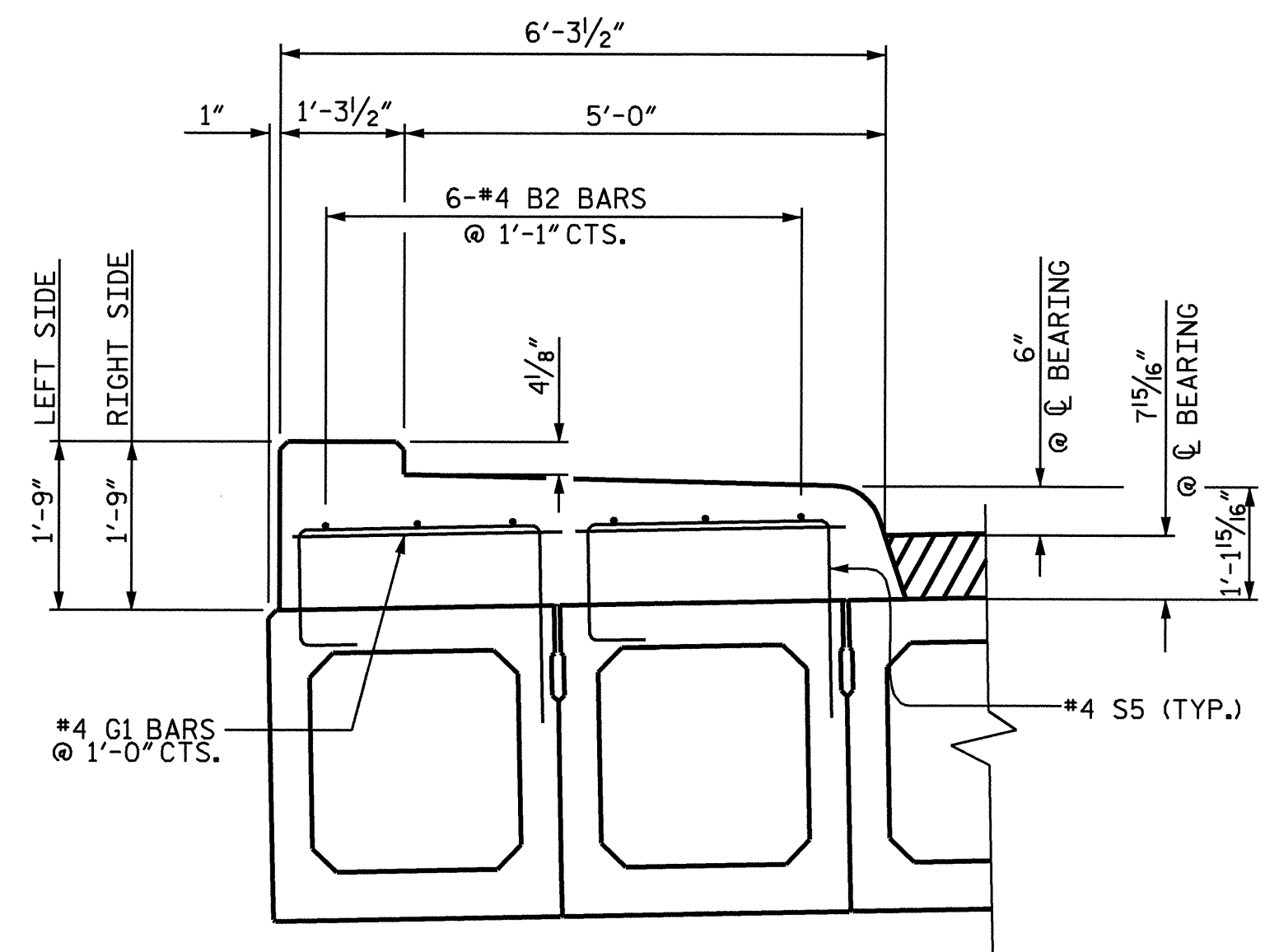
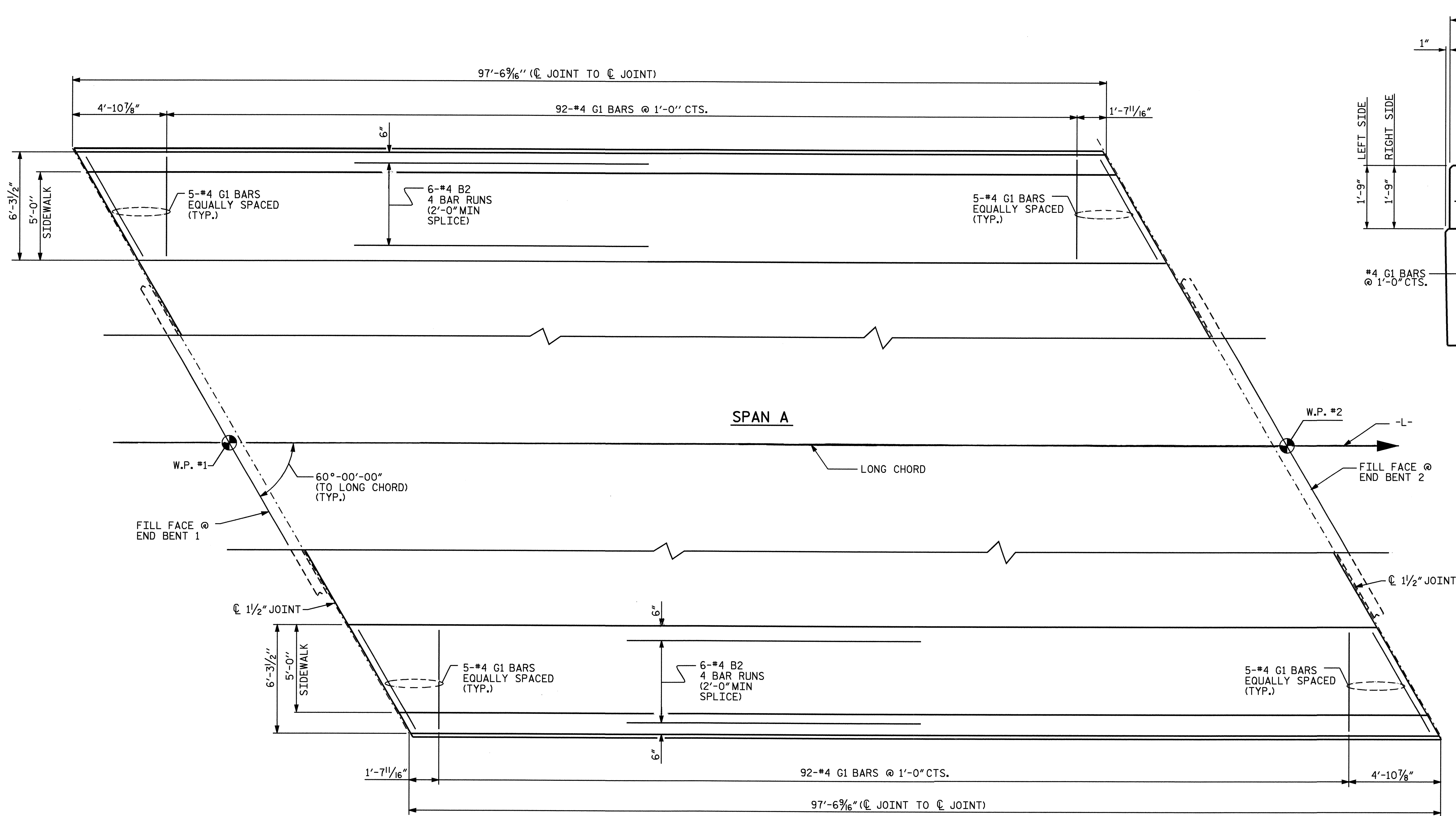
ASSEMBLED BY : N. Q. TRAN DATE : 2-09
 CHECKED BY : J.A. TILLMAN DATE : 4-13-09

04-AUG-2009 10:03
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 drwithrow

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

STR. #2

SHEET NO.
 5-34
 TOTAL SHEETS
 51

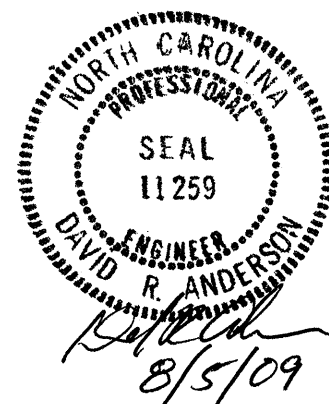


SECTION THRU SIDEWALK

PROJECT NO. B-3919
WAKE COUNTY
 STATION: 38+12.60 -L-

SHEET 6 OF 12

BILL OF MATERIAL FOR SIDEWALK					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B2	48	*4	STR	25'-4"	812
*G1	200	*4	STR	5'-9"	768
*EPOXY COATED REINFORCING STEEL					LBS. 1580
CLASS AA CONCRETE					CU.YDS. 60.9

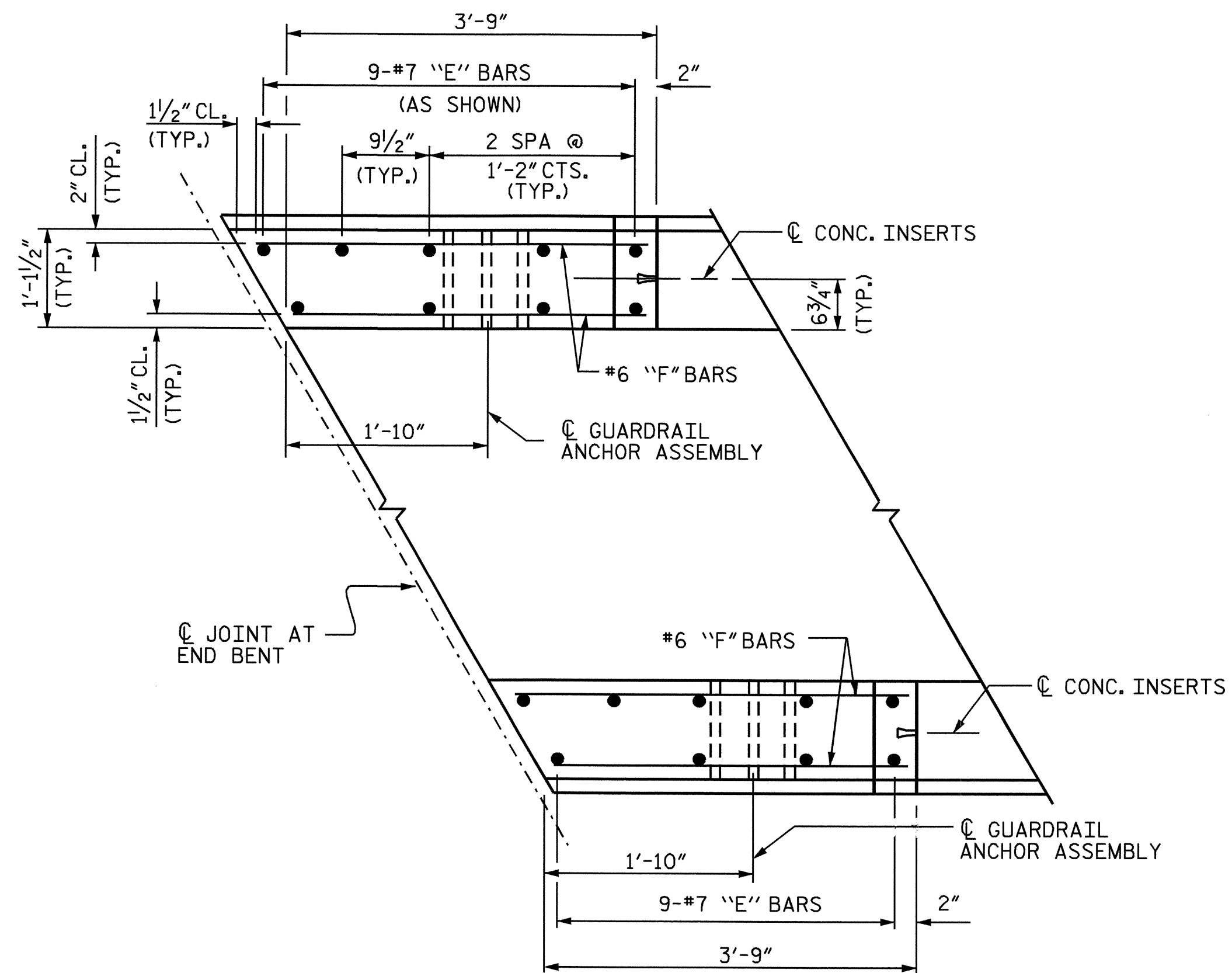


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 SIDEWALK DETAILS

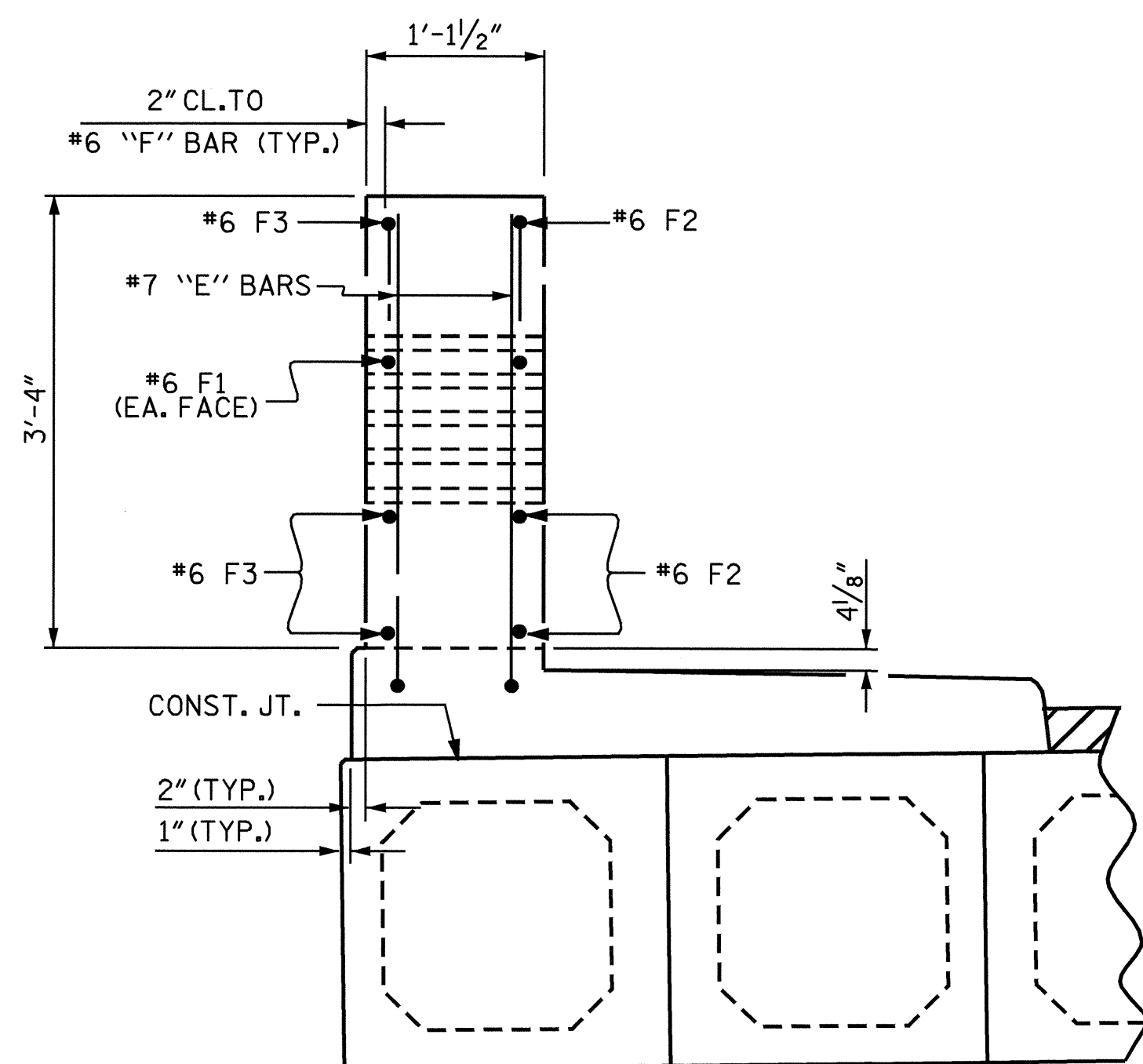
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	5-35	
1			3			TOTAL SHEETS	
2			4			51	

ASSEMBLED BY : N. Q. TRAN DATE : 2-09
 CHECKED BY : J.A. TILLMAN DATE : 4-13-09

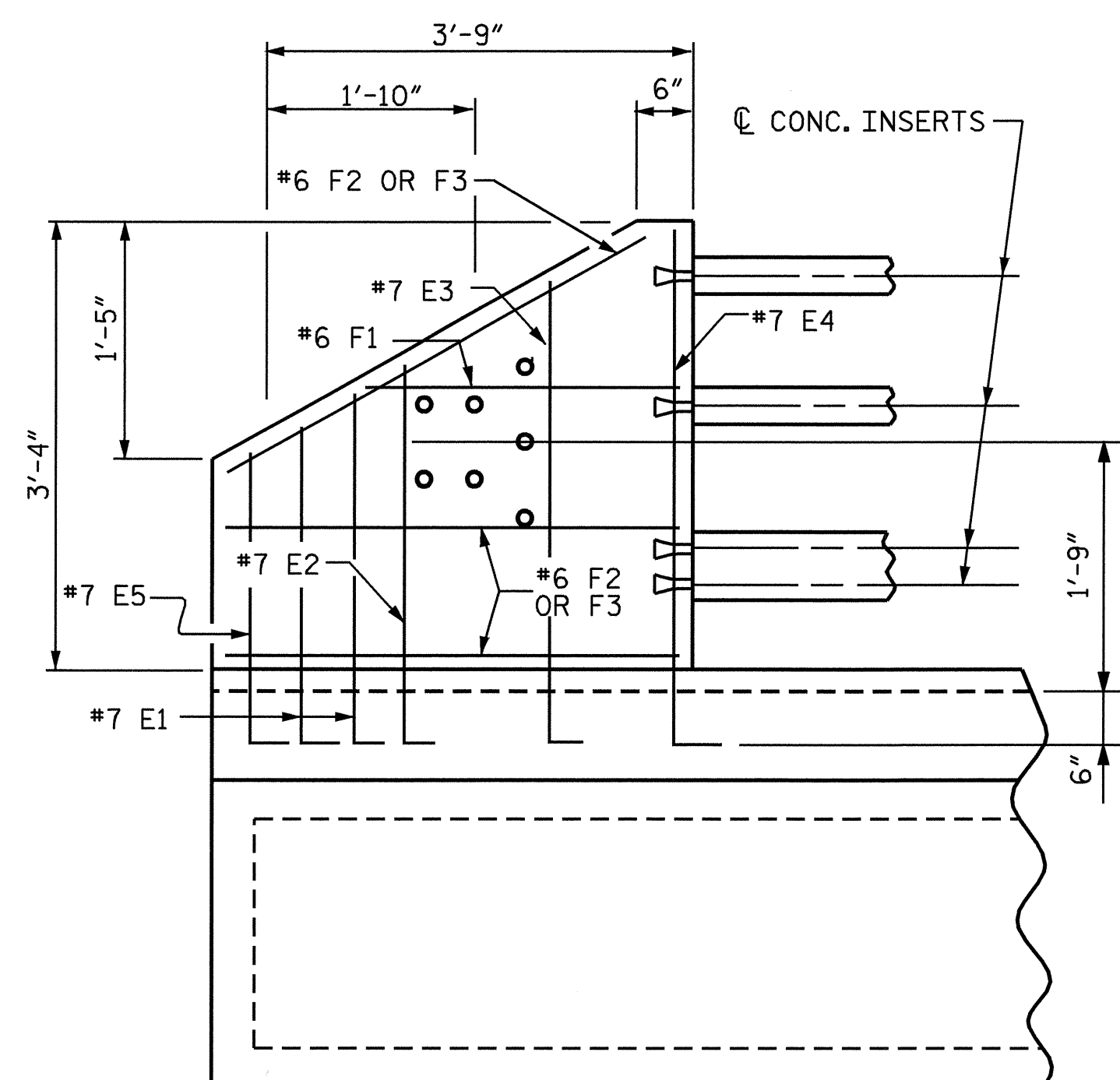
07-JUL-2009 09:59
 c:\structures\str2\tillman\m\crostation\b-3919-02.bb.dgn
 danderson



PLAN OF END POST

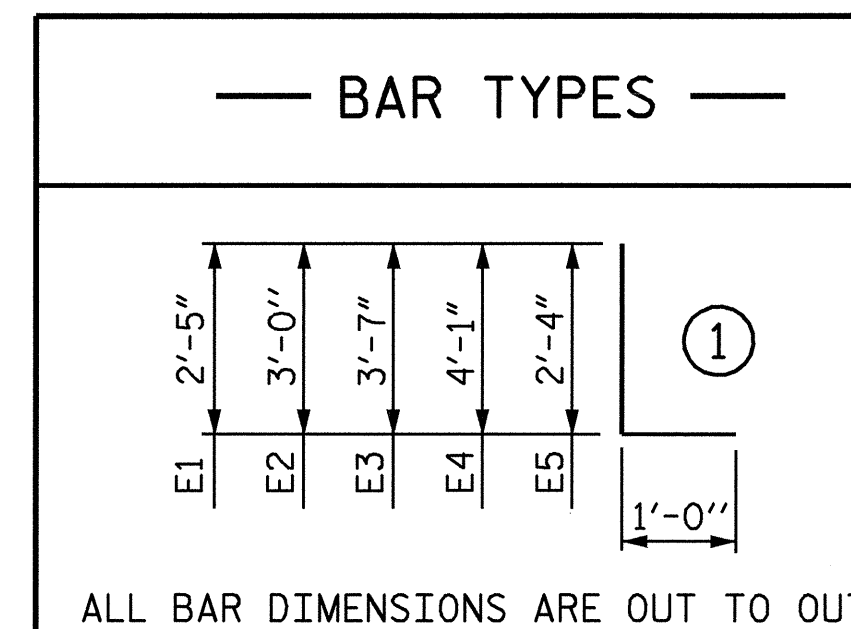


END VIEW



ELEVATION

END POST DETAILS



BILL OF MATERIAL FOR END POSTS					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* E1	8	# 7	1	3'-5"	56
* E2	8	# 7	1	4'-0"	65
* E3	8	# 7	1	4'-7"	75
* E4	8	# 7	1	5'-1"	83
* E5	4	# 7	1	3'-4"	27
* F1	8	# 6	STR	3'-2"	38
* F2	12	# 6	STR	3'-4"	60
* F3	12	# 6	STR	4'-0"	72
* EPOXY COATED REINFORCING STEEL LBS.					476
CLASS AA CONCRETE				CU.YDS.	1.8

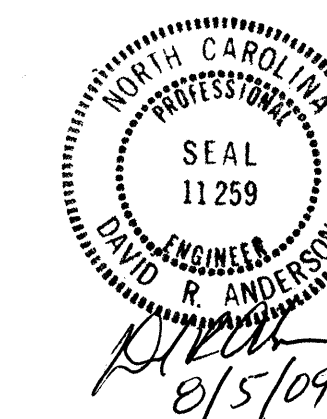
COMBINED TOTALS FOR SIDEWALK AND END POST		
* EPOXY COATED REINFORCING STEEL LBS.		2056
CLASS AA CONCRETE		CU.YDS. 62.7

PROJECT NO. B-3919
WAKE COUNTY
 STATION: 38+12.60 -L-

SHEET 7 OF 12

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

3 BAR METAL RAIL
 END POST DETAILS

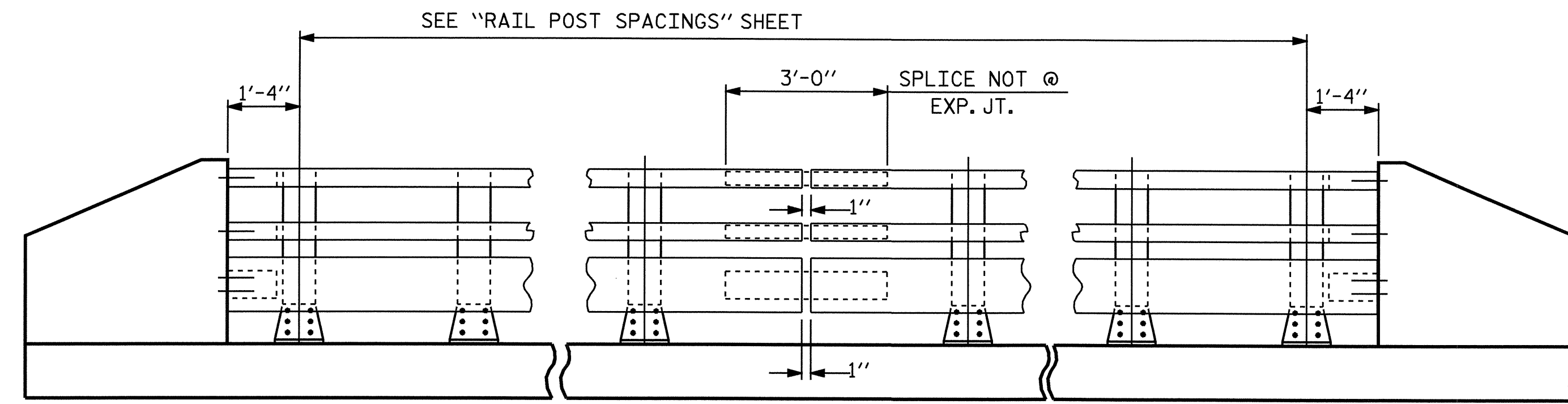


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-36
1			3			TOTAL SHEETS
2			4			51

ASSEMBLED BY : N. Q. TRAN DATE : 2-09
 CHECKED BY : J.A. TILLMAN DATE : 4-13-09

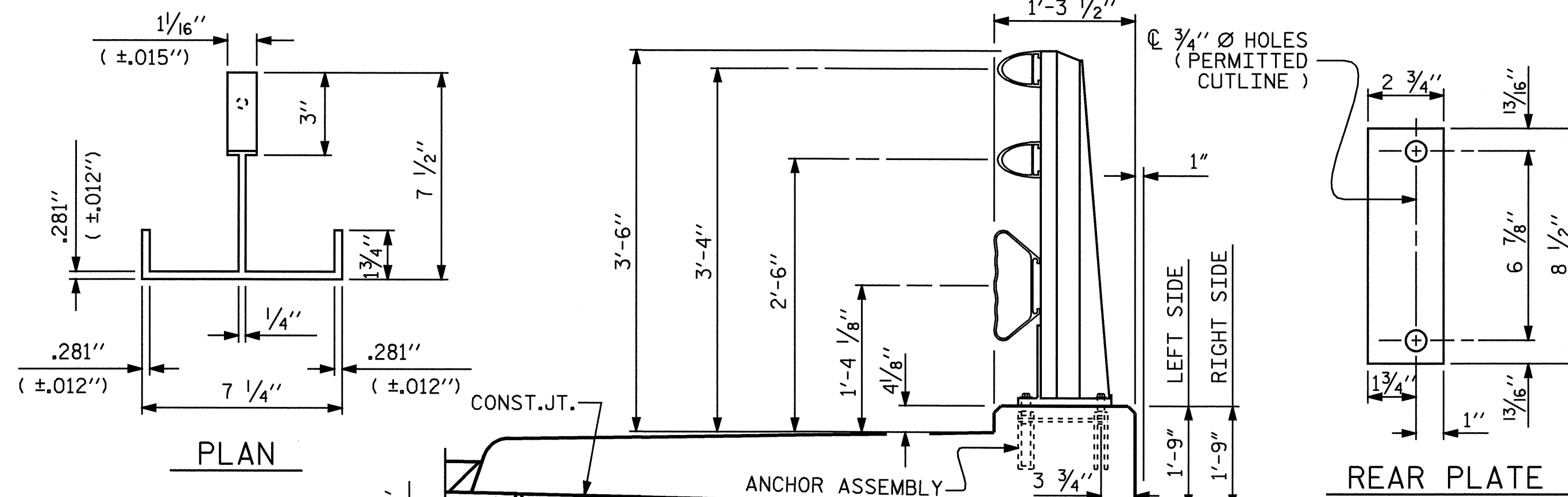
08-JUN-2009 11:06
 r:\structures\str2\jillman\microrstation\b-3919-02.bb.dgn
 jtillman

STR. 2



NOTE:
FOR ATTACHMENT OF METAL RAIL TO END
POST, SEE SHEET 10 OF 12.

ELEVATION



PLAN

SECTION THRU RAIL

FOR ANCHOR ASSEMBLY, SEE 10 OF 12.

REAR PLATE

FRONT PLATE
SHIM DETAILS

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

PAY LENGTH = 178.5 LIN.FT.

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 B221 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. PLACE ONE JOINT SPLICE JUST BEYOND THE 3RD RAIL POST FROM EACH END, TYPICALLY 14' FROM THE END. PLACE OTHER JOINTS AS NEEDED.

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE SHEET 10 OF 12.

CAP SCREWS SHALL BE ASTM F593 ALLOY 305 STAINLESS STEEL. WASHERS FOR RAIL ATTACHMENT 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.

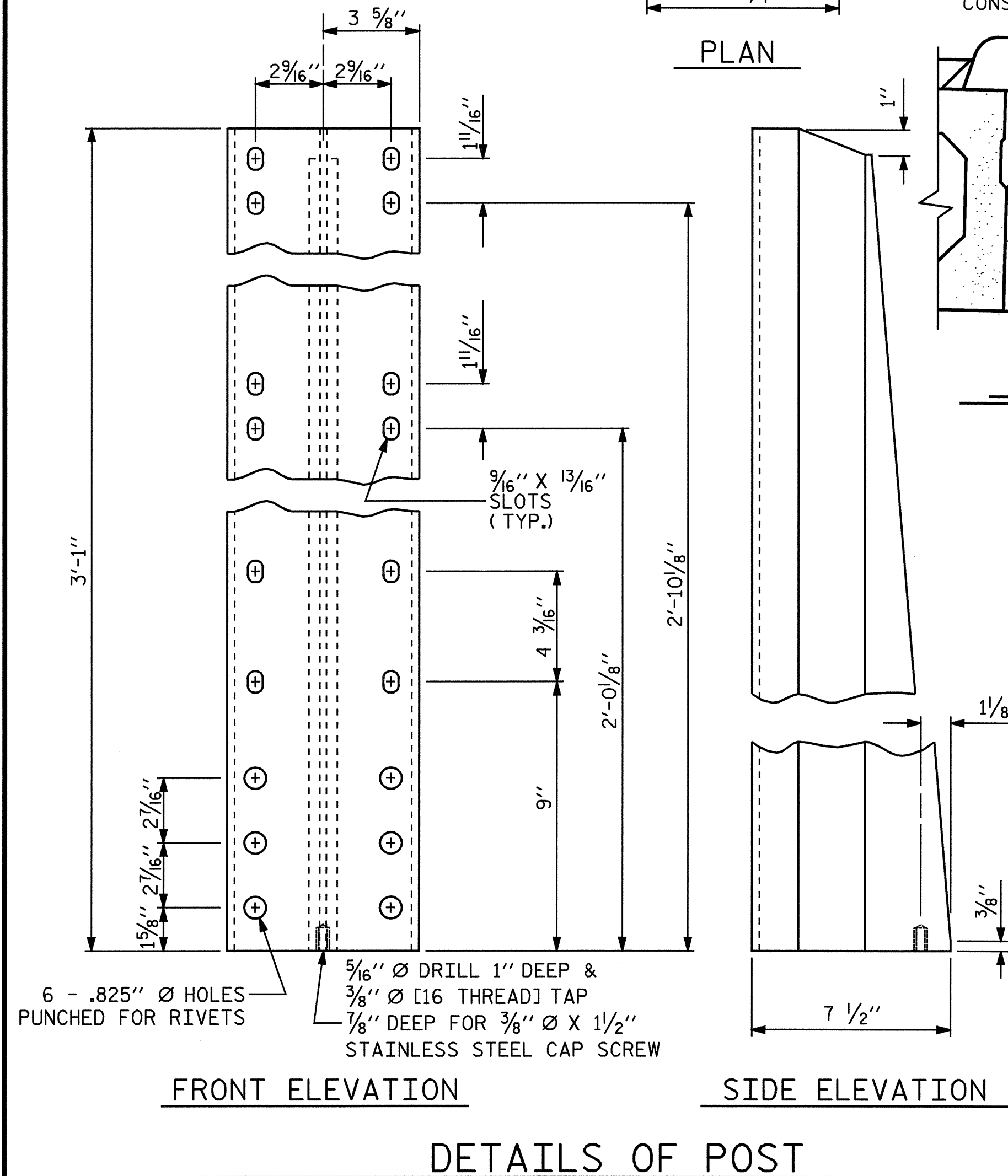
CURVED RAIL USAGE: WHERE RAILS ARE TO BE USED ON BRIDGES ON HORIZONTAL AND/OR VERTICAL CURVATURE THE CONTRACTOR MAY, AT HIS OPTION, HAVE THE REQUIRED CURVATURE IN THE RAIL FORMED IN THE SHOP OR IN THE FIELD. IN EITHER EVENT, THE RAIL SHALL CONFORM WITHOUT BUCKLING OR KINKING TO THE REQUIRED CURVATURE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

