

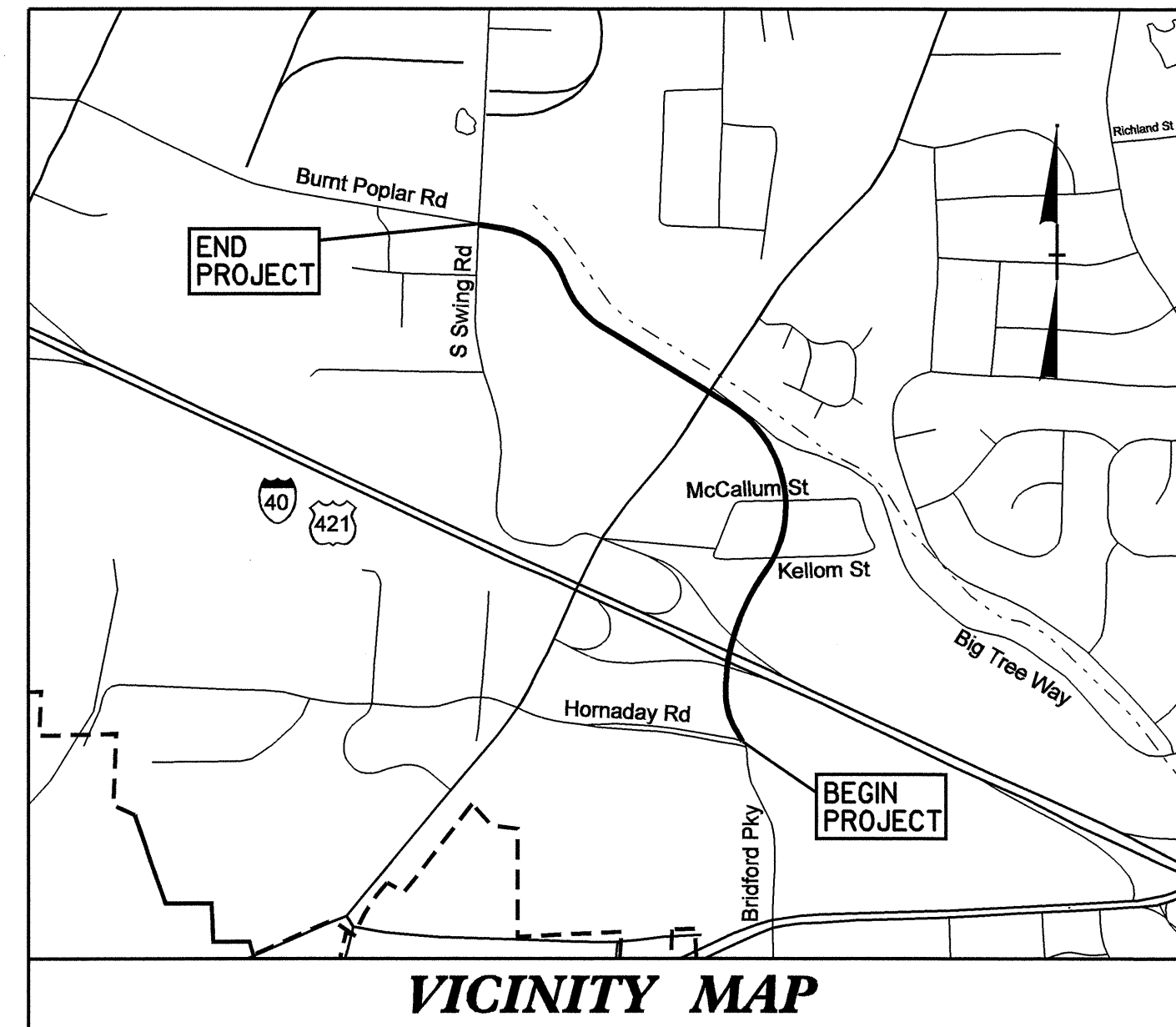
09/08/99

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-4006		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
35007.1.1	STP-4126(1)	P.E.	
35007.2.1	STP-4126(1)	R/W UTIL	
35007.3.1	STP-4126(2)	CONST	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GUILFORD COUNTY

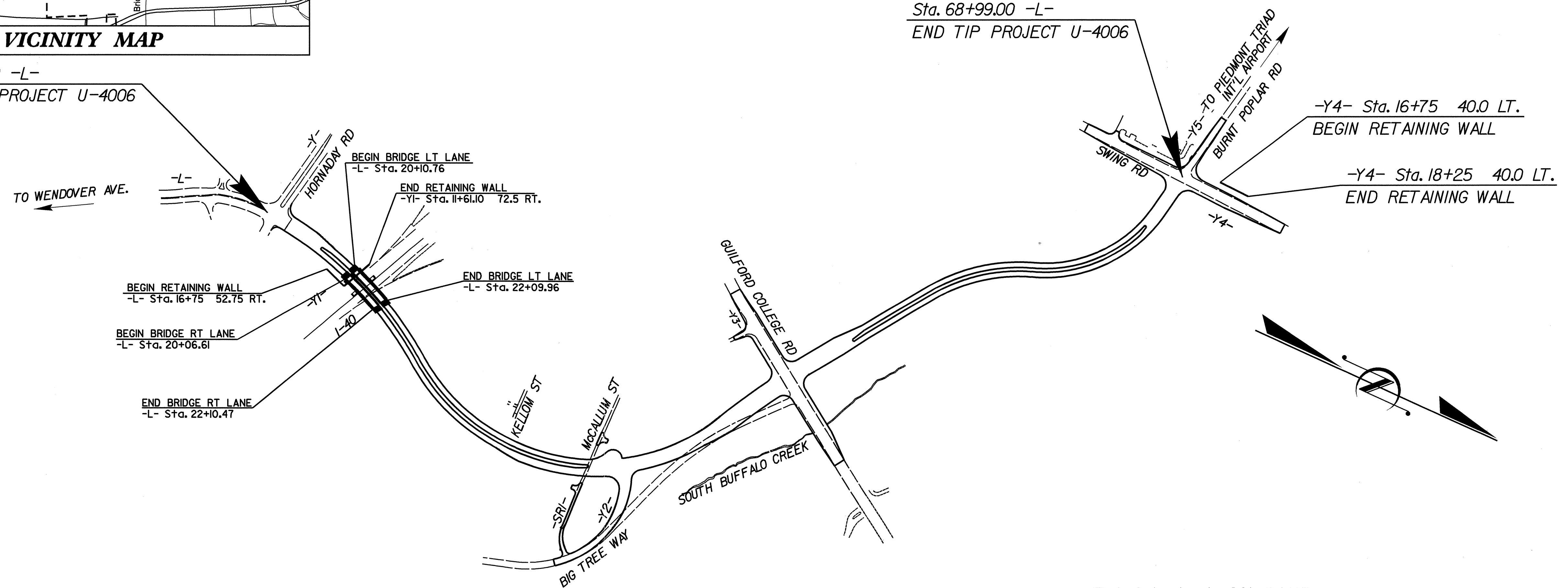
**LOCATION: GREENSBORO SR 4126 (BRIDFORD PARKWAY, NEW ROUTE)
FROM SR 1541 (WENDOVER AVE.) AT HORNADAY RD. TO
SR 1607 (BURNT POPLAR ROAD) AT SWING ROAD
TYPE OF WORK: GRADING, PAVING, DRAINAGE, STRUCTURES,
AND SIGNALS**



Sta. 15+00.00 -L-
BEGIN TIP PROJECT U-4006

Sta. 68+99.00 -L-
END TIP PROJECT U-4006

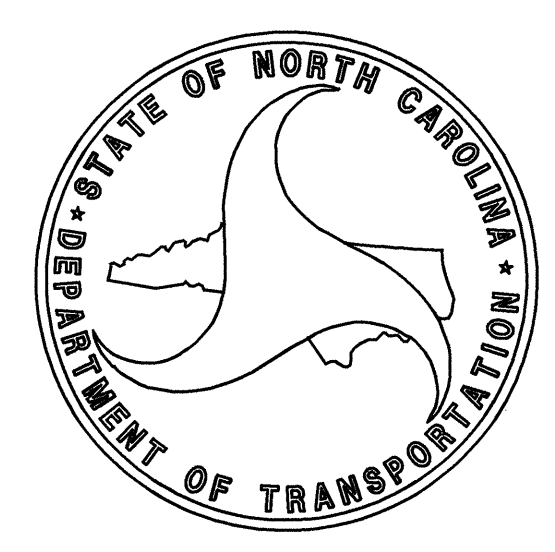
STRUCTURES



THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON THE PLANS.

ARCADIS G&M
Date: \$DATE\$
Time: \$TIME\$
Filename: \$FILE\$

TIP PROJECT: U-4006
CONTRACT: C202163



DESIGN DATA

ADT 2009 =	23,577
ADT 2030 =	32,300
DHV =	11 %
D =	60 %
T =	6 % *
V =	40 MPH
* TTST 1%	DUAL 5%

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT U-4006 =	0.985 miles
LENGTH OF STRUCTURE TIP PROJECT U-4006 =	0.038 miles
TOTAL LENGTH TIP PROJECT U-4006 =	1.023 miles

PREPARED IN THE OFFICE OF:
DIVISION OF HIGHWAYS

2006 STANDARD SPECIFICATIONS

LETTING DATE:
AUGUST 18, 2009

Q.H. NGUYEN, PE
PROJECT ENGINEER

J.R. DUGGINS, JR, PE
PROJECT DESIGN ENGINEER

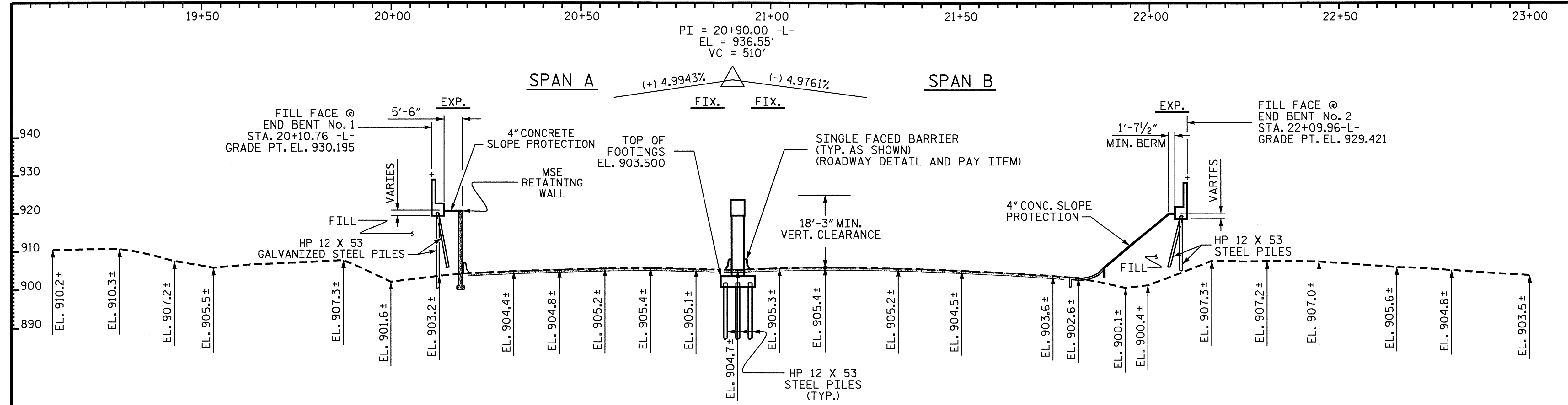
STRUCTURE DESIGN UNIT
1000 BIRCH RIDGE DRIVE
RALEIGH, N.C. 27610

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

STATE HIGHWAY DESIGN ENGINEER



HORIZ. CURVE DATA -L-

PI STA. 20+20.35 -L-
 $\Delta = 34^\circ-25'-31.6''$ (RT)
 $D = 3^\circ-10'-59.2''$
 $L = 1081.51'$
 $T = 557.63'$
 $R = 1800'$

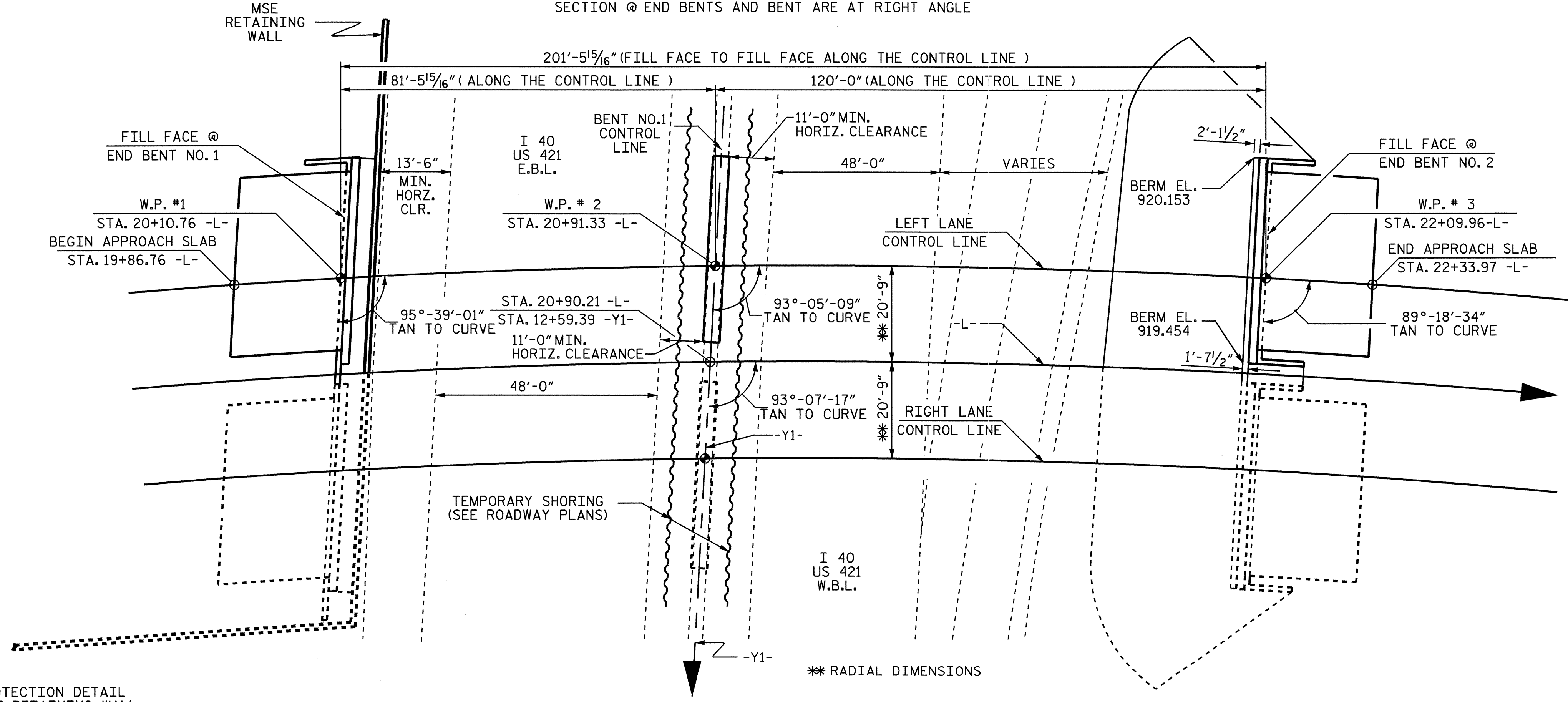
END BENT NO. 1

BENT NO. 1

END BENT NO. 2

SECTION ALONG -L-

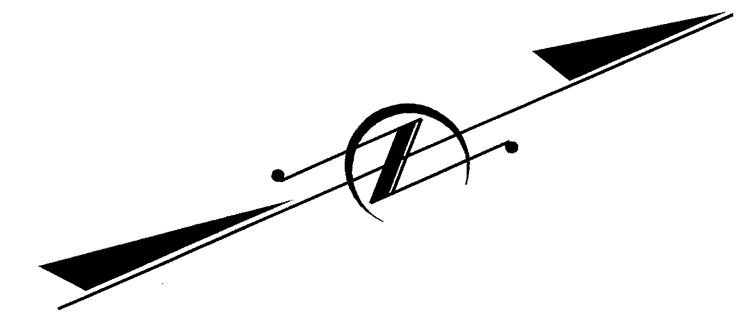
SECTION @ END BENTS AND BENT ARE AT RIGHT ANGLE



PLAN

PILES, COLUMNS, AND FOOTINGS NOT SHOWN IN PLAN VIEW FOR CLARITY

NOTE:
 SEE SLOPE PROTECTION DETAIL SHEET AND MSE RETAINING WALL SHEETS FOR BERM WIDTH AND ELEVATIONS AT END BENT NO.1



PROJECT NO. U-4006
GUILFORD COUNTY
 STATION: 20+90.21-L-
12+59.39-Y1-

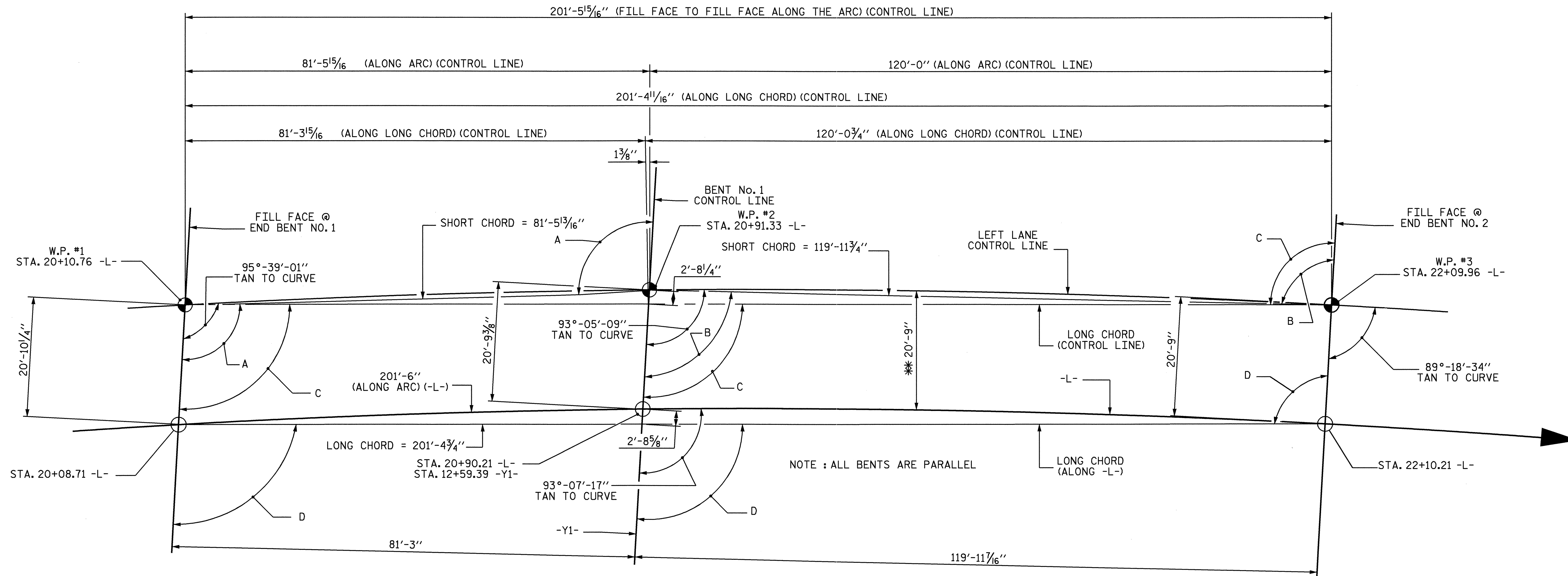
SHEET 1 OF 4 BRIDGE NO. 1047

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE ON SR 4126
 (BRIDFORD PARKWAY)
 OVER I-40/US 421
 BETWEEN SR 1541 AND SR 1607
 (LEFT LANE)



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

DRAWN BY : A.L. FIGUEROA DATE : 05-07-09
 CHECKED BY : J.R. DUGGINS DATE : 05-08-09



- ANGLES**
- A = 94°-22'-05" TO SHORT CHORD SPAN A
 - B = 91°-11'-52" TO SHORT CHORD SPAN B
 - C = 92°-28'-48" TO LONG CHORD CONTROL LINE
 - D = 92°-30'-31" TO LONG CHORD -L- LINE

LONG CHORD LAYOUT

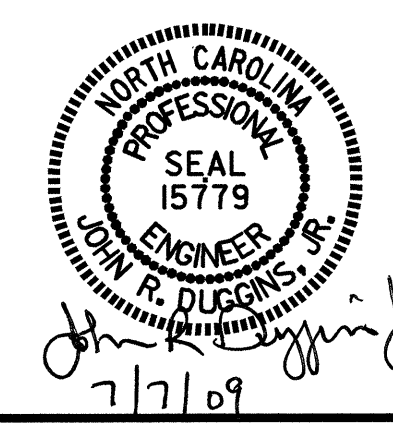
* RADIAL DIMENSION

NOTE : ALL BENTS ARE PARALLEL

PROJECT NO. U-4006
 GUILFORD COUNTY
 STATION: 20+90.21 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE ON SR 4126
 (BRIDFORD PARKWAY)
 OVER I-40/US 421
 BETWEEN SR 1541 AND SR 1607
 (LEFT LANE)

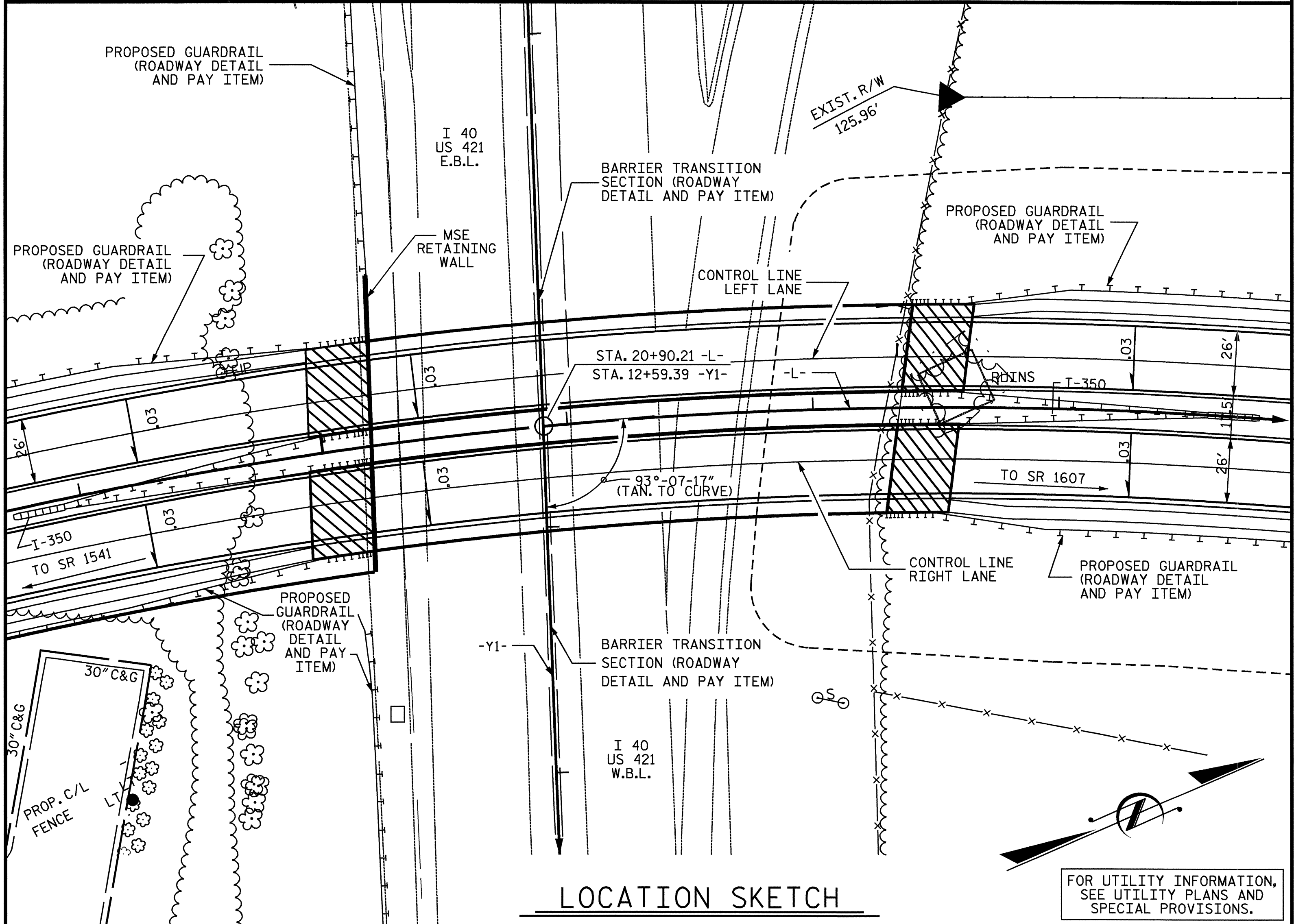


DRAWN BY : M. POOLE DATE : 04/09
 CHECKED BY : J. R. DUGGINS DATE : 04/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	6-3
1			3			TOTAL SHEETS
2			4			75

06-JUL-2009 11:18
 r:\structures\4006\mpoole\microstation\Left Lane\U-4006_sd.LC.01.dgn
 dahodge

BM#2 RAIL ROAD SPIKE SET IN ROOT OF A 15" MAPLE TREE 177 FEET LEFT OF BASE LINE STA. 20+36, EL.907.57'



NOTES

ASSUMED LIVE LOAD = HS 20 OR ALTERNATE LOADING, EXCEPT THAT THE GIRDERS HAVE BEEN DESIGNED FOR HS 25.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

PRESTRESSED CONCRETE DECK PANELS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.

REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.

FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.

THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLE 1024-5 AND 1024-6 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLE OF REINFORCING STEEL AS FOLLOWING: FOR PROJECT 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 SAMPLE OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICES WITH REPLACEMENTS BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS.

FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.

NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.

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

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 SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GALVANIZED PILES, A MINIMUM OF 35' OF THE TOP OF EACH PILE SHALL BE GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

TOTAL BILL OF MATERIAL

	FOUNDATION EXCAVATION FOR BENT	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	MODIFIED 72" PRESTRESSED CONCRETE GIRDERS	HP 12 X 53 STEEL PILES	HP 12 X 53 GALVANIZED STEEL PILES	THREE BAR METAL RAIL	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	EVAZOTE JOINT SEALS
	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO. LIN. FT.	NO. LIN. FT.	NO. LIN. FT.	LIN. FT.	LIN. FT.	SO. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE		7661	6637		LUMP SUM			10 988.96			191.82	199.41		LUMP SUM	LUMP SUM
END BENT NO. 1				37.0		5,056				9 675			28		
BENT NO. 1	LUMP SUM			47.3		7,971	1,338	15 790							
END BENT NO. 2				38.0		5,128		11 880					235		
TOTAL	LUMP SUM	7661	6637	122.3	LUMP SUM	18,155	1,338	10 988.96	26 1,670	9 675	191.82	199.41	263	LUMP SUM	LUMP SUM

PROJECT NO. U-4006
GUILFORD COUNTY
 STATION: 20+90.21-L-

SHEET 4 OF 4



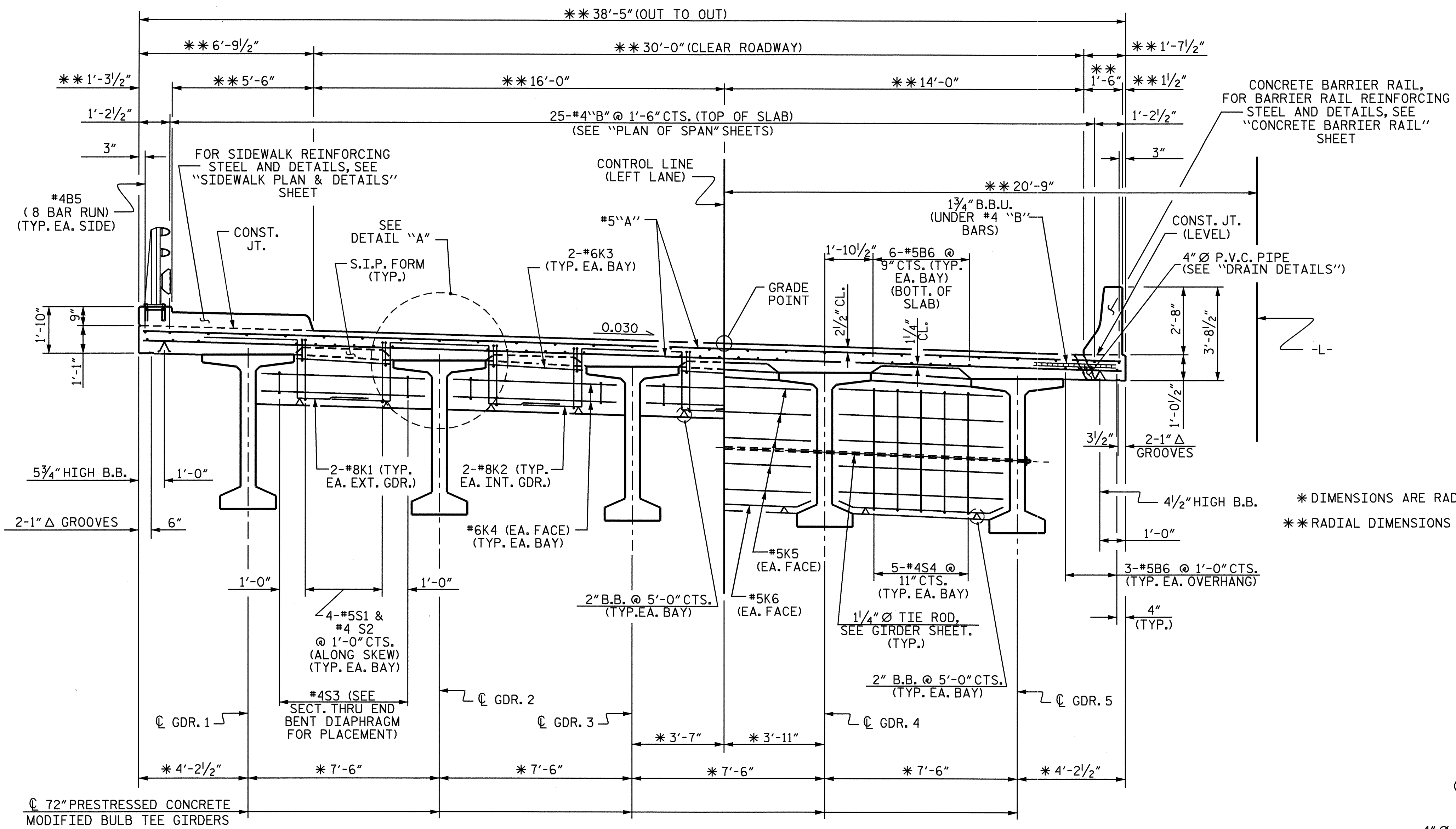
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE ON SR 4126
 (BRIDFORD PARKWAY)
 OVER I-40/US 421
 BETWEEN SR 1541 AND SR 1607
 (LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			8-4
2			4			TOTAL SHEETS 75

DRAWN BY : A.L. FIGUEROA DATE : 5-07-09
 CHECKED BY : J.R. DUGGINS DATE : 05-08-09

06-JUL-2009 11:24
 r:\structures\U4006\A.L.Figueroa\Microstation\U-4006_SD-02-B_GD.dgn
 dhdodge



NOTES

PROVIDE 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF 'A' BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 2 1/2" ABOVE THE TOP OF THE REMOVABLE FORM.

LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

TEMPORARY STRUTS SHALL BE PLACED BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE DIAPHRAGMS AND THE NUTS ON THE 1/4" DIA. TIE RODS SHALL BE FULLY TIGHTENED BEFORE THE DIAPHRAGMS ARE CAST. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED. THE TIE RODS SHALL BE RE-TIGHTENED AFTER THE STRUTS HAVE BEEN REMOVED.

CONCRETE IN INTERMEDIATE DIAPHRAGMS MAY BE CLASS A IN LIEU OF CLASS AA. PAYMENT SHALL BE MADE UNDER THE UNIT CONTRACT PRICE FOR REINFORCED CONCRETE DECK SLAB.

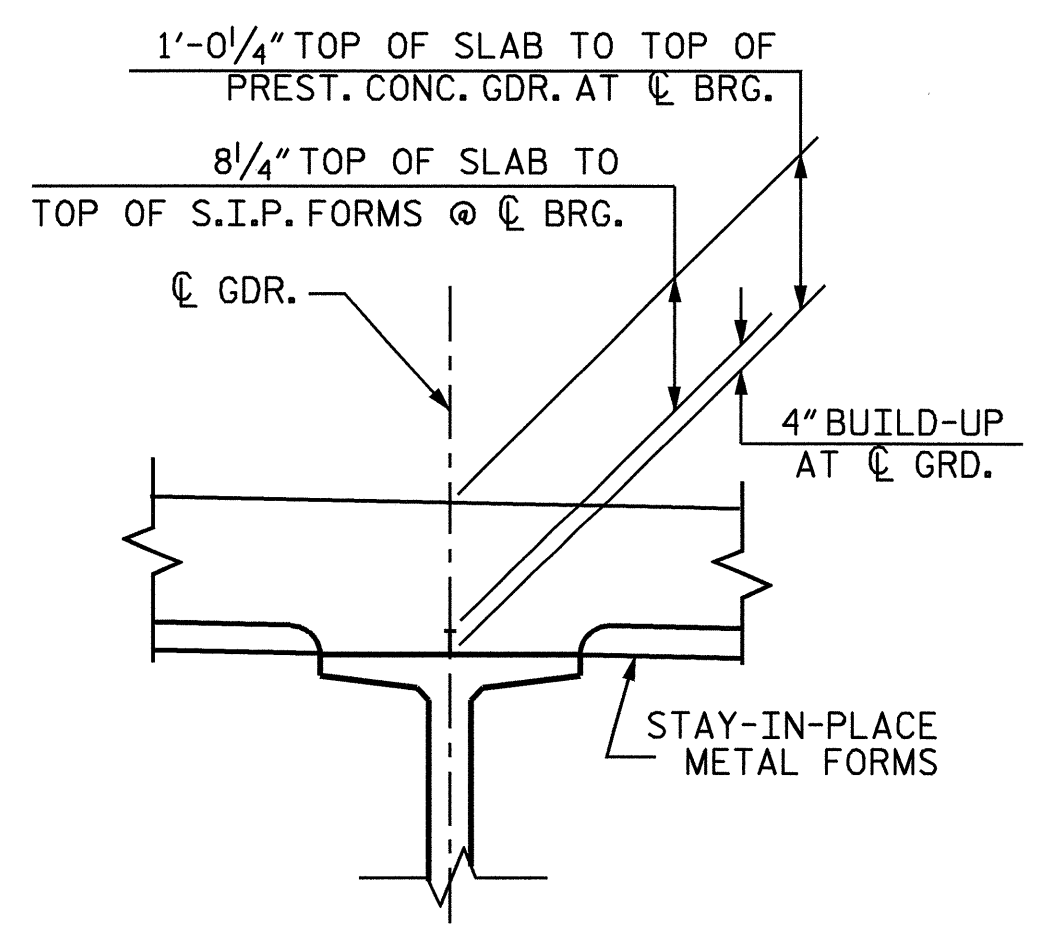
PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

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

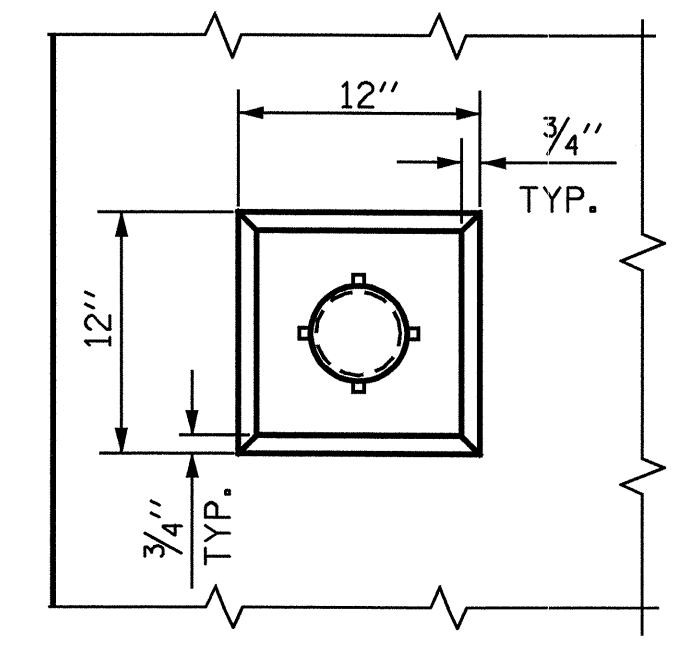
* DIMENSIONS ARE RADIAL THRU WORKPOINTS
 ** RADIAL DIMENSIONS

TYPICAL SECTION
 SHOWING END BENT DIAPHRAGMS

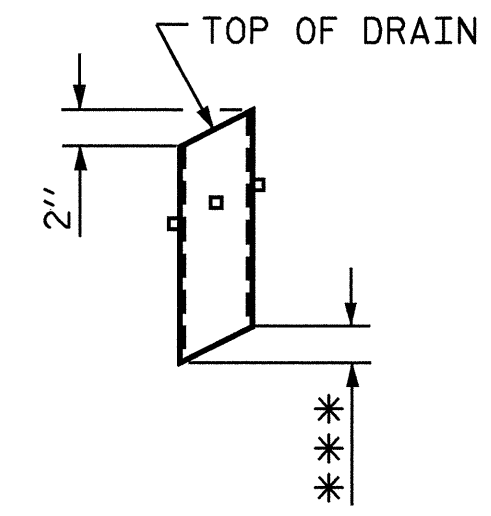
TYPICAL SECTION
 SHOWING INTERMEDIATE DIAPHRAGMS



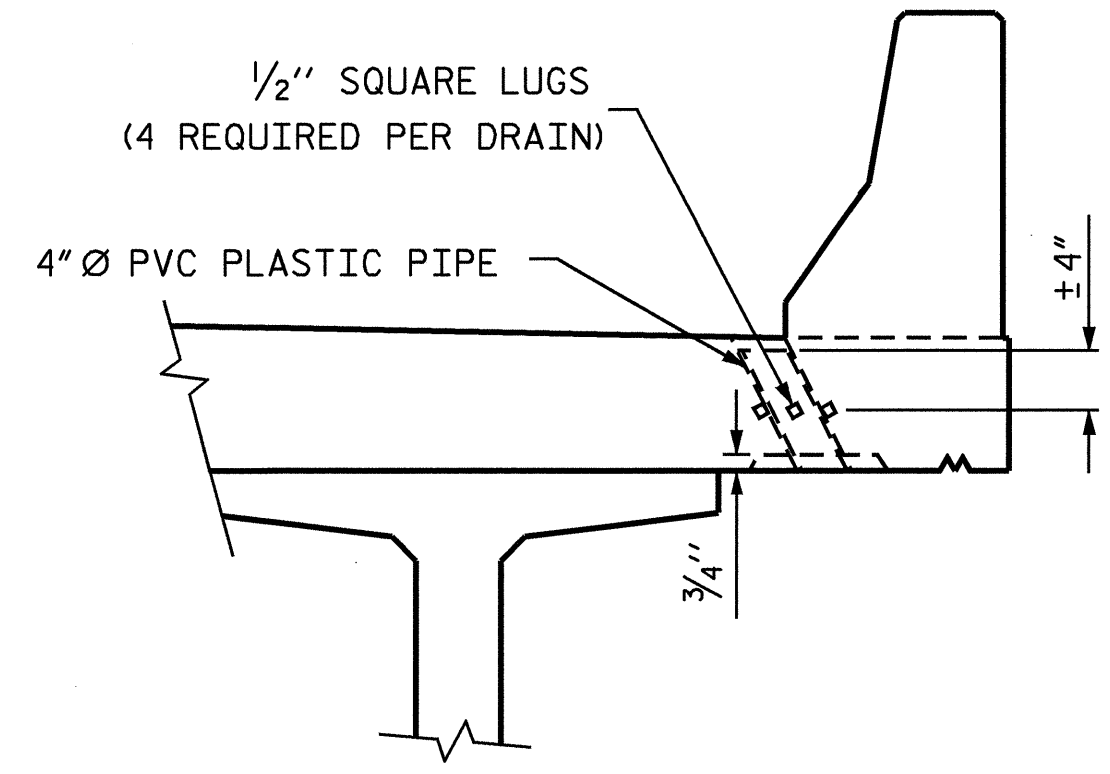
DETAIL "A"



PLAN OF RECESS



*** TO BE SET TO MATCH SLOPE OF BOTTOM OF OVERHANG (5 DRAINS REQUIRED)

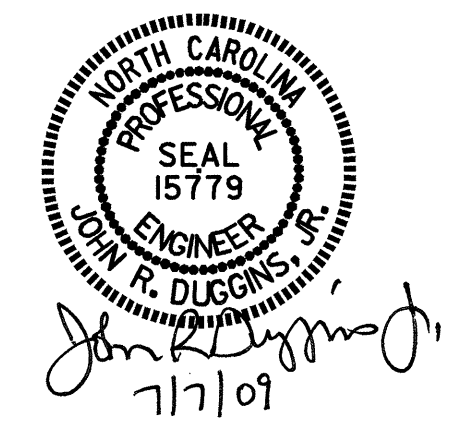


ELEVATION

PIPE DETAIL

TOP OF FLOOR DRAINS TO BE SET 3/8" BELOW SURFACE OF SLAB.
 4 - 1/2" SQUARE LUGS TO BE GLUED TO THE P.V.C. PLASTIC PIPE AT EQUAL SPACES AROUND THE PIPE DRAIN APPROXIMATELY 4" FROM THE TOP OF THE PIPE.
 THE 4" Ø PVC PLASTIC PIPE AND FITTINGS SHALL BE SCHEDULE 40 AND CONFORM TO ASTM D1785.

DRAIN DETAILS



PROJECT NO. U-4006
GUILFORD COUNTY
 STATION: 20+90.21 -L-

SHEET 1 OF 3

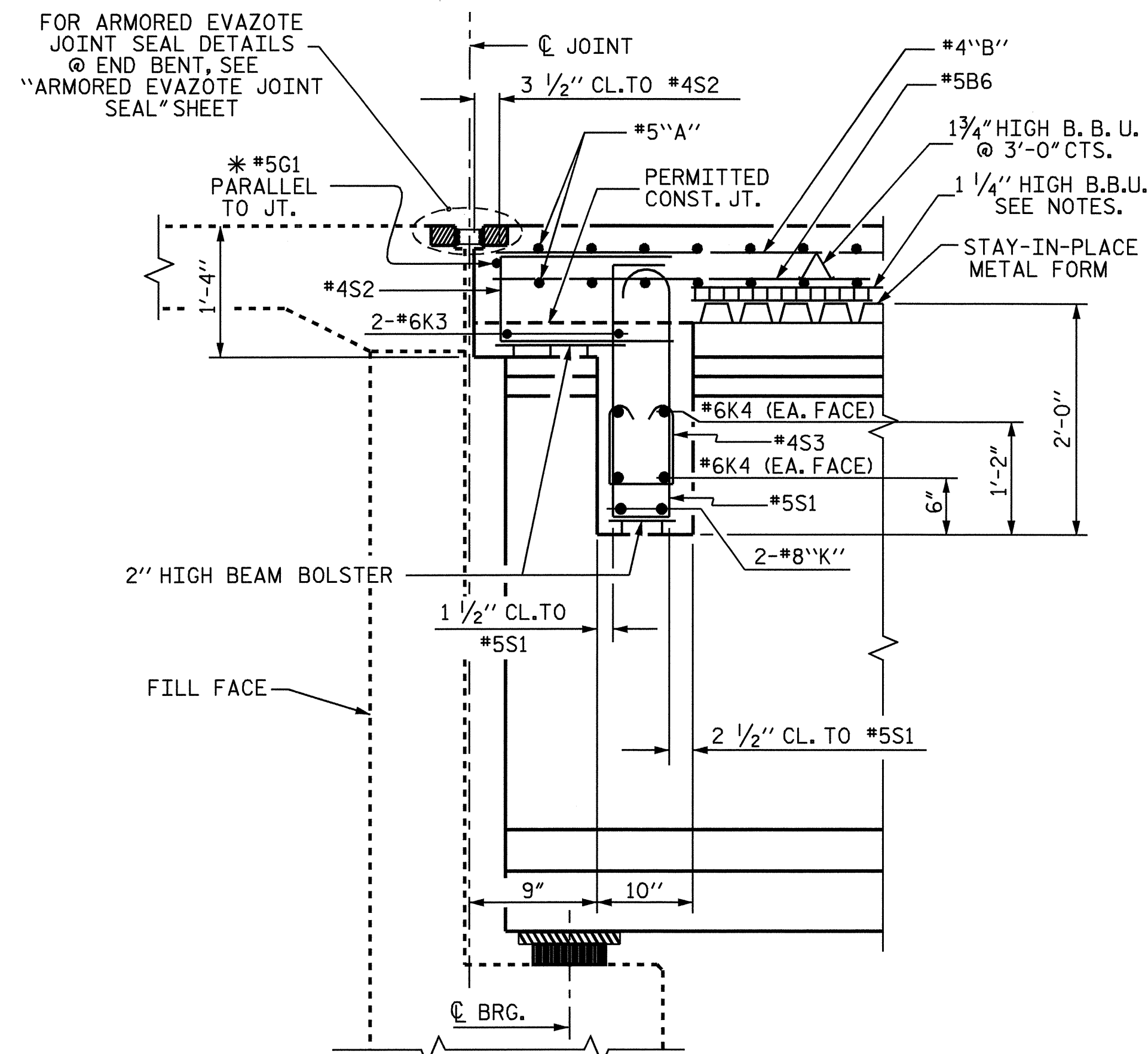
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUPERSTRUCTURE
 TYPICAL SECTION**

(LEFT LANE)

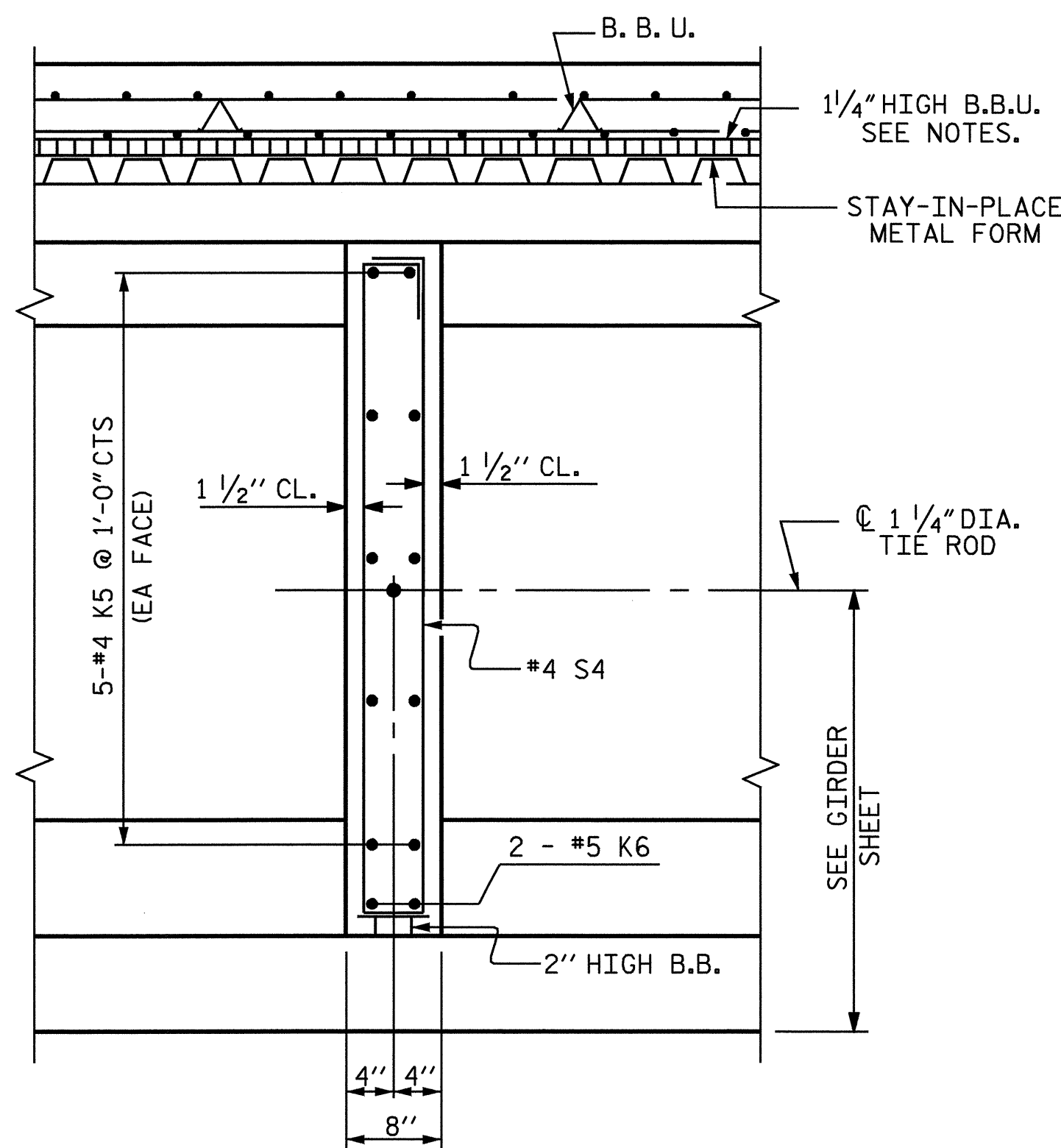
REVISIONS						SHEET NO. 6-5
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 75
2			4			

DRAWN BY: J. LAMBERT DATE: 12/08
 CHECKED BY: D. HODGE DATE: 4/09

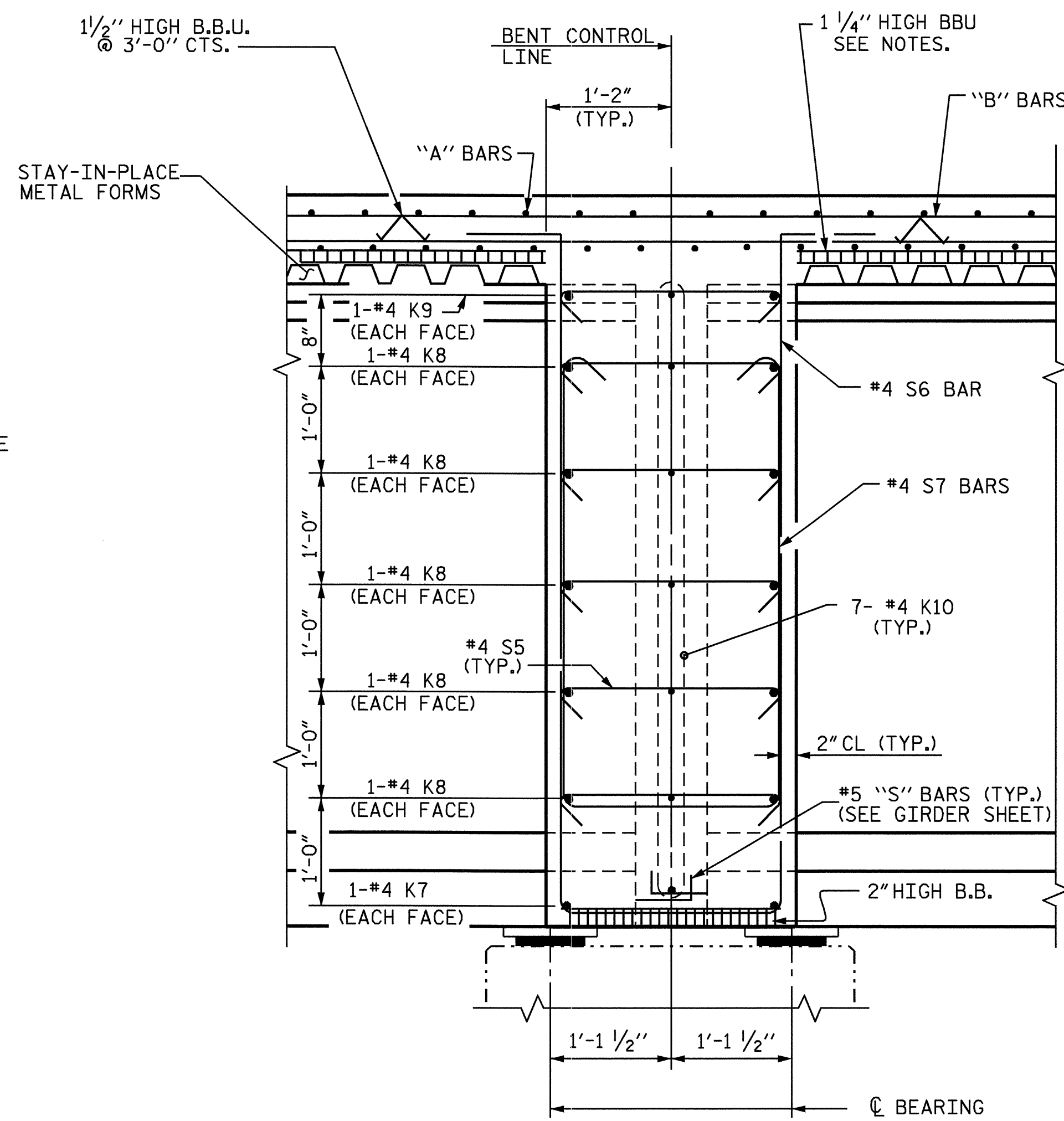


SECTION THRU END BENT DIAPHRAGM

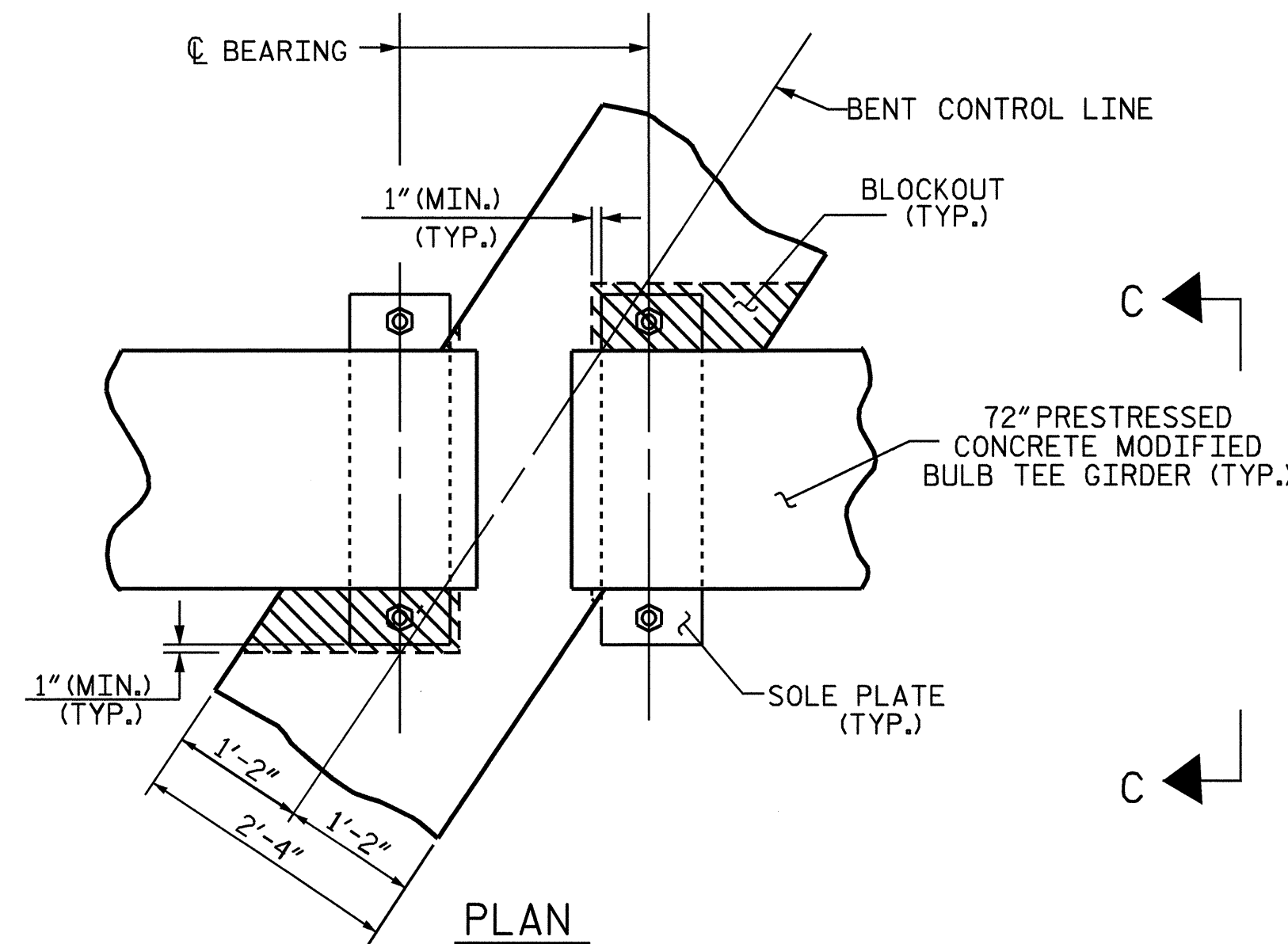
*#5G1 BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.



SECTION THRU INTERMEDIATE DIAPHRAGM



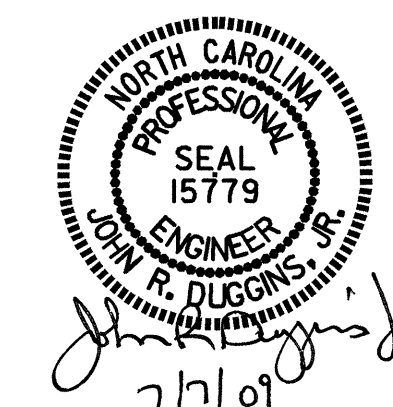
SECTION THRU CONTINUOUS BENT DIAPHRAGM



BENT DIAPHRAGM BLOCK-OUT DETAIL

PROJECT NO. U-4006
GUILFORD COUNTY
 STATION: 20+90.21 -L-

SHEET 3 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

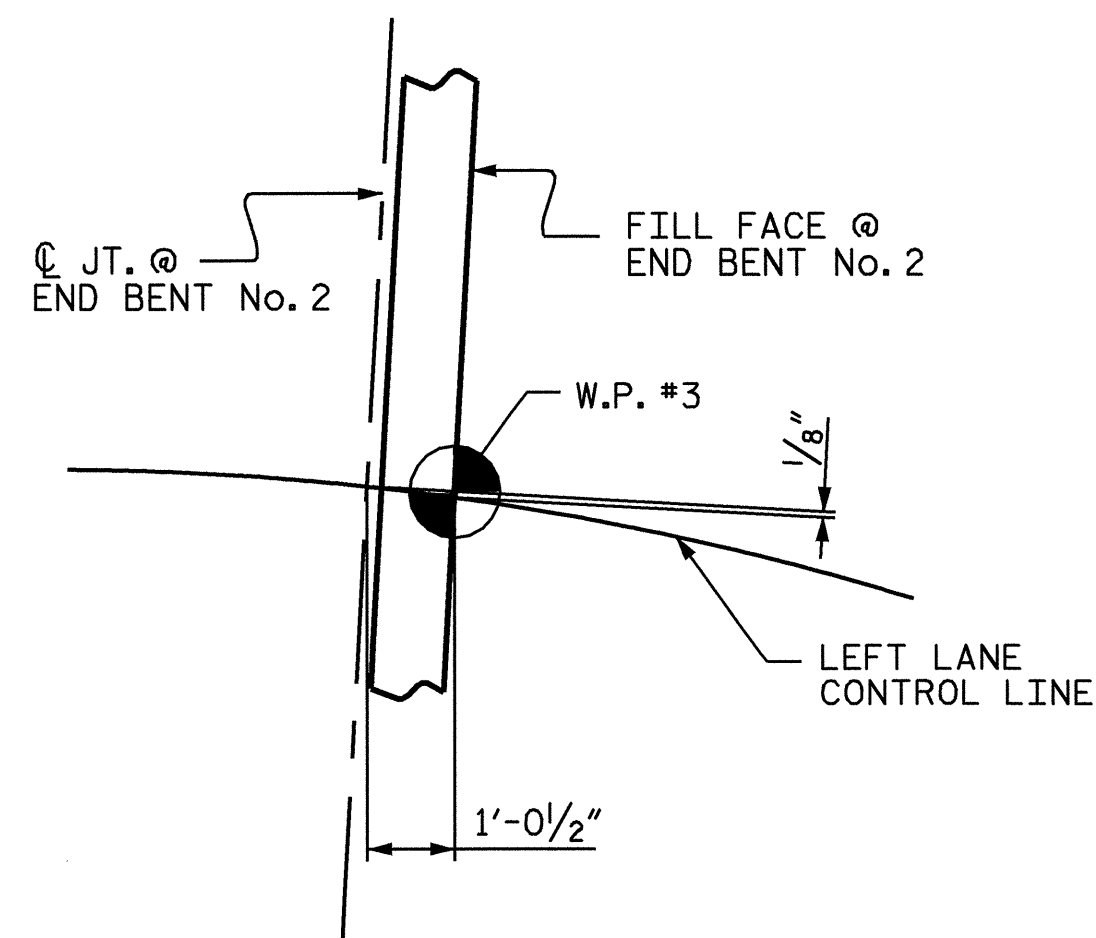
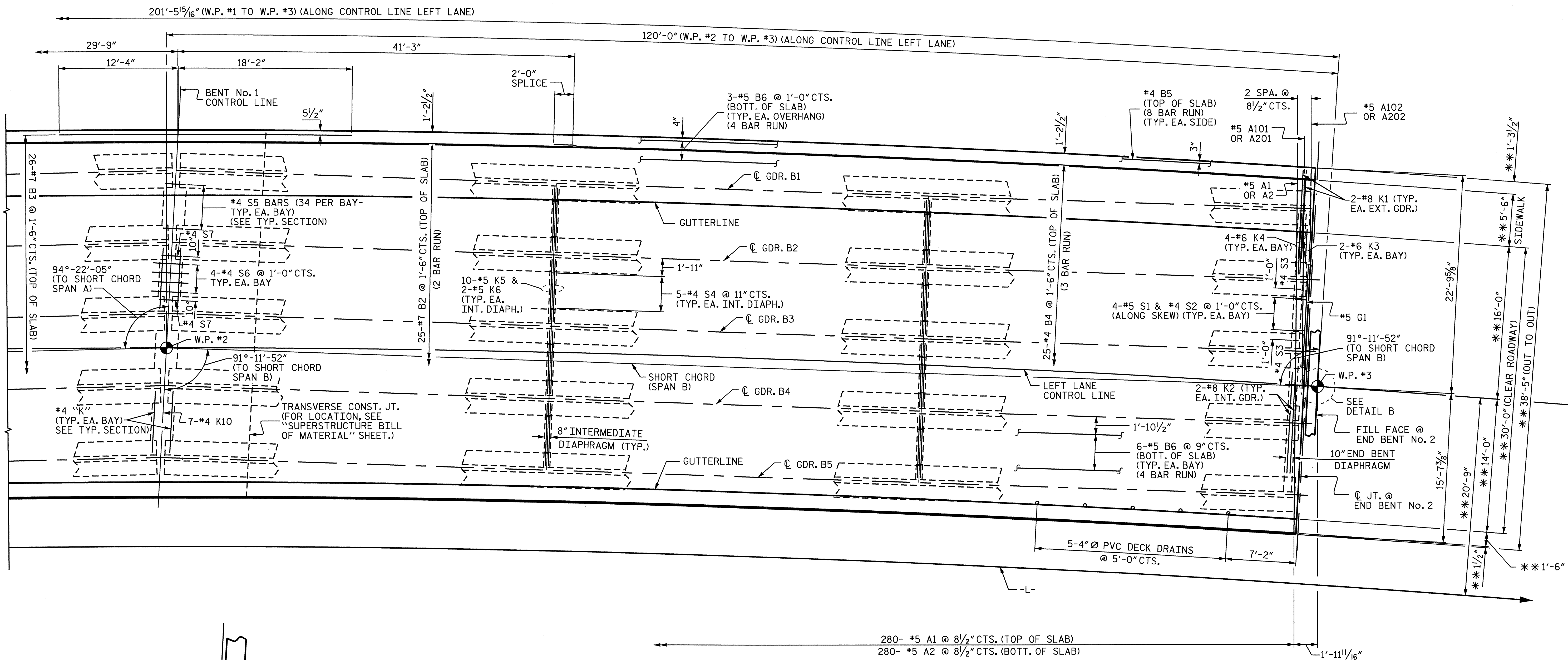
SUPERSTRUCTURE
 TYPICAL SECTION
 DETAILS

(LEFT LANE)

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

5-7
 TOTAL SHEETS
 75

DRAWN BY: J. LAMBERT DATE: 12/08
 CHECKED BY: D. HODGE DATE: 4/09



PLAN OF SPAN "B"

FOR REINFORCING STEEL IN BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEET.

FOR REINFORCING STEEL IN SIDEWALK, SEE "SIDEWALK DETAILS" SHEET.

#5 "A" BARS PLACED PERPENDICULAR TO LONG CHORD AND SPACED ALONG LONG CHORD.

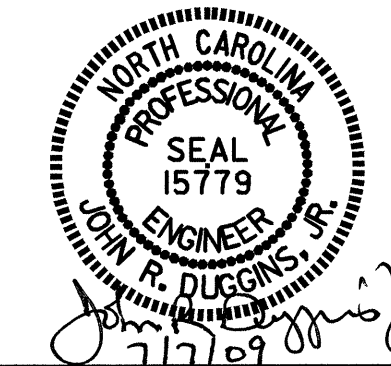
** RADIAL DIMENSIONS

PROJECT NO. U-4006
 GUILFORD COUNTY
 STATION: 20+90.21 -L-

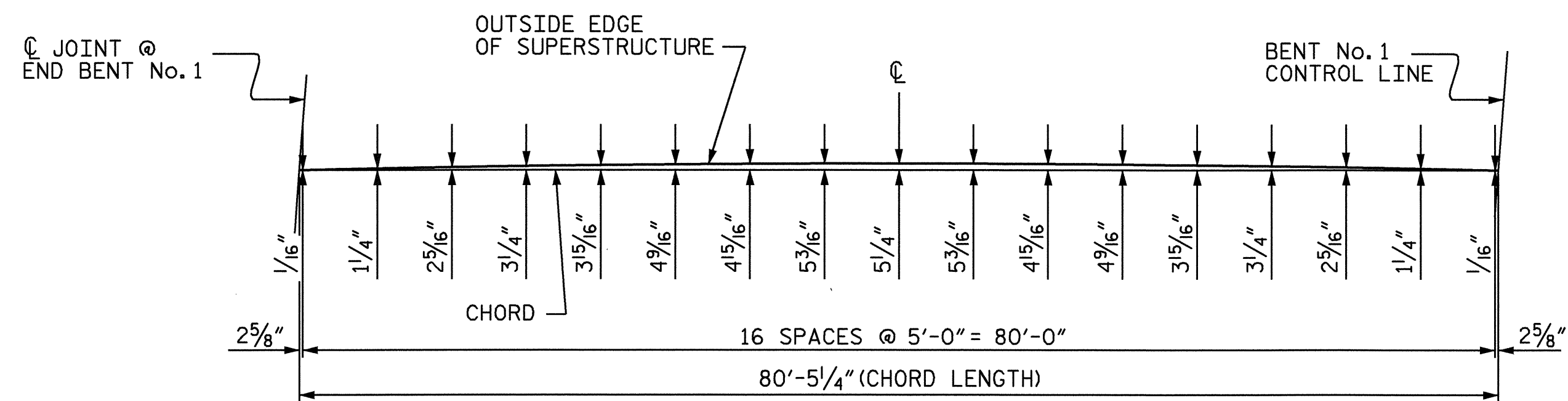
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 PLAN OF SPAN B
 (LEFT LANE)

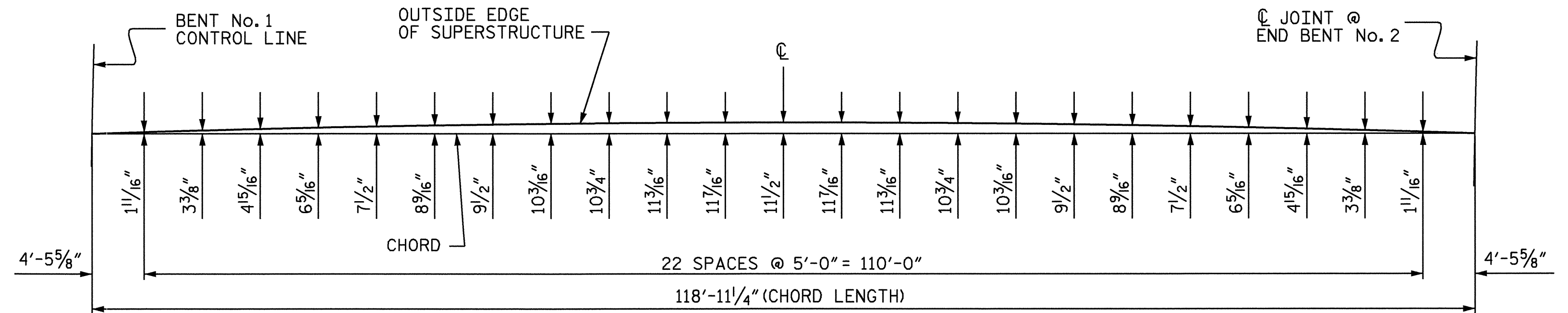
REVISIONS						SHEET NO. S-9
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 75
2			4			



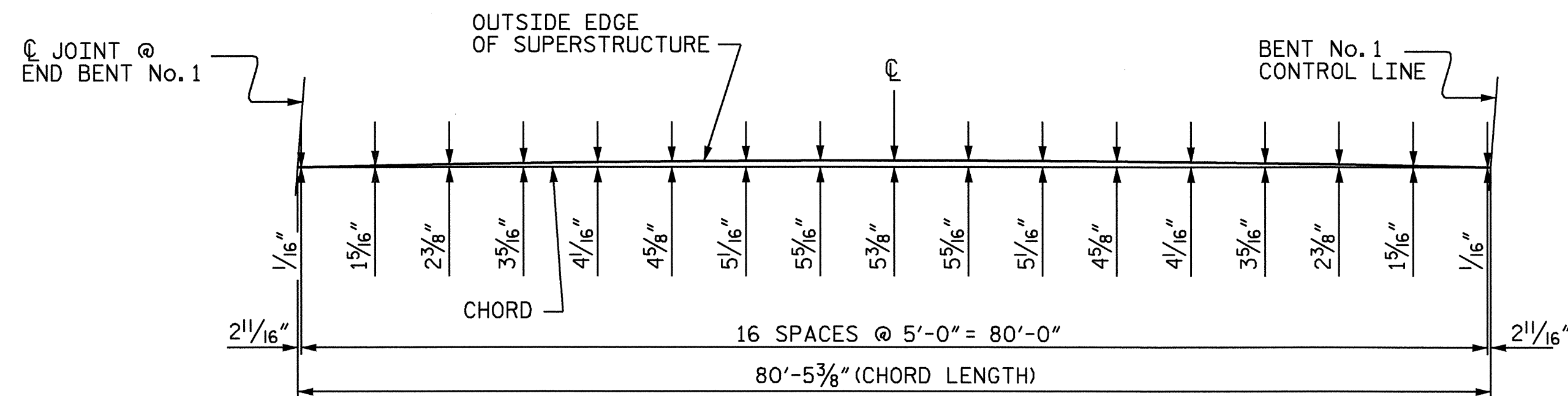
DRAWN BY: D. HODGE DATE: 4/09
 CHECKED BY: J.R. DUGGINS DATE: 4/09



ARC OFFSETS - LEFT SIDE

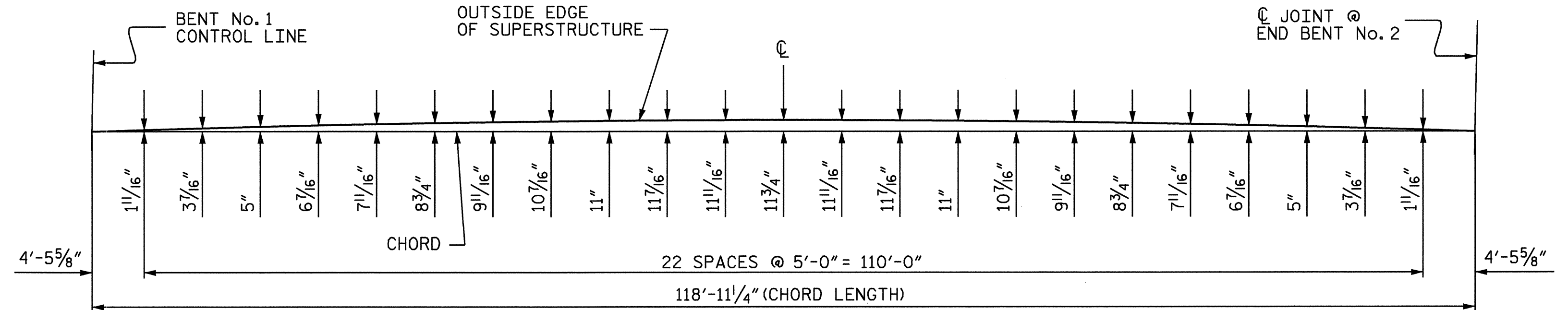


ARC OFFSETS - LEFT SIDE



ARC OFFSETS - RIGHT SIDE

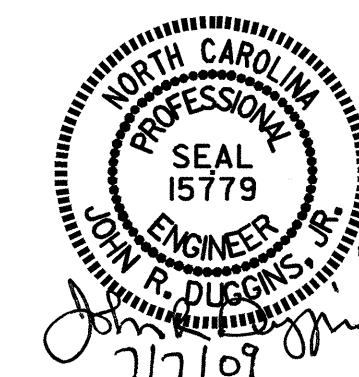
SPAN A



ARC OFFSETS - RIGHT SIDE

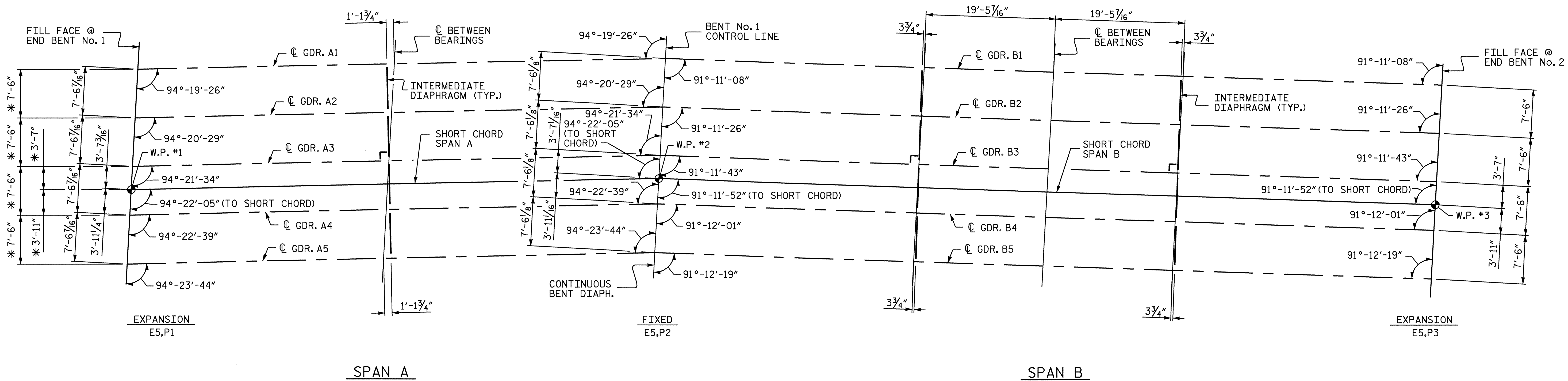
SPAN B

PROJECT NO. U-4006
GUILFORD COUNTY
 STATION: 20+90.21 -L-



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE ARC OFFSETS (LEFT LANE)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-10
					TOTAL SHEETS 75

DRAWN BY: D. HODGE DATE: 4/09
 CHECKED BY: J.R. DUGGINS DATE: 4/09



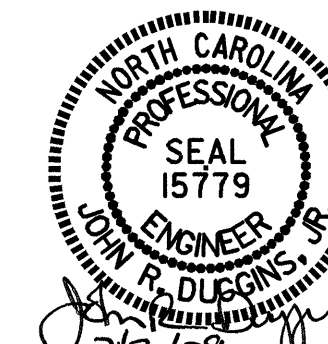
* DIMENSIONS RADIAL THRU WORKPOINTS

GIRDER LAYOUT

PROJECT NO. U-4006
GUILFORD COUNTY
 STATION: 20+90.21 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

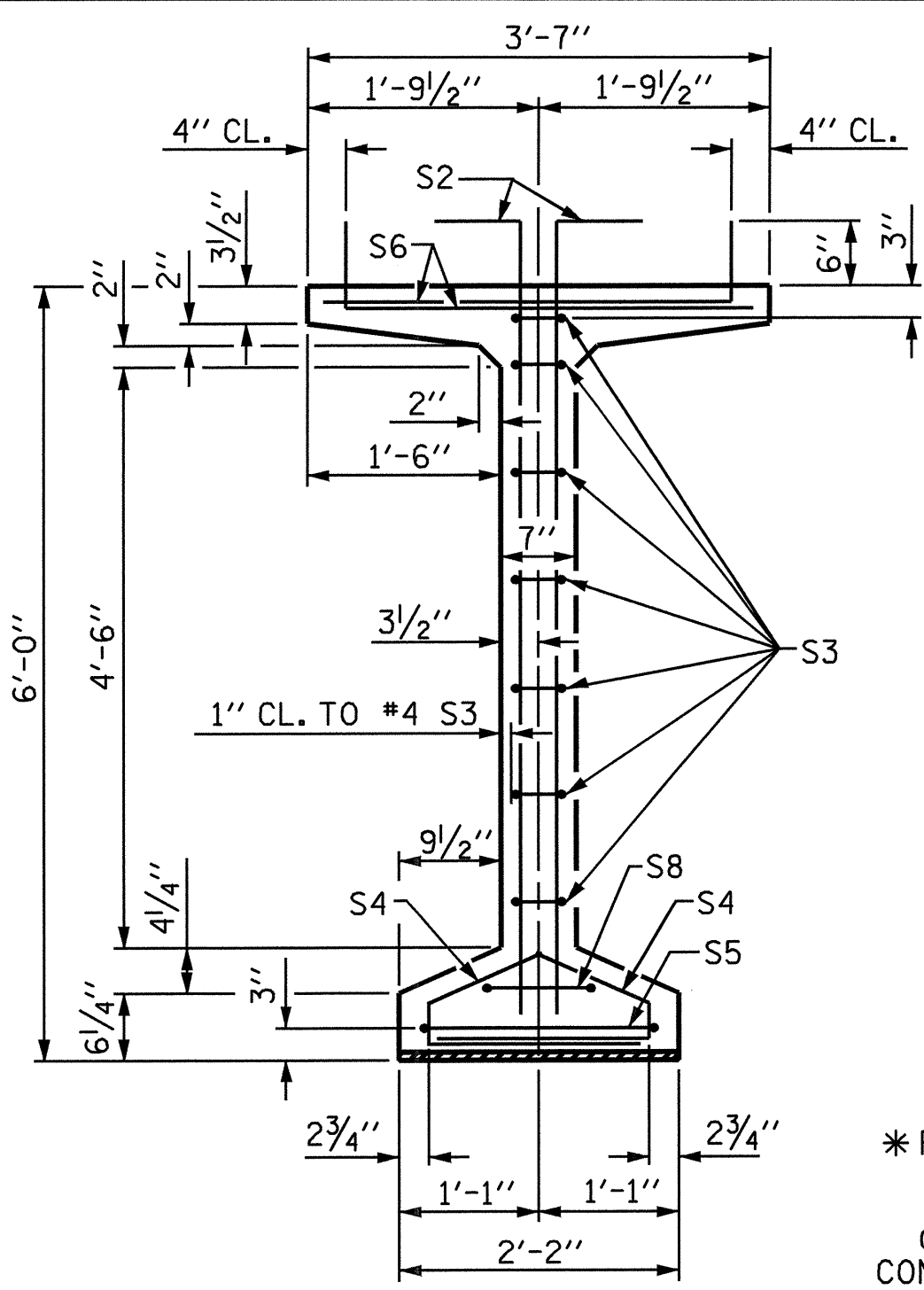
SUPERSTRUCTURE
 GIRDER LAYOUT
 (LEFT LANE)



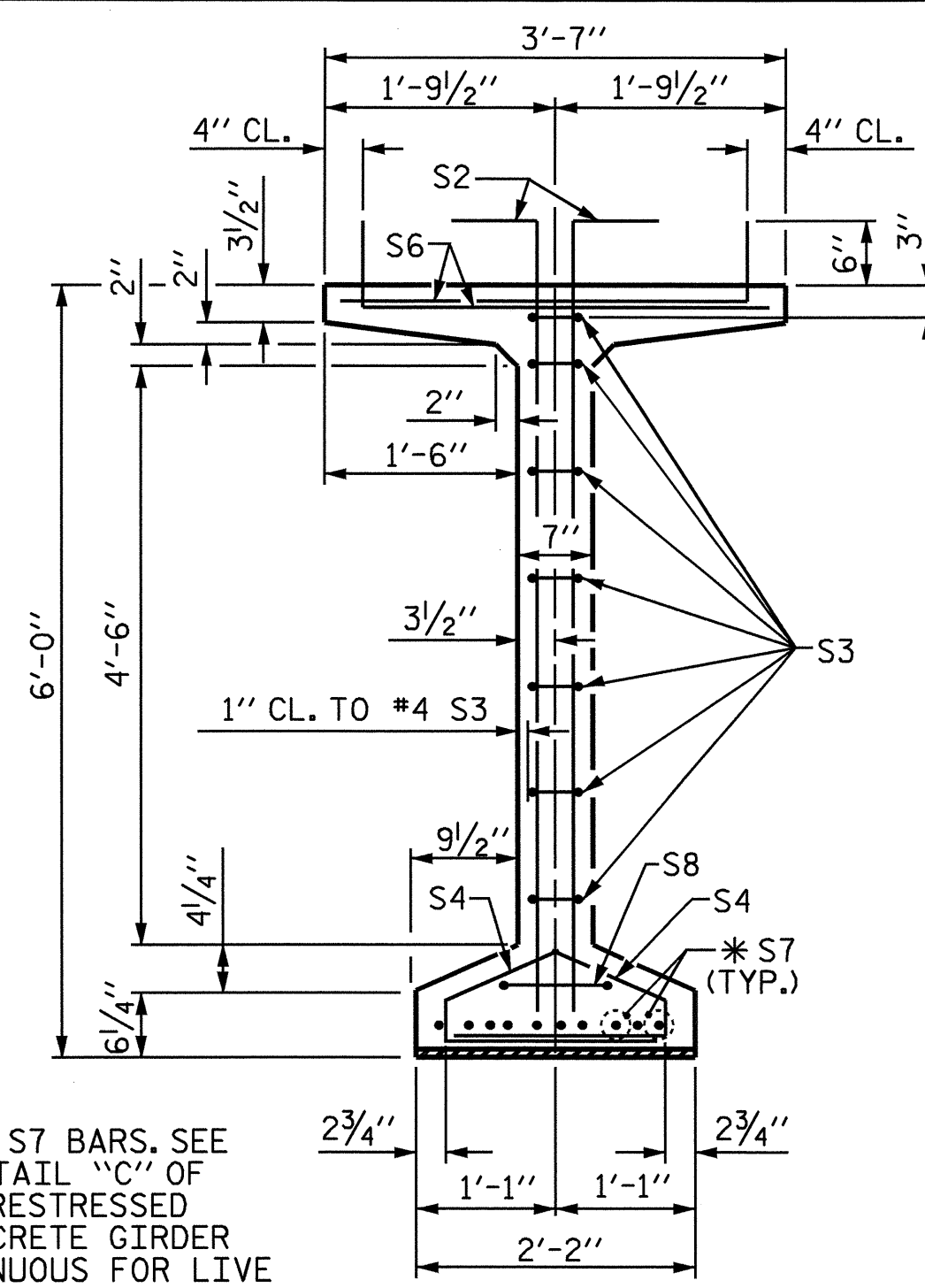
DRAWN BY: D. HODGE DATE: 4/09
 CHECKED BY: J.R. DUGGINS DATE: 4/09

30-JUN-2009 15:07
 r:\structures\4006\lamber+microstation\Left Lane\U-4006.sd.FP.dgn
 dhodge

REVISIONS						SHEET NO. S-11
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 15
2			4			

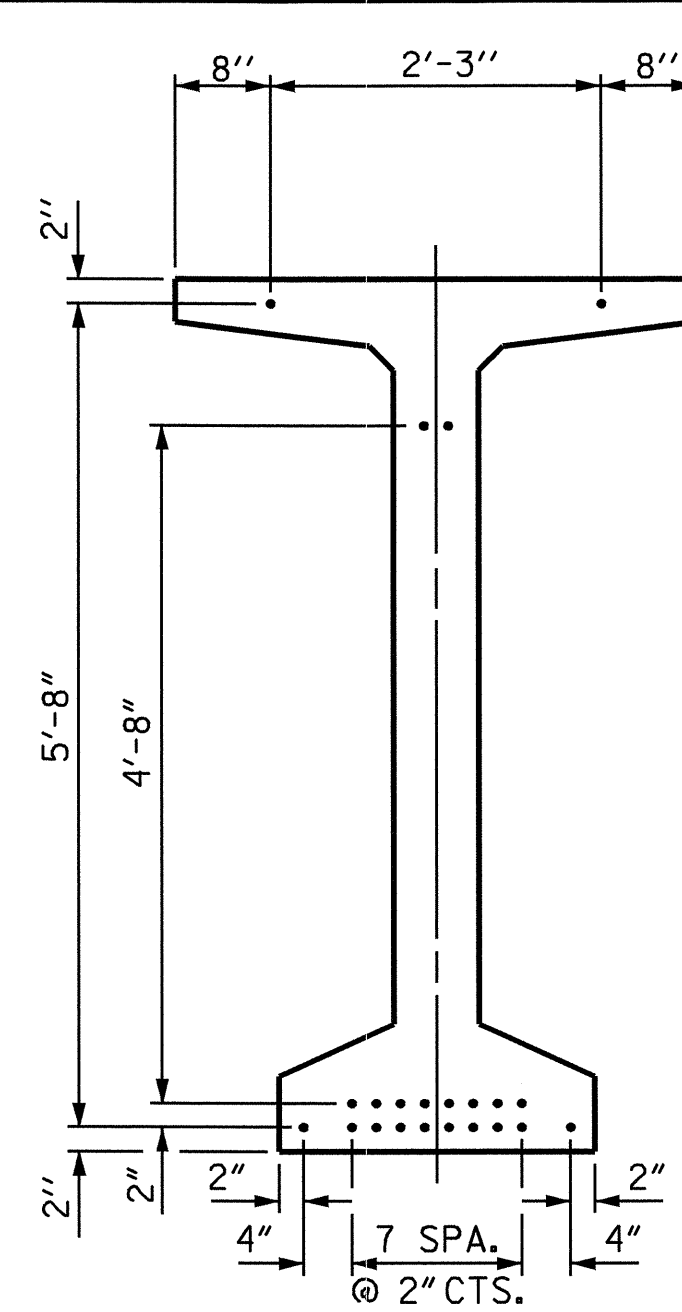


SECTION A-A

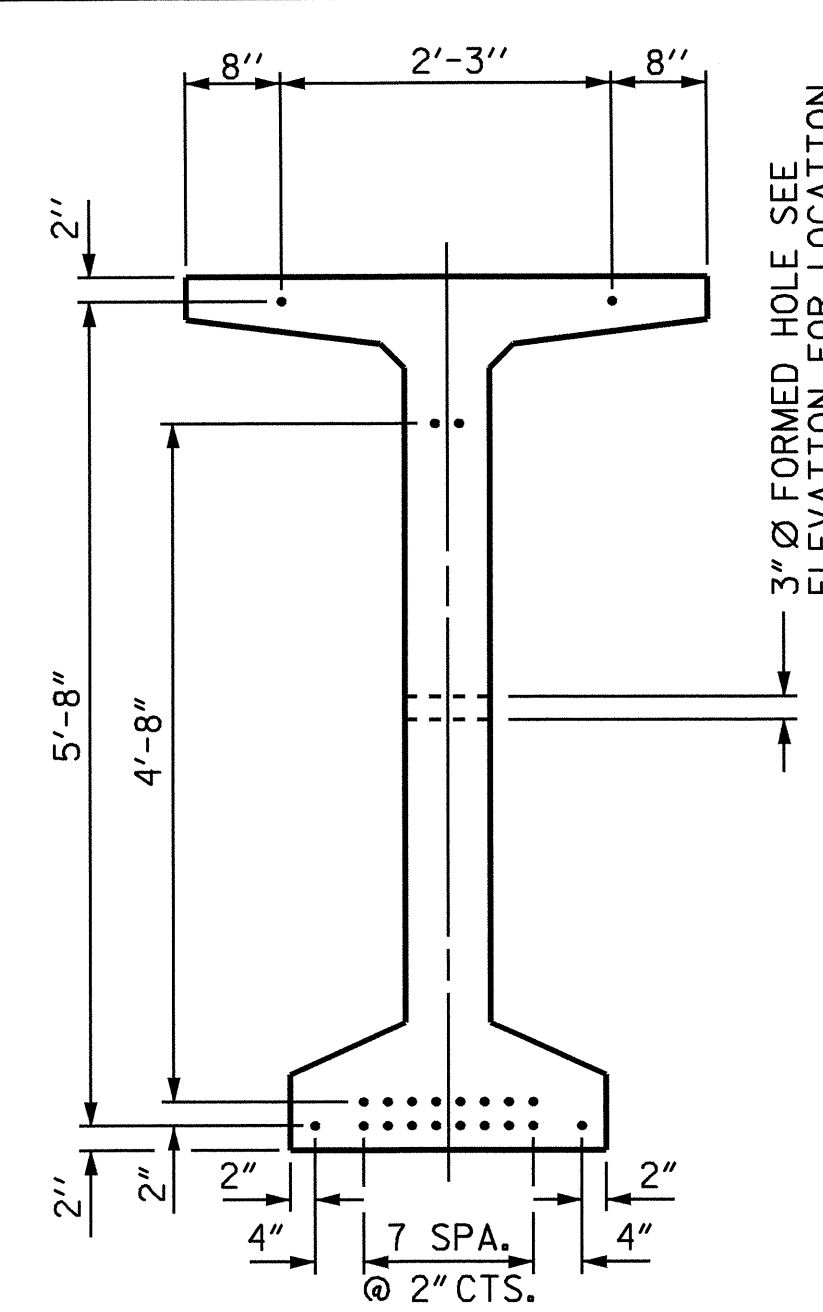


SECTION B-B

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

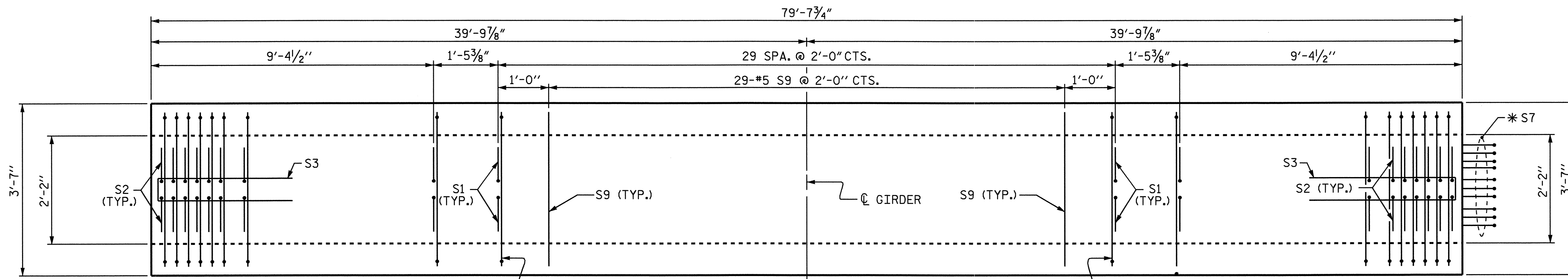


AT END OF GIRDER

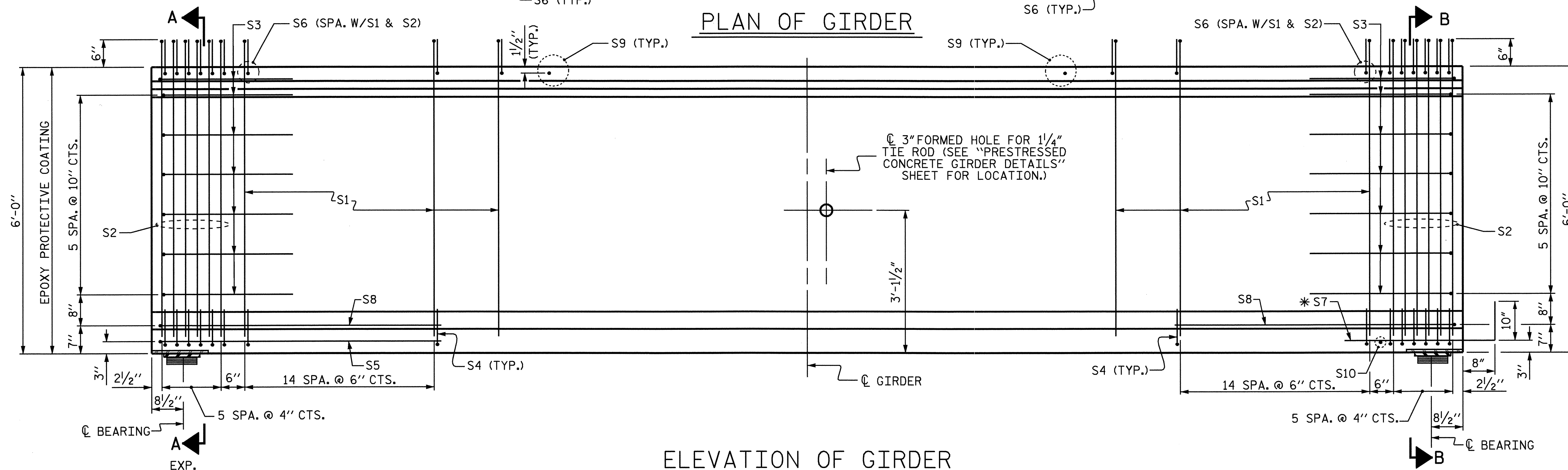


AT C OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER



ELEVATION OF GIRDER

0.6" Ø L. R. GRADE 270 STRANDS

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

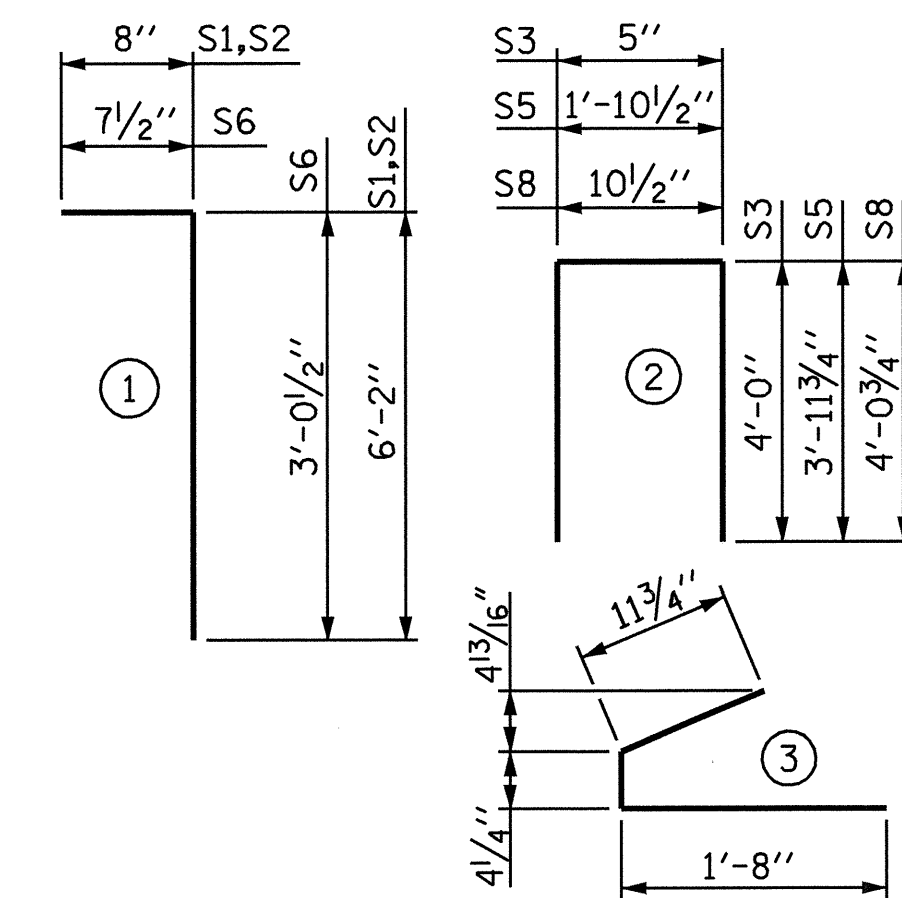
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	64	#4	1	6'-10"	292
S2	24	#5	1	6'-10"	171
S3	14	#4	2	8'-5"	79
S4	84	#4	3	3'-0"	168
S5	1	#5	2	9'-10"	10
S6	88	#5	1	3'-8"	337
* S7	10	#5	STR	3'-8"	38
S8	2	#5	2	9'-0"	19
S9	29	#5	STR	3'-3"	98
S10	1	#3	STR	1'-10"	1

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

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

REINFORCING STEEL	5500 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.
	1213	16.8

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	79'-7 3/4"	398'-2 3/4"

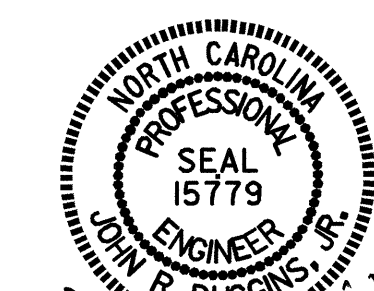
PROJECT NO. U-4006
GUILFORD COUNTY
STATION: 20+90.21 -L-

SHEET 1 OF 3

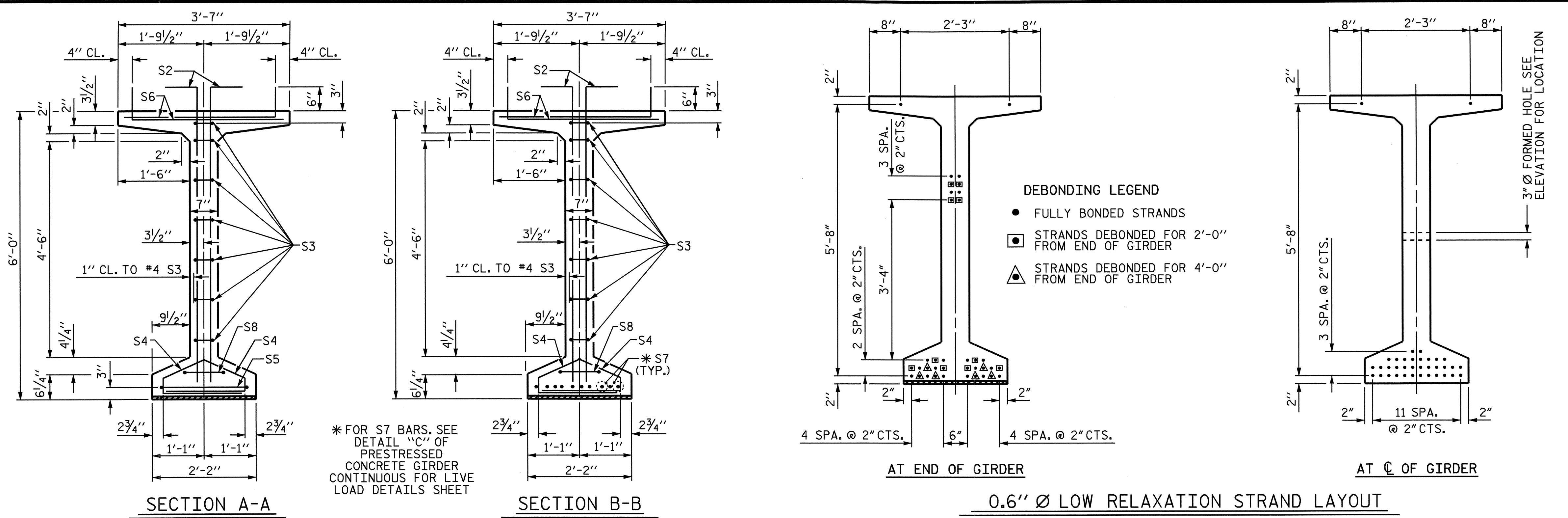
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

72" PRESTRESSED CONCRETE
MODIFIED BULB TEE
CONTINUOUS FOR LIVE LOAD
SPAN A
(LEFT LANE)

REVISIONS						SHEET NO. S-12
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 75
2			4			



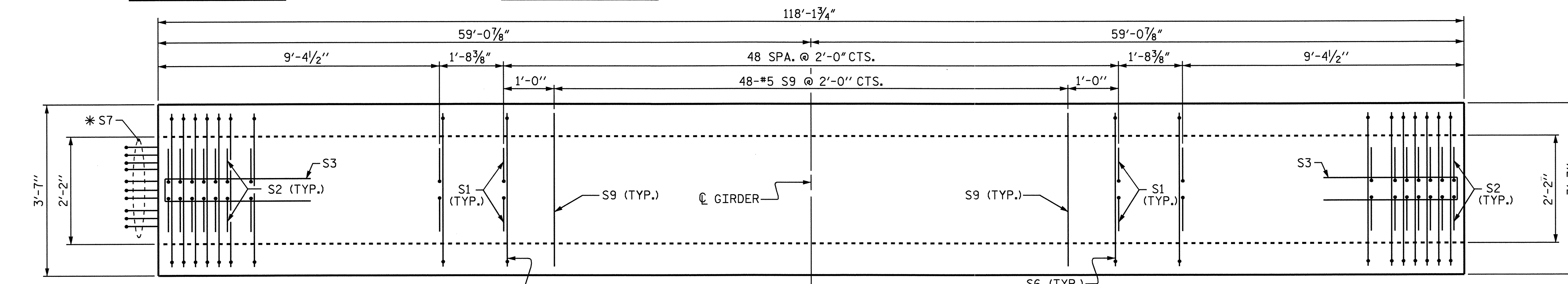
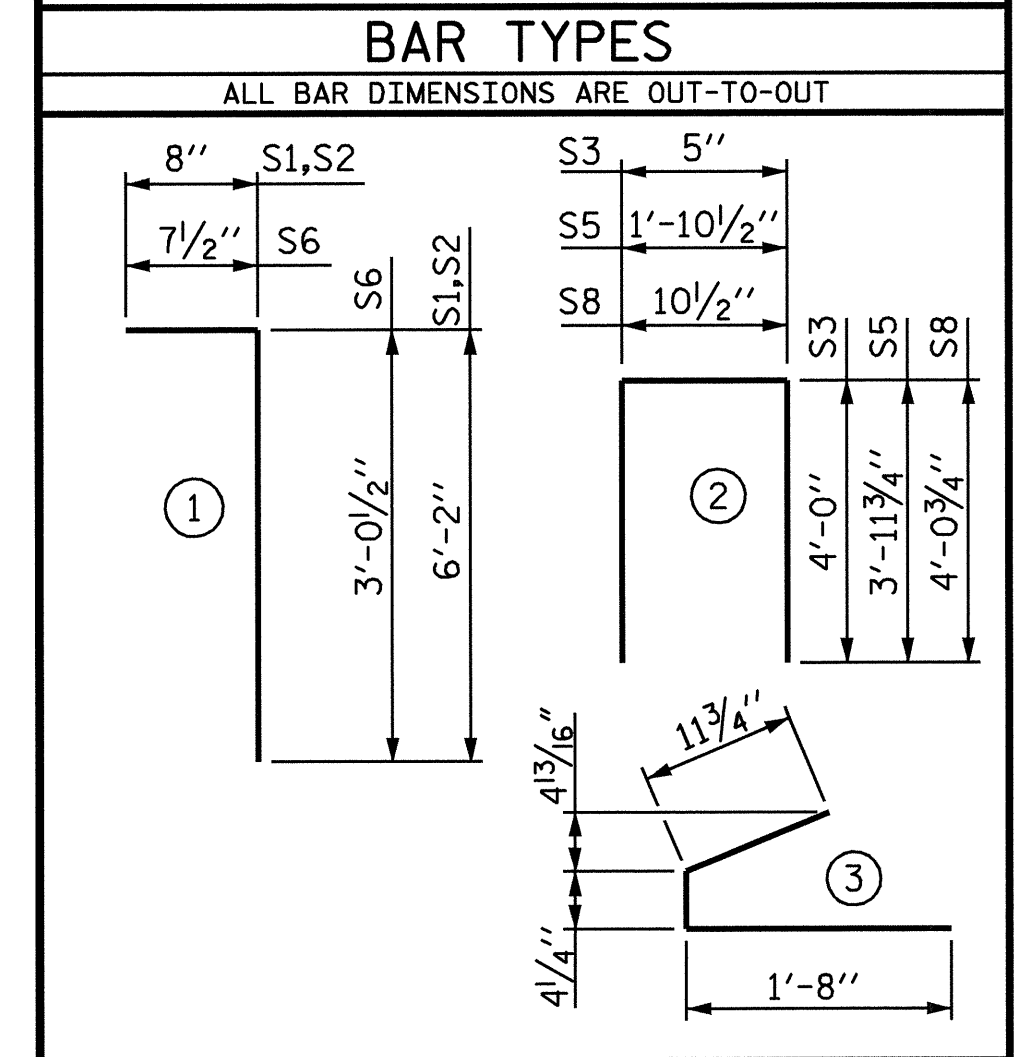
ASSEMBLED BY : A. SORSENGINH DATE : 5/04/09
CHECKED BY : J.R. DUGGINS DATE : 5/09
DRAWN BY : RWW 9/19/02 ADDED 9/19/02
CHECKED BY : GM 9/19/02 REV. 5/1/06 TLA/GM



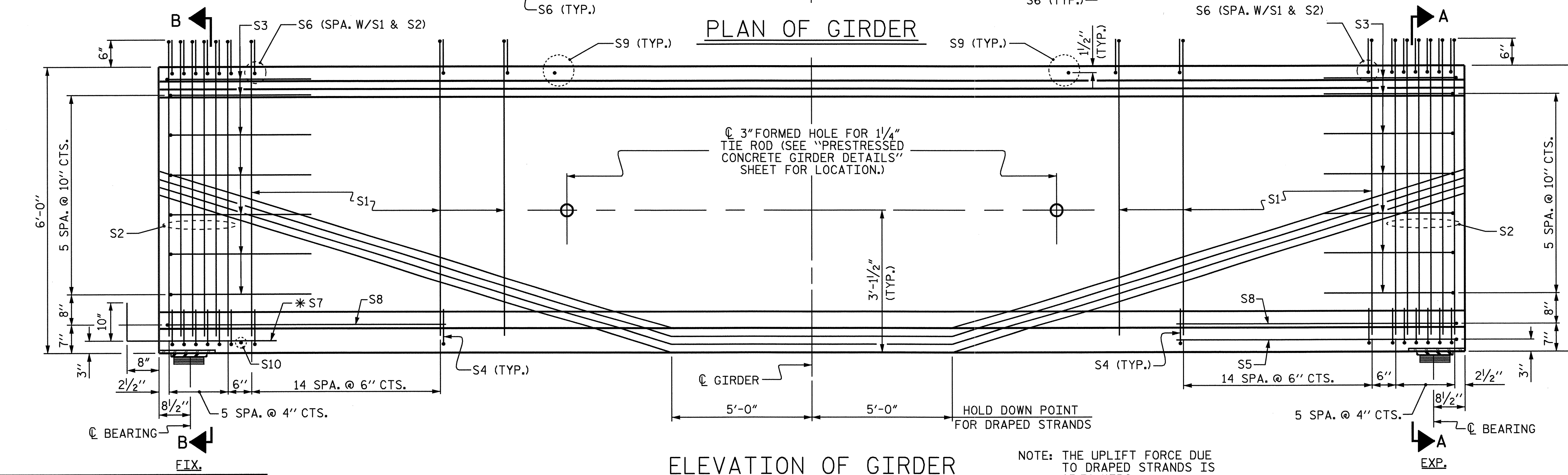
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
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S4	84	#4	3	3'-0"	168
S5	1	#5	2	9'-10"	10
S6	88	#5	1	3'-8"	337
*S7	10	#5	STR	3'-8"	38
S8	2	#5	2	9'-0"	19
S9	48	#5	STR	3'-3"	163
S10	1	#3	STR	1'-10"	1

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



QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL	8000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
	1278	25.0	36

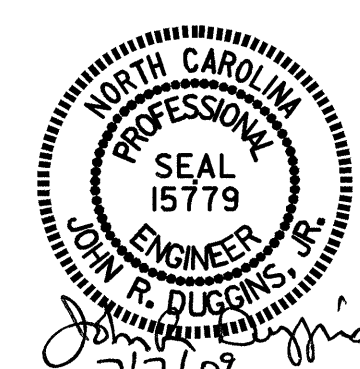


GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
5	118'-1 3/4"	590'-8 3/4"

PROJECT NO. U-4006
GUILFORD COUNTY
 STATION: 20+90.21 -L-
 SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

72" PRESTRESSED CONCRETE
 MODIFIED BULB TEE
 CONTINUOUS FOR LIVE LOAD
 SPAN B
 (LEFT LANE)



REVISIONS						SHEET NO. S-13
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 75
2			4			

ASSEMBLED BY : A. SORSENGINH DATE : 5/04/09
 CHECKED BY : J.R. DUGGINS DATE : 5/09
 DRAWN BY : RWW 9/19/02 ADDED 9/19/02
 CHECKED BY : GM 9/19/02 REV. 5/1/06 TLA/GM

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION	SPAN A																					
	GIRDER A1											GIRDERS A2, A3, A4 & A5										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.042	0.080	0.109	0.128	0.134	0.128	0.109	0.080	0.042	0	0	0.042	0.080	0.109	0.128	0.134	0.128	0.109	0.080	0.042	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.013	0.025	0.034	0.040	0.042	0.040	0.034	0.025	0.013	0	0	0.011	0.022	0.030	0.035	0.037	0.035	0.030	0.022	0.011	0
FINAL CAMBER ↑	0	3/8"	1 1/16"	7/8"	1 1/16"	1 1/8"	1 1/16"	7/8"	1 1/16"	3/8"	0	0	3/8"	1 1/16"	1 5/16"	1 1/8"	1 3/16"	1 1/8"	1 5/16"	1 1/16"	3/8"	0

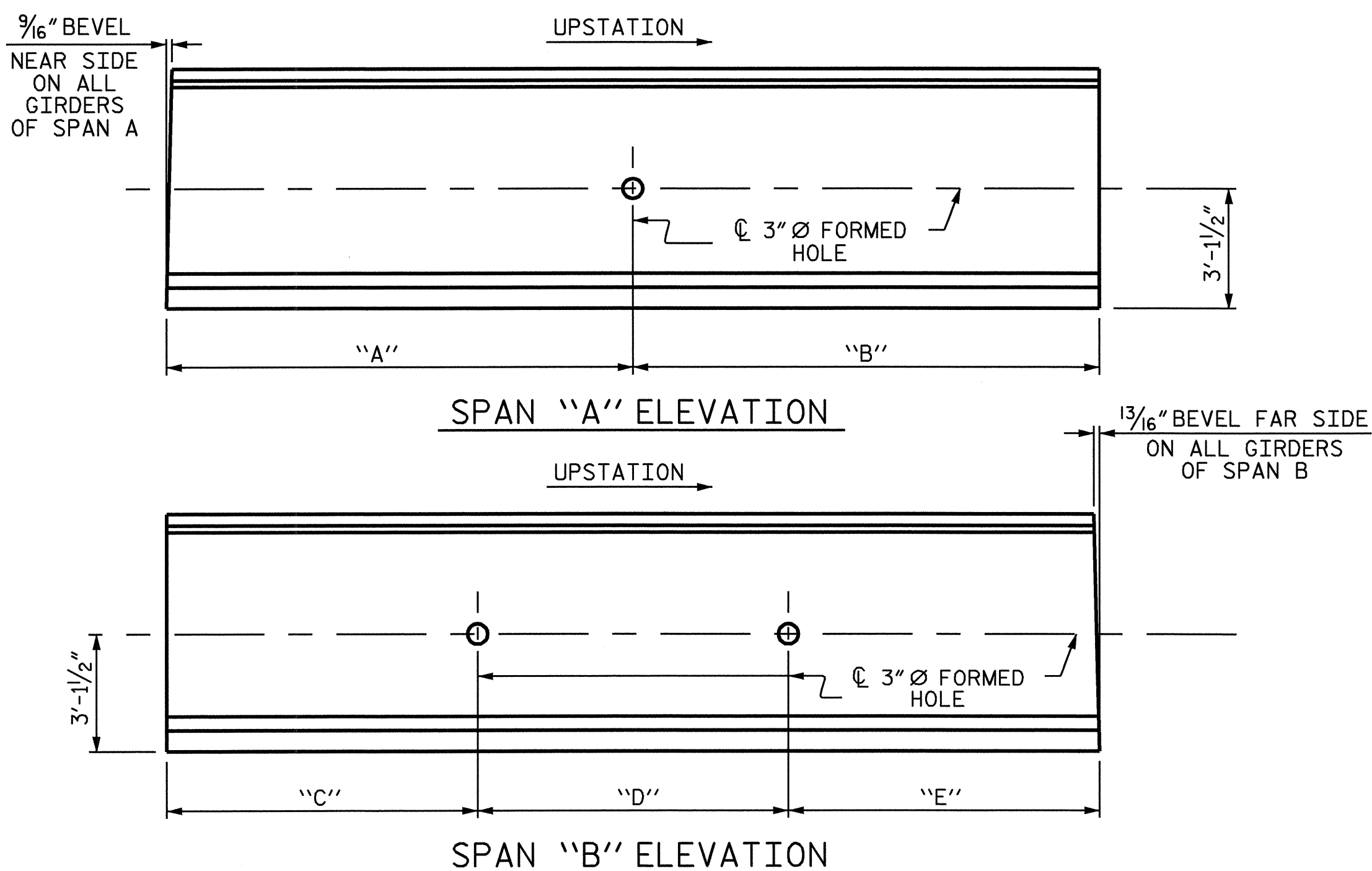
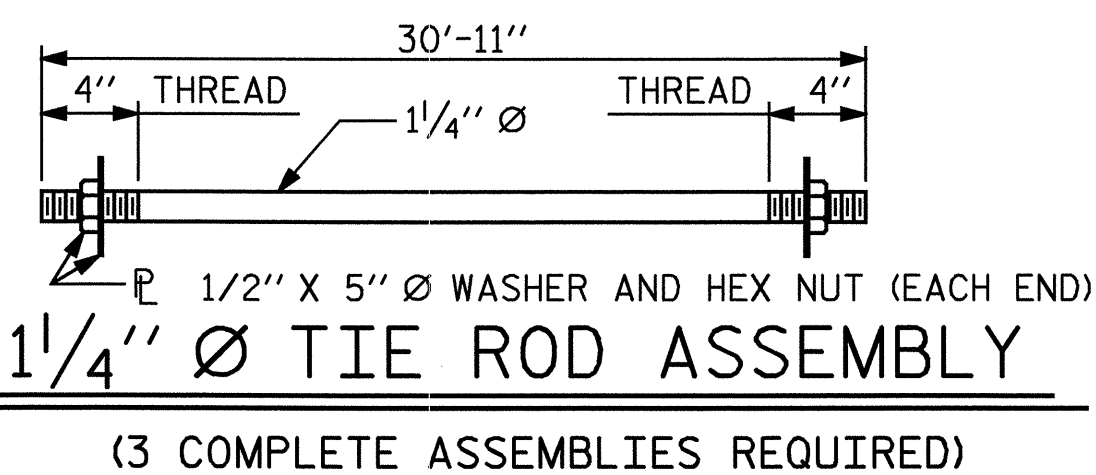
DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION	SPAN B																					
	GIRDER B1											GIRDERS B2, B3, B4 & B5										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.131	0.249	0.340	0.399	0.419	0.399	0.340	0.249	0.131	0	0	0.131	0.249	0.340	0.399	0.419	0.399	0.340	0.249	0.131	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.056	0.106	0.145	0.170	0.178	0.170	0.145	0.106	0.056	0	0	0.047	0.089	0.122	0.143	0.150	0.143	0.122	0.089	0.047	0
FINAL CAMBER ↑	0	7/8"	1 1/16"	2 5/16"	2 3/4"	2 7/8"	2 3/4"	2 5/16"	1 11/16"	7/8"	0	0	1"	1 5/16"	2 5/8"	3 1/16"	3 1/4"	3 1/16"	2 5/8"	1 5/16"	1"	0

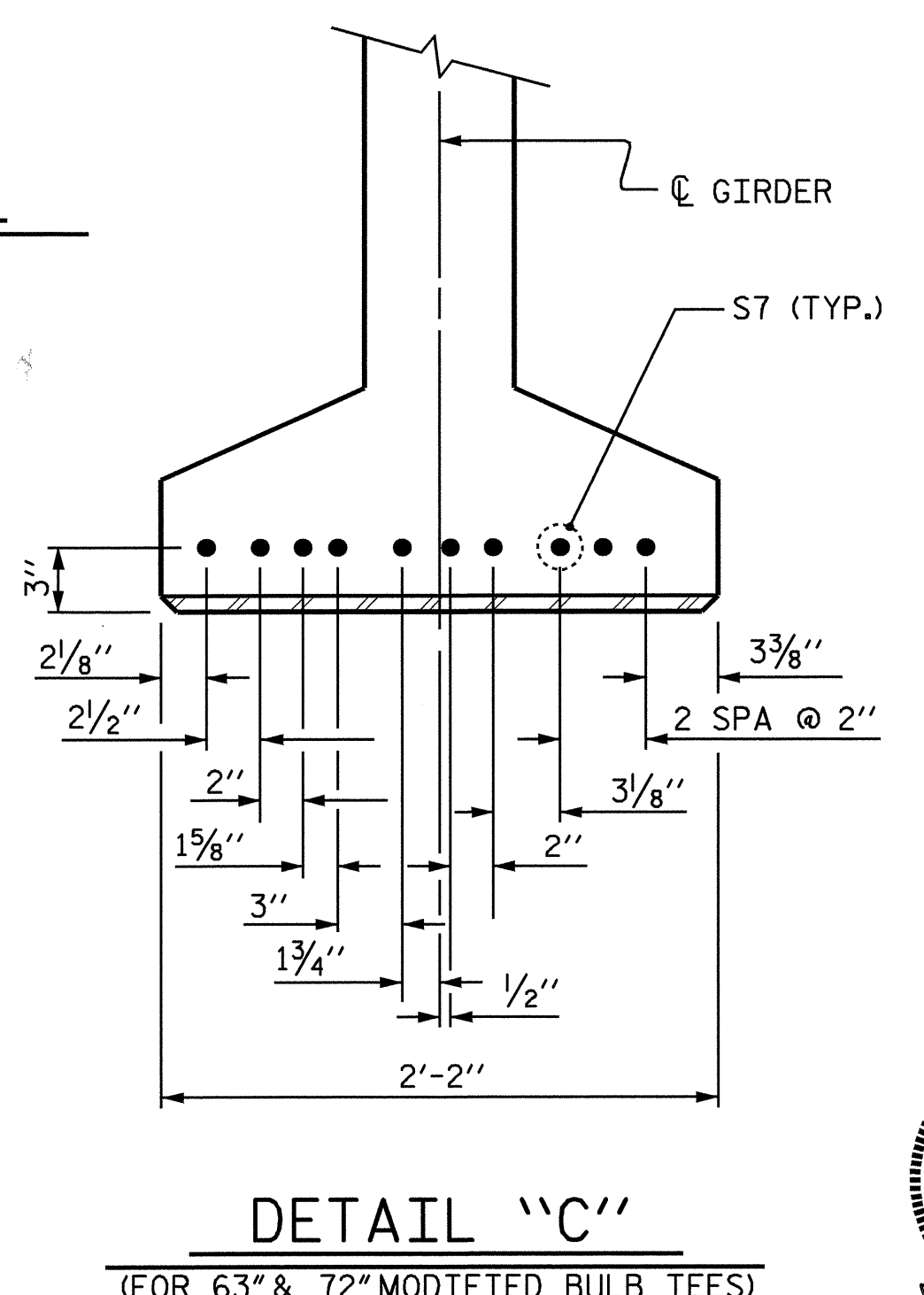
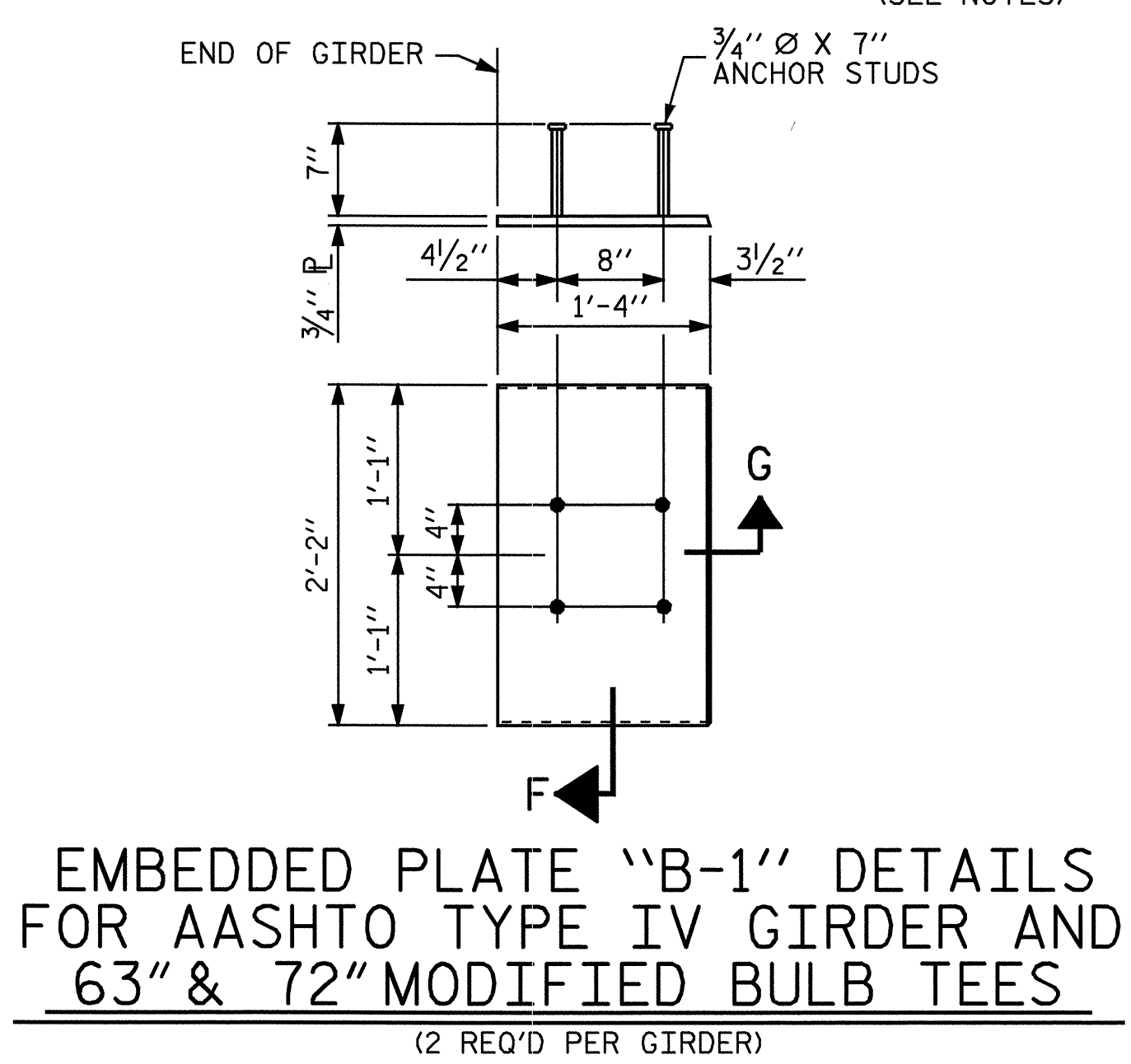
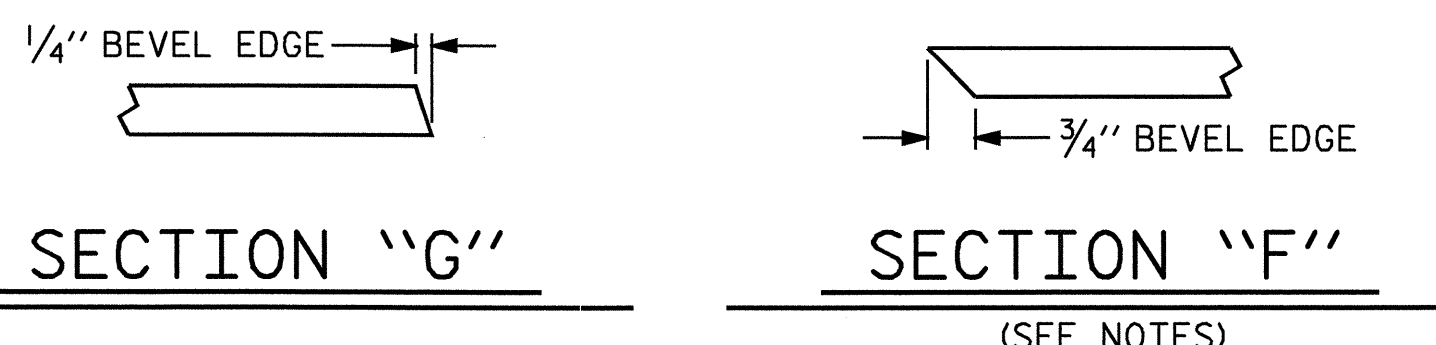
* INCLUDES FUTURE WEARING SURFACE
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

TIE ROD PLACEMENT TABLE

GIRDER	SPAN A		SPAN B		
	DIM. "A"	DIM. "B"	DIM. "C"	DIM. "D"	DIM. "E"
#1	38'-8 1/8"	40'-11 5/8"	39'-3 1/2"	38'-11"	39'-11 1/4"
#2	39'-3"	40'-4 3/4"	39'-5 1/2"	38'-11"	39'-9 1/4"
#3	39'-9 7/8"	39'-9 7/8"	39'-7 3/8"	38'-11"	39'-7 3/8"
#4	40'-4 3/4"	39'-3"	39'-9 3/8"	38'-11"	39'-5 3/8"
#5	40'-11 5/8"	38'-8 1/8"	39'-11 1/4"	38'-11"	39'-3 1/2"



BEVEL ON GIRDER & TIE ROD PLACEMENT DETAILS



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.

TIE ROD ASSEMBLY SHALL BE AASHTO M270 GRADE 36 STRUCTURAL STEEL.

ALL REINFORCING STEEL SHALL BE GRADE 60.

APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES INDICATED IN ELEVATION VIEW.

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

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

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

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4400 PSI FOR SPAN A AND 6200 PSI FOR SPAN B.

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

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

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

A 2" x 2" CHAMFER IS ALLOWED AT THE INTERSECTION OF THE WEB AND THE BOTTOM FLANGE OF THE 63" AND 72" MODIFIED BULB TEES ONLY.

