

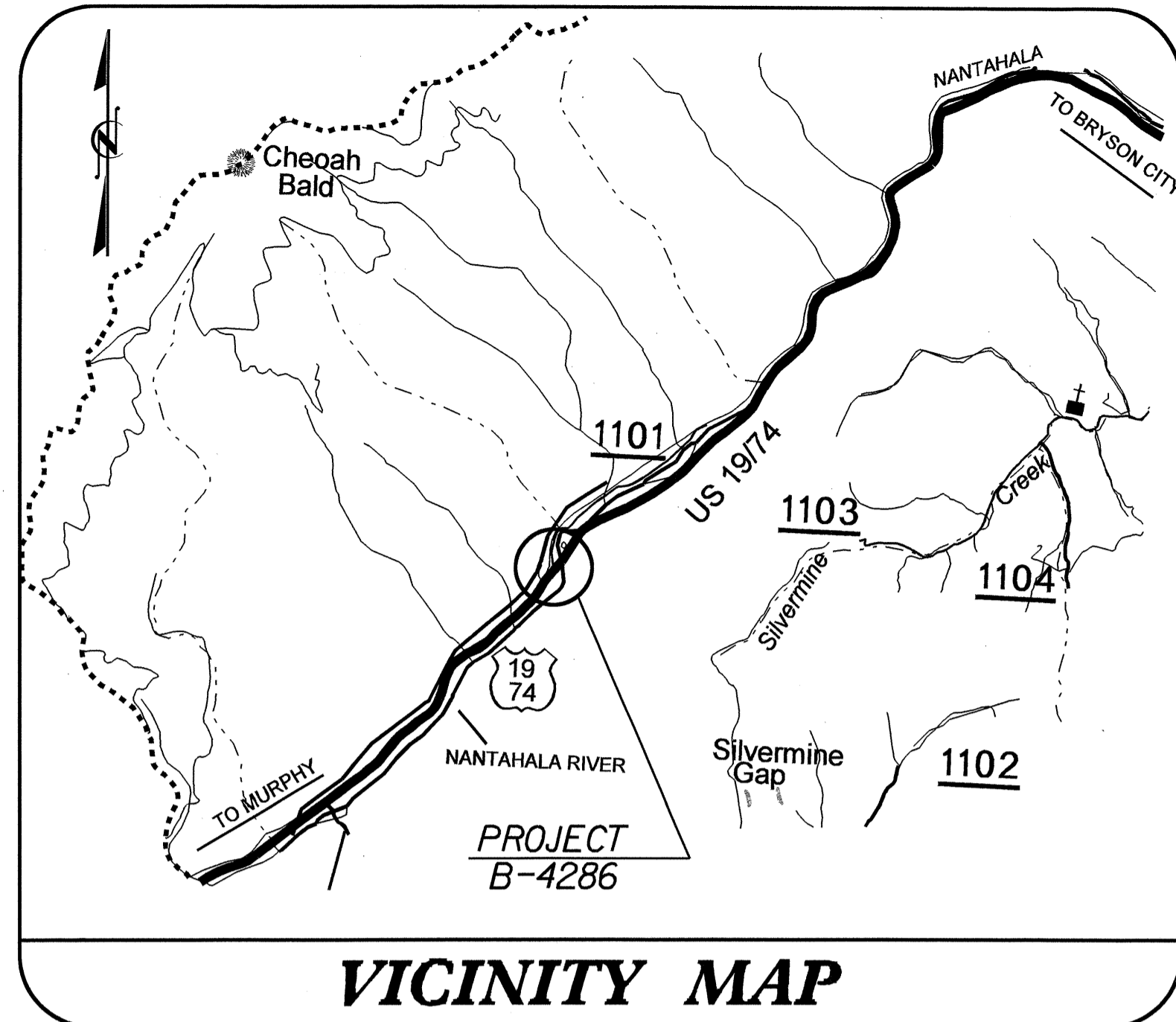
CONTRACT: C202554 TIP PROJECT: B-4286

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4286		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33625.1.1	BRNH-0019(7)	PE	
33625.2.1	BRNH-0019(7)	UTIL. & RW	
33625.3.1	BRNH-0019(7)	CONST.	

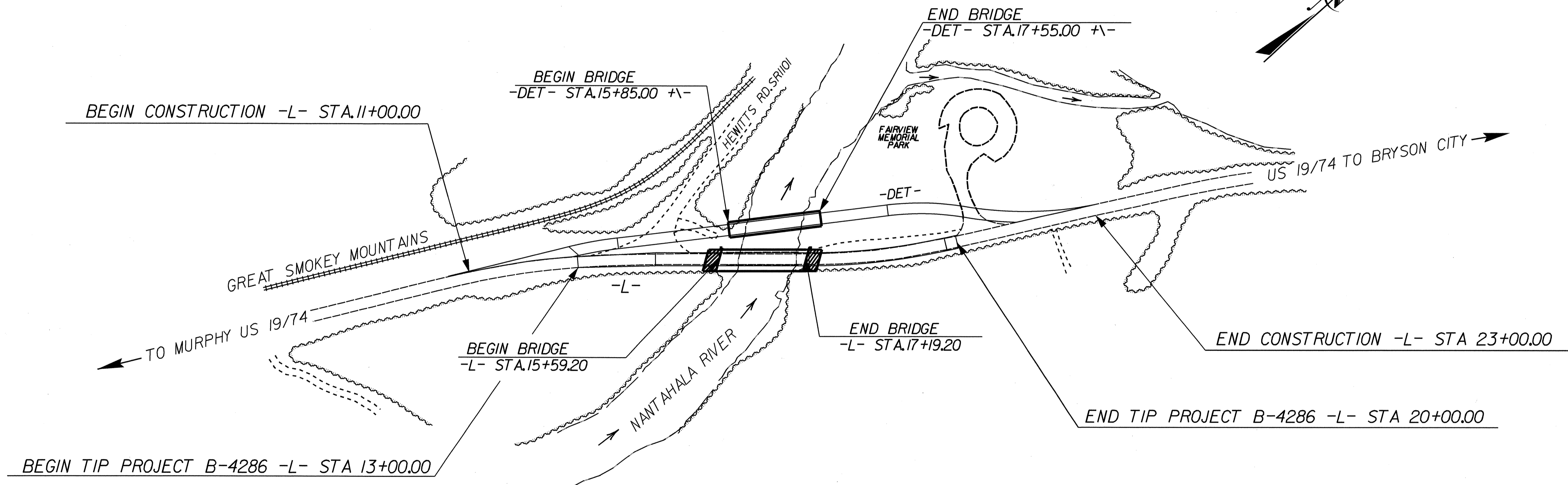


STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS
SWAIN COUNTY

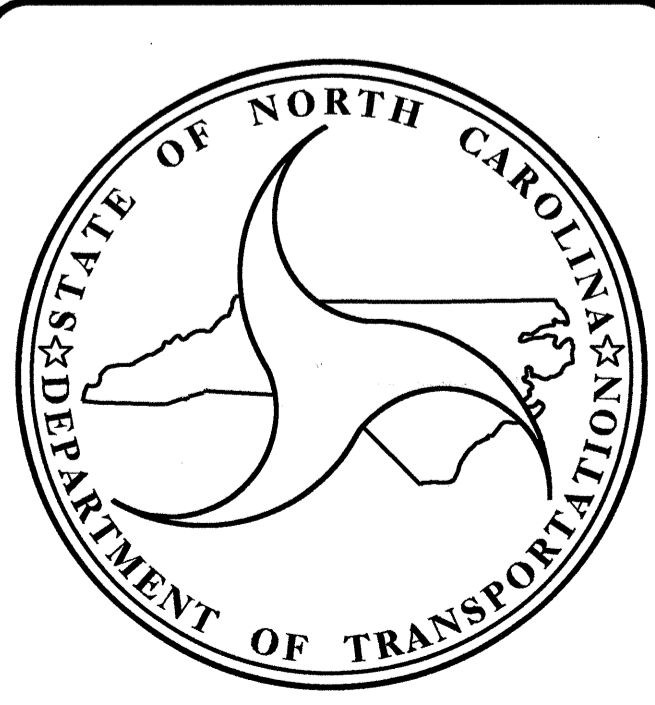
LOCATION: BRIDGE NO. 3 ON US 1974 OVER THE NANTAHALA RIVER
 TYPE OF WORK: GRADING, DRAINAGE, PAVING & STRUCTURE



VICINITY MAP



STRUCTURE



DESIGN DATA

ADT 2007	=	5,400
ADT 2027	=	8,733
DHV	=	10 %
D	=	60 %
T	=	13 % *
V	=	50 MPH
* TTST	8% DUAL	5%
FUN. CLASS	=	ARTERIAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4286	=	0.103 MI
LENGTH STRUCTURE TIP PROJECT B-4286	=	0.030 MI
TOTAL LENGTH TIP PROJECT B-4286	=	0.133 MI

Prepared in the Office of:

DIVISION OF HIGHWAYS

2006 STANDARD SPECIFICATIONS

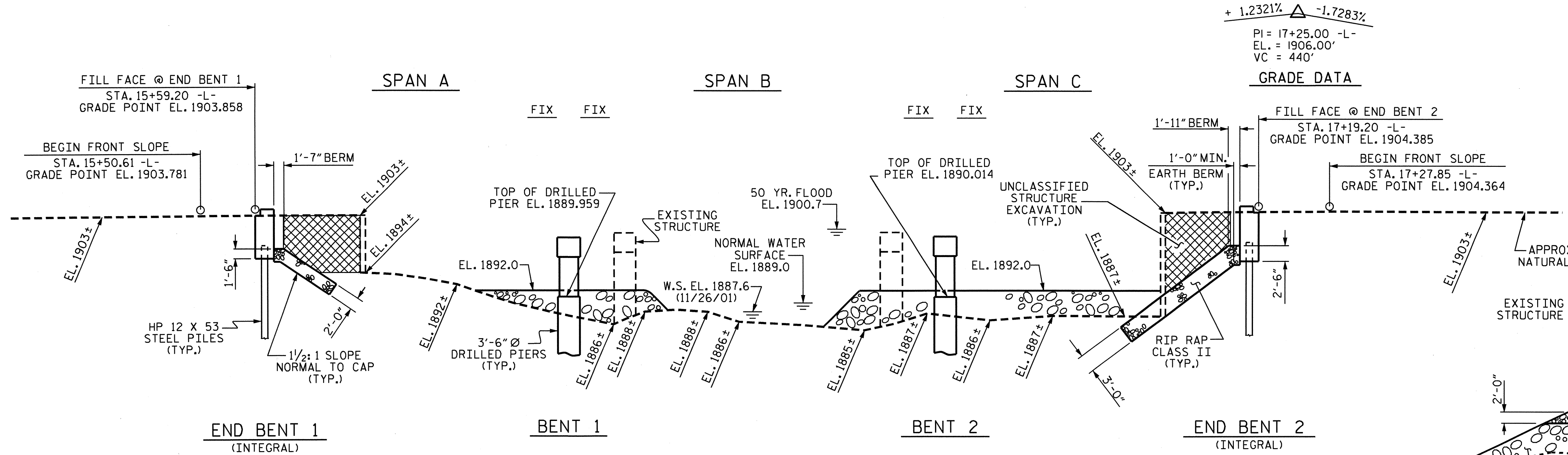
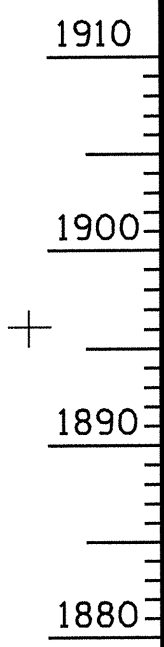
LETTING DATE : DECEMBER 21, 2010	J. C. FRYE, P.E. PROJECT ENGINEER
	T.H. FANG, P.E. PROJECT DESIGN ENGINEER

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

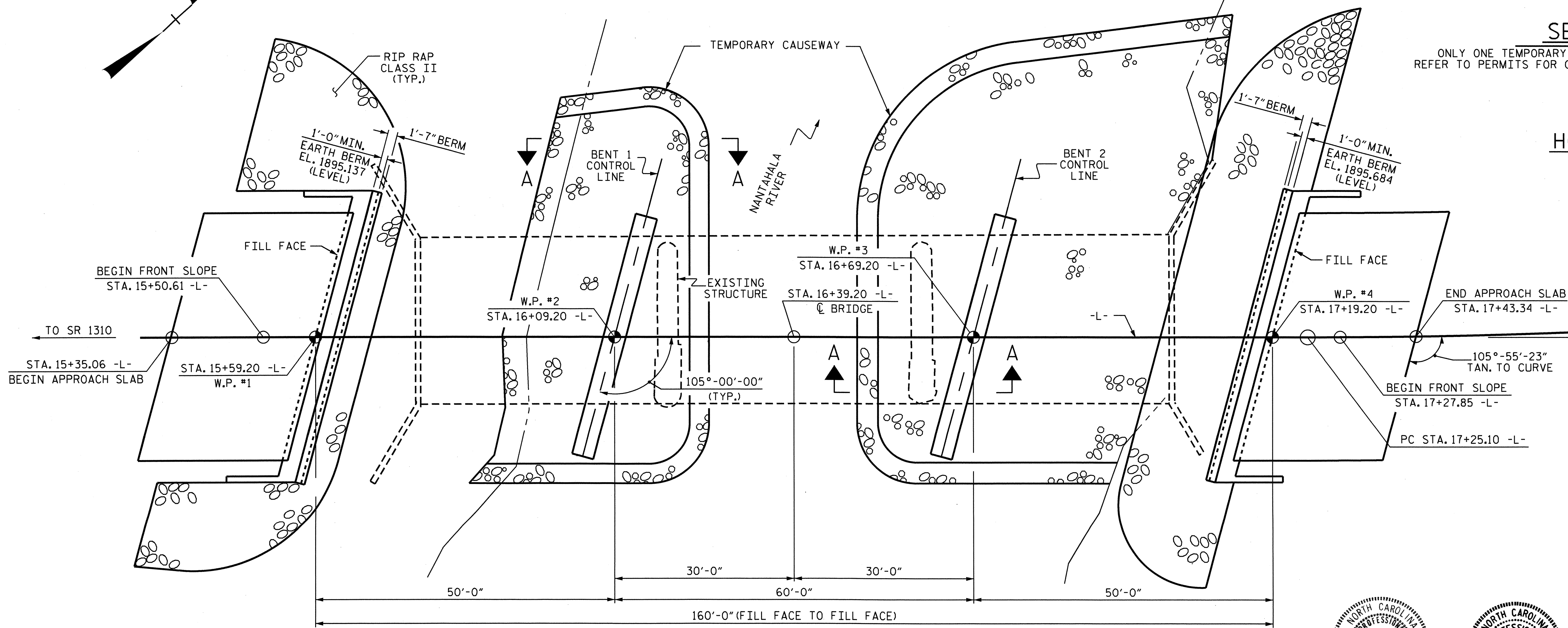


SECTION ALONG -L-
 SECTION AT END BENTS AND BENTS TAKEN AT RIGHT ANGLES

SECTION A-A

HORIZONTAL CURVE DATA

P.I. STA. = 18+52.50 -L-
 Δ = 12°-50'-31.2" (LT.)
 D = 5°-03'-41.3"
 L = 253.72'
 T = 127.39'
 R = 1132.00'



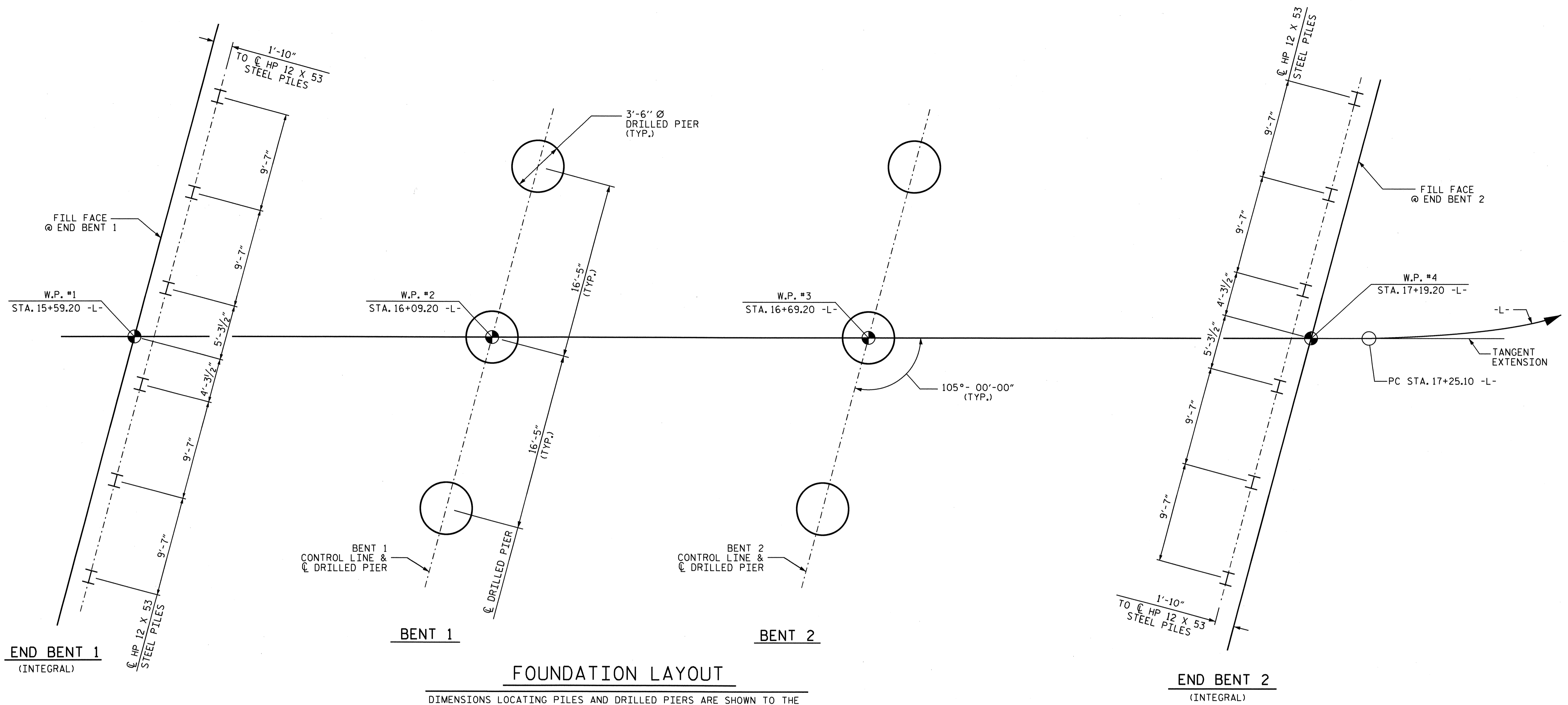
PROJECT NO. B-4286
 SWAIN COUNTY
 STATION: 16+39.20 -L-
 SHEET 1 OF 3 REPLACES BRIDGE No. 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE OVER
 NANTAHALA RIVER
 ON US 19-74 BETWEEN
 SR 1109 AND SR 1310

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

DRAWN BY: QT NGUYEN DATE: 8-09
 CHECKED BY: E.I. OMILE DATE: 1-10





FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES AND DRILLED PIERS ARE SHOWN TO THE CENTERLINE OF PILES AND DRILLED PIERS. ORIENT PILES AS SHOWN.

NOTES

FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.

DRILLED PIERS AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 337 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 35 TSF.

DRILLED PIERS AT BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 337 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 35 TSF.

INSTALL DRILLED PIERS AT BENT 1 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 1844 FT (LEFT AND CENTER) AND ELEVATION 1853 FT (RIGHT) AND SATISFY THE REQUIRED TIP RESISTANCE.

INSTALL DRILLED PIERS AT BENT 2 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 1863 FT AND SATISFY THE REQUIRED TIP RESISTANCE.

PERMANENT STEEL CASING IS REQUIRED FOR DRILLED PIERS AT BENT 1. DO NOT EXTEND CASING BELOW ELEVATION 1877 FT WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

PERMANENT STEEL CASING IS REQUIRED FOR DRILLED PIERS AT BENT 2. DO NOT EXTEND CASING BELOW ELEVATION 1876 FT WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

SPT TESTING MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SPT TESTING.

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

INTEGRITY TESTING MAY BE REQUIRED FOR DRILLED PIERS. IF REQUIRED AND AFTER DRILLED PIER CONCRETE ACHIEVES 3000 PSI COMPRESSIVE STRENGTH, PROVIDE ACCESS TO AND PREPARE TOP OF PIERS AS DIRECTED BY THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR AND PERFORM INTEGRITY TESTING. DO NOT CONSTRUCT COLUMNS ON TOP OF PIERS THAT ARE TESTED UNTIL TEST RESULTS ARE ACCEPTABLE. PAYMENT FOR COSTS ASSOCIATED WITH INTEGRITY TESTING WILL BE CONSIDERED INCIDENTAL TO THE CONTRACT UNIT PRICE BID FOR THE DRILLED PIERS.

FOR PILES, SEE SPECIAL PROVISIONS.

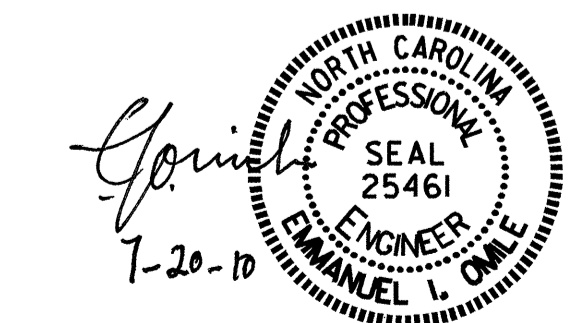
PILES AT END BENTS 1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 100 TONS PER PILE. DRIVE PILES TO A REQUIRED DRIVING RESISTANCE OF 170 TONS PER PILE.

THE SCOUR CRITICAL ELEVATION FOR BENT 1 IS ELEVATION 1876 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

THE SCOUR CRITICAL ELEVATION FOR BENT 2 IS ELEVATION 1875 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

DRAWN BY : QT NGUYEN DATE : 8-09
 CHECKED BY : E.I. OMILE DATE : 1-10

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PROJECT NO. B-4286
SWAIN COUNTY
 STATION: 16+39.20 -L-

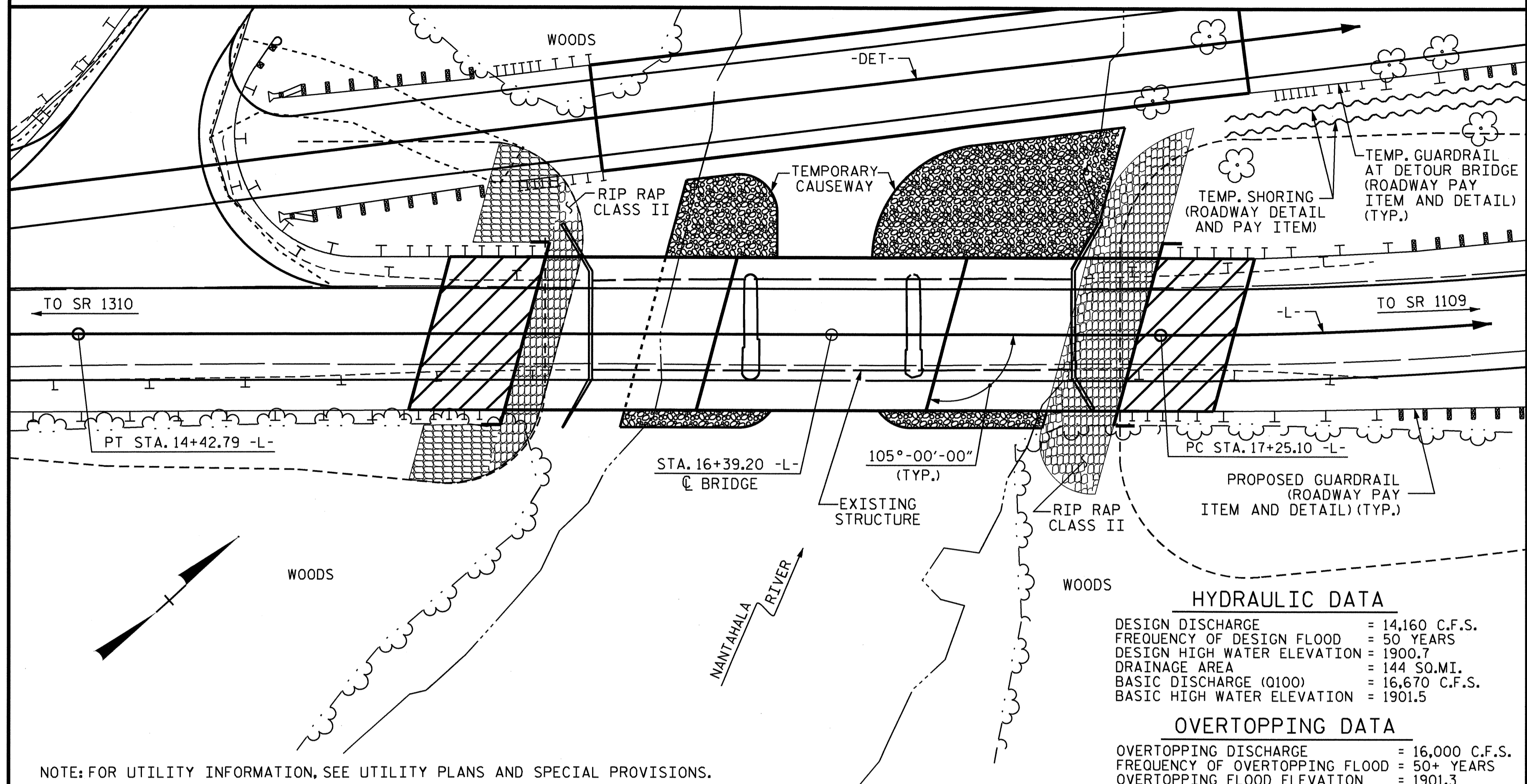
SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE OVER
 NANTAHALA RIVER
 ON US 19-74 BETWEEN
 SR 1109 AND SR 1310

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

S-2
TOTAL SHEETS 41

BM #2: 8" SPIKE IN BASE OF 10" WHITE PINE, 25.00 RT. OF STA. 17+19 -L-, EL. 1907.45



LOCATION SKETCH

HYDRAULIC DATA

DESIGN DISCHARGE	= 14,160 C.F.S.
FREQUENCY OF DESIGN FLOOD	= 50 YEARS
DESIGN HIGH WATER ELEVATION	= 1900.7
DRAINAGE AREA	= 144 SQ.MI.
BASIC DISCHARGE (Q100)	= 16,670 C.F.S.
BASIC HIGH WATER ELEVATION	= 1901.5

OVERTOPPING DATA

OVERTOPPING DISCHARGE	= 16,000 C.F.S.
FREQUENCY OF OVERTOPPING FLOOD	= 50+ YEARS
OVERTOPPING FLOOD ELEVATION	= 1901.3

NOTES

- ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
- FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.
- THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN 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 MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON S-1 SHALL BE EXCAVATED FOR A DISTANCE OF 40 FT. EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 ON THE STANDARD SPECIFICATION.
- THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.
- THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH HEC 18, "EVALUATING SCOUR AT BRIDGES", MAY, 2001.
- 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.
- 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 SPICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE PLUS A MINIMUM LAP SPICED 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 AT STATION 16+39.20 -L-.
- FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS AND PROVISIONS.
- STEEL SHEET PILING REQUIRED FOR SHORING SHALL BE HOT ROLLED.
- 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 OR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.
- THE CONTRACTOR WILL BE REQUIRED TO CONSTRUCT, MAINTAIN AND AFTERWARDS REMOVE A TEMPORARY STRUCTURE AT STATION 16+39.20 -L- FOR USE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURE, SEE SPECIAL PROVISIONS.
- THE BRIDGE RAILS ON THE TEMPORARY STRUCTURE SHALL BE DESIGNED FOR THE AASHTO LRFD TEST LEVEL 3 (TL-3) CRASH TEST CRITERIA. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURE, SEE SPECIAL PROVISIONS.
- THE EXISTING STRUCTURE CONSISTING OF 3 SPANS (3 @ 42'-6") OF 33" REINFORCED CONCRETE DECK GIRDERS (4 LINES) WITH A CLEAR ROADWAY WIDTH OF 23.8' WITH REINFORCED CONCRETE ABUTMENTS AT END BENTS AND ROUND NOSE POST AND WEB AT BENTS AND LOCATED AT PROPOSED SITE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.
- FOR ARCHITECTURAL CONCRETE SURFACE TREATMENT, SEE SPECIAL PROVISIONS.
- FOR CONCRETE PENETRATING STAIN, SEE SPECIAL PROVISIONS. PAYMENT FOR CONCRETE PENETRATING STAIN IS INCLUDED IN THE PAYMENT FOR ARCHITECTURAL CONCRETE SURFACE TREATMENT.
- FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE AT STATION 16+39.20 -L-, SEE SPECIAL PROVISIONS.
- FOR CURING CONCRETE, SEE SPECIAL PROVISIONS.
- FOR FORMS FOR CONCRETE BRIDGE DECKS, SEE SPECIAL PROVISIONS.
- FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.
- 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.

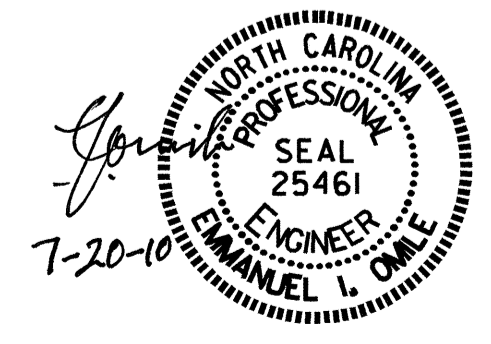
TOTAL BILL OF MATERIAL

	CONST. MAINT. & REMOVAL OF TEMP. STRUCTURE	CONST. MAINT. & REMOVAL OF TEMP. ACCESS	REMOVAL OF EXISTING STRUCTURE	3'-6" DIA. DRILLED PIER IN SOIL	3'-6" DIA. DRILLED PIER NOT IN SOIL	PERMANENT STEEL CASING FOR 3'-6" DIA. DRILLED PIERS	SID INSPECTION	SPT TESTING	CROSSHOLE SONIC LOGGING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS
	LUMP SUM	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	EA.	EA.	EA.	LUMP SUM	SO. FT.	SO. FT.
SUPERSTRUCTURE	LUMP SUM	LUMP SUM	LUMP SUM								6,907	7,537
END BENT 1												
BENT 1				114.0	15.0	39						
BENT 2				51.0	30.0	42						
END BENT 2												
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	165.0	45.0	81	1	1	1	LUMP SUM	6,907	7,537

	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	45" PRESTRESSED CONCRETE GIRDERS	HP 12 X 53 STEEL PILES	TWO BAR METAL RAIL	1'-7" X 2'-6" CONC. PARAPET	RIP RAP CLASS II (2'-0" THICK)	RIP RAP CLASS II (3'-0" THICK)	FILTER FABRIC FOR DRAINAGE	ELAST. BEARINGS	EVAZOTE JOINT SEALS	ARCHITECTURAL CONCRETE SURFACE TREATMENT
	CU. YDS	LUMP SUM	LBS.	LBS.	NO. LIN. FT.	NO. LIN. FT.	NO. LIN. FT.	NO. LIN. FT.	TONS	TONS	SO. YDS.	LUMP SUM	LUMP SUM	LUMP SUM
SUPERSTRUCTURE		LUMP SUM			15 779.37		300.70	316.55				LUMP SUM	LUMP SUM	LUMP SUM
END BENT 1	25.0		3,574			6 210			125		135			
BENT 1	26.1		10,567	3,061										
BENT 2	26.2		8,629	2,100										
END BENT 2	24.8		3,574			6 150				410	305			
TOTAL	102.1	LUMP SUM	26,344	5,161	15 779.37	12 360	300.70	316.55	125	410	440	LUMP SUM	LUMP SUM	LUMP SUM

DRAWN BY : OT NGUYEN DATE : 8-09
 CHECKED BY : E.I. OMILE DATE : 1-10

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PROJECT NO. B-4286
SWAIN COUNTY
 STATION: 16+39.20 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH				
GENERAL DRAWING FOR BRIDGE OVER NANTAHALA RIVER ON US 19-74 BETWEEN SR 1109 AND SR 1310				
REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	
				S-3
				TOTAL SHEETS 41

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93(Inv)	N/A	1	1.037	--	1.75	0.832	1.17	A	I	23.509	0.934	1.28	C	I	37.615	0.80	0.895	1.04	B	I	28.917		
	HL-93(0pr)	N/A	--	1.512	--	1.35	0.832	1.51	A	I	23.509	0.934	1.66	C	I	37.615	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	2	1.312	47.222	1.75	0.832	1.44	A	I	23.509	0.934	1.50	C	I	37.615	0.80	0.787	1.31	B	I	28.917		
	HS-20(0pr)	36.000	--	1.866	67.179	1.35	0.832	1.87	A	I	23.509	0.934	1.94	C	I	37.615	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	2.690	36.313	1.4	0.832	3.61	A	I	23.509	0.934	3.70	C	I	18.807	0.80	0.832	2.69	A	I	23.509	
		SNGARBS2	20.000	--	2.141	42.830	1.4	0.832	2.87	A	I	23.509	0.934	2.85	C	I	18.807	0.80	0.832	2.14	A	I	23.509	
		SNAGRIS2	22.000	--	2.070	45.546	1.4	0.832	2.79	A	I	28.211	0.934	2.74	C	I	18.807	0.80	0.787	2.07	B	I	28.917	
		SNCOTTS3	27.250	--	1.342	36.577	1.4	0.832	1.80	A	I	23.509	0.934	1.87	C	I	18.807	0.80	0.832	1.34	A	I	23.509	
		SNAGGRS4	34.925	--	1.173	40.978	1.4	0.832	1.57	A	I	23.509	0.934	1.71	C	I	18.807	0.80	0.832	1.17	A	I	23.509	
		SNS5A	35.550	--	1.144	40.660	1.4	0.832	1.53	A	I	23.509	0.934	1.83	C	I	18.807	0.80	0.832	1.14	A	I	23.509	
	TTST	SNS6A	39.950	--	1.072	42.838	1.4	0.832	1.44	A	I	23.509	0.934	1.72	C	I	37.615	0.80	0.832	1.07	A	I	23.509	
		SNS7B	42.000	--	1.022	42.925	1.4	0.832	1.37	A	I	23.509	0.934	1.75	C	I	37.615	0.80	0.832	1.02	A	I	23.509	
		TNAGRIT3	33.000	--	1.315	43.380	1.4	0.832	1.76	A	I	23.509	0.934	2.02	C	I	37.615	0.80	0.832	1.31	A	I	23.509	
		TNT4A	33.075	--	1.327	43.886	1.4	0.832	1.78	A	I	23.509	0.934	1.88	C	I	18.807	0.80	0.832	1.33	A	I	23.509	
		TNT6A	41.600	--	1.097	45.617	1.4	0.832	1.49	A	I	23.509	0.934	1.89	C	I	37.615	0.80	0.787	1.10	B	I	28.917	
		TNT7A	42.000	--	1.108	46.517	1.4	0.832	1.51	A	I	23.509	0.934	1.75	C	I	37.615	0.80	0.787	1.11	B	I	28.917	
TNT7B	42.000	--	1.157	48.580	1.4	0.832	1.58	A	I	23.509	0.934	1.67	C	I	37.615	0.80	0.787	1.16	B	I	28.917			
TNAGRIT4	43.000	--	1.093	46.992	1.4	0.832	1.50	A	I	23.509	0.934	1.60	C	I	37.615	0.80	0.787	1.09	B	I	28.917			
TNAGT5A	45.000	--	1.026	46.155	1.4	0.832	1.40	A	I	23.509	0.934	1.66	C	I	37.615	0.80	0.787	1.03	B	I	28.917			
TNAGT5B	45.000	3	1.009	45.408	1.4	0.832	1.37	A	I	23.509	0.934	1.52	C	I	37.615	0.80	0.787	1.01	B	I	28.917			

LOAD FACTORS:

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

	YEAR	ADTT
CURRENT	2007	421
FUTURE	2027	681

NOTES:

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

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

COMMENTS:

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

CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

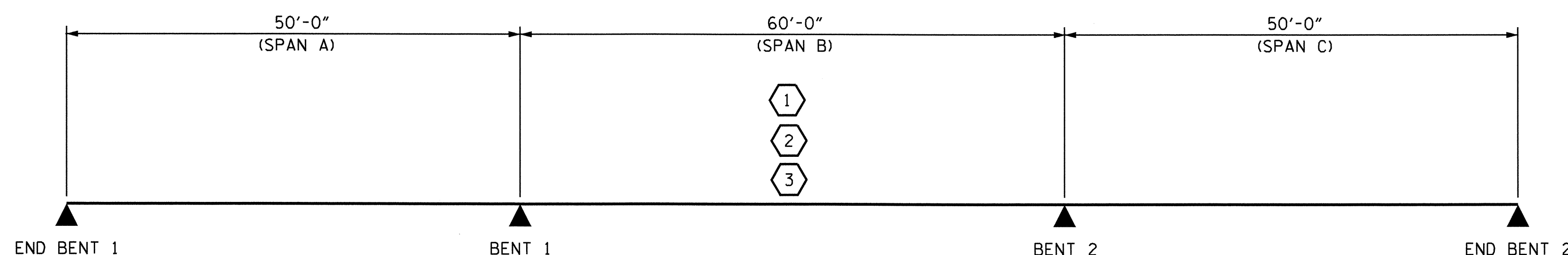
2 DESIGN LOAD RATING (HS-20)

3 LEGAL LOAD RATING **

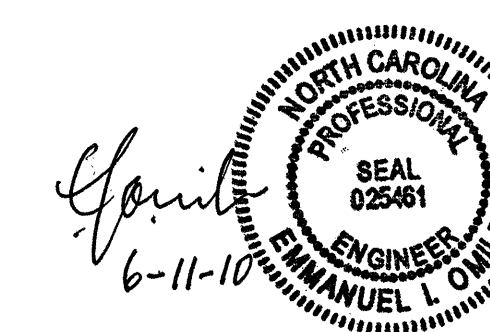
** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY



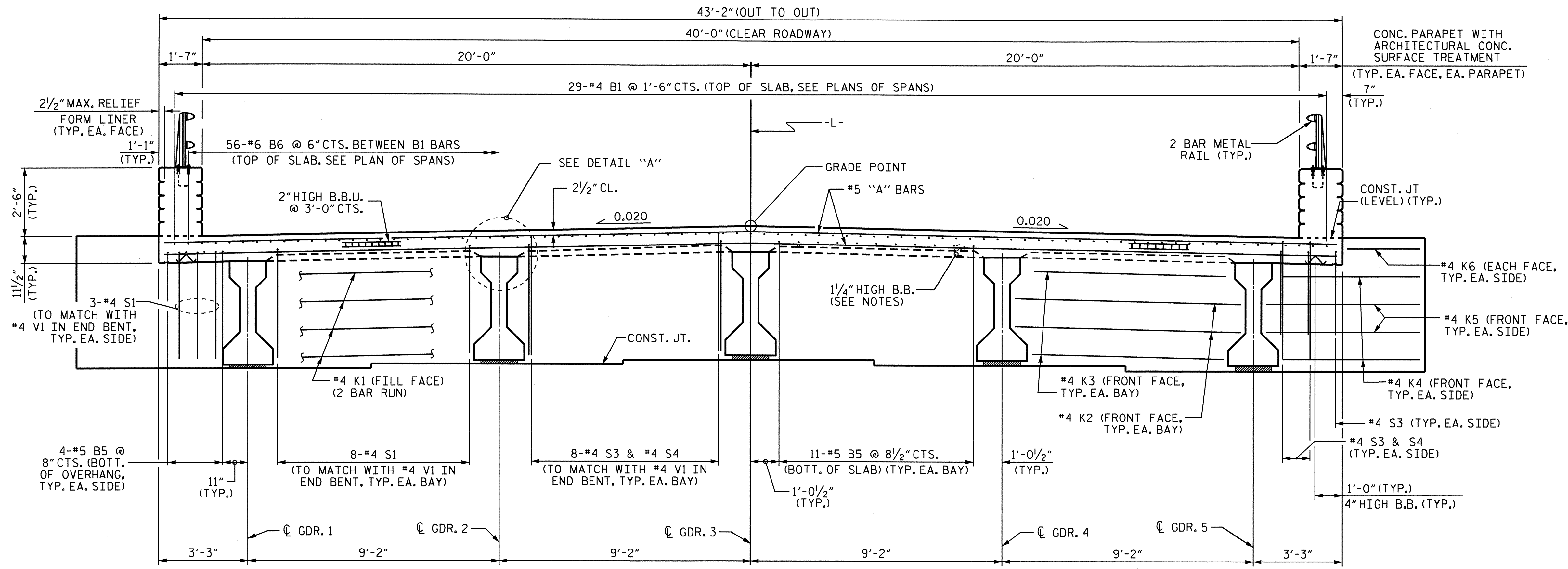
PROJECT NO. B-4286
SWAIN COUNTY
 STATION: 16+39.20 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

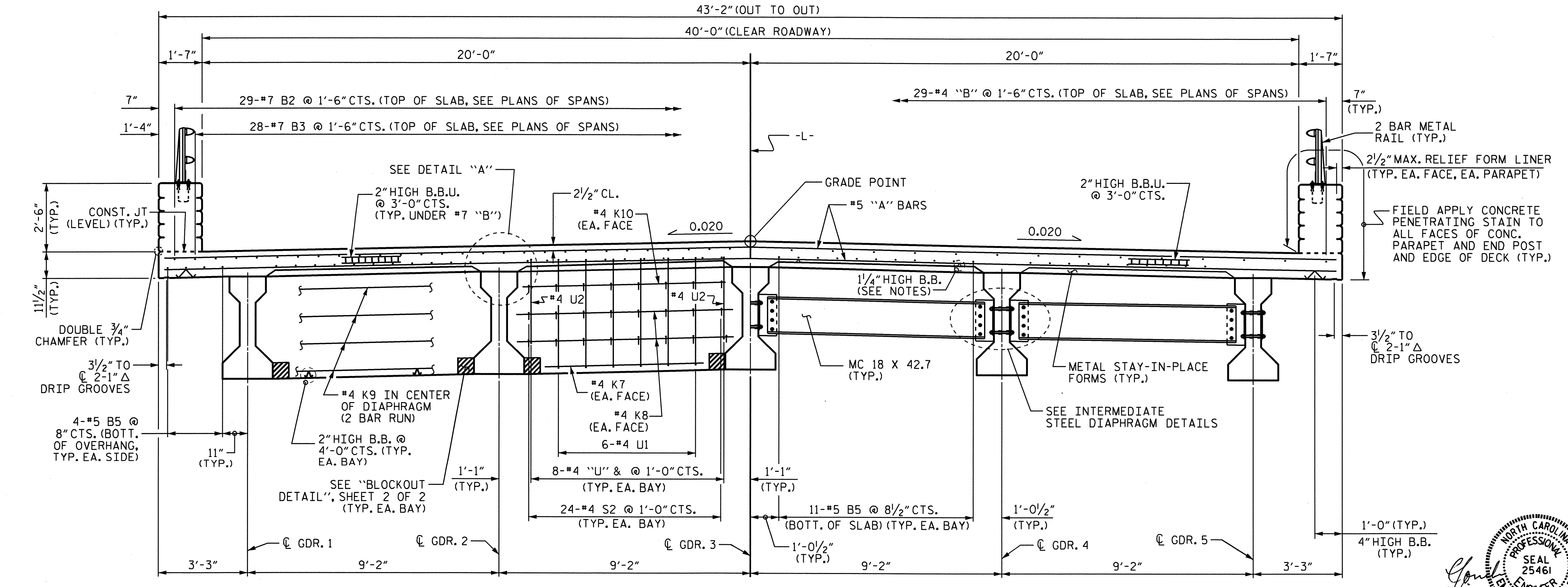
STANDARD
 LRFR SUMMARY FOR
 PRESTRESSED
 CONCRETE GIRDERS
 (NON-INTERSTATE TRAFFIC)

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

ASSEMBLED BY : RAMAN PATEL DATE : 3-18-10
 CHECKED BY : E. I. OMILE DATE : 3-18-10
 DRAWN BY : MAA 1/08 REV. 11/2/08R MAA/GM
 CHECKED BY : GM/DI 2/08



TYPICAL SECTION
(SHOWING ABUTMENT WALL AT END BENT)



TYPICAL SECTION
(SHOWING BENT DIAPHRAGMS)

TYPICAL SECTION
(SHOWING INTERMEDIATE DIAPHRAGMS)

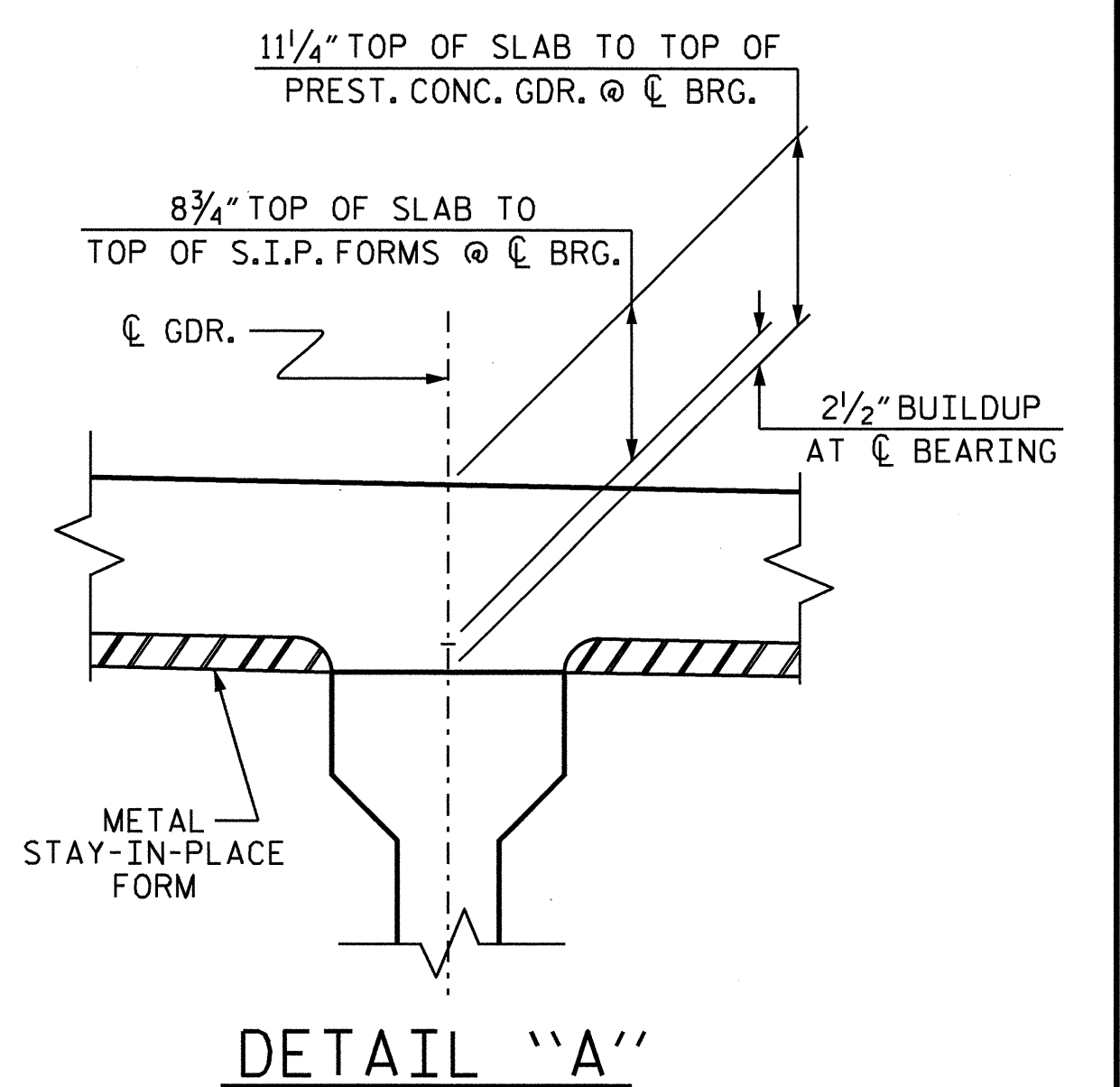
NOTES:

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

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

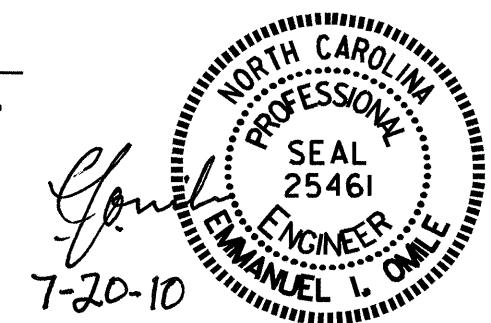
PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

FOR WING ELEVATIONS AND DETAILS, SEE "PLAN OF SPANS DETAILS" SHEETS.



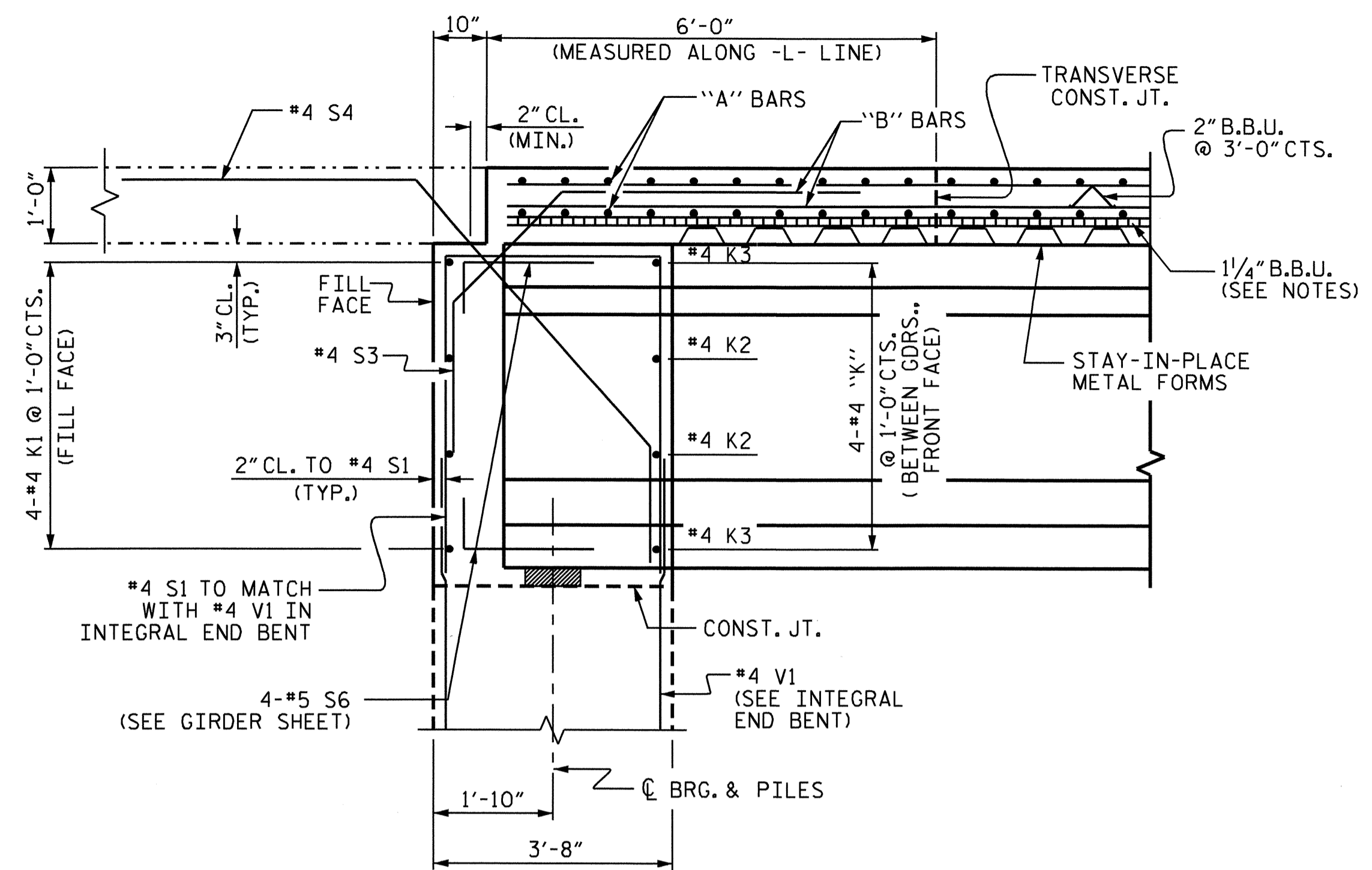
PROJECT NO. B-4286
SWAIN COUNTY
 STATION: 16+39.20 -L-
 SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
TYPICAL SECTION

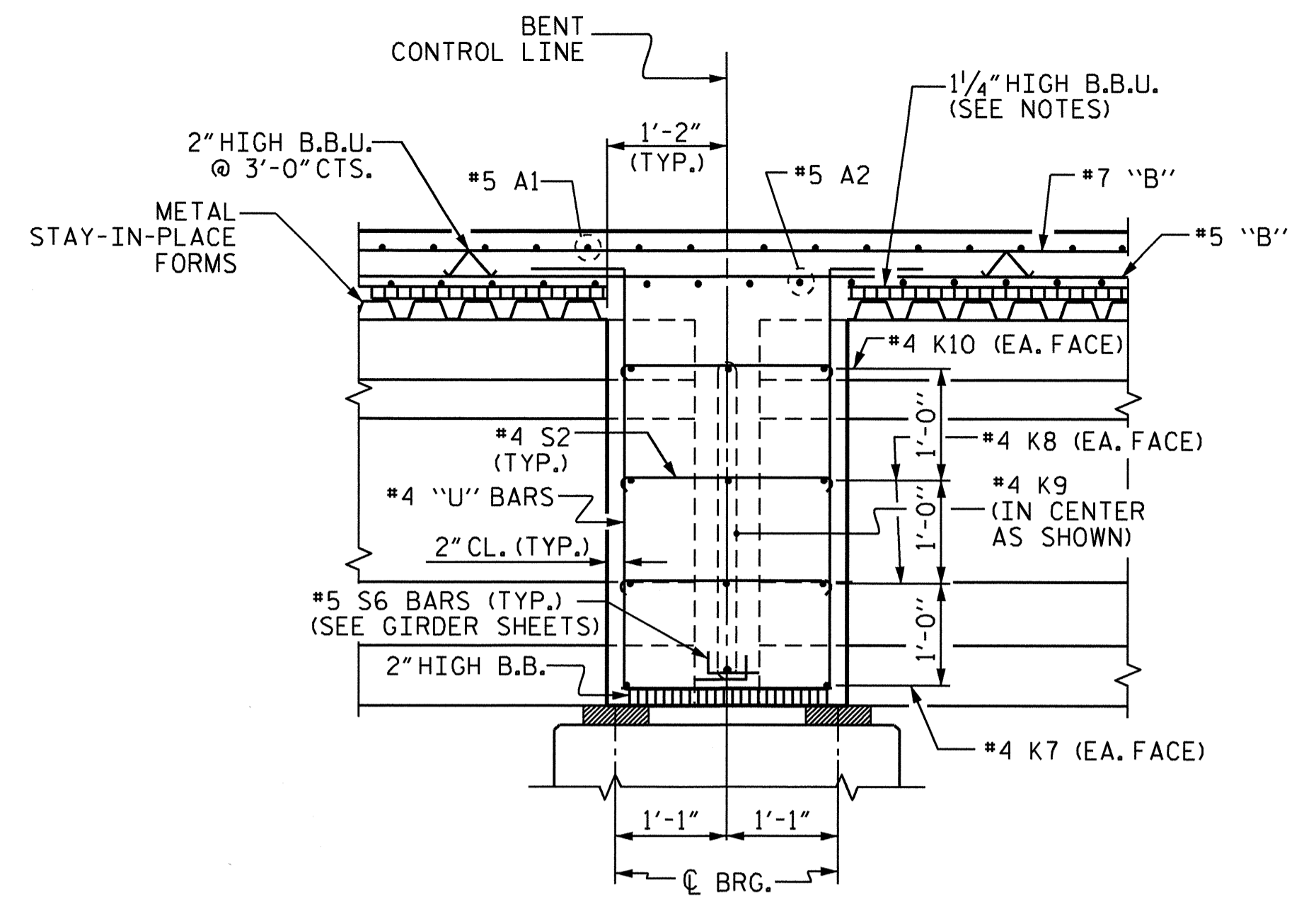


DRAWN BY: OT NGUYEN DATE: 4-09
 CHECKED BY: E.I. OMLIE DATE: 1-10

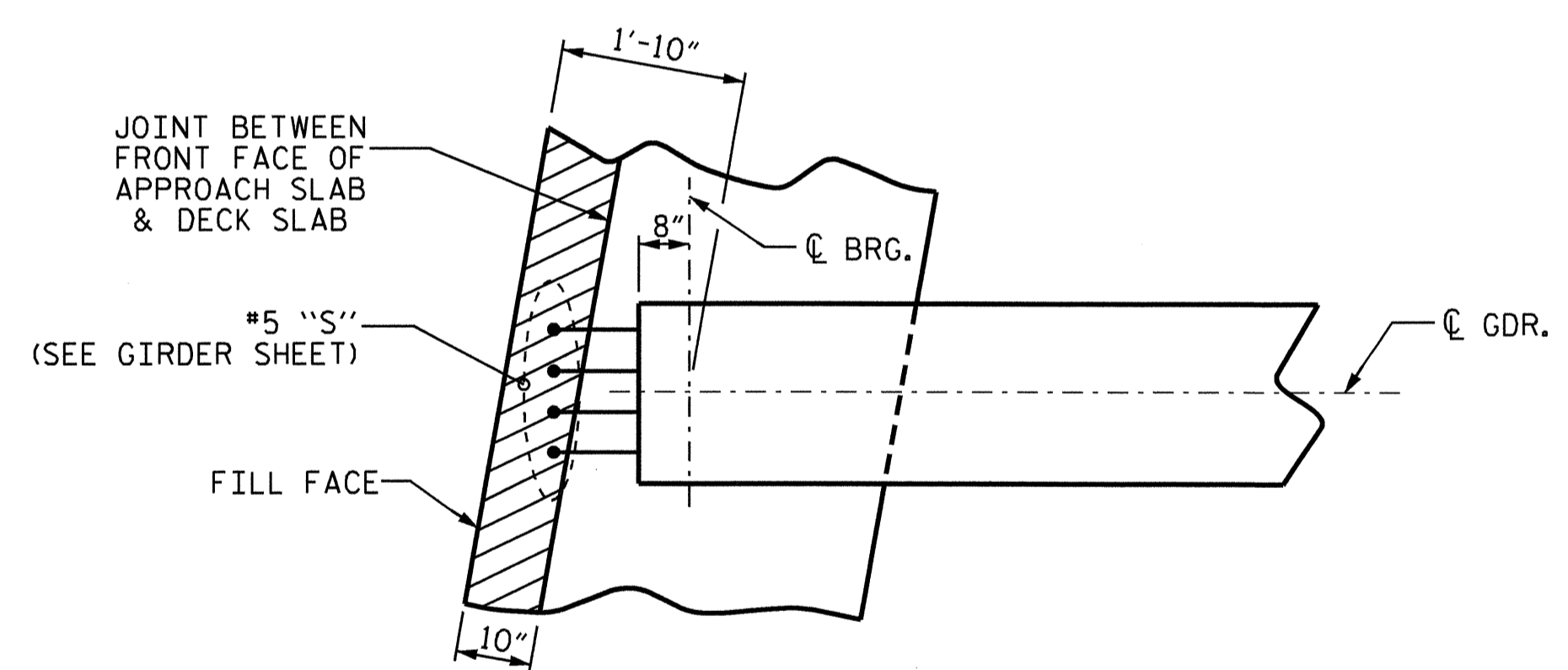
REVISIONS						SHEET NO. S-5
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			41



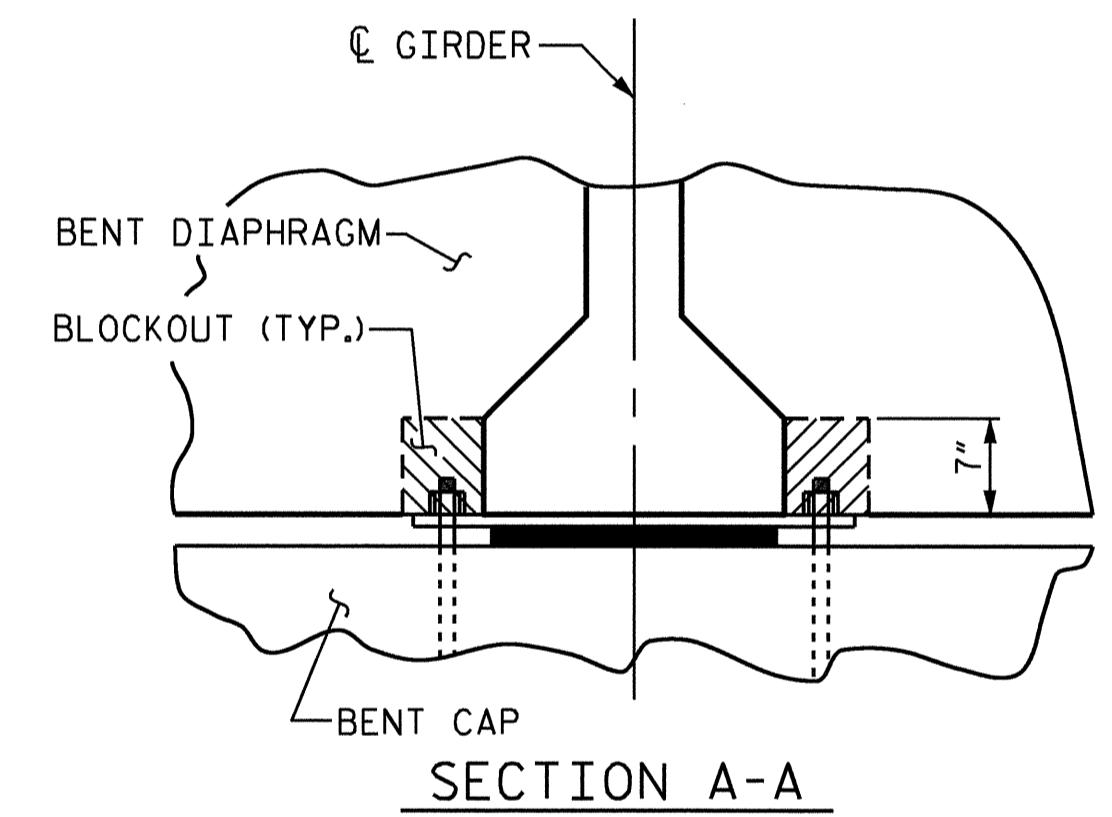
SECTION THROUGH INTEGRAL END BENT



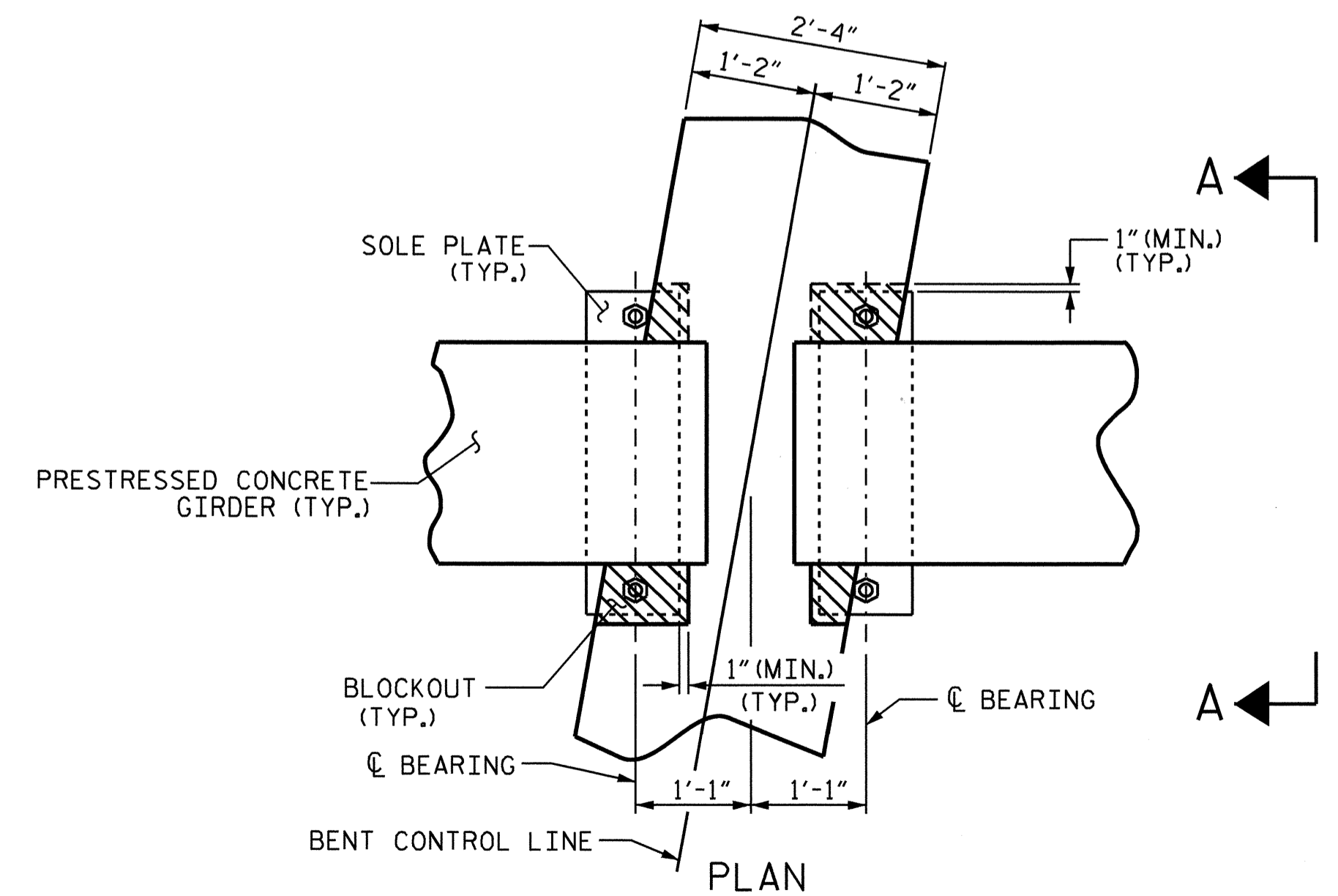
SECTION THROUGH BENT DIAPHRAGM



PLAN OF GIRDER AT INTEGRAL END BENT

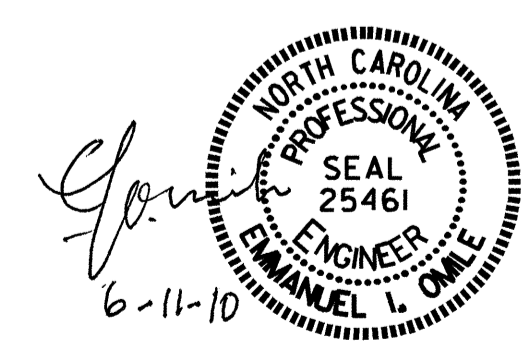


SECTION A-A



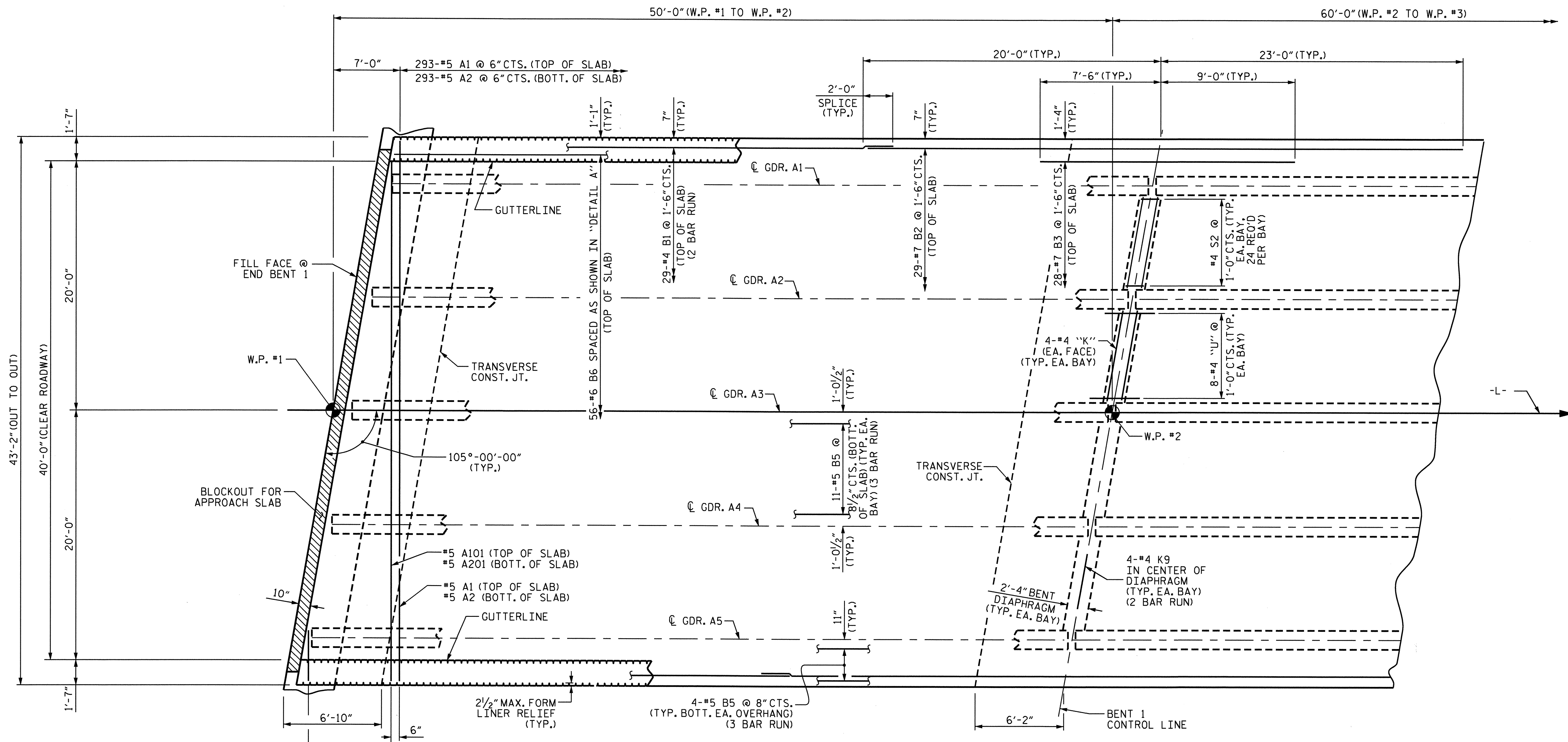
BENT DIAPHRAGM BLOCK-OUT DETAIL

PROJECT NO. B-4286
SWAIN COUNTY
 STATION: 16+39.20 -L-
 SHEET 2 OF 2



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO.
SUPERSTRUCTURE						S-6
TYPICAL SECTION DETAILS						TOTAL SHEETS
REVISIONS						41
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

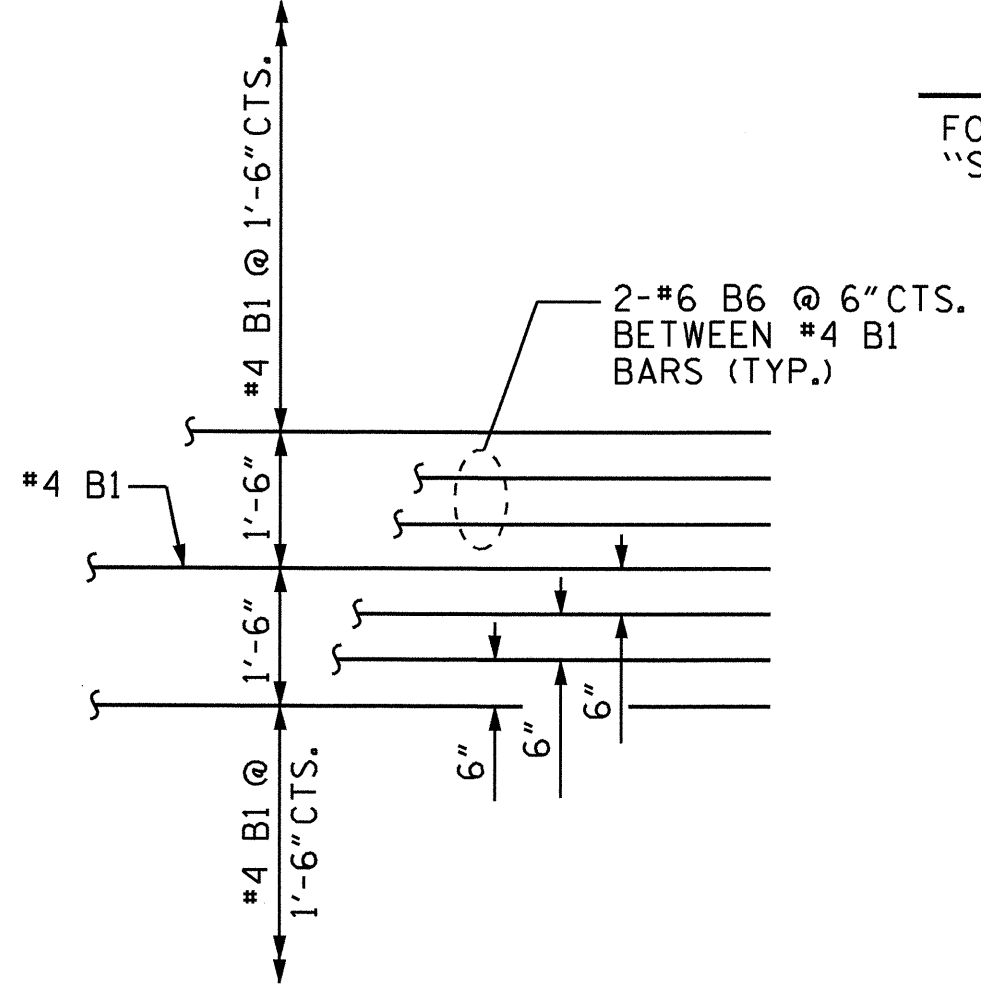
DRAWN BY : OT NGUYEN DATE : 4-09
 CHECKED BY : E.I. OMLIE DATE : 1-10



#5 A101 THRU #5 A122 @ 6"CTS. (TOP OF SLAB)
 #5 A201 THRU #5 A222 @ 6"CTS. (BOTT. OF SLAB)

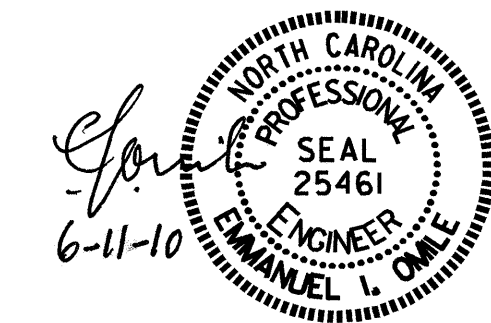
SPAN A

FOR TRANSVERSE CONSTRUCTION JOINT DETAIL, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.



