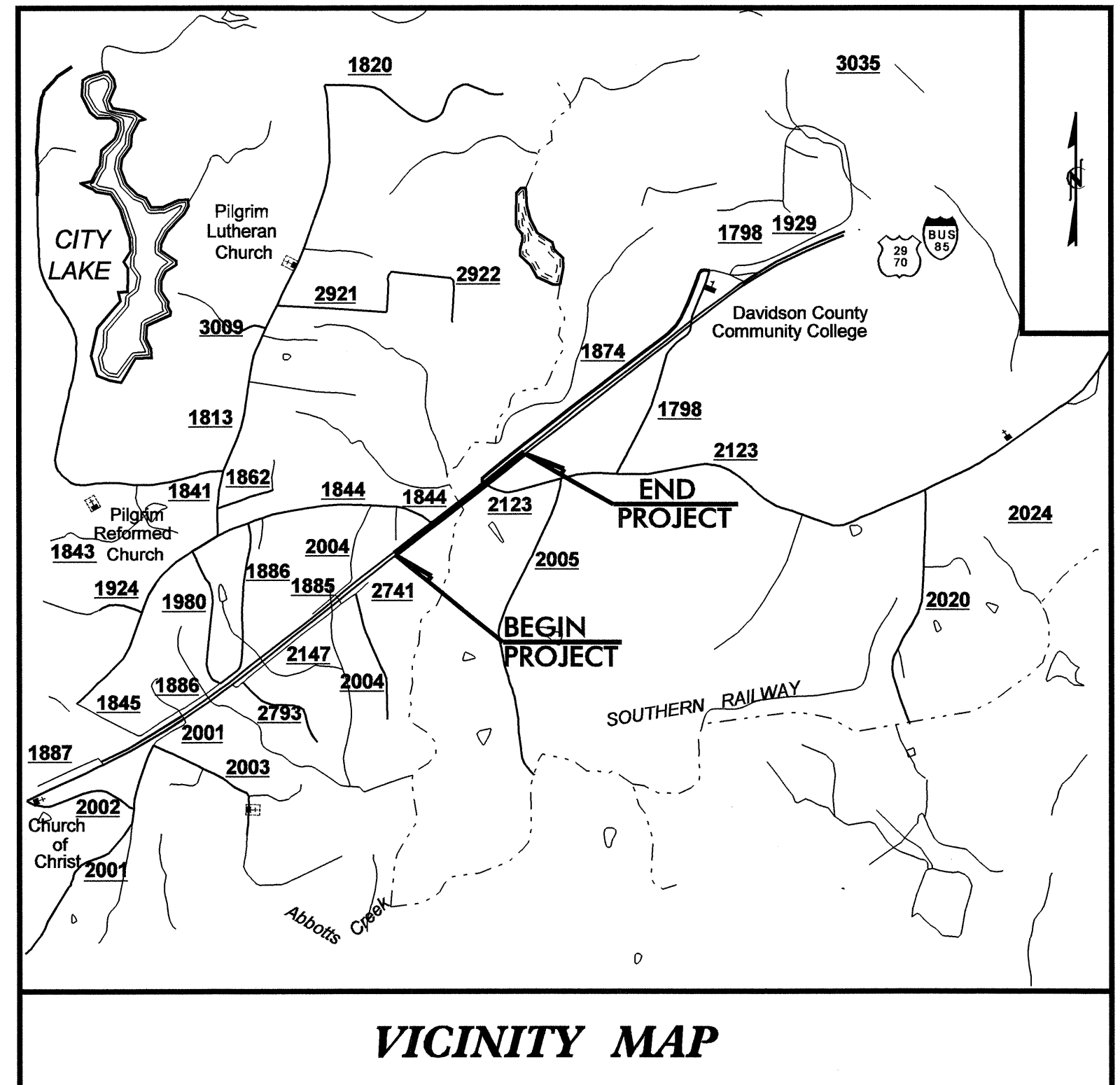


**CONTRACT: C201601 TIP PROJECT: B-4095**



STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**DAVIDSON COUNTY**

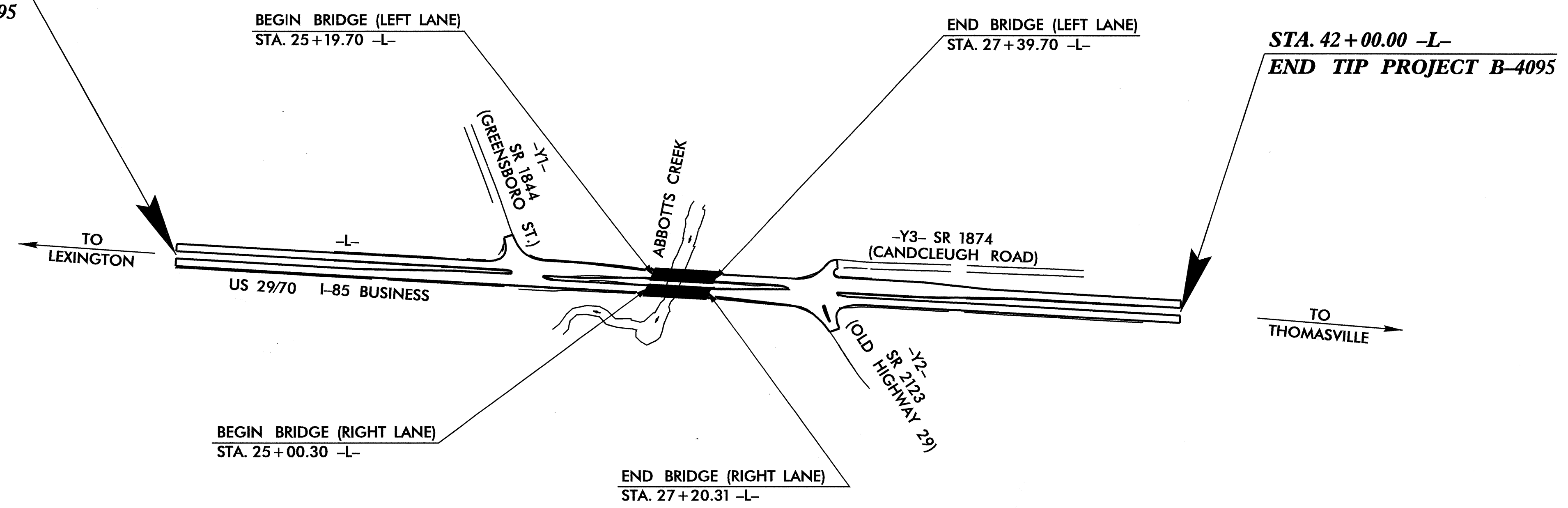
**LOCATION: BRIDGE NO. 128 (NBL) & NO. 130 (SBL) OVER ABBOTTS CREEK ON US 29 /70 AND I-85 BUSINESS LOOP**

**TYPE OF WORK: GRADING, DRAINAGE, STRUCTURES, PAVING, WIDENING AND RESURFACING**

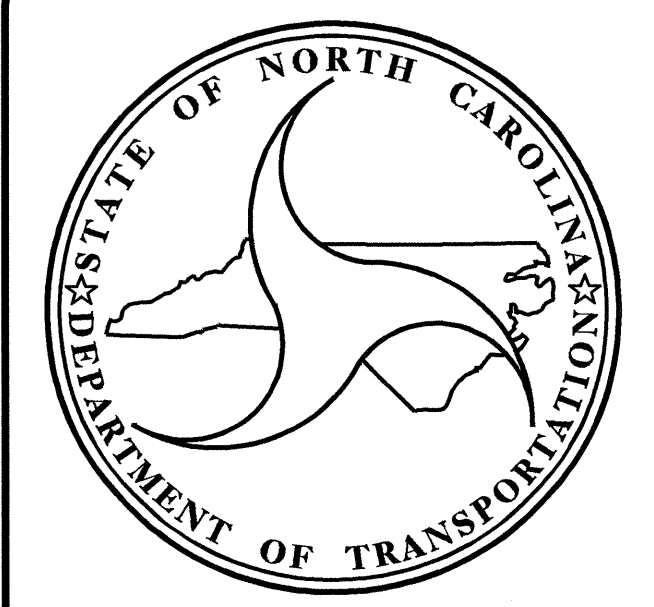
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4095		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33453.1.1	BRSTP-29(19)	PE	
33453.2.2	BRSTP-29(19)	R /W & UTILITIES	
33453.3.1	BRSTP-29(19)	CONST.	

**STRUCTURES**

**STA. 10+00.00 -L-  
BEGIN TIP PROJECT B-4095**



**STA. 42+00.00 -L-  
END TIP PROJECT B-4095**



**DESIGN DATA**

ADT 2006 =	25,820
ADT 2026 =	39,900
DHV =	10 %
D =	60 %
T =	16 % *
V =	60 MPH
* TTST	6% DUAL 10%
FUNC CLASS =	RURAL MINOR ARTERIAL

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT B-4095 =	0.564 MILES
LENGTH STRUCTURES TIP PROJECT B-4095 =	0.042 MILES
TOTAL LENGTH OF TIP PROJECT B-4095 =	0.606 MILES

Prepared in the Office of:  
**DIVISION OF HIGHWAYS**

2006 STANDARD SPECIFICATIONS

**LETTING DATE:**  
AUGUST 21, 2007

**Q.H. NGUYEN, P.E.**  
PROJECT ENGINEER

**MARC G. CHEEK, P.E.**  
PROJECT DESIGN ENGINEER

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

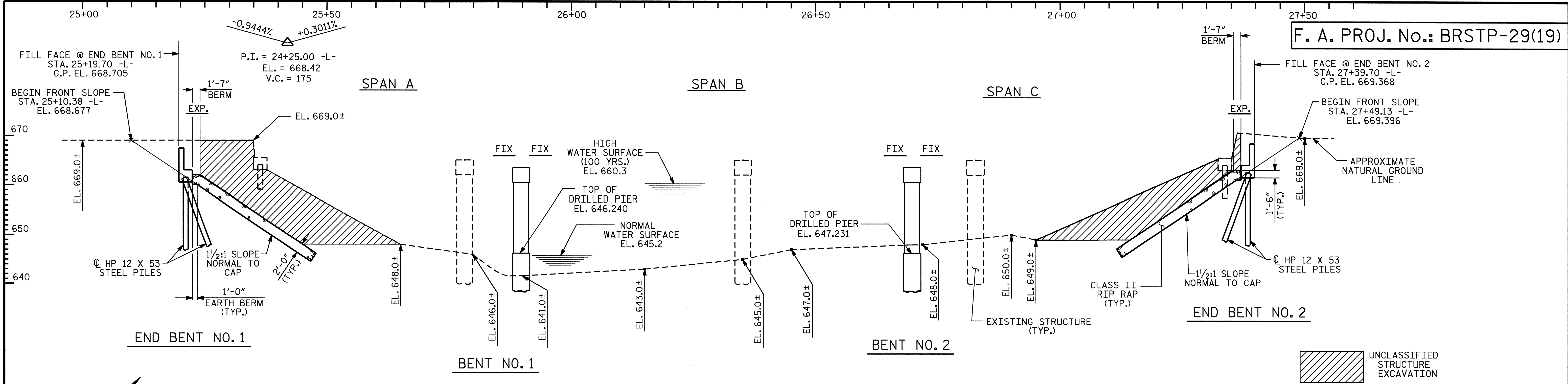
**DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA**

STATE DESIGN ENGINEER \_\_\_\_\_ P.E.

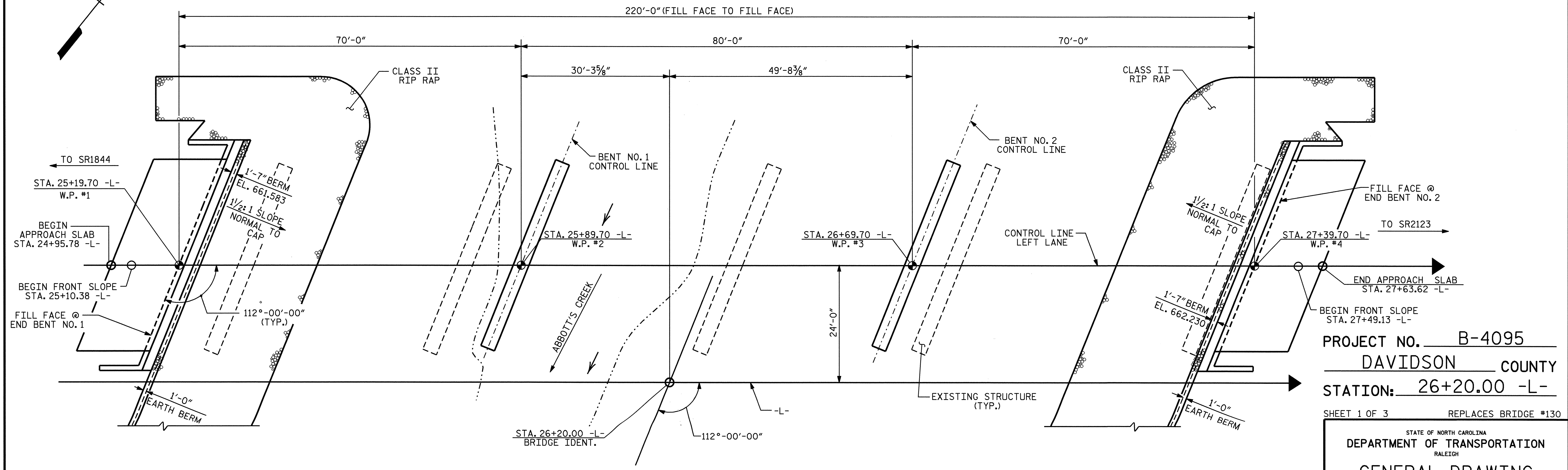
**DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION**

APPROVED \_\_\_\_\_  
DIVISION ADMINISTRATOR \_\_\_\_\_ DATE \_\_\_\_\_

15-MAY-2007 10:28  
 \*\*\*\*\*DIGNS\*\*\*\*\*  
 \*\*\*\*\*  
 \*\*\*\*\*



**SECTION ALONG CONTROL LINE LEFT LANE**  
(SECTION THROUGH END BENTS & BENTS ARE TAKEN AT RIGHT ANGLES)



**PLAN**  
(PILES AND COLUMNS NOT SHOWN IN PLAN VIEW)  
FOR TEMPORARY ACCESS, SEE SHEET S-4.

PROJECT NO. B-4095  
 DAVIDSON COUNTY  
 STATION: 26+20.00 -L-

SHEET 1 OF 3 REPLACES BRIDGE #130

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 BRIDGE ON US29/US70/I85BUS  
 OVER ABBOTT'S CREEK  
 BETWEEN SR1844 AND SR2123  
 LEFT LANE

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

DRAWN BY: V. X. NGUYEN DATE: 8-19-05  
 CHECKED BY: L. L. MURPHY DATE: 10-05

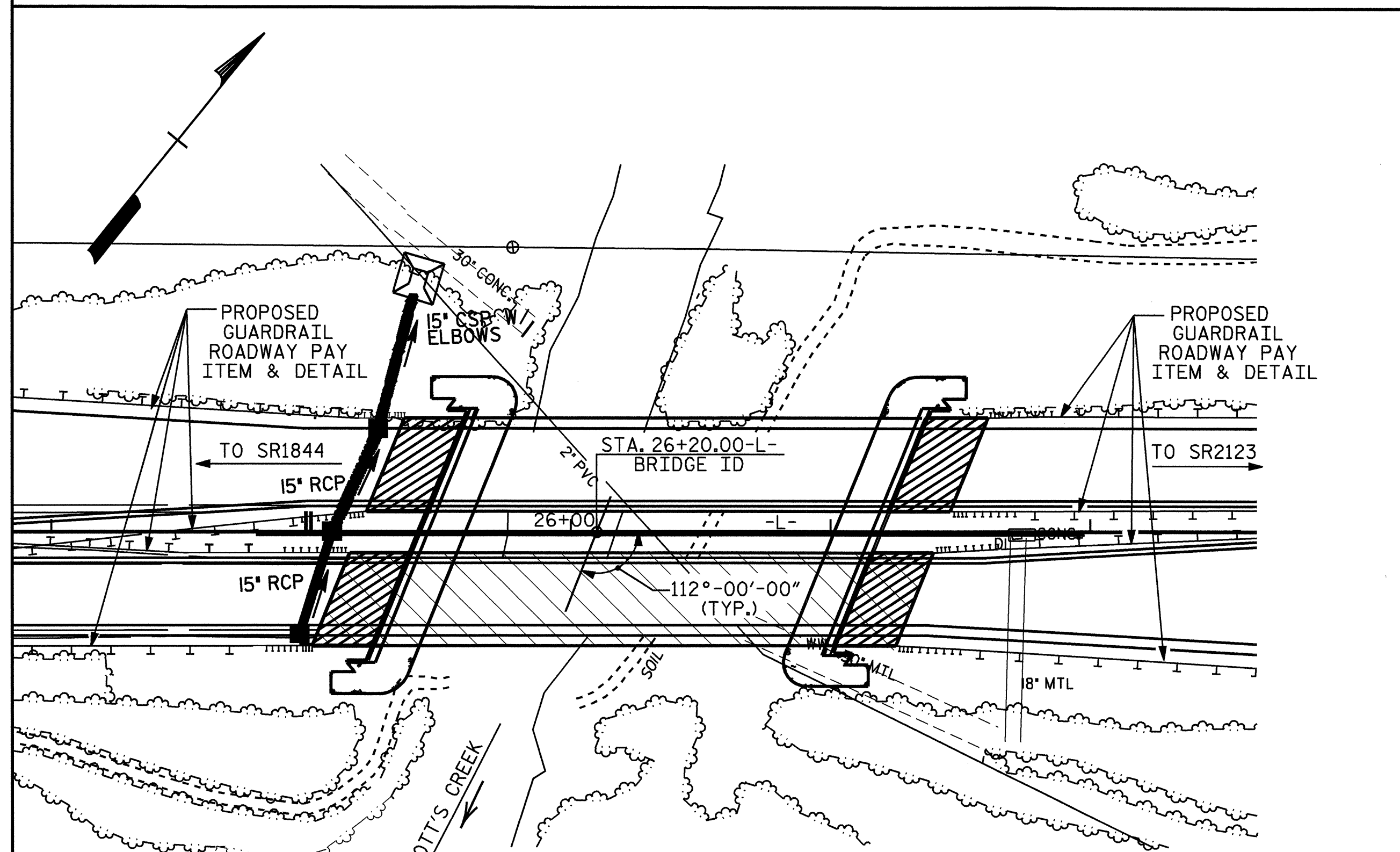




# TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS	REMOVAL OF EXISTING STRUCTURE	4'-0" DIA. DRILLED PIER IN SOIL	4'-0" DIA. DRILLED PIER NOT IN SOIL	PERMANENT STEEL CASING FOR 4'-0" DIA. DRILLED PIER	SID INSPECTION	SPT TESTING	CROSSHOLE SONIC LOGGING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDERS	HP 12 X 53 STEEL PILES	CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE	ELASTOMERIC BEARINGS	EVAZOTE JOINT SEALS			
	LUMP SUM	LUMP SUM	LIN.FT.	LIN.FT.	LIN.FT.	EA.	EA.	EA.	CU.YDS.	SQ.FT.	SQ.FT.	CU.YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN.FT.	NO.	LIN.FT.	LIN.FT.	TONS	SQ.YDS.	LUMP SUM	LUMP SUM	
SUPERSTRUCTURE										8547	8708		LUMP SUM				15	1072.50			435.52			LUMP SUM	LUMP SUM
END BENT NO.1									650			28.9		4529			10	300			521	579			
BENT NO.1			27.75	18.00	24.75		1					35.9		10327	2222										
BENT NO.2			75.75	21.00			1					35.1		13435	3411										
END BENT NO.2									400			28.9		4529			10	400			432	480			
TOTAL	LUMP SUM	LUMP SUM	103.50	39.00	24.75	2	2	1	1050	8547	8708	128.8	LUMP SUM	32820	5633	15	1072.50	20	700	435.52	953	1059	LUMP SUM	LUMP SUM	

B.M. #1: RR SPIKE SET IN BASE OF 18" MAPLE 35' RT. OF NORTH EDGE OF SB US 29/70 BUS. 85 -BL-STA. 12+62.00 70' LT. EL. 689.33



### HYDRAULIC DATA

DESIGN DISCHARGE	=	8,500 C.F.S.
FREQUENCY OF DESIGN FLOOD	=	50 YRS.
DESIGN HIGH WATER ELEVATION	=	659.6
DRAINAGE AREA	=	70.7 SQ. MI.
BASIC DISCHARGE (Q100)	=	10,600 C.F.S.
BASIC HIGH WATER ELEVATION	=	660.0

### OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	=	30,200 C.F.S.
FREQUENCY OF OVERTOPPING FLOOD	=	500 YRS.
OVERTOPPING FLOOD ELEVATION	=	668.1

### LOCATION SKETCH

SEE STR. #2  
 FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIFICATIONS.

### NOTES

- ASSUMED LIVE LOAD = HS20 OR ALTERNATE LOADING, EXCEPT THESE GIRDERS HAVE BEEN DESIGNED FOR HS25.
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
- FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.
- THIS BRIDGE HAS BEEN DESIGNED BY THE STRENGTH DESIGN METHOD AS SPECIFIED IN AASHTO STANDARD SPECIFICATIONS.
- PRESTRESSED CONCRETE DECK PANELS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
- REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
- THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.
- REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.
- THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.
- THE 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 ARTICLES 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.
- THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH HEC 18, 'EVALUATING SCOUR AT BRIDGES', MAY, 2001.
- 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.
- THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS.
- AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR "CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS".
- NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.
- THE EXISTING 4 SPAN STRUCTURE (4 @ 50') CONSISTING OF A 7" CONCRETE DECK WITH A 5/2" ASPHALT WEARING SURFACE ON 4 LINES OF REINFORCED CONCRETE DECK GIRDERS SPACED AT 8'-6" CENTERS. ON A SUBSTRUCTURE CONSISTING OF A REINFORCED CONCRETE CAP AT END BENT #1, REINFORCED CONCRETE CAP ON STEEL PILES AT END BENT #2 AND REINFORCED CONCRETE POST AND WEB BENTS AND LOCATED AT THE SITE OF THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POST FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.
- THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA OF SHEET S-1 SHALL BE EXCAVATED FOR A DISTANCE OF 50 FT. LEFT SIDE OF CENTERLINE -L- ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE MEASURED AND PAID FOR AT THE CONTRACT UNIT PRICE PER CUBIC YARD FOR UNCLASSIFIED STRUCTURE EXCAVATION.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

PROJECT NO. B-4095  
DAVIDSON COUNTY  
 STATION: 26+20.00-L-

SHEET 3 OF 3  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 BRIDGE ON US29/US70/I85BUS  
 OVER ABBOTT'S CREEK  
 BETWEEN SR1844 AND SR2123  
 LEFT LANE



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

DRAWN BY : V. X. NGUYEN DATE : 8-29-05  
 CHECKED BY : L.L. MURPHY DATE : 10-05

10-JUL-2007 14:31  
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 dahodge

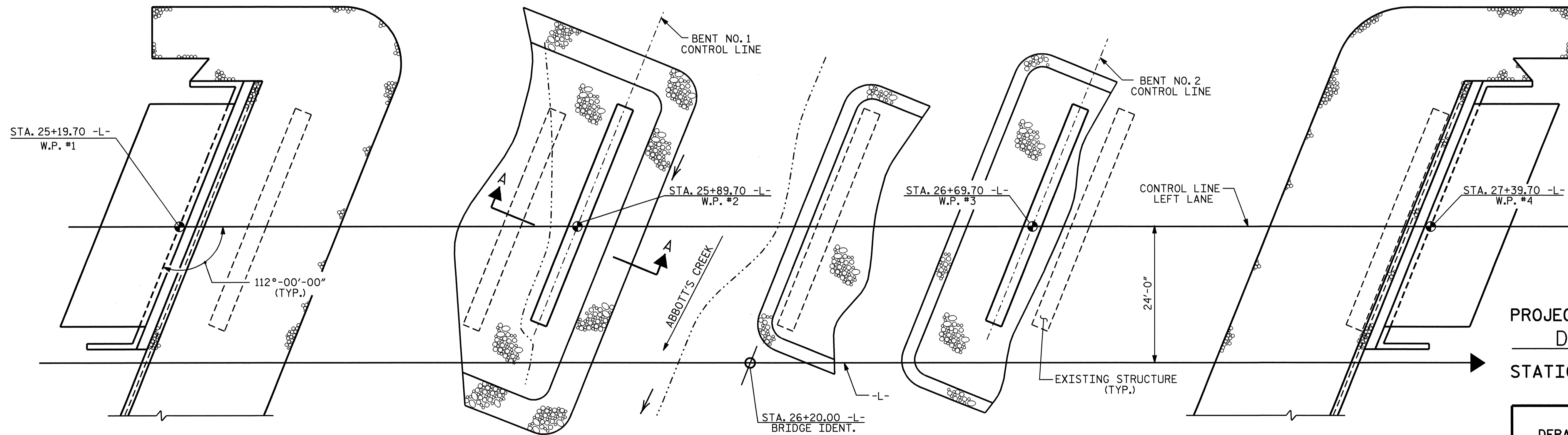
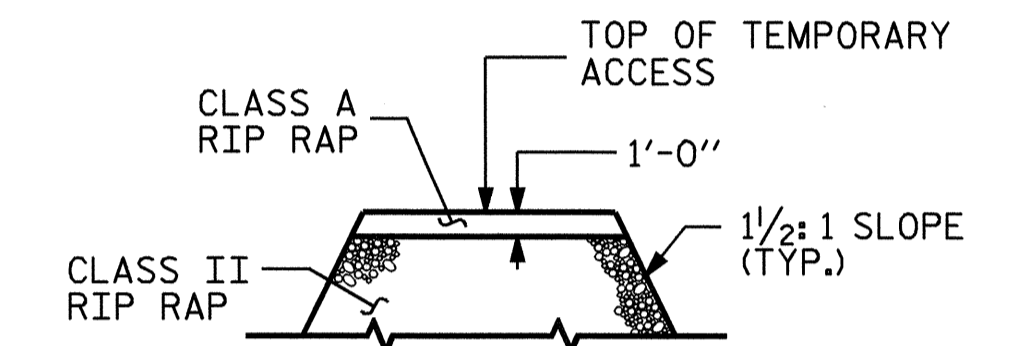
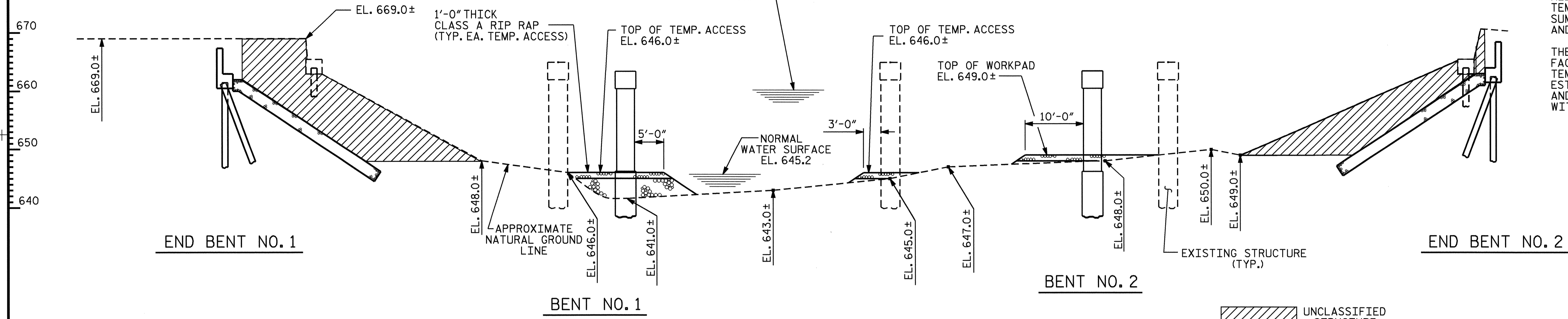
25+00 25+50 26+00 26+50 27+00 27+50

**NOTES**

FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS, SEE SPECIAL PROVISIONS.

ALL GRADING REQUIRED FOR ACCESS TO THE TEMPORARY ACCESS SHALL BE INCLUDED IN THE LUMP SUM BID PRICE FOR "CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS".

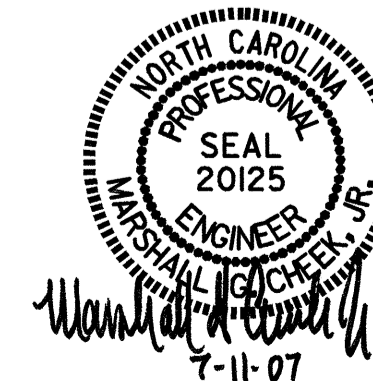
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LOCATION AND PROFILE OF THE TEMPORARY ACCESS SHOWN ON THE PLANS IS FOR ESTIMATING PURPOSES ONLY. THE ACTUAL LOCATION AND PROFILE SHALL BE DETERMINED IN THE FIELD WITH THE APPROVAL OF THE ENGINEER.



PROJECT NO. B-4095  
DAVIDSON COUNTY  
 STATION: 26+20.00 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

TEMPORARY ACCESS  
 LEFT LANE

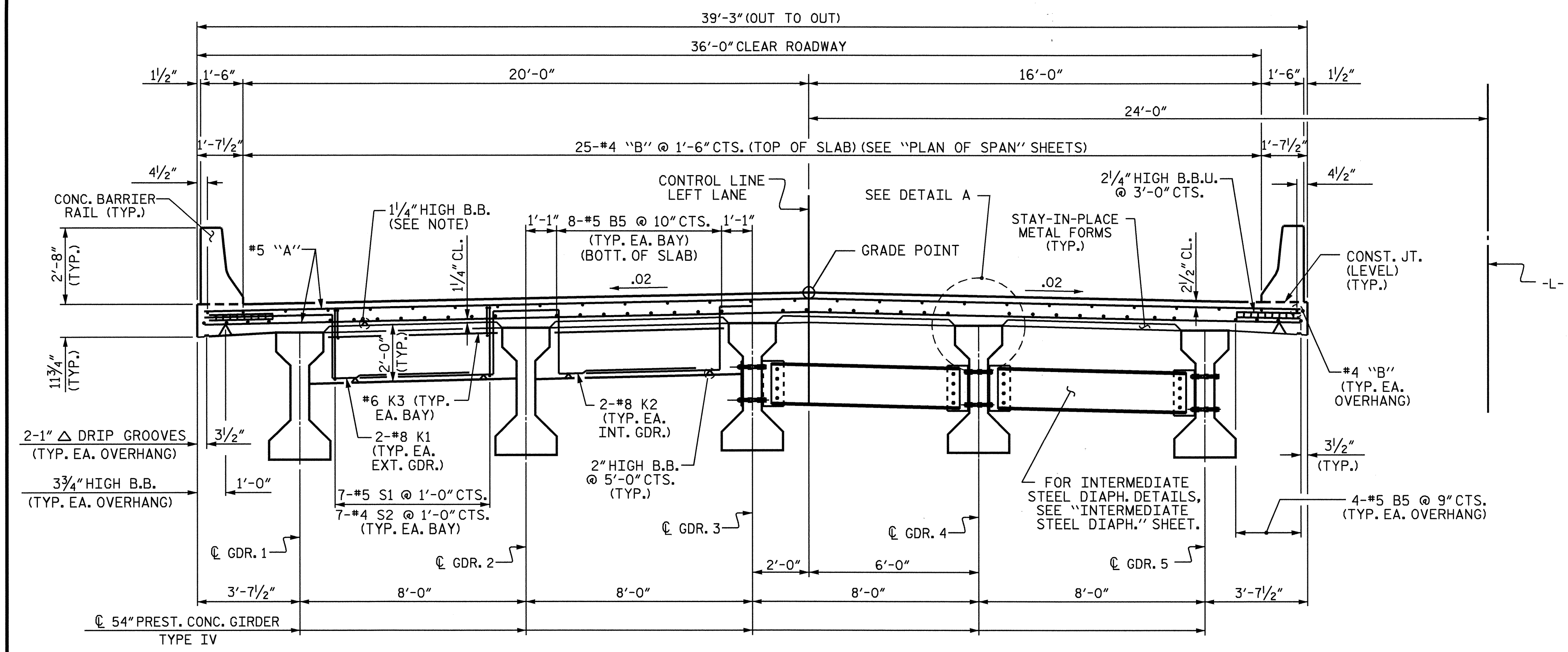


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			69

DRAWN BY : V. X. NGUYEN/DAH DATE : 5/07  
 CHECKED BY : M.G. CHEEK DATE : 5/07

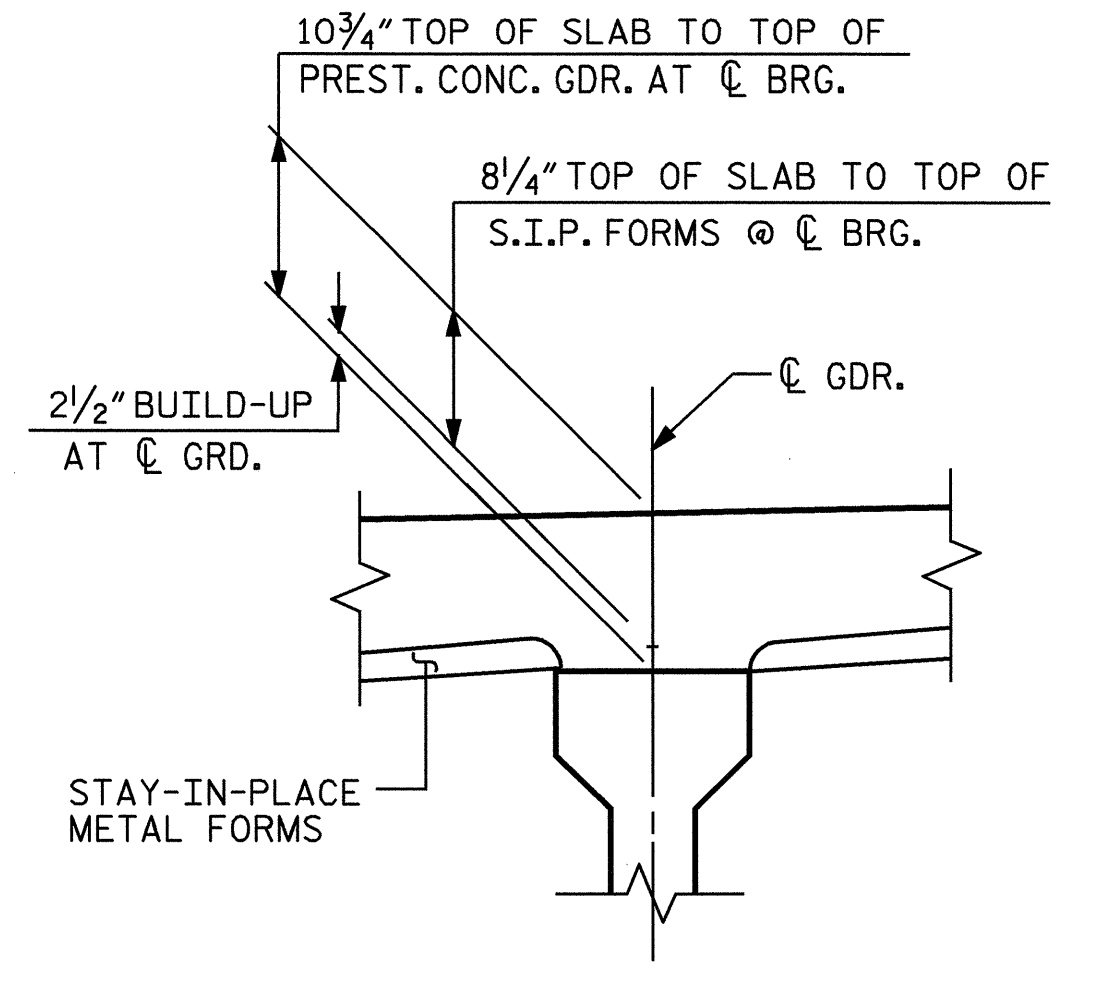
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 dahodge

STR. #1

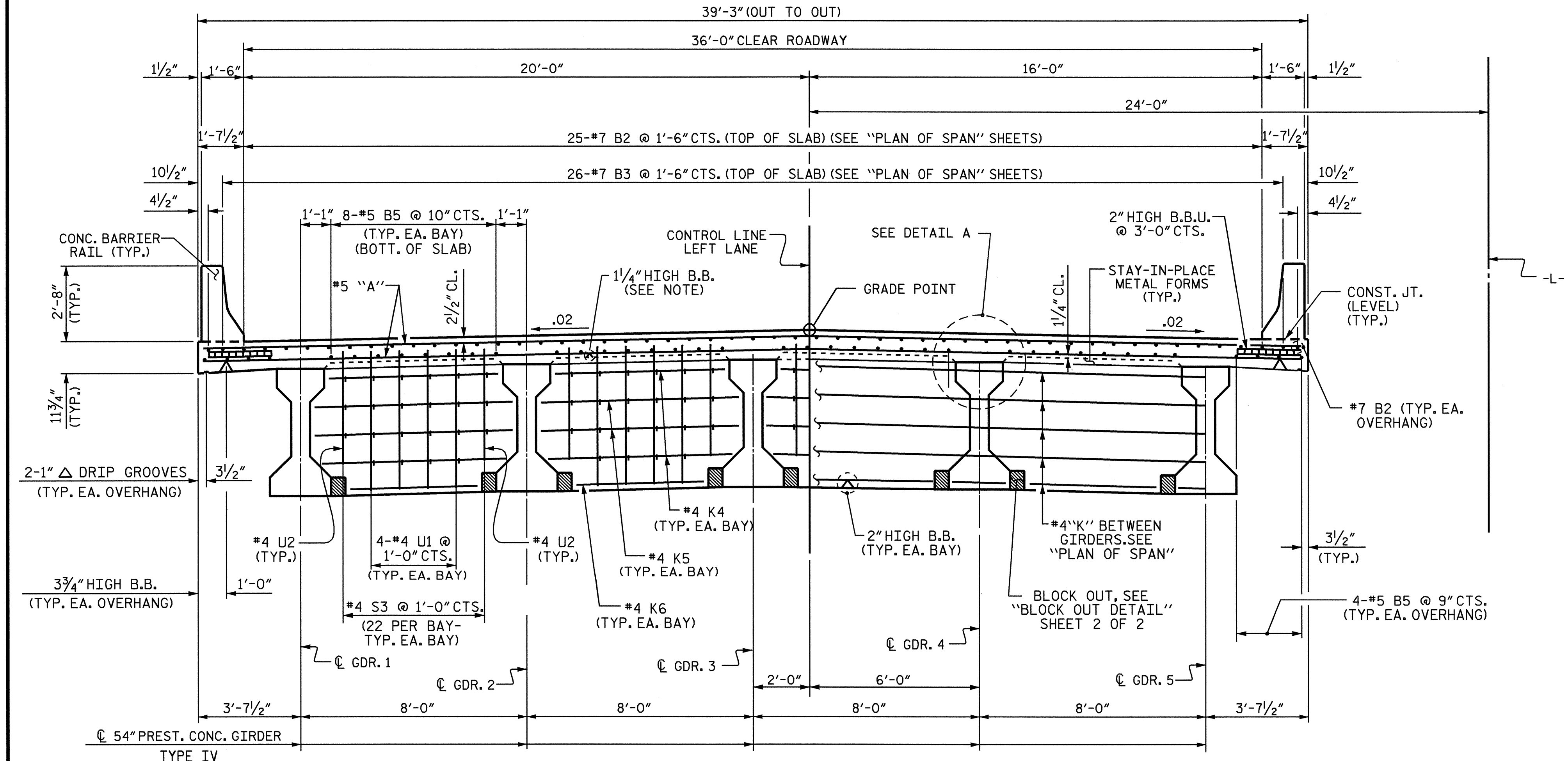


**TYPICAL HALF SECTION**  
(SHOWING END BENT DIAPHRAGMS)

**TYPICAL HALF SECTION**  
(SHOWING INTERMEDIATE STEEL DIAPHRAGMS)



**DETAIL A**



**TYPICAL SECTION**  
(SHOWING CONTINUOUS BENT DIAPHRAGMS)

**NOTES**

PROVIDE 1 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.

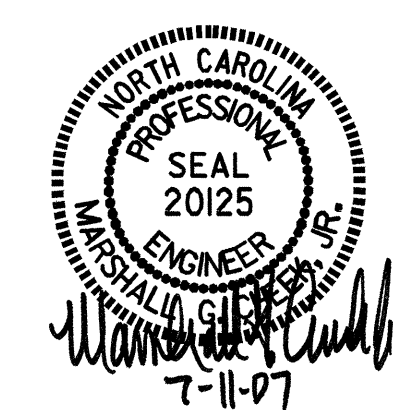
PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

PROJECT NO. B-4095  
DAVIDSON COUNTY  
STATION: 26+20.00-L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**SUPERSTRUCTURE  
TYPICAL SECTIONS  
LEFT LANE**

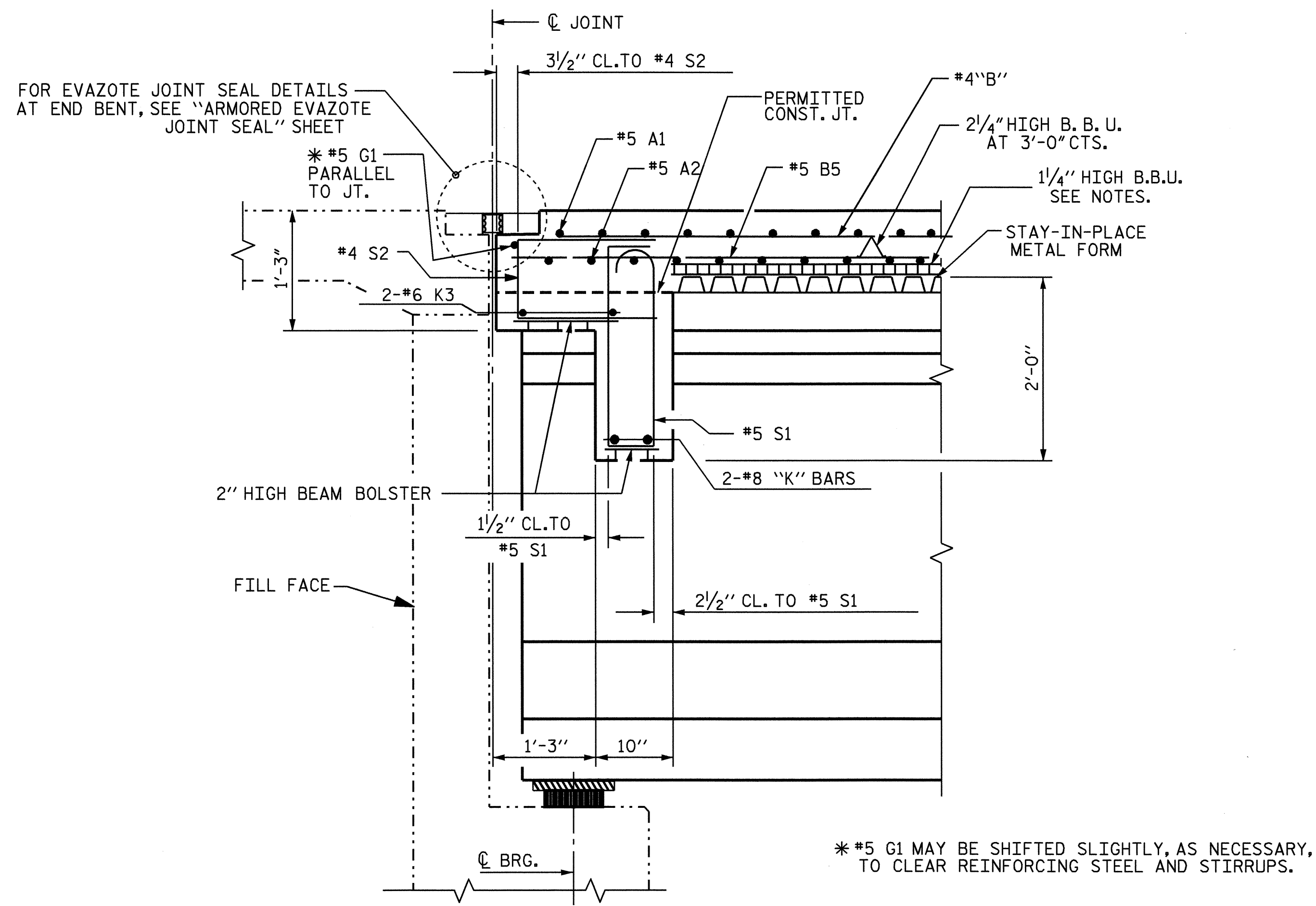


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS 69
2			4			

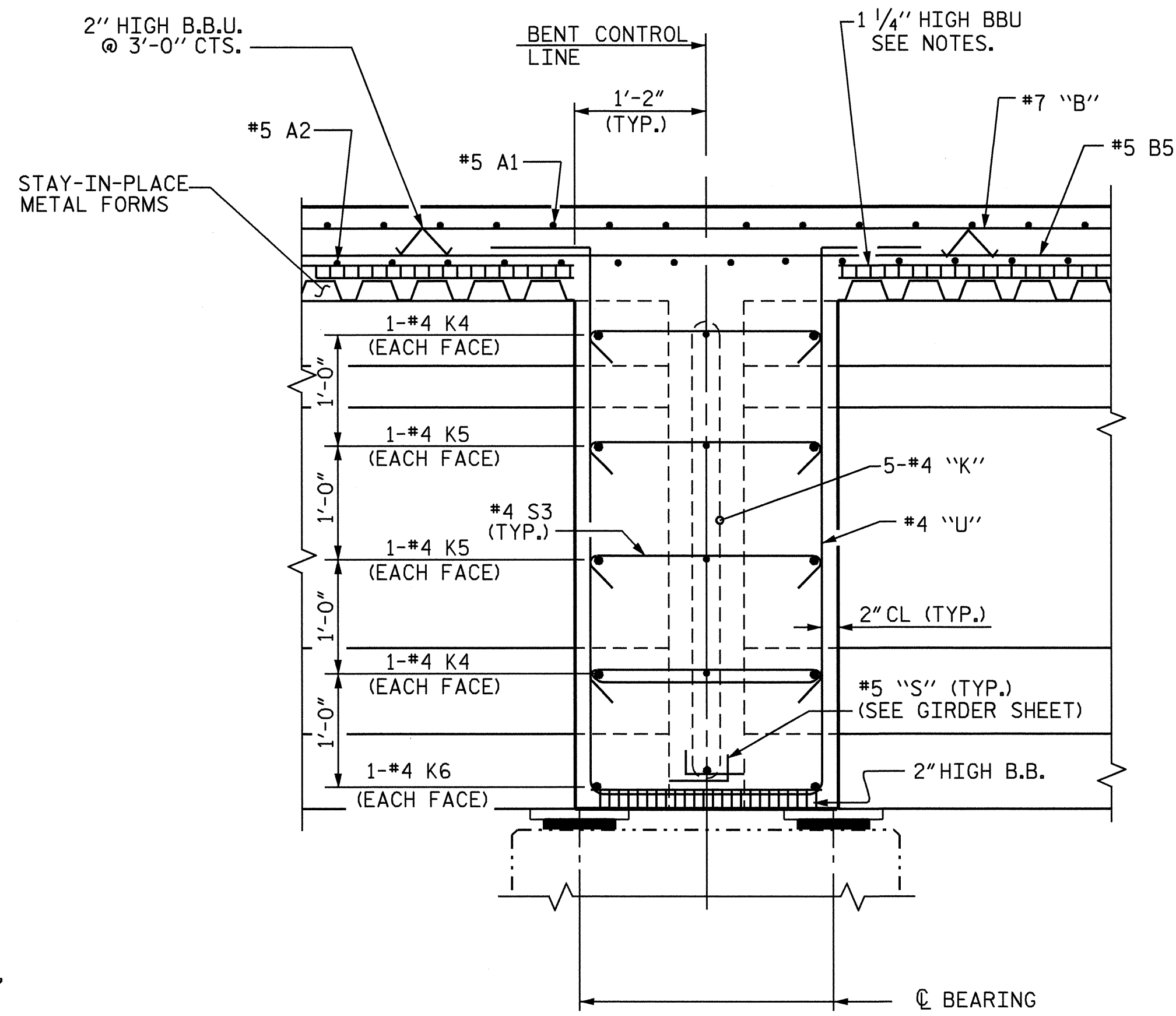
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CHECKED BY: L.L. MURPHY DATE: 10-06

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vnguyen

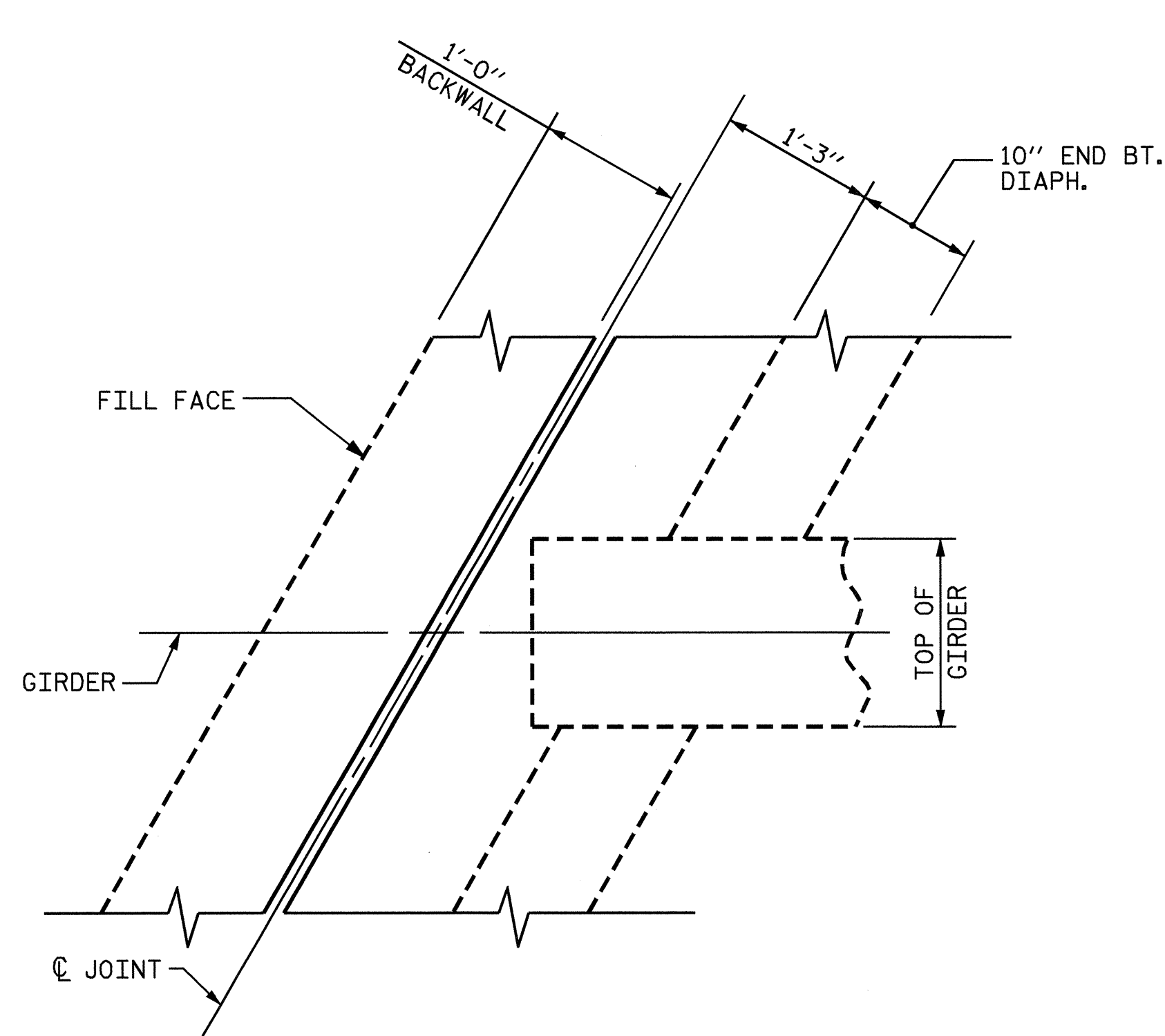
STR. #1



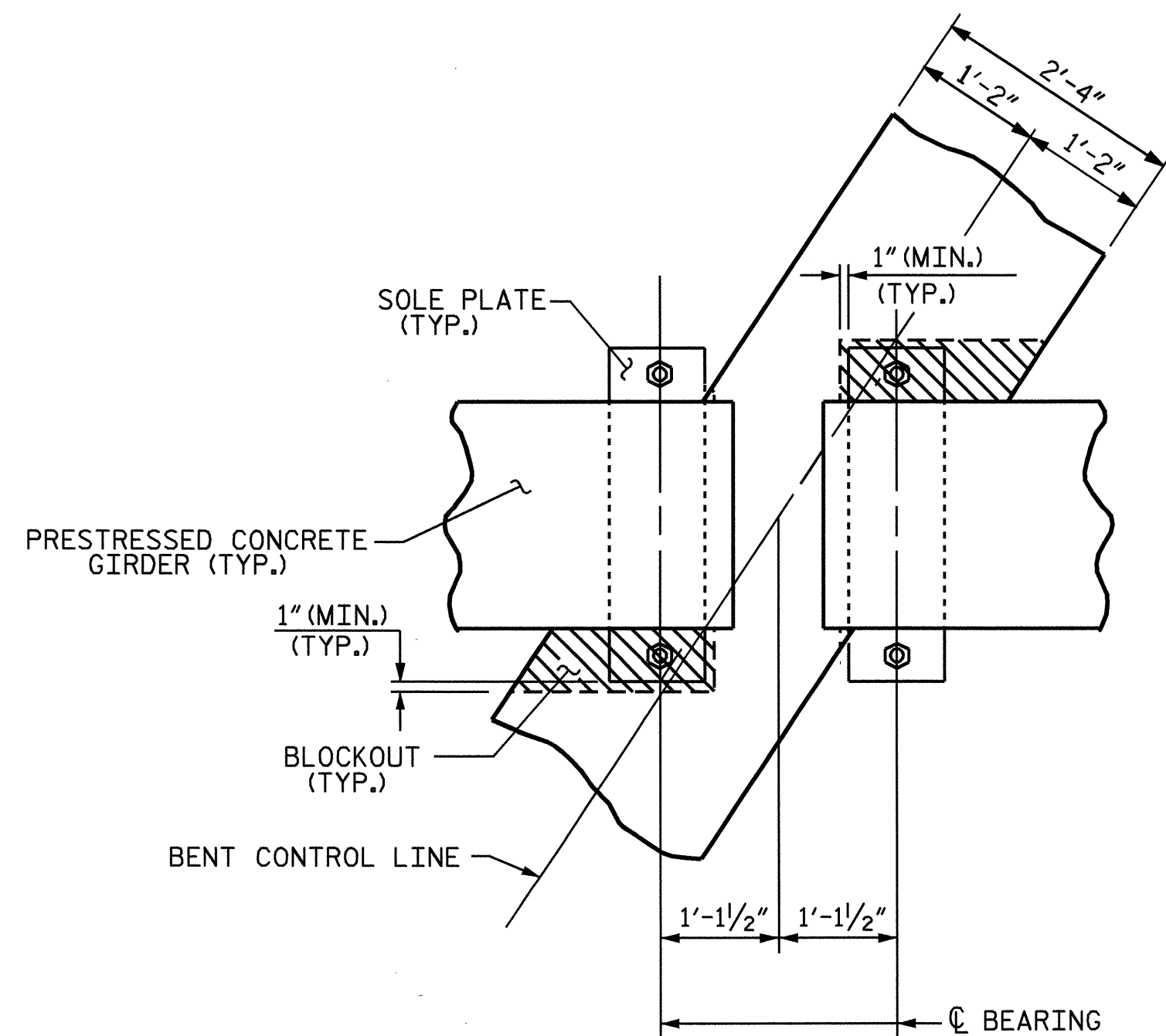
SECTION THRU END BENT DIAPHRAGM



SECTION THRU CONTINUOUS BENT DIAPHRAGM

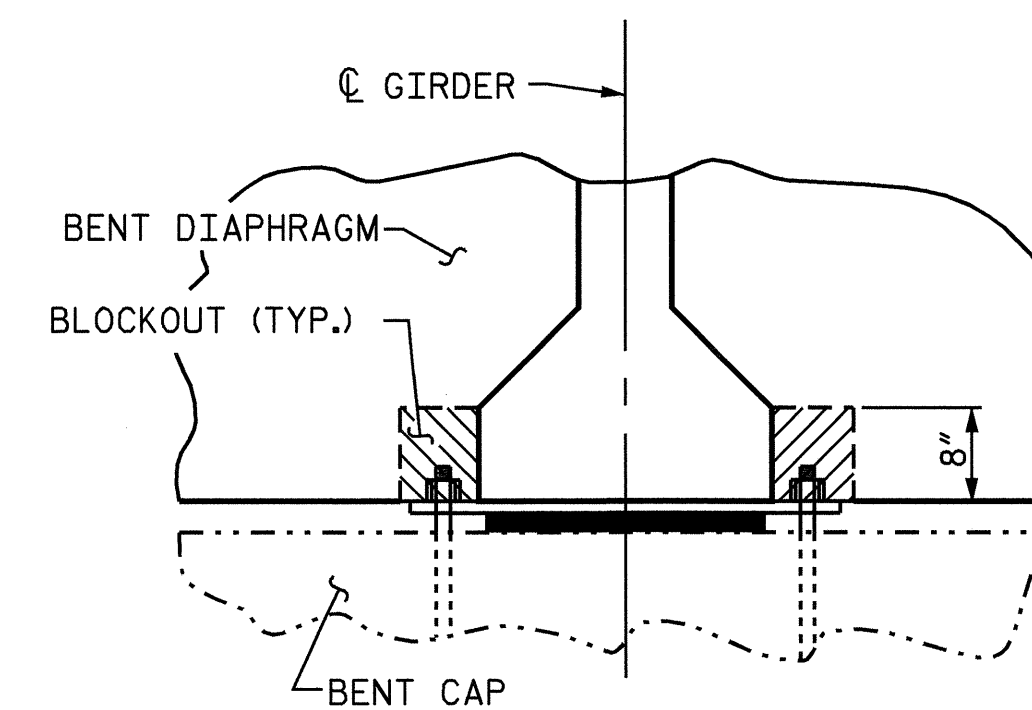


PLAN OF END BENT DIAPHRAGM



PLAN

BENT DIAPHRAGM BLOCK-OUT DETAIL



SECTION

PROJECT NO. B-4095  
 DAVIDSON COUNTY  
 STATION: 26+20.00-L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 TYPICAL SECTIONS  
 LEFT LANE

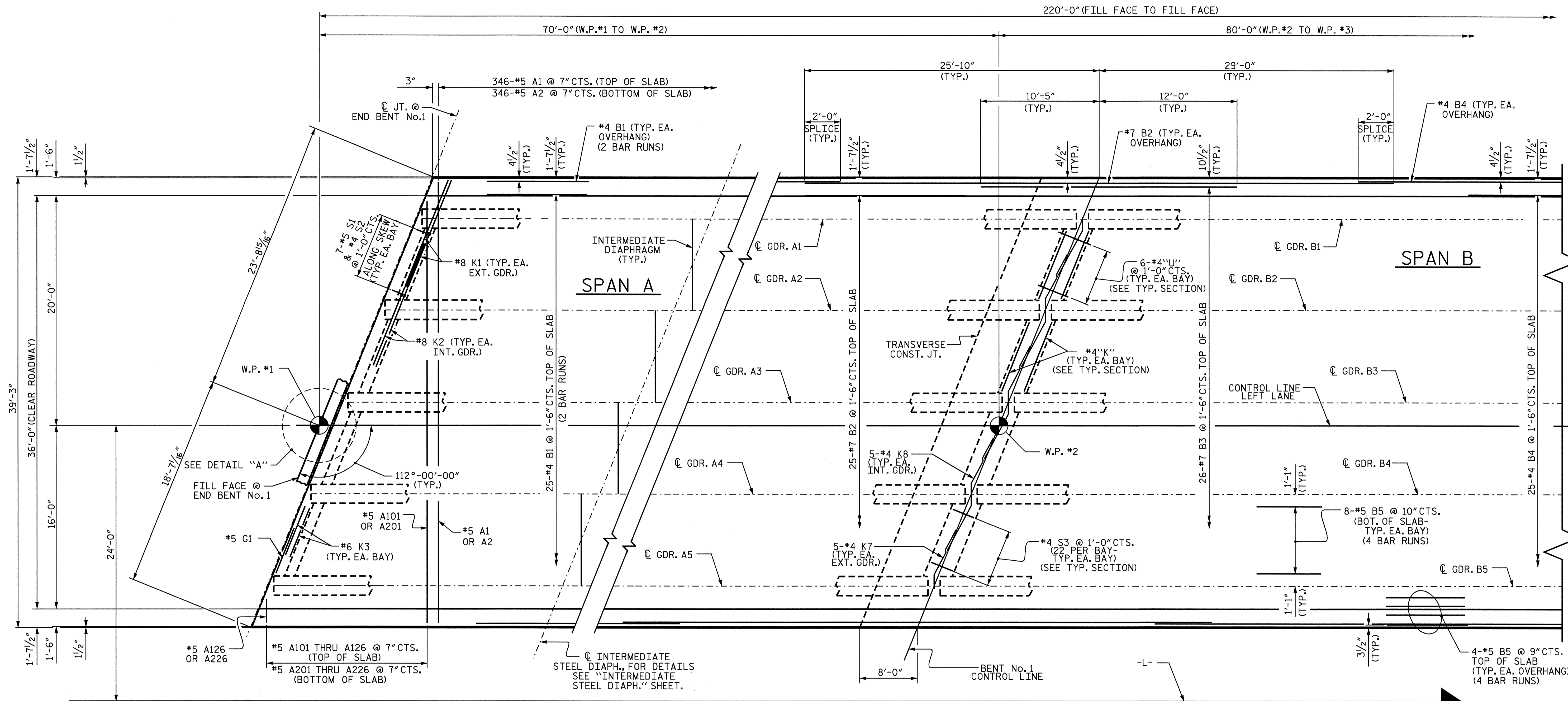


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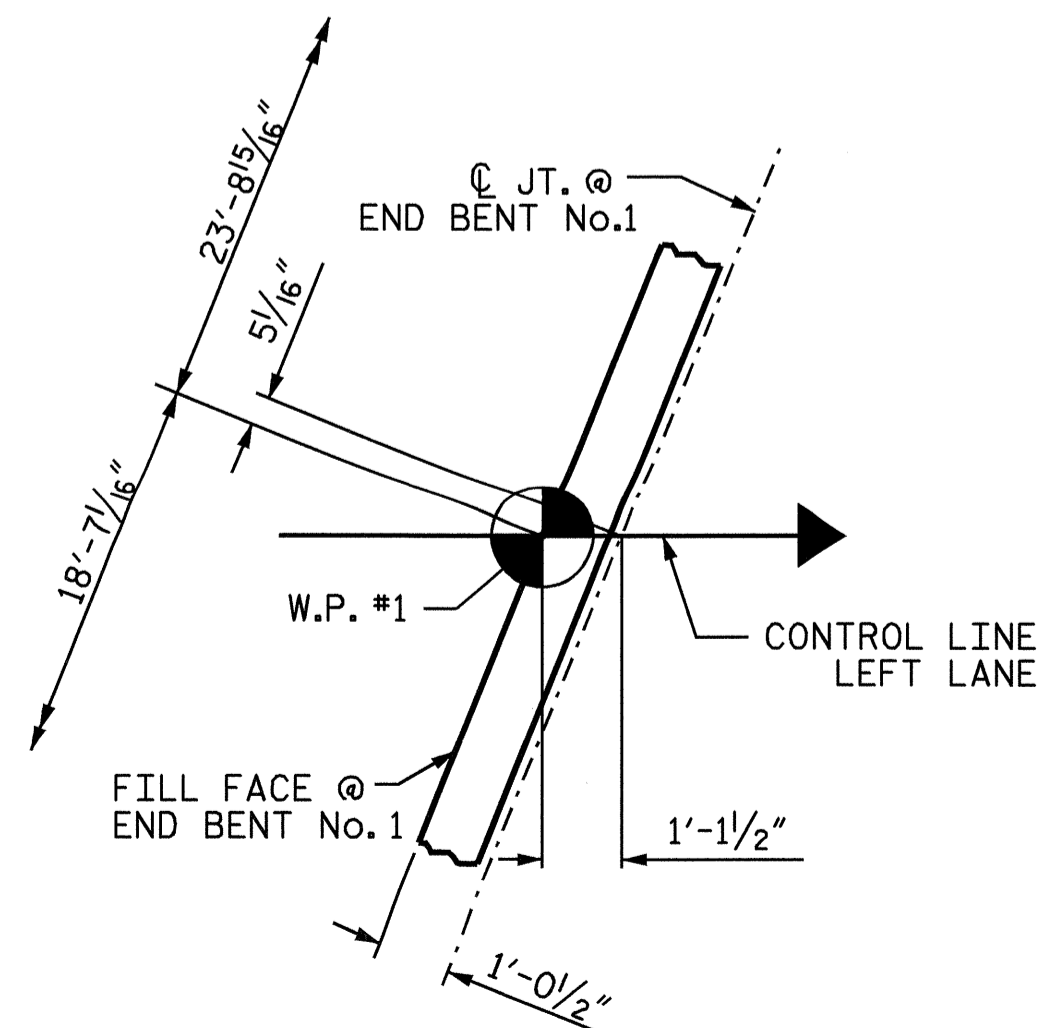
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 vnguyen

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			69

STR. #1



PLAN OF SPANS A & B



DETAIL "A"

PROJECT NO. B-4095  
DAVIDSON COUNTY  
STATION: 26+20.00-L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUPERSTRUCTURE  
PLAN OF SPANS A & B  
LEFT LANE



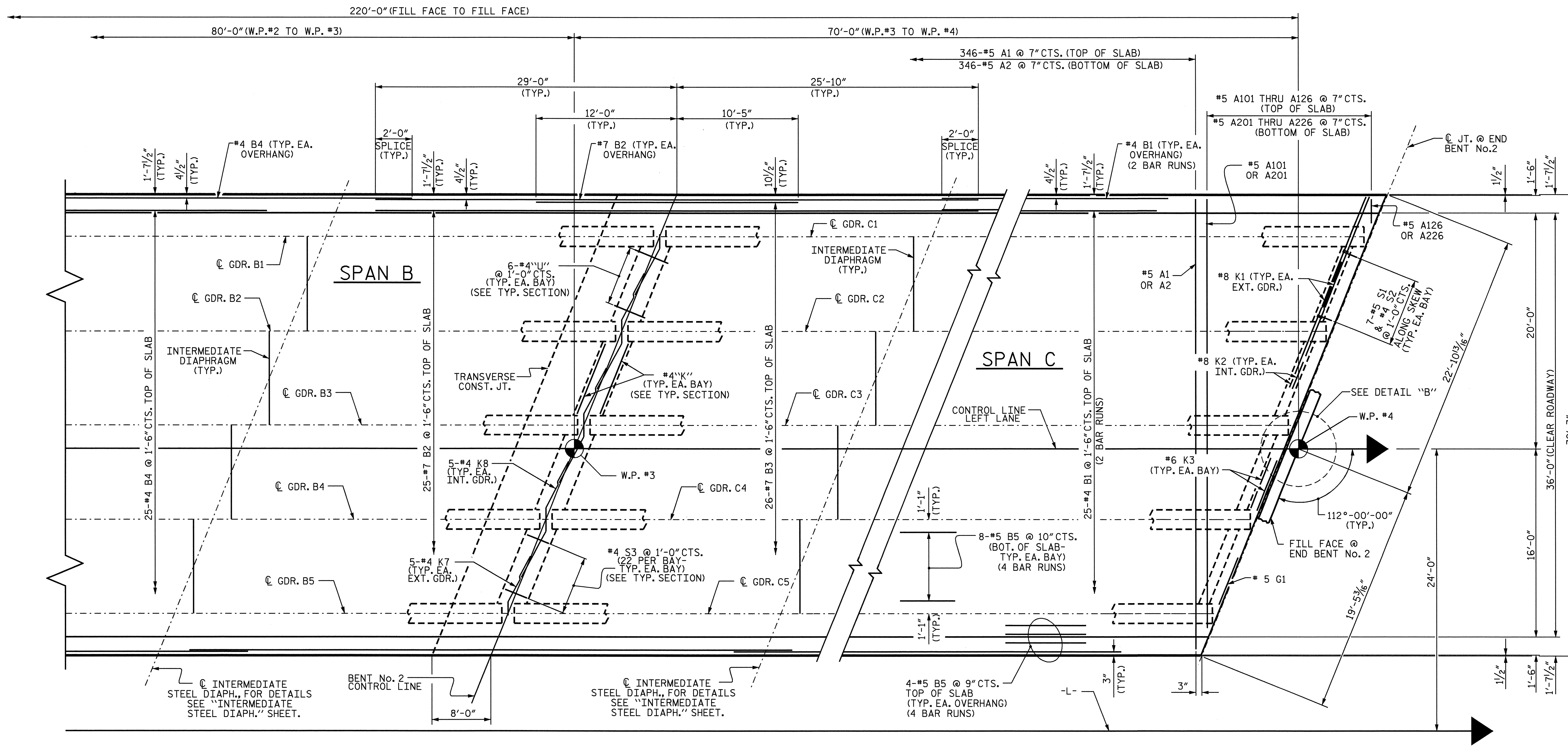
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			69

DRAWN BY : V.X. NGUYEN      DATE : 10-10-06  
CHECKED BY : M.G. CHEEK      DATE : 2-07

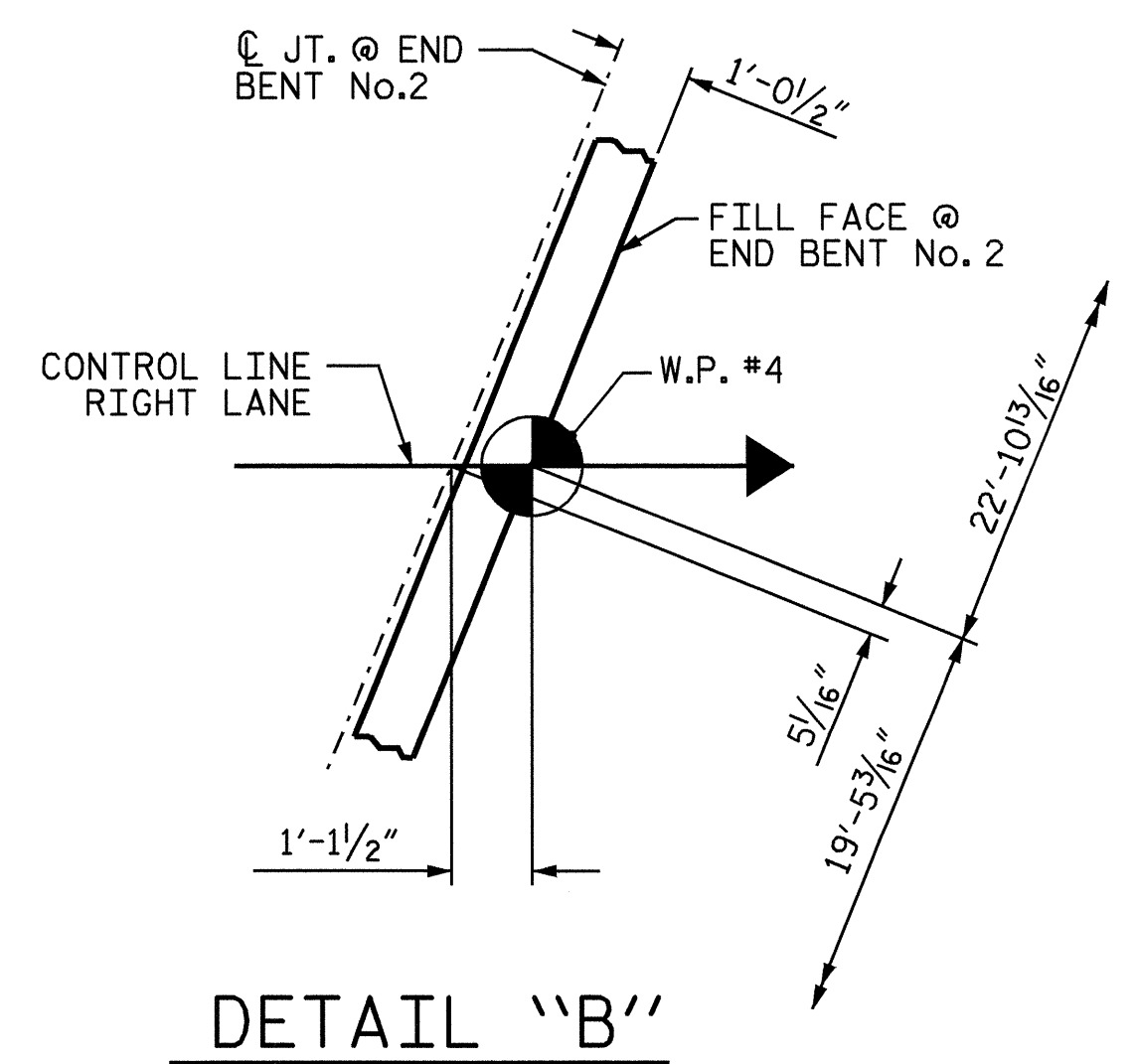
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vnguyen

STR. #1      NC005





PLAN OF SPANS B & C



PROJECT NO. B-4095  
 DAVIDSON COUNTY  
 STATION: 26+20.00-L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 PLAN OF SPANS B & C  
 LEFT LANE

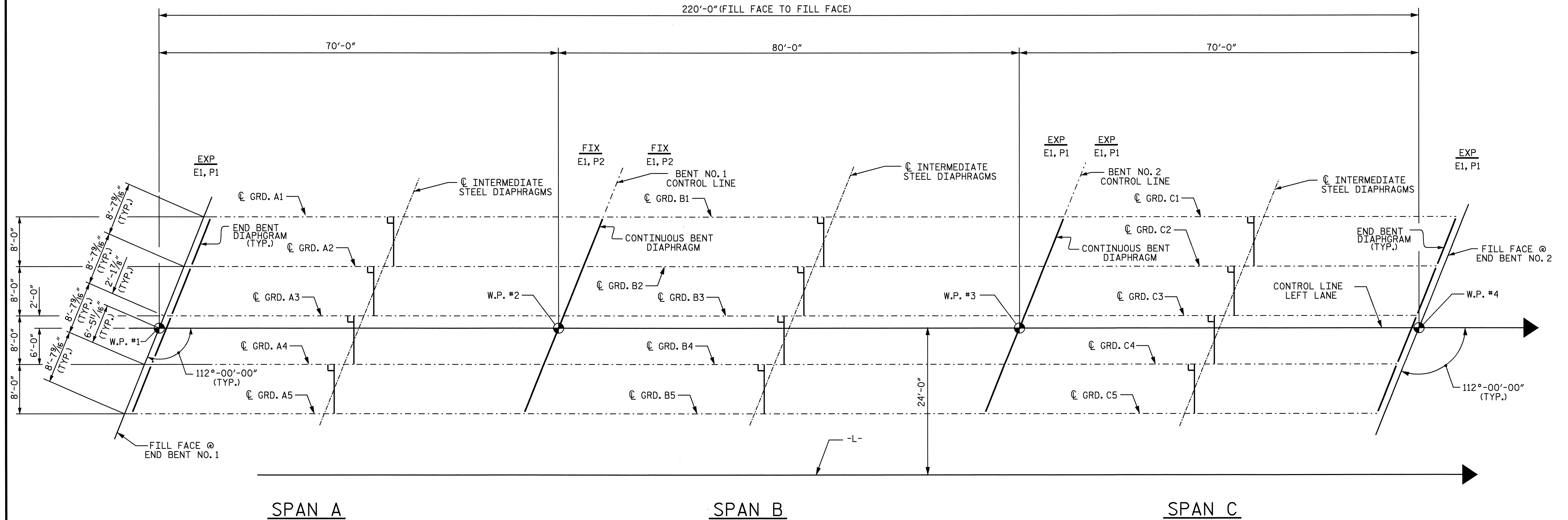


DRAWN BY: V.X. NGUYEN DATE: 10-10-06  
 CHECKED BY: M.G. CHEEK DATE: 2-07

23-MAY-2007 09:31  
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 vnguyen

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			69

STR. #1 NC006



FRAMING PLAN

PROJECT NO. B-4095  
DAVIDSON COUNTY  
 STATION: 26+20.00-L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 FRAMING PLAN  
 LEFT LANE

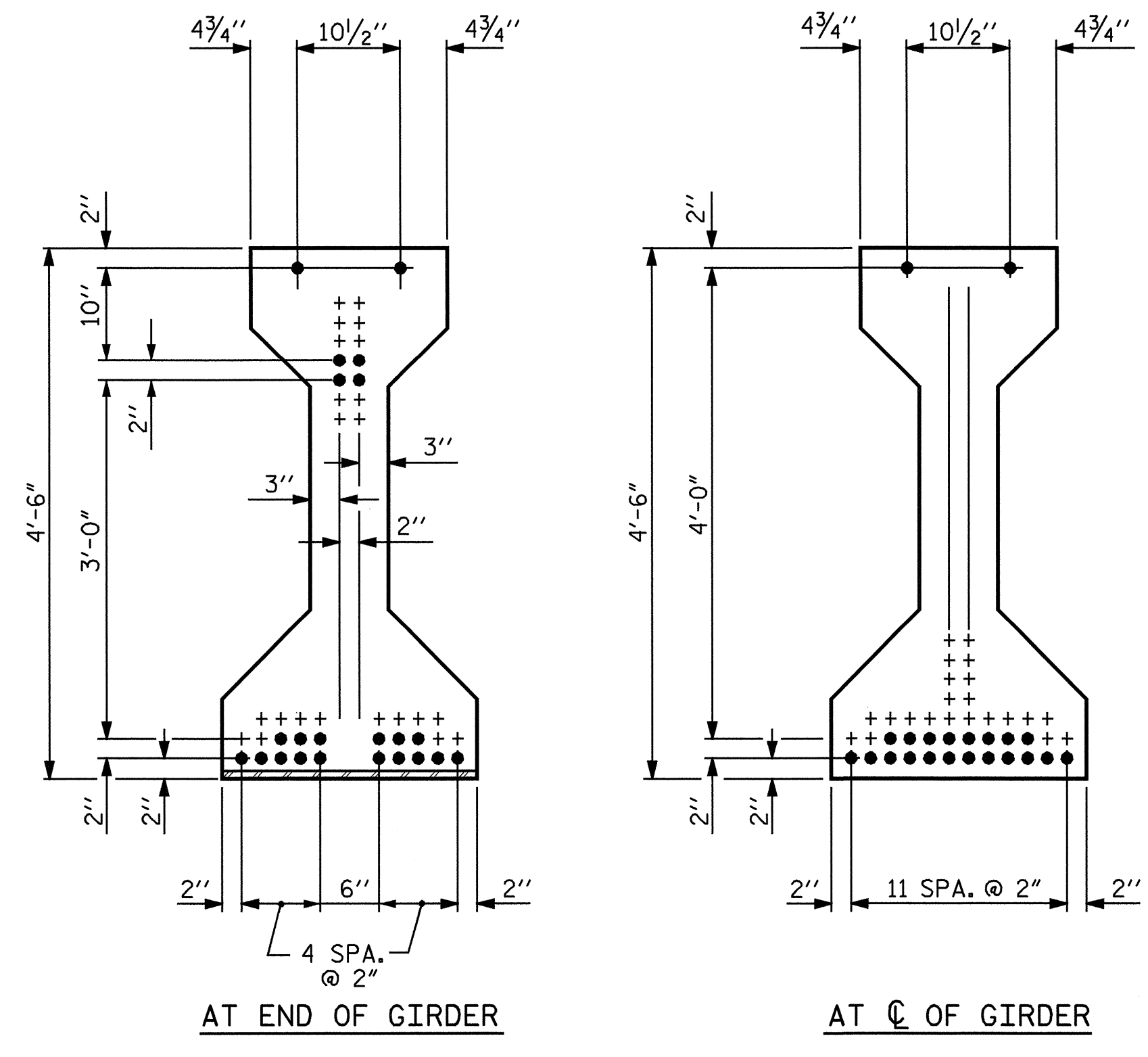
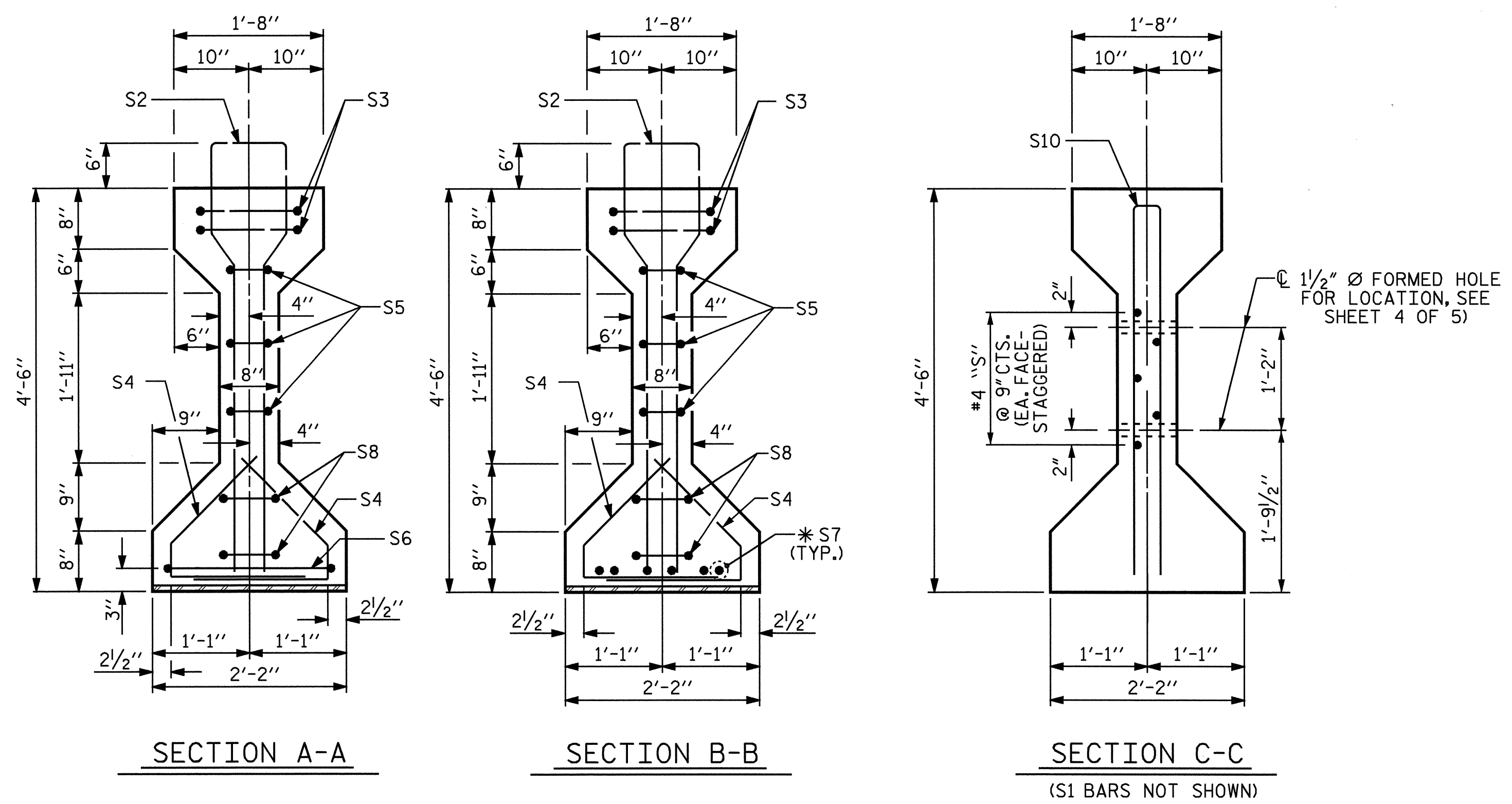
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			69



DRAWN BY : V. X. NGUYEN DATE : 2-22-06  
 CHECKED BY : M.G. CHEEK DATE : 2-07

22-MAY-2007 11:04  
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 vnguyen

STR. #1 NC006



1/2" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.153	41,300	30,980

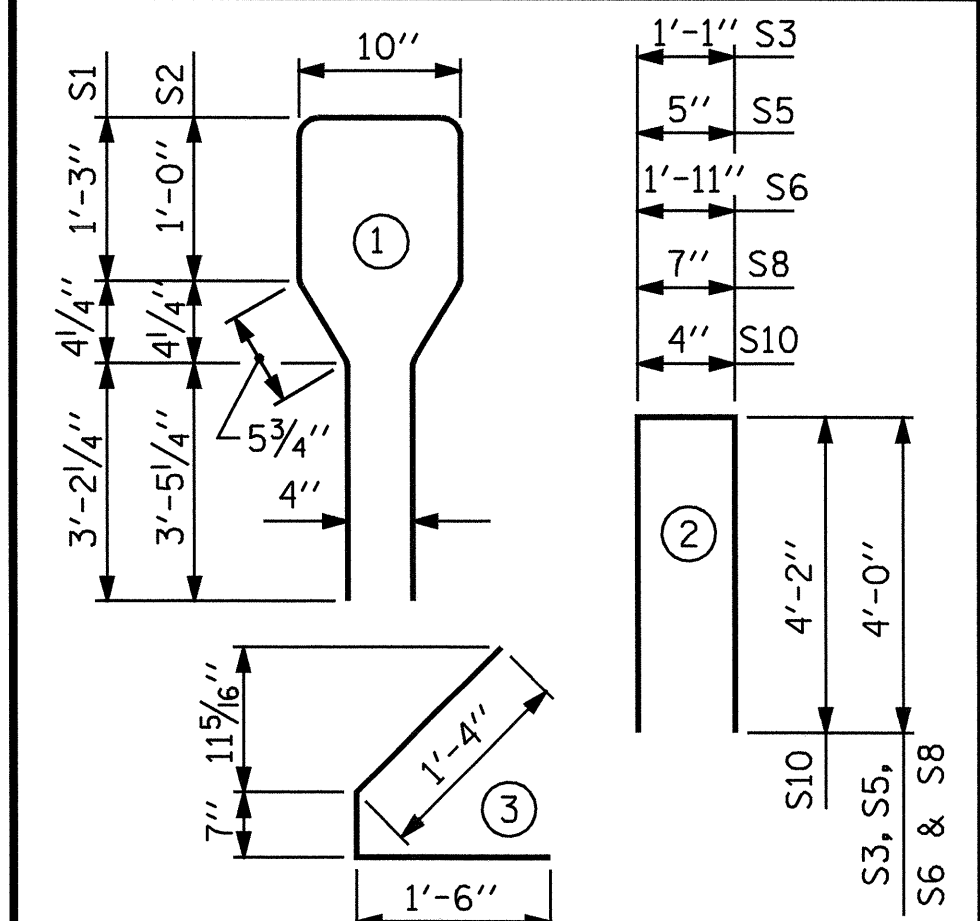
REINFORCING STEEL FOR ONE GIRDER						
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	
S1	57	#4	1	10'-8"	406	
S2	12	#6	1	10'-8"	192	
S3	4	#4	2	9'-1"	24	
S4	64	#4	3	3'-5"	146	
S5	6	#4	2	8'-5"	34	
S6	1	#4	2	9'-11"	7	
*S7	6	#5	STR	3'-8"	23	
S8	4	#4	2	8'-7"	23	
S9	1	#3	STR	1'-10"	1	
INTERIOR GDR.	S10	4	#5	2	8'-8"	36
EXTERIOR GDR.	S10	2	#5	2	8'-8"	18
INTERIOR GDR.	S11	5	#4	STR	10'-3"	34
EXTERIOR GDR.	S12	5	#4	STR	7'-0"	23

INTERIOR GDR.  
EXTERIOR GDR.  
INTERIOR GDR.  
EXTERIOR GDR.

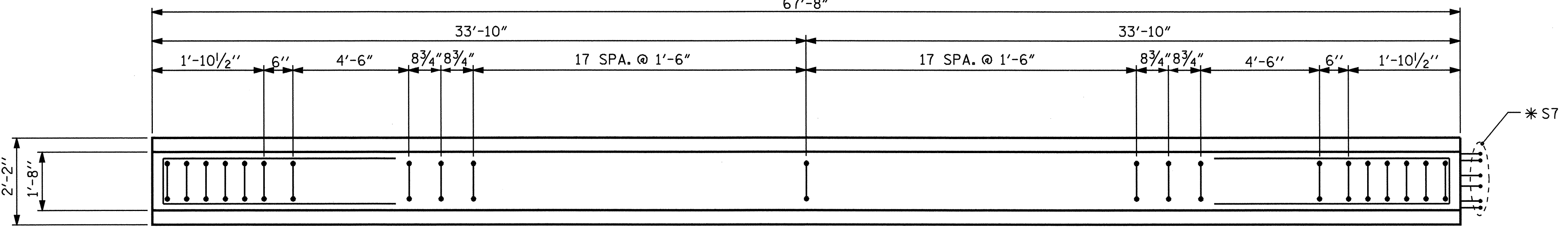
\* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

**BAR TYPES**

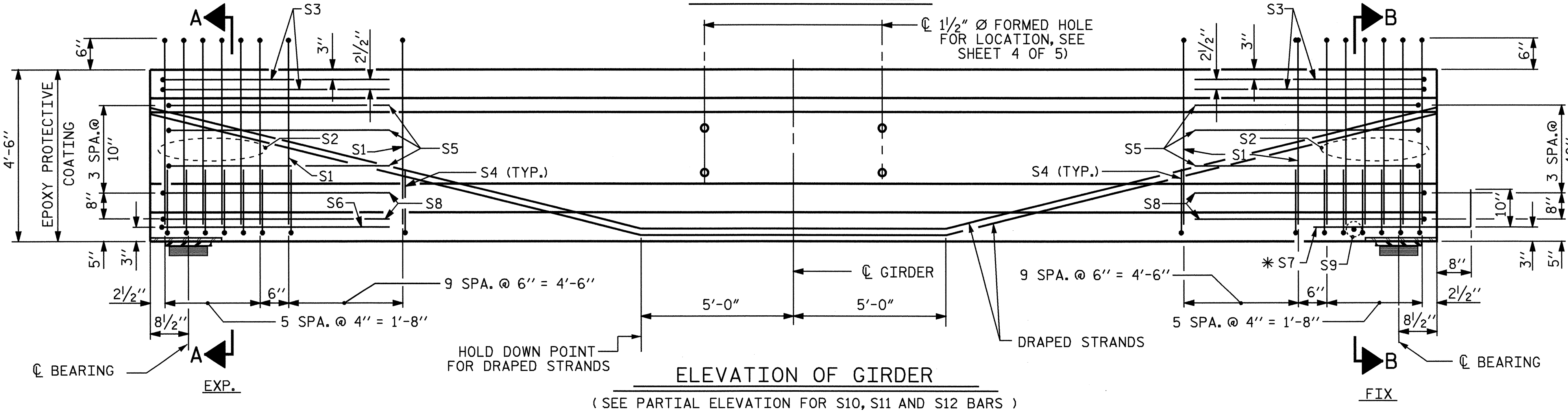
ALL BAR DIMENSIONS ARE OUT-TO-OUT



\*FOR S7 BARS, SEE  
DETAIL "A" SHEET 4 OF 5

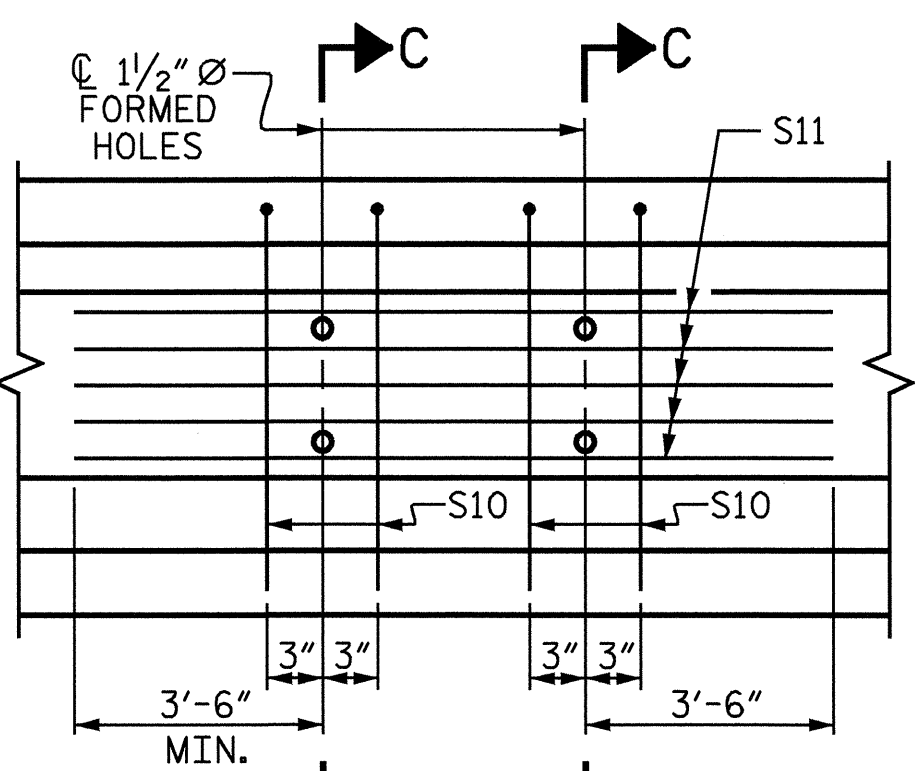


PLAN OF GIRDER



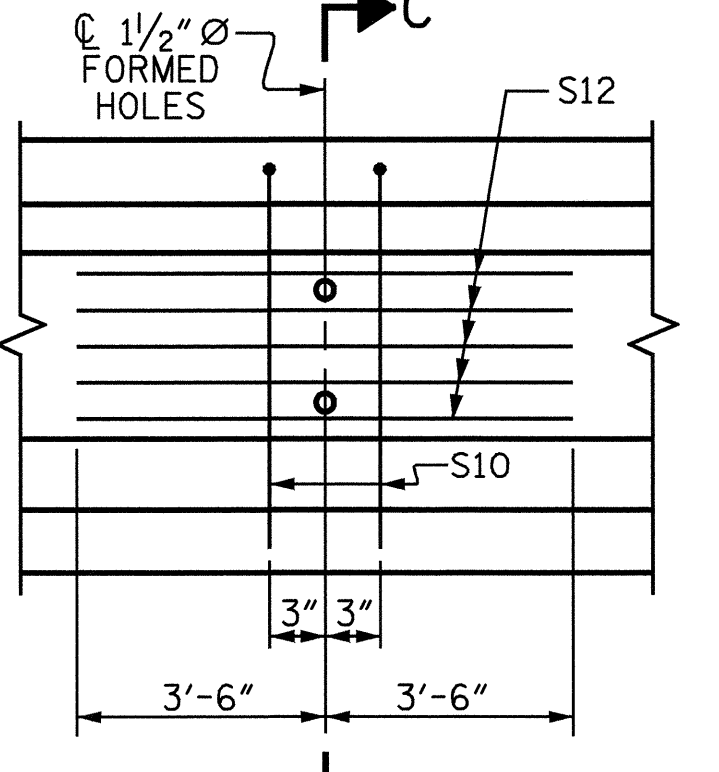
ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR S10, S11 AND S12 BARS)



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 2, 3 & 4



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1 & 5

DEAD LOAD DEFLECTION TABLE FOR GIRDERS													
1/2" Ø LOW RELAXATION		SPAN A - GIRDER #1 THRU #5											
TENTH POINTS		Ø BRG.	.10	.20	.30	.40	.50	.60	.70	.80	.90	Ø BRG.	
CAMBER ( GIRDER ALONE IN PLACE )		↑	0	.028	.054	.074	.086	.091	.086	.074	.054	.028	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.		↓	0	.014	.026	.036	.042	.044	.042	.036	.026	.014	0
FINAL CAMBER		↑	0	3/16"	5/16"	1/2"	9/16"	5/8"	1/2"	5/16"	3/16"	0	

\* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.  
ALL VALUES ARE SHOWN IN FEET ( DECIMAL FORM ), EXCEPT " FINAL CAMBER ", WHICH IS GIVEN IN INCHES ( FRACTION FORM ).

**QUANTITIES FOR ONE GIRDER**

	REINFORCING STEEL	5,000 PSI CONCRETE	1/2" Ø L.R. STRANDS
	LB.	C.Y.	No.
INTERIOR GIRDER	926	13.7	22
EXTERIOR GIRDER	897	13.7	22

**GIRDERS REQUIRED**

NUMBER	LENGTH	TOTAL LENGTH
5	67'-8"	338.33'

PROJECT NO. B-4095  
DAVIDSON COUNTY  
STATION: 26+20.00-L-

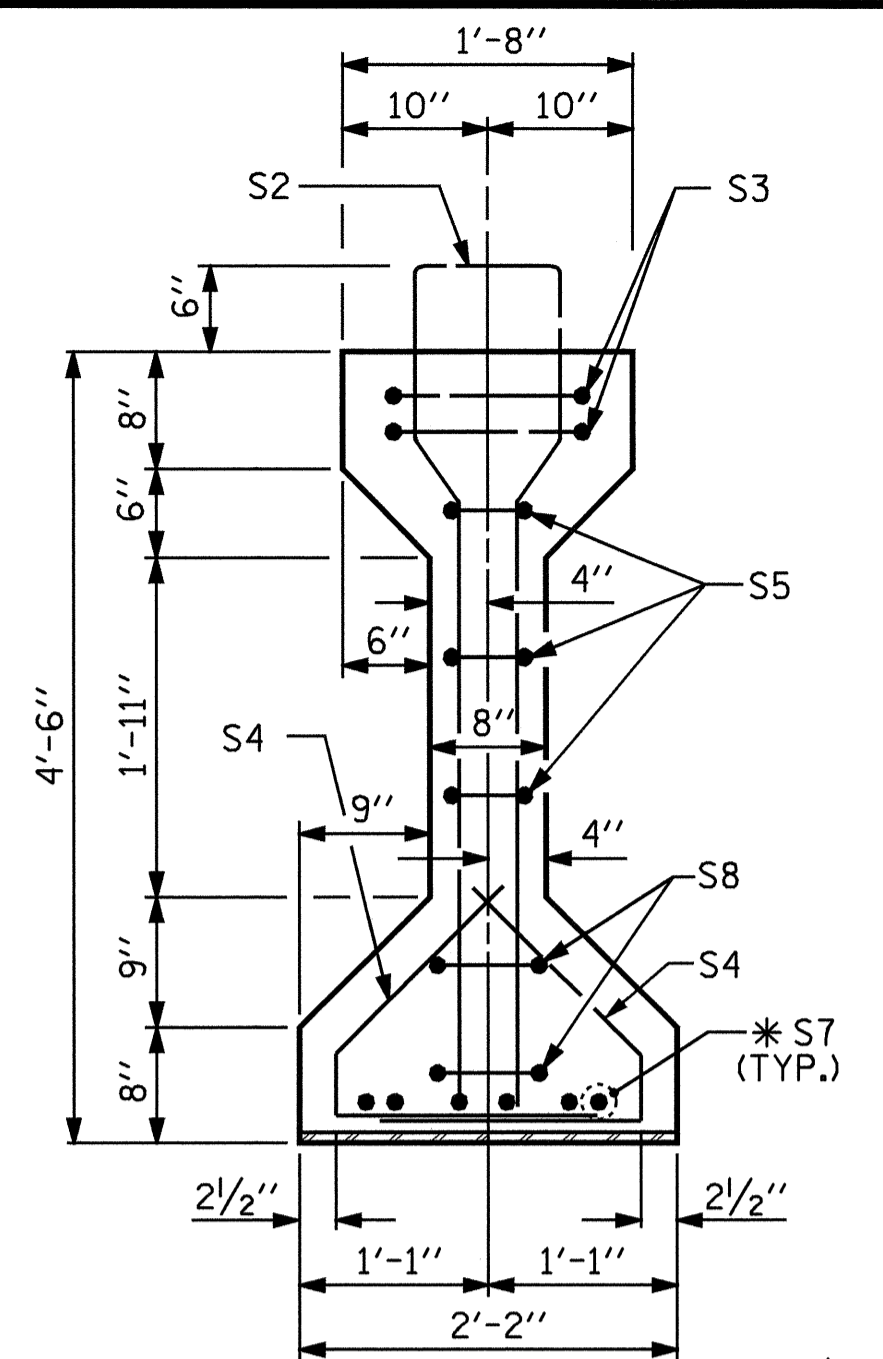
SHEET 1 OF 5

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



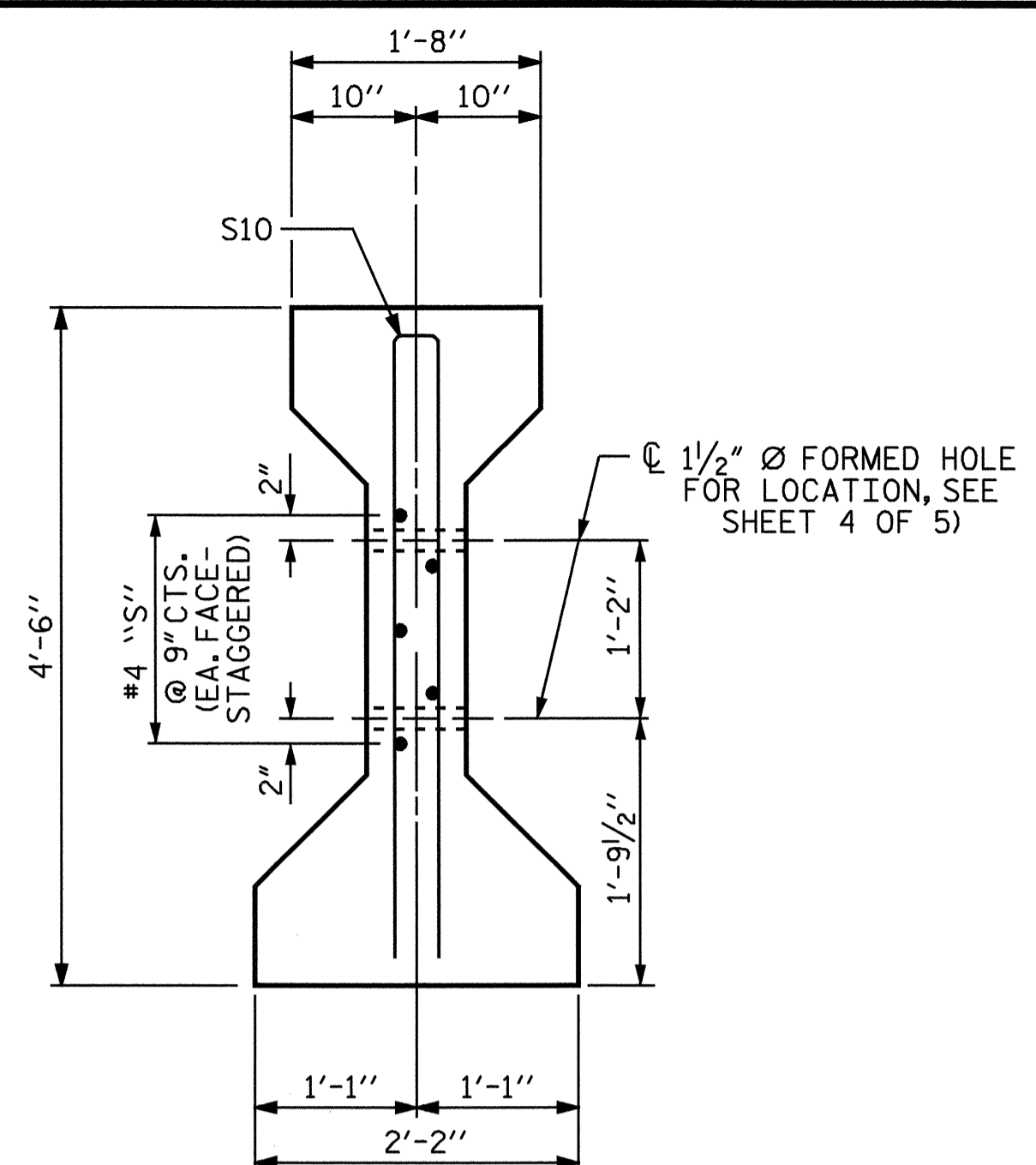
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	DATE:	S-10
1			3		TOTAL SHEETS
2			4		69

ASSEMBLED BY: V. X. NGUYEN DATE: 2-23-06  
CHECKED BY: M.G. CHECK DATE: 2-07  
DRAWN BY: ELR 8/91 REV. 2/6/97 EEM/RGW  
CHECKED BY: GRP 8/91 REV. 7/17/98 RWW/LES  
REV. 10/17/00R RWW/LES

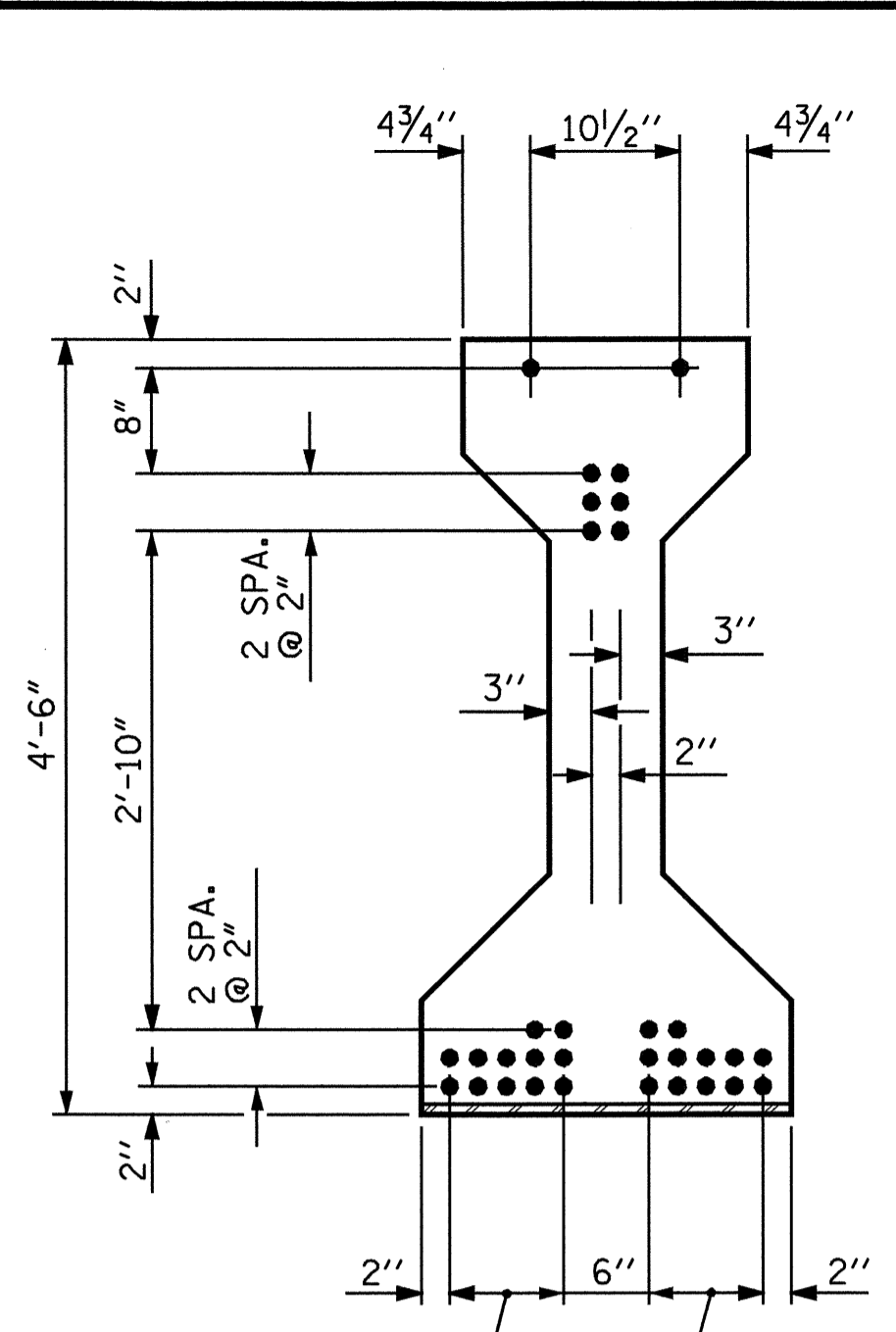


SECTION B-B

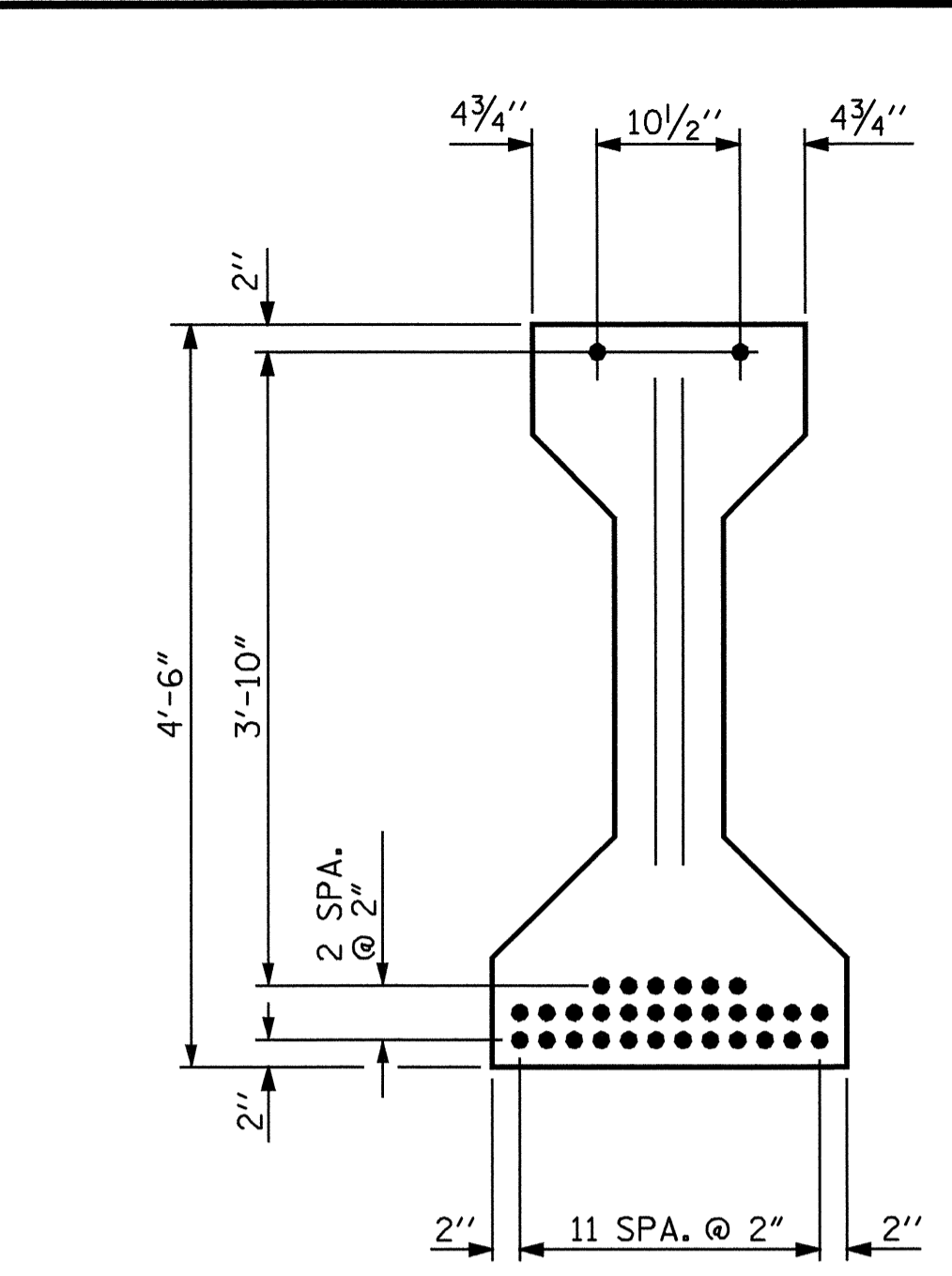
\* FOR S7 BARS, SEE DETAIL "A" SHEET 4 OF 5



SECTION C-C  
(S1 BARS NOT SHOWN)

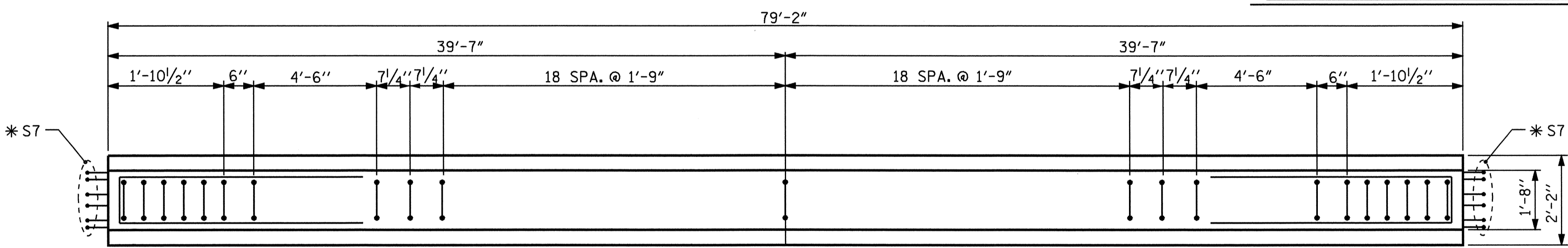


AT END OF GIRDER

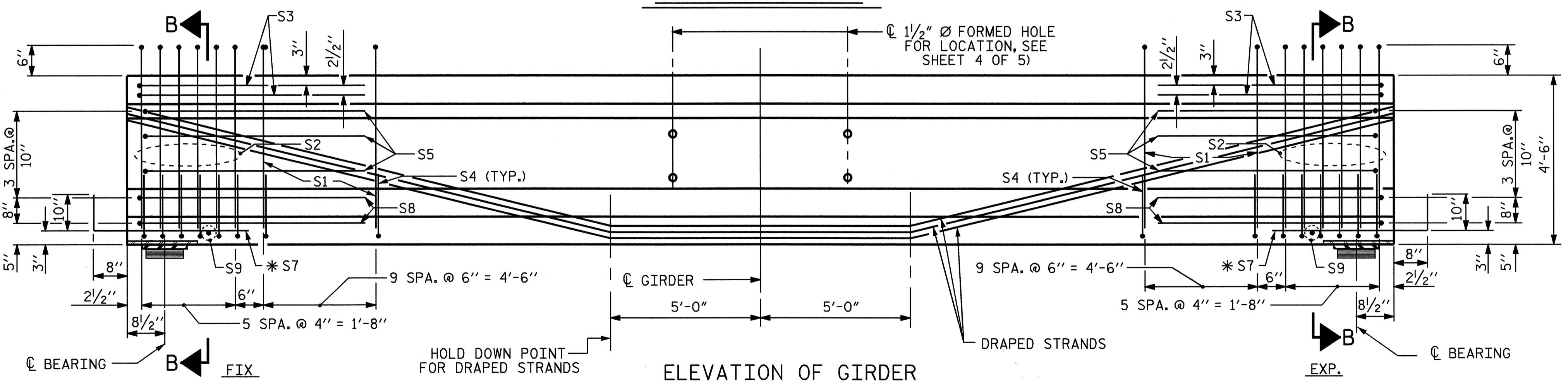


AT C OF GIRDER

1/2" Ø LOW RELAXATION STRAND LAYOUT

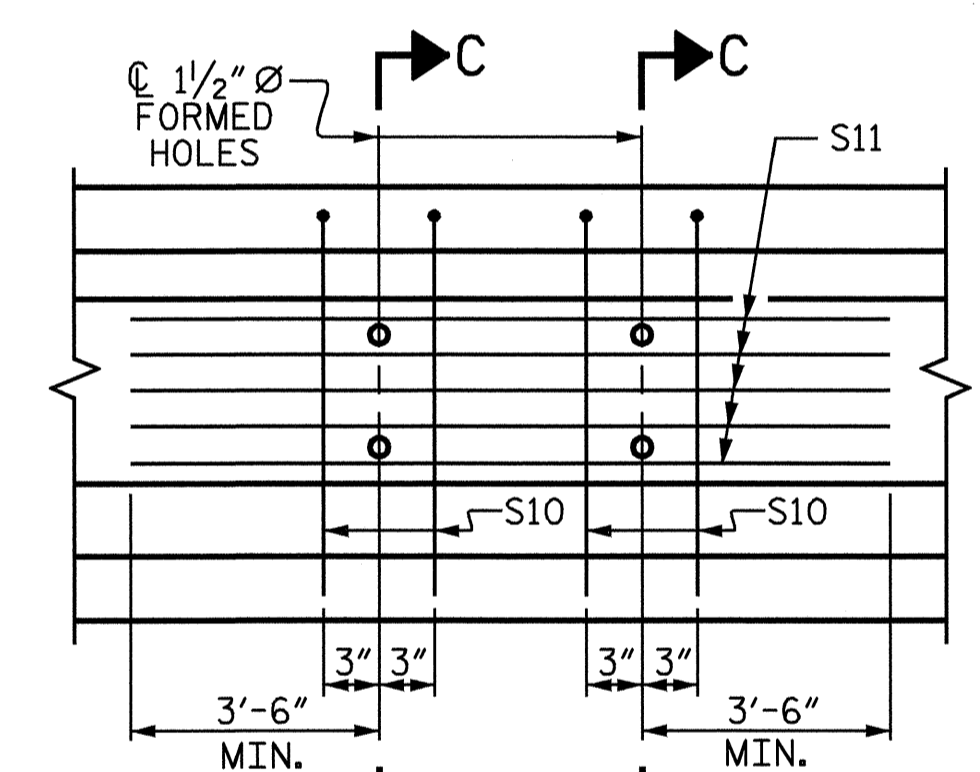


PLAN OF GIRDER



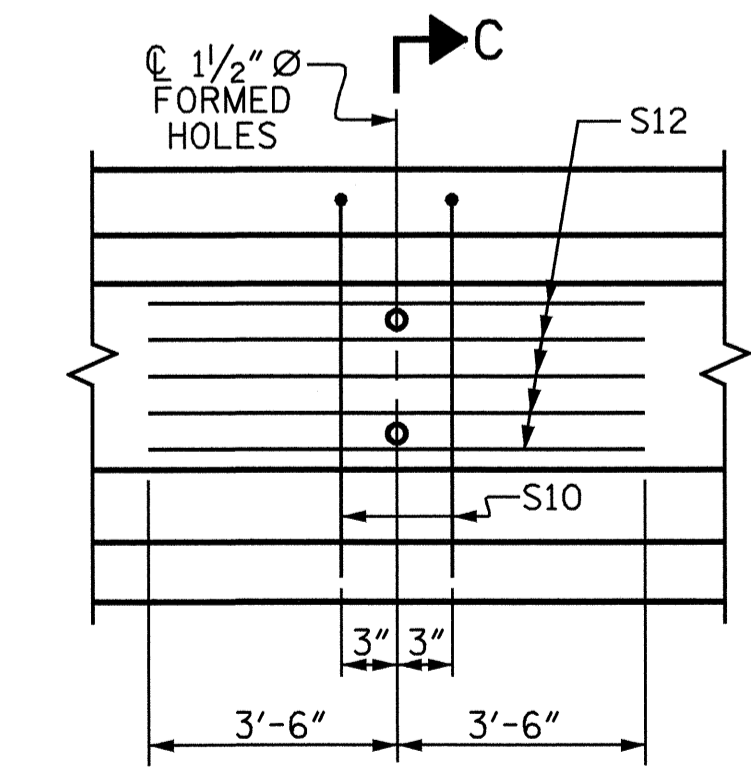
ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR S10, S11 AND S12 BARS)



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 2, 3 & 4



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1 & 5

1/2" Ø L. R. GRADE 270 STRANDS		
AREA (SQ. INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.153	41,300	30,980

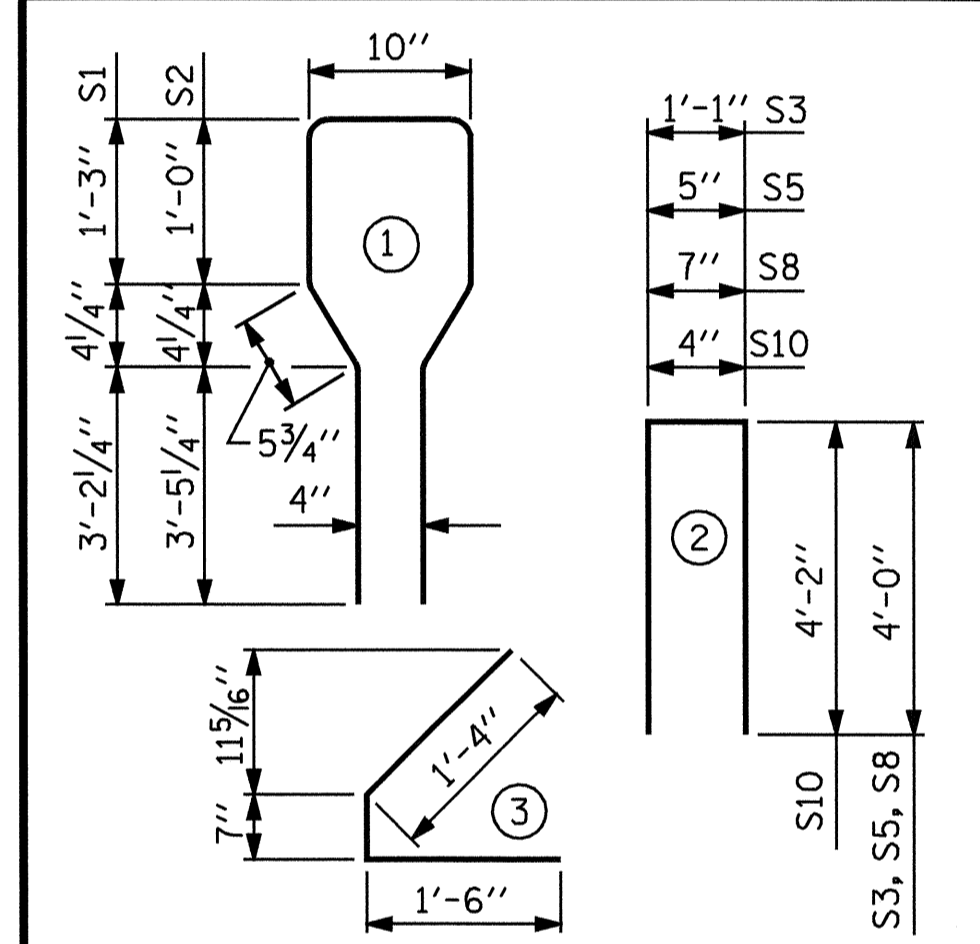
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	59	#4	1	10'-8"	420
S2	12	#6	1	10'-8"	192
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34
*S7	12	#5	STR	3'-8"	46
S8	4	#4	2	8'-7"	23
S9	2	#3	STR	1'-10"	1
INTERIOR GDR. S10	4	#5	2	8'-8"	36
EXTERIOR GDR. S10	2	#5	2	8'-8"	18
INTERIOR GDR. S11	5	#4	STR	10'-3"	34
EXTERIOR GDR. S12	5	#4	STR	7'-0"	23

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

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LB.	5,000 PSI CONCRETE C.Y.	1/2" Ø L.R. STRANDS No.
INTERIOR GIRDER	956	16.1	32
EXTERIOR GIRDER	927	16.1	32

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	79'-2"	395.83 LIN. FT.