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

PROJECT NO. U-4006
GUILFORD COUNTY
STATION: 20+90.21 -L-

SHEET 3 OF 3
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS (LEFT LANE)



REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14	
1			3			TOTAL SHEETS	75
2			4				

ASSEMBLED BY : M. POOLE/A.S. DATE : 5/09
CHECKED BY : J.R. DUGGINS DATE : 5/09
DRAWN BY : ELR 11/91 REV. 10/17/00 RWW/LES
CHECKED BY : GRP 11/91 REV. 7/10/01RR LES/RDR
REV. 5/11/06 TLA/GM

NOTES

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

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

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

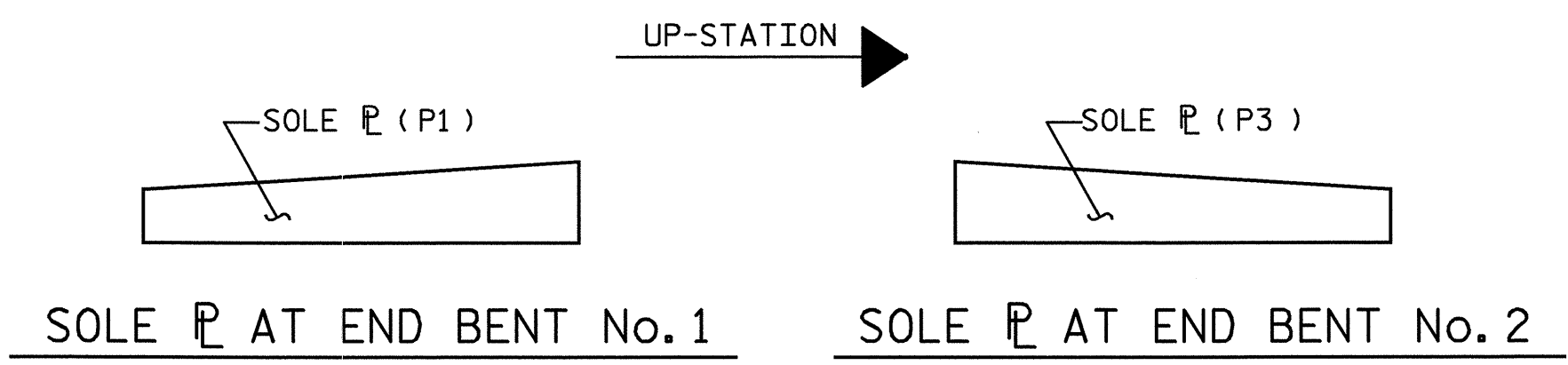
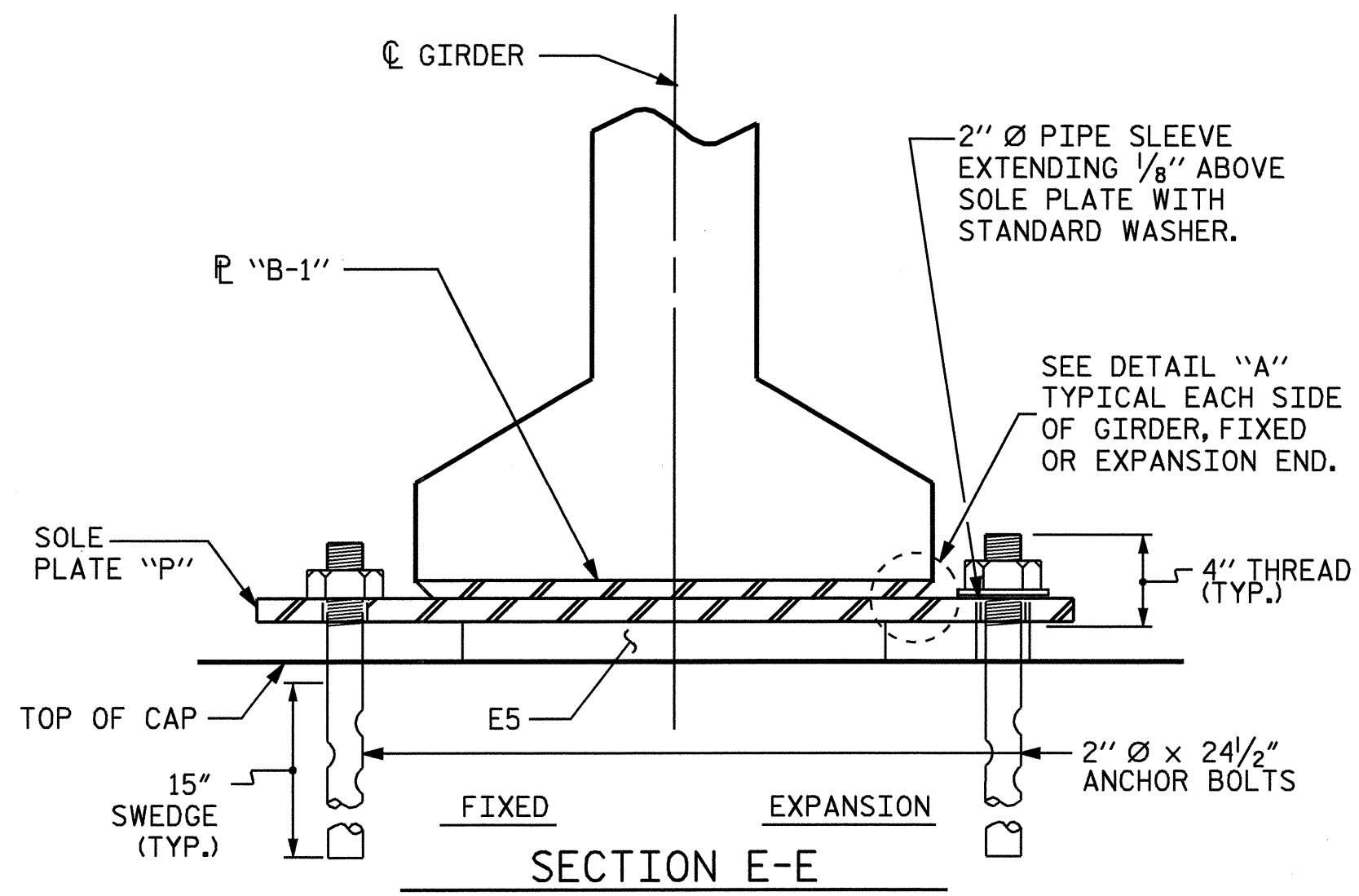
PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE PORTION OF THE EMBEDDED PLATE AND SOLE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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

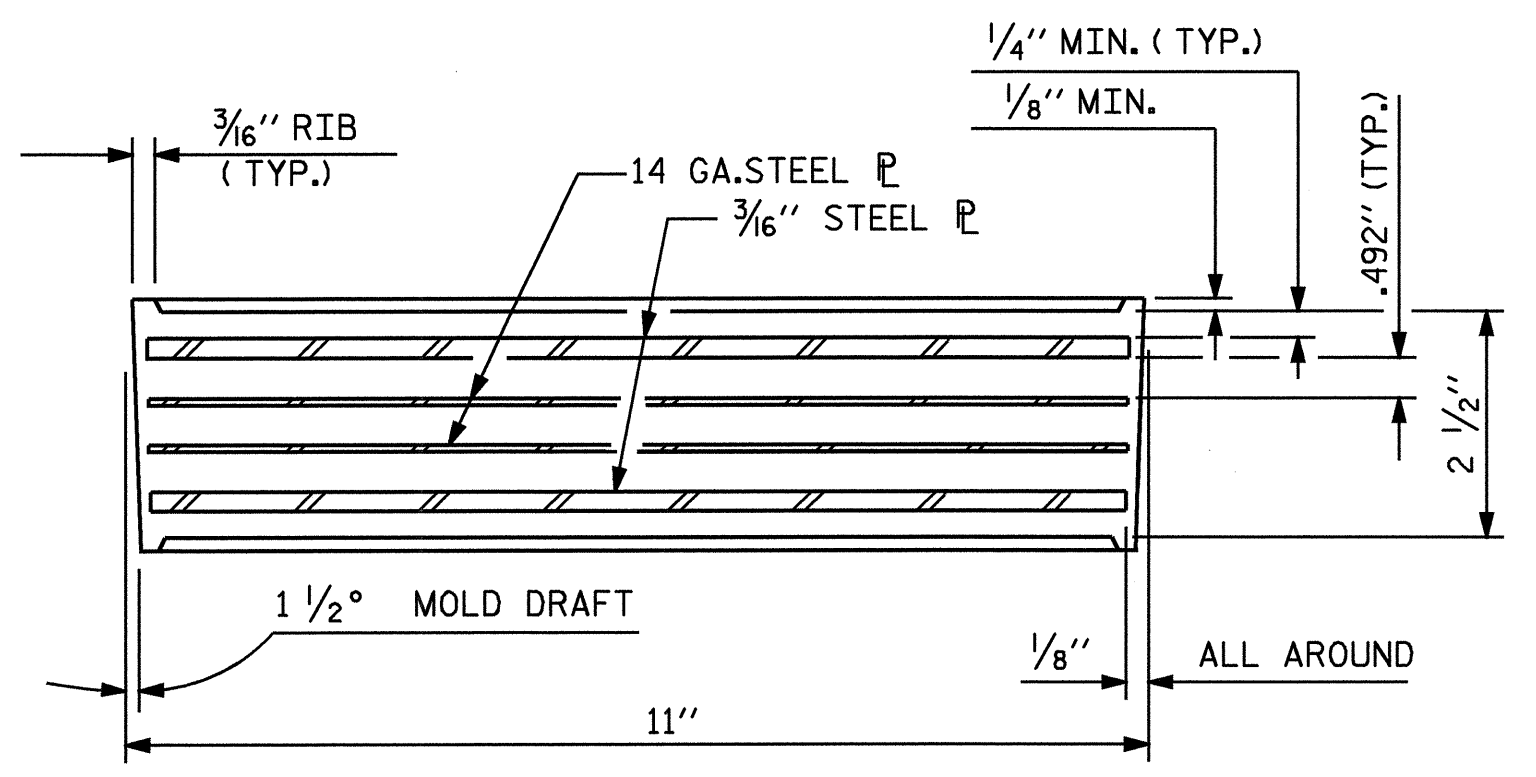
SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

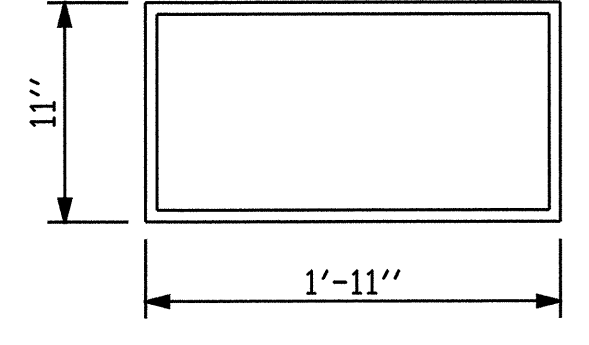
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.



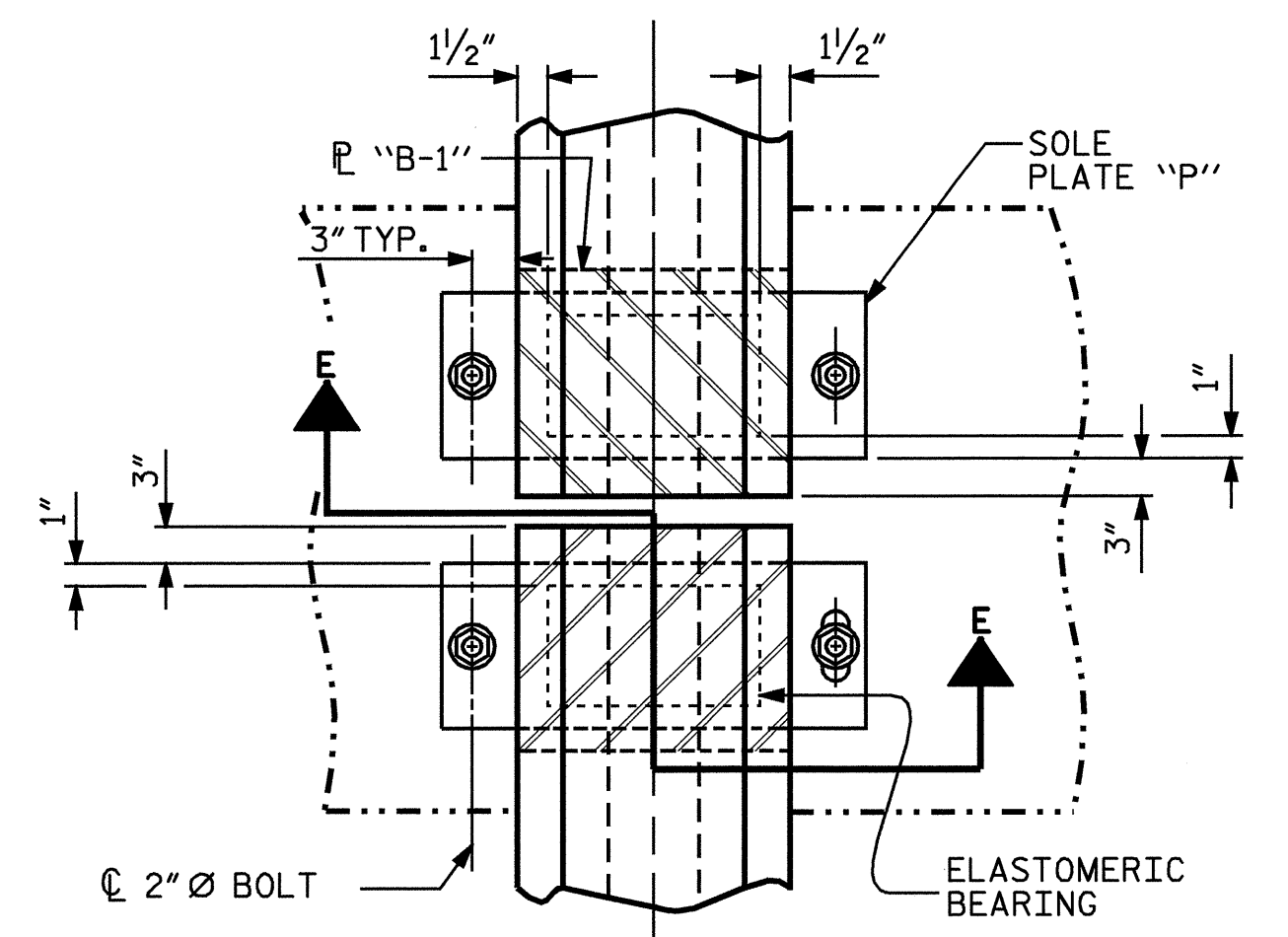
SOLE P PLACEMENT DETAIL



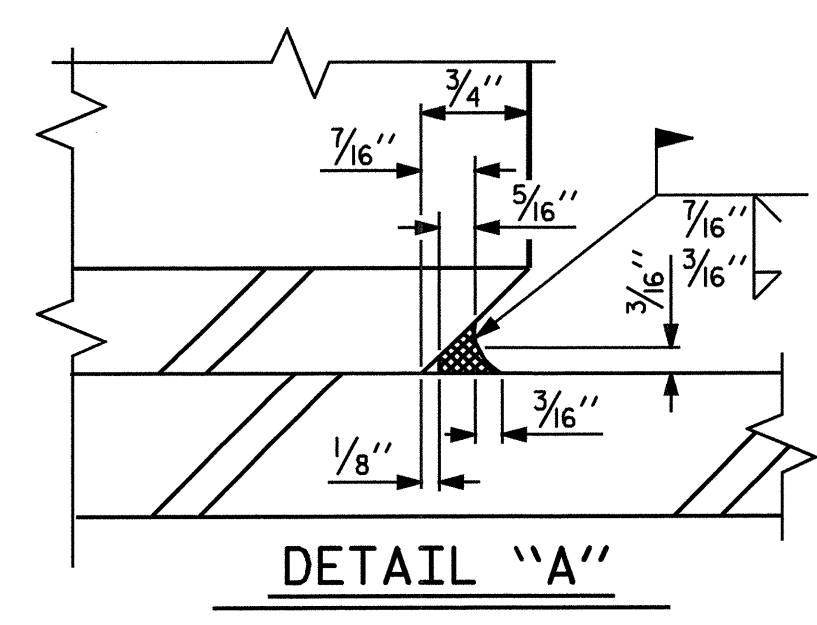
TYPICAL SECTION OF ELASTOMERIC BEARINGS



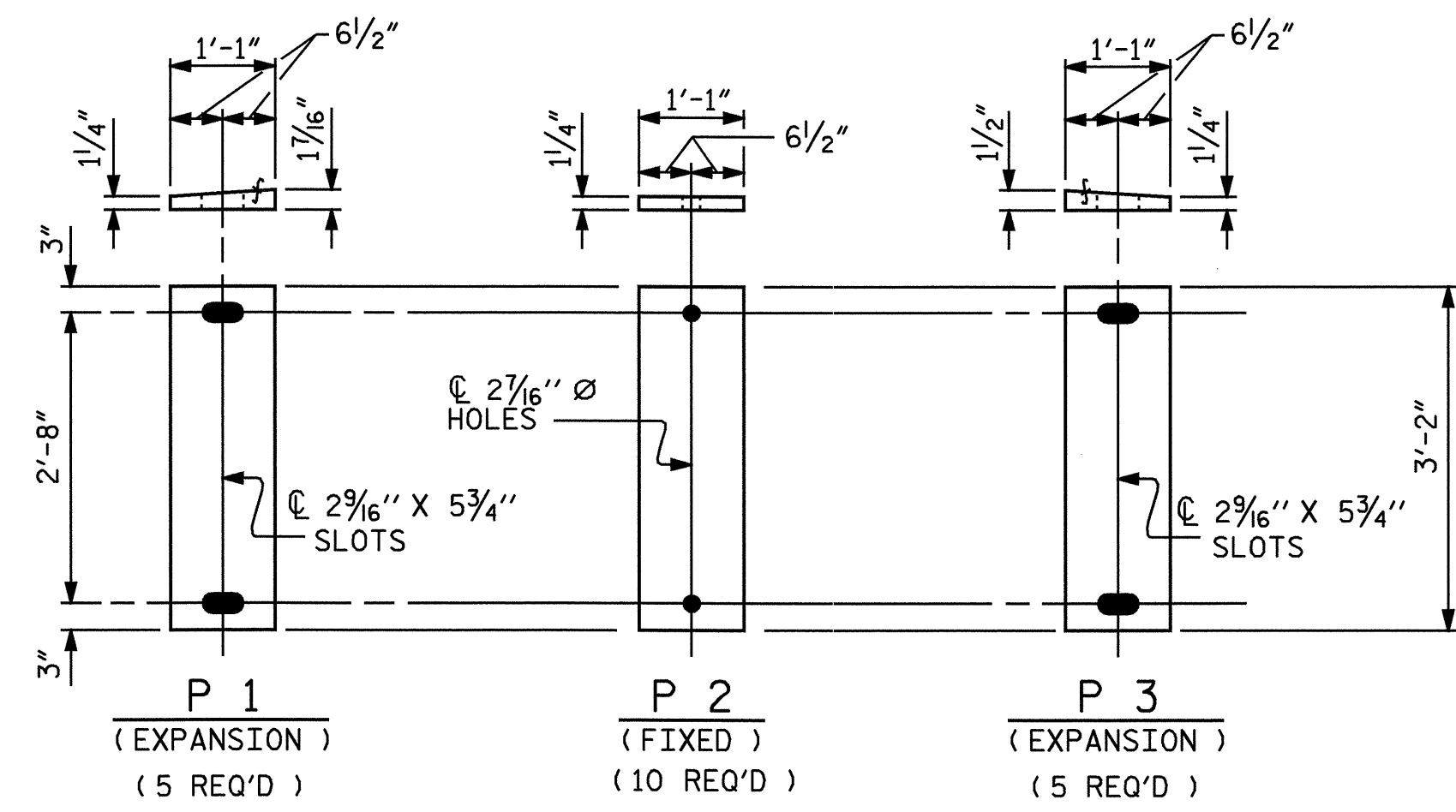
E5 (20 REQ'D)
PLAN VIEW OF ELASTOMERIC BEARING
TYPE VI



TYPICAL HALF-PLAN (SHOWING CONTINUOUS BENT)
TYPICAL HALF-PLAN (SHOWING SIMPLE SPAN)



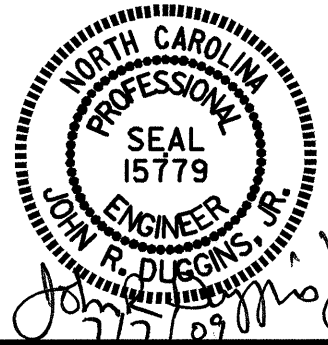
DETAIL "A"



SOLE PLATE DETAILS ("P")

LOAD RATINGS	
TYPE VI	211 K

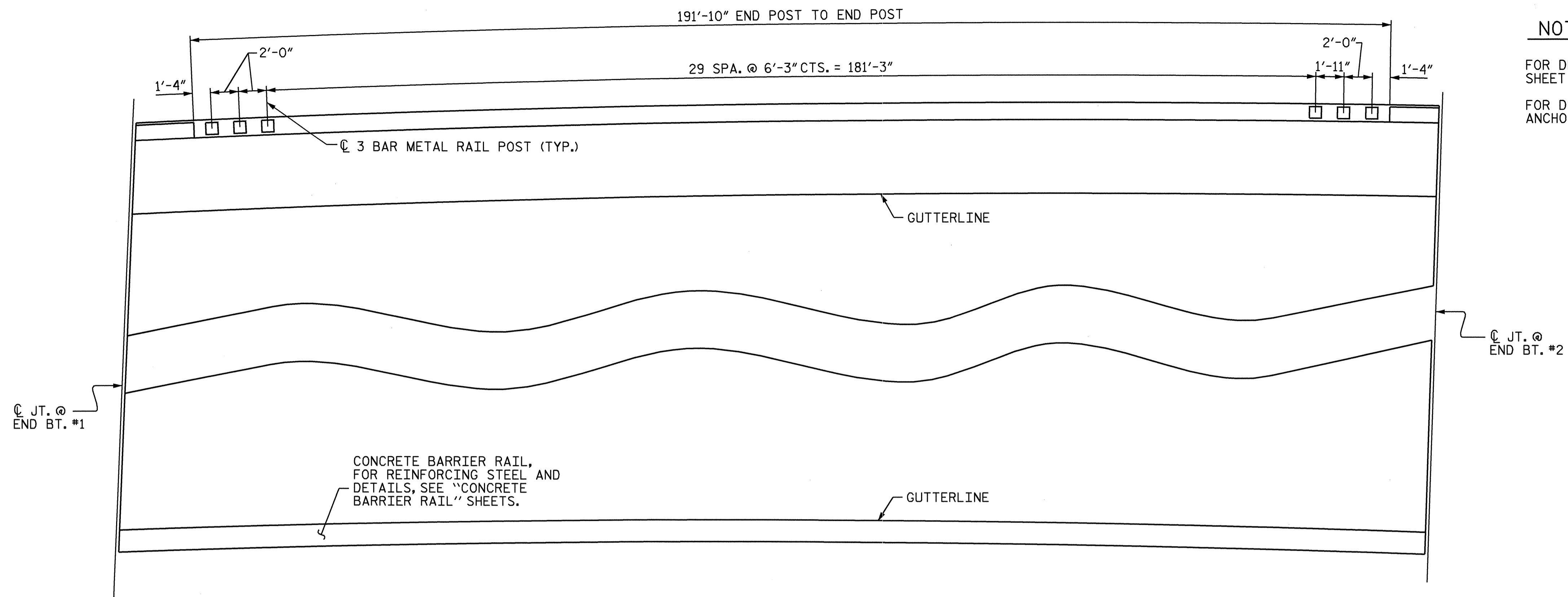
PROJECT NO. U-4006
GUILFORD COUNTY
STATION: 20+90.21 -L-



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
ELASTOMERIC BEARING
DETAILS
PRESTRESSED CONCRETE GIRDER
SUPERSTRUCTURE
(LEFT LANE)

REVISIONS						SHEET NO. S-15
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 15
2			4			

ASSEMBLED BY: D. HODGE	DATE: 4/09
CHECKED BY: J.R. DUGGINS	DATE: 4/09
DRAWN BY: EEM 2/97	REV. 8/16/99 RWW/LES
CHECKED BY: VAP 2/97	REV. 10/17/00 RWW/LES
	REV. 5/1/06 TLA/GM



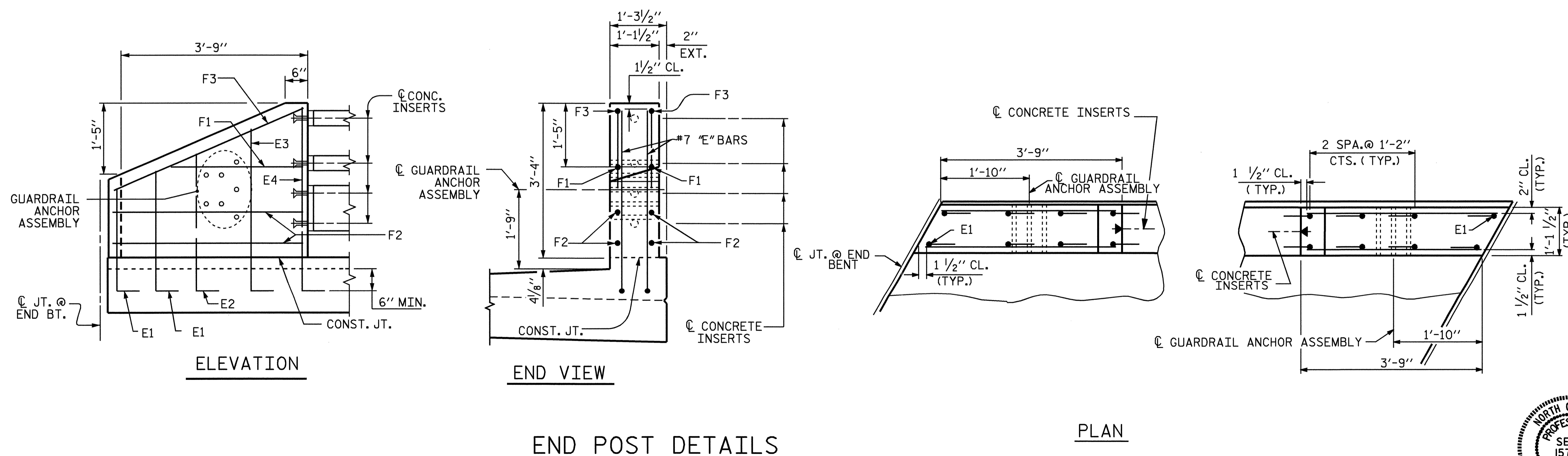
NOTES :

FOR DETAILS OF CONCRETE INSERTS, SEE "3 BAR METAL RAIL" SHEET 3 OF 3.

FOR DETAILS OF GUARDRAIL ANCHOR ASSEMBLIES, SEE "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" SHEET.

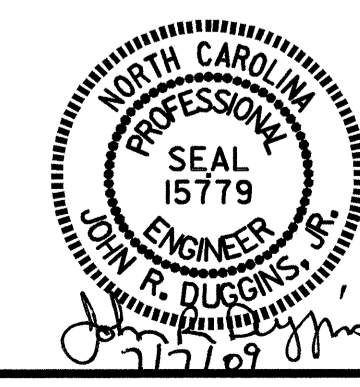
PLAN OF RAIL POST SPACING

RAIL POST DIMENSIONS ARE MEASURED ALONG ARC AT OUTSIDE OF SUPERSTRUCTURE.



PROJECT NO. U-4006
 GUILFORD COUNTY
 STATION: 20+90.21 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**RAIL POST SPACINGS
 AND
 END OF RAIL DETAILS
 FOR 3 BAR METAL RAILS
 (LEFT LANE)**



DRAWN BY : D. HODGE DATE : 4/09
 CHECKED BY : J.R. DUGGINS DATE : 4/09

30-JUN-2009 15:03
 r:\structures\4006\lambert\lambertstation\Left Lane\U-4006.SD_3MR.dgn
 dahodge

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-17
1			3			TOTAL SHEETS
2			4			75

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 STANDARD NO. BMR7.

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.

PAY LENGTH = 191.82 LIN.FT.

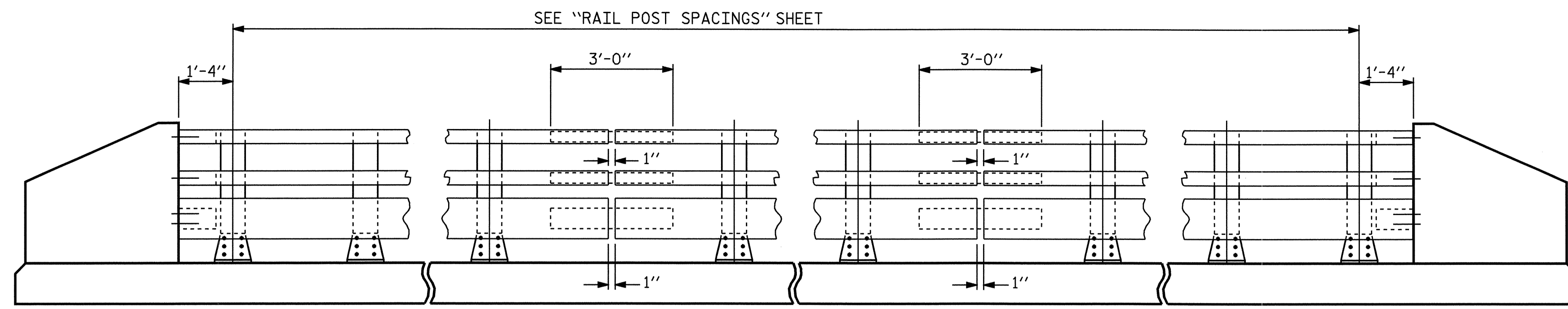


PROJECT NO. U-4006
 GUILFORD COUNTY
 STATION: 20+90.21 -L-

SHEET 1 OF 3
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 3 BAR METAL RAIL
 (LEFT LANE)

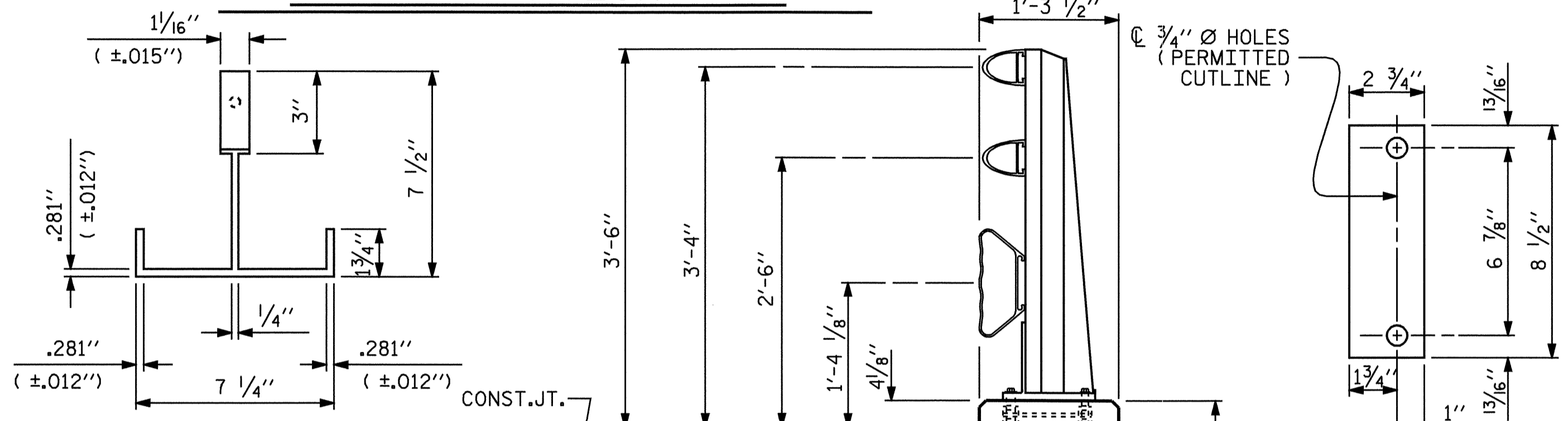
REVISIONS						SHEET NO. 3-18
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 15
2			4			

STD. NO. BMR5

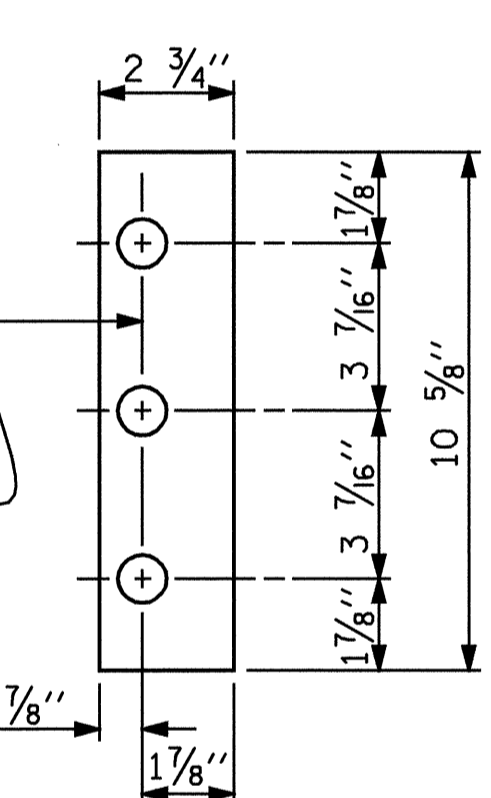


NOTE:
 FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR7.

ELEVATION



REAR PLATE

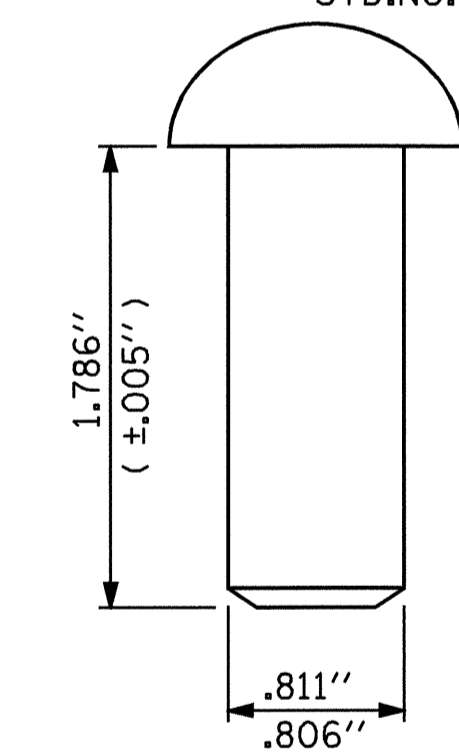


FRONT PLATE SHIM DETAILS

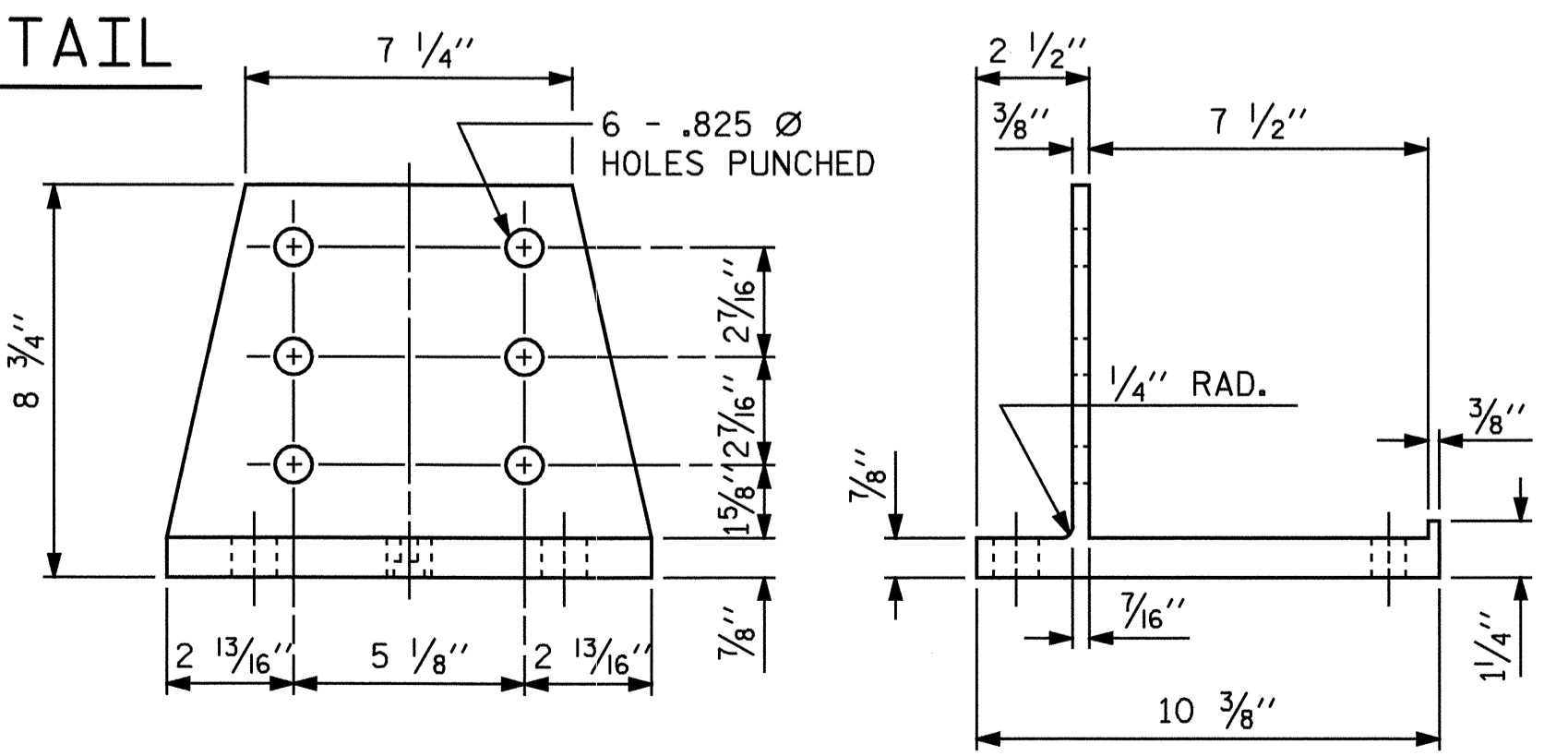
NOTE:
 SHIMS MAY BE CUT ALONG PERMITTED CUTLINE OR SLOTTED TO EDGE OF PLATE TO FACILITATE PLACEMENT.

SECTION THRU RAIL

FOR ANCHOR ASSEMBLY, SEE "3 BAR METAL RAIL" STD.No.BMR6



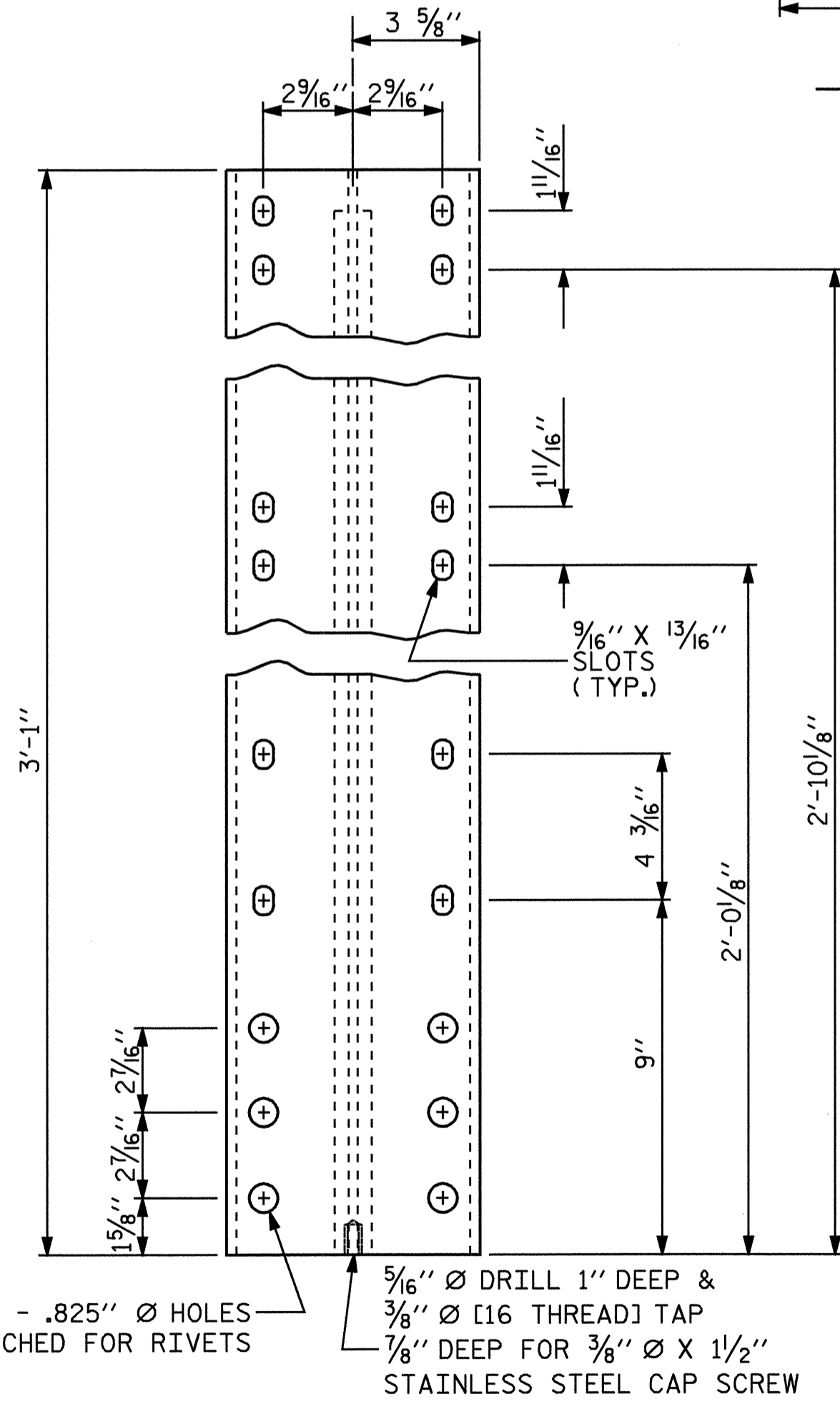
RIVET DETAIL



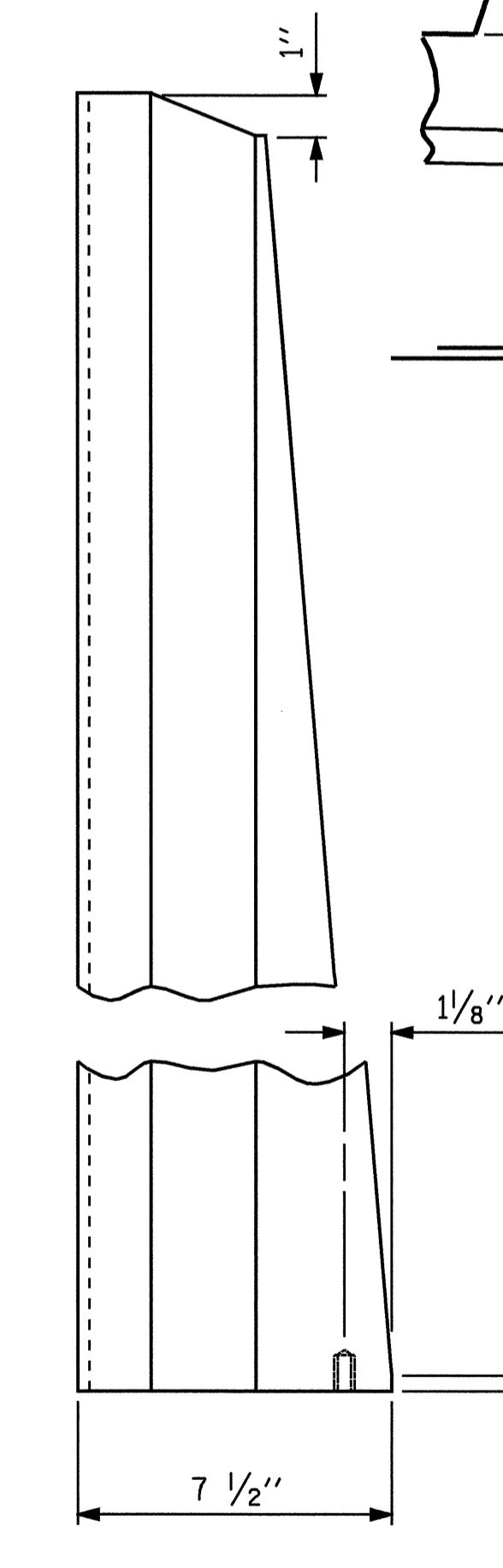
FRONT ELEVATION

SIDE ELEVATION

POST BASE DETAILS



FRONT ELEVATION

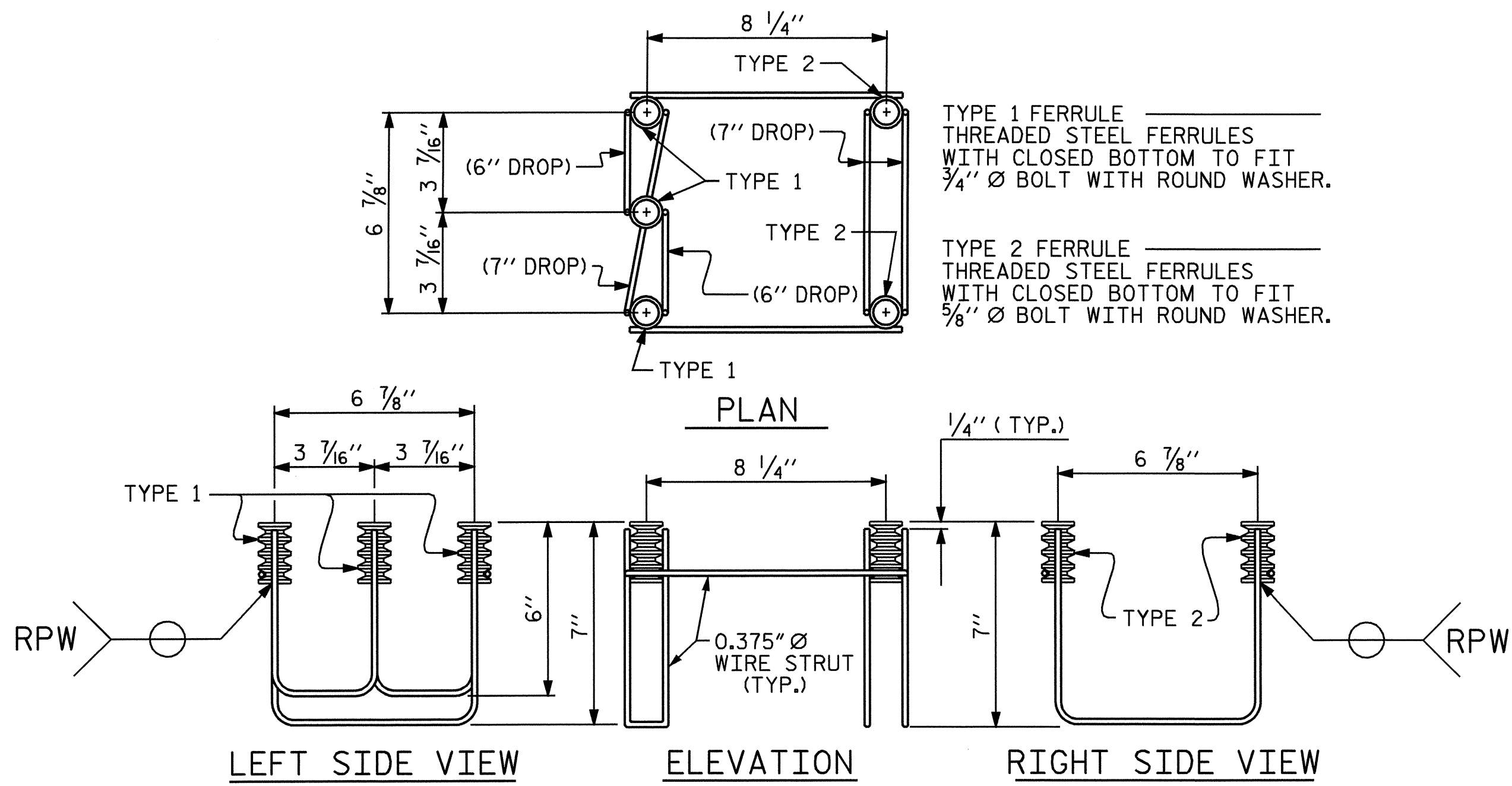


SIDE ELEVATION

DETAILS OF POST

6 - .825" Ø HOLES PUNCHED FOR RIVETS
 5/16" Ø DRILL 1" DEEP & 3/8" Ø [16 THREAD] TAP 7/8" DEEP FOR 3/8" Ø X 1 1/2" STAINLESS STEEL CAP SCREW
 9/16" X 13/16" SLOTS (TYP.)

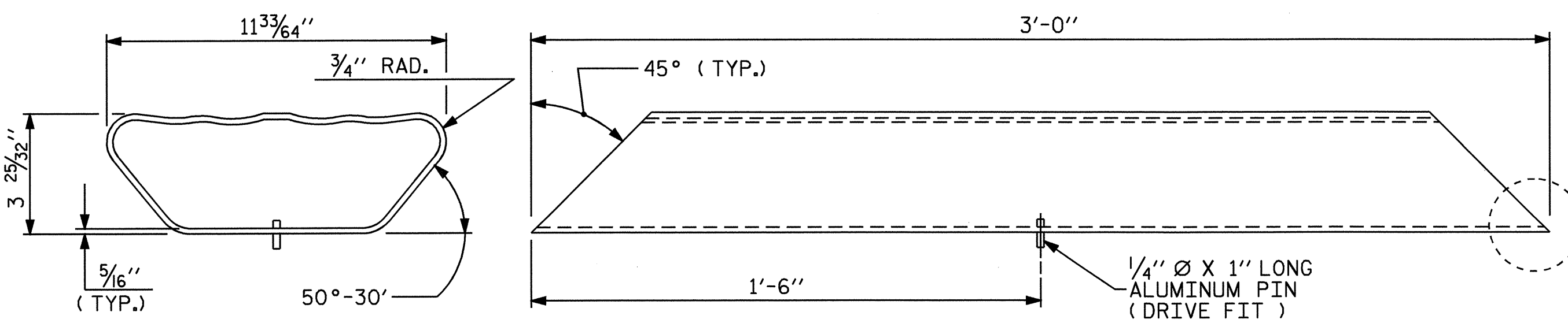
ASSEMBLED BY : D. HODGE	DATE : 4/09
CHECKED BY : J.R. DUGGINS	DATE : 4/09
DRAWN BY : JMB 1/88	REV. 10/17/00 RWW/LES
CHECKED BY : GGH 1/88	REV. 5/7/03 RWW/JTE
	REV. 5/1/06 TLA/GM



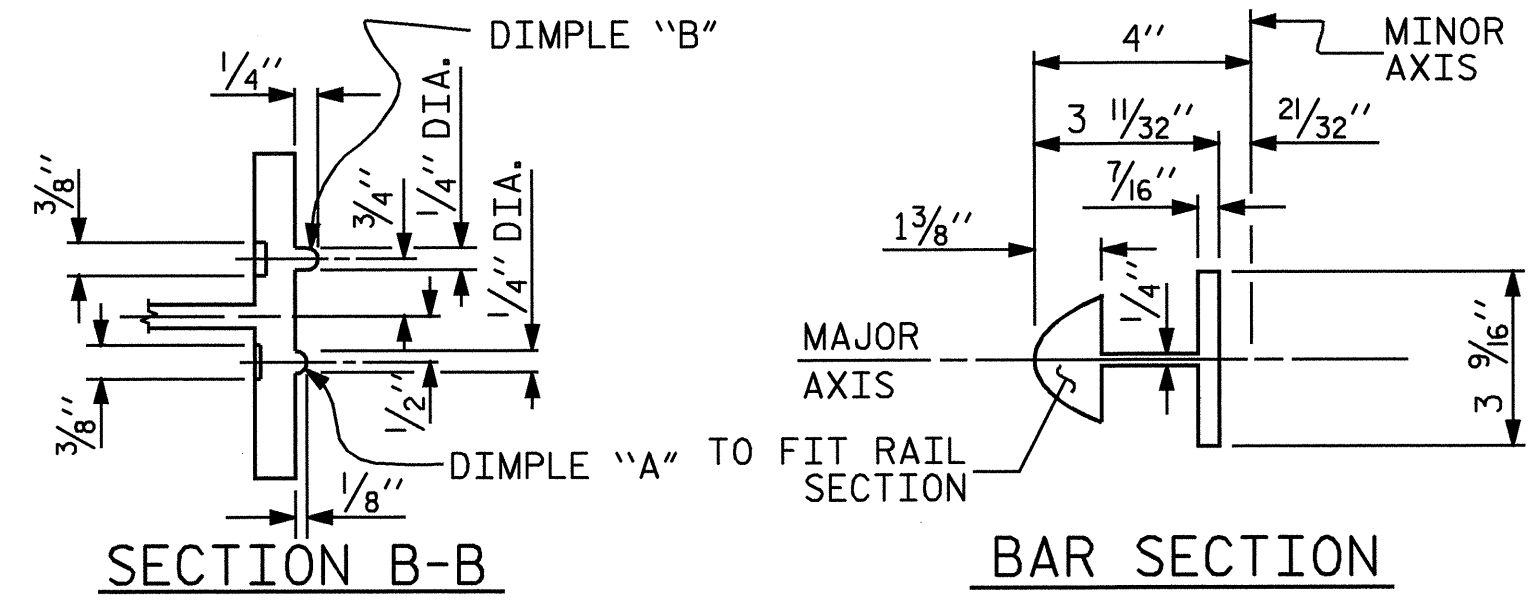
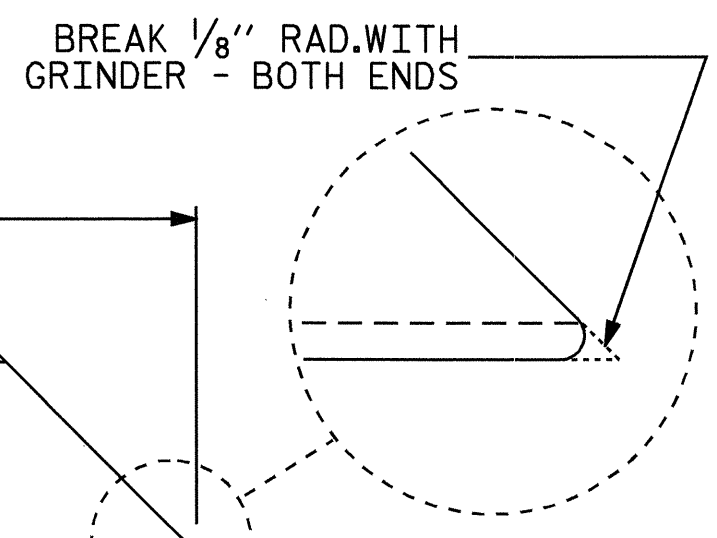
LEFT SIDE VIEW ELEVATION RIGHT SIDE VIEW

5-BOLT METAL RAIL ANCHOR ASSEMBLY

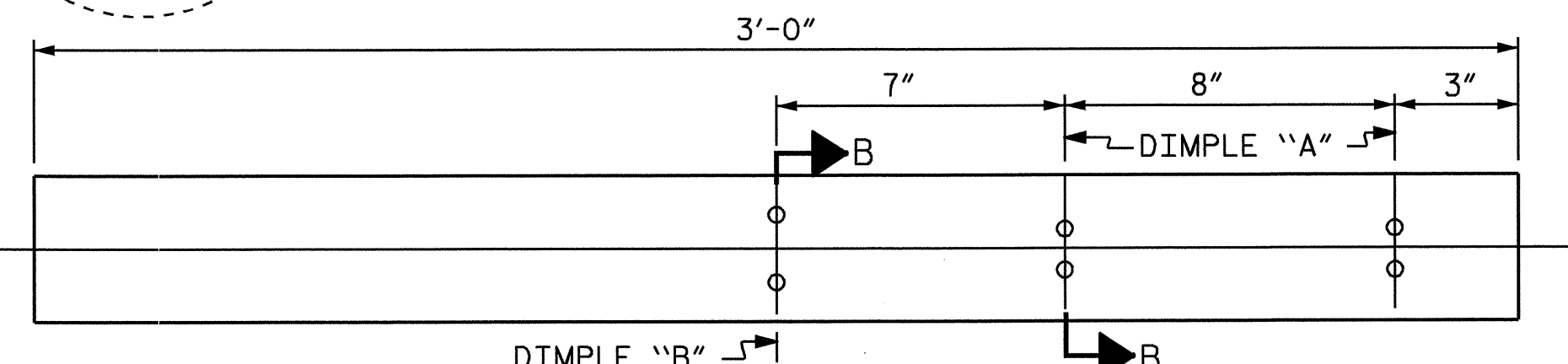
(34 ASSEMBLIES REQUIRED)



END VIEW PLAN VIEW
BOTTOM RAIL EXPANSION BAR

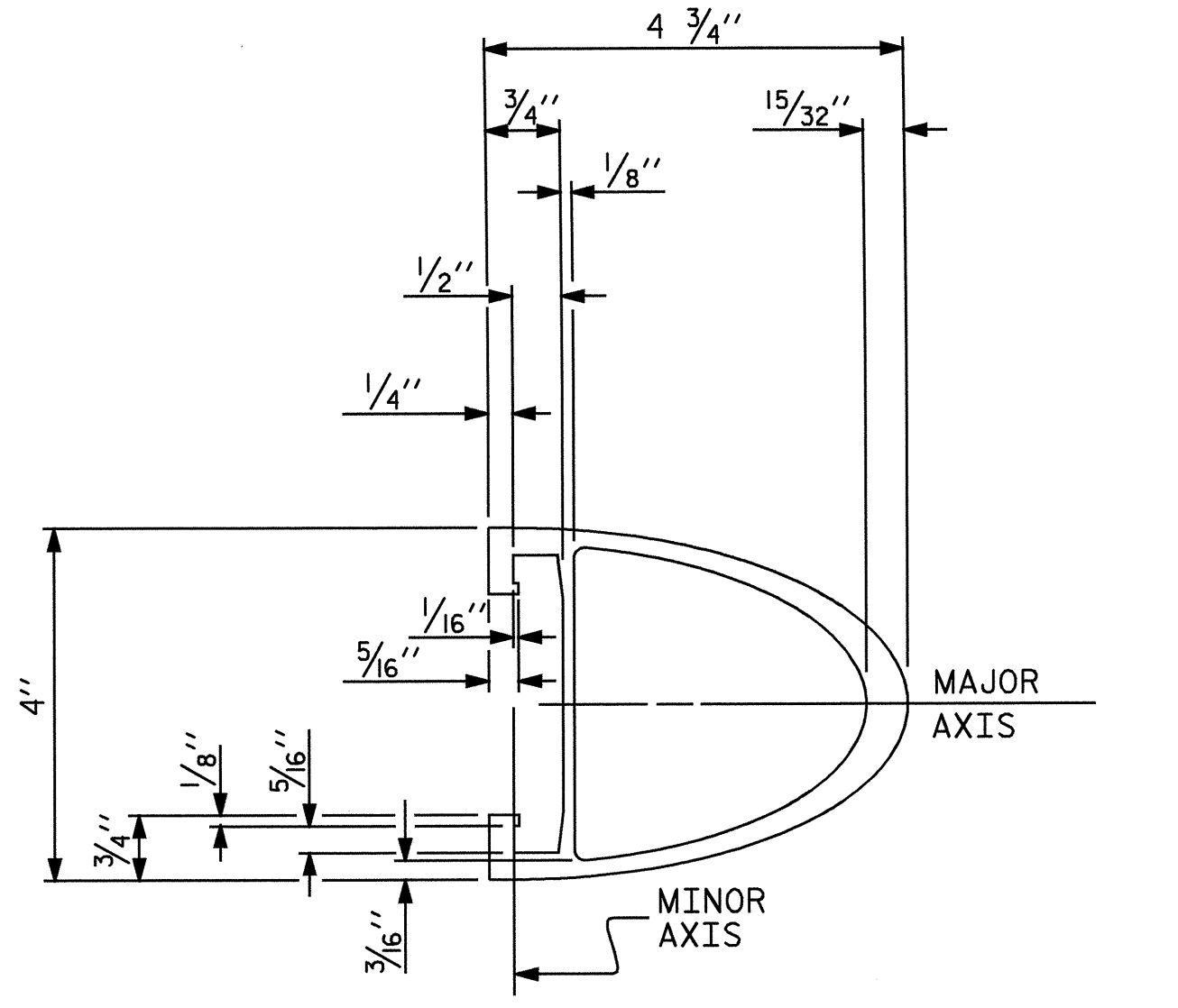


SECTION B-B BAR SECTION

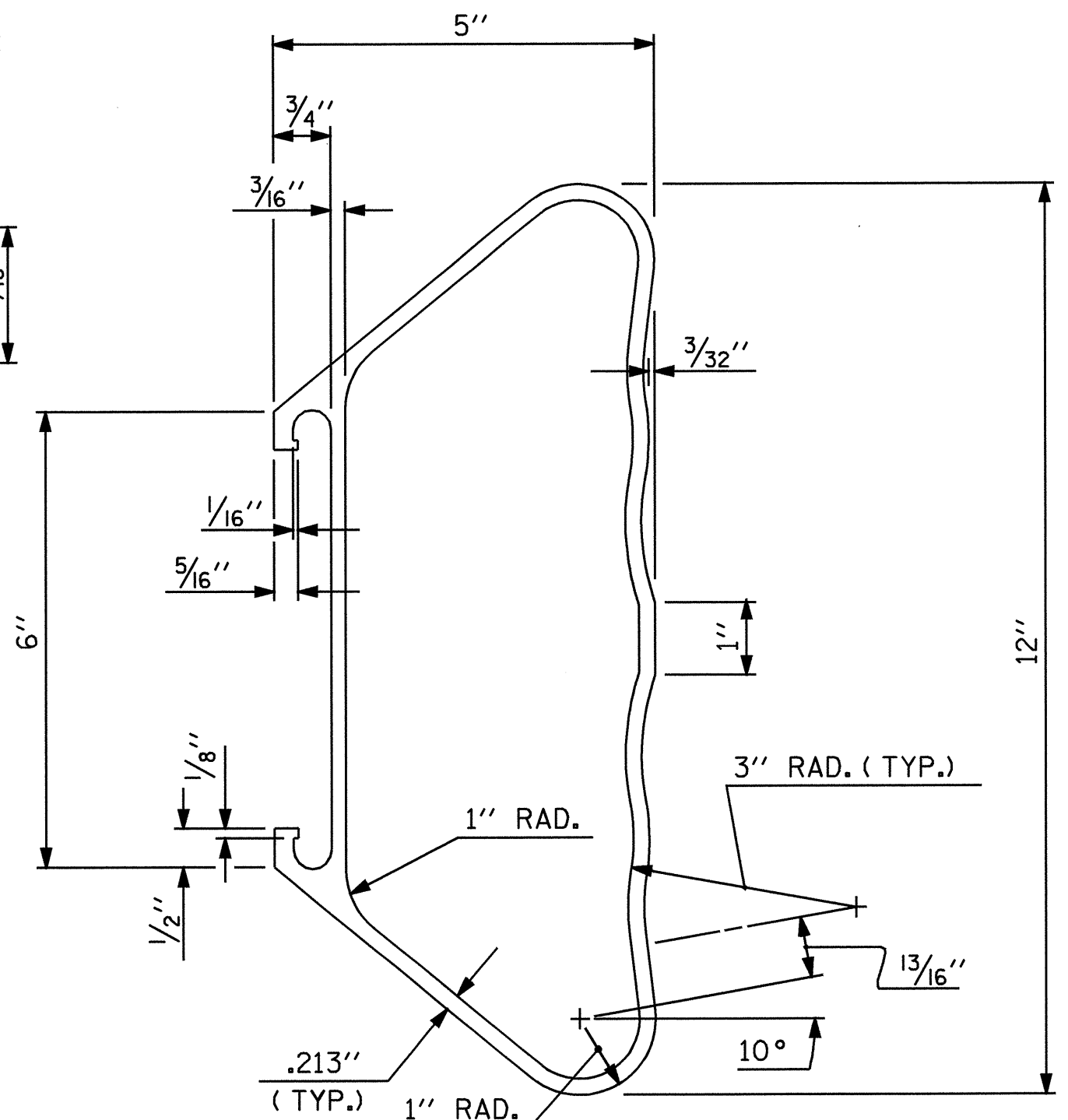


BACK ELEVATION

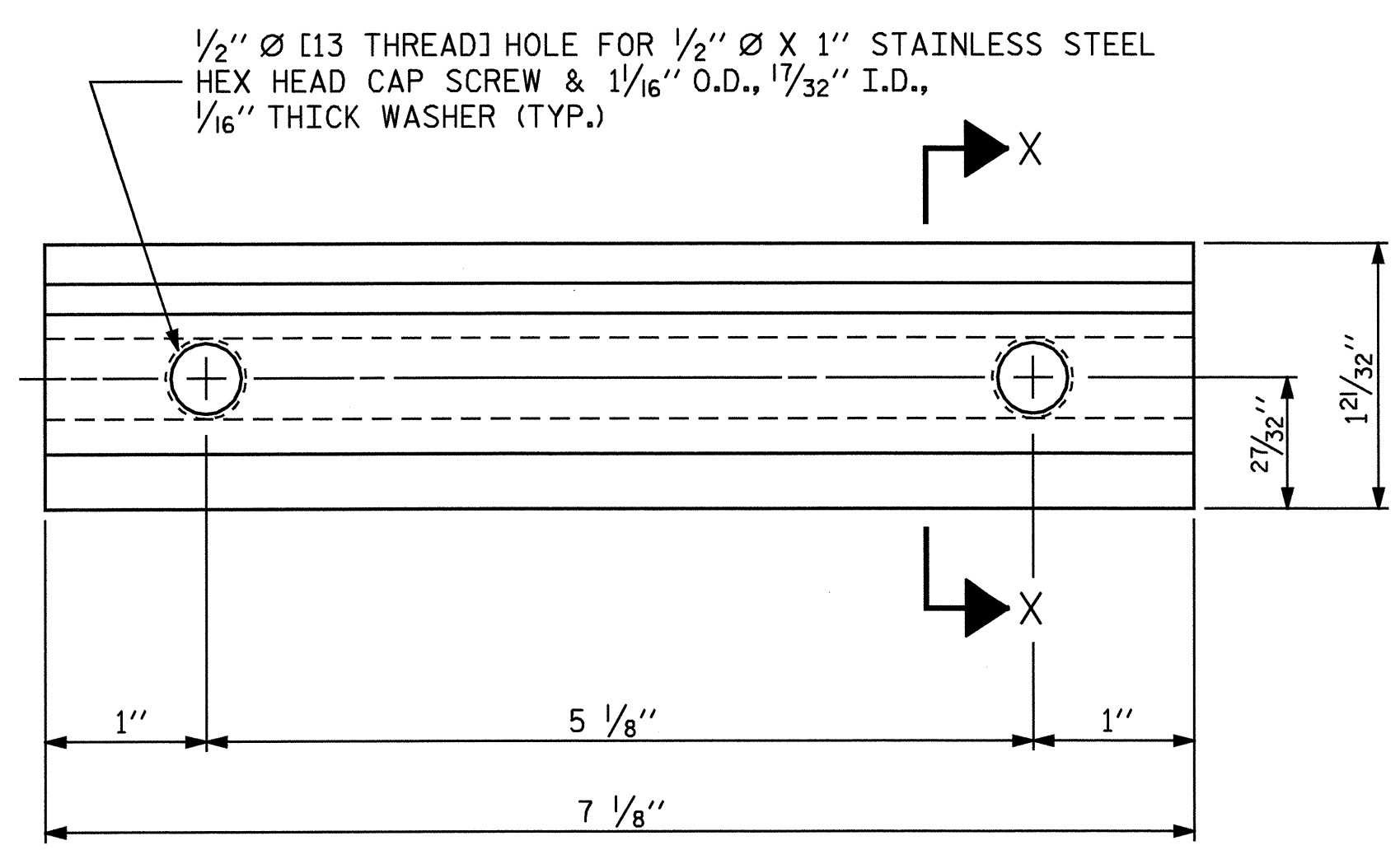
TOP & MIDDLE RAIL EXPANSION BAR



TOP & MIDDLE RAIL SECTION

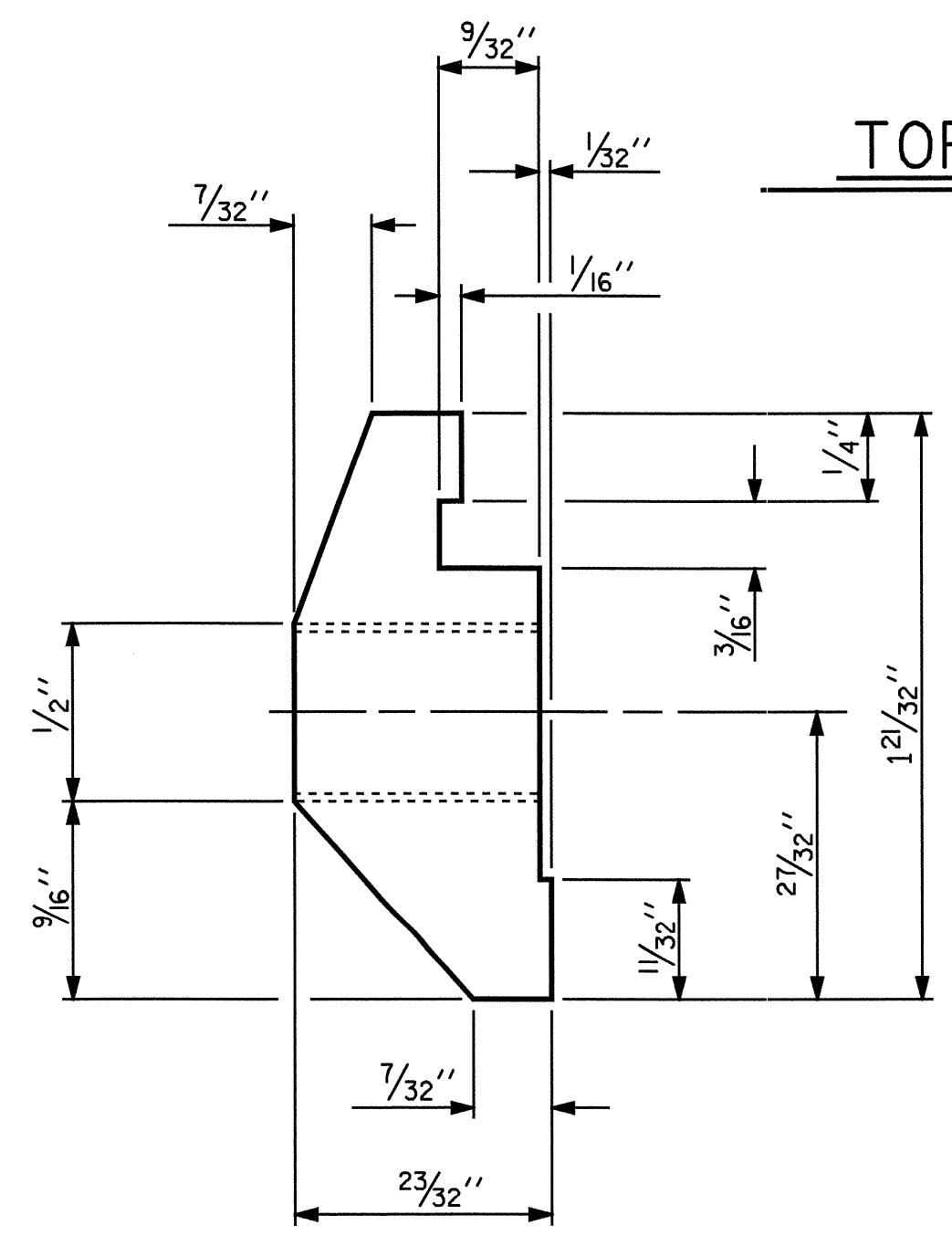


BOTTOM RAIL SECTION

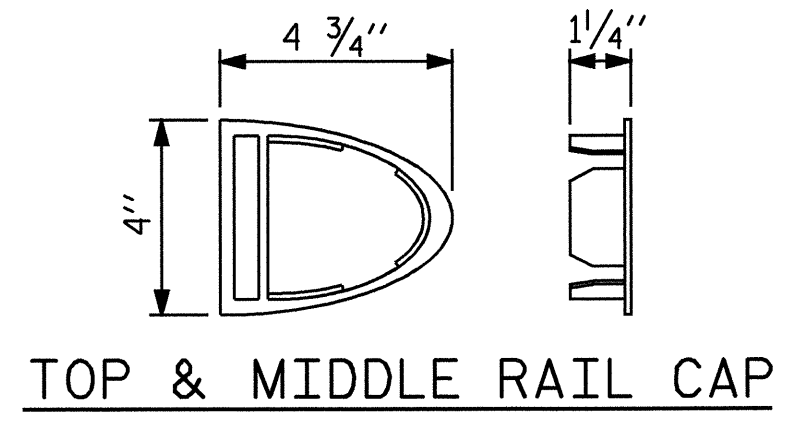


ELEVATION
CLAMP BAR DETAIL

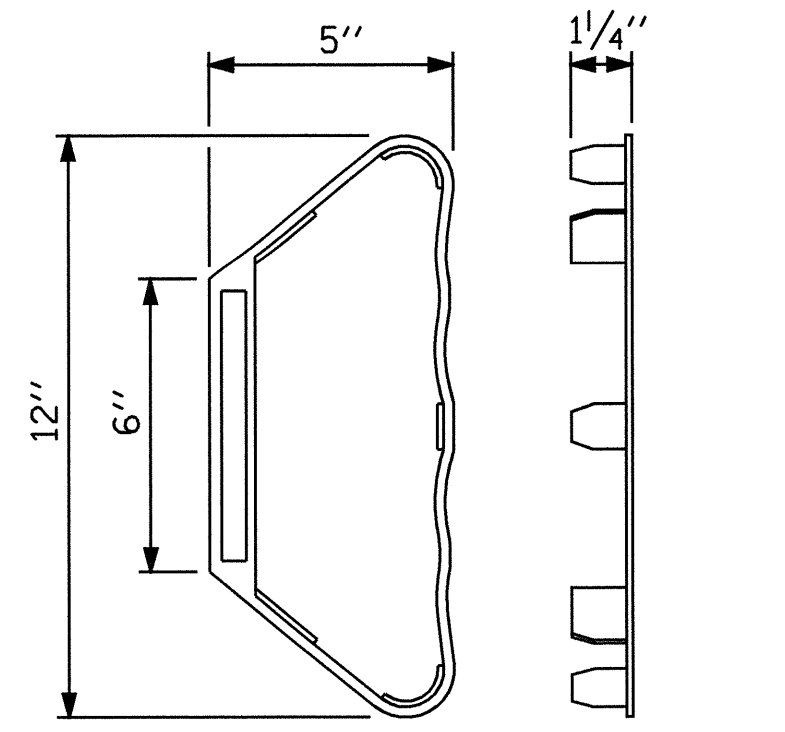
(6 REQUIRED PER POST)



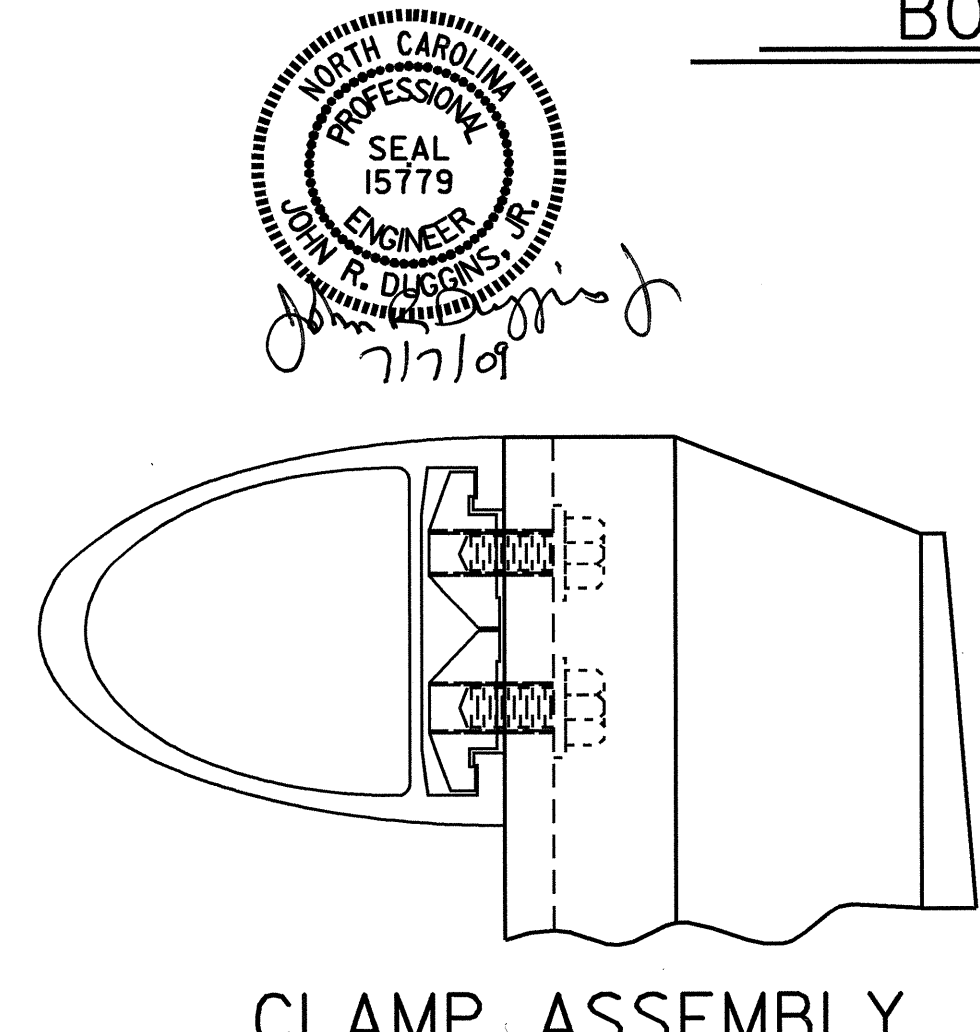
SECTION X-X



TOP & MIDDLE RAIL CAP



BOTTOM RAIL CAP



CLAMP ASSEMBLY



ASSEMBLED BY : D. HODGE	DATE : 4/09
CHECKED BY : J.R. DUGGINS	DATE : 4/09
DRAWN BY : JMB 1/88	REV. 7/10/01 RWW/LES
CHECKED BY : GGH 1/88	REV. 5/7/03 RWW/JTE
	REV. 5/1/06 TLA/GM

PROJECT NO. U-4006
GUILFORD COUNTY
 STATION: 20+90.21 -L-
 SHEET 2 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD					
3 BAR METAL RAIL (LEFT LANE)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. 8-19
					TOTAL SHEETS 15

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 (STD. No. BMR6).

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.

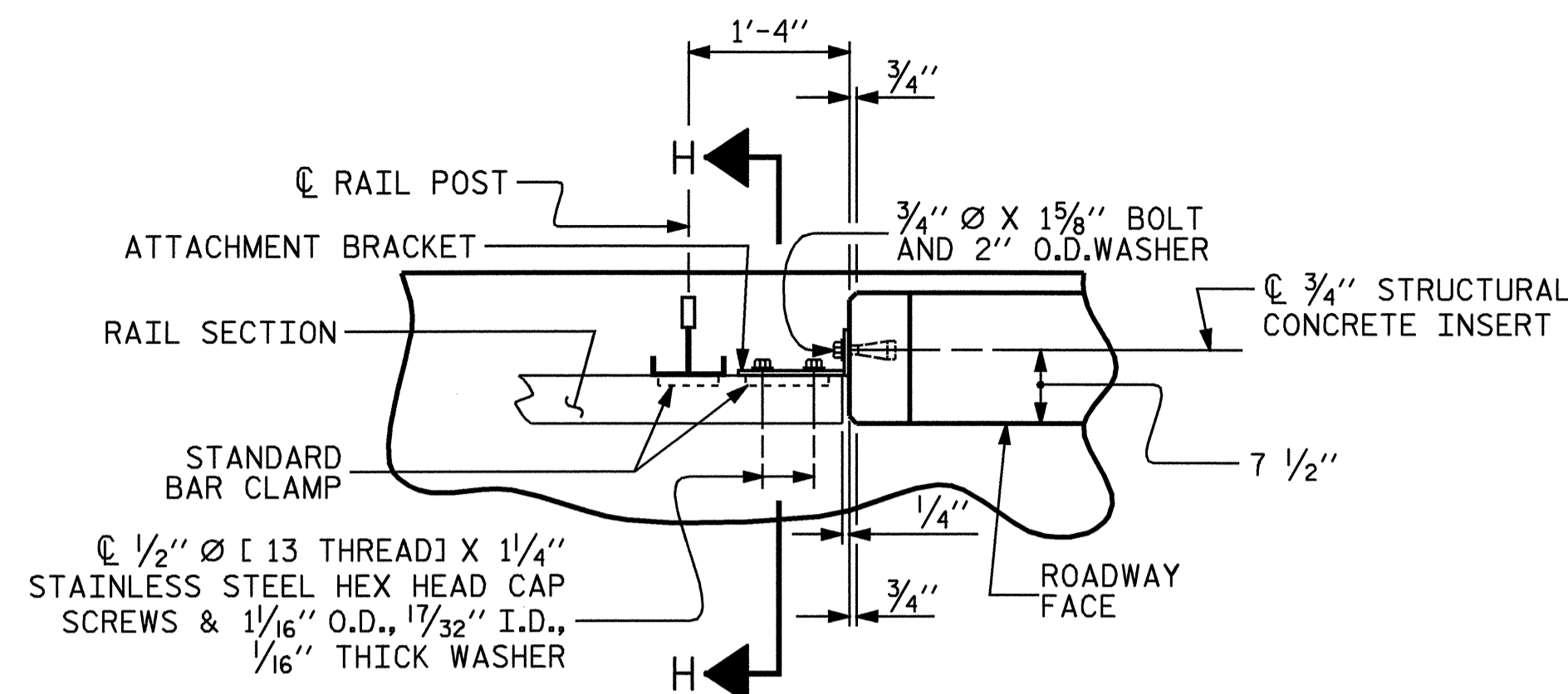
THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø X 1 5/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" Ø X 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT 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

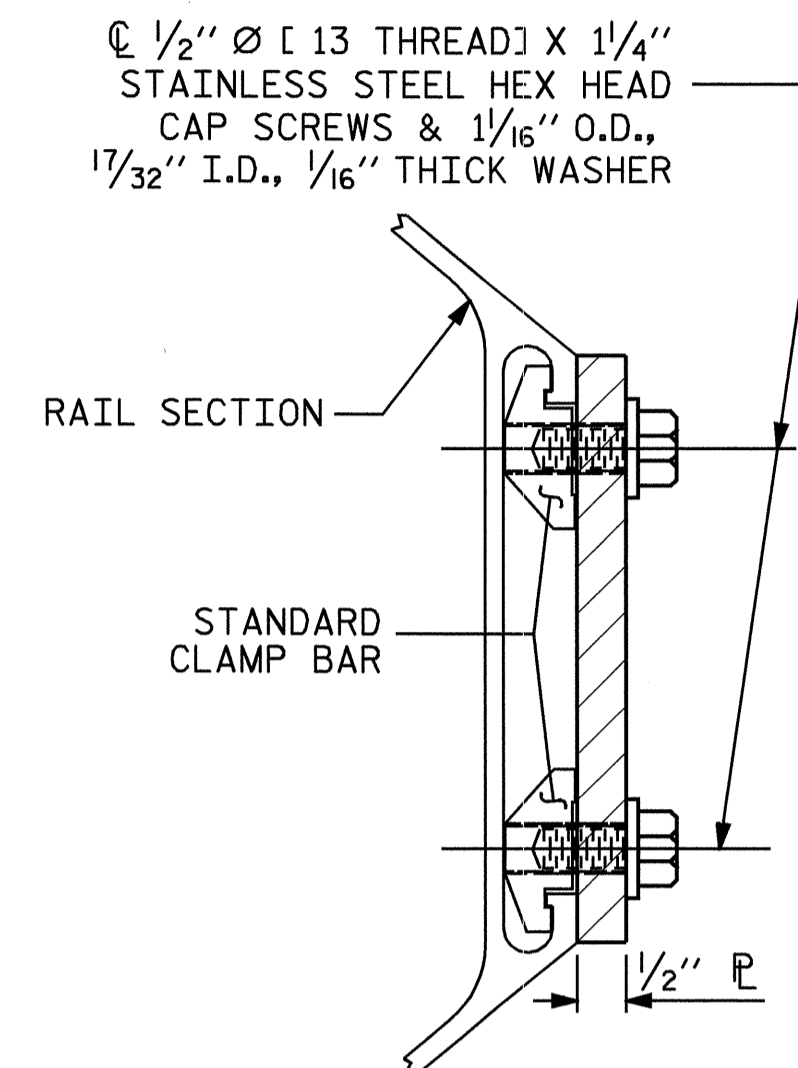
THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:

- 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 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 1/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.



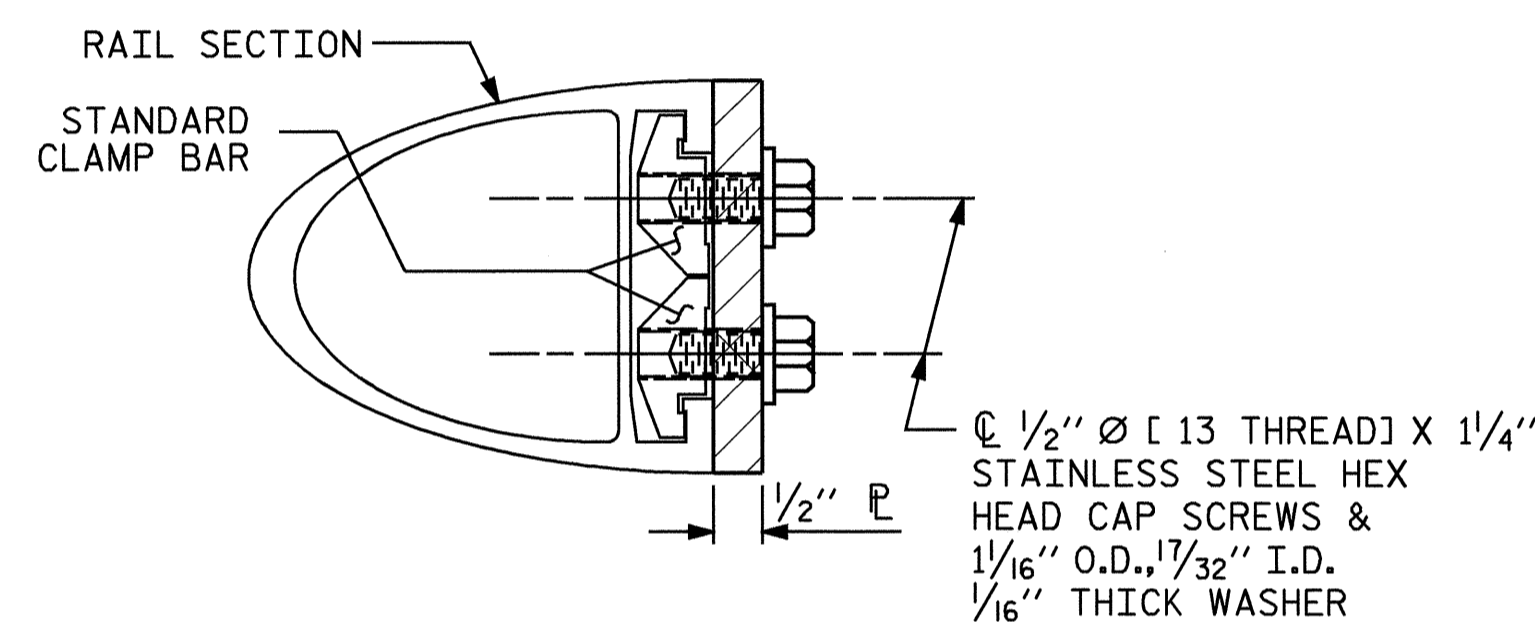
PLAN OF RAIL AND END POST

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



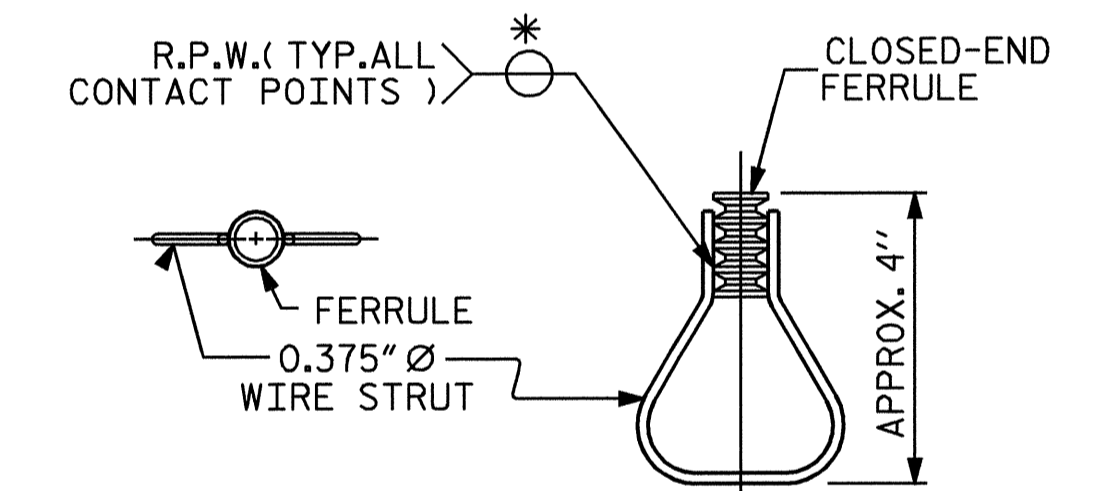
SECTION H-H

(FOR BOTTOM RAIL)



SECTION H-H

(FOR TOP & MIDDLE RAIL)



STRUCTURAL CONCRETE INSERT

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

PROJECT NO. U-4006
 GUILFORD COUNTY
 STATION: 20+90.21 -L-

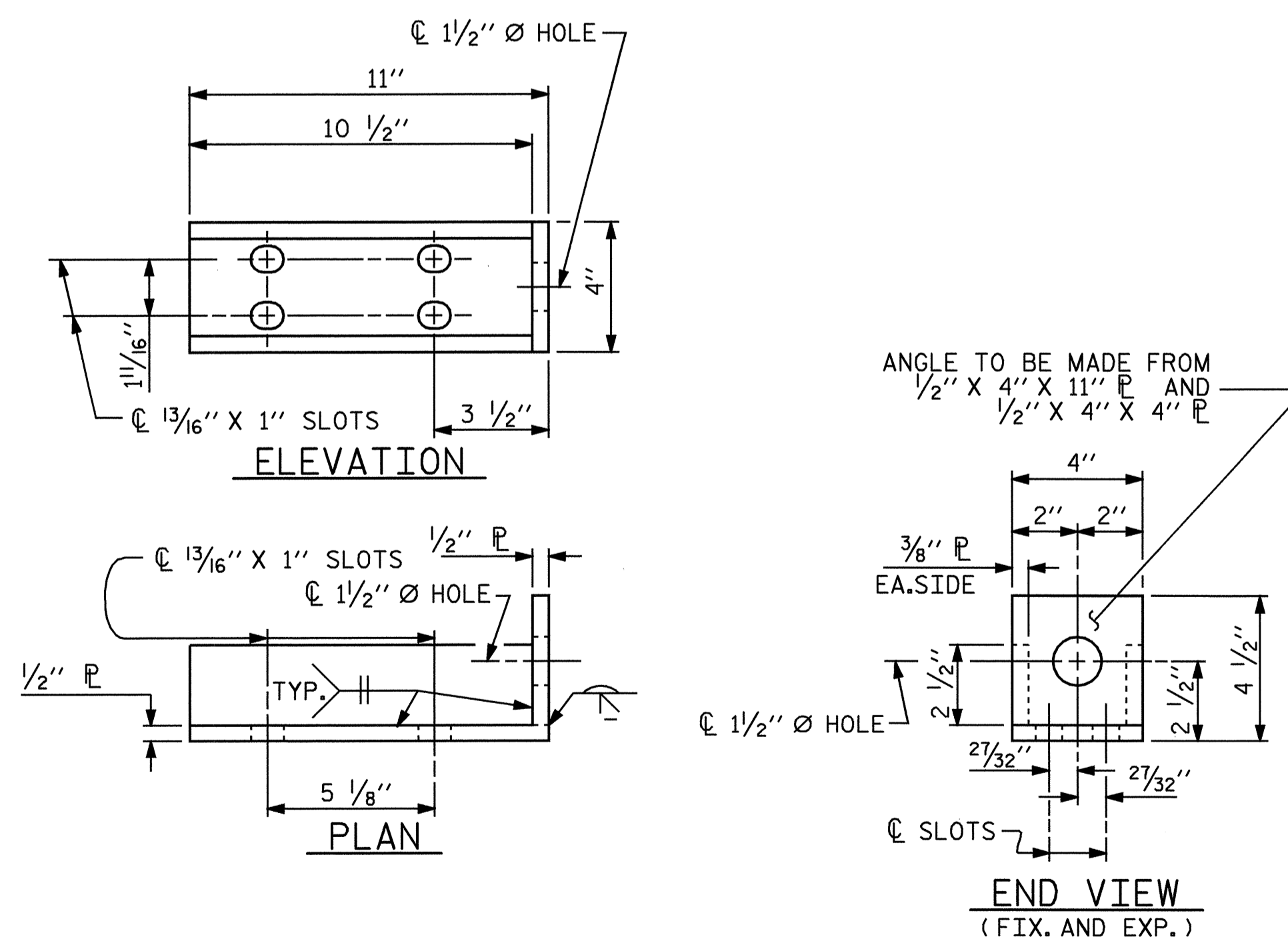
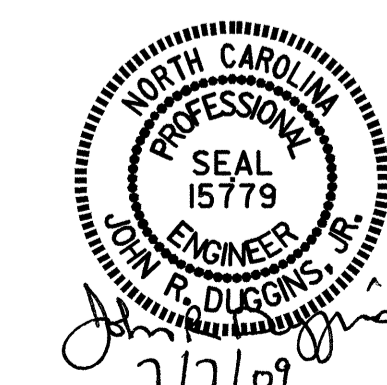
SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD

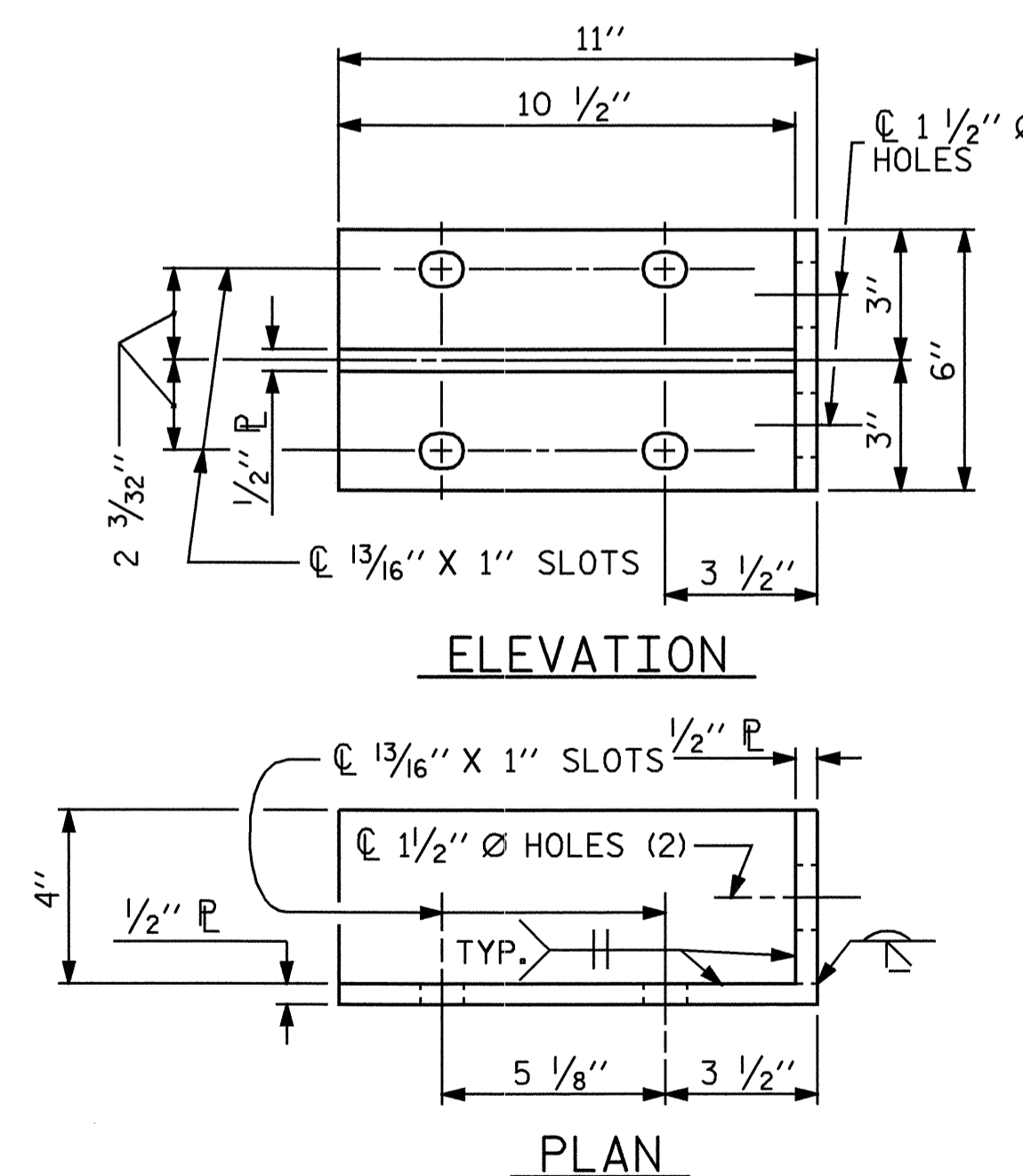
3 BAR METAL RAIL
 (LEFT LANE)

REVISIONS						SHEET NO. 3-20
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 75
2			4			



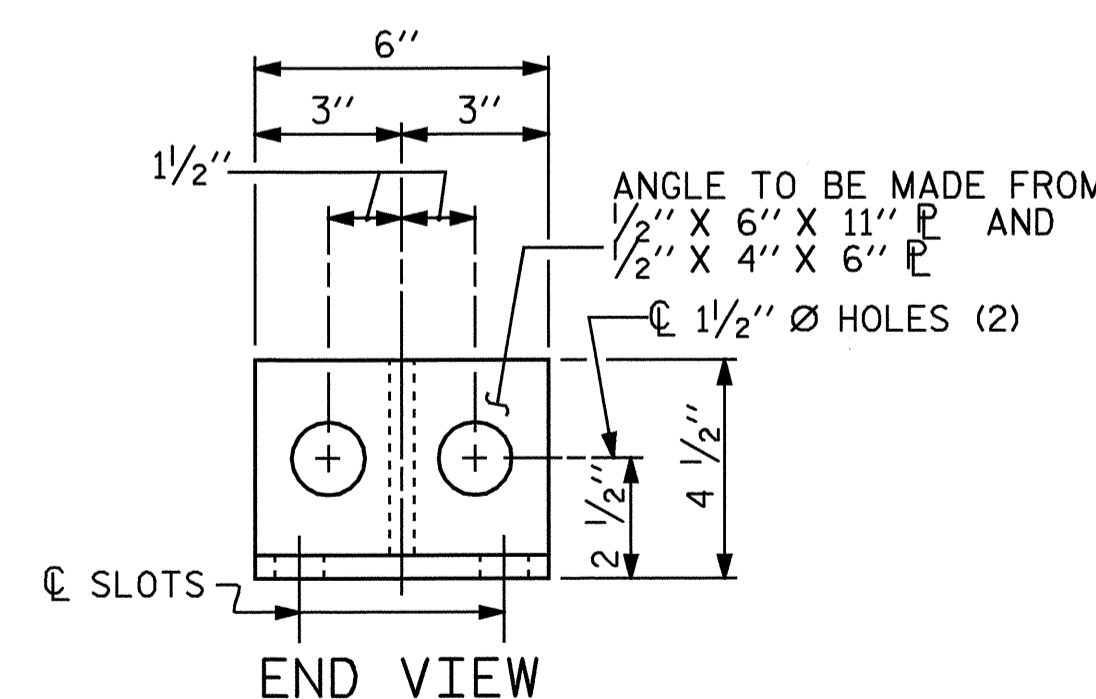
DETAILS FOR ATTACHMENT BRACKET

(TOP & MIDDLE RAIL ONLY)



DETAILS FOR ATTACHMENT BRACKET

(BOTTOM RAIL ONLY)



ASSEMBLED BY : D. HODGE	DATE : 4/09
CHECKED BY : J.R. DUGGINS	DATE : 4/09
DRAWN BY : JMB	1/88
CHECKED BY : GGH	1/88
REV. 7/10/01	RWW/LES
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.

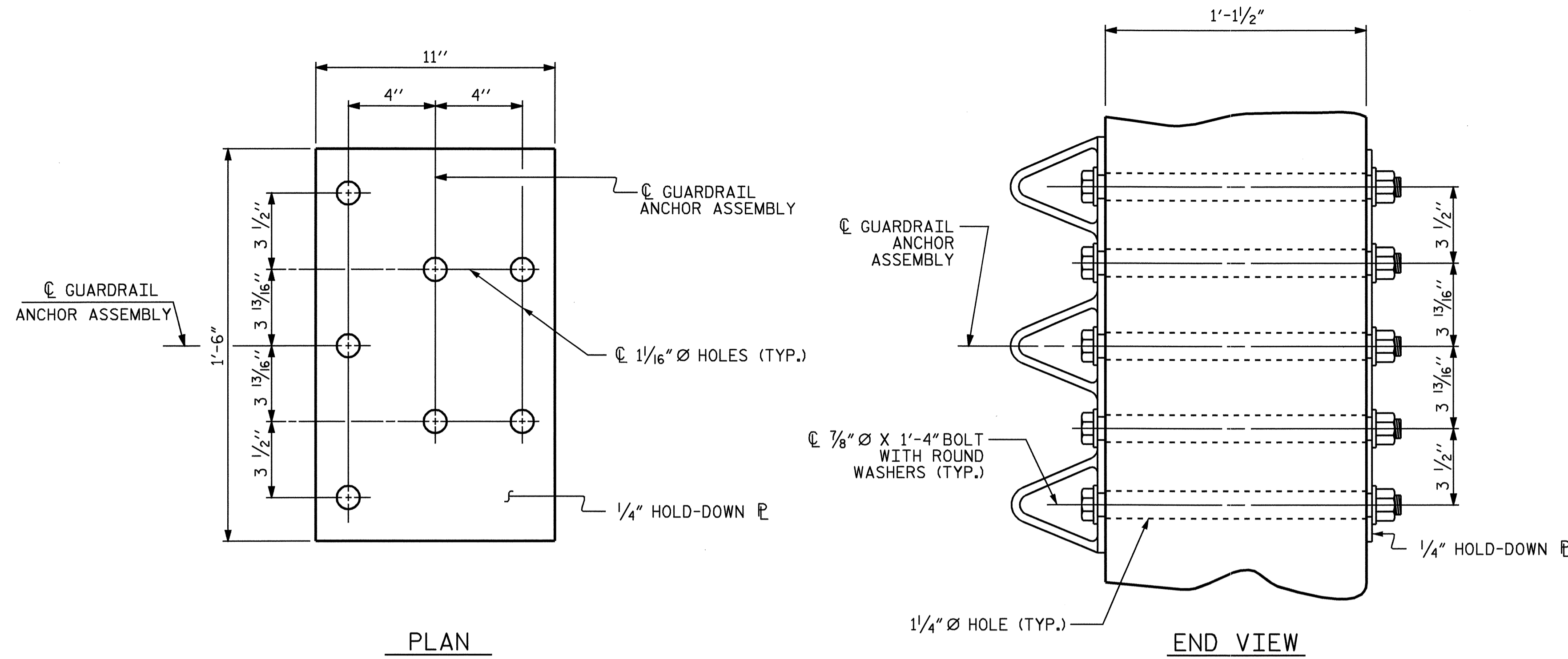
BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS.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

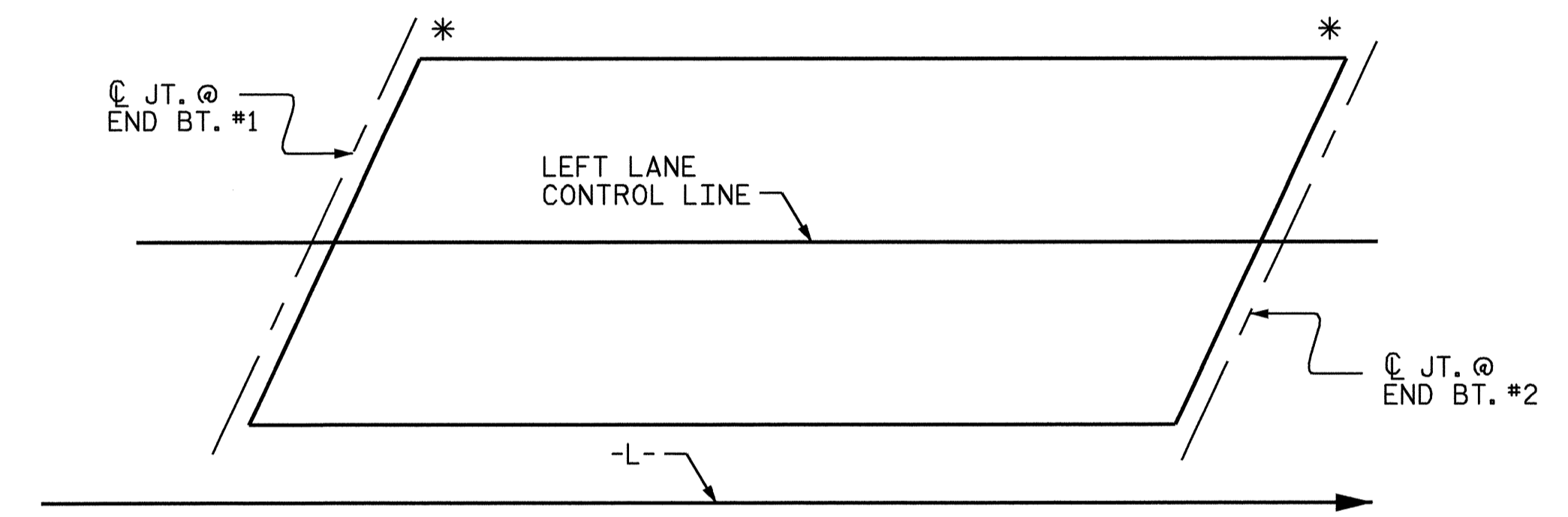
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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

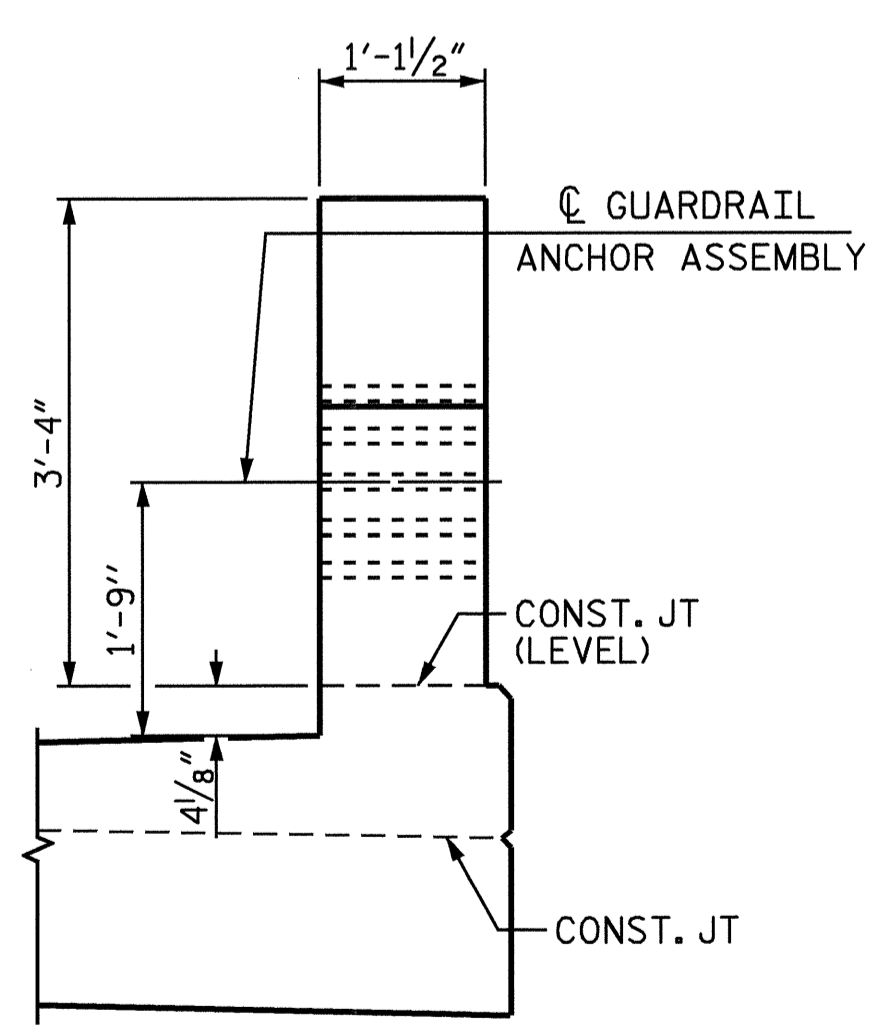
THE 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



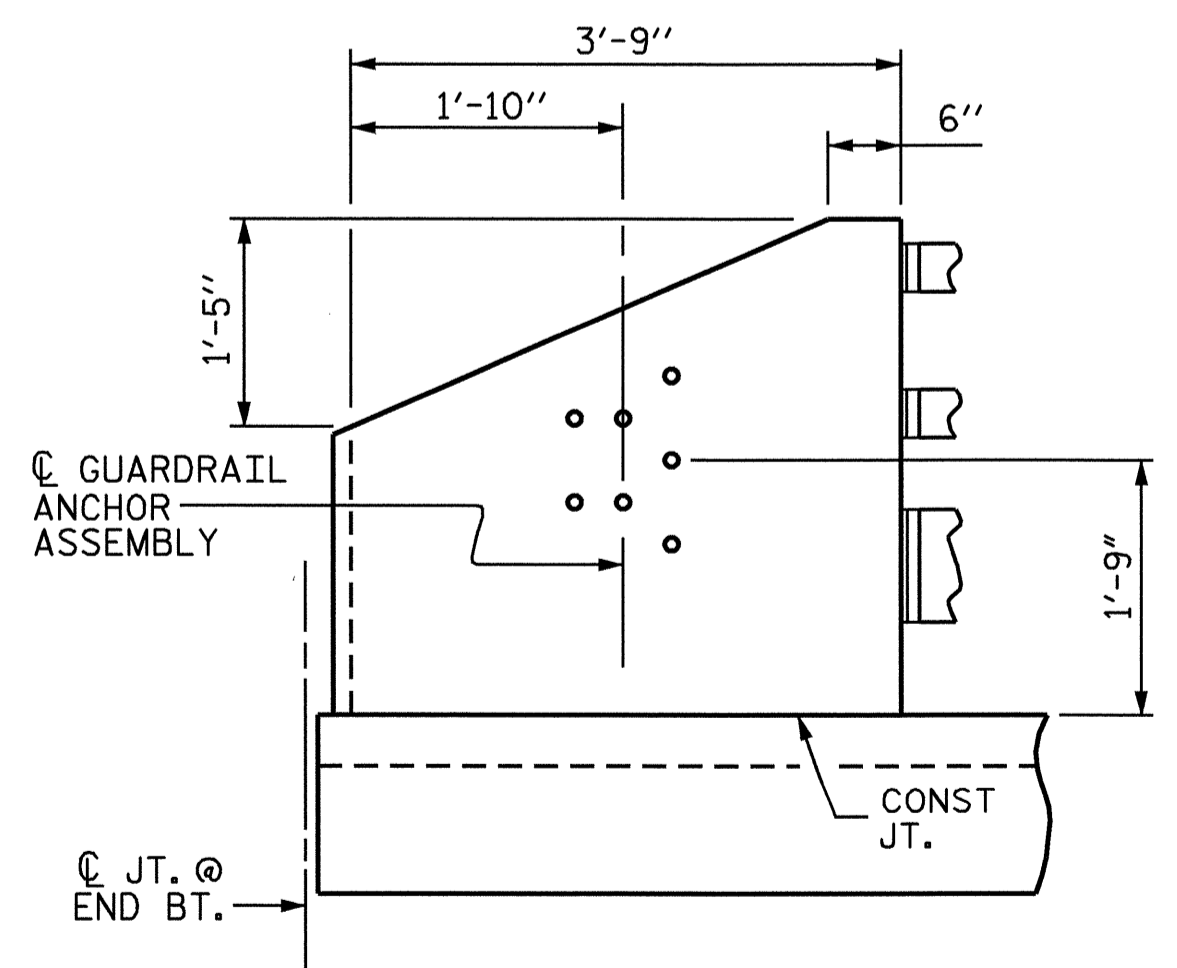
PLAN
END VIEW
GUARDRAIL ANCHOR ASSEMBLY DETAILS



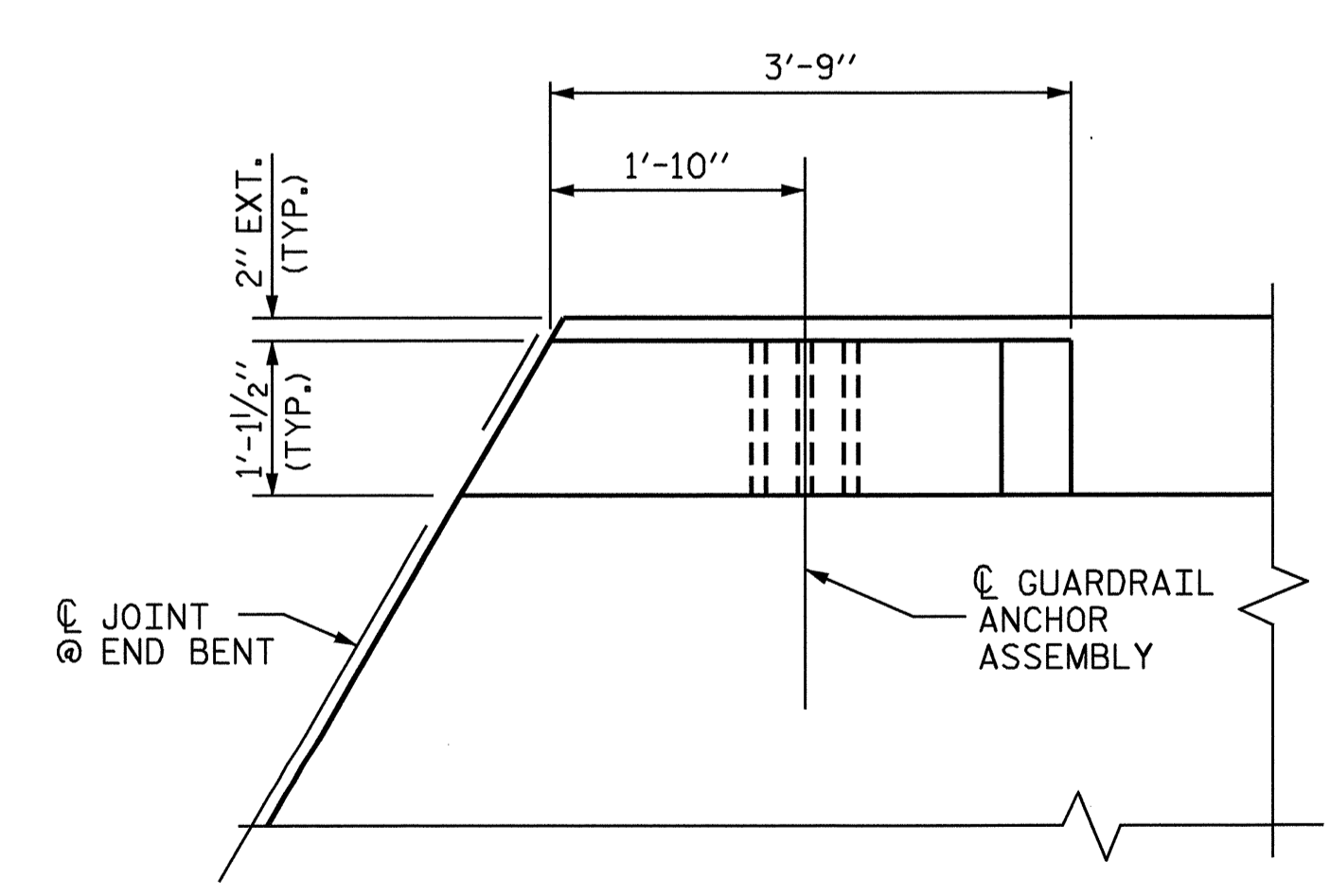
SKETCH SHOWING POINTS OF ATTACHMENT
* LOCATION OF GUARDRAIL ATTACHMENT



END VIEW
(THREE BAR METAL RAIL)



ELEVATION
LOCATION OF GUARDRAIL ANCHOR AT END POST



PLAN

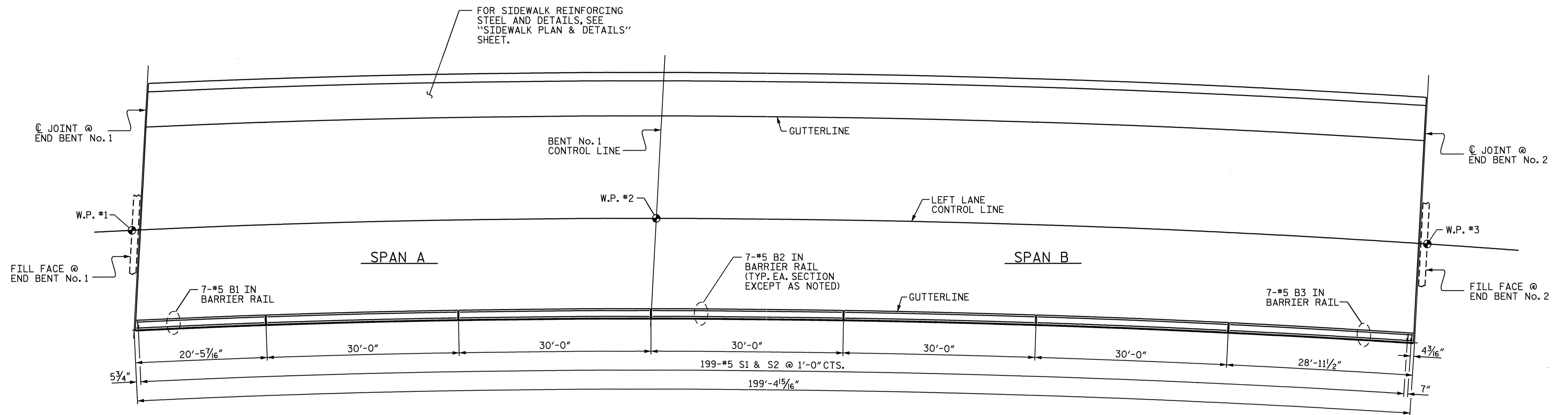
ASSEMBLED BY : D. HODGE	DATE : 4/09
CHECKED BY : J.R. DUGGINS	DATE : 4/09
DRAWN BY : EEM 6/94	REV. 10/17/00 RWW/LES
CHECKED BY : RGW 6/94	REV. 5/7/03 RWW/JTE
	REV. 5/1/06 TLA/GM

7/1/09
JOHN R. DUGGINS, INC.
PROFESSIONAL ENGINEER
SEAL 15779

PROJECT NO. U-4006
GUILFORD COUNTY
STATION: 20+90.21 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
GUARDRAIL ANCHORAGE
DETAILS
FOR METAL RAILS
(LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	3-21
1			3			TOTAL SHEETS
2			4			75



PLAN

DIMENSIONS FOR BARRIER RAIL SECTIONS ARE TAKEN ALONG THE OUTSIDE FACE OF BARRIER RAIL ALONG ARC.

PROJECT NO. U-4006
GUILFORD COUNTY
 STATION: 20+90.21 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 CONCRETE
 BARRIER RAIL
 (LEFT LANE)



DRAWN BY : D. HODGE DATE : 4/09
 CHECKED BY : J.R. DUGGINS DATE : 4/09

30-JUN-2009 15:01
 r:\structures\4006\lamber\lambert\Microstation\Left Lane\4006_SD_BR.dgn
 dahodge

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-22
1			3			TOTAL SHEETS
2			4			75

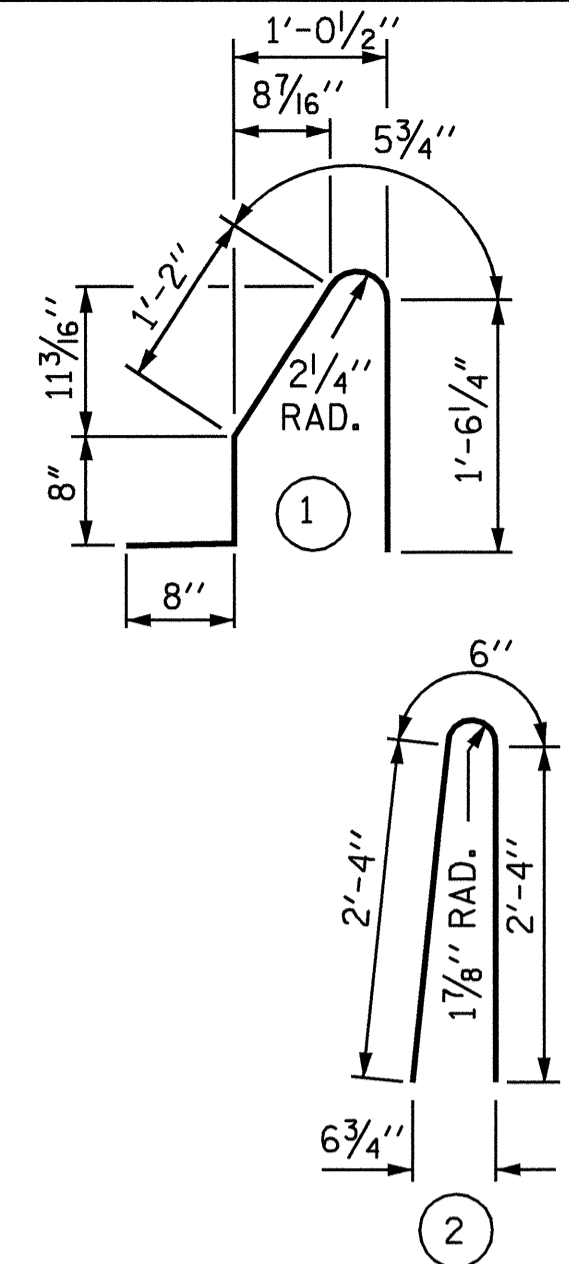
NOTES

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

BAR TYPES

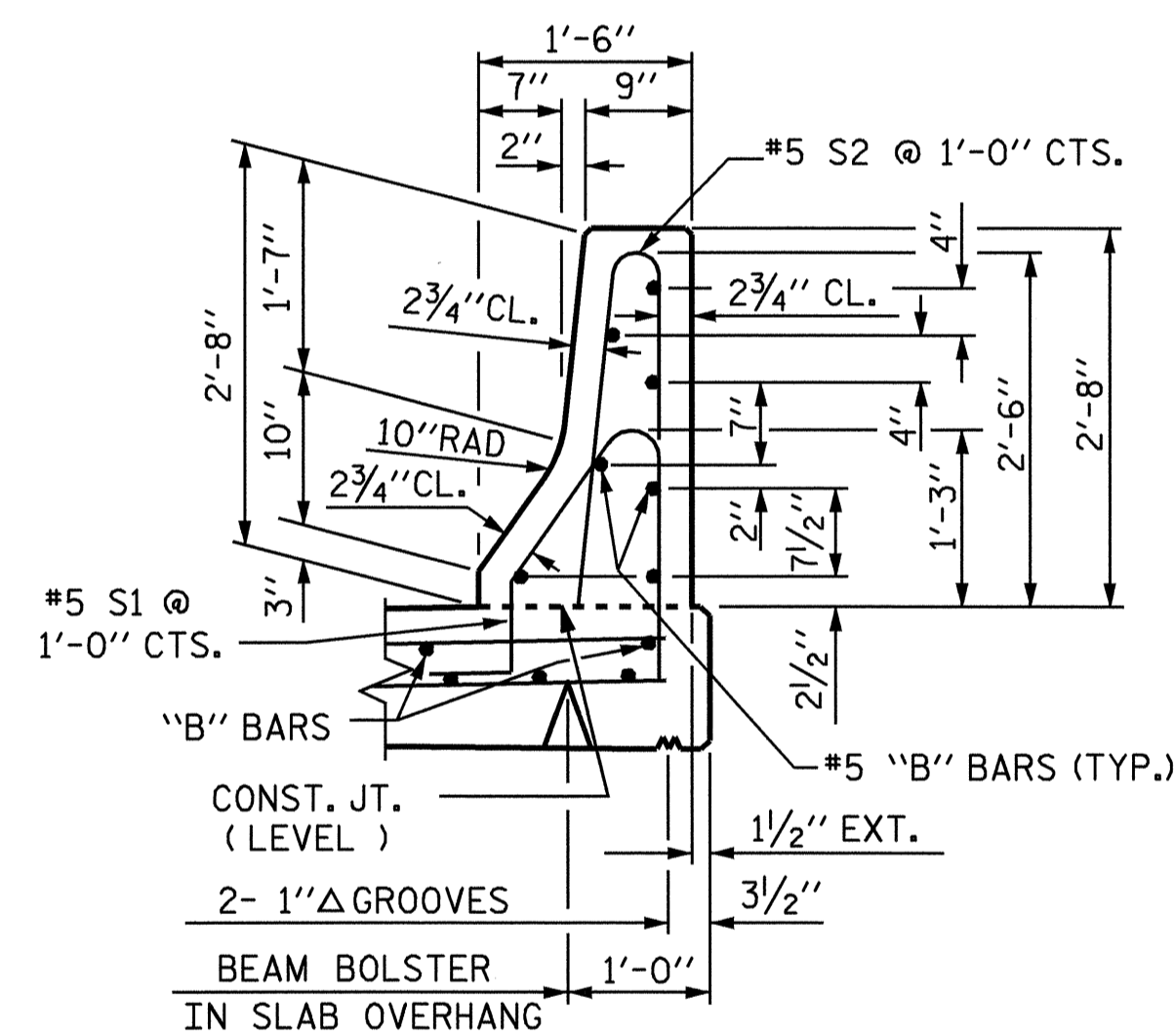


ALL BAR DIMENSIONS ARE OUT TO OUT

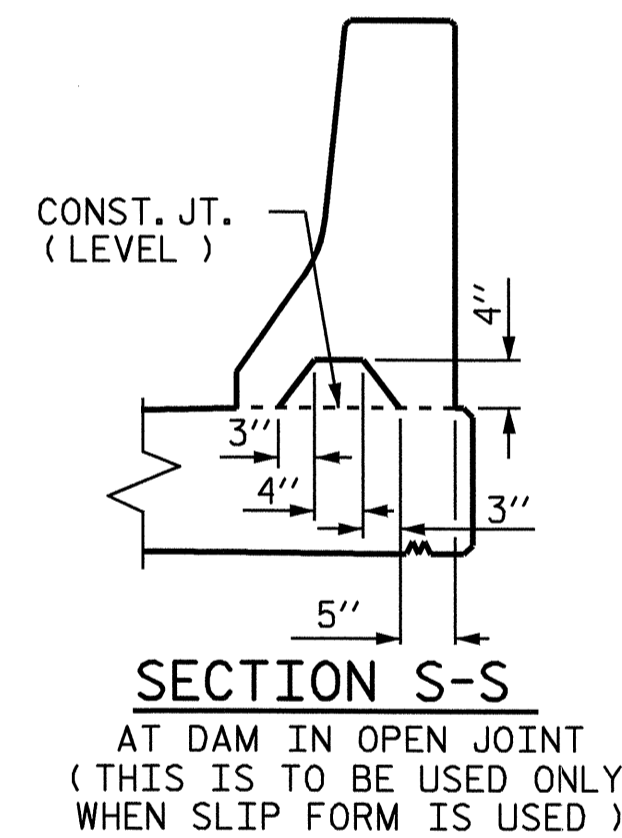
BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* S1	200	#5	1	4'-6"	939
* S2	200	#5	2	5'-2"	1078
* B1	7	#5	STR	19'-11"	145
* B2	35	#5	STR	29'-7"	1080
* B3	7	#5	STR	28'-6"	208
* EPOXY COATED REINFORCING STEEL					3,450 LBS.
CLASS AA CONCRETE					20.0 CU. YDS.
CONCRETE BARRIER RAIL					199.41 LIN. FT.