DETAIL "A"

SHOWING PLACEMENT OF #6 B6 BETWEEN #4 B1 BARS IN TOP OF SLAB



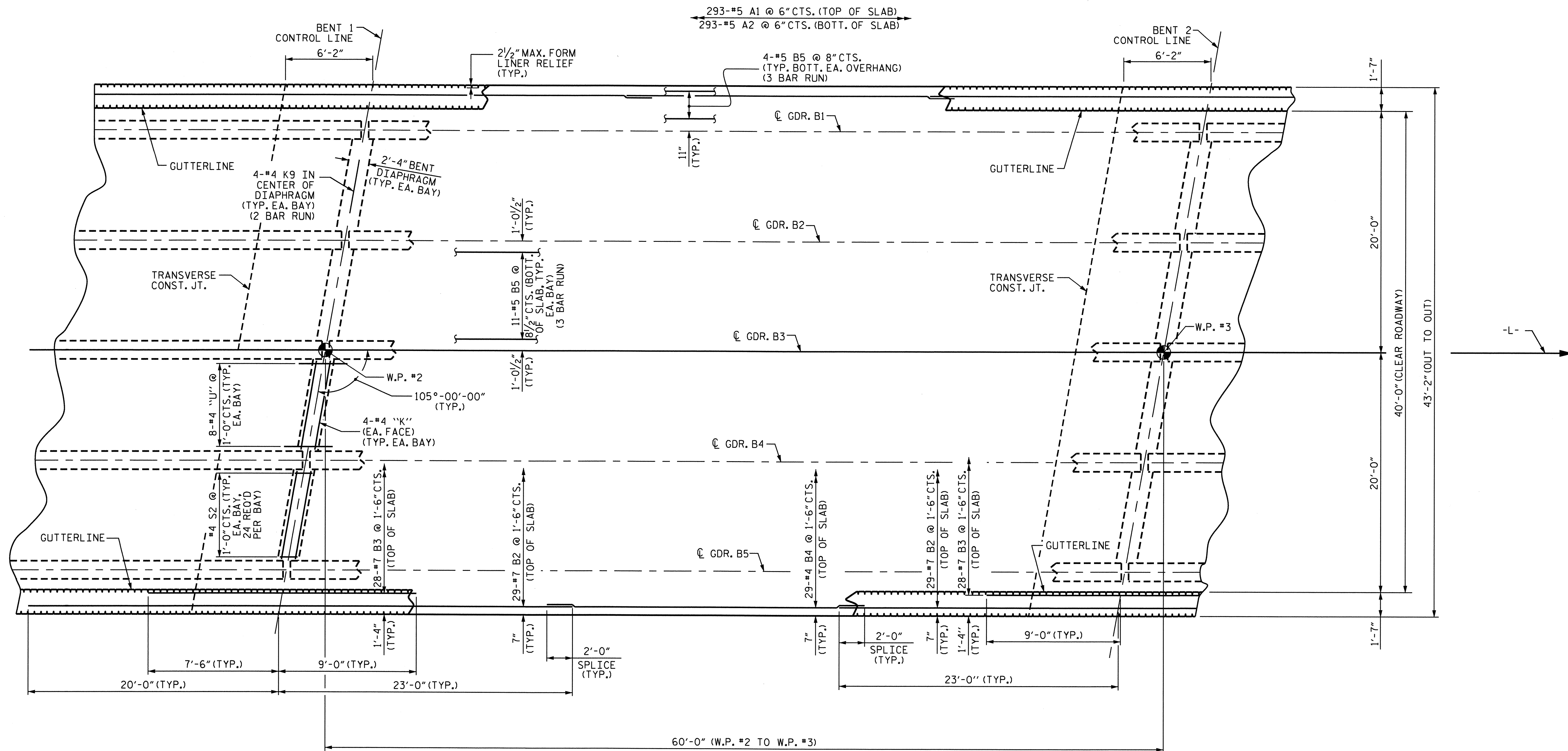
PROJECT NO. B-4286
SWAIN COUNTY
 STATION: 16+39.20 -L-

SHEET 1 OF 6

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

DRAWN BY: QT NGUYEN DATE: 4-09
 CHECKED BY: E.I. OMLE DATE: 1-10

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			41



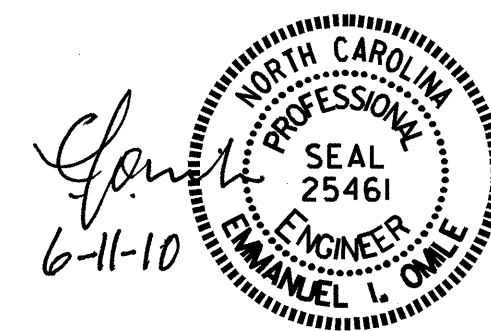
SPAN B

FOR TRANSVERSE CONSTRUCTION JOINT DETAIL, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.

PROJECT NO. B-4286
SWAIN COUNTY
 STATION: 16+39.20 -L-

SHEET 2 OF 6

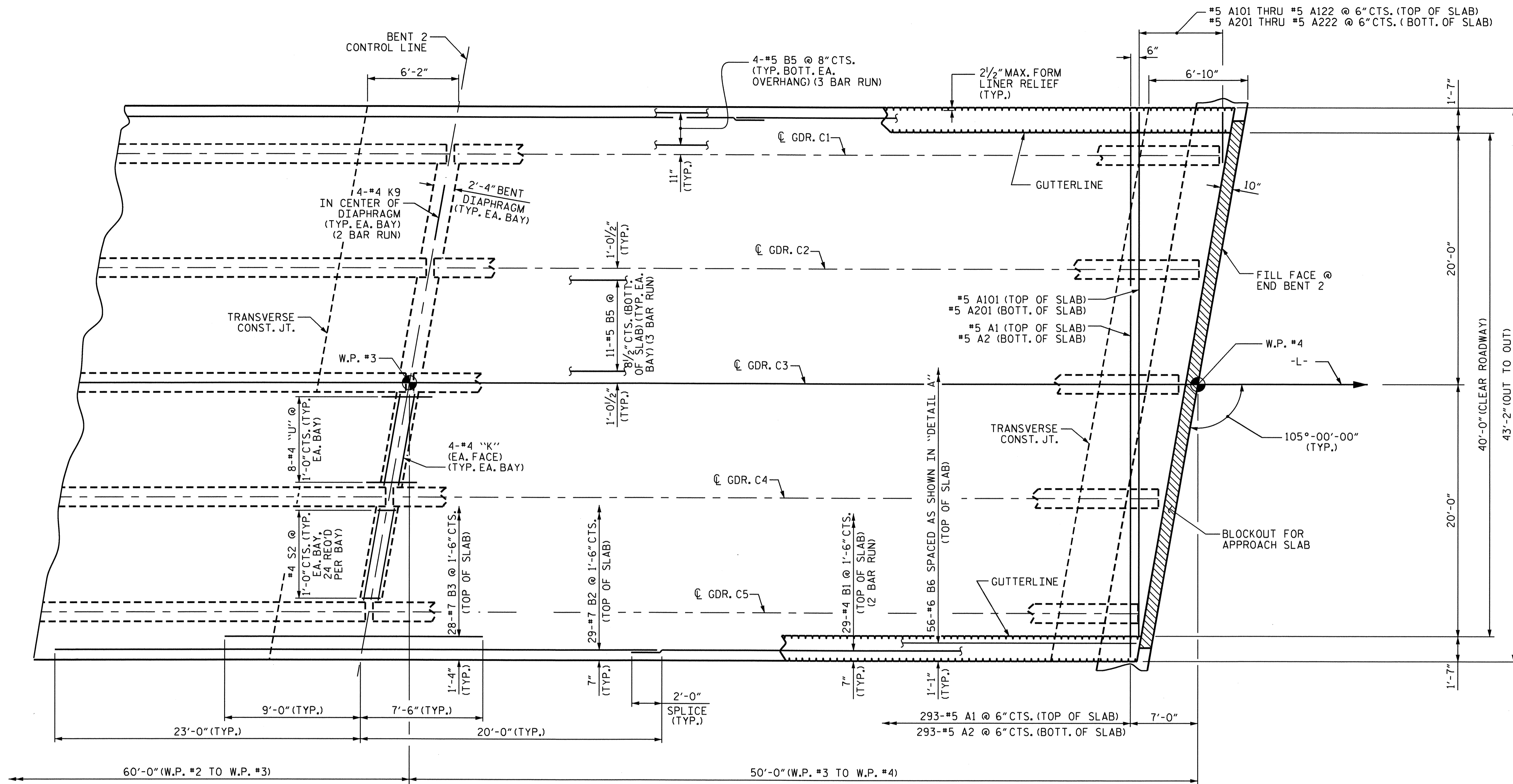
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PLAN OF SPANS
 SPAN B



DRAWN BY : OT NGUYEN DATE : 4-09
 CHECKED BY : E.I. OMILE DATE : 1-10

09-JUN-2010 12:38
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 eomile

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			41



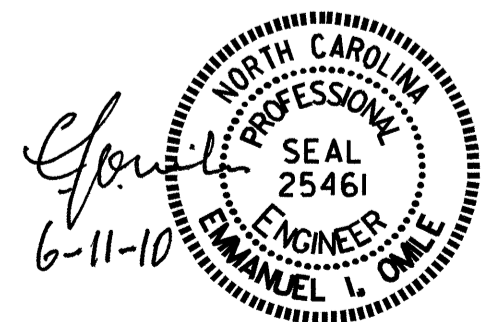
SPAN C

FOR TRANSVERSE CONSTRUCTION JOINT DETAIL, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.

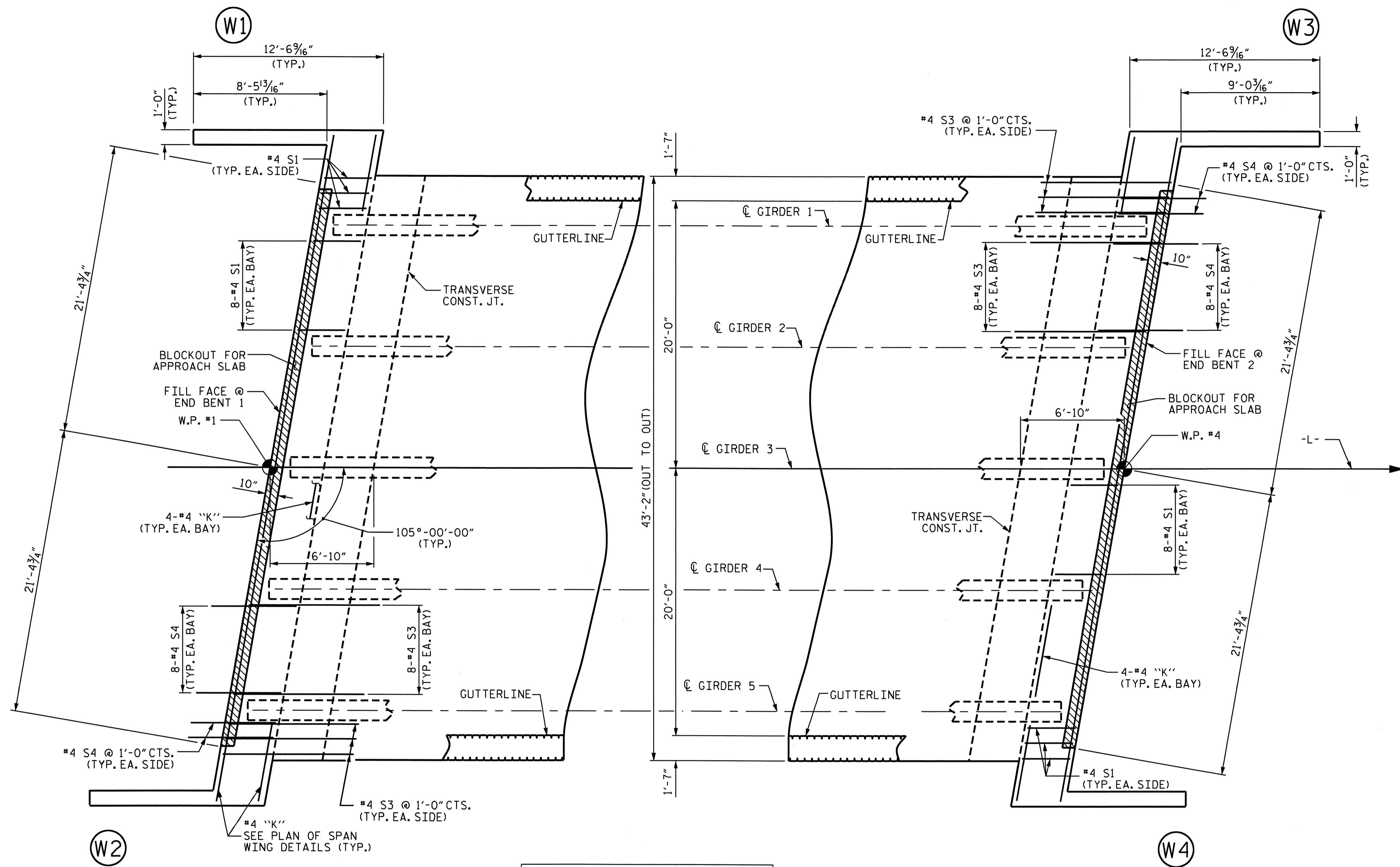
PROJECT NO. B-4286
SWAIN COUNTY
 STATION: 16+39.20 -L-

SHEET 3 OF 6

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE					
PLAN OF SPANS SPAN C					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
TOTAL SHEETS					41



DRAWN BY: QT NGUYEN DATE: 4-09
 CHECKED BY: E.I. OMILE DATE: 1-10



PLAN OF ABUTMENT AT END BENT 1

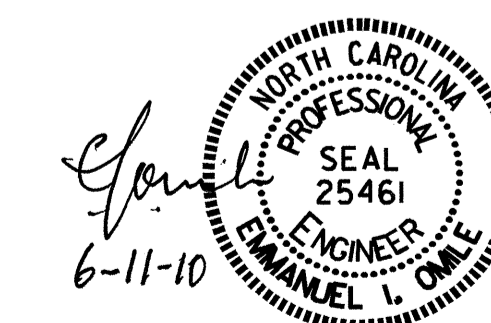
PLAN OF ABUTMENT AT END BENT 2

ALL "S" BARS IN ABUTMENT SHALL MATCH WITH #4 V1 IN THE END BENTS.

PROJECT NO. B-4286
SWAIN COUNTY
 STATION: 16+39.20 -L-

SHEET 4 OF 6

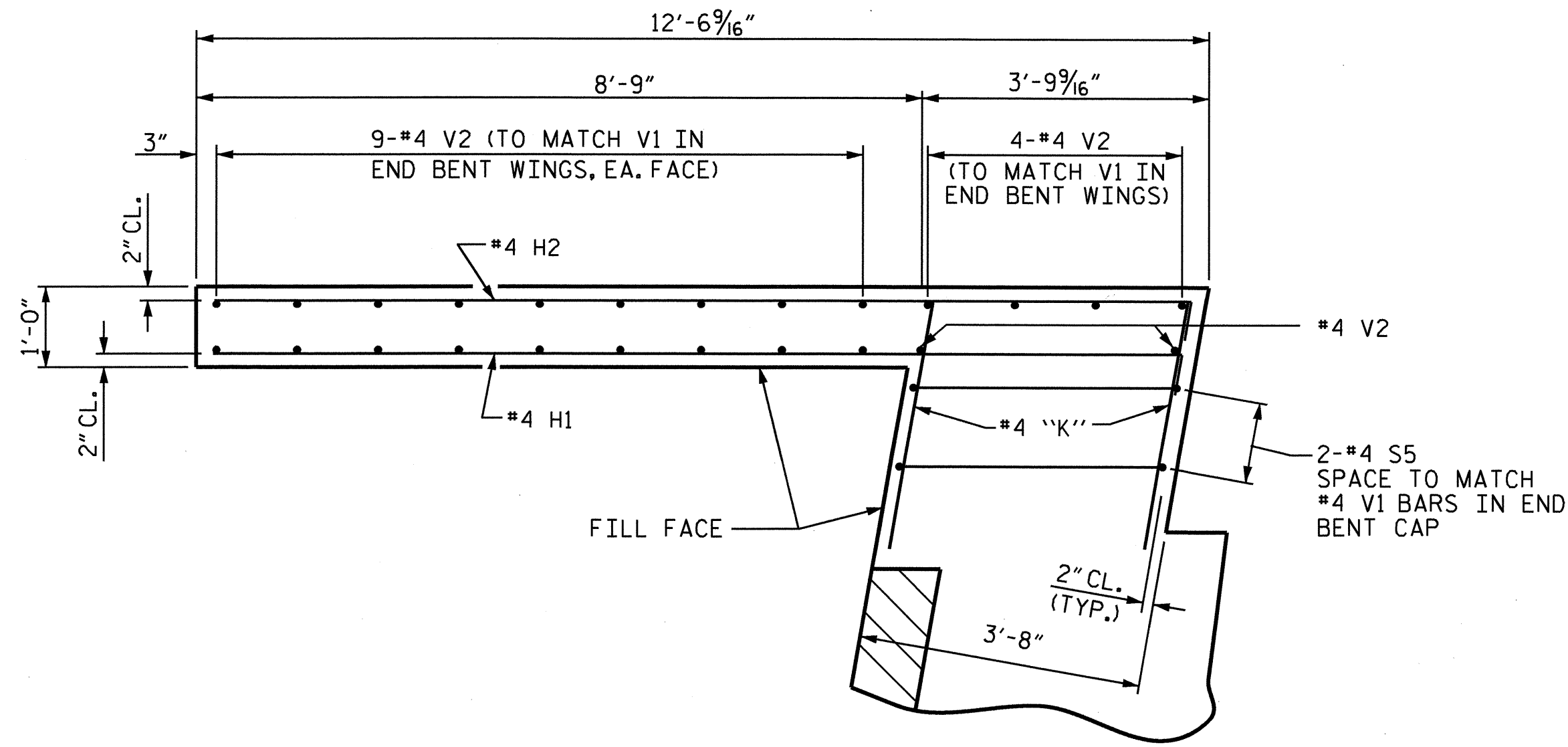
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PLAN OF SPAN
 DETAILS



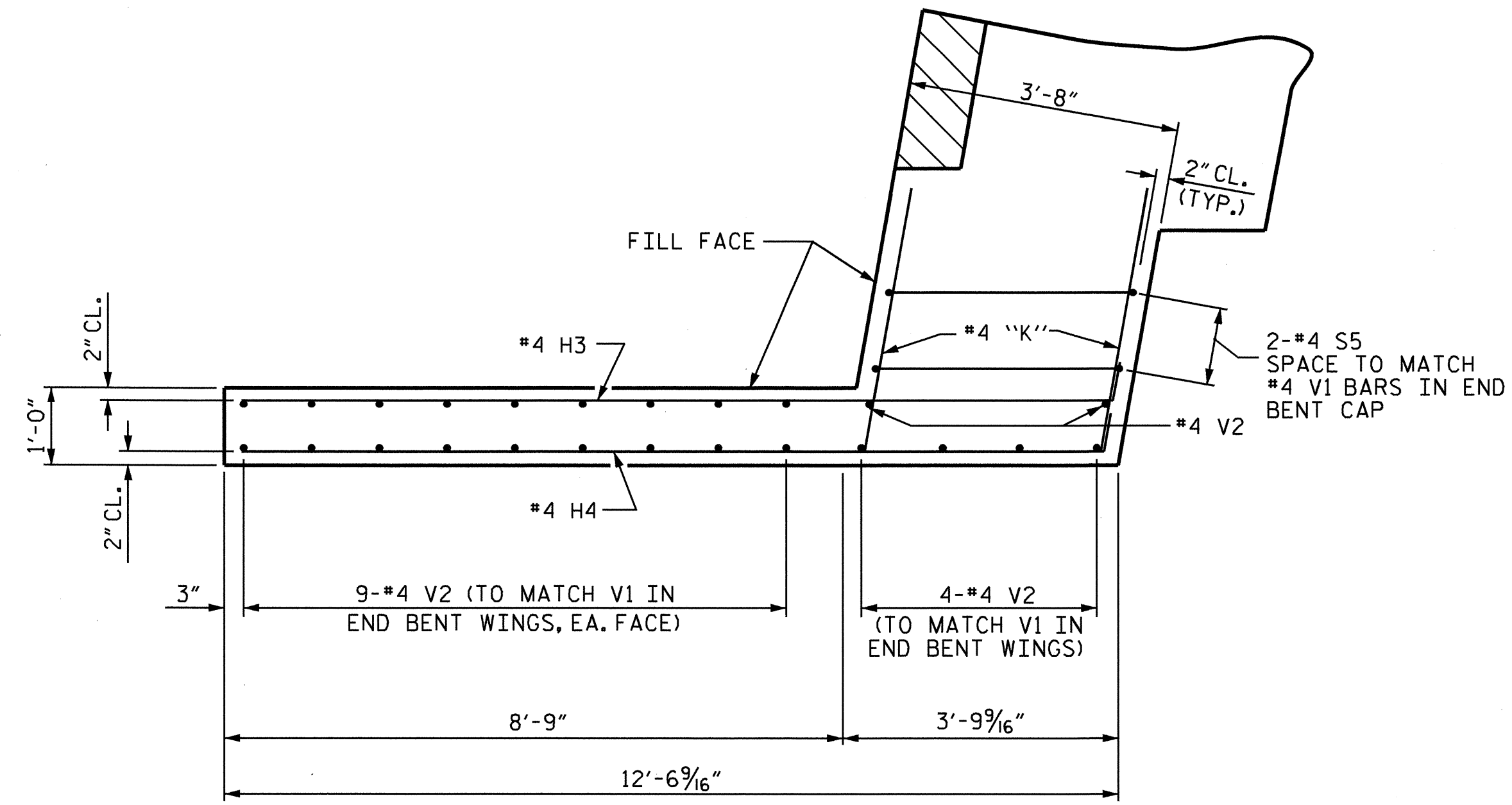
DRAWN BY : OT NGUYEN DATE : 4-09
 CHECKED BY : E.I. OMILE DATE : 1-10

09-JUN-2010 12:38
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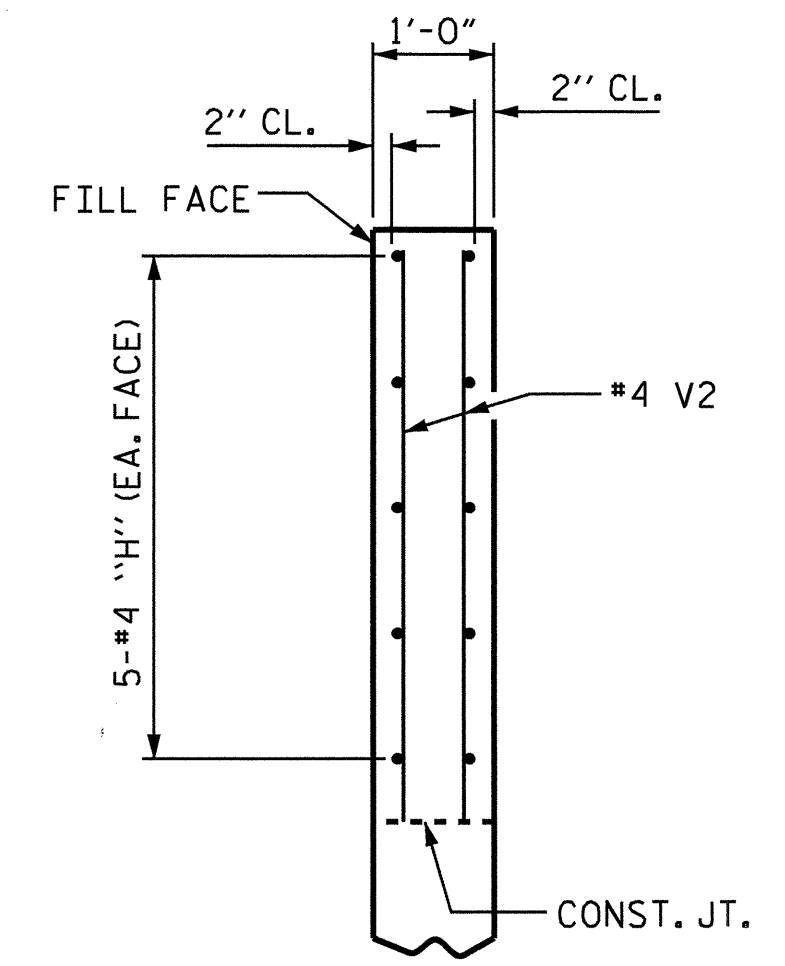
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NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS
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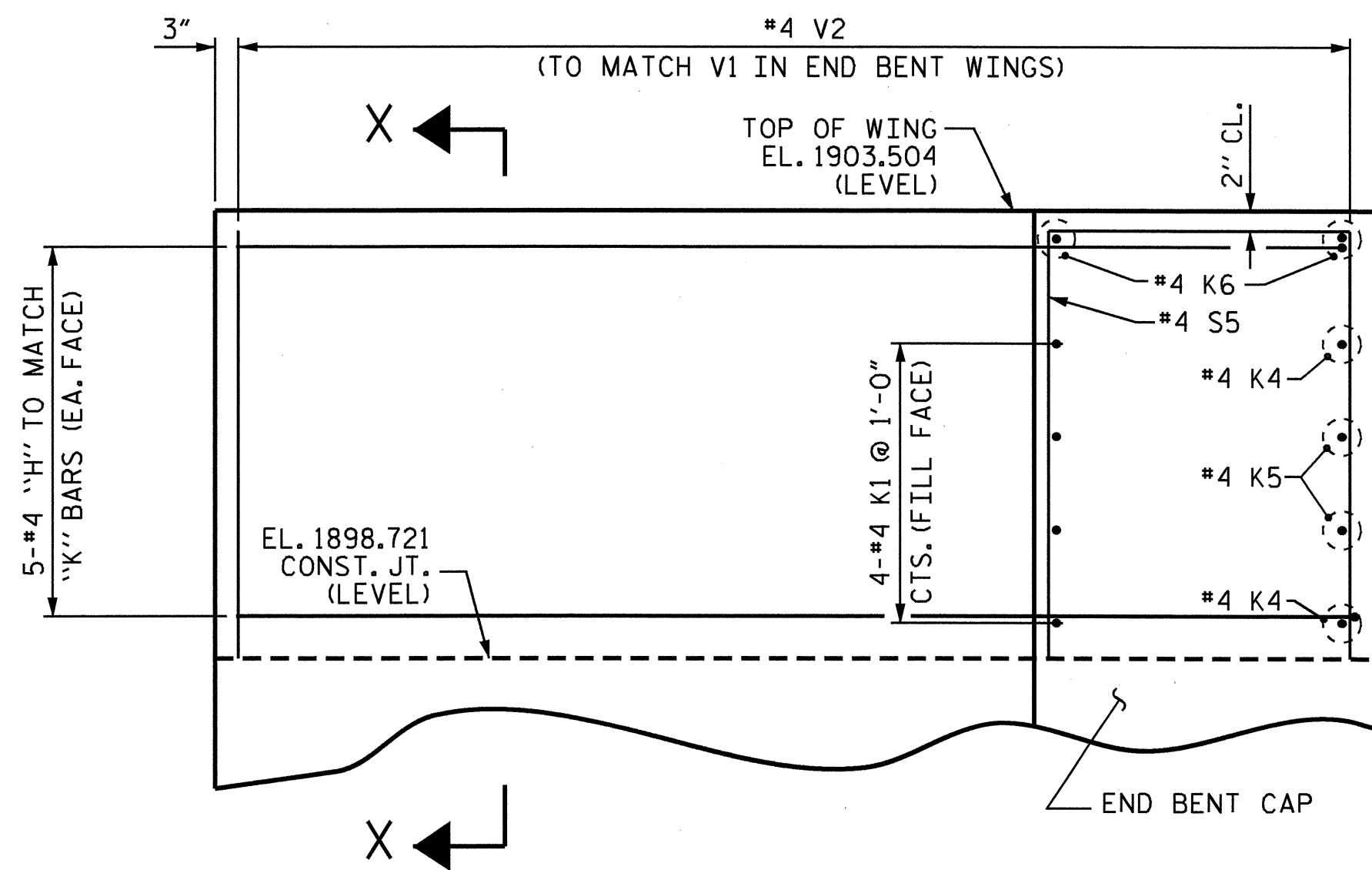
PLAN OF WING (W1)



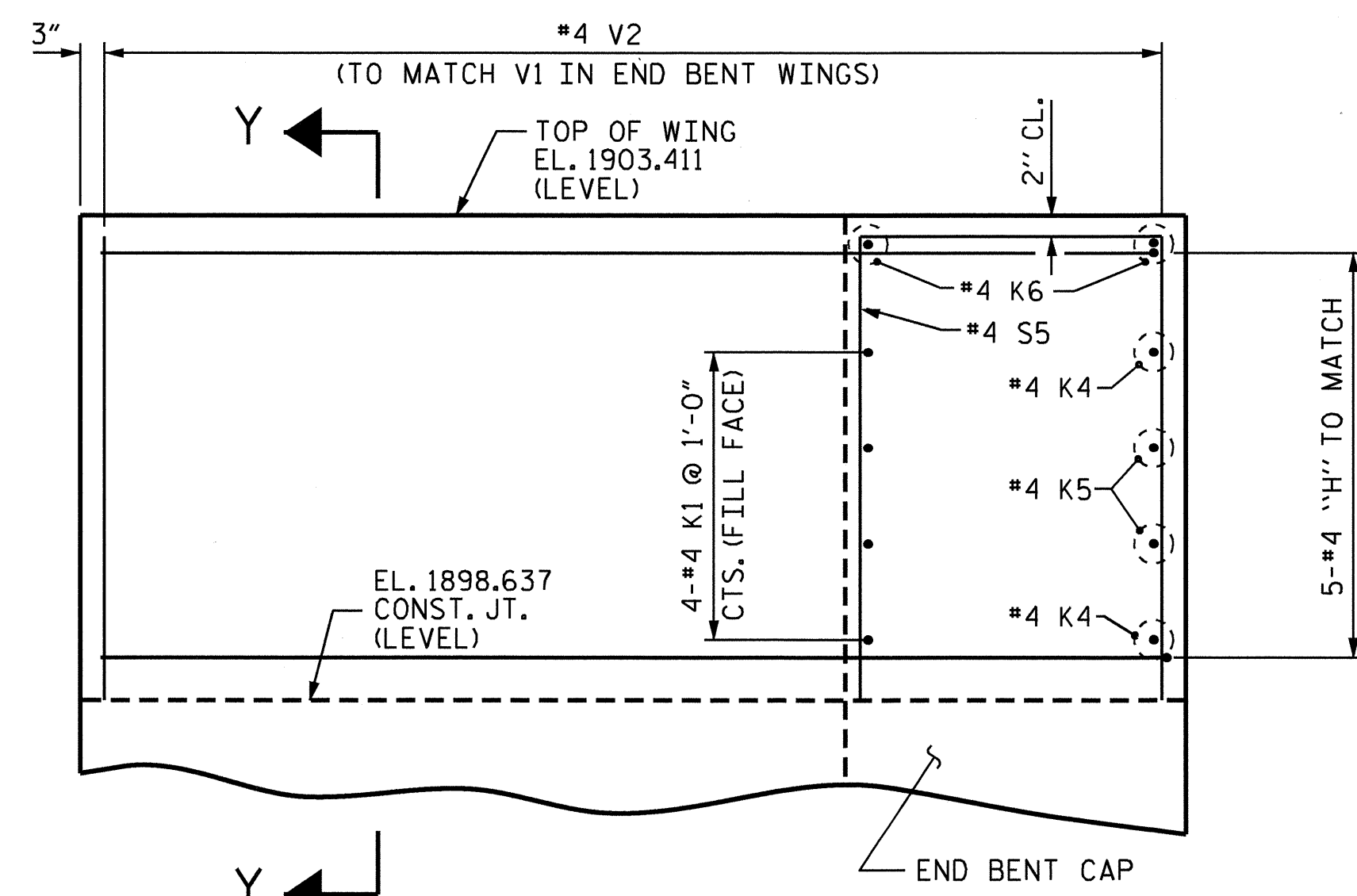
PLAN OF WING (W2)



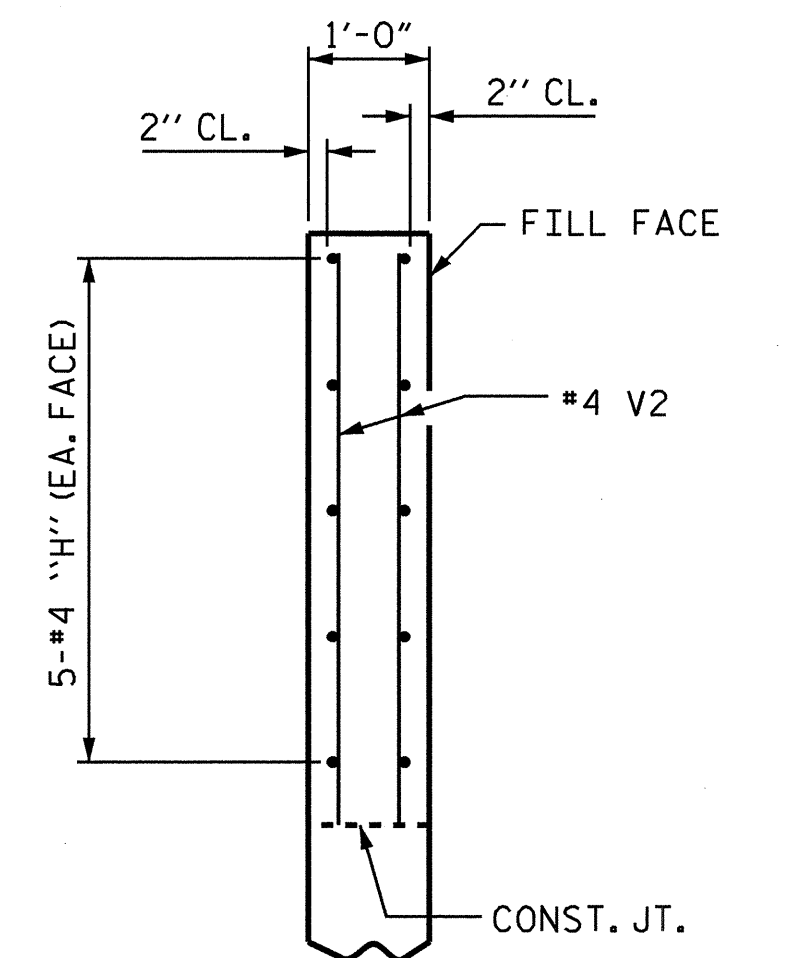
SECTION X-X



ELEVATION OF WING (W1)

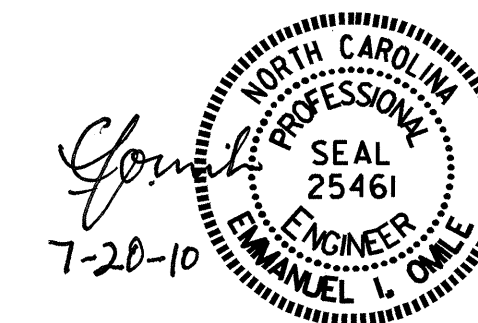


ELEVATION OF WING (W2)



SECTION Y-Y

ABUTMENT WINGS AT END BENT 1
FOR END BENT REINFORCING STEEL AND DETAILS, "SEE END BENT 1" SHEETS



PROJECT NO. B-4286
SWAIN COUNTY
STATION: 16+39.20 -L-

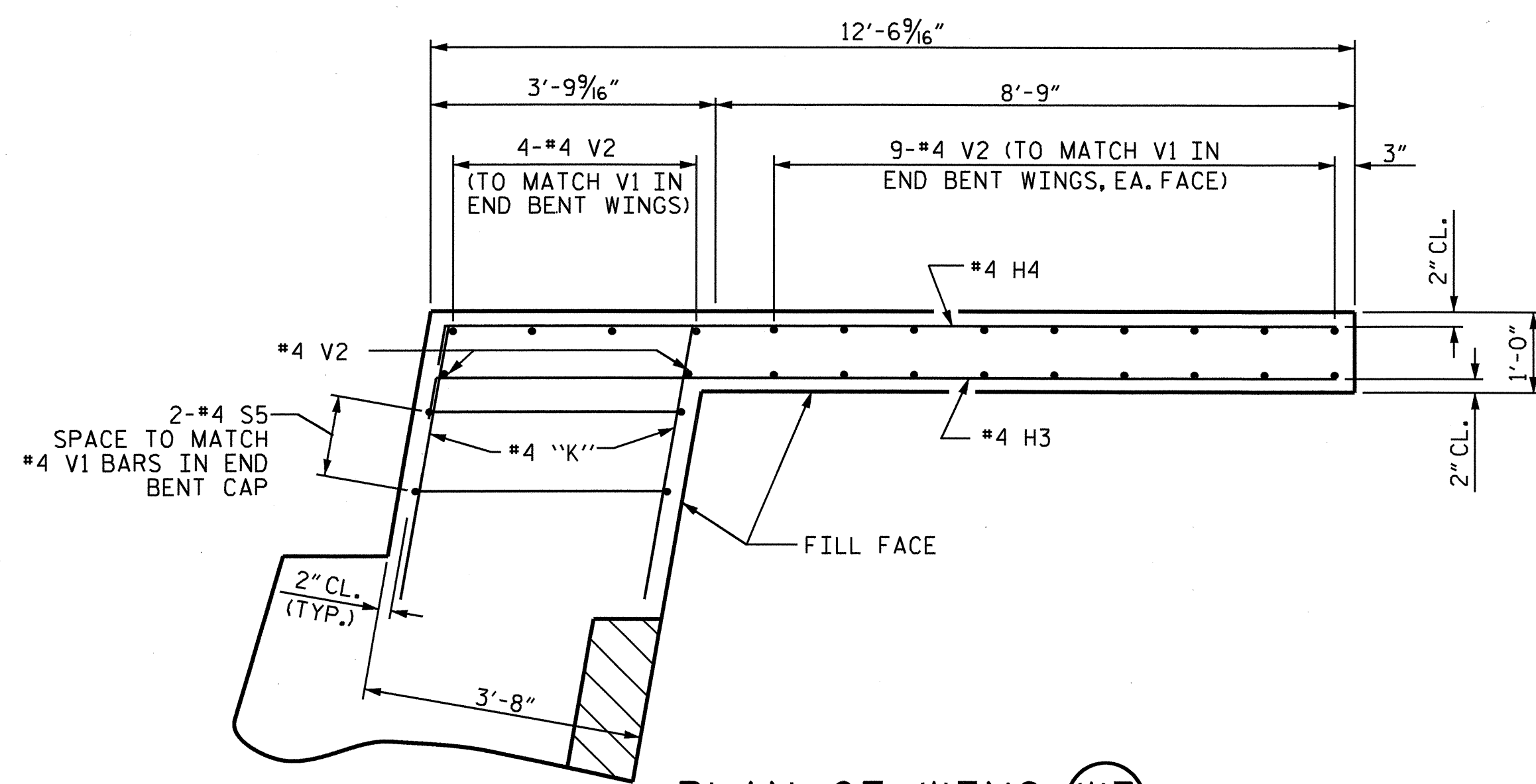
SHEET 5 OF 6

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

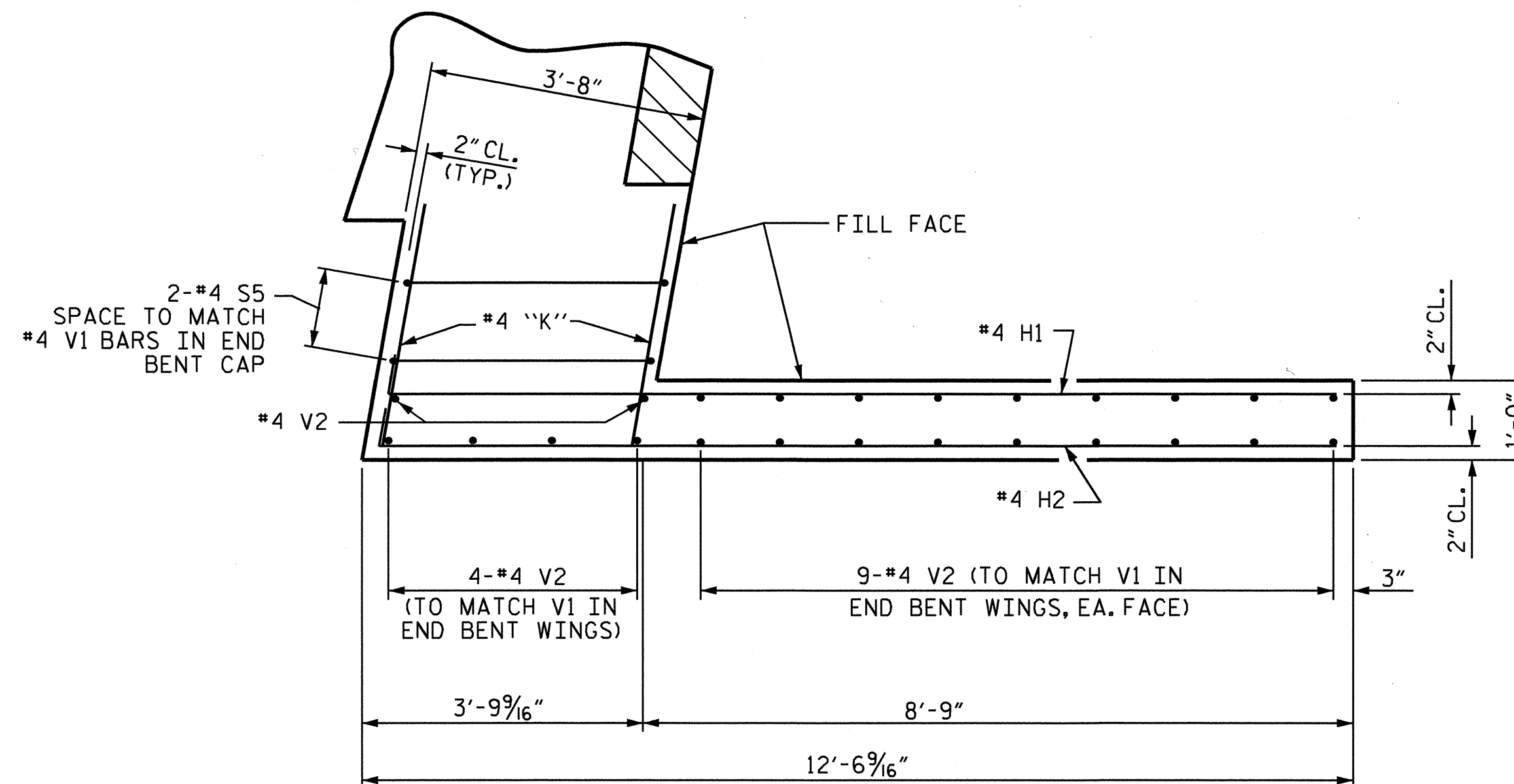
DRAWN BY : QT NGUYEN DATE : 4-09
CHECKED BY : E.I. OMILE DATE : 1-10

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

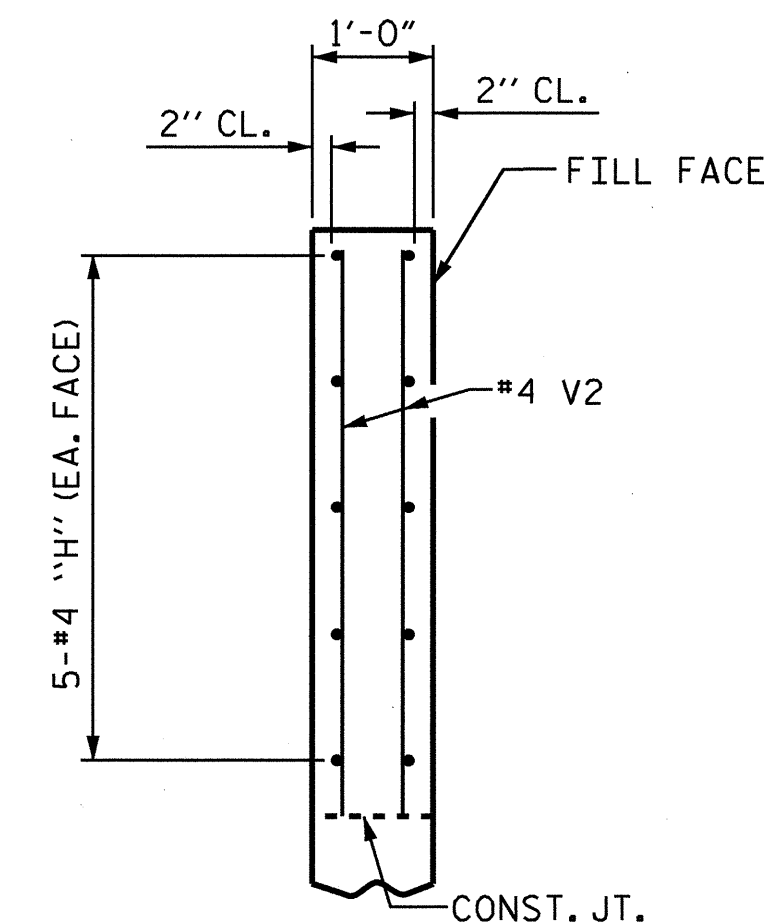
TOTAL SHEETS: 41



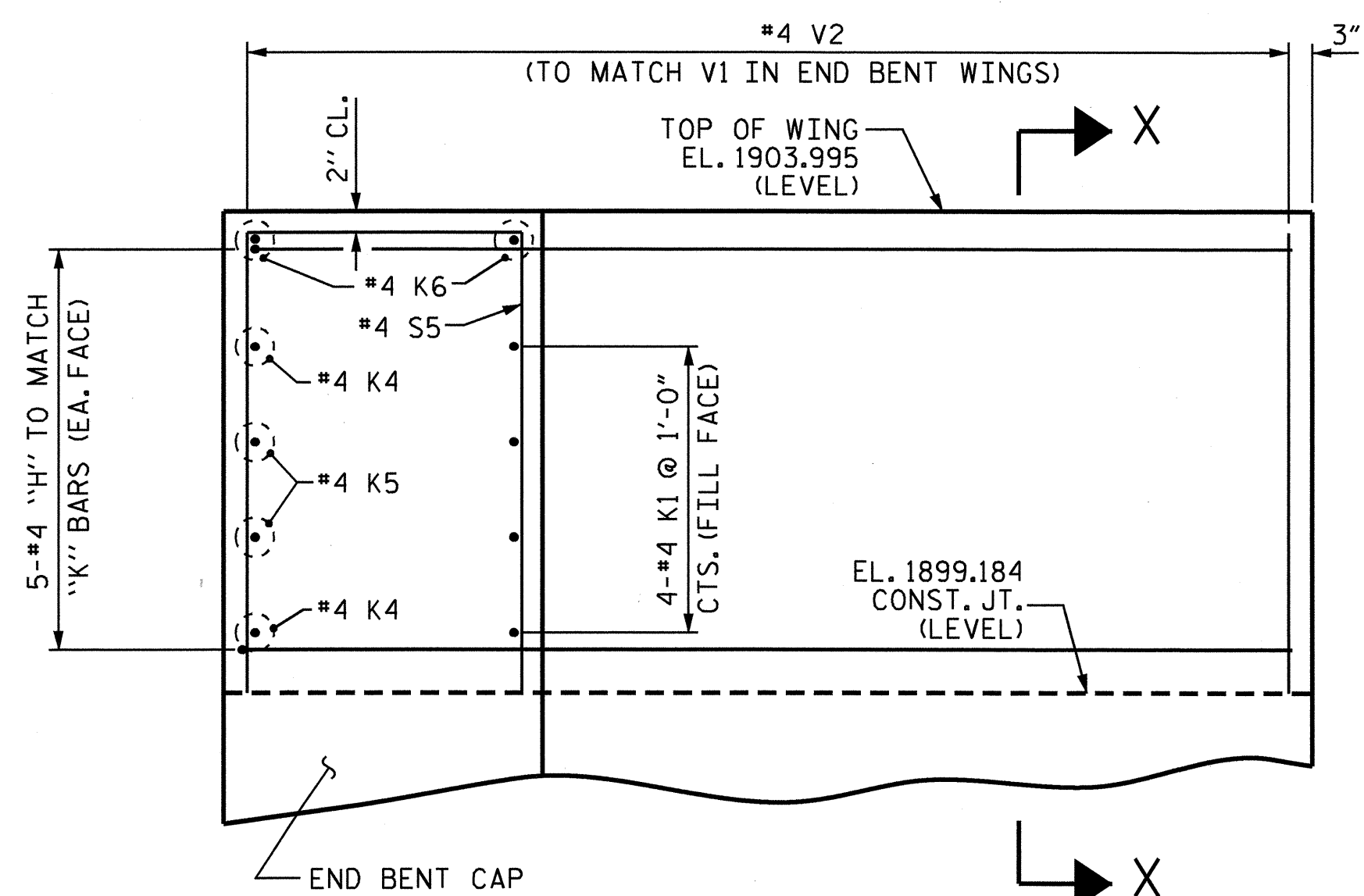
PLAN OF WING (W3)



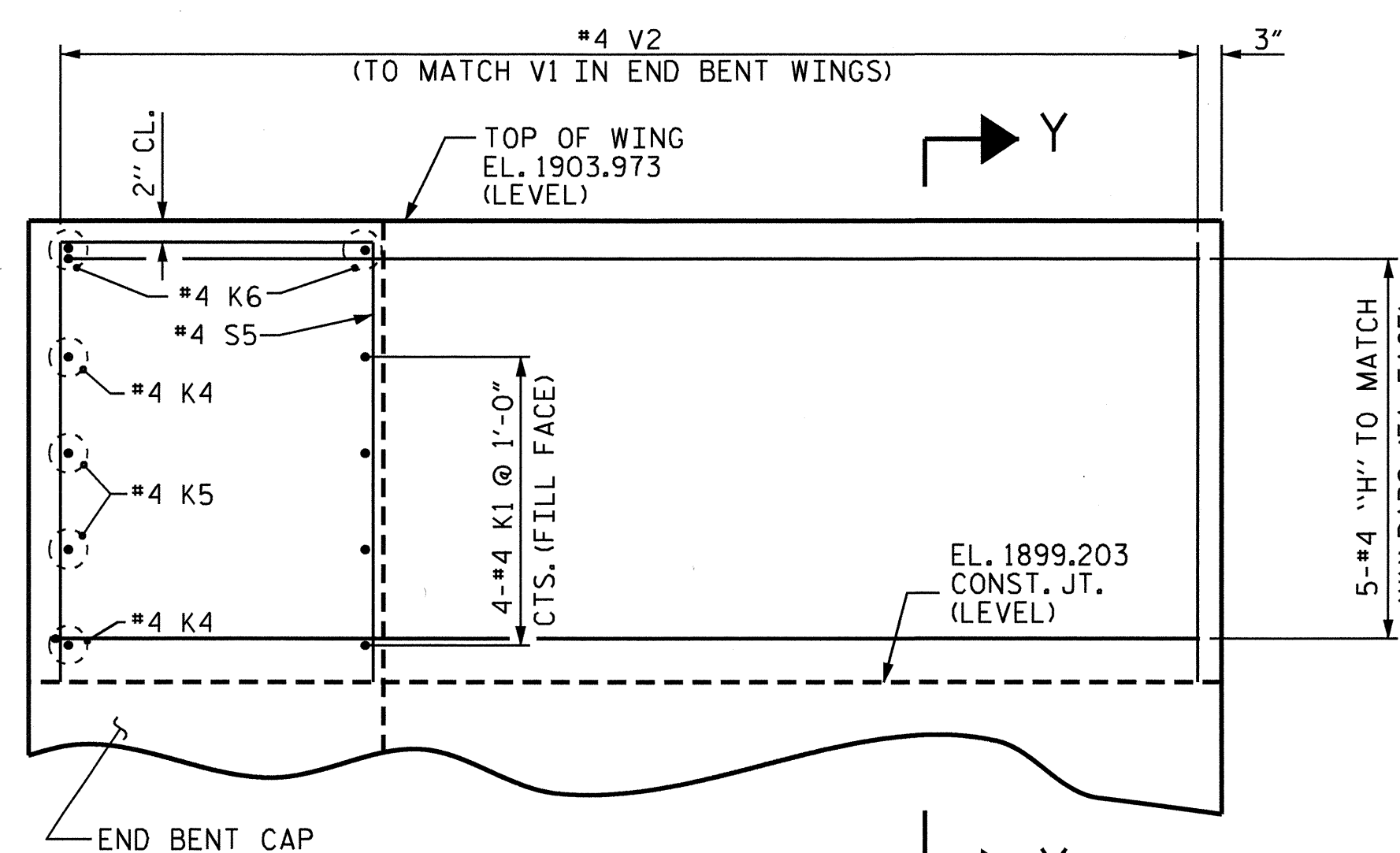
PLAN OF WING (W4)



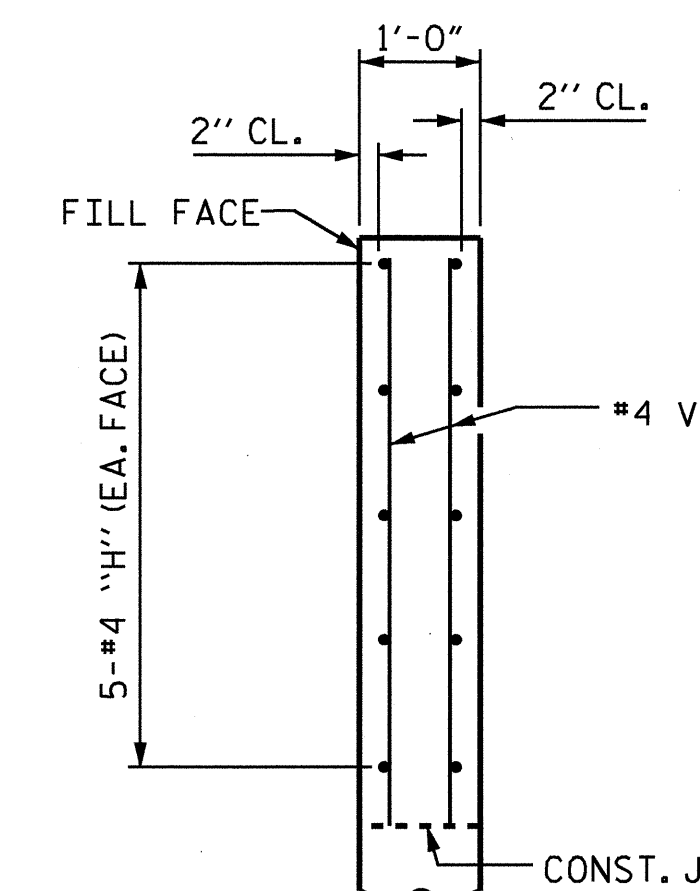
SECTION X-X



ELEVATION OF WING (W3)



ELEVATION OF WING (W4)

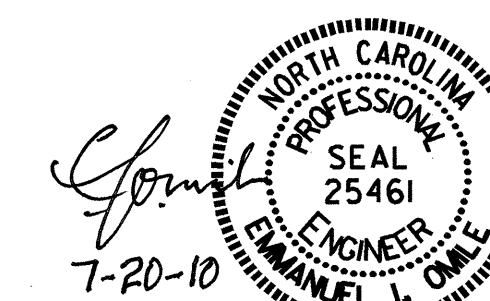


SECTION Y-Y

PROJECT NO. B-4286
 SWAIN COUNTY
 STATION: 16+39.20 -L-

SHEET 6 OF 6

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

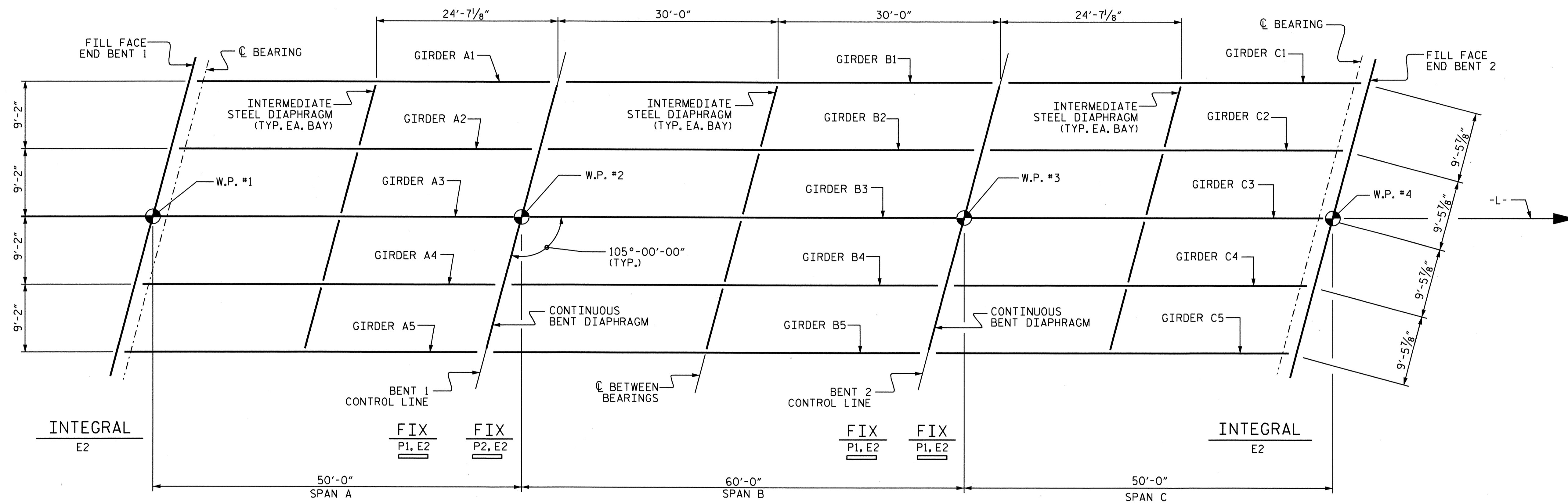


ABUTMENT WINGS AT END BENT 2
 FOR END BENT REINFORCING STEEL AND DETAILS, "SEE END BENT 2" SHEETS

DRAWN BY: QT NGUYEN DATE: 4-09
 CHECKED BY: E.I. OMILE DATE: 1-10

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

TOTAL SHEETS: 41

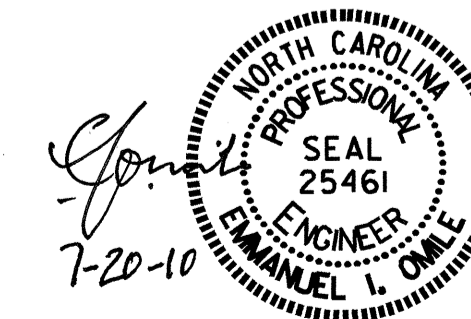


FRAMING PLAN

PROJECT NO. B-4286
SWAIN COUNTY
 STATION: 16+39.20 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

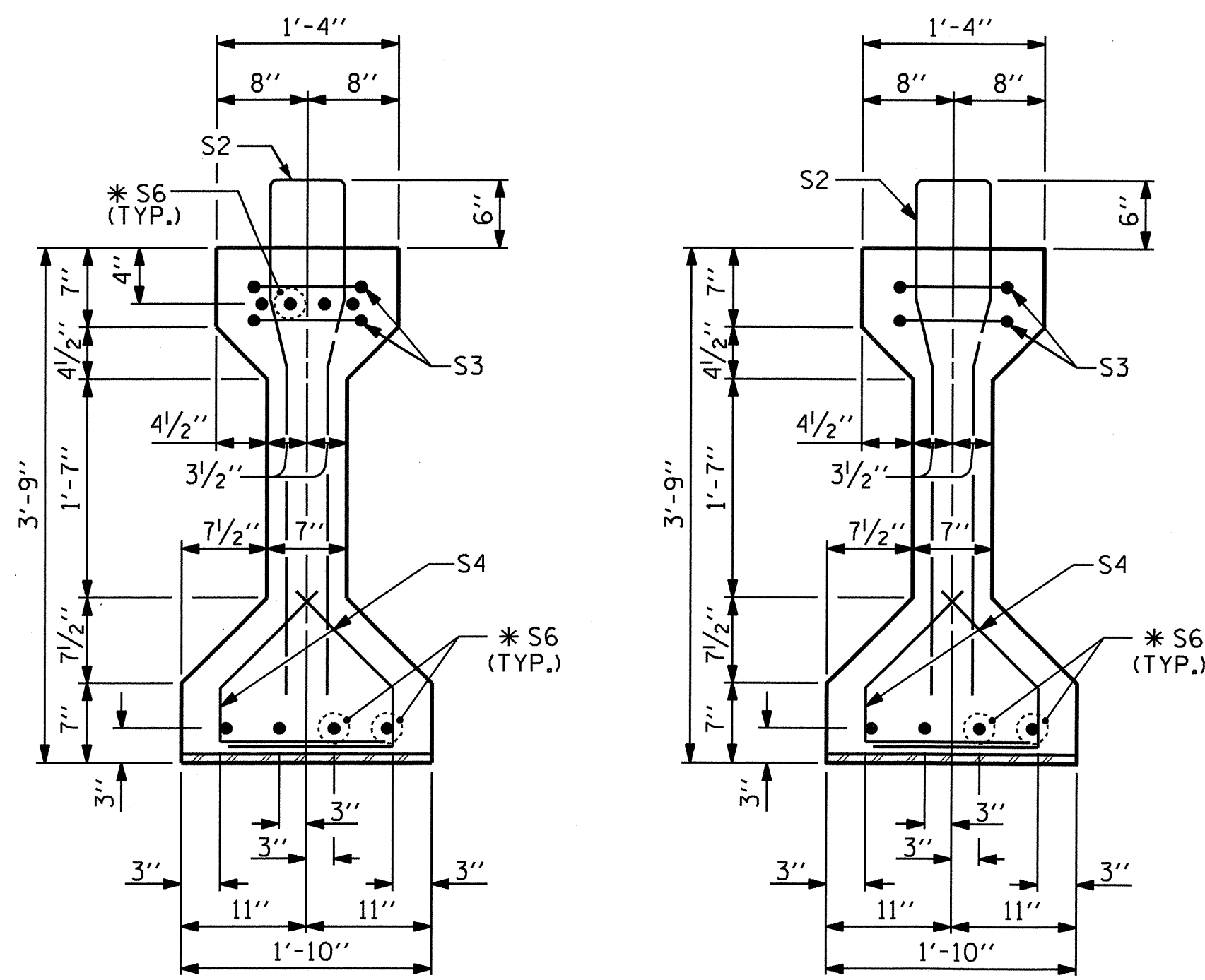
SUPERSTRUCTURE
 FRAMING PLAN



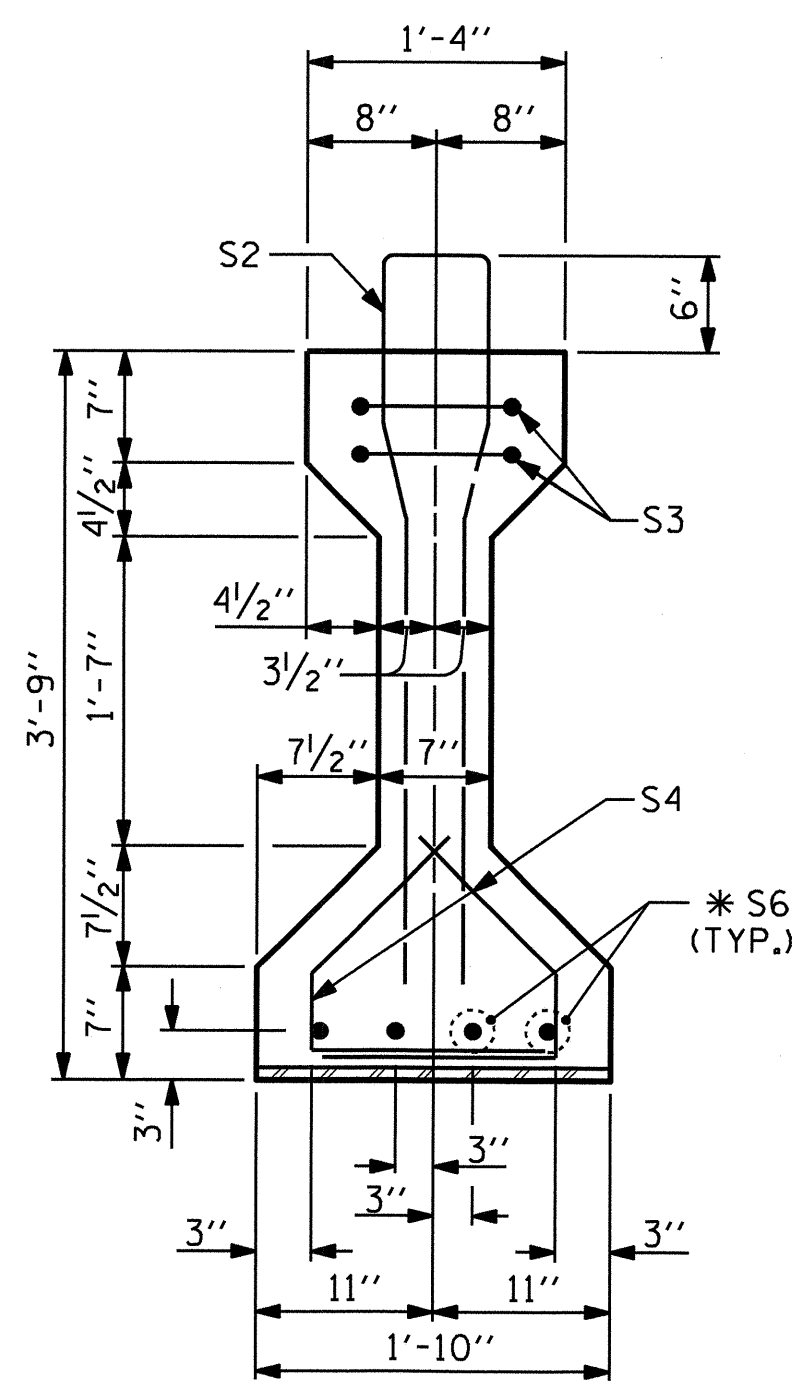
DRAWN BY : QT NGUYEN DATE : 4-09
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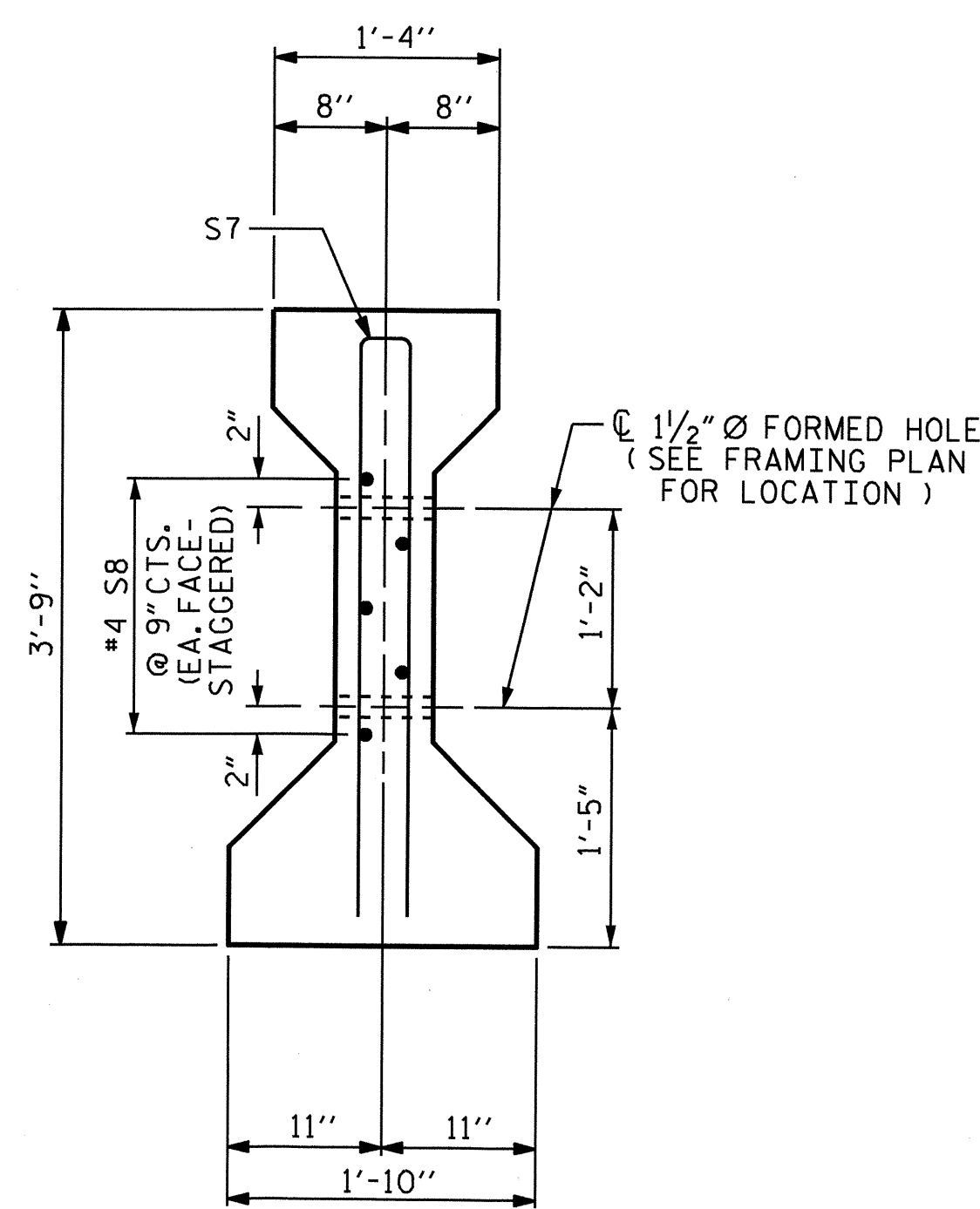
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			41



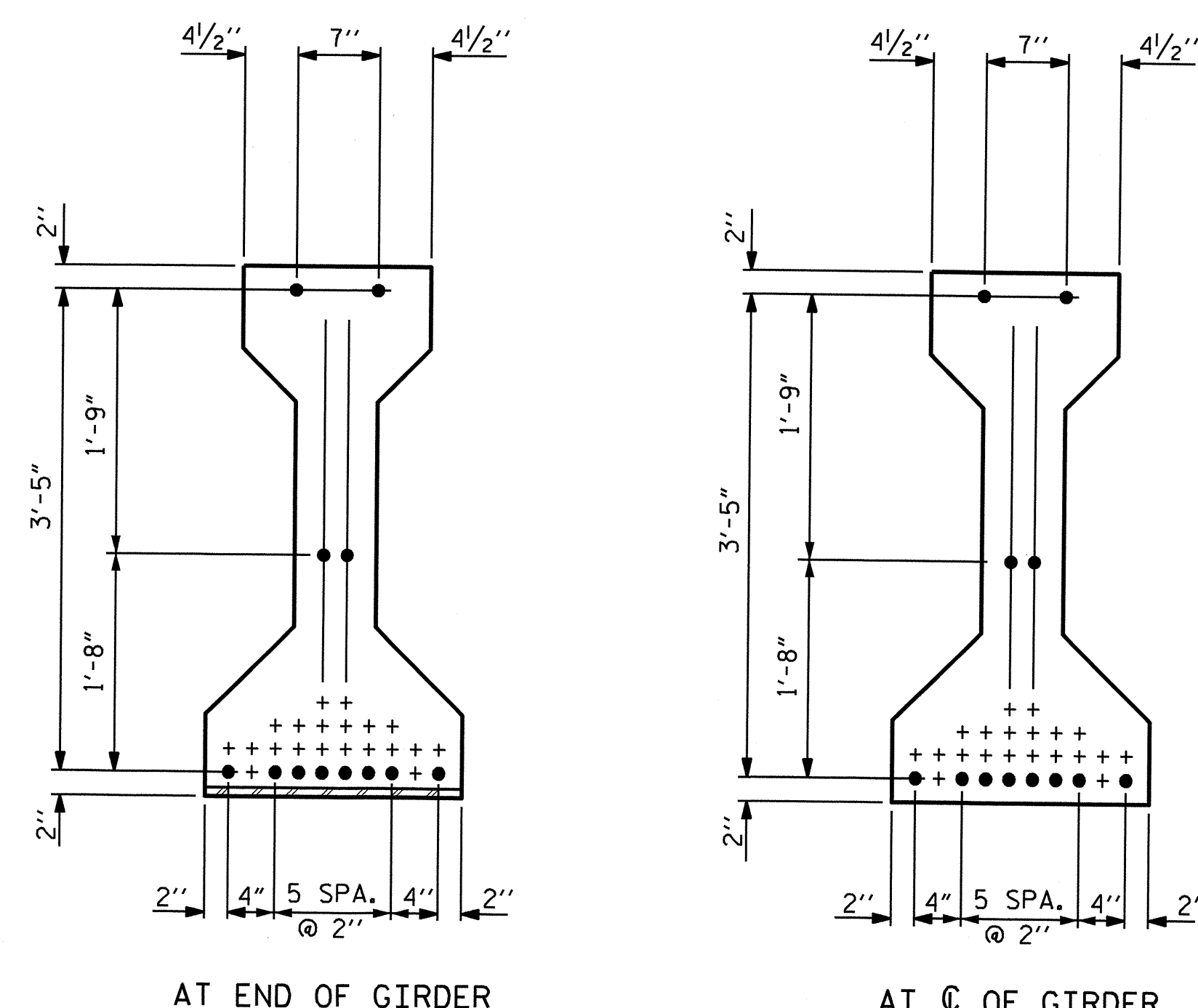
SECTION A-A



SECTION B-B

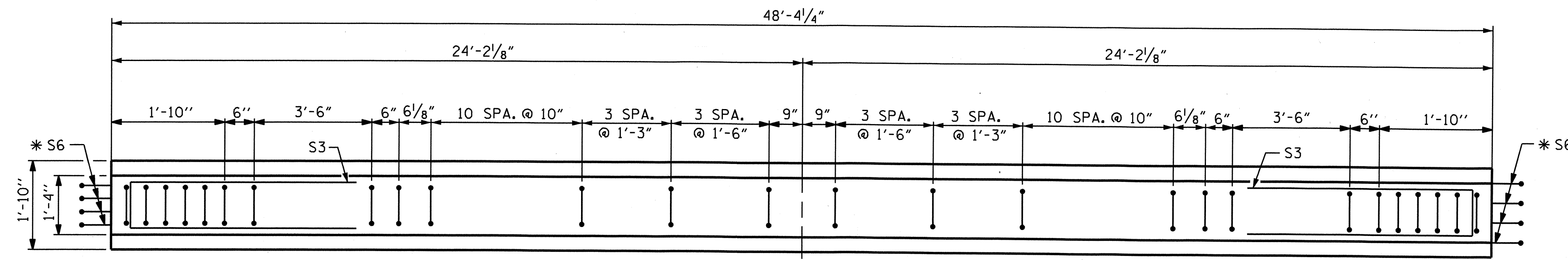


SECTION C-C
(S1 BARS NOT SHOWN)

