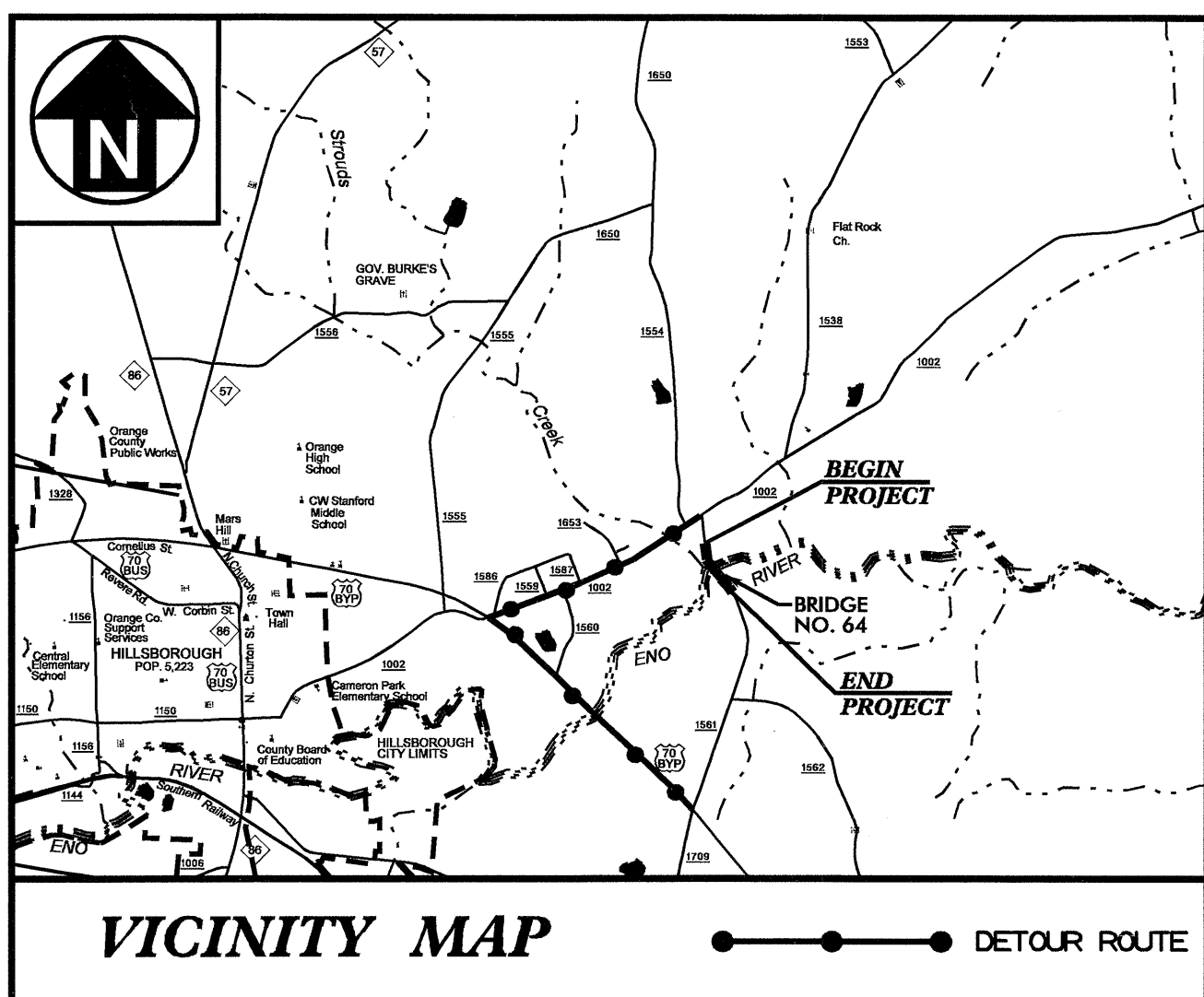


09/08/09

TIP PROJECT: B-4592

CONTRACT: C202047



NEAREST SHIPPING POINT: HILLSBOROUGH ON SOUTHERN RAILROAD 3.5 MILES FROM BRIDGE

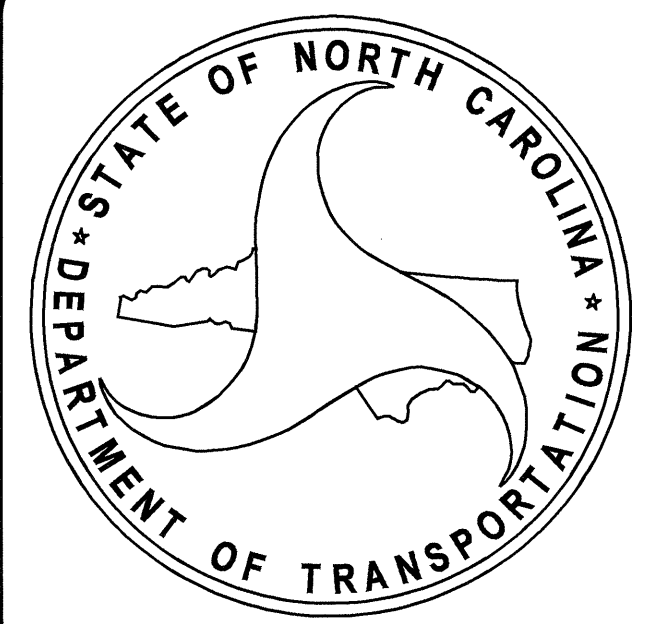
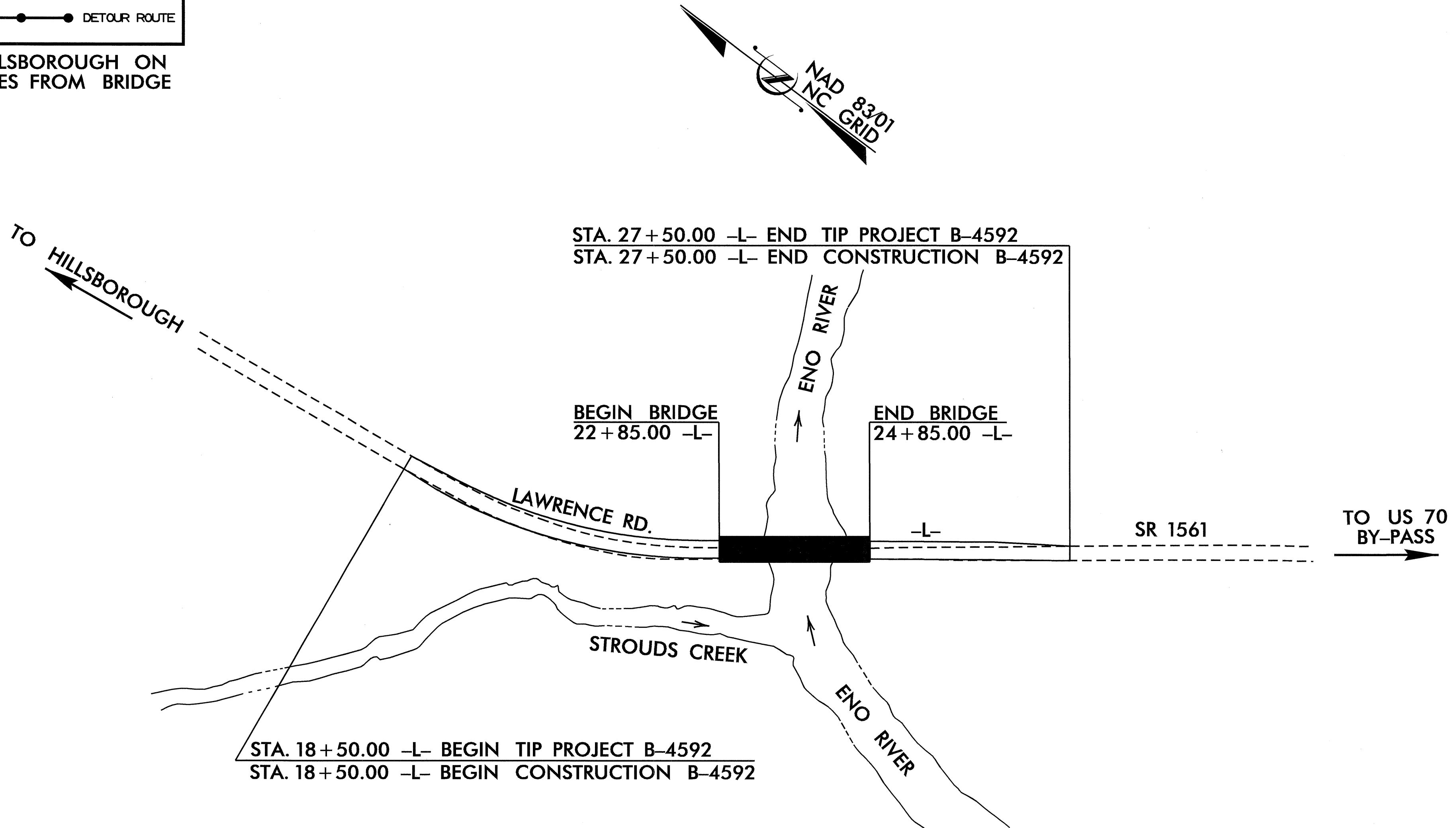
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ORANGE COUNTY

LOCATION: BRIDGE NO. 64 OVER ENO RIVER ON SR 1561
TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4592		
W.B.ELEMENT	F.A. PROJ. NO.	DESCRIPTION	
33790.1.1	BRZ-1561(5)	P.E.	
33790.2.1	BRZ-1561(5)	R/W, UTL.	
33790.3.1	BRZ-1561(5)	CONST.	

STRUCTURE



DESIGN DATA

ADT 2008 = 3,970
ADT 2030 = 7,400
DHV = 13 %
D = 75 %
T = 2 %*
V = 50 MPH
* TTST 1% DUAL 1%

FUNCTIONAL CLASSIFICATION
LOCAL RURAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4592 = 0.132 MILES
LENGTH STRUCTURE TIP PROJECT B-4592 = 0.038 MILES
TOTAL LENGTH TIP PROJECT B-4592 = 0.170 MILES

Prepared in the Office of:
DIVISION OF HIGHWAYS
1000 BIRCH RIDGE DRIVE, RALEIGH, NC 27610

2006 STANDARD SPECIFICATIONS

LETTING DATE:
JANUARY 20, 2009

J.M. BAILEY, PE
PROJECT ENGINEER

D.A. DAVENPORT, JR., PE
PROJECT DESIGN ENGINEER

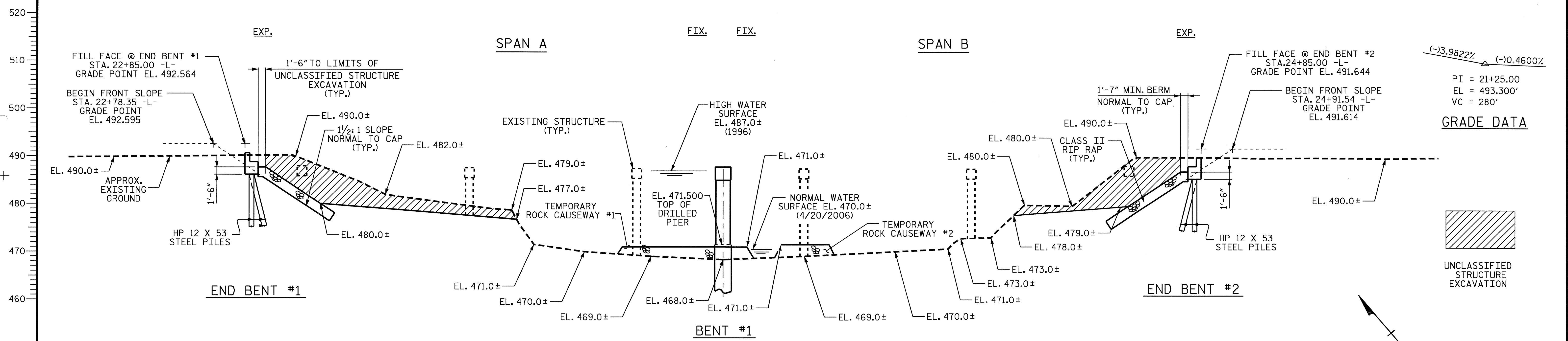
STRUCTURE DESIGN UNIT
1000 BIRCH RIDGE DRIVE
RALEIGH, NC 27610

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

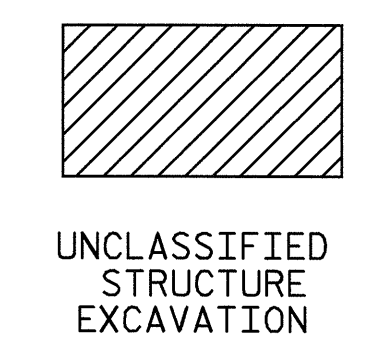
P.E.
STATE DESIGN ENGINEER
DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED _____
DIVISION ADMINISTRATOR DATE

20-NOV-2008 14:32
\$\$\$\$\$\$\$\$\$DGN\$\$\$\$\$\$\$\$\$
davenport



GRADE DATA
 PI = 21+25.00
 EL = 493.300'
 VC = 280'

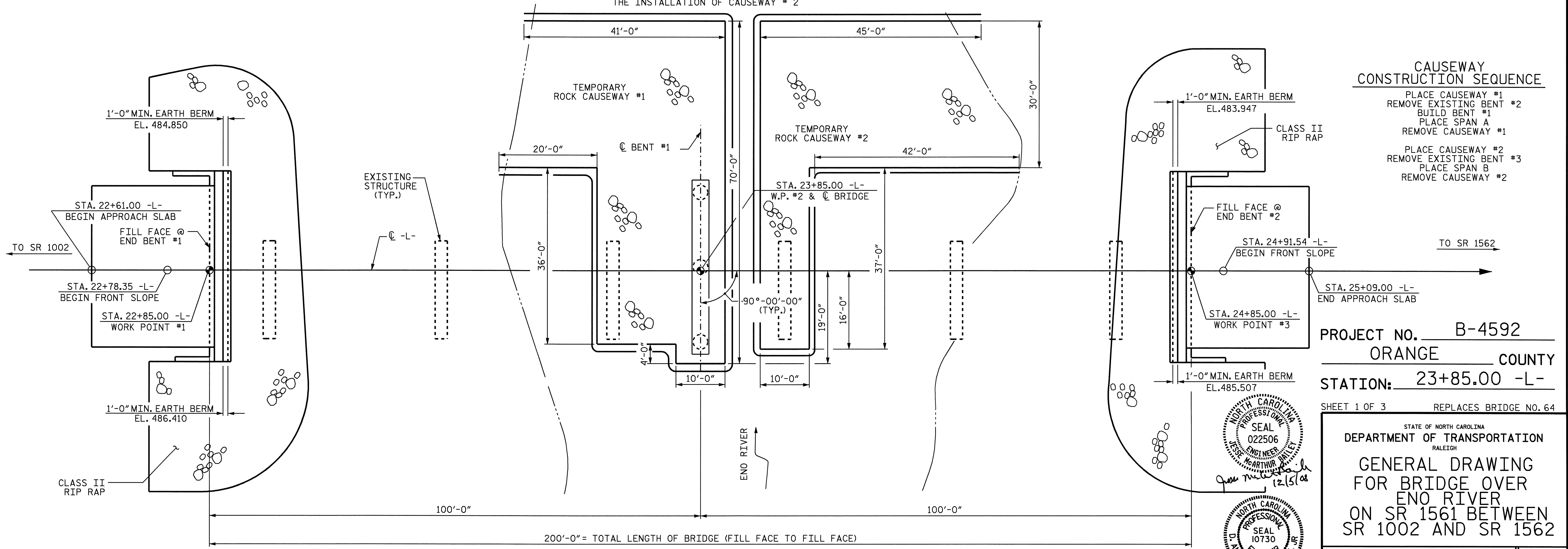


SECTION ALONG C SURVEY

CAUSEWAY #1 MUST BE REMOVED PRIOR TO THE INSTALLATION OF CAUSEWAY #2

CAUSEWAY CONSTRUCTION SEQUENCE

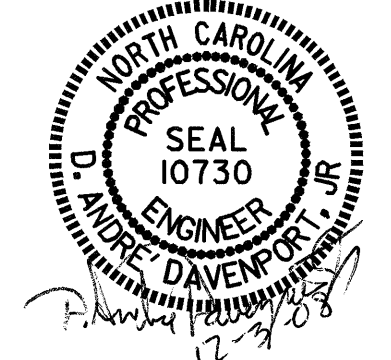
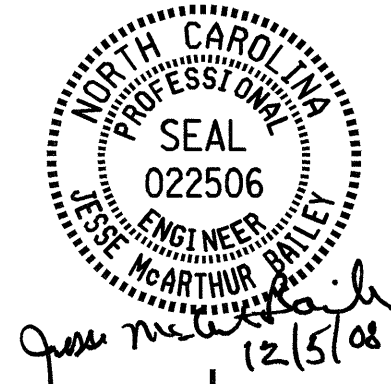
- PLACE CAUSEWAY #1
- REMOVE EXISTING BENT #2
- BUILD BENT #1
- PLACE SPAN A
- REMOVE CAUSEWAY #1
- PLACE CAUSEWAY #2
- REMOVE EXISTING BENT #3
- PLACE SPAN B
- REMOVE CAUSEWAY #2



PLAN

(PILES NOT SHOWN FOR CLARITY)

DRAWN BY : D. A. DAVENPORT DATE : 09-08
 CHECKED BY : M. G. SHAIKH DATE : 10/08

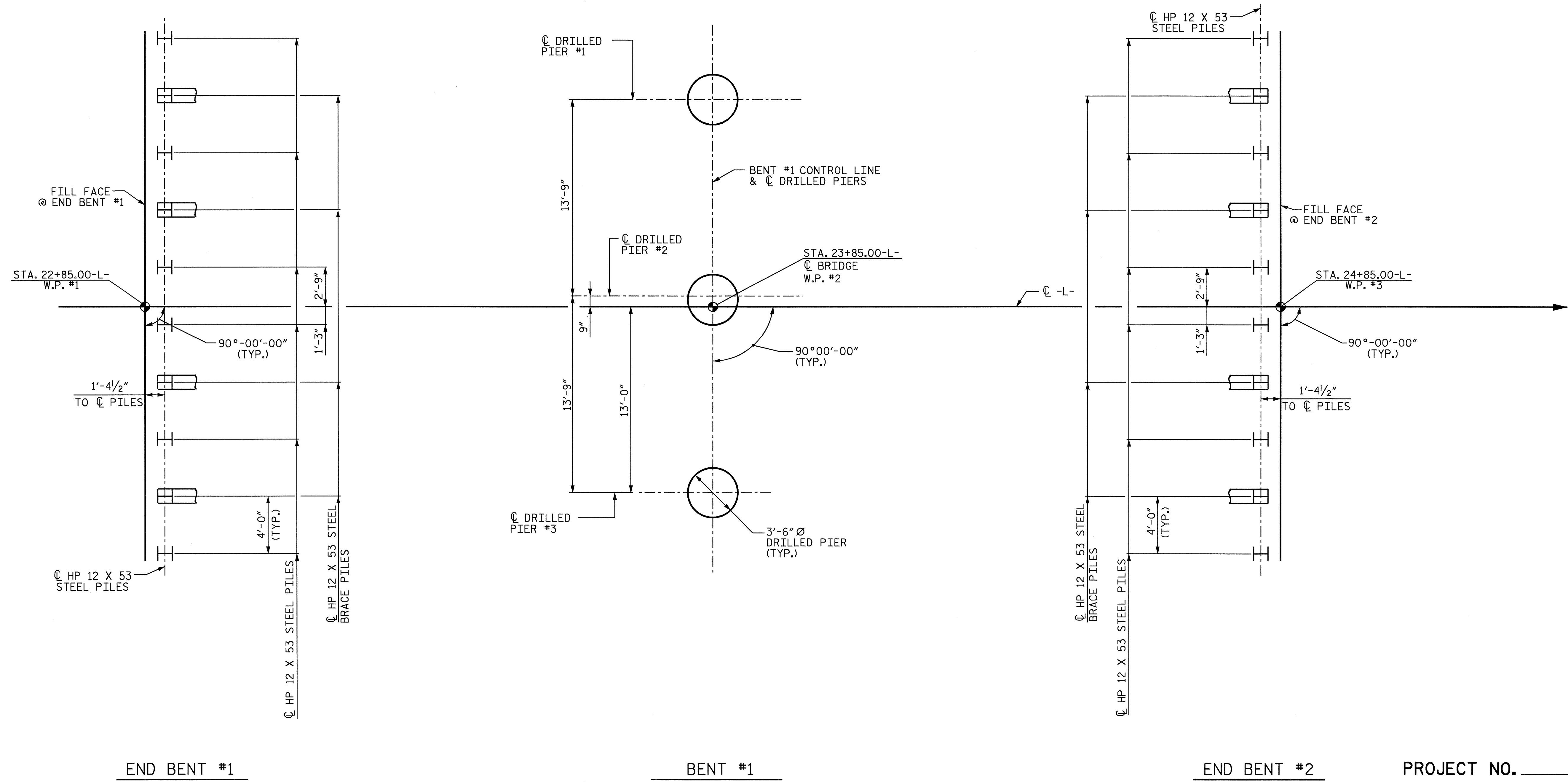


PROJECT NO. B-4592
 ORANGE COUNTY
 STATION: 23+85.00 -L-

SHEET 1 OF 3 REPLACES BRIDGE NO. 64

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING
 FOR BRIDGE OVER
 ENO RIVER
 ON SR 1561 BETWEEN
 SR 1002 AND SR 1562

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



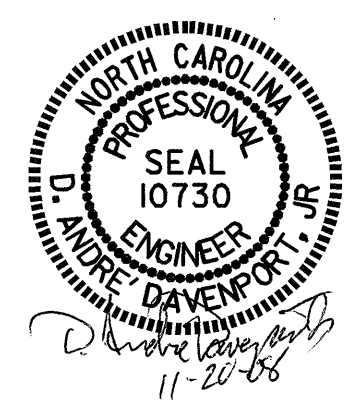
FOUNDATION LAYOUT
 ALL DIMENSIONS LOCATING PILES ARE TO THE PILE CENTERLINE
 HP 12 X 53 STEEL BRACE PILES ARE BATTERED 3:12

PROJECT NO. B-4592
ORANGE COUNTY
 STATION: 23+85.00-L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**GENERAL DRAWING
 FOR BRIDGE OVER
 ENO RIVER
 ON SR 1561 BETWEEN
 SR 1002 AND SR 1562**

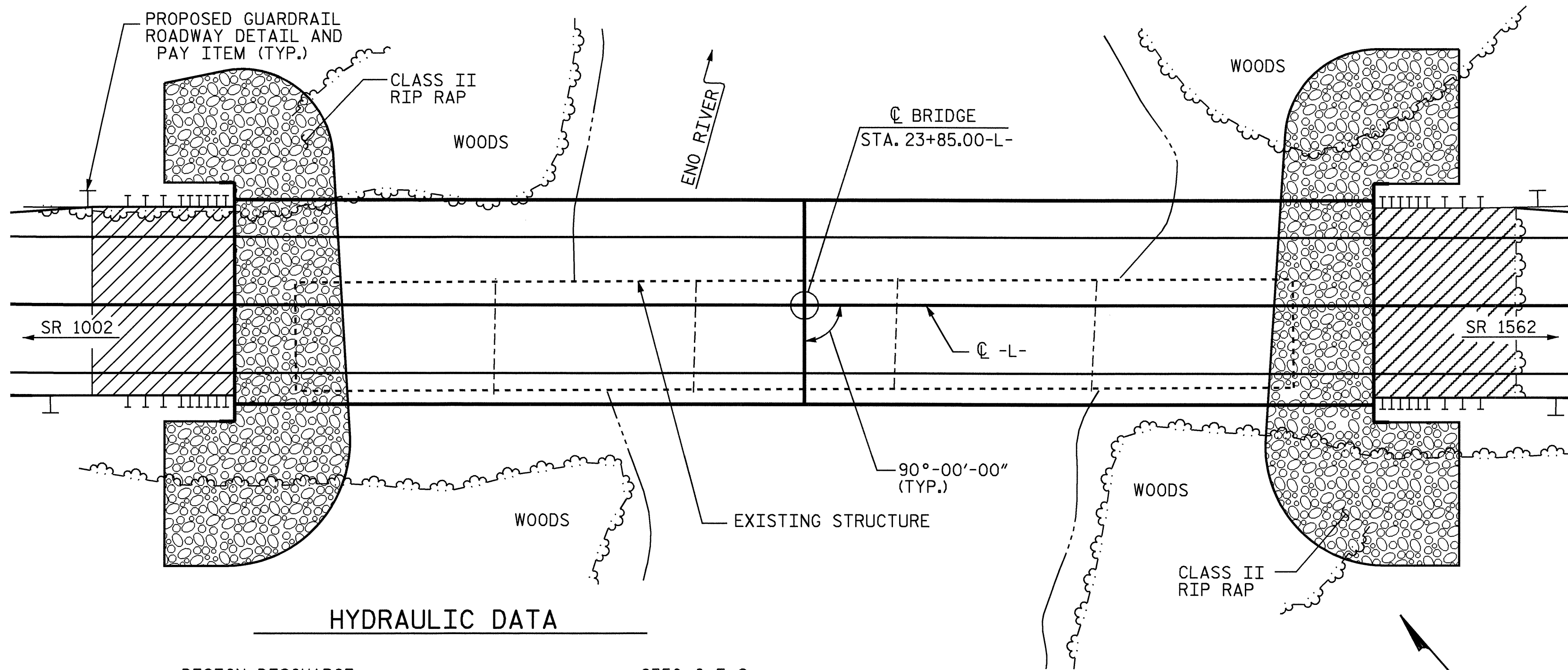


DRAWN BY : D.A. DAVENPORT DATE : 09-08
 CHECKED BY : M.G. SHAIKH DATE : 10/08

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

BENCH MARK #1 : RAILROAD SPIKE SET IN 15" Ø OAK TREE 365.95 FT. LEFT OF STA.25+47.36 -L-, ELEV. 477.340

NOTES



HYDRAULIC DATA

DESIGN DISCHARGE ----- = 8350 C. F. S.
 FREQUENCY OF DESIGN FLOOD ----- = 25 YEAR
 DESIGN HIGH WATER ELEVATION ----- = 483.600
 DRAINAGE AREA ----- = 82.5 SQ. MI.
 BASIC DISCHARGE(Q100) ----- = 11400 C. F. S.
 BASIC HIGH WATER ELEVATION ----- = 485.600

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE ----- = 21300 C. F. S.
 FREQUENCY OF OVERTOPPING FLOOD ----- = 500 YEAR +
 OVERTOPPING FLOOD ELEVATION ----- = 491.200

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

LOCATION SKETCH

ASSUMED LIVE LOAD = HS 20 OR ALTERNATE LOADING, EXCEPT THAT THE BOX BEAM UNITS HAVE BEEN DESIGNED FOR HS25.

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

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 MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET S-1 SHALL BE EXCAVATED FOR A DISTANCE OF 25 FT. EACH SIDE 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.

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.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO STANDARD SPECIFICATIONS FOR SEISMIC DESIGN OF HIGHWAY BRIDGES FOR SEISMIC PERFORMANCE CATEGORY A.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

THE EXISTING STRUCTURE CONSISTING OF 1 SPAN @ 35'-9", 3 SPANS @ 35'-0" AND 1 SPAN @ 35'-9" OF STEEL GIRDER, TIMBER JOISTS AND STEEL FLOOR BEAM SYSTEM, WITH A CLEAR ROADWAY WIDTH OF 18'-7" WITH A 3/4" ASPHALT WEARING SURFACE ON A 4" X 8" TIMBER FLOOR ON REINFORCED CONCRETE ABUTMENTS AND REINFORCED CONCRETE INTERIOR BENTS AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT.

AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 23+85.00-L-.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 23+85.00-L-."

FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STA. 23+85.00-L-, SEE SPECIAL PROVISIONS.

DRIVE PILES AT END BENT NO.1 AND END BENT NO.2 TO A REQUIRED BEARING CAPACITY OF 120 TONS PER PILE. THE REQUIRED BEARING CAPACITY IS EQUAL TO THE ALLOWABLE BEARING CAPACITY WITH A MINIMUM FACTOR OF SAFETY OF TWO.

THE ALLOWABLE BEARING CAPACITY FOR PILES AT END BENT NO.1 AND END BENT NO.2 IS 60 TONS PER PILE.

FOR DRILLED PIERS, SEE DRILLED PIERS SPECIAL PROVISION.

DRILLED PIERS AT BENT NO.1 ARE DESIGNED FOR BOTH SKIN FRICTION AND END BEARING. CHECK FIELD CONDITIONS FOR THE REQUIRED END BEARING CAPACITY OF 60 TSF.

DRILLED PIERS AT BENT NO.1 ARE DESIGNED FOR AN APPLIED LOAD OF 370 TONS EACH AT THE TOP OF THE COLUMN.

INSTALL DRILLED PIERS AT BENT NO.1 THAT EXTEND TO AN ELEVATION NO HIGHER THAN EL. 455,000 AND SATISFY THE REQUIRED END BEARING CAPACITY.

PERMANENT STEEL CASING IS REQUIRED FOR DRILLED PIERS AT BENT NO.1. DO NOT EXTEND THE CASING BELOW ELEVATION 467,000 WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

THE SCOUR CRITICAL ELEVATION FOR BENT NO.1 IS EL. 462,000. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

DO NOT USE SLURRY CONSTRUCTION FOR DRILLED PIERS AT BENT NO.1.

SID INSPECTIONS MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SID INSPECTIONS.

CSL TUBES ARE REQUIRED AND CSL TESTING MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR CSL TESTING. SEE CROSSHOLE SONIC LOGGING SPECIAL PROVISION.

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

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH HEC 18, "EVALUATING SCOUR AT BRIDGES", MAY, 2001.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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.

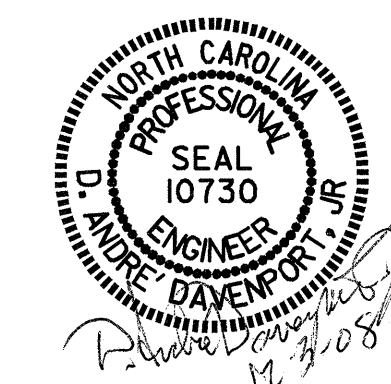
TOTAL BILL OF MATERIAL

	CONSTRUCTION MAINT. & REMOVAL OF TEMP. ACCESS	REMOVAL OF EXISTING STRUCTURE	3'-6" Ø DRILLED PIERS IN SOIL	3'-6" Ø DRILLED PIERS NOT IN SOIL	3'-6" Ø PERMANENT STEEL CASING	SID INSPECTION	CROSSHOLE SONIC LOGGING	UNCLASSIFIED STRUCTURE EXCAVATION	CONCRETE WEARING SURFACE	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	HP 12 X 53 STEEL PILES	TWO BAR METAL RAIL	1'-2" X 3'-0 3/4" CONCRETE PARAPET	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	LUMP SUM	LIN. FEET	LIN. FEET	LIN. FEET	EACH	EACH	CU. YDS.	SQ. FEET	SQ. FEET	CU. YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.	LIN. FT.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	LUMP SUM	LIN. FT.
SUPERSTRUCTURE									6003	6717						380,000	395,500					2173,875	
END BENT NO. 1								405			17.2		2785		10	200		185	205				
BENT NO. 1			19.50	30.00	13.50						28.0		8888	1950									
END BENT NO. 2								300			17.2		2785		10	200		190	210				
TOTAL	LUMP SUM	LUMP SUM	19.50	30.00	13.50	1	1	705	6003	6717	62.4	LUMP SUM	14458	1950	20	400	380,000	395,500	375	415	LUMP SUM	LUMP SUM	2173,875

PROJECT NO. B-4592
ORANGE COUNTY
 STATION: 23+85.00 -L-

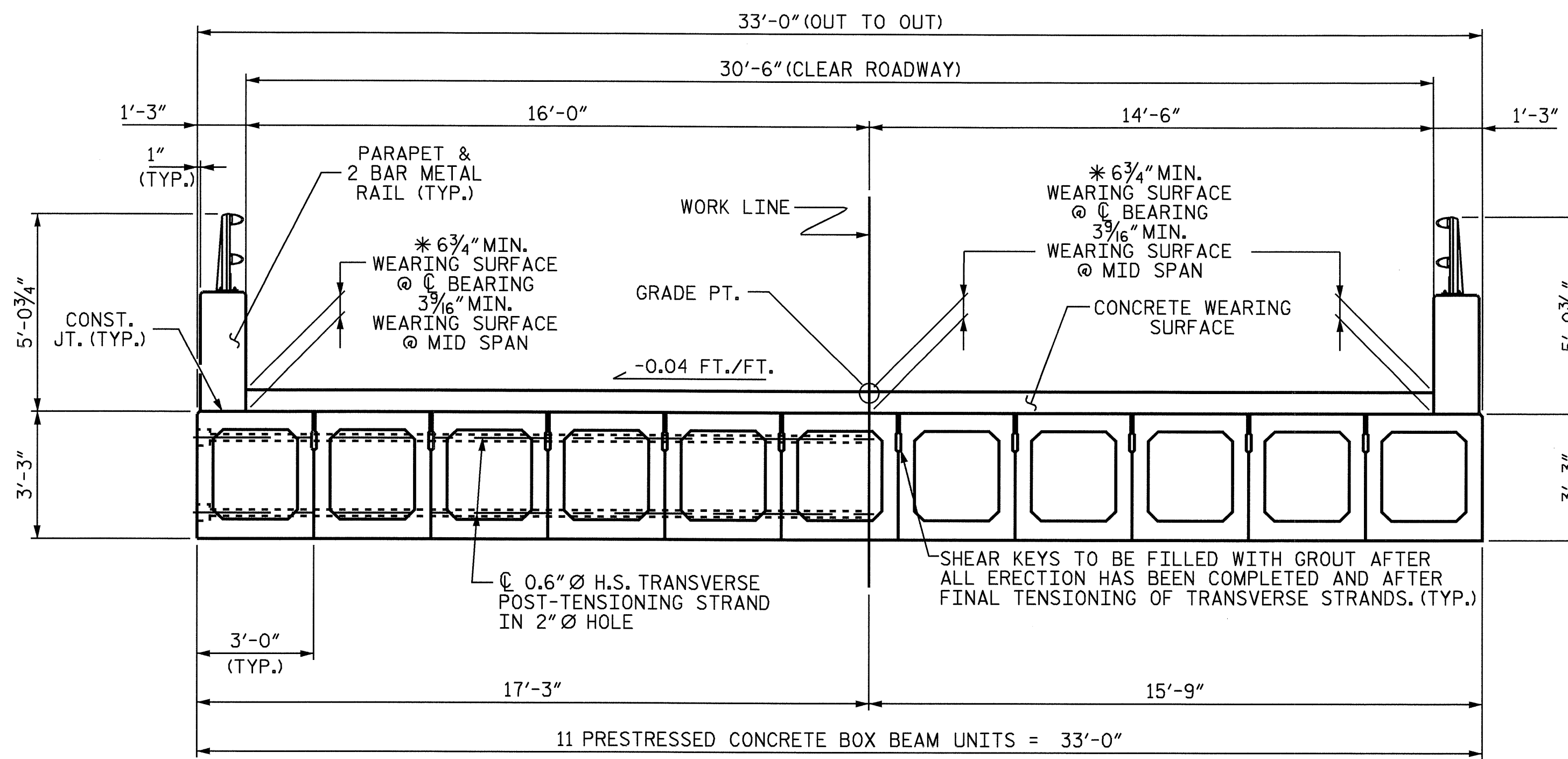
SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING
 FOR BRIDGE OVER
 ENO RIVER
 ON SR 1561 BETWEEN
 SR 1002 AND SR 1562



DRAWN BY : D. A. DAVENPORT DATE : 09-08
 CHECKED BY : M.G. SHAIKH DATE : 10/08

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



TYPICAL SECTION

*BASED ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATIONS

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. THE 2" Ø BACKER ROD SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER. 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 5500 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS 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.

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

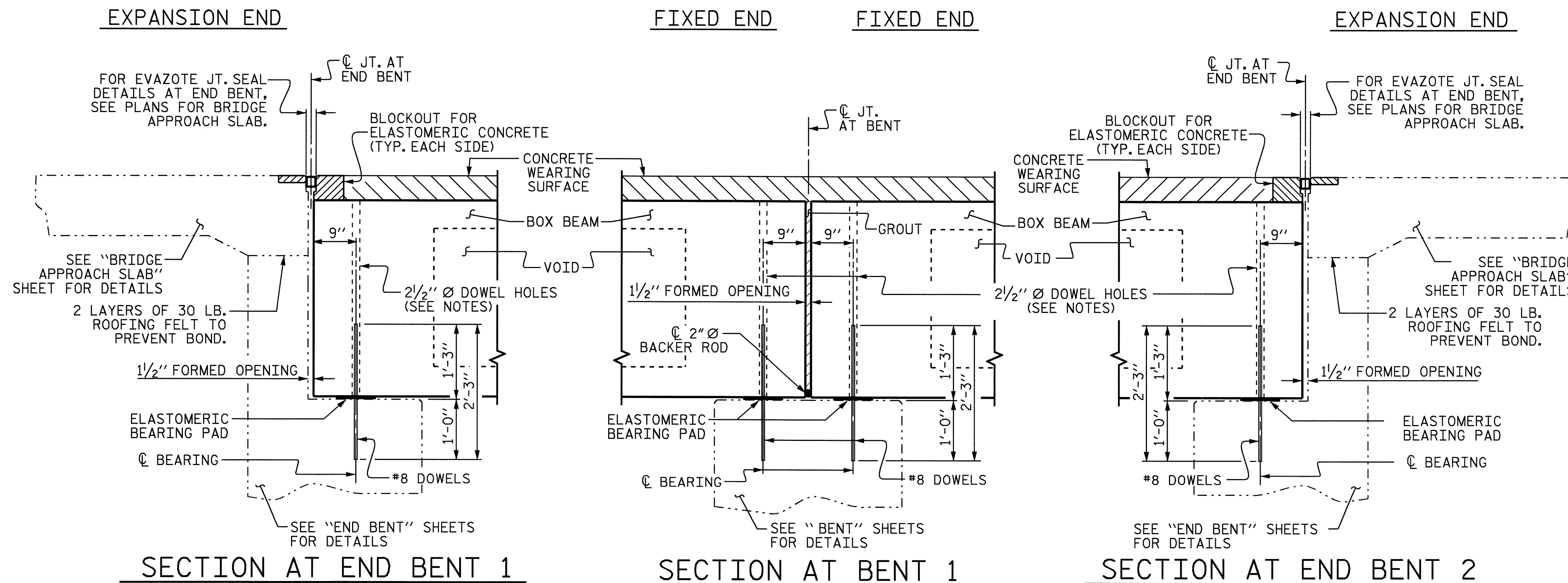
FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 2 1/2" AT END BENT NO. 1 & END BENT NO. 2.

PLACEMENT OF THE CONCRETE WEARING SURFACE SHALL OCCUR AFTER CASTING THE CONCRETE PARAPET. 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.

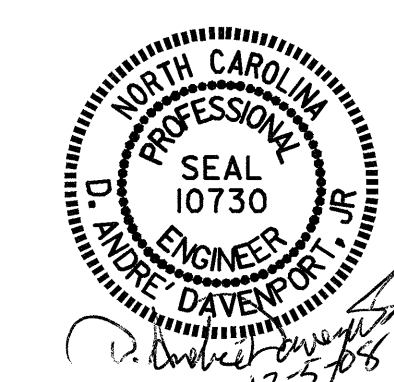


PROJECT NO. B-4592
ORANGE COUNTY
 STATION: 23+85.00-L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

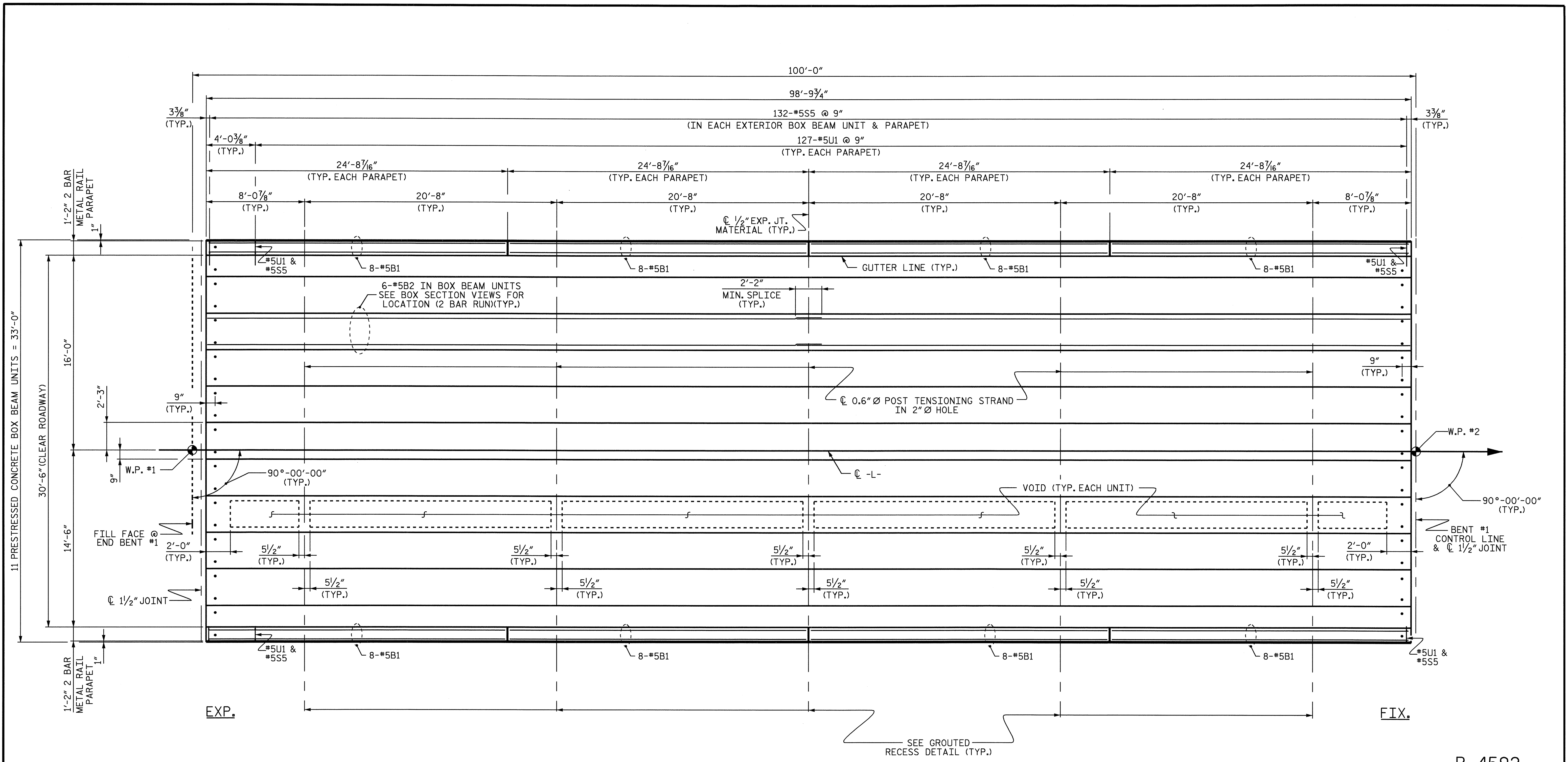
3'-0" X 3'-3"
 PRESTRESSED CONCRETE
 BOX BEAM UNIT



ASSEMBLED BY :	H. T. BARBOUR	DATE :	4-23-07
CHECKED BY :	C. R. YARBROUGH	DATE :	6-07
DRAWN BY :	TLA 5/05	ADDED :	7/11/05R
CHECKED BY :	GM 6/05	REV. :	5/1/06

05-DEC-2008 07:42
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 ddavenport

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



PLAN OF SPAN A

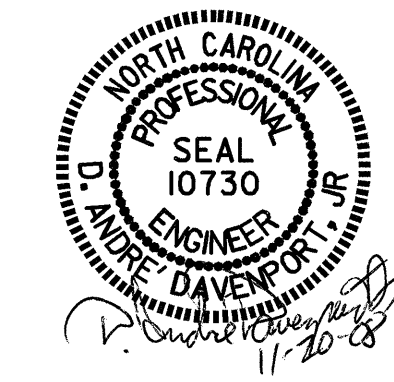
PROJECT NO. B-4592
 ORANGE COUNTY
 STATION: 23+85.00-L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

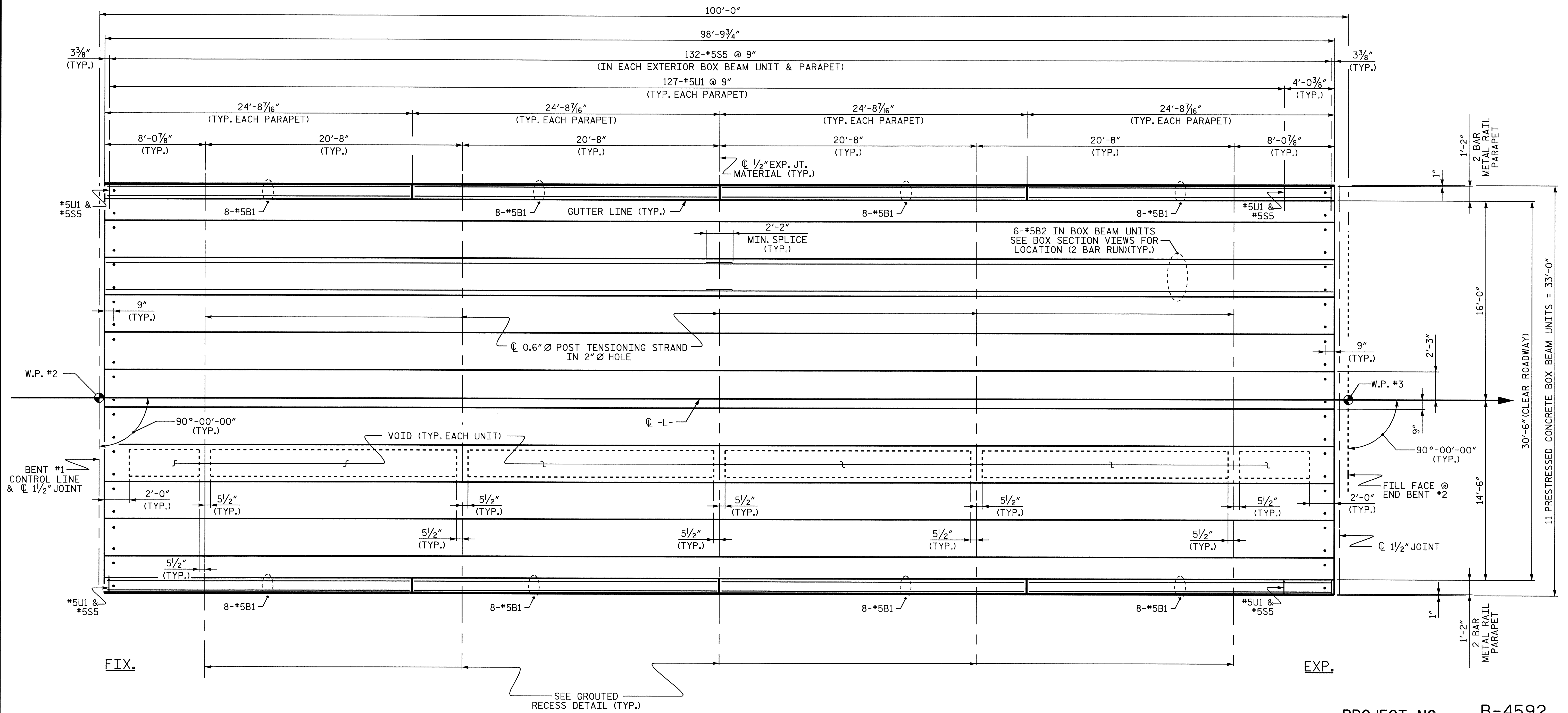
SUPERSTRUCTURE
 PLAN OF SPAN A

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5	
1			3			TOTAL SHEETS 24	
2			4				