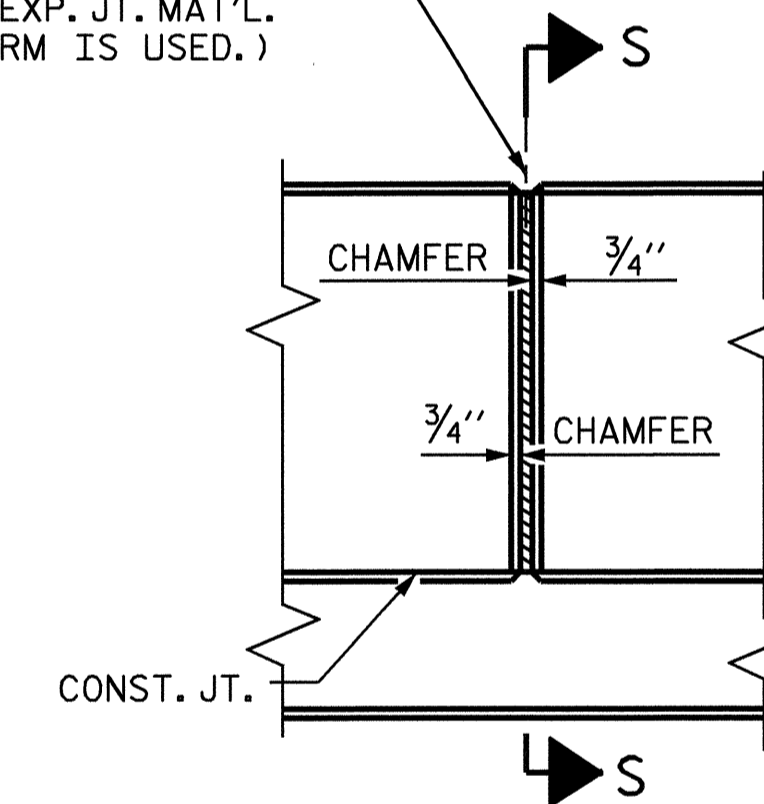


SECTION THRU RAIL



SECTION S-S
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY
WHEN SLIP FORM IS USED)

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

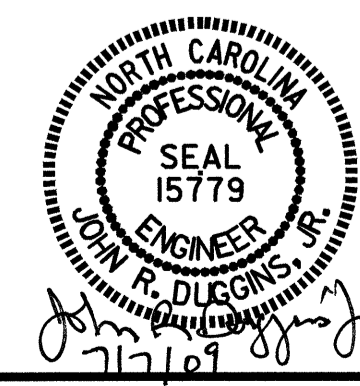


ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

PROJECT NO. U-4006
GUILFORD COUNTY
 STATION: 20+90.21 -L-
 SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 CONCRETE
 BARRIER RAIL
 (LEFT LANE)



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	3-23
1			3			TOTAL SHEETS
2			4			75

ASSEMBLED BY : D. HODGE	DATE : 4/09
CHECKED BY : J.R. DUGGINS	DATE : 4/09
DRAWN BY : ARB 5/87	REV. 10/17/00 RWW/LES
CHECKED BY : SJD 9/87	REV. 5/7/03R RWW/JTE
	REV. 5/1/06 TLA/GM

NOTES

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

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

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 1/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

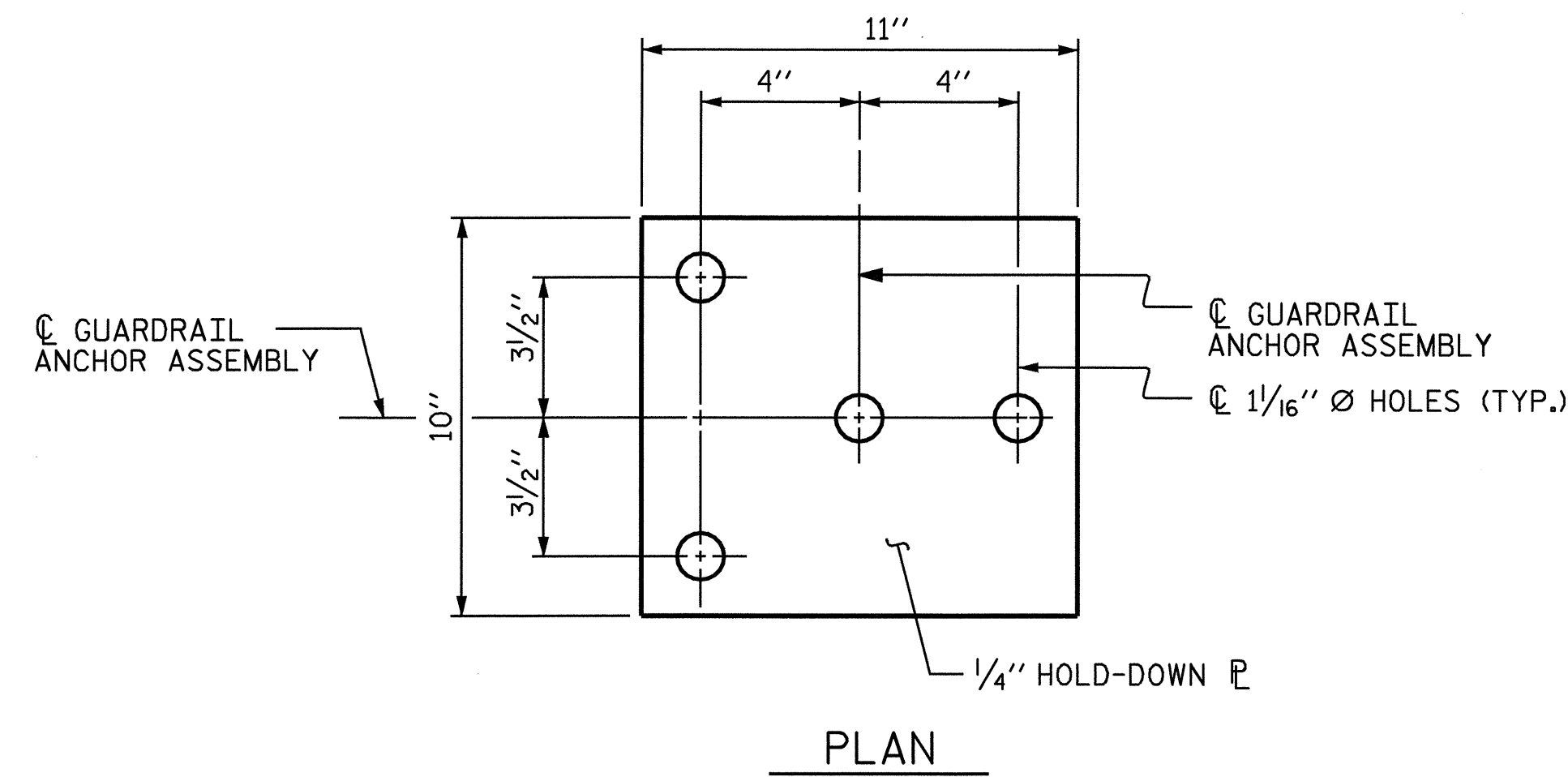
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

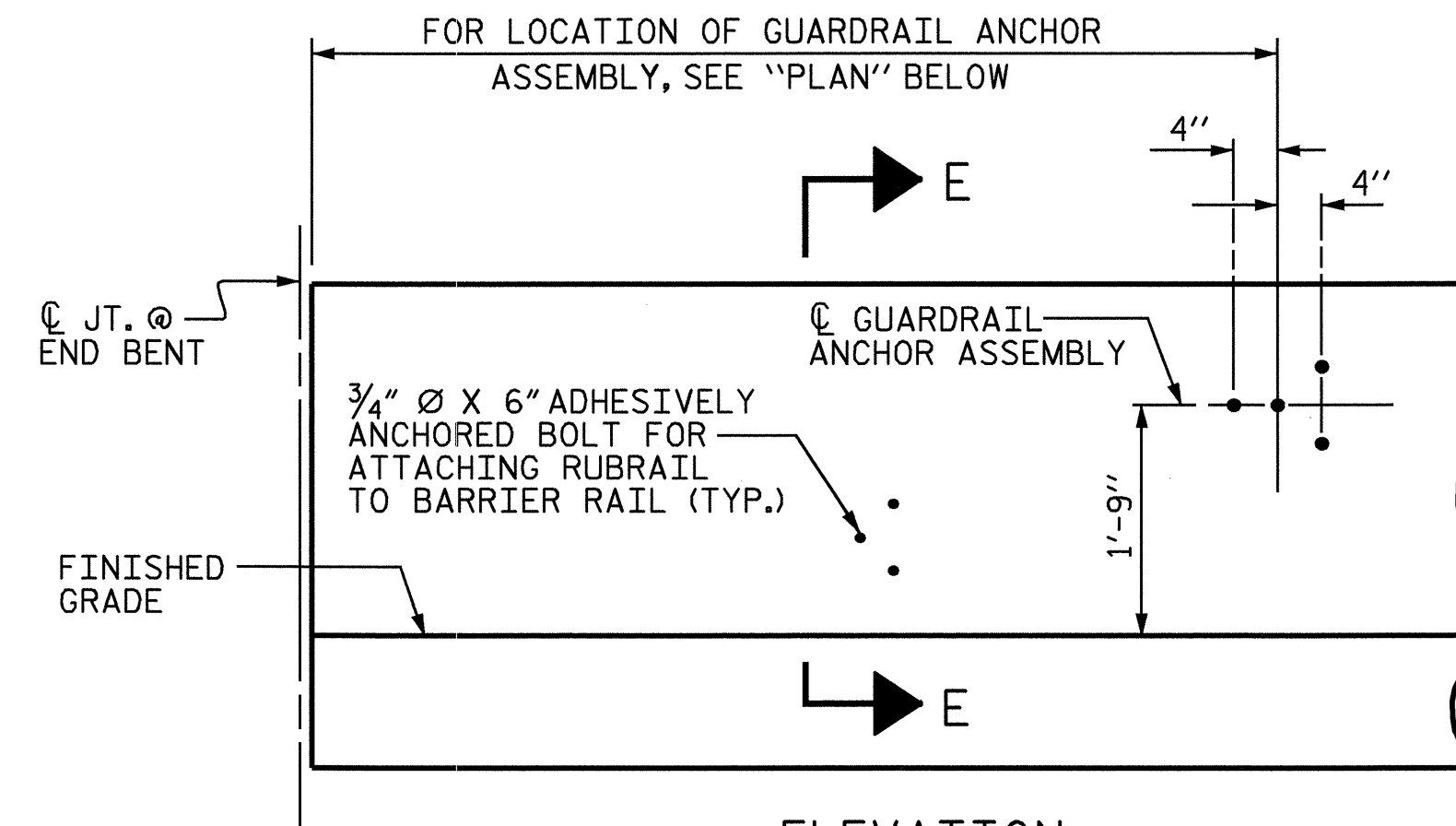
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

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

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

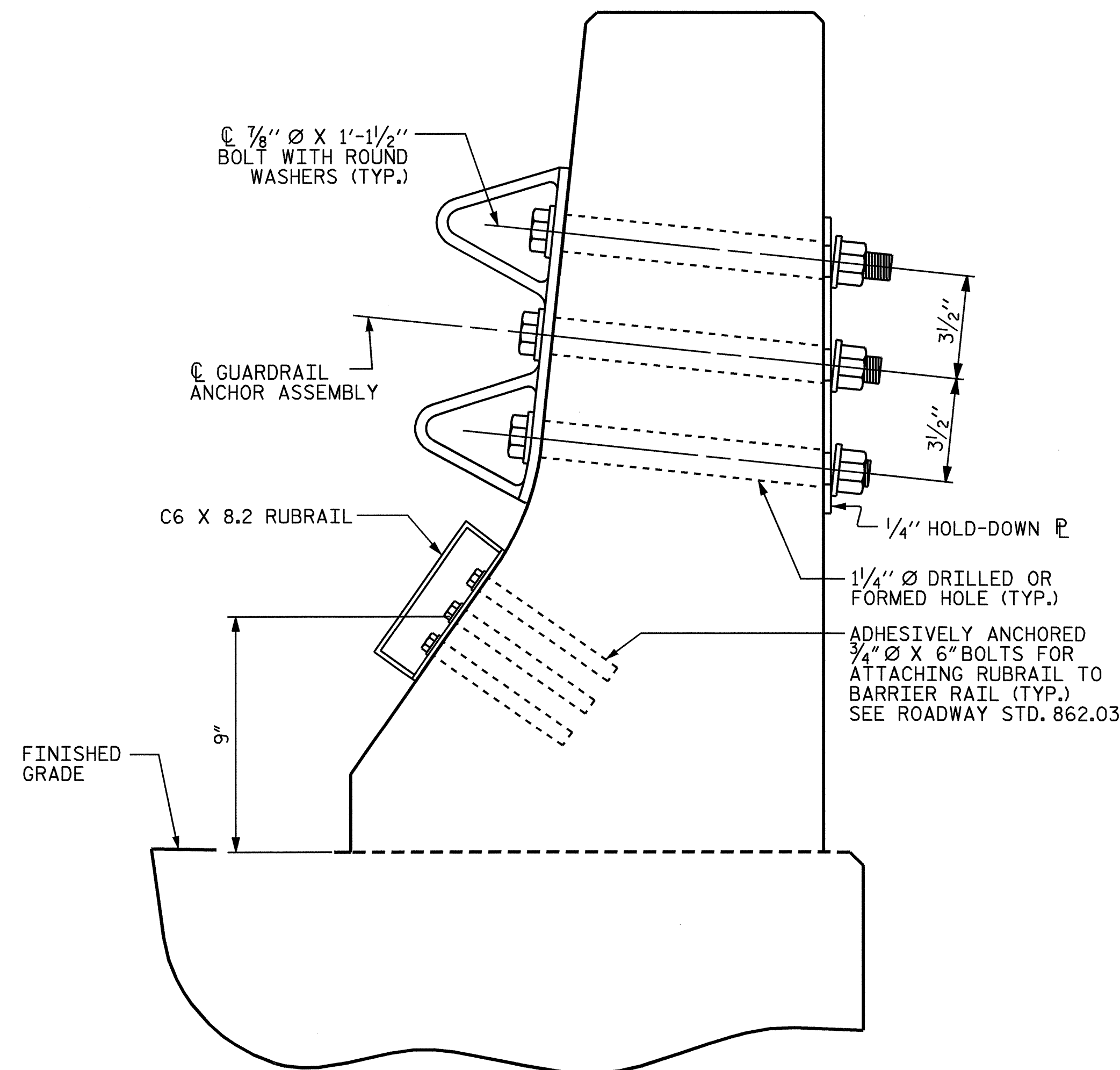


PLAN



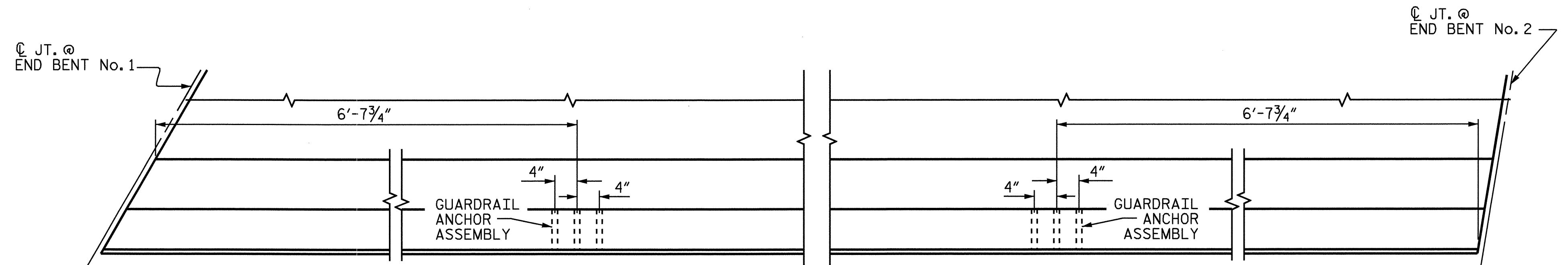
ELEVATION

FOR LOCATION OF RUBRAIL, SEE ROADWAY STD. 862.03



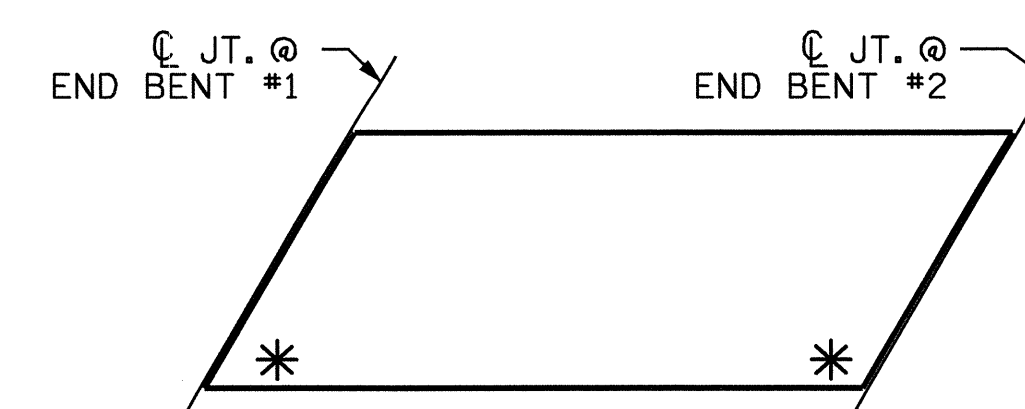
SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

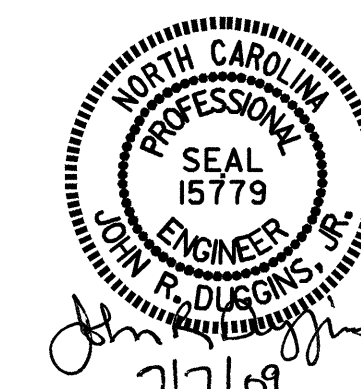


SKETCH SHOWING POINTS OF ATTACHMENTS

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. U-4006
 GUILFORD COUNTY
 STATION: 20+90.21 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 GUARDRAIL ANCHORAGE
 FOR BARRIER RAIL
 (LEFT LANE)



ASSEMBLED BY : D. HODGE	DATE : 4/09
CHECKED BY : J.R. DUGGINS	DATE : 4/09
DRAWN BY : TLA 5/06	ADDED 5/1/06R KMM/GM
CHECKED BY : GM 5/06	

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24	
1			3			TOTAL SHEETS	
2			4			15	

NOTES

ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL STUD ANCHORS SHALL CONFORM TO AASHTO M169 GRADES 1010 THRU 1020 OR APPROVED EQUAL.

STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON THE PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.

UPON COMPLETION OF SHOP FABRICATION, THE ENTIRE ANCHOR ASSEMBLY SHALL BE METALLIZED. THE 1/2" Ø STUD ANCHORS AND ANCHOR TABS NEED NOT BE METALLIZED. SEE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).

ANCHOR ASSEMBLY SHALL BE MADE CONTINUOUS THE LENGTH OF THE JOINT FROM GUTTER TO GUTTER. FOR FIELD SPLICES AT ALL CROWN BREAK POINTS, THE ENDS OF THE STEEL ANGLES SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE. FINISHED FIELD WELDS SHALL BE GROUND SMOOTH AND COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

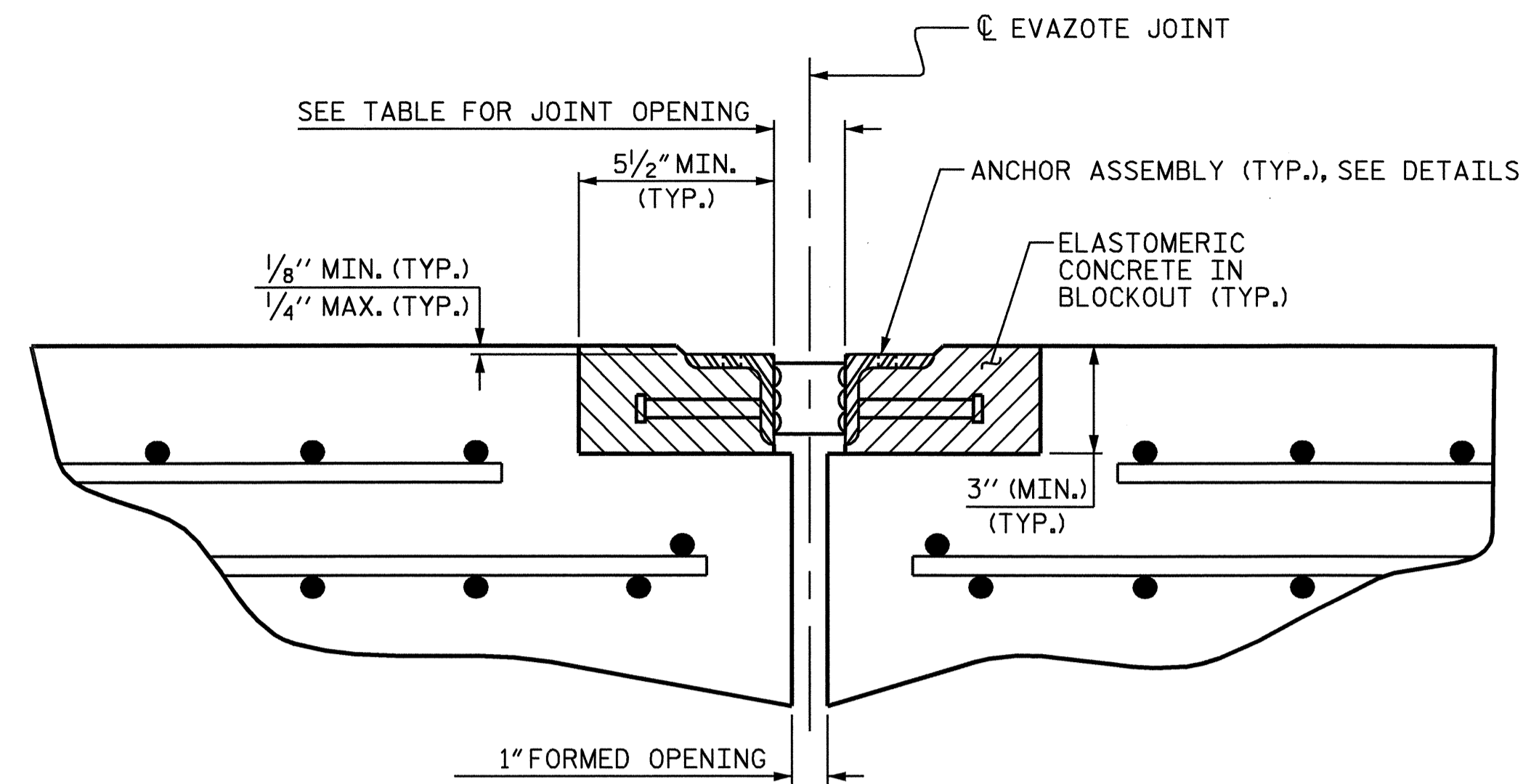
ANCHOR ASSEMBLY SEGMENTS SHALL NOT BE LESS THAN 12 FEET NOR MORE THAN 20 FEET IN LENGTH. SHORTER SEGMENTS MAY BE USED AT THE EDGE OF ROADWAY OR AT POINTS OF STAGED CONSTRUCTION.

THE ANCHOR ASSEMBLY SHALL BE SECURED AND LEVELLED AS SHOWN IN THE "ARMORED JOINT ANCHOR ASSEMBLY DETAILS". NO SUBMITTALS ARE REQUIRED FOR 3/8" Ø EXPANSION ANCHORS, NUTS OR WASHERS. THE CONTRACTOR MAY SUBMIT FOR APPROVAL AN ALTERNATE METHOD OF ALIGNING AND LEVELLING THE ANGLES. THE ALTERNATE METHOD SHALL NOT INCLUDE ANY WELDING TO THE OUTSIDE FACE OF THE ANGLES.

AFTER THE ELASTOMERIC CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE ANY EXCESS CONCRETE THAT COMES THROUGH THE WEEP HOLES AND THOROUGHLY CLEAN THE ANGLES. ANY DAMAGED STEEL SHALL BE COATED WITH A MINIMUM OF 4 MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

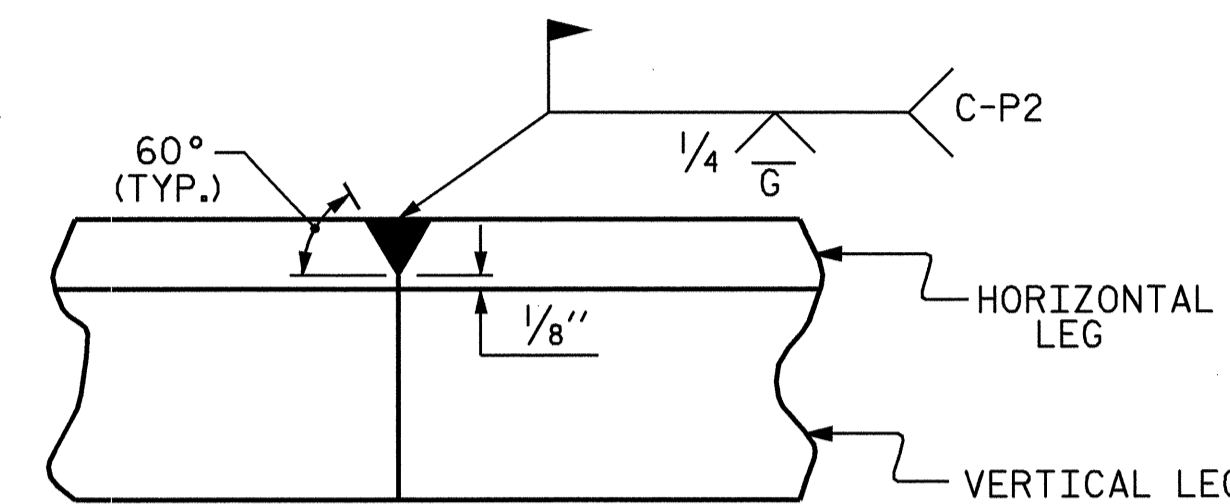
SEE SPECIAL PROVISIONS FOR EVAZOTE JOINT SEALS.

SEE SPECIAL PROVISIONS FOR ELASTOMERIC CONCRETE.

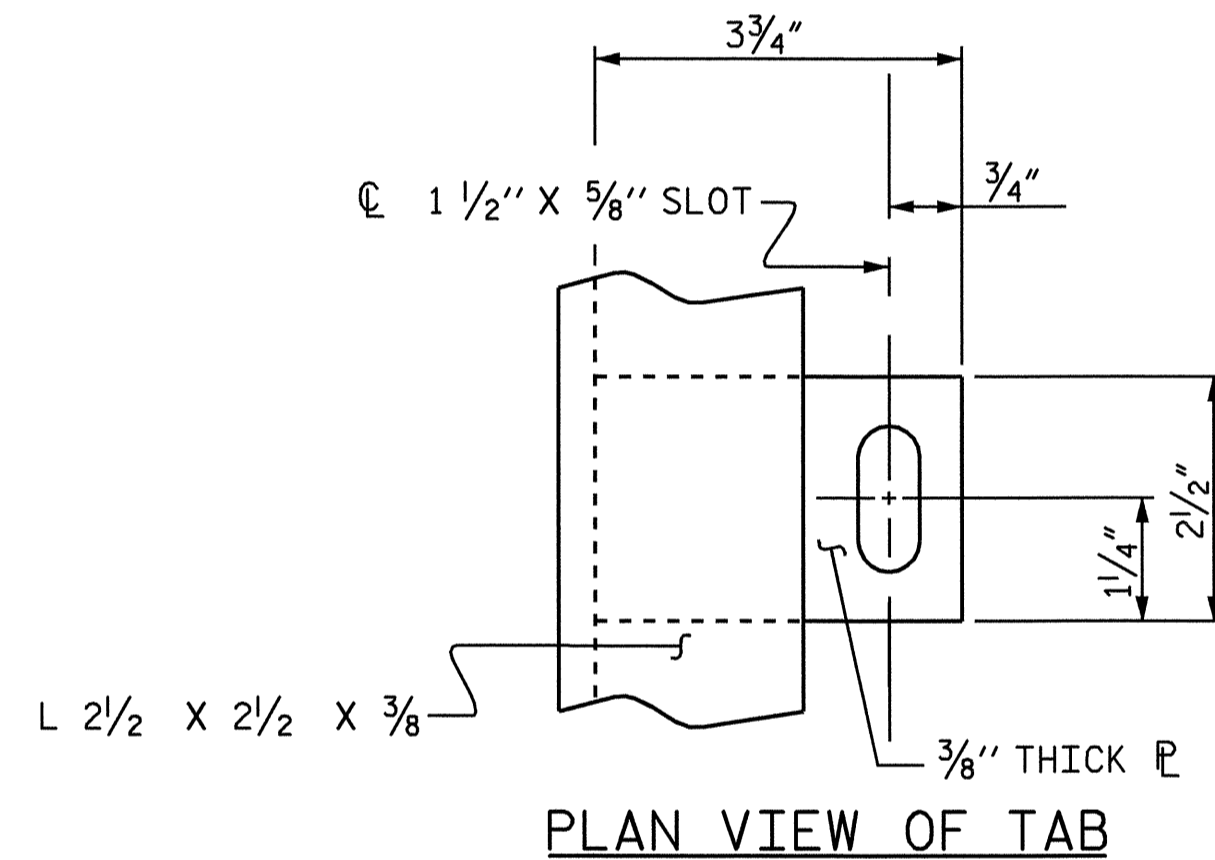


ARMORED JOINT DETAILS

SECTION NORMAL TO JOINT AT END BENT



DETAIL- FIELD WELD SPLICE OF ANGLE



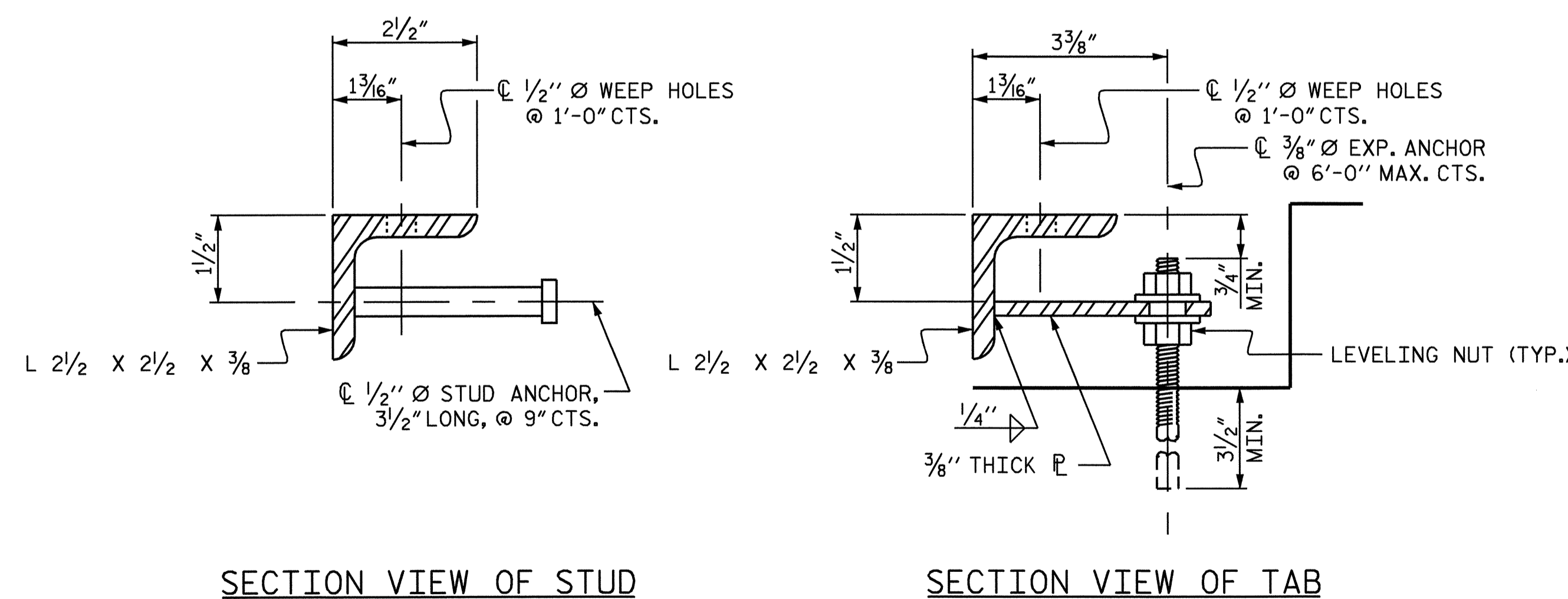
PLAN VIEW OF TAB

MOVEMENT AND SETTING AT EVAZOTE JOINT						
END BENT NO.	SKEW ANGLE (TO SHORT CHORD)	NOMINAL UNCOMPRESSED SEAL WIDTH	TOTAL MOVEMENT (ALONG C.R.D.W.Y.)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
1	94°-22'-05"	2 1/2"	5/8"	2 1/8"	2"	1 3/4"
2	91°-11'-52"	2 1/2"	1"	2 3/16"	2"	1 11/16"

TOTAL MOVEMENT IS CALCULATED ALONG THE CENTERLINE OF ROADWAY. JOINT OPENINGS ARE MEASURED PERPENDICULAR TO THE JOINT.

BILL OF MATERIAL		
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)	TOTAL LENGTH OF ANGLE (FT)
1	6.9	60'-3 1/2"
2	6.9	60'-0"

* BASED ON THE MINIMUM BLOCKOUT SHOWN.



SECTION VIEW OF STUD

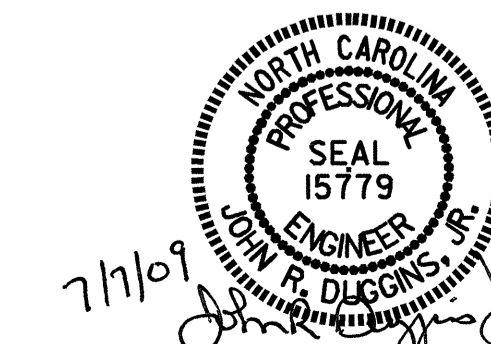
SECTION VIEW OF TAB

ARMORED JOINT ANCHOR ASSEMBLY DETAILS

PROJECT NO. U-4006
GUILFORD COUNTY
 STATION: 20+90.21 -L-

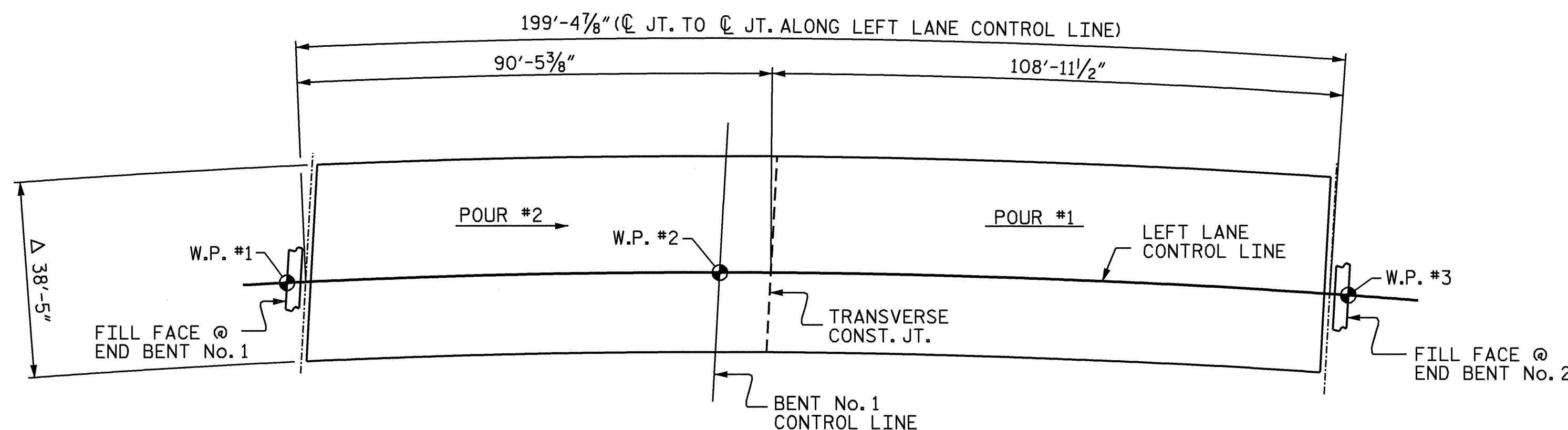
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 ARMORED EVAZOTE
 JOINT DETAILS
 (LEFT LANE)

ASSEMBLED BY : D. HODGE DATE : 4/09
 CHECKED BY : J.R. DUGGINS DATE : 4/09
 DRAWN BY : EEM 1/96 REV. 7/10/01 LES/RDR
 CHECKED BY : RGW 1/96 REV. 5/7/03RR RWW/JTE
 REV. 5/1/06 TLA/GM



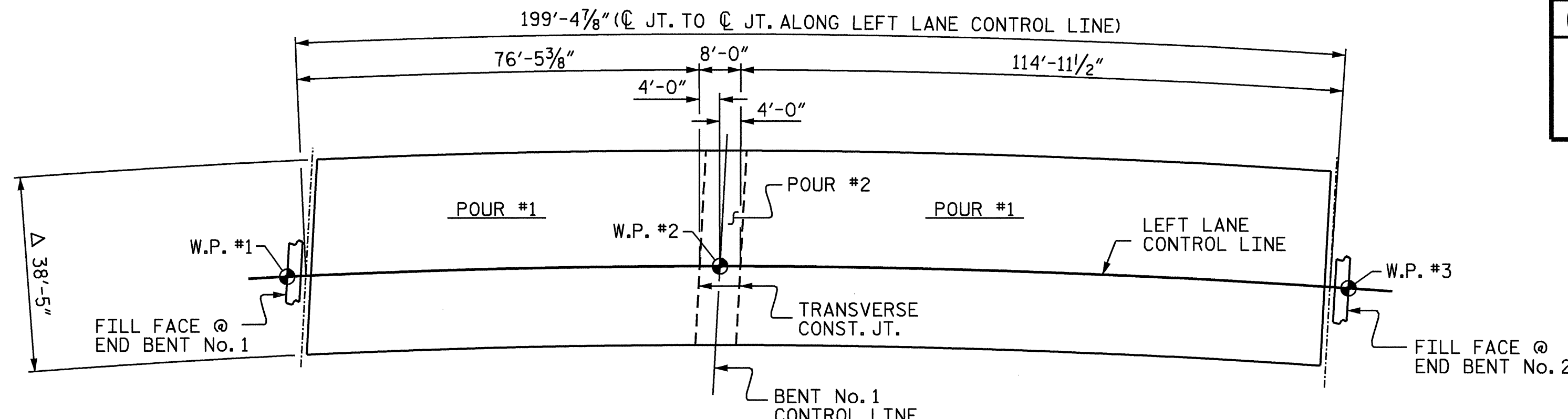
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			7.5
2			4			

STD. NO. AEJ1



Δ RADIAL DIMENSION

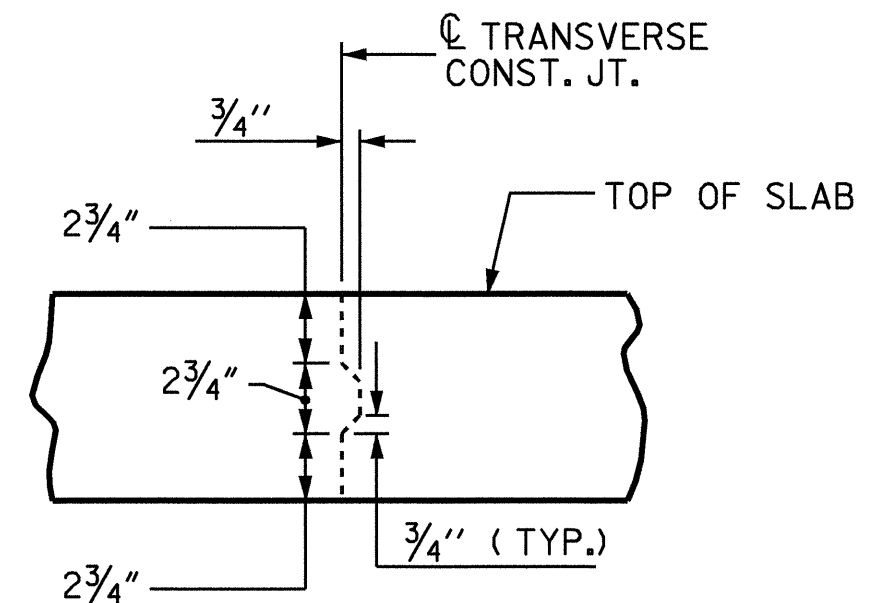
POURING SEQUENCE SKETCH



Δ RADIAL DIMENSION

OPTIONAL POURING SEQUENCE SKETCH

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



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

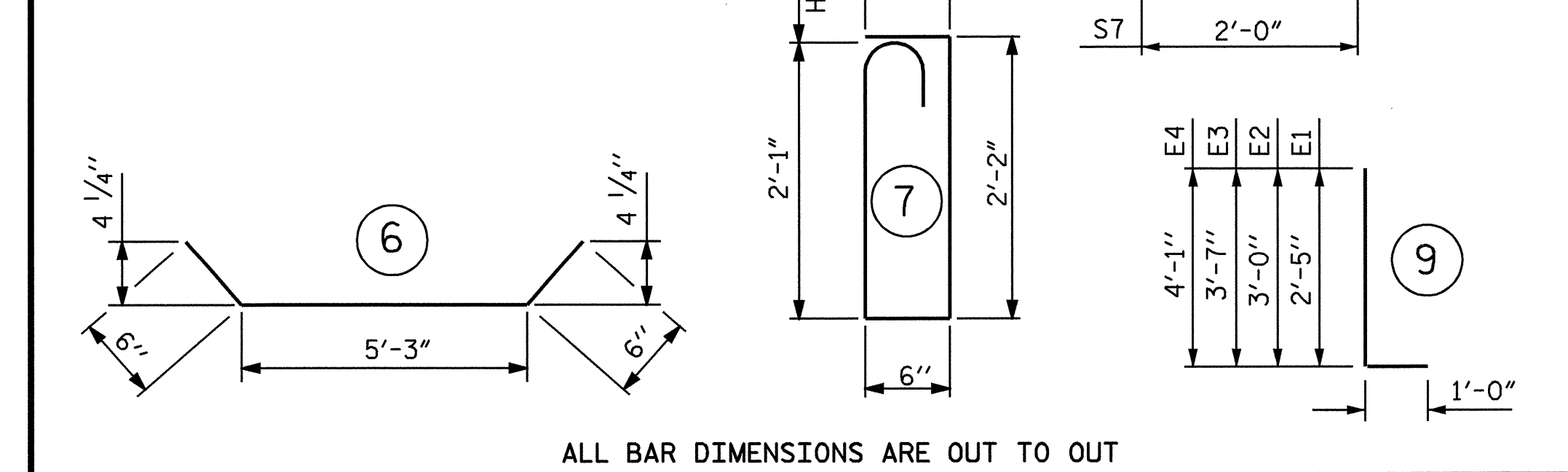
GROOVING BRIDGE FLOORS		
APPROACH SLABS	1,285	SQ.FT.
BRIDGE DECK	5,352	SQ.FT.
TOTAL	6,637	SQ.FT.

—SUPERSTRUCTURE BILL OF MATERIAL—			
SPAN A & B	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
POUR 1	153.2		
POUR 2	127.2		
SIDEWALK	26.2		
END POST	0.8		
TOTALS**	307.4	20,377	22,311

**QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED, QUANTITIES FOR SIDEWALK AND END POST ARE INCLUDED.

BAR SCHEDULE						
SPANS A & B						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	280	5	STR	38'-1"	1122	
A2	280	5	STR	38'-1"	1122	
*A101	2	5	STR	23'-0"	48	
*A102	2	5	STR	6'-9"	14	
A201	2	5	STR	23'-0"	48	
A202	2	5	STR	6'-9"	14	
*B1	50	4	STR	27'-3"	910	
*B2	50	7	STR	38'-2"	3901	
*B3	26	7	STR	30'-6"	1621	
*B4	75	4	STR	27'-10"	1394	
*B5	16	4	STR	26'-8"	285	
B6	120	5	STR	51'-8"	6467	
*B7	48	4	STR	26'-11"	863	
*D1	116	4	STR	10"	65	
*E1	4	7	9	3'-5"	28	
*E2	4	7	9	4'-0"	33	
*E3	4	7	9	4'-7"	37	
*E4	4	7	9	5'-1"	42	
*F1	4	6	STR	3'-2"	19	
*F2	8	6	STR	3'-5"	41	
*F3	4	6	STR	3'-4"	20	
*G1	2	5	STR	38'-1"	79	
*G2	200	4	STR	6'-1"	813	
*K1	8	8	3	10'-2"	217	
*K2	12	8	1	15'-8"	502	
K3	16	6	STR	3'-7"	86	
K4	32	6	STR	6'-7"	316	
K5	120	5	STR	6'-7"	824	
K6	24	5	6	6'-3"	156	
K7	8	4	STR	3'-11"	21	
K8	40	4	STR	6'-7"	176	
K9	8	4	STR	3'-7"	19	
K10	7	4	STR	30'-0"	140	
*S1	32	5	7	5'-10"	195	
*S2	32	4	8	2'-11"	62	
S3	16	4	5	2'-11"	31	
S4	60	4	4	11'-4"	454	
S5	136	4	2	2'-9"	250	
S6	16	4	1	18'-2"	194	
S7	8	4	5	11'-1"	59	
REINFORCING STEEL				LBS.	20,377	
*EPOXY COATED REINFORCING STEEL				LBS.	22,311	

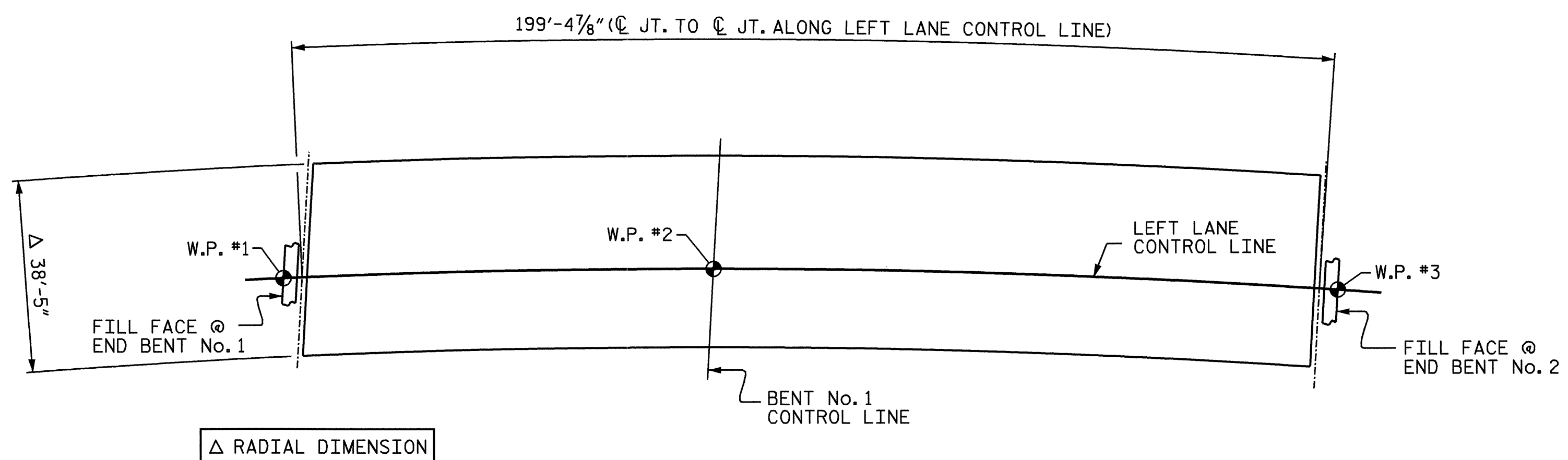
* THESE BARS ARE EPOXY COATED



ALL BAR DIMENSIONS ARE OUT TO OUT

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

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



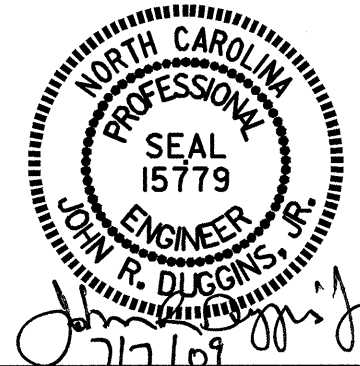
Δ RADIAL DIMENSION

LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 7,661)

PROJECT NO. U-4006
GUILFORD COUNTY
STATION: 20+90.21 -L-

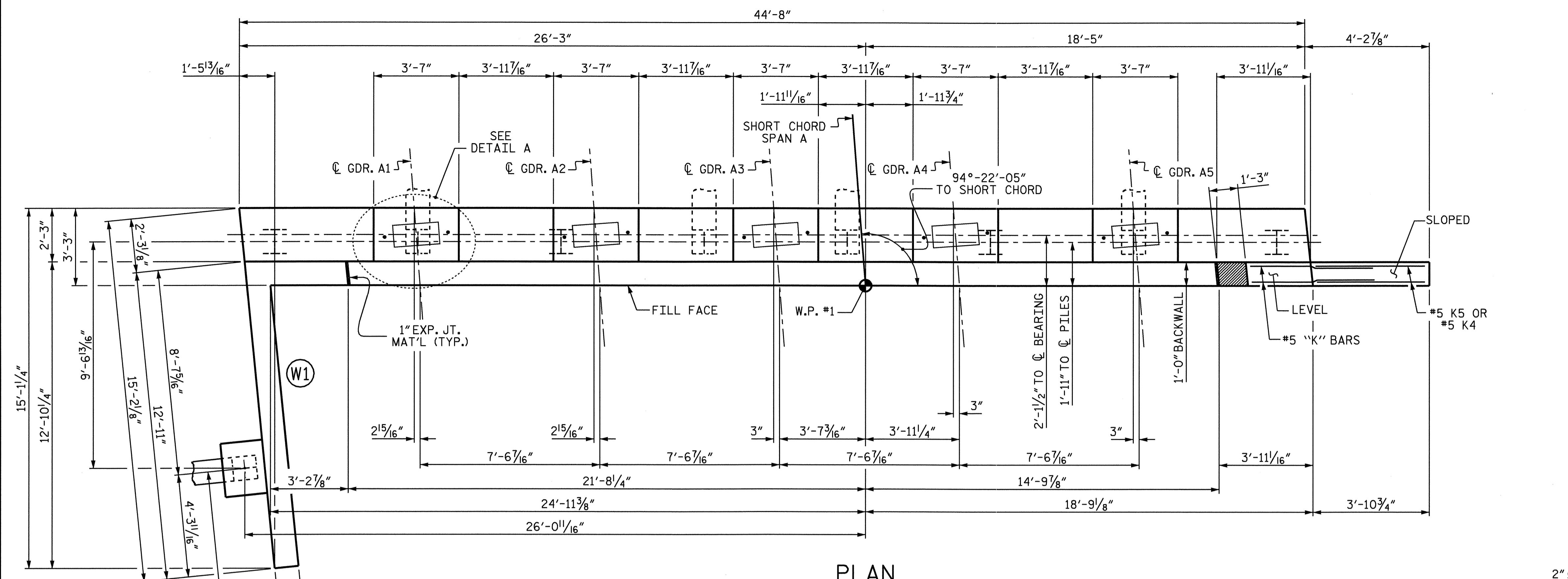
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
SUPERSTRUCTURE
BILL OF MATERIAL
(LEFT LANE)

ASSEMBLED BY: D. HODGE DATE: 4/09
CHECKED BY: J.R. DUGGINS DATE: 4/09
DRAWN BY: JMB 5/87 REV. 6/1/94 EEM/GRP
CHECKED BY: SJD 9/87 REV. 8/16/99 RWW/LES
REV. 5/1/06 TLA/GM

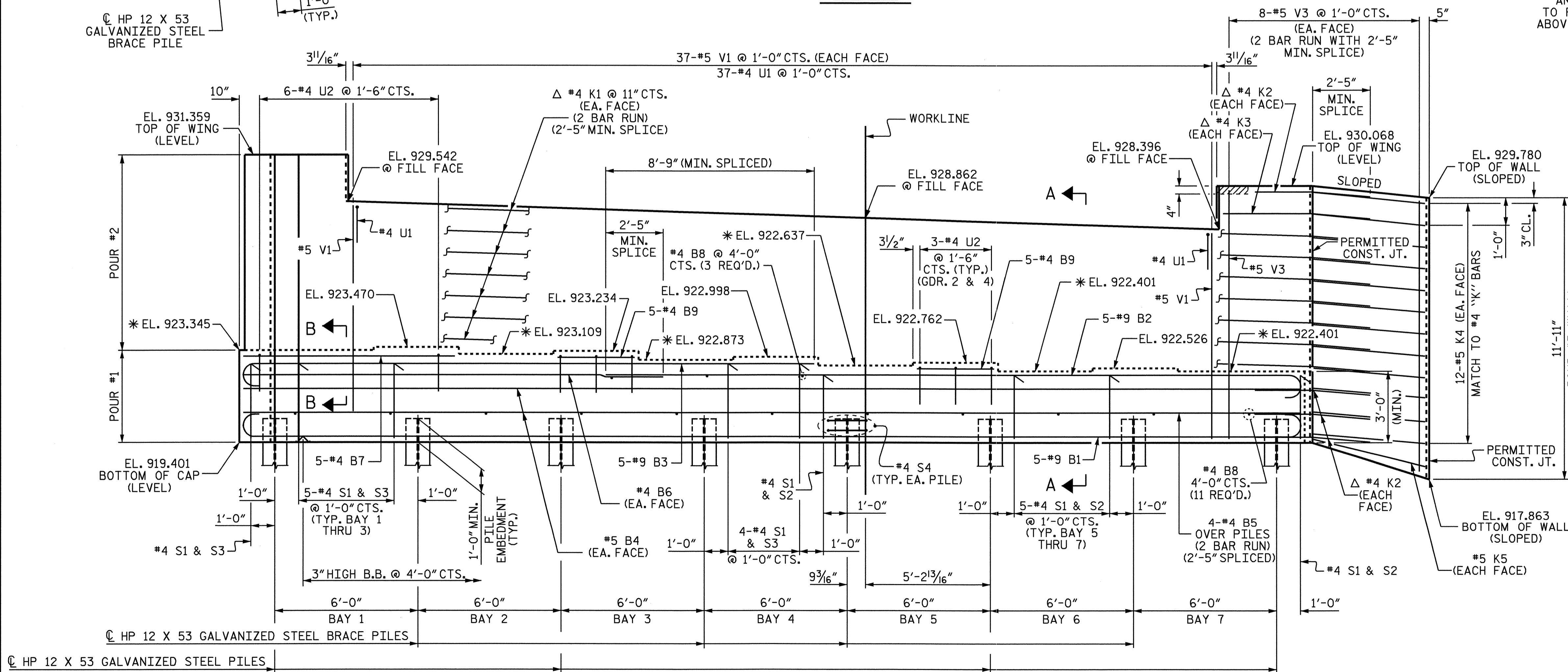


REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26	
1			3			TOTAL SHEETS	
2			4			75	

STD. NO. BOM2



PLAN

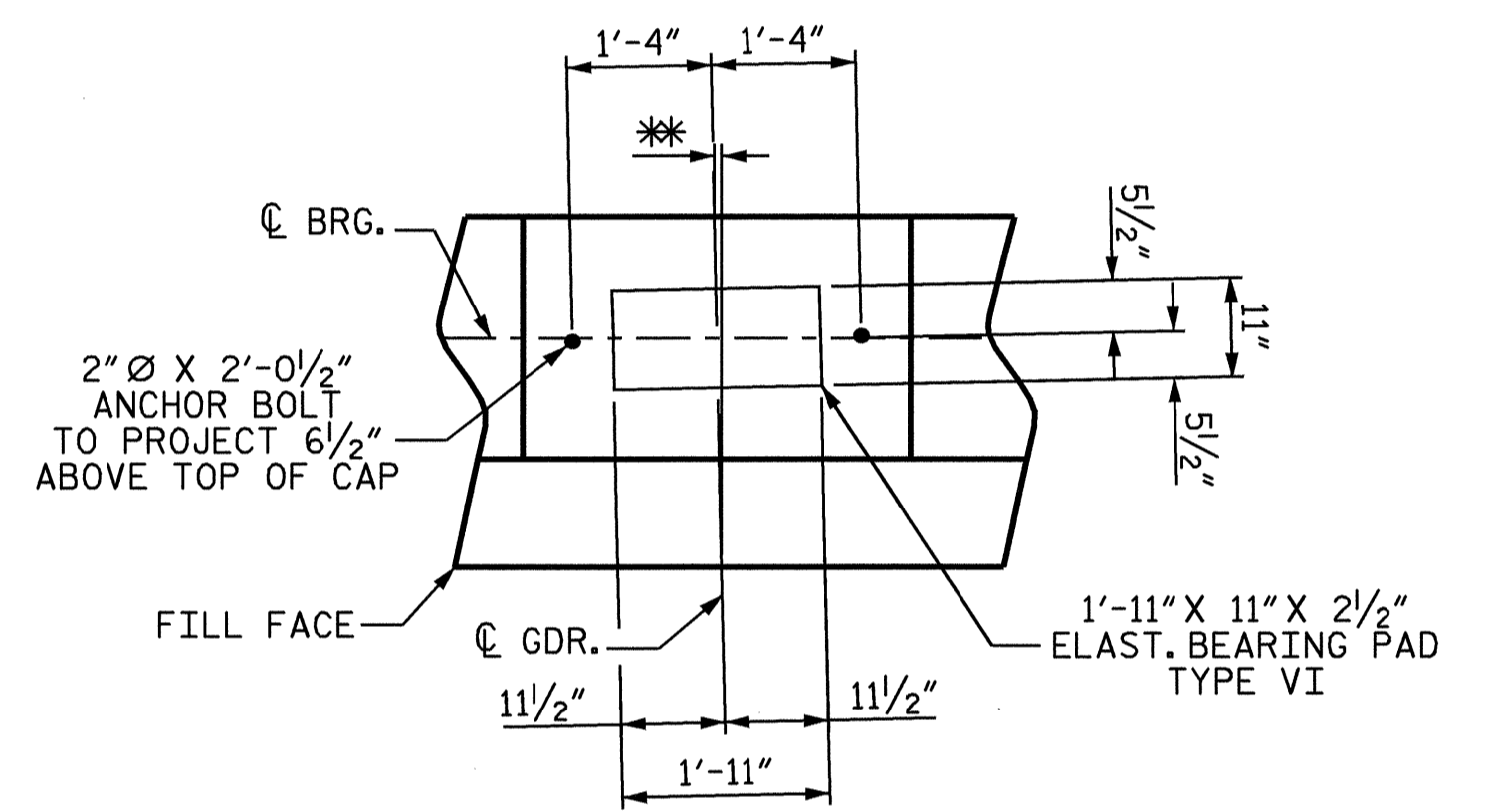


ELEVATION

PILE IN WING NOT SHOWN FOR CLARITY

NOTES

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
- THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.
- FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.
- BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
- THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.
- A MINIMUM OF 35' OF THE TOP OF EACH PILE SHALL BE GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

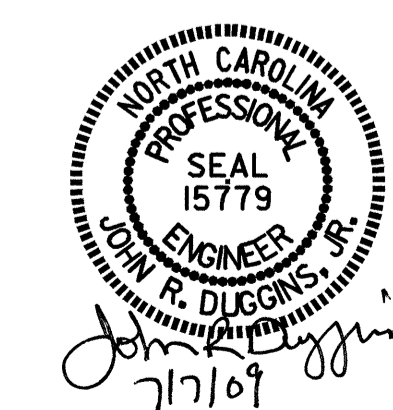


DETAIL A
(DIMENSIONS TYP. EA. BRG.)
* VARIES, SEE PLAN VIEW FOR DIMENSION

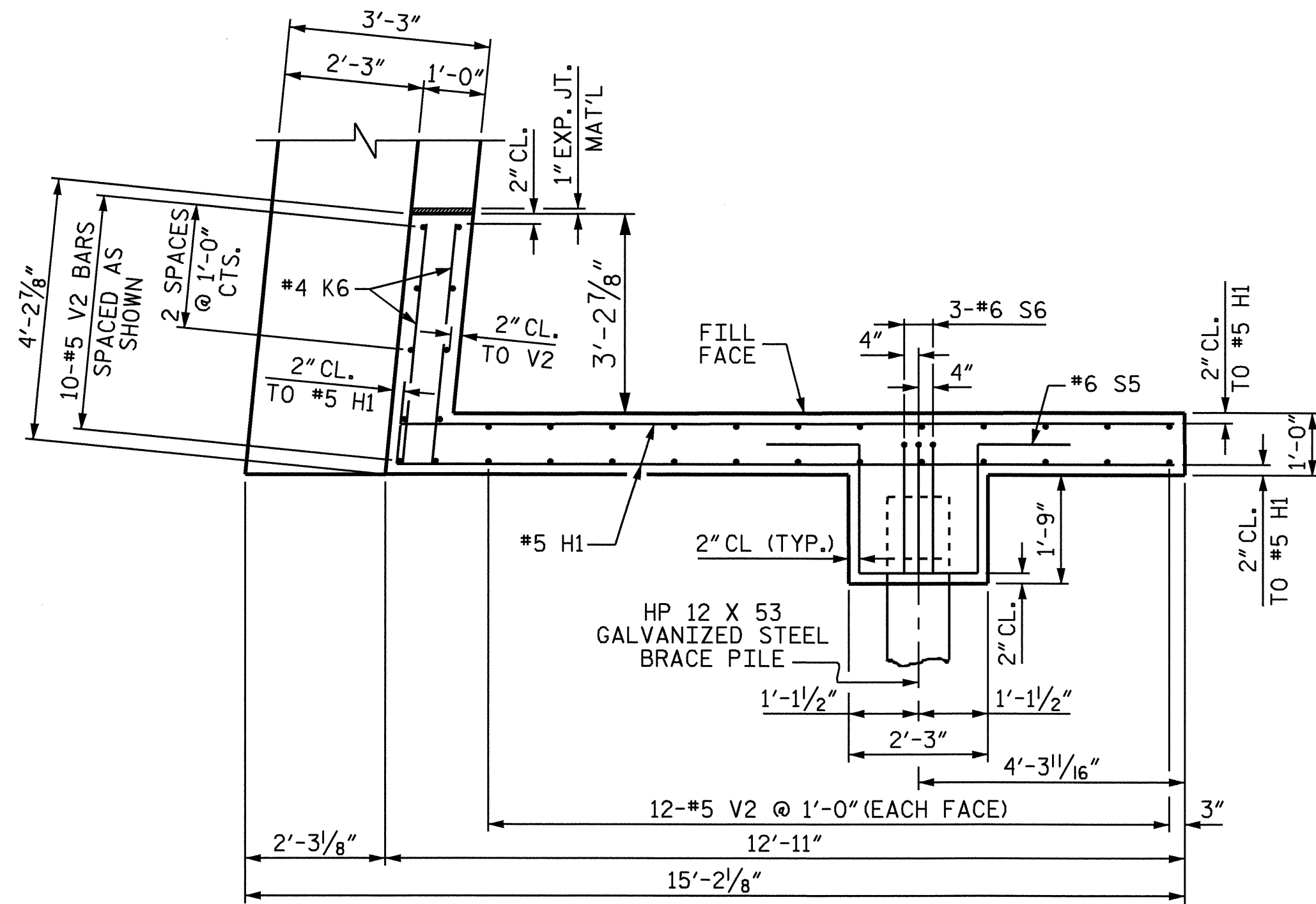
- Δ FIELD BEND AS NECESSARY
- * FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS, SEE SECTION A-A, SHEET 3 OF 3.

PROJECT NO. U-4006
 GUILFORD COUNTY
 STATION: 20+90.21 -L-
 SHEET 1 OF 3

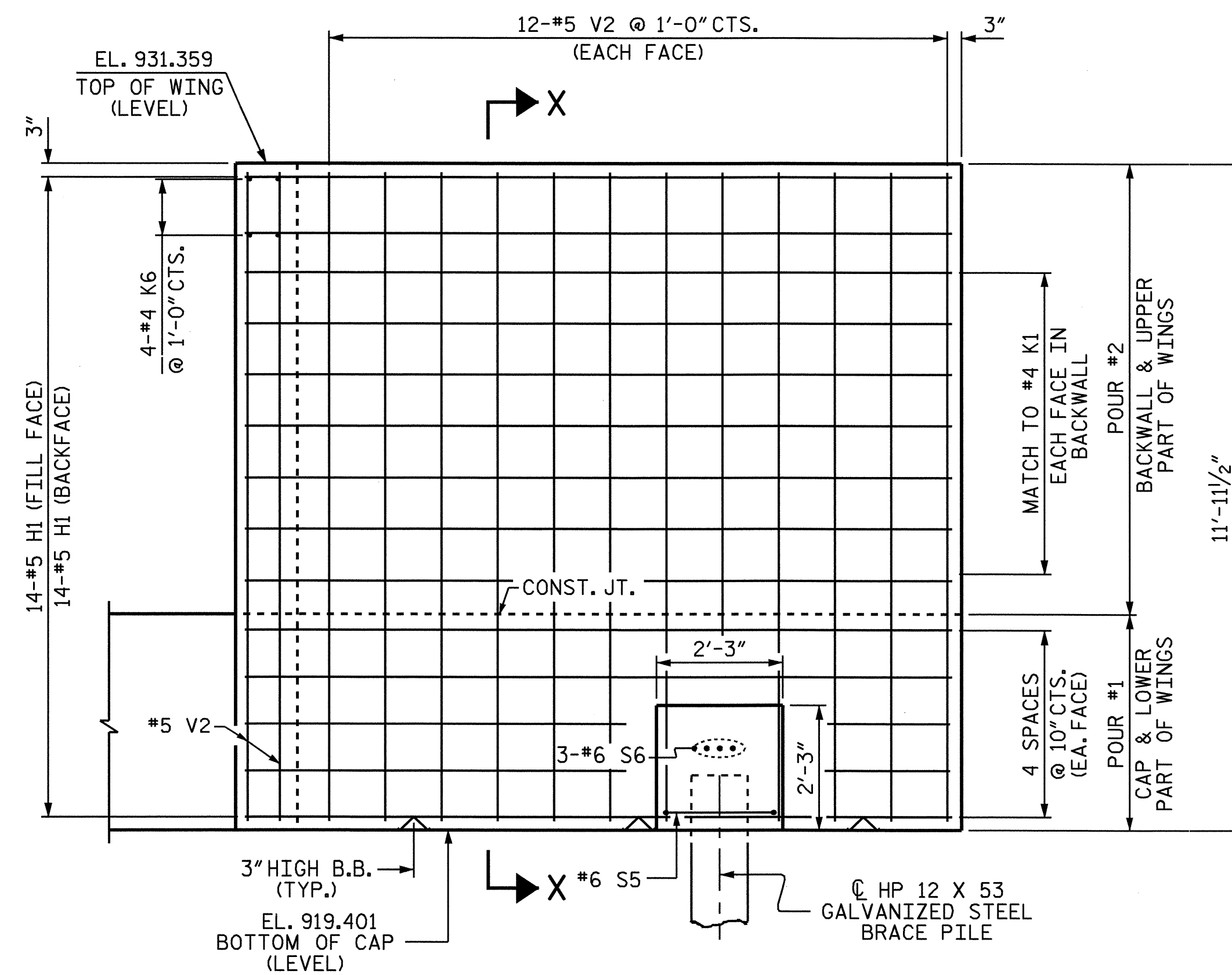
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT #1 LEFT LANE					
SHEET NO. S-27					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 75



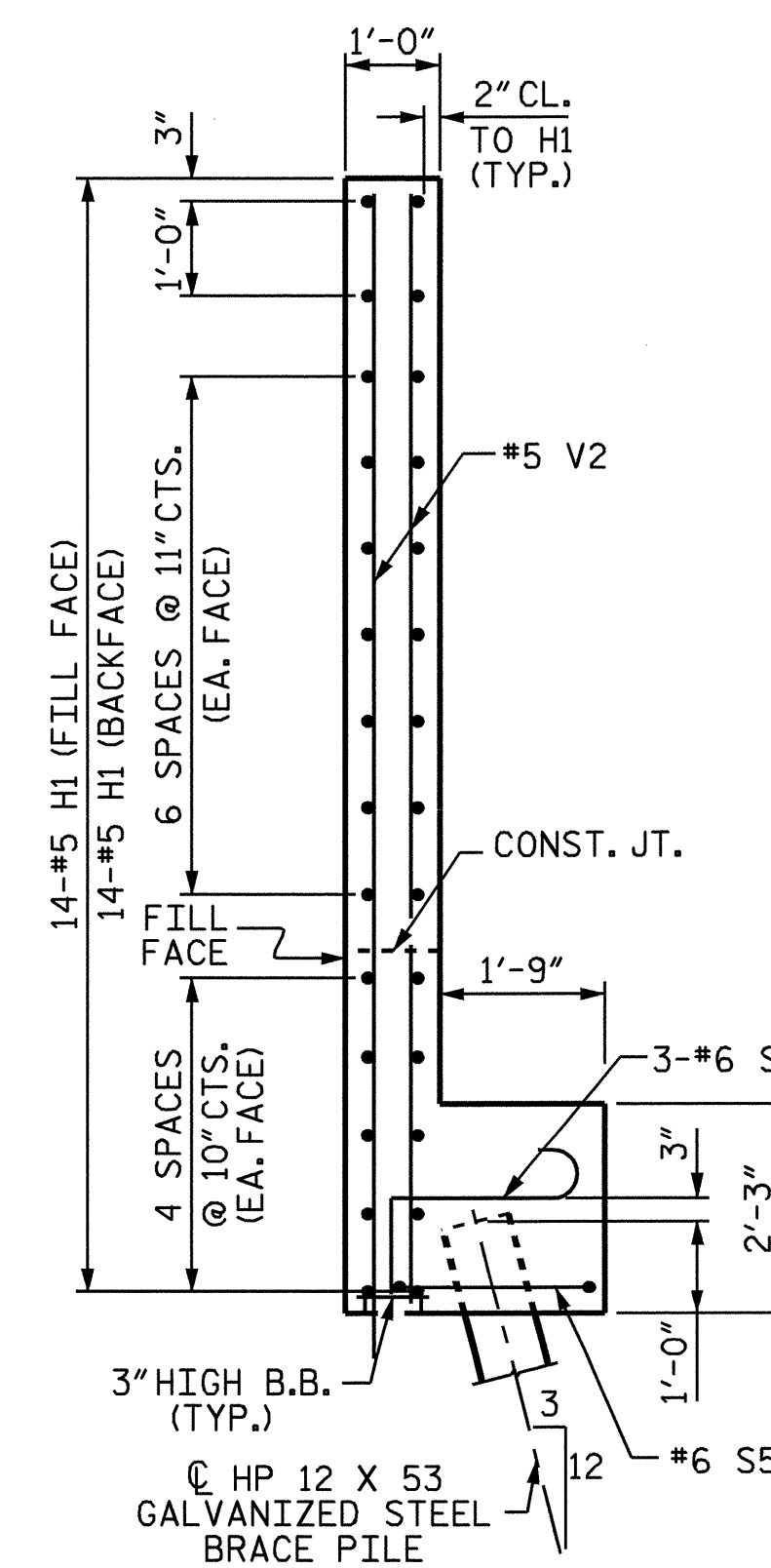
DRAWN BY: A. SORSENGINH DATE: 2-26-09
 CHECKED BY: JL LAMBERT DATE: 4-12-09



PLAN OF LEFT WING - W1



ELEVATION OF LEFT WING - W1



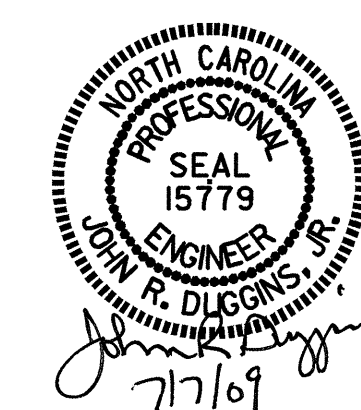
SECTION X-X

PROJECT NO. U-4006
GUILFORD COUNTY
 STATION: 20+90.21 -L-

SHEET 2 OF 3

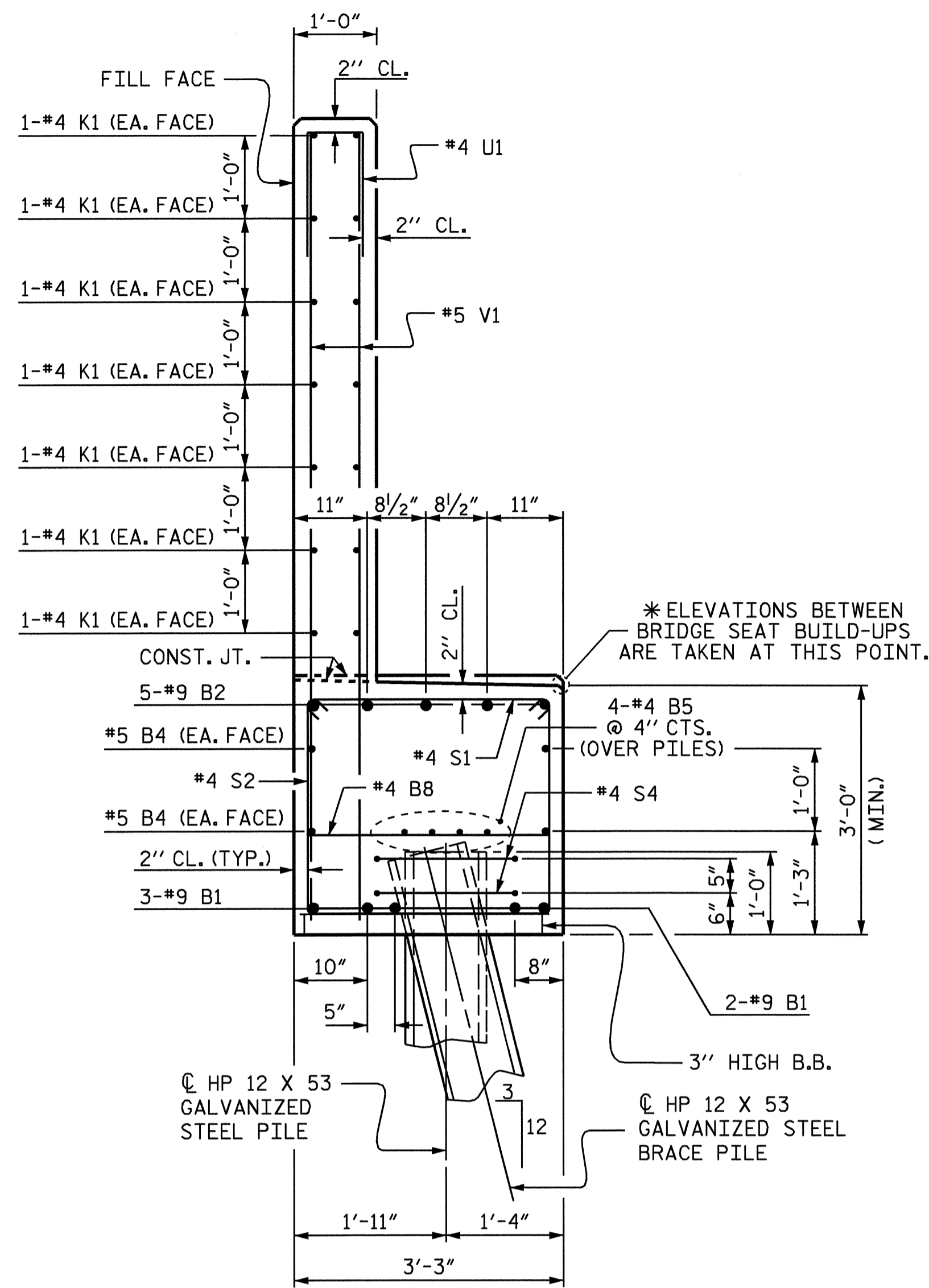
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT #1
 LEFT LANE

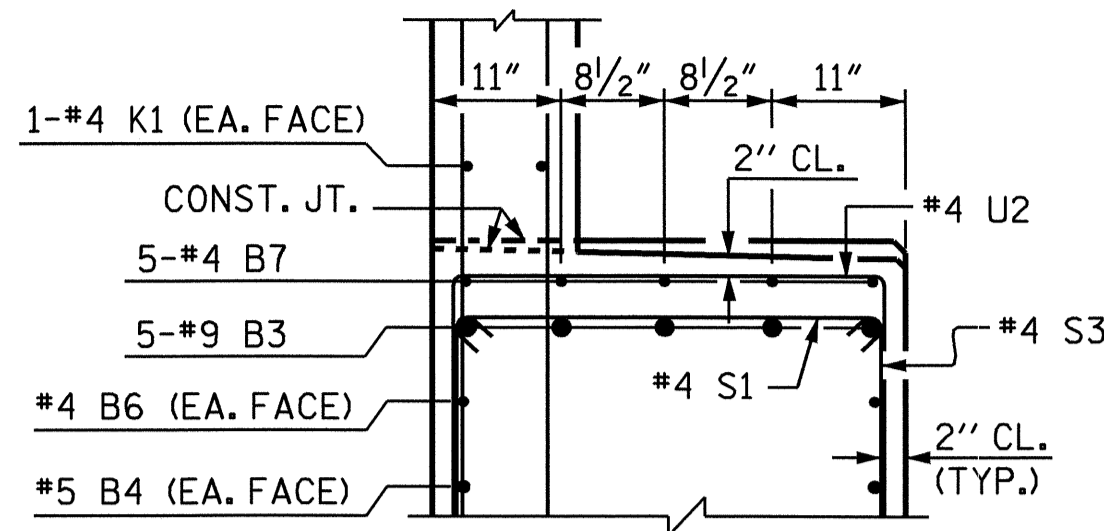


REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS
					75

DRAWN BY: A. SORSENGINH DATE: 3/3/09
 CHECKED BY: JL LAMBERT DATE: 4/12/09



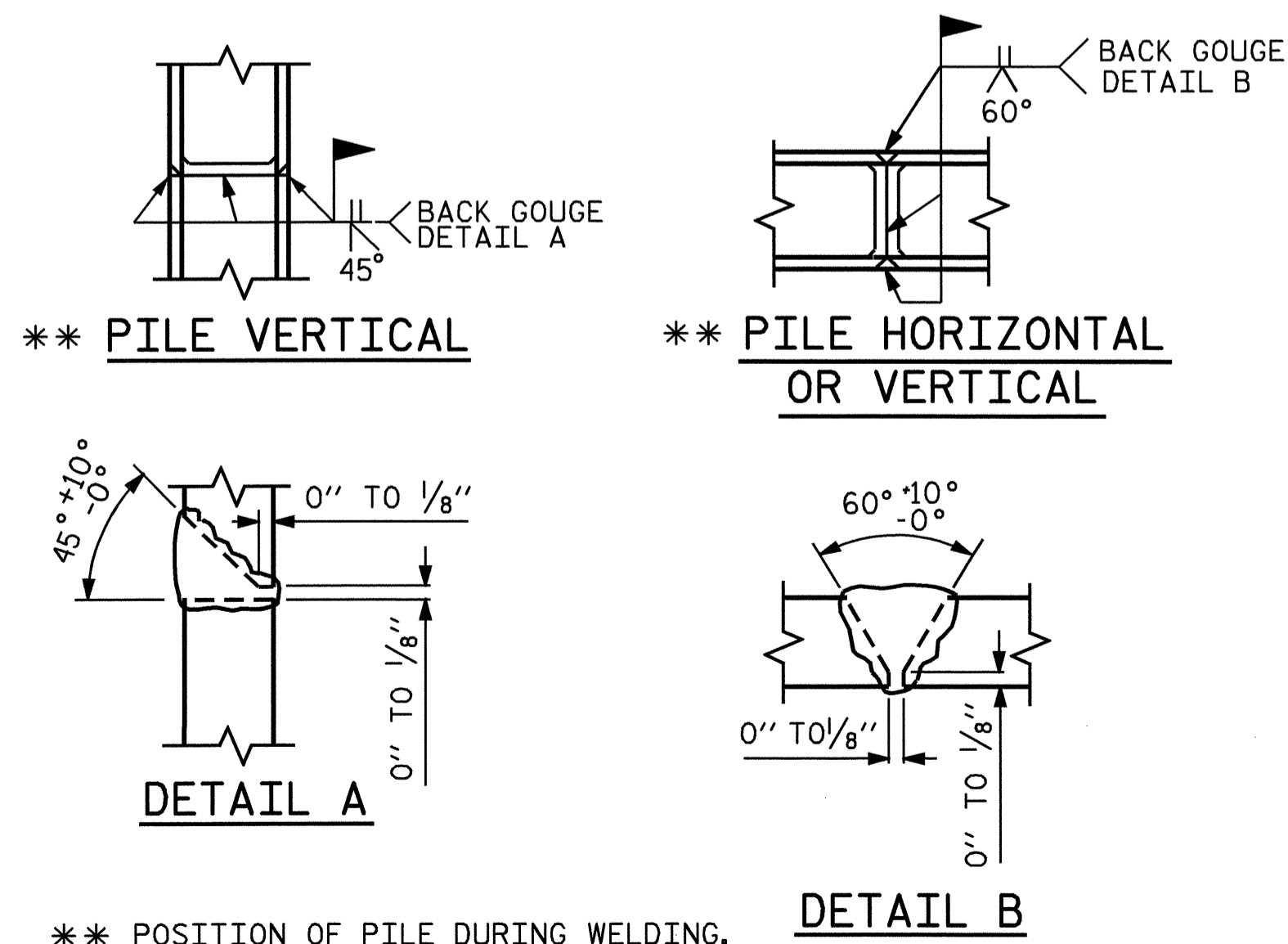
SECTION A-A



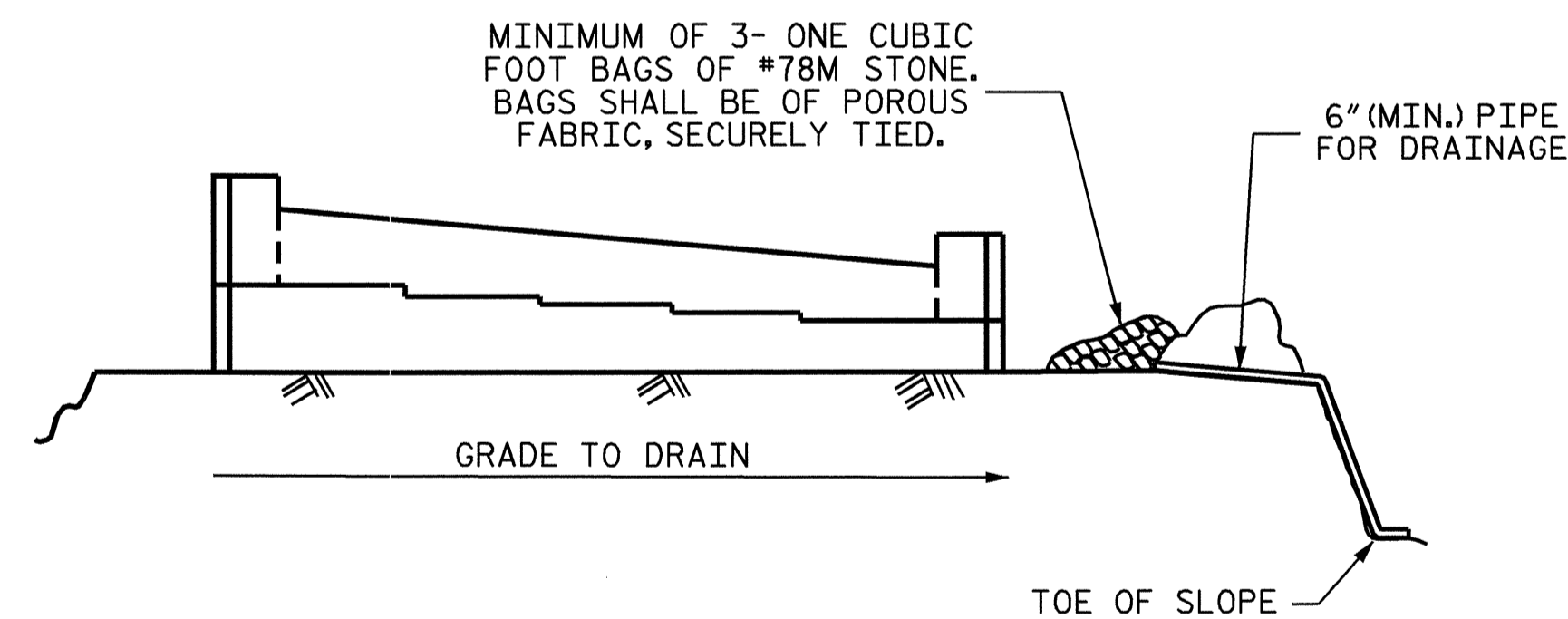
SECTION B-B

BILL OF MATERIAL					
END BENT #1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	#9	1	46'-8"	793
B2	5	#9	2	30'-8"	521
B3	5	#9	2	24'-9"	421
B4	4	#5	STR	44'-4"	185
B5	8	#4	STR	23'-4"	125
B6	2	#4	STR	17'-8"	24
B7	5	#4	STR	8'-6"	28
B8	14	#4	STR	2'-11"	27
B9	10	#4	STR	3'-3"	22
H1	28	#5	6	13'-2"	385
K1	28	#4	STR	24'-7"	460
K2	8	#4	STR	4'-10"	26
K3	2	#4	STR	6'-2"	8
K4	24	#5	STR	3'-7"	90
K5	2	#5	STR	3'-10"	8
K6	4	#4	STR	3'-11"	10
S1	37	#4	4	3'-8"	91
S2	17	#4	5	8'-11"	101
S3	20	#4	5	9'-9"	130
S4	16	#4	3	6'-6"	69
S5	1	#6	8	9'-1"	14
S6	3	#6	9	3'-9"	17
U1	37	#4	7	5'-8"	140
U2	12	#4	7	5'-11"	47
V1	74	#5	STR	8'-8"	669
V2	34	#5	STR	11'-7"	411
V3	32	#5	STR	7'-0"	234
REINFORCING STEEL				LBS.	5056
CLASS A CONC. BREAKDOWN					
POUR #1					
CAP & LOWER PART OF WING 21.0 CU. YDS.					
POUR #2					
BACKWALL & UPPER PART OF WING 14.2 CU. YDS.					
POUR #3					
WALL 1.8 CU. YDS.					
CLASS A CONCRETE TOTAL					37.0 CU. YDS.
HP 12 X 53 GALVANIZED STEEL PILES					
NO. 9				LIN. FT.	675

ALL BAR DIMENSIONS ARE OUT TO OUT.



PILE SPLICE DETAILS



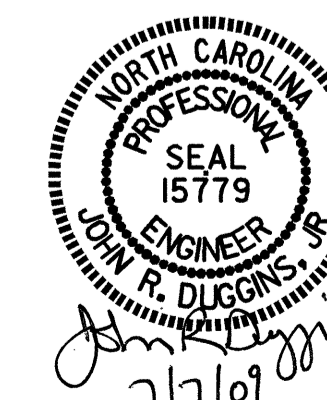
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

TEMPORARY DRAINAGE AT END BENT

DRAWN BY: A. SORSENGINH DATE: 3/4/09
 CHECKED BY: J.L. LAMBERT DATE: 4/12/09



PROJECT NO. U-4006
 GUILFORD COUNTY
 STATION: 20+90.21 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT #1
 LEFT LANE

REVISIONS						TOTAL SHEETS
NO.	BY:	DATE:	NO.	BY:	DATE:	75
1			3			
2			4			

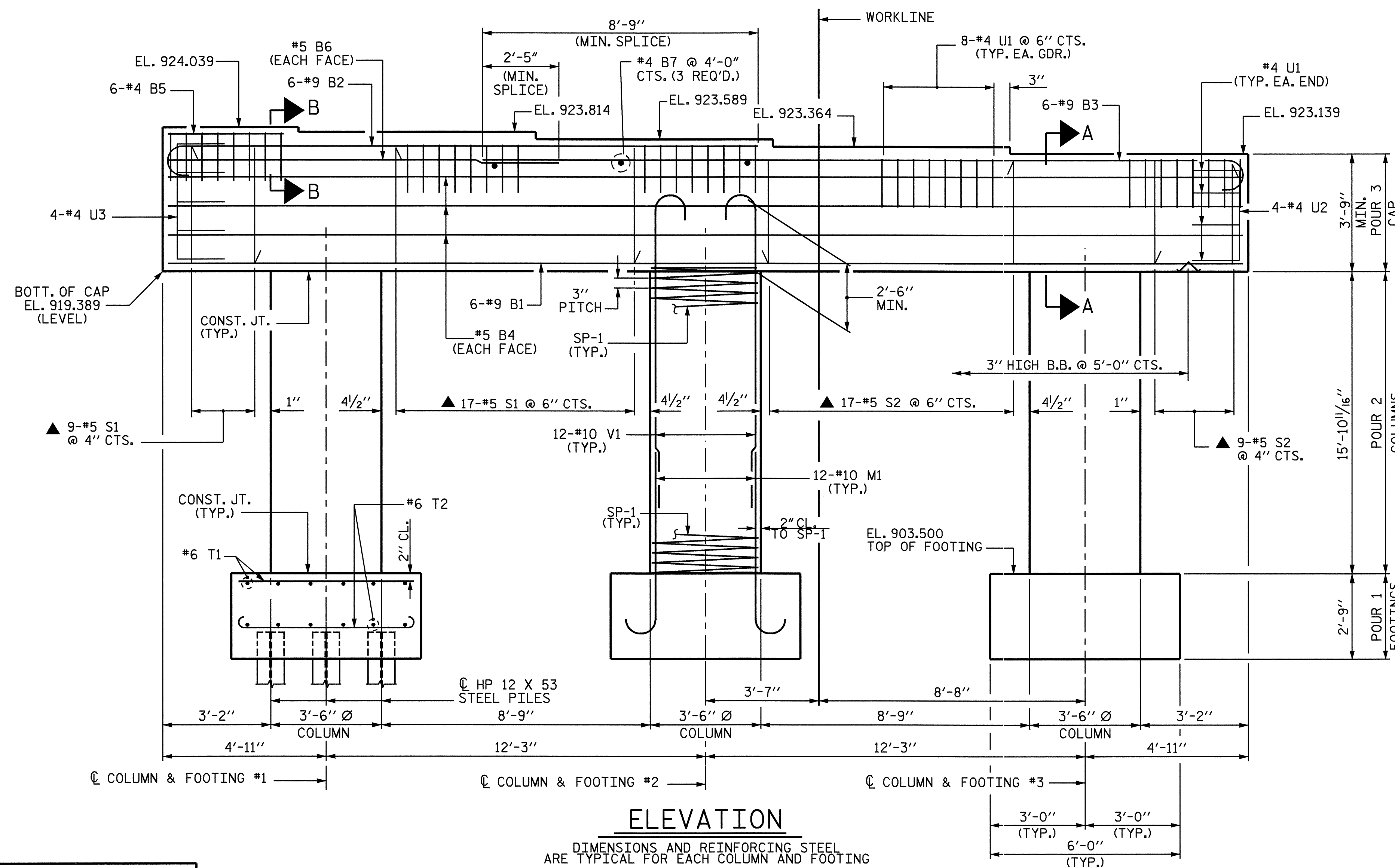
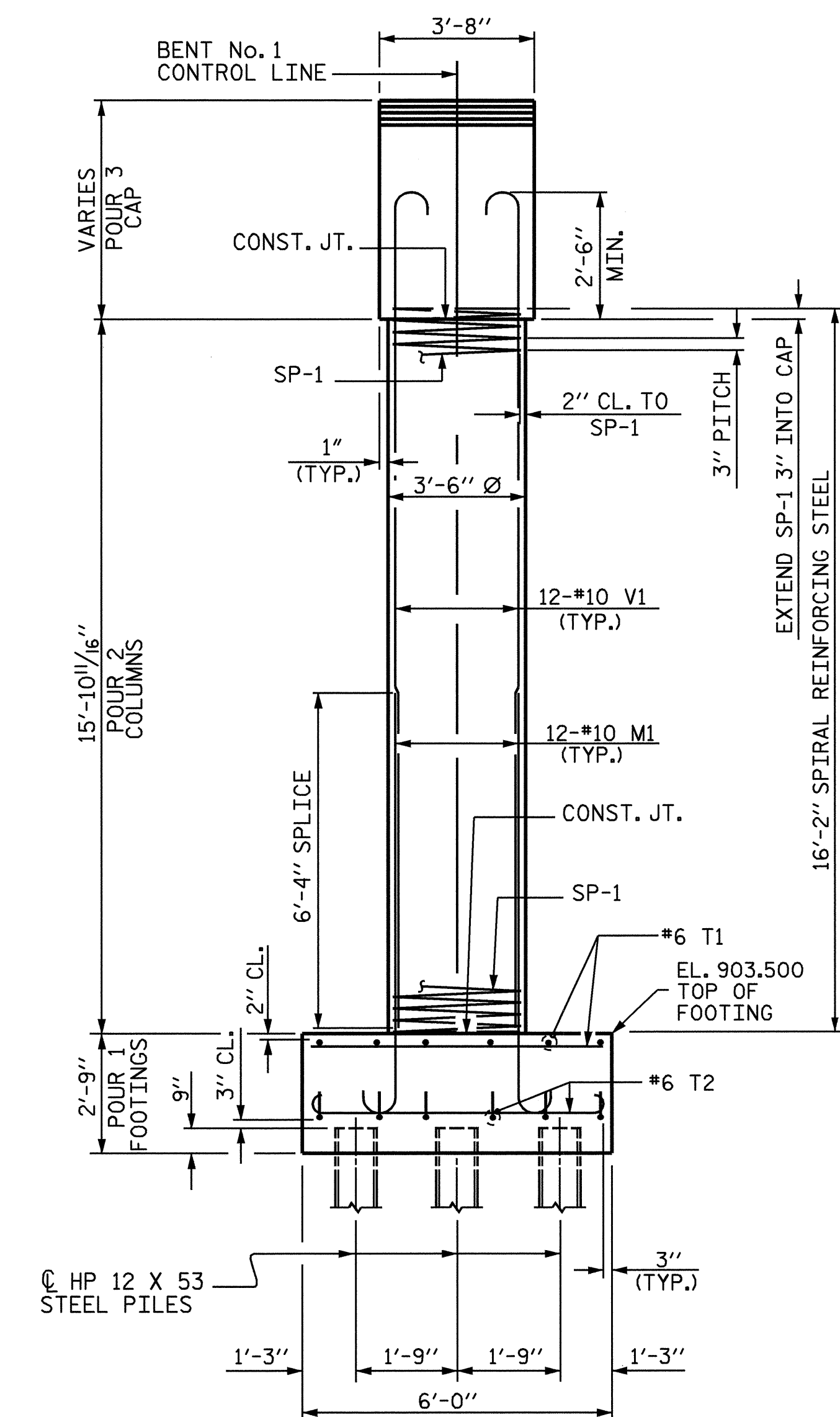
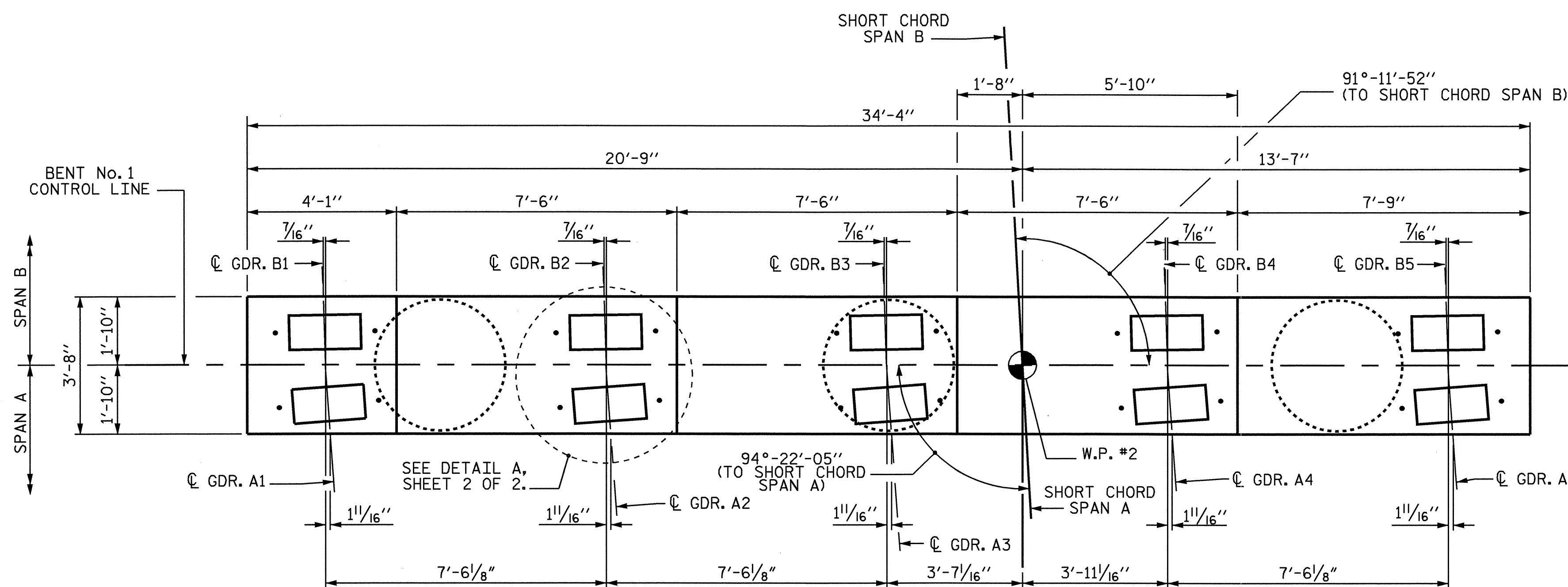
SHEET NO.
 S-29

NOTES

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

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

FOR PILE SPLICE DETAILS, SEE END BENT SHEETS.

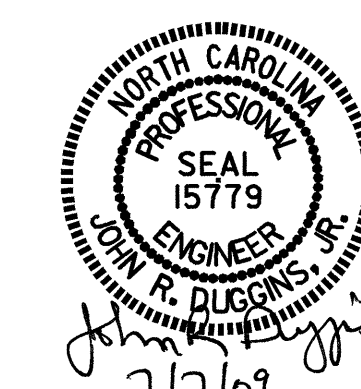


PROJECT NO. U-4006
 GUILFORD COUNTY
 STATION: 20+90.21 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

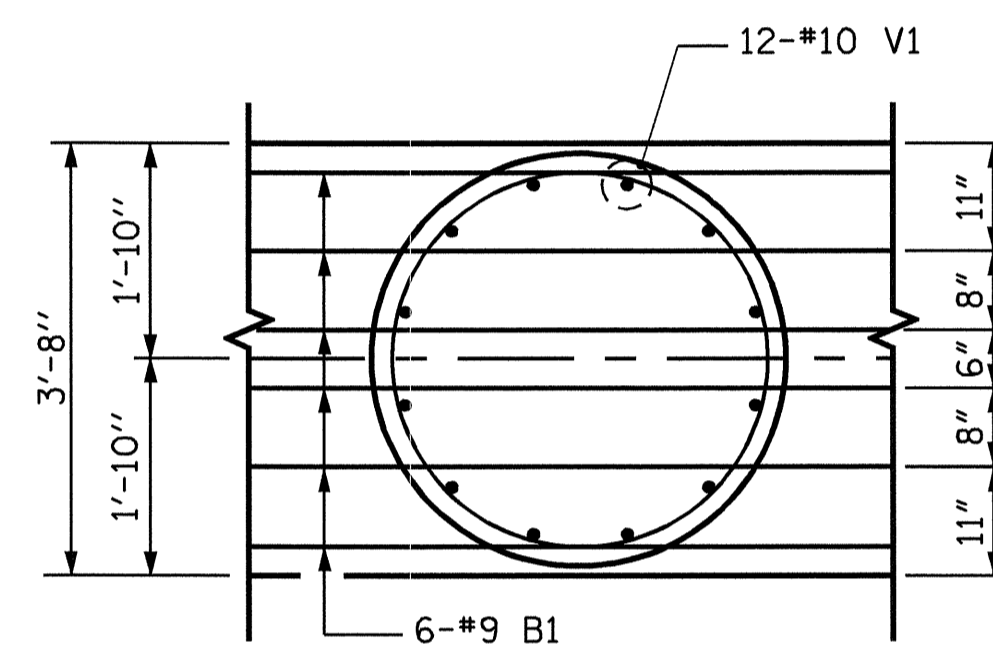
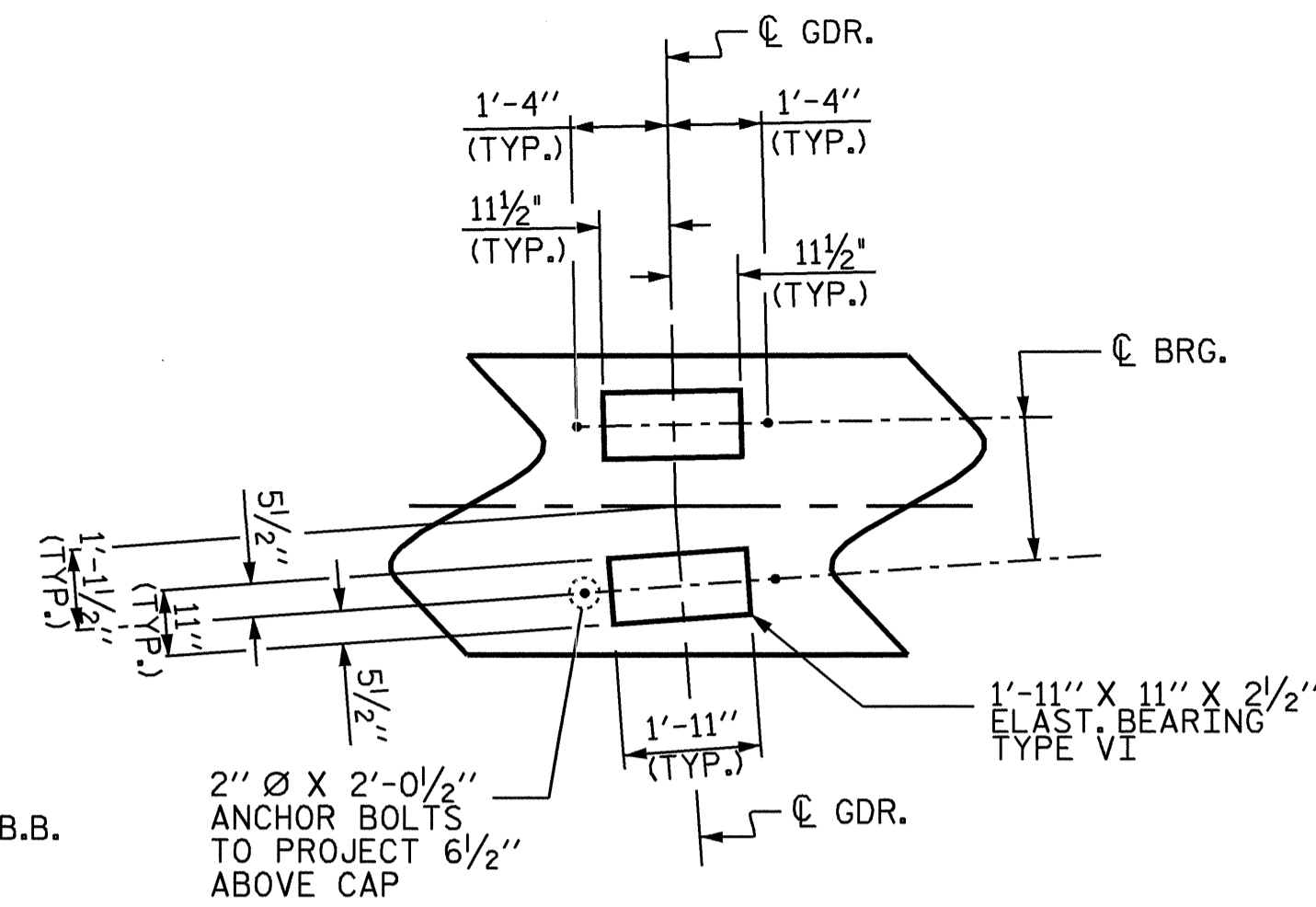
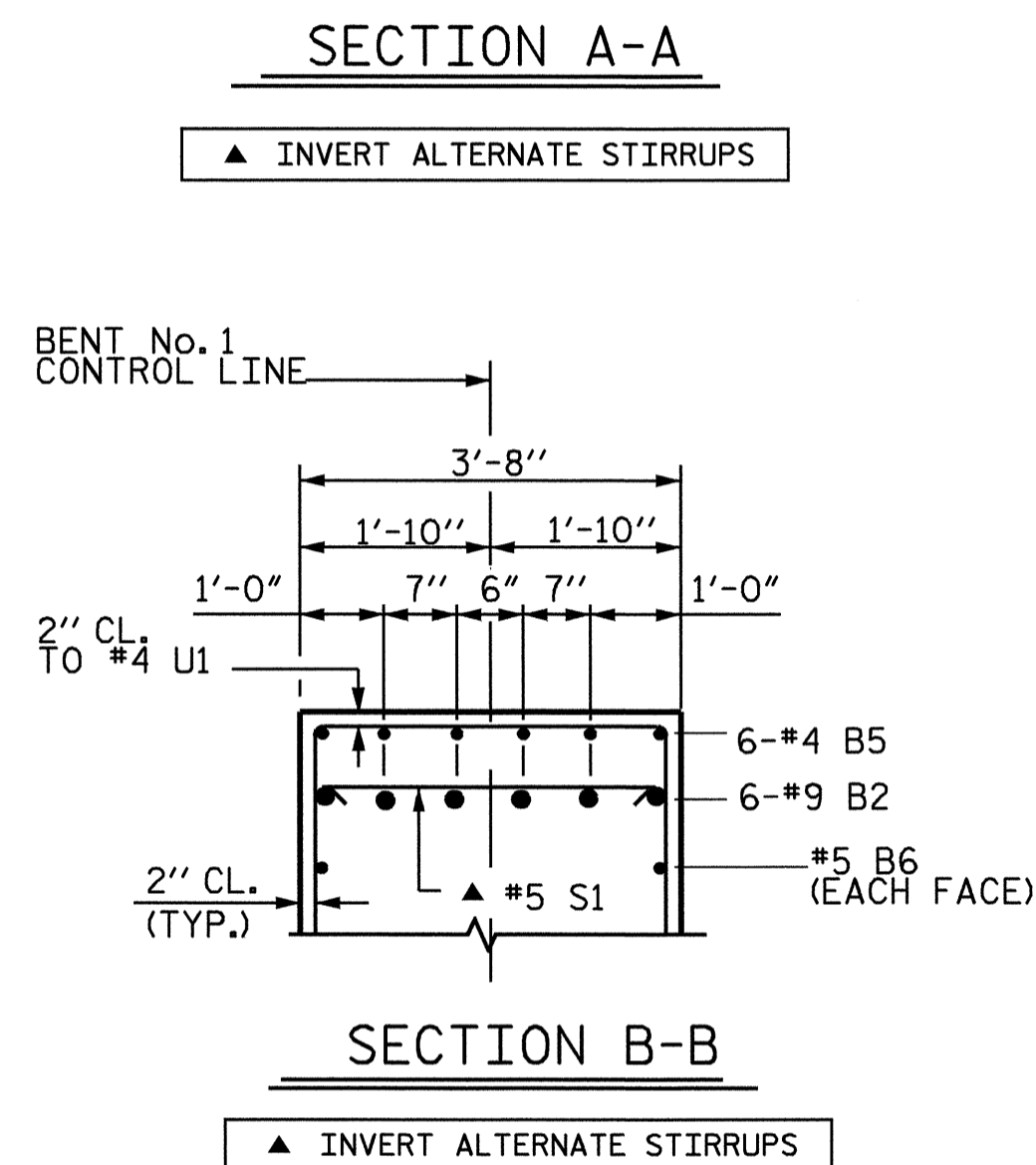
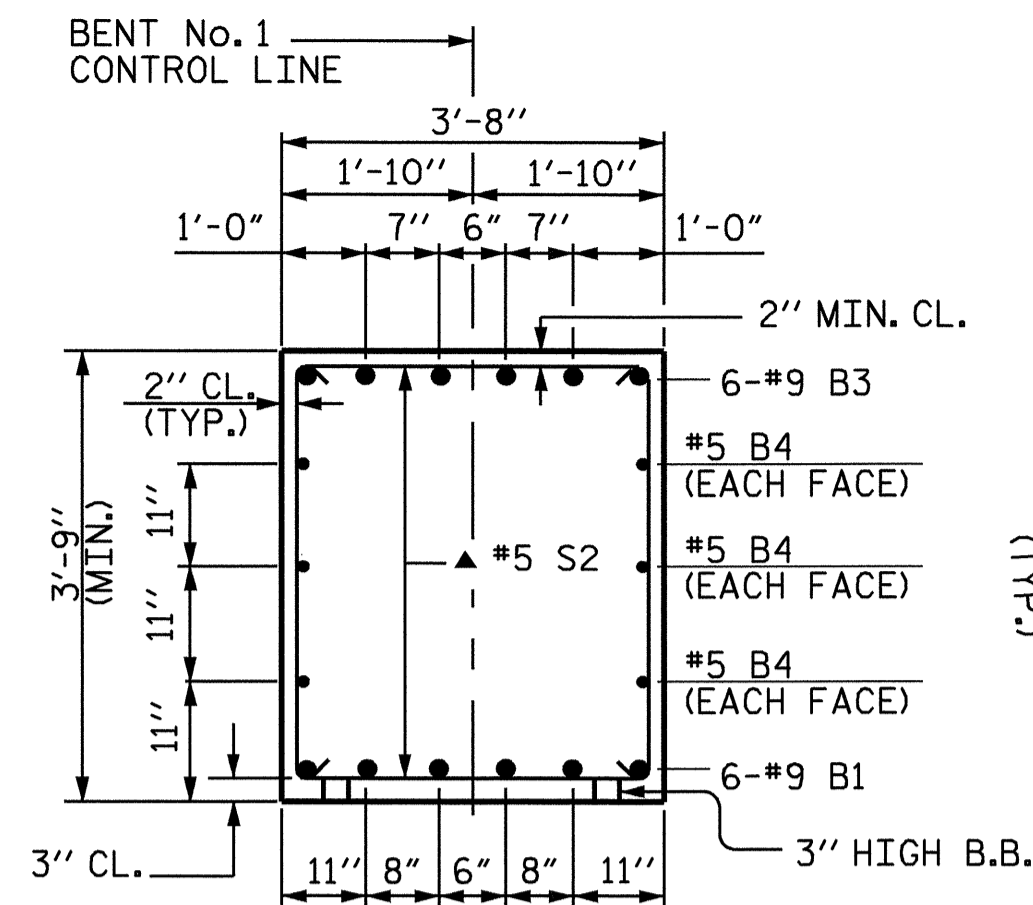
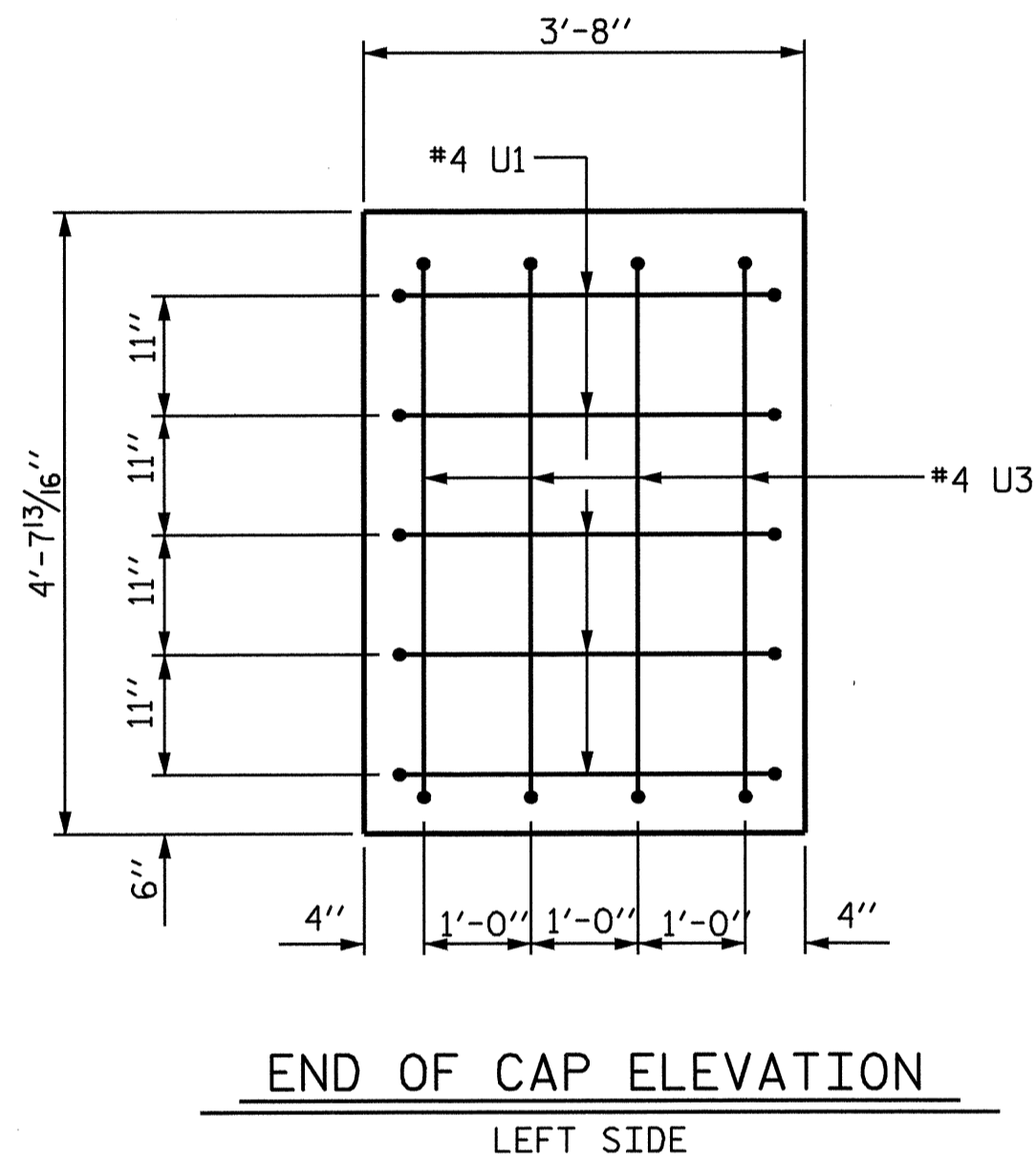
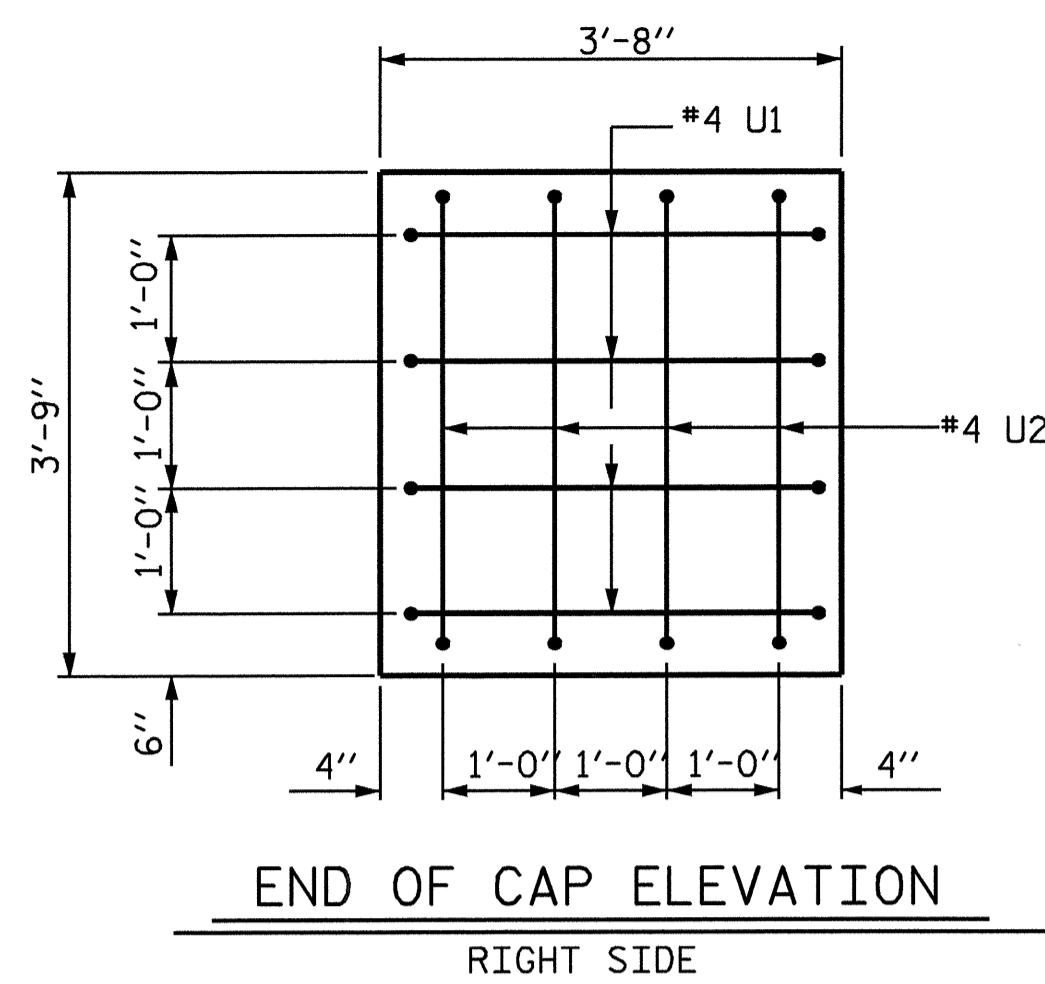
SUBSTRUCTURE
 BENT No. 1
 LEFT LANE



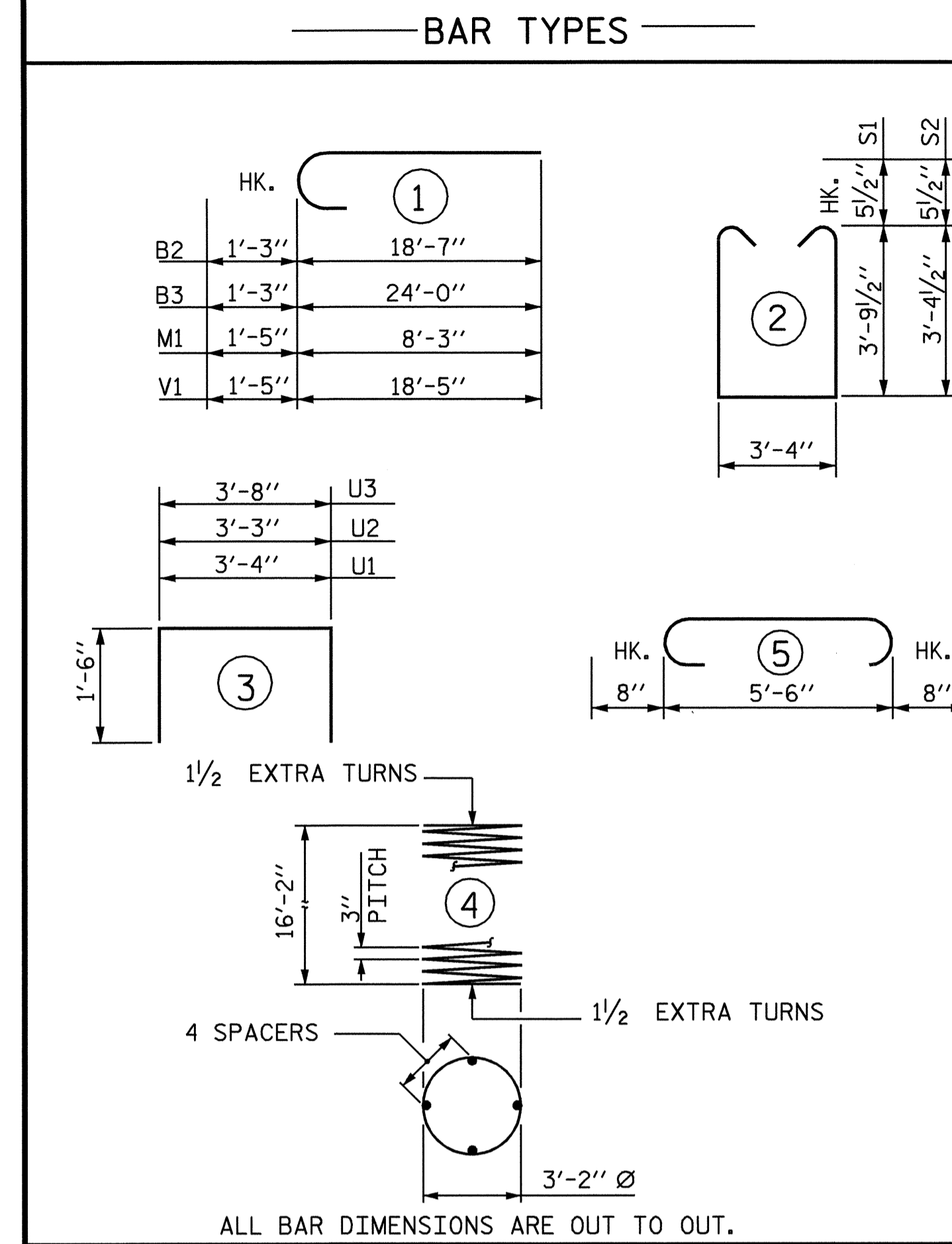
REVISIONS						SHEET NO. S-30
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 75
2			4			

DRAWN BY: M. POOLE DATE: 3/09
 CHECKED BY: A. SORSENGIN DATE: 4/09

06-JUL-2009 12:13
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 dahodge

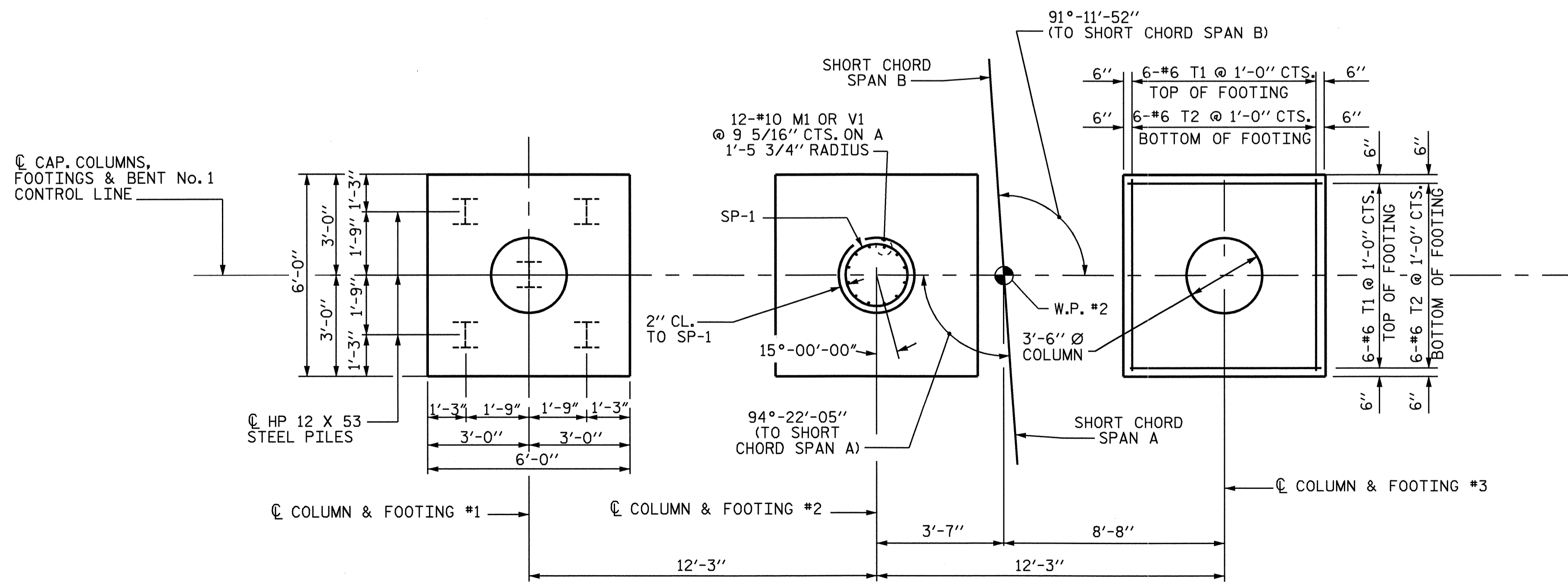


BOTTOM OF CAP



*** THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

BILL OF MATERIAL						
BENT No. 1						
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT		
B1	6	9	STR	34'-0"	694	
B2	6	9	1	19'-10"	405	
B3	6	9	1	25'-3"	515	
B4	6	5	STR	34'-0"	213	
B5	6	4	STR	3'-9"	15	
B6	2	5	STR	12'-6"	26	
B7	3	4	STR	3'-4"	7	
M1	36	10	1	9'-8"	1497	
S1	26	5	2	11'-10"	321	
S2	26	5	2	11'-0"	298	
T1	36	6	STR	5'-6"	297	
T2	36	6	5	6'-10"	369	
U1	49	4	3	6'-4"	207	
U2	4	4	3	6'-3"	17	
U3	4	4	3	6'-8"	18	
V1	36	10	1	19'-10"	3072	
REINFORCING STEEL					7971	LBS
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT		
SP-1	3	***	4	667'-10"	1338	
TOTAL SPIRAL COLUMN REINFORCING STEEL					1338	Lbs
CLASS A CONCRETE BREAKDOWN						
POUR #1 (FOOTINGS)					11.0	C.Y.
POUR #2 (COLUMNS)					17.0	C.Y.
POUR #3 (CAP)					19.3	C.Y.
TOTAL					47.3	C.Y.
HP 12 X 53 STEEL PILES						
No. 15					790	LN. FEET



PLAN OF FOOTINGS

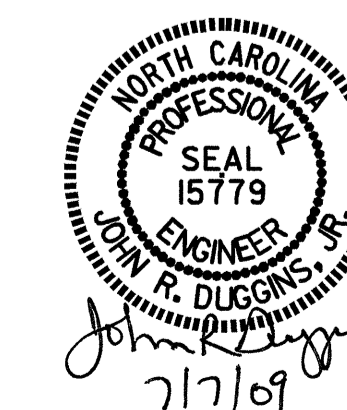
ALL FOOTINGS ARE TYPICAL

PROJECT NO. U-4006
 GUILFORD COUNTY
 STATION: 20+90.21 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

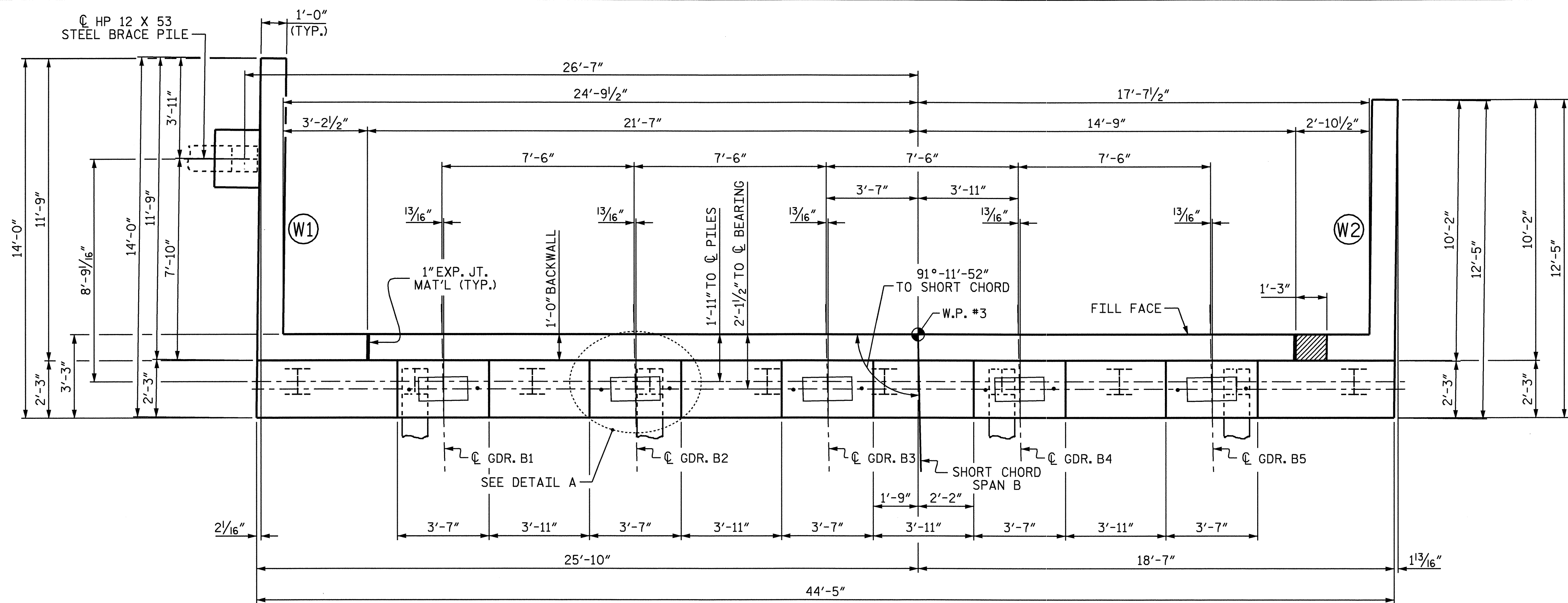
SUBSTRUCTURE
 BENT No. 1
 LEFT LANE



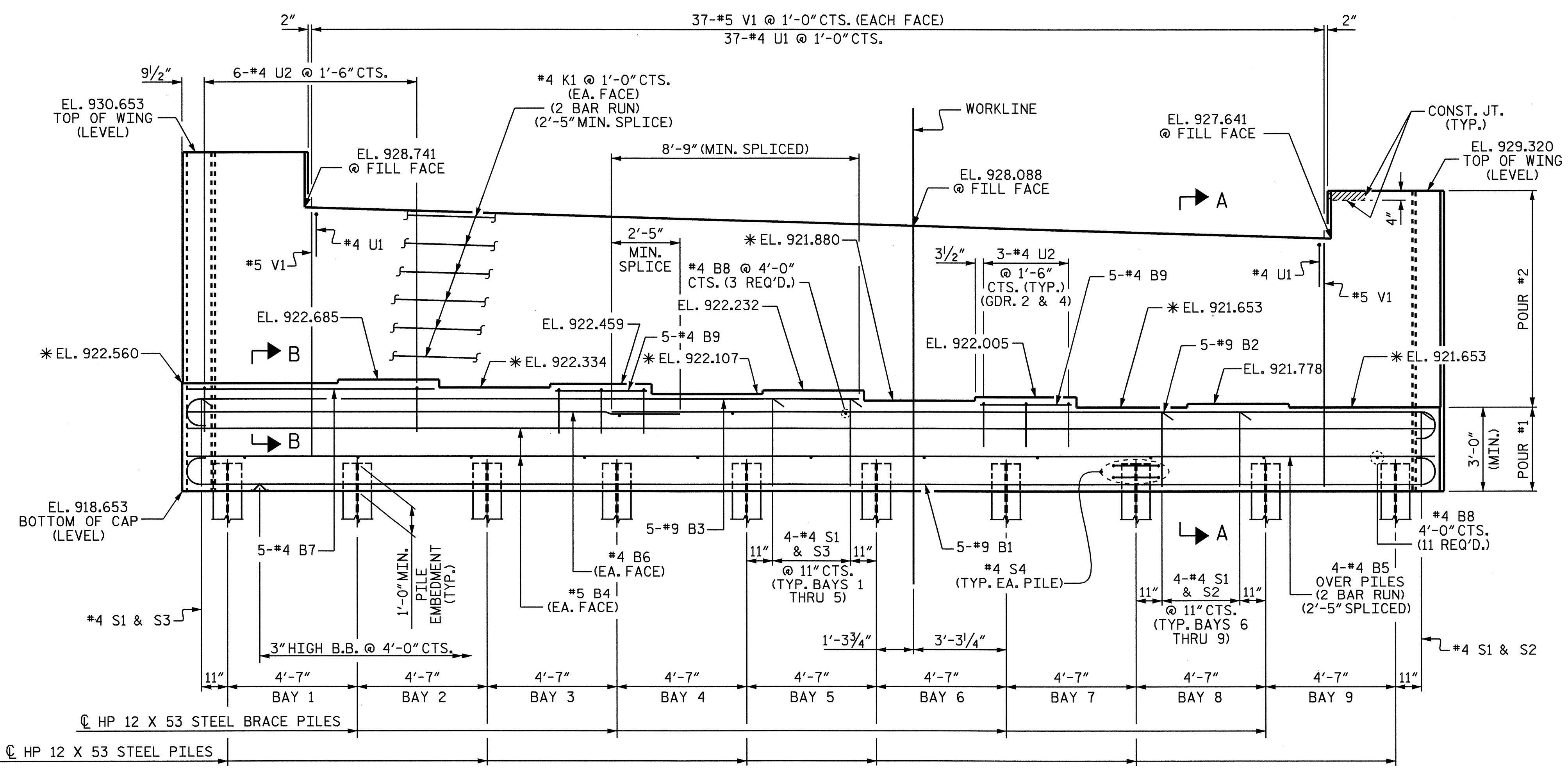
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS
2			4			75

DRAWN BY: M. POOLE DATE: 3/09
 CHECKED BY: A. SORSENGINH DATE: 4/09

06-JUL-2009 14:32
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 dahodge



PLAN

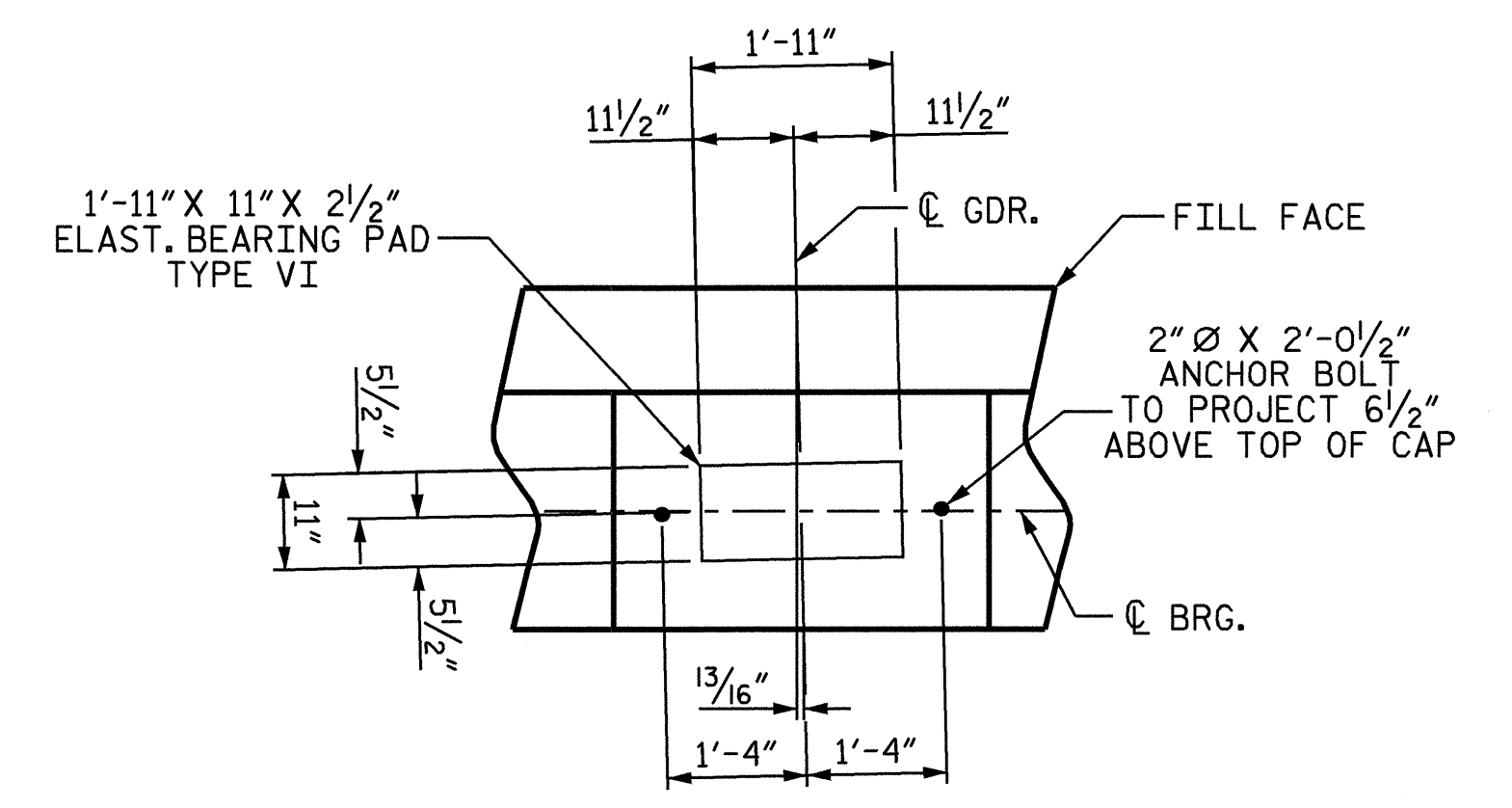


ELEVATION

PILE IN WING NOT SHOWN FOR CLARITY

NOTES

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
- THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.
- FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.
- BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
- THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.
- THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.