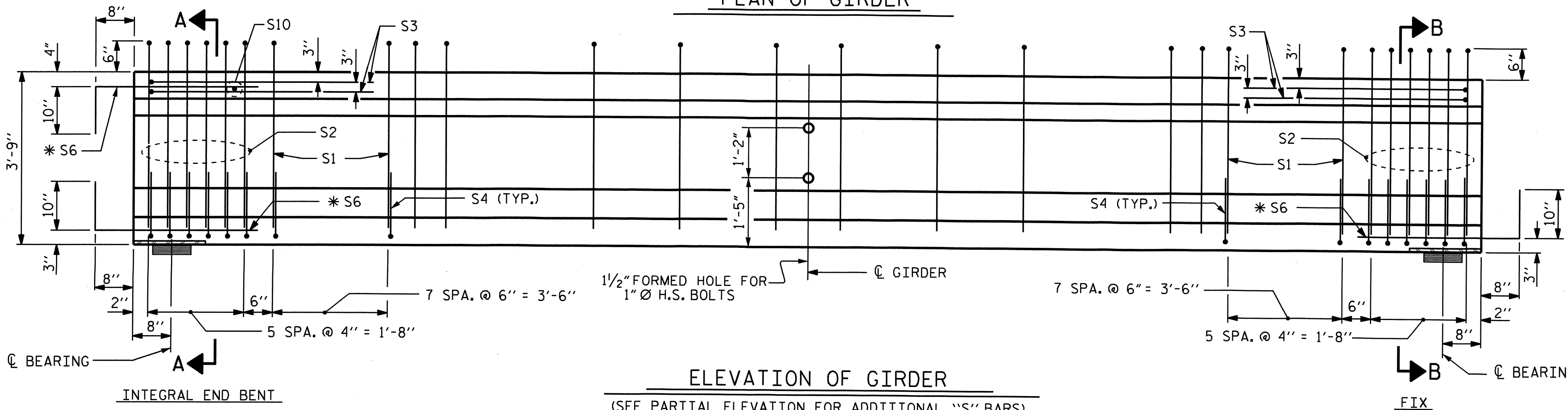
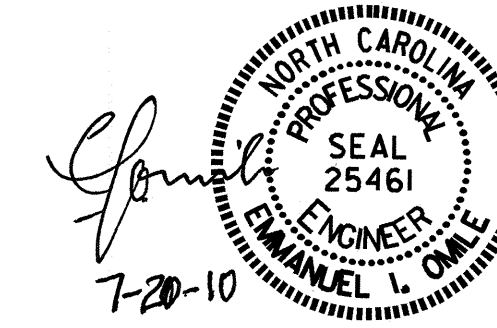


0.6" Ø LOW RELAXATION STRAND LAYOUT (ALL STRAIGHT)

(12 STRANDS REQUIRED)

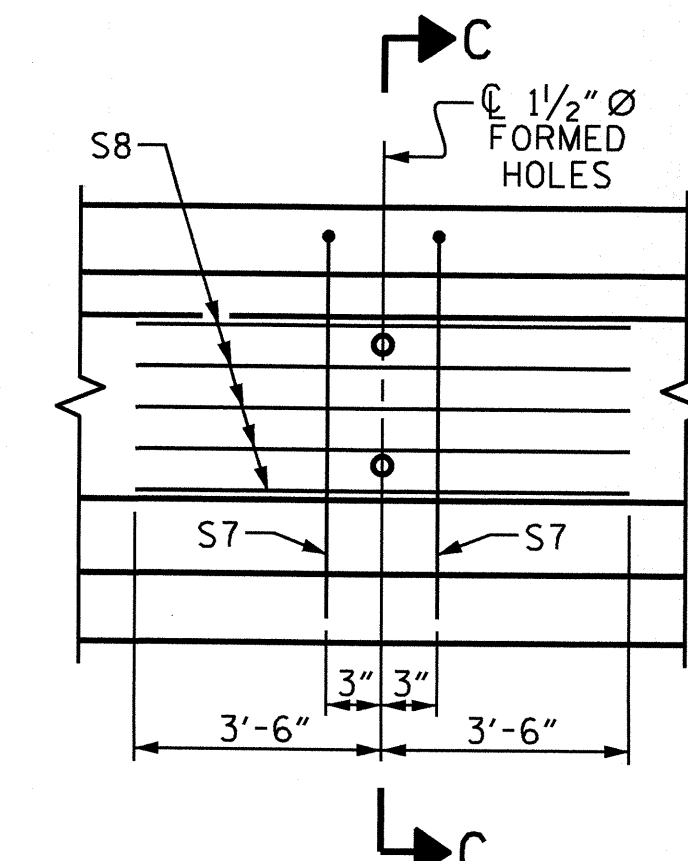


PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR ALL GIRDERS

0.6" Ø L.R. GRADE 270 STRANDS

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

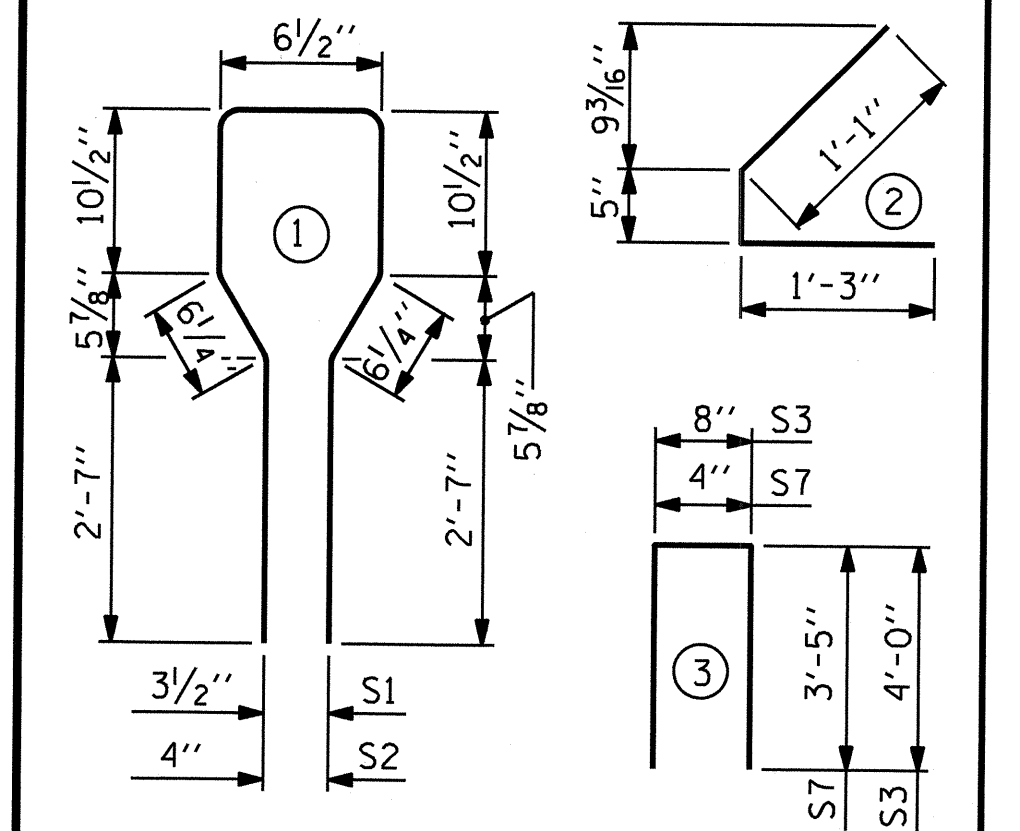
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	52	#4	1	8'-6"	295
S2	12	#6	1	8'-6"	153
S3	4	#4	3	8'-8"	23
S4	56	#4	2	2'-9"	103
*S6	12	#5	STR	3'-8"	46
S7	2	#5	3	7'-2"	15
S8	5	#4	STR	7'-0"	23
S10	1	#3	STR	1'-0"	1

TOTAL LBS. 659

*S6 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

SPAN A	REINFORCING STEEL	5000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LBS.	C.Y.	No.
SPAN A	659	7.0	12

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	48'-4 1/4"	241.77'

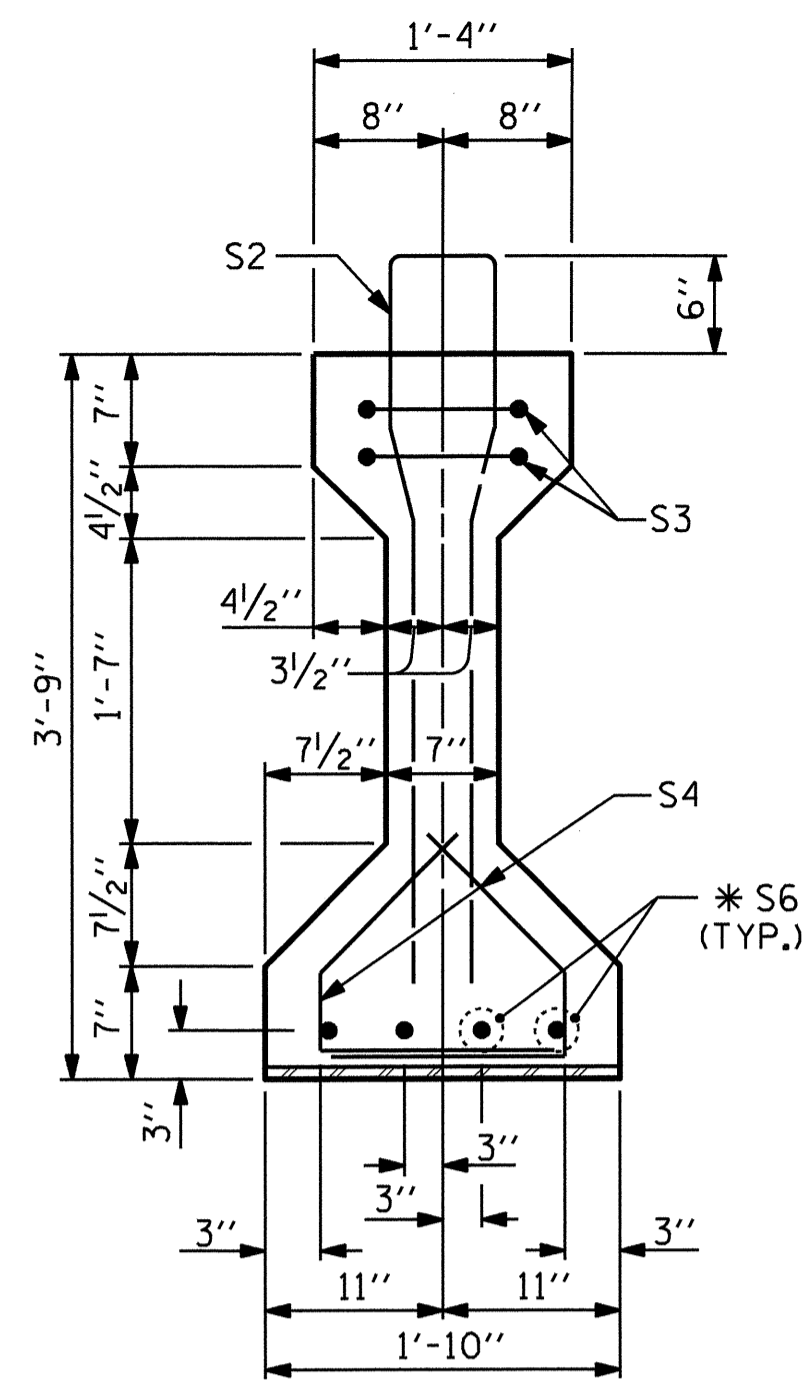
PROJECT NO. B-4286
SWAIN COUNTY
STATION: 16+39.20 -L-

SHEET 1 OF 4

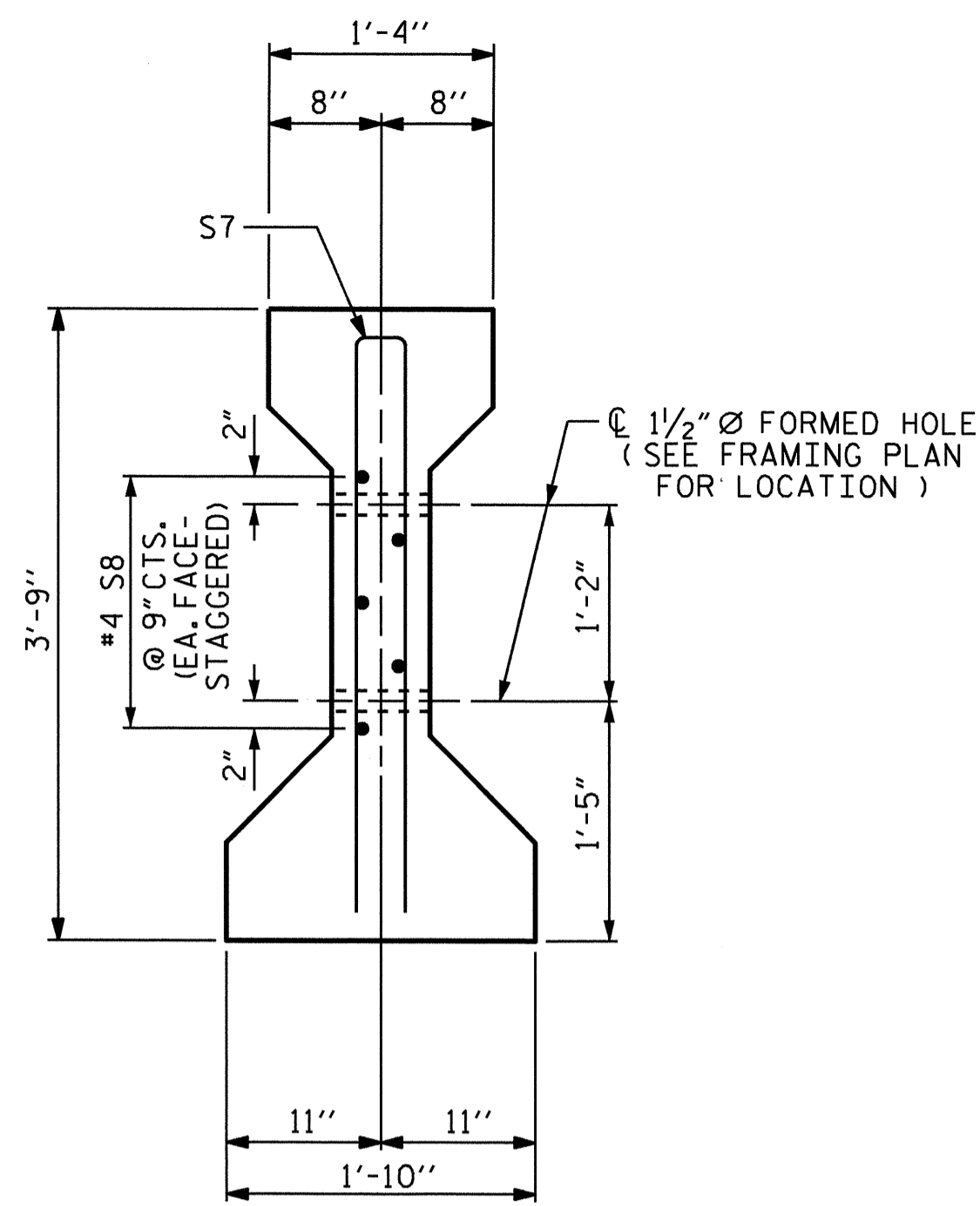
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
AASHTO TYPE III
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
SPAN A

REVISIONS						SHEET NO. S-14
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 41
2			4			

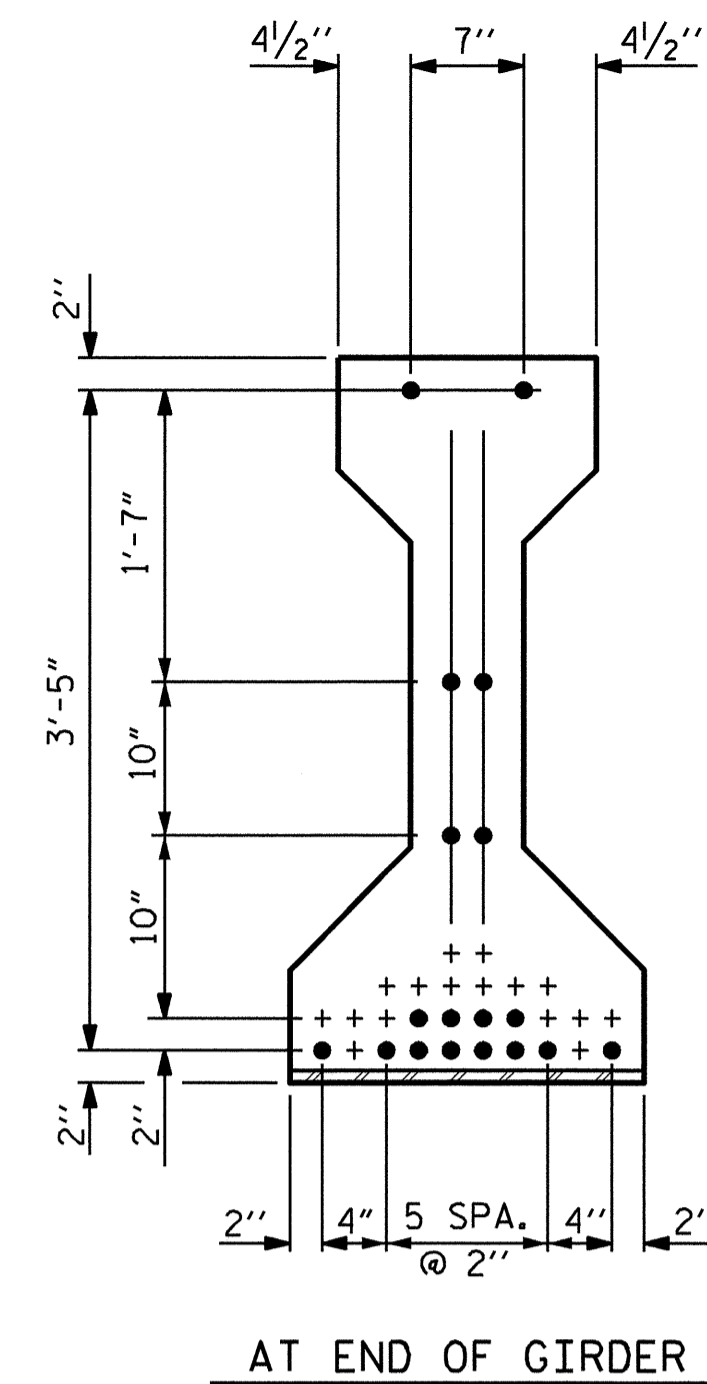
ASSEMBLED BY : OT NGUYEN	DATE : 6-09
CHECKED BY : E.I. OMILE	DATE : 1-10
DRAWN BY : ELR 8/91	REV. 7/17/98 RWW/LES
CHECKED BY : GRP 8/91	REV. 10/17/00R RWW/LES
	REV. 5/1/06 TLA/GM



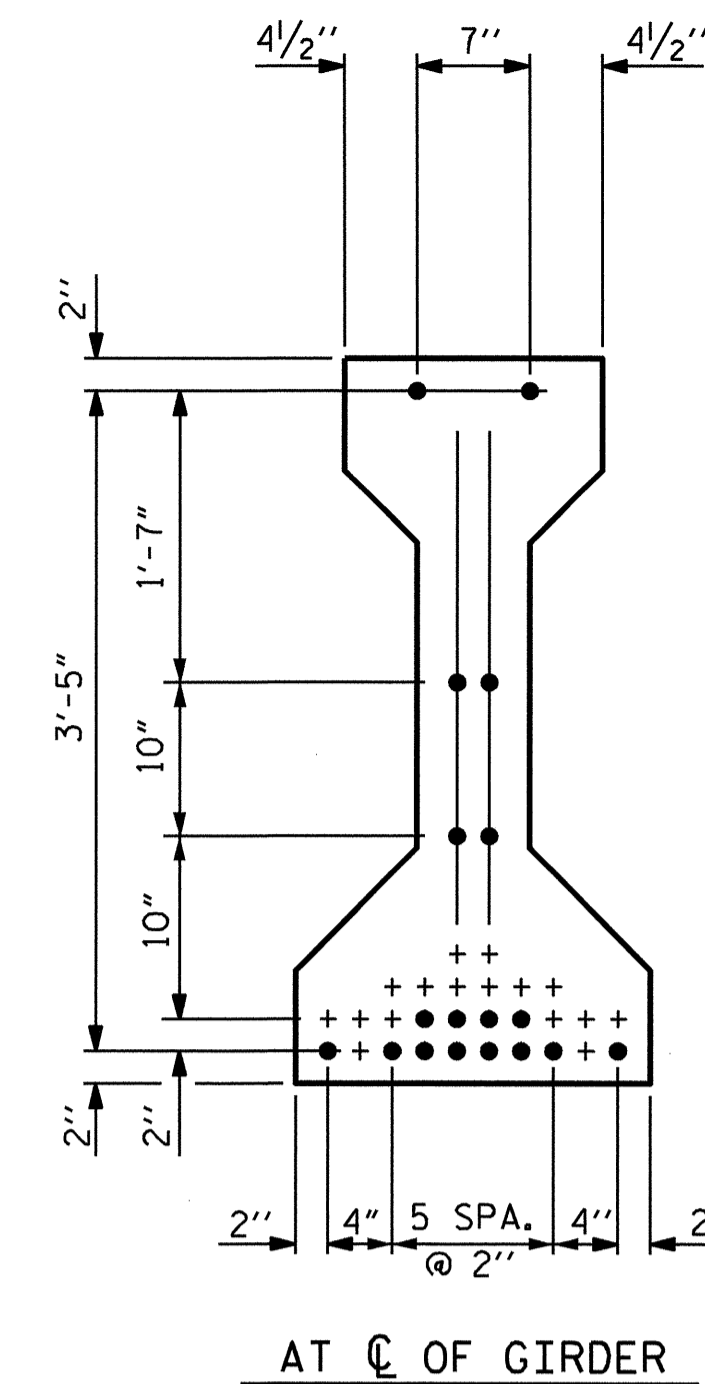
SECTION B-B



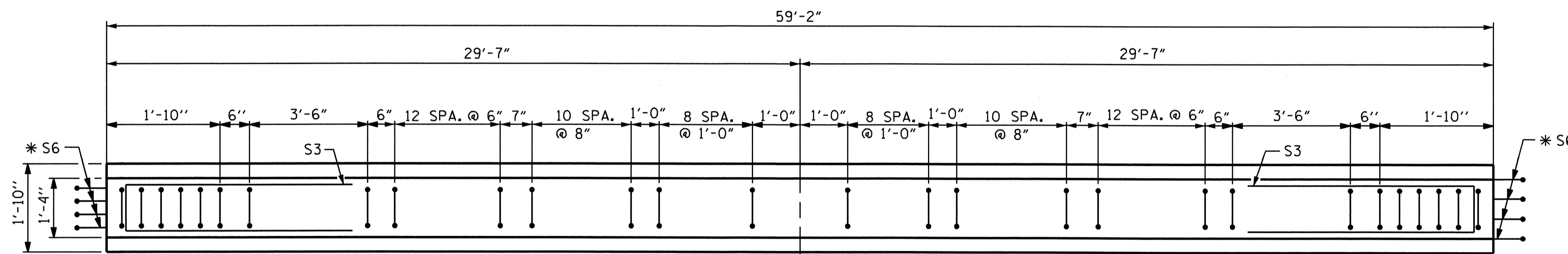
SECTION C-C
(S1 BARS NOT SHOWN)



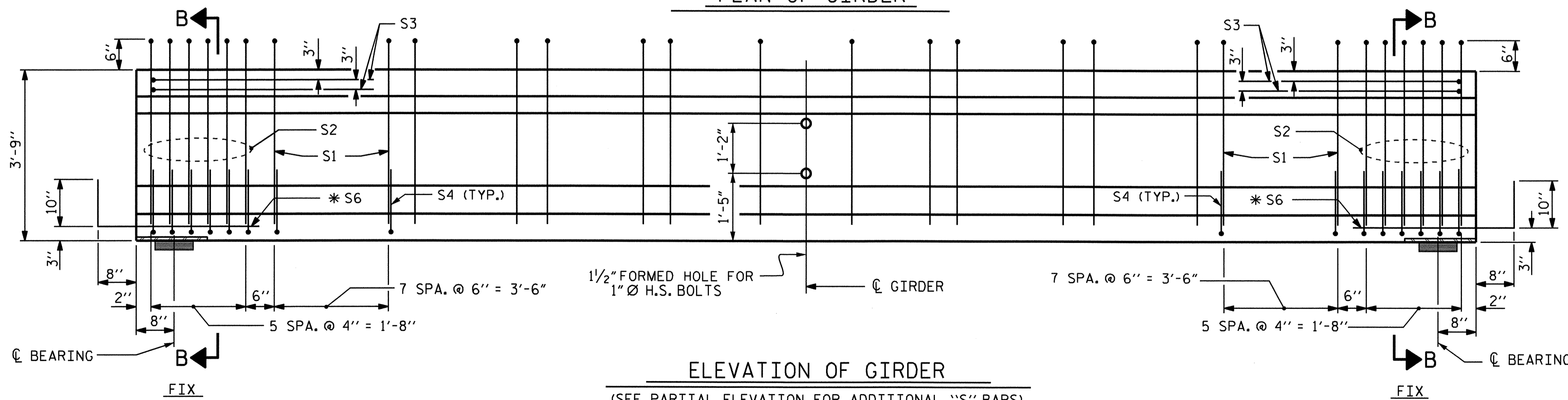
0.6" Ø LOW RELAXATION STRAND LAYOUT (ALL STRAIGHT)



(18 STRANDS REQUIRED)

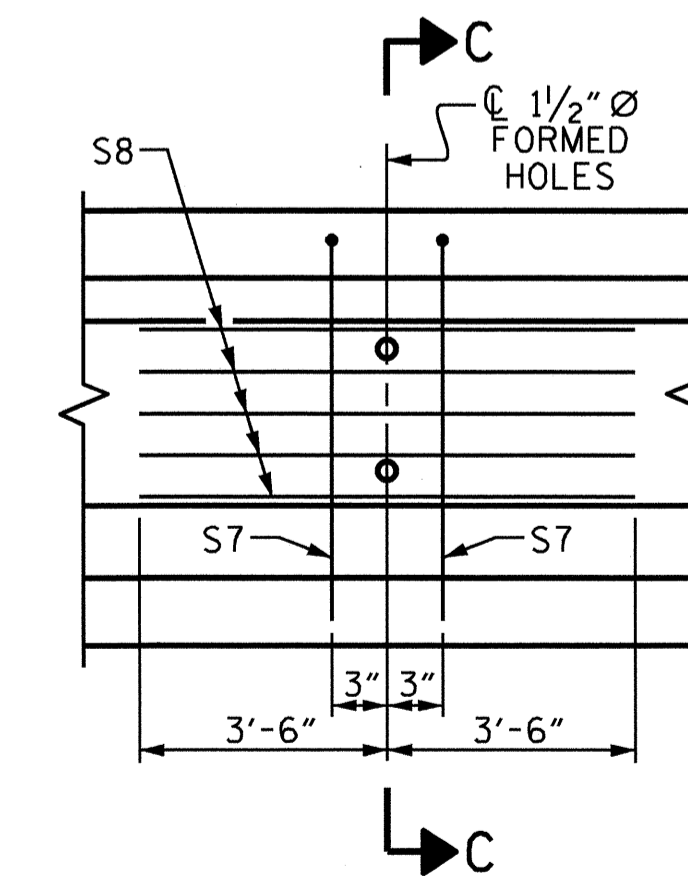


PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR ALL GIRDERS

0.6" Ø L. R. GRADE 270 STRANDS

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

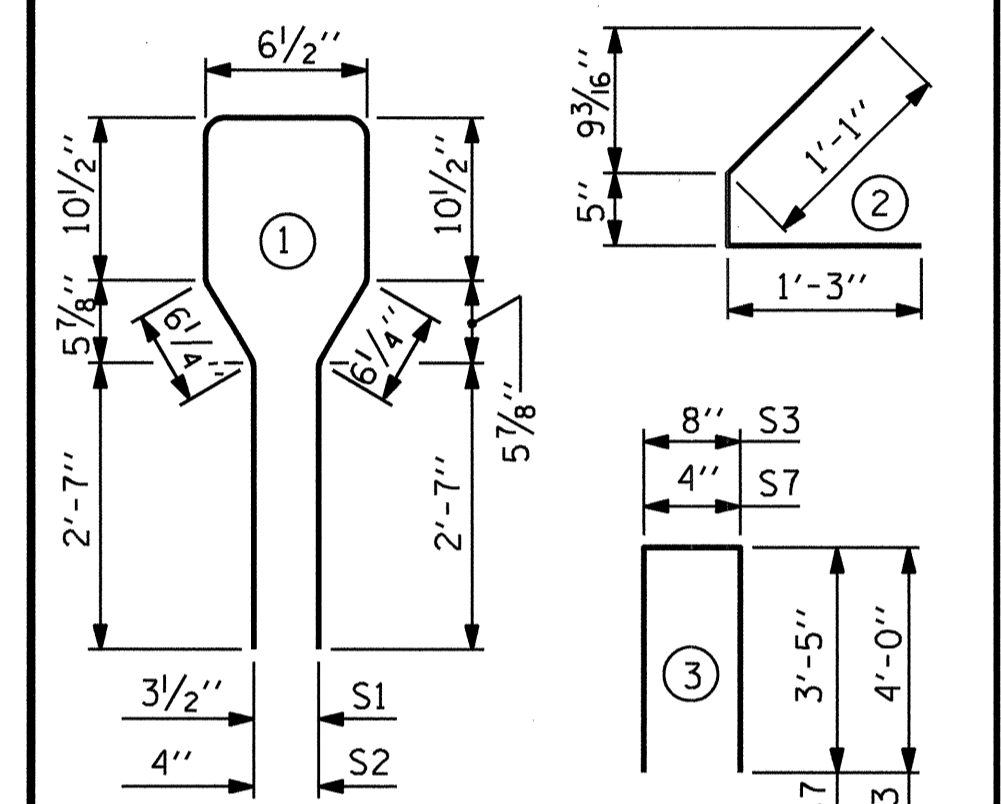
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	82	#4	1	8'-6"	466
S2	12	#6	1	8'-6"	153
S3	4	#4	3	8'-8"	23
S4	56	#4	2	2'-9"	103
*S6	8	#5	STR	3'-8"	31
S7	2	#5	3	7'-2"	15
S8	5	#4	STR	7'-0"	23

TOTAL LBS. 814

*S6 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

SPAN B	REINFORCING STEEL	5000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
SPAN B	814	8.5	18

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	59'-2"	295.83'

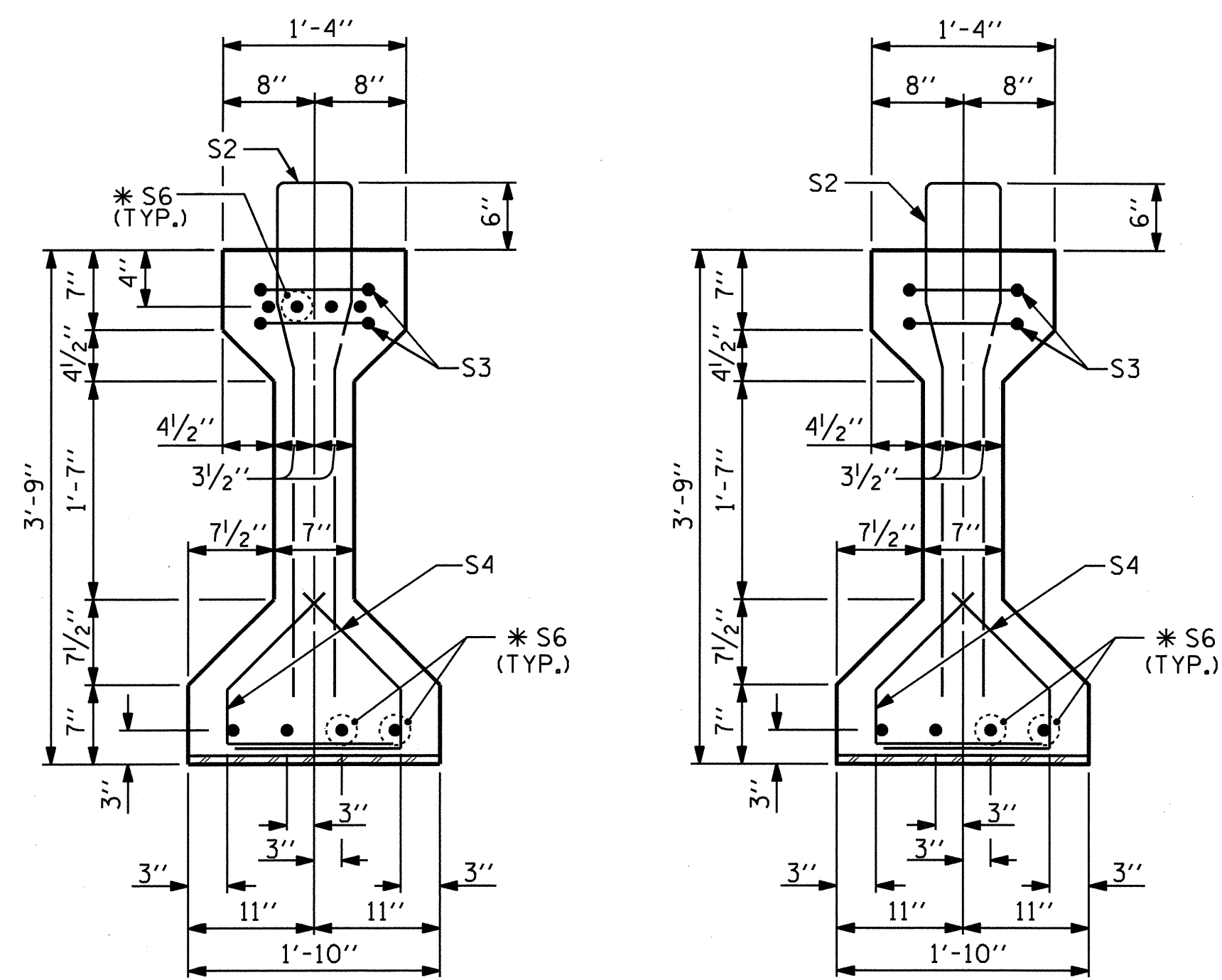


PROJECT NO. B-4286
SWAIN COUNTY
STATION: 16+39.20 -L-

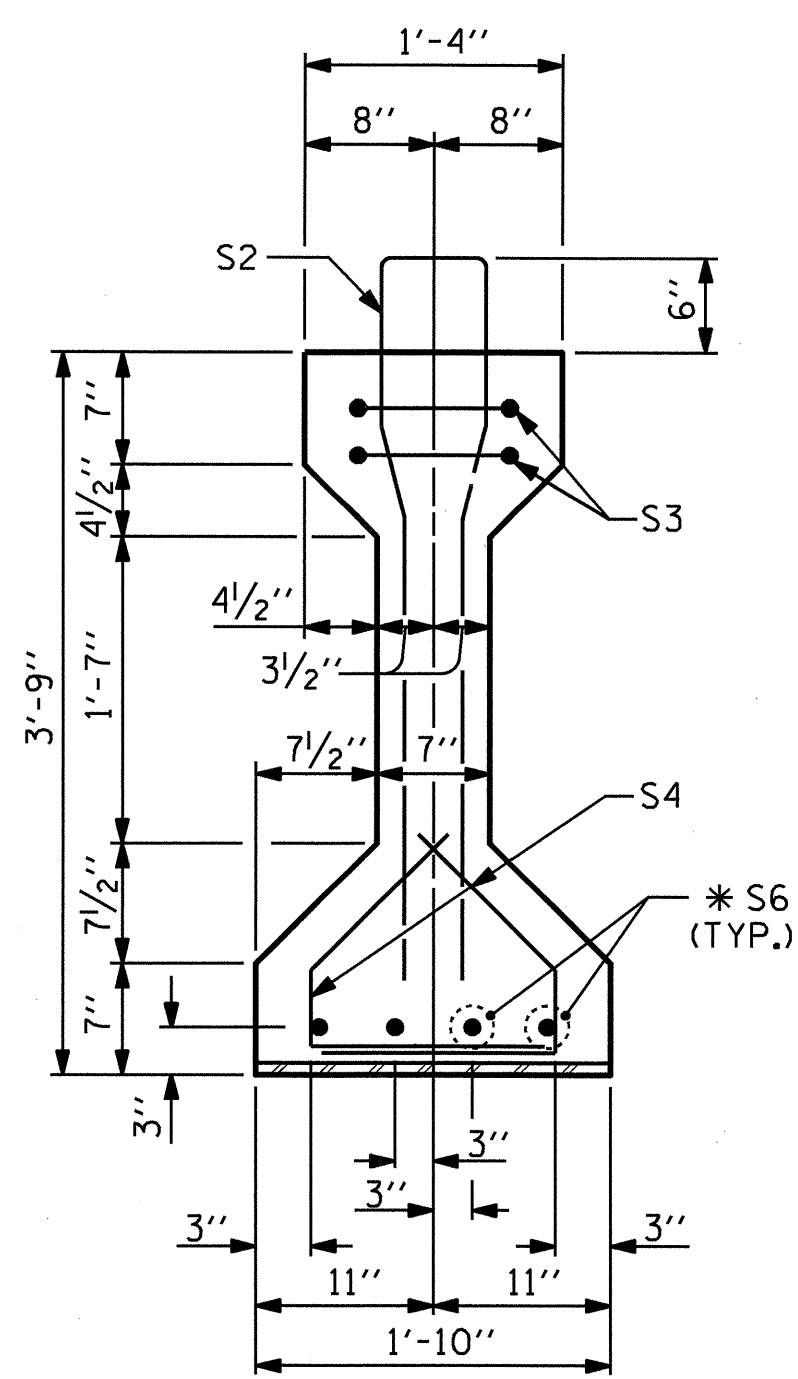
SHEET 2 OF 4
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
AASHTO TYPE III
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
SPAN B

ASSEMBLED BY : QT NGUYEN	DATE : 6-09
CHECKED BY : E.I. OMILE	DATE : 1-10
DRAWN BY : ELR 8/91	REV. 7/17/98 RWN/LES
CHECKED BY : GRP 8/91	REV. 10/17/00R RWN/LES
	REV. 5/1/06 TLA/GM

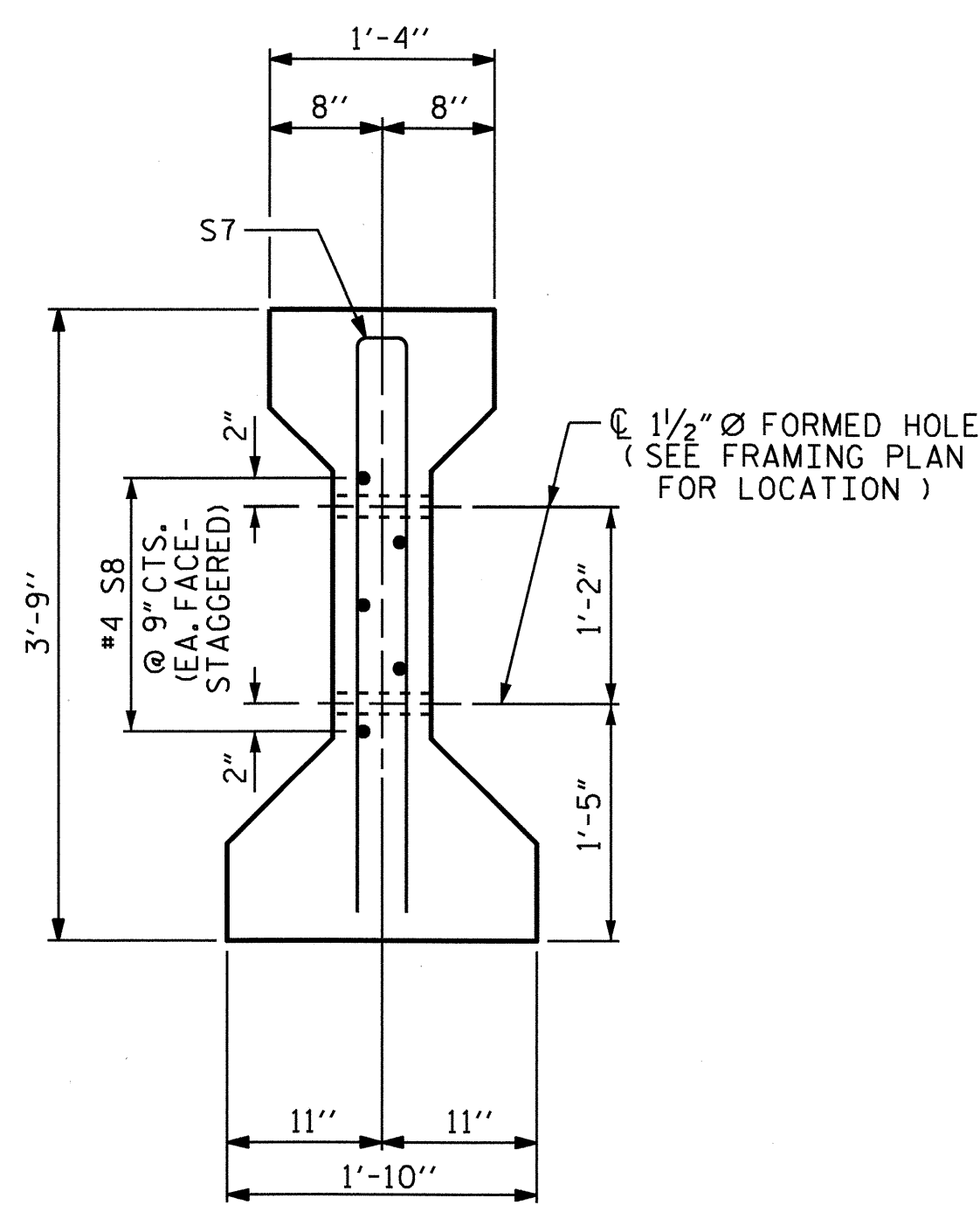
REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	S-15
1			3	TOTAL SHEETS
2			4	41



SECTION A-A

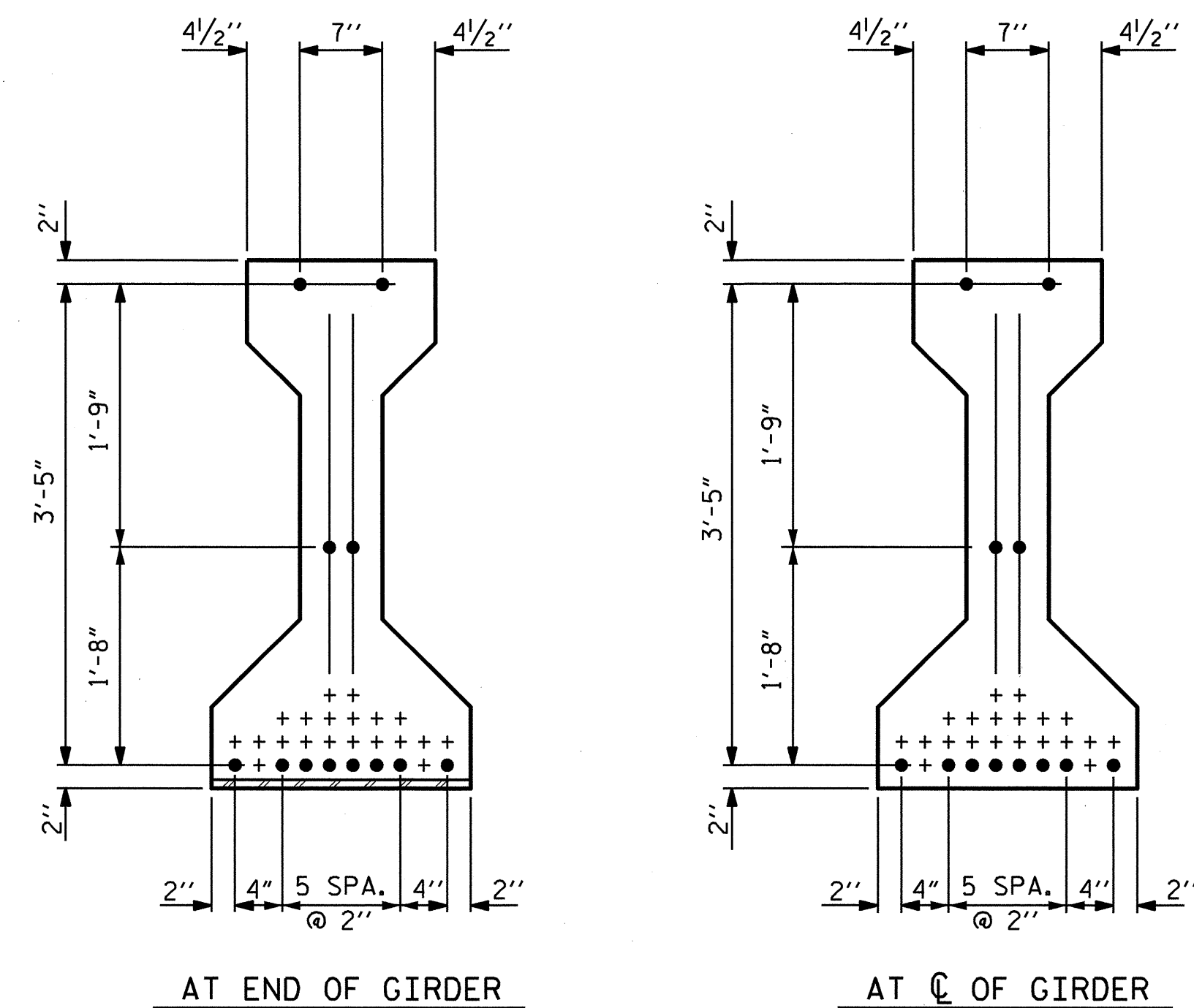


SECTION B-B



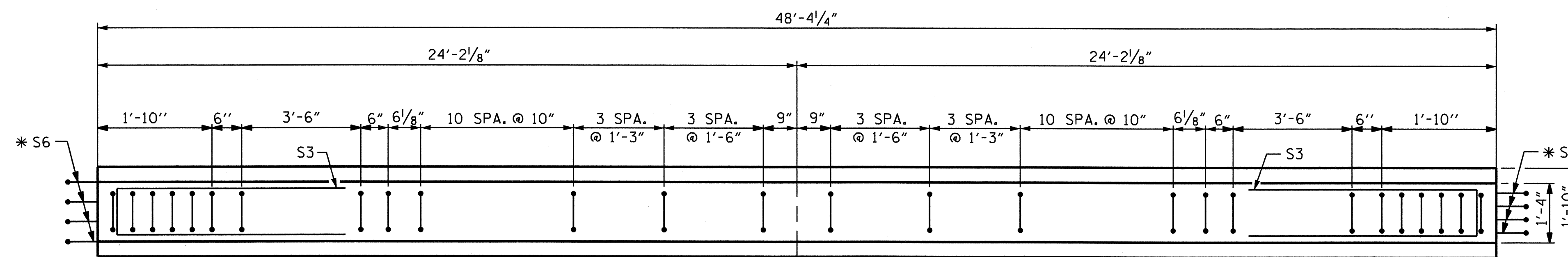
SECTION C-C

(S1 BARS NOT SHOWN)

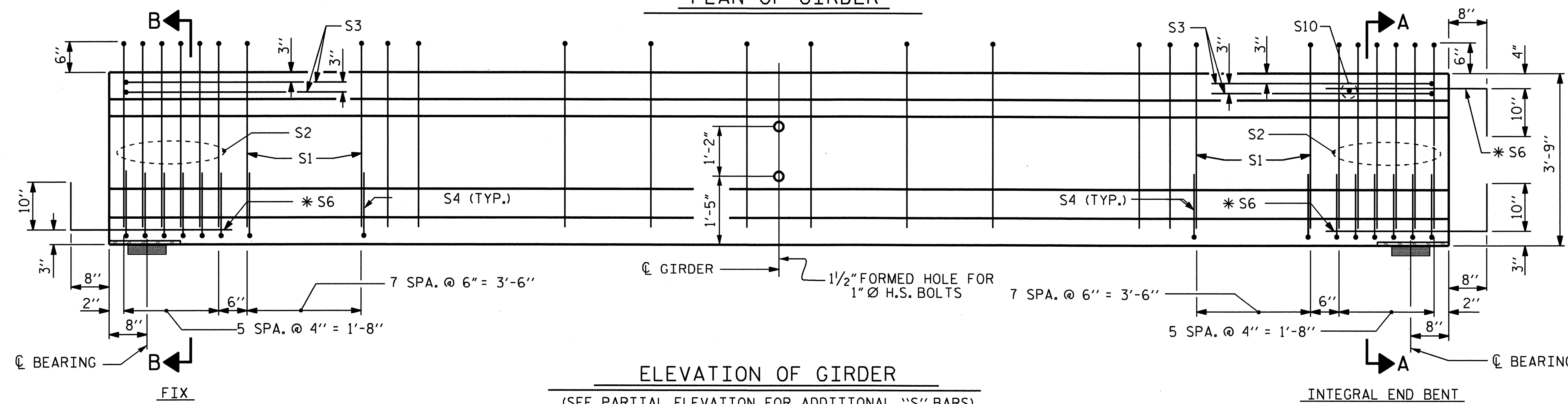


0.6" Ø LOW RELAXATION STRAND LAYOUT (ALL STRAIGHT)

(12 STRANDS REQUIRED)

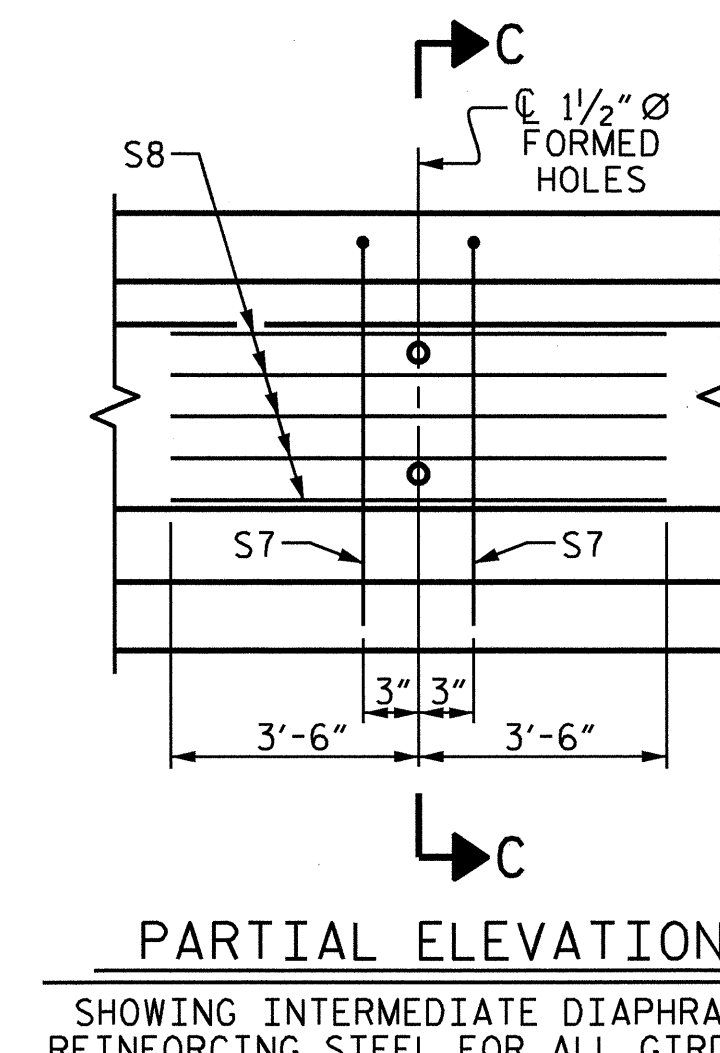


PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR ALL GIRDERS

0.6" Ø L. R. GRADE 270 STRANDS

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

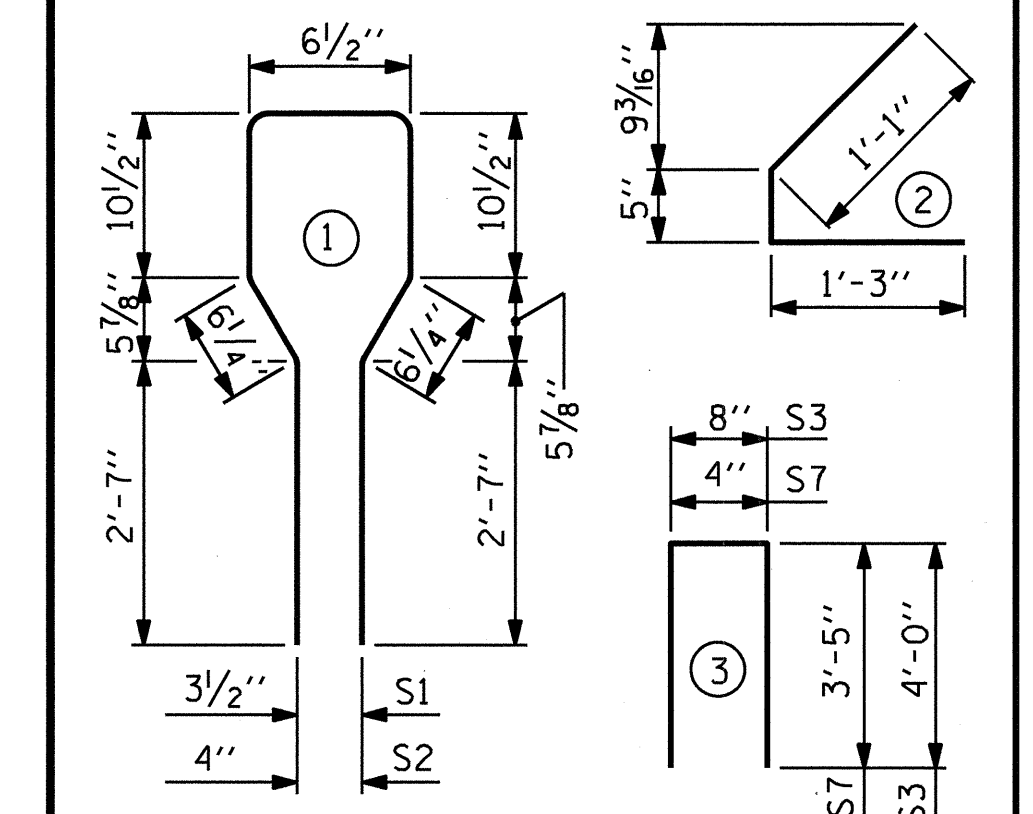
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	52	#4	1	8'-6"	295
S2	12	#6	1	8'-6"	153
S3	4	#4	3	8'-8"	23
S4	56	#4	2	2'-9"	103
*S6	12	#5	STR	3'-8"	46
S7	2	#5	3	7'-2"	15
S8	5	#4	STR	7'-0"	23
S10	1	#3	STR	1'-0"	1

TOTAL LBS. 659

*S6 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

SPAN C	REINFORCING STEEL	5000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
SPAN C	659	7.0	12

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	48'-4 1/4"	241.77'

PROJECT NO. B-4286
 SWAIN COUNTY
 STATION: 16+39.20 -L-

SHEET 3 OF 4

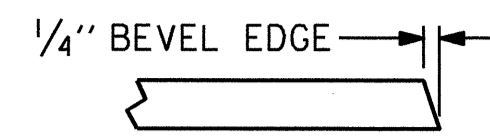
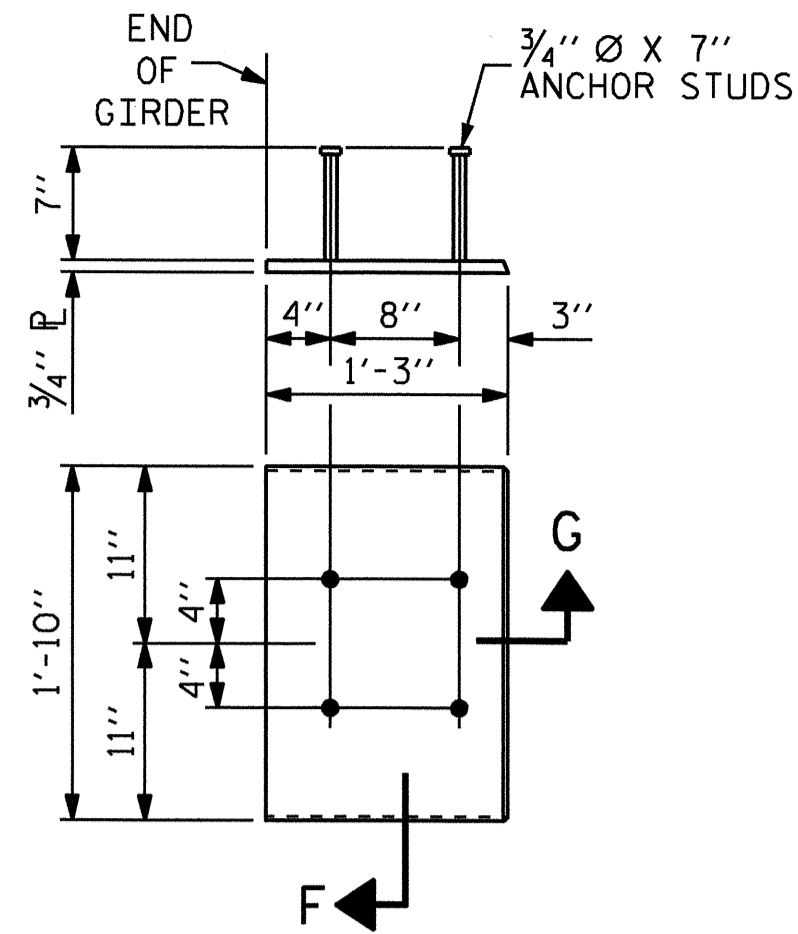
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 AASHTO TYPE III
 PRESTRESSED CONCRETE GIRDER
 CONTINUOUS FOR LIVE LOAD
 SPAN C

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

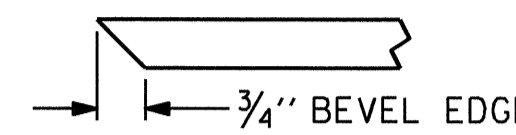
TOTAL SHEETS 41

ASSEMBLED BY :	QT NGUYEN	DATE :	6-09
CHECKED BY :	E.I. OMILE	DATE :	1-10
DRAWN BY :	ELR 8/91	REV. 7/17/98	RWW/LES
CHECKED BY :	GRP 8/91	REV. 10/17/00R	RWW/LES
		REV. 5/1/06	TLA/GM

NOTES



SECTION "G"



SECTION "F"

(SEE NOTES)

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

(2 REQ'D PER GIRDER)

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

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

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

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".

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

DEAD LOAD DEFLECTION TABLE

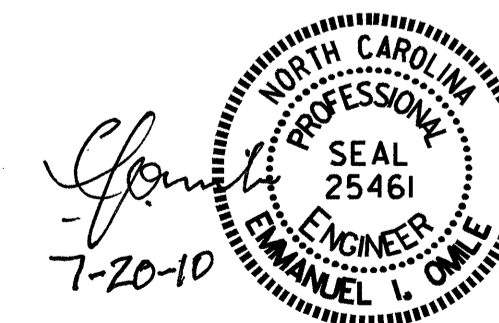
0.6" Ø LOW RELAXATION		SPAN A																					
		GIRDERS 2, 3 & 4										GIRDERS 1 & 5											
TENTH POINTS		0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE)	↑	0.0	0.134	0.253	0.346	0.405	0.425	0.405	0.346	0.253	0.134	0.0	0.0	0.134	0.253	0.346	0.405	0.425	0.405	0.346	0.253	0.134	0.0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.0	0.088	0.167	0.229	0.268	0.282	0.268	0.229	0.167	0.088	0.0	0.0	0.078	0.148	0.203	0.238	0.250	0.238	0.203	0.148	0.078	0.0
FINAL CAMBER	↑	0.0	1/16"	1/16"	1/8"	1/8"	1/8"	1/8"	1/8"	1/16"	1/16"	0.0	0.0	1/16"	1/8"	1/8"	3/16"	3/16"	3/16"	1/8"	1/8"	1/16"	0.0
0.6" Ø LOW RELAXATION		SPAN B																					
		GIRDERS 2, 3 & 4										GIRDERS 1 & 5											
TENTH POINTS		0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE)	↑	0.0	0.373	0.706	0.966	1.132	1.188	1.132	0.966	0.706	0.373	0.0	0.0	0.373	0.706	0.966	1.132	1.188	1.132	0.966	0.706	0.373	0.0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.0	0.202	0.382	0.523	0.612	0.643	0.612	0.523	0.382	0.202	0.0	0.0	0.179	0.339	0.464	0.544	0.571	0.544	0.464	0.339	0.179	0.0
FINAL CAMBER	↑	0.0	3/16"	5/16"	7/16"	1/2"	9/16"	1/2"	7/16"	5/16"	3/16"	0.0	0.0	3/16"	3/8"	1/2"	9/16"	5/8"	9/16"	1/2"	3/8"	3/16"	0.0
0.6" Ø LOW RELAXATION		SPAN C																					
		GIRDERS 2, 3 & 4										GIRDERS 1 & 5											
TENTH POINTS		0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE)	↑	0.0	0.134	0.253	0.346	0.405	0.425	0.405	0.346	0.253	0.134	0.0	0.0	0.134	0.253	0.346	0.405	0.425	0.405	0.346	0.253	0.134	0.0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.0	0.088	0.167	0.229	0.268	0.282	0.268	0.229	0.167	0.088	0.0	0.0	0.078	0.148	0.203	0.238	0.250	0.238	0.203	0.148	0.078	0.0
FINAL CAMBER	↑	0.0	1/16"	1/16"	1/8"	1/8"	1/8"	1/8"	1/8"	1/16"	1/16"	0.0	0.0	1/16"	1/8"	1/8"	3/16"	3/16"	3/16"	1/8"	1/8"	1/16"	0.0

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

PROJECT NO. B-4286
SWAIN COUNTY
STATION: 16+39.20 -L-

SHEET 4 OF 4

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



ASSEMBLED BY : OT NGUYEN	DATE : 6-09
CHECKED BY : E.I. OMILE	DATE : 1-10
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-17
1			3			TOTAL SHEETS
2			4			41

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 THE STANDARD SPECIFICATIONS. FOR DIRECT TENSION INDICATORS, SEE SPECIAL PROVISIONS.

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

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

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

GALVANIZE THE HIGH STRENGTH BOLTS, NUTS, WASHERS AND DIRECT TENSION INDICATORS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR HIGH STRENGTH BOLTS, 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. HARDENED WASHERS AND DIRECT TENSION INDICATORS ARE TO BE USED IN CONJUNCTION WITH THE PLATE WASHERS IN THE CHANNEL MEMBER CONNECTION.

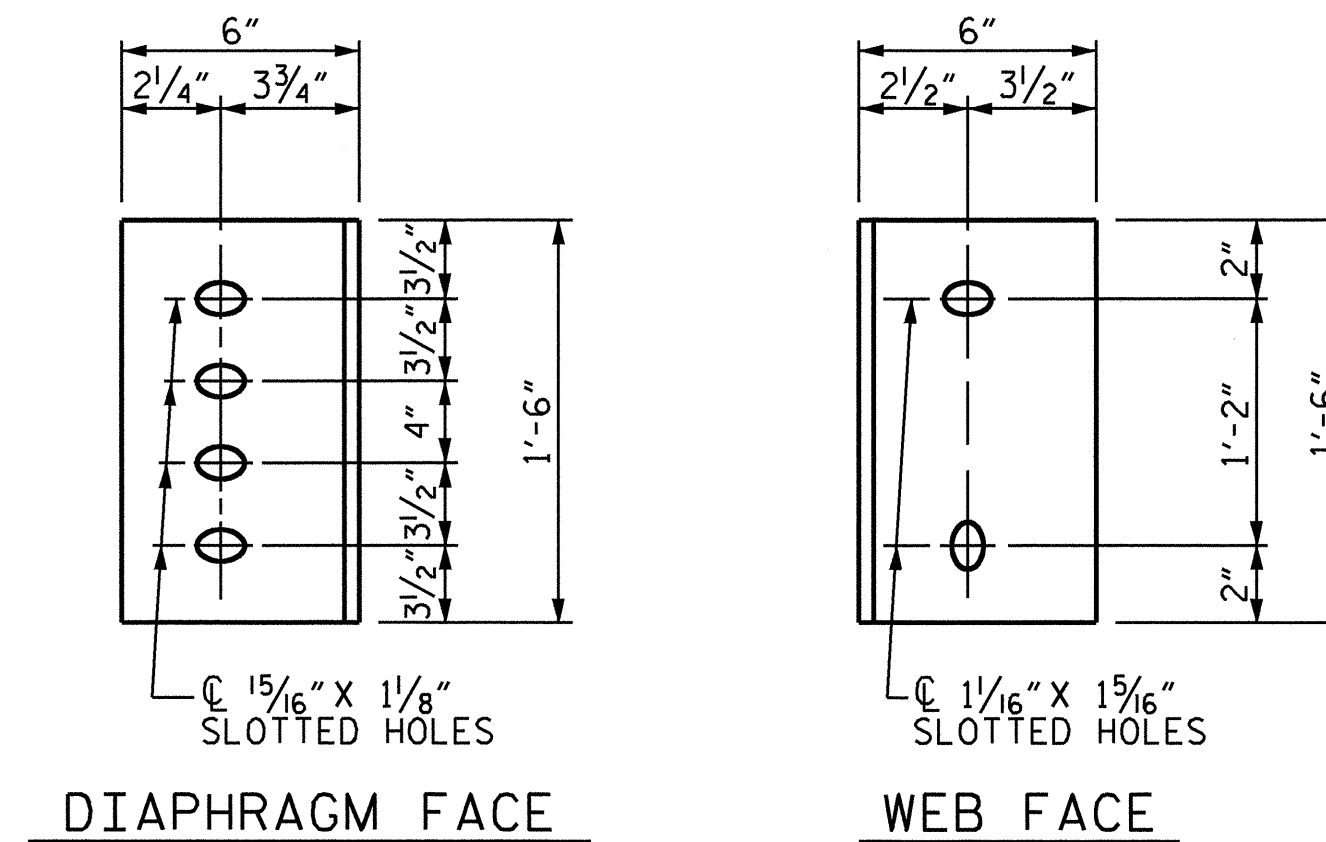
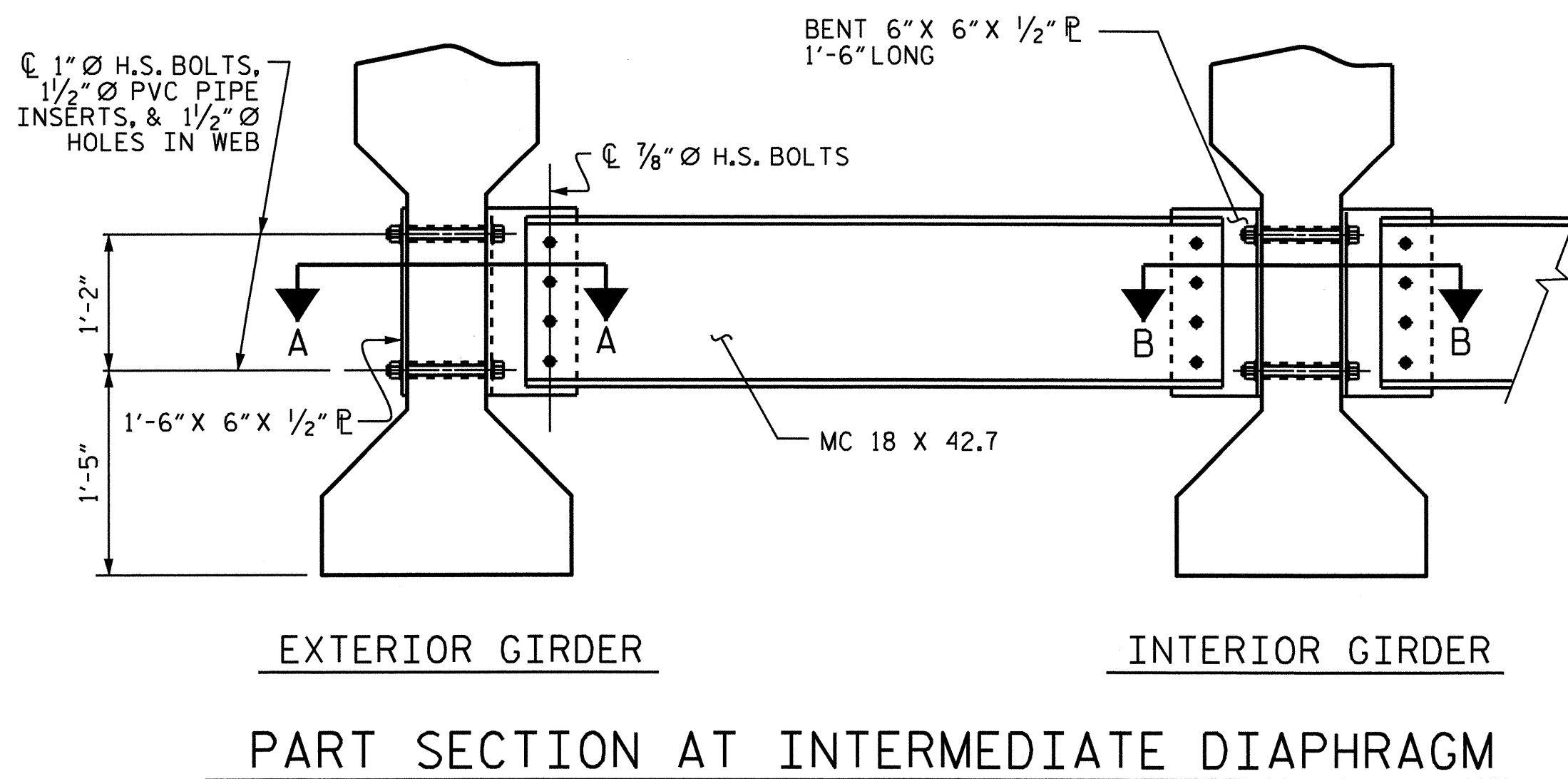
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

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.