PROJECT NO. B-4095  
DAVIDSON COUNTY  
 STATION: 26+20.00-L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD  
 AASHTO TYPE IV  
 PRESTRESSED CONCRETE GIRDER  
 CONTINUOUS FOR LIVE LOAD  
 SPAN B  
 LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS 69
2			4			

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

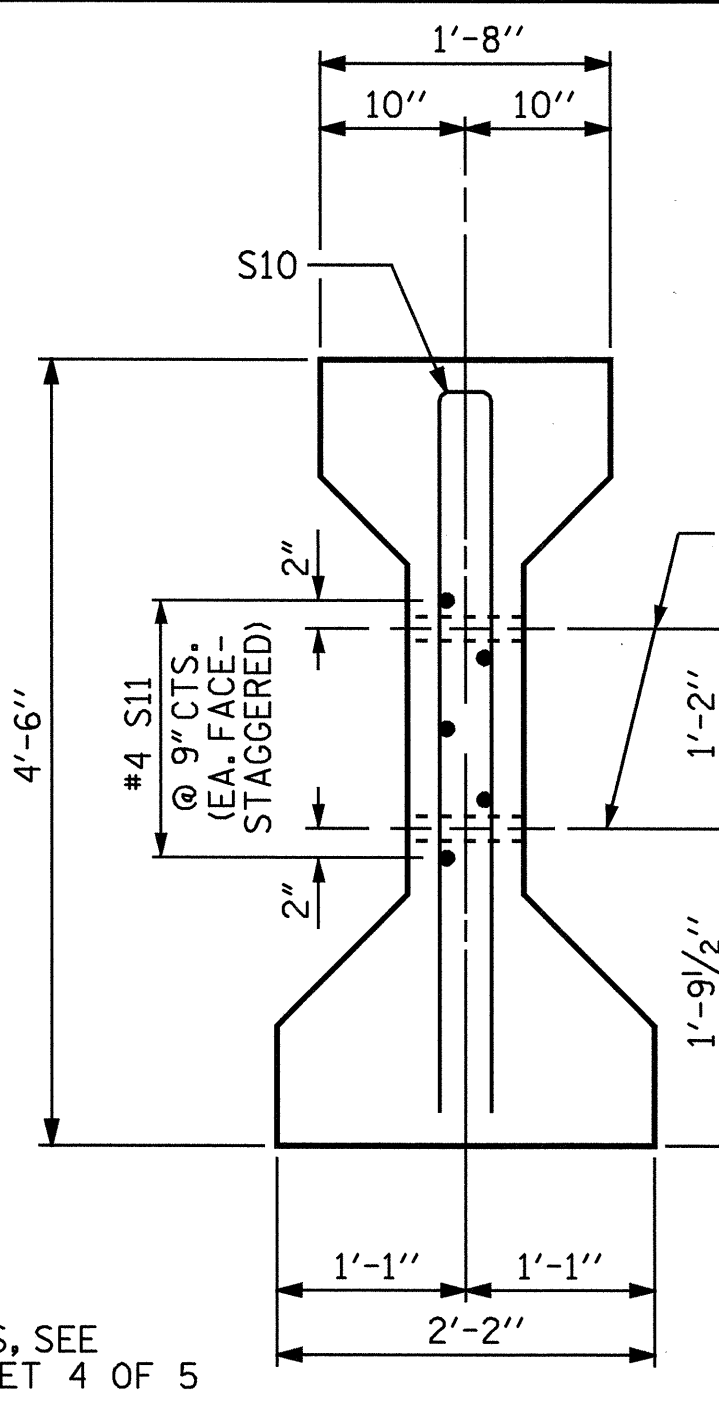
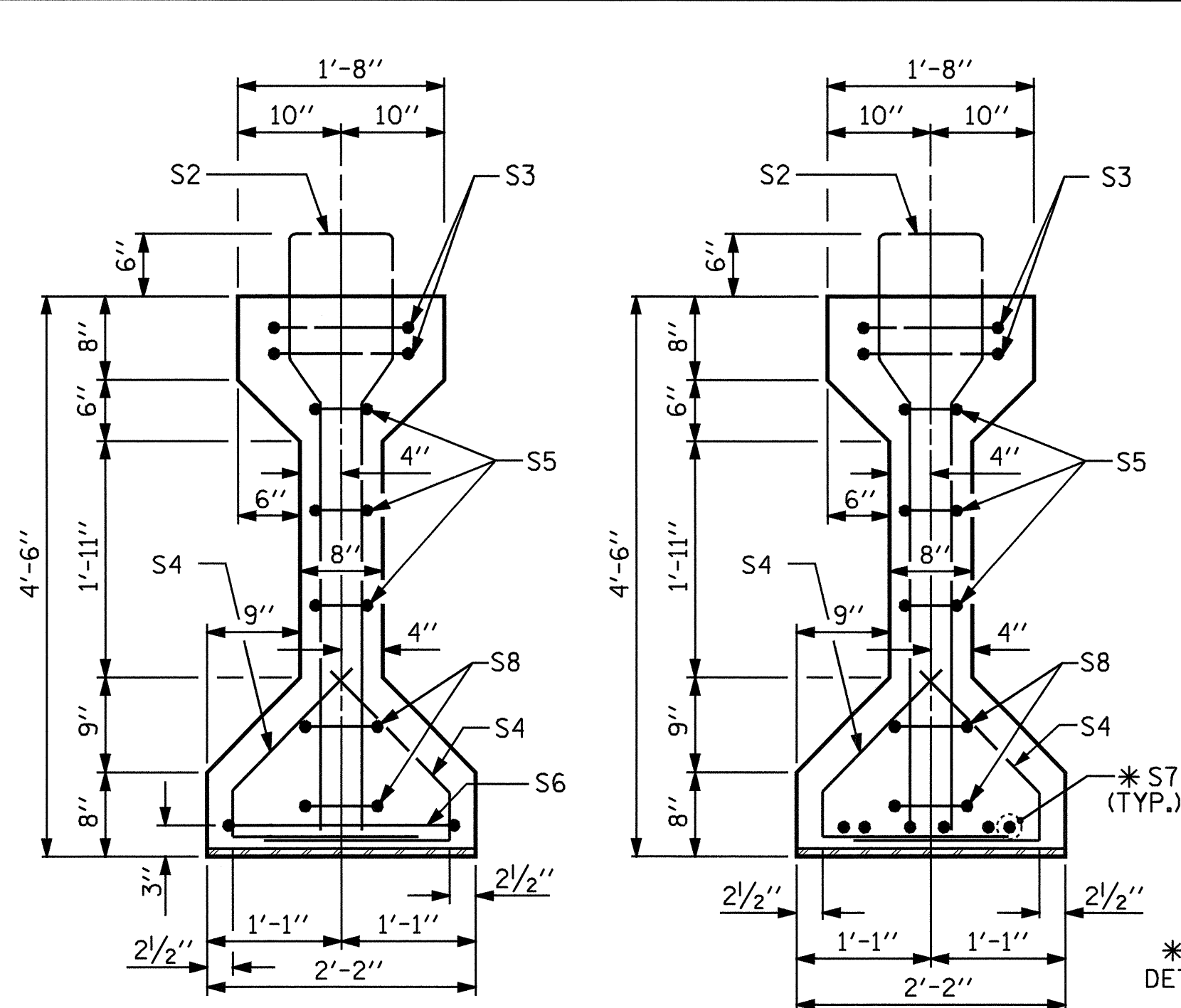
1/2" Ø LOW RELAXATION TENTH POINTS	SPAN B - GIRDER #1 THRU #5										
	¢ BRG.	.10	.20	.30	.40	.50	.60	.70	.80	.90	¢ BRG.
CAMBER ( GIRDER ALONE IN PLACE )	† 0	.060	.114	.156	.183	.192	.183	.156	.114	.060	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	† 0	.025	.048	.065	.076	.080	.076	.065	.048	.025	0
FINAL CAMBER	† 0	7/16"	13/16"	1 1/16"	1 1/4"	1 5/16"	1 1/4"	1 1/16"	13/16"	7/16"	0

\* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS. ALL VALUES ARE SHOWN IN FEET ( DECIMAL FORM ), EXCEPT " FINAL CAMBER ", WHICH IS GIVEN IN INCHES ( FRACTION FORM ).

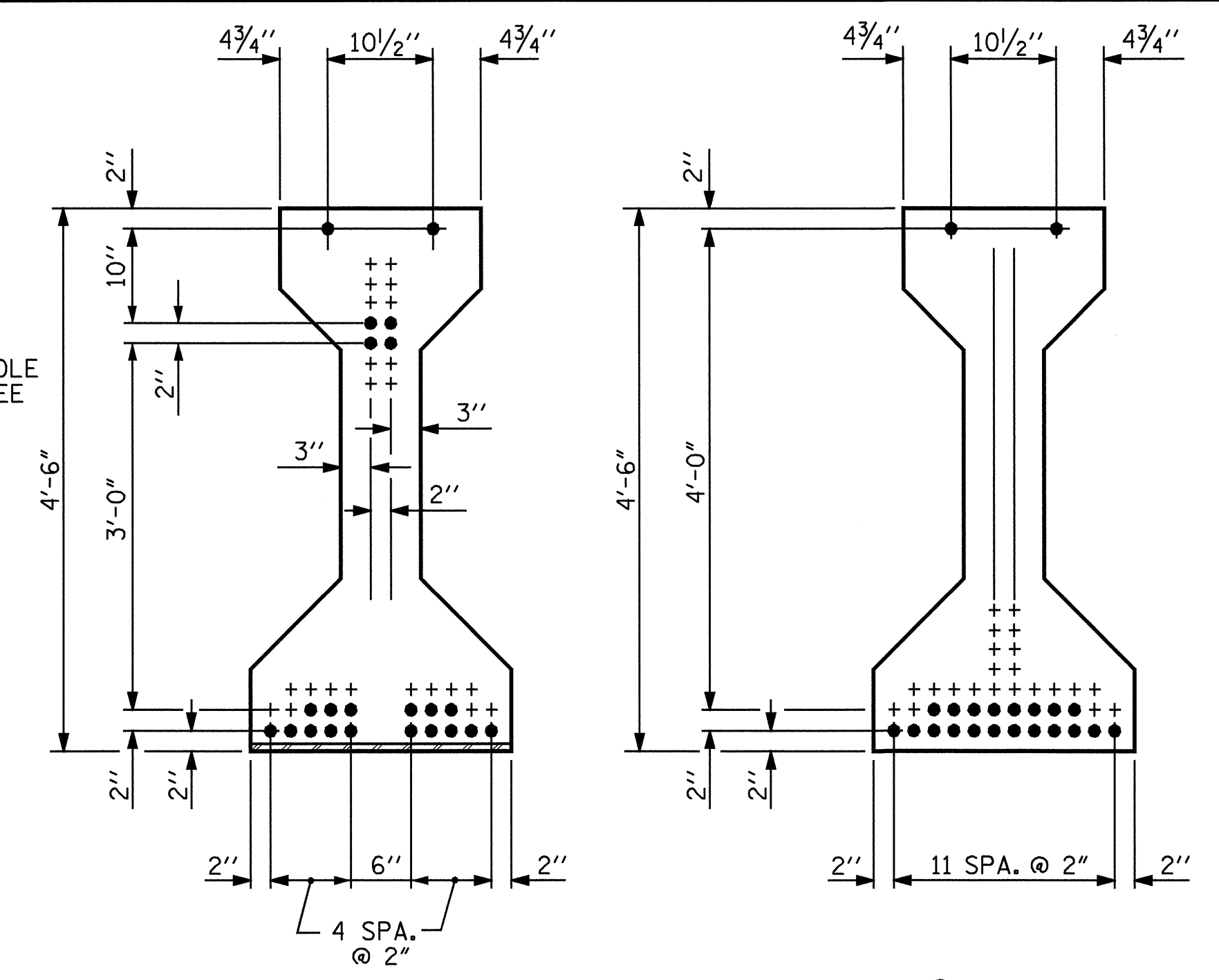
ASSEMBLED BY : V. X. NGUYEN DATE : 2-23-06  
 CHECKED BY : M.G. CHEEK DATE : 2-07  
 DRAWN BY : ELR 8/91 REV. 2/6/97 EEM/RGW  
 CHECKED BY : GRP 8/91 REV. 7/17/98 RWW/LES  
 REV. 10/17/00R RWW/LES



STR. #1



1/2" Ø FORMED HOLE FOR LOCATION, SEE SHEET 4 OF 5

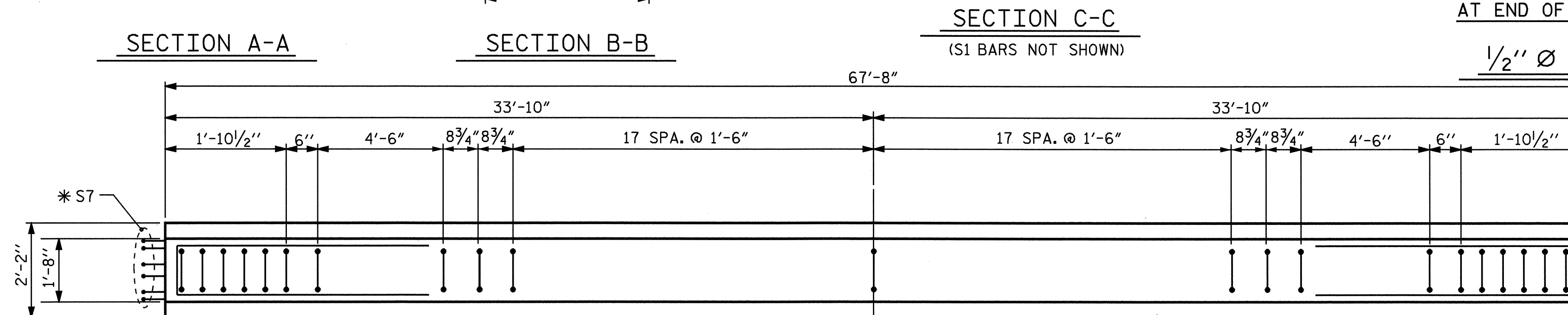
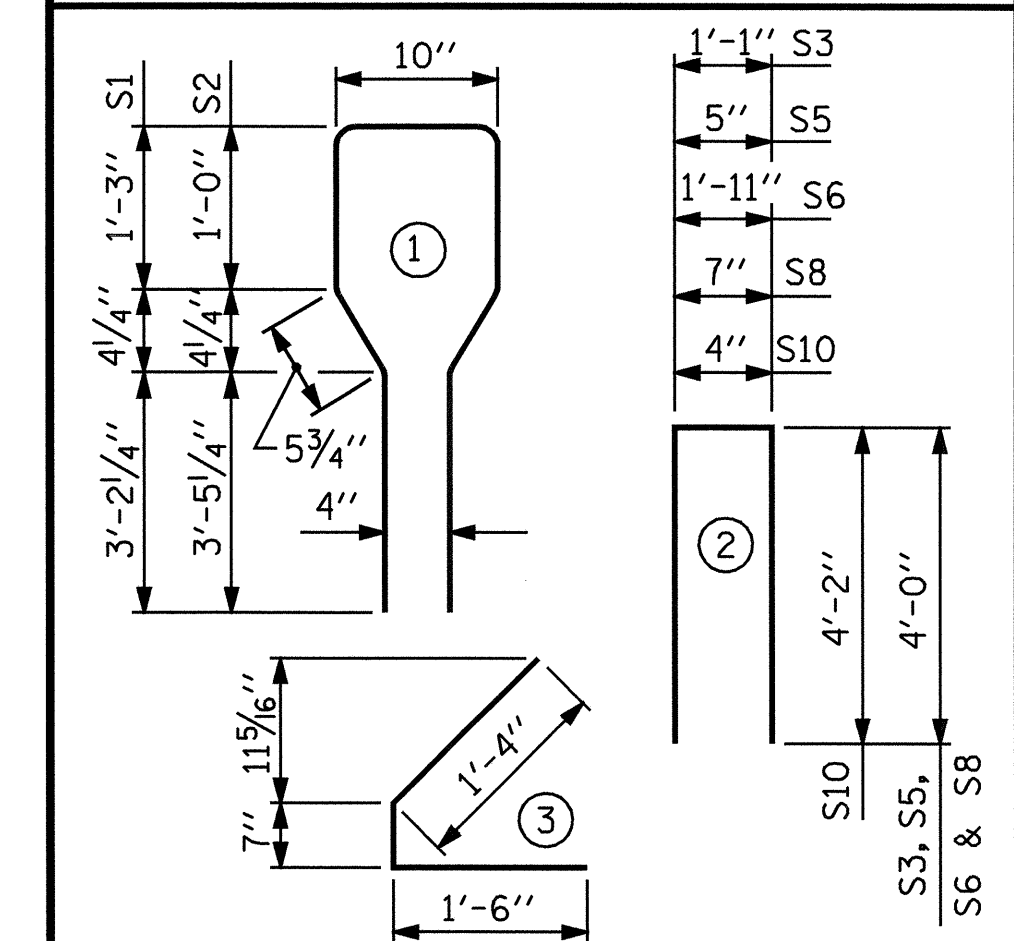


INTERIOR GDR.	S10	4	#5	2	8'-8"	36
EXTERIOR GDR.	S10	2	#5	2	8'-8"	18
INTERIOR GDR.	S11	5	#4	STR	10'-3"	34
EXTERIOR GDR.	S12	5	#4	STR	7'-0"	23

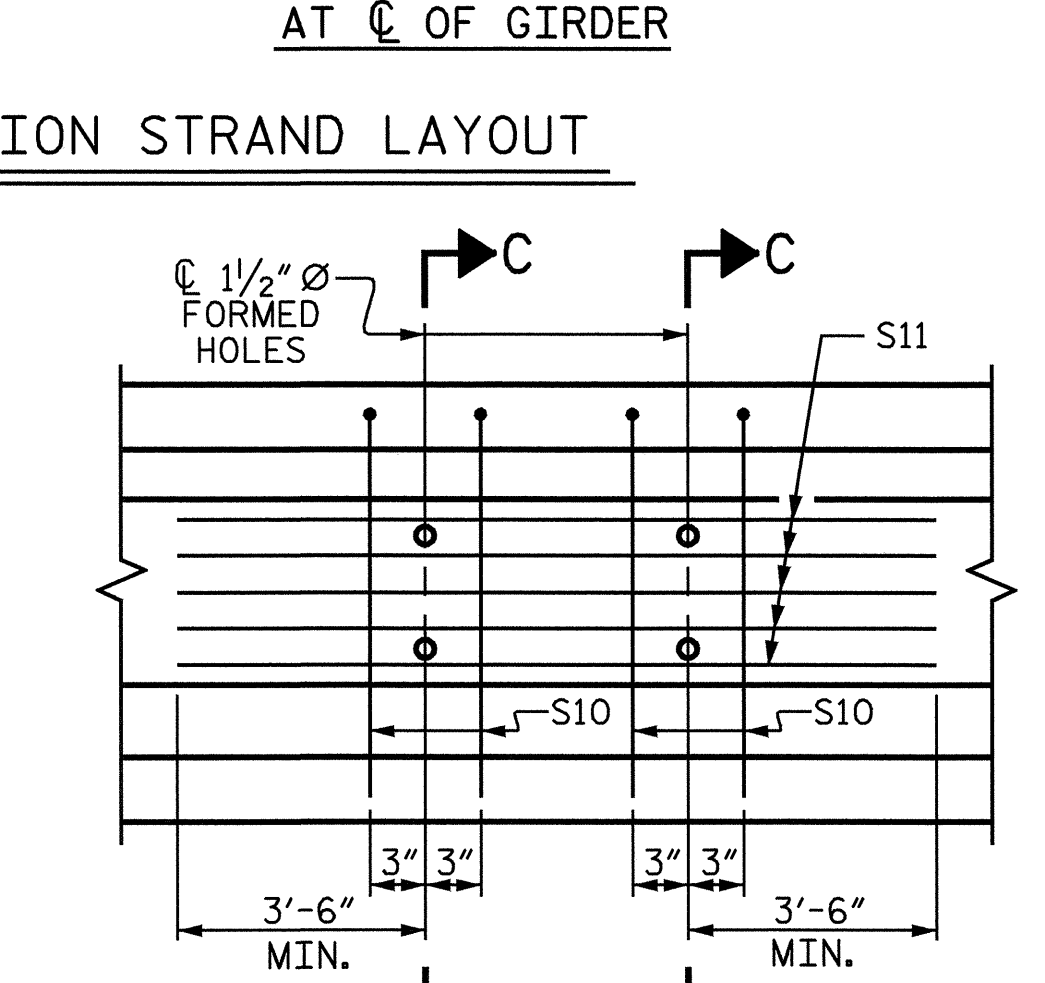
1/2" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.153	41,300	30,980

REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	57	#4	1	10'-8"	406
S2	12	#6	1	10'-8"	192
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34
S6	1	#4	2	9'-11"	7
* S7	6	#5	STR	3'-8"	23
S8	4	#4	2	8'-7"	23
S9	1	#3	STR	1'-10"	1

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

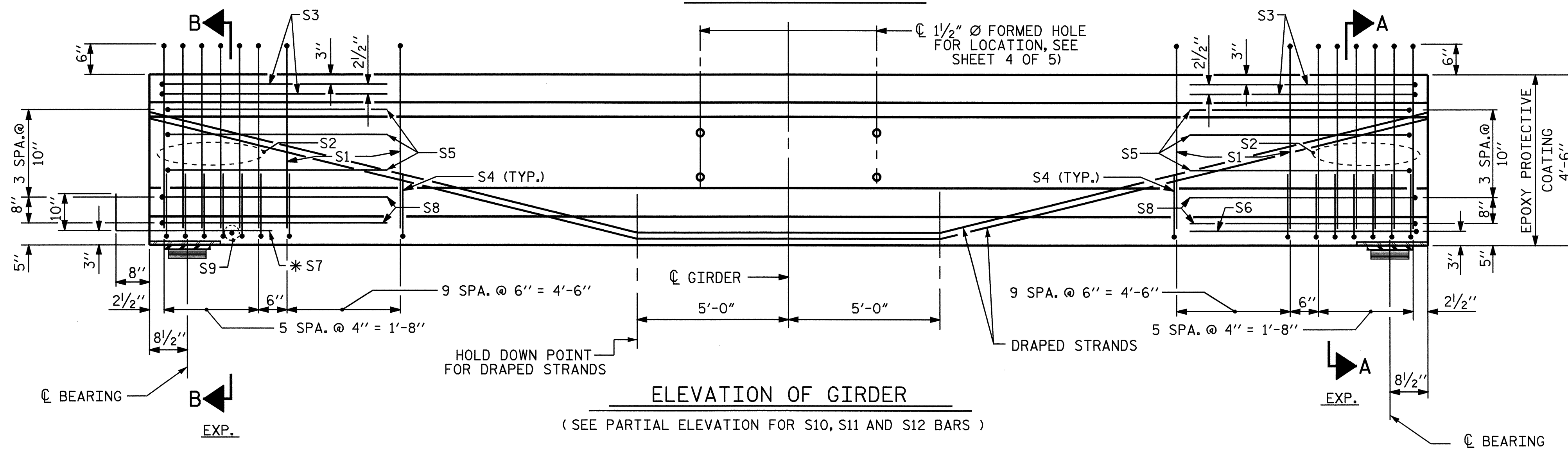


PLAN OF GIRDER



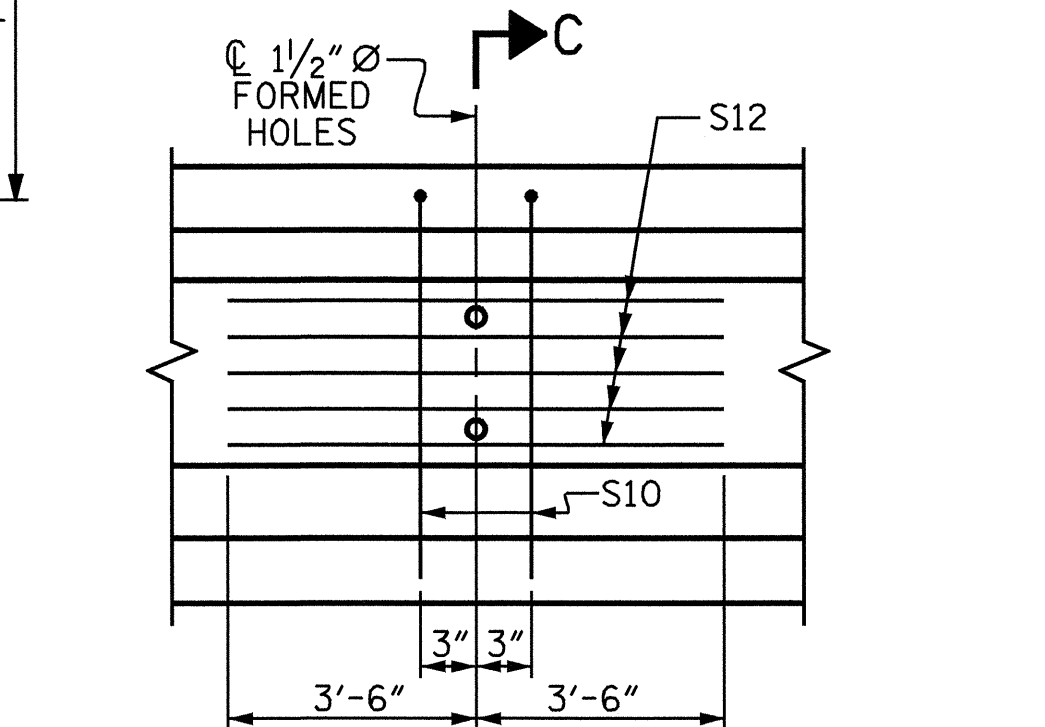
PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 2, 3 & 4



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR S10, S11 AND S12 BARS)



PARTIAL ELEVATION

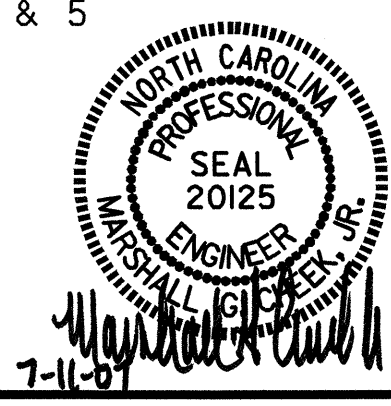
SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1 & 5

DEAD LOAD DEFLECTION TABLE FOR GIRDERS												
1/2" Ø LOW RELAXATION			SPAN C - GIRDER #1 THRU #5									
TENTH POINTS	¢ BRG.	.10	.20	.30	.40	.50	.60	.70	.80	.90	¢ BRG.	
CAMBER ( GIRDER ALONE IN PLACE )	†	0	.028	.054	.074	.086	.091	.086	.074	.054	.028	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	†	0	.014	.026	.036	.042	.044	.042	.036	.026	.014	0
FINAL CAMBER	†	0	3/16"	5/16"	1/2"	9/16"	5/8"	1/2"	5/8"	3/16"	0	

\* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS. ALL VALUES ARE SHOWN IN FEET ( DECIMAL FORM ), EXCEPT " FINAL CAMBER ", WHICH IS GIVEN IN INCHES ( FRACTION FORM ).

ASSEMBLED BY : V. X. NGUYEN DATE : 2-23-06  
 CHECKED BY : M.G. CHEEK DATE : 2-07  
 DRAWN BY : ELR 8/91 REV. 2/6/97 EEM/RGW  
 CHECKED BY : GRP 8/91 REV. 7/17/98 RWW/LES  
 REV. 10/17/00R RWW/LES

21-MAY-2007 10:50  
 R:\Structures\B4095\Final Plans\B4095.sd.dgn  
 vnguyen



QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL (LB.)	5,000 PSI CONCRETE (C.Y.)	1/2" Ø L.R. STRANDS (No.)
INTERIOR GIRDER	926	13.7	22
EXTERIOR GIRDER	897	13.7	22

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
5	67'-8"	338.33'

PROJECT NO. B-4095  
 DAVIDSON COUNTY  
 STATION: 26+20.00-L-

SHEET 3 OF 5

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			69

STR. #1



**STRUCTURAL STEEL NOTES**

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

TENSION ON THE AASHTO M164 BOLTS THROUGH THE CHANNEL MEMBER SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-8 OF THE STANDARD SPECIFICATIONS.

TENSION ON THE AASHTO M164 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL 1/4 TURN.

THE CHANNELS, ANGLES, BOLTS, WASHERS, PLATE WASHERS AND DIRECT TENSION INDICATORS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS, OR METALLIZED. FOR METALLIZATION, SEE SPECIAL PROVISIONS.

USE A MINIMUM 7/16" THICK PLATE WASHER WITH STANDARD HOLES UNDER EACH BOLT HEAD AND NUT. THE PLATE WASHERS SHALL HAVE SUFFICIENT SIZE TO COVER THE HOLES AFTER INSTALLATION. DIRECT TENSION INDICATORS ARE TO BE USED IN CONJUNCTION WITH THE PLATE WASHERS.

PROVIDE SUFFICIENT LENGTH OF ALL BOLTS TO ACCOMMODATE WASHERS, DIRECT TENSION INDICATORS, THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

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

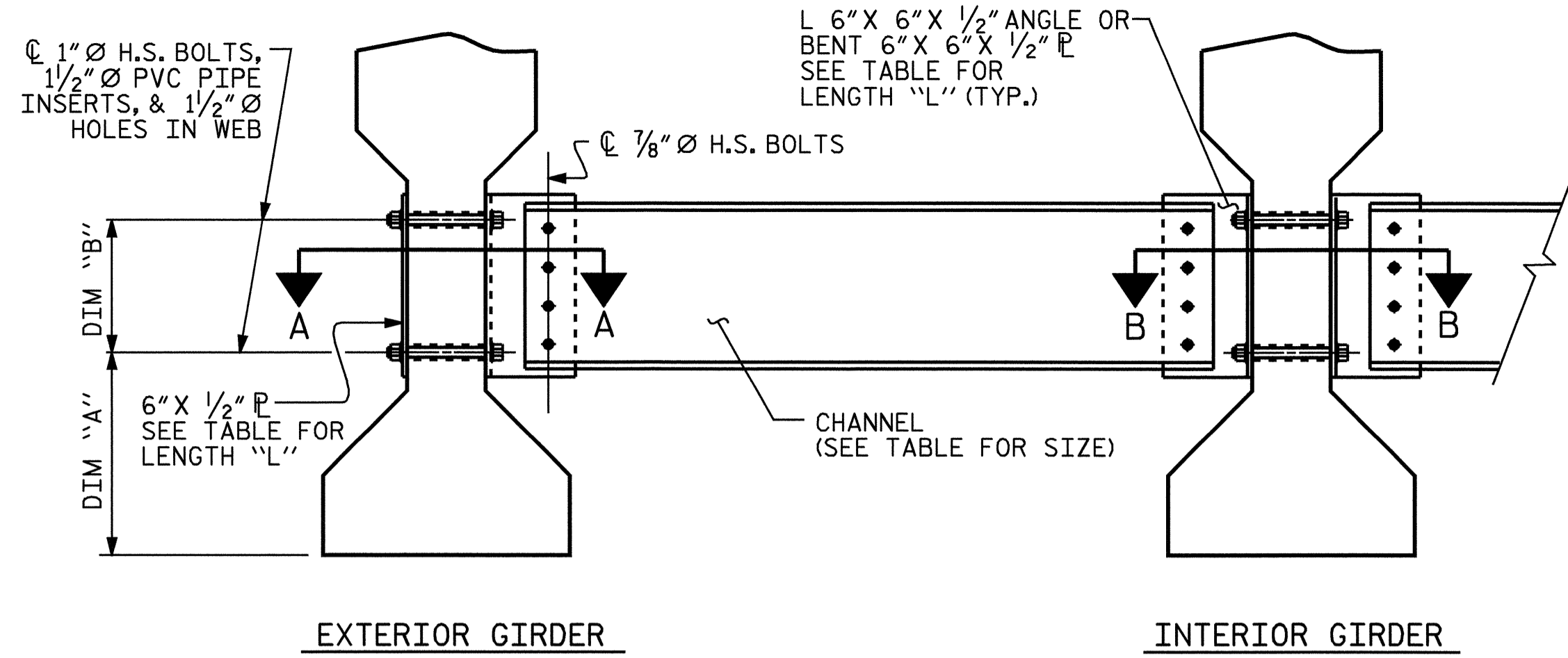
IN THE EXTERIOR BAYS, TEMPORARY STRUTS SHALL BE PLACED BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED. ALL AASHTO M164 H.S. BOLTS SHALL BE FULLY TIGHTENED AFTER THE STRUTS HAVE BEEN REMOVED.

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

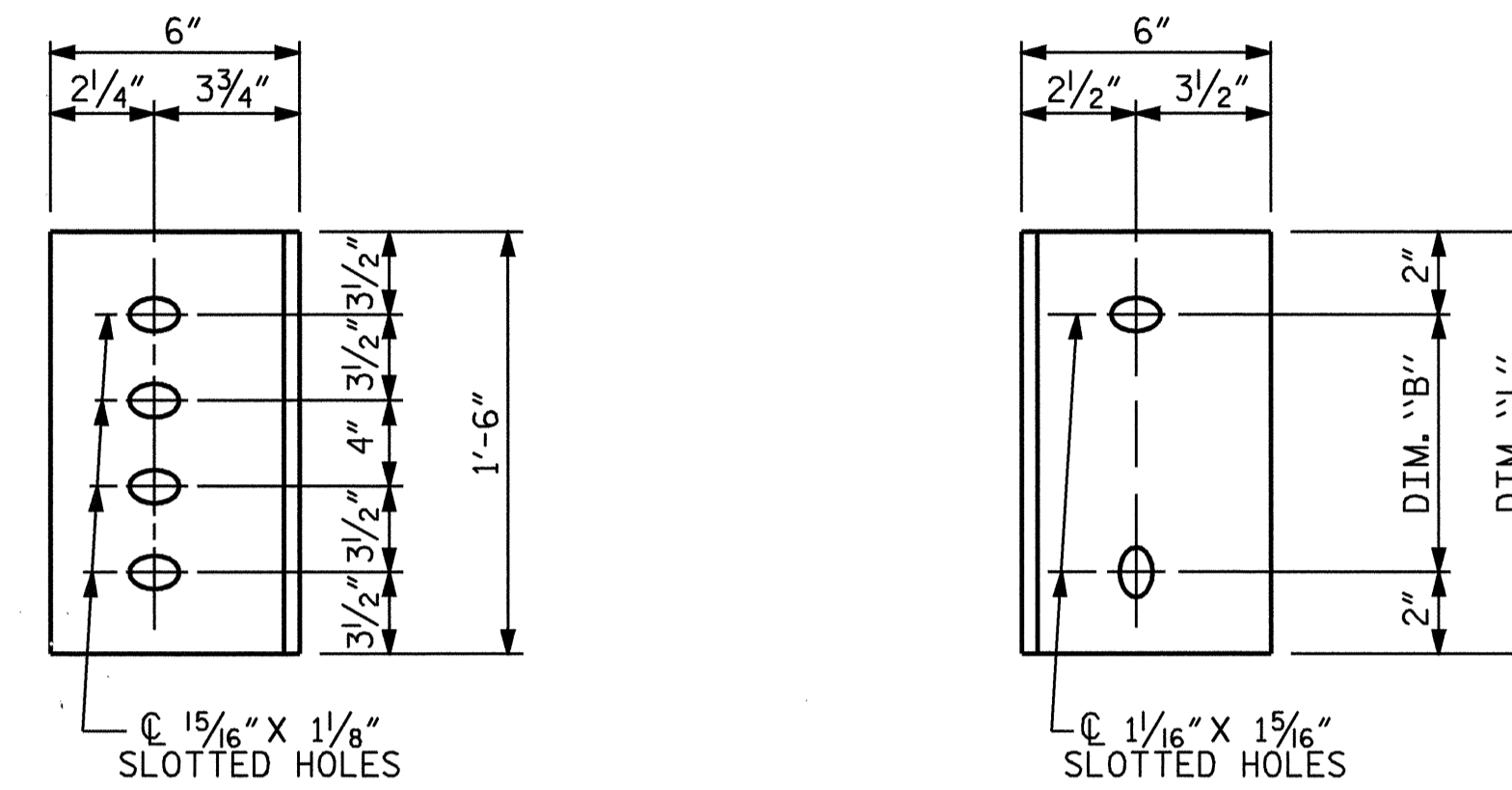
FOR HIGH STRENGTH BOLTS, SEE SPECIAL PROVISIONS.

**TABLE**

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



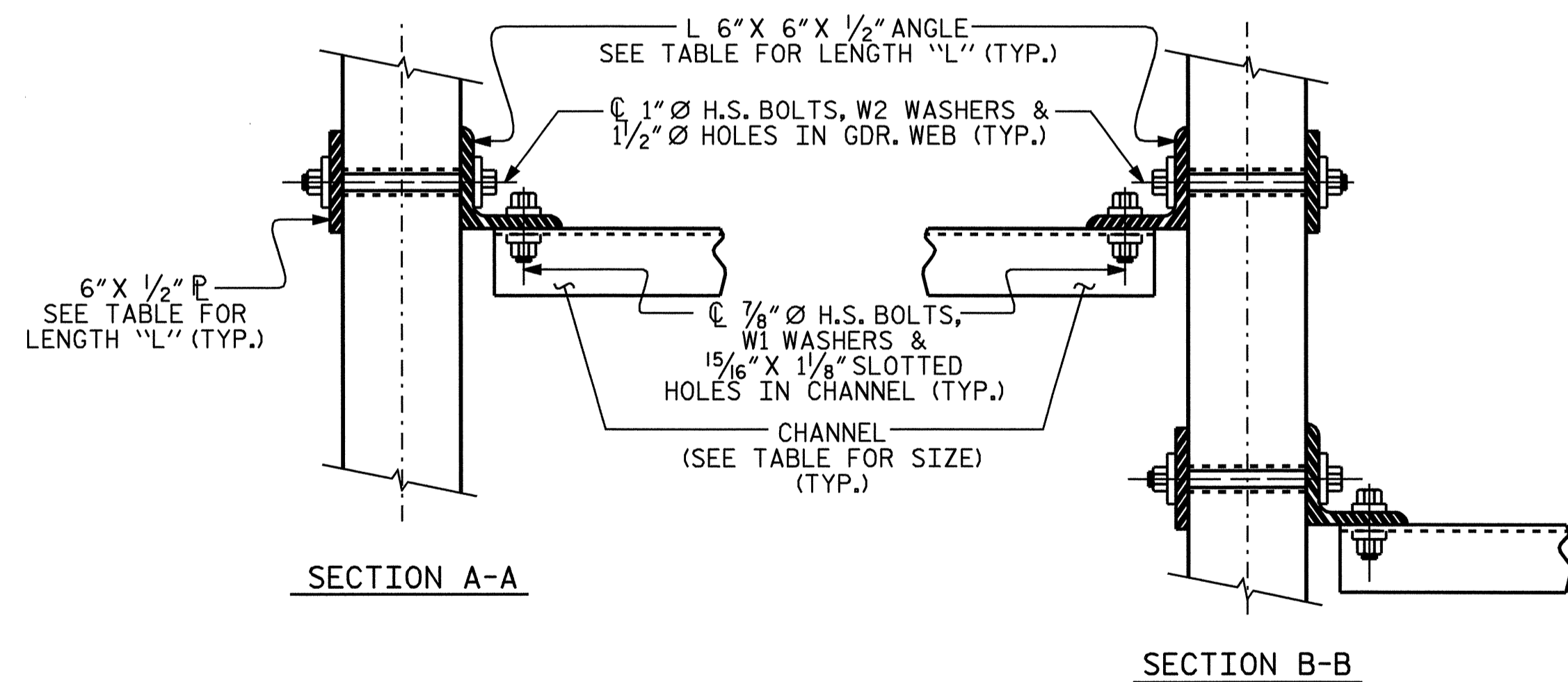
**PART SECTION AT INTERMEDIATE DIAPHRAGM**



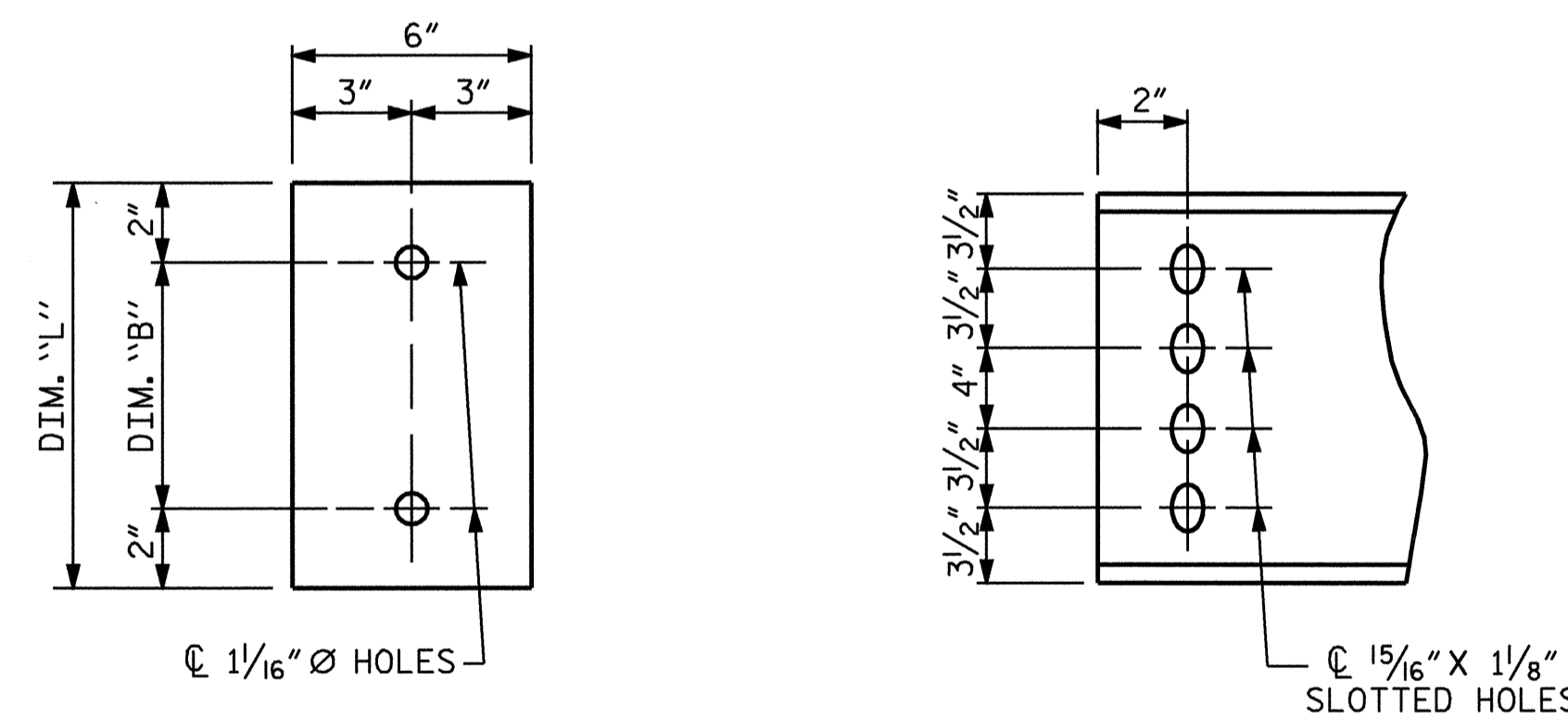
**DIAPHRAGM FACE**

**WEB FACE**

**CONNECTOR PLATE DETAILS**

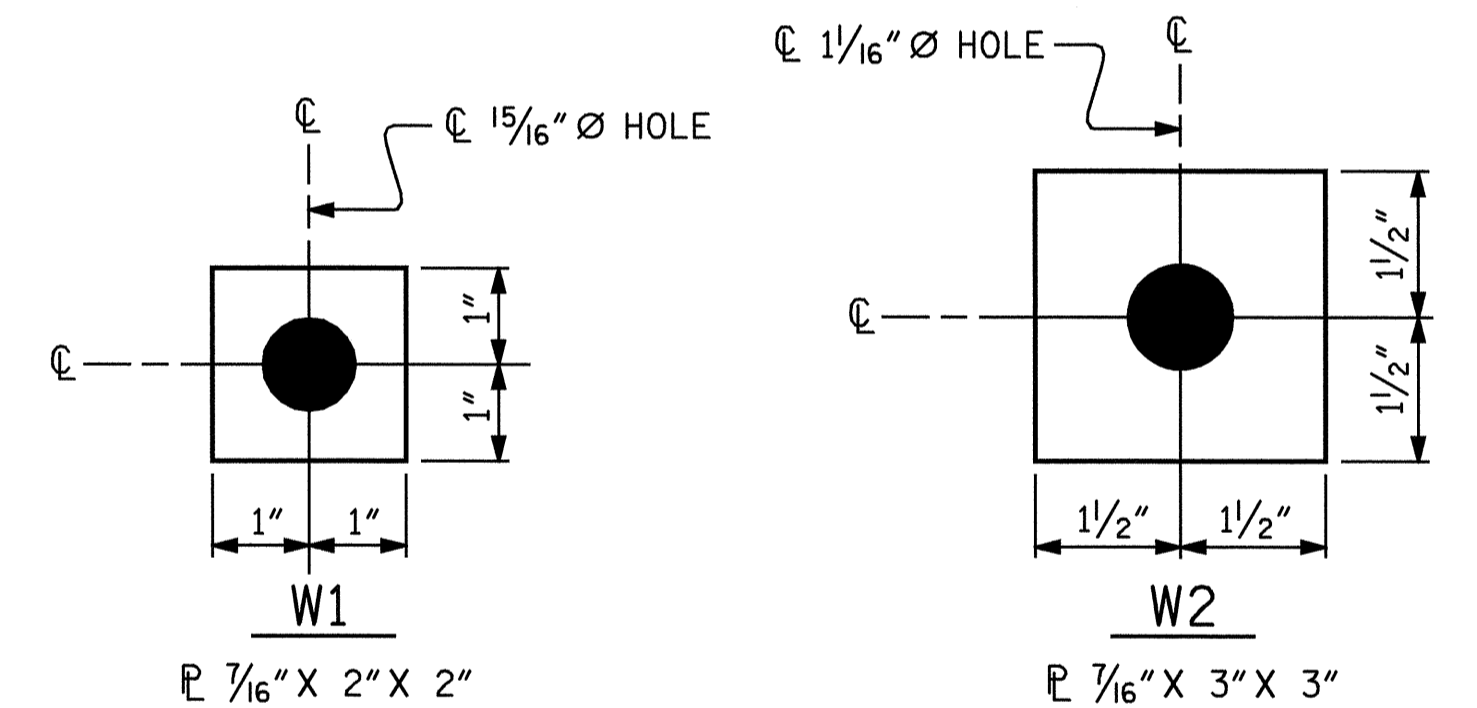


**CONNECTION DETAILS**



**PLATE DETAILS**

**CHANNEL END**



USE WITH 7/8" Ø HVY. HEX NUTS & DIRECT TENSION INDICATOR WASHERS AT DIAPHRAGM CHANNEL TO CONNECTOR PLATE CONNECTIONS

USE WITH 1" Ø HVY. HEX NUTS & DIRECT TENSION INDICATOR WASHERS AT CONNECTOR PLATE TO GIRDER CONNECTIONS

**WASHER DETAILS**

PROJECT NO. B-4095  
DAVIDSON COUNTY  
 STATION: 26+20.00-L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

INTERMEDIATE  
 STEEL DIAPHRAGMS FOR  
 TYPE IV PRESTRESSED  
 CONCRETE GIRDERS

LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			69



ASSEMBLED BY : V. X. NGUYEN DATE : 10-17-06  
 CHECKED BY : M.G. CHEEK DATE : 2-07  
 DRAWN BY : TLA 6/05  
 CHECKED BY : VC 6/05

ADDED 10/21/05  
 REV. 5/1/06 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.

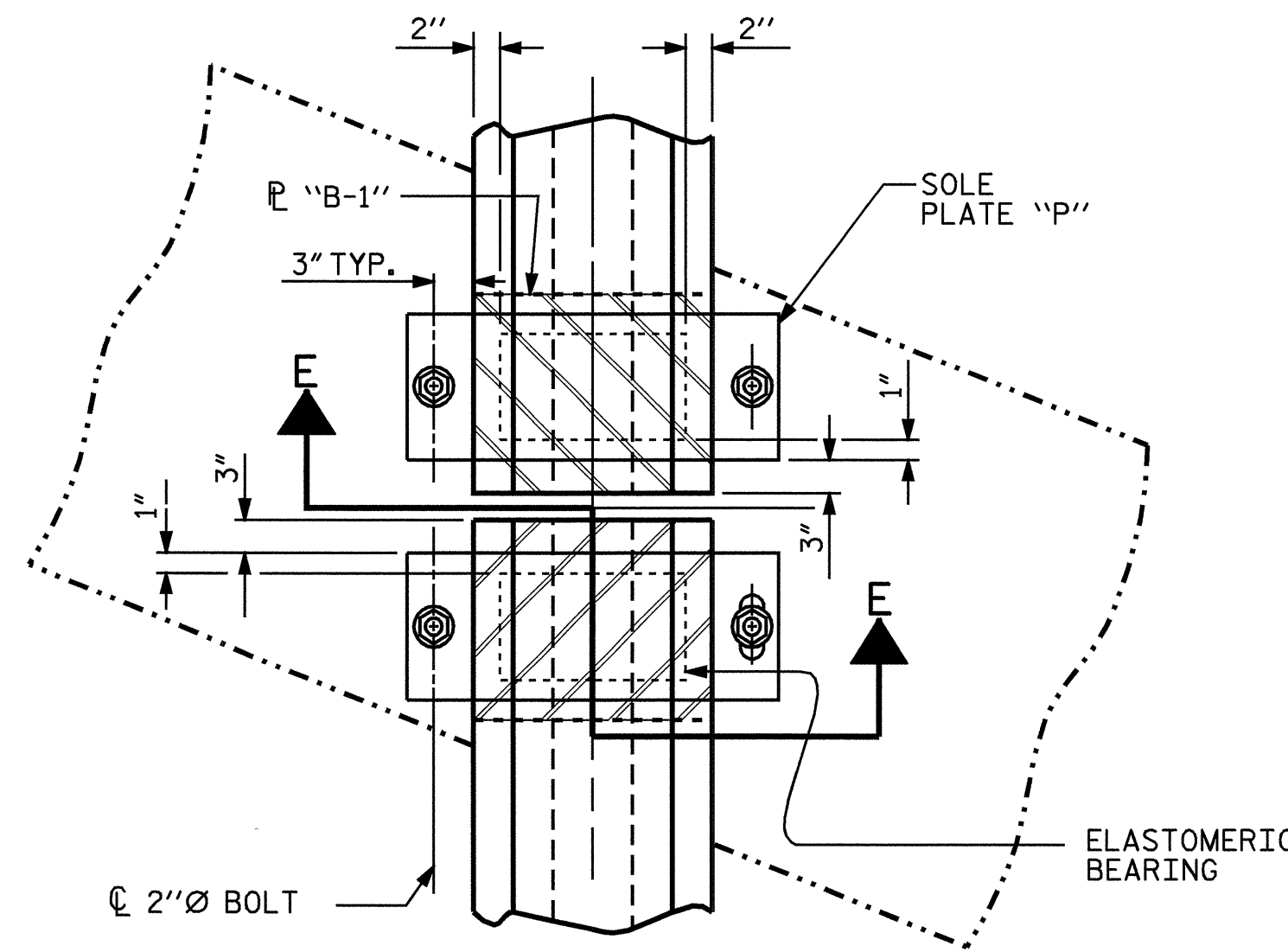
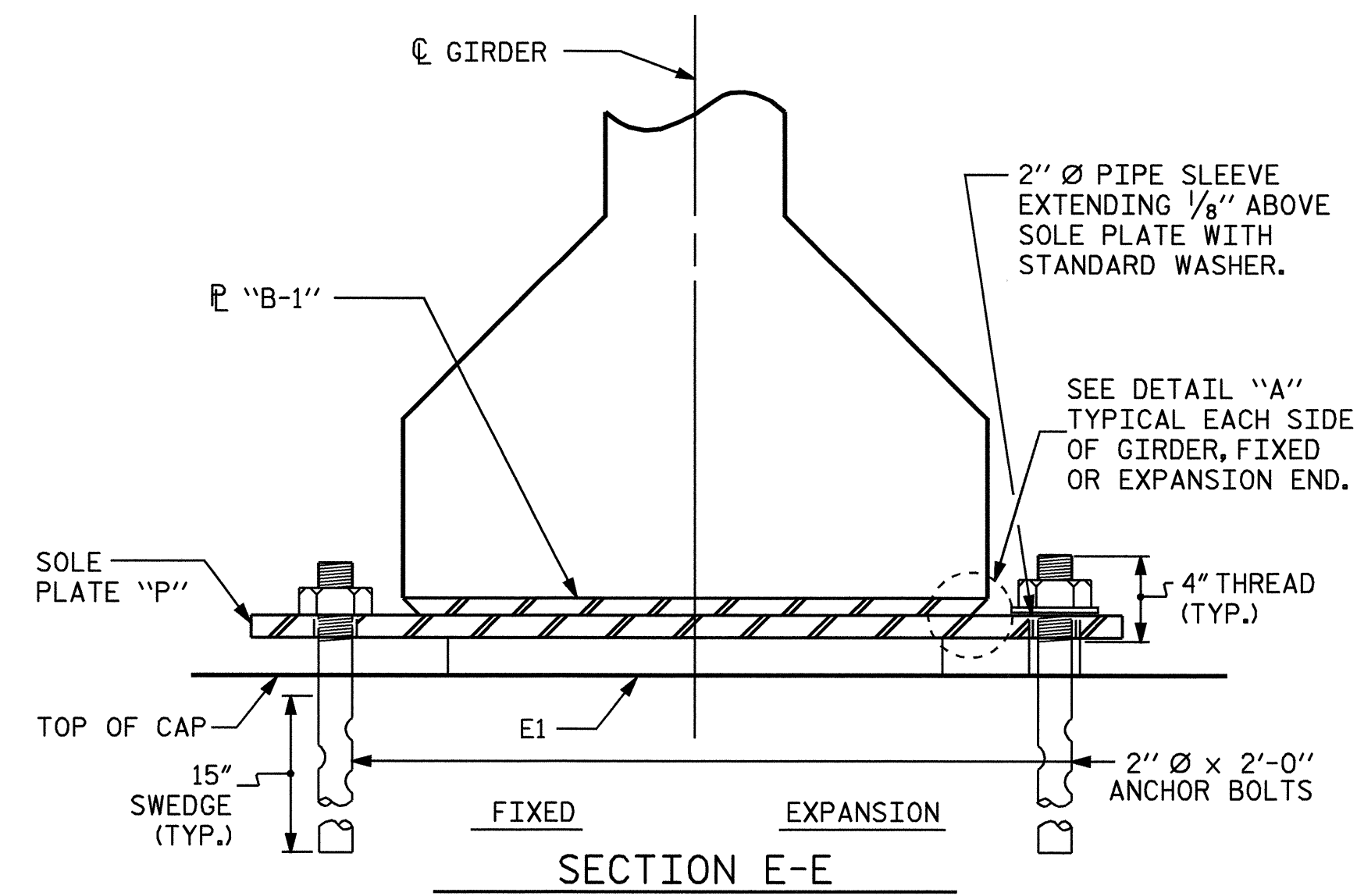
WHEN WELDING THE SOLE PLATE TO THE EMBEDDED PLATE IN THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE SOLE PLATE DOES NOT EXCEED 300°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.

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

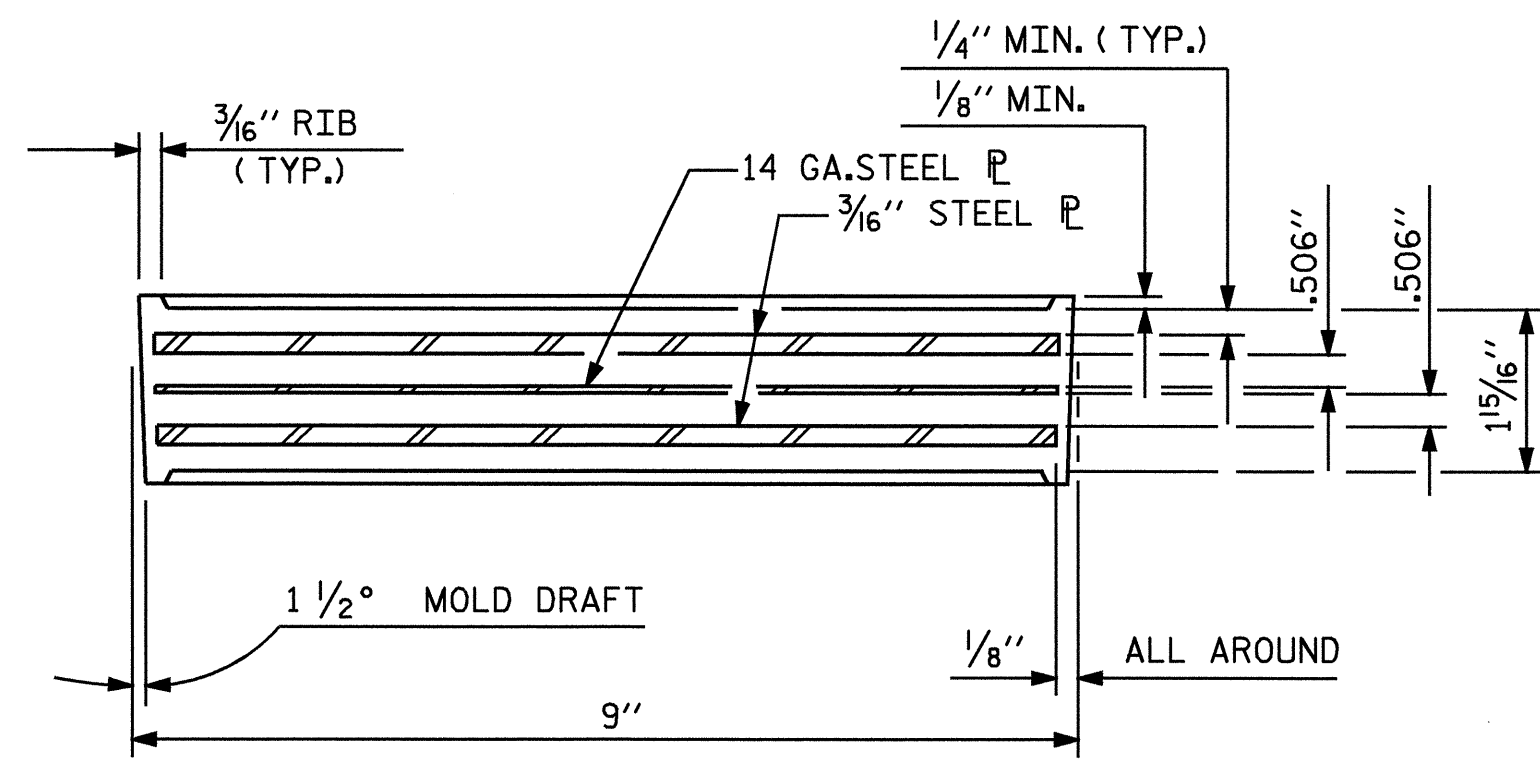
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLT, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

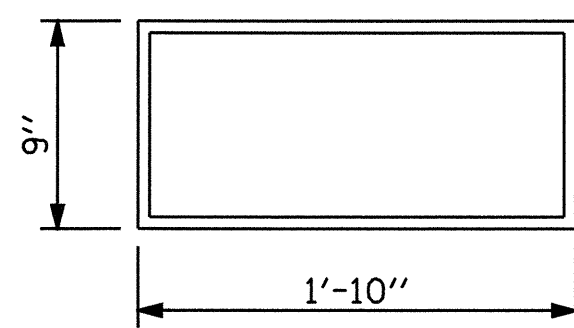
ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.



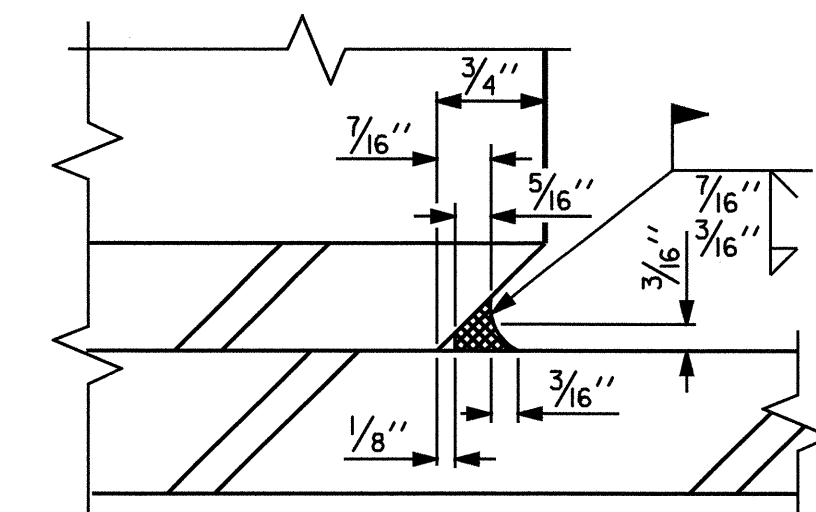
**TYPICAL HALF-PLAN**  
(SHOWING CONTINUOUS BENT)



**TYPICAL SECTION OF ELASTOMERIC BEARINGS**



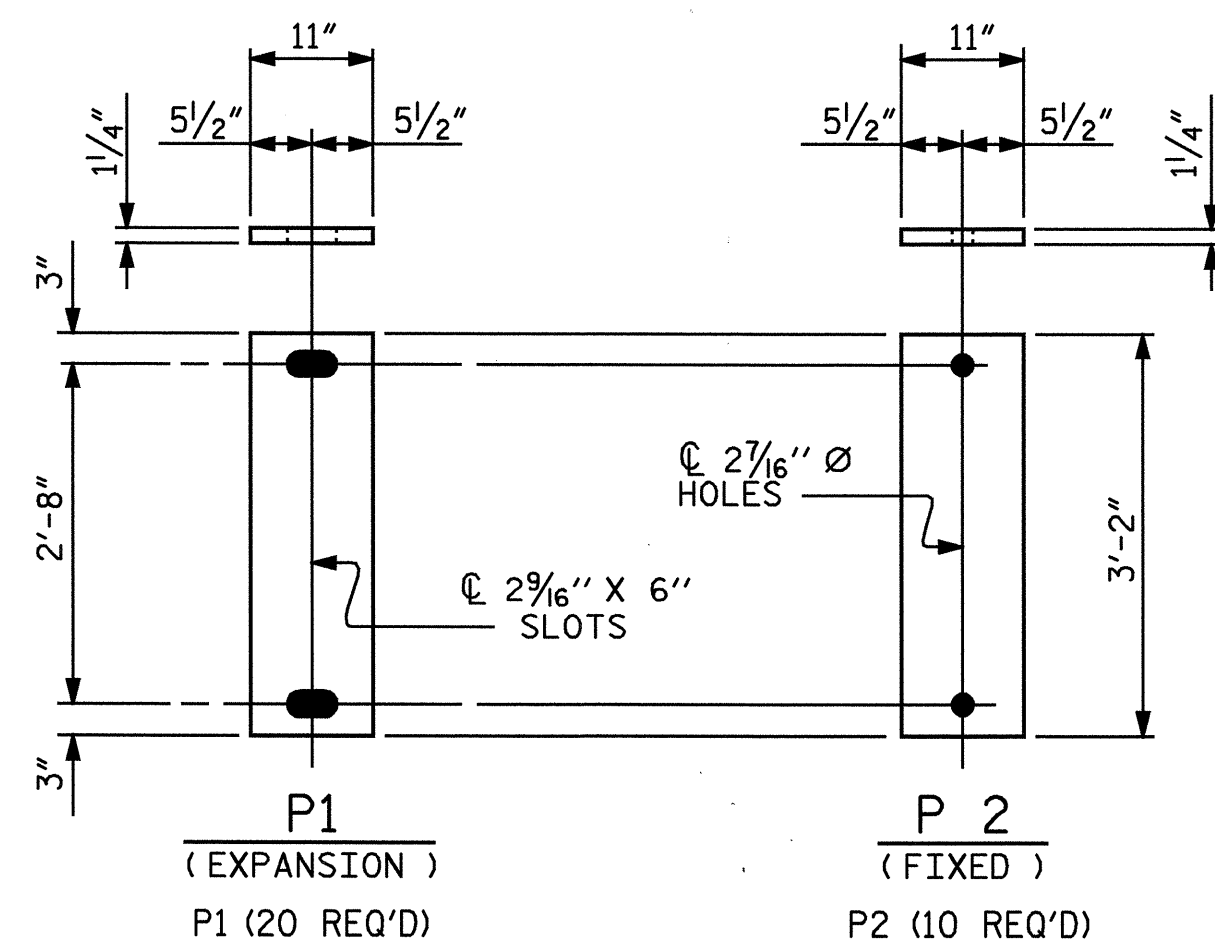
**E1 (30 REQ'D)**  
**PLAN VIEW OF ELASTOMERIC BEARING**  
**TYPE IV**



**DETAIL "A"**

— LOAD RATINGS —	
54" PCG -TYPE IV	MAX.D.L.+L.L. 137 K

ALL BEARINGS SHALL BE 60 DUROMETER



**SOLE PLATE DETAILS ("P")**

PROJECT NO. B-4095  
DAVIDSON COUNTY  
STATION: 26+20.00-L-

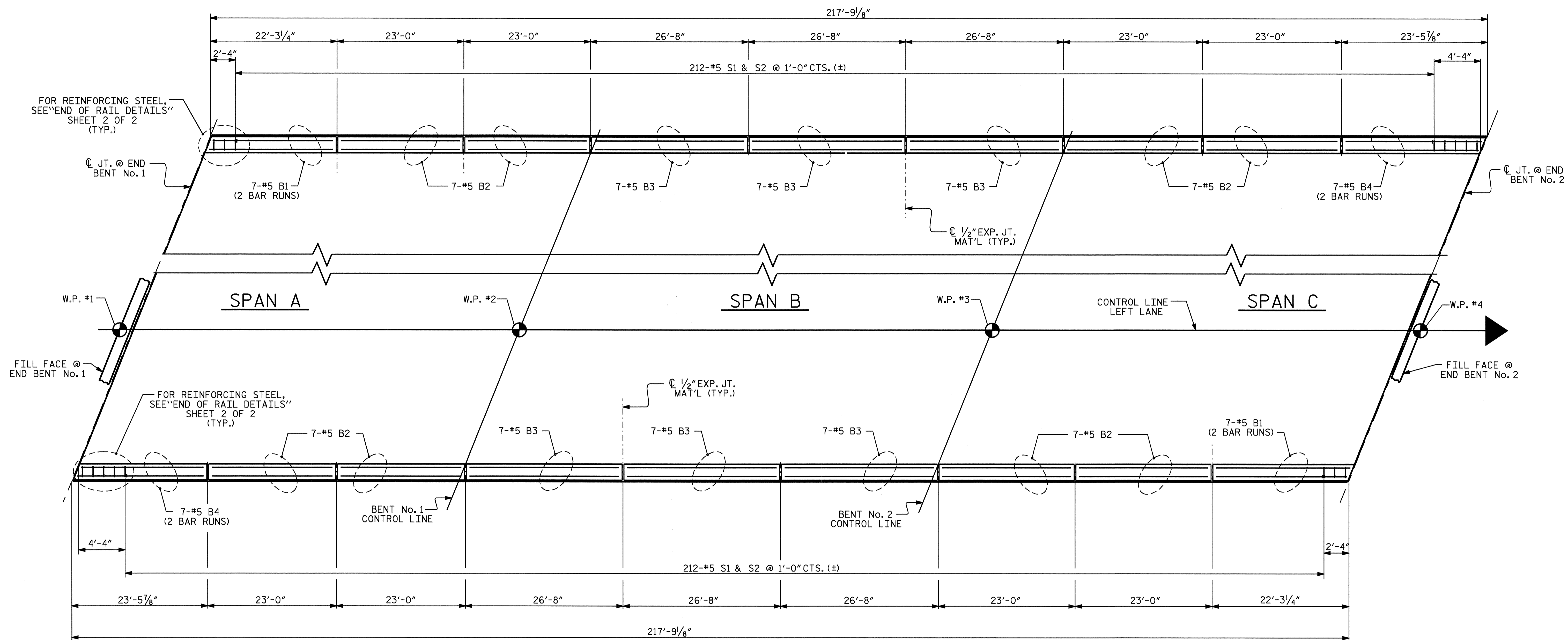
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
**ELASTOMERIC BEARING**  
**DETAILS**  
PRESTRESSED CONCRETE GIRDER  
SUPERSTRUCTURE  
LEFT LANE



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			69

ASSEMBLED BY :	V. X. NGUYEN	DATE :	10-10-06
CHECKED BY :	M.G. CHEEK	DATE :	02-07
DRAWN BY :	WJH 8/89	REV. 10/17/00	RWW/LES
CHECKED BY :	CRK 8/89	REV. 7/10/01	RWW/LES
		REV. 5/1/06	TLA/GM





PLAN

PROJECT NO. B-4095  
DAVIDSON COUNTY  
 STATION: 26+20.00-L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**CONCRETE  
 BARRIER RAIL  
 LEFT LANE**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			69



DRAWN BY: V. X. NGUYEN DATE: 2-23-06  
 CHECKED BY: M.G. CHEEK DATE: 02-07

10-JUL-2007 14:39  
 R:\Structures\b4095\Final Plans\B4095.sd\_BR.dgn  
 dahodge

STR. #1

**NOTES**

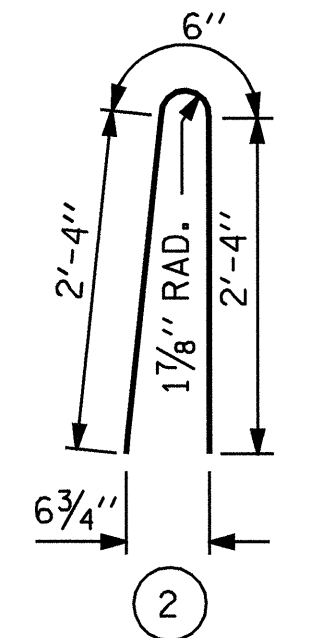
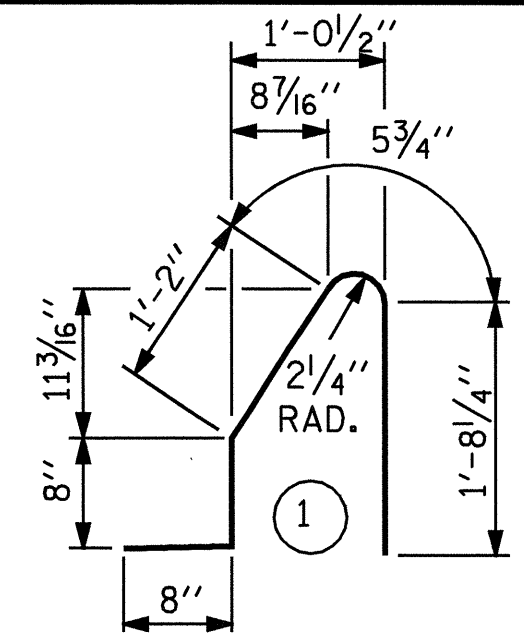
THE BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

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.

FOR PLAN OF CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEET 1 OF 2

**BAR TYPES**



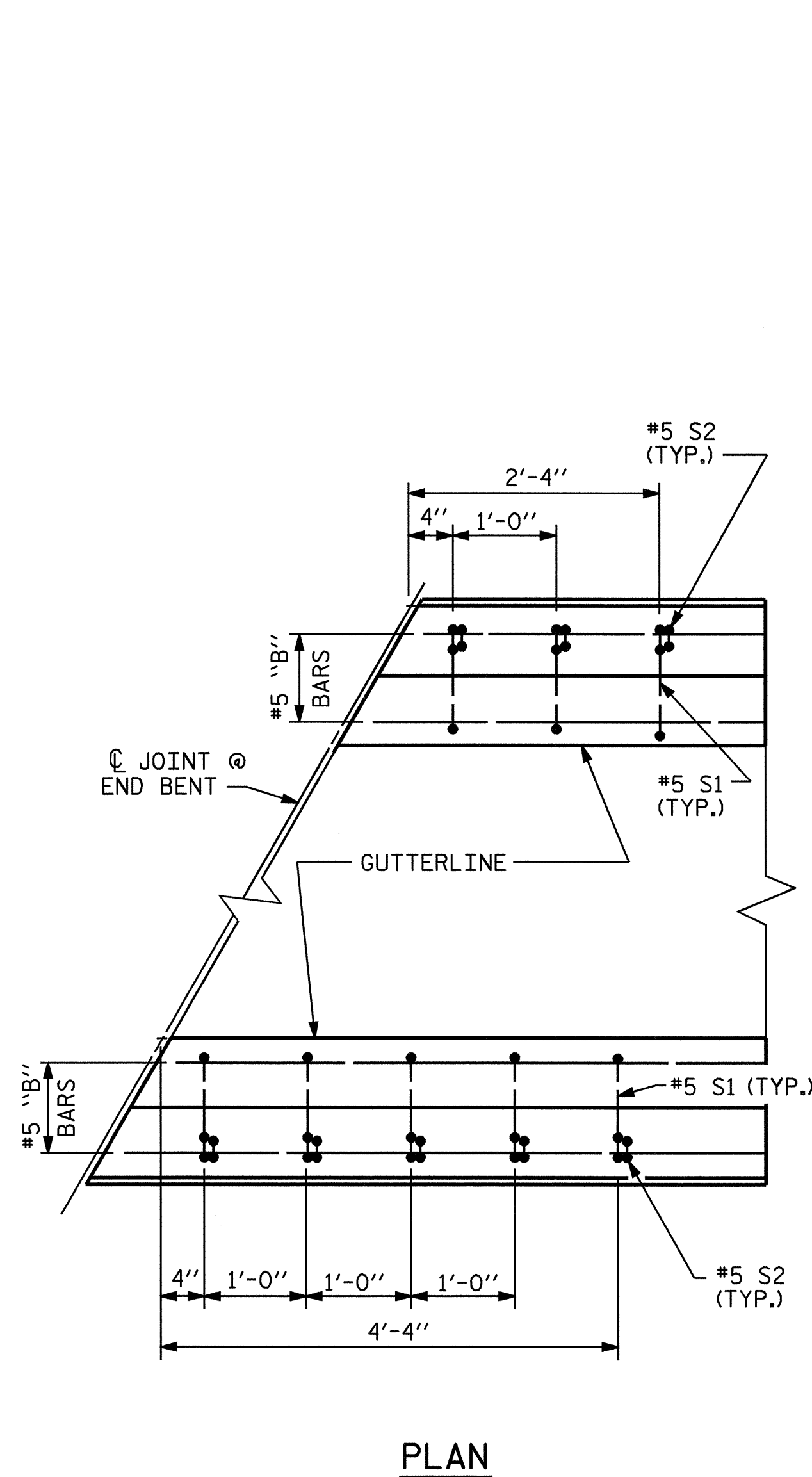
ALL BAR DIMENSIONS ARE OUT TO OUT

**BILL OF MATERIAL**

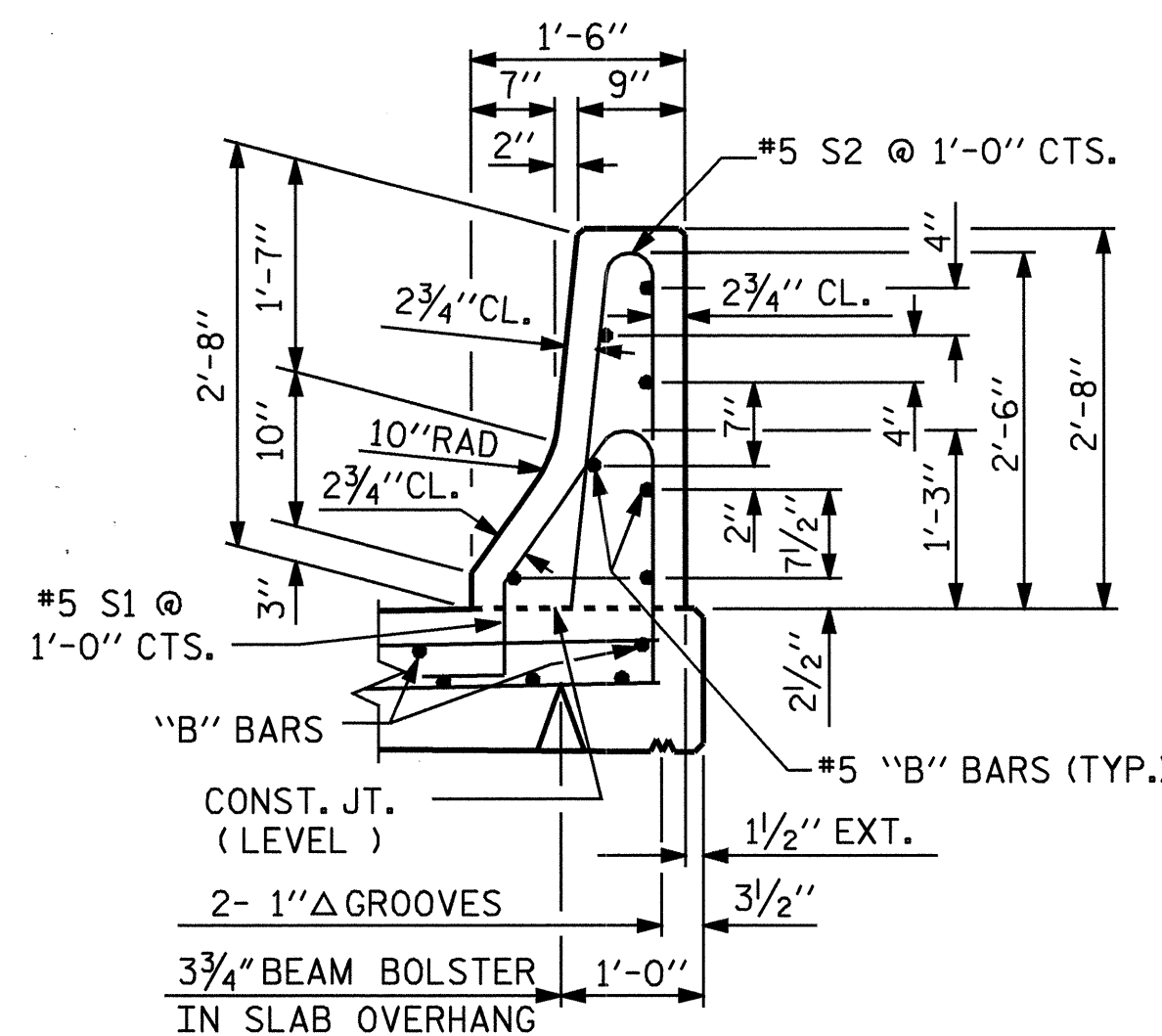
FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	28	#5	STR	12'-8"	370
* B2	56	#5	STR	22'-5"	1309
* B3	42	#5	STR	26'-3"	1150
* B4	28	#5	STR	13'-3"	387
* S1	436	#5	1	4'-8"	2122
* S2	436	#5	2	5'-2"	2350

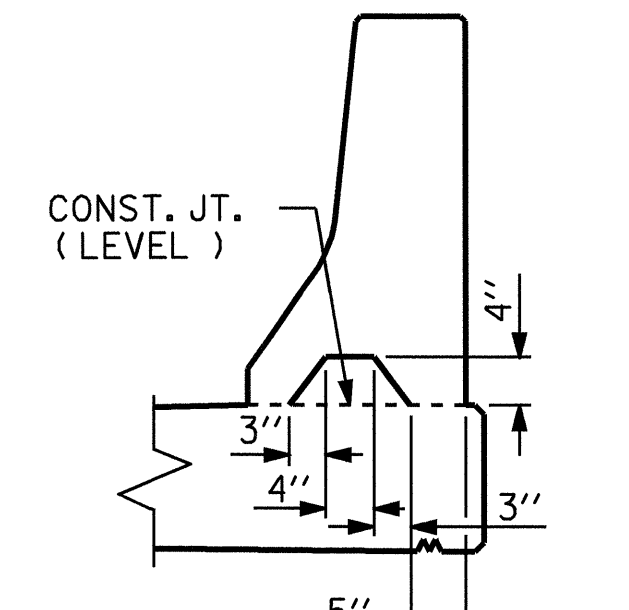
* EPOXY COATED REINFORCING STEEL	7688 LBS.
CLASS AA CONCRETE	43.6 CU. YDS.
CONCRETE BARRIER RAIL	435.52 LIN. FT.



**PLAN**  
**END OF RAIL DETAILS**

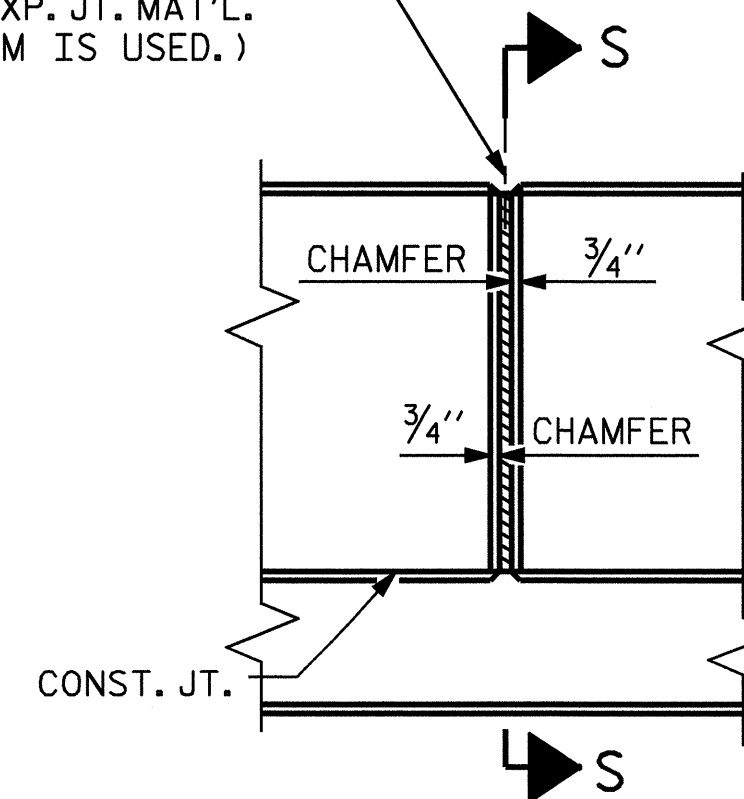


**SECTION THRU RAIL**



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

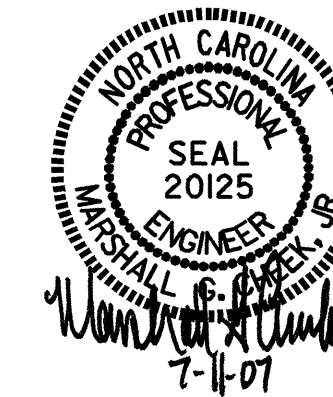
1/2" EXP. JT. MAT'L HELD IN PLACE WITH GALVANIZED NAILS.  
(NOTE: OMIT EXP. JT. MAT'L. WHEN SLIP FORM IS USED.)



**ELEVATION AT EXPANSION JOINT**  
**BARRIER RAIL DETAIL**

ASSEMBLED BY :	V. X. NGUYEN	DATE :	10-16-06
CHECKED BY :	M.G. CHEEK	DATE :	02-07
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

10-JUL-2007 14:40  
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dahodge



PROJECT NO. B-4095  
DAVIDSON COUNTY  
STATION: 26+20.00-L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**CONCRETE BARRIER RAIL**  
**LEFT LANE**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			69

STR. #1

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 4 - 5/8" 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 5/8" 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.)

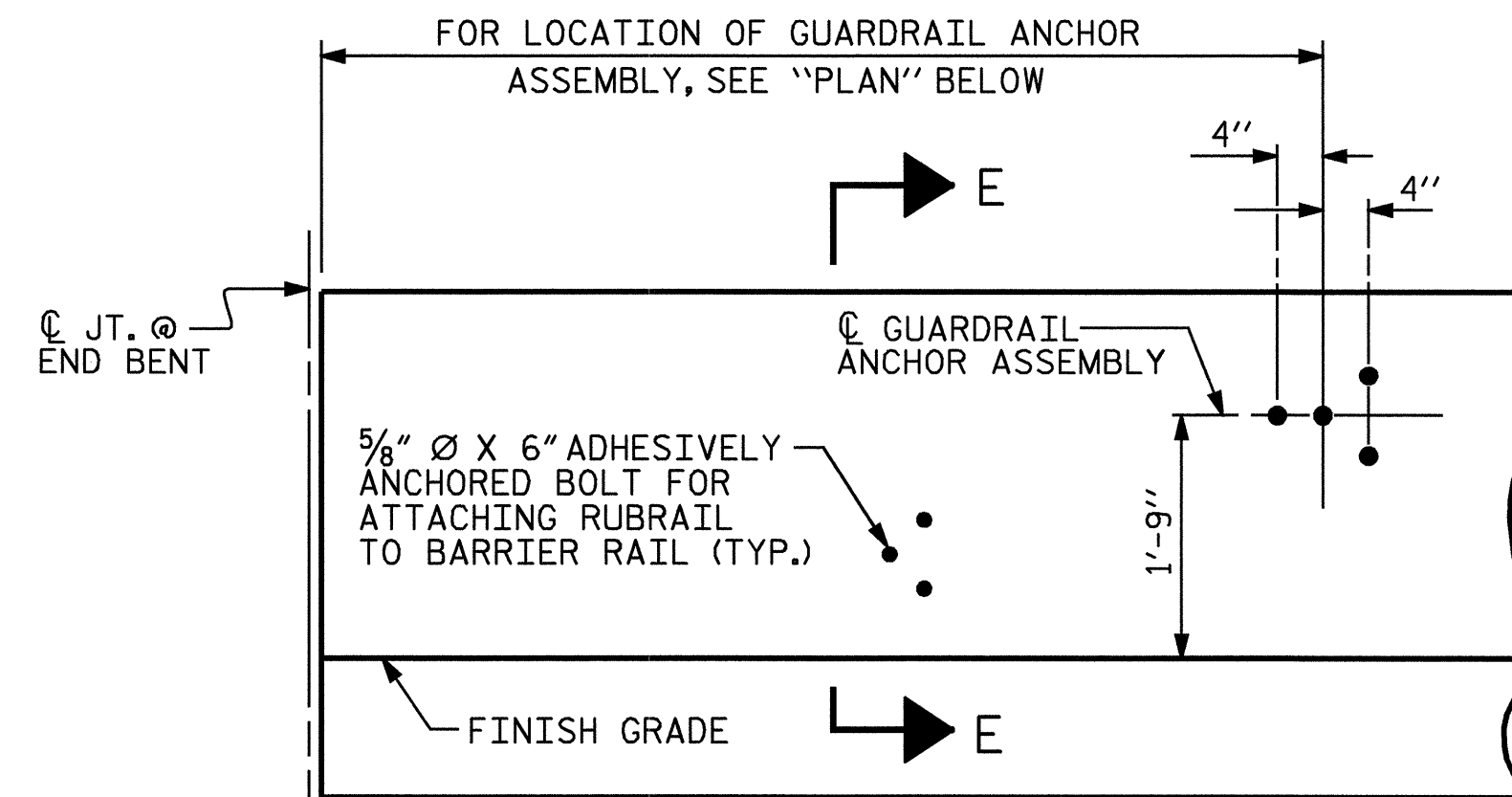
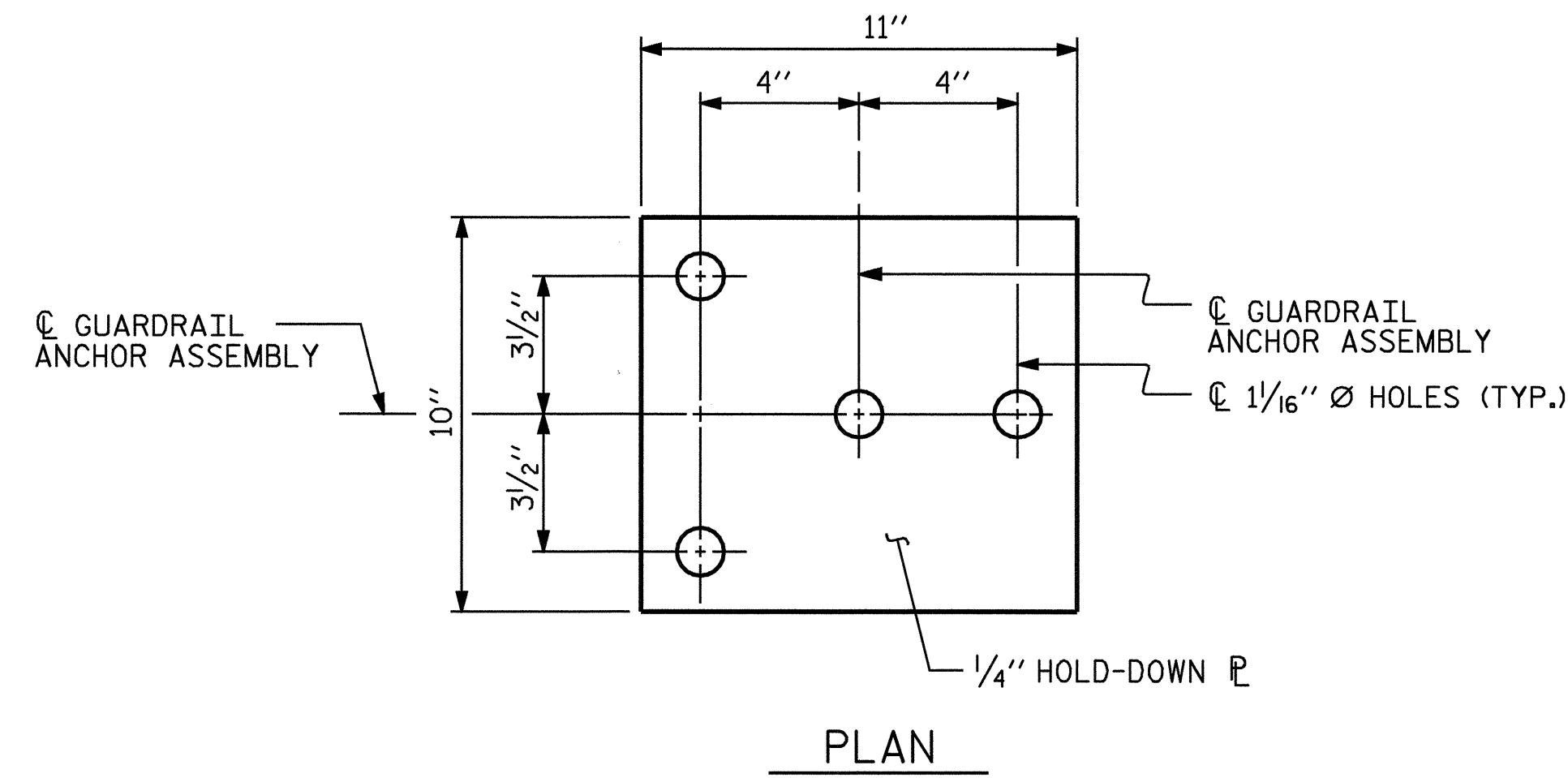
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

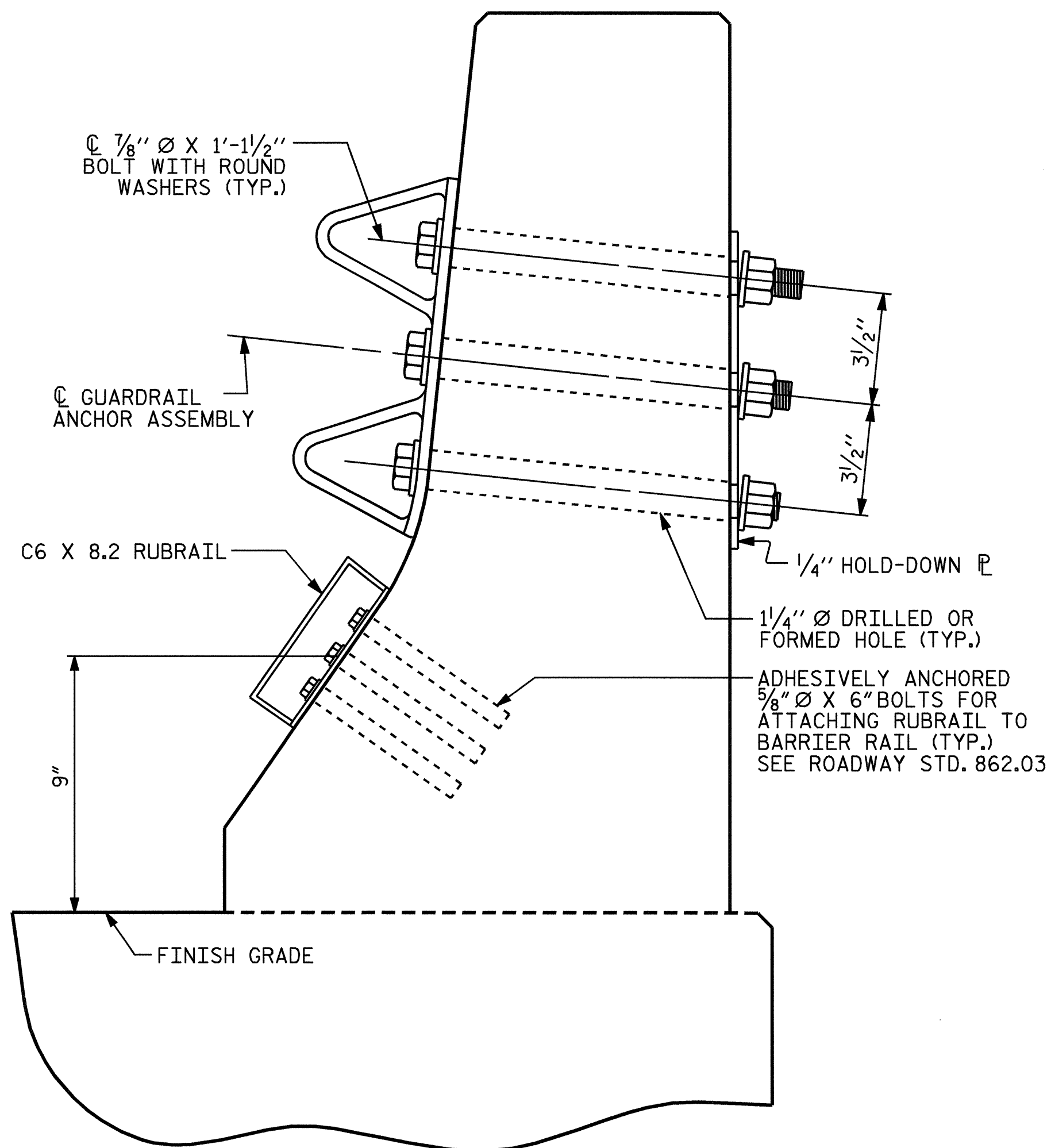
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

THE 1/4" 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 5/8" Ø X 6" BOLTS WITH WASHERS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.

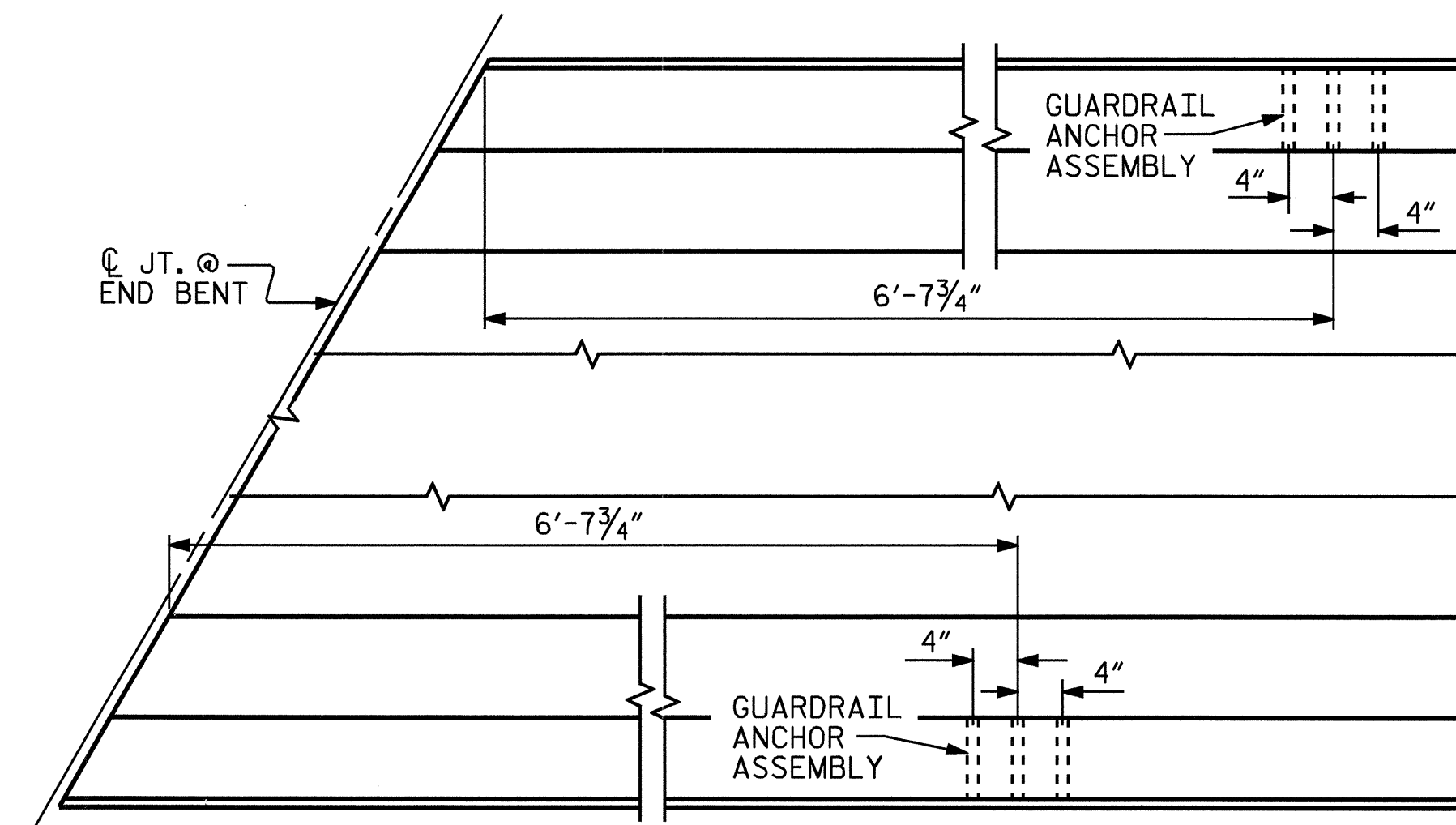


ELEVATION  
FOR LOCATION OF RUBRAIL, SEE ROADWAY STD. 862.03



SECTION E-E

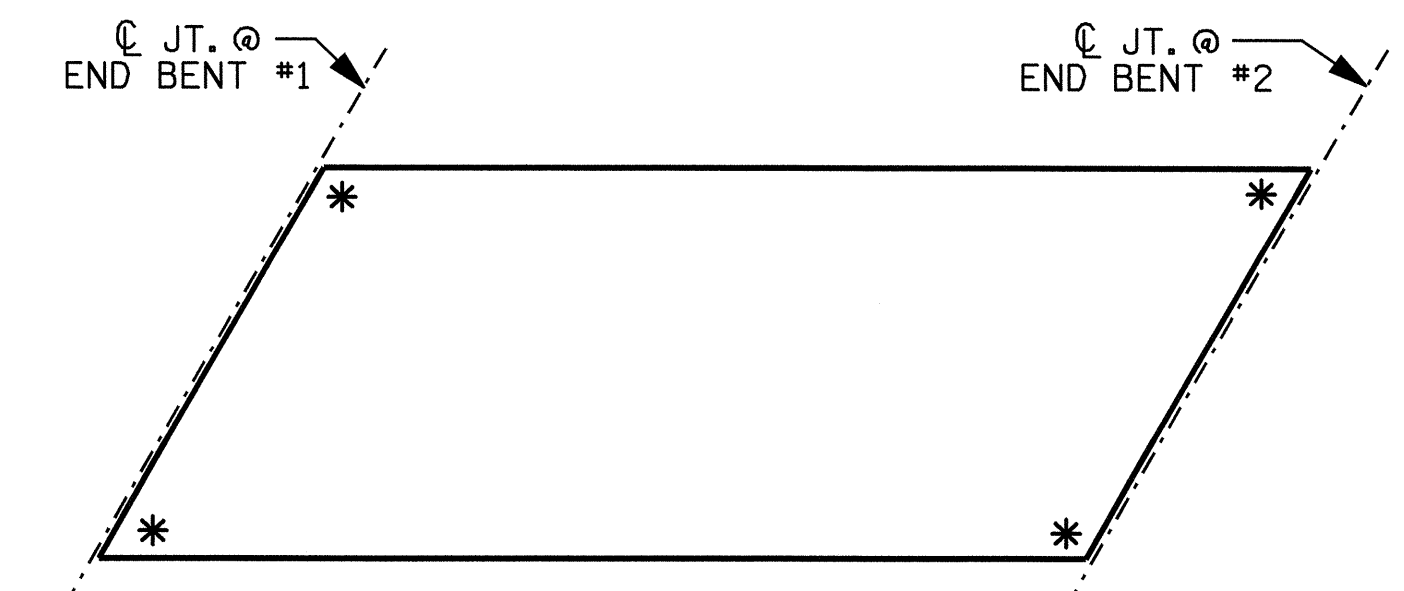
GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

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



SKETCH SHOWING POINTS OF ATTACHMENTS

\* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. B-4095  
DAVIDSON COUNTY  
STATION: 26+20.00 -L-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD GUARDRAIL ANCHORAGE FOR BARRIER RAIL LEFT LANE					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
TOTAL SHEETS					69



ASSEMBLED BY : V.X. NGUYEN DATE : 5-14-07  
CHECKED BY : M.G. CHEEK DATE : 5-07  
DRAWN BY : TLA 5/06  
CHECKED BY : GM 5/06

ADDED 5/1/06  
10-JUL-2007 14:41  
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dahodge

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.

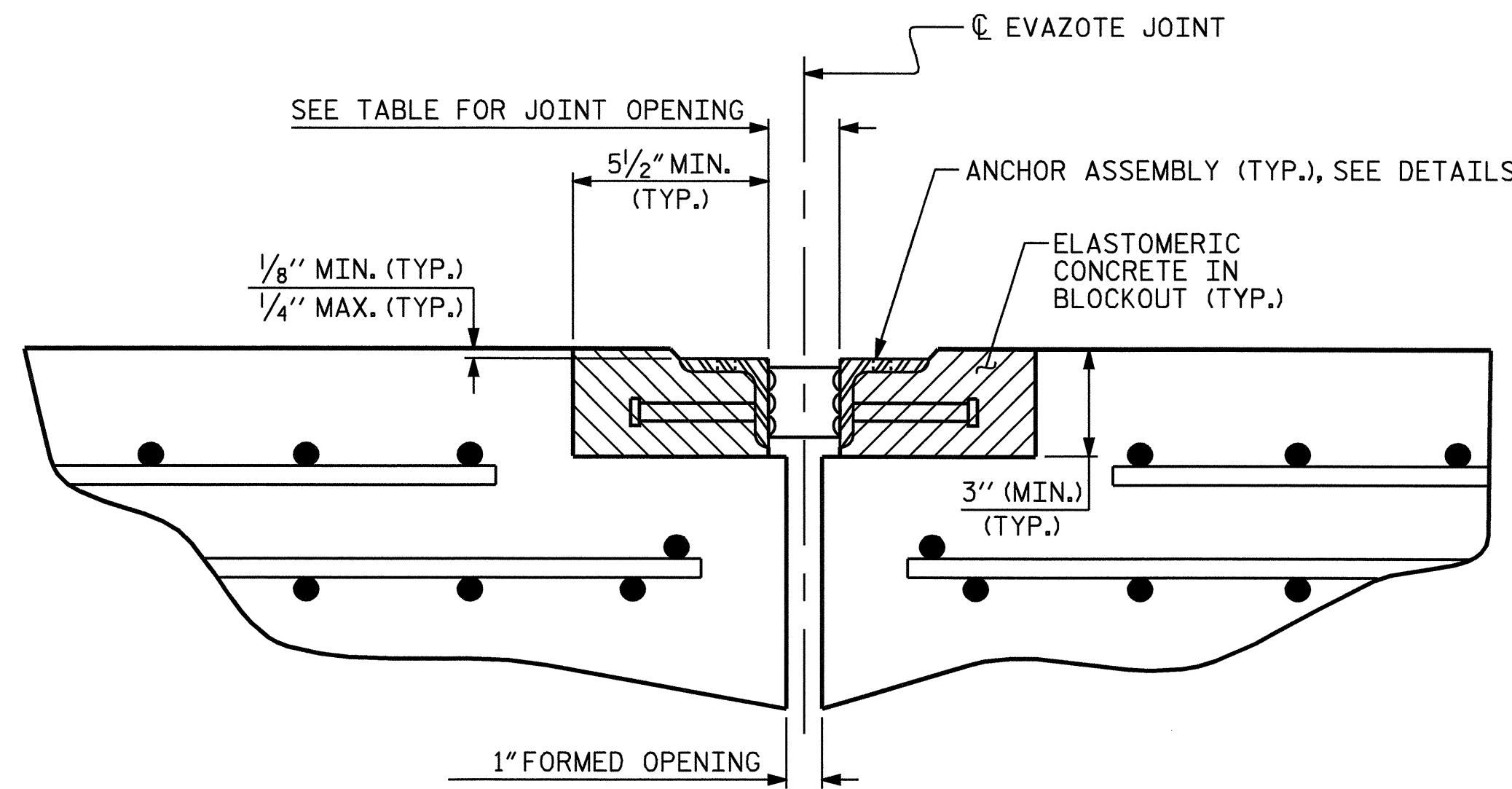
ANCHOR ASSEMBLY SEGMENTS SHALL NOT BE LESS THAN 12 FEET NOR MORE THAN 20 FEET IN LENGTH. SHORTER SEGMENTS MAY BE USED AT THE EDGE OF ROADWAY OR AT POINTS OF STAGED CONSTRUCTION.

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 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.

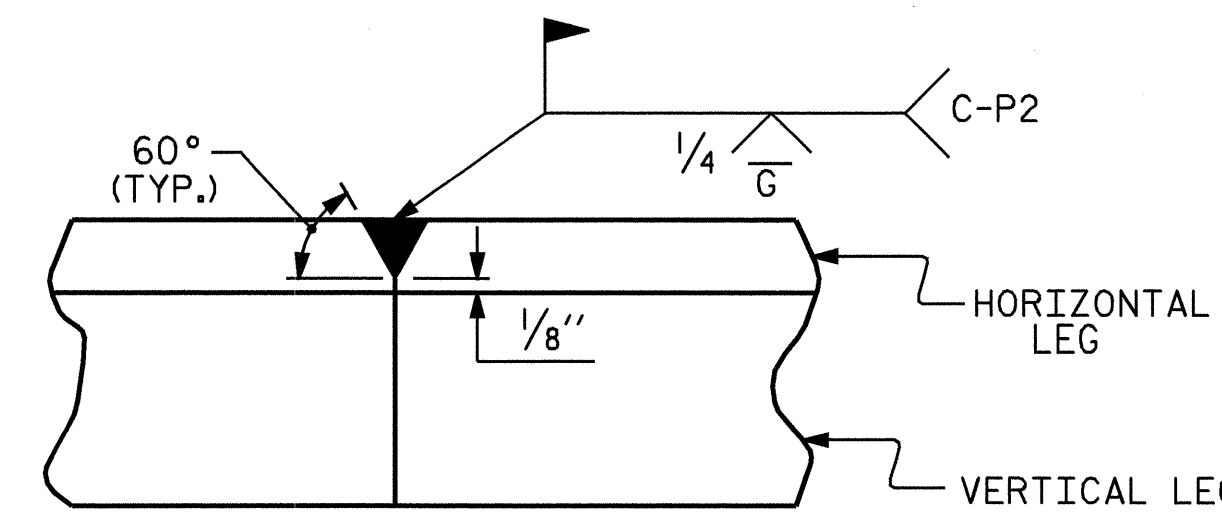
SEE SPECIAL PROVISIONS FOR EVAZOTE JOINT SEALS.

SEE SPECIAL PROVISIONS FOR ELASTOMERIC CONCRETE.

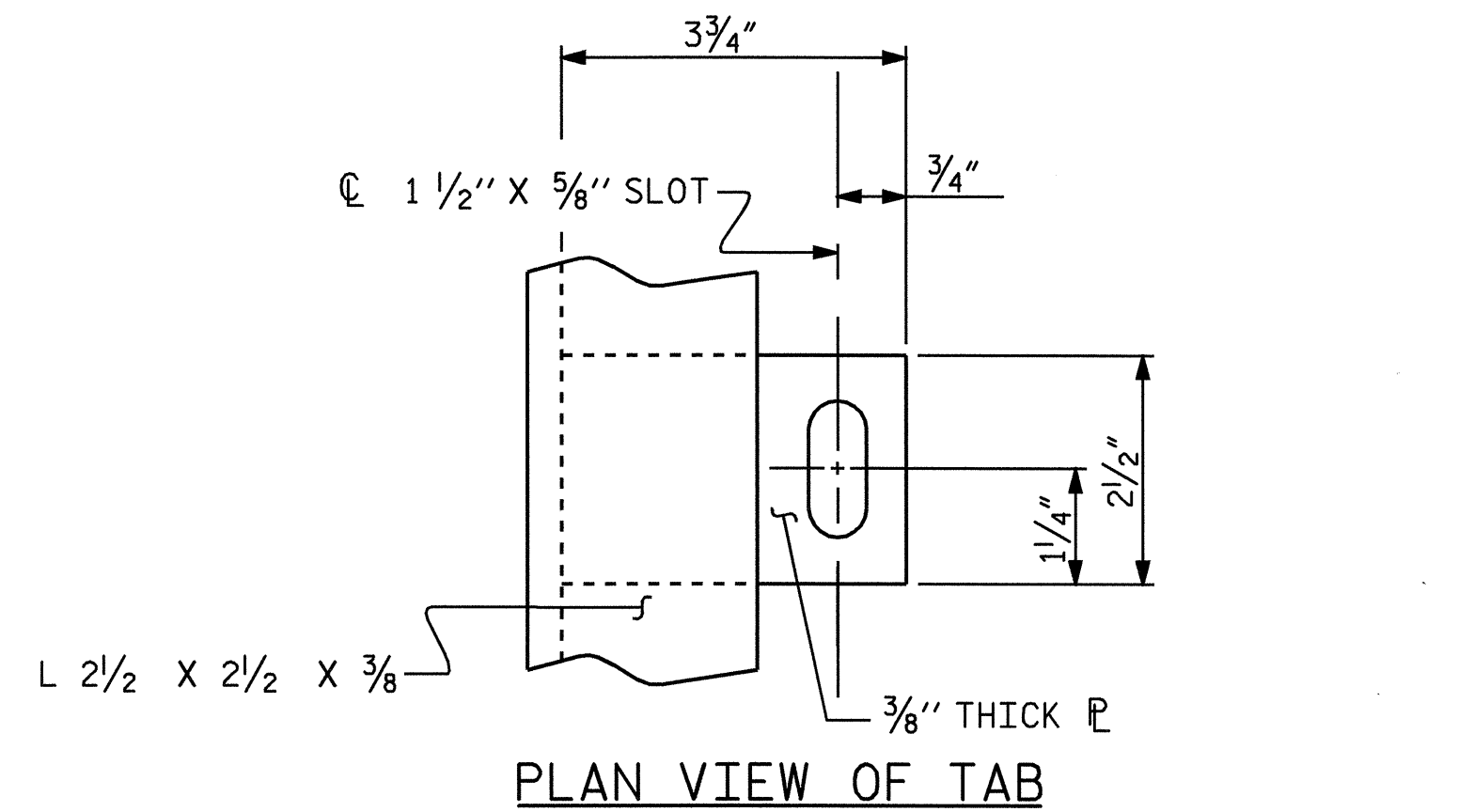


ARMORED JOINT DETAILS

SECTION NORMAL TO JOINT AT END BENT



DETAIL- FIELD WELD SPLICE OF ANGLE



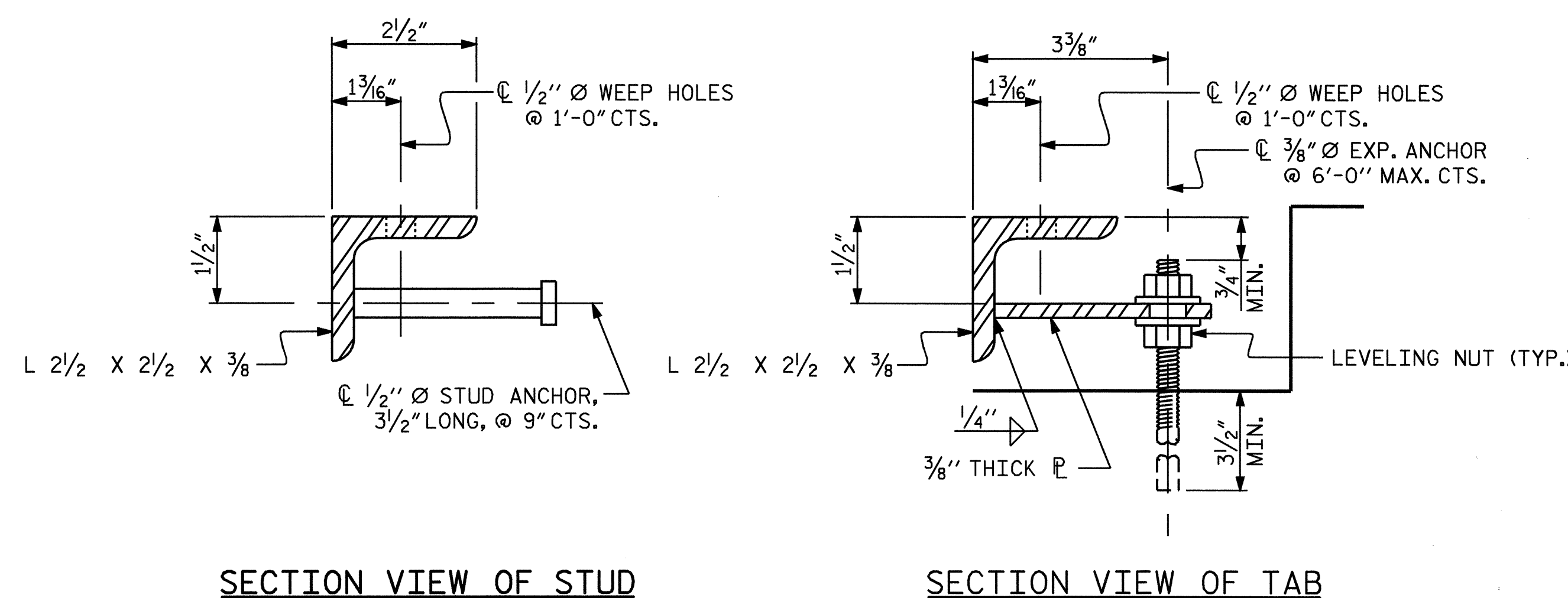
PLAN VIEW OF TAB

MOVEMENT AND SETTING AT EVAZOTE JOINT					
	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
END BENT 1	2 1/2"	1/2"	2 1/8"	2"	1 13/16"
END BENT 2	2 1/2"	1 1/8"	2 3/16"	2"	1 5/8"

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

BILL OF MATERIAL		
BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)	TOTAL LENGTH OF ANGLE (FT)
END BENT 1	8.9	77'-7 7/8"
END BENT 2	8.9	77'-7 7/8"

\* BASED ON THE MINIMUM BLOCKOUT SHOWN.