DETAIL A
(DIMENSIONS TYP. EA. BRG.)

* FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS, SEE SECTION A-A, SHEET 3 OF 3.

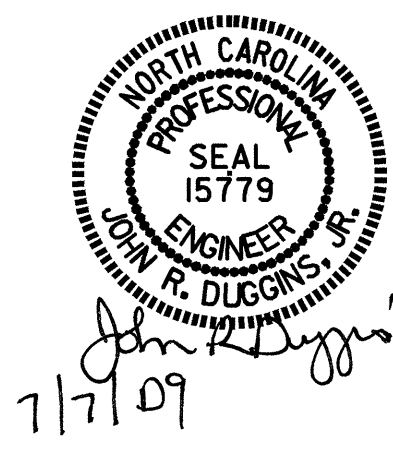
PROJECT NO. U-4006
GUILFORD COUNTY
 STATION: 20+90.21 -L-

SHEET 1 OF 3

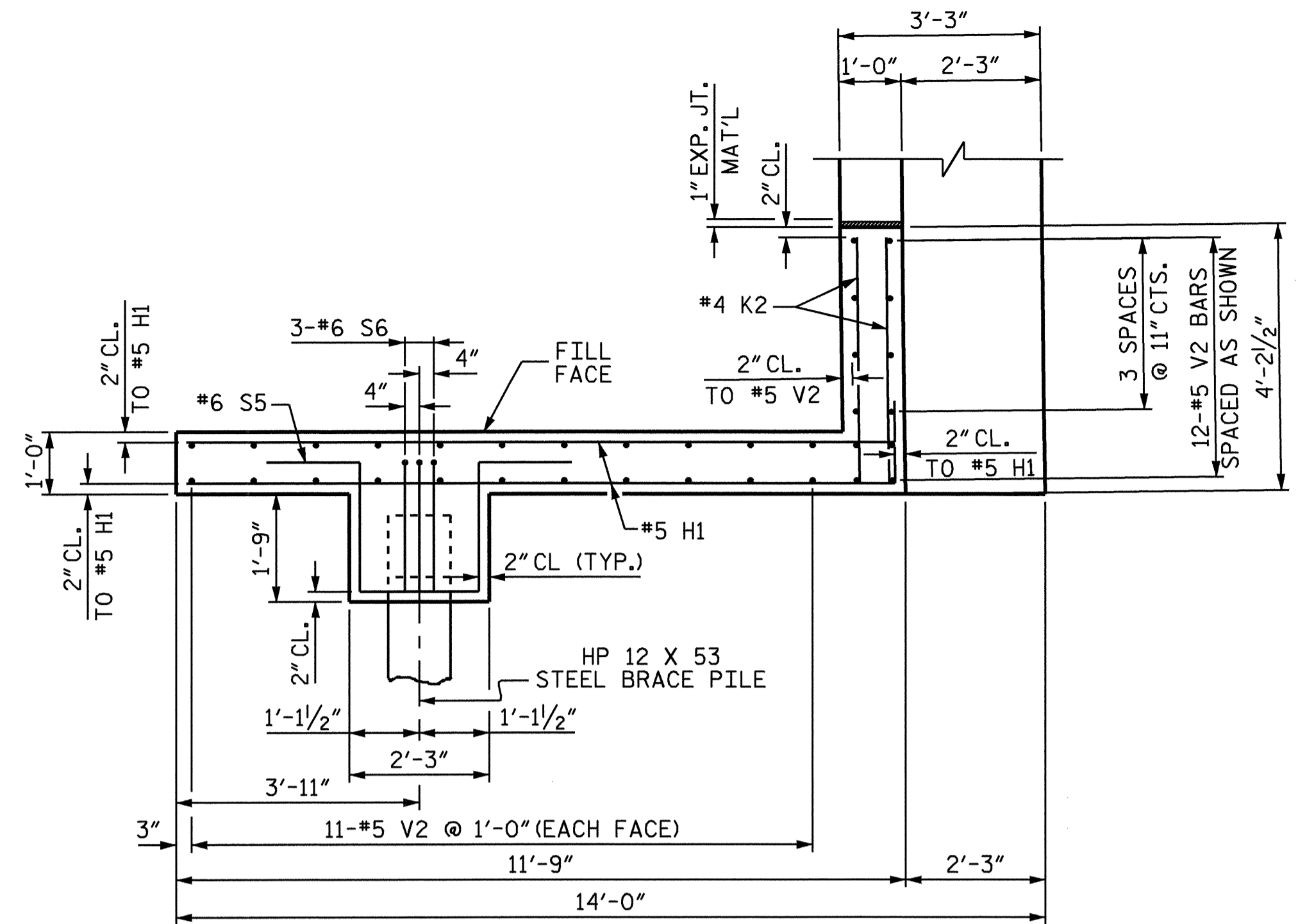
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 END BENT #2
 LEFT LANE**

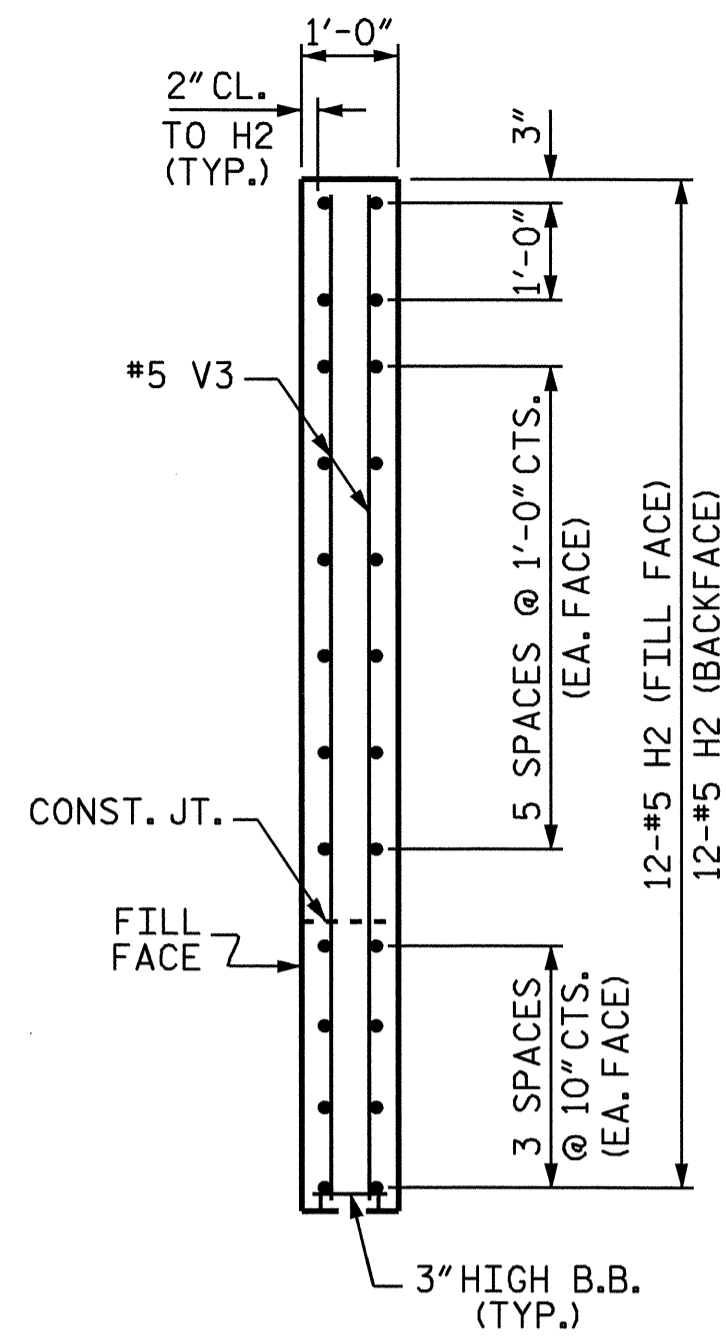
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			75
2			4			



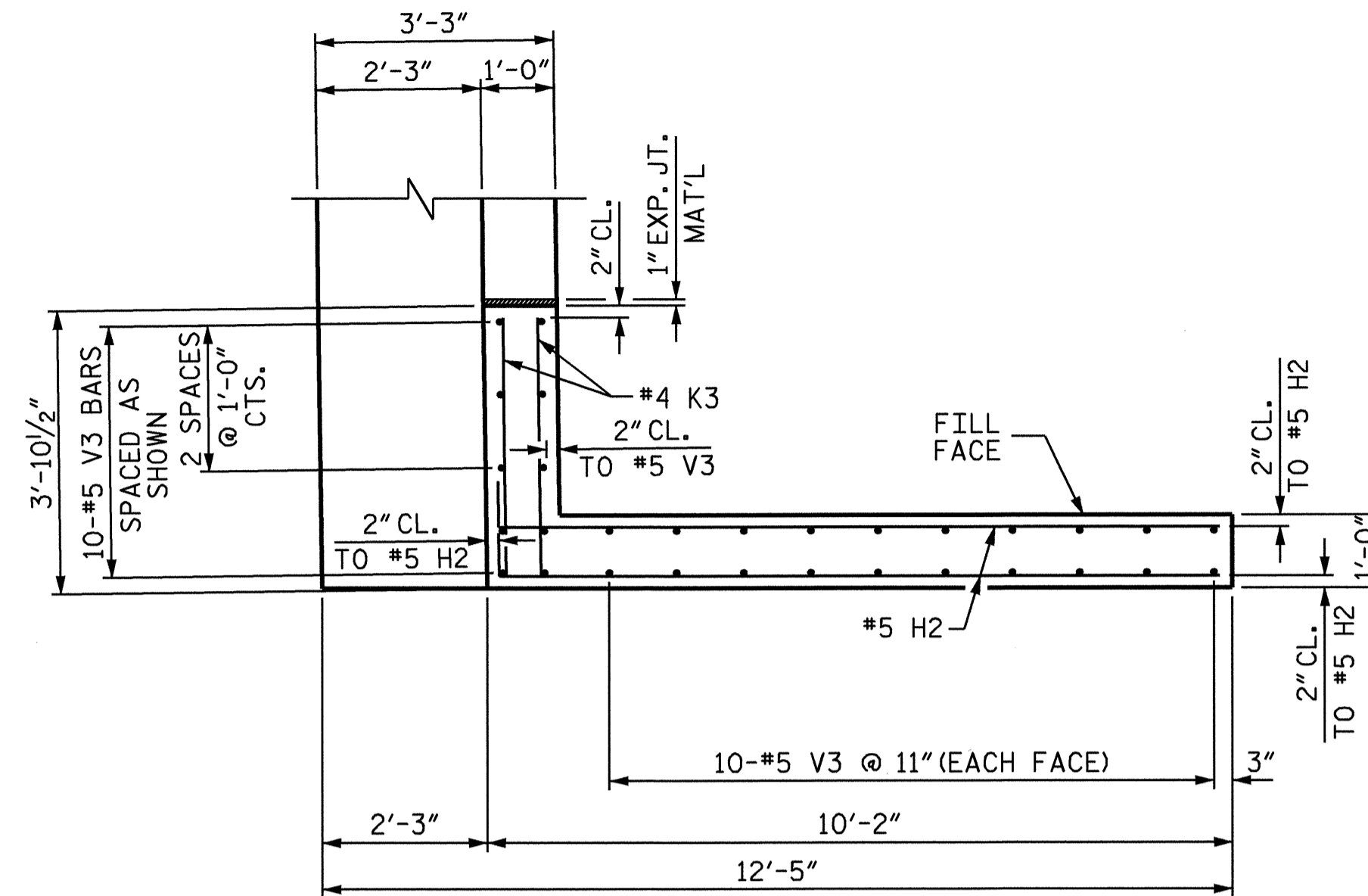
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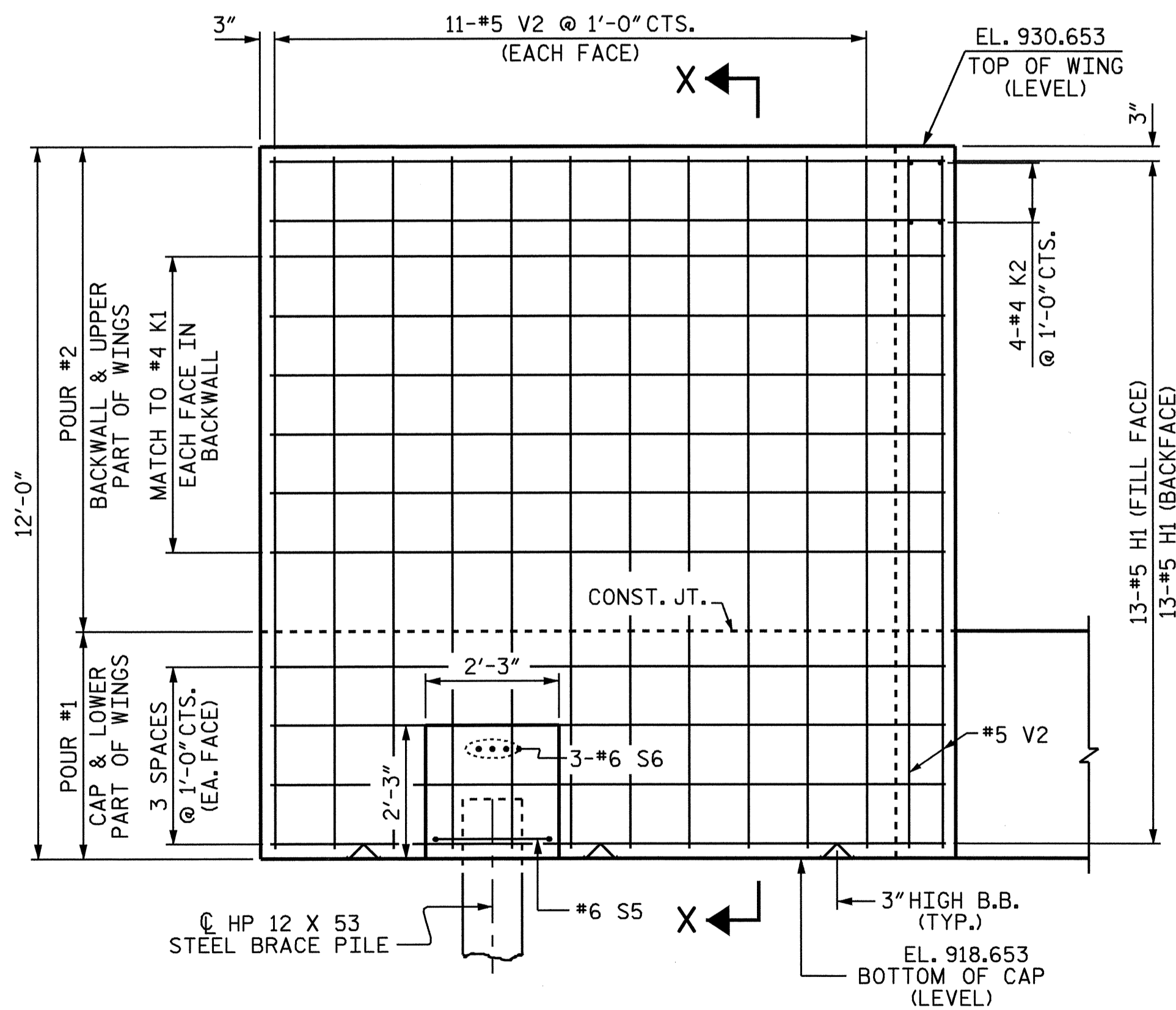
PLAN OF LEFT WING - W1



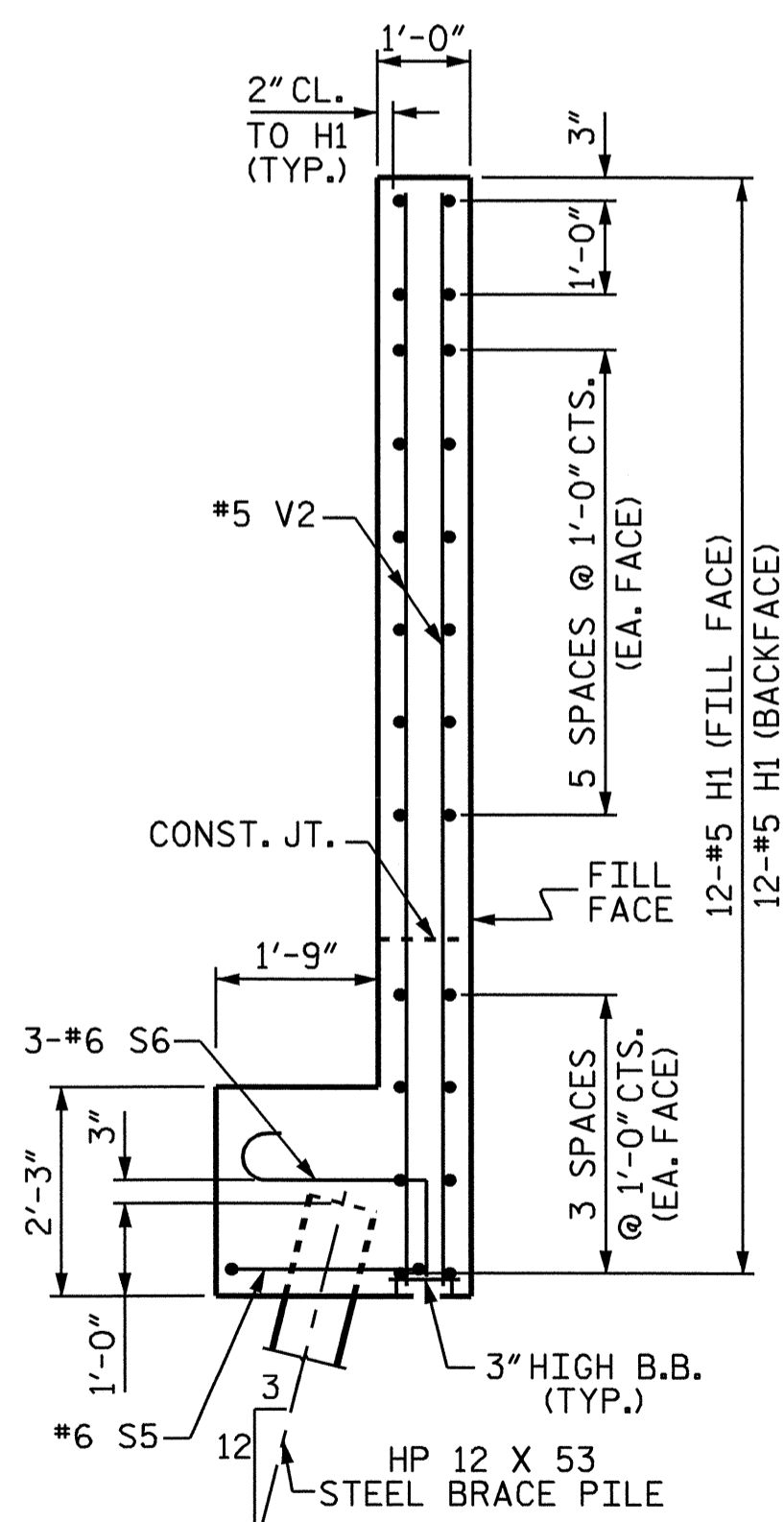
SECTION Y-Y



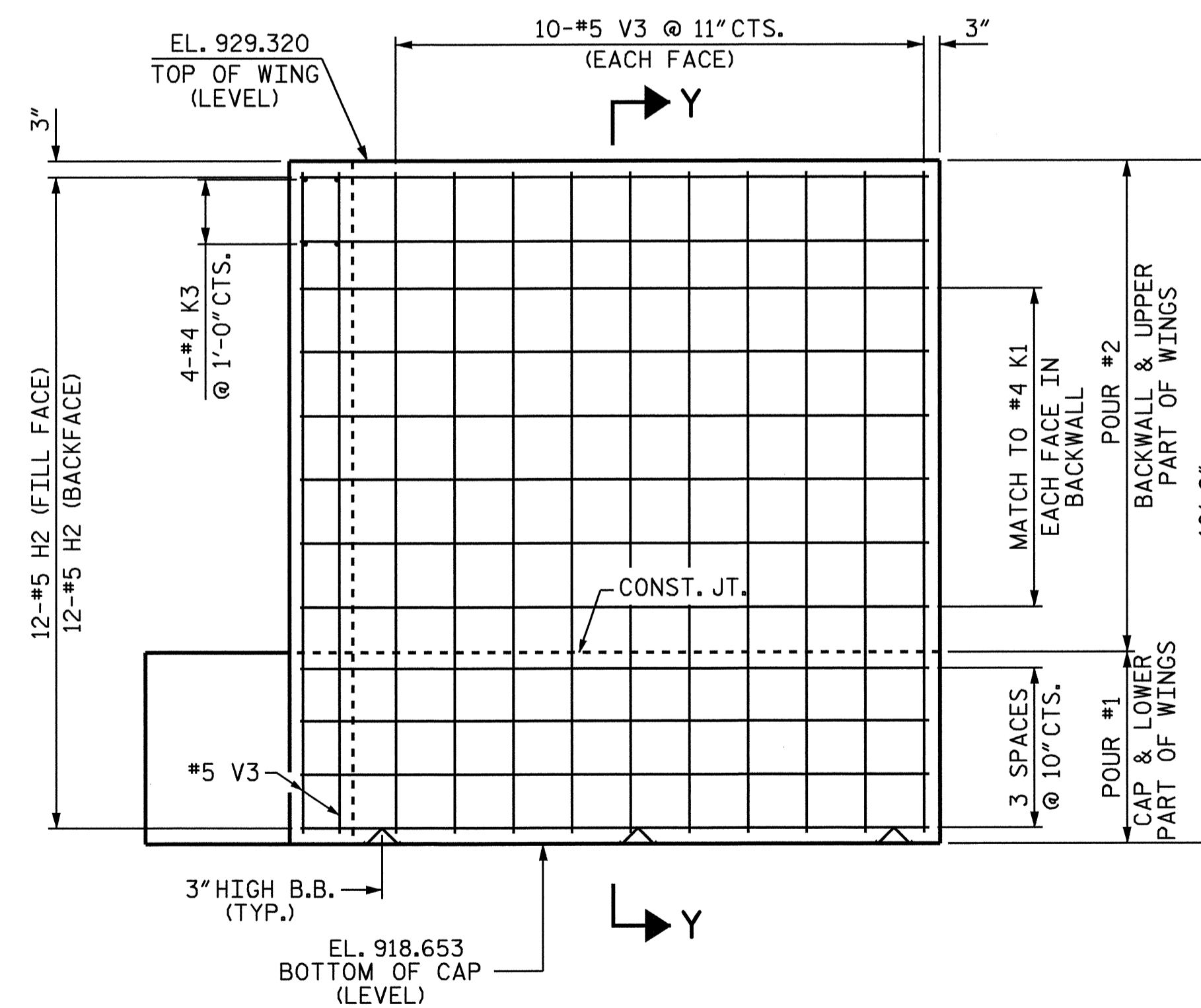
PLAN OF RIGHT WING - W2



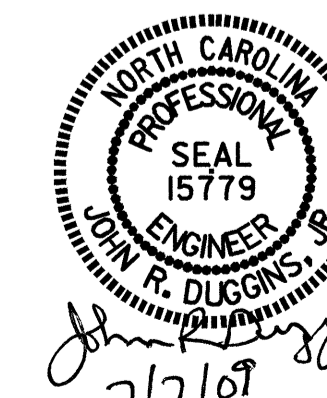
ELEVATION OF LEFT WING - W1



SECTION X-X



ELEVATION OF LEFT WING - W2



PROJECT NO. U-4006
GUILFORD COUNTY
 STATION: 20+90.21 -L-

SHEET 2 OF 3

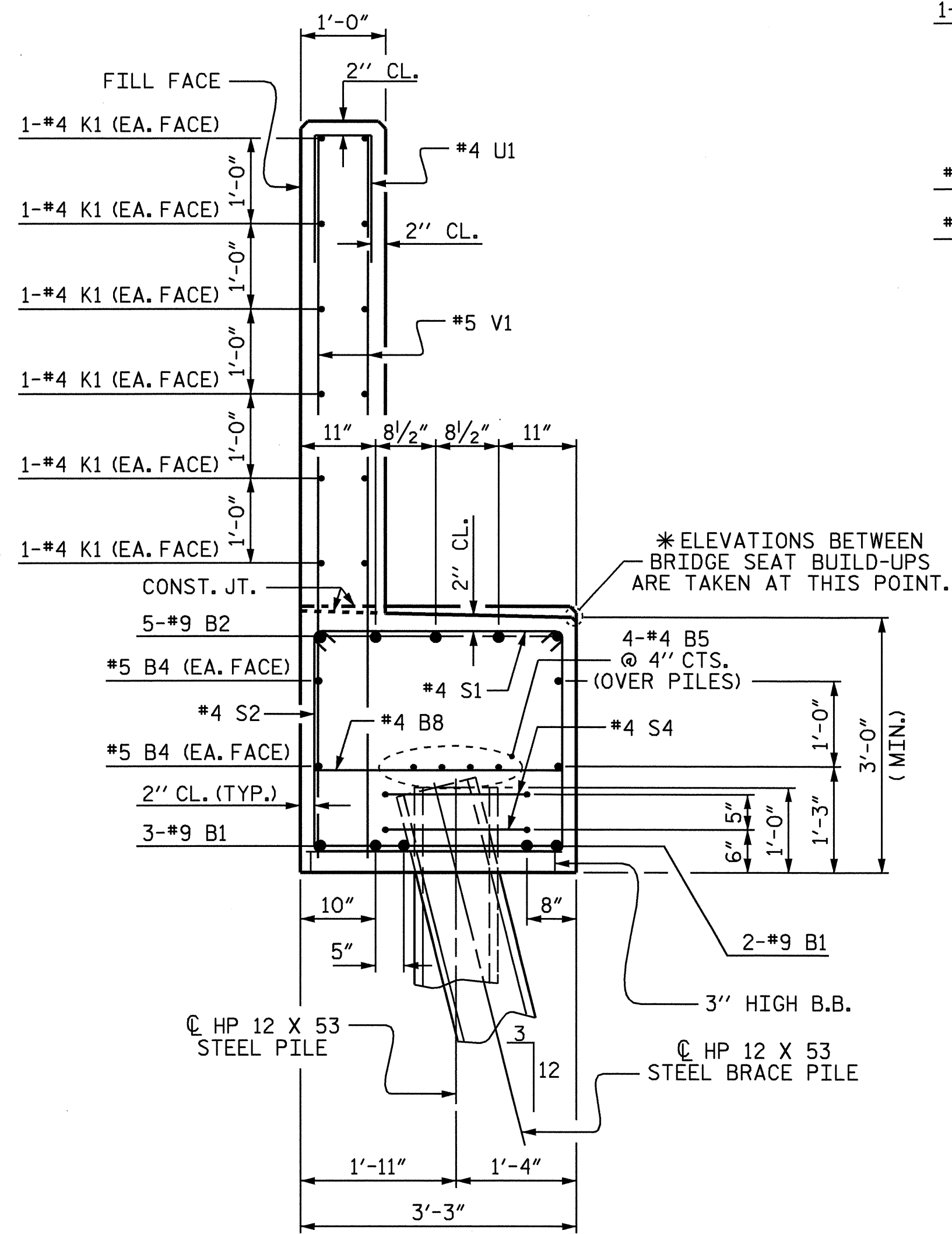
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT #2
 LEFT LANE

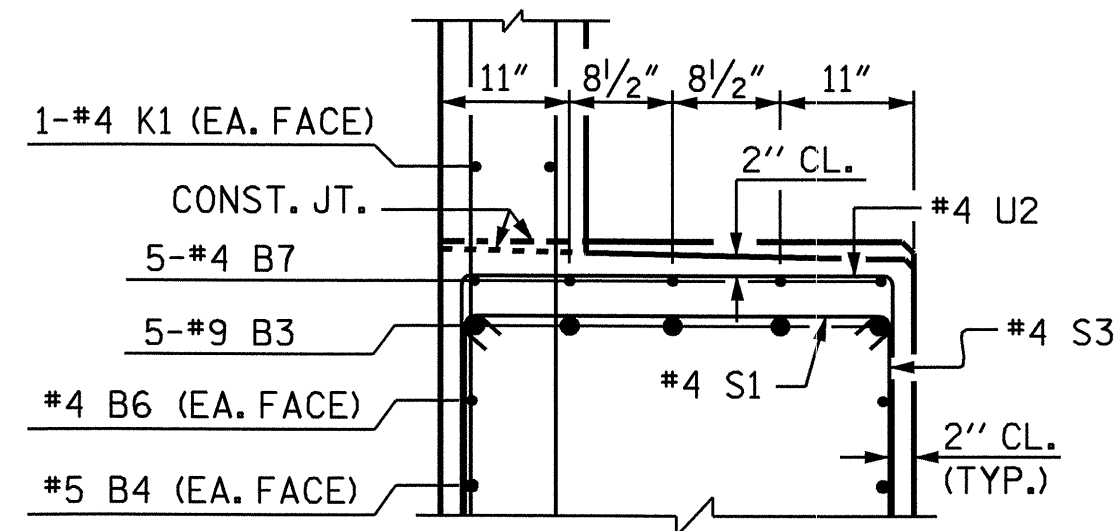
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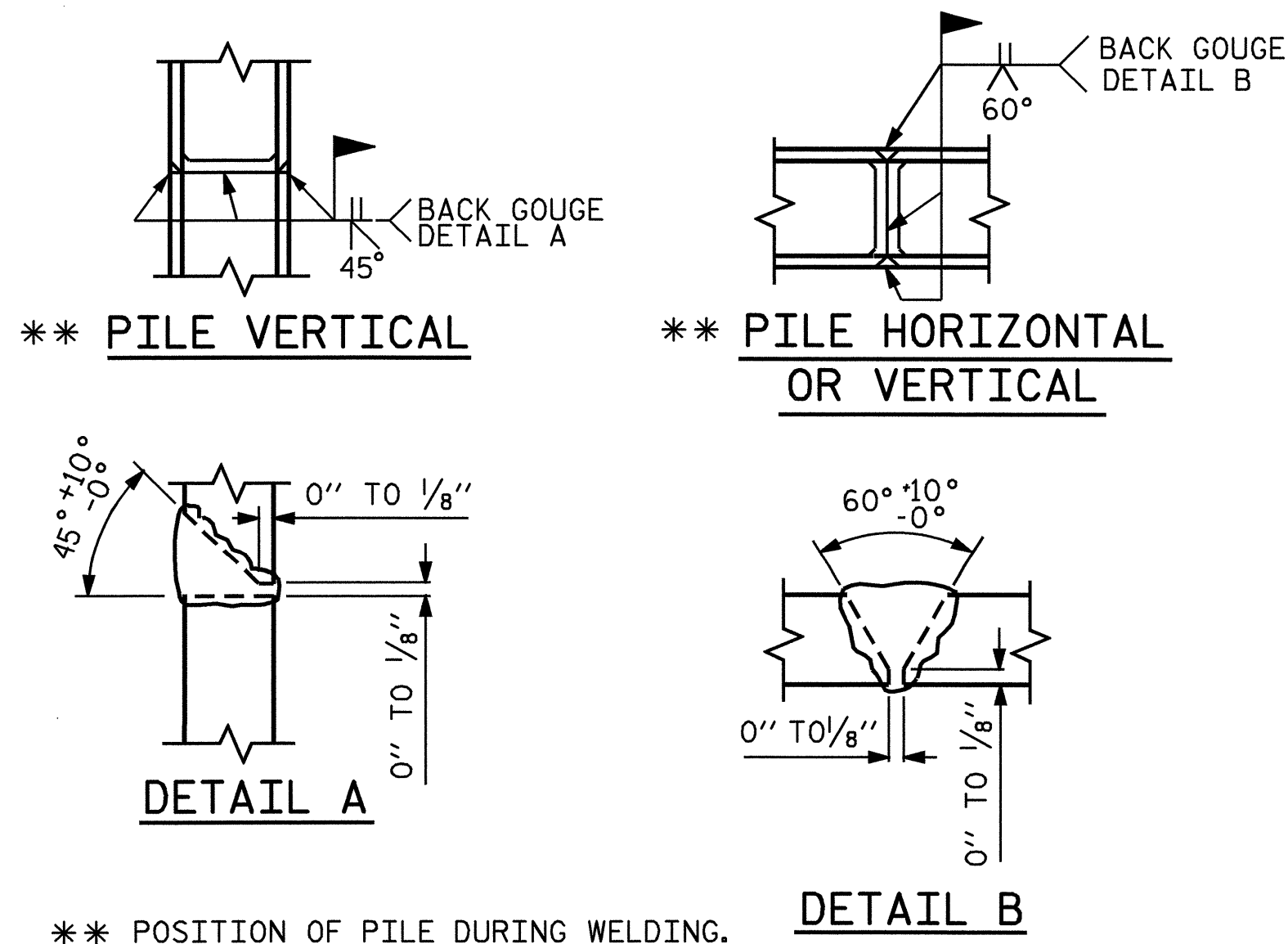
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33	
1			3			TOTAL SHEETS	75
2			4				



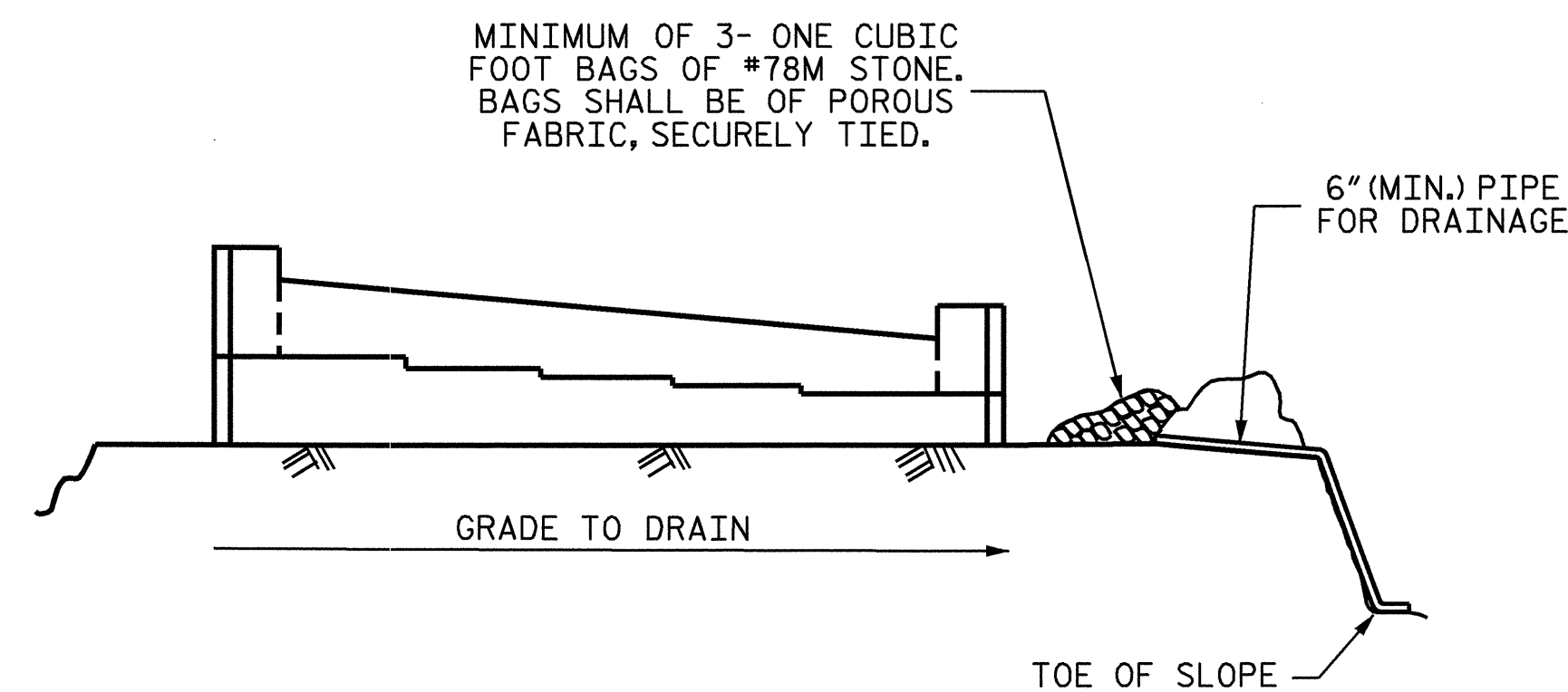
SECTION A-A



SECTION B-B



PILE SPLICE DETAILS



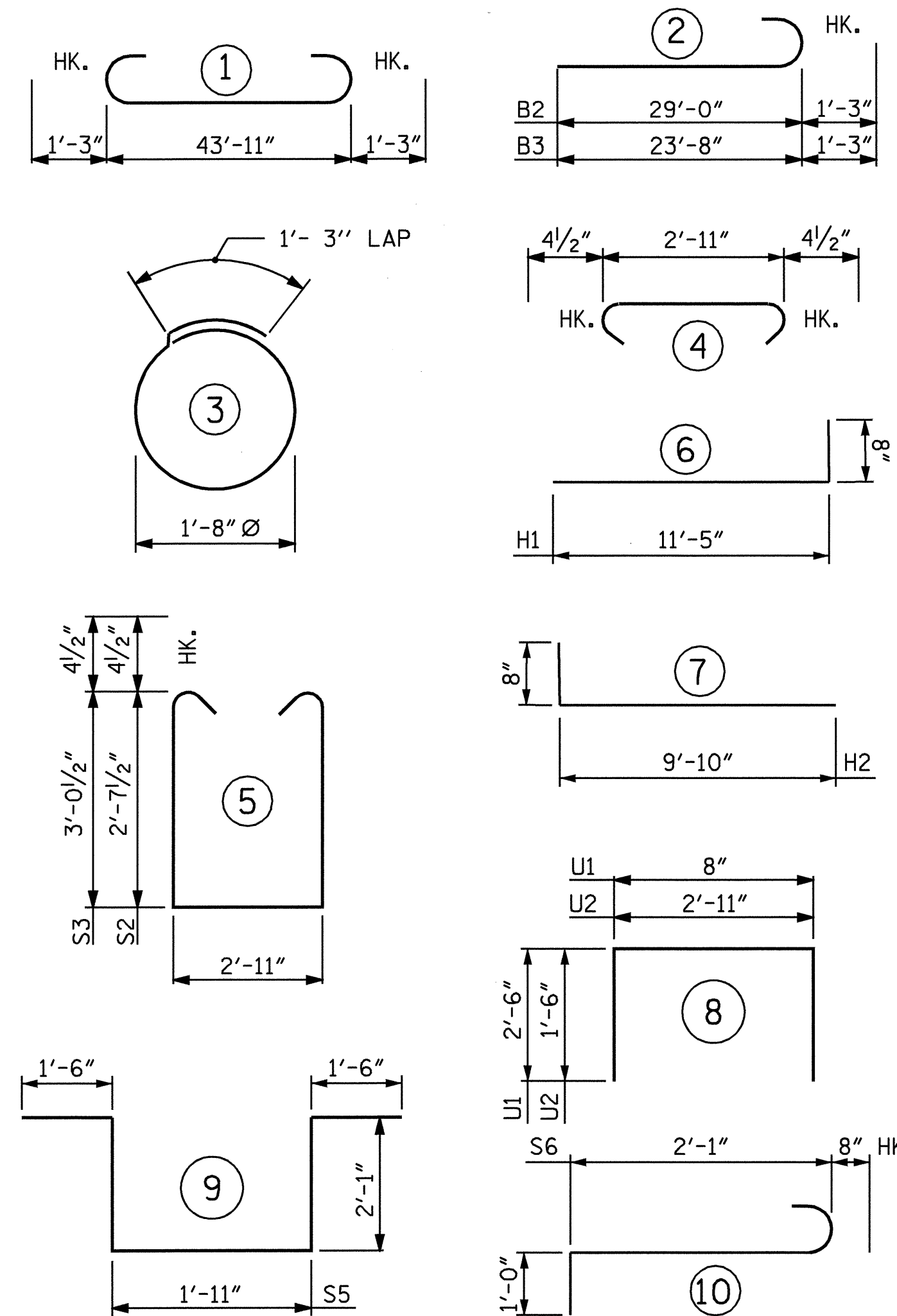
TEMPORARY DRAINAGE AT END BENT

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.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT #2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	#9	1	46'-5"	789
B2	5	#9	2	30'-3"	514
B3	5	#9	2	24'-11"	424
B4	4	#5	STR	44'-1"	184
B5	8	#4	STR	23'-3"	124
B6	2	#4	STR	17'-4"	23
B7	5	#4	STR	8'-8"	29
B8	14	#4	STR	2'-11"	27
B9	10	#4	STR	3'-3"	22
H1	24	#5	6	12'-1"	302
H2	24	#5	7	10'-6"	263
K1	24	#4	STR	23'-3"	373
K2	4	#4	STR	3'-11"	10
K3	4	#4	STR	3'-6"	9
S1	38	#4	4	3'-8"	93
S2	17	#4	5	8'-11"	101
S3	21	#4	5	9'-9"	137
S4	20	#4	3	6'-6"	87
S5	1	#6	9	9'-1"	14
S6	3	#6	10	3'-9"	17
U1	37	#4	8	5'-8"	140
U2	12	#4	8	5'-11"	47
V1	74	#5	STR	8'-7"	662
V2	34	#5	STR	11'-8"	414
V3	30	#5	STR	10'-4"	323
REINFORCING STEEL					LBS. 5128

CLASS A CONC. BREAKDOWN

POUR #1
CAP & LOWER PART OF WINGS 21.6 CU. YDS.
POUR #2
BACKWALL & UPPER PART OF WINGS 16.4 CU. YDS.
CLASS A CONCRETE TOTAL 38.0 CU. YDS.

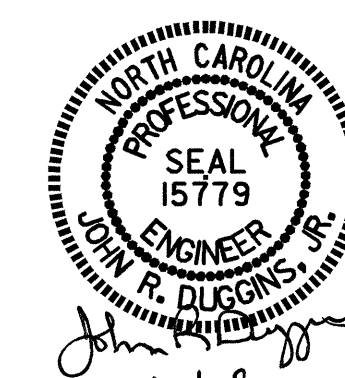
HP 12 X 53 STEEL PILES
NO. 11 LIN. FT. 880

PROJECT NO. U-4006
GUILFORD COUNTY
STATION: 20+90.21 -L-

SHEET 3 OF 3

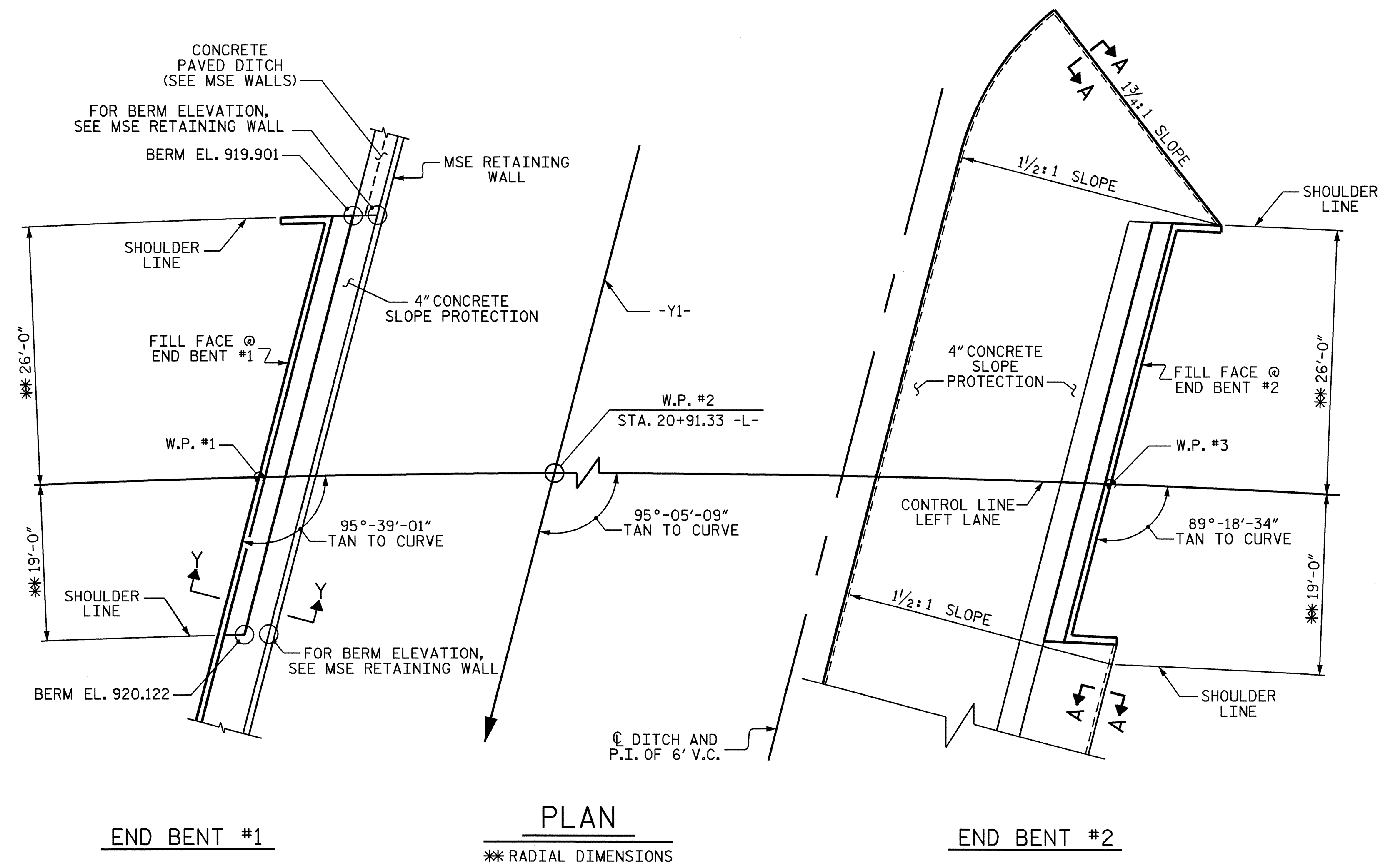
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT #2
LEFT LANE



REVISIONS						TOTAL SHEETS
NO.	BY:	DATE:	NO.	BY:	DATE:	75
1			3			34
2			4			75

DRAWN BY: A. SORSENGINH DATE: 2/25/09
CHECKED BY: J.L. LAMBERT DATE: 4/12/09



GENERAL NOTES

SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. THE CONTRACTOR, AT HIS OPTION, MAY USE ALTERNATE "B" ONLY FOR HIGHWAY OVER HIGHWAY GRADE SEPARATIONS WITH 2:1 END BENT SLOPE IN RURAL, UNPOPULATED AREAS. STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS. FOR BERM WIDTH, SEE GENERAL DRAWING.

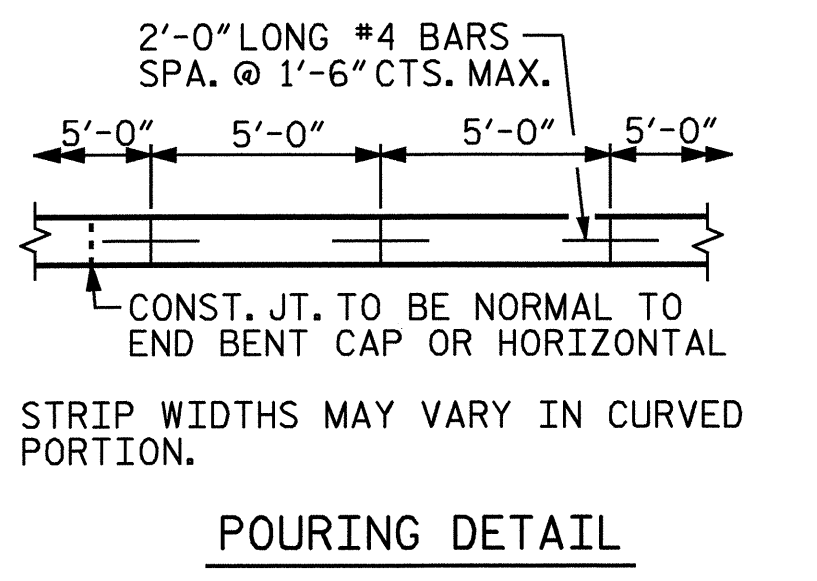
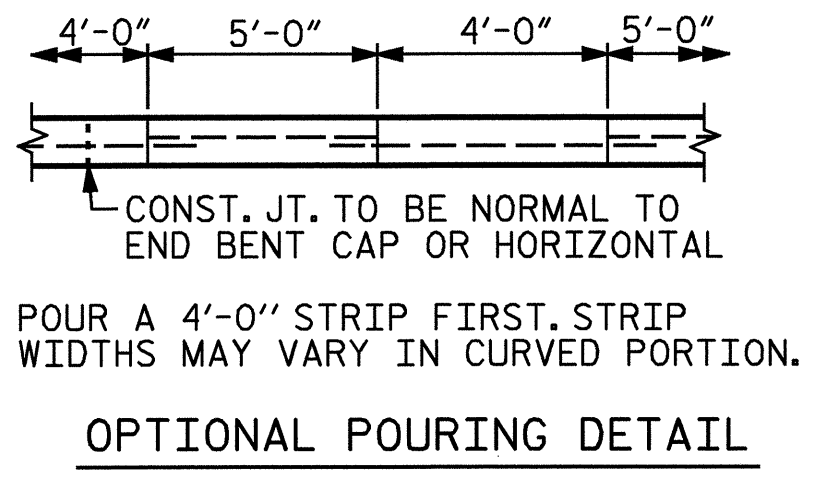
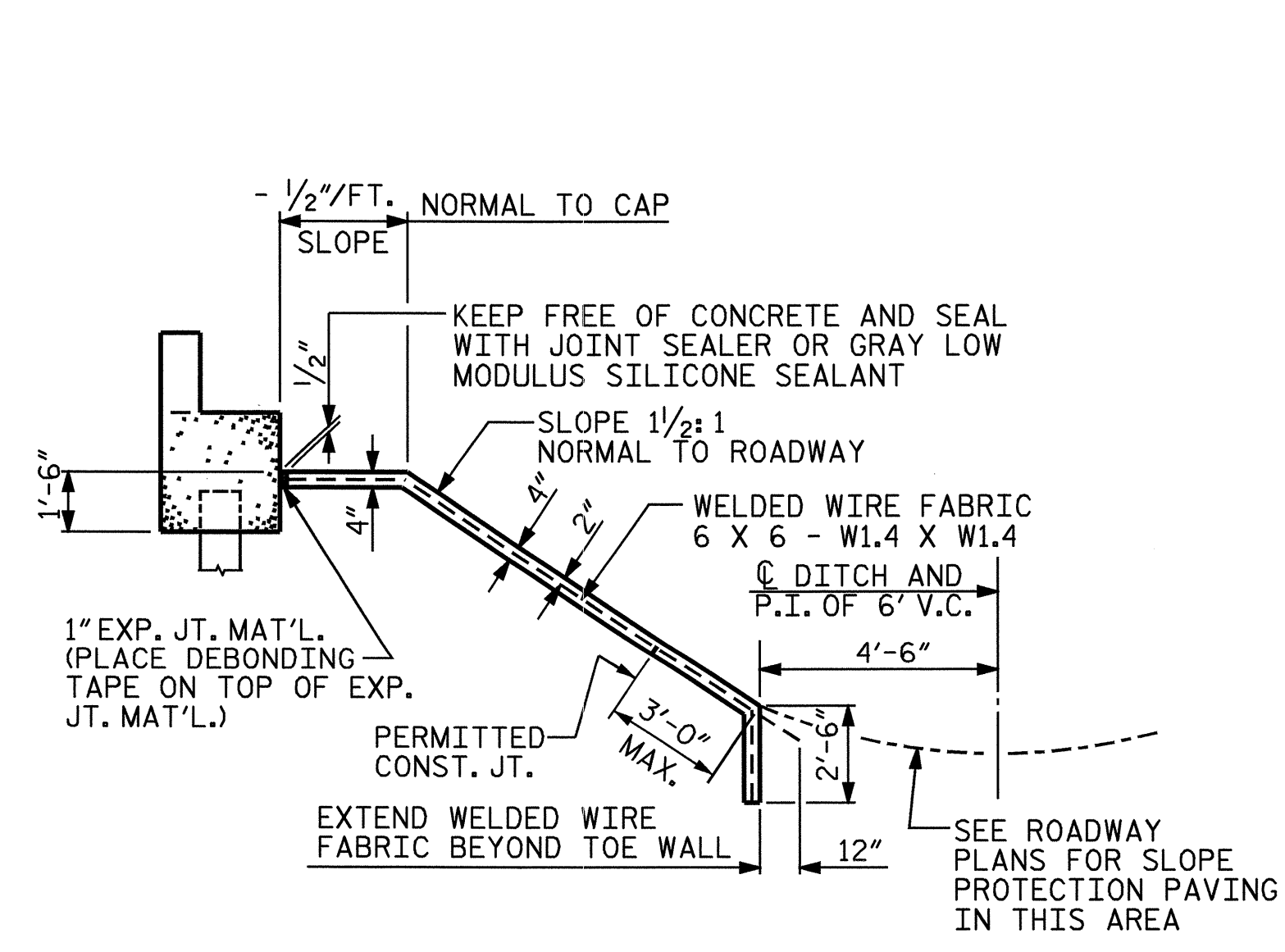
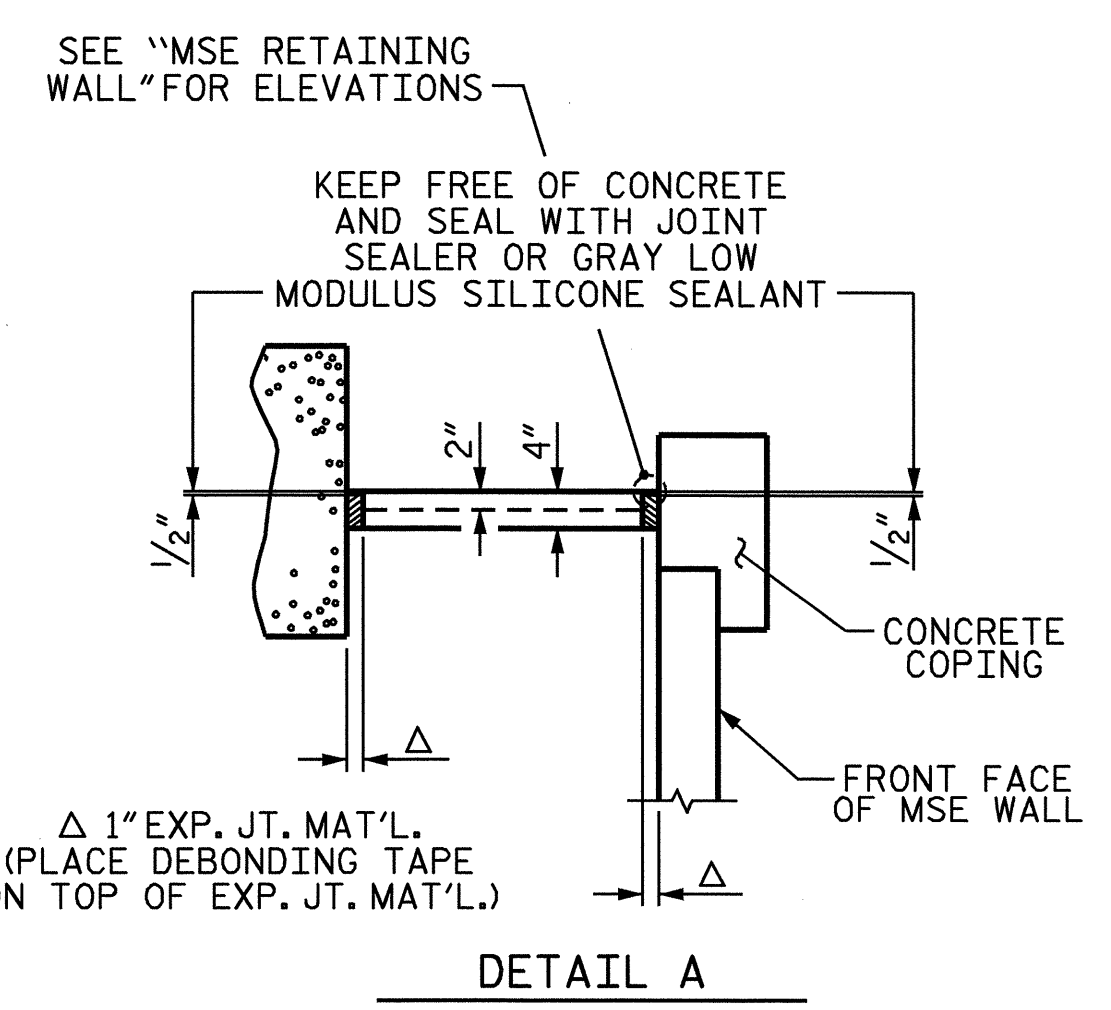
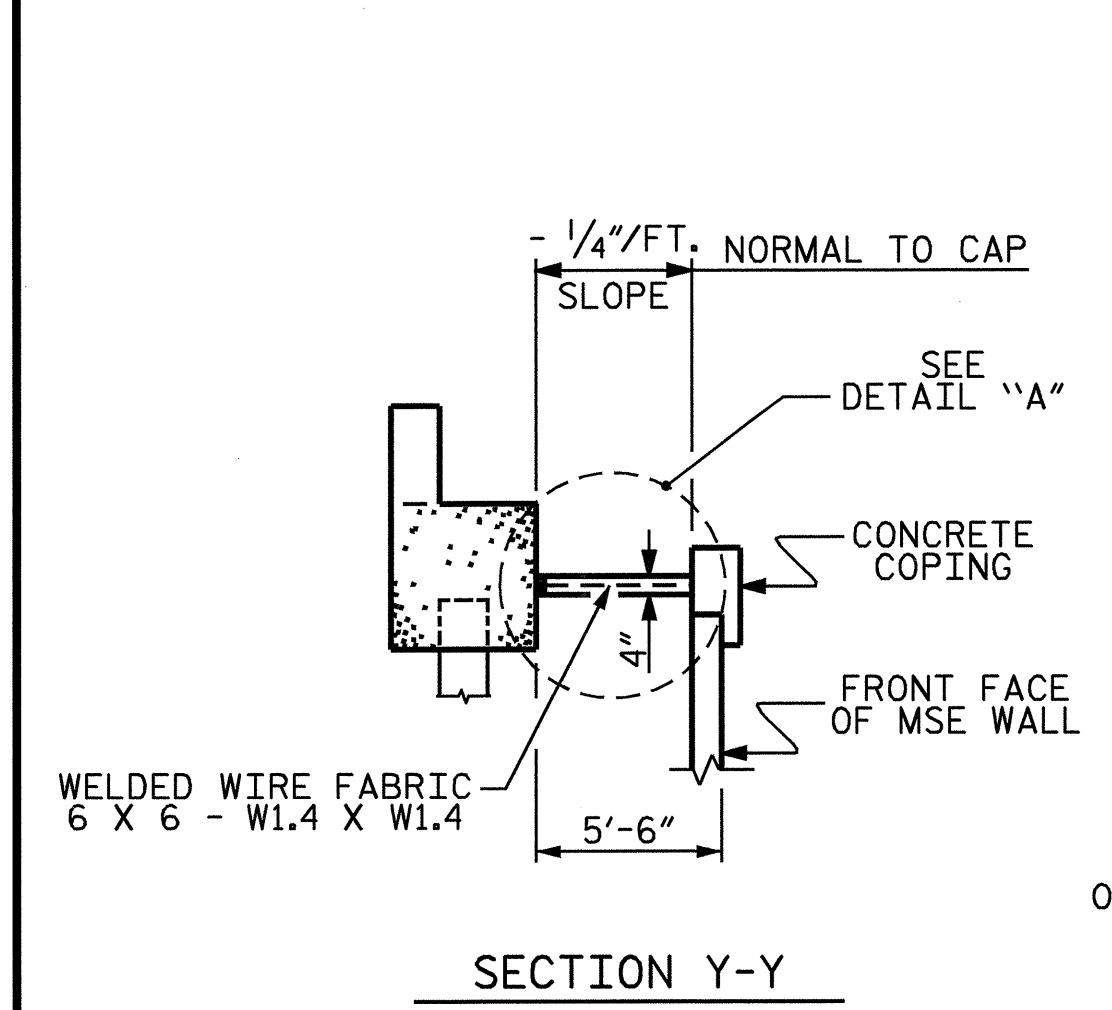
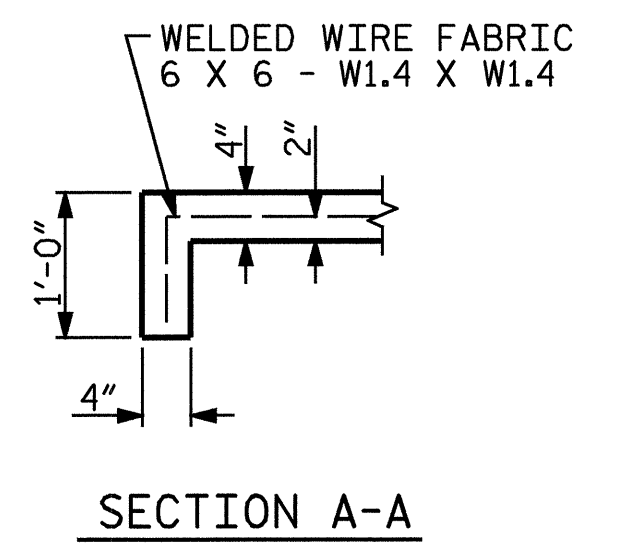
ALTERNATE "A"

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

FOR BERM WIDTHS AND ELEVATIONS AT END BENT NO. 2, SEE GENERAL DRAWING SHEET 1 OF 4.

BRIDGE @ STATION 20+90.21 -L- (LEFT LANE)	4" INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	28	56
END BENT 2	235	470

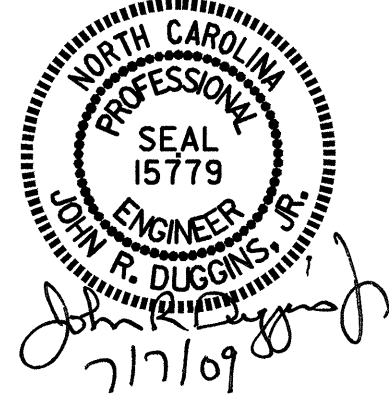
* QUANTITY SHOWN IS BASED ON 5' POURS.



PROJECT NO. U-4006
GUILFORD COUNTY
 STATION: 20+90.21 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SLOPE PROTECTION
 DETAILS
 LEFT LANE**



ASSEMBLED BY : A. SORSENGINH	DATE : 4/17/09
CHECKED BY : J.R. DUGGINS	DATE : 4/09
DRAWN BY : ELR 5/92	REV. 7/10/01 LES/RDR
CHECKED BY : GRP 6/92	REV. 5/7/03 RWW/JTE
	REV. 5/1/06 TLA/GM

REVISIONS					SHEET NO. 3-35
NO.	BY:	DATE:	NO.	DATE:	
1			3		TOTAL SHEETS 75
2			4		

NOTES

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

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 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 SHALL BE 2 1/2".

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

BILL OF MATERIAL

APPROACH SLAB AT EB #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	50	#4	STR	19'-0"	635
A2	54	#4	STR	18'-11"	682
*B1	72	#5	STR	24'-5"	1834
B2	72	#6	STR	24'-11"	2695
*B3	4	#4	STR	24'-11"	67
*D1	20	#4	STR	1'-0"	13
*G1	25	#4	STR	5'-2"	86

REINFORCING STEEL	LBS.	3377
*EPOXY COATED REINFORCING STEEL	LBS.	2635

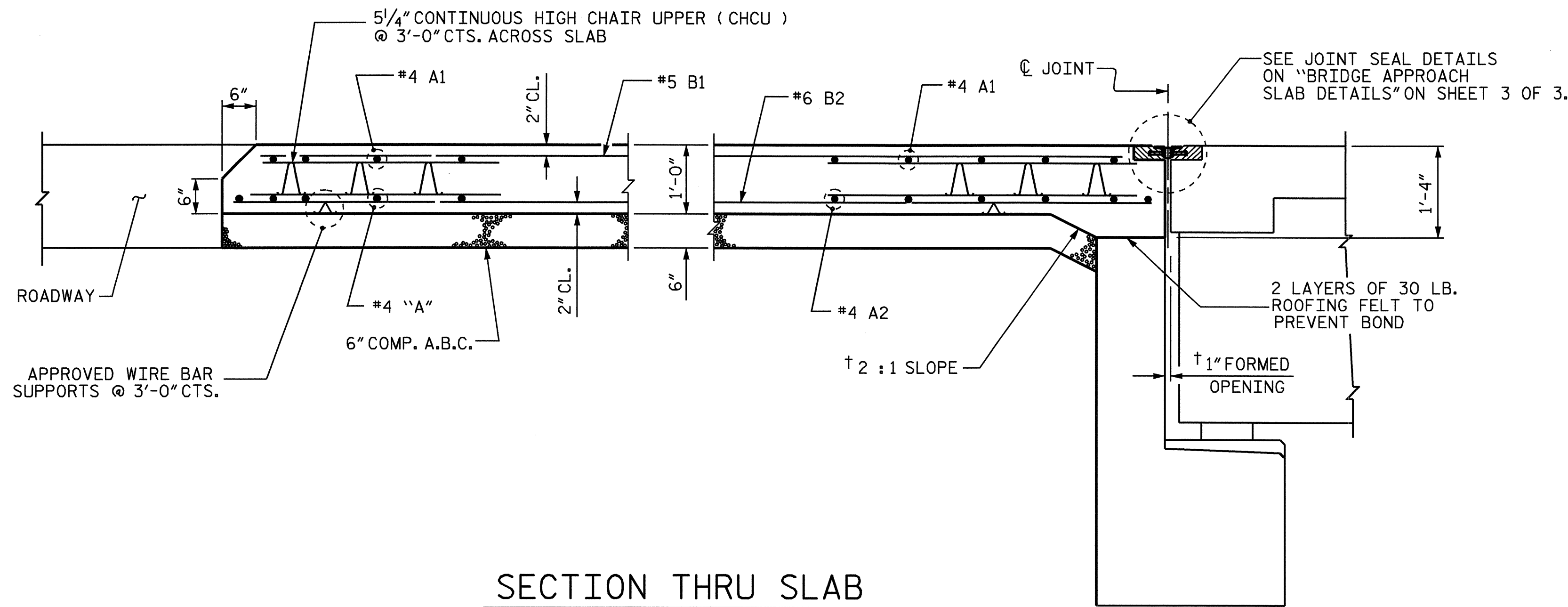
CLASS AA CONCRETE		
POUR 1 (SLAB)	C. Y.	34.3
POUR 2 (SIDEWALK)	C. Y.	2.8
TOTAL	C. Y.	37.1

APPROACH SLAB AT EB #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	50	#4	STR	19'-0"	635
A2	54	#4	STR	18'-11"	682
*B1	72	#5	STR	24'-5"	1834
B2	72	#6	STR	24'-11"	2695
*B3	4	#4	STR	24'-11"	67
*D1	20	#4	STR	1'-0"	13
*G1	25	#4	STR	5'-2"	86

REINFORCING STEEL	LBS.	3377
*EPOXY COATED REINFORCING STEEL	LBS.	2635

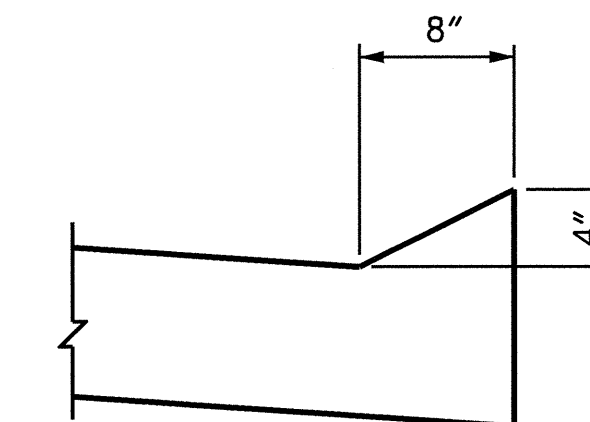
CLASS AA CONCRETE		
POUR 1 (SLAB)	C. Y.	34.3
POUR 2 (SIDEWALK)	C. Y.	2.8
TOTAL	C. Y.	37.1



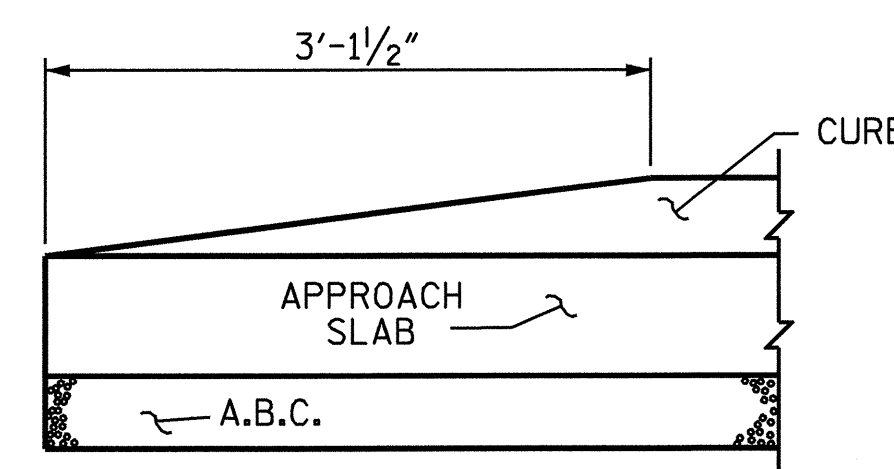
SECTION THRU SLAB

FOR APPROACH SLAB @ END BENT #1

† NORMAL TO END BENT

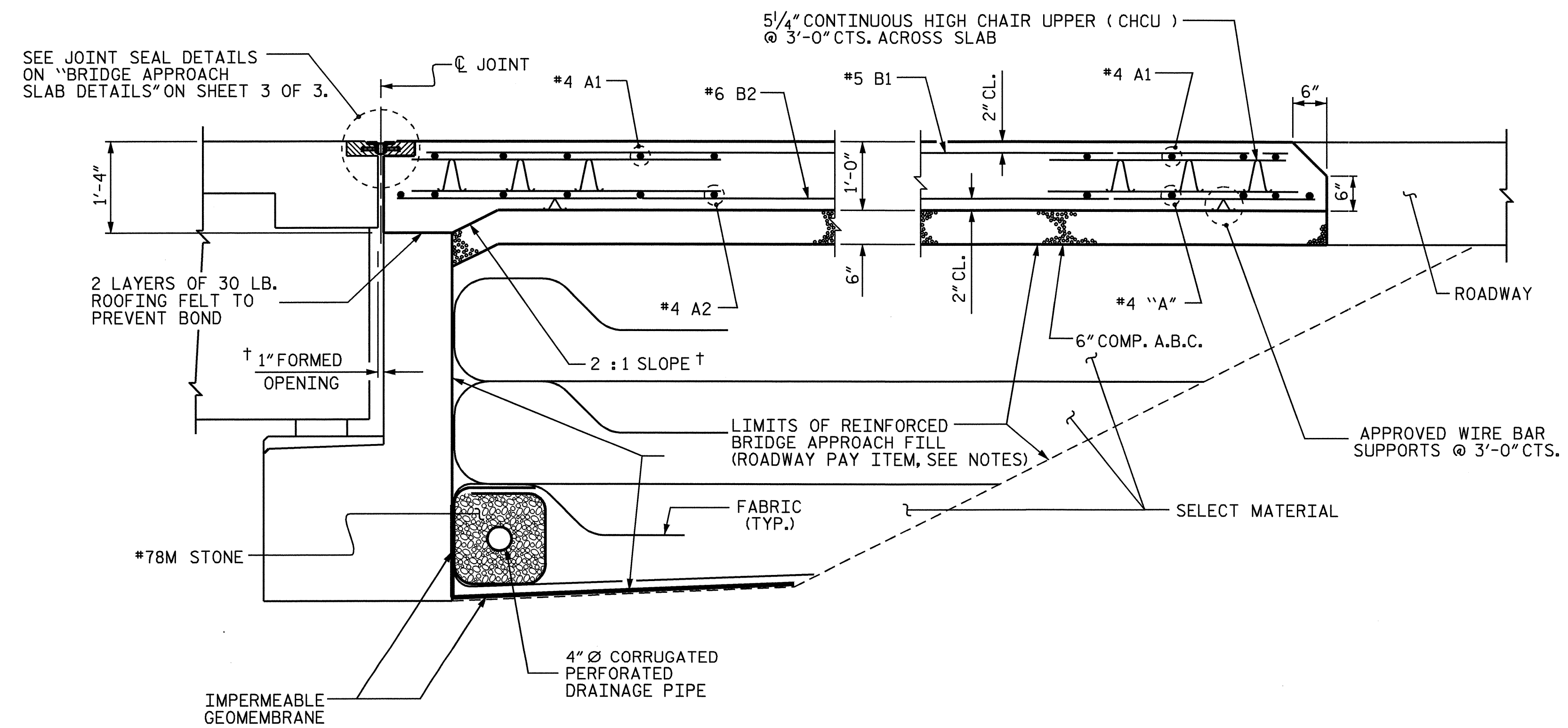


SECTION M-M



END OF CURB WITHOUT SHOULDER BERM GUTTER

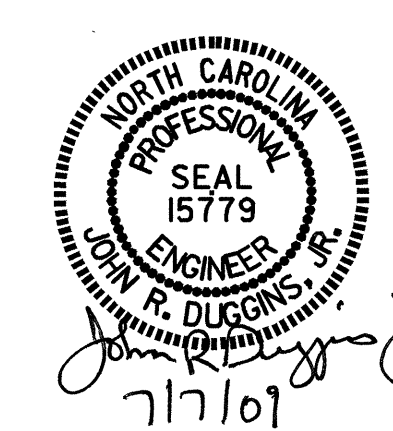
CURB DETAILS



SECTION THRU SLAB

FOR APPROACH SLAB @ END BENT #2

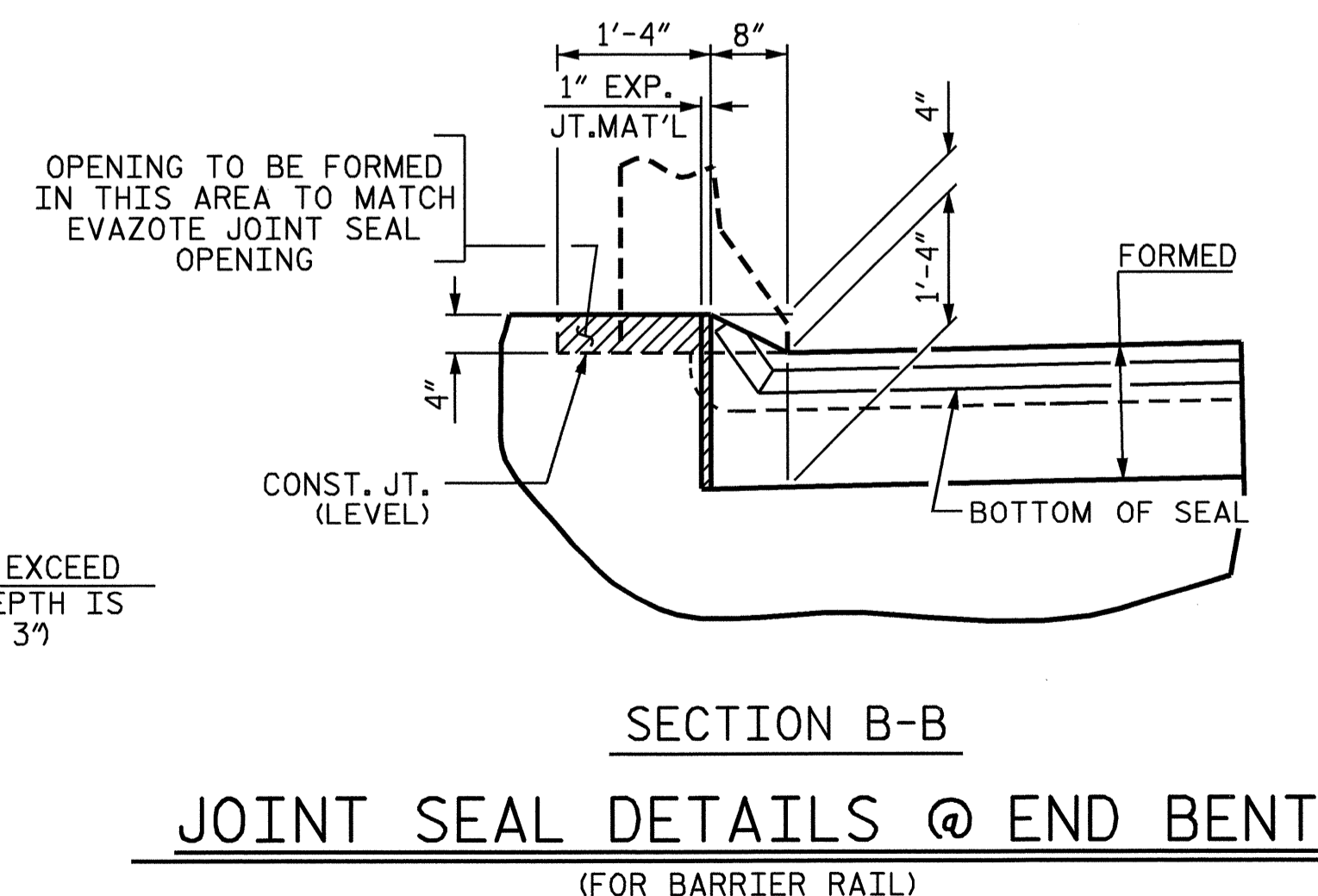
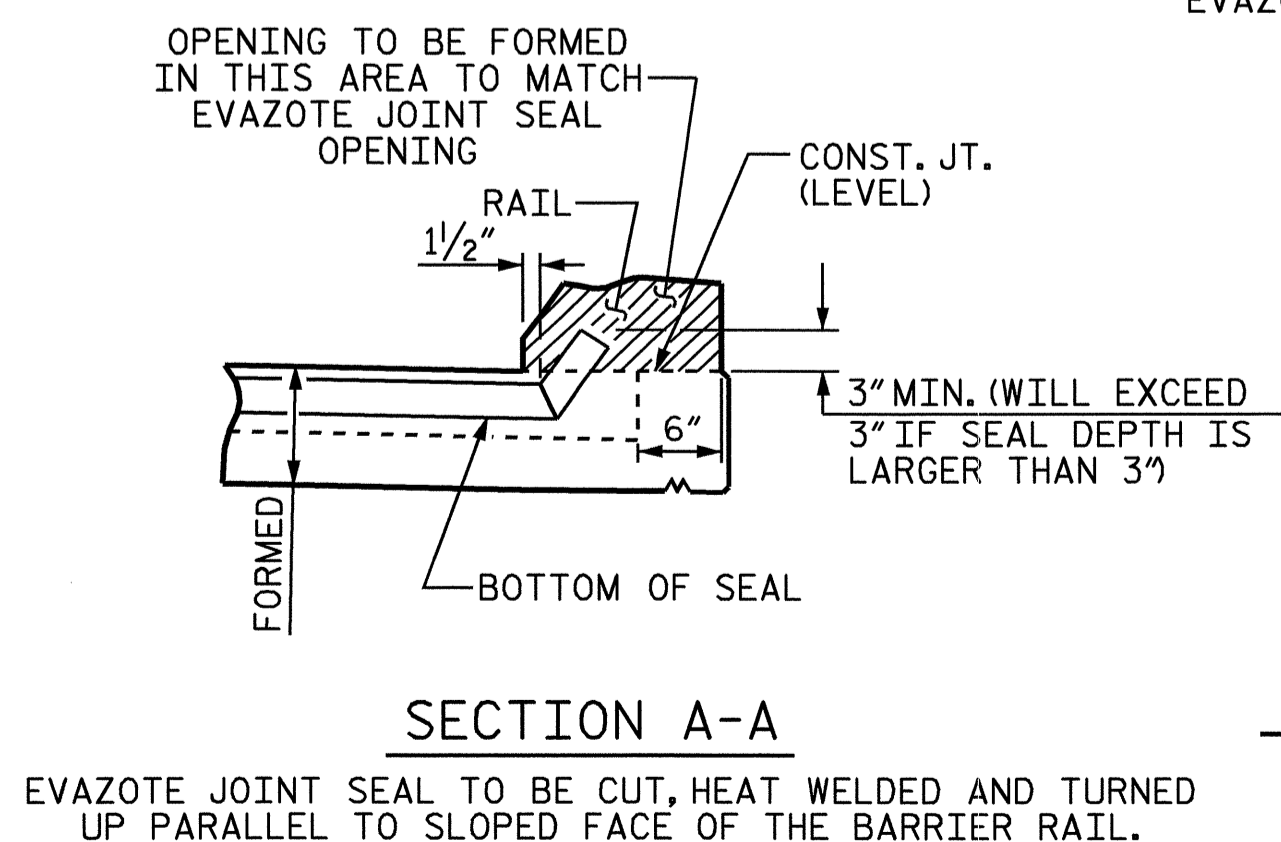
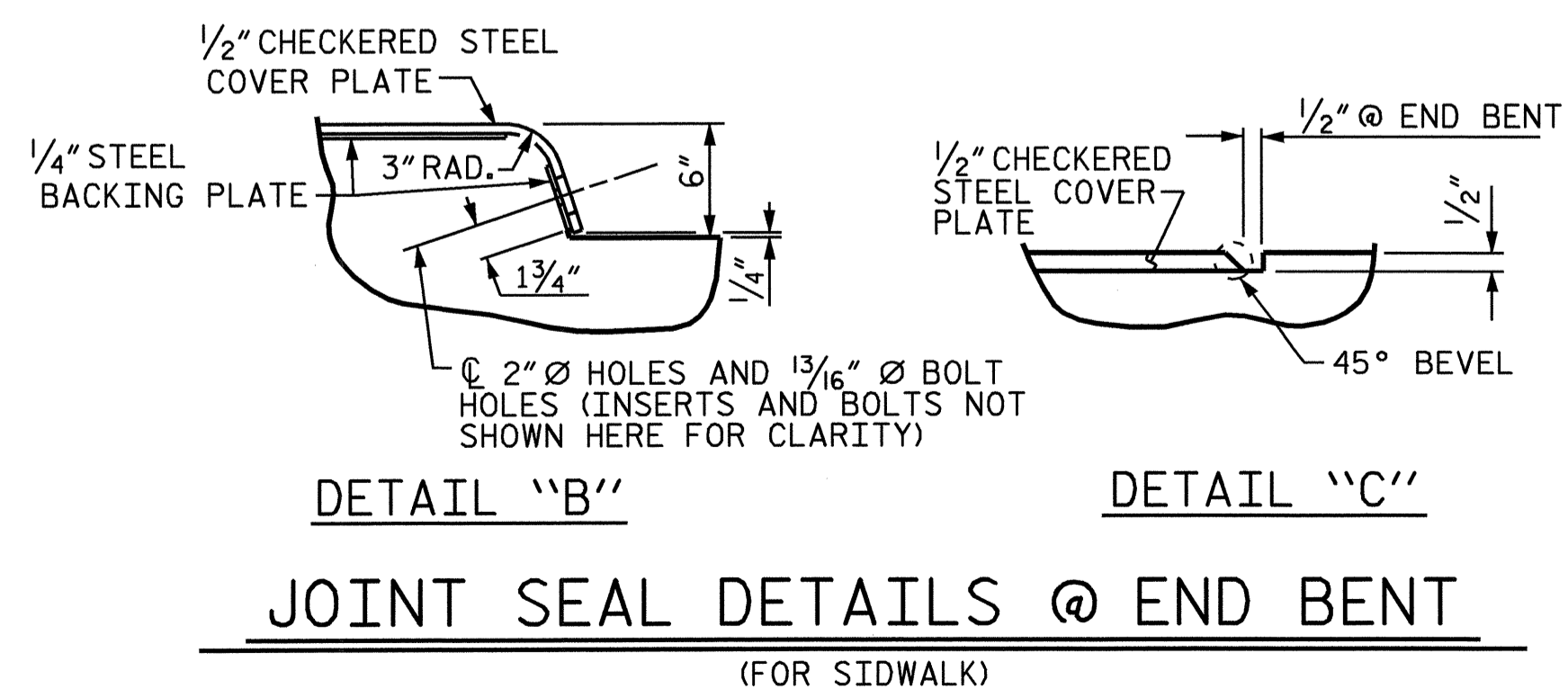
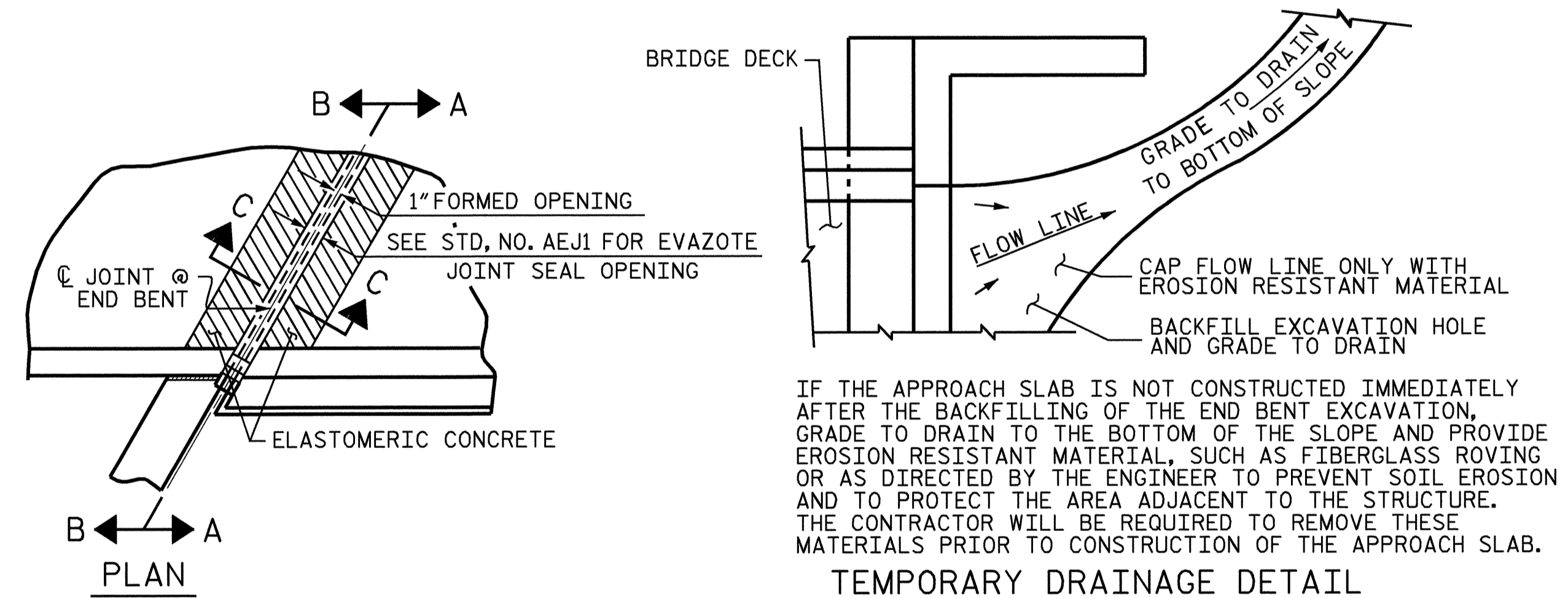
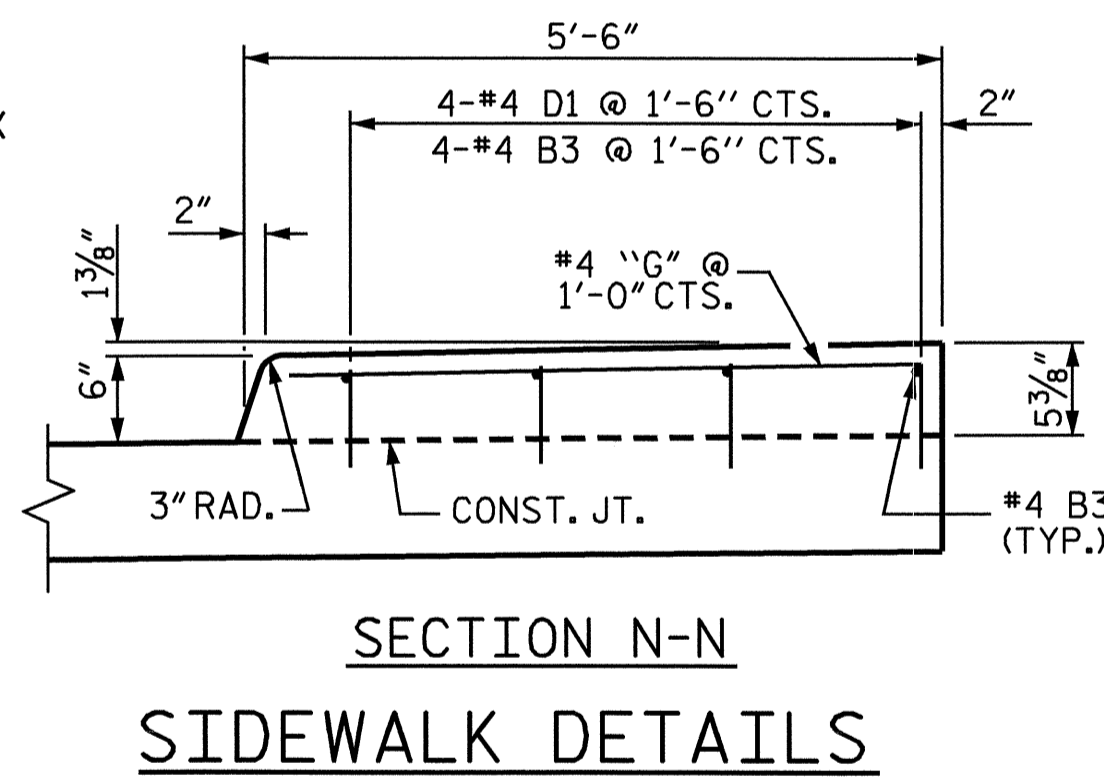
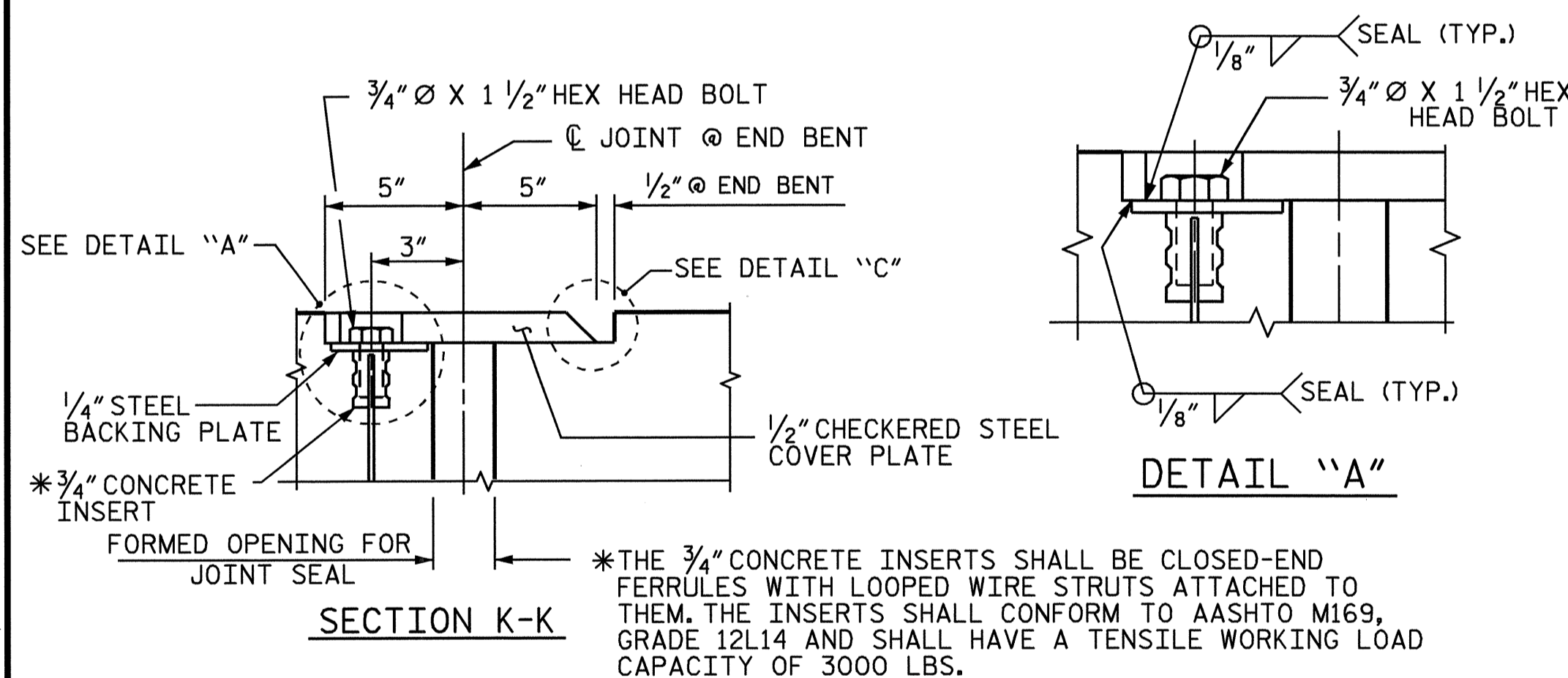
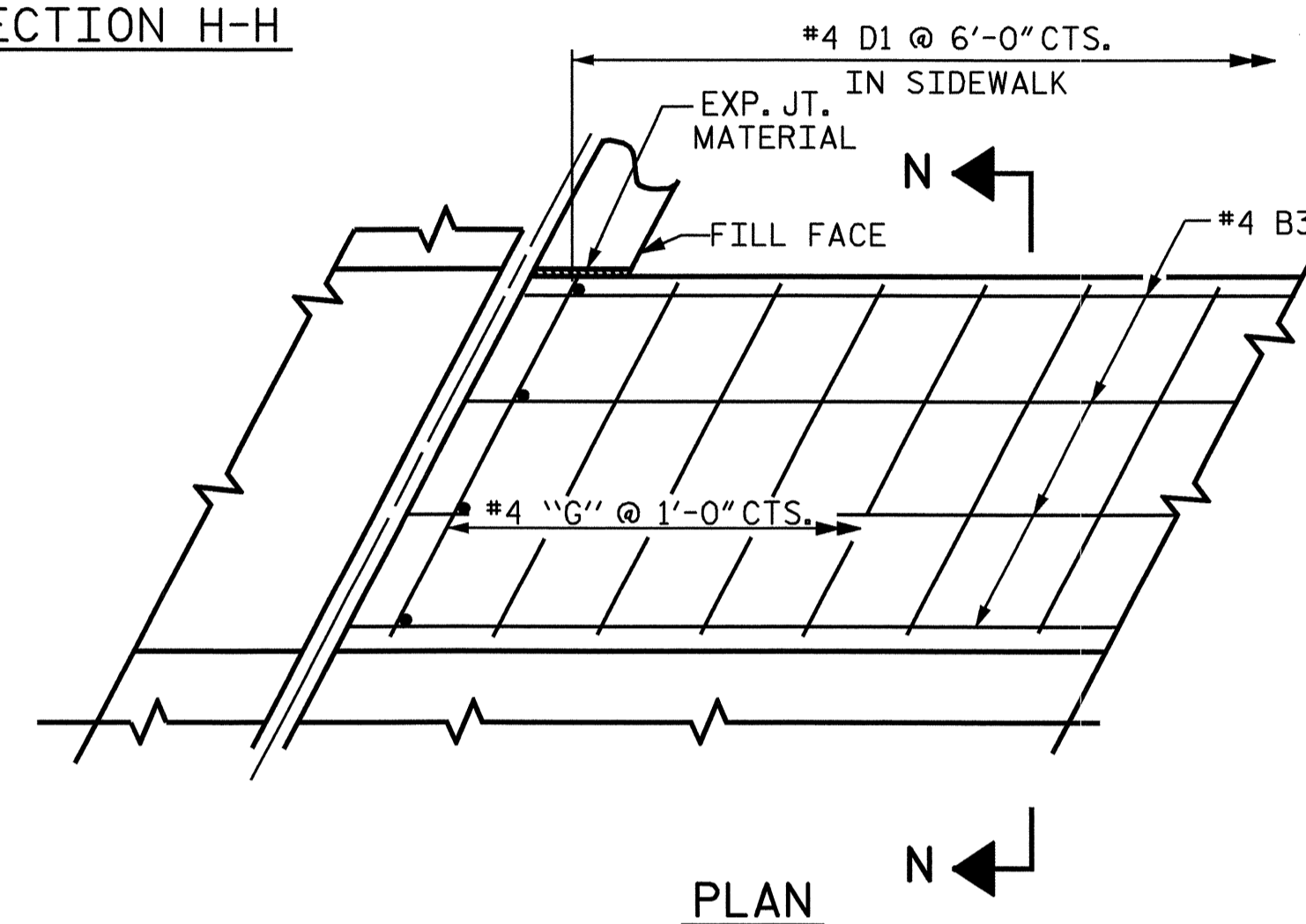
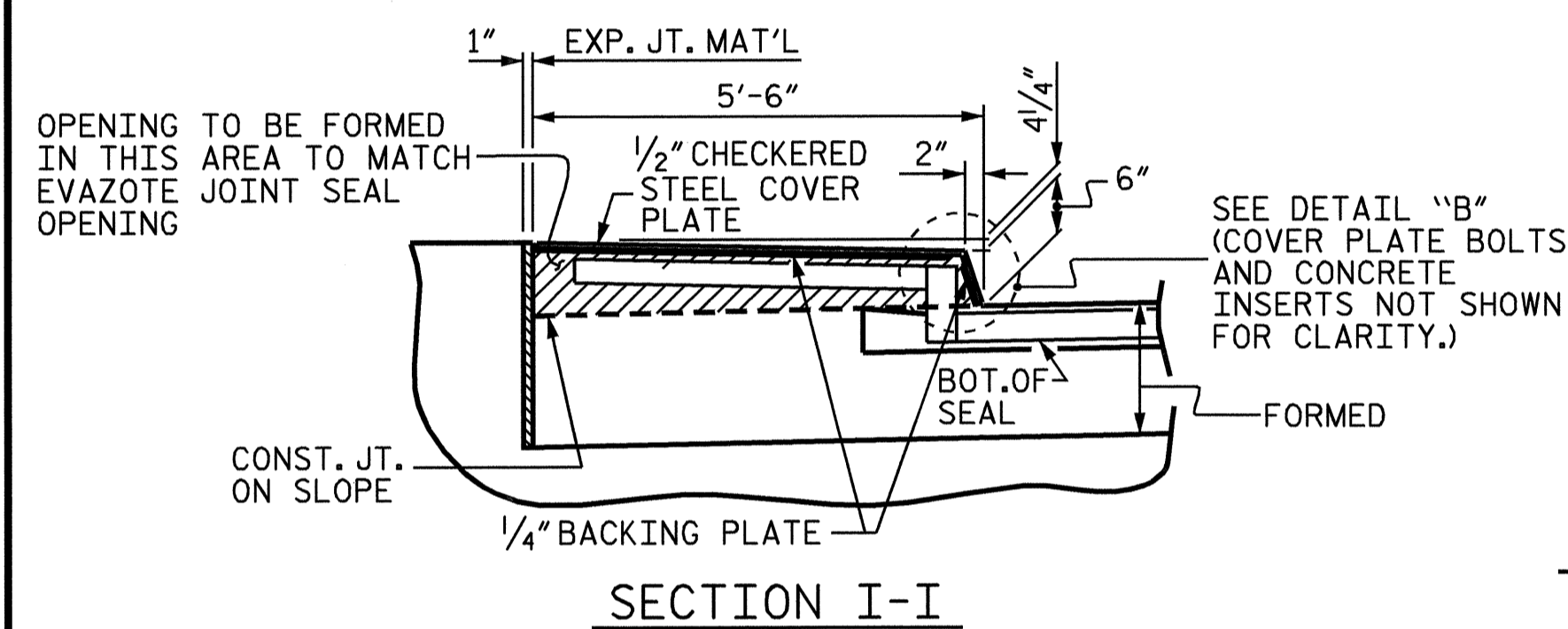
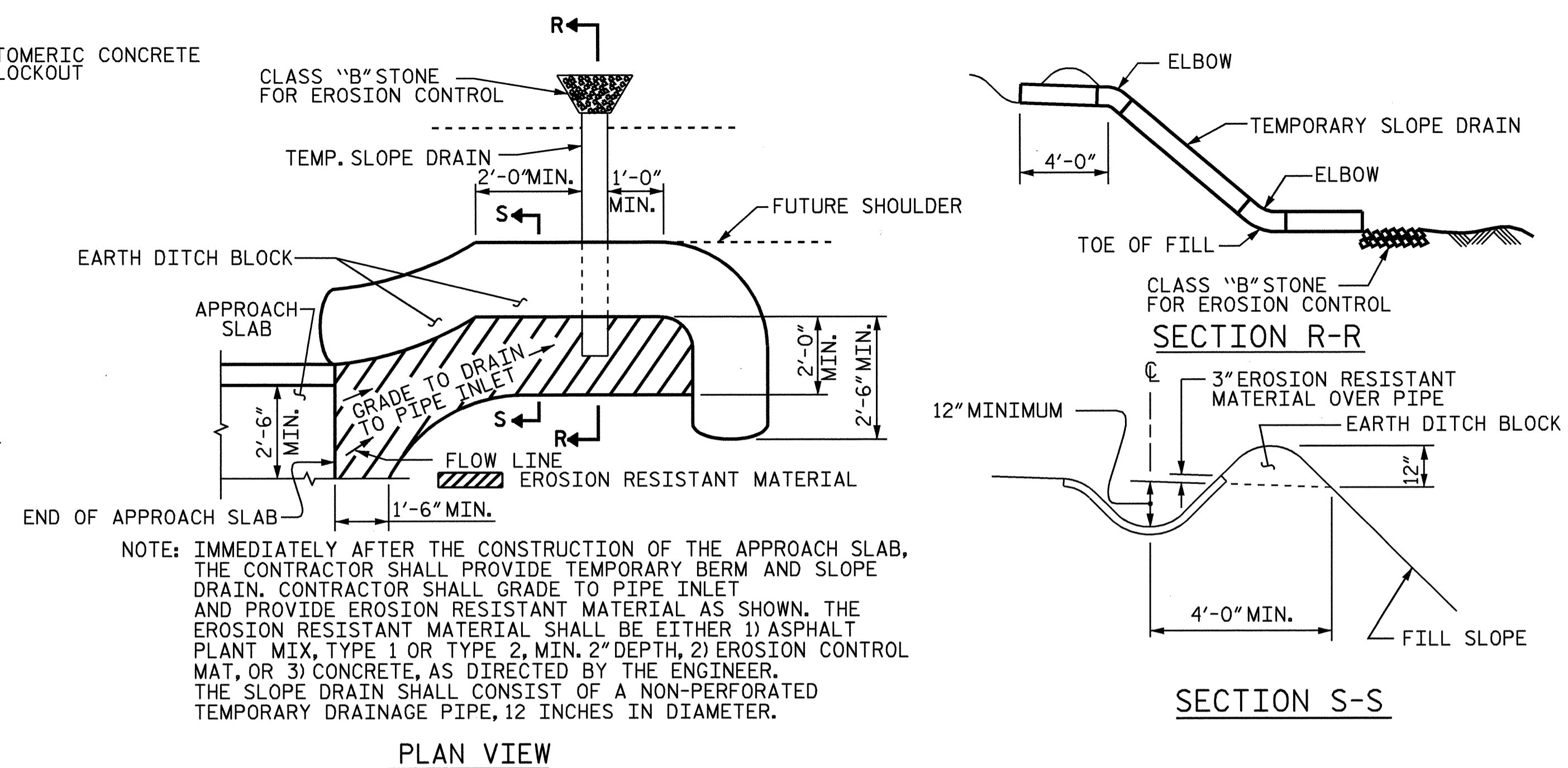
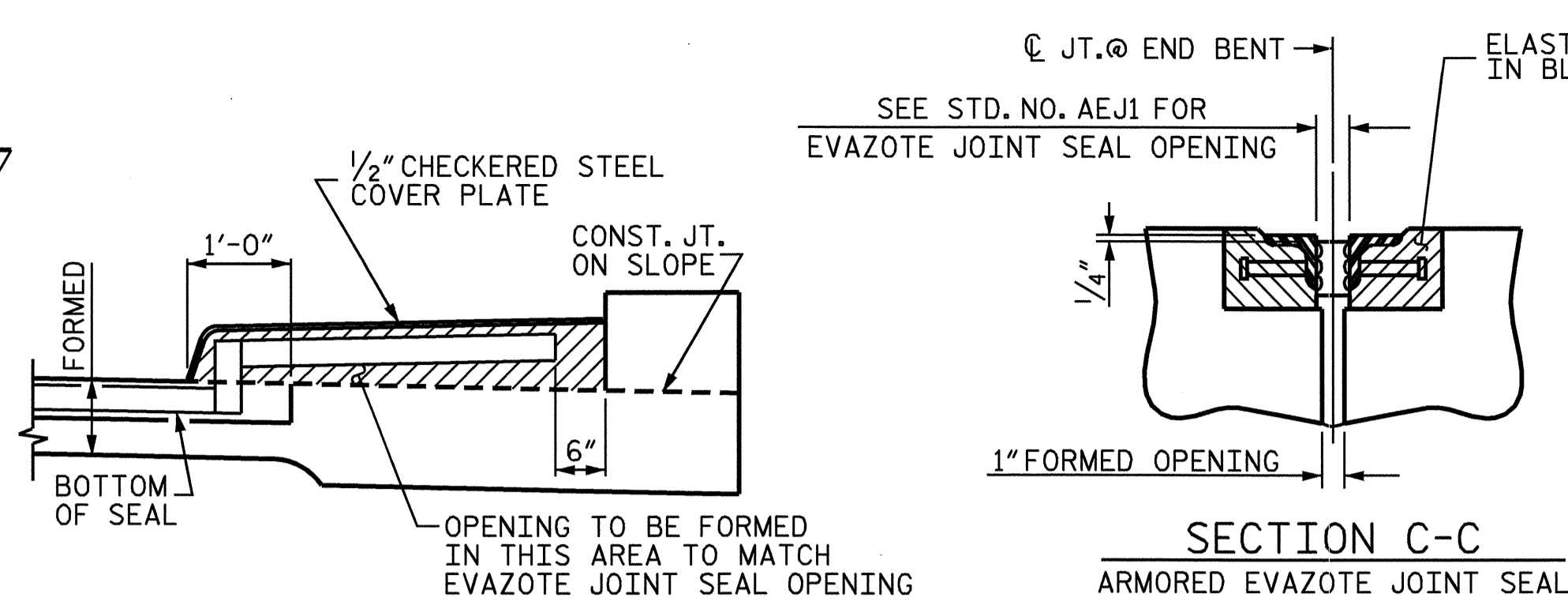
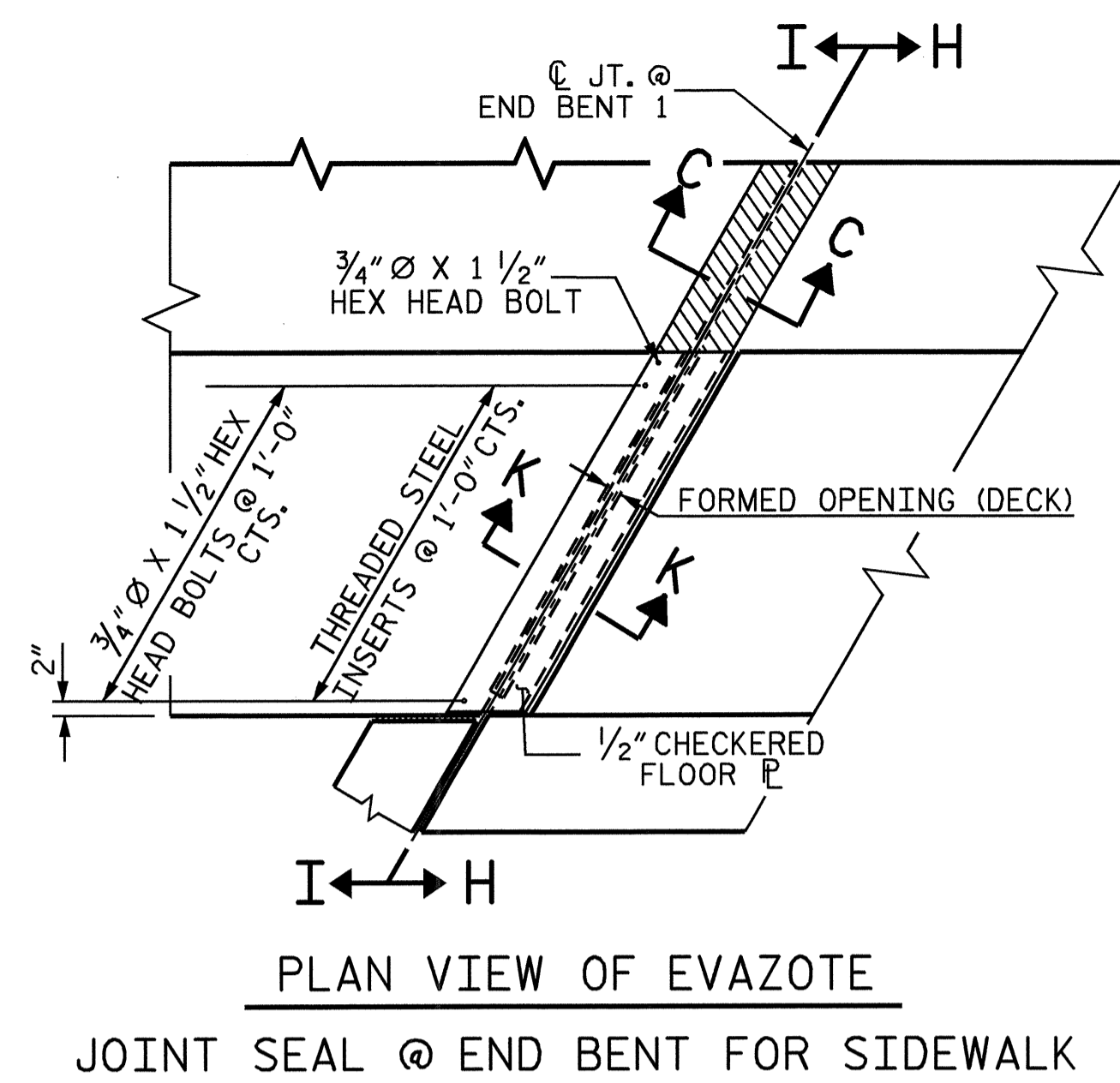
ASSEMBLED BY :	A. SORSENGINH	DATE :	3/16/09
CHECKED BY :	J.R. DUGGINS	DATE :	4/09
DRAWN BY :	EEM	3/95	REV. 7/10/01 LES/RDR
CHECKED BY :	VAP	3/95	REV. 5/7/03R RWW/JTE
			REV. 5/1/06 TLA/GM



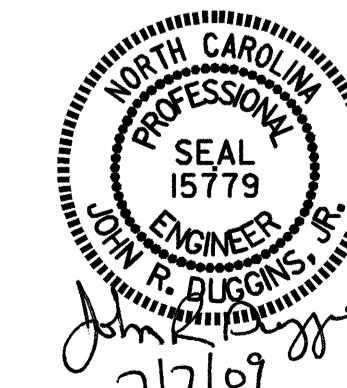
PROJECT NO. U-4006
GUILFORD COUNTY
 STATION: 20+90.21 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA			
DEPARTMENT OF TRANSPORTATION			
RALEIGH			
BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT			
LEFT LANE			
REVISIONS			SHEET NO.
NO.	BY:	DATE:	NO.
1			3
2			4
			TOTAL SHEETS
			75



ASSEMBLED BY :	A. SORSENGINH	DATE :	3/17/09
CHECKED BY :	J.R. DUGGINS	DATE :	4/09
DRAWN BY :	FCJ 11/88	REV. 10/17/00	RWN/LJS
CHECKED BY :	ARB 11/88	REV. 5/17/03	RWN/JTE
		REV. 5/1/06	TLA/GM

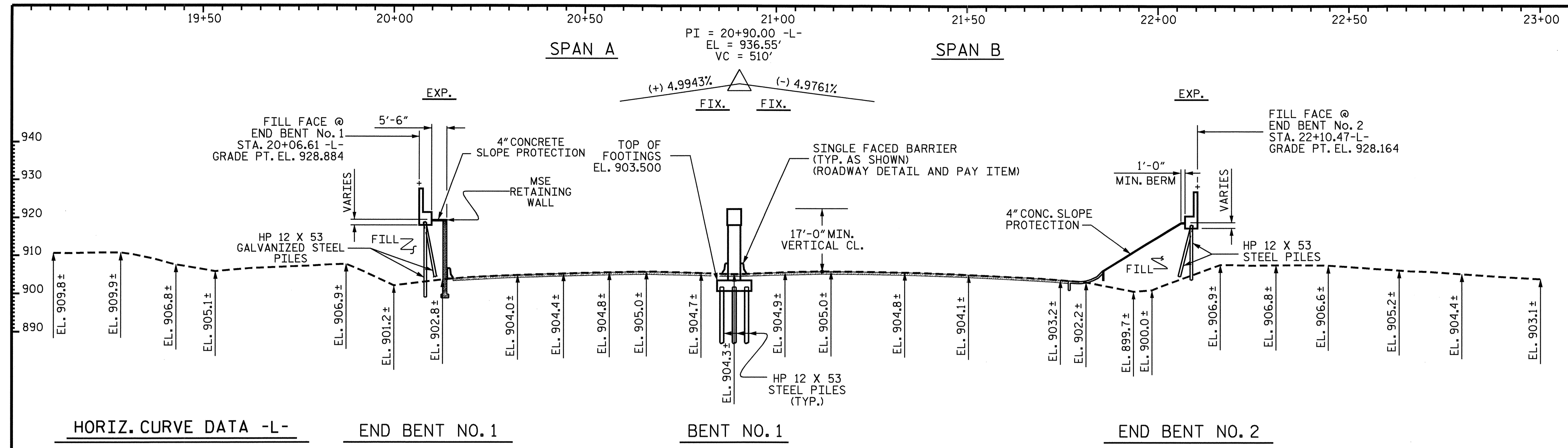


PROJECT NO. U-4006
GUILFORD COUNTY
STATION: 20+90.21 -L-

SHEET 3 OF 3

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	3-38
1			3			TOTAL SHEETS
2			4			75

BRIDGE APPROACH SLAB DETAILS
LEFT LANE



HORIZ. CURVE DATA -L-

PI STA. 20+20.35 -L-
 $\Delta = 34^\circ - 25' - 31.6''$ (RT)
 $D = 3^\circ - 10' - 59.2''$
 $L = 1081.51'$
 $T = 557.63'$
 $R = 1800'$

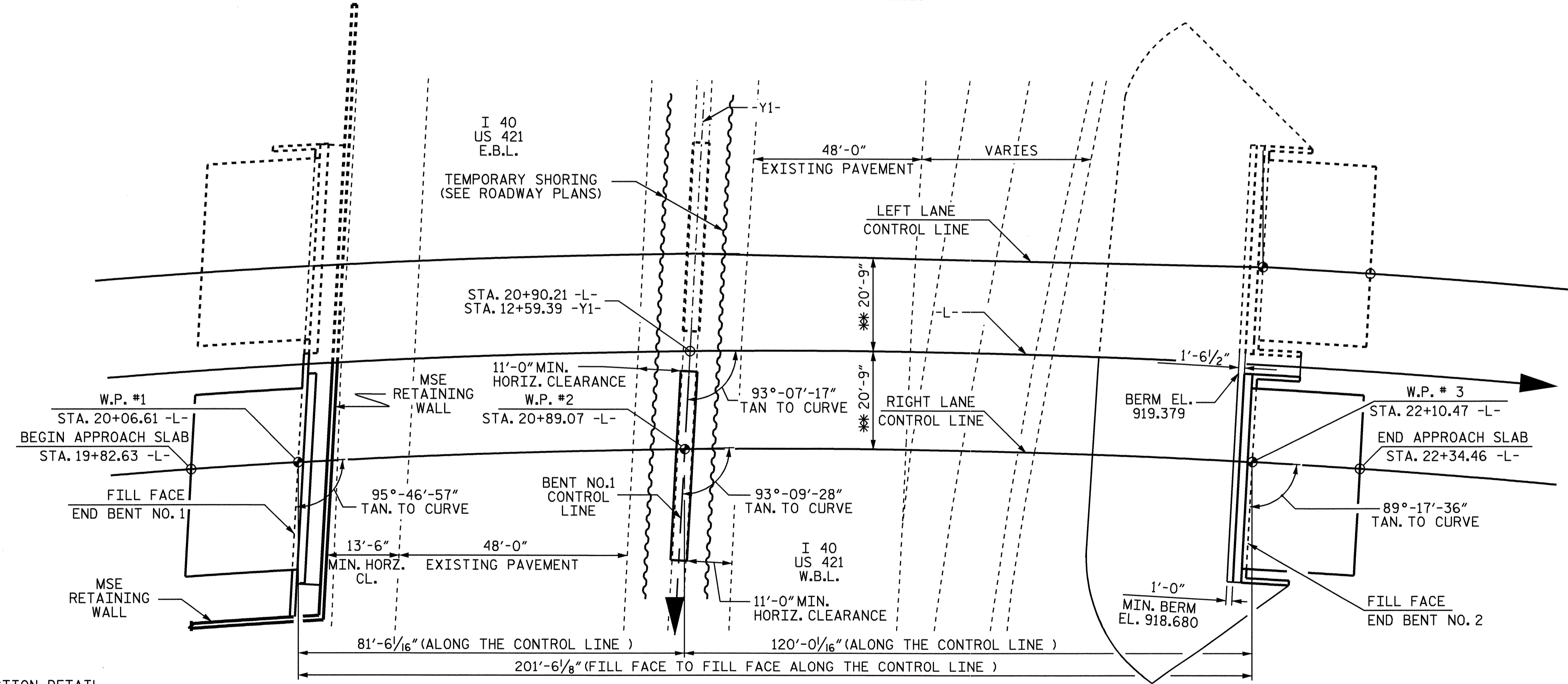
END BENT NO. 1

BENT NO. 1

END BENT NO. 2

SECTION ALONG -L-

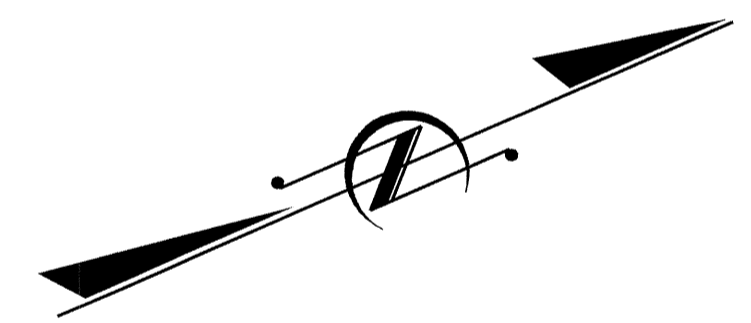
SECTION @ END BENTS AND BENT ARE AT RIGHT ANGLES



NOTE:
 SEE SLOPE PROTECTION DETAIL SHEET AND MSE RETAINING WALL SHEETS FOR BERM WIDTH AND ELEVATIONS AT END BENT NO.1

PLAN

PILES, COLUMNS, AND FOOTINGS NOT SHOWN IN PLAN VIEW FOR CLARITY



PROJECT NO. U-4006
 GUILFORD COUNTY
 STATION: 20+90.21-L-
12+59.39-Y1-

SHEET 1 OF 4 BRIDGE NO. 1048

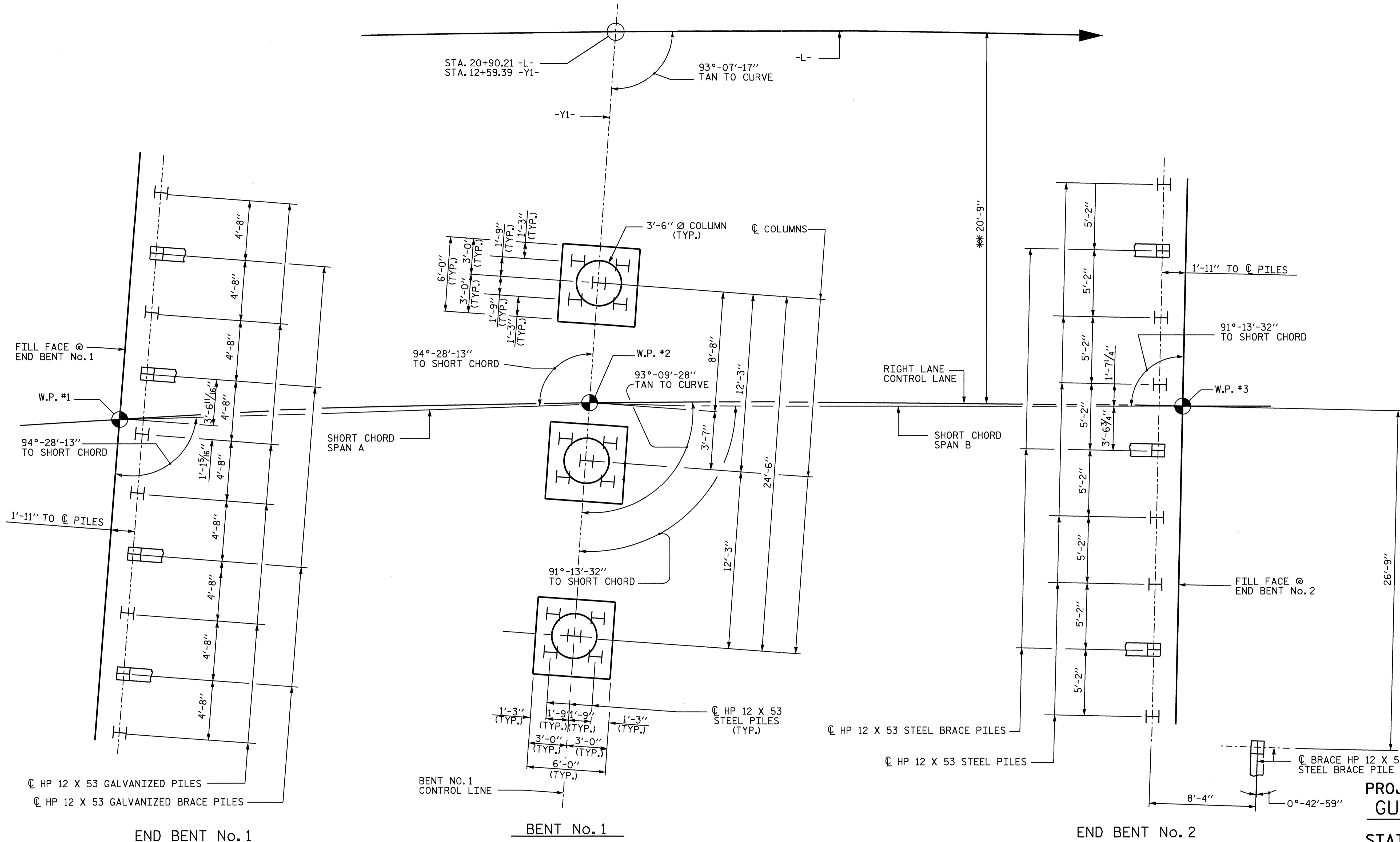
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE ON SR 4126
 (BRIDFORD PARKWAY)
 OVER I-40/US 421
 BETWEEN SR 1541 AND SR 1607
 (RIGHT LANE)



DRAWN BY : A.L. FIGUEROA DATE : 05-07-09
 CHECKED BY : J.R. DUGGINS DATE : 05-08-09

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

TOTAL SHEETS: 75



FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE AT BOTTOM OF CAP
 END BENT PILES ARE BATTERED 3 : 12
 ALL PILES ARE HP 12 X 53

* RADIAL DIMENSION

NOTES

DRIVE PILES AT END BENT No. 1, END BENT No. 2, AND BENT No. 1 TO A REQUIRED BEARING CAPACITY OF 150 TONS PER PILE. THE REQUIRED BEARING CAPACITY IS EQUAL TO THE ALLOWABLE BEARING CAPACITY WITH A MINIMUM FACTOR OF SAFETY OF TWO.