CONNECTOR PLATE DETAILS

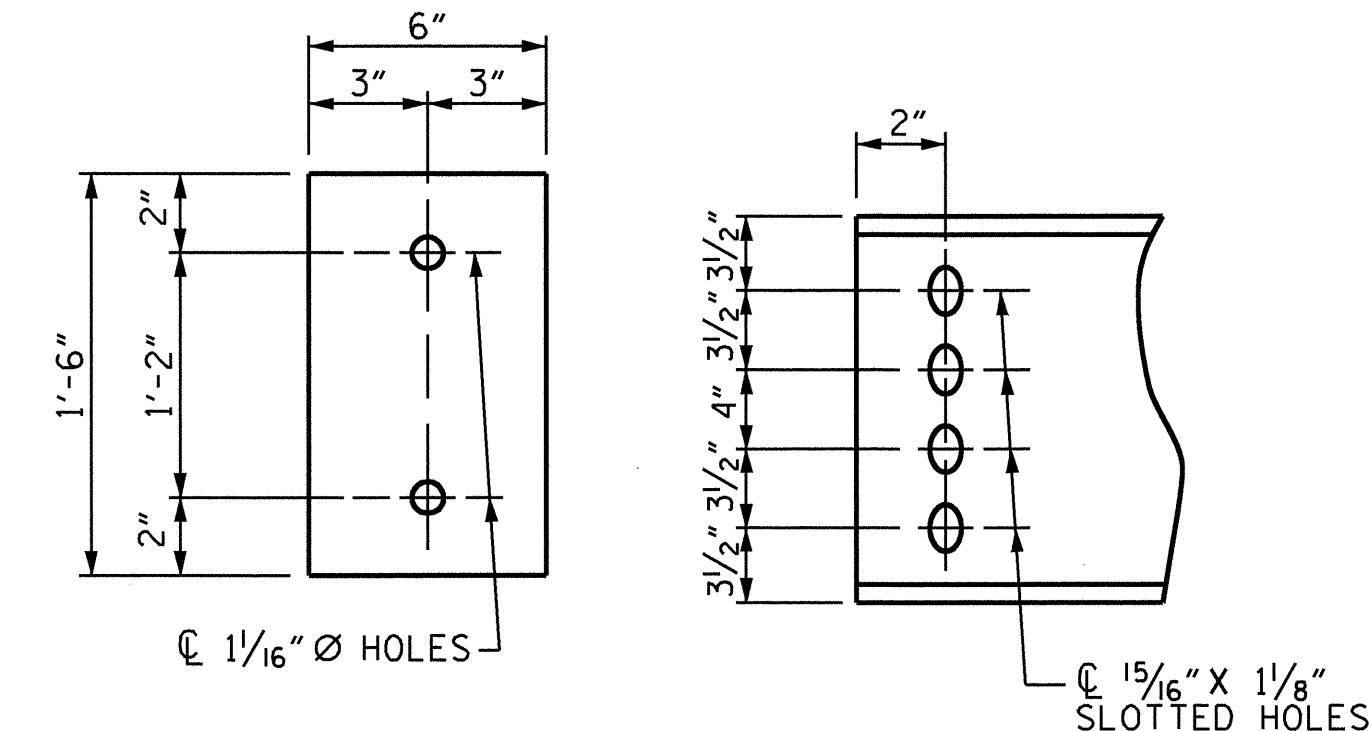
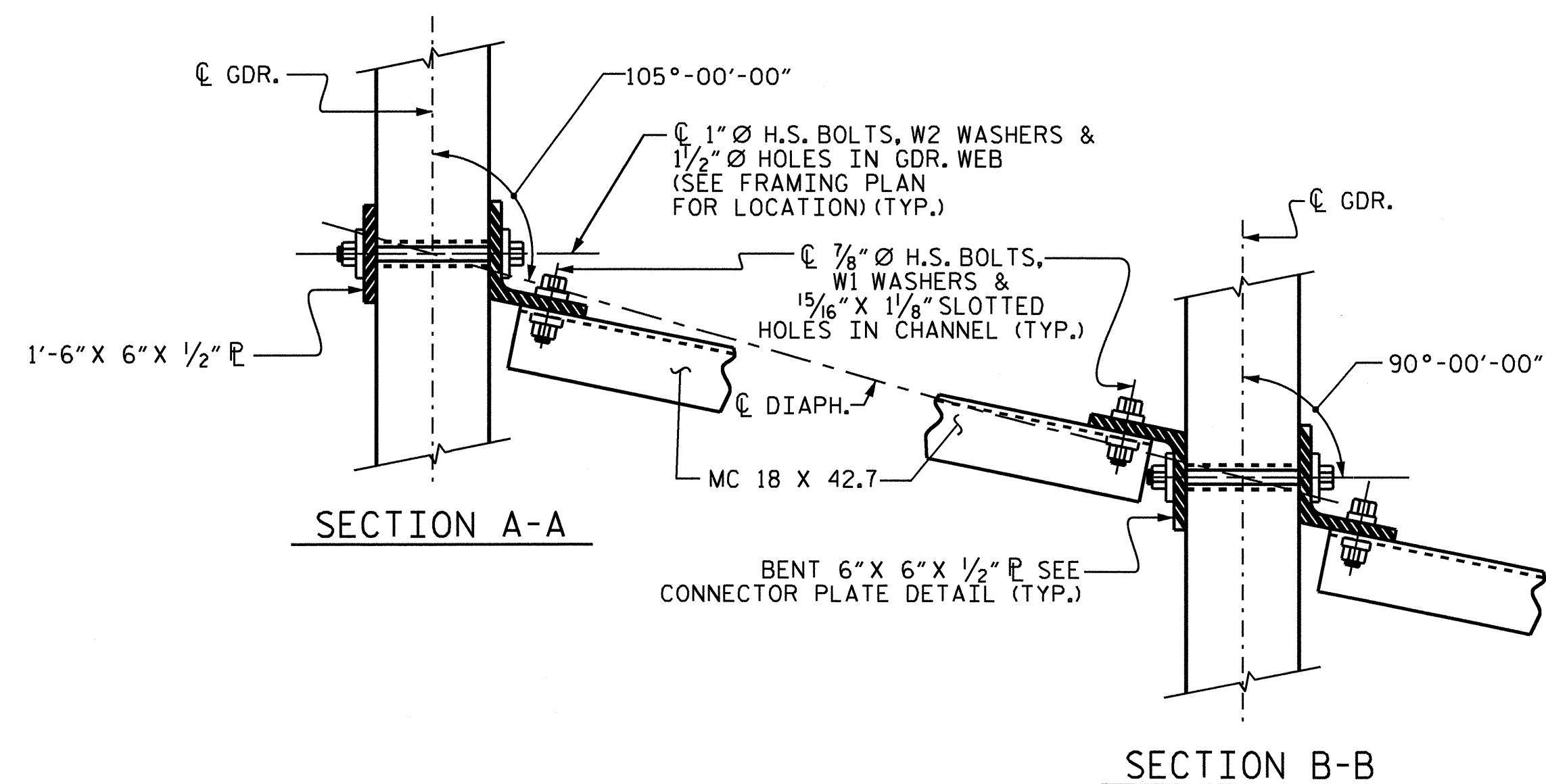
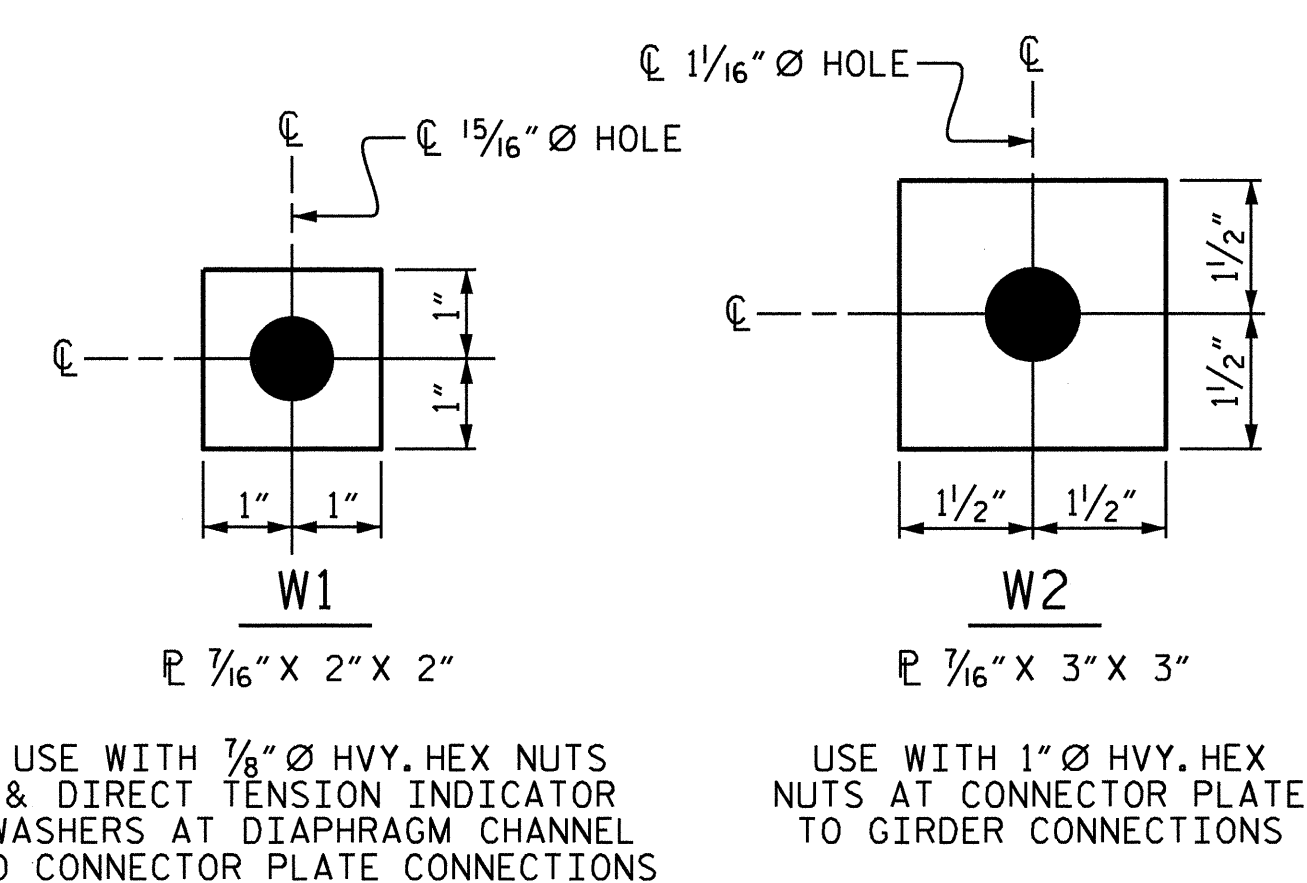


PLATE DETAILS CHANNEL END

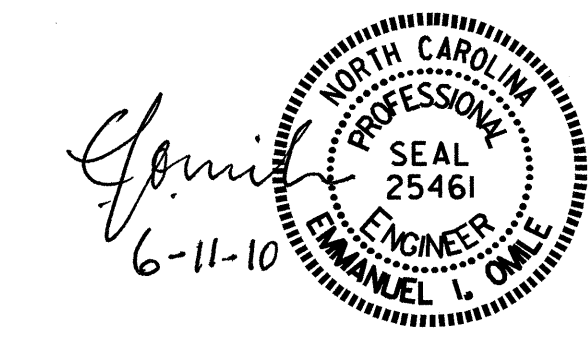


CONNECTION DETAILS



WASHER DETAILS

PROJECT NO. B-4286
SWAIN COUNTY
STATION: 16+39.20 -L-



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

ASSEMBLED BY : QT NGUYEN	DATE : 6-09
CHECKED BY : E.I. OMILE	DATE : 1-10
DRAWN BY : TLA 6/05	ADDED 10/21/05
CHECKED BY : VC 6/05	REV. 5/1/06RR KMM/GM

REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	DATE:	S-18
1			3		TOTAL SHEETS
2			4		41

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.

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

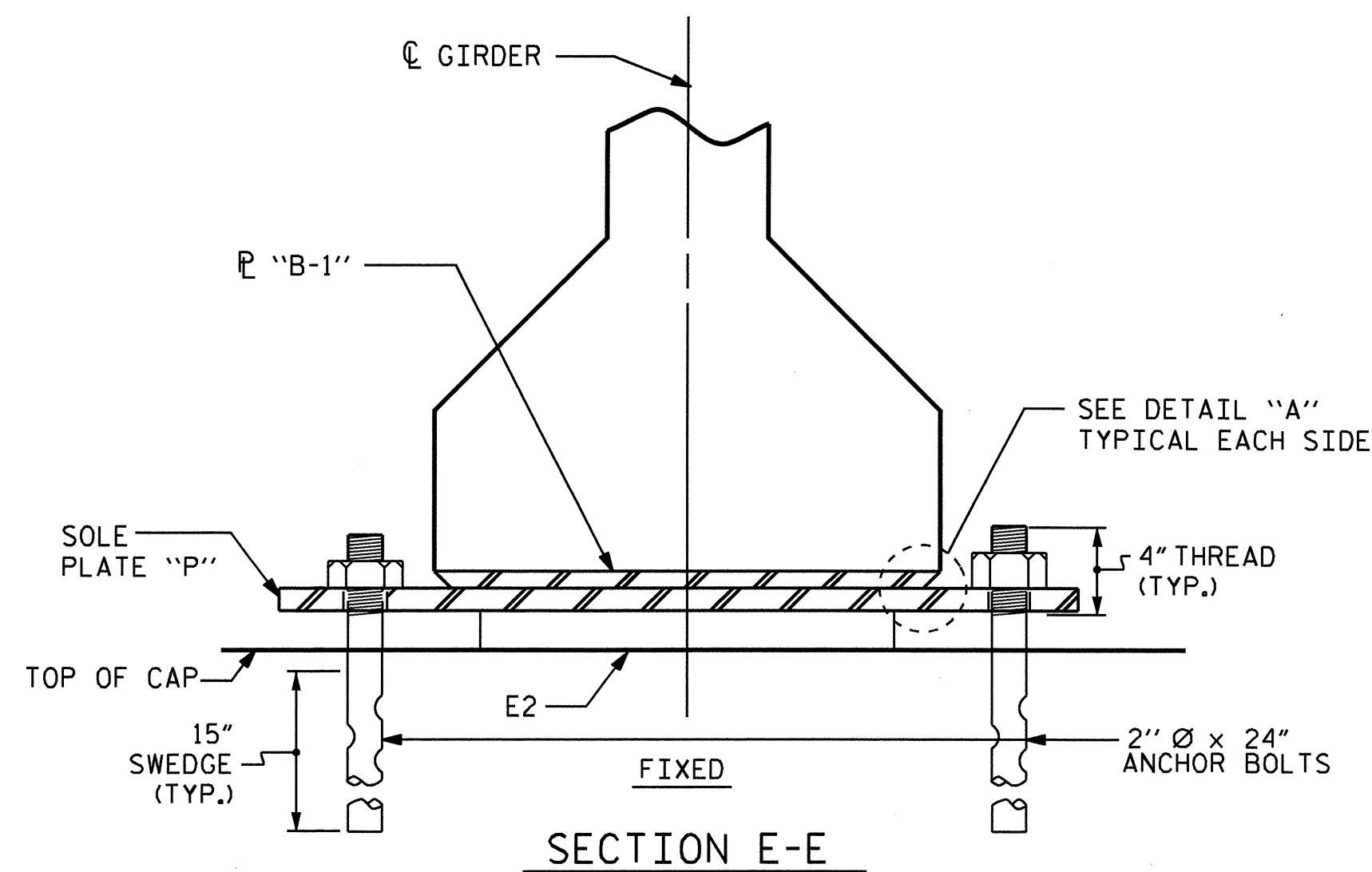
PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE PORTION OF THE EMBEDDED PLATE AND SOLE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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.

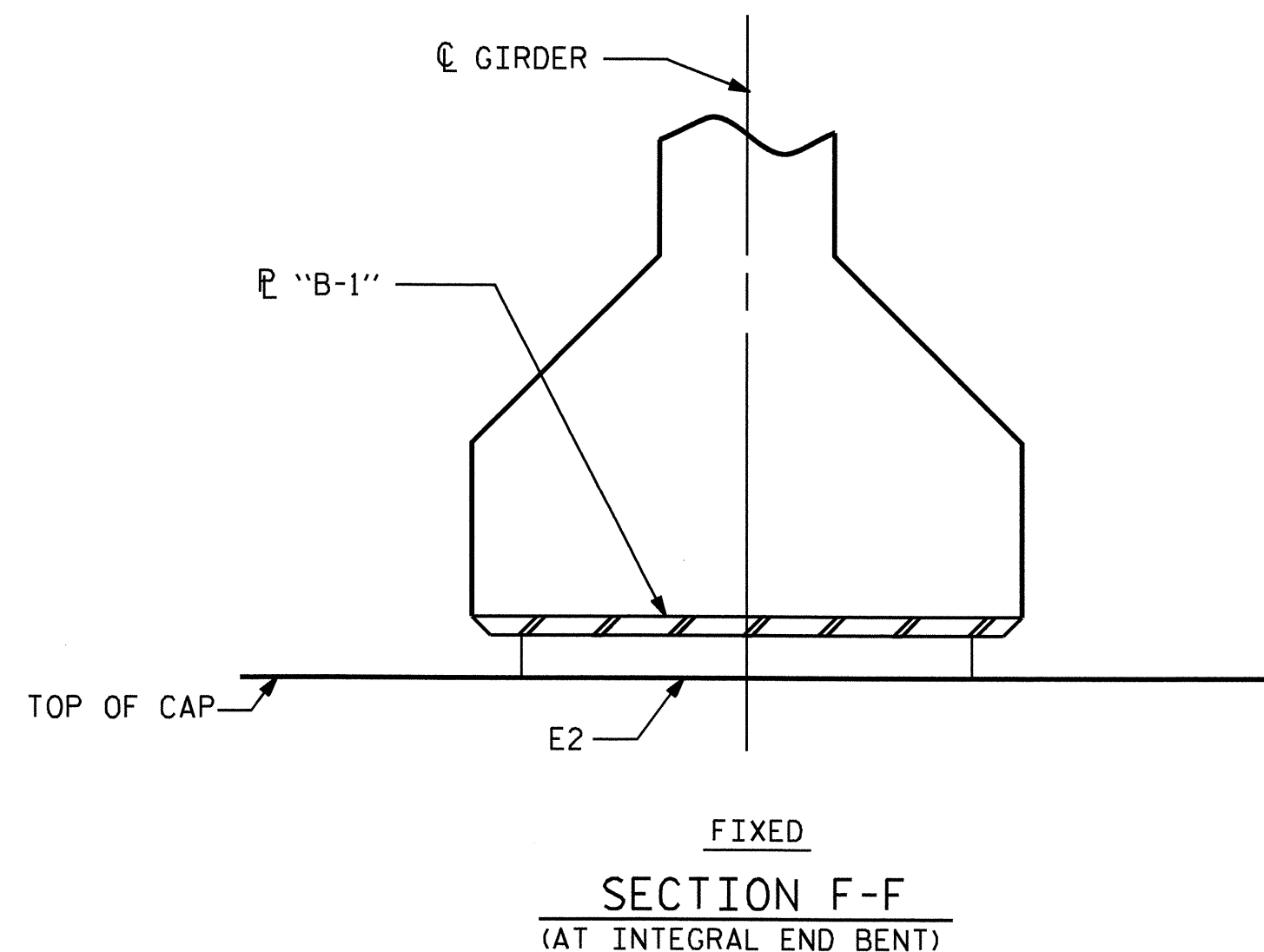
SOLE PLATE "P", BOLTS, NUTS, AND WASHERS SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

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.

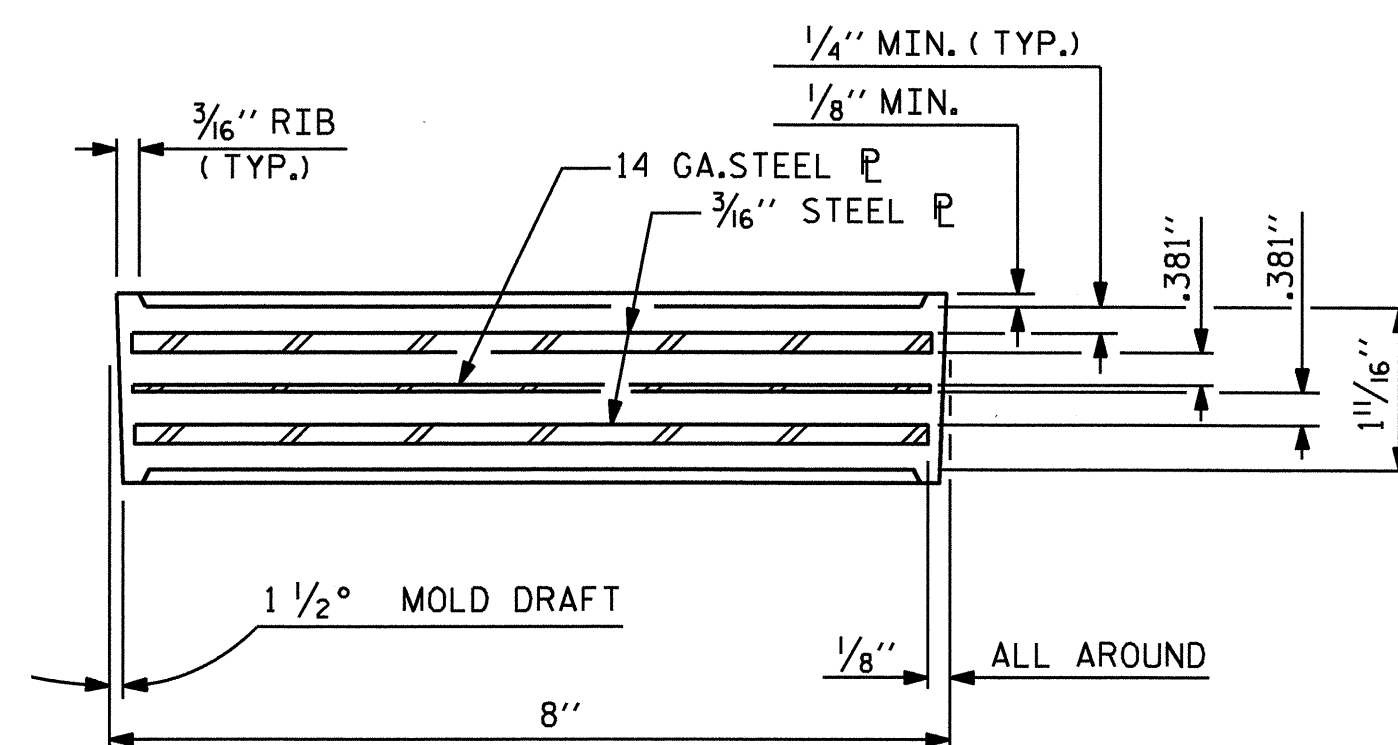
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.



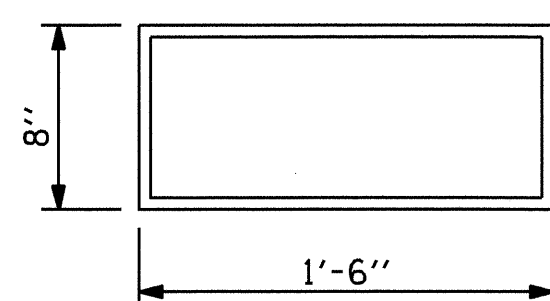
SECTION E-E



**SECTION F-F
(AT INTEGRAL END BENT)**



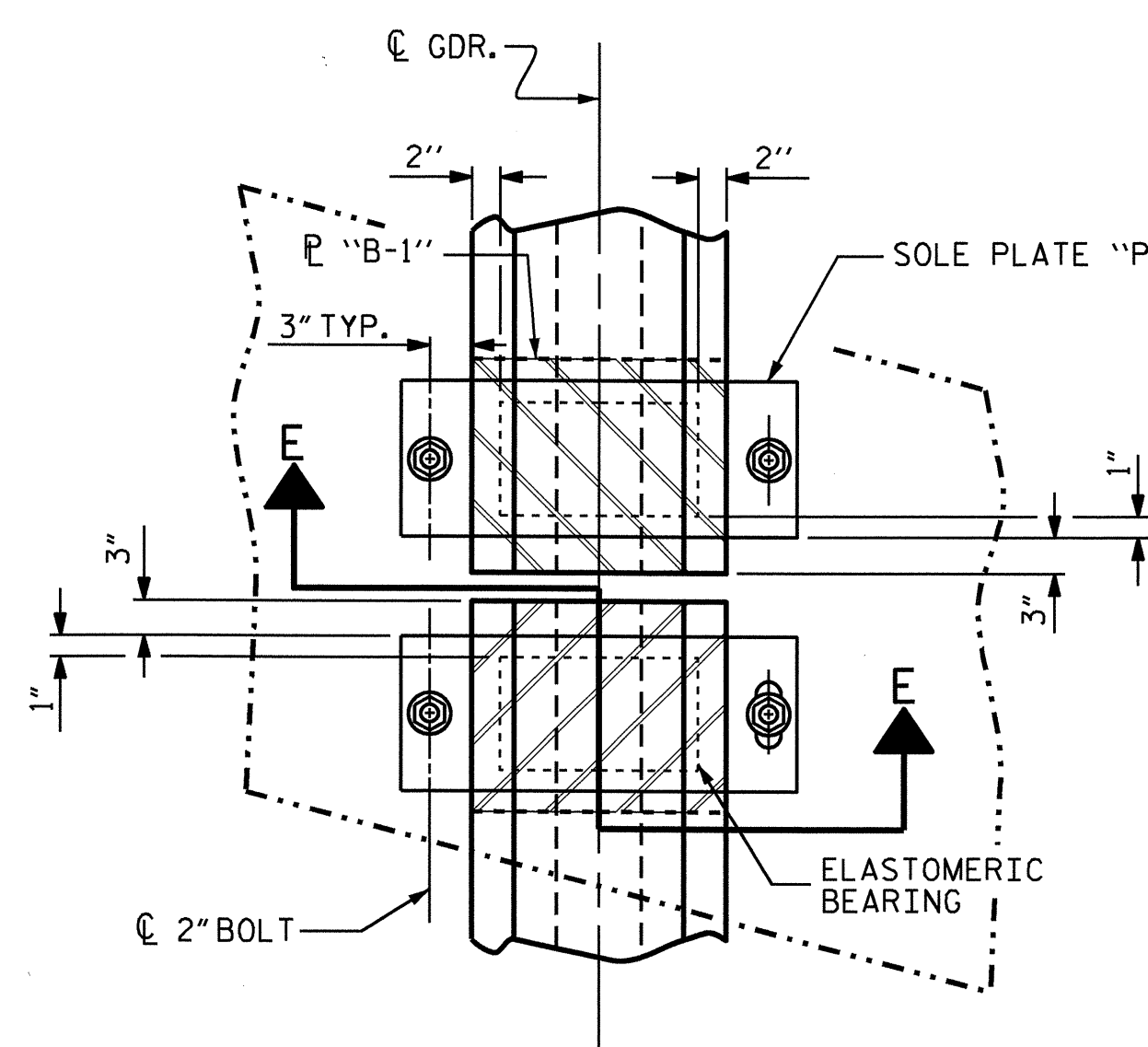
**TYPICAL SECTION OF ELASTOMERIC BEARINGS
(TYP. FOR E1 & E2)**



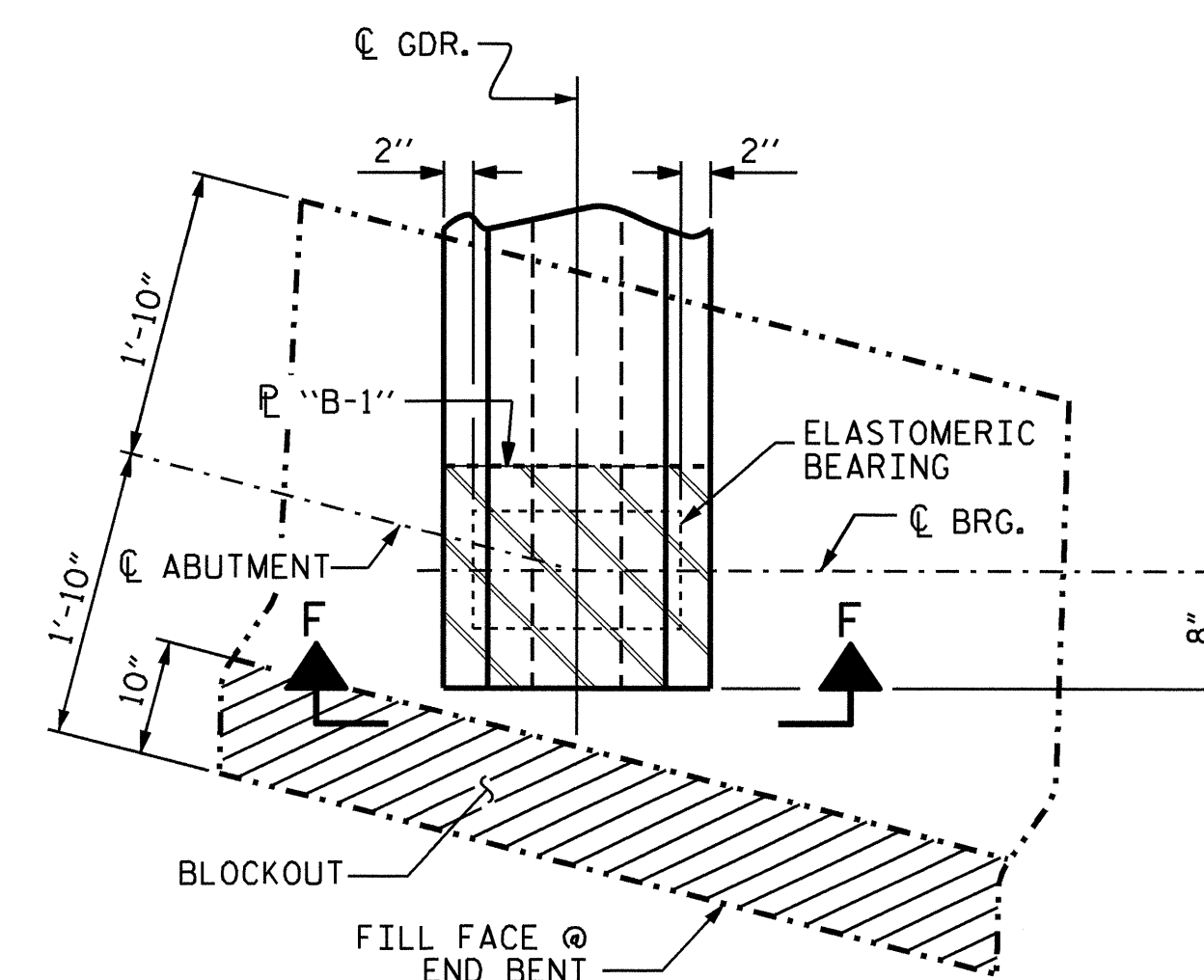
E2 (30 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE III

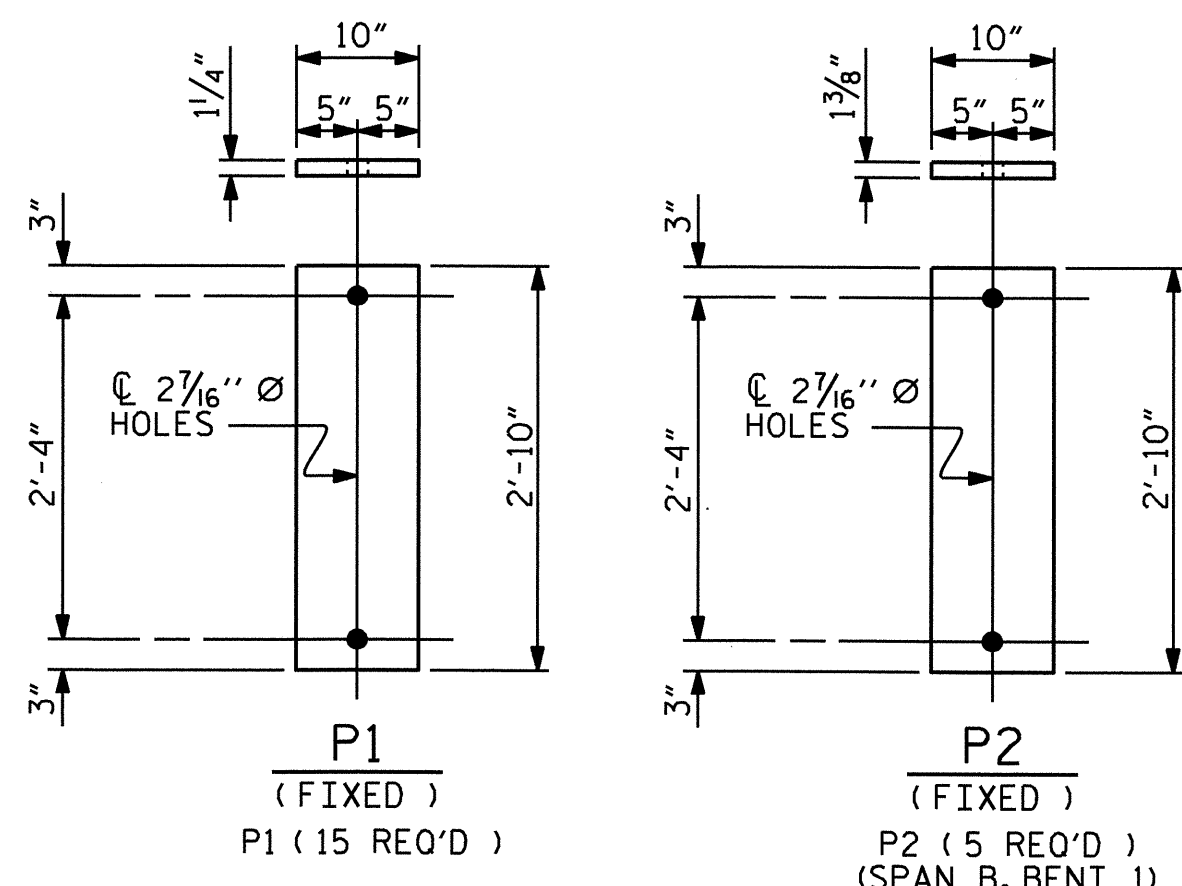


TYPICAL PLAN AT BENT

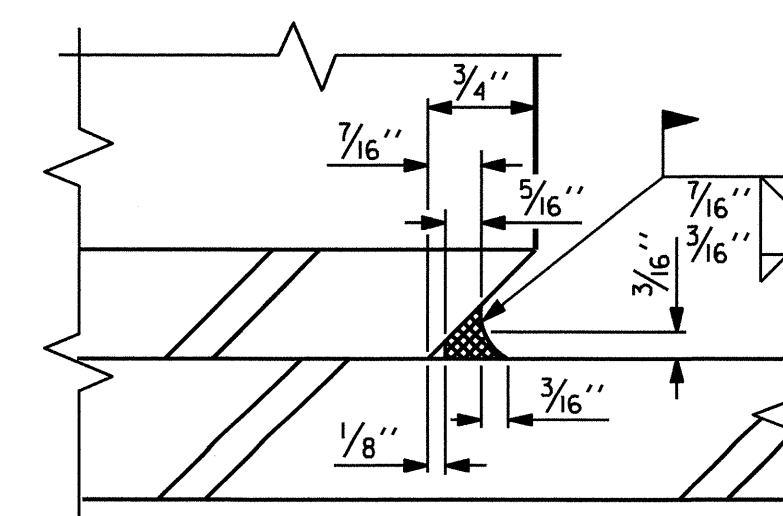


**TYPICAL PLAN AT END BENT
(INTEGRAL)**

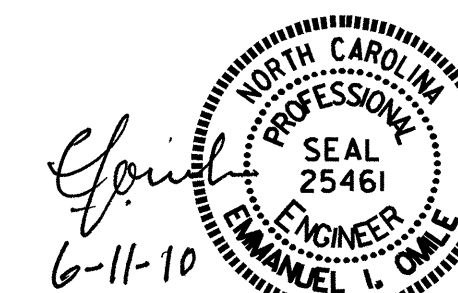
— LOAD RATINGS —	
	MAX.D.L.+L.L.
45" PCG -TYPE III	144 K+



SOLE PLATE DETAILS ("P")



DEATIL "A"

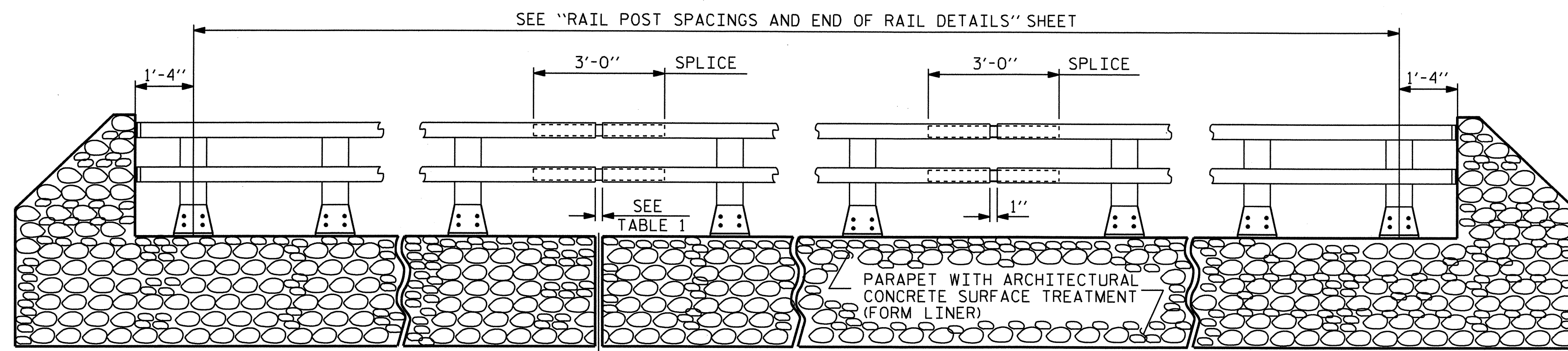


PROJECT NO. B-4286
SWAIN COUNTY
 STATION: 16+39.20 -L-

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

REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	DATE:	S-19
1			3		TOTAL SHEETS
2			4		41

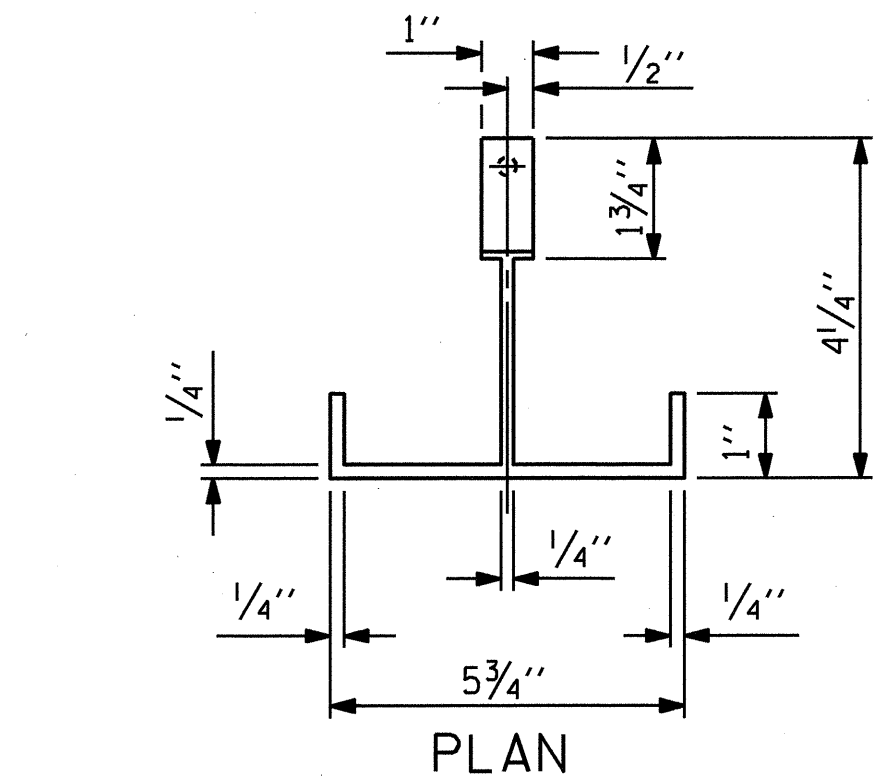
ASSEMBLED BY :	OT NGUYEN	DATE :	6-09
CHECKED BY :	E.I. OMLE	DATE :	1-10
DRAWN BY :	WJH 8/89	REV. 10/17/00	RWW/LES
CHECKED BY :	CRK 8/89	REV. 7/10/01	RWW/LES
		REV. 5/11/06	TLA/GM



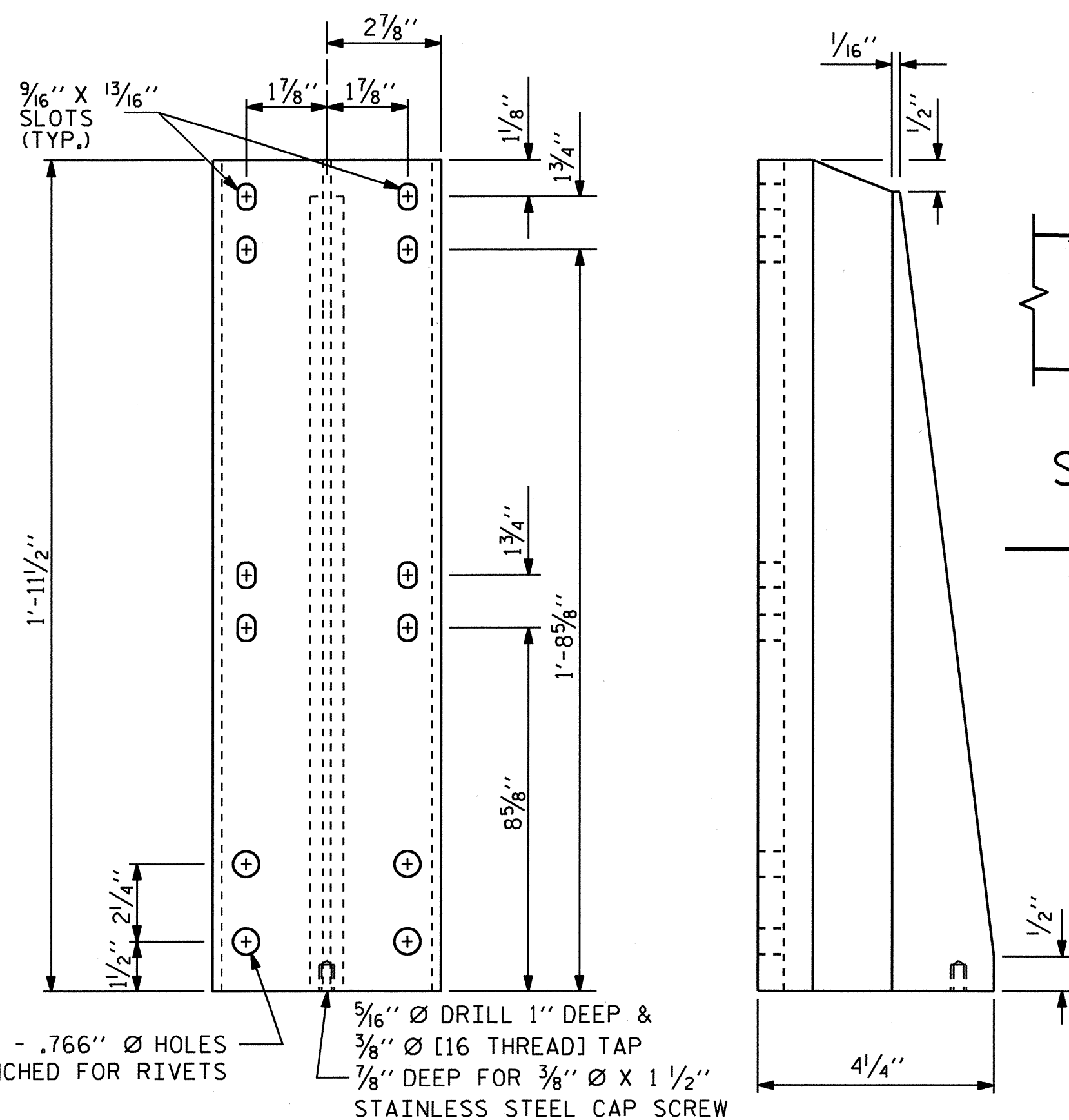
EXP. JT. IN PARAPET

ELEVATION

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



PLAN



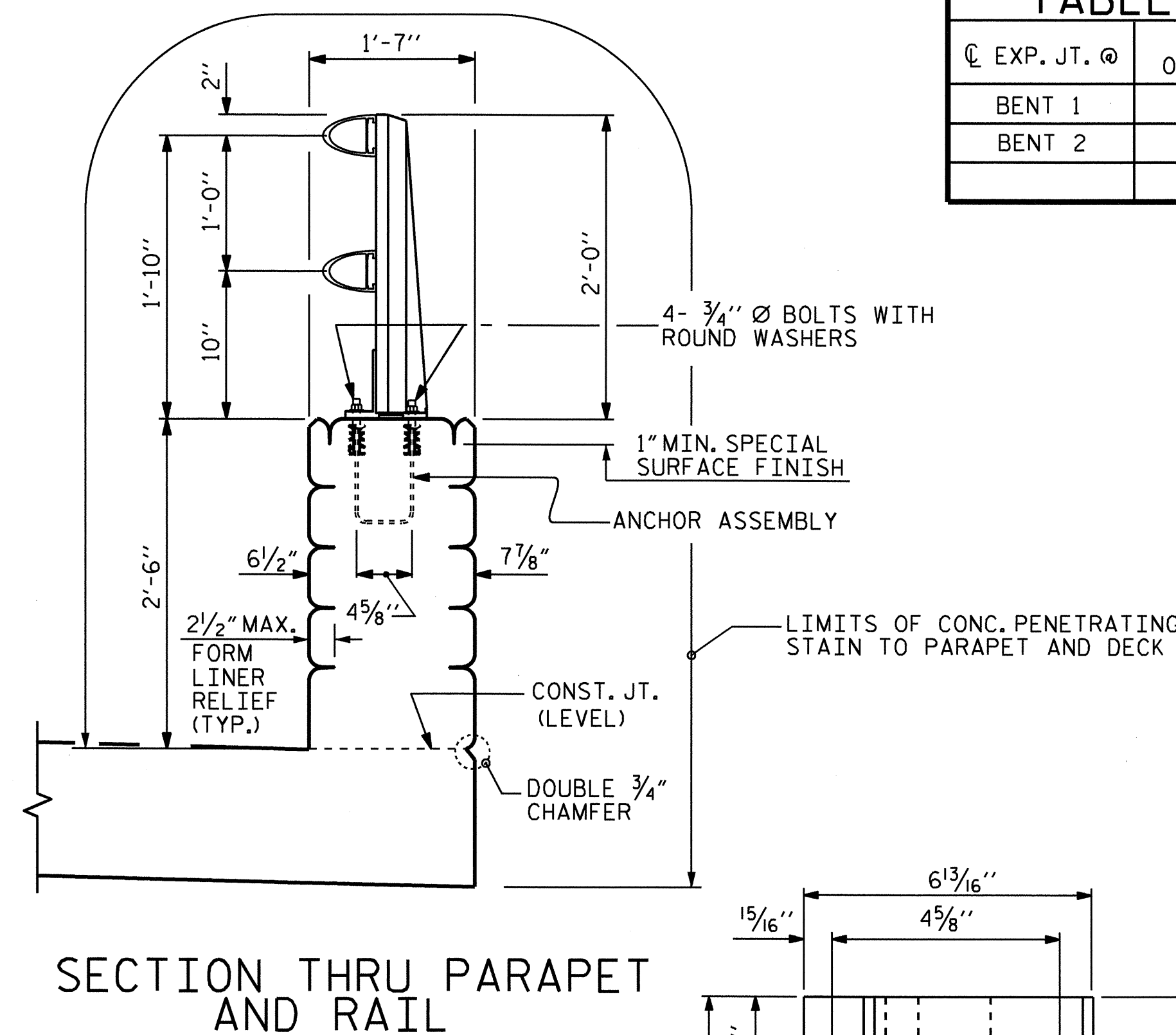
FRONT ELEVATION

SIDE ELEVATION

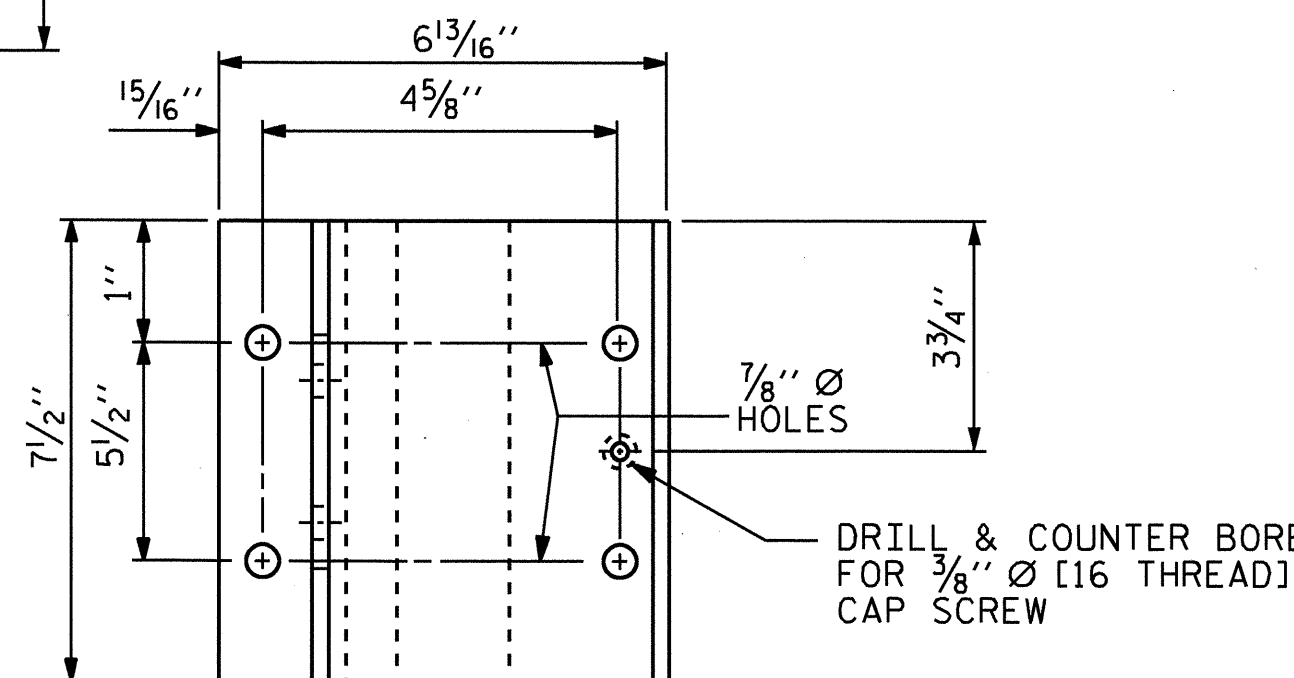
DETAILS OF POST

ASSEMBLED BY :	QT NGUYEN	DATE :	6-09
CHECKED BY :	E.I. OMILE	DATE :	1-10
DRAWN BY :	EEM 6/94	REV. 10/17/00	LES/RDR
CHECKED BY :	RGW 6/94	REV. 5/7/03R	RWW/JTE
		REV. 5/1/06	TLA/GM

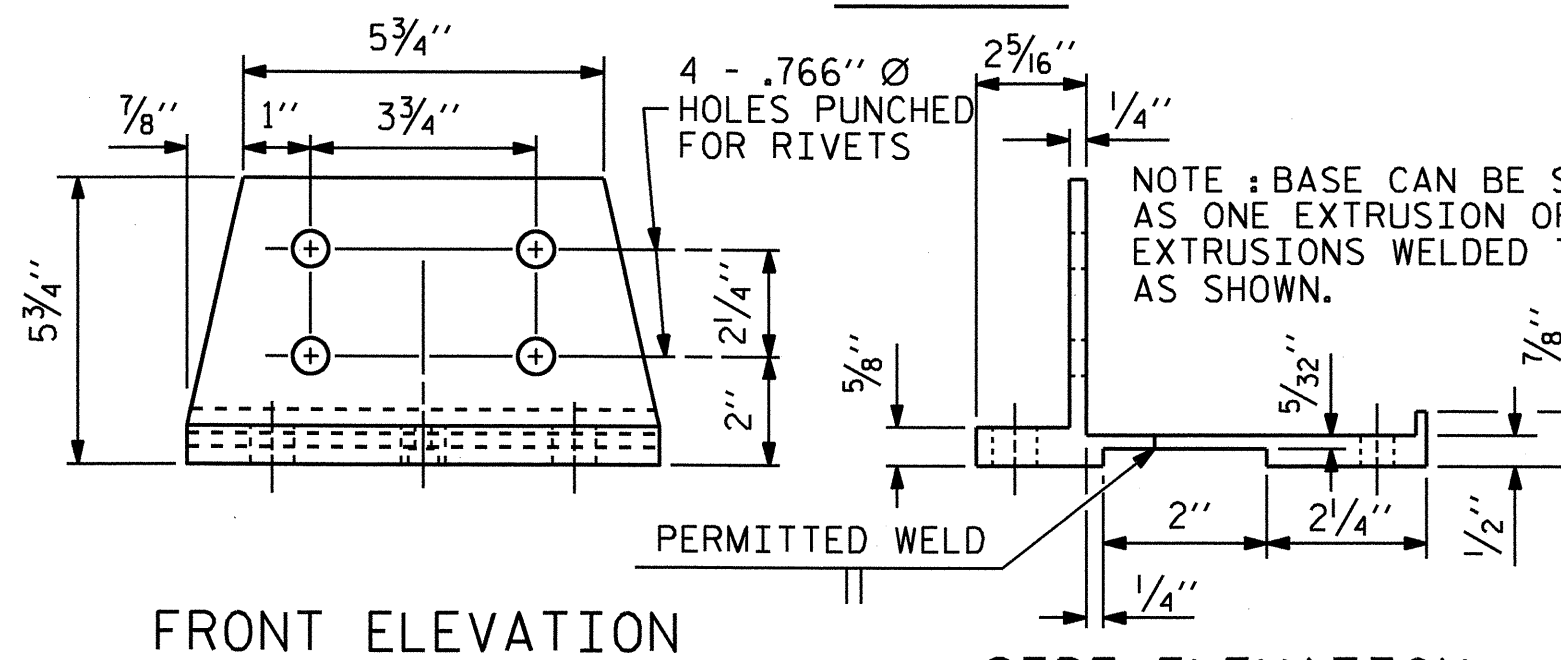
EXP. JT. @	RAIL OPENING
BENT 1	1"
BENT 2	1"



SECTION THRU PARAPET AND RAIL



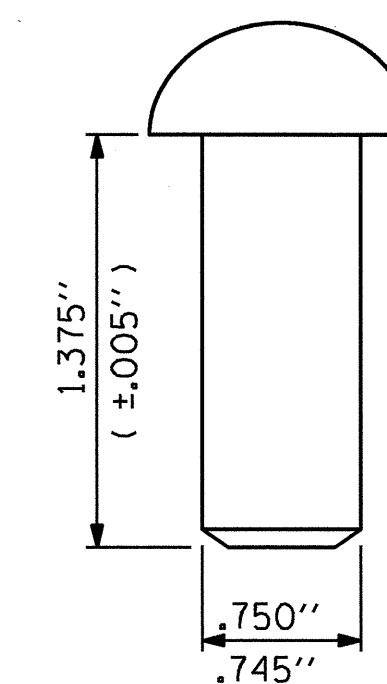
PLAN



FRONT ELEVATION

SIDE ELEVATION

POST BASE DETAILS



RIVET DETAIL

PAY LENGTH = 300.70 LIN. FT.

NOTES

ALUMINUM RAILS

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

ANODIZING

ANODIZE ALUMINUM FOR POSTS, BASES, RAILS, EXPANSION BARS, CLAMP BARS, RIVETS, CAPS, SHIMS, ATTACHMENT BRACKETS AND HOLD-DOWN PLATES. SUBMIT THREE (3) SETS OF ASTM B-221 6061-T6 ALUMINUM SAMPLES ANODIZED LIGHT BRONZE, MEDIUM BRONZE AND DARK BRONZE TO THE ENGINEER. THE ENGINEER WILL COORDINATE WITH THE US FOREST SERVICE FOR THE SELECTION OF THE COLOR.

AT THE DIRECTION OF THE ENGINEER, REPAIR ANY DAMAGE TO THE ANODIZED SURFACE OF THE RAIL OR COMPONENTS DURING CONSTRUCTION ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS. REPAIRS MADE ARE AT THE CONTRACTOR'S EXPENSE.

AFTER A SHADE OF BRONZE HAS BEEN SELECTED FOR THE RAILING, SUBMIT A SAMPLE OF COMPATIBLE COLOR ACRYLIC HOUSE PAINT TO THE ENGINEER FOR APPROVAL. MATCH THE PAINT WITH THE ANODIZED RAIL COLOR AS CLOSELY AS POSSIBLE. AFTER ERECTION OF THE ANODIZED RAIL, PAINT WITH A MINIMUM OF TWO COATS ALL EXPOSED ANCHOR BOLTS, NUTS, WASHERS, MACHINE SCREWS, CAP SCREWS, BOLTS, BUILT UP ANGLES AND ANY OTHER NON-BRONZE METAL IN THE RAIL ASSEMBLIES. SUPPLYING PAINT AND PAINTING MISCELLANEOUS ELEMENTS OF METAL RAIL IS CONSIDERED INCIDENTAL TO THE INSTALLATION OF THE METAL RAIL.

GENERAL NOTES

RAILING SHALL BE CONTINUOUS FROM END POST TO END POST OF BRIDGE. EACH JOINT IN RAIL LENGTH SHALL BE SPLICED AS DETAILED. PANEL LENGTHS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS. FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE STANDARD NO. BMR2.

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

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

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

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

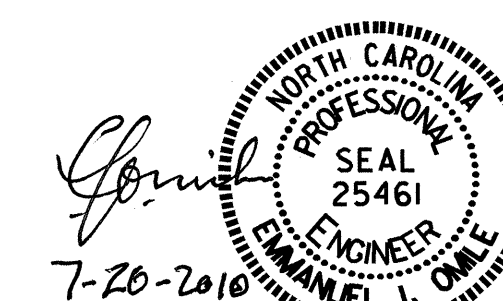
PROJECT NO. B-4286
SWAIN COUNTY
 STATION: 16+39.20 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD

2 BAR METAL RAIL



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

STD. NO. BMR3

NOTES

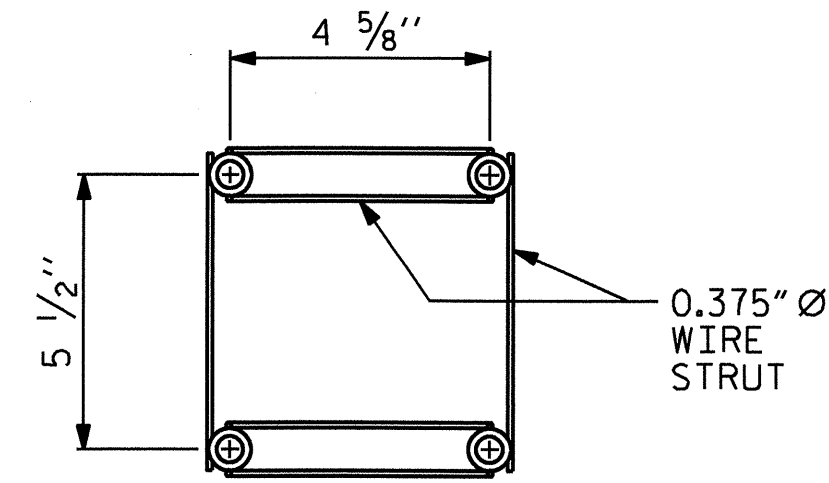
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

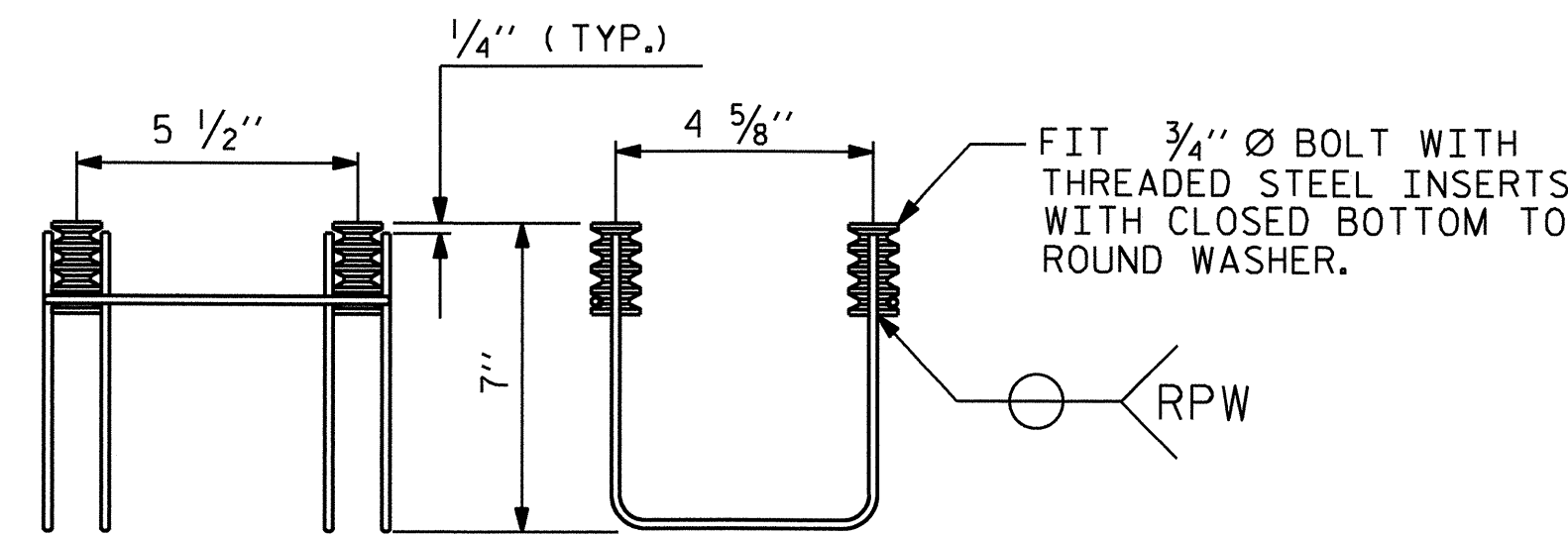
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.
- B. 4 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT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

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

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



PLAN



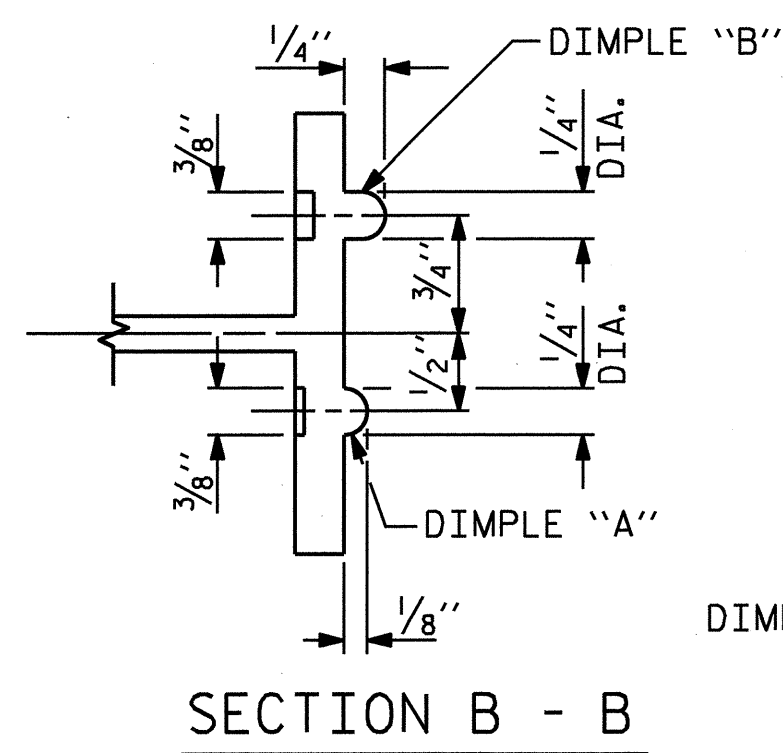
SIDE VIEW

ELEVATION

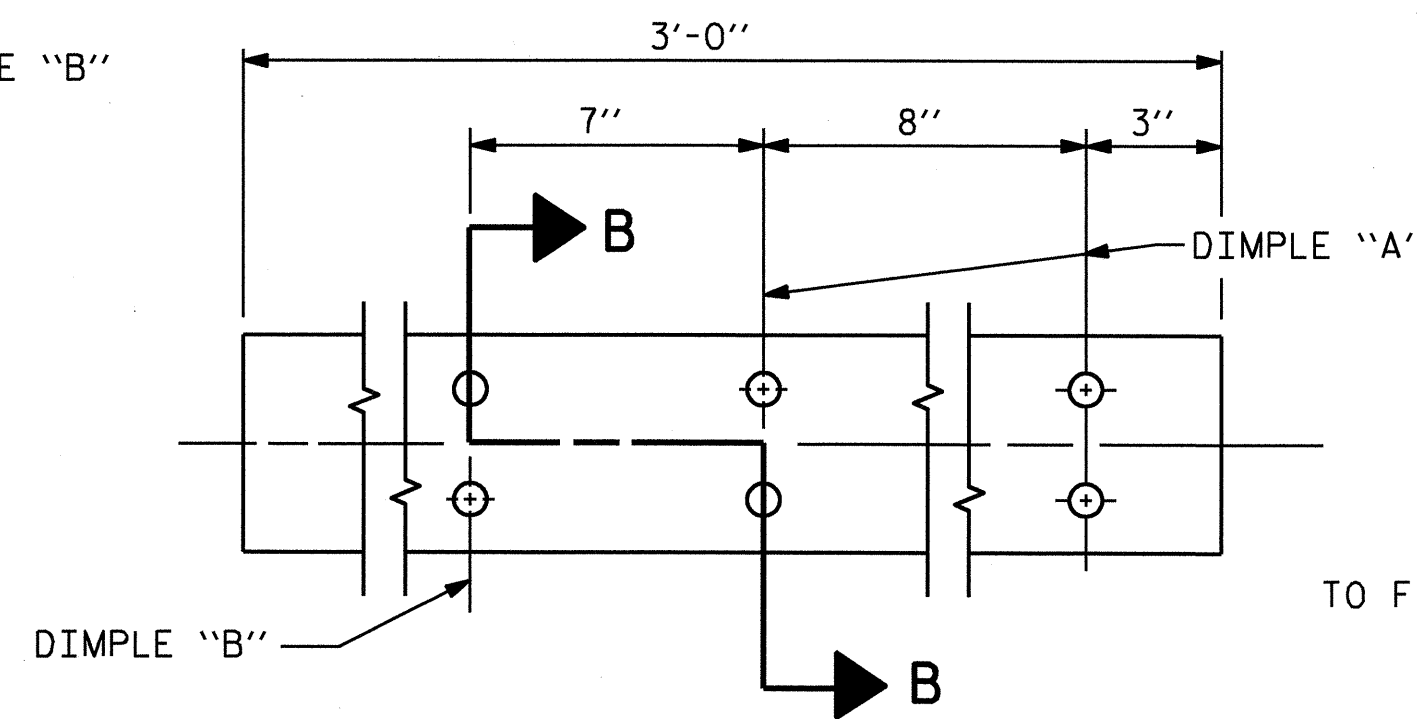
MINIMUM LENGTH OF THREADS IN INSERT (FERRULE) : 1 3/4"

4-BOLT METAL RAIL ANCHOR ASSEMBLY

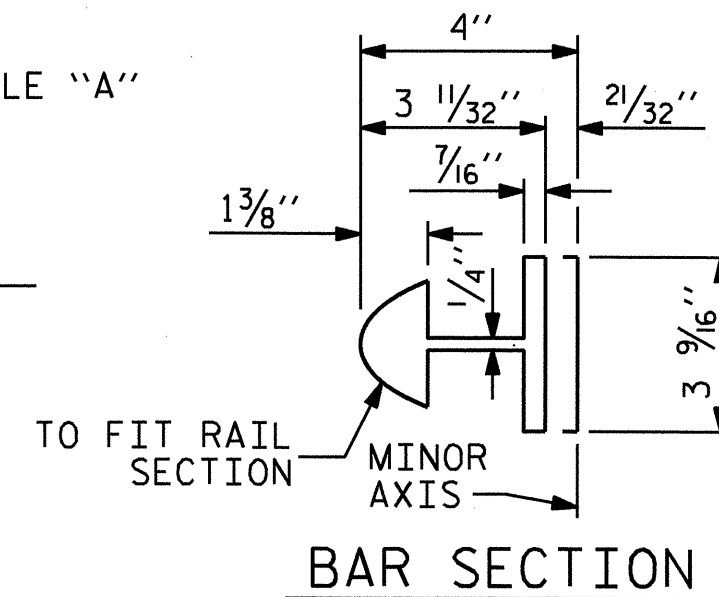
(48 ASSEMBLIES REQUIRED)



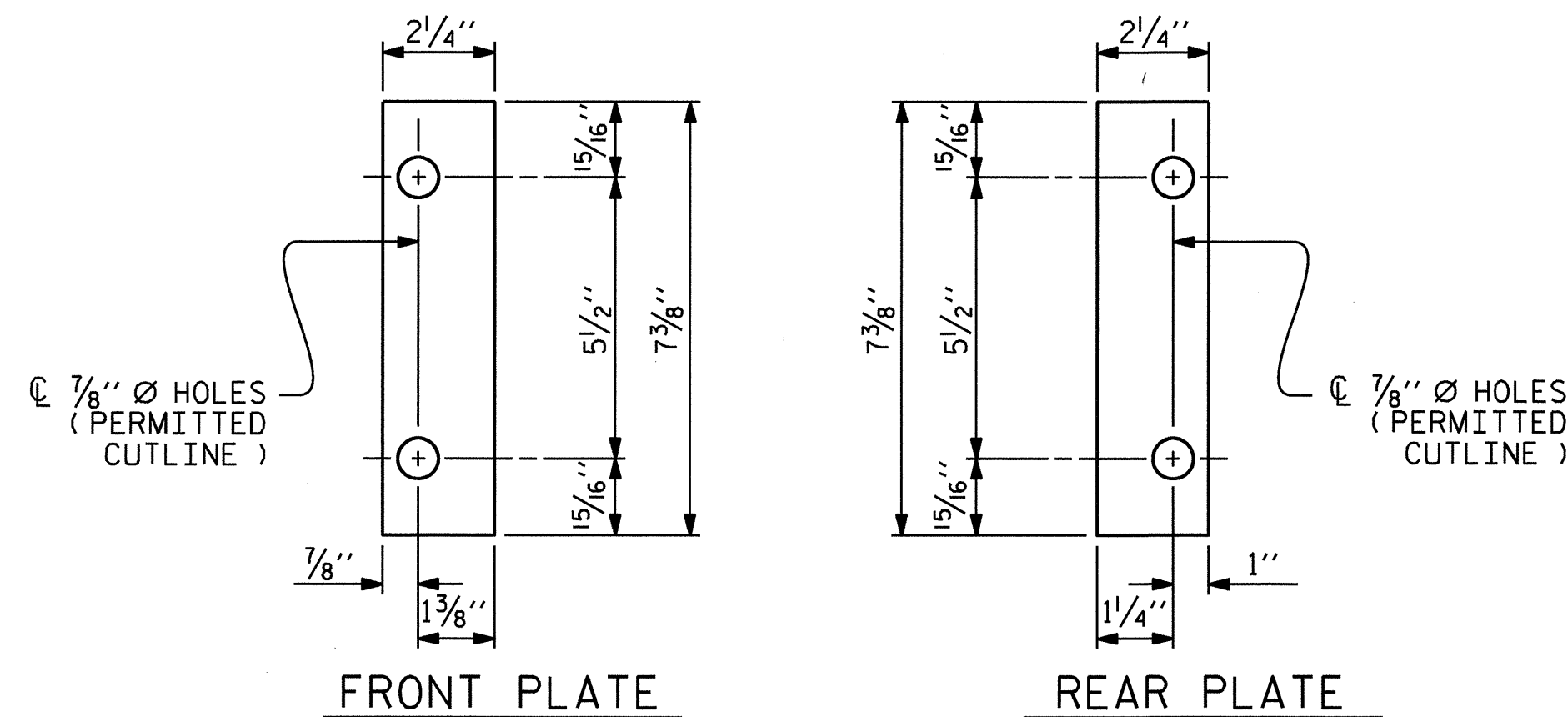
SECTION B - B



EXPANSION BAR DETAILS



BAR SECTION

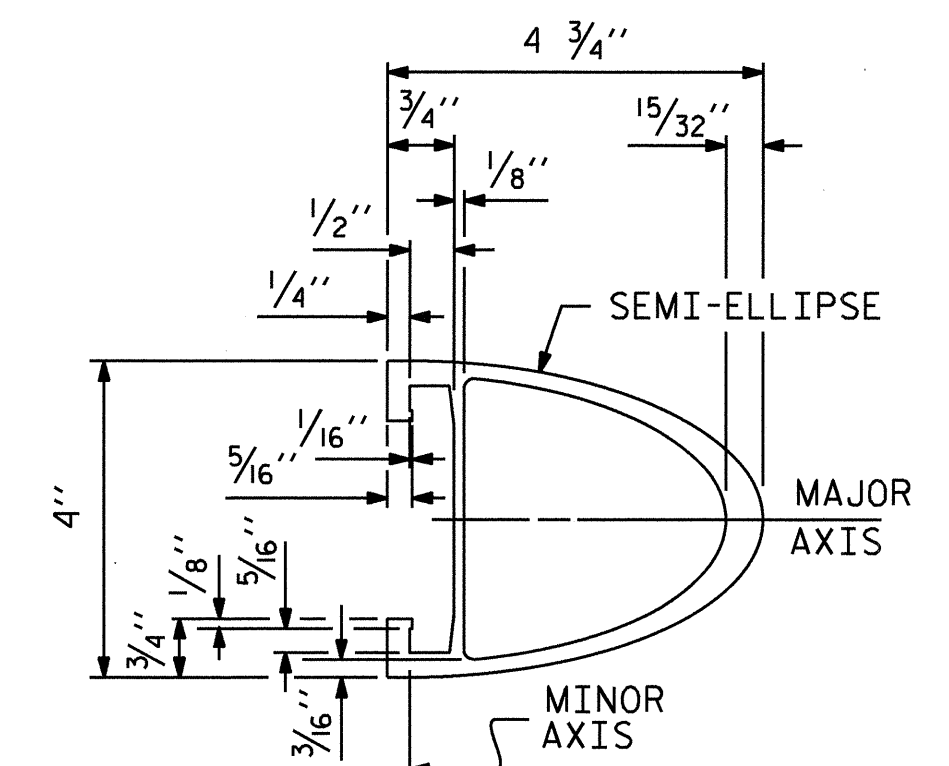


FRONT PLATE

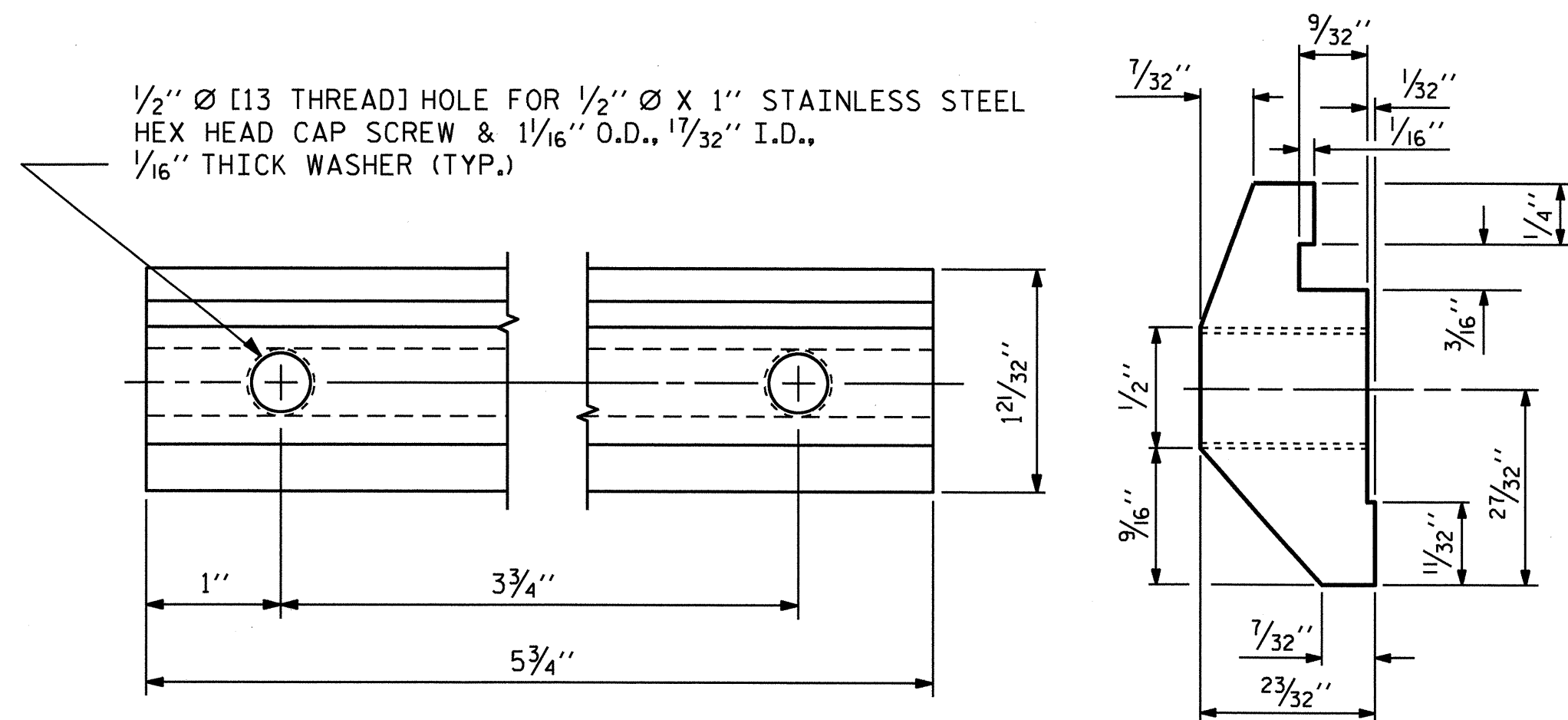
REAR PLATE

SHIM DETAILS

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

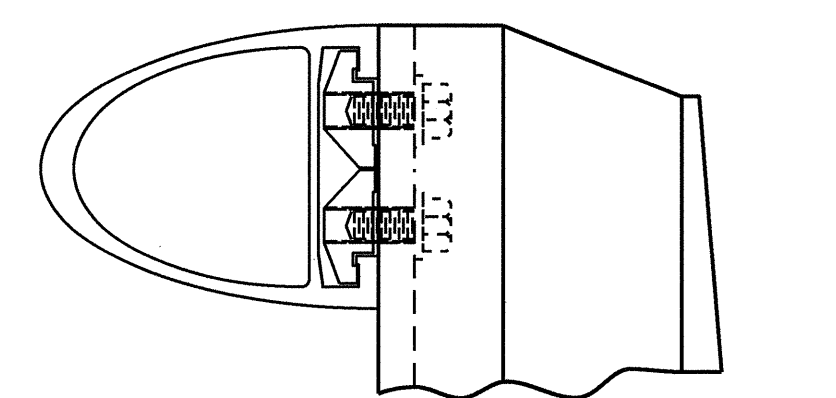


RAIL SECTION

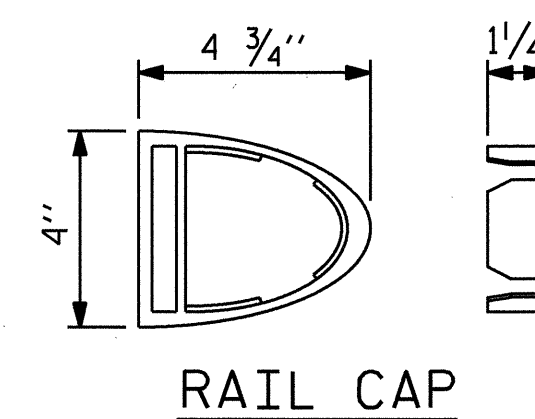


CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY



RAIL CAP

PROJECT NO. B-4286
SWAIN COUNTY
STATION: 16+39.20 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