DRAWN BY : H. T. BARBOUR DATE : 4-30-07
 CHECKED BY : C. R. YARBROUGH DATE : 6-07

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 ddavenport



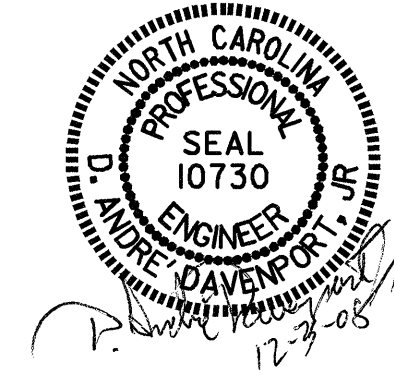
PLAN OF SPAN B

PROJECT NO. B-4592
 ORANGE COUNTY
 STATION: 23+85.00-L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

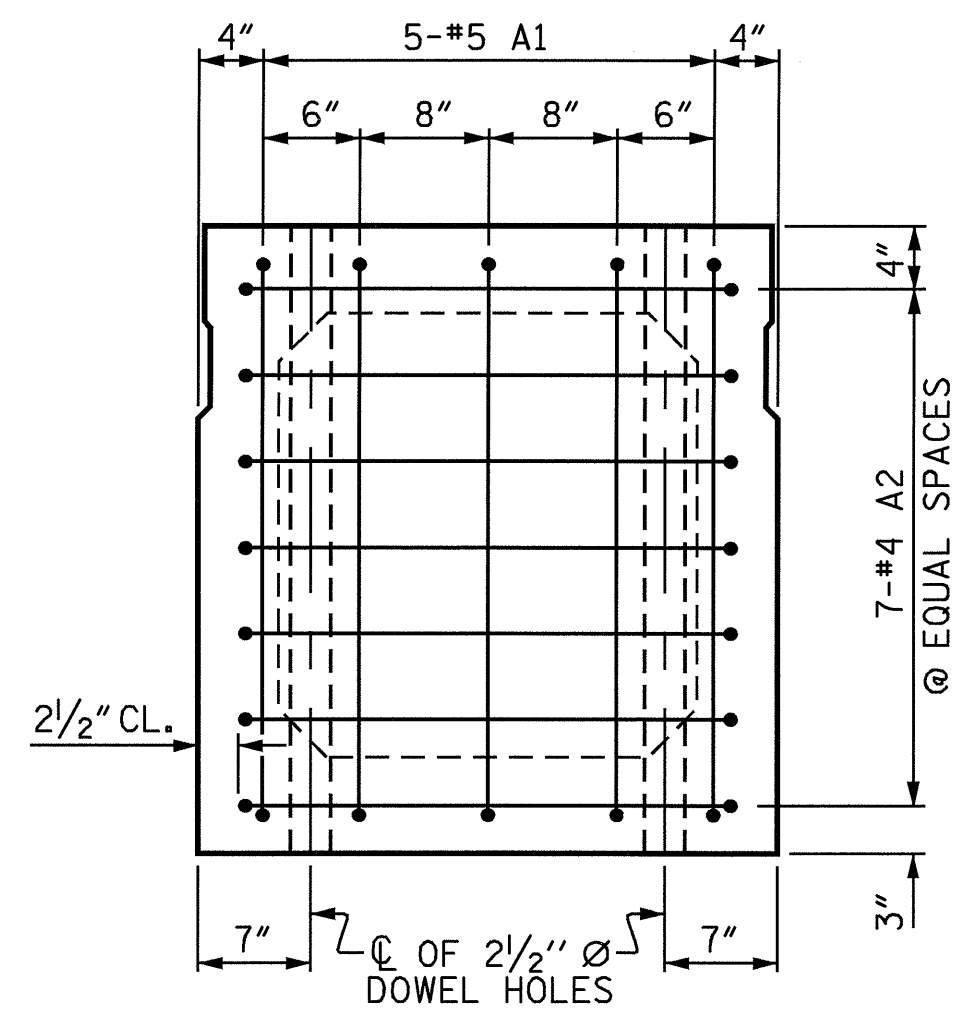
SUPERSTRUCTURE
 PLAN OF SPAN B



DRAWN BY : H. T. BARBOUR DATE : 4-30-07
 CHECKED BY : C. R. YARBROUGH DATE : 6-07

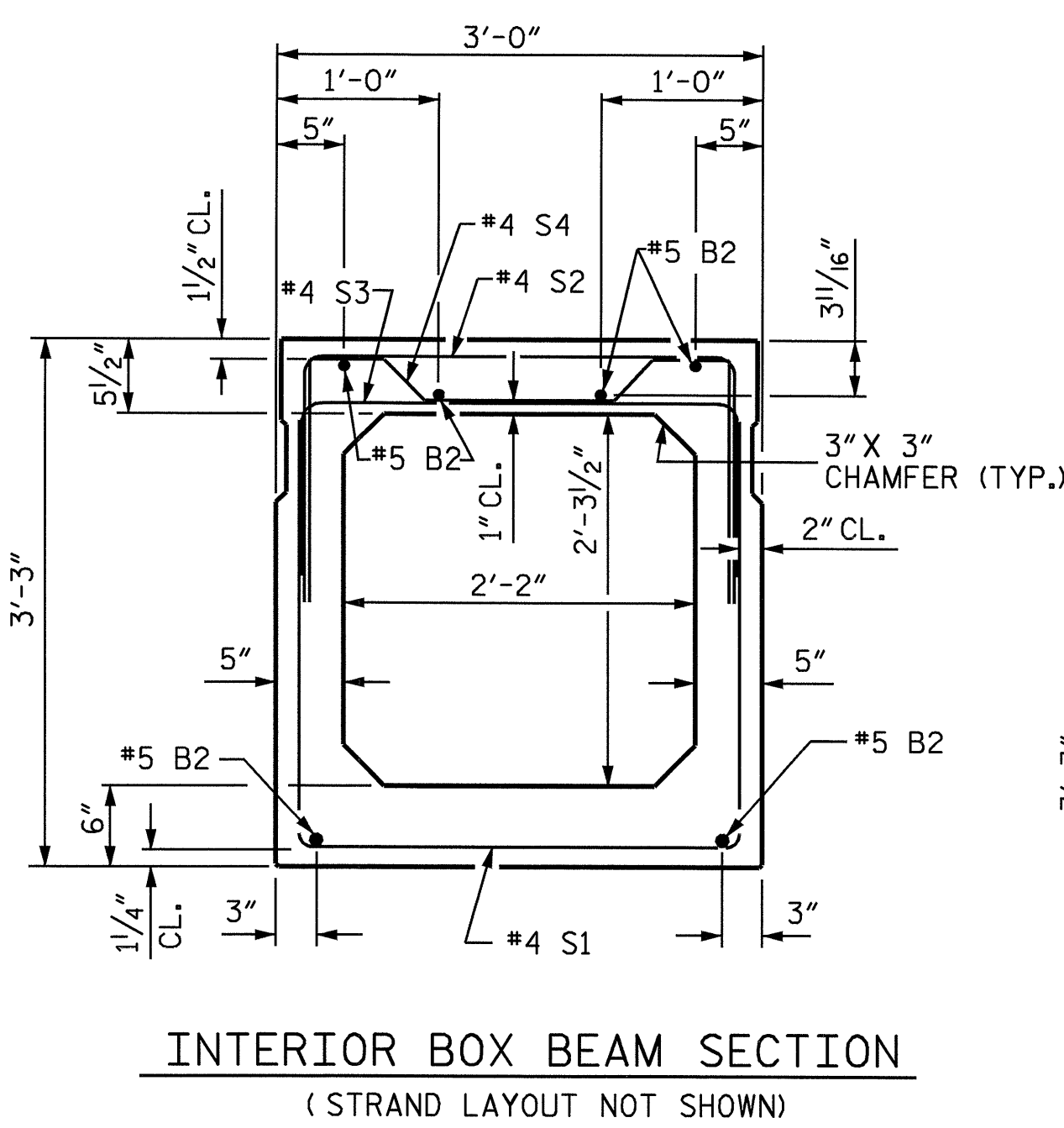
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6	
1			3			TOTAL SHEETS	
2			4			24	

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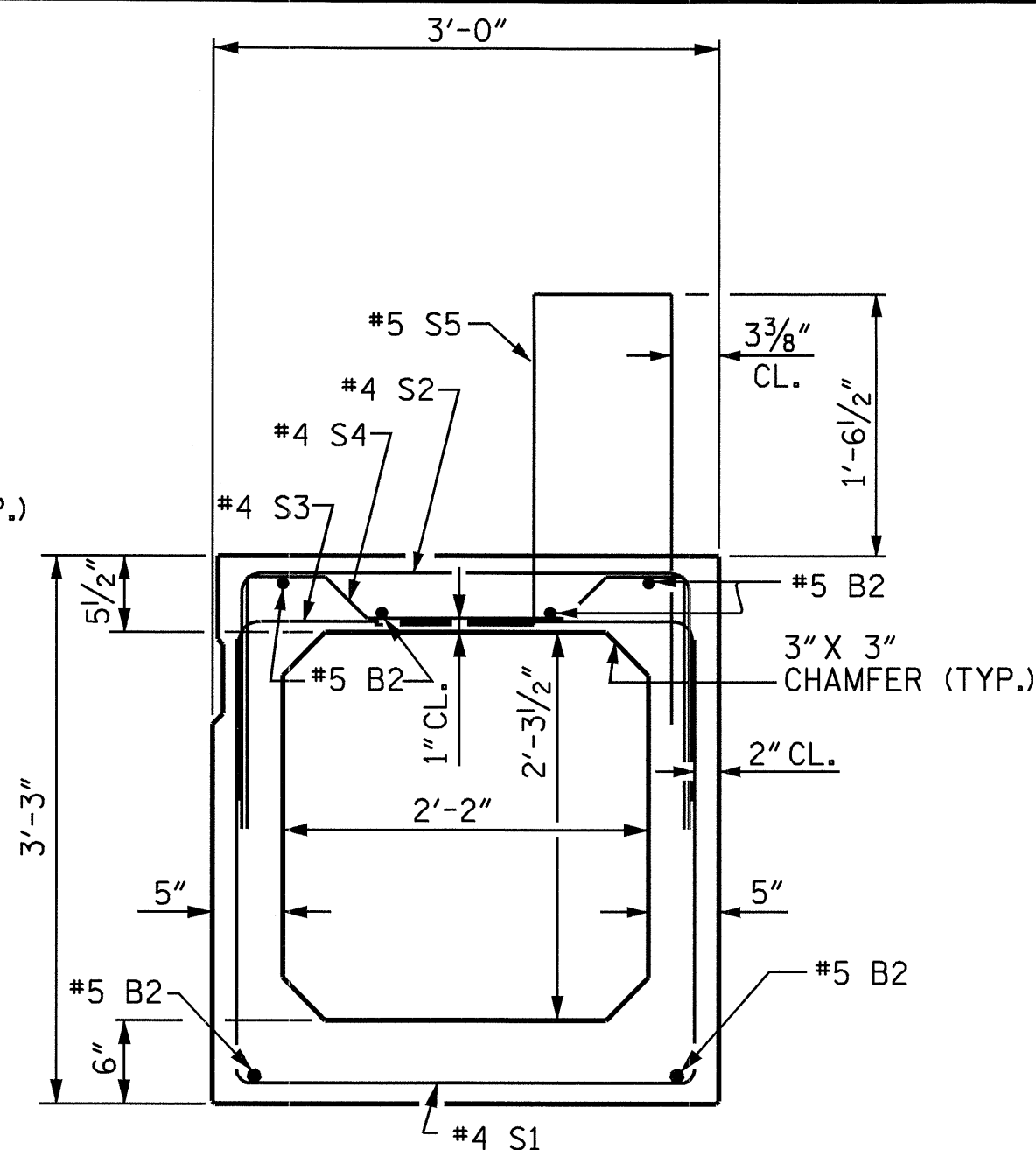


END ELEVATION

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.)

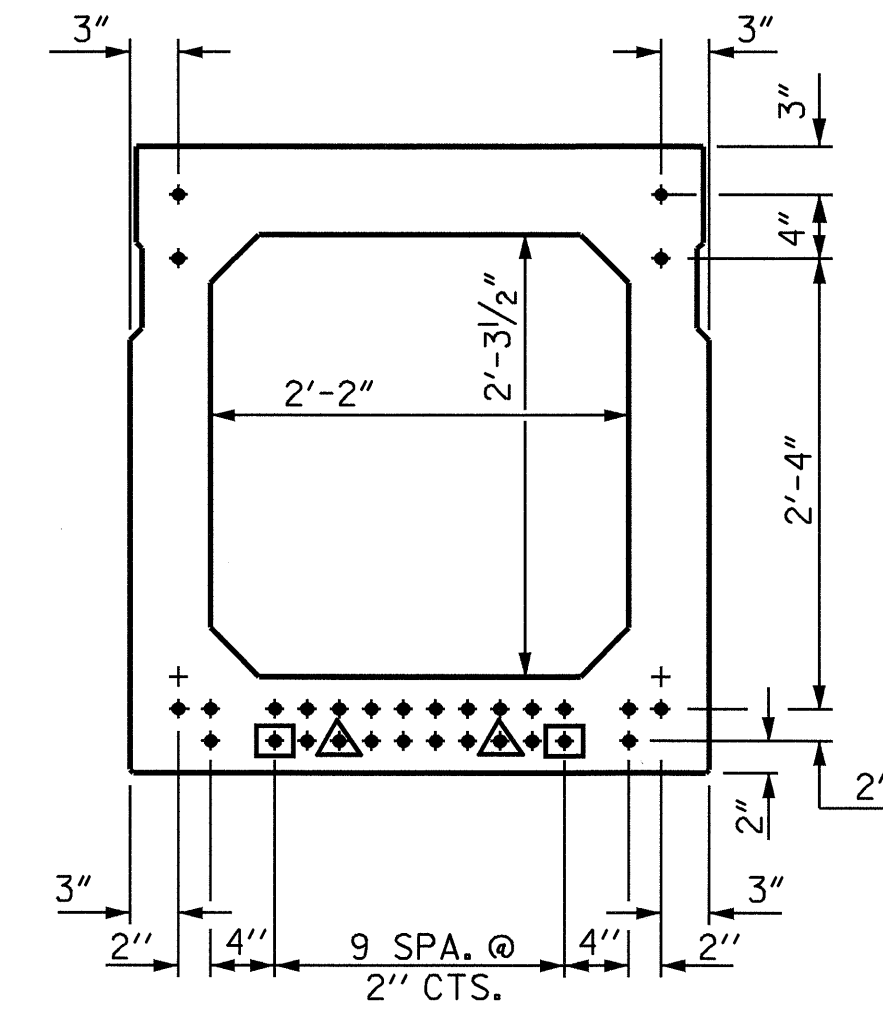


INTERIOR BOX BEAM SECTION
(STRAND LAYOUT NOT SHOWN)



EXTERIOR BOX BEAM SECTION
(STRAND LAYOUT NOT SHOWN)

0.6" Ø LOW RELAXATION STRAND LAYOUT



TYPICAL STRAND LOCATION

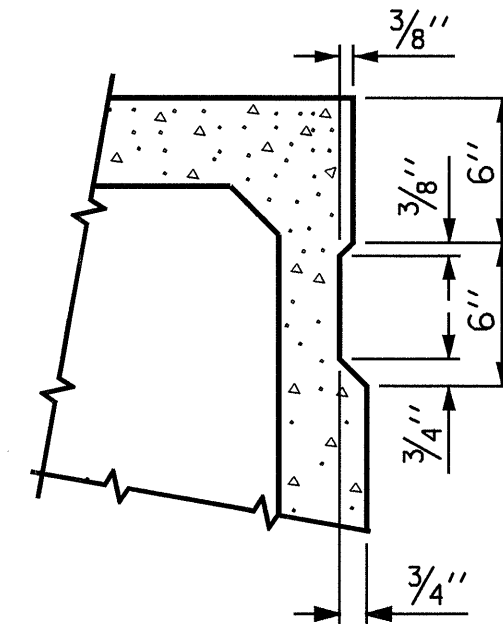
(30 STRANDS REQUIRED)
(INTERIOR BOX BEAM SECTION SHOWN-EXTERIOR SECTION SIMILAR EXCEPT SHEAR KEY LOCATION)

DEBONDING LEGEND

- FULLY BONDED STRANDS
- STRANDS DEBONDED FOR 4'-9" FROM END OF GIRDER
- STRANDS DEBONDED FOR 8'-9" FROM END OF GIRDER

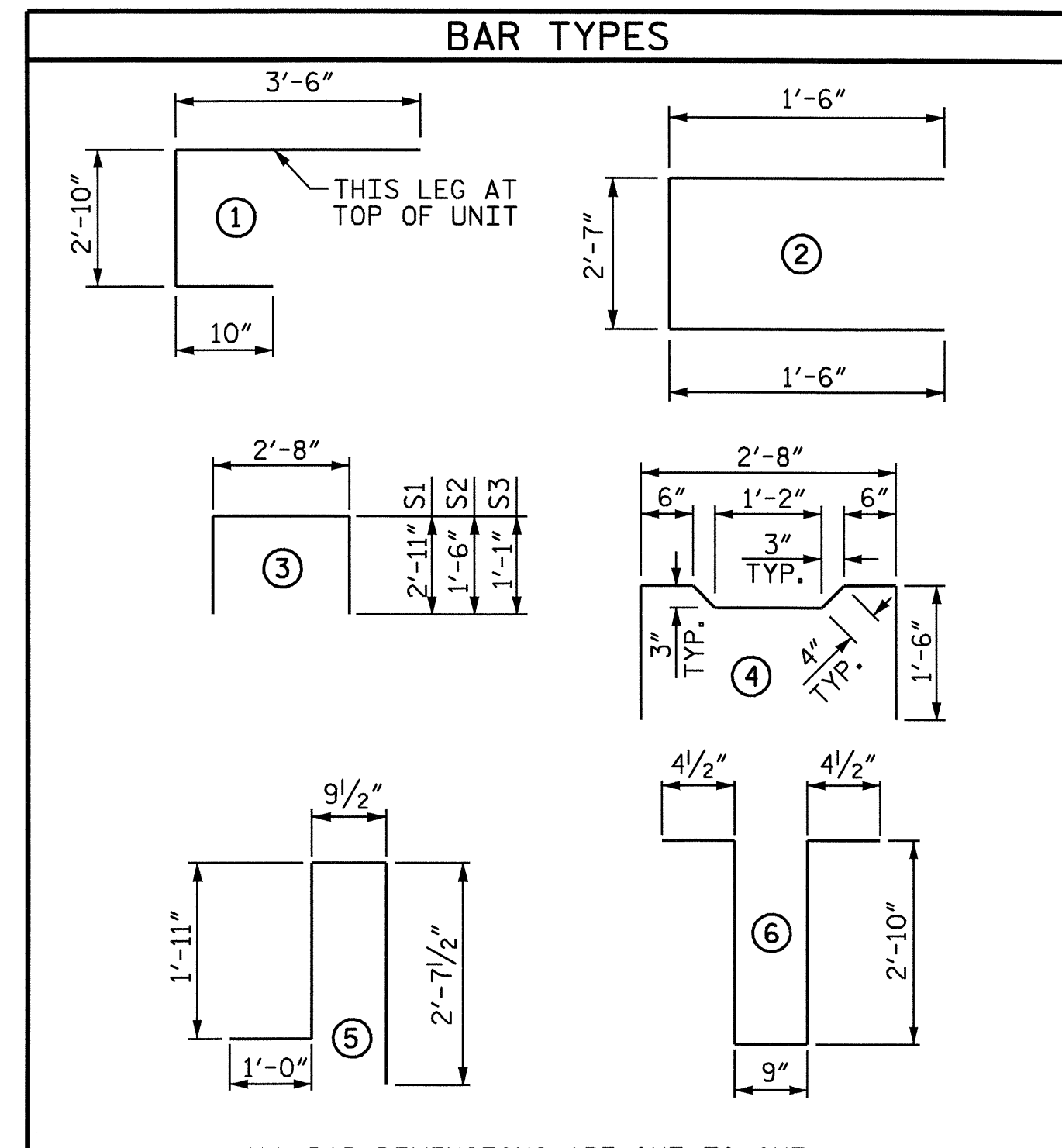
GRADE 270 STRANDS

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



SHEAR KEY DETAIL

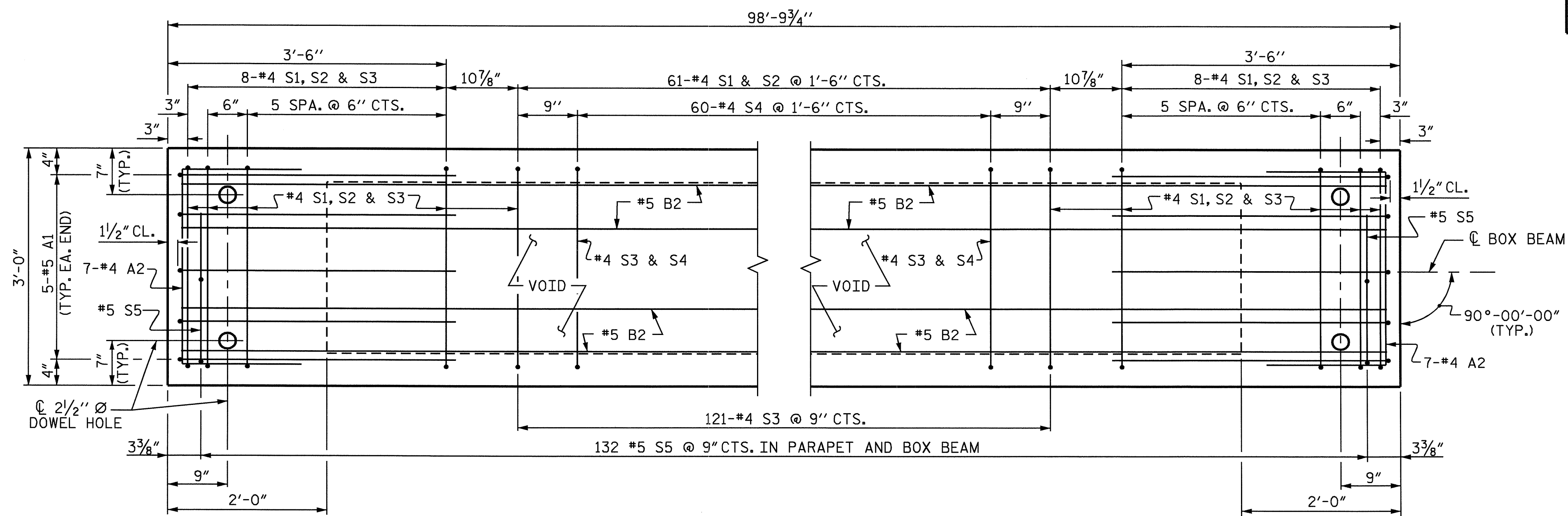
NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR BOX BEAMS.



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	7'-2"	75	7'-2"	75
A2	44	#4	5'-7"	164	5'-7"	164
B2	12	#5 STR	50'-4"	630	50'-4"	630
K1	15	#4	7'-2"	72	7'-2"	72
K2	10	#4 STR	2'-7"	17	2'-7"	17
S1	77	#4	8'-6"	437	8'-6"	437
S2	77	#4	5'-8"	291	5'-8"	291
S3	137	#4	4'-10"	442	4'-10"	442
S4	60	#4	5'-10"	234	5'-10"	234
*S5	132	#5	6'-4"	872	--	--
REINFORCING STEEL			2362 LBS.		2362 LBS.	
*EPOXY COATED REINF. STEEL			872 LBS.			
7000 P.S.I. CONCRETE			19.3 CU. YDS.		19.1 CU. YDS.	
0.6" Ø L.R. STRANDS			No. 30		No. 30	



PLAN OF BOX BEAM

EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S5 BARS. FOR LOCATION OF DIAPHRAGMS, SEE PLAN OF SPANS. FOR REINFORCING STEEL IN DIAPHRAGMS, SEE DIAPHRAGM DETAILS.

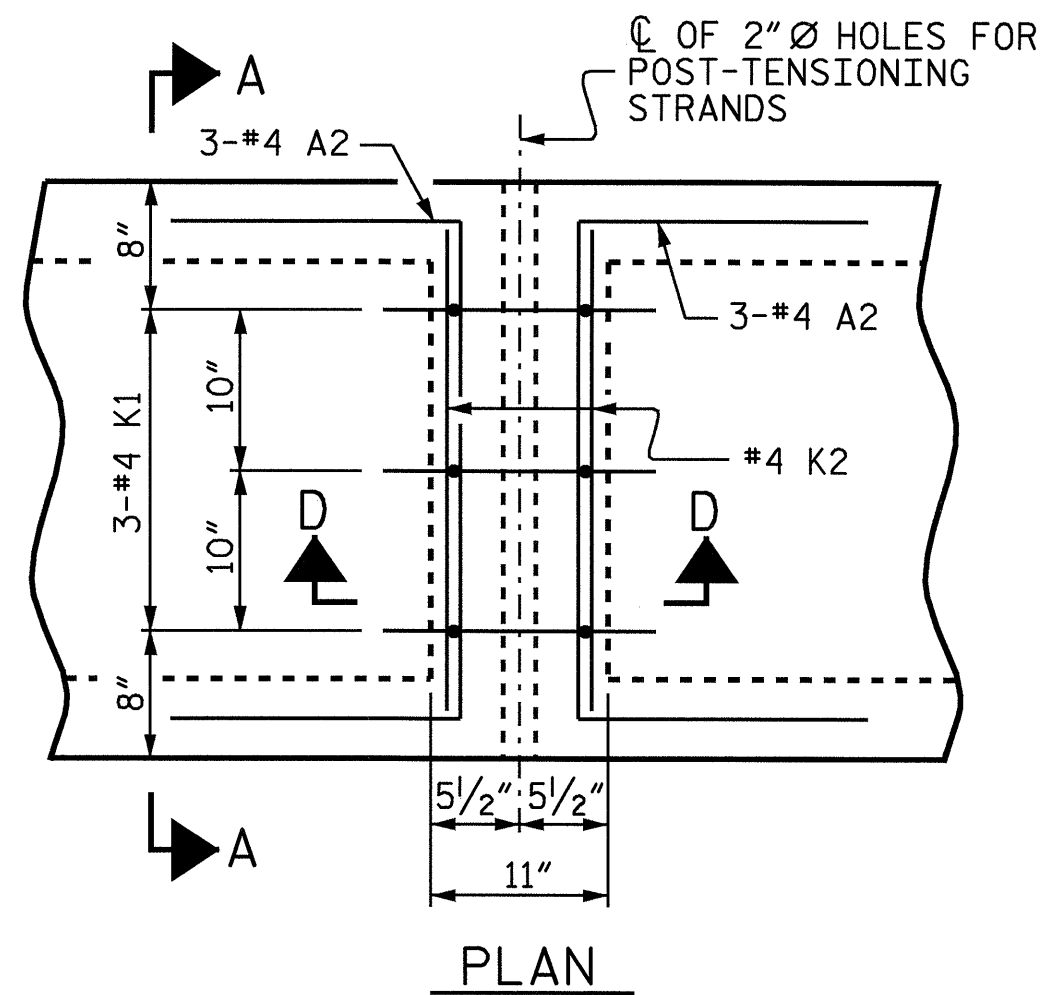
PROJECT NO. B-4592
ORANGE COUNTY
STATION: 23+85.00-L
SHEET 4 OF 5



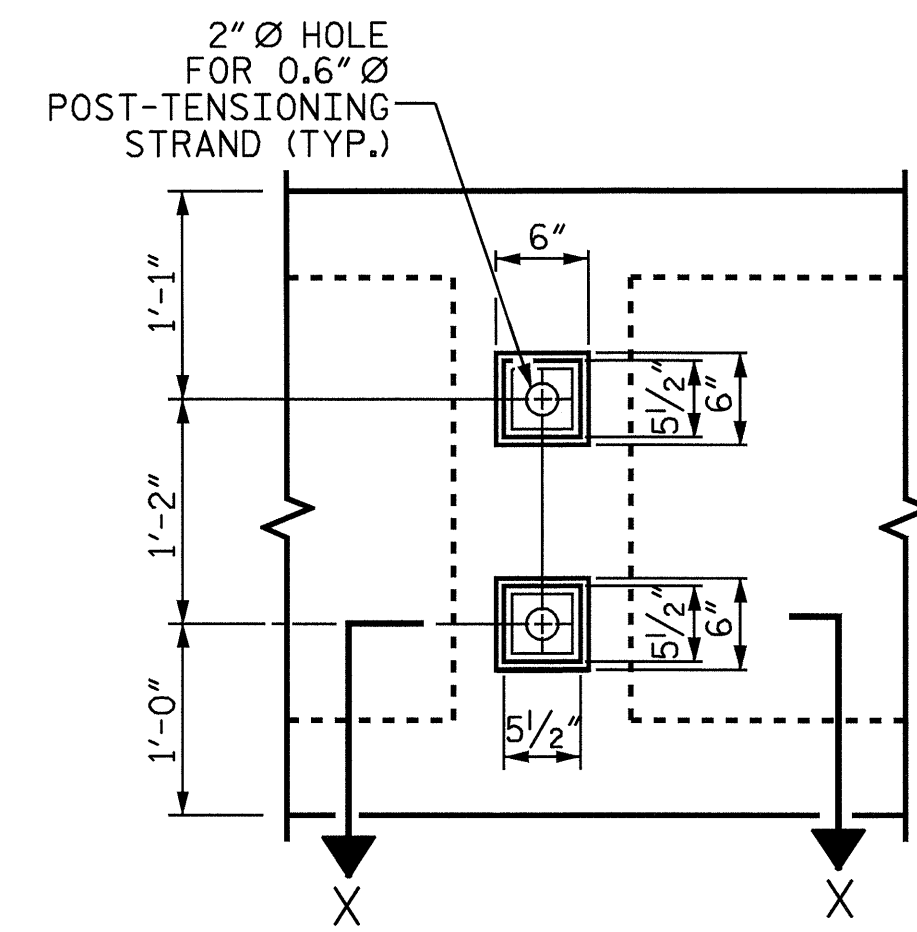
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
3'-0" X 3'-3"
PRESTRESSED CONCRETE
BOX BEAM UNIT
SPANS A & B

ASSEMBLED BY :	H. T. BARBOUR	DATE :	4-25-07
CHECKED BY :	C. R. YARBROUGH	DATE :	6-07
DRAWN BY :	TLA 5/05	ADDED :	7/11/05
CHECKED BY :	GM 6/05	REV. :	5/1/06 TLA/GM

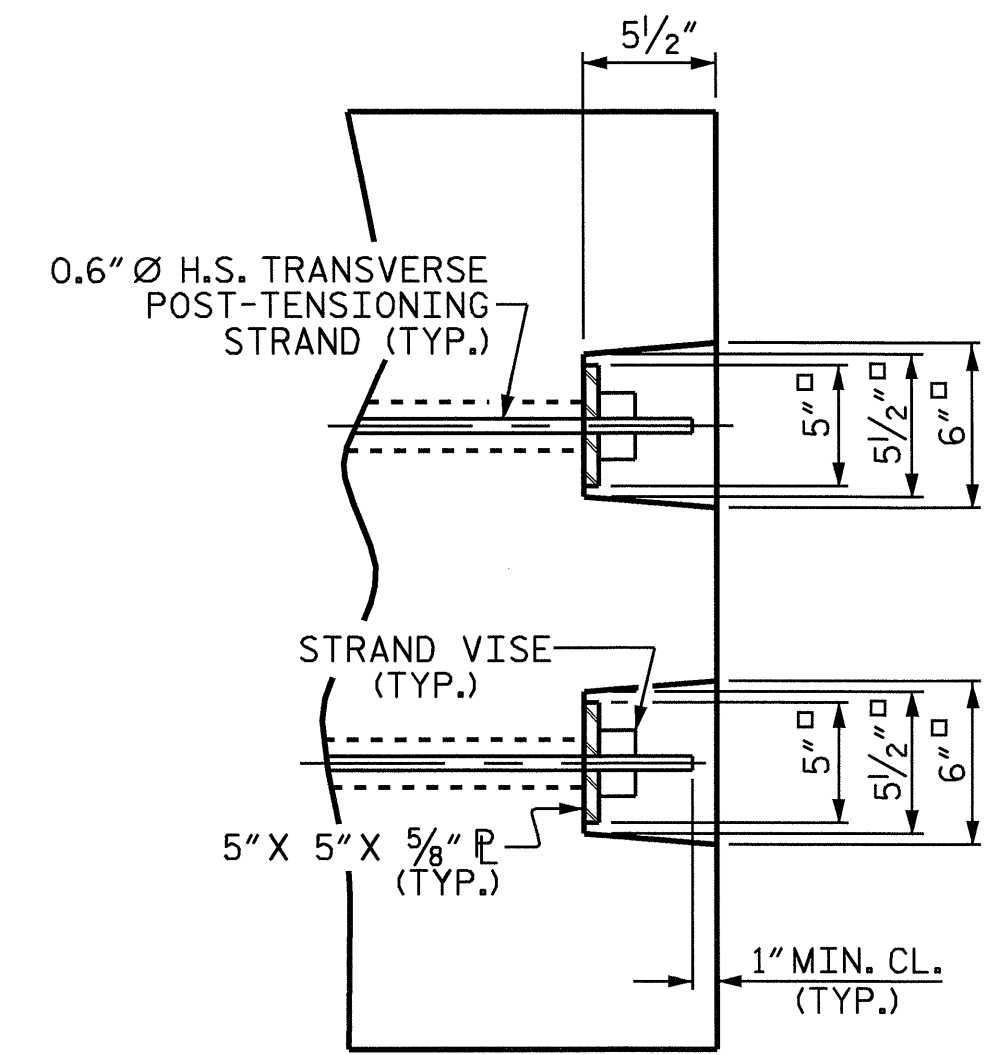
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		



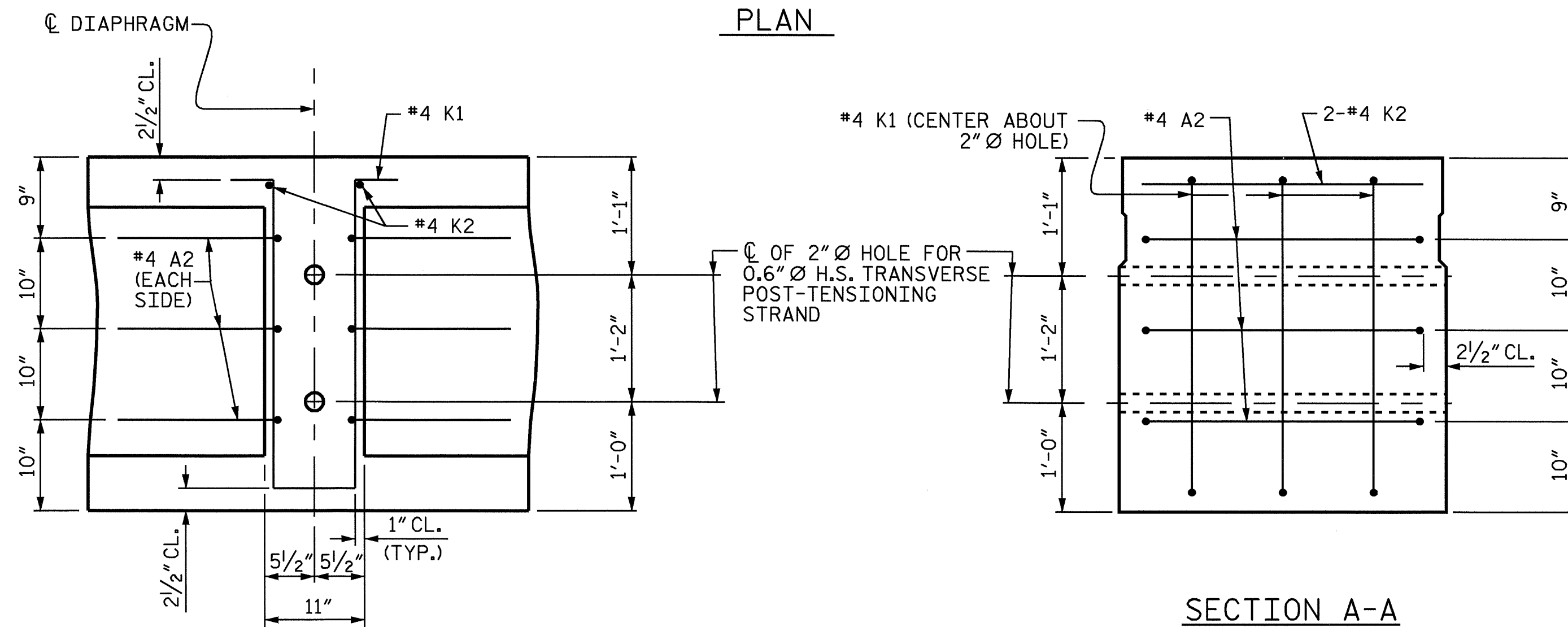
PLAN



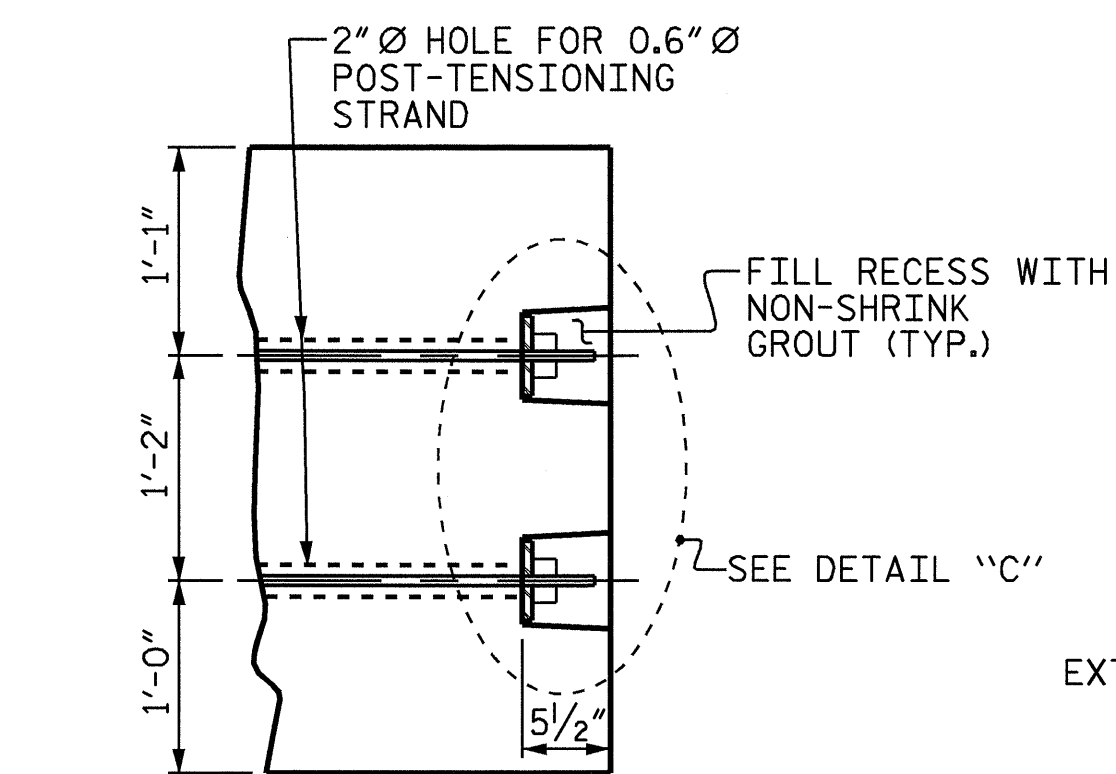
VIEW Y-Y
SHOWING ELEVATION VIEW OF GROUDED RECESS



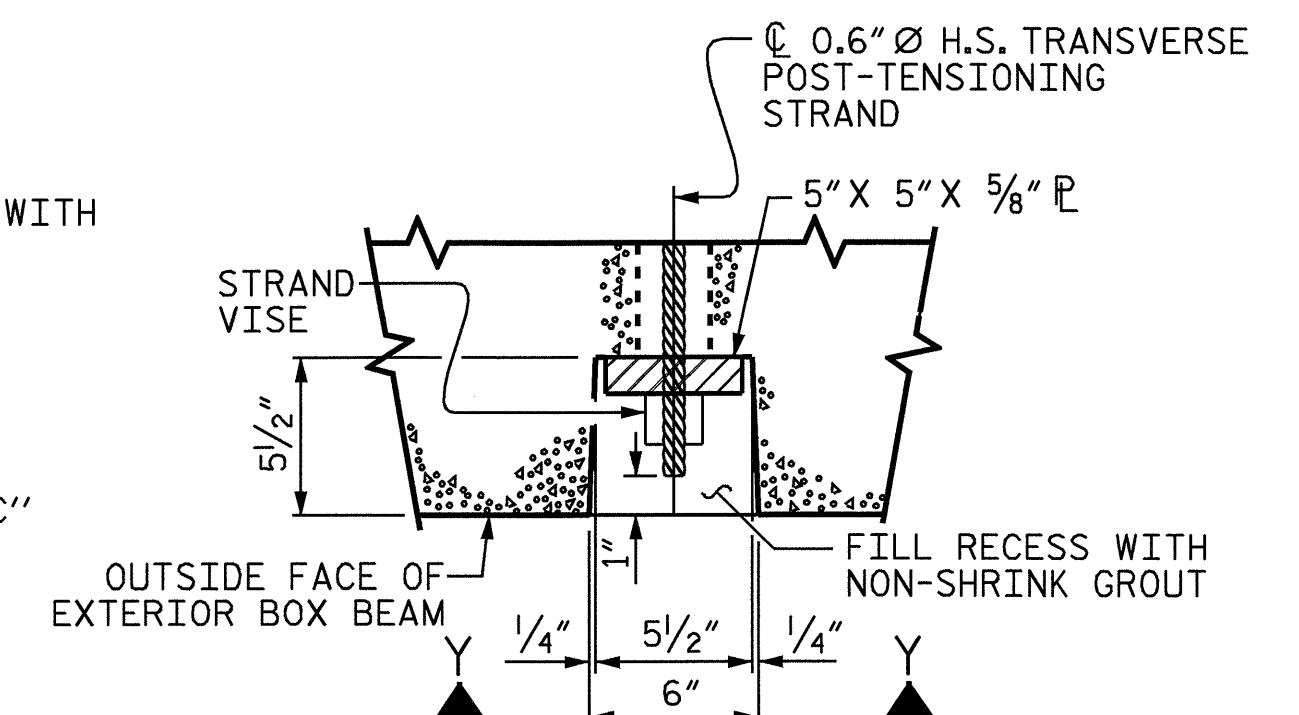
DETAIL "C"



SECTION A-A
VOIDS NOT SHOWN



PART SECTION AT RECESS

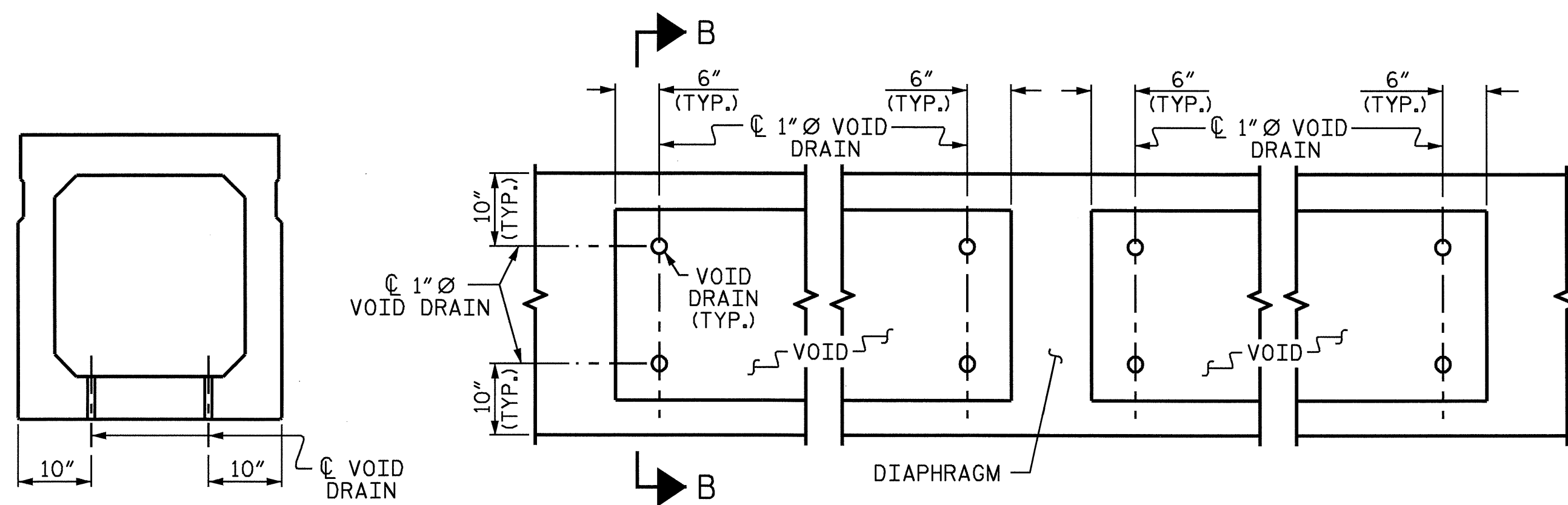


SECTION X-X

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

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

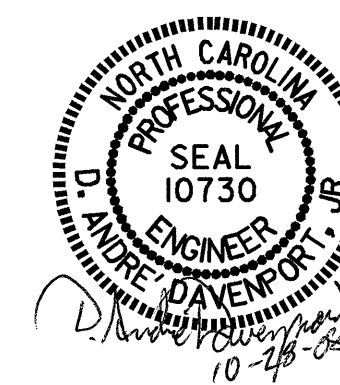
(DIMENSIONS SHOWN ARE TYPICAL FOR EACH VOID)