SECTION VIEW OF STUD

SECTION VIEW OF TAB

ARMORED JOINT ANCHOR ASSEMBLY DETAILS

PROJECT NO. B-4095  
DAVIDSON COUNTY  
 STATION: 26+20.00-L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD  
 ARMORED EVAZOTE  
 JOINT DETAILS  
 LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-19
2			4			TOTAL SHEETS 69



ASSEMBLED BY : V.X. NGUYEN	DATE : 2-20-07
CHECKED BY : M.G. CHEEK	DATE : 2-07
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

# BAR SCHEDULE

## SPANS A, B, & C - LEFT LANE

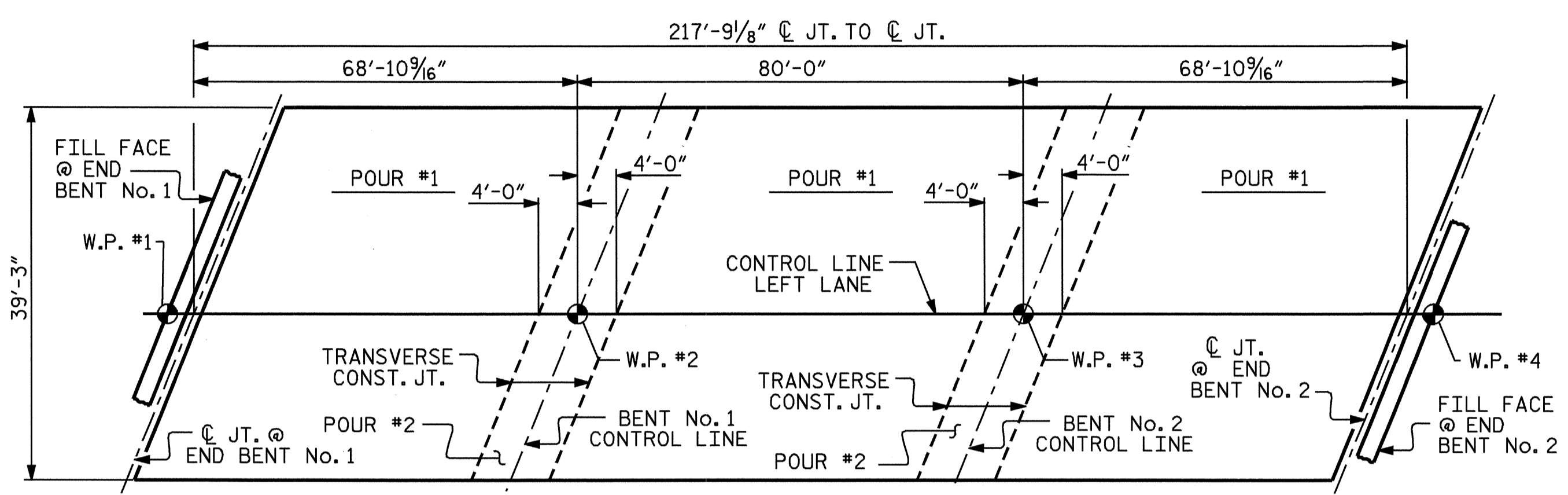
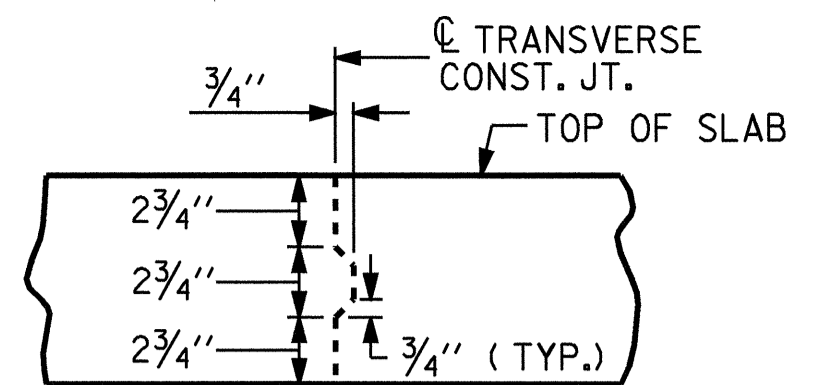
BAR No.	SIZE	TYPE	LENGTH	WEIGHT	BAR No.	SIZE	TYPE	LENGTH	WEIGHT		
*A1	346	#5	STR.	38'-10"	14014	*B1	108	#4	STR.	23'-9"	1713
A2	346	#5	STR.	38'-10"	14014	*B2	54	#7	STR.	54'-10"	6052
*A101	2	#5	STR.	37'-8"	79	*B3	52	#7	STR.	22'-5"	2383
*A102	2	#5	STR.	36'-2"	75	B4	27	#4	STR.	26'-0"	469
*A103	2	#5	STR.	34'-9"	72	B5	160	#5	STR.	56'-4"	9401
*A104	2	#5	STR.	33'-4"	70	*G1	2	#5	STR.	41'-10"	87
*A105	2	#5	STR.	31'-10"	66	*K1	8	#8	1	12'-9"	272
*A106	2	#5	STR.	30'-5"	63	*K2	12	#8	2	18'-5"	590
*A107	2	#5	STR.	29'-0"	60	K3	16	#6	STR.	6'-4"	152
*A108	2	#5	STR.	27'-6"	57	K4	32	#4	STR.	6'-4"	135
*A109	2	#5	STR.	26'-1"	54	K5	32	#4	STR.	7'-6"	160
*A110	2	#5	STR.	24'-8"	51	K6	16	#4	STR.	4'-8"	50
*A111	2	#5	STR.	23'-2"	48	K7	20	#4	5	5'-6"	73
*A112	2	#5	STR.	21'-9"	45	K8	30	#4	6	10'-8"	214
*A113	2	#5	STR.	20'-4"	42	*S1	56	#5	3	5'-10"	341
*A114	2	#5	STR.	18'-10"	39	*S2	56	#4	4	3'-11"	147
*A115	2	#5	STR.	17'-5"	36	S3	176	#4	7	2'-9"	323
*A116	2	#5	STR.	16'-0"	33	*U1	32	#4	8	15'-2"	324
*A117	2	#5	STR.	14'-6"	30	*U2	16	#4	8	13'-2"	141
*A118	2	#5	STR.	13'-1"	27	REINFORCING STEEL				25,577	LBS.
*A119	2	#5	STR.	11'-8"	24	* EPOXY COATED				27,588	LBS.
*A120	2	#5	STR.	10'-2"	21	* THESE BARS ARE EPOXY COATED					
*A121	2	#5	STR.	8'-9"	18						
*A122	2	#5	STR.	7'-4"	15						
*A123	2	#5	STR.	5'-10"	12						
*A124	2	#5	STR.	4'-5"	9						
*A125	2	#5	STR.	3'-0"	6						
*A126	2	#5	STR.	1'-6"	3						
A201	2	#5	STR.	37'-8"	79						
A202	2	#5	STR.	36'-2"	75						
A203	2	#5	STR.	34'-9"	72						
A204	2	#5	STR.	33'-4"	70						
A205	2	#5	STR.	31'-10"	66						
A206	2	#5	STR.	30'-5"	63						
A207	2	#5	STR.	29'-0"	60						
A208	2	#5	STR.	27'-6"	57						
A209	2	#5	STR.	26'-1"	54						
A210	2	#5	STR.	24'-8"	51						
A211	2	#5	STR.	23'-2"	48						
A212	2	#5	STR.	21'-9"	45						
A213	2	#5	STR.	20'-4"	42						
A214	2	#5	STR.	18'-10"	39						
A215	2	#5	STR.	17'-5"	36						
A216	2	#5	STR.	16'-0"	33						
A217	2	#5	STR.	14'-6"	30						
A218	2	#5	STR.	13'-1"	27						
A219	2	#5	STR.	11'-8"	24						
A220	2	#5	STR.	10'-2"	21						
A221	2	#5	STR.	8'-9"	18						
A222	2	#5	STR.	7'-4"	15						
A223	2	#5	STR.	5'-10"	12						
A224	2	#5	STR.	4'-5"	9						
A225	2	#5	STR.	3'-0"	6						
A226	2	#5	STR.	1'-6"	3						

### GROOVING BRIDGE FLOORS

APPROACH SLABS	1564	SQ.FT.
BRIDGE DECK	7144	SQ.FT.
TOTAL	8708	SQ.FT.

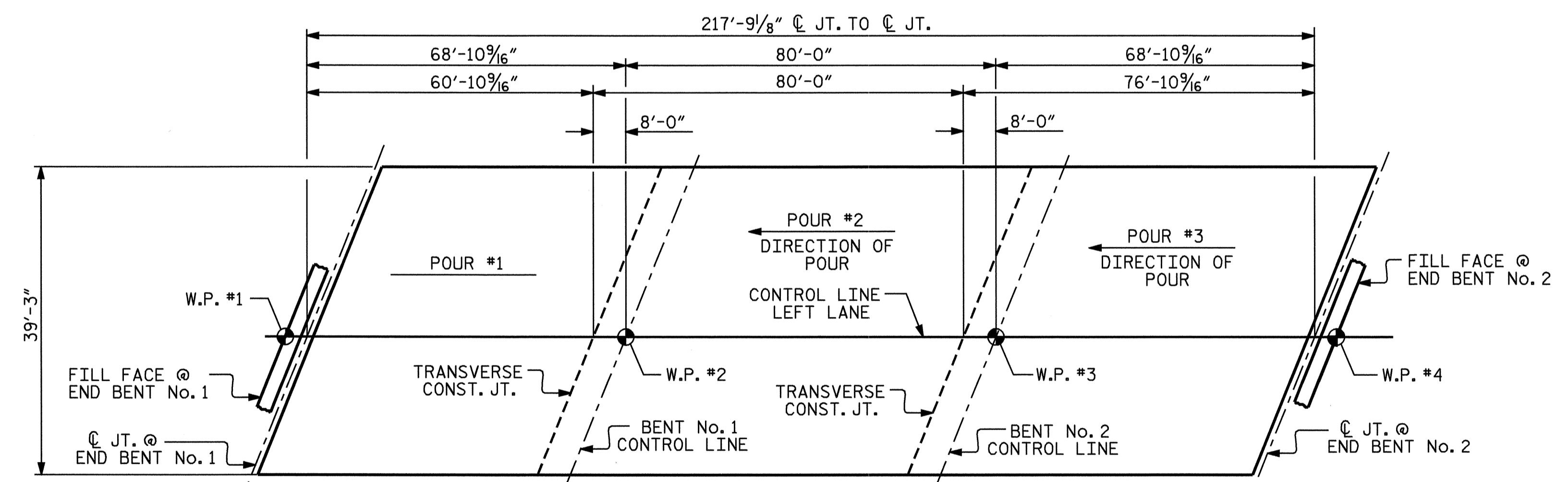
### TRANSVERSE CONSTRUCTION JOINT DETAIL

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

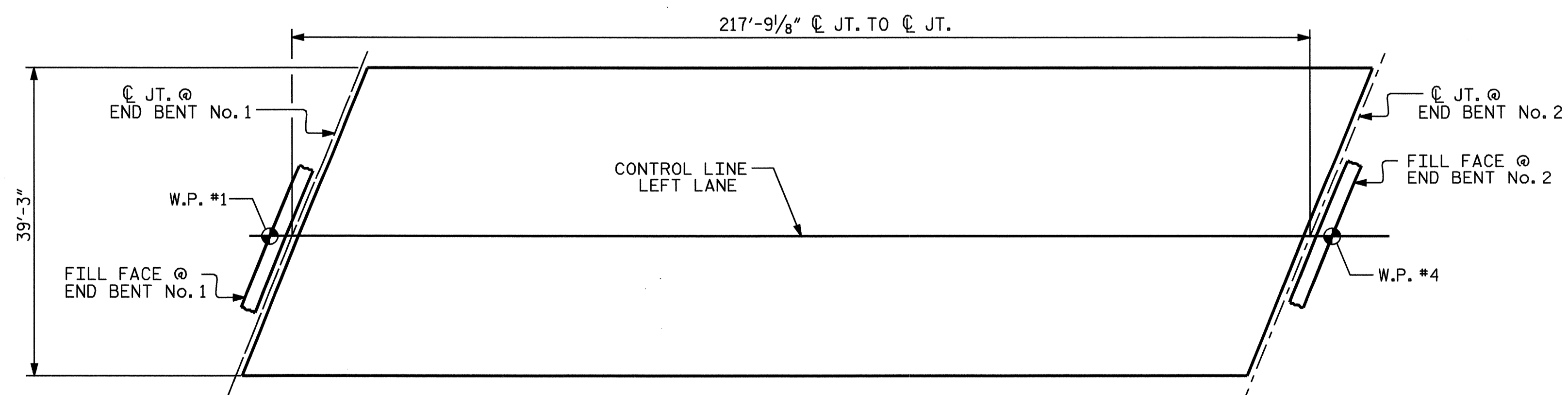


### OPTIONAL POURING SEQUENCE SKETCH

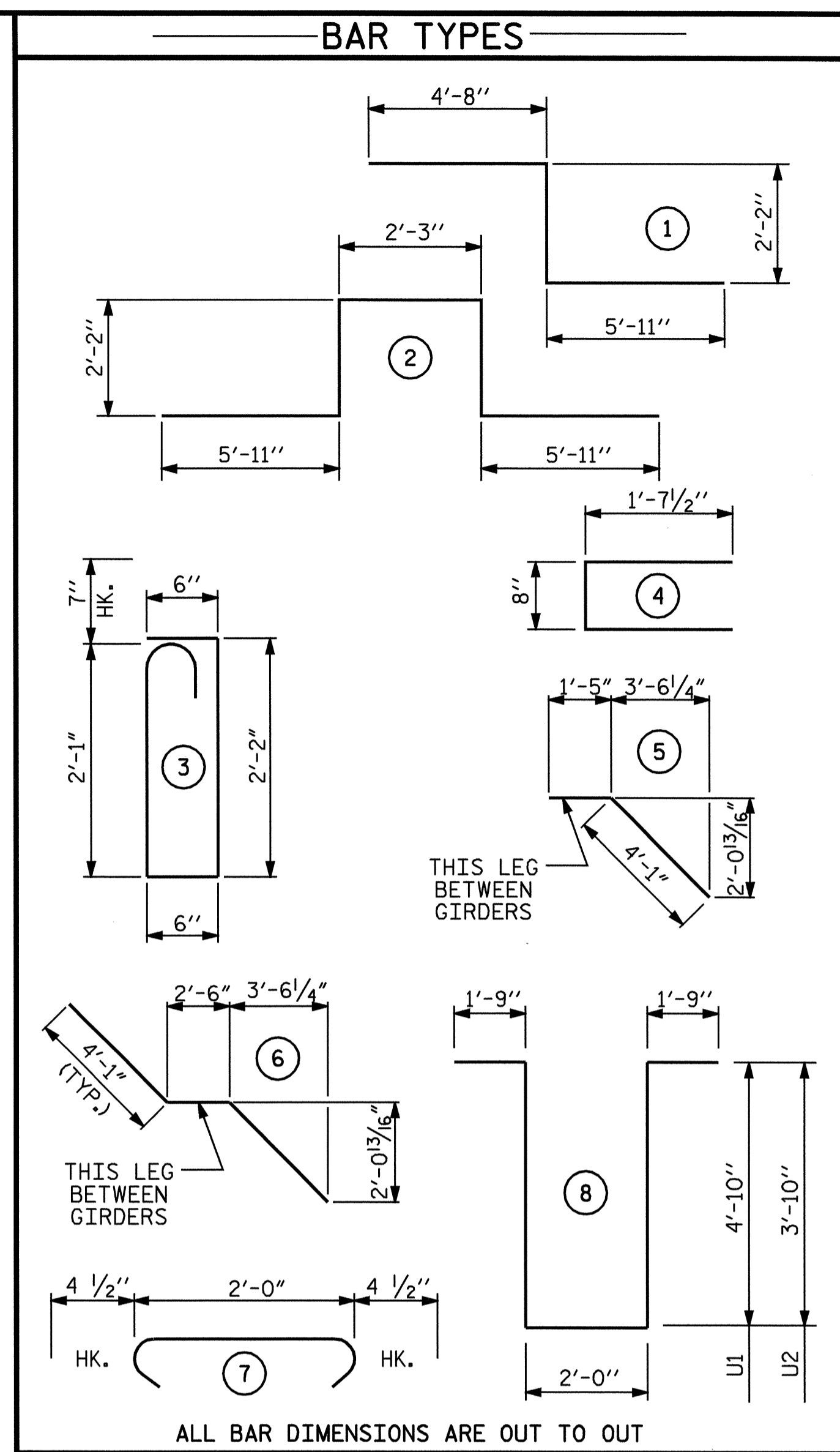
NOTE: POUR 2 CAN NOT BE STARTED UNTIL BOTH ADJACENT POURS REACH A MINIMUM OF 3000 PSI.



### POURING SEQUENCE SKETCH



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 8547)



SUPERSTRUCTURE BILL OF MATERIAL			
	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
TOTALS**	300.8	25,577	27,588

\*\*QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

### 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"			

POUR SEQUENCE BREAKDOWN	
SPANS A,B,&C	CLASS AA CONCRETE (C.Y.)
POUR #1	78.3
POUR #2	112.1
POUR #3	110.4
TOTAL **	300.8

\*\*QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

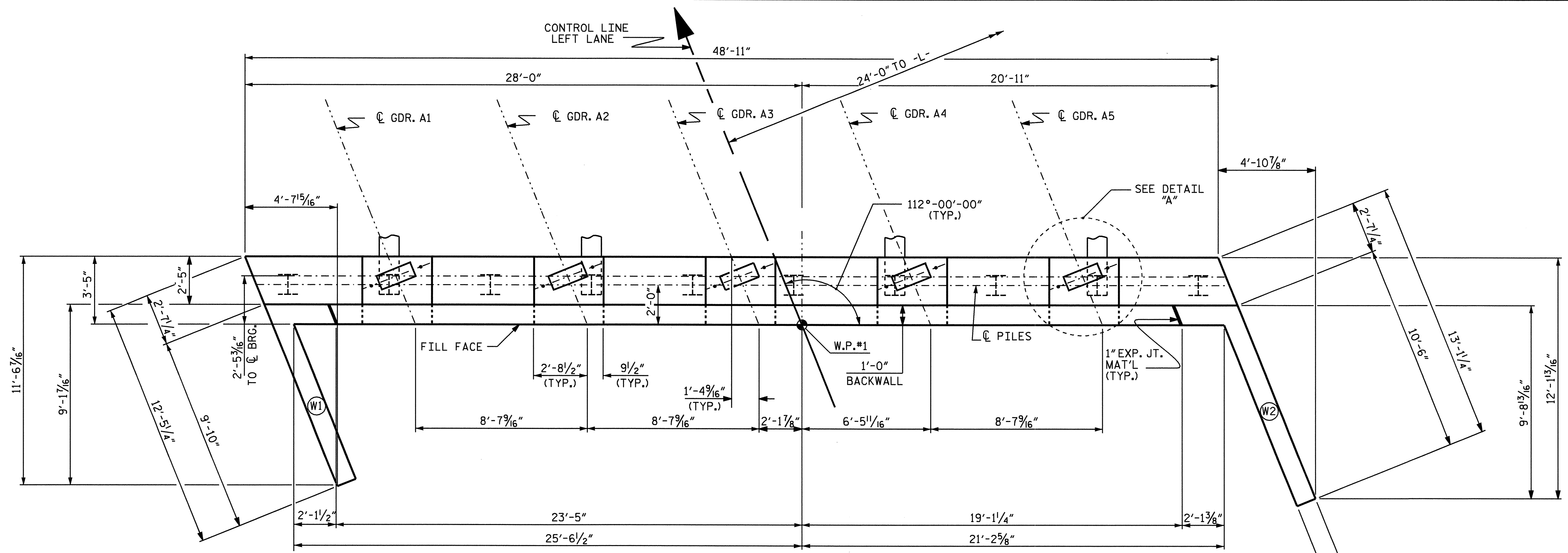
PROJECT NO. B-4095  
DAVIDSON COUNTY  
STATION: 26+20.00-L-

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



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-20
2			4			TOTAL SHEETS 69

ASSEMBLED BY : V.X. NGUYEN	DATE : 3-13-06
CHECKED BY : M.G. CHEEK	DATE : 02-07
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



**NOTES**

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

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

FOR PILE SPLICE DETAILS SEE SHEET 3 OF 3.

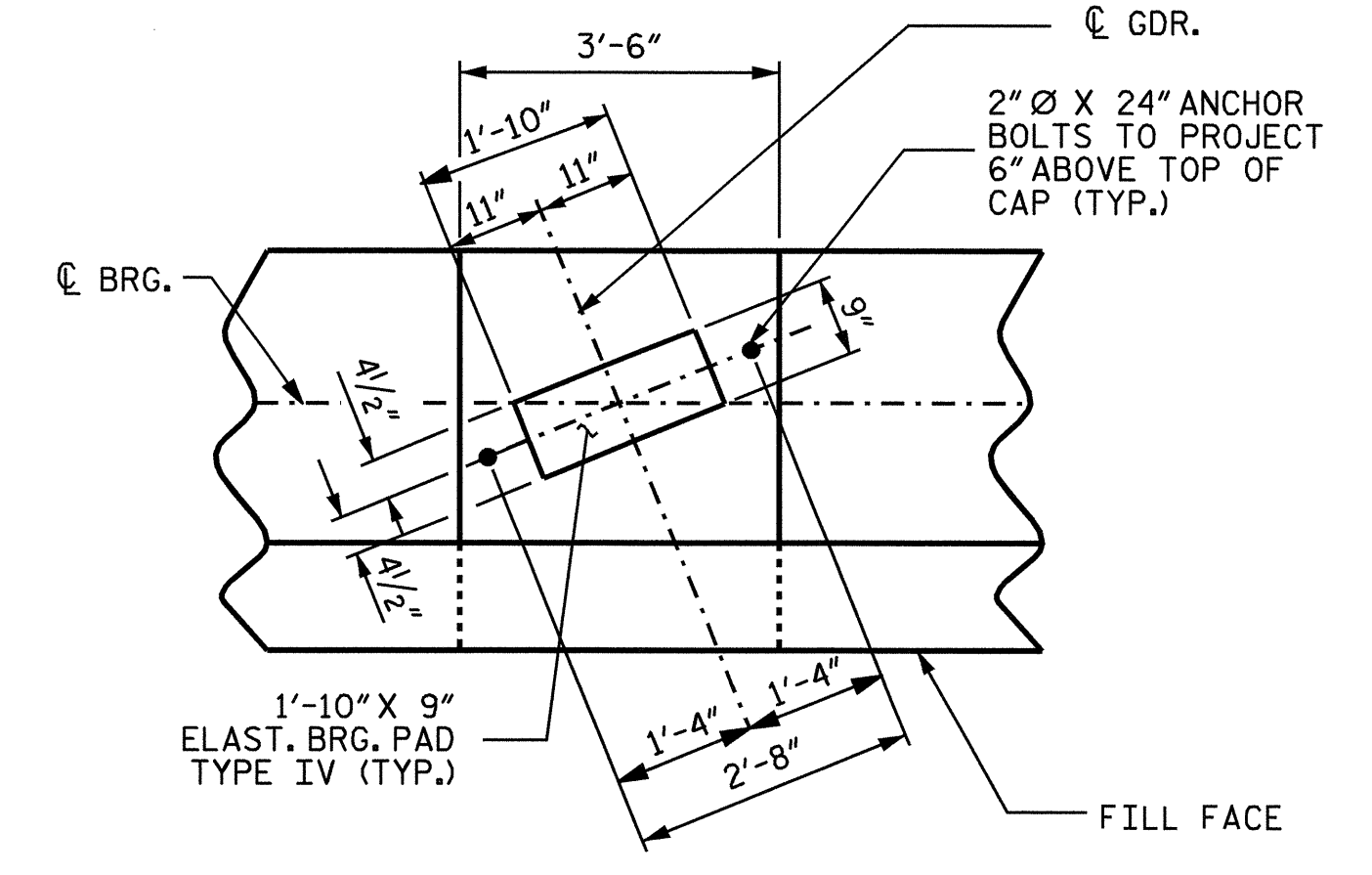
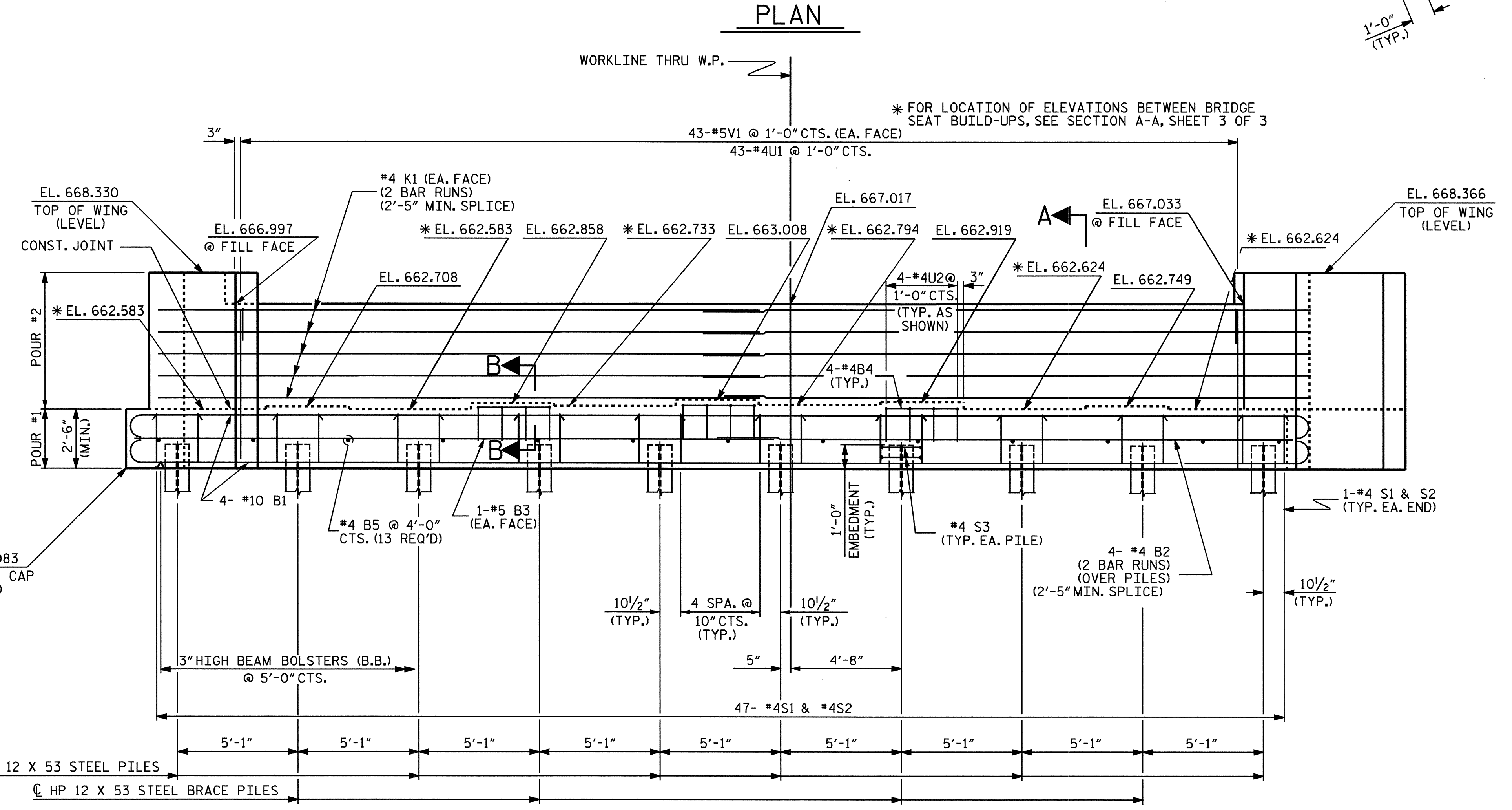
FOR TEMPORARY DRAINAGE AT END BENTS, SEE SHEET 3 OF 3.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

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

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



PROJECT NO. B-4095

DAVIDSON COUNTY

STATION: 26+20.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE  
END BENT NO. 1  
LEFT LANE

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21	
1			3			TOTAL SHEETS	
2			4			69	

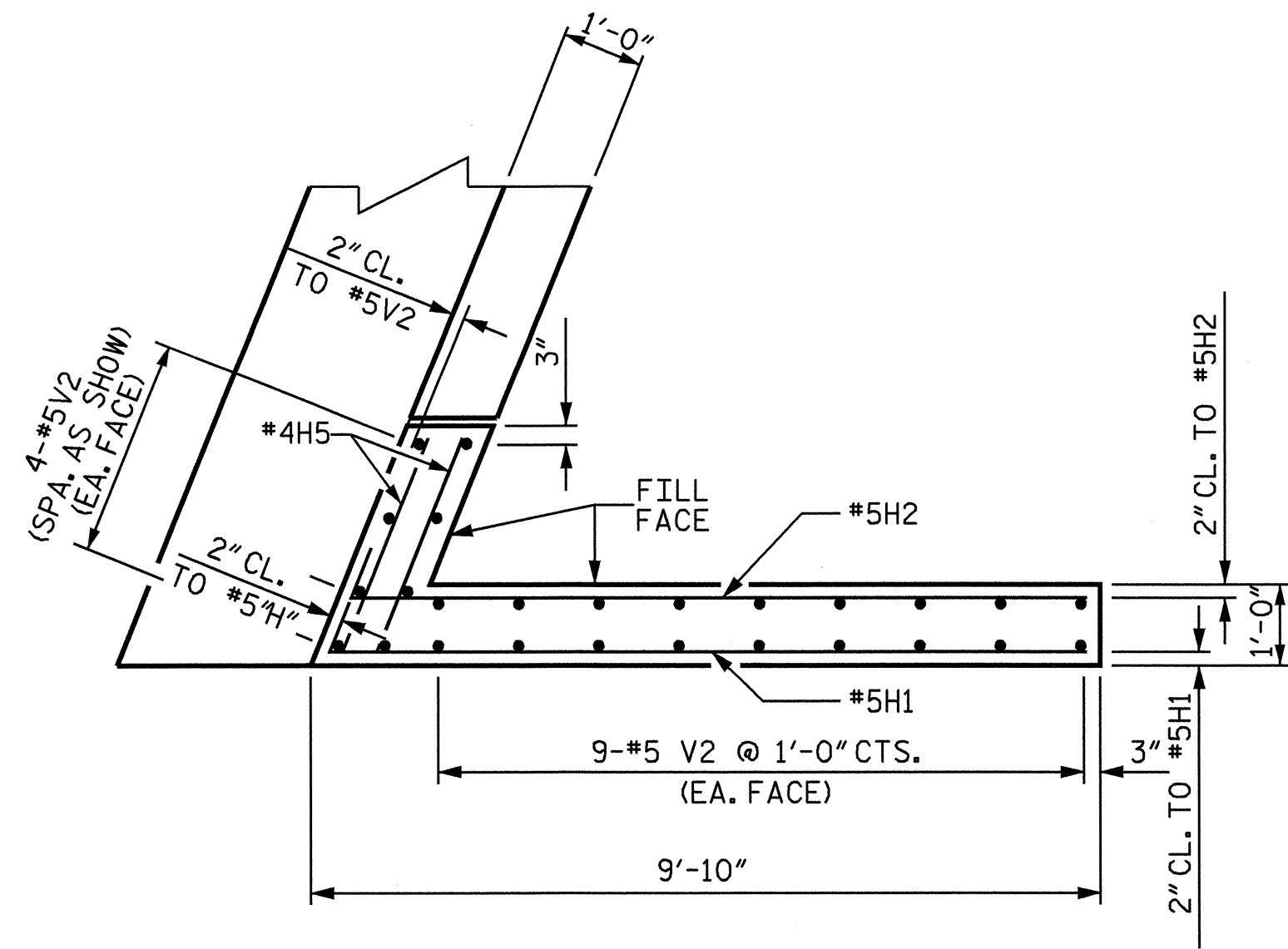
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DRAWN BY: A.L. FIGUEROA DATE: 3-29-07

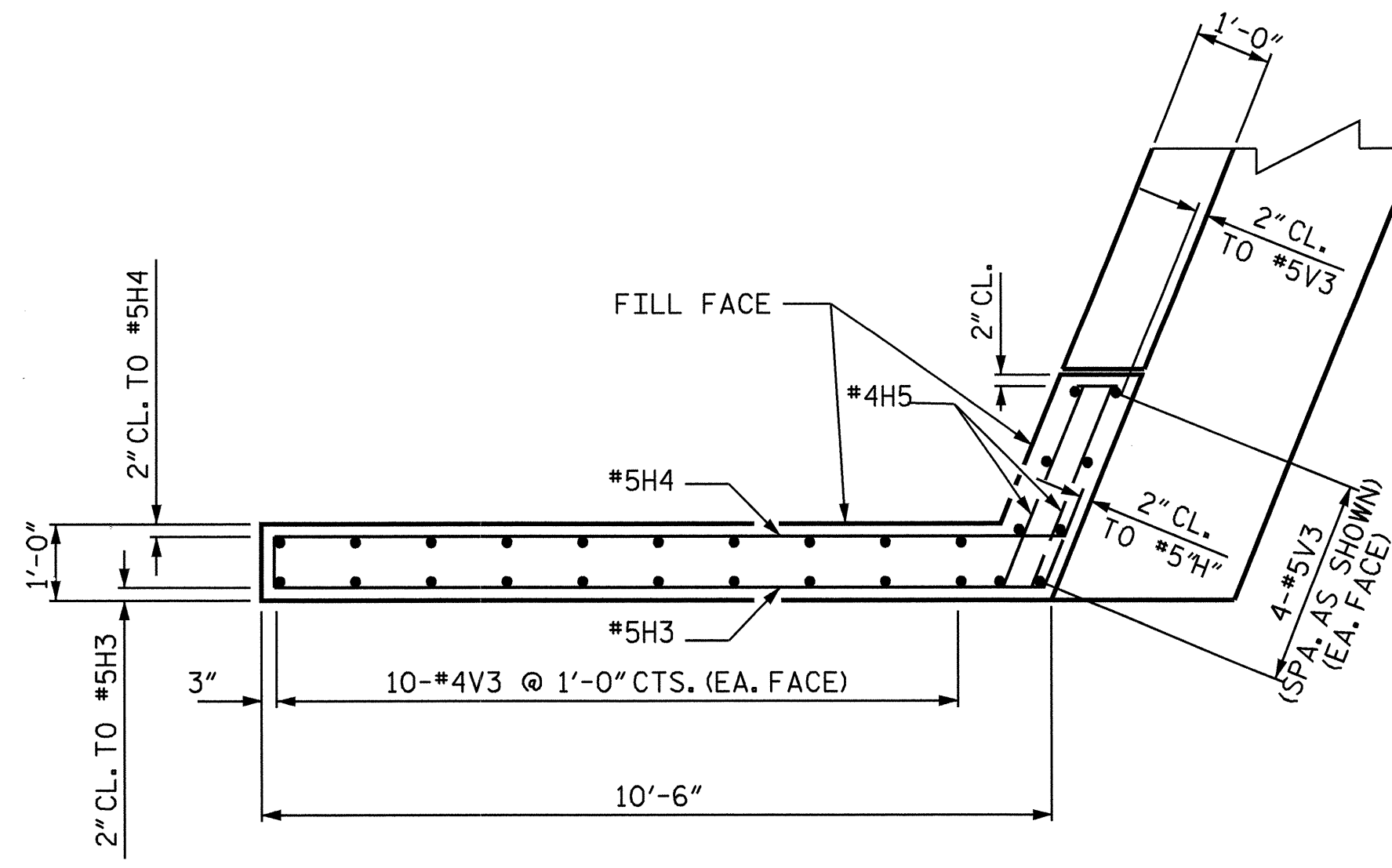
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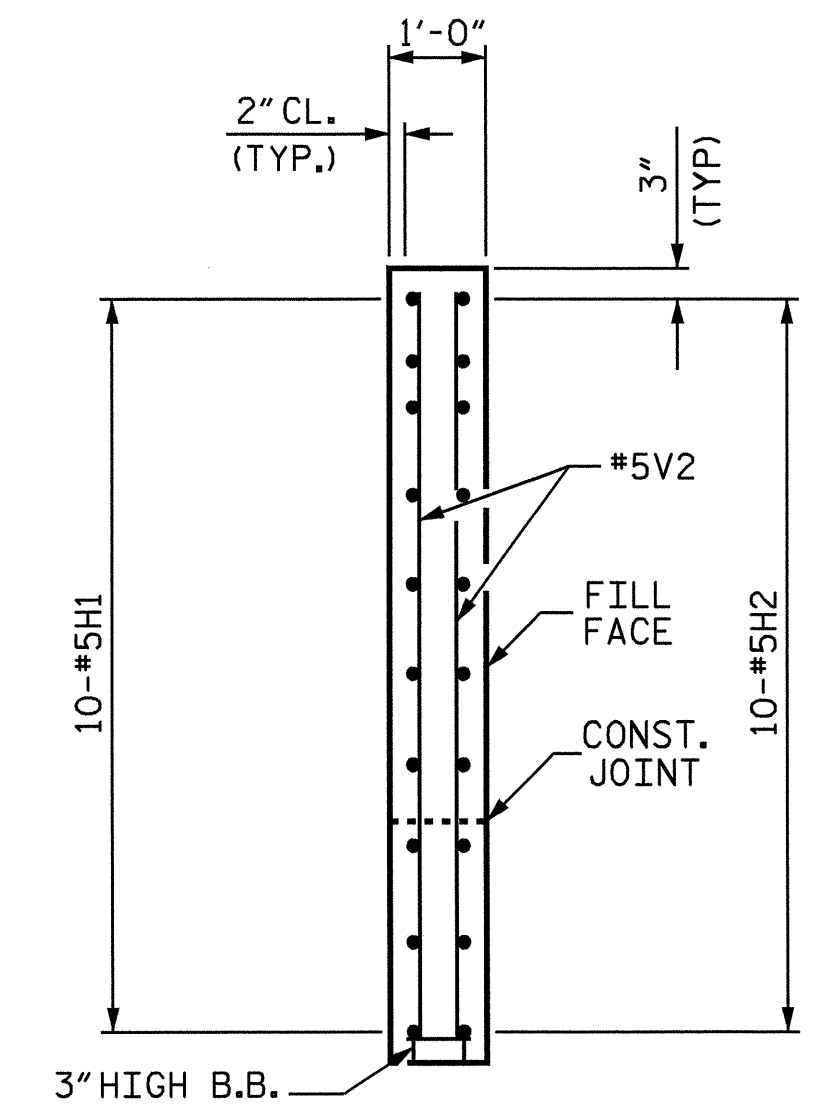




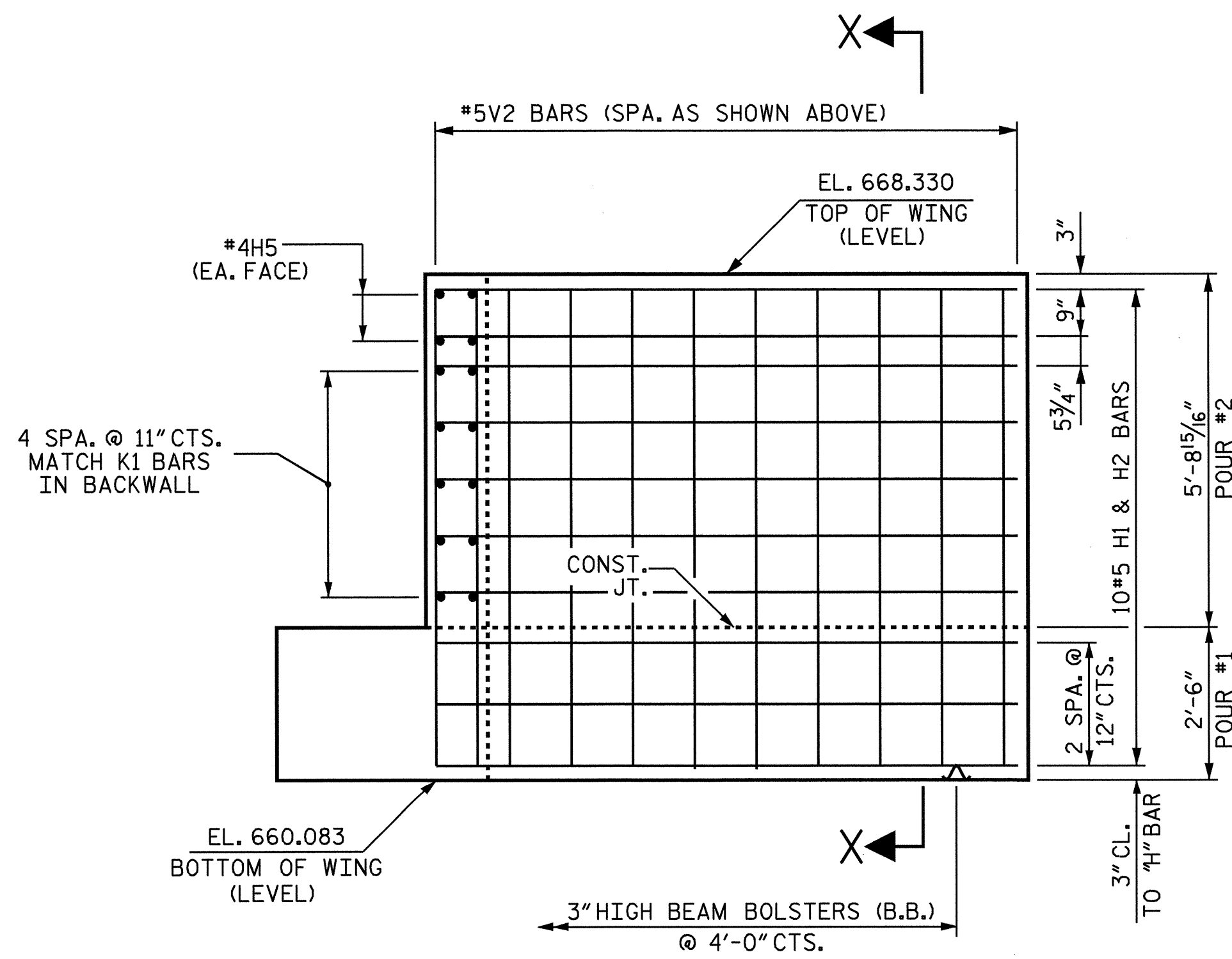
PLAN OF LEFT WING - W1



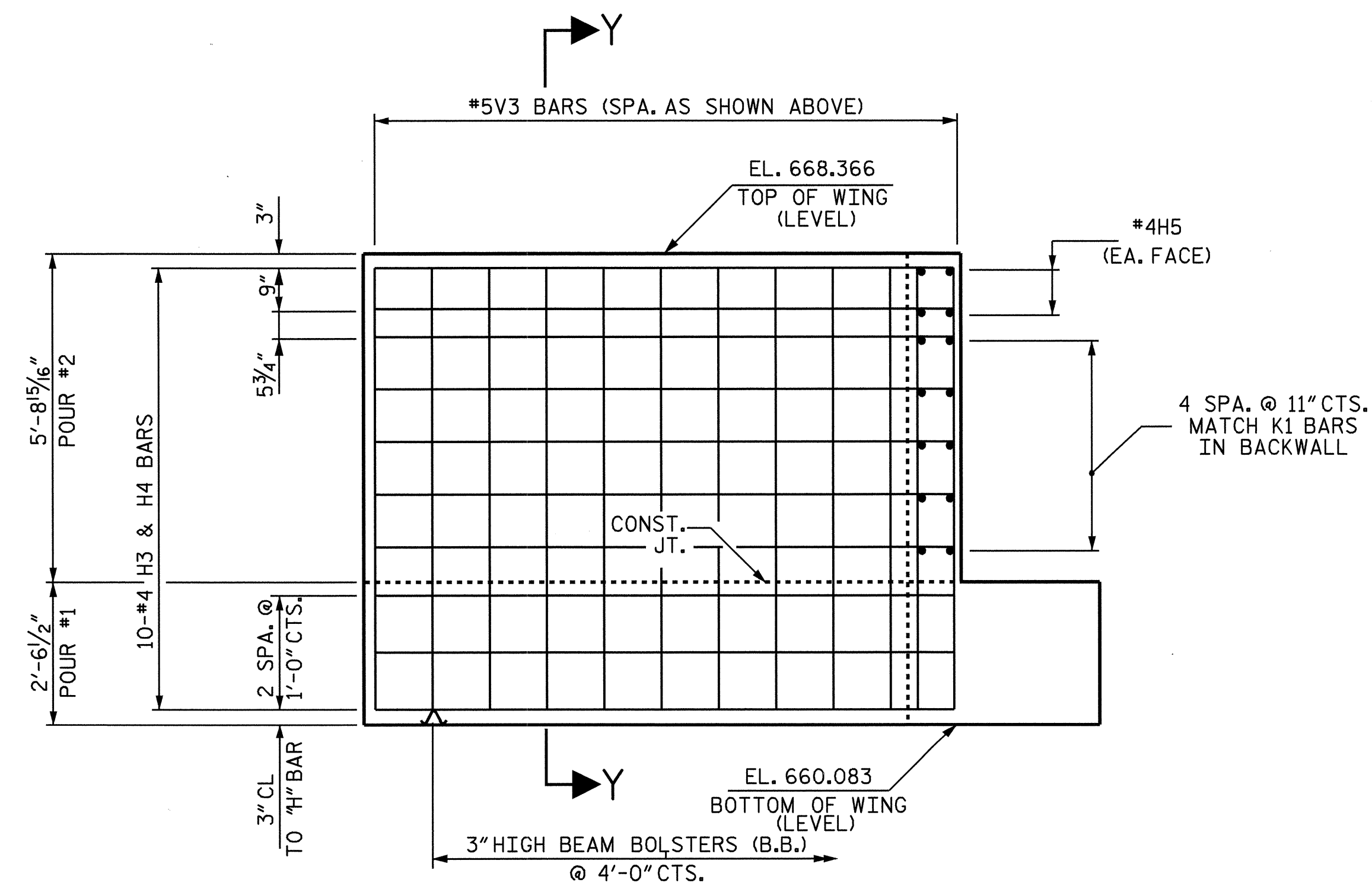
PLAN OF RIGHT WING - W2



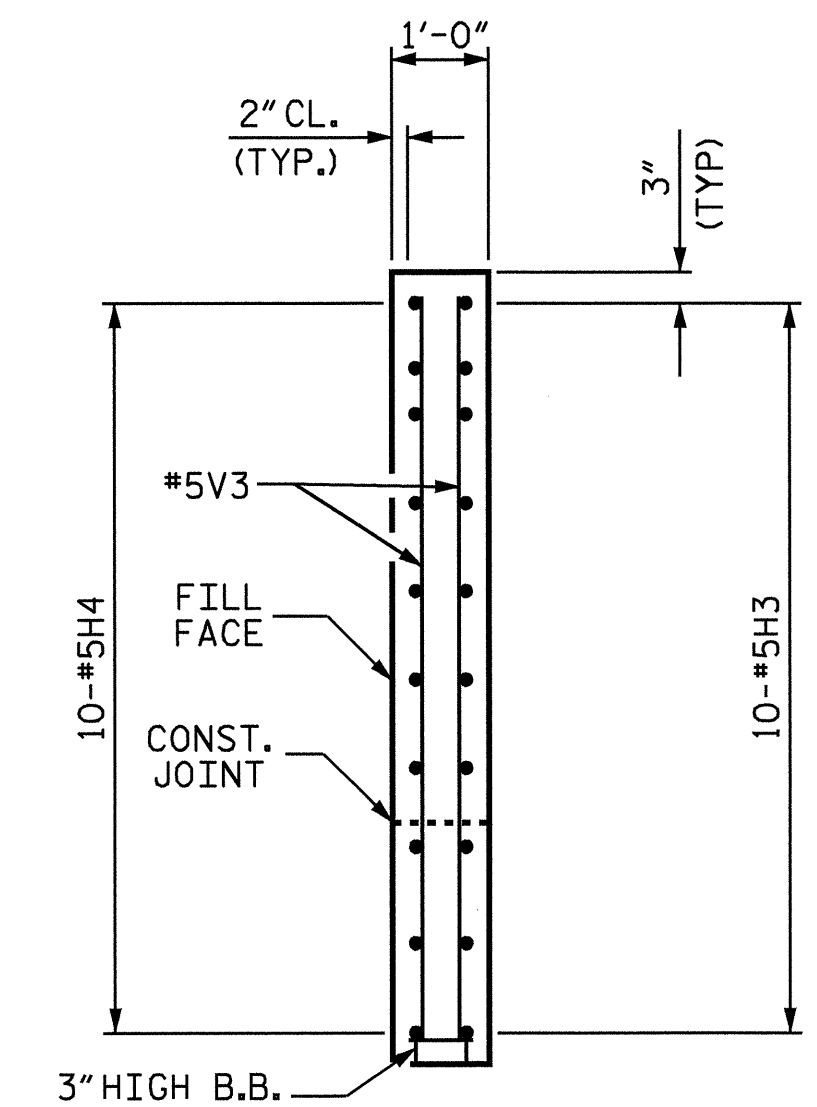
SECTION X-X



ELEVATION OF LEFT WING - W1



ELEVATION OF RIGHT WING - W2



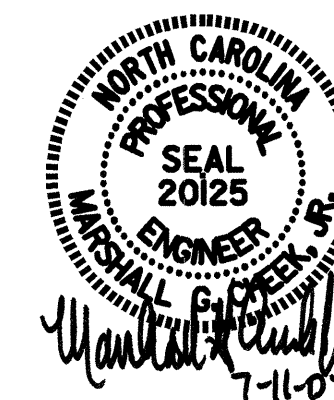
SECTION Y-Y

PROJECT NO. B-4095  
 DAVIDSON COUNTY  
 STATION: 26+20.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT NO. 1  
 LEFT LANE



REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22	
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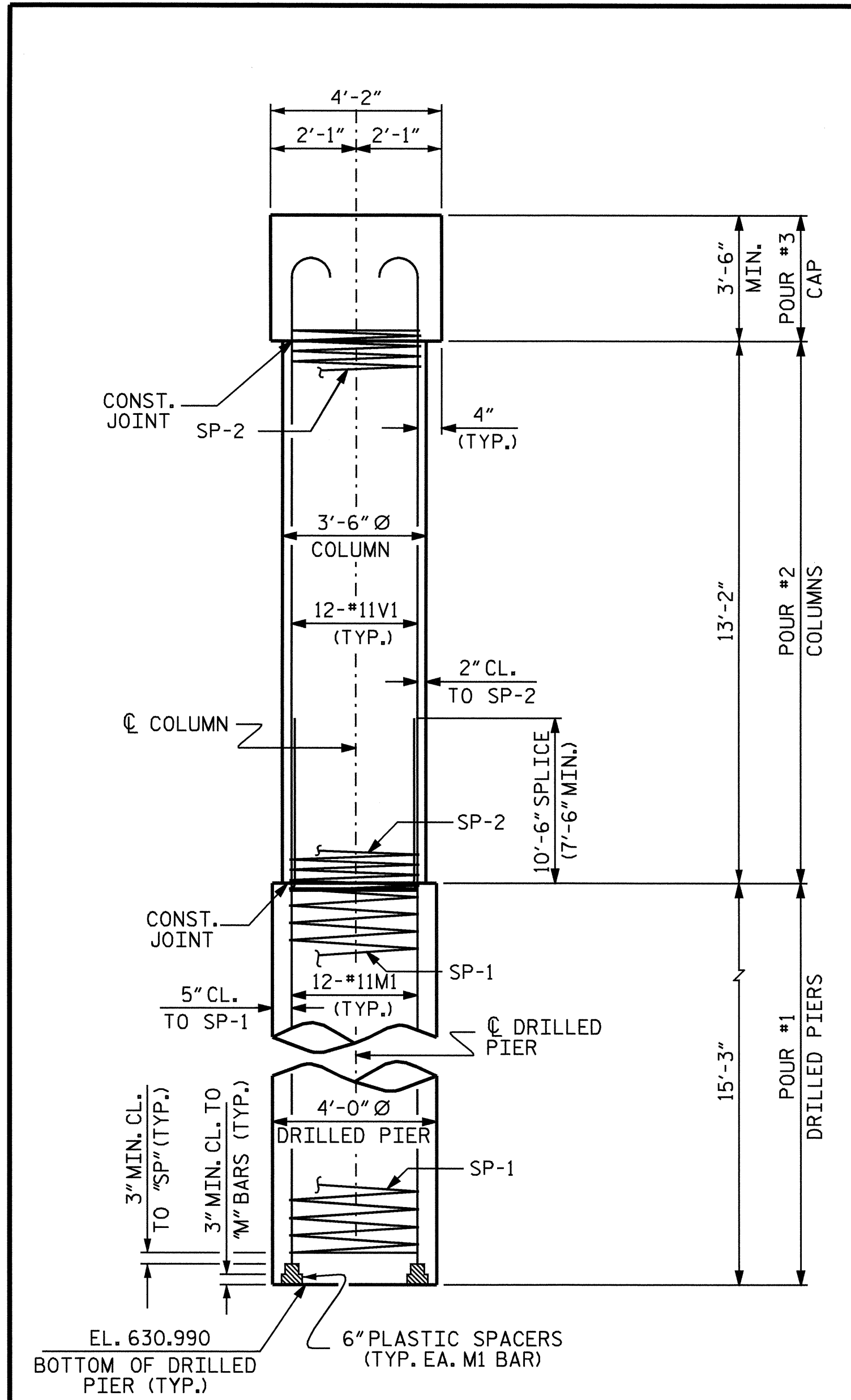
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 afigueroa

STR#1

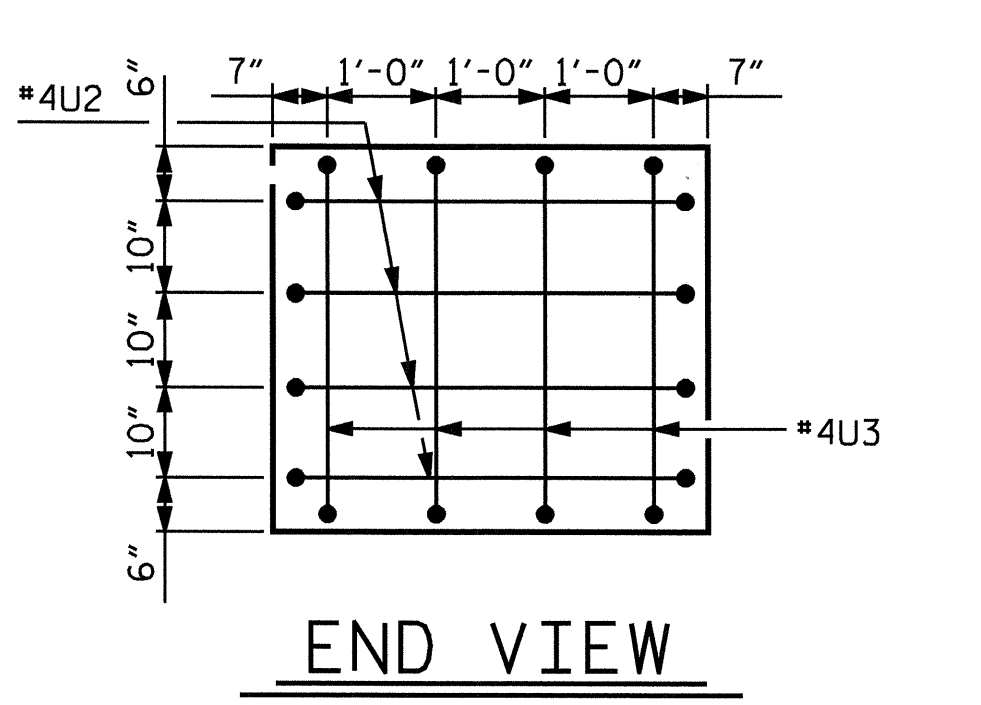




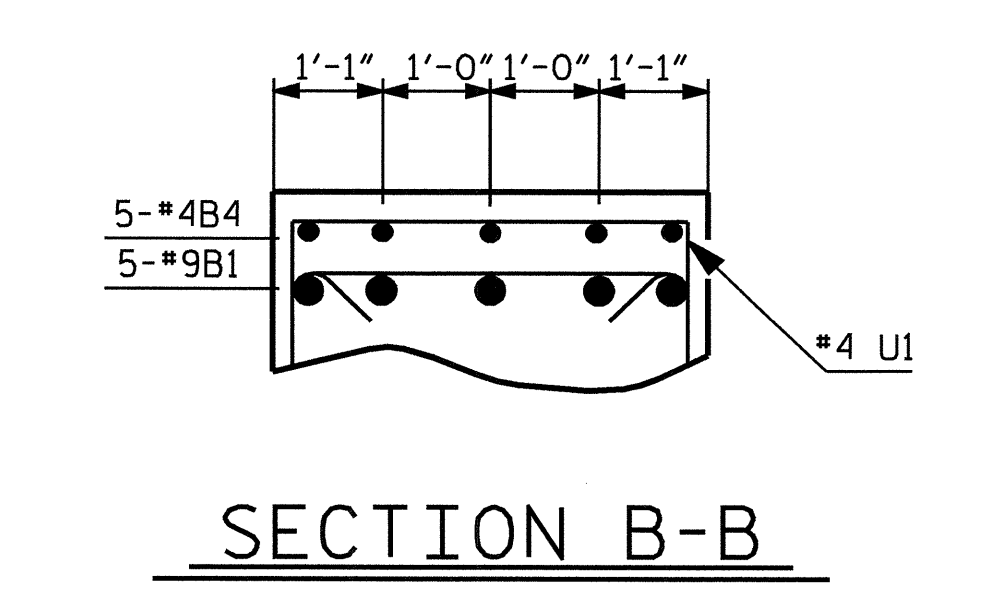




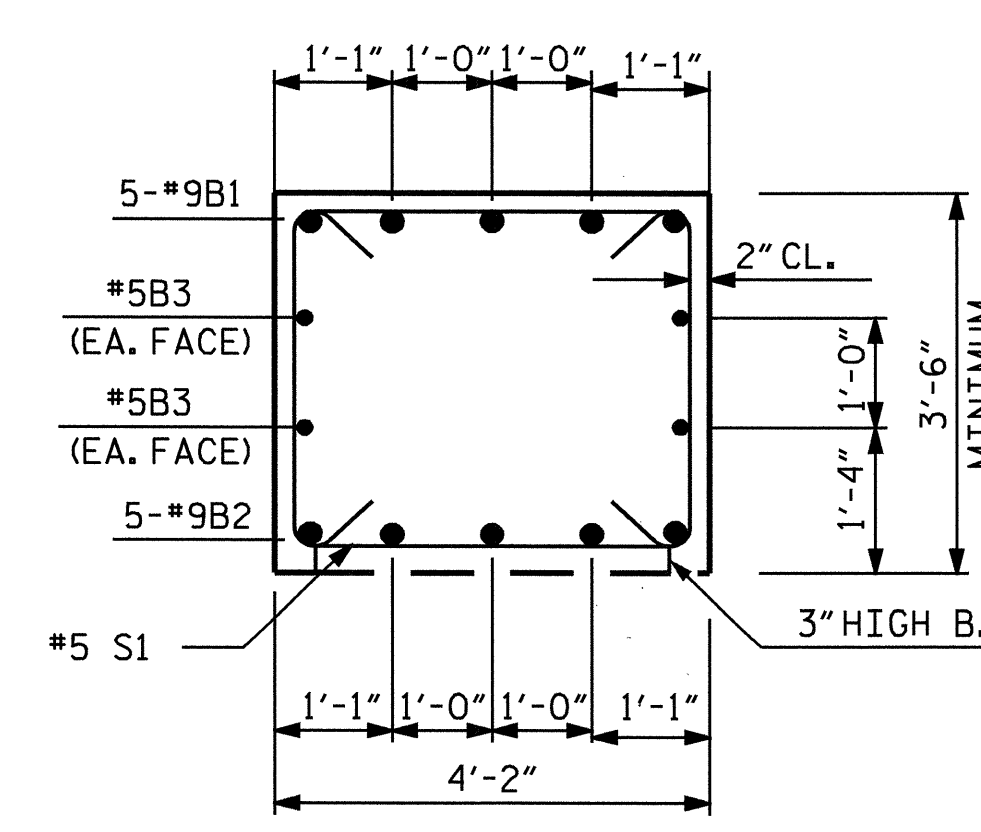
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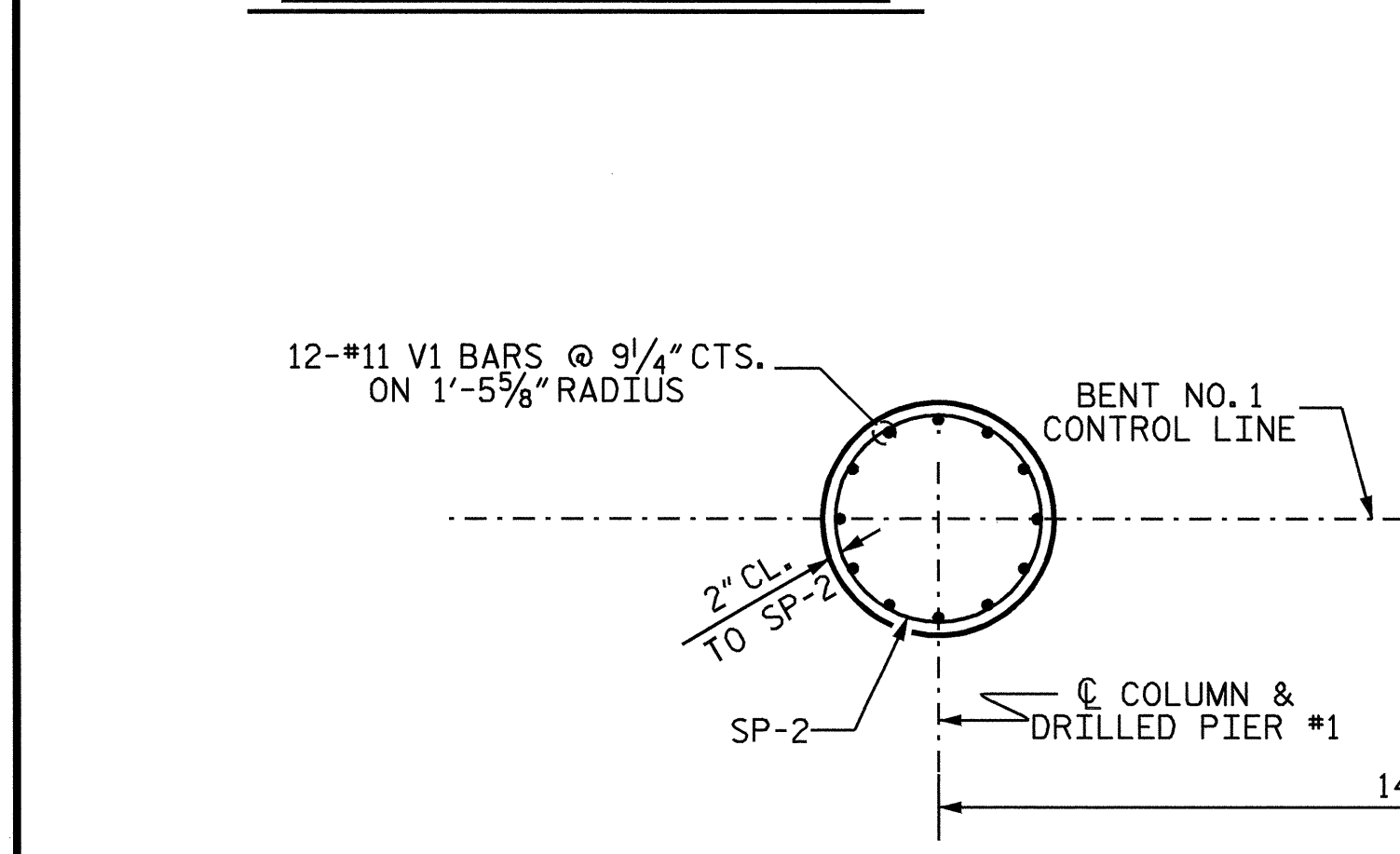
**END VIEW**



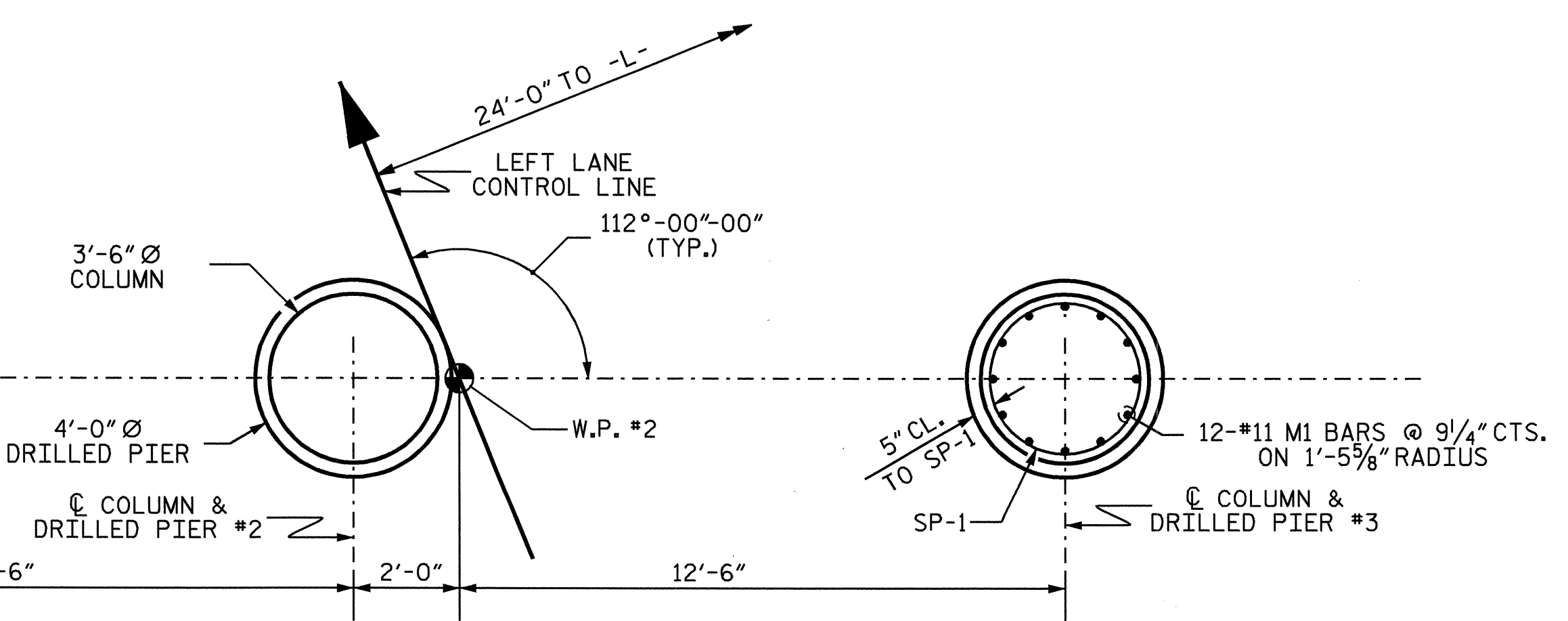
**SECTION B-B**



**SECTION A-A**



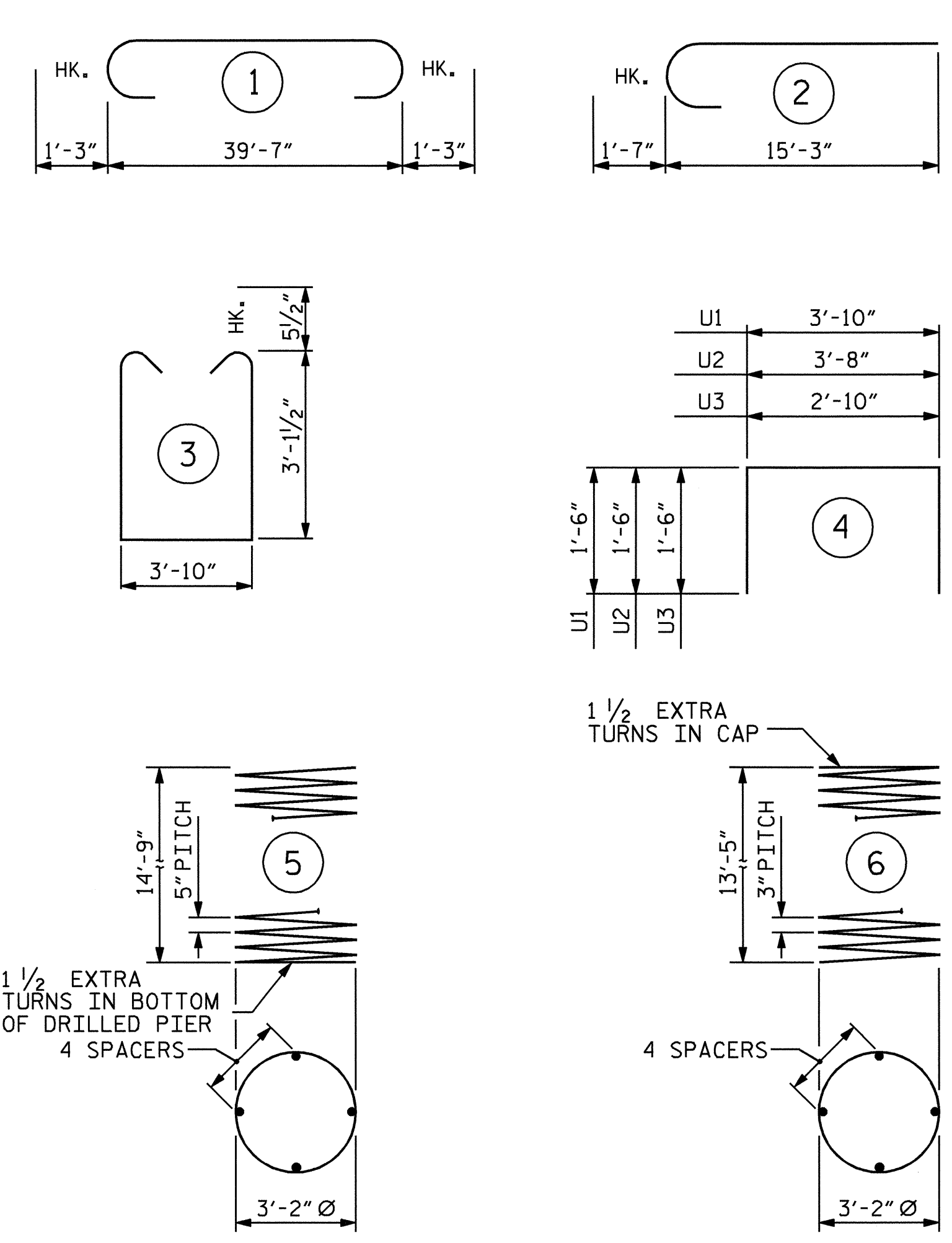
**PARTIAL PLAN OF COLUMN**



**PARTIAL PLAN OF DRILLED PIER**

**PLAN OF COLUMNS & DRILLED PIERS**  
(DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER)

**BAR TYPES**



ALL BAR DIMENSIONS ARE OUT TO OUT.

\*\* THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.  
 \*\*\* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR  
 ▲ NO SEPARATE PAYMENT WILL BE MADE FOR CSL TUBES. CSL TUBES WILL BE INCLUDED IN THE UNIT BID PRICE FOR DRILLED PIERS.

**BILL OF MATERIAL**

**BENT NO.1**

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	#9	1	42'-1"	715
B2	5	#9	STR	39'-8"	674
B3	4	#5	STR	39'-8"	165
B4	5	#4	STR	4'-0"	13
M1	36	#11	STR	25'-6"	4877
S1	36	#5	3	11'-0"	413
U1	40	#4	4	6'-10"	183
U2	8	#4	4	6'-8"	36
U3	8	#4	4	5'-10"	31
V1	36	#11	2	16'-10"	3220
SP-1	3	***	5	362'-5"	1134
SP-2	3	**	6	542'-8"	1088

REINFORCING STEEL = 10327 LBS  
 SPIRAL REINFORCING STEEL = 2222 LBS

**CLASS "A" CONCRETE BREAKDOWN**

POUR	C.Y.
POUR #2 (COLUMNS)	14.1
POUR #3 (CAP)	21.8
<b>TOTAL</b>	<b>35.9</b>

**DRILLED PIERS**

DRILLED PIER CONCRETE

POUR # 1 (DRILLED PIERS) C.Y. = 21.3

4'-0" Ø DRILLED PIERS

NOT IN SOIL	LIN. FT.
IN SOIL	18.00
	27.75

4'-0" Ø PERMANENT STEEL CASING

LIN. FT.
24.75

SID INSPECTION EA. = 1

▲ CSL TUBES LIN. FT. = 213.00

CROSSHOLE SONIC LOGGING EA. = 1

PROJECT NO. B-4095  
DAVIDSON COUNTY  
 STATION: 26+20.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 BENT NO. 1  
 LEFT LANE



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS 69
2			4			

DRAWN BY: A.L. FIGUEROA DATE: 9-18-06  
 CHECKED BY: MG CHEEK DATE: 5-04-07

**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.

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

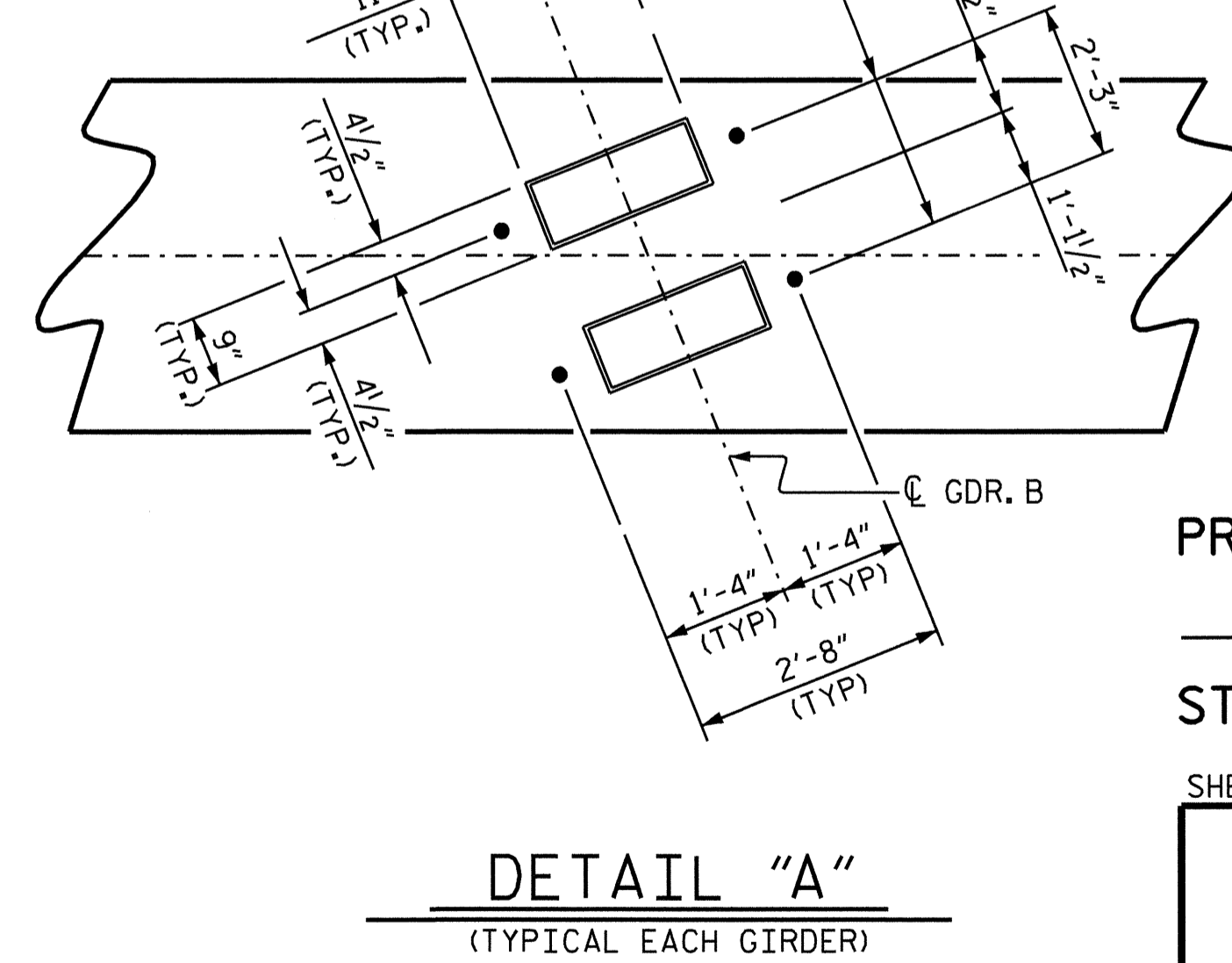
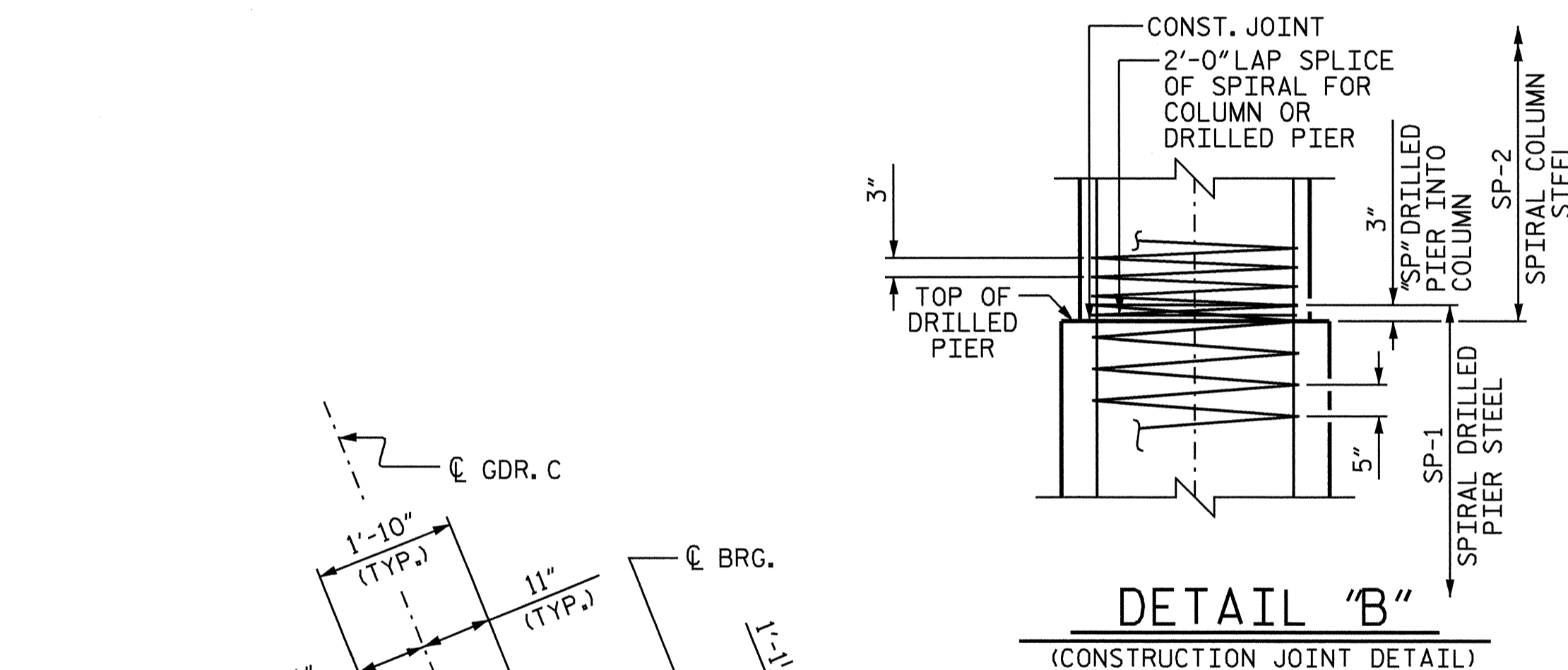
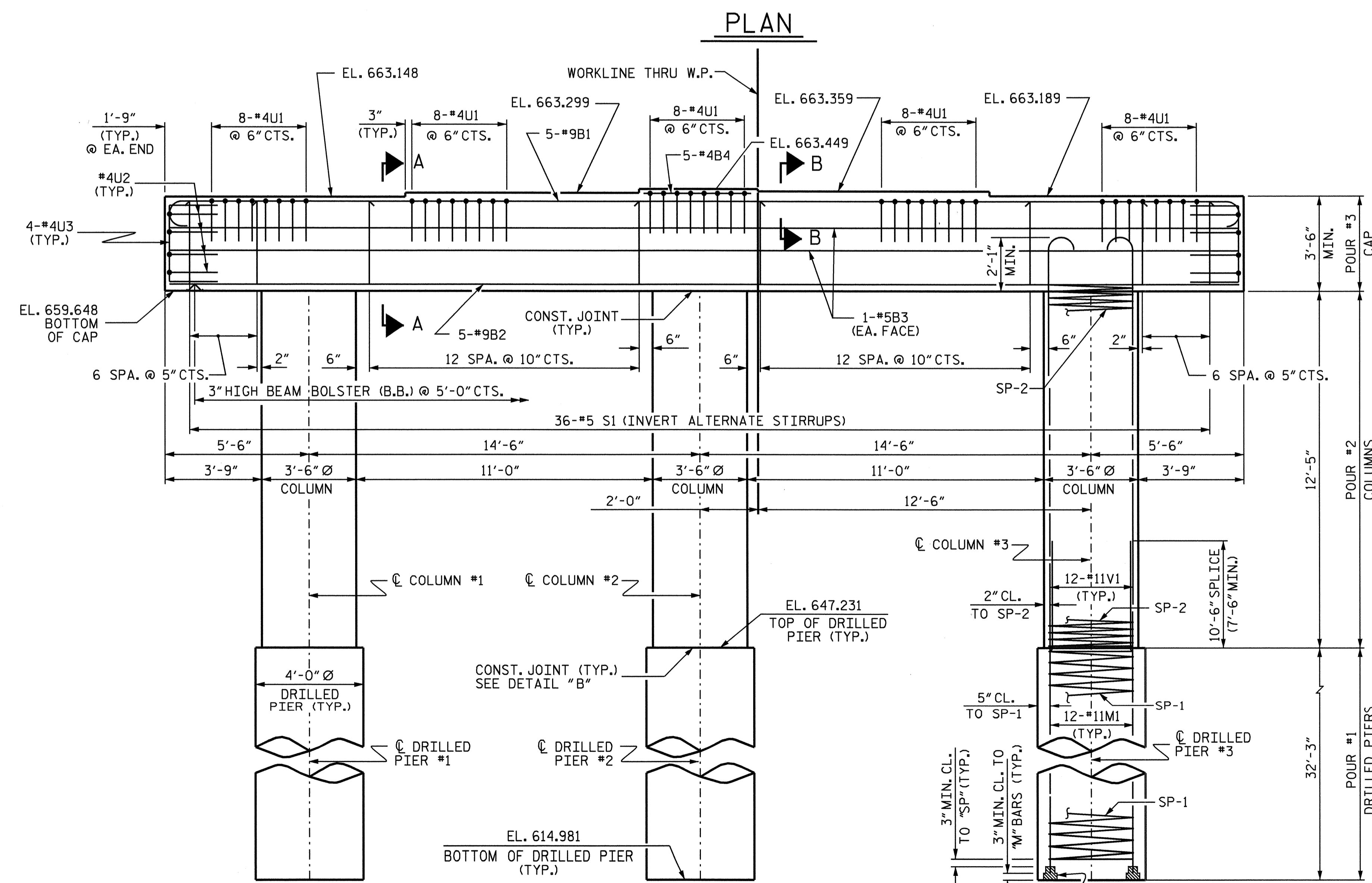
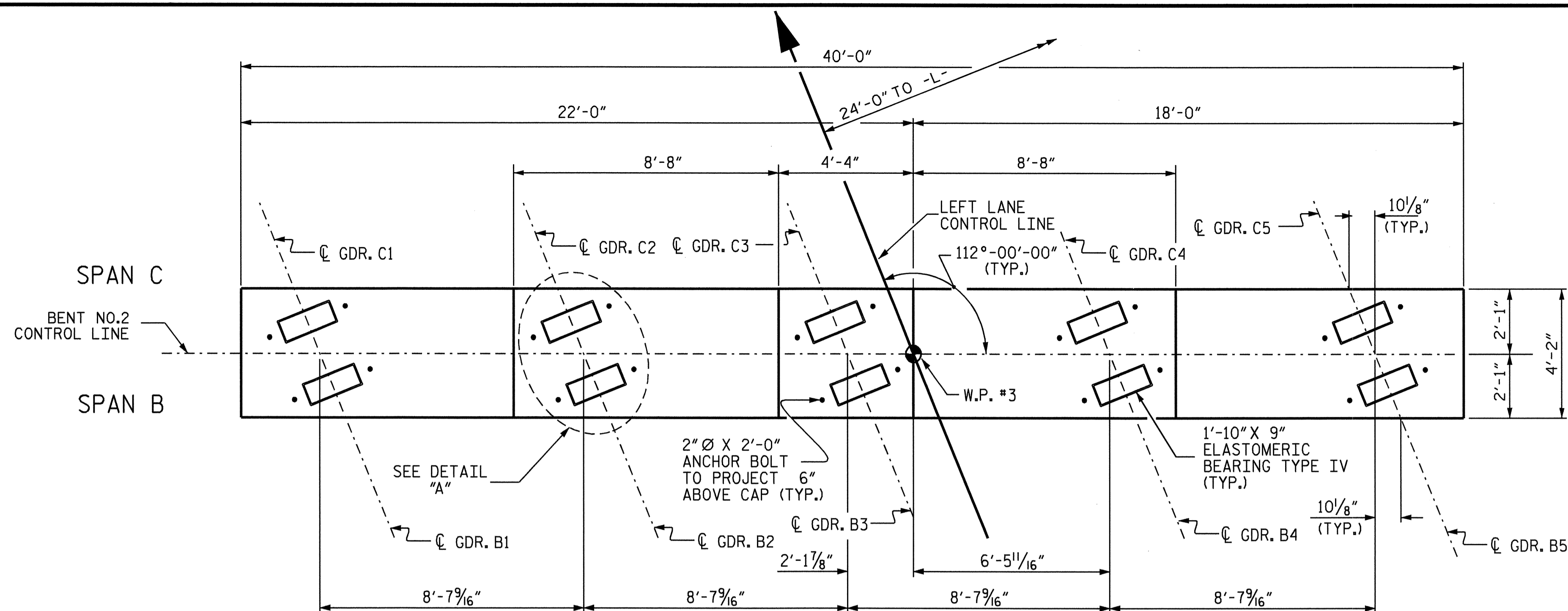
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

SPLICING OF THE LONGITUDINAL BARS IN THE DRILLED PIER WILL NOT BE PERMITTED.

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.

NO SEPARATE PAYMENT SHALL BE MADE FOR ANY ADDITIONAL STEEL REQUIRED IN CONSTRUCTION OF DRILLED PIERS AS THIS IS CONSIDERED INCIDENTAL TO THE LINEAR FOOT PRICE FOR DRILLED PIERS.

FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.



PROJECT NO. B-4095  
DAVIDSON COUNTY  
 STATION: 26+20.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 BENT NO. 2  
 LEFT LANE

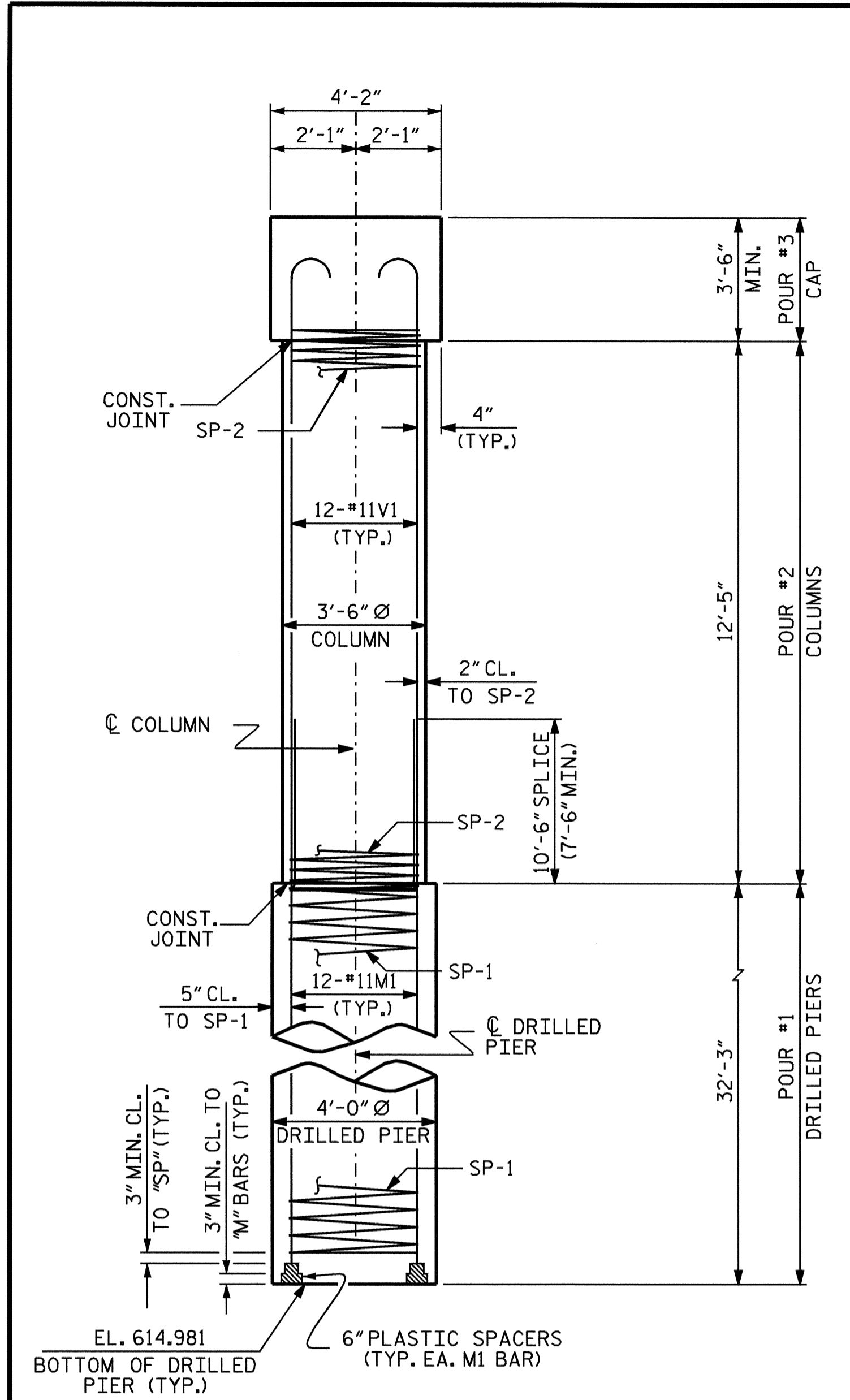


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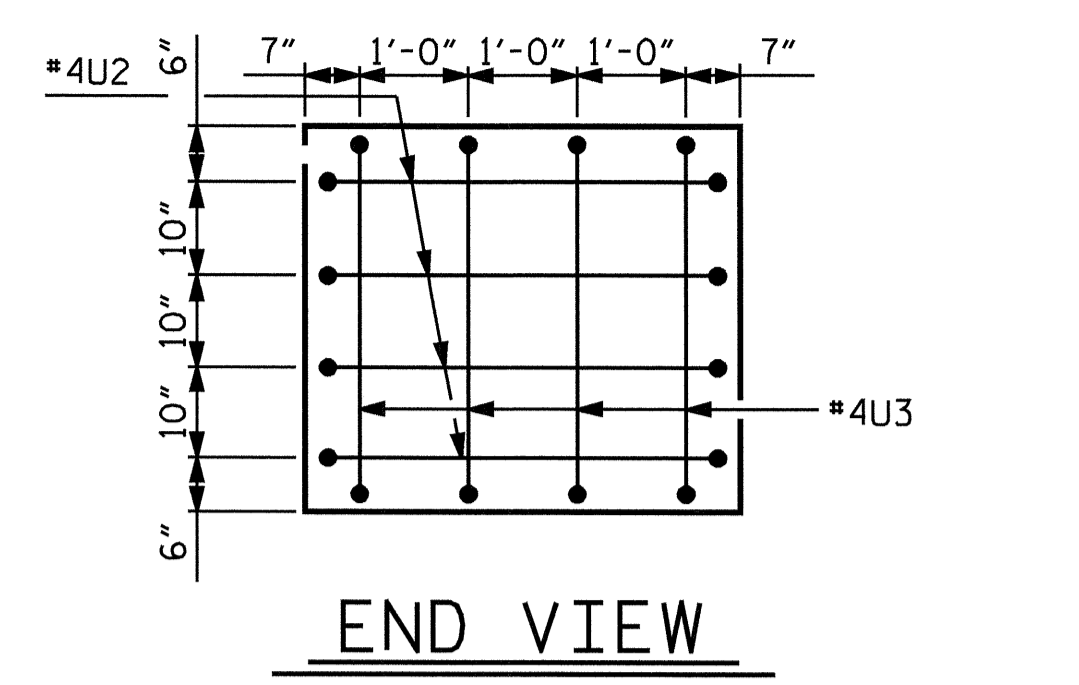
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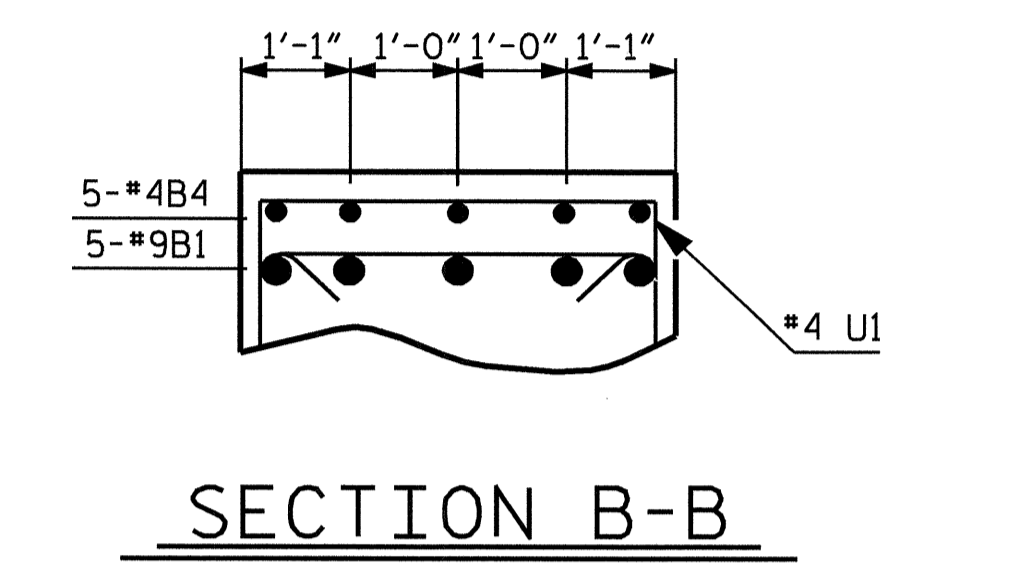
(DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN AND DRILLED PIER)



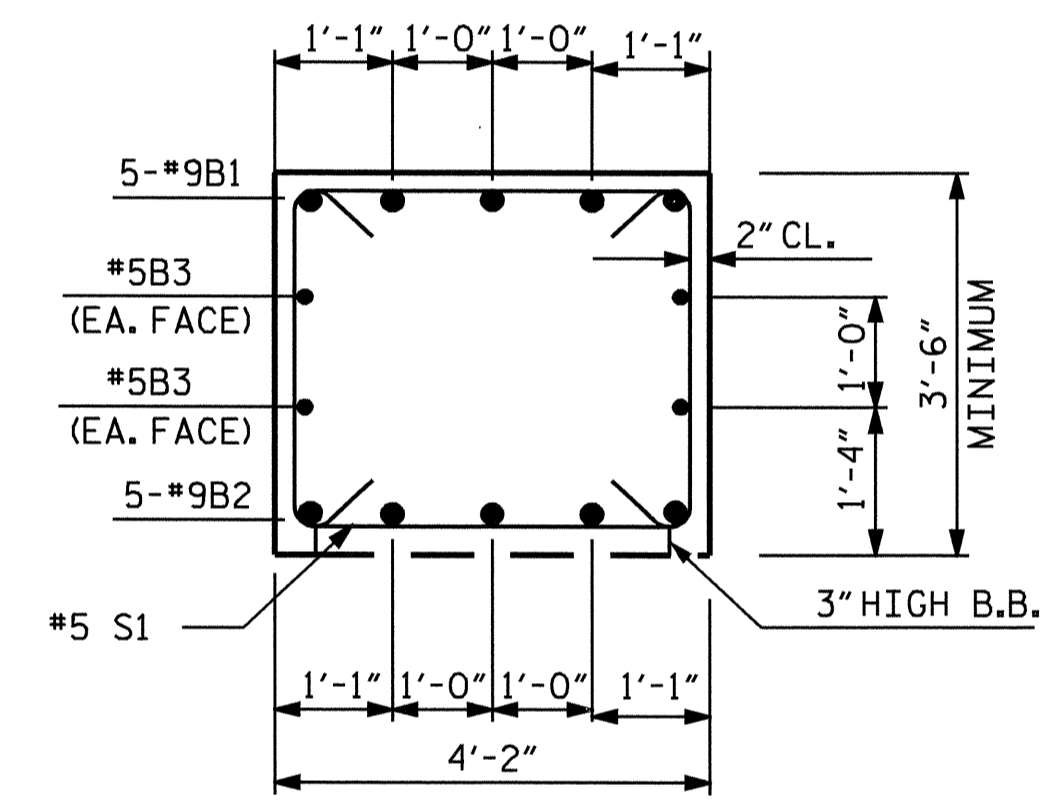
**END ELEVATION**



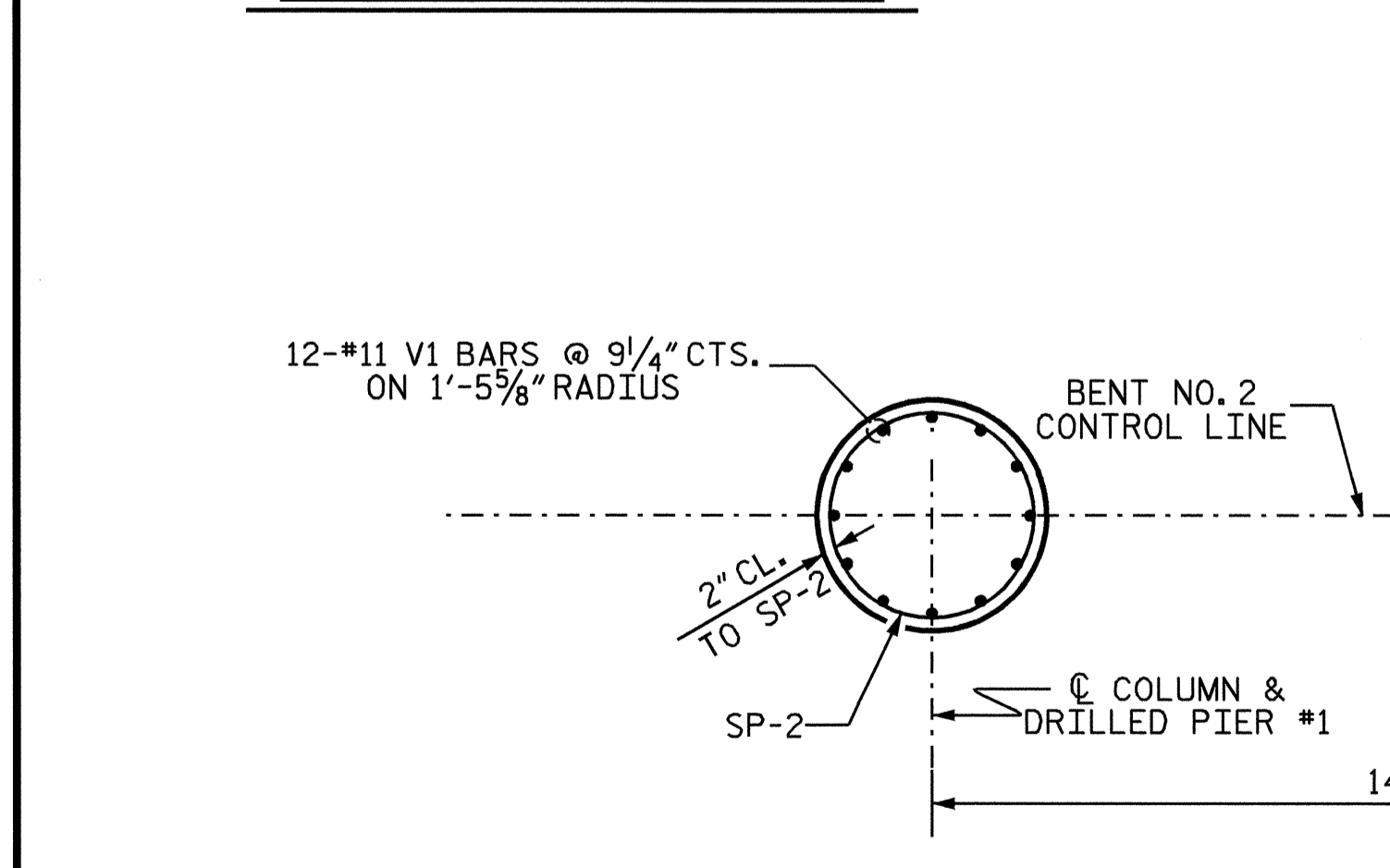
**END VIEW**



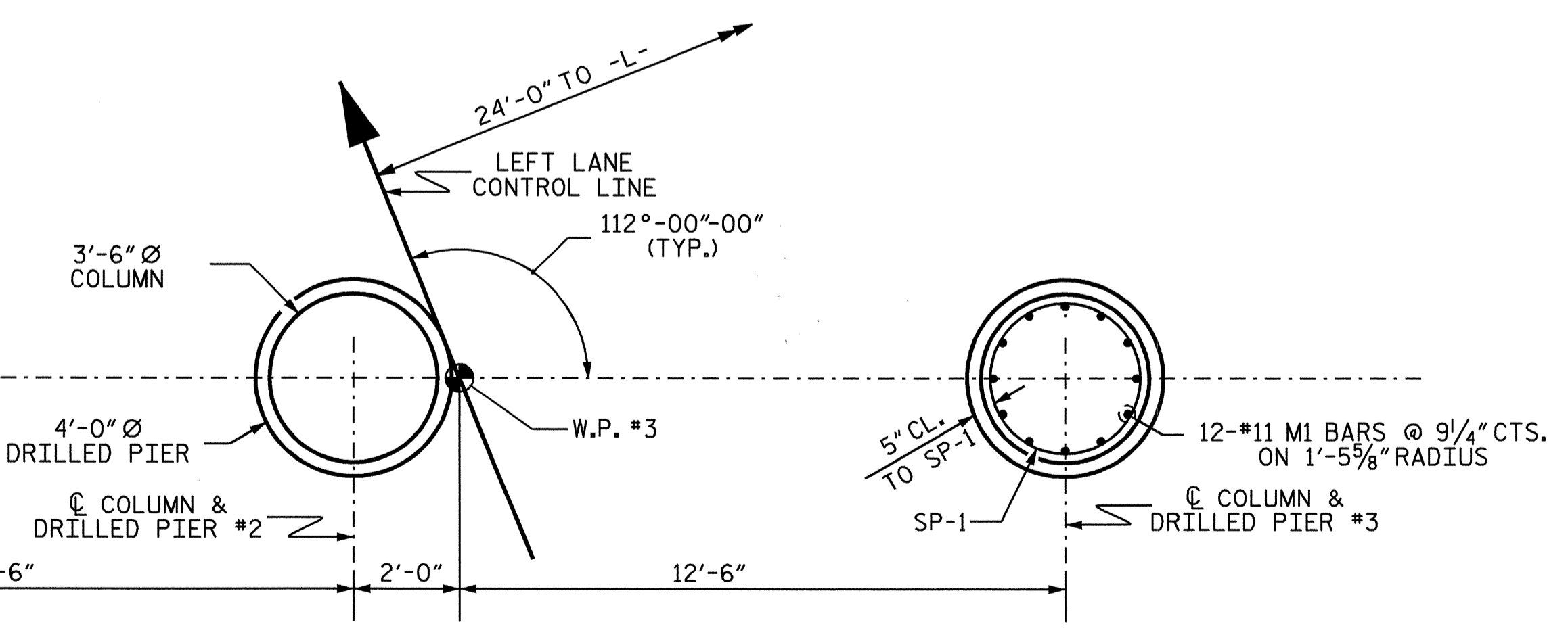
**SECTION B-B**



**SECTION A-A**



**PARTIAL PLAN OF COLUMN**



**PARTIAL PLAN OF DRILLED PIER**

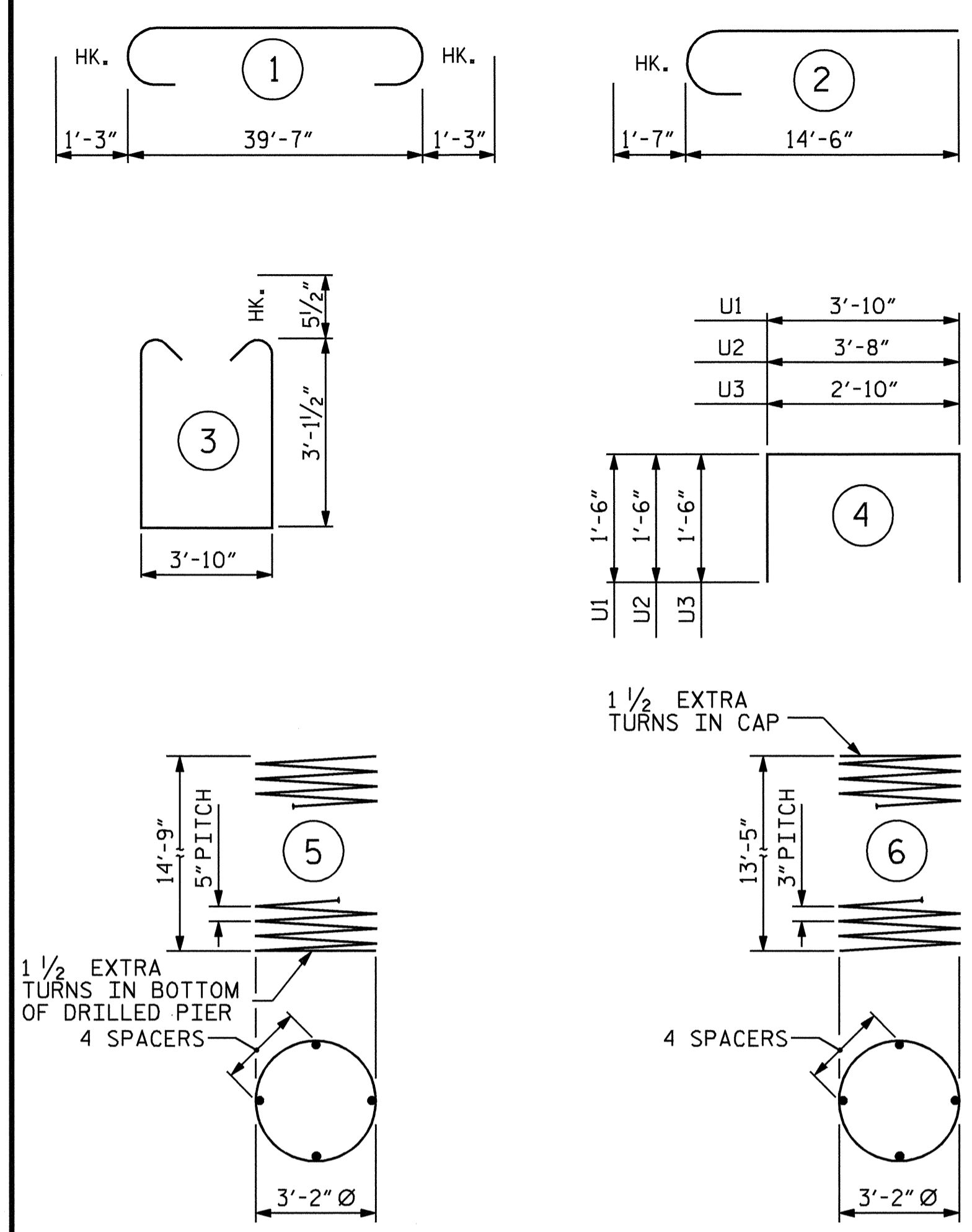
**PLAN OF COLUMNS & DRILLED PIERS**

(DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER)

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 CHECKED BY: MG CHEEK DATE: 5-04-07

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**BAR TYPES**



ALL BAR DIMENSIONS ARE OUT TO OUT.

\*\* THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.  
 \*\*\* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR  
 ▲ NO SEPARATE PAYMENT WILL BE MADE FOR CSL TUBES. CSL TUBES WILL BE INCLUDED IN THE UNIT BID PRICE FOR DRILLED PIERS.

**BILL OF MATERIAL**

**BENT NO.2**

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	#9	1	42'-1"	715
B2	5	#9	STR	39'-8"	674
B3	4	#5	STR	39'-8"	165
B4	5	#4	STR	4'-0"	13
M1	36	#11	STR	42'-6"	8129
S1	36	#5	3	11'-0"	413
U1	40	#4	4	6'-10"	183
U2	8	#4	4	6'-8"	36
U3	8	#4	4	5'-10"	31
V1	36	#11	2	16'-1"	3076
SP-1	3	***	5	761'-6"	2383
SP-2	3	**	6	513'-2"	1028

REINFORCING STEEL = 13435 LBS  
 SPIRAL REINFORCING STEEL = 3411 LBS

**CLASS "A" CONCRETE BREAKDOWN**

POUR	C.Y.	WEIGHT
POUR #2 (COLUMNS)	13.3	183
POUR #3 (CAP)	21.8	36
TOTAL	35.1	31

**DRILLED PIERS**  
 DRILLED PIER CONCRETE  
 POUR # 1 (DRILLED PIERS) C.Y. = 45.0

4'-0" Ø DRILLED PIERS  
 NOT IN SOIL LIN. FT. = 21.00  
 IN SOIL LIN. FT. = 75.75

SID INSPECTION EA. = 1  
 ▲ CSL TUBES LIN. FT. = 417.00  
 CROSSHOLE SONIC LOGGING EA. = 1

PROJECT NO. B-4095  
DAVIDSON COUNTY  
 STATION: 26+20.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 BENT NO. 2  
 LEFT LANE



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS 69
2			4			

STR # 1

**NOTES**

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

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

FOR PILE SPLICE DETAILS SEE SHEET 3 OF 3.

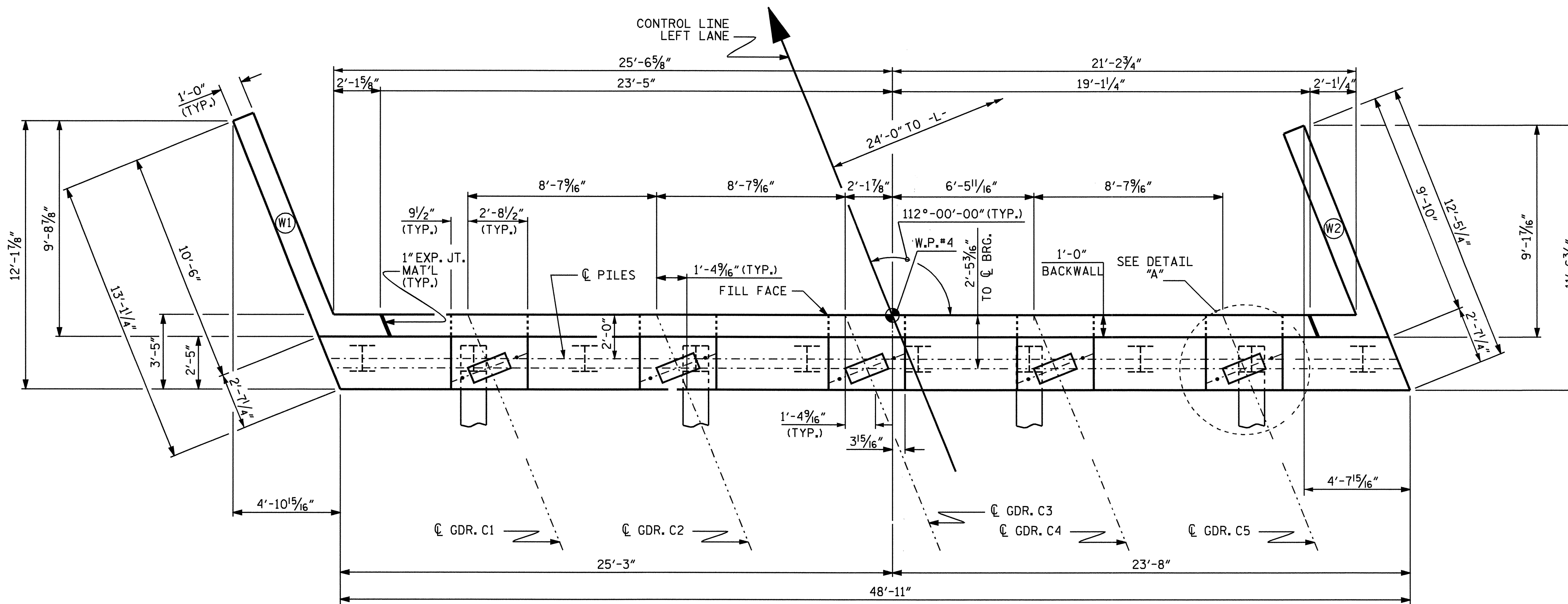
FOR TEMPORARY DRAINAGE AT END BENTS, SEE SHEET 3 OF 3.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

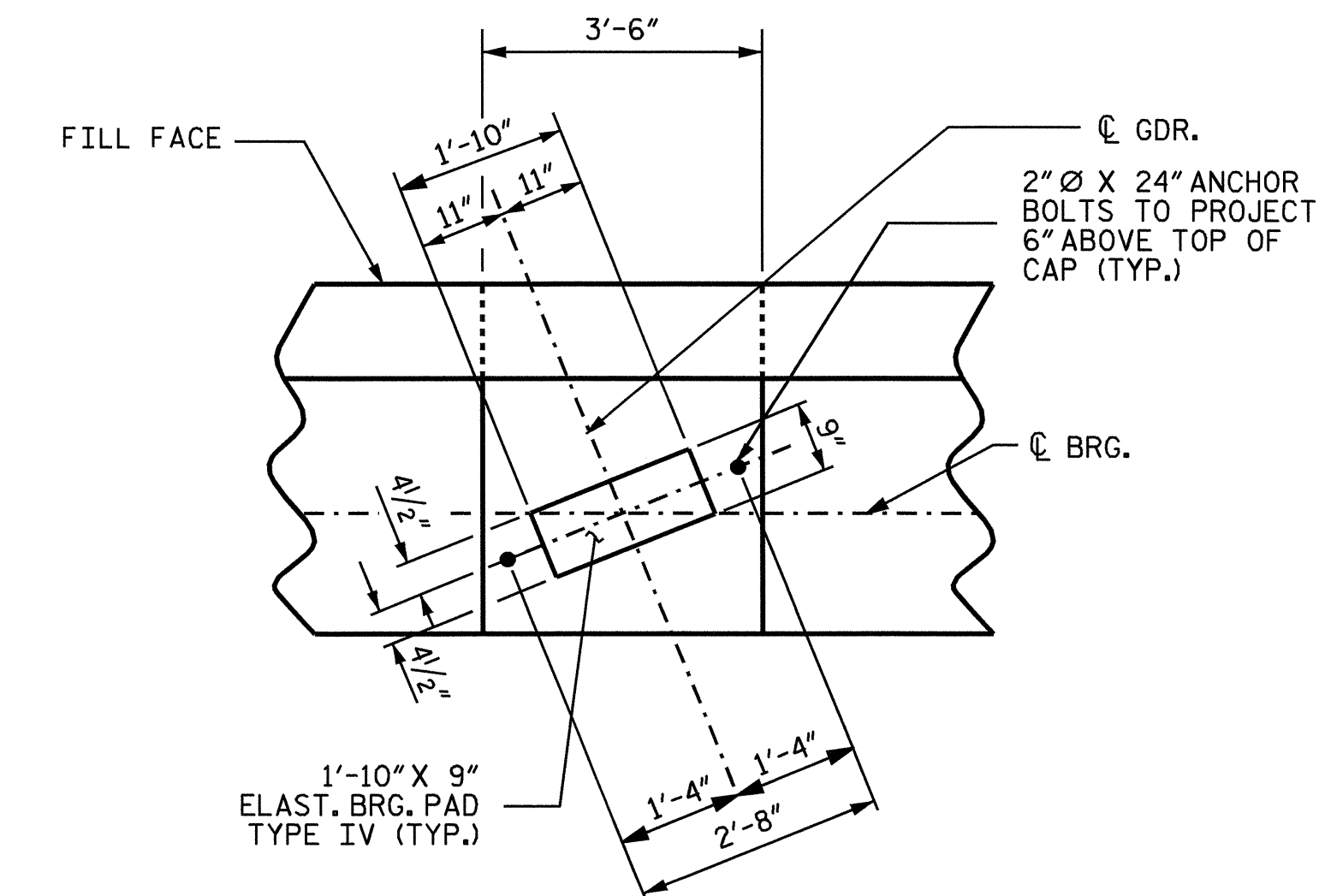
THE TOP SURFACE AREA OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

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

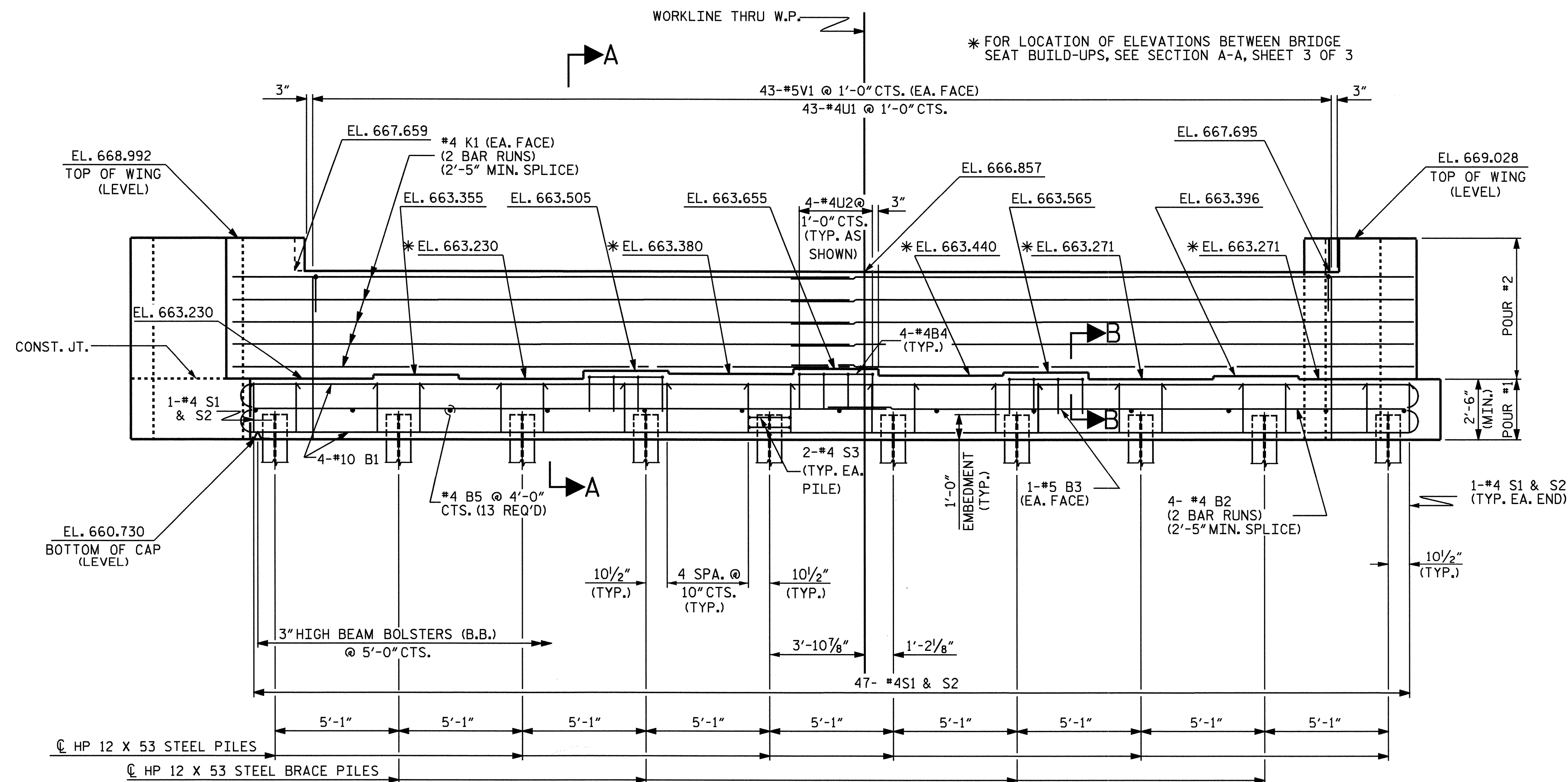
THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS. SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.