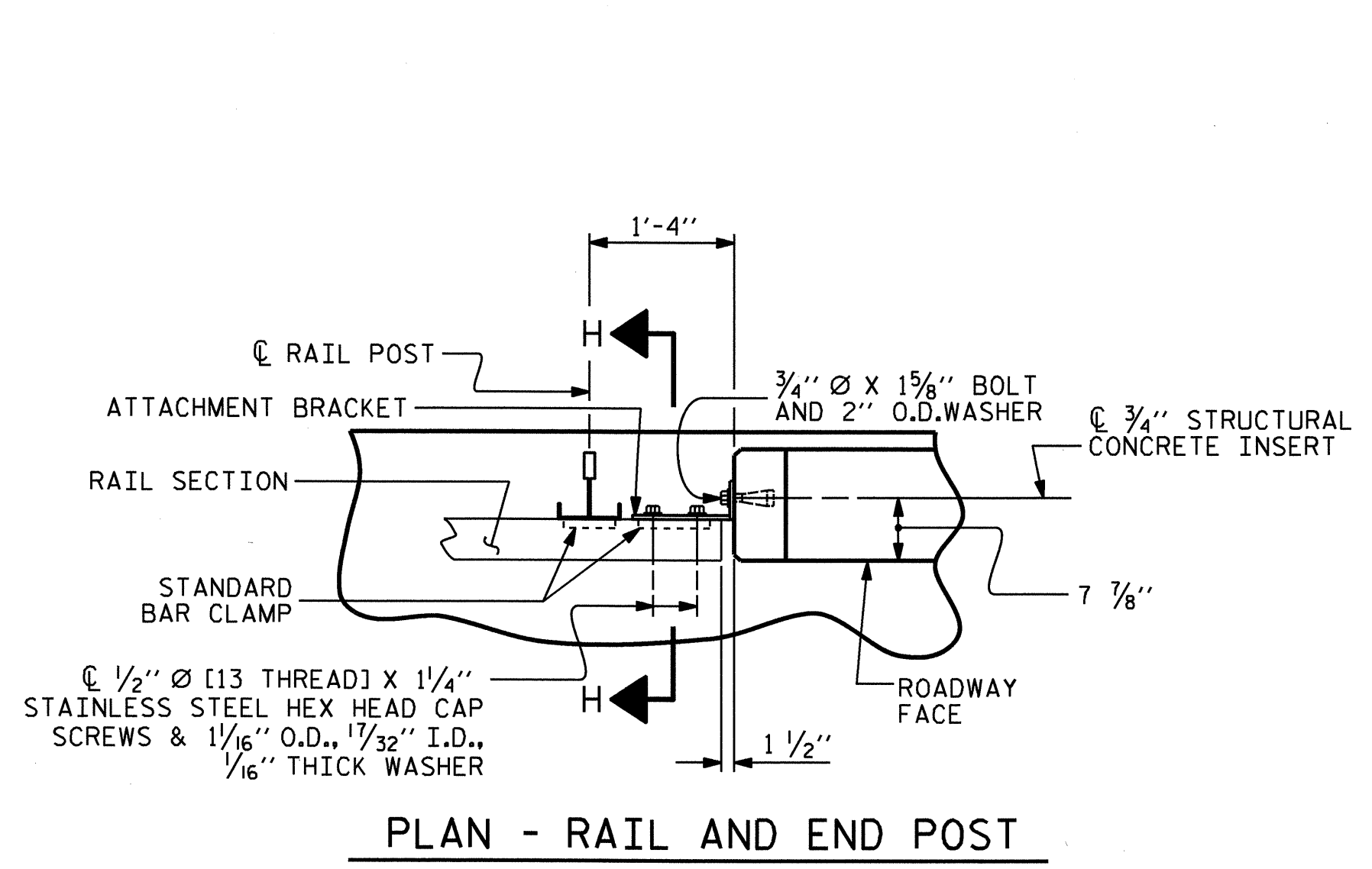
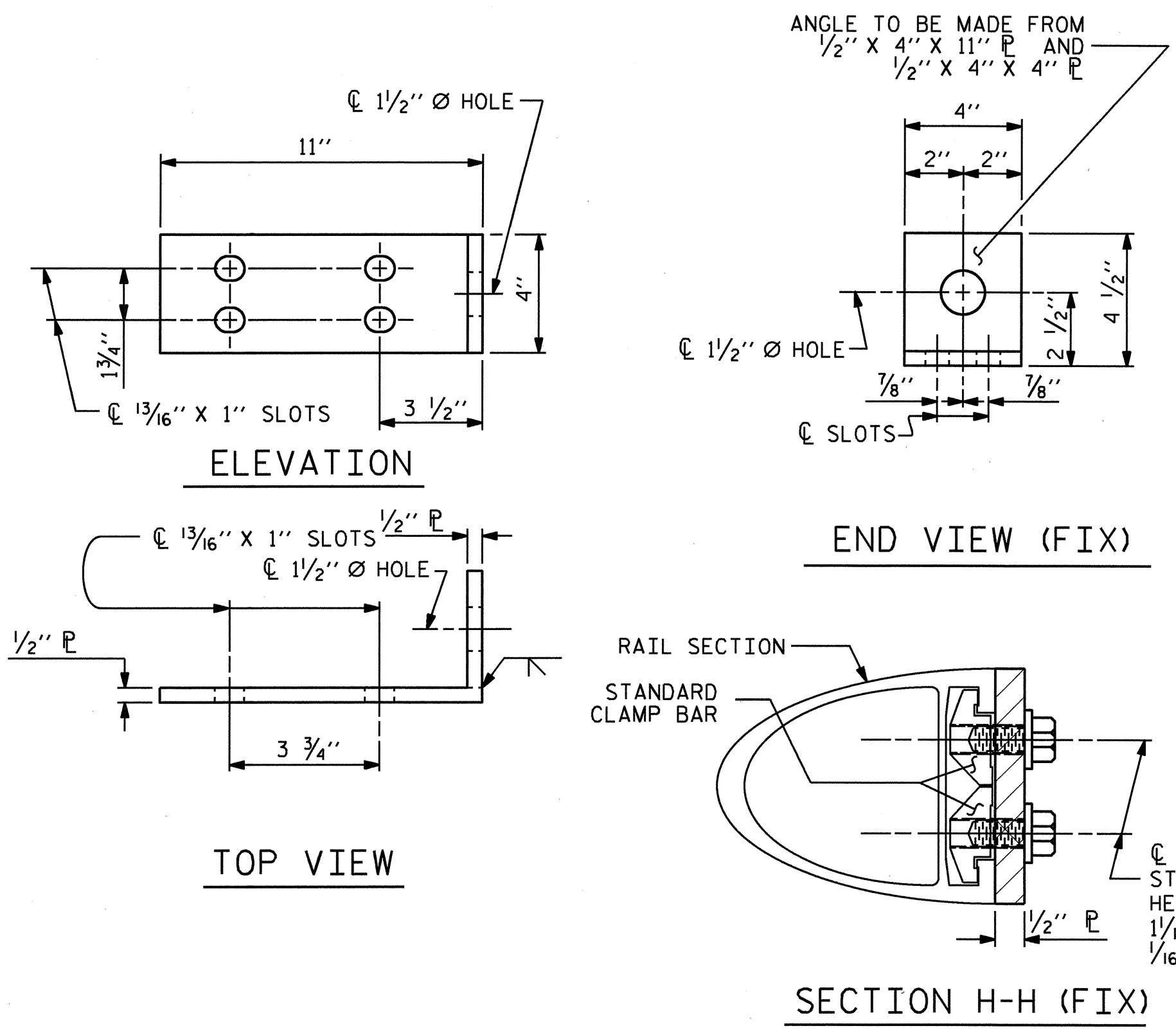
2 BAR METAL RAIL



ASSEMBLED BY :	QT NGUYEN	DATE :	6-09
CHECKED BY :	E.I. OMILE	DATE :	1-10
DRAWN BY :	EEM 6/94	REV. 2/6/97	EEM/RGW
CHECKED BY :	RCW 6/94	REV. 8/16/99	MAB/LES
		REV. 5/1/06R	KMM/GM

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

S-21
TOTAL SHEETS 41



FIXED
DETAILS FOR ATTACHING METAL RAIL TO END POST

NOTES

- STRUCTURAL CONCRETE INSERT
- THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1 1/2".
 - B. 1 - 3/4" Ø X 1 5/8" BOLT WITH WASHER, BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 1 5/8" GALVANIZED BOLT AND WASHER, THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)
 - C. WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

NOTES

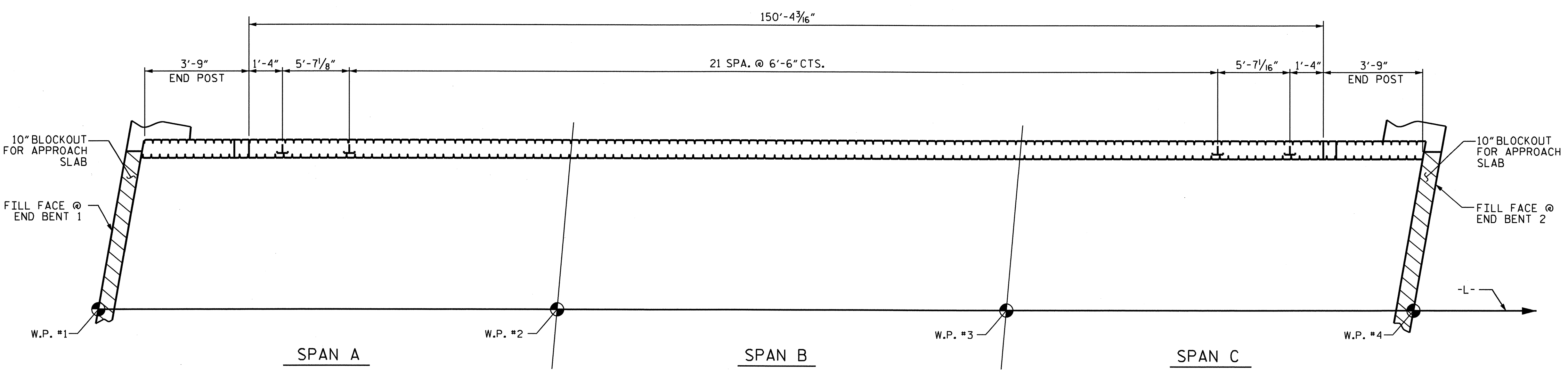
- METAL RAIL TO END POST CONNECTION
- THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
 - B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 5/8" BOLT SHALL HAVE N. C. THREADS.
 - C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F.
 - D. STANDARD CLAMP BARS (SEE METAL RAIL SHEET).
 - E. 1/2" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

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

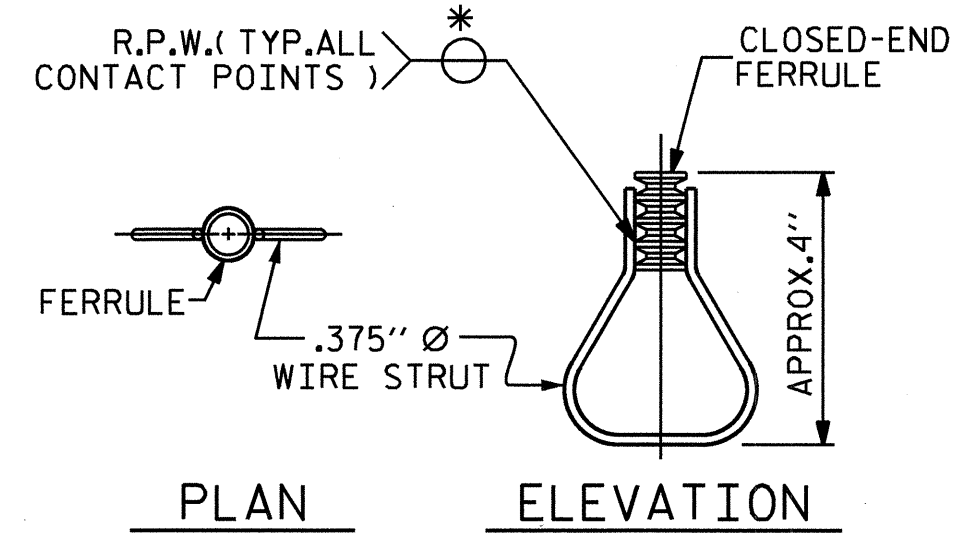
THE 3/4" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

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

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



PLAN OF RAIL POST SPACINGS
LEFT SIDE SHOWN, RIGHT SIDE SIMILAR.



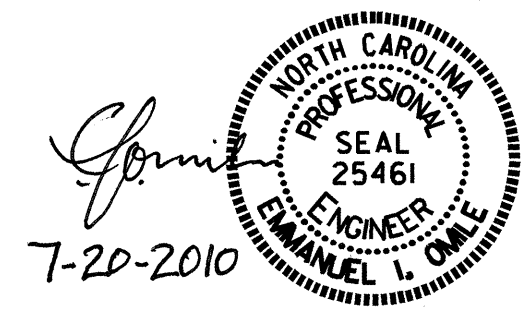
STRUCTURAL CONCRETE INSERT

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

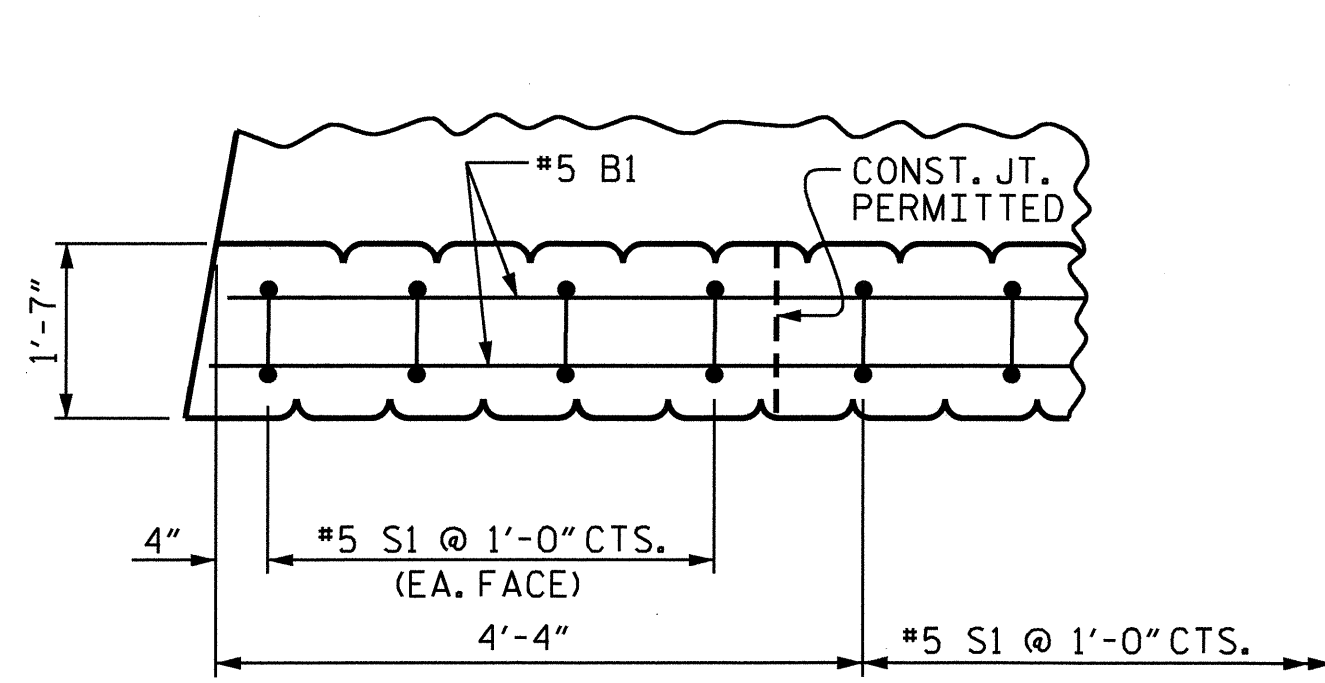
PROJECT NO. B-4286
SWAIN COUNTY
STATION: 16+39.20 -L-

SHEET 3 OF 3

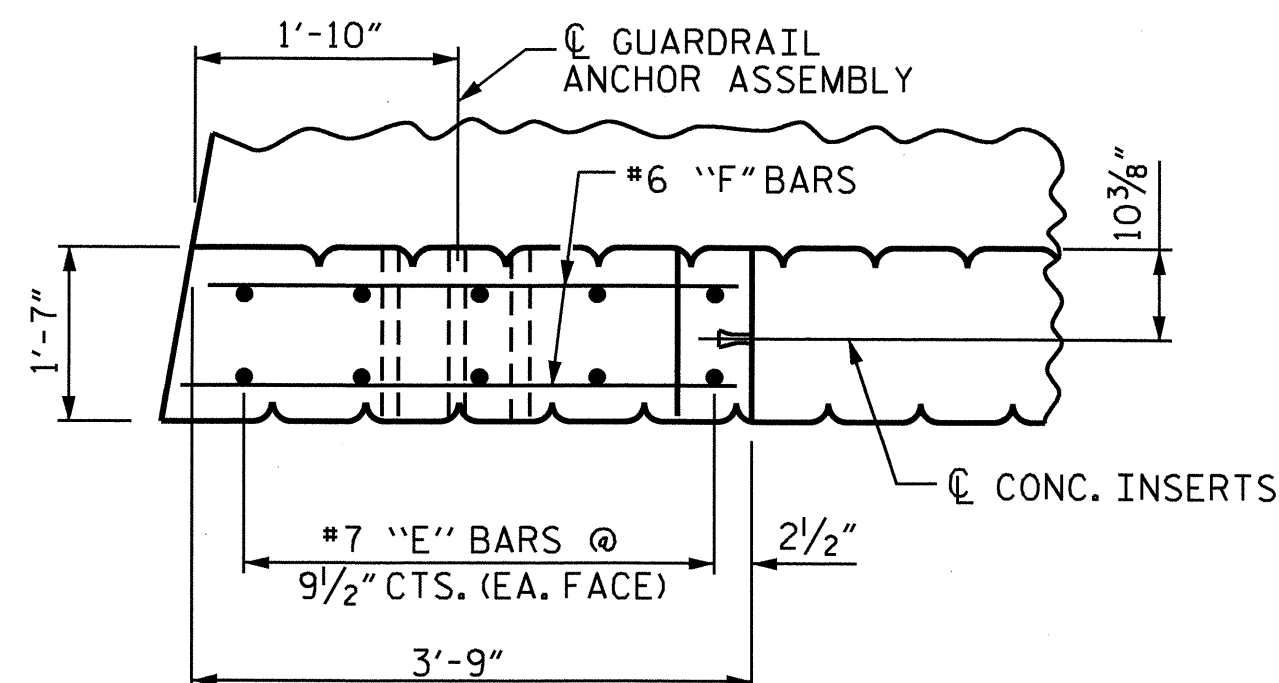
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH STANDARD				
RAIL POST SPACINGS AND END OF RAIL DETAILS				
REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	
				TOTAL SHEETS 41
				S-22



ASSEMBLED BY :	QT NGUYEN	DATE :	6-09
CHECKED BY :	E.I. OMILE	DATE :	1-10
DRAWN BY :	FCJ 1/88	REV. 10/17/00	LES/RDR
CHECKED BY :	CRK 3/89	REV. 5/7/03	RWW/JTE
		REV. 5/1/06	TLA/GM



PLAN OF PARAPET



PLAN OF END POST

NOTES

ALL REINFORCING STEEL IN PARAPETS AND END POSTS SHALL BE EPOXY COATED.

FOR DETAIL OF CONCRETE INSERT AND GUARDRAIL ANCHOR ASSEMBLY, SEE "RAIL POST SPACINGS AND END OF RAIL DETAIL" SHEET.

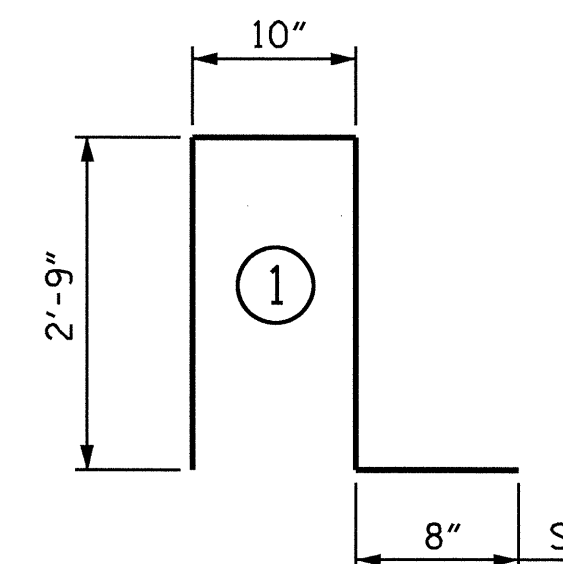
PARAPET IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

THE COST OF THE FORM LINERS AND SPECIAL SURFACE FINISH ARE INCLUDED IN THE LUMP SUM PRICE BID FOR ARCHITECTURAL CONCRETE SURFACE TREATMENT.

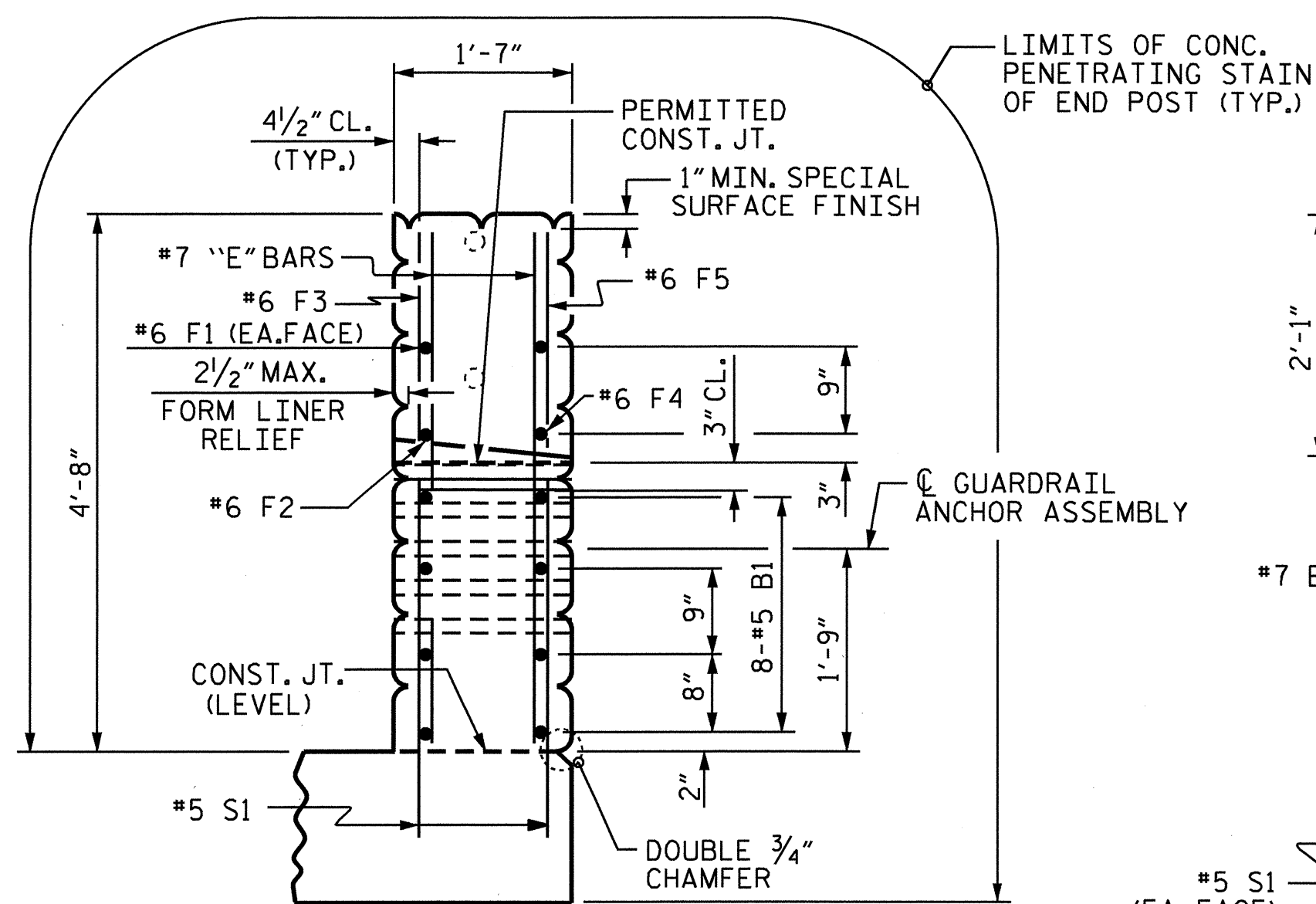
BAR TYPE

BILL OF MATERIAL

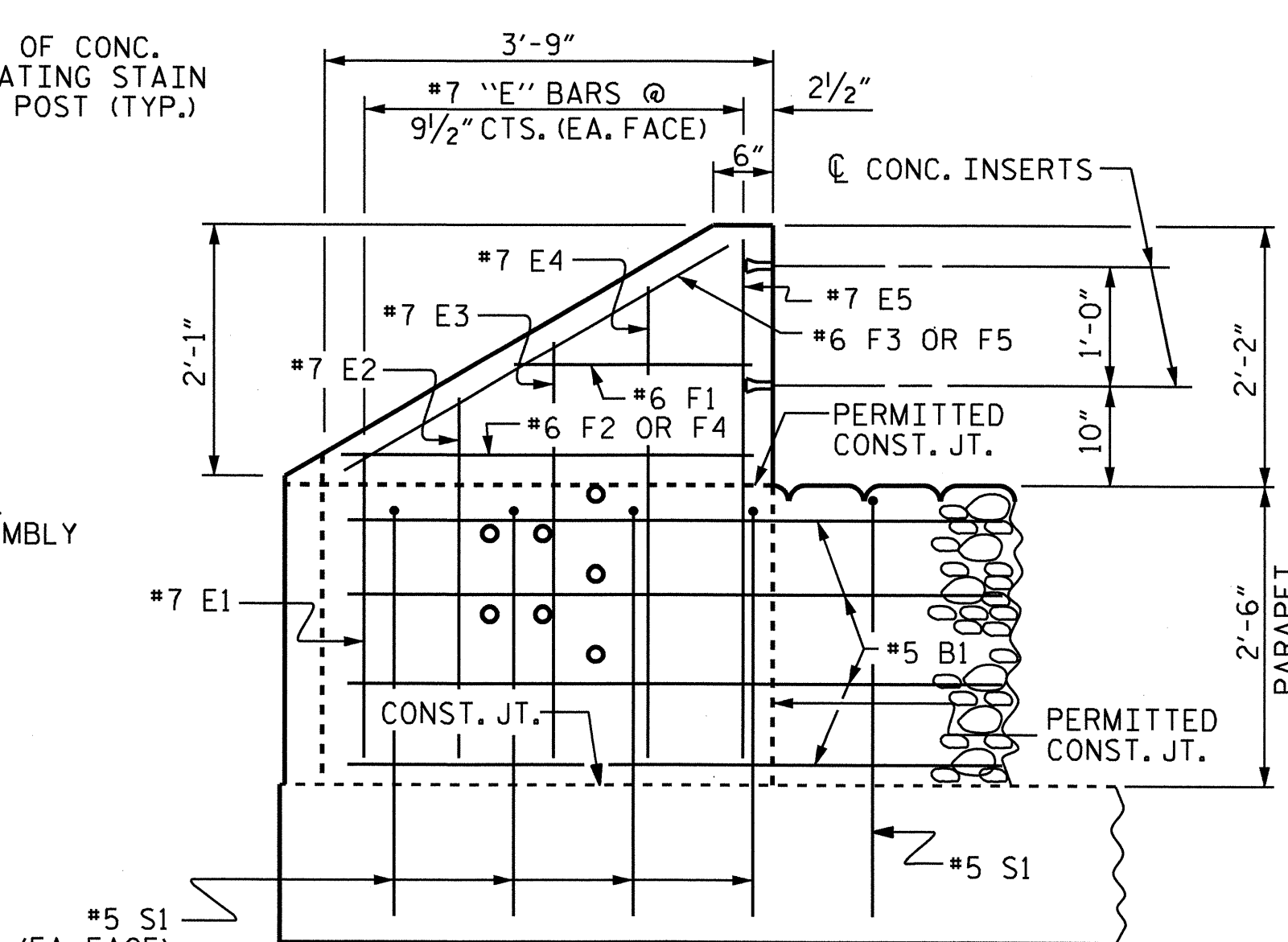
FOR 2 PARAPETS AND 4 END POSTS					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	64	#5	STR	24'-0"	1602
*B2	32	#5	STR	29'-7"	987
*E1	8	#7	STR	2'-6"	41
*E2	8	#7	STR	3'-0"	49
*E3	8	#7	STR	3'-6"	57
*E4	8	#7	STR	4'-0"	65
*E5	8	#7	STR	4'-4"	71
*F1	8	#6	STR	2'-0"	24
*F2	4	#6	STR	3'-6"	21
*F3	4	#6	STR	3'-6"	21
*F4	4	#6	STR	3'-3"	20
*F5	4	#6	STR	3'-9"	23
*S1	316	#5	1	7'-0"	2307
* EPOXY COATED REINFORCING STEEL					5288 LBS.
CLASS AA CONCRETE					45.2 CU. YDS.
1'-7" X 2'-6" CONCRETE PARAPET					316.55 LIN. FT.



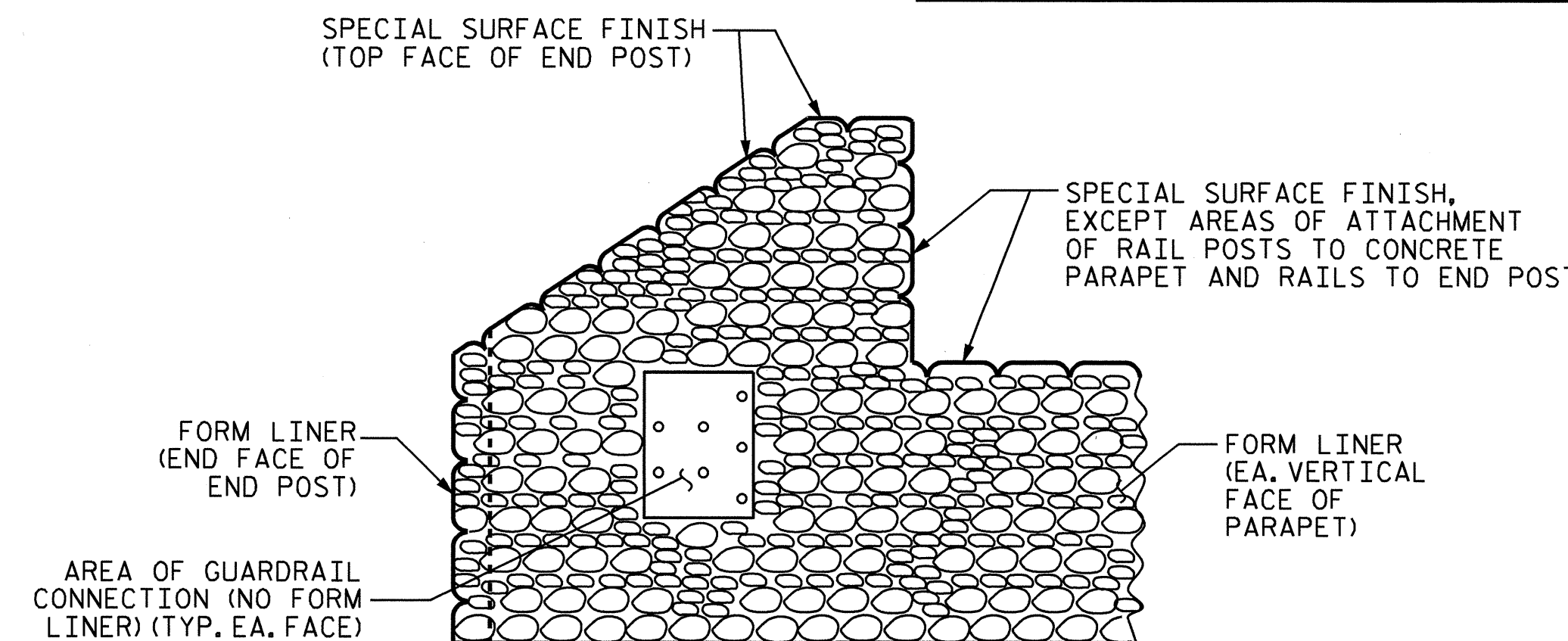
BAR DIMENSIONS ARE OUT TO OUT



END VIEW



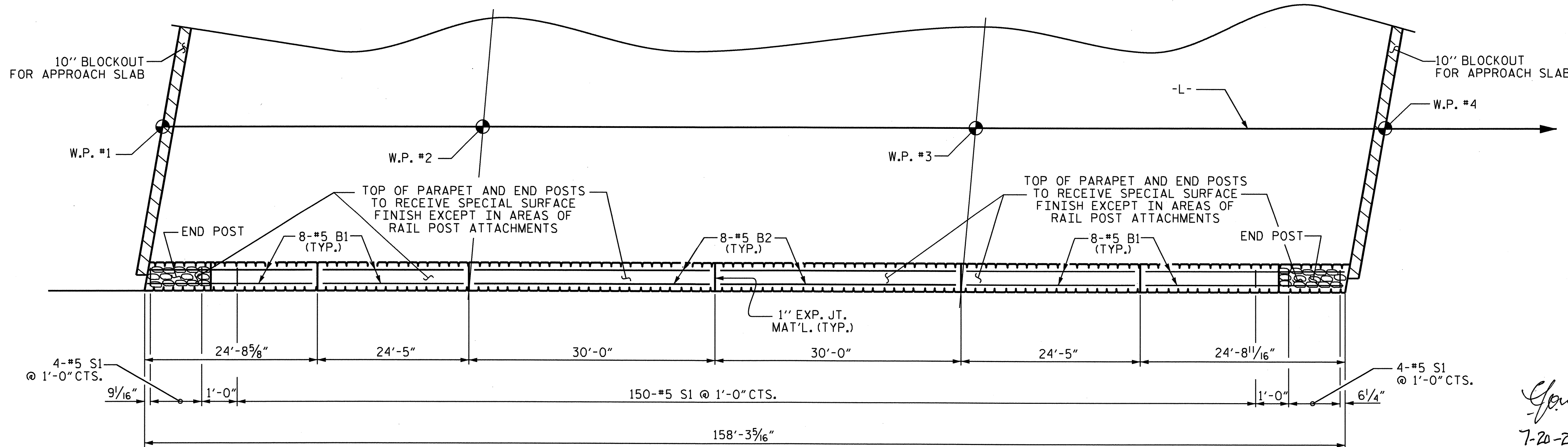
ELEVATION



FORM LINER DETAIL

FOR LOCATION OF GUARDRAIL CONNECTION AND AREA WITH NO FORM LINER SEE "GUARDRAIL ANCHORAGE DETAILS" SHEET

PARAPET AND END POST FOR TWO BAR RAIL



PLAN OF PARAPET

(TYPICAL EACH SIDE)

DRAWN BY : QT NGUYEN DATE : 6-09
 CHECKED BY : E.I. OMILE DATE : 1-10

20-JUL-2010 08:28
 M:\Structures\FINAL PLANS\B4286.sd.2MR.dgn
 eomile

PROJECT NO. B-4286
 SWAIN COUNTY
 STATION: 16+39.20 -L-

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



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

TOTAL SHEETS: 41

NOTES

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

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

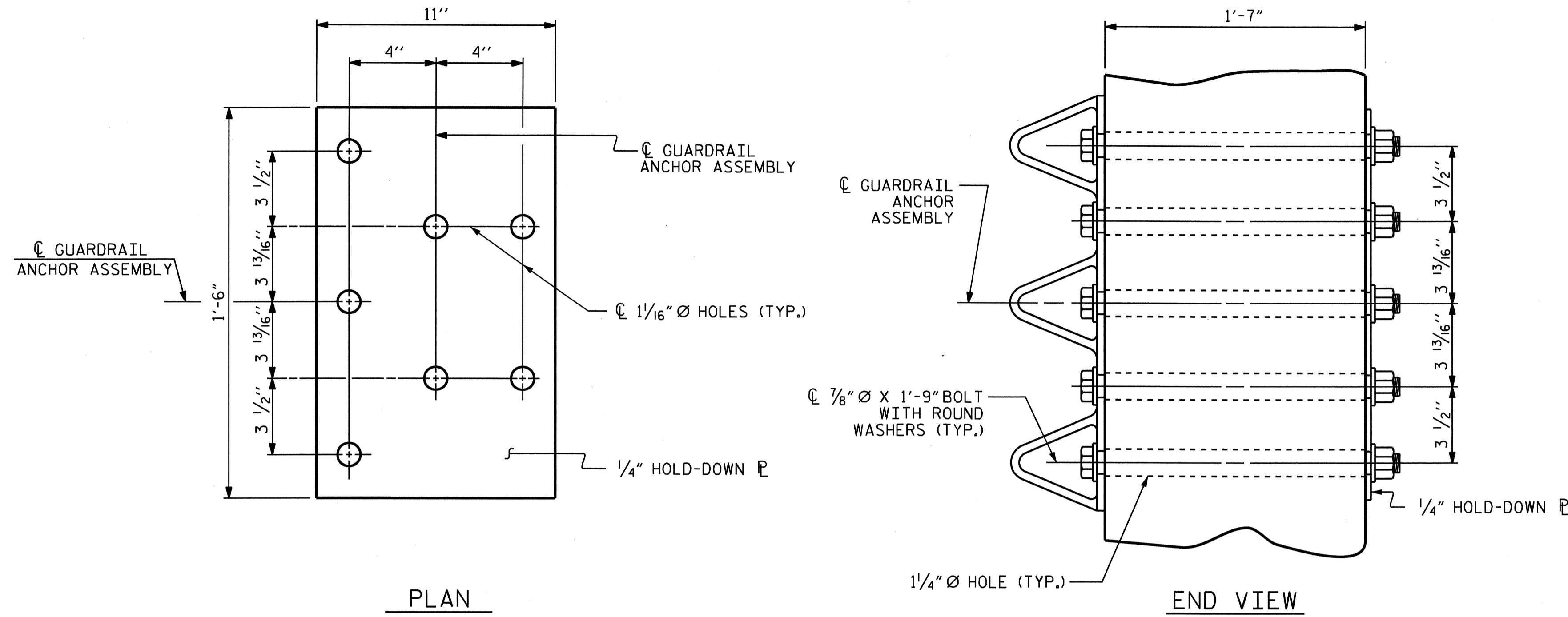
BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS.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

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

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

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

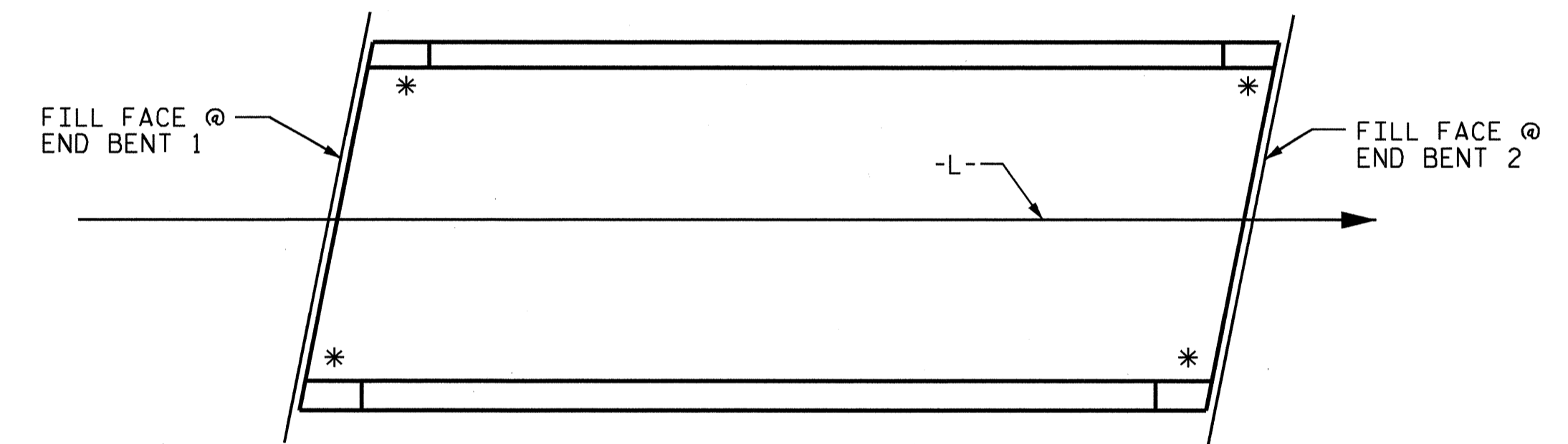
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



PLAN

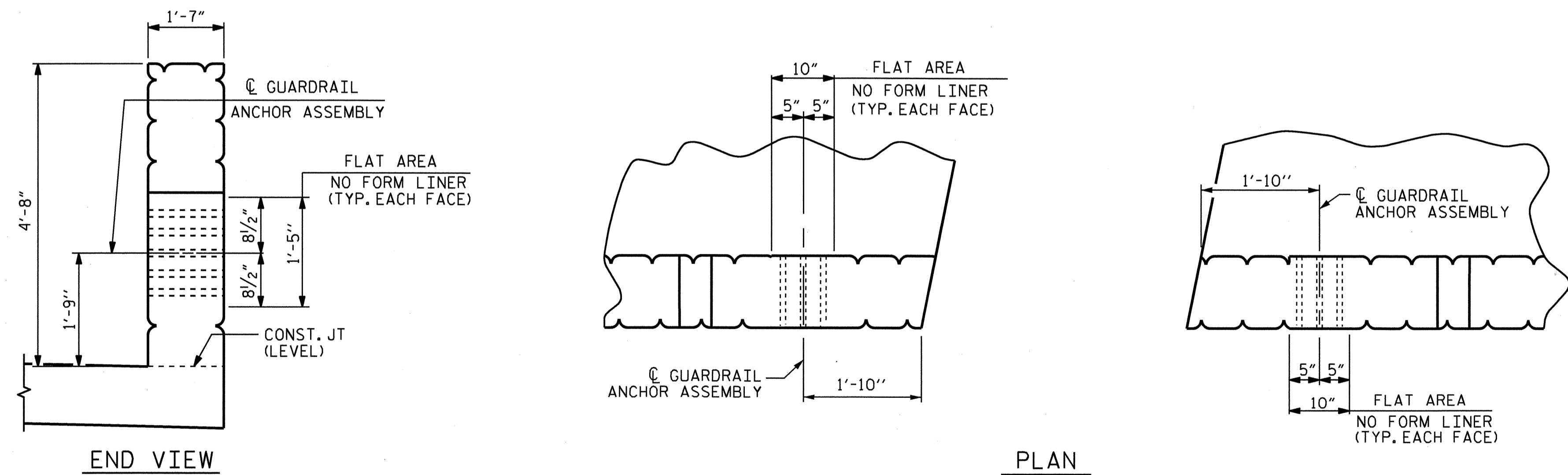
END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS



SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT



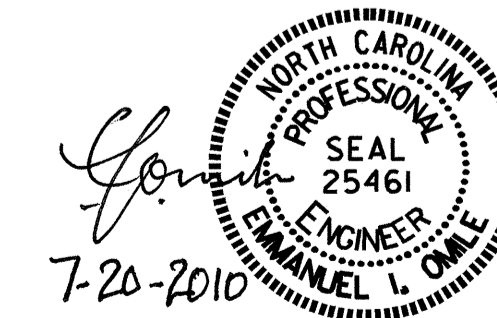
END VIEW

PLAN

LOCATION OF GUARDRAIL ANCHOR AT END POST

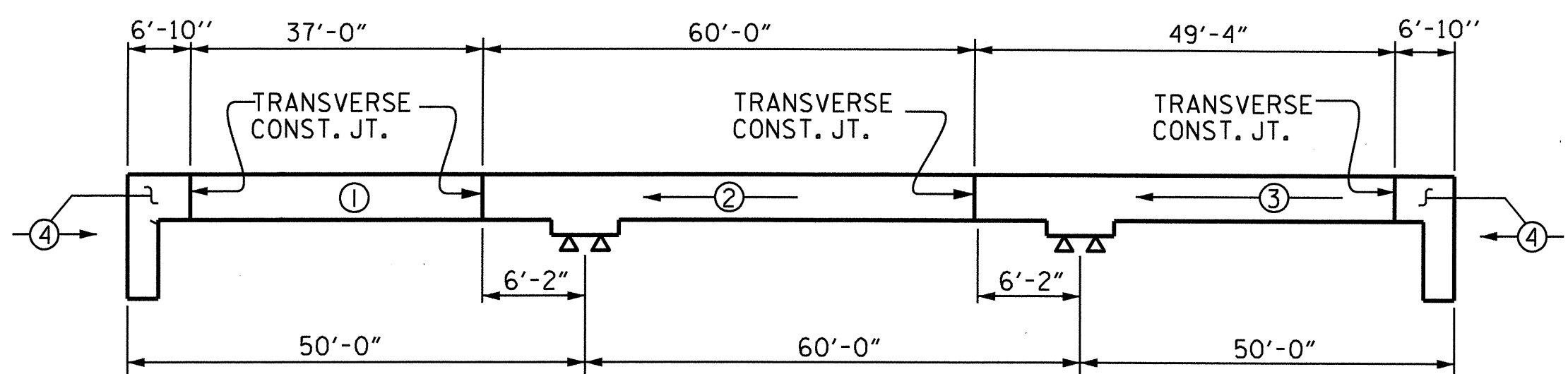
PROJECT NO. B-4286
SWAIN COUNTY
 STATION: 16+39.20 -L-

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



ASSEMBLED BY :	QT NGUYEN	DATE :	6-09
CHECKED BY :	E.I. OMILE	DATE :	1-10
DRAWN BY :	EEM 6/94	REV. 10/17/00	RWW/LES
CHECKED BY :	RGW 6/94	REV. 5/7/03	RWW/JTE
		REV. 5/1/06	TLA/GM

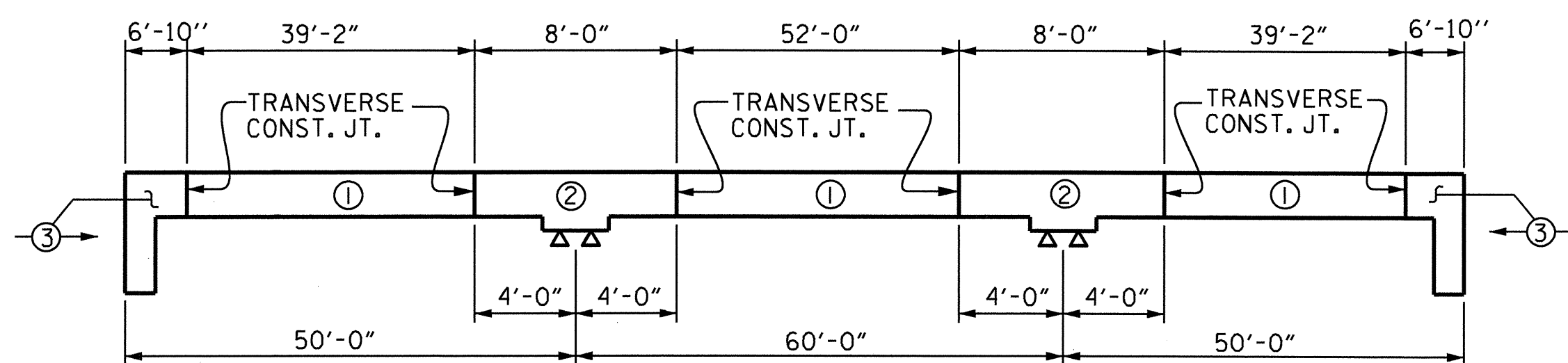
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS
					41



POURING SEQUENCE

SEE TRANSVERSE CONSTRUCTION JOINT DETAIL

⊕ = INDICATES POUR NUMBER AND DIRECTION OF POUR

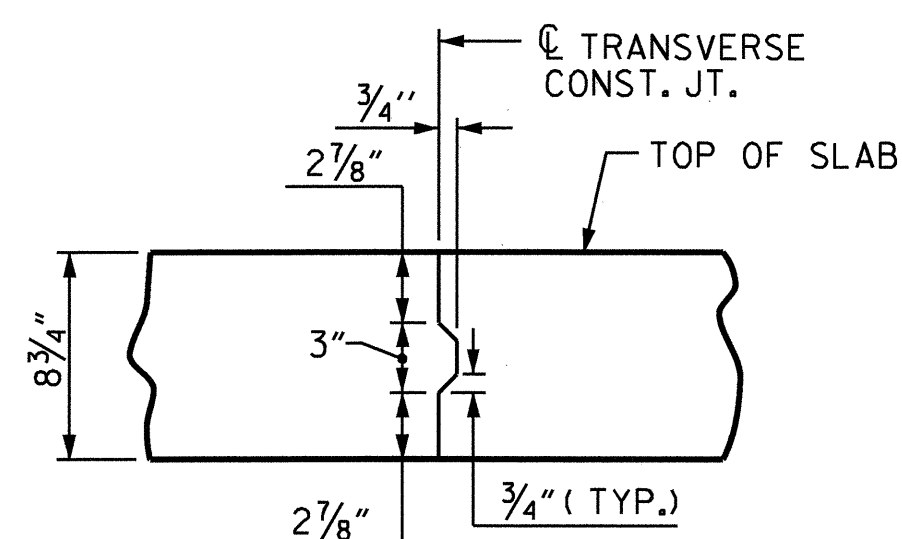


OPTIONAL POURING SEQUENCE

SEE TRANSVERSE CONSTRUCTION JOINT DETAIL.

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

⊕ = INDICATES POUR NUMBER AND DIRECTION OF POUR

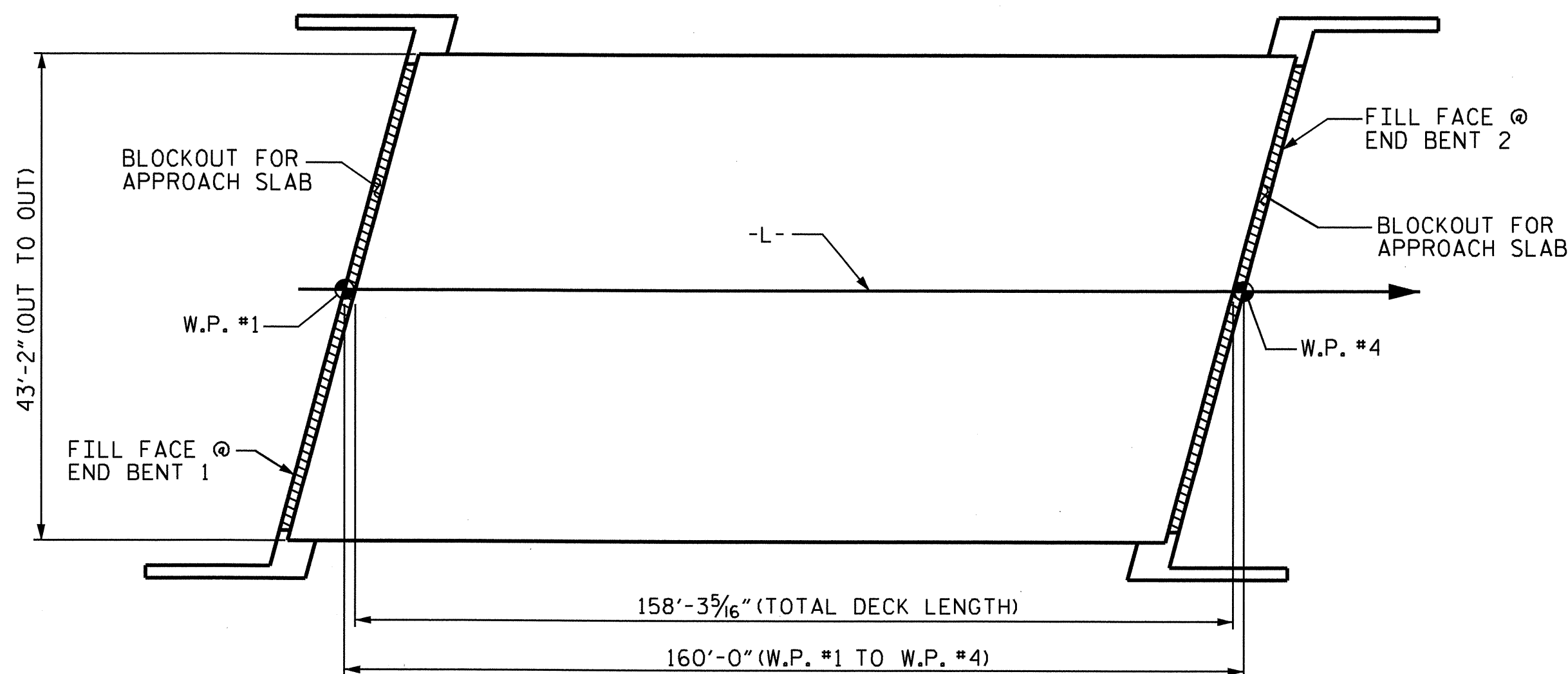


TRANSVERSE CONSTRUCTION JOINT DETAIL

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

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

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



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ. FT. = 6,907)

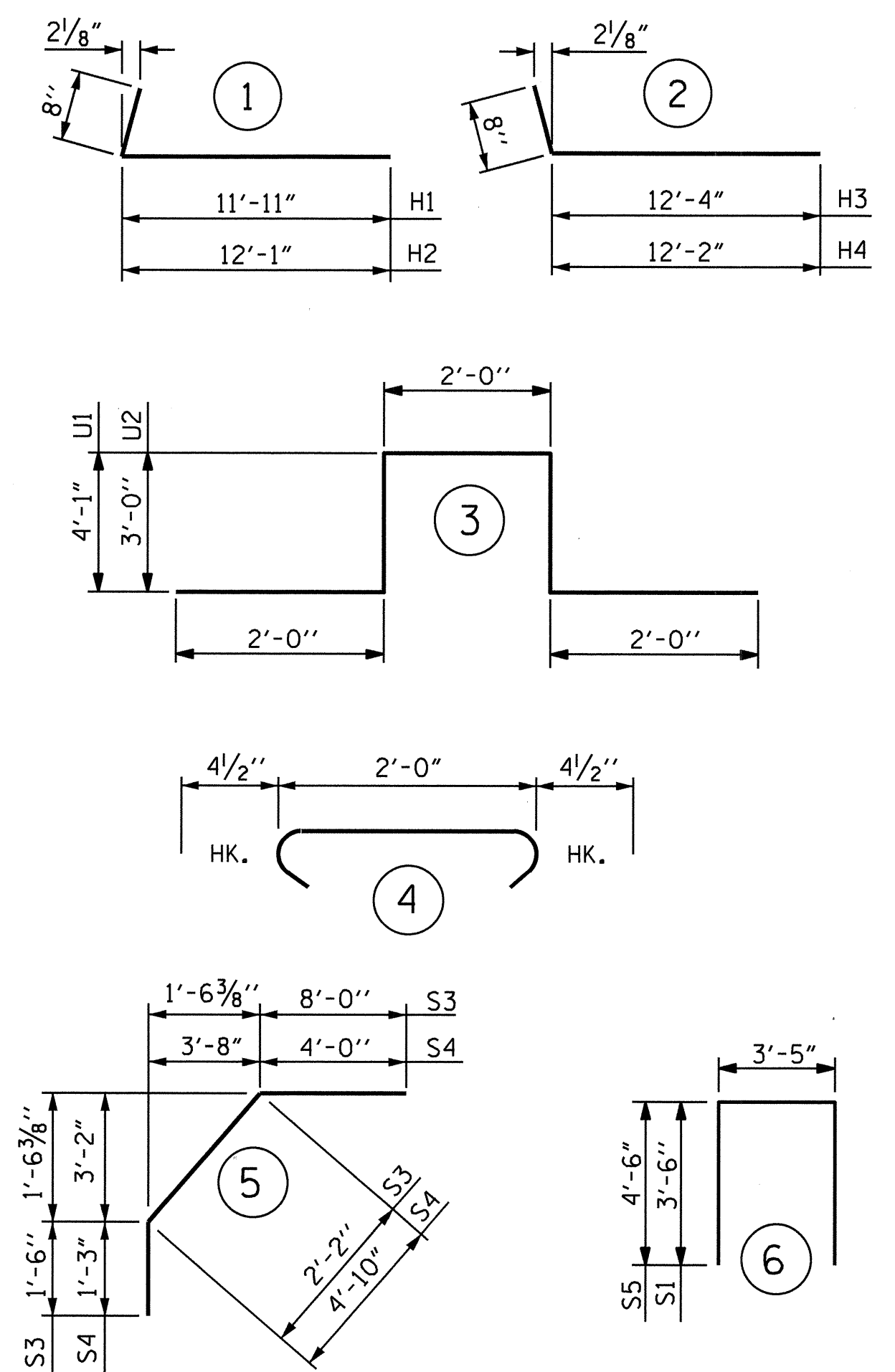
BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	293	#5	STR	42'-10"	13090	A217	2	#5	STR	11'-4"	24
A2	293	#5	STR	42'-10"	13090	A218	2	#5	STR	9'-6"	20
						A219	2	#5	STR	7'-7"	16
*A101	2	#5	STR	41'-2"	86	A220	2	#5	STR	5'-9"	12
*A102	2	#5	STR	39'-4"	82	A221	2	#5	STR	3'-11"	8
*A103	2	#5	STR	37'-5"	78	A222	2	#5	STR	2'-0"	4
*A104	2	#5	STR	35'-7"	74						
*A105	2	#5	STR	33'-9"	70	*B1	116	#4	STR	16'-6"	1279
*A106	2	#5	STR	31'-10"	66	*B2	58	#7	STR	43'-0"	5098
*A107	2	#5	STR	30'-0"	63	*B3	56	#7	STR	16'-6"	1889
*A108	2	#5	STR	28'-2"	59	*B4	29	#4	STR	18'-0"	349
*A109	2	#5	STR	26'-3"	55	B5	156	#5	STR	54'-3"	8827
*A110	2	#5	STR	24'-5"	51	*B6	112	#6	STR	10'-0"	1682
*A111	2	#5	STR	22'-6"	47						
*A112	2	#5	STR	20'-8"	43	H1	10	#4	1	12'-7"	84
*A113	2	#5	STR	18'-10"	39	H2	10	#4	1	12'-9"	85
*A114	2	#5	STR	16'-11"	35	H3	10	#4	2	13'-0"	87
*A115	2	#5	STR	15'-1"	31	H4	10	#4	2	12'-10"	86
*A116	2	#5	STR	13'-3"	28						
*A117	2	#5	STR	11'-4"	24	K1	16	#4	STR	26'-6"	283
*A118	2	#5	STR	9'-6"	20	K2	16	#4	STR	8'-6"	91
*A119	2	#5	STR	7'-7"	16	K3	16	#4	STR	7'-3"	77
*A120	2	#5	STR	5'-9"	12	K4	8	#4	STR	5'-2"	28
*A121	2	#5	STR	3'-11"	8	K5	8	#4	STR	5'-10"	31
*A122	2	#5	STR	2'-0"	4	K6	8	#4	STR	2'-9"	15
						K7	16	#4	STR	6'-0"	64
A201	2	#5	STR	41'-2"	86	K8	32	#4	STR	8'-6"	182
A202	2	#5	STR	39'-4"	82	K9	16	#4	STR	20'-0"	214
A203	2	#5	STR	37'-5"	78	K10	16	#4	STR	7'-9"	83
A204	2	#5	STR	35'-7"	74						
A205	2	#5	STR	33'-9"	70	*S1	76	#4	6	10'-5"	529
A206	2	#5	STR	31'-10"	66	S2	192	#4	4	2'-9"	353
A207	2	#5	STR	30'-0"	63	*S3	76	#4	5	11'-8"	592
A208	2	#5	STR	28'-2"	59	*S4	72	#4	5	10'-1"	485
A209	2	#5	STR	26'-3"	55	*S5	8	#4	6	12'-5"	66
A210	2	#5	STR	24'-5"	51						
A211	2	#5	STR	22'-6"	47	U1	48	#4	3	14'-2"	454
A212	2	#5	STR	20'-8"	43	U2	16	#4	3	12'-0"	128
A213	2	#5	STR	18'-10"	39						
A214	2	#5	STR	16'-11"	35	V2	88	#4	STR	4'-6"	265
A215	2	#5	STR	15'-1"	31	REINFORCING STEEL = 25,518 LBS					
A216	2	#5	STR	13'-3"	28	*EPOXY COATED REINF. STEEL = 26,050 LBS					

GROOVING BRIDGE FLOORS

APPROACH SLABS	1681	SO.FT.
BRIDGE DECK	5856	SO.FT.
TOTAL	7537	SO.FT.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

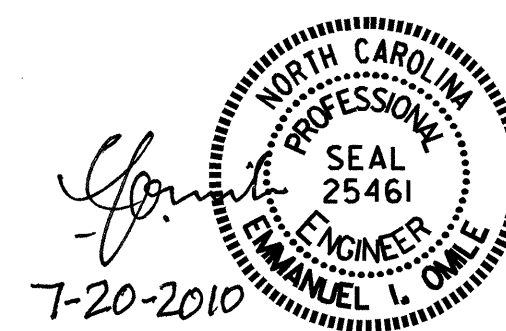
SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE (CU.YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
SPANS A, B & C		25,518	26,050
POUR #1	54.5		
POUR #2	100.4		
POUR #3	84.6		
POUR #4	75.3		
TOTALS **	314.8	25,518	26,050

** QUANTITIES FOR PARAPETS ARE NOT INCLUDED

PROJECT NO. B-4286
SWAIN COUNTY
STATION: 16+39.20 -L-

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

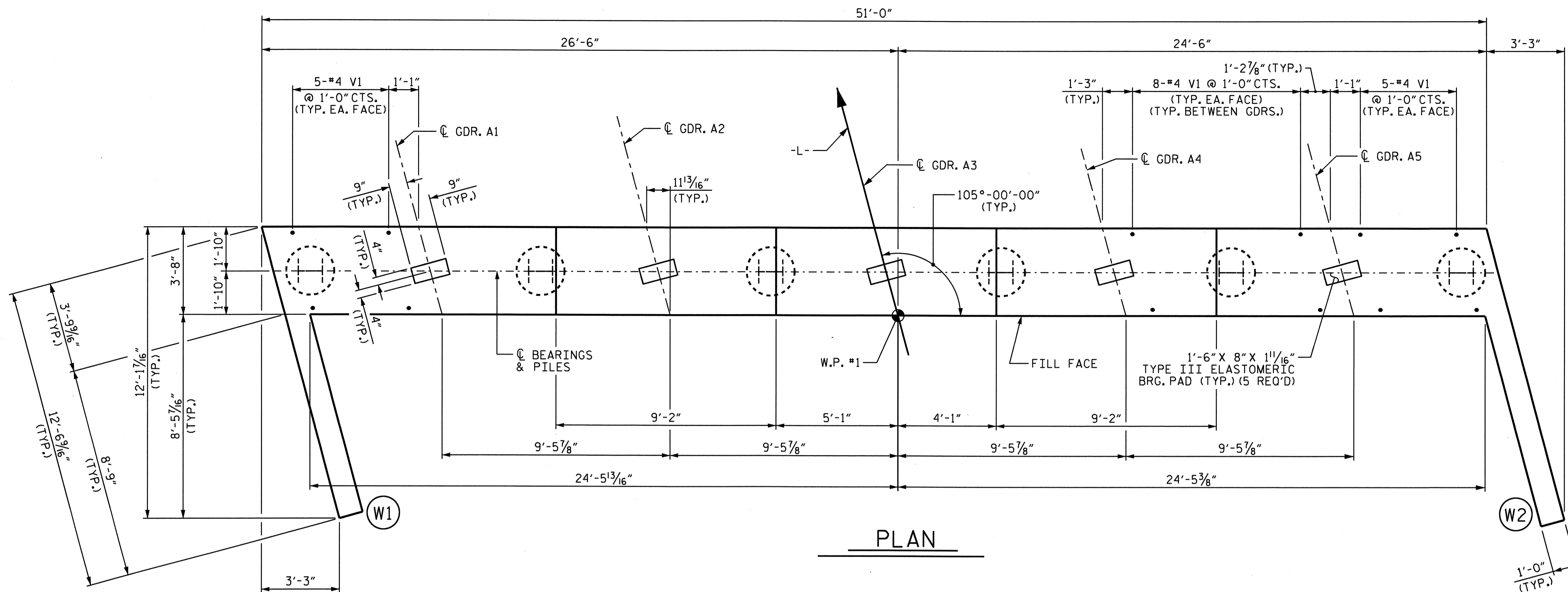


ASSEMBLED BY :	QT NGUYEN	DATE :	6-09
CHECKED BY :	E.I. OMIE	DATE :	1-10
DRAWN BY :	JMB 5/87	REV. 6/1/94	EEM/GRP
CHECKED BY :	SJD 9/87	REV. 8/16/99	RWW/LES
		REV. 5/1/06	TLA/GM

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

TOTAL SHEETS 41

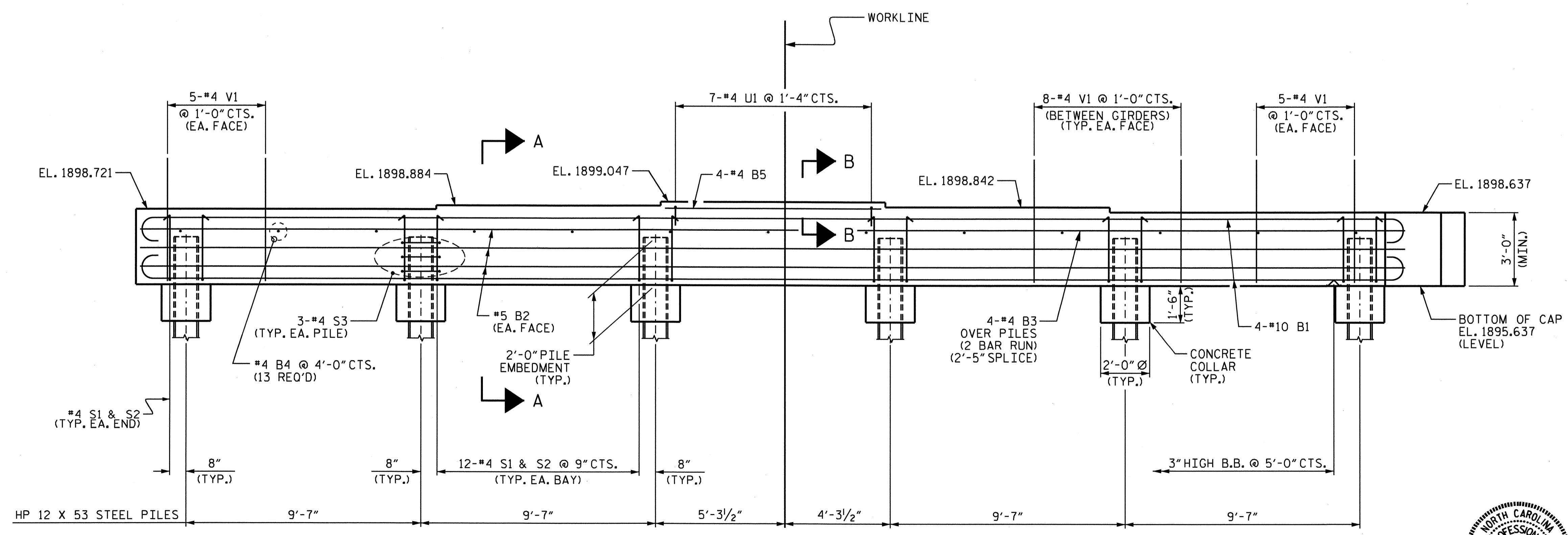
STD. NO. BOM1



PLAN

NOTES :

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.
 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.
 SEE SUPERSTRUCTURE SHEETS FOR THE ABUTMENT DETAILS.