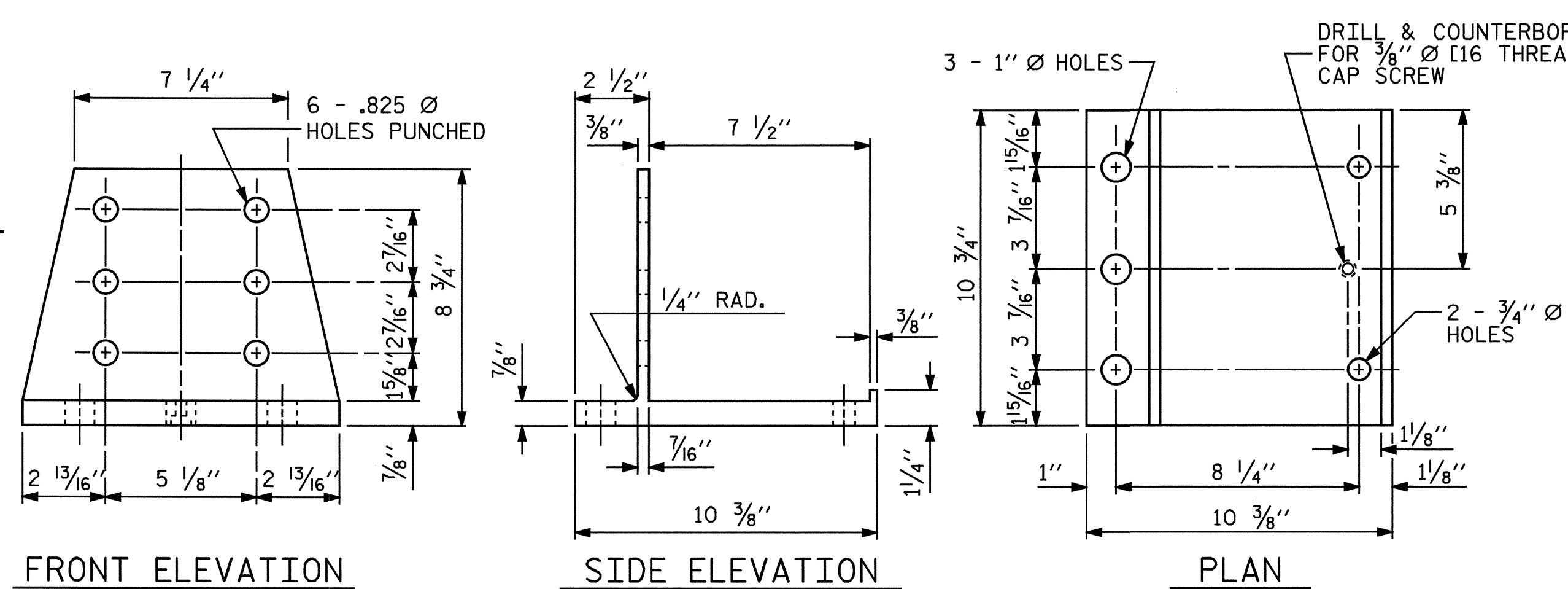


FRONT ELEVATION

SIDE ELEVATION

RIVET DETAIL

DETAILS OF POST

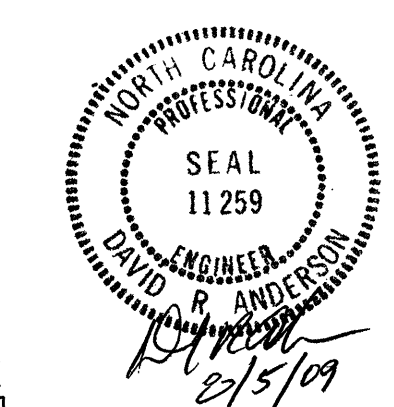


FRONT ELEVATION

SIDE ELEVATION

PLAN

POST BASE DETAILS



PROJECT NO. B-3919
WAKE COUNTY
STATION: 38+12.60 -L-

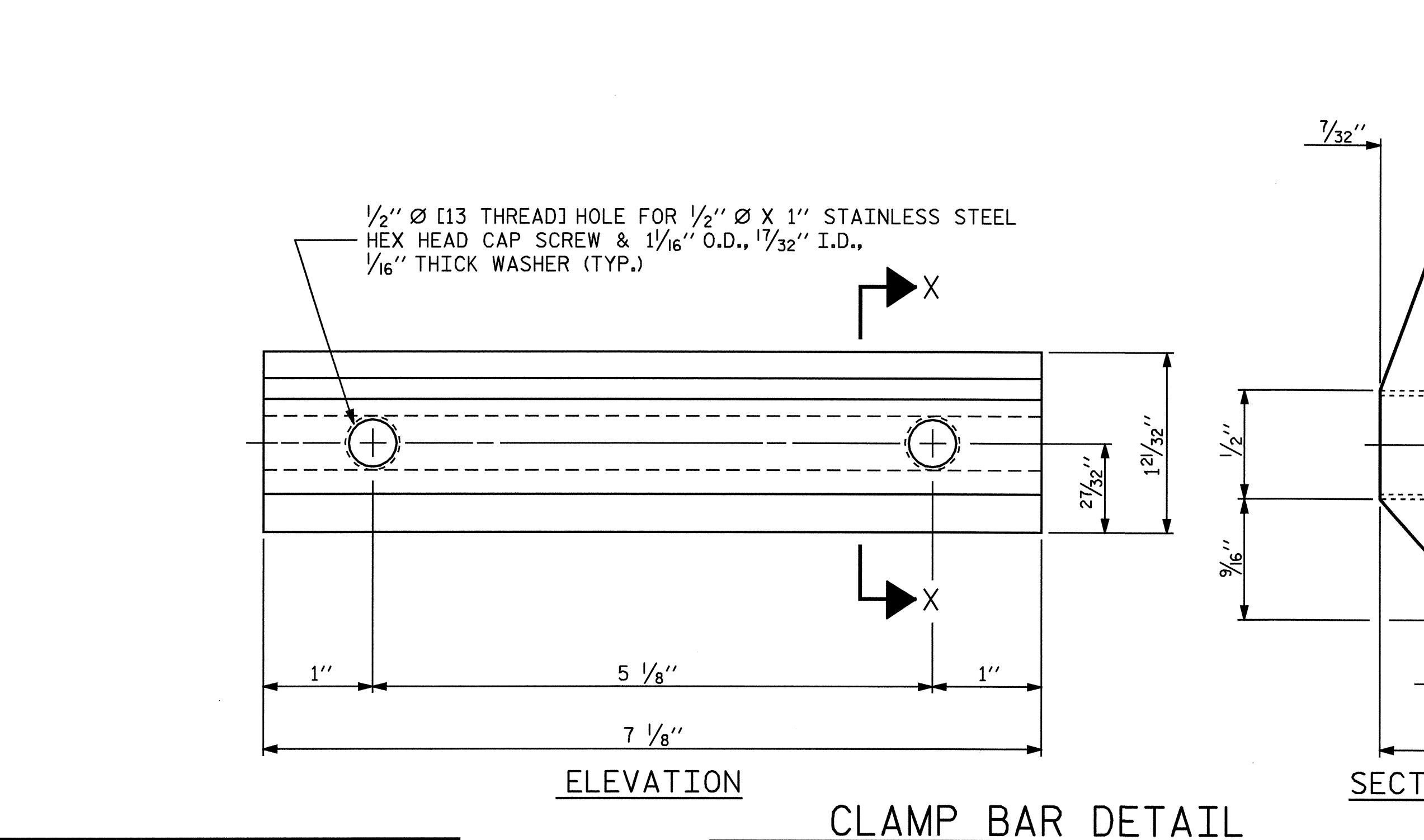
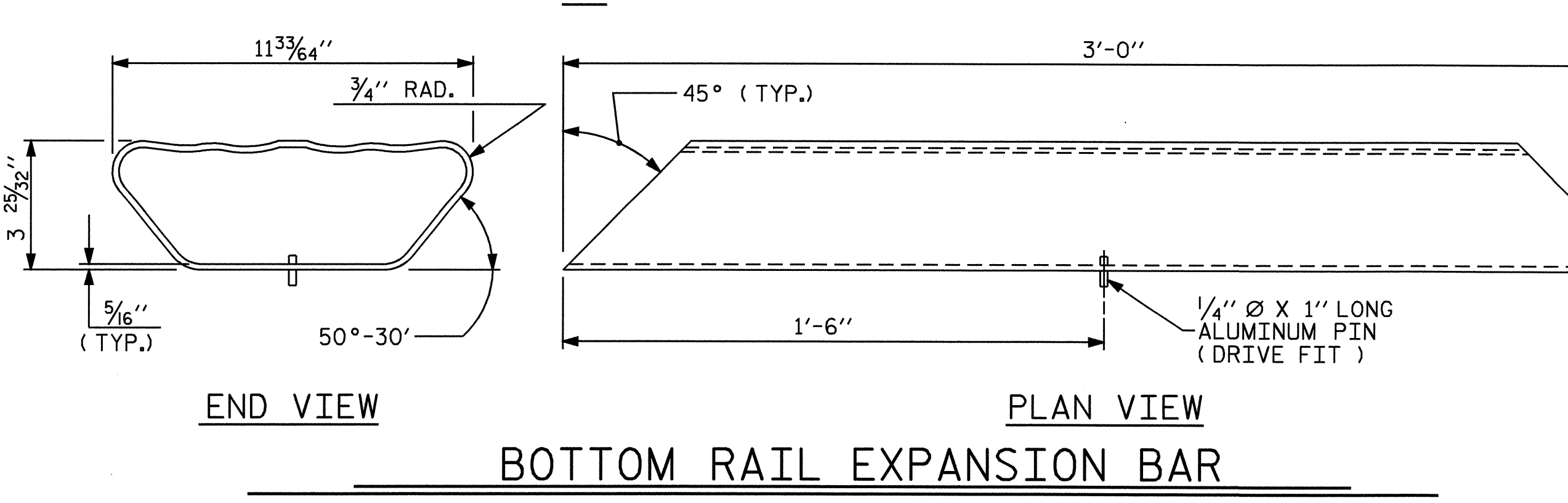
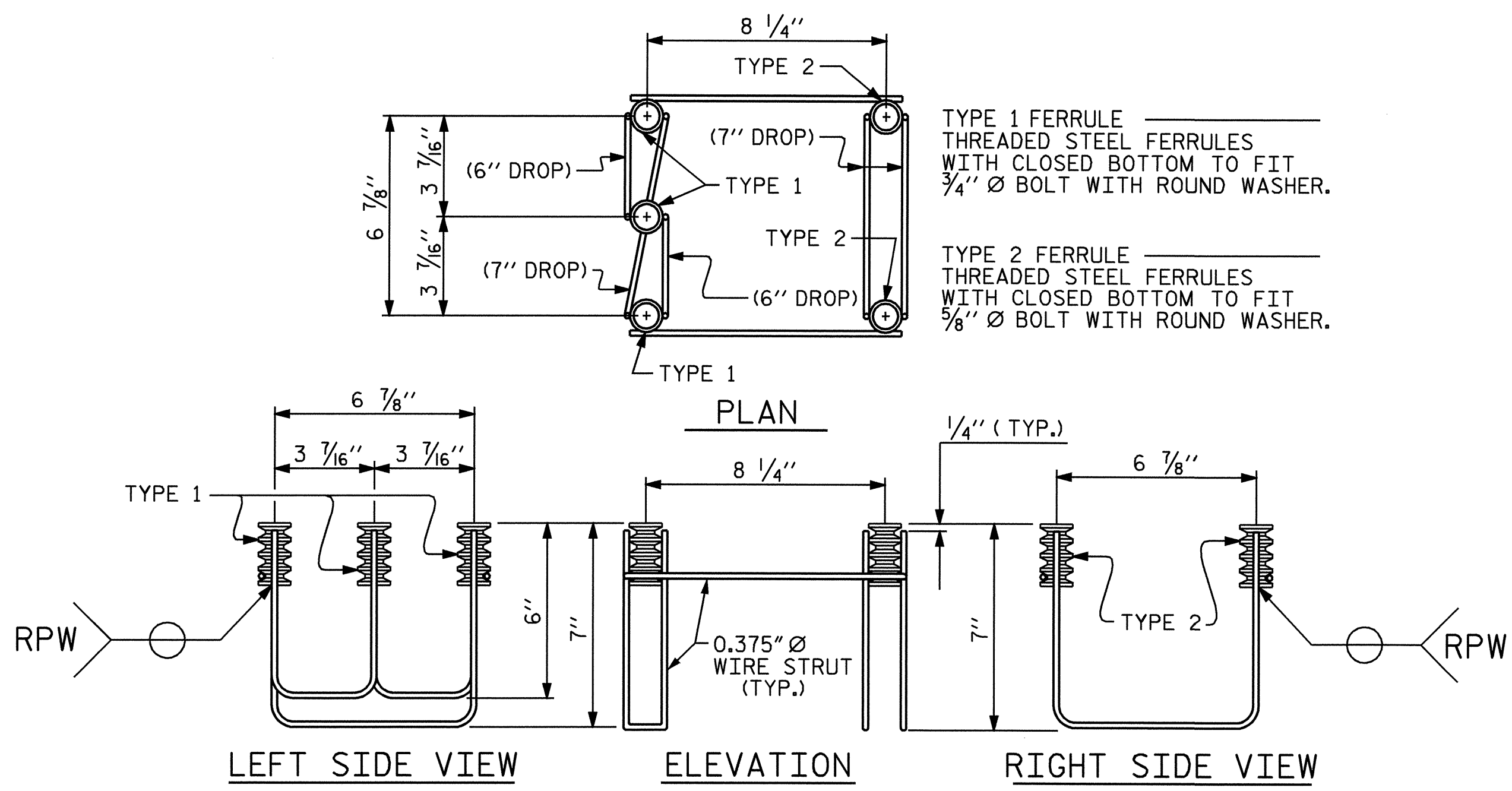
SHEET 8 OF 12

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-37
STANDARD 3 BAR METAL RAIL						TOTAL SHEETS 51
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			51
2			4			

ASSEMBLED BY: N. Q. TRAN	DATE: 2-09
CHECKED BY: J.A. TILLMAN	DATE: 4-13-09
DRAWN BY: JMB 1/88	REV. 10/17/00 RWW/LES
CHECKED BY: GGH 1/88	REV. 5/7/03 RWW/JTE
	REV. 5/1/06 TLA/GM

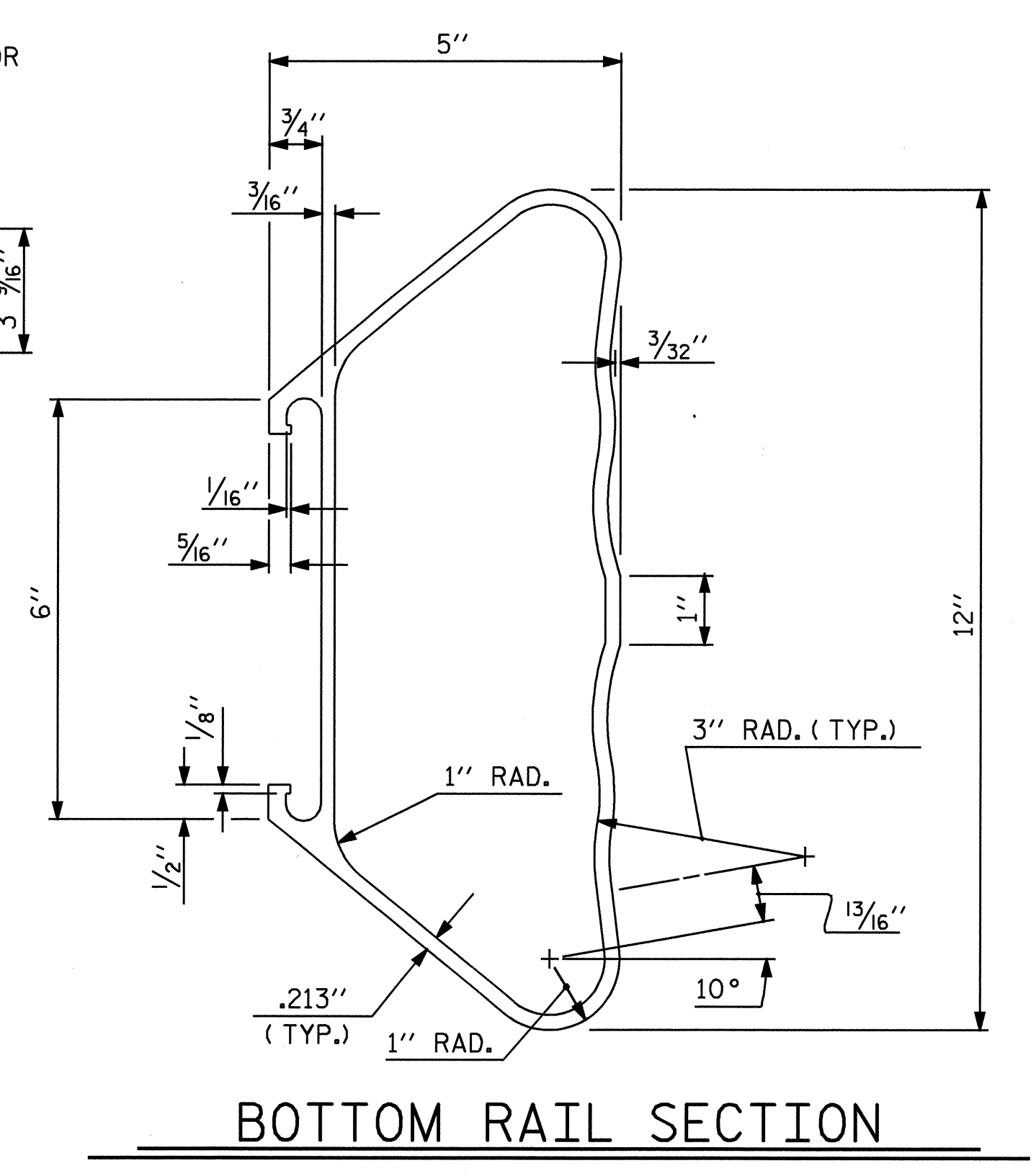
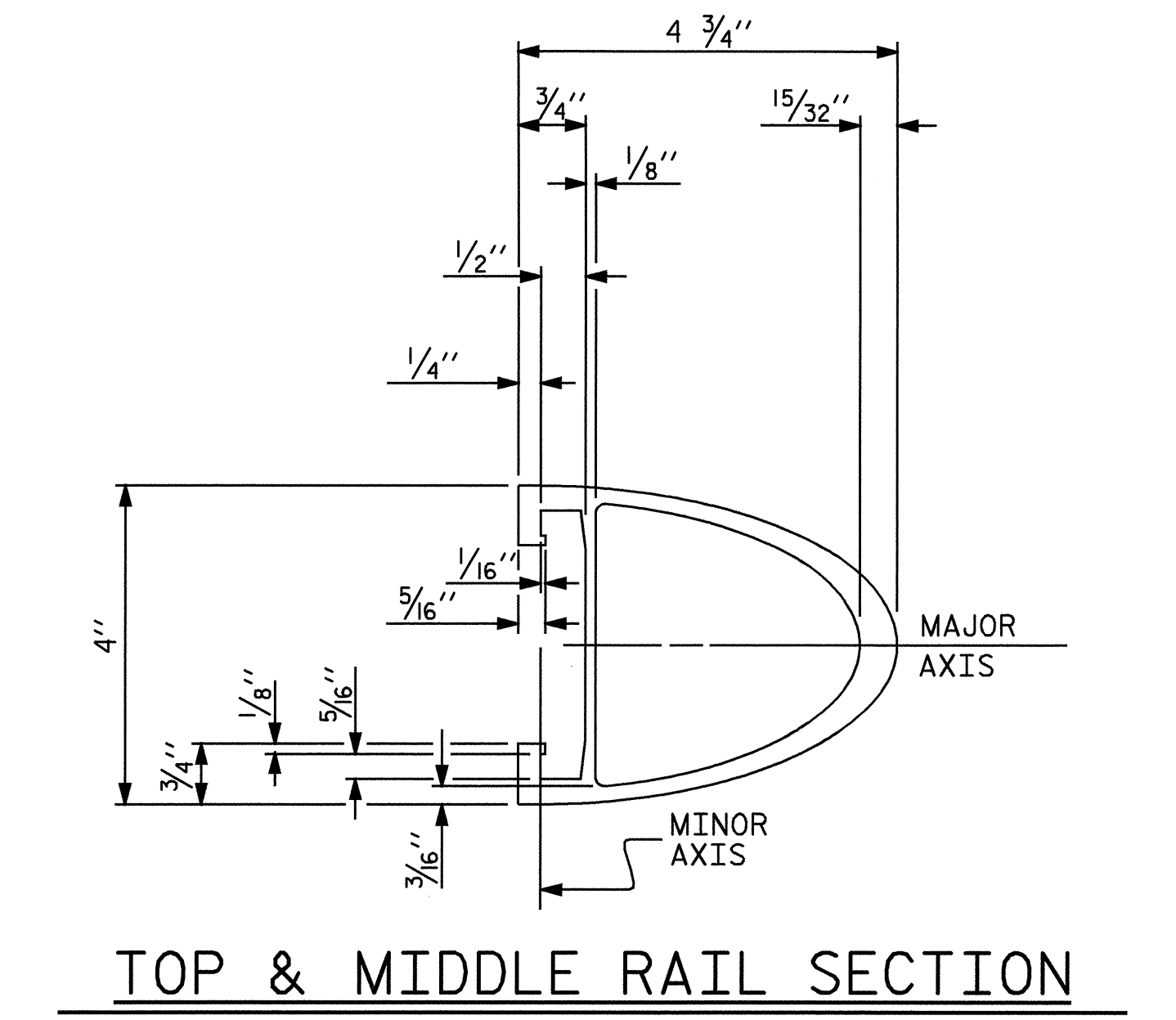
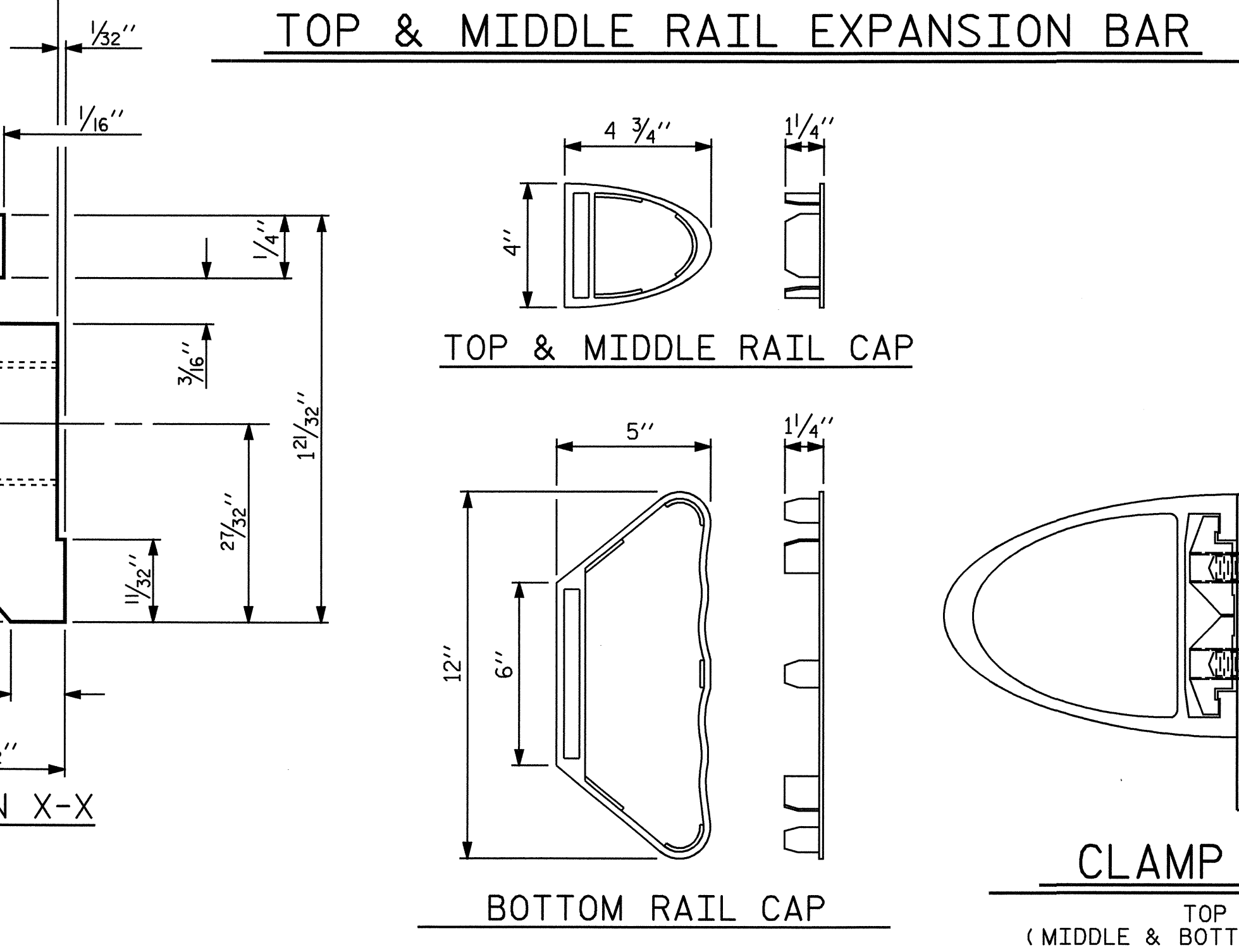
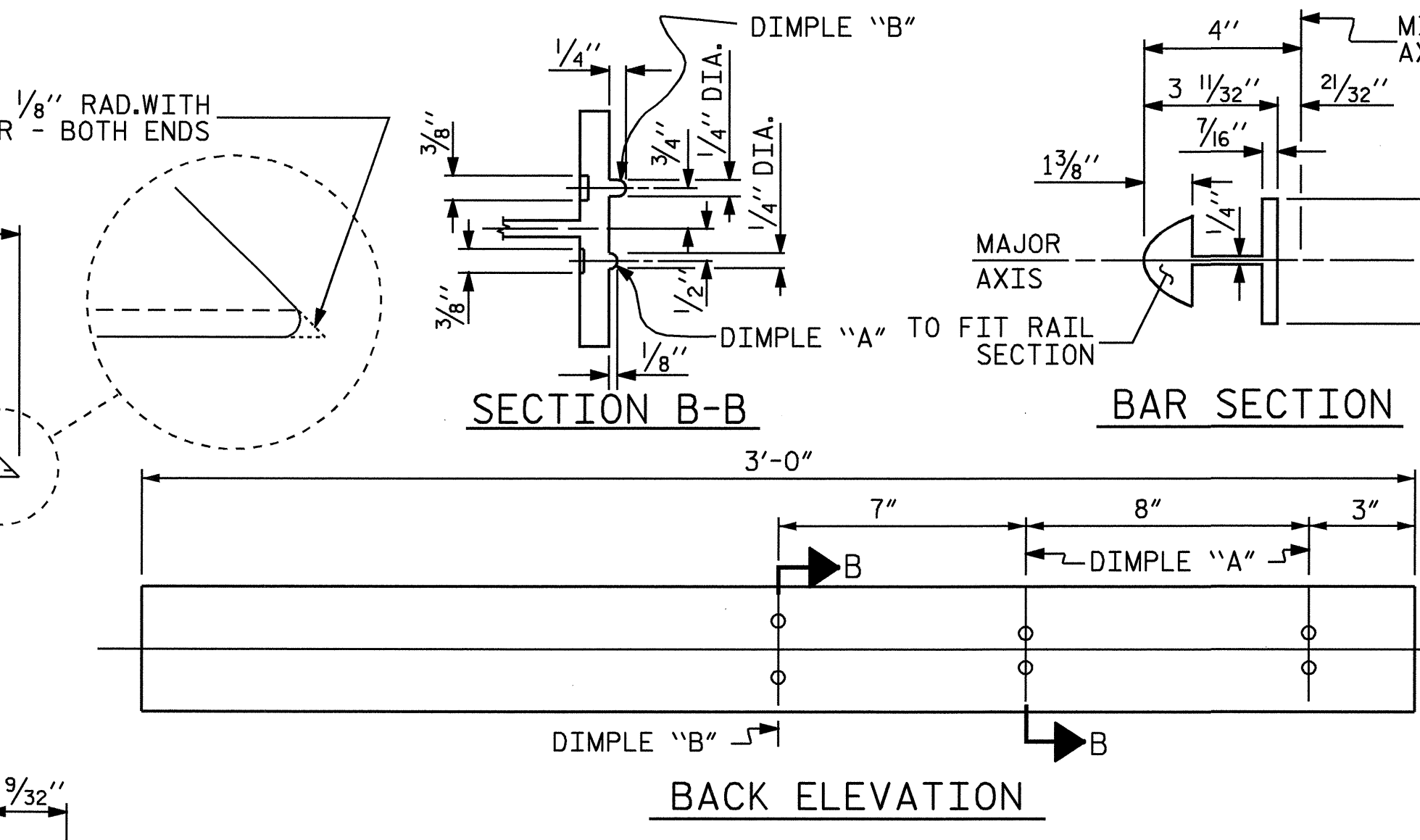
04-AUG-2009 10:51
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drwlthrow

STR. #2 STD. NO. BMR5



ASSEMBLED BY : N. Q. TRAN DATE : 2-09
 CHECKED BY : J. A. TILLMAN DATE : 4-13-09
 DRAWN BY : JMB 1/88 REV. 10/17/00 RWW/LES
 CHECKED BY : GGH 1/88 REV. 5/7/03 RWW/JTE
 REV. 5/1/06 TLA/GM

- NOTES
- STRUCTURAL CONCRETE ANCHOR ASSEMBLY
- THE STRUCTURAL CONCRETE ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- 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 AND 1 3/4" FOR 5/8" FERRULES.
 - 3 - 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.
 - 2 - 5/8" Ø X 2 1/4" 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 5/8" Ø X 2 1/4" 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.
 - 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.
 - THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.
 - 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.
 - BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.



PROJECT NO. B-3919
 WAKE COUNTY
 STATION: 38+12.60 -L-

SHEET 9 OF 12

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 3 BAR METAL RAIL

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	5-38	
1			3			TOTAL SHEETS	
2			4			51	

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 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 5/8" 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. WASHERS FOR RAIL ATTACHMENT SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.
- D. STANDARD CLAMP BARS (SEE SHEET 9 OF 12).

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 3 BAR METAL RAIL.

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.

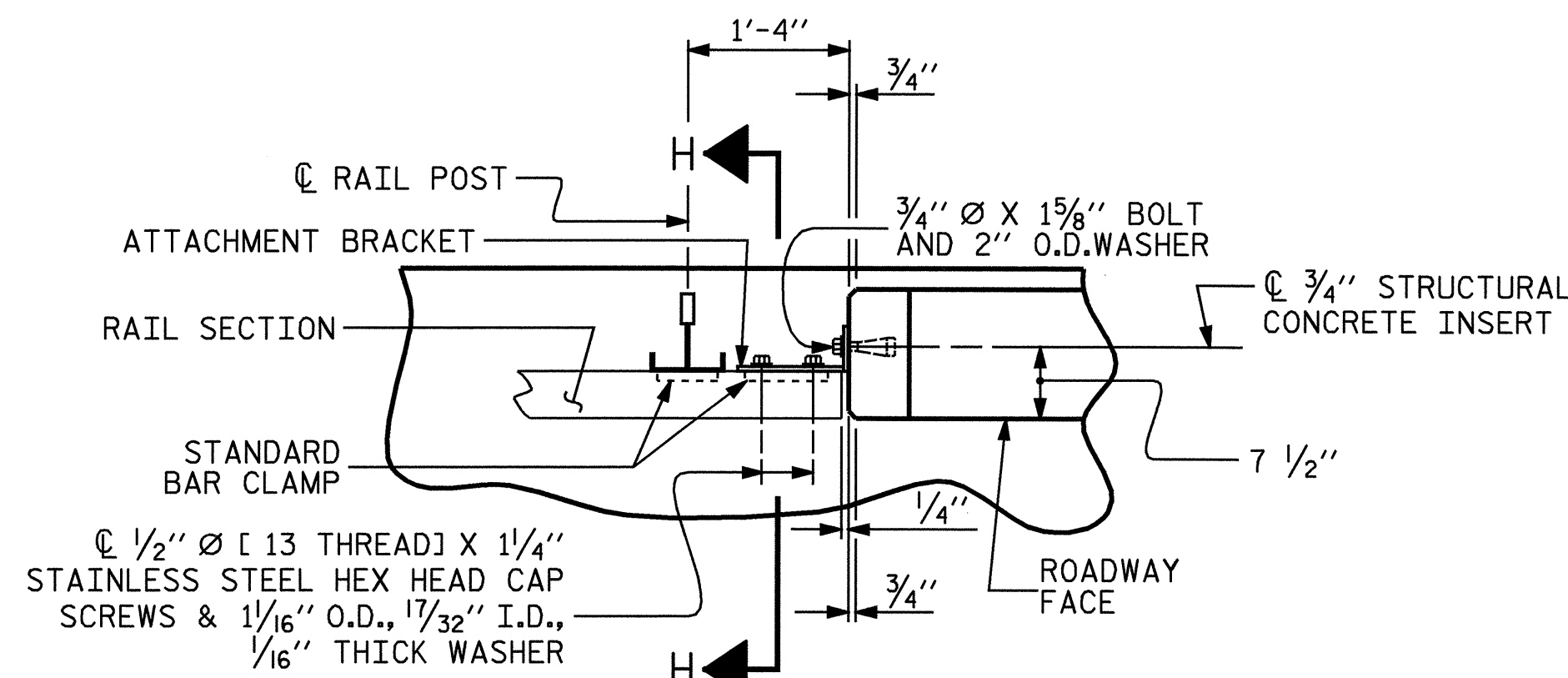
THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø X 1 5/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" Ø X 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE 3/4" Ø X 1 5/8" BOLT SHALL APPLY TO THE 3/4" Ø X 6 1/2" BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

NOTES

STRUCTURAL CONCRETE INSERT

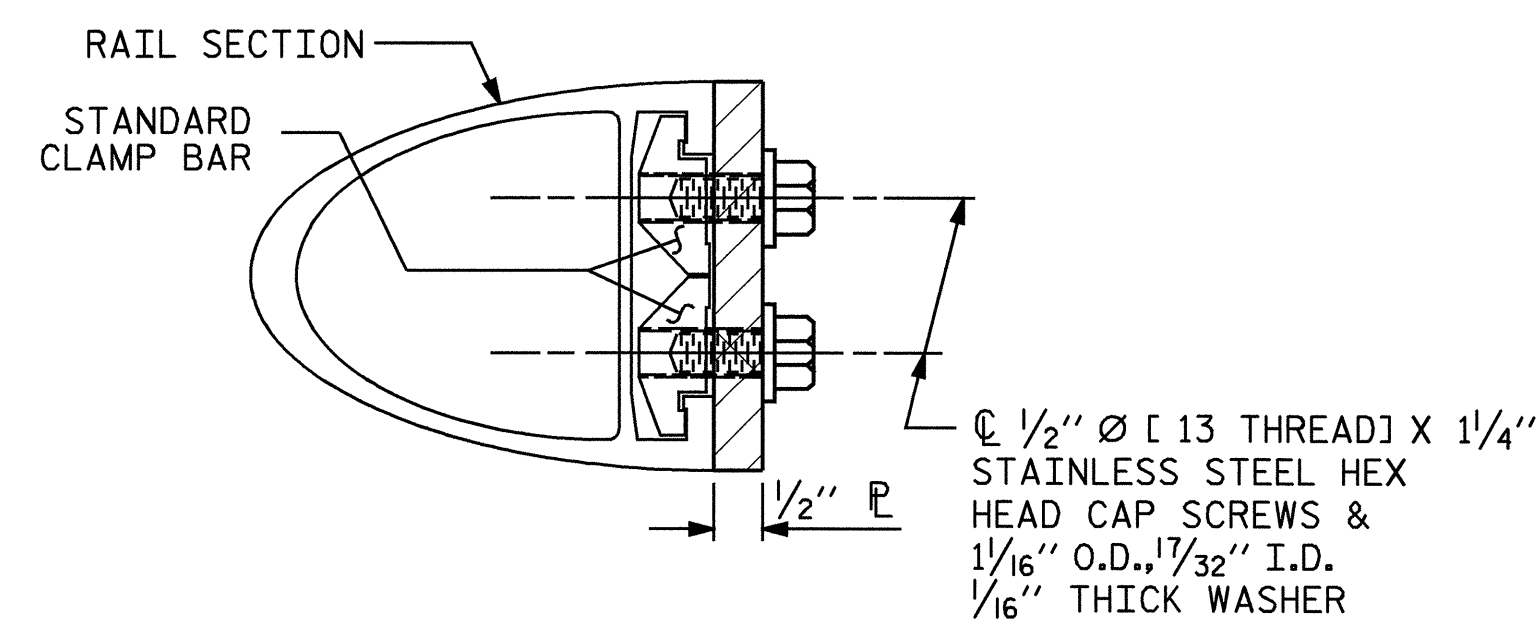
THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:

- 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 1/2".
- B. 1 - 3/4" Ø X 1 5/8" BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. AT THE CONTRACTORS OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 1 5/8" 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 1/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.