**PLAN**



**DETAIL "A"**



**ELEVATION**

PROJECT NO. B-4095  
DAVIDSON COUNTY  
 STATION: 26+20.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT NO. 2  
 LEFT LANE

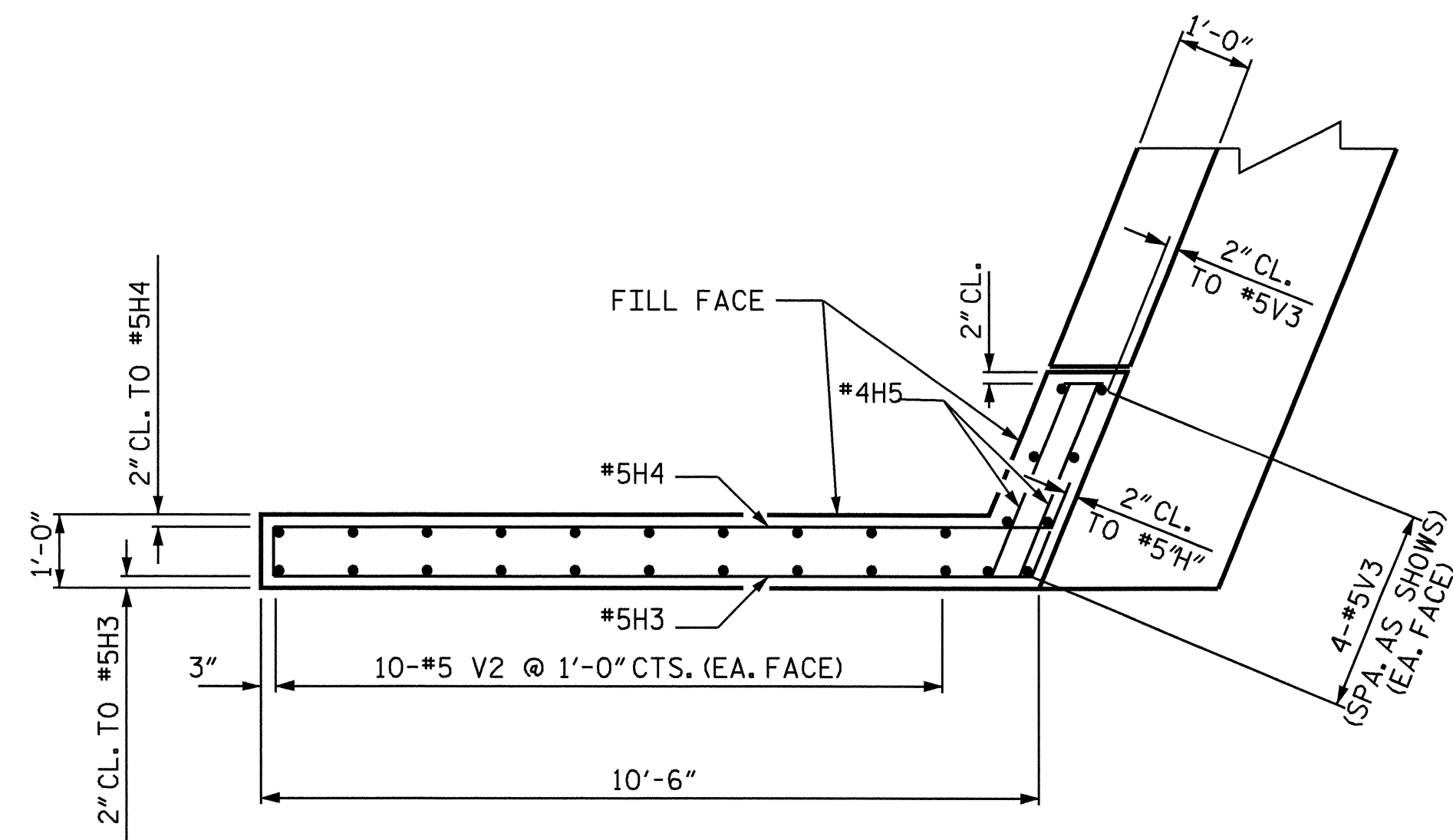


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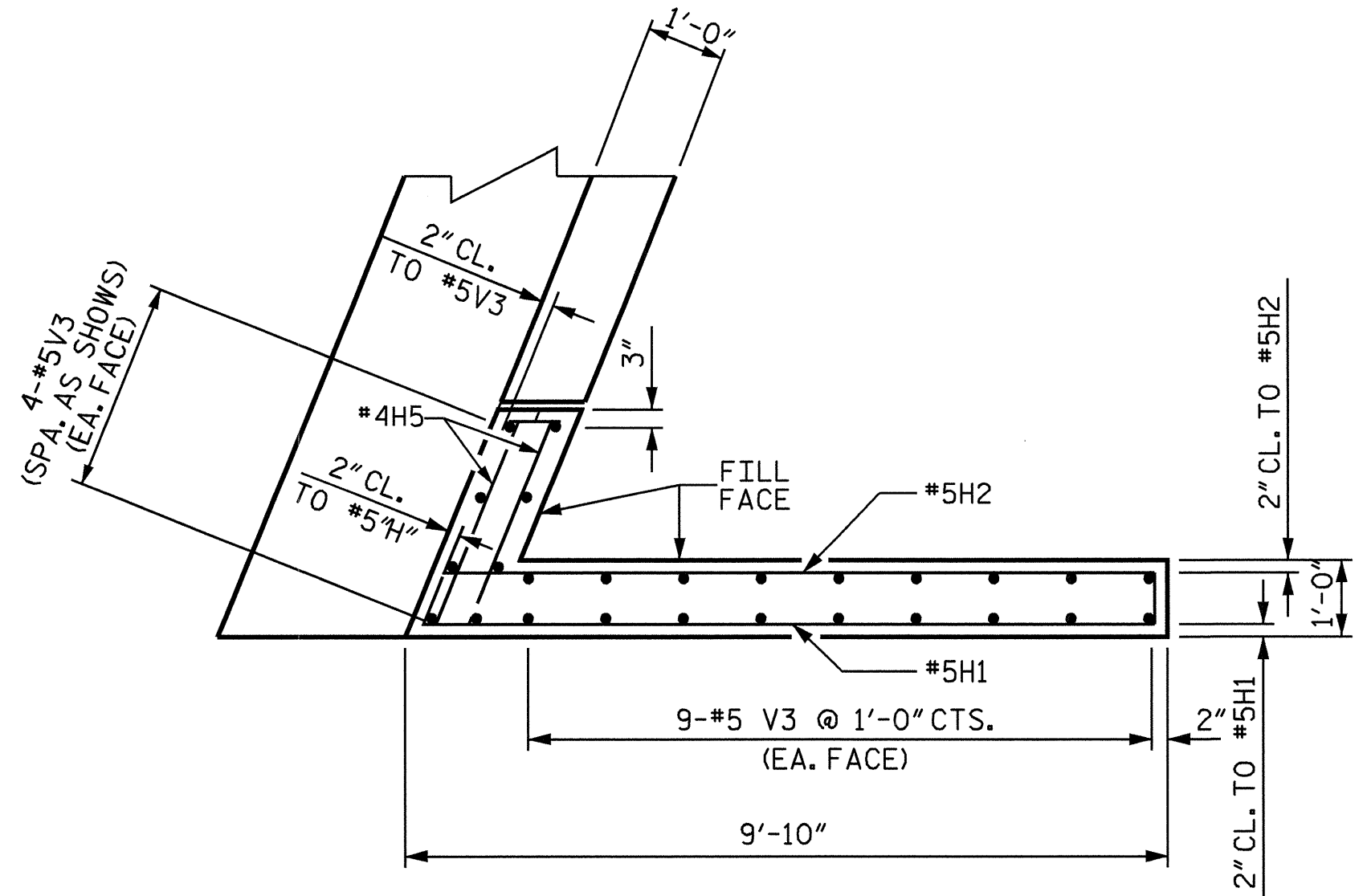
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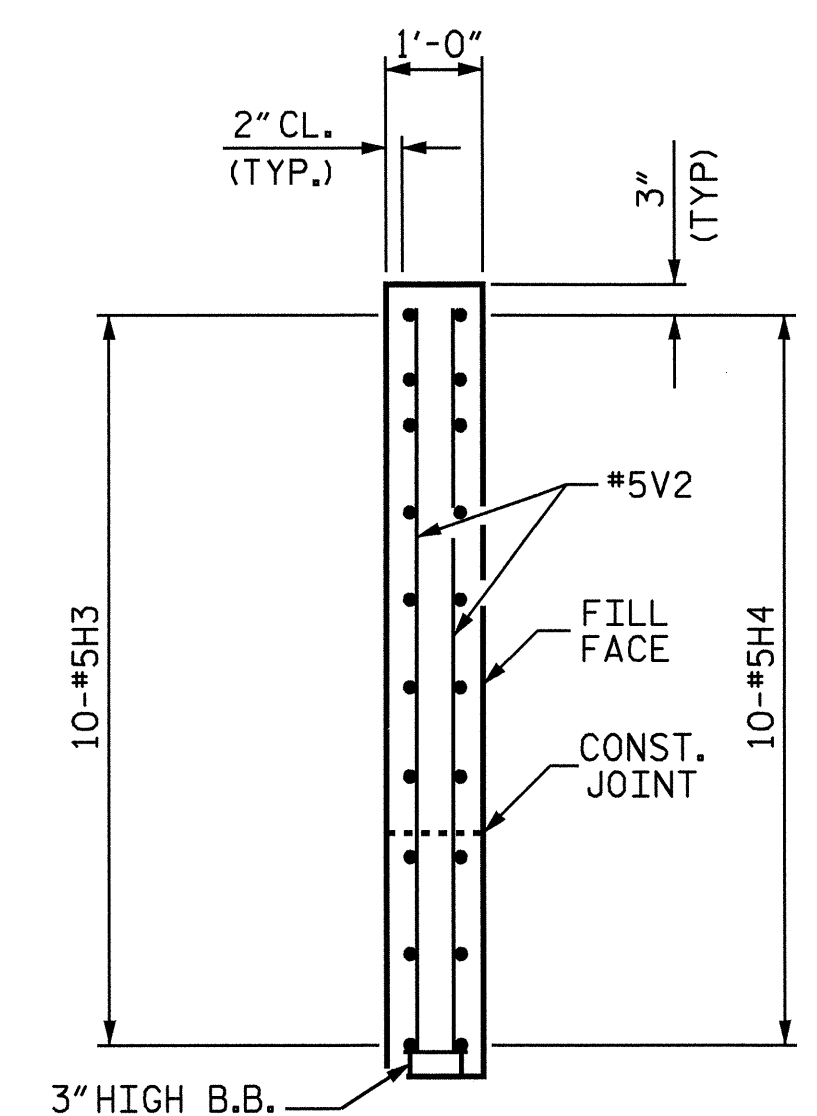
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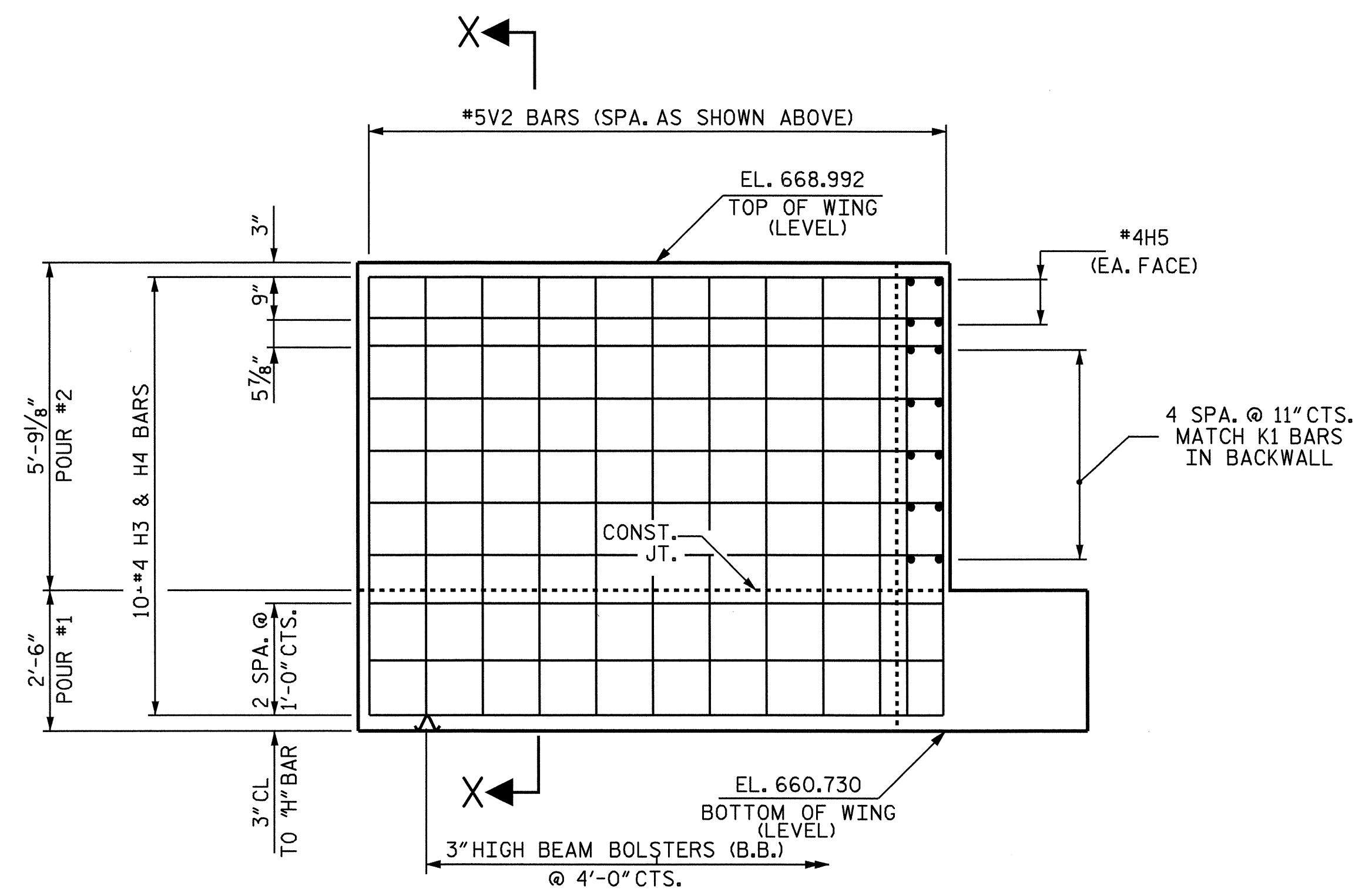
PLAN OF LEFT WING - W1



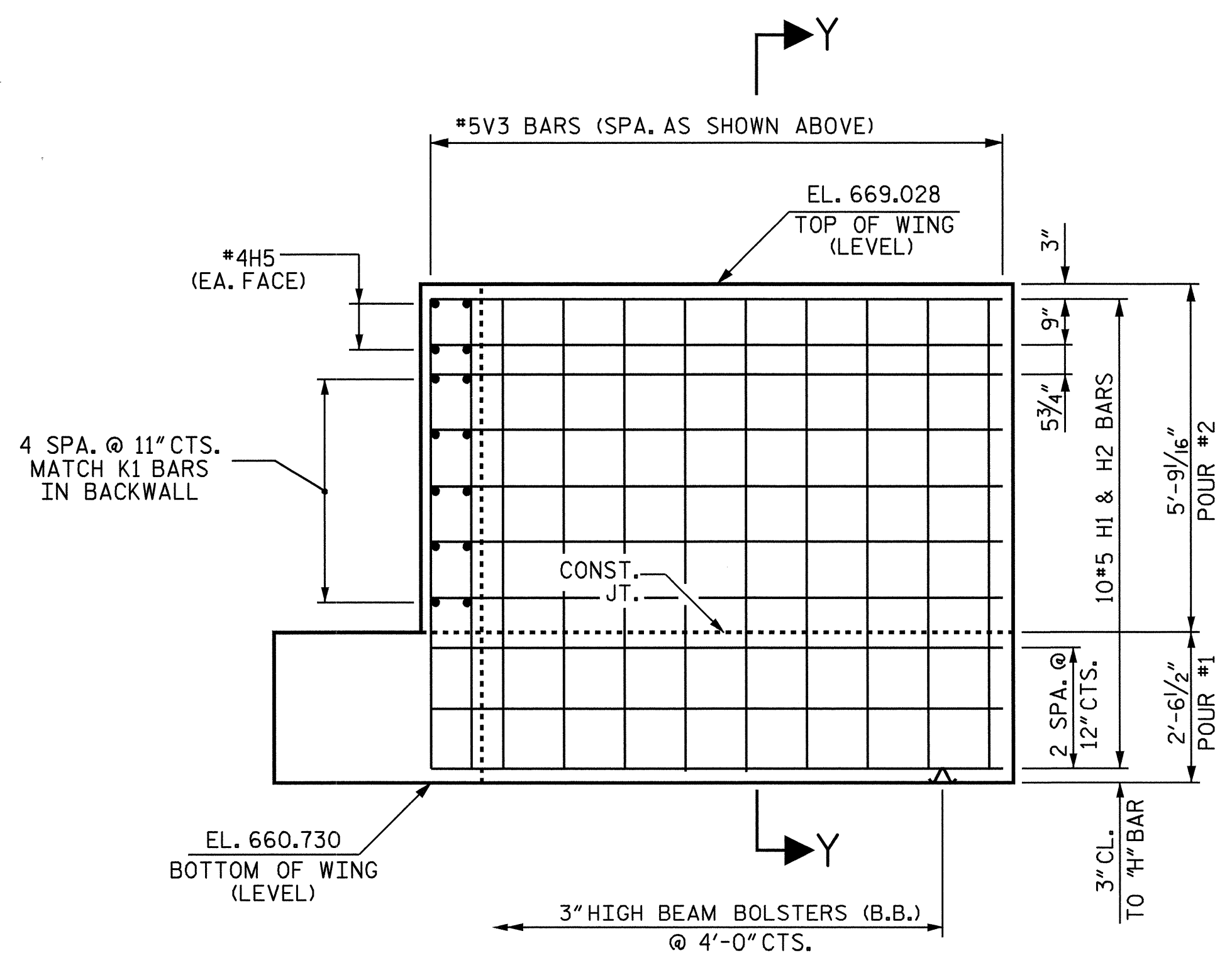
PLAN OF RIGHT WING - W2



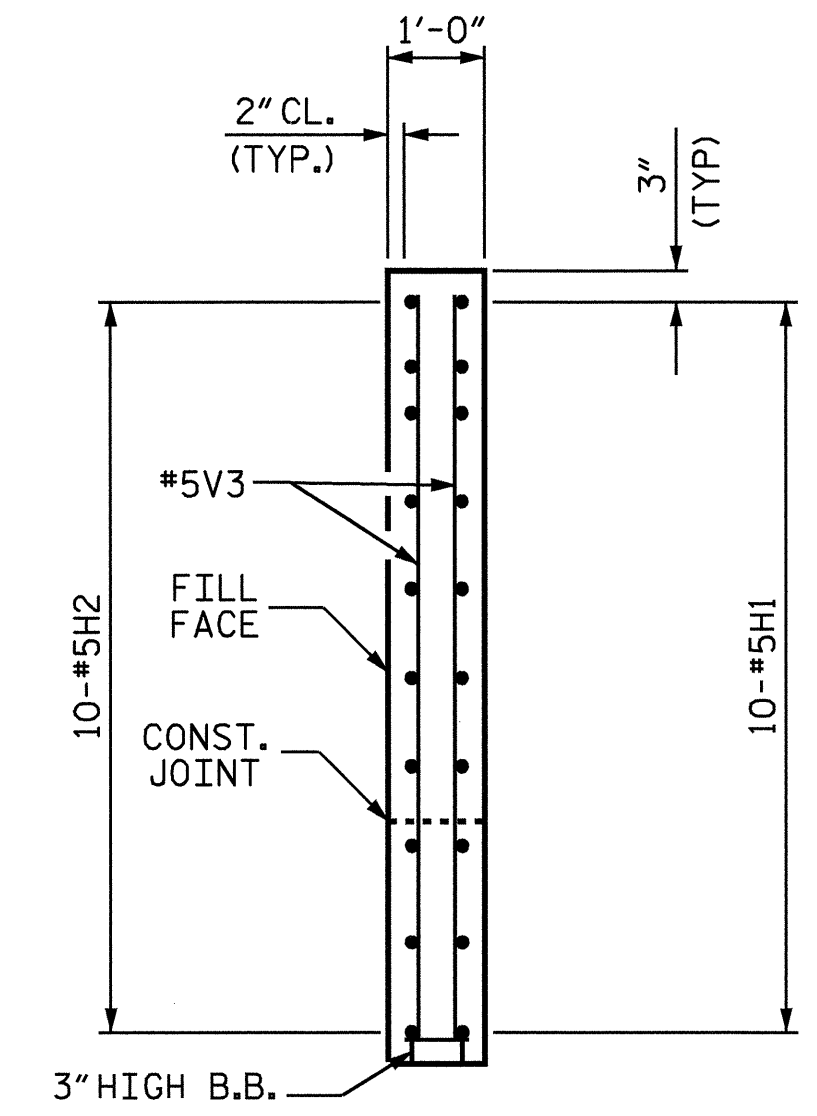
SECTION X-X



ELEVATION OF LEFT WING - W1



ELEVATION OF RIGHT WING - W2



SECTION Y-Y

PROJECT NO. B-4095  
 DAVIDSON COUNTY  
 STATION: 26+20.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT NO. 2  
 LEFT LANE

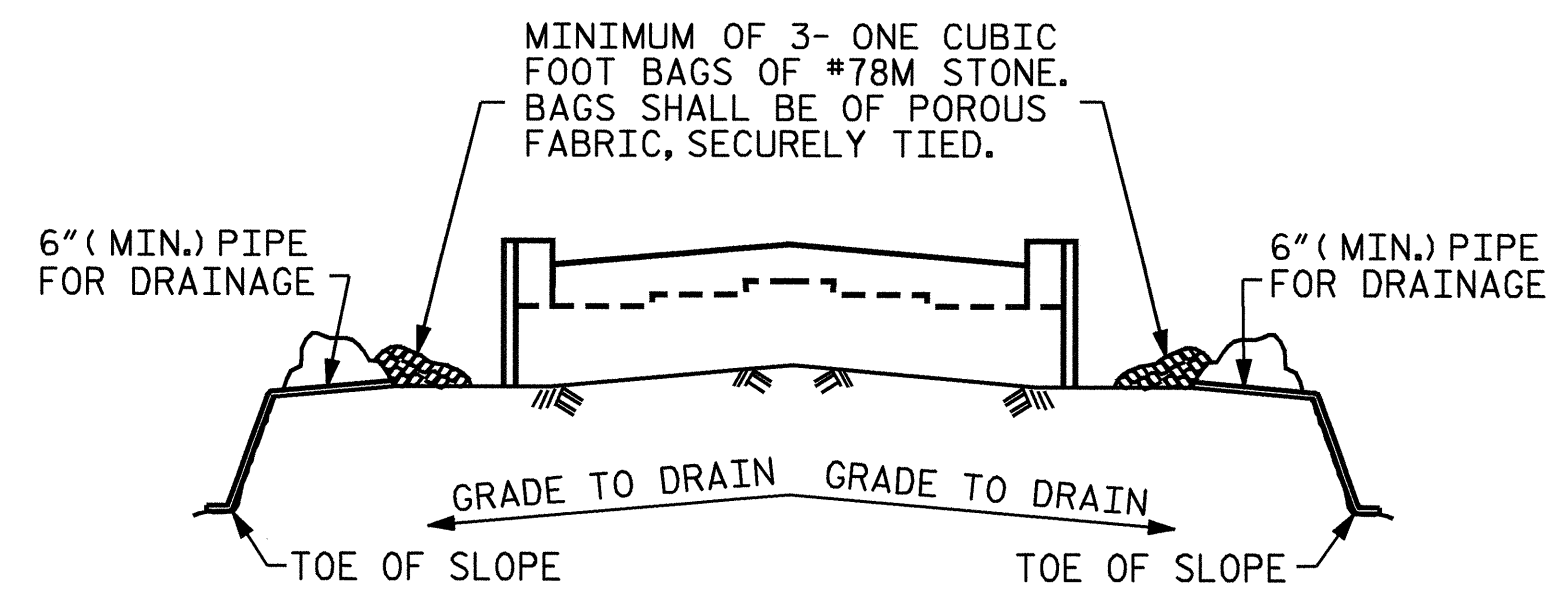


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 CHECKED BY: R.D. MARTIN DATE: 5-04-07

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REVISIONS						SHEET NO. S-29
NO.	BY:	DATE:	NO.	BY:	DATE:	
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2			4			

STR#1

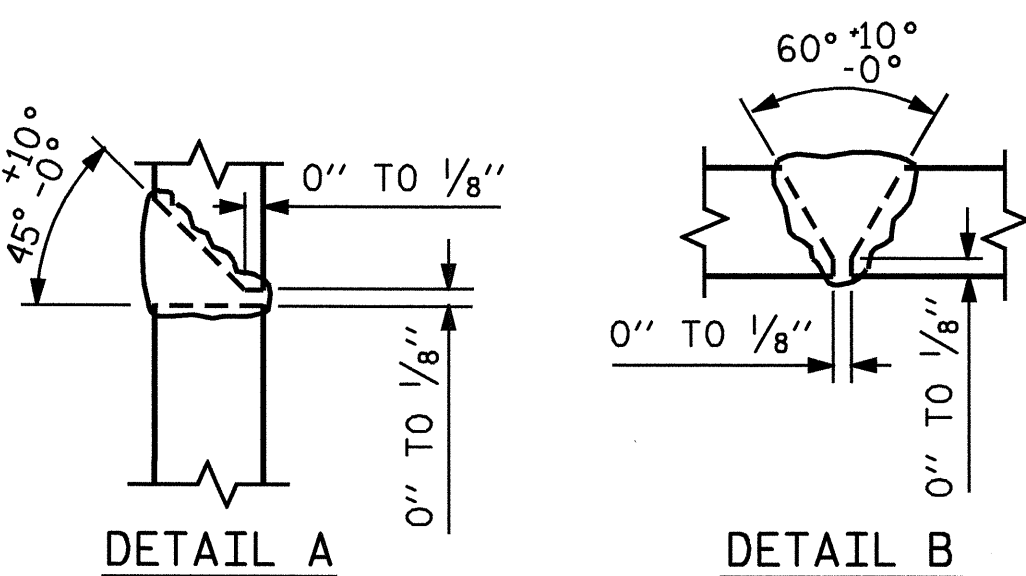
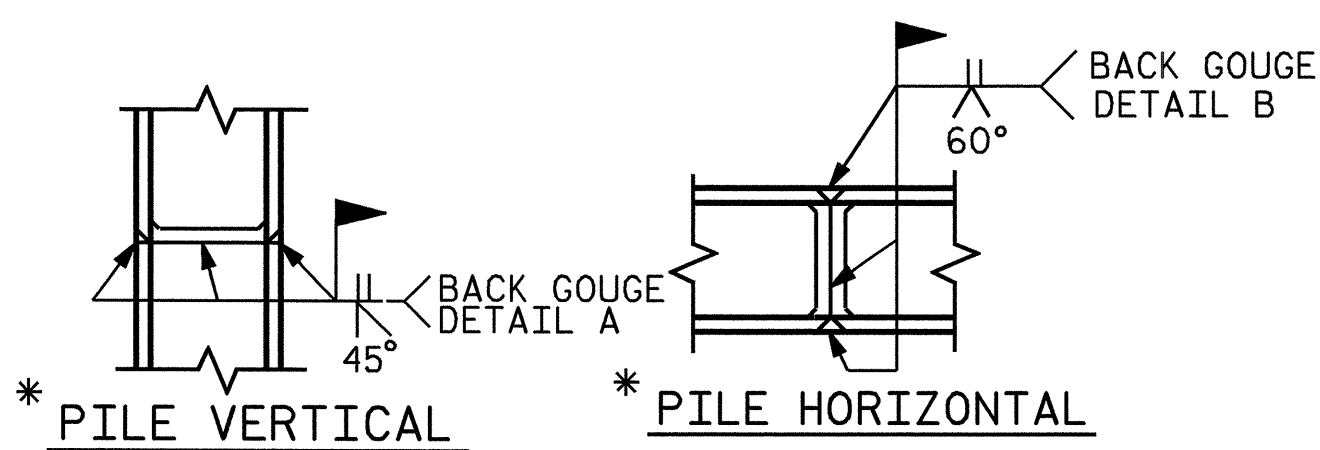


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

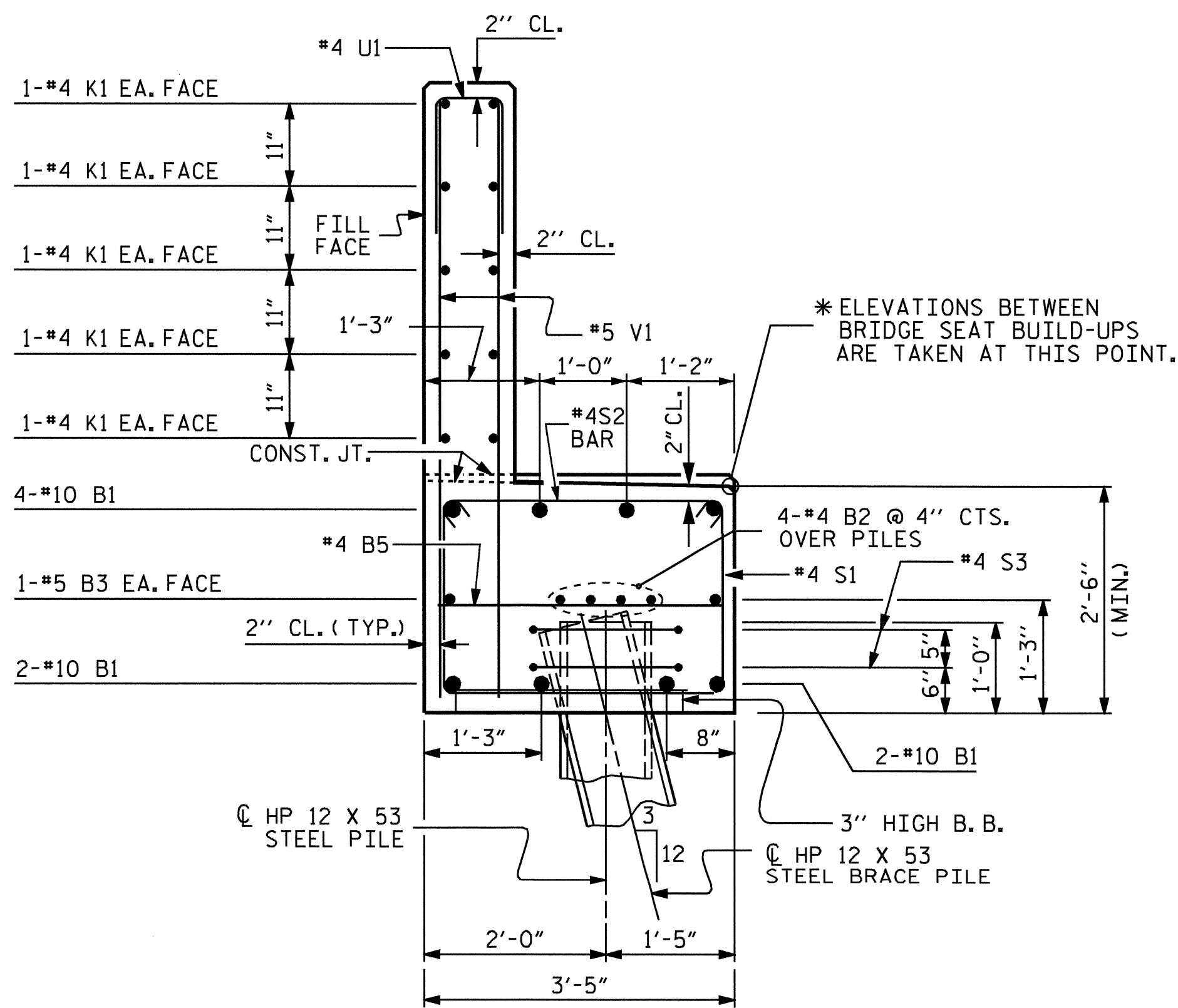
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

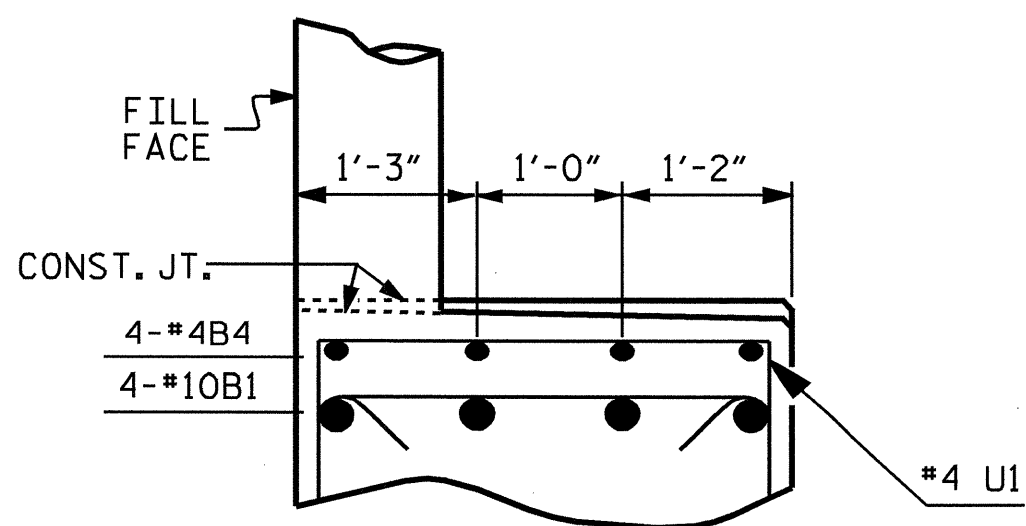
**TEMPORARY DRAINAGE AT END BENT**



**PILE SPLICE DETAILS**

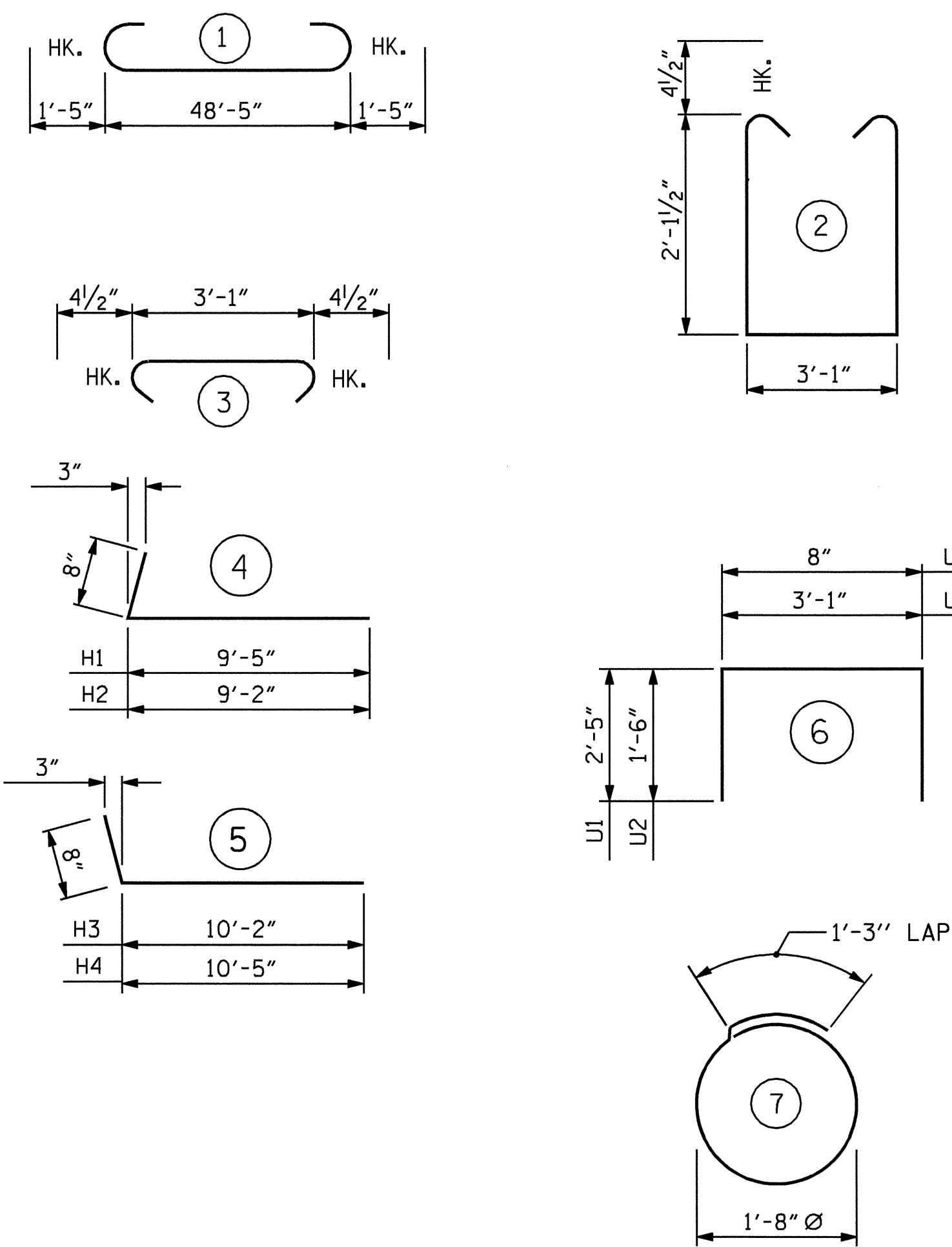


**SECTION A-A**



**SECTION B-B**

**BAR TYPES**



ALL BAR DIMENSIONS ARE OUT TO OUT.

**BILL OF MATERIAL  
END BENT NO. 2**

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	10	1	51'-3"	1764
B2	8	4	STR	25'-6"	136
B3	2	5	STR	48'-7"	101
B4	12	4	STR	3'-2"	26
B5	13	4	STR	3'-1"	27
H1	10	5	4	10'-1"	105
H2	10	5	4	9'-10"	103
H3	10	5	5	10'-10"	113
H4	10	5	5	11'-1"	116
H5	8	4	STR	2'-9"	15
K1	20	4	STR	25'-6"	341
S1	47	4	2	8'-1"	254
S2	47	4	3	3'-10"	120
S3	20	4	7	6'-6"	87
U1	43	4	6	5'-6"	158
U2	12	4	6	6'-1"	37
V1	86	5	STR	6'-6"	583
V2	26	5	STR	7'-10"	212
V3	28	5	STR	7'-11"	231

REINFORCING STEEL 4,529 LBS.

CLASS A CONCRETE BREAKDOWN  
POUR #1  
END BENT CAP & LOWER WINGS 17.2 C.Y.  
POUR #2  
BACKWALL & UPPER PART OF WINGS 11.7 C.Y.  
TOTAL CLASS A CONCRETE 28.9 C.Y.

HP 12 X 53 STEEL PILES  
NO. 10 400 LIN. FT.

PROJECT NO. B-4095  
DAVIDSON COUNTY  
STATION: 26+20.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE  
END BENT NO.2  
LEFT LANE

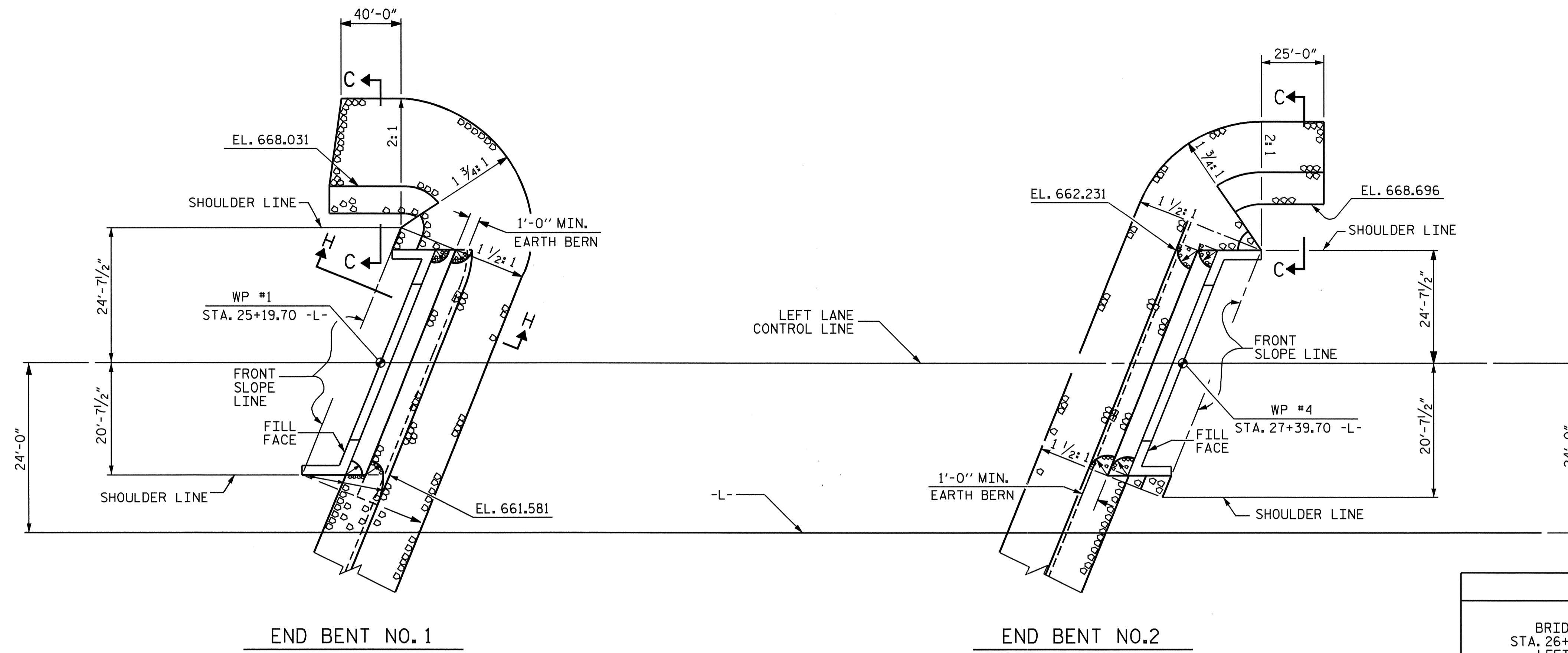


REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30	
1			3			TOTAL SHEETS 69	
2			4				

DRAWN BY : A.L. FIGUEROA DATE : 3-29-07  
CHECKED BY : R.D. MARTIN DATE : 5-04-07

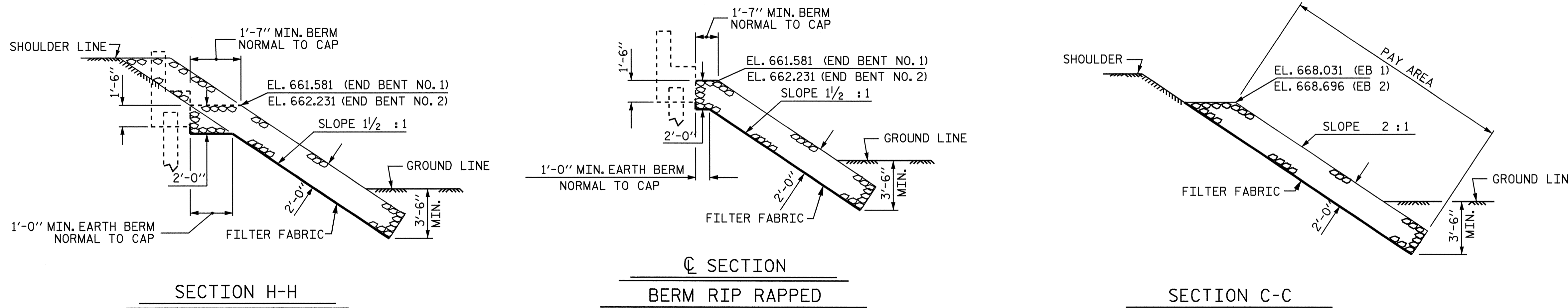
STR #1

NOTES :  
FOR BERM WIDTH DIMENSIONS,SEE GENERAL DRAWING.



ESTIMATED QUANTITIES		
BRIDGE @ STA. 26+20.00 -L- LEFT LANE	RIP RAP CLASS II	FILTER FABRIC FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	521	579
END BENT 2	432	480

PLAN



SECTION H-H

SECTION C-C  
BERM RIP RAPPED

SECTION C-C

PROJECT NO. B-4095  
DAVIDSON COUNTY  
STATION: 26+20.00-L-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

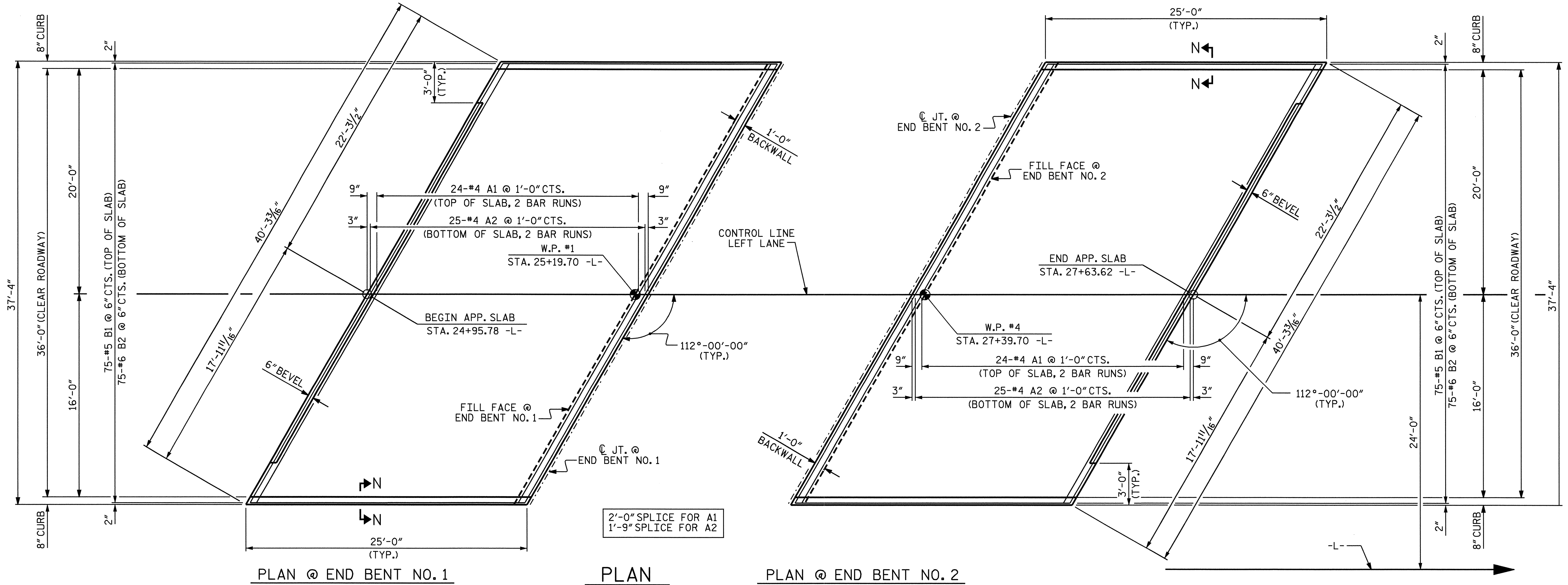
**STANDARD  
RIP RAP DETAILS  
LEFT LANE**

REVISIONS						SHEET NO. S-31
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 69
2			4			



ASSEMBLED BY : A.L. FIGUEROA DATE : 8-29-06  
CHECKED BY : V.X. NGUYEN DATE : 8-30-06  
DRAWN BY : REK 1/84 REV. 7/17/98 REK/RWW  
CHECKED BY : RDU 1/84 REV. 8/16/99 RWW/LES  
REV. 10/17/00 RWW/LES

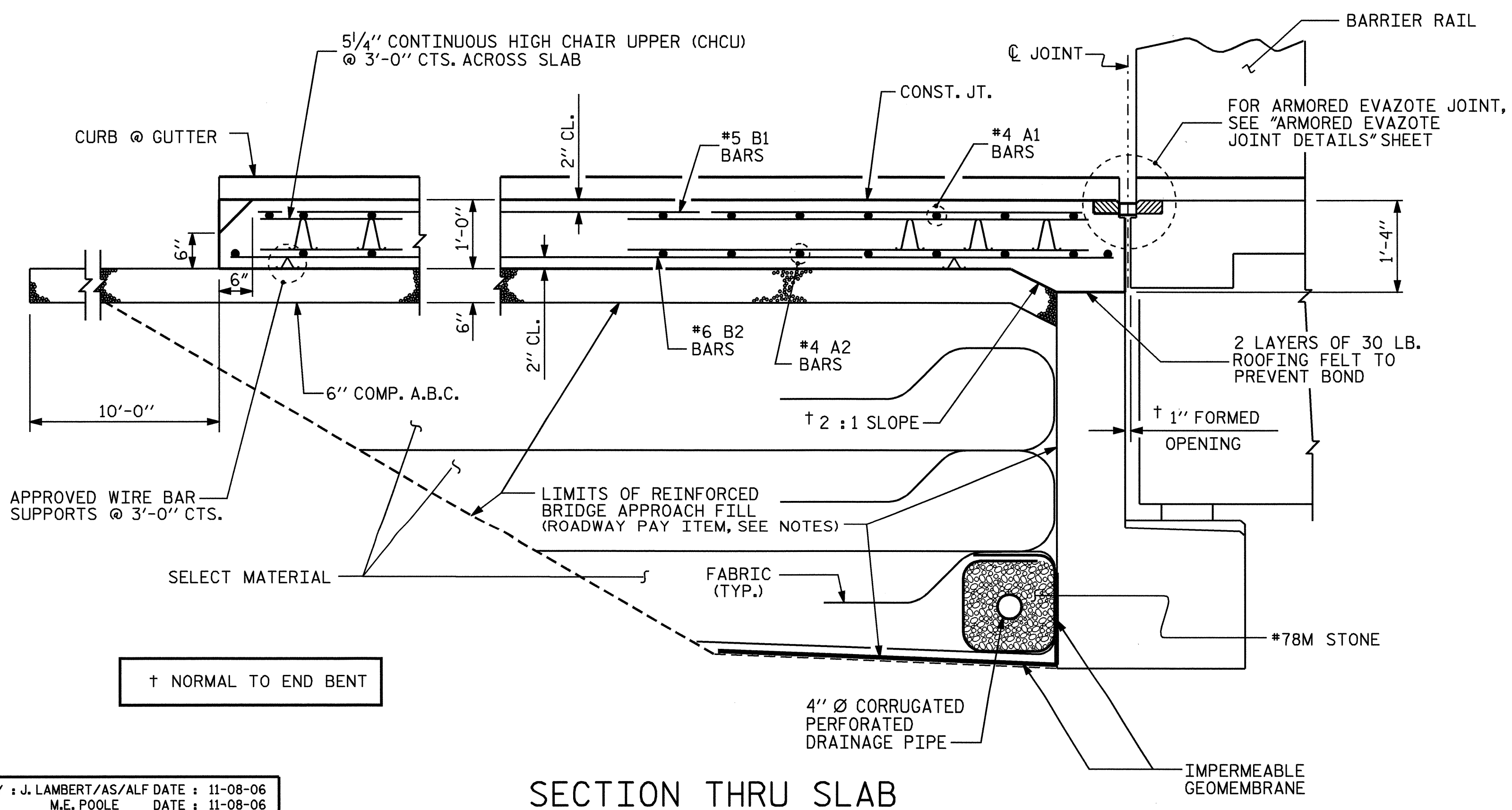




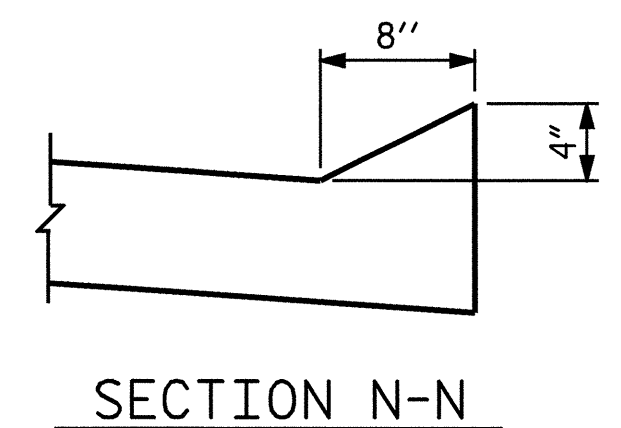
PLAN @ END BENT NO. 1

PLAN

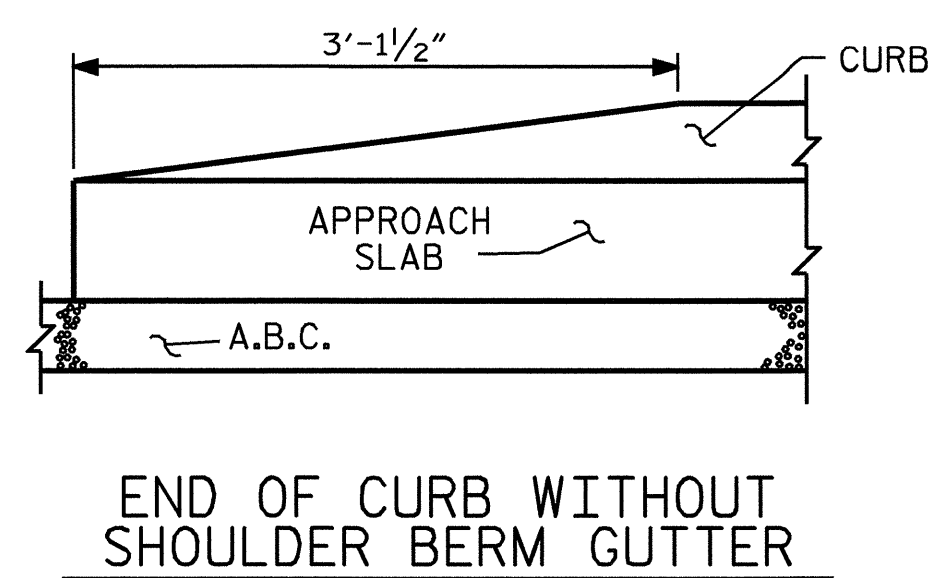
PLAN @ END BENT NO. 2



SECTION THRU SLAB



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

PROJECT NO. B-4095  
 DAVIDSON COUNTY  
 STATION: 26+20.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

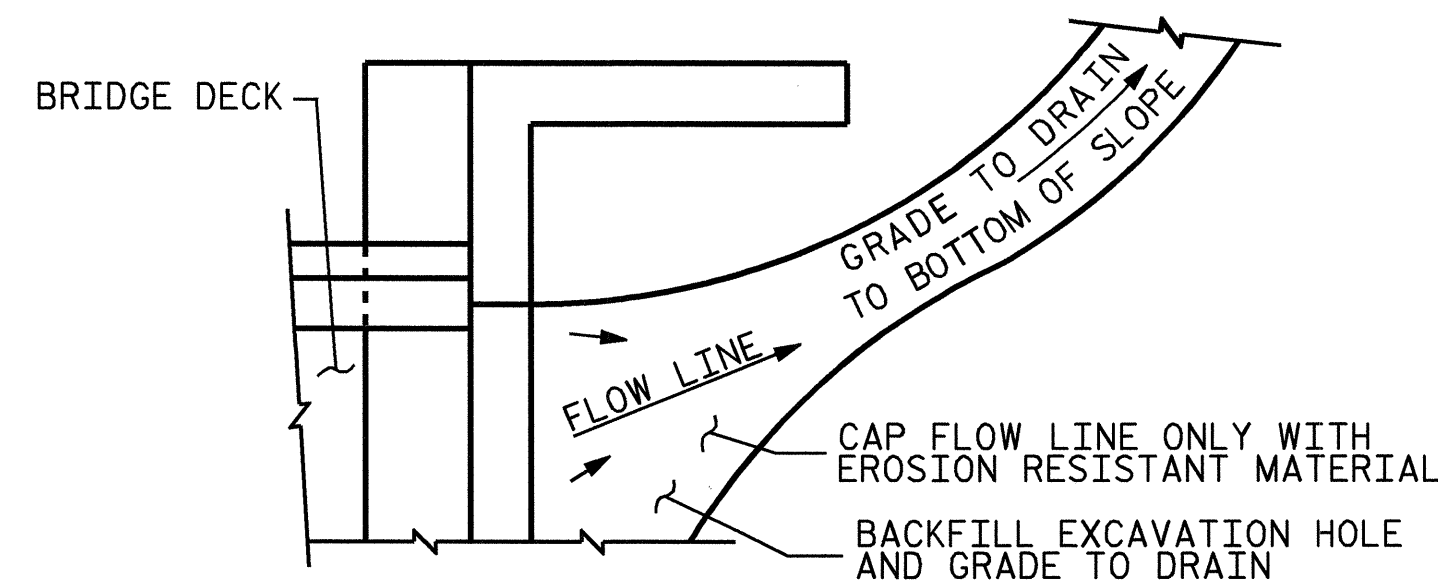
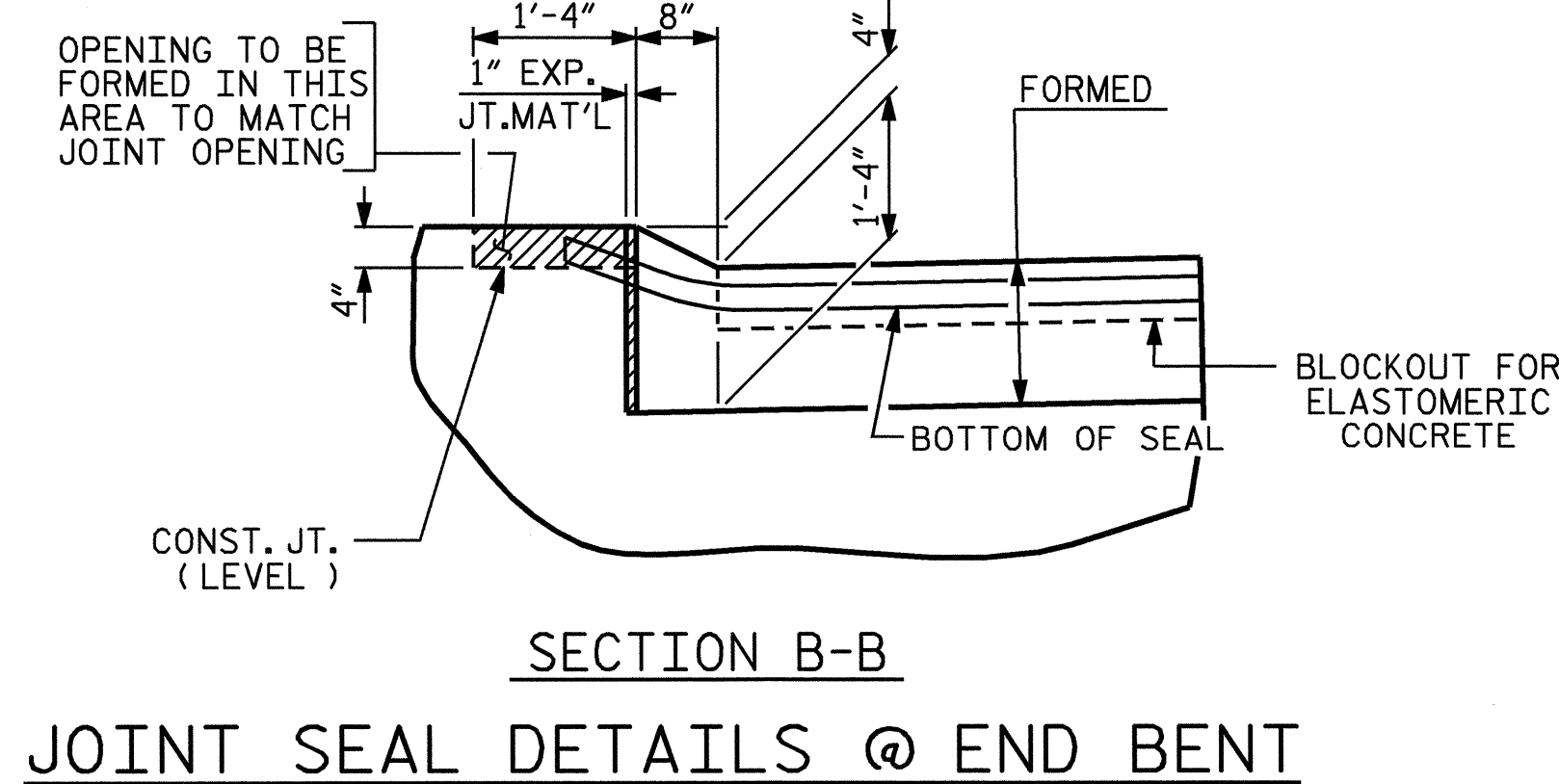
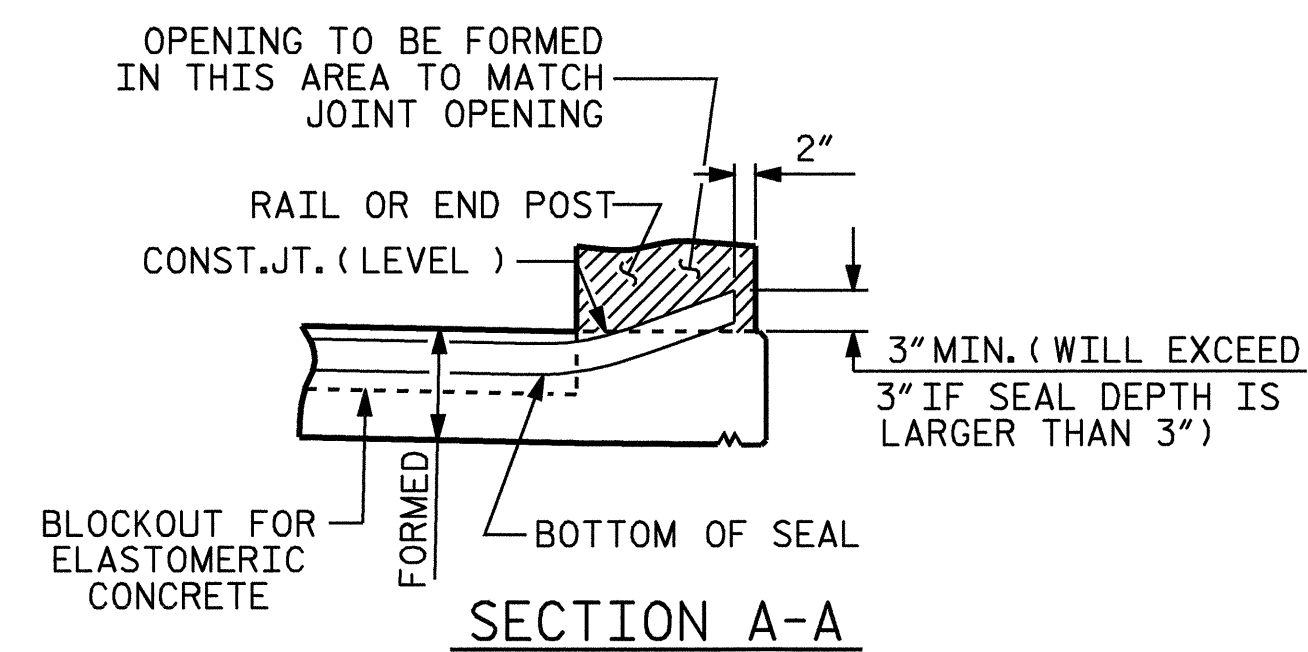
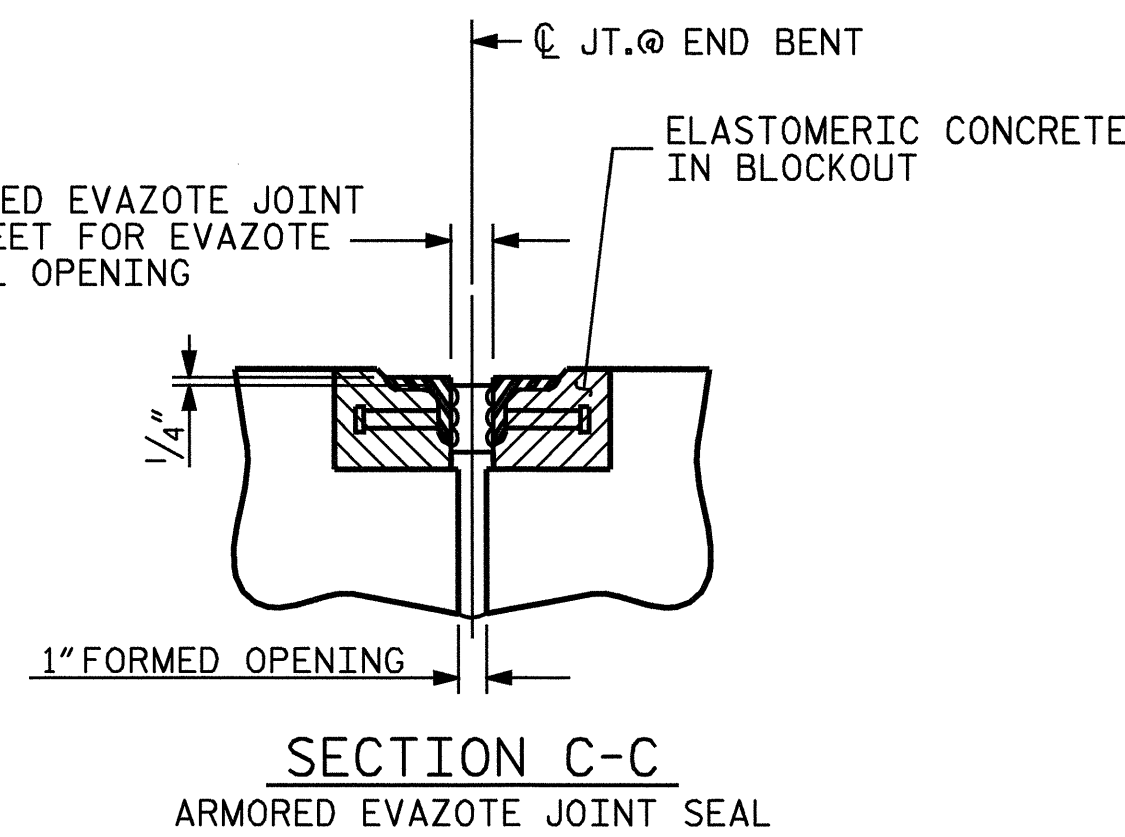
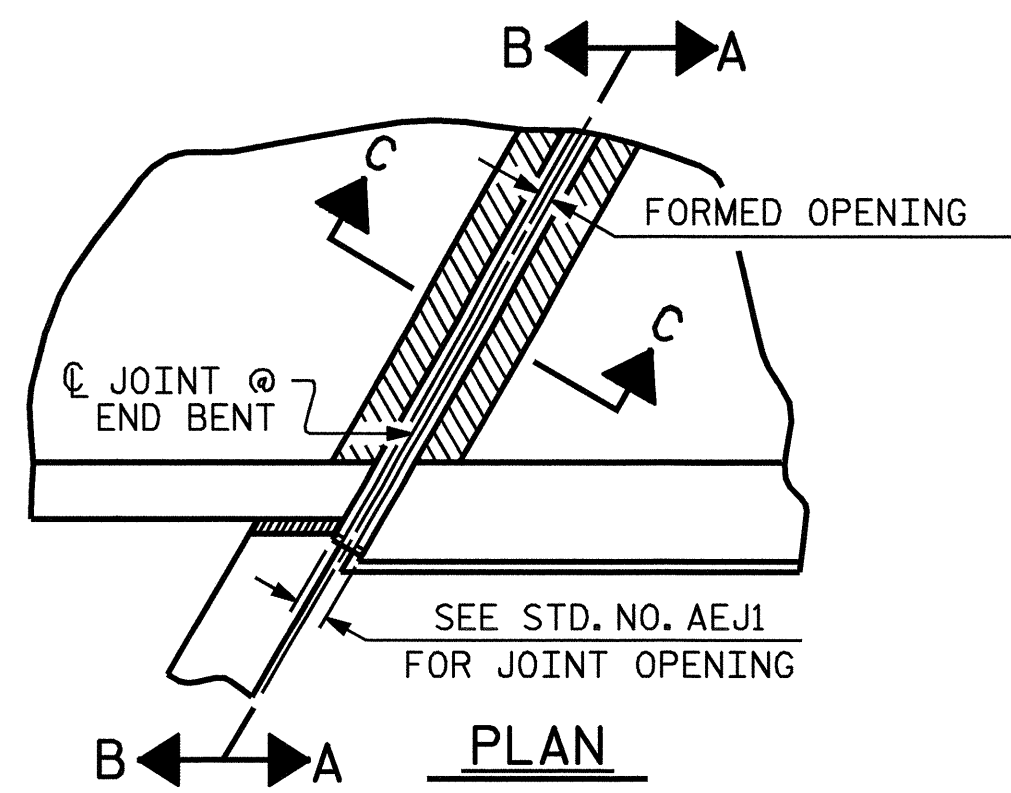
BRIDGE APPROACH SLAB  
 FOR FLEXIBLE PAVEMENT  
 LEFT LANE



ASSEMBLED BY : J. LAMBERT/AS/ALF DATE : 11-08-06  
 CHECKED BY : M.E. POOLE DATE : 11-08-06  
 DRAWN BY : LES 8/01  
 CHECKED BY : RDR 8/01

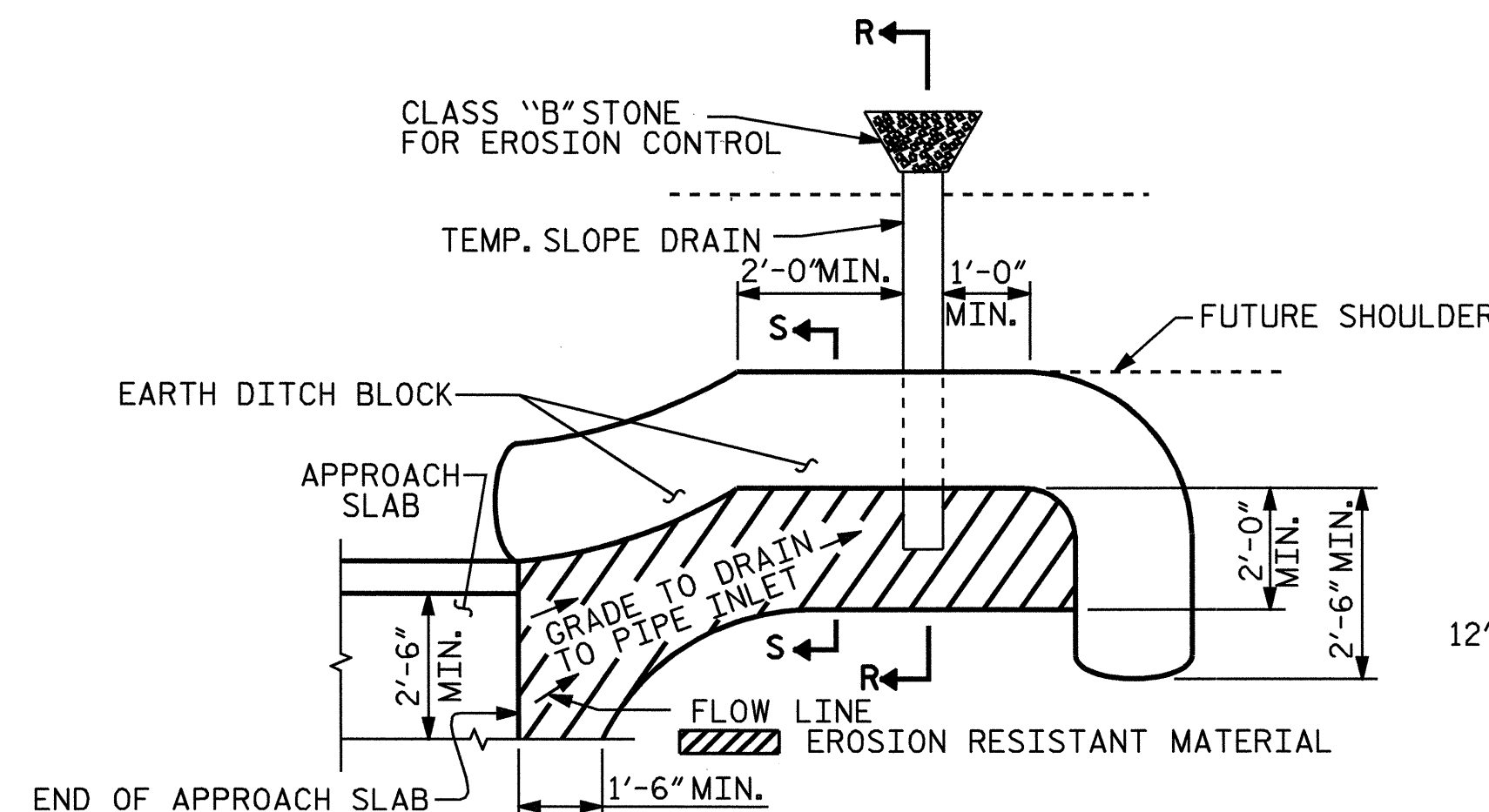
REV. 5/7/03RR RWW/JTE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS
2			4			69



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

**TEMPORARY DRAINAGE DETAIL**



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.

**PLAN VIEW**

**TEMPORARY BERM AND SLOPE DRAIN DETAILS**

**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.

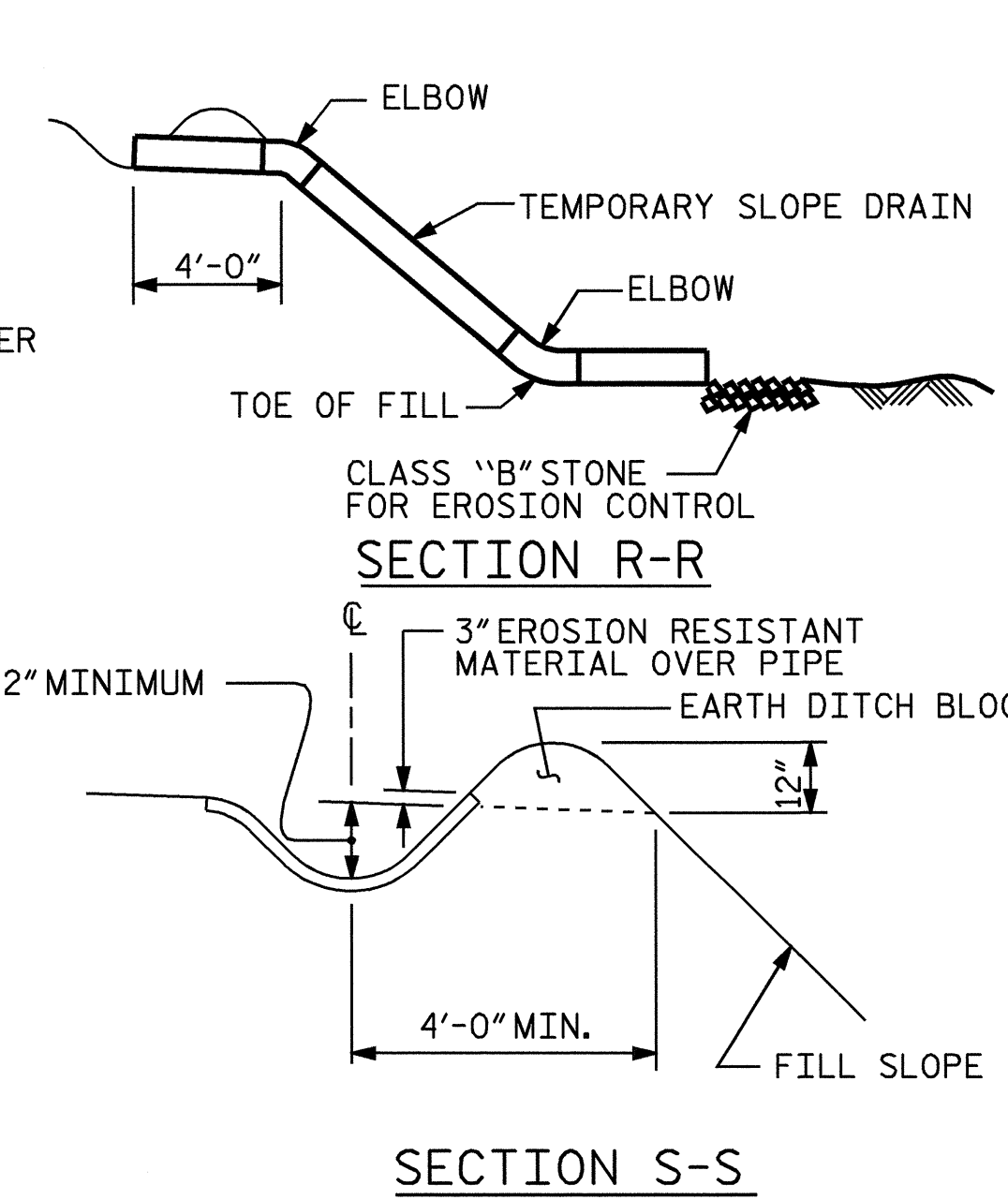
TEMPORARY DRAINAGE AND TEMPORARY BERM AND SLOPE DRAINS WILL BE PAID FOR UNDER THE LUMP SUM PRICE FOR BRIDGE APPROACH SLAB.

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 EXTEND 10'-0" BEYOND THE END OF THE APPROACH SLAB AND 1'-0" OUTSIDE OF EACH EDGE OF 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 EXTEND 1'-0" BEYOND THE 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 EXTEND 1'-0" BEYOND THE 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.



**SECTION S-S**

**BILL OF MATERIAL FOR ONE APPROACH SLAB (2 REQ'D)**

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	48	#4	STR	21'-0"	673
A2	50	#4	STR	20'-10"	696
*B1	75	#5	STR	23'-8"	1851
B2	75	#6	STR	24'-8"	2779
REINFORCING STEEL				LBS.	3475
*EPOXY COATED REINFORCING STEEL				LBS.	2524
CLASS AA CONCRETE BREAKDOWN					
SLAB AND CURB				C. Y.	38.0
TOTAL CLASS AA CONCRETE				C. Y.	38.0

\* THESE BARS ARE EPOXY COATED.

PROJECT NO. B-4095  
DAVIDSON COUNTY  
 STATION: 26+20.00 -L-

SHEET 2 OF 2

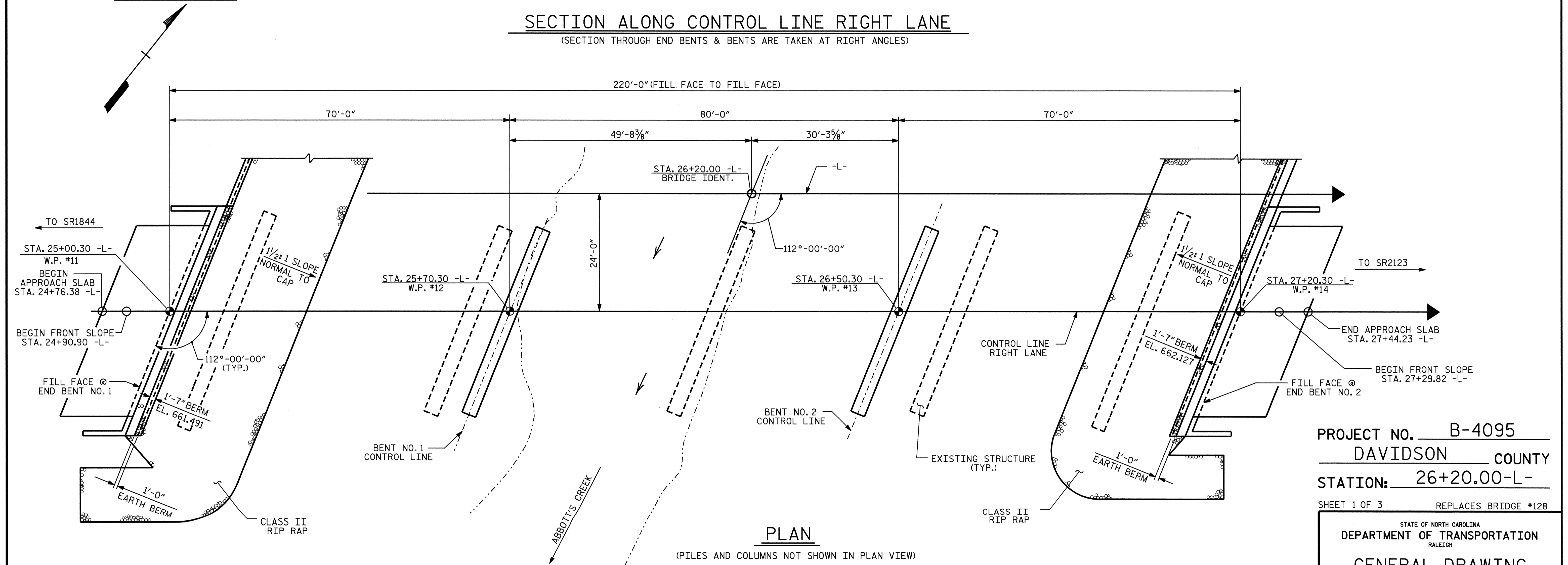
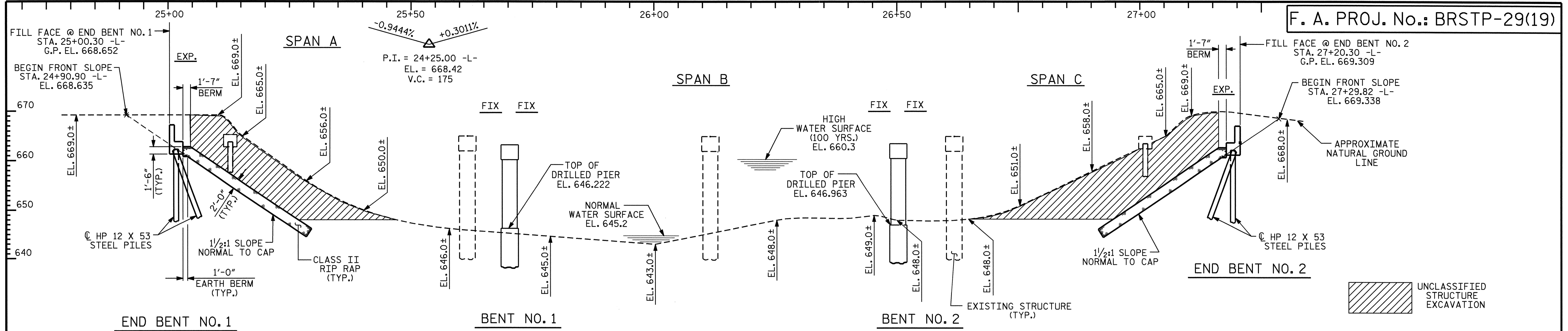
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD  
 BRIDGE APPROACH  
 SLAB DETAILS  
 LEFT LANE

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33	
1			3			TOTAL SHEETS	
2			4			69	



ASSEMBLED BY :	A.L. FIGUEROA	DATE :	11-08-06
CHECKED BY :	M.E. POOLE	DATE :	11-08-06
DRAWN BY :	FCJ 11/88	REV. 10/17/00	RWW/LES
CHECKED BY :	ARB 11/88	REV. 5/7/03	RWW/JTE
		REV. 5/1/06	TLA/GM



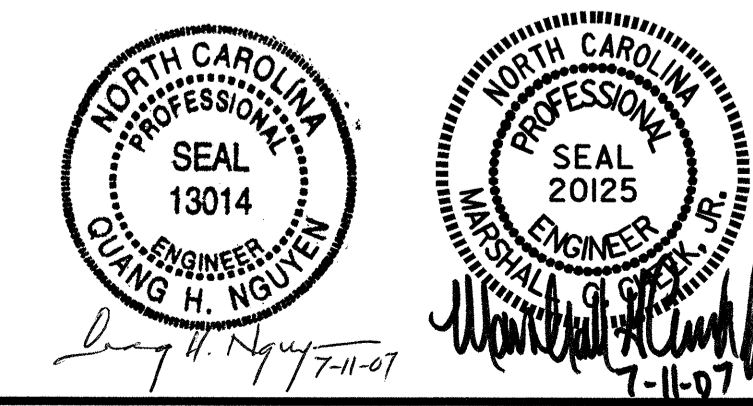
PROJECT NO. B-4095  
DAVIDSON COUNTY  
 STATION: 26+20.00-L-

SHEET 1 OF 3 REPLACES BRIDGE #128

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 BRIDGE ON US29/US70/I85BUS  
 OVER ABBOTT'S CREEK  
 BETWEEN SR1844 AND SR2123  
 RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34
1			3			TOTAL SHEETS
2			4			69

DRAWN BY: V. X. NGUYEN DATE: 8-19-05  
 CHECKED BY: L. L. MURPHY DATE: 10-05



**NOTES**

DRIVE PILES AT END BENT NO.1 TO A REQUIRED BEARING CAPACITY OF 100 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 IS 50 TONS PER PILE.

DRIVE PILES AT END BENT NO.2 TO A REQUIRED BEARING CAPACITY OF 100 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.2 IS 50 TONS PER PILE.

THE DRILLED PIERS AT BENT NO.1 ARE DESIGNED FOR BOTH SKIN FRICTION AND END BEARING. CHECK FIELD CONDITIONS FOR THE REQUIRED END BEARING CAPACITY OF 25 TONS/FT<sup>2</sup>.

THE DRILLED PIERS AT BENT NO.2 ARE DESIGNED FOR BOTH SKIN FRICTION AND END BEARING. CHECK FIELD CONDITIONS FOR THE REQUIRED END BEARING CAPACITY 40 TONS/FT<sup>2</sup>.

DRILLED PIERS AT BENT NO.1 ARE DESIGNED FOR AN APPLIED LOAD OF 232 TONS EACH AT THE TOP OF THE COLUMN.

DRILLED PIERS AT BENT NO.2 ARE DESIGNED FOR AN APPLIED LOAD OF 232 TONS EACH AT THE TOP OF THE COLUMN.

PERMANENT STEEL CASING MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO.1 IF REQUIRED, DO NOT EXTEND THE CASING BELOW ELEVATION 634.0 FT. WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT STEEL CASING. SEE DRILLED PIERS SPECIAL PROVISION.

PERMANENT STEEL CASING IS NOT REQUIRED FOR DRILLED PIERS AT BENT NO.2.

DRILLED PIERS AT BENT NO.1 SHALL EXTEND TO AN ELEVATION NO HIGHER THAN 626.0 FT. AND SATISFY THE REQUIRED END BEARING CAPACITY.

DRILLED PIERS AT BENT NO.2 SHALL EXTEND TO AN ELEVATION NO HIGHER THAN 614.0 FT. AND SATISFY THE REQUIRED END BEARING CAPACITY.

THE SCOUR CRITICAL ELEVATION FOR BENT NO.1 IS ELEVATION 632.0 FT. THE SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

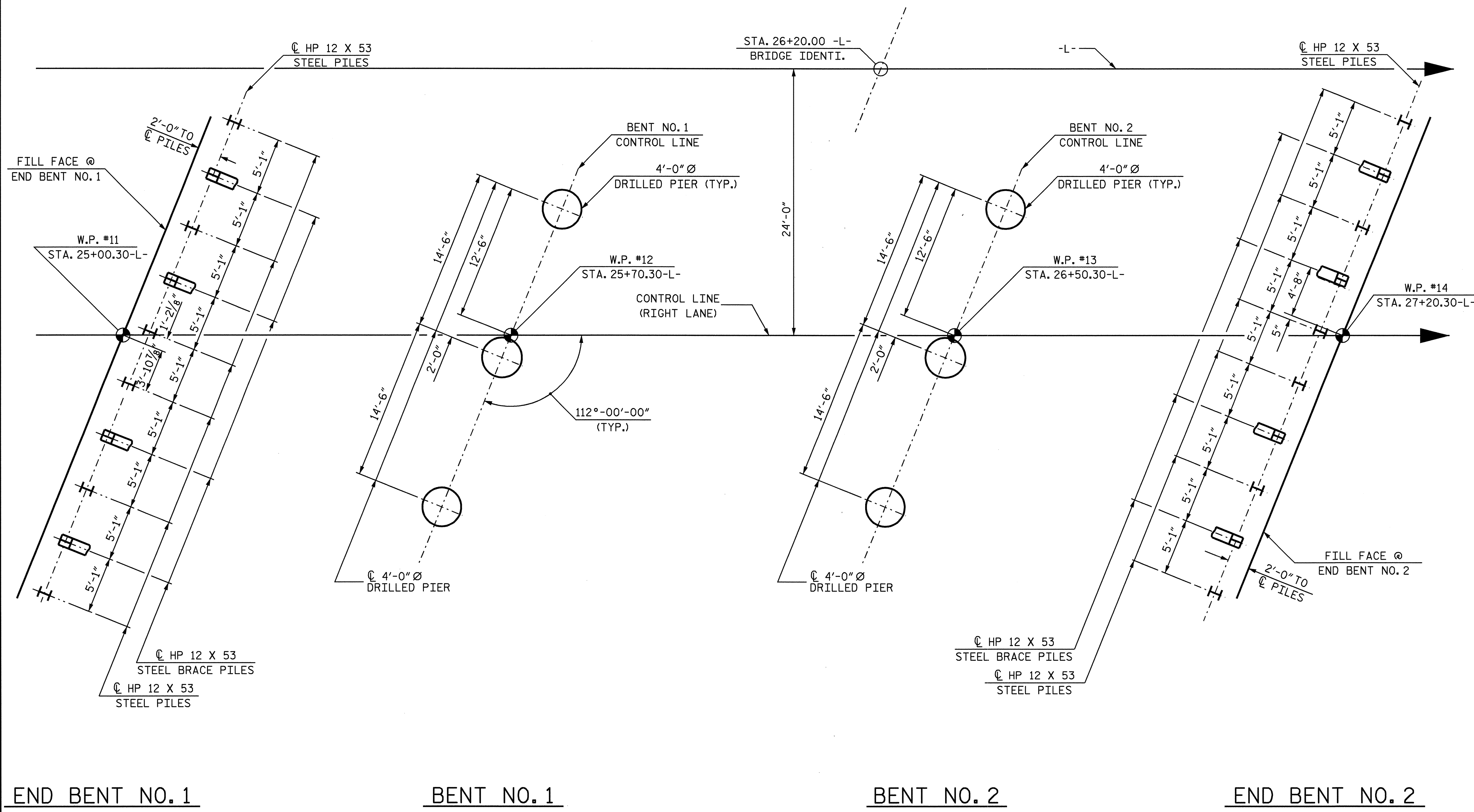
THE SCOUR CRITICAL ELEVATION FOR BENT NO.2 IS 621.0 FT. THE SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

FOR DRILLED PIERS, SEE DRILLED PIER SPECIAL PROVISION.

SPT TESTING MAY BE REQUIRED TO DETERMINE THE END BEARING CAPACITY OF THE DRILLED PIERS AT BENT NO.1 AND BENT NO.2.

SID INSPECTIONS MAY BE REQUIRED TO INSPECT THE BOTTOM CLEANLINESS OF THE DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SID INSPECTIONS. SEE DRILLED PIERS SPECIAL PROVISION.

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



PROJECT NO. B-4095  
DAVIDSON COUNTY  
 STATION: 26+20.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 BRIDGE ON US29/US70/I85 BUS  
 OVER ABBOTTS CREEK  
 BETWEEN SR 1844 AND SR 2123  
 RIGHT LANE



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-35
1			3			TOTAL SHEETS
2			4			69

**FOUNDATION LAYOUT**

ALL PILES IN END BENT ARE HP 12 X 53 STEEL PILES

ALL END BENT BRACE PILES ARE BATTERED AT 3:12

DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTER LINE AT THE BOTTOM OF THE CAP.

DRAWN BY : A.L. FIGUEROA DATE : 4-03-07  
 CHECKED BY : D. HODGE DATE : 5-10-07

# TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS	REMOVAL OF EXISTING STRUCTURE	4'-0" DIA. DRILLED PIER IN SOIL	4'-0" DIA. DRILLED PIER NOT IN SOIL	PERMANENT STEEL CASING FOR 4'-0" DIA. DRILLED PIER	SID INSPECTION	SPT TESTING	CROSSHOLE SONIC LOGGING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDERS	HP 12 X 53 STEEL PILES	CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE	ELASTOMERIC BEARINGS	EVAZOTE JOINT SEALS		
	LUMP SUM	LUMP SUM	LIN.FT.	LIN.FT.	LIN.FT.	EA.	EA.	EA.	CU.YDS.	SQ.FT.	SQ.FT.	CU.YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN.FT.	NO.	LIN.FT.	LIN.FT.	TONS	SQ.YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE										8547	8708		LUMP SUM			15	1072.50			435.52			LUMP SUM	LUMP SUM
END BENT NO.1									520			28.9		4529			10	300			491	546		
BENT NO.1			36.75	24.00	36.67		1					37.0		11268	2584									
BENT NO.2			75.00	24.00			1					36.5		13610	3479									
END BENT NO.2									730			28.9		4537			10	500			532	591		
TOTAL	LUMP SUM	LUMP SUM	111.75	48.00	36.67	2	2	1	1250	8547	8708	131.3	LUMP SUM	33944	6063	15	1072.50	20	800	435.52	1023	1137	LUMP SUM	LUMP SUM

## NOTES

ASSUMED LIVE LOAD = HS20 OR ALTERNATE LOADING, EXCEPT THESE GIRDERS HAVE BEEN DESIGNED FOR HS25.

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

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

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

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

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

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

THE 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 ARTICLES 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.

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

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.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS.

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

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

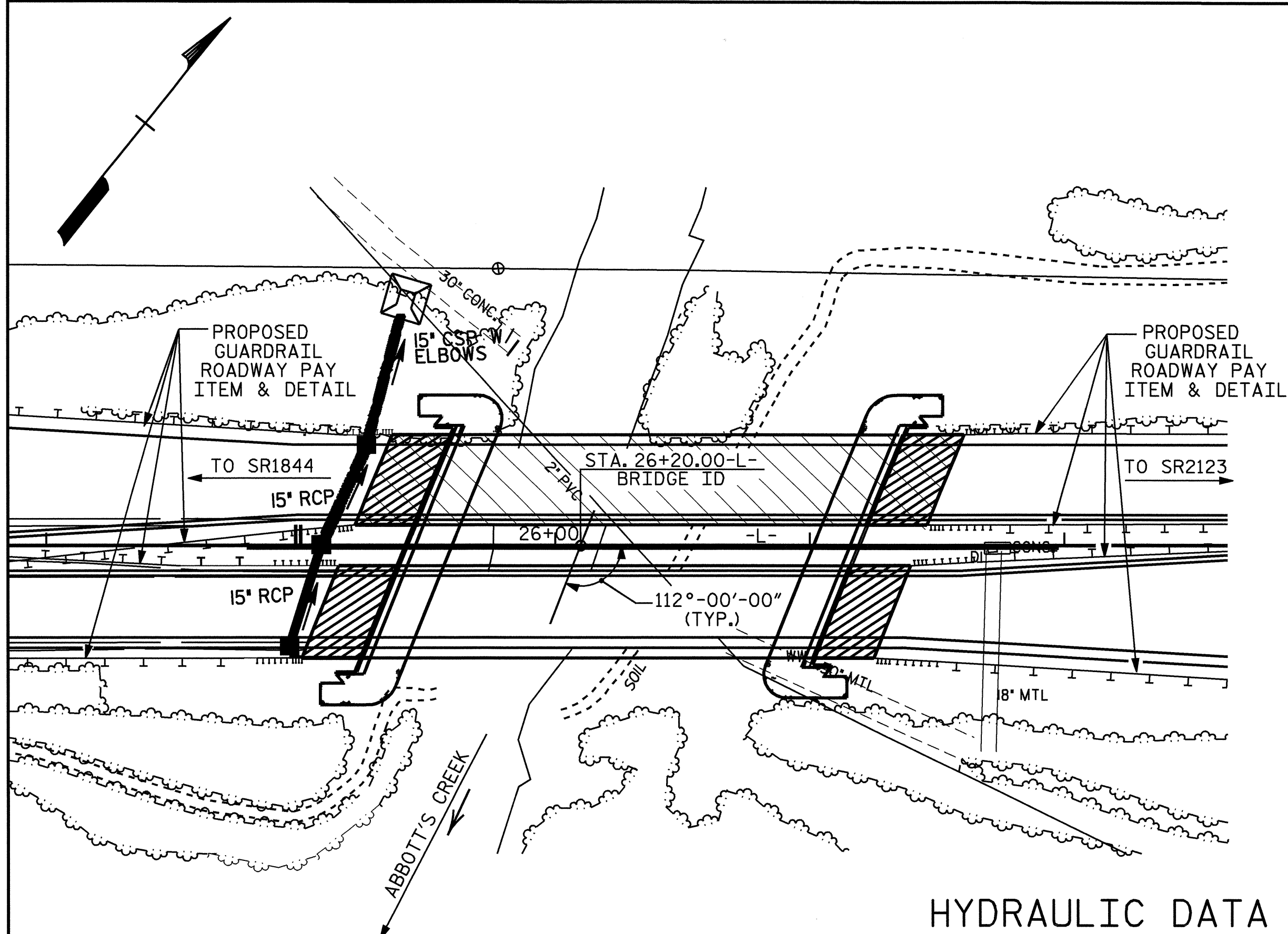
FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

THE EXISTING 4 SPAN STRUCTURE (4 @ 50') CONSISTING OF A 7" CONCRETE DECK WITH A 5/2" ASPHALT WEARING SURFACE ON 4 LINES OF REINFORCED CONCRETE DECK GIRDERS SPACED AT 8'-6" CENTERS. ON A SUBSTRUCTURE CONSISTING OF A REINFORCED CONCRETE CAP AT END BENT #1, REINFORCED CONCRETE CAP ON STEEL PILES AT END BENT #2 AND REINFORCED CONCRETE POST AND WEB BENTS AND LOCATED AT THE SITE OF THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POST FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA OF SHEET S-1 SHALL BE EXCAVATED FOR A DISTANCE OF 50 FT. RIGHT SIDE OF CENTERLINE -L- ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE MEASURED AND PAID FOR AT THE CONTRACT UNIT PRICE PER CUBIC YARD FOR UNCLASSIFIED STRUCTURE EXCAVATION.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

B.M. #1: RR SPIKE SET IN BASE OF 18" MAPLE 35' RT. OF NORTH EDGE OF SB US 29/70 BUS. 85 -BL-STA. 12+62.00 70' LT. EL. 689.33



## HYDRAULIC DATA

DESIGN DISCHARGE	=	8,500 C.F.S.
FREQUENCY OF DESIGN FLOOD	=	50 YRS.
DESIGN HIGH WATER ELEVATION	=	659.6
DRAINAGE AREA	=	70.7 SQ. MI.
BASIC DISCHARGE (Q100)	=	10,600 C.F.S.
BASIC HIGH WATER ELEVATION	=	660.0

## OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	=	30,200 C.F.S.
FREQUENCY OF OVERTOPPING FLOOD	=	500 YRS.
OVERTOPPING FLOOD ELEVATION	=	668.1

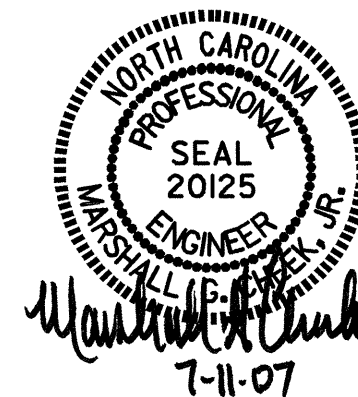
## LOCATION SKETCH

SEE STR. #1  
FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIFICATIONS.

PROJECT NO. B-4095  
DAVIDSON COUNTY  
STATION: 26+20.00-L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
**GENERAL DRAWING**  
BRIDGE ON US29/US70/I85BUS  
OVER ABBOTT'S CREEK  
BETWEEN SR1844 AND SR2123  
RIGHT LANE

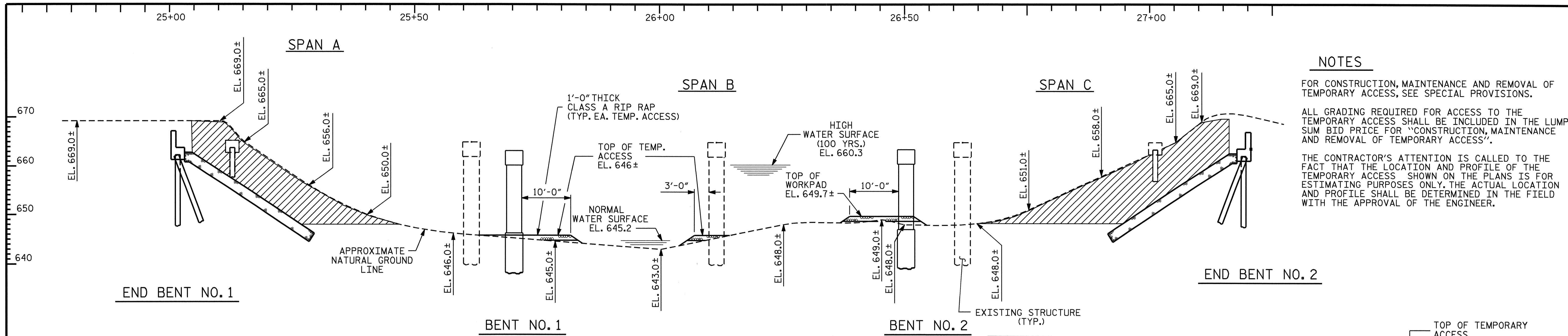


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-36
1			3			TOTAL SHEETS 69
2			4			

DRAWN BY : V. X. NGUYEN DATE : 8-29-05  
CHECKED BY : L.L. MURPHY DATE : 10-05

10-JUL-2007 14:31  
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dahodge

STR. #2



**NOTES**

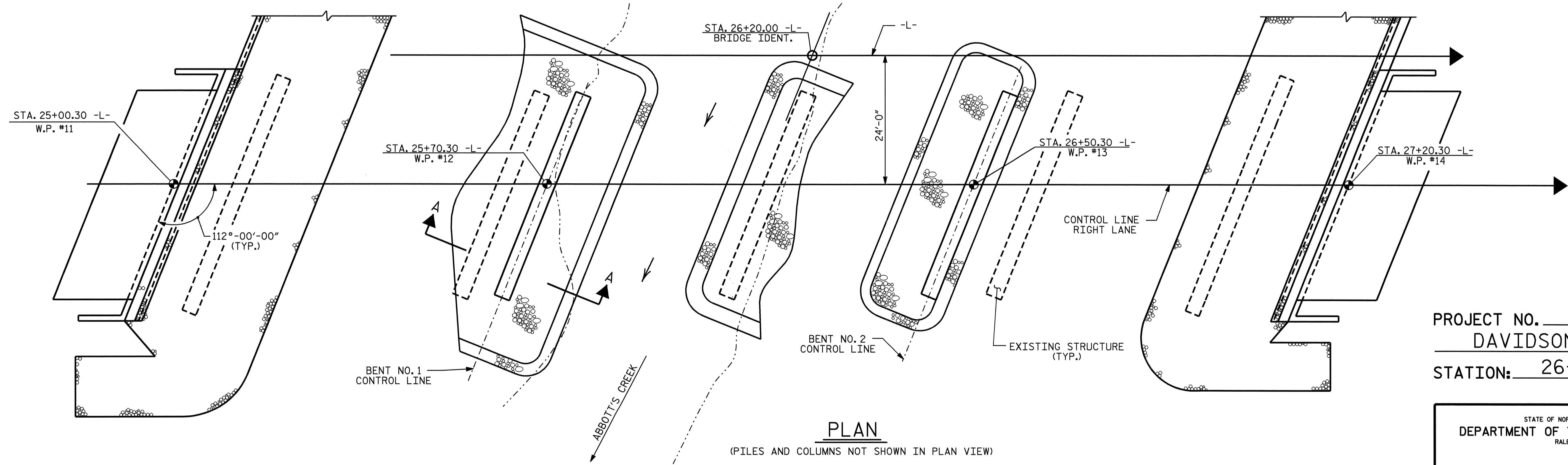
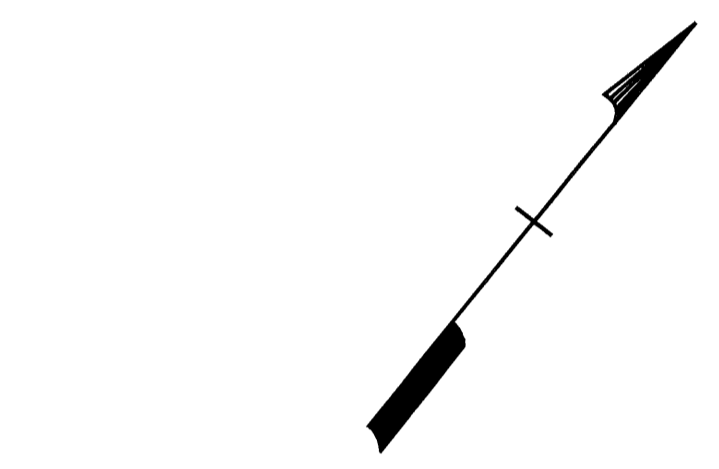
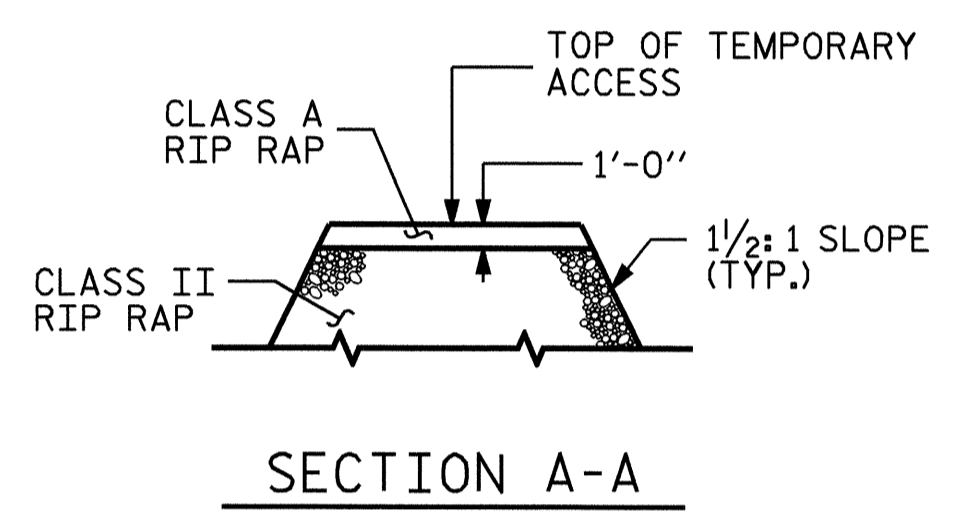
FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS, SEE SPECIAL PROVISIONS.

ALL GRADING REQUIRED FOR ACCESS TO THE TEMPORARY ACCESS SHALL BE INCLUDED IN THE LUMP SUM BID PRICE FOR "CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS".

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LOCATION AND PROFILE OF THE TEMPORARY ACCESS SHOWN ON THE PLANS IS FOR ESTIMATING PURPOSES ONLY. THE ACTUAL LOCATION AND PROFILE SHALL BE DETERMINED IN THE FIELD WITH THE APPROVAL OF THE ENGINEER.

**SECTION ALONG CONTROL LINE RIGHT LANE**  
 (SECTION THROUGH END BENTS & BENTS ARE TAKEN AT RIGHT ANGLES)

UNCLASSIFIED STRUCTURE EXCAVATION



**PLAN**  
 (PILES AND COLUMNS NOT SHOWN IN PLAN VIEW)

PROJECT NO. B-4095  
DAVIDSON COUNTY  
 STATION: 26+20.00-L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**TEMPORARY ACCESS  
 RIGHT LANE**

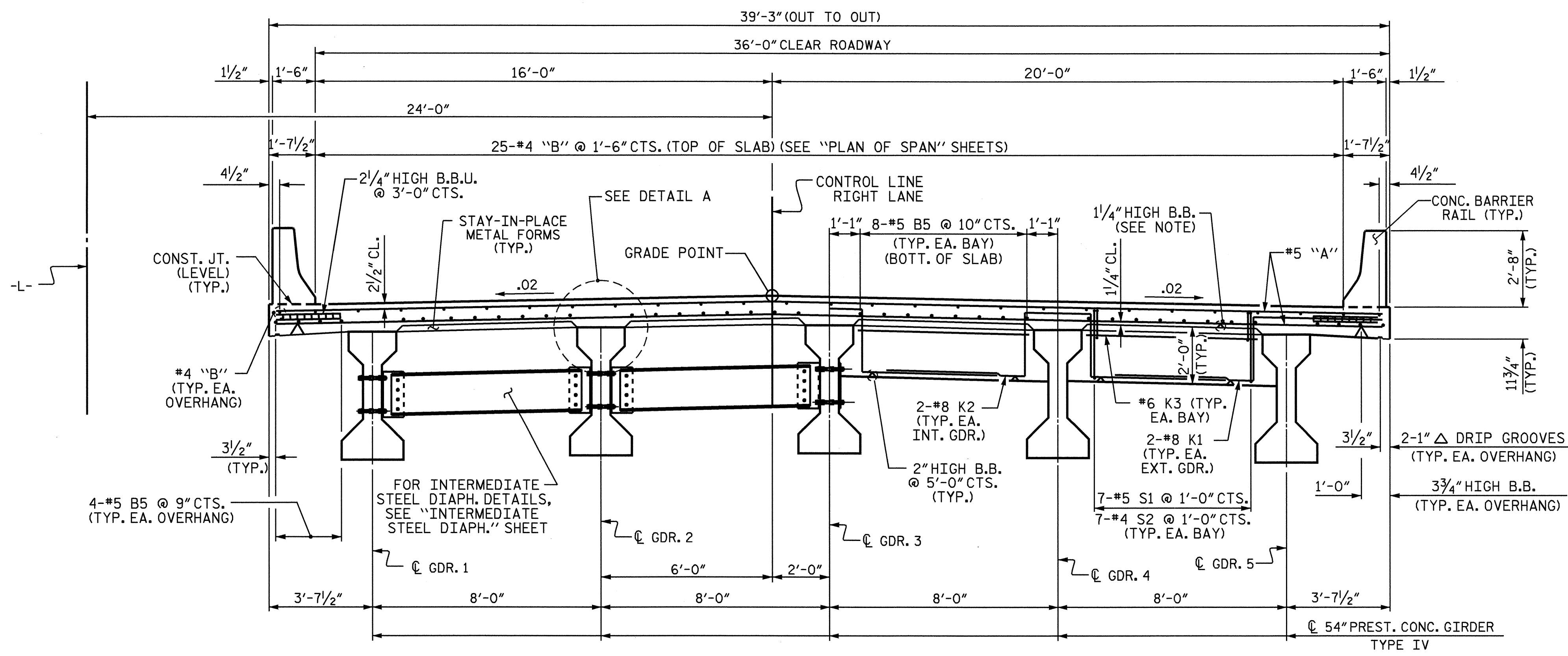
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S-37  
 TOTAL SHEETS 69



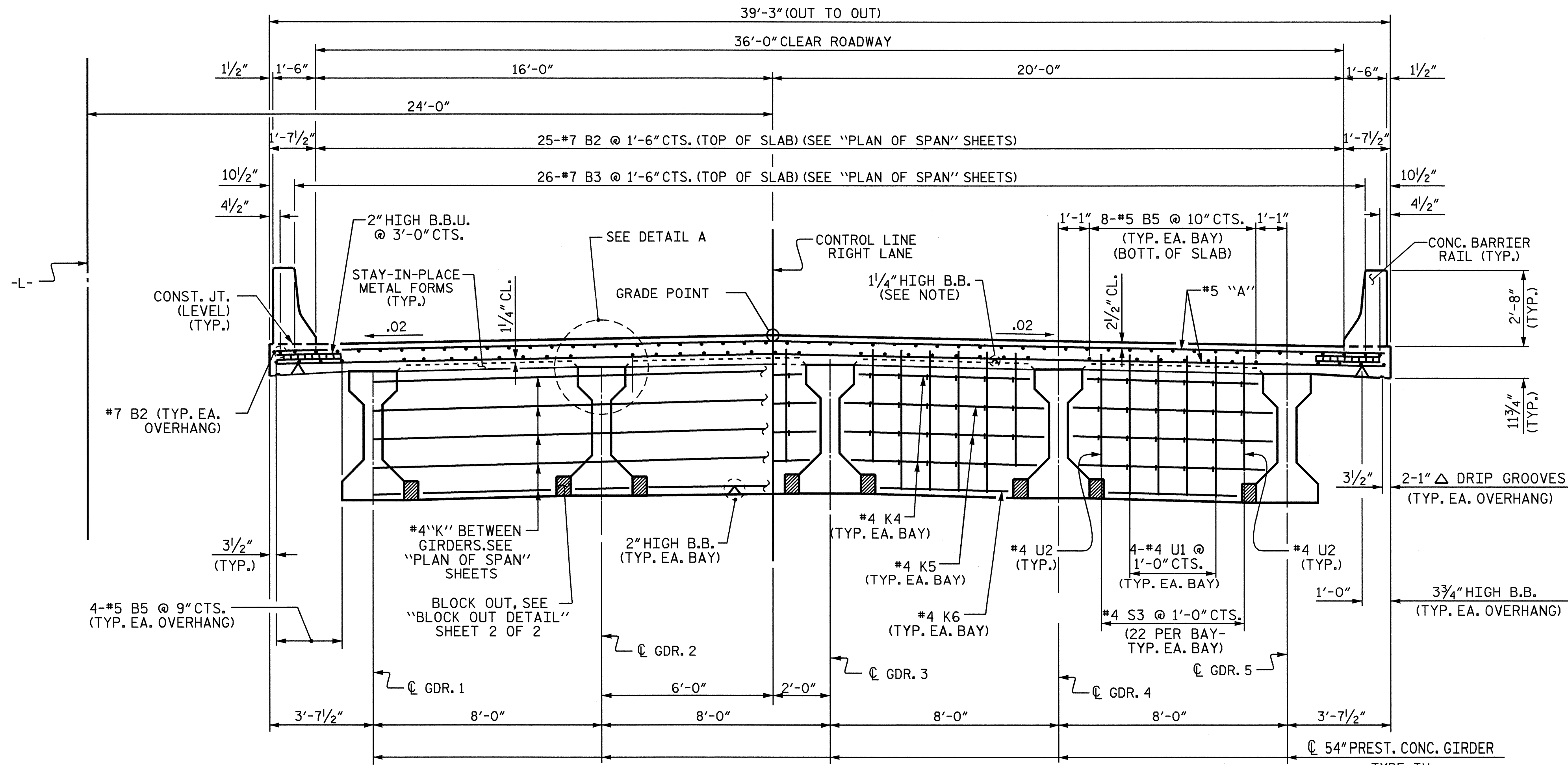
DRAWN BY: V. X. NGUYEN/DAH DATE: 5/07  
 CHECKED BY: M.G. CHEEK DATE: 5/07

10-JUL-2007 17:26  
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 dahodge

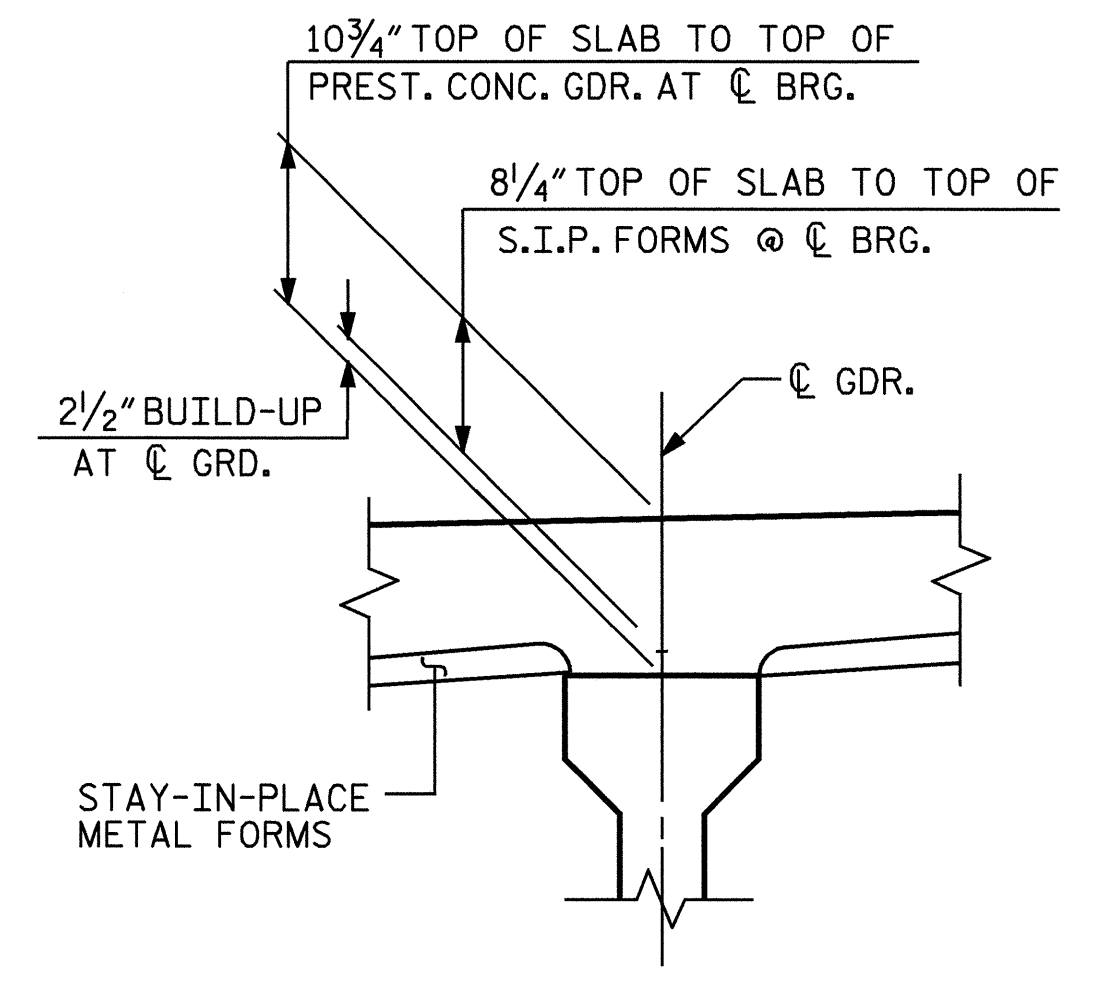


**TYPICAL HALF SECTION**  
(SHOWING INTERMEDIATE STEEL DIAPHRAGMS)

**TYPICAL HALF SECTION**  
(SHOWING END BENT DIAPHRAGMS)



**TYPICAL SECTION**  
(SHOWING CONTINUOUS BENT DIAPHRAGMS)



**DETAIL A**

**NOTES**

PROVIDE 1 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.

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.

PROJECT NO. B-4095  
DAVIDSON COUNTY  
STATION: 26+20.00-L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

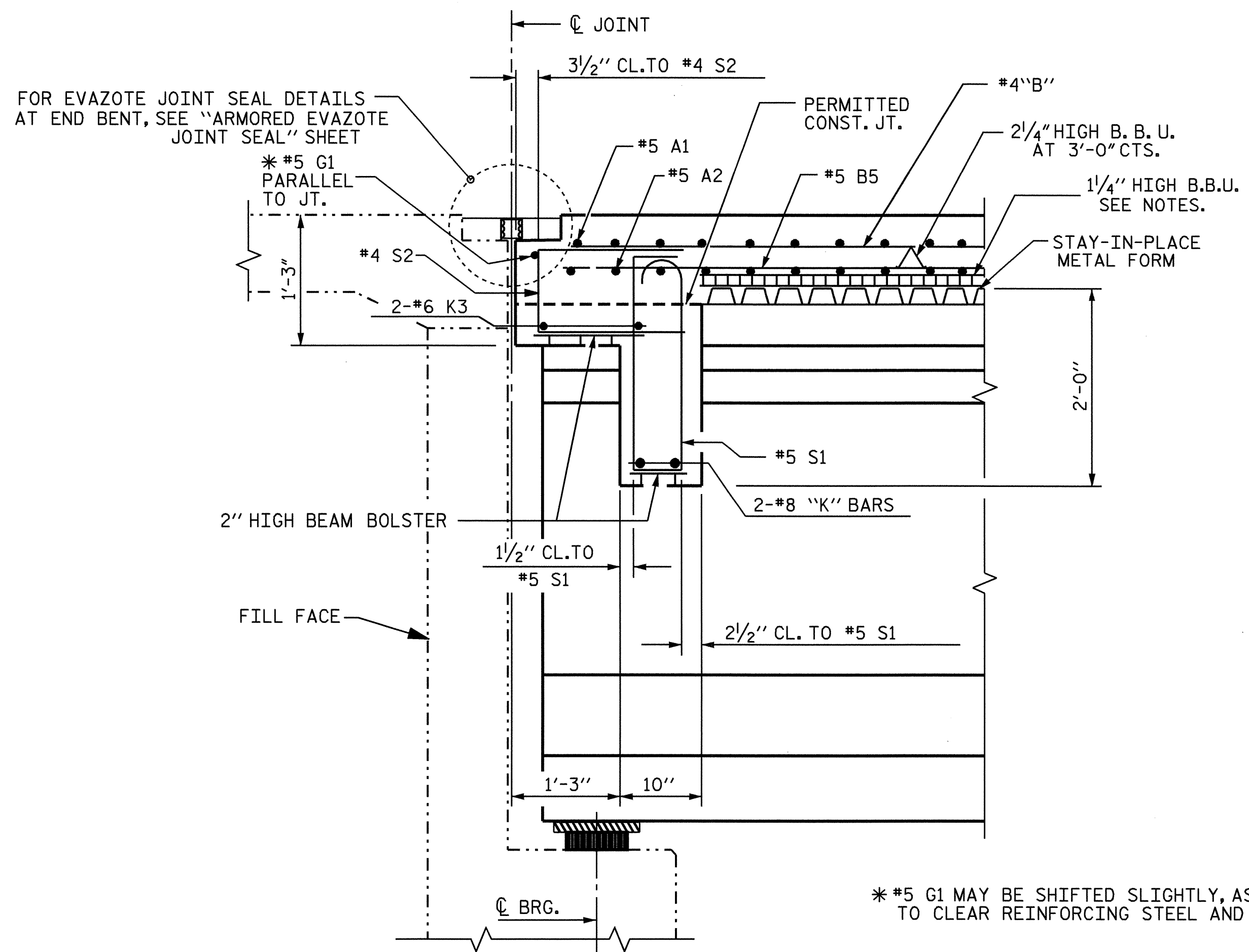
SUPERSTRUCTURE  
TYPICAL SECTIONS  
RIGHT LANE



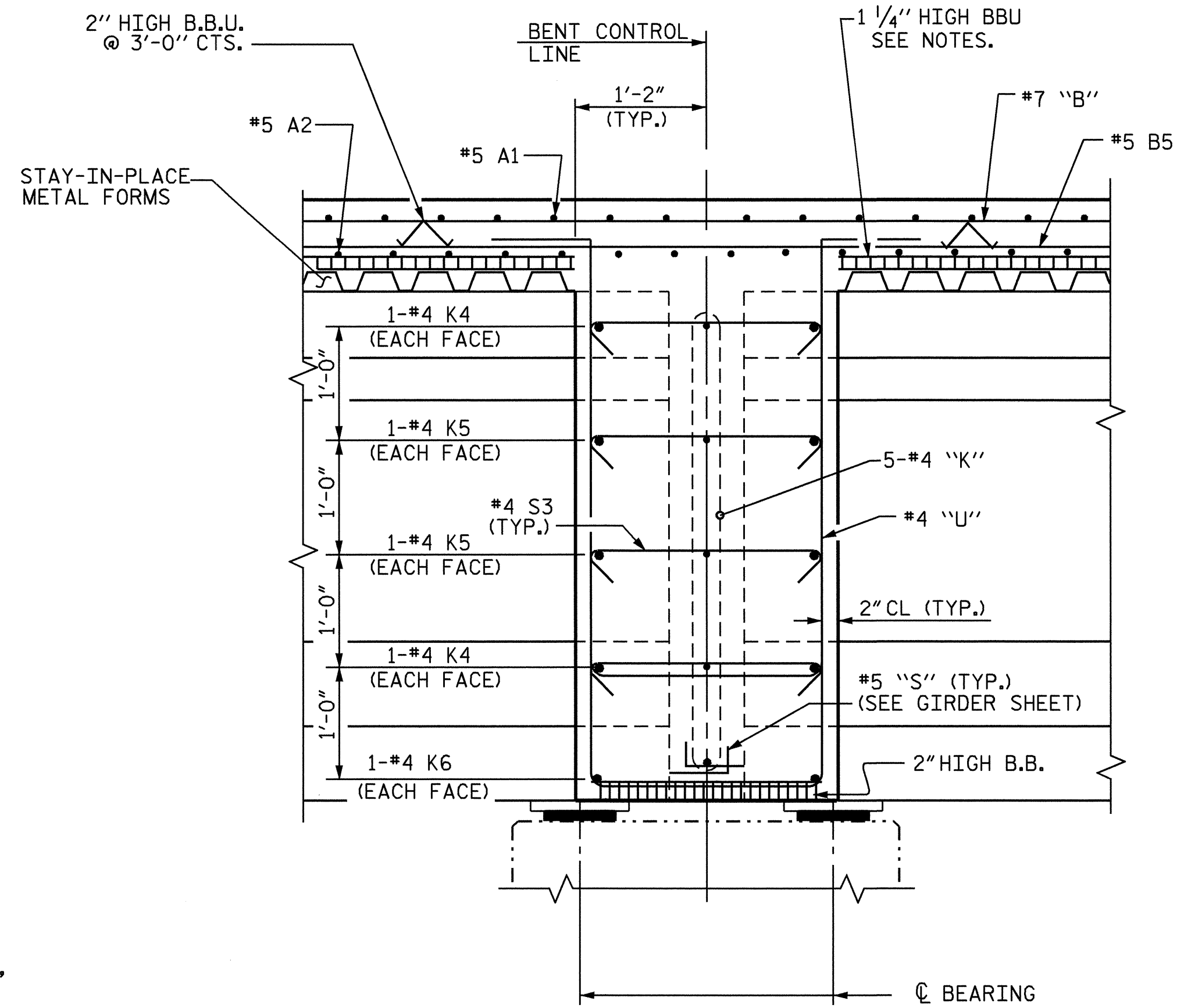
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-38
1			3			TOTAL SHEETS
2			4			69

DRAWN BY: V. X. NGUYEN DATE: 2-13-06  
CHECKED BY: M.G. CHEEK DATE: 2-07

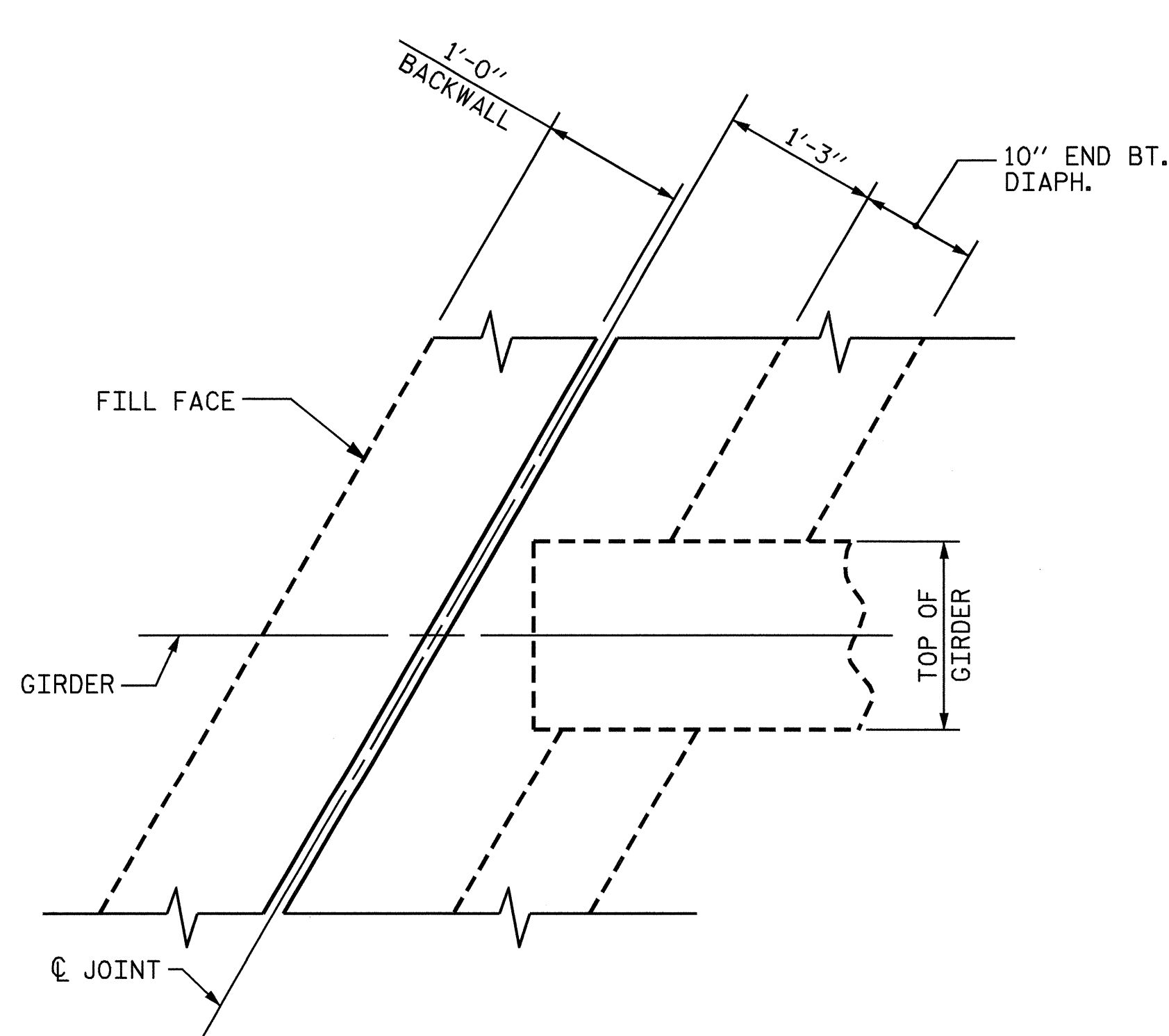
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vnguyen



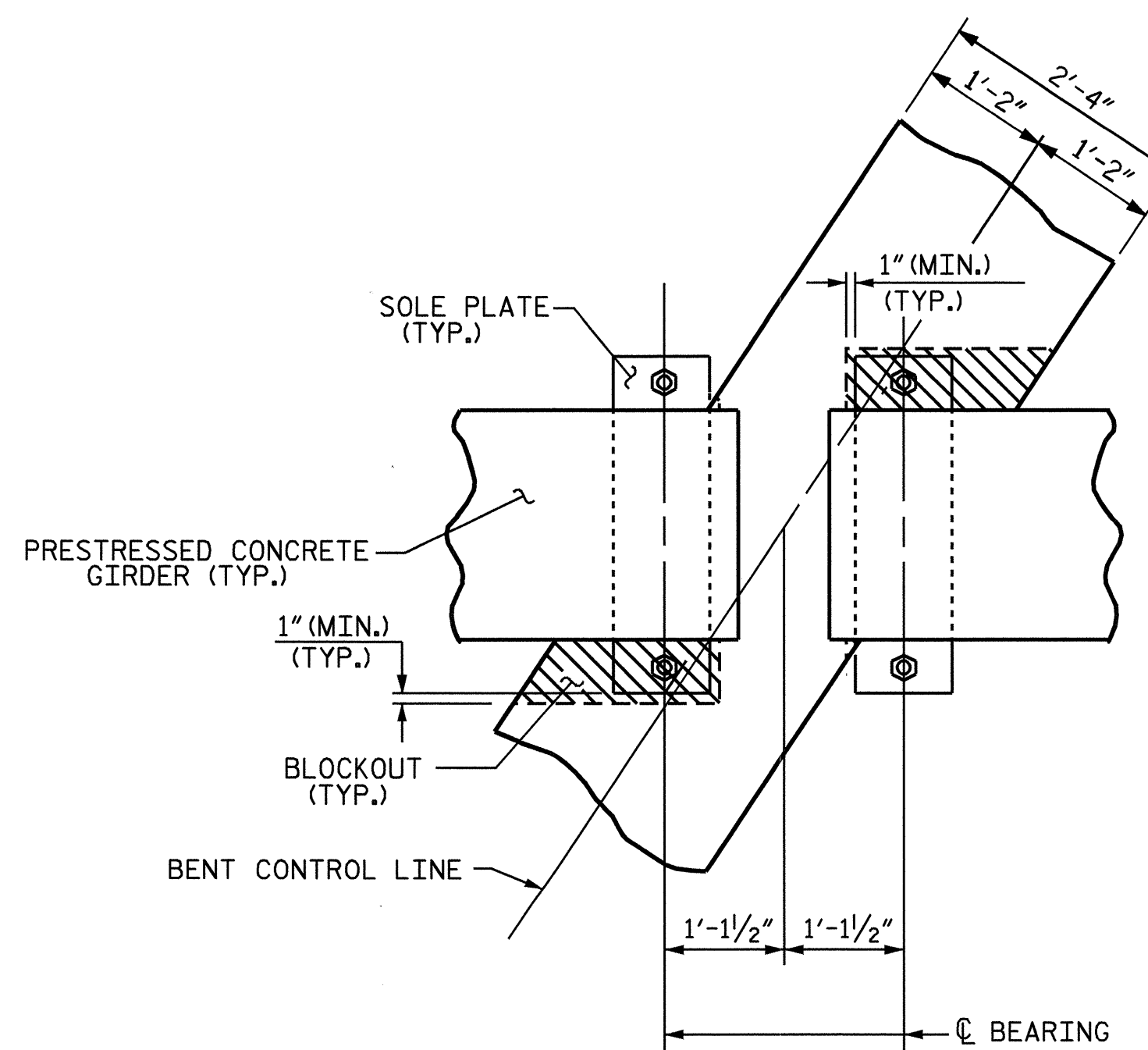
SECTION THRU END BENT DIAPHRAGM



SECTION THRU CONTINUOUS BENT DIAPHRAGM

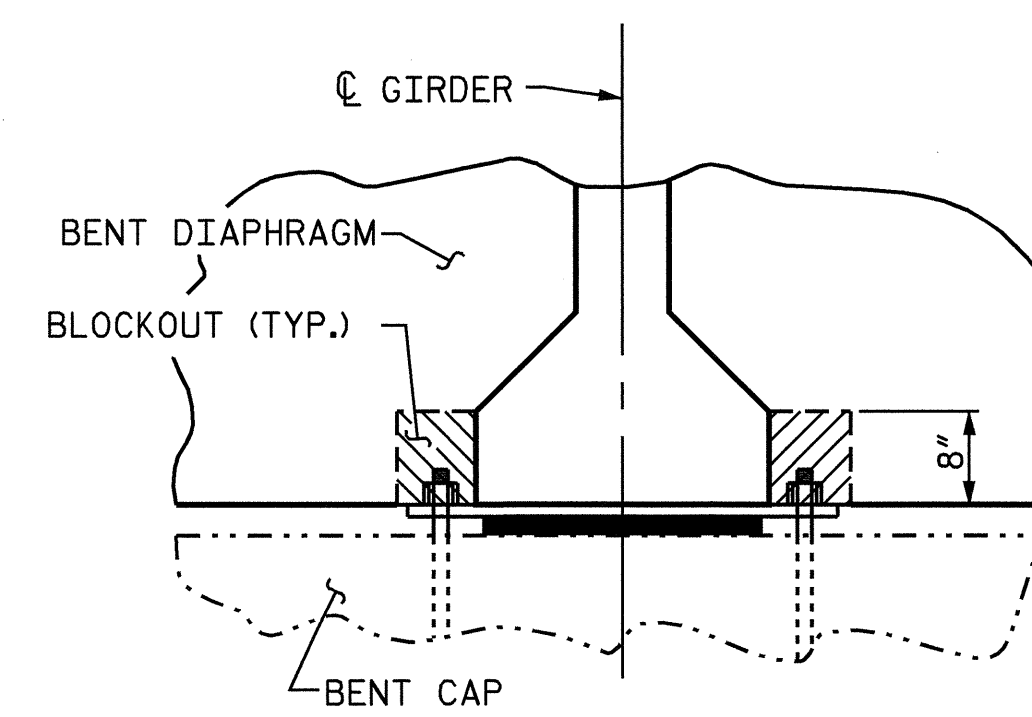


PLAN OF END BENT DIAPHRAGM



PLAN

BENT DIAPHRAGM BLOCK-OUT DETAIL



SECTION

PROJECT NO. B-4095  
DAVIDSON COUNTY  
 STATION: 26+20.00-L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 TYPICAL SECTIONS  
 RIGHT LANE



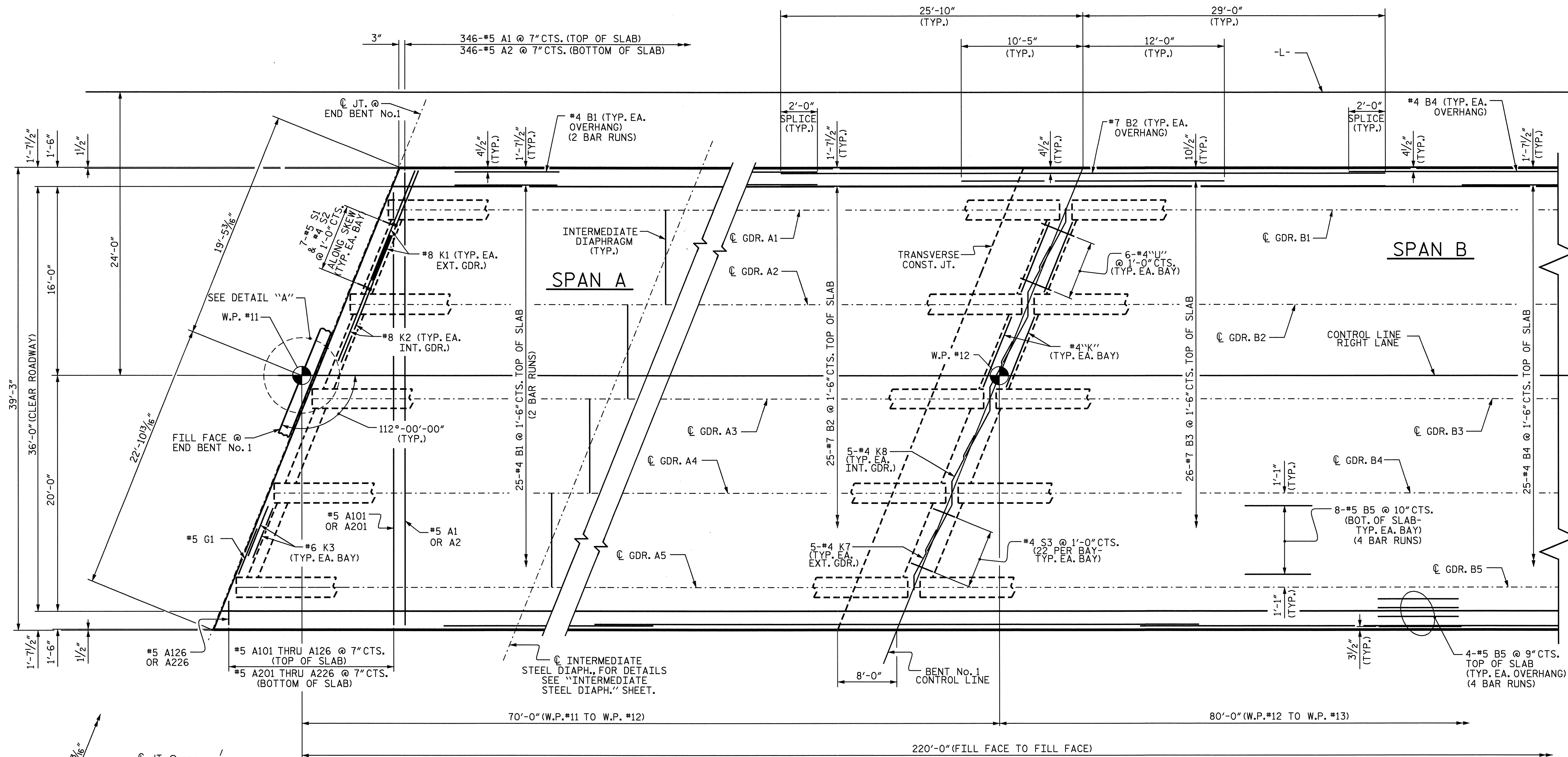
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-39
1			3			TOTAL SHEETS
2			4			69

DRAWN BY: V. X. NGUYEN DATE: 2-13-06  
 CHECKED BY: M.G. CHEEK DATE: 2-07

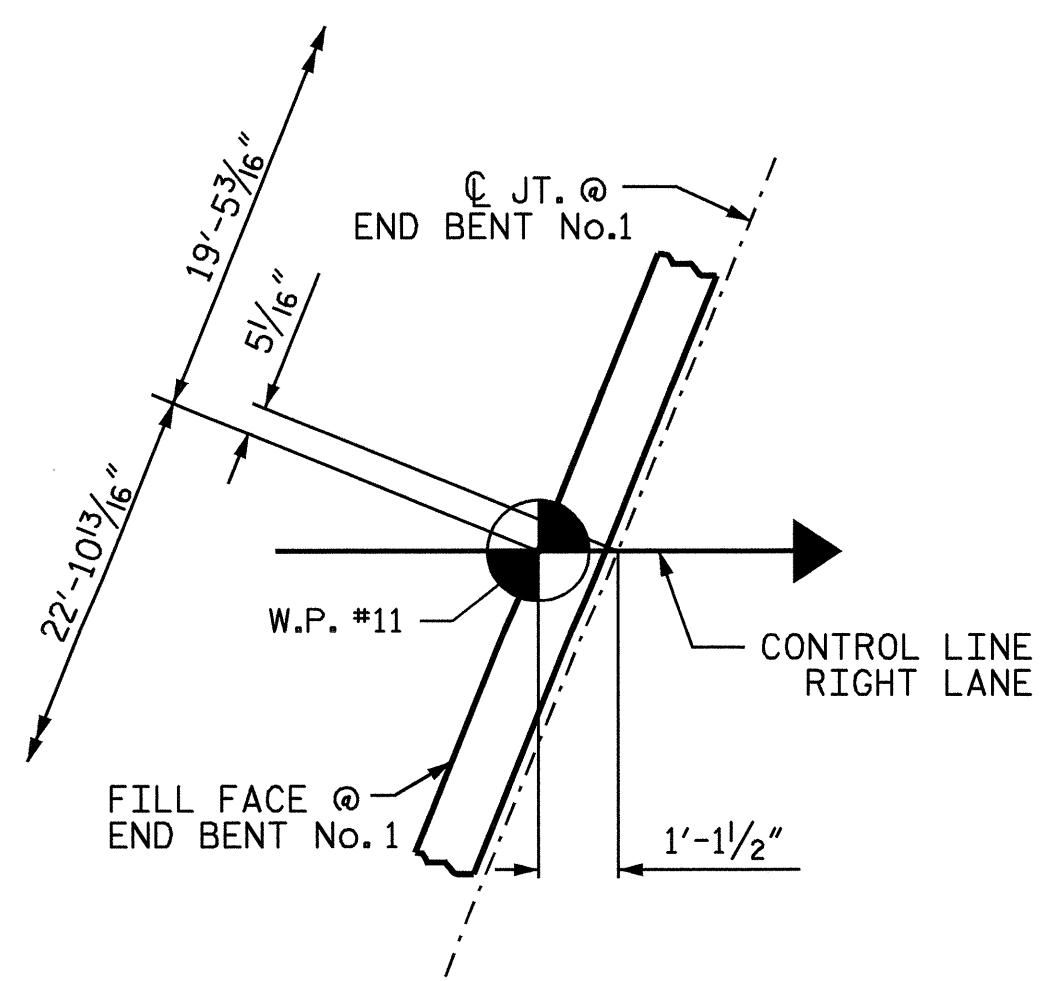
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 vnguyen

STR. #2





PLAN OF SPANS A & B



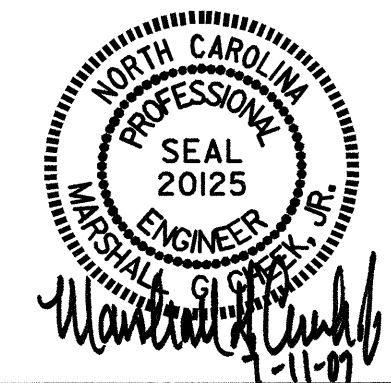
DETAIL "A"

PROJECT NO. B-4095  
DAVIDSON COUNTY  
 STATION: 26+20.00-L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 PLAN OF SPANS A & B  
 RIGHT LANE



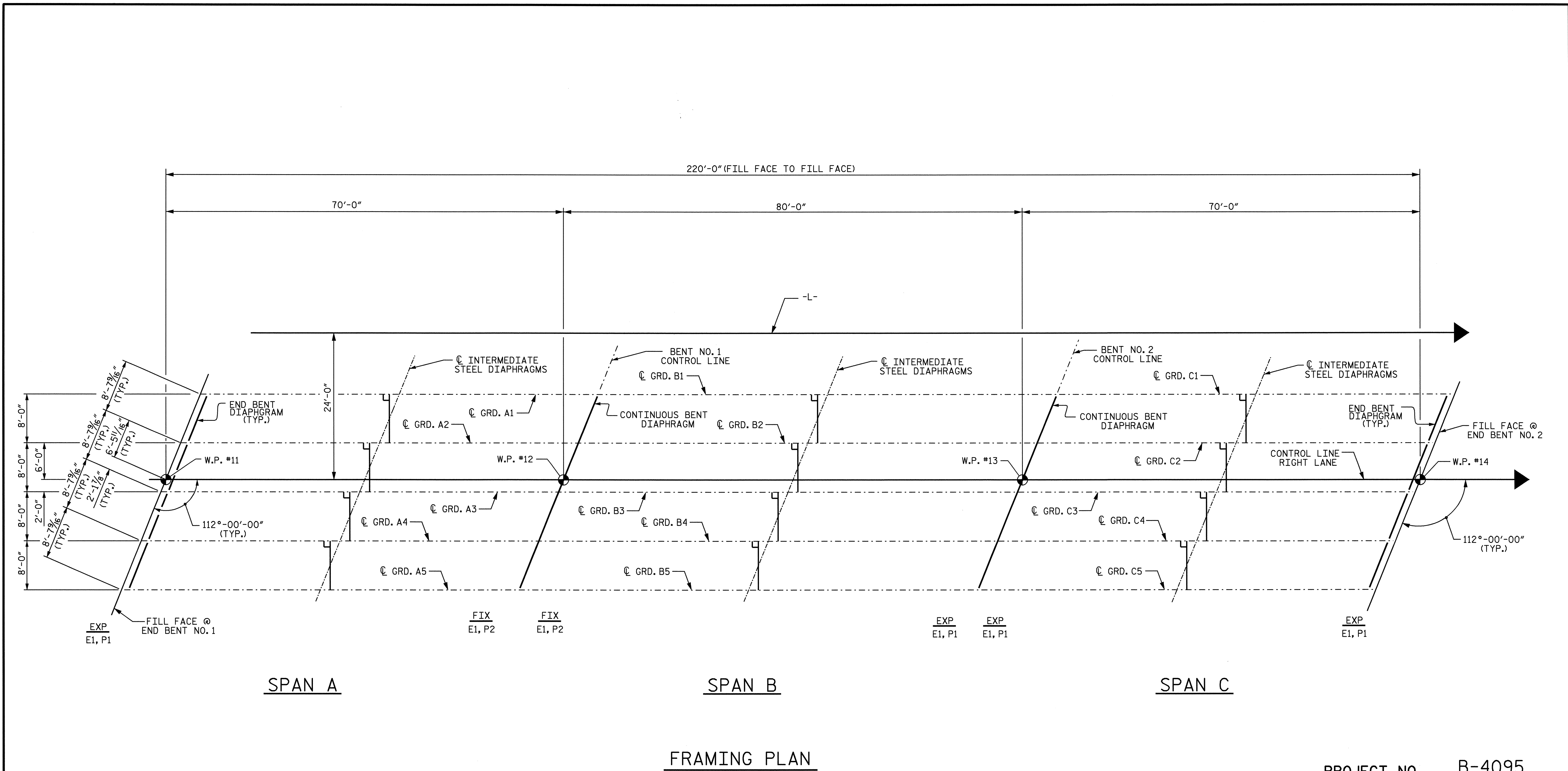
DRAWN BY: V.X. NGUYEN DATE: 10-10-06  
 CHECKED BY: M.G. CHEEK DATE: 2-07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-40
1			3			TOTAL SHEETS 69
2			4			

23-MAY-2007 09:31  
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 vnguyen

STR. #2





SPAN A

SPAN B

SPAN C

FRAMING PLAN

PROJECT NO. B-4095  
DAVIDSON COUNTY  
 STATION: 26+20.00-L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 FRAMING PLAN  
 RIGHT LANE

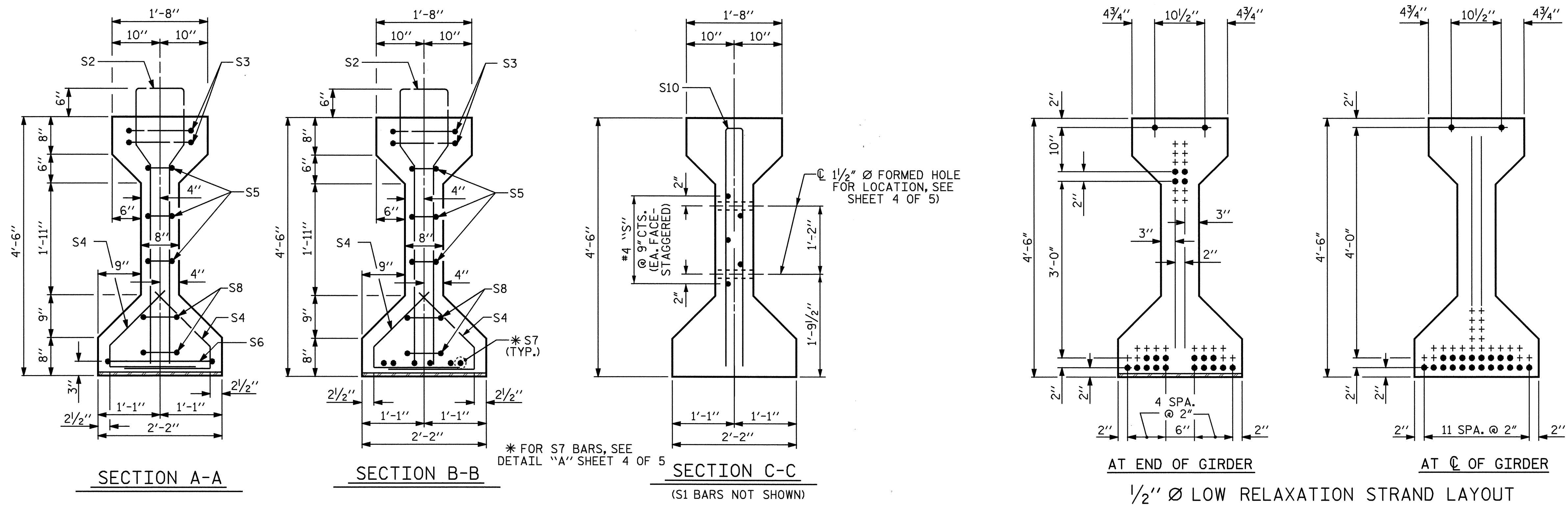


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 CHECKED BY: M.G. CHEEK DATE: 2-07

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 vnguyen

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-42
1			3			TOTAL SHEETS
2			4			69

STR. #2 NC006



1/2" Ø L. R. GRADE 270 STRANDS

AREA (SQ. INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.153	41,300	30,980

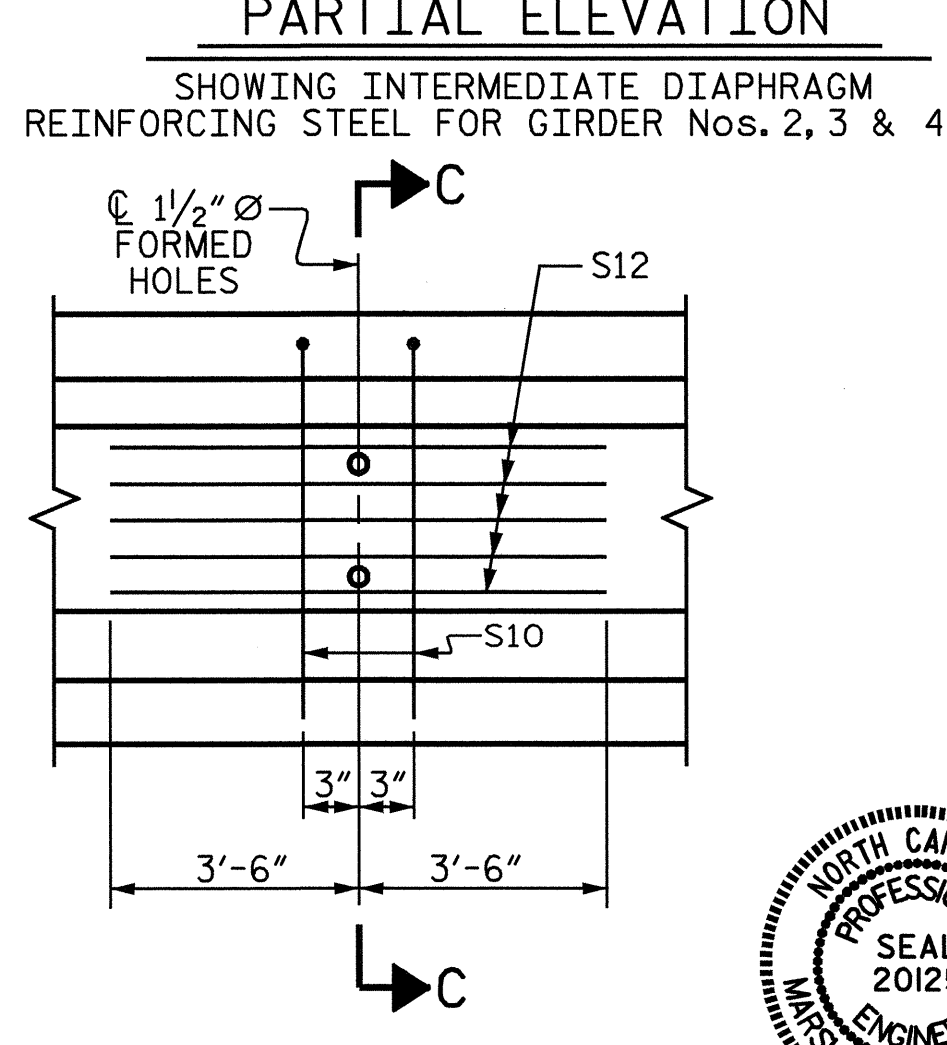
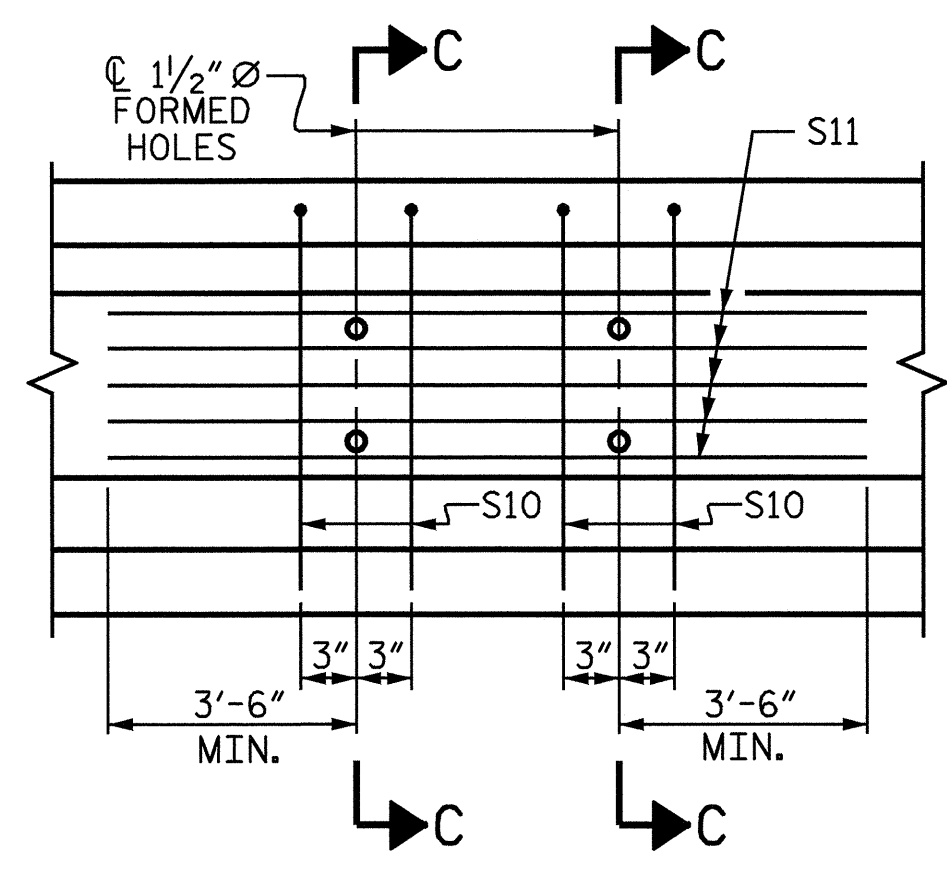
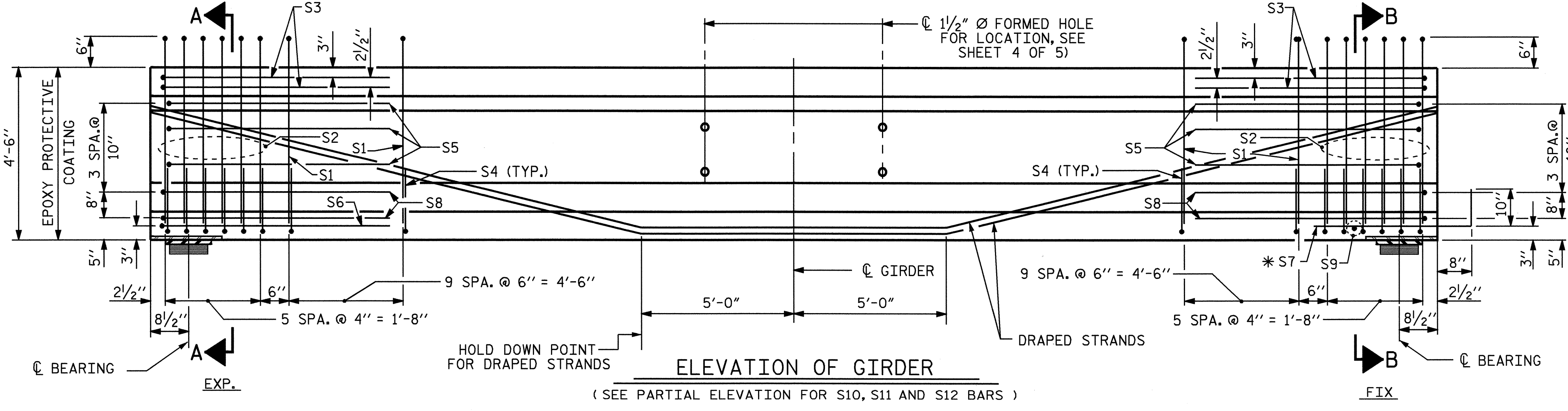
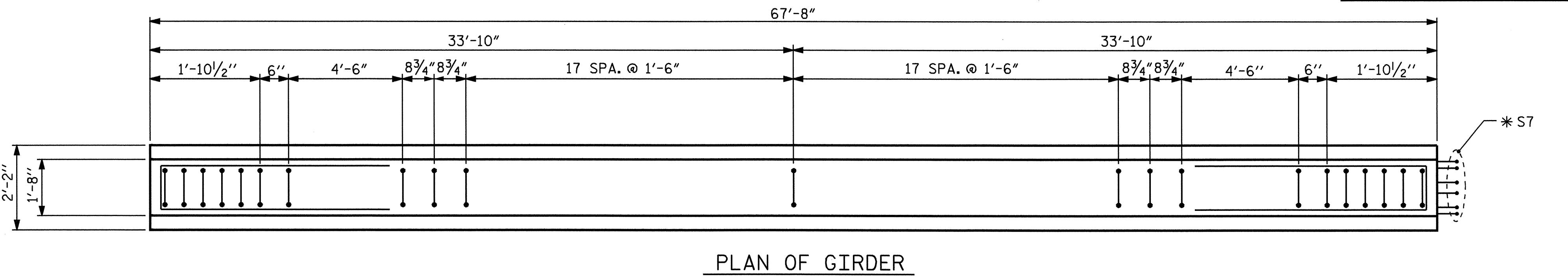
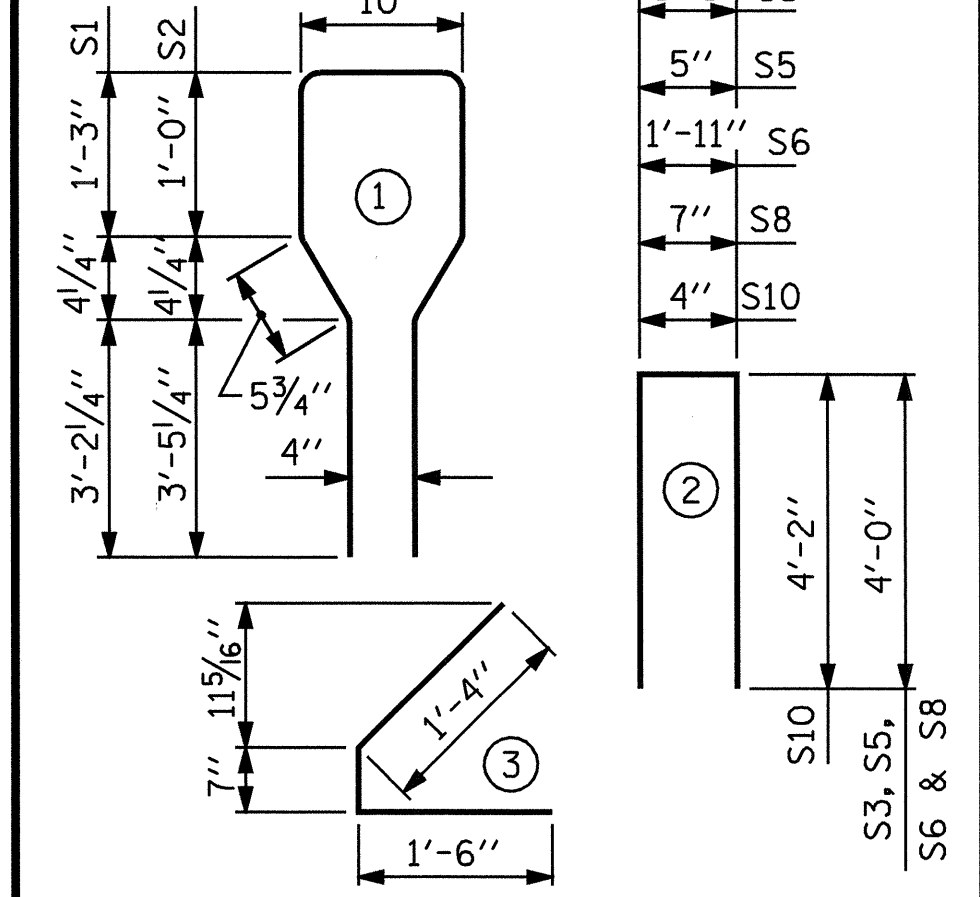
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	57	#4	1	10'-8"	406
S2	12	#6	1	10'-8"	192
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34
S6	1	#4	2	9'-11"	7
* S7	6	#5	STR	3'-8"	23
S8	4	#4	2	8'-7"	23
S9	1	#3	STR	1'-10"	1
INTERIOR GDR. S10	4	#5	2	8'-8"	36
EXTERIOR GDR. S10	2	#5	2	8'-8"	18
INTERIOR GDR. S11	5	#4	STR	10'-3"	34
EXTERIOR GDR. S12	5	#4	STR	7'-0"	23

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

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	5,000 PSI CONCRETE	1/2" Ø L.R. STRANDS
	LB.	C.Y.	No.
INTERIOR GIRDER	926	13.7	22
EXTERIOR GIRDER	897	13.7	22

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	67'-8"	338.33'

PROJECT NO. B-4095  
 DAVIDSON COUNTY  
 STATION: 26+20.00-L-

SHEET 1 OF 5

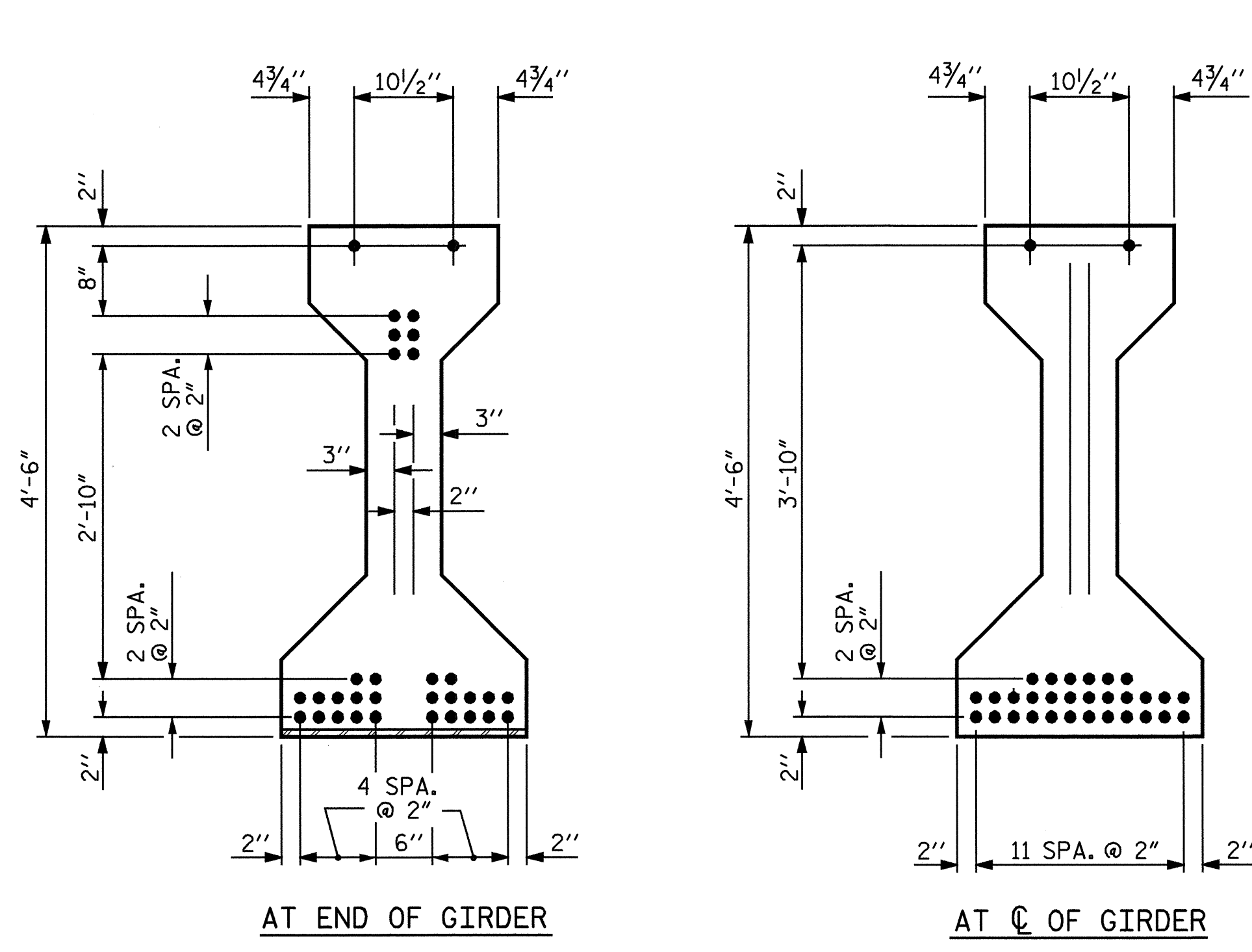
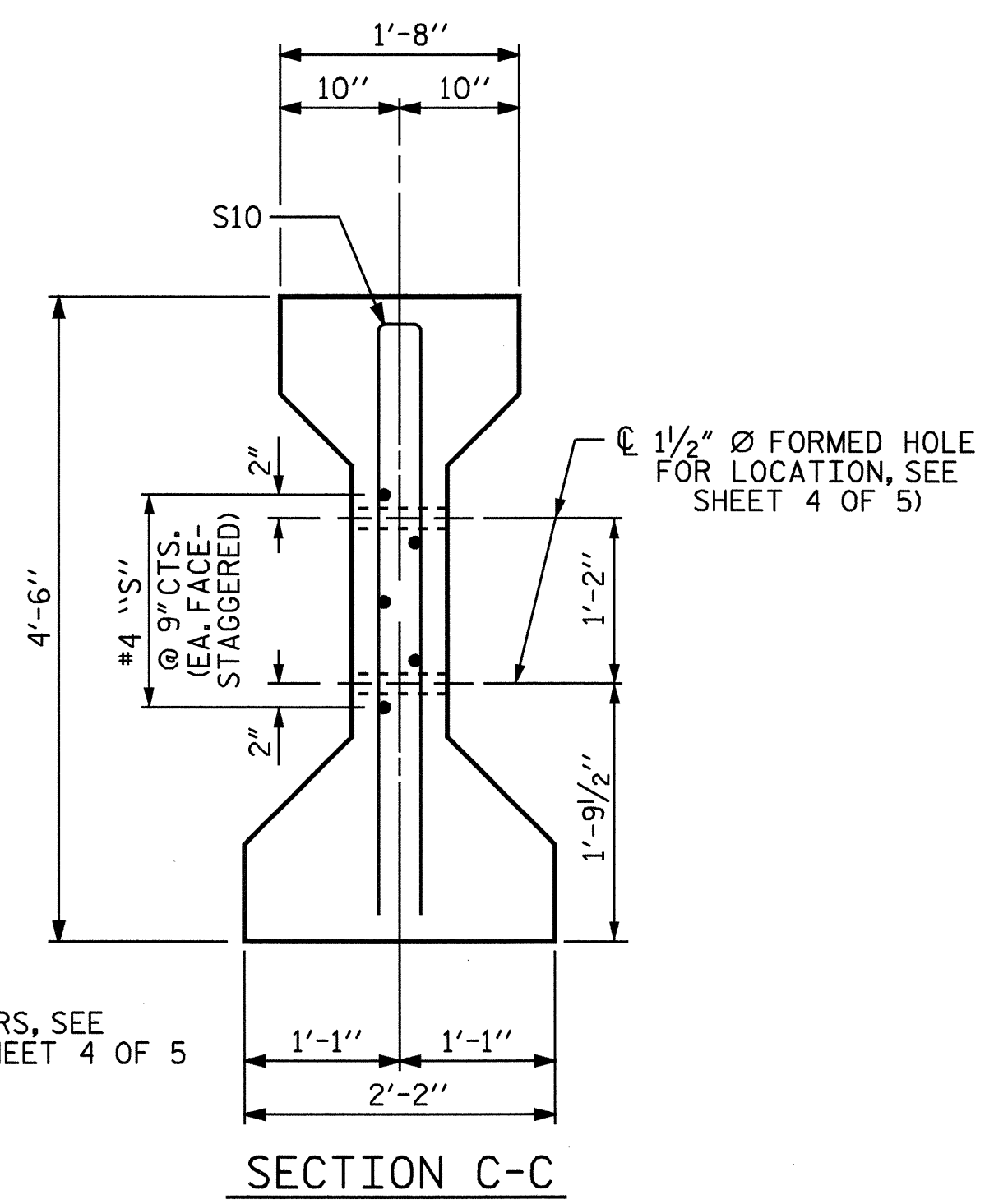
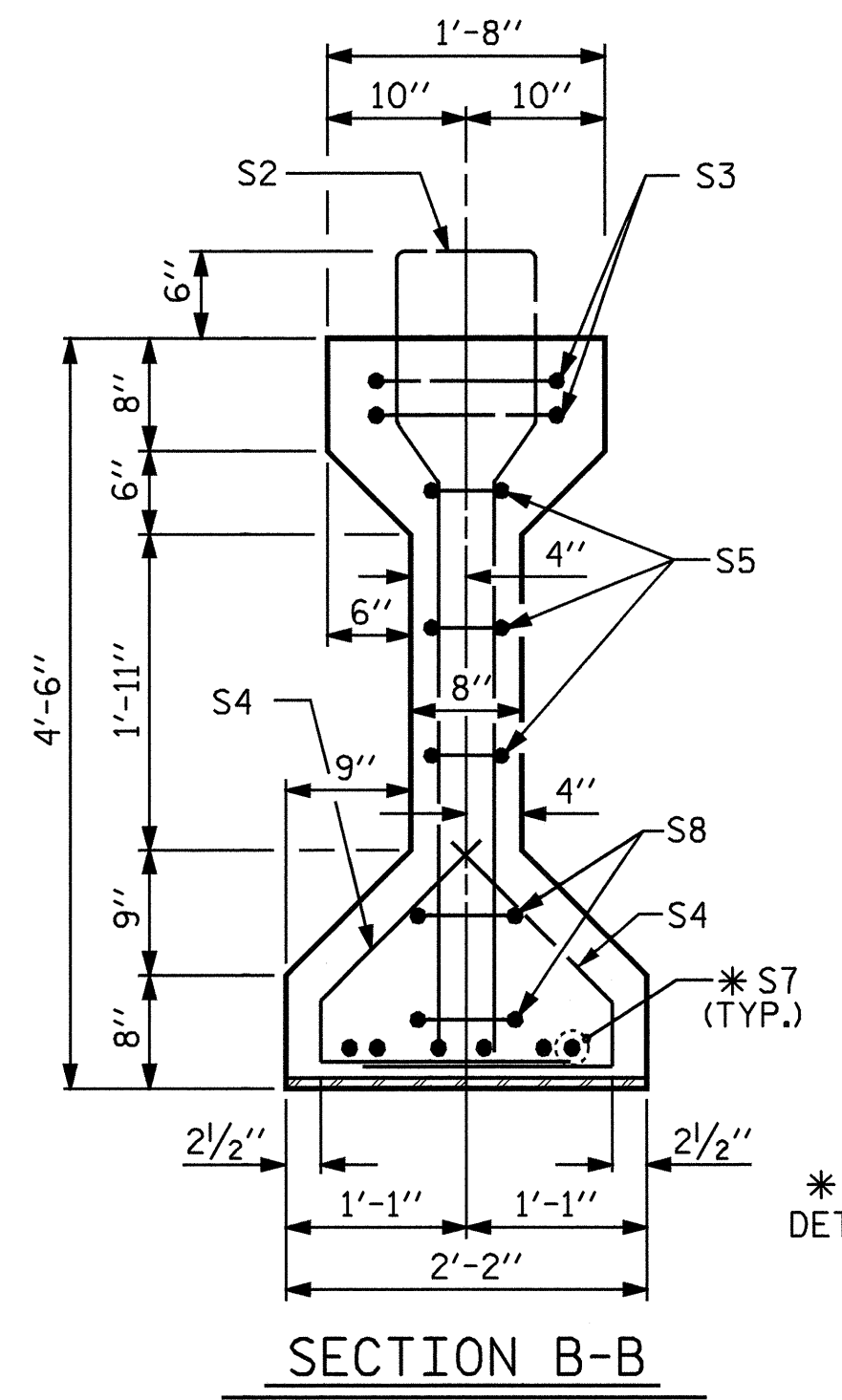
DEAD LOAD DEFLECTION TABLE FOR GIRDERS

TENTH POINTS	SPAN A - GIRDER #1 THRU #5											
	1/2" Ø LOW RELAXATION	0	.10	.20	.30	.40	.50	.60	.70	.80	.90	0
CAMBER (GIRDER ALONE IN PLACE)	↑	0	.028	.054	.074	.086	.091	.086	.074	.054	.028	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	.014	.026	.036	.042	.044	.042	.036	.026	.014	0
FINAL CAMBER	↑	0	3/16"	5/16"	1/2"	9/16"	9/16"	9/16"	1/2"	5/16"	3/16"	0

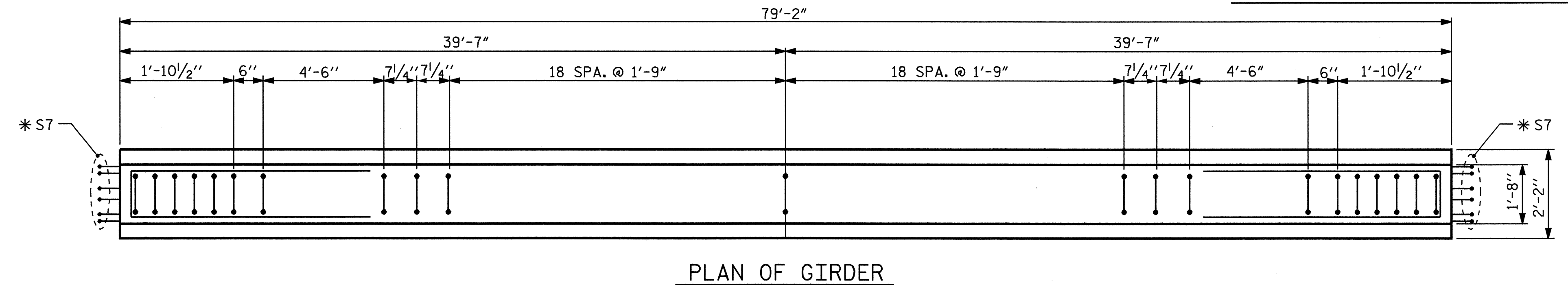
\* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS. ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

ASSEMBLED BY: V. X. NGUYEN DATE: 2-23-06  
 CHECKED BY: M.G. CHEEK DATE: 2-07  
 DRAWN BY: ELR 8/91 REV. 2/6/97 EEM/RGW  
 CHECKED BY: GRP 8/91 REV. 7/17/98 RWW/LES  
 REV. 10/17/00R RWW/LES

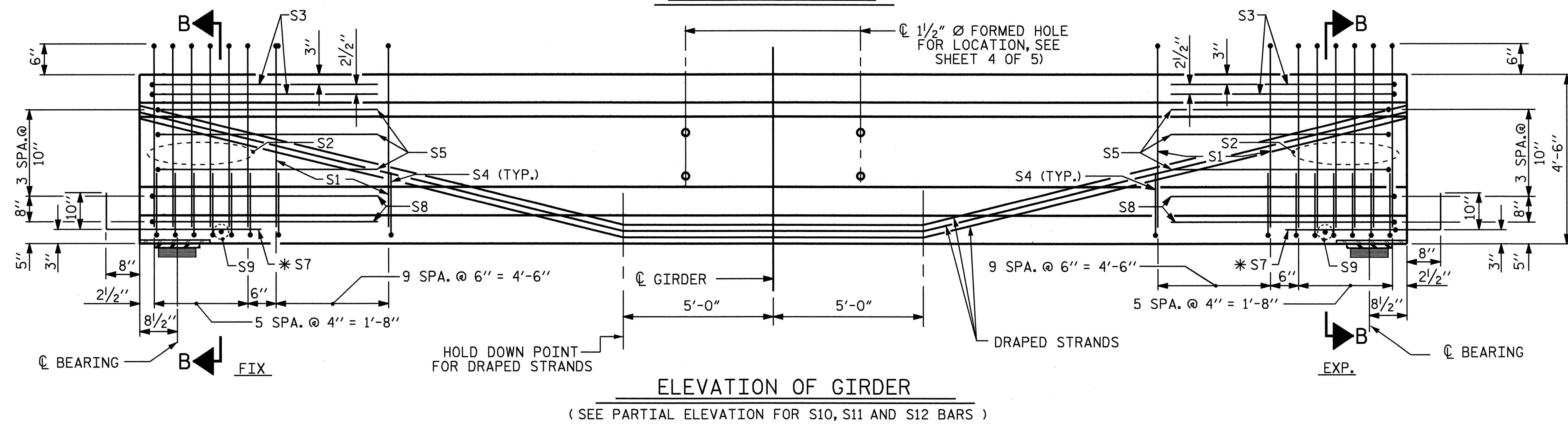




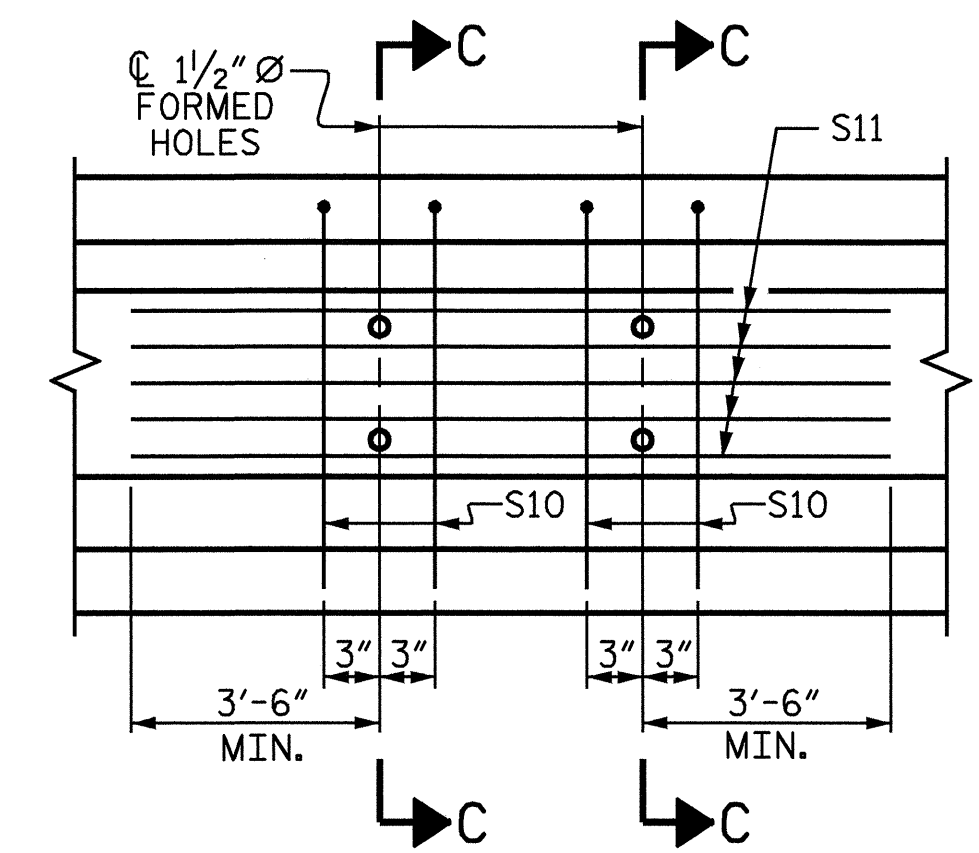
1/2" Ø LOW RELAXATION STRAND LAYOUT



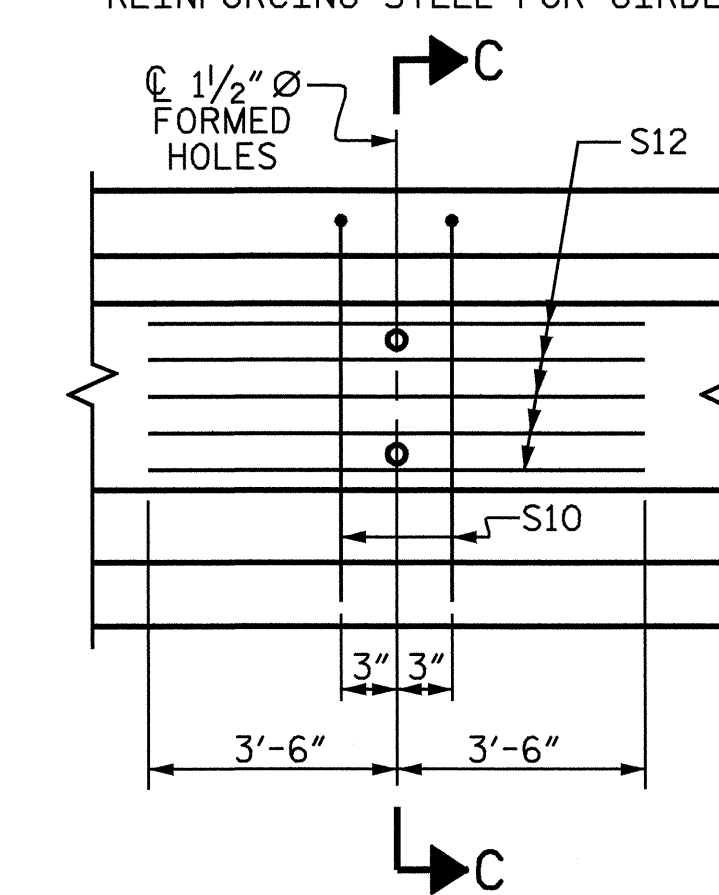
PLAN OF GIRDER



ELEVATION OF GIRDER  
(SEE PARTIAL ELEVATION FOR S10, S11 AND S12 BARS)



PARTIAL ELEVATION  
SHOWING INTERMEDIATE DIAPHRAGM  
REINFORCING STEEL FOR GIRDER Nos. 2, 3 & 4



PARTIAL ELEVATION  
SHOWING INTERMEDIATE DIAPHRAGM  
REINFORCING STEEL FOR GIRDER Nos. 1 & 5

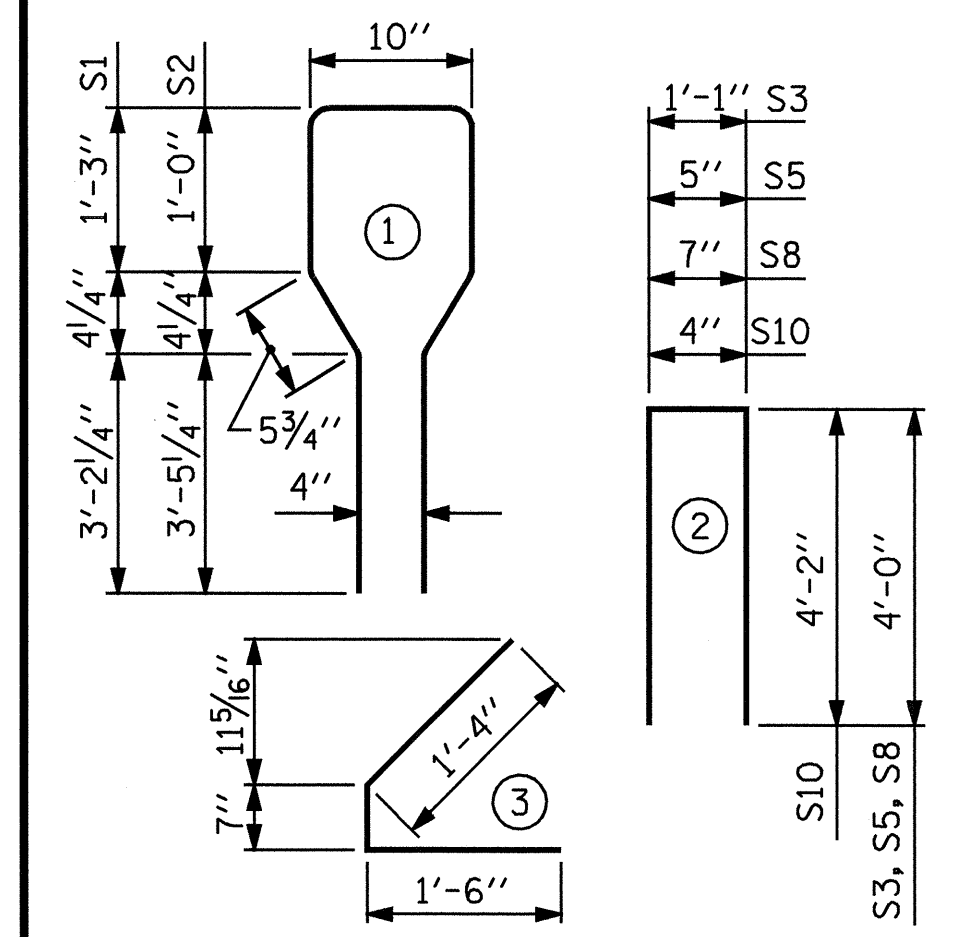
1/2" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.153	41,300	30,980

REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	59	#4	1	10'-8"	420
S2	12	#6	1	10'-8"	192
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34

* S7	12	#5	STR	3'-8"	46	
S8	4	#4	2	8'-7"	23	
S9	2	#3	STR	1'-10"	1	
INTERIOR GDR.	S10	4	#5	2	8'-8"	36
EXTERIOR GDR.	S10	2	#5	2	8'-8"	18
INTERIOR GDR.	S11	5	#4	STR	10'-3"	34
EXTERIOR GDR.	S12	5	#4	STR	7'-0"	23

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

BAR TYPES  
ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL LB.	5,000 PSI CONCRETE C.Y.	1/2" Ø L.R. STRANDS No.
INTERIOR GIRDER	956	16.1	32
EXTERIOR GIRDER	927	16.1	32

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
5	79'-2"	395.83 LIN. FT.

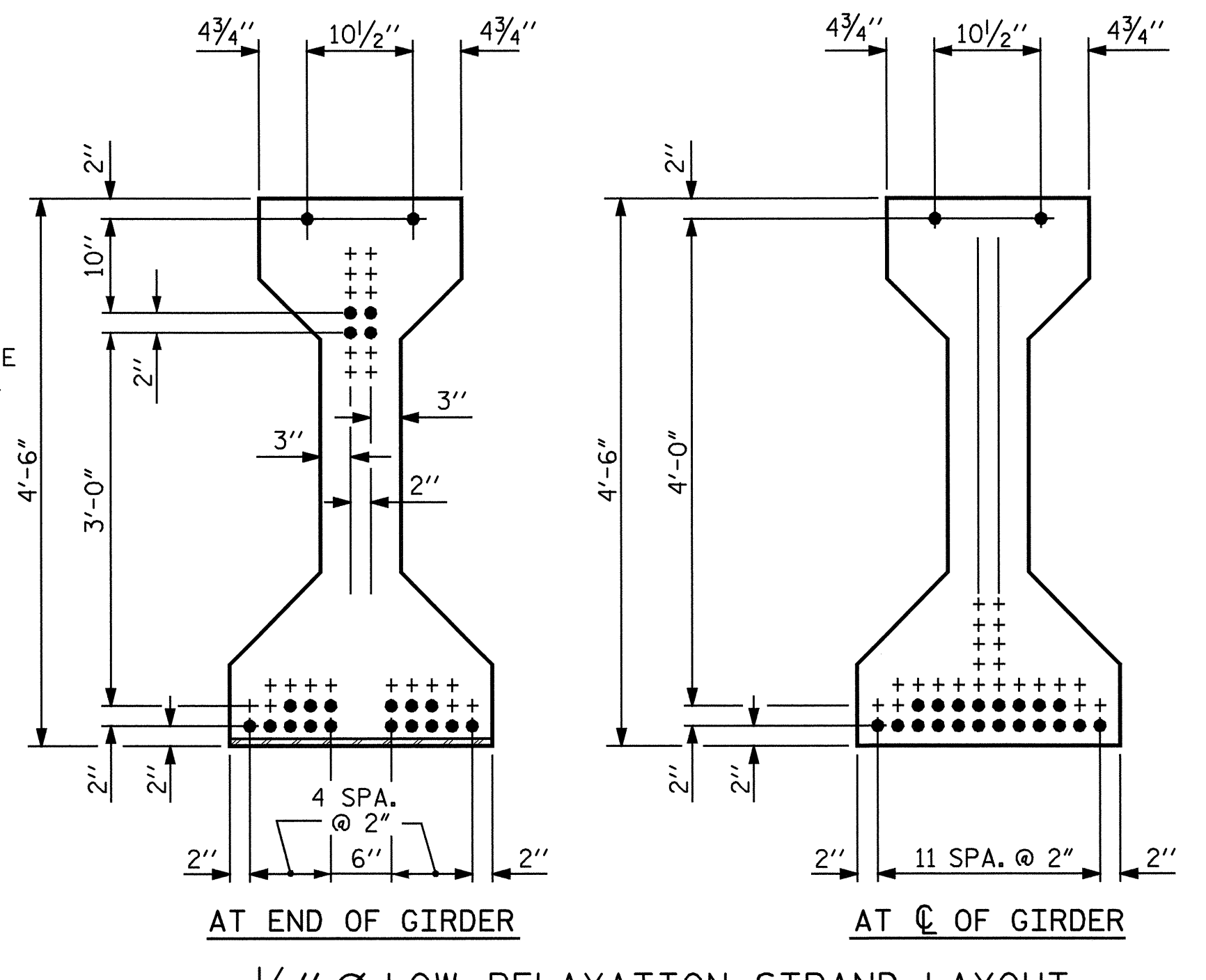
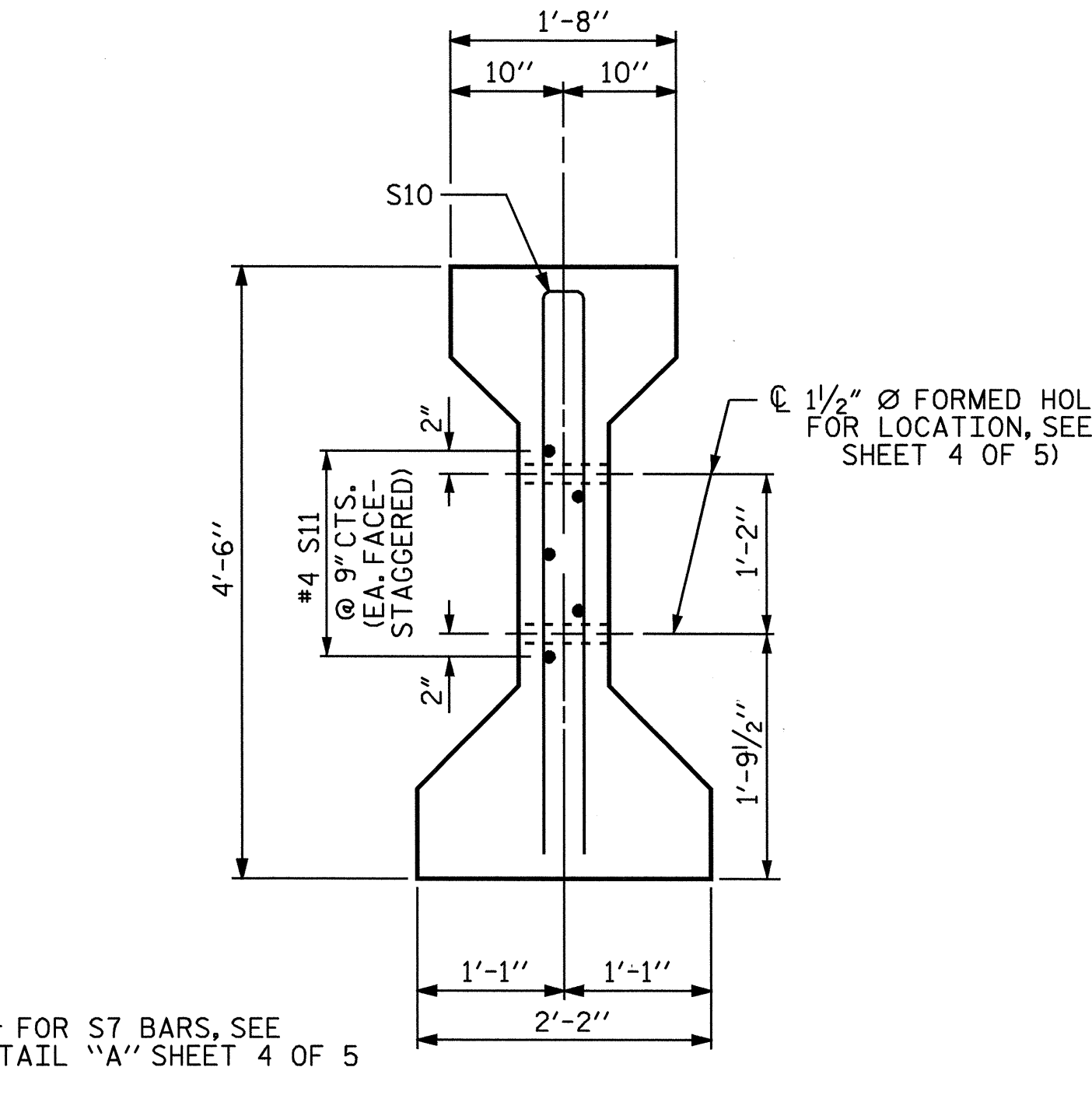
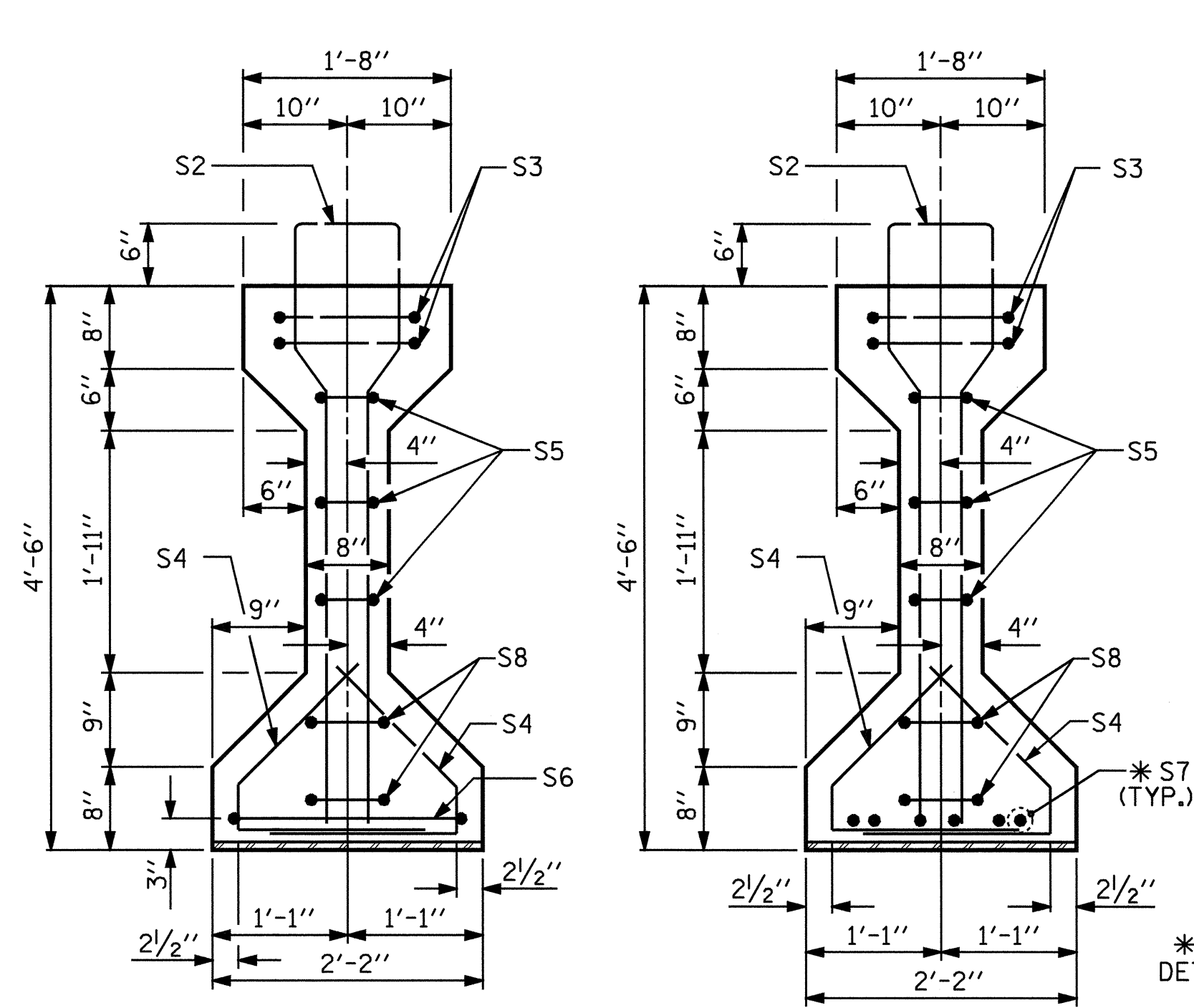
PROJECT NO. B-4095  
DAVIDSON COUNTY  
STATION: 26+20.00-L-  
SHEET 2 OF 5

DEAD LOAD DEFLECTION TABLE FOR GIRDERS													
1/2" Ø LOW RELAXATION		SPAN B - GIRDER #1 THRU #5											
TENTH POINTS		CL BRG.	.10	.20	.30	.40	.50	.60	.70	.80	.90	CL BRG.	
CAMBER (GIRDER ALONE IN PLACE)		↑	0	.060	.114	.156	.183	.192	.183	.156	.114	.060	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.		↓	0	.025	.048	.065	.076	.080	.076	.065	.048	.025	0
FINAL CAMBER		↑	0	7/16"	13/16"	1 1/16"	1 1/4"	1 5/16"	1 1/4"	1 1/16"	13/16"	7/16"	0

\* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.  
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

ASSEMBLED BY: V. X. NGUYEN DATE: 2-23-06  
CHECKED BY: M.G. CHEEK DATE: 2-07  
DRAWN BY: ELR 8/91 REV. 2/6/97 EEM/RGW  
CHECKED BY: GRP 8/91 REV. 7/17/98 RWW/LES  
REV. 10/17/00R RWW/LES



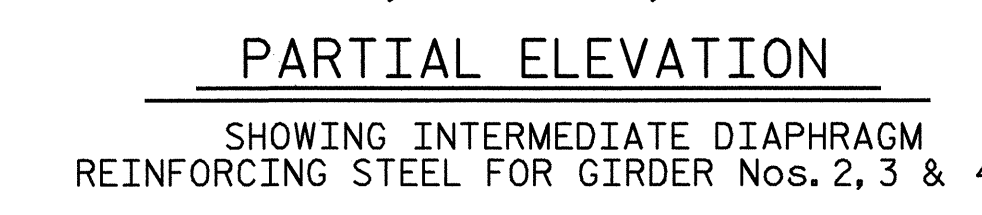
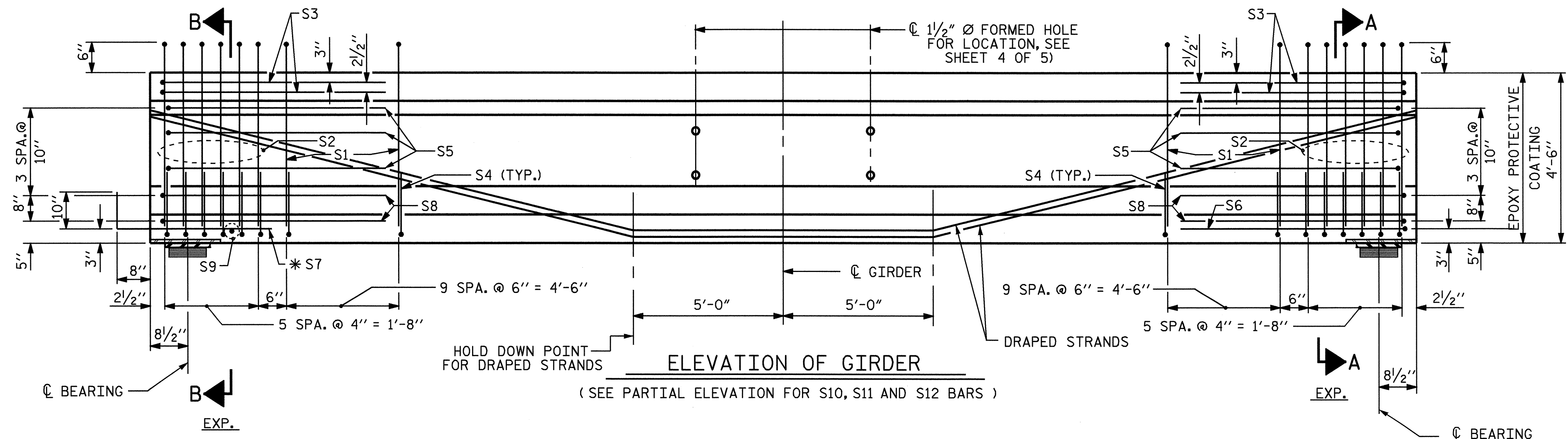
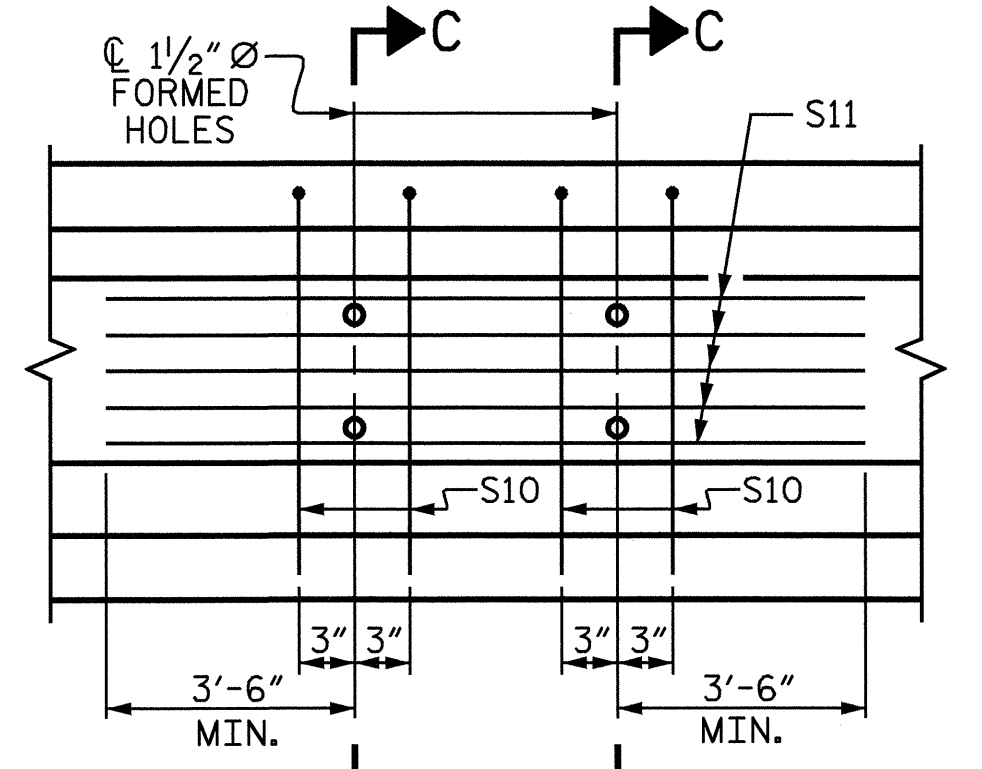
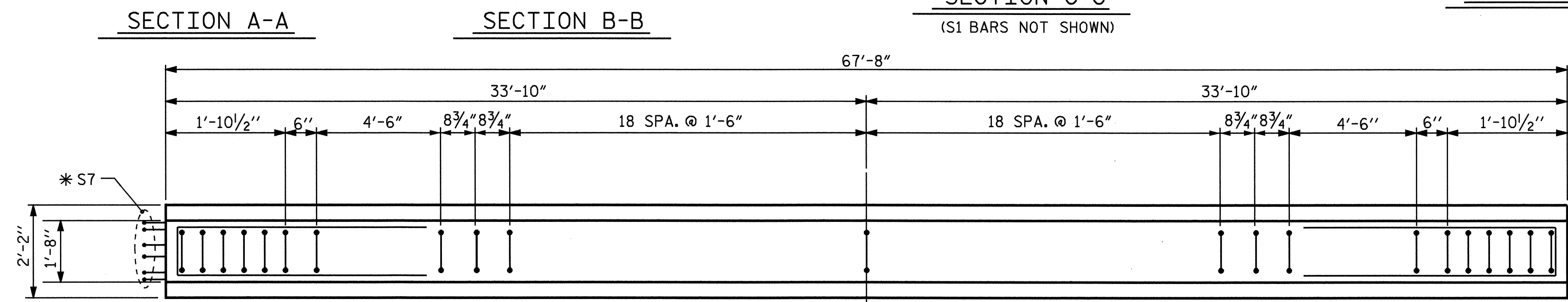
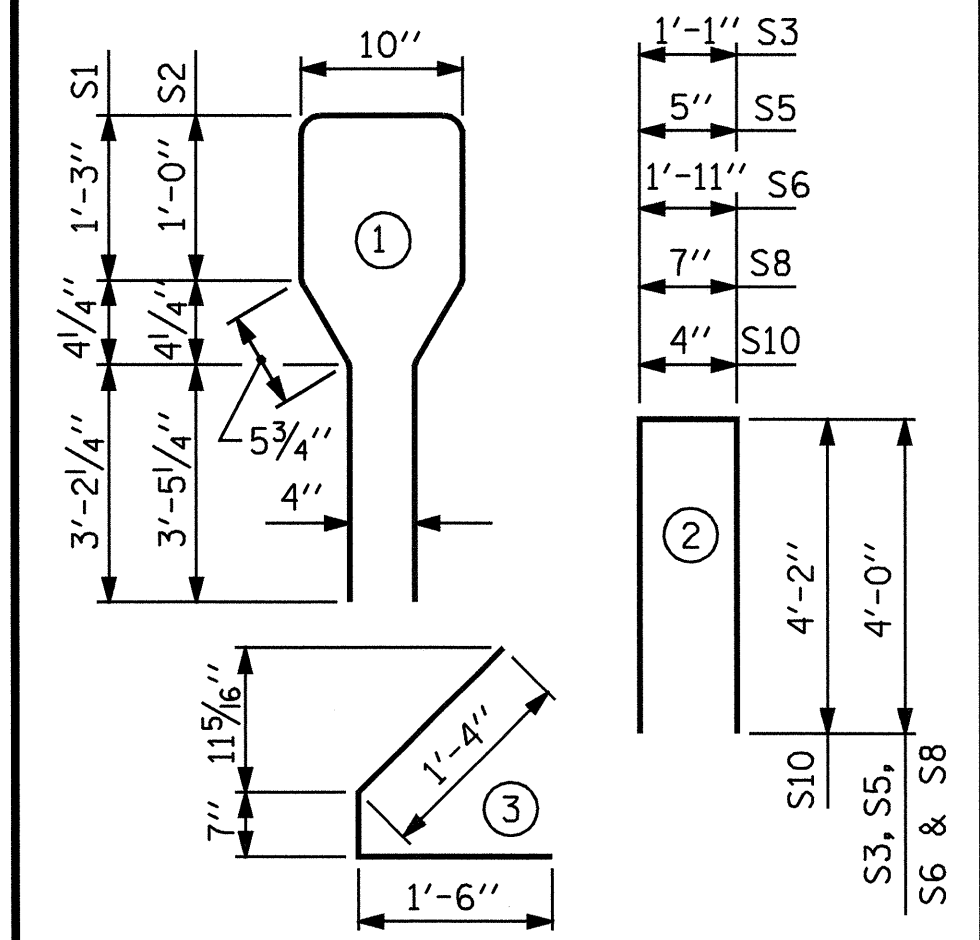


1/2" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.153	41,300	30,980

REINFORCING STEEL FOR ONE GIRDER						
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	
S1	57	#4	1	10'-8"	406	
S2	12	#6	1	10'-8"	192	
S3	4	#4	2	9'-1"	24	
S4	64	#4	3	3'-5"	146	
S5	6	#4	2	8'-5"	34	
S6	1	#4	2	9'-11"	7	
*S7	6	#5	STR	3'-8"	23	
S8	4	#4	2	8'-7"	23	
S9	1	#3	STR	1'-10"	1	
INTERIOR GDR.	S10	4	#5	2	8'-8"	36
EXTERIOR GDR.	S10	2	#5	2	8'-8"	18
INTERIOR GDR.	S11	5	#4	STR	10'-3"	34
EXTERIOR GDR.	S12	5	#4	STR	7'-0"	23

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

**BAR TYPES**  
ALL BAR DIMENSIONS ARE OUT-TO-OUT



**QUANTITIES FOR ONE GIRDER**

	REINFORCING STEEL	5,000 PSI CONCRETE	1/2" Ø L.R. STRANDS
	LB.	C.Y.	No.
INTERIOR GIRDER	926	13.7	22
EXTERIOR GIRDER	897	13.7	22

**GIRDERS REQUIRED**

NUMBER	LENGTH	TOTAL LENGTH
5	67'-8"	338.33'

PROJECT NO. B-4095  
 DAVIDSON COUNTY  
 STATION: 26+20.00-L-

SHEET 3 OF 5

DEAD LOAD DEFLECTION TABLE FOR GIRDERS												
1/2" Ø LOW RELAXATION												
SPAN C - GIRDER #1 THRU #5												
TENTH POINTS	Ø BRG.	.10	.20	.30	.40	.50	.60	.70	.80	.90	Ø BRG.	
CAMBER ( GIRDER ALONE IN PLACE )	↑	0	.028	.054	.074	.086	.091	.086	.074	.054	.028	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	.014	.026	.036	.042	.044	.036	.026	.014	0	0
FINAL CAMBER	↑	0	3/16"	5/16"	1/2"	9/16"	5/8"	1/2"	3/8"	1/4"	0	0

\* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.  
 ALL VALUES ARE SHOWN IN FEET ( DECIMAL FORM ), EXCEPT " FINAL CAMBER ", WHICH IS GIVEN IN INCHES ( FRACTION FORM ).

ASSEMBLED BY : V. X. NGUYEN DATE : 2-23-06  
 CHECKED BY : M.G. CHECK DATE : 2-07  
 DRAWN BY : ELR 8/91 REV. 2/6/97 EEM/RGW  
 CHECKED BY : GRP 8/91 REV. 7/17/98 RWW/LES  
 REV. 10/17/00R RWW/LES



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**STANDARD  
 AASHTO TYPE IV  
 PRESTRESSED CONCRETE GIRDER  
 CONTINUOUS FOR LIVE LOAD  
 SPAN C  
 RIGHT LANE**

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

SHEET NO. S-45  
 TOTAL SHEETS 69

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.

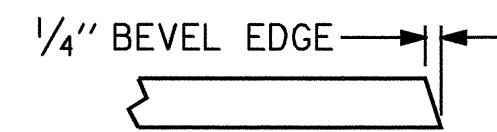
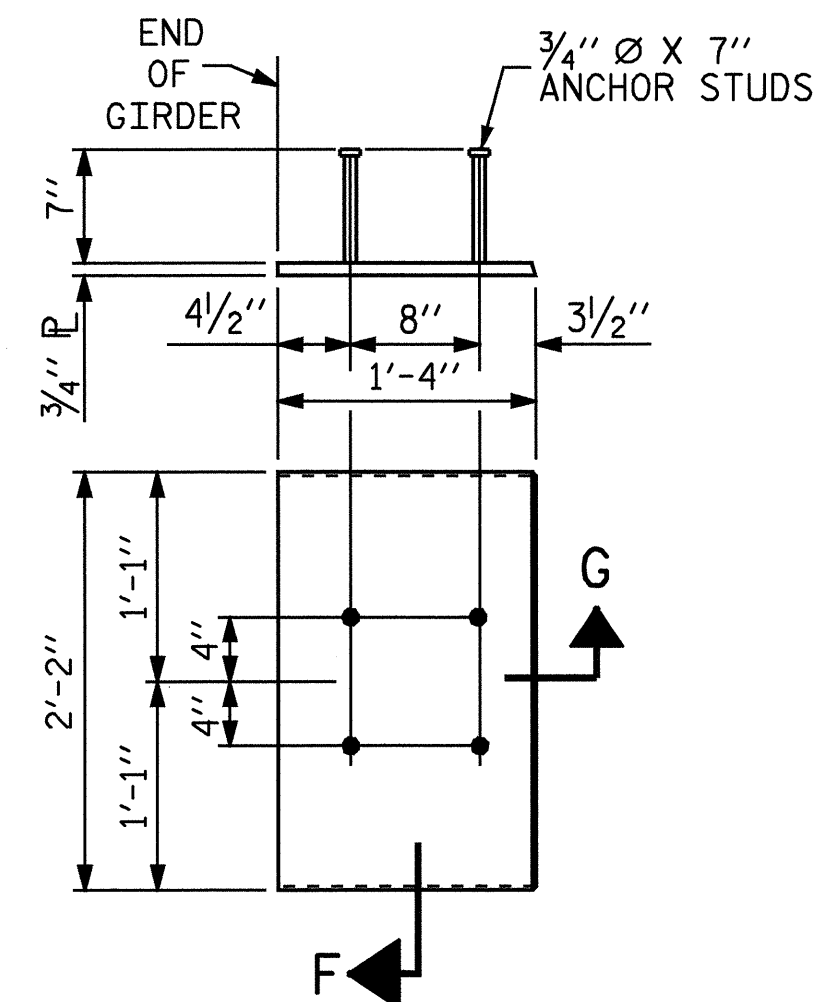
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4000 PSI.

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

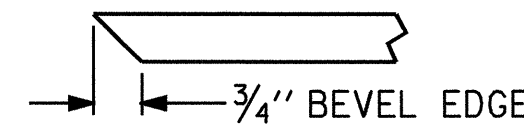
THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF 1/4".

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.

FOR CRACK REPAIR OF PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS.



SECTION "G"



SECTION "F"

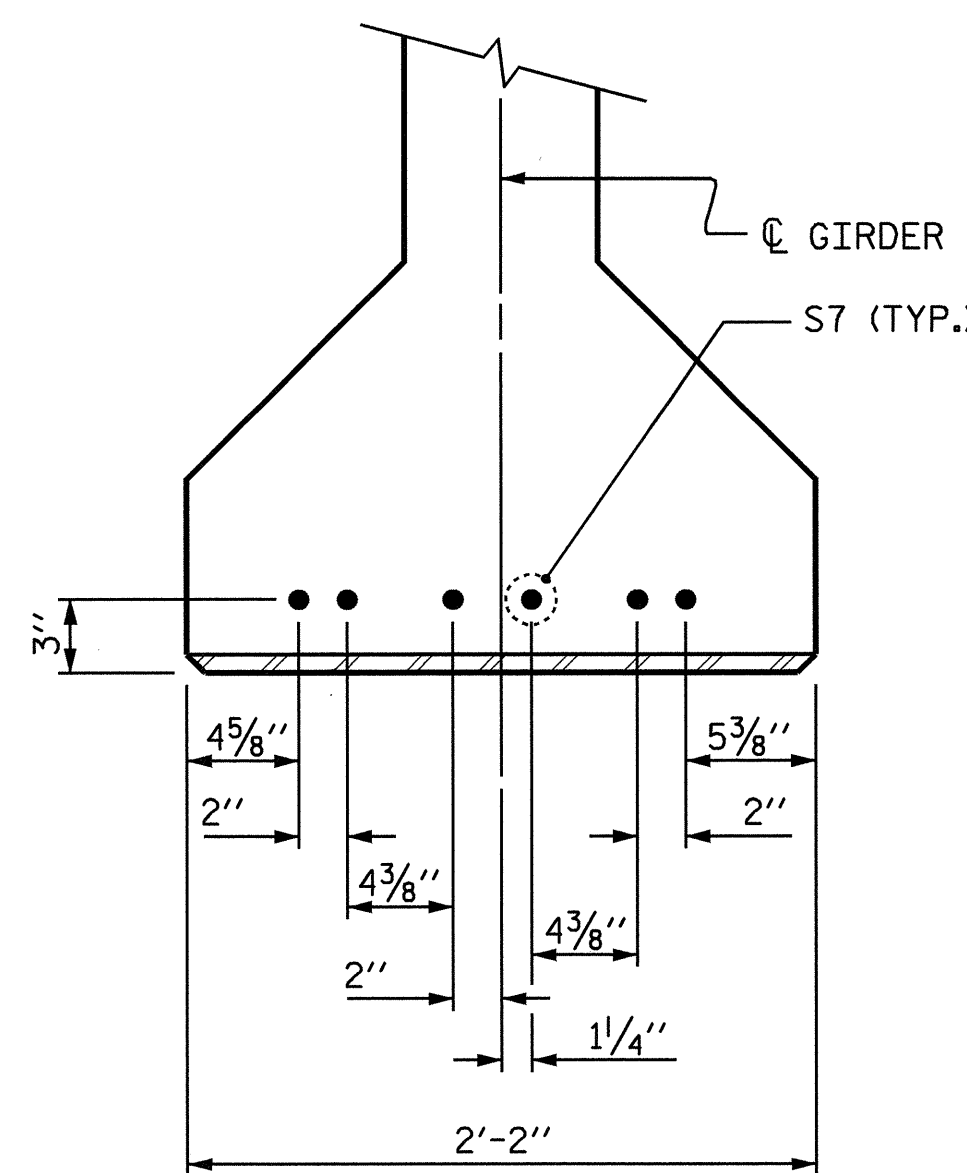
(SEE NOTES)

CHART A

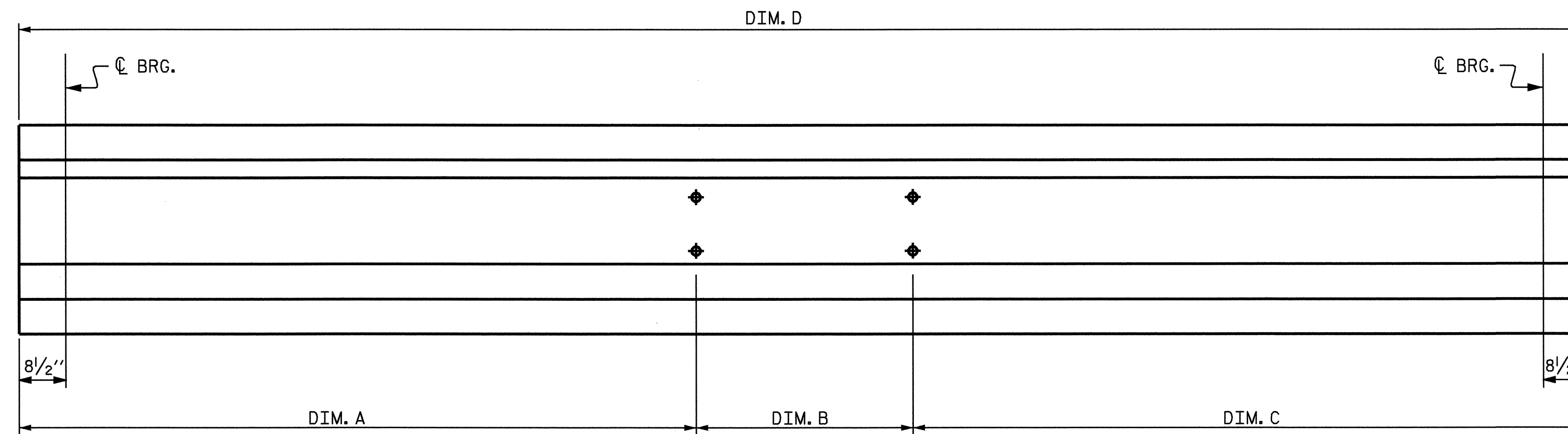
GIRDER	DIM. A	DIM. B	DIM. C	DIM. D
GDR. A1	32'-2 5/8"	0	35'-5 3/8"	67'-8"
GDR. A2	32'-2 5/8"	3'-2 3/4"	32'-2 5/8"	67'-8"
GDR. A3	32'-2 5/8"	3'-2 3/4"	32'-2 5/8"	67'-8"
GDR. A4	32'-2 5/8"	3'-2 3/4"	32'-2 5/8"	67'-8"
GDR. A5	35'-5 3/8"	0	32'-2 5/8"	67'-8"
GDR. B1	37'-11 5/8"	0	41'-2 3/8"	79'-2"
GDR. B2	37'-11 5/8"	3'-2 3/4"	37'-11 5/8"	79'-2"
GDR. B3	37'-11 5/8"	3'-2 3/4"	37'-11 5/8"	79'-2"
GDR. B4	37'-11 5/8"	3'-2 3/4"	37'-11 5/8"	79'-2"
GDR. B5	42'-2 3/8"	0	37'-11 5/8"	79'-2"
GDR. C1	32'-2 5/8"	0	35'-5 3/8"	67'-8"
GDR. C2	32'-2 5/8"	3'-2 3/4"	32'-2 5/8"	67'-8"
GDR. C3	32'-2 5/8"	3'-2 3/4"	32'-2 5/8"	67'-8"
GDR. C4	32'-2 5/8"	3'-2 3/4"	32'-2 5/8"	67'-8"
GDR. C5	35'-5 3/8"	0	32'-2 5/8"	67'-8"

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

(2 REQ'D PER GIRDER)



DETAIL "A"



LOCATION OF BOLT HOLES IN GIRDERS

FOR DIMENSIONS SEE CHART A

PROJECT NO. B-4095  
 DAVIDSON COUNTY  
 STATION: 26+20.00-L-

SHEET 4 OF 5

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



ASSEMBLED BY : V. X. NGUYEN DATE : 2-23-06  
 CHECKED BY : M.G. CHEEK DATE : 2-07  
 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-46
1			3			TOTAL SHEETS
2			4			69

STRUCTURAL STEEL NOTES

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

TENSION ON THE AASHTO M164 BOLTS THROUGH THE CHANNEL MEMBER SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-8 OF THE STANDARD SPECIFICATIONS.

TENSION ON THE AASHTO M164 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL 1/4 TURN.

THE CHANNELS, ANGLES, BOLTS, WASHERS, PLATE WASHERS AND DIRECT TENSION INDICATORS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS, OR METALLIZED. FOR METALLIZATION, SEE SPECIAL PROVISIONS.

USE A MINIMUM 7/16" THICK PLATE WASHER WITH STANDARD HOLES UNDER EACH BOLT HEAD AND NUT. THE PLATE WASHERS SHALL HAVE SUFFICIENT SIZE TO COVER THE HOLES AFTER INSTALLATION. DIRECT TENSION INDICATORS ARE TO BE USED IN CONJUNCTION WITH THE PLATE WASHERS.

PROVIDE SUFFICIENT LENGTH OF ALL BOLTS TO ACCOMMODATE WASHERS, DIRECT TENSION INDICATORS, THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

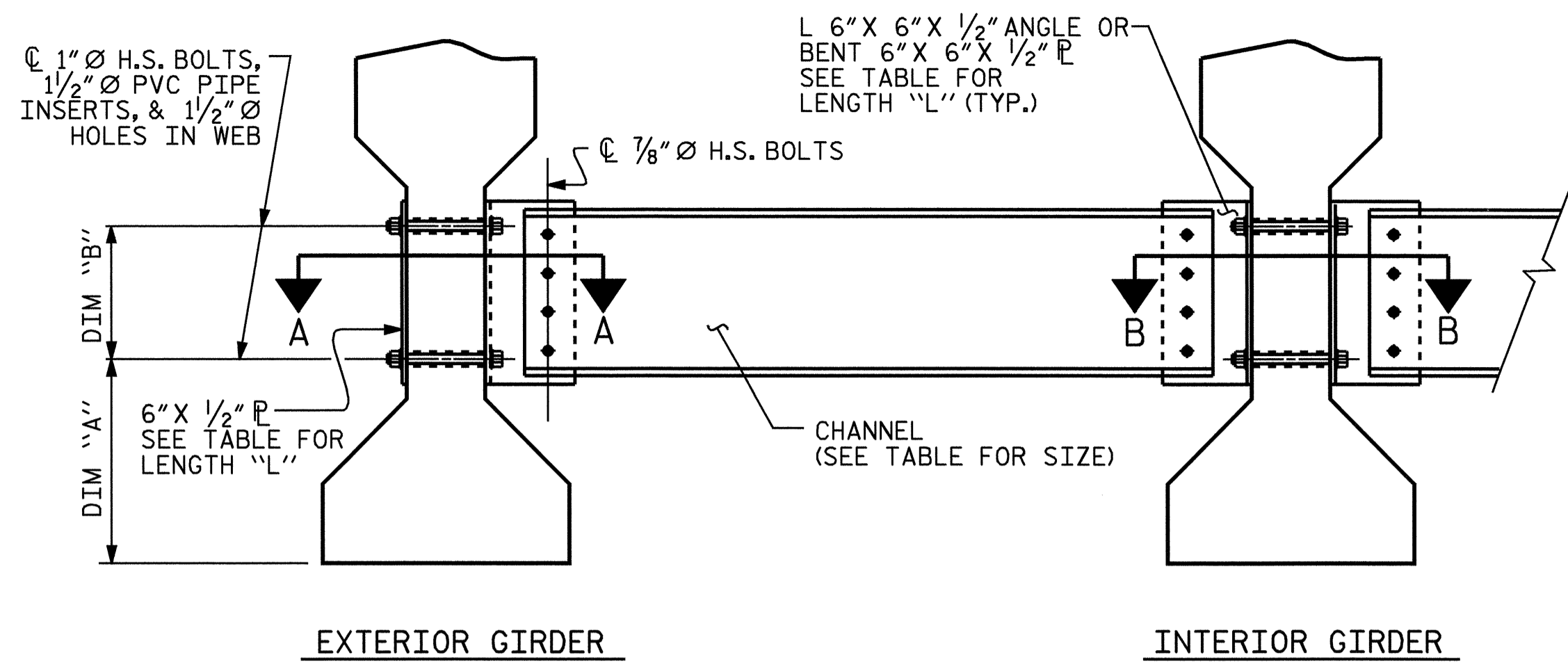
INTERMEDIATE DIAPHRAGM ASSEMBLY SHALL COMPLY WITH SECTION 1072 OF THE STANDARD SPECIFICATIONS.

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

IN THE EXTERIOR BAYS, TEMPORARY STRUTS SHALL BE PLACED BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED. ALL AASHTO M164 H.S. BOLTS SHALL BE FULLY TIGHTENED AFTER THE STRUTS HAVE BEEN REMOVED.

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

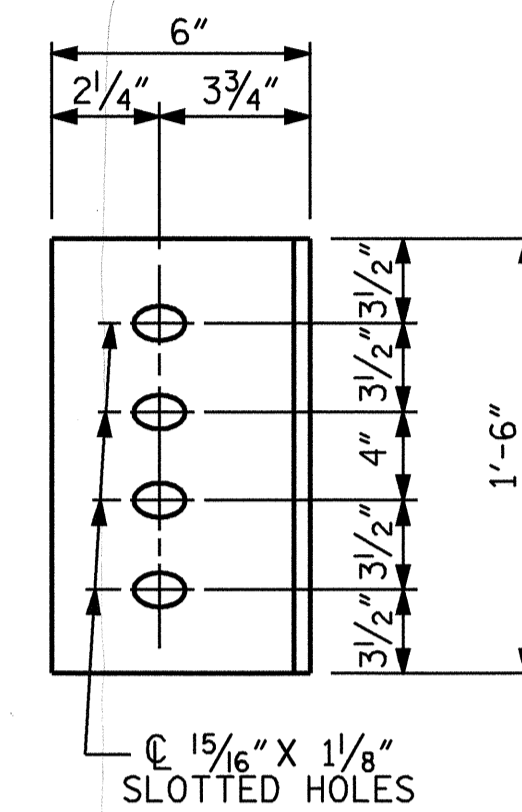
FOR HIGH STRENGTH BOLTS, SEE SPECIAL PROVISIONS.