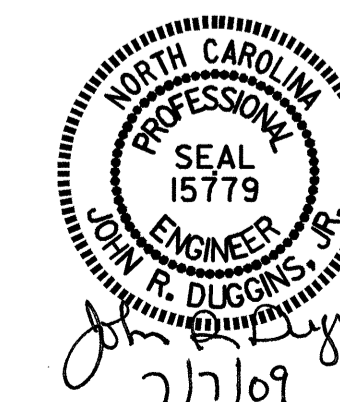
THE ALLOWABLE BEARING CAPACITY FOR PILES AT END BENT No. 1, END BENT No. 2, AND BENT No. 1 IS 75 TONS PER PILE.

DRIVE PILES AT END BENT No. 1 BEFORE CONSTRUCTING MSE WALL.

PROJECT NO. U-4006
 GUILFORD COUNTY
 STATION: 20+90.21 -L-

SHEET 2 OF 4

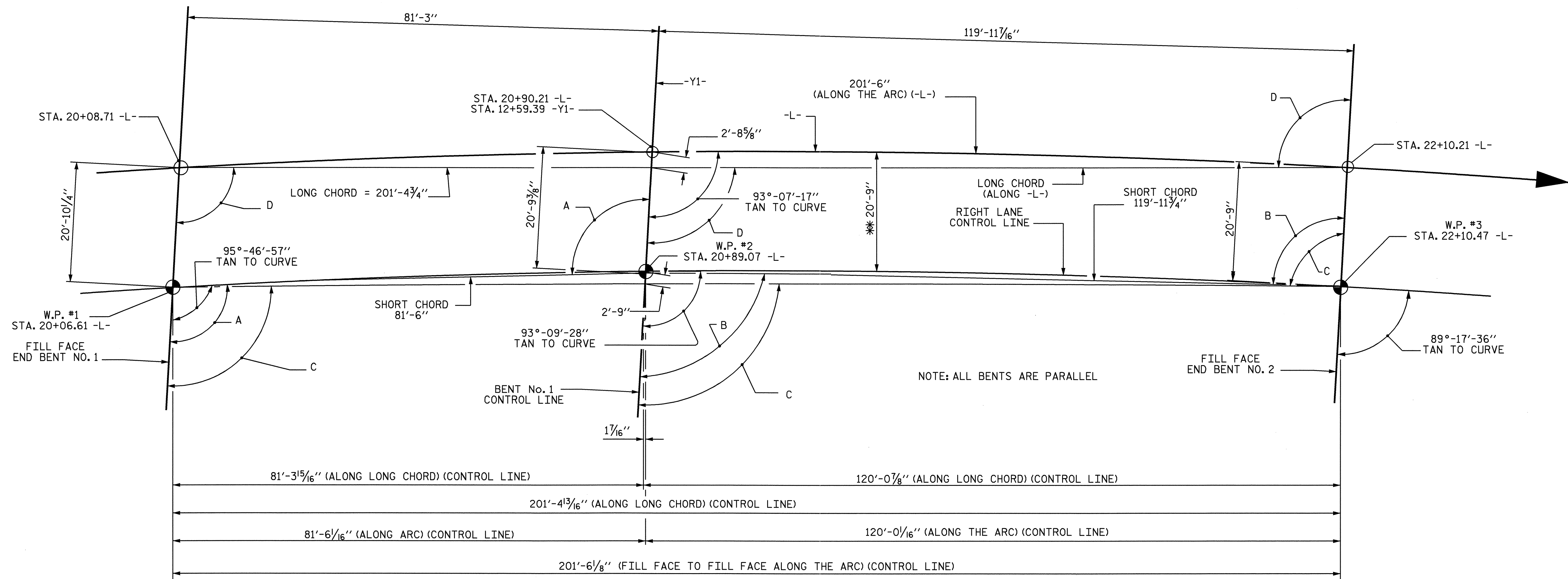
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING
 FOR BRIDGE ON SR 4126
 (BRIDFORD PARKWAY)
 OVER I-40/US 421
 BETWEEN SR 1541 AND SR 1607
 (RIGHT LANE)



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-40
1			3			TOTAL SHEETS
2			4			75

DRAWN BY: M. POOLE DATE: 04/09
 CHECKED BY: A. SORSENGINH DATE: 04/09

07-JUL-2009 08:19
 r:\structures\4006\mpoole\microstation\Right Lane\U-4006_sd_FL.02.dgn
 dahodge



NOTE: ALL BENTS ARE PARALLEL

- ANGLES**
- A = 94°-28'-13" TO SHORT CHORD SPAN A
 - B = 91°-13'-32" TO SHORT CHORD SPAN B
 - C = 92°-32'-17" TO LONG CHORD CONTROL LINE
 - D = 92°-30'-31" TO LONG CHORD -L- LINE

LONG CHORD LAYOUT

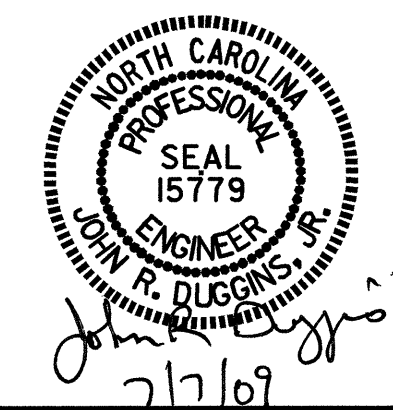
**RADIAL DIMENSION

PROJECT NO. U-4006
 GUILFORD COUNTY
 STATION: 20+90.21 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE ON SR 4126
 (BRIDFORD PARKWAY)
 OVER I-40/US 421
 BETWEEN SR 1541 AND SR 1607
 (RIGHT LANE)

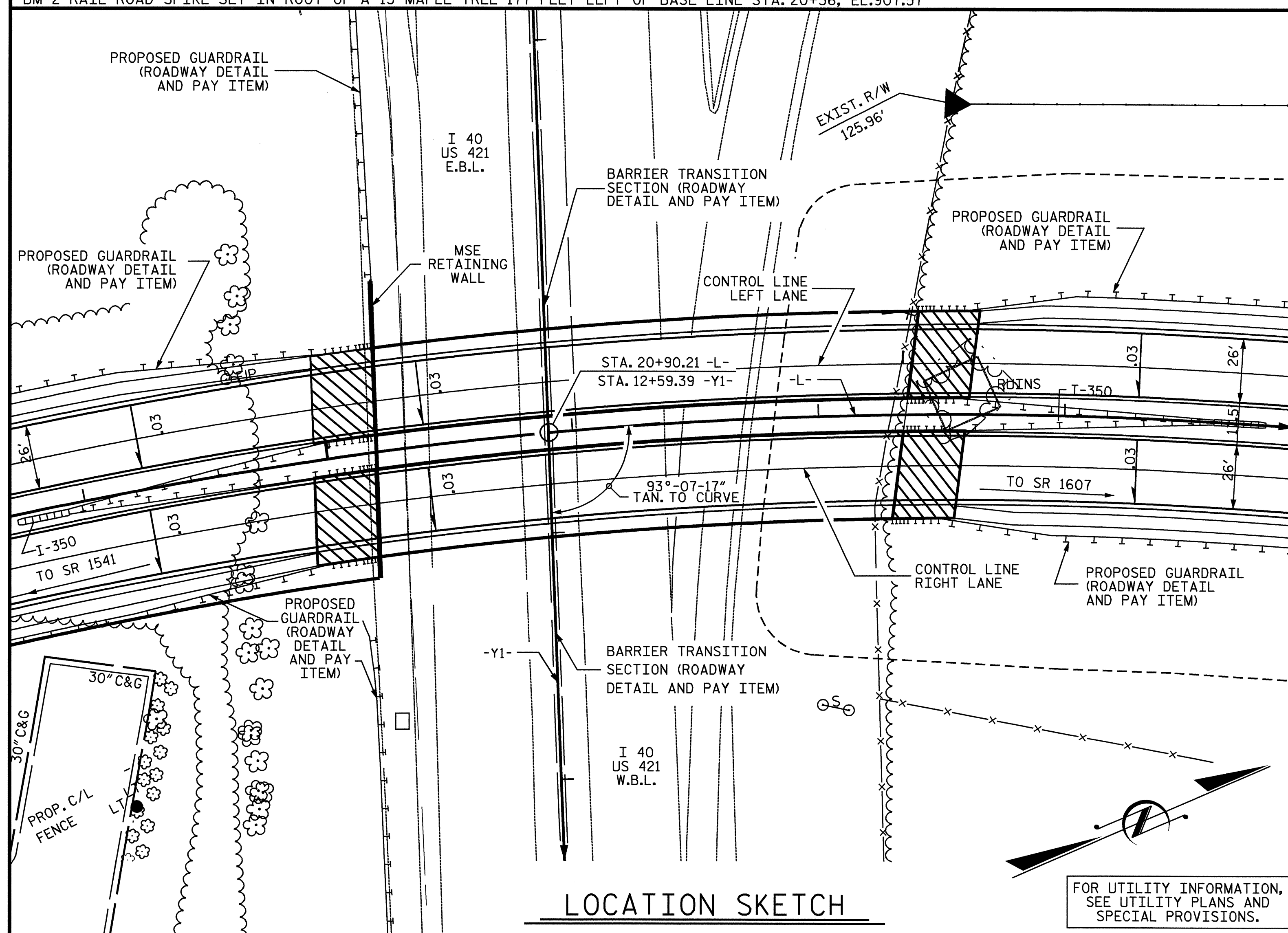


DRAWN BY: M. POOLE DATE: 04/09
 CHECKED BY: J. R. DUGGINS DATE: 04/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			TOTAL SHEETS
2			4			75

07-JUL-2009 08:23
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 dahodge

BM#2 RAIL ROAD SPIKE SET IN ROOT OF A 15" MAPLE TREE 177 FEET LEFT OF BASE LINE STA. 20+36, EL. 907.57'



NOTES

ASSUMED LIVE LOAD = HS 20 OR ALTERNATE LOADING, EXCEPT THAT THE GIRDERS HAVE BEEN DESIGNED FOR HS 25.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.

FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.

THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLE 1024-5 AND 1024-6 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLE OF REINFORCING STEEL AS FOLLOWING: FOR PROJECT 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 SAMPLE OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICES WITH REPLACEMENTS BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS.

FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.

NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.

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

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 SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GALVANIZED PILES, A MINIMUM OF 35' OF THE TOP OF EACH PILE SHALL BE GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

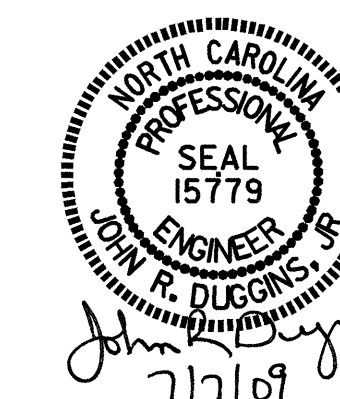
	FOUNDATION EXCAVATION FOR BENT	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	MODIFIED 72" PRESTRESSED CONCRETE GIRDERS	HP 12 X 53 STEEL PILES	HP 12 X 53 GALVANIZED STEEL PILES	THREE BAR METAL RAIL	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	EVAZOTE JOINT SEALS
	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO. LIN. FT.	NO. LIN. FT.	NO. LIN. FT.	LIN. FT.	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE		7661	6637		LUMP SUM			10 989.01			191.92	199.42		LUMP SUM	LUMP SUM
END BENT NO. 1				31.5		3,980				10 700			28		
BENT NO. 1	LUMP SUM			45.8		7,739	1,220		15 790						
END BENT NO. 2				38.3		5,246			10 800				235		
TOTAL	LUMP SUM	7661	6637	115.6	LUMP SUM	16,965	1,220	10 989.01	25 1,590	10 700	191.92	199.42	263	LUMP SUM	LUMP SUM

PROJECT NO. U-4006
GUILFORD COUNTY
 STATION: 20+90.21-L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE ON SR 4126
 (BRIDFORD PARKWAY)
 OVER I-40/US 421
 BETWEEN SR 1541 AND SR 1607
 (RIGHT LANE)

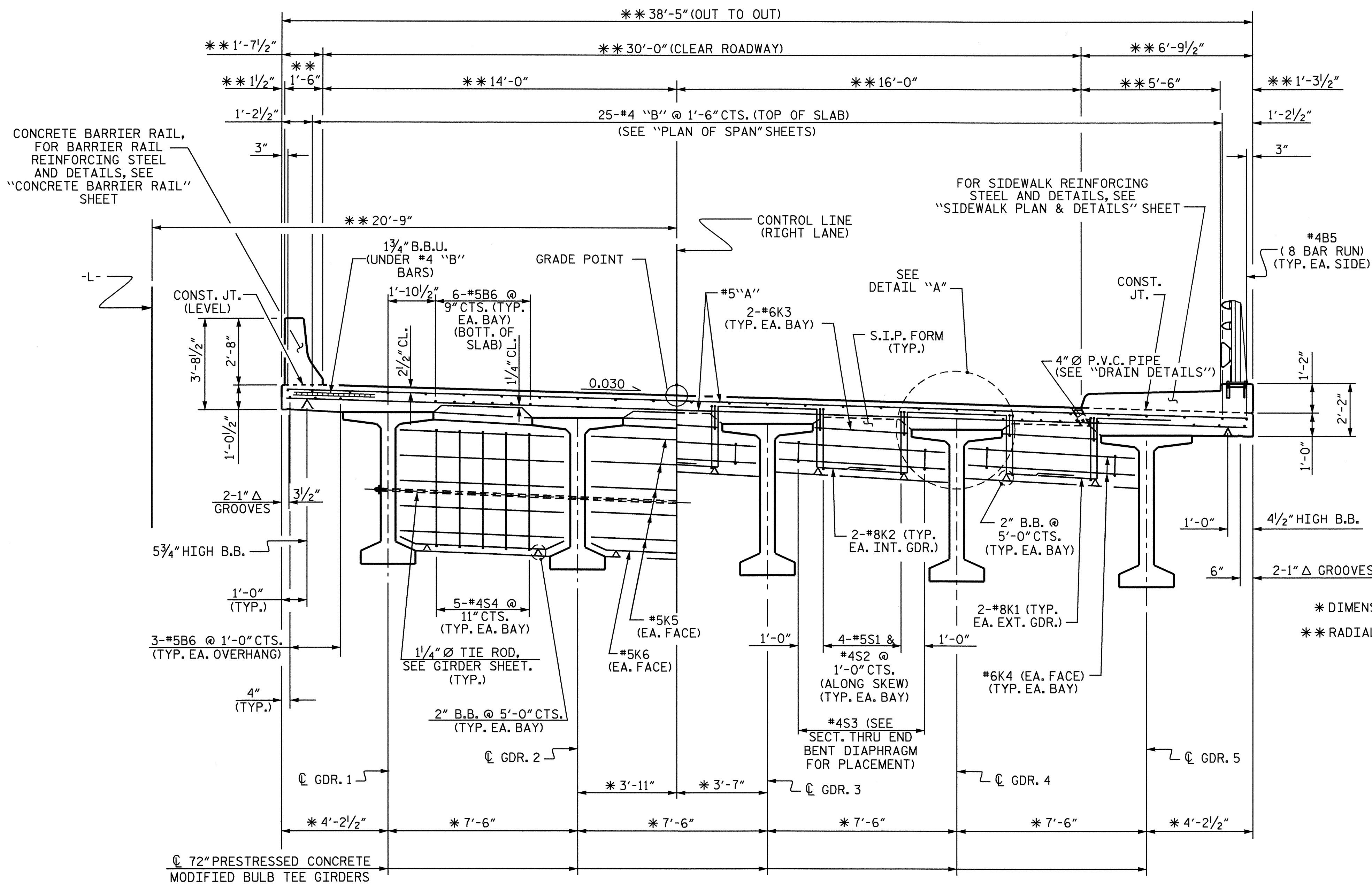


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			3-42
2			4			TOTAL SHEETS 75

DRAWN BY: A.L. FIGUEROA DATE: 05-07-09
 CHECKED BY: J.R. DUGGINS DATE: 05-08-09

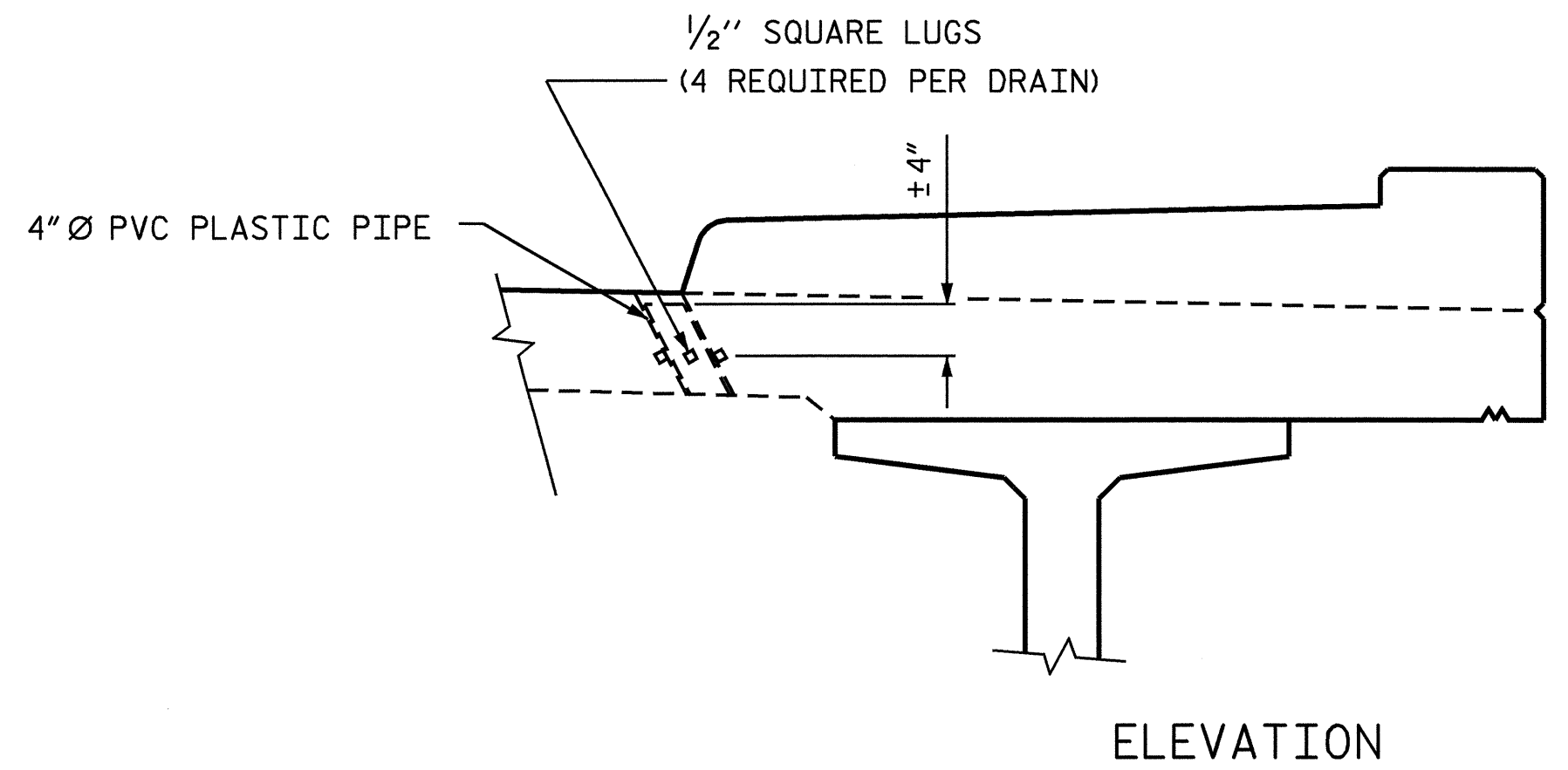
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 dahodge

STR. #2

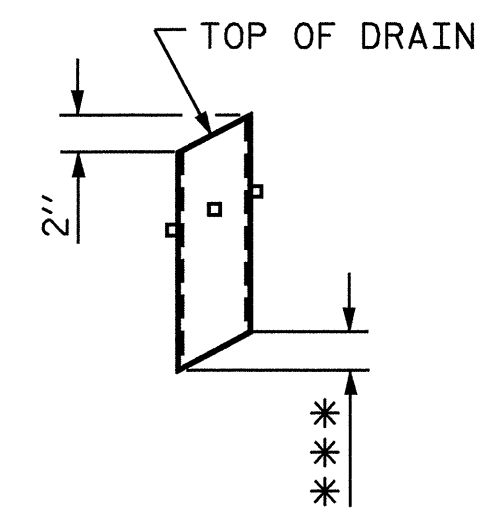


TYPICAL SECTION
SHOWING INTERMEDIATE DIAPHRAGMS

TYPICAL SECTION
SHOWING END BENT DIAPHRAGMS



DRAIN DETAILS



PIPE DETAIL

*** TO BE SET TO MATCH SLOPE OF BOTTOM OF OVERHANG (5 DRAINS REQUIRED)

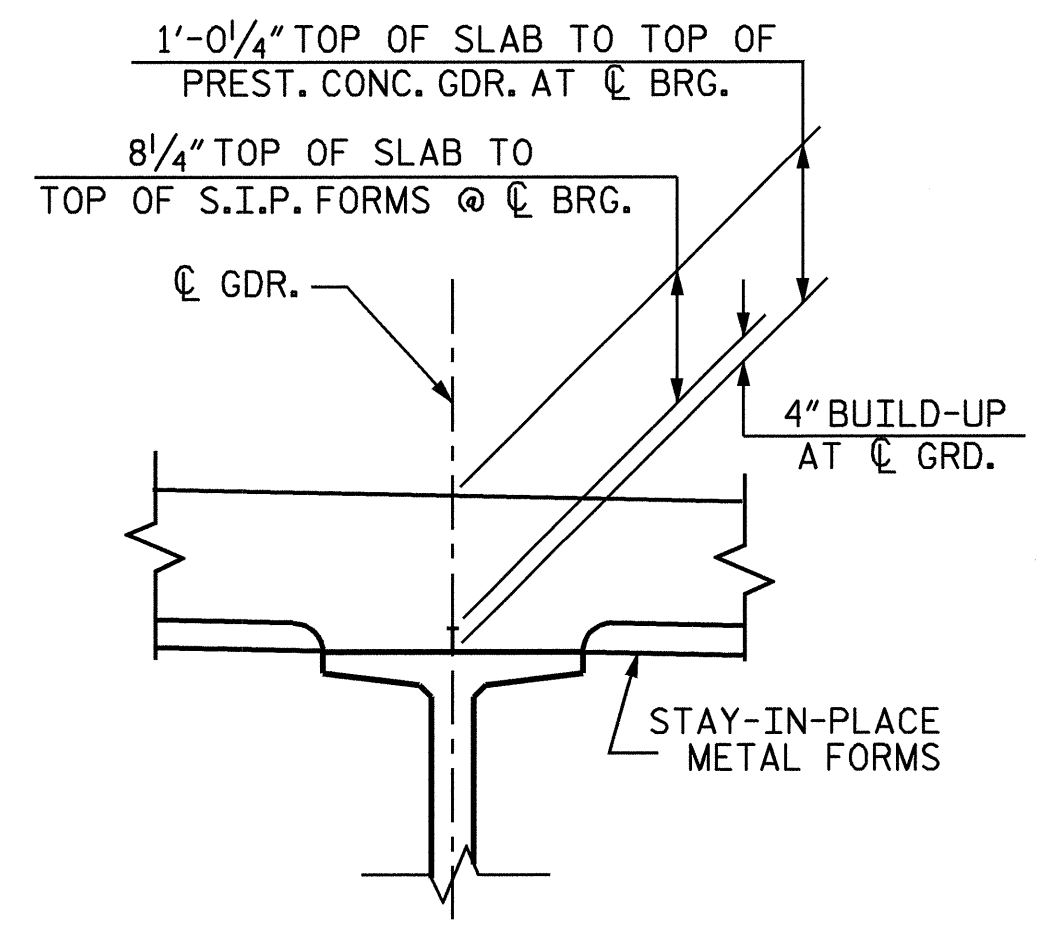
TOP OF FLOOR DRAINS TO BE SET 3/8" BELOW SURFACE OF SLAB.

4 - 1/2" SQUARE LUGS TO BE GLUED TO THE P.V.C. PLASTIC PIPE AT EQUAL SPACES AROUND THE PIPE DRAIN APPROXIMATELY 4" FROM THE TOP OF THE PIPE.

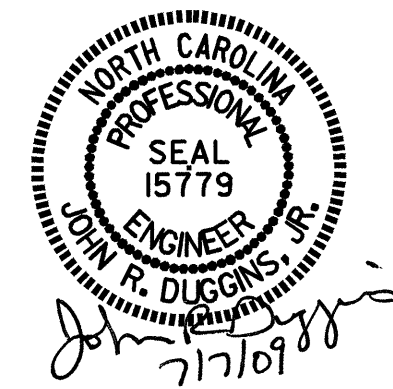
THE 4" Ø PVC PLASTIC PIPE AND FITTINGS SHALL BE SCHEDULE 40 AND CONFORM TO ASTM D1785.

NOTES

- PROVIDE 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF 'A' BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 2 1/2" ABOVE THE TOP OF THE REMOVABLE FORM.
- LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.
- TEMPORARY STRUTS SHALL BE PLACED BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE DIAPHRAGMS AND THE NUTS ON THE 1/4" DIA. TIE RODS SHALL BE FULLY TIGHTENED BEFORE THE DIAPHRAGMS ARE CAST. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED. THE TIE RODS SHALL BE RE-TIGHTENED AFTER THE STRUTS HAVE BEEN REMOVED.
- CONCRETE IN INTERMEDIATE DIAPHRAGMS MAY BE CLASS A IN LIEU OF CLASS AA. PAYMENT SHALL BE MADE UNDER THE UNIT CONTRACT PRICE FOR REINFORCED CONCRETE DECK SLAB.
- PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.
- BARRIER RAIL AND SIDEWALK IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.



DETAIL "A"



PROJECT NO. U-4006
GUILFORD COUNTY
 STATION: 20+90.21 -L-
 SHEET 1 OF 3

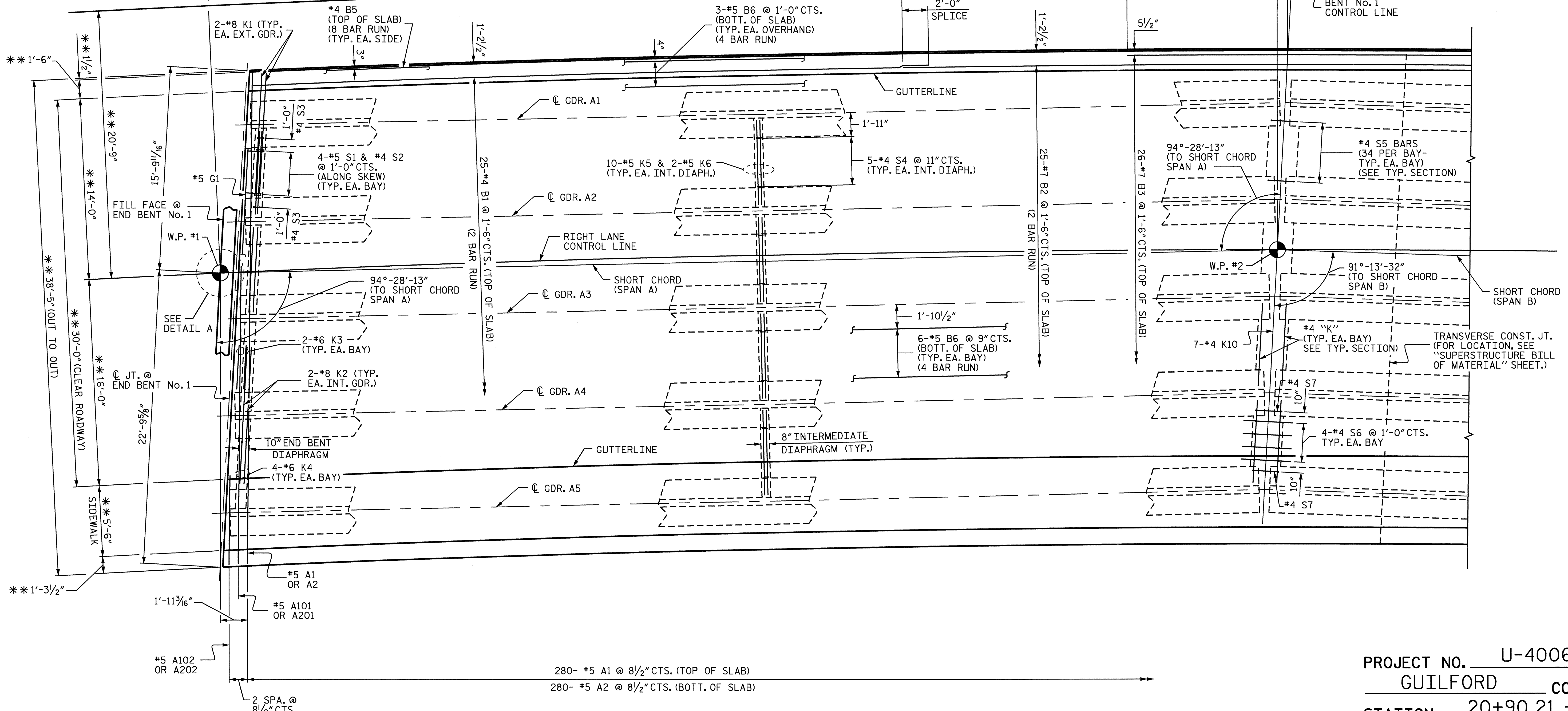
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE TYPICAL SECTION (RIGHT LANE)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-43					TOTAL SHEETS 15

DRAWN BY: J. LAMBERT DATE: 1/09
 CHECKED BY: D. HODGE DATE: 4/09

201'-6 1/8" (W.P. #1 TO W.P. #3) (ALONG CONTROL LINE RIGHT LANE)

81'-6 1/16" (W.P. #1 TO W.P. #2)
(ALONG CONTROL LINE RIGHT LANE)

120'-0 1/16" (W.P. #2 TO W.P. #3)
(ALONG CONTROL LINE RIGHT LANE)
41'-3"

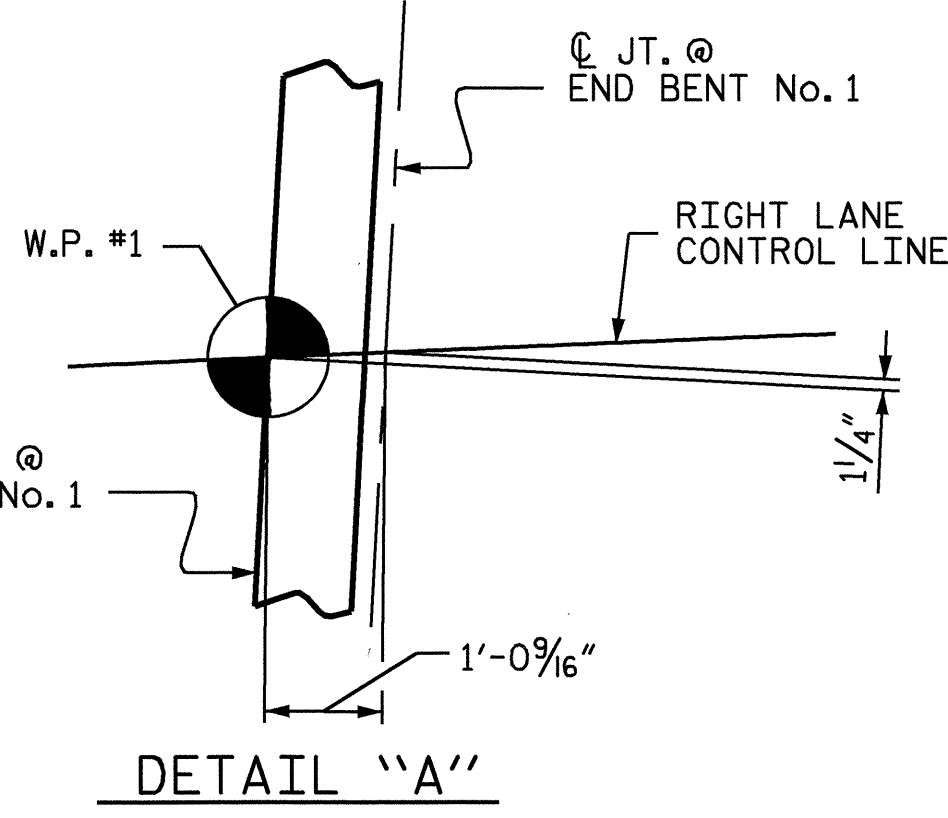


PROJECT NO. U-4006
GUILFORD COUNTY
 STATION: 20+90.21 -L-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE PLAN OF SPAN A (RIGHT LANE)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. 3-46
					TOTAL SHEETS 75

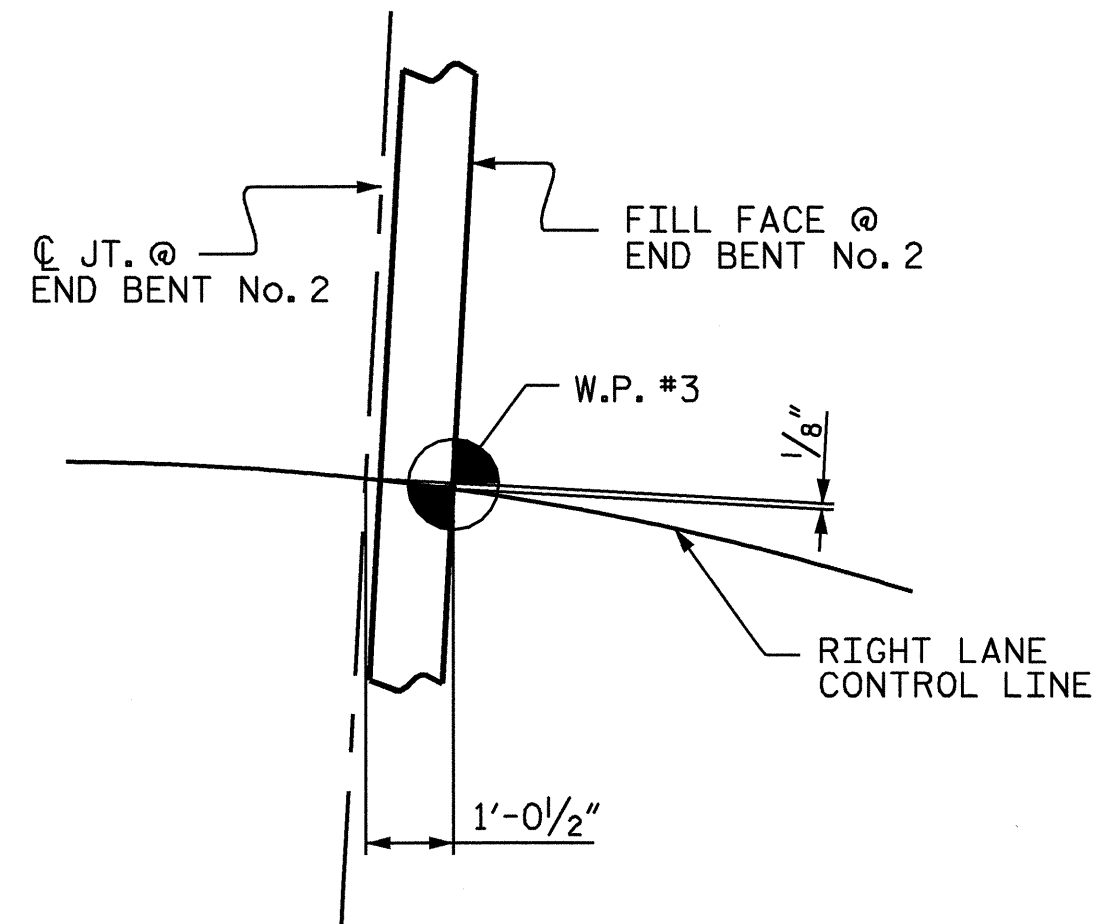
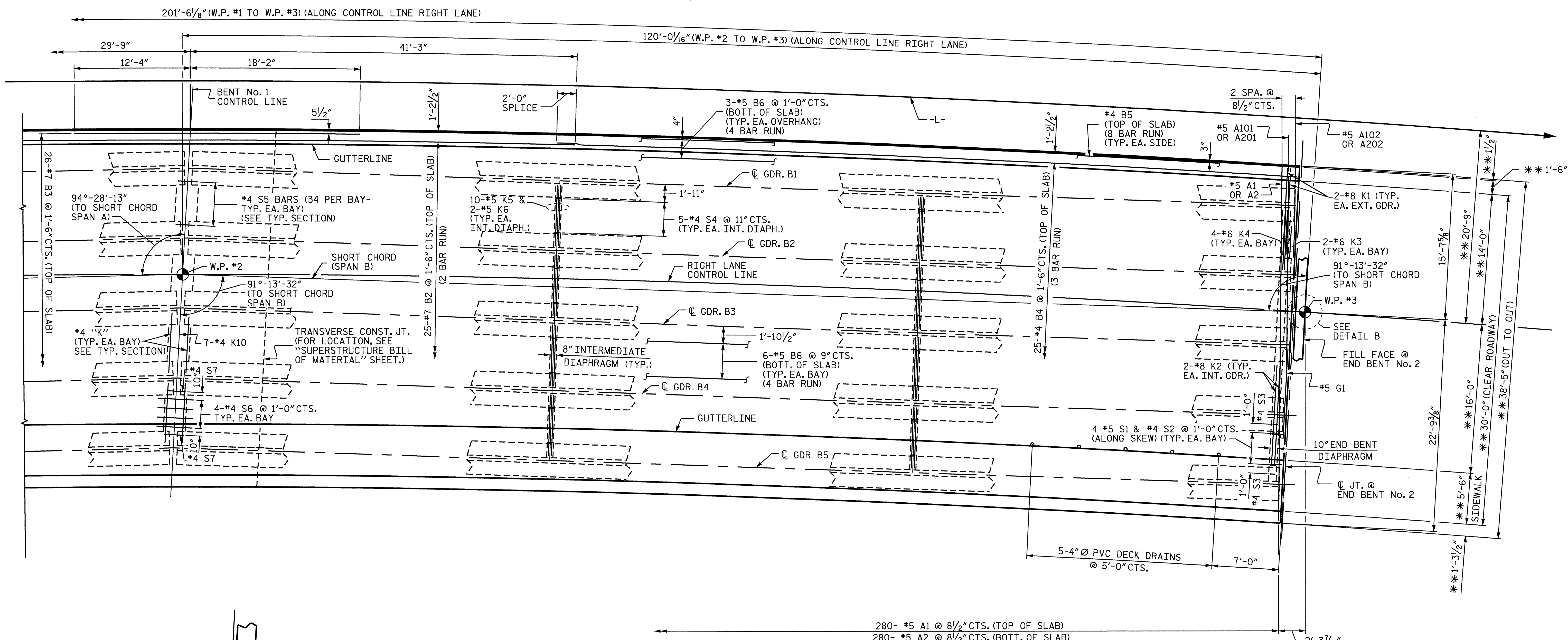
PLAN OF SPAN "A"

FOR REINFORCING STEEL IN BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEET.
 FOR REINFORCING STEEL IN SIDEWALK, SEE "SIDEWALK DETAILS" SHEET.
 #5 "A" BARS PLACED PERPENDICULAR TO LONG CHORD AND SPACED ALONG LONG CHORD.



** RADIAL DIMENSIONS

DRAWN BY: D. HODGE DATE: 4/09
 CHECKED BY: J.R. DUGGINS DATE: 4/09



DETAIL "B"

PLAN OF SPAN "B"

FOR REINFORCING STEEL IN BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEET.

FOR REINFORCING STEEL IN SIDEWALK, SEE "SIDEWALK DETAILS" SHEET.

#5 "A" BARS PLACED PERPENDICULAR TO LONG CHORD AND SPACED ALONG LONG CHORD.

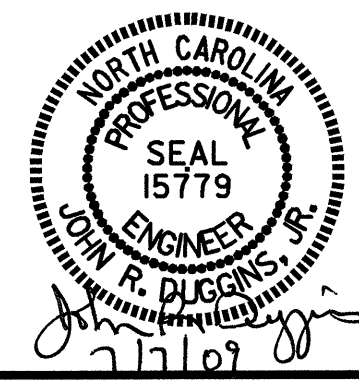
** RADIAL DIMENSIONS

PROJECT NO. U-4006
 GUILFORD COUNTY
 STATION: 20+90.21 -L-

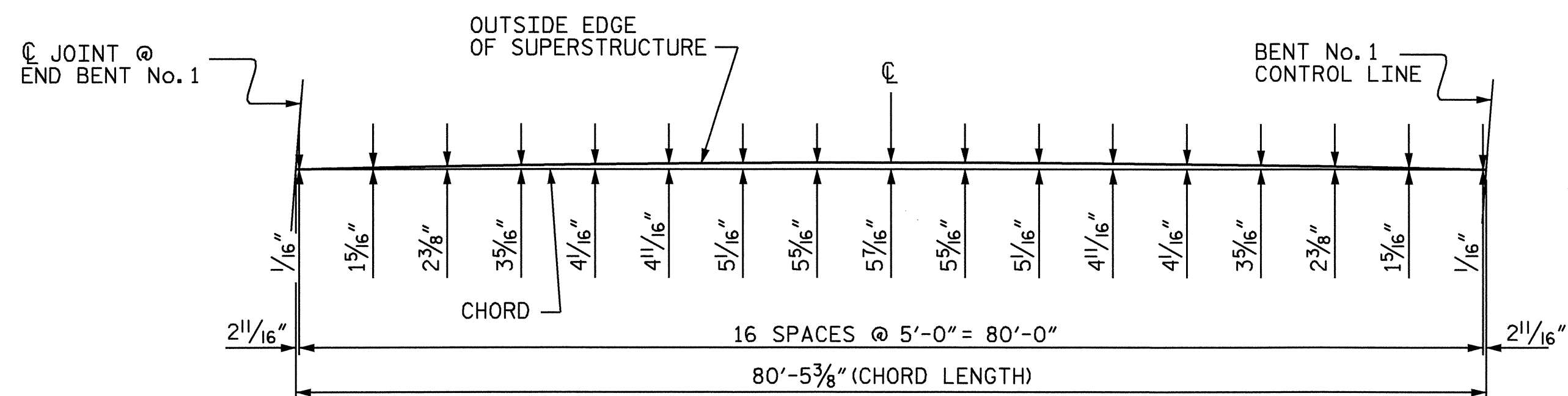
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 PLAN OF SPAN B
 (RIGHT LANE)

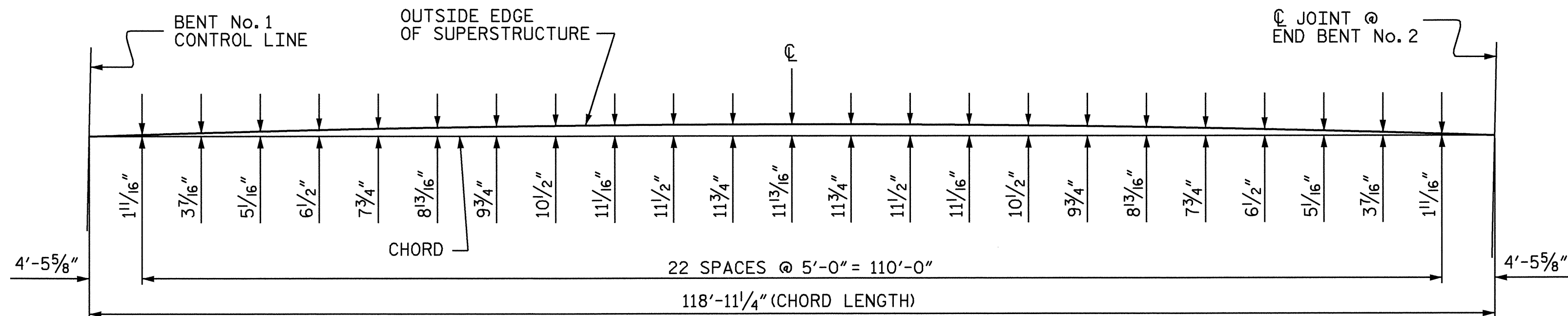
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-47
1			3			TOTAL SHEETS
2			4			75



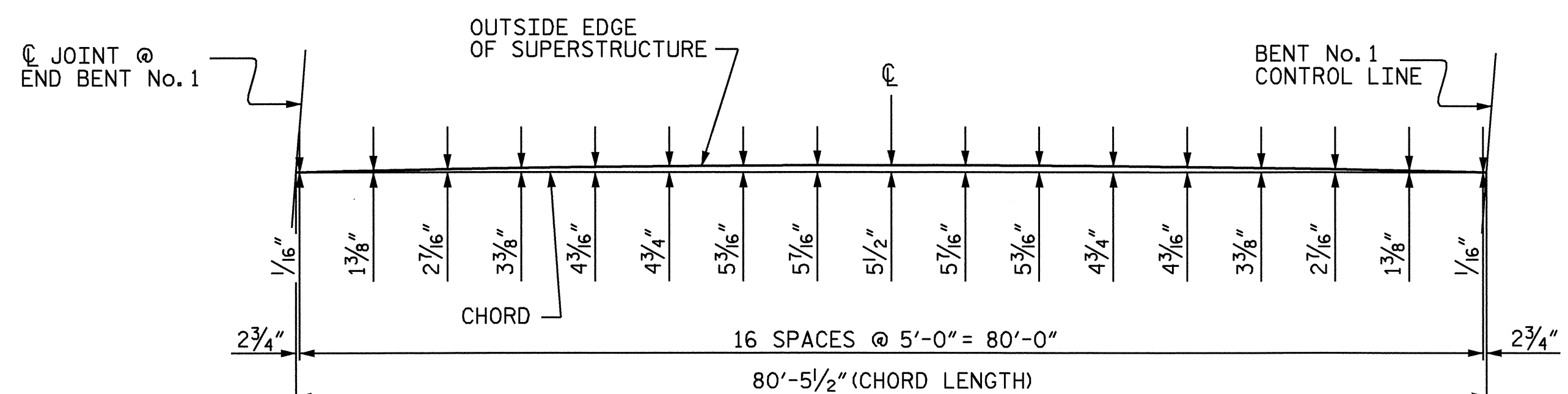
DRAWN BY: D. HODGE DATE: 4/09
 CHECKED BY: J.R. DUGGINS DATE: 4/09



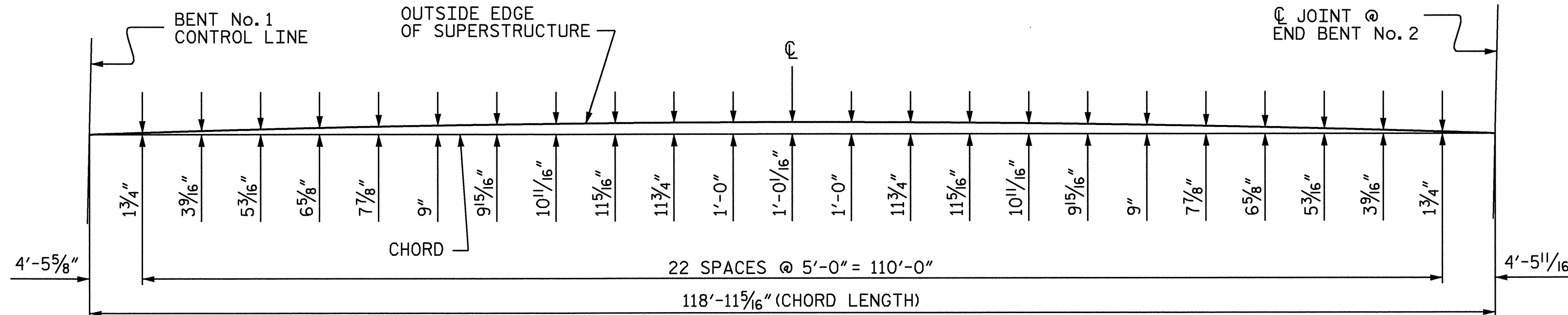
ARC OFFSETS - LEFT SIDE



ARC OFFSETS - LEFT SIDE



ARC OFFSETS - RIGHT SIDE



ARC OFFSETS - RIGHT SIDE

SPAN A

SPAN B

PROJECT NO. U-4006
GUILFORD COUNTY
 STATION: 20+90.21 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

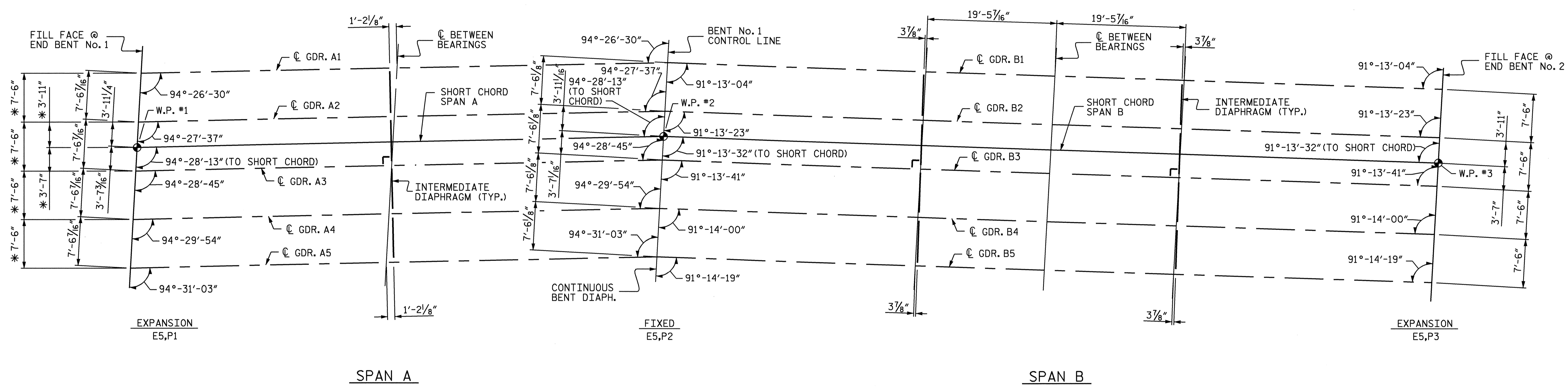
SUPERSTRUCTURE
 ARC OFFSETS
 (RIGHT LANE)

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-48	
1			3			TOTAL SHEETS	
2			4			15	



DRAWN BY : D. HODGE DATE : 4/09
 CHECKED BY : J.R. DUGGINS DATE : 4/09

30-JUN-2009 14:11
 F:\structures\U4006\Jamber\Microstation\Right Lane\U-4006.sd.A0.dgn
 dhodge

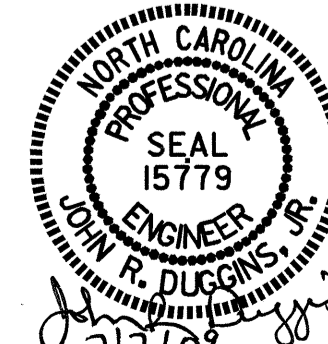


* DIMENSIONS RADIAL THRU WORKPOINTS

GIRDER LAYOUT

PROJECT NO. U-4006
GUILFORD COUNTY
 STATION: 20+90.21 -L-

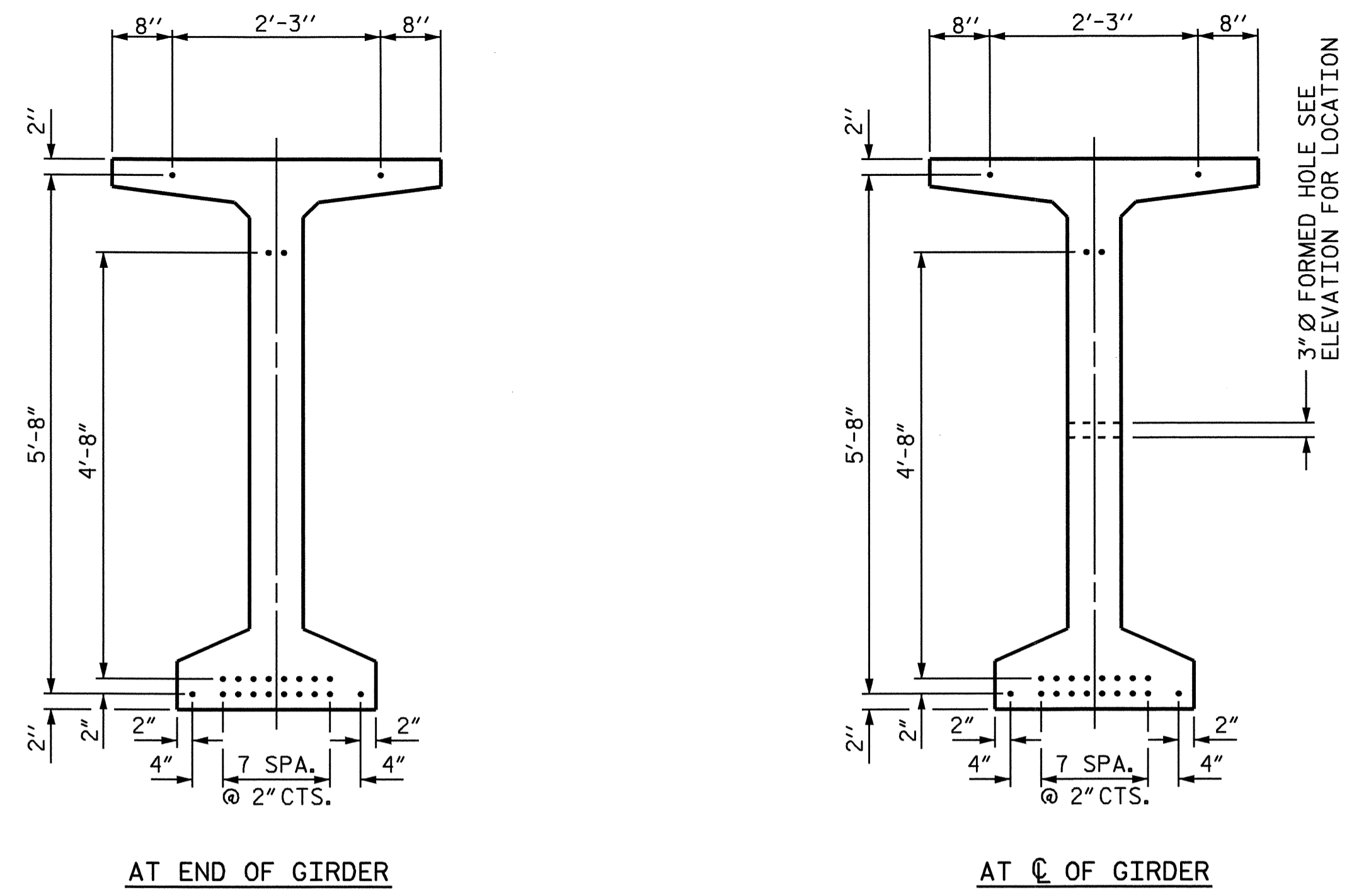
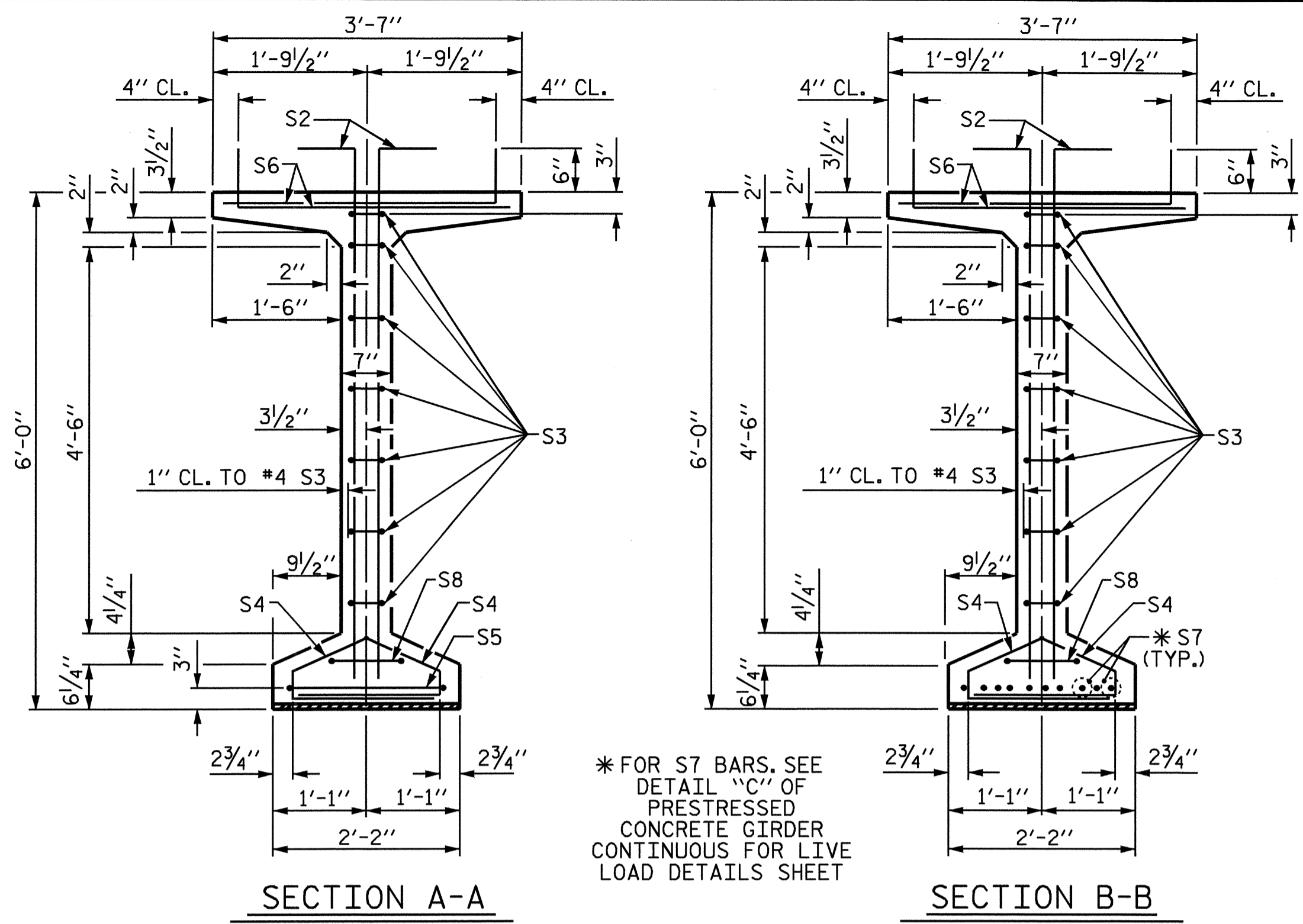
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 GIRDER LAYOUT
 (RIGHT LANE)



DRAWN BY : D. HODGE DATE : 4/09
 CHECKED BY : J.R. DUGGINS DATE : 4/09

30-JUN-2009 14:11
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			75

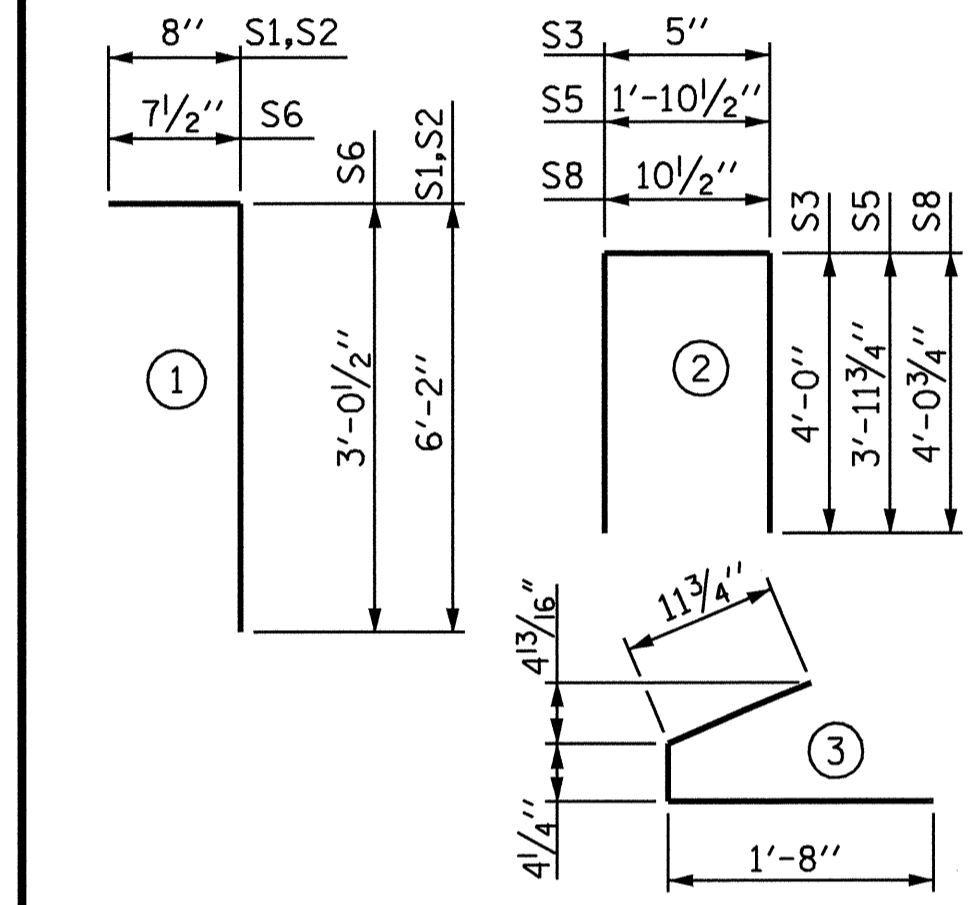


0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	64	#4	1	6'-10"	292
S2	24	#5	1	6'-10"	171
S3	14	#4	2	8'-5"	79
S4	84	#4	3	3'-0"	168
S5	1	#5	2	9'-10"	10
S6	88	#5	1	3'-8"	337
*S7	10	#5	STR	3'-8"	38
S8	2	#5	2	9'-0"	19
S9	29	#5	STR	3'-3"	98
S10	1	#3	STR	1'-10"	1

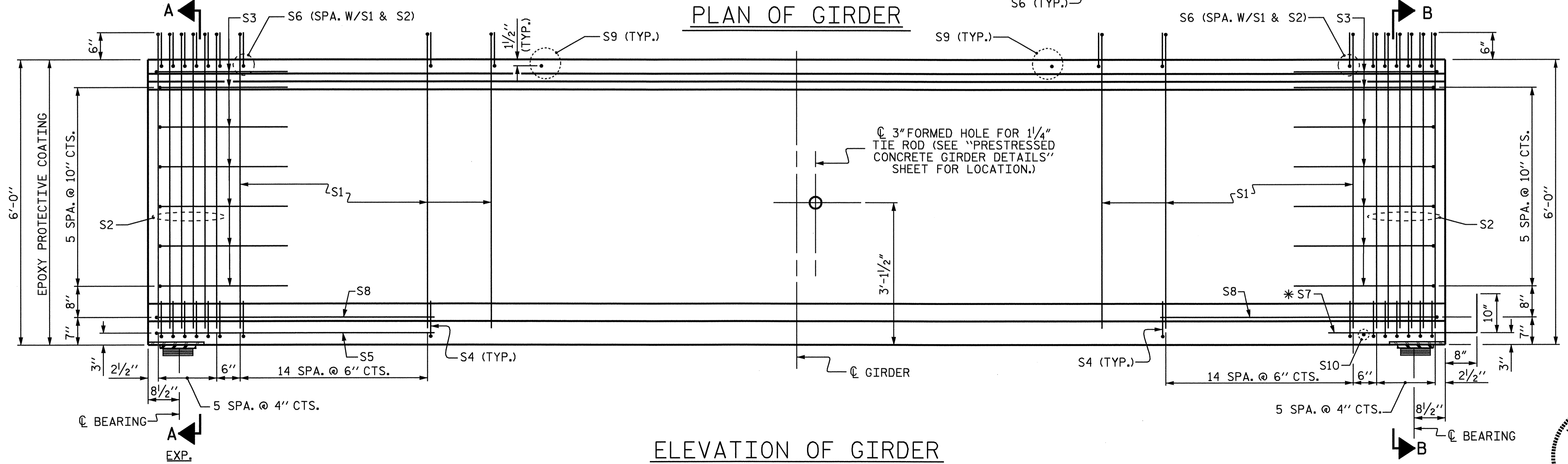
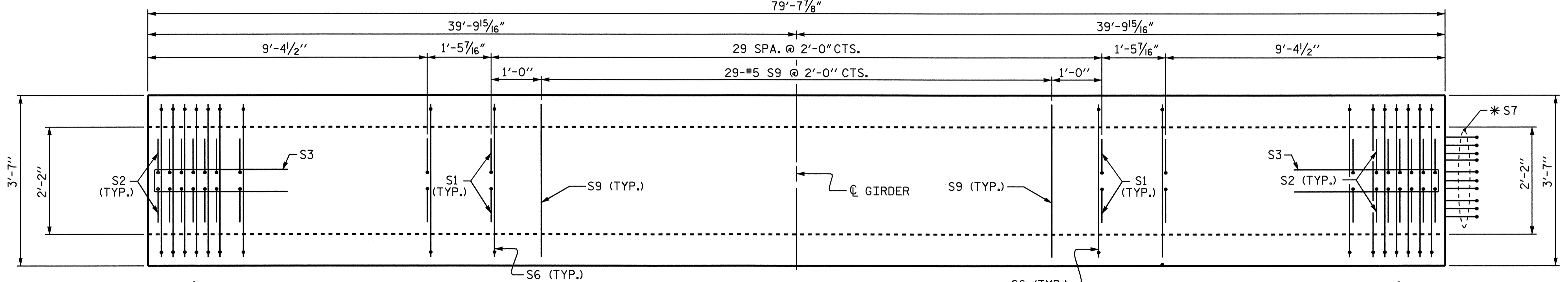
* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES
ALL BAR DIMENSIONS ARE OUT-TO-OUT



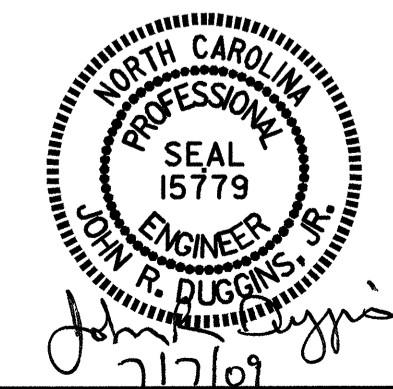
QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL	5500 PSI CONCRETE	0.6" Ø L. R. STRANDS
	LB.	C.Y.	No.
	1213	16.8	22

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
5	79'-7 7/8"	398'-3 3/8"



ASSEMBLED BY : A. SORSENGIH DATE : 5/04/09
 CHECKED BY : J.R. DUGGINS DATE : 5/09
 DRAWN BY : RWW 9/19/02 ADDED 9/19/02
 CHECKED BY : GM 9/19/02 REV. 5/1/06 TLA/GM

30-JUN-2009 14:10
 R:\structures\4006\asorsenginh\microsat\lan\rightlane\U-4006_SD.G*
 dahodge

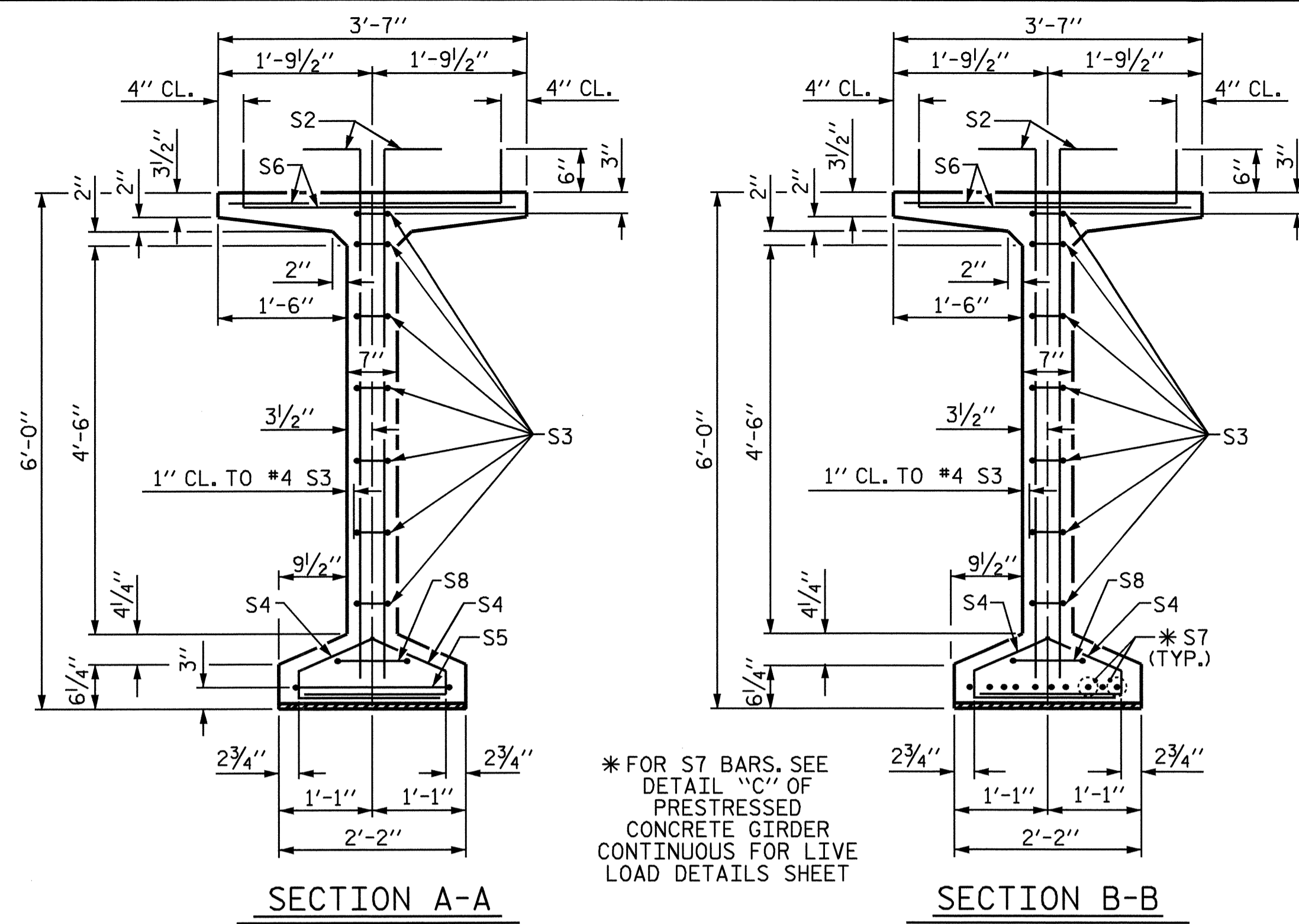


PROJECT NO. U-4006
GUILFORD COUNTY
 STATION: 20+90.21 -L-

SHEET 1 OF 3
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 72" PRESTRESSED CONCRETE
 MODIFIED BULB TEE
 CONTINUOUS FOR LIVE LOAD
 SPAN A
 (RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-50
1			3			TOTAL SHEETS
2			4			75

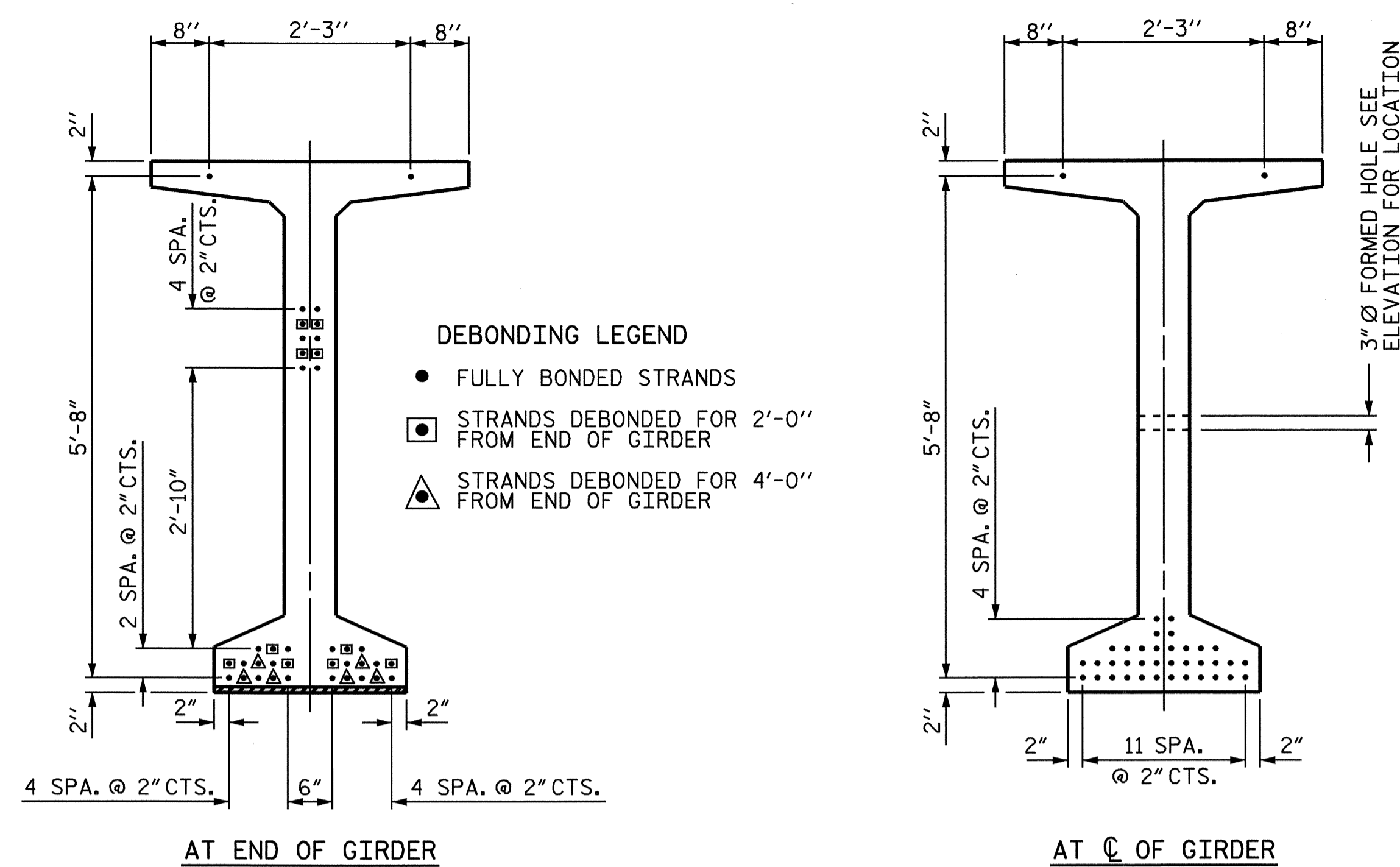
STR. #2 STD. NO. PCGD10



SECTION A-A

SECTION B-B

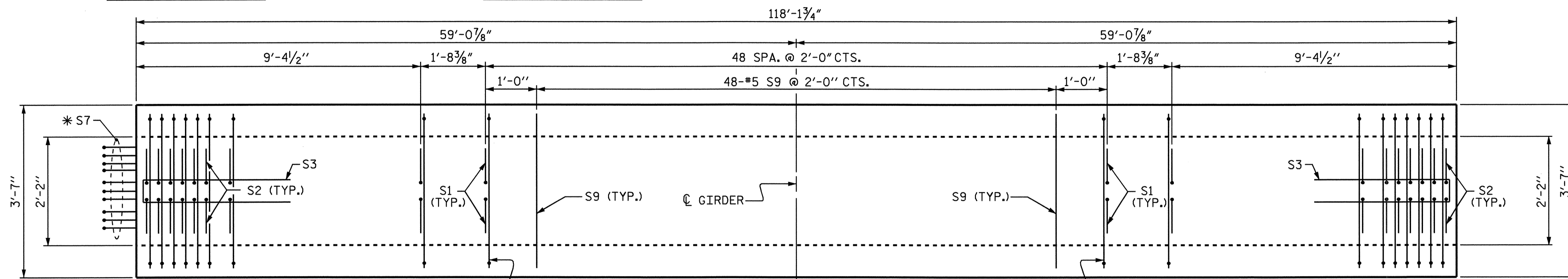
* FOR S7 BARS, SEE
DETAIL "C" OF
PRESTRESSED
CONCRETE GIRDER
CONTINUOUS FOR LIVE
LOAD DETAILS SHEET



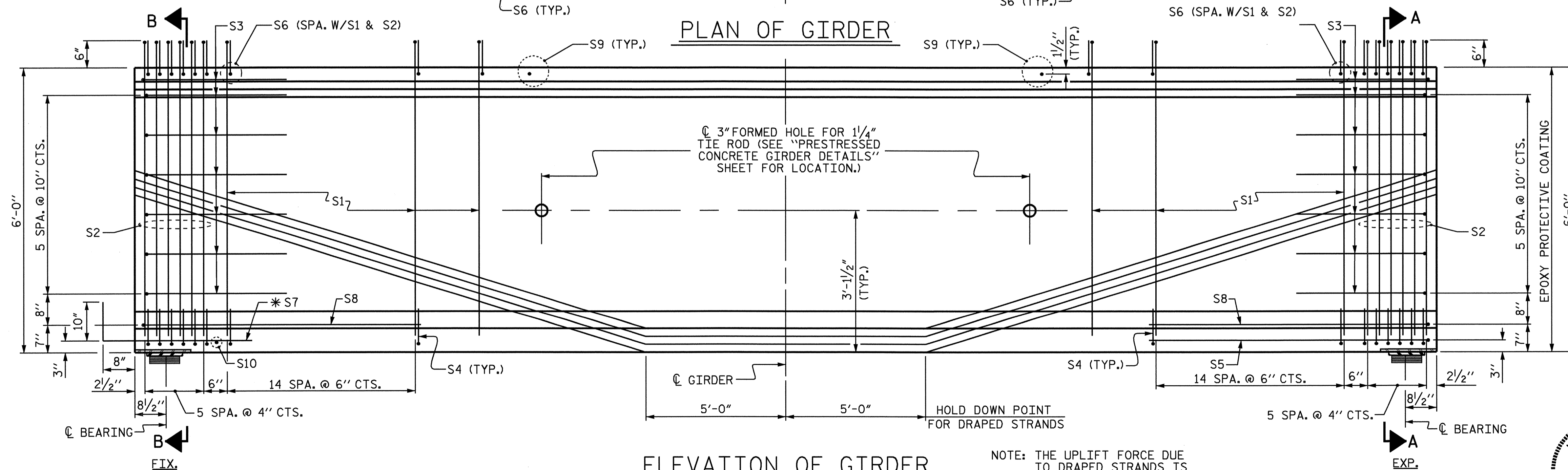
AT END OF GIRDER

AT C OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER



ELEVATION OF GIRDER

NOTE: THE UPLIFT FORCE DUE
TO DRAPED STRANDS IS
25.68 KIPS.

0.6" Ø L. R. GRADE 270 STRANDS

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

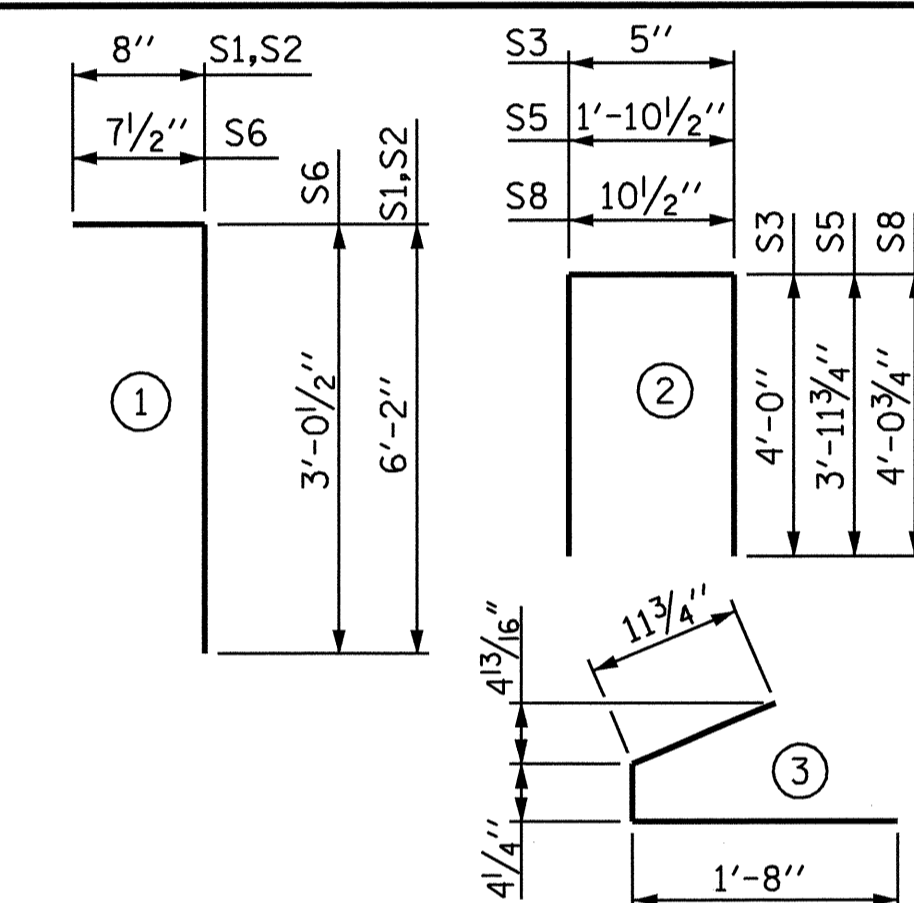
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	64	#4	1	6'-10"	292
S2	24	#5	1	6'-10"	171
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S5	1	#5	2	9'-10"	10
S6	88	#5	1	3'-8"	337
*S7	10	#5	STR	3'-8"	38
S8	2	#5	2	9'-0"	19
S9	48	#5	STR	3'-3"	163
S10	1	#3	STR	1'-10"	1

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

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	8000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
	1278	25.0	38

GIRDERS REQUIRED

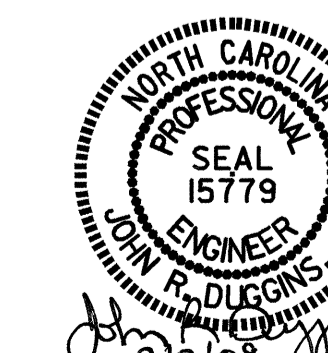
NUMBER	LENGTH	TOTAL LENGTH
5	118'-1 3/4"	590'-8 3/4"

PROJECT NO. U-4006
GUILFORD COUNTY
STATION: 20+90.21 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
72" PRESTRESSED CONCRETE
MODIFIED BULB TEE
CONTINUOUS FOR LIVE LOAD
SPAN B
(RIGHT LANE)

ASSEMBLED BY : A. SORSENGINH	DATE : 5/04/09
CHECKED BY : J.R. DUGGINS	DATE : 5/09
DRAWN BY : RWW 9/19/02	ADDED 9/19/02
CHECKED BY : GM 9/19/02	REV. 5/1/06 TLA/GM



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-51
1			3			TOTAL SHEETS
2			4			75

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION	SPAN A																					
	GIRDER A1										GIRDERS A2, A3, A4 & A5											
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.042	0.080	0.109	0.128	0.134	0.128	0.109	0.080	0.042	0	0	0.042	0.080	0.109	0.128	0.134	0.128	0.109	0.080	0.042	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.013	0.025	0.034	0.040	0.042	0.040	0.034	0.025	0.013	0	0	0.011	0.022	0.030	0.035	0.037	0.035	0.030	0.022	0.011	0
FINAL CAMBER ↑	0	3/8"	1 1/16"	7/8"	1 1/16"	1 1/8"	1 1/16"	7/8"	1 1/16"	3/8"	0	0	3/8"	1 1/16"	1 5/16"	1 1/8"	1 3/16"	1 1/8"	1 5/16"	1 1/16"	3/8"	0

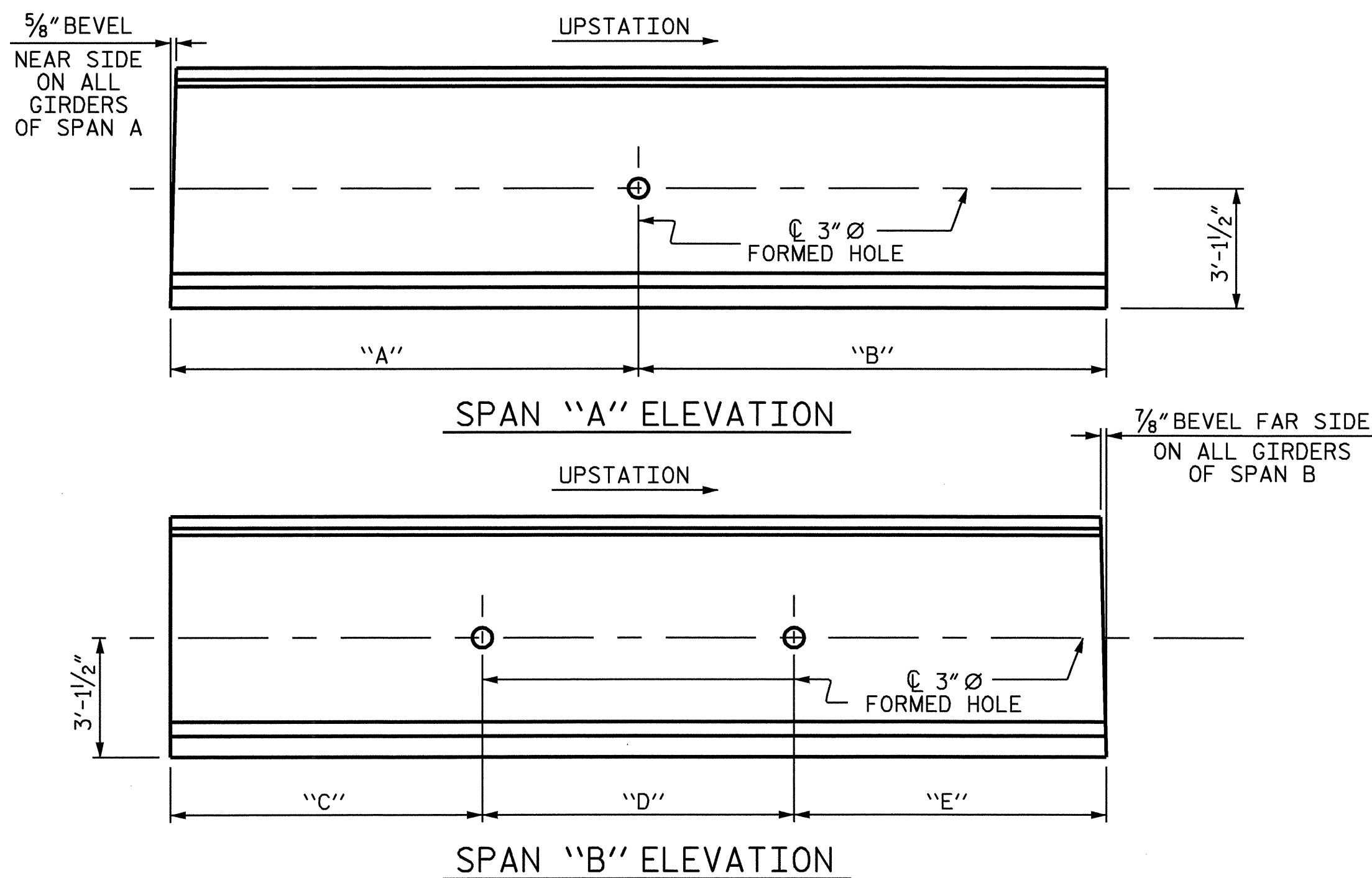
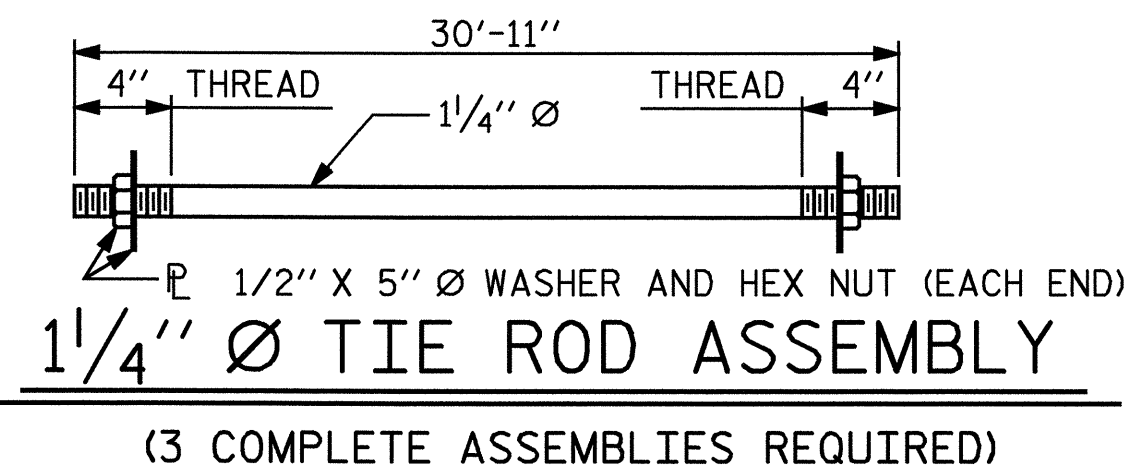
DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION	SPAN B																					
	GIRDER B1										GIRDERS B2, B3, B4 & B5											
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.141	0.266	0.364	0.427	0.448	0.427	0.364	0.266	0.141	0	0	0.141	0.266	0.365	0.427	0.488	0.427	0.365	0.266	0.141	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.058	0.110	0.151	0.177	0.185	0.177	0.151	0.110	0.058	0	0	0.048	0.091	0.124	0.146	0.153	0.146	0.124	0.091	0.048	0
FINAL CAMBER ↑	0	1"	1 7/8"	2 9/16"	3"	3 3/8"	3"	2 9/16"	1 7/8"	1"	0	0	1 1/8"	2 1/8"	2 7/8"	3 3/8"	4"	3 3/8"	2 7/8"	2 1/8"	1 1/8"	0

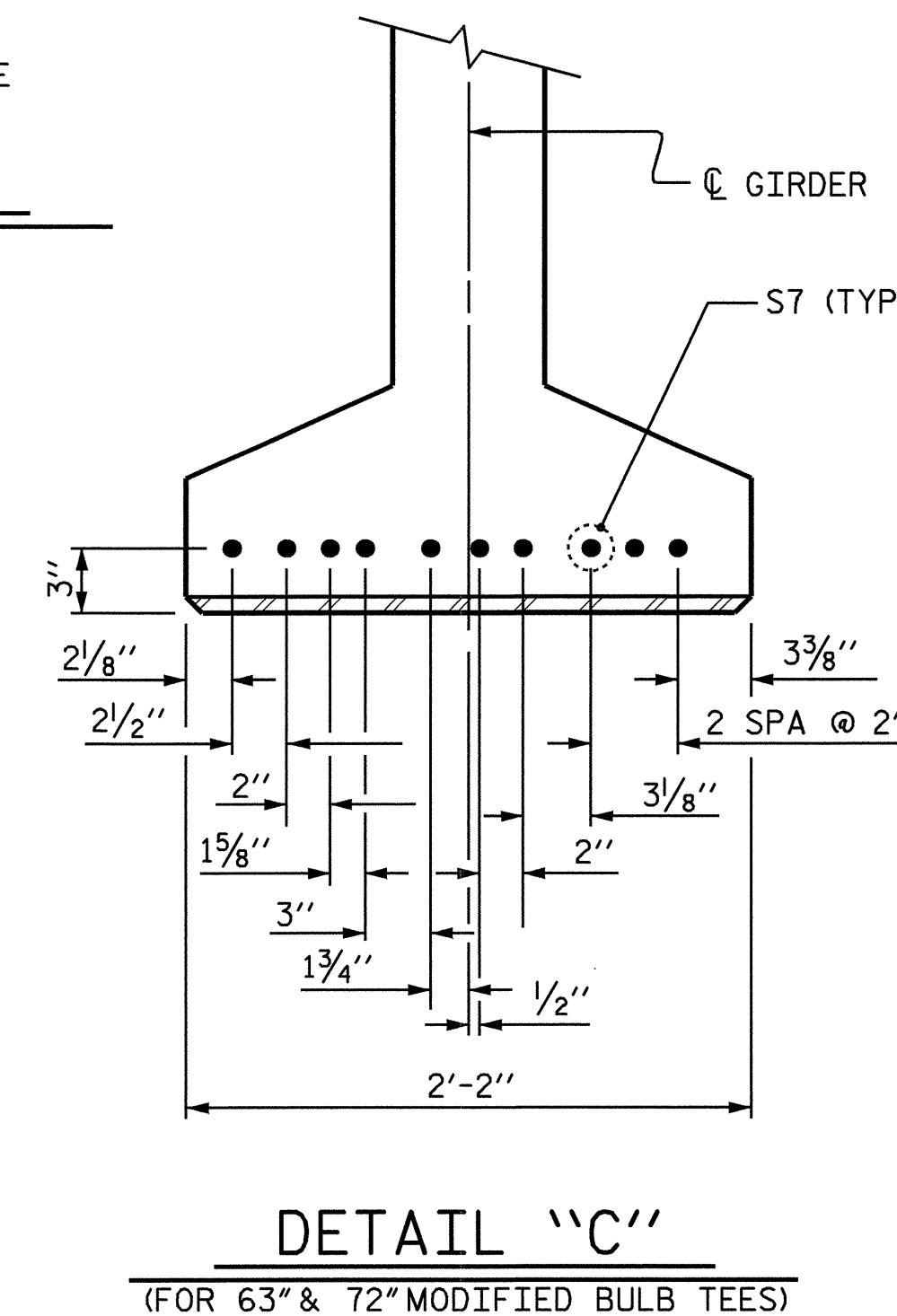
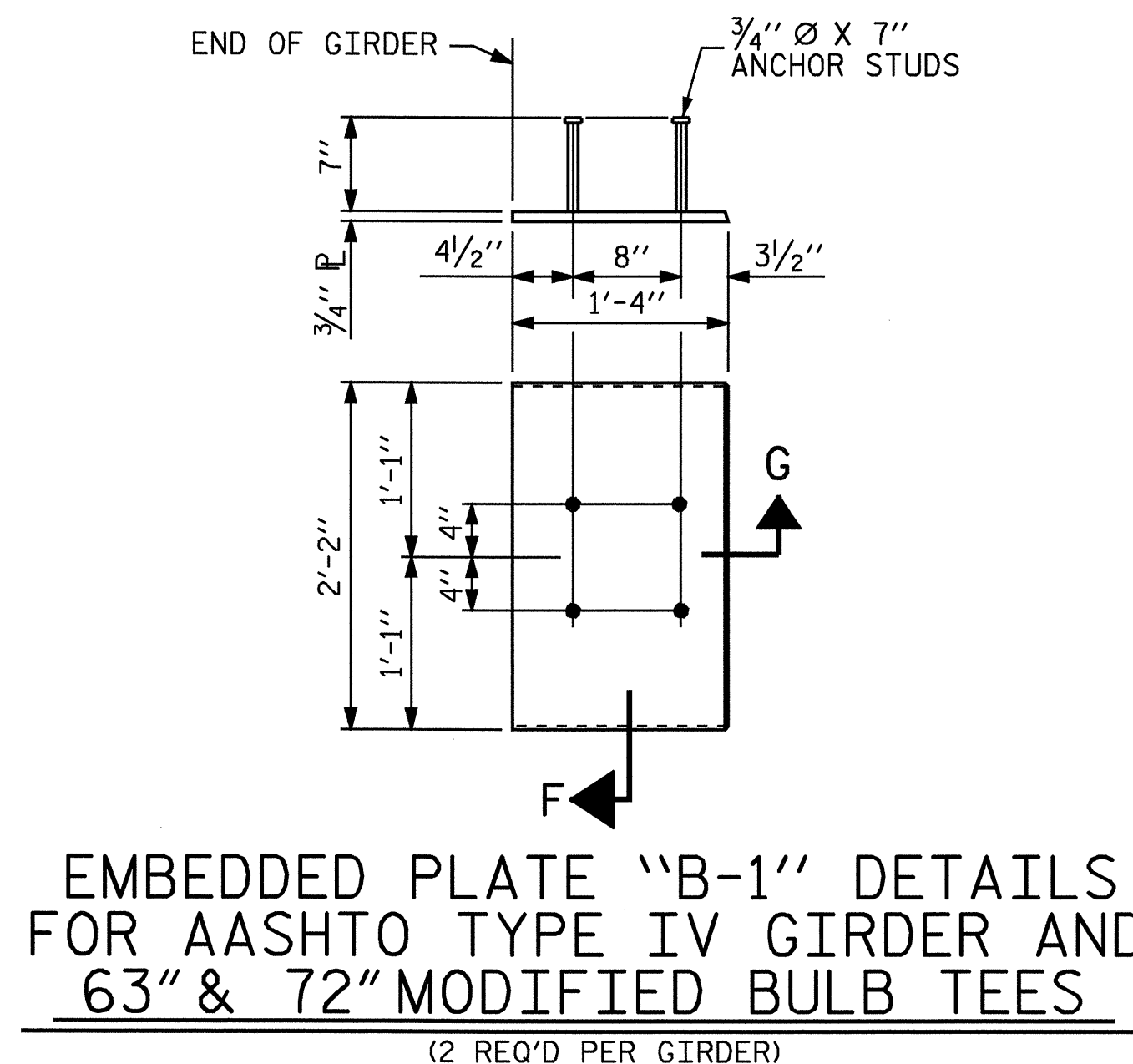
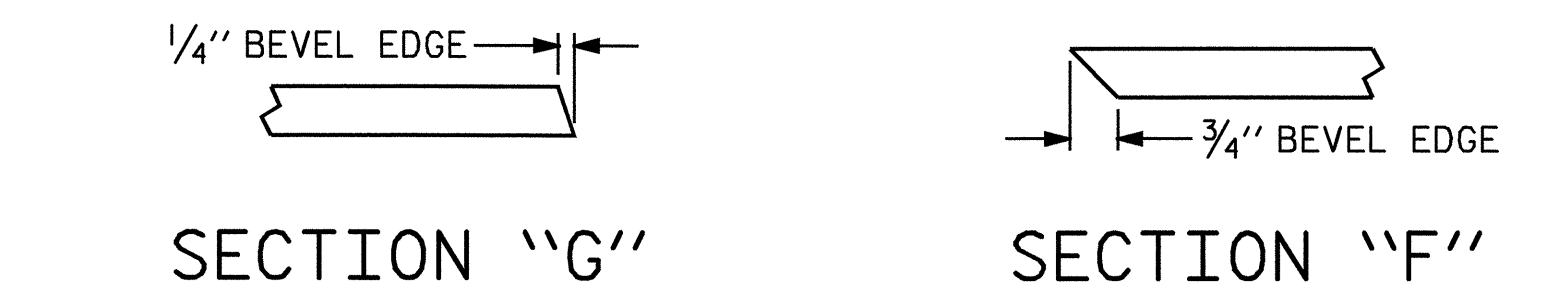
* INCLUDES FUTURE WEARING SURFACE
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

TIE ROD PLACEMENT TABLE

GIRDER	SPAN A		SPAN B		
	DIM. "A"	DIM. "B"	DIM. "C"	DIM. "D"	DIM. "E"
#1	38'-7 13/16"	41'-0 1/16"	39'-3 1/2"	38'-11"	39'-11 1/4"
#2	39'-2 7/8"	40'-5"	39'-5 1/2"	38'-11"	39'-9 1/4"
#3	39'-9 15/16"	39'-9 15/16"	39'-7 3/8"	38'-11"	39'-7 3/8"
#4	40'-5"	39'-2 7/8"	39'-9 1/4"	38'-11"	39'-5 1/2"
#5	41'-0 1/16"	38'-7 13/16"	39'-11 1/4"	38'-11"	39'-3 1/2"



BEVEL ON GIRDER & TIE ROD PLACEMENT DETAILS



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.

TIE ROD ASSEMBLY SHALL BE AASHTO M270 GRADE 36 STRUCTURAL STEEL.

ALL REINFORCING STEEL SHALL BE GRADE 60.

APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES INDICATED IN ELEVATION VIEW.

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

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

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

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4400 PSI FOR SPAN A AND 6200 PSI FOR SPAN B.

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

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

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

A 2" x 2" CHAMFER IS ALLOWED AT THE INTERSECTION OF THE WEB AND THE BOTTOM FLANGE OF THE 63" AND 72" MODIFIED BULB TEES ONLY.

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

PROJECT NO. U-4006
GUILFORD COUNTY
STATION: 20+90.21 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS (RIGHT LANE)



ASSEMBLED BY : M. POOLE/A.S. DATE : 5/09
CHECKED BY : J.R. DUGGINS DATE : 5/09
DRAWN BY : ELR 11/91 REV. 10/17/00 RWW/LES
CHECKED BY : GRP 11/91 REV. 7/10/01RR LES/RDR
REV. 5/1/06 TLA/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-52
1			3			TOTAL SHEETS 75
2			4			

NOTES

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

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

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

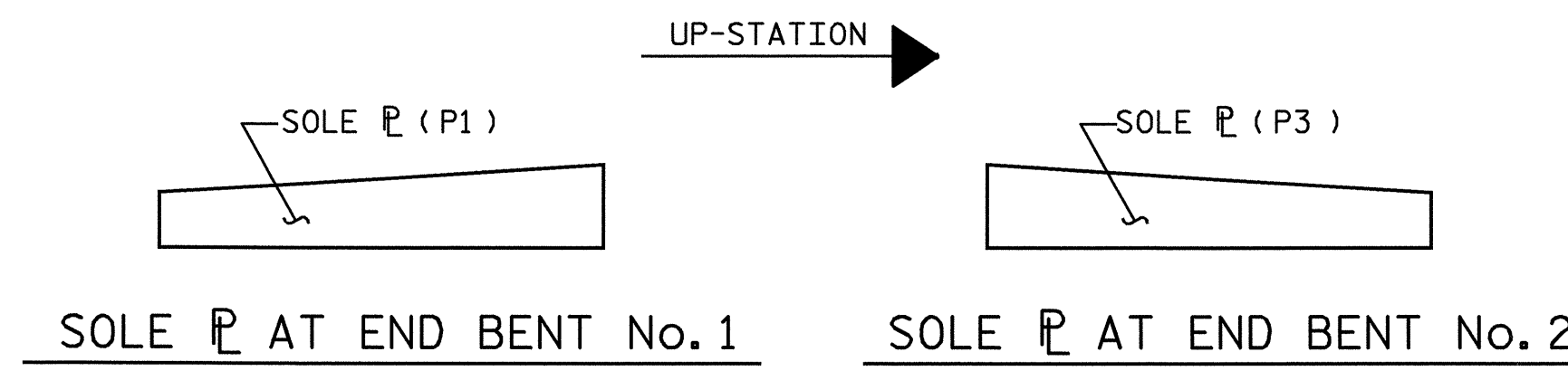
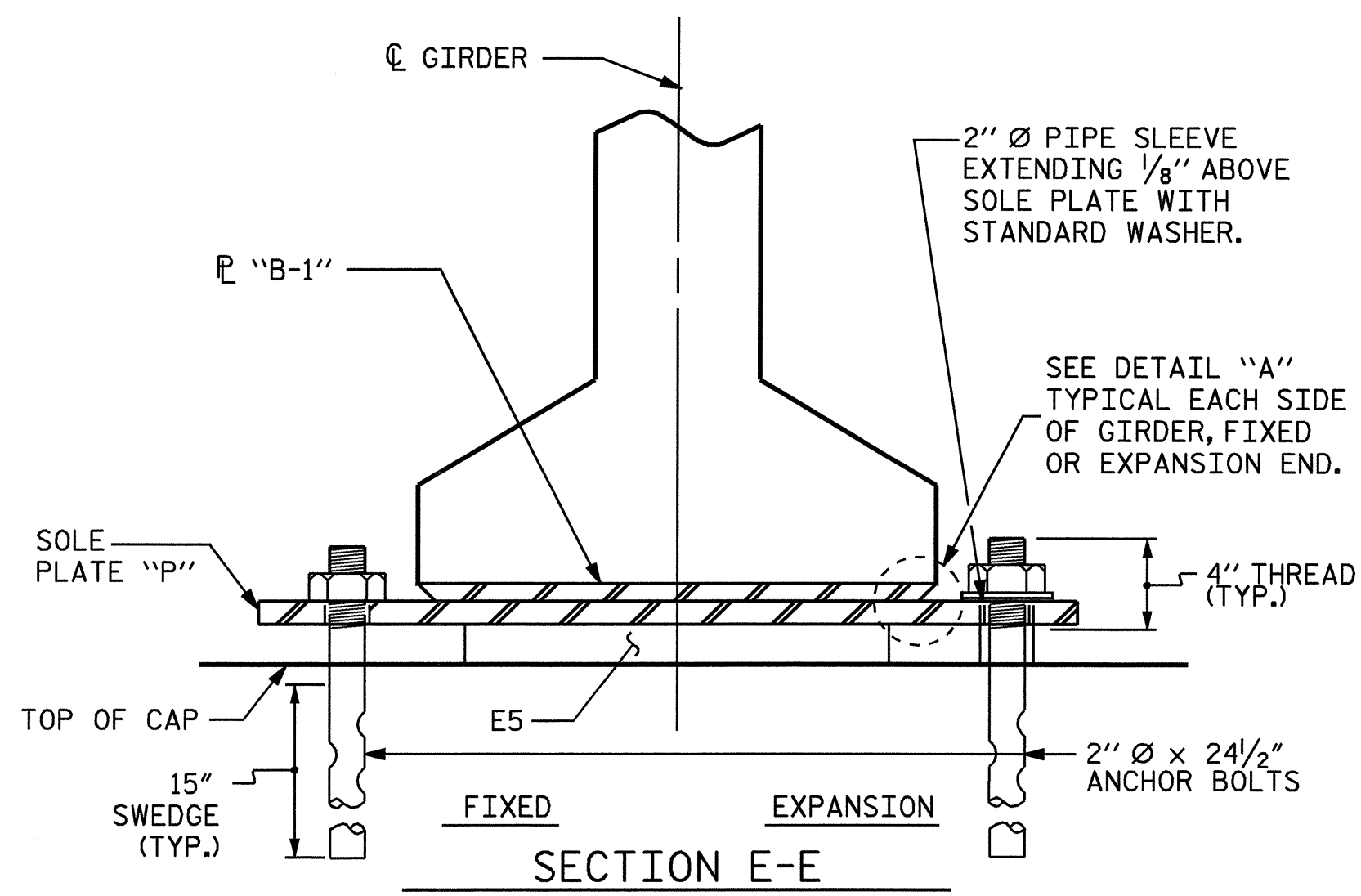
PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE PORTION OF THE EMBEDDED PLATE AND SOLE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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

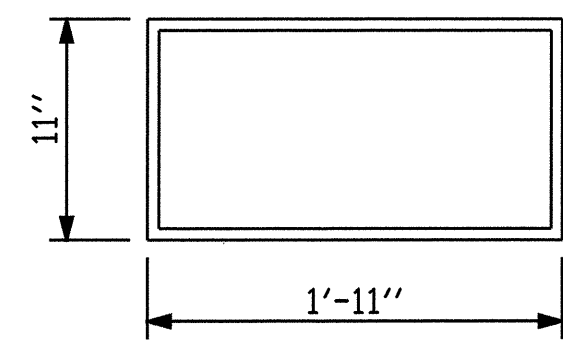
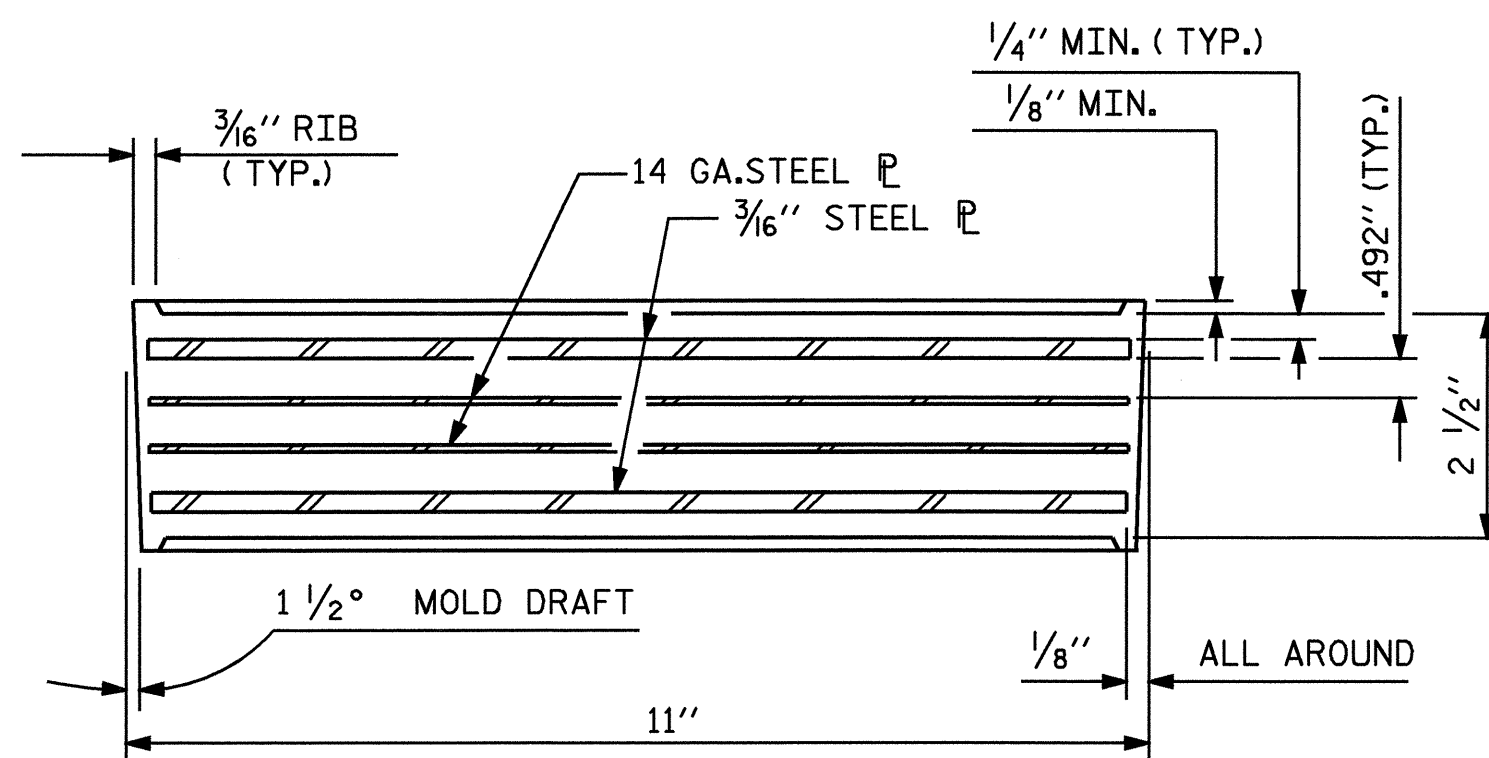
SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

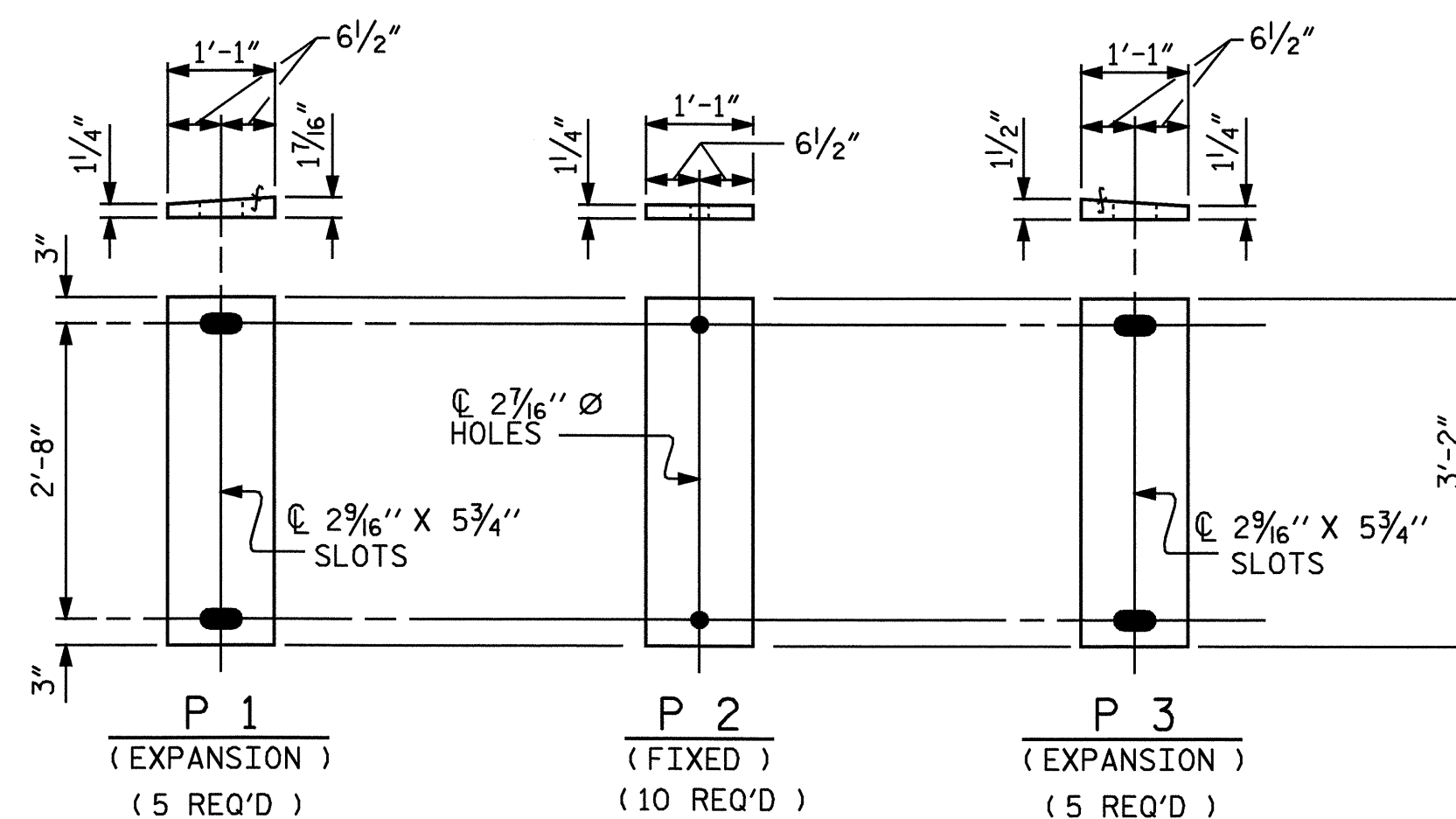
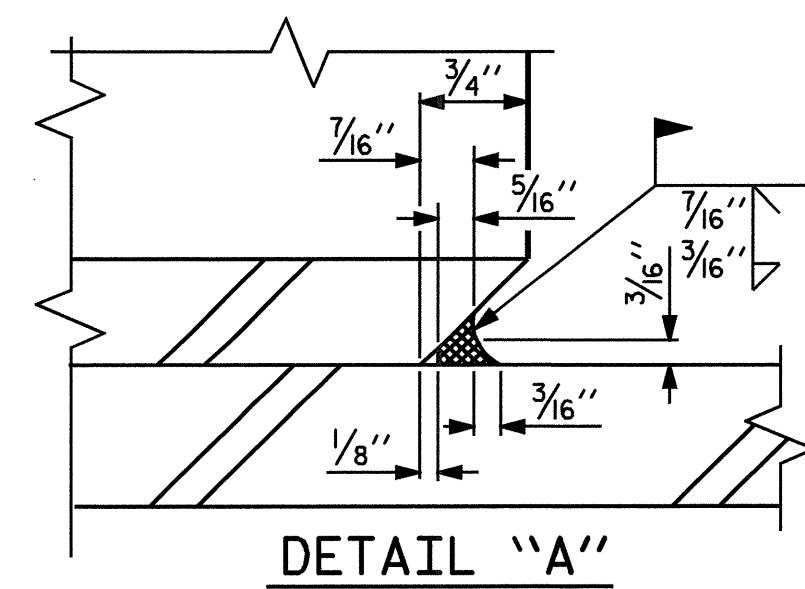
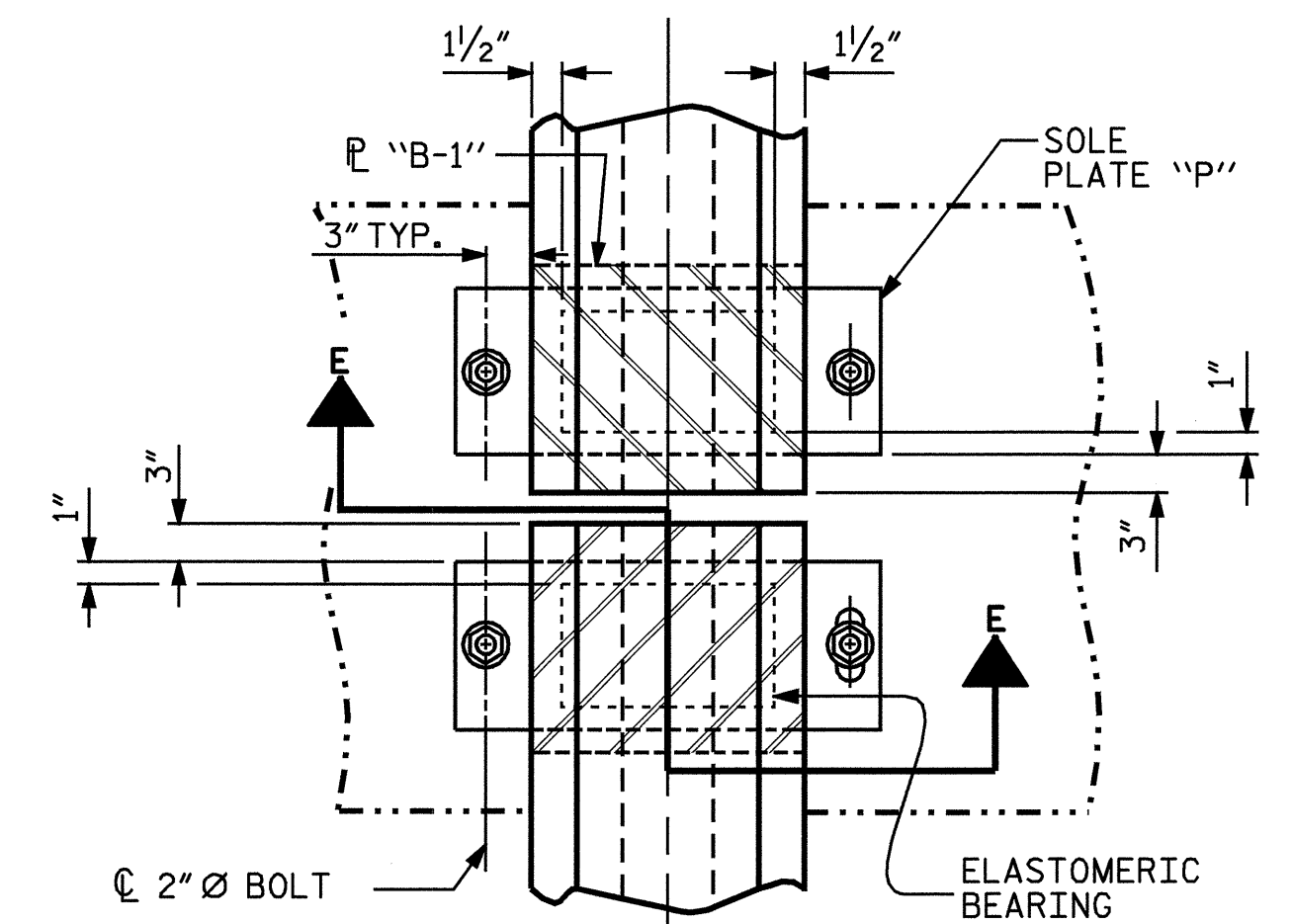


SOLE P PLACEMENT DETAIL



E5 (20 REQ'D)

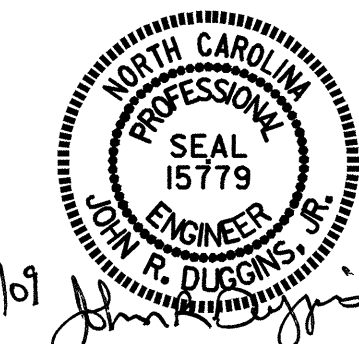
TYPE VI



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

PROJECT NO. U-4006
 GUILFORD COUNTY
 STATION: 20+90.21 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
ELASTOMERIC BEARING
 DETAILS
 PRESTRESSED CONCRETE GIRDER
 SUPERSTRUCTURE
 (RIGHT LANE)

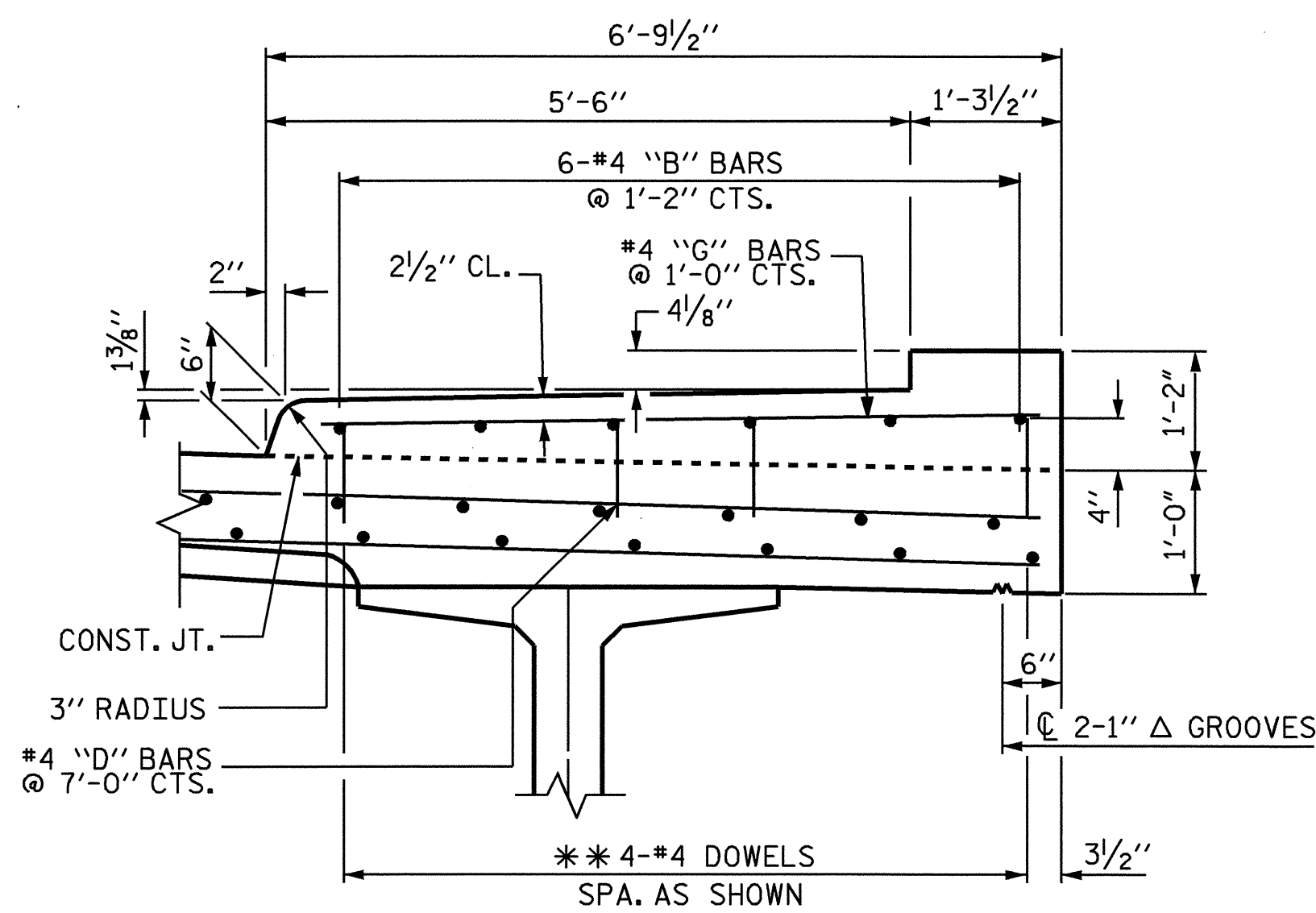
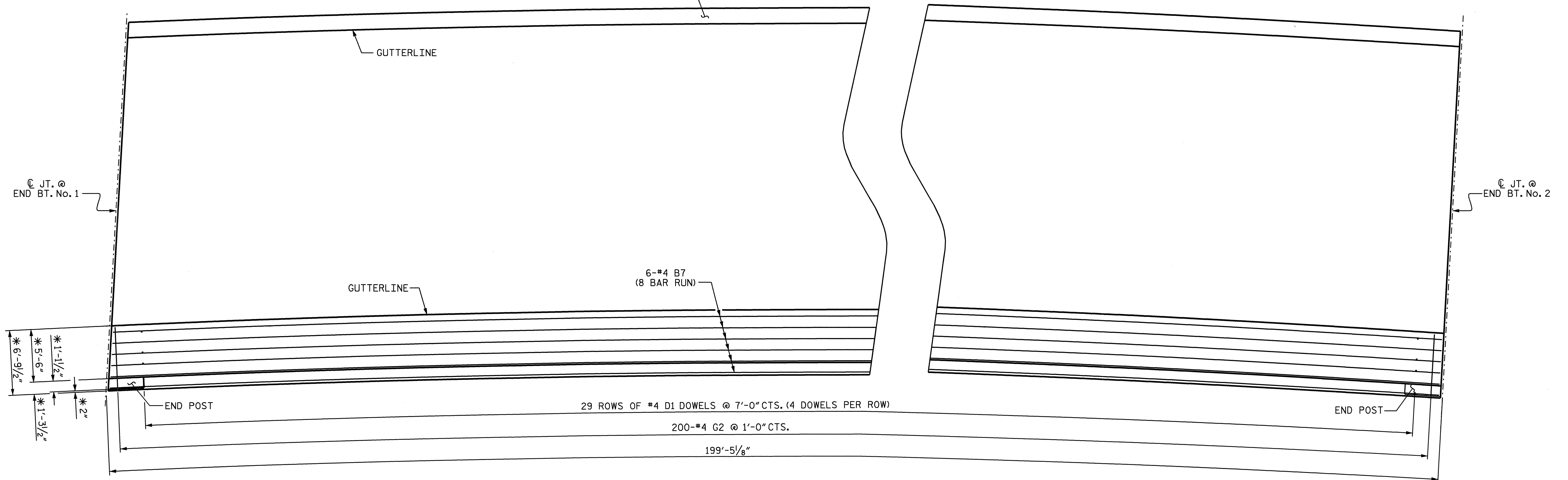


ASSEMBLED BY : D. HODGE	DATE : 4/09
CHECKED BY : J.R. DUGGINS	DATE : 4/09
DRAWN BY : EEM 2/97	REV. 8/16/99 RWW/LES
CHECKED BY : VAP 2/97	REV. 10/17/00 RWW/LES
	REV. 5/1/06 TLA/GM

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

TOTAL SHEETS 75

CONCRETE BARRIER RAIL,
FOR REINFORCING STEEL AND
DETAILS, SEE "CONCRETE
BARRIER RAIL" SHEETS.