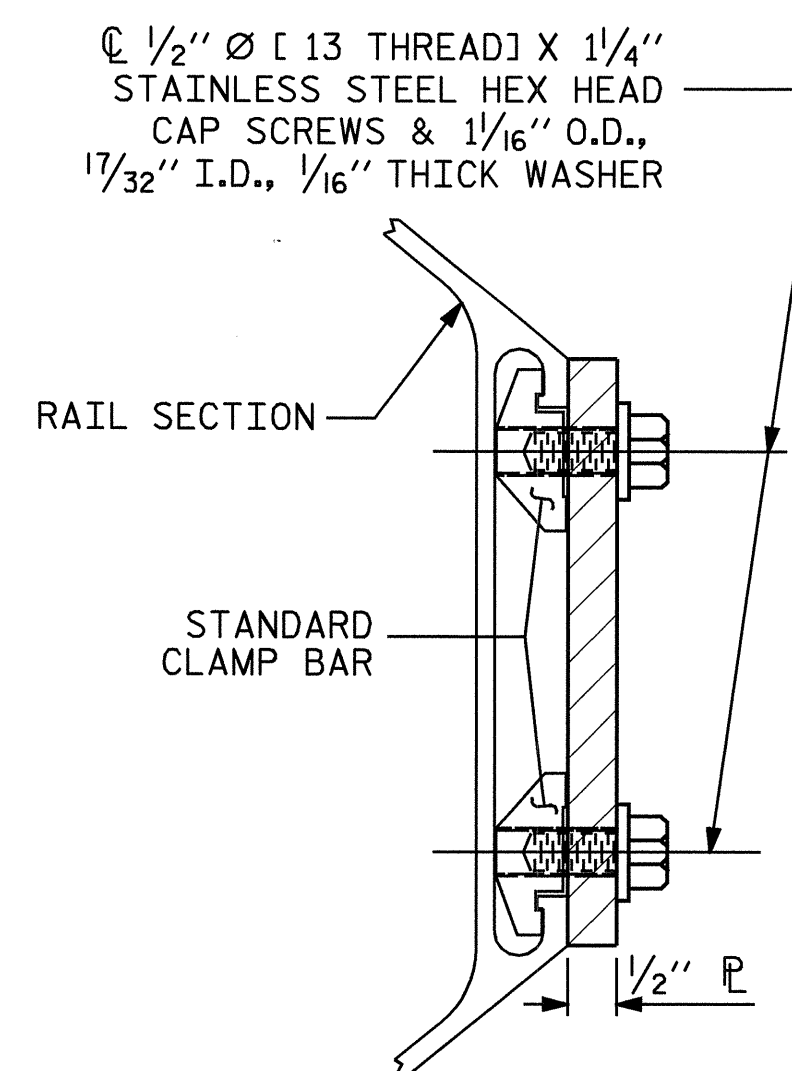
PLAN OF RAIL AND END POST

(STIFFENER ON 1/2" P NOT SHOWN FOR CLARITY)



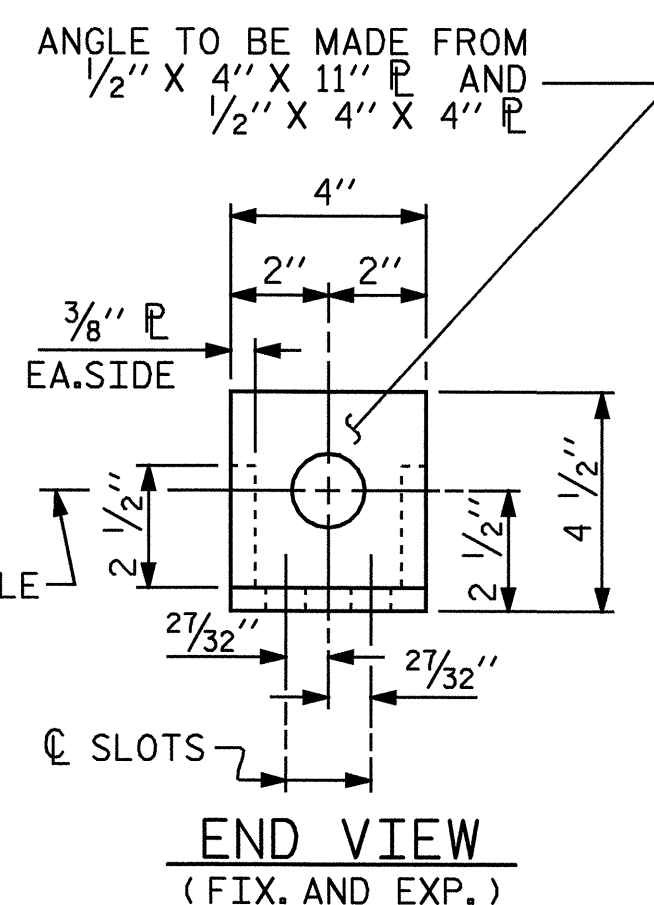
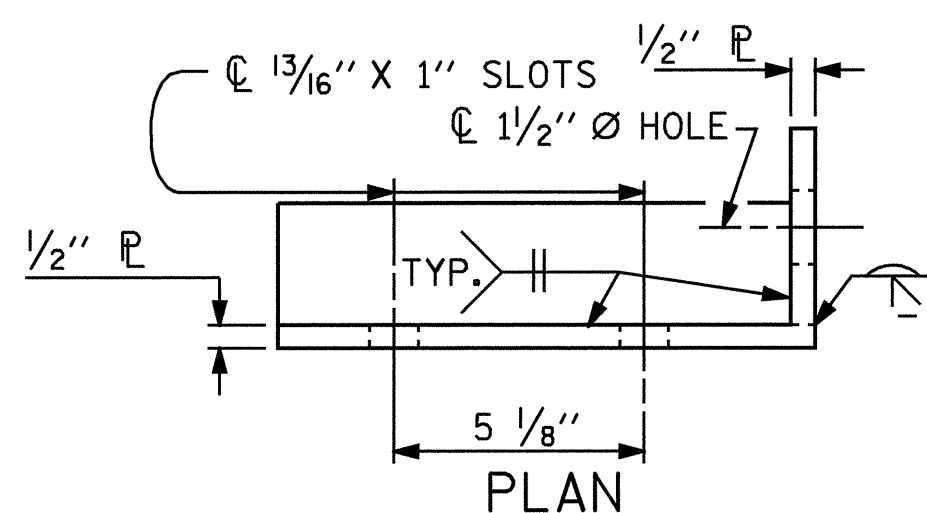
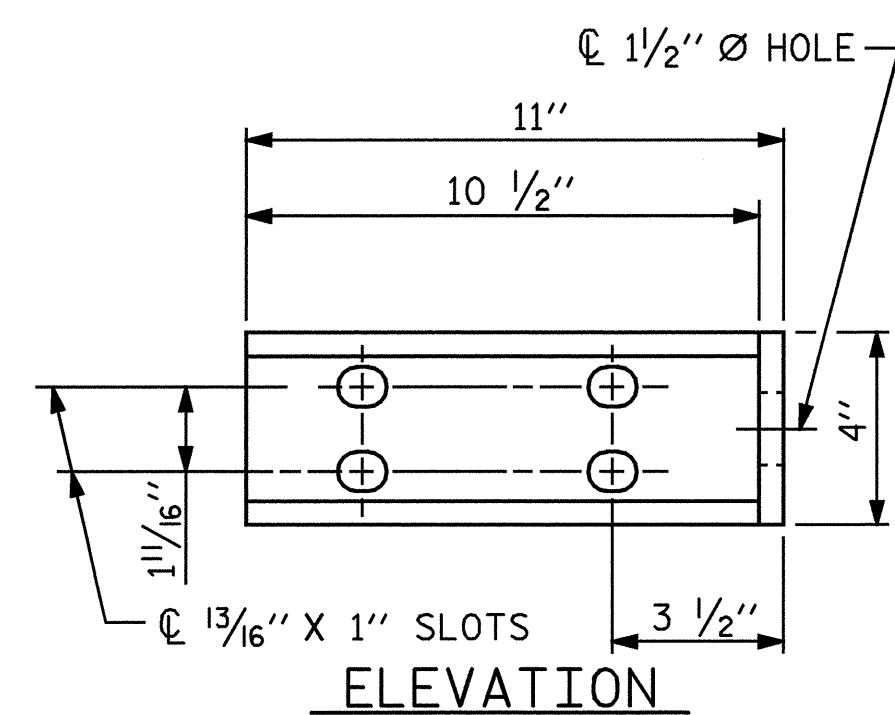
SECTION H-H

(FOR TOP & MIDDLE RAIL)



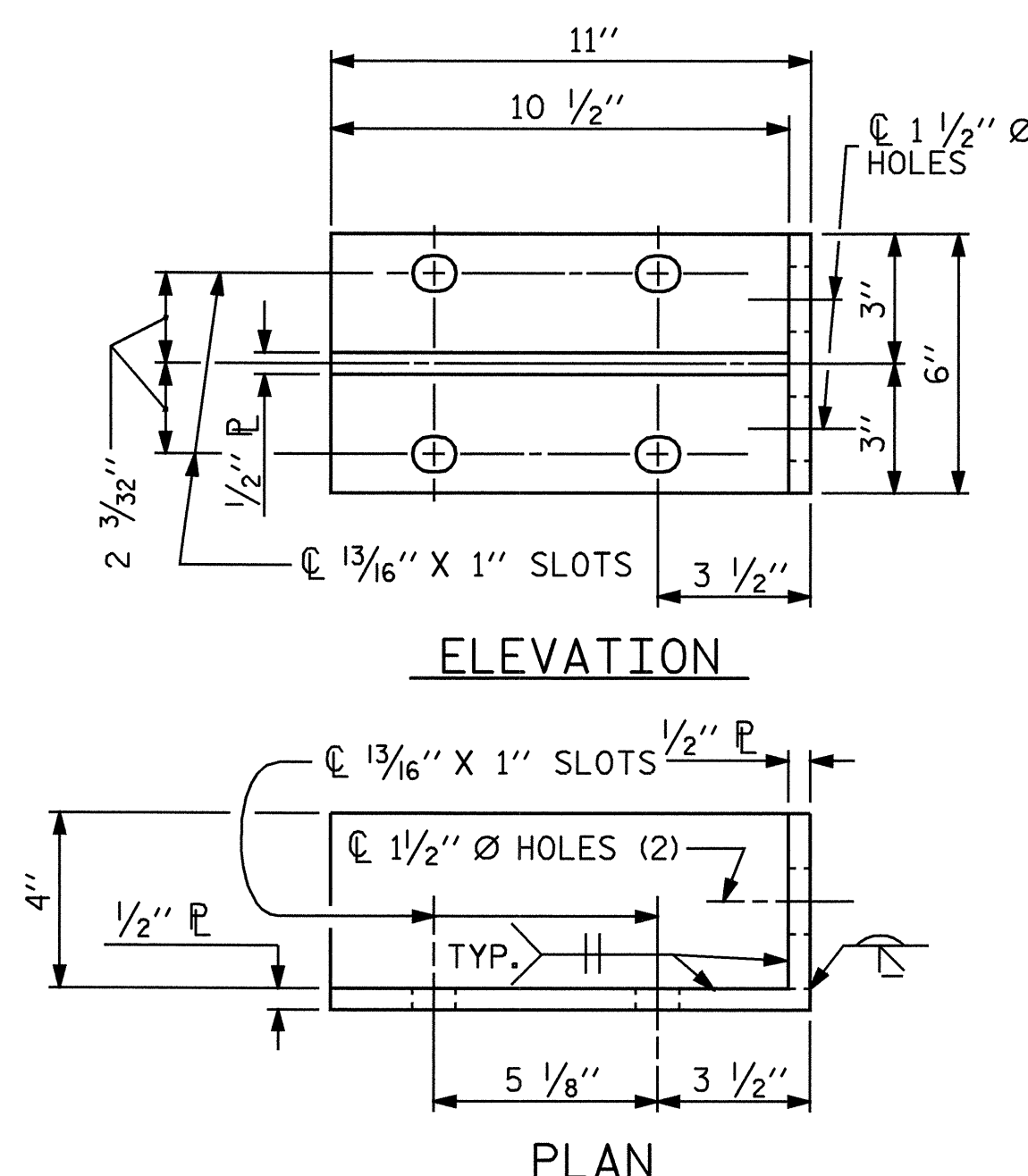
SECTION H-H

(FOR BOTTOM RAIL)



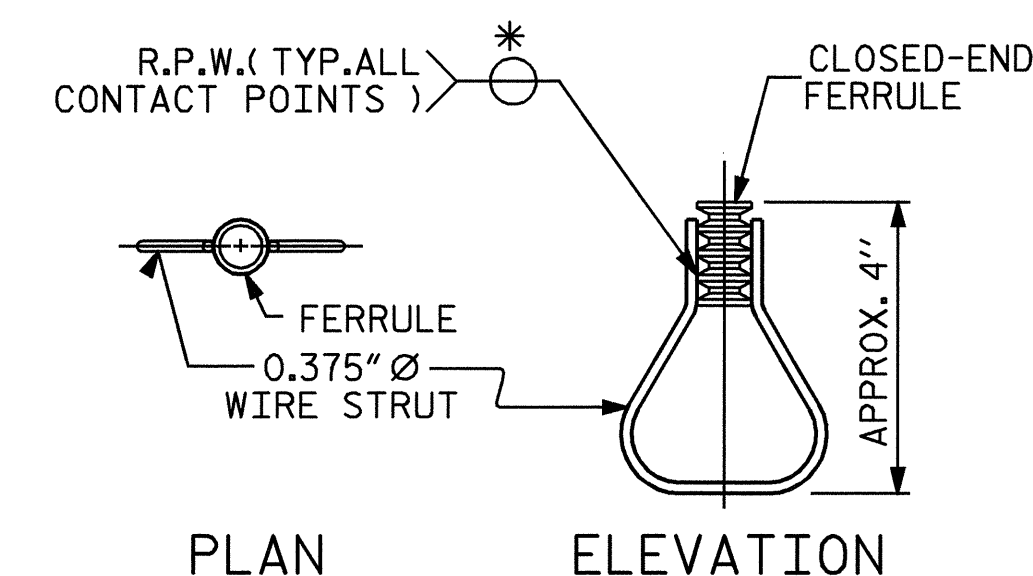
DETAILS FOR ATTACHMENT BRACKET

(TOP & MIDDLE RAIL ONLY)



DETAILS FOR ATTACHMENT BRACKET

(BOTTOM RAIL ONLY)



STRUCTURAL CONCRETE INSERT

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

PROJECT NO. B-3919

WAKE COUNTY

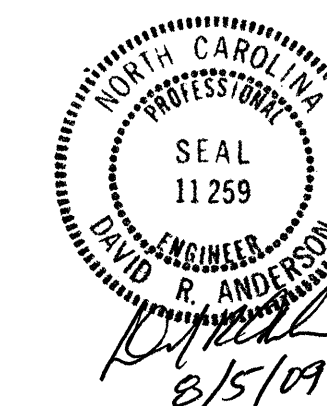
STATION: 38+12.60 -L-

SHEET 10 OF 12

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD

3 BAR METAL RAIL



ASSEMBLED BY :	N. Q. TRAN	DATE :	2-09
CHECKED BY :	J. A. TILLMAN	DATE :	4-13-09
DRAWN BY :	JMB 1/88	REV. 10/17/00	RWW/LES
CHECKED BY :	GGH 1/88	REV. 5/17/03	RWW/JTE
		REV. 5/1/06	TLA/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-39
1			3			TOTAL SHEETS
2			4			51

NOTES

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

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

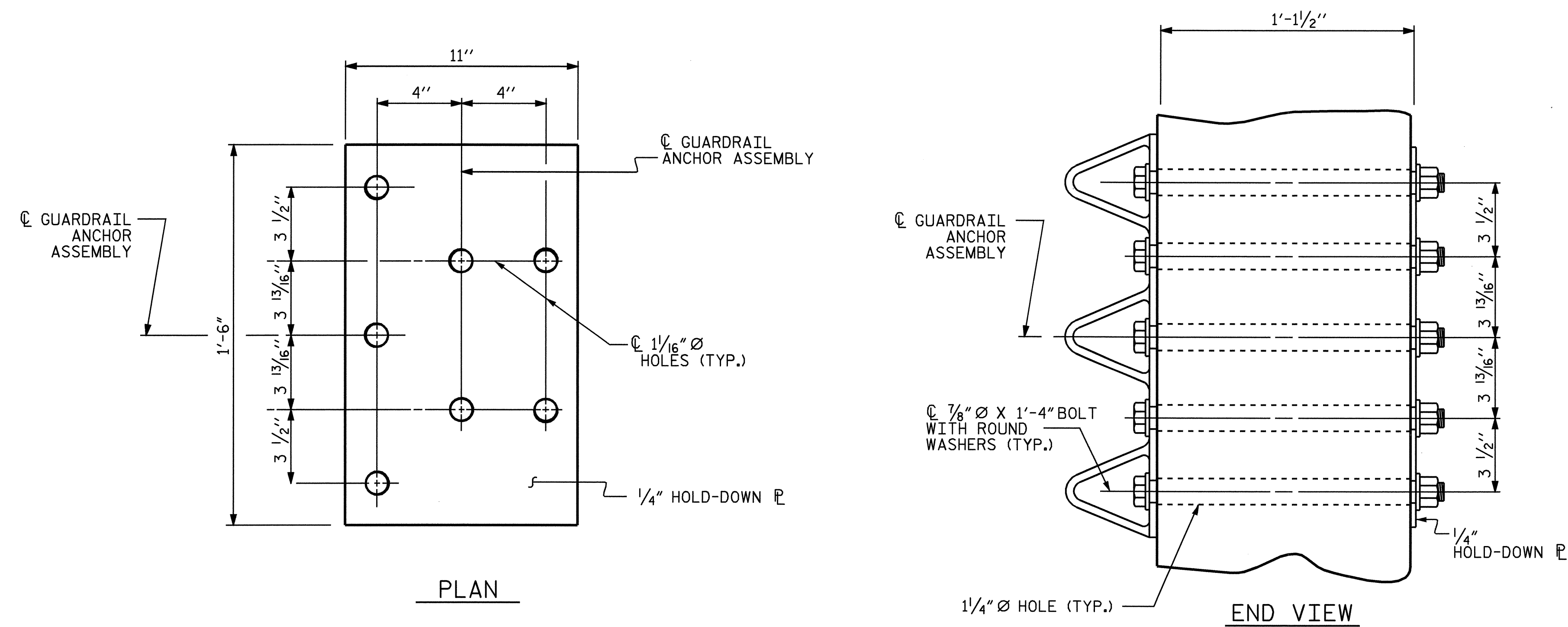
BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A309. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

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

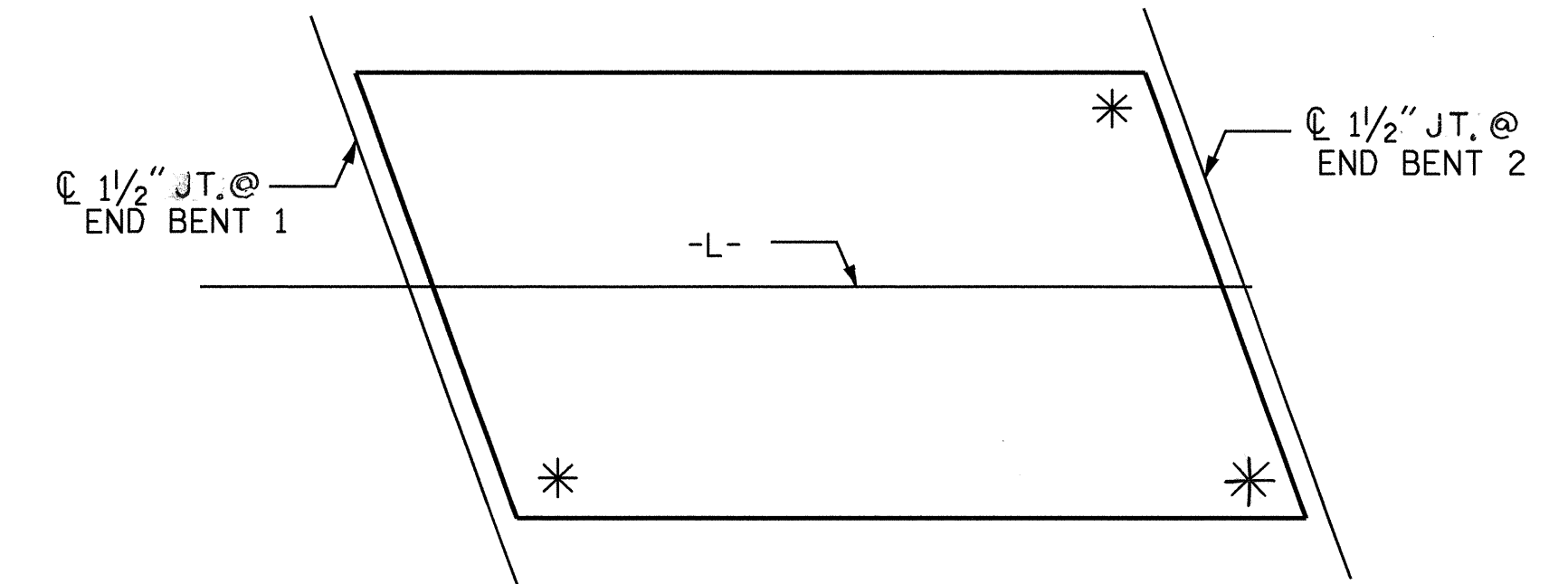
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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

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

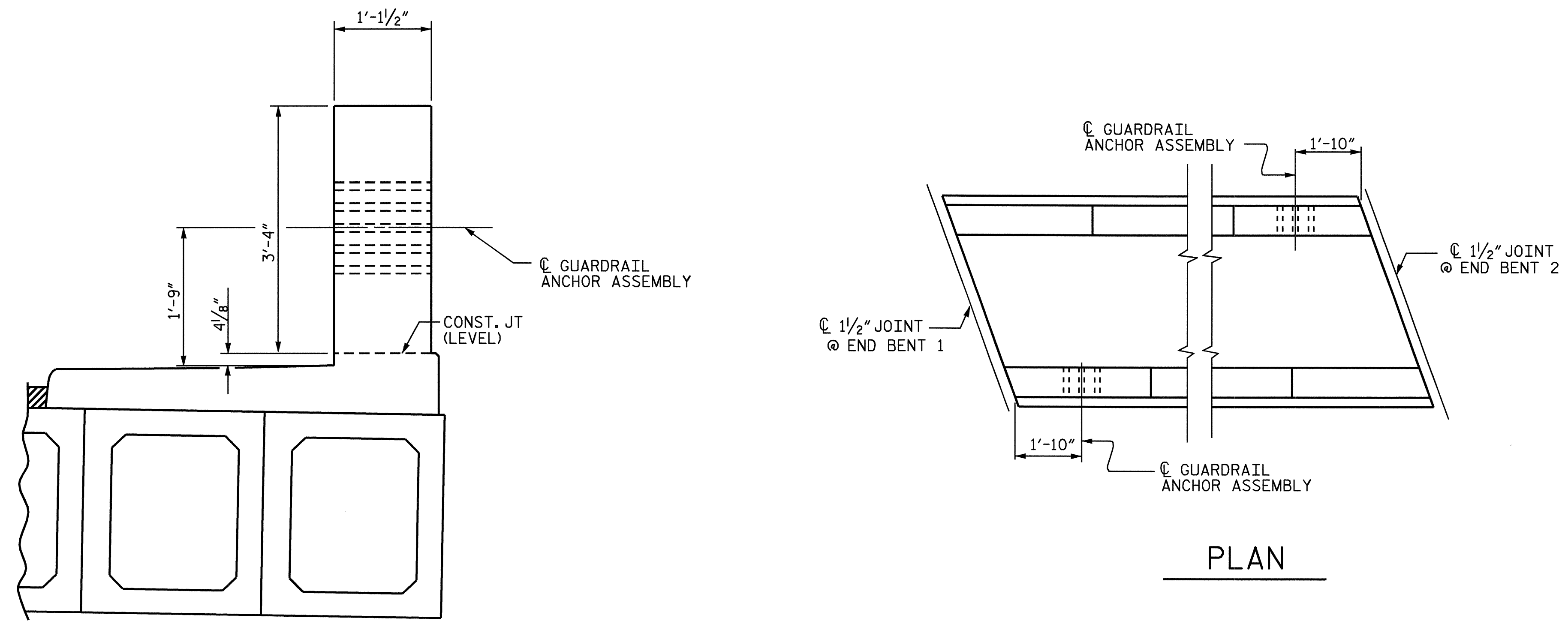


PLAN
GUARDRAIL ANCHOR ASSEMBLY DETAILS



SKETCH SHOWING POINTS OF ATTACHMENT

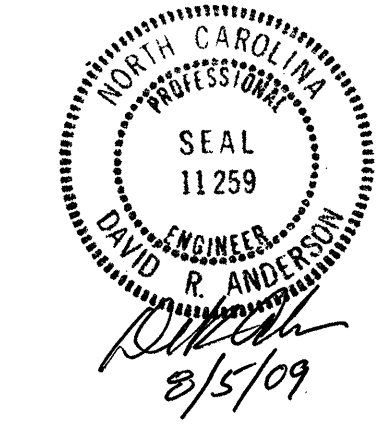
* LOCATION OF GUARDRAIL ATTACHMENT



END VIEW
LOCATION OF GUARDRAIL ANCHOR AT END POST

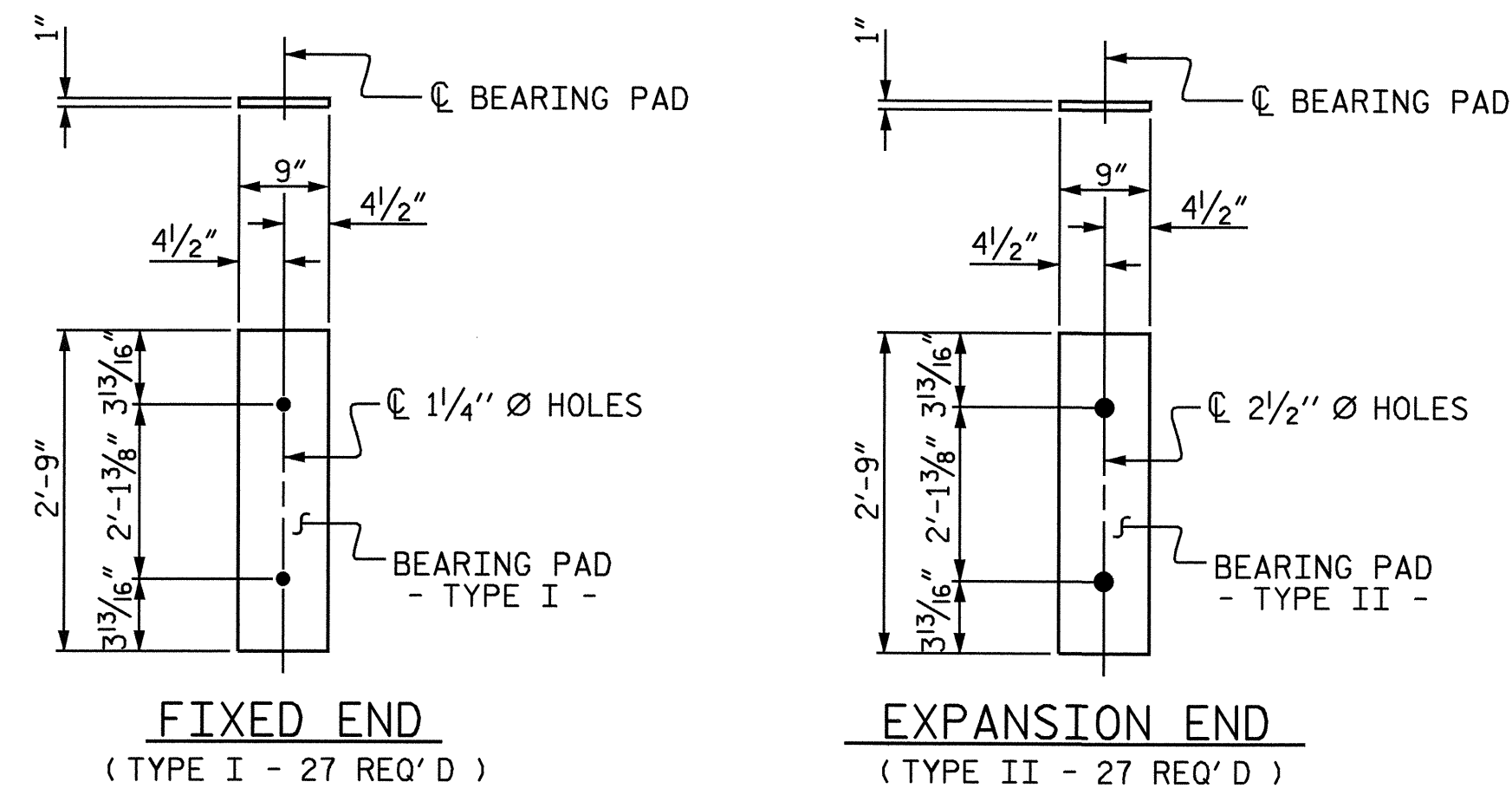
ASSEMBLED BY : N. Q. TRAN	DATE : 2-09
CHECKED BY : J.A. TILLMAN	DATE : 4-13-09
DRAWN BY : WJH 4/89	REV. 10/17/00 RWW/LES
CHECKED BY : FCJ 5/89	REV. 5/7/03 RWW/JTE
	REV. 5/1/06 TLA/GM

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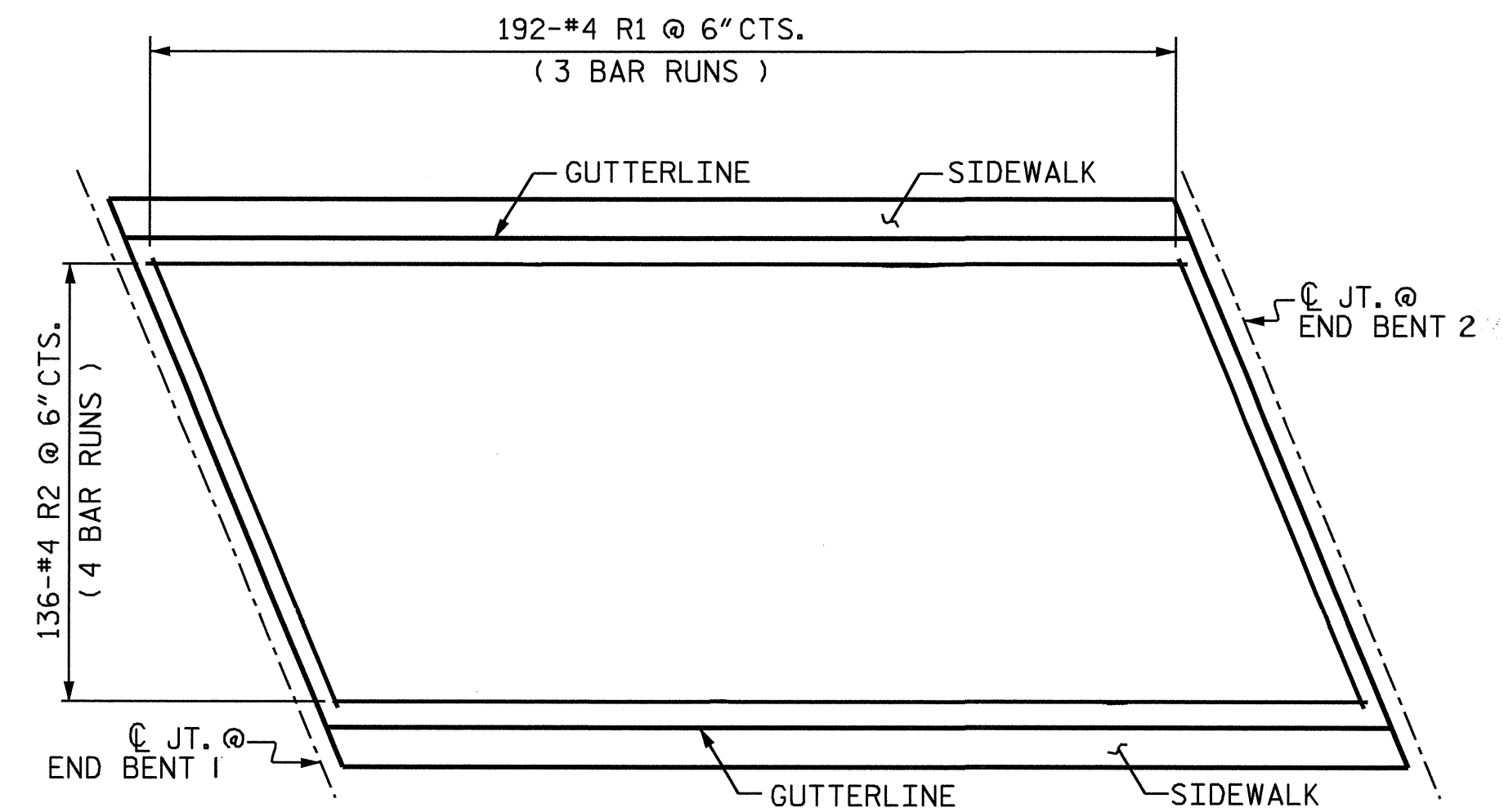


PROJECT NO. B-3919
WAKE COUNTY
 STATION: 38+12.60 -L-
 SHEET 11 OF 12

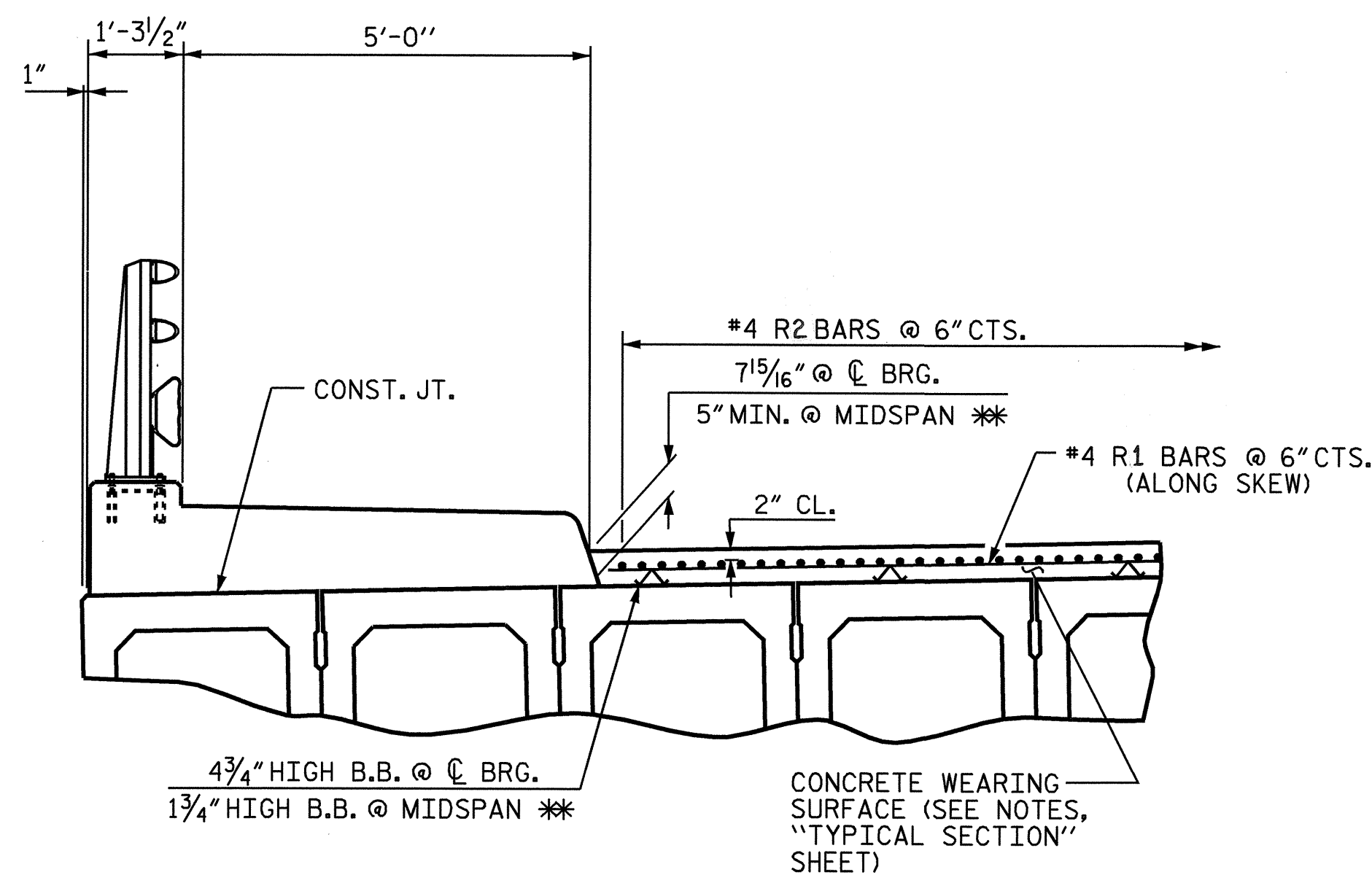
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD GUARDRAIL ANCHORAGE DETAILS FOR METAL RAIL					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
TOTAL SHEETS					51



ELASTOMERIC BEARING DETAILS



PLAN SHOWING CONCRETE WEARING SURFACE REINFORCING STEEL



REINFORCING FOR CONCRETE WEARING SURFACE

* BASED ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATIONS

BILL OF MATERIAL FOR CONCRETE WEARING SURFACE					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*R1	576	#4	STR	27'-5"	10,549
*R2	544	#4	STR	25'-5"	9,236
* EPOXY COATED REINFORCING STEEL					LBS. 19,785
CONCRETE WEARING SURFACE					SQ. FT. 6,566

BOX BEAM UNITS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
SPAN A			
EXTERIOR	2	97'-4 3/4"	194'-9 1/2"
INTERIOR	25	97'-4 3/4"	2434'-10 3/4"
TOTAL	27		2629'-8 1/4"

GROOVING BRIDGE FLOORS	
APPROACH SLABS	1530 SQ.FT.
BRIDGE DECK	6253 SQ.FT.
TOTAL	7783 SQ.FT.