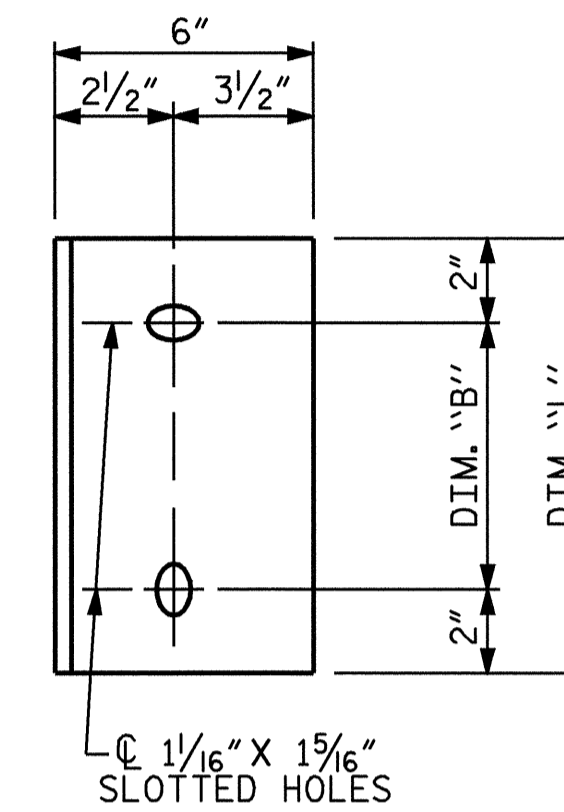
PART SECTION AT INTERMEDIATE DIAPHRAGM

TABLE

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

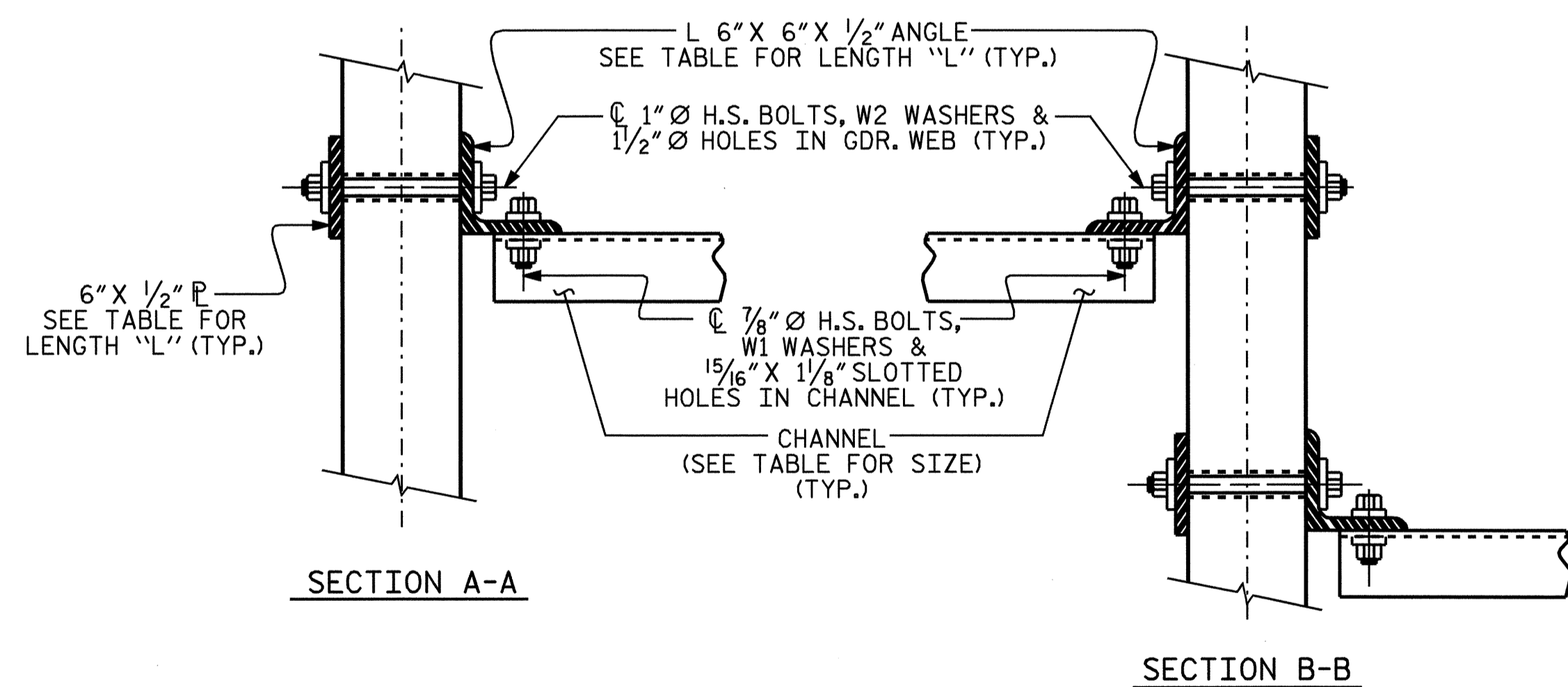


DIAPHRAGM FACE



WEB FACE

CONNECTOR PLATE DETAILS



CONNECTION DETAILS

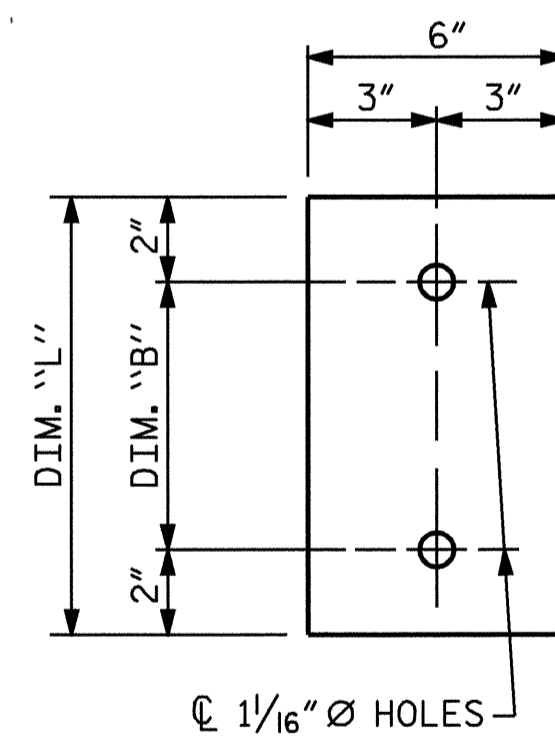
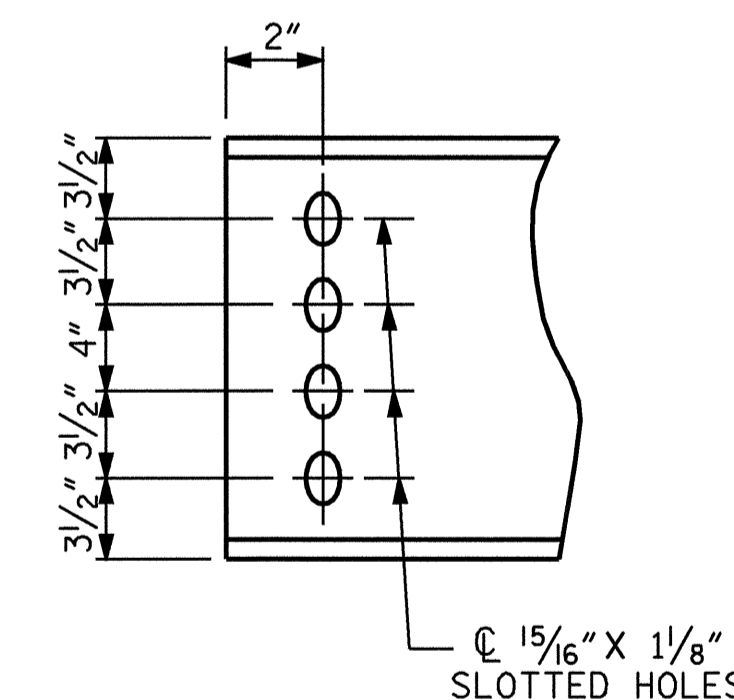
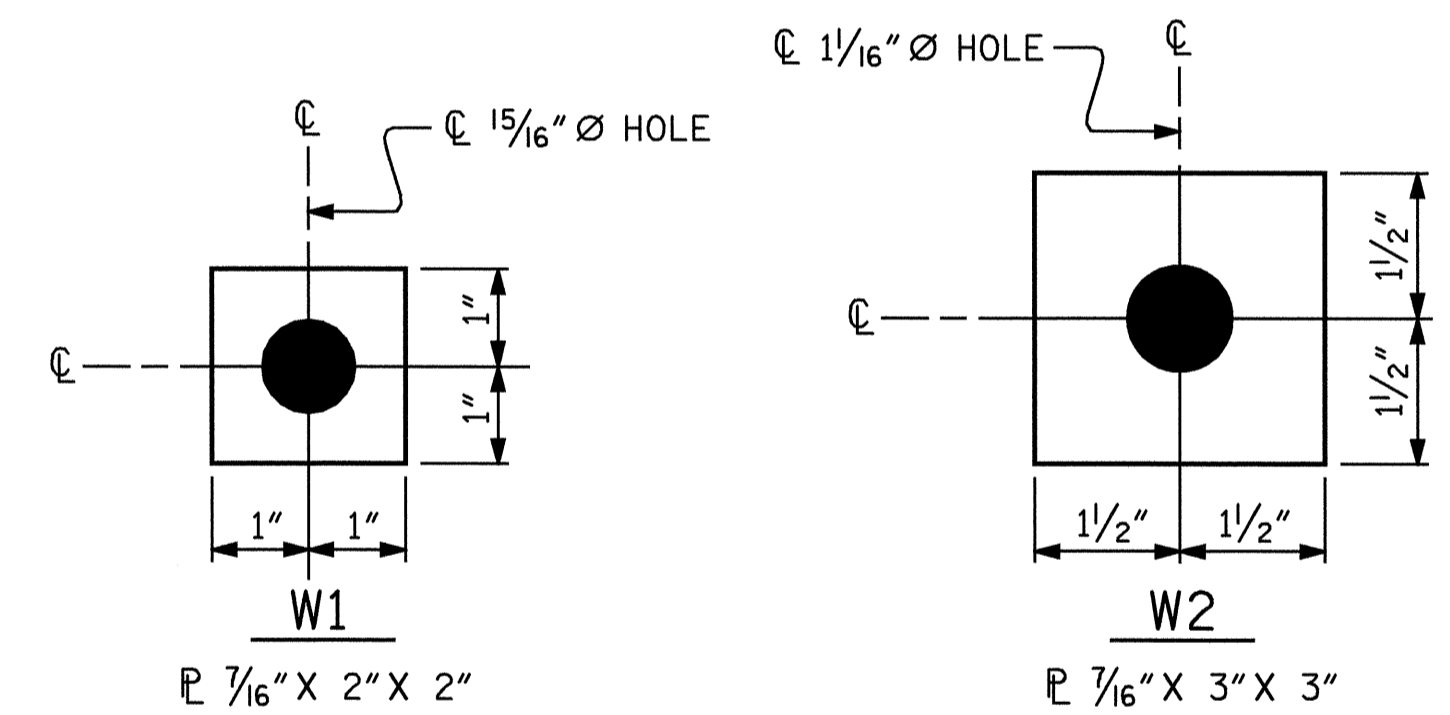


PLATE DETAILS



CHANNEL END



USE WITH 7/8" HVY. HEX NUTS & DIRECT TENSION INDICATOR WASHERS AT DIAPHRAGM CHANNEL TO CONNECTOR PLATE CONNECTIONS

USE WITH 1" HVY. HEX NUTS & DIRECT TENSION INDICATOR WASHERS AT CONNECTOR PLATE TO GIRDER CONNECTIONS

WASHER DETAILS

PROJECT NO. B-4095  
 DAVIDSON COUNTY  
 STATION: 26+20.00-L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

INTERMEDIATE  
 STEEL DIAPHRAGMS FOR  
 TYPE IV PRESTRESSED  
 CONCRETE GIRDERS

RIGHT LANE

ASSEMBLED BY : V. X. NGUYEN DATE : 10-17-06  
 CHECKED BY : M.G. CHEEK DATE : 2-07  
 DRAWN BY : TLA 6/05  
 CHECKED BY : VC 6/05

ADDED 10/21/05  
 REV. 5/1/06 TLA/GM



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-47
1			3			TOTAL SHEETS
2			4			69



**NOTES**

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

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

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

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

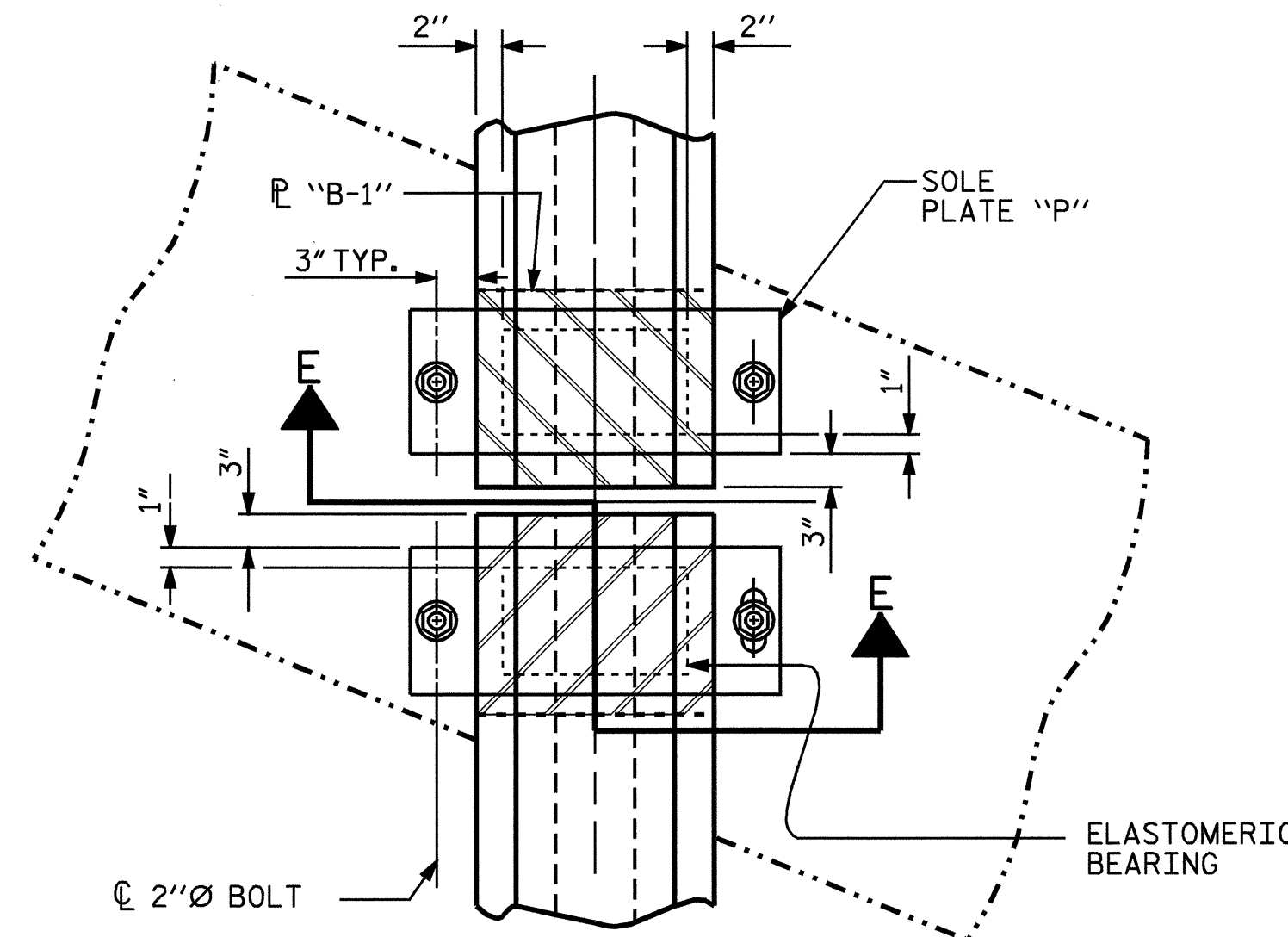
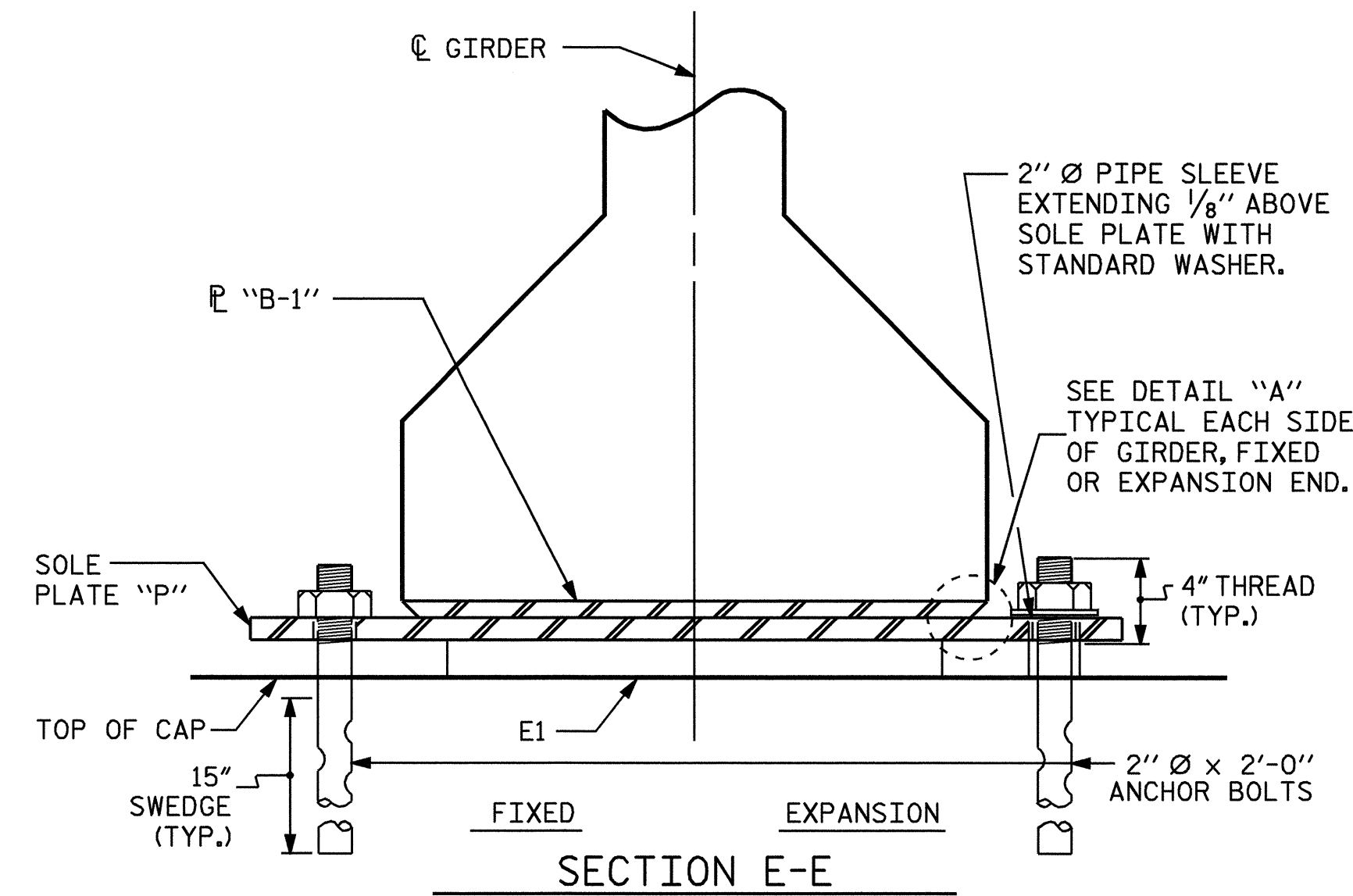
WHEN WELDING THE SOLE PLATE TO THE EMBEDDED PLATE IN THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE SOLE PLATE DOES NOT EXCEED 300°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.

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

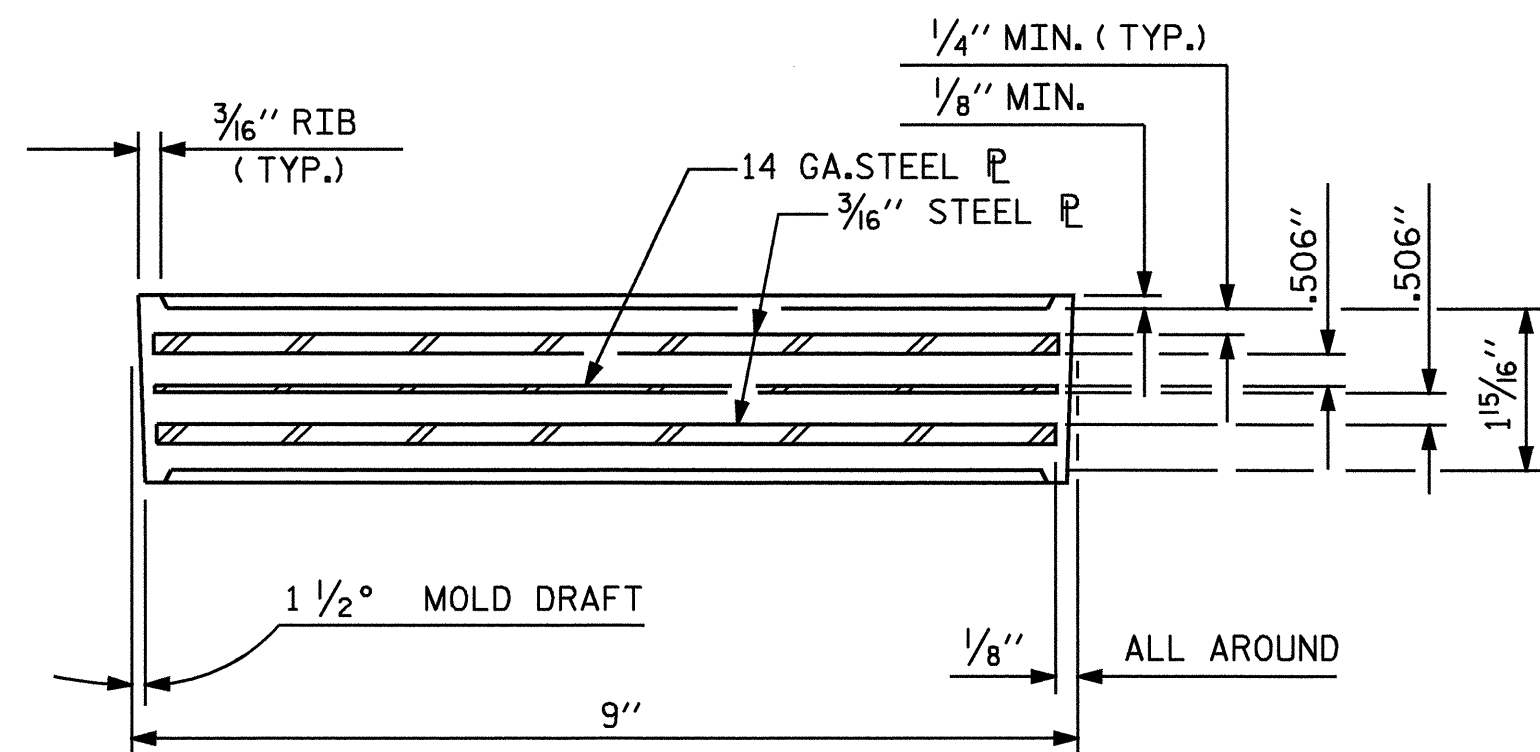
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLT, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

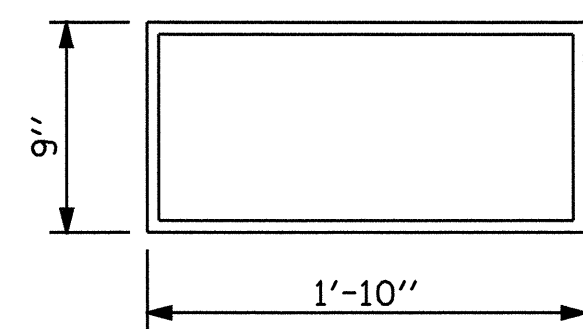
ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.



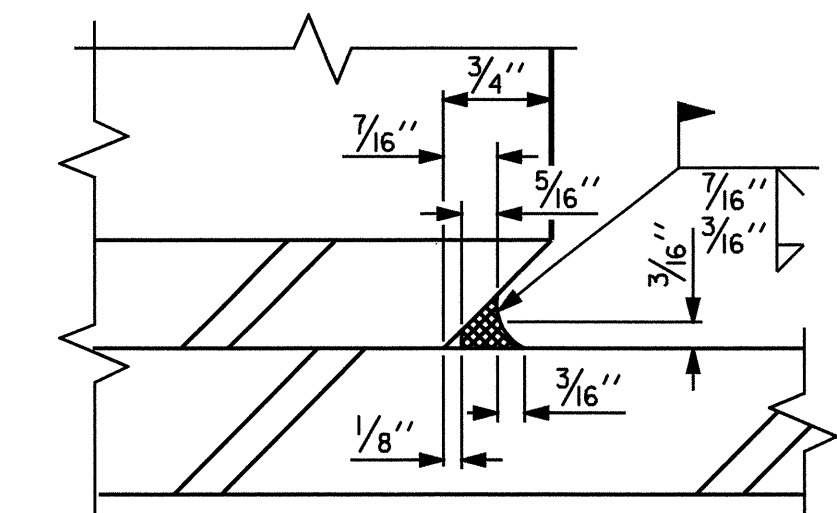
**TYPICAL HALF-PLAN**  
(SHOWING CONTINUOUS BENT)



**TYPICAL SECTION OF ELASTOMERIC BEARINGS**



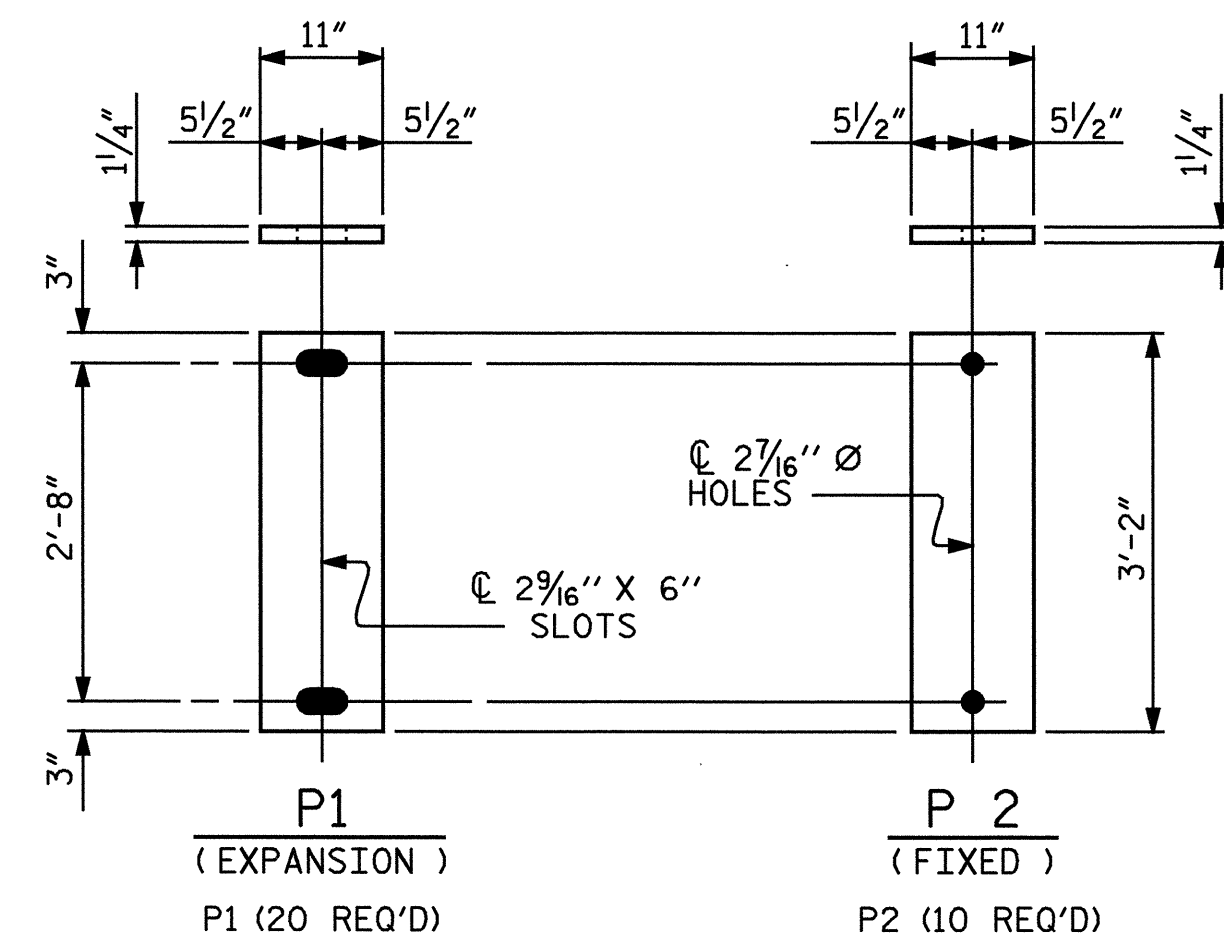
E1 (30 REQ'D)  
**PLAN VIEW OF ELASTOMERIC BEARING**  
**TYPE IV**



**DETAIL "A"**

— LOAD RATINGS —	
54" PCG -TYPE IV	MAX.D.L.+L.L. 137 K

ALL BEARINGS SHALL BE 60 DUROMETER



**SOLE PLATE DETAILS ("P")**

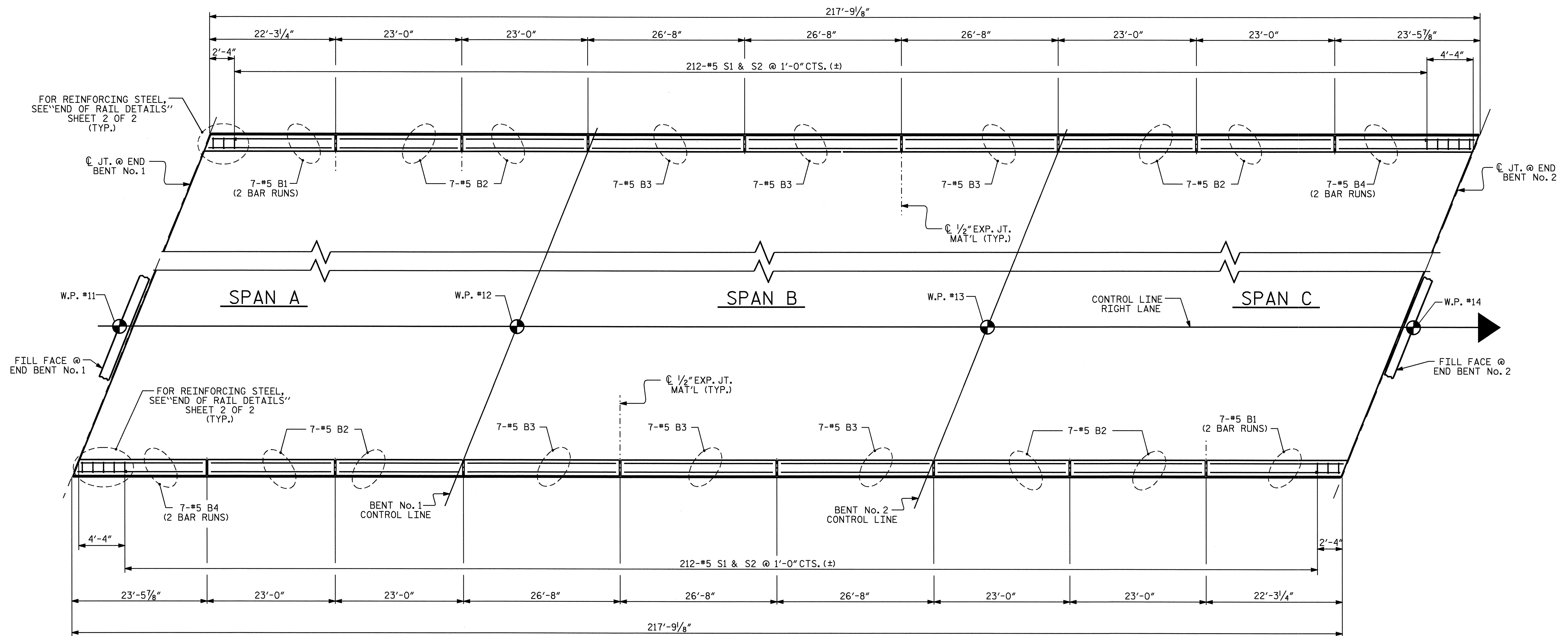
PROJECT NO. B-4095  
DAVIDSON COUNTY  
STATION: 26+20.00-L-

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



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-48
1			3			TOTAL SHEETS
2			4			69

ASSEMBLED BY :	V. X. NGUYEN	DATE :	10-10-06
CHECKED BY :	M.G. CHEEK	DATE :	02-07
DRAWN BY :	WJH 8/89	REV. 10/17/00	RWW/LES
CHECKED BY :	CRK 8/89	REV. 7/10/01	RWW/LES
		REV. 5/1/06	TLA/GM



PLAN

PROJECT NO. B-4095  
DAVIDSON COUNTY  
 STATION: 26+20.00-L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

CONCRETE  
 BARRIER RAIL  
 RIGHT LANE



DRAWN BY: V. X. NGUYEN DATE: 2-23-06  
 CHECKED BY: M.G. CHEEK DATE: 02-07

10-JUL-2007 14:39  
 RA\Structures\B4095\Final Plans\B4095.ed.BR.dgn  
 dahodge

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-49
1			3			TOTAL SHEETS
2			4			69

STR. #2

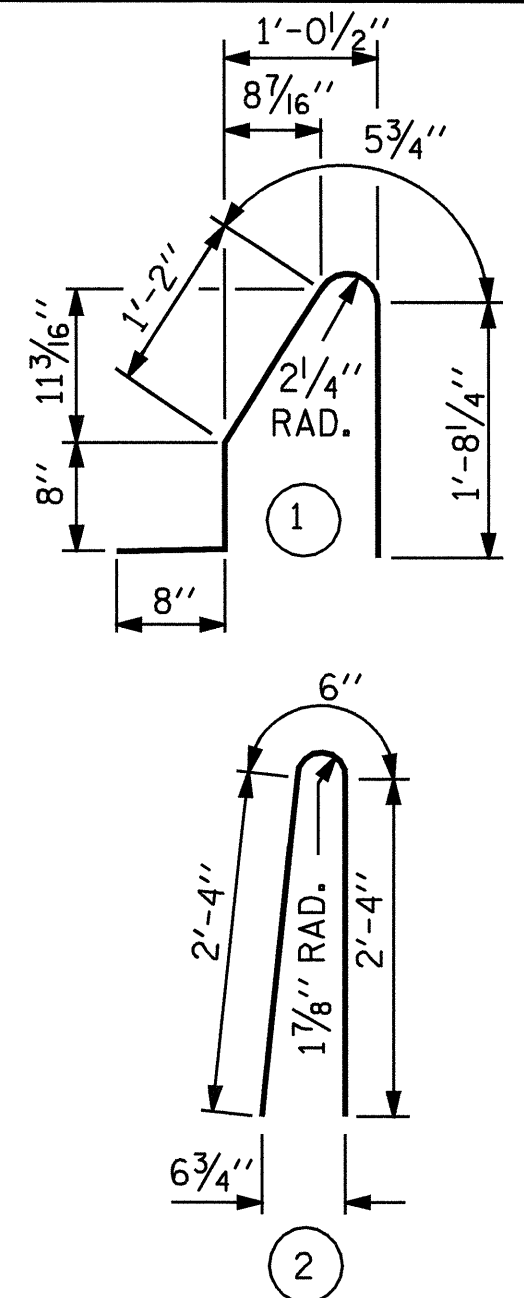
NOTES

THE BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT UNIT 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	
* B1	28	#5 STR	12'-8"	370	
* B2	56	#5 STR	22'-5"	1309	
* B3	42	#5 STR	26'-3"	1150	
* B4	28	#5 STR	13'-3"	387	
* S1	436	#5	1	4'-8"	2122
* S2	436	#5	2	5'-2"	2350

\* EPOXY COATED REINFORCING STEEL 7688 LBS.  
CLASS AA CONCRETE 43.6 CU. YDS.  
CONCRETE BARRIER RAIL 435.52 LIN. FT.

PROJECT NO. B-4095  
DAVIDSON COUNTY  
STATION: 26+20.00-L-

SHEET 2 OF 2

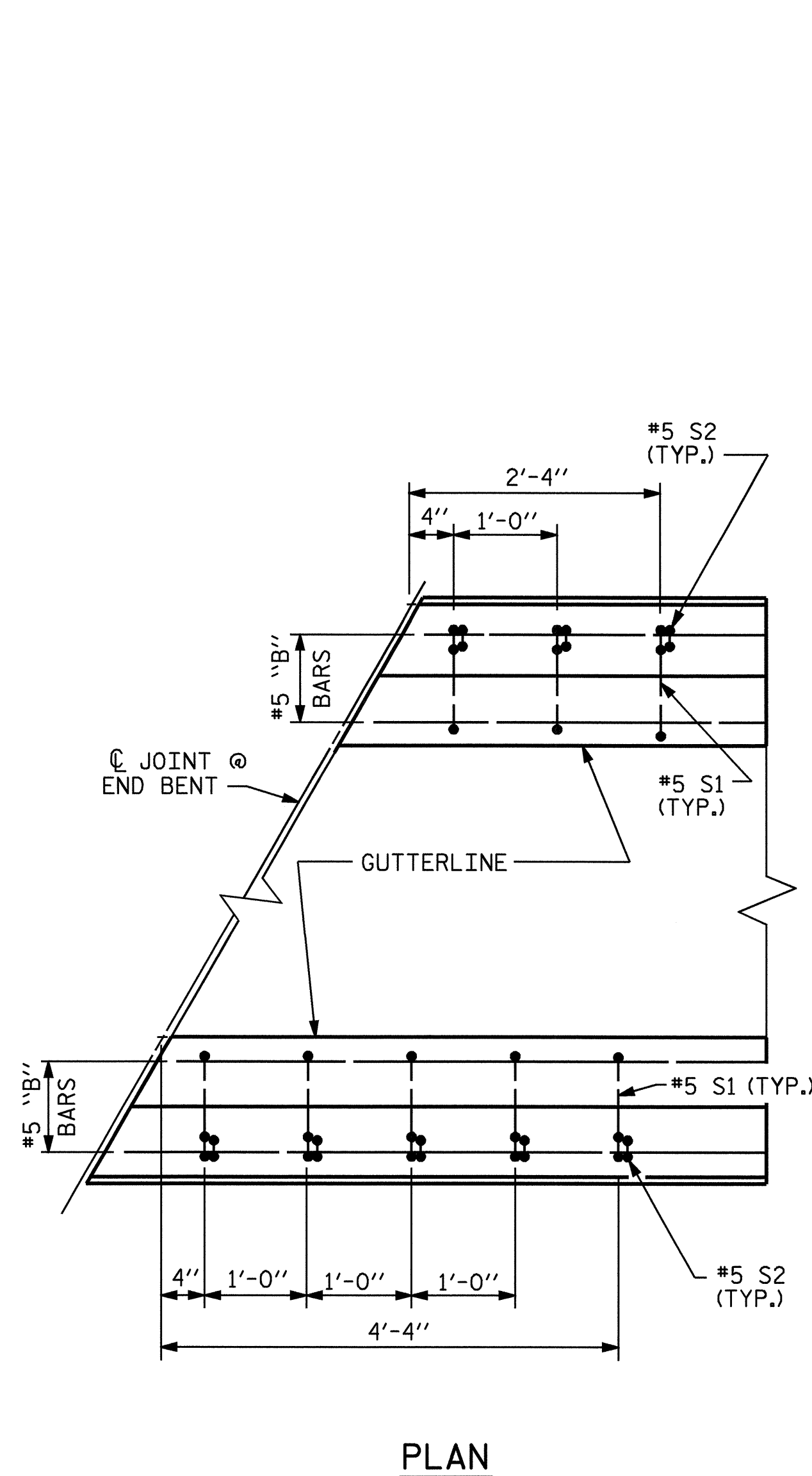
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

CONCRETE BARRIER RAIL  
RIGHT LANE

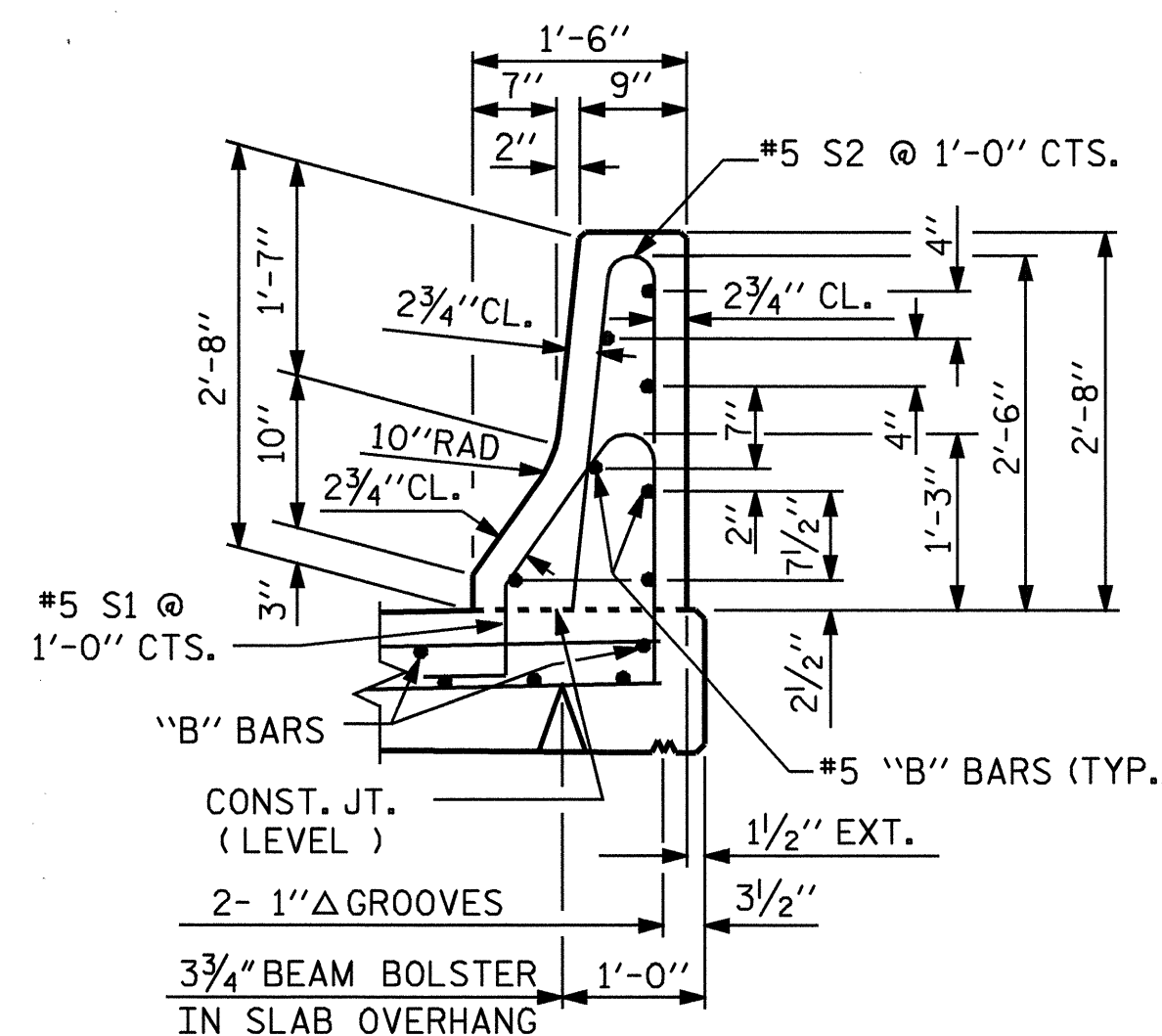
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-50
1			3			TOTAL SHEETS
2			4			69



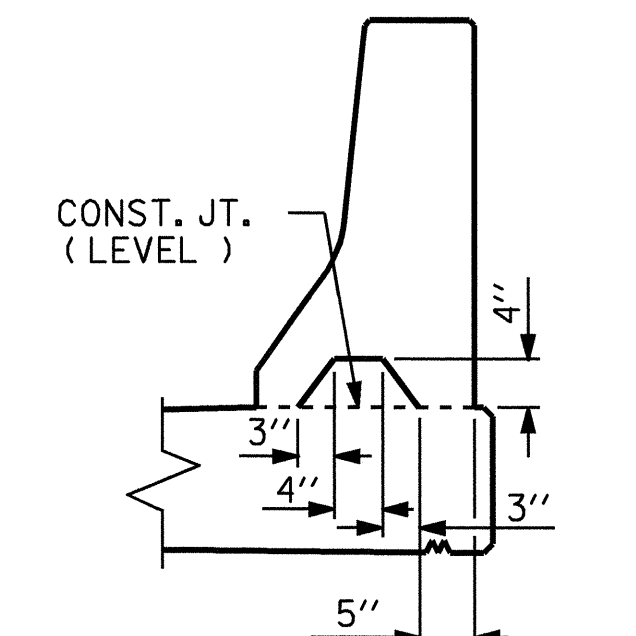
FOR PLAN OF CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEET 1 OF 2



END OF RAIL DETAILS

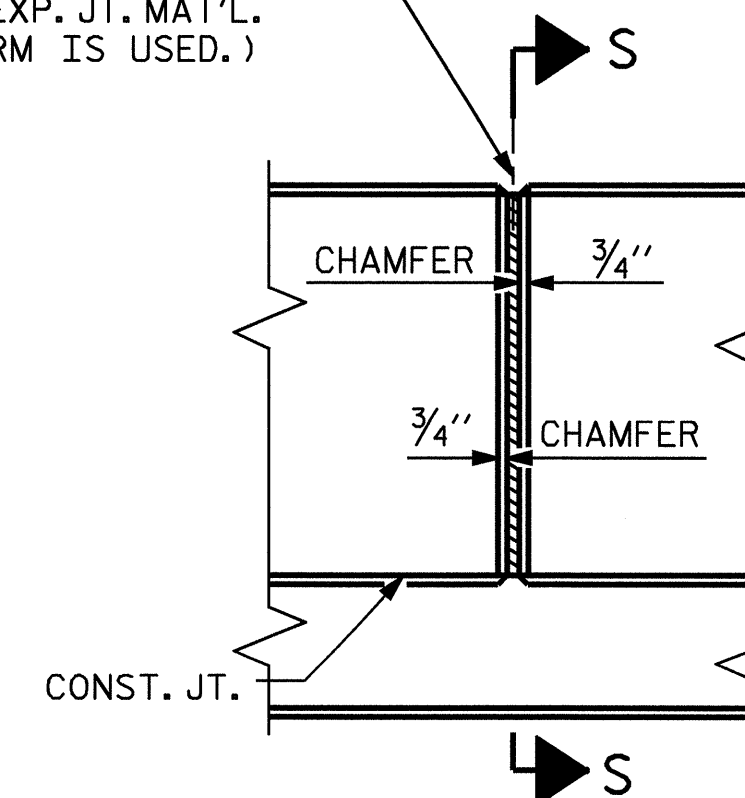


SECTION THRU RAIL



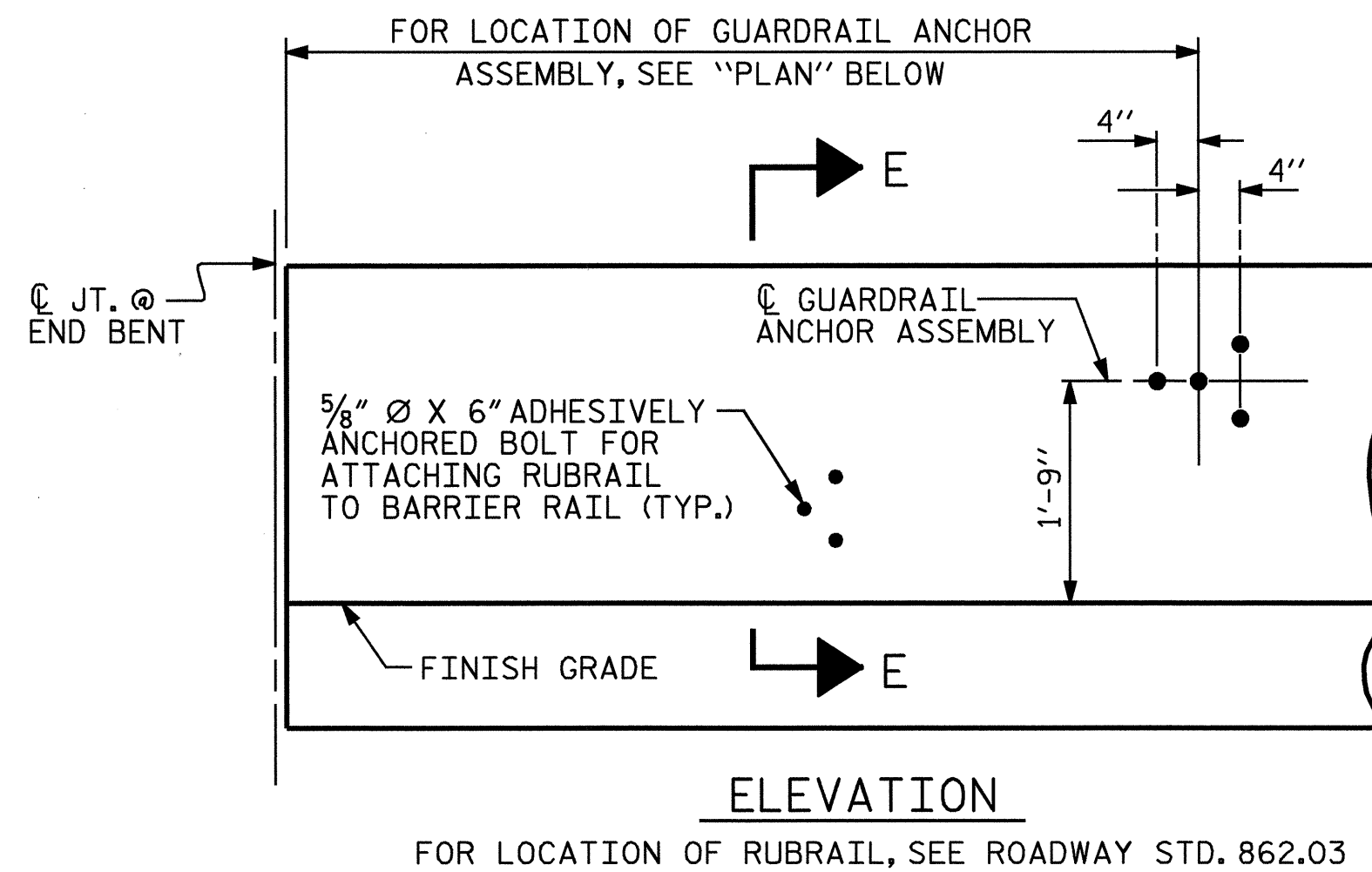
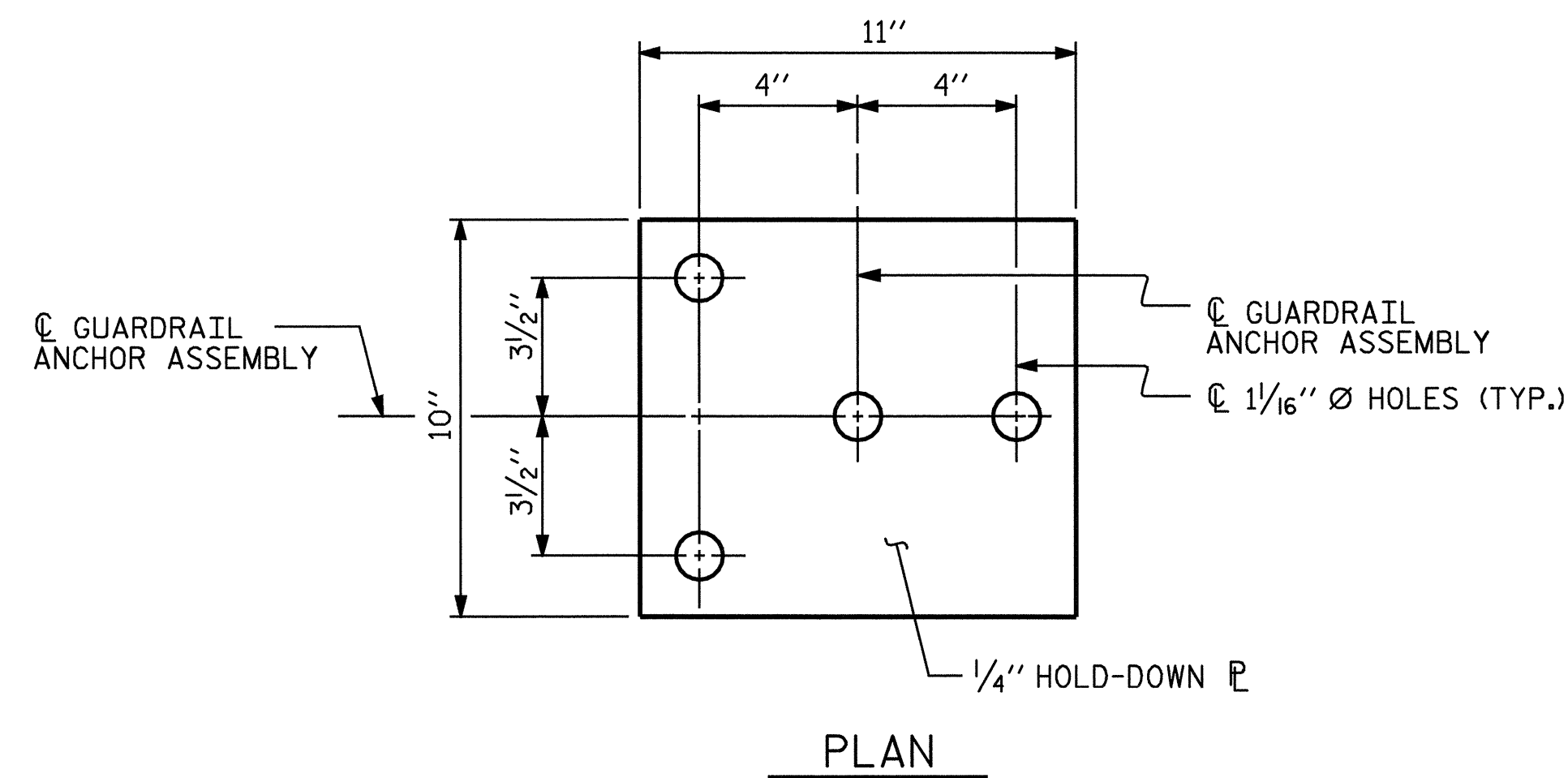
SECTION S-S  
AT DAM IN OPEN JOINT  
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)

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 JOINT  
BARRIER RAIL DETAIL

ASSEMBLED BY : V. X. NGUYEN	DATE : 10-16-06
CHECKED BY : M.G. CHEEK	DATE : 02-07
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 ASTM A291. 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.)

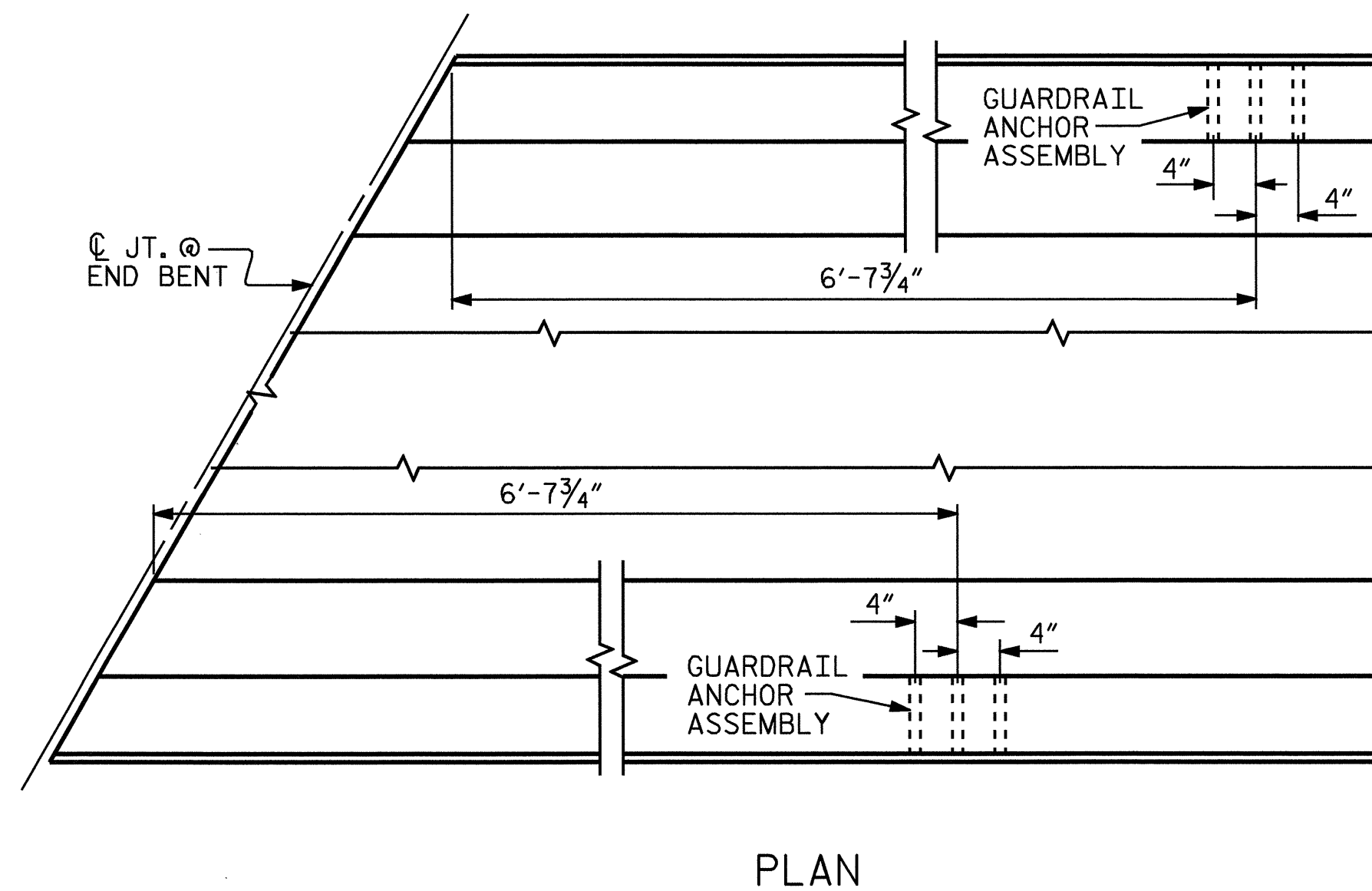
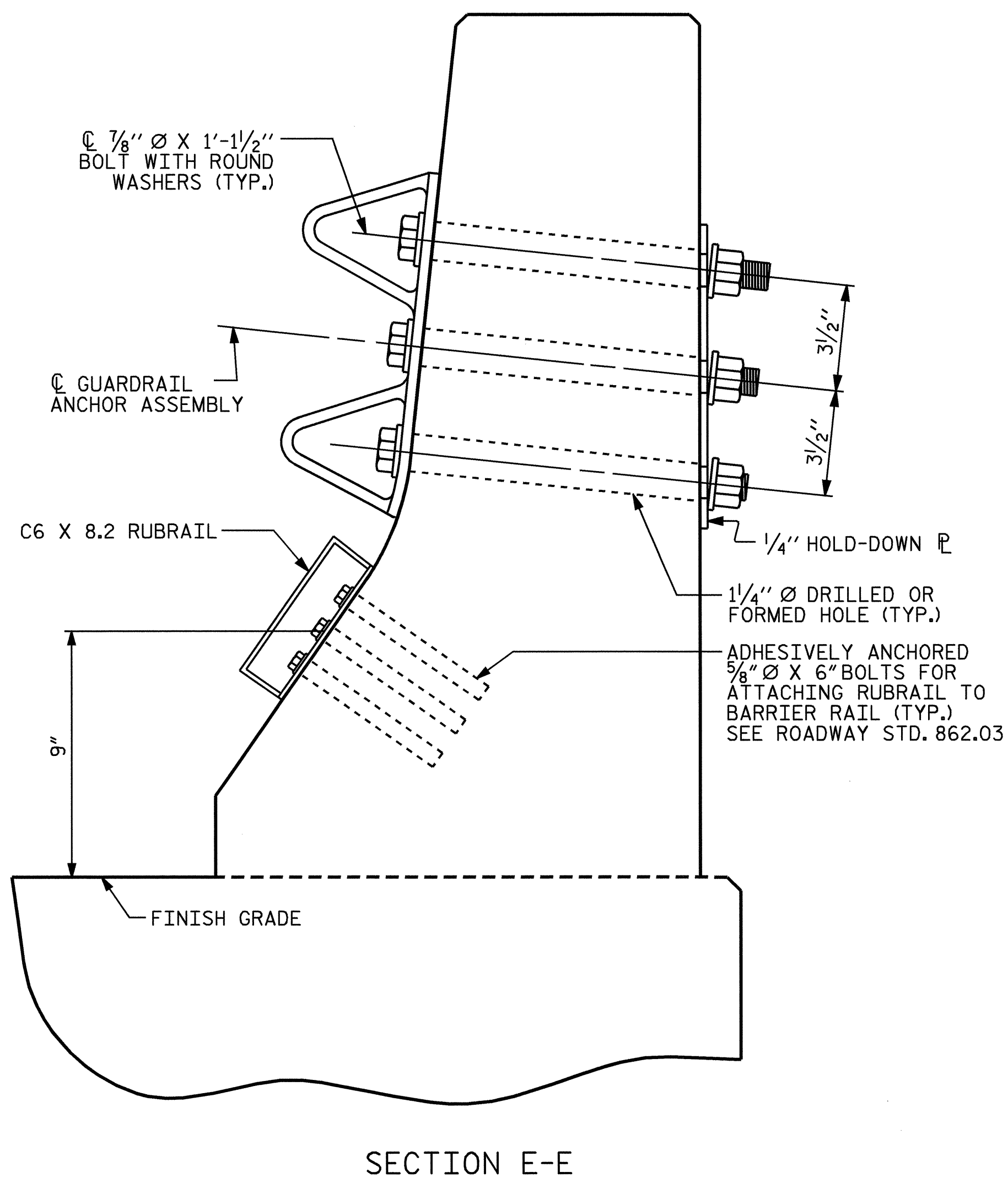
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.

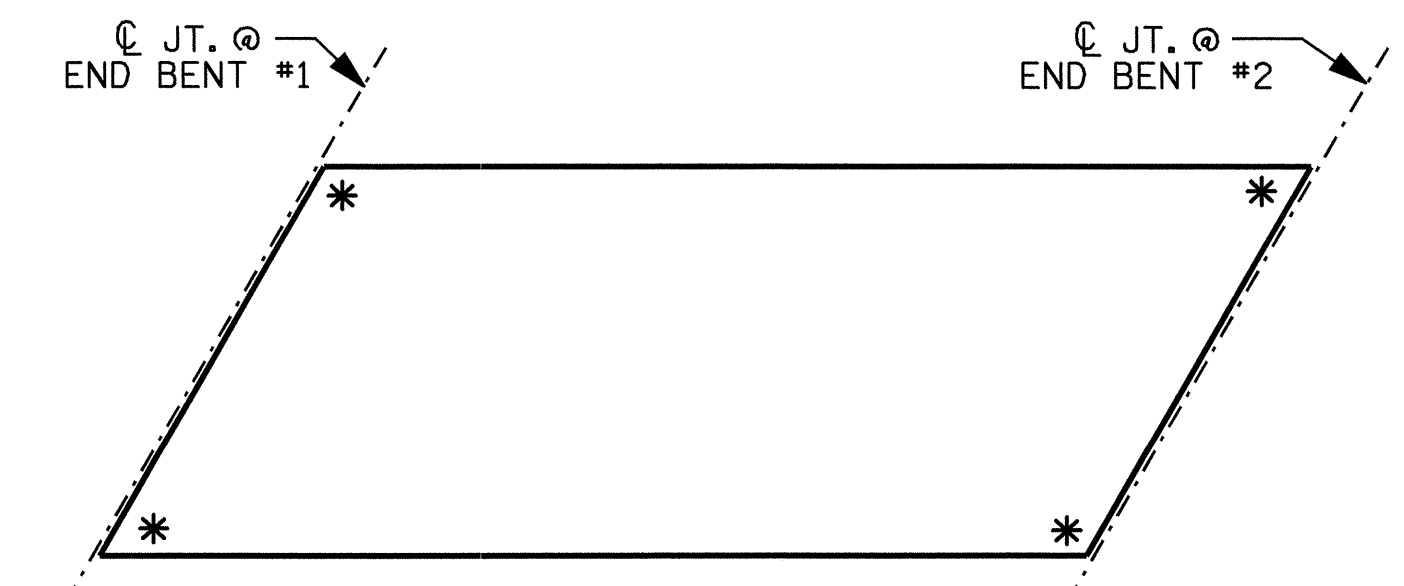
THE 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 5/8" Ø X 6" BOLTS WITH WASHERS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.



**LOCATION OF ANCHORS FOR GUARDRAIL**

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



**SKETCH SHOWING POINTS OF ATTACHMENTS**

\* DENOTES GUARDRAIL ANCHOR ASSEMBLY

**GUARDRAIL ANCHOR ASSEMBLY DETAILS**

PROJECT NO. B-4095  
DAVIDSON COUNTY  
 STATION: 26+20.00 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD  
 GUARDRAIL ANCHORAGE  
 FOR BARRIER RAIL  
 RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-51
1			3			TOTAL SHEETS
2			4			69



ASSEMBLED BY : V.X. NGUYEN DATE : 5-14-07  
 CHECKED BY : M.G. CHEEK DATE : 5-07  
 DRAWN BY : TLA 5/06 ADDED 5/1/06  
 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 GROUND SMOOTH AND COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

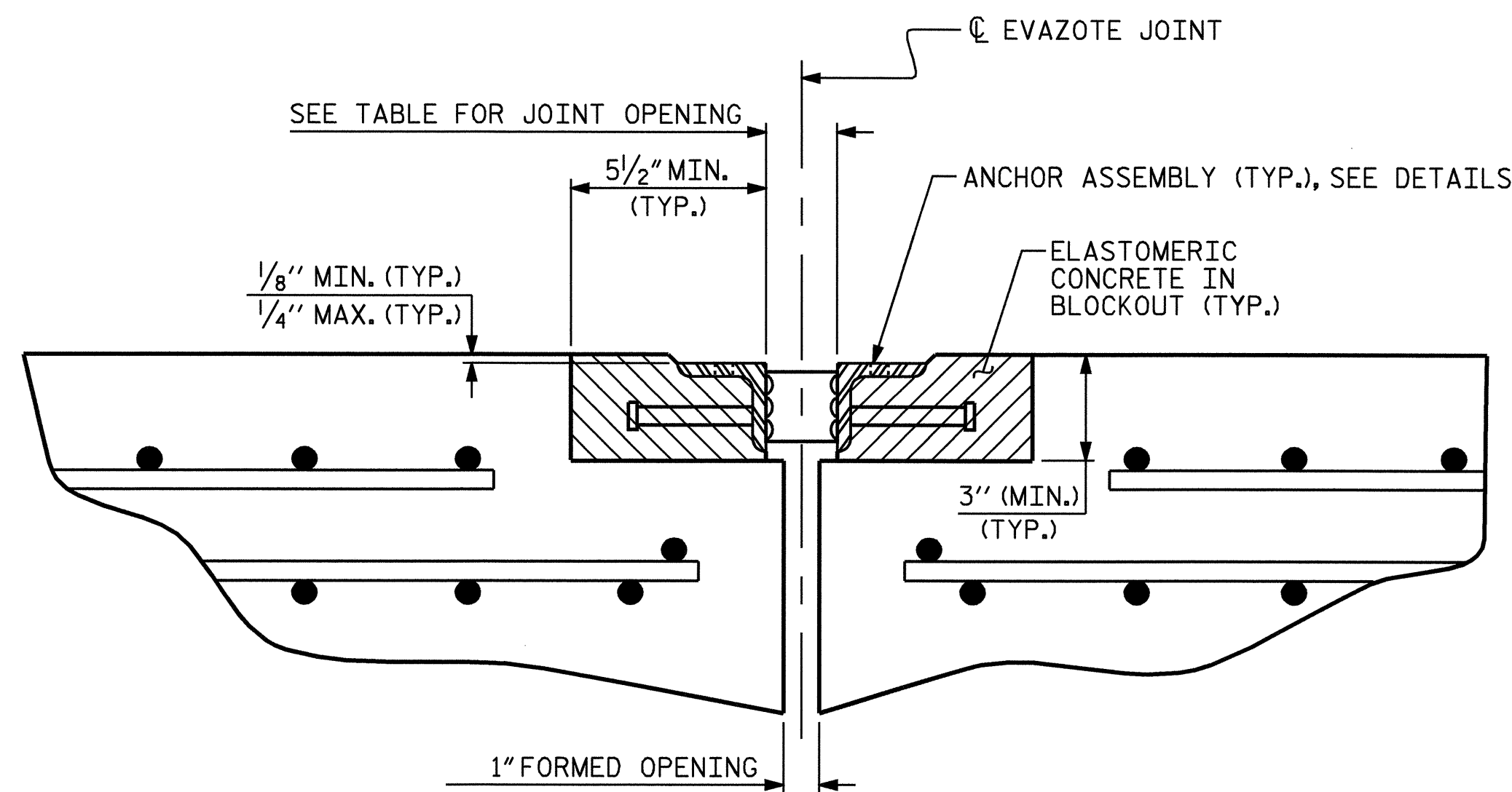
ANCHOR ASSEMBLY SEGMENTS SHALL NOT BE LESS THAN 12 FEET NOR MORE THAN 20 FEET IN LENGTH. SHORTER SEGMENTS MAY BE USED AT THE EDGE OF ROADWAY OR AT POINTS OF STAGED CONSTRUCTION.

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.

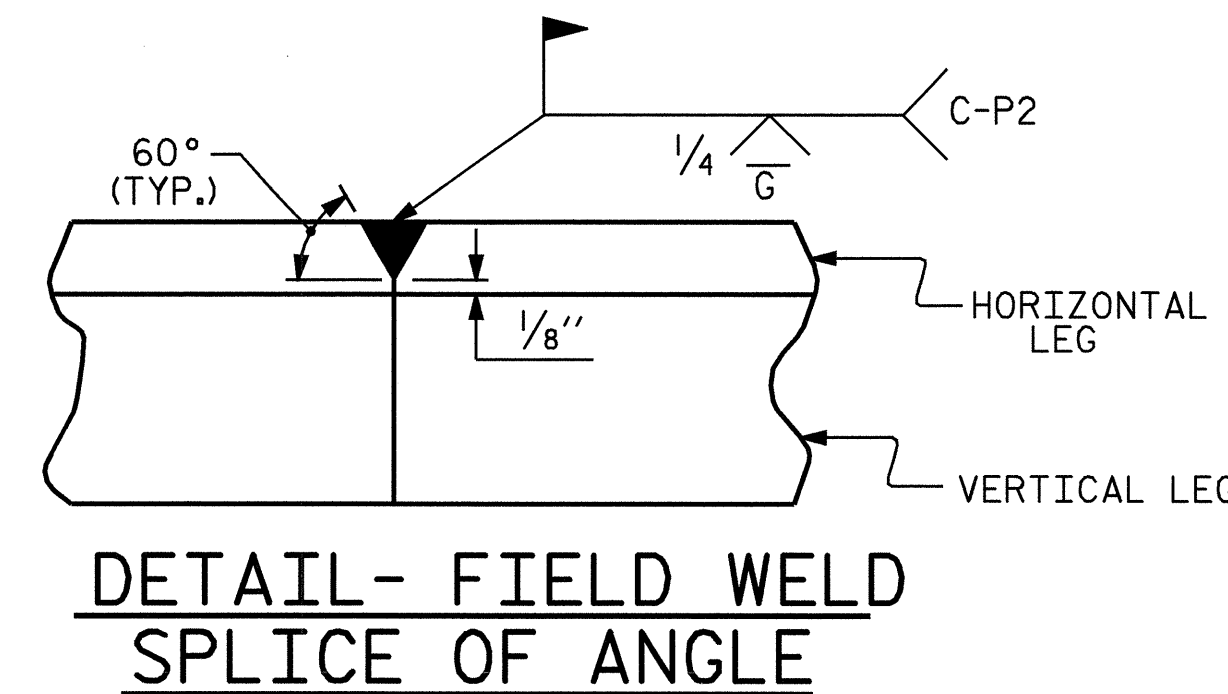
SEE SPECIAL PROVISIONS FOR EVAZOTE JOINT SEALS.

SEE SPECIAL PROVISIONS FOR ELASTOMERIC CONCRETE.

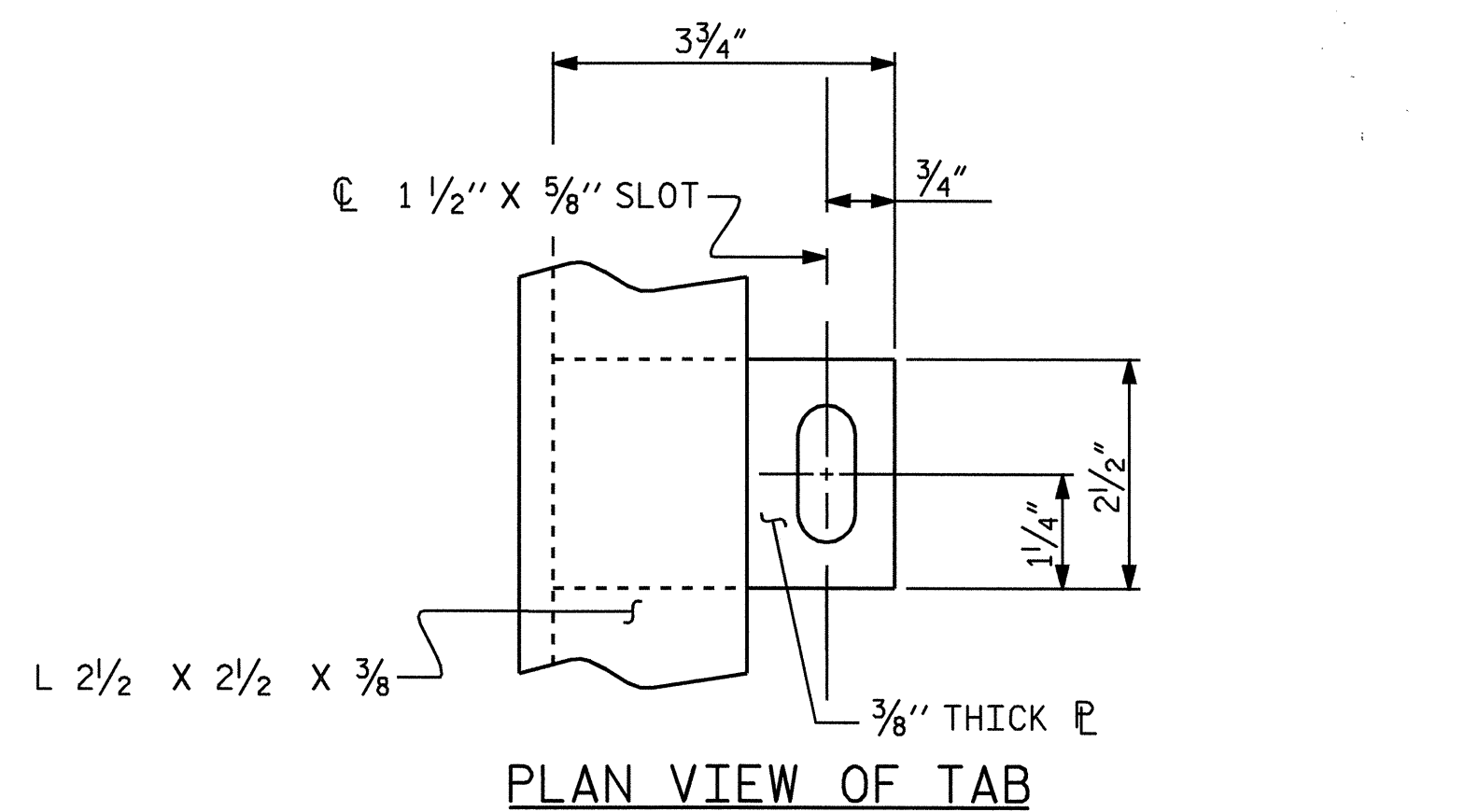


ARMORED JOINT DETAILS

SECTION NORMAL TO JOINT AT END BENT



DETAIL- FIELD WELD SPLICE OF ANGLE

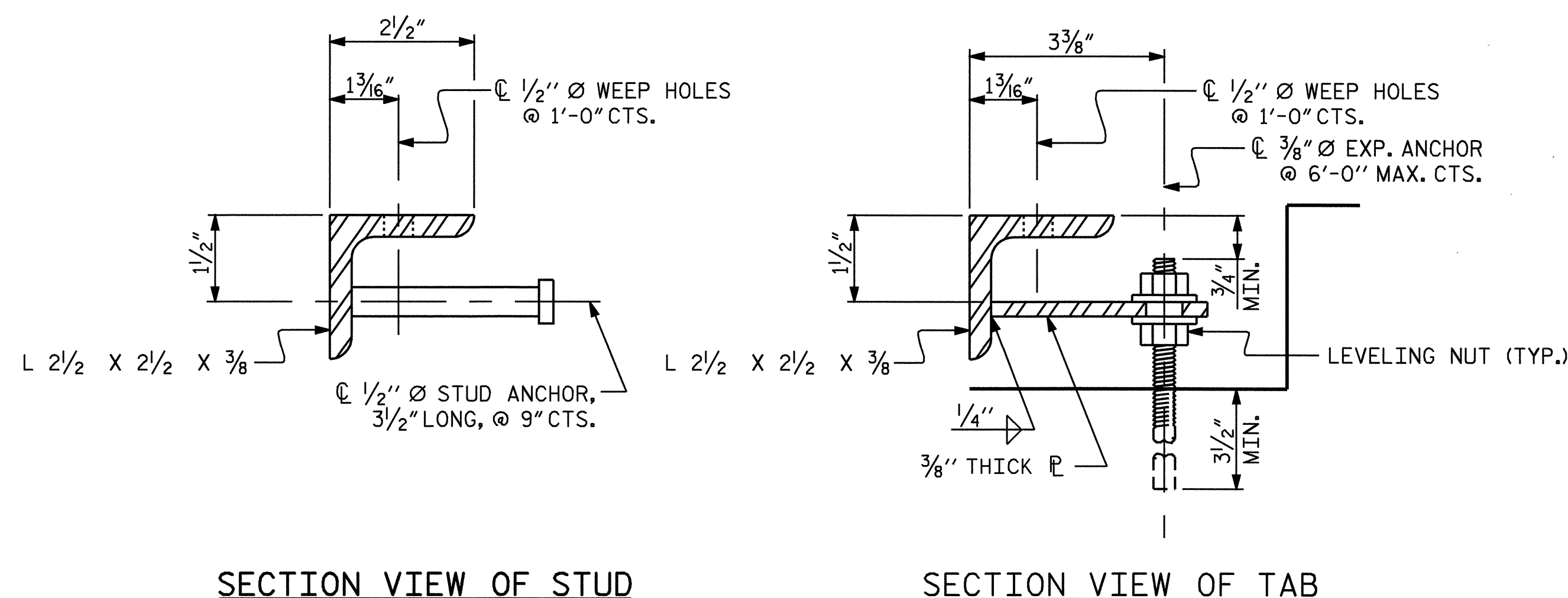


MOVEMENT AND SETTING AT EVAZOTE JOINT					
	NOMINAL UNCOMPRESSED SEAL WIDTH	TOTAL MOVEMENT (ALONG C RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
END BENT 1	2 1/2"	1/2"	2 7/8"	2"	1 13/16"
END BENT 2	2 1/2"	1 1/8"	2 3/16"	2"	1 5/8"

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

BILL OF MATERIAL		
BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)	TOTAL LENGTH OF ANGLE (FT)
END BENT 1	8.9	77'-7 7/8"
END BENT 2	8.9	77'-7 7/8"

\* BASED ON THE MINIMUM BLOCKOUT SHOWN.



SECTION VIEW OF STUD

SECTION VIEW OF TAB

ARMORED JOINT ANCHOR ASSEMBLY DETAILS

PROJECT NO. B-4095  
 DAVIDSON COUNTY  
 STATION: 26+20.00-L-

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

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

SHEET NO. S-52  
 TOTAL SHEETS 69



ASSEMBLED BY : V.X. NGUYEN DATE : 2-20-07  
 CHECKED BY : M.G. CHEEK DATE : 2-07  
 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

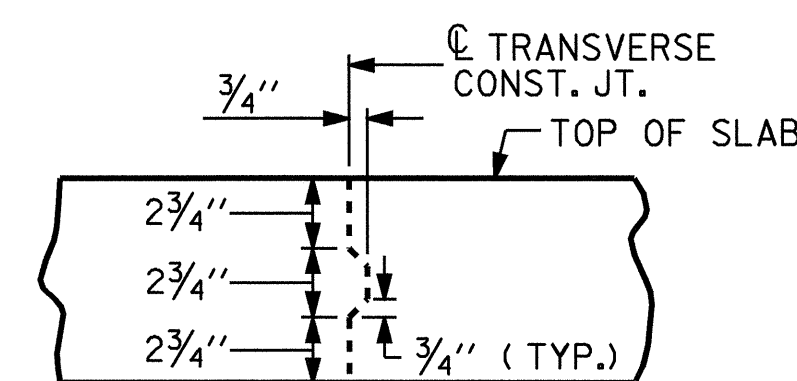
# BAR SCHEDULE

## SPANS A, B, & C - RIGHT LANE

BAR No.	SIZE	TYPE	LENGTH	WEIGHT	BAR No.	SIZE	TYPE	LENGTH	WEIGHT		
*A1	346	#5	STR.	38'-10"	14014	*B1	108	#4	STR.	23'-9"	1713
A2	346	#5	STR.	38'-10"	14014	*B2	54	#7	STR.	54'-10"	6052
*A101	2	#5	STR.	37'-8"	79	*B3	52	#7	STR.	22'-5"	2383
*A102	2	#5	STR.	36'-2"	75	*B4	27	#4	STR.	26'-0"	469
*A103	2	#5	STR.	34'-9"	72	B5	160	#5	STR.	56'-4"	9401
*A104	2	#5	STR.	33'-4"	70	*G1	2	#5	STR.	41'-10"	87
*A105	2	#5	STR.	31'-10"	66	*K1	8	#8	1	12'-9"	272
*A106	2	#5	STR.	30'-5"	63	*K2	12	#8	2	18'-5"	590
*A107	2	#5	STR.	29'-0"	60	K3	16	#6	STR.	6'-4"	152
*A108	2	#5	STR.	27'-6"	57	K4	32	#4	STR.	6'-4"	135
*A109	2	#5	STR.	26'-1"	54	K5	32	#4	STR.	7'-6"	160
*A110	2	#5	STR.	24'-8"	51	K6	16	#4	STR.	4'-8"	50
*A111	2	#5	STR.	23'-2"	48	K7	20	#4	5	5'-6"	73
*A112	2	#5	STR.	21'-9"	45	K8	30	#4	6	10'-8"	214
*A113	2	#5	STR.	20'-4"	42	*S1	56	#5	3	5'-10"	341
*A114	2	#5	STR.	18'-10"	39	*S2	56	#4	4	3'-11"	147
*A115	2	#5	STR.	17'-5"	36	S3	176	#4	7	2'-9"	323
*A116	2	#5	STR.	16'-0"	33	*U1	32	#4	8	15'-2"	324
*A117	2	#5	STR.	14'-6"	30	*U2	16	#4	8	13'-2"	141
*A118	2	#5	STR.	13'-1"	27	REINFORCING STEEL				25,577	LBS.
*A119	2	#5	STR.	11'-8"	24	EPOXY COATED REINFORCING STEEL				27,588	LBS.
*A120	2	#5	STR.	10'-2"	21	* THESE BARS ARE EPOXY COATED					
*A121	2	#5	STR.	8'-9"	18						
*A122	2	#5	STR.	7'-4"	15						
*A123	2	#5	STR.	5'-10"	12						
*A124	2	#5	STR.	4'-5"	9						
*A125	2	#5	STR.	3'-0"	6						
*A126	2	#5	STR.	1'-6"	3						
A201	2	#5	STR.	37'-8"	79						
A202	2	#5	STR.	36'-2"	75						
A203	2	#5	STR.	34'-9"	72						
A204	2	#5	STR.	33'-4"	70						
A205	2	#5	STR.	31'-10"	66						
A206	2	#5	STR.	30'-5"	63						
A207	2	#5	STR.	29'-0"	60						
A208	2	#5	STR.	27'-6"	57						
A209	2	#5	STR.	26'-1"	54						
A210	2	#5	STR.	24'-8"	51						
A211	2	#5	STR.	23'-2"	48						
A212	2	#5	STR.	21'-9"	45						
A213	2	#5	STR.	20'-4"	42						
A214	2	#5	STR.	18'-10"	39						
A215	2	#5	STR.	17'-5"	36						
A216	2	#5	STR.	16'-0"	33						
A217	2	#5	STR.	14'-6"	30						
A218	2	#5	STR.	13'-1"	27						
A219	2	#5	STR.	11'-8"	24						
A220	2	#5	STR.	10'-2"	21						
A221	2	#5	STR.	8'-9"	18						
A222	2	#5	STR.	7'-4"	15						
A223	2	#5	STR.	5'-10"	12						
A224	2	#5	STR.	4'-5"	9						
A225	2	#5	STR.	3'-0"	6						
A226	2	#5	STR.	1'-6"	3						

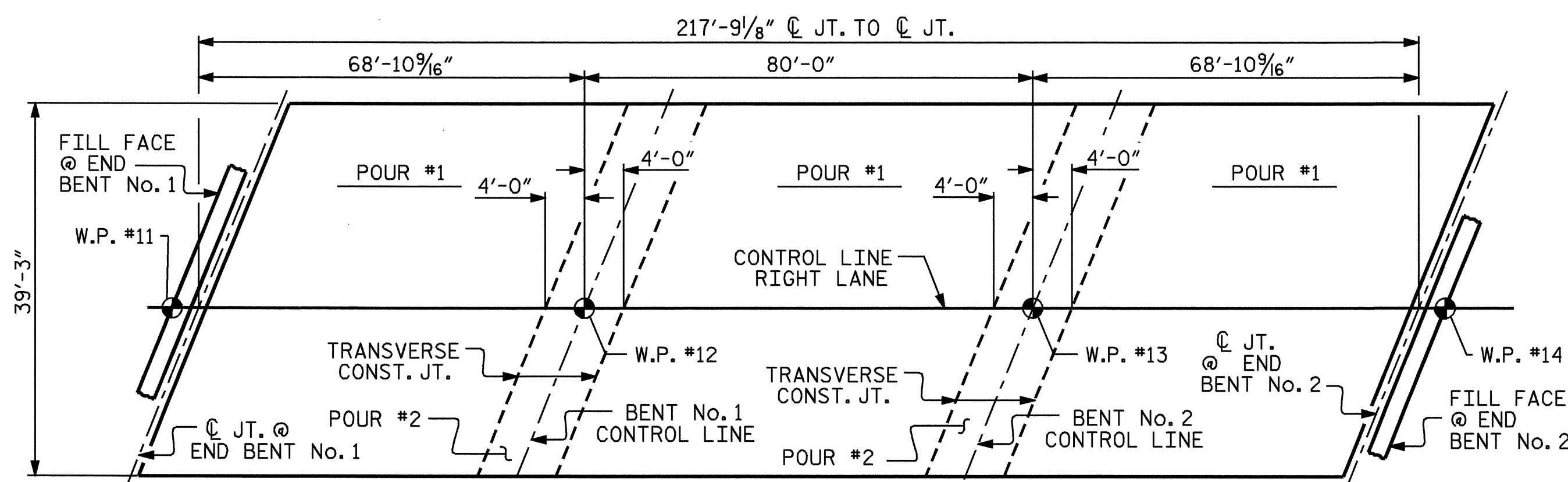
### GROOVING BRIDGE FLOORS

APPROACH SLABS	1564	SQ.FT.
BRIDGE DECK	7144	SQ.FT.
TOTAL	8708	SQ.FT.



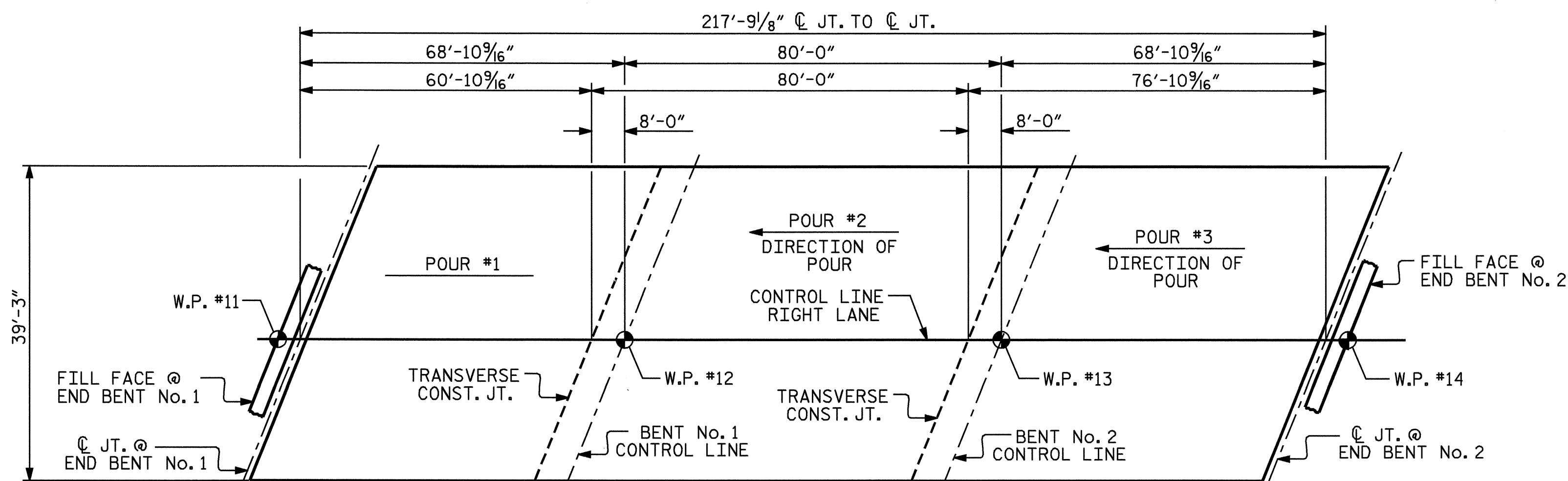
### TRANSVERSE CONSTRUCTION JOINT DETAIL

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

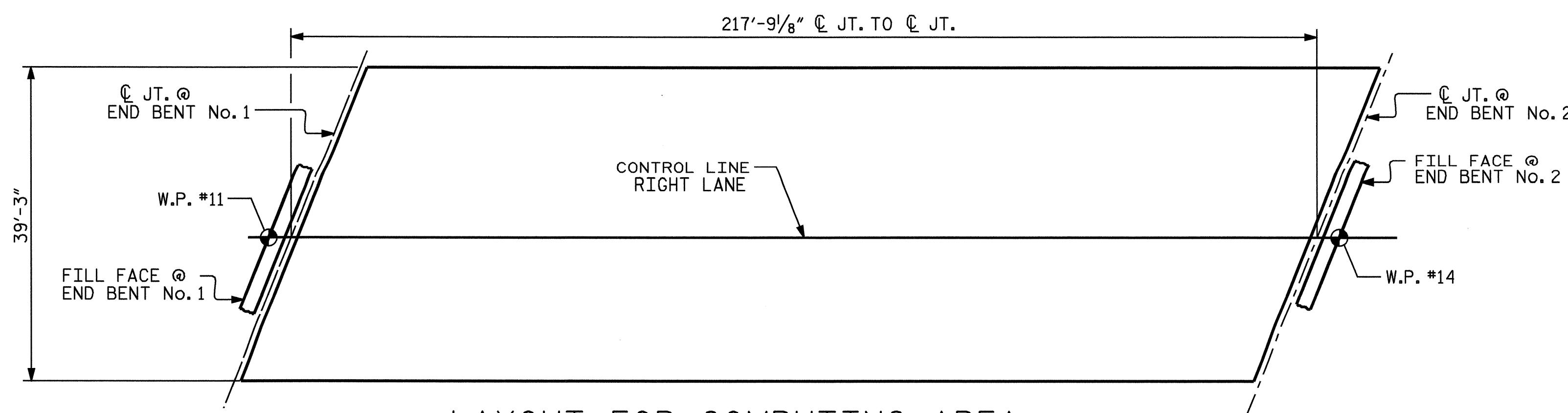


### OPTIONAL POURING SEQUENCE SKETCH

NOTE: POUR 2 CAN NOT BE STARTED UNTIL BOTH ADJACENT POURS REACH A MINIMUM OF 3000 PSI.

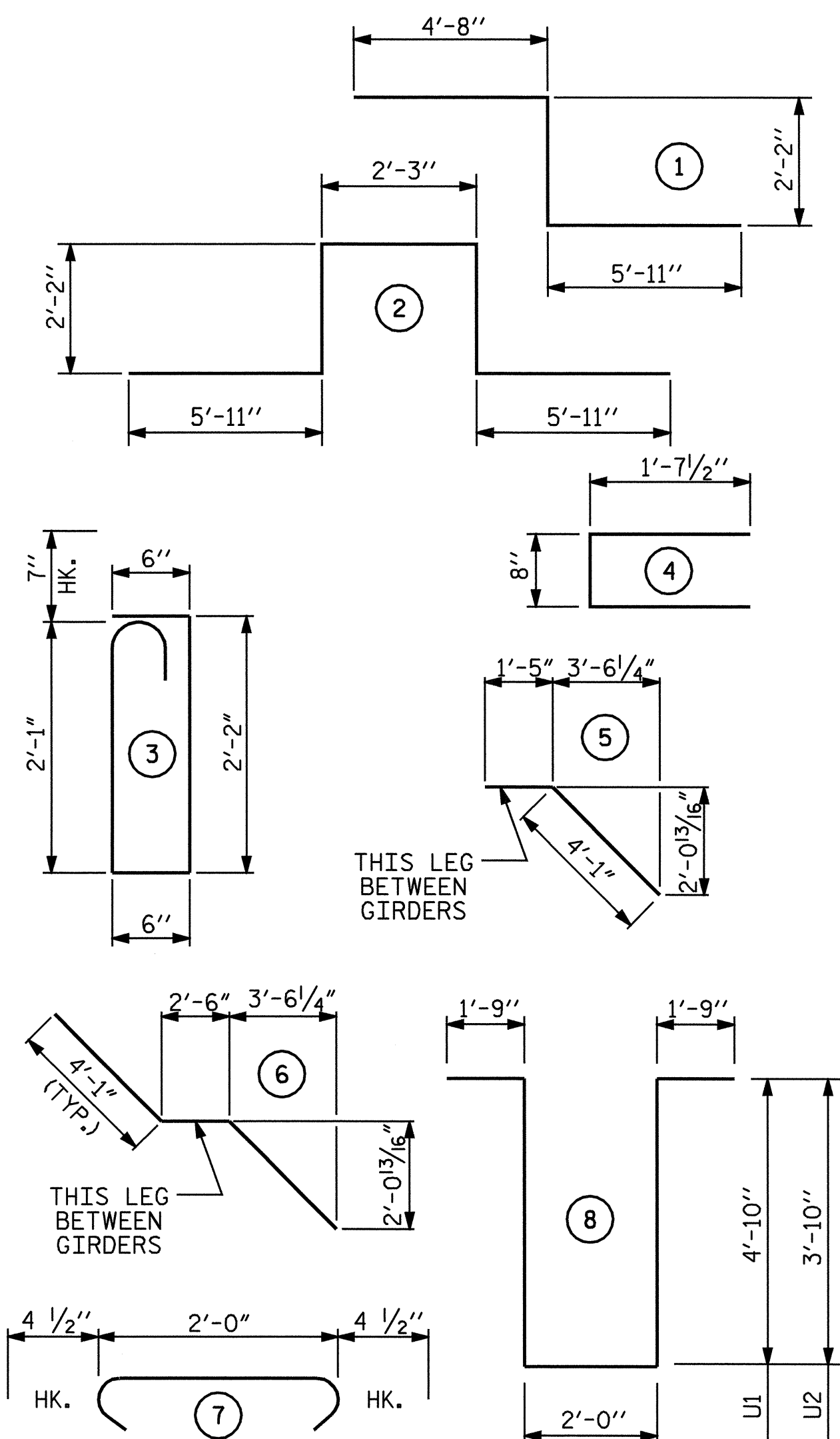


### POURING SEQUENCE SKETCH



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 8547)

### BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

### SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
TOTALS**	300.8	25,577	27,588

\*\*QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

### POUR SEQUENCE BREAKDOWN

SPANS A,B,&C	CLASS AA CONCRETE (C.Y.)
POUR #1	78.3
POUR #2	112.1
POUR #3	110.4
TOTAL **	300.8

\*\*QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

PROJECT NO. B-4095  
DAVIDSON COUNTY  
STATION: 26+20.00-L-

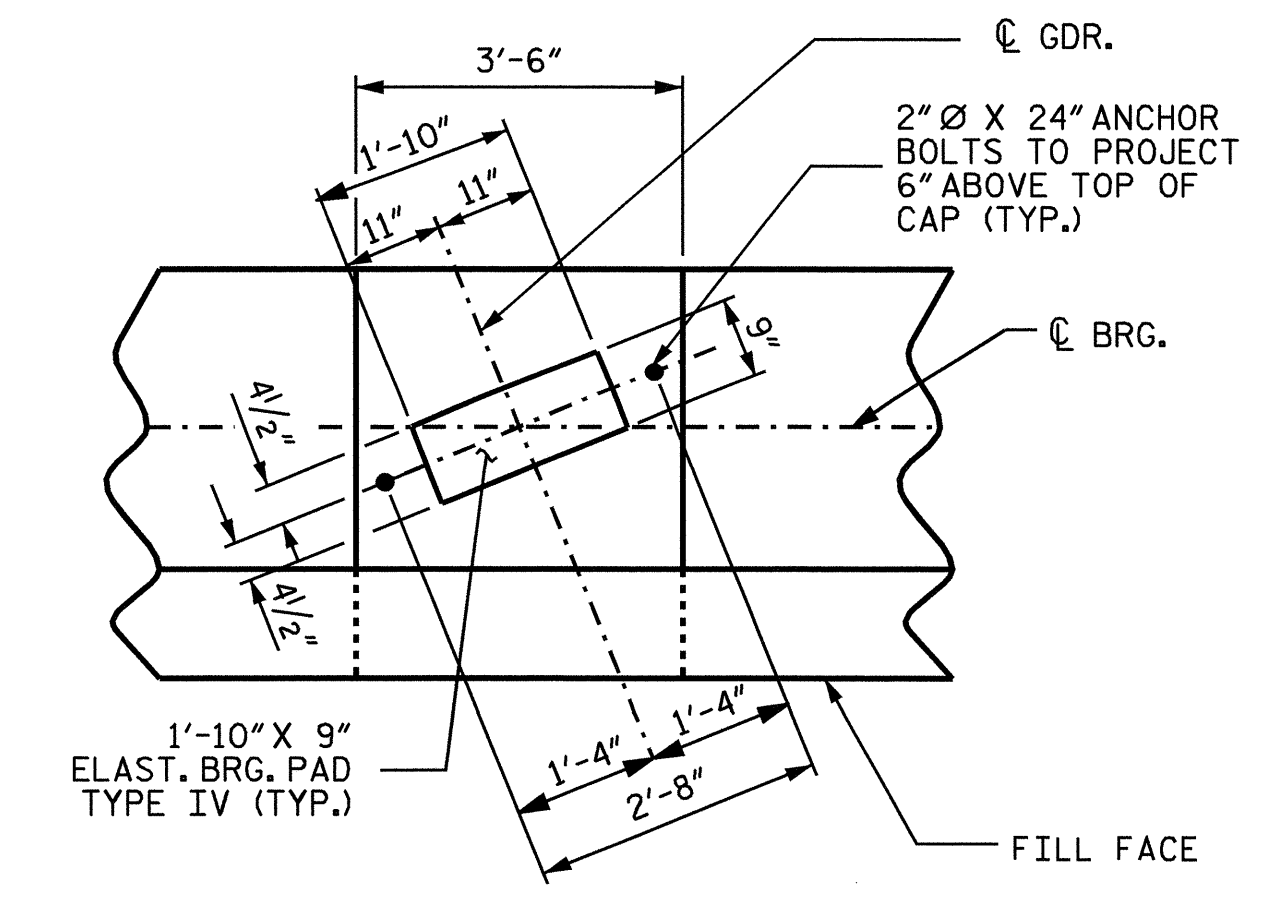
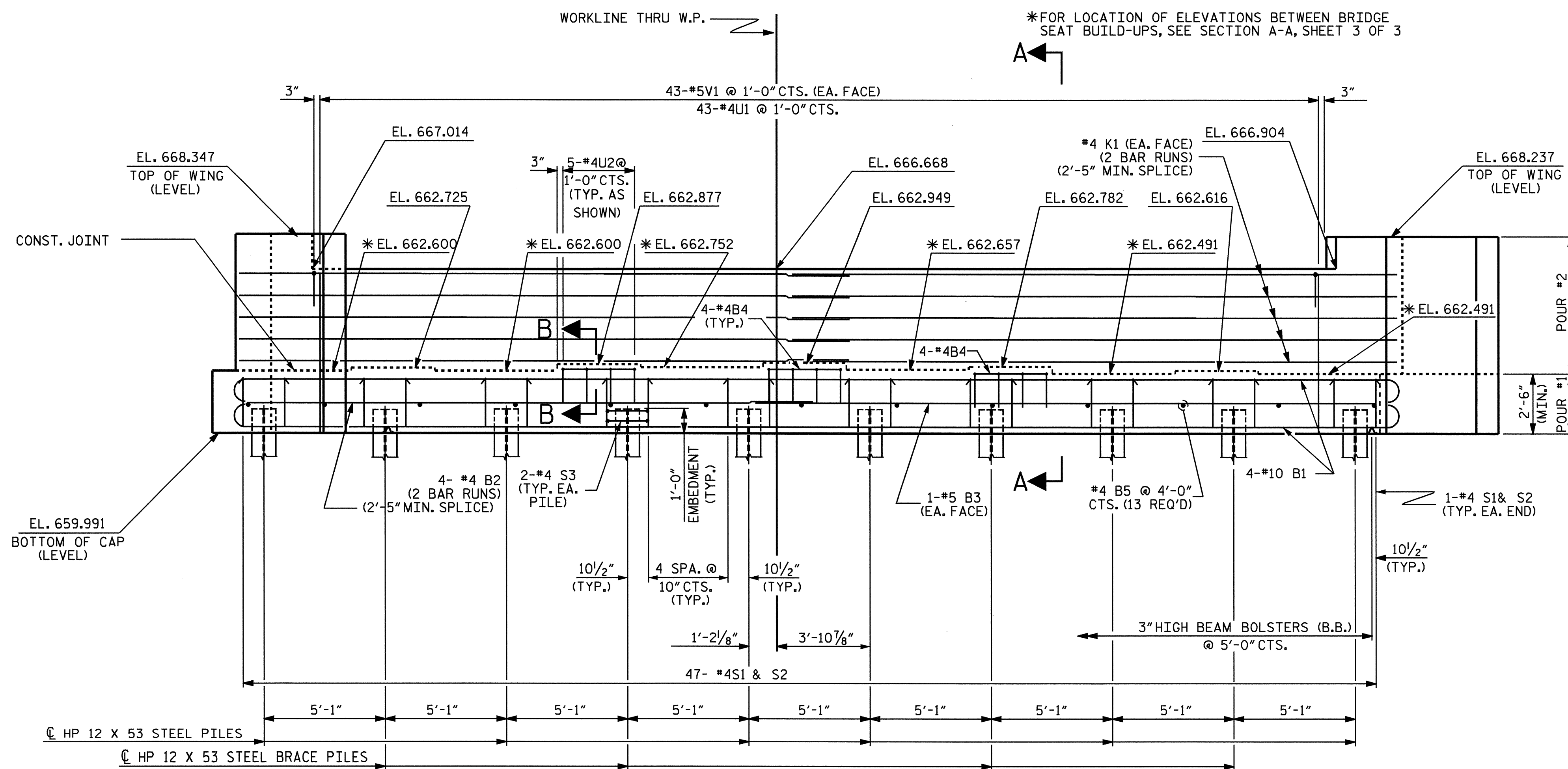
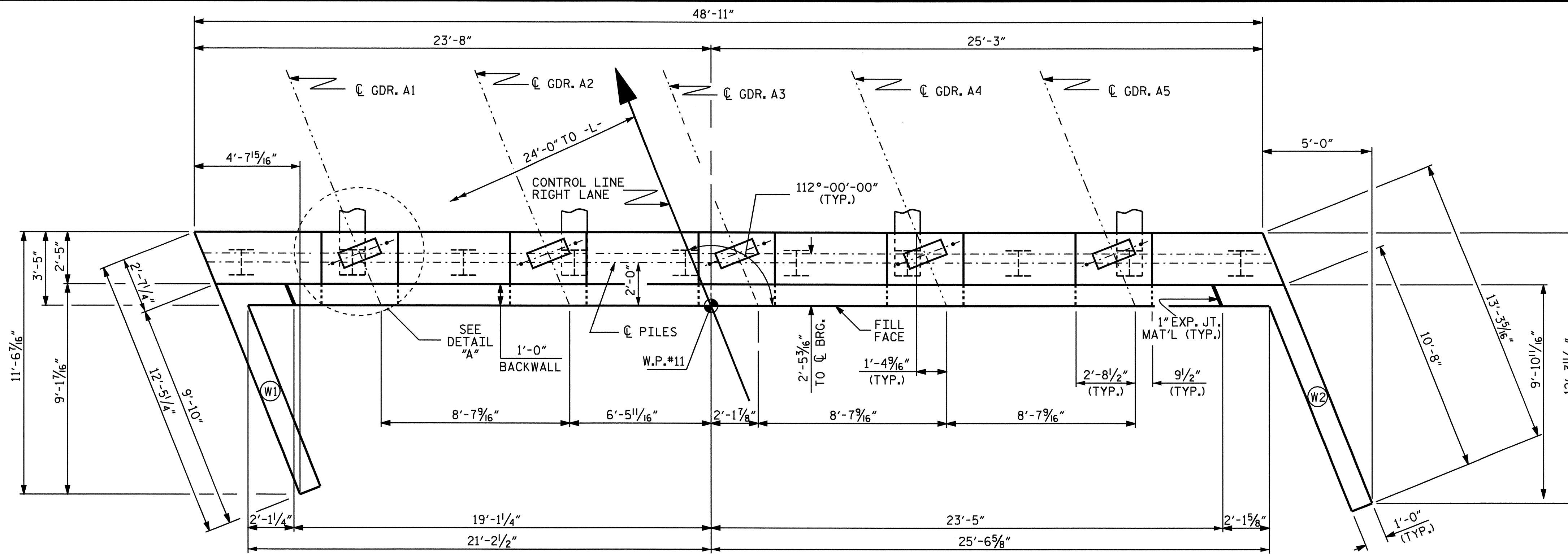
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUPERSTRUCTURE  
BILL OF MATERIAL  
RIGHT LANE



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-53
1			3			TOTAL SHEETS 69
2			4			

ASSEMBLED BY :	V.X. NGUYEN	DATE :	10-17-06
CHECKED BY :	M.G. CHEEK	DATE :	02-07
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



**NOTES**

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- FOR SECTION A-A, SEE SHEET 3 OF 3.
- FOR PILE SPLICE DETAILS SEE SHEET 3 OF 3.
- FOR TEMPORARY DRAINAGE AT END BENTS, SEE SHEET 3 OF 3.
- BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
- THE TOP SURFACE AREA OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NO BE USED.
- THE TOP SURFACE OF THE END BENT CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.
- THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

PROJECT NO. B-4095  
DAVIDSON COUNTY  
 STATION: 26+20.00 -L-

SHEET 1 OF 3

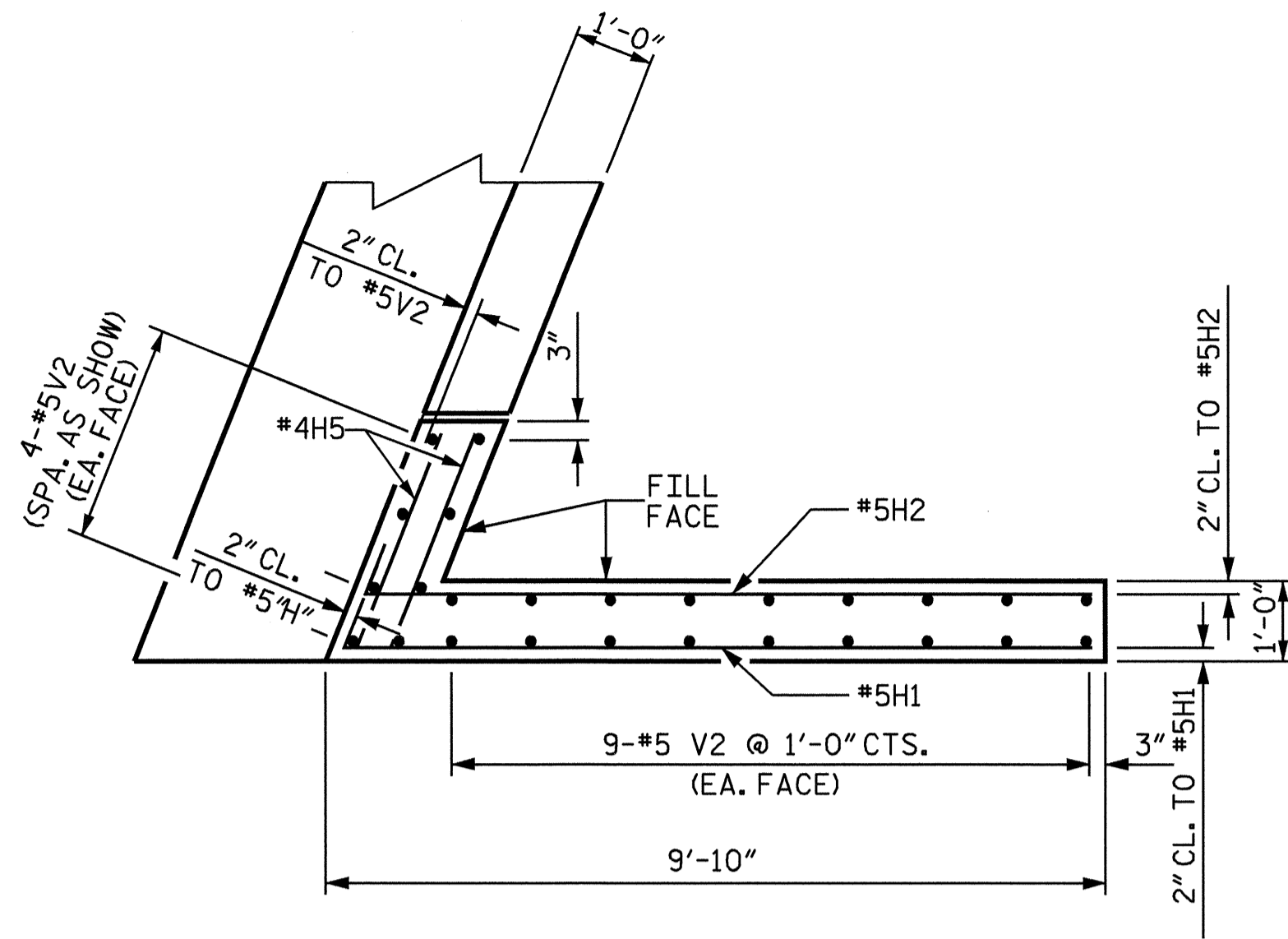
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT NO. 1  
 RIGHT LANE

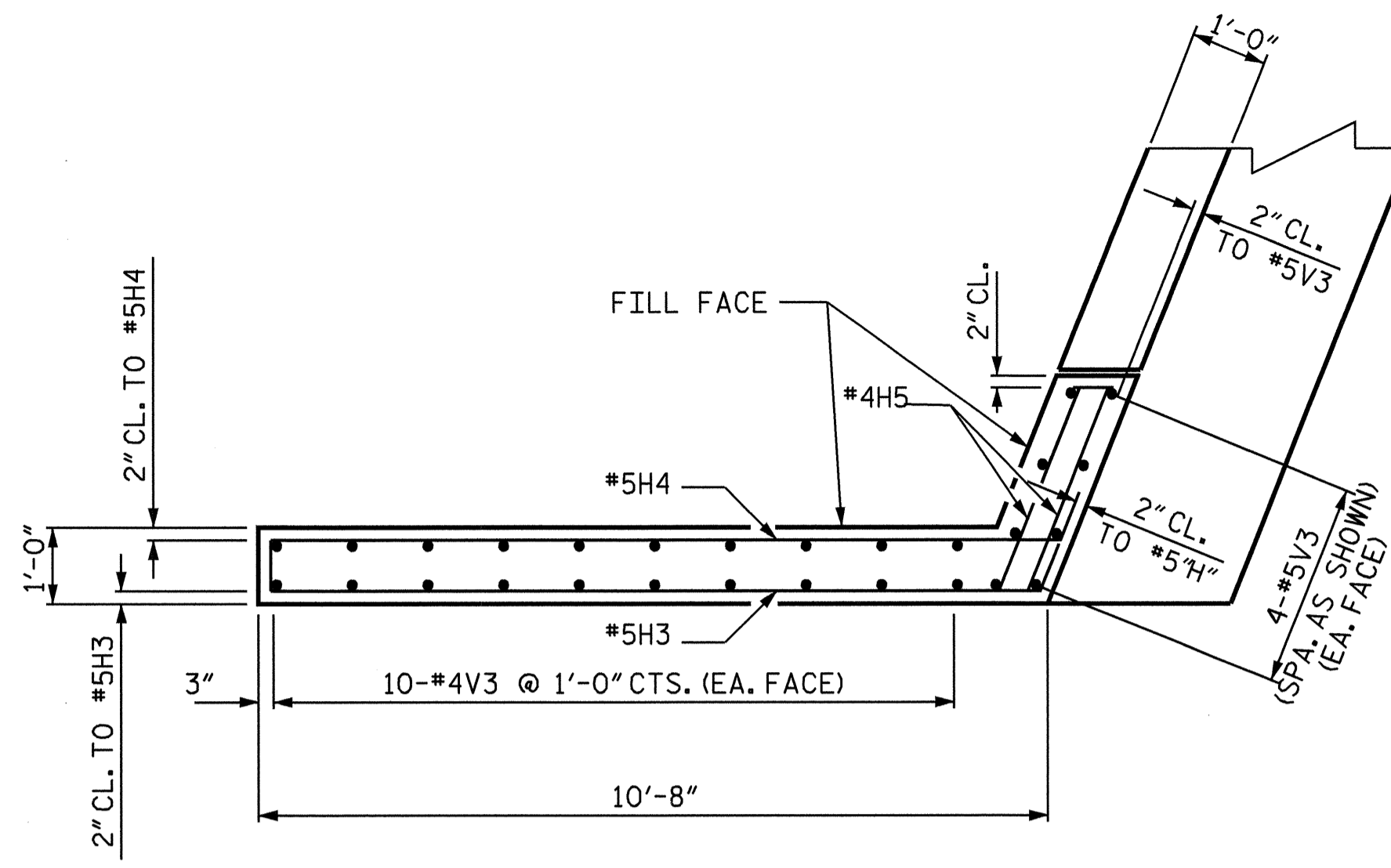


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-54
1			3			TOTAL SHEETS 69
2			4			

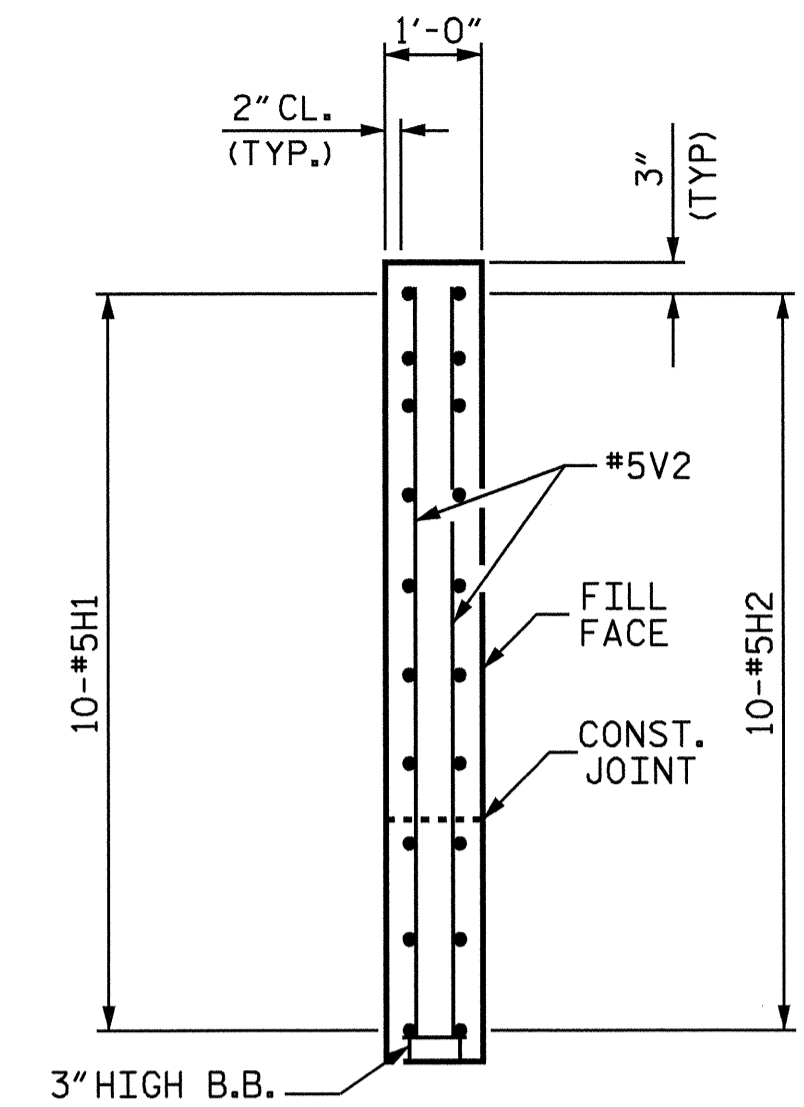
DRAWN BY : A.L. FIGUEROA DATE : 3-29-07  
 CHECKED BY : R.D. MARTIN DATE : 5-04-07



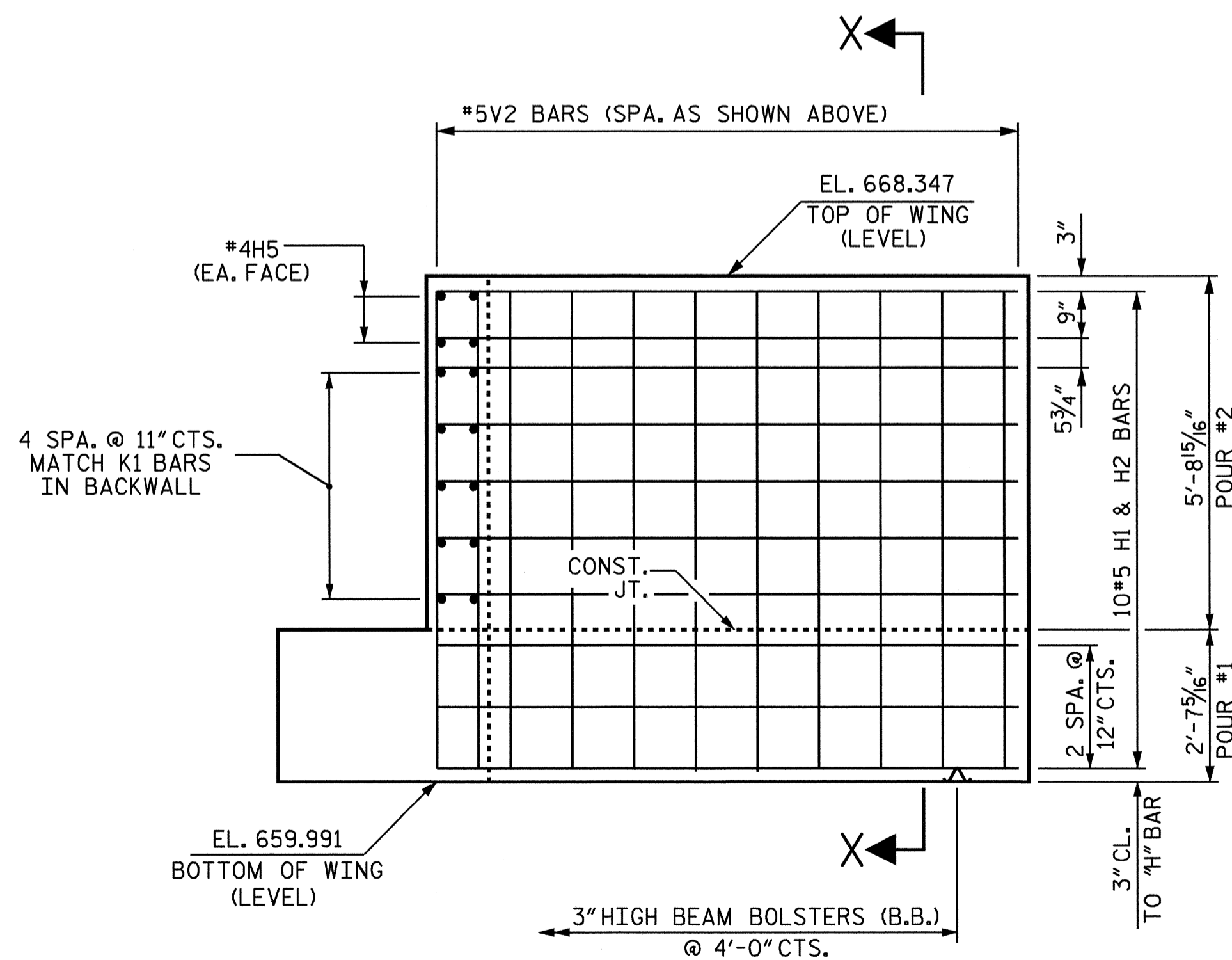
PLAN OF LEFT WING - W1



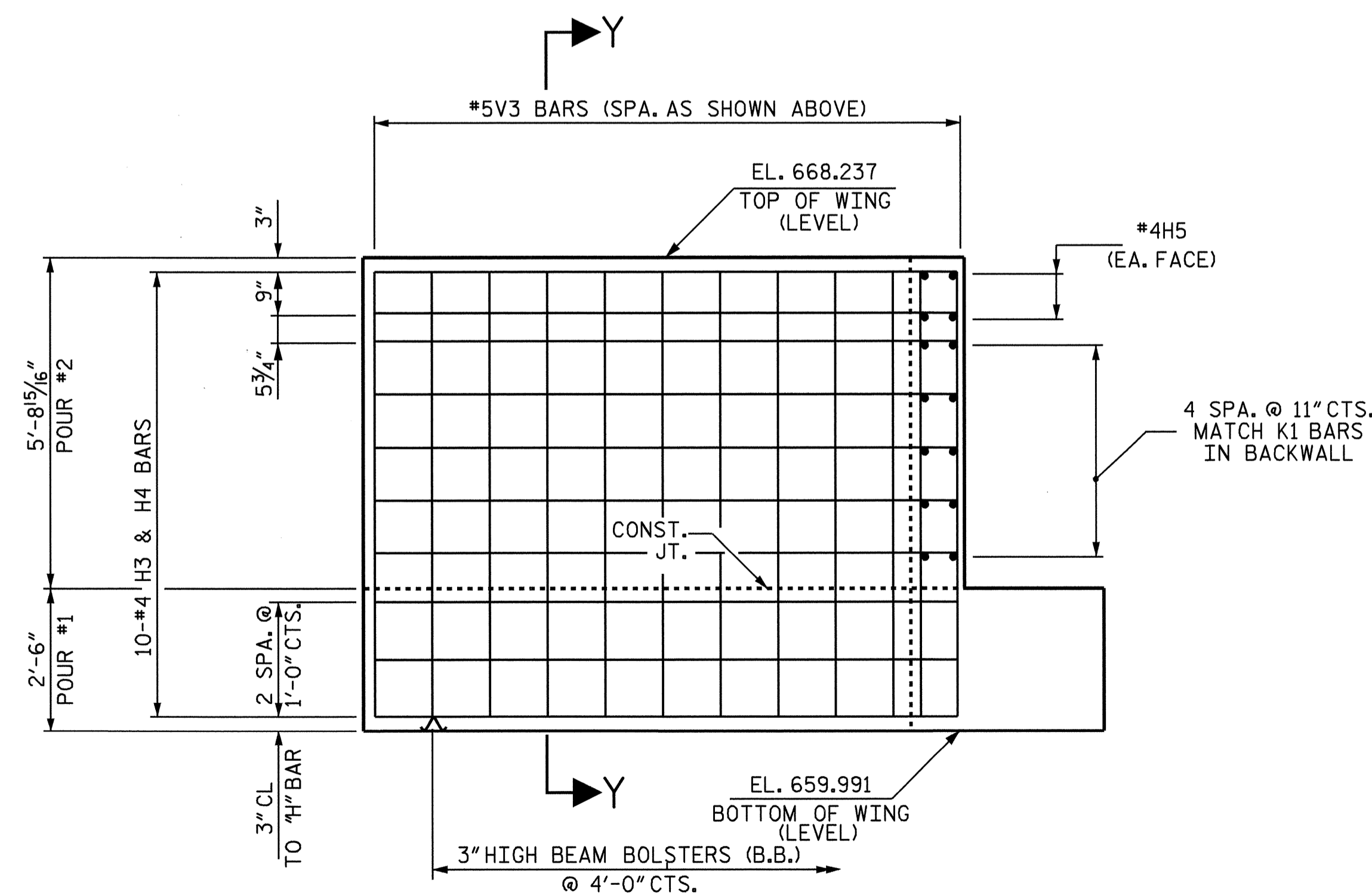
PLAN OF RIGHT WING - W2



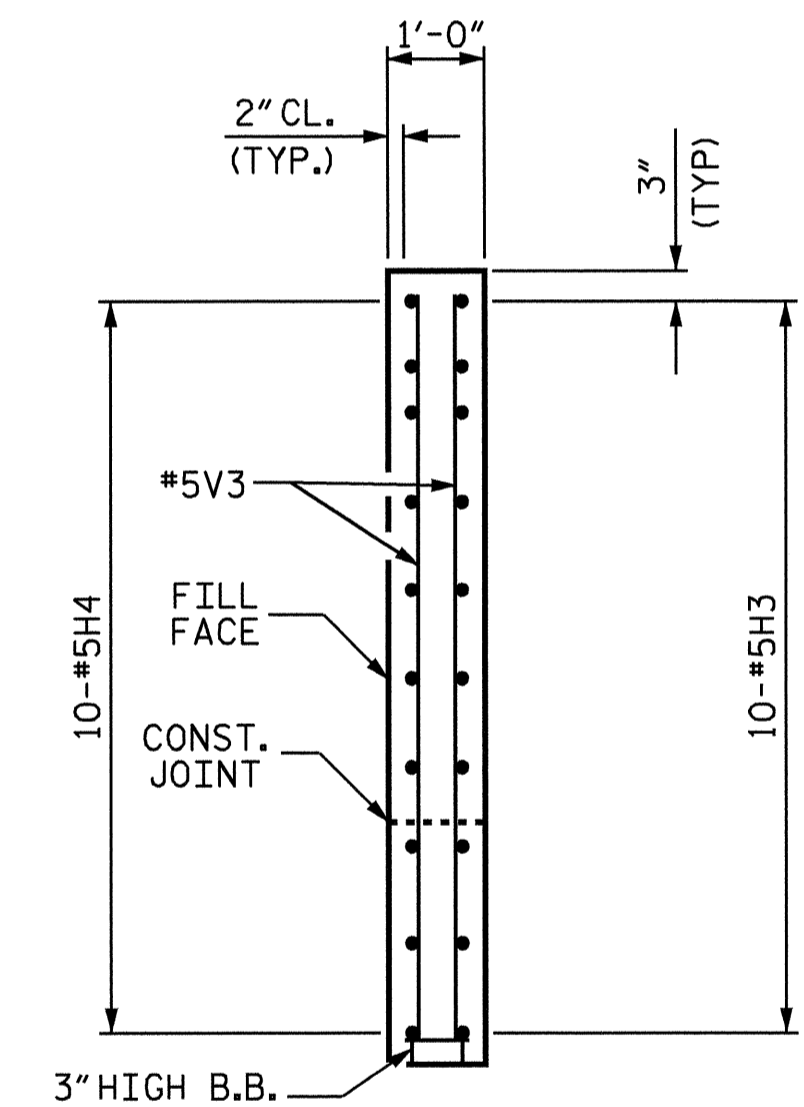
SECTION X-X



ELEVATION OF LEFT WING - W1



ELEVATION OF RIGHT WING - W2



SECTION Y-Y

PROJECT NO. B-4095  
 DAVIDSON COUNTY  
 STATION: 26+20.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT NO. 1  
 RIGHT LANE



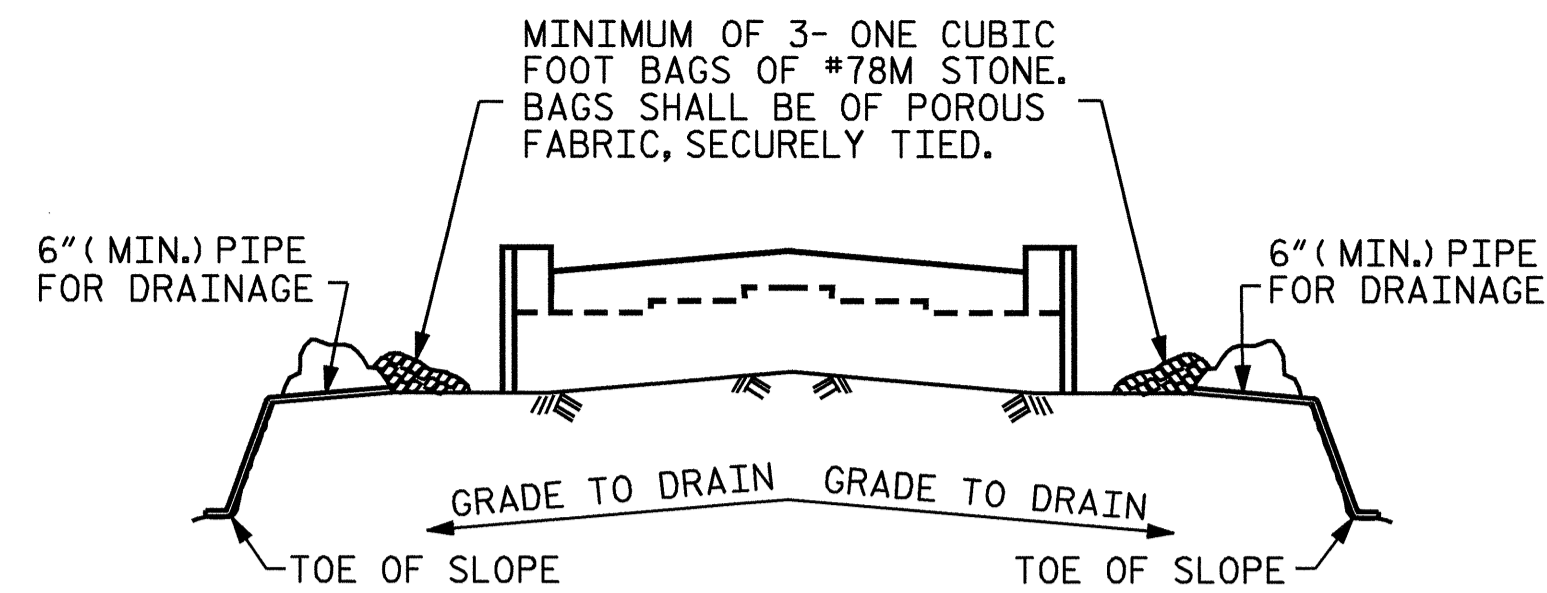
REVISIONS						SHEET NO. S-55
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 69
2			4			

DRAWN BY: A.L. FIGUEROA DATE: 3-29-07  
 CHECKED BY: R.D. MARTIN DATE: 5-04-07

14-MAY-2007 13:47  
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 afigueroa

STR#2



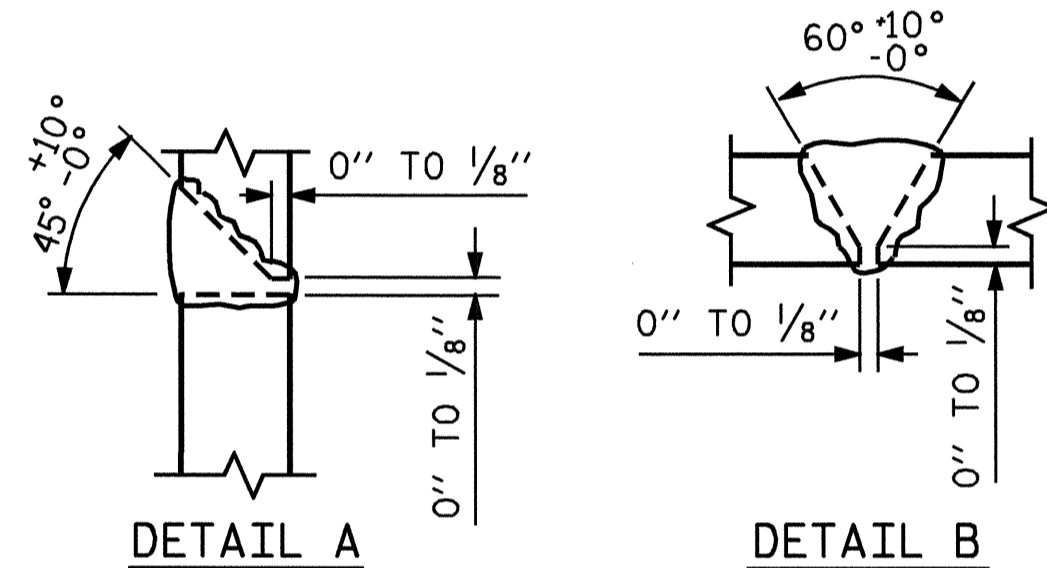
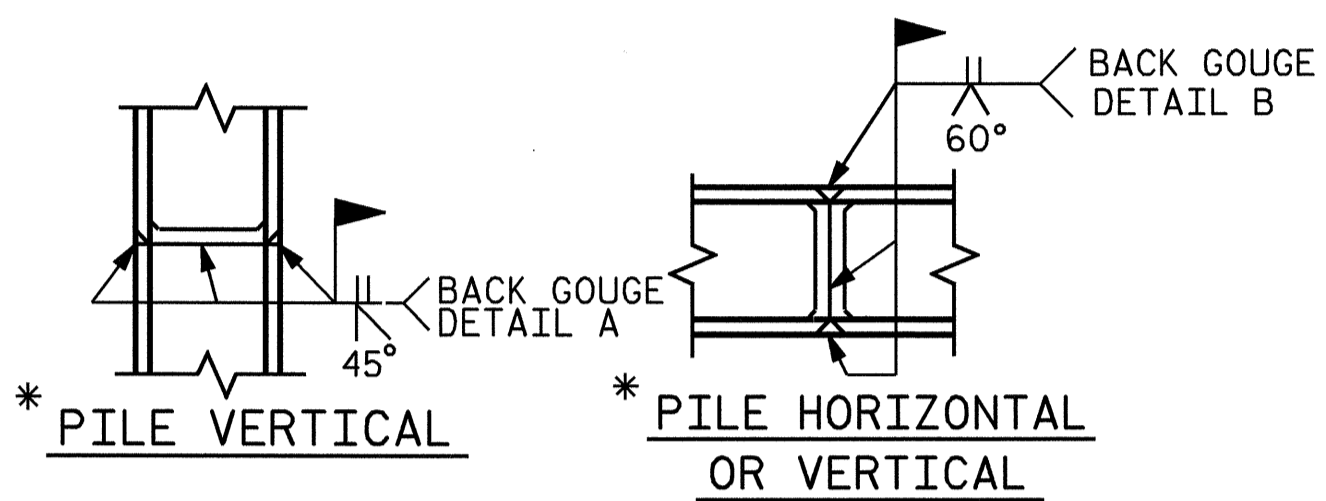


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

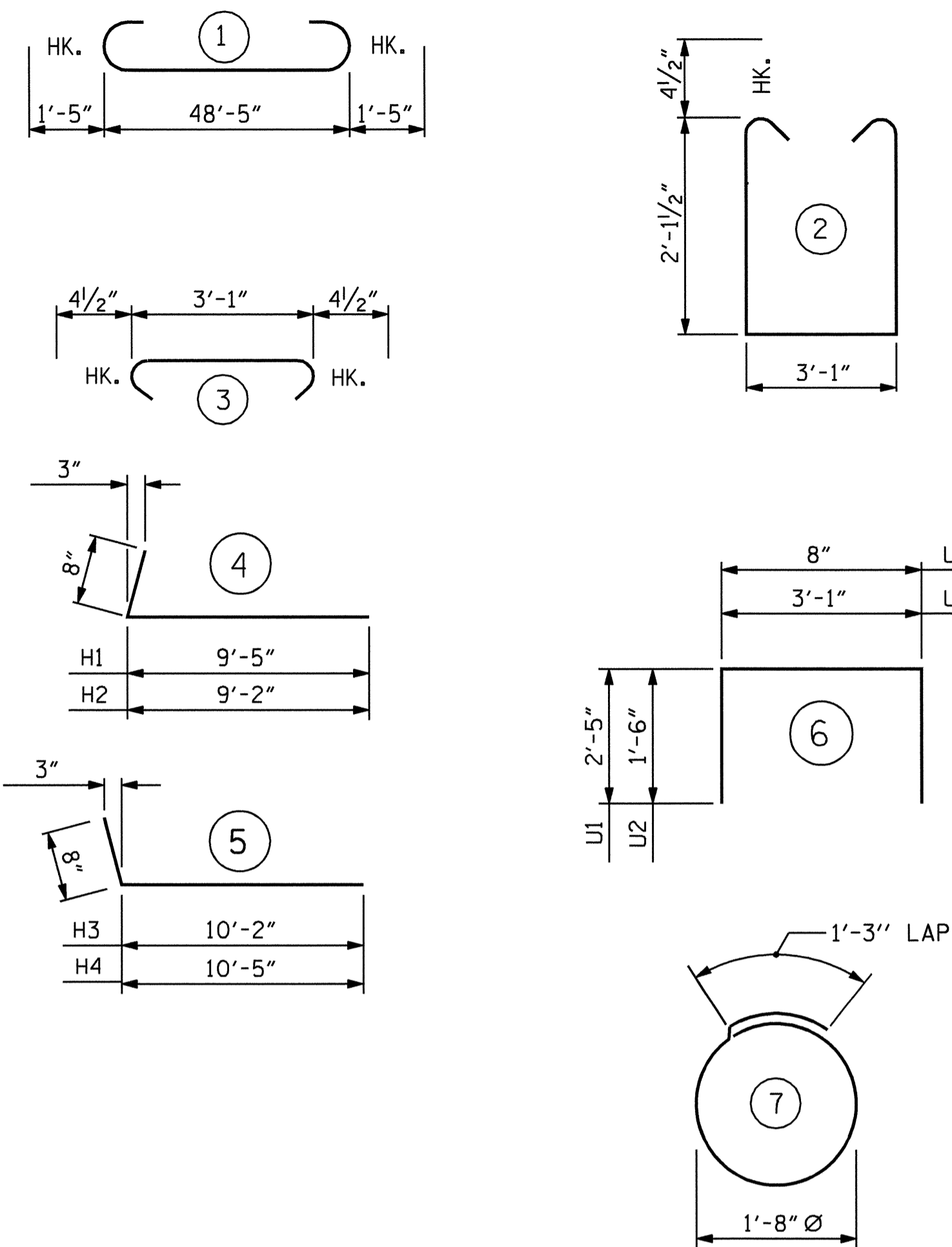
**TEMPORARY DRAINAGE AT END BENT**



\* POSITION OF PILE DURING WELDING.

**PILE SPLICE DETAILS**

**BAR TYPES**



ALL BAR DIMENSIONS ARE OUT TO OUT.

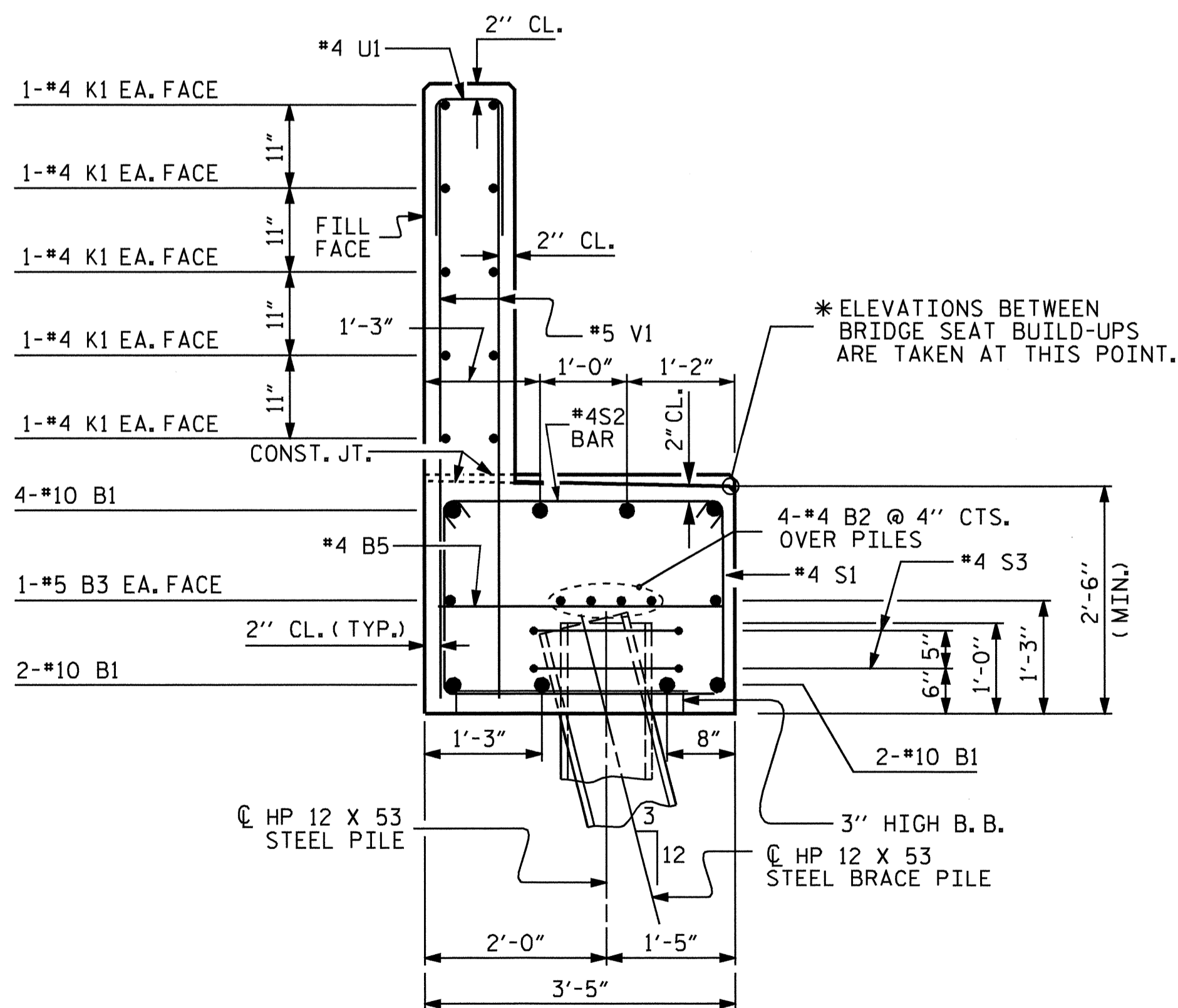
**BILL OF MATERIAL**  
**END BENT NO. 1**

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	10	1	51'-3"	1764
B2	8	4	STR	25'-6"	136
B3	2	5	STR	48'-7"	101
B4	12	4	STR	3'-2"	26
B5	13	4	STR	3'-1"	27
H1	10	5	4	10'-1"	105
H2	10	5	4	9'-10"	103
H3	10	5	5	10'-10"	113
H4	10	5	5	11'-1"	116
H5	8	4	STR	2'-9"	15
K1	20	4	STR	25'-6"	341
S1	47	4	2	8'-1"	254
S2	47	4	3	3'-10"	120
S3	20	4	7	6'-6"	87
U1	43	4	6	5'-6"	158
U2	12	4	6	6'-1"	37
V1	86	5	STR	6'-6"	583
V2	26	5	STR	7'-11"	231
V3	28	5	STR	7'-10"	212

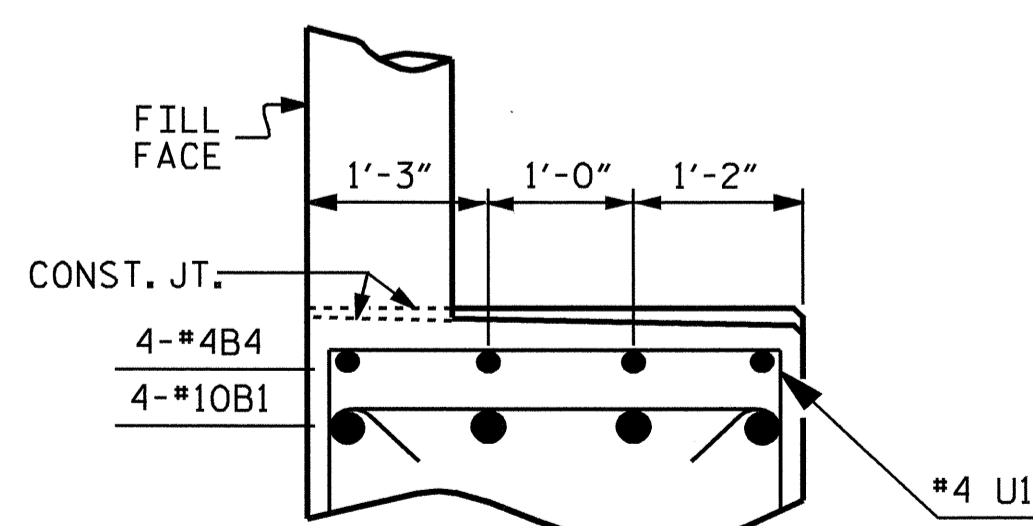
REINFORCING STEEL 4,529 LBS.

CLASS A CONCRETE BREAKDOWN  
POUR #1  
END BENT CAP & LOWER WINGS 17.2 C.Y.  
POUR #2  
BACKWALL & UPPER PART OF WINGS 11.7 C.Y.  
TOTAL CLASS A CONCRETE 28.9 C.Y.

HP 12 X 53 STEEL PILES  
NO. 10 300 LIN. FT.



**SECTION A-A**



**SECTION B-B**

PROJECT NO. B-4095  
DAVIDSON COUNTY  
STATION: 26+20.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE  
END BENT NO.1  
RIGHT LANE

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S-56
2			4			TOTAL SHEETS 69



DRAWN BY : A.L.FIGUEROA DATE : 3-29-07  
CHECKED BY : R.D.MARTIN DATE : 5-04-06

STR #2

**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.

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

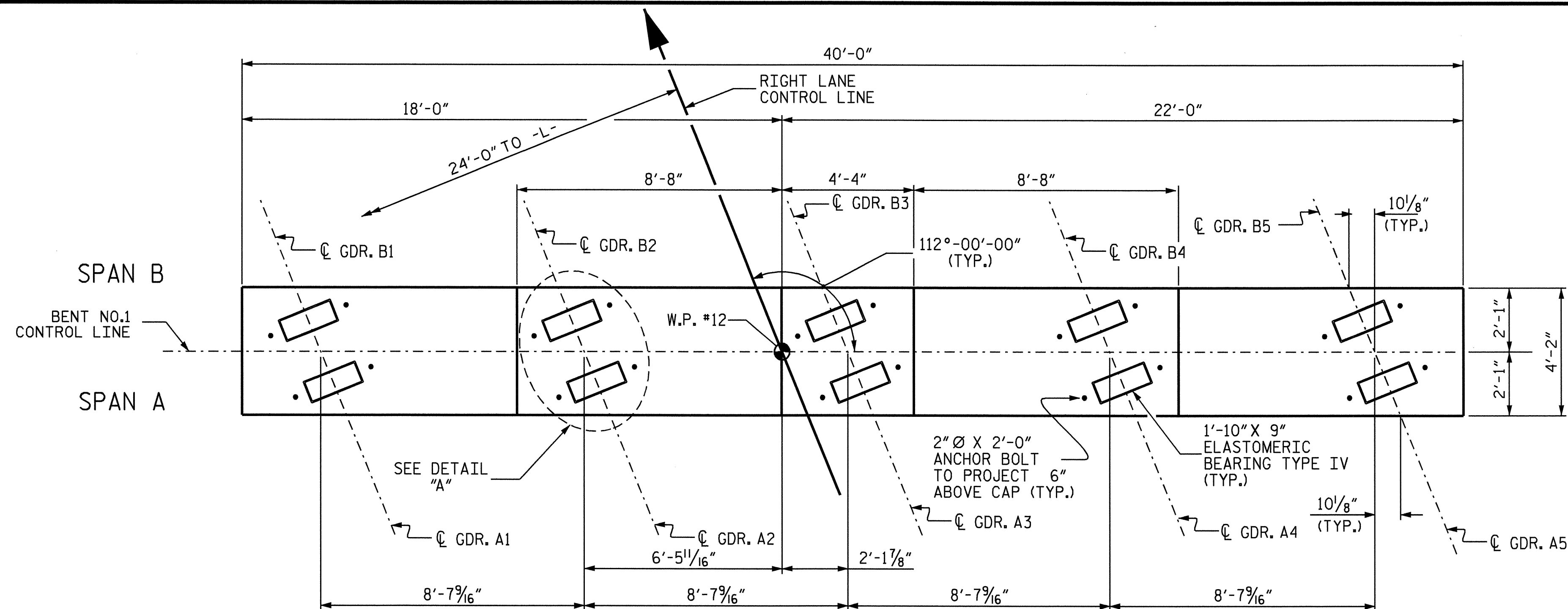
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

SPLICING OF THE LONGITUDINAL BARS IN THE DRILLED PIER WILL NOT BE PERMITTED.

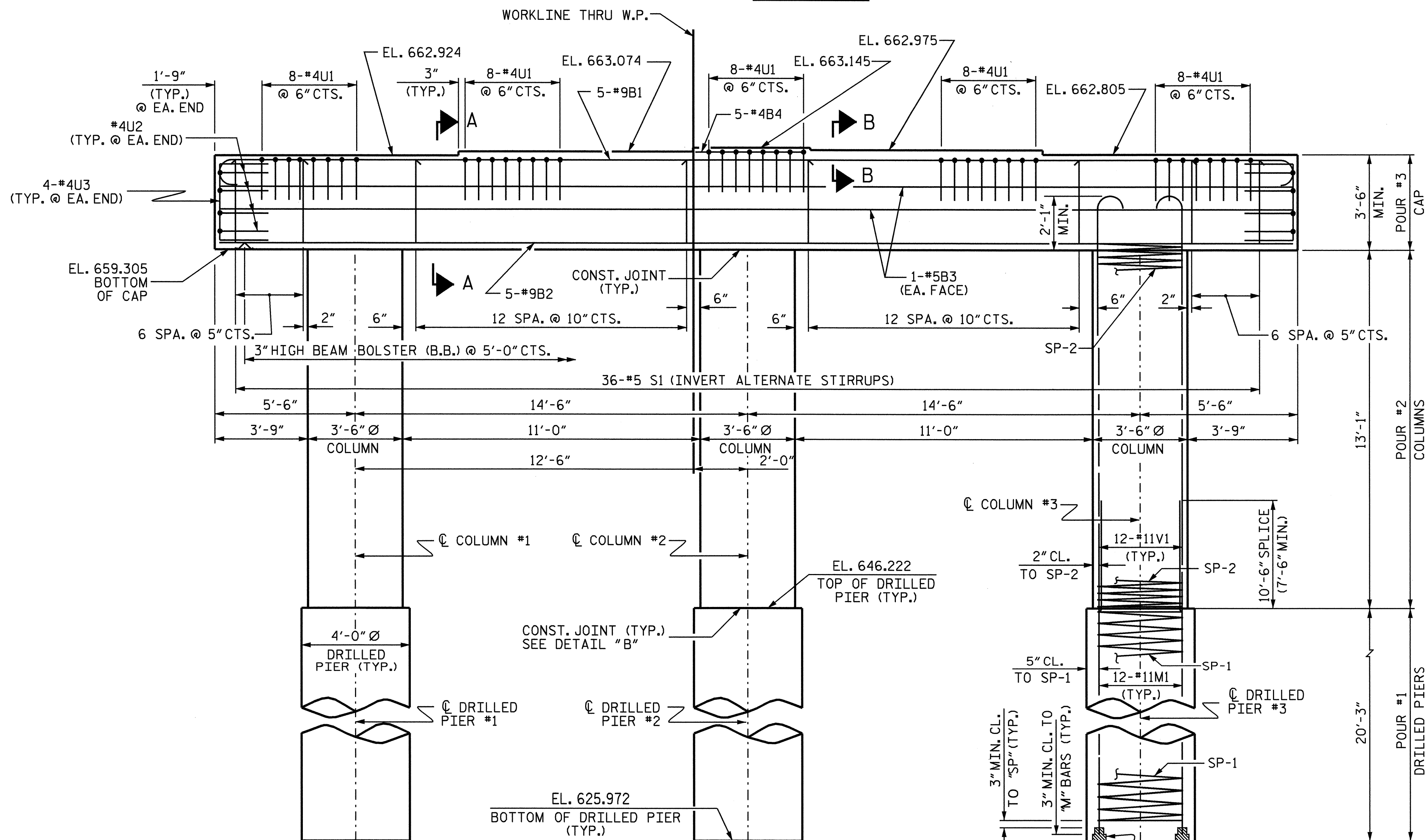
THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.

NO SEPARATE PAYMENT SHALL BE MADE FOR ANY ADDITIONAL STEEL REQUIRED IN CONSTRUCTION OF DRILLED PIERS AS THIS IS CONSIDERED INCIDENTAL TO THE LINEAR FOOT PRICE FOR DRILLED PIERS.

FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.

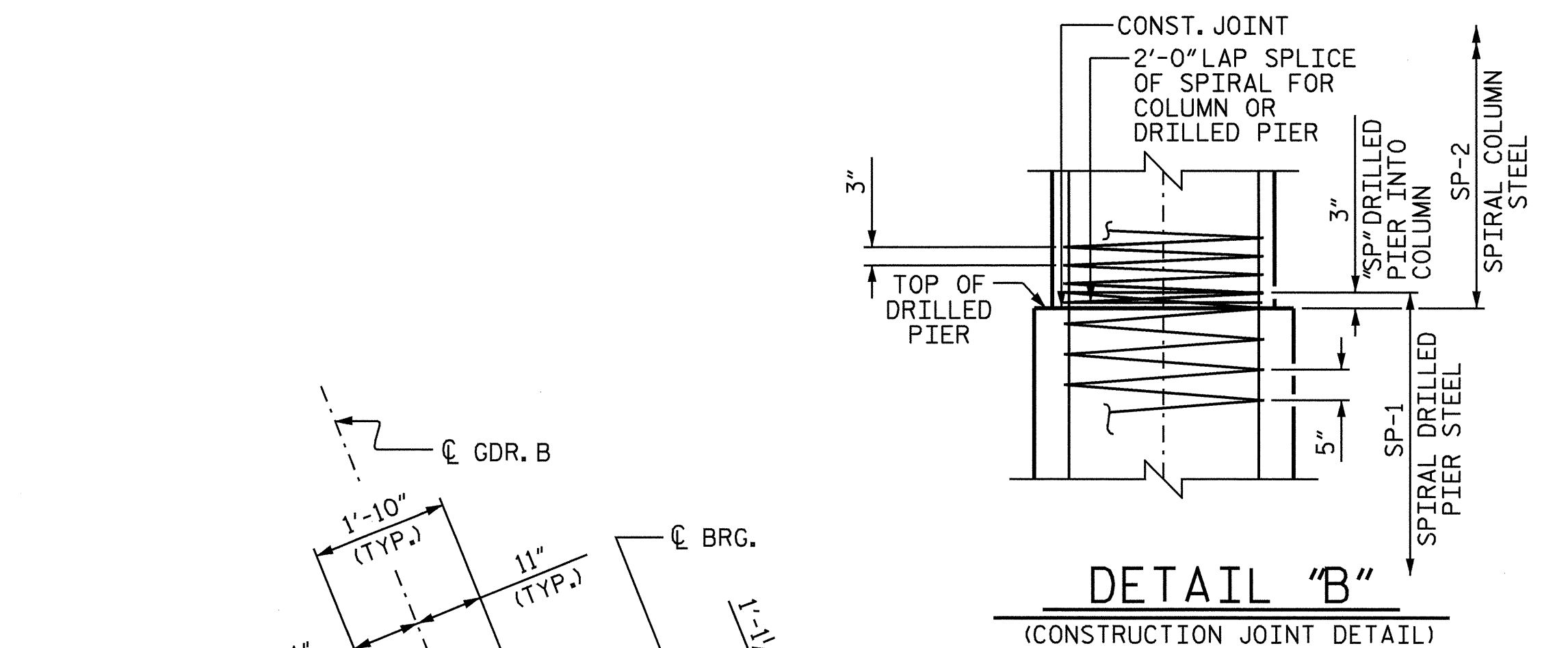


**PLAN**

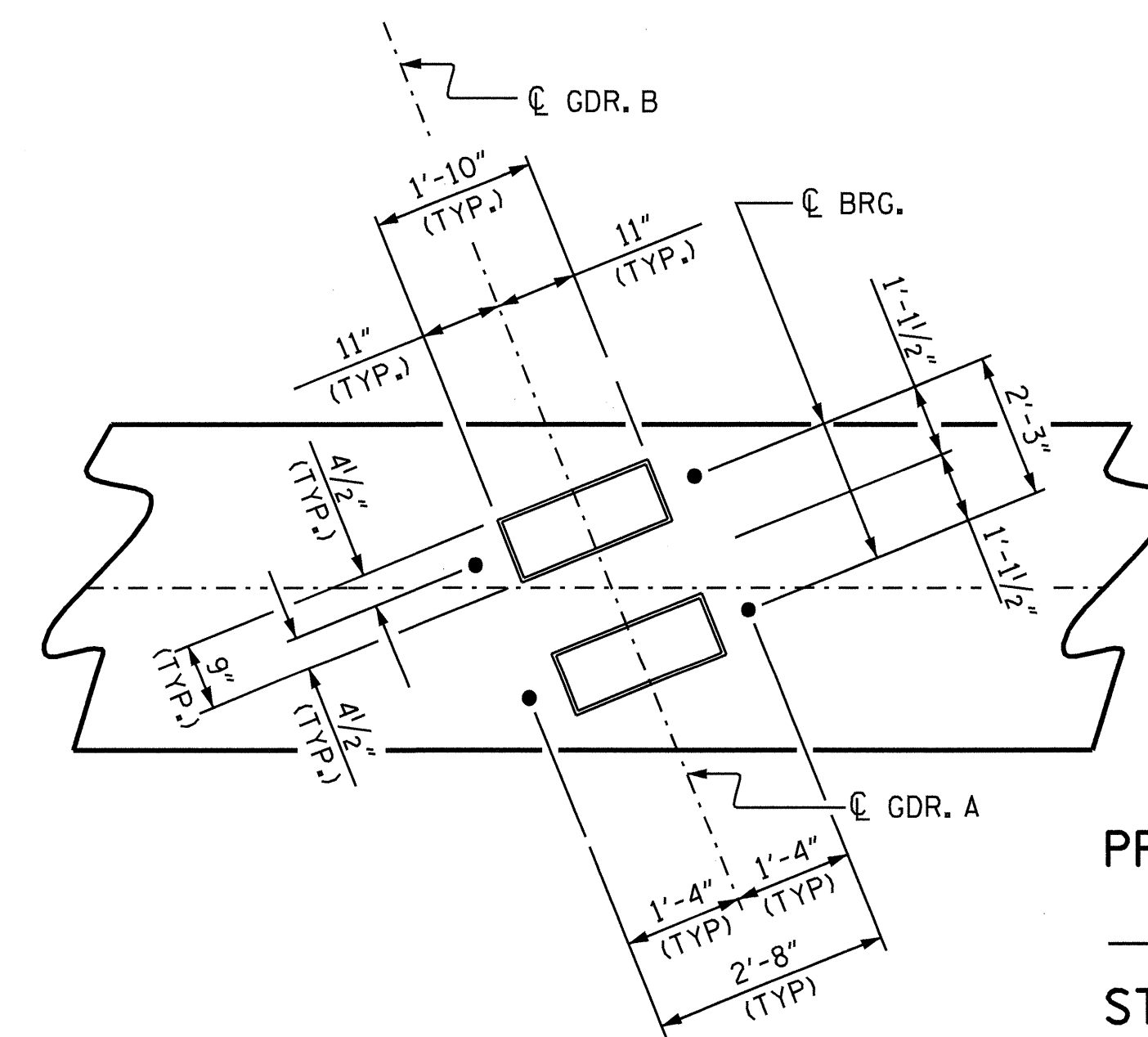


**ELEVATION**

(DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN AND DRILLED PIER)



**DETAIL "B"**  
(CONSTRUCTION JOINT DETAIL)



**DETAIL "A"**  
(TYPICAL EACH GIRDER)

PROJECT NO. B-4095  
DAVIDSON COUNTY  
 STATION: 26+20.00 -L-

SHEET 1 OF 2

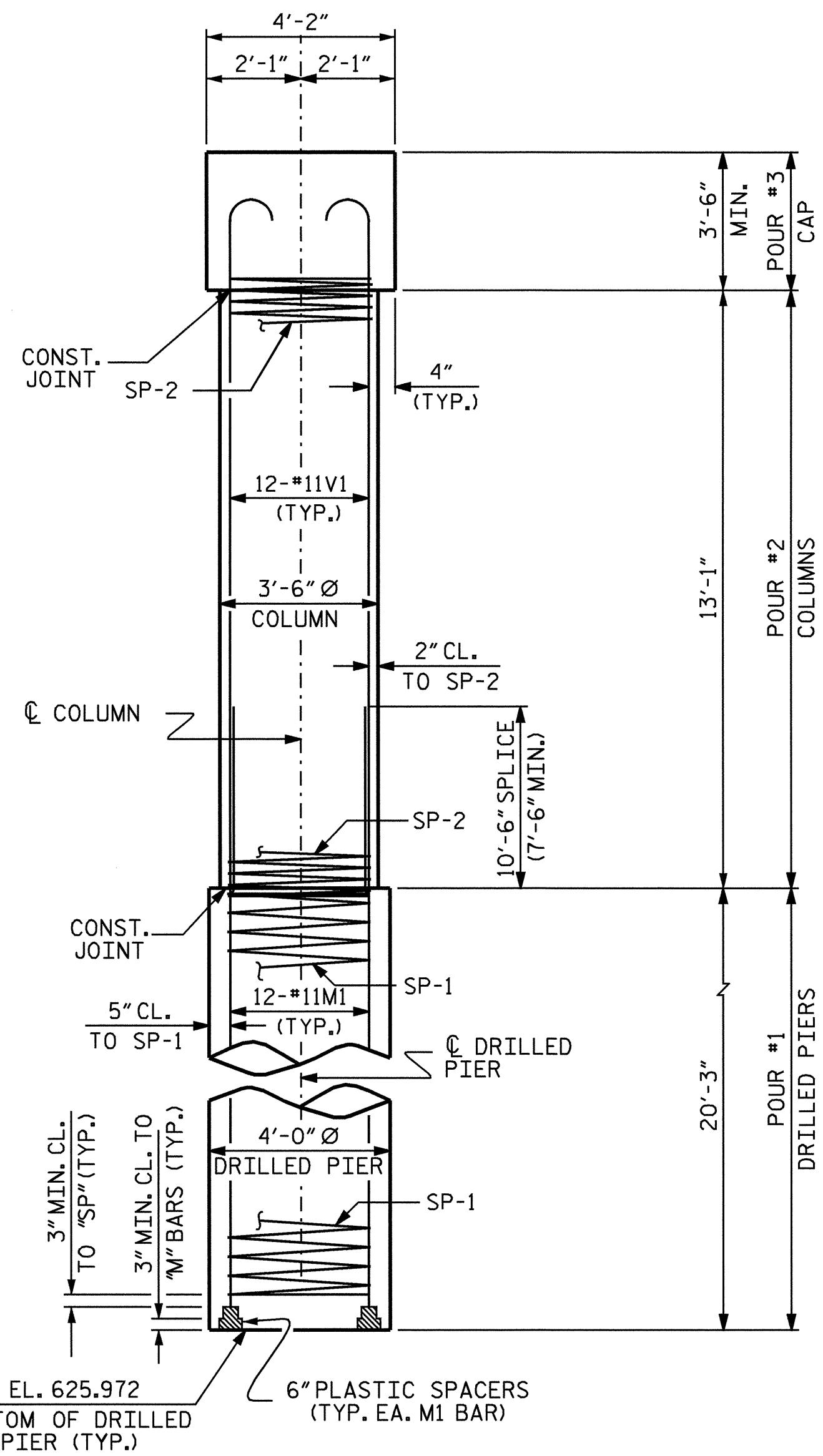


STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT NO. 1 RIGHT LANE					
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

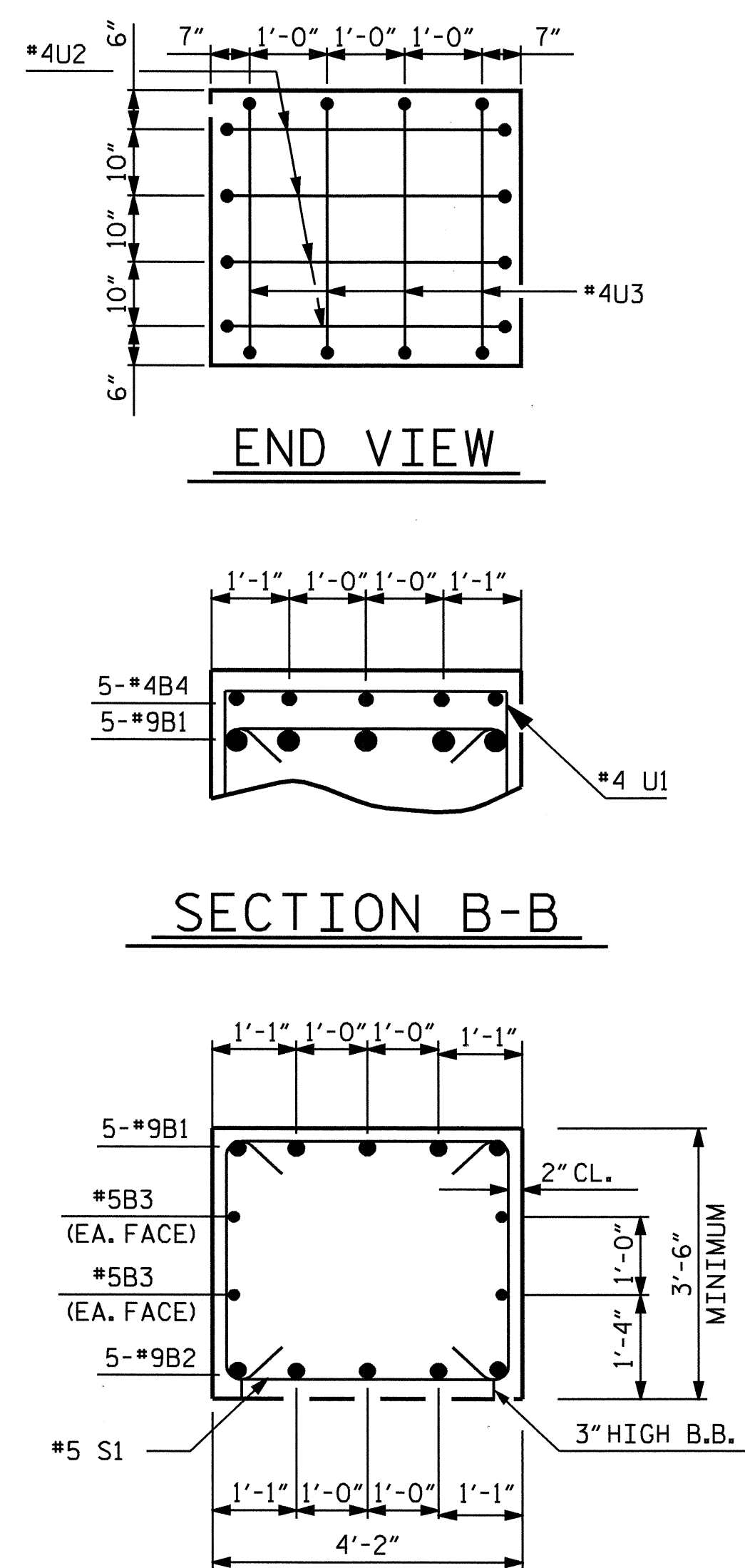
SHEET NO.  
S-57  
TOTAL SHEETS  
69

DRAWN BY: A.L. FIGUEROA DATE: 9-18-06  
 CHECKED BY: MG CHEEK DATE: 5-04-07

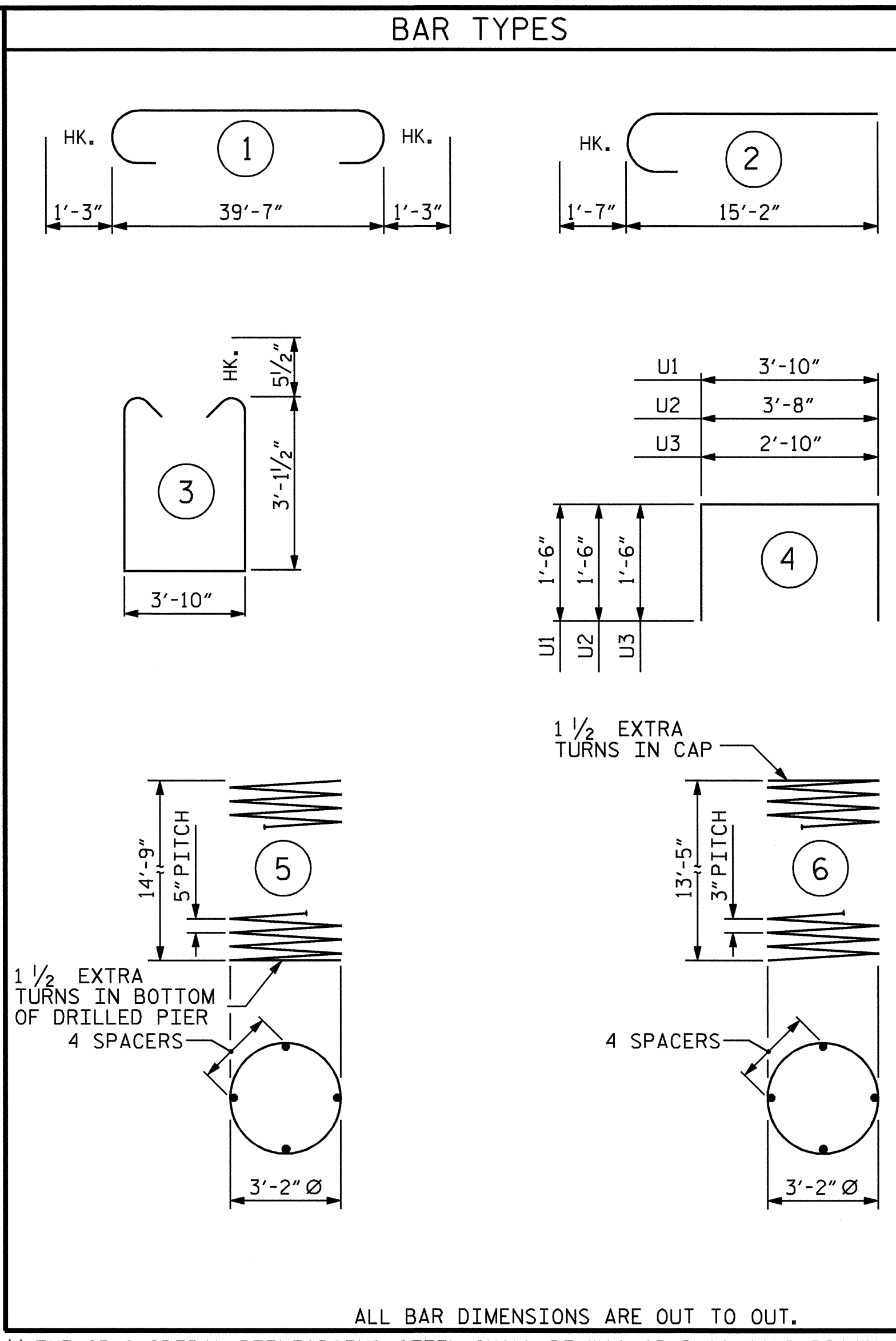
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 afigueroa



END ELEVATION



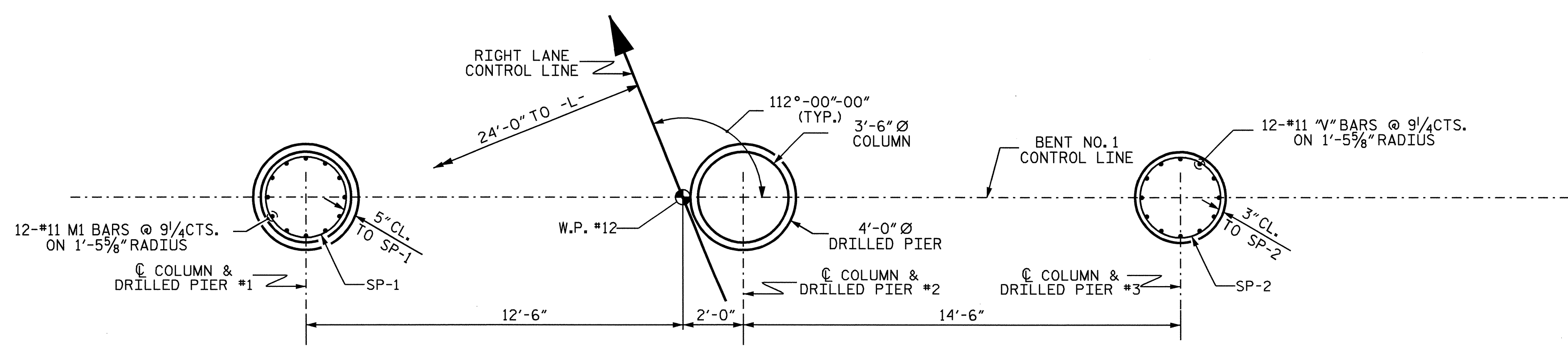
SECTION A-A



ALL BAR DIMENSIONS ARE OUT TO OUT.

\* THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.  
 \*\* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR  
 ▲ NO SEPARATE PAYMENT WILL BE MADE FOR CSL TUBES. CSL TUBES WILL BE INCLUDED IN THE UNIT BID PRICE FOR DRILLED PIERS.

BILL OF MATERIAL					
BENT NO.1					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	5	#9	1	42'-1"	715
B2	5	#9	STR	39'-8"	674
B3	4	#5	STR	39'-8"	165
B4	5	#4	STR	4'-0"	13
M1	36	#11	STR	30'-6"	5834
S1	36	#5	3	11'-0"	413
U1	40	#4	4	6'-10"	183
U2	8	#4	4	6'-8"	36
U3	8	#4	4	5'-10"	31
V1	36	#11	2	16'-9"	3204
SP-1	3	**	5	479'-11"	1502
SP-2	3	**	6	540'-2"	1082
REINFORCING STEEL			= 11268 LBS		
SPIRAL REINFORCING STEEL			= 2584 LBS		
CLASS "A" CONCRETE BREAKDOWN					
POUR #2 (COLUMNS)			C.Y.	= 14.0	
POUR #3 (CAP)			C.Y.	= 23.0	
TOTAL			C.Y.	= 37.0	
DRILLED PIERS					
DRILLED PIER CONCRETE					
POUR #1 (DRILLED PIERS) C.Y.			= 23.3		
4'-0" Ø DRILLED PIERS					
NOT IN SOIL			LIN. FT.	= 24.00	
IN SOIL			LIN. FT.	= 36.75	
4'-0" Ø PERMANENT STEEL CASING			LIN. FT.	= 36.67	
SID INSPECTION			EA.	= 1	
▲ CSL TUBES			LIN. FT.	= 273.00	
CROSSHOLE SONIC LOGGING			EA.	= 1	



PARTIAL PLAN OF DRILLED PIER

PARTIAL PLAN OF COLUMN

PLAN OF COLUMNS & DRILLED PIERS

(DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER)

DRAWN BY : A.L. FIGUEROA DATE : 9-18-06  
 CHECKED BY : MG CHEEK DATE : 5-04-07

10-JUL-2007 15:22  
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 dahodae

PROJECT NO. B-4095  
 DAVIDSON COUNTY  
 STATION: 26+20.00 -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:	S-58
1			3			TOTAL SHEETS
2			4			69

STR # 2

**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.

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

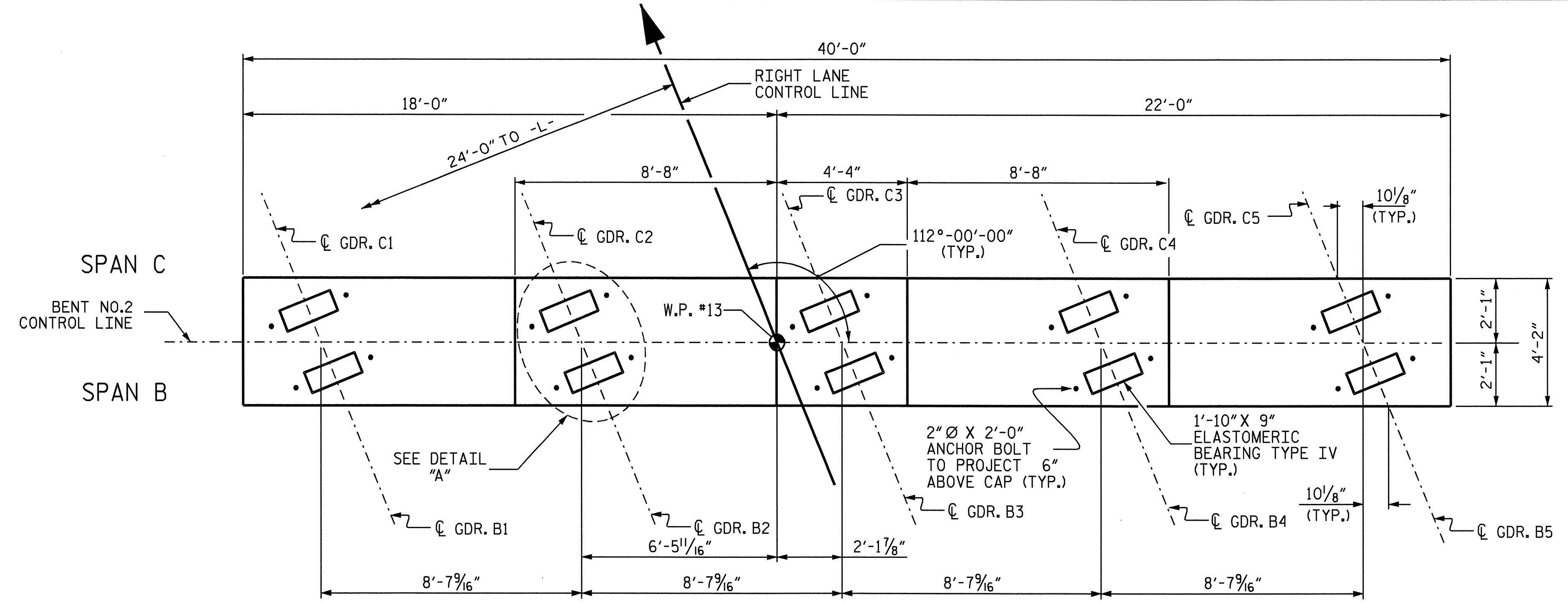
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

SPlicing OF THE LONGITUDINAL BARS IN THE DRILLED PIER WILL NOT BE PERMITTED.

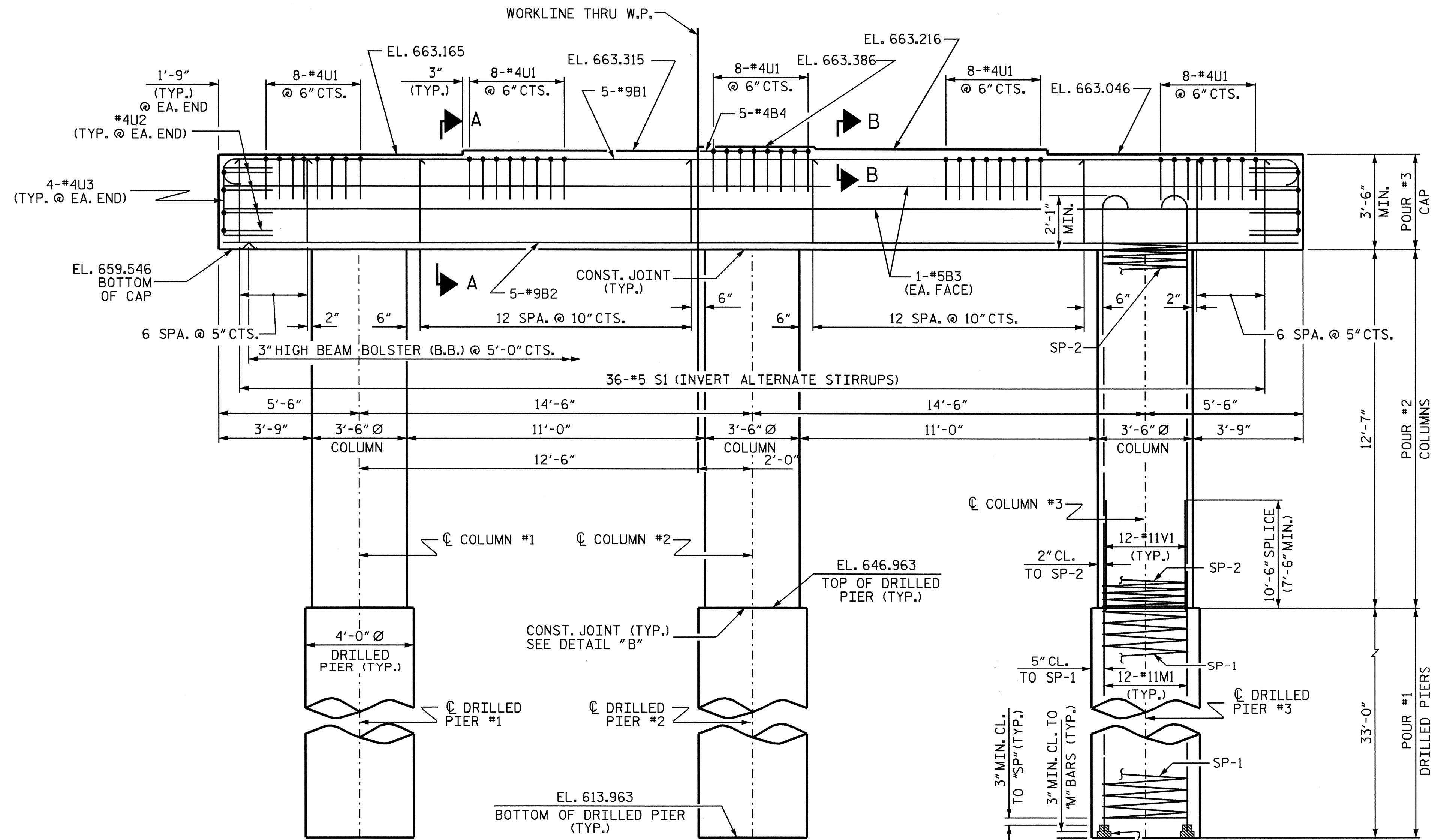
THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.

NO SEPARATE PAYMENT SHALL BE MADE FOR ANY ADDITIONAL STEEL REQUIRED IN CONSTRUCTION OF DRILLED PIERS AS THIS IS CONSIDERED INCIDENTAL TO THE LINEAR FOOT PRICE FOR DRILLED PIERS.

FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.

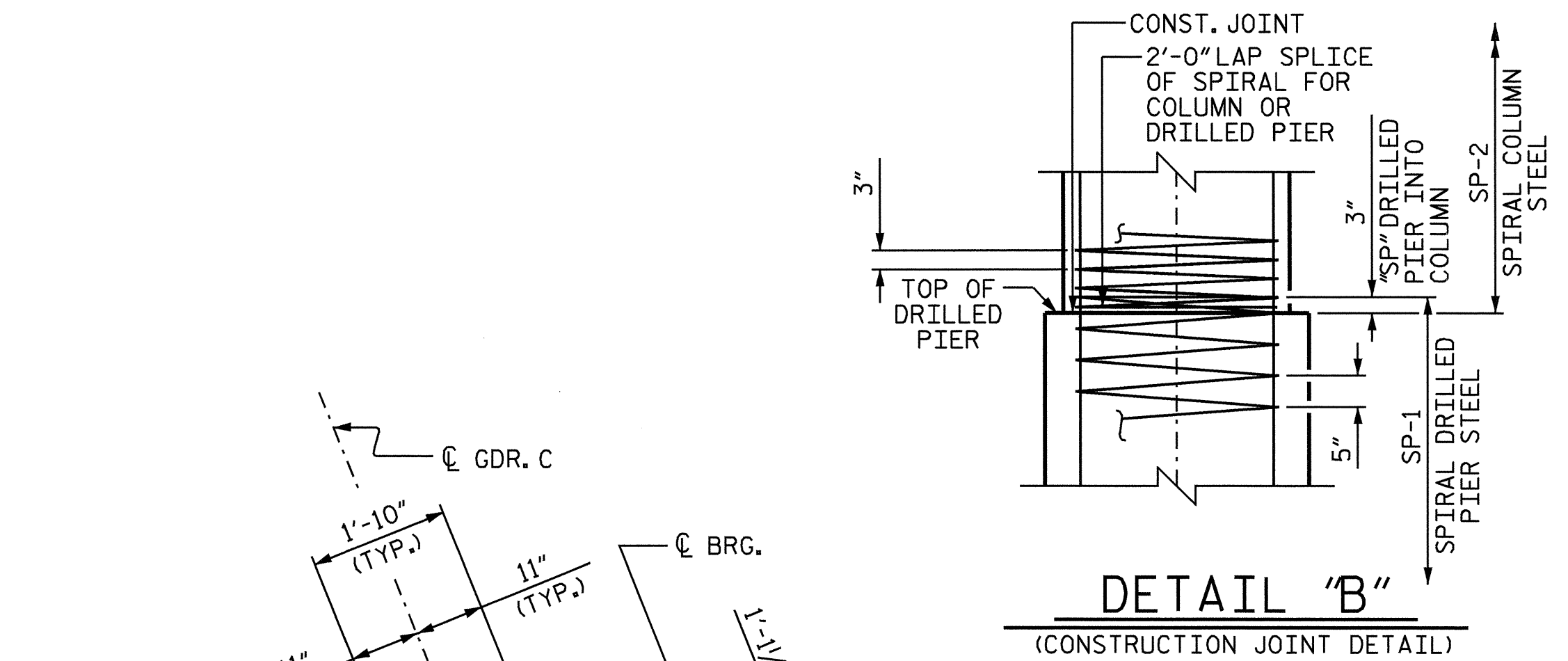


**PLAN**

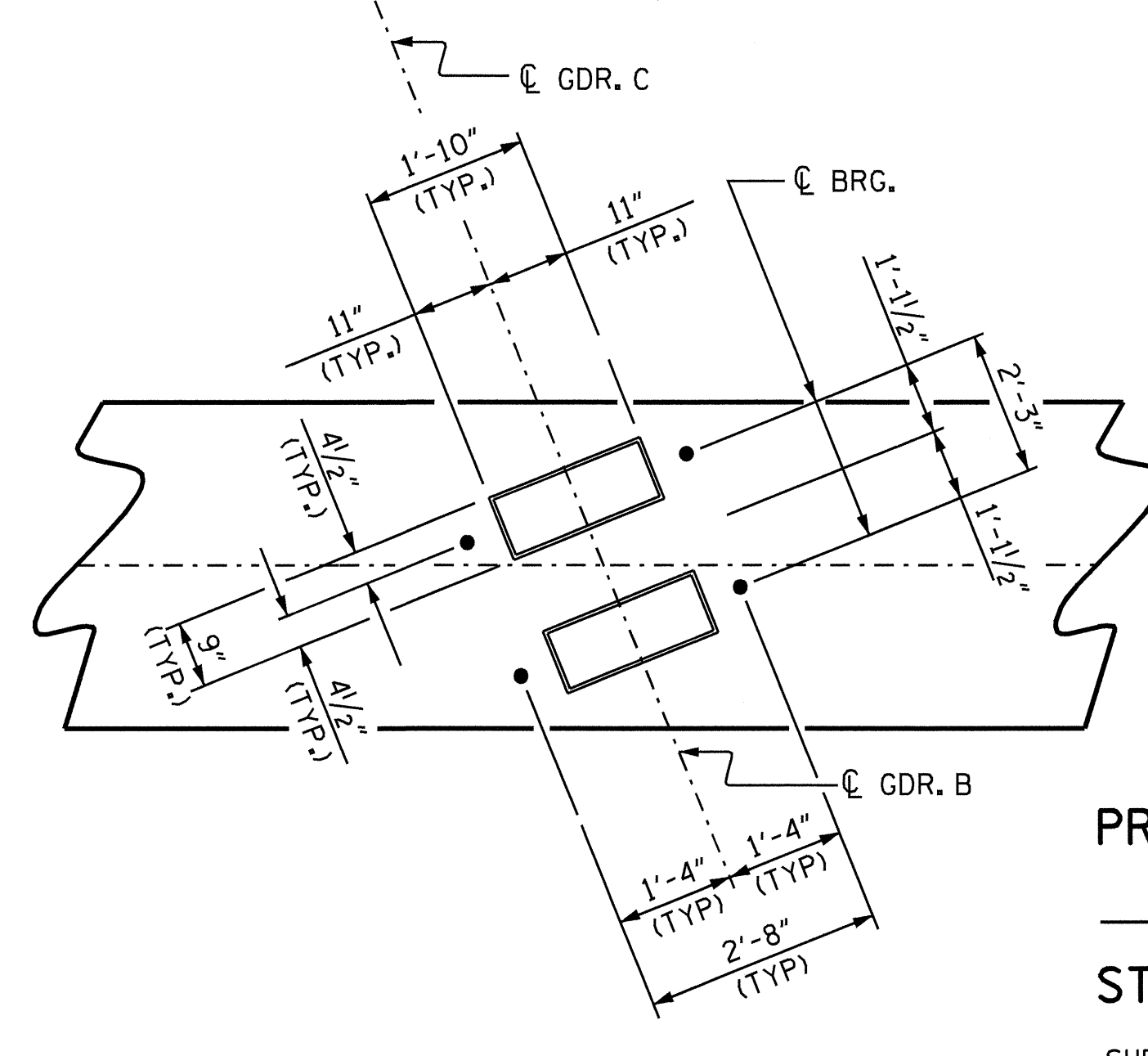


**ELEVATION**

(DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN AND DRILLED PIER)



**DETAIL "B"**  
(CONSTRUCTION JOINT DETAIL)



**DETAIL "A"**  
(TYPICAL EACH GIRDER)

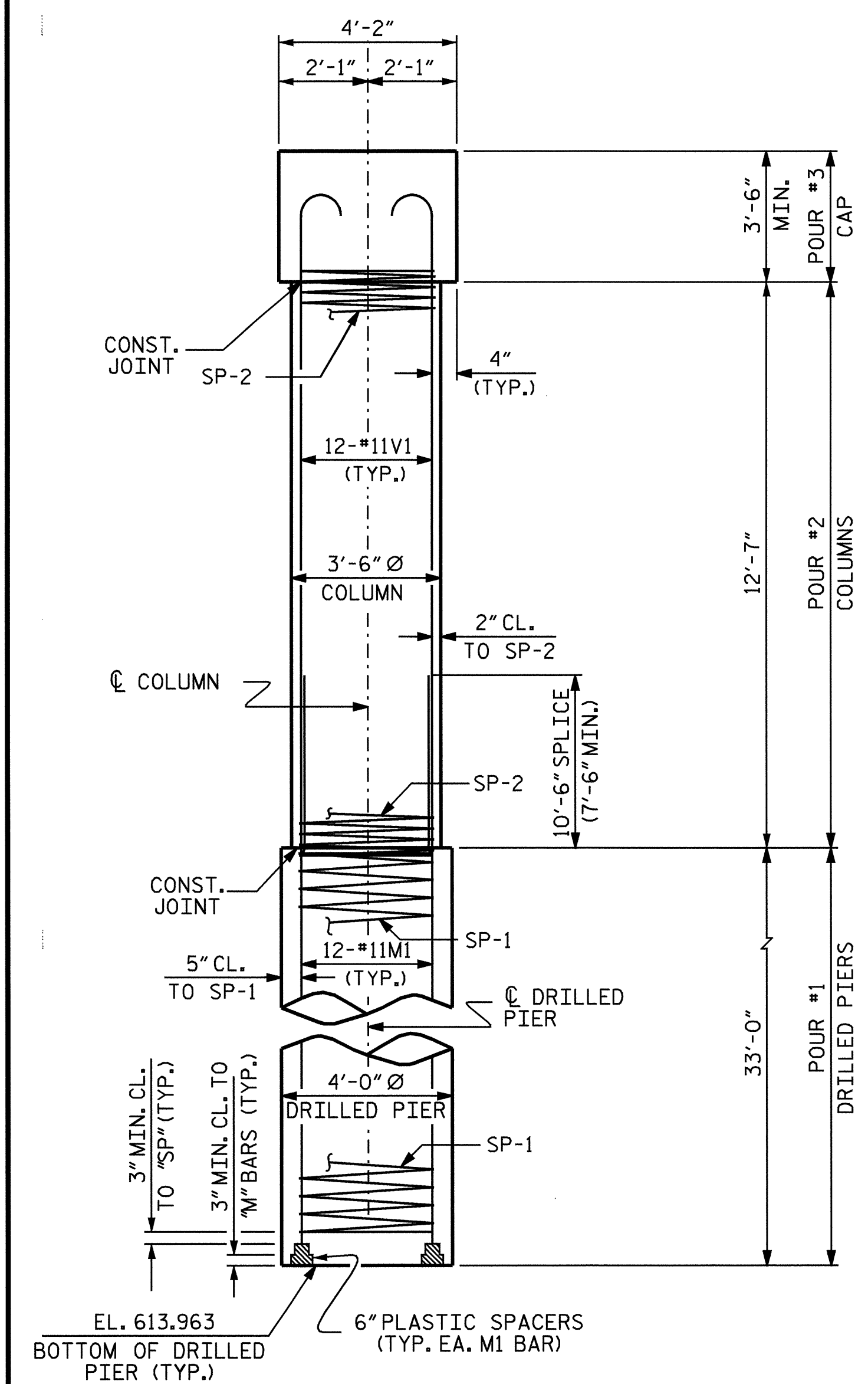
PROJECT NO. B-4095  
DAVIDSON COUNTY  
 STATION: 26+20.00 -L-

SHEET 1 OF 2

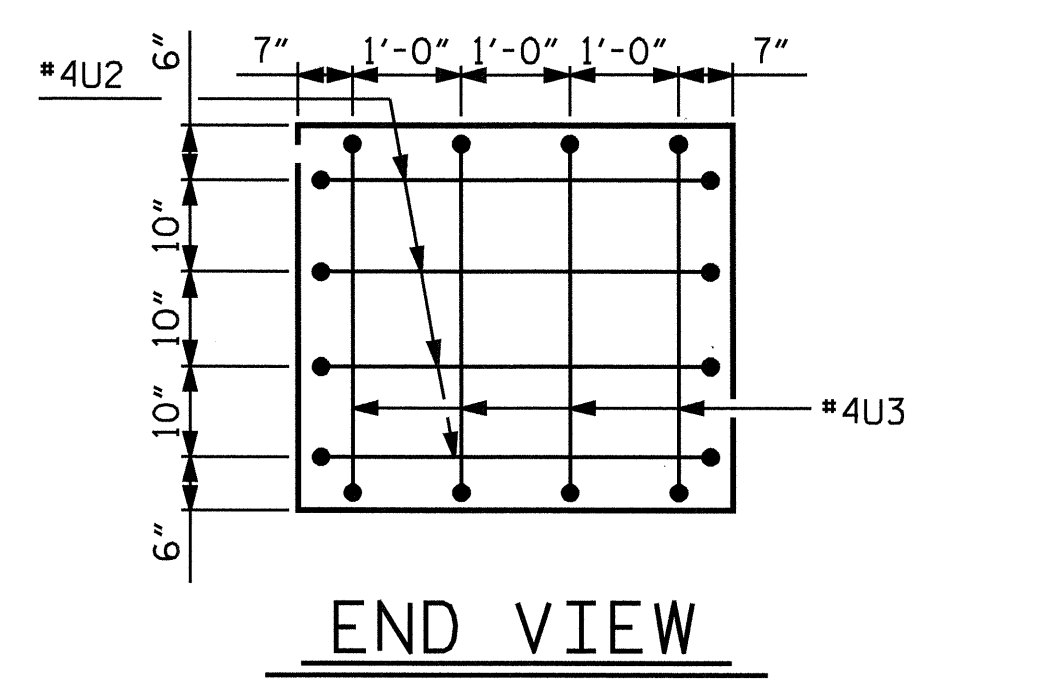
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT NO. 2 RIGHT LANE					
REVISIONS					
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2			4		
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					TOTAL SHEETS 69



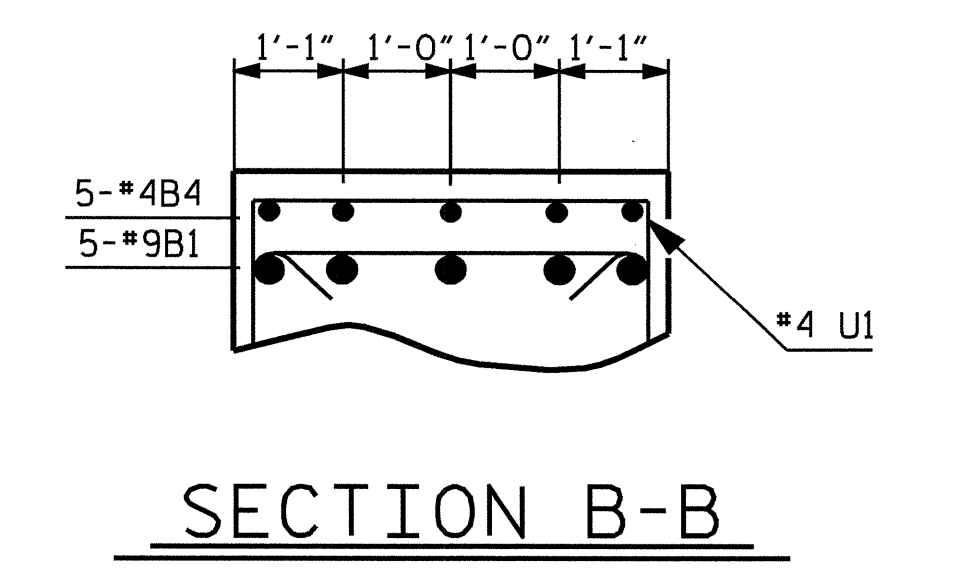
DRAWN BY: A.L. FIGUEROA DATE: 9-18-06  
 CHECKED BY: MG CHEEK DATE: 5-04-07



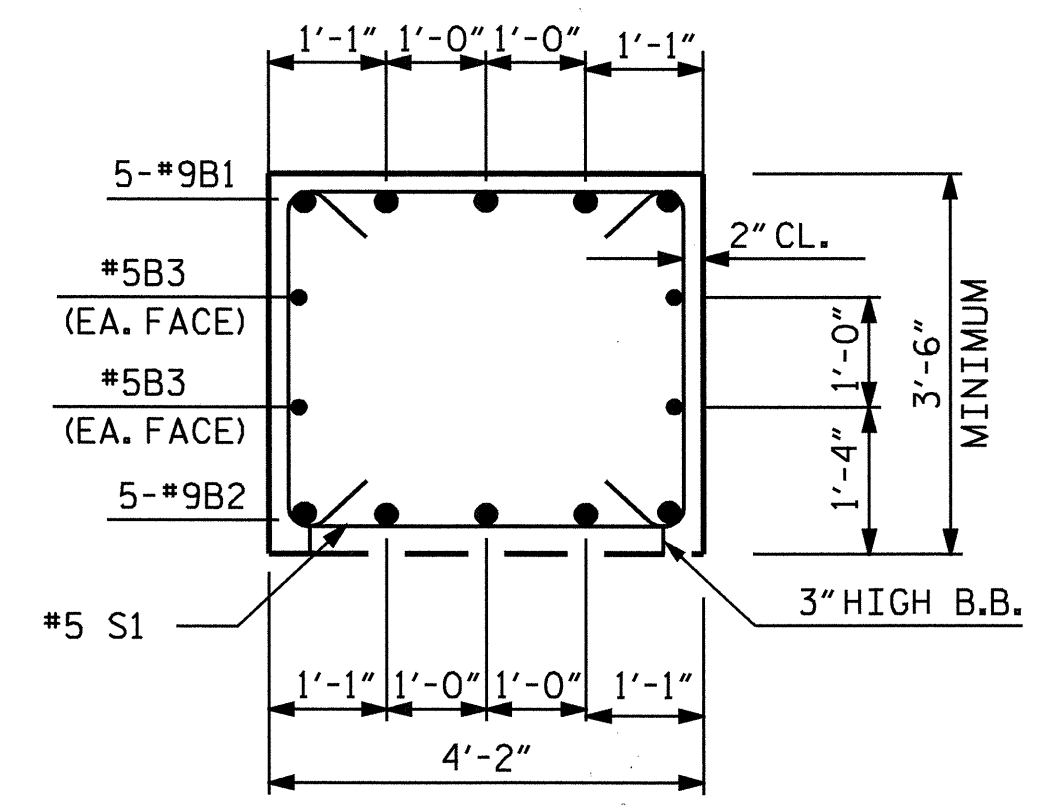
**END ELEVATION**



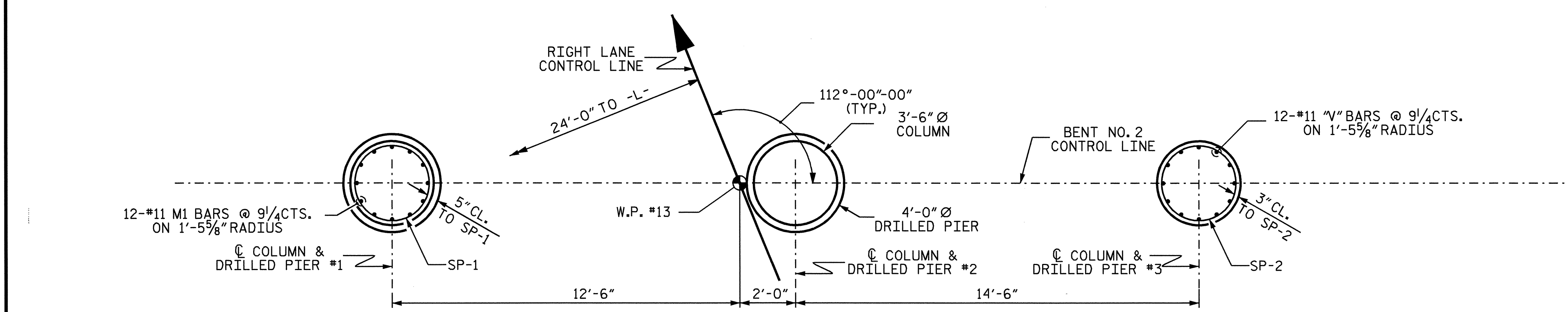
**END VIEW**



**SECTION B-B**



**SECTION A-A**



**PARTIAL PLAN OF DRILLED PIER**

**PARTIAL PLAN OF COLUMN**

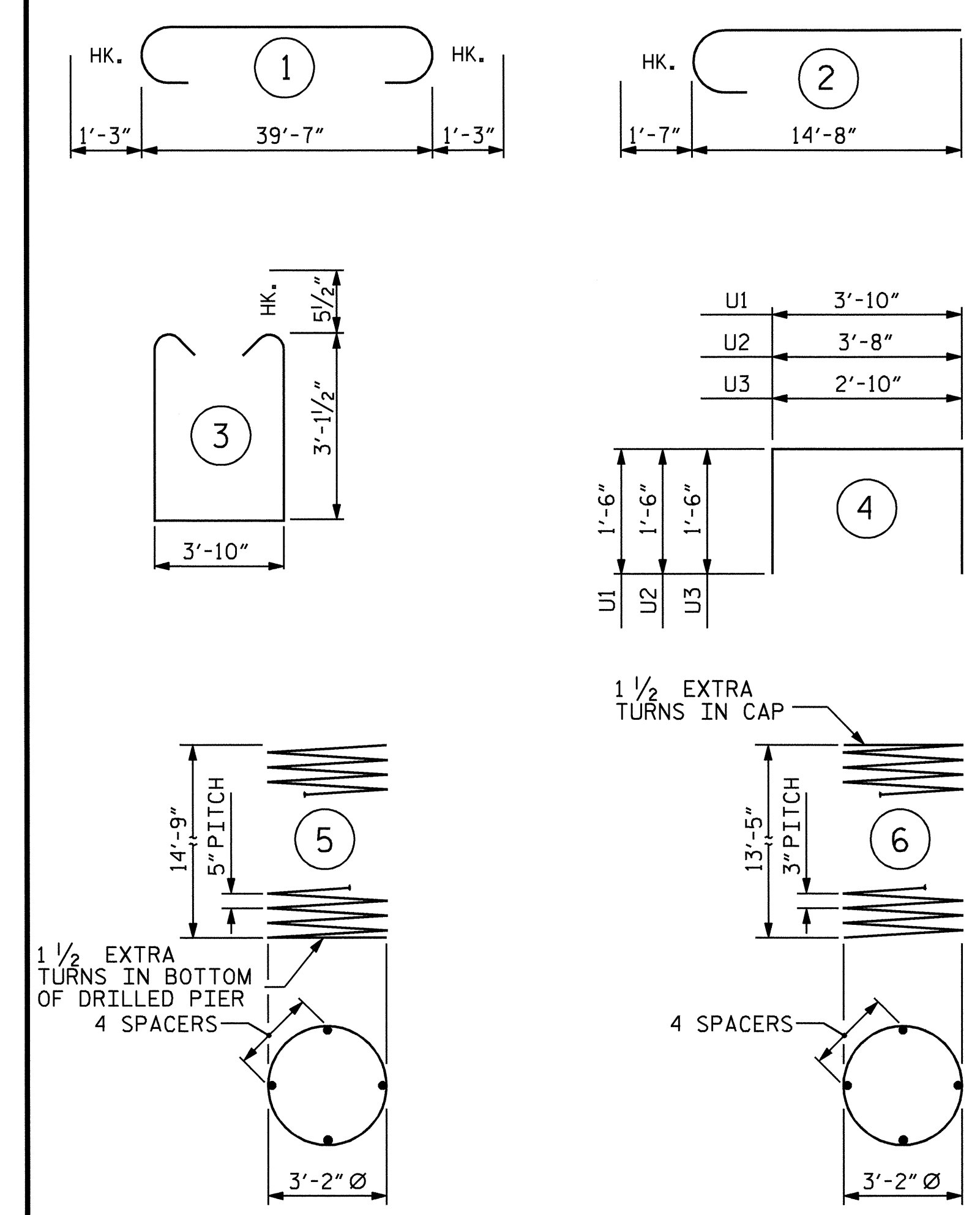
**PLAN OF COLUMNS & DRILLED PIERS**

(DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER)

DRAWN BY : A.L.FIGUEROA DATE : 9-18-06  
 CHECKED BY : MG CHEEK DATE : 5-04-07

10-JUL-2007 15:09  
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 dahodae

**BAR TYPES**



ALL BAR DIMENSIONS ARE OUT TO OUT.

\* THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.  
 \*\* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR  
 ▲ NO SEPARATE PAYMENT WILL BE MADE FOR CSL TUBES. CSL TUBES WILL BE INCLUDED IN THE UNIT BID PRICE FOR DRILLED PIERS.

**BILL OF MATERIAL**

BENT NO.2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	#9	1	42'-1"	715
B2	5	#9	STR	39'-8"	674
B3	4	#5	STR	39'-8"	165
B4	5	#4	STR	4'-0"	13
M1	36	#11	STR	43'-3"	8272
S1	36	#5	3	11'-0"	413
U1	40	#4	4	6'-10"	183
U2	8	#4	4	6'-8"	36
U3	8	#4	4	5'-10"	31
V1	36	#11	2	16'-9"	3108
SP-1	3	**	5	778'-8"	2436
SP-2	3	**	6	520'-6"	1043
REINFORCING STEEL				=	13610 LBS
SPIRAL REINFORCING STEEL				=	3479 LBS
CLASS "A" CONCRETE BREAKDOWN					
POUR #2 (COLUMNS)				C.Y.	= 13.5
POUR #3 (CAP)				C.Y.	= 23.0
TOTAL				C.Y.	= 36.5
DRILLED PIERS					
DRILLED PIER CONCRETE					
POUR #1 (DRILLED PIERS) C.Y.				=	46.1
4'-0" Ø DRILLED PIERS					
NOT IN SOIL				LIN. FT.	= 24.00
IN SOIL				LIN. FT.	= 75.00
SID INSPECTION				EA.	= 1
▲ CSL TUBES				LIN. FT.	= 426.00
CROSSHOLE SONIC LOGGING				EA.	= 1

PROJECT NO. B-4095  
DAVIDSON COUNTY  
 STATION: 26+20.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 BENT NO. 2  
 RIGHT LANE

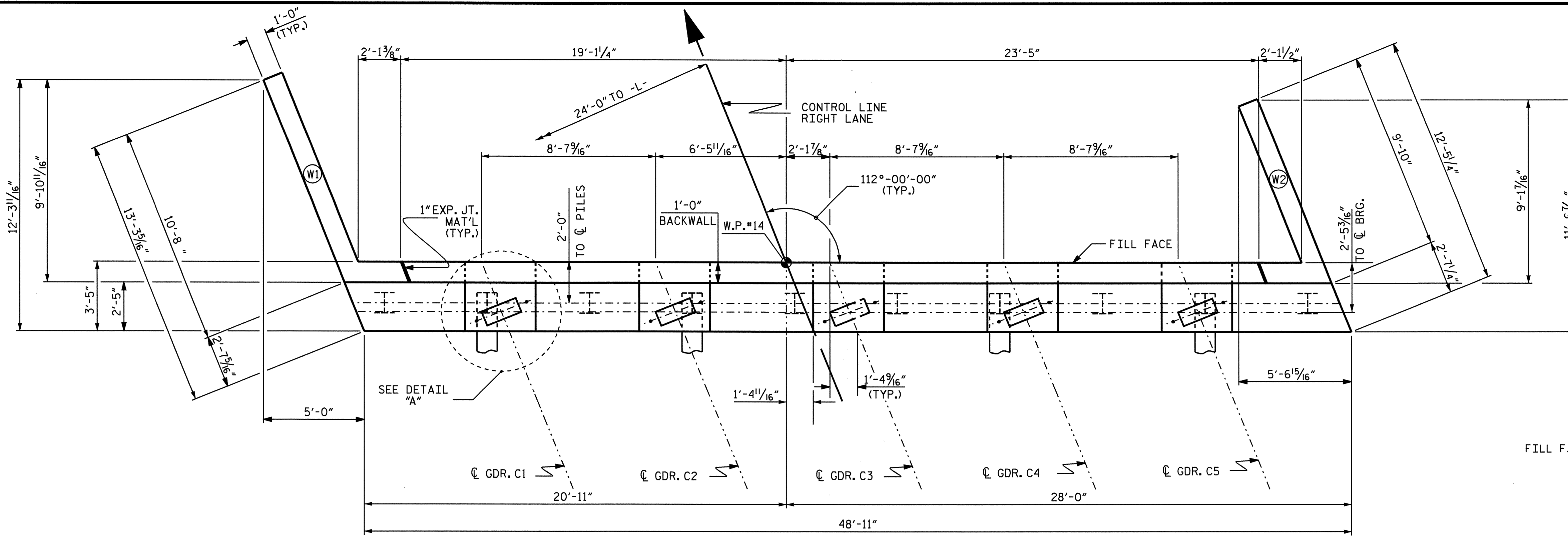


REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			69

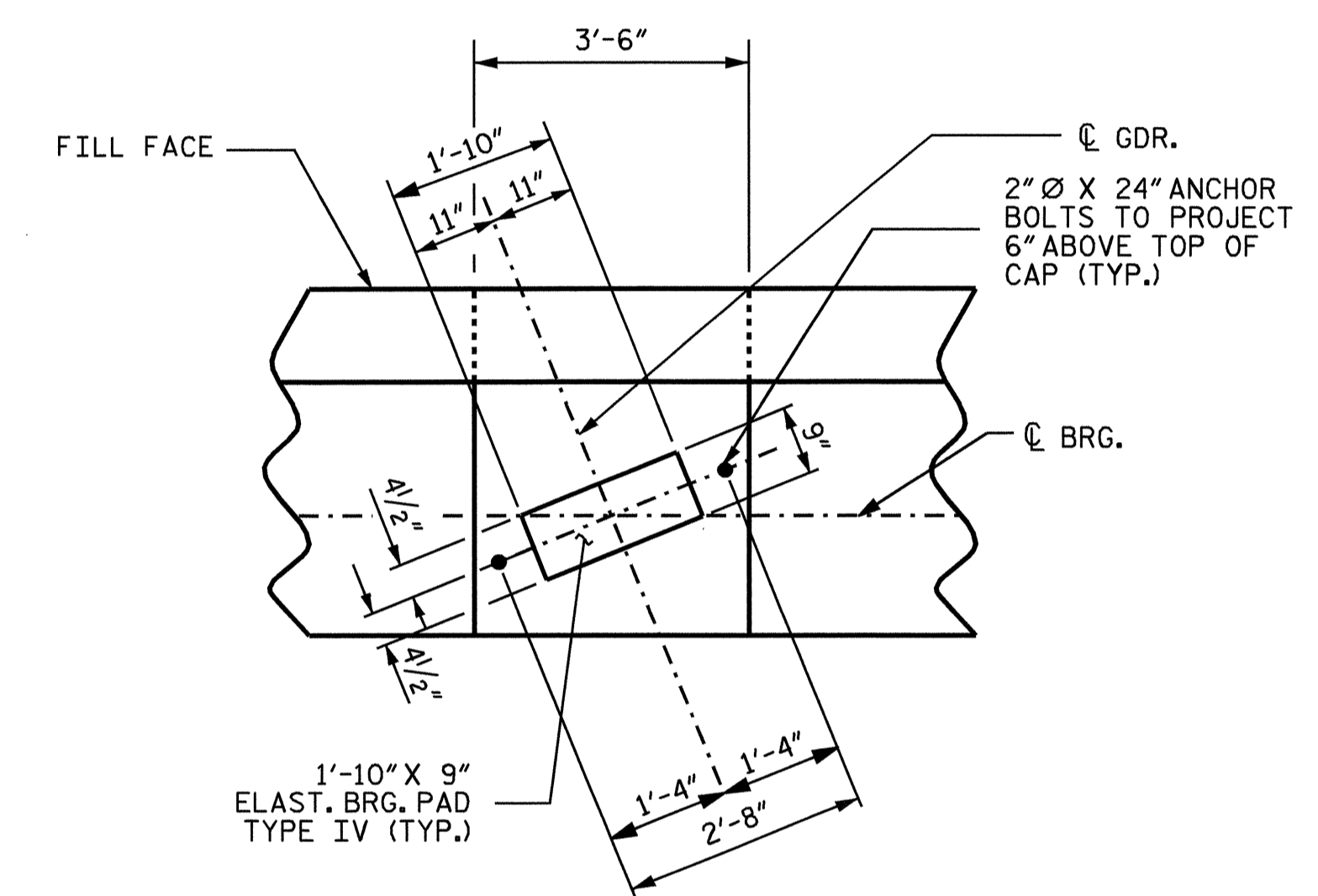
STR # 2

**NOTES**

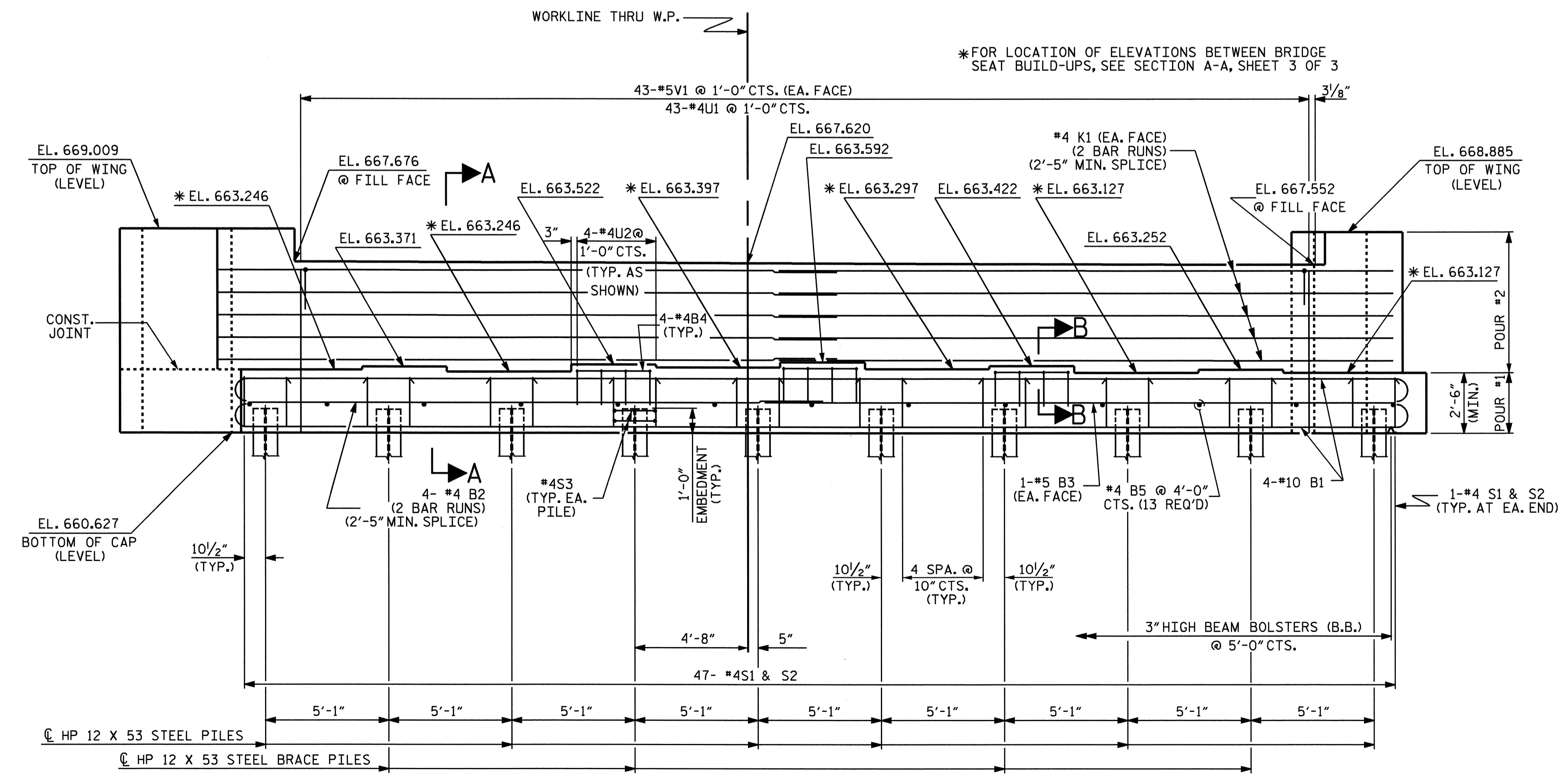
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.  
 FOR SECTION A-A, SEE SHEET 3 OF 3.  
 FOR PILE SPLICE DETAILS SEE SHEET 3 OF 3.  
 FOR TEMPORARY DRAINAGE AT END BENTS, SEE SHEET 3 OF 3.  
 BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.  
 THE TOP SURFACE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



**PLAN**



**DETAIL "A"**



**ELEVATION**

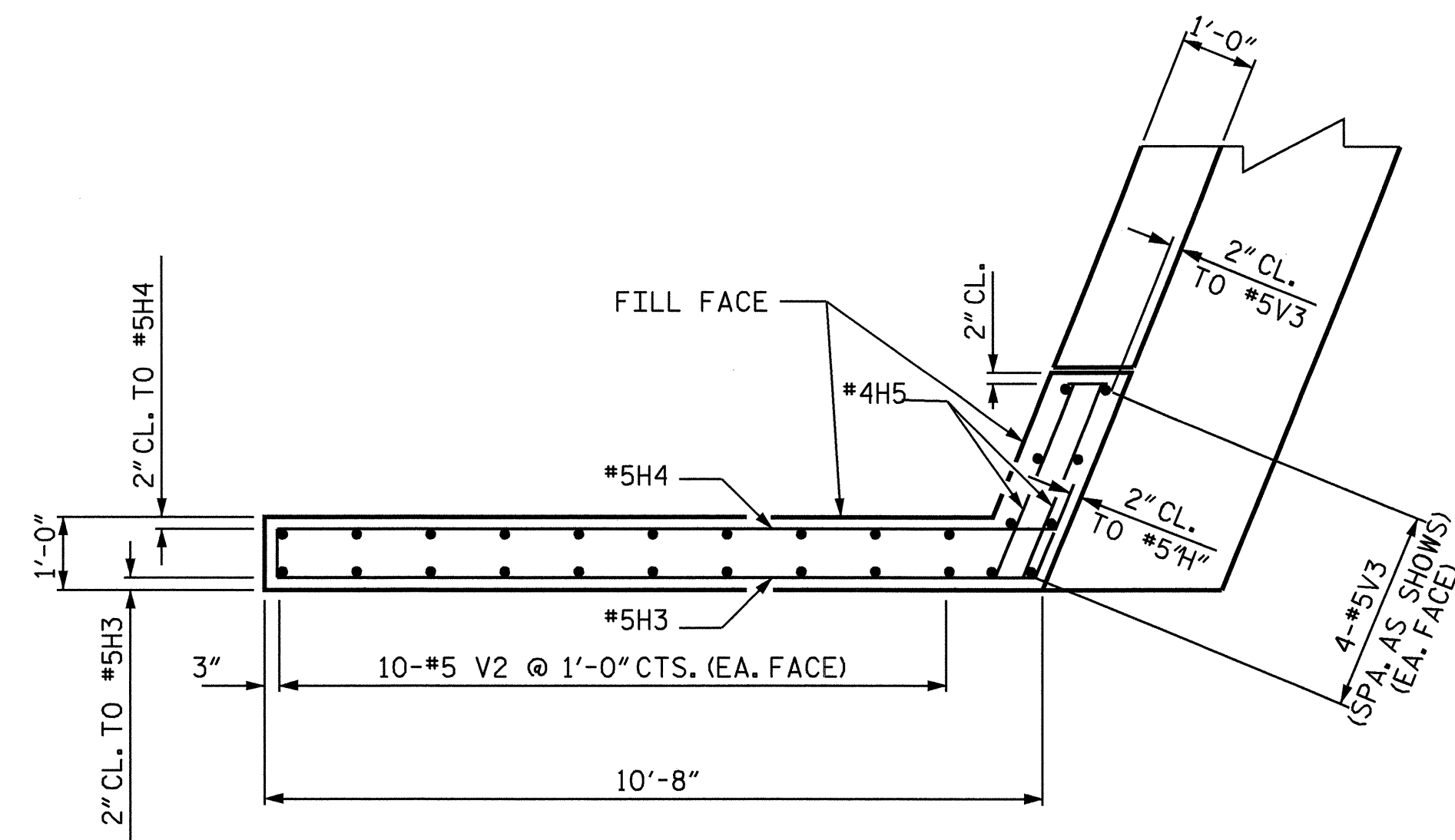
PROJECT NO. B-4095  
DAVIDSON COUNTY  
 STATION: 26+20.00 -L-

SHEET 1 OF 3  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT NO. 2  
 RIGHT LANE

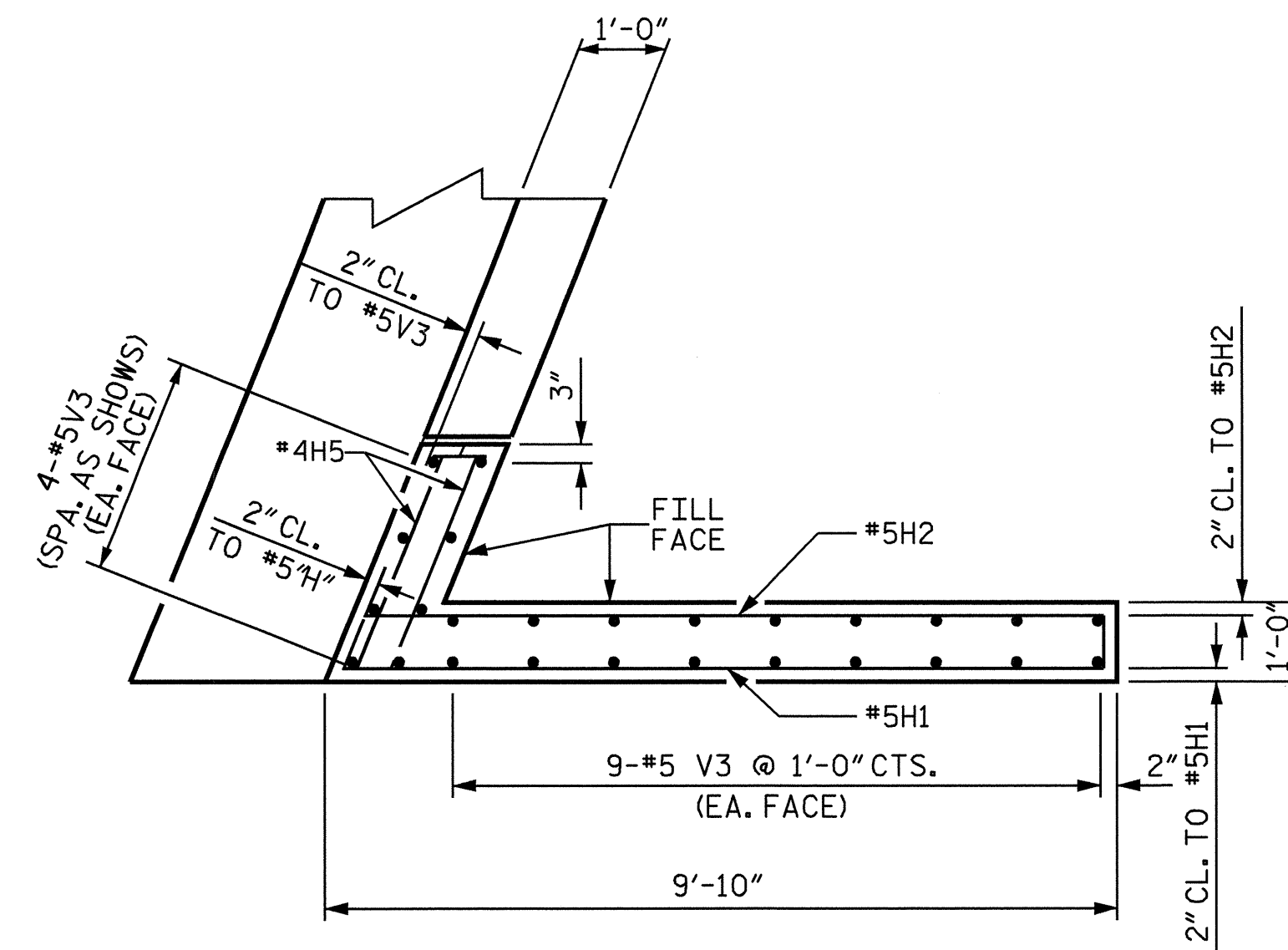


DRAWN BY: A.L. FIGUEROA DATE: 3-29-07  
 CHECKED BY: R.D. MARTIN DATE: 5-04-07

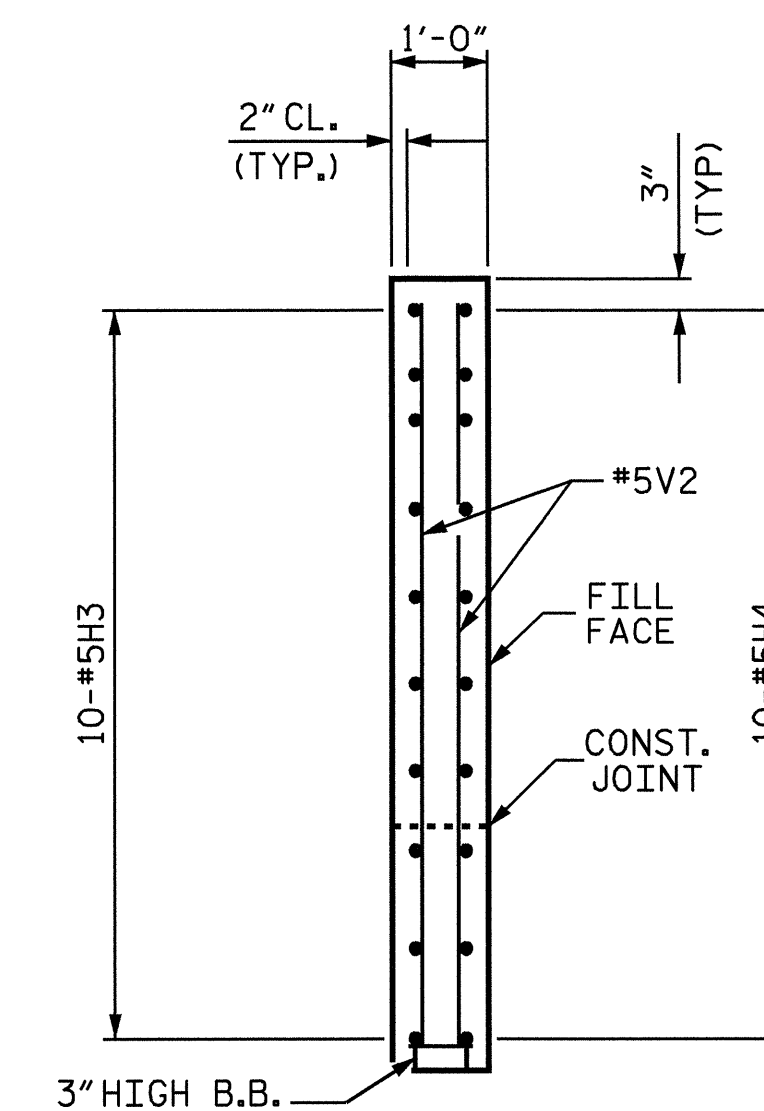
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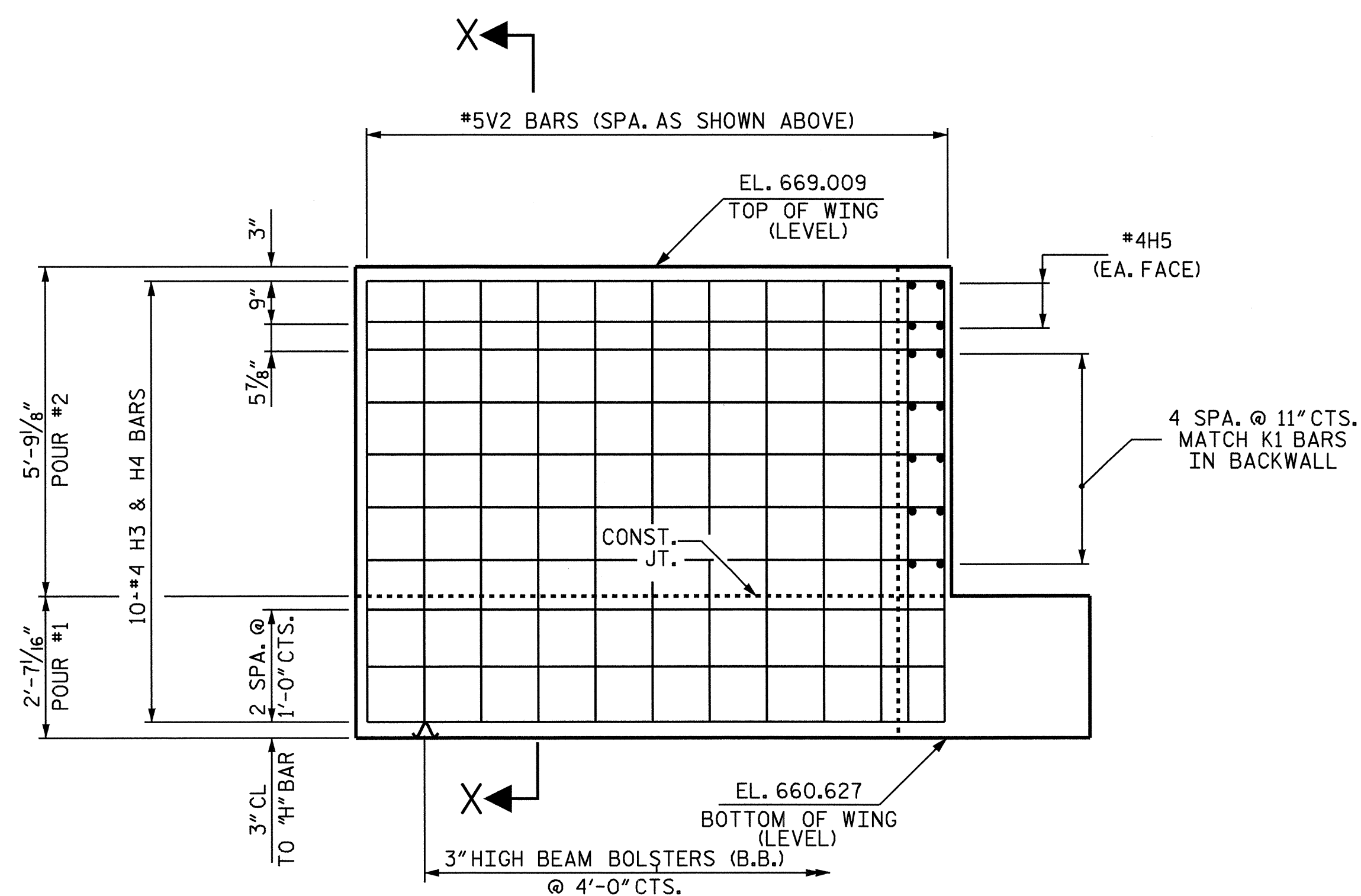
PLAN OF LEFT WING - W1



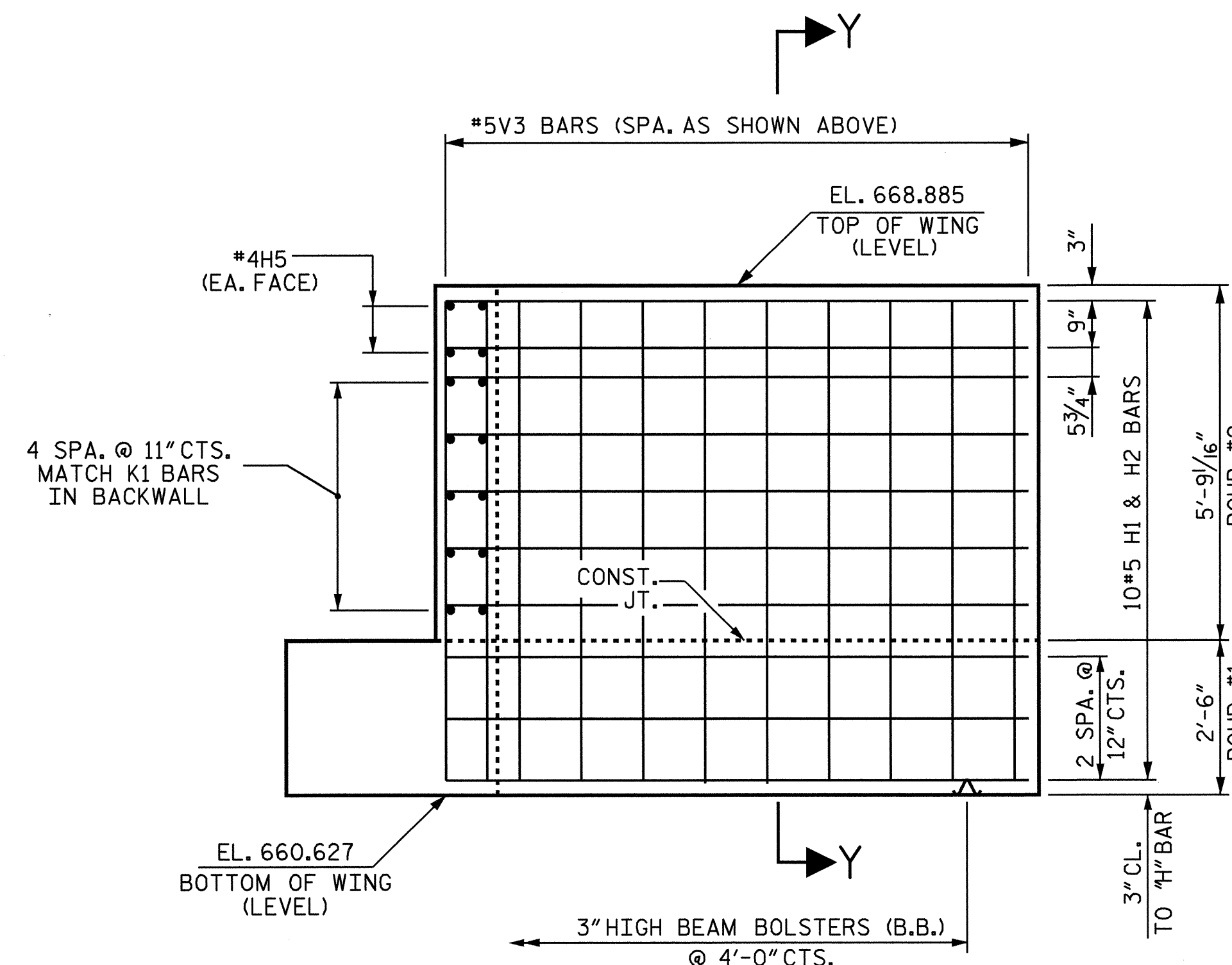
PLAN OF RIGHT WING - W2



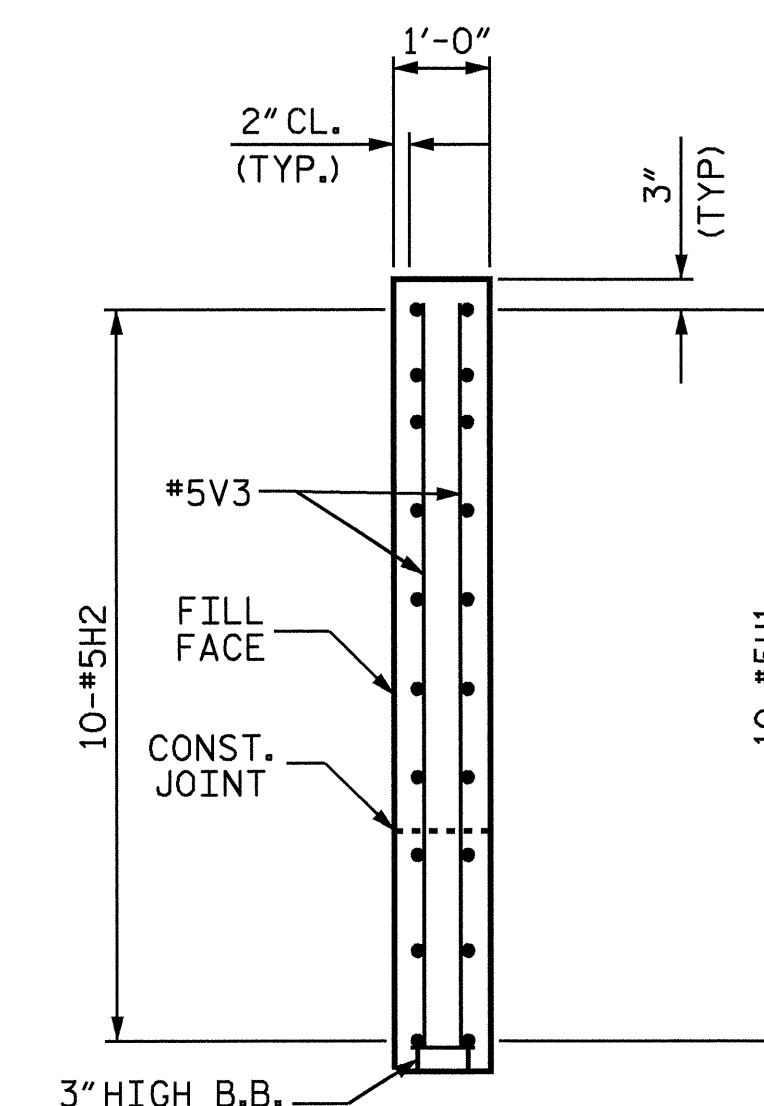
SECTION X-X



ELEVATION OF LEFT WING - W1



ELEVATION OF RIGHT WING - W2



SECTION Y-Y

PROJECT NO. B-4095  
 DAVIDSON COUNTY  
 STATION: 26+20.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT NO. 2  
 RIGHT LANE

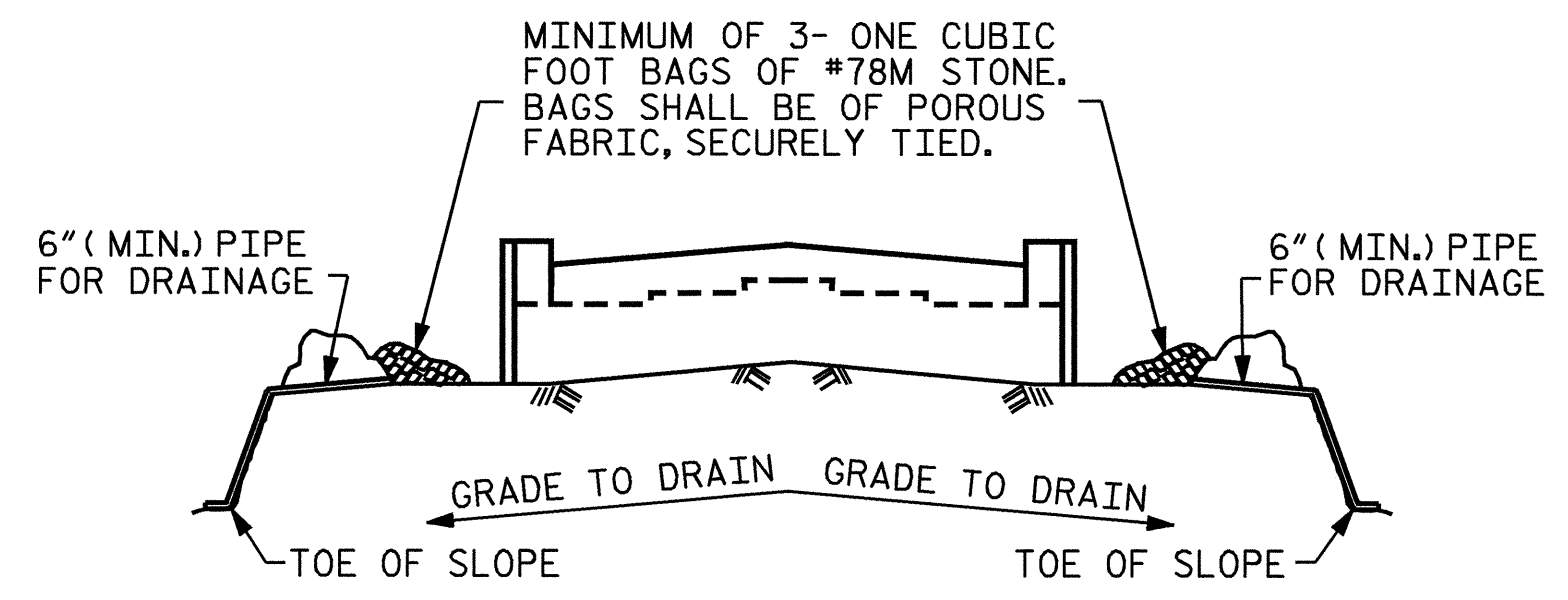


DRAWN BY: A.L. FIGUEROA DATE: 3-29-07  
 CHECKED BY: R.D. MARTIN DATE: 5-04-07

14-MAY-2007 13:54  
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 afigueroa

REVISIONS						SHEET NO.	
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2			4				

STR#2

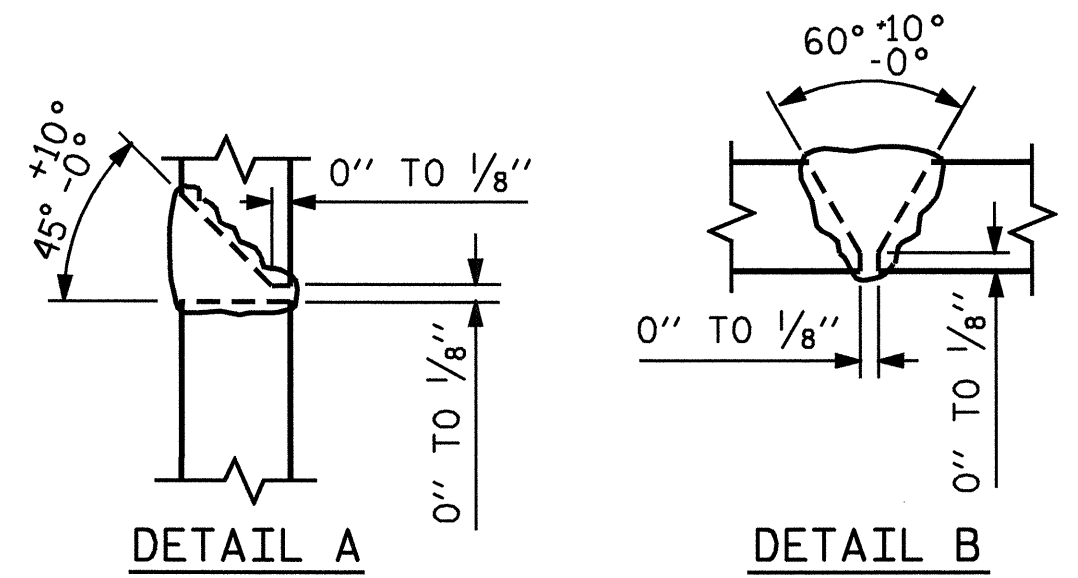
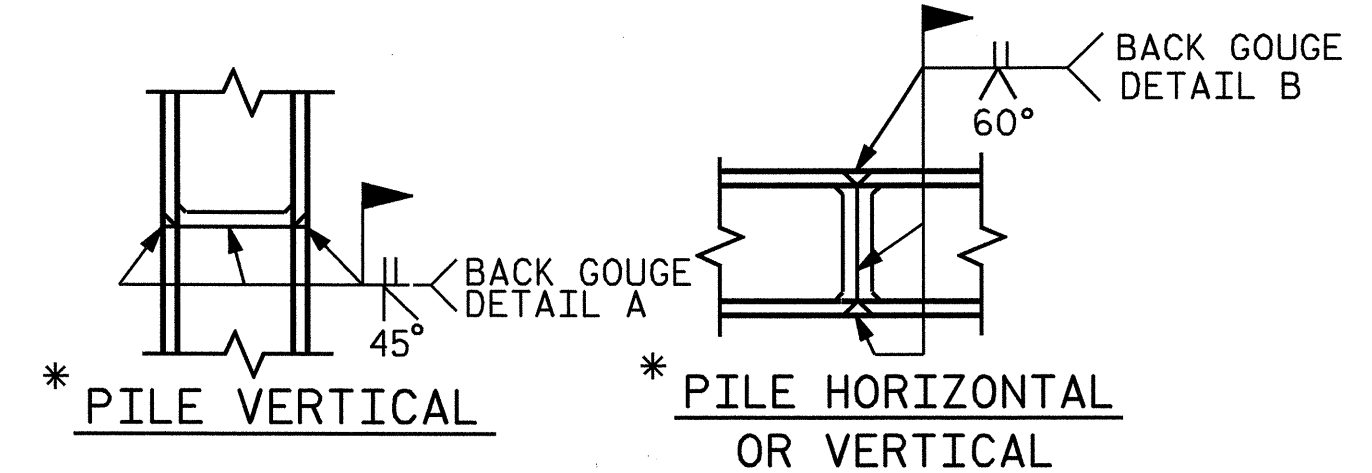


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

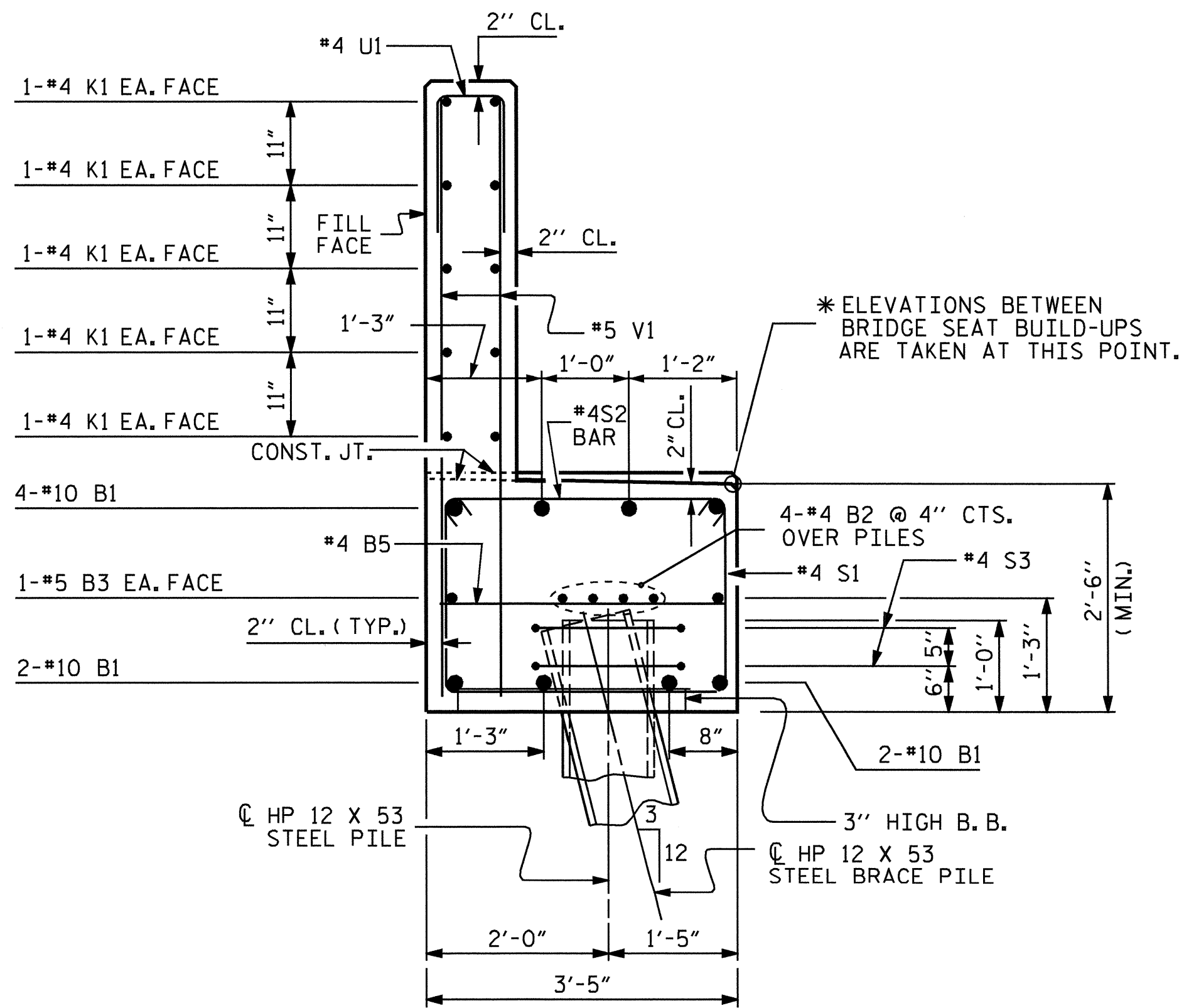
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

**TEMPORARY DRAINAGE AT END BENT**

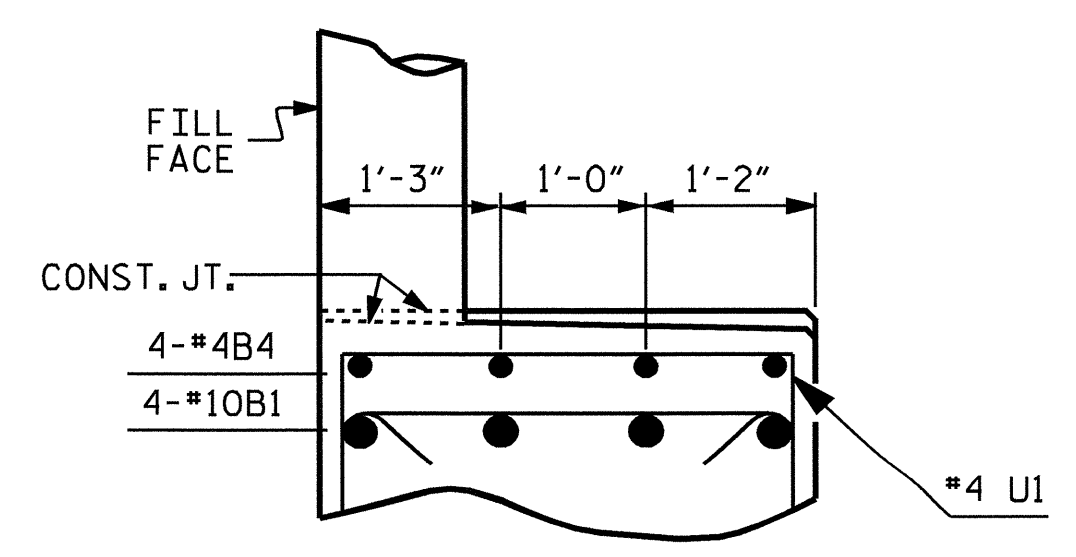


\* POSITION OF PILE DURING WELDING.

**PILE SPLICE DETAILS**

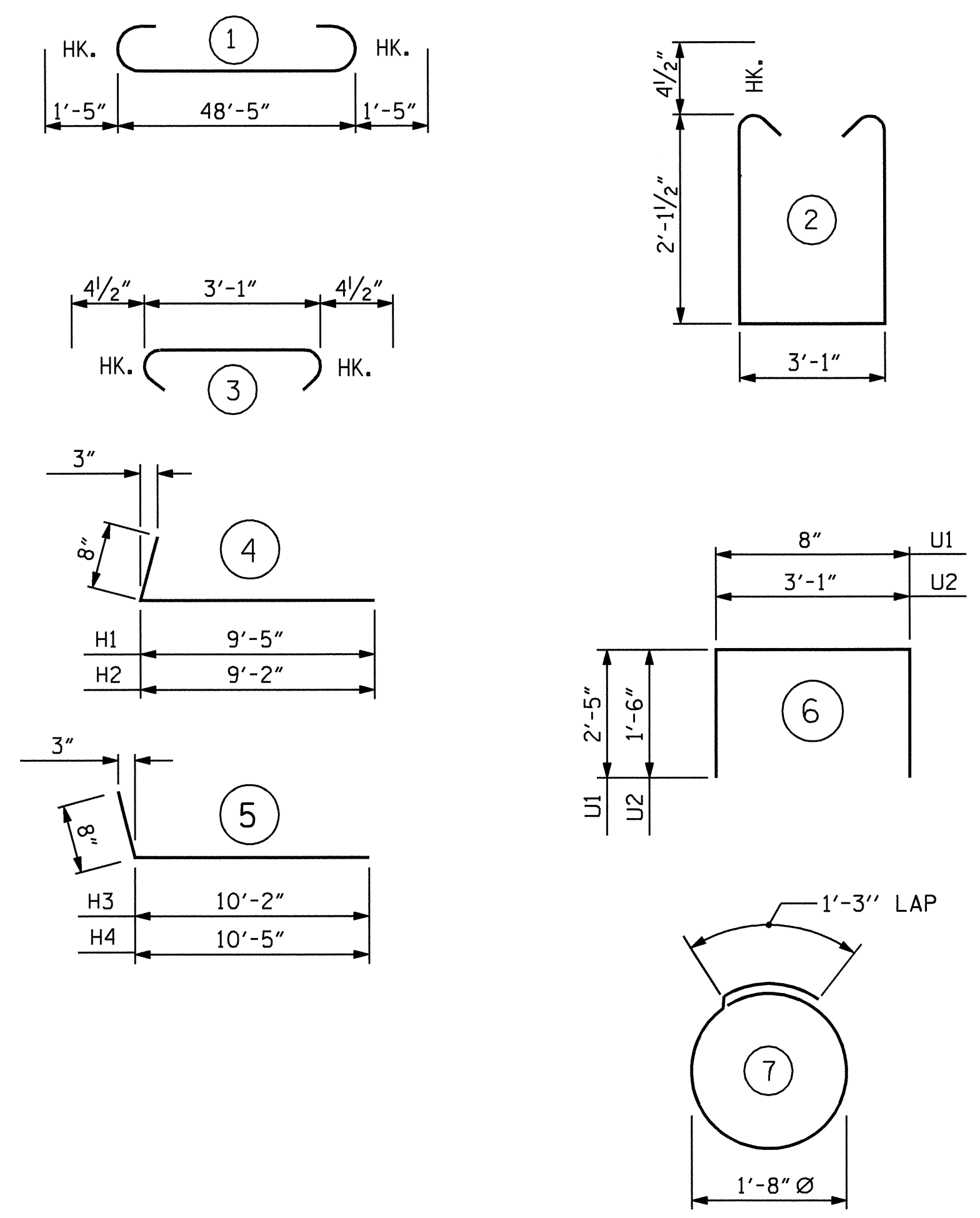


**SECTION A-A**



**SECTION B-B**

**BAR TYPES**



ALL BAR DIMENSIONS ARE OUT TO OUT.

**BILL OF MATERIAL**  
**END BENT NO. 2**

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	10	1	51'-3"	1764
B2	8	4	STR	25'-6"	136
B3	2	5	STR	48'-7"	101
B4	12	4	STR	3'-2"	26
B5	13	4	STR	3'-1"	27
H1	10	5	4	10'-1"	105
H2	10	5	4	9'-10"	103
H3	10	5	5	10'-10"	113
H4	10	5	5	11'-1"	116
H5	8	4	STR	2'-9"	15
K1	20	4	STR	25'-6"	341
S1	47	4	2	8'-1"	254
S2	47	4	3	3'-10"	120
S3	20	4	7	6'-6"	87
U1	43	4	6	5'-6"	158
U2	12	4	6	6'-1"	37
V1	86	5	STR	6'-7"	591
V2	26	5	STR	7'-11"	231
V3	28	5	STR	7'-10"	212

REINFORCING STEEL 4,537 LBS.

CLASS A CONCRETE BREAKDOWN  
POUR #1  
END BENT CAP & LOWER WINGS 17.2 C.Y.  
POUR #2  
BACKWALL & UPPER PART OF WINGS 11.7 C.Y.  
TOTAL CLASS A CONCRETE 28.9 C.Y.

HP 12 X 53 STEEL PILES  
NO. 10 500 LIN. FT.

PROJECT NO. B-4095  
DAVIDSON COUNTY  
STATION: 26+20.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE  
END BENT NO.2  
RIGHT LANE

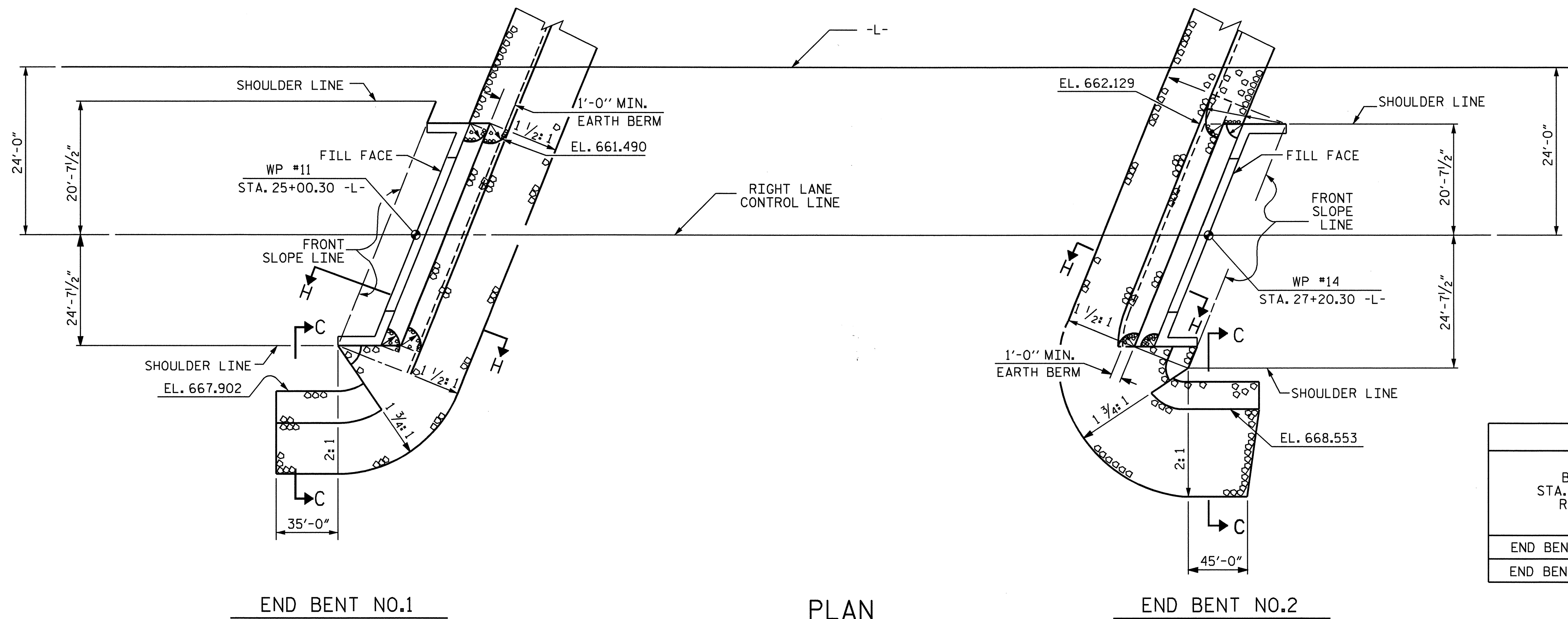


REVISIONS						TOTAL SHEETS
NO.	BY:	DATE:	NO.	BY:	DATE:	69
1			3			69
2			4			

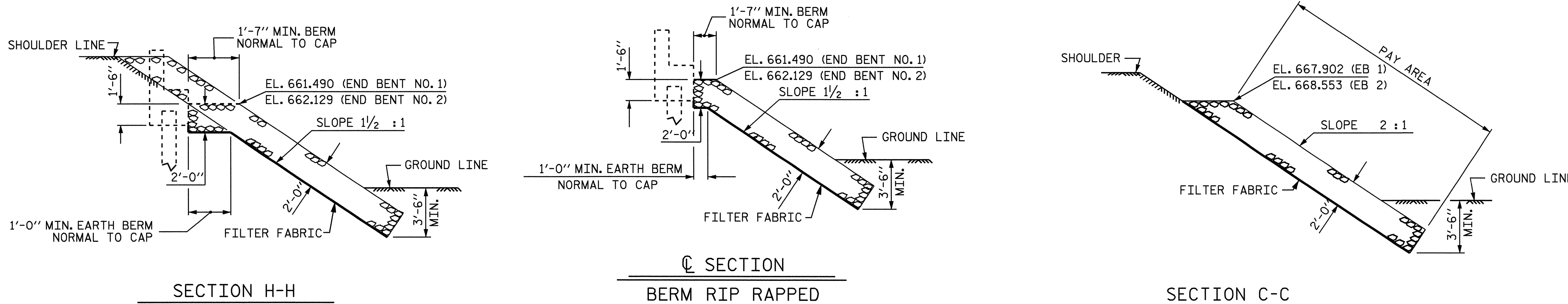
DRAWN BY: A.L. FIGUEROA DATE: 3-29-07  
CHECKED BY: R.D. MARTIN DATE: 5-04-06



NOTES :  
FOR BERM WIDTH DIMENSIONS,SEE GENERAL DRAWING.



ESTIMATED QUANTITIES		
BRIDGE @ STA. 26+20.00 -L- RIGHT LANE	RIP RAP CLASS II	FILTER FABRIC FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	491	546
END BENT 2	532	591



PROJECT NO. B-4095  
DAVIDSON COUNTY  
STATION: 26+20.00-L-

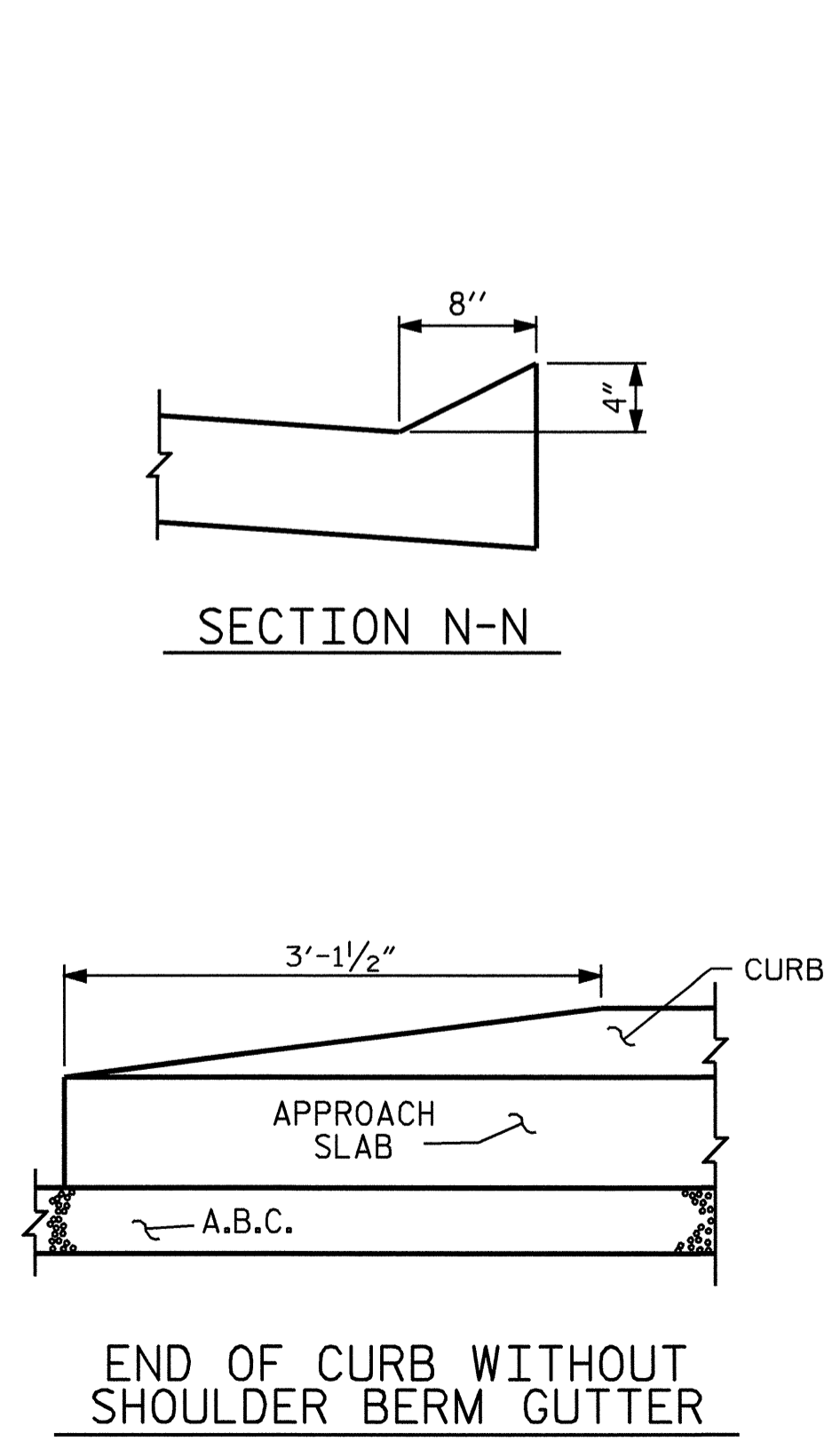
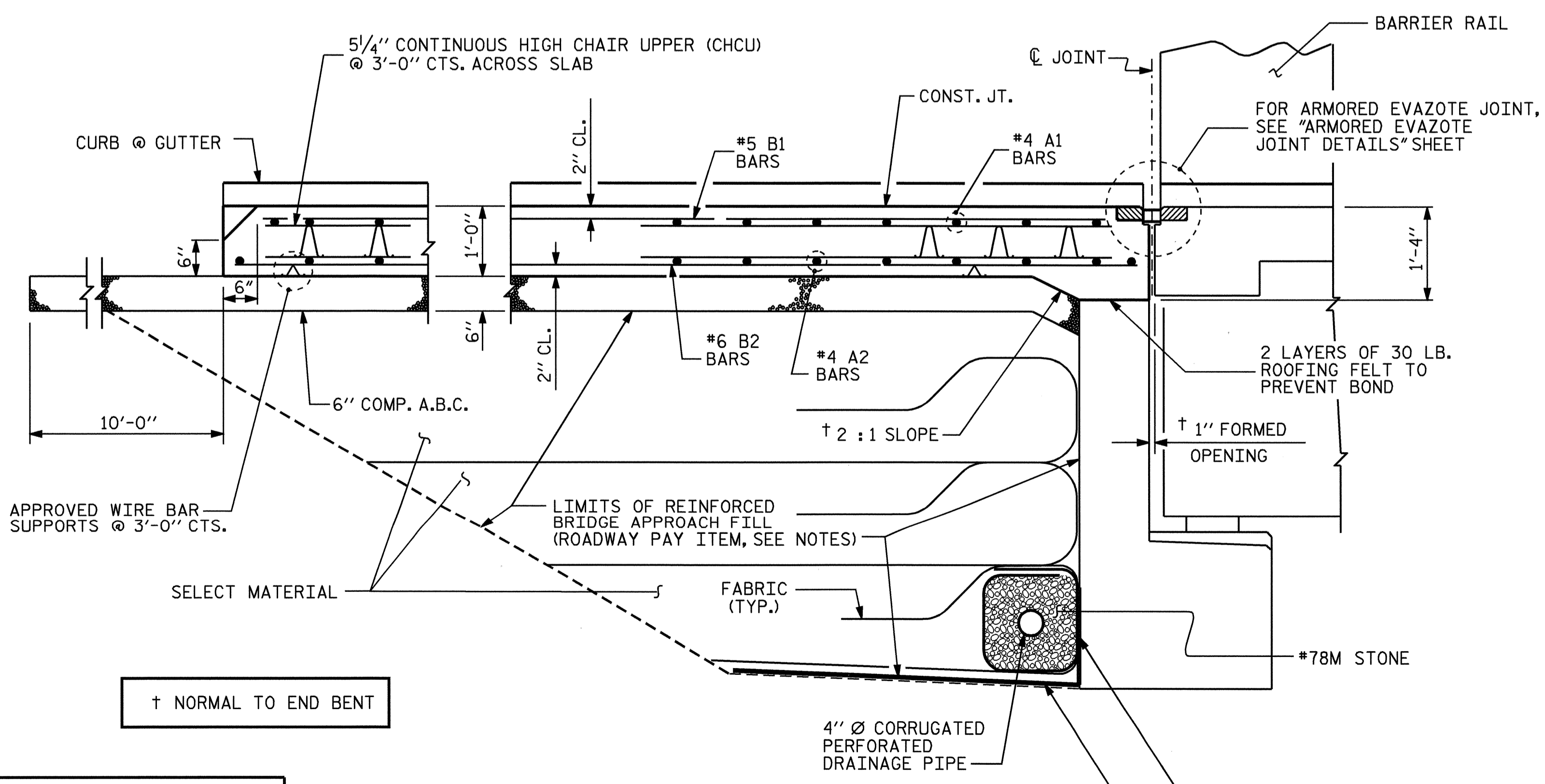
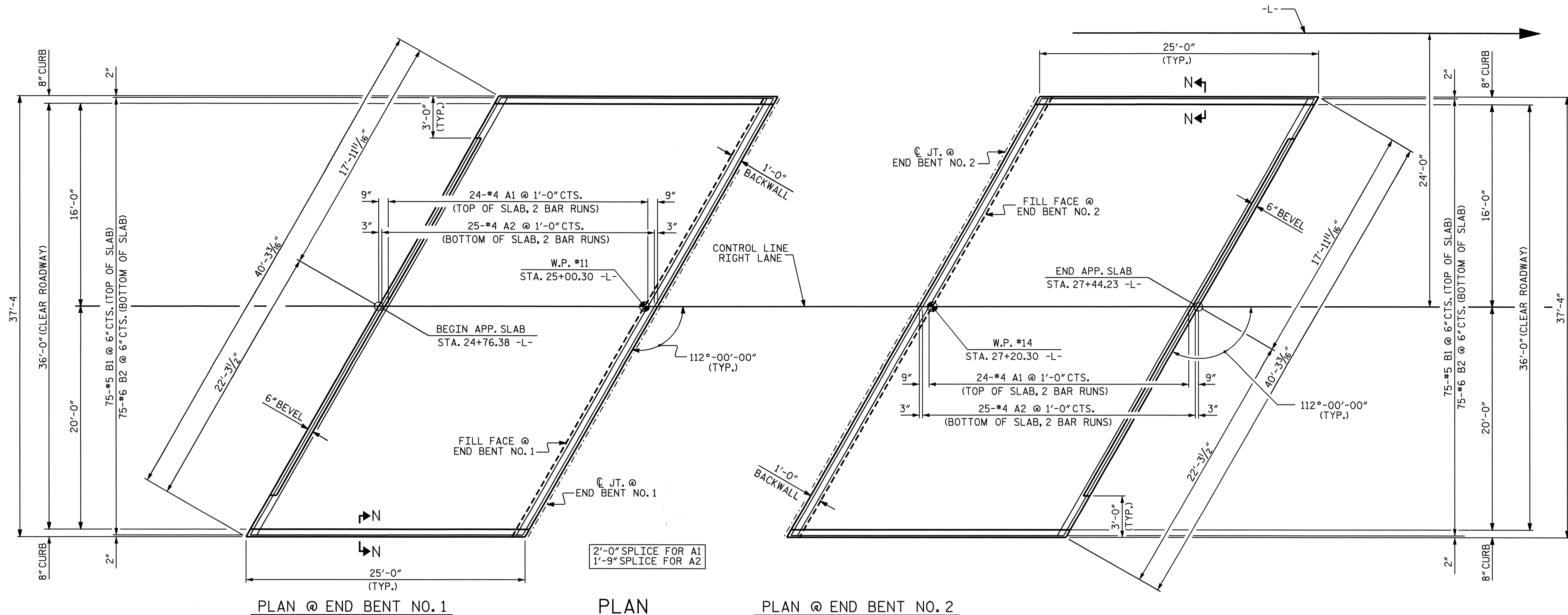
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

STANDARD  
RIP RAP DETAILS  
RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-64
1			3			TOTAL SHEETS 69
2			4			



ASSEMBLED BY : A.L. FIGUEROA DATE : 8-29-06  
CHECKED BY : V. X. NGUYEN DATE : 8-30-06  
DRAWN BY : REK 1/84 REV. 7/17/98 REK/RWW  
CHECKED BY : RDU 1/84 REV. 8/16/99 RWW/LES  
REV. 10/17/00 RWW/LES



PROJECT NO. B-4095  
DAVIDSON COUNTY  
 STATION: 26+20.00 -L-

SHEET 1 OF 2

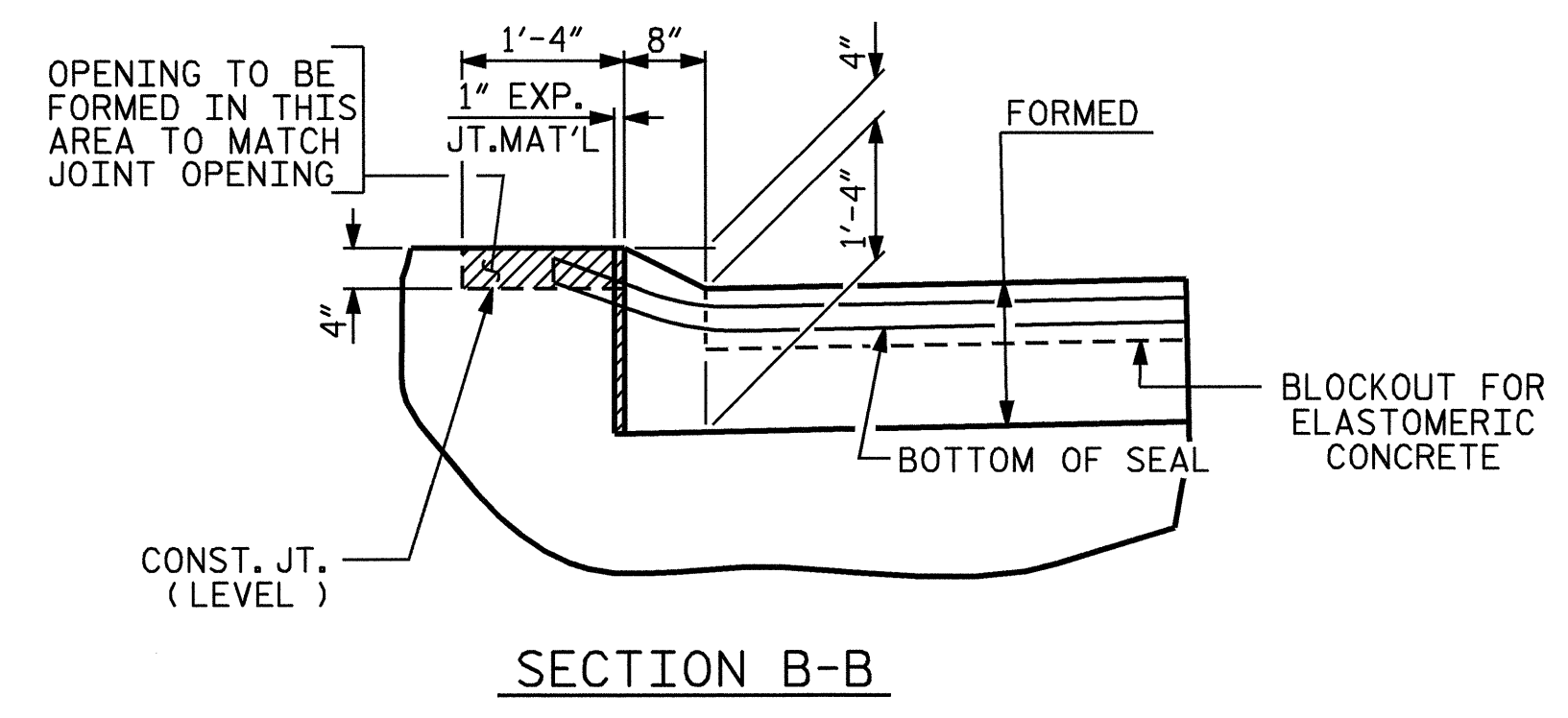
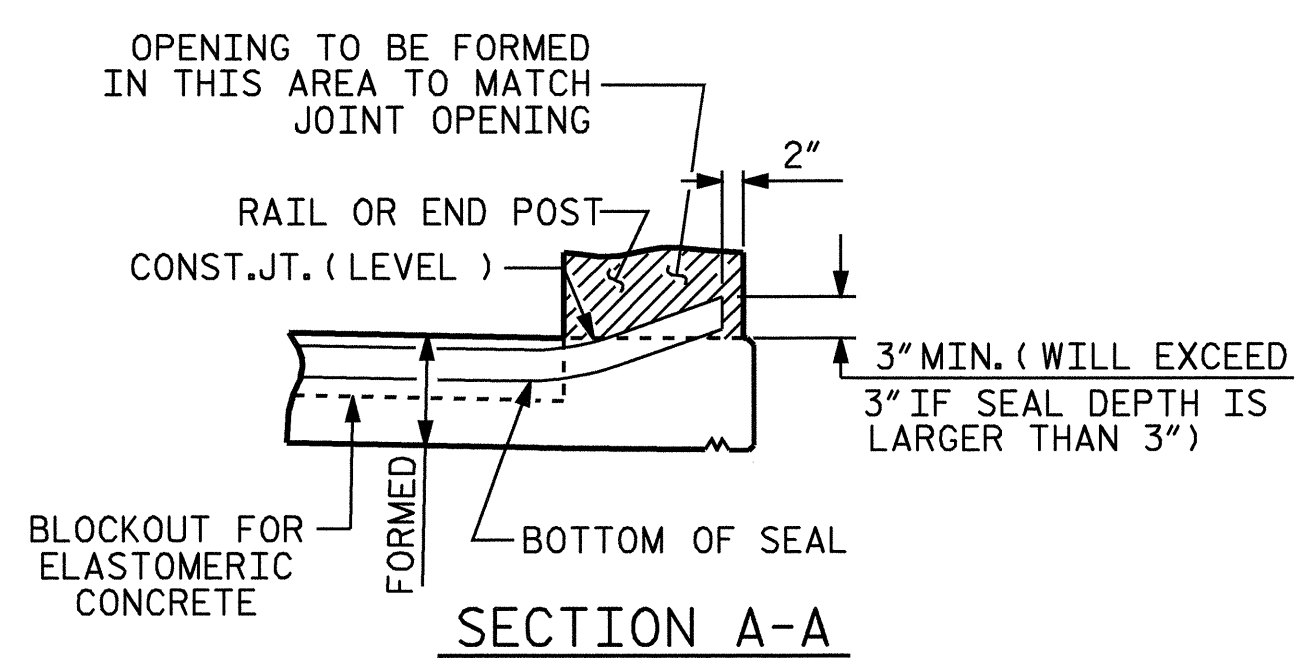
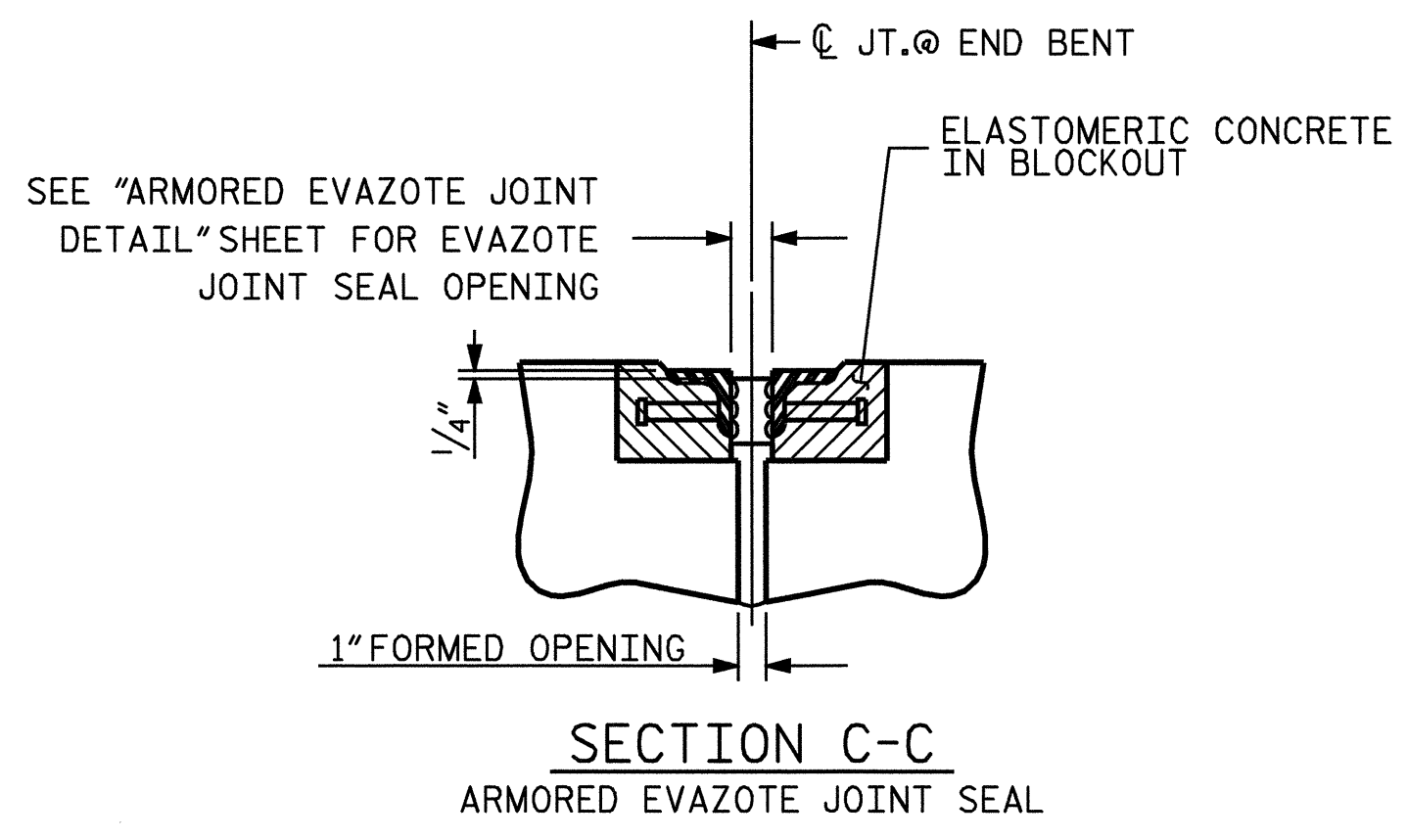
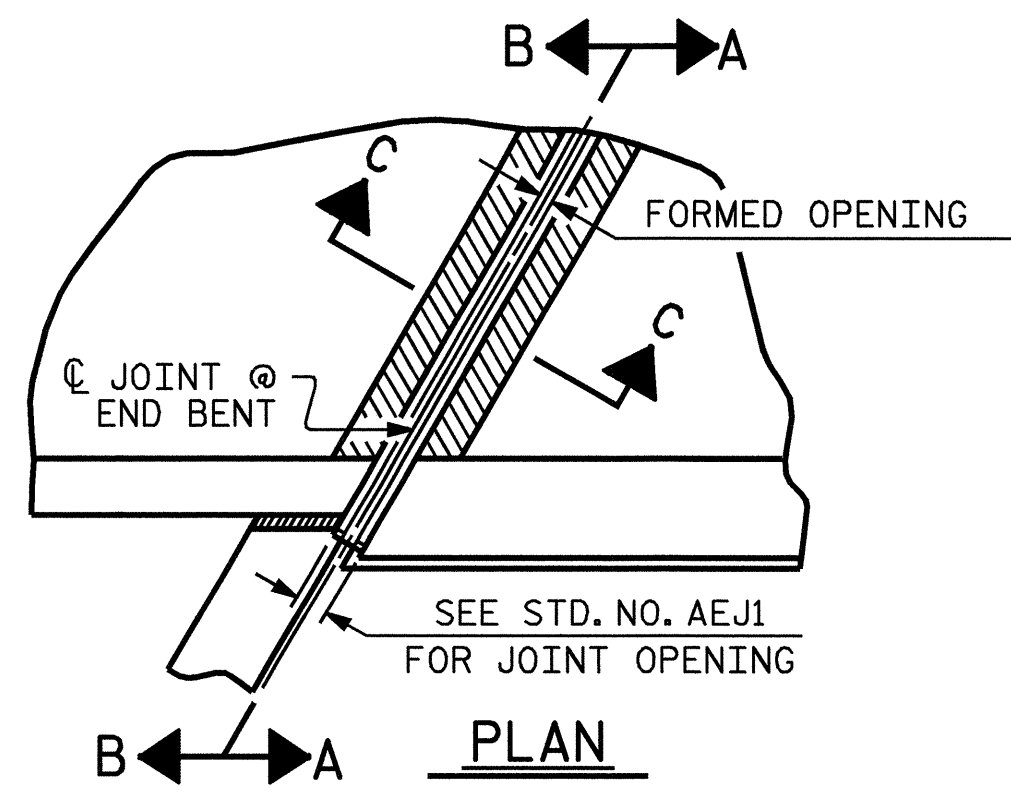
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**BRIDGE APPROACH SLAB  
 FOR FLEXIBLE PAVEMENT  
 RIGHT LANE**

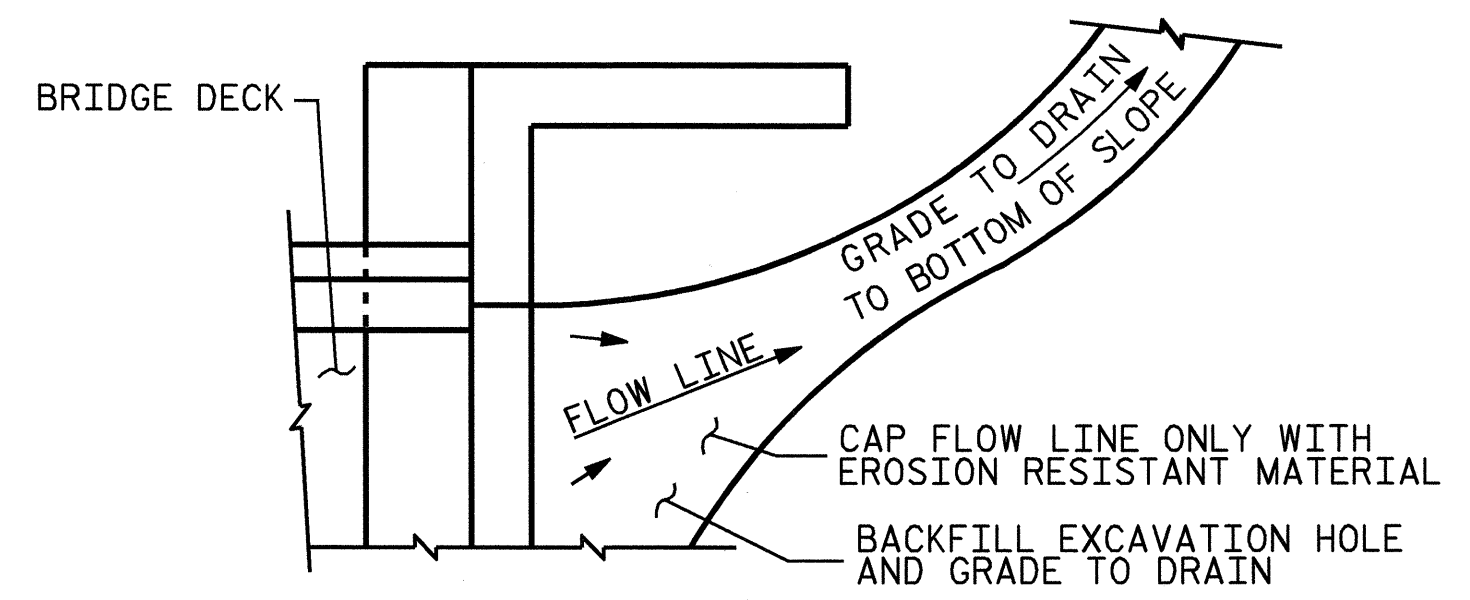
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S-65  
 TOTAL SHEETS 69

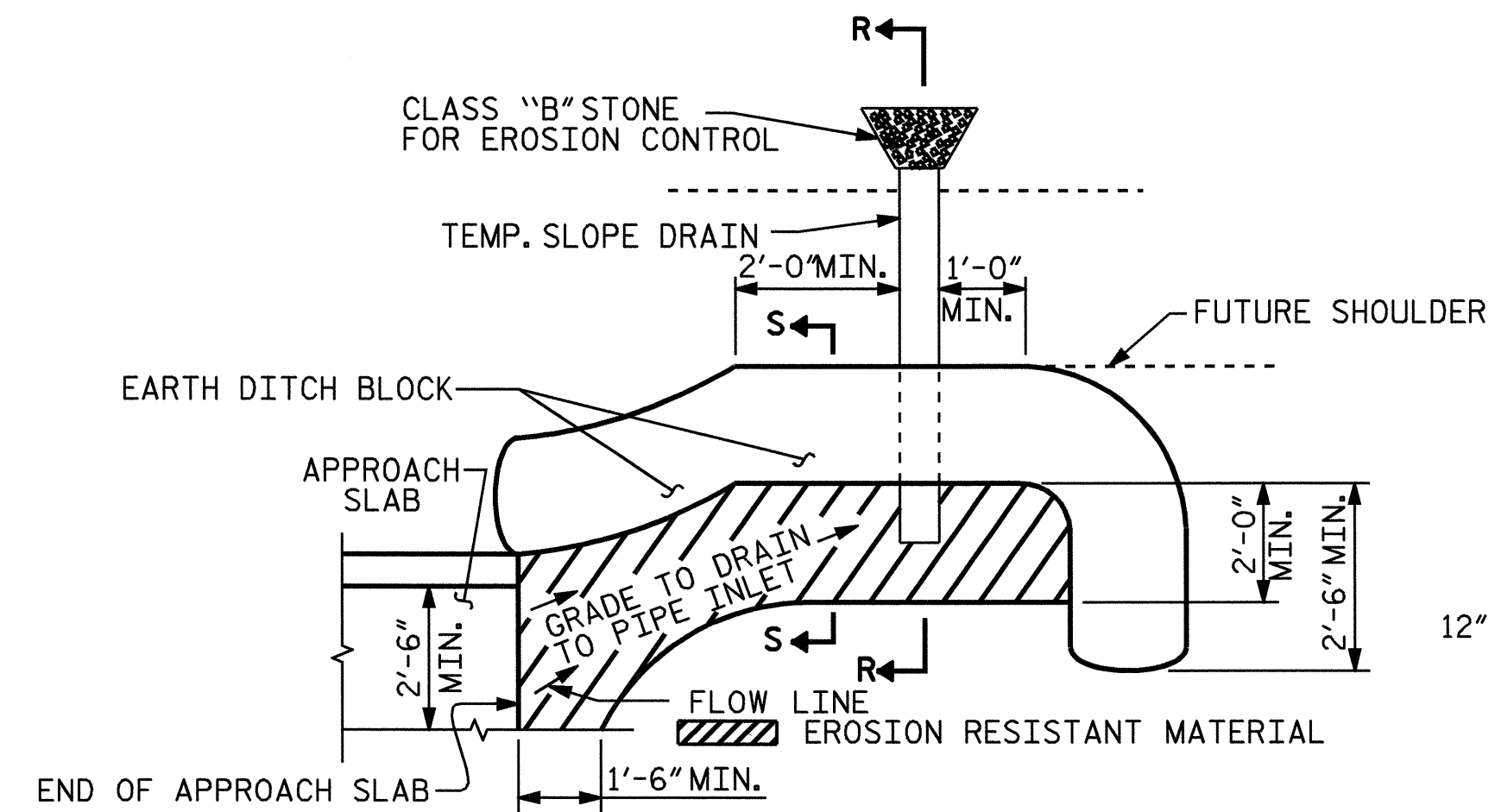
ASSEMBLED BY : J. LAMBERT/AS/ALF DATE : 11-08-06  
 CHECKED BY : M.E. POOLE DATE : 11-08-06  
 DRAWN BY : LES 8/01 REV. 5/7/03RR RWW/JTE  
 CHECKED BY : RDR 8/01



JOINT SEAL DETAILS @ END BENT



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



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

TEMPORARY BERM AND SLOPE DRAIN DETAILS

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.

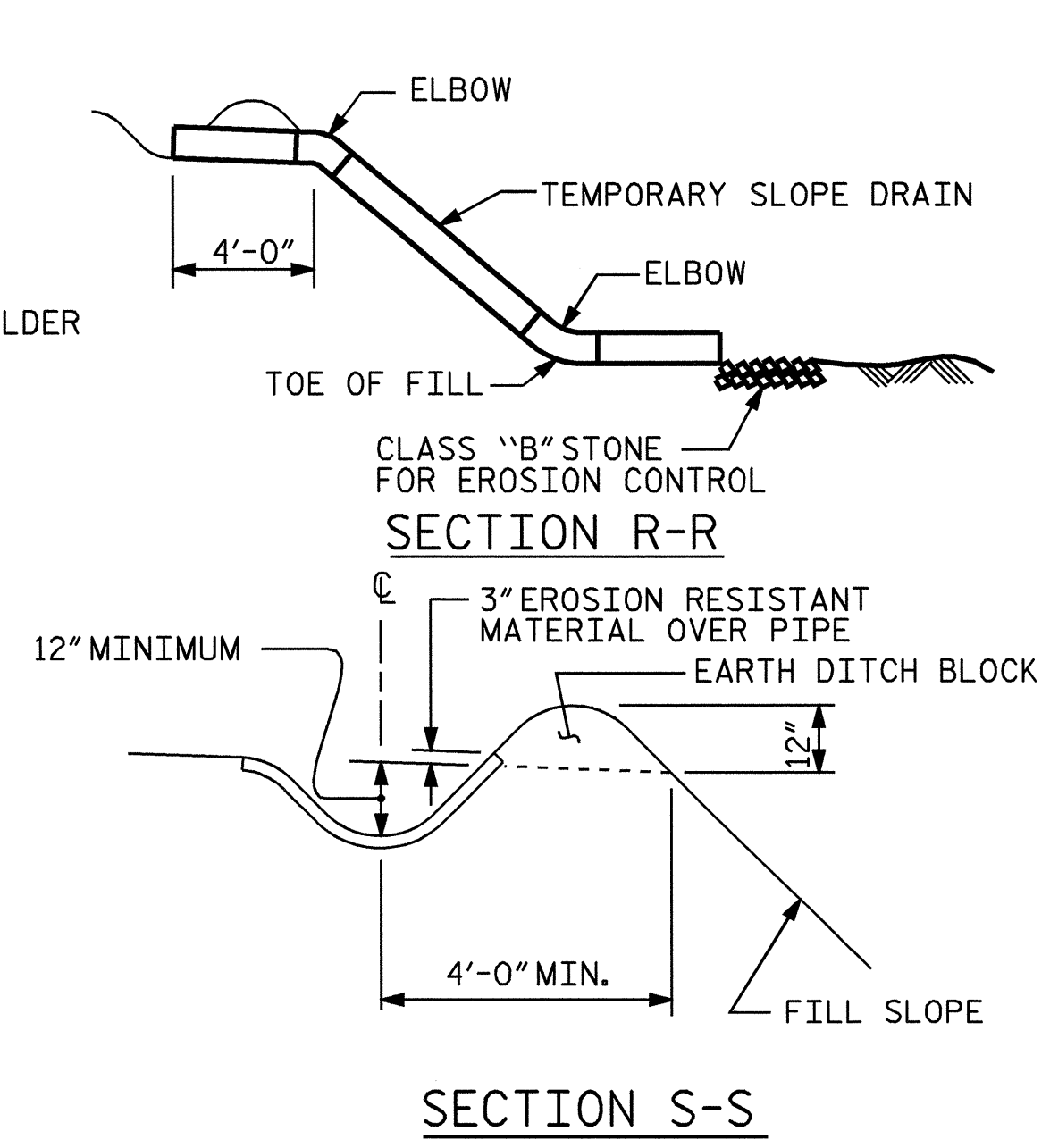
TEMPORARY DRAINAGE AND TEMPORARY BERM AND SLOPE DRAINS WILL BE PAID FOR UNDER THE LUMP SUM PRICE FOR BRIDGE APPROACH SLAB.

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 EXTEND 10'-0" BEYOND THE END OF THE APPROACH SLAB AND 1'-0" OUTSIDE OF EACH EDGE OF 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 EXTEND 1'-0" BEYOND THE 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 EXTEND 1'-0" BEYOND THE 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.



BILL OF MATERIAL					
FOR ONE APPROACH SLAB (2 REQ'D)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	48	#4	STR	21'-0"	673
A2	50	#4	STR	20'-10"	696
*B1	75	#5	STR	23'-8"	1851
B2	75	#6	STR	24'-8"	2779
REINFORCING STEEL				LBS.	3475
*EPOXY COATED REINFORCING STEEL				LBS.	2524
CLASS AA CONCRETE BREAKDOWN					
SLAB AND CURB				C. Y.	38.0
TOTAL CLASS AA CONCRETE				C. Y.	38.0

\* THESE BARS ARE EPOXY COATED.

PROJECT NO. B-4095  
DAVIDSON COUNTY  
STATION: 26+20.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

STANDARD  
BRIDGE APPROACH  
SLAB DETAILS  
RIGHT LANE

ASSEMBLED BY :	A.L. FIGUEROA	DATE :	11-08-06
CHECKED BY :	M.E. POOLE	DATE :	11-08-06
DRAWN BY :	FCJ 11/88	REV. 10/17/00	RWW/LES
CHECKED BY :	ARB 11/88	REV. 5/7/03	RWW/JTE
		REV. 5/1/06	TLA/GM



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

SHEET NO. S-66  
TOTAL SHEETS 69

OVERHANG BRACKET CALCULATION INSTRUCTIONS

AASHTO SHAPES - TYPES III, IV, V, AND VI

- RECORD KNOWN INFORMATION ON "BRIDGE OVERHANG BRACKET SUMMARY" ON SHEET 2
- CALCULATE THE MAXIMUM SCREED LOAD PER BRACKET (SLPB) WITH AN ESTIMATED R = 1.5.  $SLPB = R \times W$ . ROUND VALUE UP TO NEAREST SLPB VALUE INDICATED ON APPROPRIATE TABLE 1-1, 1-2, 1-3, OR 1-4.
- WITH THE ESTIMATED SLPB, OVERHANG SLAB THICKNESS, "K" VALUE, AND 45° HANGER SAFE WORKING LOAD (SWL), ENTER THE APPROPRIATE TABLE 1-1, 1-2, 1-3, OR 1-4 (BASED ON OVERHANG DIMENSION) AND DETERMINE THE BRACKET SPACING, S.
- CALCULATE S/D1 AND S/D2, ROUNDING UP TO NEAREST VALUE IN TABLE 2 AND DETERMINE R VALUE.
- CALCULATE REVISED SLPB, ROUND VALUE UP TO NEAREST SLPB VALUE INDICATED ON APPROPRIATE TABLE 1-1, 1-2, 1-3, OR 1-4.
- WITH THE REVISED SLPB, OVERHANG SLAB THICKNESS, "K" VALUE AND 45° HANGER SAFE WORKING LOAD (SWL), ENTER THE APPROPRIATE TABLE 1-1, 1-2, 1-3 OR 1-4 (BASED ON OVERHANG DIMENSION) AND DETERMINE REVISED BRACKET SPACING, S.
- CONTINUE ITERATIONS OF STEPS 4-6 UNTIL THE REVISED BRACKET SPACING, S, IS THE SAME AS THE PREVIOUS S VALUE.
- CHECK LUMBER JOIST SPACING: WITH BRACKET SPACING VALUE, S, ROUND THIS VALUE UP TO THE NEAREST VALUE OF ALLOWABLE SPAN LENGTH OF JOIST OF TABLE 3. USING THIS VALUE, ALONG WITH THE AVERAGE OVERHANG SLAB THICKNESS AND THE LUMBER JOIST SIZE, DETERMINE JOIST SPACING FROM TABLE 3. IF NECESSARY, ADJUST LUMBER JOIST SIZE AND/OR JOIST SPACING TO MEET ALLOWABLE SPAN LENGTH OF JOIST.
- CONVERSELY, IF THE DESIRED JOIST SPACING IS KNOWN, USE THIS ALONG WITH THE AVERAGE OVERHANG SLAB THICKNESS AND THE LUMBER JOIST SIZE TO DETERMINE IF ALLOWABLE SPAN LENGTH OF JOIST IS GREATER THAN THE BRACKET SPACING, S. IF NECESSARY, ADJUST LUMBER JOIST SIZE TO MEET REQUIREMENTS OF ALLOWABLE SPAN LENGTH OF JOIST AND JOIST SPACING.
- RECORD REMAINING INFORMATION ON "BRIDGE OVERHANG BRACKET SUMMARY" FORM.
- SUBMIT FORM AND CALCULATIONS FOR REVIEW AND APPROVAL.

TABLE 1-1 (FOR USE ON UP TO 2'-0" OVERHANG (L) & 54" HORIZONTAL LEG LENGTH OF THE OVERHANG BRACKET)

AVG. SLAB THICKNESS (in)	BRACKET DIMENSION (in)	SCREED LOAD PER BRACKET								45° HANGER SWL (lbs)	
		2500 lbs.	2250 lbs.	2000 lbs.	1750 lbs.	1500 lbs.	1250 lbs.	1000 lbs.	750 lbs.		0 lbs.
10	30	3'-6"	4'-0"	4'-5"	2'-1"	2'-7"	3'-2"	3'-8"	4'-2"	5'-9"	4000
	40	3'-6"	4'-0"	4'-5"	2'-1"	2'-7"	3'-2"	3'-8"	4'-2"	5'-9"	6000
	50	3'-6"	4'-0"	4'-5"	2'-1"	2'-7"	3'-2"	3'-8"	4'-2"	5'-9"	6000
12	30	3'-2"	3'-7"	4'-1"	2'-4"	2'-10"	3'-4"	3'-9"	5'-2"	4000	
	40	3'-2"	3'-7"	4'-1"	2'-4"	2'-10"	3'-4"	3'-9"	5'-2"	6000	
	50	3'-2"	3'-7"	4'-1"	2'-4"	2'-10"	3'-4"	3'-9"	5'-2"	6000	
14	30	2'-10"	3'-4"	3'-9"	2'-2"	2'-7"	3'-0"	3'-5"	4'-9"	4000	
	40	2'-10"	3'-4"	3'-9"	2'-2"	2'-7"	3'-0"	3'-5"	4'-9"	6000	
	50	2'-10"	3'-4"	3'-9"	2'-2"	2'-7"	3'-0"	3'-5"	4'-9"	6000	
16	30	2'-8"	3'-0"	3'-5"	2'-0"	2'-4"	2'-9"	3'-2"	4'-4"	4000	
	40	2'-8"	3'-0"	3'-5"	2'-0"	2'-4"	2'-9"	3'-2"	4'-4"	6000	
	50	2'-8"	3'-0"	3'-5"	2'-0"	2'-4"	2'-9"	3'-2"	4'-4"	6000	

TABLE 1-2 (FOR USE ON OVER 2'-0" TO 2'-6" OVERHANG (L) & 54" HORIZONTAL LEG LENGTH OF THE OVERHANG BRACKET)

AVG. SLAB THICKNESS (in)	BRACKET DIMENSION (in)	SCREED LOAD PER BRACKET								45° HANGER SWL (lbs)
		2500 lbs.	2250 lbs.	2000 lbs.	1750 lbs.	1500 lbs.	1250 lbs.	1000 lbs.	750 lbs.	
10	30	3'-1"	3'-6"	4'-0"	2'-4"	2'-9"	3'-3"	3'-8"	5'-1"	4000
	40	3'-1"	3'-6"	4'-0"	2'-4"	2'-9"	3'-3"	3'-8"	5'-1"	6000
	50	3'-1"	3'-6"	4'-0"	2'-4"	2'-9"	3'-3"	3'-8"	5'-1"	6000
12	30	2'-9"	3'-2"	3'-7"	2'-1"	2'-6"	2'-11"	3'-4"	4'-6"	4000
	40	2'-9"	3'-2"	3'-7"	2'-1"	2'-6"	2'-11"	3'-4"	4'-6"	6000
	50	2'-9"	3'-2"	3'-7"	2'-1"	2'-6"	2'-11"	3'-4"	4'-6"	6000
14	30	2'-6"	2'-10"	3'-3"	2'-3"	2'-7"	3'-0"	4'-1"	4000	
	40	2'-6"	2'-10"	3'-3"	2'-3"	2'-7"	3'-0"	4'-1"	6000	
	50	2'-6"	2'-10"	3'-3"	2'-3"	2'-7"	3'-0"	4'-1"	6000	
16	30	2'-3"	2'-7"	2'-11"	2'-1"	2'-5"	2'-9"	3'-9"	4000	
	40	2'-3"	2'-7"	2'-11"	2'-1"	2'-5"	2'-9"	3'-9"	6000	
	50	2'-3"	2'-7"	2'-11"	2'-1"	2'-5"	2'-9"	3'-9"	6000	

TABLE 1-3 (FOR USE ON OVER 2'-6" TO 3'-0" OVERHANG (L) & 54" HORIZONTAL LEG LENGTH OF THE OVERHANG BRACKET)

AVG. SLAB THICKNESS (in)	BRACKET DIMENSION (in)	SCREED LOAD PER BRACKET								45° HANGER SWL (lbs)			
		2500 lbs.	2250 lbs.	2000 lbs.	1750 lbs.	1500 lbs.	1250 lbs.	1000 lbs.	750 lbs.		0 lbs.		
10	30							2'-1"	2'-6"	2'-11"	3'-4"	4'-6"	4000
	40							2'-1"	2'-6"	2'-11"	3'-4"	4'-6"	6000
	50	2'-9"	3'-2"	3'-7"	4'-0"	4'-5"	4'-10"	5'-3"	5'-7"	6'-7"	4000		
12	30							2'-1"	2'-6"	2'-11"	3'-4"	4'-6"	4000
	40							2'-1"	2'-6"	2'-11"	3'-4"	4'-6"	6000
	50	2'-9"	3'-2"	3'-7"	4'-0"	4'-5"	4'-10"	5'-3"	5'-7"	6'-7"	4000		
14	30							2'-2"	2'-7"	2'-11"	4'-0"	4000	
	40							2'-2"	2'-7"	2'-11"	4'-0"	6000	
	50	2'-9"	3'-2"	3'-7"	4'-0"	4'-5"	4'-10"	5'-3"	5'-7"	6'-7"	4000		
16	30							2'-2"	2'-7"	2'-11"	4'-0"	4000	
	40							2'-2"	2'-7"	2'-11"	4'-0"	6000	
	50	2'-9"	3'-2"	3'-7"	4'-0"	4'-5"	4'-10"	5'-3"	5'-7"	6'-7"	4000		

TABLE 1-4 (FOR USE ON OVER 3'-0" TO 3'-6" OVERHANG (L) & 54" HORIZONTAL LEG LENGTH OF THE OVERHANG BRACKET)

AVG. SLAB THICKNESS (in)	BRACKET DIMENSION (in)	SCREED LOAD PER BRACKET								45° HANGER SWL (lbs)			
		2500 lbs.	2250 lbs.	2000 lbs.	1750 lbs.	1500 lbs.	1250 lbs.	1000 lbs.	750 lbs.		0 lbs.		
10	30							2'-3"	2'-11"	2'-5"	2'-9"	3'-10"	4000
	40							2'-3"	2'-11"	2'-5"	2'-9"	3'-10"	6000
	50							2'-3"	2'-11"	2'-5"	2'-9"	3'-10"	6000
12	30							2'-4"	2'-8"	3'-4"	3'-11"	5'-2"	4000
	40							2'-4"	2'-8"	3'-4"	3'-11"	5'-2"	6000
	50	2'-4"	2'-8"	3'-0"	3'-4"	3'-8"	4'-1"	4'-5"	4'-9"	5'-9"	6000		
14	30							2'-4"	2'-8"	3'-4"	3'-11"	5'-2"	4000
	40							2'-4"	2'-8"	3'-4"	3'-11"	5'-2"	6000
	50	2'-4"	2'-8"	3'-0"	3'-4"	3'-8"	4'-1"	4'-5"	4'-9"	5'-9"	6000		
16	30							2'-4"	2'-8"	3'-4"	3'-11"	5'-2"	4000
	40							2'-4"	2'-8"	3'-4"	3'-11"	5'-2"	6000
	50	2'-4"	2'-8"	3'-0"	3'-4"	3'-8"	4'-1"	4'-5"	4'-9"	5'-9"	6000		

DEFINITIONS

- SLPB = SCREED LOAD PER BRACKET (R x W)
- R = SCREED LOAD FACTOR, OBTAINED FROM TABLE 2
- W = WHEEL LOAD
- S = BRACKET SPACING
- T = AVERAGE SLAB THICKNESS
- SWL = SAFE WORKING LOAD
- K = DIMENSION DEFINED ON "BRIDGE OVERHANG BRACKET SUMMARY" ON SHEET 2
- L = OVERHANG MEASURED FROM EDGE OF TOP FLANGE TO EDGE OF SUPERSTRUCTURE

PROJECT NO. B-4095

DAVIDSON COUNTY

STATION: 26+20.00 -L-

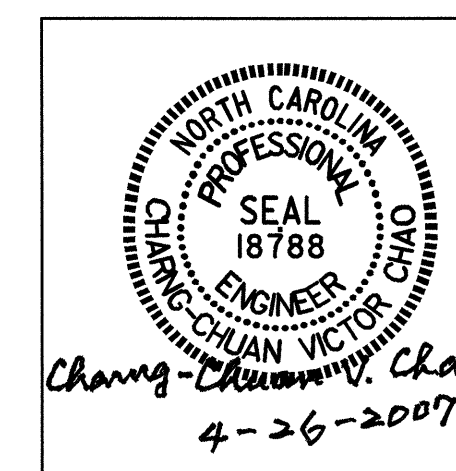
SHEET 1 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

STANDARD OVERHANG FALSEWORK

AASHTO TYPES  
III, IV, V, AND VI

LEFT & RIGHT LANES



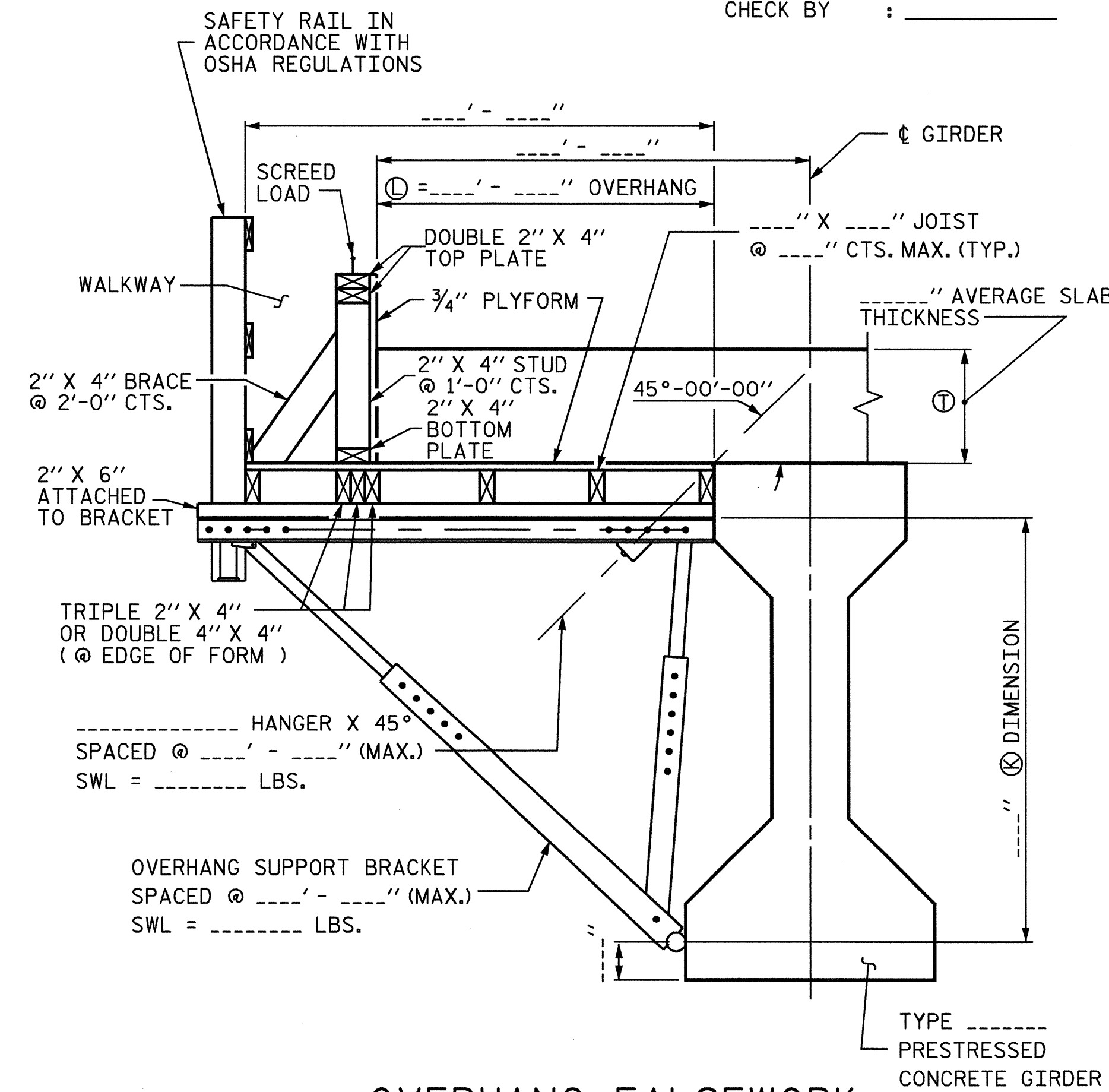
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-67
1			3			TOTAL SHEETS 69
2			4			

ASSEMBLED BY:	DATE:
CHECKED BY:	DATE:
DRAWN BY: R. WRIGHT 06/04	REV.
CHECKED BY: C. V. CHAO 06/04	

BRIDGE OVERHANG BRACKET SUMMARY

TOTAL SCREED WEIGHT = \_\_\_\_\_ LBS. PROJECT No. : \_\_\_\_\_  
 NUMBER OF SCREED WHEELS = \_\_\_\_\_ COUNTY : \_\_\_\_\_  
 SCREED WHEEL LOAD (W) = \_\_\_\_\_ LBS. STATION : \_\_\_\_\_  
 SCREED LOAD PER BRACKET = \_\_\_\_\_ LBS. DESCRIPTION : \_\_\_\_\_

DATE : \_\_\_\_\_  
 DESIGN BY : \_\_\_\_\_  
 CHECK BY : \_\_\_\_\_



OVERHANG FALSEWORK

NOTES

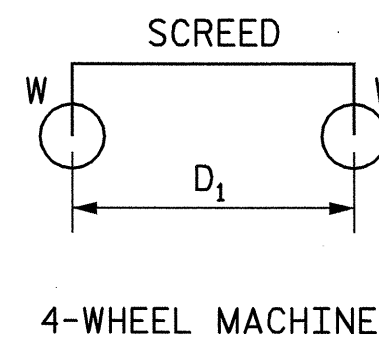
DESIGN INCLUDES CONSTRUCTION LIVE LOAD 20 PSF ON THE AREA SUPPORTED AND 75 PLF AT THE OUTSIDE DECK OF OVERHANGS.

REQUIRED MINIMUM DIAGONAL LEG CAPACITY: 3600 LB WORKING LOAD

THE CONTRACTOR HAS THE OPTION OF SUBMITTING HIS OWN DESIGN FOR OVERHANG FALSEWORK IN ACCORDANCE WITH THE SPECIAL PROVISIONS.

SUBMITTALS UTILIZING THE INSTRUCTIONS AND PROCEDURES DESCRIBED ON SHEET 1 OF 3 SHALL BE IN ACCORDANCE WITH THE APPLICABLE SECTIONS OF THE SPECIFICATIONS AND SPECIAL PROVISIONS, EXCEPT THAT CALCULATIONS FOR OVERHANG FALSEWORK NEED NOT BE SEALED BY A REGISTERED ENGINEER.

FOR OVERHANG FALSEWORK BRACING DESIGN, SEE SHEET 3 OF 3.



4 WHEEL MACHINE	
S/D <sub>1</sub>	R
<= 1.0	1.00
1.1	1.09
1.2	1.17
1.3	1.23
1.4	1.29
1.5	1.33
1.6	1.38
1.7	1.41
1.8	1.44
1.9	1.47
2.0	1.50
2.2	1.55
2.4	1.58
2.6	1.62
2.8	1.64
3.0	1.67
3.5	1.71
4.0	1.75

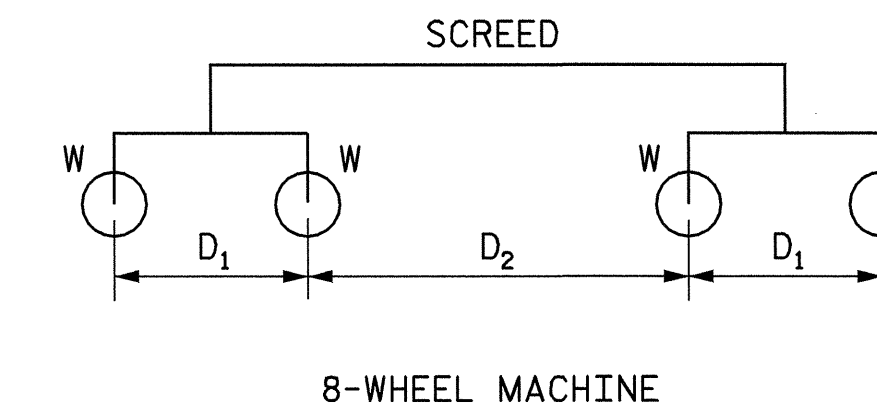


TABLE 2: SCREED LOAD FACTOR "R"

		THE SCREED LOAD FACTOR R (FOR 8 WHEEL MACHINE)																	
		S/D <sub>2</sub>																	
		<= 1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.2	2.4	2.6	2.8	3.0	3.5	4.0
S/D <sub>1</sub>	<= 1.0	1.00	1.09	1.17	1.23	1.29	1.33	1.38	1.41	1.44	1.47	1.50	1.55	1.58	1.62	1.64	1.67	1.71	1.75
	1.1	1.09	1.18	1.26	1.32	1.38	1.42	1.47	1.50	1.54	1.56	1.59	1.64	1.67	1.71	1.73	1.76	1.81	1.84
	1.2	1.17	1.26	1.33	1.40	1.45	1.50	1.54	1.58	1.61	1.64	1.67	1.71	1.75	1.78	1.81	1.83	1.88	1.92
	1.3	1.23	1.32	1.40	1.46	1.52	1.56	1.61	1.64	1.68	1.70	1.73	1.78	1.81	1.85	1.87	1.90	1.95	1.98
	1.4	1.29	1.38	1.45	1.52	1.57	1.62	1.66	1.70	1.73	1.76	1.79	1.83	1.87	1.90	1.93	1.95	2.00	2.07
	1.5	1.33	1.42	1.50	1.56	1.62	1.67	1.71	1.75	1.78	1.81	1.83	1.88	1.92	1.95	1.98	2.00	2.10	2.17
	1.6	1.38	1.47	1.54	1.61	1.66	1.71	1.75	1.79	1.82	1.85	1.88	1.92	1.96	1.99	2.04	2.08	2.18	2.25
	1.7	1.41	1.50	1.58	1.64	1.70	1.75	1.79	1.82	1.86	1.89	1.91	1.96	2.00	2.05	2.11	2.16	2.25	2.32
	1.8	1.44	1.54	1.61	1.68	1.73	1.78	1.82	1.86	1.89	1.92	1.94	1.99	2.06	2.12	2.17	2.22	2.32	2.39
	1.9	1.47	1.56	1.64	1.70	1.76	1.81	1.85	1.89	1.92	1.95	1.97	2.04	2.11	2.18	2.23	2.28	2.38	2.45
	2.0	1.50	1.59	1.67	1.73	1.79	1.83	1.88	1.91	1.94	1.97	2.00	2.09	2.17	2.23	2.29	2.33	2.43	2.50
2.2	1.55	1.64	1.71	1.78	1.83	1.88	1.92	1.96	1.99	2.04	2.09	2.18	2.26	2.32	2.38	2.42	2.52	2.59	
2.4	1.58	1.67	1.75	1.81	1.87	1.92	1.96	2.00	2.06	2.11	2.17	2.26	2.33	2.40	2.45	2.50	2.60	2.67	
2.6	1.62	1.71	1.78	1.85	1.90	1.95	1.99	2.05	2.12	2.18	2.23	2.32	2.40	2.46	2.52	2.56	2.66	2.73	
2.8	1.64	1.73	1.81	1.87	1.93	1.98	2.04	2.11	2.17	2.23	2.29	2.38	2.45	2.52	2.57	2.62	2.71	2.79	
3.0	1.67	1.76	1.83	1.90	1.95	2.00	2.08	2.16	2.22	2.28	2.33	2.42	2.50	2.56	2.62	2.67	2.76	2.83	
3.5	1.71	1.81	1.88	1.95	2.00	2.10	2.18	2.25	2.32	2.38	2.43	2.52	2.60	2.66	2.71	2.76	2.86	2.93	
4.0	1.75	1.84	1.92	1.98	2.07	2.17	2.25	2.32	2.39	2.45	2.50	2.59	2.67	2.73	2.79	2.83	2.93	3.00	

TABLE 3: ALLOWABLE SPAN LENGTH OF JOISTS AND JOIST SPACINGS

AVG. SLAB THICKNESS (IN)	LUMBER JOIST SIZE (IN X IN)	JOIST SPACINGS			
		15 IN	12 IN	10 IN	8 IN
THE ALLOWABLE SPAN LENGTH OF JOISTS					
10	2 X 4	—	4' - 6"	4' - 9"	5' - 0"
	4 X 4	5' - 9"	6' - 3"	6' - 6"	6' - 7"
12	2 X 4	—	4' - 3"	4' - 9"	5' - 0"
	4 X 4	5' - 3"	6' - 0"	6' - 3"	6' - 5"
14	2 X 4	—	4' - 0"	4' - 6"	5' - 0"
	4 X 4	—	5' - 6"	6' - 0"	6' - 4"
16	2 X 4	—	4' - 0"	4' - 3"	4' - 9"
	4 X 4	—	5' - 3"	5' - 9"	6' - 3"

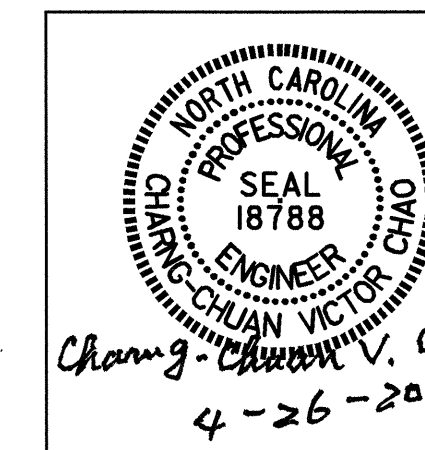
PROJECT NO. B-4095  
DAVIDSON COUNTY  
 STATION: 26+20.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

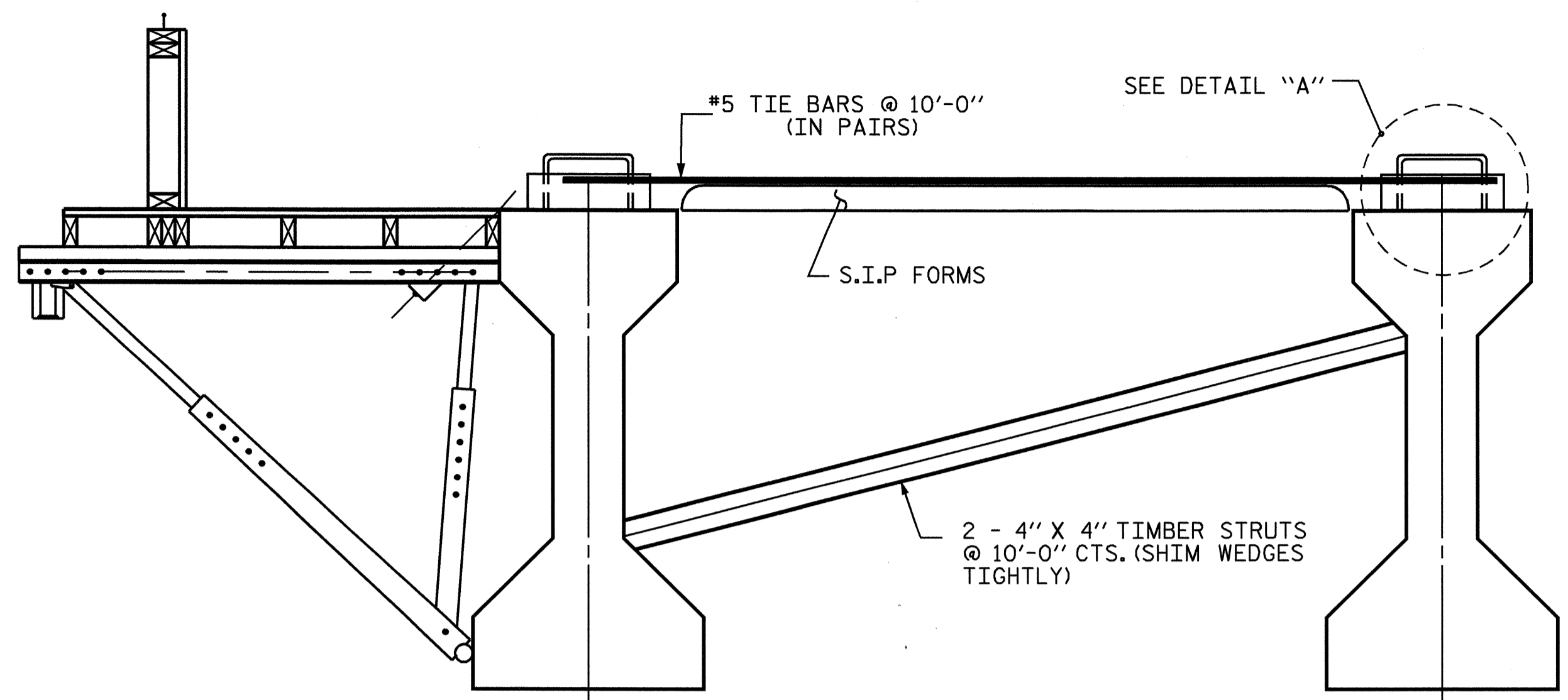
STANDARD OVERHANG FALSEWORK

AASHTO TYPES  
 III, IV, V, AND VI  
 LEFT & RIGHT LANES



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-68
1			3			TOTAL SHEETS 69
2			4			

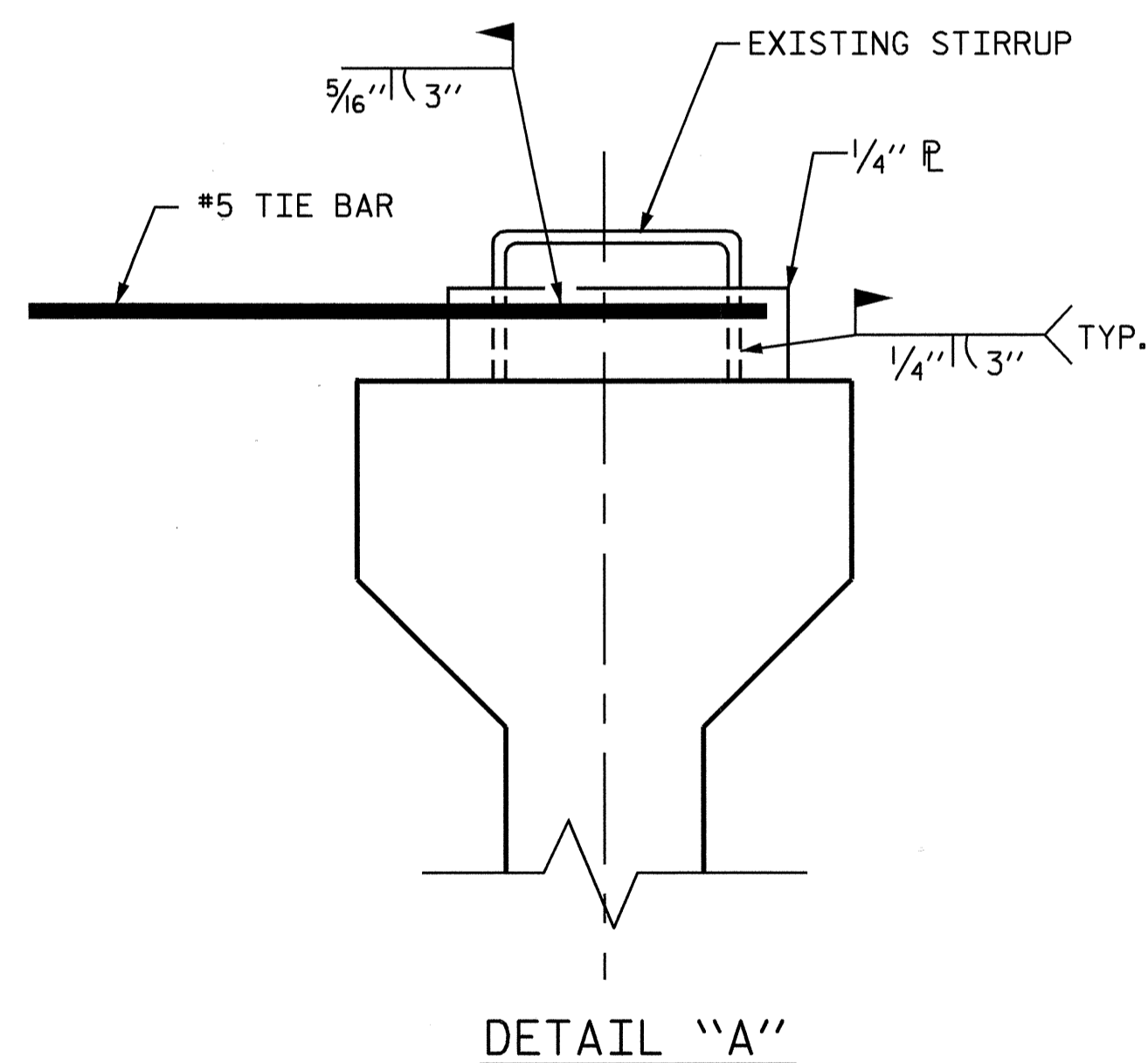
ASSEMBLED BY:	DATE:
CHECKED BY:	DATE:
DRAWN BY: R. WRIGHT 06/04	REV.
CHECKED BY: C. V. CHAO 06/04	



EXTERIOR GIRDER

INTERIOR GIRDER

DETAIL OF REQUIRED OVERHANG FALSEWORK BRACING SYSTEM



DETAIL "A"

NOTES:

EACH #5 TIE BAR SHALL BE WELDED TO ONE STIRRUP LOOP AS SHOWN IN DETAIL "A". #5 TIE BARS SHALL BE WELDED TO TWO ADJACENT STIRRUPS OF THE EXTERIOR GIRDER AND THE ADJACENT INTERIOR GIRDER BETWEEN PERMANENT DIAPHRAGMS. WELD STEEL PLATES IN BETWEEN THE TIE BARS AND THE STIRRUP LOOP. WELDING TWO TIE BARS TO THE SAME STIRRUP LOOP SHALL NOT BE PERMITTED.

MAXIMUM SPACING BETWEEN THE BRACING (TIE BARS-TIMBER STRUT) IS 10'-0" CTS. #5 TIE BARS SHALL BE LOCATED OVER A TIMBER STRUT.

INSTALL TIE BARS AND TIMBER STRUTS PRIOR TO PLACEMENT OF CONCRETE OR SCREED WEIGHT ONTO THE OVERHANG FALSEWORK.

PROJECT NO. B-4095  
DAVIDSON COUNTY  
 STATION: 26+20.00 -L-

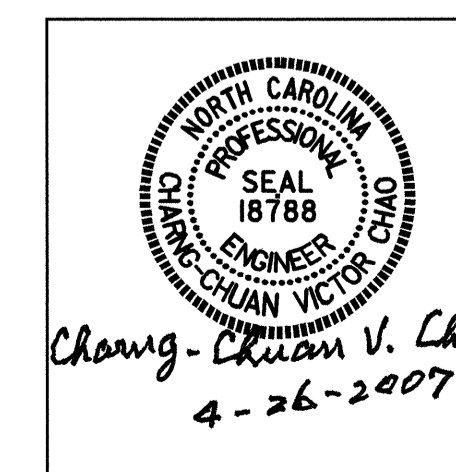
SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD OVERHANG FALSEWORK

AASHTO TYPES  
 III, IV, V, AND VI

LEFT & RIGHT LANES

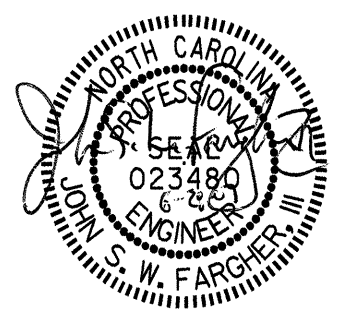


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-69
1			3			TOTAL SHEETS
2			4			69

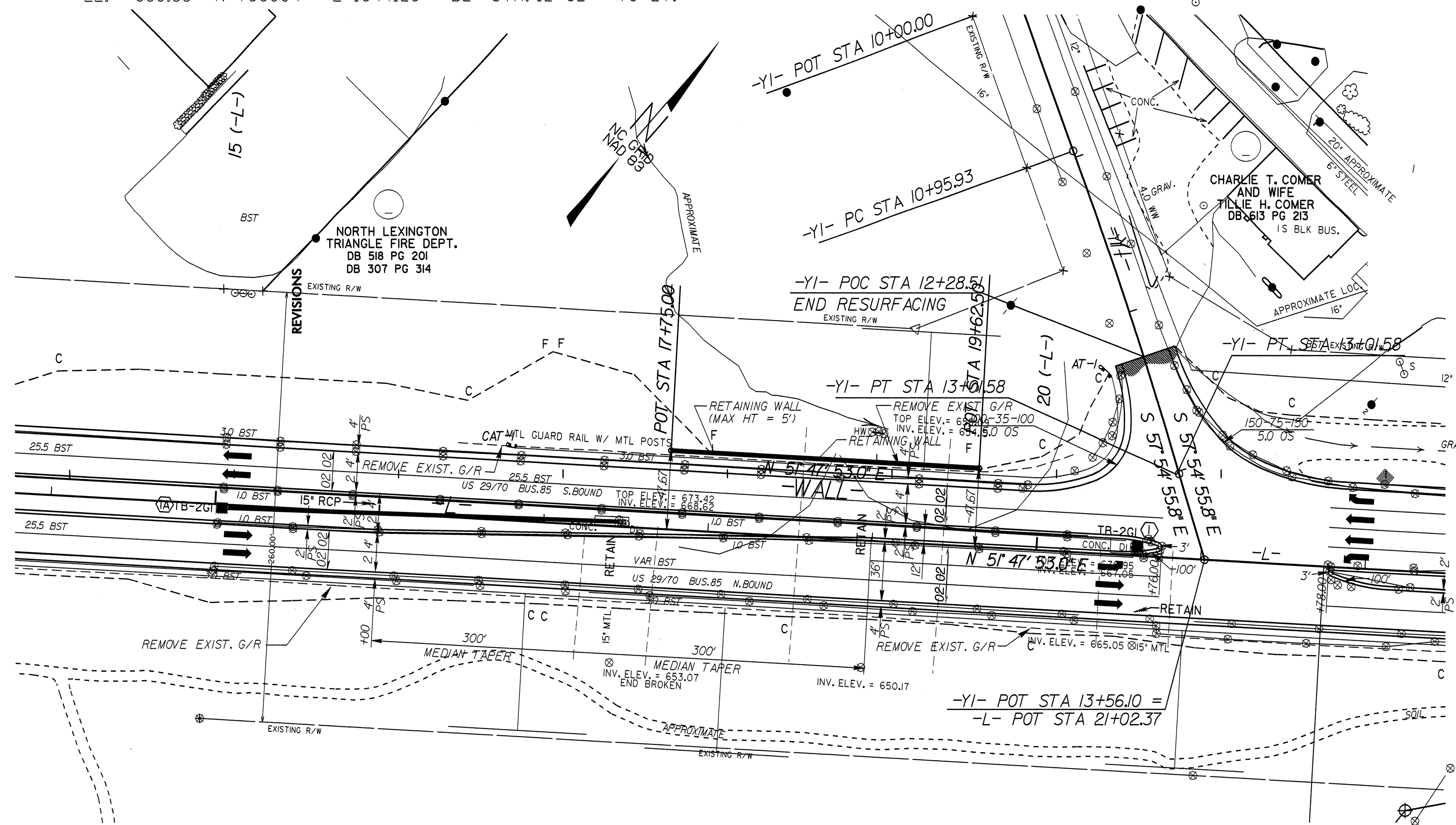
DRAWN BY: R. WRIGHT 06/04 DATE : \_\_\_\_\_  
 CHECKED BY: C. V. CHAO 06/04 DATE : \_\_\_\_\_

BM - #1 RR SPIKE SET IN BASE OF 18" MAPLE 35" RT. OF NORTH EDGE OF SB US 29/70 BUS. 85  
 EL. = 689.33' N 766904 E 1644129 -BL- STA. 12+62 70' LT.

GEOTECHNICAL ENGINEER



SIGNATURE DATE



LOCATION SKETCH

GRAVITY RETAINING WALL ELEVATIONS

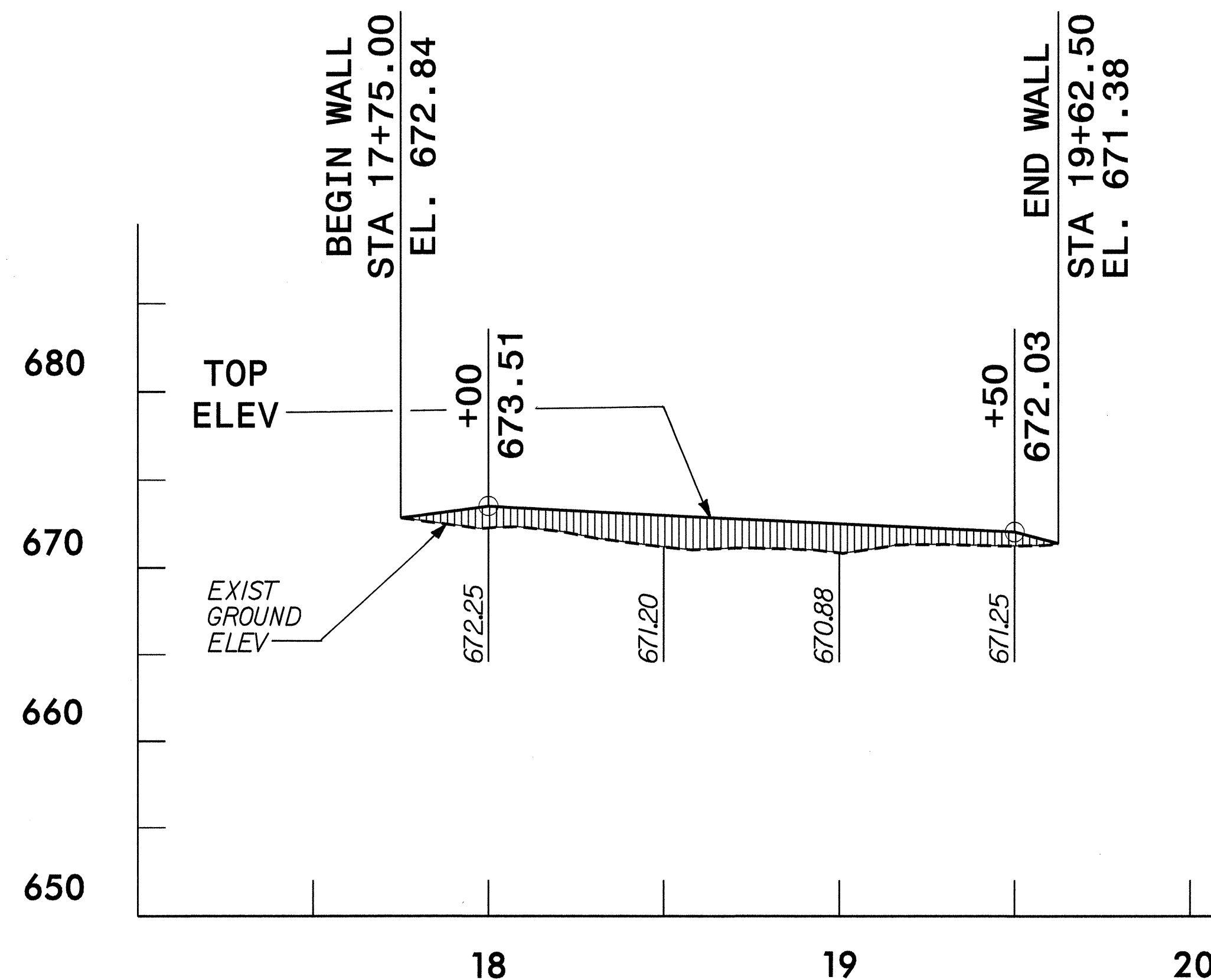
-L- STA	OFFSET FROM C (LEFT)	ELEV @ TOP OF WALL	EXISTING GROUND ELEVATION
17+75.00	47.67	672.84	672.84
18+00.00	47.67	673.51	672.25
18+50.00	47.67	672.98	671.20
19+00.00	47.67	672.50	670.88
19+50.00	47.67	672.03	671.25
19+62.50	47.67	671.38	671.38

TOTAL STRUCTURE QUANTITIES

GRAVITY RETAINING WALL 245 SQ. FT.

NOTES

NO BRICK VENEER WILL BE ALLOWED.  
 NO FENCE WILL BE REQUIRED



PROJECT NO.: B-4095  
 DAVIDSON COUNTY  
 STATION: 17+75.00 -L- TO 19+62.50 -L-  
 SHEET 1 OF 2

**GEOTECHNICAL ENGINEERING UNIT**  
 EASTERN REGIONAL OFFICE  
 WESTERN REGIONAL OFFICE

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

GRAVITY RETAINING WALL

REVISIONS

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

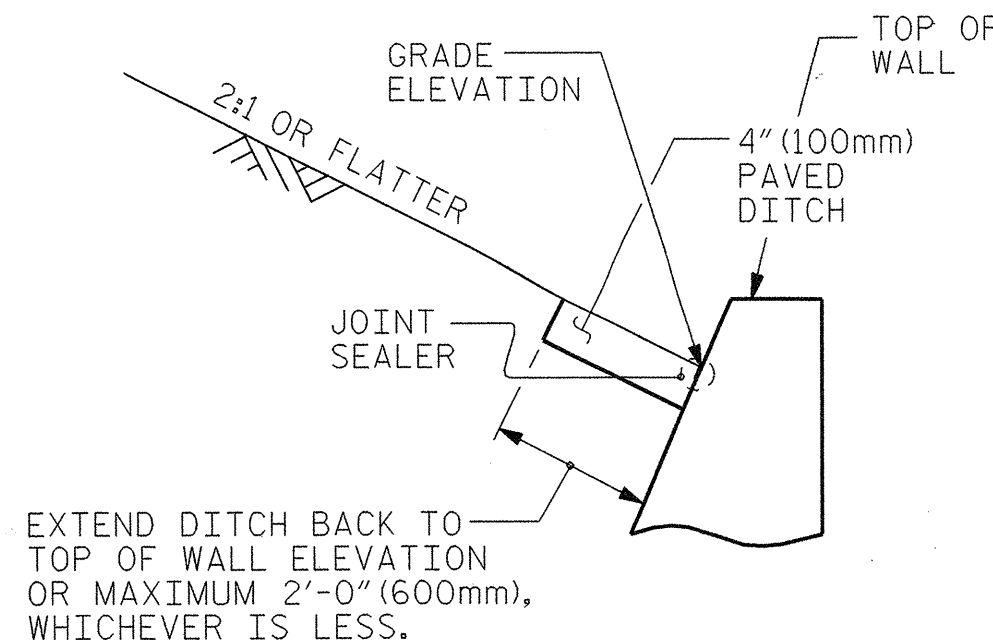
PREPARED BY: E.J.S. DATE: 08/01/07  
 REVIEWED BY: J.S.F. DATE: 08/01/07

SHEET NO. W-1  
 TOTAL SHEETS 2



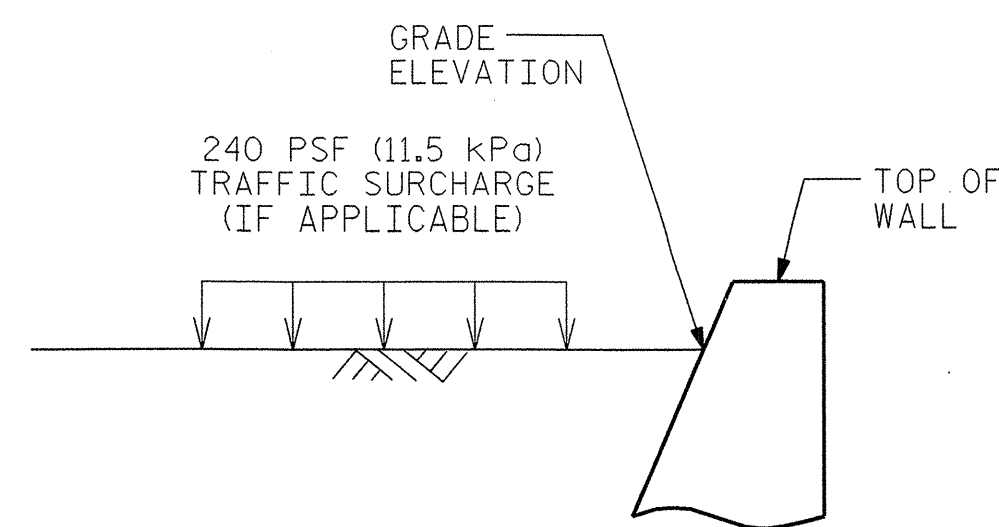
Scott A. Hadden 4/3/07  
SIGNATURE DATE

SIGNATURE DATE

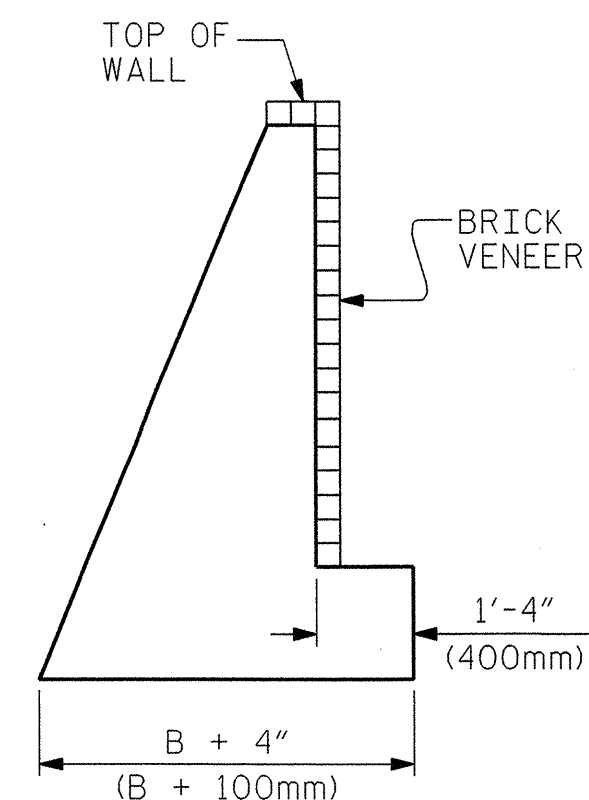


EXTEND DITCH BACK TO TOP OF WALL ELEVATION OR MAXIMUM 2'-0" (600mm), WHICHEVER IS LESS.

SLOPE CONDITION



NO SLOPE CONDITION



BRICK VENEER DETAIL

(WHEN APPLICABLE)

NOTES

FOR GRAVITY RETAINING WALLS, SEE SECTION 453 OF THE STANDARD SPECIFICATIONS.

THE STANDARD GRAVITY RETAINING WALL IS BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:  
TOTAL UNIT WEIGHT = 120 PCF (18.8 kN/m<sup>3</sup>)  
COHESION = 0 PSF (0 kPa)  
FRICTION ANGLE = 35 DEGREES  
(GROUNDWATER WITHIN 5'-0" (1.5m) OF BOTTOM OF FOOTING)  
FRICTION ANGLE = 30 DEGREES  
(GROUNDWATER MORE THAN 5'-0" (1.5m) BELOW BOTTOM OF FOOTING)

DO NOT USE A STANDARD GRAVITY RETAINING WALL IF THE ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE OR GROUNDWATER IS ABOVE THE BOTTOM OF FOOTING.

DO NOT USE A STANDARD GRAVITY RETAINING WALL WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS PRESENT BELOW THE WALL.

DO NOT PLACE CONCRETE UNTIL OBTAINING APPROVAL OF THE EXCAVATION DEPTH AND CHECKING FOUNDATION MATERIAL FOR IN-SITU ASSUMED SOIL PARAMETERS.

USE CLASS "A" CONCRETE AND PROVIDE CLASS I SURFACE FINISH FOR ALL EXPOSED SURFACES.

PROVIDE 3" (75mm) DIAMETER WEEP HOLES ON 10'-0" (3m) CENTERS ALONG WALL. SLOPE WEEP HOLES ON A 1" (25mm) PER FOOT (300mm) SLOPE THROUGH THE WALL SO THAT WATER DRAINS OUT OF THE FRONT OF THE WALL.

CONSTRUCT A HORIZONTAL DRAIN IN SUBDRAIN FINE AGGREGATE AT LEAST 1'-0" (300mm) TALL AND 1'-0" (300mm) WIDE TO CONNECT ALL STONE DRAINS.

PROVIDE GROOVED CONTRACTION JOINTS EVERY 10'-0" (3m) AND EXPANSION JOINTS EVERY 30'-0" (9m) ALONG THE WALL.

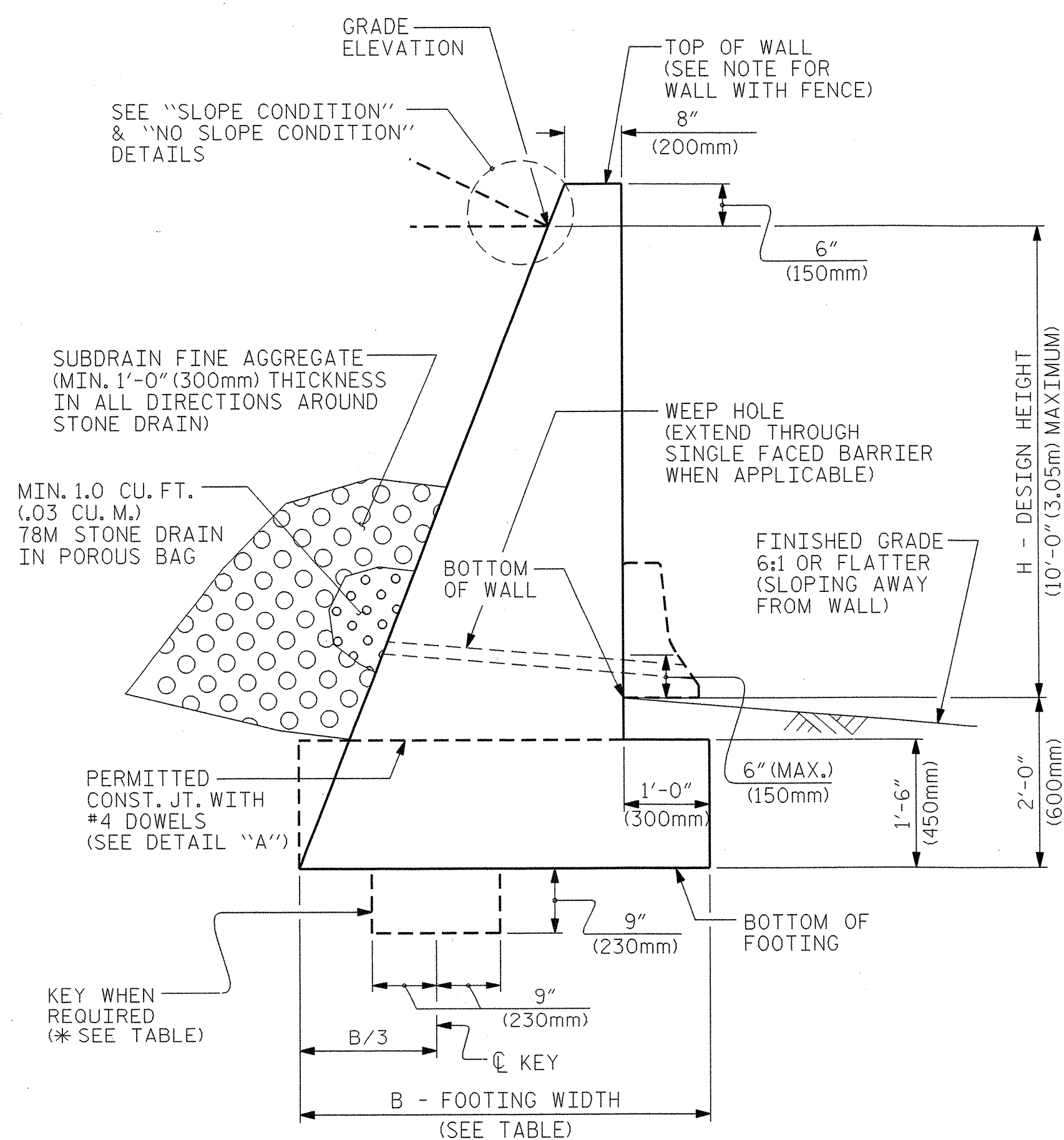
FOR WALL WITH BRICK VENEER, SUBMIT BRICK SAMPLES TO THE ENGINEER FOR APPROVAL BEFORE BEGINNING CONSTRUCTION. ANCHOR BRICK VENEER TO CONCRETE RETAINING WALL WITH BRICK TO CONCRETE TYPE ANCHORS ACCORDING TO MANUFACTURER'S SPECIFICATIONS WITH A MINIMUM VERTICAL SPACING OF 1'-4" (400mm) AND A MINIMUM HORIZONTAL SPACING OF 2'-8" (800mm) WITH EACH ROW STAGGERED 1'-4" (400mm) FROM THE ROW OF ANCHORS ABOVE AND BELOW.

DO NOT BACKFILL BEHIND WALL UNTIL CONCRETE DEVELOPS A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI (20.7 MPa). COMPACT BACKFILL IN ACCORDANCE WITH SUBARTICLE 235-4(C) OF THE STANDARD SPECIFICATIONS. PLACE BACKFILL WITHIN 3'-0" (1m) OF THE BACK OF THE WALL WITH HAND OPERATED EQUIPMENT. DO NOT OPERATE HEAVY EARTH MOVING EQUIPMENT WITHIN 10'-0" (3m) OF THE BACK OF WALL.

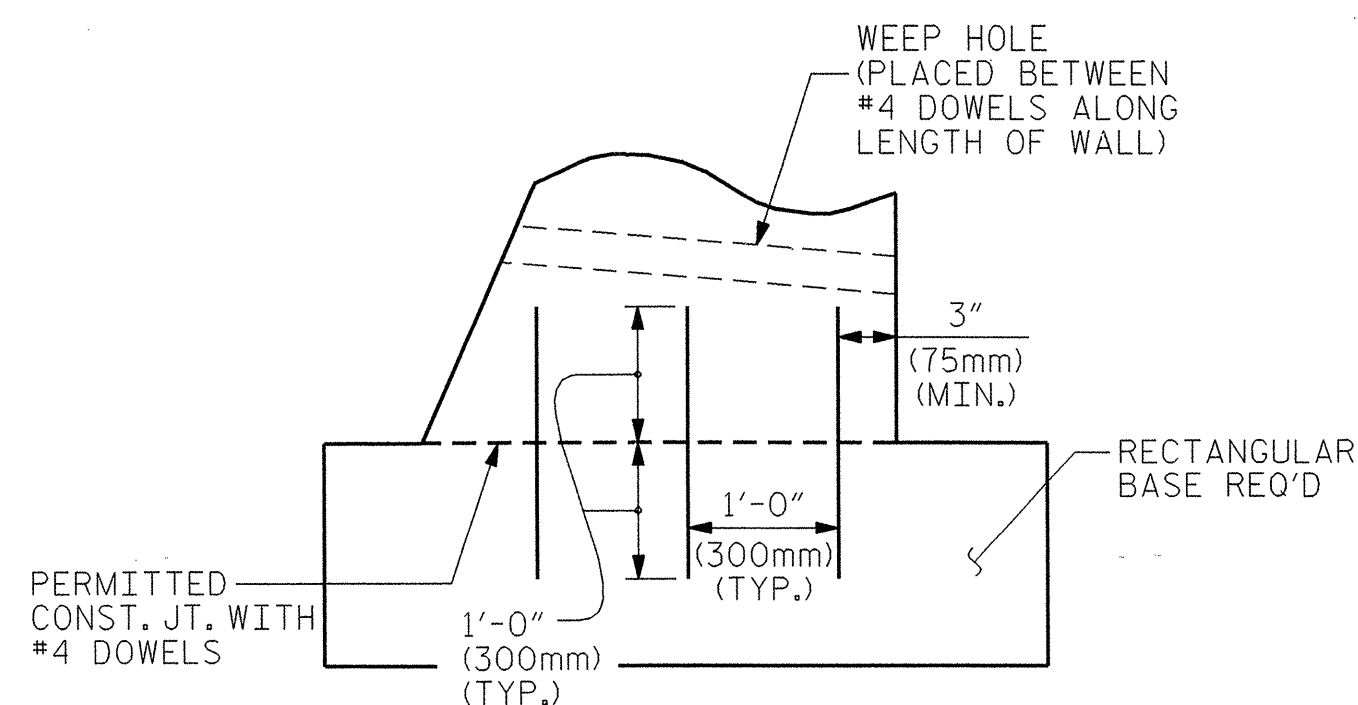
WHEN A CONSTRUCTION JOINT IS LOCATED AT THE BASE OF THE WALL, IN SECTION, PROVIDE A MINIMUM OF 3-#4 DOWELS AT AN EQUAL SPACING. SPACE ALL DOWELS AT 1'-6" (460mm) CENTERS ALONG THE LENGTH OF THE WALL.

SEE PREVIOUS SHEET(S) FOR PLAN AND PROFILE VIEW (WALL ENVELOPE) AND PROPOSED ELEVATIONS FOR GRAVITY RETAINING WALL(S).

FOR WALL WITH FENCE, USE SLEEVES IN ACCORDANCE WITH SECTION 866 OF THE STANDARD SPECIFICATIONS FOR FENCE POSTS, OR SUBMIT FENCE POST ANCHOR PLATE DETAILS.



TYPICAL SECTION



DETAIL "A"

H + 2 (ft)	< 6	6 - 9	> 9 - 12
H + 0.6 (m)	< 1.83	1.83 - 2.74	> 2.74 - 3.65
NO SLOPE CONDITION WITHOUT TRAFFIC SURCHARGE	.60	.60	.60
NO SLOPE CONDITION WITH TRAFFIC SURCHARGE	.80	.75 *	.70 *
SLOPE CONDITION	.66	.70 *	.75 *

B/(H + 2) RATIO

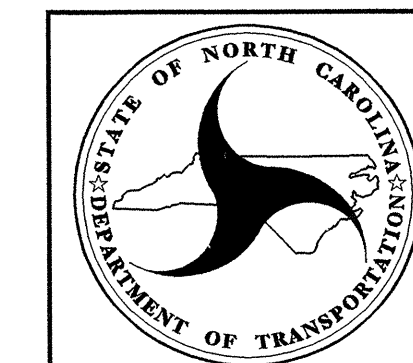
\* KEY IS REQUIRED FOR SLOPE CONDITION OR NO SLOPE CONDITION WITH TRAFFIC SURCHARGE WHEN H + 2ft (H + 0.6m) IS 6'-0" (1.83m) OR GREATER.

PROJECT NO.: \_\_\_\_\_ COUNTY \_\_\_\_\_

STATION: \_\_\_\_\_

SHEET 2 OF 2

STANDARD DRAWING NO. 453.01



**GEOTECHNICAL ENGINEERING UNIT**  
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

STANDARD GRAVITY RETAINING WALL

DATE: 7-18-06

SHEET NO. W-2  
TOTAL SHEETS 2



## STANDARD NOTES

### DESIGN DATA:

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

### MATERIAL AND WORKMANSHIP:

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

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

### CONCRETE:

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

### CONCRETE CHAMFERS:

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

### DOWELS:

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

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

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

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

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

### REINFORCING STEEL:

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

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

### STRUCTURAL STEEL:

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

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

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

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

### HANDRAILS AND POSTS:

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

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

### SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

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