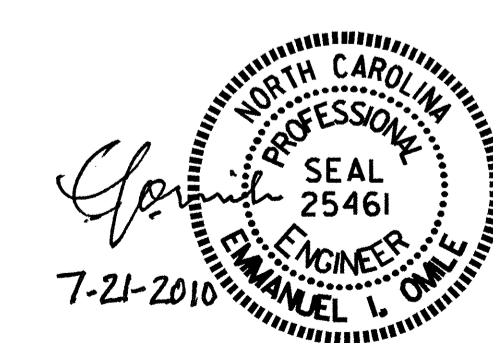


ELEVATION

LEFT WING NOT SHOWN FOR CLARITY

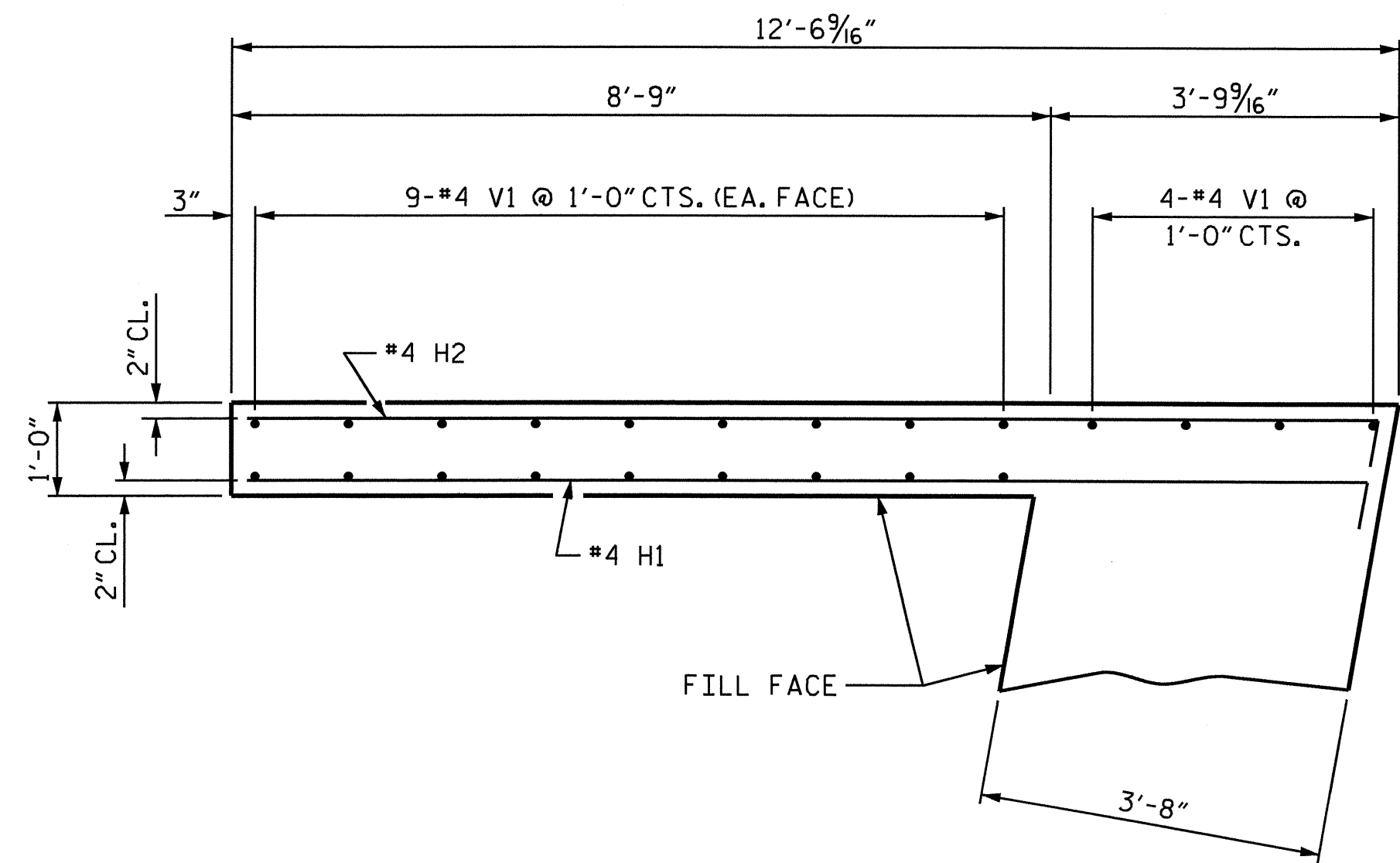
PROJECT NO. B-4286
SWAIN COUNTY
 STATION: 16+39.20 -L-
 SHEET 1 OF 3

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

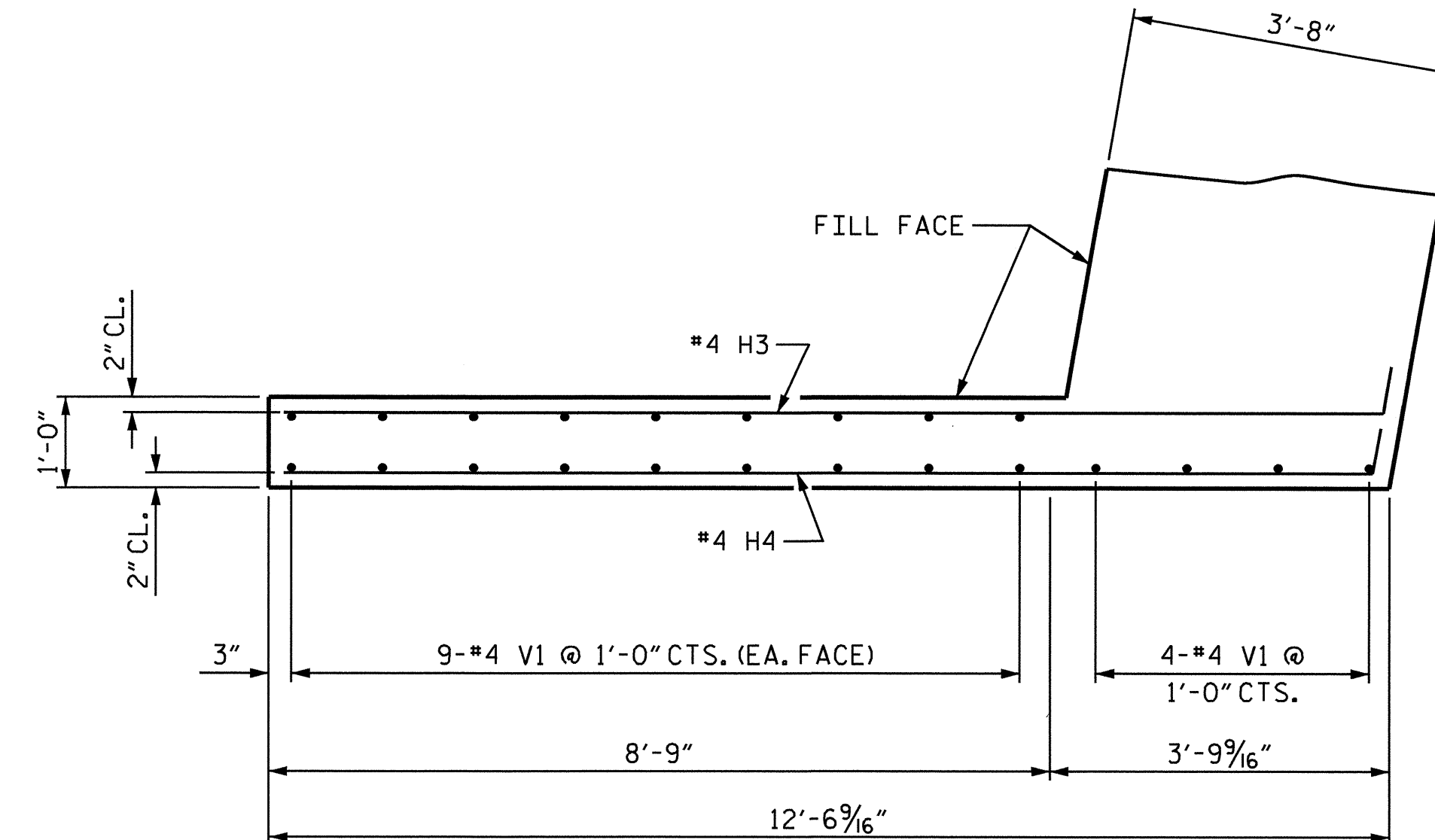


DRAWN BY : QT NGUYEN DATE : 6-09
 CHECKED BY : E.I. OMILE DATE : 1-10

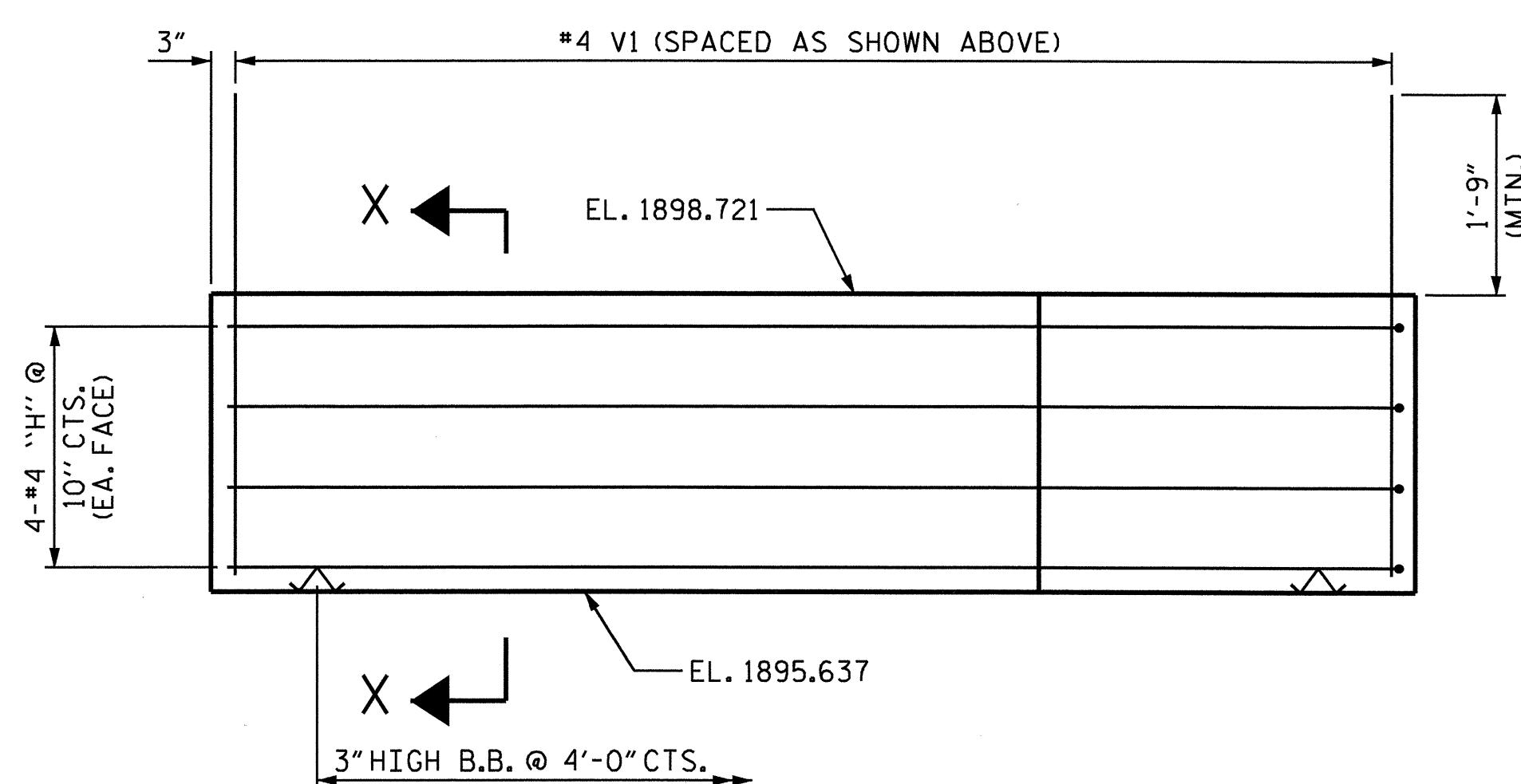
REVISIONS						SHEET NO. S-26
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 41
2			4			



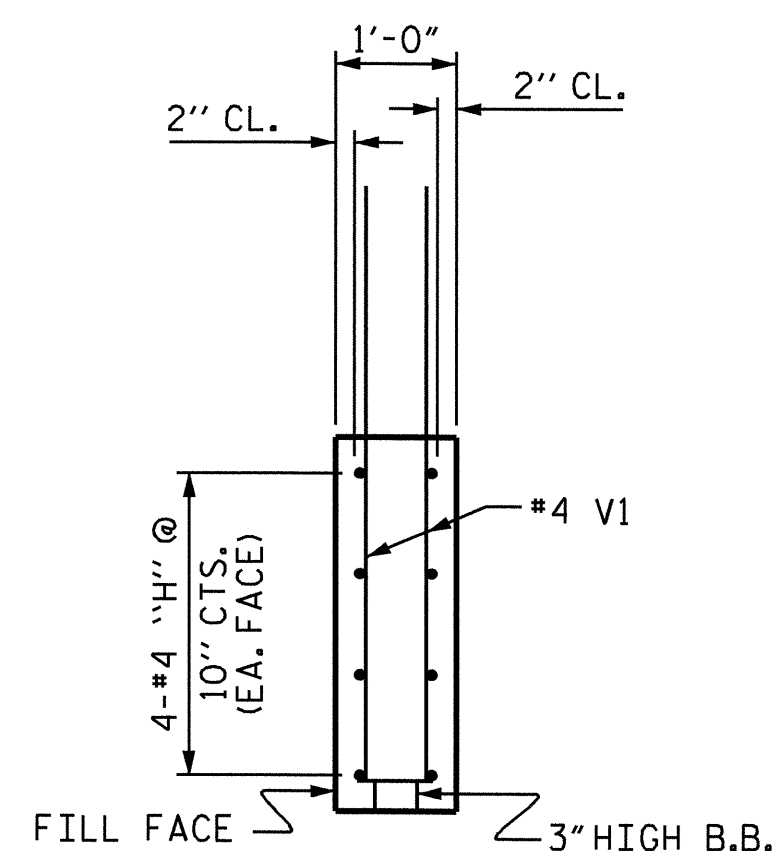
PLAN OF WING (W1)



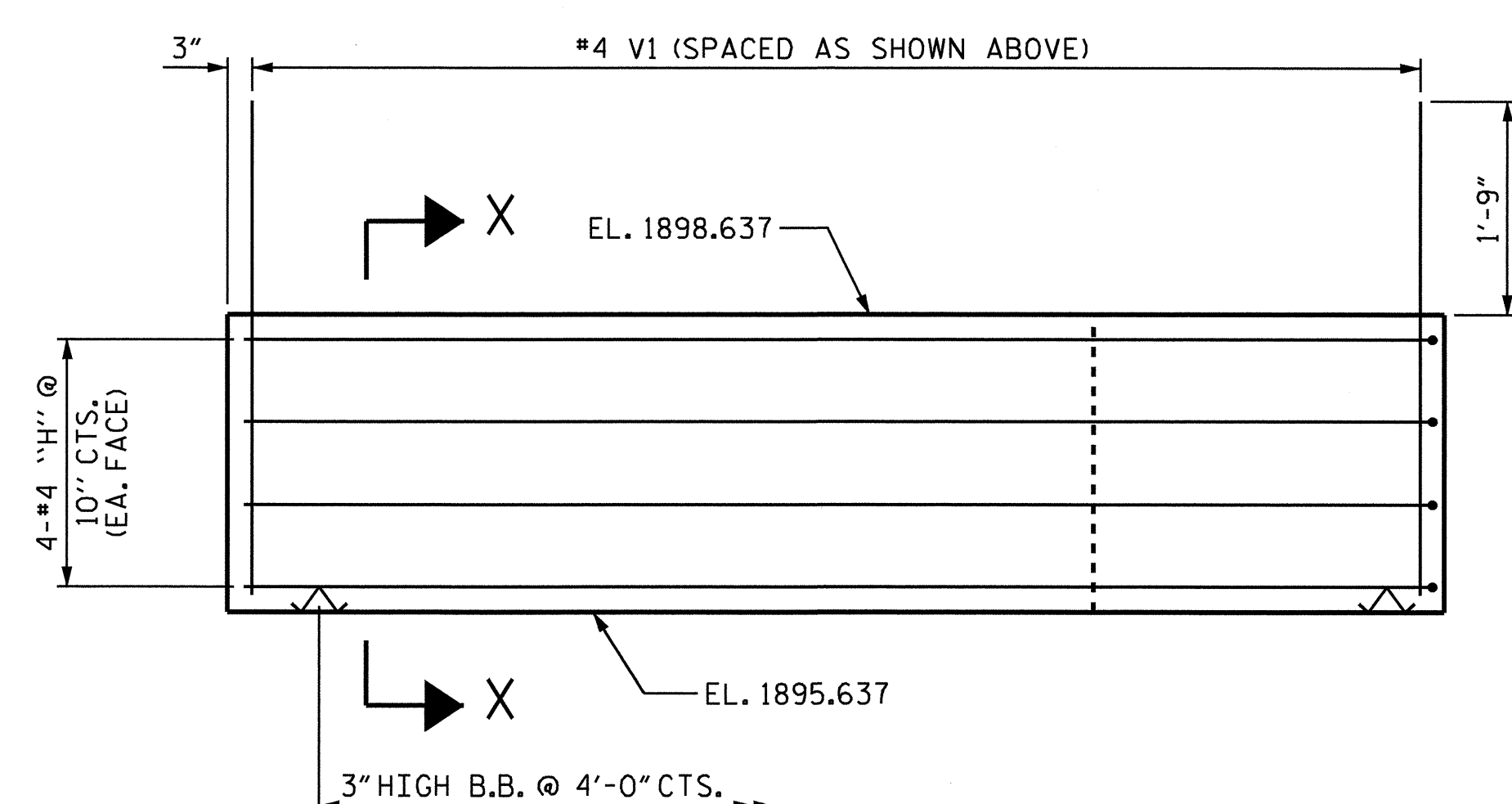
PLAN OF WING (W2)



ELEVATION OF WING (W1)



SECTION X-X



ELEVATION OF WING (W2)

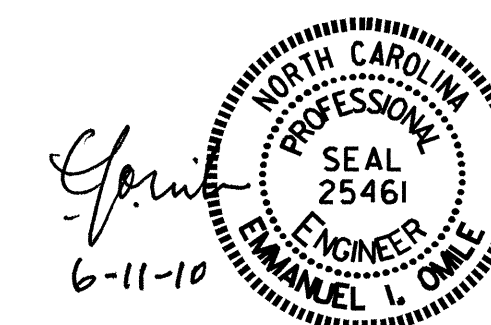
PROJECT NO. B-4286
SWAIN COUNTY
 STATION: 16+39.20 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE

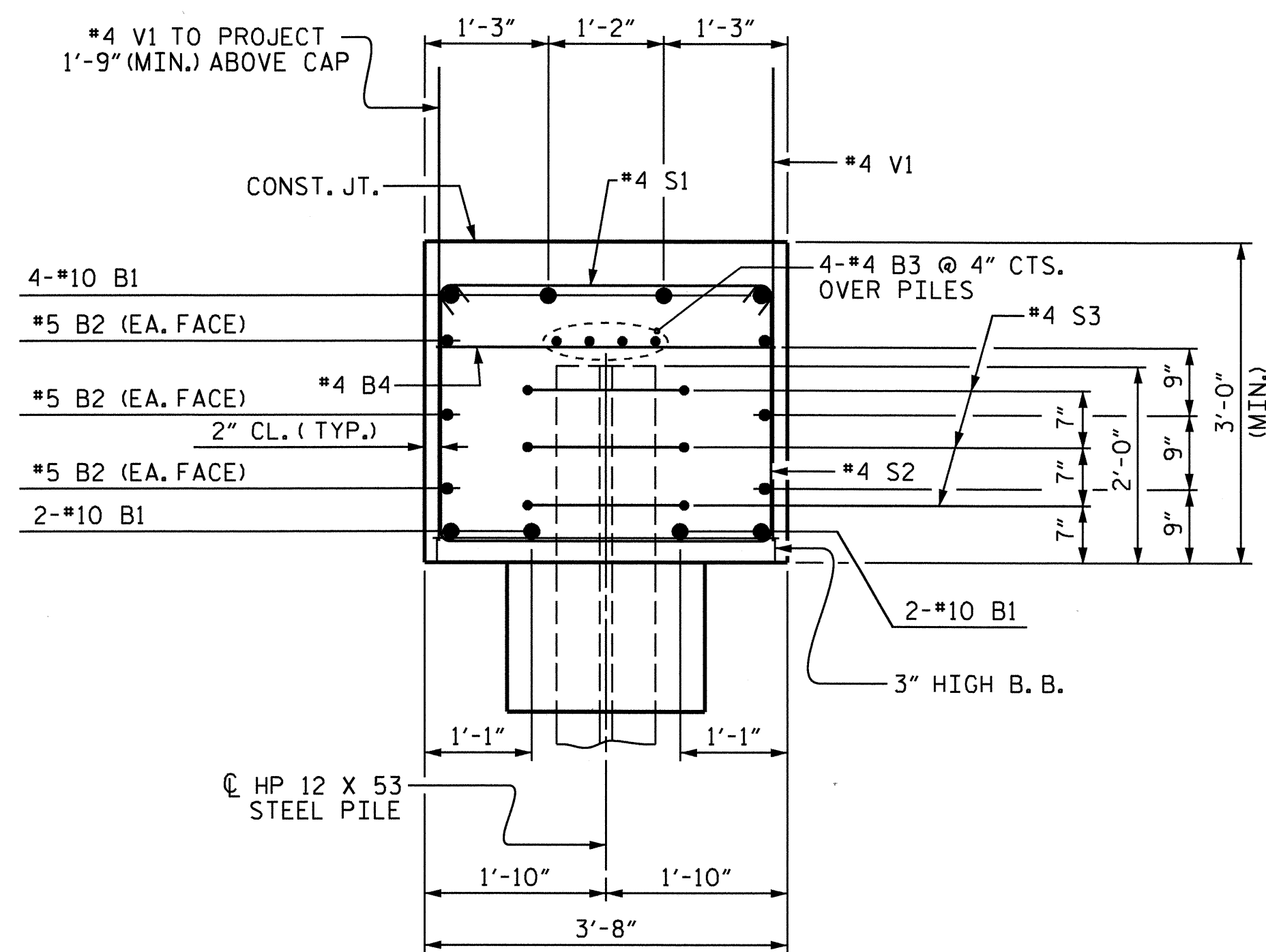
END BENT 1
 INTEGRAL



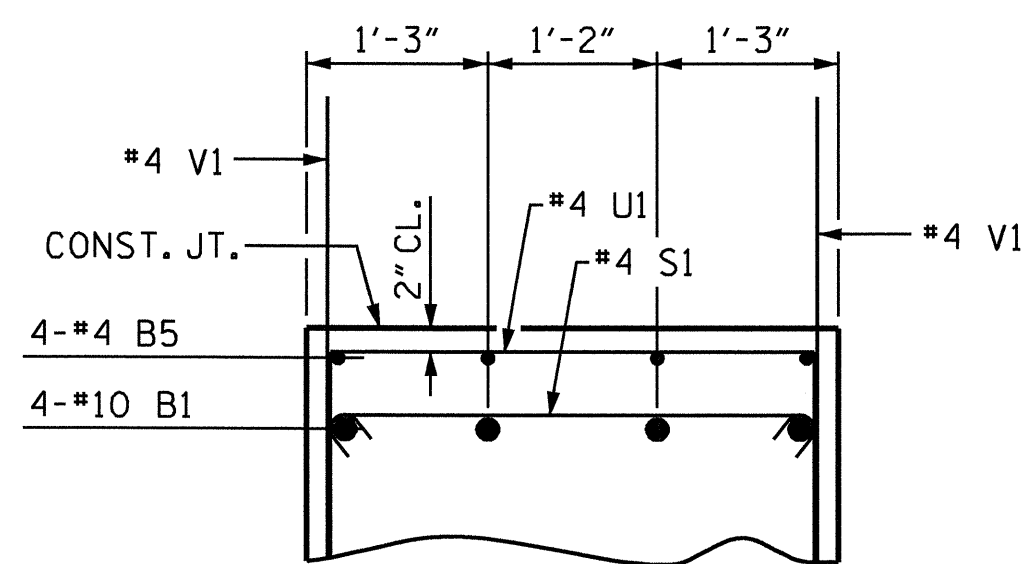
DRAWN BY: QT NGUYEN DATE: 6-09
 CHECKED BY: E.I. OMILE DATE: 1-10

09-JUN-2010 12:37
 Q:\Structures\FINAL PLANS\B4286_SD_E1&2.dgn
 eomile

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			41



SECTION A-A



PARTIAL SECTION B-B

BILL OF MATERIAL

END BENT 1

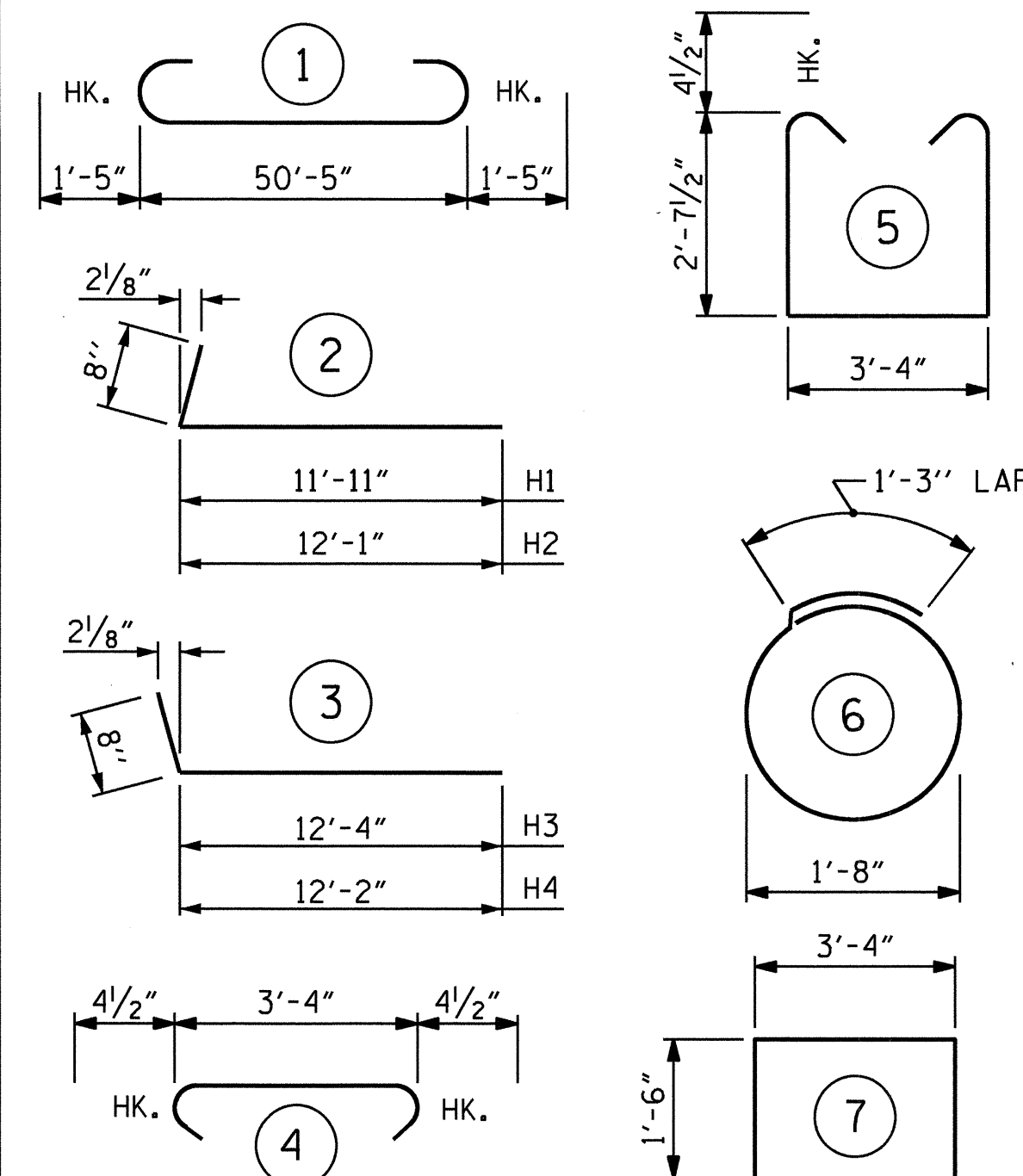
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#10	1	53'-3"	1833
B2	6	#5	STR	50'-7"	317
B3	8	#4	STR	26'-7"	142
B4	13	#4	STR	3'-4"	29
B5	4	#4	STR	8'-10"	24
H1	4	#4	2	12'-7"	34
H2	4	#4	2	12'-9"	34
H3	4	#4	3	13'-0"	35
H4	4	#4	3	12'-10"	34
S1	62	#4	4	4'-1"	169
S2	62	#4	5	9'-4"	387
S3	18	#4	6	6'-6"	78
U1	7	#4	7	6'-4"	30
V1	128	#4	STR	5'-0"	428

REINFORCING STEEL = 3574 LBS

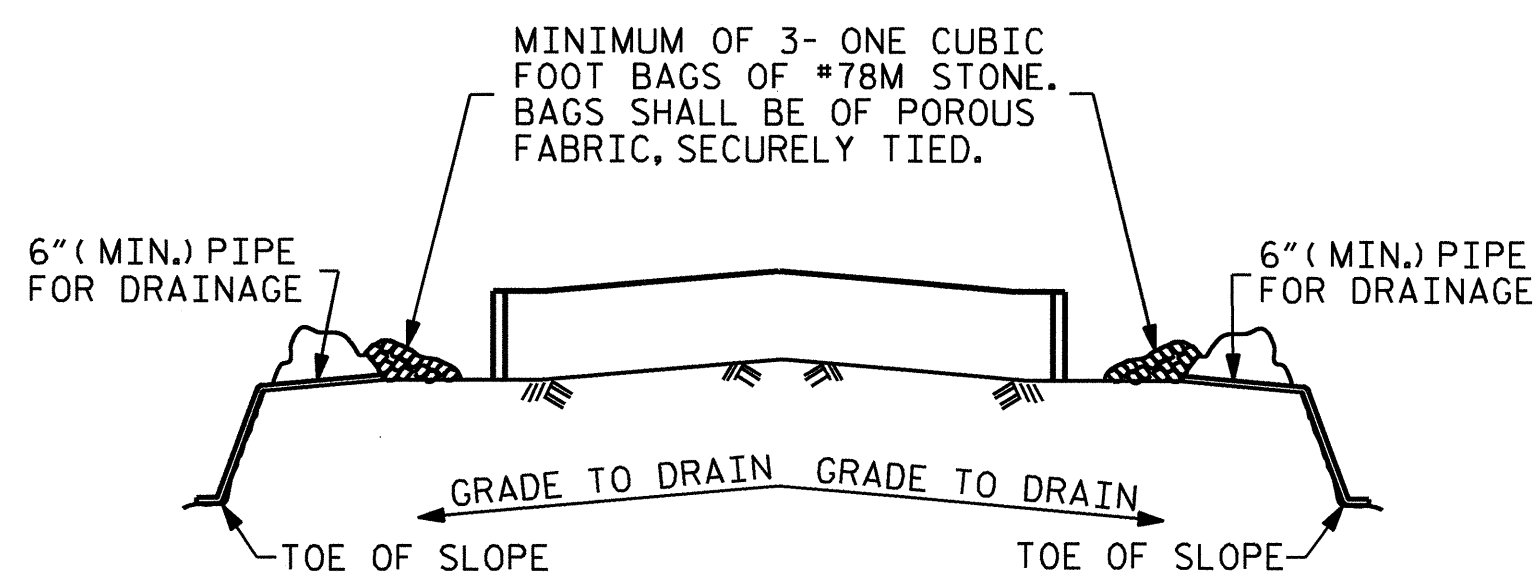
CLASS A CONCRETE BREAKDOWN :
CAP, LOWER WINGS & COLLARS = 25.0 C.Y.

HP 12 X 53 STEEL PILES :
No. 6 LIN. FT. 210

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

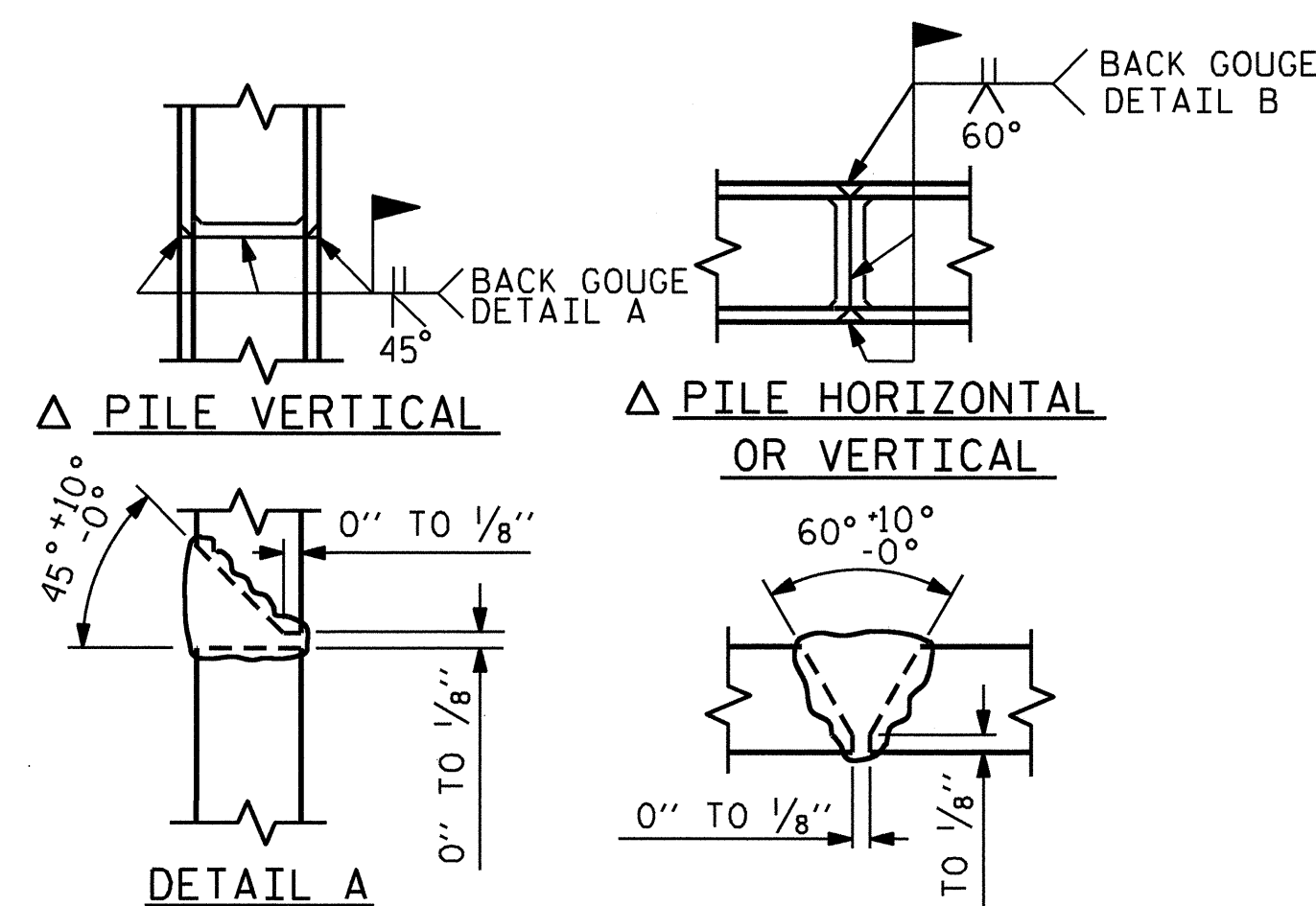


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

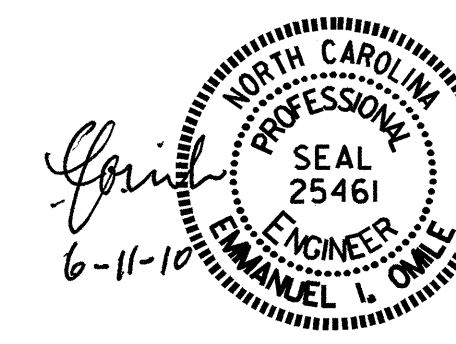
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



PROJECT NO. B-4286
SWAIN COUNTY
STATION: 16+39.20 -L-

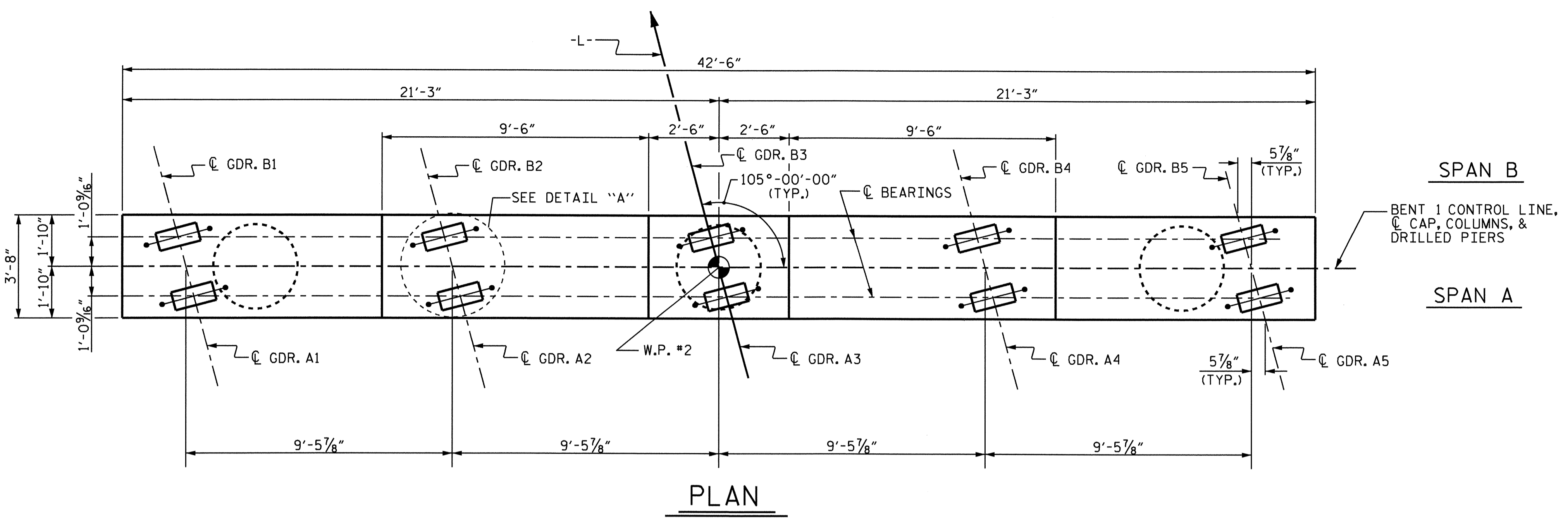
SHEET 3 OF 3

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

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

TOTAL SHEETS 41

DRAWN BY : QT NGUYEN DATE : 6-09
CHECKED BY : E.I. OMILE DATE : 1-10



NOTES

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

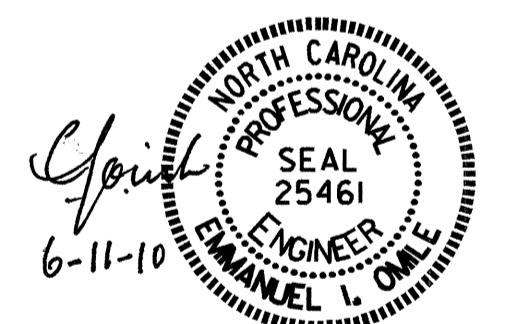
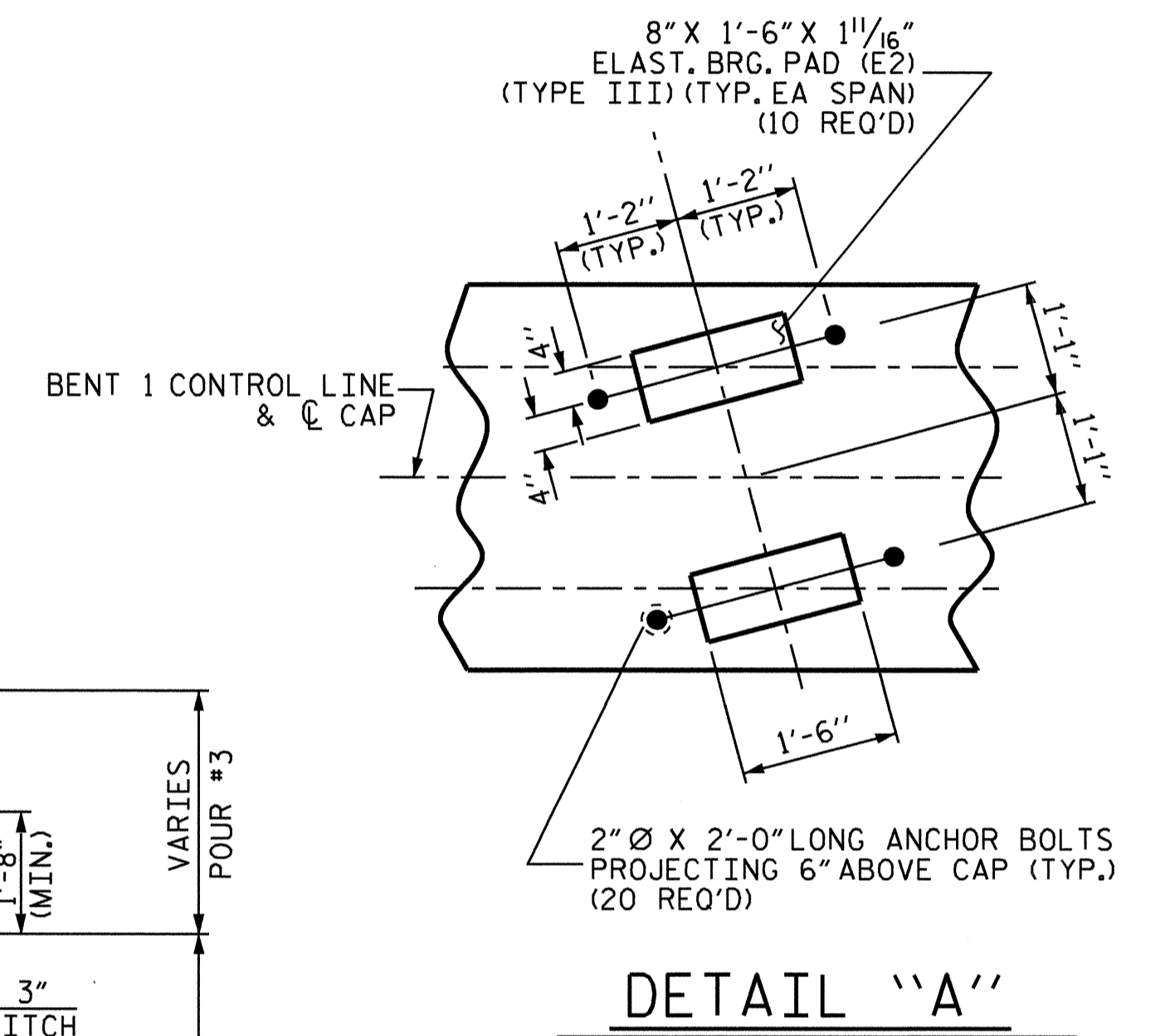
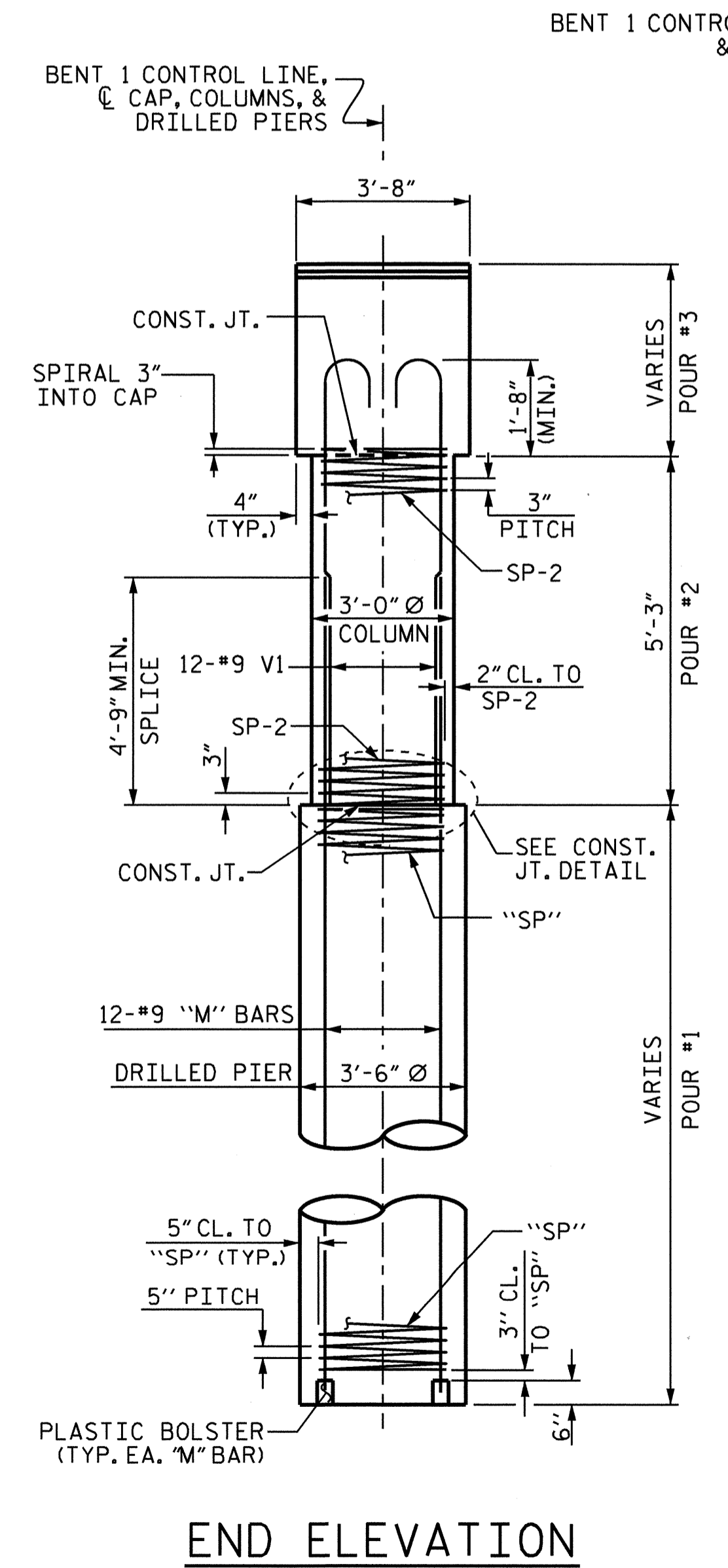
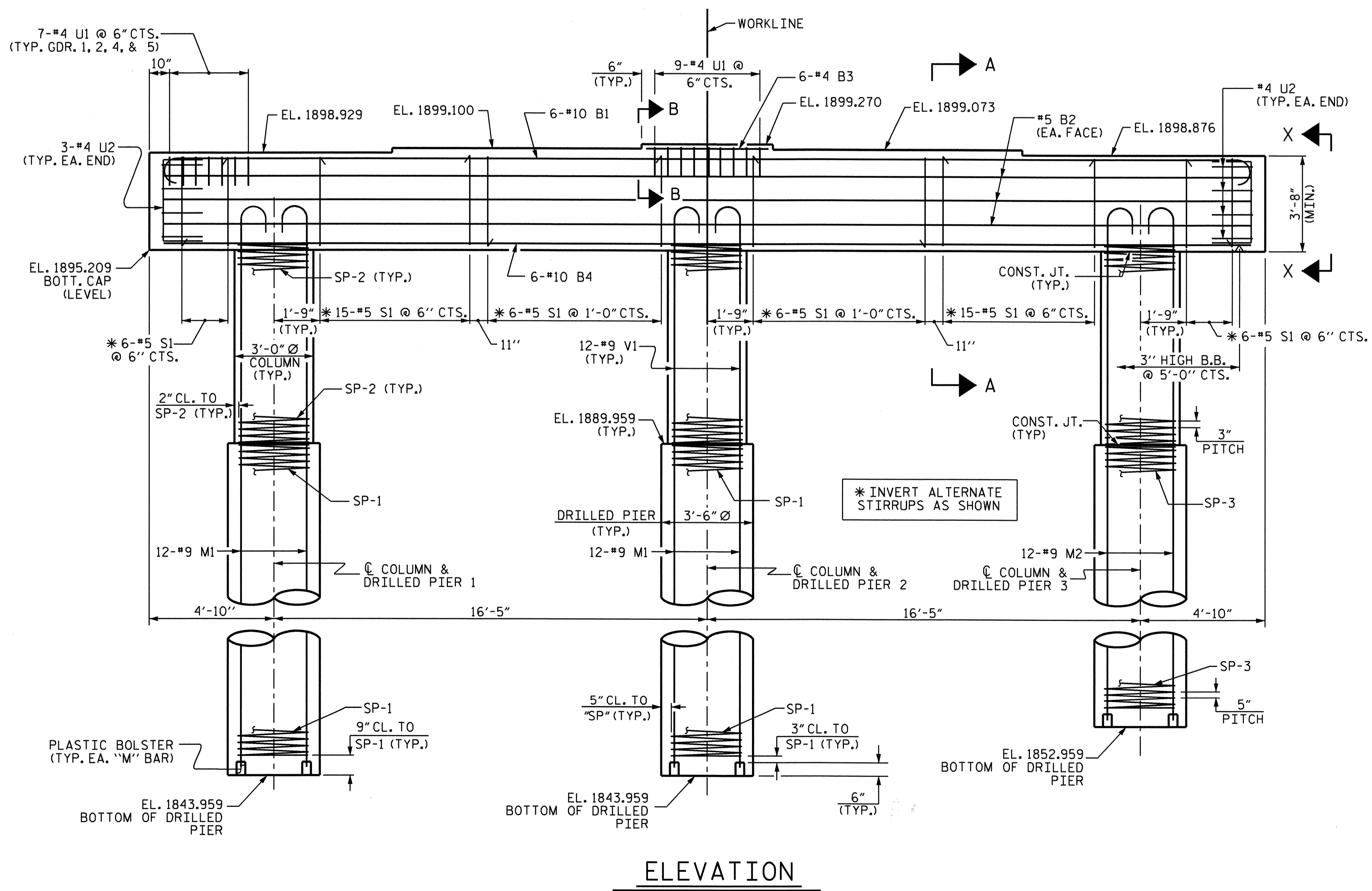
HOOKS IN "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

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 PIERS WILL NOT BE PERMITTED.

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

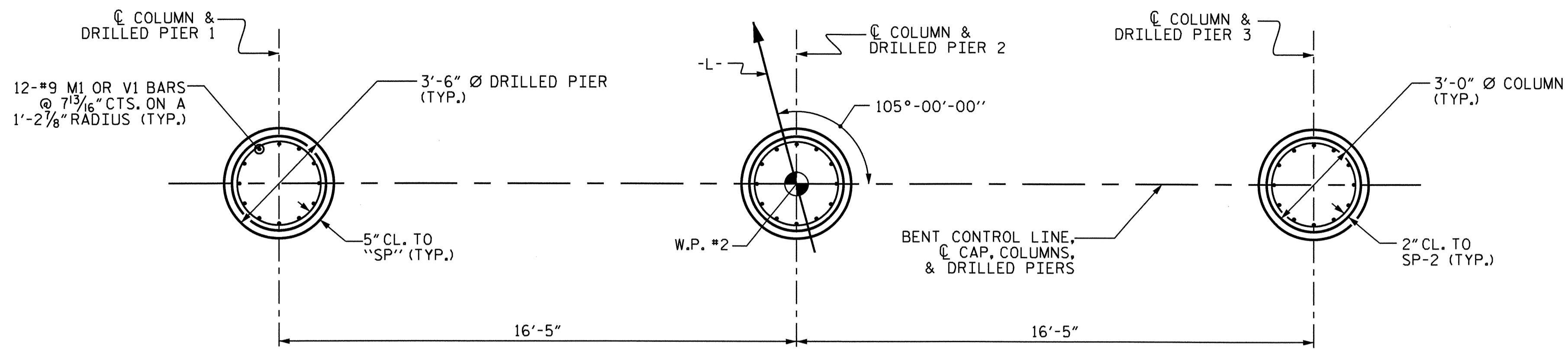


PROJECT NO. B-4286
SWAIN COUNTY
 STATION: 16+39.20 -L-

SHEET 1 OF 2

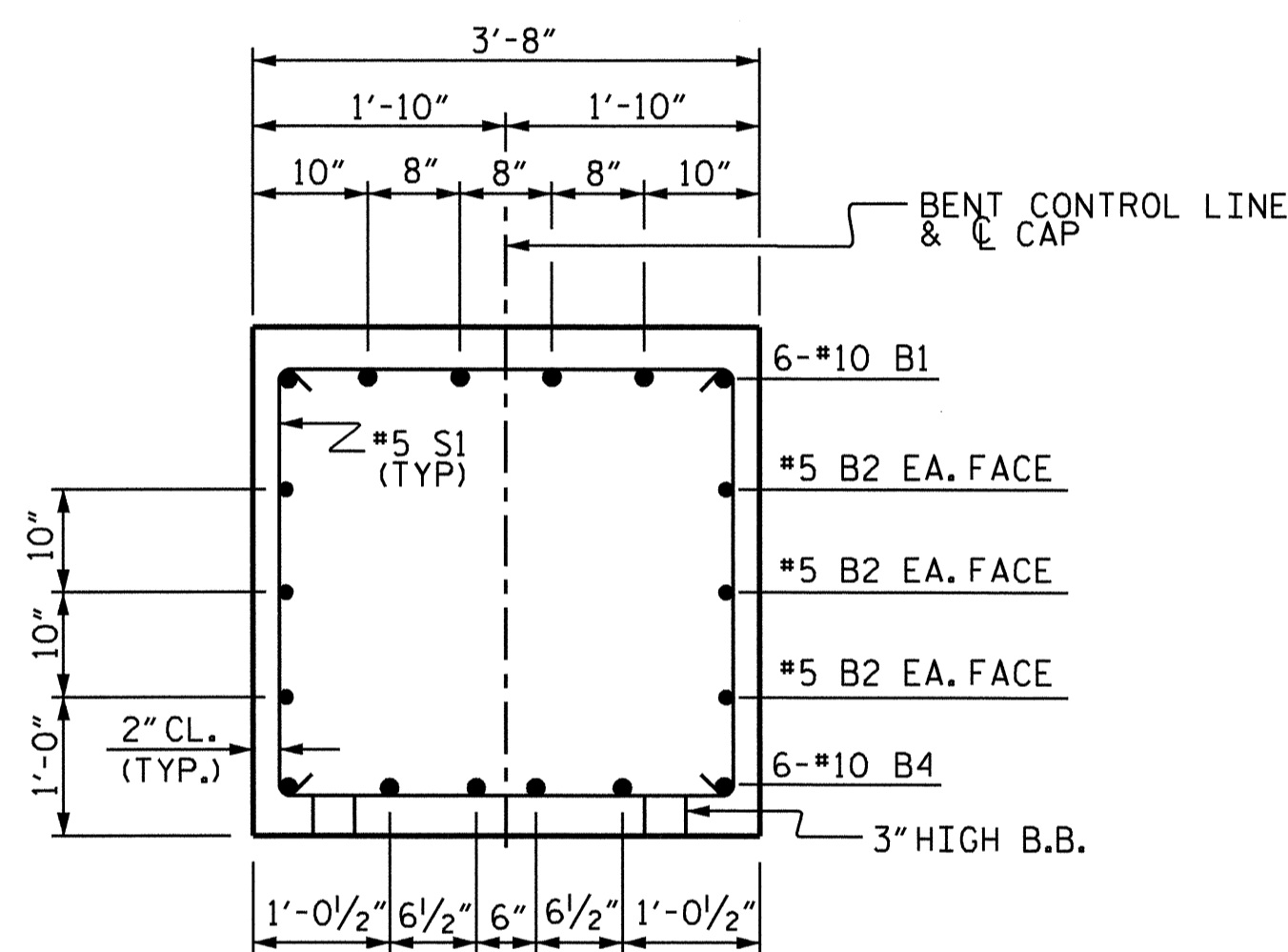
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
BENT 1					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					5-29
					TOTAL SHEETS 41

DRAWN BY: Z. H. BROWN DATE: 3/18/09
 CHECKED BY: O. T. NGUYEN DATE: 2/03/10

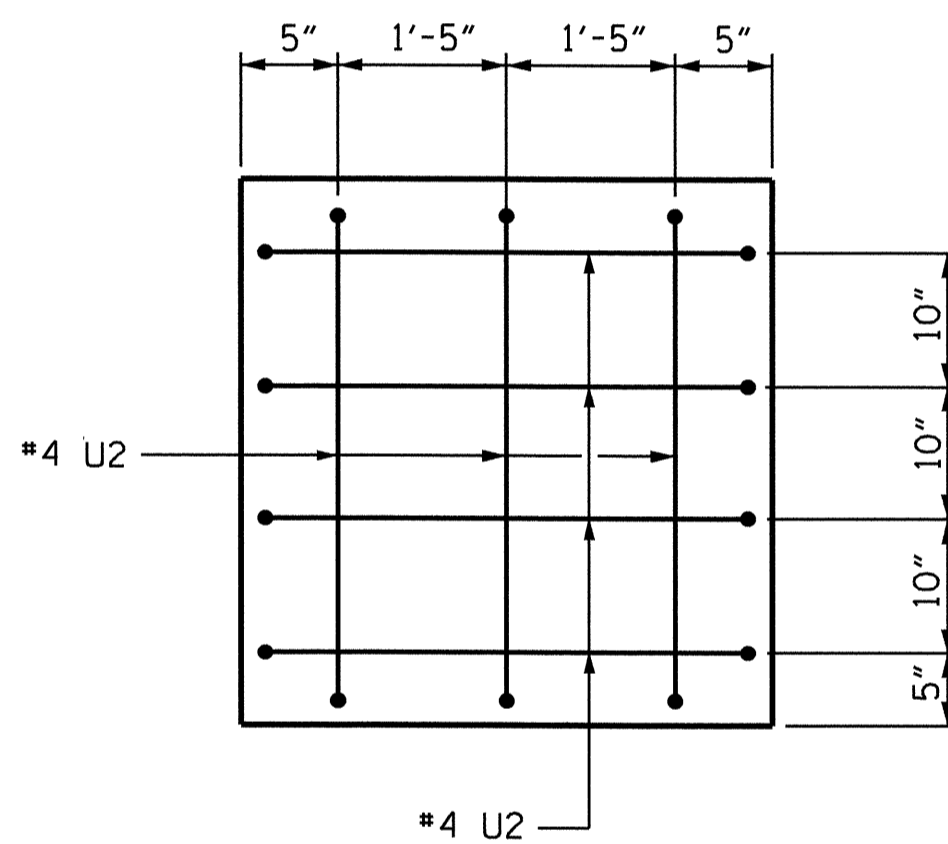


PLAN OF COLUMNS & DRILLED PIERS

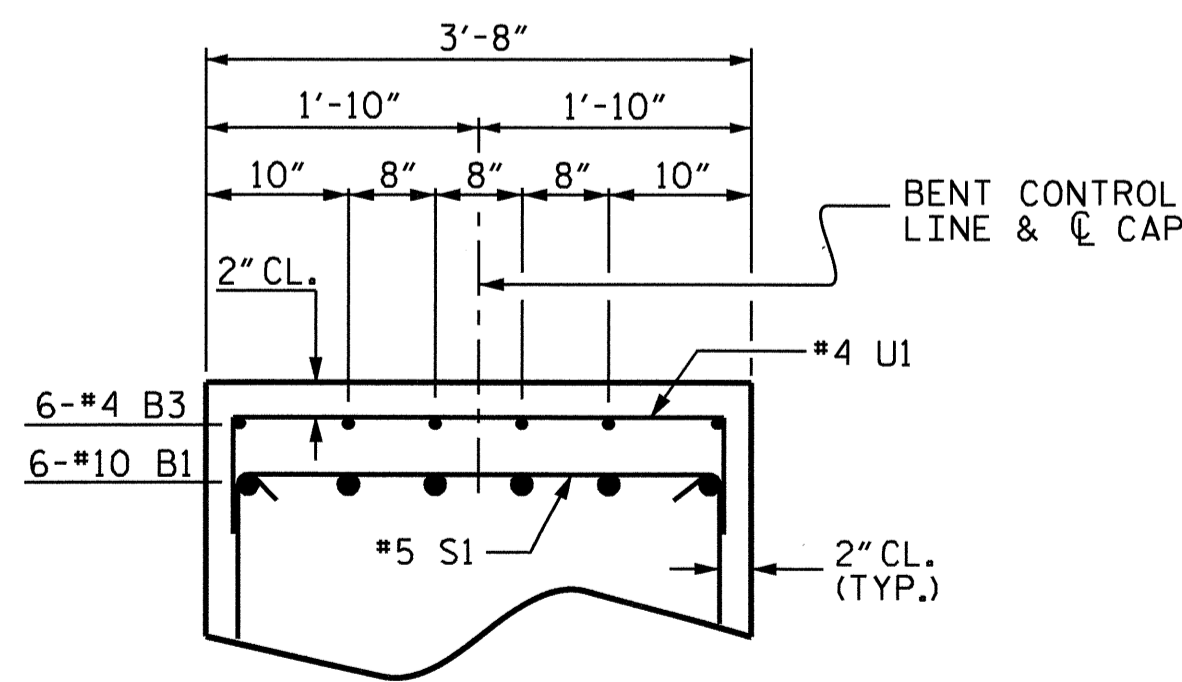
(REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER)



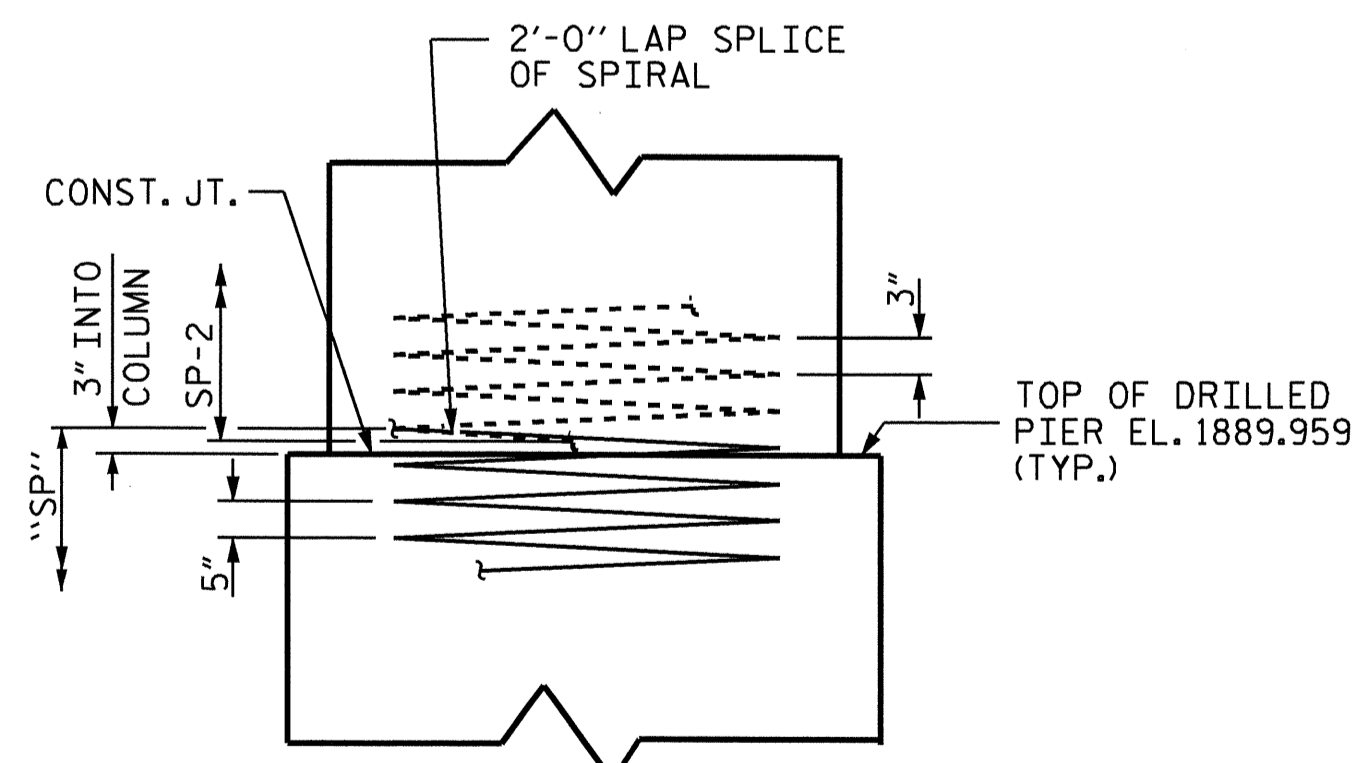
SECTION A-A



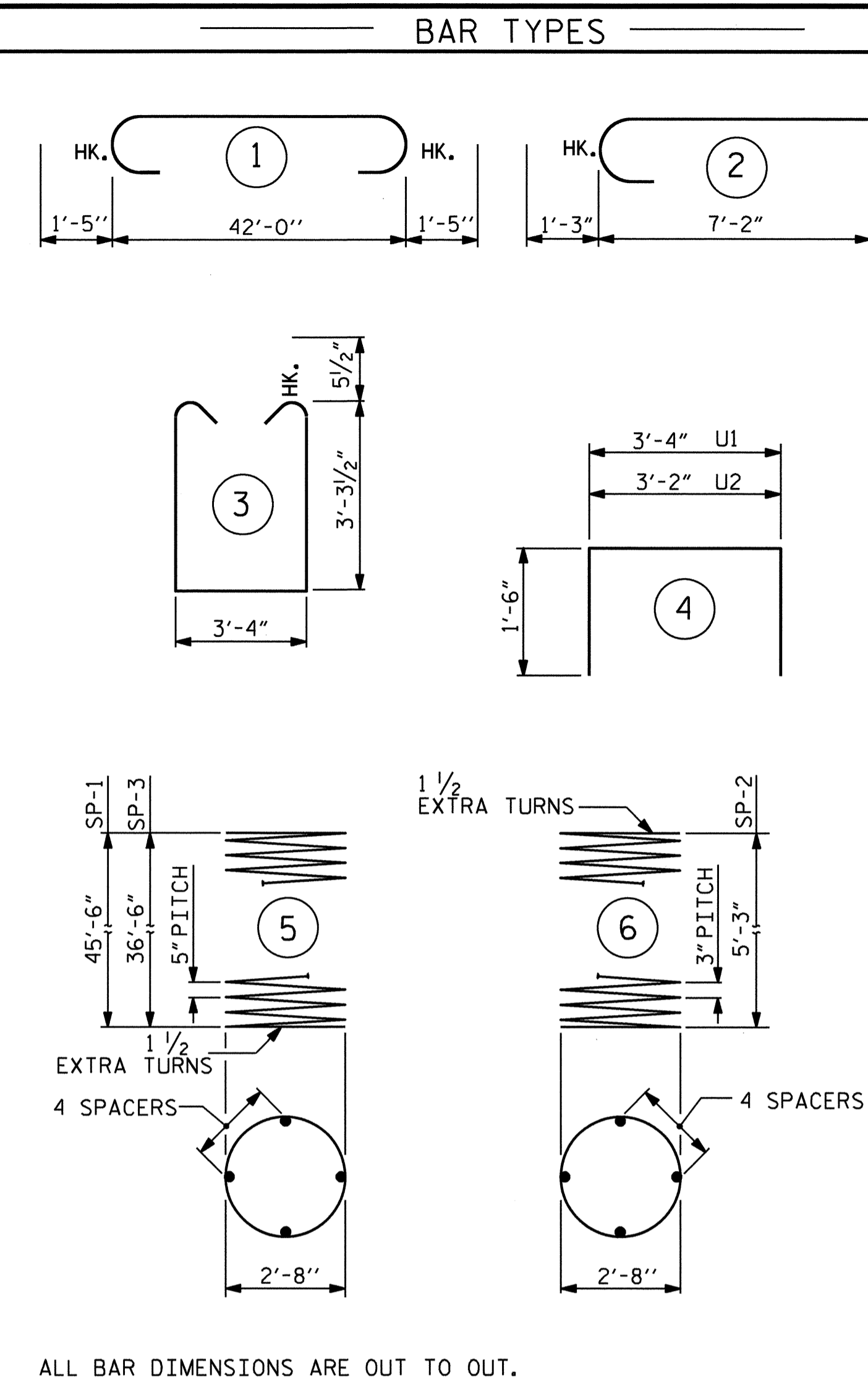
VIEW X-X



SECTION B-B



CONSTRUCTION JOINT DETAIL



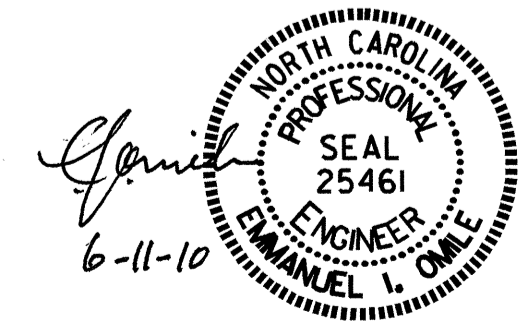
* THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.
 * THE SP-1 & SP-3 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR,

BILL OF MATERIAL

BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#10	1	44'-10"	1158
B2	6	#5	STR	42'-2"	264
B3	6	#4	STR	4'-8"	19
B4	6	#10	STR	42'-2"	1089
M1	24	#9	STR	53'-6"	4366
M2	12	#9	STR	44'-6"	1816
S1	54	#5	3	10'-10"	610
U1	37	#4	4	6'-4"	157
U2	14	#4	4	6'-2"	58
V1	36	#9	2	8'-5"	1030
REINFORCING STEEL					= 10,567 LBS.
SPIRAL REINFORCING STEEL					
SP-1	2	*	5	913'-0"	1905
SP-2	3	**	6	191'-10"	384
SP-3	1	*	5	740'-3"	772
TOTAL SPIRAL COLUMN REINFORCING STEEL					3,061 LBS.
CLASS A CONCRETE BREAKDOWN					
POUR #2 COLUMNS					4.1 C.Y.
POUR #3 CAP					22.0 C.Y.
CLASS A CONCRETE TOTAL					26.1 C.Y.
DRILLED PIER QUANTITIES					
POUR #1 DRILLED PIER CONCRETE					46.0 C.Y.
3'-6" Ø DRILLED PIERS IN SOIL					114.0 L.F.
3'-6" Ø DRILLED PIERS NOT IN SOIL					15.0 L.F.
3'-6" Ø PERMANENT STEEL CASING					39.0 L.F.
CSL TUBES					546.0 FT.