SECTION THRU SIDEWALK

** DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF.

PLAN OF SIDEWALK

SIDEWALK DIMENSIONS ARE MEASURED ALONG ARC AT OUTSIDE EDGE OF SUPERSTRUCTURE.

* RADIAL DIMENSIONS

NOTES:

FOR END POST DETAILS AND REINFORCING STEEL SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEET.

ALL REINFORCING STEEL IN SIDEWALK AND PERMANENT CONCRETE MEDIAN SHALL BE EPOXY COATED.

THE CONTRACTOR MAY USE ADHESIVELY ANCHORED DOWELS IN PLACE OF #4 D1 DOWELS. NO FIELD TESTING IS REQUIRED. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS.

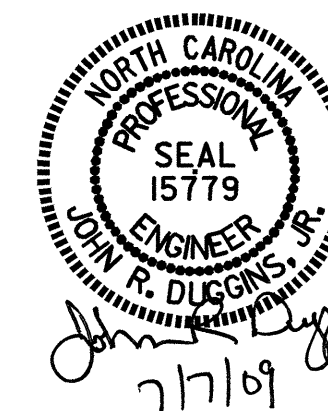
GROOVED CONTRACTION JOINTS 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF SIDEWALK AND CONCRETE MEDIAN IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FEET TO 10 FEET BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS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

SIDEWALK QUANTITIES ARE INCLUDED IN PAYMENT FOR "REINFORCED CONCRETE DECK SLAB".

PROJECT NO. U-4006
GUILFORD COUNTY
STATION: 20+90.21 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
SIDEWALK DETAILS
(RIGHT LANE)



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			75
2			4			

DRAWN BY : A. SORSENGINH DATE : 5/7/09
CHECKED BY : J.R. DUGGINS DATE : 5/09

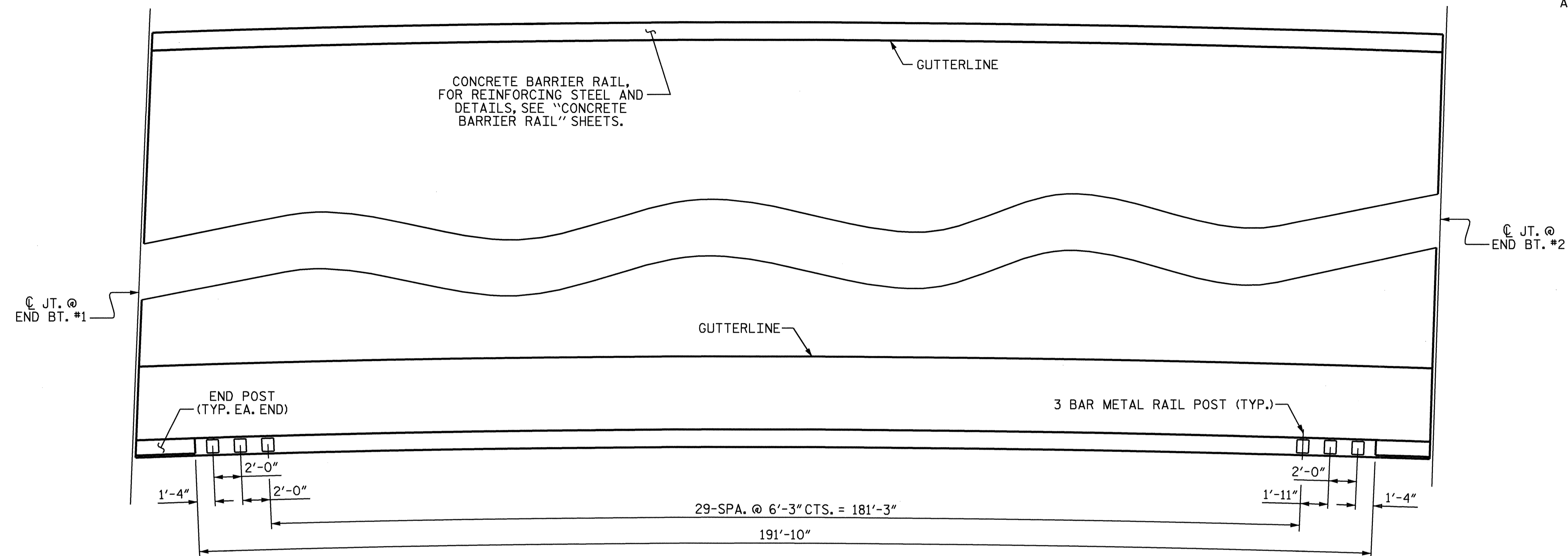
30-JUN-2009 14:08
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dahodge

STR. #2

NOTES:

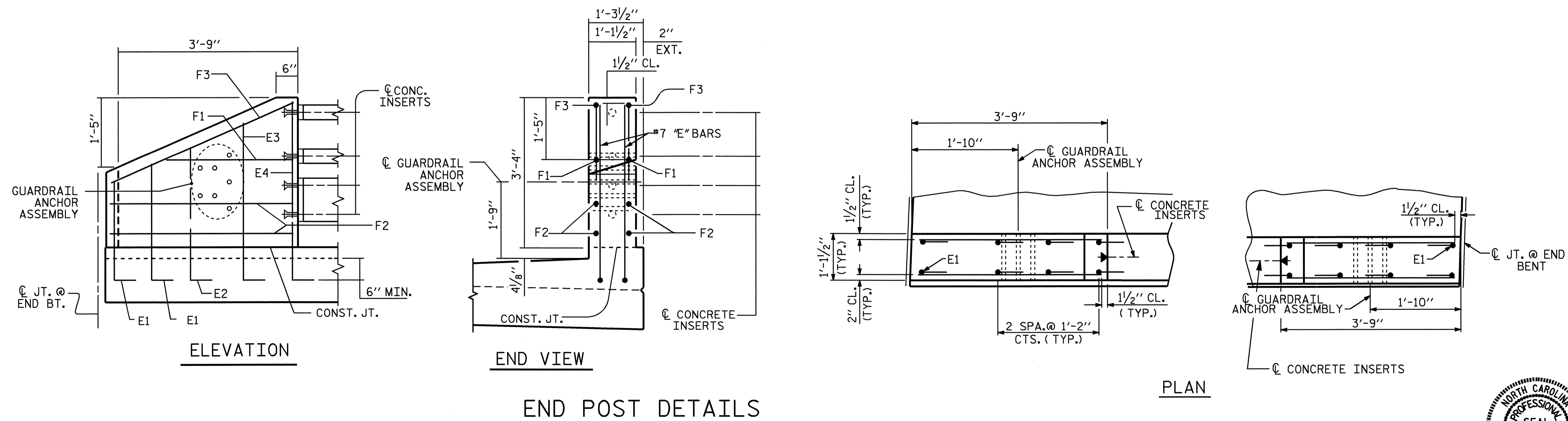
FOR DETAILS OF CONCRETE INSERTS, SEE "3 BAR METAL RAIL" SHEET 3 OF 3.

FOR DETAILS OF GUARDRAIL ANCHOR ASSEMBLIES, SEE "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" SHEET.



PLAN OF RAIL POST SPACING

RAIL POST DIMENSIONS ARE MEASURED ALONG ARC AT OUTSIDE OF SUPERSTRUCTURE.



PROJECT NO. U-4006
GUILFORD COUNTY
 STATION: 20+90.21 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**RAIL POST SPACINGS
 AND
 END OF RAIL DETAILS
 FOR 3 BAR METAL RAILS
 (RIGHT LANE)**



REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-55	
1			3			TOTAL SHEETS	75
2			4				

DRAWN BY : A. SORSENGINH DATE : 5/8/09
 CHECKED BY : J.R. DUGGINS DATE : 5/09

30-JUN-2009 14:07
 r:\structures\4006\casor_senginh\microsat\lan\RightLane\U-4006_SD_3MR.dgn
 dahodge

STR. #2

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 STANDARD NO. BMR7.

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.

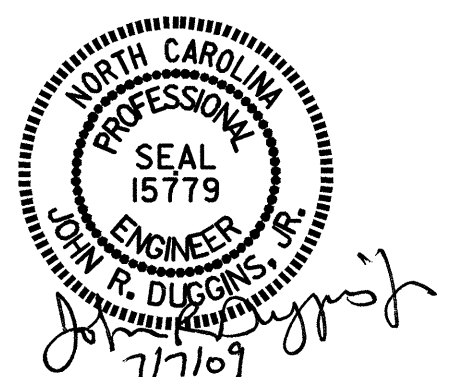
TO INSURE FUTURE IDENTIFICATION OF THE FABRICATOR, A PERMANENT IDENTIFYING MARK SHALL BE PLACED ON EACH POST. THE METHOD OF MARKING AND LOCATION SHALL BE SUCH THAT IT DOES NOT DETRACT FROM THE APPEARANCE OF THE POST, BUT REMAIN VISIBLE AFTER RAIL PLACEMENT.

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.

PAY LENGTH = 191.92 LIN.FT.



PROJECT NO. U-4006
GUILFORD COUNTY
 STATION: 20+90.21 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

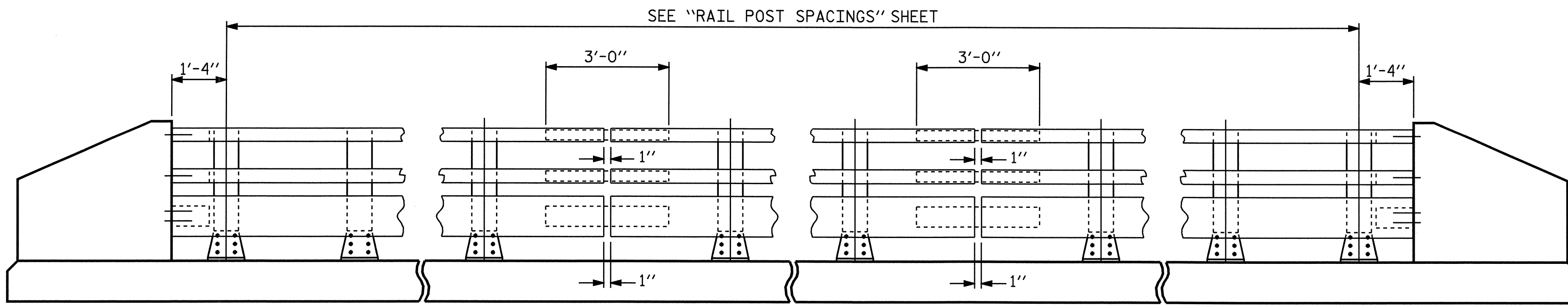
STANDARD

3 BAR METAL RAIL
 (RIGHT LANE)

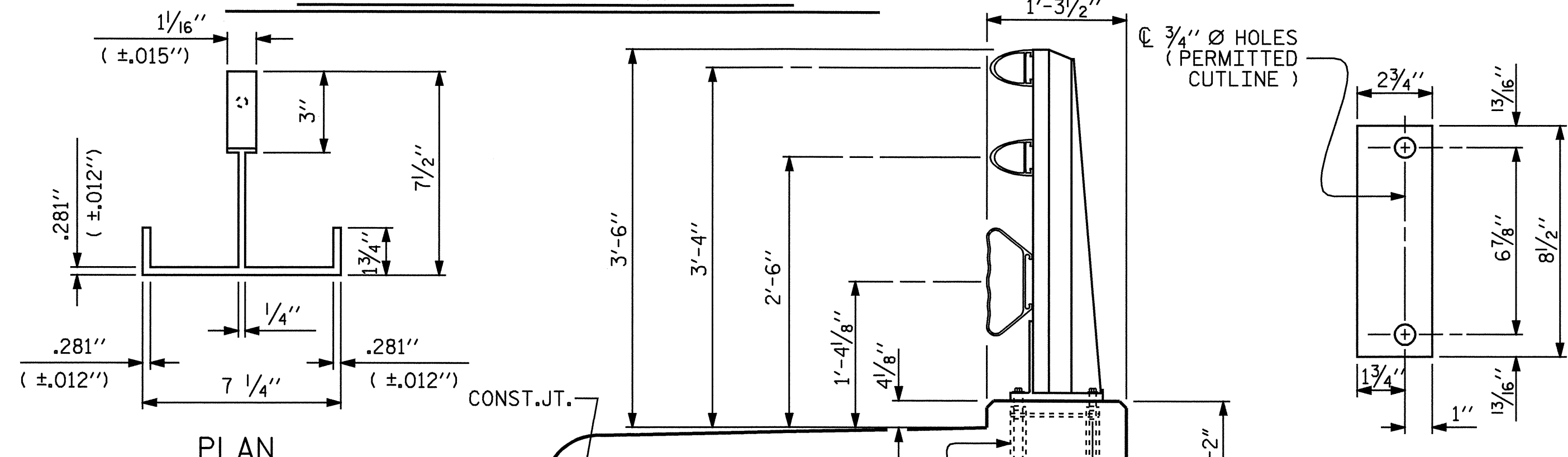
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-56
1			3			TOTAL SHEETS
2			4			15

STR. #2

STD. NO. BMR5



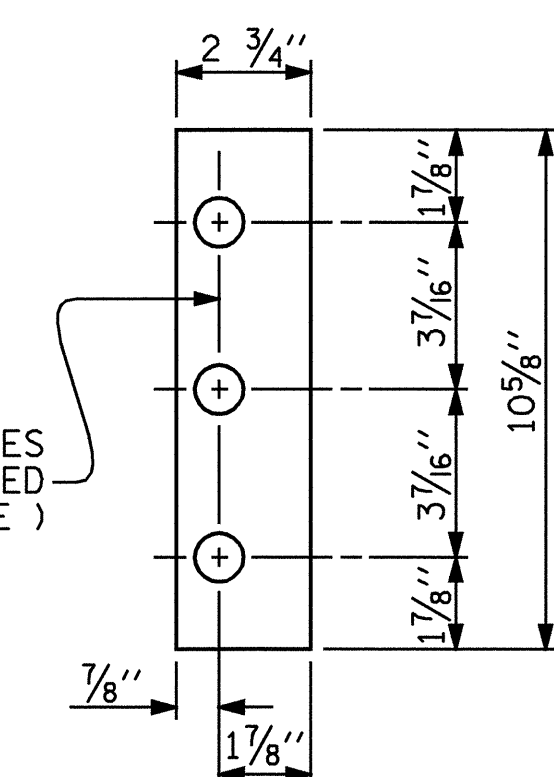
ELEVATION



PLAN

SECTION THRU RAIL

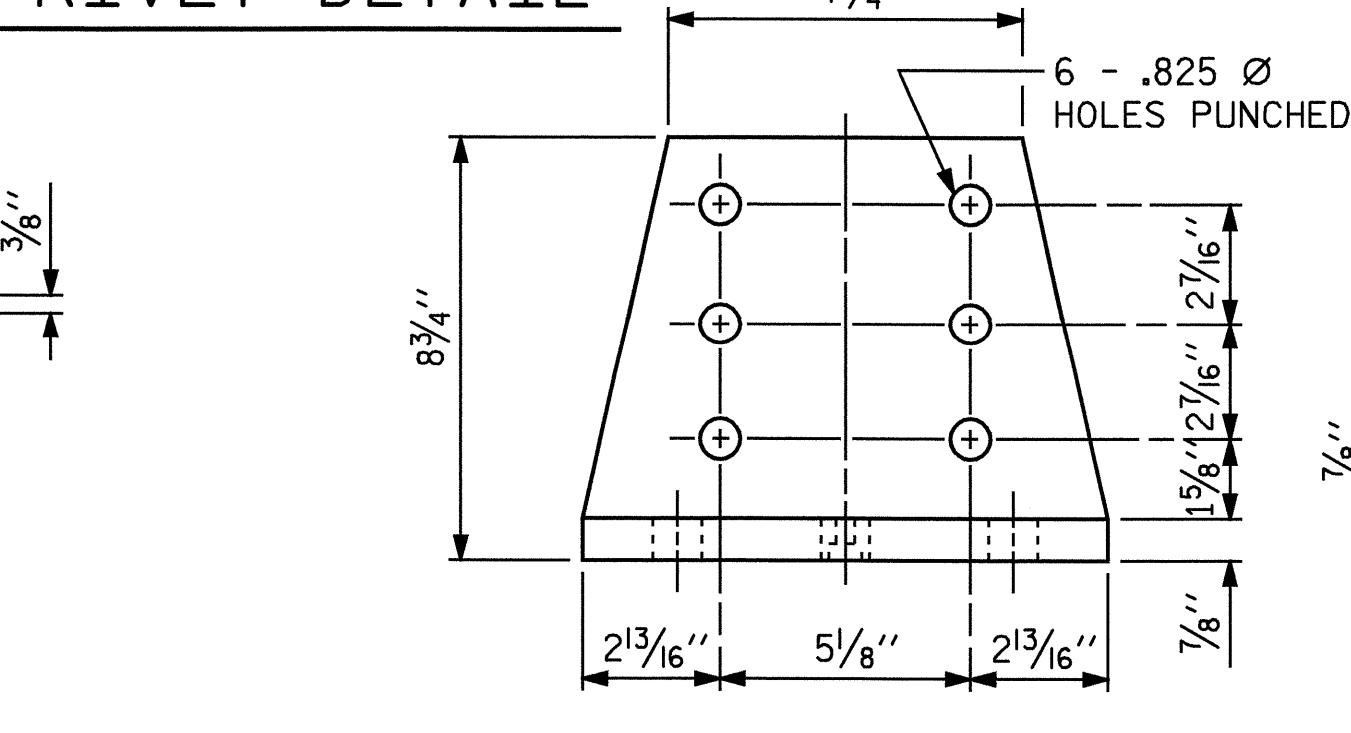
REAR PLATE



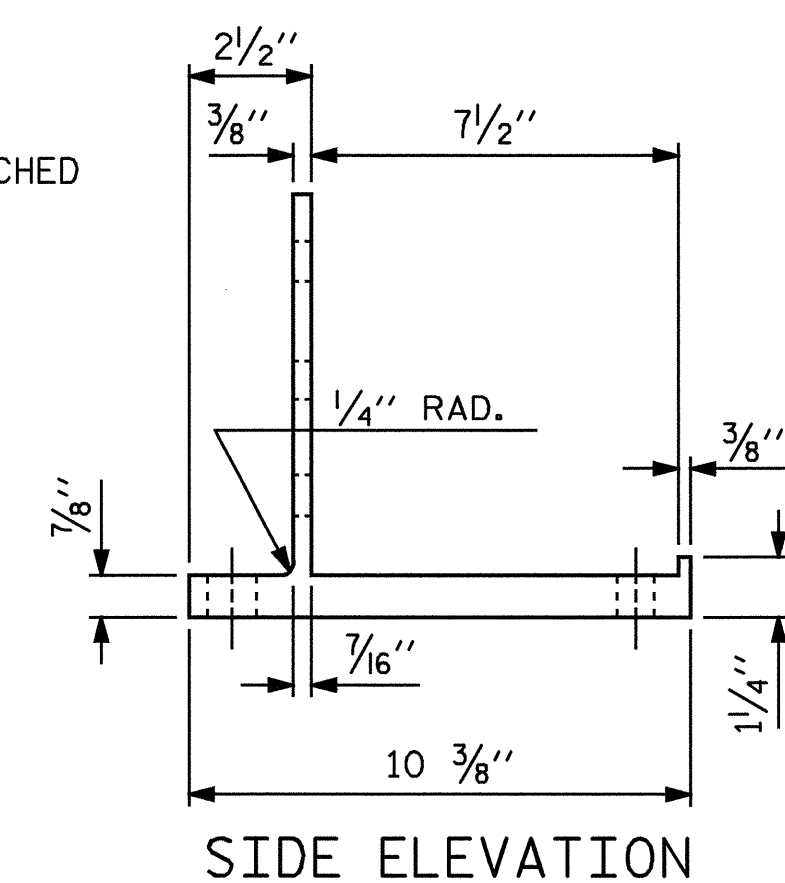
FRONT PLATE SHIM DETAILS

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

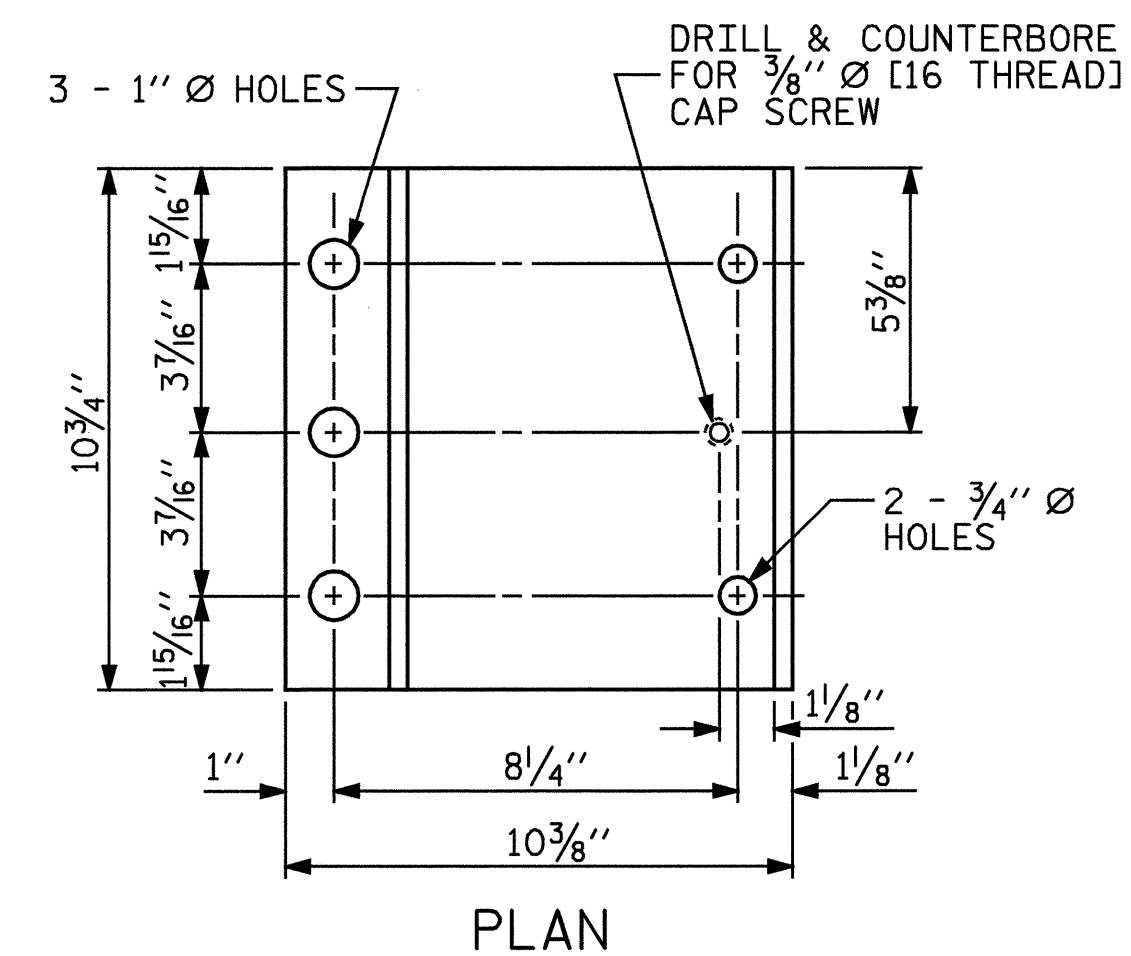
RIVET DETAIL



FRONT ELEVATION



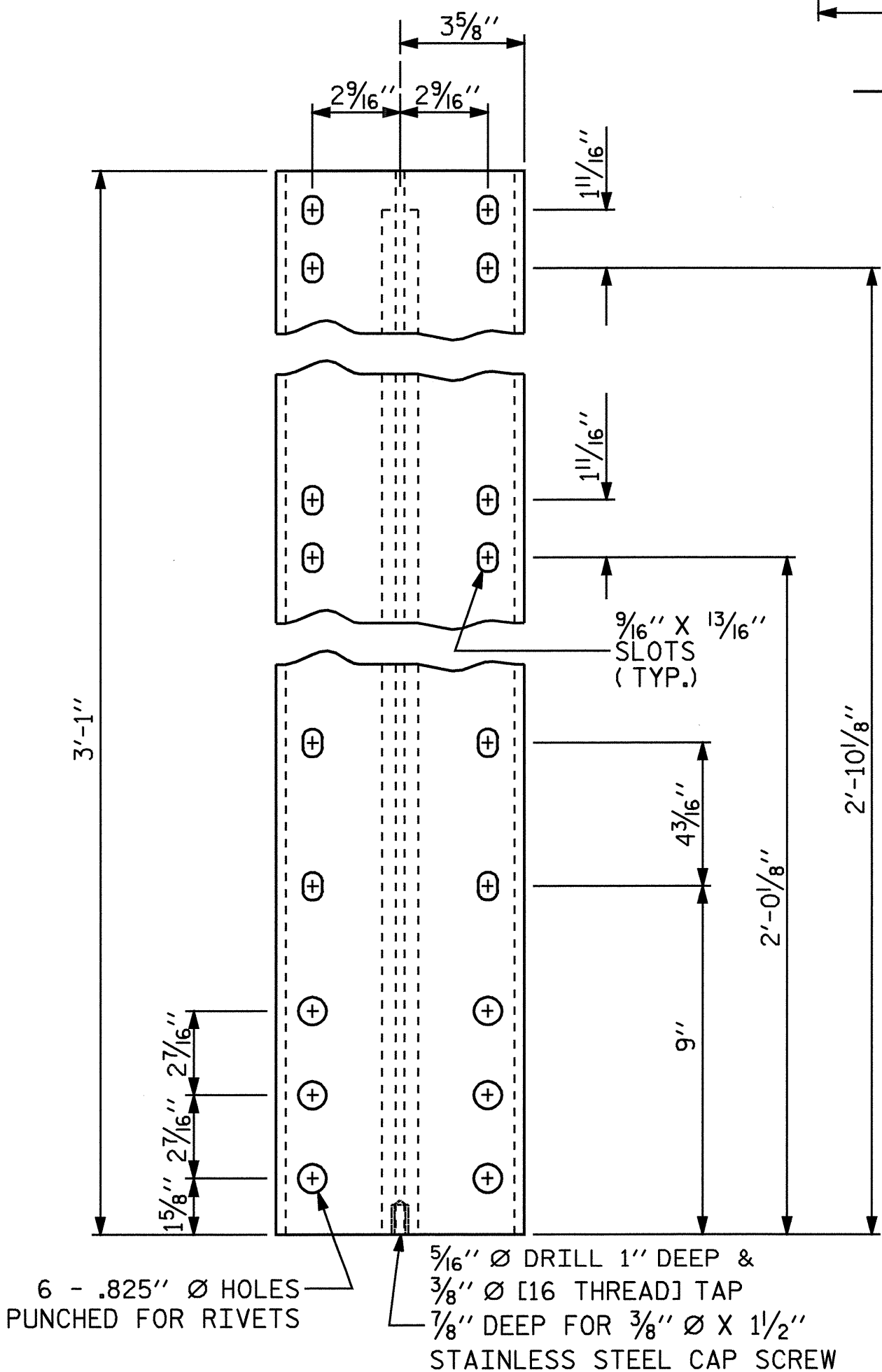
SIDE ELEVATION



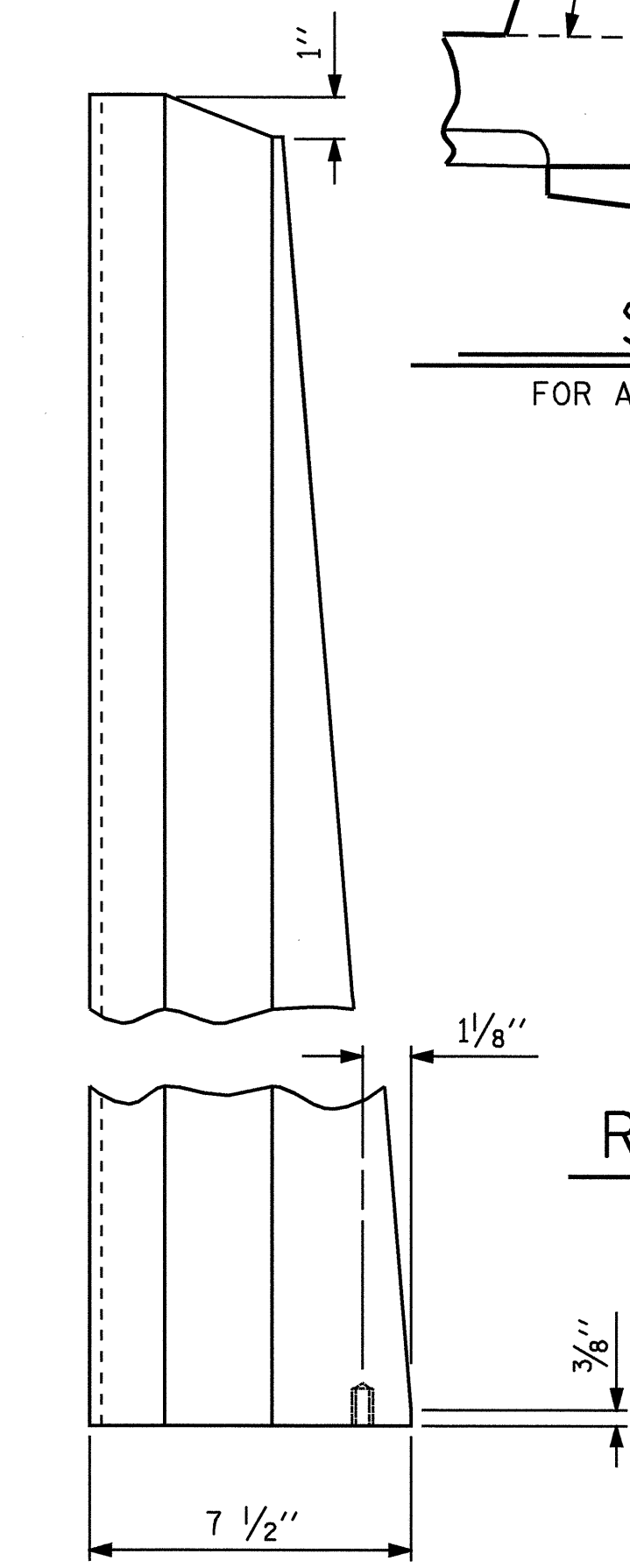
PLAN

POST BASE DETAILS

NOTE: FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR7.



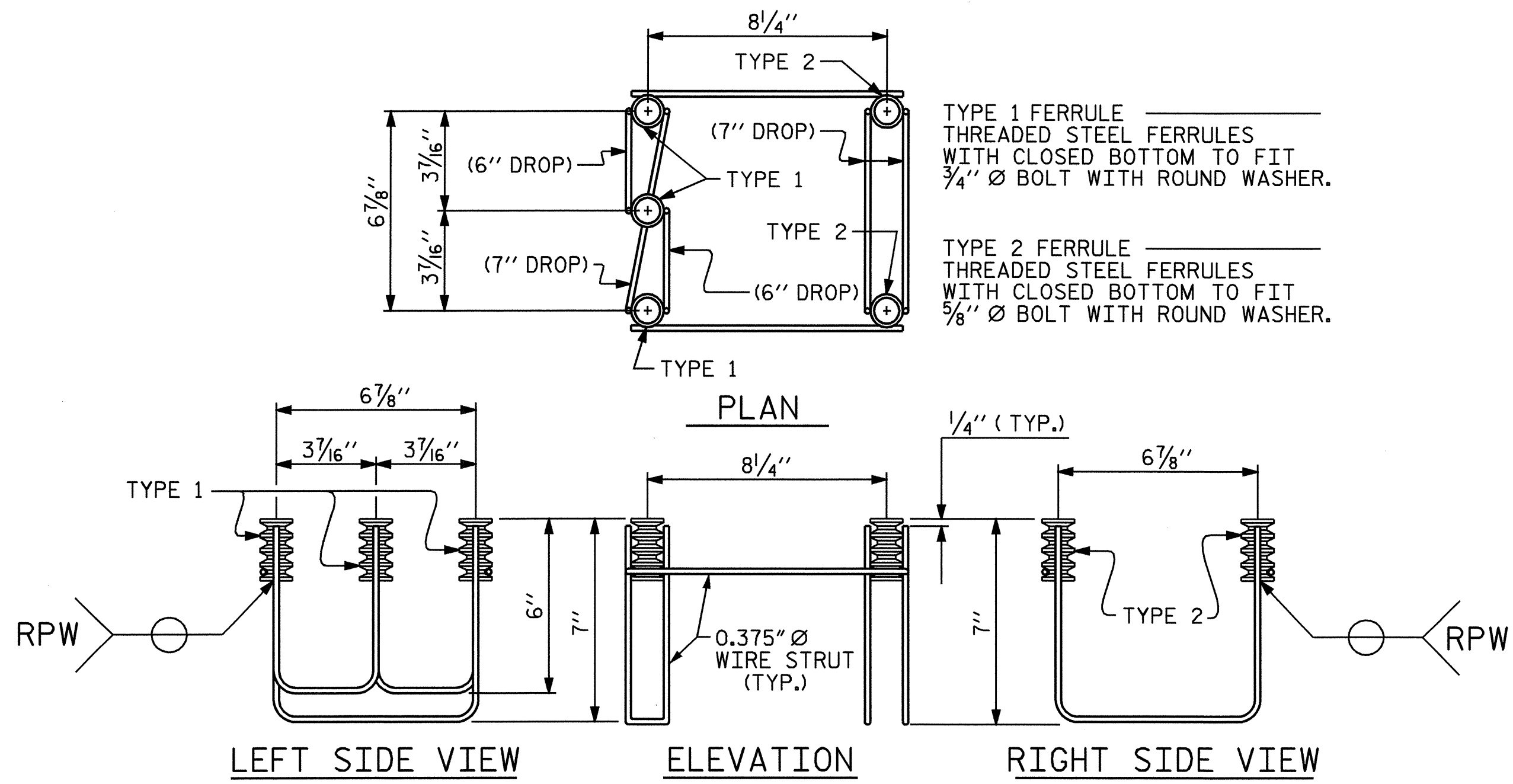
FRONT ELEVATION



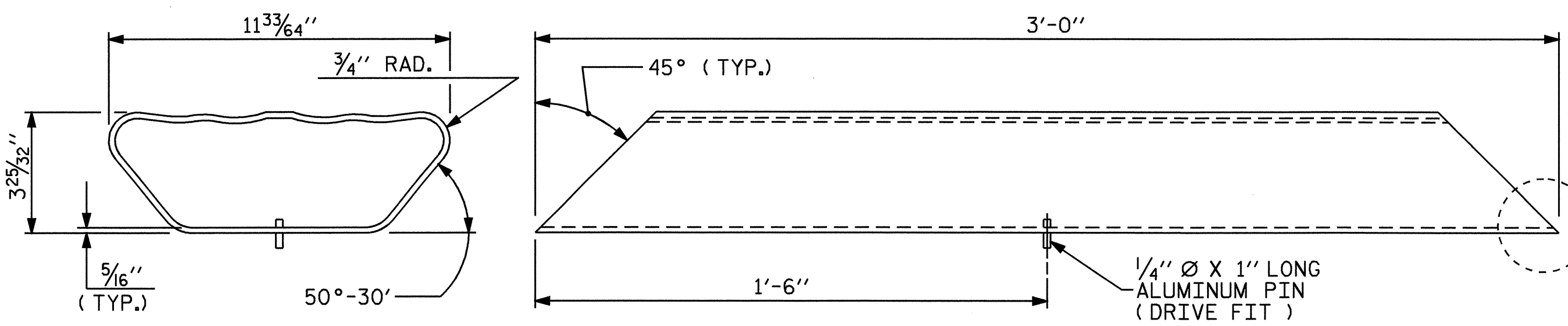
SIDE ELEVATION

DETAILS OF POST

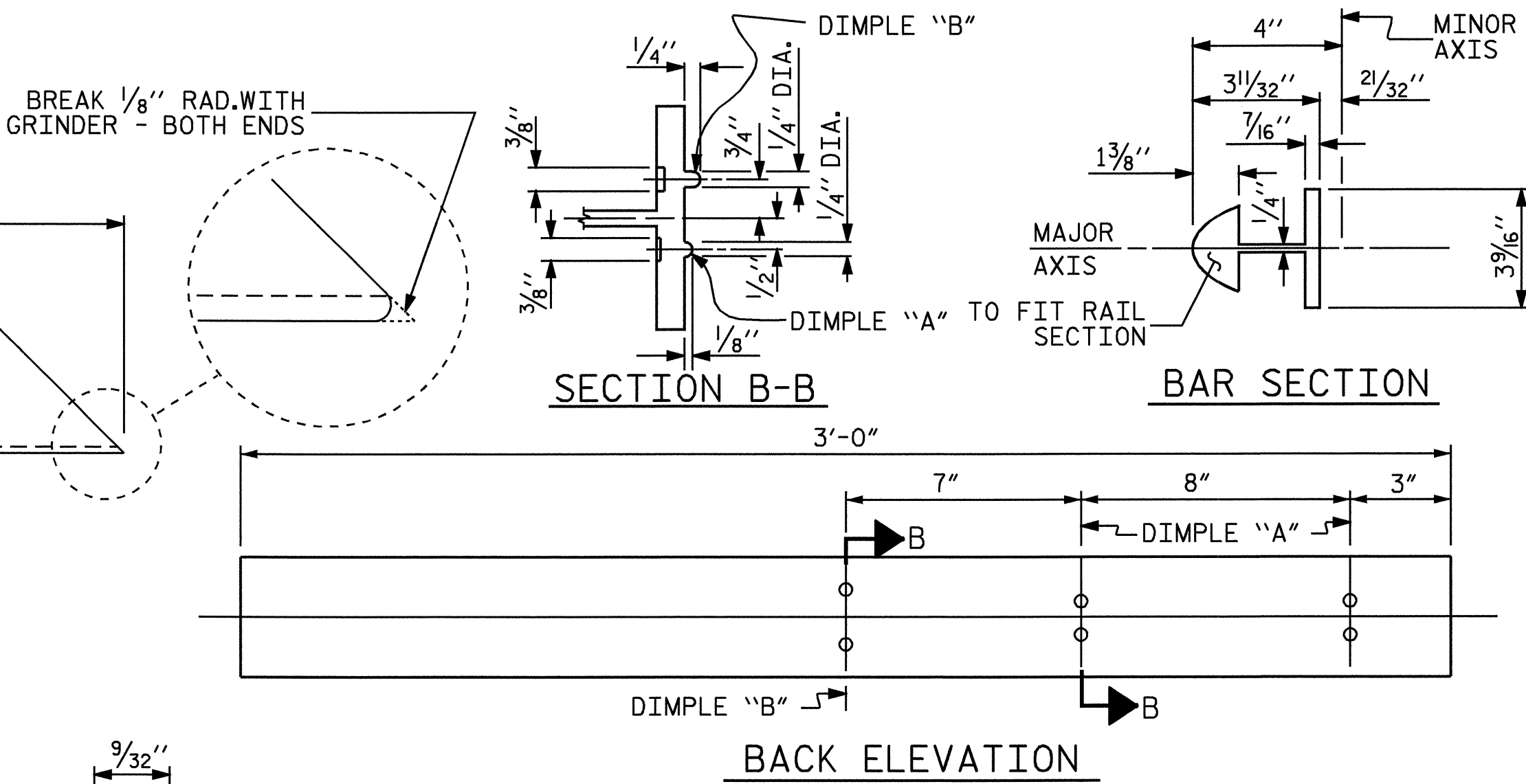
ASSEMBLED BY : A. SORSENGINH	DATE : 5/7/09
CHECKED BY : J.R. DUGGINS	DATE : 5/09
DRAWN BY : JMB 1/88	REV. 10/17/00 RWW/LES
CHECKED BY : GGH 1/88	REV. 5/7/03 RWW/JTE
	REV. 5/1/06 TLA/GM



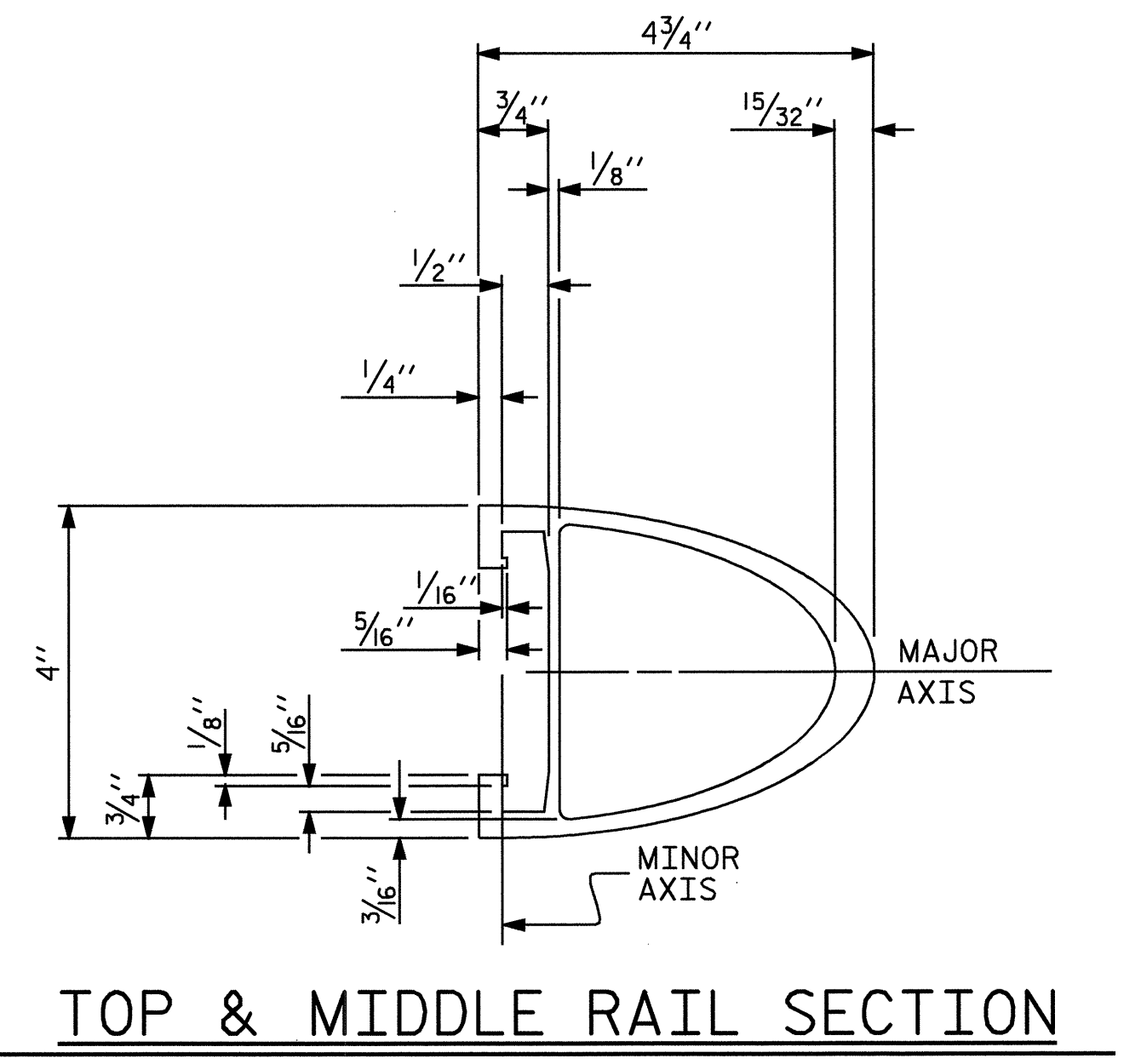
5-BOLT METAL RAIL ANCHOR ASSEMBLY
(34 ASSEMBLIES REQUIRED)



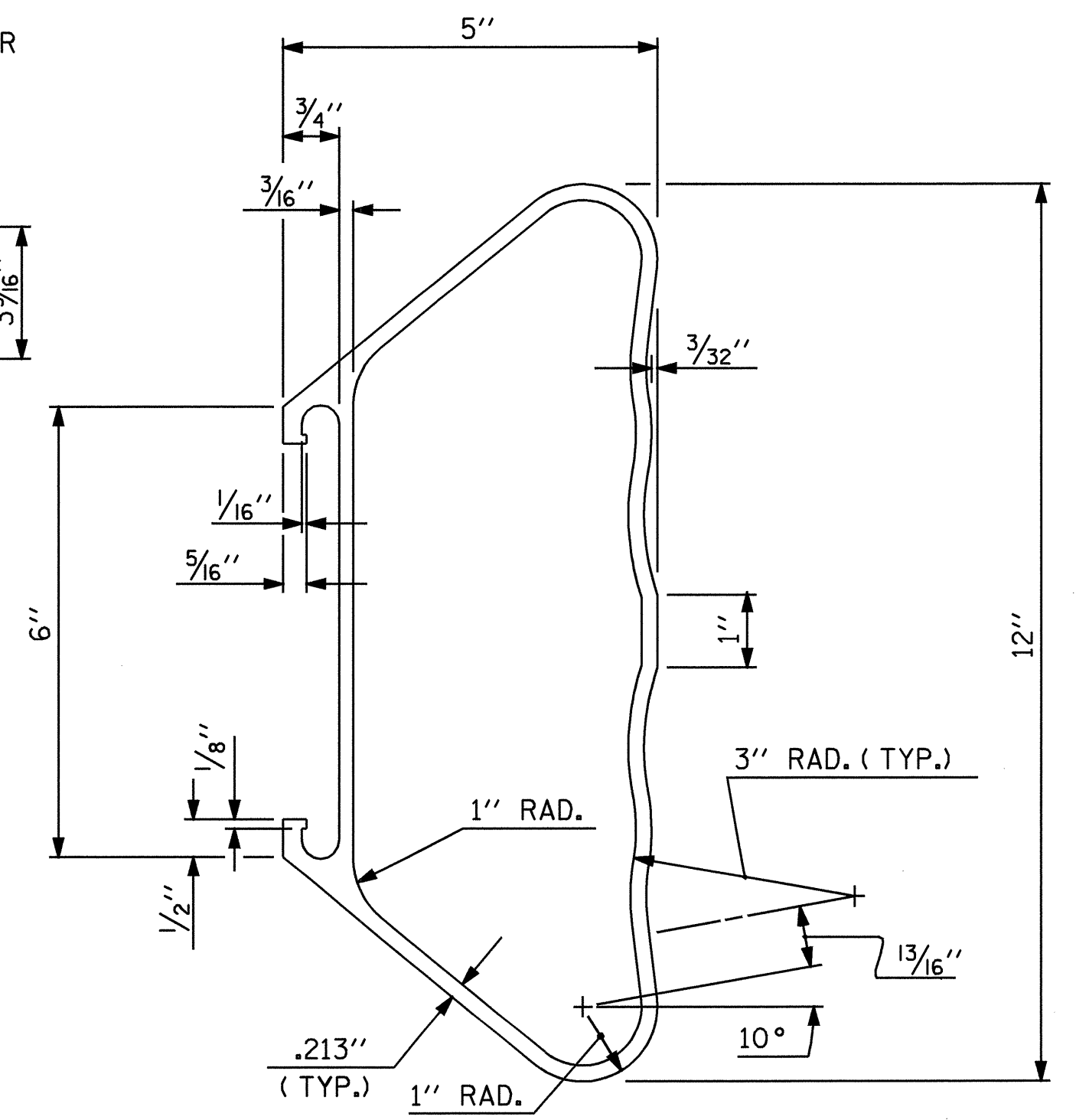
BOTTOM RAIL EXPANSION BAR



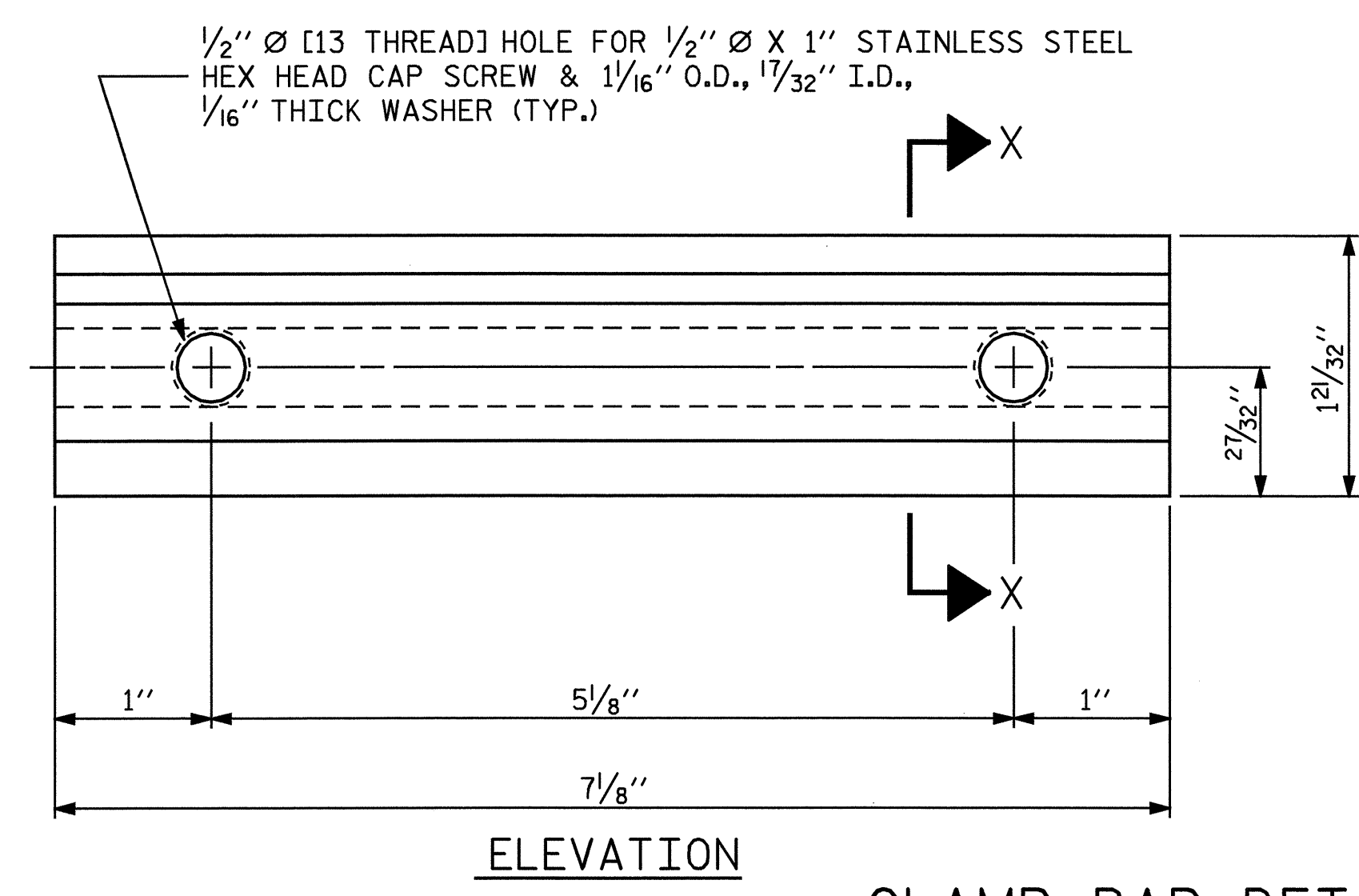
TOP & MIDDLE RAIL EXPANSION BAR



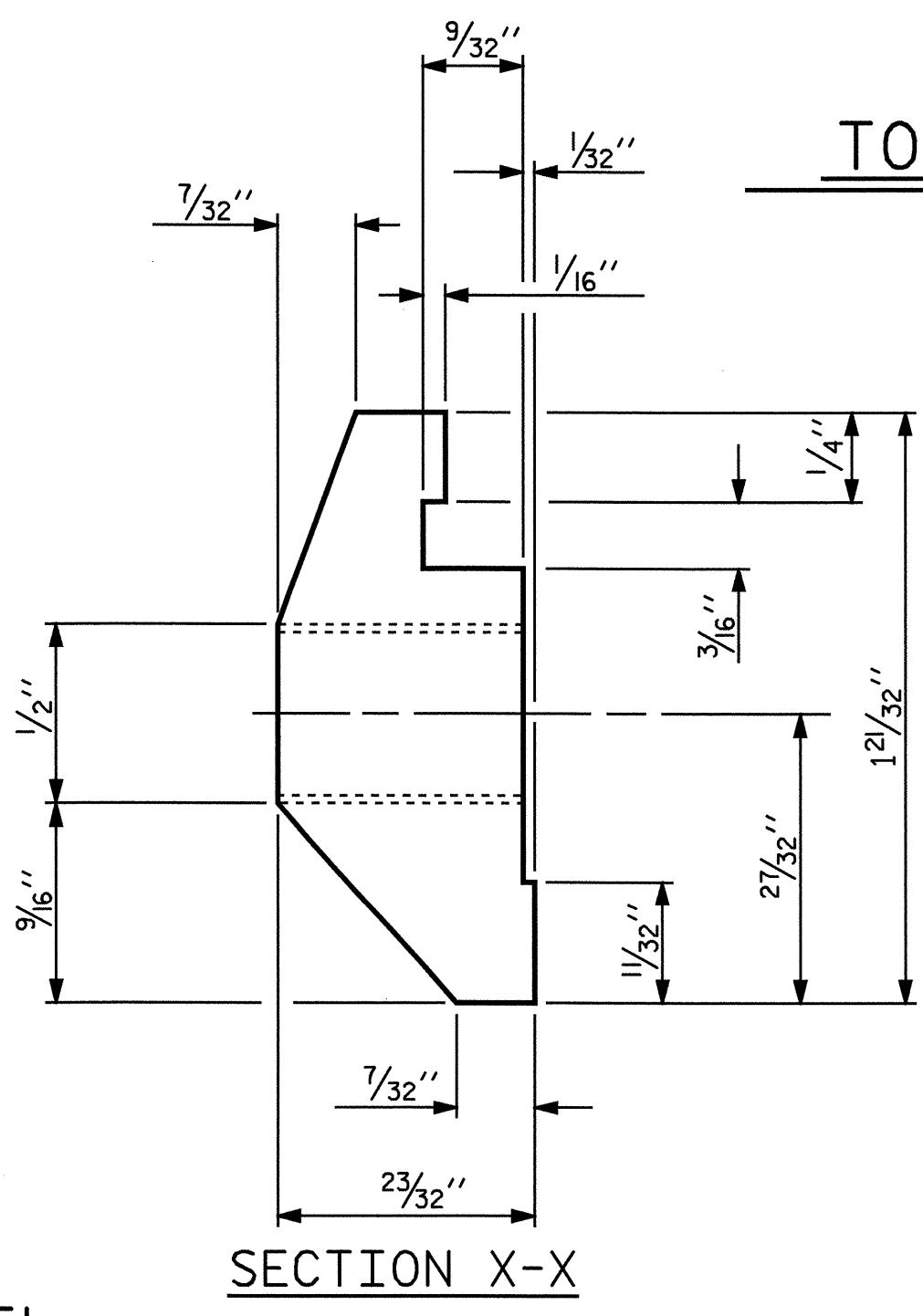
TOP & MIDDLE RAIL SECTION



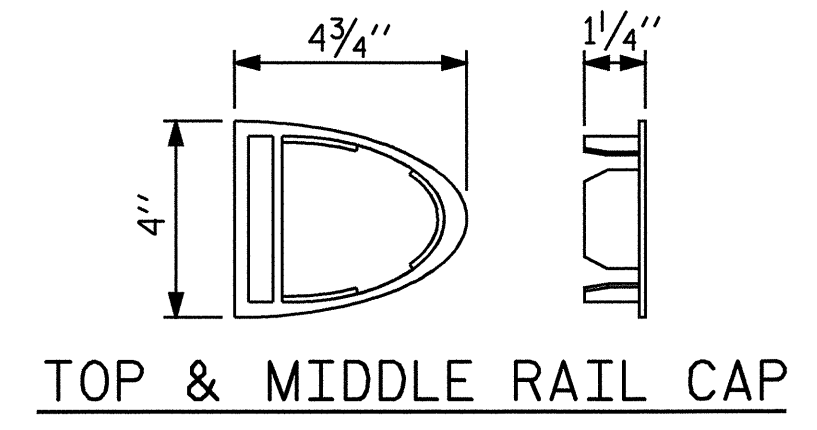
BOTTOM RAIL SECTION



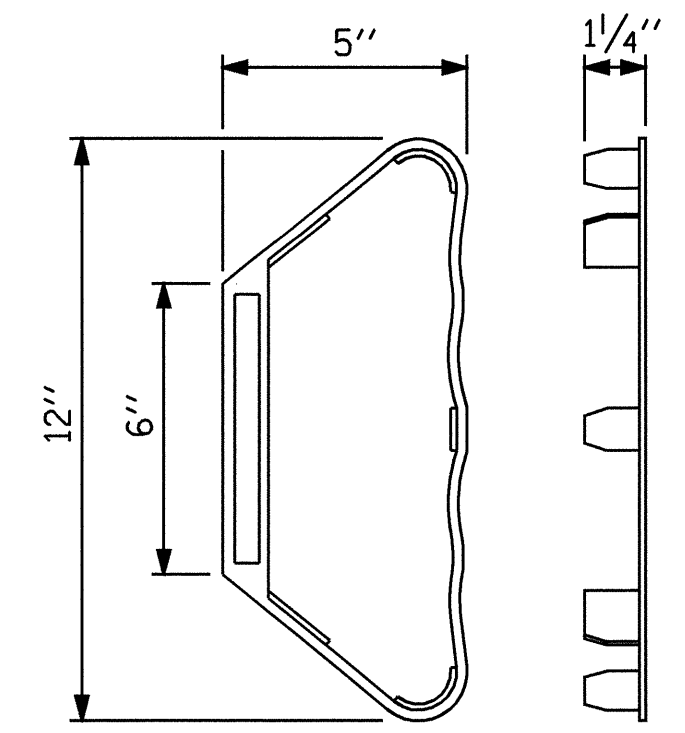
CLAMP BAR DETAIL
(6 REQUIRED PER POST)



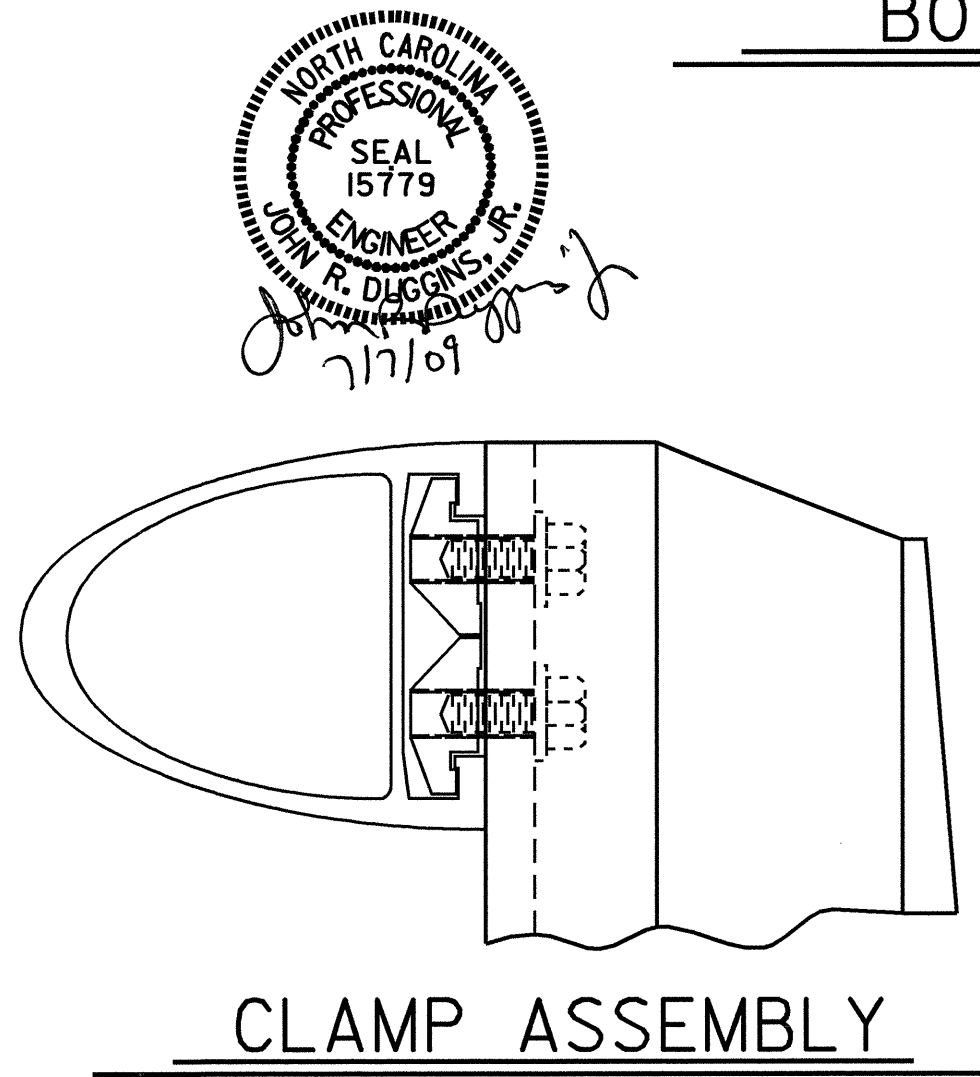
SECTION X-X



TOP & MIDDLE RAIL CAP



BOTTOM RAIL CAP



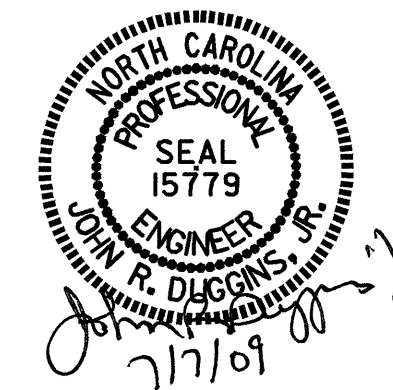
CLAMP ASSEMBLY
TOP RAIL SHOWN
(MIDDLE & BOTTOM RAIL ARE SIMILAR)

NOTES

STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

- 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 AND 1 3/4" FOR 5/8" FERRULES.
- B. 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.
- C. 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.
- D. 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.
- E. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.
- F. 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.
- G. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.



PROJECT NO. U-4006
GUILFORD COUNTY
 STATION: 20+90.21 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD					
3 BAR METAL RAIL (RIGHT LANE)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S-57
TOTAL SHEETS 75

ASSEMBLED BY : A. SORSENGINH	DATE : 5/7/09
CHECKED BY : J.R. DUGGINS	DATE : 5/09
DRAWN BY : JMB 1/88	REV. 7/10/01 RWW/LES
CHECKED BY : GGH 1/88	REV. 5/7/03 RWW/JTE
	REV. 5/1/06 TLA/GM

NOTES

METAL RAIL TO END POST CONNECTION

- THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
 - B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 1/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 1/8" BOLT SHALL HAVE N. C. THREADS.
 - C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F. 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 (STD. No. BMR6).

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.

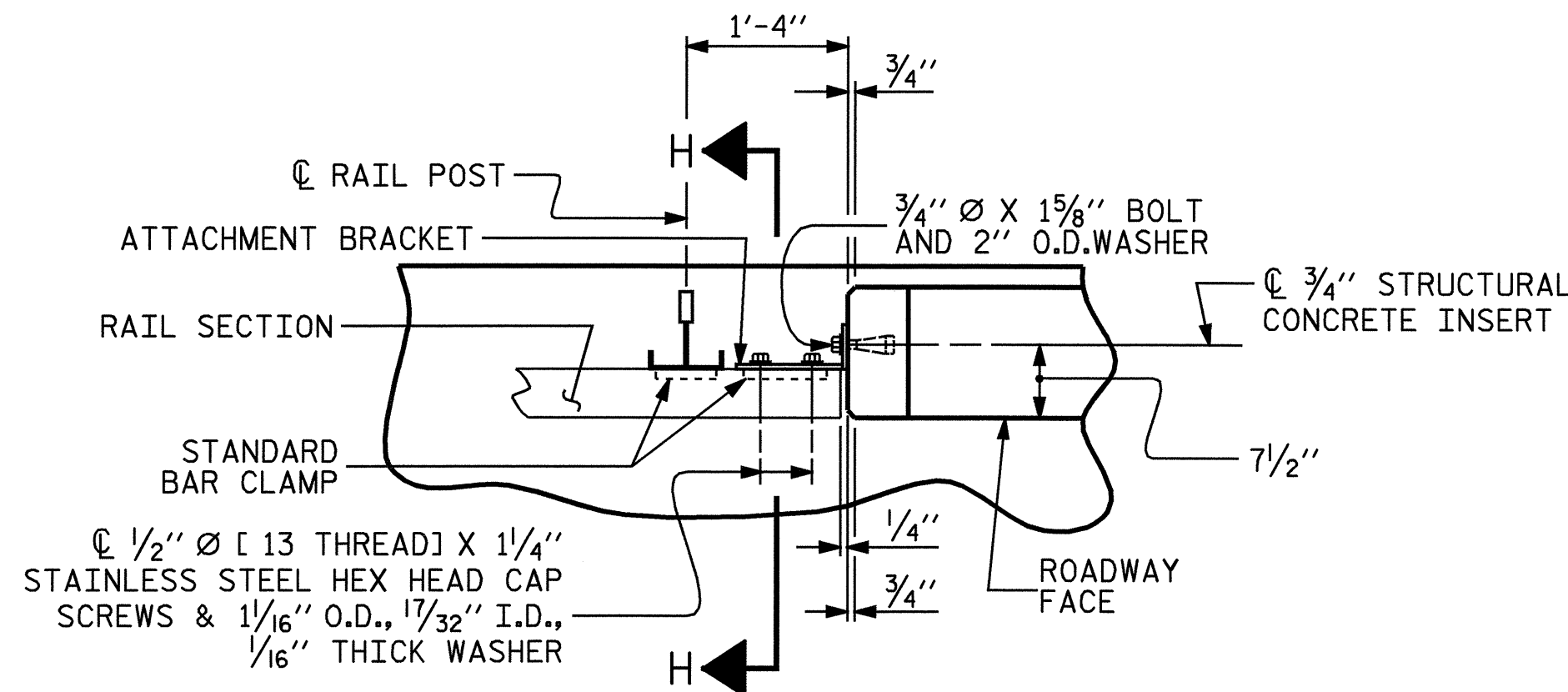
THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø X 1 1/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" Ø X 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT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

NOTES

STRUCTURAL CONCRETE INSERT

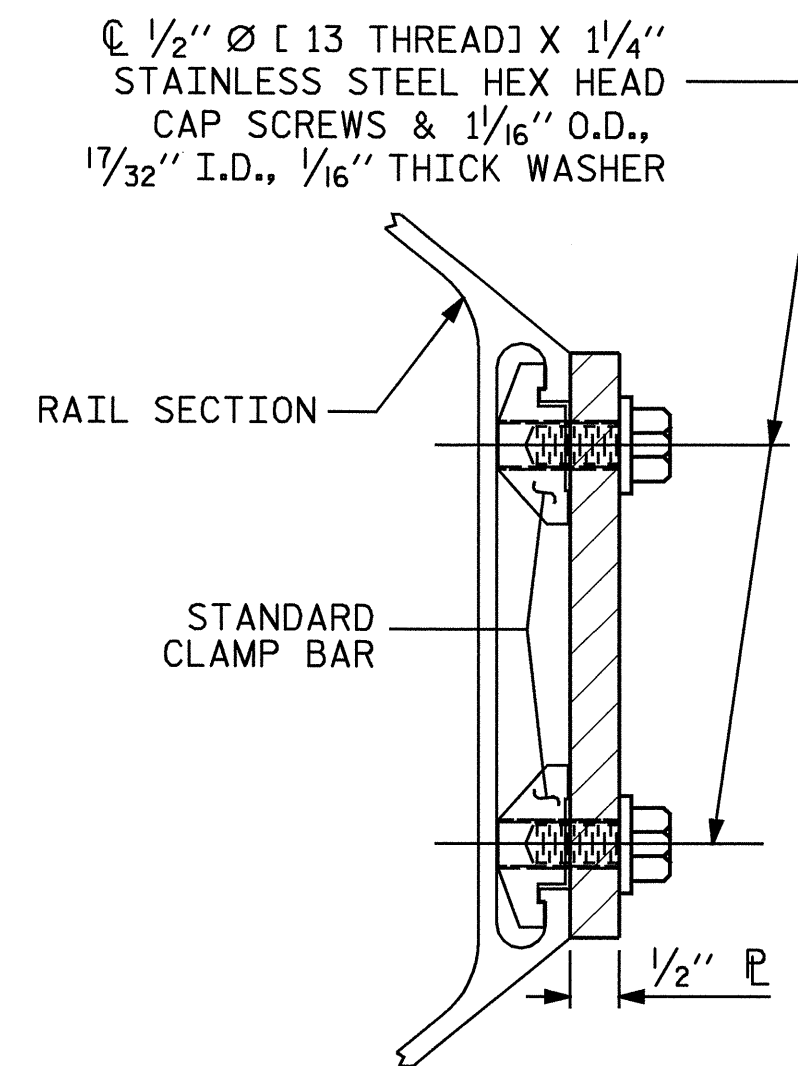
THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:

- 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 1/8" 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 1/8" GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.
- C. WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 1/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.



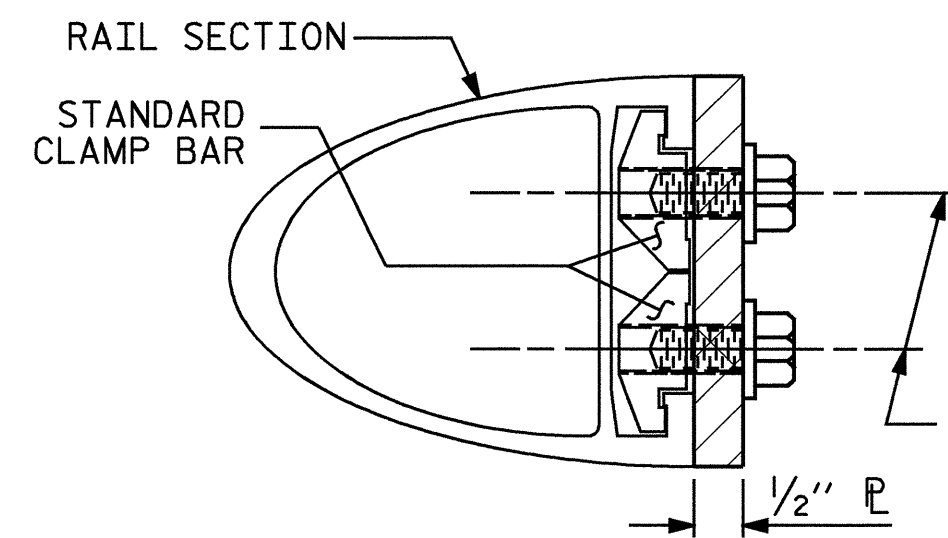
PLAN OF RAIL AND END POST

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



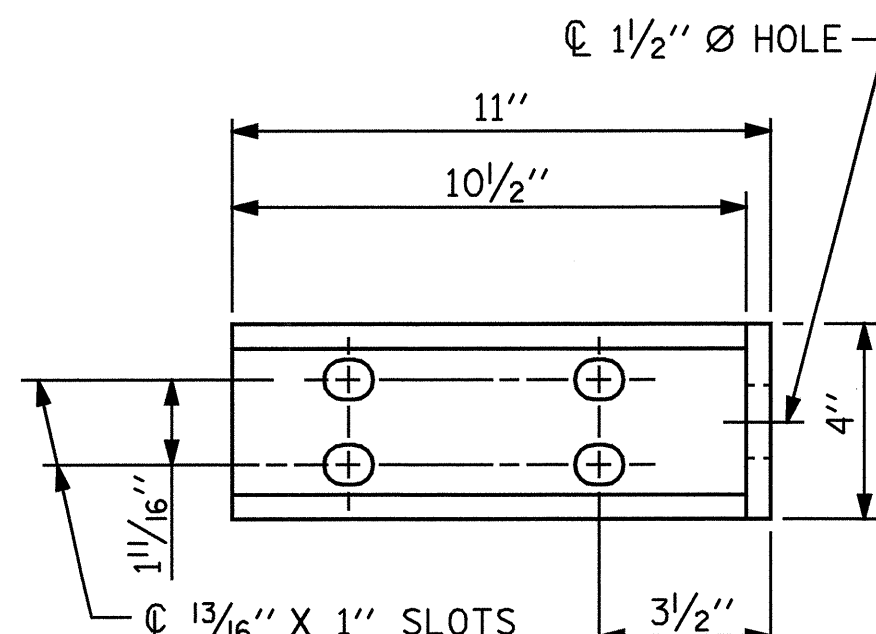
SECTION H-H

(FOR BOTTOM RAIL)

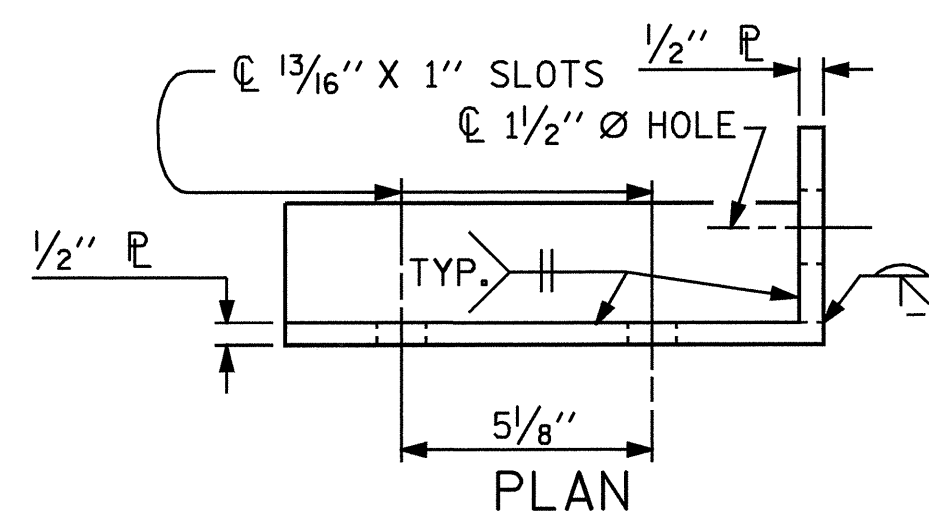


SECTION H-H

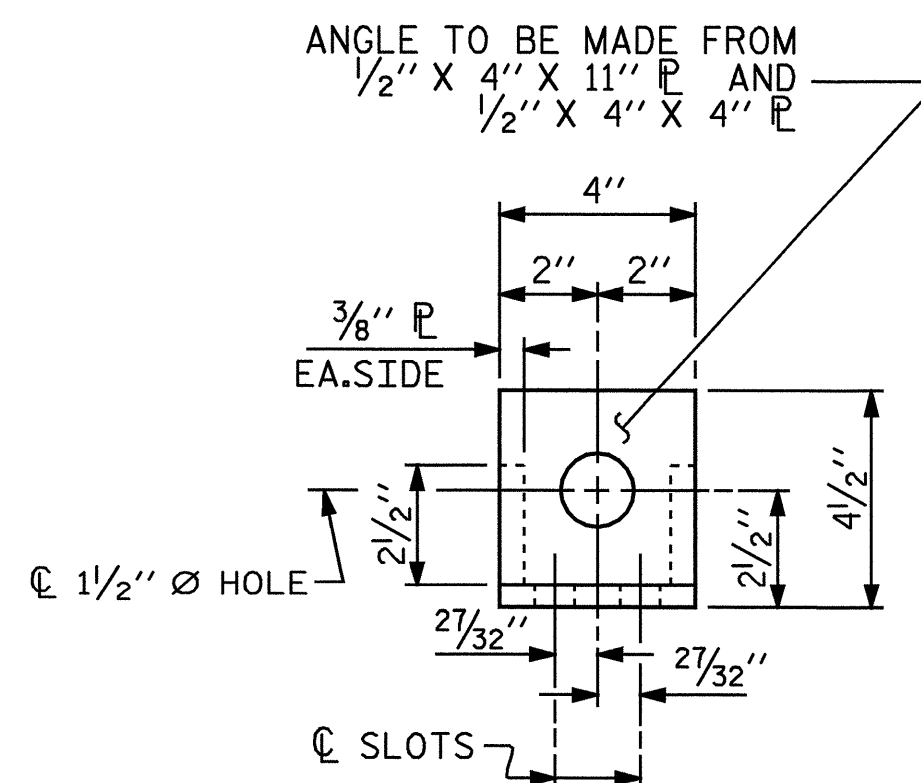
(FOR TOP & MIDDLE RAIL)



ELEVATION



PLAN

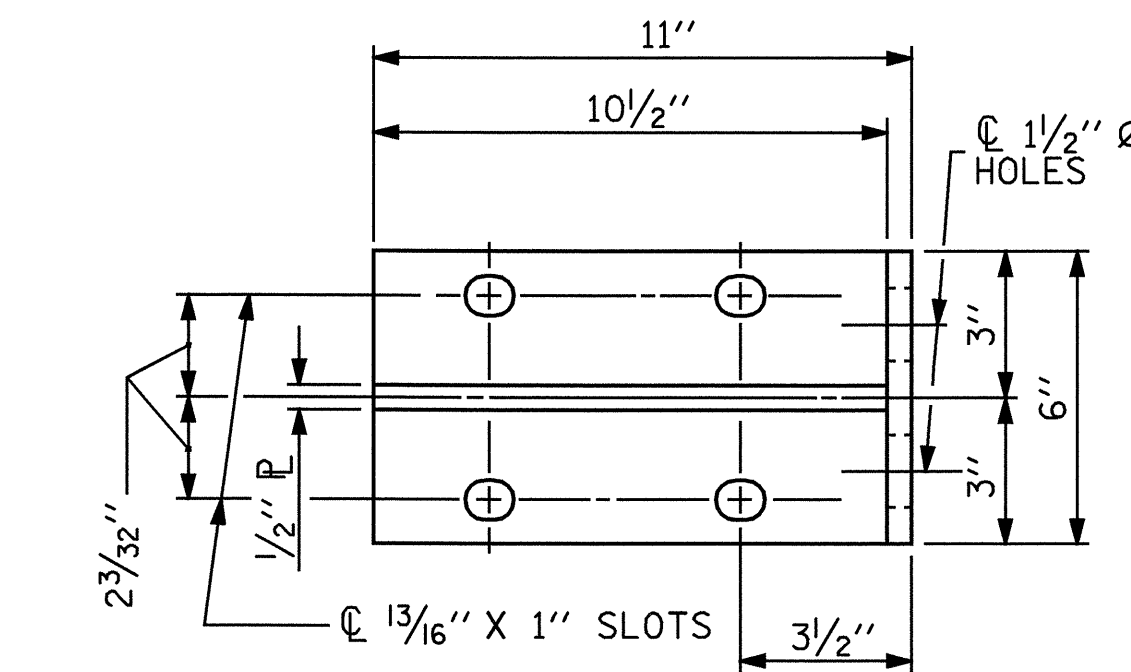


END VIEW

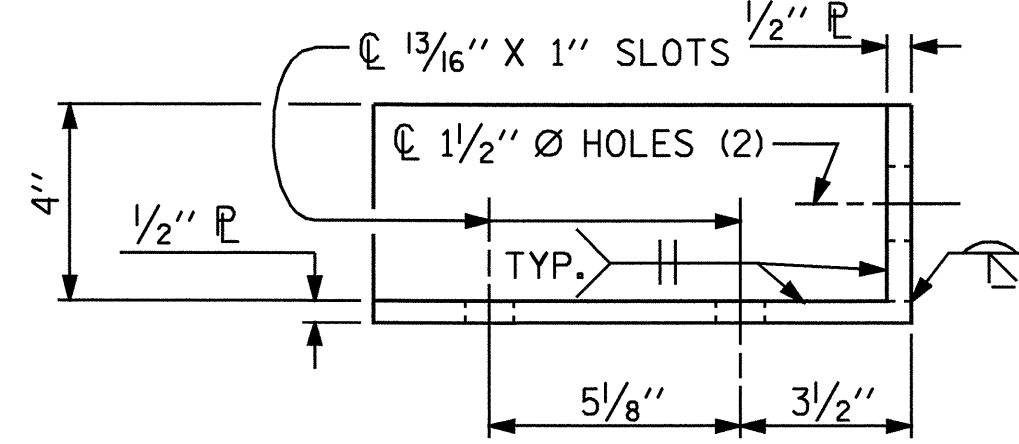
(FIX. AND EXP.)

DETAILS FOR ATTACHMENT BRACKET

(TOP & MIDDLE RAIL ONLY)



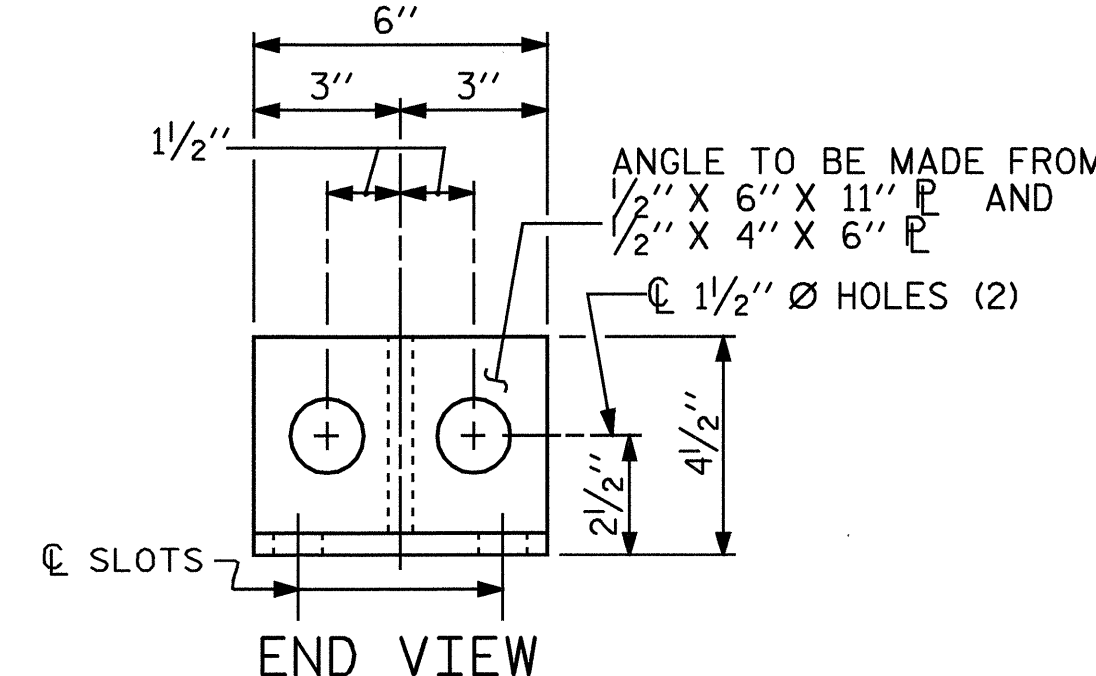
ELEVATION



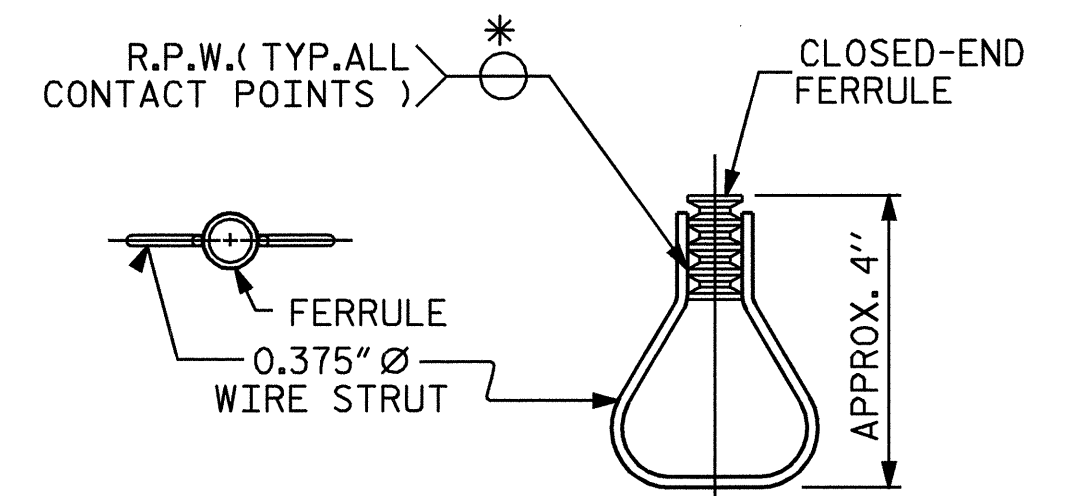
PLAN

DETAILS FOR ATTACHMENT BRACKET

(BOTTOM RAIL ONLY)



END VIEW



PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

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

PROJECT NO. U-4006

GUILFORD COUNTY

STATION: 20+90.21 -L-

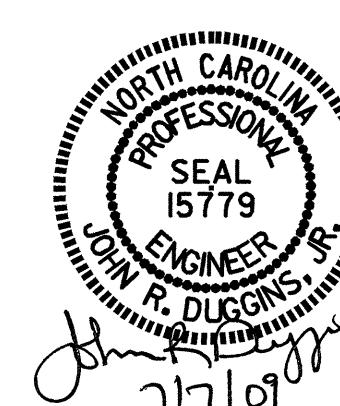
SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

3 BAR METAL RAIL

(RIGHT LANE)



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-58
1			3			TOTAL SHEETS
2			4			75

ASSEMBLED BY :	A. SORSENGINH	DATE :	5/8/09
CHECKED BY :	J.R. DUGGINS	DATE :	5/09
DRAWN BY :	JMB 1/88	REV. 7/10/01	RWW/LES
CHECKED BY :	GGH 1/88	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.

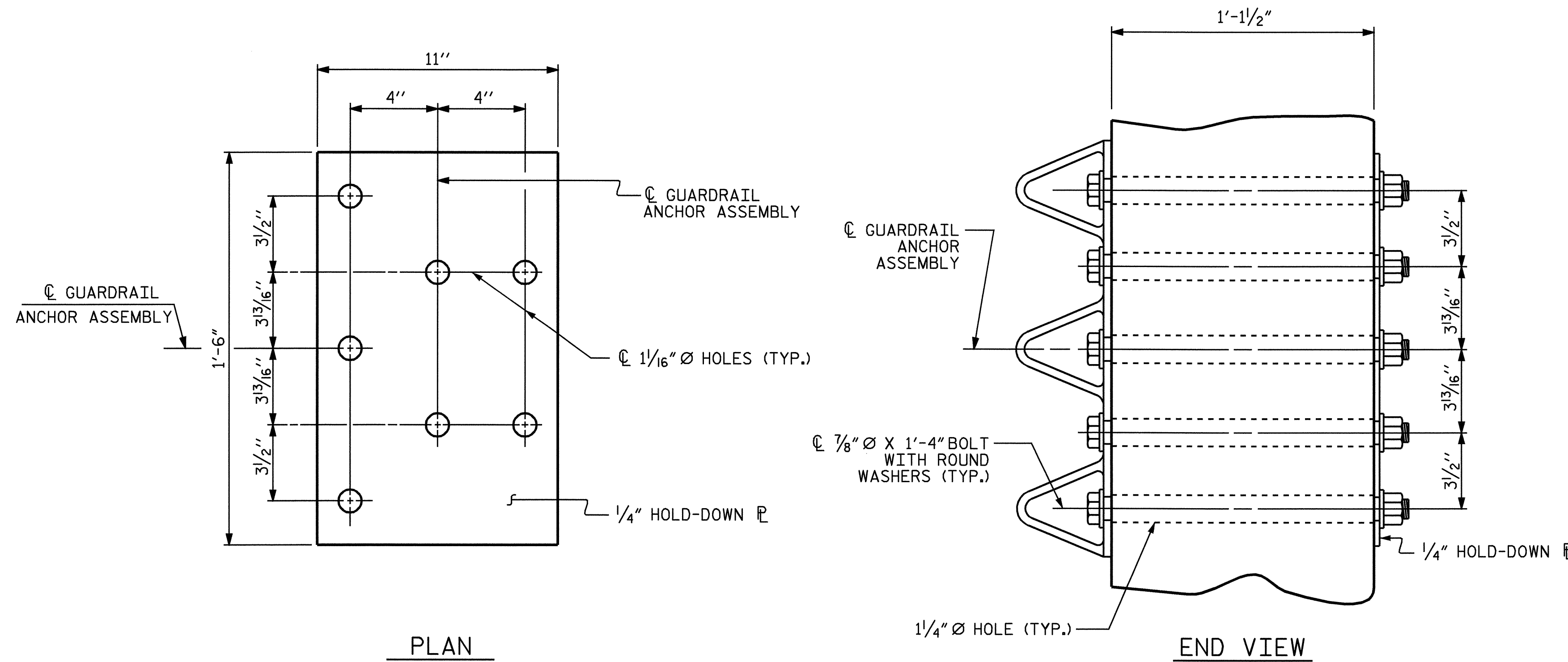
BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS.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

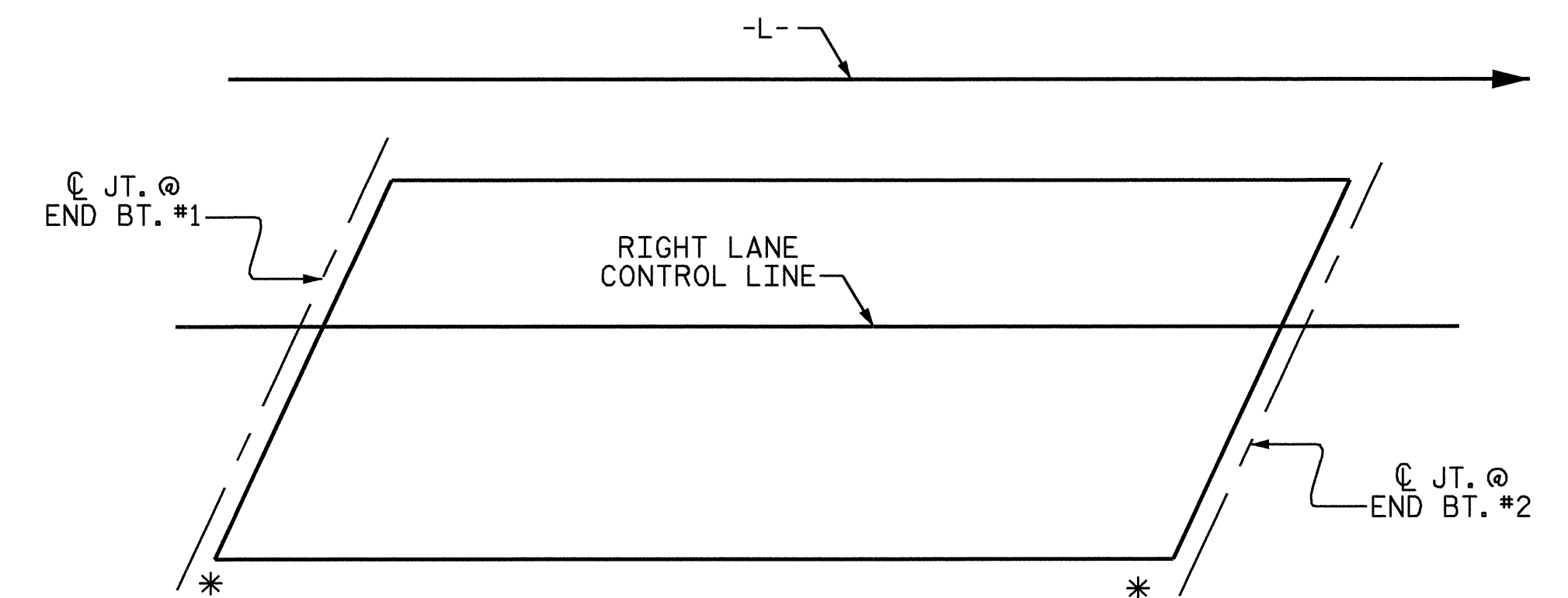
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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.

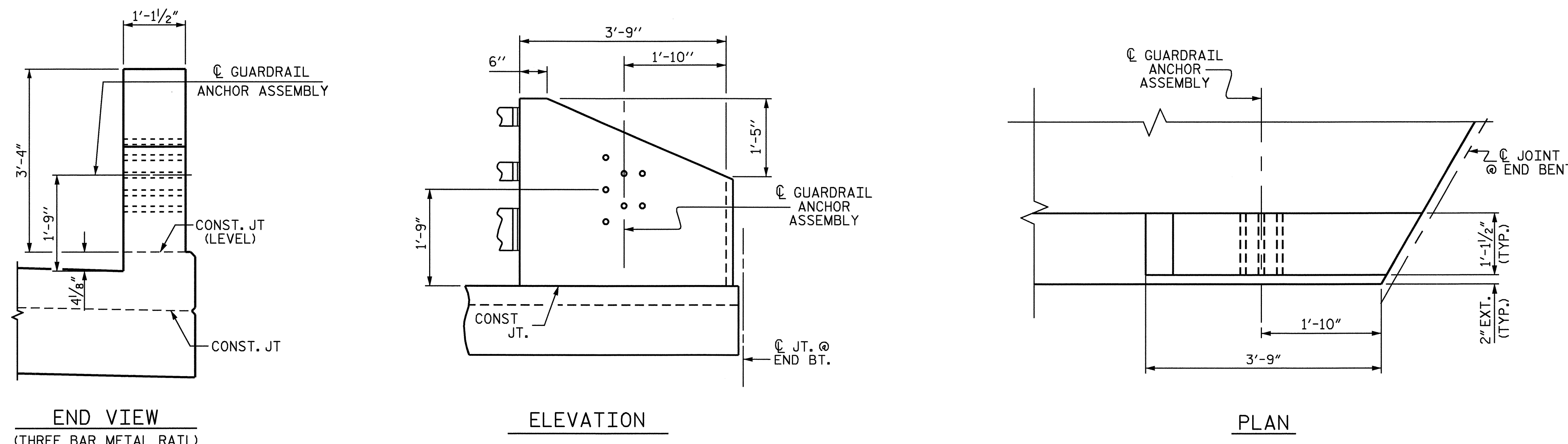


GUARDRAIL ANCHOR ASSEMBLY DETAILS



SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT



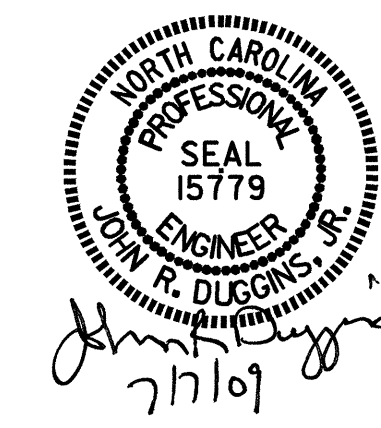
LOCATION OF GUARDRAIL ANCHOR AT END POST

END VIEW
(THREE BAR METAL RAIL)

ELEVATION

PLAN

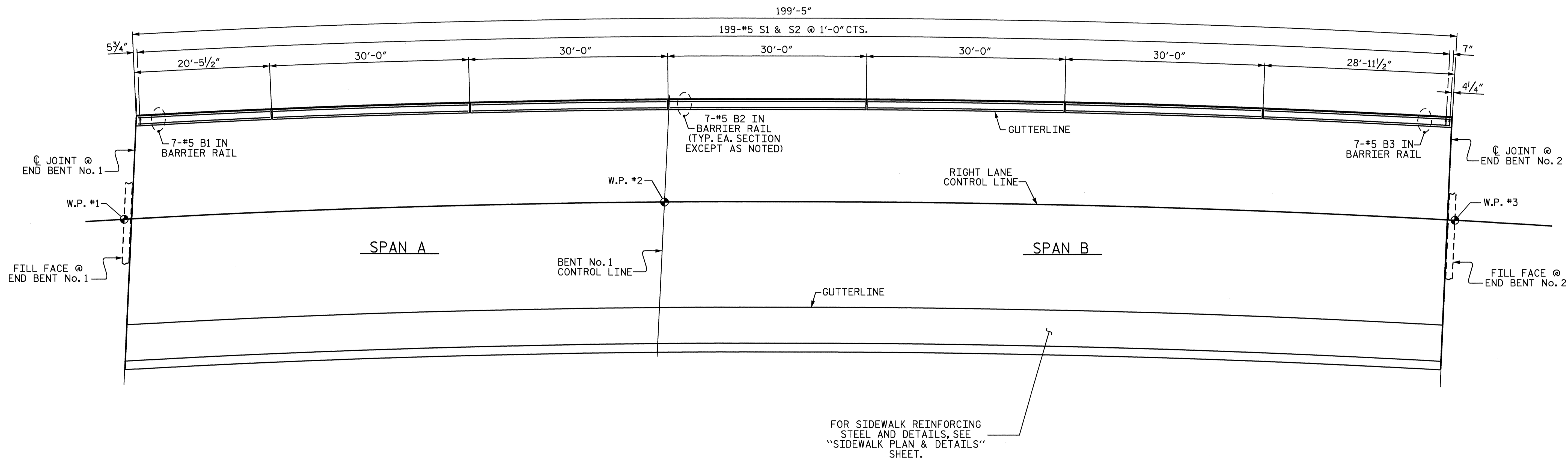
PROJECT NO. U-4006
GUILFORD COUNTY
 STATION: 20+90.21 -L-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 GUARDRAIL ANCHORAGE
 DETAILS
 FOR METAL RAILS
 (RIGHT LANE)

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-51	
1			3			TOTAL SHEETS	
2			4			15	

ASSEMBLED BY : A. SORSENGINH	DATE : 5/8/09
CHECKED BY : J.R. DUGGINS	DATE : 5/09
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



PLAN
 DIMENSIONS FOR BARRIER RAIL SECTIONS
 ARE TAKEN ALONG THE OUTSIDE FACE OF
 BARRIER RAIL ALONG ARC.

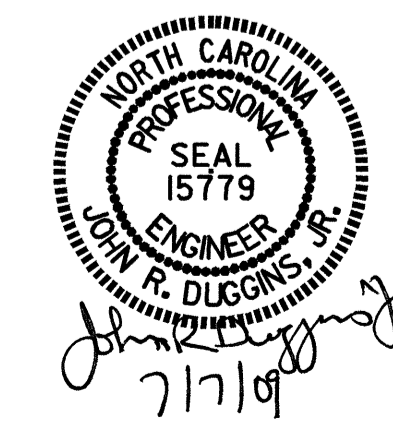
FOR SIDEWALK REINFORCING
 STEEL AND DETAILS, SEE
 "SIDEWALK PLAN & DETAILS"
 SHEET.

PROJECT NO. U-4006
GUILFORD COUNTY
 STATION: 20+90.21 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 CONCRETE
 BARRIER RAIL
 (RIGHT LANE)



DRAWN BY : A. SORSENGINH DATE : 5/07/09
 CHECKED BY : J.R. DUGGINS DATE : 5/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-60
1			3			TOTAL SHEETS
2			4			75

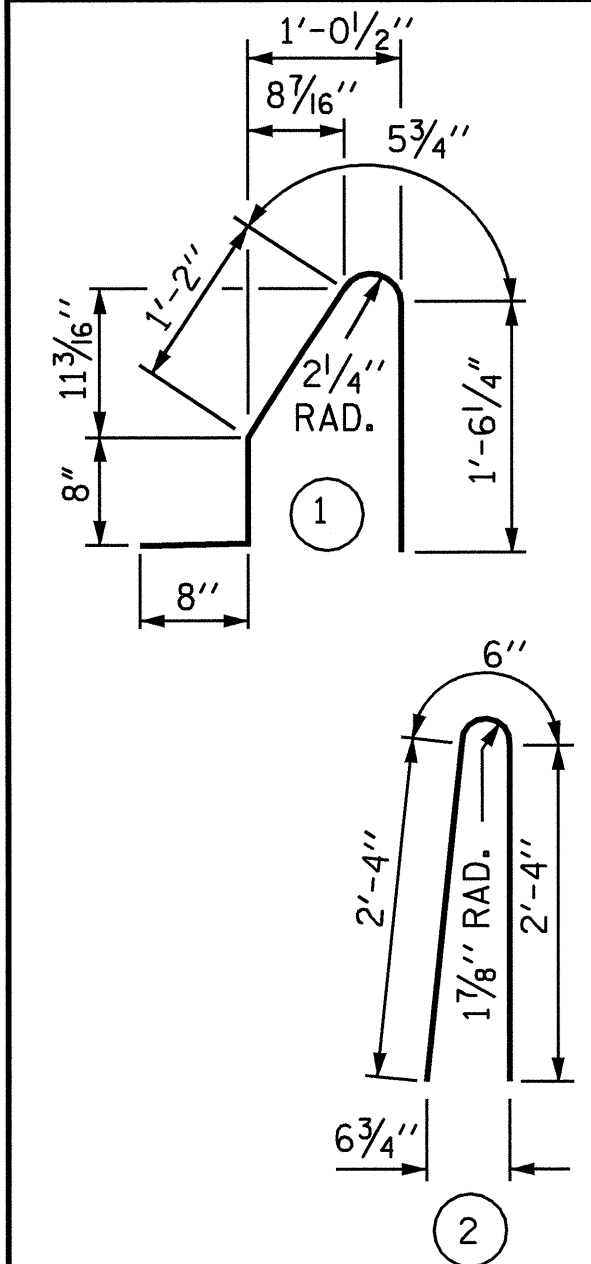
NOTES

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

BAR TYPES

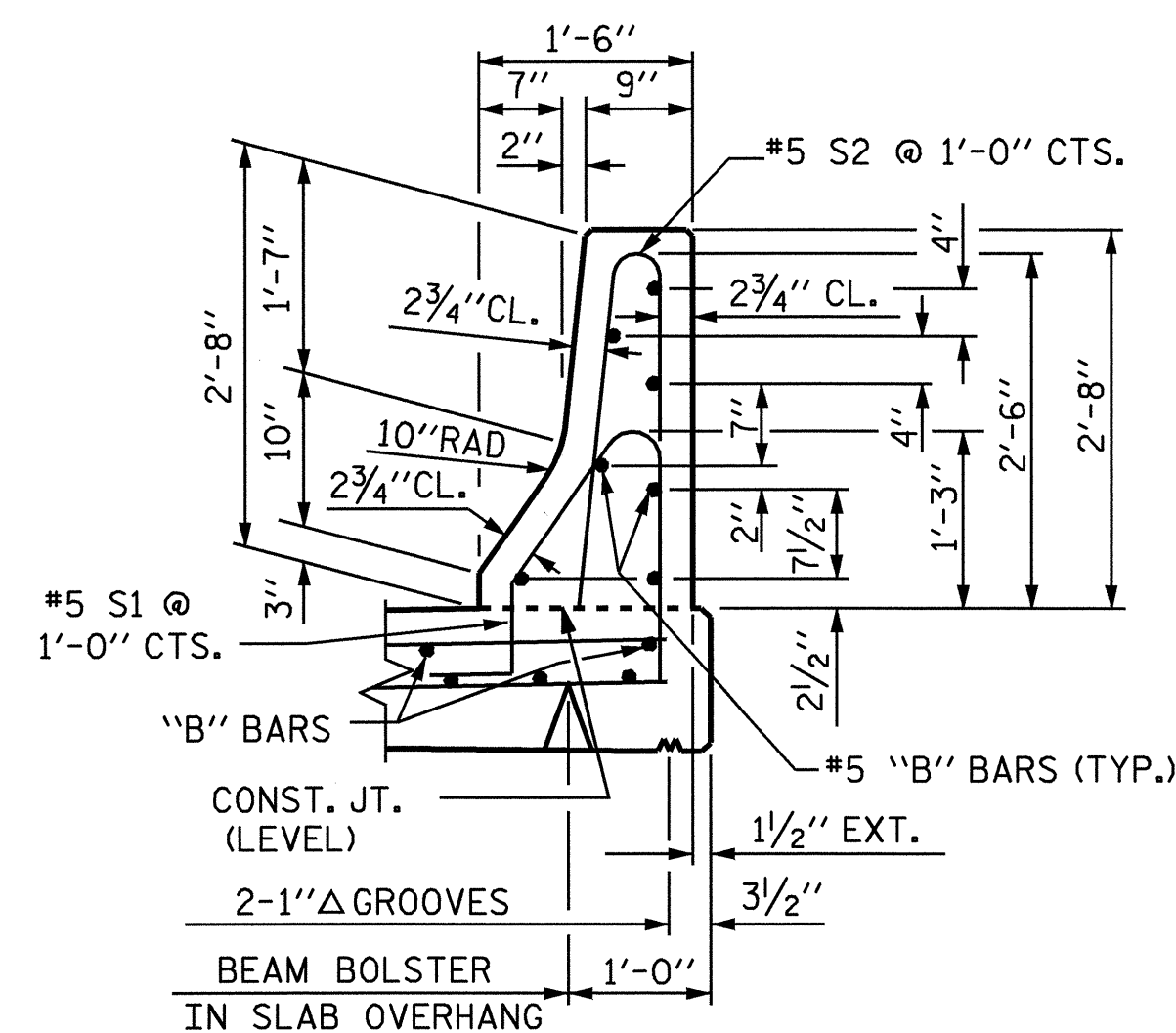


ALL BAR DIMENSIONS ARE OUT TO OUT

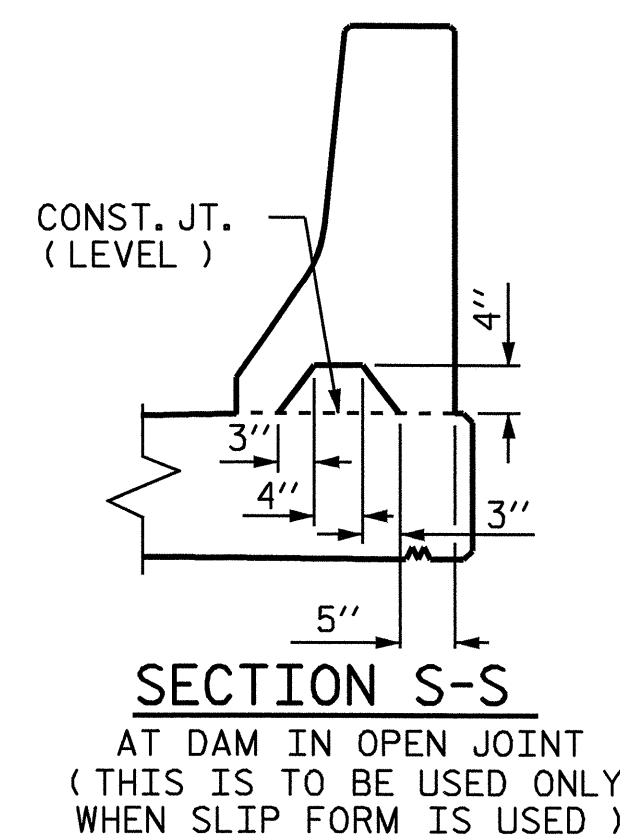
BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* S1	200	#5	1	4'-6"	939
* S2	200	#5	2	5'-2"	1078
* B1	7	#5	STR	19'-11"	145
* B2	35	#5	STR	29'-7"	1080
* B3	7	#5	STR	28'-6"	208
* EPOXY COATED REINFORCING STEEL					3,450 LBS.
CLASS AA CONCRETE					20.0 CU. YDS.
CONCRETE BARRIER RAIL					199.42 LIN. FT.

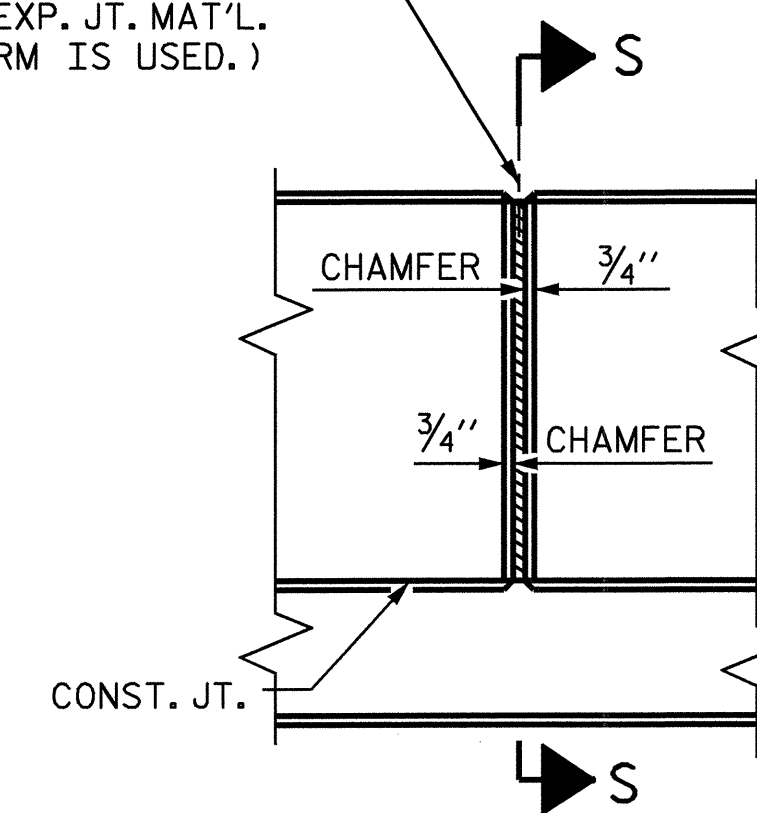


SECTION THRU RAIL



SECTION S-S
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY
WHEN SLIP FORM IS USED)

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



ELEVATION AT EXPANSION JOINTS

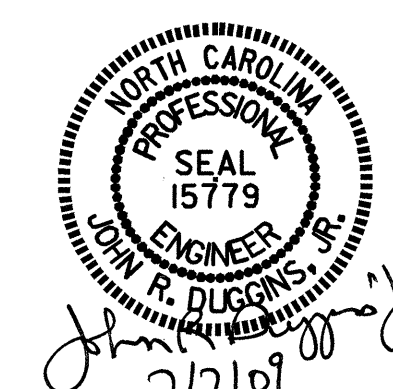
BARRIER RAIL DETAILS

PROJECT NO. U-4006
GUILFORD COUNTY
STATION: 20+90.21 -L-

SHEET 2 OF 2

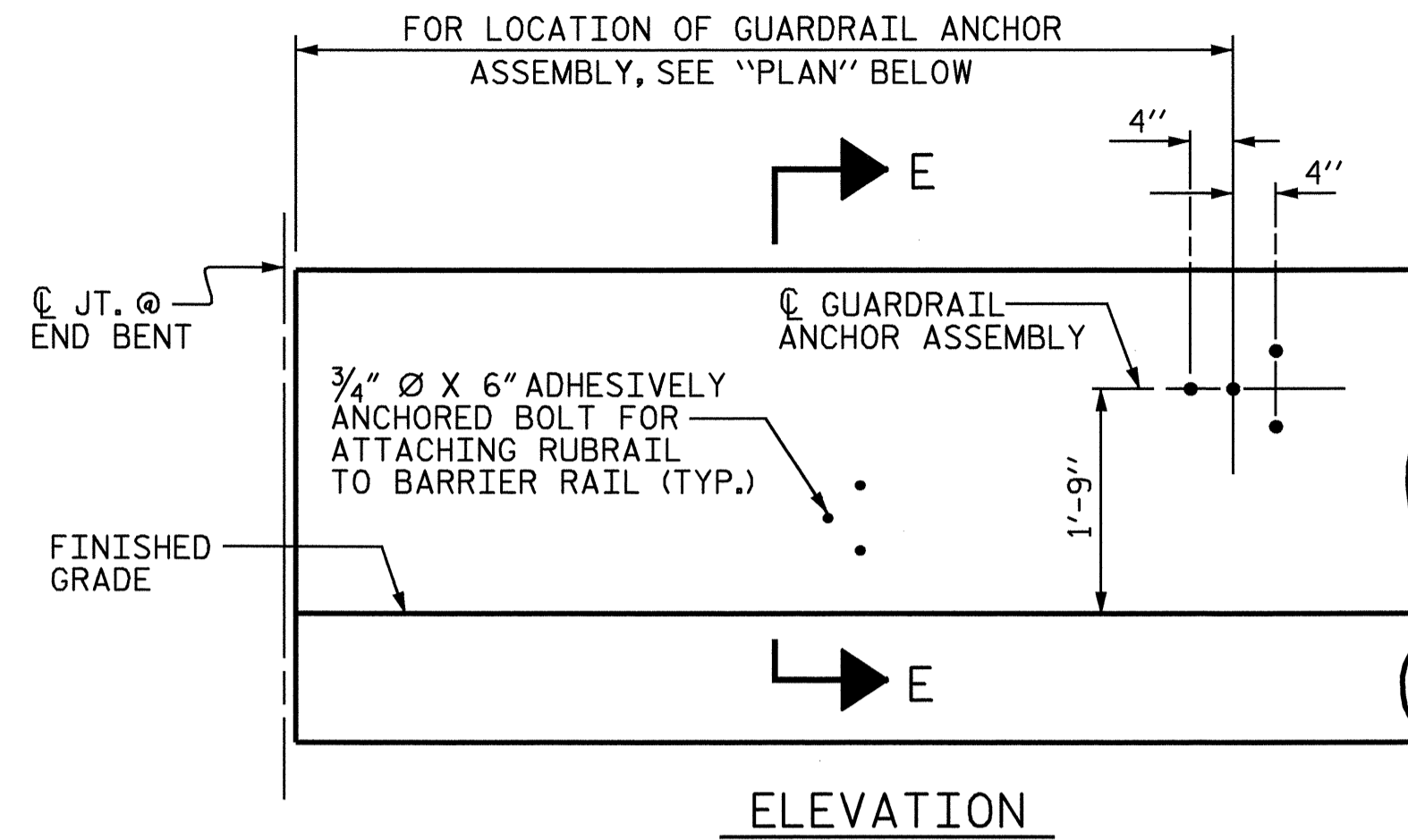
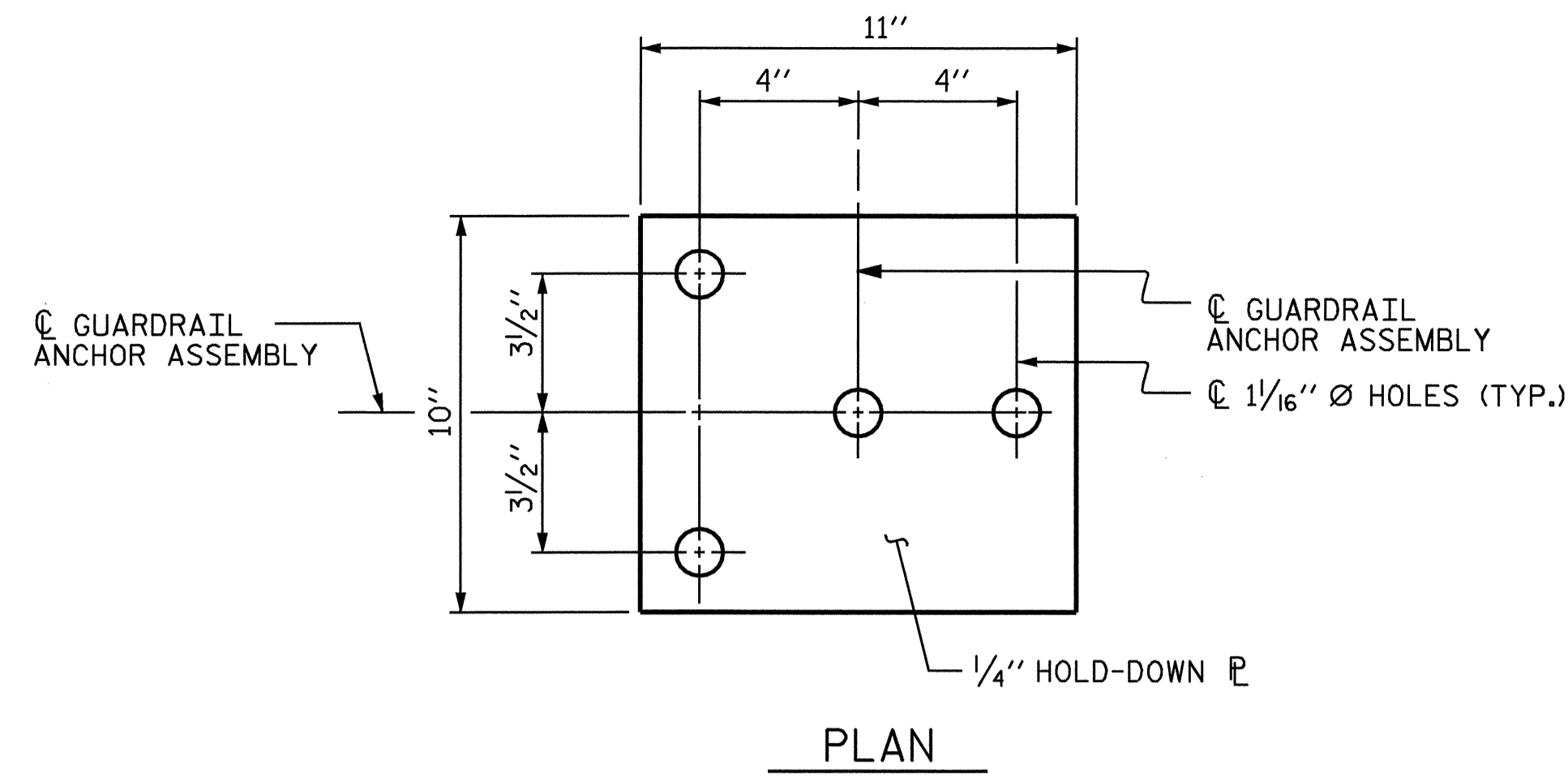
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
CONCRETE
BARRIER RAIL
(RIGHT LANE)

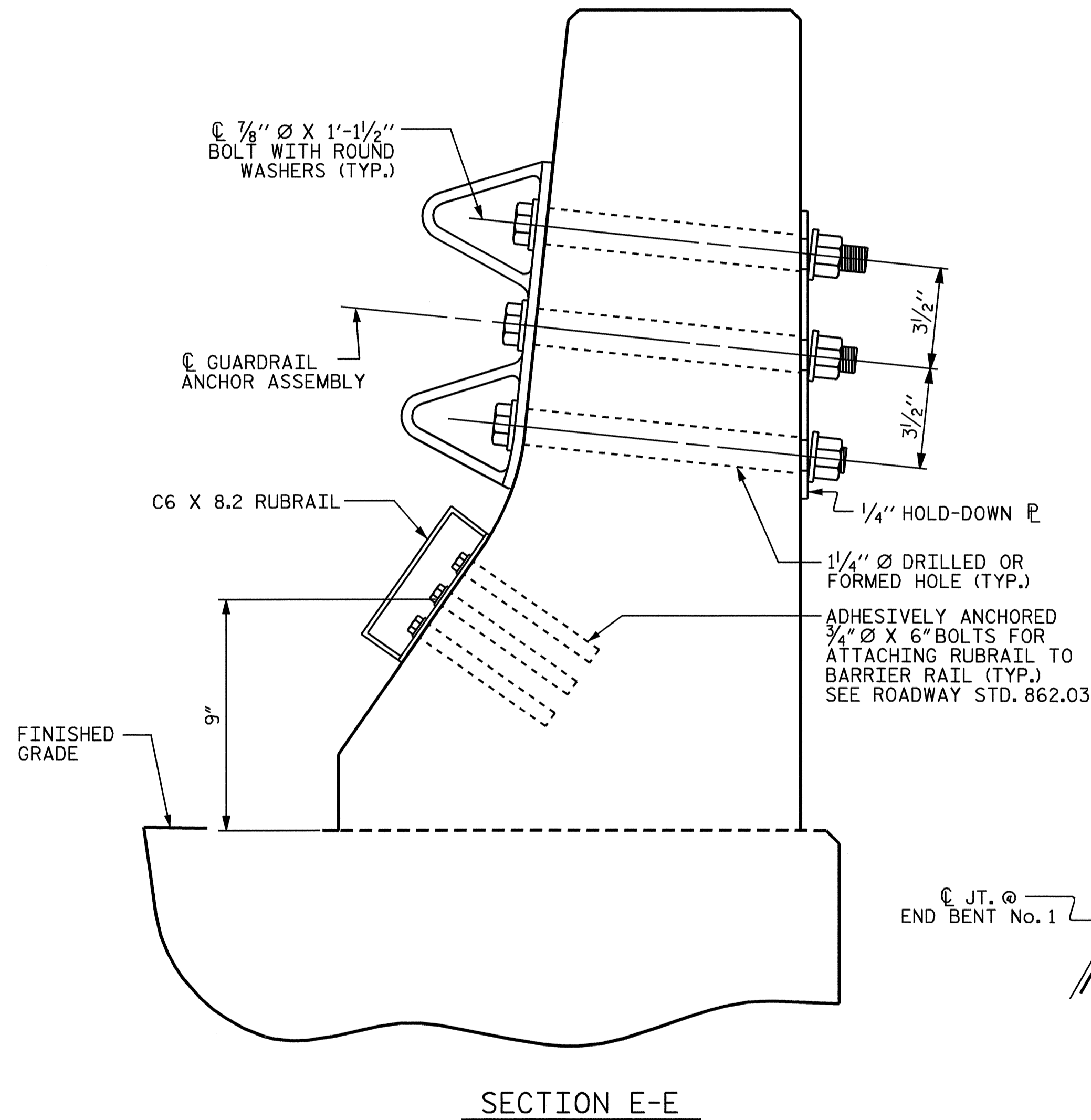


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-61
1			3			TOTAL SHEETS
2			4			75

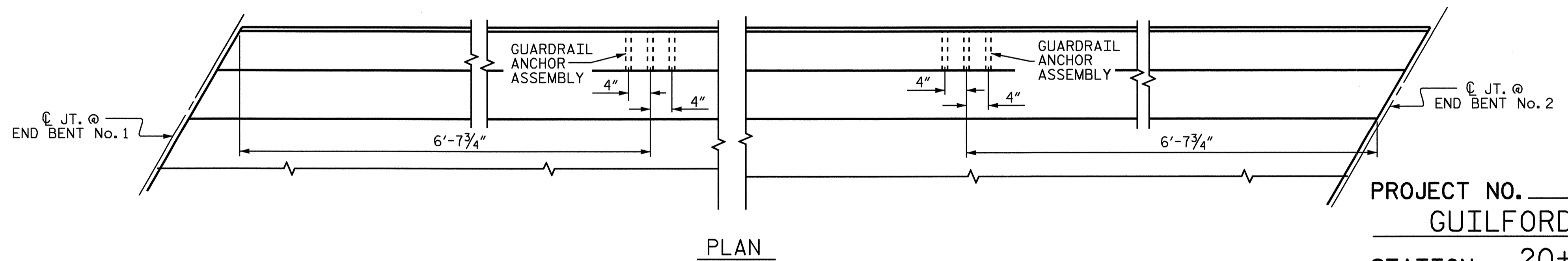
ASSEMBLED BY : A. SORSENGIH	DATE : 5/7/09
CHECKED BY : J.R. DUGGINS	DATE : 5/09
DRAWN BY : ARB 5/87	REV. 10/17/00 RWW/LES
CHECKED BY : SJD 9/87	REV. 5/1/03R RWW/JTE
	REV. 5/1/06 TLA/GM



FOR LOCATION OF RUBRAIL, SEE ROADWAY STD. 862.03



GUARDRAIL ANCHOR ASSEMBLY DETAILS



LOCATION OF ANCHORS FOR GUARDRAIL

NOTES

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

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

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

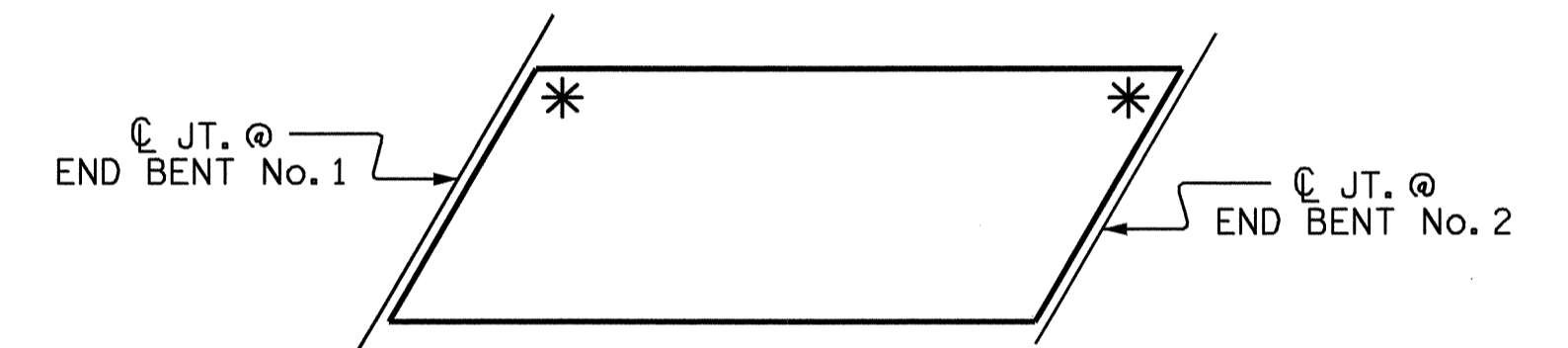
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

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

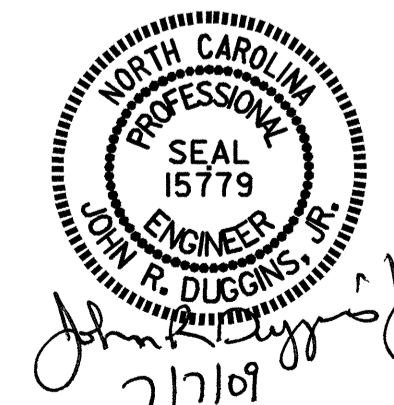
THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SPECIAL PROVISIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS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



SKETCH SHOWING POINTS OF ATTACHMENTS

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. U-4006
 GUILFORD COUNTY
 STATION: 20+90.21 -L-



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD GUARDRAIL ANCHORAGE FOR BARRIER RAIL RIGHT LANE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-62
					TOTAL SHEETS 15

ASSEMBLED BY : J. LAMBERT	DATE : 01/09
CHECKED BY : J.R. DUGGINS	DATE : 05/09
DRAWN BY : TLA 5/06	ADDED 5/1/06R KMM/GM
CHECKED BY : GM 5/06	

NOTES

ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL STUD ANCHORS SHALL CONFORM TO AASHTO M169 GRADES 1010 THRU 1020 OR APPROVED EQUAL.

STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON THE PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.

UPON COMPLETION OF SHOP FABRICATION, THE ENTIRE ANCHOR ASSEMBLY SHALL BE METALLIZED. THE 1/2" Ø STUD ANCHORS AND ANCHOR TABS NEED NOT BE METALLIZED. SEE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).

ANCHOR ASSEMBLY SHALL BE MADE CONTINUOUS THE LENGTH OF THE JOINT FROM GUTTER TO GUTTER. FOR FIELD SPLICES AT ALL CROWN BREAK POINTS, THE ENDS OF THE STEEL ANGLES SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE. FINISHED FIELD WELDS SHALL BE GRIND SMOOTH AND COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

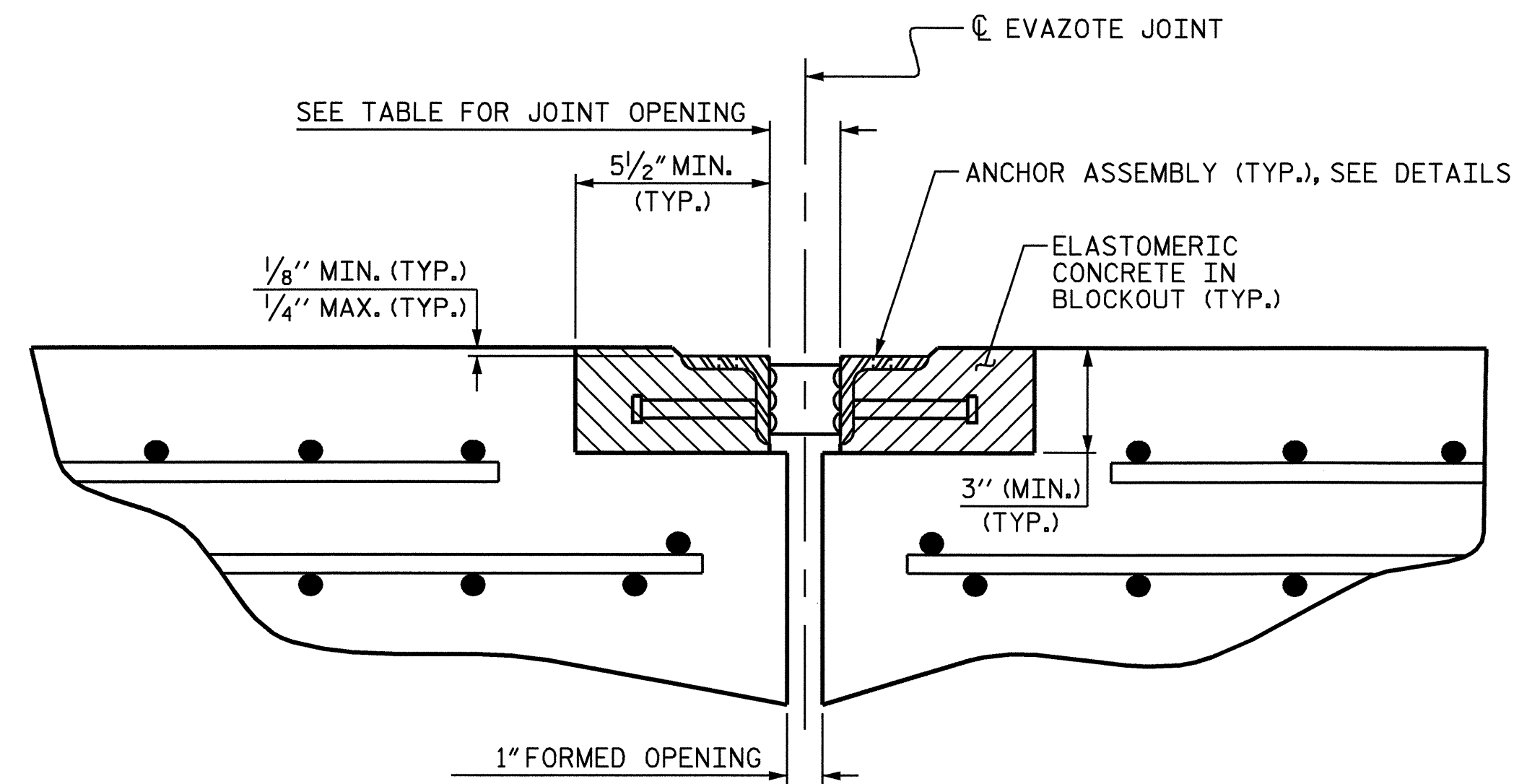
ANCHOR ASSEMBLY SEGMENTS SHALL NOT BE LESS THAN 12 FEET NOR MORE THAN 20 FEET IN LENGTH. SHORTER SEGMENTS MAY BE USED AT THE EDGE OF ROADWAY OR AT POINTS OF STAGED CONSTRUCTION.

THE ANCHOR ASSEMBLY SHALL BE SECURED AND LEVELLED AS SHOWN IN THE "ARMORED JOINT ANCHOR ASSEMBLY DETAILS". NO SUBMITTALS ARE REQUIRED FOR 3/8" Ø EXPANSION ANCHORS, NUTS OR WASHERS. THE CONTRACTOR MAY SUBMIT FOR APPROVAL AN ALTERNATE METHOD OF ALIGNING AND LEVELING THE ANGLES. THE ALTERNATE METHOD SHALL NOT INCLUDE ANY WELDING TO THE OUTSIDE FACE OF THE ANGLES.

AFTER THE ELASTOMERIC CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE ANY EXCESS CONCRETE THAT COMES THROUGH THE WEEP HOLES AND THOROUGHLY CLEAN THE ANGLES. ANY DAMAGED STEEL SHALL BE COATED WITH A MINIMUM OF 4 MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

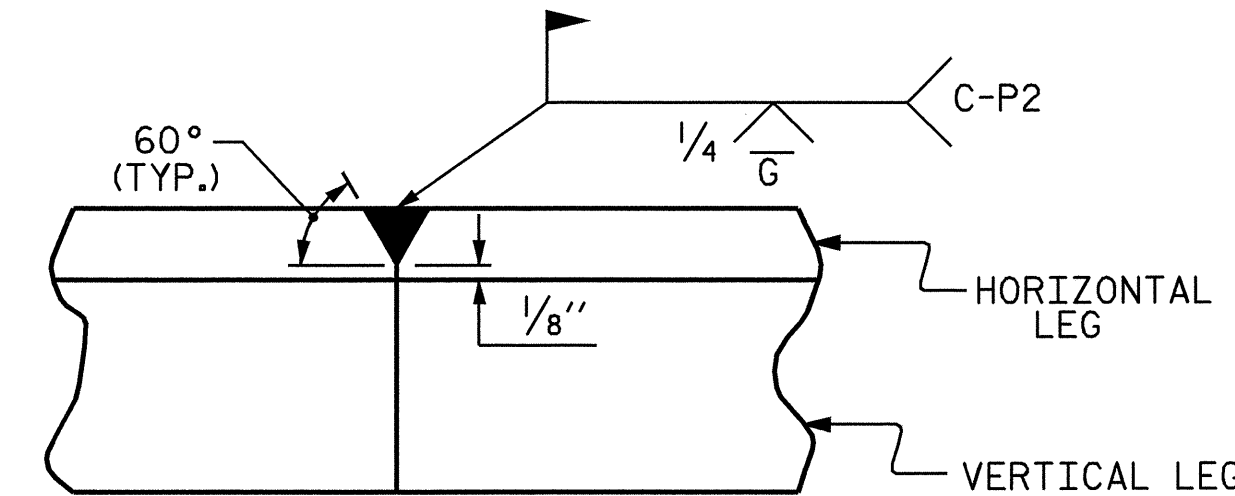
SEE SPECIAL PROVISIONS FOR EVAZOTE JOINT SEALS.

SEE SPECIAL PROVISIONS FOR ELASTOMERIC CONCRETE.

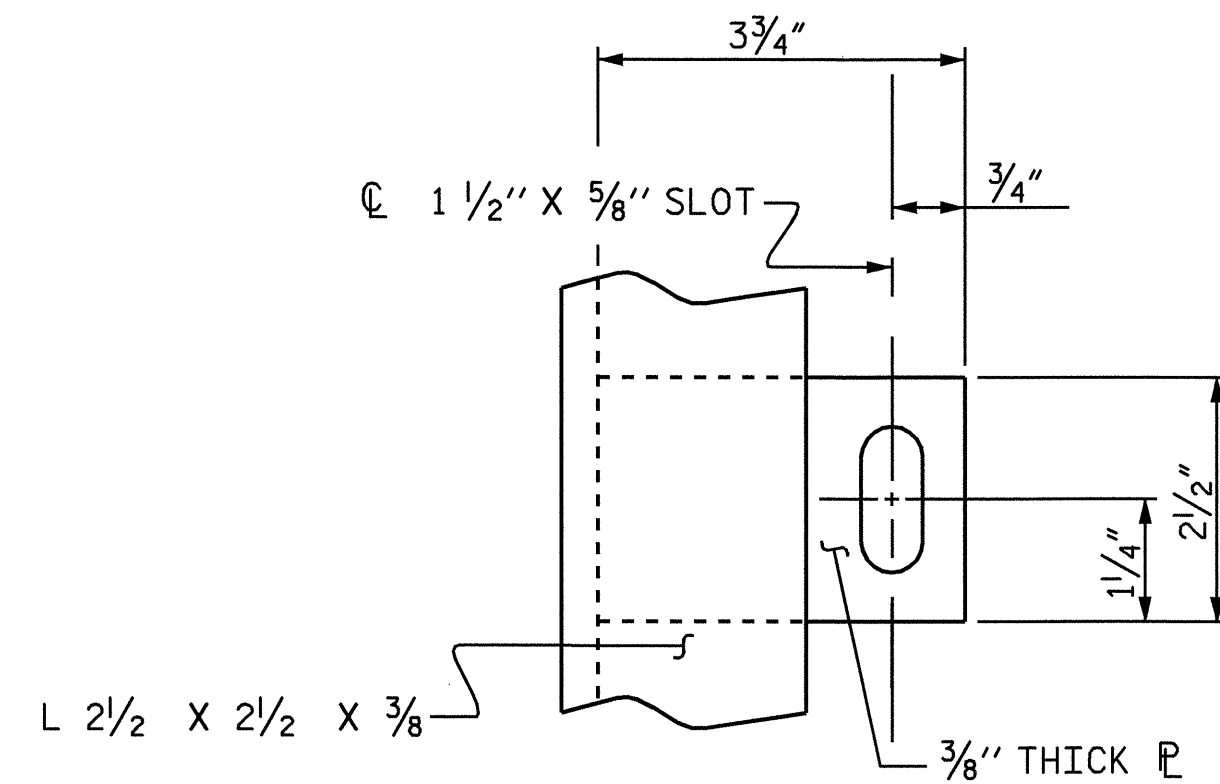


ARMORED JOINT DETAILS

SECTION NORMAL TO JOINT AT END BENT



DETAIL- FIELD WELD SPLICE OF ANGLE



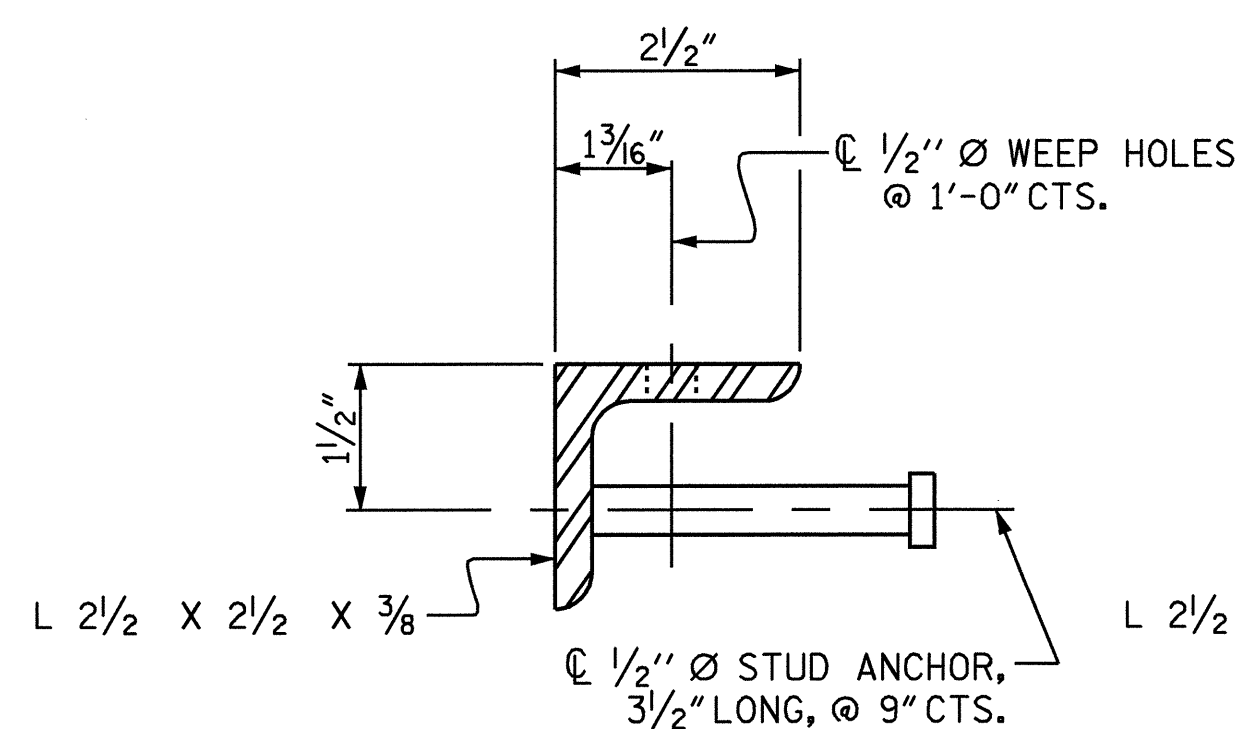
PLAN VIEW OF TAB

MOVEMENT AND SETTING AT EVAZOTE JOINT						
END BENT NO.	SKIEW ANGLE (TO SHORT CHORD)	NOMINAL UNCOMPRESSED SEAL WIDTH	TOTAL MOVEMENT (ALONG C RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
1	94°-22'-05"	2 1/2"	5/8"	2 1/8"	2"	1 3/4"
2	91°-11'-52"	2 1/2"	1"	2 3/16"	2"	1 1/16"

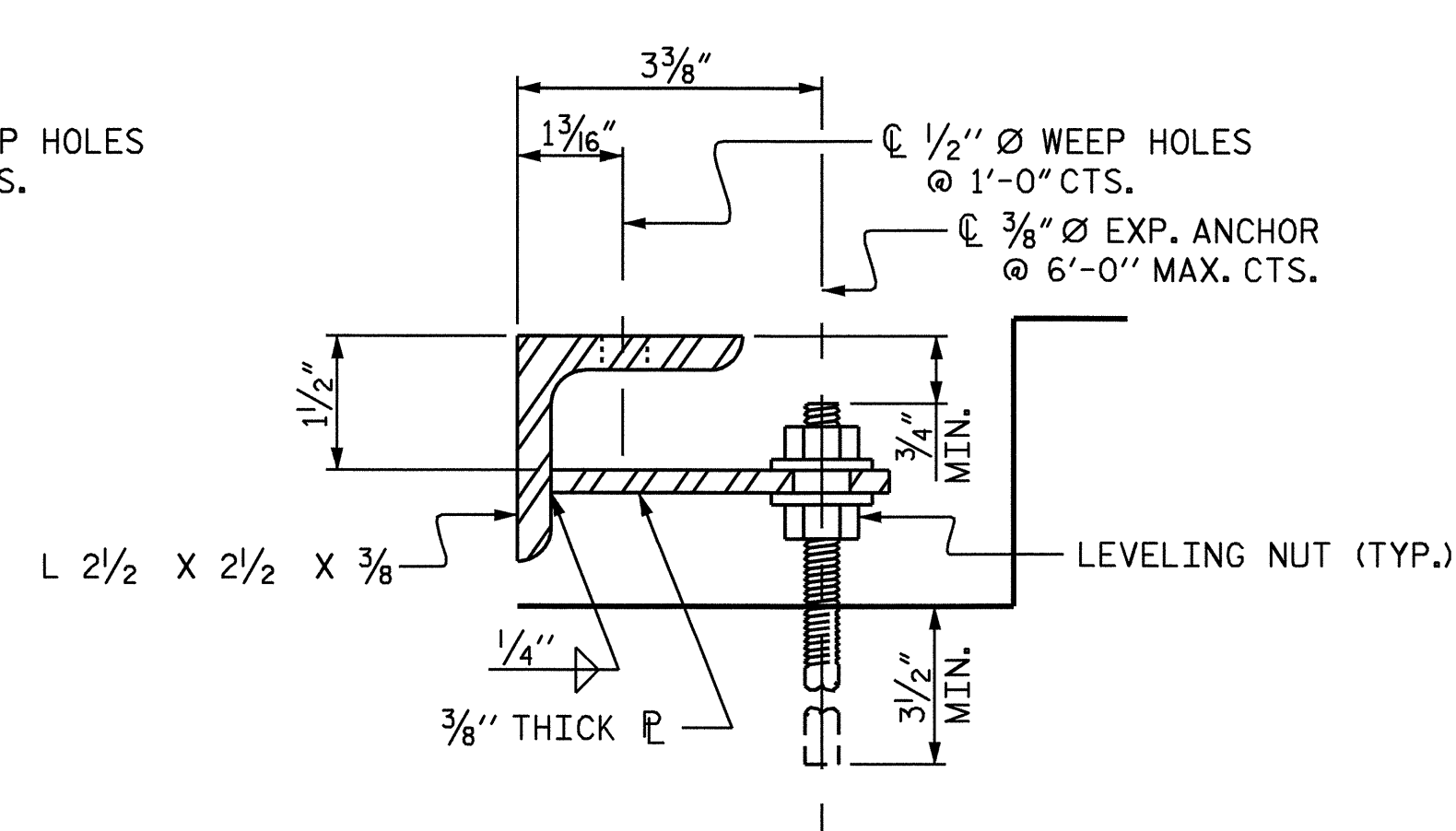
TOTAL MOVEMENT IS CALCULATED ALONG THE CENTERLINE OF ROADWAY. JOINT OPENINGS ARE MEASURED PERPENDICULAR TO THE JOINT.

BILL OF MATERIAL		
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)	TOTAL LENGTH OF ANGLE (FT)
1	6.9	60'-3 1/2"
2	6.9	60'-0"

* BASED ON THE MINIMUM BLOCKOUT SHOWN.



SECTION VIEW OF STUD



SECTION VIEW OF TAB

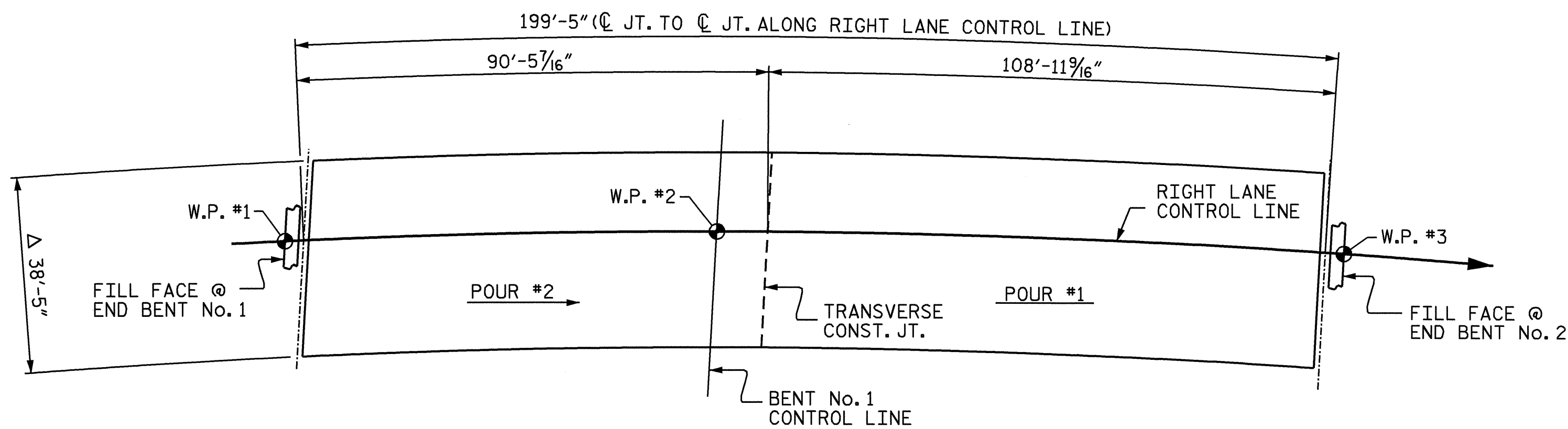
ARMORED JOINT ANCHOR ASSEMBLY DETAILS

PROJECT NO. U-4006
GUILFORD COUNTY
 STATION: 20+90.21 -L-

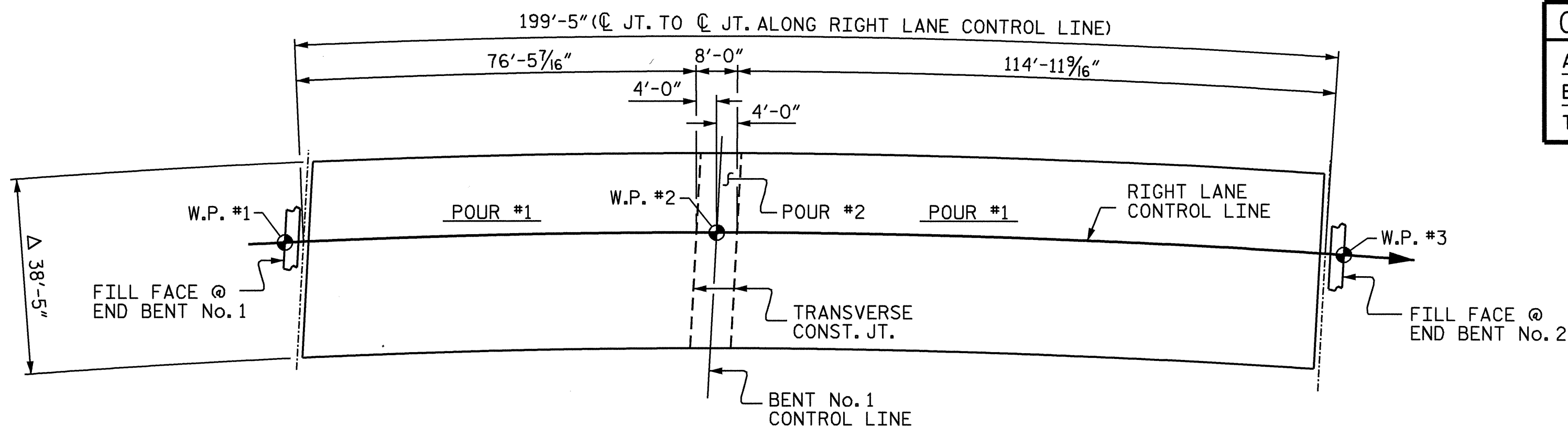
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 ARMORED EVAZOTE
 JOINT DETAILS
 (RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			75
2			4			

ASSEMBLED BY : D. HODGE DATE : 4/09
 CHECKED BY : J.R. DUGGINS DATE : 4/09
 DRAWN BY : EEM 1/96 REV. 7/10/01 LES/RDR
 CHECKED BY : RGW 1/96 REV. 5/7/03RR RWN/JTE
 REV. 5/1/06 TLA/GM

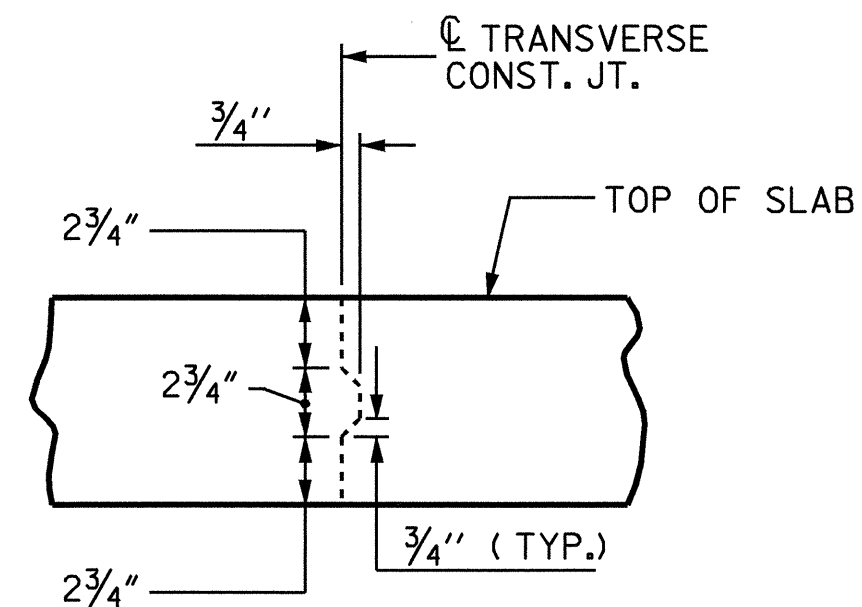


POURING SEQUENCE SKETCH



OPTIONAL POURING SEQUENCE SKETCH

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

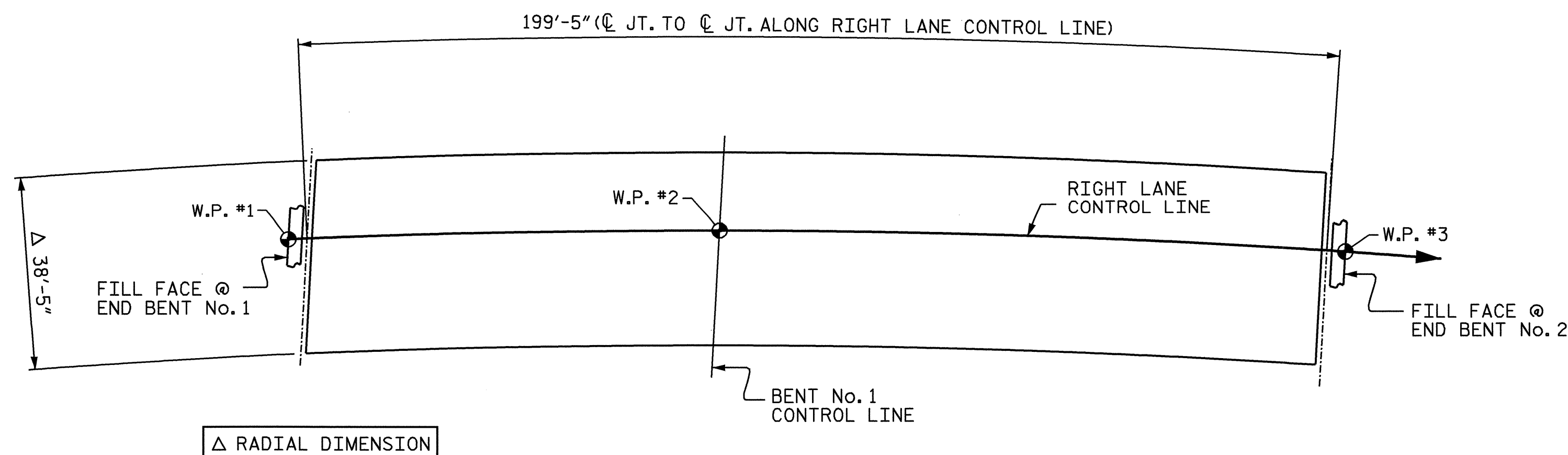


TRANSVERSE CONSTRUCTION JOINT DETAIL

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

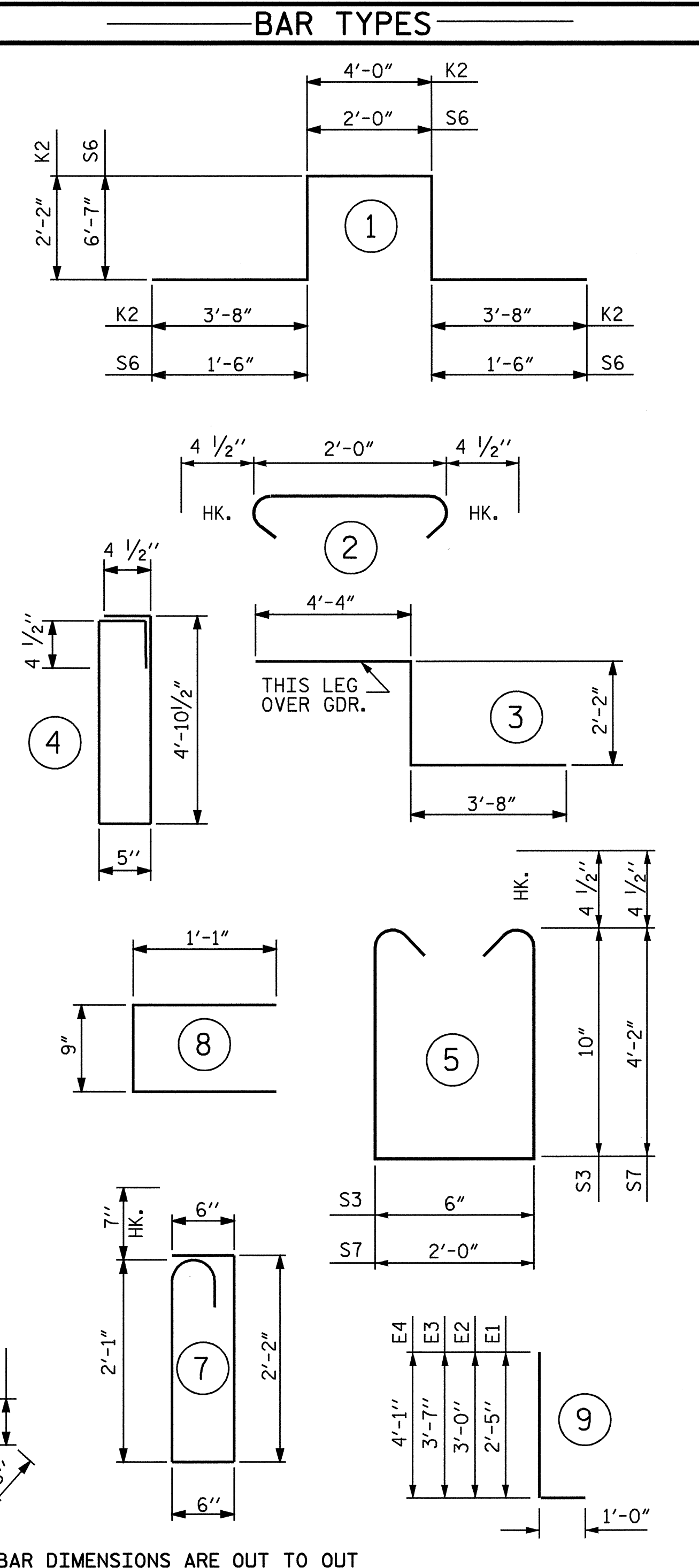
SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

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



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 7,661)

BAR SCHEDULE					
SPANS A & B					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	280	5	STR	38'-1"	11122
A2	280	5	STR	38'-1"	11122
*A101	2	5	STR	23'-0"	48
*A102	2	5	STR	6'-9"	14
A201	2	5	STR	23'-0"	48
A202	2	5	STR	6'-9"	14
*B1	50	4	STR	27'-3"	910
*B2	50	7	STR	38'-2"	3901
*B3	26	7	STR	30'-6"	1621
*B4	75	4	STR	27'-10"	1394
*B5	16	4	STR	26'-8"	285
B6	120	5	STR	51'-8"	6467
*B7	48	4	STR	26'-11"	863
*D1	116	4	STR	10"	65
*E1	4	7	9	3'-5"	28
*E2	4	7	9	4'-0"	33
*E3	4	7	9	4'-7"	37
*E4	4	7	9	5'-1"	42
*F1	4	6	STR	3'-2"	19
*F2	8	6	STR	3'-5"	41
*F3	4	6	STR	3'-4"	20
*G1	2	5	STR	38'-1"	79
*G2	200	4	STR	6'-1"	813
*K1	8	8	3	10'-2"	217
*K2	12	8	1	15'-8"	502
K3	16	6	STR	3'-7"	86
K4	32	6	STR	6'-7"	316
K5	120	5	STR	6'-7"	824
K6	24	5	6	6'-3"	156
K7	8	4	STR	3'-11"	21
K8	40	4	STR	6'-7"	176
K9	8	4	STR	3'-7"	19
K10	7	4	STR	30'-0"	140
*S1	32	5	7	5'-10"	195
*S2	32	4	8	2'-11"	62
S3	16	4	5	2'-11"	31
S4	60	4	4	11'-4"	454
S5	136	4	2	2'-9"	250
S6	16	4	1	18'-2"	194
S7	8	4	5	11'-1"	59
REINFORCING STEEL					LBS. 20,377
*EPOXY COATED REINFORCING STEEL					LBS. 22,311
* THESE BARS ARE EPOXY COATED					



GROOVING BRIDGE FLOORS	
APPROACH SLABS	1,285 SQ.FT.
BRIDGE DECK	5,352 SQ.FT.
TOTAL	6,637 SQ.FT.

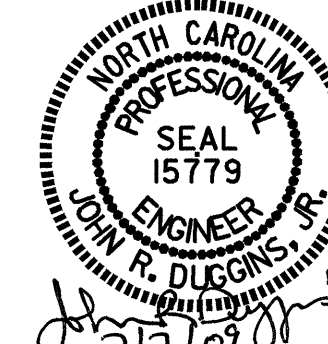
—SUPERSTRUCTURE BILL OF MATERIAL—			
SPAN A & B	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
POUR 1	153.2		
POUR 2	127.2		
SIDEWALK	36.5		
END POST	0.8		
TOTALS**	317.7	20,377	22,311

**QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED, QUANTITIES FOR SIDEWALK AND END POST ARE INCLUDED.

PROJECT NO. U-4006
GUILFORD COUNTY
STATION: 20+90.21 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
SUPERSTRUCTURE
BILL OF MATERIAL
(RIGHT LANE)



ASSEMBLED BY : D. HODGE DATE : 4/09
CHECKED BY : J.R. DUGGINS DATE : 4/09
DRAWN BY : JMB 5/87 REV. 6/1/94 EEM/GRP
CHECKED BY : SJD 9/87 REV. 8/16/99 RWW/LES
REV. 5/1/06 TLA/GM

REVISIONS						SHEET NO. S-69
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 75
2			4			

STD. NO. BOM2

NOTES

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

THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

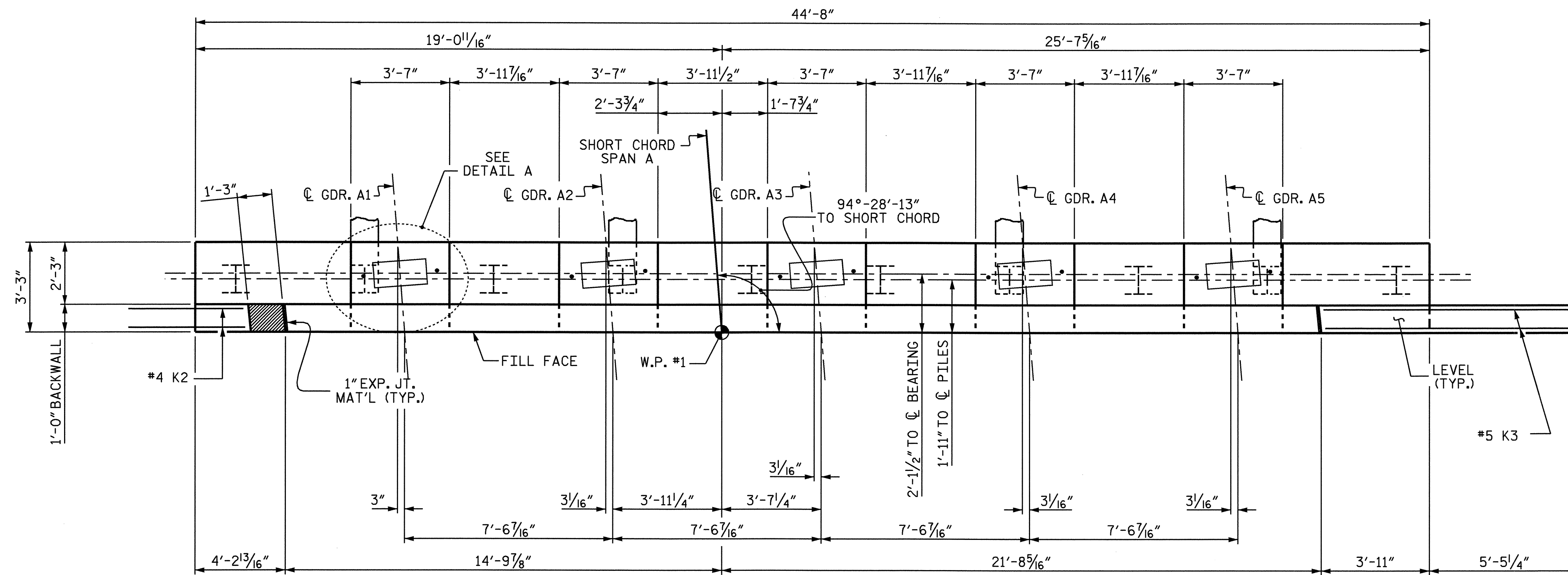
THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

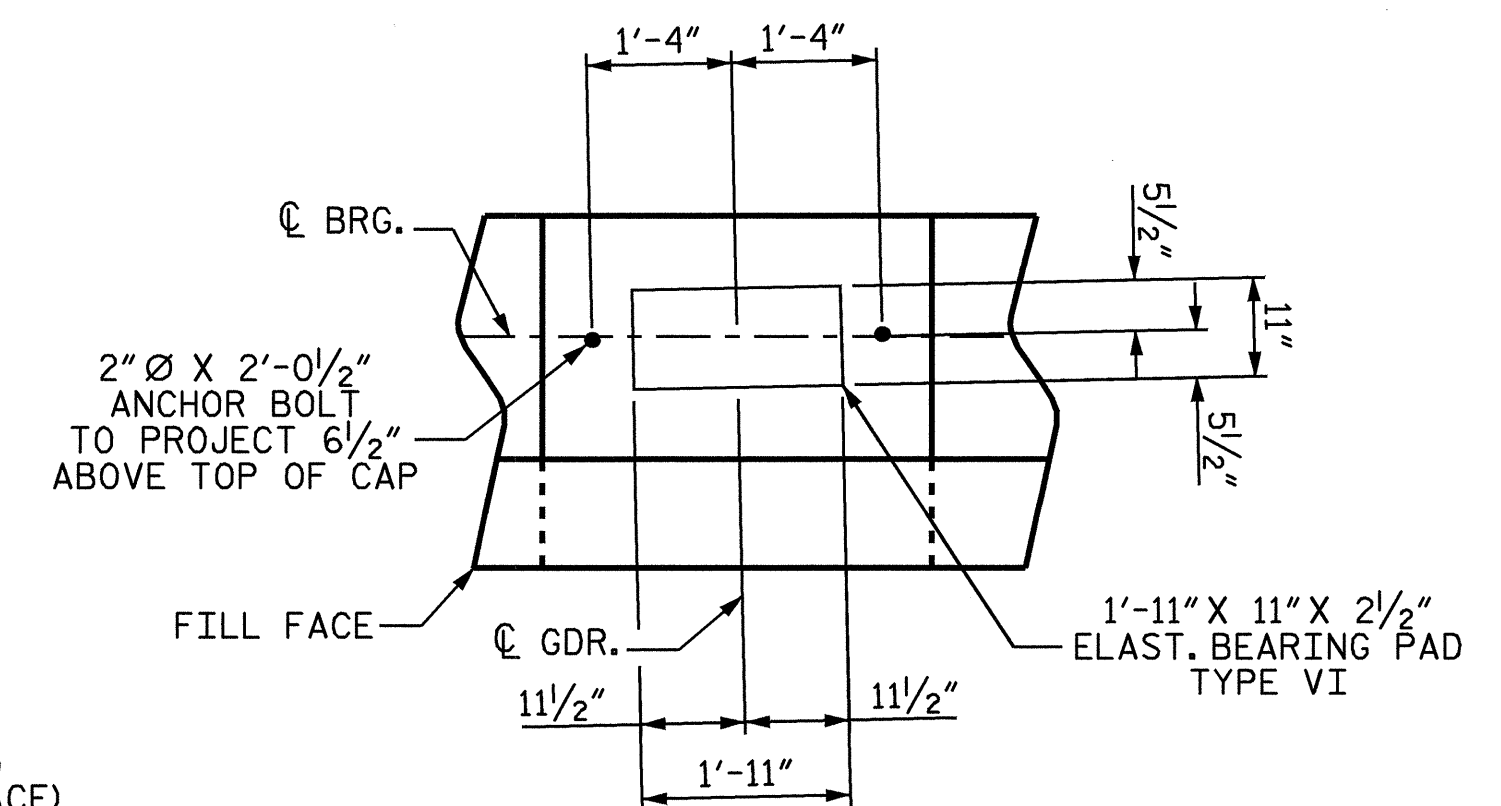
BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

A MINIMUM OF 35' OF THE TOP OF EACH PILE SHALL BE GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

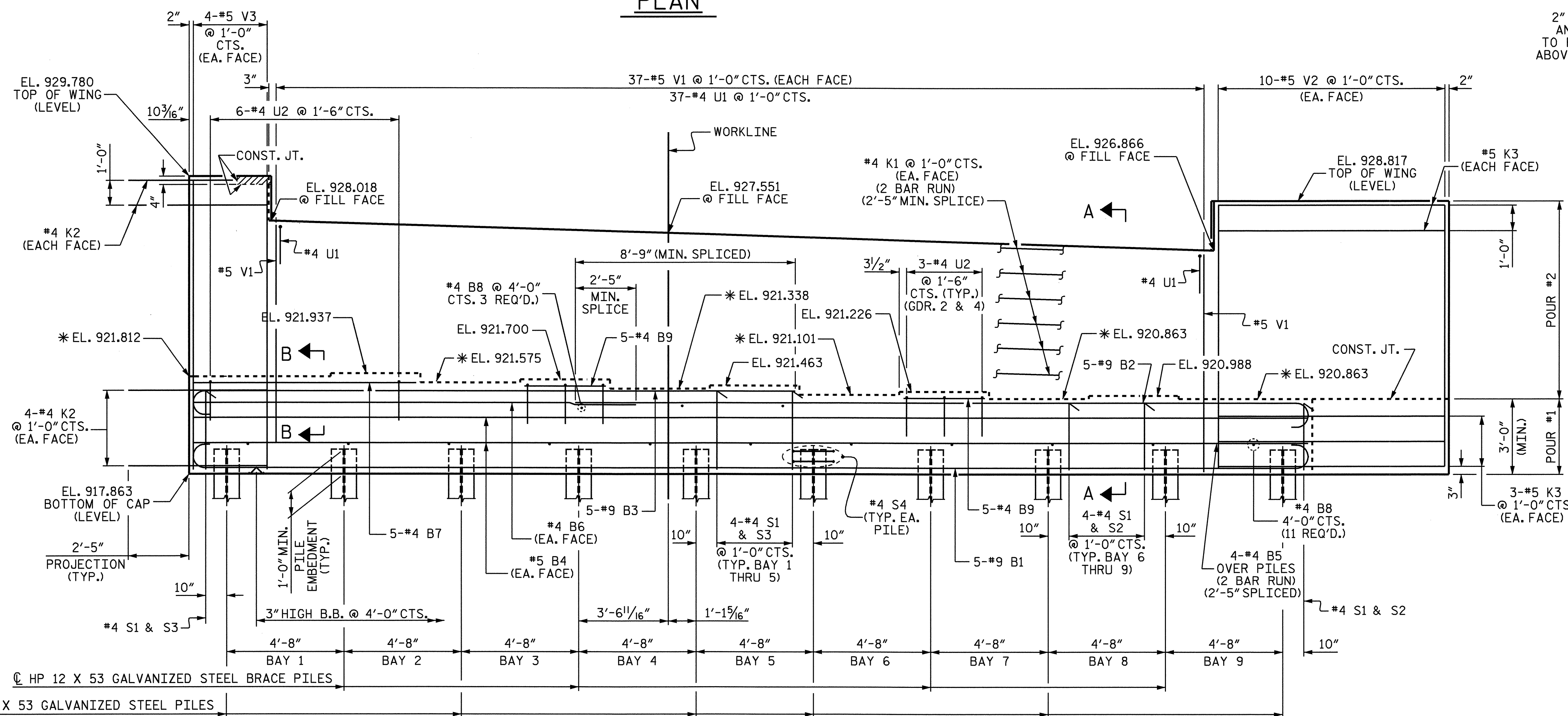


PLAN



DETAIL A
(DIMENSIONS TYP. EA. BRG.)

* FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILD UPS, SEE SECTION VIEWS, SHEET 2 OF 2.



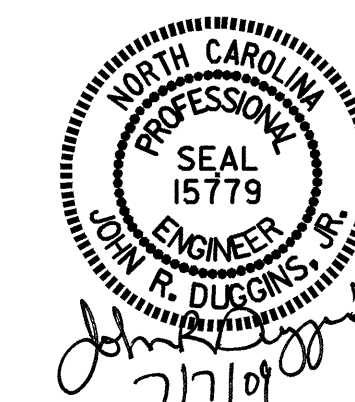
ELEVATION

PROJECT NO. U-4006
GUILFORD COUNTY
 STATION: 20+90.21 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

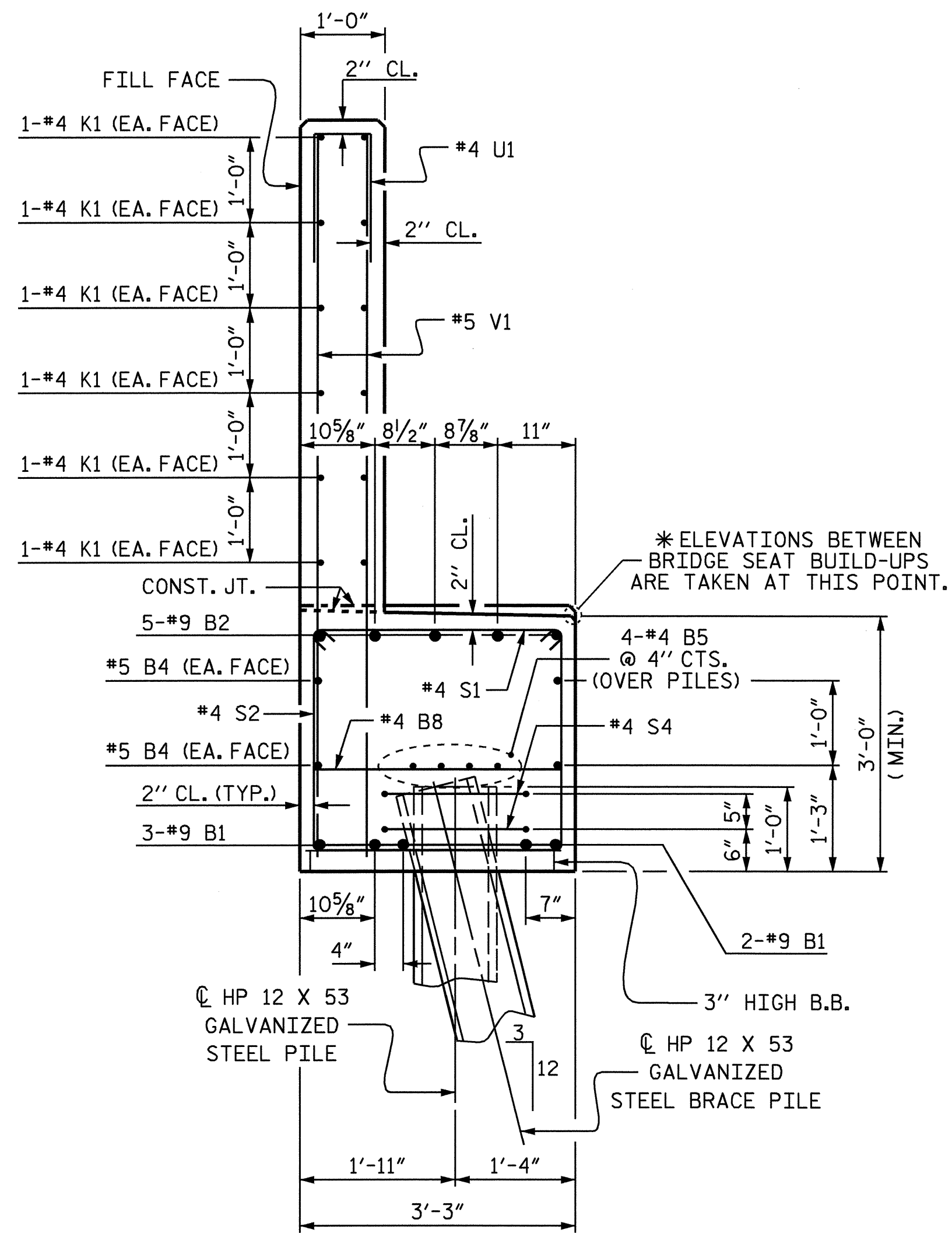
**SUBSTRUCTURE
 END BENT #1
 RIGHT LANE**



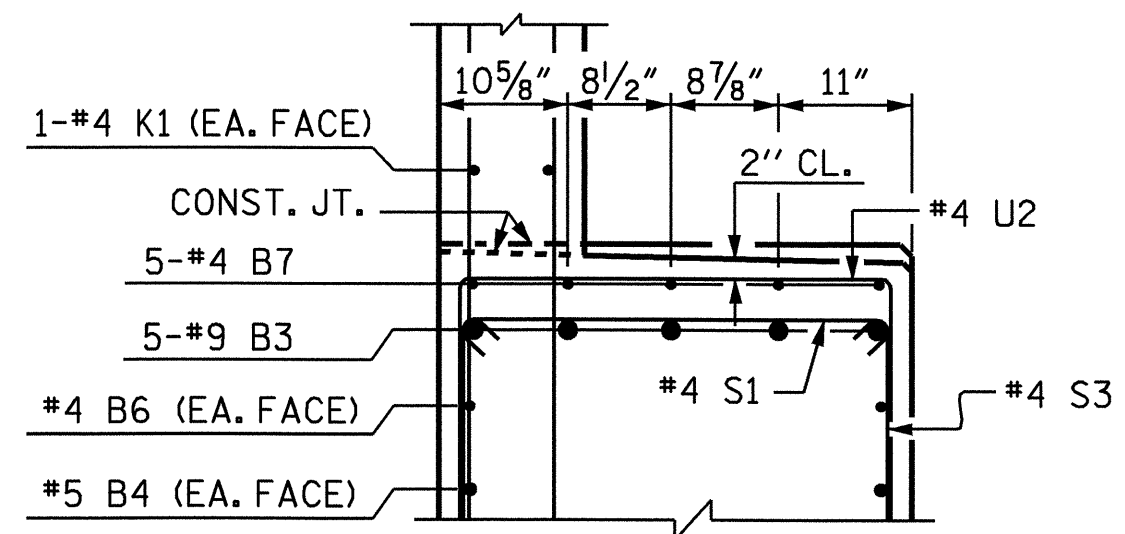
DRAWN BY : A. SORSENGINH DATE : 4-15-09
 CHECKED BY : D. HODGE DATE : 6-1-09

07-JUL-2009 10:44
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 dahodge

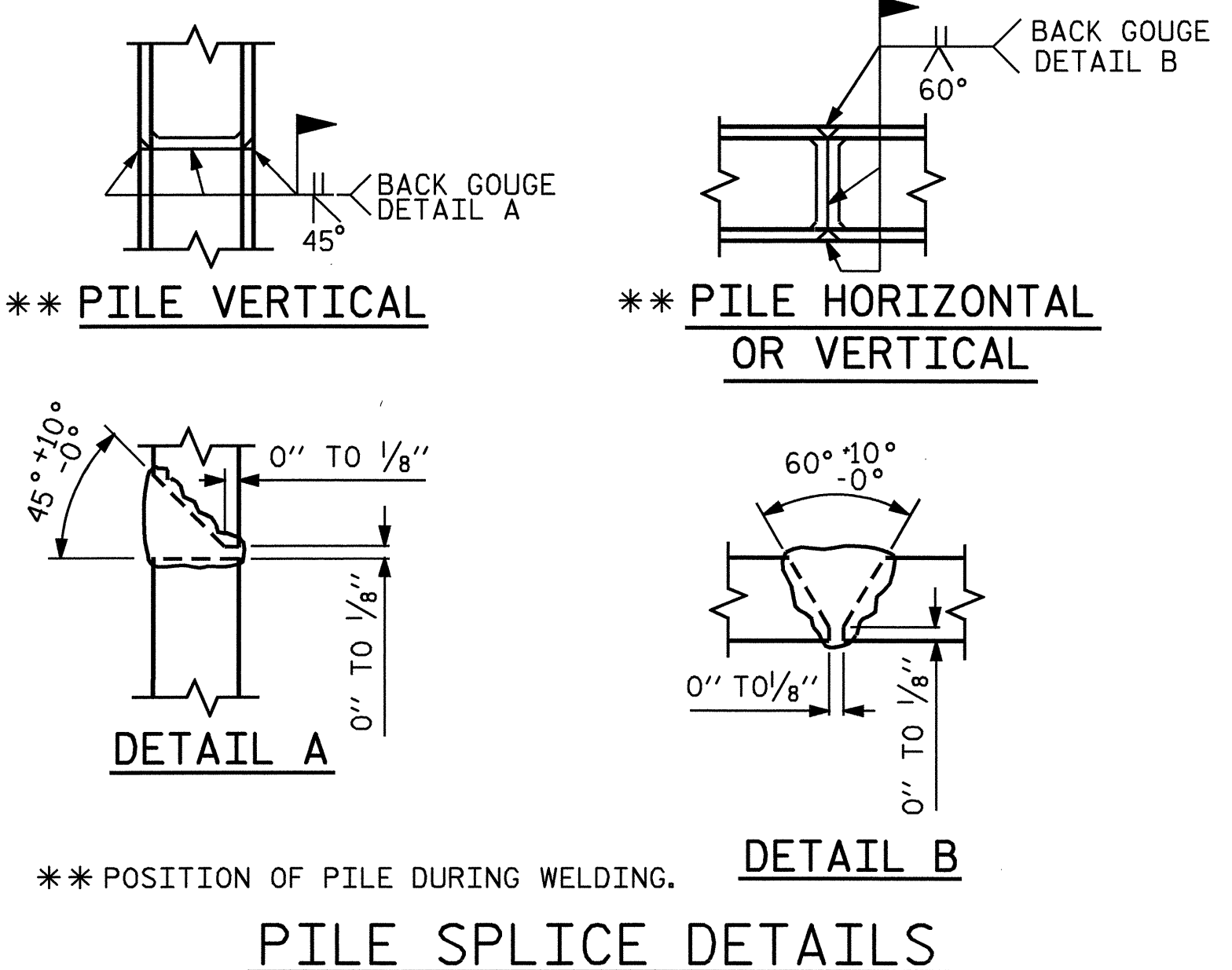
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	3-65
1			3			TOTAL SHEETS
2			4			75



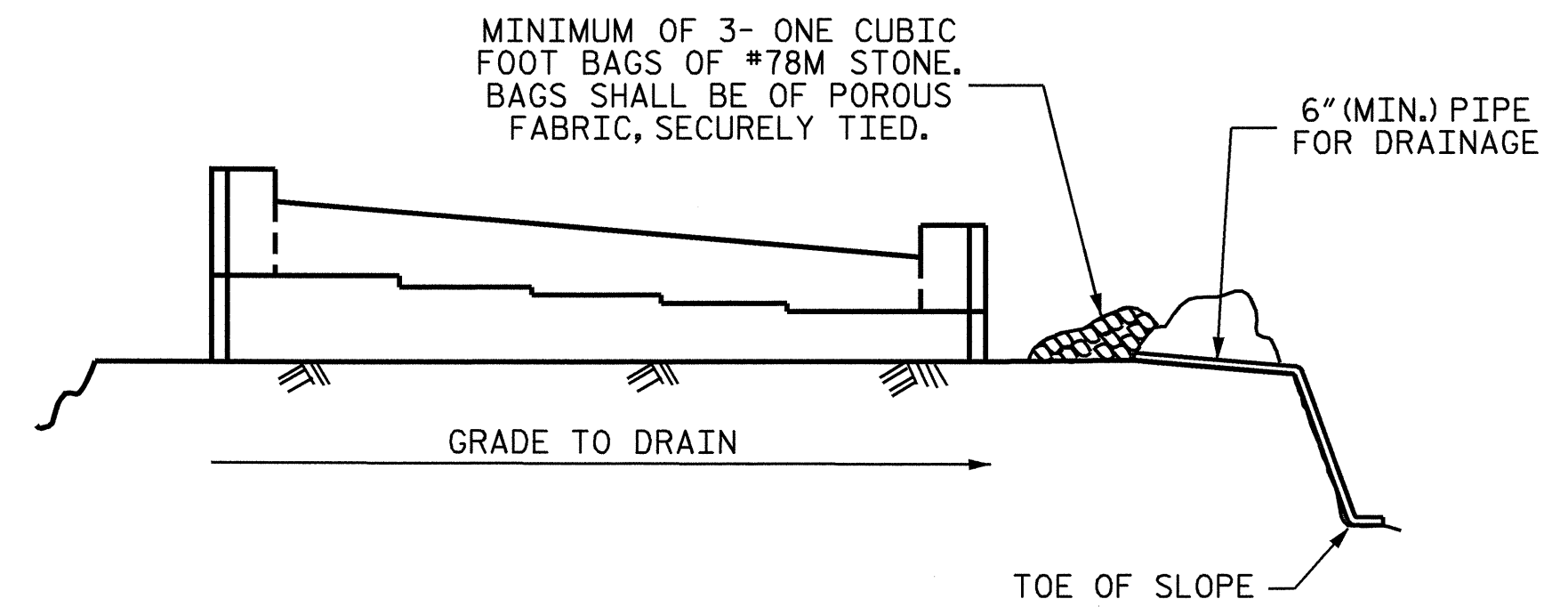
SECTION A-A



SECTION B-B



PILE SPLICE DETAILS

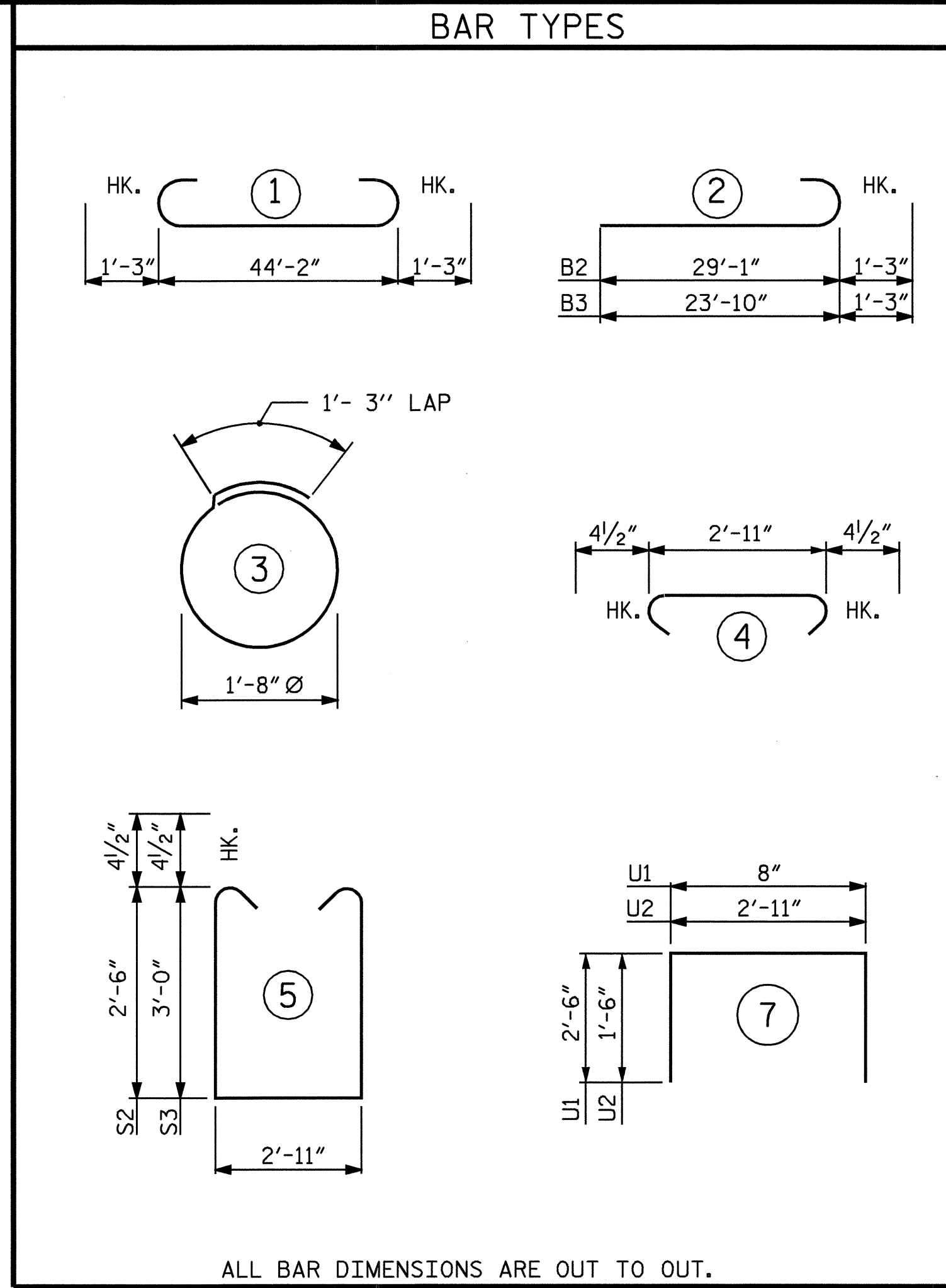


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

TEMPORARY DRAINAGE AT END BENT

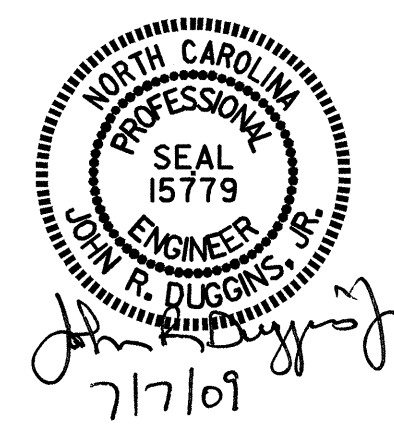


ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
END BENT #1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	#9	1	46'-8"	793
B2	5	#9	2	30'-4"	516
B3	5	#9	2	25'-1"	426
B4	4	#5	STR	44'-4"	185
B5	8	#4	STR	23'-5"	125
B6	2	#4	STR	17'-7"	23
B7	5	#4	STR	8'-10"	30
B8	14	#4	STR	2'-11"	27
B9	10	#4	STR	3'-3"	22
K1	24	#4	STR	26'-1"	418
K2	12	#4	STR	6'-5"	51
K3	10	#5	STR	9'-0"	94
S1	38	#4	4	3'-8"	93
S2	17	#4	5	8'-8"	98
S3	21	#4	5	9'-8"	136
S4	20	#4	3	6'-6"	87
U1	37	#4	7	5'-8"	140
U2	12	#4	7	5'-11"	47
V1	74	#5	STR	8'-8"	669
REINFORCING STEEL				LBS.	3980
CLASS A CONC. BREAKDOWN					
POUR #1				CAP & LOWER PART OF WINGS 19.3 CU. YDS.	
POUR #2				BACKWALL & UPPER PART OF WINGS 12.2 CU. YDS.	
CLASS A CONCRETE TOTAL				31.5 CU. YDS.	
HP 12 X 53 GALVANIZED STEEL PILES					
NO. 10		LIN. FT.		700	

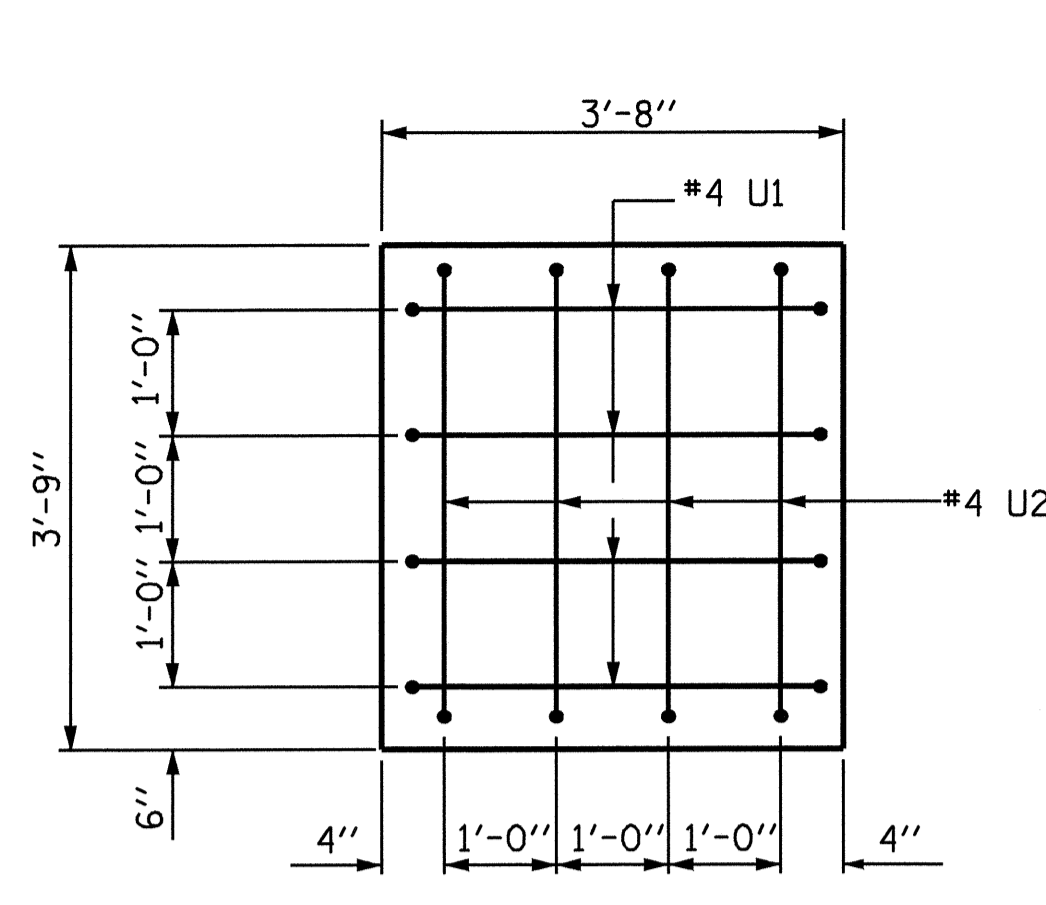
PROJECT NO. U-4006
GUILFORD COUNTY
 STATION: 20+90.21 -L-

SHEET 2 OF 2
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT #1
 RIGHT LANE

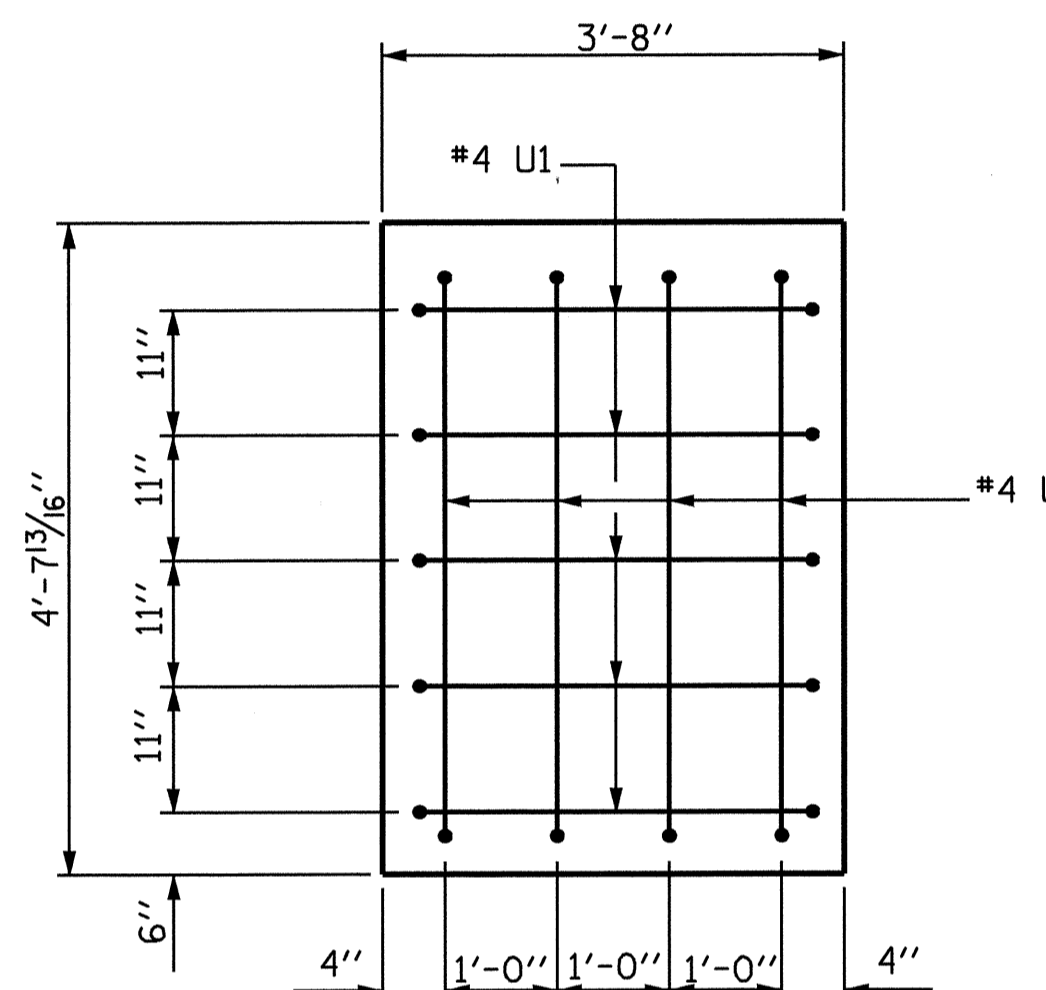


DRAWN BY: A. SORSENGINH DATE: 4/15/09
 CHECKED BY: D. HODGE DATE: 6/1/09

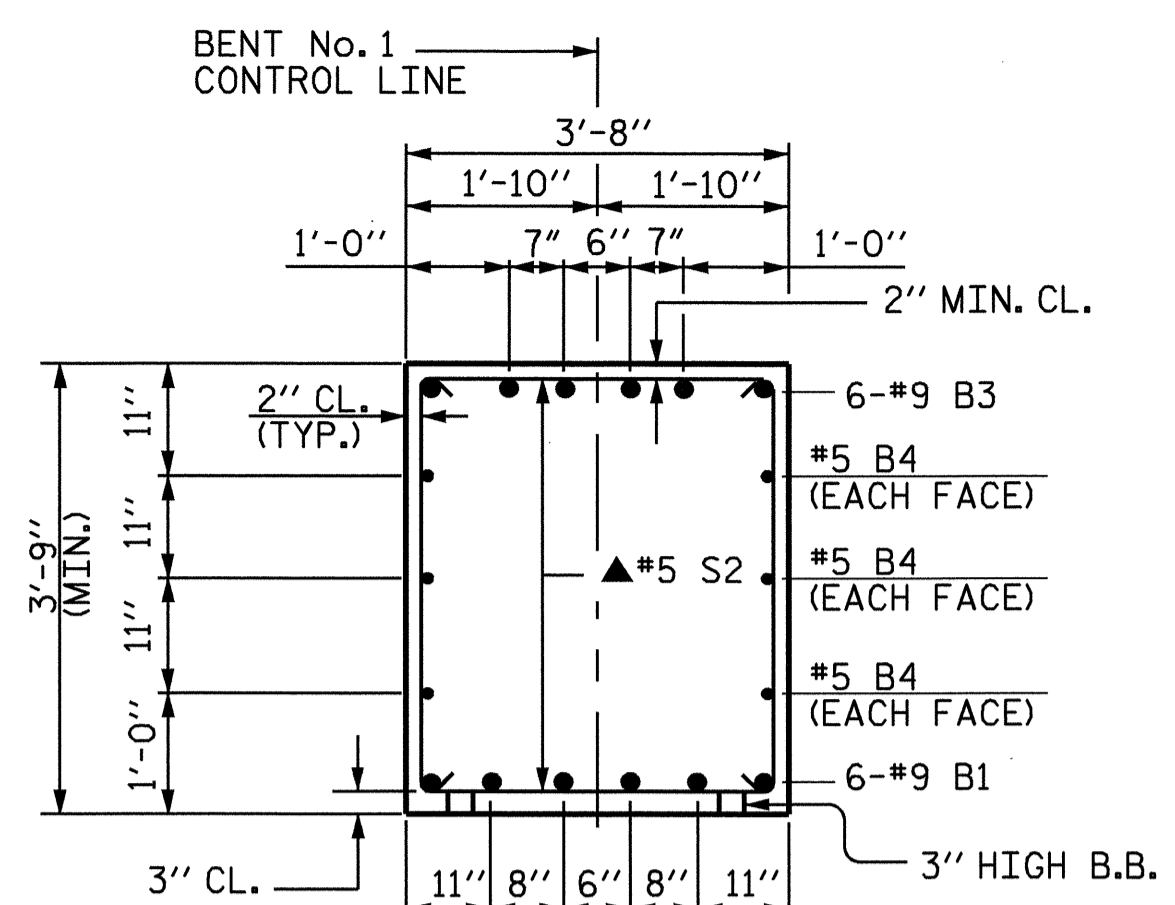
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			5-66
2			4			75



END OF CAP ELEVATION
RIGHT SIDE

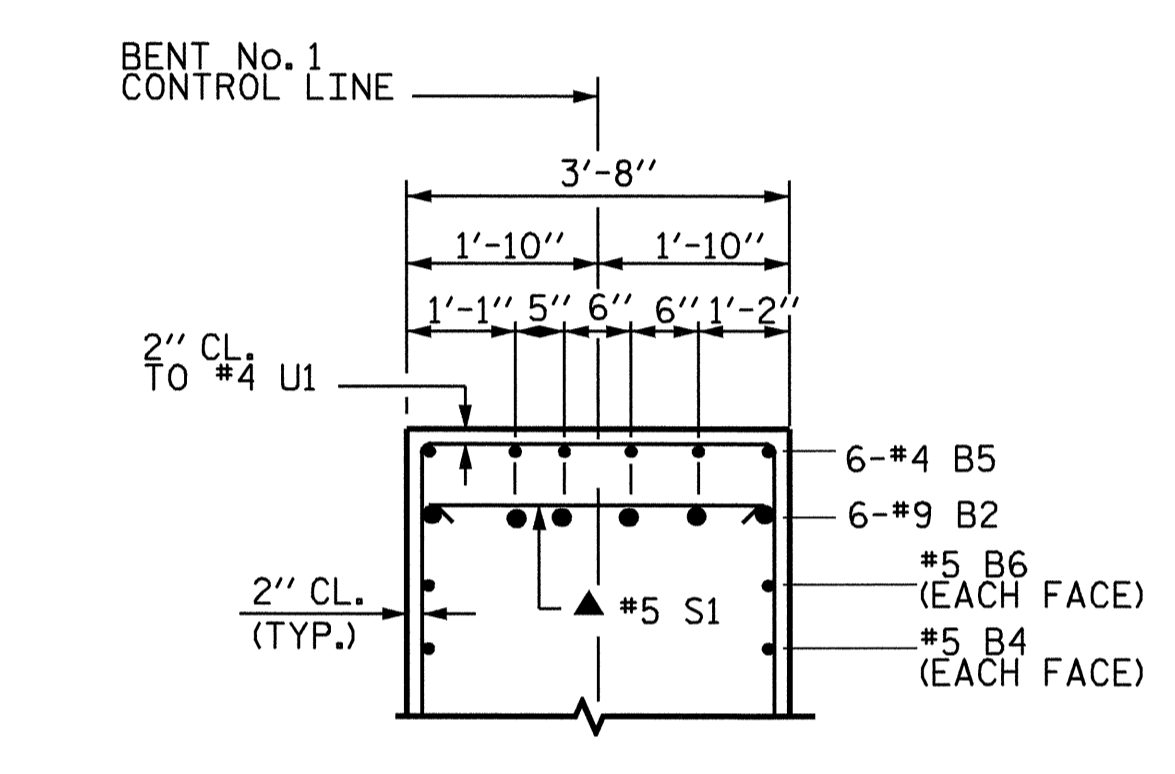


END OF CAP ELEVATION
LEFT SIDE



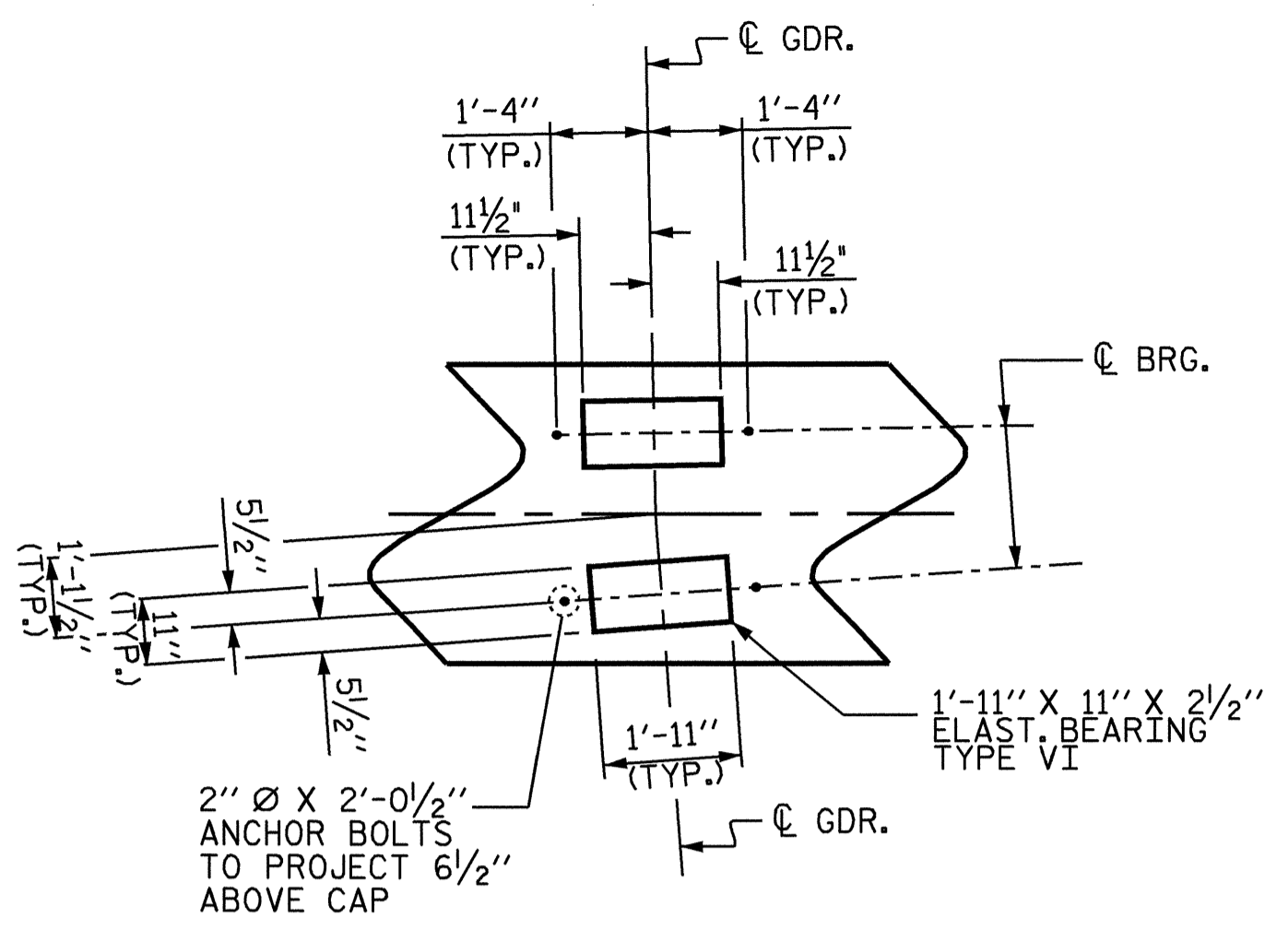
SECTION A-A

▲ INVERT ALTERNATE STIRRUPS

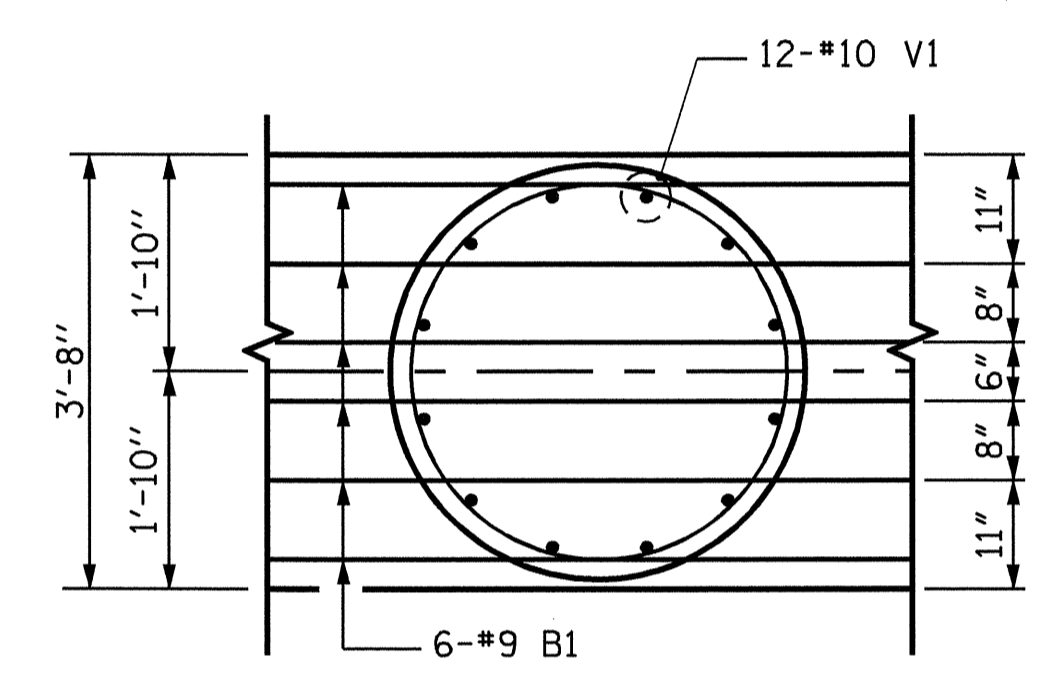


SECTION B-B

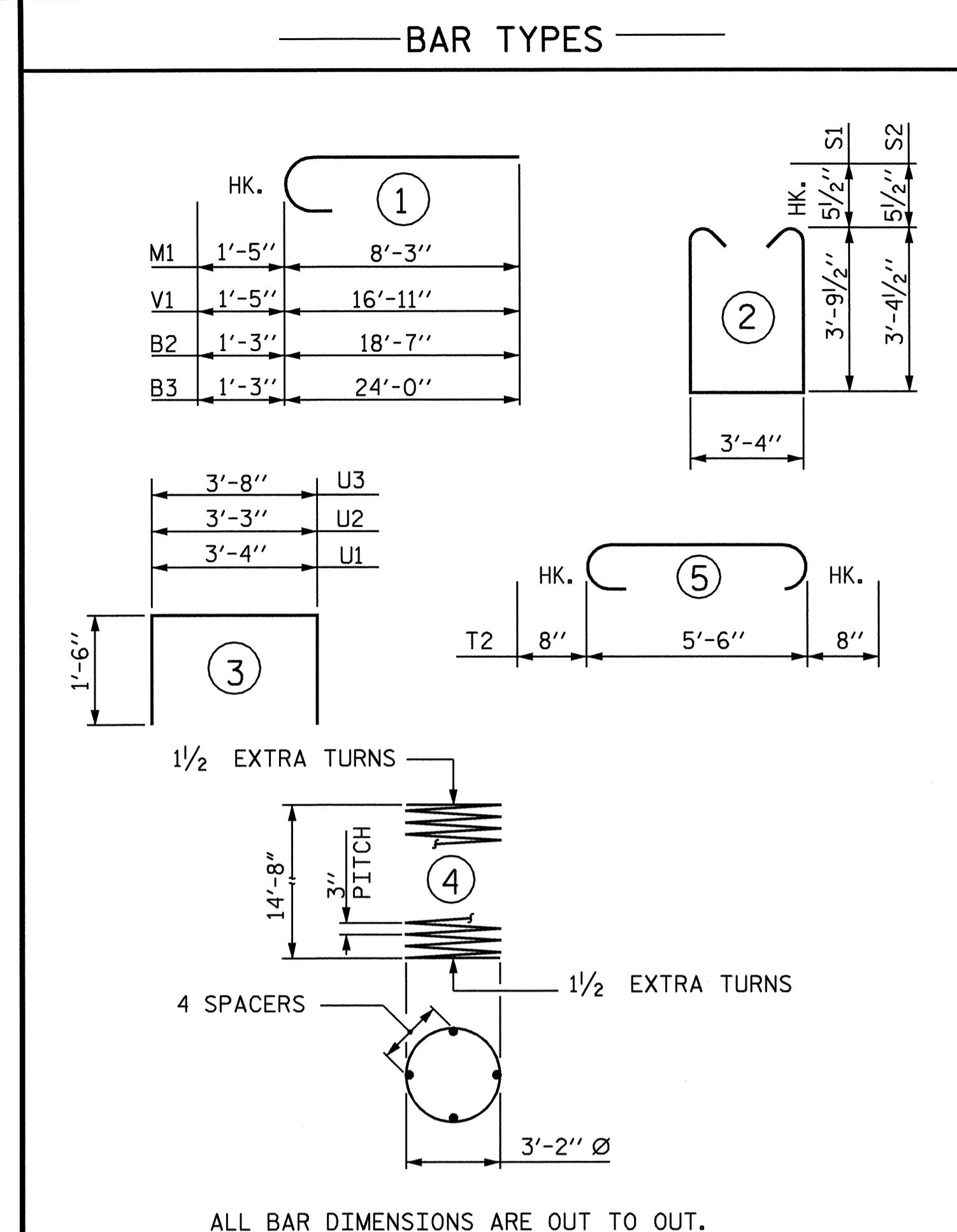
▲ INVERT ALTERNATE STIRRUPS



DETAIL A



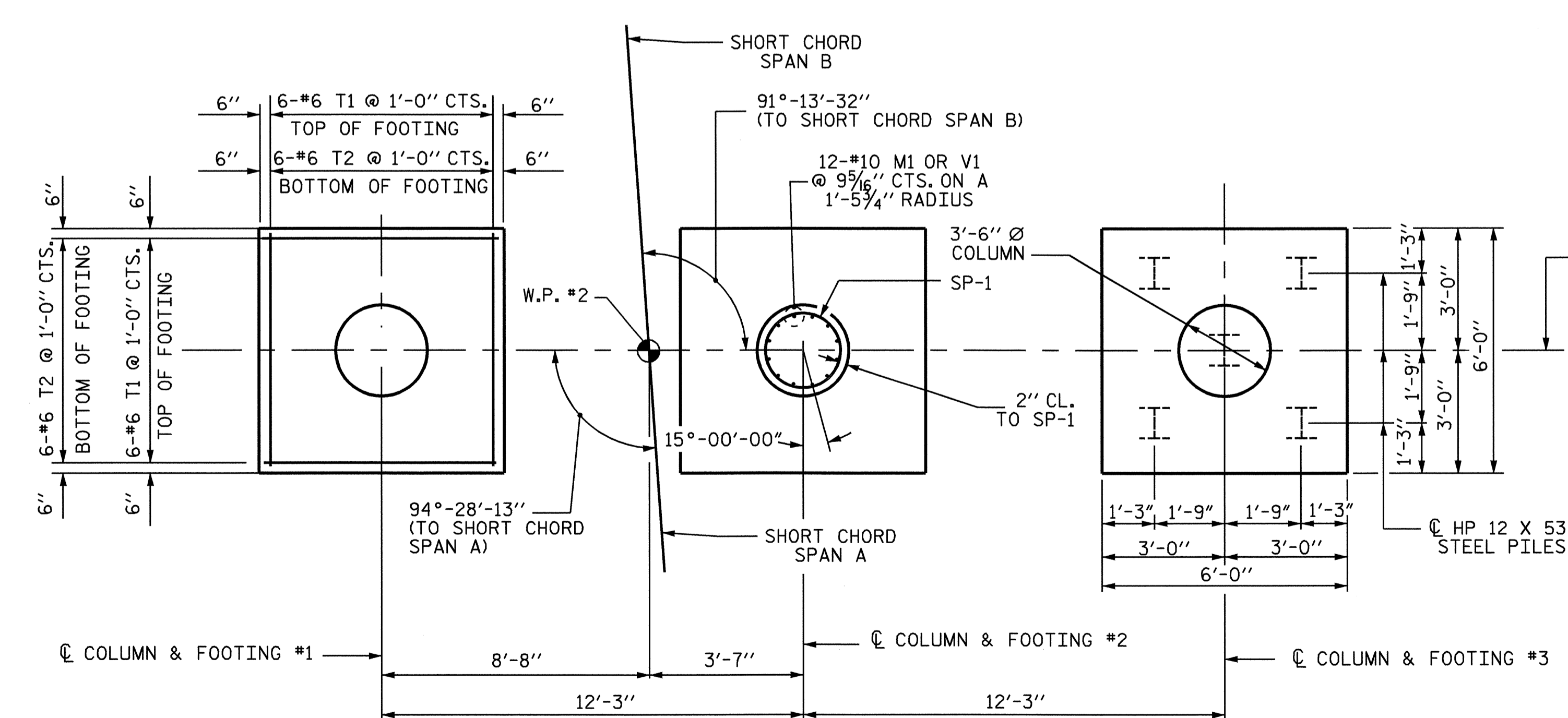
BOTTOM OF CAP



ALL BAR DIMENSIONS ARE OUT TO OUT.

*** THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

BILL OF MATERIAL					
BENT No. 1					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	6	9	STR	34'-0"	694
B2	6	9	1	19'-10"	405
B3	6	9	1	25'-3"	515
B4	6	5	STR	34'-0"	213
B5	6	4	STR	3'-9"	15
B6	2	5	STR	12'-6"	26
B7	3	4	STR	3'-4"	7
M1	36	10	1	9'-8"	1497
S1	26	5	2	11'-10"	321
S2	26	5	2	11'-0"	298
T1	36	6	STR	5'-6"	297
T2	36	6	5	6'-10"	369
U1	49	4	3	6'-4"	207
U2	4	4	3	6'-3"	17
U3	4	4	3	6'-8"	18
V1	36	10	1	18'-4"	2840
REINFORCING STEEL				7739	LBS
CLASS A CONCRETE BREAKDOWN					
POUR #1 (FOOTINGS)				11.0	C.Y.
POUR #2 (COLUMNS)				15.5	C.Y.
POUR #3 (CAP)				19.3	C.Y.
TOTAL				45.8	C.Y.
HP 12 X 53 STEEL PILES					
No. 15				790	LN. FEET
TOTAL SPIRAL COLUMN REINFORCING STEEL 1220 LBS					
BAR NO. SIZE TYPE LENGTH WEIGHT					
SP-1	3	***	4	608'-11"	1220

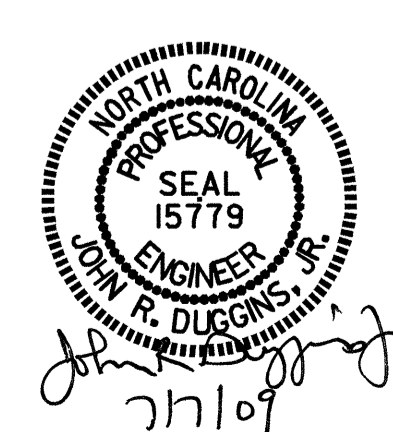


PLAN OF FOOTINGS

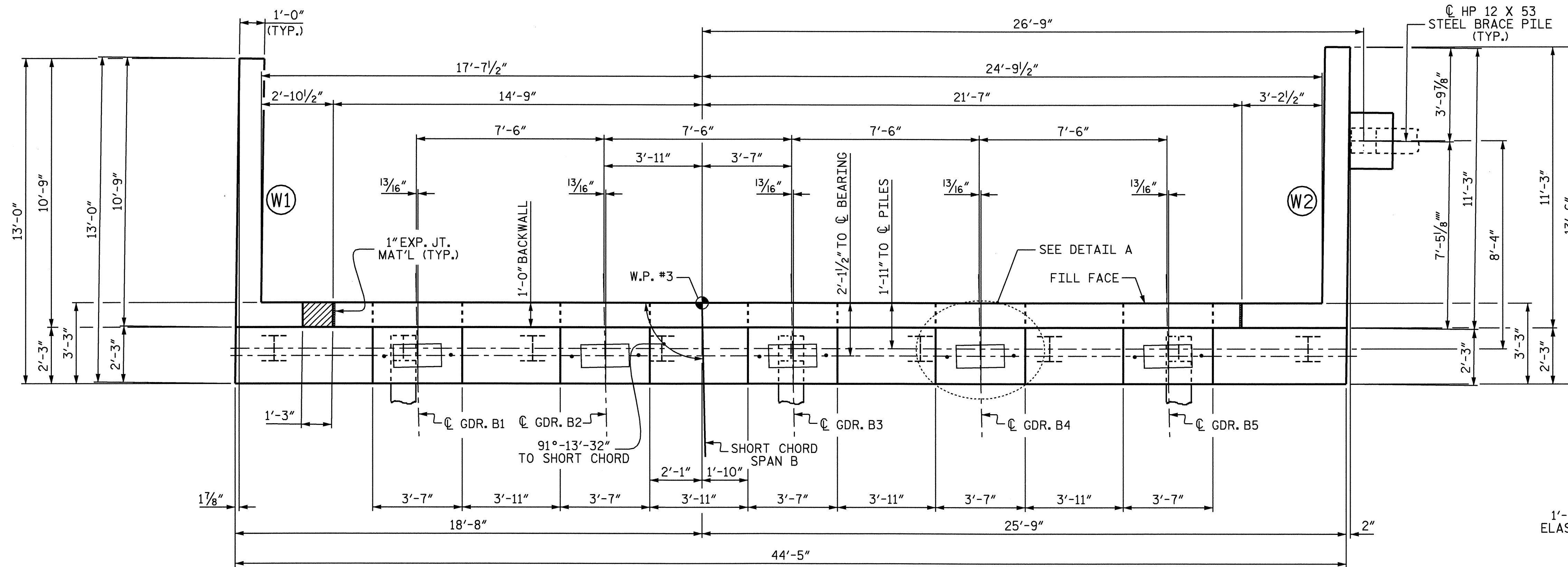
ALL FOOTINGS ARE TYPICAL

PROJECT NO. U-4006
GUILFORD COUNTY
STATION: 20+90.21 -L-
SHEET 2 OF 2

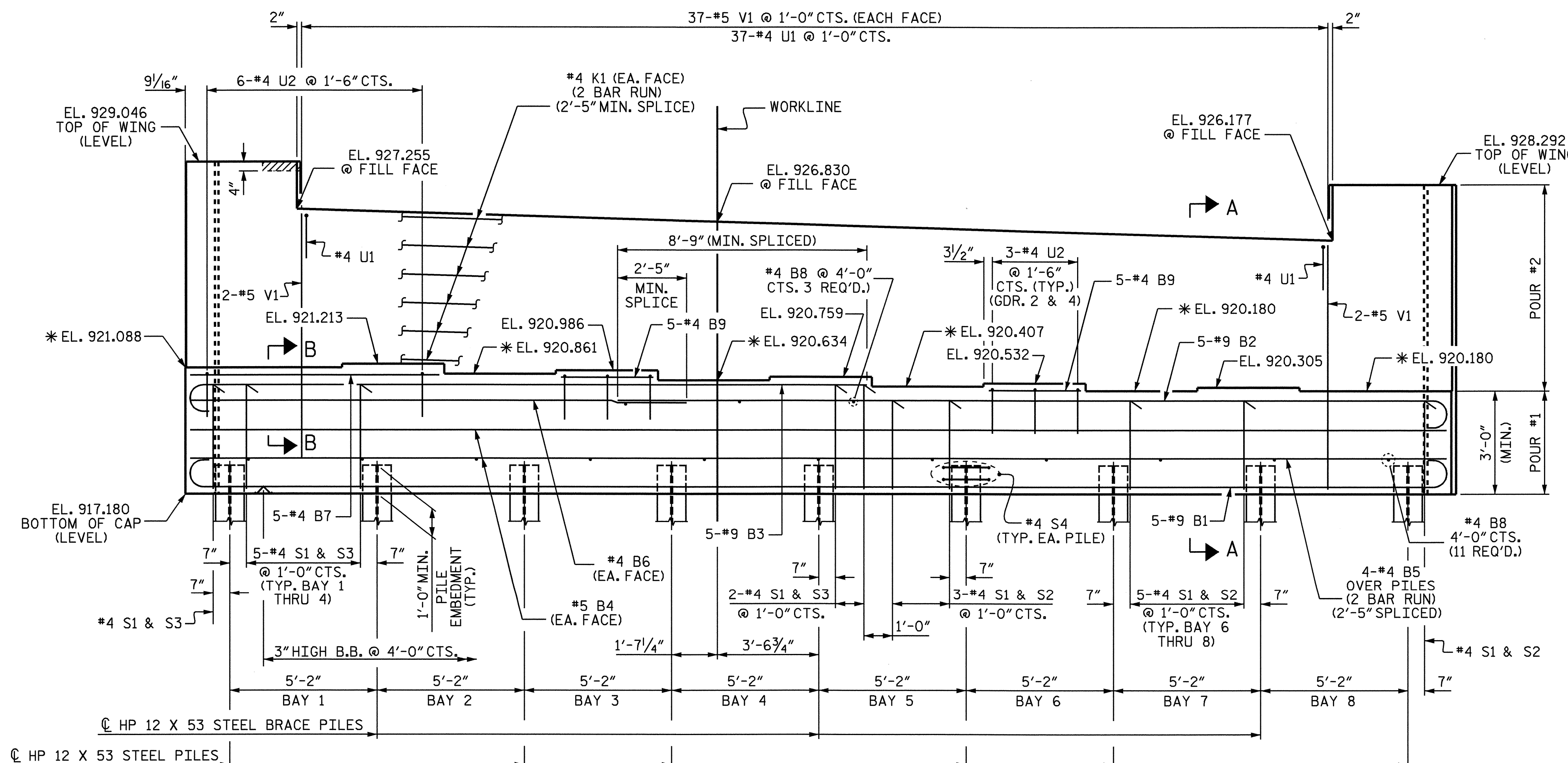
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT No. 1 RIGHT LANE					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 75



DRAWN BY: M. POOLE DATE: 3/09
CHECKED BY: A. SORSENGINH DATE: 4/09



PLAN



ELEVATION

PILE IN WING NOT SHOWN FOR CLARITY

NOTES

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

THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

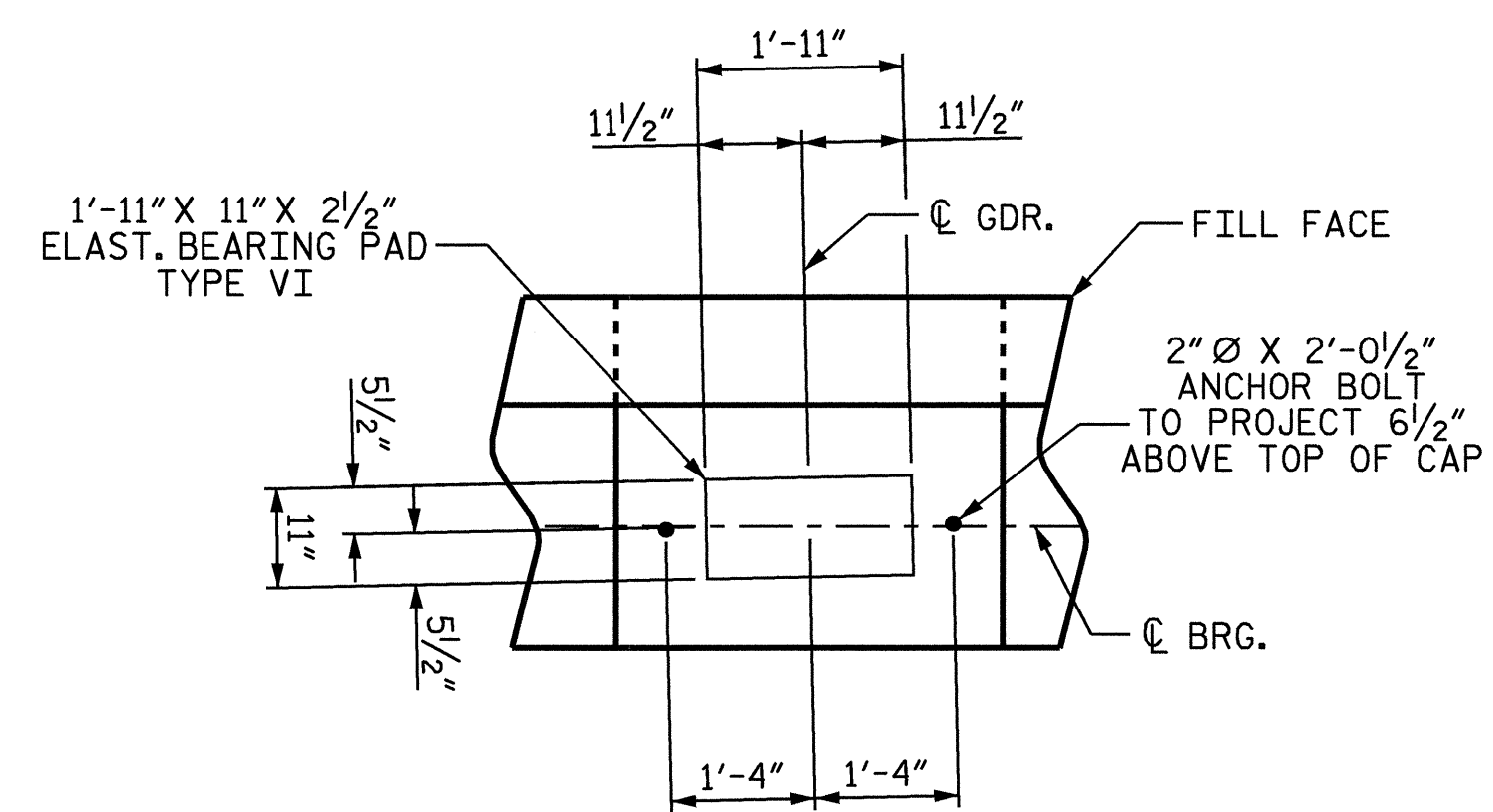
THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

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



DETAIL A
(DIMENSIONS TYP. EA. BRG.)

* FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILD UPS, SEE SECTION VIEWS, SHEET 2 OF 2.

PROJECT NO. U-4006
GUILFORD COUNTY
 STATION: 20+90.21 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

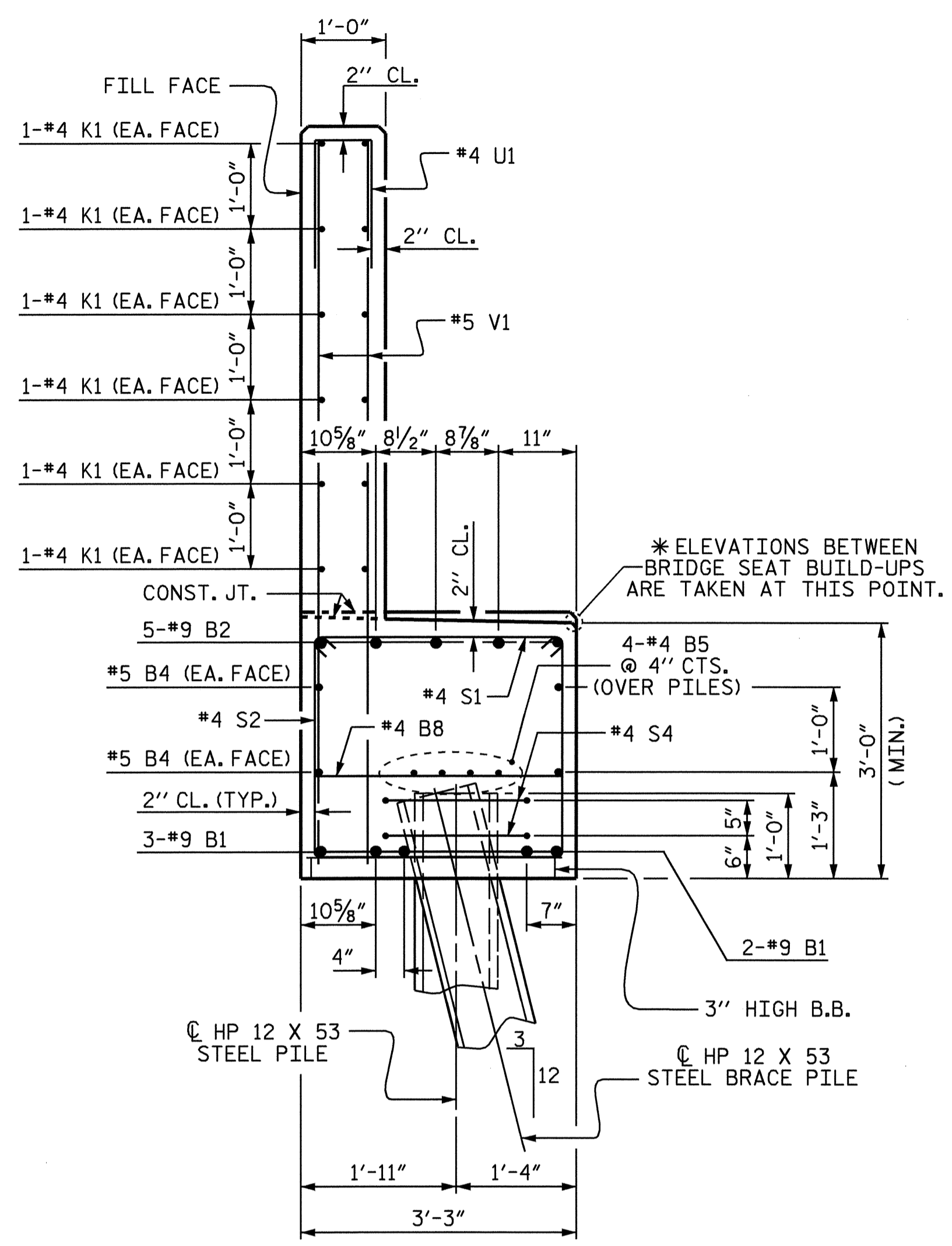
**SUBSTRUCTURE
 END BENT #2
 RIGHT LANE**



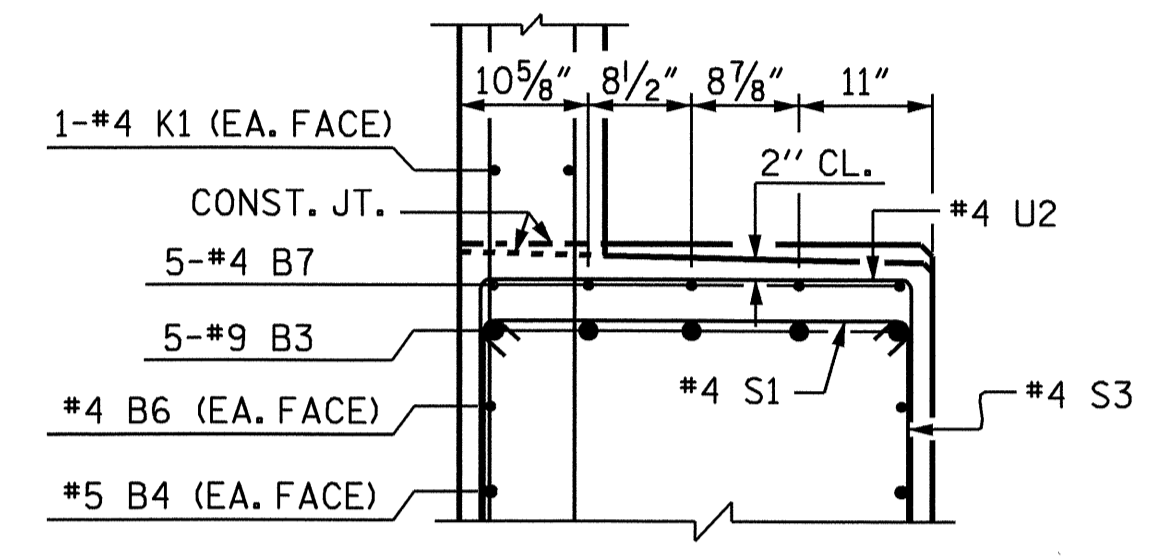
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-69	
1			3			TOTAL SHEETS	
2			4			75	

DRAWN BY: A. SORSENGINH DATE: 3-26-09
 CHECKED BY: D. HODGE DATE: 6-1-09

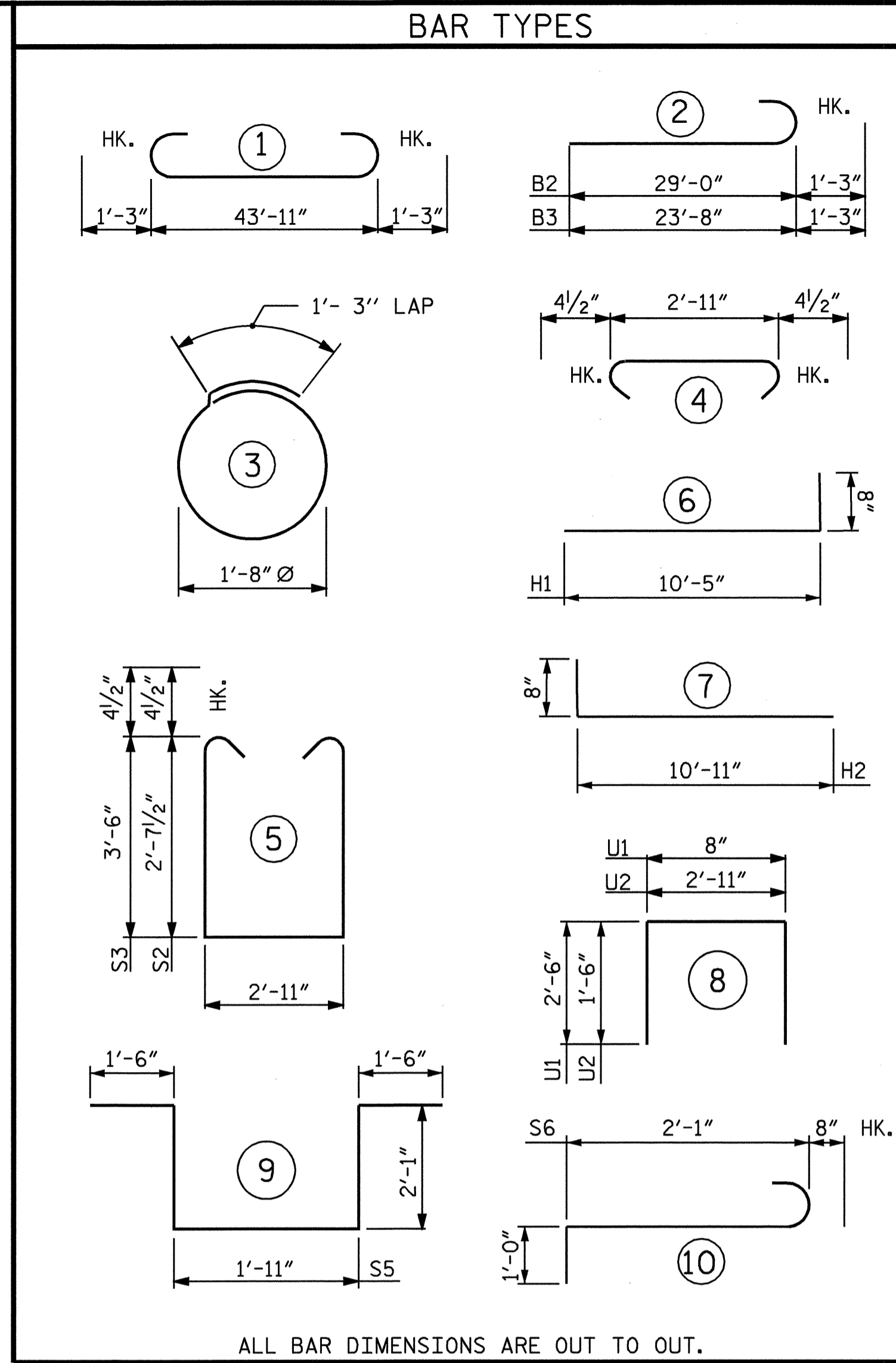
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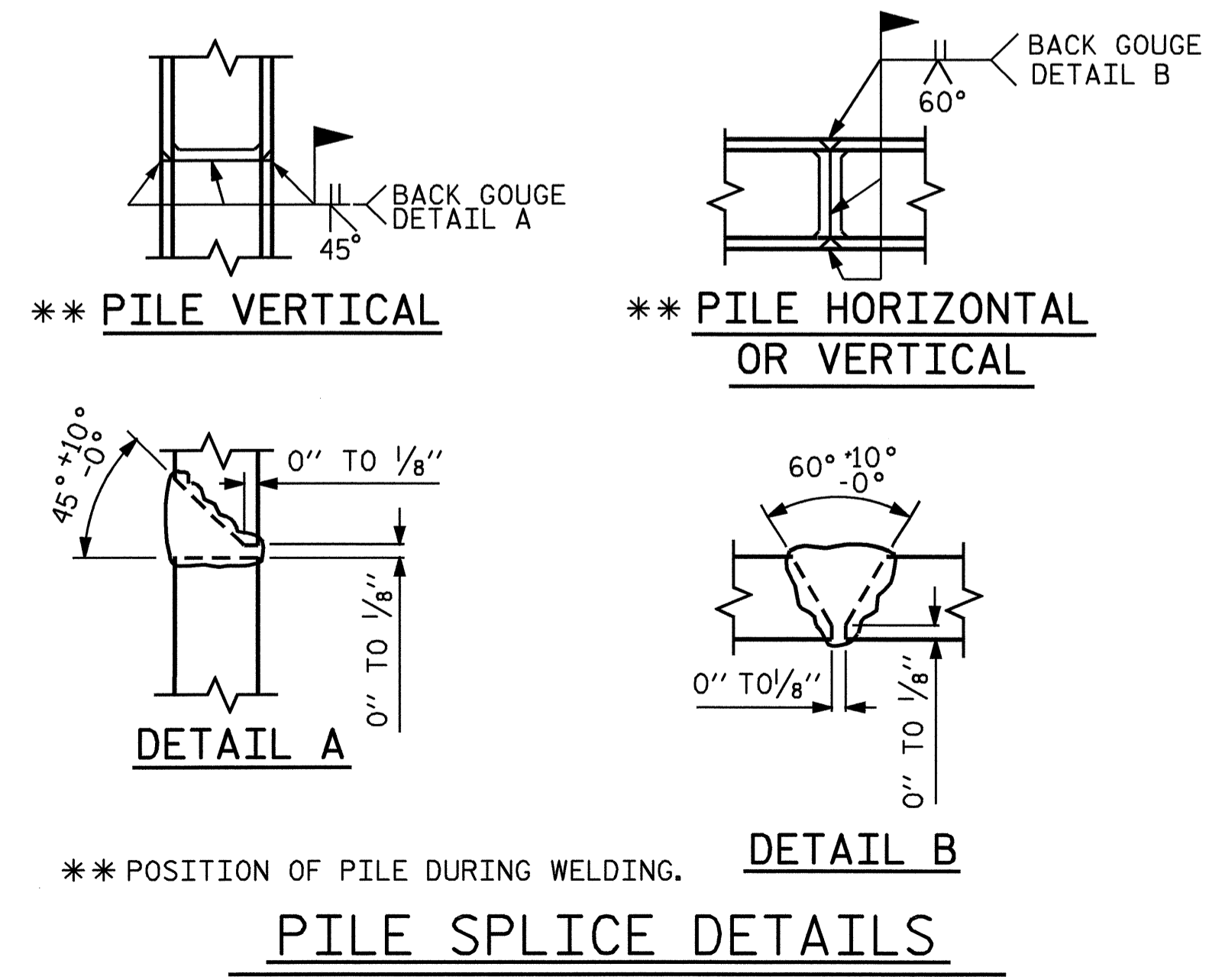
SECTION A-A



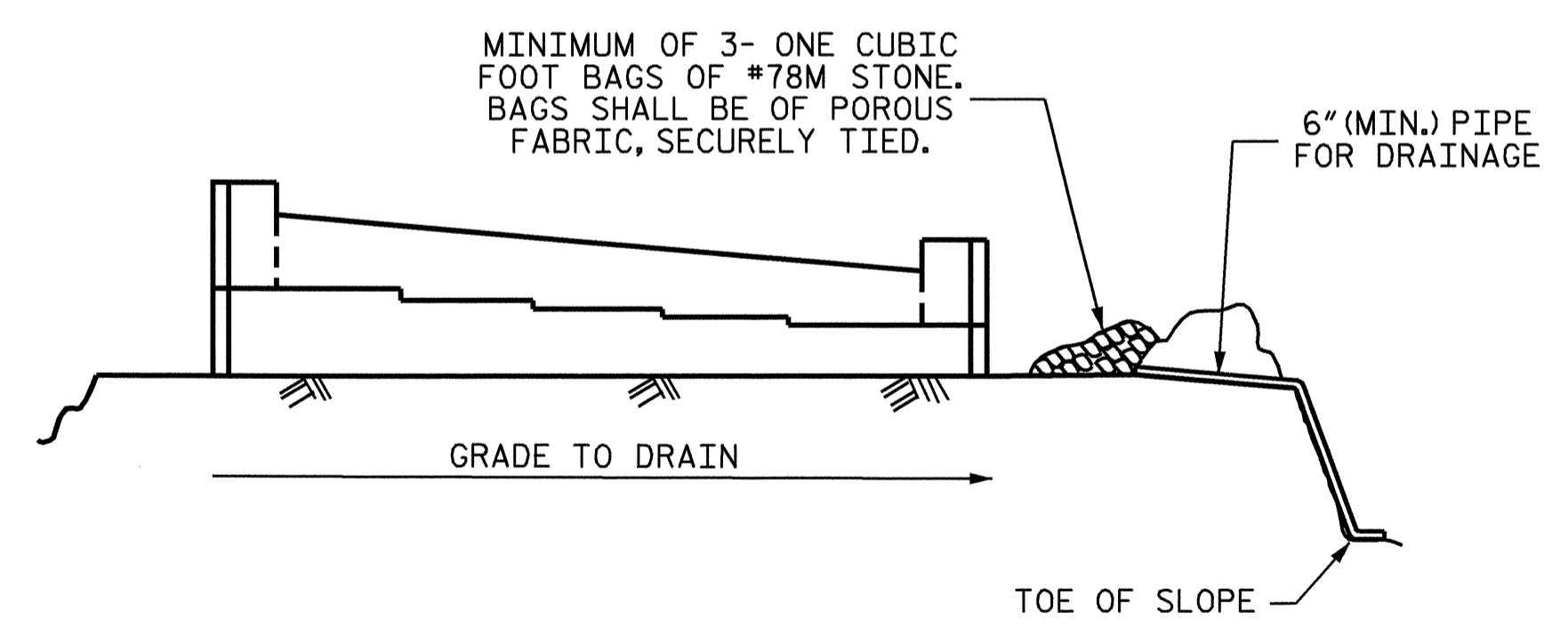
SECTION B-B



BILL OF MATERIAL					
END BENT #2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	#9	1	46'-5"	789
B2	5	#9	2	30'-3"	514
B3	5	#9	2	24'-11"	424
B4	4	#5	STR	44'-1"	184
B5	8	#4	STR	23'-3"	124
B6	2	#4	STR	17'-4"	23
B7	5	#4	STR	8'-8"	29
B8	14	#4	STR	2'-11"	27
B9	10	#4	STR	3'-3"	22
H1	26	#5	6	11'-1"	301
H2	24	#5	7	11'-7"	290
K1	24	#4	STR	23'-5"	375
K2	4	#4	STR	3'-6"	9
K3	4	#4	STR	3'-10"	10
S1	42	#4	4	3'-8"	103
S2	19	#4	5	8'-11"	113
S3	23	#4	5	10'-8"	164
S4	18	#4	3	6'-6"	78
S5	1	#6	9	9'-1"	14
S6	3	#6	10	3'-9"	17
U1	37	#4	8	5'-8"	140
U2	12	#4	8	5'-11"	47
V1	74	#5	STR	9'-2"	708
V2	30	#5	STR	11'-6"	360
V3	34	#5	STR	10'-9"	381
REINFORCING STEEL					LBS. 5246
CLASS A CONC. BREAKDOWN					
POUR #1					
CAP & LOWER PART OF WINGS 21.5 CU. YDS.					
POUR #2					
BACKWALL & UPPER PART OF WINGS 16.8 CU. YDS.					
CLASS A CONCRETE TOTAL					38.3 CU. YDS.
HP 12 X 53 STEEL PILES					
NO. 10 LIN. FT. 800					



PILE SPLICE DETAILS



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

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

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

TEMPORARY DRAINAGE AT END BENT

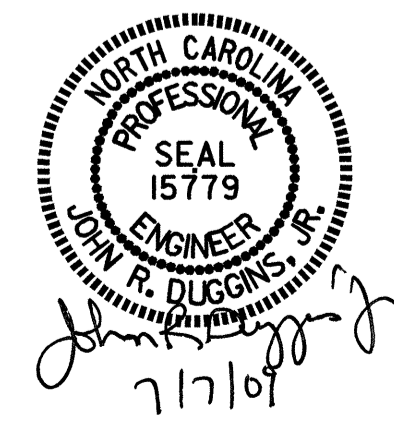
PROJECT NO. U-4006
GUILFORD COUNTY
 STATION: 20+90.21 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT #2
 RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-71
2			4			TOTAL SHEETS 75



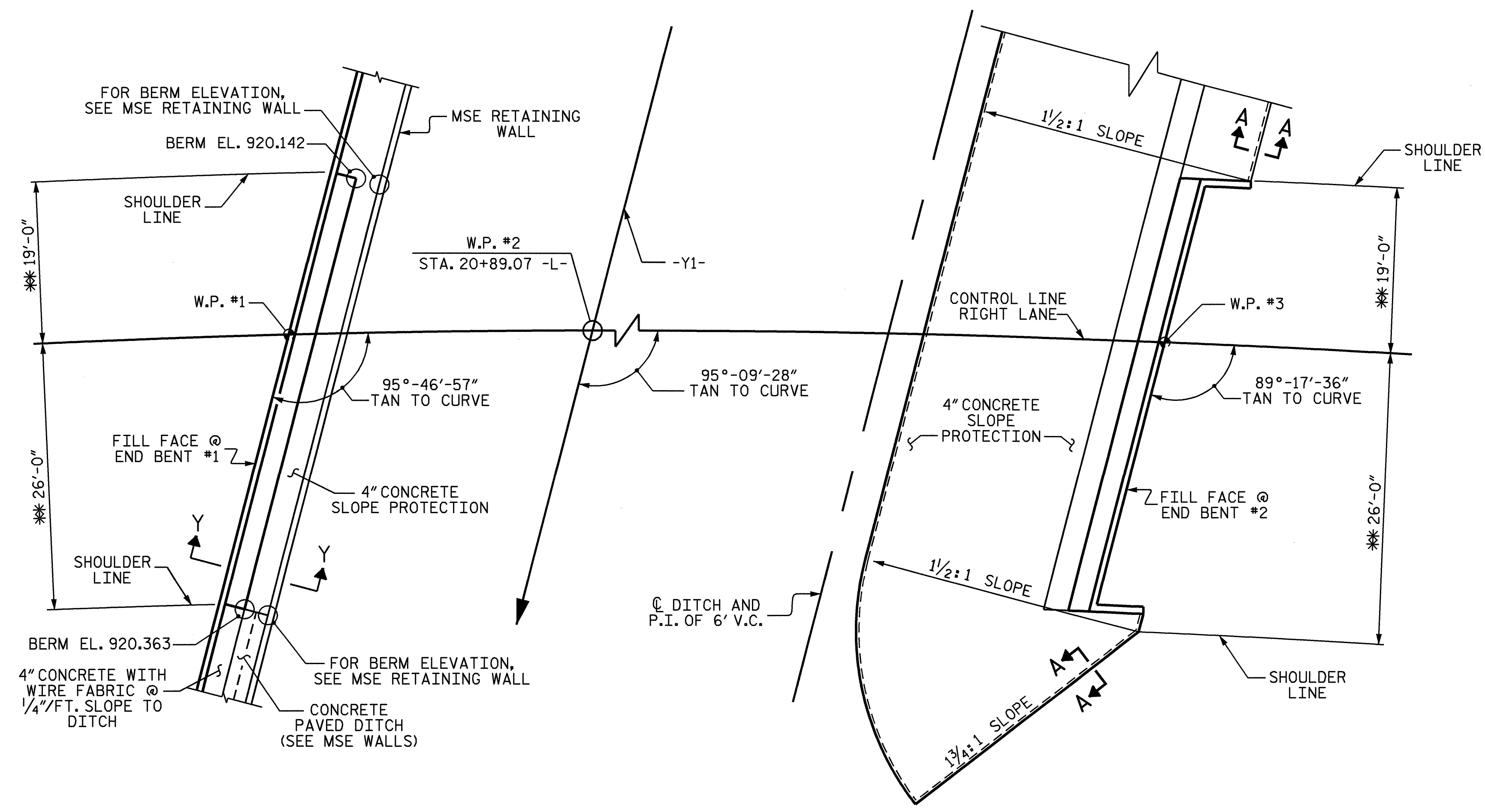
GENERAL NOTES

SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. THE CONTRACTOR, AT HIS OPTION, MAY USE ALTERNATE "B" ONLY FOR HIGHWAY OVER HIGHWAY GRADE SEPARATIONS WITH 2:1 END BENT SLOPE IN RURAL, UNPOPULATED AREAS. STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS. FOR BERM WIDTH, SEE GENERAL DRAWING.

ALTERNATE "A"

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

FOR BERM WIDTHS AND ELEVATIONS AT END BENT NO. 2, SEE GENERAL DRAWING SHEET 1 OF 4.



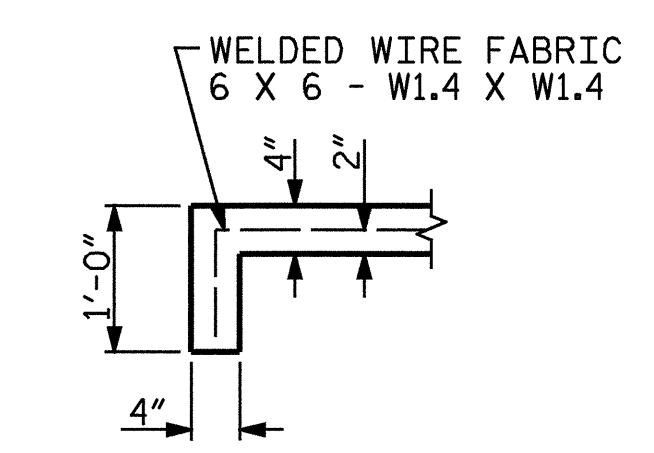
END BENT #1

PLAN
** RADIAL DIMENSIONS

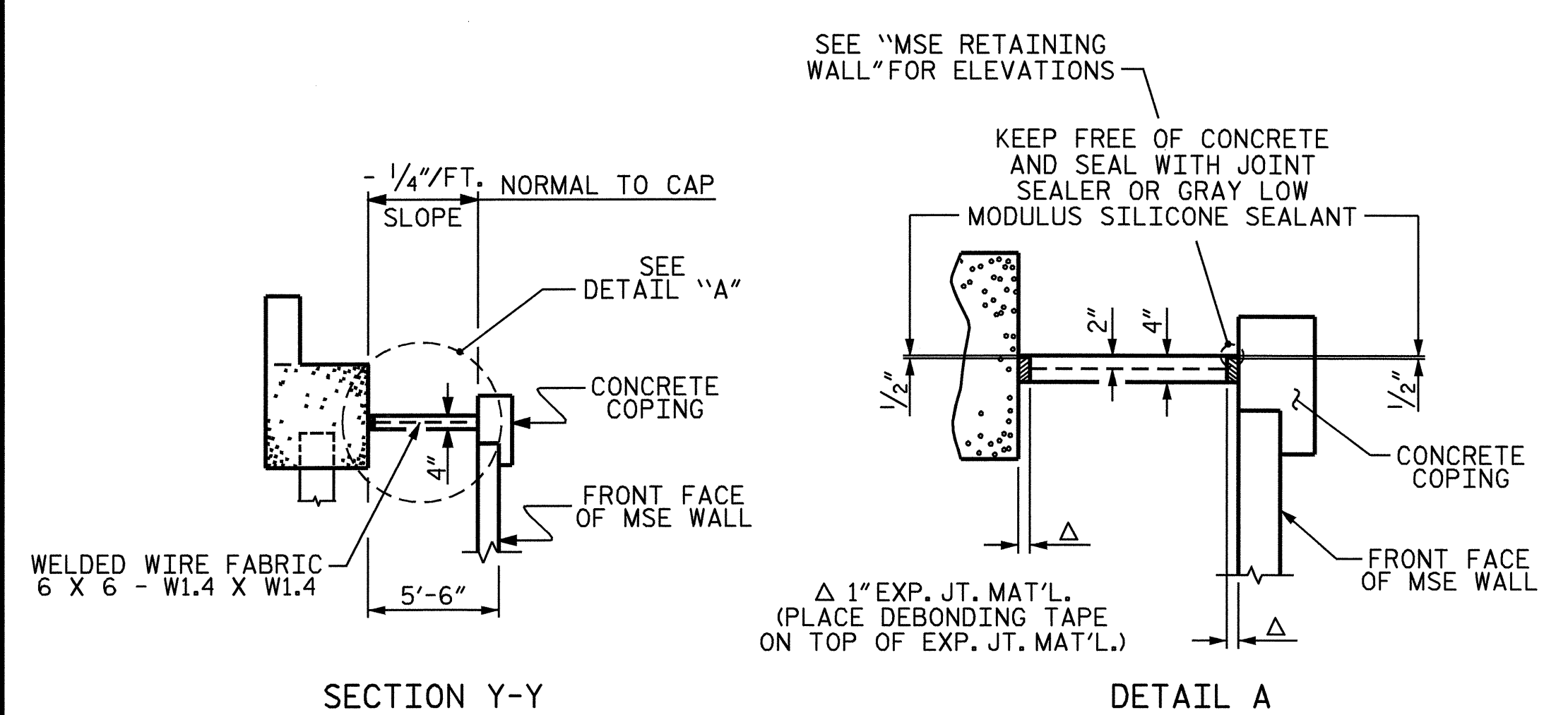
END BENT #2

BRIDGE @ STATION 20+90.21 -L- (RIGHT LANE)	4" INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	28	56
END BENT 2	235	470

* QUANTITY SHOWN IS BASED ON 5' POURS.

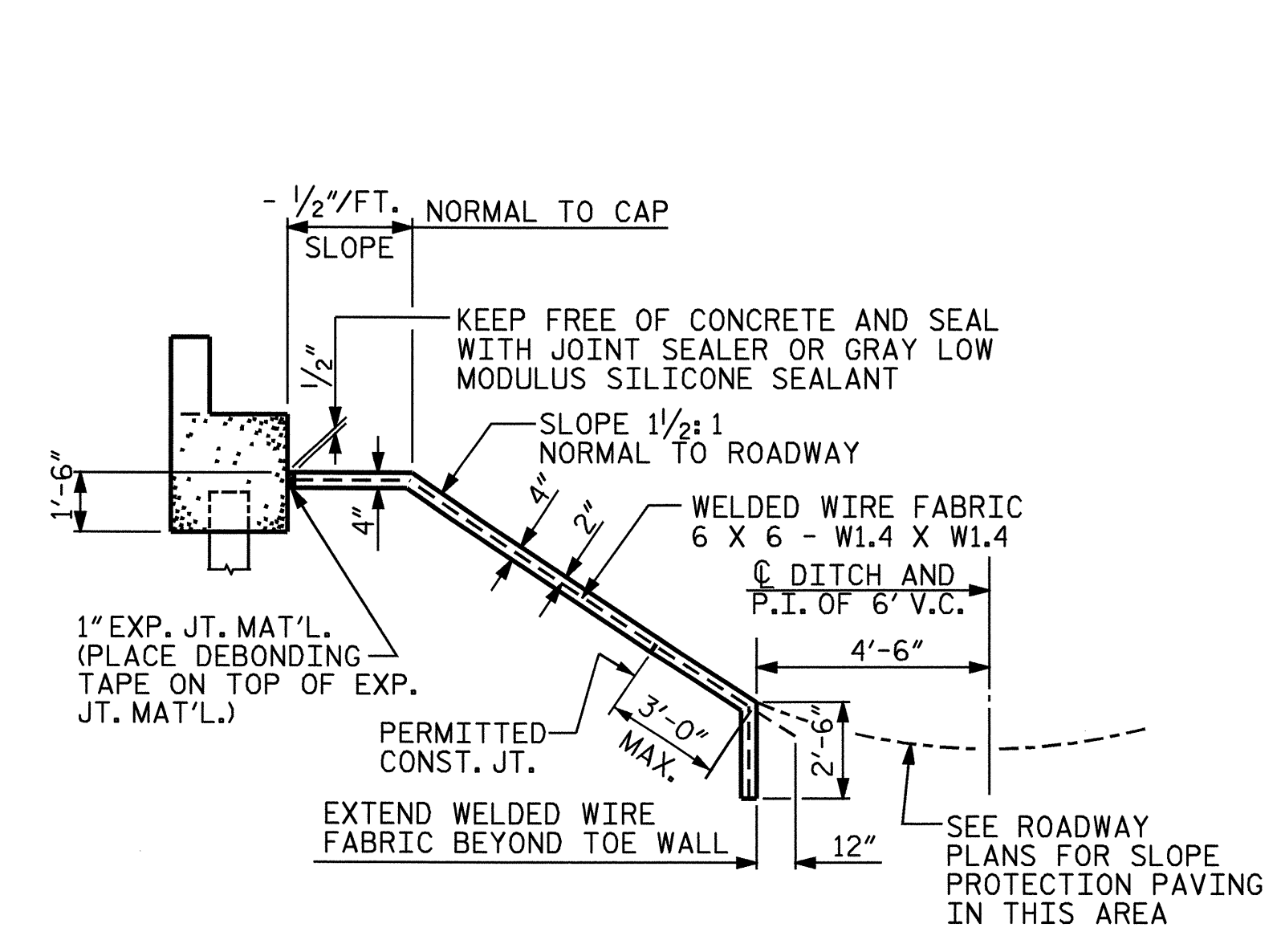


SECTION A-A

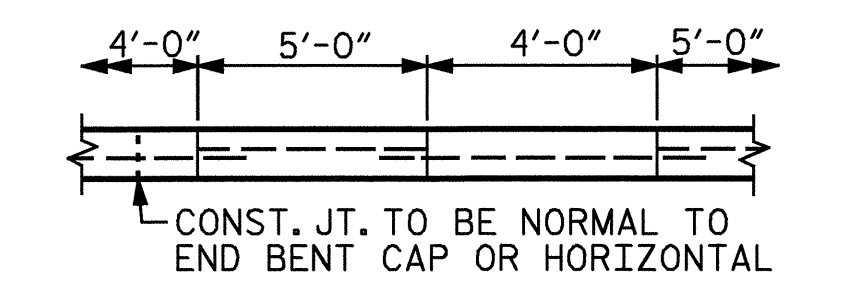


SECTION Y-Y

DETAIL A

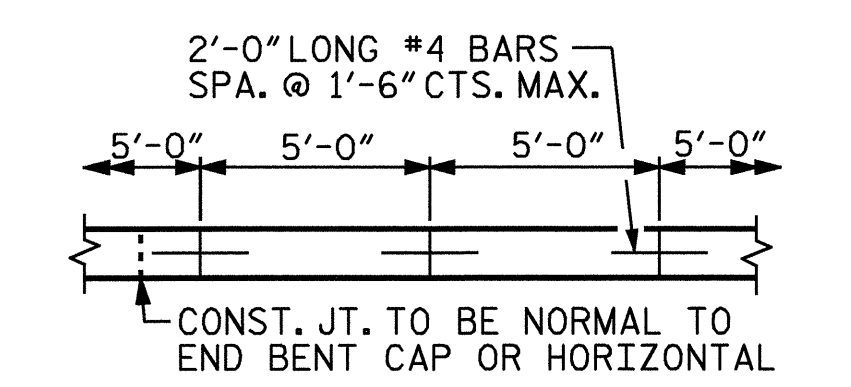


SECTION ALONG C. ROADWAY WHEN FILL CATCHES IN DITCH



POUR A 4'-0" STRIP FIRST. STRIP WIDTHS MAY VARY IN CURVED PORTION.

OPTIONAL POURING DETAIL



STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL

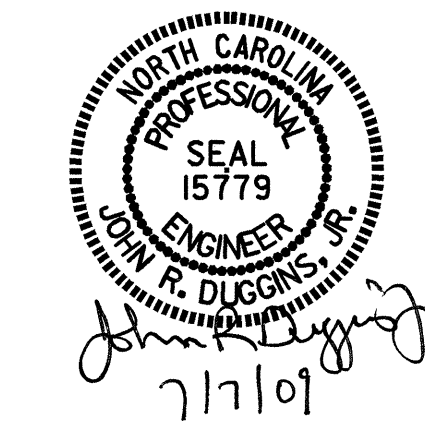
PROJECT NO. U-4006
GUILFORD COUNTY
STATION: 20+90.21 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**SLOPE PROTECTION
DETAILS
RIGHT LANE**

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

TOTAL SHEETS: 75



ASSEMBLED BY : A. SORSENGINH	DATE : 4/17/09
CHECKED BY : J.R. DUGGINS	DATE : 4/09
DRAWN BY : ELR 5/92	REV. 7/10/01 LES/RDR
CHECKED BY : GRP 6/92	REV. 5/7/03 RWW/JTE
	REV. 5/1/06 TLA/GM

NOTES

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

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 EACH EDGE OF THE APPROACH SLAB.

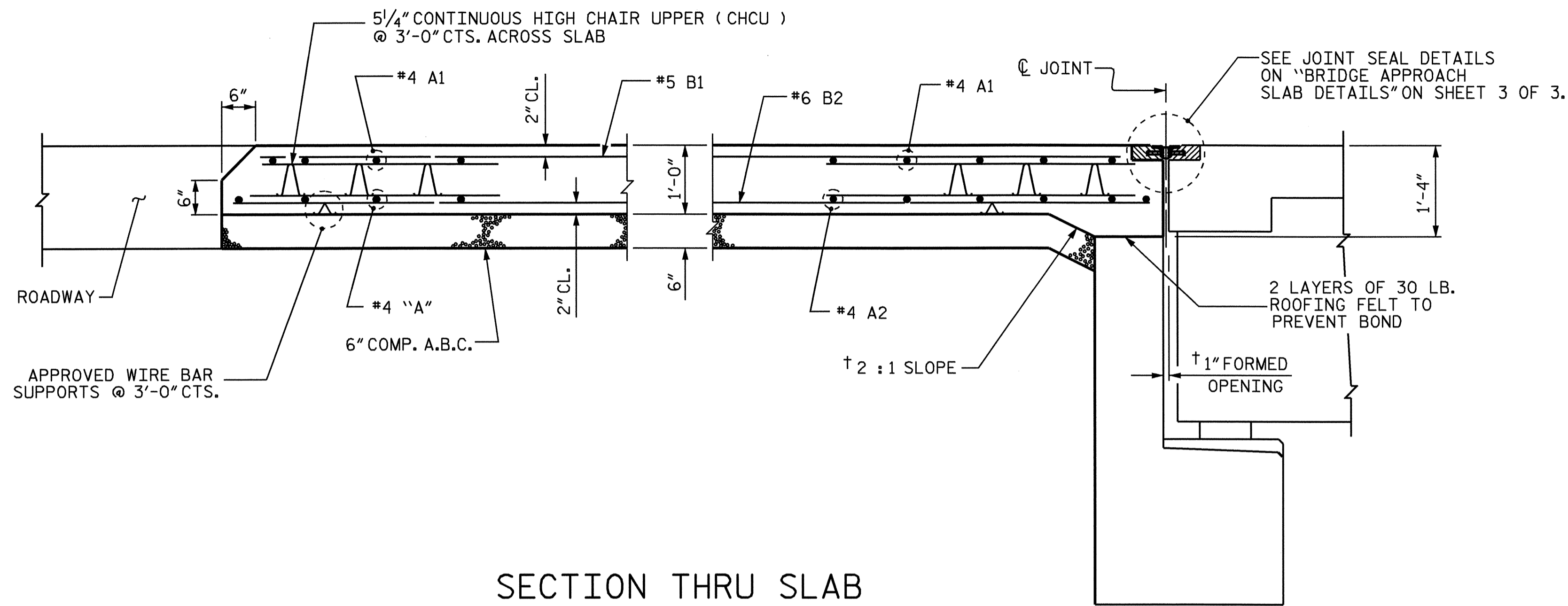
THE CONTRACTOR MAY USE 4" TYPE B-25.0B ASPHALT CONCRETE BASE COURSE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE BASE COURSE SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB, AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB.

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 SHALL BE 2 1/2".

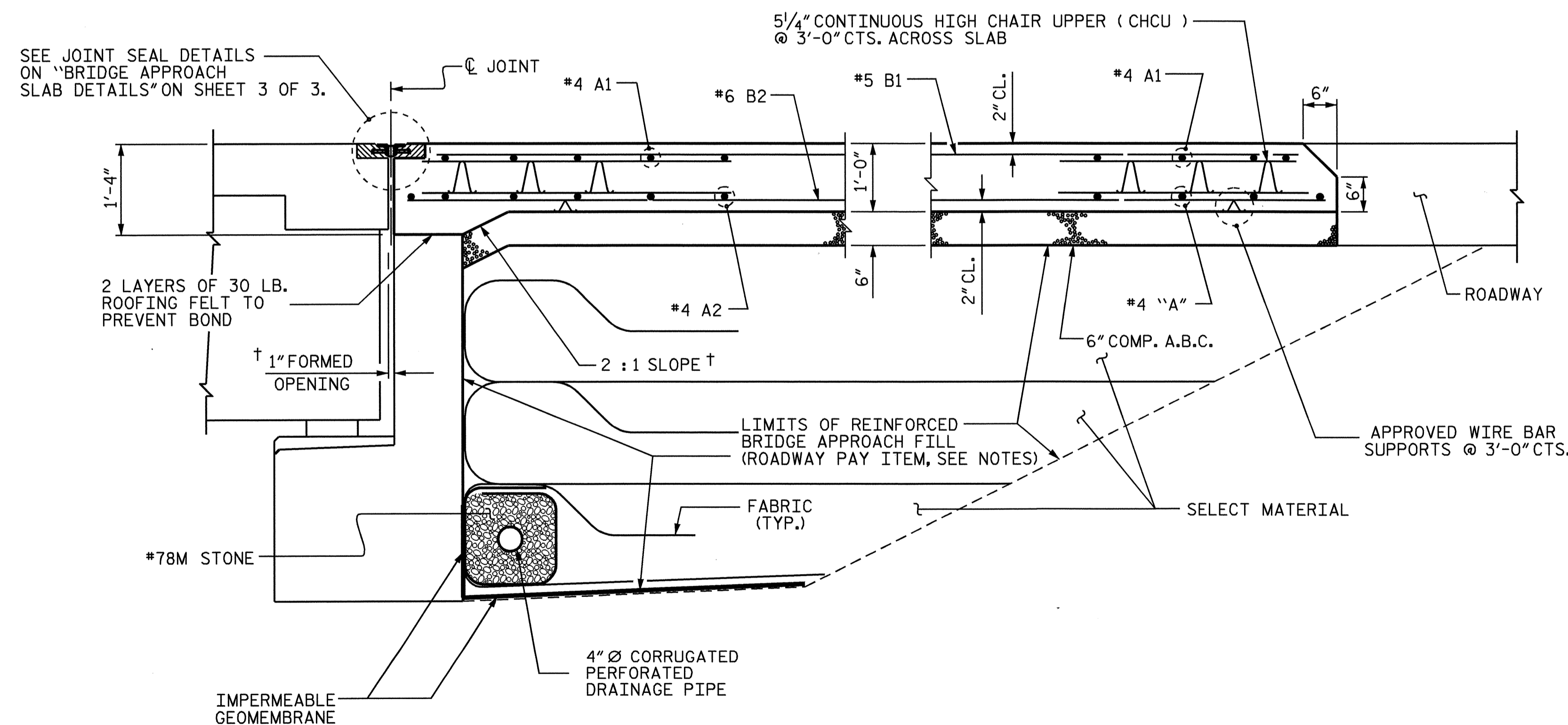
FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.



SECTION THRU SLAB

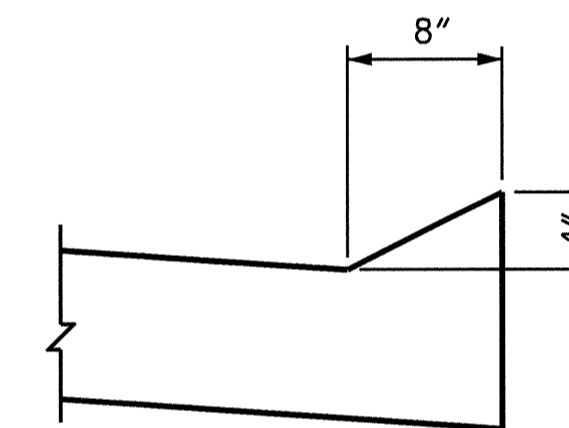
FOR APPROACH SLAB @ END BENT #1

† NORMAL TO END BENT

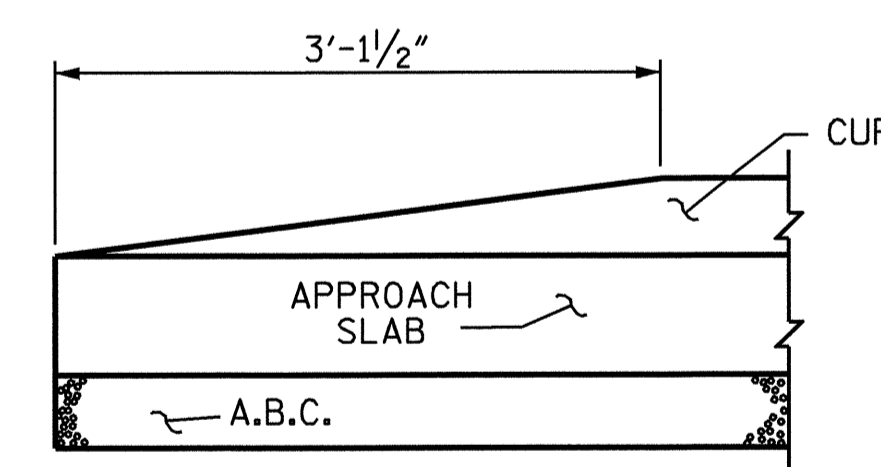


SECTION THRU SLAB

FOR APPROACH SLAB @ END BENT #2



SECTION M-M



END OF CURB WITHOUT SHOULDER BERM GUTTER

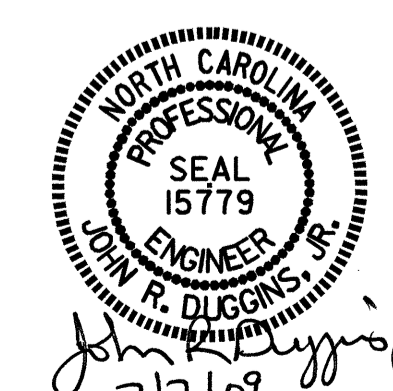
CURB DETAILS

BILL OF MATERIAL					
APPROACH SLAB AT EB #1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	50	#4	STR	19'-0"	635
A2	52	#4	STR	18'-11"	657
*B1	72	#5	STR	23'-10"	1790
B2	72	#6	STR	24'-4"	2632
*B3	4	#4	STR	24'-4"	65
*D1	20	#4	STR	1'-0"	13
*G1	25	#4	STR	5'-2"	86
REINFORCING STEEL				LBS.	3289
*EPOXY COATED REINFORCING STEEL				LBS.	2589
CLASS AA CONCRETE					
POUR 1 (SLAB)				C. Y.	33.5
POUR 2 (SIDEWALK)				C. Y.	3.5
TOTAL				C. Y.	37.0
APPROACH SLAB AT EB #2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	50	#4	STR	19'-0"	635
A2	52	#4	STR	18'-11"	657
*B1	72	#5	STR	23'-10"	1790
B2	72	#6	STR	24'-4"	2632
*B3	4	#4	STR	24'-4"	65
*D1	20	#4	STR	1'-0"	13
*G1	25	#4	STR	5'-2"	86
REINFORCING STEEL				LBS.	3289
*EPOXY COATED REINFORCING STEEL				LBS.	2589
CLASS AA CONCRETE					
POUR 1 (SLAB)				C. Y.	33.5
POUR 2 (SIDEWALK)				C. Y.	3.5
TOTAL				C. Y.	37.0

PROJECT NO. U-4006
GUILFORD COUNTY
 STATION: 20+90.21 -L-

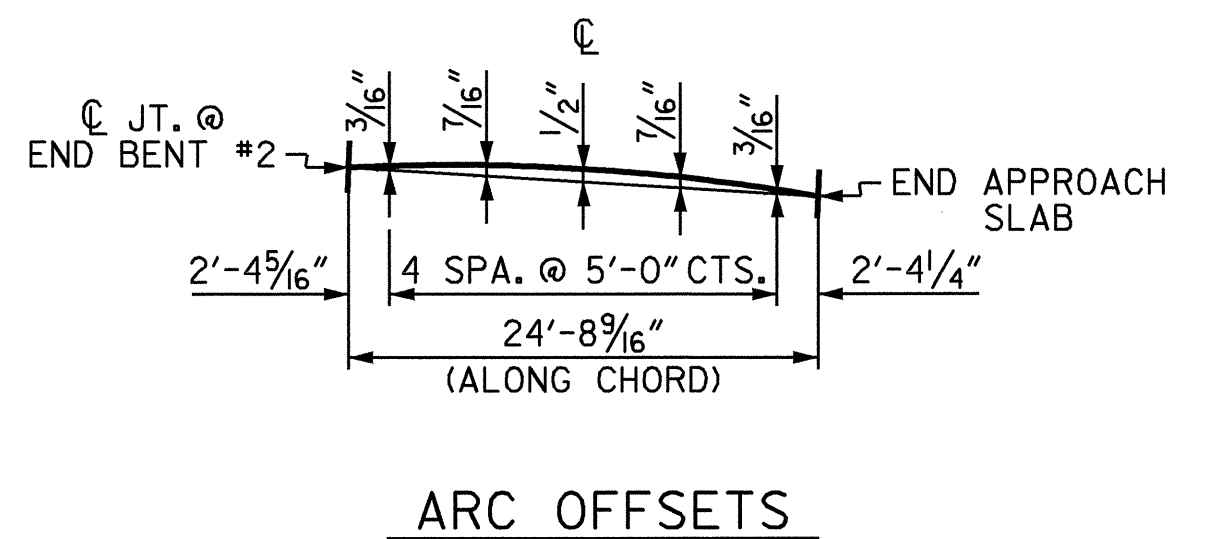
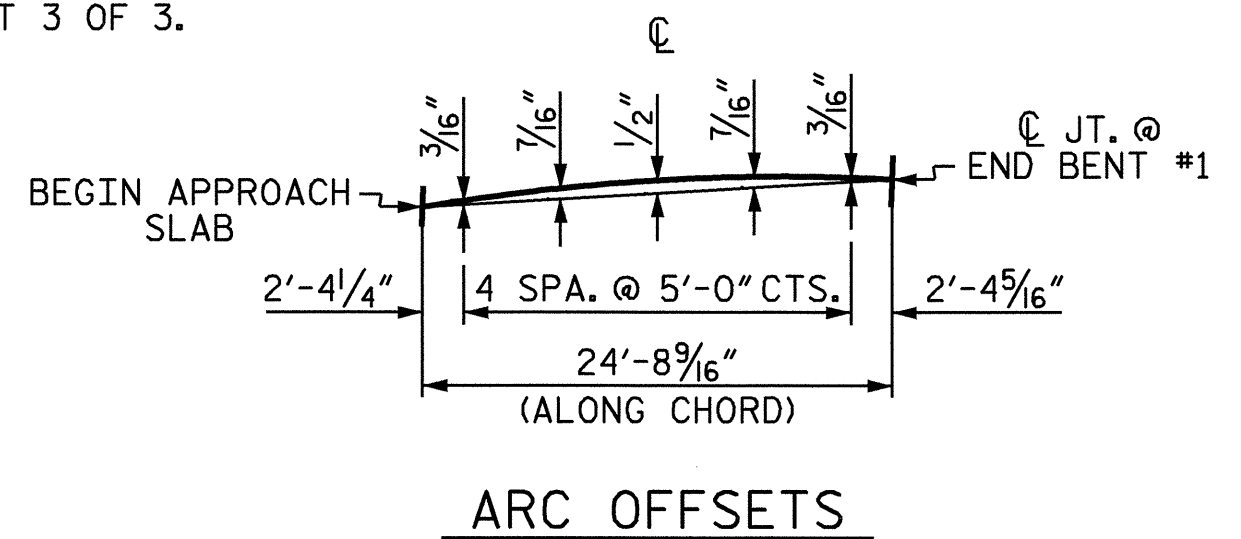
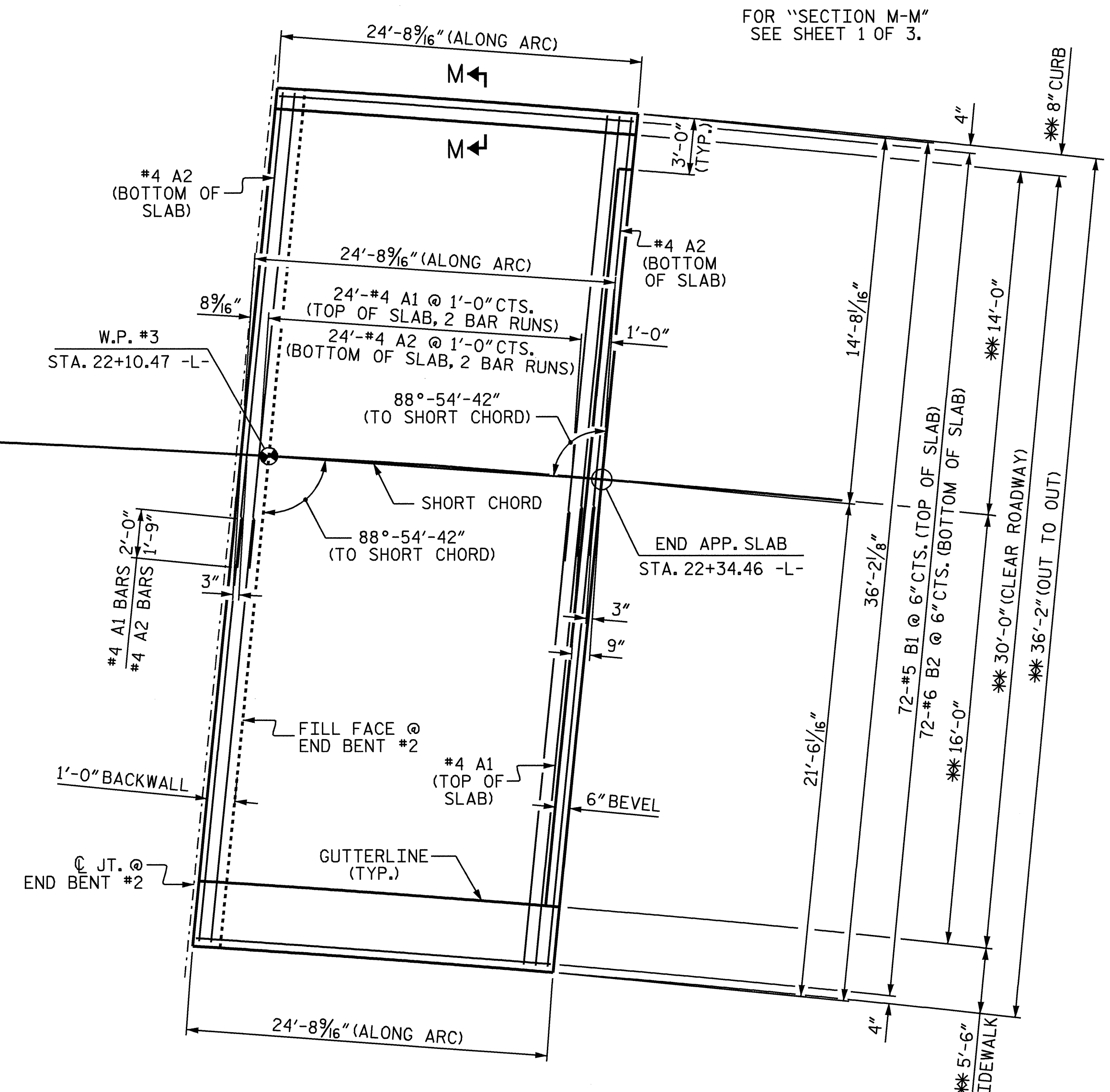
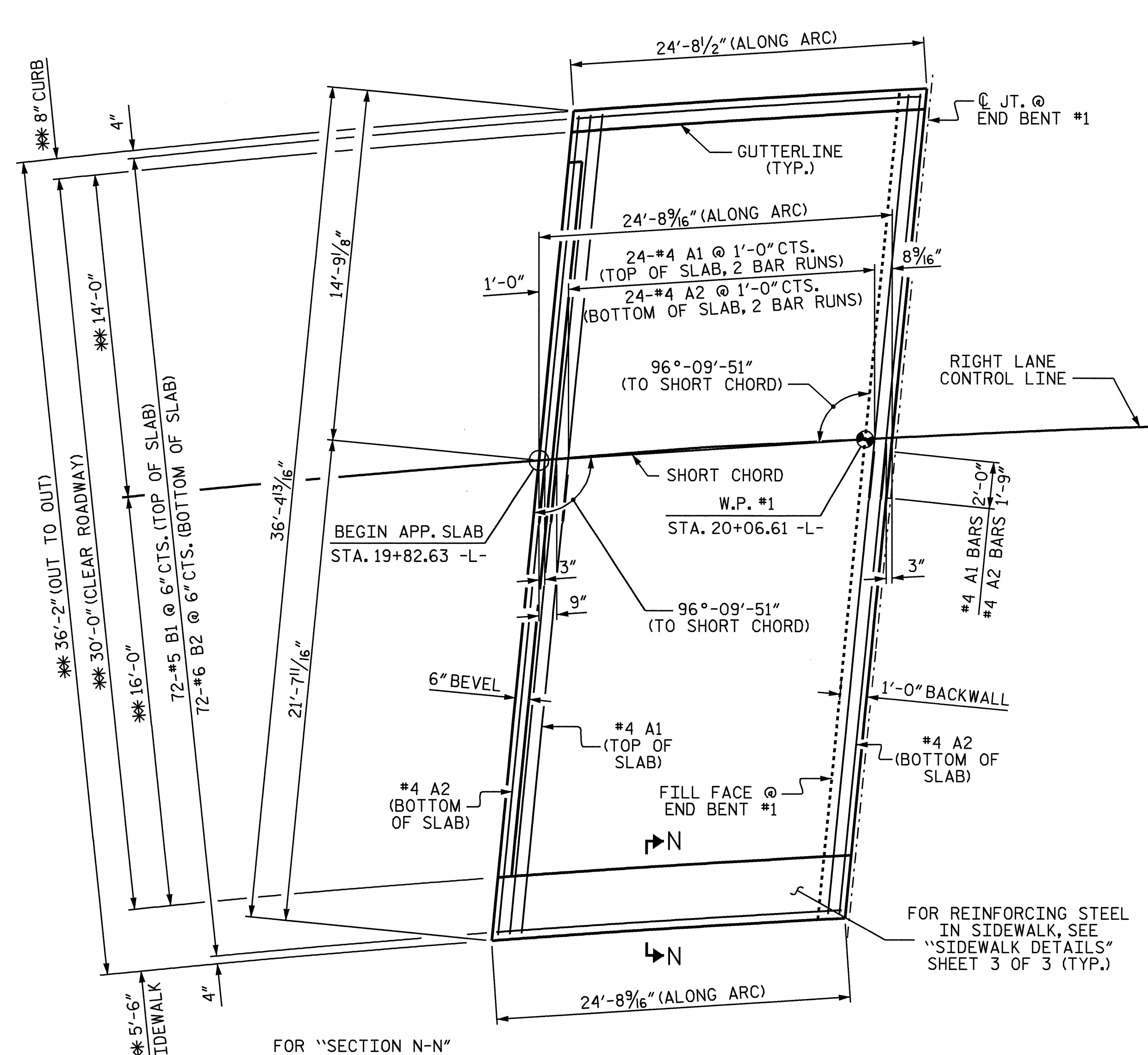
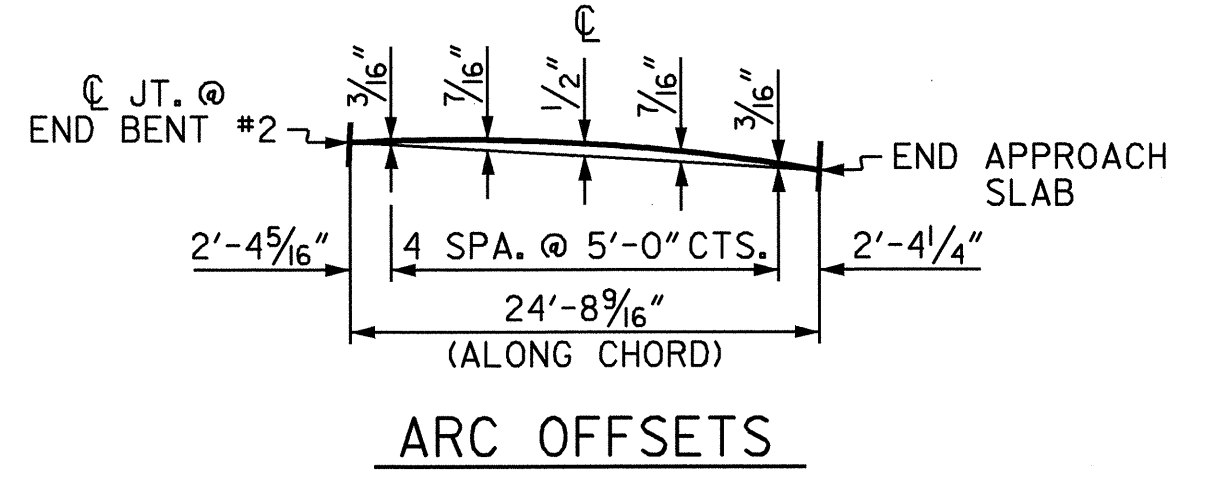
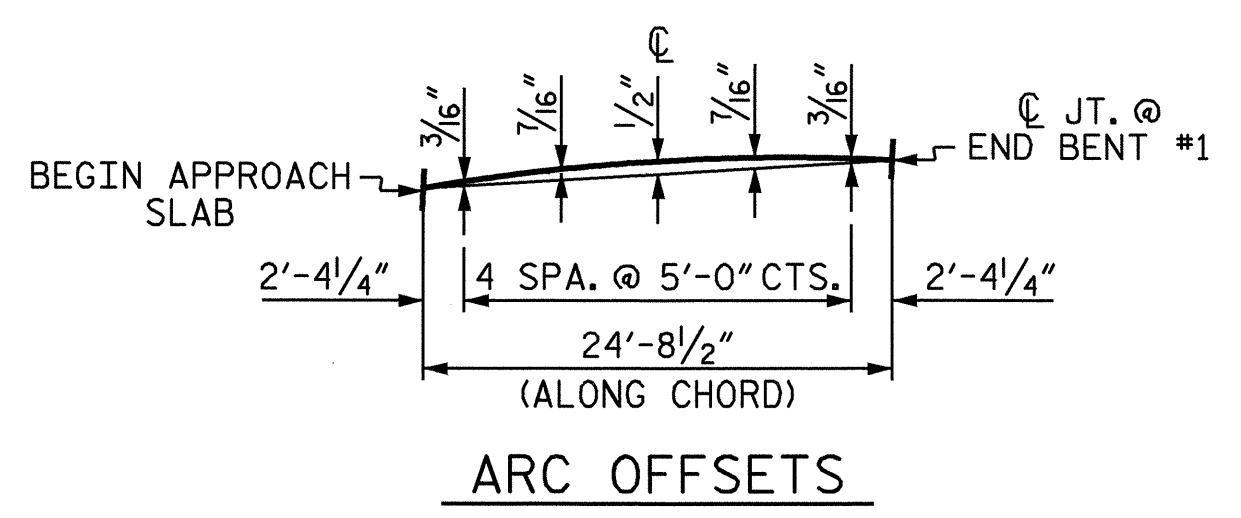
SHEET 1 OF 3

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



REVISIONS						SHEET NO. S-73
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 75
2			4			

ASSEMBLED BY : A. SORSENGINH	DATE : 3/18/09
CHECKED BY : J.R. DUGGINS	DATE : 4/09
DRAWN BY : EEM	3/95
CHECKED BY : VAP	3/95
REV. 1/10/01	LES/RDR
REV. 5/17/03R	RWW/JTE
REV. 5/1/06	TLA/GM



PLAN @ END BENT #1

PLAN @ END BENT #2

(** RADIAL DIMENSIONS)

PROJECT NO. U-4006
GUILFORD COUNTY
 STATION: 20+90.21 -L-
 SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

BRIDGE APPROACH SLAB
 FOR FLEXIBLE PAVEMENT

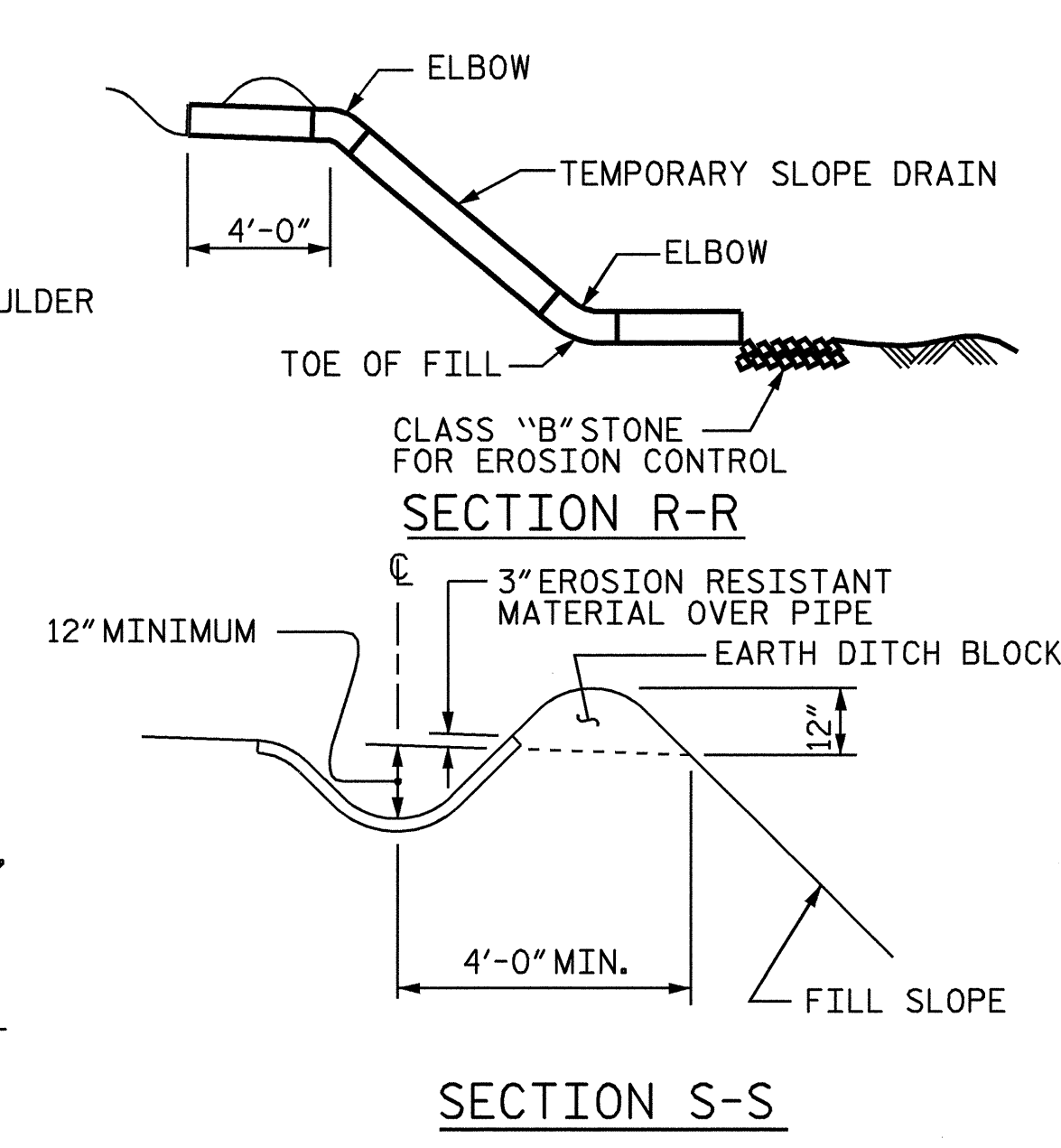
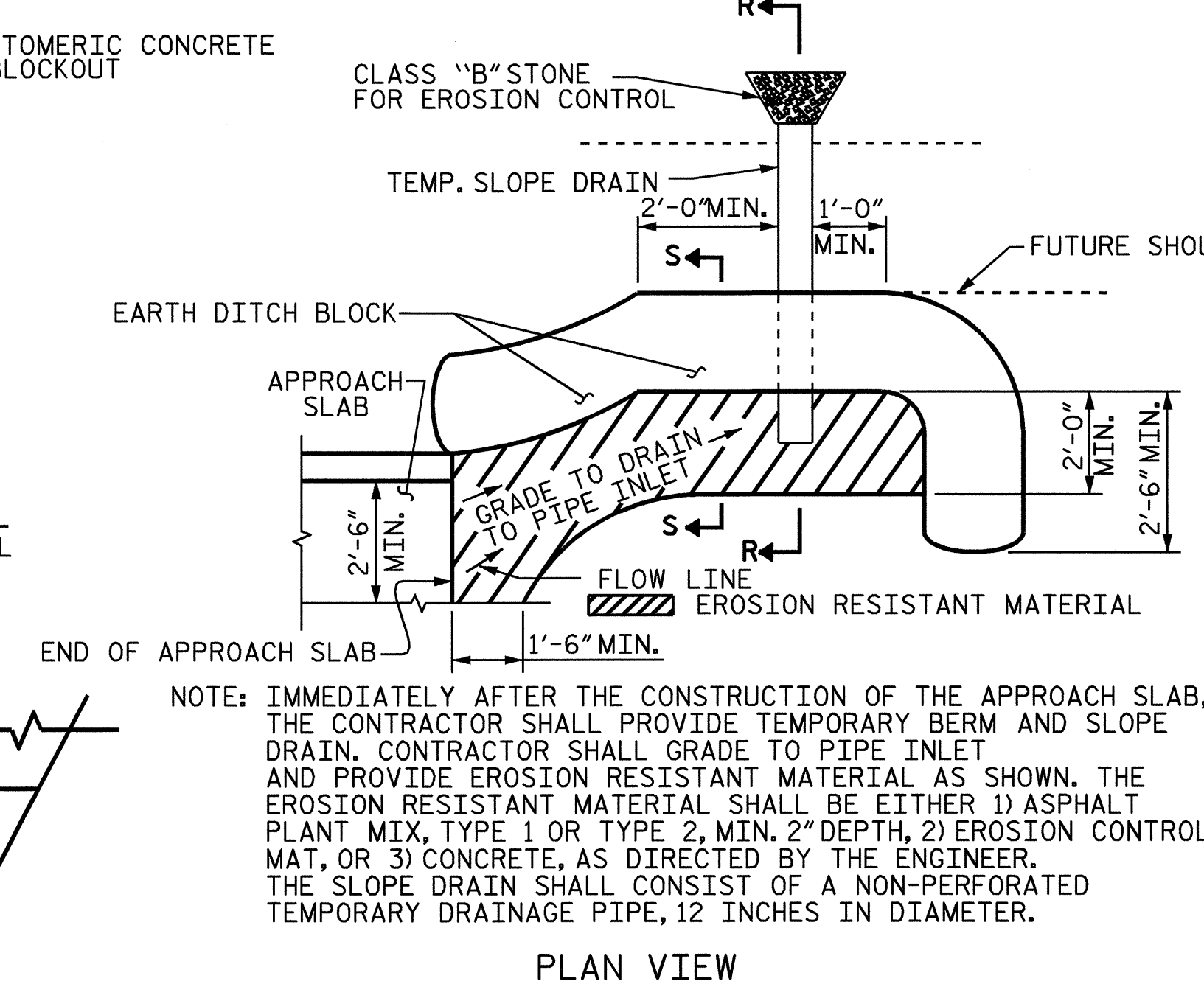
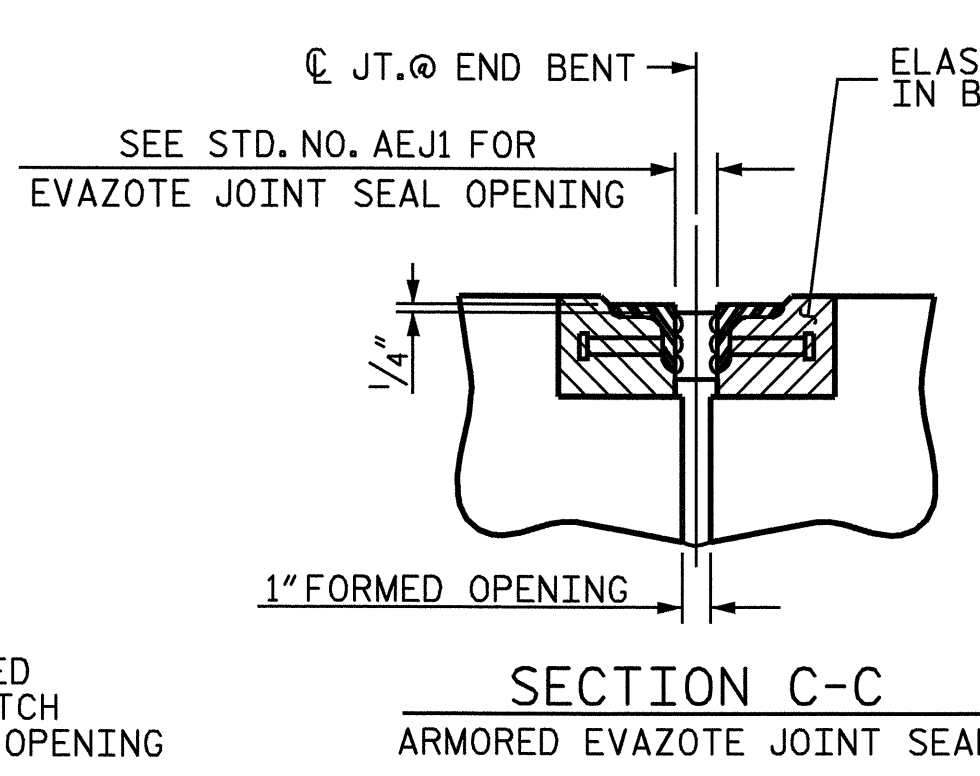
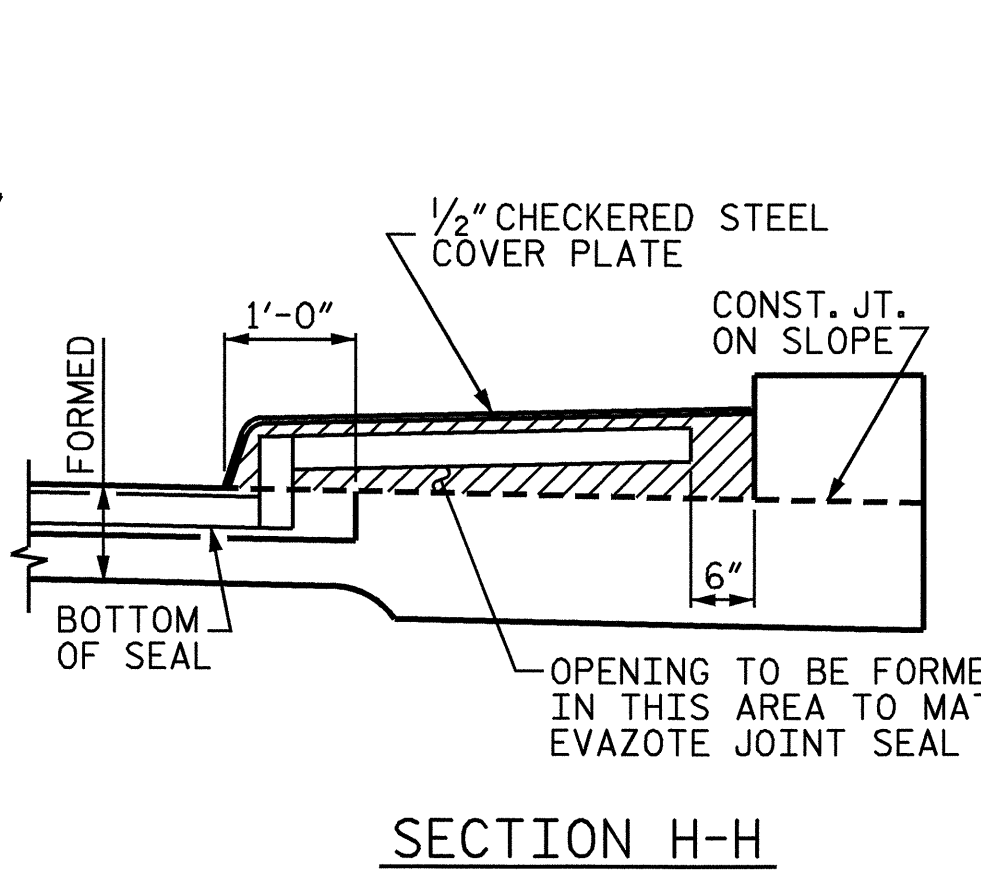
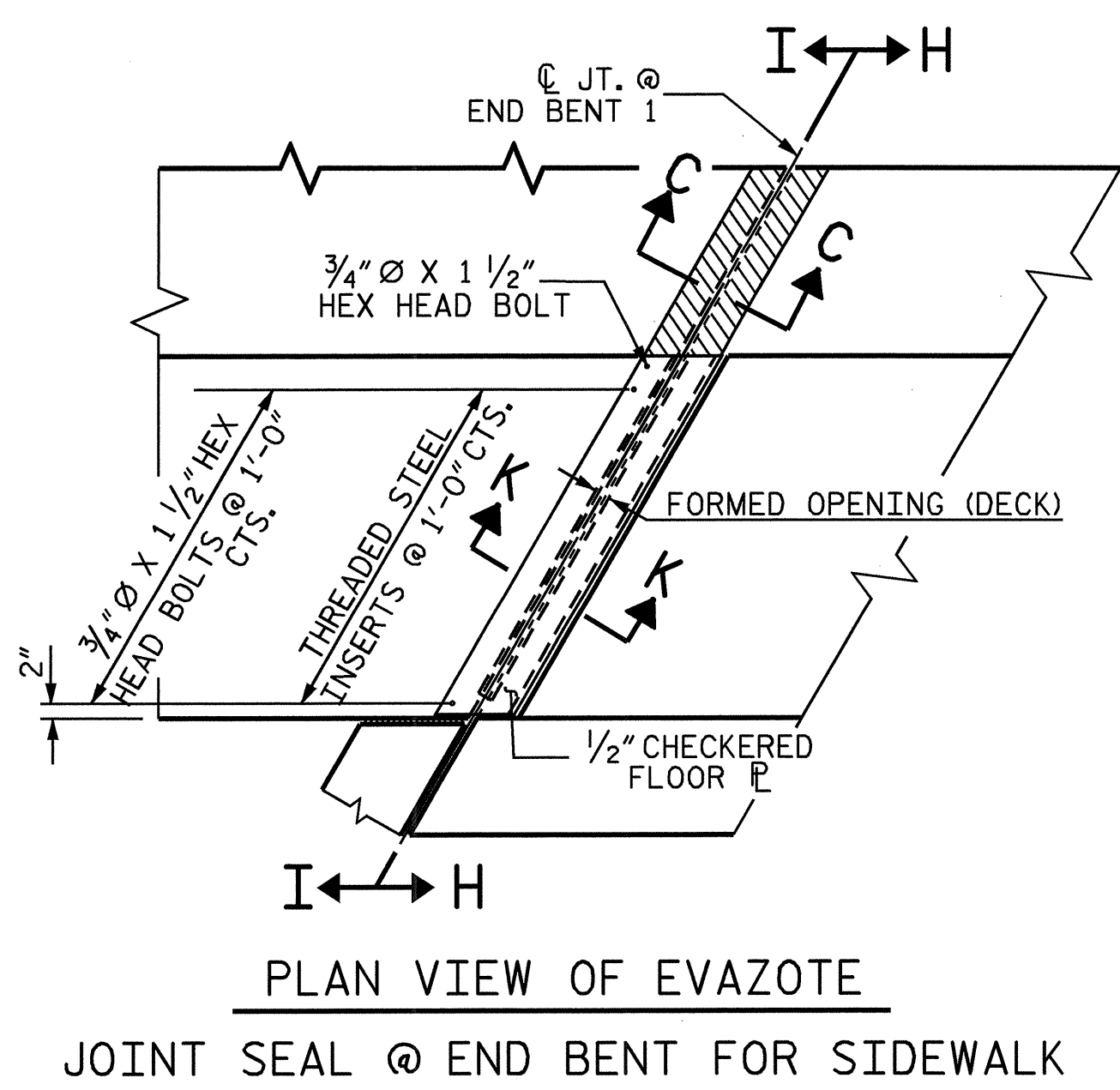
RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-74
1			3			TOTAL SHEETS
2			4			15



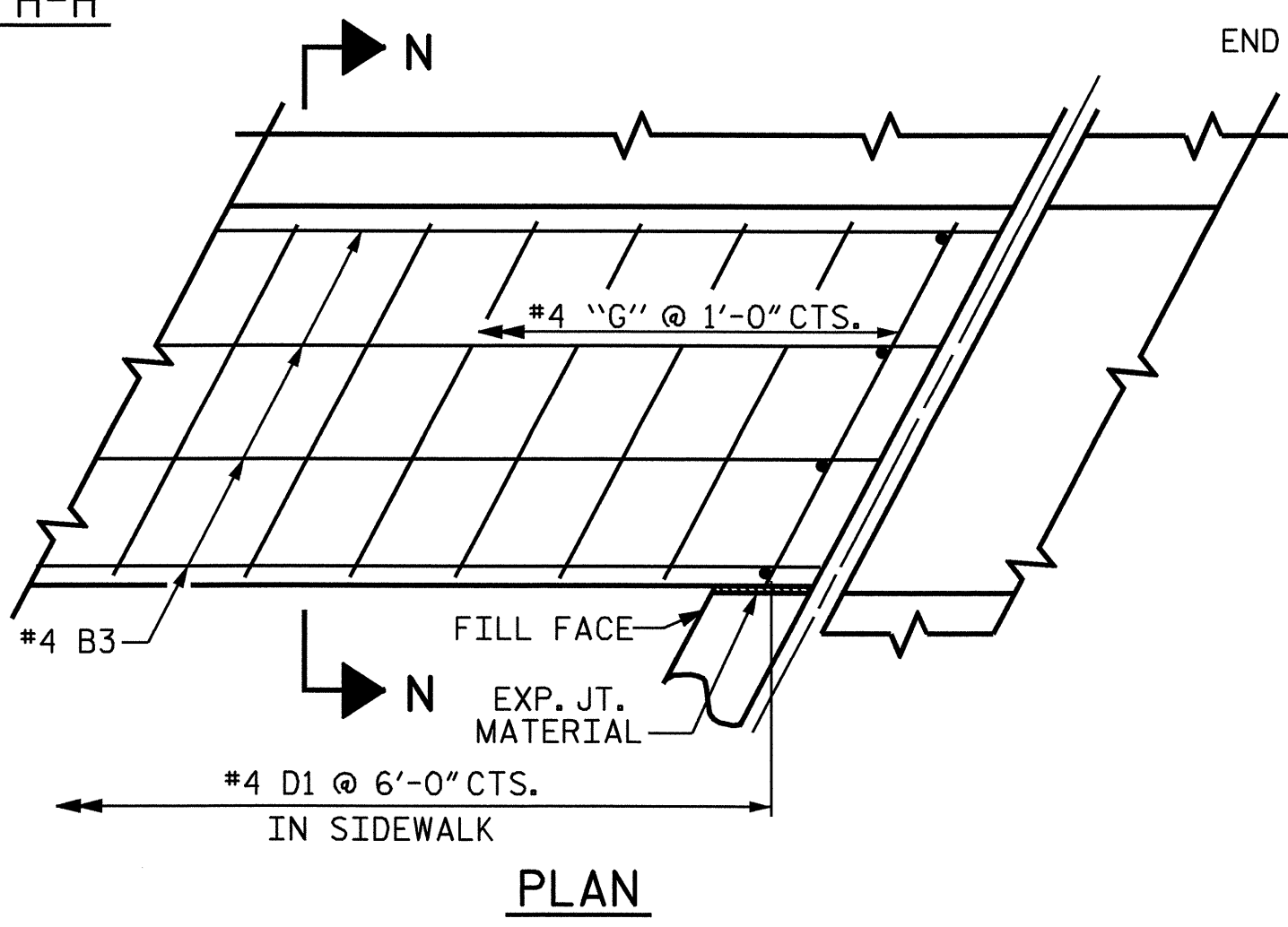
DRAWN BY : A. SORSENGINH DATE : 3/18/09
 CHECKED BY : J.R. DUGGINS DATE : 4/09

30-JUN-2009 13:00
 r:\structures\4006\asorsenginh\Microsoftation\RightLane\U-4006.sd.AS.dgn
 dahodge

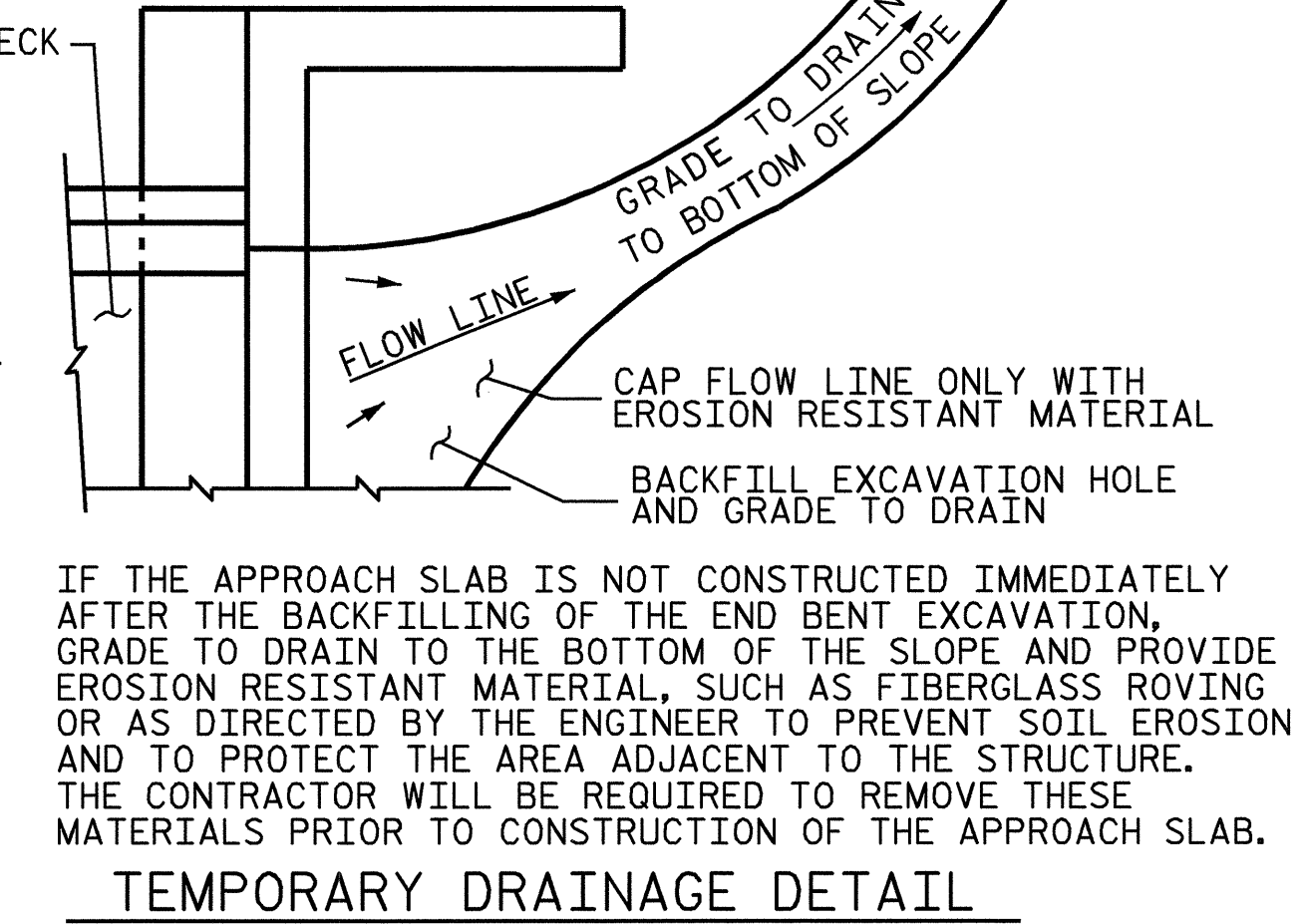
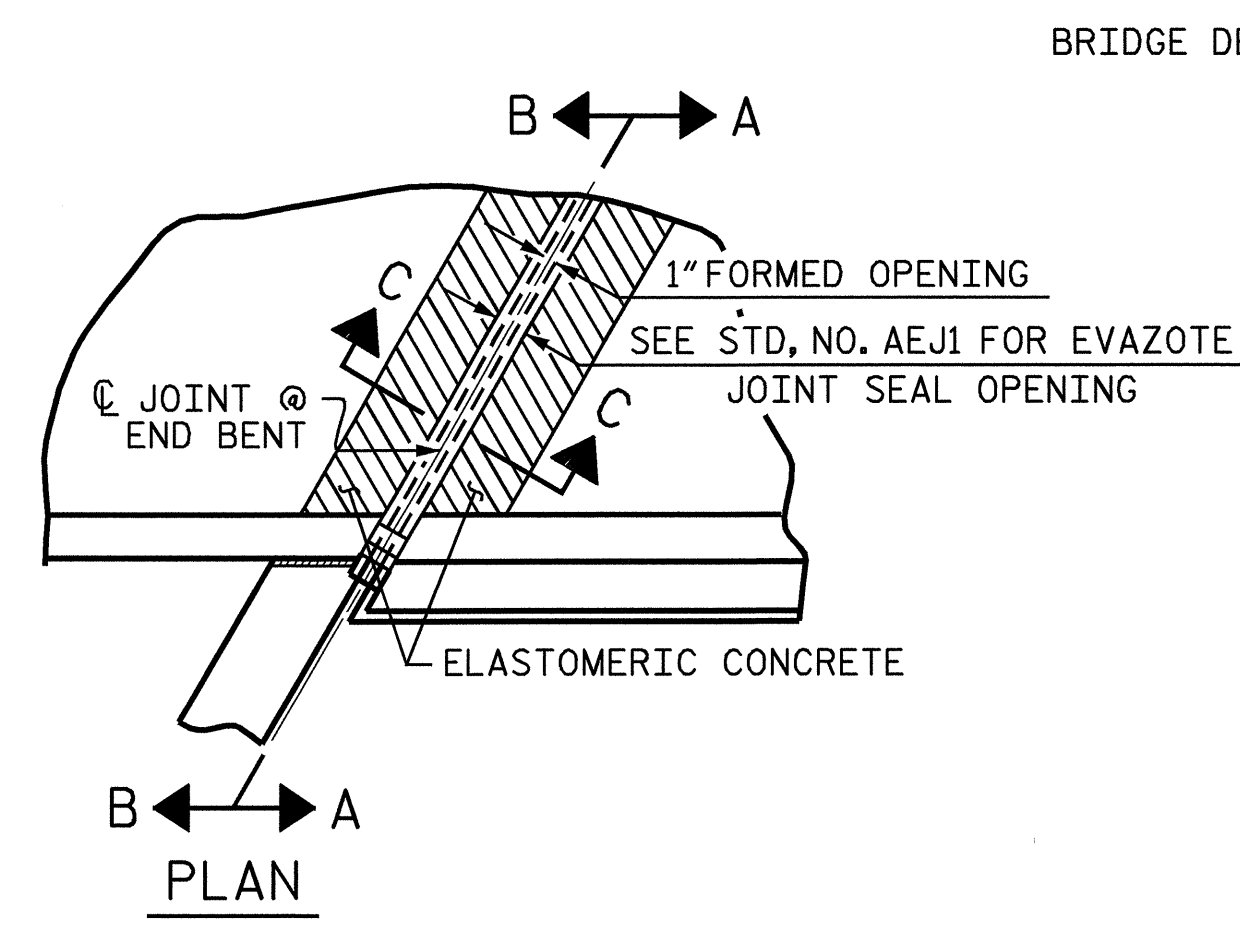
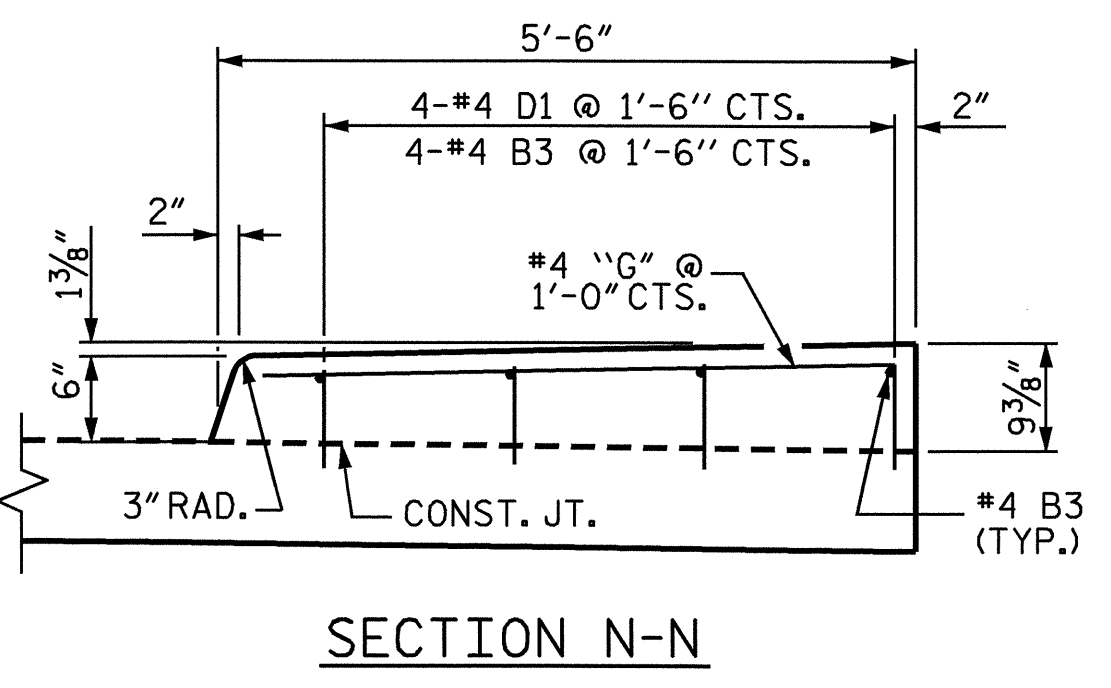
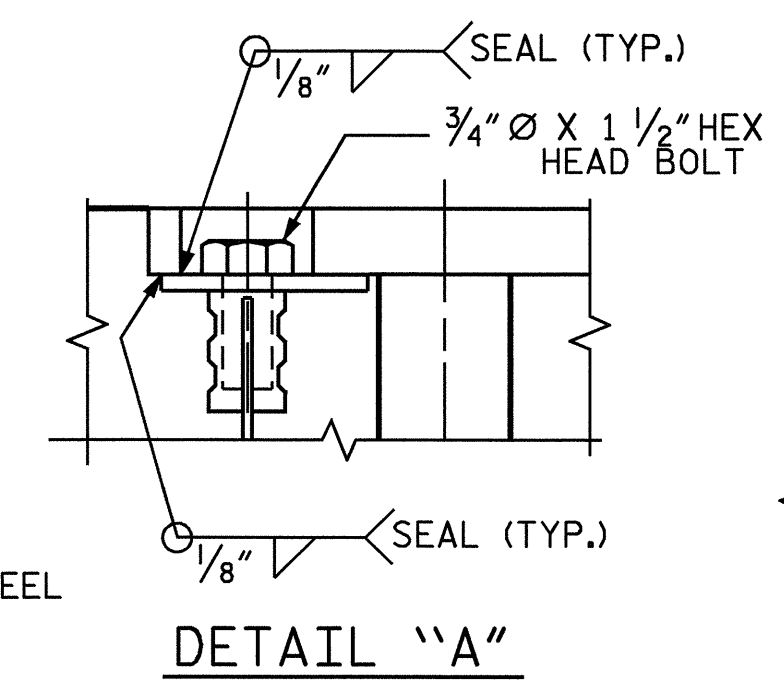
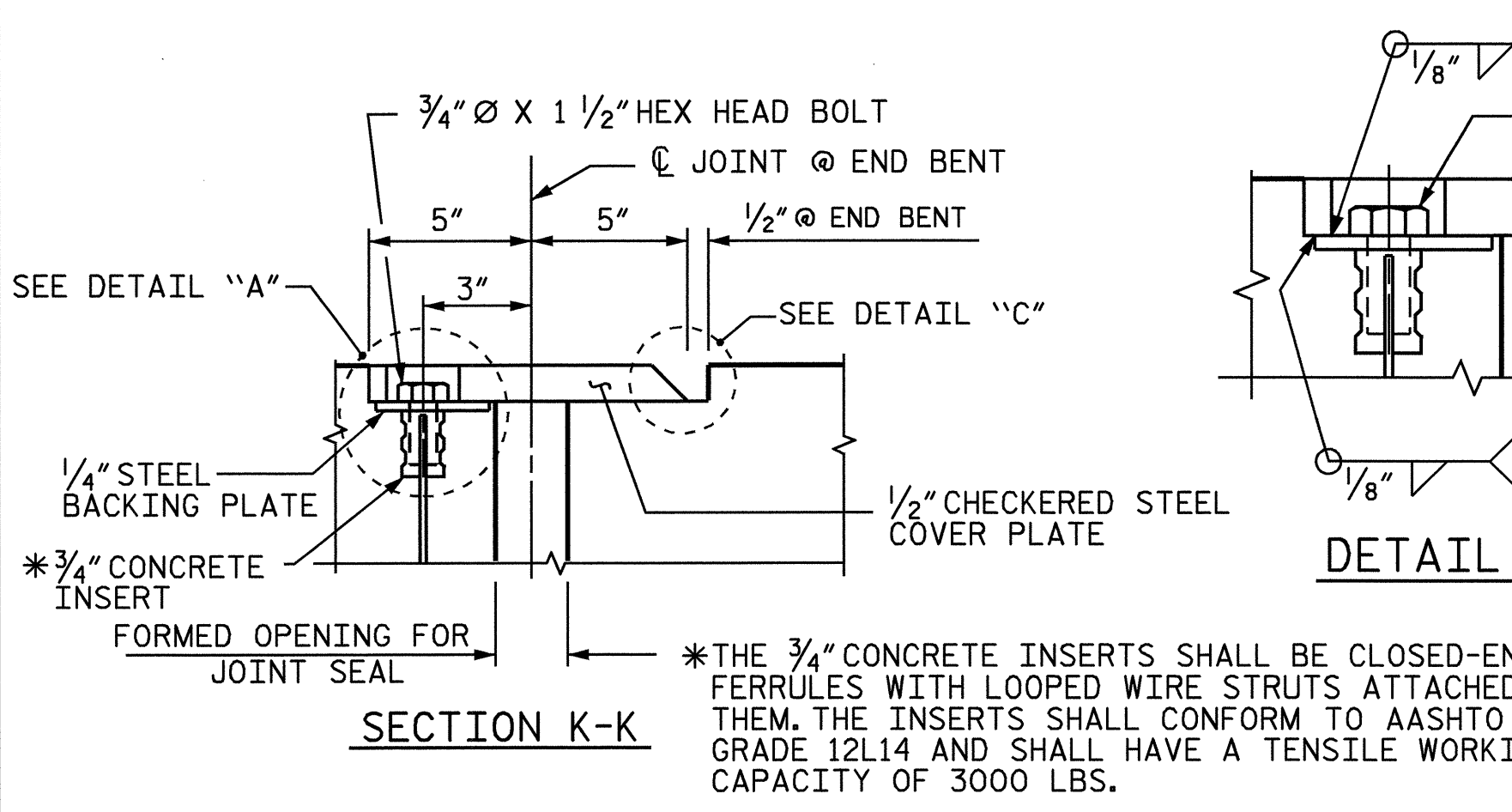
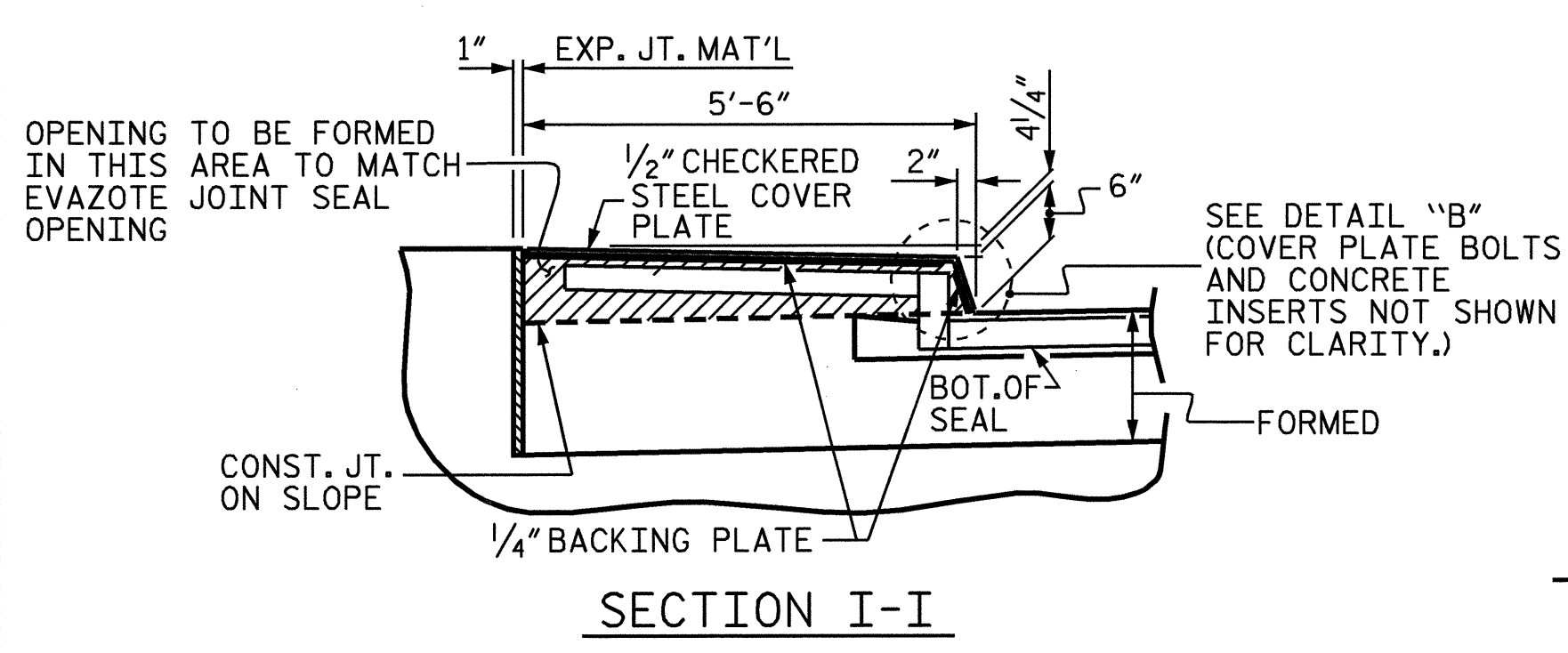


TEMPORARY BERM AND SLOPE DRAIN DETAILS
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

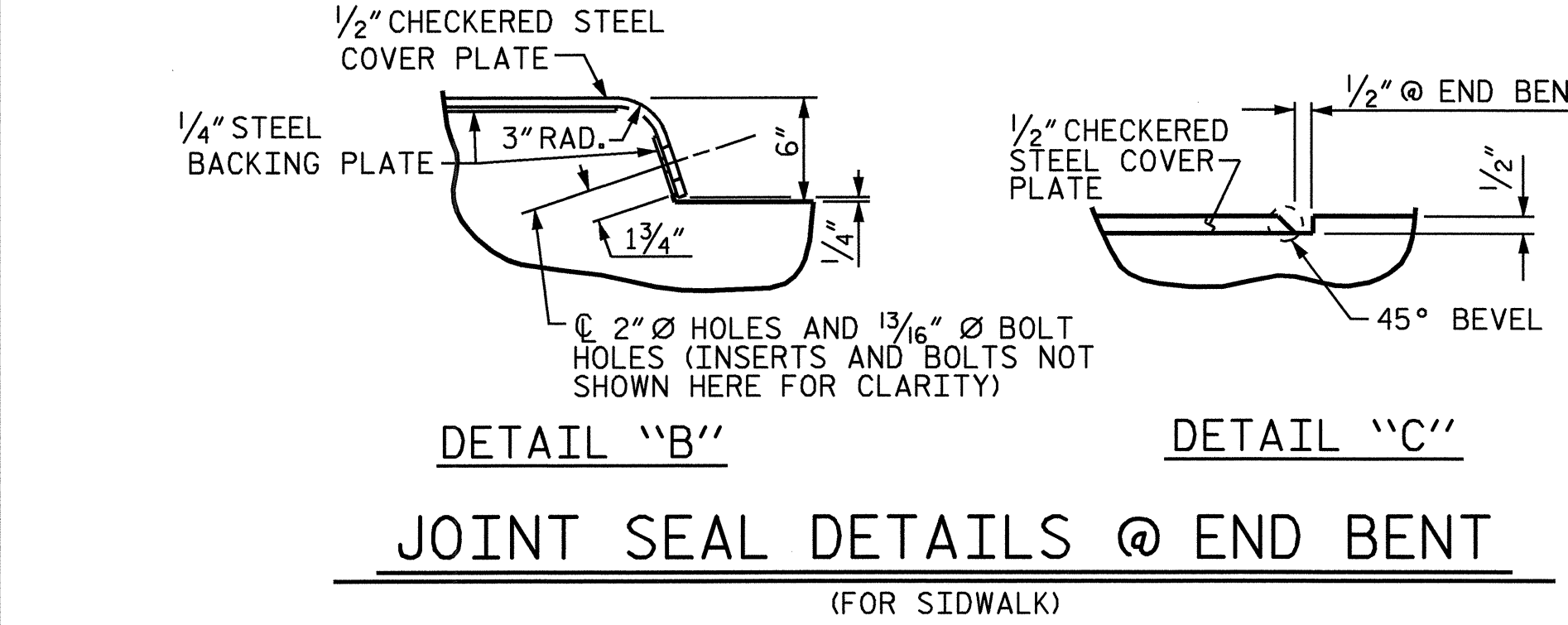
NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 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.



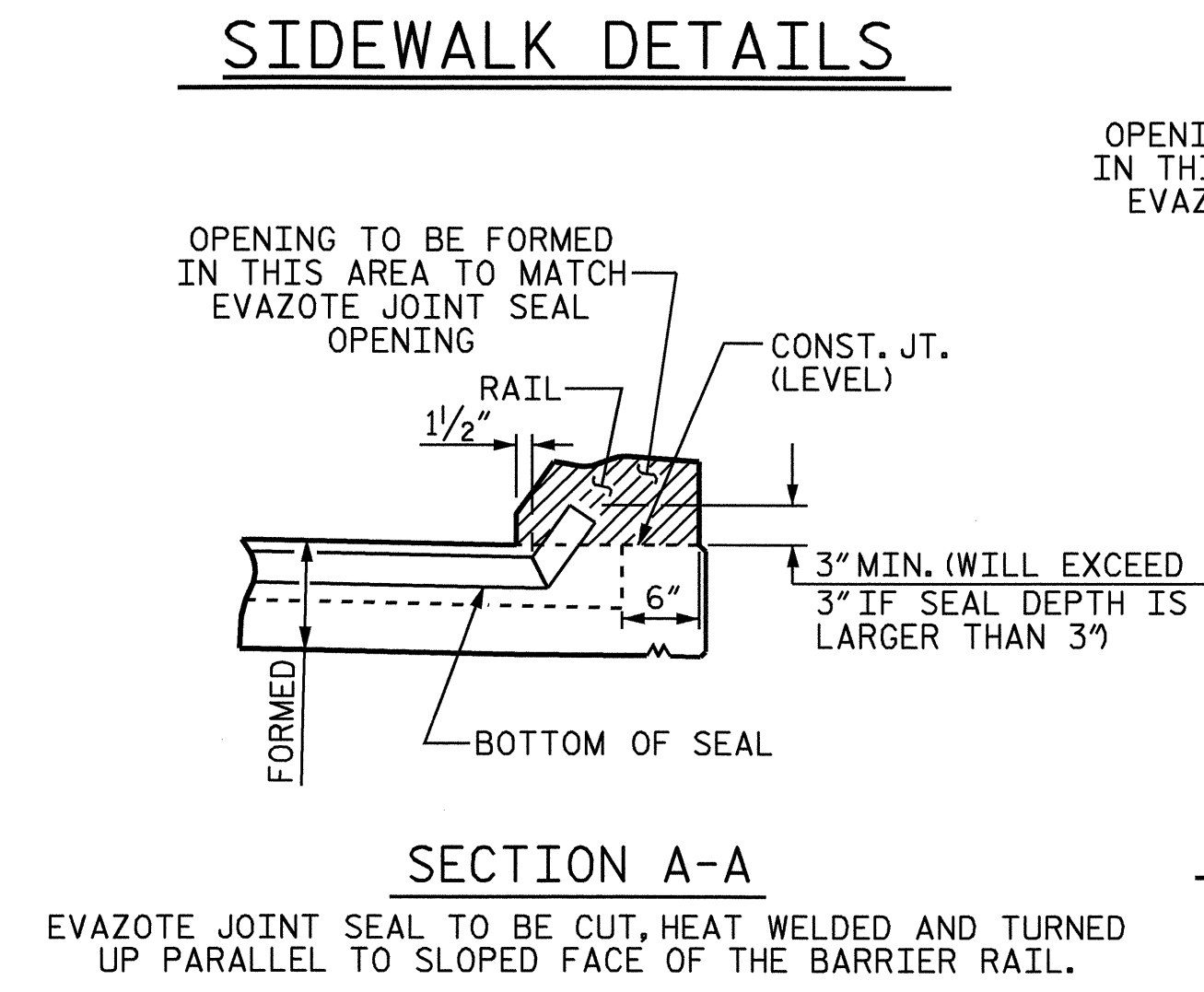
DETAILS OF SIDEWALK ON APPROACH SLAB



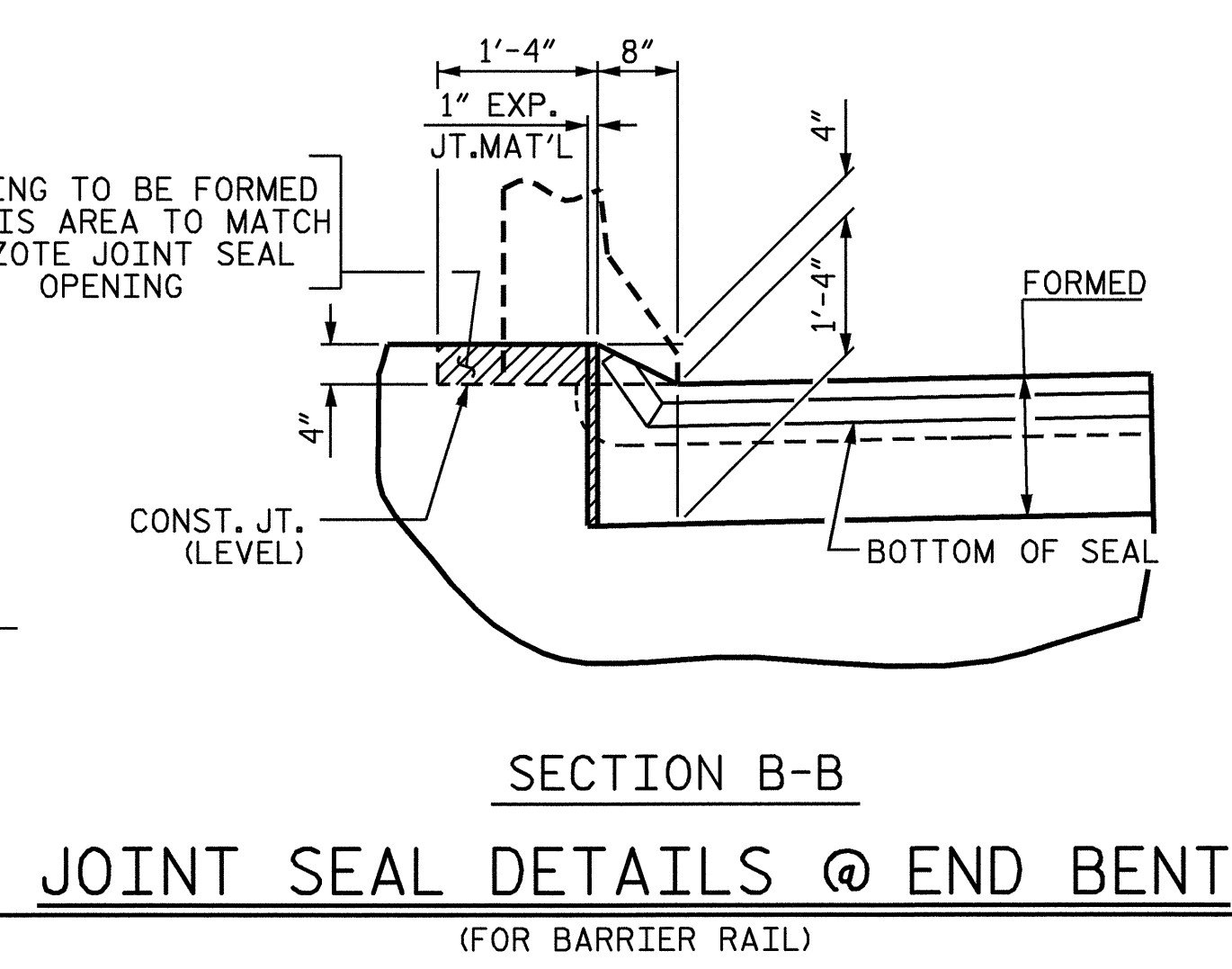
IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT TO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



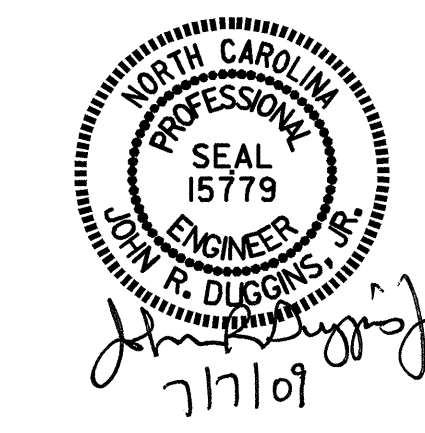
JOINT SEAL DETAILS @ END BENT
(FOR SIDEWALK)



EVAZOTE JOINT SEAL TO BE CUT, HEAT WELDED AND TURNED UP PARALLEL TO SLOPED FACE OF THE BARRIER RAIL.



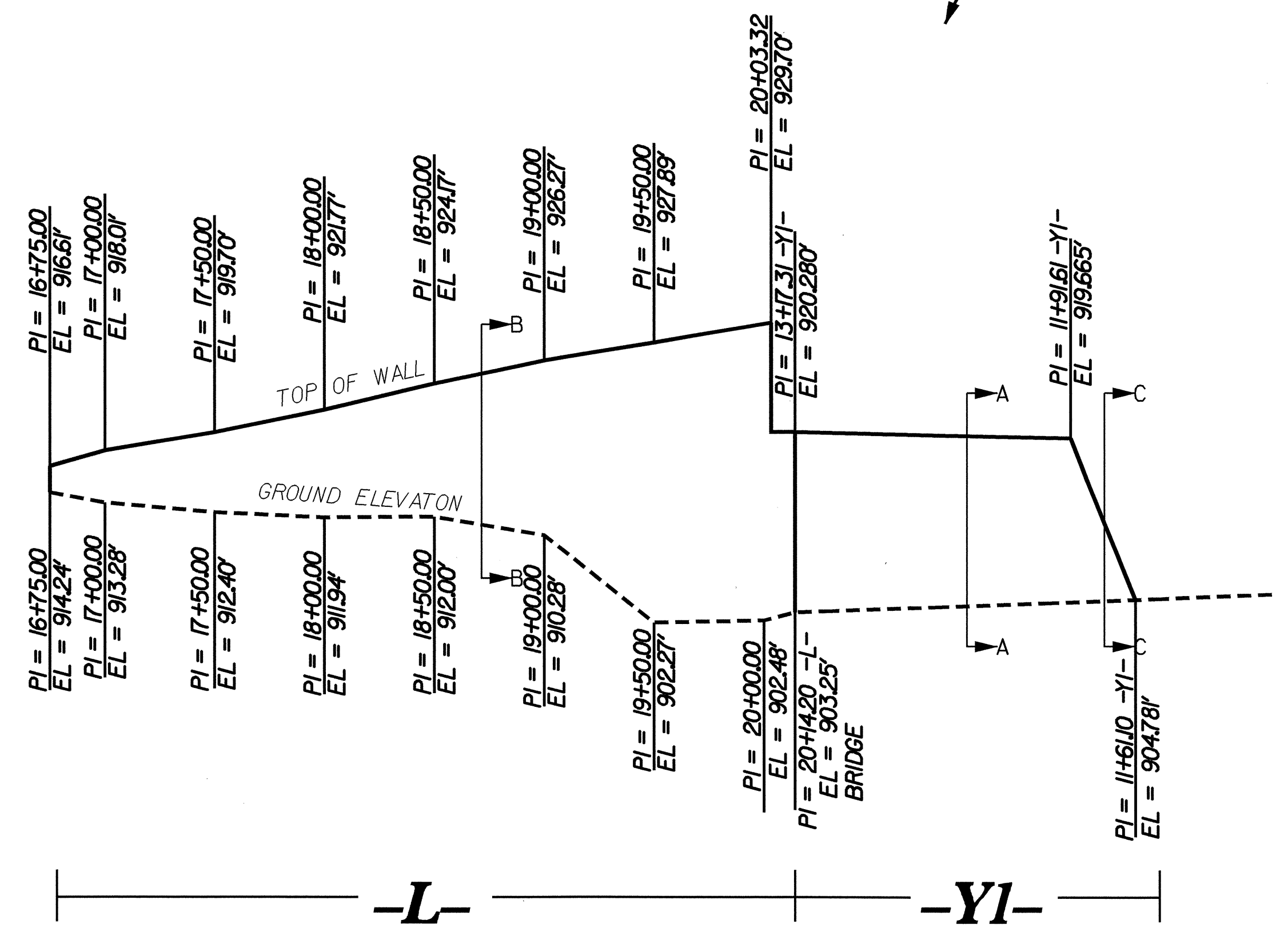
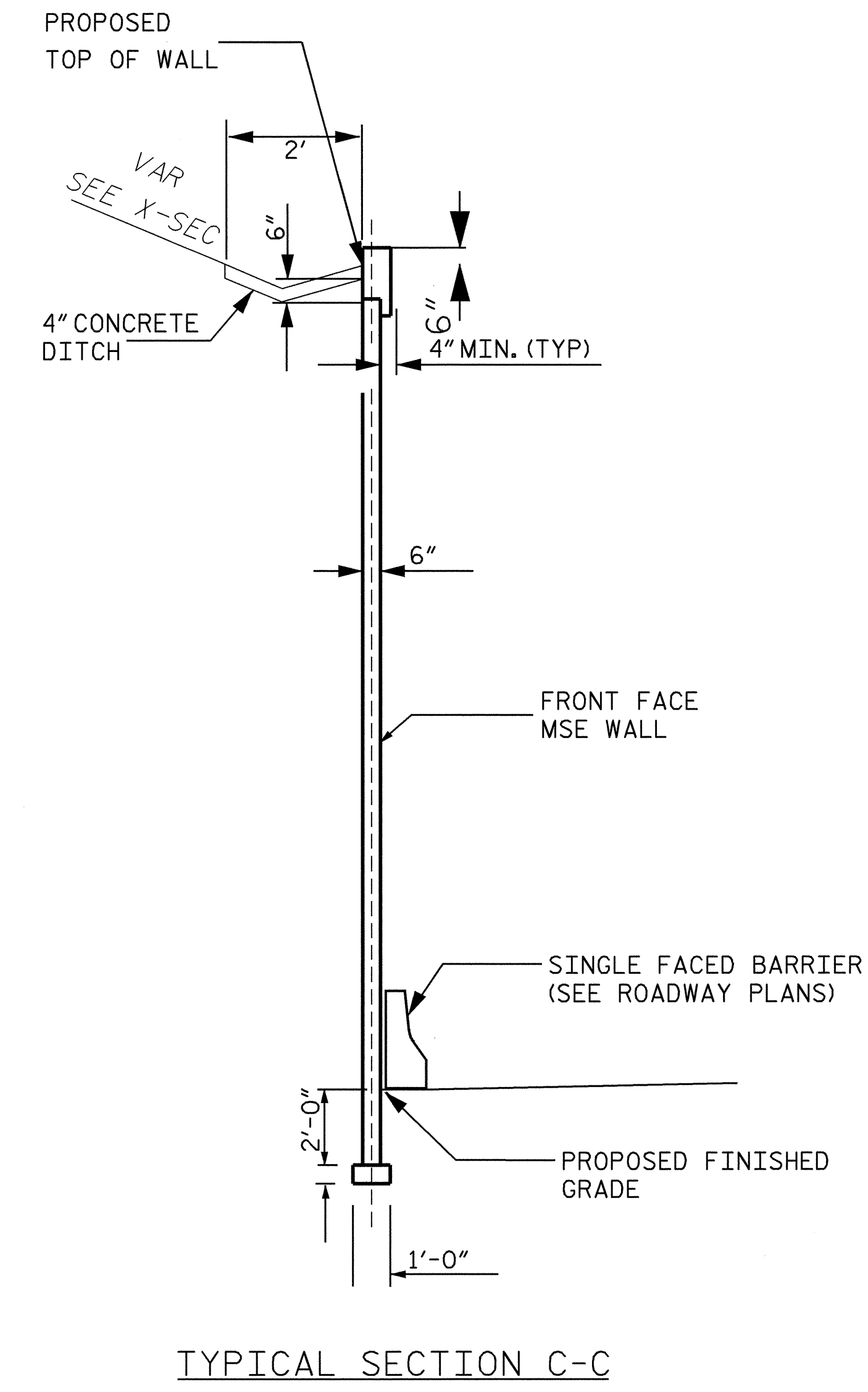
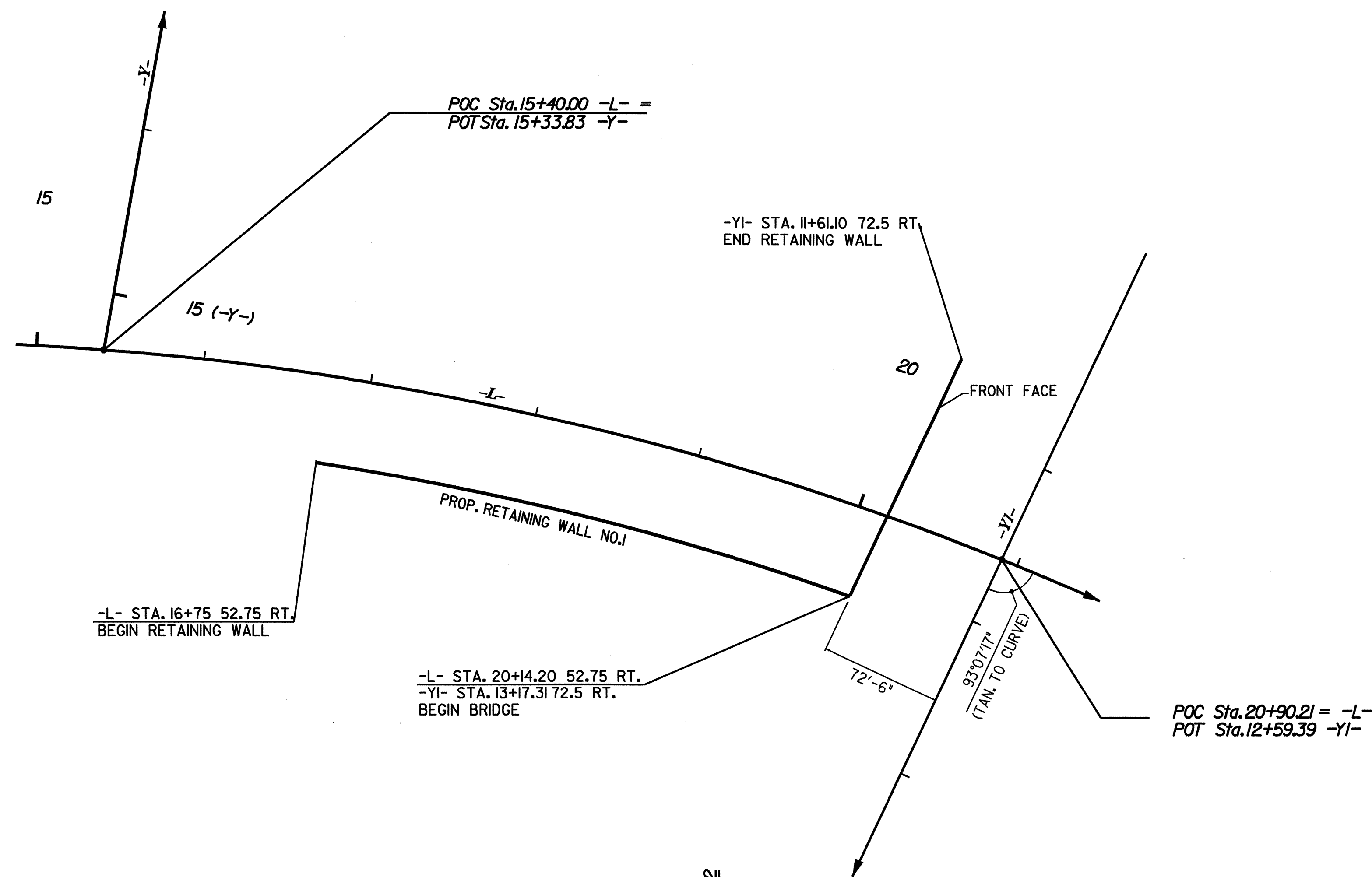
JOINT SEAL DETAILS @ END BENT
(FOR BARRIER RAIL)



PROJECT NO. U-4006
GUILFORD COUNTY
STATION: 20+90.21 -L-
SHEET 3 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
BRIDGE APPROACH SLAB DETAILS					
RIGHT LANE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-75
					TOTAL SHEETS 75

ASSEMBLED BY :	A. SORSENGINH	DATE :	3/17/09
CHECKED BY :	J.R. DUGGINS	DATE :	4/09
DRAWN BY :	FCJ	REV. 10/17/00	RWW/LES
CHECKED BY :	ARB	REV. 5/7/03	RWW/JTE
		REV. 5/1/06	TLA/GM



PROJECT NO.: U-4006 (35007.1.1)

GUILFORD COUNTY

STATION: 16+75.00 -L- to 11+61.10 -YI-

SHEET 1 OF 3

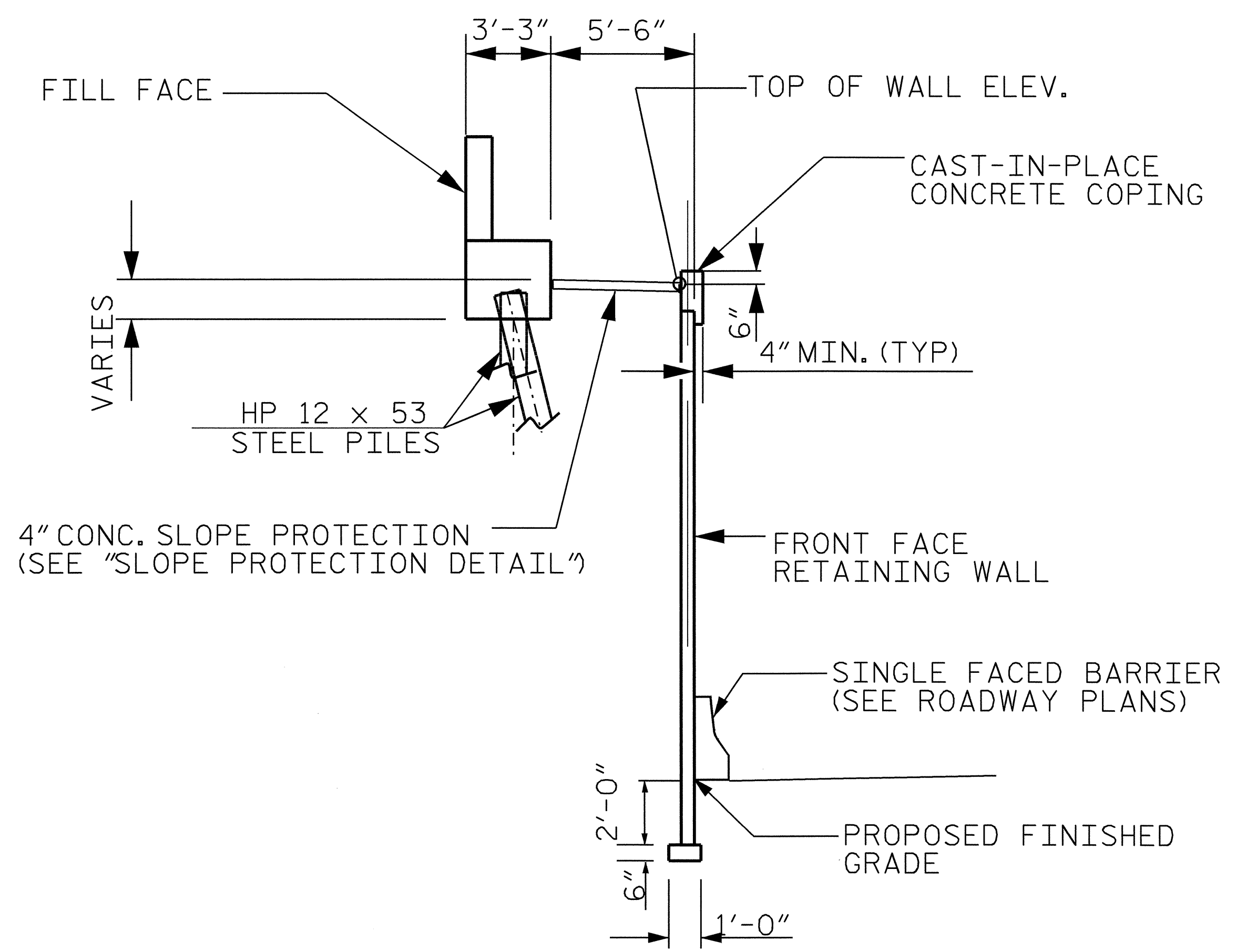
GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

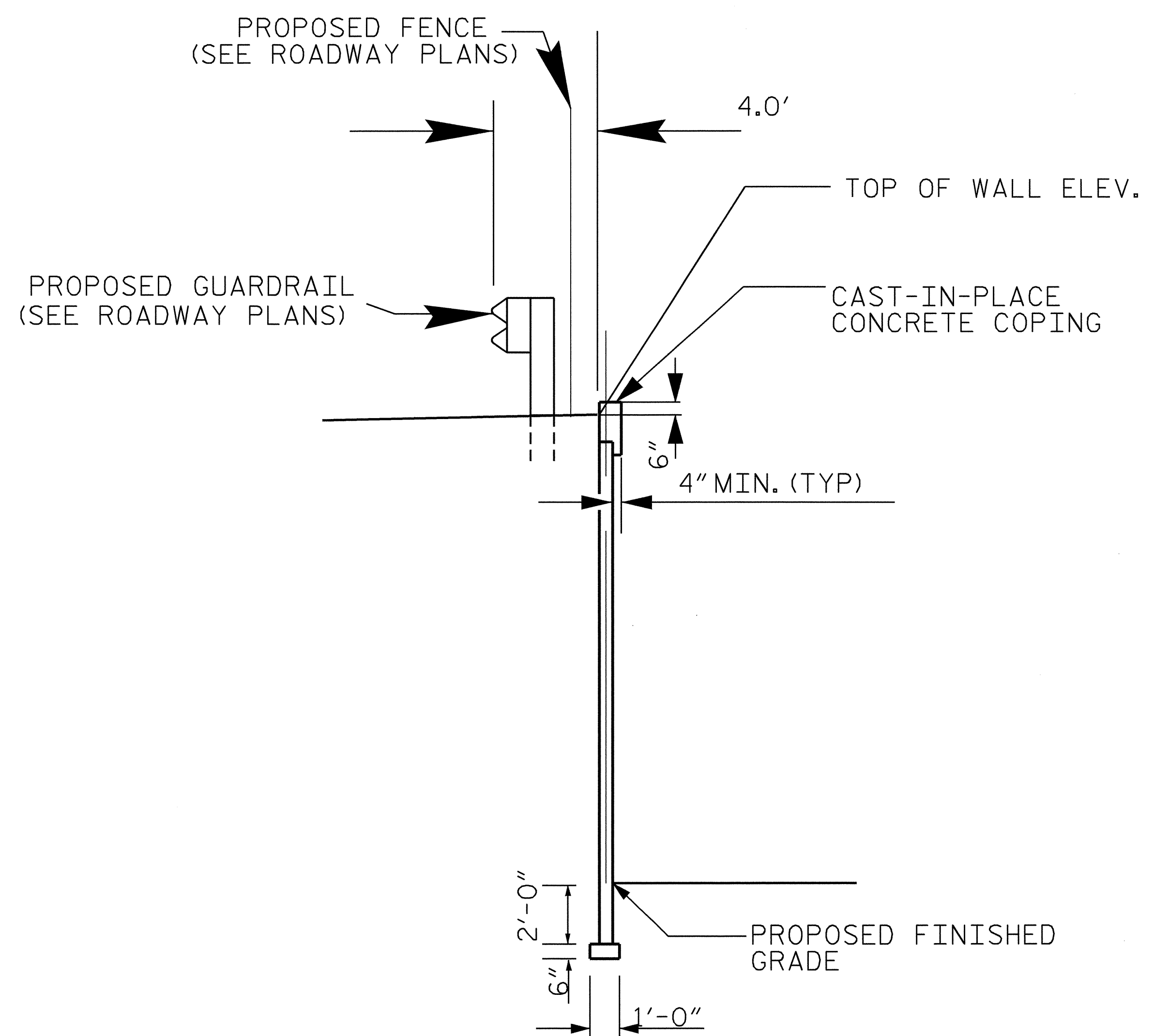
EASTERN REGIONAL OFFICE
 WESTERN REGIONAL OFFICE
 CONTRACT OFFICE

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

RETAINING WALL #1 MSE WALL



TYPICAL SECTION A-A



TYPICAL SECTION B-B

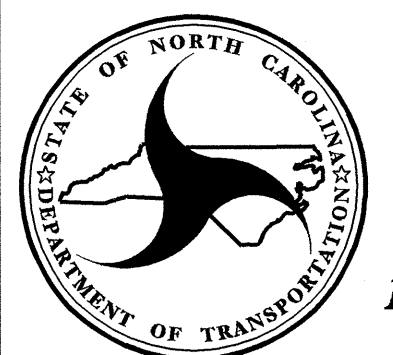
BILL OF MATERIAL	
RETAINING WALL #1	6,900 SQ.FT.

PROJECT NO.: U-4006 (35007.1.1)
 GUILFORD COUNTY
 STATION: 16+75.00 -L- to 11+61.10 -Y1-
 SHEET 2 OF 3

PREPARED BY: D. TEAGUE DATE: 2/09
 REVIEWED BY: E. WILLIAMS DATE: 2/09

GEOTECHNICAL ENGINEERING UNIT


EASTERN REGIONAL OFFICE
 WESTERN REGIONAL OFFICE
 CONTRACT OFFICE



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

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

RETAINING WALL #1
MSE WALL

GEOTECHNICAL ENGINEER  David L. Teague <small>SIGNATURE</small>	ENGINEER <small>SIGNATURE</small>
--------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------

NOTES

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

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

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

3. DO NOT USE AN MSE WALL SYSTEM WITH SEGMENTAL RETAINING WALL UNITS FOR WALL NO.1.

4. DO NOT USE STANDARD SIZE 2S OR 2MS FOR WALL BACKFILL FOR RETAINING WALL NO.1.

5. BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALL NO.1, SURVEY ALL EXISTING GROUND ELEVATIONS SHOWN ON THE PLANS AND SUBMIT A REVISED WALL ENVELOPE FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THE ENVELOPE IS ACCEPTED.

6. CAST IN PLACE CONCRETE COPING IS REQUIRED FOR RETAINING WALL NO.1.

7. DESIGN RETAINING WALL NO.1 FOR A WALL HEIGHT EQUAL TO THE DESIGN HEIGHT (DIFFERENCE BETWEEN GRADE ELEVATION AND BOTTOM OF WALL ELEVATION) PLUS EMBEDMENT (DIFFERENCE BETWEEN BOTTOM OF WALL ELEVATION AND TOP OF LEVELING PAD ELEVATION).

8. DESIGN RETAINING WALL NO.1 FOR THE FOLLOWING:

- 1) MINIMUM SERVICE LIFE = 100 YEARS
- 2) ALLOWABLE BEARING CAPACITY = 4500 PSF
- 3) WALL BACKFILL PARAMETERS:

MATERIAL STANDARD SIZE NO. (IN ACCORDANCE WITH SECTIONS 1005 AND 1014 OF THE STANDARD SPECIFICATIONS)	UNIT WEIGHT PCF	FRICTION ANGLE DEGREES	COHESION PSF
57, 67 AND 78M	110	38	0

4) IN-SITU ASSUMED SOIL MATERIAL PARAMETERES:

MATERIAL TYPE	UNIT WEIGHT PCF	FRICTION ANGLE DEGREES	COHESION (c) PSF
RETAINED AND RANDOM BACKFILL	120	30	0
FOUNDATION	120	30	0

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

10. FOUNDATIONS FOR END BENT NO.1 WILL INTERFERE WITH REINFORCEMENT FOR WALL NO.1. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

11. DO NOT PLACE LEVELING PAD CONCRETE, WALL BACKFILL, OR FIRST REINFORCEMENT LAYER FOR RETAINING WALL NO.1 UNTIL OBTAINING APPROVAL OF THE EXCAVATION DEPTH AND FOUNDATION MATERIAL.

12. INCLUDE IN THE UNIT BID PRICE FOR MSE RETAINING WALLS ALL COSTS FOR DESIGN, SUBMITTALS, FURNISHING LABOR, TOOLS, EQUIPMENT AND MATERIALS, PERFORMING ANY EXCAVATION, PROVIDING SITE ASSISTANCE, LEVELING PADS, FACING ELEMENTS, REINFORCEMENT, BACKFILL, FABRIC, COPING, 4" CONCRETE SLOPE PROTECTION, AND MISCELLANEOUS COMPONENTS AND ANY INCIDENTALS NECESSARY TO DESIGN AND CONSTRUCT MSE WALLS.

PROJECT NO.: U-4006 (35007.1.1)
GUILFORD COUNTY
STATION: 16+75.00 -L- to 11+61.10 -Y1-
 SHEET 3 OF 3

GEOTECHNICAL ENGINEERING UNIT

EASTERN REGIONAL OFFICE
 WESTERN REGIONAL OFFICE
 CONTRACT OFFICE

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH


RETAINING WALL #1 MSE WALL

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			3			N-3
2			4			5

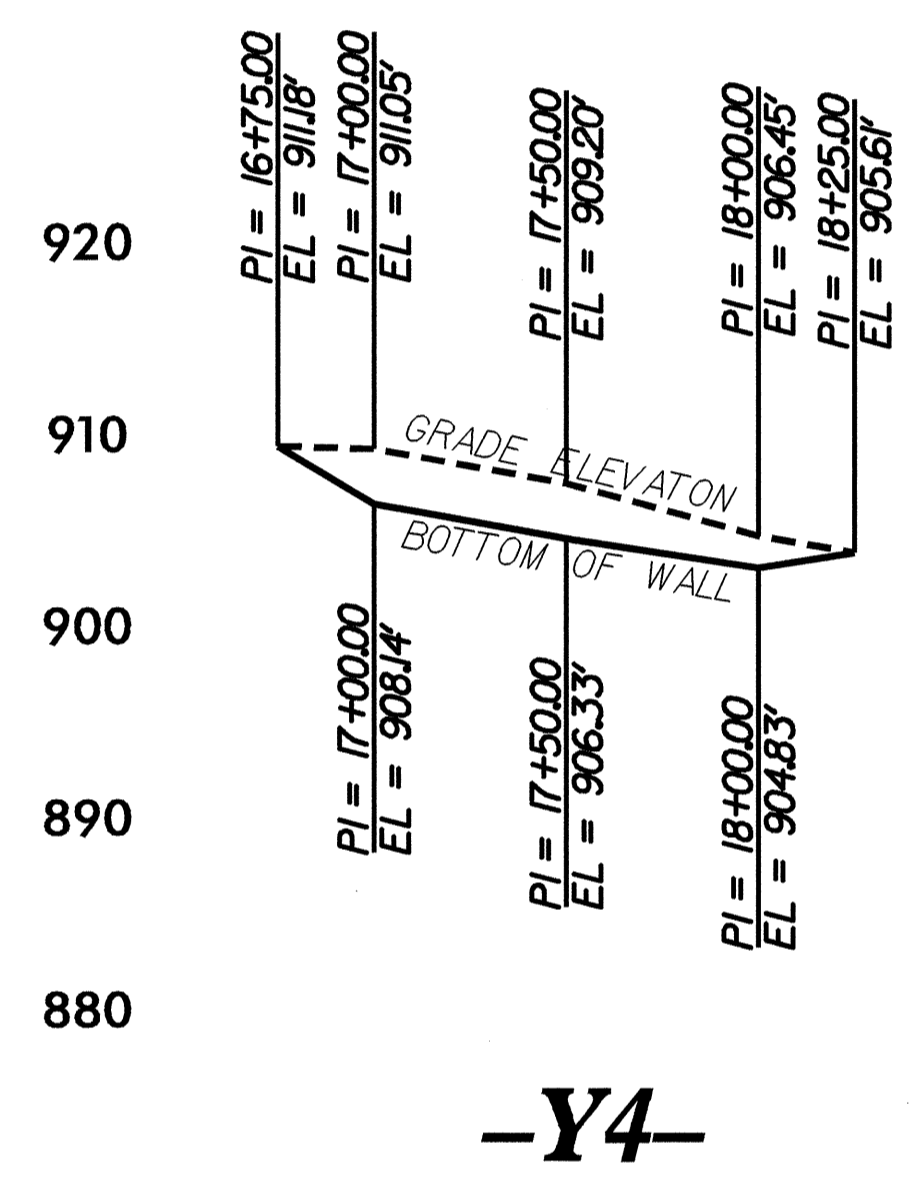
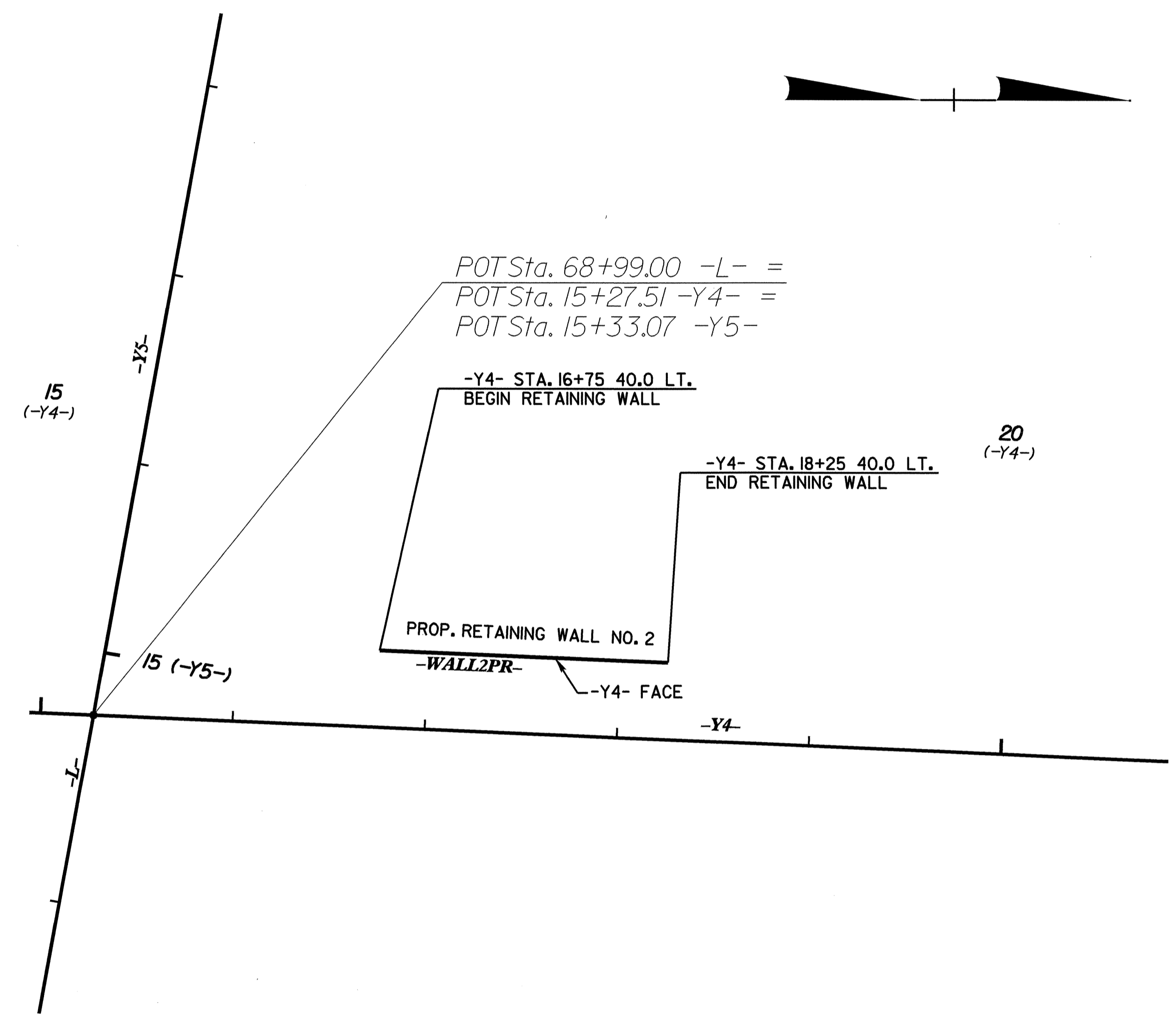
PREPARED BY: D. TEAGUE	DATE: 2/09
REVIEWED BY: E. WILLIAMS	DATE: 2/09

GEOTECHNICAL ENGINEER

ENGINEER


 SEAL 027869
 DAVID L. TEAGUE

Signature: *David L. Teague* Date: _____
 Signature: _____ Date: _____



BILL OF MATERIAL	
RETAINING WALL #2	350 SQ.FT.

PROJECT NO.: U-4006 (35007.1.1)
 GUILFORD COUNTY
STATION: 16+75.00 -Y4- TO 18+25.00 -Y4-
 SHEET 1 OF 2

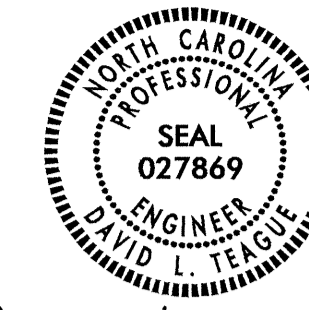
PREPARED BY: D. TEAGUE DATE: 2/09
 REVIEWED BY: E. WILLIAMS DATE: 2/09

GEOTECHNICAL ENGINEERING UNIT
 EASTERN REGIONAL OFFICE
 WESTERN REGIONAL OFFICE
 CONTRACT OFFICE

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

RETAINING WALL #2
 PLAN VIEW AND
 WALL ENVELOPE

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



David L. Teague 5/27/09
SIGNATURE DATE

SIGNATURE DATE

NOTES

FOR SEGMENTAL GRAVITY RETAINING WALLS, SEE SEGMENTAL GRAVITY RETAINING WALLS PROVISION.

FREEZE-THAW DURABLE SEGMENTAL RETAINING WALL UNITS ARE REQUIRED IN ACCORDANCE WITH THE SEGMENTAL GRAVITY RETAINING WALLS PROVISION.

A DRAIN IS REQUIRED FOR RETAINING WALL NO. 2.

BEFORE BEGINNING SEGMENTAL GRAVITY WALL DESIGN FOR RETAINING WALL NO. 2, SURVEY EXISTING GROUND ELEVATIONS SHOWN ON THE WALL PROFILE VIEW (WALL ENVELOPE) AND SUBMIT A REVISED WALL ENVELOPE FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THIS ENVELOPE IS ACCEPTED.

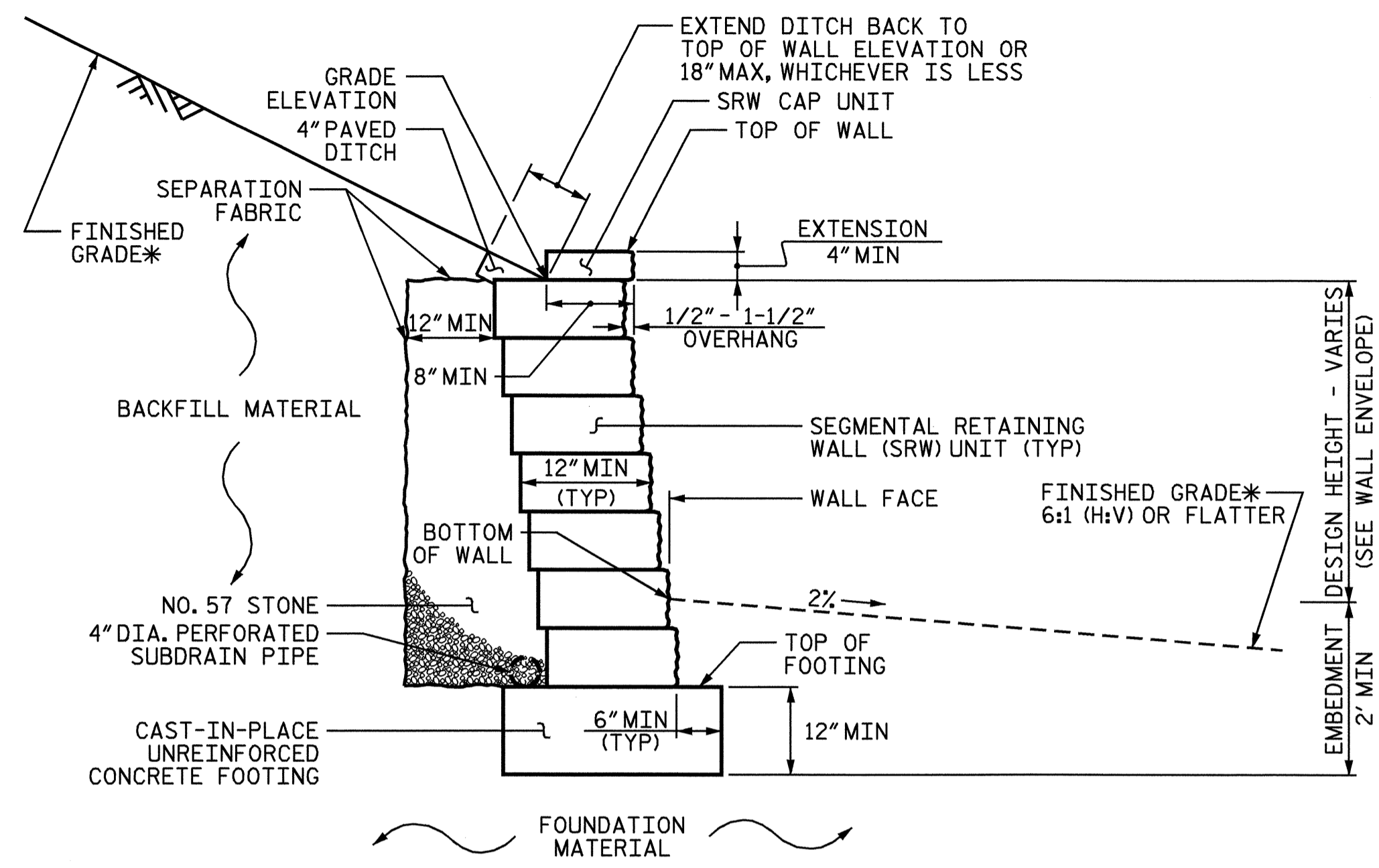
DESIGN RETAINING WALL NO. 2 FOR WALL HEIGHTS EQUAL TO THE DESIGN HEIGHT PLUS DEPTH TO TOP OF FOOTING (DIFFERENCE BETWEEN GRADE ELEVATION AND TOP OF FOOTING ELEVATION).

DESIGN RETAINING WALL NO. 2 FOR THE FOLLOWING:

- 1) MINIMUM SERVICE LIFE = 75 YEARS
- 2) ALLOWABLE BEARING CAPACITY = 2,000 PSF
- 3) MINIMUM EMBEDMENT ELEVATION = 2 FT
- 4) IN-SITU ASSUMED MATERIAL PARAMETERS:

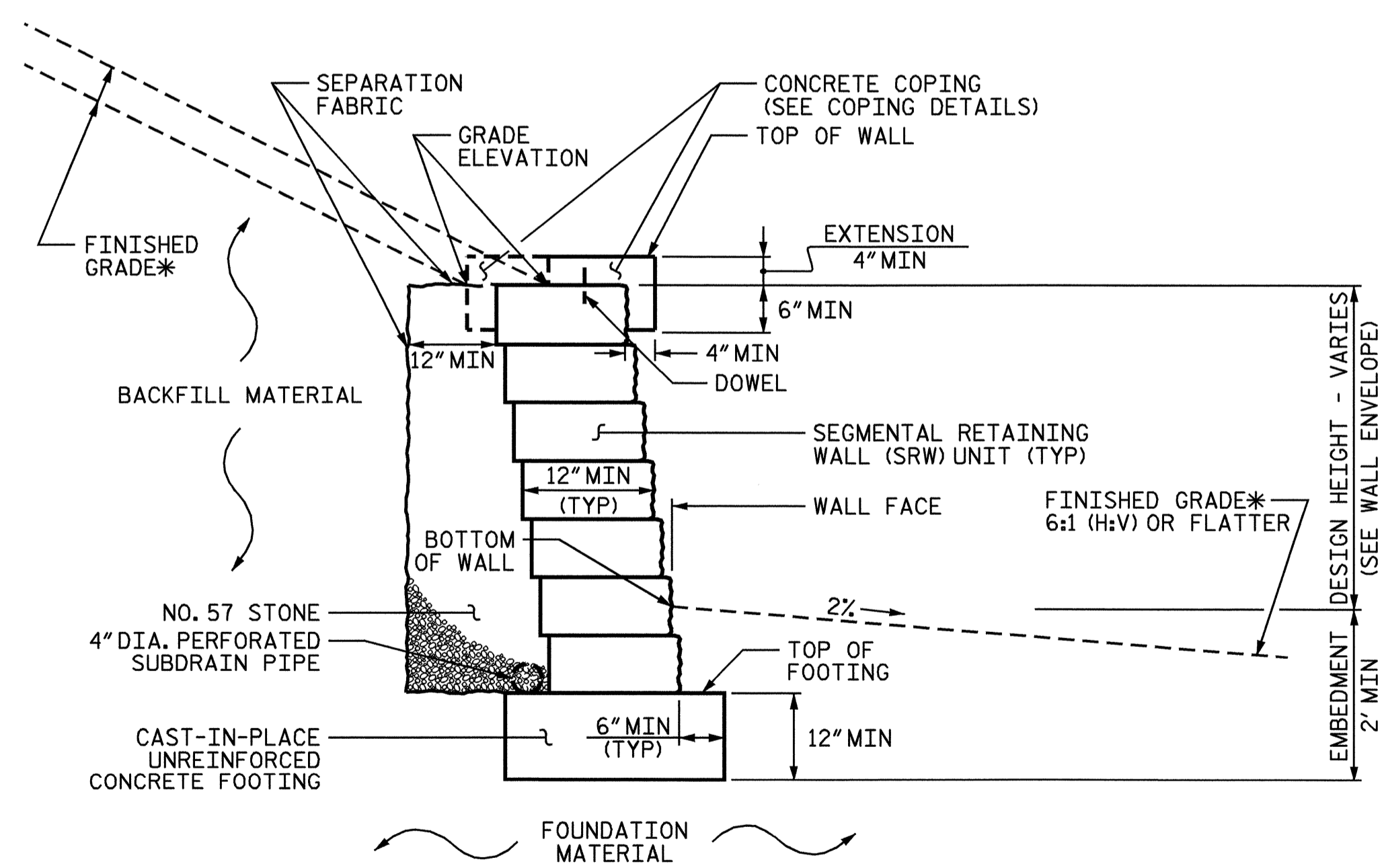
MATERIAL TYPE	UNIT WEIGHT (gamma) PCF	FRICTION ANGLE (phi) DEGREES	COHESION (c) PSF
BACKFILL	120	30	0
FOUNDATION	120	30	0

DO NOT PLACE CONCRETE FOR FOOTINGS FOR RETAINING WALL NO. 2 UNTIL OBTAINING APPROVAL OF THE EXCAVATION DEPTH AND FOUNDATION MATERIAL.



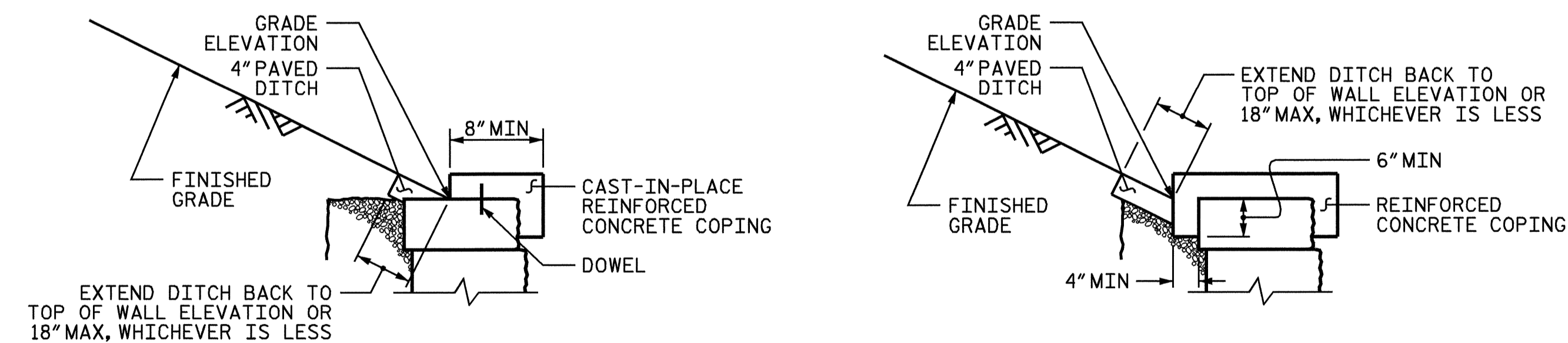
SEGMENTAL GRAVITY WITH SRW CAP UNIT TYPICAL SECTION

*SEE ROADWAY TYPICAL SECTIONS FOR FINISHED GRADE DETAILS.



SEGMENTAL GRAVITY WITH COPING TYPICAL SECTION

*SEE ROADWAY TYPICAL SECTIONS FOR FINISHED GRADE DETAILS.



COPING DETAILS

AT THE CONTRACTOR'S OPTION, EXTEND COPING DOWN BACK OF SRW UNITS IN LIEU OF USING DOWELS.

PROJECT NO.: U-4006 (35007.1.1)

GUILFORD COUNTY

STATION: 16+75.00 -Y4- TO 18+25.00 -Y4-

SHEET 2 OF 2

PREPARED BY: D. TEAGUE DATE: 2/09
REVIEWED BY: E. WILLIAMS DATE: 2/09

GEOTECHNICAL ENGINEERING UNIT

EASTERN REGIONAL OFFICE
 WESTERN REGIONAL OFFICE
 CONTRACT OFFICE

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RETAINING WALL #2
TYPICAL SECTIONS
AND NOTES

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

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. FINISHES 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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