DEAD LOAD DEFLECTION AND CAMBER		
	3'-0" x 3'-3"	
	0.6" Ø L.R. STRAND	
	SPAN "A"	SPAN "B"
CAMBER (BEAM ALONE IN PLACE)	3 3/8"	3 3/8"
DEFLECTION DUE TO CONCRETE WEARING SURFACE	7/16"	7/16"
FINAL CAMBER	3 3/16"	3 3/16"

PROJECT NO. B-4592
ORANGE COUNTY
STATION: 23+85.00-L-

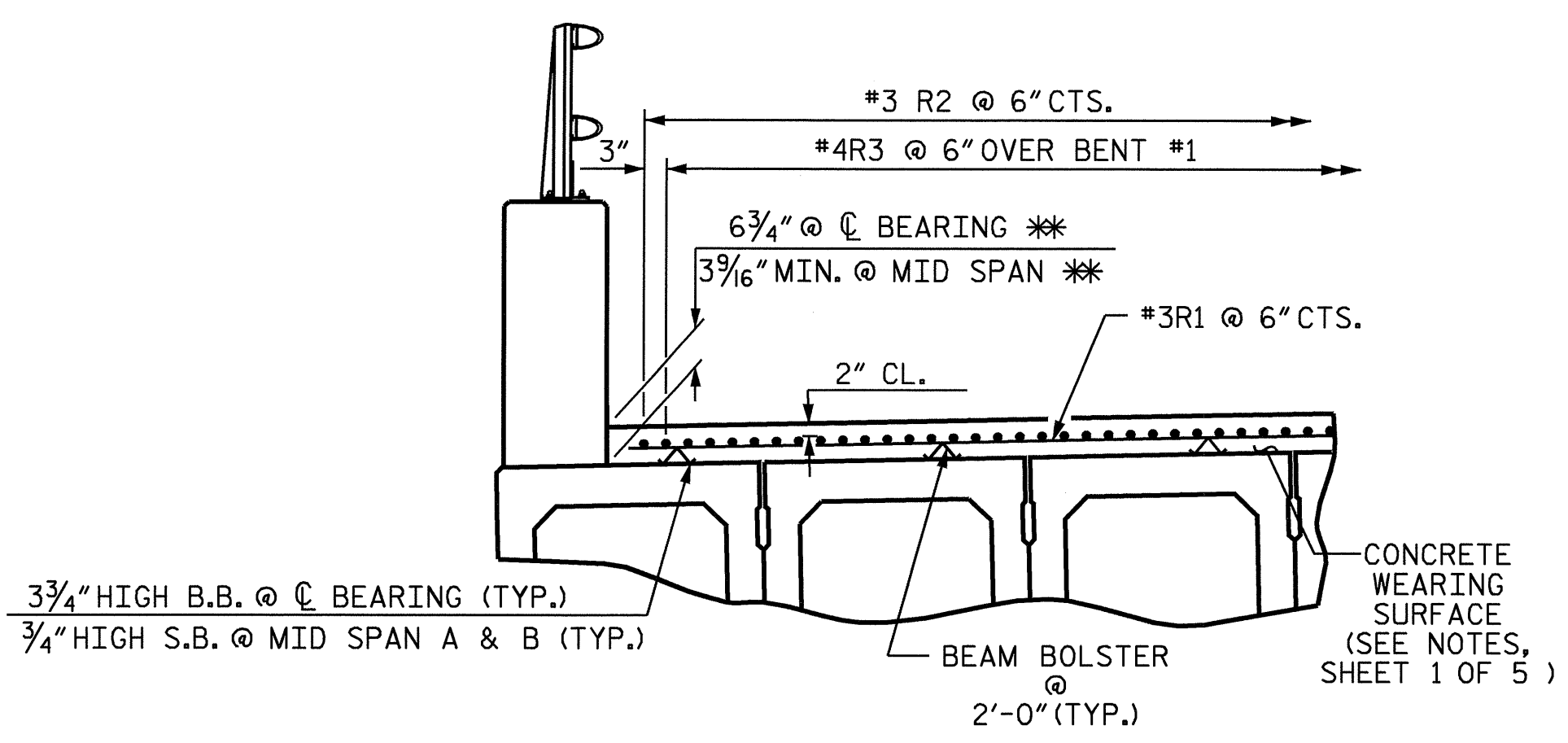
SHEET 5 OF 5

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.	BY:	DATE:	S-8
1			3			TOTAL SHEETS 24
2			4			

ASSEMBLED BY: H. T. BARBOUR DATE: 4-25-07
CHECKED BY: C. R. YARBROUGH DATE: 6-07
DRAWN BY: TLA 5/05
CHECKED BY: GM 6/05
ADDED 7/11/05
REV. 5/1/06 TLA/GM



BILL OF MATERIAL FOR CONCRETE WEARING SURFACE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*R1	788	#3	STR	15'-9"	4667
*R2	427	#3	STR	29'-2"	4683
*R3	60	#4	STR	20'-0"	802
* EPOXY COATED REINFORCING STEEL					LBS. 10152
CONCRETE WEARING SURFACE					SQ. FT. 6003

BOX BEAM UNITS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
SPAN A	11	98'-9 3/4"	1086'-11 1/4"
SPAN B	11	98'-9 3/4"	1086'-11 1/4"
TOTAL	22		2173'-10 1/2"

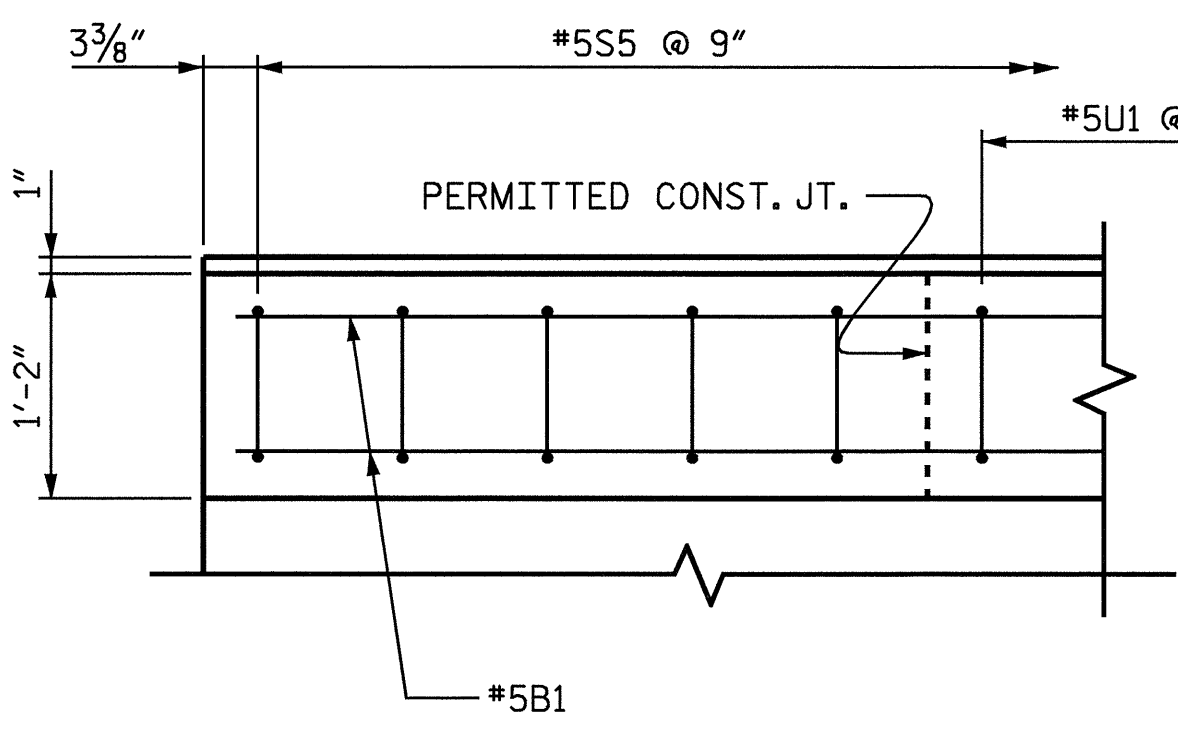
BILL OF MATERIAL FOR PARAPET & END POSTS

BAR	BARS PER SPAN		TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
	SPAN A	SPAN B					
*B1	64	64	128	#5	STR	24'-4"	3249
*E1	4	4	8	#7	STR	3'-0"	49
*E2	4	4	8	#7	STR	3'-6"	57
*E3	4	4	8	#7	STR	4'-0"	65
*E4	4	4	8	#7	STR	4'-6"	74
*E5	4	4	8	#7	STR	4'-10"	79
*F1	4	4	8	#6	STR	1'-10"	22
*F2	4	4	8	#6	STR	3'-0"	36
*F3	4	4	8	#6	STR	3'-5"	41
*U1	254	254	508	#5	10	6'-3"	3312
* EPOXY COATED REINFORCING STEEL					LBS. 6984		
CLASS AA CONCRETE					CU.YDS. 53.1		
TOTAL LIN. FT. OF 1'-2" X 3'-0 3/4" CONCRETE PARAPET						395.500	

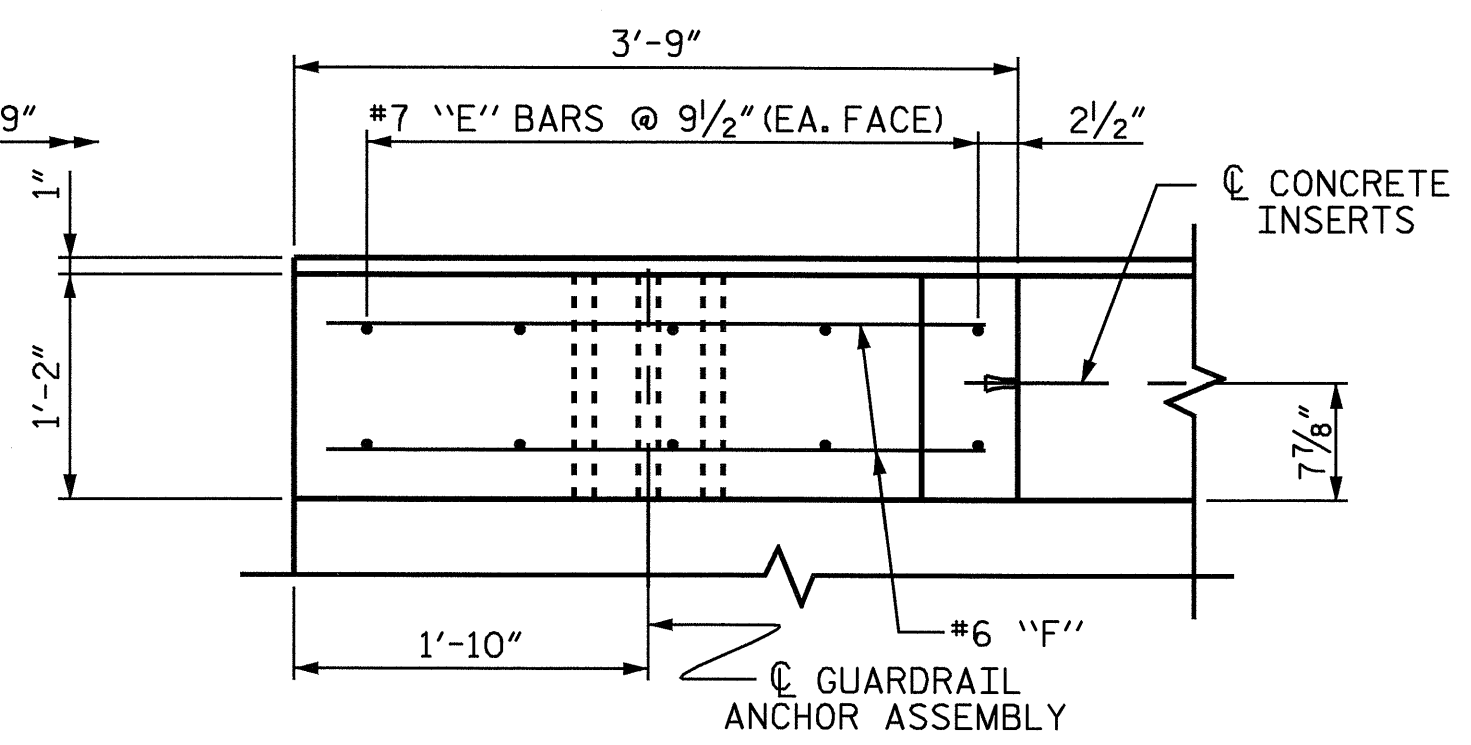
GROOVING BRIDGE FLOORS

APPROACH SLABS	1310 SQ.FT.
BRIDGE DECK	5407 SQ.FT.
TOTAL	6717 SQ.FT.

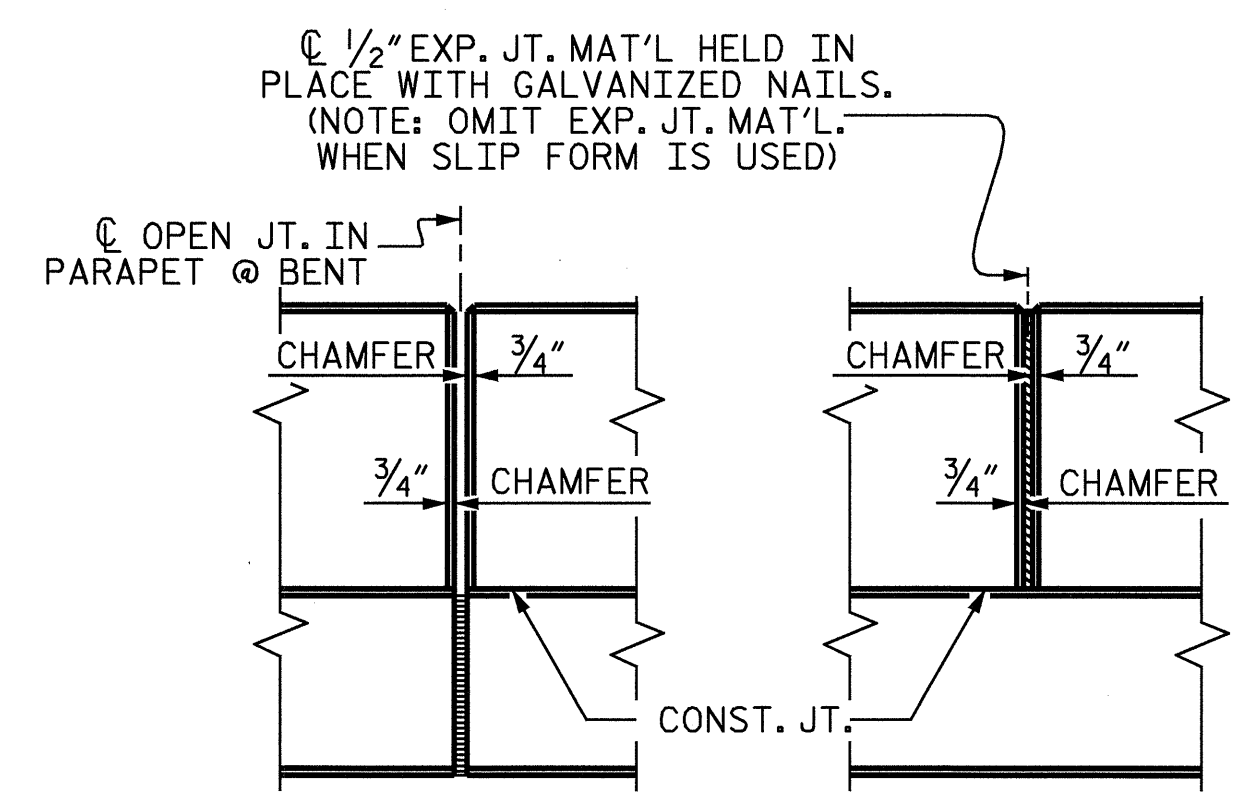
REINFORCING FOR CONCRETE WEARING SURFACE
 ** BASED ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATIONS



PLAN OF PARAPET



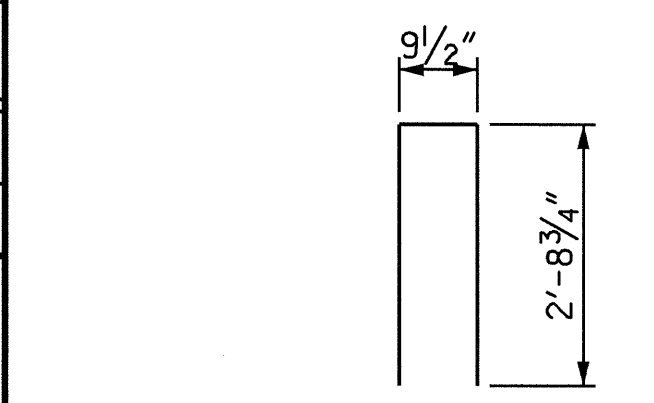
PLAN OF END POST



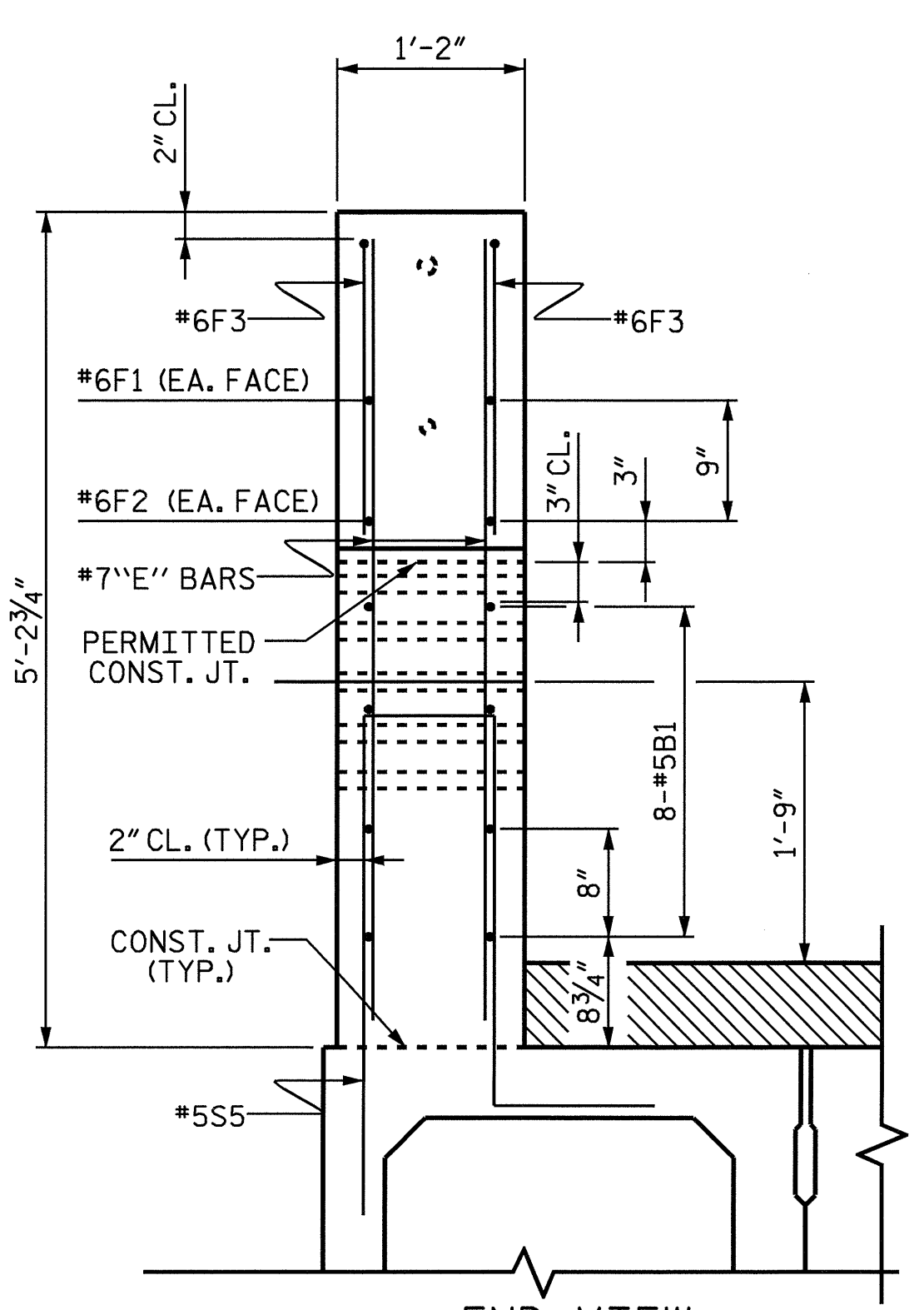
ELEVATION AT EXPANSION JOINTS

SPLICE LENGTH CHART

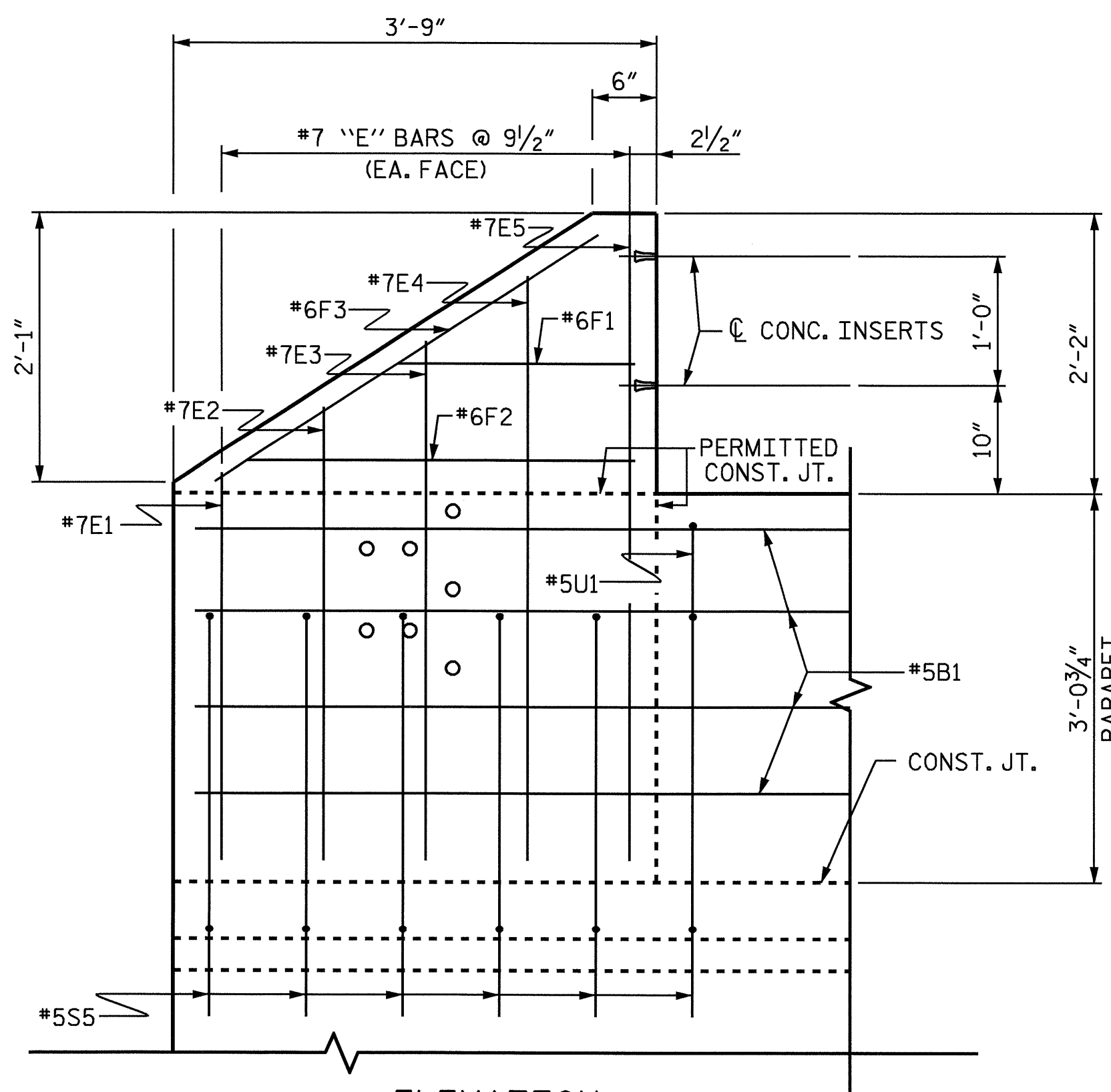
BAR SIZE	EPOXY COATED
#3	1'-3"
#4	1'-8"



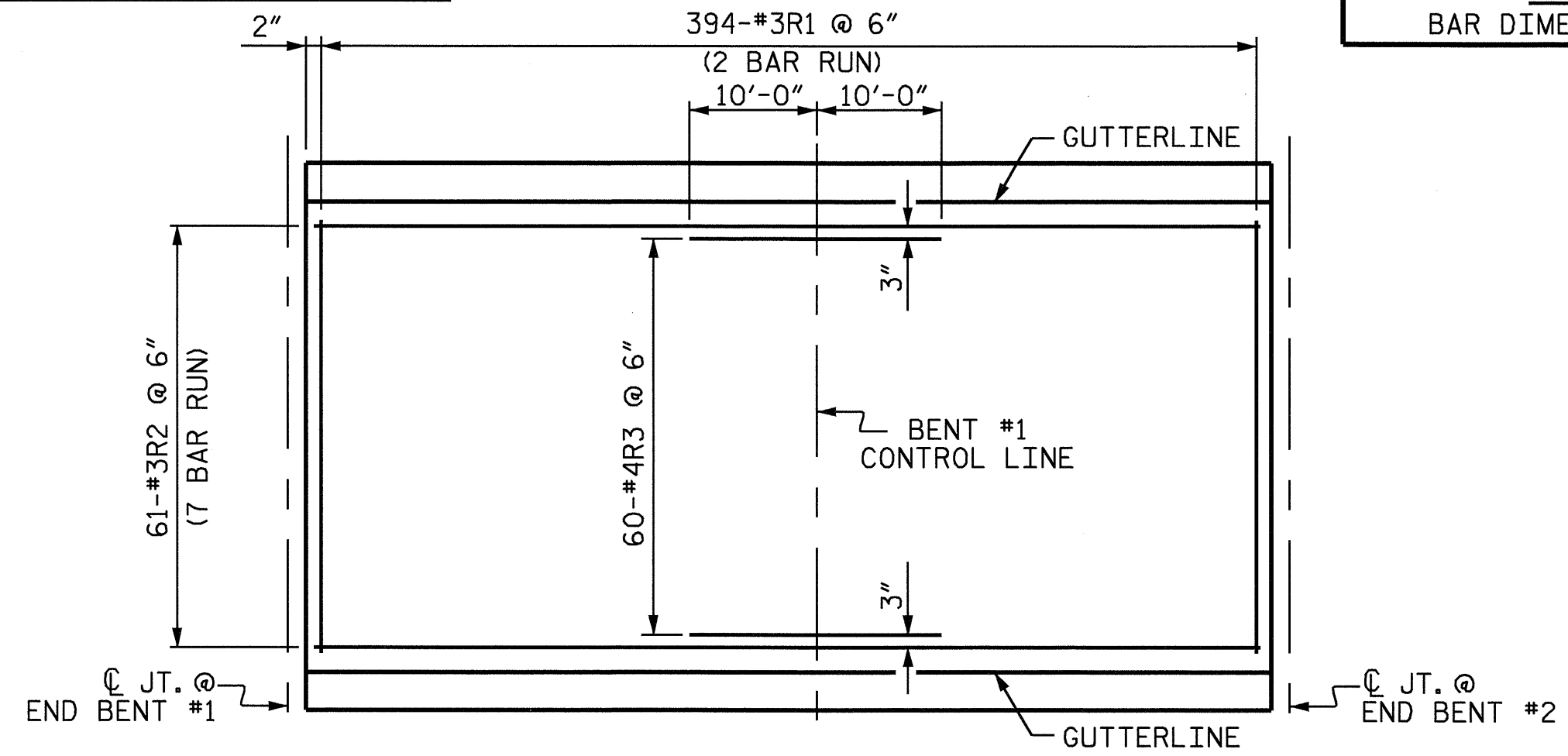
BAR TYPE
 BAR DIMENSIONS ARE OUT TO OUT



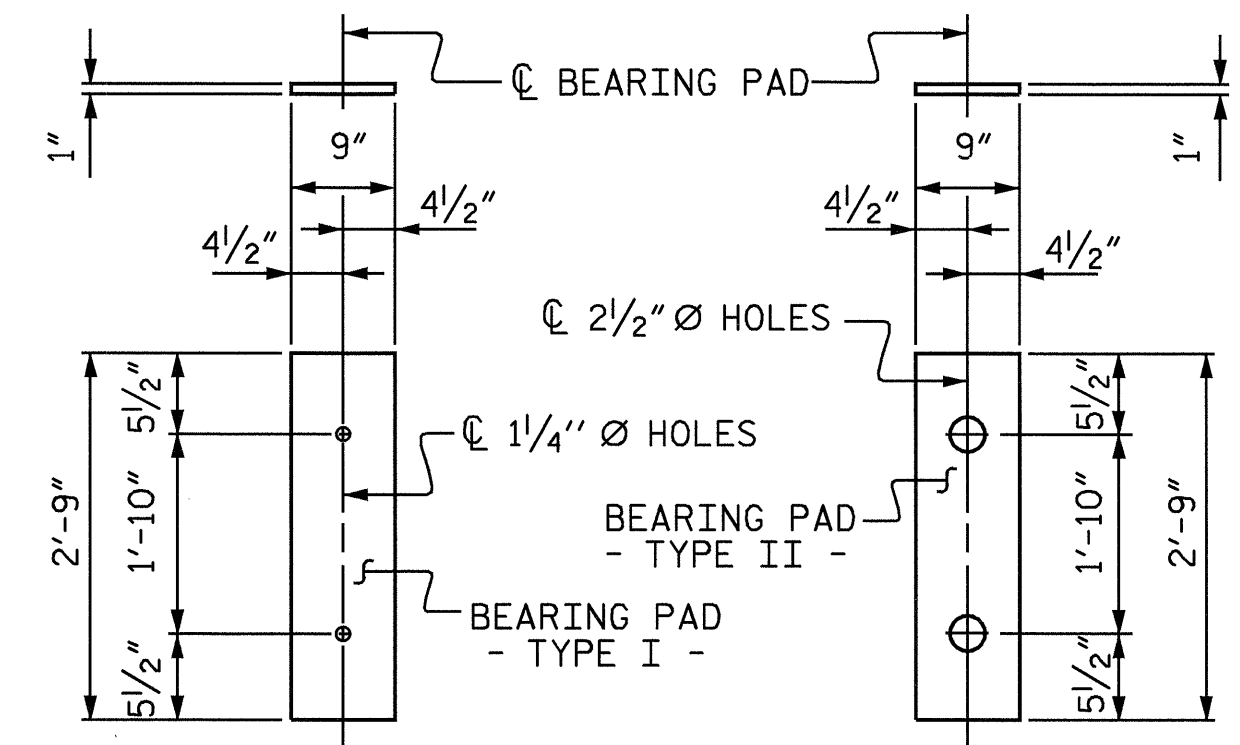
END VIEW



ELEVATION



PLAN SHOWING CONCRETE WEARING SURFACE REINFORCING STEEL



ELASTOMERIC BEARING DETAILS
 (ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS)

PROJECT NO. B-4592
ORANGE COUNTY
 STATION: 23+85.00-L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

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

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

ASSEMBLED BY : H. T. BARBOUR DATE : 4-25-07
 CHECKED BY : C. R. YARBROUGH DATE : 6-07
 DRAWN BY : TLA 5/05
 CHECKED BY : GM 6/05

NOTES

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B-221 ALLOY 6061-T6. MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING.

THE BASE OF RAIL POSTS, OR ANY OTHER ALUMINUM SURFACE IN CONTACT WITH CONCRETE SHALL BE THOROUGHLY COATED WITH AN ALUMINUM IMPREGNATED CAULKING COMPOUND OF APPROVED QUALITY.

MATERIAL FOR SHIMS TO BE ASTM B209 ALLOY 6061-T6.

ALUMINUM FOR POSTS, BASES, RAILS, EXPANSION BARS, CLAMP BARS, WASHERS, RIVETS, CAPS AND SHIMS SHALL BE ANODIZED. THE CONTRACTOR SHALL SUBMIT THREE (3) SETS OF ASTM B-221 6061-T6 ALUMINUM SAMPLES ANODIZED LIGHT BRONZE, MEDIUM BRONZE AND DARK BRONZE TO THE ENGINEER. THE ENGINEER SHALL SELECT THE COLOR FROM THE SAMPLES FURNISHED BY THE CONTRACTOR.

AFTER A SHADE OF BRONZE HAS BEEN SELECTED FOR THE RAILING, THE CONTRACTOR SHALL SUBMIT A SAMPLE OF A COMPATIBLE EXTERIOR ACRYLIC HOUSE PAINT TO THE ENGINEER. THIS PAINT SHALL MATCH THE ANODIZED RAIL COLOR AS CLOSELY AS POSSIBLE. AFTER ERECTION OF THE ANODIZED ALUMINUM RAILING, ALL EXPOSED ANCHOR BOLTS, NUTS, WASHERS, MACHINE SCREWS, CAP SCREWS, BOLTS AND BUILT UP ANGLES SHALL BE COATED WITH TWO COATS OF THIS PAINT.

GENERAL NOTES

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

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE STANDARD NO. BMR2.

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

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

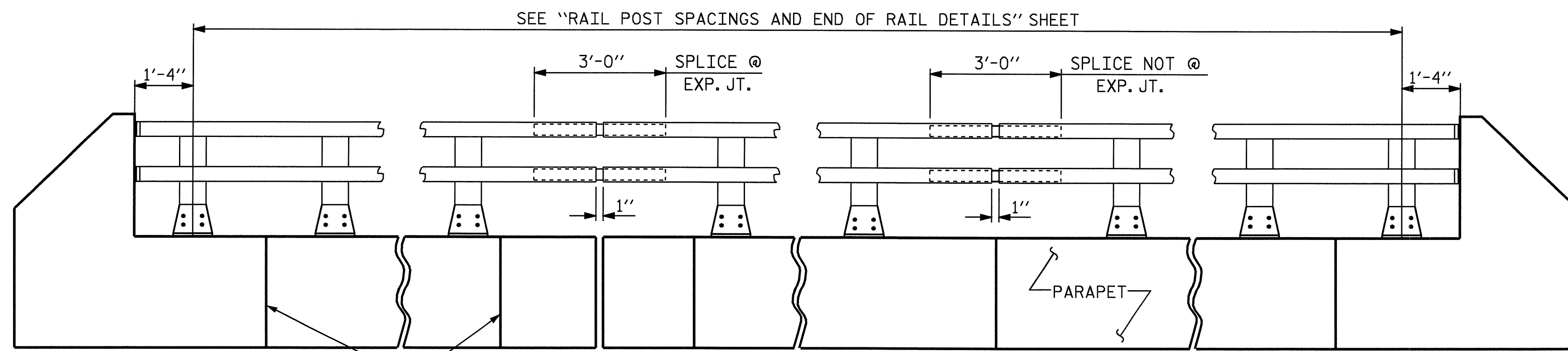
SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

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

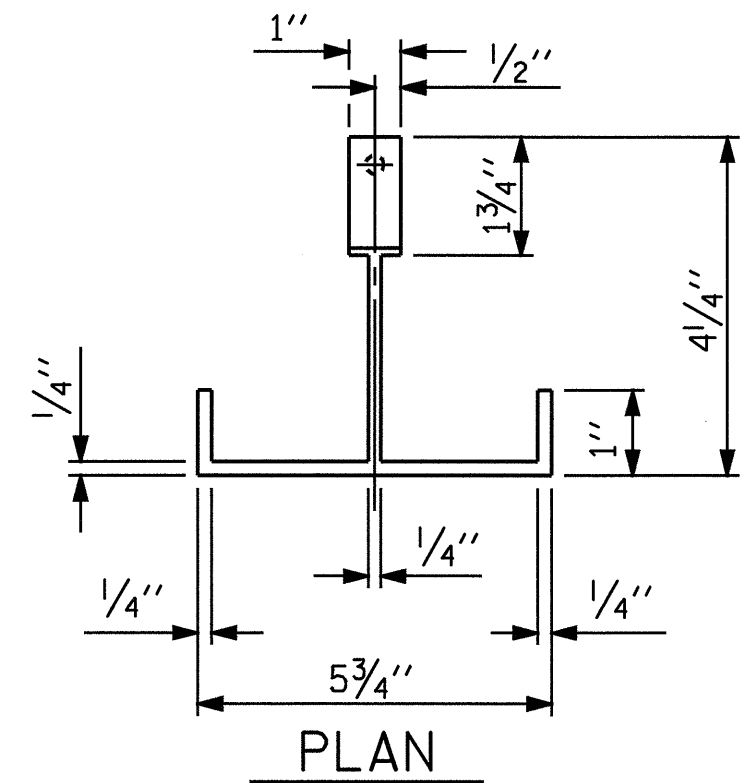
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT A SPACING OF 8FT. TO 10FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR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

PAY LENGTH = 380'-0" LIN. FT.

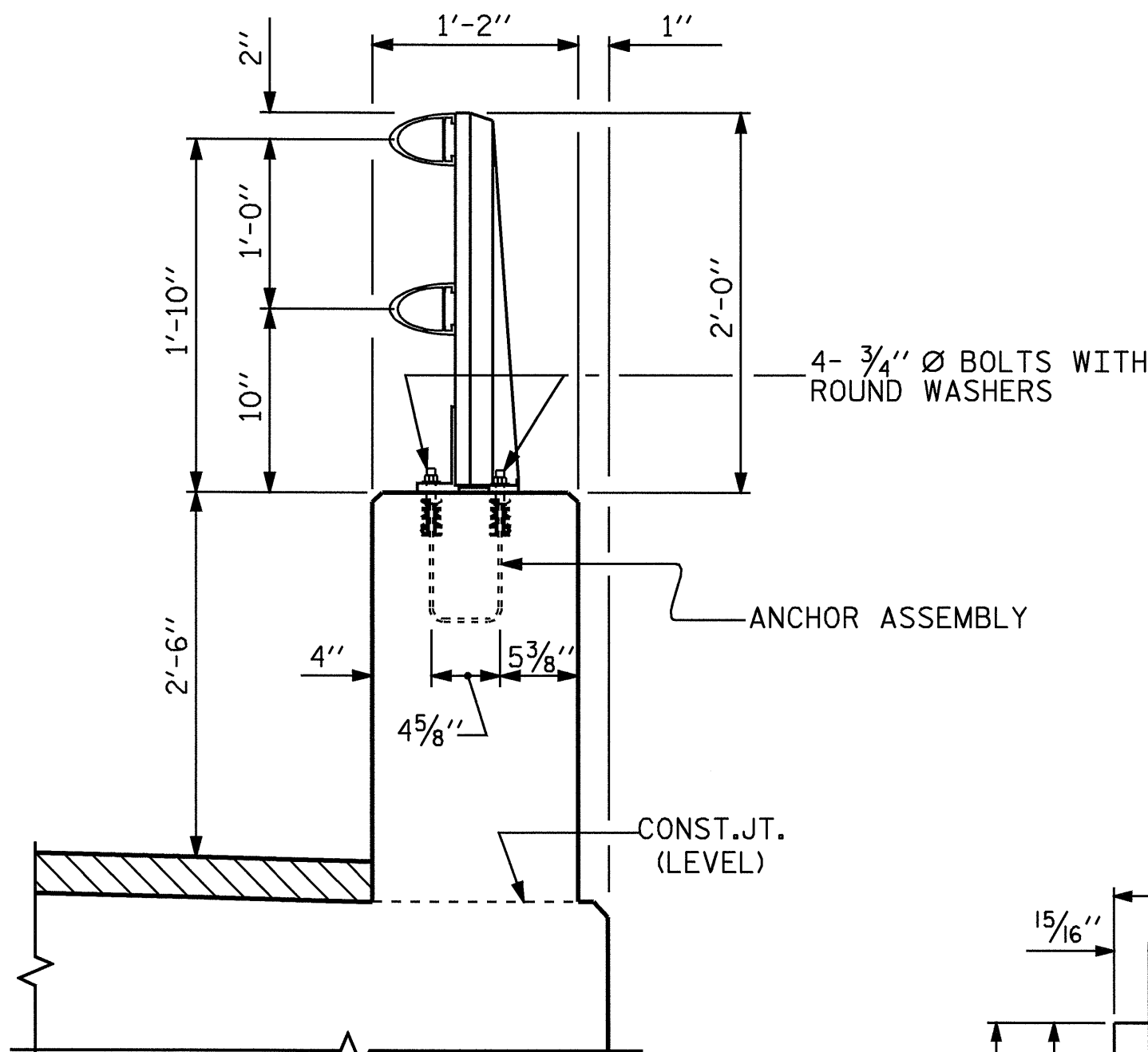


ELEVATION

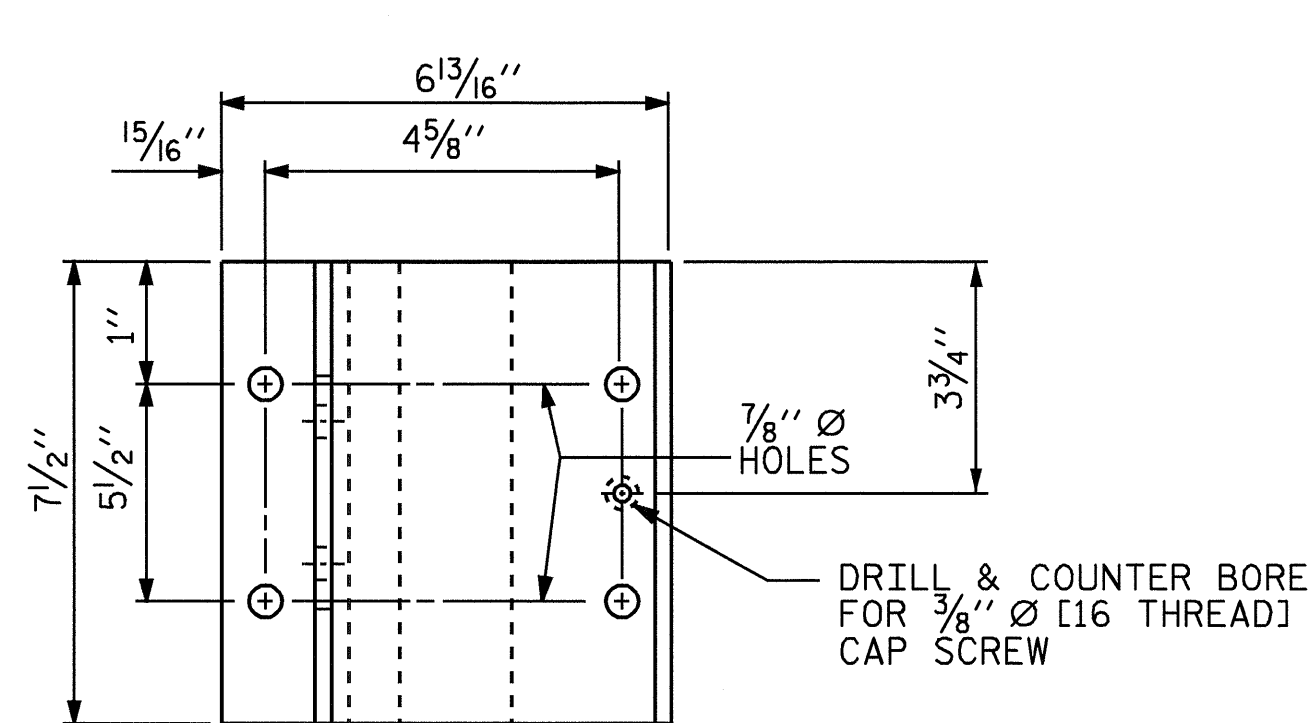
NOTE: FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR2.



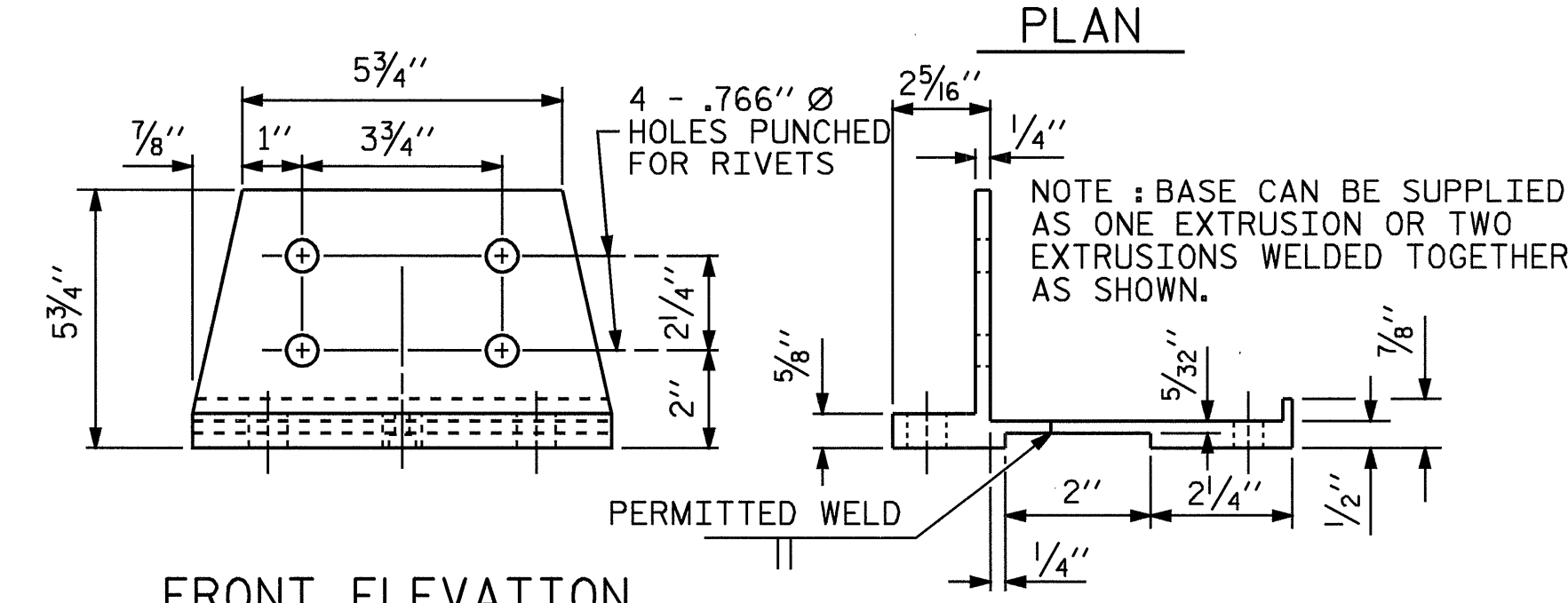
PLAN



SECTION THRU PARAPET AND RAIL



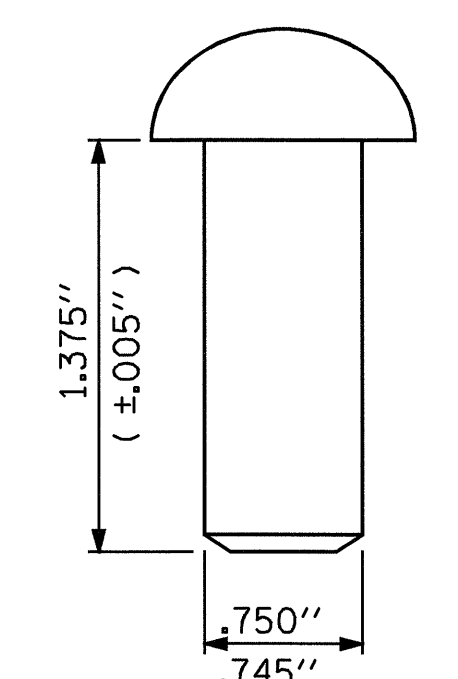
PLAN



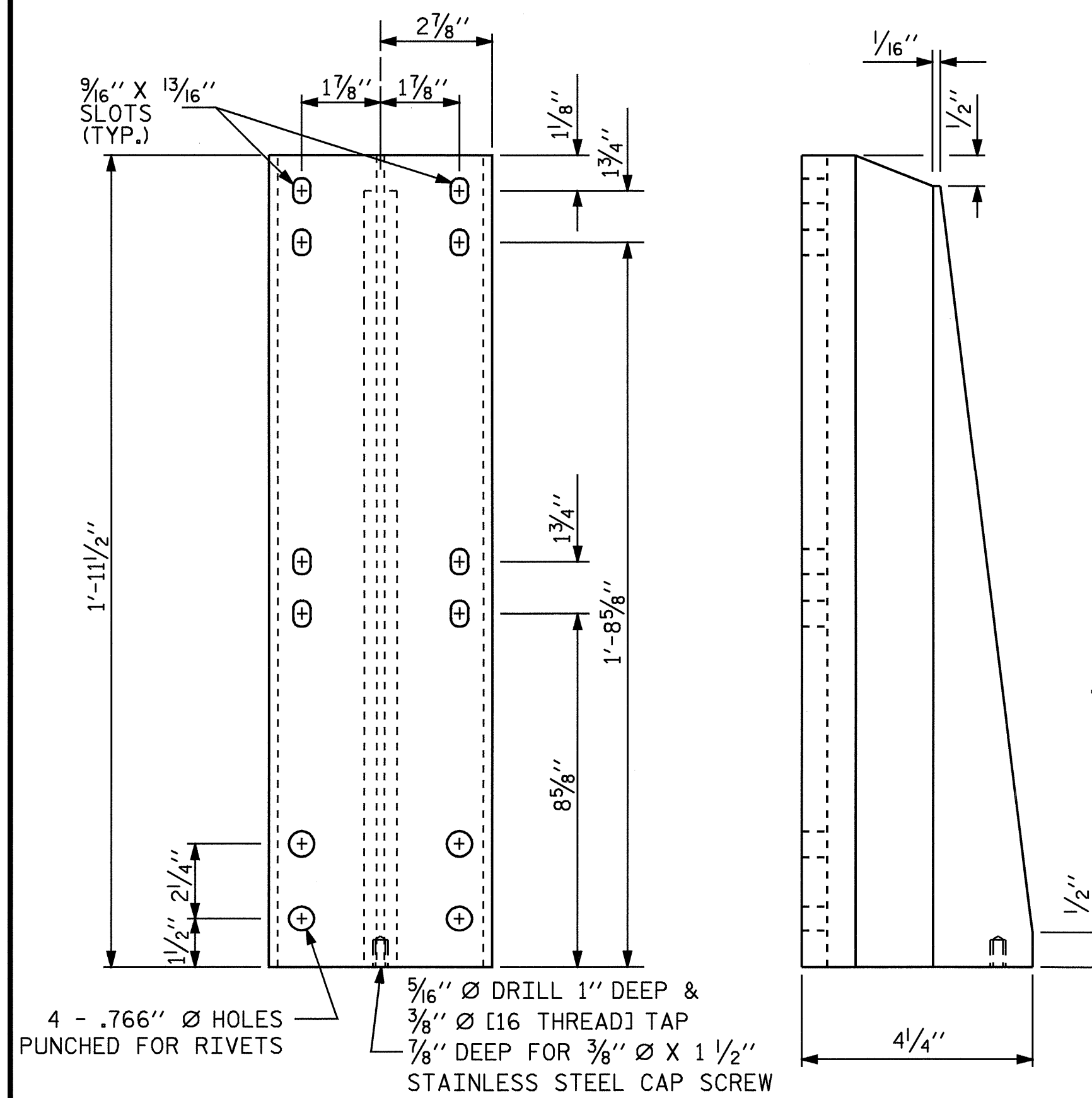
FRONT ELEVATION

SIDE ELEVATION

POST BASE DETAILS



RIVET DETAIL

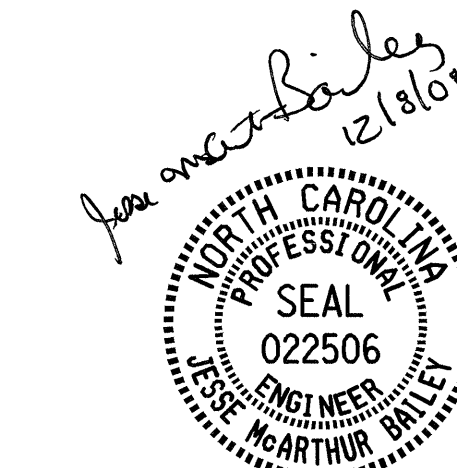


FRONT ELEVATION

SIDE ELEVATION

DETAILS OF POST

ASSEMBLED BY :	H. T. BARBOUR	DATE :	4-23-07
CHECKED BY :	C. R. YARBROUGH	DATE :	6-07
DRAWN BY :	EEM 6/94	REV. 10/17/00	LES/RDR
CHECKED BY :	RCW 6/94	REV. 5/7/03R	RWW/JTE
		REV. 5/1/06	TLA/GM



PROJECT NO. B-4592
ORANGE COUNTY
 STATION: 23+85.00-L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

2 BAR METAL RAIL

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10	
1			3			TOTAL SHEETS	
2			4			24	

STD. NO. BMR3

NOTES

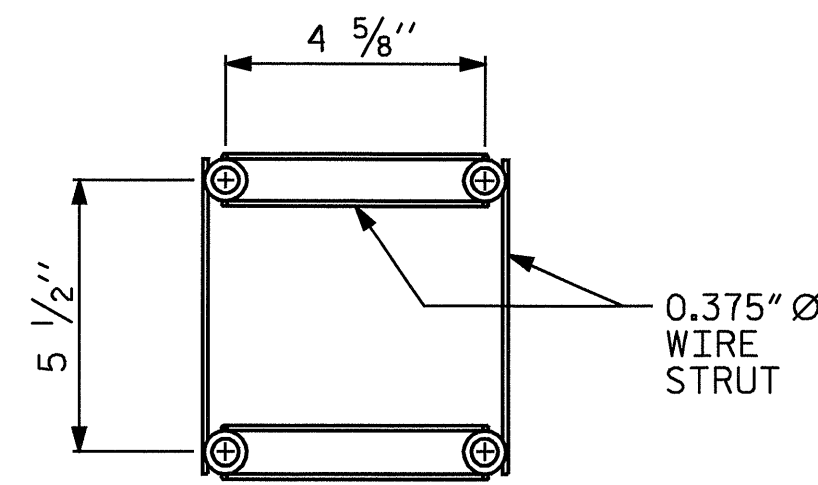
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

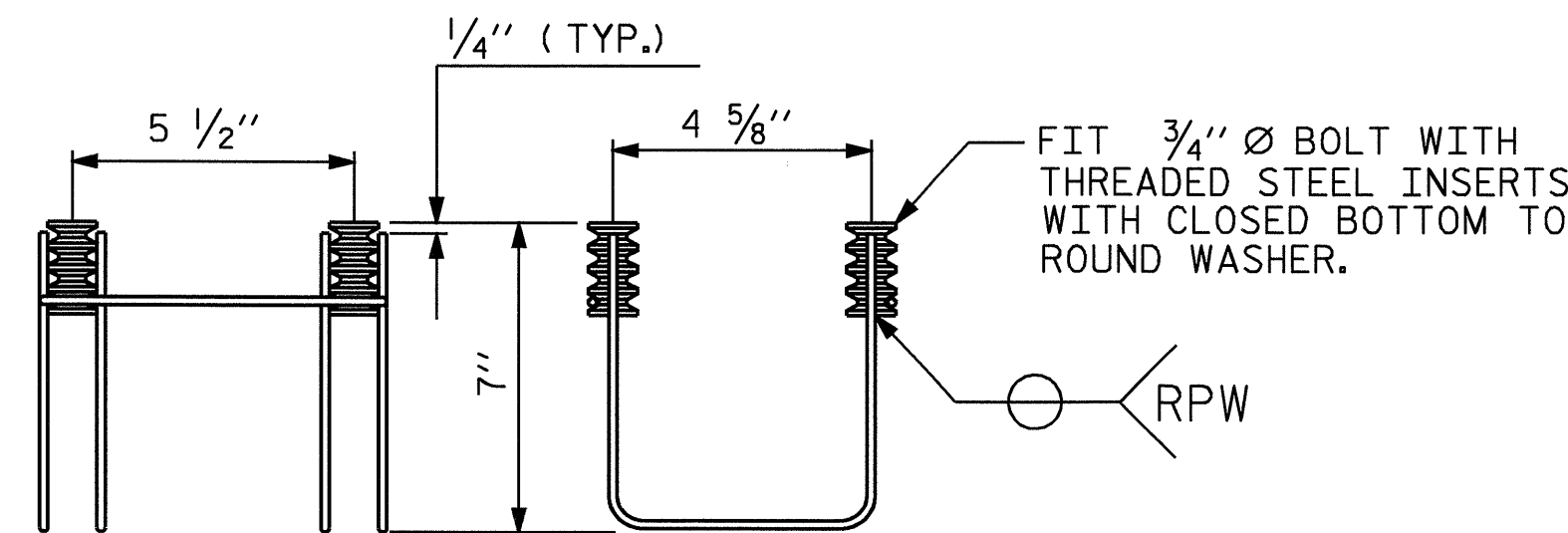
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.
- B. 4 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 2 1/2" GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.
- C. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.
- D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.
- E. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.
- F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

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

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



PLAN

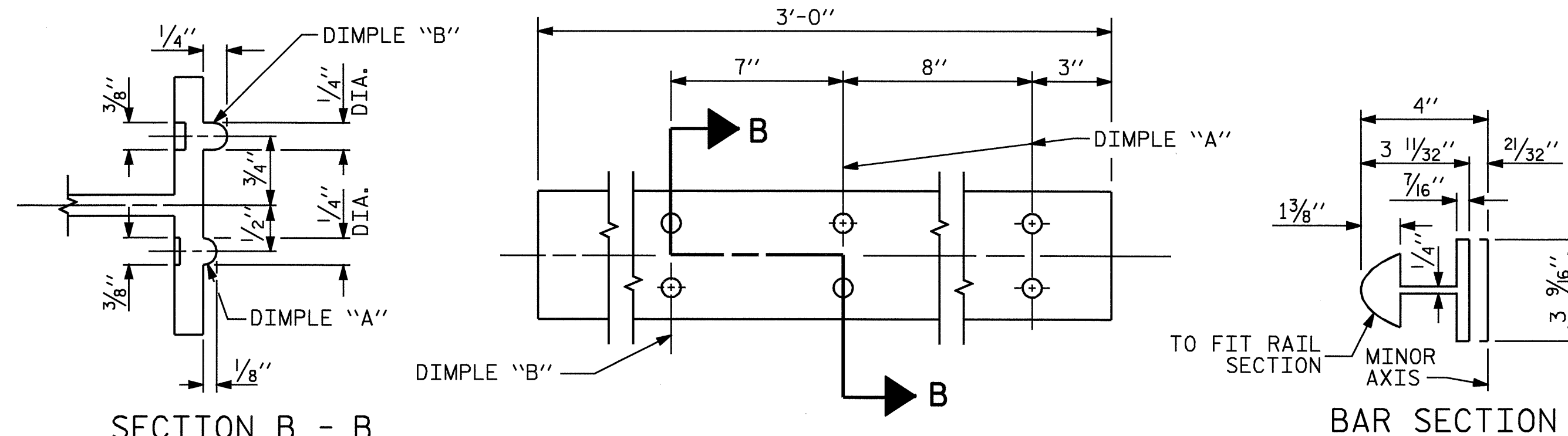


SIDE VIEW ELEVATION

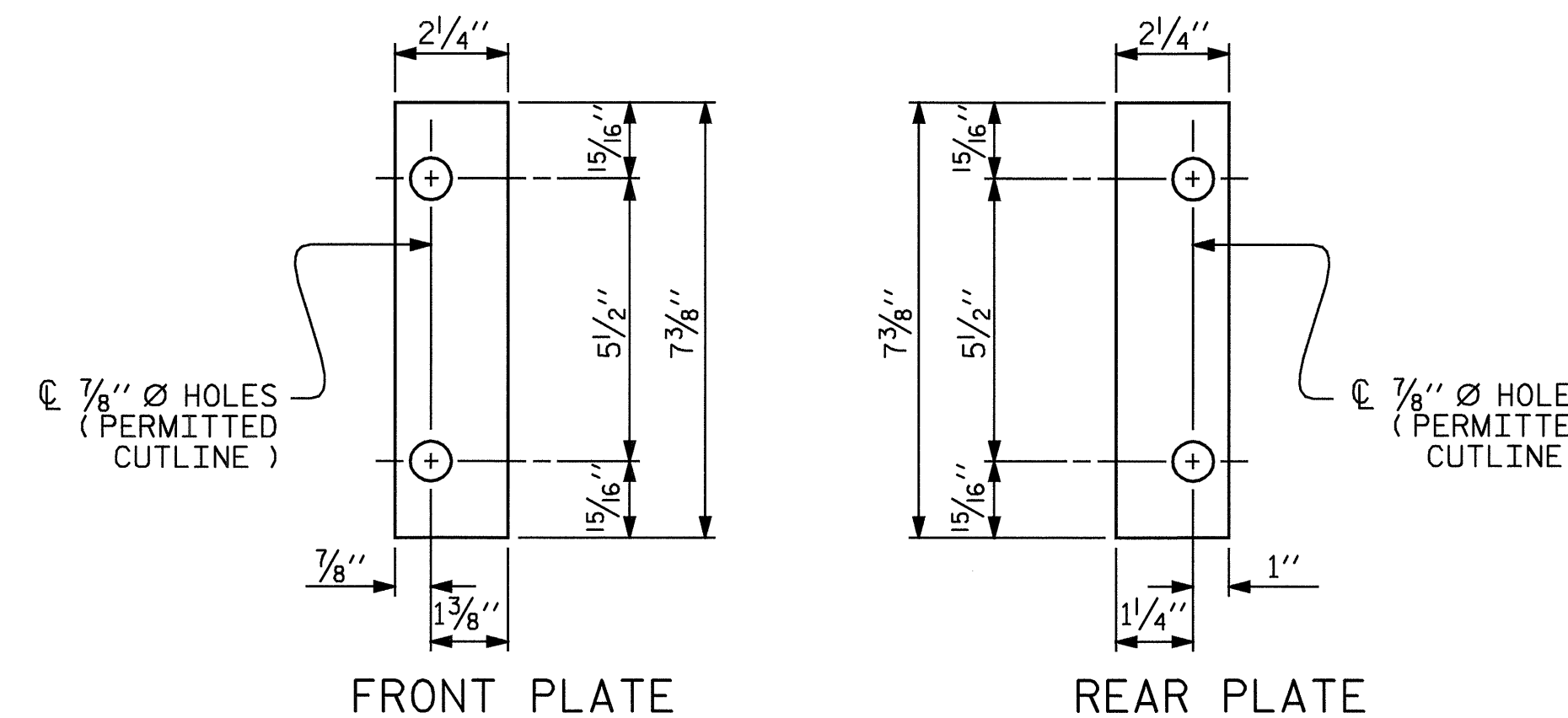
MINIMUM LENGTH OF THREADS IN INSERT (FERRULE) : 1 3/4"

4-BOLT METAL RAIL ANCHOR ASSEMBLY

(60 ASSEMBLIES REQUIRED)

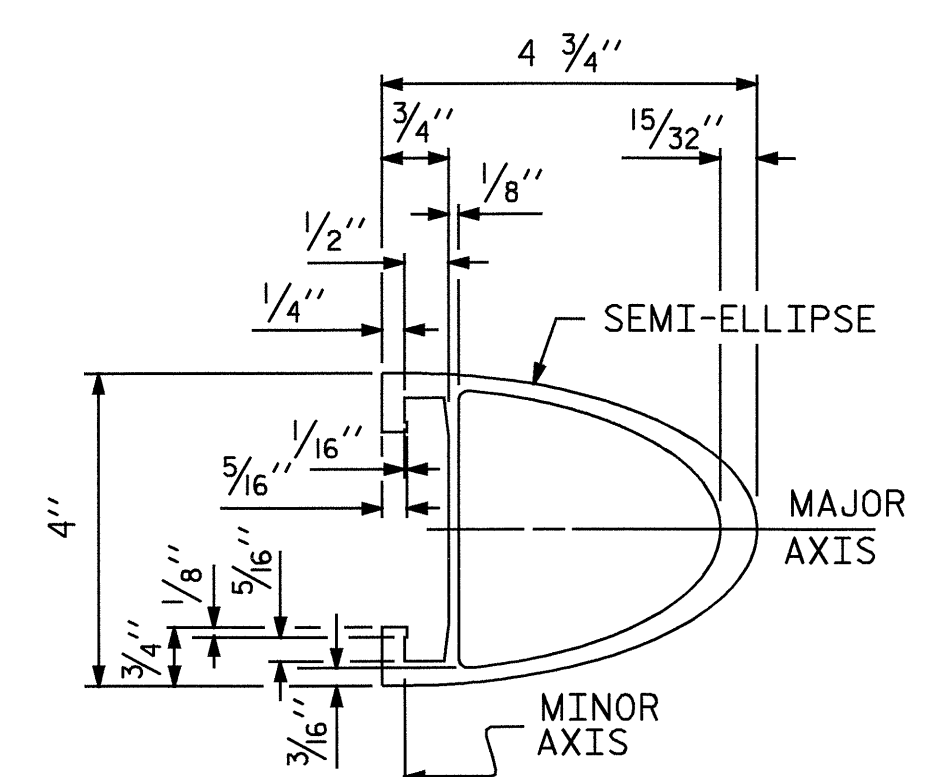


EXPANSION BAR DETAILS

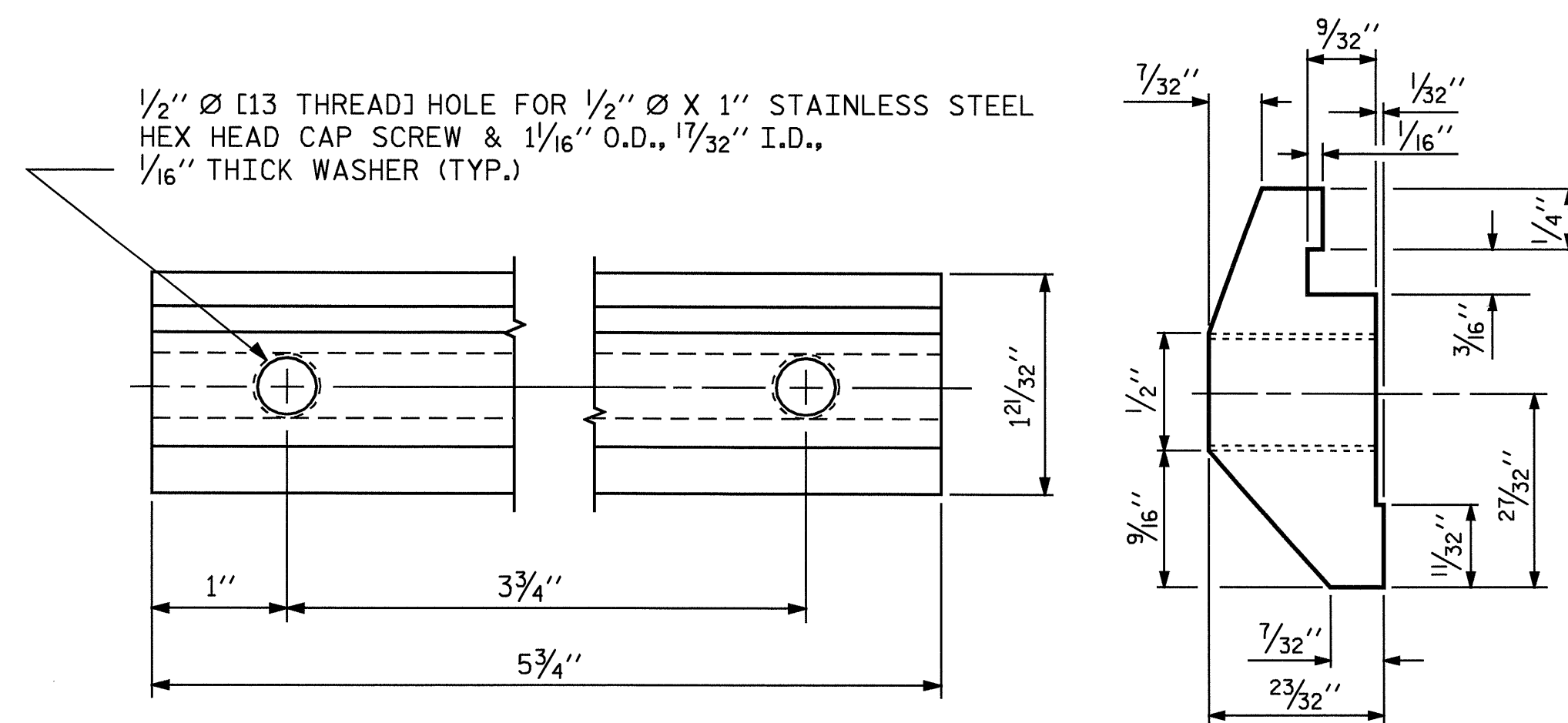


SHIM DETAILS

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

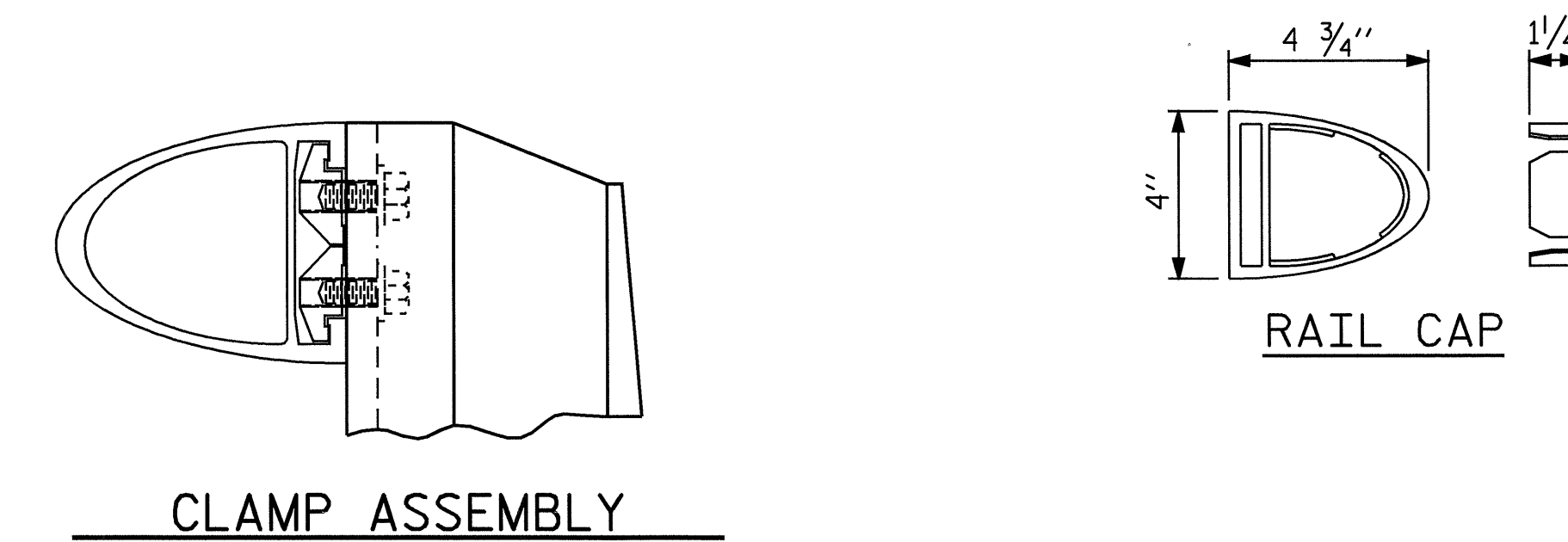


RAIL SECTION



CLAMP BAR DETAIL

(4 REQUIRED PER POST)



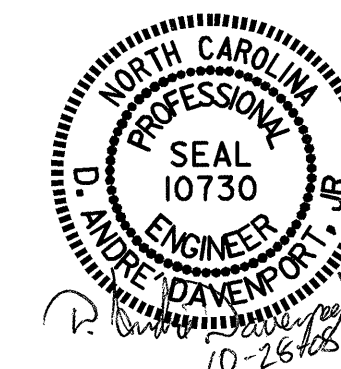
CLAMP ASSEMBLY

RAIL CAP

PROJECT NO. B-4592
ORANGE COUNTY
 STATION: 23+85.00-L-

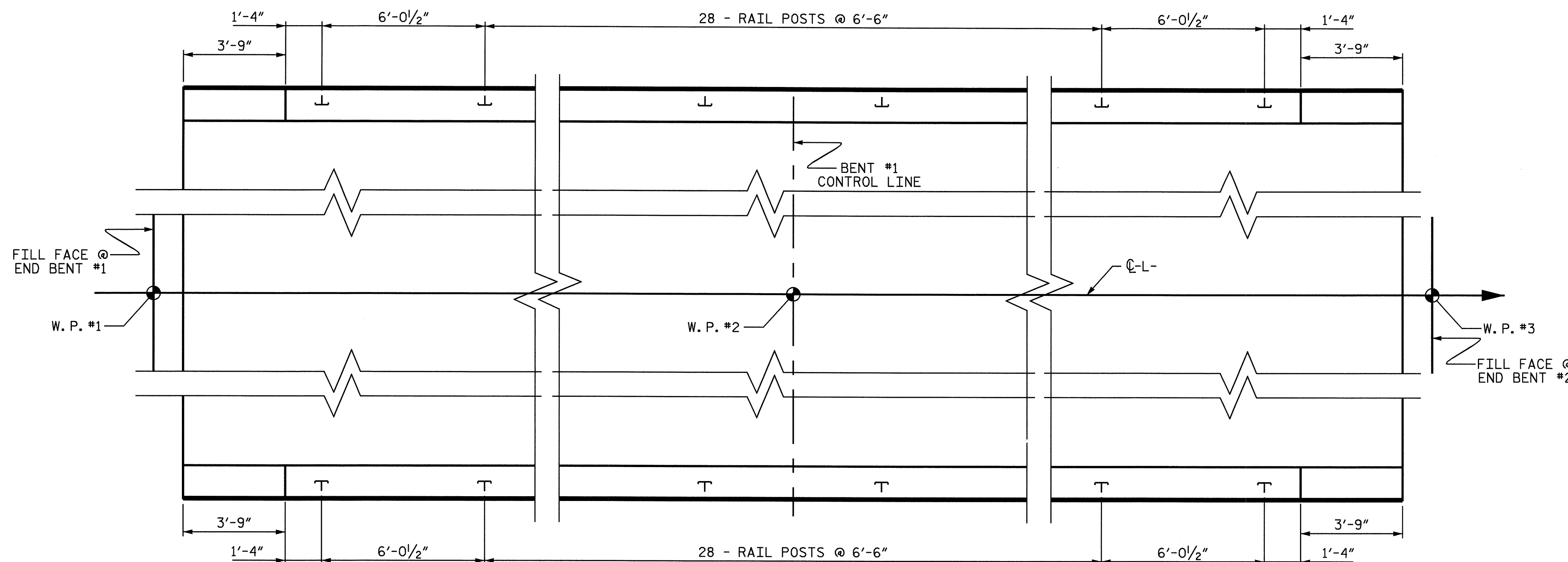
SHEET 2 OF 2

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

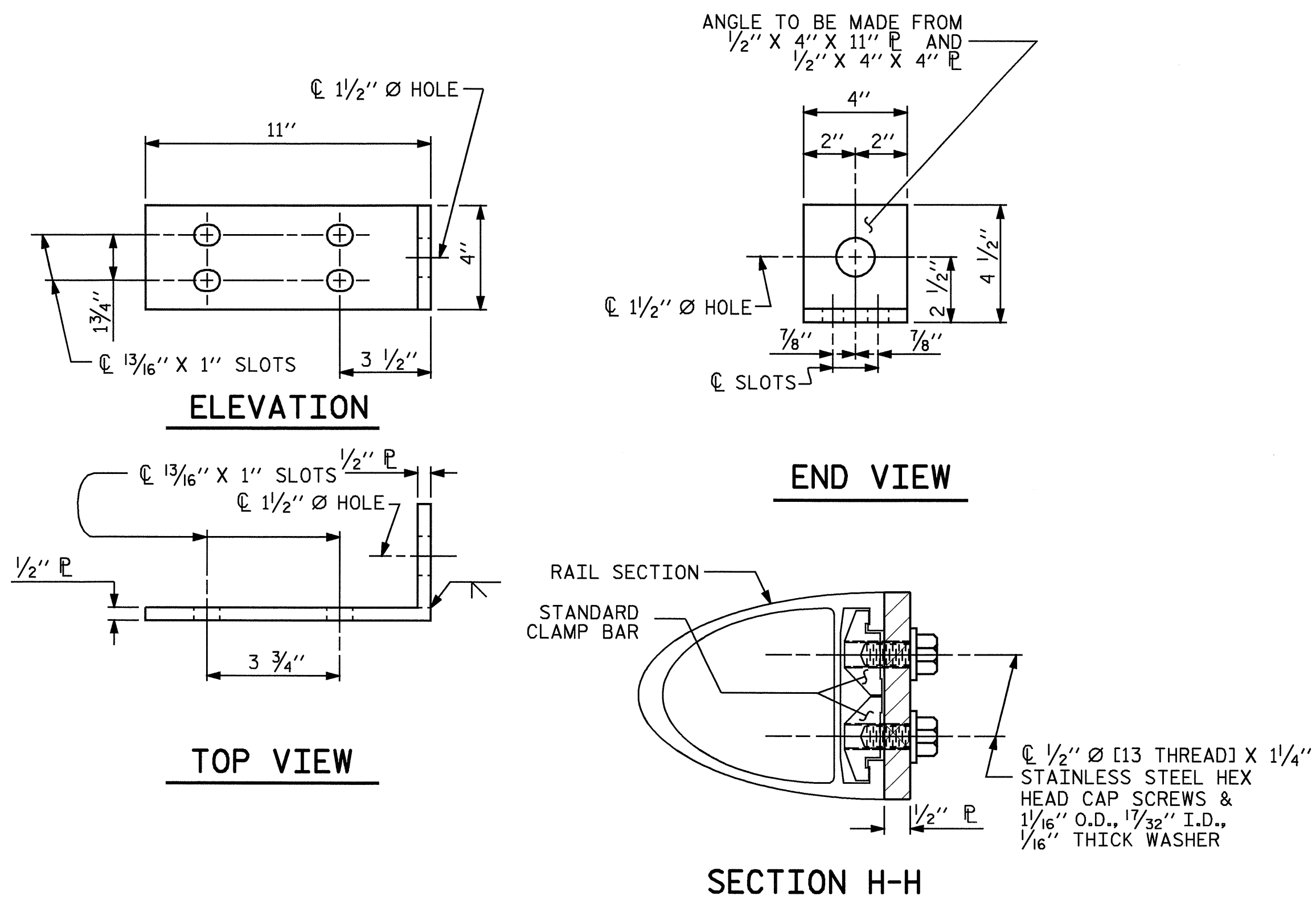


REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-II	
1			3			TOTAL SHEETS	
2			4			24	

ASSEMBLED BY :	H. T. BARBOUR	DATE :	4-23-07
CHECKED BY :	C. R. YARBROUGH	DATE :	6-07
DRAWN BY :	EEM 6/94	REV. 2/6/97	EEM/RGW
CHECKED BY :	RGW 6/94	REV. 8/16/99	MAB/LES
		REV. 5/7/03	RWW/JTE



PLAN OF RAIL POST SPACINGS



DETAILS FOR ATTACHING METAL RAIL TO END POST

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 CONTRACTOR'S 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 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

NOTES

METAL RAIL TO END POST CONNECTION

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

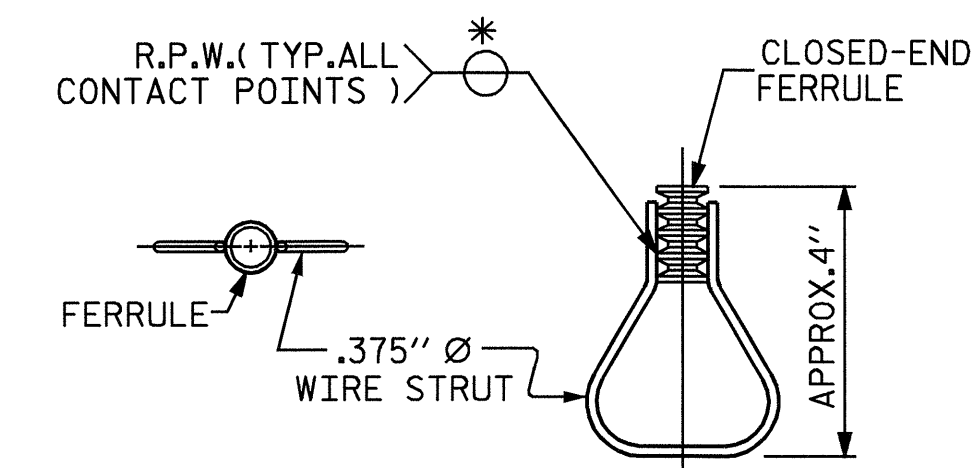
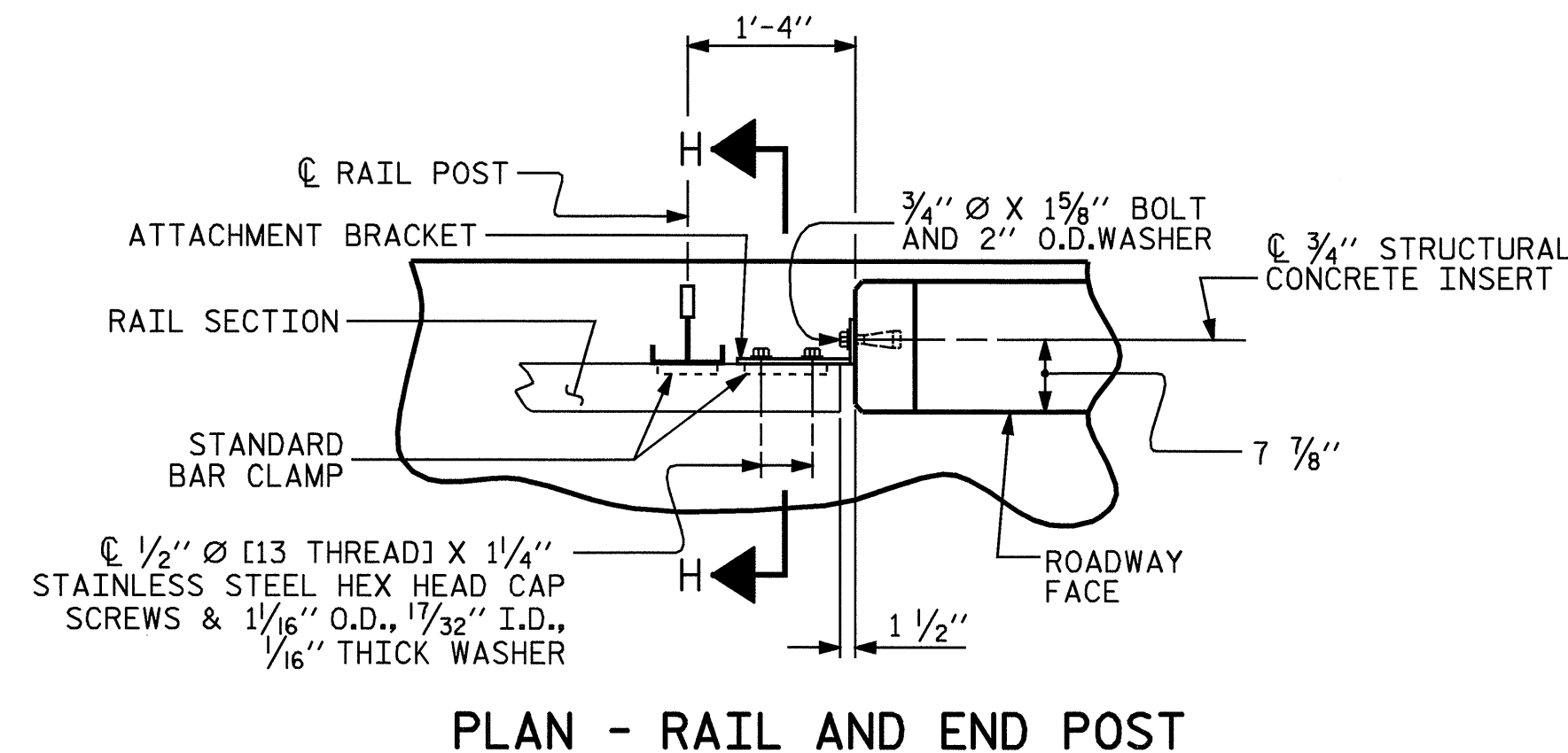
- A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
- B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 5/8" BOLT SHALL HAVE 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.
- D. STANDARD CLAMP BARS (SEE METAL RAIL SHEET).
- E. 1/2" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 1 OR 2 BAR METAL RAILS.

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

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

THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø X 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.



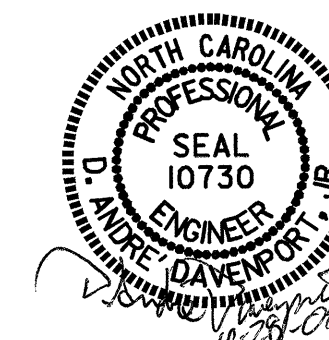
**PLAN ELEVATION
STRUCTURAL CONCRETE INSERT**

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

PROJECT NO. B-4592
ORANGE COUNTY
 STATION: 23+85.00-L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**RAIL POST SPACINGS
 AND
 END OF RAIL DETAILS**



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			24

ASSEMBLED BY : H. T. BARBOUR	DATE : 4-23-07
CHECKED BY : C. R. YARBROUGH	DATE : 6-07
DRAWN BY : FCJ 1/88	REV. 10/17/00 LES/RDR
CHECKED BY : CRK 3/89	REV. 5/7/03 RWW/JTE
	REV. 5/1/06 TLA/GM

NOTES

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

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

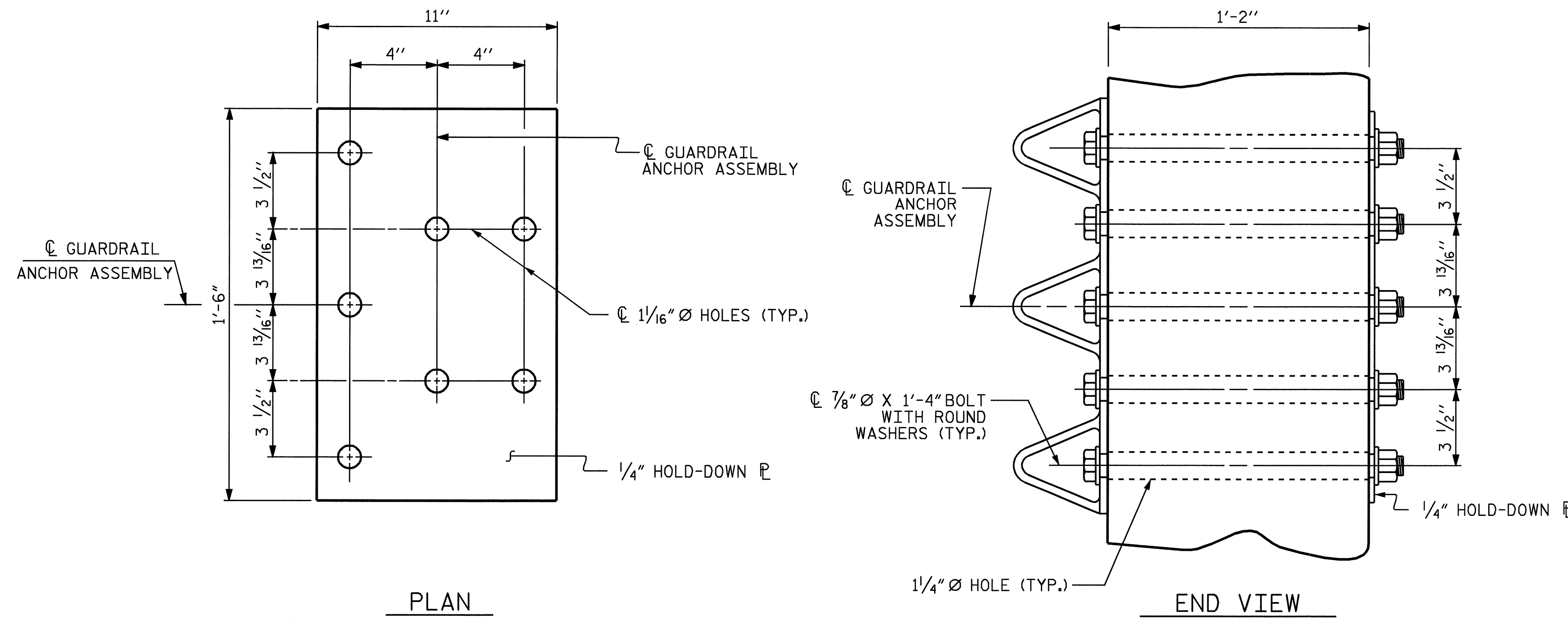
BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS.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

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

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

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

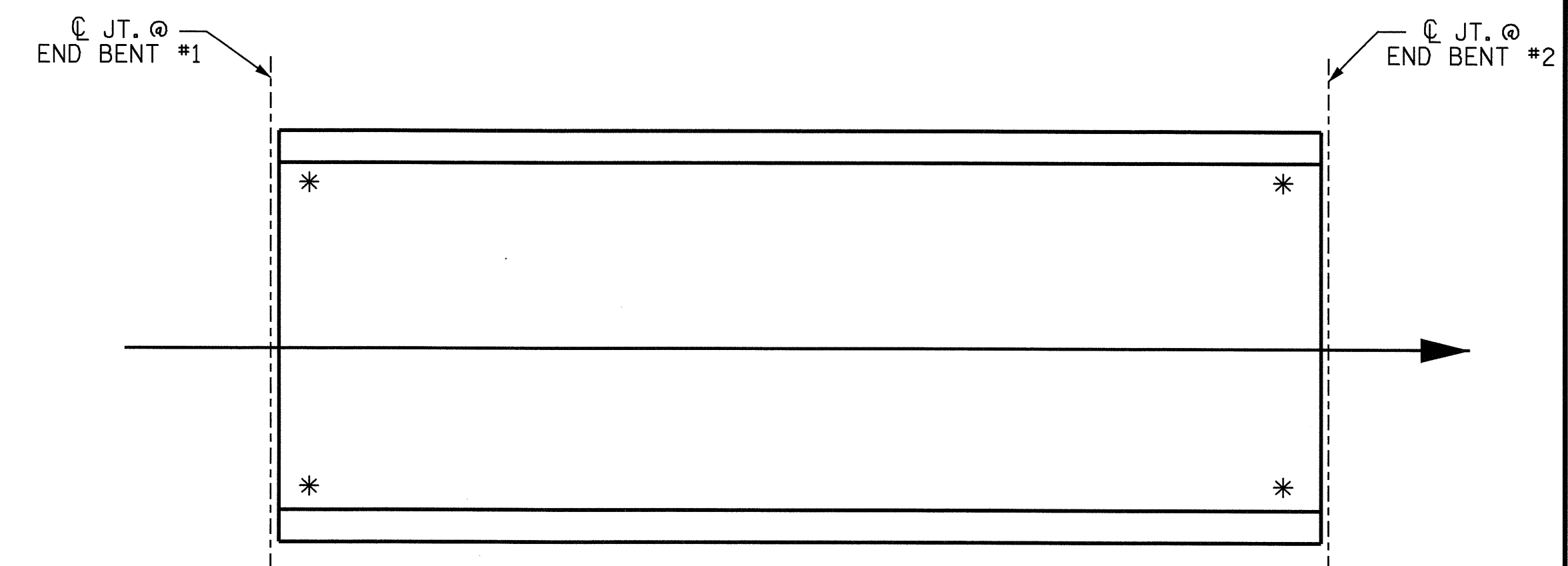
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



PLAN

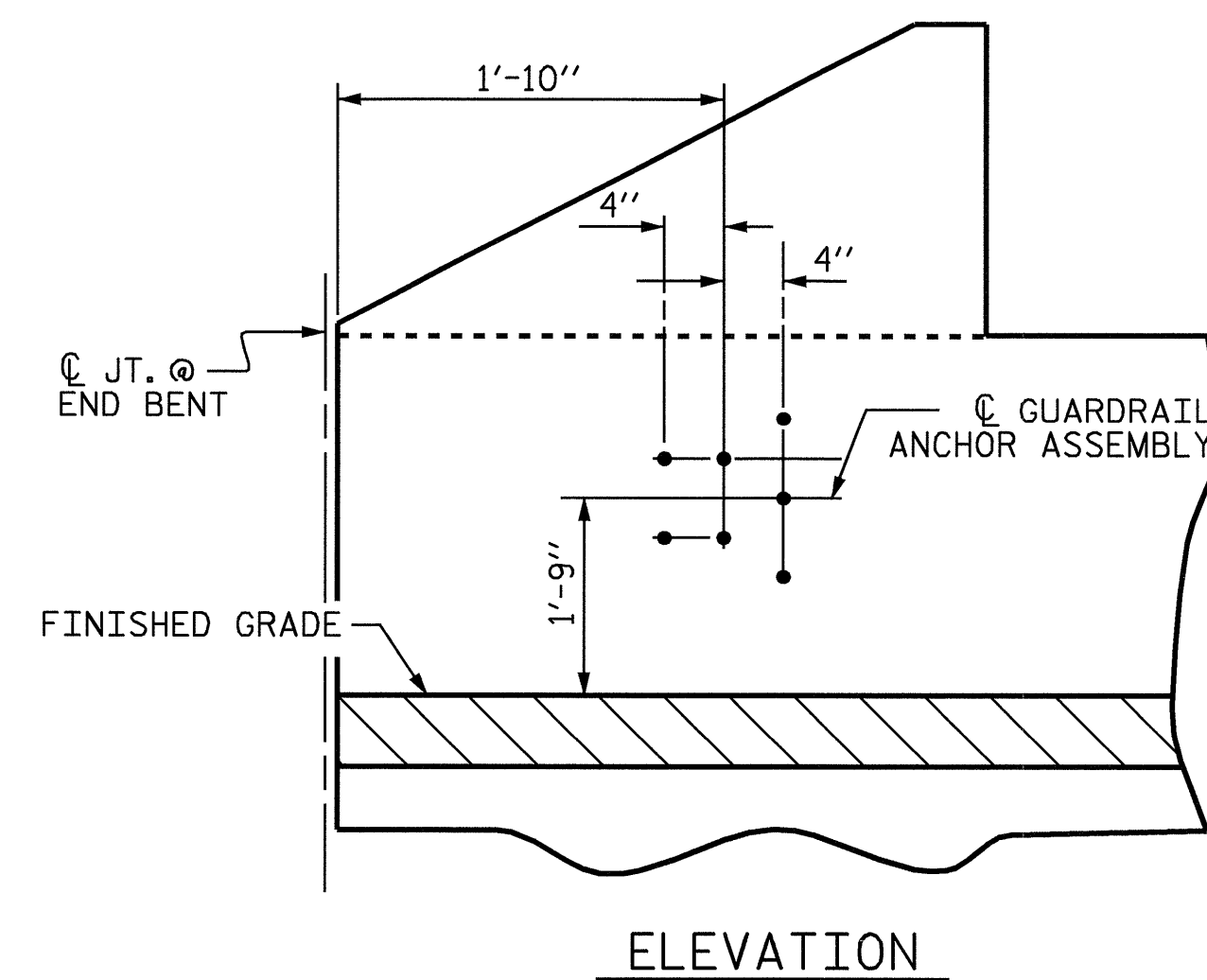
END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS

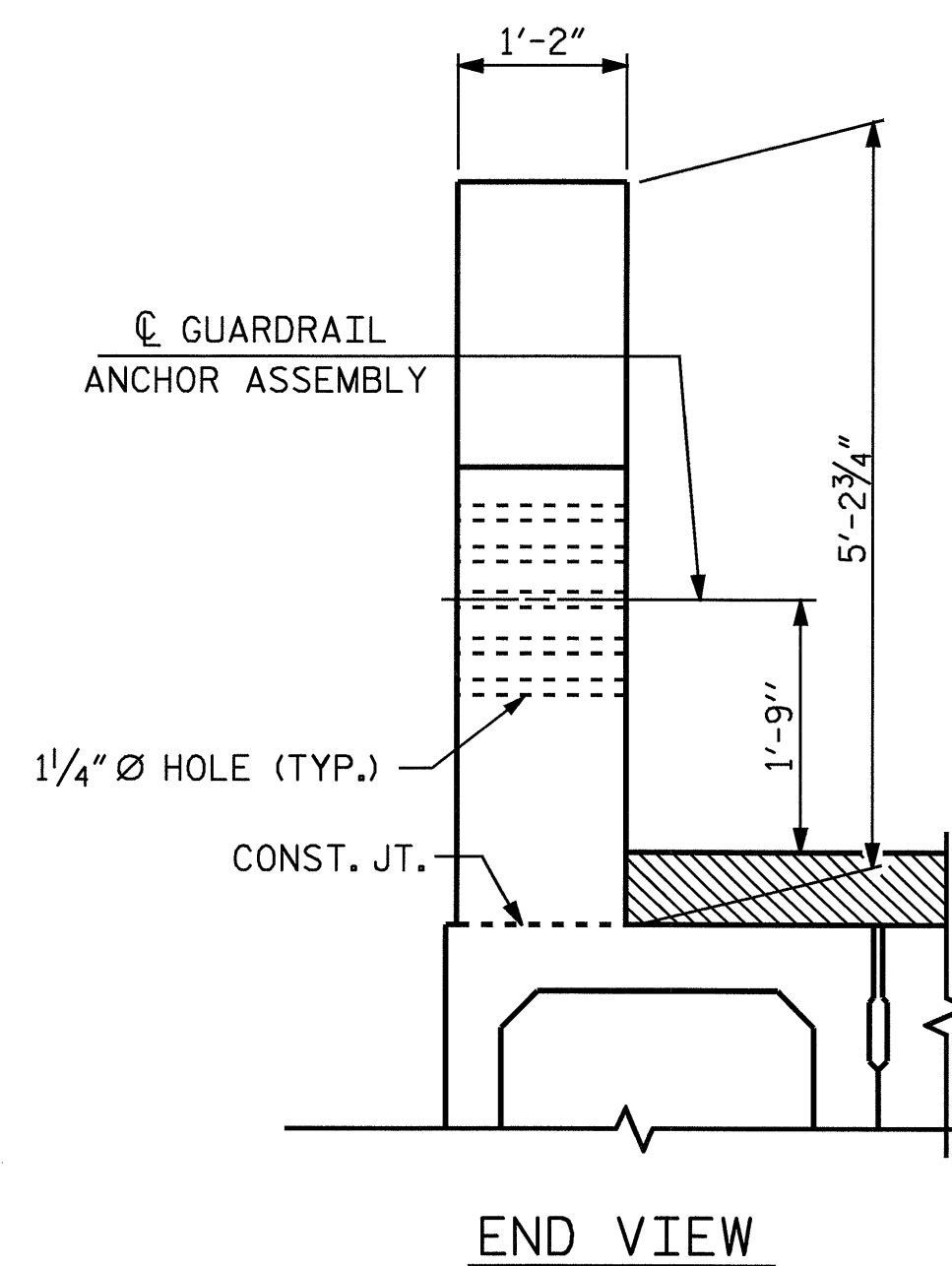


SKETCH SHOWING POINTS OF ATTACHMENT

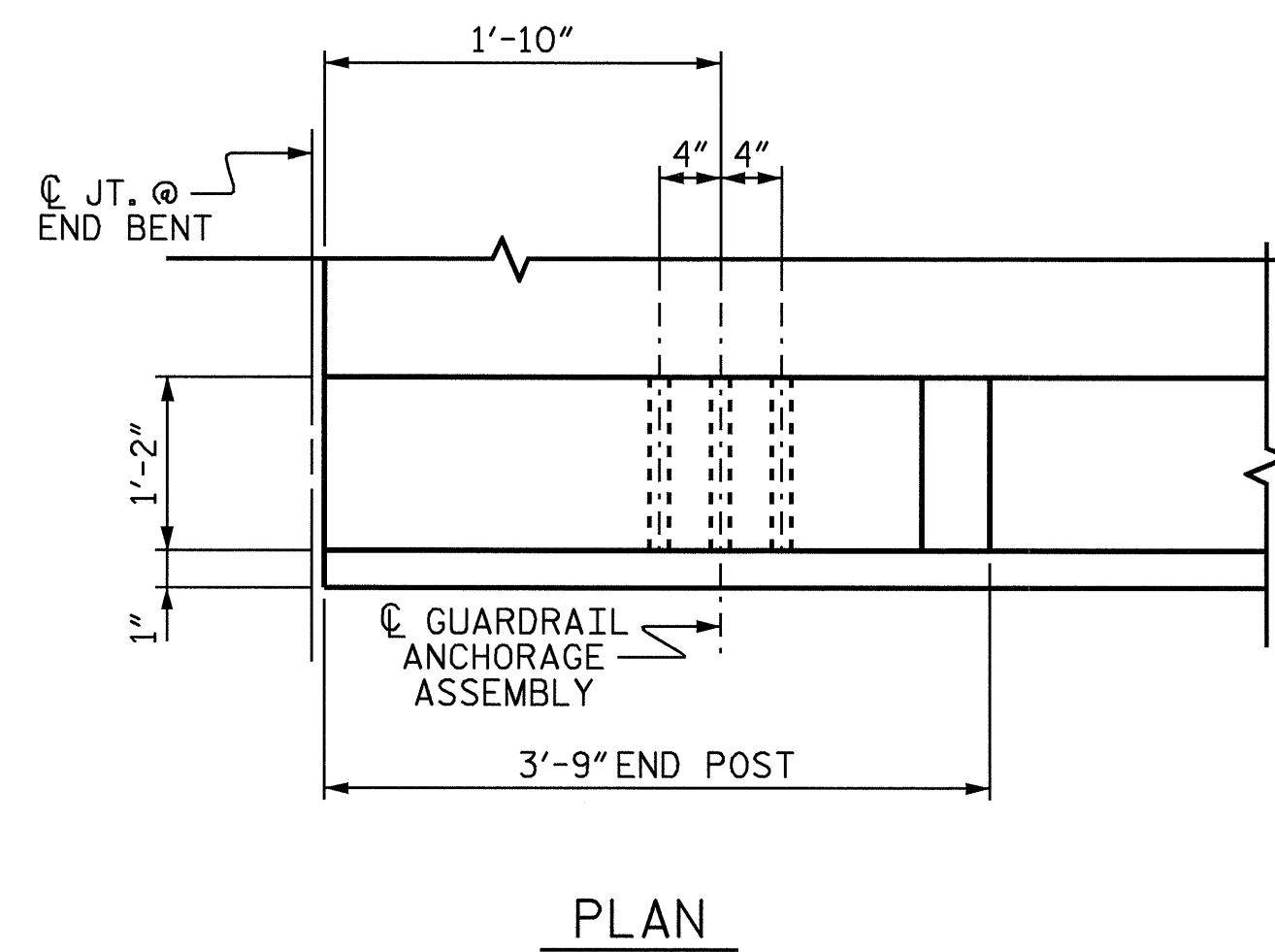
* LOCATION OF GUARDRAIL ATTACHMENT



ELEVATION



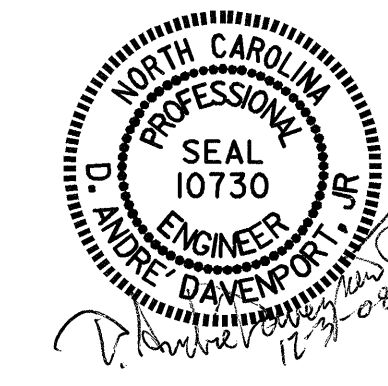
END VIEW



PLAN

LOCATION OF GUARDRAIL ANCHOR AT END POST

ASSEMBLED BY :	H. T. BARBOUR	DATE :	4-23-07
CHECKED BY :	C. R. YARBROUGH	DATE :	6-07
DRAWN BY :	EEM 6/94	REV. 10/17/00	RWW/LES
CHECKED BY :	RGW 6/94	REV. 5/7/03	RWW/JTE
		REV. 5/1/06	TLA/GM

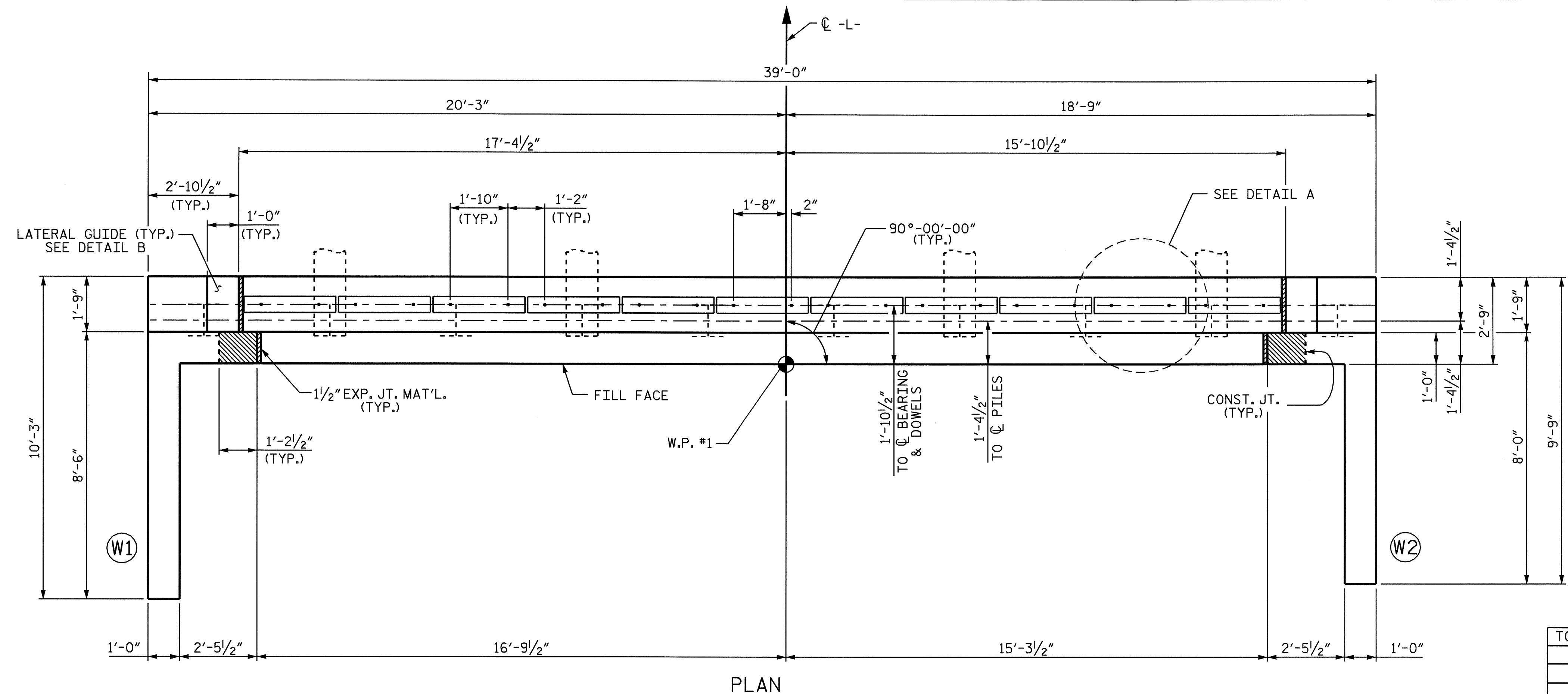


PROJECT NO. B-4592
ORANGE COUNTY
 STATION: 23+85.00-L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GUARDRAIL ANCHORAGE
 DETAILS
 FOR METAL RAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-13
1			3			TOTAL SHEETS
2			4			24



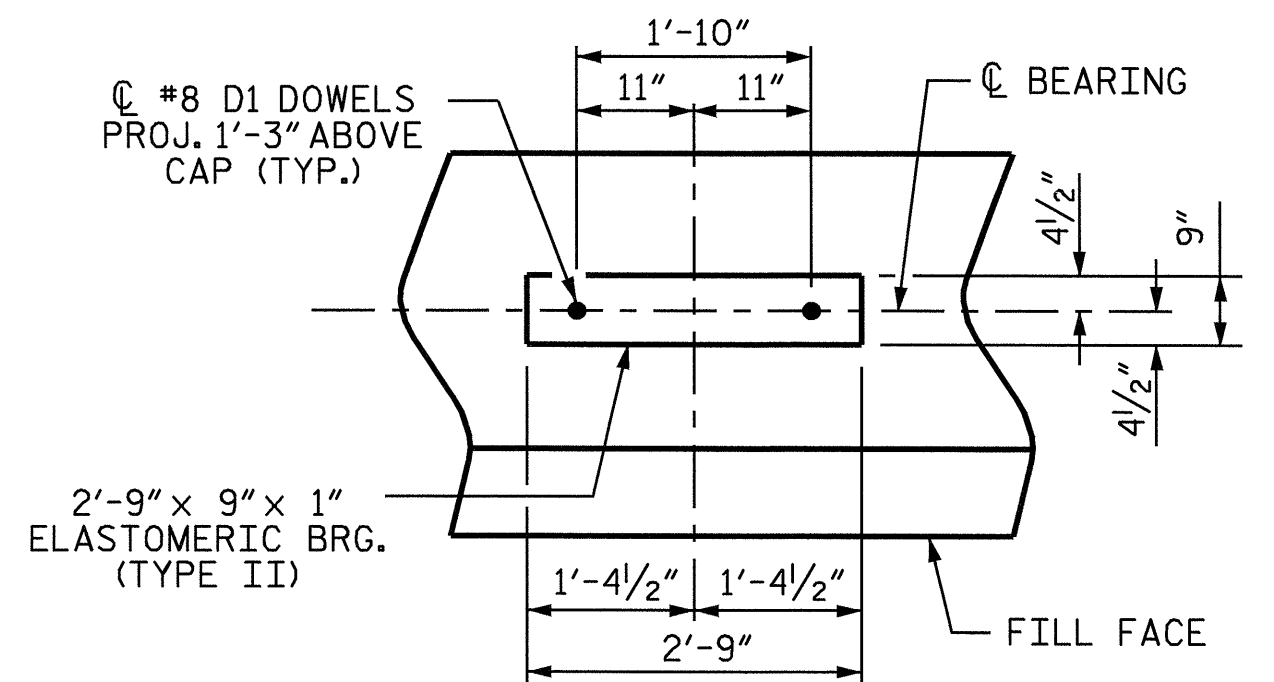
PLAN

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

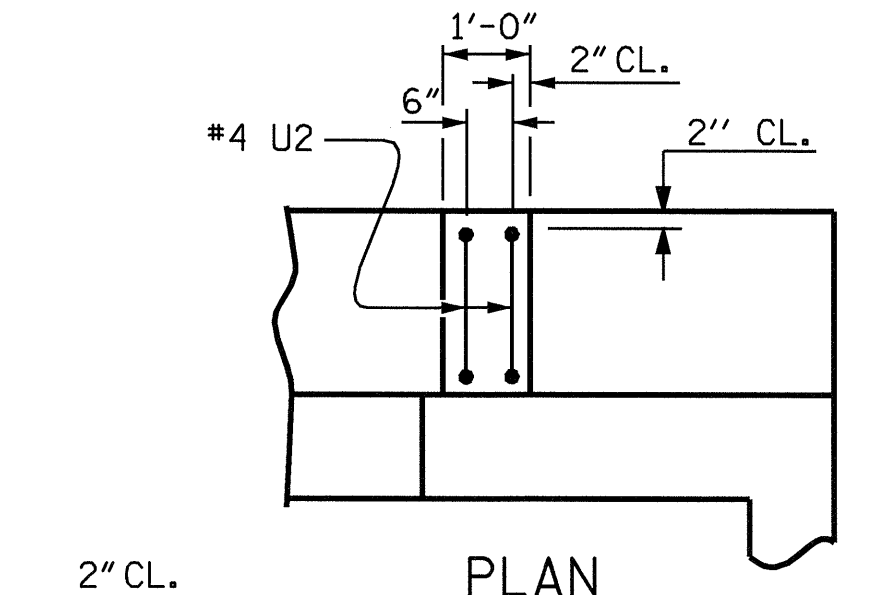
THE LATERAL GUIDE AT EACH END OF THE CAP IS NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE PARAPETS ARE CAST IF SLIP FORMING IS USED.

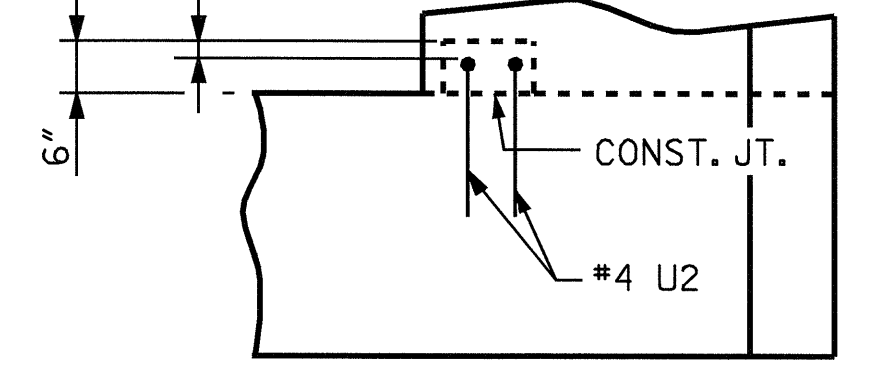


DETAIL A

TOP OF PILE ELEVATIONS	
PILE #	ELEVATION
PILE #1	486.430
PILE #2	486.590
PILE #3	486.750
PILE #4	486.910
PILE #5	487.070
PILE #6	487.230
PILE #7	487.390
PILE #8	487.550
PILE #9	487.710
PILE #10	487.870



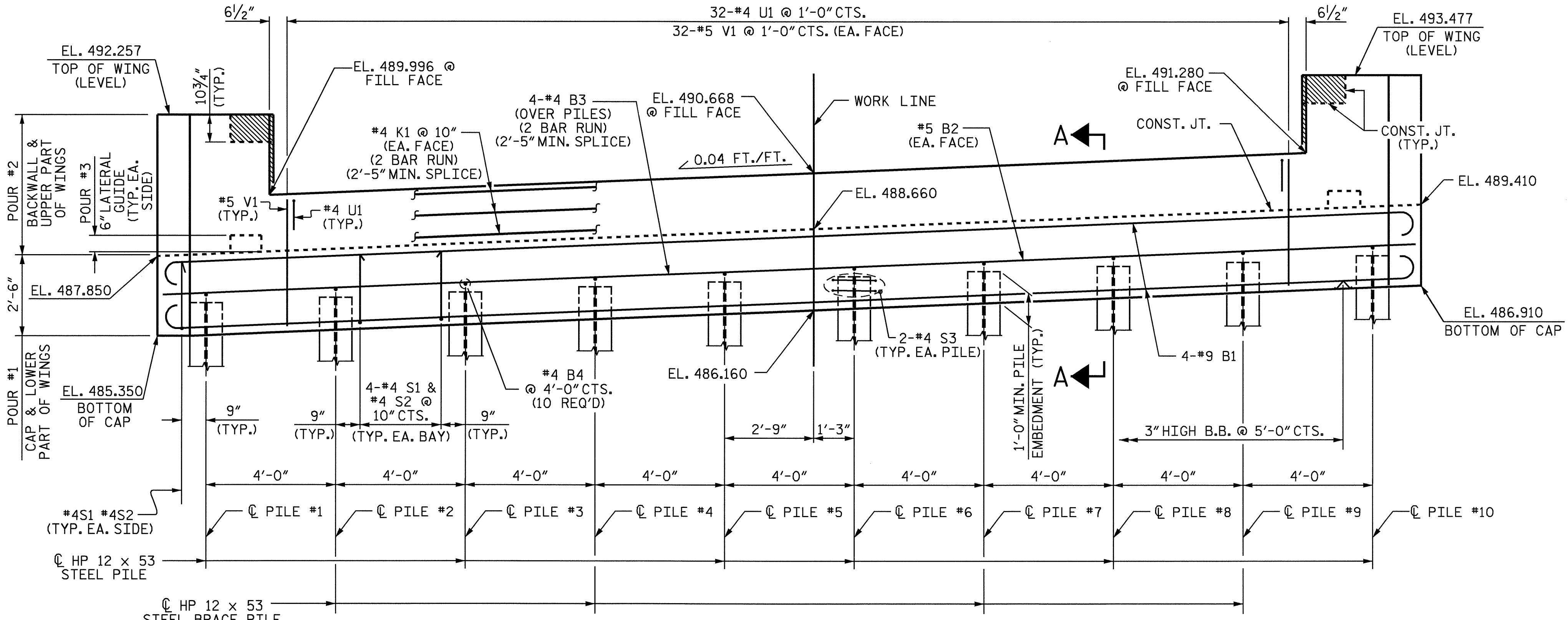
PLAN



ELEVATION

DETAIL B

(EA. END SIMILAR)



ELEVATION

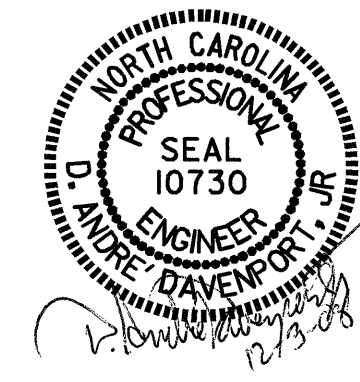
PROJECT NO. B-4592
ORANGE COUNTY
 STATION: 23+85.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

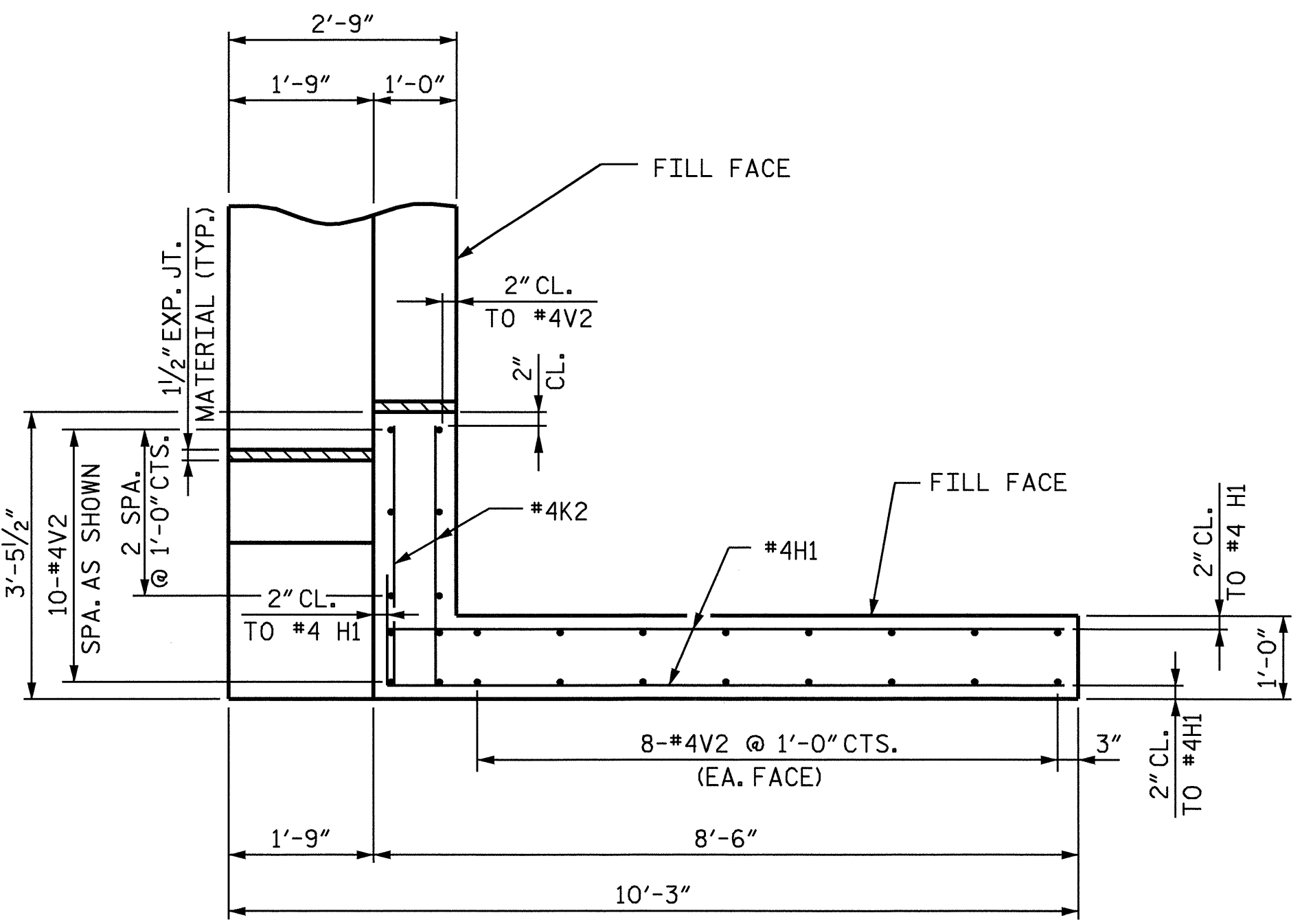
**SUBSTRUCTURE
 END BENT #1**

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14	
1			3			TOTAL SHEETS	
2			4			24	

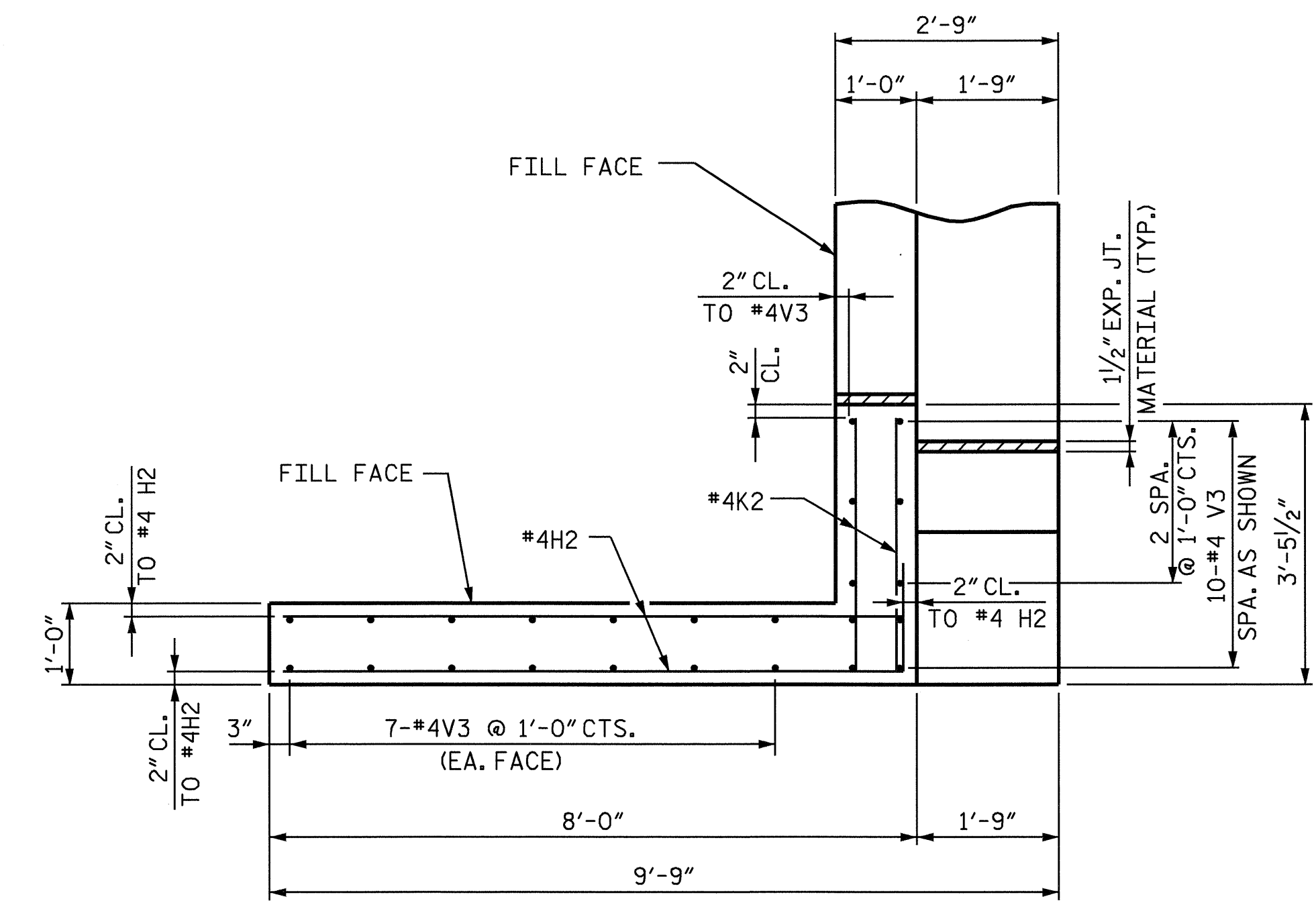


DRAWN BY : M. G. SHAIKH DATE : 6-18-08
 CHECKED BY : H. T. BARBOUR DATE : 8-17-08

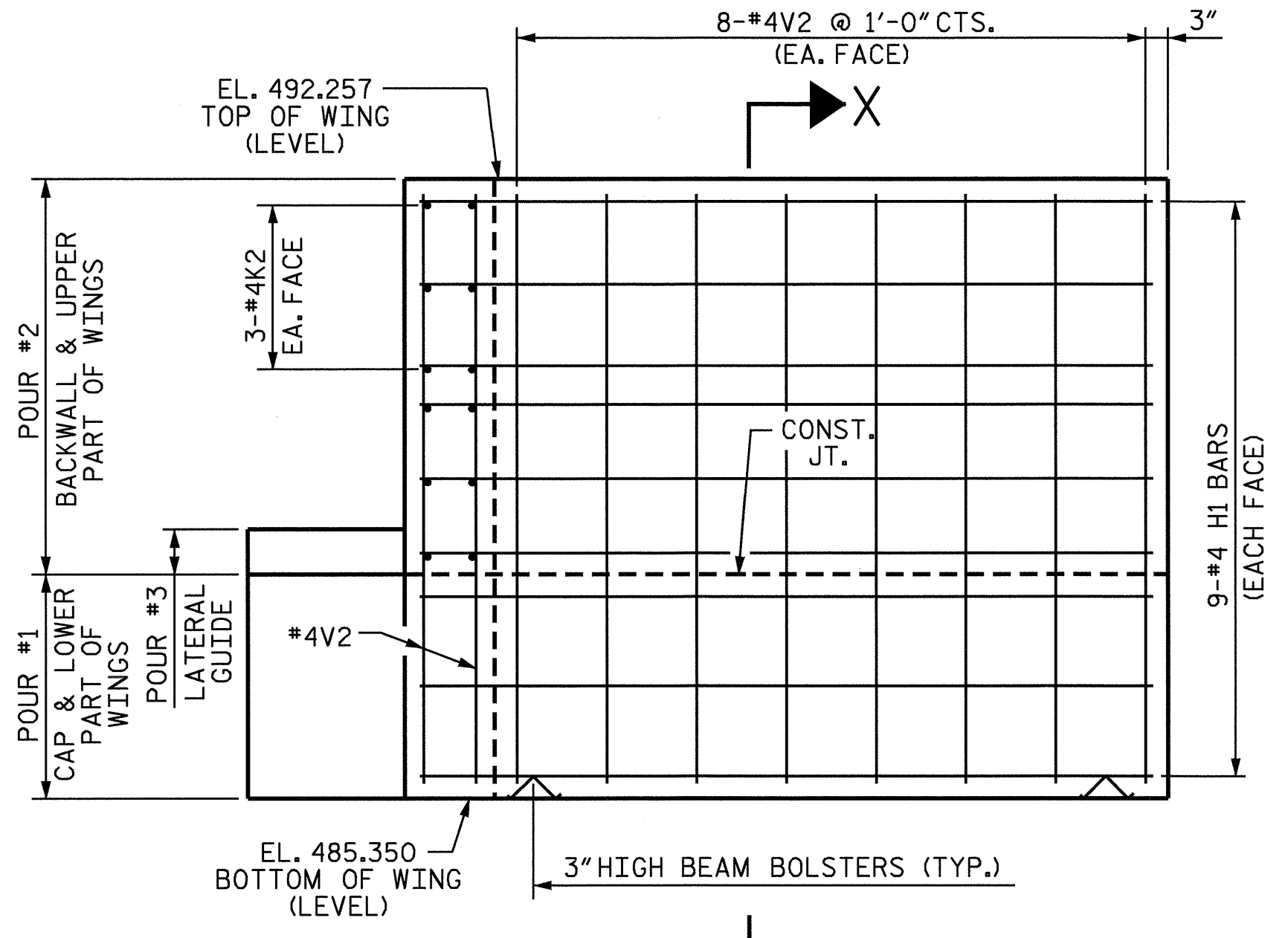
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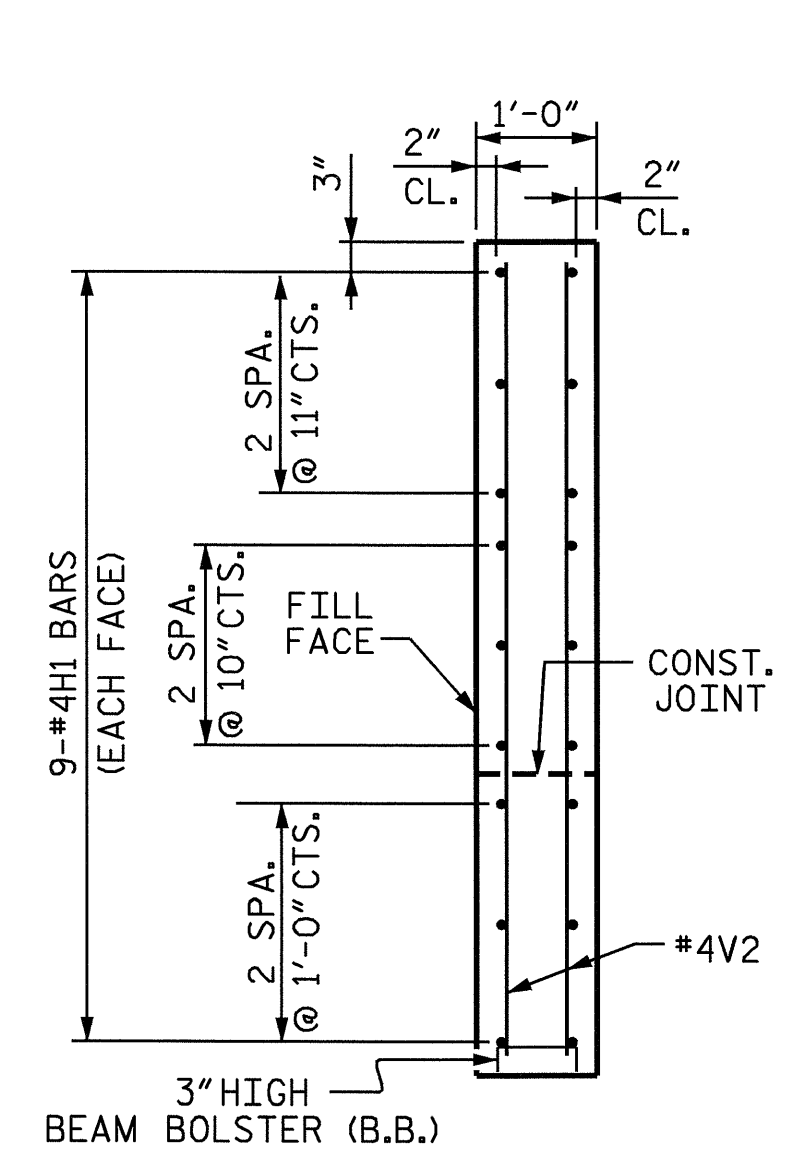
PLAN OF LEFT WING (W1)



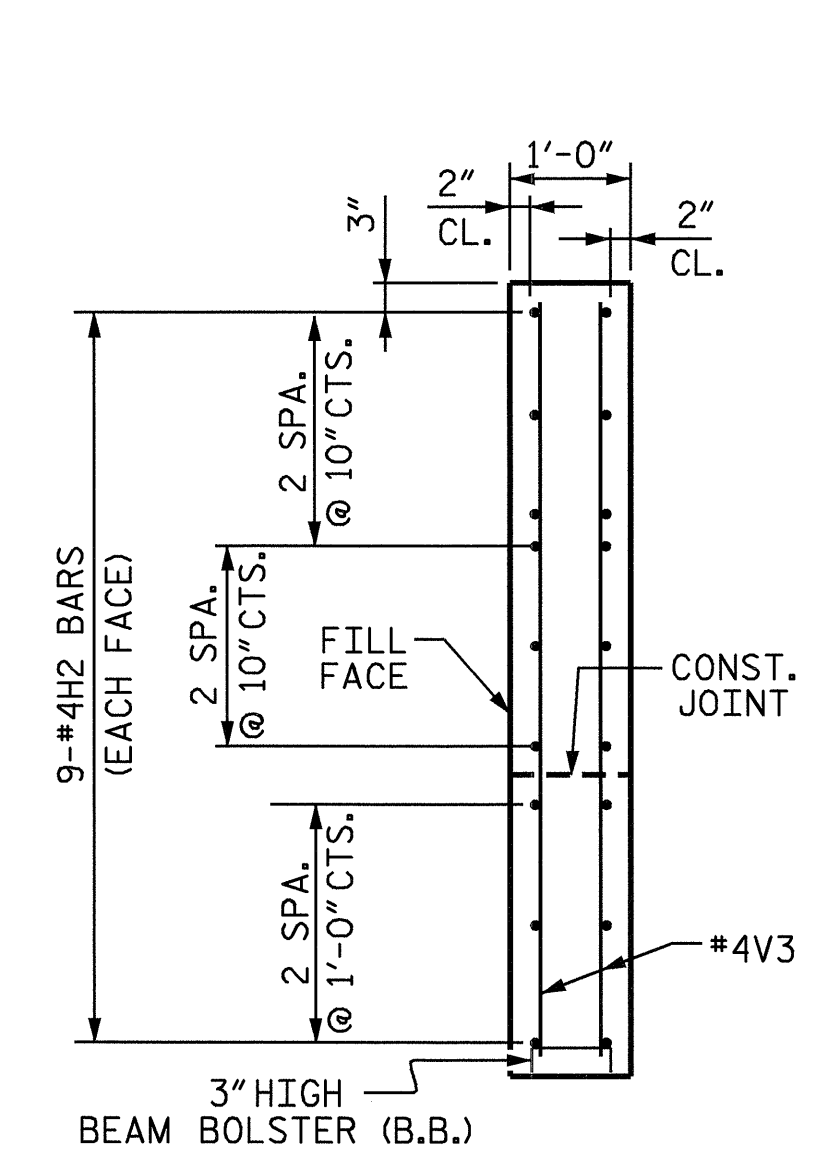
PLAN OF RIGHT WING (W2)



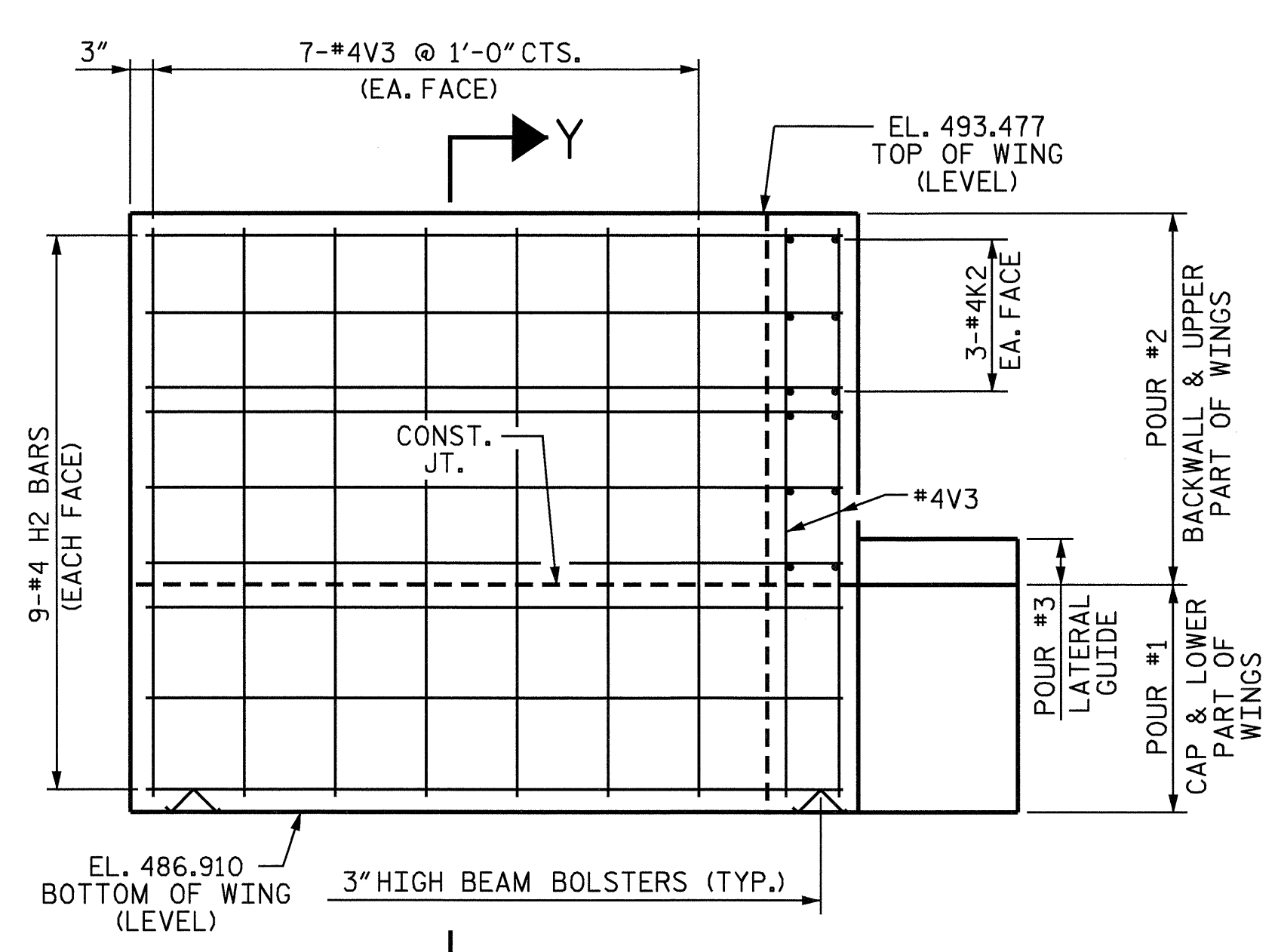
ELEVATION OF LEFT WING (W1)



SECTION X-X



SECTION Y-Y

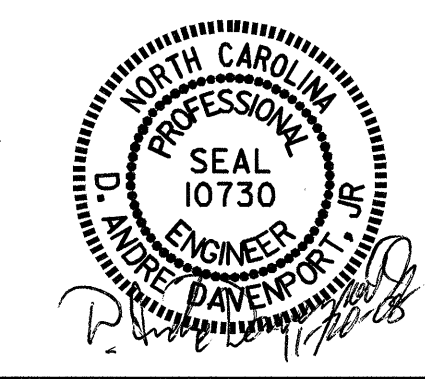


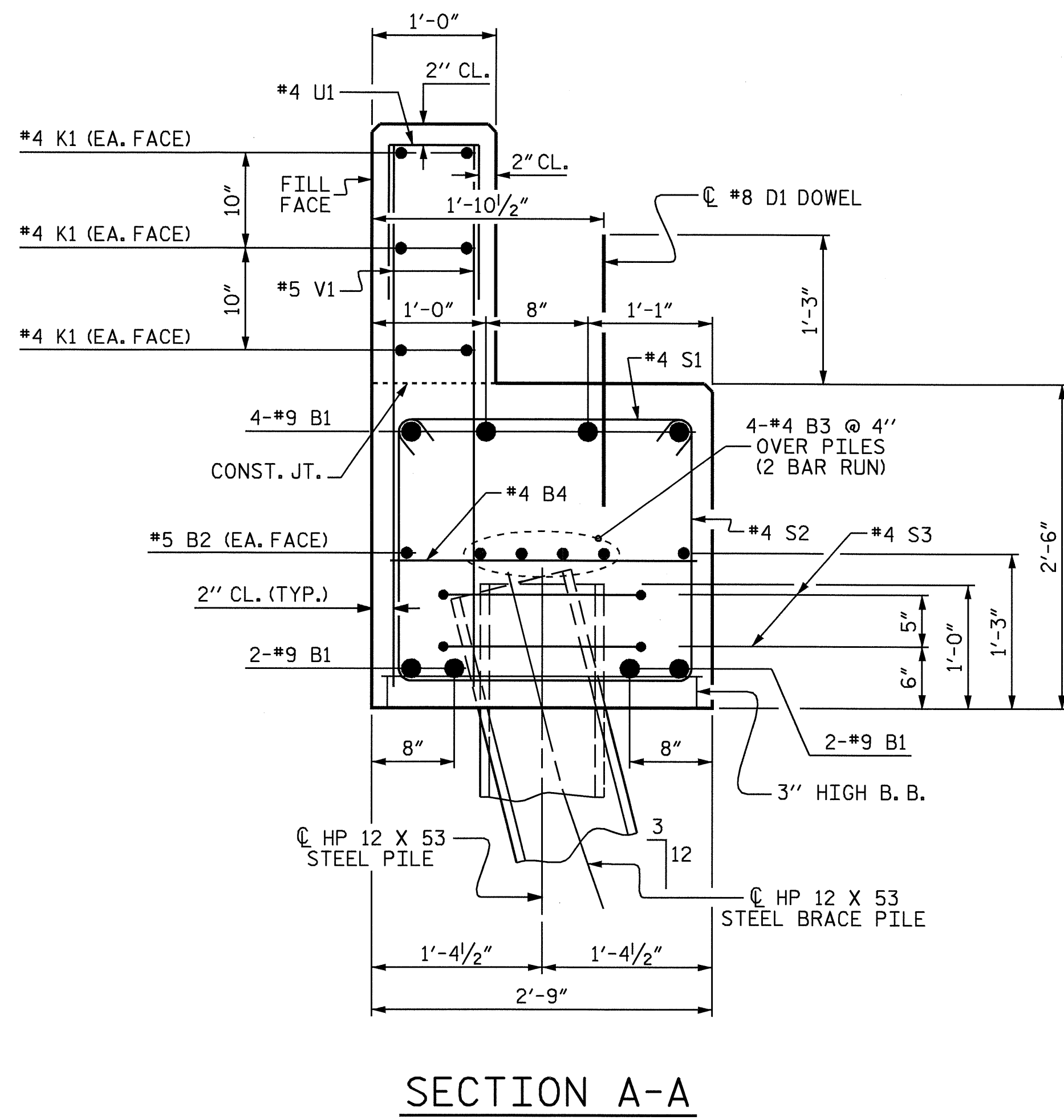
ELEVATION OF RIGHT WING (W2)

PROJECT NO. B-4592
ORANGE COUNTY
 STATION: 23+85.00 -L-
 SHEET 2 OF 3

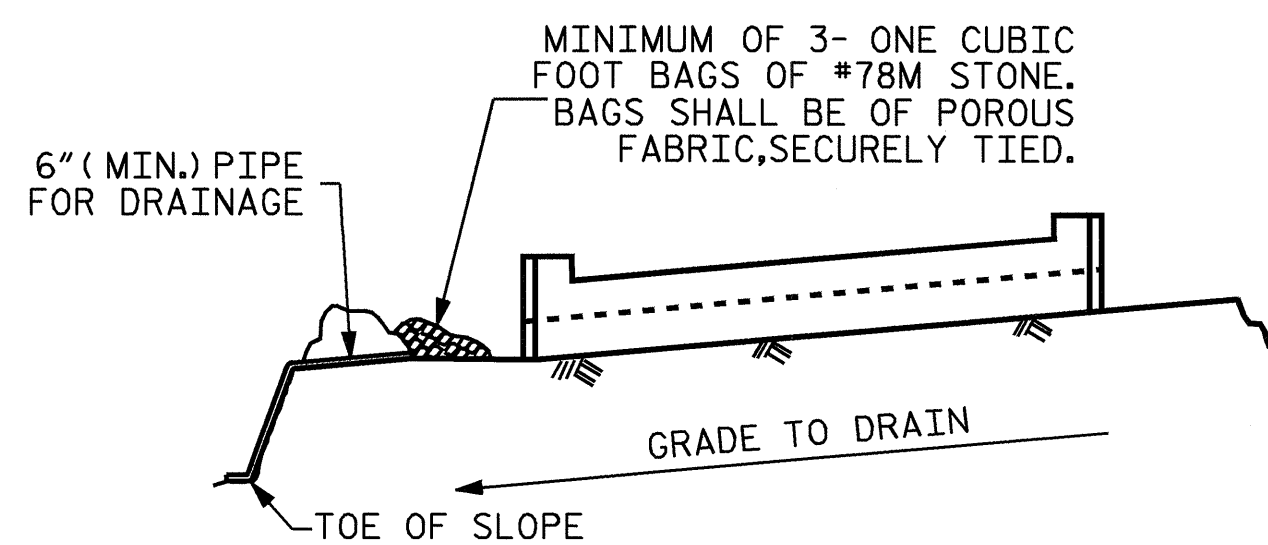
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT #1					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-15
TOTAL SHEETS					24

DRAWN BY : M. G. SHAIKH DATE : 06-18-08
 CHECKED BY : H. T. BARBOUR DATE : 06-17-08





SECTION A-A

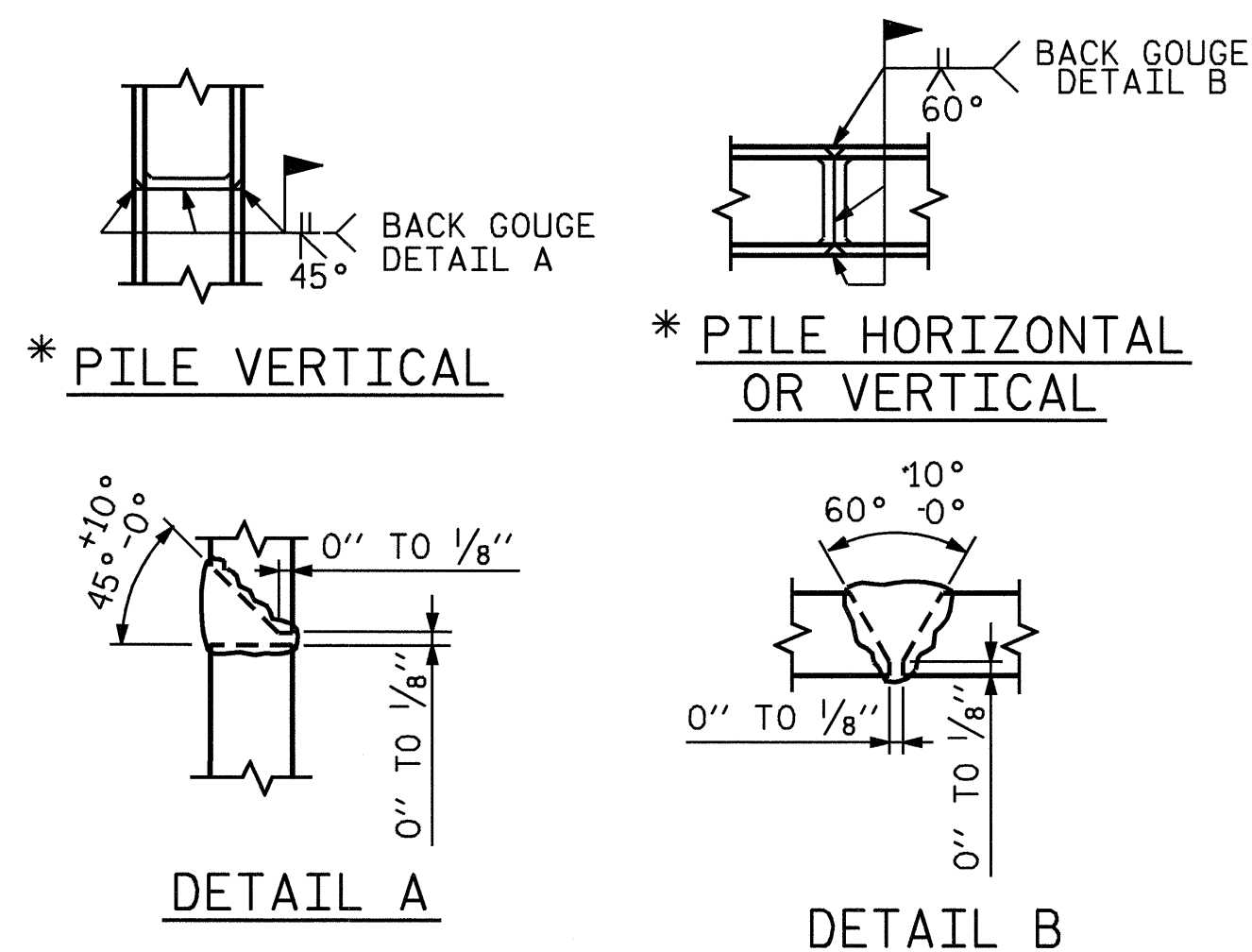


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

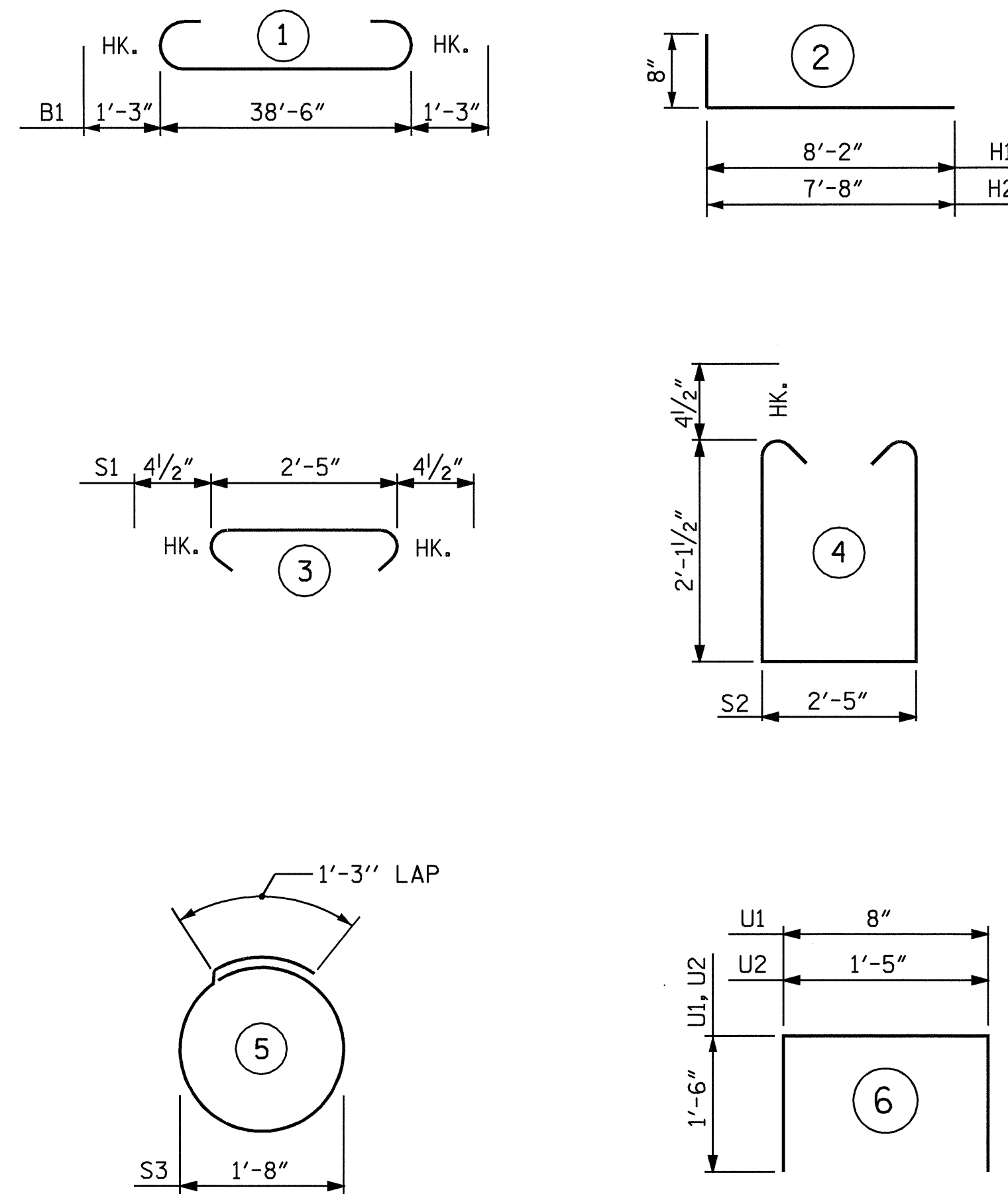
TEMPORARY DRAINAGE AT END BENT



PILE SPLICE DETAILS

* POSITION OF PILE DURING WELDING.

BAR TYPE



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

FOR END BENT #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	41'-0"	1115
B2	2	#5	STR	38'-8"	81
B3	8	#4	STR	20'-7"	110
B4	10	#4	STR	2'-5"	16
D1	22	#8	STR	2'-3"	132
H1	18	#4	2	8'-10"	106
H2	18	#4	2	8'-4"	100
K1	12	#4	STR	20'-7"	165
K2	12	#4	STR	3'-1"	25
S1	38	#4	3	3'-2"	80
S2	38	#4	4	7'-5"	188
S3	20	#4	5	6'-6"	87
U1	32	#4	6	3'-8"	78
U2	4	#4	6	4'-5"	12
V1	64	#5	STR	4'-2"	278
V2	26	#4	STR	6'-6"	113
V3	24	#4	STR	6'-2"	99

REINFORCING STEEL = 2785 LBS

CLASS A CONCRETE BREAKDOWN

POUR #1	CAP & LOWER PART OF WINGS	C.Y.	11.3
POUR #2	UPPER PART OF WINGS & BACKWALL	C.Y.	5.8
POUR #3	LATERAL GUIDES	C.Y.	0.1
TOTAL CLASS A CONCRETE		C.Y.	17.2

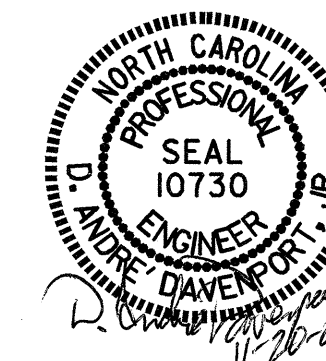
HP 12 X 53 STEEL PILES NO. 10 LIN. FT. 200

PROJECT NO. B-4592
ORANGE COUNTY
 STATION: 23+85.00 -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:	S-16
1			3			TOTAL SHEETS 24
2			4			

DRAWN BY : M. G. SHAIKH DATE : 06-19-08
 CHECKED BY : H. T. BARBOUR DATE : 08-17-08

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

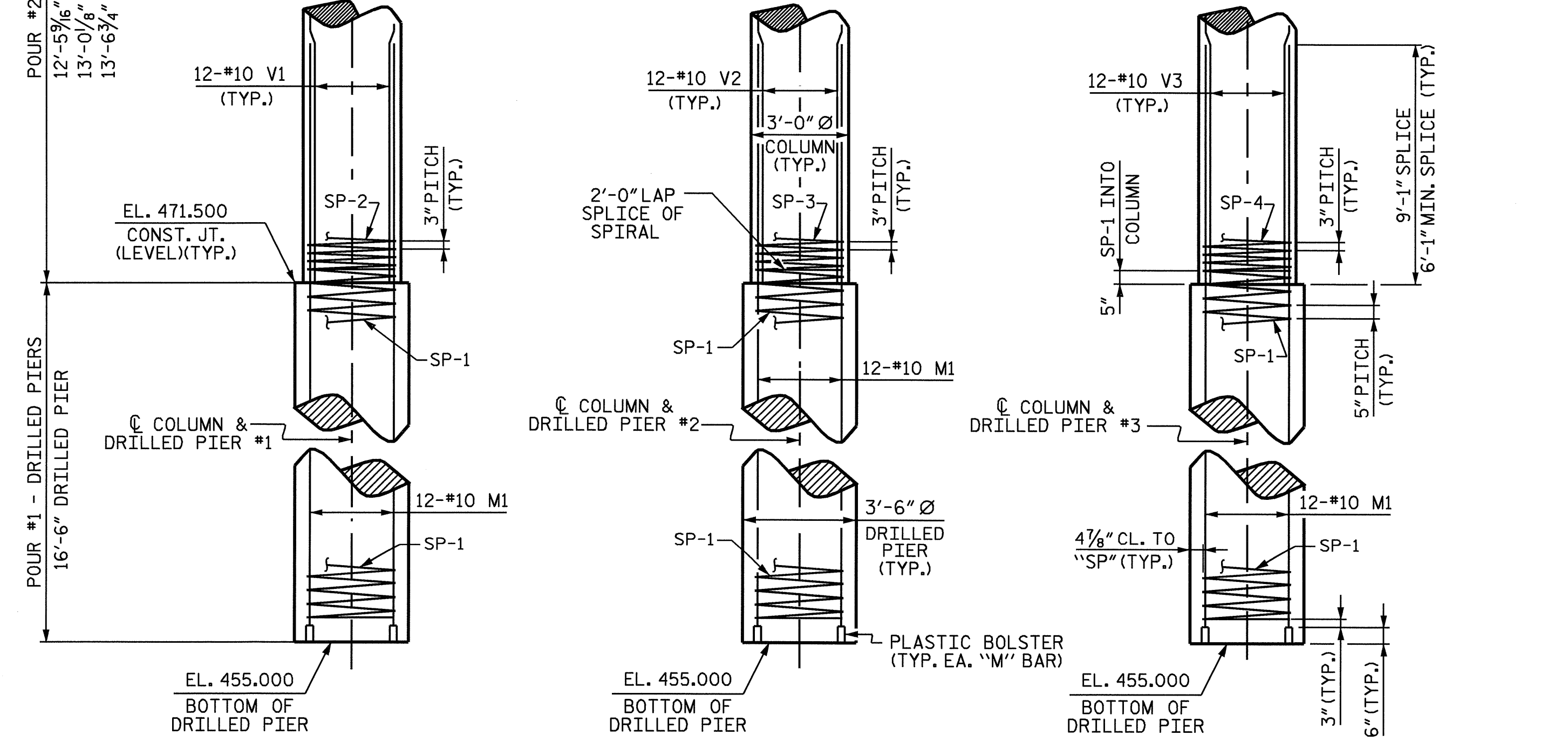
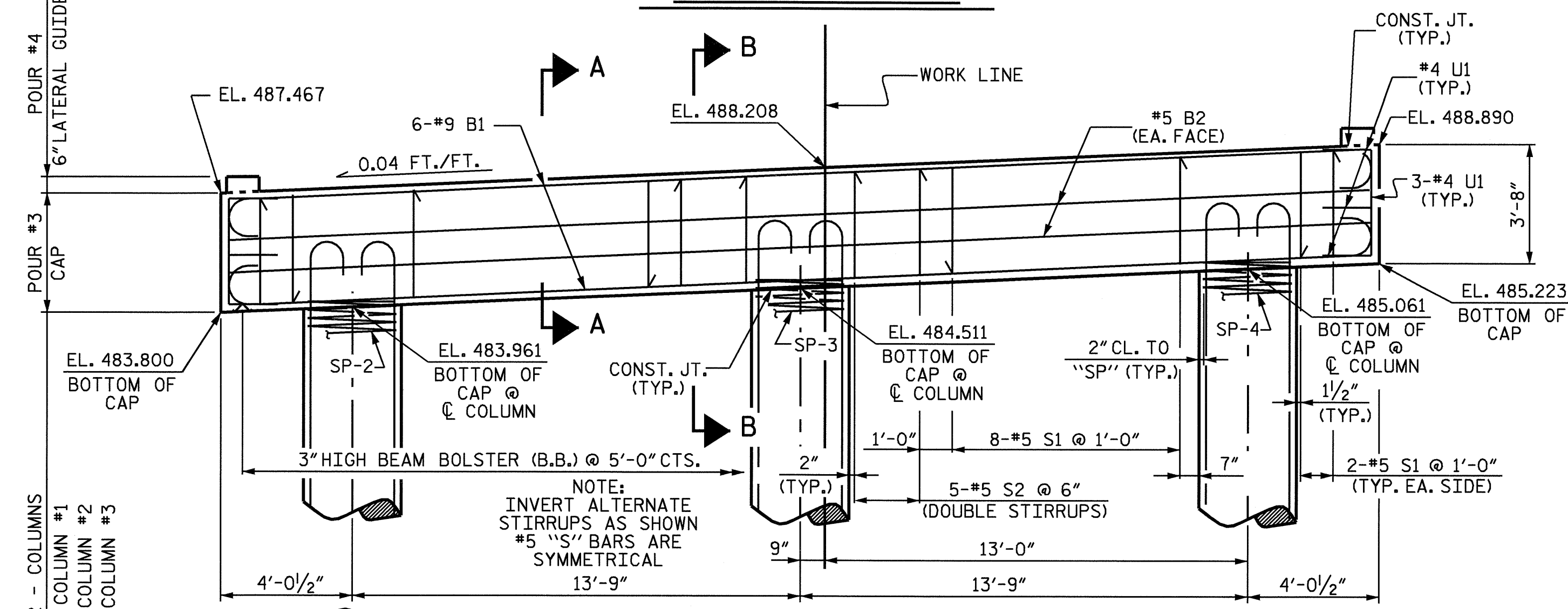
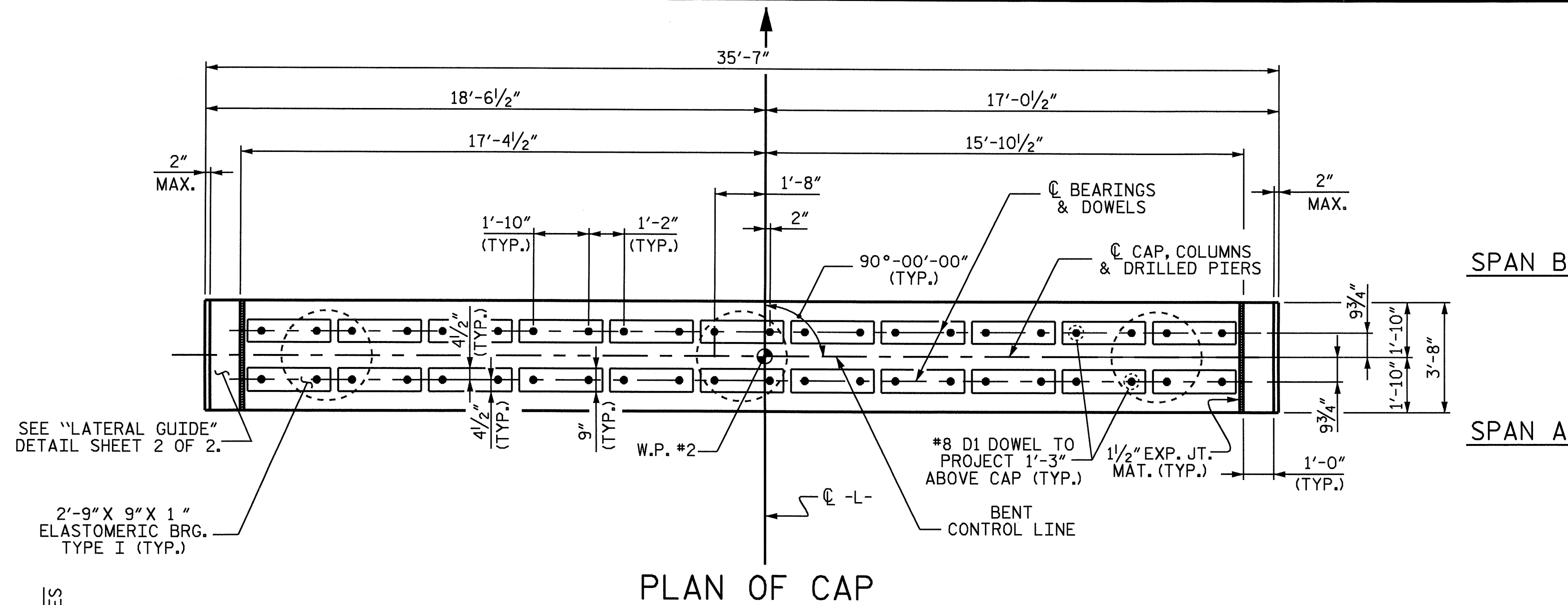
HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".

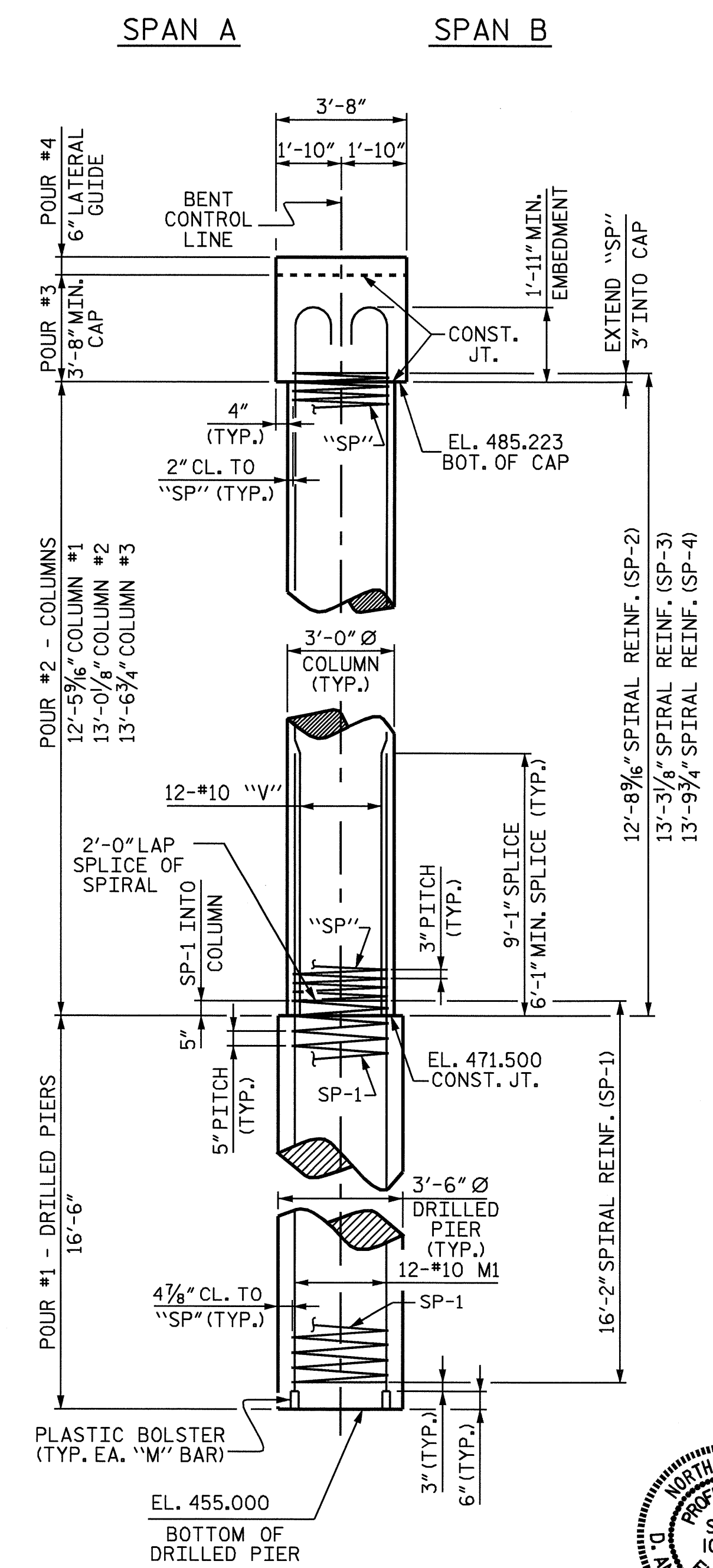
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

FOR PERMANENT STEEL CASING, SEE SPECIAL PROVISION FOR DRILLED PIERS.

FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.



ELEVATION
ALL DRILLED PIERS ARE IDENTICAL AND ALL COLUMNS ARE SIMILAR



RIGHT END ELEVATION

DRAWN BY: D.A. DAVENPORT DATE: 10/08
CHECKED BY: M.G. SHAIKH DATE: 10/08

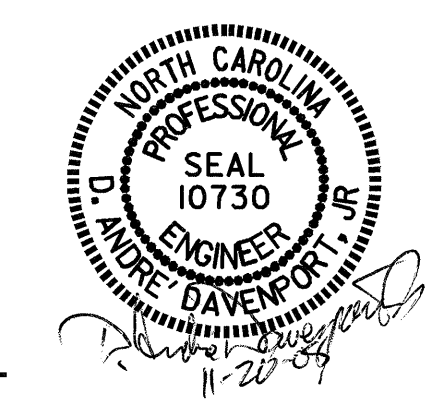
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PROJECT NO. B-4592
ORANGE COUNTY
STATION: 23+85.00-L-

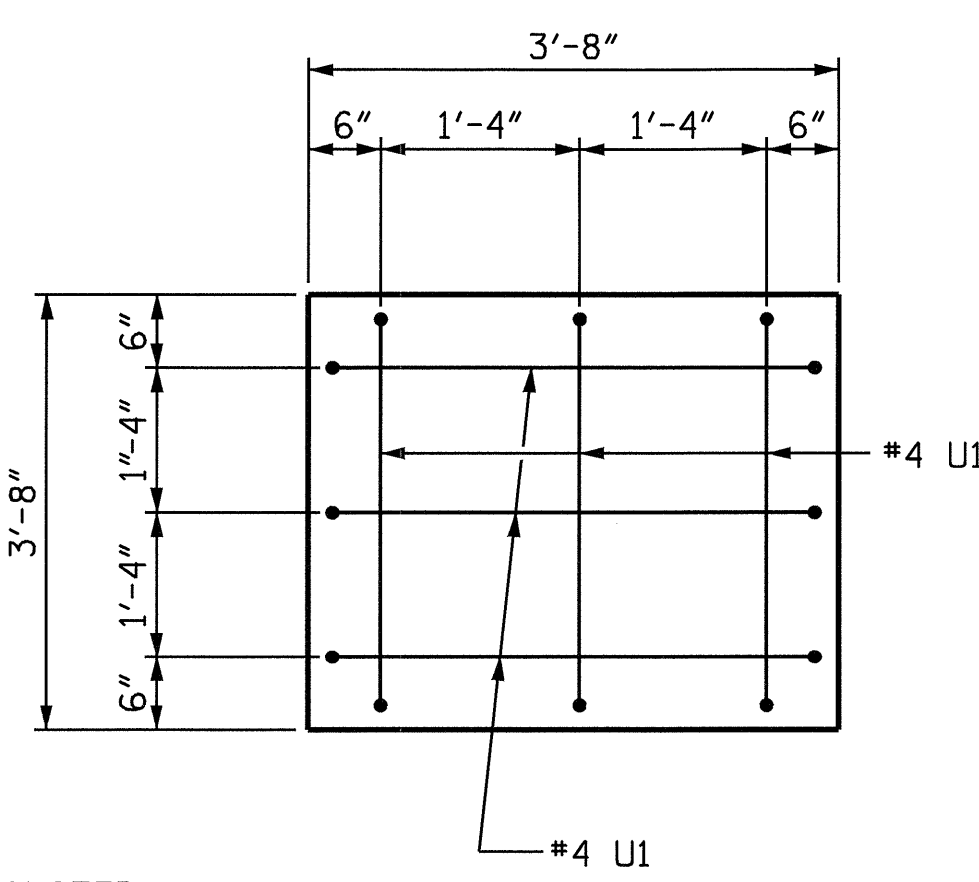
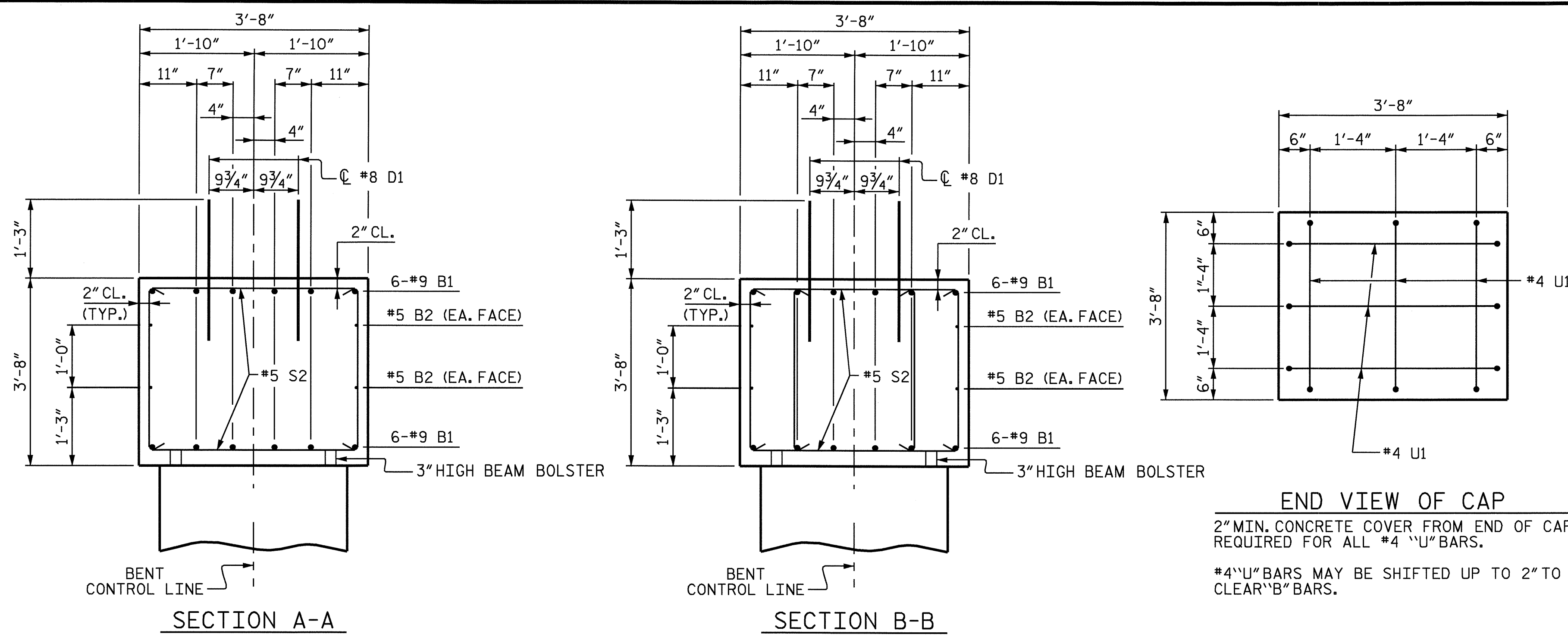
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

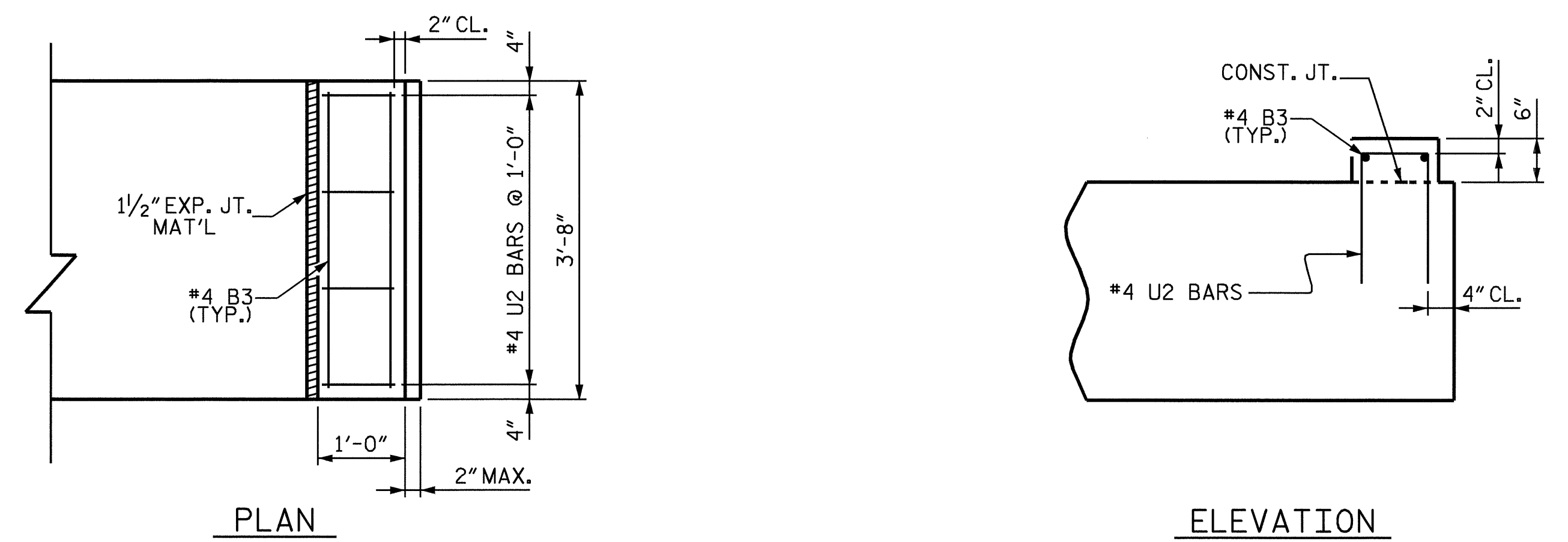
SUBSTRUCTURE BENT #1



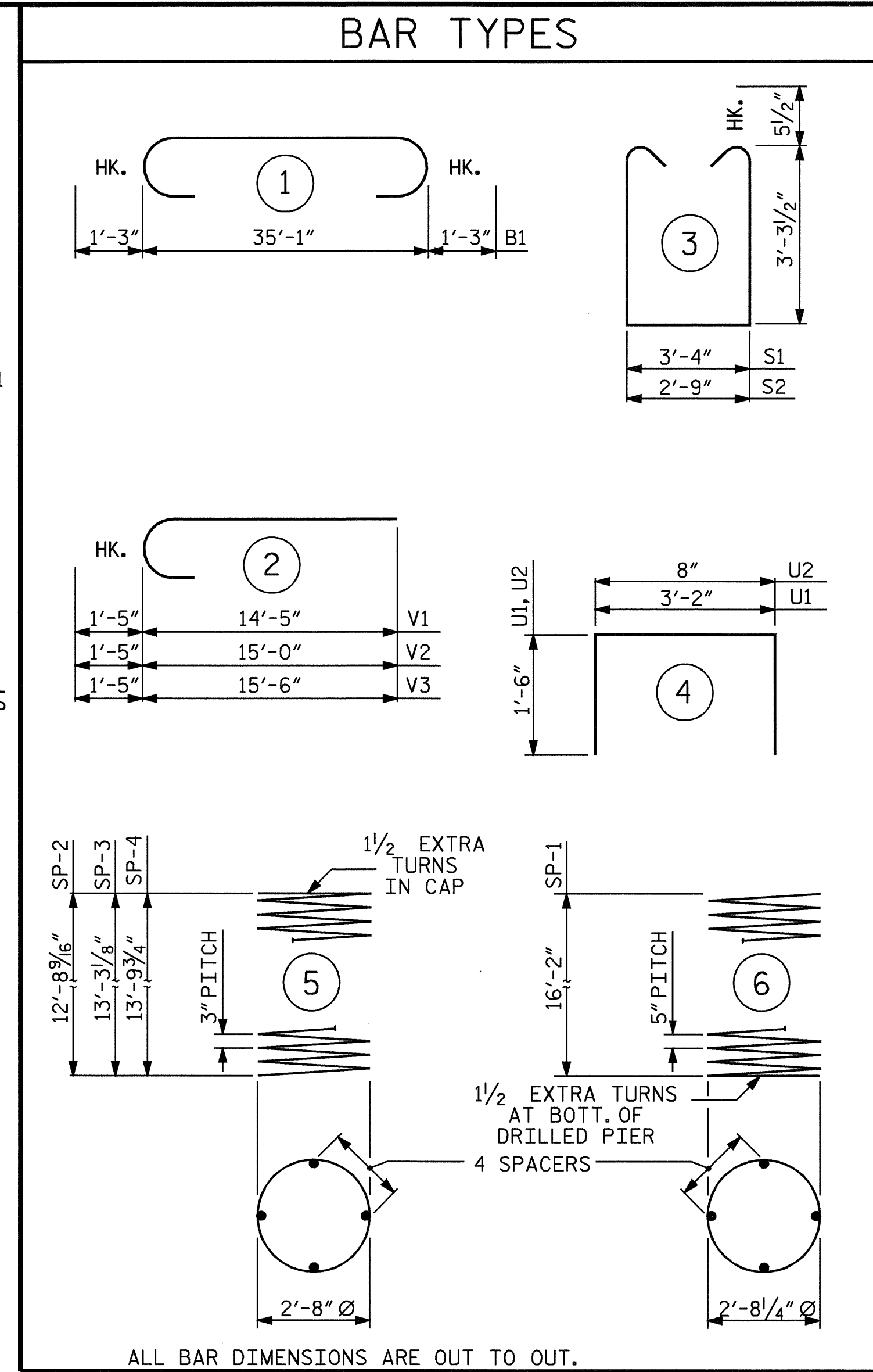
REVISIONS						SHEET NO. S-17
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 24
2			4			



2" MIN. CONCRETE COVER FROM END OF CAP REQUIRED FOR ALL #4 "U" BARS.
 #4 "U" BARS MAY BE SHIFTED UP TO 2" TO CLEAR "B" BARS.



LATERAL GUIDE DETAIL



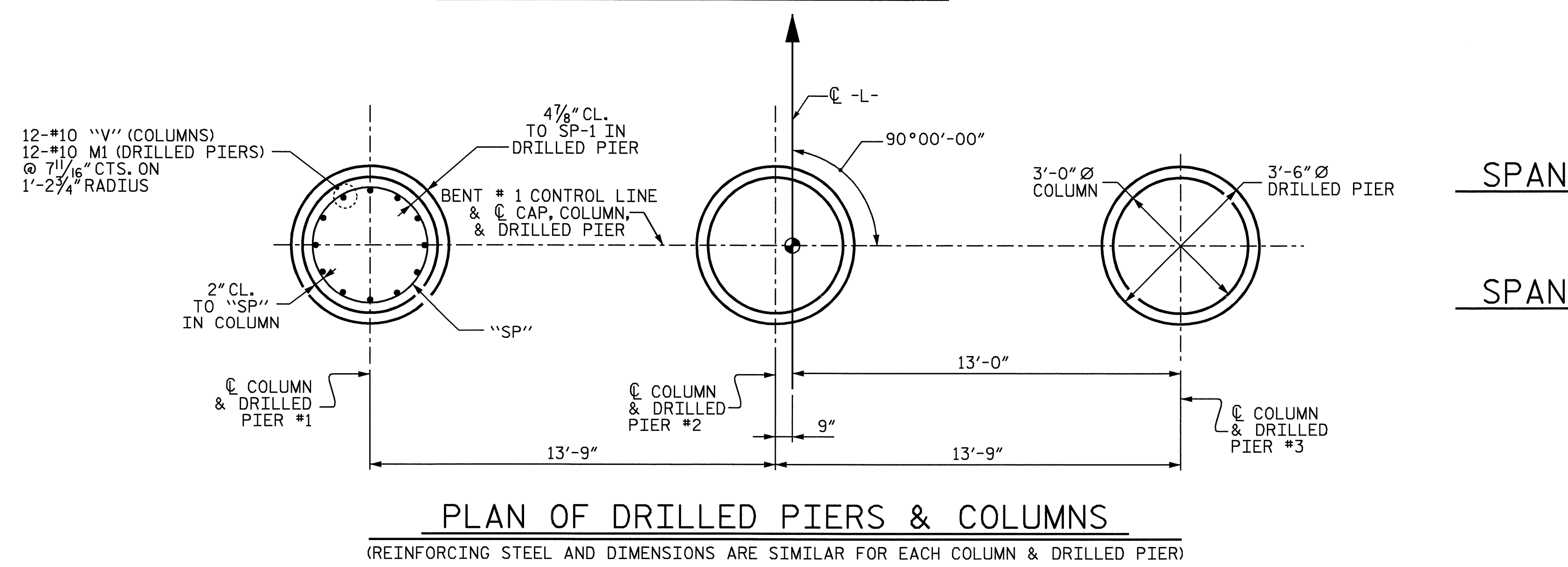
ALL BAR DIMENSIONS ARE OUT TO OUT.
 * THE SP-2, SP-3, SP-4 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.
 ** THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

BILL OF MATERIAL

BENT #1					
BAR	NO	SIZE	TYPE	LENGTH	WEIGHT
B1	12	9	1	37'-7"	1533
B2	4	5	STR	35'-3"	147
B3	4	4	STR	3'-4"	9
D1	44	8	STR	2'-3"	264
M1	36	10	STR	25'-1"	3886
S1	20	5	3	10'-10"	226
S2	20	5	3	10'-3"	214
U1	12	4	4	6'-2"	49
U2	8	4	4	3'-8"	20
V1	12	10	2	15'-10"	818
V2	12	10	2	16'-5"	848
V3	12	10	2	16'-11"	874

REINFORCING STEEL	LBS.	
	8,888	
SP-1	3	** 6 335'-1" 1048
SP-2	1	* 5 432'-4" 289
SP-3	1	* 5 450'-10" 301
SP-4	1	* 5 467'-4" 312
SPIRAL COLUMN REINFORCING STEEL	LBS.	1,950
CLASS A CONCRETE BREAKDOWN		
POUR #2 (COLUMNS)		10.2 C.Y.
POUR #3 (CAP)		17.7 C.Y.
POUR #4 (LATERAL GUIDES)		0.1 C.Y.
TOTAL		28.0 C.Y.

DRILLED PIERS	
DRILLED PIER CONCRETE	
POUR #1 (DRILLED PIERS)	17.6 C.Y.
3'-6" Ø DRILLED PIERS NOT IN SOIL	30.00 LIN. FT.
3'-6" Ø DRILLED PIERS IN SOIL	19.50 LIN. FT.
3'-6" Ø PERMANENT STEEL CASING	13.50 LIN. FT.
CSL TUBES	228.00 LIN. FT.



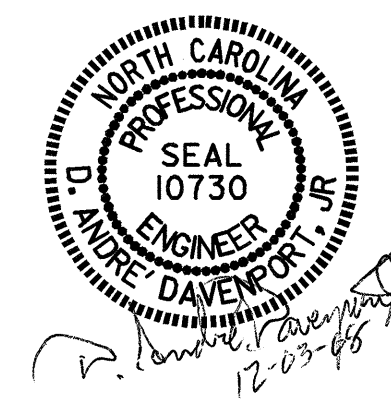
SPAN B
 SPAN A

PROJECT NO. B-4592
ORANGE COUNTY
 STATION: 23+85.00-L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE BENT #1

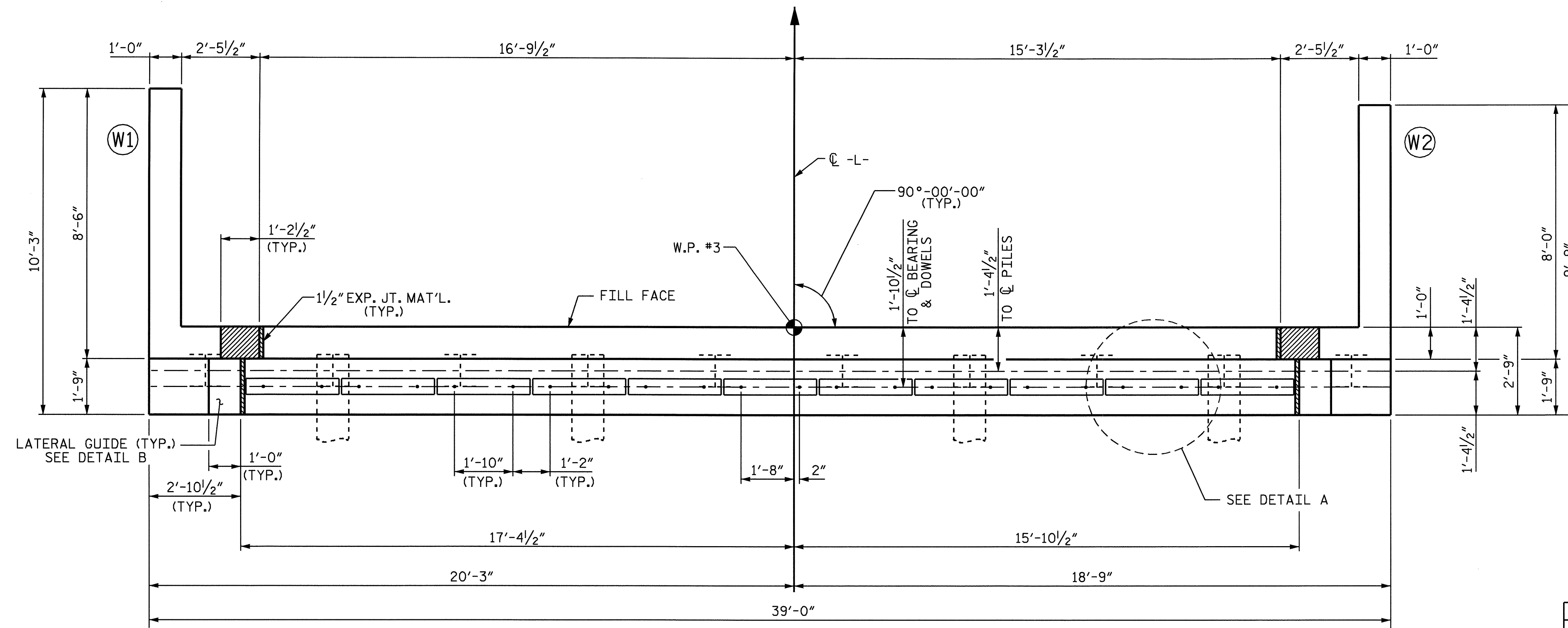


DRAWN BY: D.A. DAVENPORT DATE: 10/08
 CHECKED BY: M.G. SHAIKH DATE: 10/08

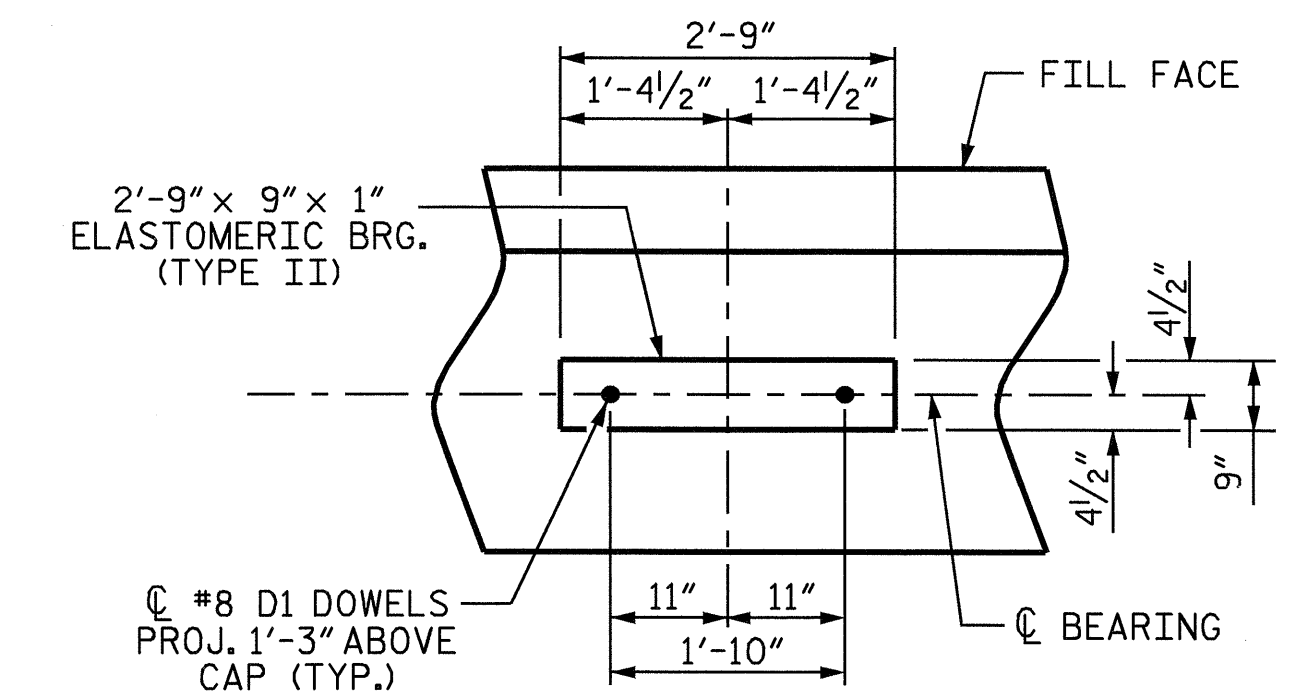
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS 24
2			4			

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.
 THE LATERAL GUIDE AT EACH END OF THE CAP IS NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.
 THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE PARAPETS ARE CAST IF SLIP FORMING IS USED.

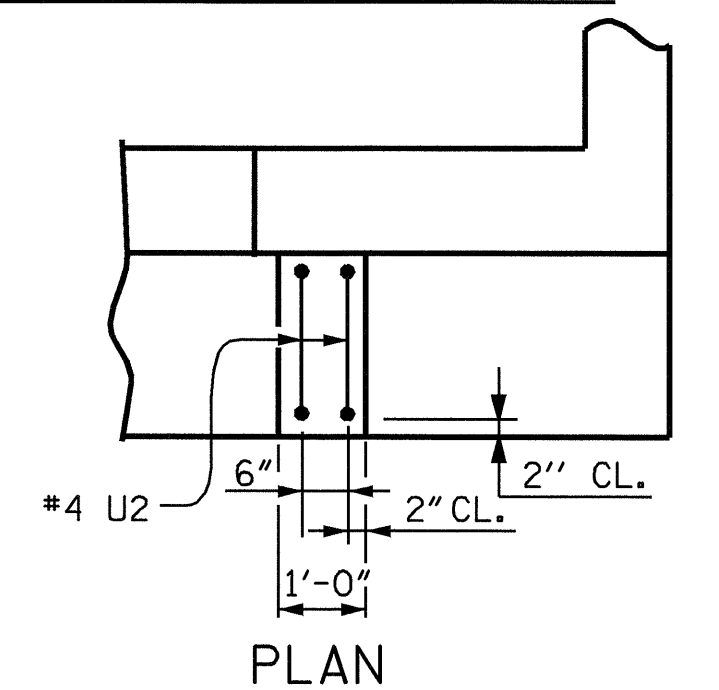


PLAN

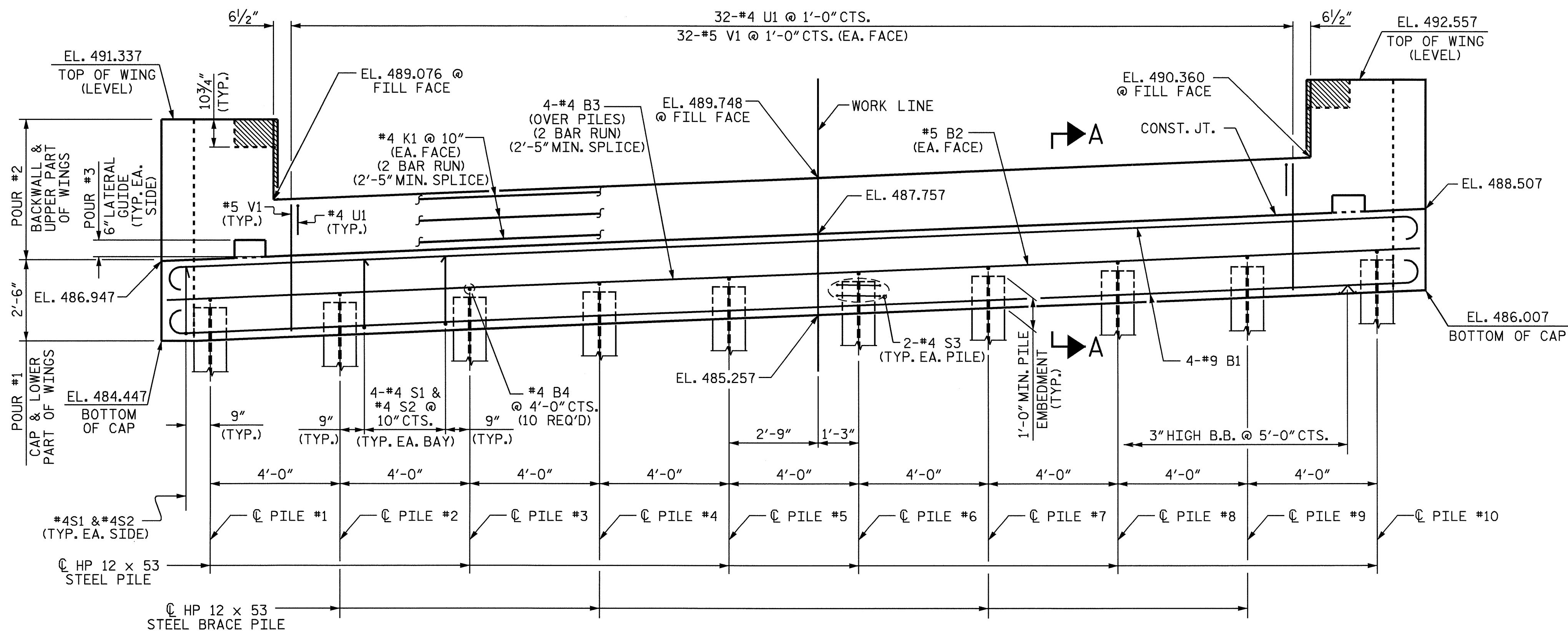


DETAIL A

PILE #	ELEVATION
PILE #1	485.527
PILE #2	485.687
PILE #3	485.847
PILE #4	486.007
PILE #5	486.167
PILE #6	486.327
PILE #7	486.487
PILE #8	486.647
PILE #9	486.807
PILE #10	486.967



DETAIL B



ELEVATION

PROJECT NO. B-4592
ORANGE COUNTY
 STATION: 23+85.00 -L-

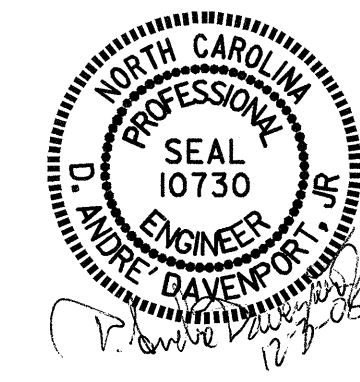
SHEET 1 OF 3

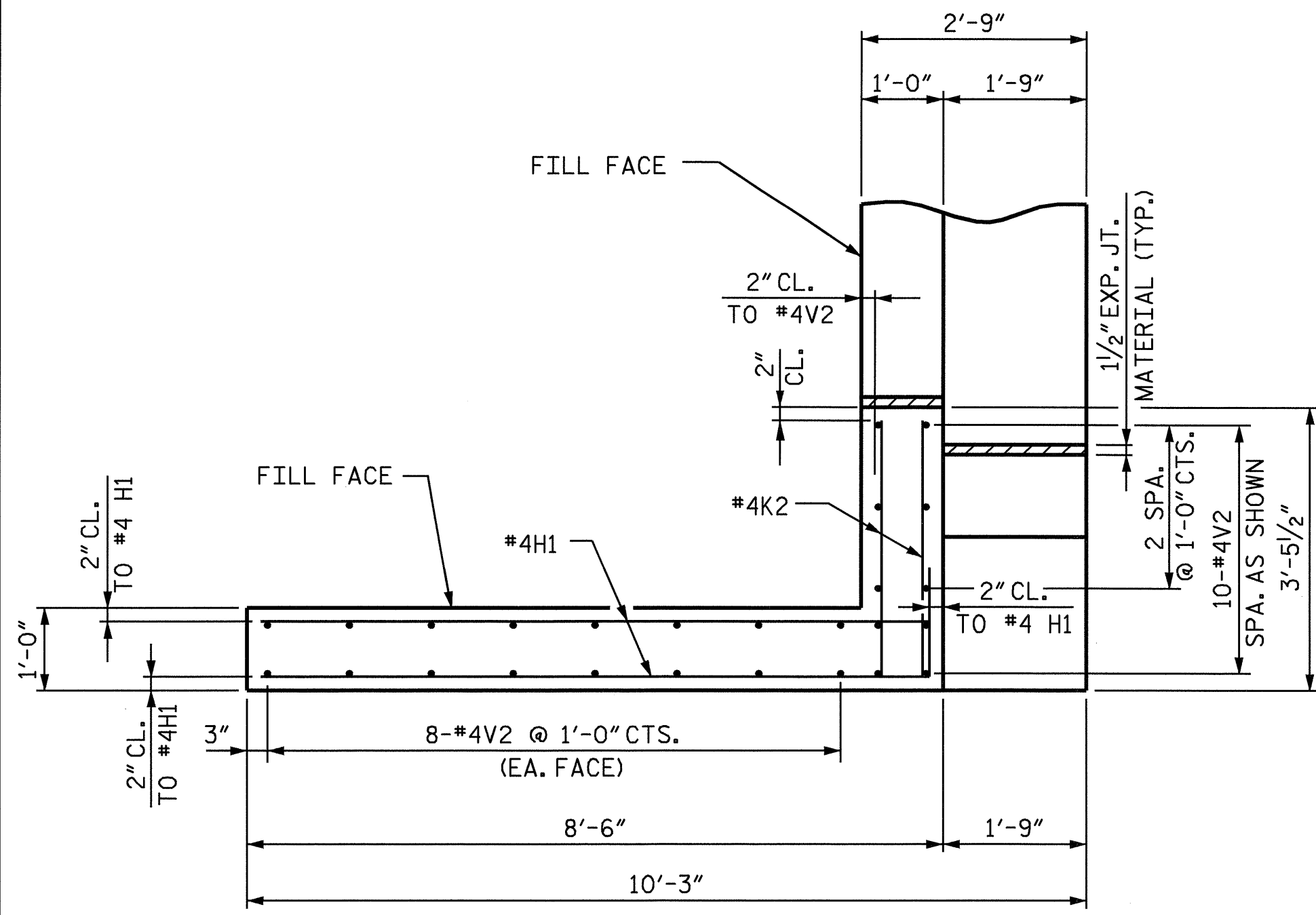
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 END BENT #2**

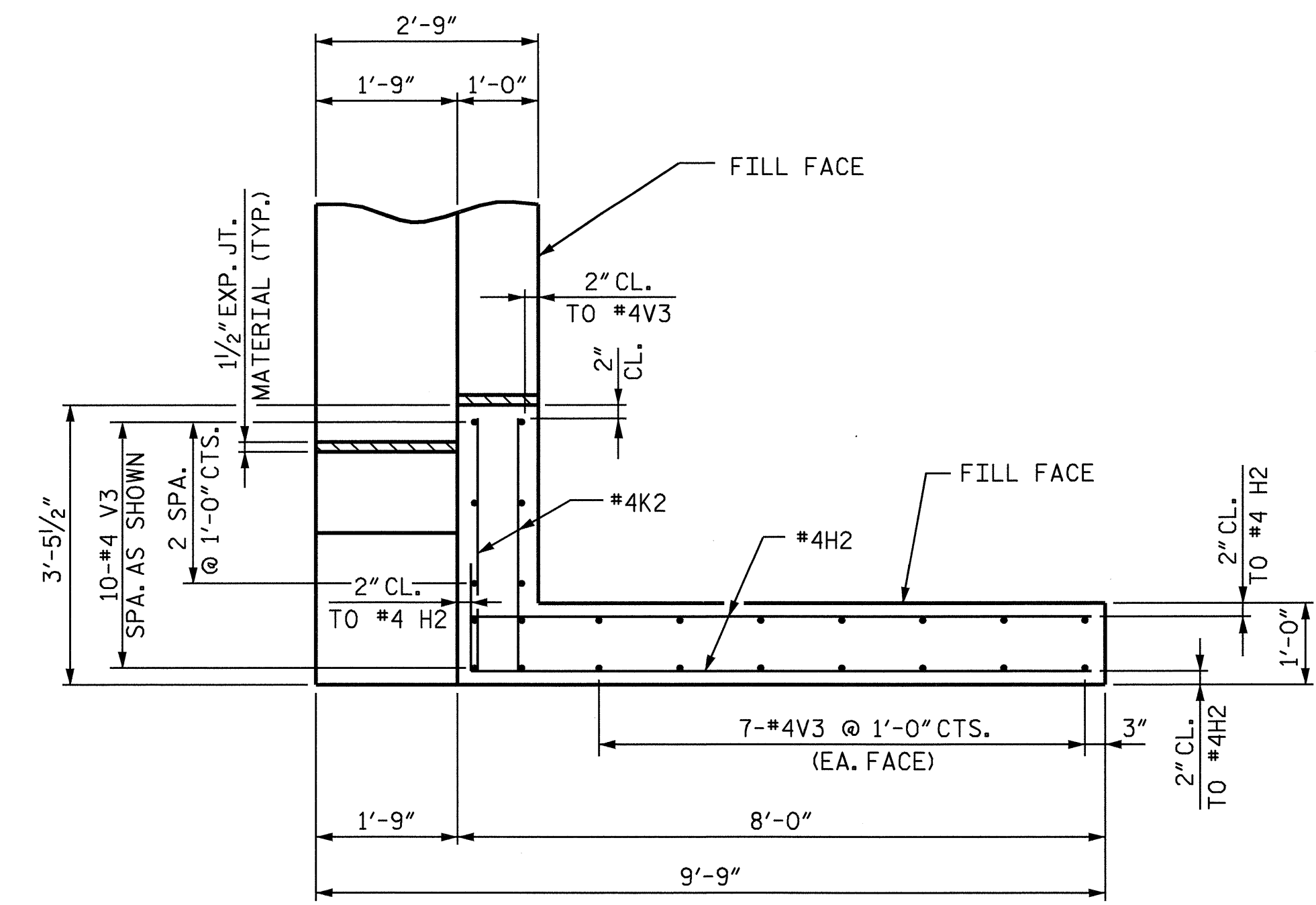
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19	
1			3			TOTAL SHEETS	
2			4			24	

DRAWN BY: M. G. SHAIKH DATE: 6-18-08
 CHECKED BY: H. T. BARBOUR DATE: 8-17-08

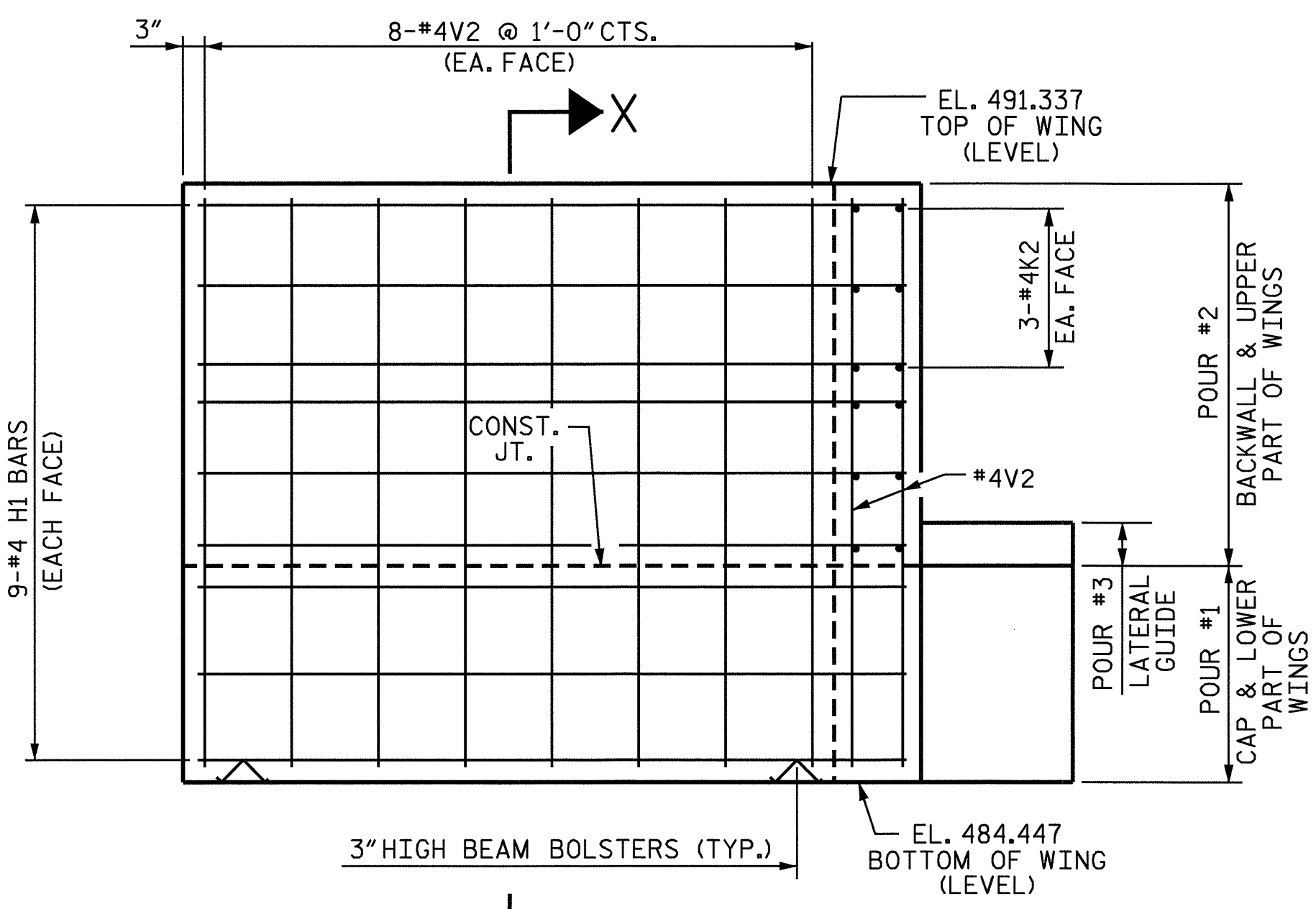




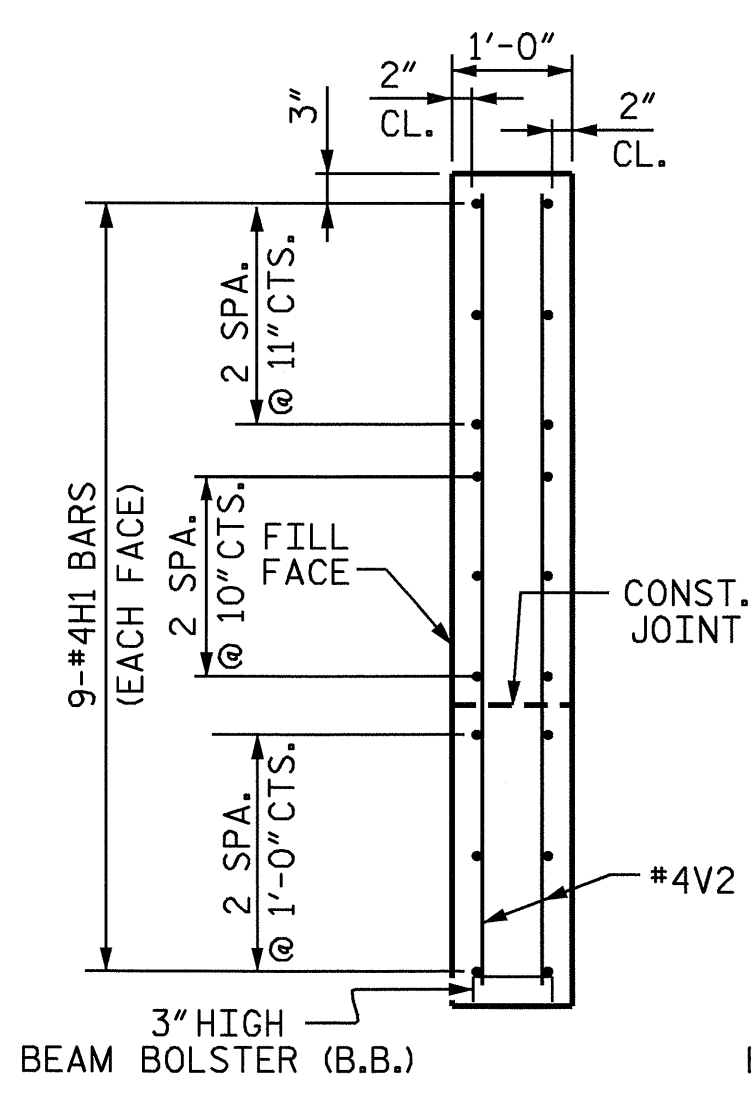
PLAN OF LEFT WING (W1)



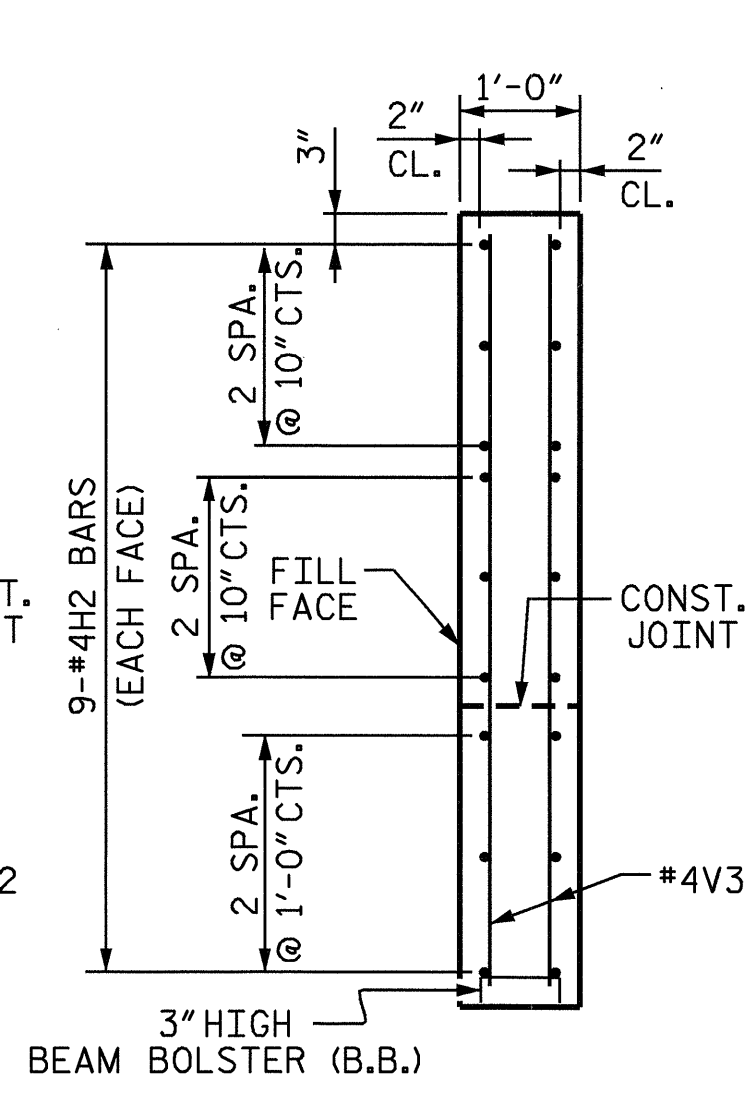
PLAN OF RIGHT WING (W2)



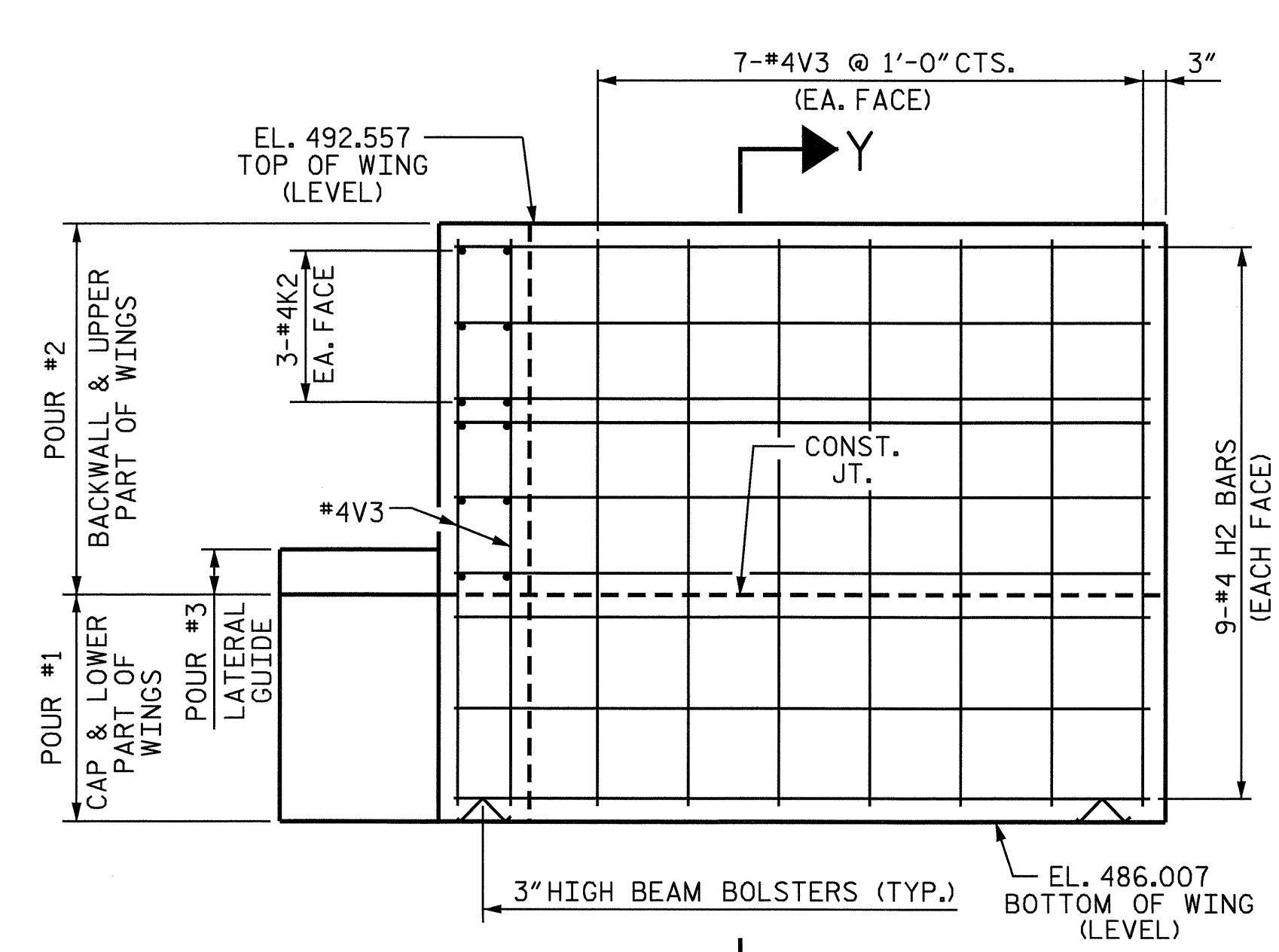
ELEVATION OF LEFT WING (W1)



SECTION X-X



SECTION Y-Y

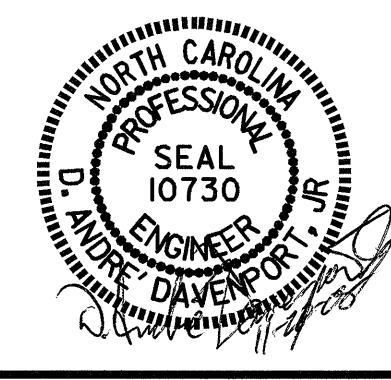


ELEVATION OF RIGHT WING (W2)

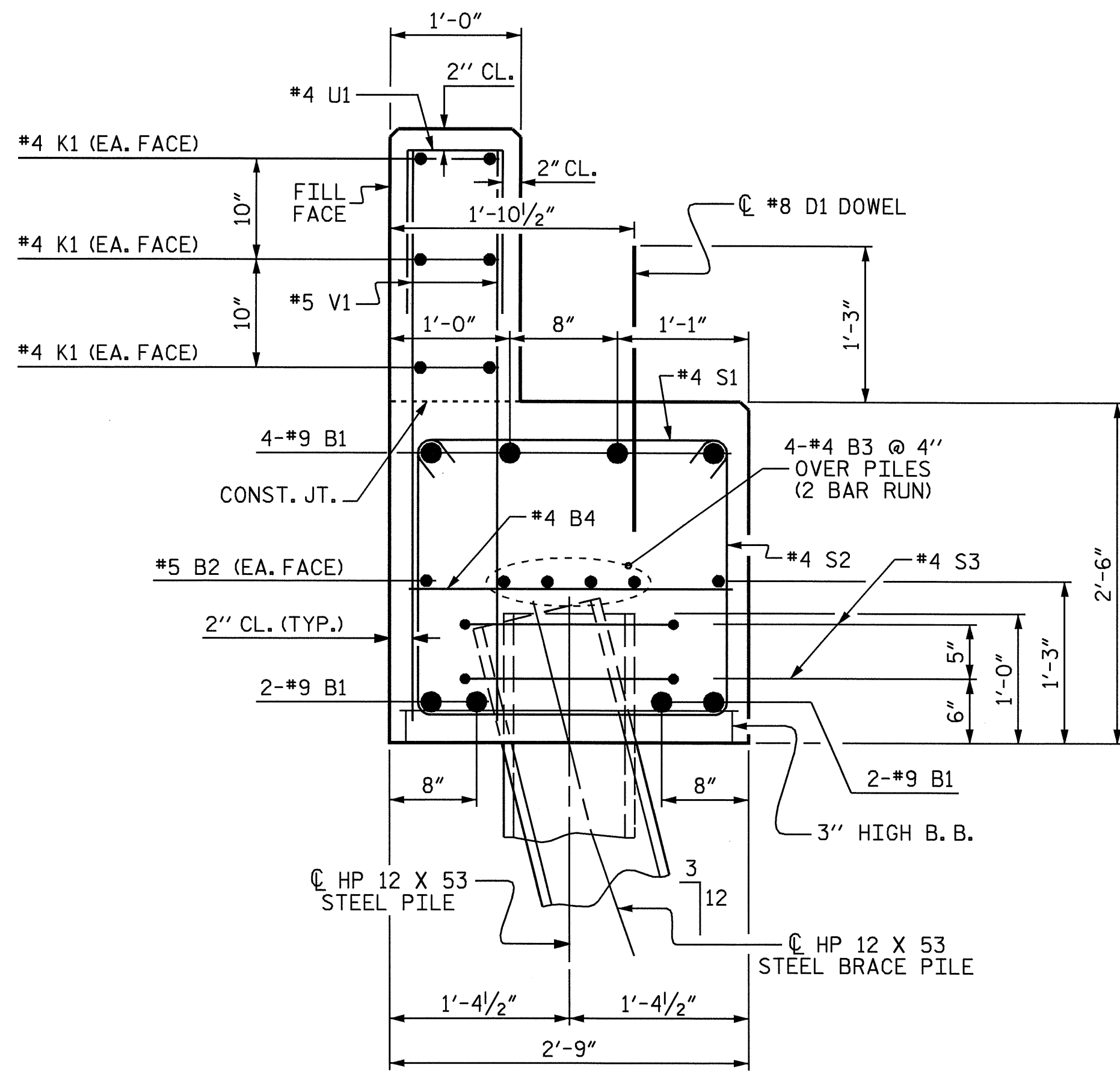
PROJECT NO. B-4592
ORANGE COUNTY
STATION: 23+85.00 -L-

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

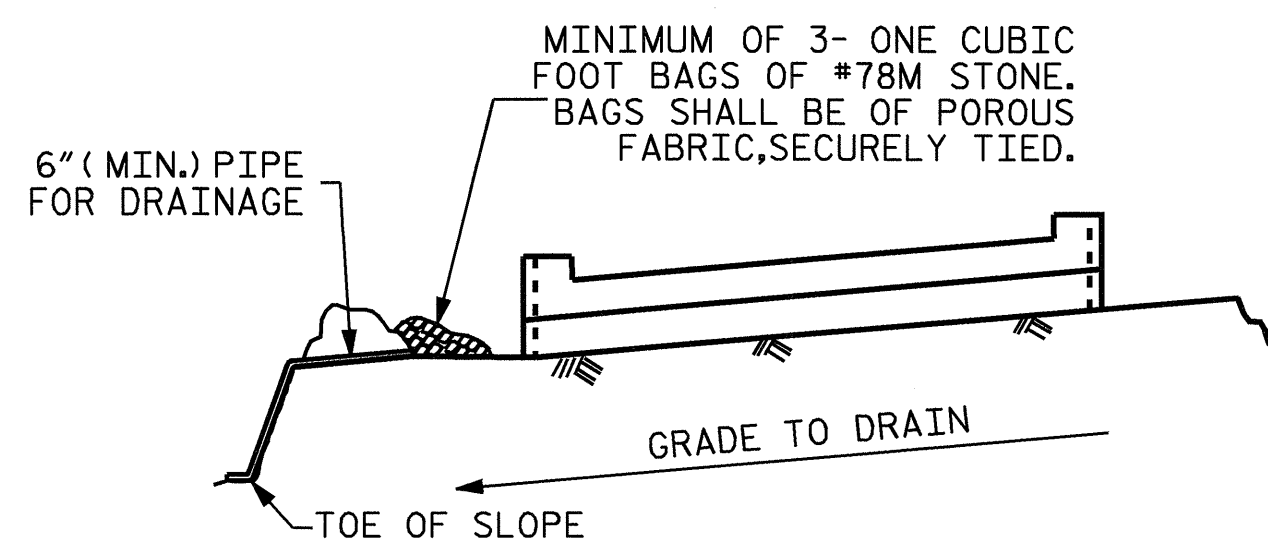
DRAWN BY: M. G. SHAIKH DATE: 06-24-08
CHECKED BY: H. T. BARBOUR DATE: 06-17-08



REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20	
1			3			TOTAL SHEETS	
2			4			24	



SECTION A-A



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

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

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

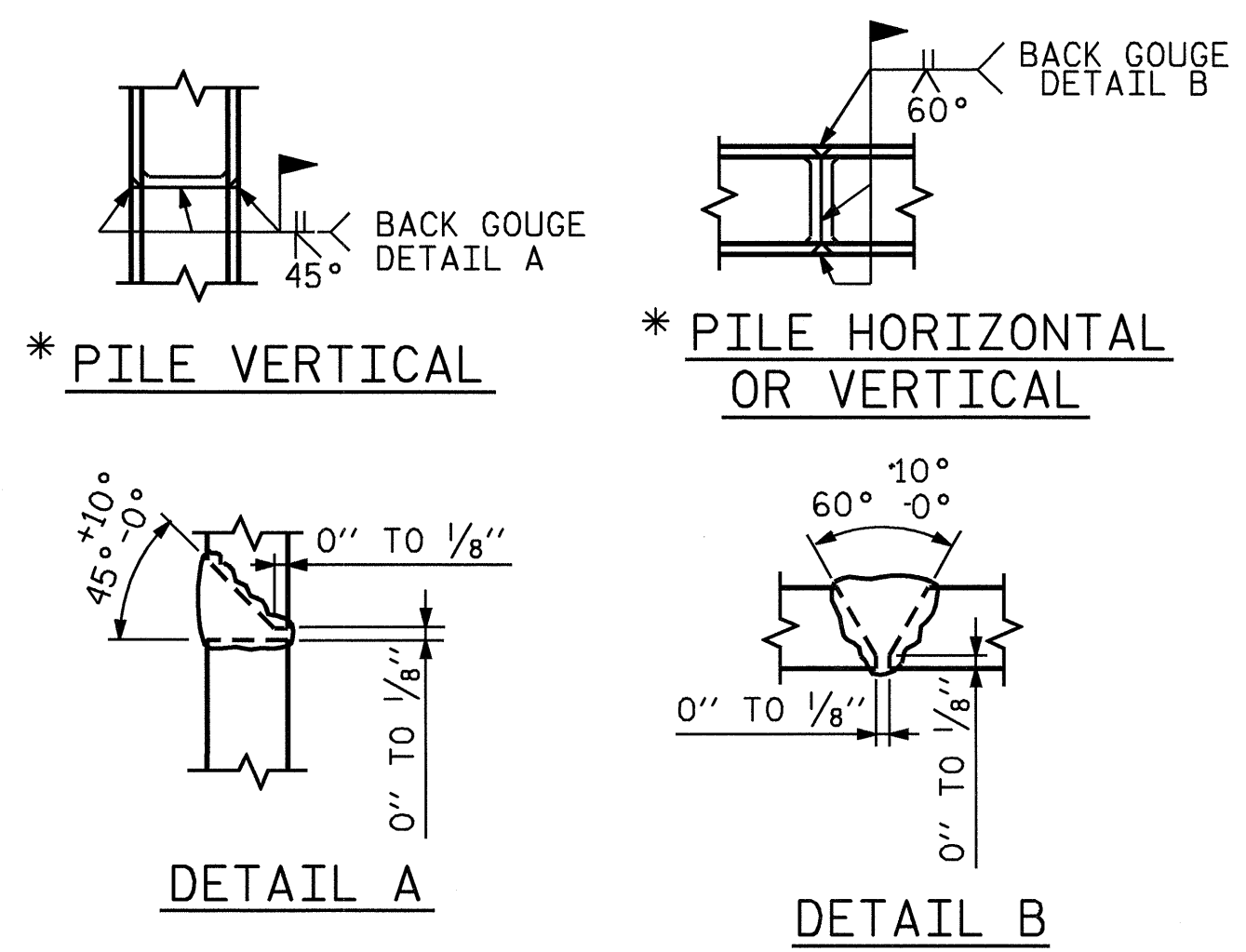
TEMPORARY DRAINAGE AT END BENT

DRAWN BY : M. G. SHAIKH DATE : 06-24-08
 CHECKED BY : H. T. BARBOUR DATE : 08-17-08

20-NOV-2008 14:02
 y:\structures\mshalkh\Microstation\B-4592.sd.E*.dgn
 adavenport

BILL OF MATERIAL FOR END BENT #2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9		41'-0"	1115
B2	2	#5	STR	38'-8"	81
B3	8	#4	STR	20'-7"	110
B4	10	#4	STR	2'-5"	16
D1	22	#8	STR	2'-3"	132
H1	18	#4		8'-10"	106
H2	18	#4		8'-4"	100
K1	12	#4	STR	20'-7"	165
K2	12	#4	STR	3'-1"	25
S1	38	#4		3'-2"	80
S2	38	#4		7'-5"	188
S3	20	#4		6'-6"	87
U1	32	#4		3'-8"	78
U2	4	#4		4'-5"	12
V1	64	#5	STR	4'-2"	278
V2	26	#4	STR	6'-6"	113
V3	24	#4	STR	6'-2"	99
REINFORCING STEEL					= 2785 LBS
CLASS A CONCRETE BREAKDOWN					
POUR #1 CAP & LOWER PART OF WINGS					
C.Y.					11.3
POUR #2 UPPER PART OF WINGS & BACKWALL					
C.Y.					5.8
POUR #3 LATERAL GUIDES					
C.Y.					0.1
TOTAL CLASS A CONCRETE					17.2
HP 12 X 53 STEEL PILES					
NO. 10					LIN. FT. 200

ALL BAR DIMENSIONS ARE OUT TO OUT.



PILE SPLICE DETAILS

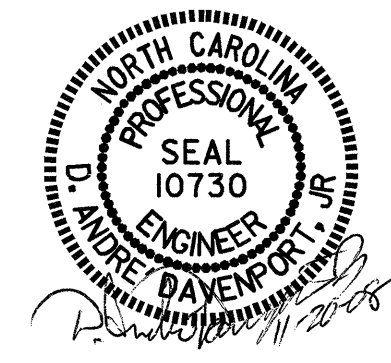
* POSITION OF PILE DURING WELDING.

PROJECT NO. B-4592
ORANGE COUNTY
 STATION: 23+85.00 -L-

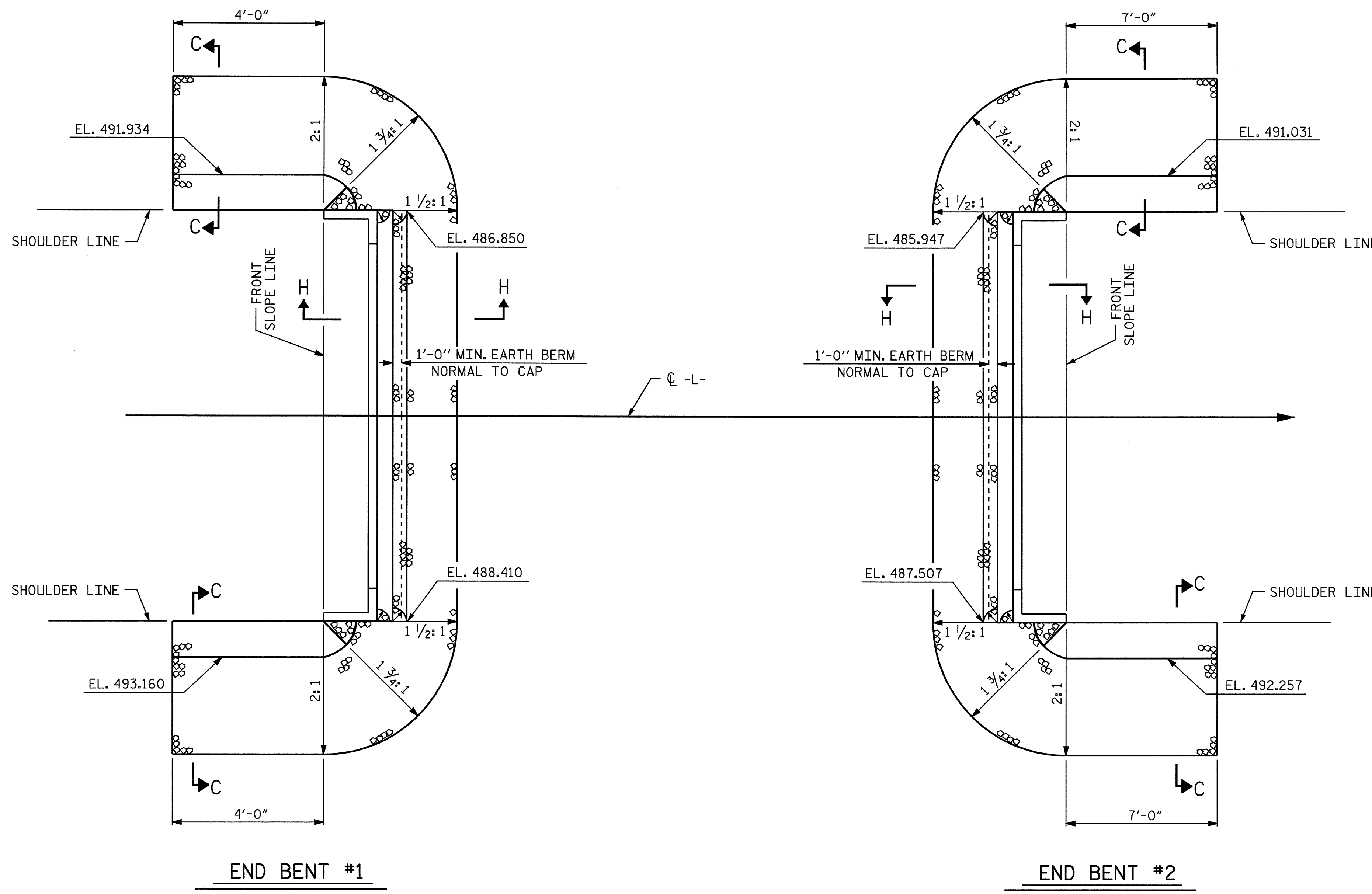
SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT #2

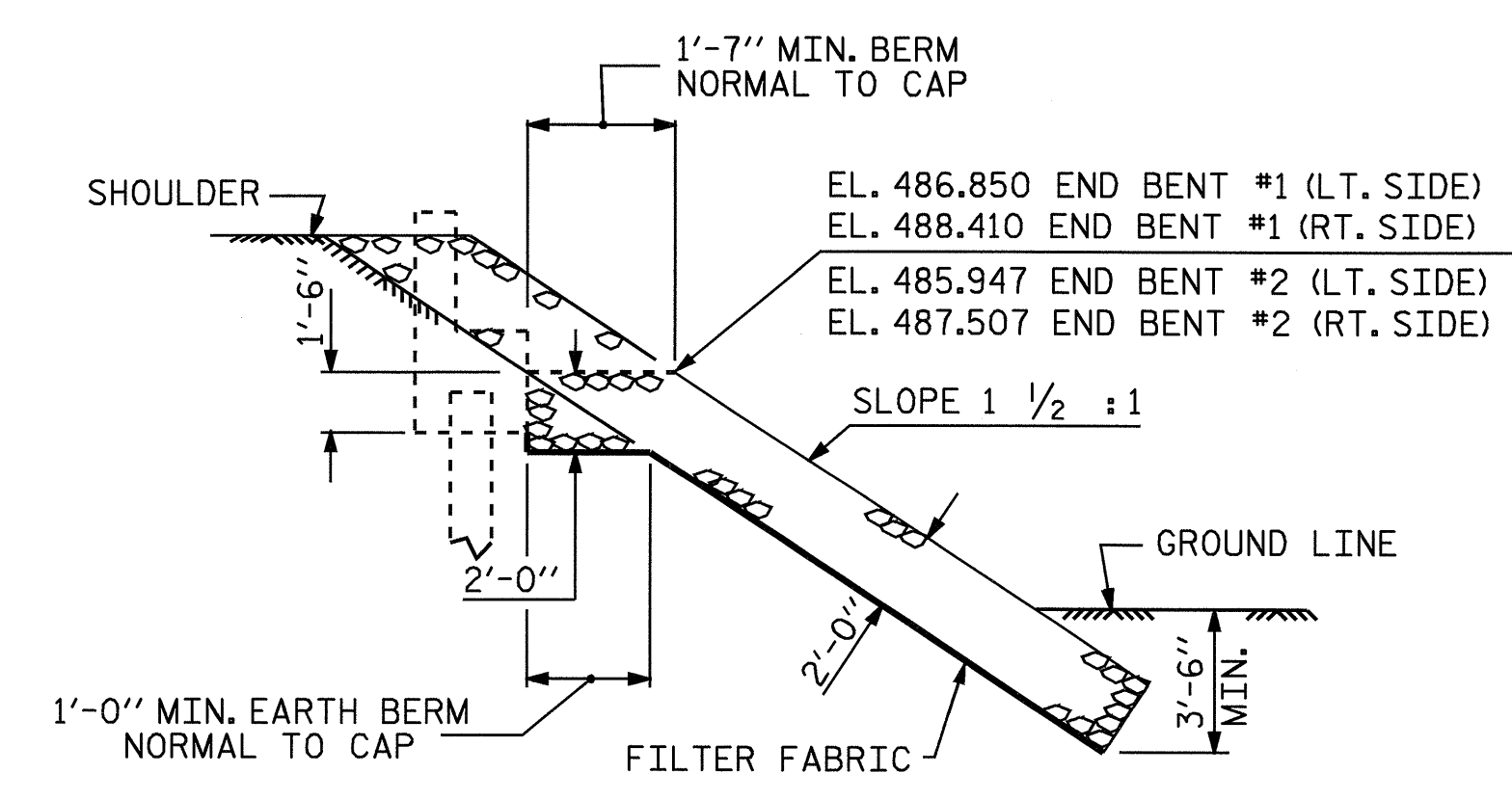


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS 24
2			4			

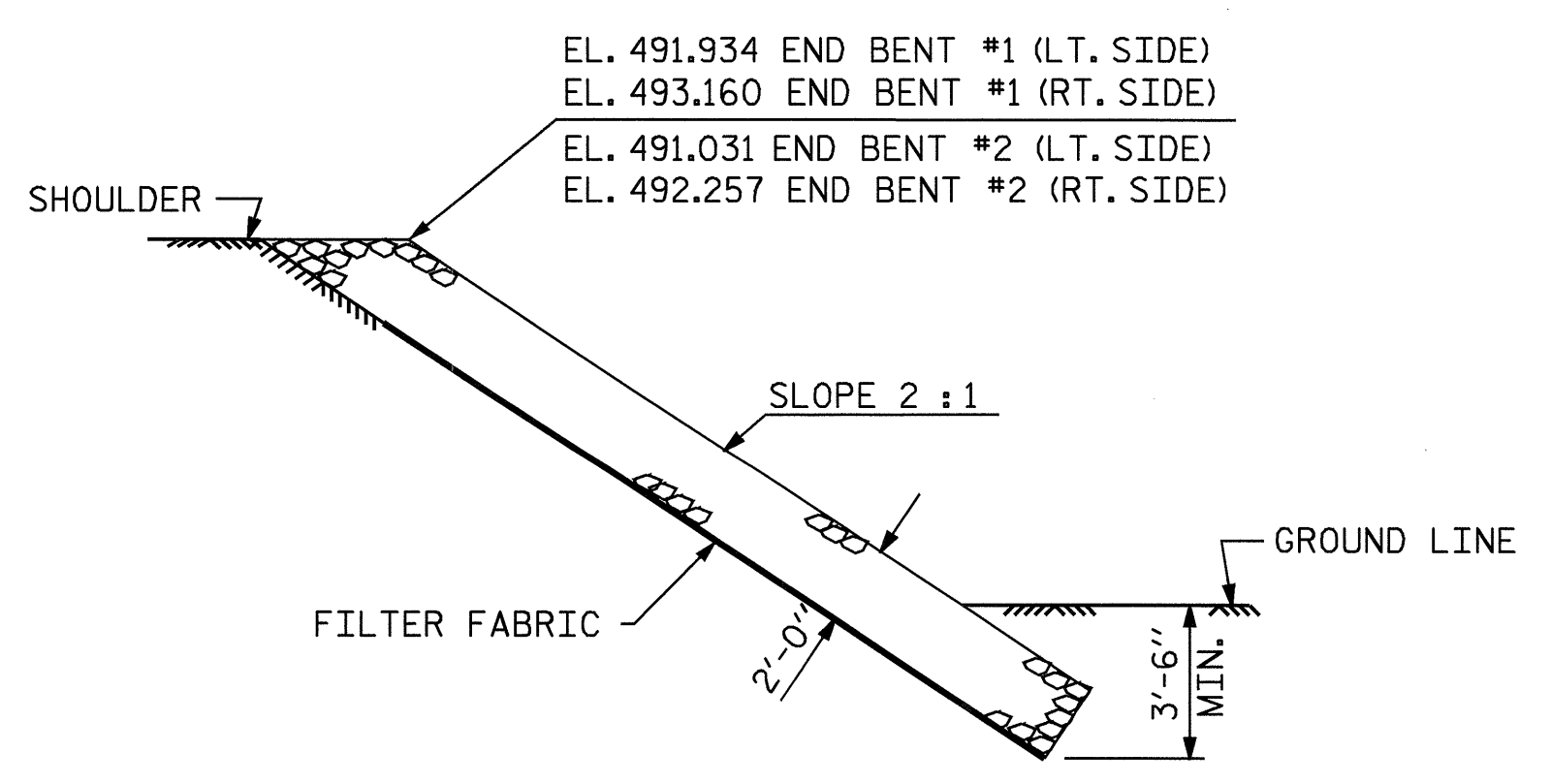


PLAN

ESTIMATED QUANTITIES		
BRIDGE @ STA. 23+85.00 -L-	RIP RAP CLASS II	FILTER FABRIC FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	185	205
END BENT 2	190	210
TOTAL	375	415



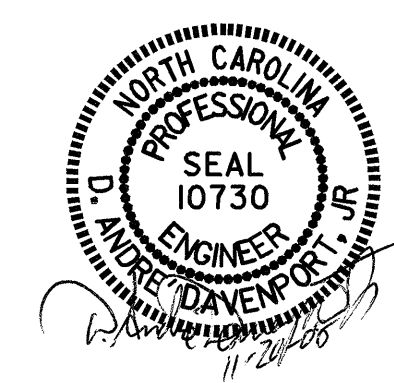
SECTION H-H



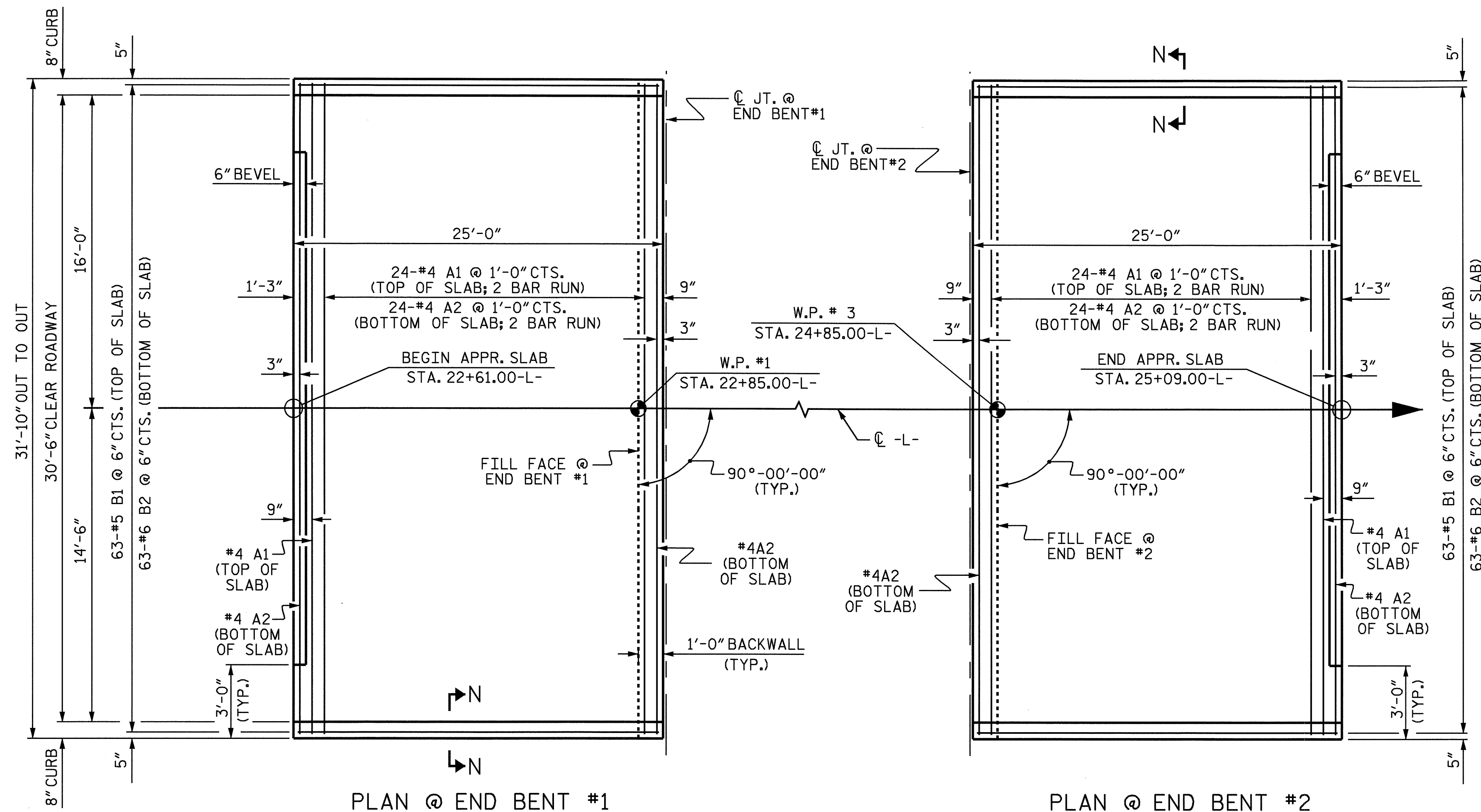
SECTION C-C

PROJECT NO. B-4592
ORANGE COUNTY
 STATION: 23+85.00 -L-

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



ASSEMBLED BY : M. G. SHAIKH DATE : 9-16-08
 CHECKED BY : D. A. DAVENPORT DATE : 10-06-08
 DRAWN BY : FCJ 2/88 REV. 7/17/98 REK/RWW
 CHECKED BY : ARB 8/88 REV. 8/16/99 RWW/LES
 REV. 10/17/00 RWW/LES



PLAN @ END BENT #1

PLAN @ END BENT #2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

NOTES

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 2 1/2".

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.

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

FOR BRIDGE APPROACH FILL INCLUDING FABRIC, 4" Ø DRAINAGE PIPE AND #78M STONE BACKFILL, SEE ROADWAY PLANS.

FABRIC SHALL BE TYPE 1 ENGINEERING FABRIC IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

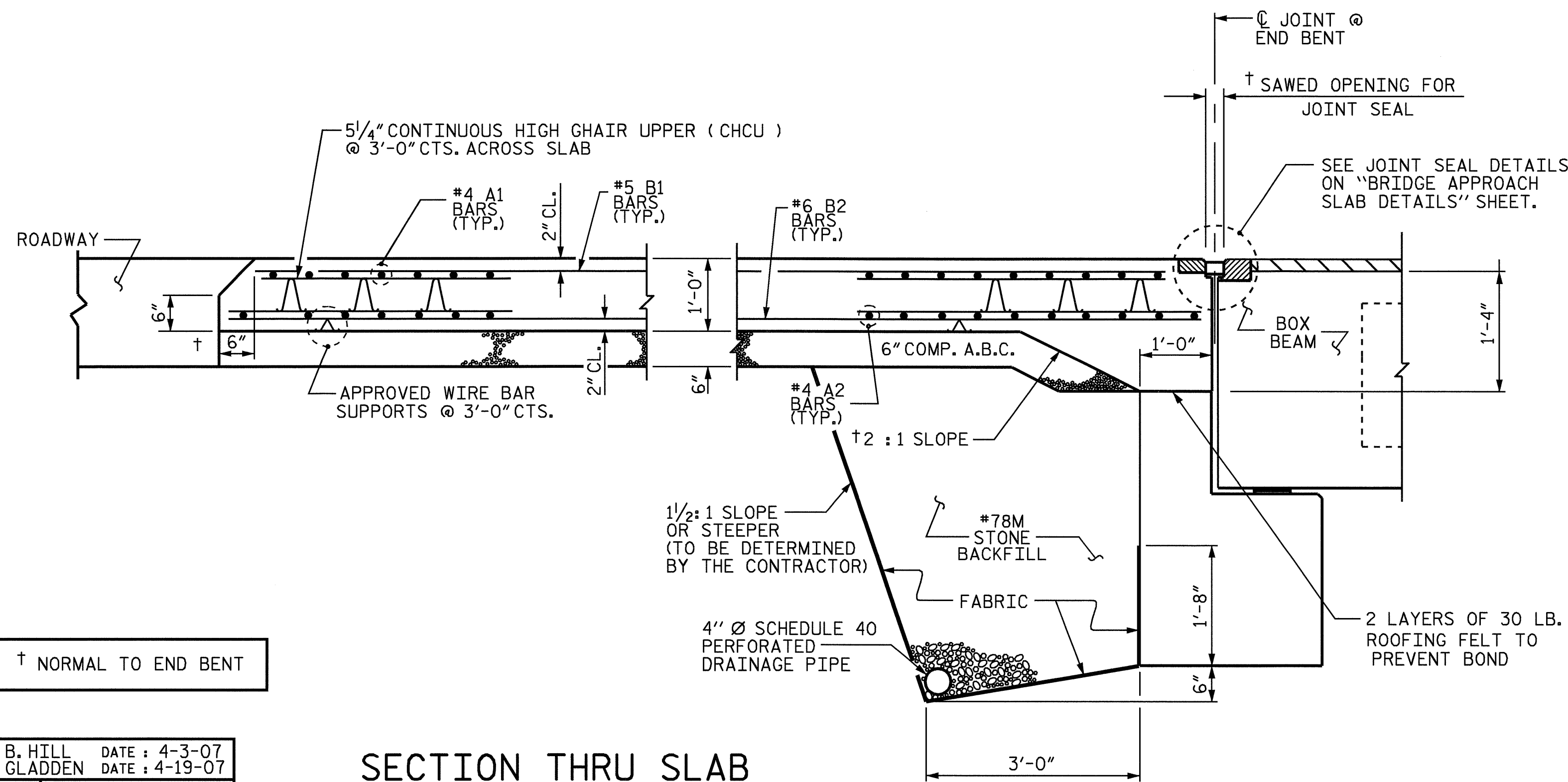
#78M STONE BACKFILL (CLASS V SELECT MATERIAL) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

#78M STONE BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

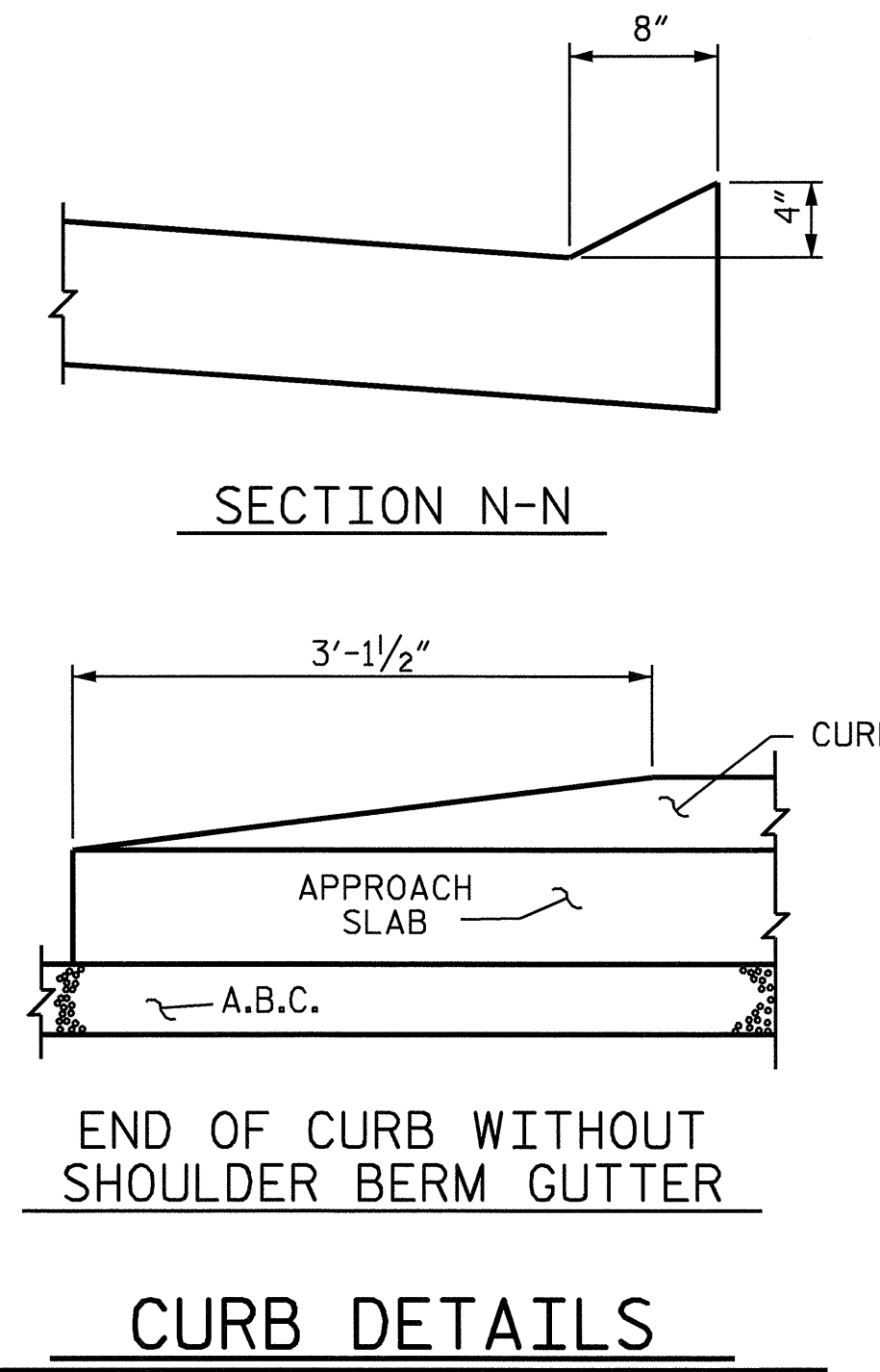
FOR THE 4" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

BILL OF MATERIAL

APPROACH SLAB AT EB #1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	50	#4	STR	16'-9"	559
A2	52	#4	STR	16'-8"	579
*B1	63	#5	STR	23'-9"	1561
B2	63	#6	STR	24'-8"	2334
REINFORCING STEEL				LBS.	2913
*EPOXY COATED REINFORCING STEEL				LBS.	2120
CLASS AA CONCRETE				C.Y.	30.9
APPROACH SLAB AT EB #2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	50	#4	STR	16'-9"	559
A2	52	#4	STR	16'-8"	579
*B1	63	#5	STR	23'-9"	1561
B2	63	#6	STR	24'-8"	2334
REINFORCING STEEL				LBS.	2913
*EPOXY COATED REINFORCING STEEL				LBS.	2120
CLASS AA CONCRETE				C.Y.	30.9



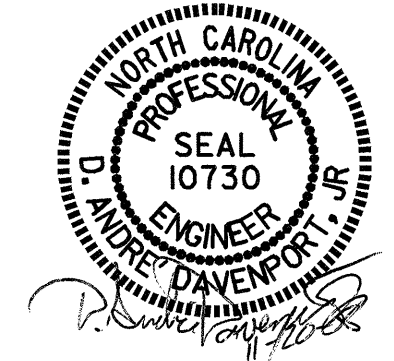
SECTION THRU SLAB



CURB DETAILS

PROJECT NO. B-4592
 ORANGE COUNTY
 STATION: 23+85.00-L-

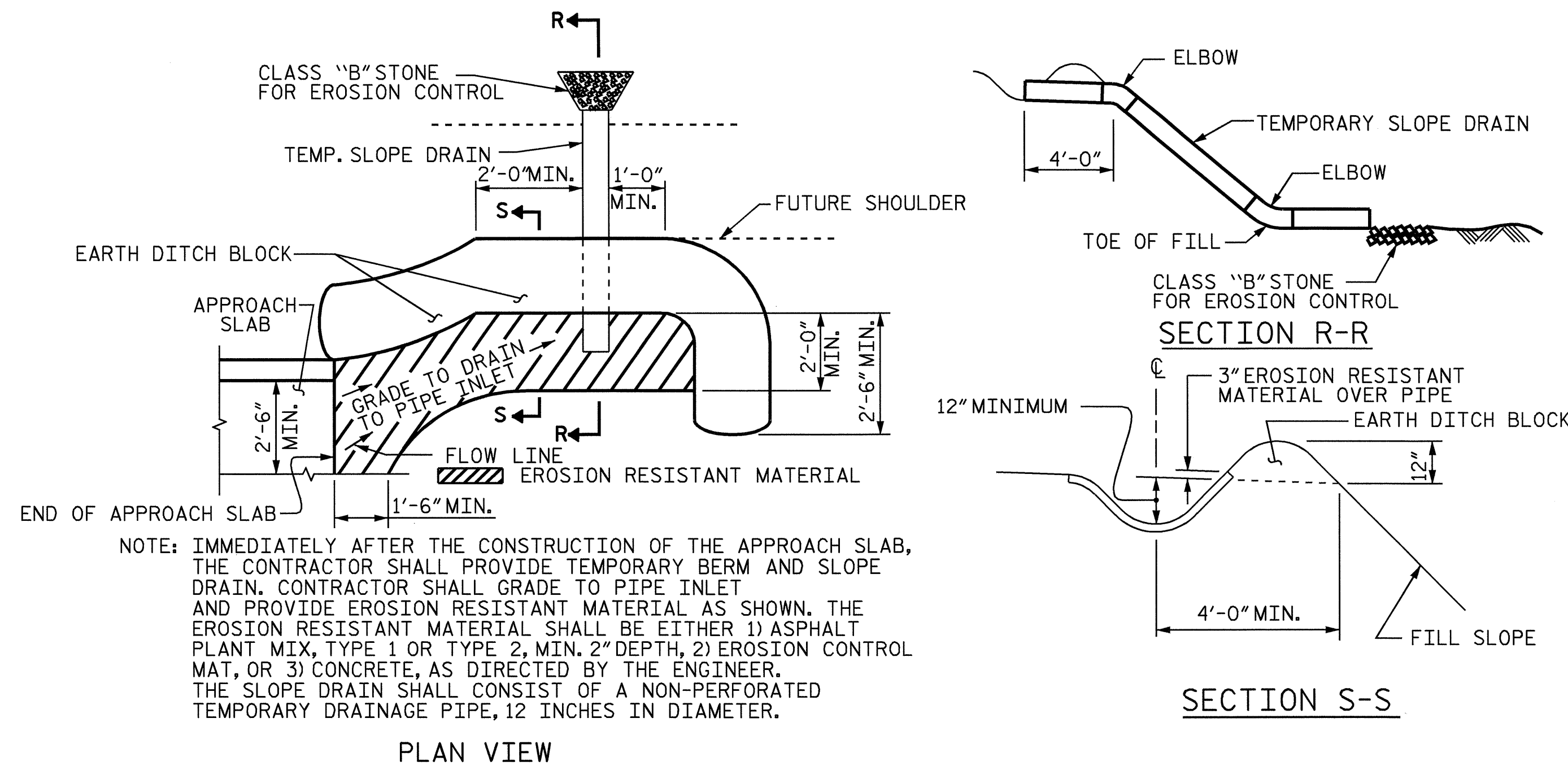
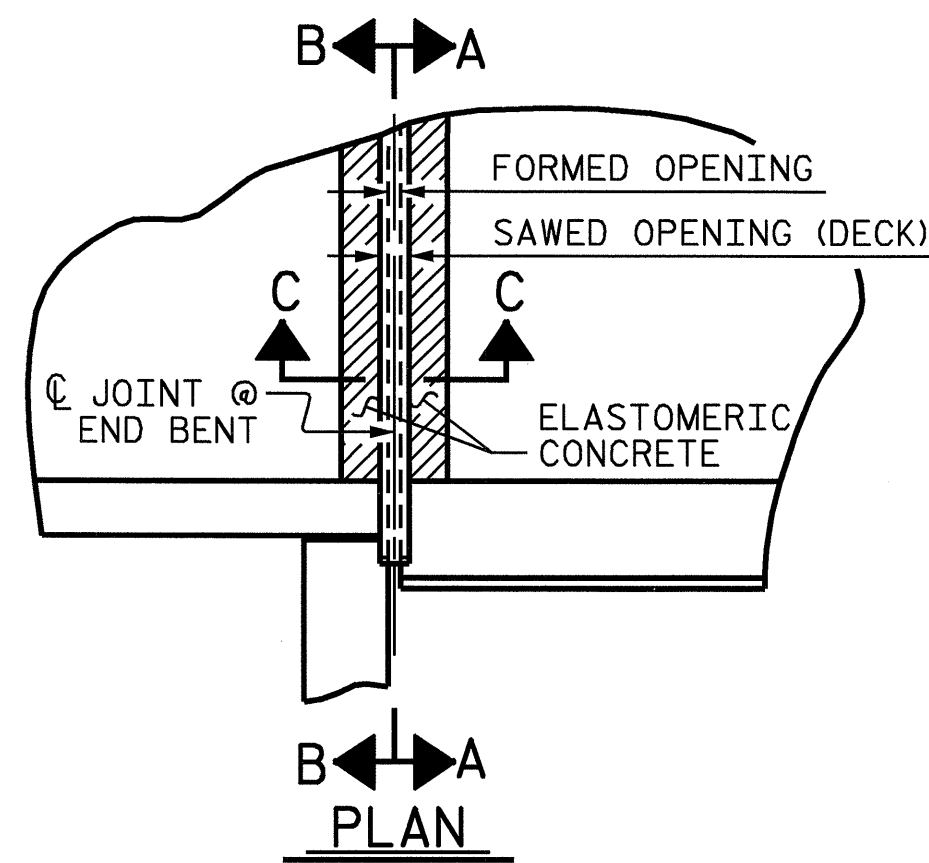
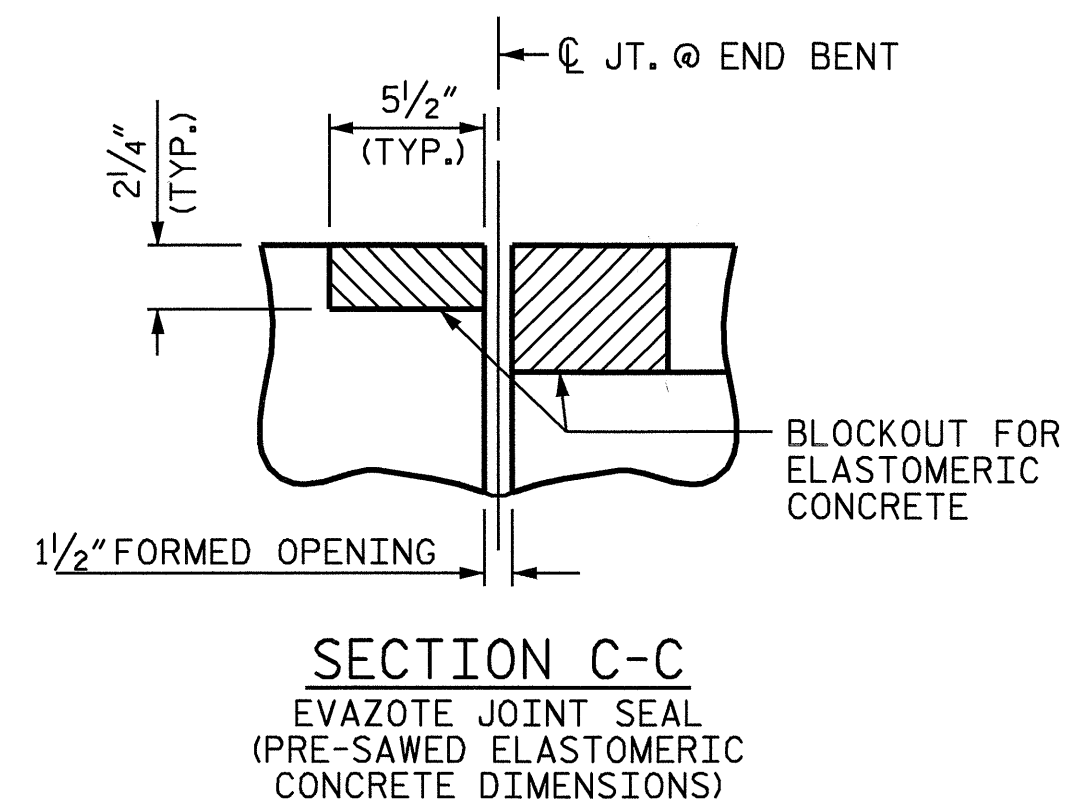
SHEET 1 OF 2
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 BRIDGE APPROACH
 SLAB FOR PRESTRESSED
 CONCRETE BOX BEAM



ASSEMBLED BY: W. B. HILL	DATE: 4-3-07
CHECKED BY: D.A. GLADDEN	DATE: 4-19-07
DRAWN BY: FCJ 6/87	REV. 1/10/01 LES/RDR
CHECKED BY: EGA 6/87	REV. 5/7/03R RWW/JTE
	REV. 5/1/06 TLA/GM

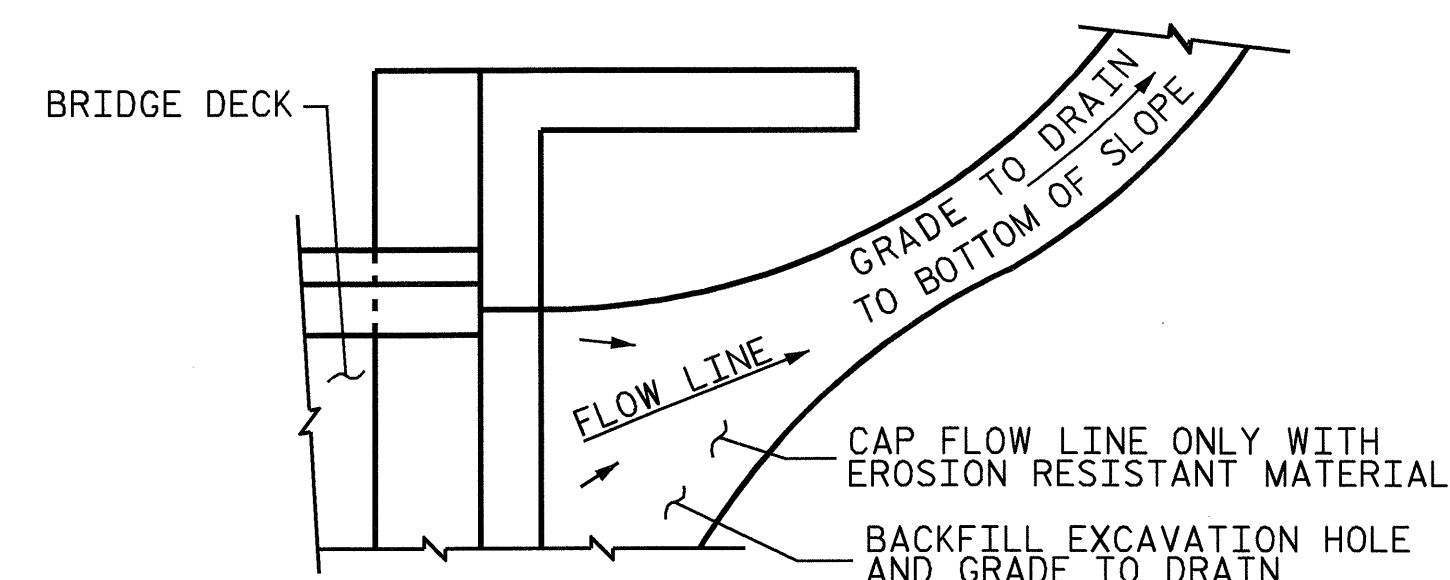
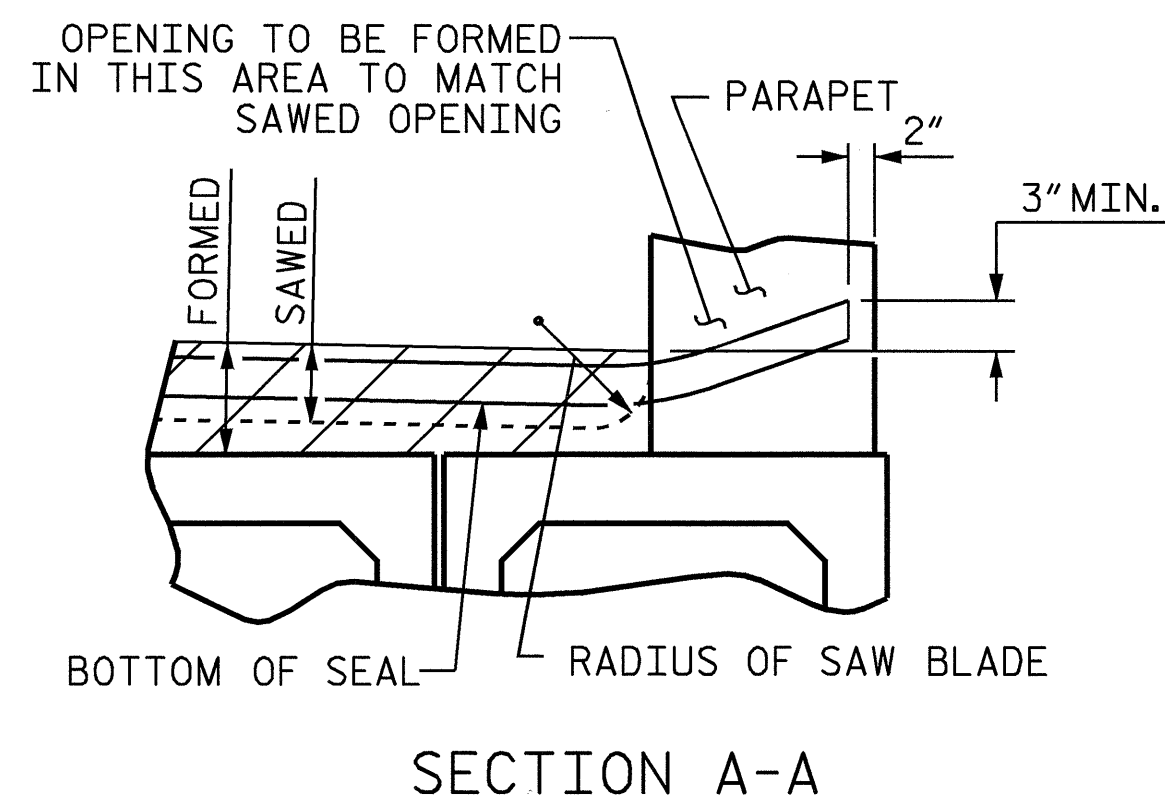
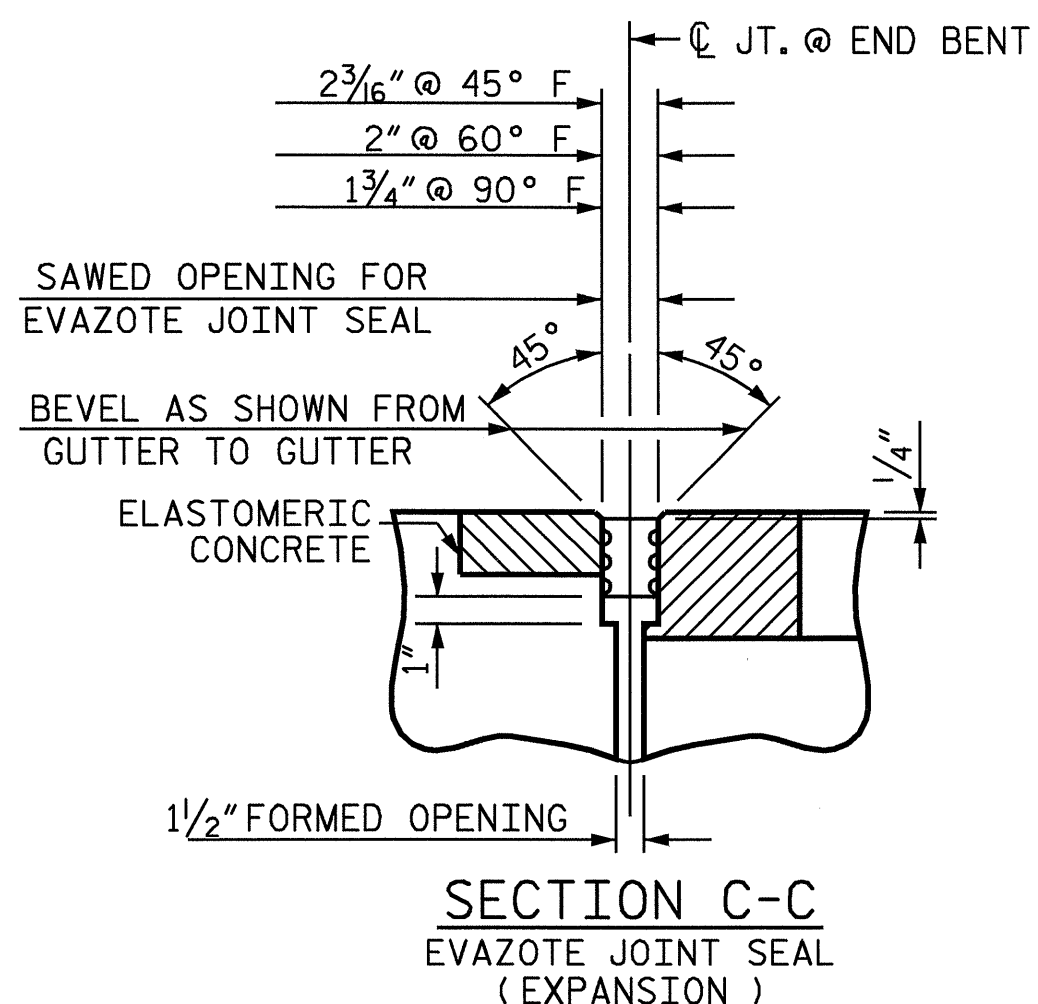
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S-23
 TOTAL SHEETS 24



TEMPORARY BERM AND SLOPE DRAIN DETAILS

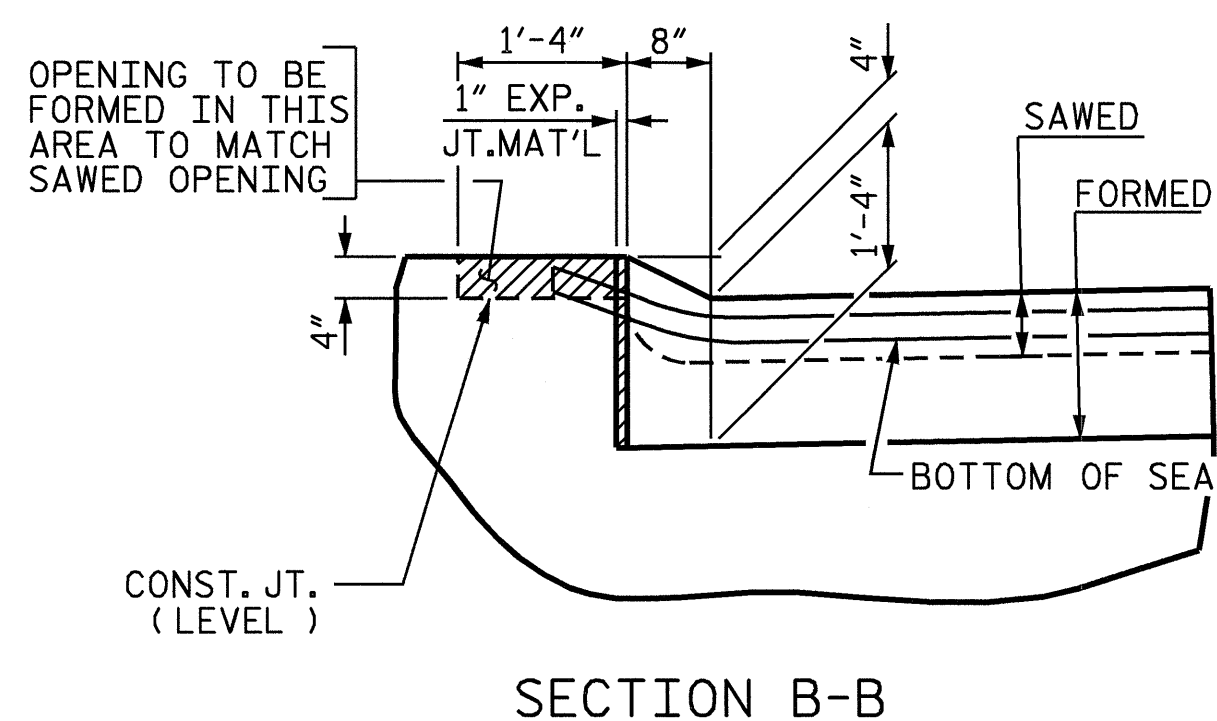
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



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.

ELASTOMERIC CONCRETE	
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
1	5.2
2	5.2
TOTAL	10.4

* BASED ON THE MINIMUM BLOCKOUT SHOWN.



JOINT SEAL DETAILS @ END BENT

PROJECT NO. B-4592

ORANGE COUNTY

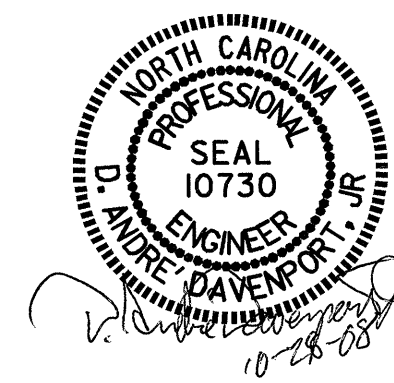
STATION: 23+85.00-L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB DETAILS

ASSEMBLED BY : W. B. HILL DATE : 4-3-07
CHECKED BY : D. A. GLADDEN DATE : 4-19-07
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



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

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2002 STANDARD SPECIFICATIONS "FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED WITH THE EXCEPTION OF #2 BARS WHICH MAY BE FABRICATED FROM COLD DRAWN STEEL WIRE. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

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

STRUCTURAL STEEL:

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

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

PLACEMENT OF BEAM OR GIRDER MEMBERS ON TRUCKS FOR HAULING SHALL BE DONE IN COMPLIANCE WITH LIMITS SHOWN ON SKETCHES PROVIDED TO THE MATERIALS AND TEST UNIT APPROVED BY THE STRUCTURE DESIGN UNIT DATED MAY 8, 1991. THESE SKETCHES PRIMARILY LIMIT THE UNSUPPORTED CANTILEVER LENGTH OF MEMBERS. WHEN THE CONTRACTOR WISHES TO PLACE MEMBERS ON TRUCKS NOT IN ACCORDANCE WITH THESE LIMITS, TO SHIP BY RAIL, TO ATTACH SHIPPING RESTRAINTS TO THE MEMBERS OR TO INVERT MEMBERS, HE SHALL SUBMIT A SKETCH FOR APPROVAL PRIOR TO SHIPPING. SEE ALSO ARTICLE 1072-11.

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

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINIS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

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

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