PROJECT NO. B-4286
 SWAIN COUNTY
 STATION: 16+39.00 -L-
 SHEET 2 OF 2

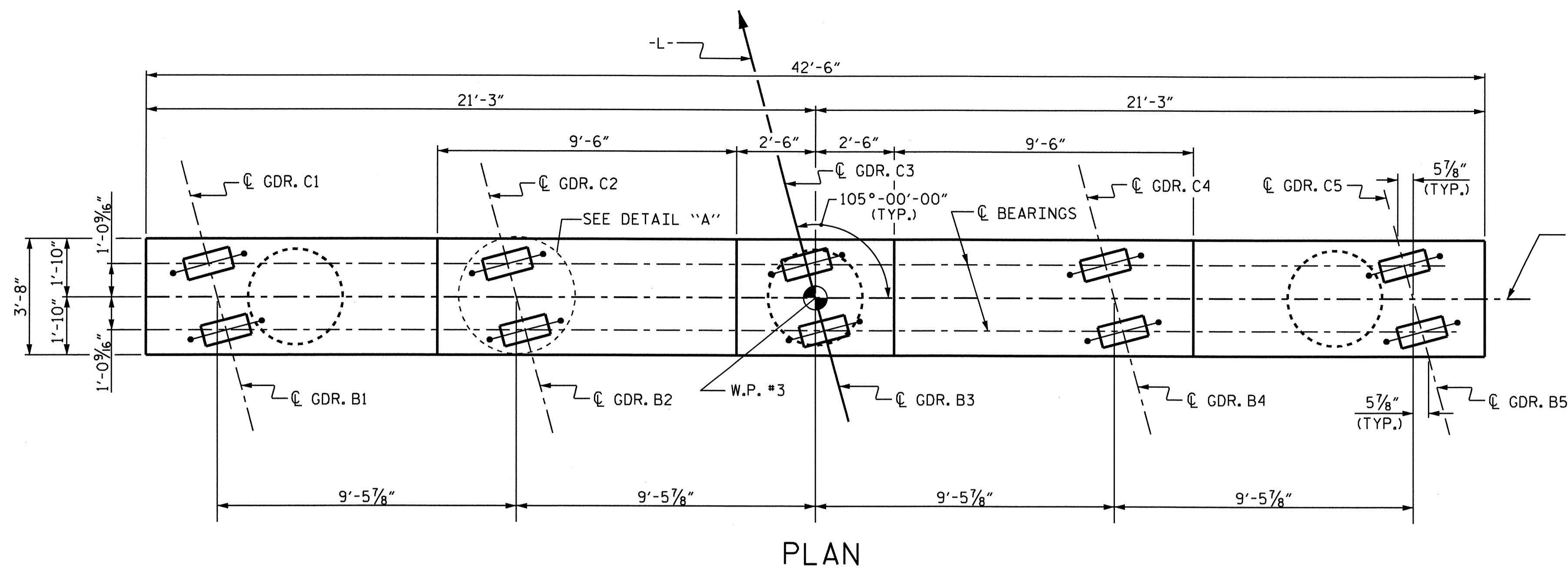
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT 1



DRAWN BY : Z. H. BROWN DATE : 4/2/09
 CHECKED BY : Q. T. NGUYEN DATE : 2/03/10

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

TOTAL SHEETS: 41



PLAN

SPAN C

SPAN B

BENT 2 CONTROL LINE,
C. CAP, COLUMNS, &
DRILLED PIERS

NOTES

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

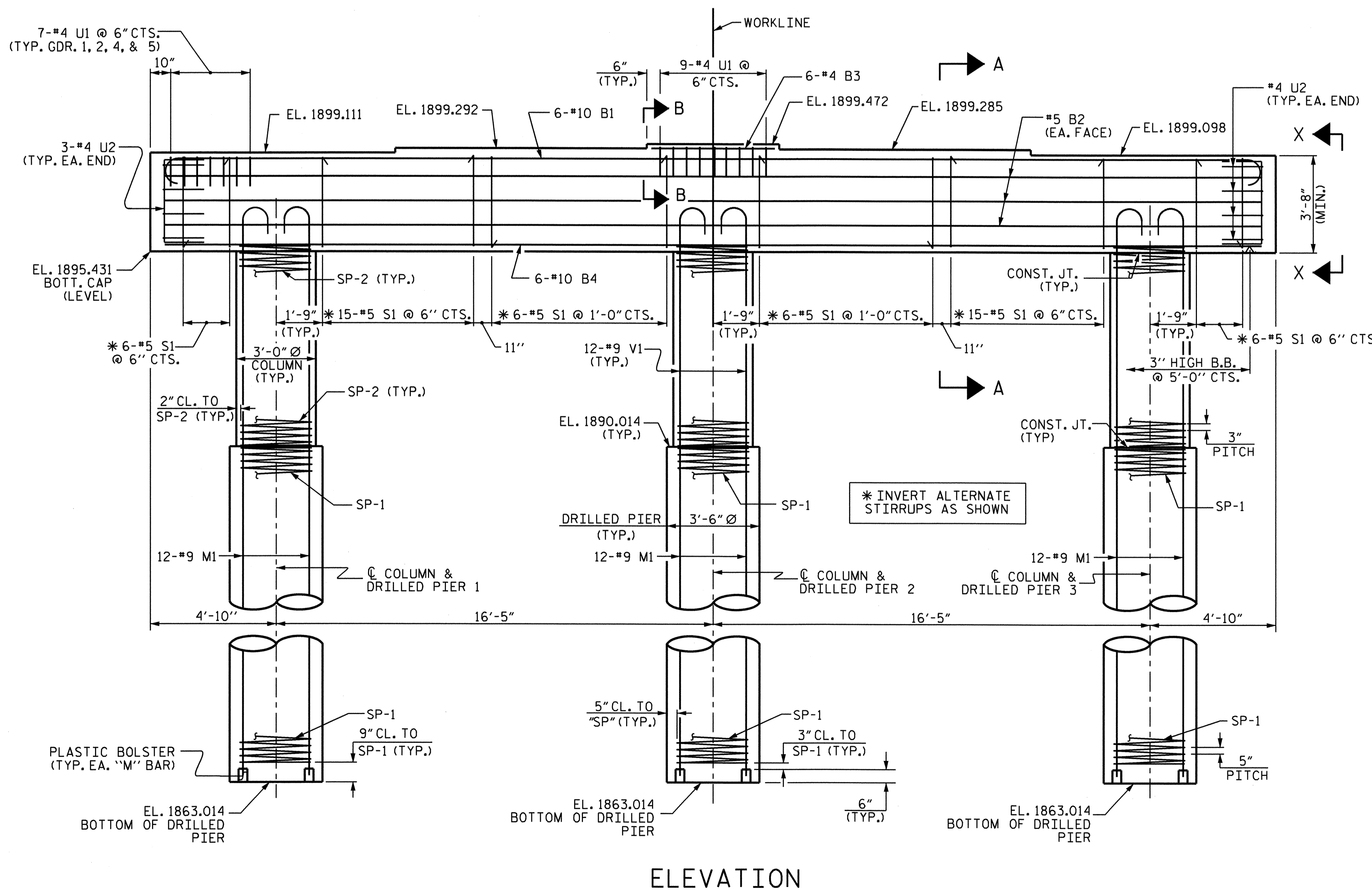
HOOKS IN "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

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

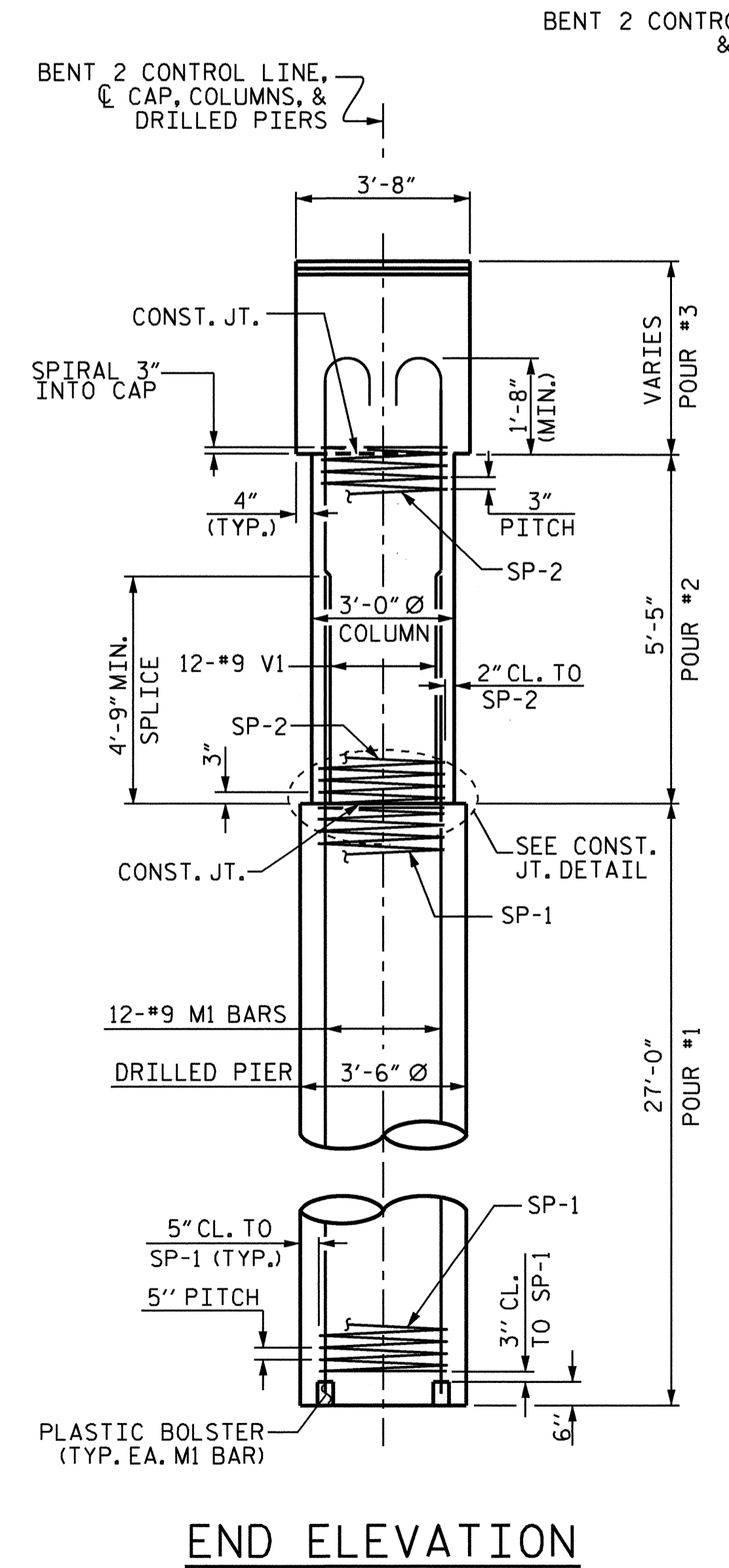
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

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

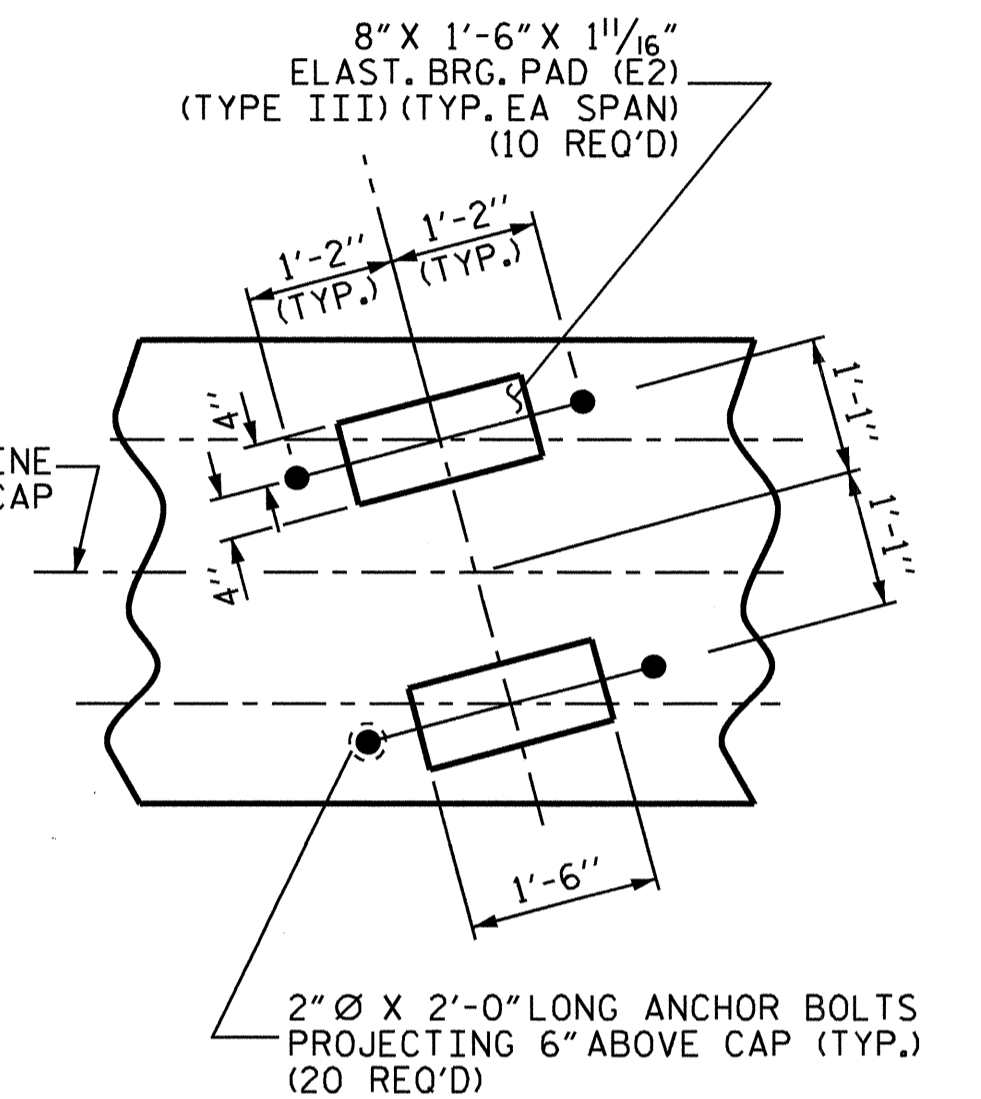
NO SEPARATE PAYMENT SHALL BE MADE FOR ANY ADDITIONAL STEEL REQUIRED IN CONSTRUCTION OF THE DRILLED PIER AS THIS IS CONSIDERED INCIDENTAL TO THE LINEAR FOOT PRICE FOR DRILLED PIER.



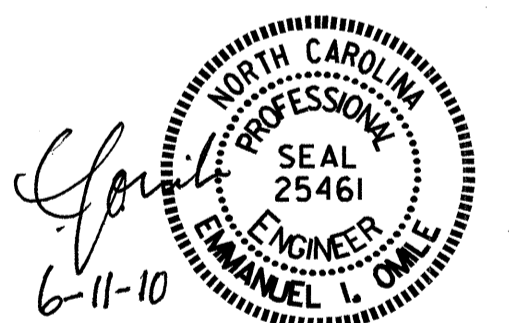
ELEVATION



END ELEVATION



DETAIL "A"

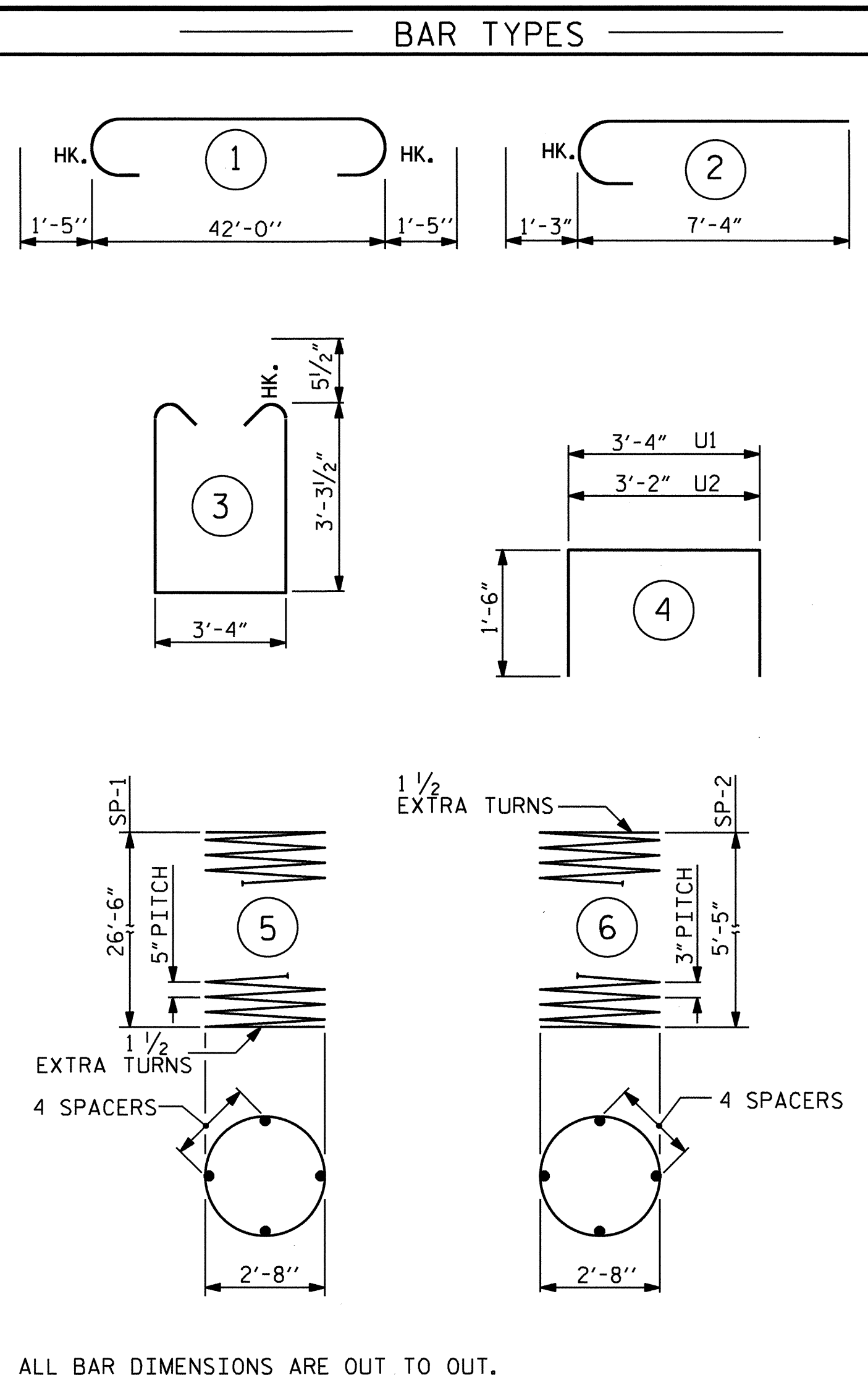
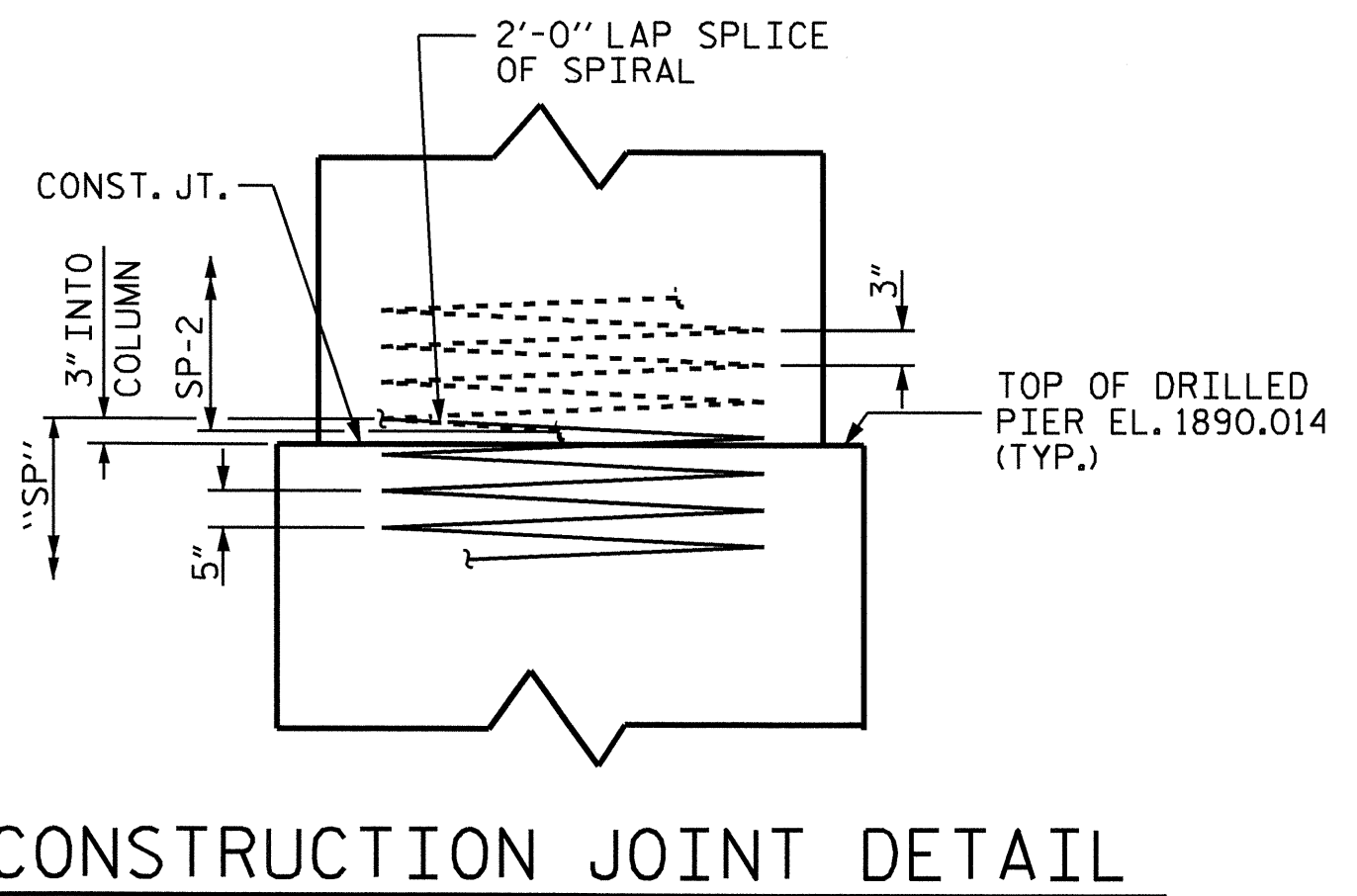
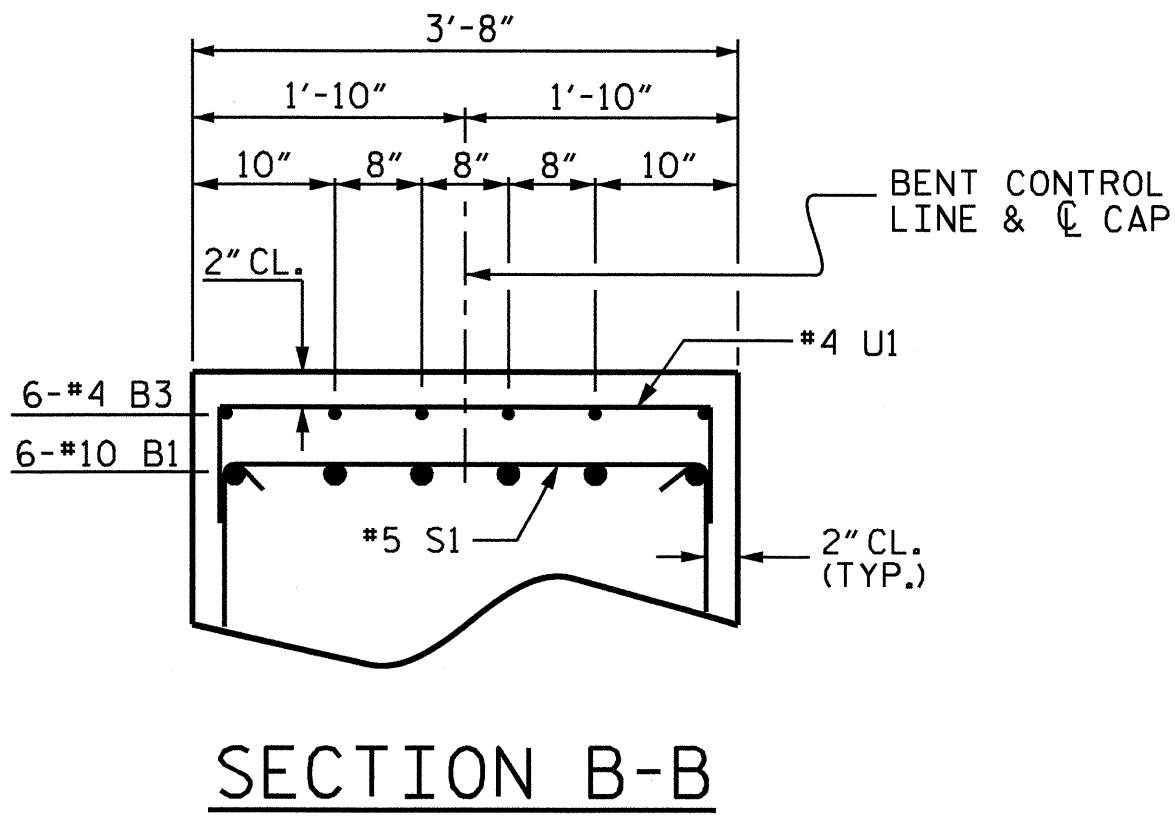
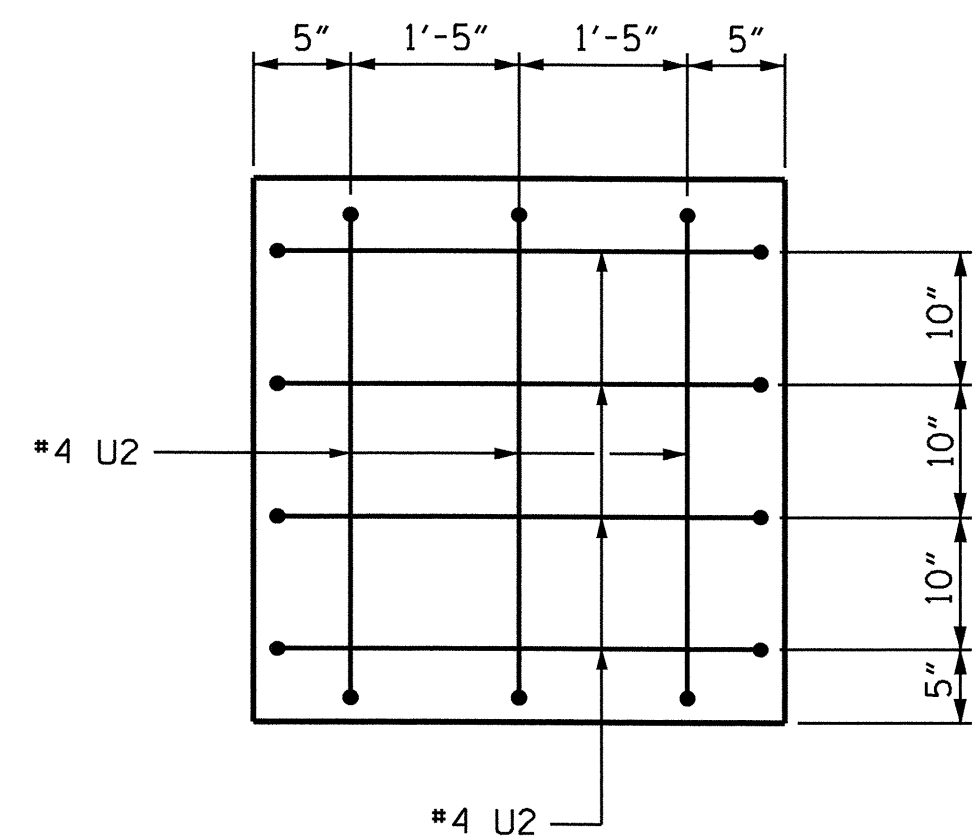
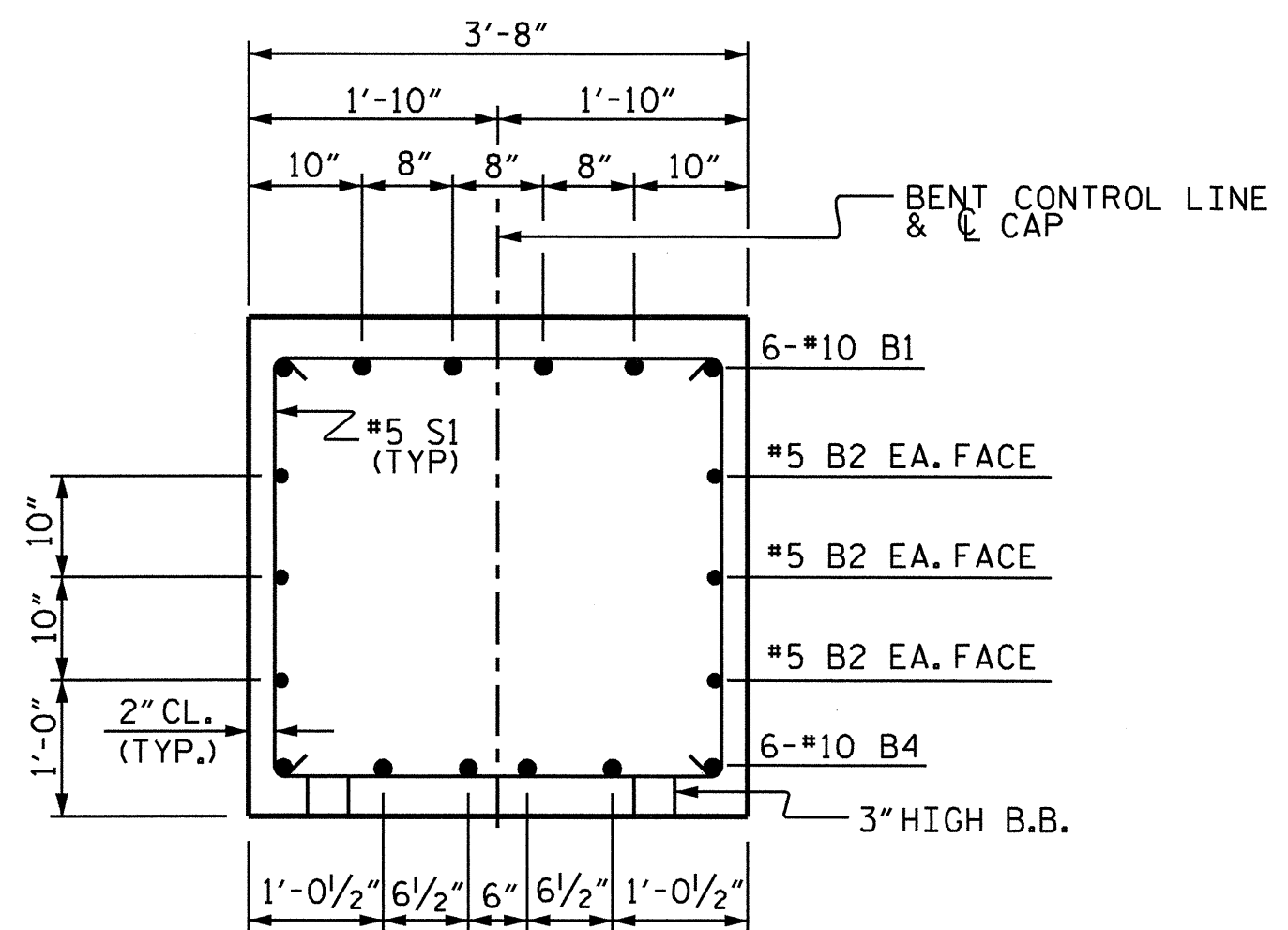
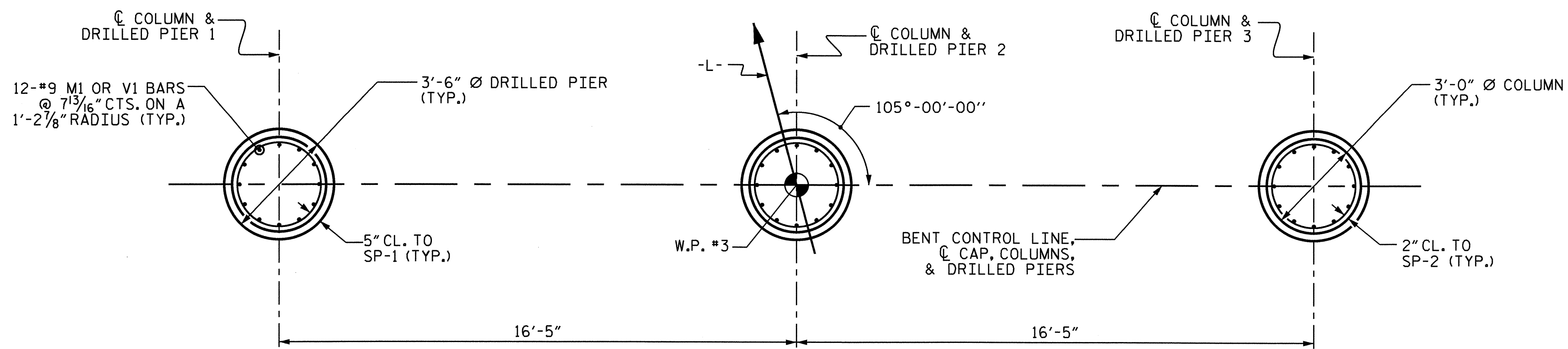


PROJECT NO. B-4286
SWAIN COUNTY
 STATION: 16+39.20 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT 2					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-31
					TOTAL SHEETS 41

DRAWN BY : Z. H. BROWN DATE : 3/18/09
 CHECKED BY : O. T. NGUYEN DATE : 2/03/10

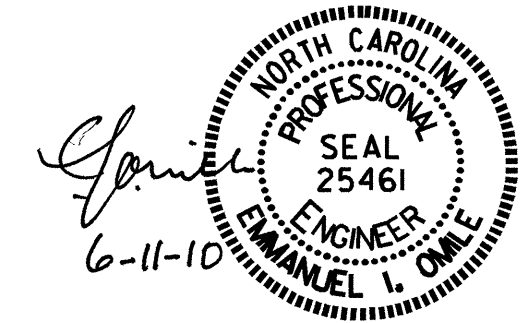


BILL OF MATERIAL					
BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#10	1	44'-10"	1158
B2	6	#5	STR	42'-2"	264
B3	6	#4	STR	4'-8"	19
B4	6	#10	STR	42'-2"	1089
M1	36	#9	STR	34'-0"	4223
S1	54	#5	3	10'-10"	610
U1	37	#4	4	6'-4"	157
U2	14	#4	4	6'-2"	58
V1	36	#9	2	8'-7"	1051
REINFORCING STEEL					= 8,629 LBS.
SPIRAL REINFORCING STEEL					
SP-1	3	*	5	542'-10"	1699
SP-2	3	**	6	200'-1"	401
TOTAL SPIRAL COLUMN REINFORCING STEEL					2,100 LBS.
CLASS A CONCRETE BREAKDOWN					
POUR #2 COLUMNS				4.3	C.Y.
POUR #3 CAP				21.9	C.Y.
CLASS A CONCRETE TOTAL				26.2	C.Y.
DRILLED PIER QUANTITIES					
POUR #1 DRILLED PIER CONCRETE				28.9	C.Y.
3'-6" Ø DRILLED PIERS IN SOIL				51.0	L.F.
3'-6" Ø DRILLED PIERS NOT IN SOIL				30.0	L.F.
3'-6" Ø PERMANENT STEEL CASING				42.0	L.F.
CSL TUBES					354.0 FT.

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 & SP-3 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

PROJECT NO. B-4286
 SWAIN COUNTY
 STATION: 16+39.00 -L-
 SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT 2					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 41



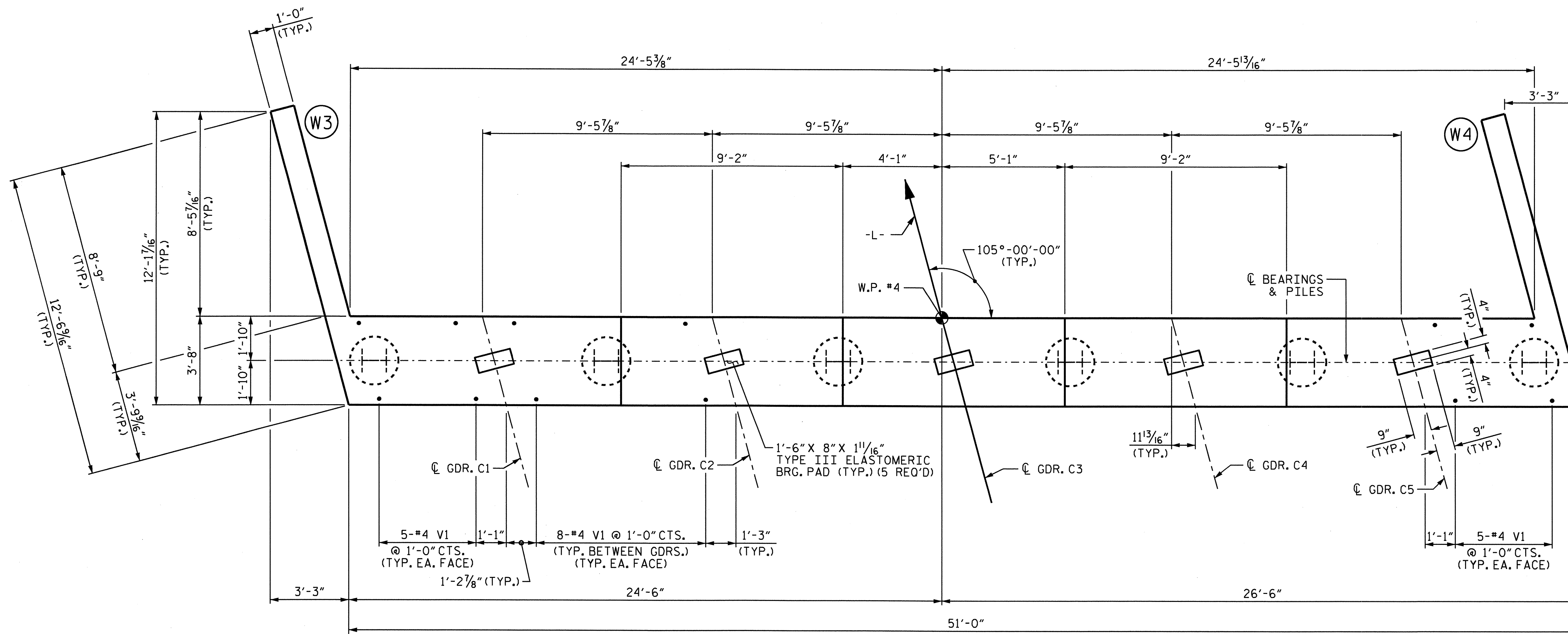
DRAWN BY: Z. H. BROWN DATE: 4/2/09
 CHECKED BY: Q. T. NGUYEN DATE: 2/03/10

NOTES :

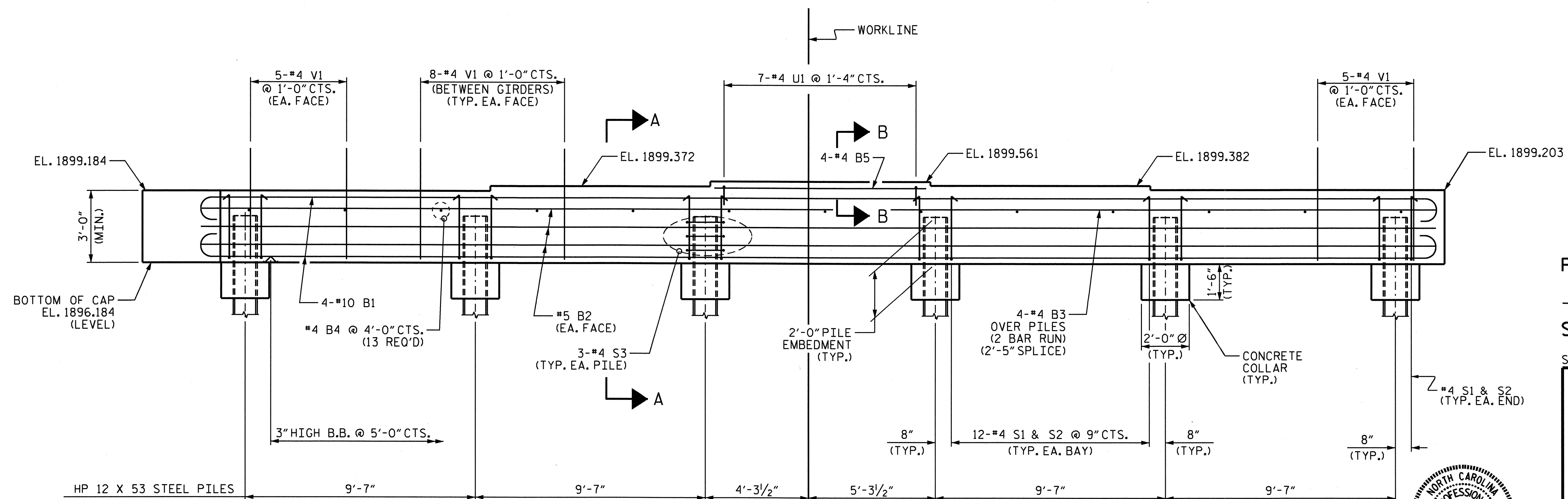
FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

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.

SEE SUPERSTRUCTURE SHEETS FOR THE ABUTMENT DETAILS.



PLAN



ELEVATION

RIGHT WING NOT SHOWN FOR CLARITY

PROJECT NO. B-4286
SWAIN COUNTY
 STATION: 16+39.20 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE

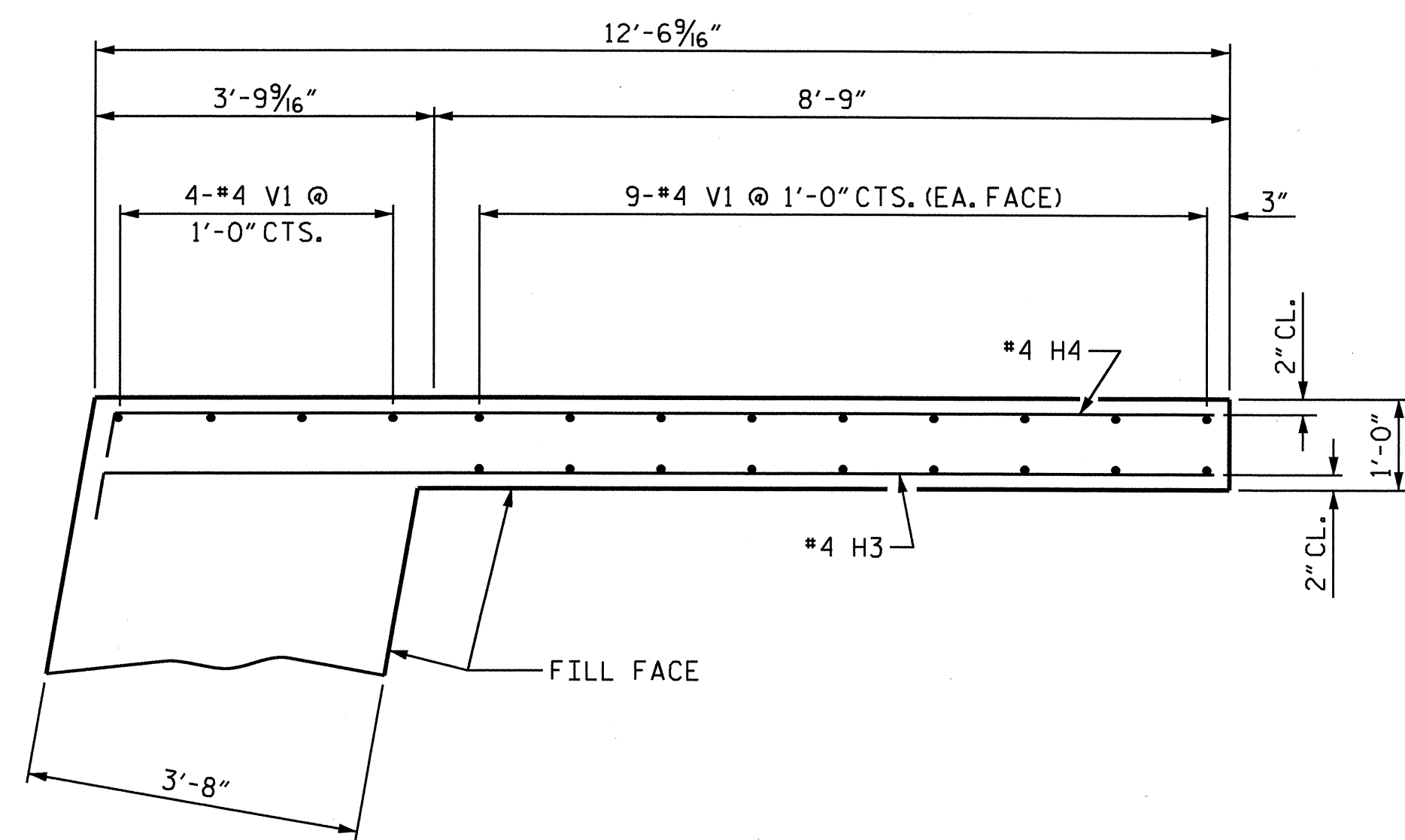
END BENT 2
 INTEGRAL



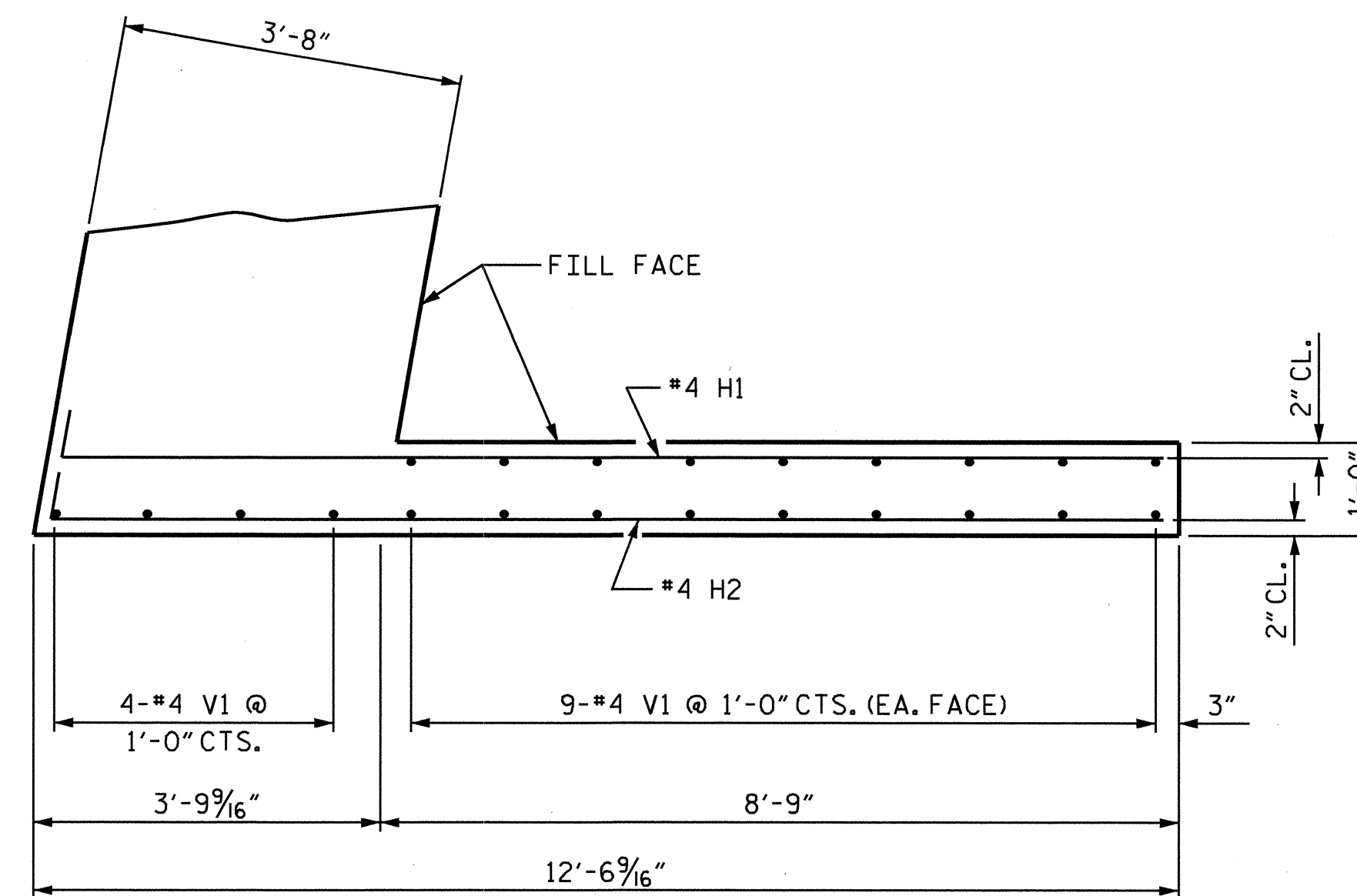
DRAWN BY: QT NGUYEN DATE: 6-09
 CHECKED BY: E.I. OMLE DATE: 1-10

21-JUL-2010 10:53
 O:\Structures\FINAL PLANS\B4286_SD.E1&2.dgn
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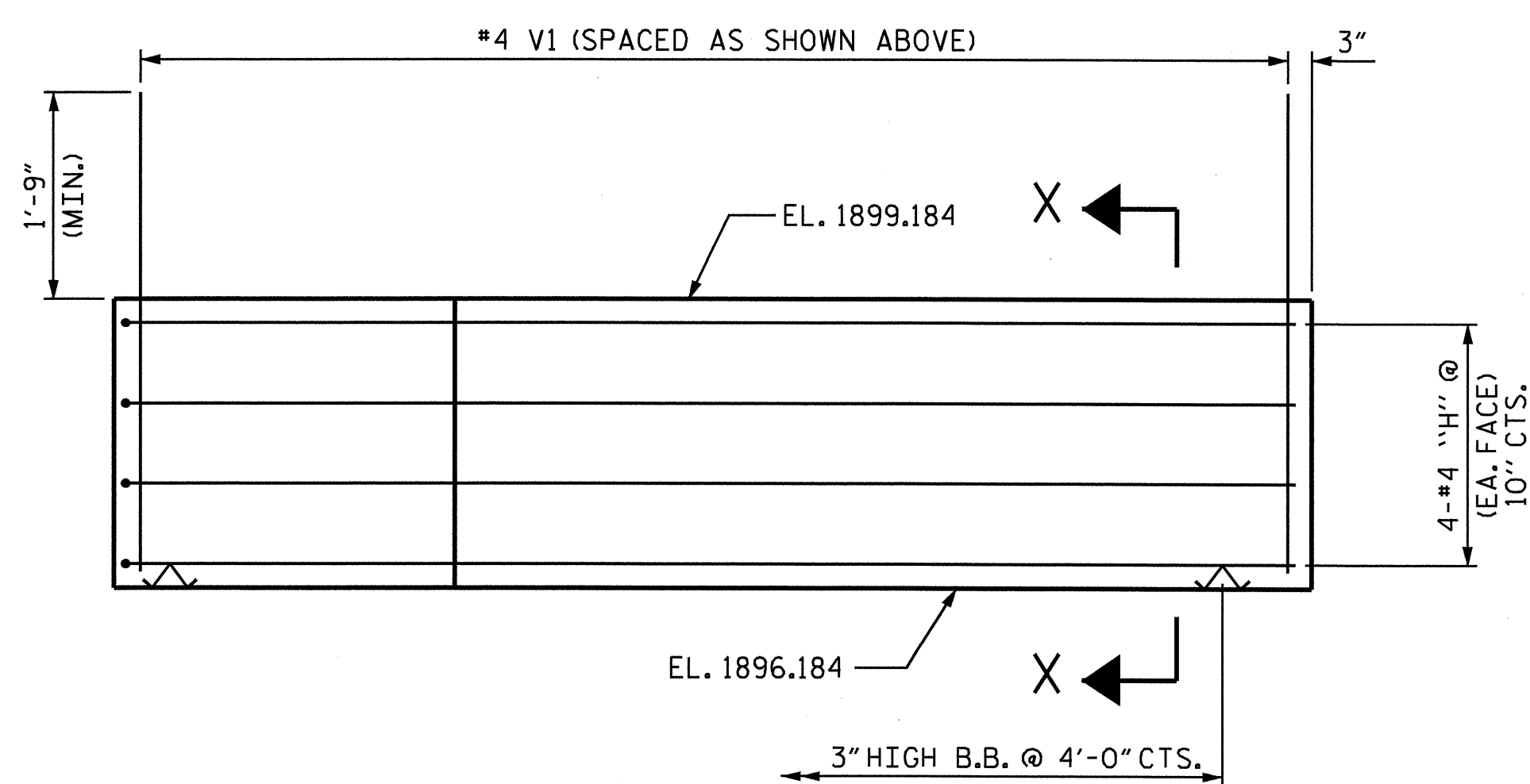
REVISIONS						SHEET NO. S-33
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 41
2			4			



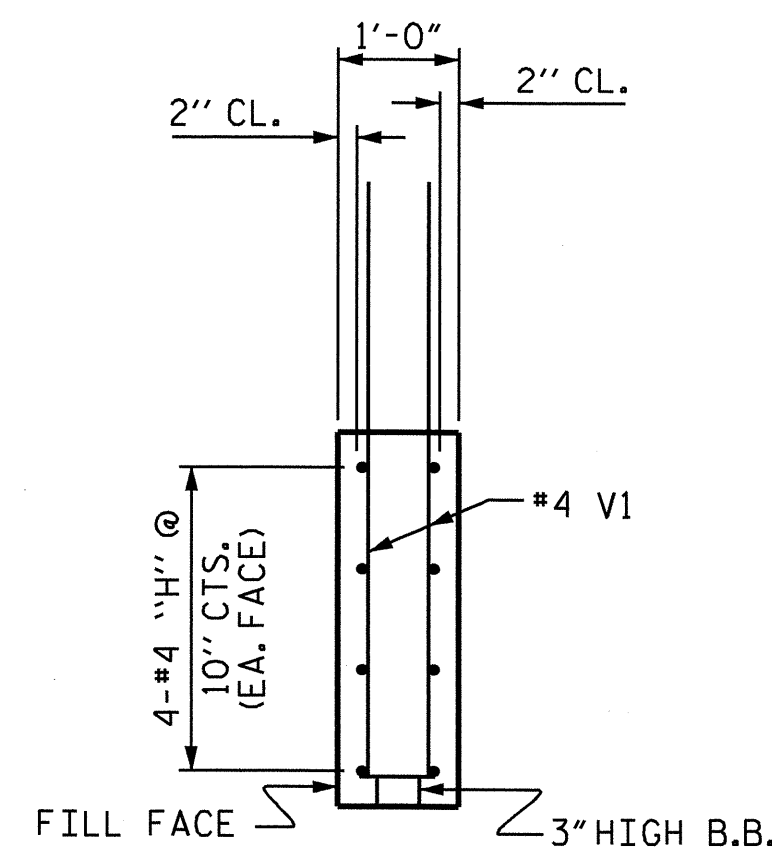
PLAN OF WING (W3)



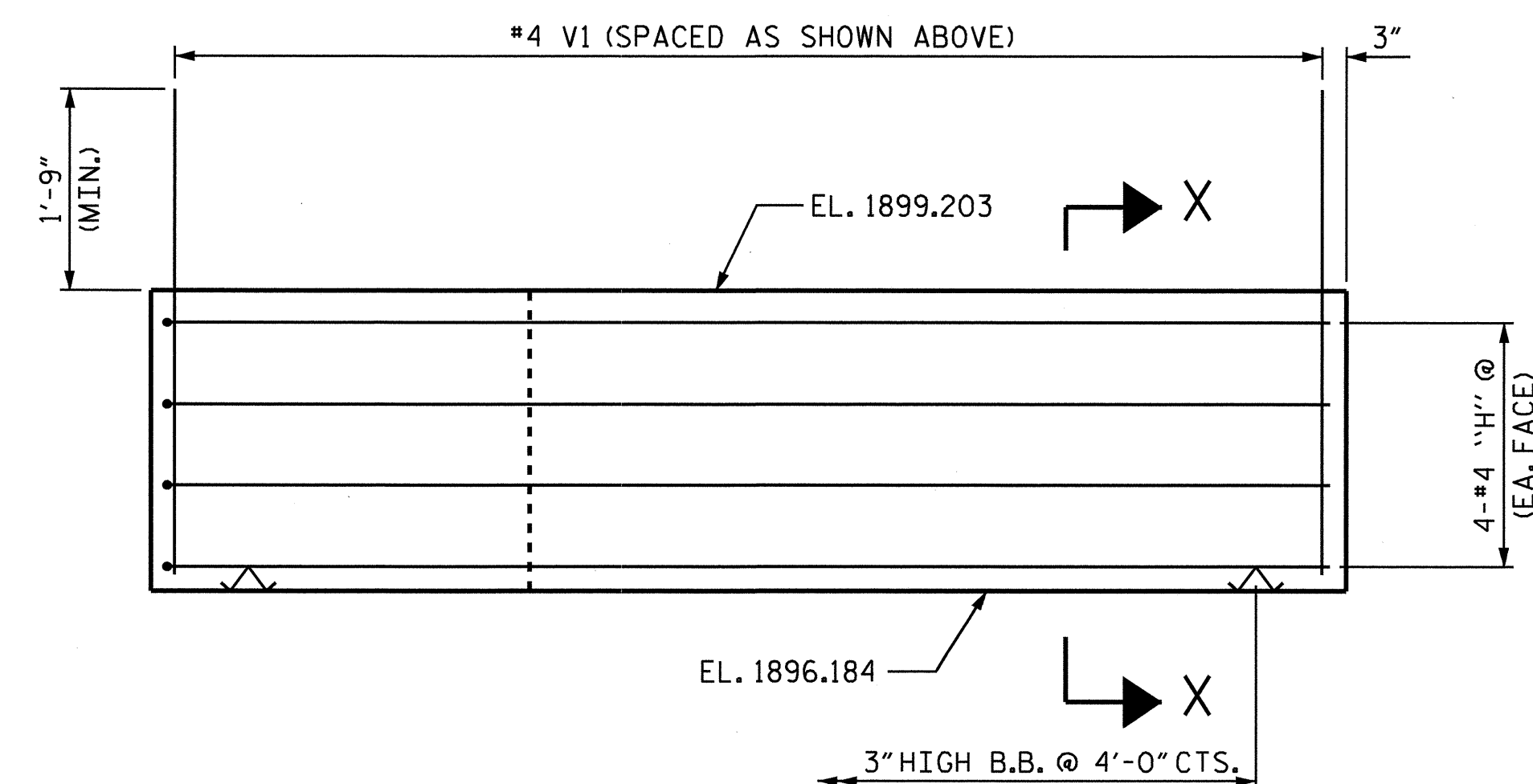
PLAN OF WING (W4)



ELEVATION OF WING (W3)



SECTION X-X



ELEVATION OF WING (W4)

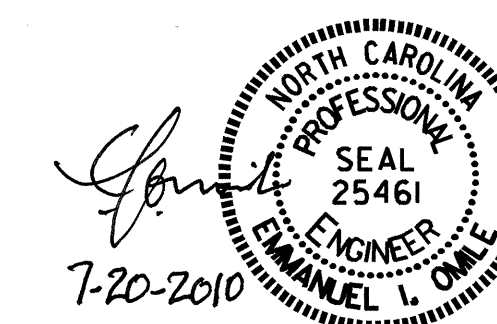
PROJECT NO. B-4286
SWAIN COUNTY
 STATION: 16+39.20 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE

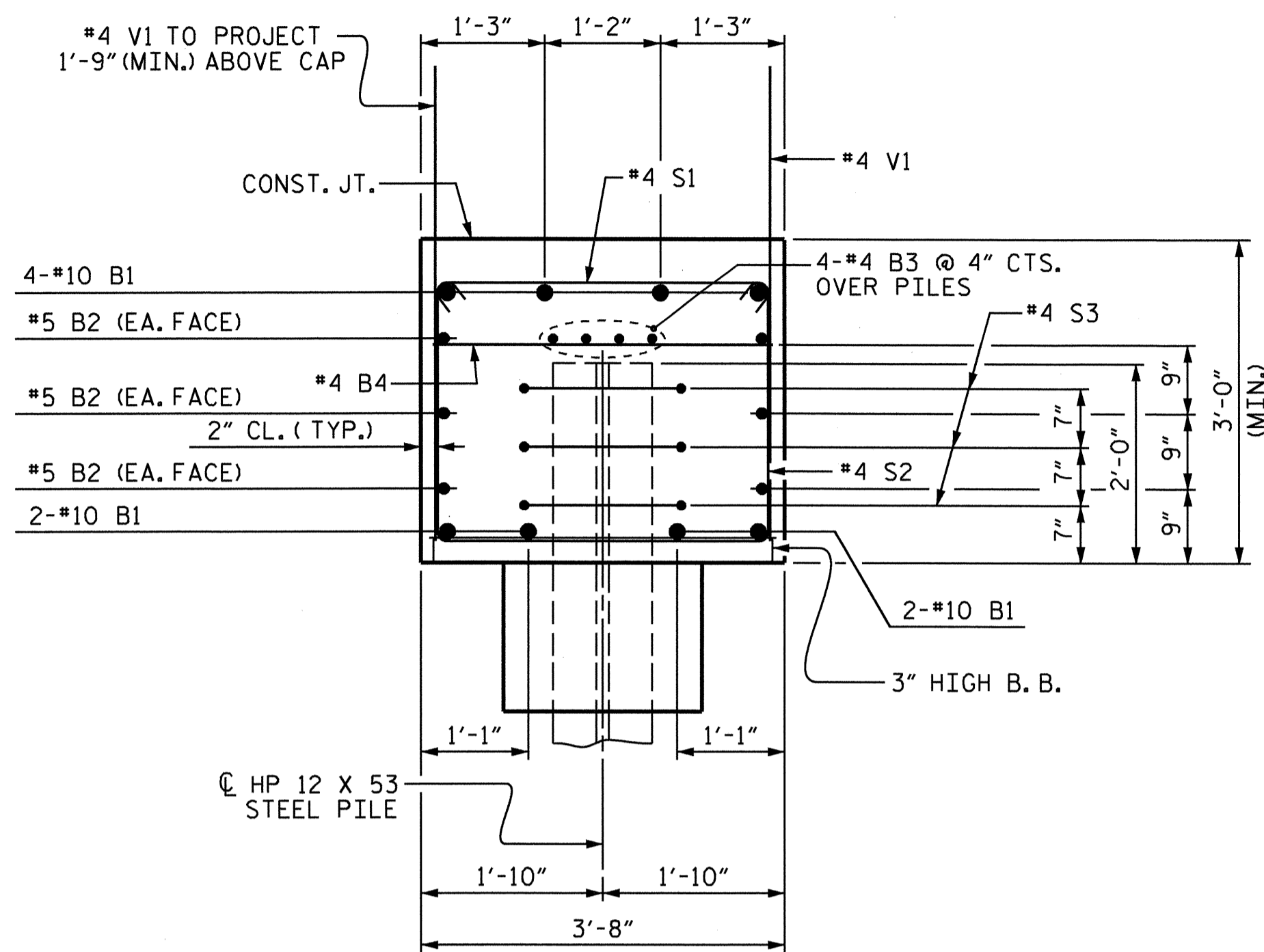
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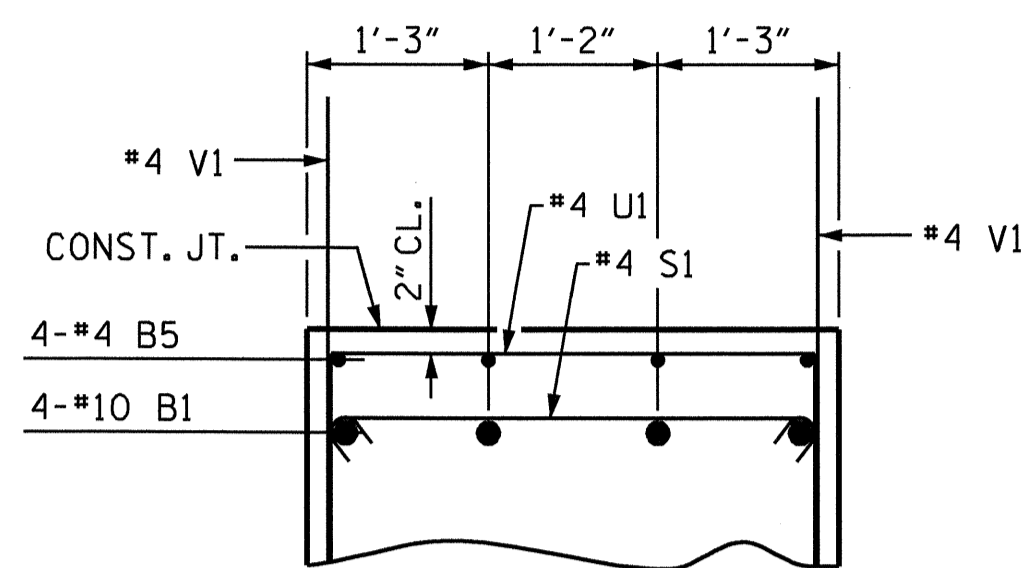
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 CHECKED BY : E.I. OMILE DATE : 1-10

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34
1			3			TOTAL SHEETS
2			4			41



SECTION A-A



PARTIAL SECTION B-B

BILL OF MATERIAL

END BENT 2

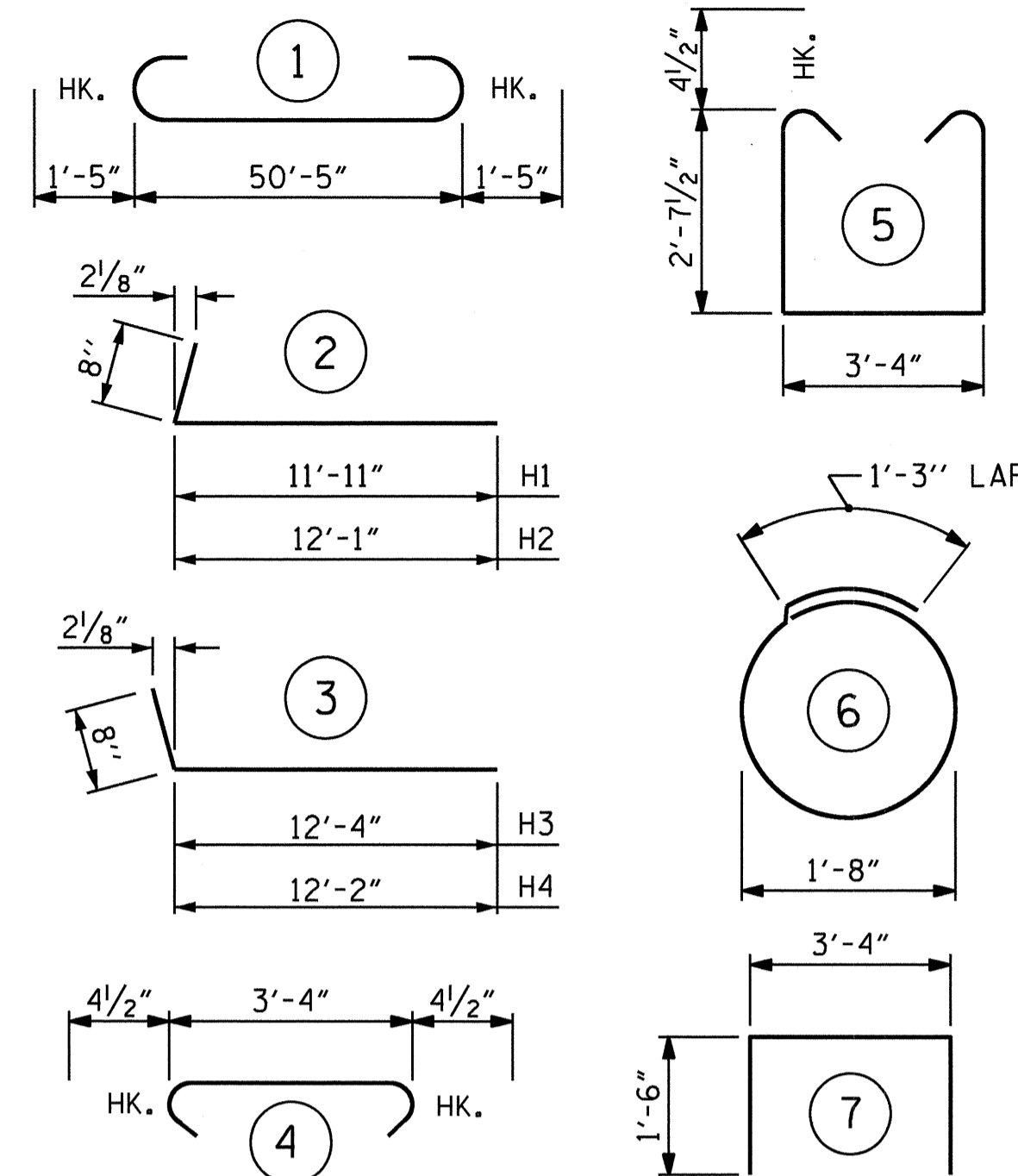
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#10	1	53'-3"	1833
B2	6	#5	STR	50'-7"	317
B3	8	#4	STR	26'-7"	142
B4	13	#4	STR	3'-4"	29
B5	4	#4	STR	8'-10"	24
H1	4	#4	2	12'-7"	34
H2	4	#4	2	12'-9"	34
H3	4	#4	3	13'-0"	35
H4	4	#4	3	12'-10"	34
S1	62	#4	4	4'-1"	169
S2	62	#4	5	9'-4"	387
S3	18	#4	6	6'-6"	78
U1	7	#4	7	6'-4"	30
V1	128	#4	STR	5'-0"	428

REINFORCING STEEL = 3574 LBS

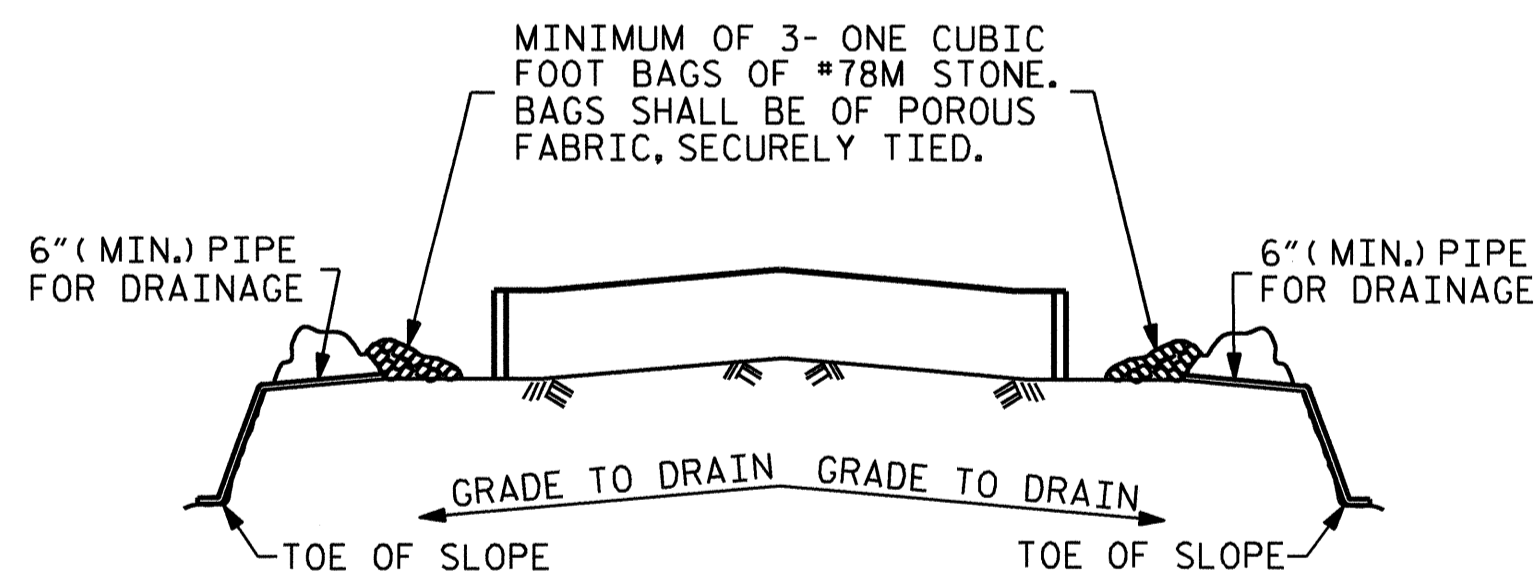
CLASS A CONCRETE BREAKDOWN :
CAP, LOWER WINGS & COLLARS = 24.8 C.Y.