SPLICE LENGTH CHART	
BAR SIZE	EPOXY COATED
#4	2'-0"

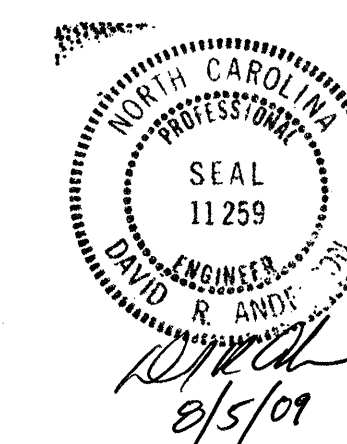
PROJECT NO. B-3919
WAKE COUNTY
 STATION: 38+12.60 -L-

SHEET 12 OF 12

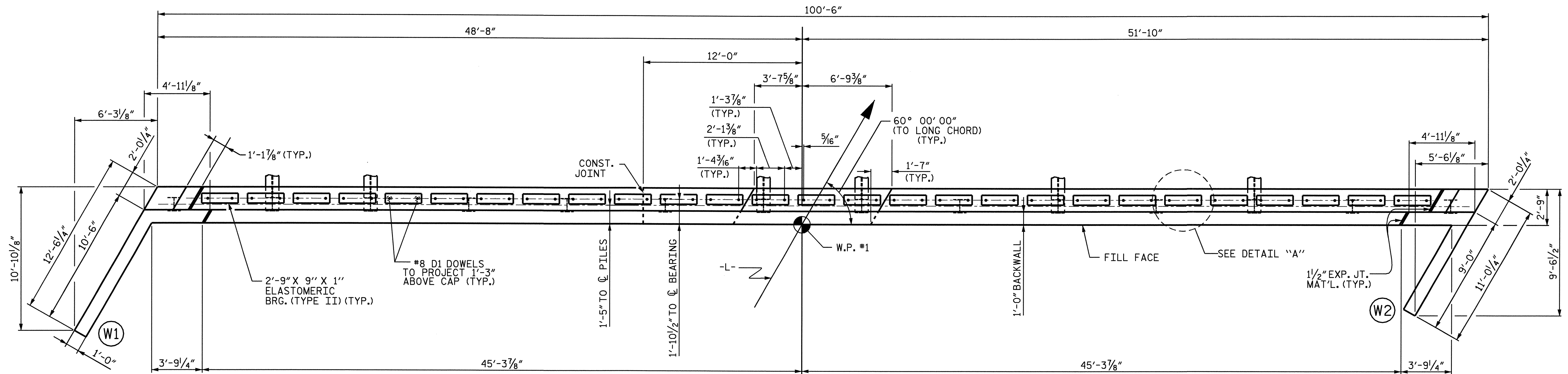
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

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

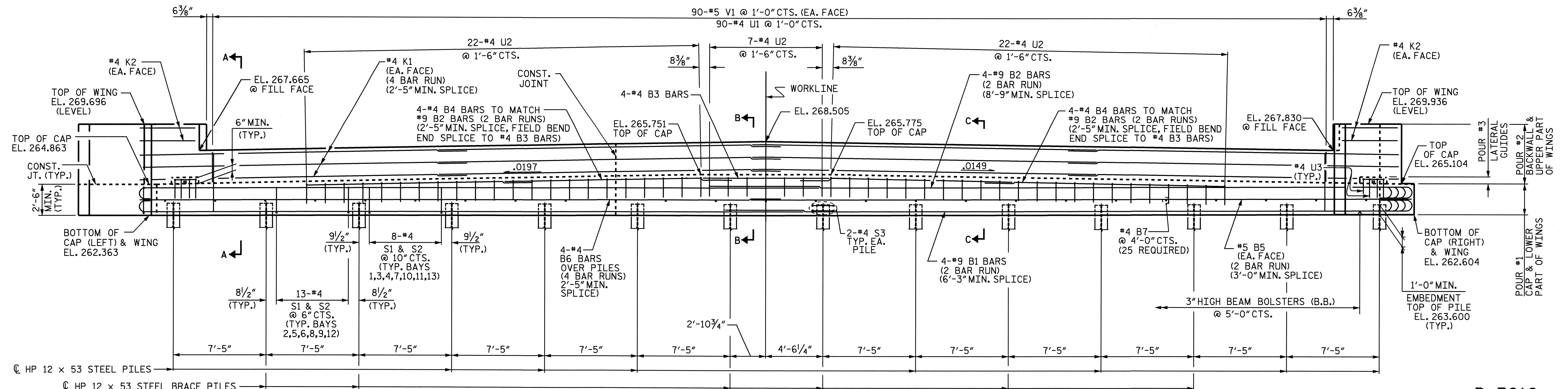
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-41
1			3			TOTAL SHEETS
2			4			51



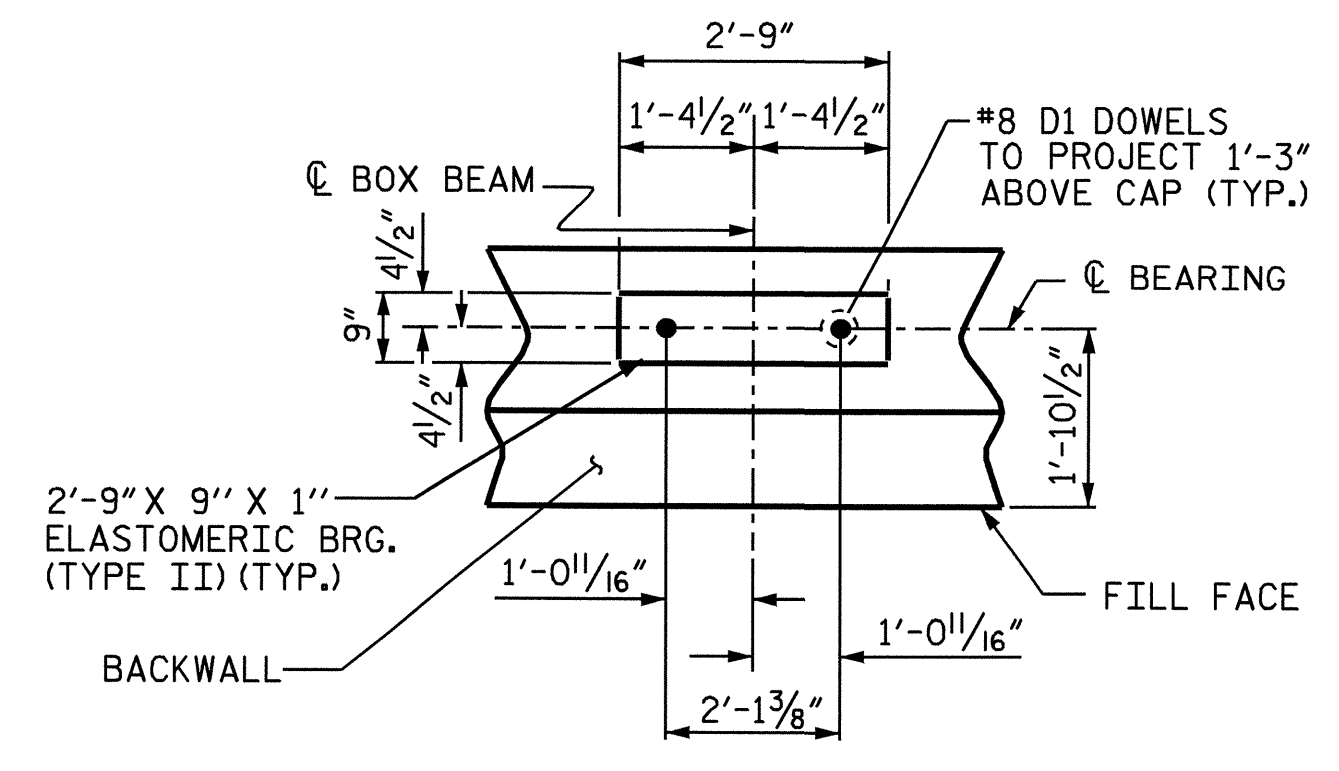
ASSEMBLED BY : N. Q. TRAN DATE : 2-09
 CHECKED BY : J.A. TILLMAN DATE : 4-13-09



PLAN



ELEVATION



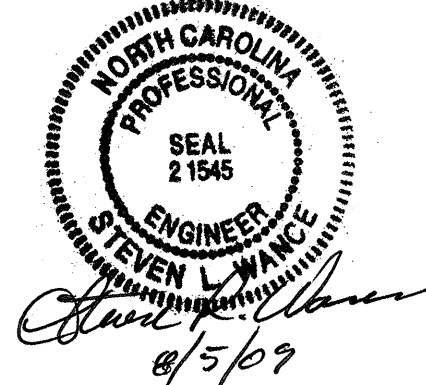
DETAIL "A"

NOTES:

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

THE LATERAL GUIDES AT EACH END OF THE CAP ARE NOT TO BE POURED UNTIL AFTER THE BOX BEAM UNITS ARE IN PLACE.

THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS. SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.



PROJECT NO. B-3919
 WAKE COUNTY
 STATION: 38+12.60 -L-

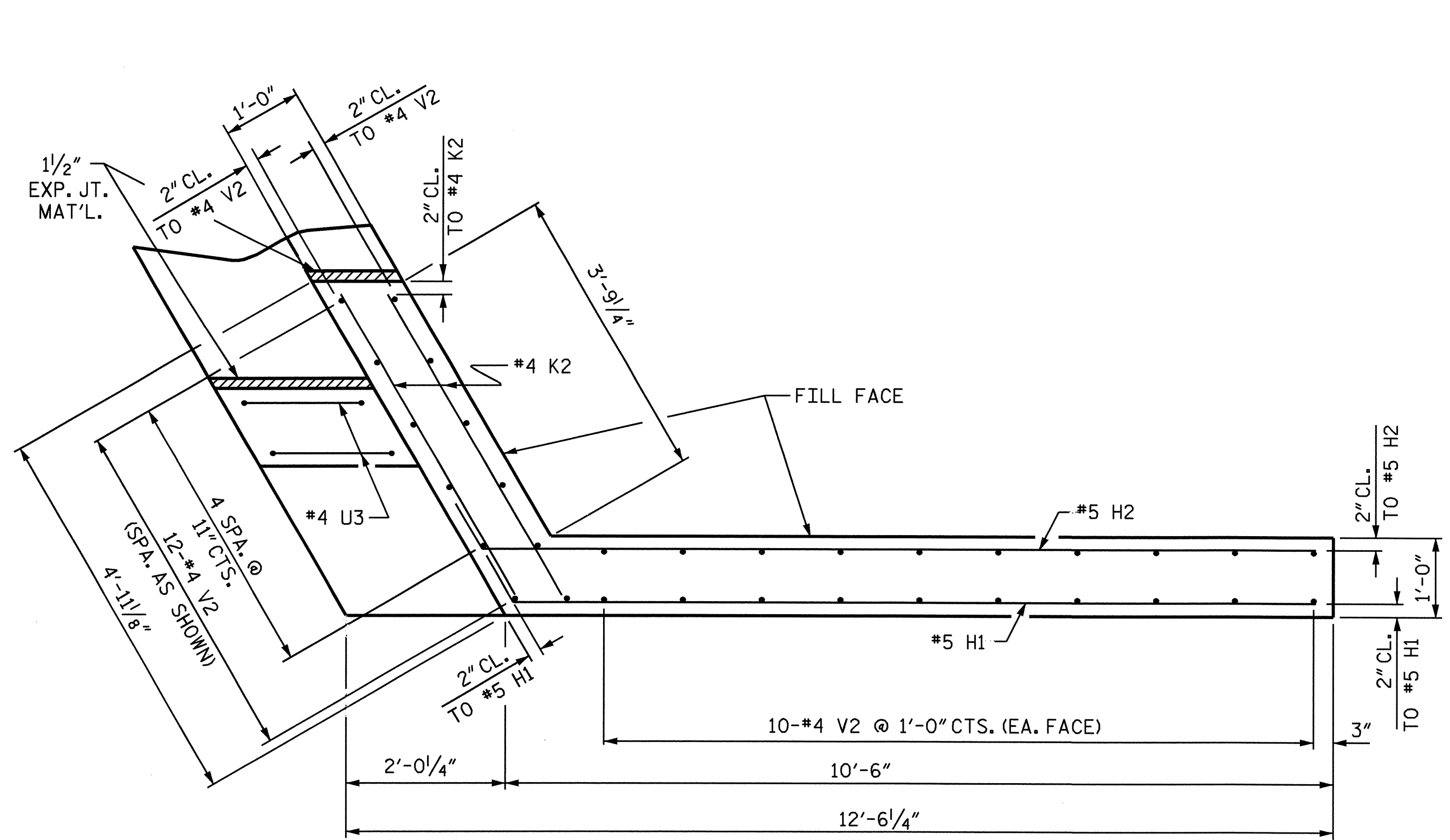
SHEET 1 OF 3

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-42
1			3			TOTAL SHEETS
2			4			51

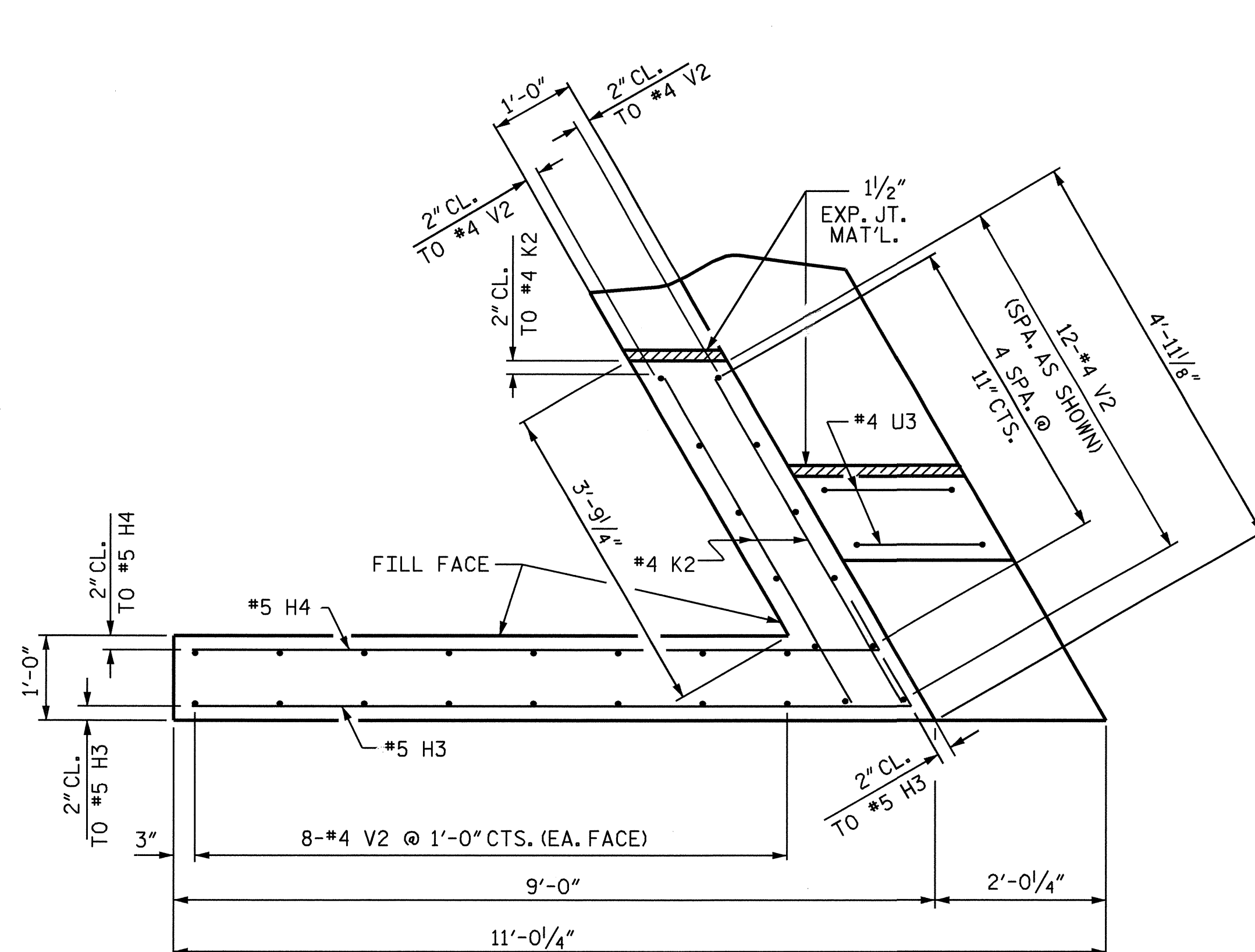
DRAWN BY: S.L. WANCE DATE: 04-06-09
 CHECKED BY: J.A. TILLMAN DATE: 06-09-09

04-AUG-2009 11:42
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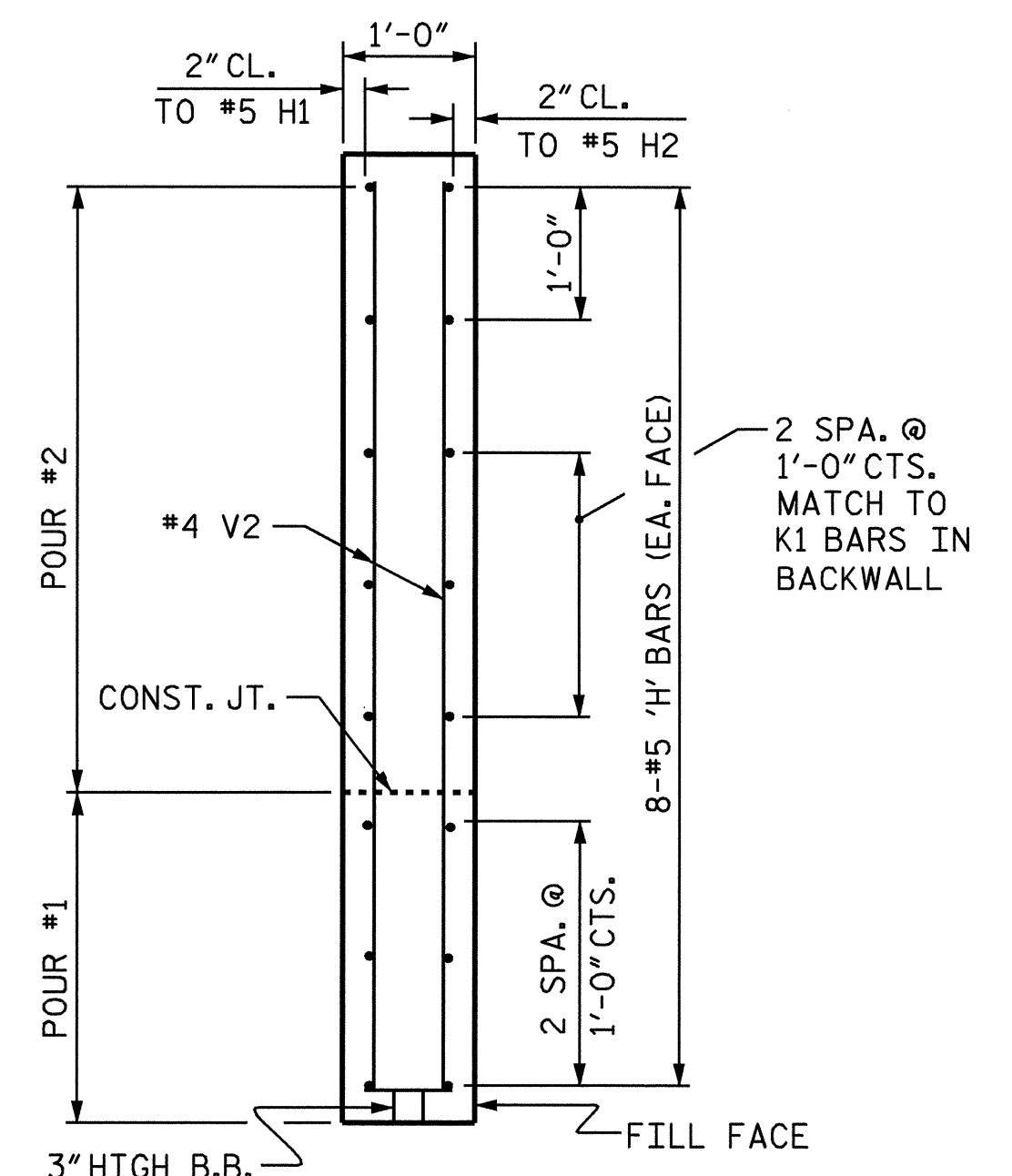
STR. #2



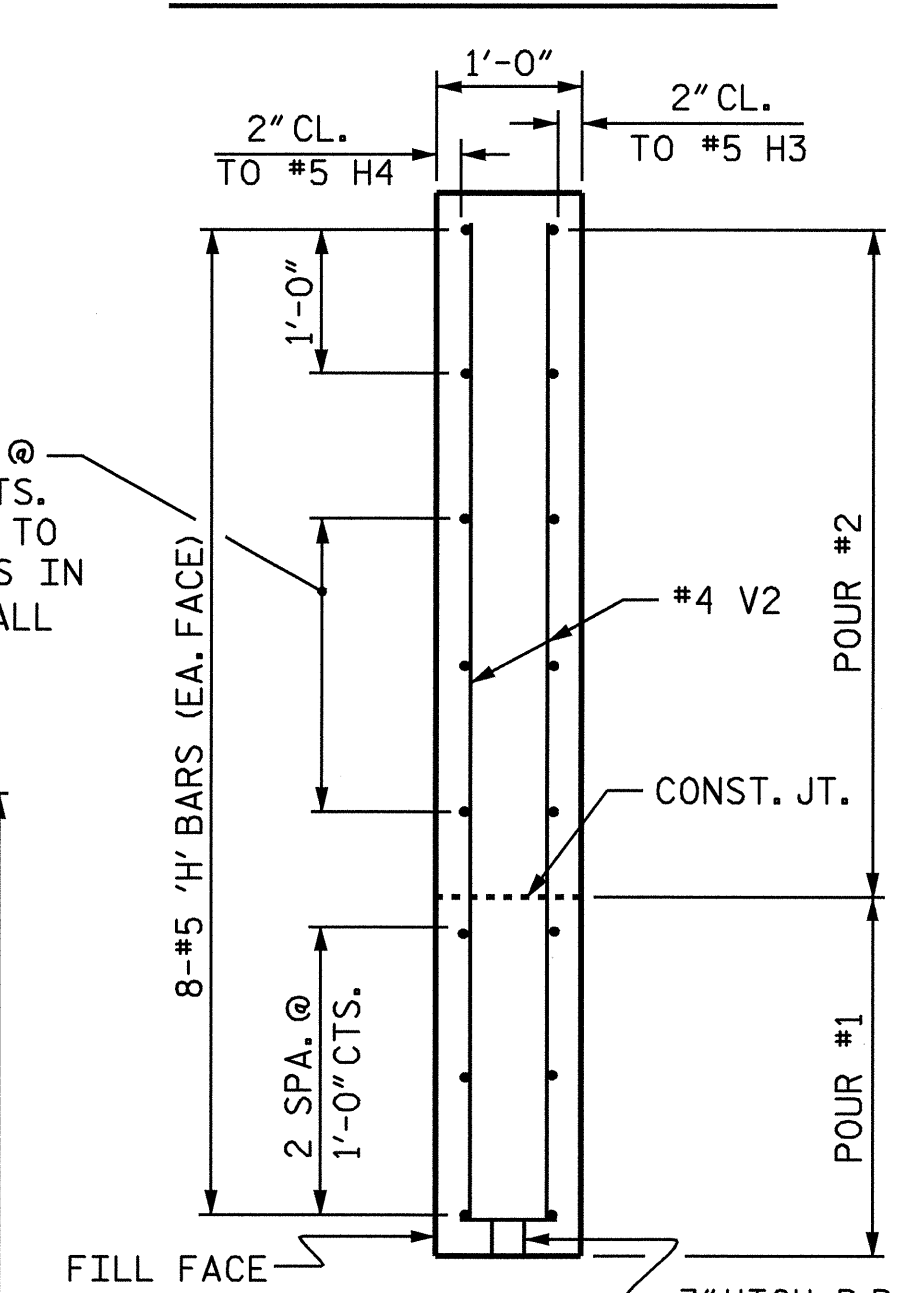
PLAN OF WING (W1)



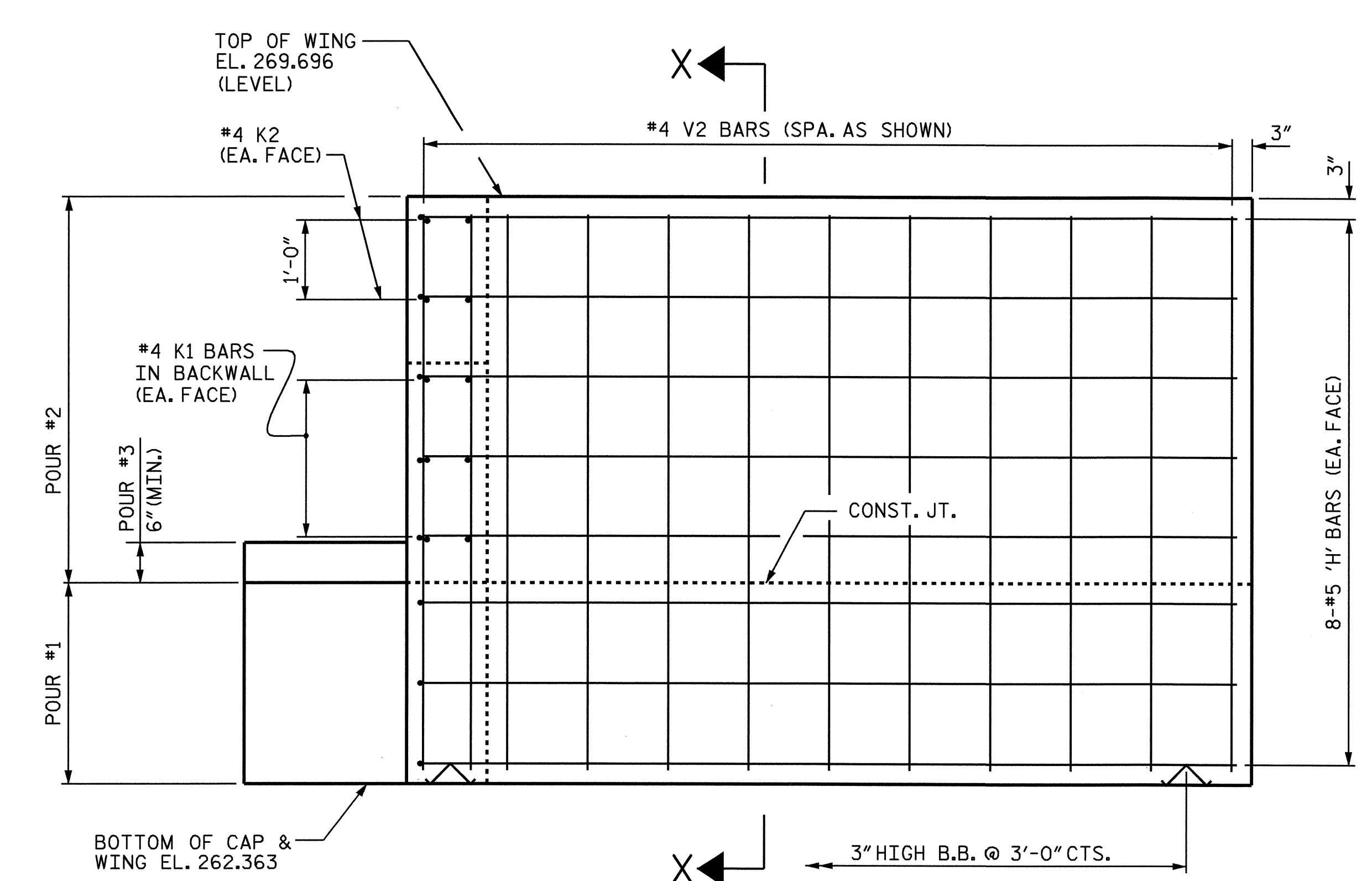
PLAN OF WING (W2)



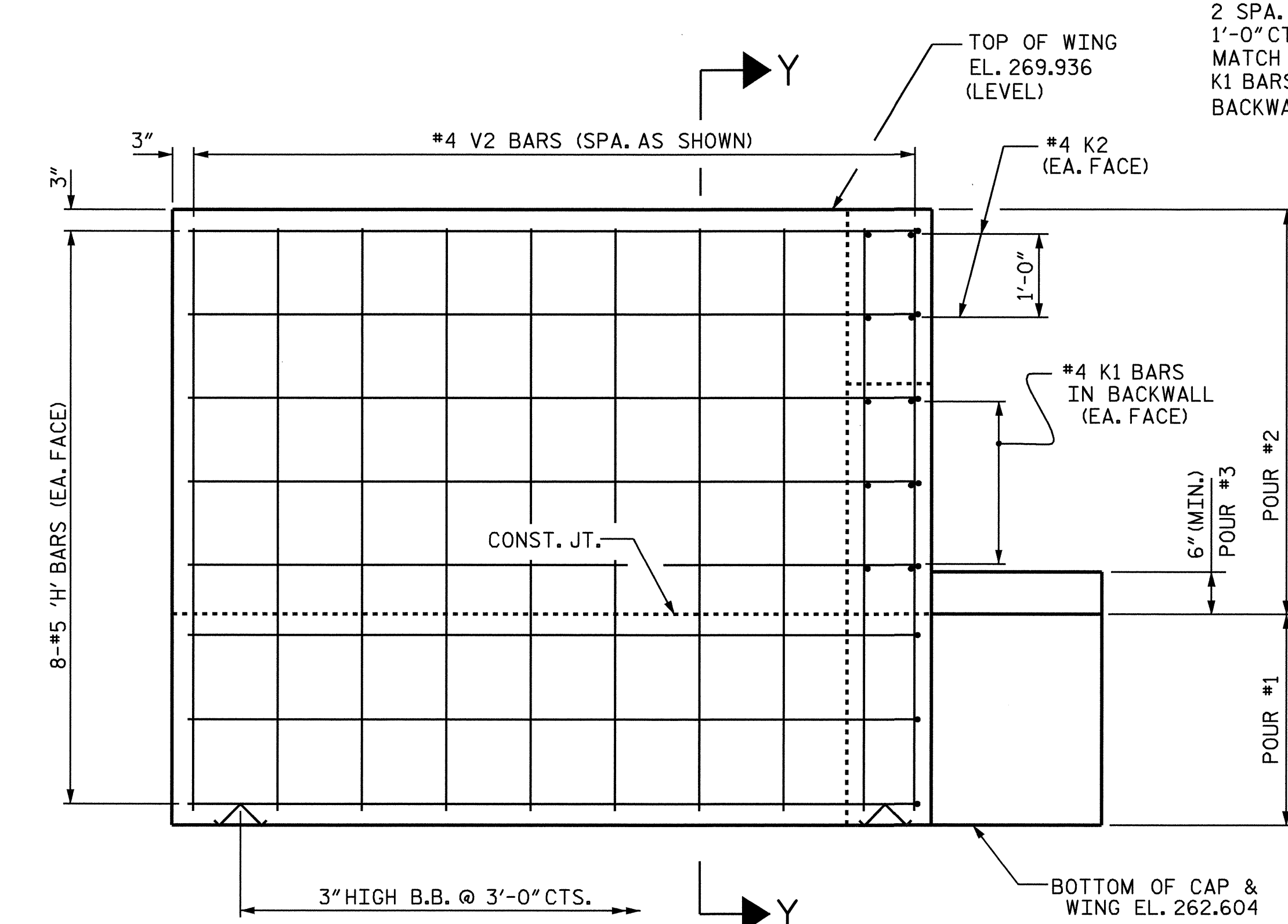
SECTION X-X



SECTION Y-Y



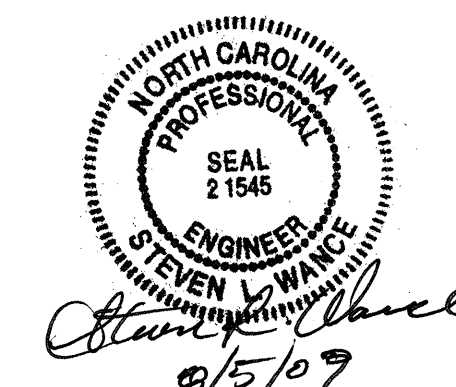
ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

PROJECT NO. B-3919
 WAKE COUNTY
 STATION: 38+12.60 -L-
 SHEET 2 OF 3

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

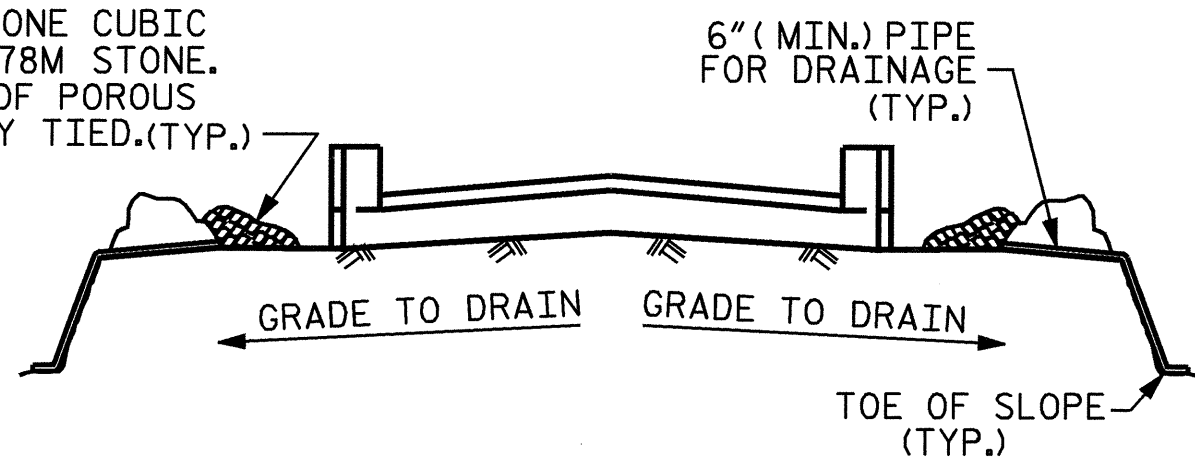


DRAWN BY: S.L. WANCE DATE: 04-07-09
 CHECKED BY: J.A. TILLMAN DATE: 06-09-09

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	5-43	
1			3			TOTAL SHEETS	
2			4			51	

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 swance

MINIMUM OF 3- ONE CUBIC FOOT BAGS OF #78M STONE. BAGS SHALL BE OF POROUS FABRIC, SECURELY TIED.(TYP.)

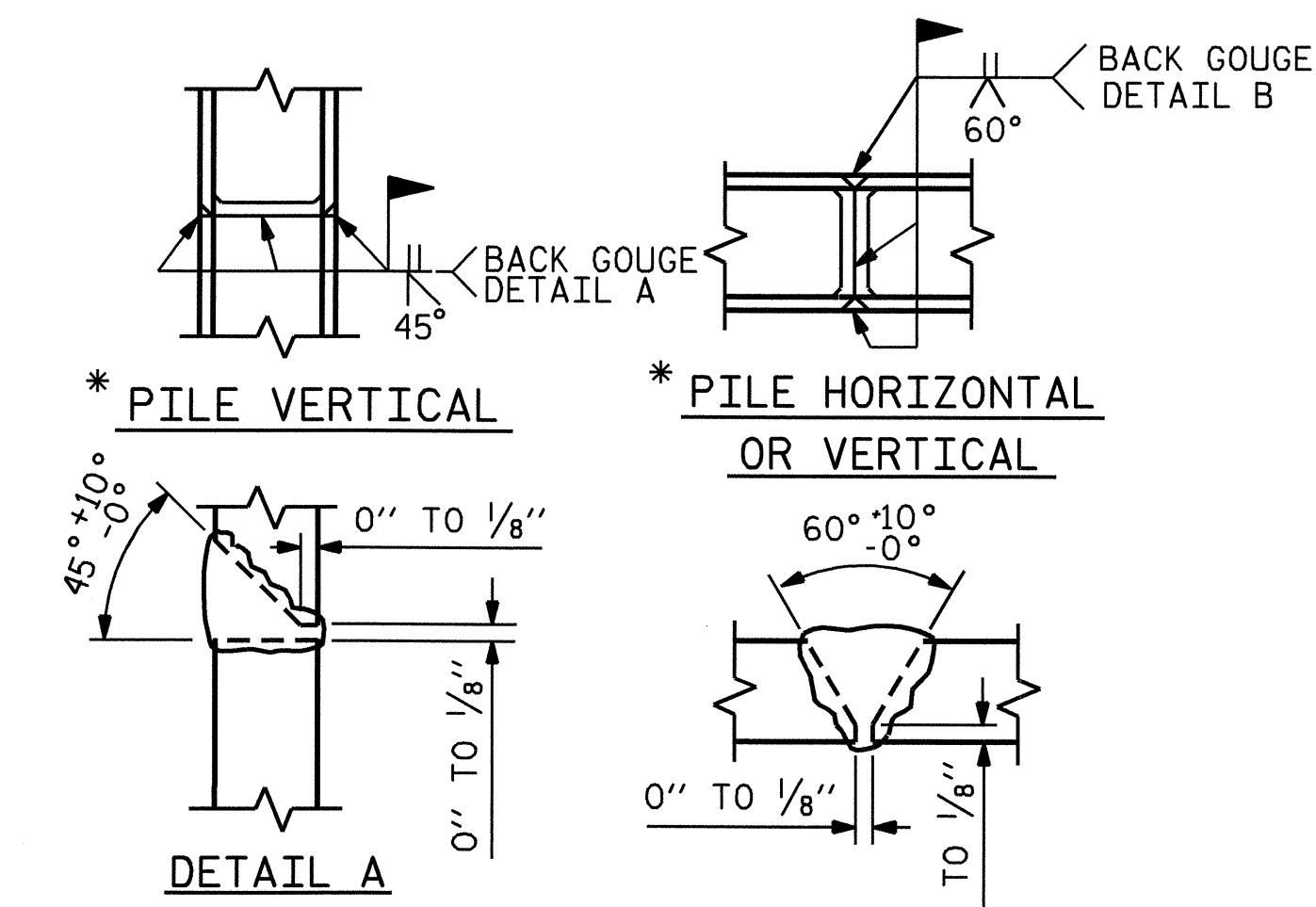


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

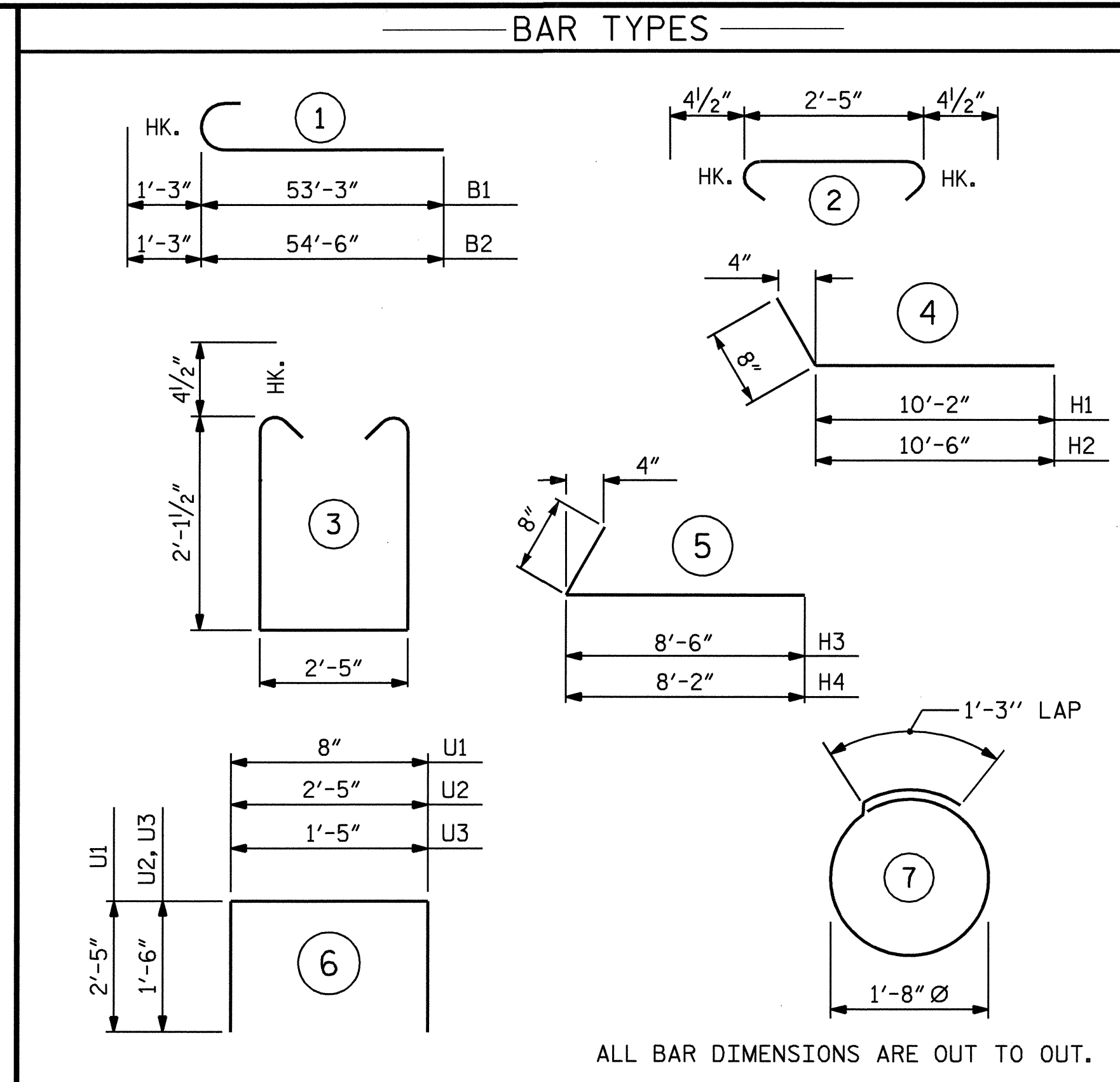
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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



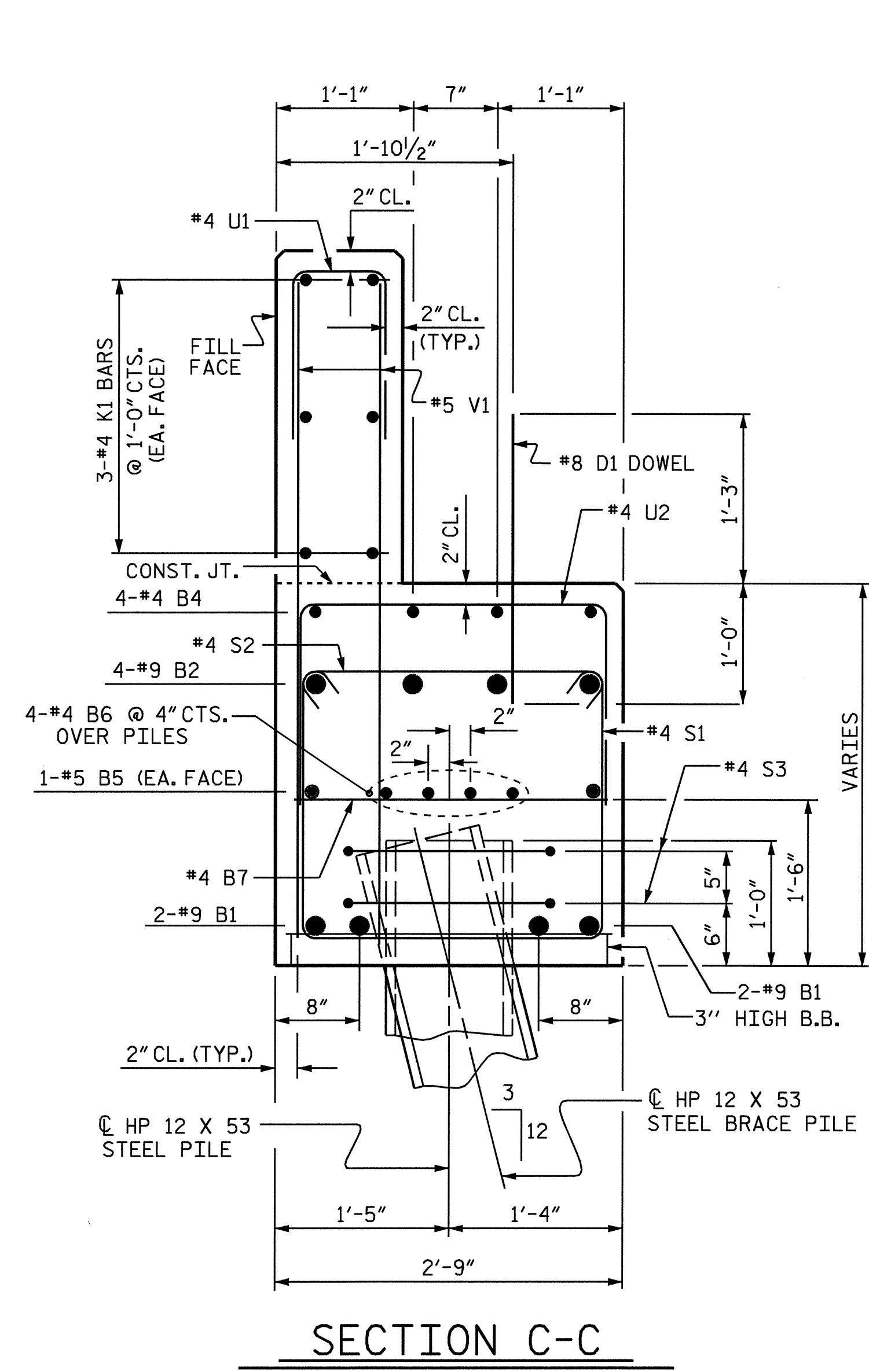
* POSITION OF PILE DURING WELDING. PILE SPLICE DETAILS



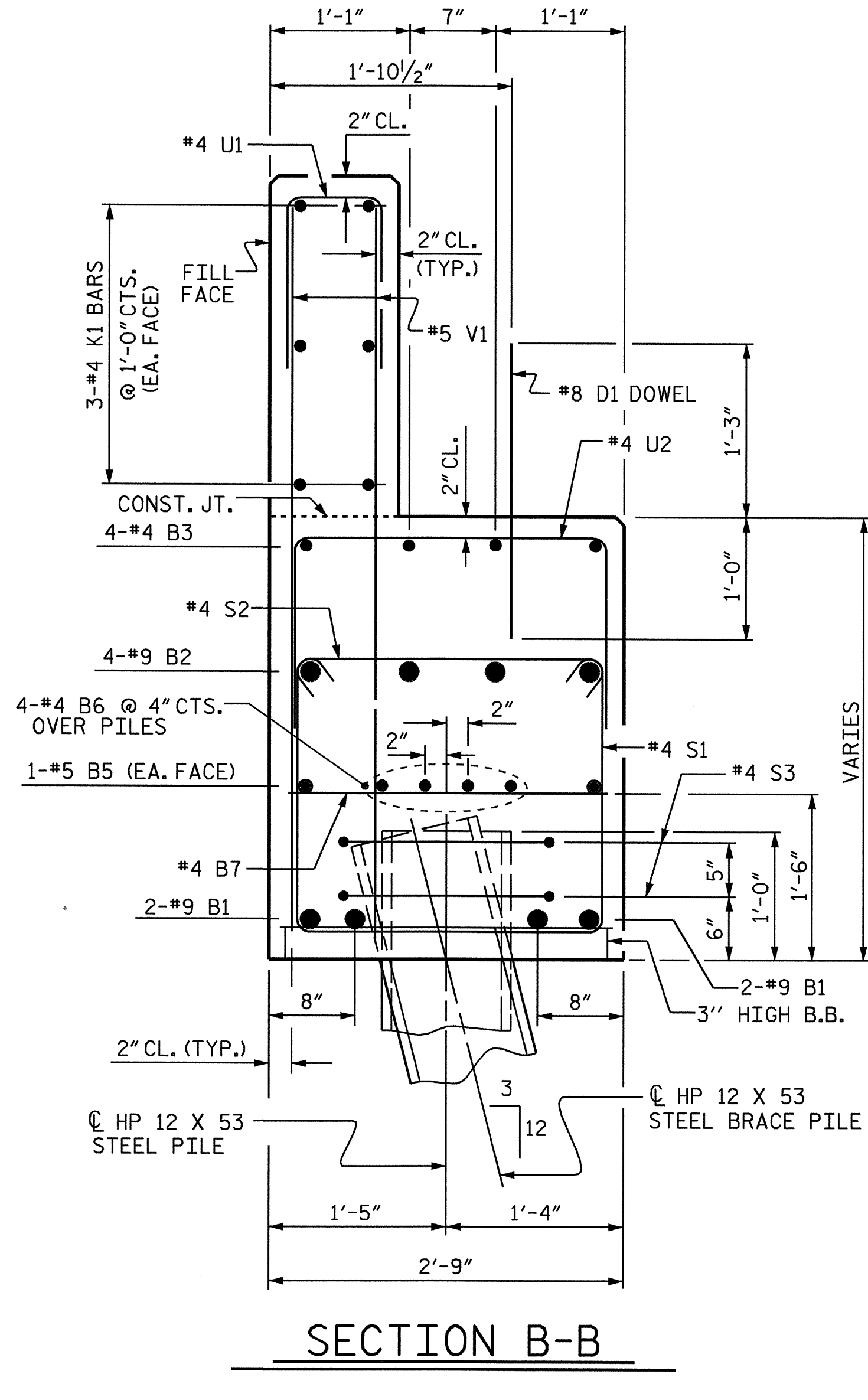
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	54'-6"	1482
B2	8	#9	1	55'-9"	1516
B3	4	#4	STR	10'-4"	28
B4	16	#4	STR	18'-3"	195
B5	4	#5	STR	51'-8"	216
B6	16	#4	STR	26'-11"	288
B7	25	#4	STR	2'-5"	40
D1	54	#8	STR	2'-3"	324
H1	8	#5	4	10'-10"	90
H2	8	#5	4	11'-2"	93
H3	8	#5	5	9'-2"	76
H4	8	#5	5	8'-10"	74
K1	24	#4	STR	26'-11"	432
K2	8	#4	STR	4'-6"	24
S1	134	#4	3	7'-5"	664
S2	134	#4	2	3'-2"	283
S3	28	#4	7	6'-6"	122
U1	90	#4	6	5'-6"	331
U2	51	#4	6	5'-5"	185
U3	4	#4	6	4'-5"	12
V1	180	#5	STR	4'-10"	907
V2	60	#4	STR	6'-10"	274
REINFORCING STEEL				LBS	7656

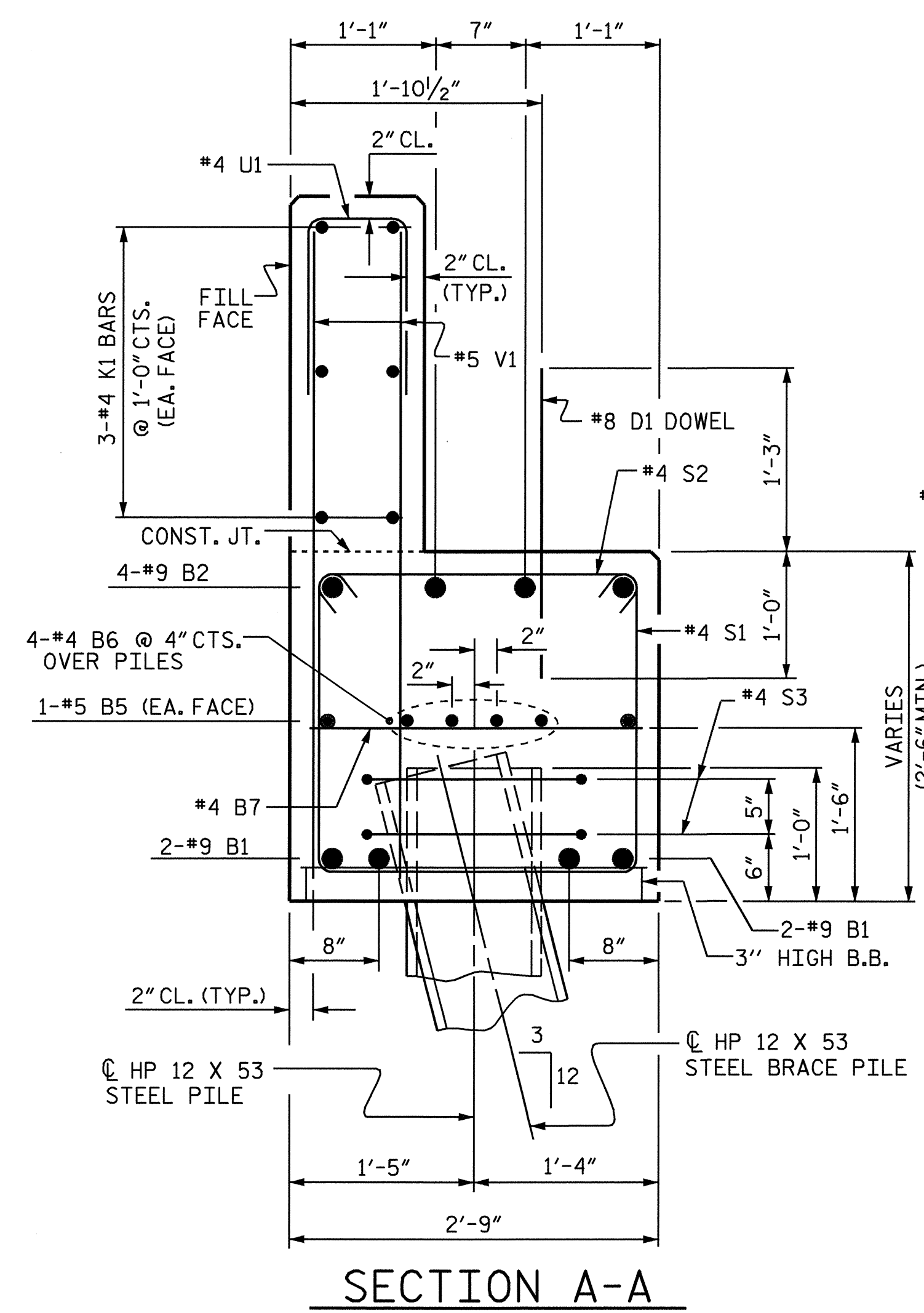
CLASS A CONCRETE BREAKDOWN:		
POUR 1 (CAP & LOWER PART OF WINGS)	C.Y.	31.7
POUR 2 (BACKWALL & UPPER PART OF WINGS)	C.Y.	13.6
POUR 3 (LATERAL GUIDES)	C.Y.	0.1
TOTAL CLASS A CONCRETE	C.Y.	45.4
HP 12 X 53 STEEL PILES		
NO. = 14	LIN. FT. =	190
PILE EXCAV. (IN SOIL)	LIN. FT. =	21
PILE EXCAV. (NOT IN SOIL)	LIN. FT. =	9



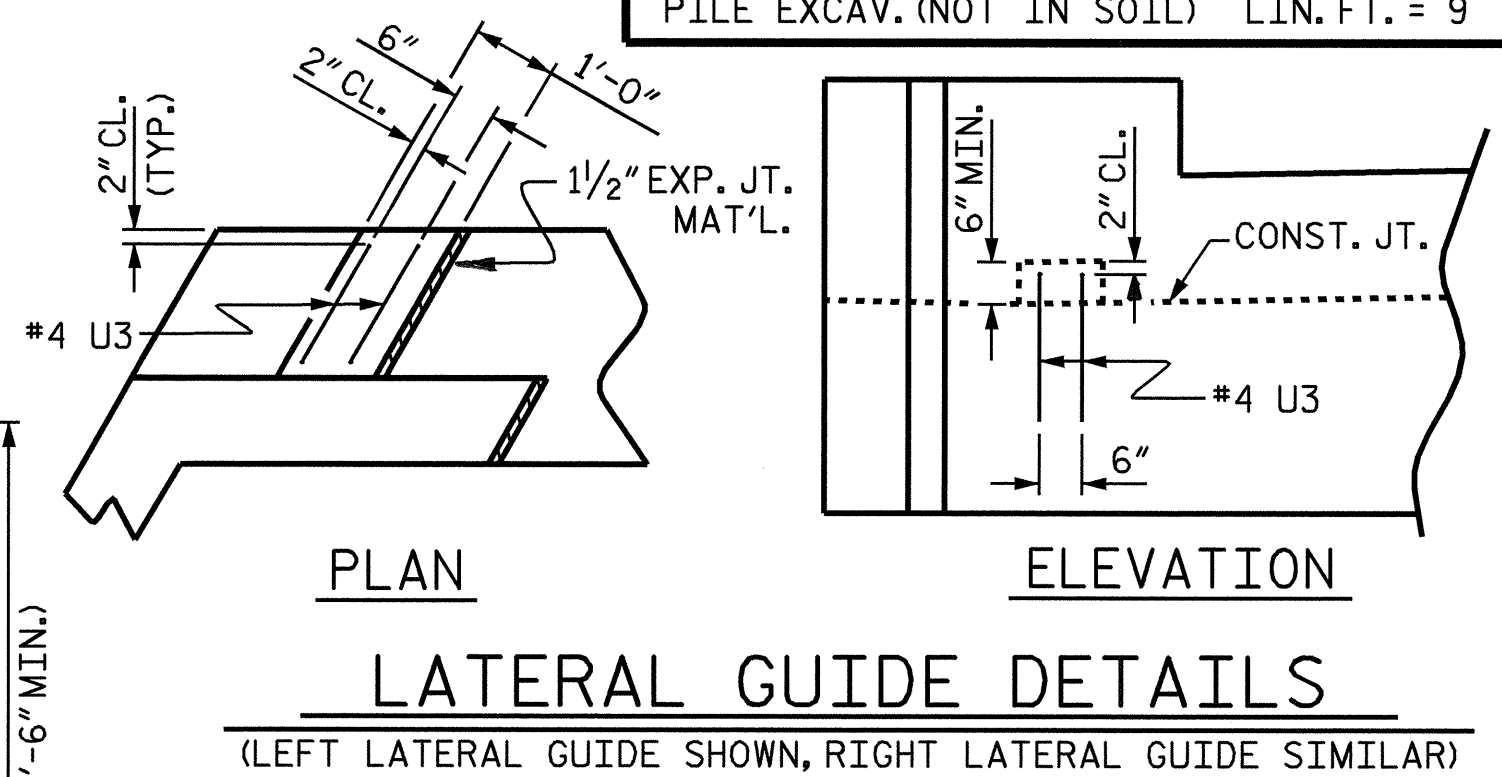
SECTION C-C



SECTION B-B



SECTION A-A

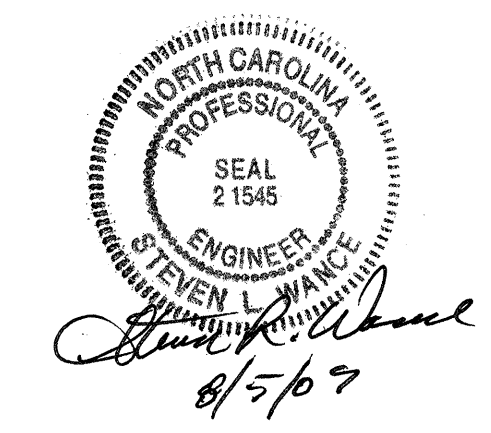


LATERAL GUIDE DETAILS
(LEFT LATERAL GUIDE SHOWN, RIGHT LATERAL GUIDE SIMILAR)

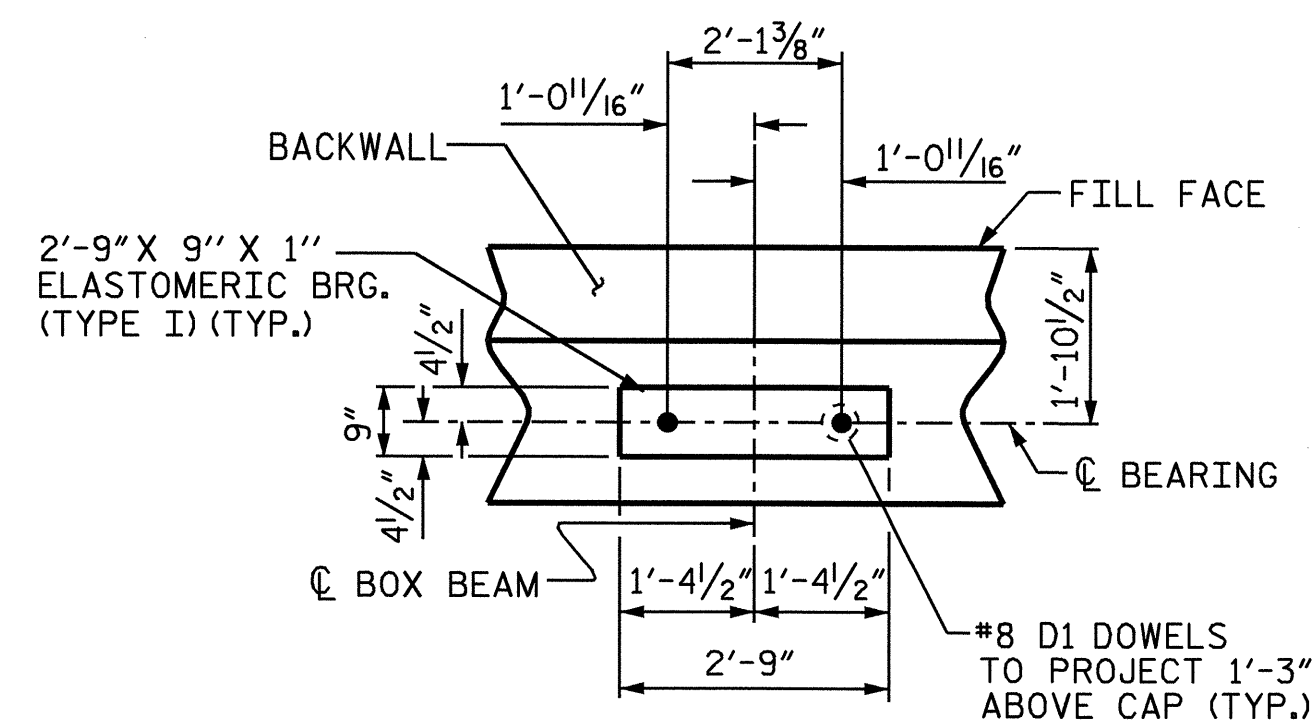
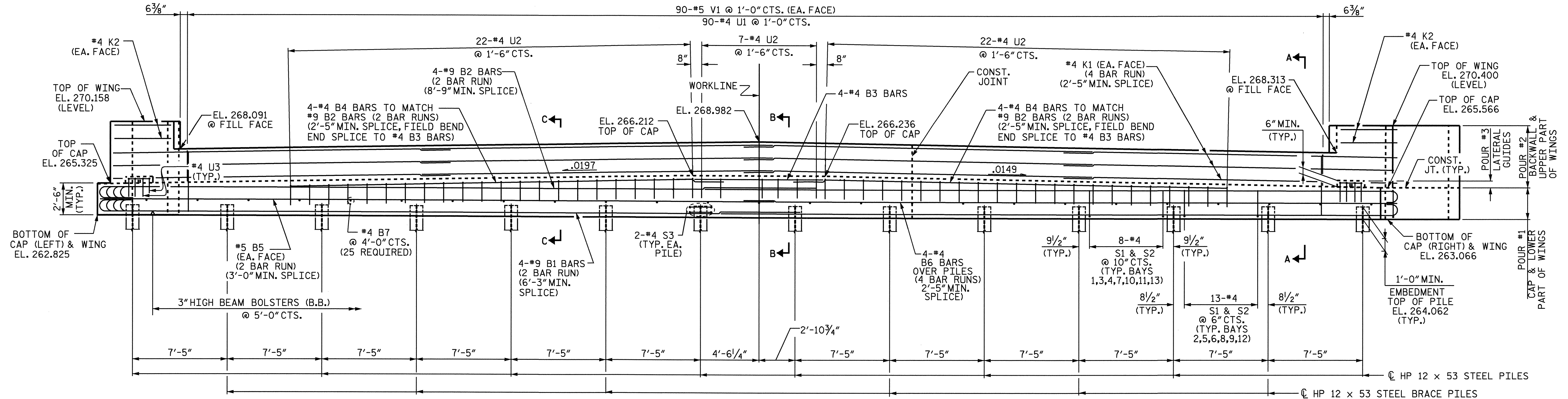
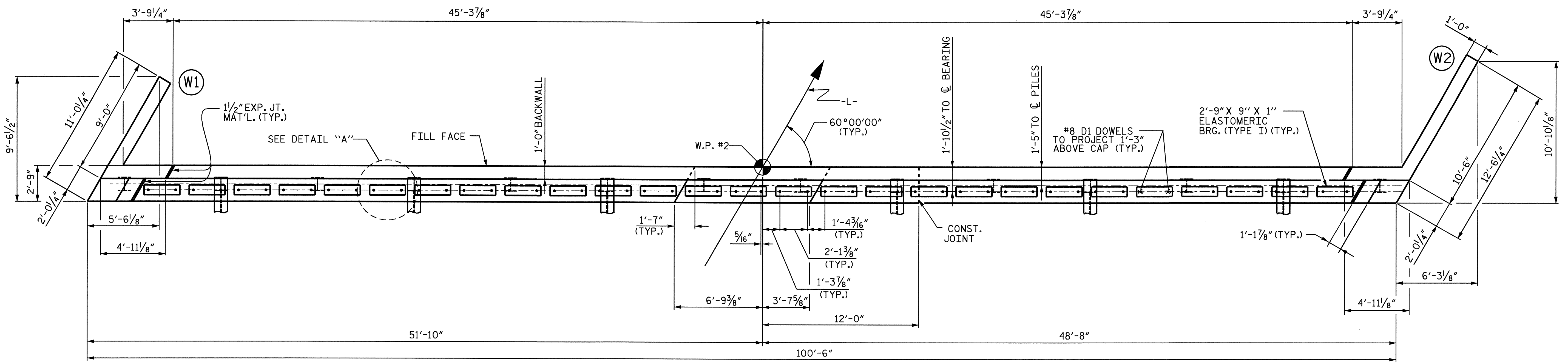
PROJECT NO. B-3919
WAKE COUNTY
 STATION: 38+12.60 -L-

SHEET 3 OF 3

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-44
1			3			TOTAL SHEETS
2			4			51



DRAWN BY: S.L. WANCE DATE: 04-07-09
 CHECKED BY: J.A. TILLMAN DATE: 06-09-09

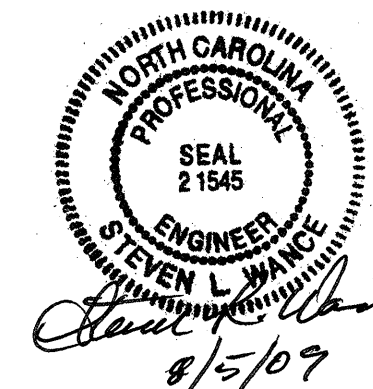


NOTES:

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

THE LATERAL GUIDES AT EACH END OF THE CAP ARE NOT TO BE POURED UNTIL AFTER THE BOX BEAM UNITS ARE IN PLACE.

THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.



PROJECT NO. B-3919
 WAKE COUNTY
 STATION: 38+12.60 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT 2

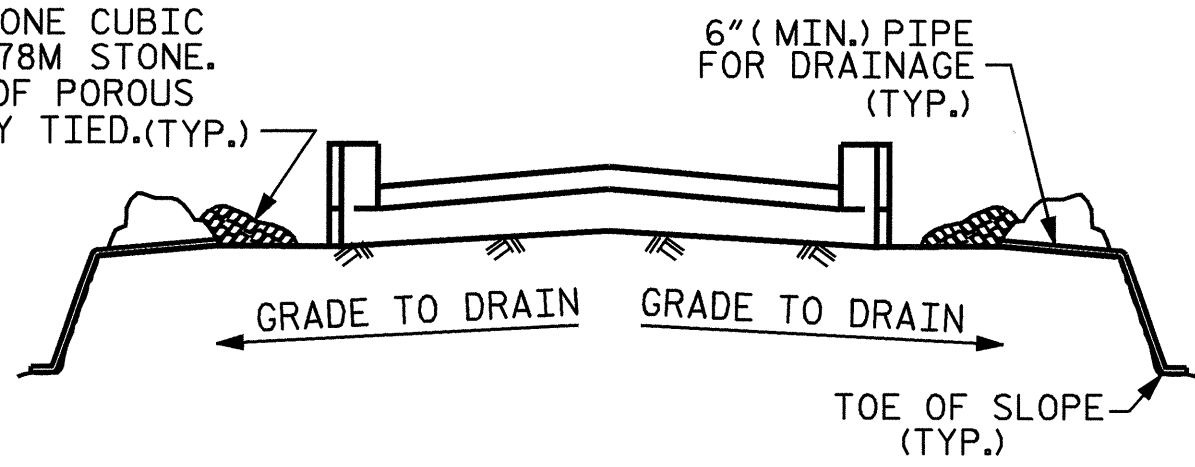
DRAWN BY: S.L. WANCE DATE: 04-06-09
 CHECKED BY: J.A. TILLMAN DATE: 06-09-09

04-AUG-2009 13:09
 r:\structures\final plans\str2\11.b3919.ed_02.eb.dgn
 drwithrow

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

STR. #2

MINIMUM OF 3- ONE CUBIC FOOT BAGS OF #78M STONE. BAGS SHALL BE OF POROUS FABRIC, SECURELY TIED.(TYP.)

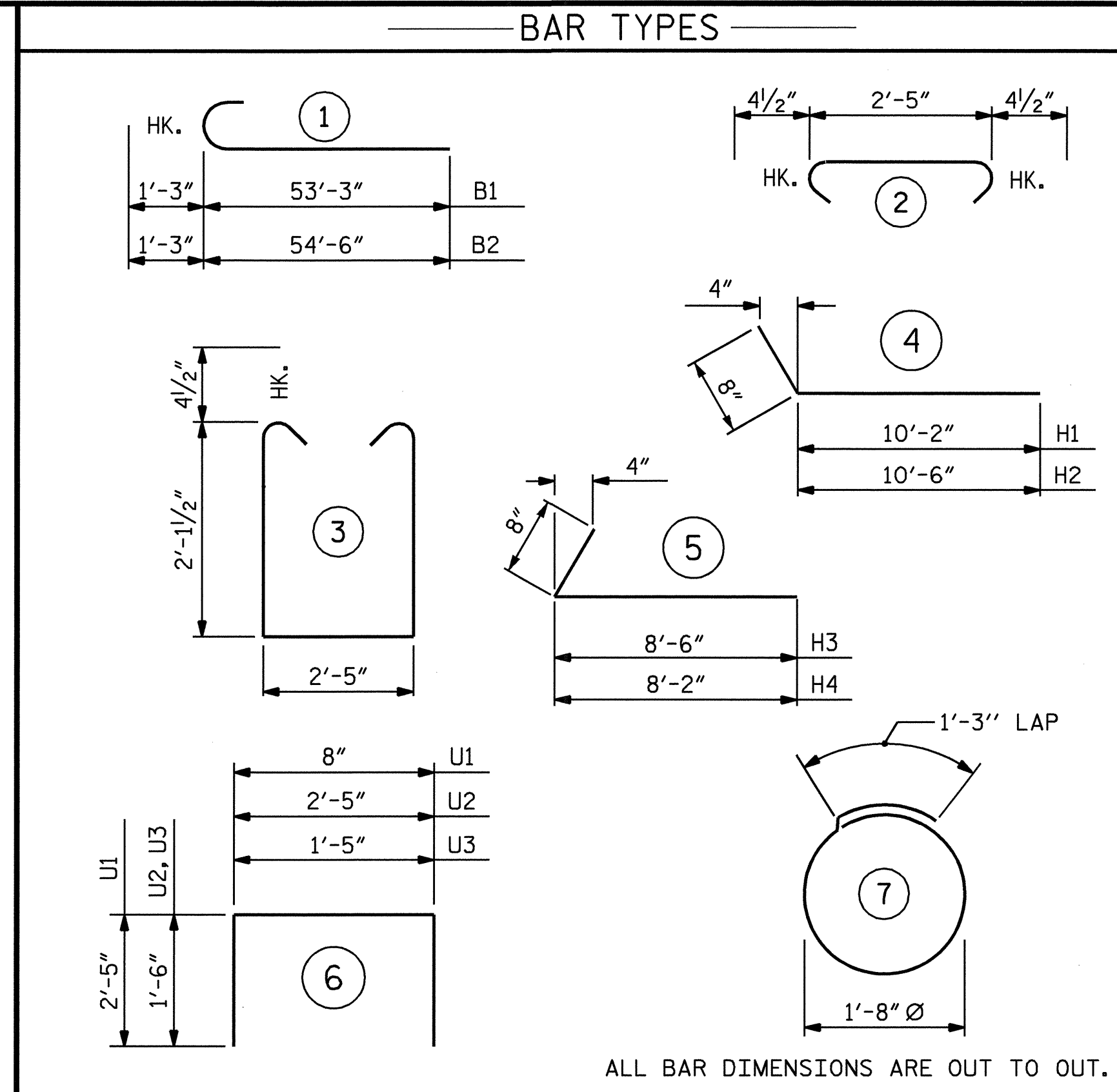
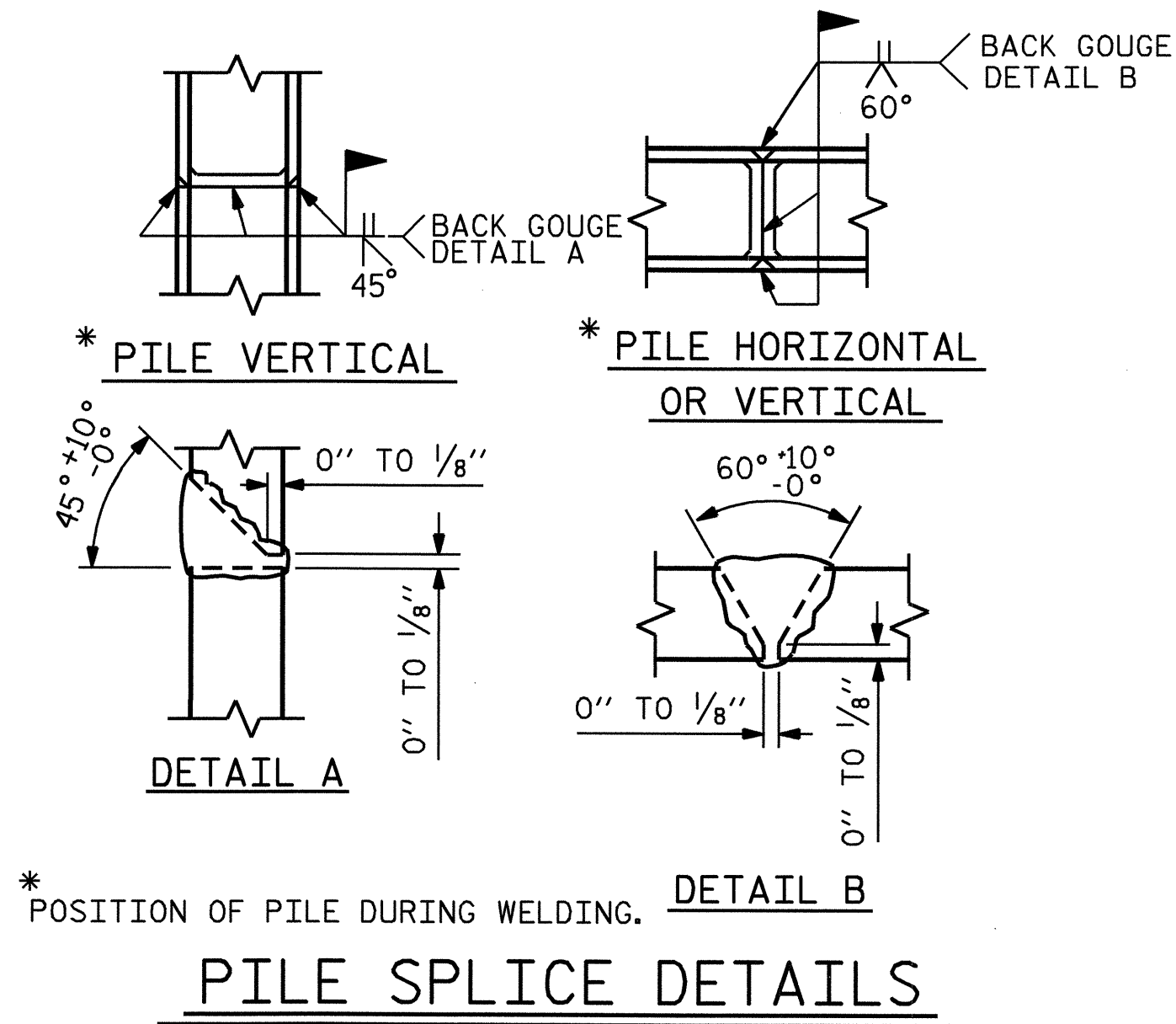


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

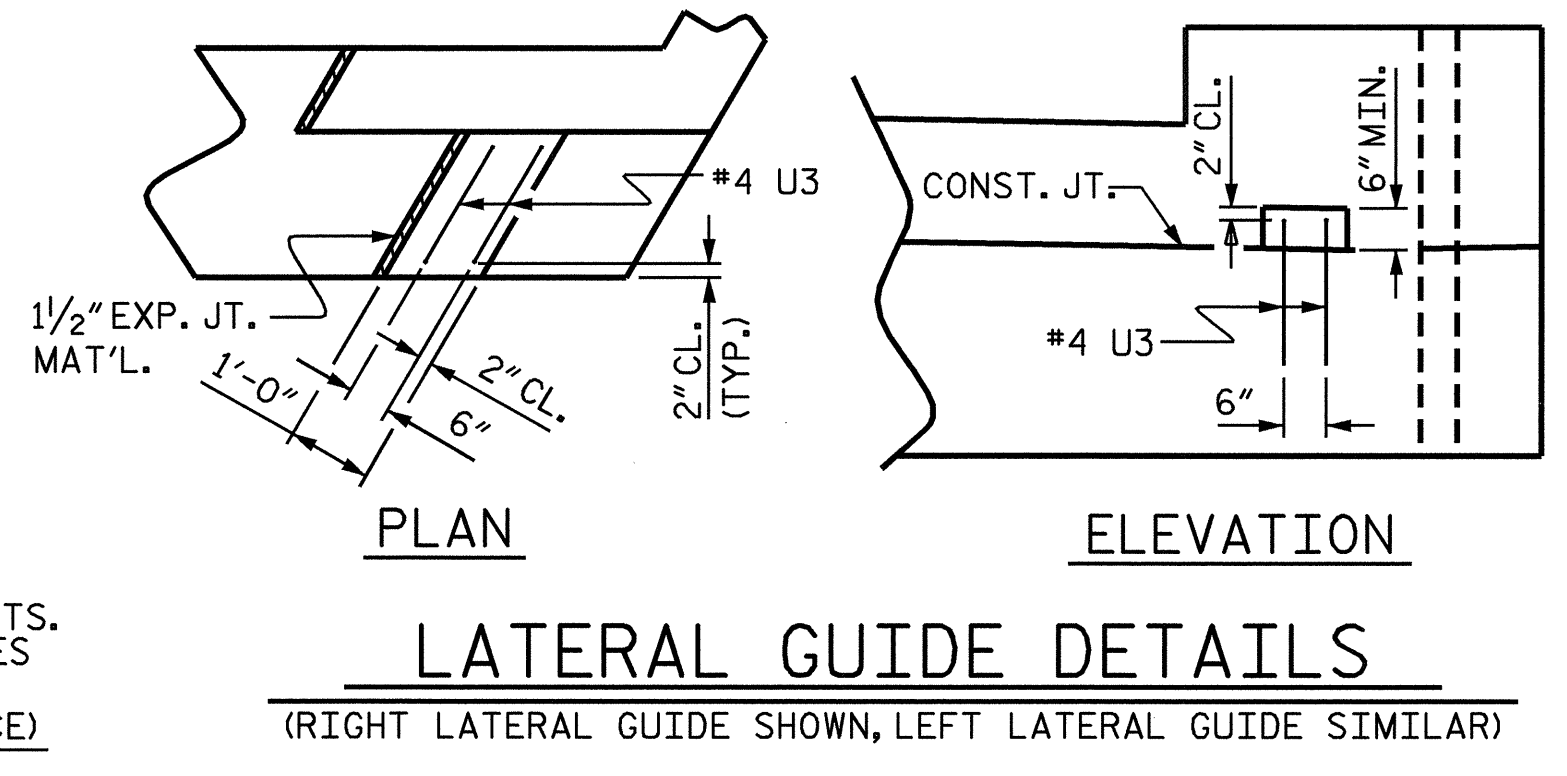
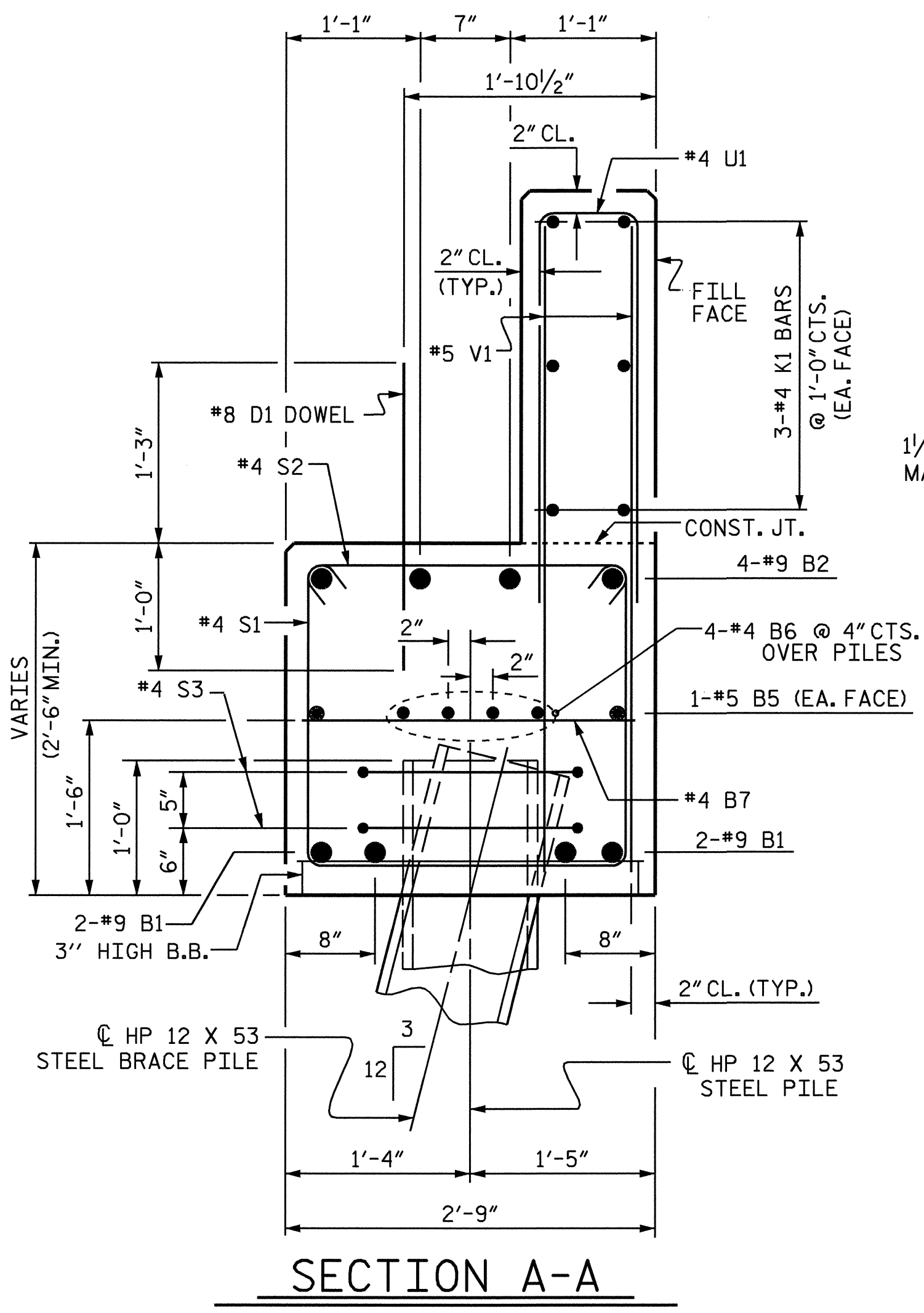
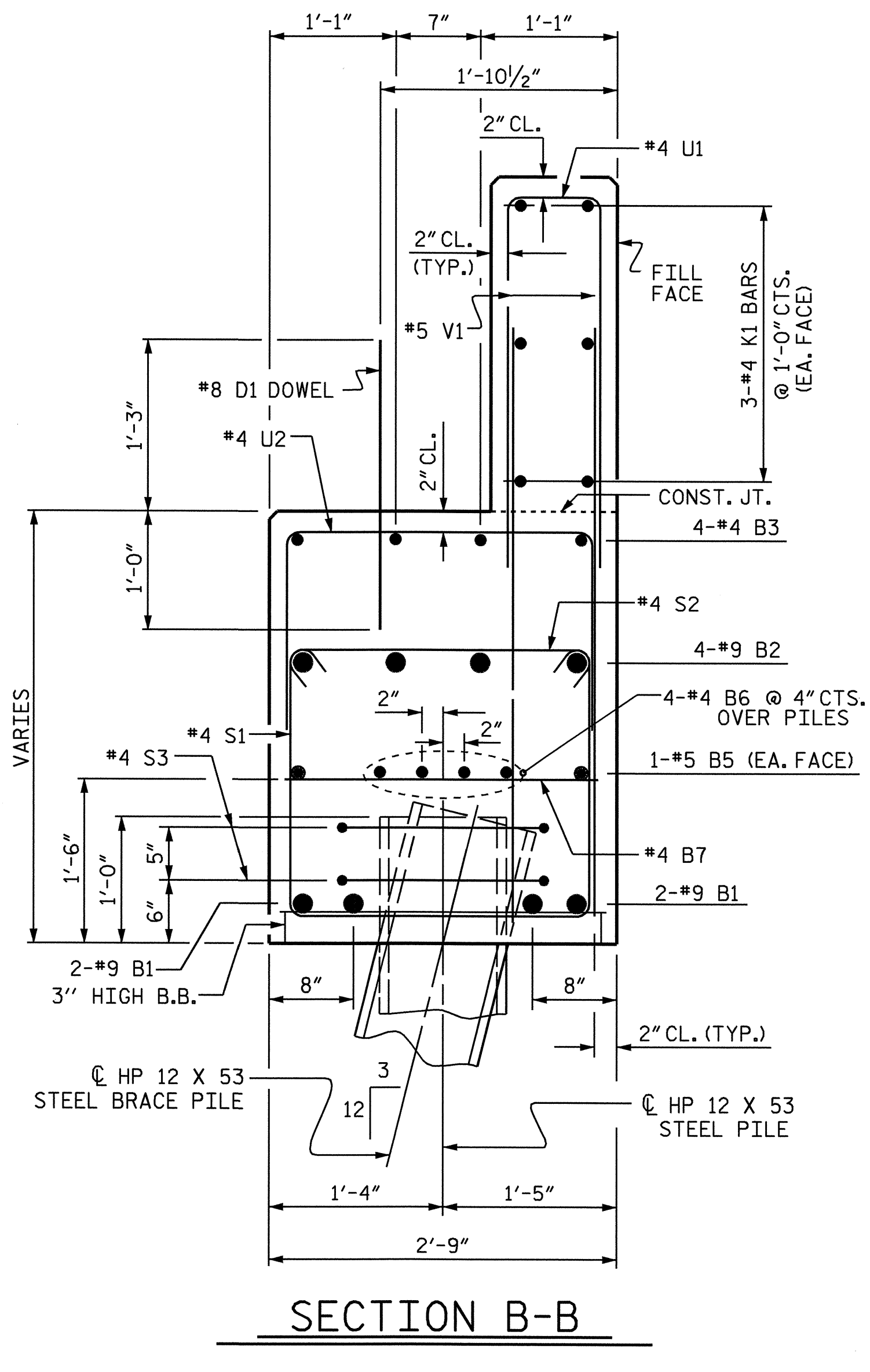
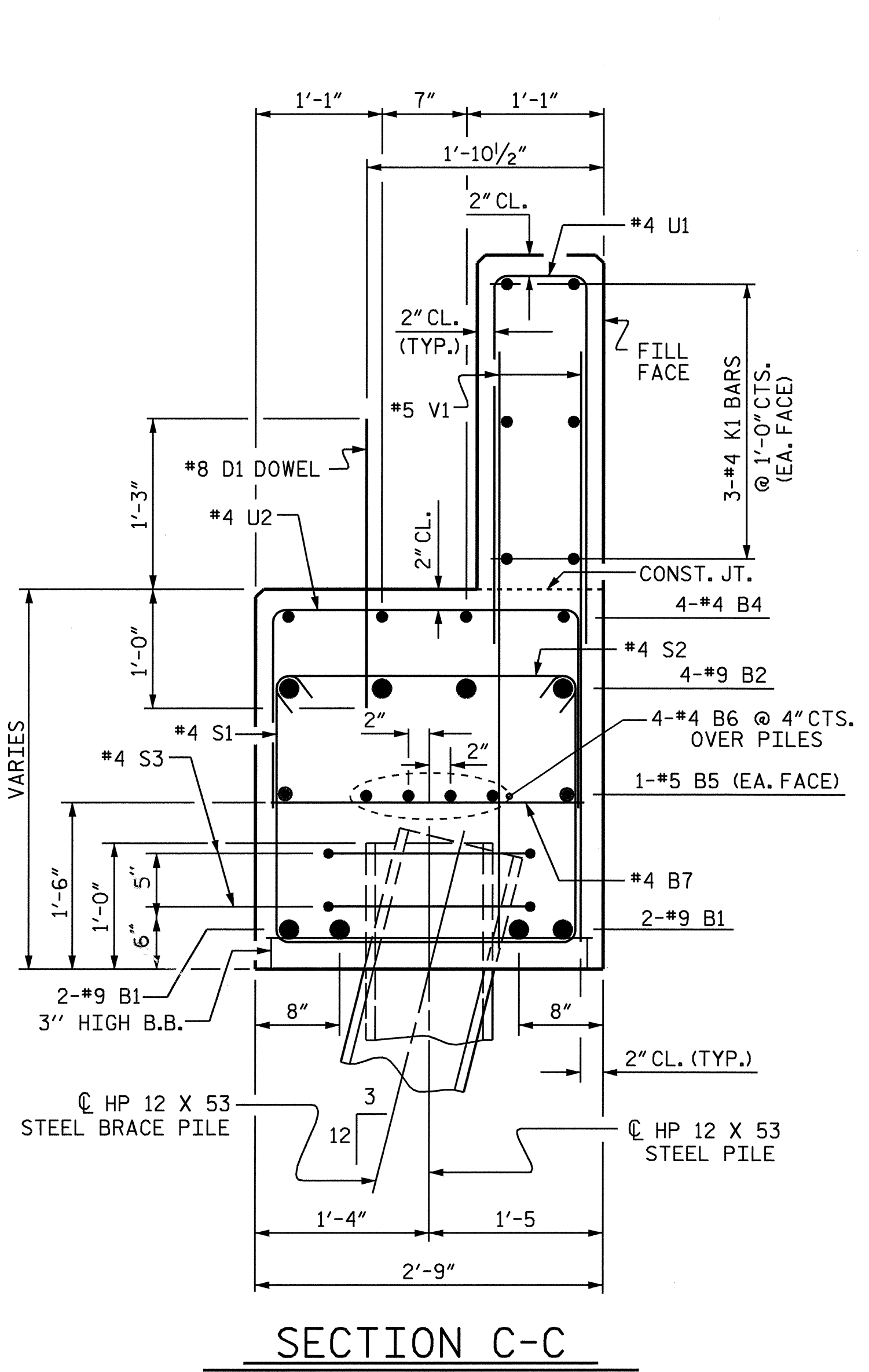
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

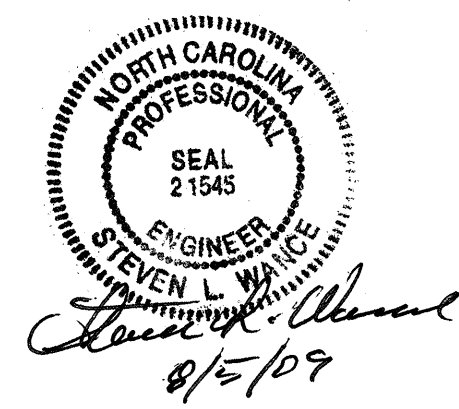
TEMPORARY DRAINAGE AT END BENT



BILL OF MATERIAL					
END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	54'-6"	1482
B2	8	#9	1	55'-9"	1516
B3	4	#4	STR	10'-4"	28
B4	16	#4	STR	18'-3"	195
B5	4	#5	STR	51'-8"	216
B6	16	#4	STR	26'-11"	288
B7	25	#4	STR	2'-5"	40
D1	54	#8	STR	2'-3"	324
H1	8	#5	4	10'-10"	90
H2	8	#5	4	11'-2"	93
H3	8	#5	5	9'-2"	76
H4	8	#5	5	8'-10"	74
K1	24	#4	STR	26'-11"	432
K2	8	#4	STR	4'-6"	24
S1	134	#4	3	7'-5"	664
S2	134	#4	2	3'-2"	283
S3	28	#4	7	6'-6"	122
U1	90	#4	6	5'-6"	331
U2	51	#4	6	5'-5"	185
U3	4	#4	6	4'-5"	12
V1	180	#5	STR	4'-10"	907
V2	60	#4	STR	6'-10"	274
REINFORCING STEEL				LBS	7656

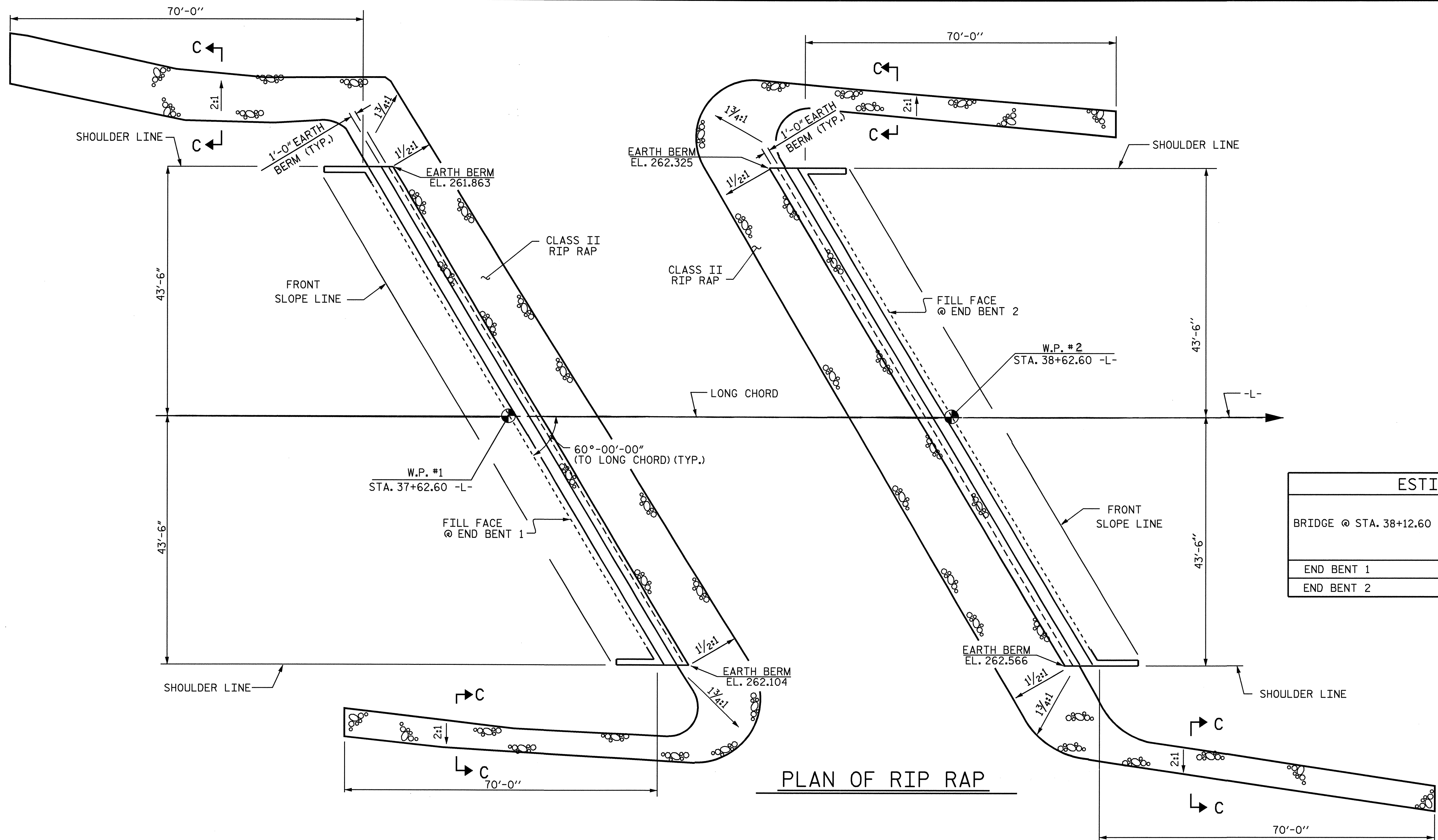


PROJECT NO. B-3919
WAKE COUNTY
 STATION: 38+12.60 -L-
 SHEET 3 OF 3



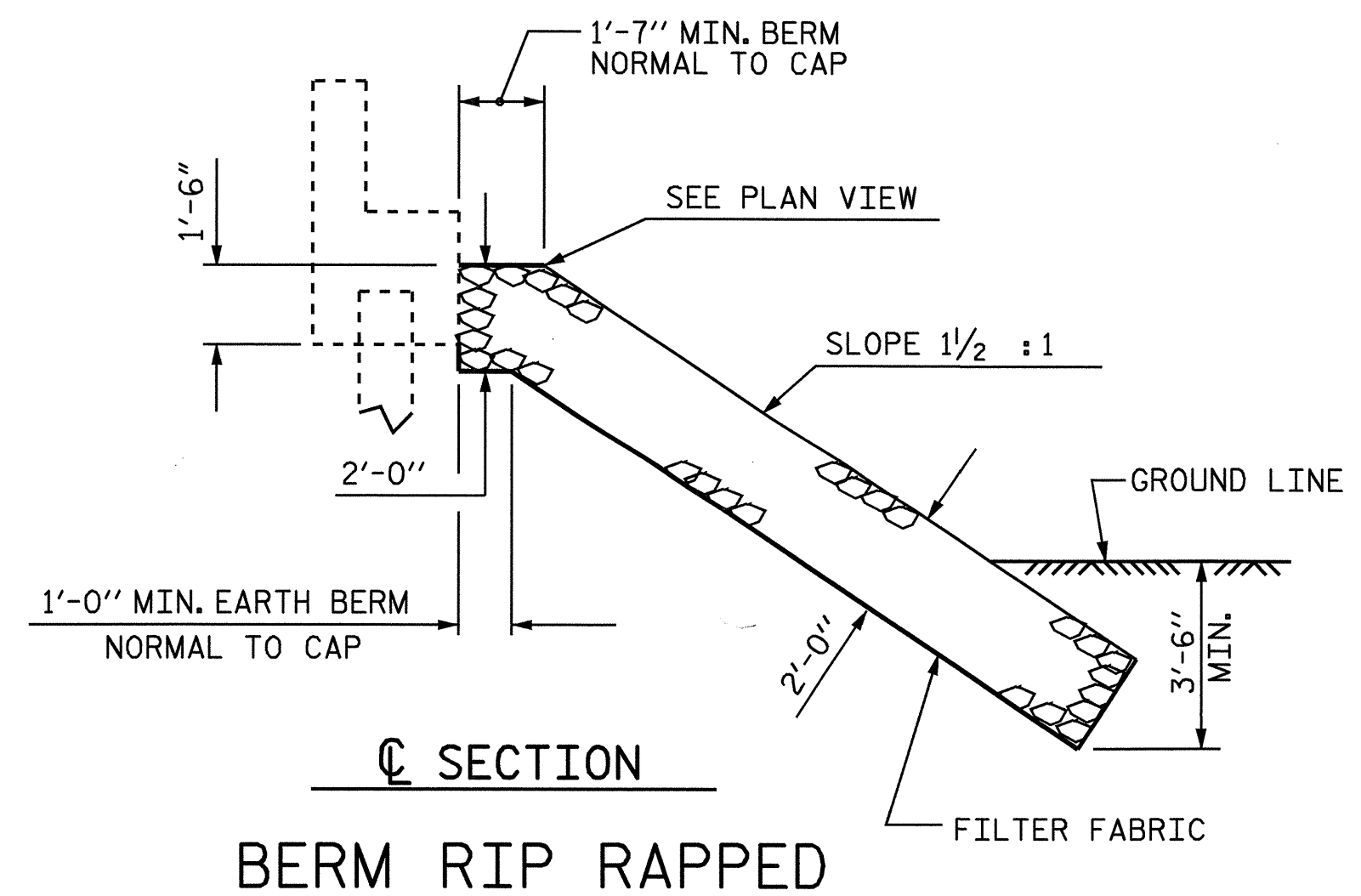
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT 2					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 51

DRAWN BY: S.L. WANCE DATE: 04-07-09
 CHECKED BY: J.A. TILLMAN DATE: 06-09-09

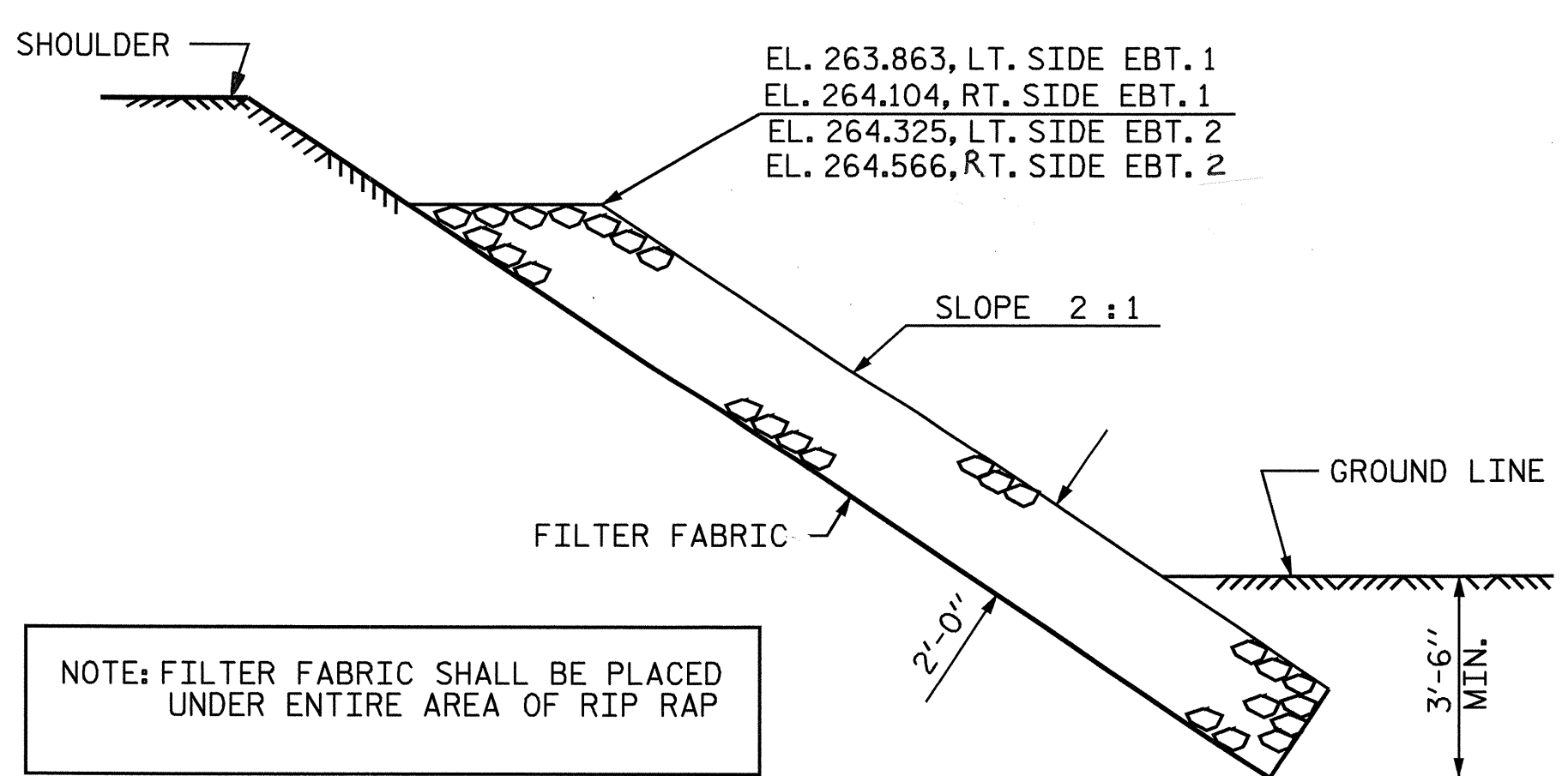


ESTIMATED QUANTITIES		
BRIDGE @ STA. 38+12.60 -L-	RIp RAP CLASS II	FILTER FABRIC FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	190	210
END BENT 2	160	180

PLAN OF RIP RAP



SECTION C-C
BERM RIP RAPPED

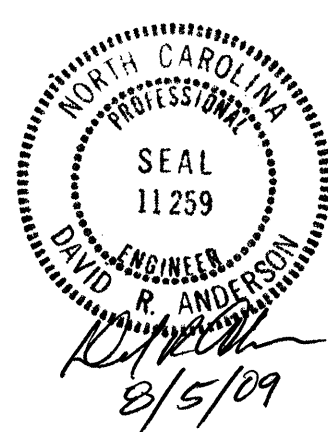


SECTION C-C

NOTE: FILTER FABRIC SHALL BE PLACED UNDER ENTIRE AREA OF RIP RAP

PROJECT NO. B-3919
WAKE COUNTY
 STATION: 38+12.60 -L-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
RIP RAP DETAILS					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
TOTAL SHEETS					51



DRAWN BY : N. Q. TRAN DATE : 2-8-09
 CHECKED BY : J. A. TILLMAN DATE : 2-28-09

NOTES

FOR REINFORCED BRIDGE APPROACH FILL INCLUDING FABRIC, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, 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 6" COMP. A.B.C. SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB AND SHALL EXTEND 1'-0" OUTSIDE OF EACH EDGE OF THE APPROACH SLAB.

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

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

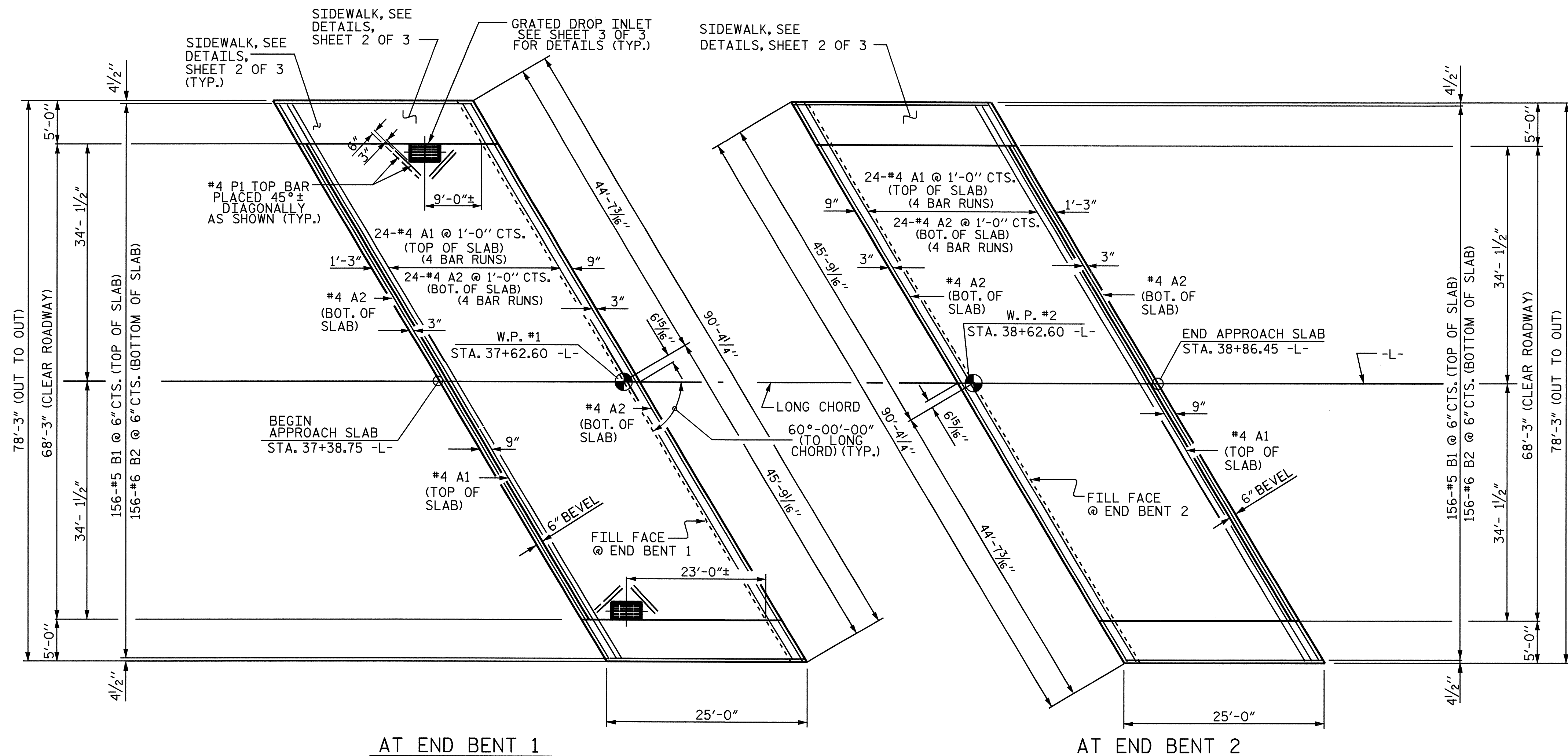
FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 3 7/16".

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

APPROACH SLABS SHALL BE POURED AFTER CONCRETE OVERLAY IS POURED.

THE JOINT SHALL BE SAWED AFTER THE CASTING OF THE PARAPET AND END POST.

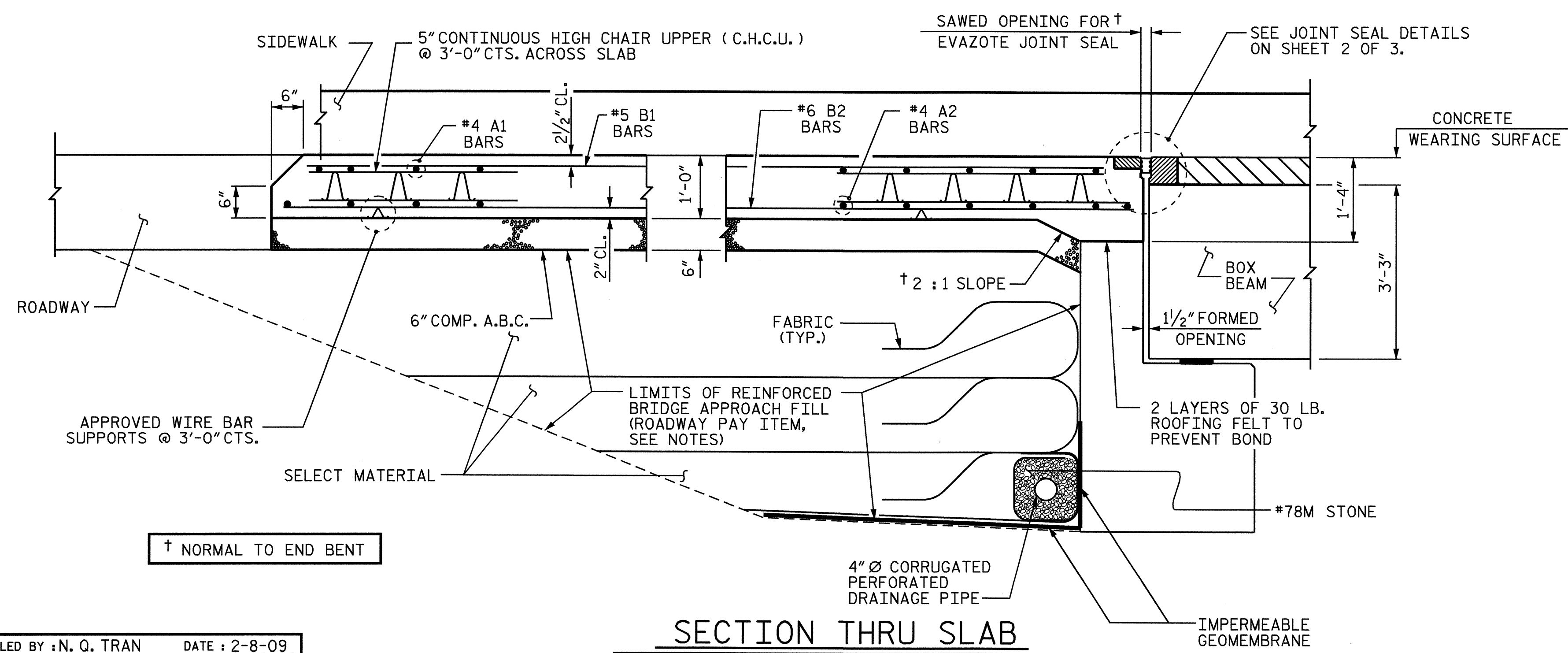


PLAN FOR APPROACH SLAB

BAR SPLICE CHART

BAR	SPLICE LENGTH
#4 A1	2'-0"
#4 A2	1'-9"

BILL OF MATERIAL													
AT END BENT 1					AT END BENT 2								
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT		
*A1	100	#4	STR	24'-0"	1603	*A1	100	#4	STR	24'-0"	1603		
A2	104	#4	STR	23'-9"	1650	A2	104	#4	STR	23'-9"	1650		
*B1	156	#5	STR	23'-6"	3824	*B1	156	#5	STR	23'-6"	3824		
B2	156	#6	STR	24'-8"	5780	B2	156	#6	STR	24'-8"	5780		
*B3	8	#4	STR	24'-8"	132	*B3	8	#4	STR	24'-8"	132		
*D1	32	#4	STR	1'-0"	21	*D1	32	#4	STR	1'-0"	21		
*G1	50	#4	STR	4'-6"	150	*G1	50	#4	STR	4'-6"	150		
*P1	8	#4	STR	4'-0"	21								
REINFORCING STEEL					LBS.	7430	REINFORCING STEEL					LBS.	7430
*EPOXY COATED REINFORCING STEEL					LBS.	5751	*EPOXY COATED REINFORCING STEEL					LBS.	5730
CLASS AA CONCRETE SLAB					C. Y.	77.3	CLASS AA CONCRETE SLAB					C. Y.	77.3
2 SIDEWALKS					C. Y.	8.1	2 SIDEWALKS					C. Y.	8.1
TOTAL :					C. Y.	85.4	TOTAL :					C. Y.	85.4



SECTION THRU SLAB

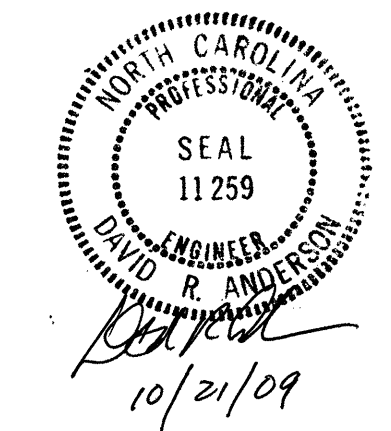
PROJECT NO. B-3919
 WAKE COUNTY
 STATION: 38+12.60 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

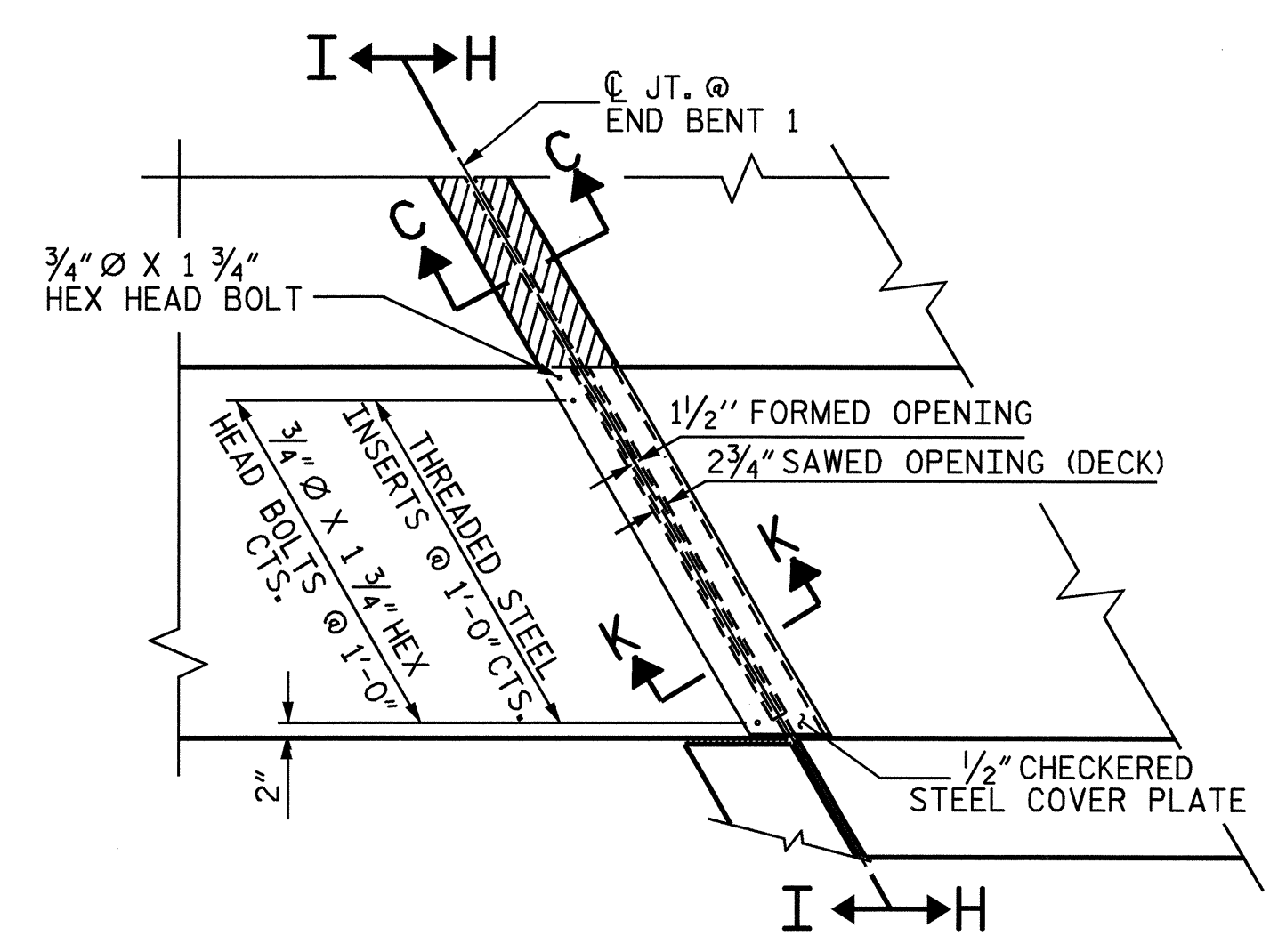
BRIDGE APPROACH SLAB
 FOR
 PRESTRESSED CONCRETE
 BOX BEAM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			5-49
2			4			TOTAL SHEETS 51

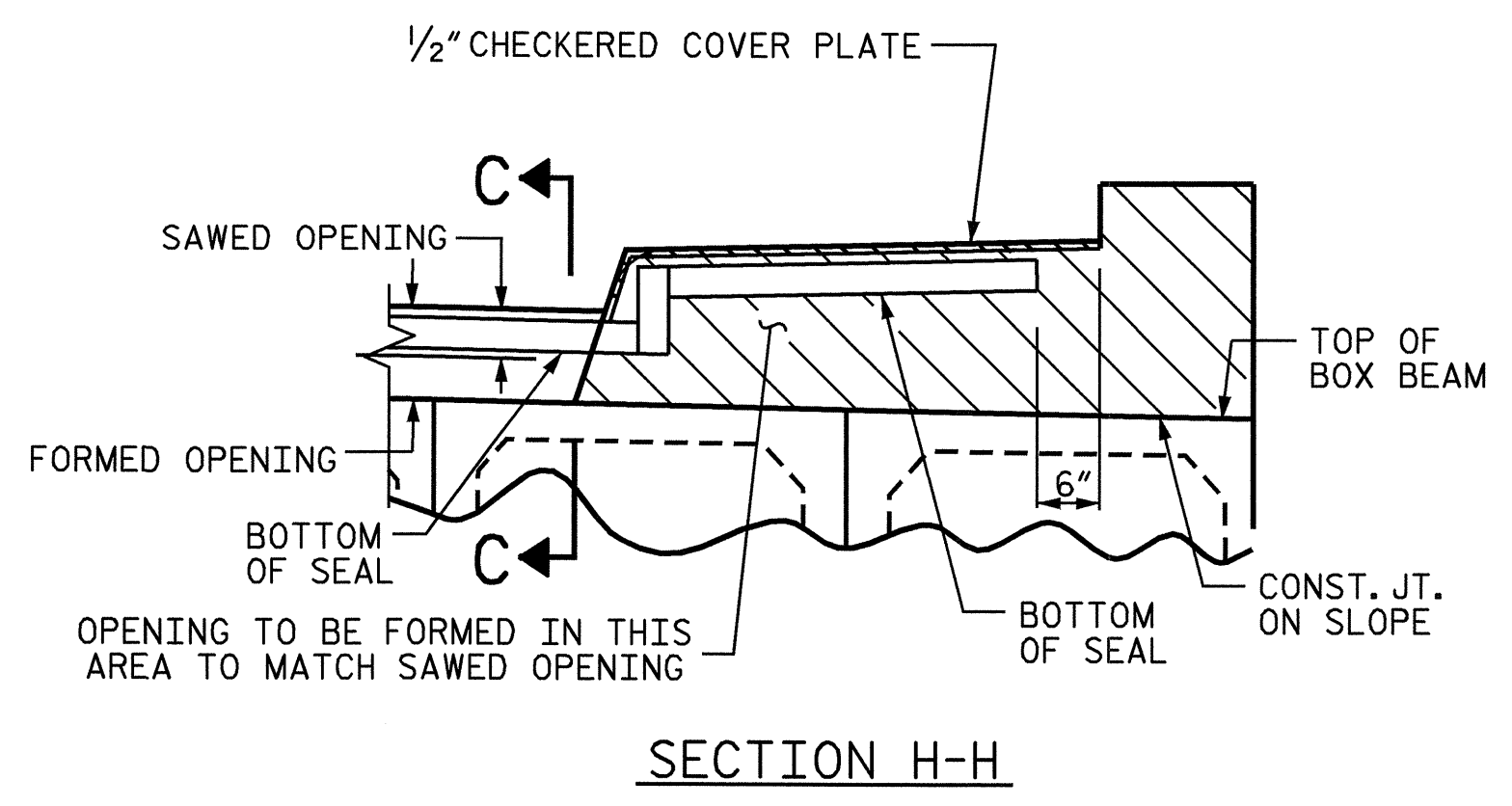


ASSEMBLED BY : N. Q. TRAN DATE : 2-8-09
 CHECKED BY : J. A. TILLMAN DATE : 2-28-09

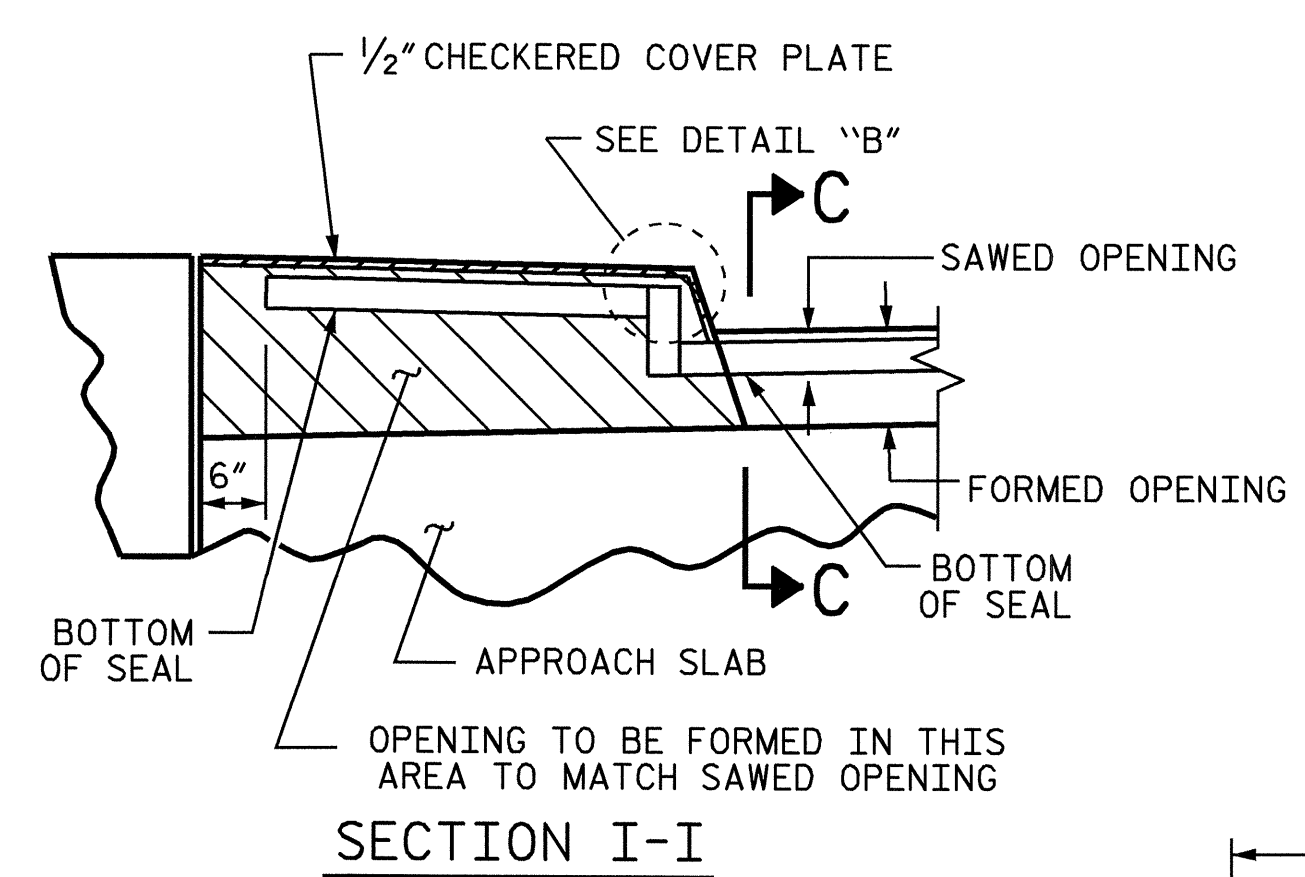
*** THESE DOWELS ARE TO BE PLACED AFTER THE SAWING OF THE JOINT. THE HOLES SHALL BE DRILLED AND THE DOWELS GROUTED INTO PLACE.



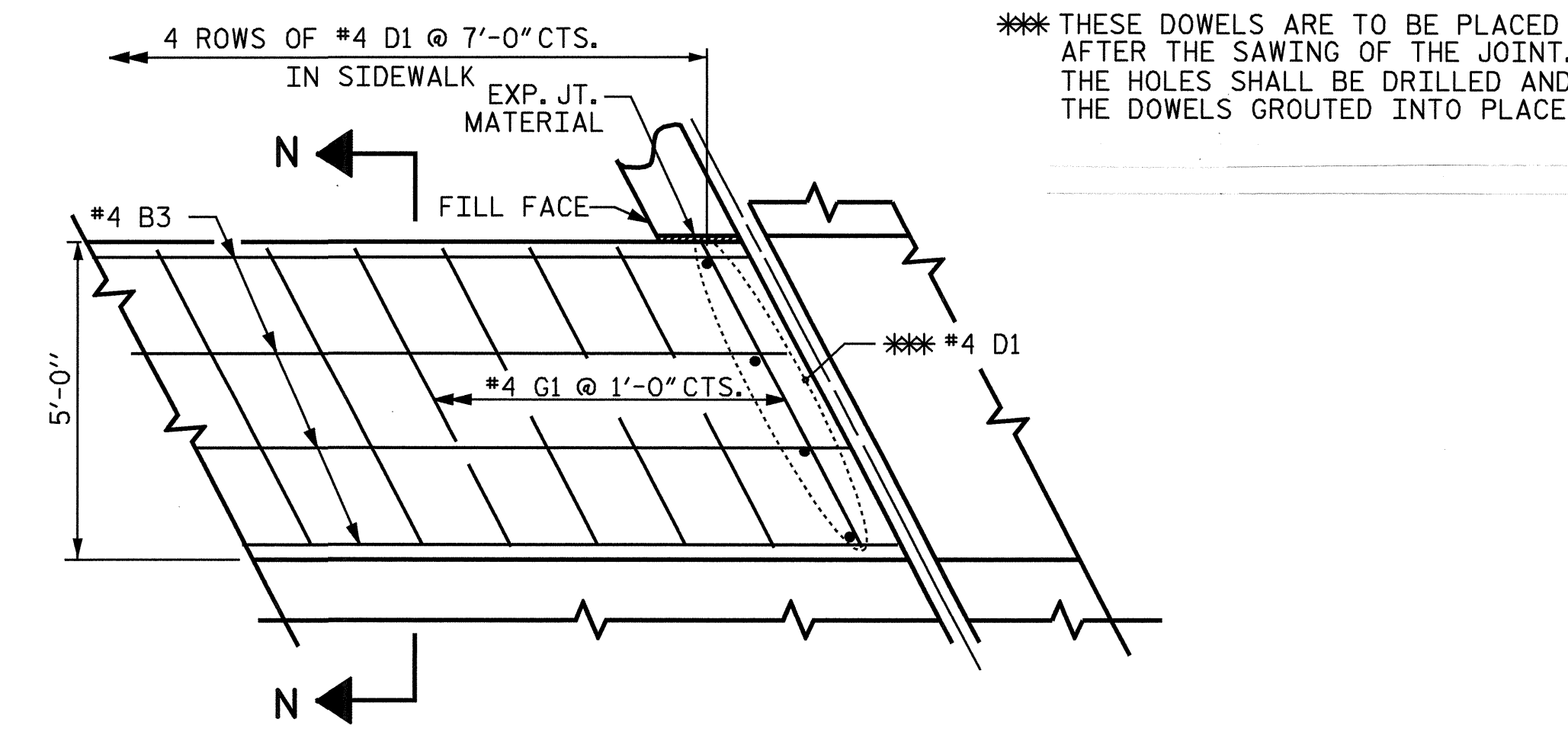
PLAN VIEW OF EVAZOTE JOINT SEAL @ END BENT FOR SIDEWALK



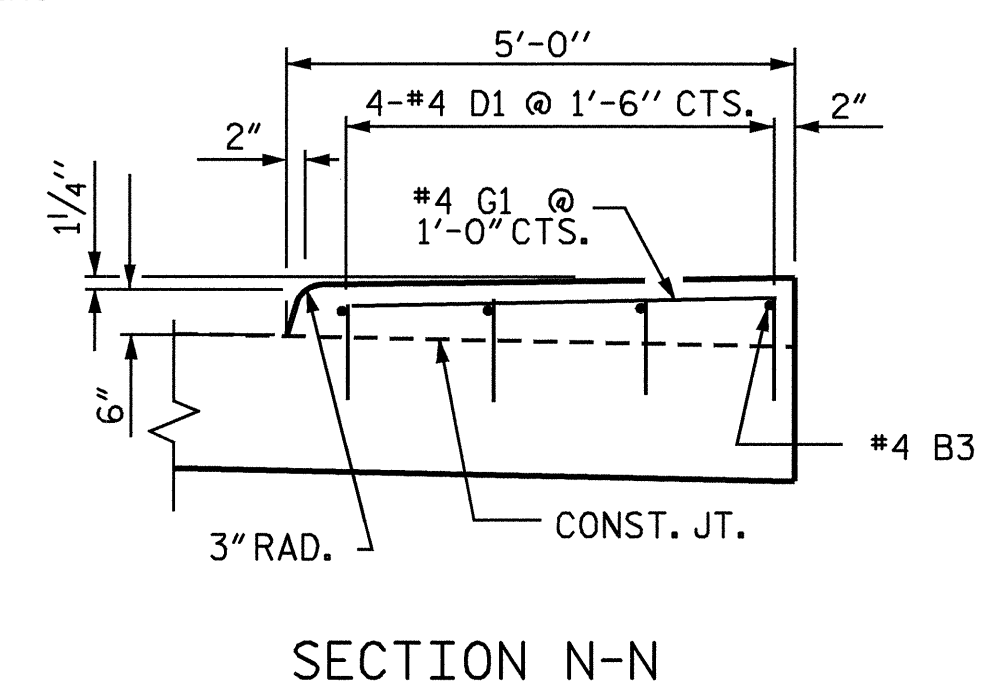
SECTION H-H



SECTION I-I



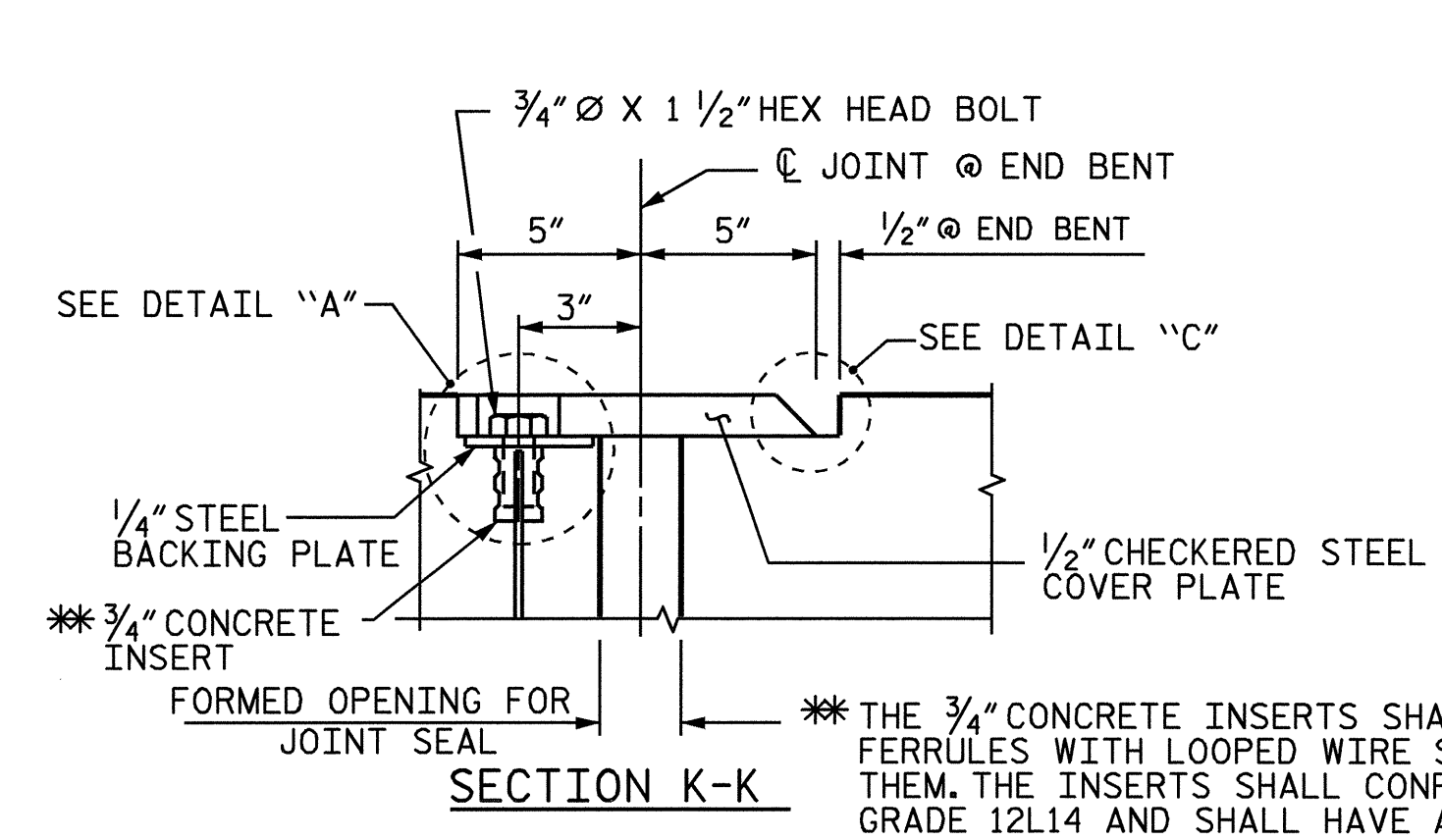
DETAILS OF SIDEWALK ON APPROACH SLAB



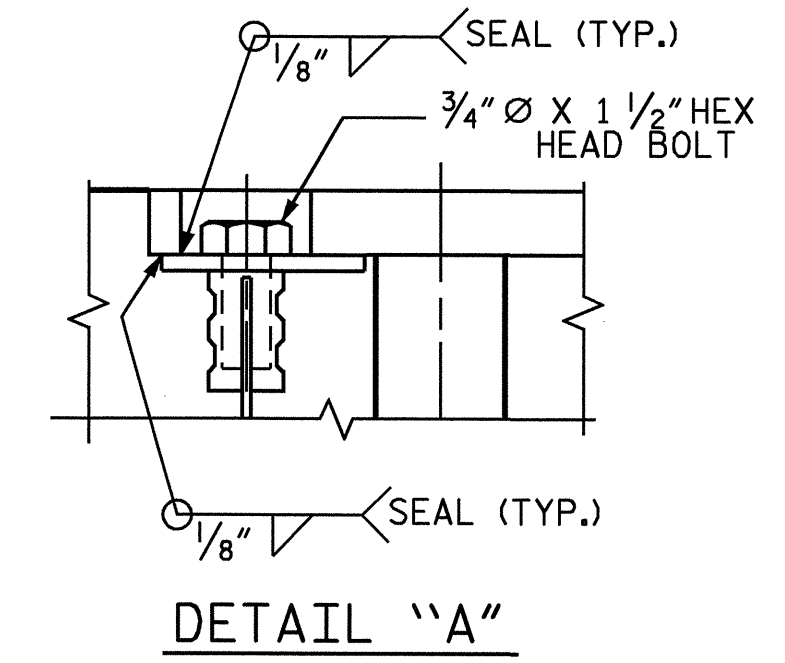
SECTION N-N
SIDEWALK DETAILS

ELASTOMERIC CONCRETE	
END BENT	ELASTOMERIC CONCRETE * (CU. FT.)
1	35.2
2	35.2
TOTAL	70.4

* BASED ON THE MINIMUM BLOCKOUT SHOWN.

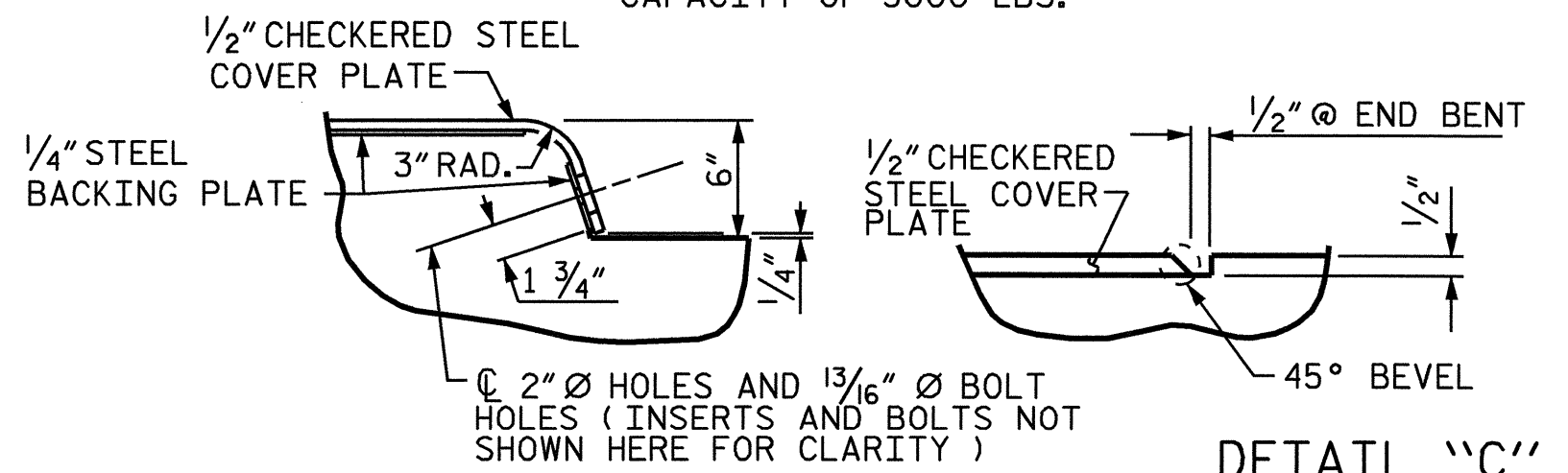


SECTION K-K



DETAIL "A"

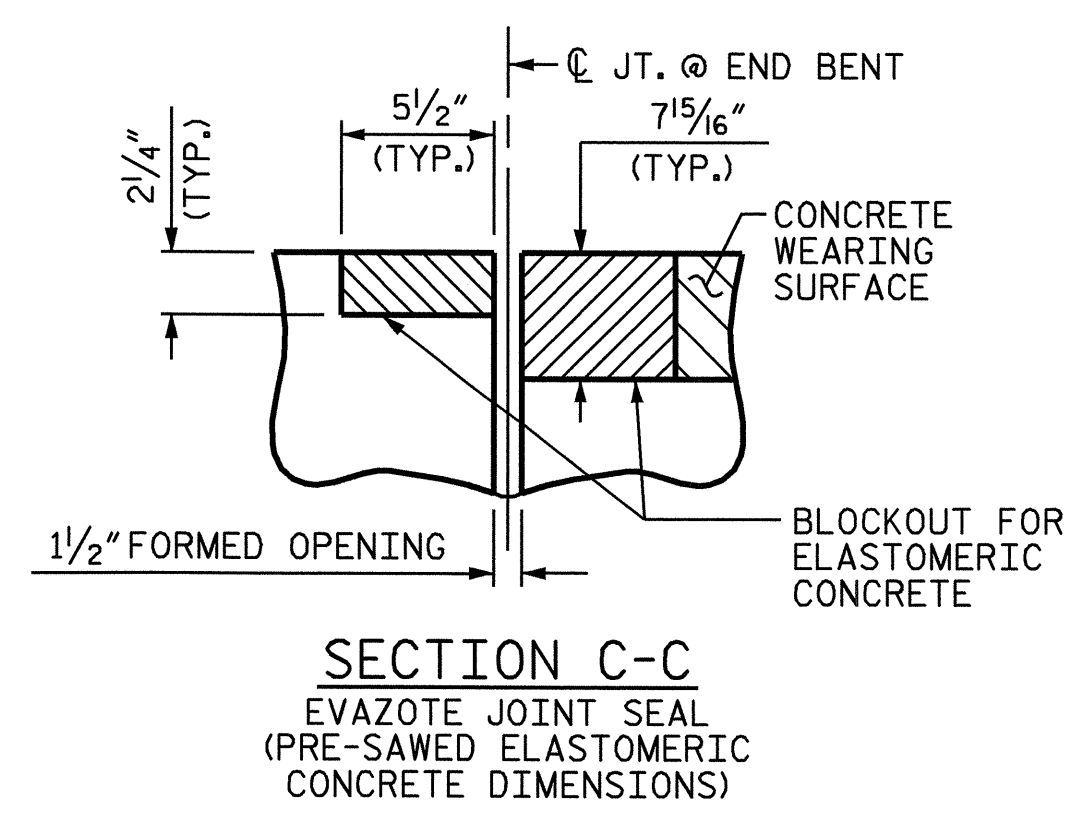
*** THE 3/4" CONCRETE INSERTS SHALL BE CLOSED-END FERRULES WITH LOOPED WIRE STRUTS ATTACHED TO THEM. THE INSERTS SHALL CONFORM TO AASHTO M169, GRADE 12L14 AND SHALL HAVE A TENSILE WORKING LOAD CAPACITY OF 3000 LBS.



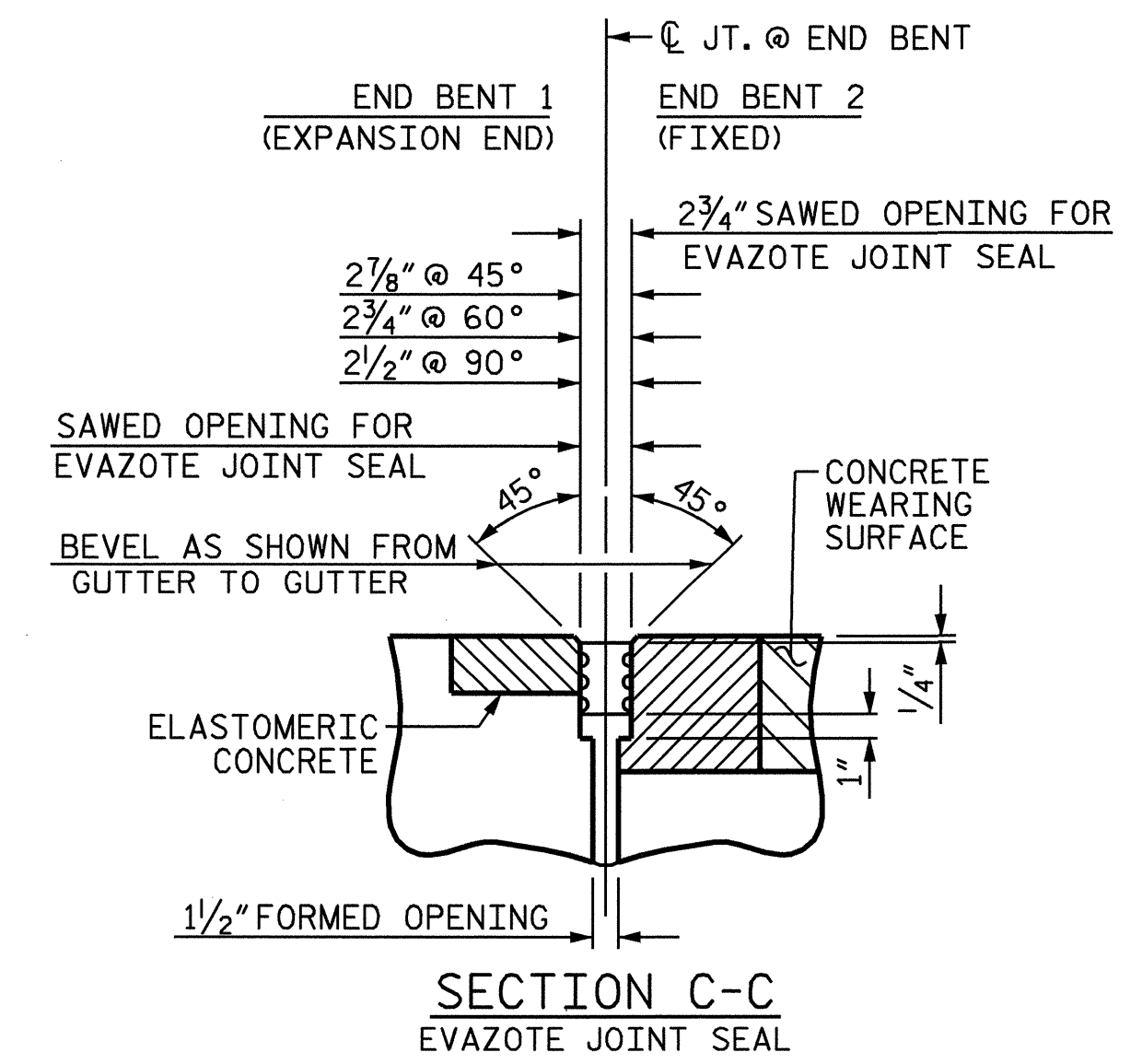
DETAIL "B"

DETAIL "C"

JOINT SEAL DETAILS @ END BENT



SECTION C-C
EVAZOTE JOINT SEAL
(PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS)



SECTION C-C
EVAZOTE JOINT SEAL

PROJECT NO. B-3919
WAKE COUNTY
STATION: 38+12.60 -L-

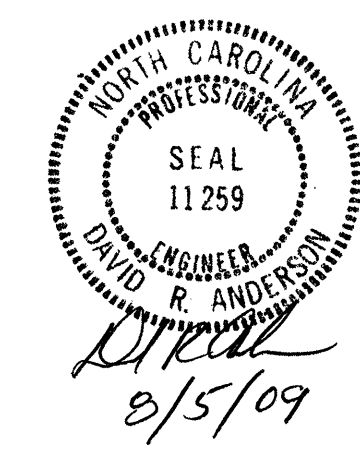
SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

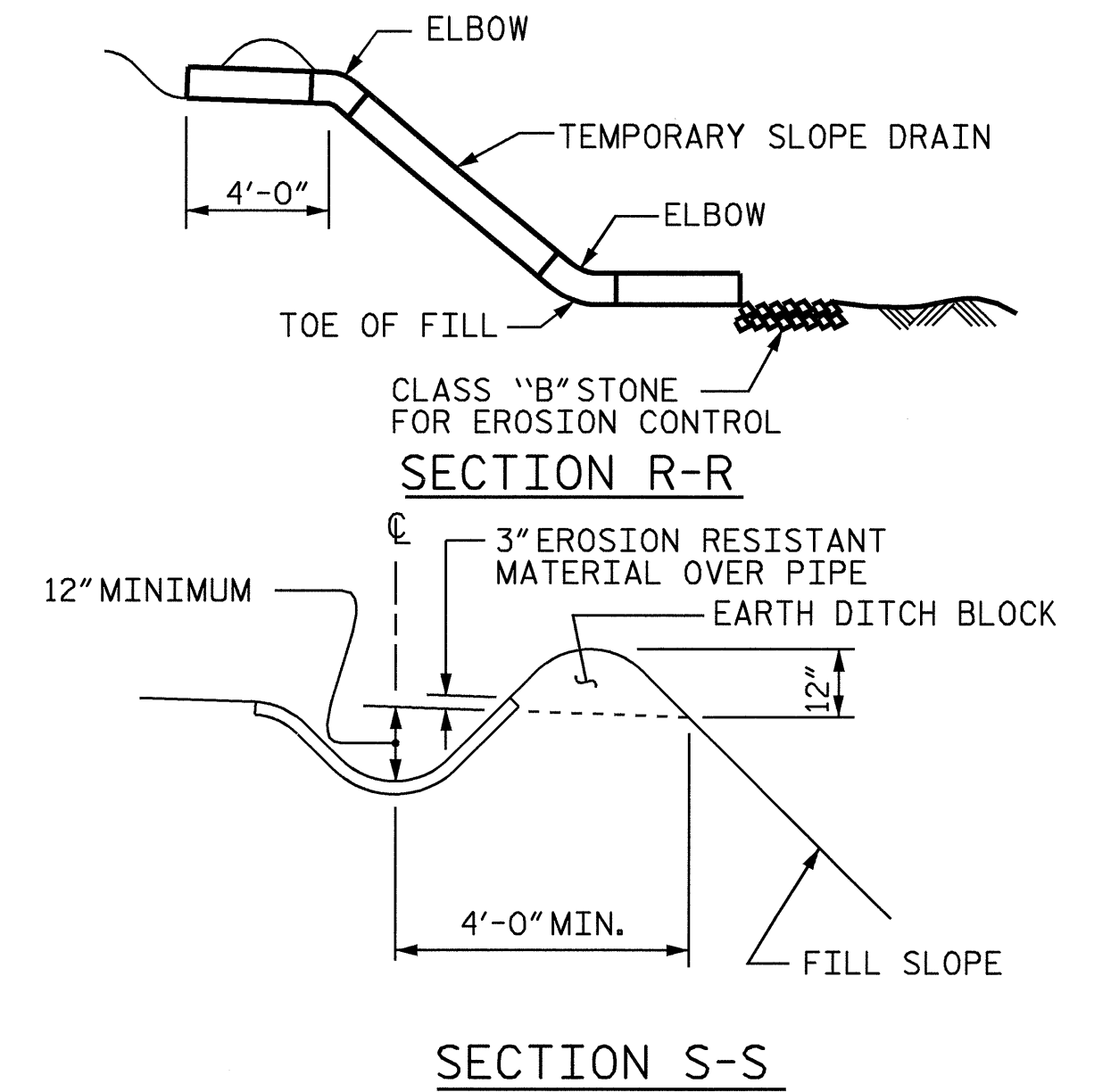
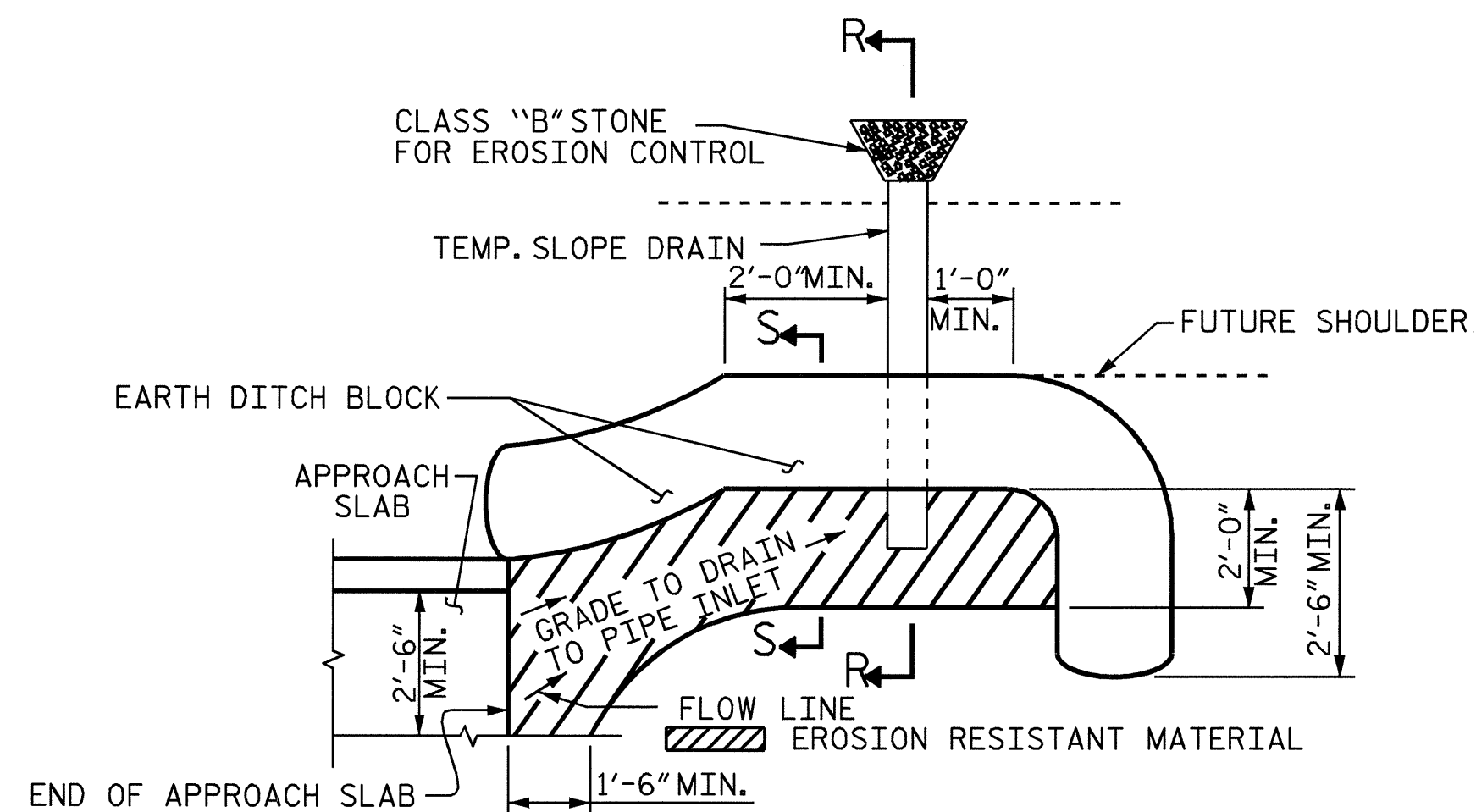
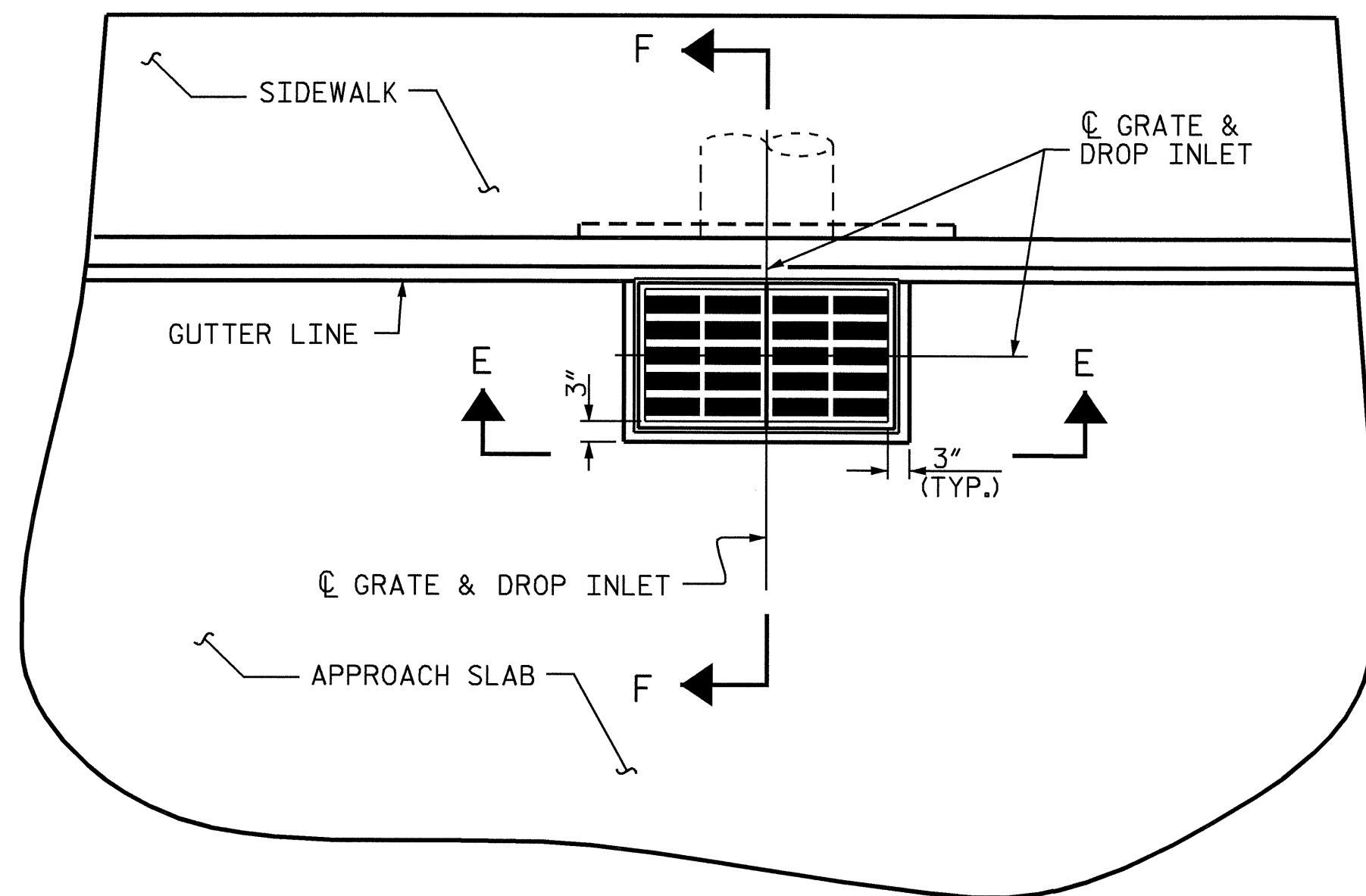
STANDARD
BRIDGE APPROACH
SLAB DETAILS

1988
SHEET NO. 5-50
TOTAL SHEETS 51

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



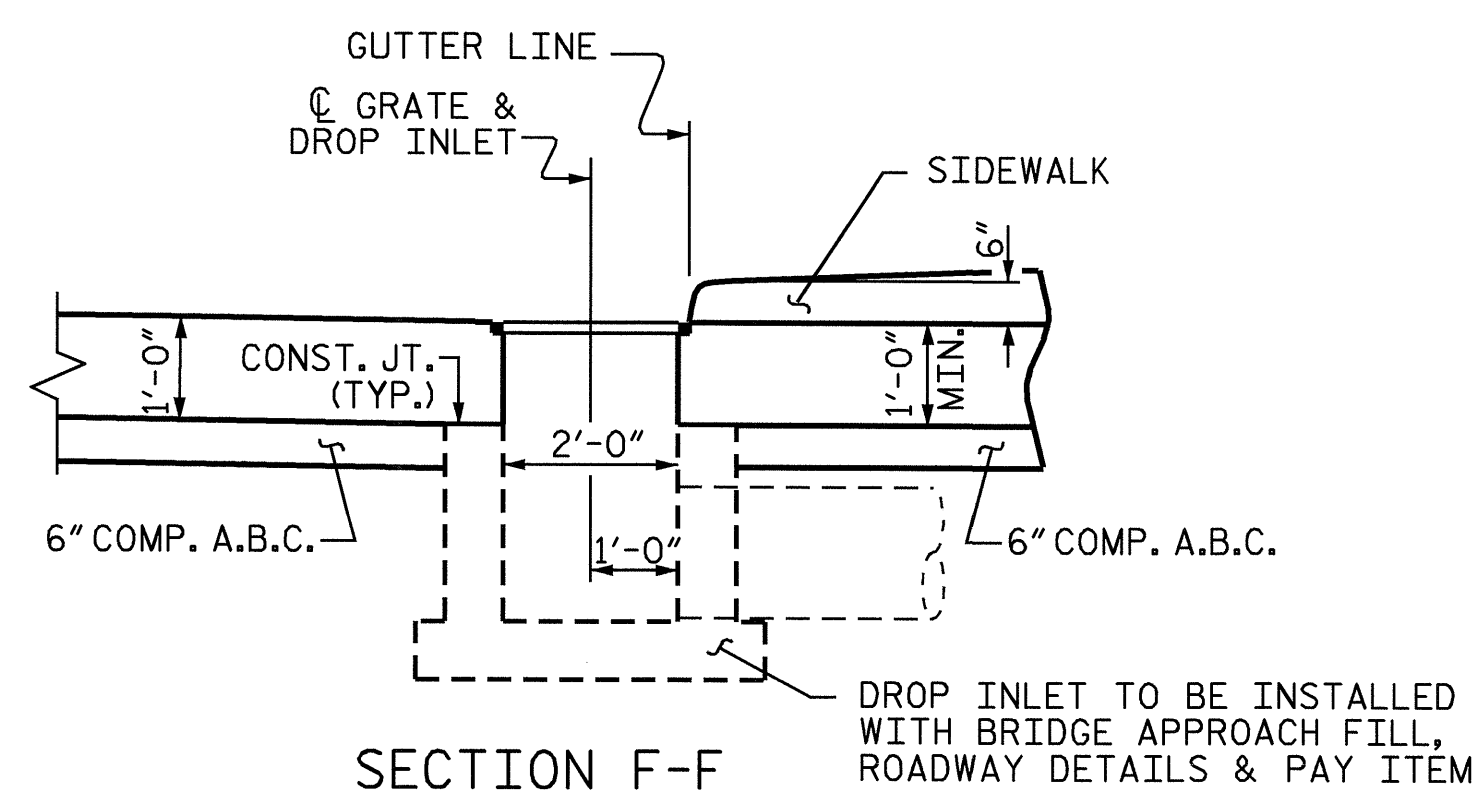
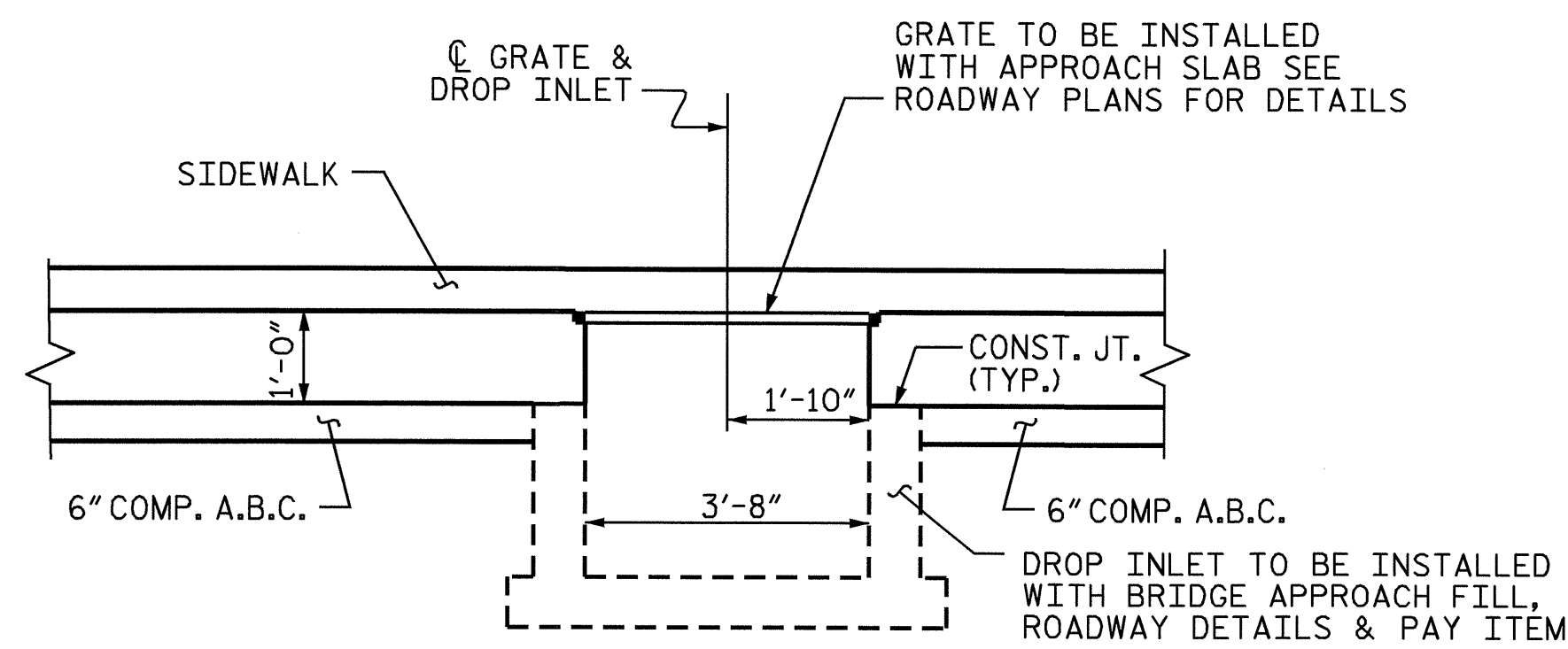
ASSEMBLED BY : N. Q. TRAN DATE : 2-20-09
CHECKED BY : J. A. TILLMAN DATE : 2-28-09
DRAWN BY : FCJ 11/88 REV. 10/17/00 RWW/LES
CHECKED BY : ARB 11/88 REV. 5/7/03 RWW/LTE
REV. 5/1/06 TLA/GM



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

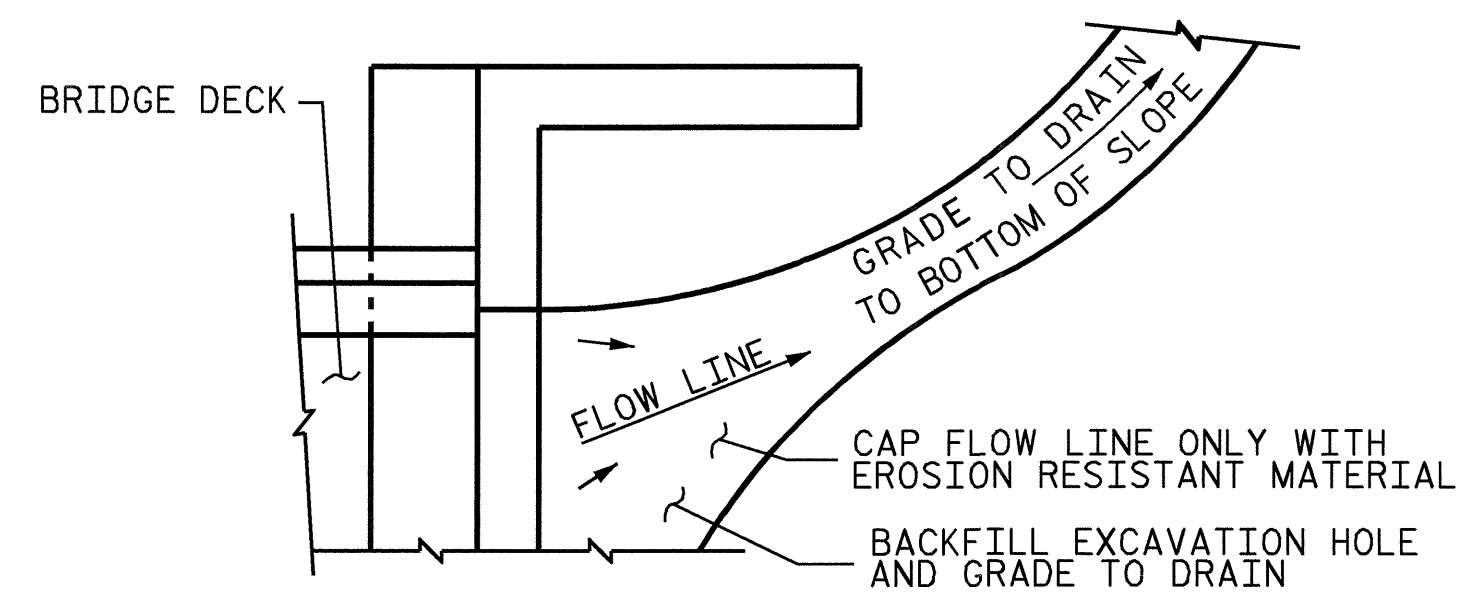
TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



GRATED DROP INLET DETAILS

NOTE: DROP INLET AND GRATE ARE ROADWAY PAY ITEMS. SEE ROADWAY PLANS FOR DETAILS.



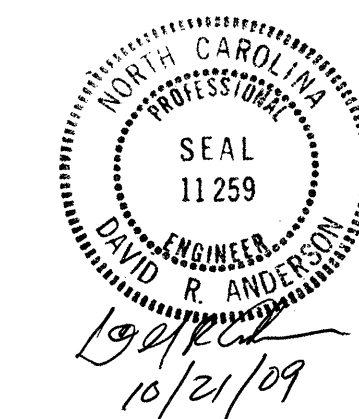
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

PROJECT NO. B-3919
WAKE COUNTY
 STATION: 38+12.60 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

BRIDGE APPROACH SLAB DETAILS



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

DRAWN BY: N. Q. TRAN DATE: 2-08-09
 CHECKED BY: J. A. TILLMAN DATE: 2-25-09

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2006 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N.C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.
 ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.
 IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.
 DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.
 WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".
 EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.
 WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16 INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.
 METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINIS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

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

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