HP 12 X 53 STEEL PILES :
No. 6 LIN. FT. 150

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

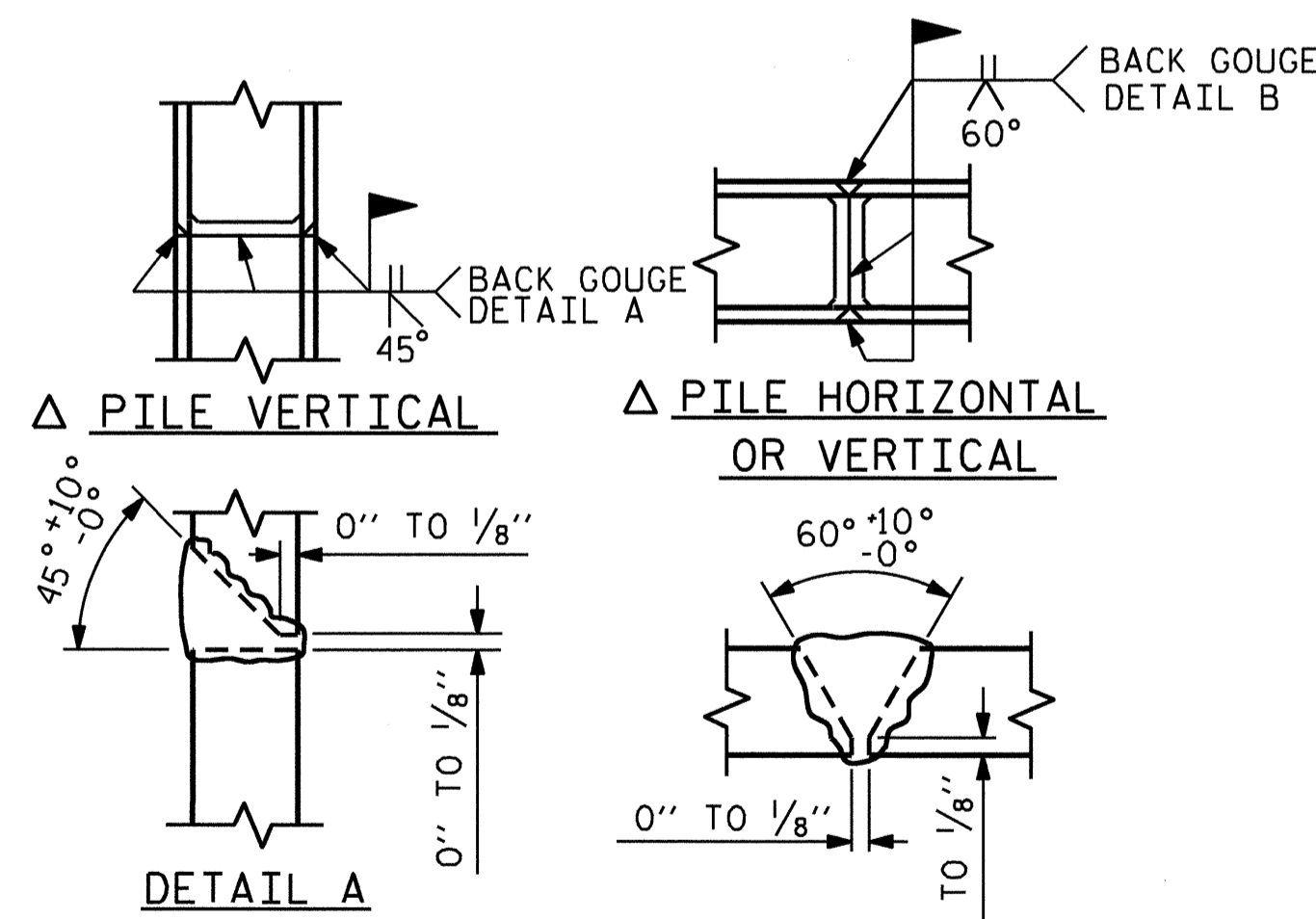


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

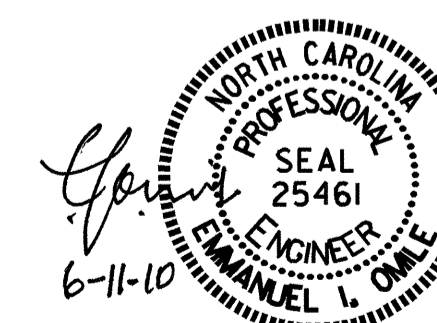
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



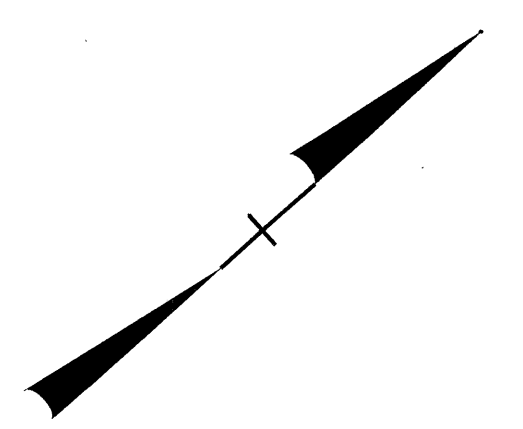
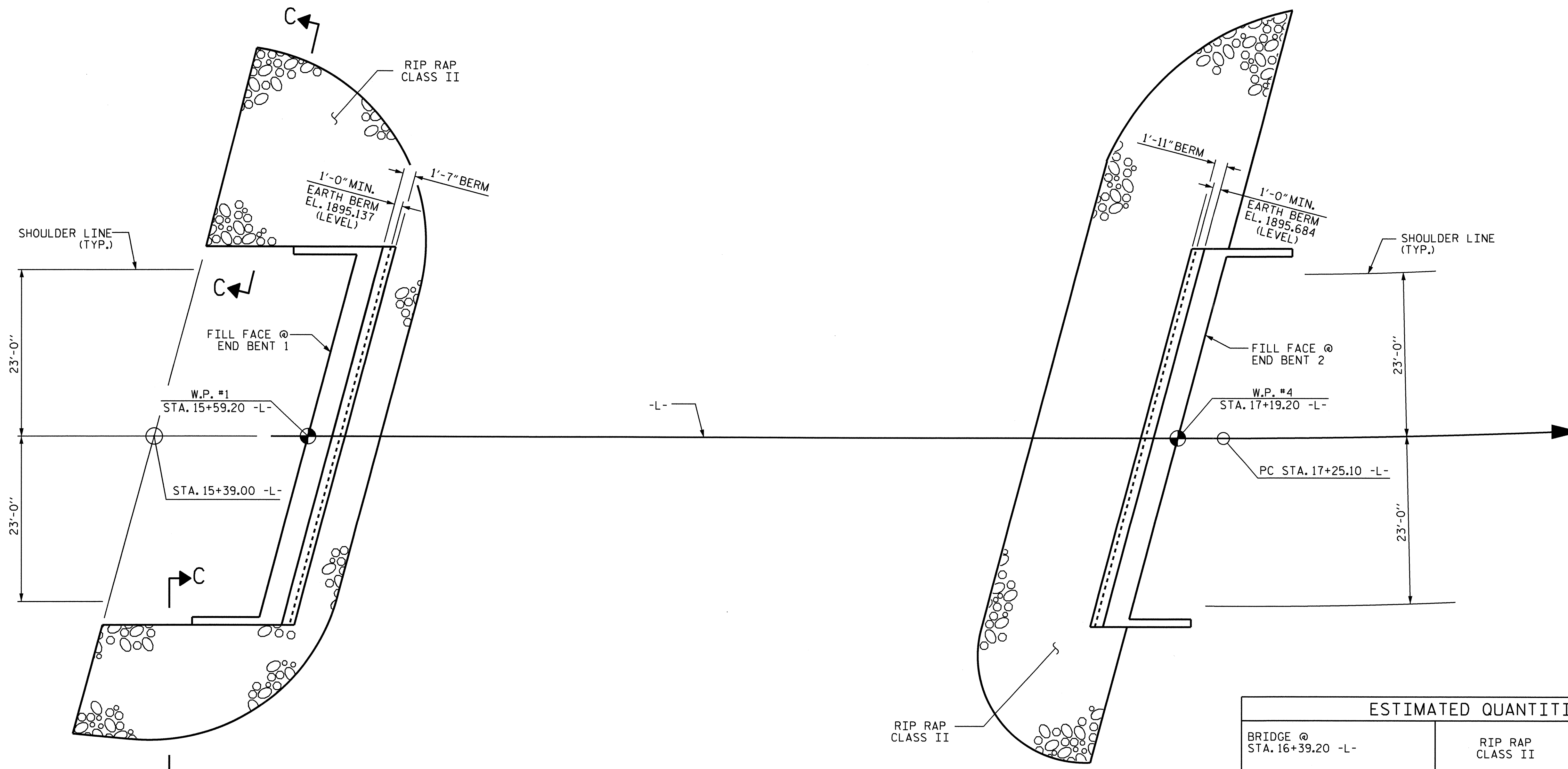
PROJECT NO. B-4286
SWAIN COUNTY
STATION: 16+39.20 -L-

SHEET 3 OF 3

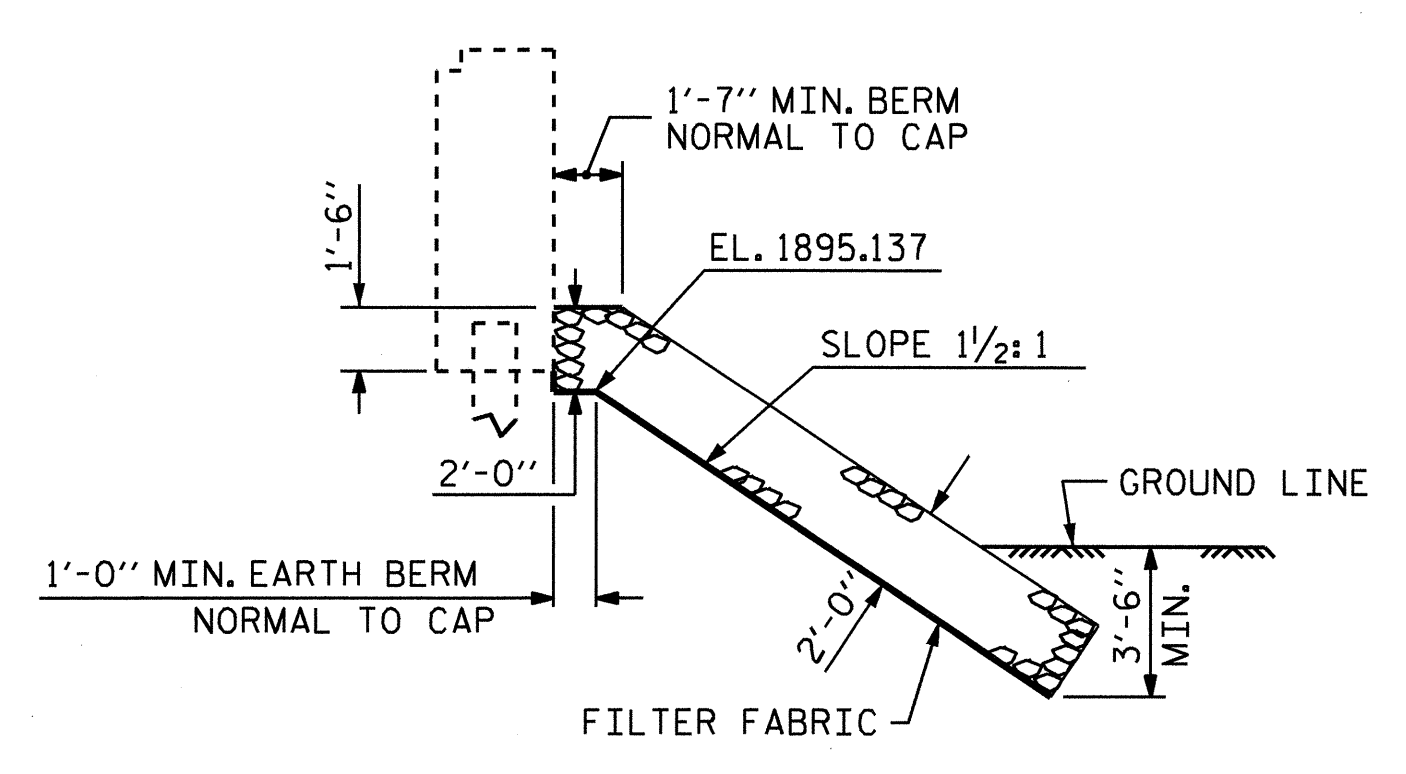
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
END BENT 2
INTEGRAL

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

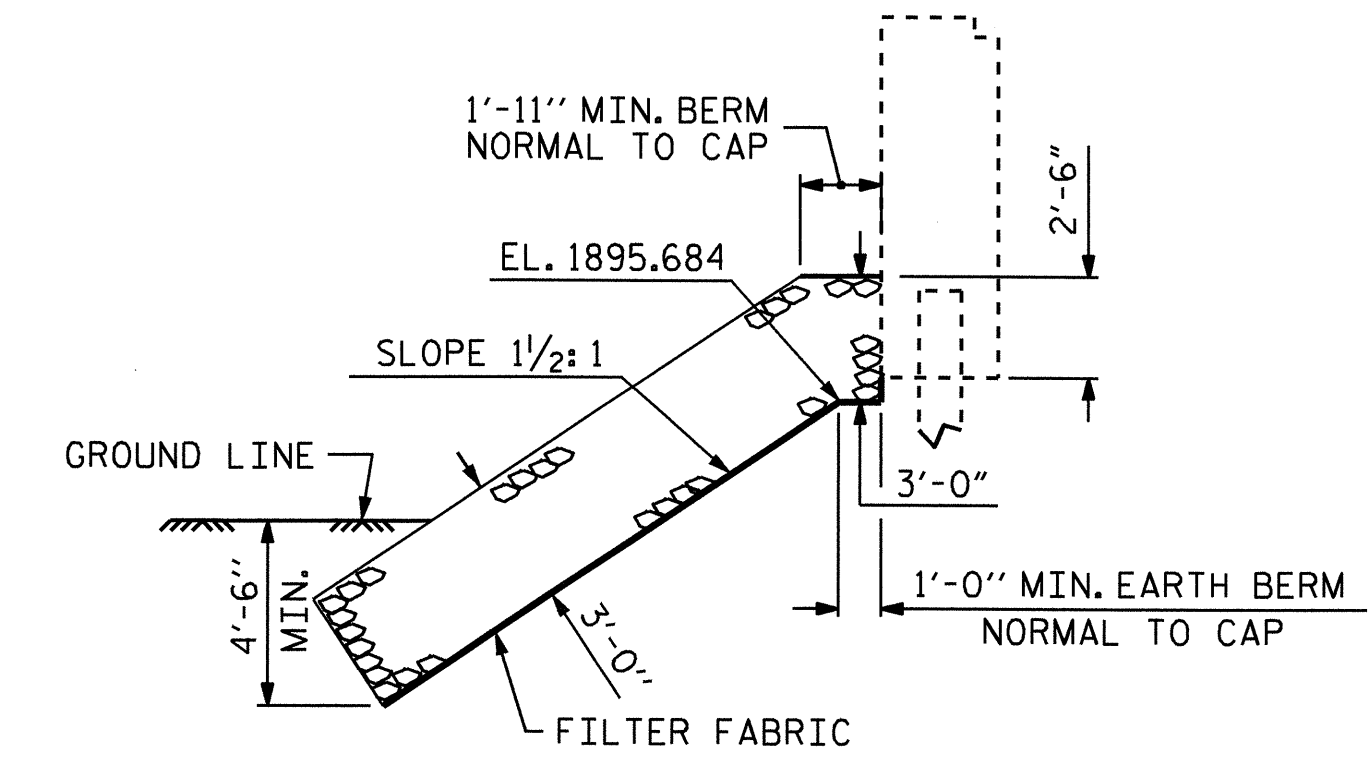
DRAWN BY : QT NGUYEN DATE : 6-09
CHECKED BY : E.I. OMILE DATE : 1-10



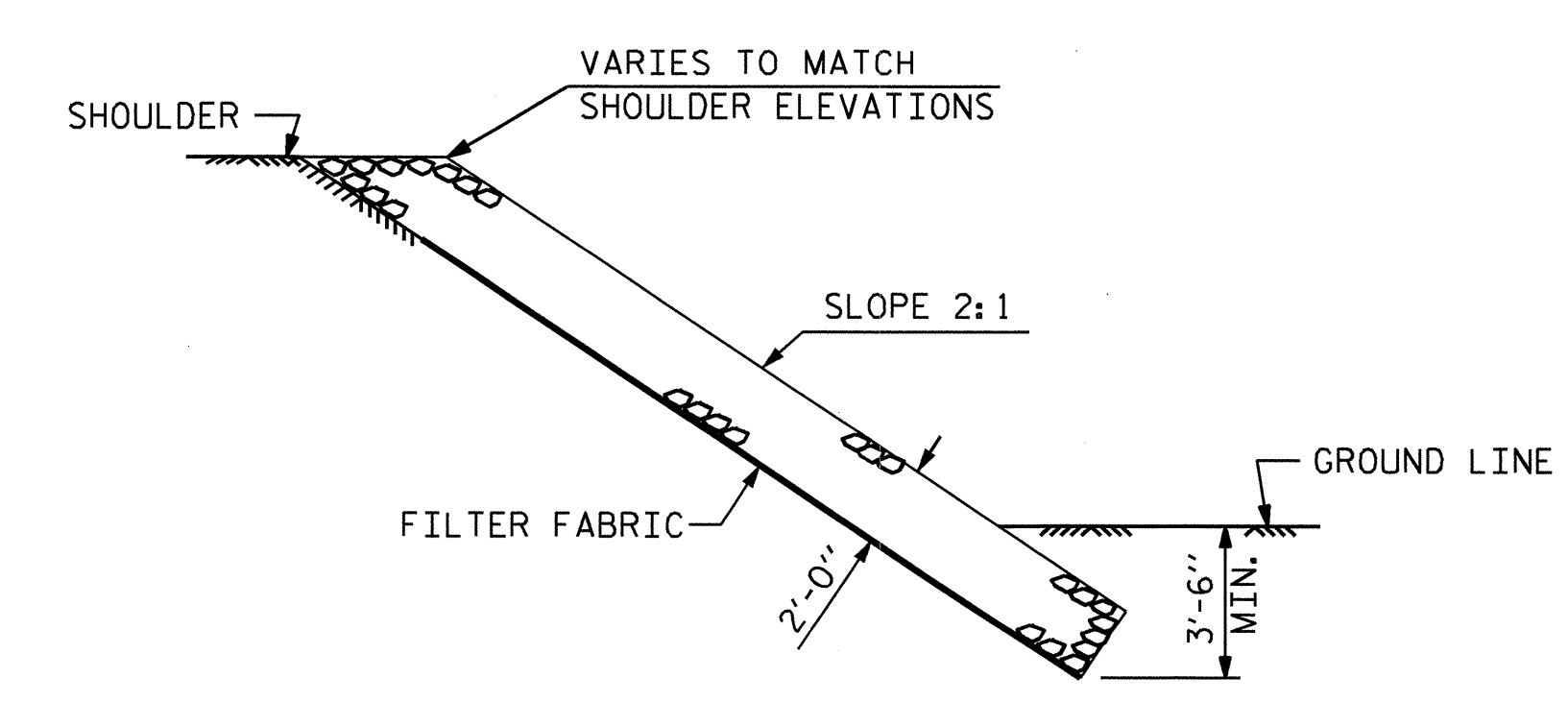
ESTIMATED QUANTITIES		
BRIDGE @ STA. 16+39.20 -L-	RIP RAP CLASS II	FILTER FABRIC FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1 (2'-0" THICK)	125	135
END BENT 2 (3'-0" THICK)	410	305



SECTION C-C
BERM RIP RAPPED
@ END BENT 1



SECTION C-C
BERM RIP RAPPED
@ END BENT 2



SECTION C-C

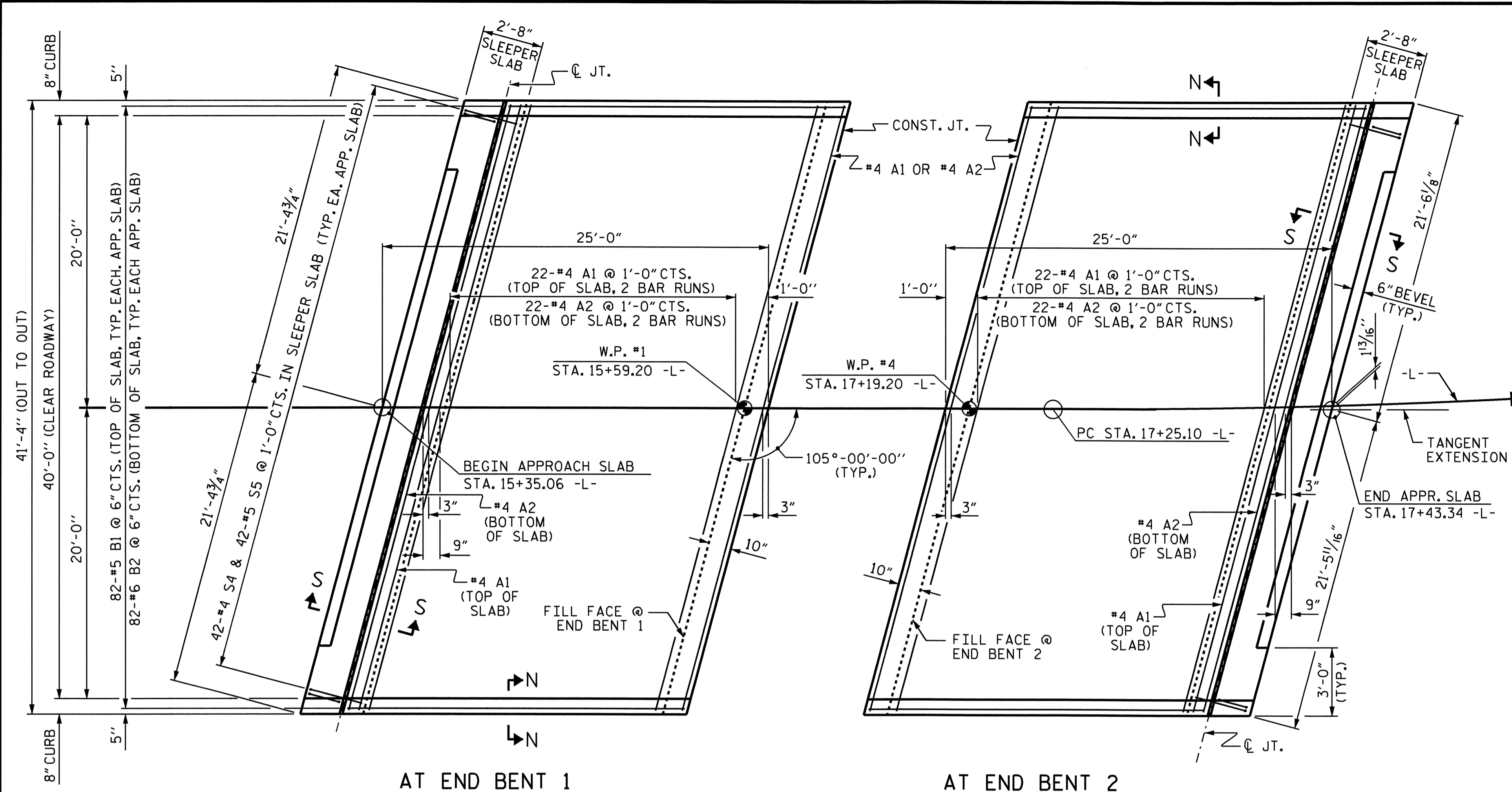
PROJECT NO. B-4286
SWAIN COUNTY
 STATION: 16+39.20 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 —RIP RAP DETAILS—

Emmanuel I. Omile
 8-25-2010
 NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 25461

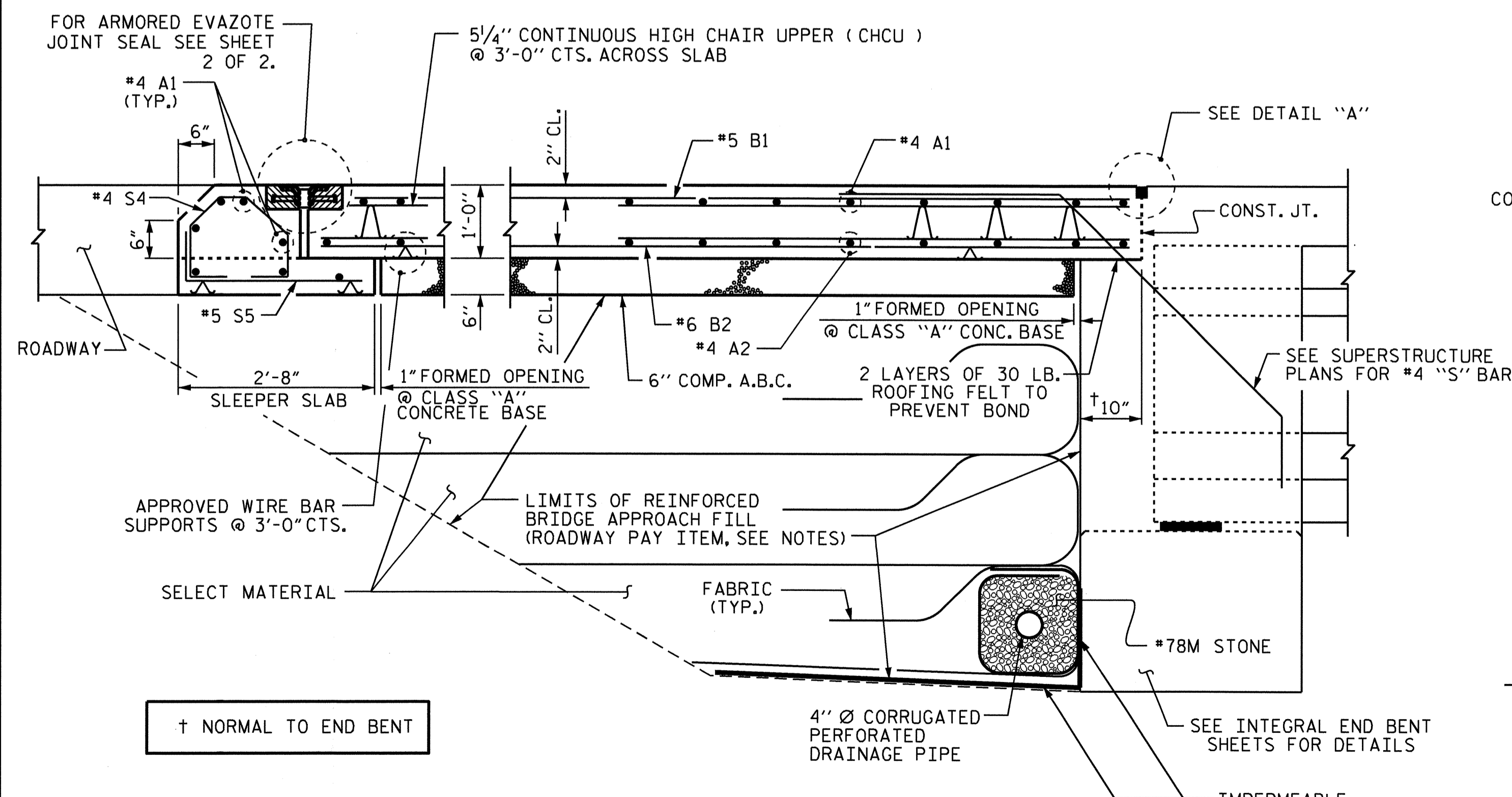
DRAWN BY : Z. H. BROWN DATE : 7/24/09
 CHECKED BY : O. T. NGUYEN DATE : 7/31/09

REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	DATE:	S-36
1			3		TOTAL SHEETS
2			4		41



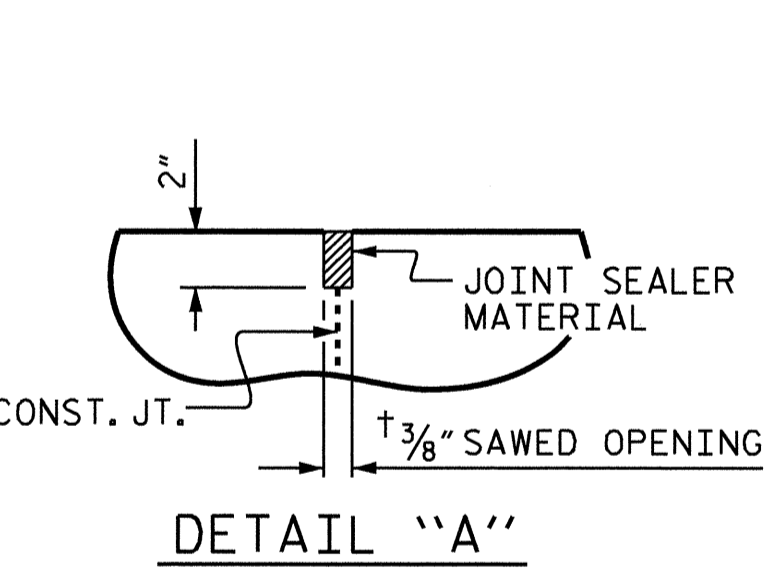
PLAN OF APPROACH SLAB

DIMENSIONS AND SKEW ANGLES SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS.
#4 A1 BARS IN SLEEPER SLAB NOT SHOWN FOR CLARITY.

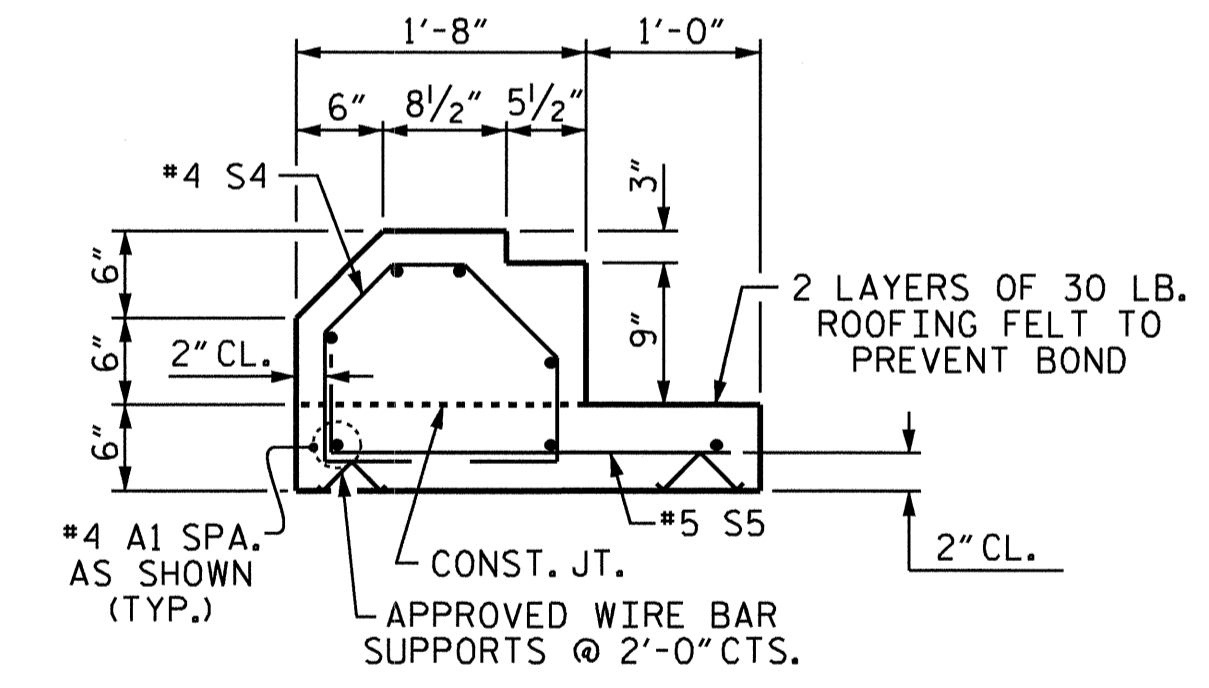


SECTION THRU SLAB

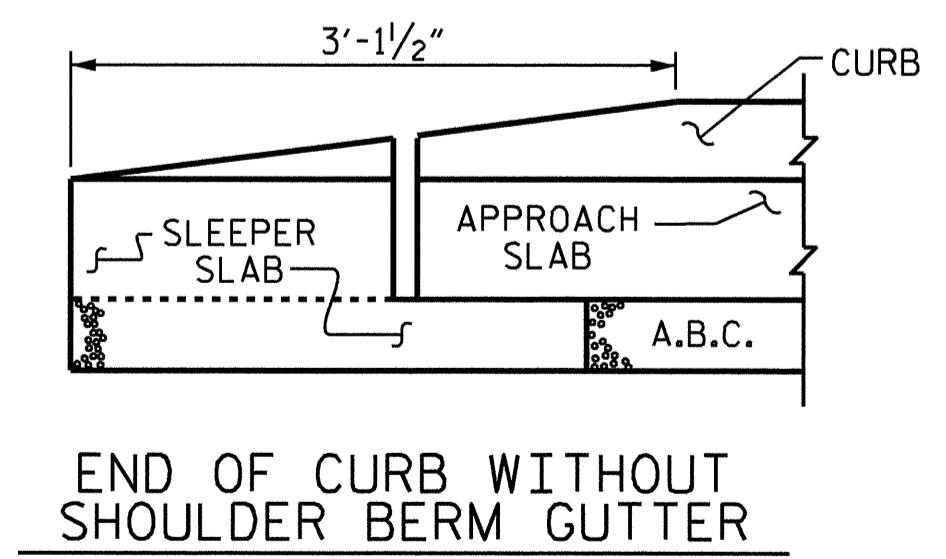
ASSEMBLED BY : Z. H. BROWN DATE : 7/23/09
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 DRAWN BY : TLA 10/05 ADDED 5/1/06R KMM/GM
 CHECKED BY : GM 5/06



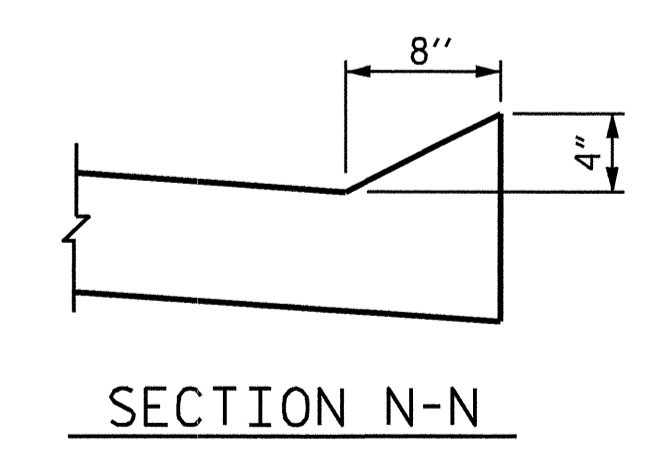
DETAIL "A"



SECTION S-S
SHOWING SLEEPER SLAB



END OF CURB WITHOUT SHOULDER BERM GUTTER



SECTION N-N

NOTES

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

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

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

THE 6" COMP. A.B.C. SHALL BE FLUSH WITH THE SLEEPER SLAB AND SHALL EXTEND 1'-0" OUTSIDE OF EACH EDGE OF THE APPROACH SLAB.

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

THE CONTRACTOR MAY USE 5" CLASS "A" CONCRETE BASE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE CONCRETE BASE SHALL BE FLUSH WITH THE SLEEPER 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.

THE VERTICAL JOINT ON THE RIGHT AND LEFT SIDE OF THE APPROACH SLAB AT THE ENDS OF THE EVAZOTE JOINT SHALL BE FILLED WITH SILICONE OR OTHER APPROVED MATERIAL IN ORDER TO PREVENT BACKFILL FROM ENTERING THE JOINT OPENING.

THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWED NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF TYPE S LOW MODULUS SILICONE SEALANT.

BILL OF MATERIAL

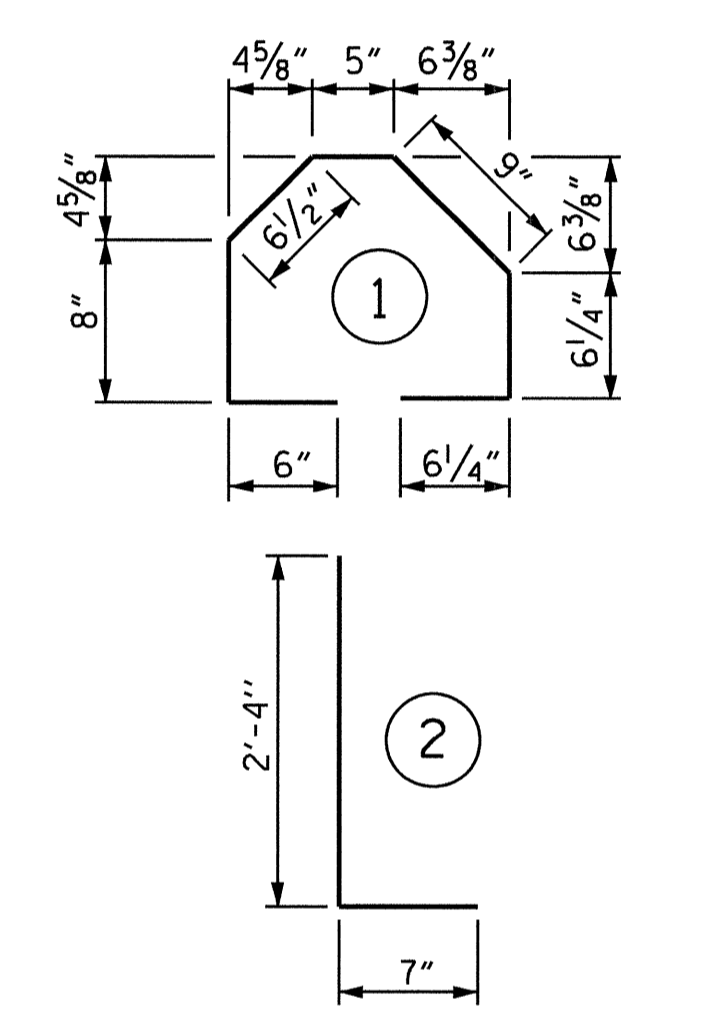
FOR ONE APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	62	#4	STR	22'-3"	922
A2	48	#4	STR	22'-1"	708
* B1	82	#5	STR	22'-4"	1910
B2	82	#6	STR	22'-10"	2812
* S4	42	#4	1	3'-11"	110
S5	42	#5	2	2'-11"	128

REINFORCING STEEL	LBS.	3648
* EPOXY COATED REINFORCING STEEL	LBS.	2942

CLASS AA CONCRETE		
POUR #1 - SLAB & CURB	C. Y.	35.7
POUR #2 - SLEEPER SLAB	C. Y.	4.4
TOTAL	C. Y.	40.1

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

SPLICE CHART

#4 A1	2'-0"
#4 A2	1'-9"

PROJECT NO. B-4286
 SWAIN COUNTY
 STATION: 16+39.20 -L-

SHEET 1 OF 2

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

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

TOTAL SHEETS: 41



NOTES

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

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

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

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

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

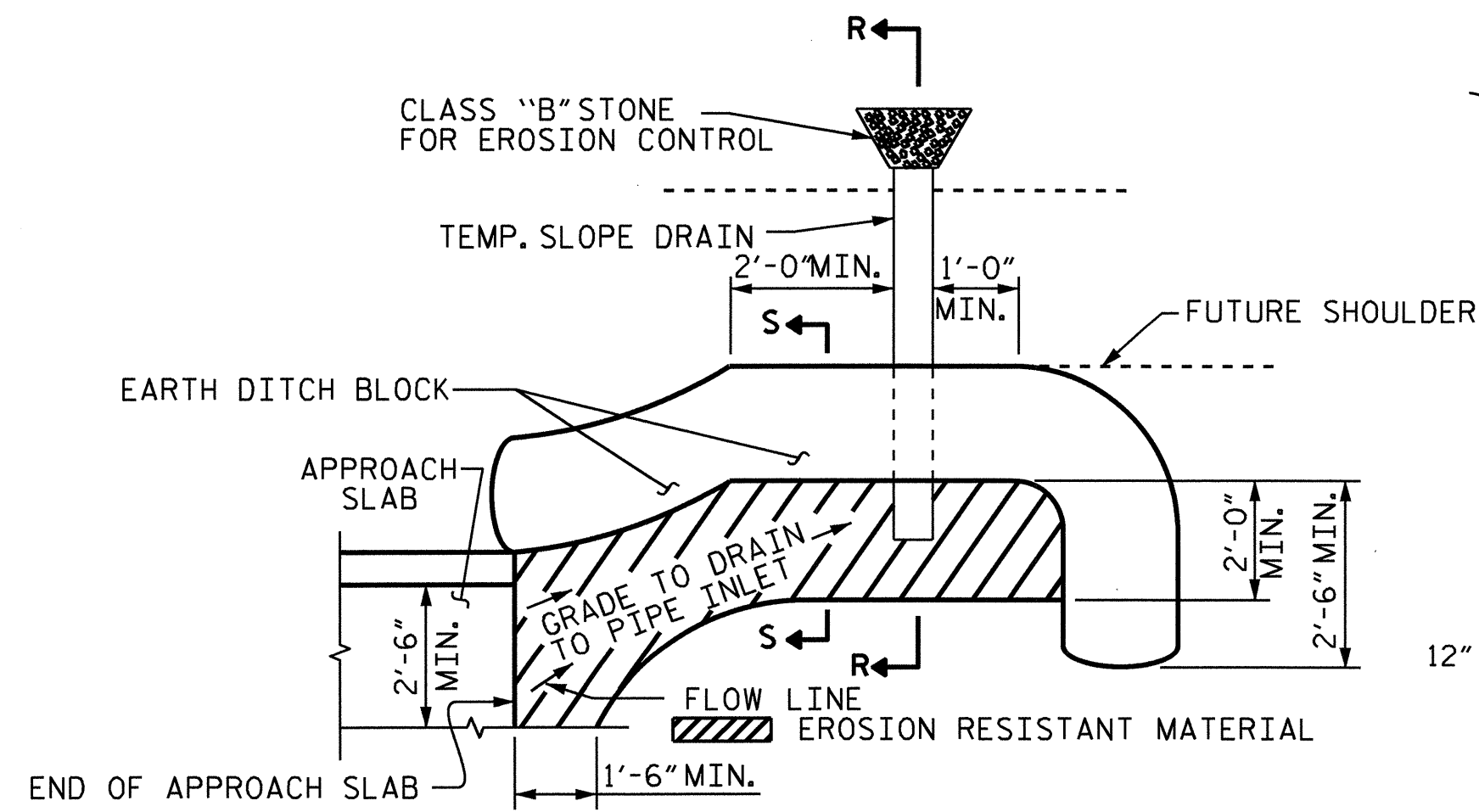
THE ANCHOR ASSEMBLY SHALL BE SECURED AND LEVELED AS SHOWN IN THE "ARMORED JOINT ANCHOR ASSEMBLY DETAILS". NO SUBMITTALS ARE REQUIRED FOR 3/8" Ø EXPANSION ANCHORS, NUTS OR WASHERS. THE CONTRACTOR MAY SUBMIT FOR APPROVAL AN ALTERNATE METHOD OF ALIGNING AND LEVELING THE ANGLES. THE ALTERNATE METHOD SHALL 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.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 2 1/2"

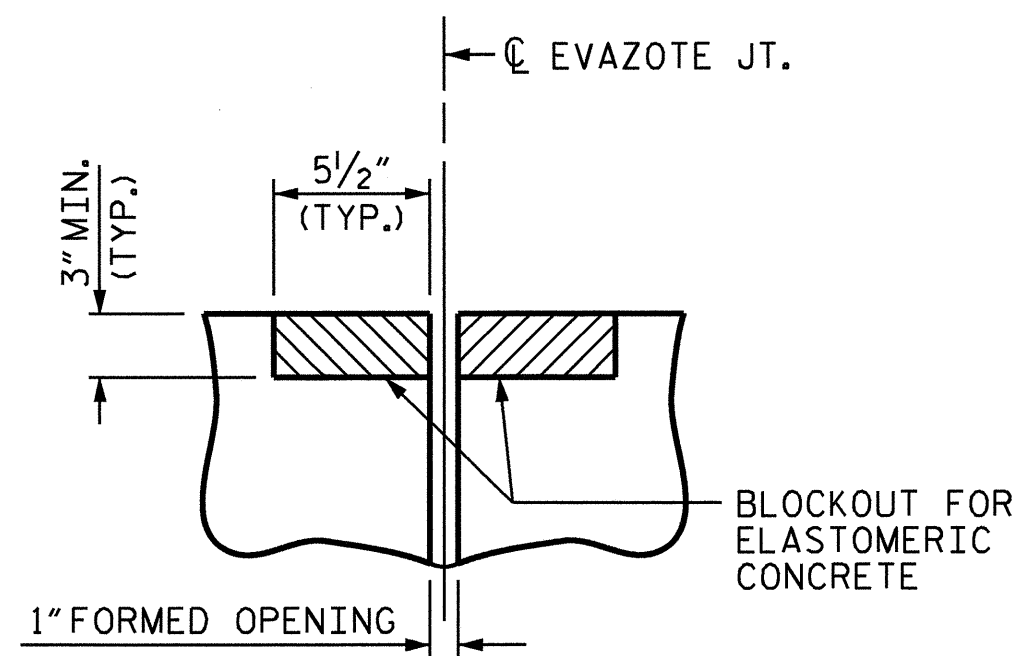


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

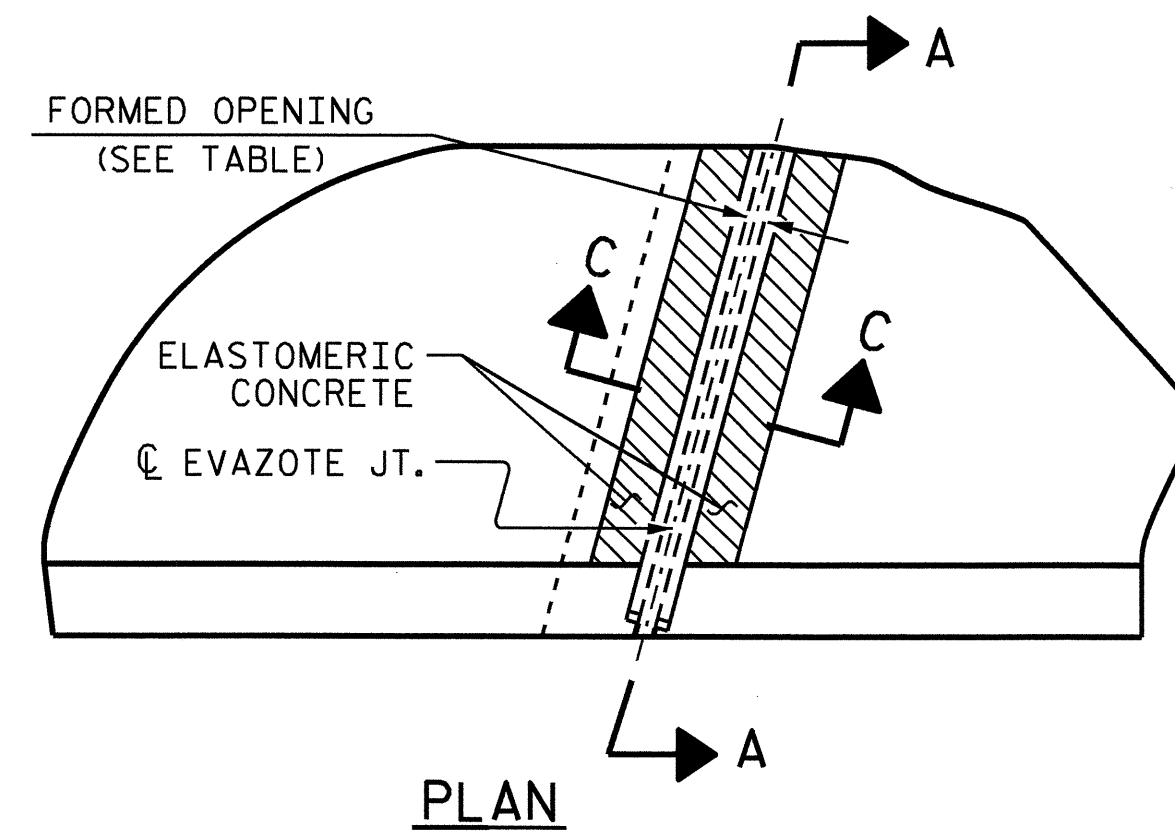
PLAN VIEW

TEMPORARY BERM AND SLOPE DRAIN DETAILS

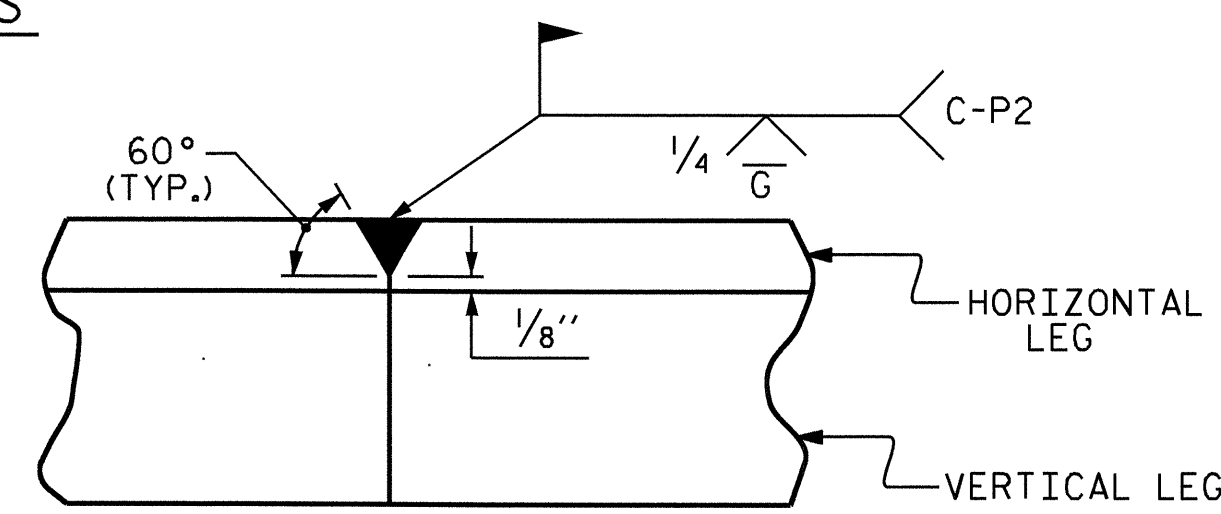
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



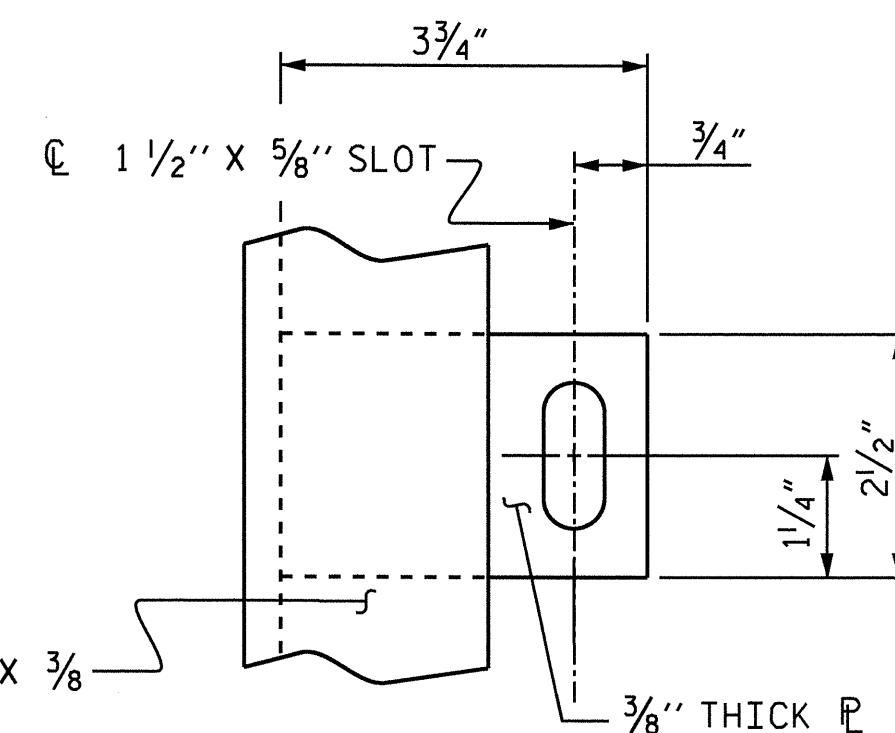
SECTION C-C
EVAZOTE JOINT SEAL
(PRE-SAWED ELASTOMERIC
CONCRETE DIMENSIONS)



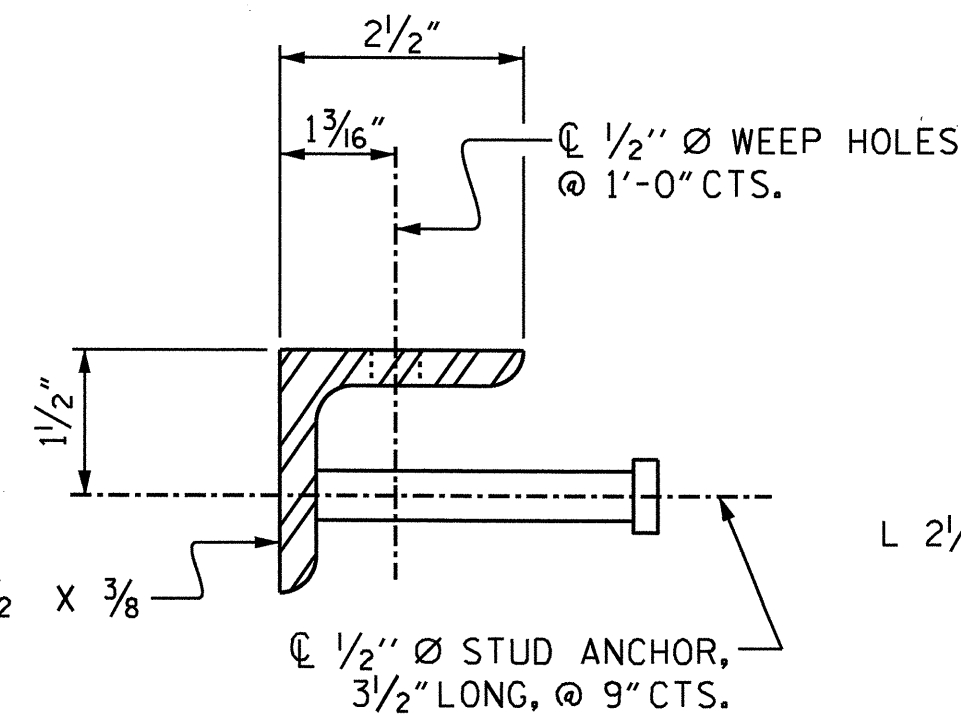
PLAN



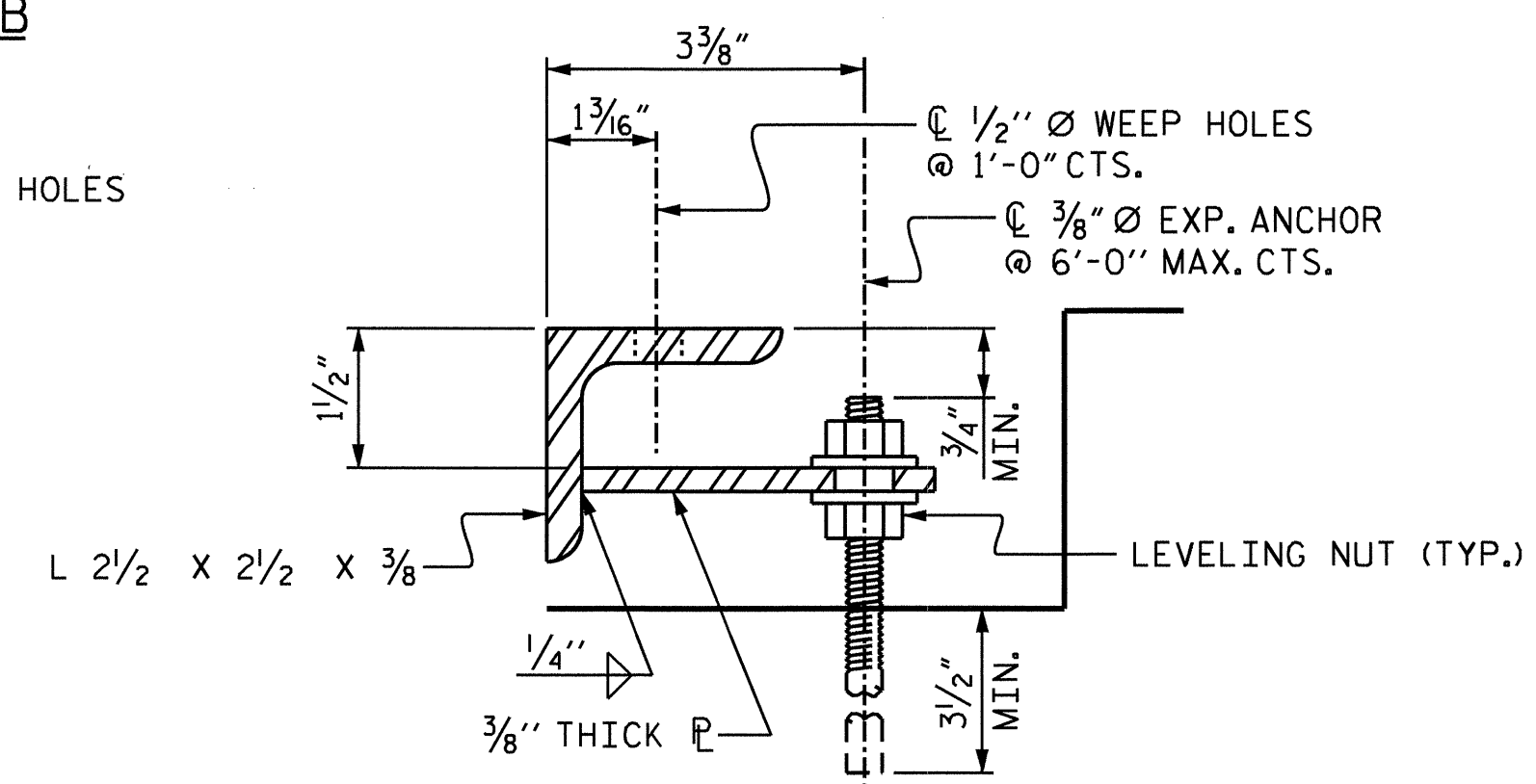
DETAIL-FIELD WELD
SPLICE OF ANGLE



PLAN VIEW OF TAB



SECTION VIEW OF STUD



SECTION VIEW OF TAB

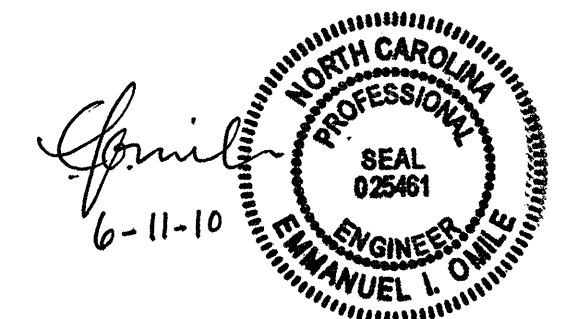
ARMORED JOINT ANCHOR ASSEMBLY DETAILS

MOVEMENT AND SETTING AT EVAZOTE JOINT						
END BENT NO.	SKEW ANGLE	NOMINAL UNCOMPRESSED SEAL WIDTH	TOTAL MOVEMENT (ALONG CL RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
1	105°-00'-00"	2 1/2"	7/8"	2 1/8"	2"	1 3/4"
2	105°-00'-00"	2 1/2"	7/8"	2 1/8"	2"	1 3/4"

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

BILL OF MATERIAL		
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)	TOTAL LENGTH OF ANGLE
1	9.5	82'-10"
2	9.5	82'-10"
TOTAL	19.0	165'-8"

* BASED ON THE MINIMUM BLOCKOUT SHOWN.



PROJECT NO. B-4286
SWAIN COUNTY
STATION: 16+39.20 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH
SLAB DETAILS

ASSEMBLED BY : Z. H. BROWN DATE : 7/23/09
CHECKED BY : Q. T. NGUYEN DATE : 7/30/09
DRAWN BY : EEM 1/96 REV. 7/10/01 LES/RDR
CHECKED BY : RGW 1/96 REV. 5/7/03RR RWW/JTE
REV. 5/1/06 REV. 5/1/06 TLA/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-38
1			3			TOTAL SHEETS
2			4			41

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, ENTER 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 & 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.	
		BRACKET SPACING									
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"	4000
	50	3'-6"	4'-0"	4'-5"	2'-1"	2'-7"	3'-2"	3'-8"	4'-2"	5'-9"	4000
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"	4000	
	50	3'-2"	3'-7"	4'-1"	2'-4"	2'-10"	3'-4"	3'-9"	5'-2"	4000	
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"	4000	
	50	2'-10"	3'-4"	3'-9"	2'-2"	2'-7"	3'-0"	3'-5"	4'-9"	4000	
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"	4000	
	50	2'-8"	3'-0"	3'-5"	2'-0"	2'-4"	2'-9"	3'-2"	4'-4"	4000	

TABLE 1-2 (FOR USE ON OVER 2'-0" TO 2'-6" OVERHANG & 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.	
		BRACKET SPACING									
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"	4000	
	50	3'-1"	3'-6"	4'-0"	2'-4"	2'-9"	3'-3"	3'-8"	5'-1"	4000	
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"	4000	
	50	2'-9"	3'-2"	3'-7"	2'-1"	2'-6"	2'-11"	3'-4"	4'-6"	4000	
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"	4000		
	50	2'-6"	2'-10"	3'-3"	2'-3"	2'-7"	3'-0"	4'-1"	4000		
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"	4000		
	50	2'-3"	2'-7"	2'-11"	2'-1"	2'-5"	2'-9"	3'-9"	4000		

TABLE 1-3 (FOR USE ON OVER 2'-6" TO 3'-0" OVERHANG & 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.	
		BRACKET SPACING									
10	30					2'-1"	2'-6"	2'-11"	3'-4"	4'-6"	4000
	40					2'-1"	2'-6"	2'-11"	3'-4"	4'-6"	4000
	50	2'-9"	3'-2"	3'-7"	4'-0"	2'-1"	2'-6"	2'-11"	3'-4"	4'-6"	4000
12	30					2'-2"	2'-7"	2'-11"	4'-0"	4000	
	40					2'-2"	2'-7"	2'-11"	4'-0"	4000	
	50	2'-9"	3'-2"	3'-7"	4'-0"	2'-2"	2'-7"	2'-11"	4'-0"	4000	
14	30					3'-11"	4'-3"	4'-8"	5'-0"	6'-1"	4000
	40					3'-11"	4'-3"	4'-8"	5'-0"	6'-1"	4000
	50	2'-5"	2'-10"	3'-2"	3'-6"	3'-11"	4'-3"	4'-8"	5'-0"	6'-1"	4000
16	30					2'-0"	2'-4"	2'-8"	3'-8"	4000	
	40					2'-0"	2'-4"	2'-8"	3'-8"	4000	
	50	2'-2"	2'-6"	2'-10"	3'-2"	3'-6"	3'-10"	4'-2"	4'-6"	5'-6"	4000

TABLE 1-4 (FOR USE ON OVER 3'-0" TO 3'-6" OVERHANG & 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.	
		BRACKET SPACING									
10	30					2'-3"	2'-11"	3'-7"	4'-3"	5'-9"	4000
	40					2'-3"	2'-11"	3'-7"	4'-3"	5'-9"	4000
	50					2'-4"	2'-8"	3'-0"	3'-4"	3'-8"	4000
12	30					2'-1"	2'-8"	3'-4"	3'-11"	5'-2"	4000
	40					2'-1"	2'-8"	3'-4"	3'-11"	5'-2"	4000
	50	2'-4"	2'-8"	3'-0"	3'-4"	3'-8"	4'-1"	4'-5"	4'-9"	5'-9"	4000
14	30					2'-0"	2'-6"	3'-1"	3'-8"	4'-8"	4000
	40					2'-0"	2'-6"	3'-1"	3'-8"	4'-8"	4000
	50					2'-2"	2'-5"	2'-8"	3'-0"	3'-3"	4000
16	30					2'-4"	2'-10"	2'-0"	2'-9"	4000	
	40					2'-4"	2'-10"	2'-0"	2'-9"	4000	
	50	2'-1"	2'-4"	2'-8"	3'-0"	3'-4"	3'-7"	3'-11"	4'-3"	5'-2"	4000

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

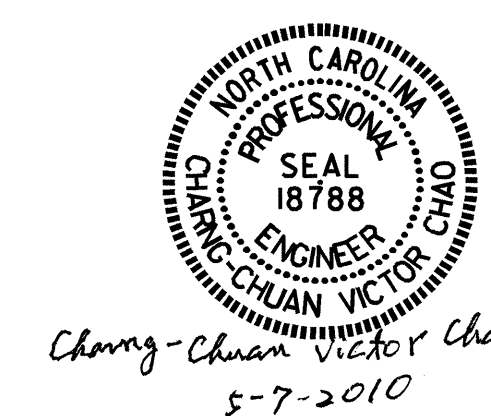
PROJECT NO. B-4286
 SWAIN COUNTY
 STATION: 16+39.20 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD OVERHANG FALSEWORK
 AASHTO TYPES
 III, IV, V, AND VI

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-39
1			3			TOTAL SHEETS 41
2			4			

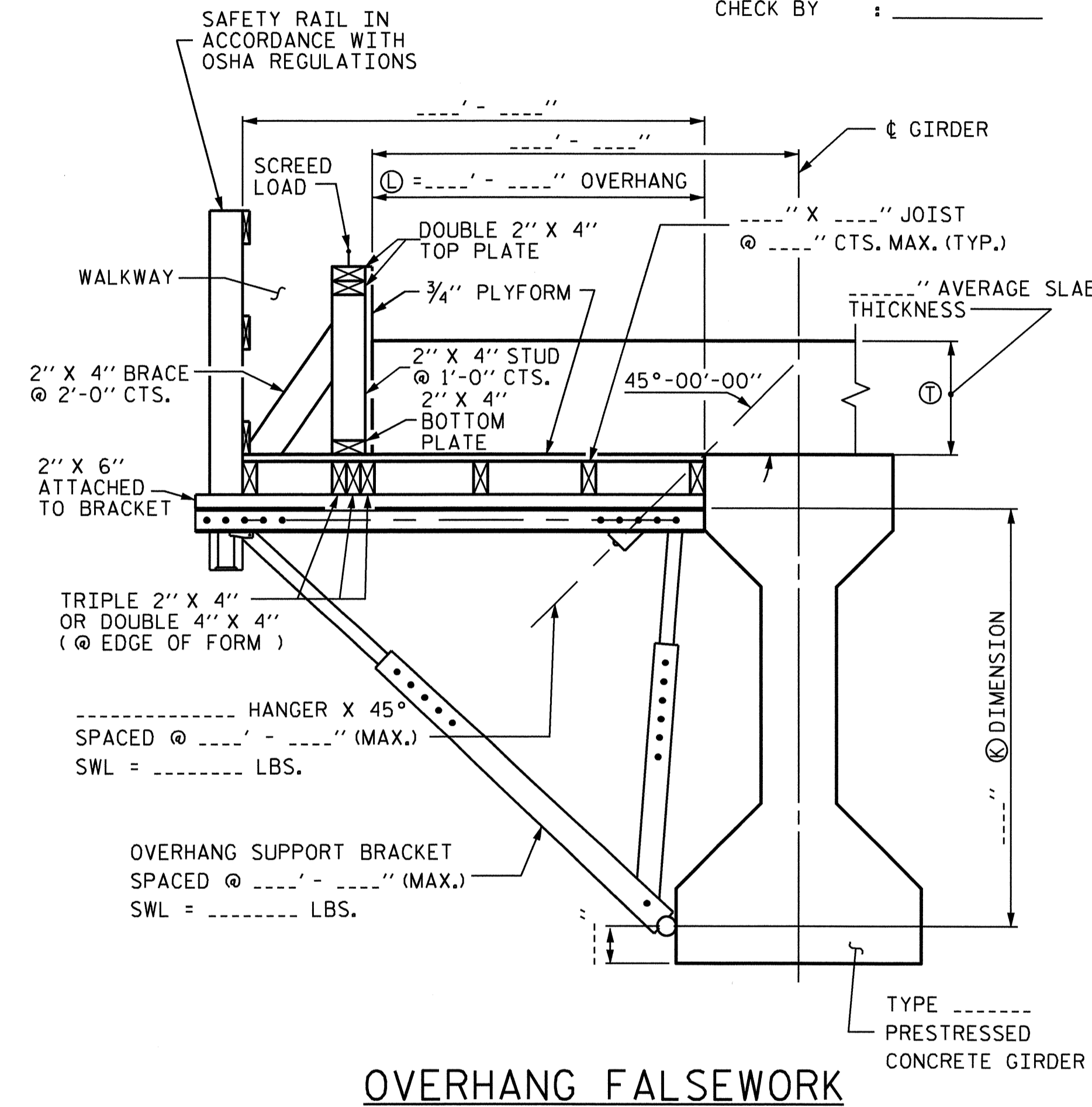


ASSEMBLED BY: DATE:
 CHECKED BY: DATE:
 DRAWN BY: R. WRIGHT 06/04 REV.
 CHECKED BY: C. V. CHAO 06/04

BRIDGE OVERHANG BRACKET SUMMARY

TOTAL SCREED WEIGHT = _____ LBS.
 NUMBER OF SCREED WHEELS = _____
 SCREED WHEEL LOAD (W) = _____ LBS.
 SCREED LOAD PER BRACKET = _____ LBS.

PROJECT No. : _____
 COUNTY : _____
 STATION : _____
 DESCRIPTION : _____
 DATE : _____
 DESIGN BY : _____
 CHECK BY : _____



OVERHANG FALSEWORK

NOTES

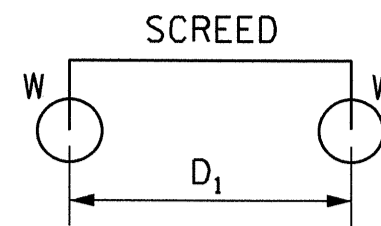
DESIGN INCLUDES CONSTRUCTION LIVE LOAD 20 PSF ON THE AREA SUPPORTED AND 75 PLF AT THE OUTSIDE DECK OF OVERHANGS.

REQUIRED MINIMUM DIAGONAL LEG CAPACITY: 3600 LB WORKING LOAD

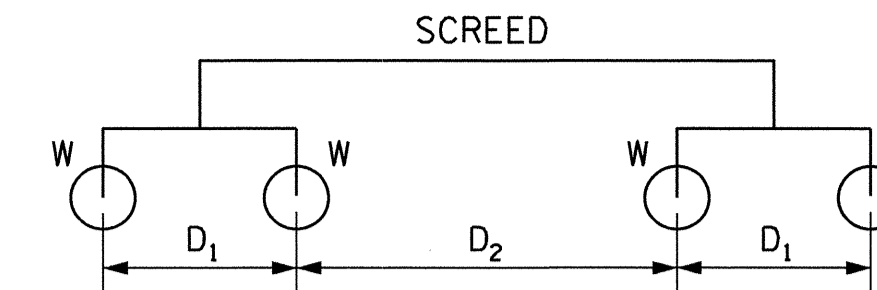
THE CONTRACTOR HAS THE OPTION OF SUBMITTING HIS OWN DESIGN FOR OVERHANG FALSEWORK IN ACCORDANCE WITH THE SPECIAL PROVISIONS.

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



8-WHEEL MACHINE

TABLE 2: SCREED LOAD FACTOR "R"

4 WHEEL MACHINE	
S/D1	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

		THE SCREED LOAD FACTOR R (FOR 8 WHEEL MACHINE)																	
		S/D ₂																	
S/D ₁		<= 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
	<= 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
1.1		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

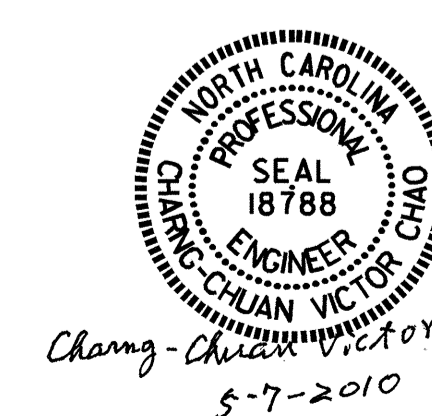
AVG. SLAB THICKNESS (IN)	LUMBER JOIST SIZE (IN X IN)	JOIST SPACINGS			
		15 IN	12 IN	10 IN	8 IN
THE ALLOWABLE SPAN LENGTH OF JOISTS					
10	2 X 4	—	4' - 6"	4' - 9"	5' - 0"
	4 X 4	5' - 9"	6' - 3"	6' - 6"	6' - 7"
12	2 X 4	—	4' - 3"	4' - 9"	5' - 0"
	4 X 4	5' - 3"	6' - 0"	6' - 3"	6' - 5"
14	2 X 4	—	4' - 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-4286
SWAIN COUNTY
 STATION: 16+39.20 -L-

SHEET 2 OF 3

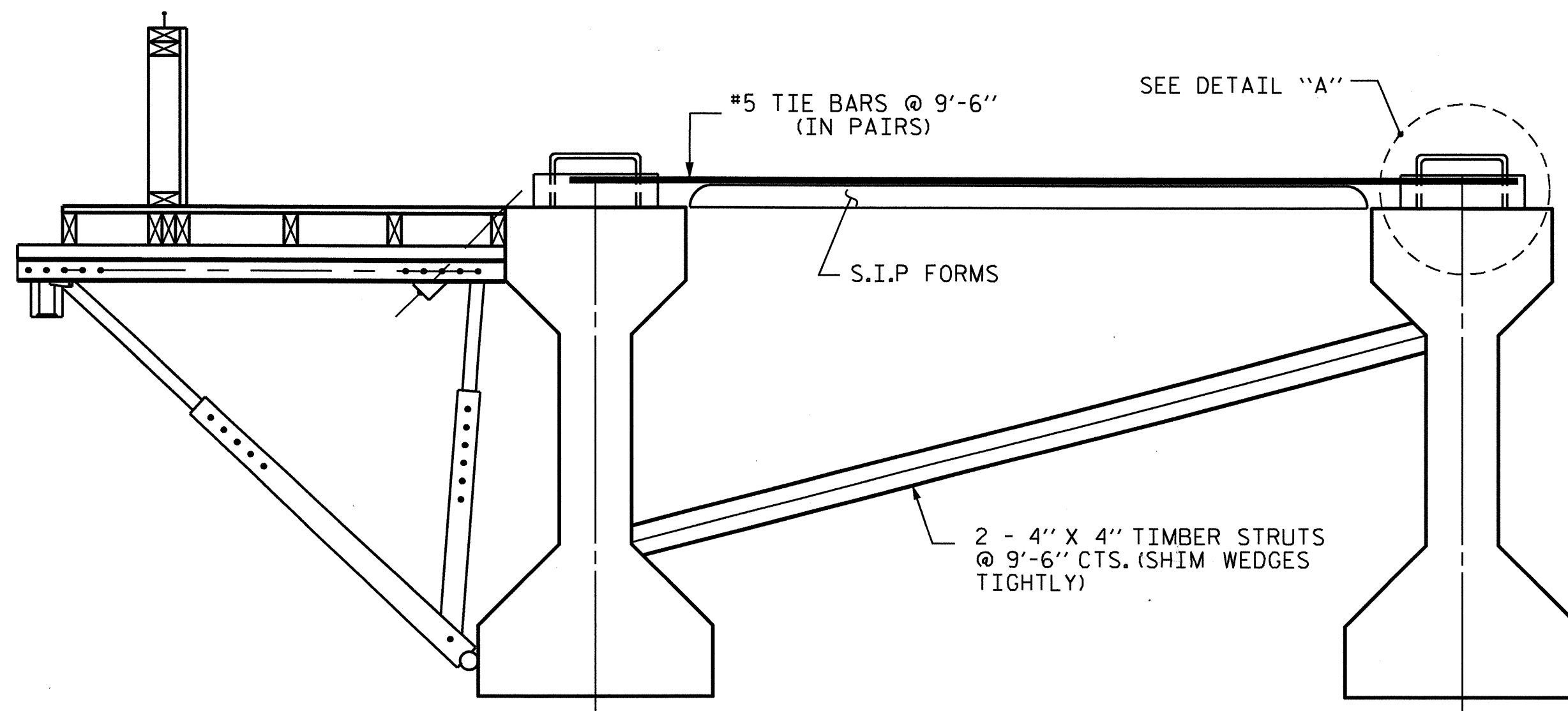
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD OVERHANG FALSEWORK
 AASHTO TYPES
 III, IV, V, AND VI



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-40
1			3			TOTAL SHEETS 41
2			4			

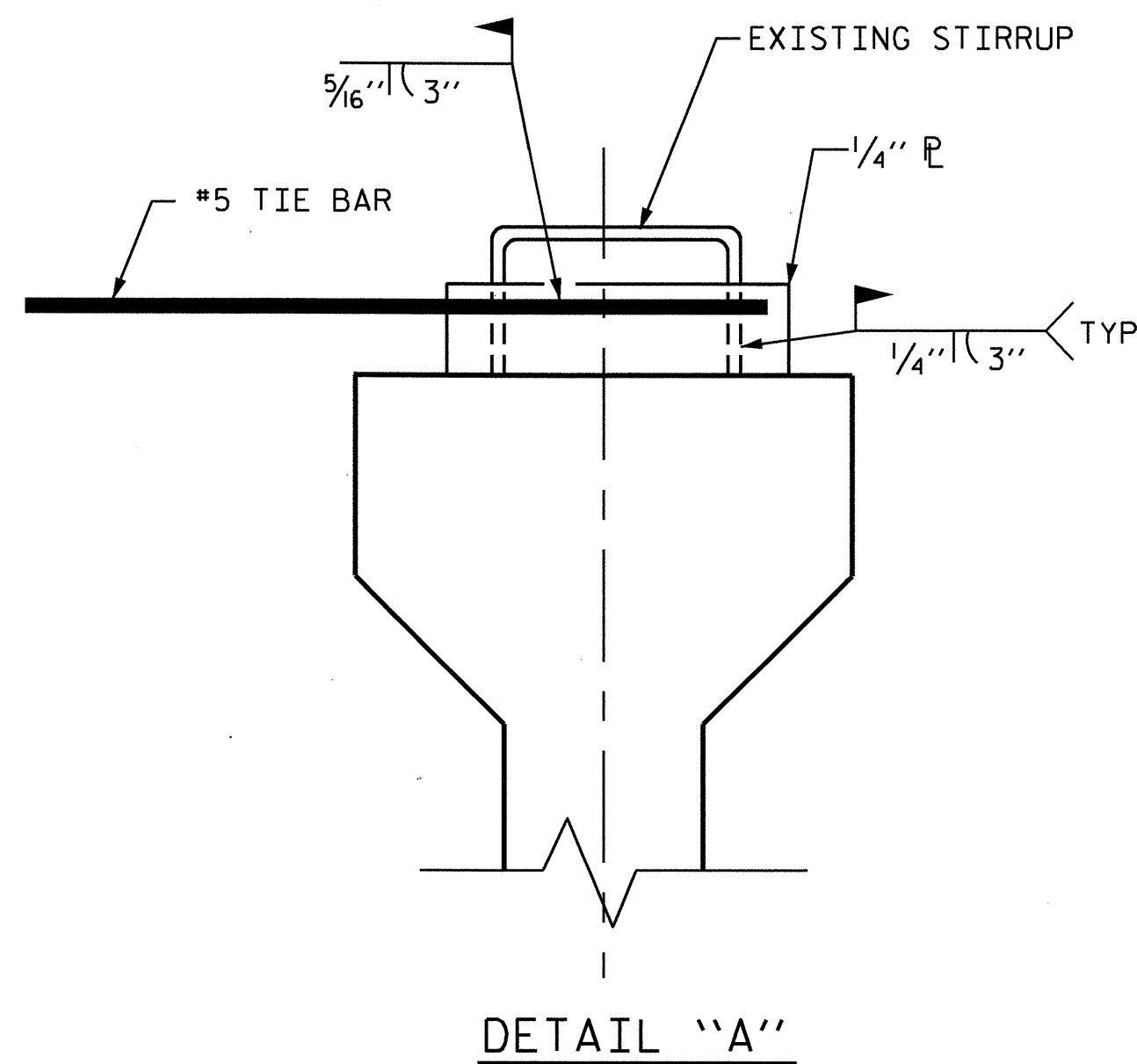
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CHECKED BY:	DATE:
DRAWN BY: R. WRIGHT 06/04	REV.
CHECKED BY: C. V. CHAO 06/04	



EXTERIOR GIRDER

INTERIOR GIRDER

DETAIL OF REQUIRED OVERHANG FALSEWORK BRACING SYSTEM



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 9'-6" CTS. #5 TIE BARS SHALL BE LOCATED OVER A TIMBER STRUT.

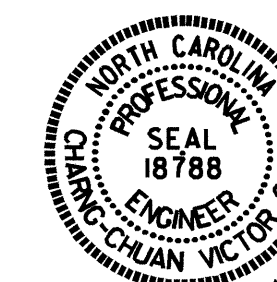
INSTALL TIE BARS AND TIMBER STRUTS PRIOR TO PLACEMENT OF CONCRETE OR SCREED WEIGHT ONTO THE OVERHANG FALSEWORK.

PROJECT NO. B-4286
SWAIN COUNTY
 STATION: 16+39.20 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD OVERHANG FALSEWORK
 AASHTO TYPES
 III, IV, V, AND VI



Chang-Chuan Victor Chao
 5-7-2010

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

07-MAY-2010 12:15
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-41
1			3			TOTAL SHEETS
2			4			41

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

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

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

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

STRUCTURAL STEEL:

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

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN