

09/08/09

TIP PROJECT: B-4574

CONTRACT: C202432

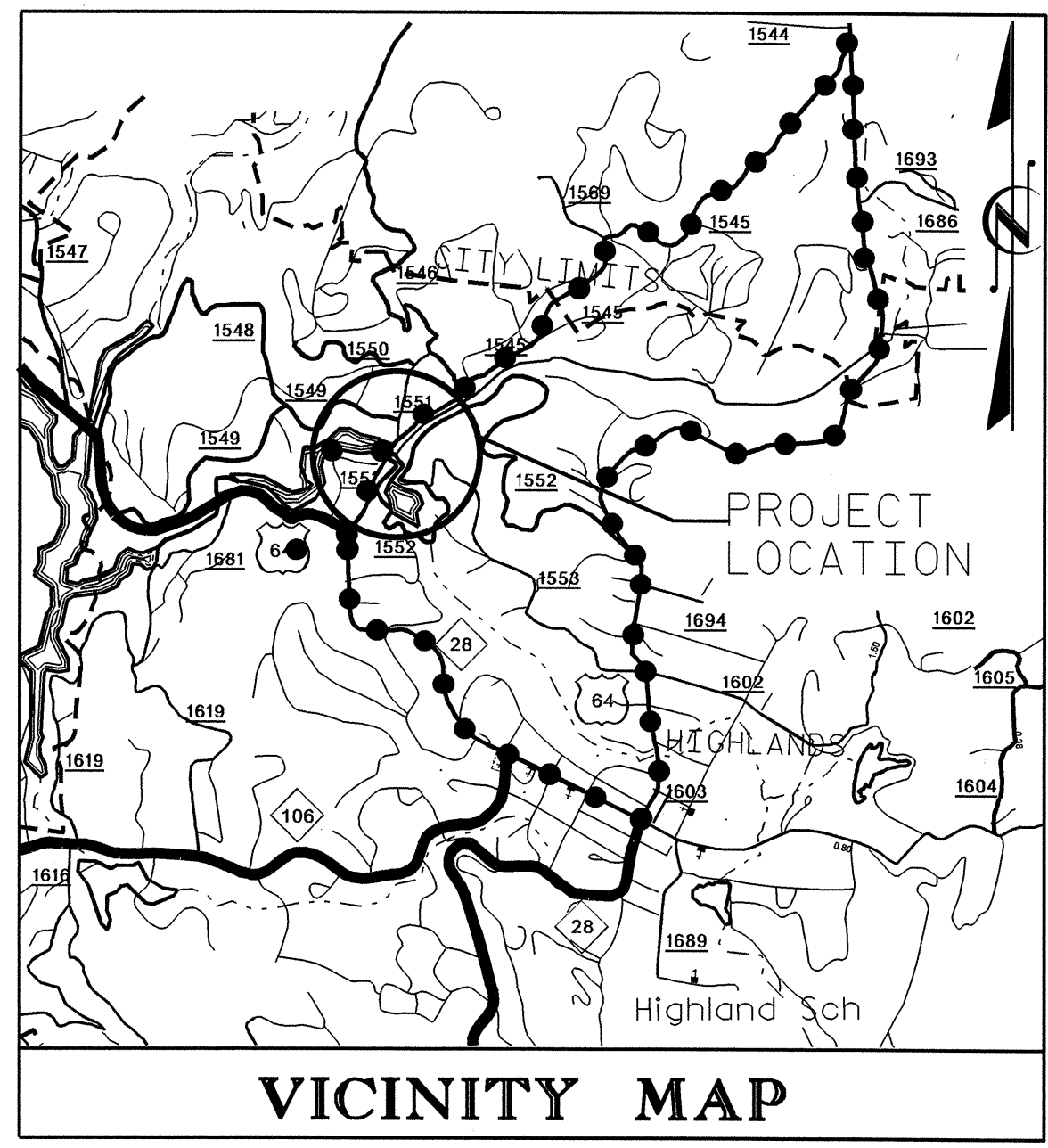
STRUCTURE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

MACON COUNTY

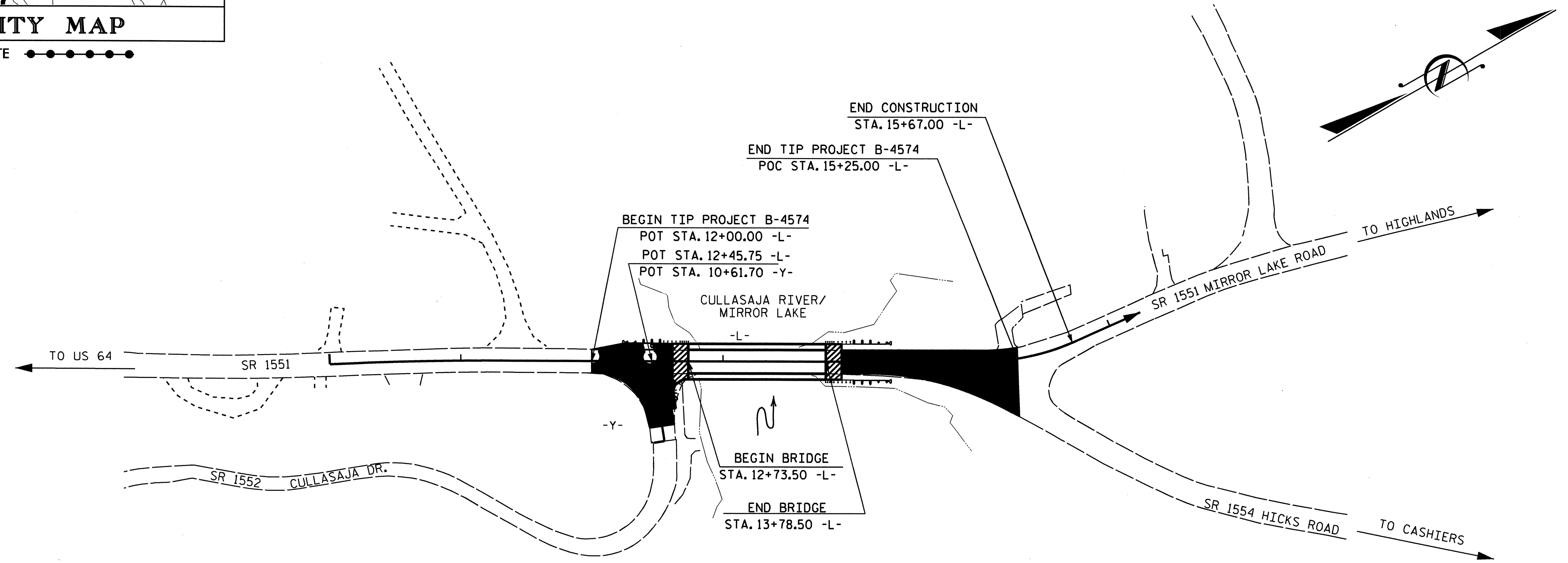
**LOCATION: BRIDGE #58 OVER THE CULLASAJA RIVER
ON SR 1551 (MIRROR LAKE ROAD)**

TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURE

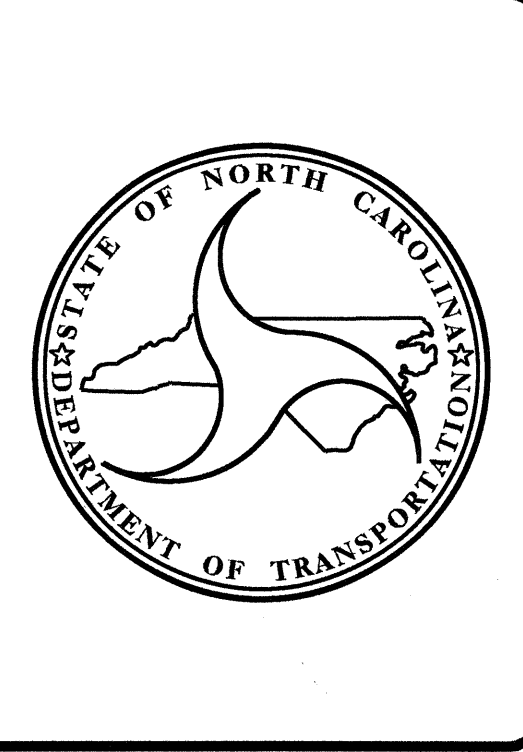
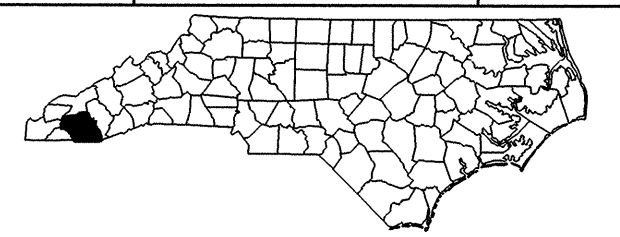


VICINITY MAP

OFF-SITE DETOUR ROUTE



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4574		
STATE PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION	
33778.1.1	BRZ-1551(1)	PE	
33778.2.1	BRZ-1551(1)	R /W & UTIL.	
33778.3.1	BRZ-1551(1)	CONSTRUCTION	



DESIGN DATA

ADT 2010 = 2,523
ADT 2030 = 3,446
DHV = 9 %
D = 65 %
* T = 7 %
** V = 30 MPH
* TTST 1% DUAL 6%

FUNCTIONAL CLASSIFICATION
RURAL LOCAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4574 = 0.042 MILES
LENGTH STRUCTURE TIP PROJECT B-4574 = 0.020 MILES
TOTAL LENGTH TIP PROJECT B-4574 = 0.062 MILES

PLANS PREPARED IN THE OFFICE OF:
DIVISION OF HIGHWAYS

2006 STANDARD SPECIFICATIONS

LETTING DATE:
MARCH 15, 2011

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

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

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

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER
DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR

P.E.
DATE

13-JAN-2011 11:32
R:\ST\Projects\Final Plans\B-4574_scd.01 - TSH.dgn
DAH0002

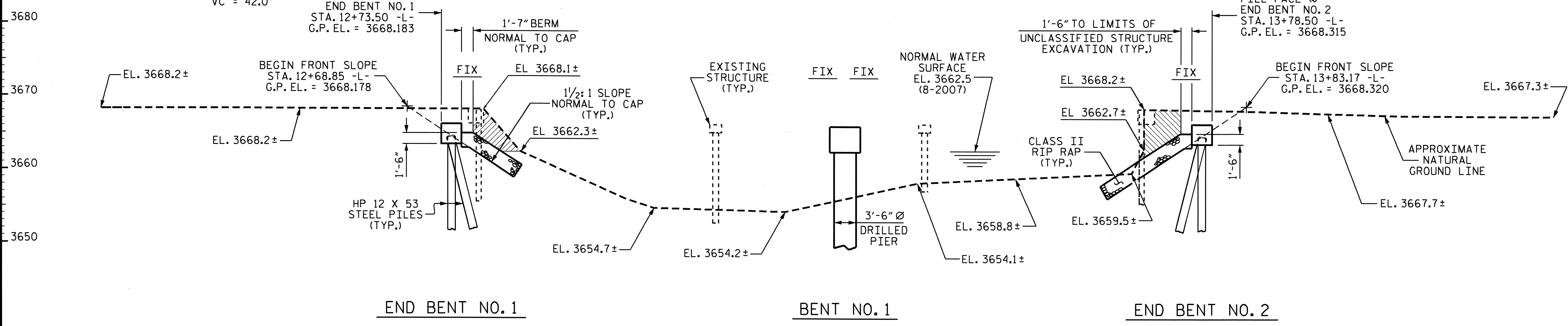
-0.0981% \triangle +0.1250%

GRADE DATA

P.I. STA. = 12+46.84 -L-
 EL. = 3668.15'
 VC = 42.0'

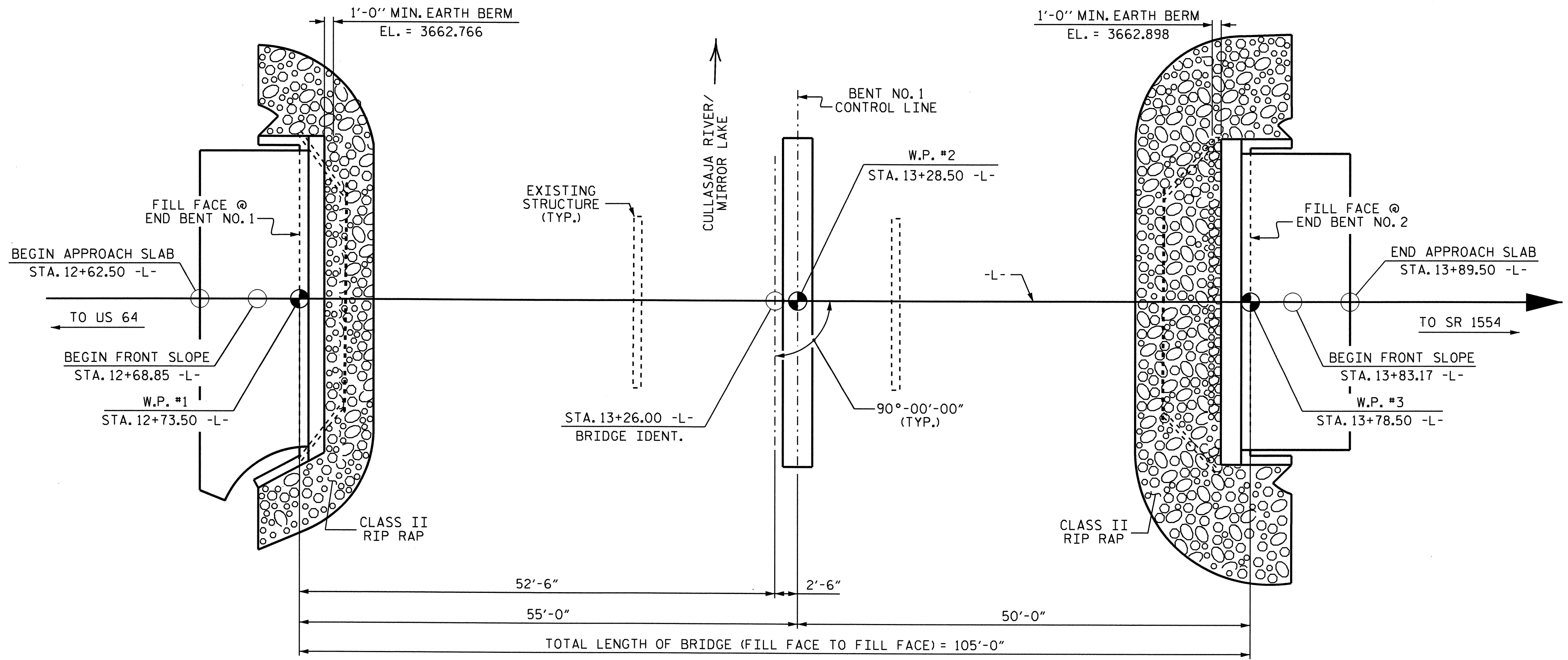
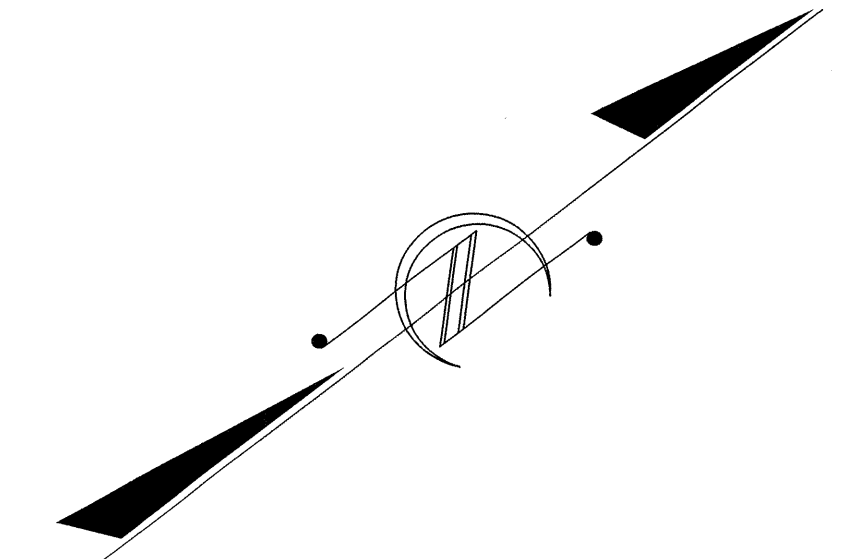
SPAN A

SPAN B



SECTION ALONG -L-

SECTIONS THRU END BENTS & BENT ARE TAKEN AT RIGHT ANGLES



PILES AND COLUMNS ARE NOT SHOWN IN PLAN VIEW

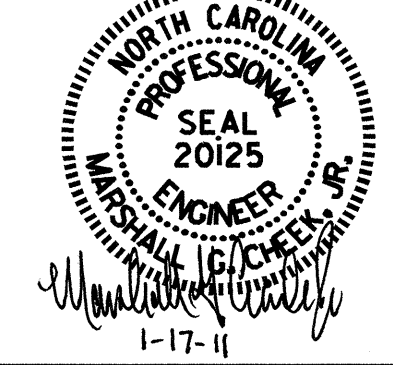
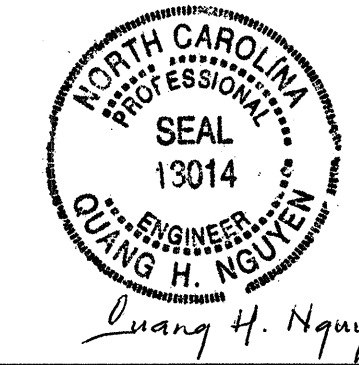
PROJECT NO. B-4574
MACON COUNTY
 STATION: 13+26.00 -L-
 SHEET 1 OF 3 REPLACES BRIDGE #58

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE OVER
 CULLASAJA RIVER/MIRROR LAKE
 ON SR 1551 BETWEEN
 US 64 AND SR 1554

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

DRAWN BY : A. SORSENGINH DATE : 10/20/10
 CHECKED BY : M.G. CHEEK DATE : 10/10



NOTES

FOR PILES, SEE SPECIAL PROVISIONS.

PILES AT END BENTS NO. 1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 80 TONS PER PILE. DRIVE PILES TO A REQUIRED DRIVING RESISTANCE OF 133 TONS PER PILE.

STEEL PILE POINTS ARE REQUIRED FOR PILES AT END BENTS NO. 1 AND 2. FOR STEEL PILE POINTS, SEE PILES SPECIAL PROVISION.

FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.

DRILLED PIERS AT BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 310.0 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 30.0 TSF.

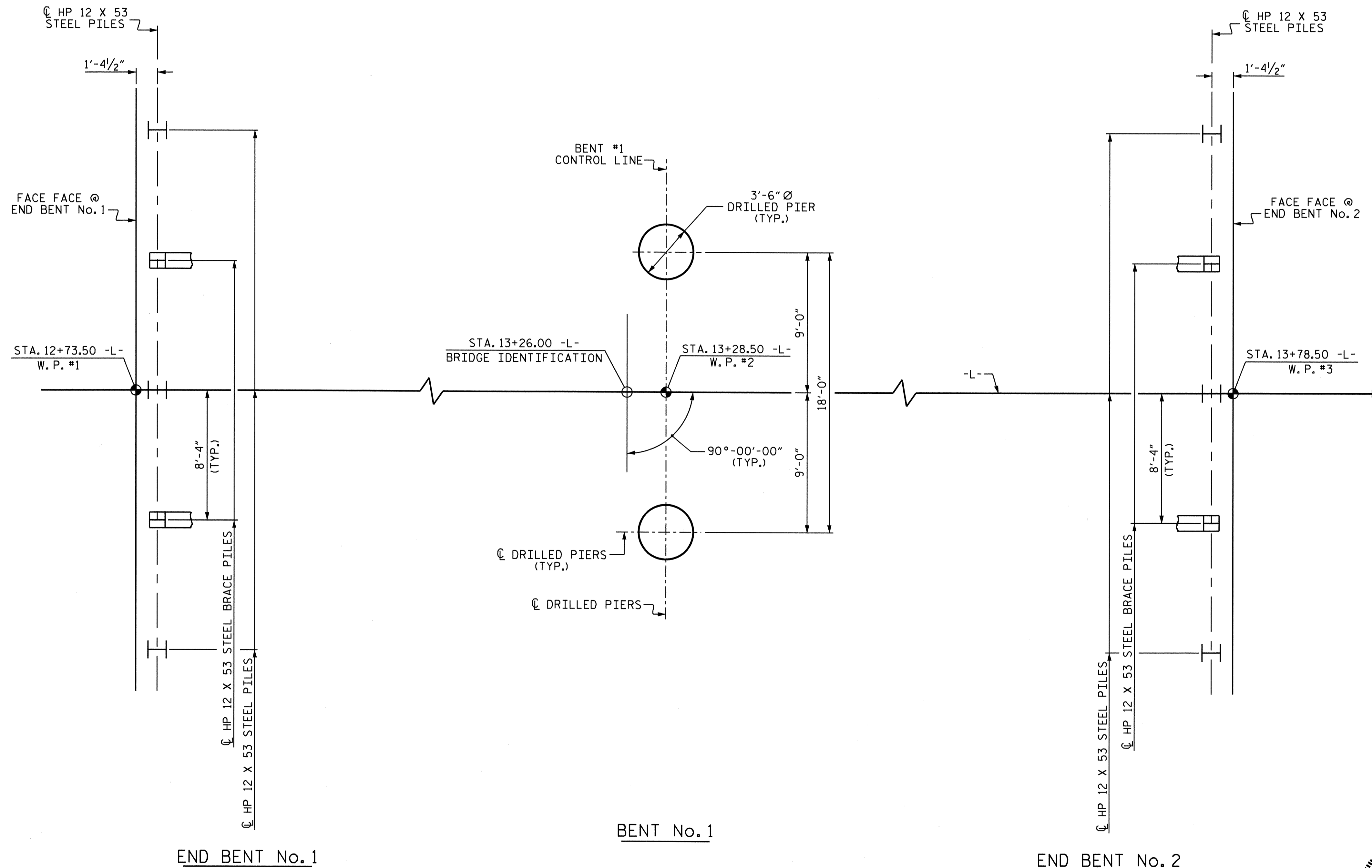
PERMANENT STEEL CASING MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO. 1. IF REQUIRED, DO NOT EXTEND CASING BELOW ELEVATION 3642.7 WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT STEEL CASING.

DRILLED PIERS AT BENT NO. 1 SHALL EXTEND TO AN ELEVATION NO HIGHER THAN 3632.0 AND SATISFY THE REQUIRED END RESISTANCE.

THE SCOUR CRITICAL ELEVATION FOR BENT NO. 1 IS ELEVATION 3640.5 SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

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

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



FOUNDATION LAYOUT

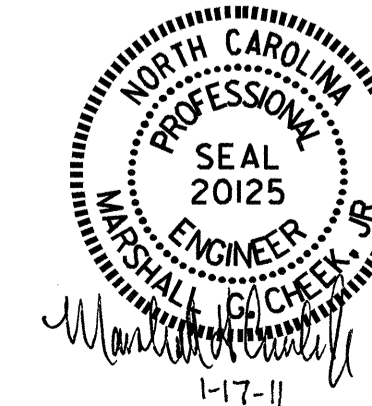
ALL END BENT PILES ARE HP 12 X 53.
DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE AT BOTTOM OF CAP.
BRACE PILES AT END BENTS ARE BATTERED AT 3:12.

PROJECT NO. B-4574
MACON COUNTY
 STATION: 13+26.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

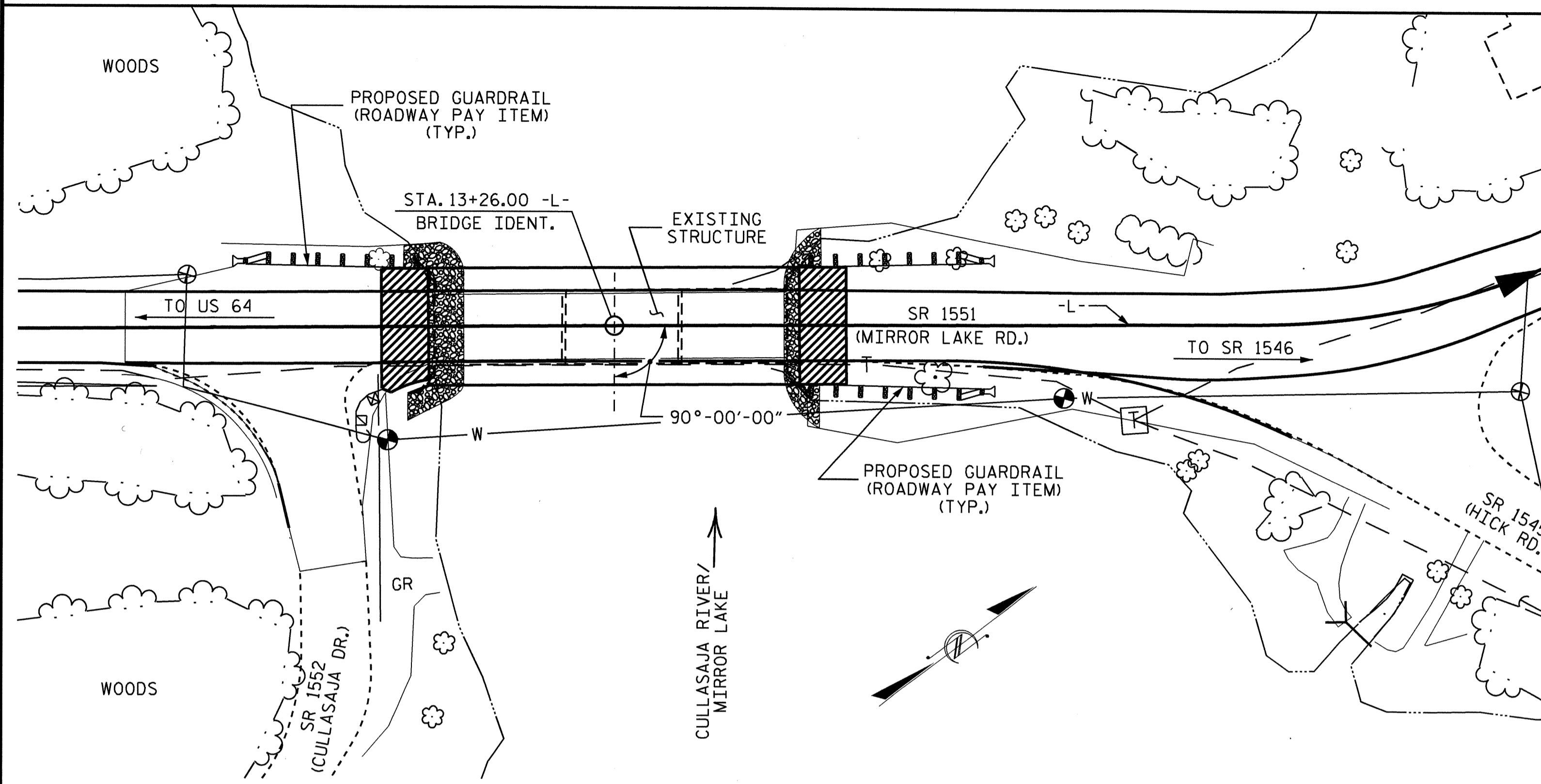
GENERAL DRAWING
 FOR BRIDGE OVER CULLASAJA
 RIVER/MIRROR LAKE ON
 SR 1551 BETWEEN
 US 64 AND SR 1554



DRAWN BY : A. SORSENGIN DATE : 10/18/10
 CHECKED BY : M.G. CHEEK DATE : 10/10

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

BENCHMARK #3: 8" SPIKE IN ON TOP OF 8" MAPLE STUMP, STA. 15+85.02 -L-, 146.23' RIGHT, EL. 3667.66



HYDRAULIC DATA

DESIGN DISCHARGE	=	1,540 CFS.
FREQUENCY OF DESIGN FLOOD	=	25 YRS.
DESIGN HIGH WATER ELEVATION	=	NOT AVAILABLE
DRAINAGE AREA	=	6.2 SQ. MI.
BASIC DISCHARGE (Q100)	=	2,480 CFS.
BASIC HIGH WATER ELEVATION	=	3658.0

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	=	NOT AVAILABLE
FREQUENCY OF OVERTOPPING FLOOD	=	500 YRS.±
OVERTOPPING FLOOD ELEVATION	=	3668.0

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

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.
 THE EXISTING 3 SPAN STRUCTURE (1 @ 30'-3", 1 @ 30'-0", 1 @ 30'-3" WITH A SUPERSTRUCTURE CONSISTING OF A TIMBER FLOOR ON STEEL I-BEAMS AND WITH A 1/2" ASPHALT WEARING SURFACE, AND A SUBSTRUCTURE CONSISTING OF TIMBER CAPS AND TIMBER POST & SILLS AT THE END BENTS AND A TIMBER CAP AND TIMBER PILES AT THE BENT SHALL BE REMOVED.
 REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.
 THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA (SEE SHEET 1 OF 3) SHALL BE EXCAVATED FOR A DISTANCE OF 25 FEET 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 OF THE STANDARD SPECIFICATIONS.
 THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.
 ASPHALT WEARING SURFACE IS INCLUDED IN ROADWAY QUANTITY ON ROADWAY PLANS.
 THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH HEC 18, "EVALUATING SCOUR AT BRIDGES", MAY, 2001.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE".
 AT 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.
 FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
 FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
 FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
 FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.
 FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
 FOR CURING CONCRETE, SEE SPECIAL PROVISIONS.
 FOR PILES, SEE SPECIAL PROVISIONS.

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

TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS	REMOVAL OF EXISTING STRUCTURE	3'-6" Ø DRILLED PIERS IN SOIL	3'-6" Ø DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 3'-6" Ø DRILLED PIERS	SID INSPECTION	CROSSHOLE SONIC LOGGING	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL
	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	LUMP SUM	CU. YDS.	LUMP SUM	LBS.
SUPERSTRUCTURE	LUMP SUM	LUMP SUM								LUMP SUM	
END BENT NO. 1								LUMP SUM	12.4		1831
BENT NO. 1			38.67	22.00	39.26	1	1		17.6		5556
END BENT NO. 2								LUMP SUM	12.4		1829
TOTAL	LUMP SUM	LUMP SUM	38.67	22.00	39.26	1	1	LUMP SUM	42.4	LUMP SUM	9216

TOTAL BILL OF MATERIAL

	SPIRAL COLUMN REINFORCING STEEL	HP 12 X 53 STEEL PILES	STEEL PILE POINTS	1'-4" X 2'-9 3/4" CONCRETE PARAPET	RIP RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLABS	2 BAR ANODIZED RAIL		
	LBS.	NO.	LIN. FT.	EACH	LIN. FT.	TONS	SO. YDS	NO.	LIN. FT.	LIN. FT.	
SUPERSTRUCTURE					205.50			10	1026.25	190.50	
END BENT NO. 1		5	65	5		148	164				
BENT NO. 1	1289										
END BENT NO. 2		5	140	5		149	166				
TOTAL	1289	10	205	10	205.50	297	330	LUMP SUM	10	1026.25	190.50

PROJECT NO. B-4574
MACON COUNTY
 STATION: 13+26.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE OVER
 CULLASAJA RIVER/MIRROR LAKE
 ON SR 1551 BETWEEN
 US 64 AND SR 1554



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

DRAWN BY: A. SORSENGINH DATE: 10/20/10
 CHECKED BY: M.G. CHEEK DATE: 10/10

13-JAN-2011 11:33
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 DAHODGE

NC006

12+50

13+00

13+50

14+00

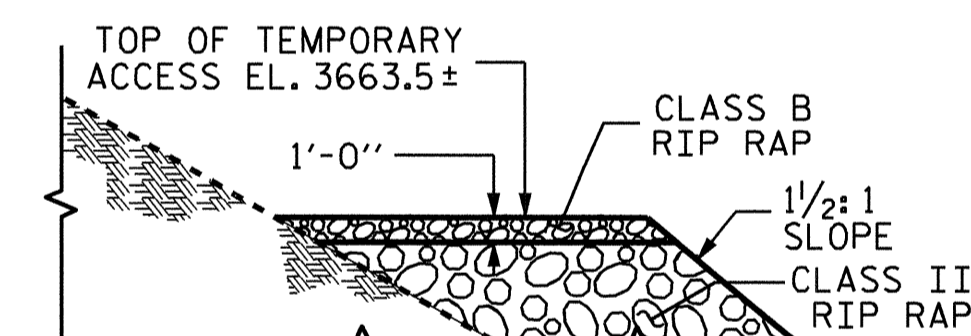
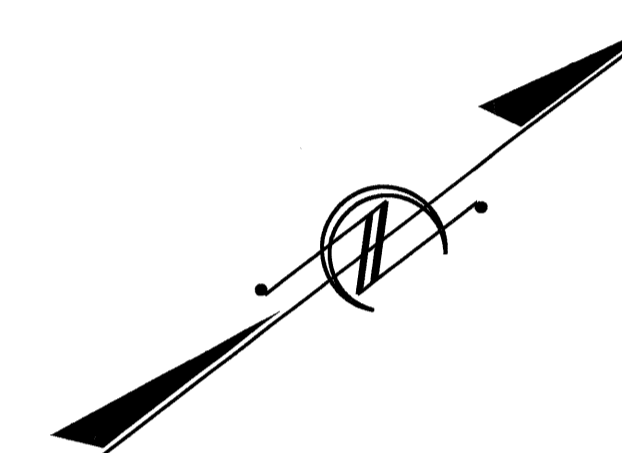
NOTES

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

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

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

FOR CLASS II RIP RAP AND CLASS B RIP RAP, SEE SPECIAL PROVISION, "CONSTRUCTION, MAINTENANCE, AND REMOVAL OF TEMPORARY ACCESS."



SECTION A-A

PROJECT NO. B-4574
MACON COUNTY
STATION: 13+26.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TEMPORARY ACCESS

REVISIONS

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

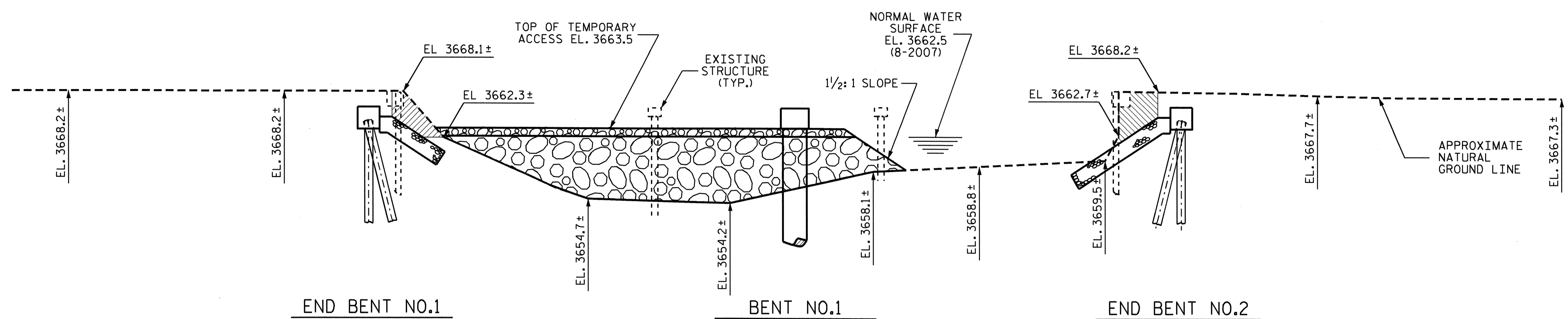
SHEET NO.	S-4
TOTAL SHEETS	23



3680
3670
3660
3650

SPAN A

SPAN B



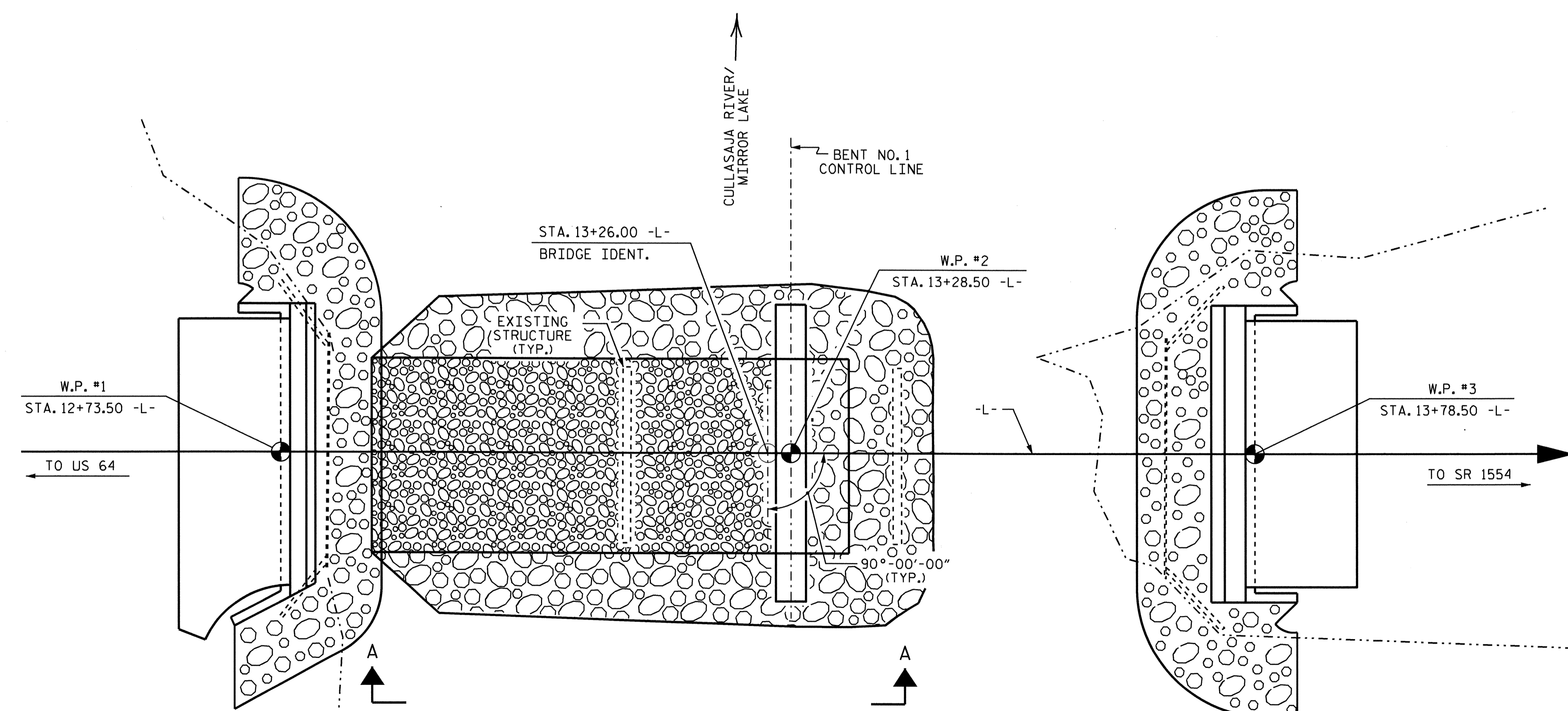
END BENT NO.1

BENT NO.1

END BENT NO.2

SECTION ALONG -L-

SECTIONS THRU END BENTS & BENT ARE TAKEN AT RIGHT ANGLES



DRAWN BY : A.L. FIGUEROA DATE : 9-21-10
CHECKED BY : M.G. CHEEK DATE : 10/10

13-JAN-2011 11:33
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DANODGE

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	1.023	--	1.75	0.273	1.02	A	EL	26.406	0.518	1.06	A	EL	2.641	0.80	0.273	1.08	A	EL	26.406		
	HL-93(Opr)	N/A	--	1.327	--	1.35	0.273	1.33	A	EL	26.406	0.518	1.37	A	EL	2.641	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	②	1.278	46.008	1.75	0.273	1.28	A	EL	26.406	0.518	1.28	A	EL	2.641	0.80	0.273	1.34	A	EL	26.406		
	HS-20(Opr)	36.000	--	1.656	59.616	1.35	0.273	1.66	A	EL	26.406	0.518	1.66	A	EL	2.641	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	2.805	37.868	1.40	0.273	3.34	A	EL	26.406	0.518	3.66	A	EL	2.641	0.80	0.273	2.81	A	EL	26.406	
		SNGARBS2	20.000	--	2.185	43.700	1.40	0.273	2.60	A	EL	26.406	0.518	2.64	A	EL	2.641	0.80	0.273	2.19	A	EL	26.406	
		SNAGRIS2	22.000	--	2.112	46.464	1.40	0.273	2.51	A	EL	26.406	0.518	2.47	A	EL	2.641	0.80	0.273	2.11	A	EL	26.406	
		SNCOTTS3	27.250	--	1.399	38.123	1.40	0.273	1.66	A	EL	26.406	0.518	1.83	A	EL	2.641	0.80	0.273	1.40	A	EL	26.406	
		SNAGGRS4	34.925	--	1.205	42.085	1.40	0.273	1.43	A	EL	26.406	0.518	1.55	A	EL	2.641	0.80	0.273	1.20	A	EL	26.406	
		SNS5A	35.550	--	1.176	41.807	1.40	0.273	1.40	A	EL	26.406	0.518	1.59	A	EL	2.641	0.80	0.273	1.18	A	EL	26.406	
		SNS6A	39.950	--	1.094	43.705	1.40	0.273	1.30	A	EL	26.406	0.518	1.46	A	EL	2.641	0.80	0.273	1.09	A	EL	26.406	
	SNS7B	42.000	--	1.043	43.806	1.40	0.273	1.24	A	EL	26.406	0.518	1.45	A	EL	2.641	0.80	0.273	1.04	A	EL	26.406		
	TTST	TNAGRIT3	33.000	--	1.339	44.187	1.40	0.273	1.59	A	EL	26.406	0.518	1.73	A	EL	2.641	0.80	0.273	1.34	A	EL	26.406	
		TNT4A	33.075	--	1.349	44.618	1.40	0.273	1.61	A	EL	26.406	0.518	1.67	A	EL	2.641	0.80	0.273	1.35	A	EL	26.406	
		TNT6A	41.600	--	1.119	46.550	1.40	0.273	1.33	A	EL	26.406	0.518	1.58	A	EL	2.641	0.80	0.273	1.12	A	EL	26.406	
		TNT7A	42.000	--	1.133	47.586	1.40	0.273	1.35	A	EL	26.406	0.518	1.49	A	EL	2.641	0.80	0.273	1.13	A	EL	26.406	
		TNT7B	42.000	--	1.182	49.644	1.40	0.273	1.41	A	EL	26.406	0.518	1.41	A	EL	2.641	0.80	0.273	1.18	A	EL	26.406	
		TNAGRIT4	43.000	--	1.120	48.160	1.40	0.273	1.33	A	EL	26.406	0.518	1.36	A	EL	2.641	0.80	0.273	1.12	A	EL	26.406	
TNAGT5A		45.000	--	1.048	47.160	1.40	0.273	1.25	A	EL	26.406	0.518	1.37	A	EL	2.641	0.80	0.273	1.05	A	EL	26.406		
TNAGT5B	45.000	③	1.029	46.305	1.40	0.273	1.22	A	EL	26.406	0.518	1.29	A	EL	2.641	0.80	0.273	1.03	A	EL	26.406			

LOAD FACTORS:

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

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)

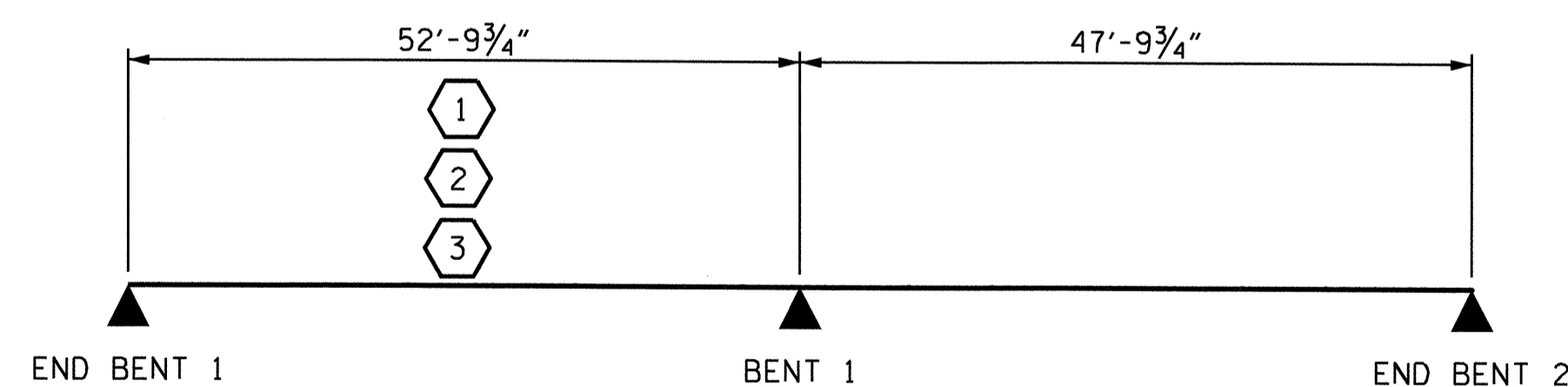
② DESIGN LOAD RATING (HS-20)

③ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

NOTE: SPAN DIMENSIONS SHOWN ARE FROM C BEARING TO C BEARING.

PROJECT NO. B-4574
MACON COUNTY
 STATION: 13+26.00 -L-

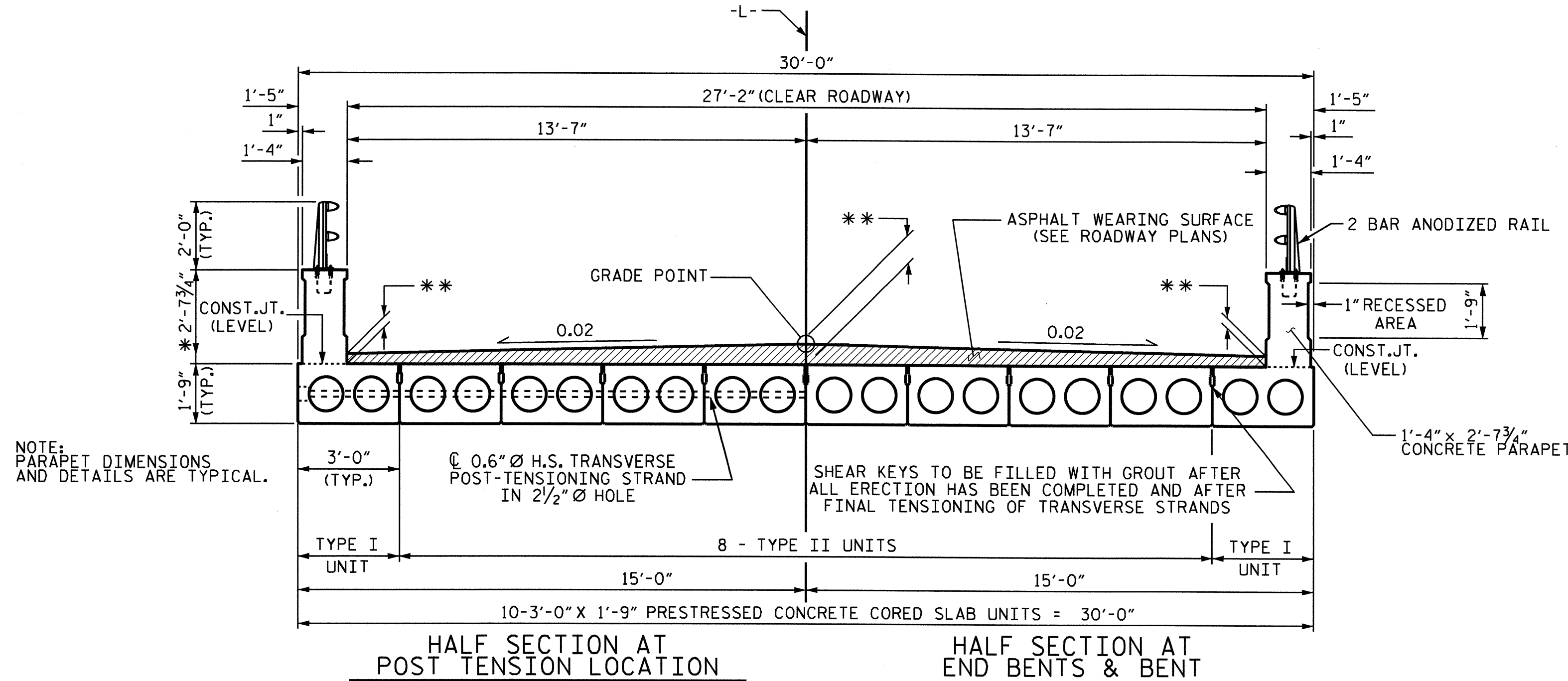
ASSEMBLED BY: J.R. MCROY DATE: 11/10
 CHECKED BY: M.G. CHEEK DATE: 11/10
 DRAWN BY: MAA 1/08 REV. 11/12/08R MAA/GM
 CHECKED BY: GM/DI 2/08



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

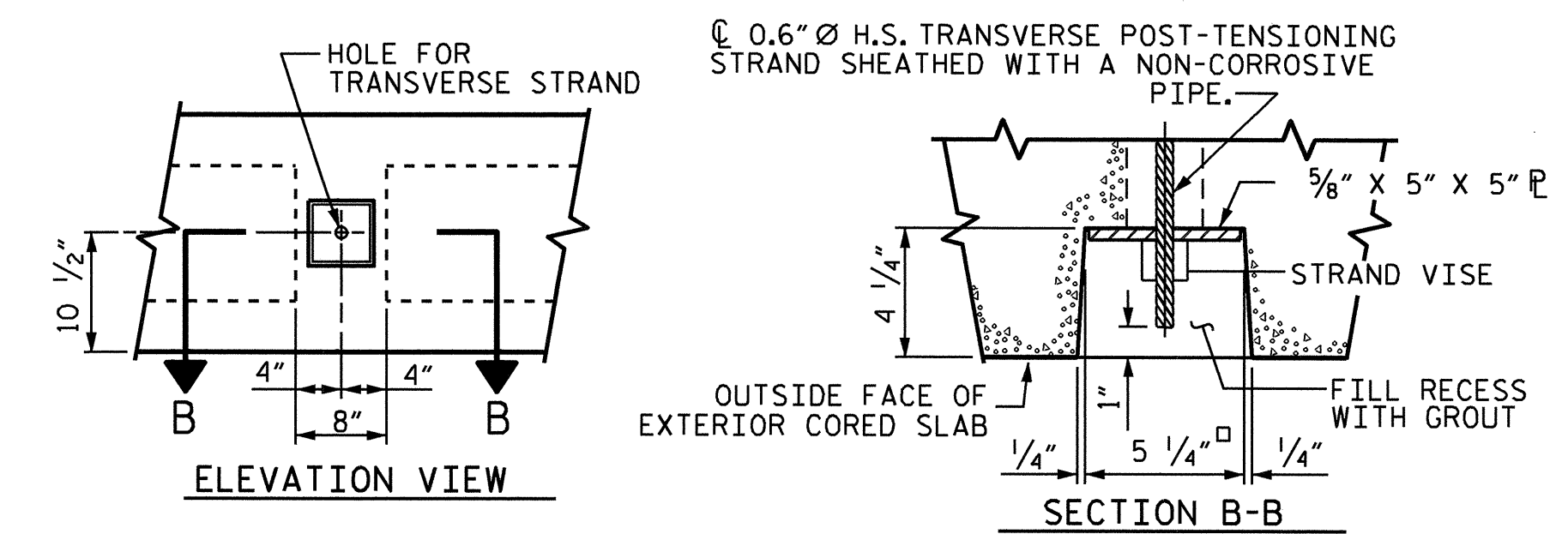
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-5
2			4			TOTAL SHEETS 23



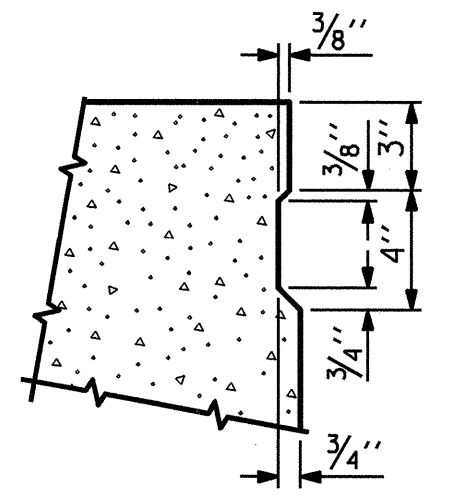
NOTE
 * THE MINIMUM HEIGHT OF THE PARAPET IS SHOWN, THE HEIGHT OF THE PARAPET VARIES WHILE THE TOP OF THE PARAPET FOLLOWS THE PROFILE OF THE GUTTERLINE.

ASPHALT WEARING SURFACE THICKNESS TABLE
 BASED ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATIONS

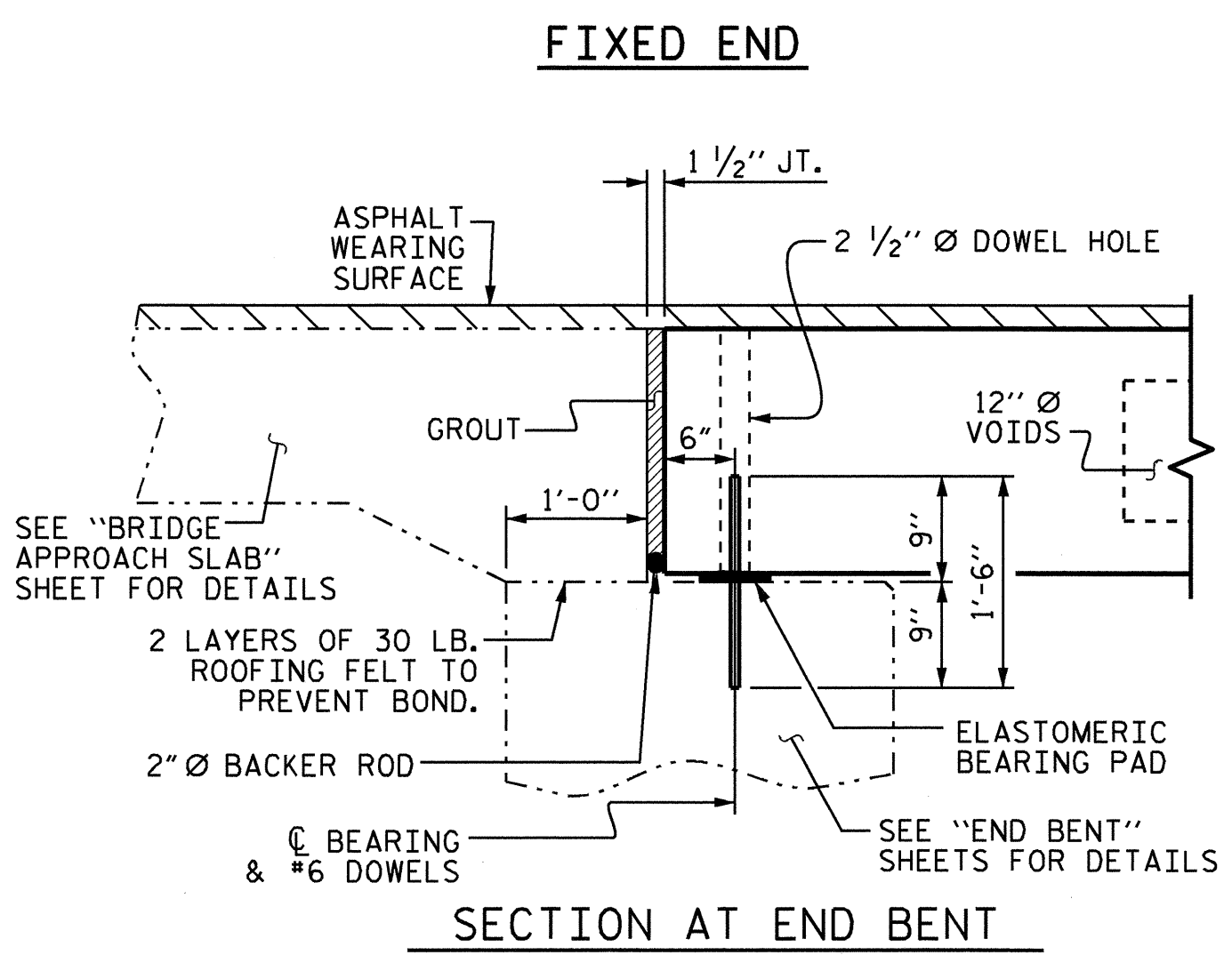
SPAN	** AT C BEARINGS		** AT MID-SPAN	
	GUTTERS	GRADE PT.	GUTTERS	GRADE PT.
A	3 3/4"	7"	1 9/16"	4 7/8"
B	3 3/4"	7"	2 3/16"	5 1/2"



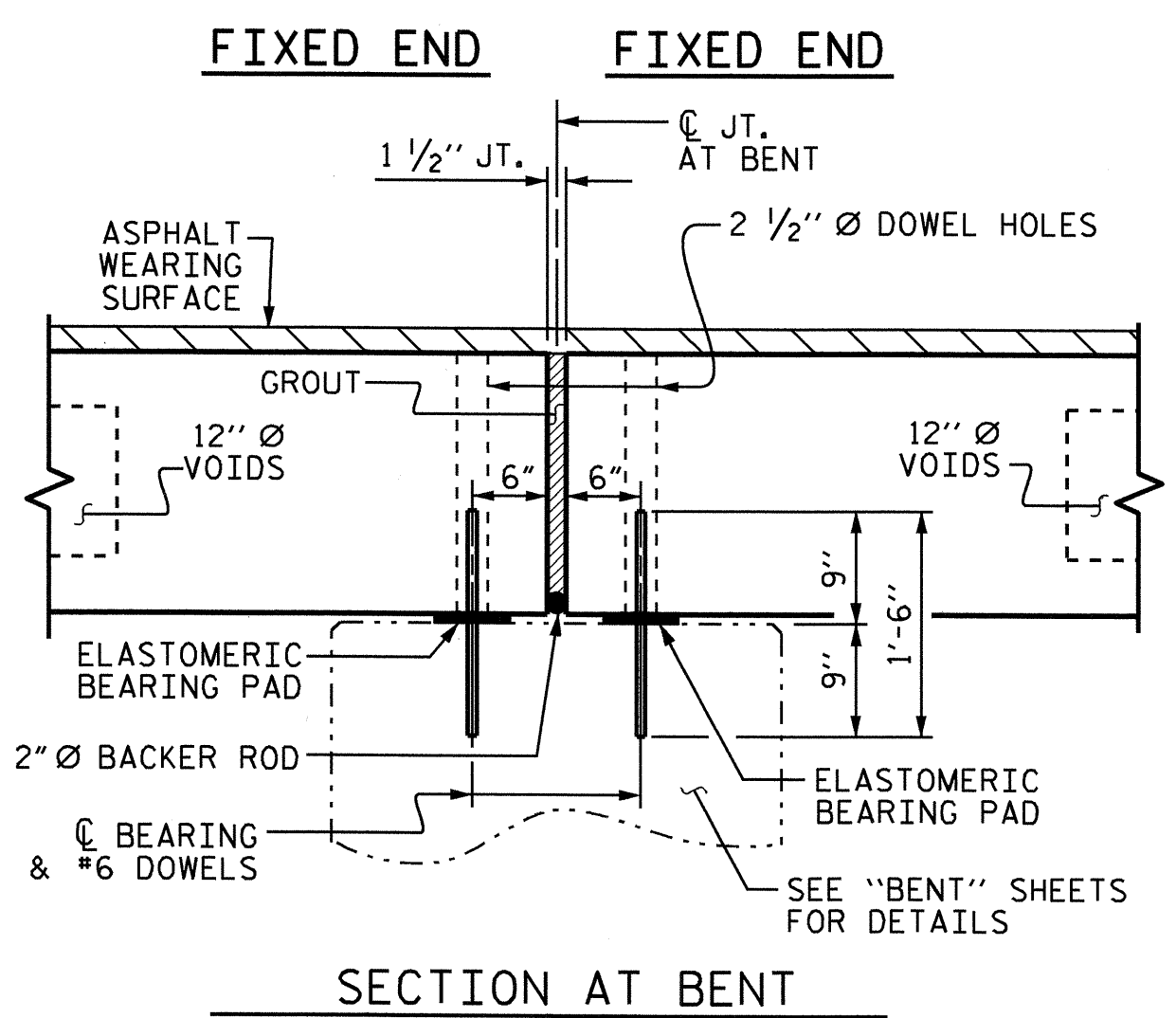
GRouted RECESS AT END OF POST-TENSIONING STRAND CORED SLABS



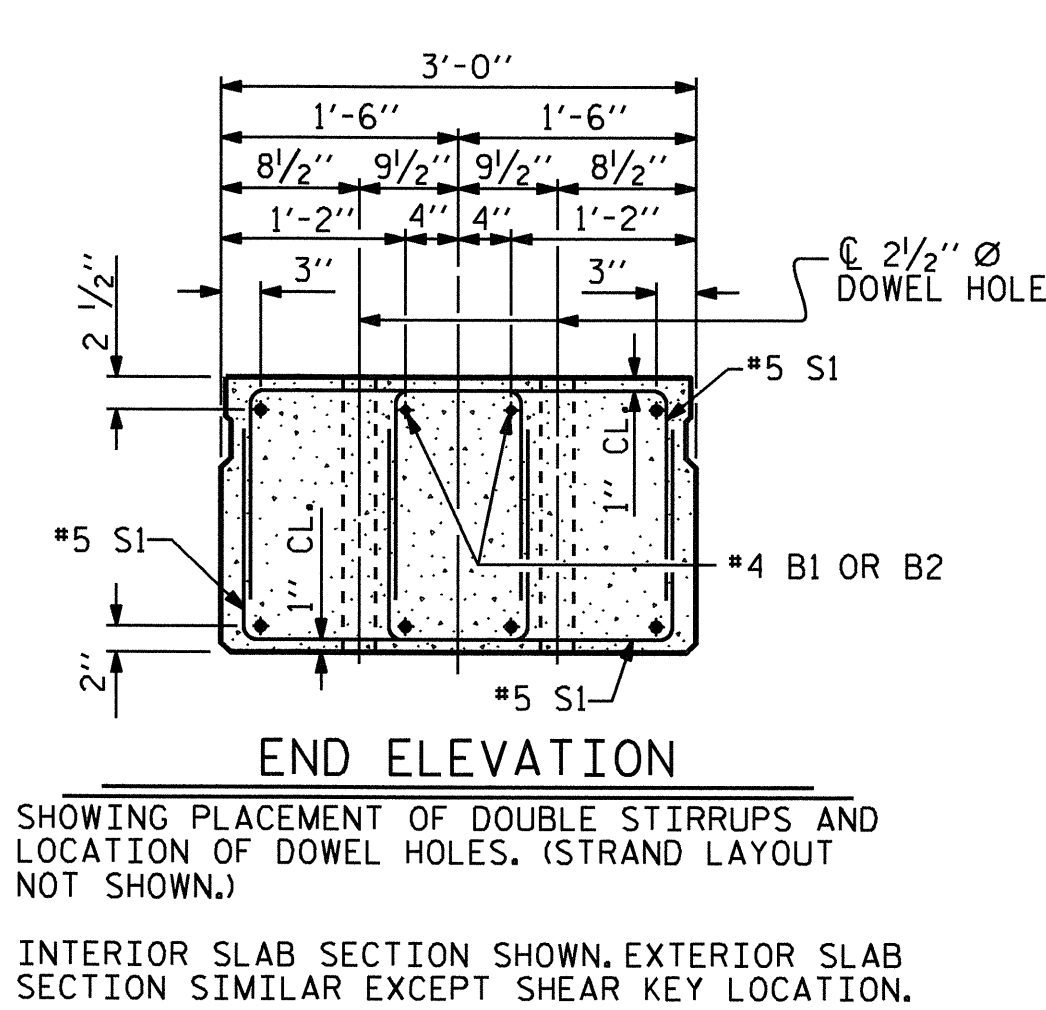
SHEAR KEY DETAIL
 NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR CORED SLABS.



SECTION AT END BENT

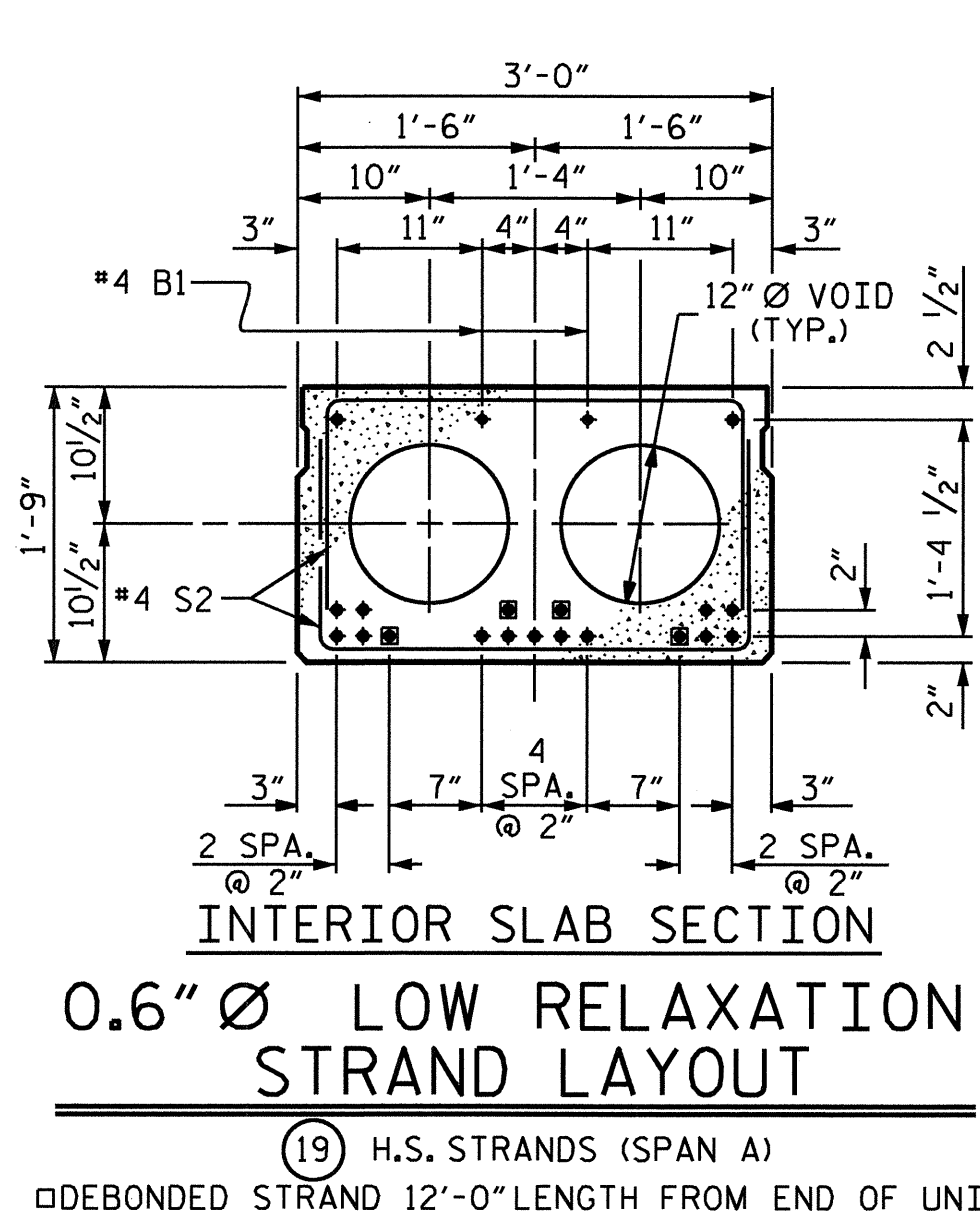


SECTION AT BENT

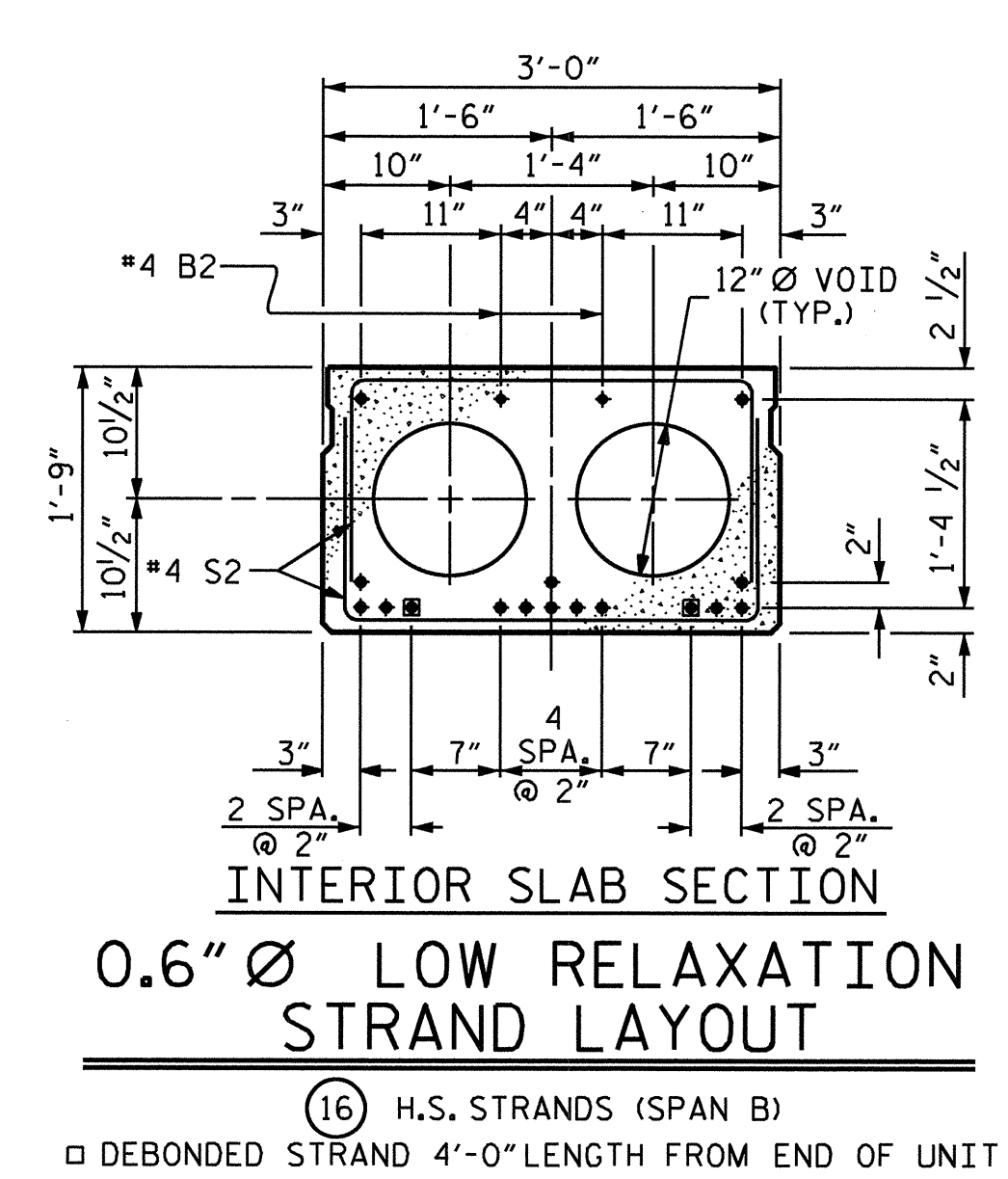


END ELEVATION

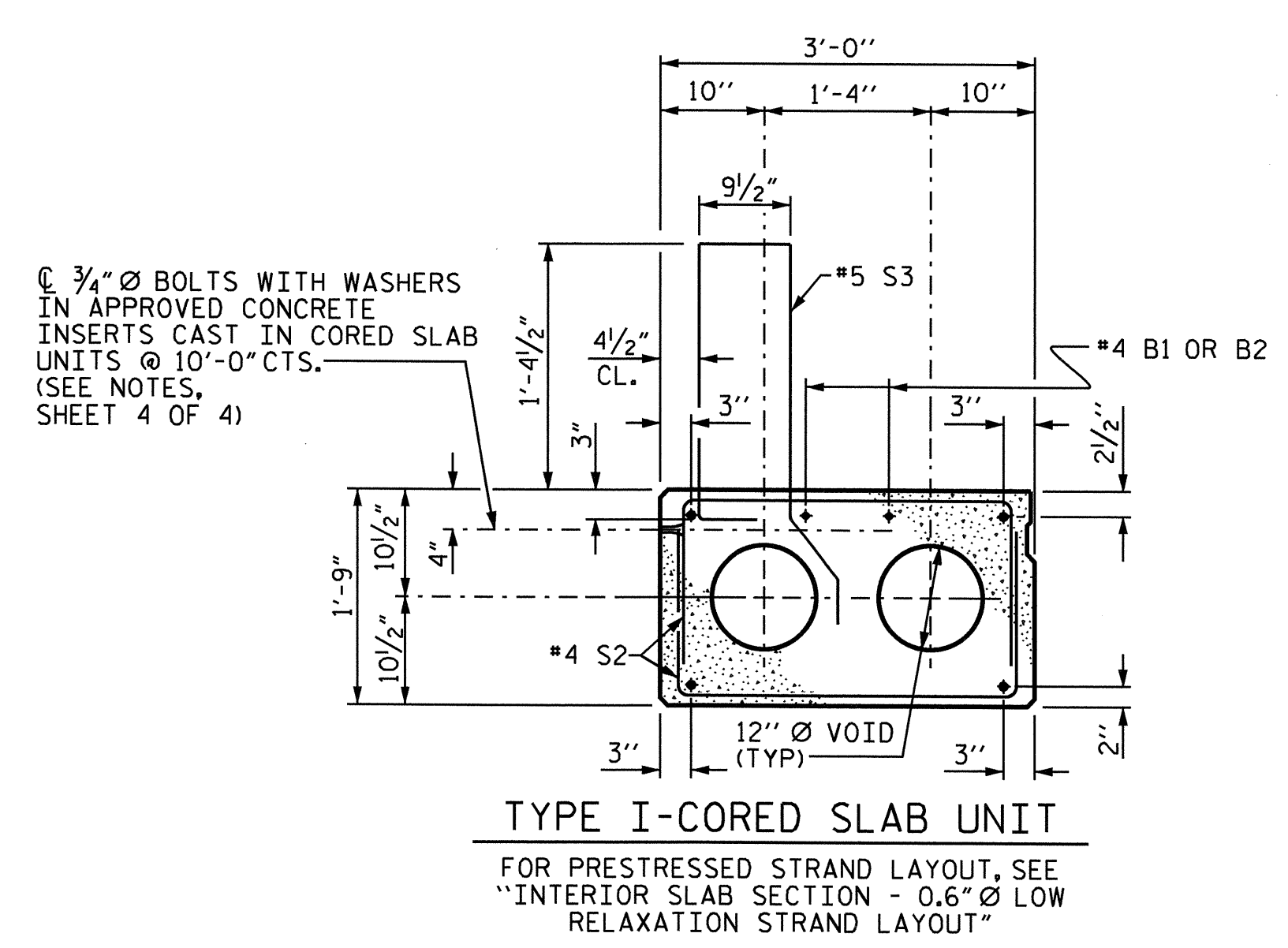
SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES. (STRAND LAYOUT NOT SHOWN.)
 INTERIOR SLAB SECTION SHOWN, EXTERIOR SLAB SECTION SIMILAR EXCEPT SHEAR KEY LOCATION.



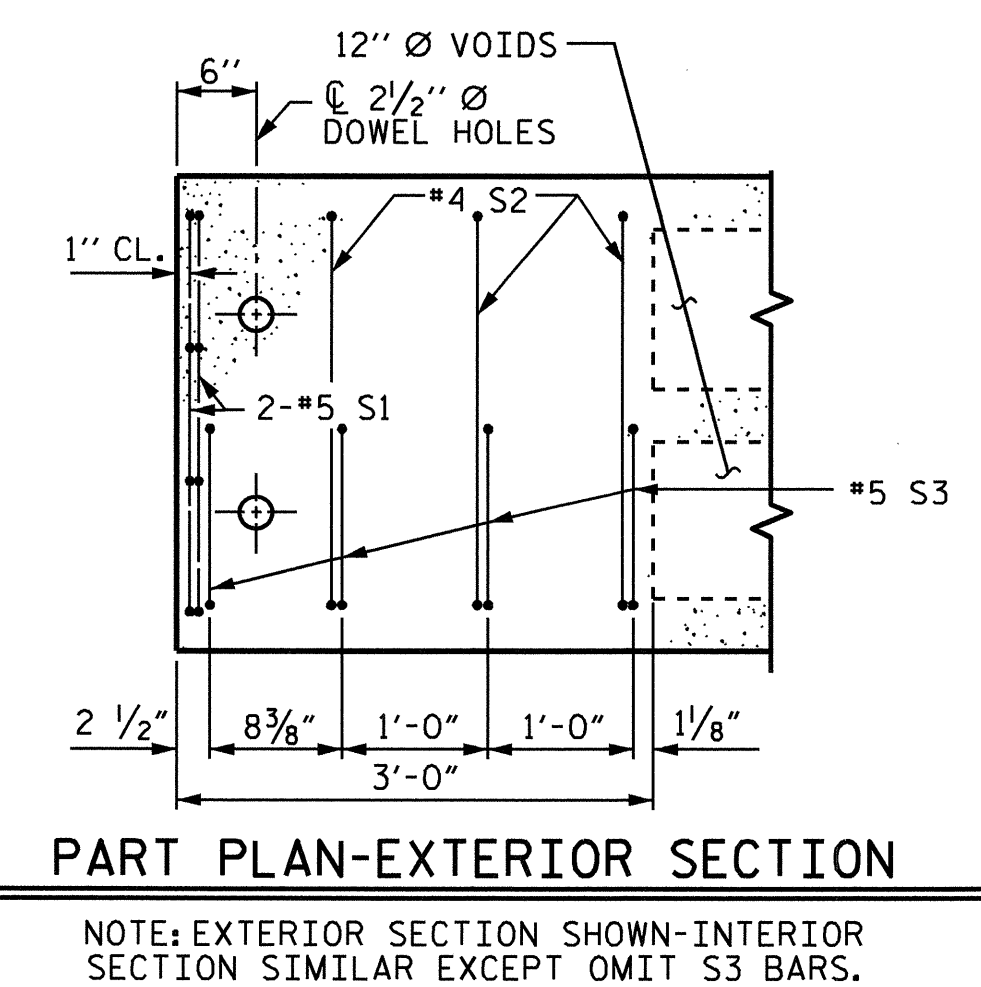
0.6" Ø LOW RELAXATION STRAND LAYOUT
 (19) H.S. STRANDS (SPAN A)
 □ DEBONDED STRAND 12"-0" LENGTH FROM END OF UNIT



0.6" Ø LOW RELAXATION STRAND LAYOUT
 (16) H.S. STRANDS (SPAN B)
 □ DEBONDED STRAND 4'-0" LENGTH FROM END OF UNIT



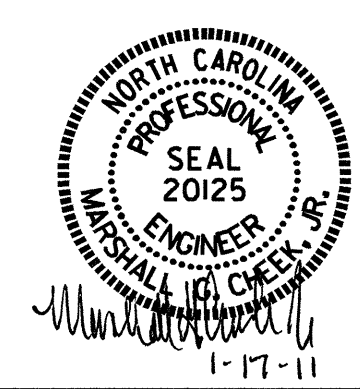
TYPE I-CORED SLAB UNIT
 FOR PRESTRESSED STRAND LAYOUT, SEE "INTERIOR SLAB SECTION - 0.6" Ø LOW RELAXATION STRAND LAYOUT"



PART PLAN-EXTERIOR SECTION
 NOTE: EXTERIOR SECTION SHOWN-INTERIOR SECTION SIMILAR EXCEPT OMIT S3 BARS.

ASSEMBLED BY : A.L. FIGUEROA DATE : 10-08-09
 CHECKED BY : V.X. NGUYEN DATE : 10-08-10
 DRAWN BY : WJH 4/89 REV. 10/17/00 RWW/LES
 CHECKED BY : FCJ 5/89 REV. 7/10/01RR RWW/LES
 REV. 5/1/06 TLA/GM

13-JAN-2011 11:54
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 DAHODGE



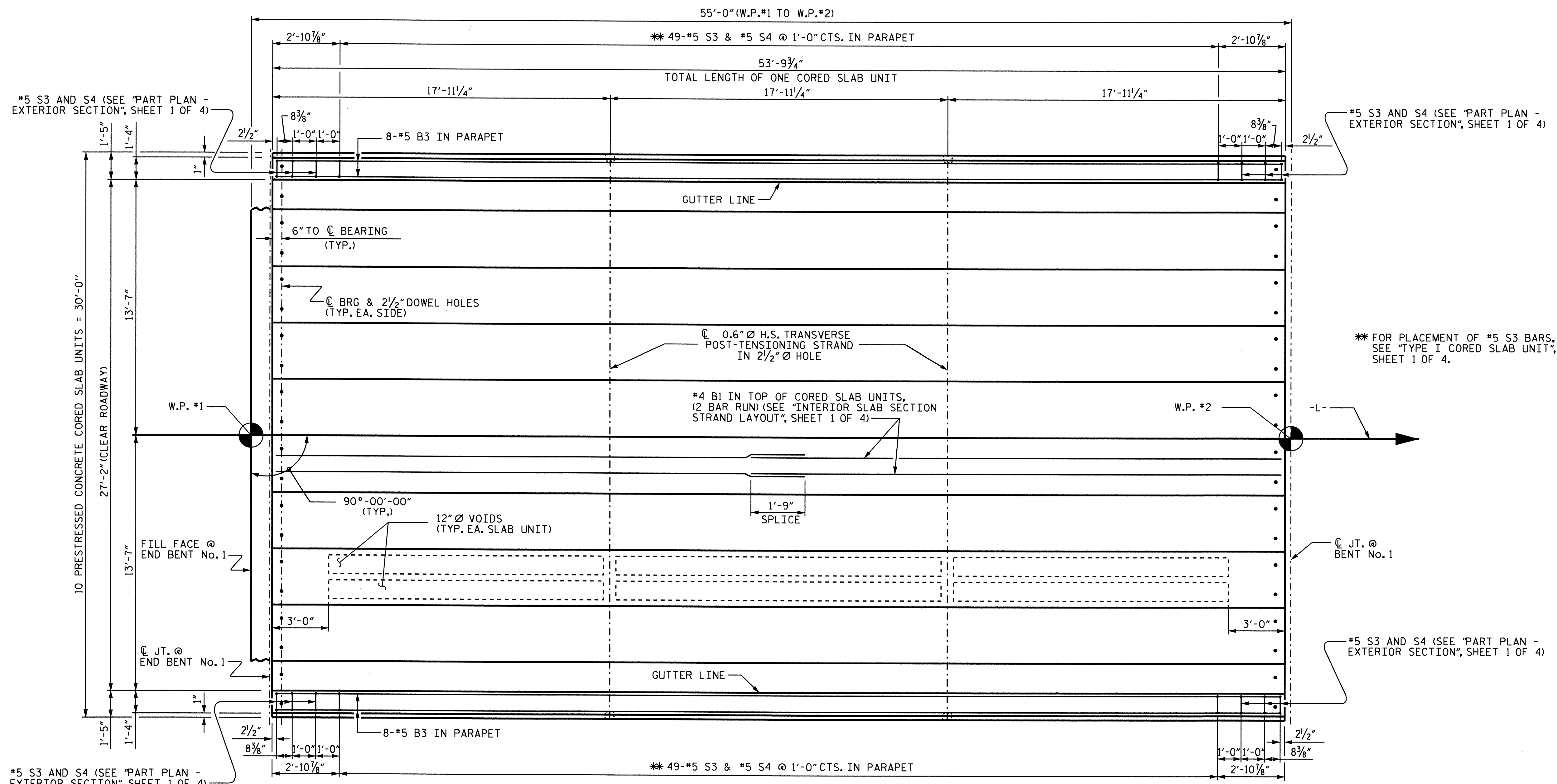
PROJECT NO. **B-4574**
MACON COUNTY
 STATION: **13+26.00 -L-**
 SHEET 1 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 3'-0" X 1'-9"
 PRESTRESSED CONCRETE
 CORED SLAB UNIT

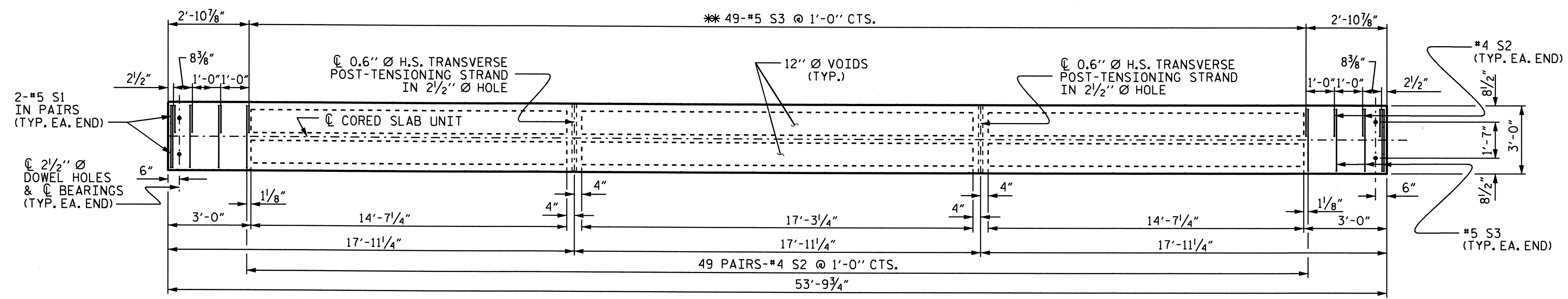
REVISIONS				SHEET NO.
NO.	BY	DATE	NO.	DATE
1			3	
2			4	

S-6
 TOTAL SHEETS 23

STD. NO. PCS2



PLAN OF SPAN A



PARTIAL PLAN OF SLAB - SPAN A
TYPE I UNIT SHOWN, TYPE II UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.

PROJECT NO. B-4574
MACON COUNTY
 STATION: 13+26.00 -L-
 SHEET 2 OF 4

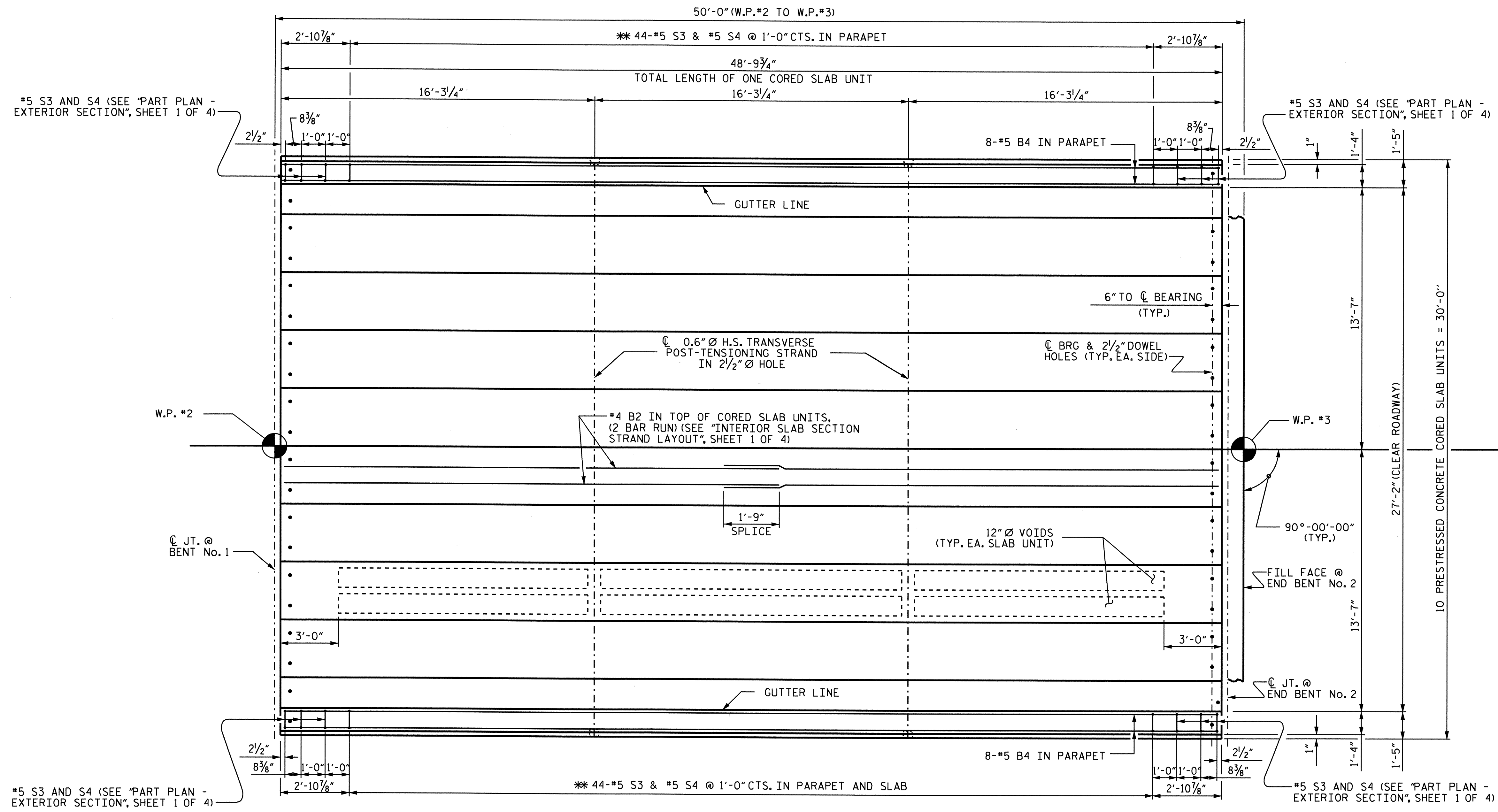
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUPERSTRUCTURE
 PLAN OF SPAN A**



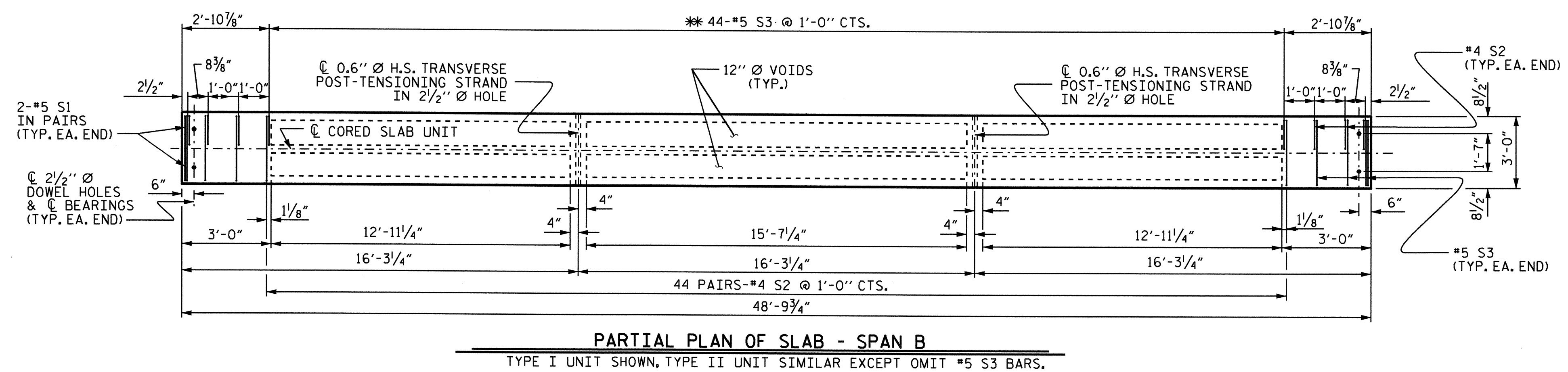
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			23

ASSEMBLED BY: A.L. FIGUEROA DATE: 10-08-09
 CHECKED BY: V.X. NGUYEN DATE: 10-08-10



* FOR PLACEMENT OF #5 S3 BARS, SEE "TYPE I CORED SLAB UNIT", SHEET 1 OF 4.

PLAN OF SPAN B



PARTIAL PLAN OF SLAB - SPAN B
TYPE I UNIT SHOWN, TYPE II UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.

PROJECT NO. B-4574
MACON COUNTY
 STATION: 13+26.00 -L-
 SHEET 3 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-8
SUPERSTRUCTURE SPAN OF B						TOTAL SHEETS 23
REVISIONS						SHEET NO. S-8 TOTAL SHEETS 23
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			



ASSEMBLED BY: A.L. FIGUEROA DATE: 10-08-09
 CHECKED BY: V.X. NGUYEN DATE: 10-08-10

NOTES

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

ALL REINFORCING STEEL CAST WITH THE CORED SLAB SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE LUMP SUM PRICE FOR PRESTRESSED CONCRETE CORED SLABS.

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

THE 2 1/2" Ø DOWEL HOLES AT FIXED ENDS OF SLAB SECTIONS SHALL BE FILLED WITH NON-SHRINK GROUT.

THE 2" Ø BACKER ROD SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.

WHEN CORED SLABS ARE CAST, A POSITIVE HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDEWAYS. THIS SYSTEM SHALL BE DESIGNED TO BE LEFT IN PLACE UNTIL THE CONCRETE HAS REACHED RELEASE STRENGTH. AT LEAST THREE WEEKS PRIOR TO CASTING CORED SLABS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. IN ADDITION TO STRUCTURAL DETAILS, LOCATION AND SPACING OF THE HOLD-DOWNS SHALL BE INDICATED.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE CORED SLAB UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4300 PSI.

ALL REINFORCING STEEL IN PARAPETS SHALL BE EPOXY COATED.

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE CORED SLAB UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

TRANSVERSE POST-TENSIONING OF THE CORED SLAB UNITS SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS, EXCEPT THAT THE STRANDS SHALL BE 0.6" Ø AND TENSIONED TO 43,950 POUNDS.

CONCRETE INSERTS SHALL HAVE A MINIMUM WORKING LOAD SHEAR CAPACITY OF 2.5 KIPS.

THE 3/4" Ø BOLTS, WASHERS AND CONCRETE INSERTS SHALL BE GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

THE BOLTS, WASHERS AND CONCRETE INSERTS ARE PROVIDED AS AN OPTION FOR THE CONTRACTOR TO ATTACH MATERIALS TO PREVENT DEBRIS FROM DROPPING INTO THE WATER DURING CONSTRUCTION OF THE VERTICAL CONCRETE BARRIER RAILS.

UPON COMPLETION OF THE BRIDGE CONSTRUCTION, THE 3/4" Ø BOLTS, AND WASHERS SHALL BE REMOVED AND THE CONCRETE INSERTS SHALL BE GROUTED.

THE COST OF THE 3/4" Ø BOLTS, WASHERS AND INSERTS SHALL BE INCLUDED IN THE PRICE BID FOR PRESTRESSED CONCRETE CORED SLABS.

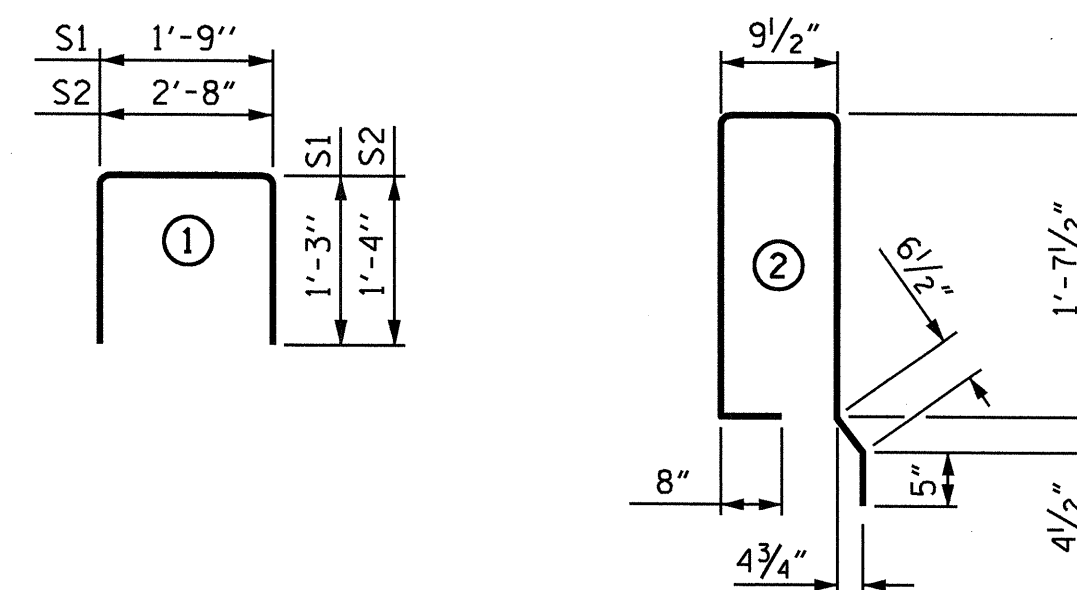
BILL OF MATERIAL FOR ONE CORED SLAB UNIT - SPAN A

BAR	NUMBER	SIZE	TYPE	TYPE I		TYPE II	
				LENGTH	WEIGHT	LENGTH	WEIGHT
B1	4	# 4	STR	27'-8"	74	27'-8"	74
S1	8	# 5	1	4'-3"	35	4'-3"	35
S2	106	# 4	1	5'-4"	378	5'-4"	378
* S3	55	# 5	2	5'-8"	325		
REINFORCING STEEL				LBS.	487		487
* EPOXY COATED REINFORCING STEEL				LBS.	325		
5,900 P.S.I. CONC.				CU. YDS.	7.8		7.8
0.6" Ø L.R. STRANDS				No.	19		19

BILL OF MATERIAL FOR ONE CORED SLAB UNIT - SPAN B

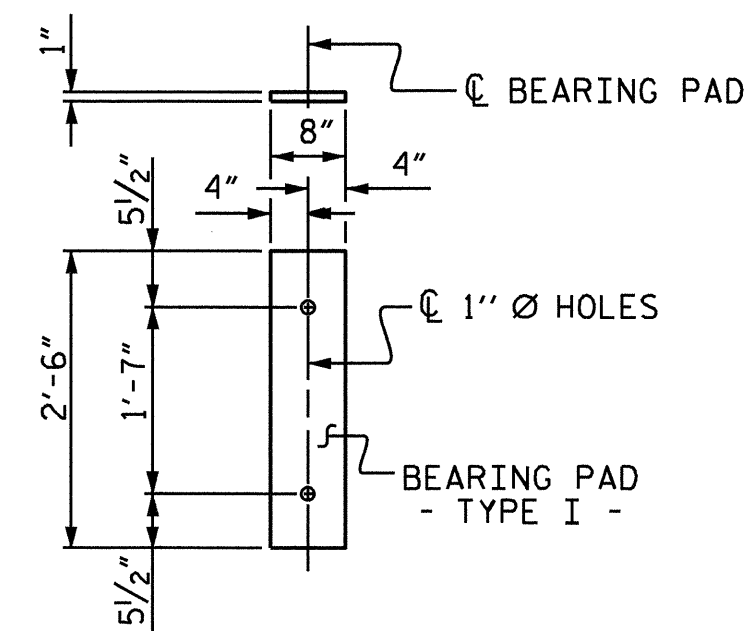
BAR	NUMBER	SIZE	TYPE	TYPE I		TYPE II	
				LENGTH	WEIGHT	LENGTH	WEIGHT
B2	4	# 4	STR	25'-2"	67	25'-2"	67
S1	8	# 5	1	4'-3"	35	4'-3"	35
S2	96	# 4	1	5'-4"	342	5'-4"	342
* S3	50	# 5	2	5'-8"	296		
REINFORCING STEEL				LBS.	444		444
* EPOXY COATED REINFORCING STEEL				LBS.	296		
5,900 P.S.I. CONC.				CU. YDS.	7.1		7.1
0.6" Ø L.R. STRANDS				No.	16		16

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT
* THESE BARS ARE EPOXY COATED

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



FIXED END
(TYPE I-40 REQ'D.)
ELASTOMERIC BEARING DETAILS

DEAD LOAD DEFLECTION AND CAMBER	
SPAN A	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	2 1/16" †
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	1/2" †
FINAL CAMBER	2 3/16" †
SPAN B	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	1 7/8" †
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	3/8" †
FINAL CAMBER	1 1/2" †

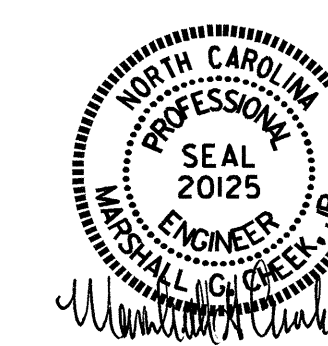
** INCLUDES FUTURE WEARING SURFACE

CORED SLABS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
SPAN A	TYPE I	2	53'-9 3/4"
	TYPE II	8	53'-9 3/4"
SPAN B	TYPE I	2	48'-9 3/4"
	TYPE II	8	48'-9 3/4"
TOTAL	20		1026'-3"

PROJECT NO. B-4574
MACON COUNTY
STATION: 13+26.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
3'-0" X 1'-9"
PRESTRESSED CONCRETE
CORED SLAB UNIT



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			23

ASSEMBLED BY: A.L. FIGUEROA DATE: 10-08-09
CHECKED BY: V.X. NGUYEN DATE: 10-08-10

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

ALUMINUM FOR POSTS, BASES, RAILS, EXPANSION BARS, CLAMP BARS, RIVETS, CAPS, SHIMS, ATTACHMENT BRACKETS AND HOLD-DOWN PLATES SHALL BE ANODIZED BROWN.

ANY DAMAGE TO THE ANODIZED SURFACE OF THE RAIL OR COMPONENTS DURING CONSTRUCTION SHALL BE REPAIRED ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS AT THE DIRECTION OF THE ENGINEER AND AT THE CONTRACTOR'S EXPENSE.

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

GENERAL NOTES

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

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

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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.

FOR LENGTH OF METAL RAILS TO BE PAID FOR, SEE THE STANDARDS SPECIFICATIONS.

FOR 2 BAR ANODIZED RAIL, SEE SPECIAL PROVISIONS.

2 BAR ANODIZED RAIL LENGTH = 190.50 LIN. FT.

PROJECT NO. B-4574
MACON COUNTY
 STATION: 13+26.00 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 2 BAR ANODIZED RAIL

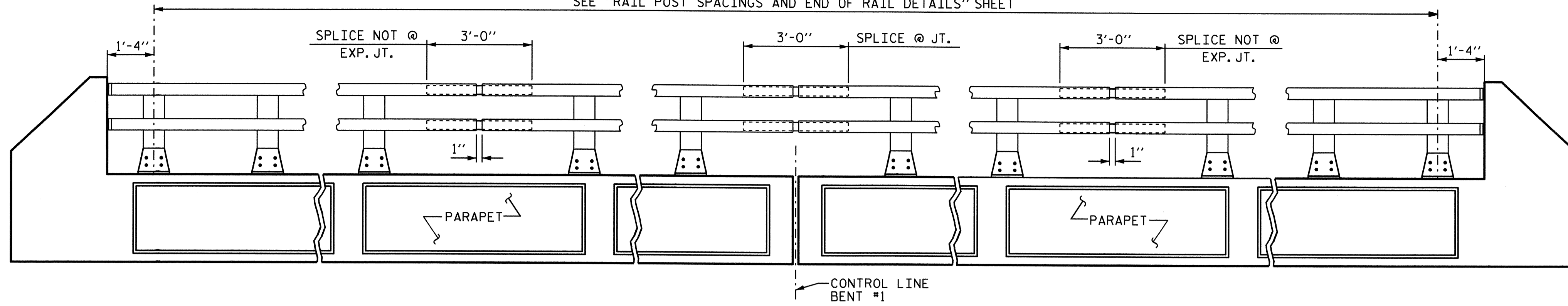


REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	

TOTAL SHEETS 23

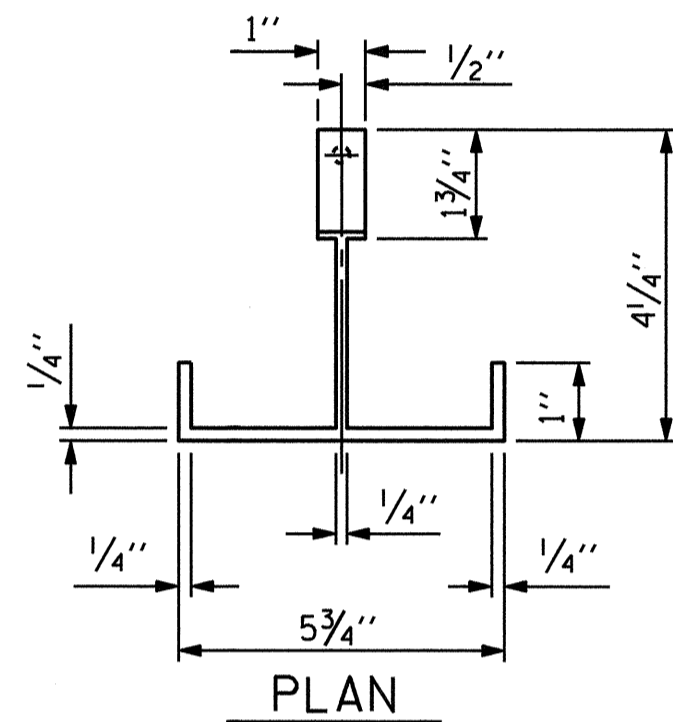
STD. NO. BMR3

SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEET



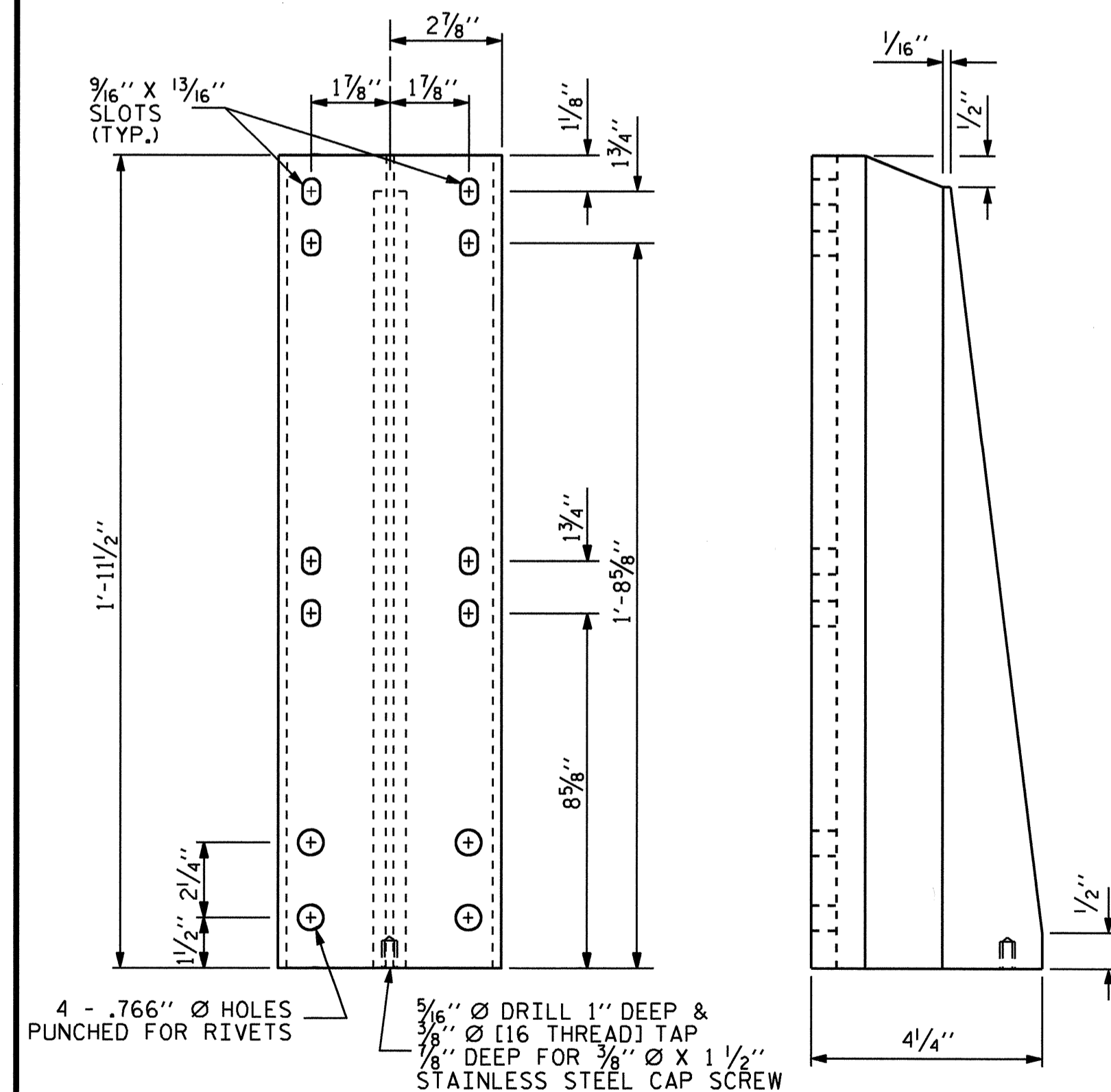
ELEVATION

NOTE: FOR ATTACHMENT OF METAL RAIL TO END POST, SEE SHEET S-12. FOR RECESSED PANELS, SEE "1'-4\" x 2'-7 3/4\" CONCRETE PARAPET" SHEET S-13.



PLAN

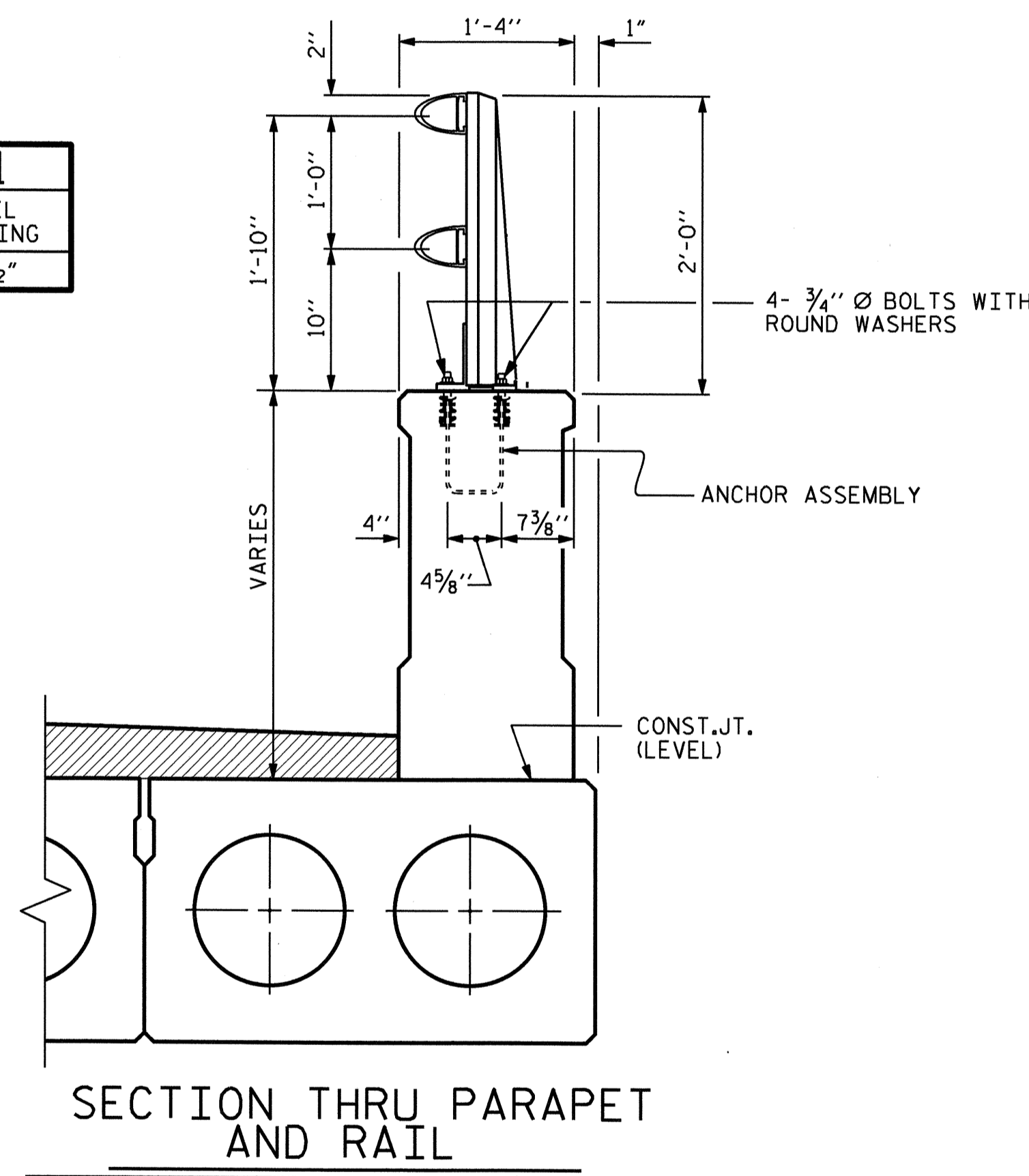
CL JT. @	RAIL OPENING
BENT No. 1	1 1/2"



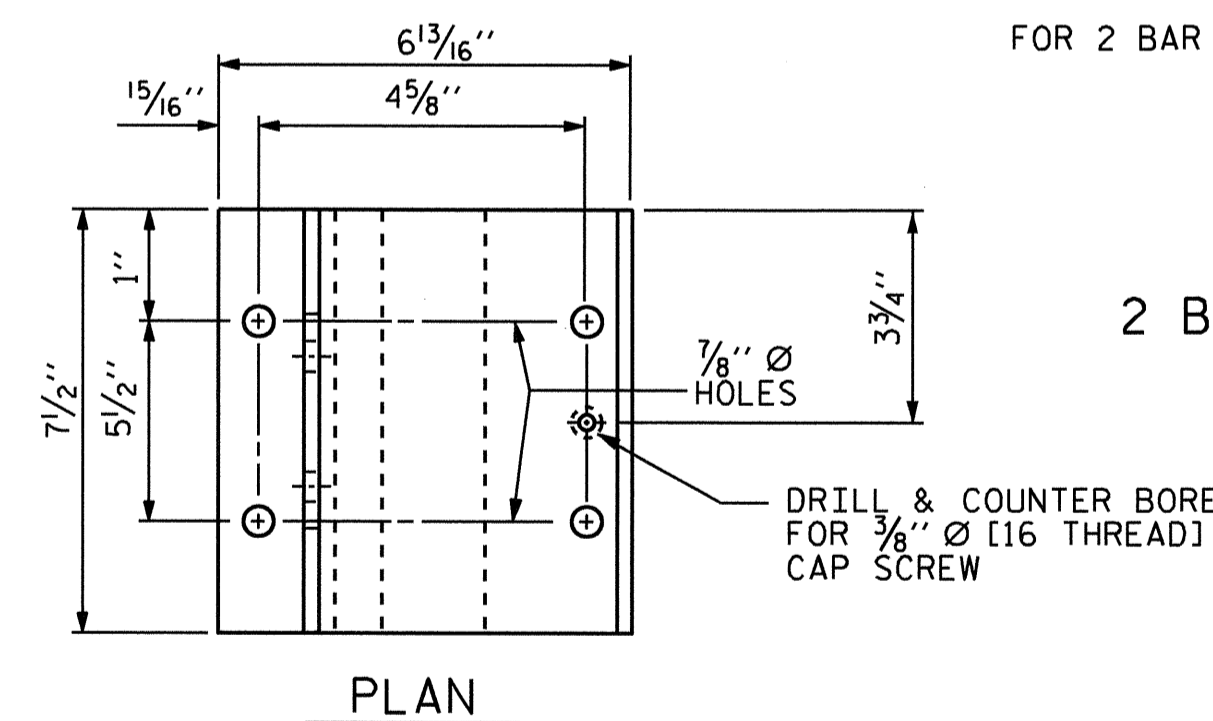
FRONT ELEVATION

SIDE ELEVATION

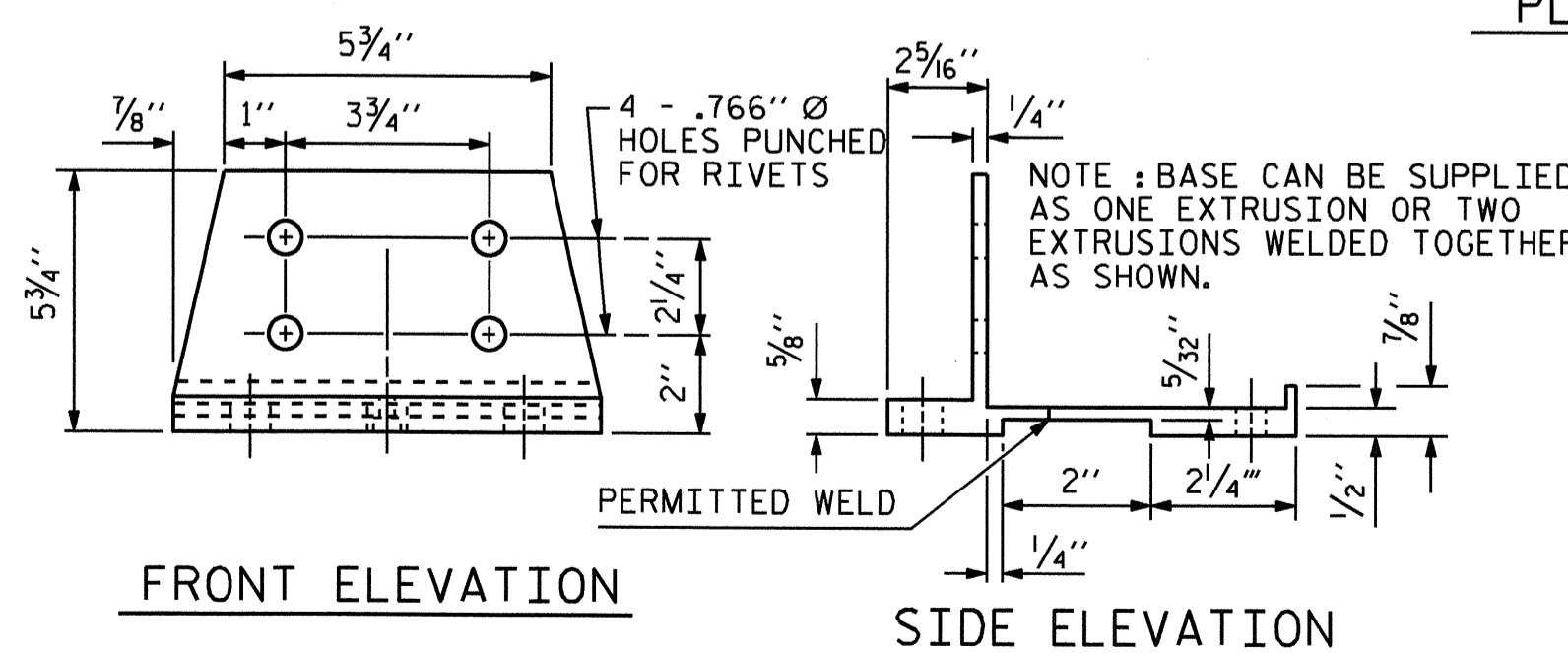
DETAILS OF POST



SECTION THRU PARAPET AND RAIL



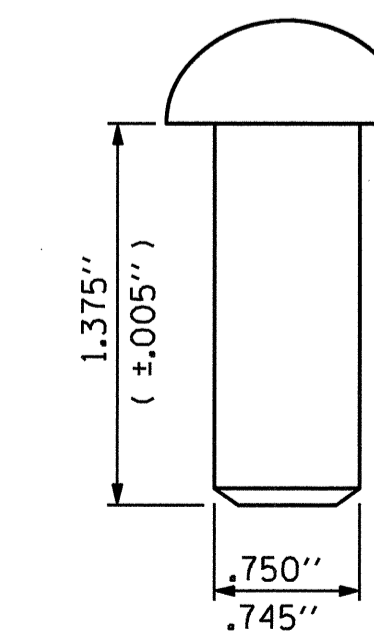
PLAN



FRONT ELEVATION

SIDE ELEVATION

POST BASE DETAILS



RIVET DETAIL

ASSEMBLED BY: A.L. FIGUEROA DATE: 10-08-09
 CHECKED BY: V.X. NGUYEN DATE: 10-08-10
 DRAWN BY: EEM 6/94 REV. 10/17/00 RWW/LJS
 CHECKED BY: RGW 6/94 REV. 5/7/03R RWW/JTE
 REV. 5/1/06 TLA/GM

13-JAN-2011 11:56
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 DAHODGE

NOTES

STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.

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.

WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

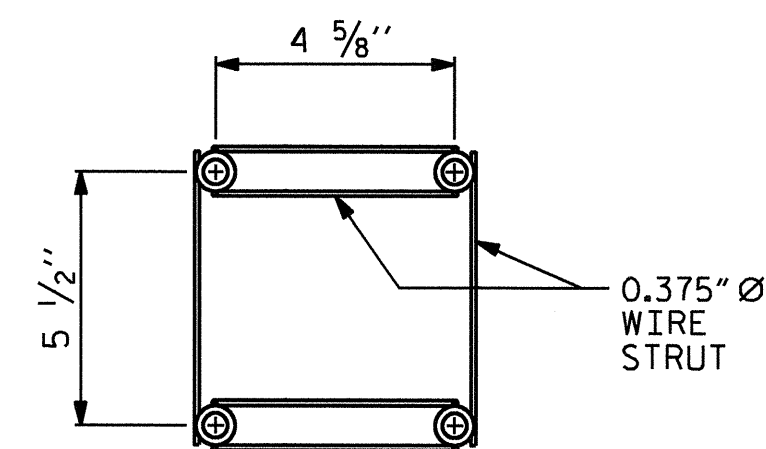
THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.

THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.

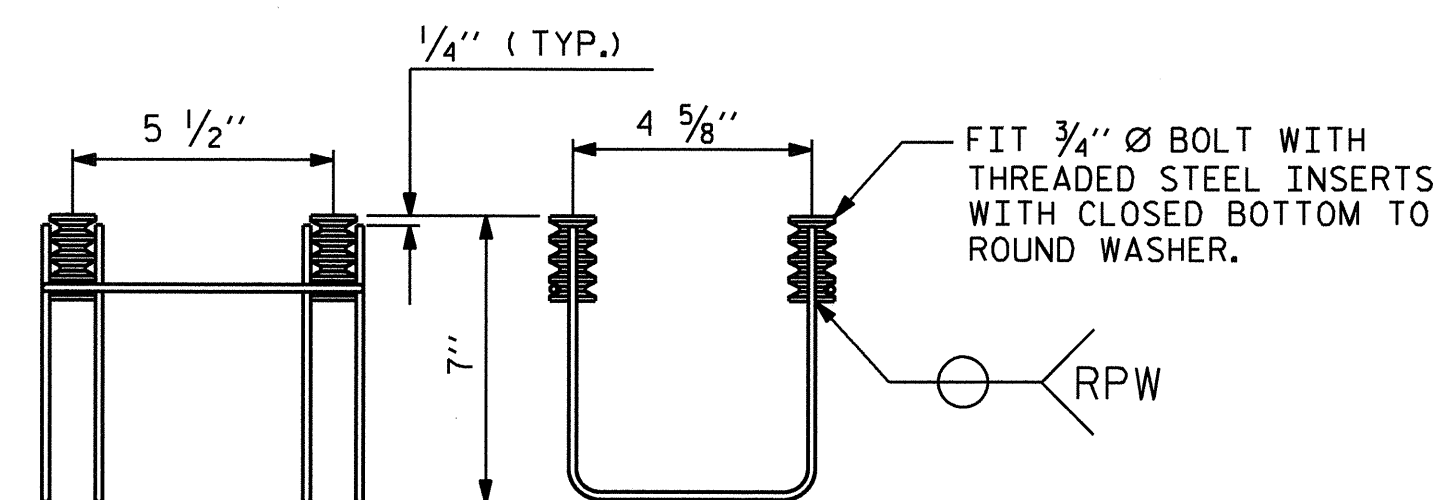
BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

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



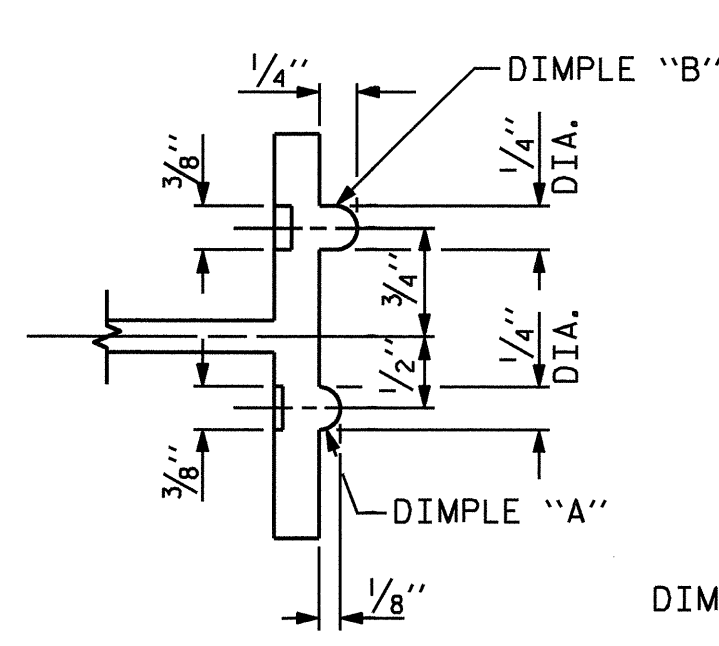
SIDE VIEW

ELEVATION

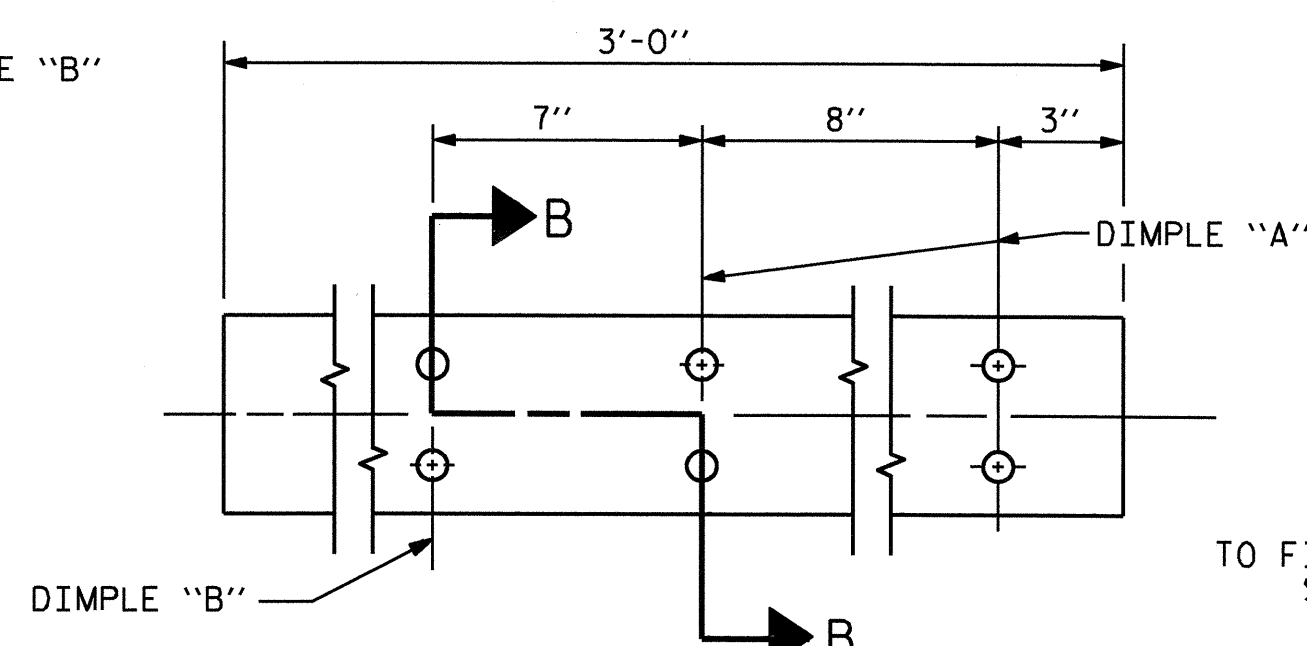
MINIMUM LENGTH OF THREADS IN INSERT (FERRULE) : 1 3/4"

4-BOLT METAL RAIL ANCHOR ASSEMBLY

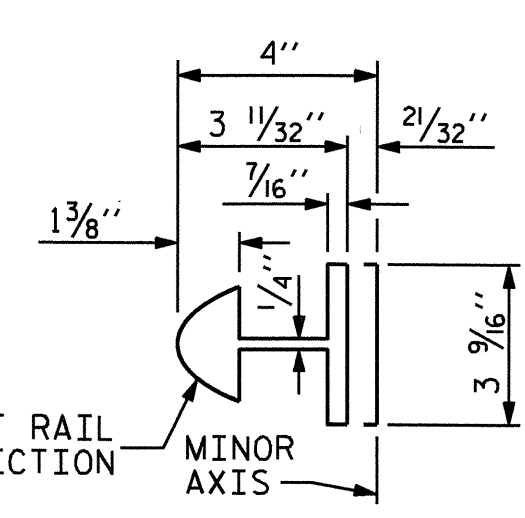
(32 ASSEMBLIES REQUIRED)



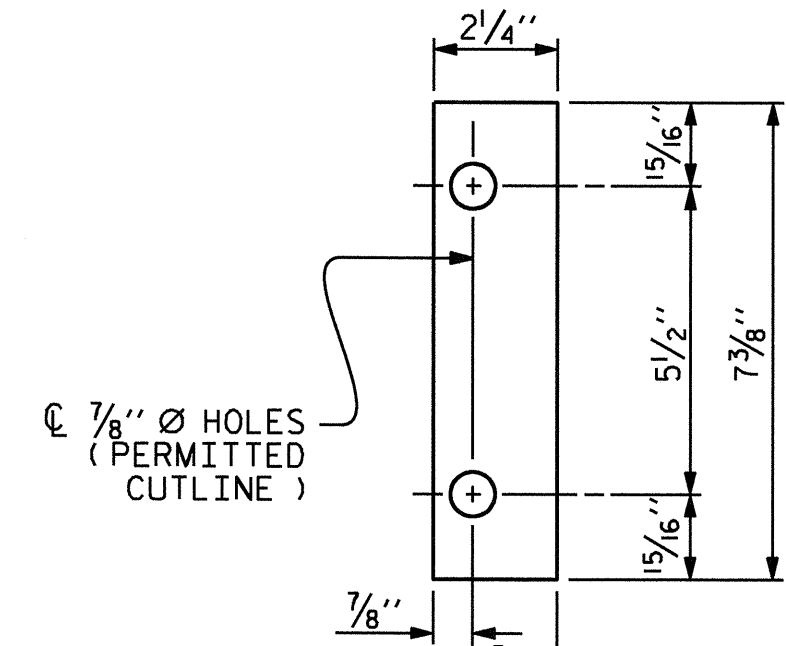
SECTION B - B



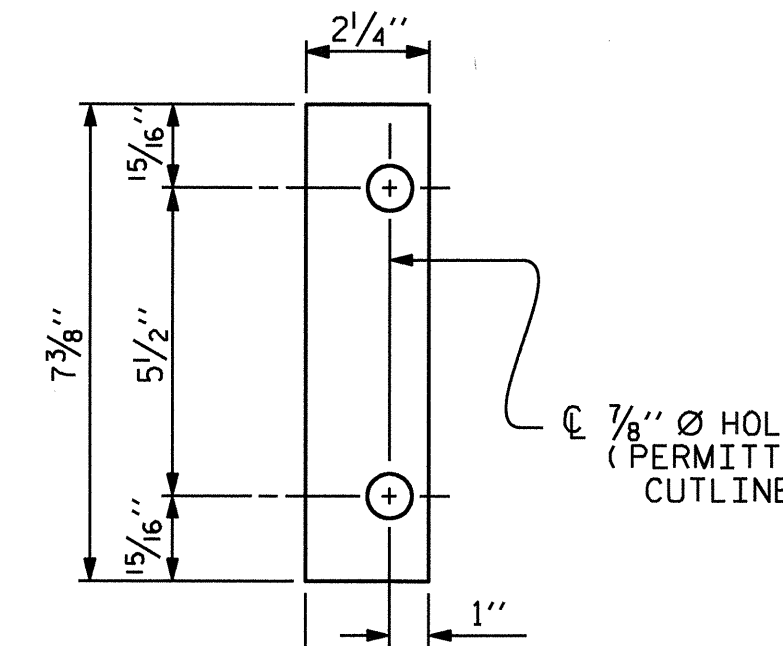
EXPANSION BAR DETAILS



BAR SECTION



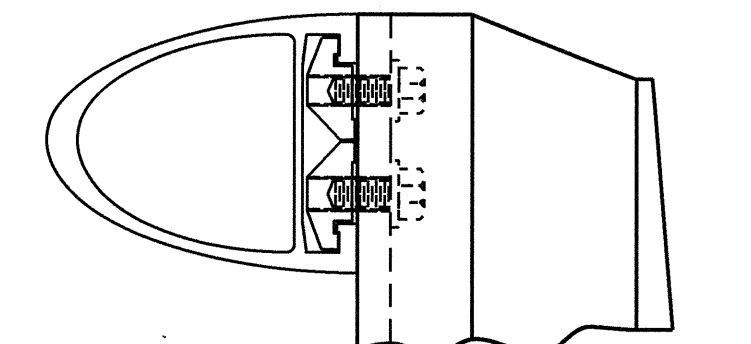
FRONT PLATE



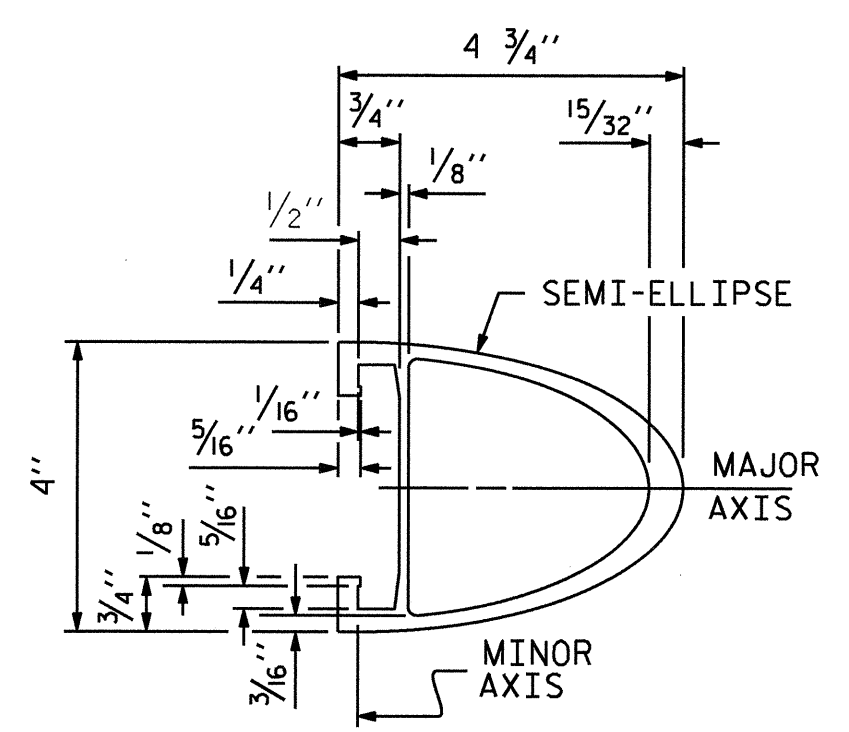
REAR PLATE

SHIM DETAILS

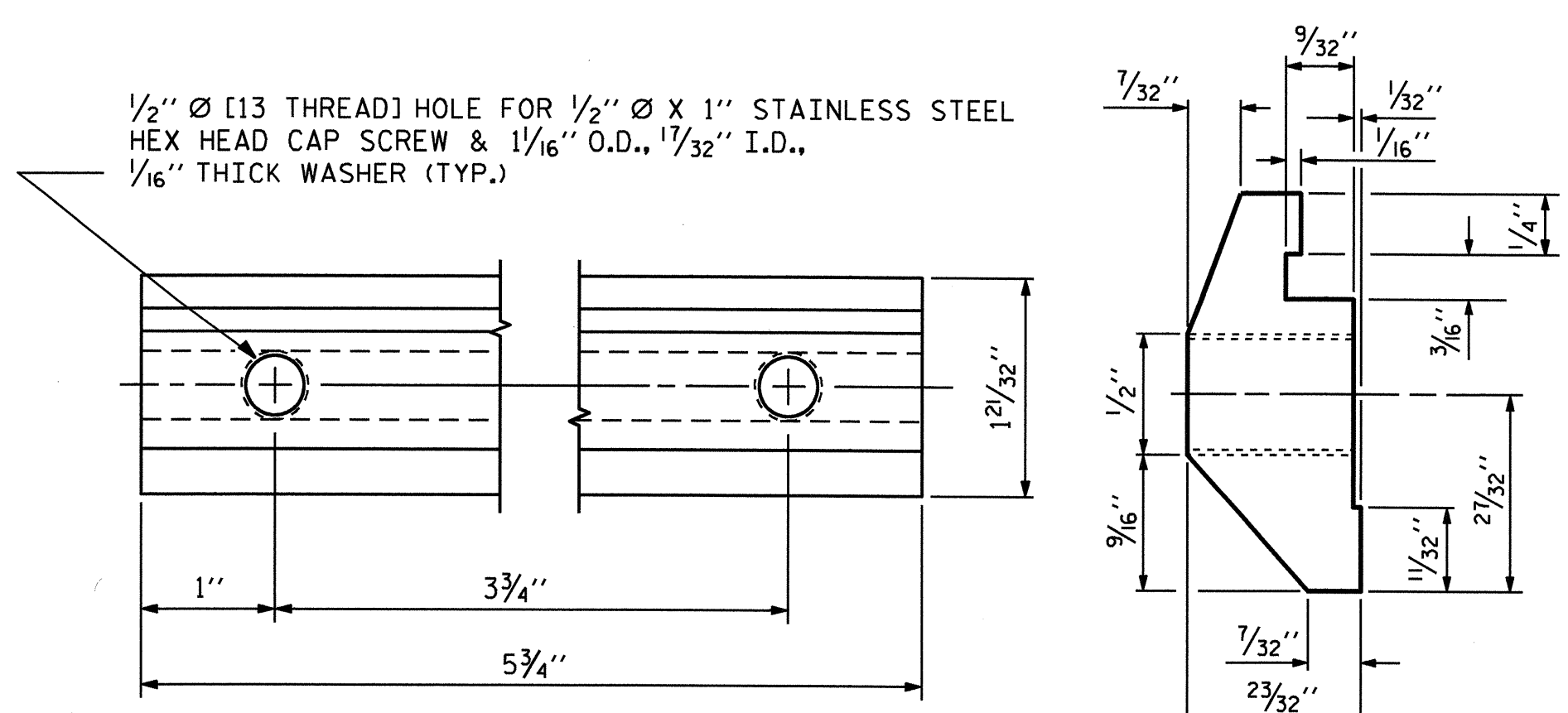
NOTE : SHIMS MAY BE CUT ALONG PERMITTED CUTLINE OR SLOTTED TO EDGE OF PLATE TO FACILITATE PLACEMENT.



CLAMP ASSEMBLY

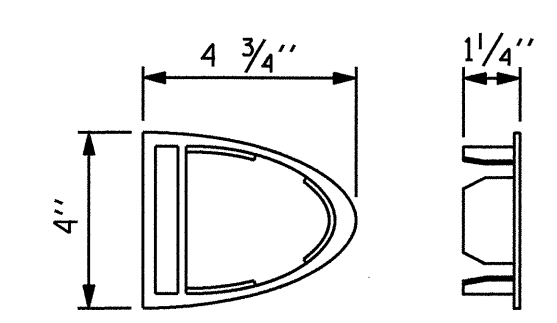


RAIL SECTION



CLAMP BAR DETAIL

(4 REQUIRED PER POST)



RAIL CAP

ASSEMBLED BY : A.L. FIGUEROA	DATE : 10-08-09
CHECKED BY : V.X. NGUYEN	DATE : 10-08-10
DRAWN BY : EEM 6/94	REV. 2/6/97 EEM/RGW
CHECKED BY : RGW 6/94	REV. 8/16/99 MAB/LES
	REV. 5/1/06R KMM/GM

06-DEC-2010 10:37
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WJHARRIS



PROJECT NO. B-4574
MACON COUNTY
STATION: 13+26.00 -L-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
2 BAR ANODIZED RAIL					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-11
					TOTAL SHEETS 23

STD. NO. BMR4

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:

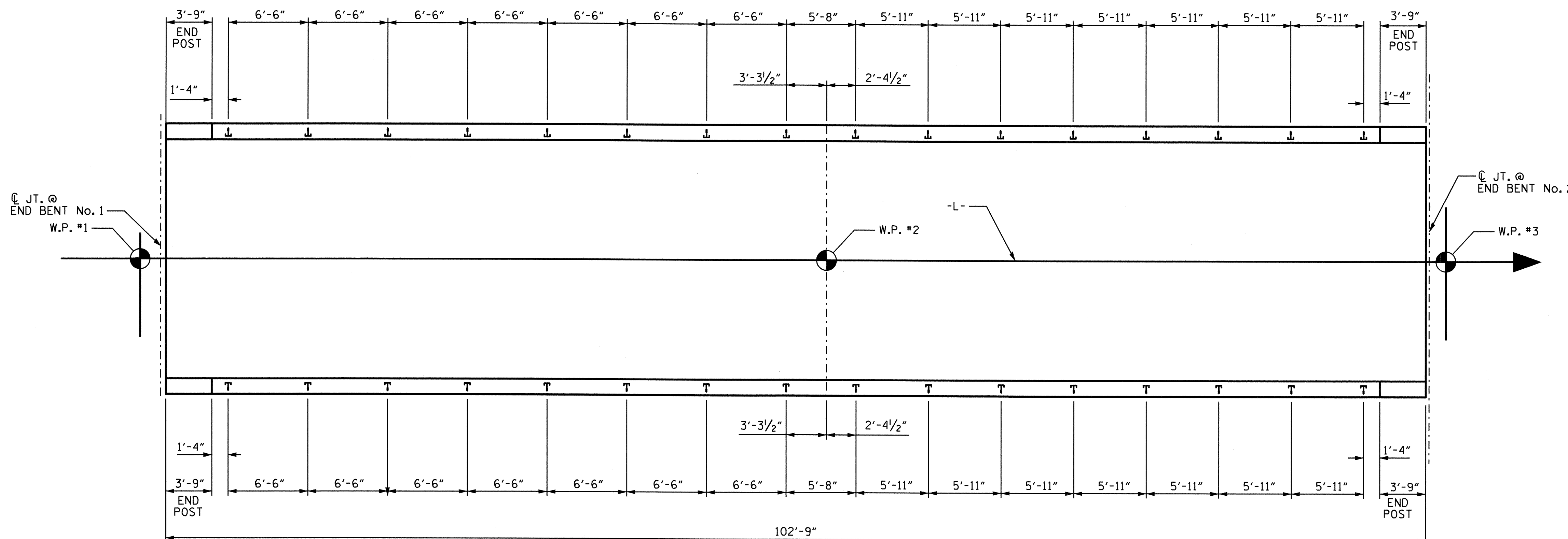
- A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
- B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 5/8" BOLT SHALL HAVE 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.

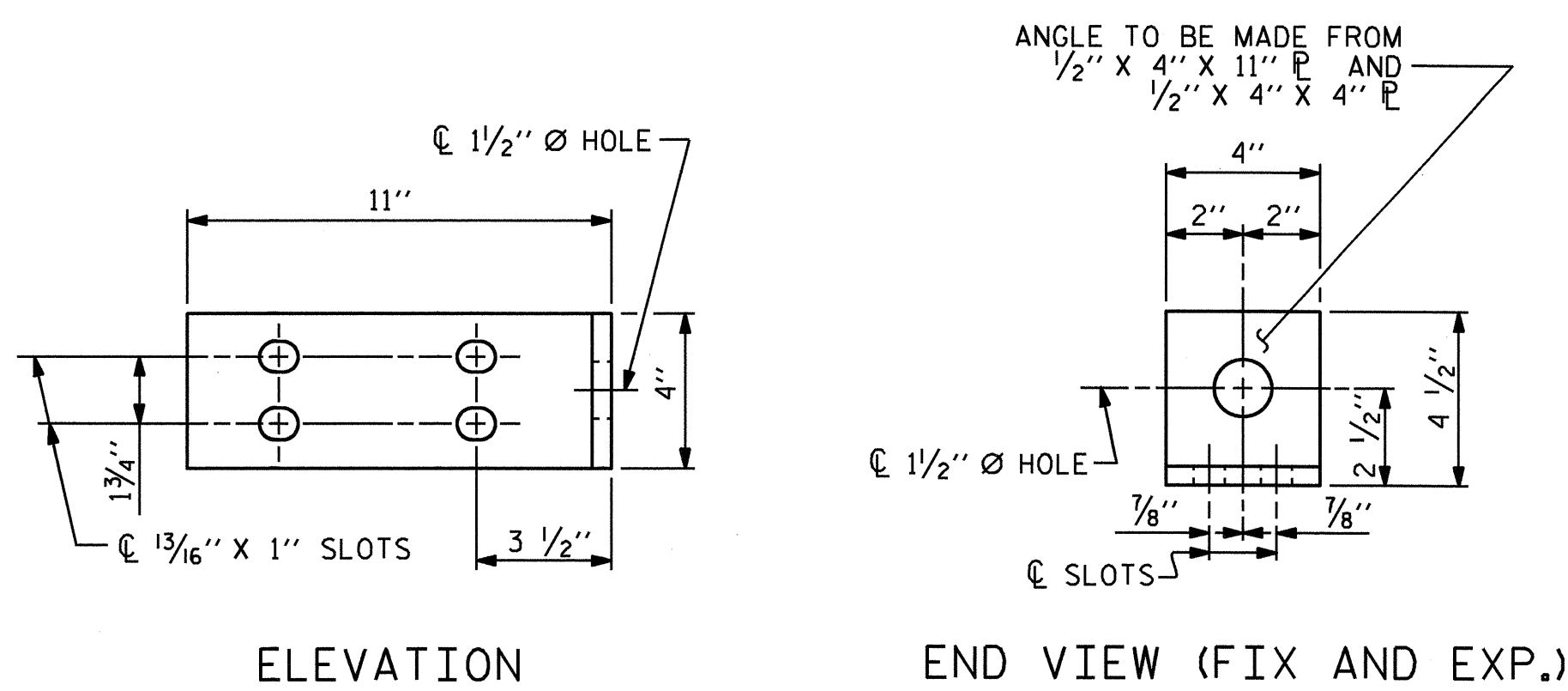
THE 3/4" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

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.

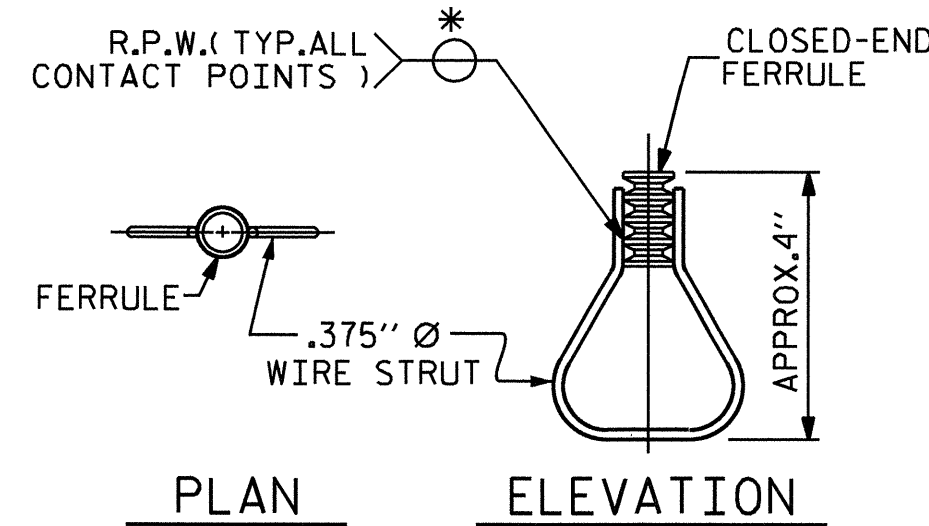


PLAN OF RAIL POST SPACINGS



ELEVATION

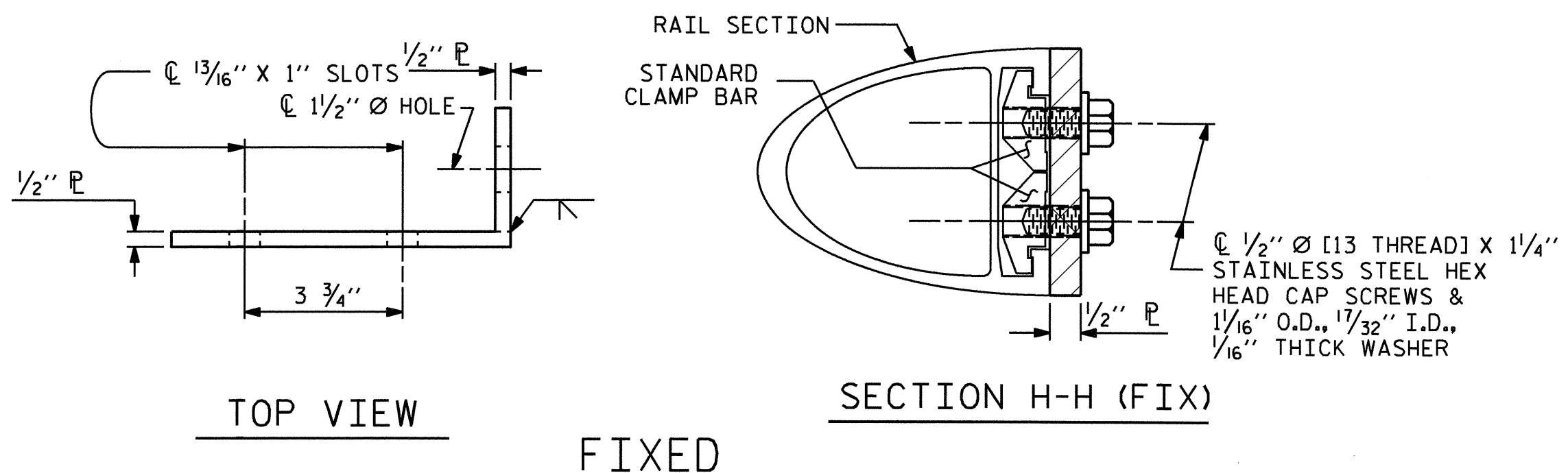
END VIEW (FIX AND EXP.)



PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

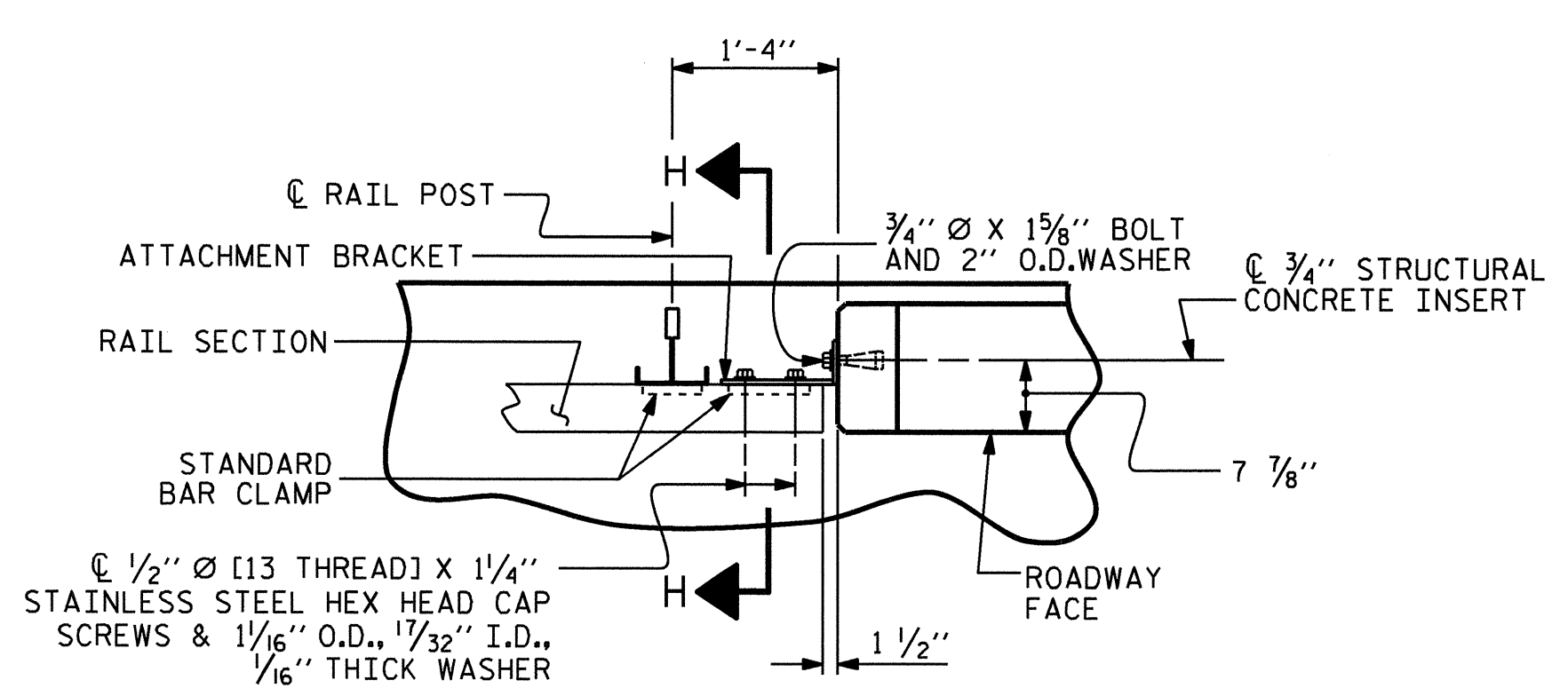
* EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.



TOP VIEW

SECTION H-H (FIX)

FIXED

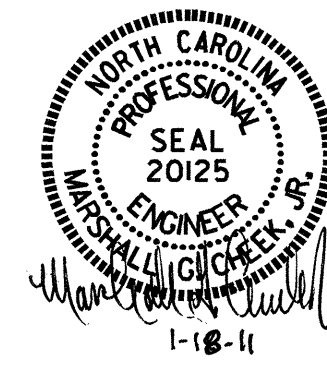


PLAN - RAIL AND END POST

DETAILS FOR ATTACHING METAL RAIL TO END POST

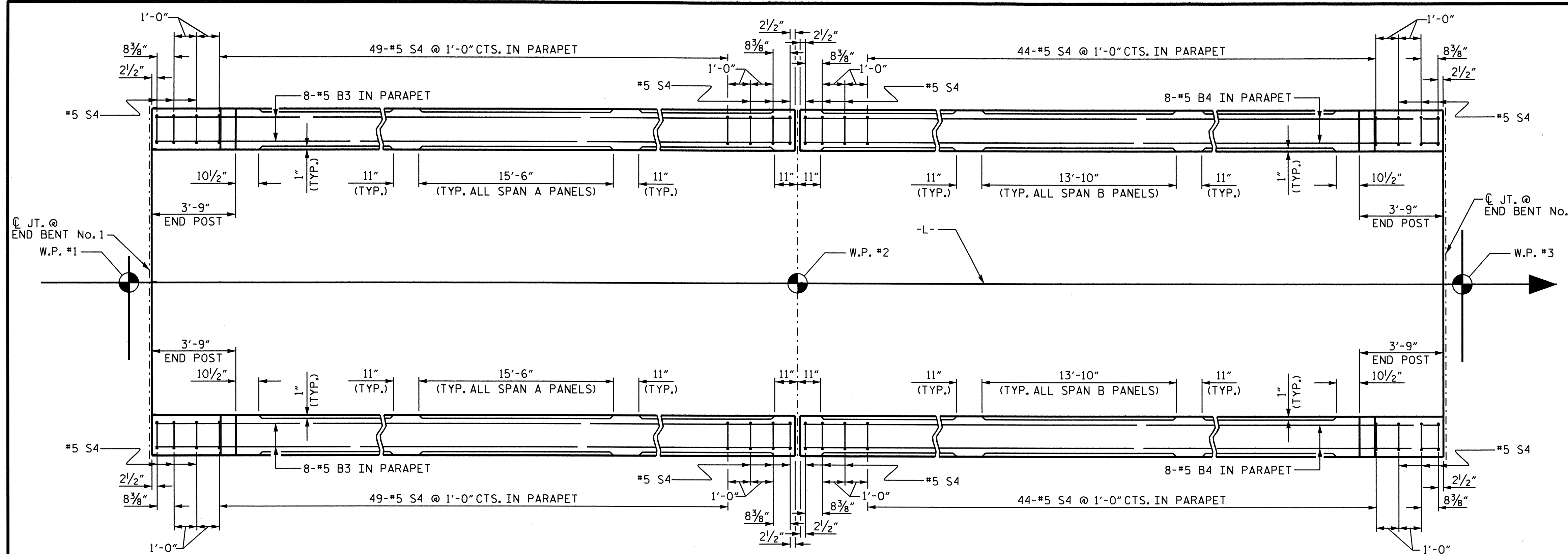
PROJECT NO. B-4574
 MACON COUNTY
 STATION: 13+26.00 -L-

STATE OF NORTH CAROLINA					
DEPARTMENT OF TRANSPORTATION					
RALEIGH					
STANDARD					
RAIL POST SPACINGS					
AND					
END OF RAIL DETAILS					
FOR TWO BAR METAL RAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
				SHEET NO.	5-12
				TOTAL SHEETS	23

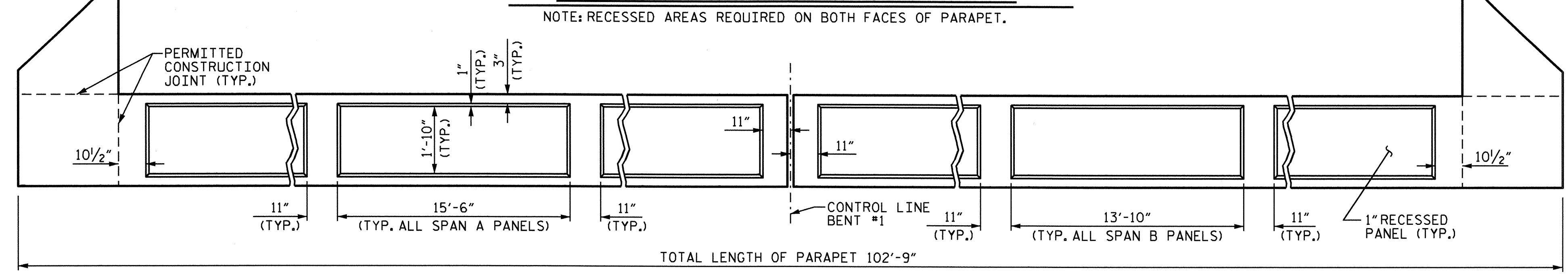


ASSEMBLED BY: A.L. FIGUEROA DATE: 10-08-09
 CHECKED BY: V.X. NGUYEN DATE: 10-08-10
 DRAWN BY: FCJ 1/88
 CHECKED BY: CRK 3/89

REV. 10/17/00 LES/RDR
 REV. 5/7/03 RWW/JTE
 REV. 5/1/06 TLA/GM



PLAN OF PARAPET



ELEVATION OF PARAPET

BILL OF MATERIAL FOR PARAPET AND END POSTS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR TYPE
*B3	16	#5	STR	53'-5"	891	
*B4	16	#5	STR	48'-5"	808	
*E1	8	#7	STR	2'-8"	44	
*E2	8	#7	STR	3'-3"	53	
*E3	8	#7	STR	3'-9"	61	
*E4	8	#7	STR	4'-3"	69	
*E5	8	#7	STR	4'-9"	78	
*F1	8	#6	STR	2'-0"	24	
*F2	8	#6	STR	3'-3"	39	
*F3	8	#6	STR	3'-9"	45	
*S4	210	#5	3	5'-7"	1223	
* EPOXY COATED REINFORCING STEEL				3335	LBS.	
CLASS "AA" CONCRETE				29.3	C.Y.	
1'-4" X 2'-7 3/4" CONCRETE PARAPET				205.50	L.F.	

ALL BAR DIMENSIONS ARE OUT TO OUT

* THESE BARS ARE EPOXY COATED

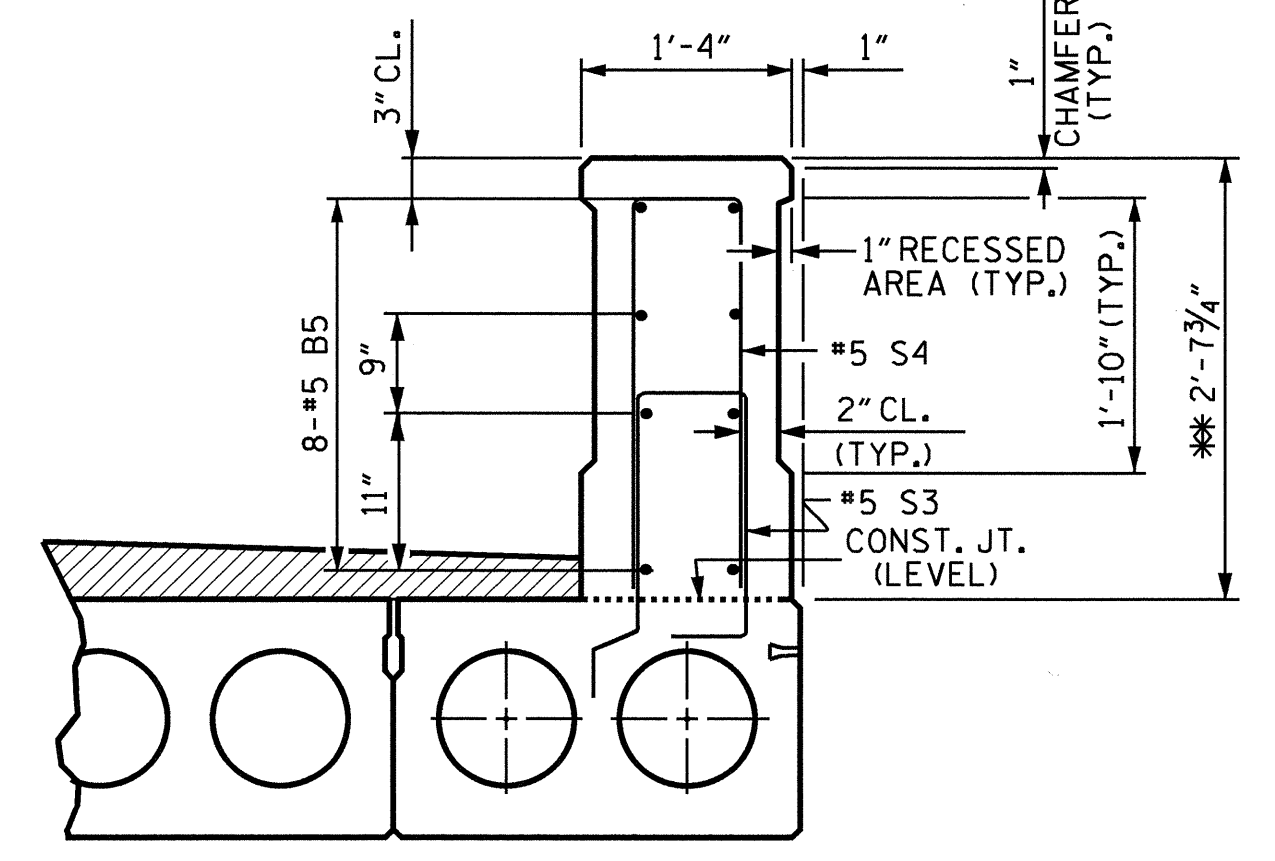
NOTES

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

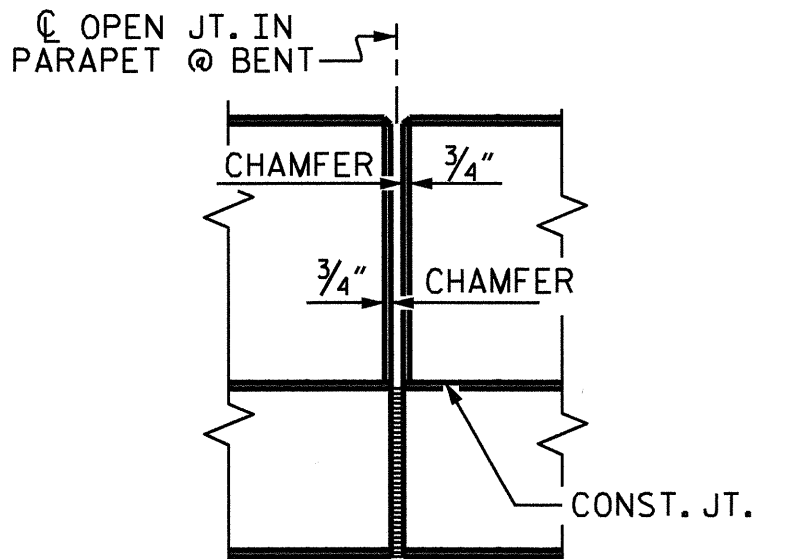
ALL DIMENSIONS ARE TAKEN ALONG OUTSIDE EDGE OF PARAPET.

ALL REINFORCING STEEL IN CONCRETE PARAPET SHALL BE EPOXY COATED.

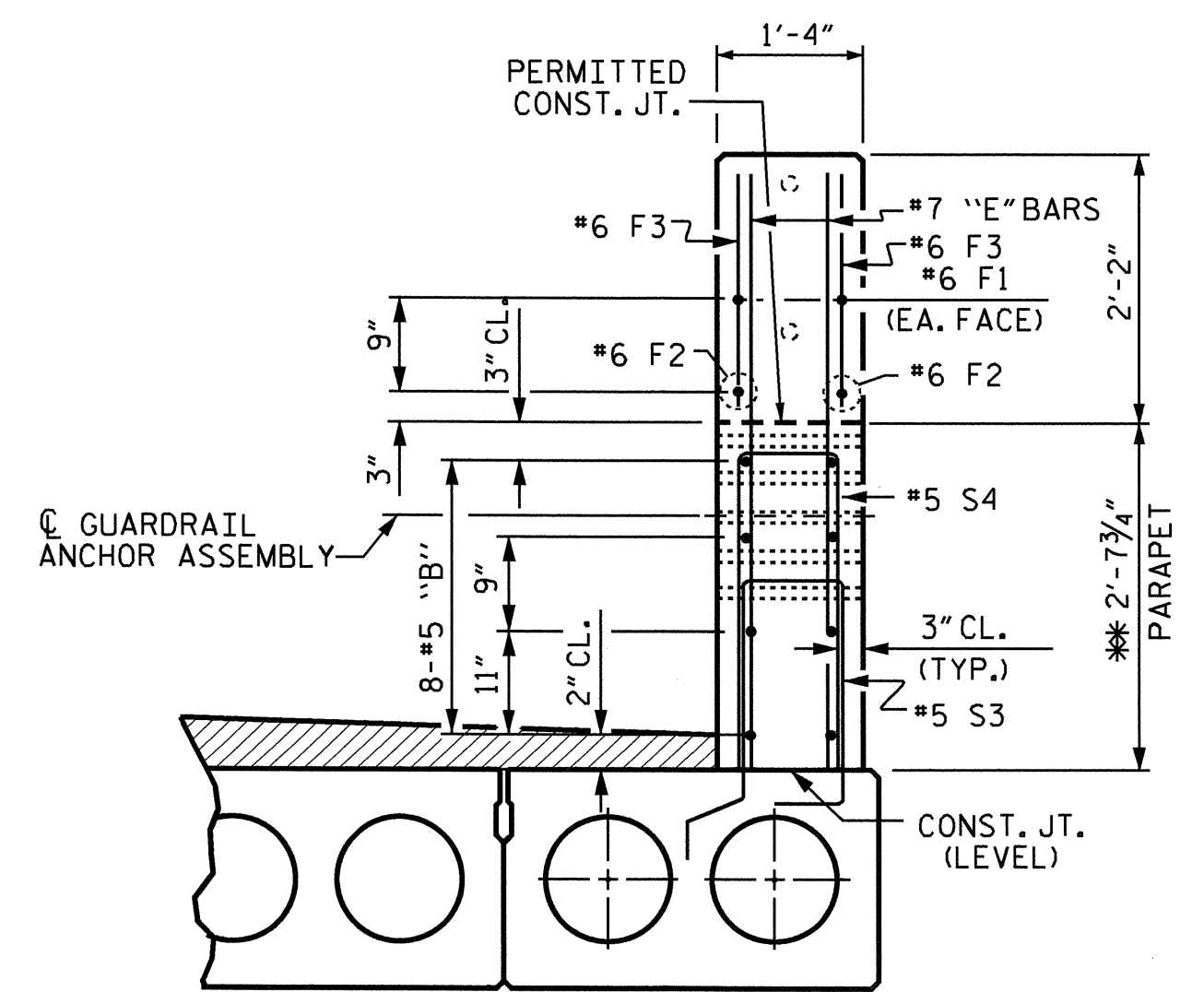
THE REINFORCING STEEL & CONCRETE IN THE END POSTS IS INCLUDED IN THE UNIT PRICE BID FOR THE 1'-4" X 2'-7 3/4" CONCRETE PARAPET.



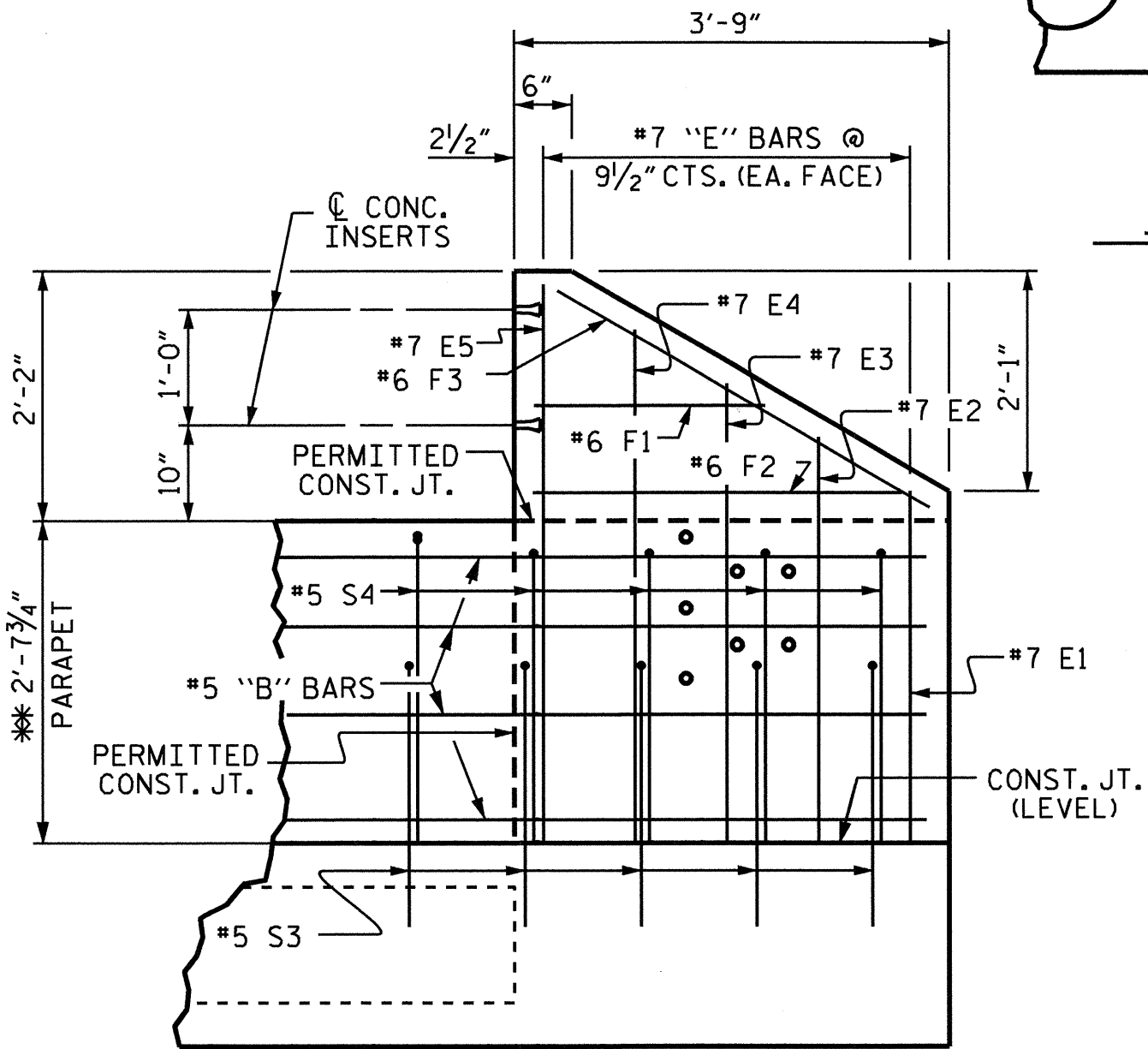
SECTION THRU PARAPET



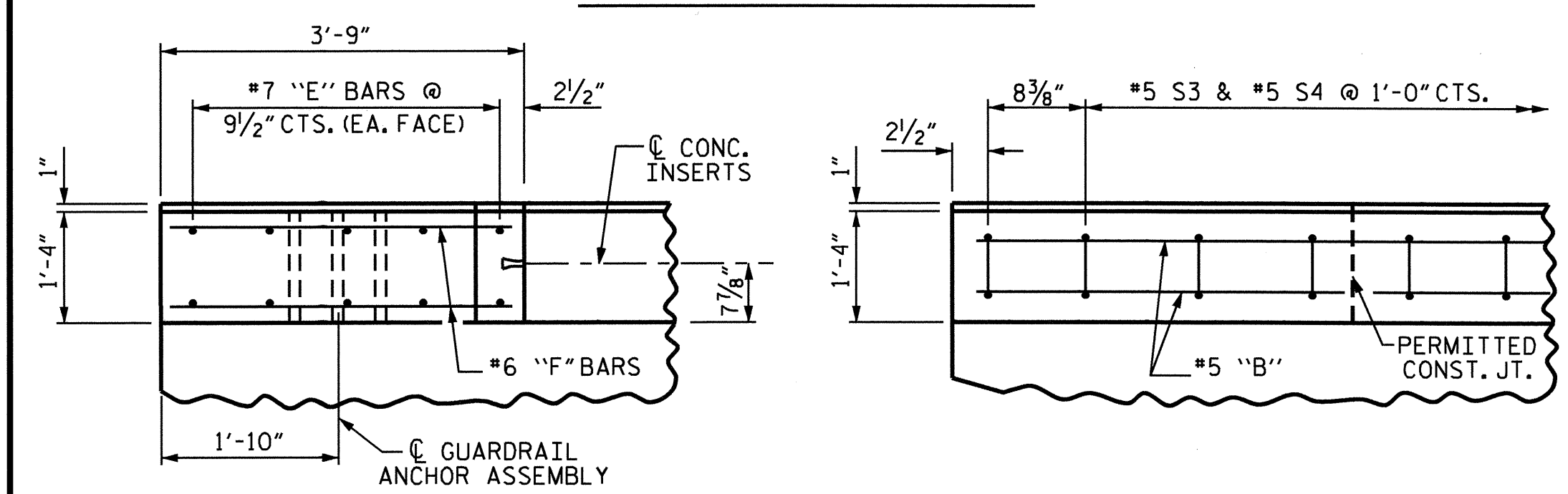
ELEVATION AT JOINTS



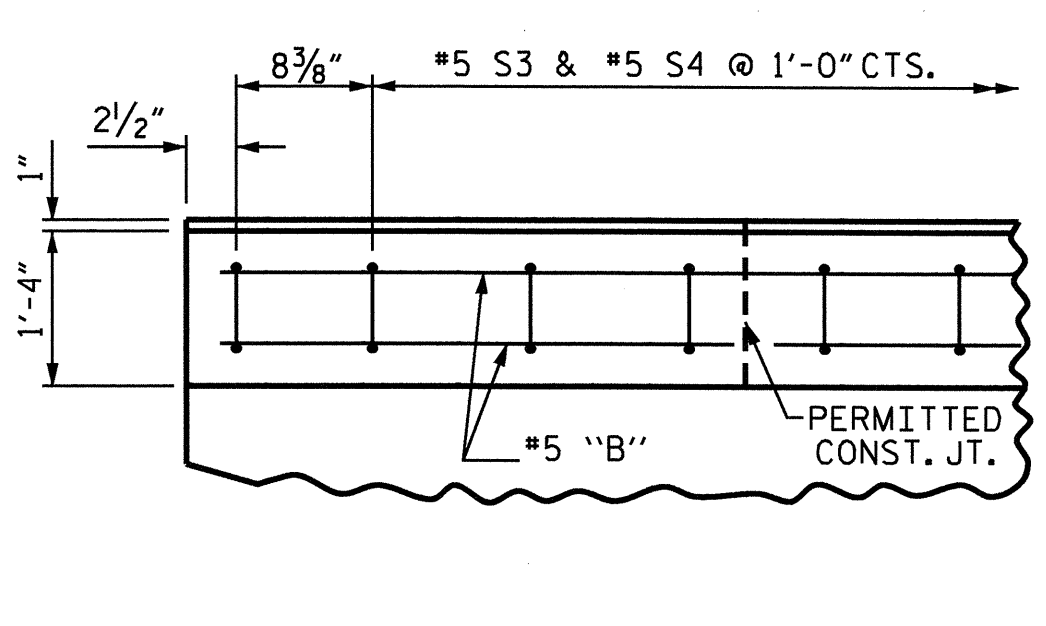
END VIEW



ELEVATION



PLAN OF END POST



PARAPET DETAIL

PARAPET AND END POST FOR TWO BAR RAIL

PROJECT NO. B-4574
MACON COUNTY
 STATION: 13+26.00 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

1'-4" X 2'-7 3/4"
 CONCRETE
 PARAPET



ASSEMBLED BY: A.L. FIGUEROA DATE: 10-08-09
 CHECKED BY: V.X. NGUYEN DATE: 10-08-10

* THE MINIMUM HEIGHT OF THE PARAPET IS SHOWN.
 THE HEIGHT OF THE PARAPET VARIES WHILE THE TOP OF
 THE PARAPET FOLLOWS THE PROFILE OF THE GUTTERLINE.

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

TOTAL SHEETS: 23

NOTES

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

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

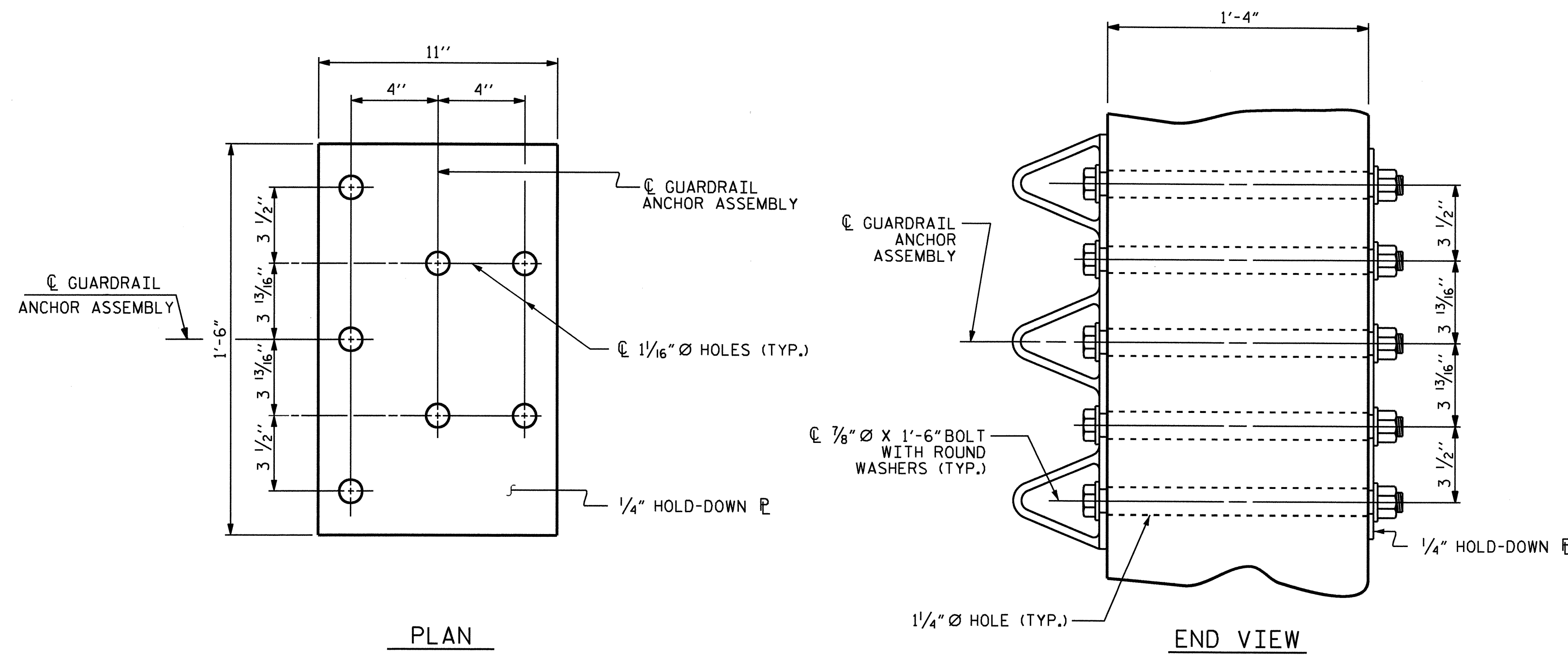
BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED, AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS,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

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

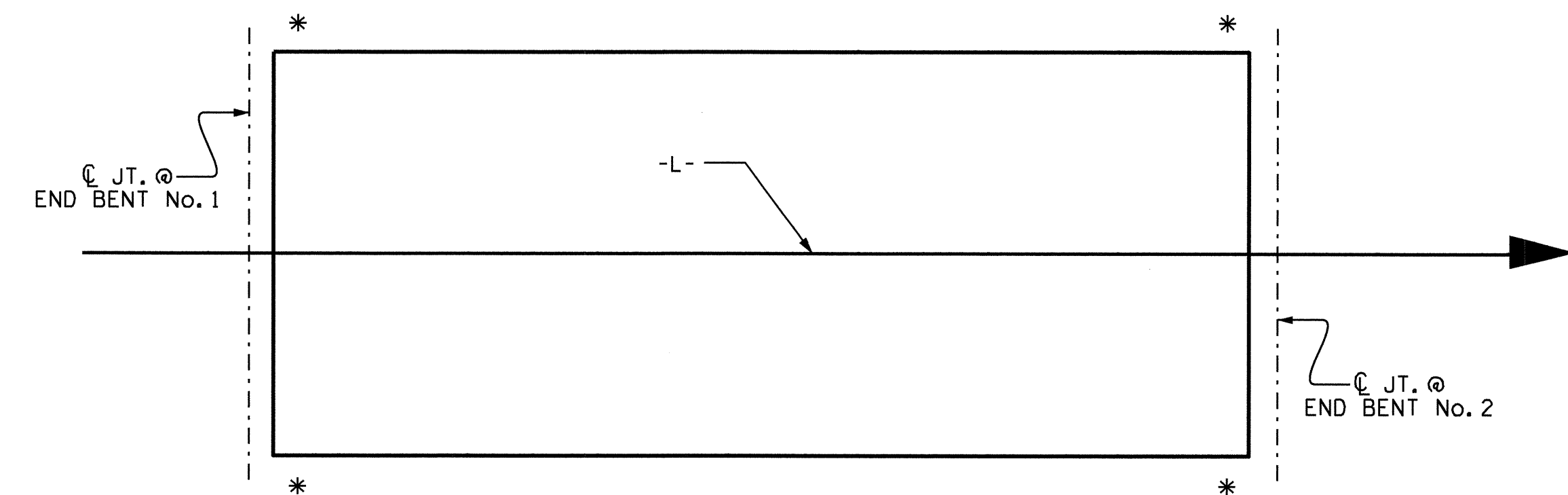
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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

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

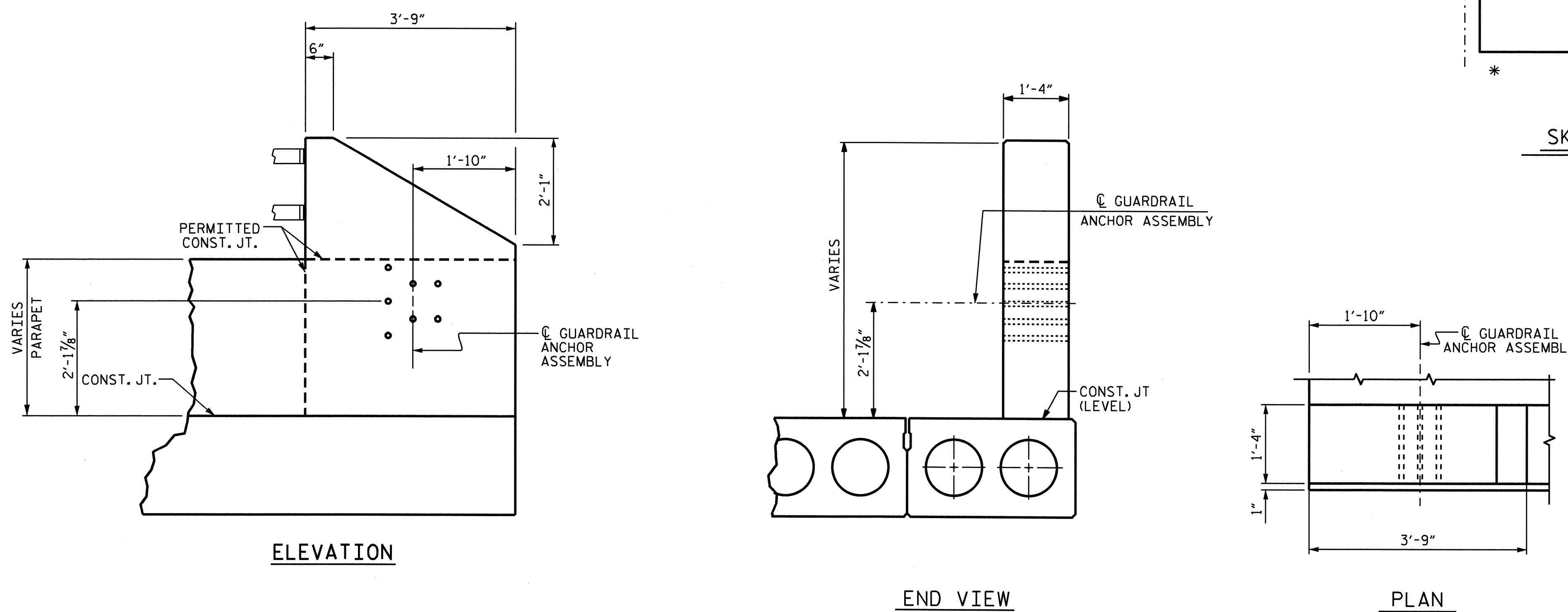


GUARDRAIL ANCHOR ASSEMBLY DETAILS



SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT



LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. B-4574
MACON COUNTY
 STATION: 13+26.00 -L-



STATE OF NORTH CAROLINA					
DEPARTMENT OF TRANSPORTATION					
RALEIGH					
STANDARD					
GUARDRAIL ANCHORAGE					
DETAILS					
FOR METAL RAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-14
TOTAL SHEETS					23

ASSEMBLED BY : A.L. FIGUEROA DATE : 10-08-09
 CHECKED BY : V.X. NGUYEN DATE : 10-08-10

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STD. NO. BMR8

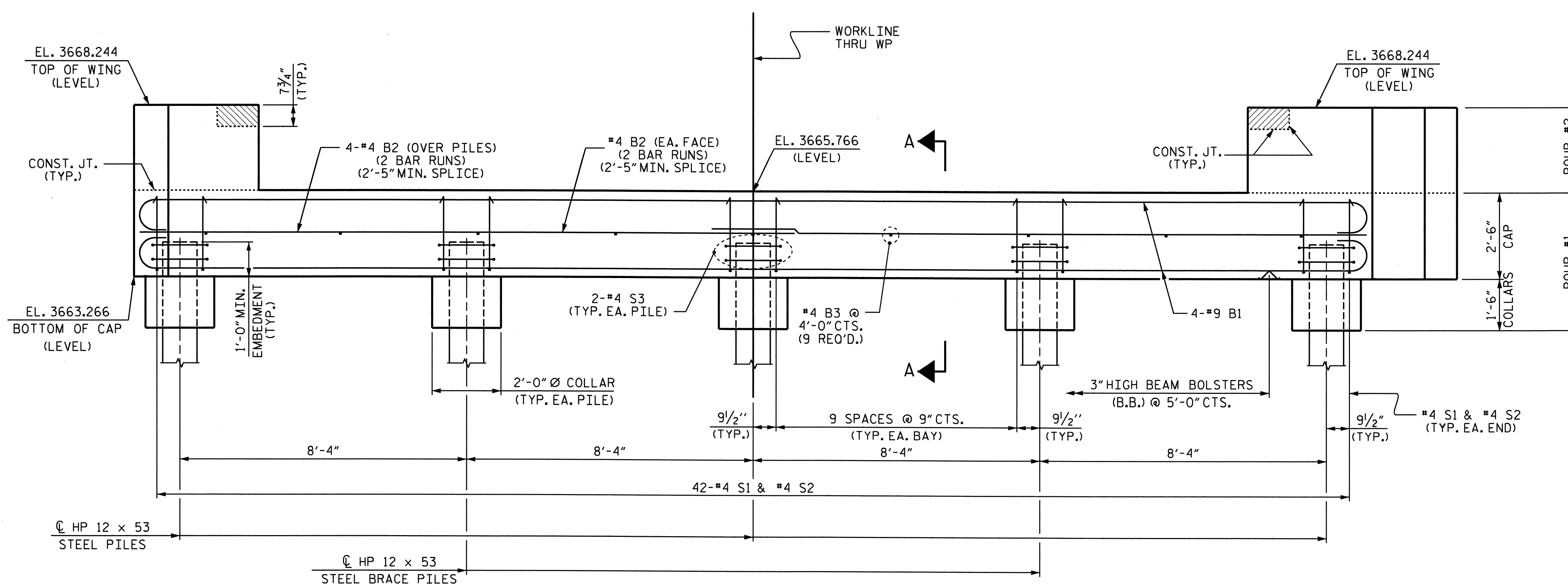
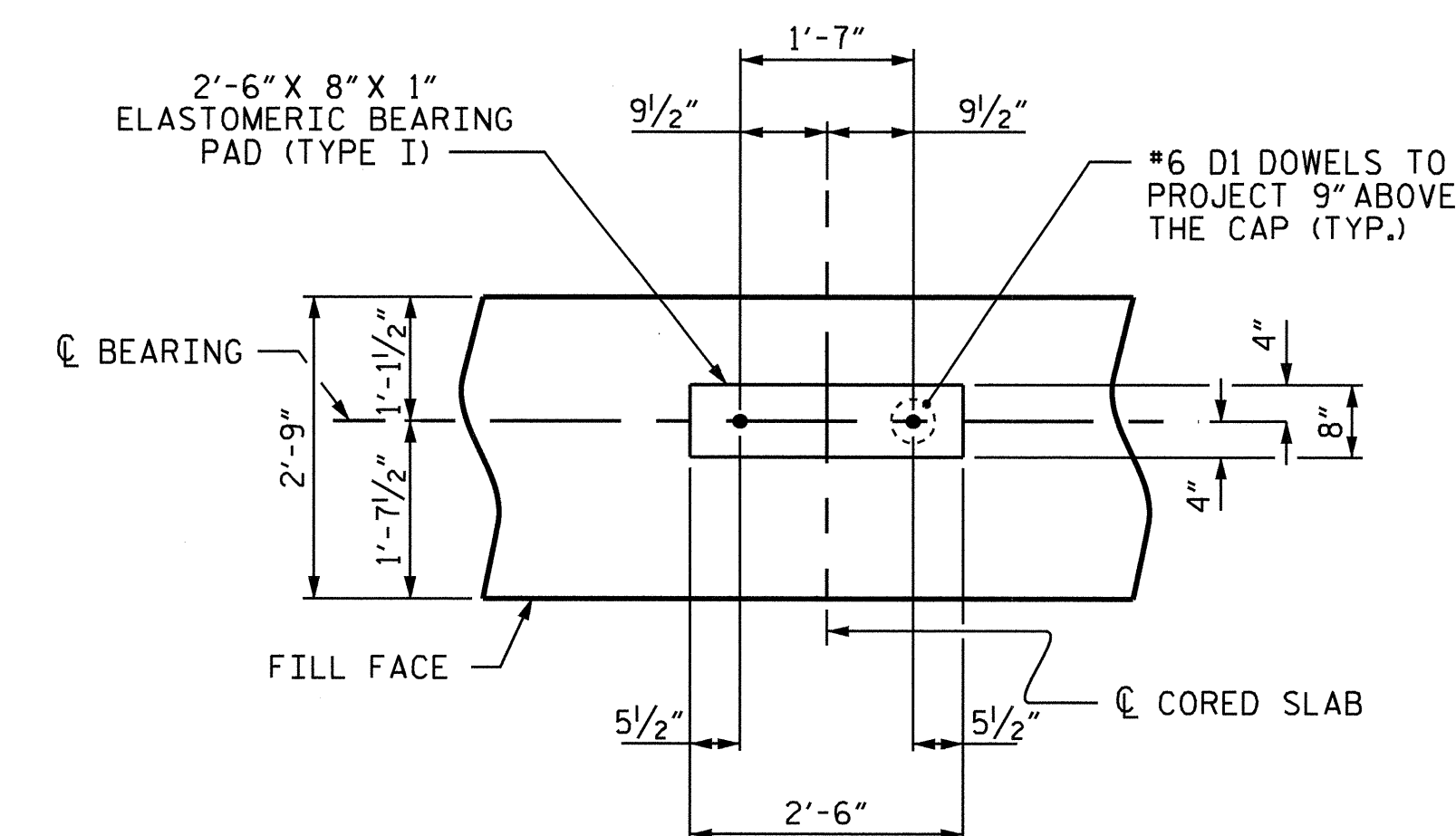
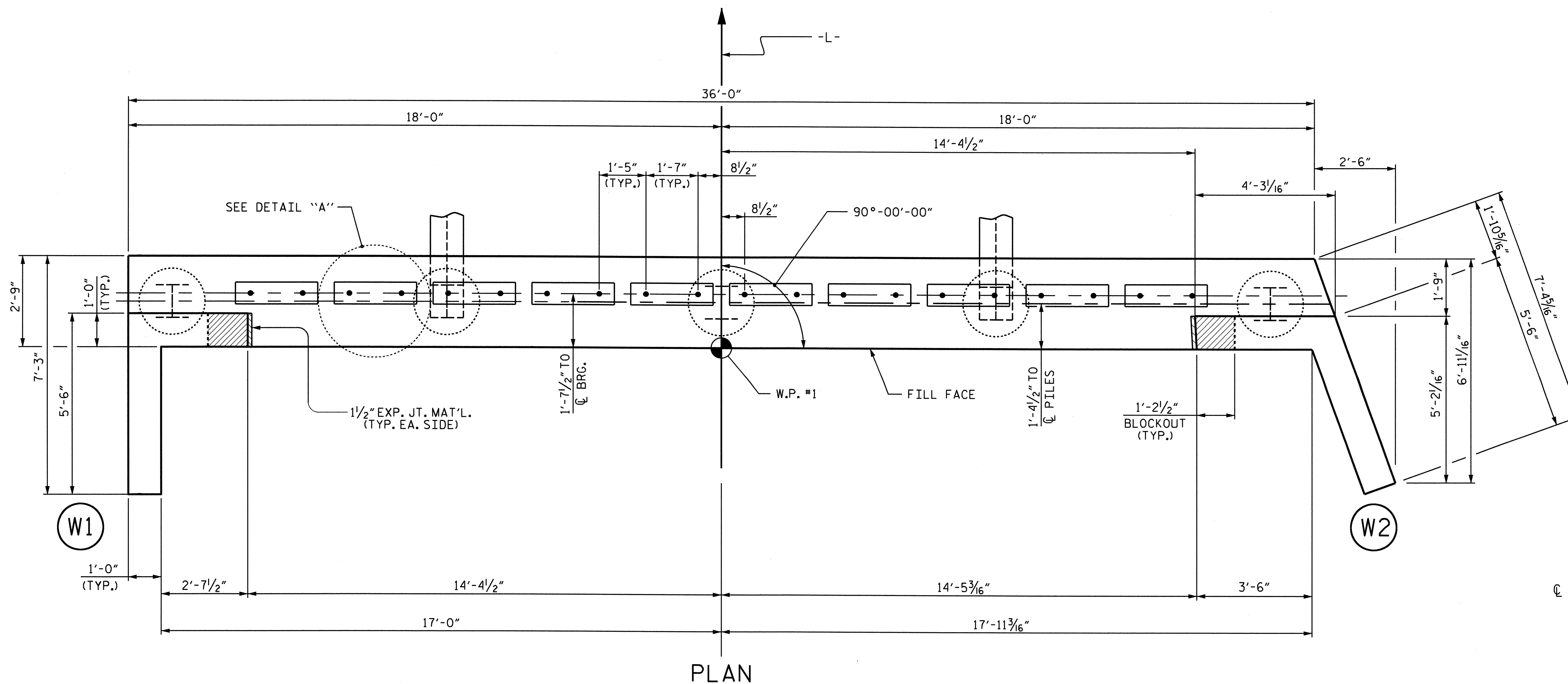
NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #6 DOWELS.

FOR SECTION A-A, SEE SHEET 2 OF 2.

FOR PILE SPLICE DETAILS, SEE SHEET 2 OF 2.

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



DRAWN BY: A.L. FIGUEROA DATE: 05-10-10
 CHECKED BY: A. SORSENGINH DATE: 06-24-10

13-JAN-2011 11:58
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 DAHODGE

PROJECT NO. B-4574
 MACON COUNTY
 STATION: 13+26.00 -L-

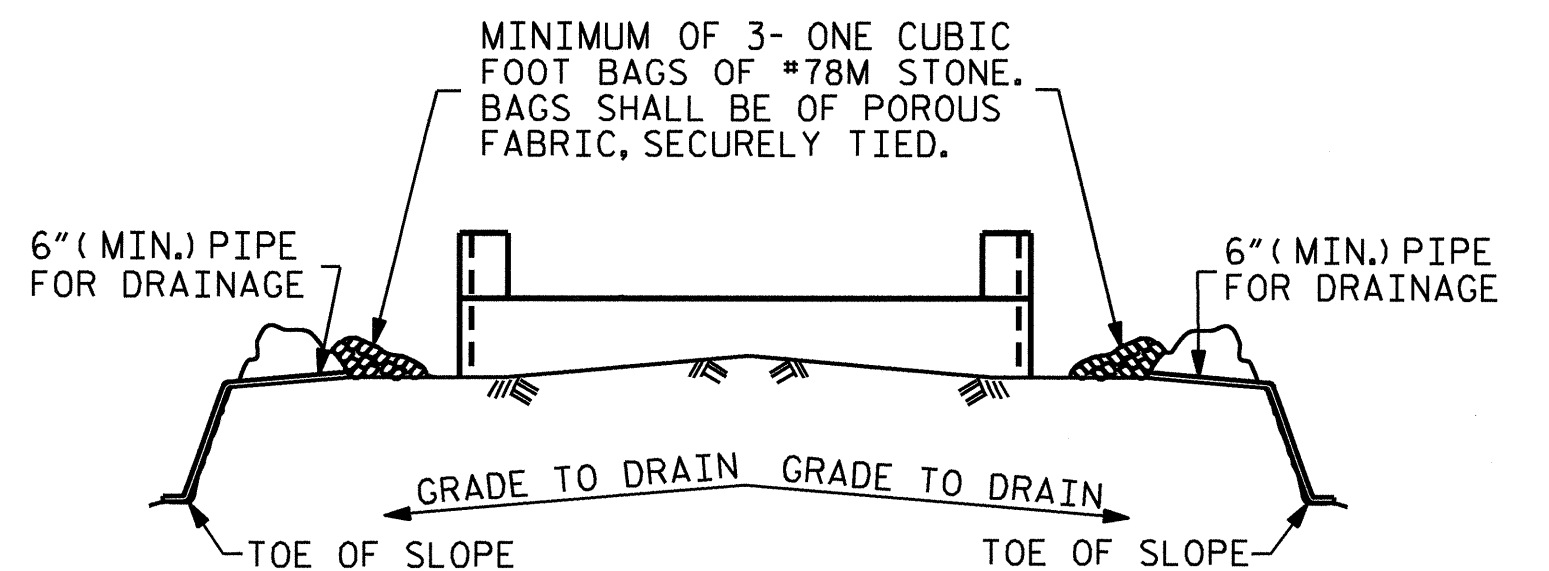
SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT NO. 1



REVISIONS						SHEET NO. S-15
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 23
2			4			



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

6" (MIN.) PIPE FOR DRAINAGE

6" (MIN.) PIPE FOR DRAINAGE

GRADE TO DRAIN GRADE TO DRAIN

TOE OF SLOPE

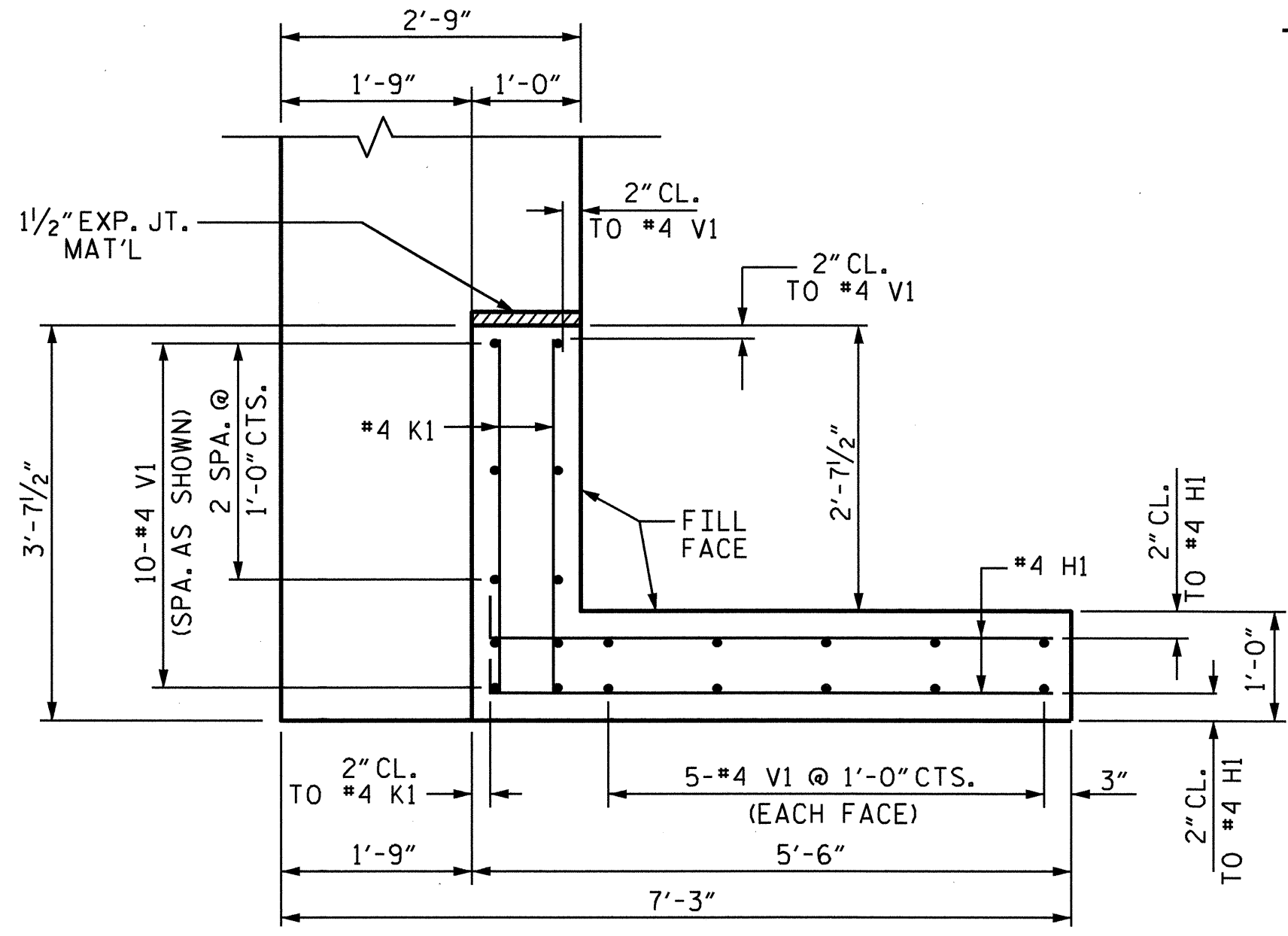
TOE OF SLOPE

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.

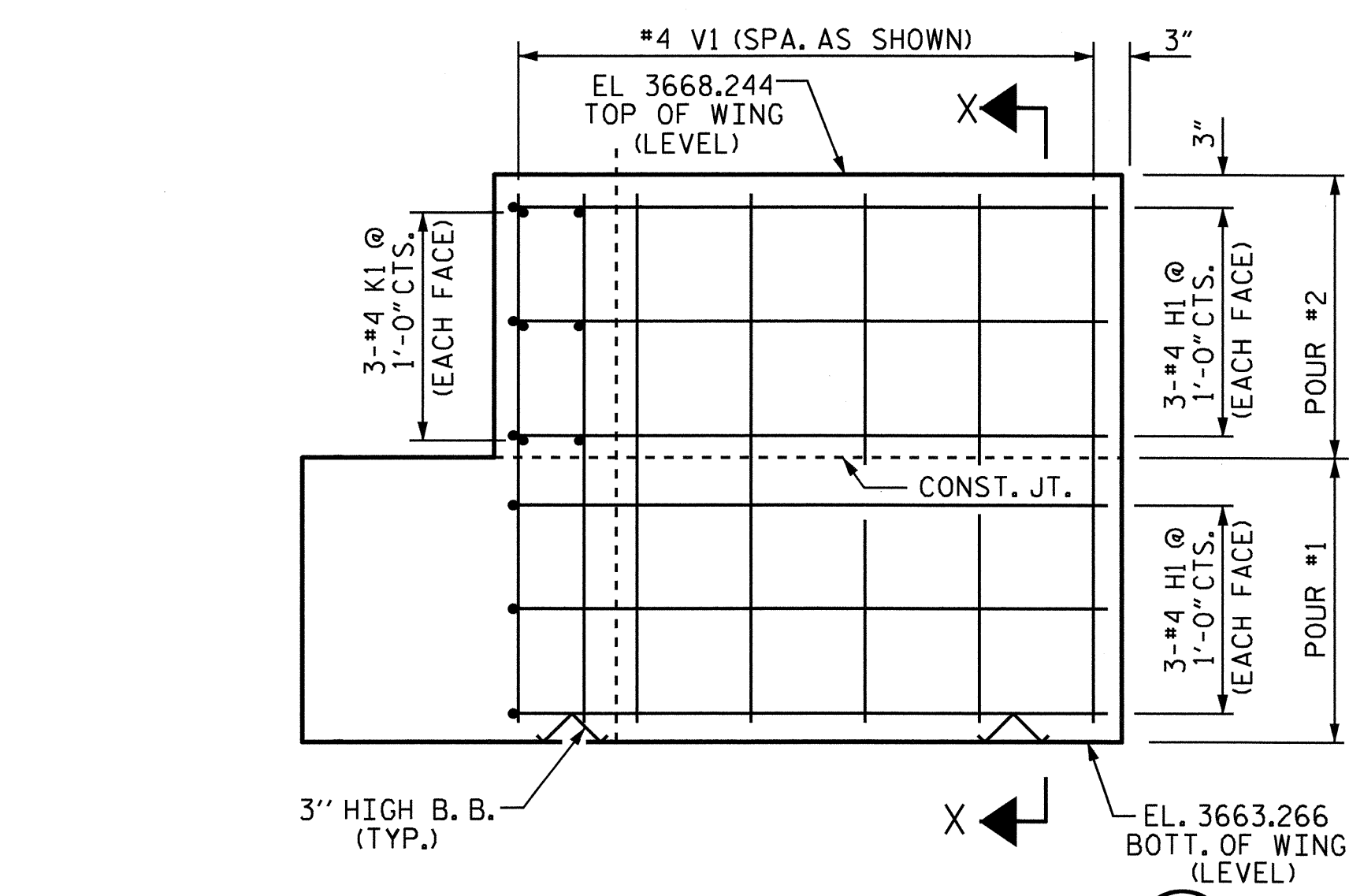
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

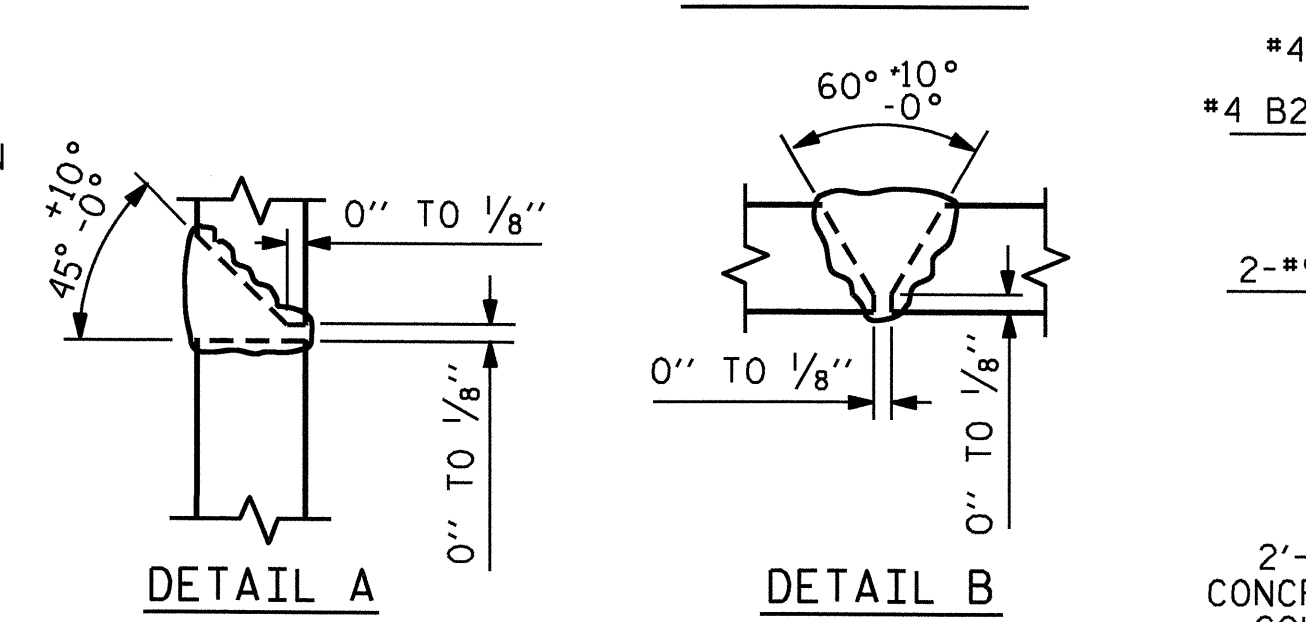
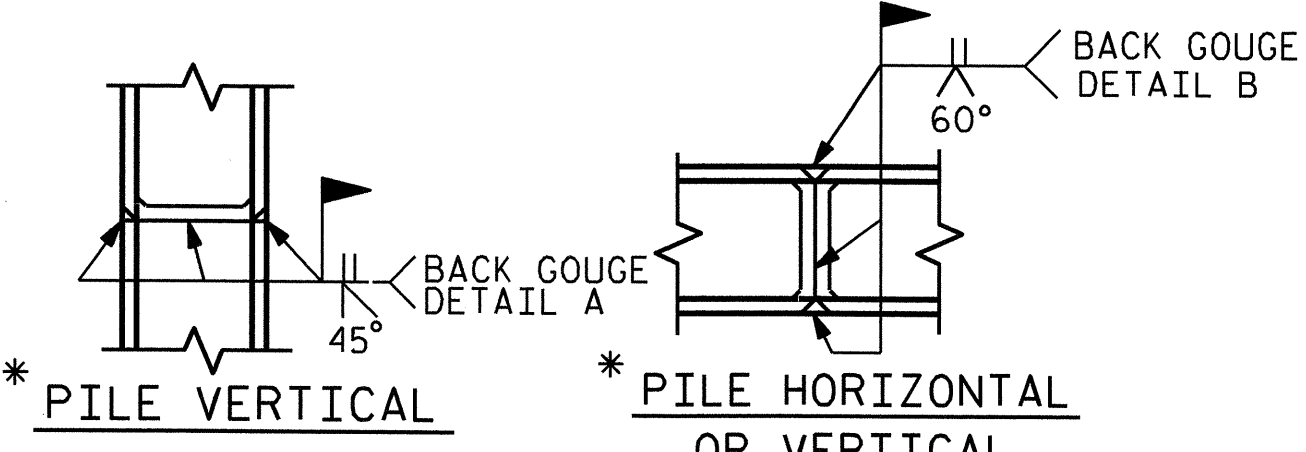
TEMPORARY DRAINAGE AT END BENT



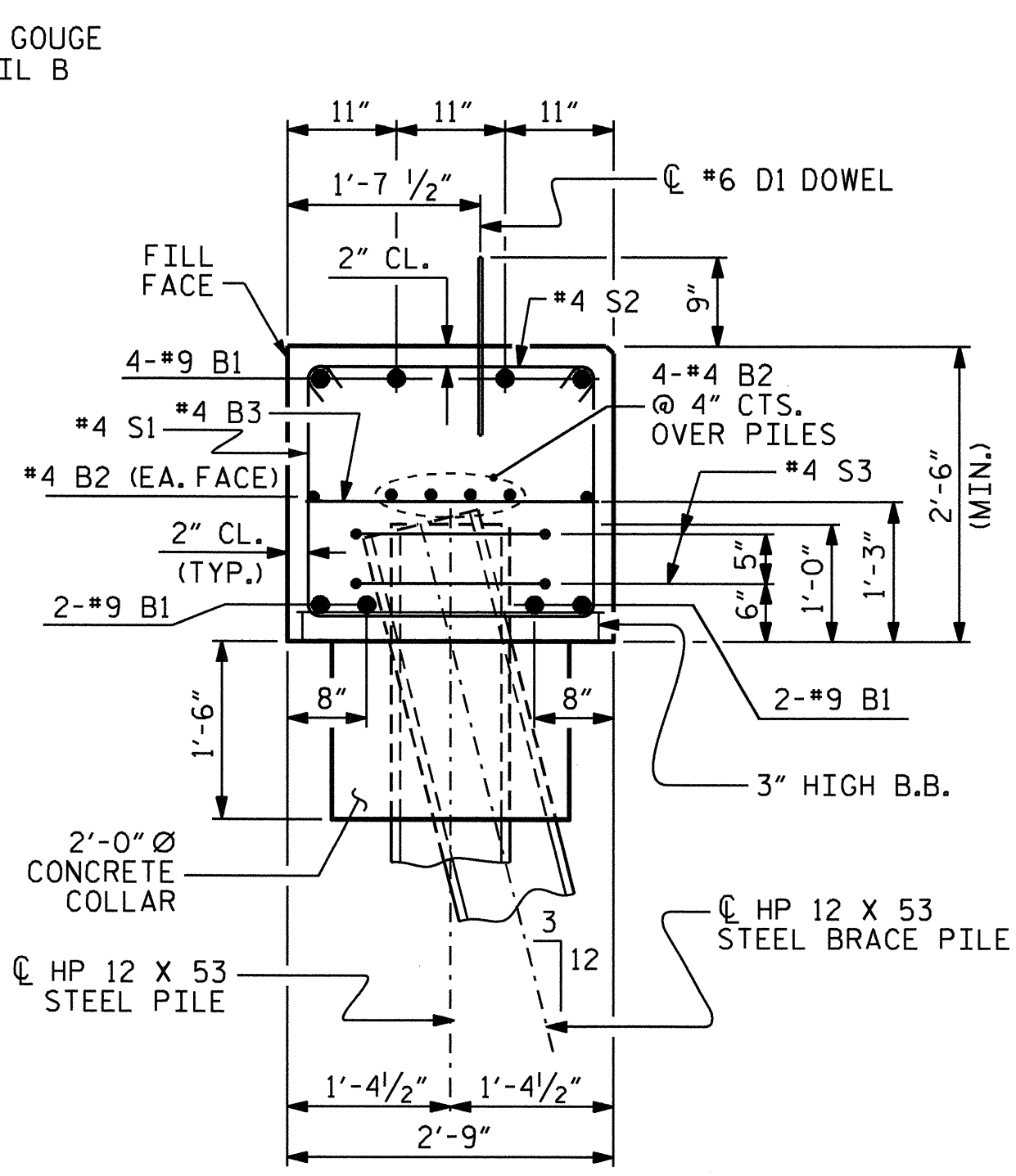
PLAN OF WING (W1)



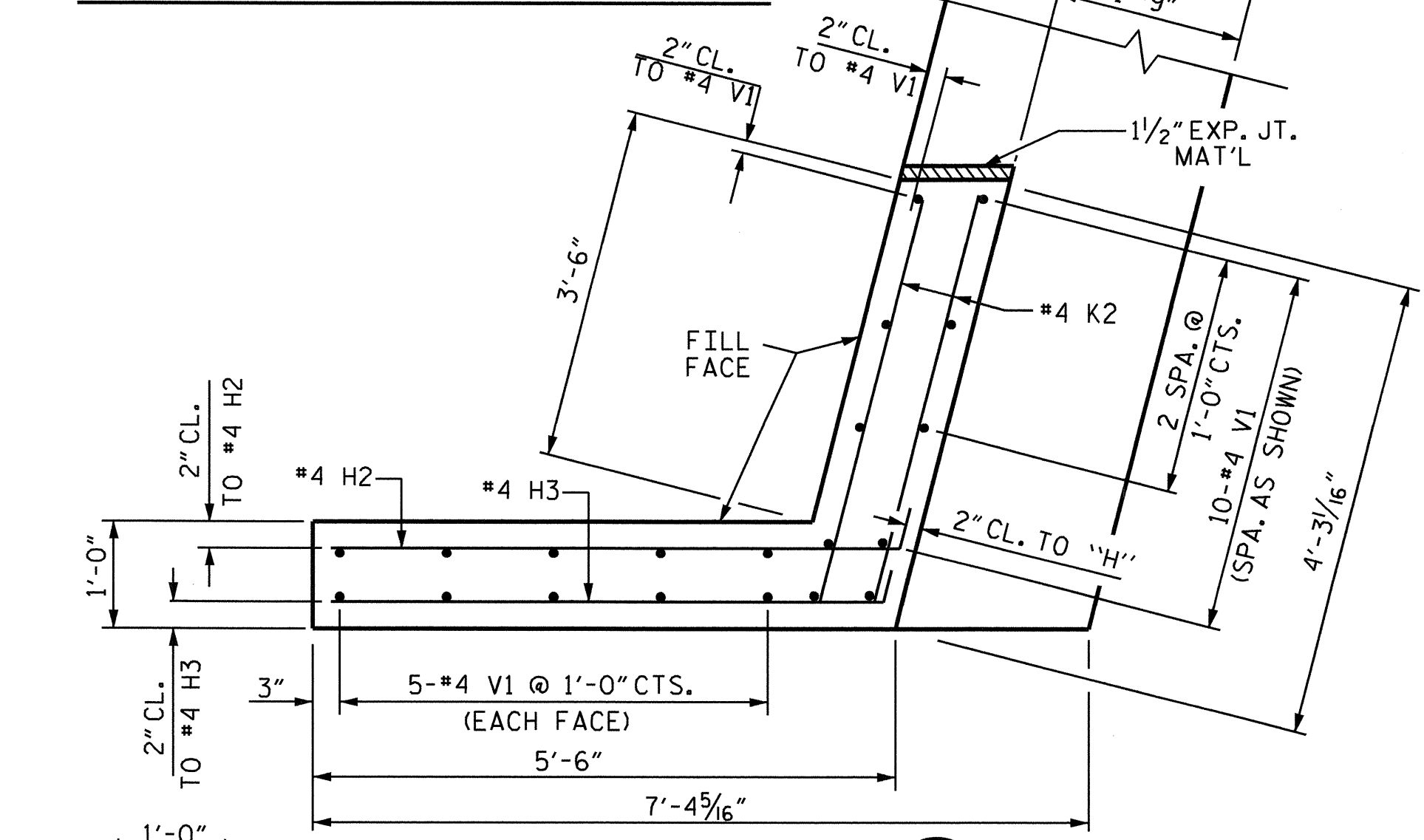
ELEVATION OF WING (W1)



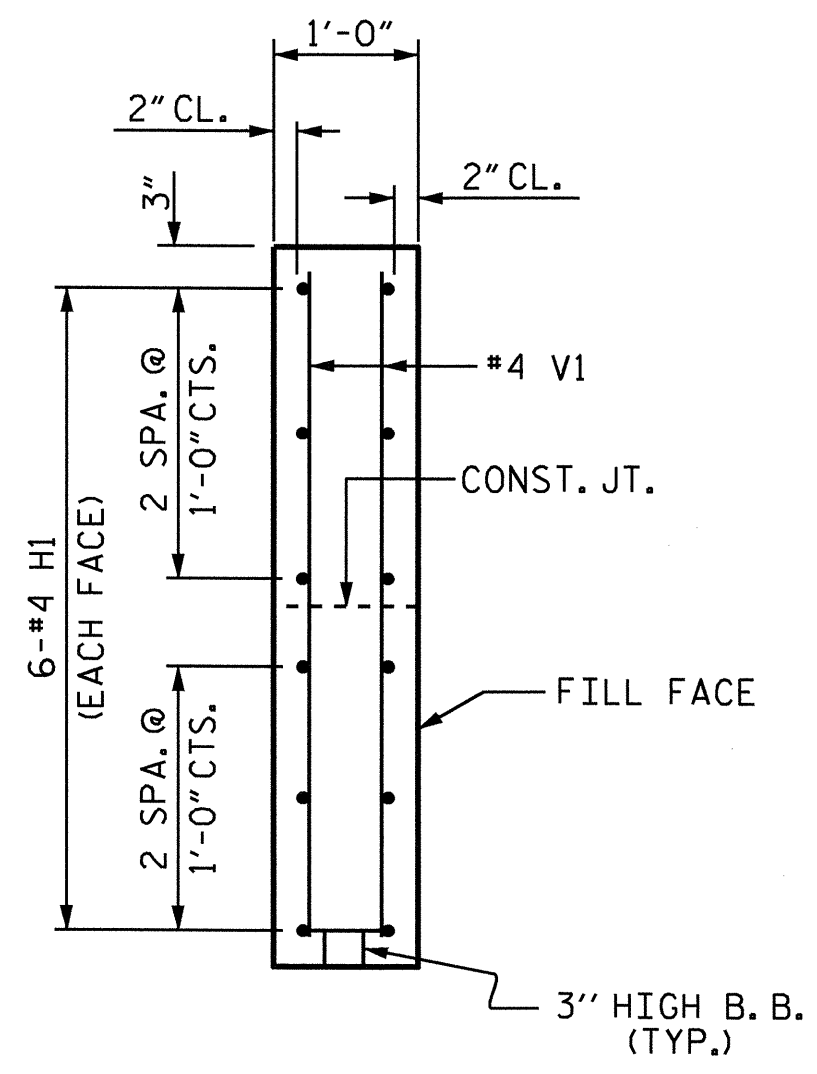
PILE SPLICE DETAILS



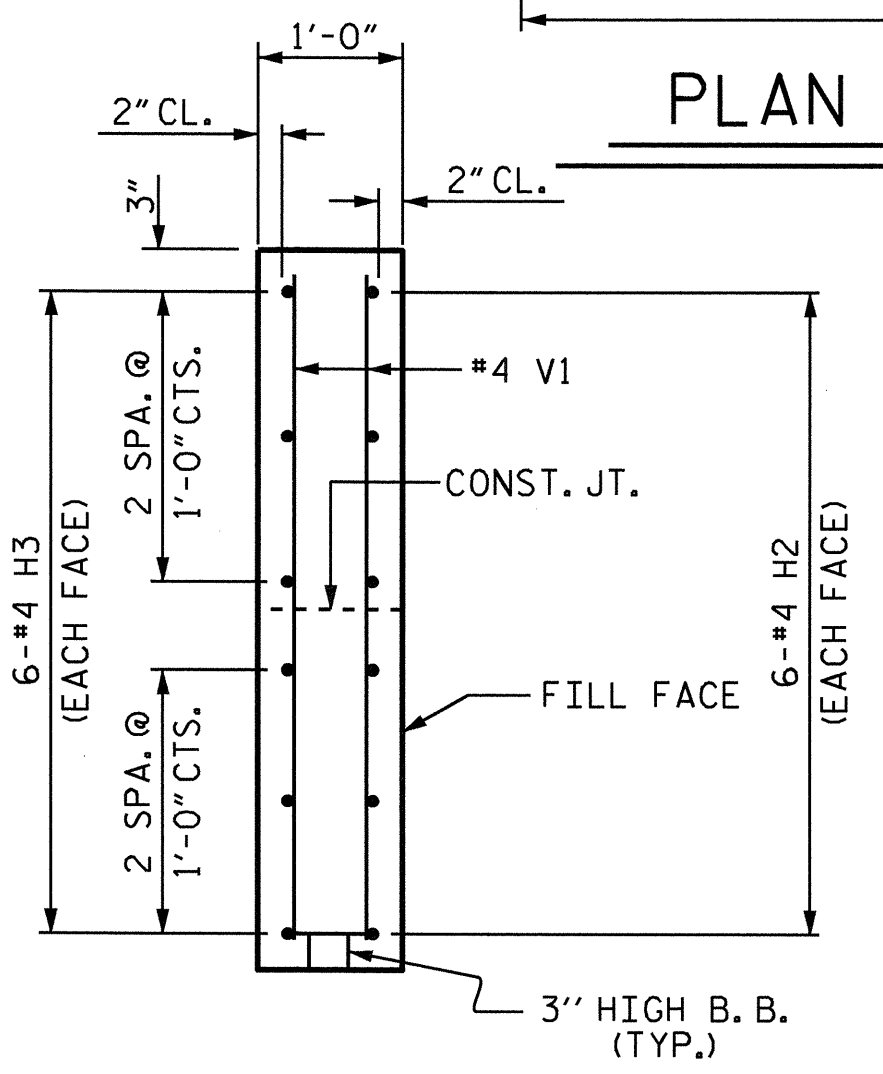
SECTION A-A



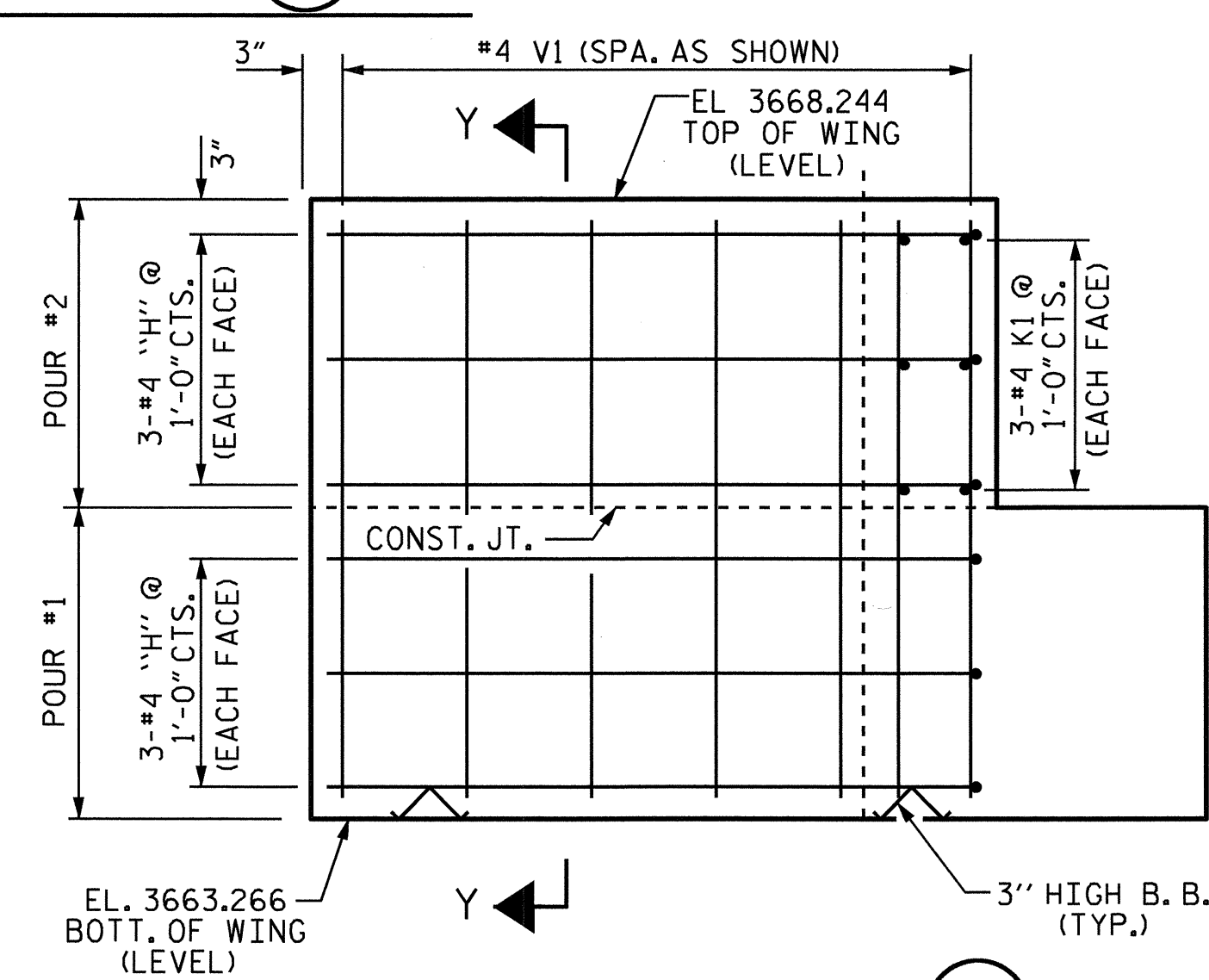
PLAN OF WING (W2)



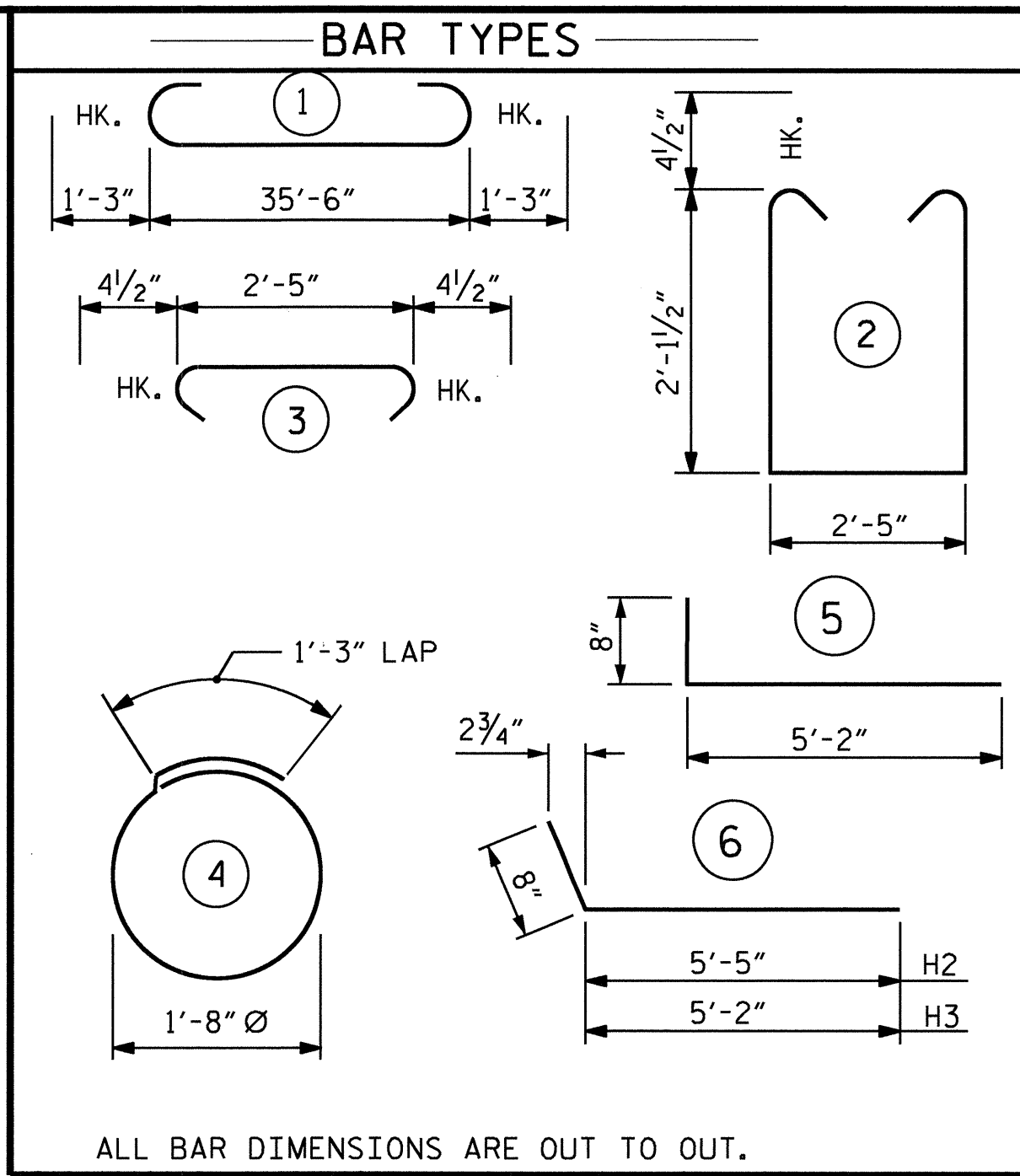
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W2)



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
END BENT NO. 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	38'-0"	1034
B2	12	#4	STR	19'-1"	153
B3	9	#4	STR	2'-5"	15
D1	20	#6	STR	1'-6"	45
H1	12	#4	5	5'-10"	47
H2	6	#4	6	6'-1"	24
H3	6	#4	6	5'-10"	23
K1	6	#4	STR	3'-3"	13
K2	6	#4	STR	3'-10"	15
S1	42	#4	2	7'-5"	208
S2	42	#4	3	3'-2"	89
S3	10	#4	4	6'-6"	43
V1	40	#4	STR	4'-7"	122
REINFORCING STEEL				=	1,831 LBS.
CLASS A CONCRETE BREAKDOWN					
POUR #1: COLLARS, CAP & BOTTOM PART OF WINGS				10.9	C.Y.
POUR #2: UPPER PART OF WINGS				1.5	C.Y.
TOTAL CLASS A CONCRETE				12.4	C.Y.
HP 12 X 53 STEEL PILES					
NO. 5				LIN. FT.	65
STEEL PILE POINTS					5 EA.



PROJECT NO. B-4574

MACON COUNTY

STATION: 13+26.00 -L-

SHEET 2 OF 2

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

SHEET NO. S-16

TOTAL SHEETS 23

DRAWN BY: A.L. FIGUEROA DATE: 05-10-10

CHECKED BY: A. SORSENGINH DATE: 06-24-10

13-JAN-2011 11:58 R:\Structures\Final Plans\B-4574.sd.12.EB.dgn DAHODGE

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #6 DOWELS.

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

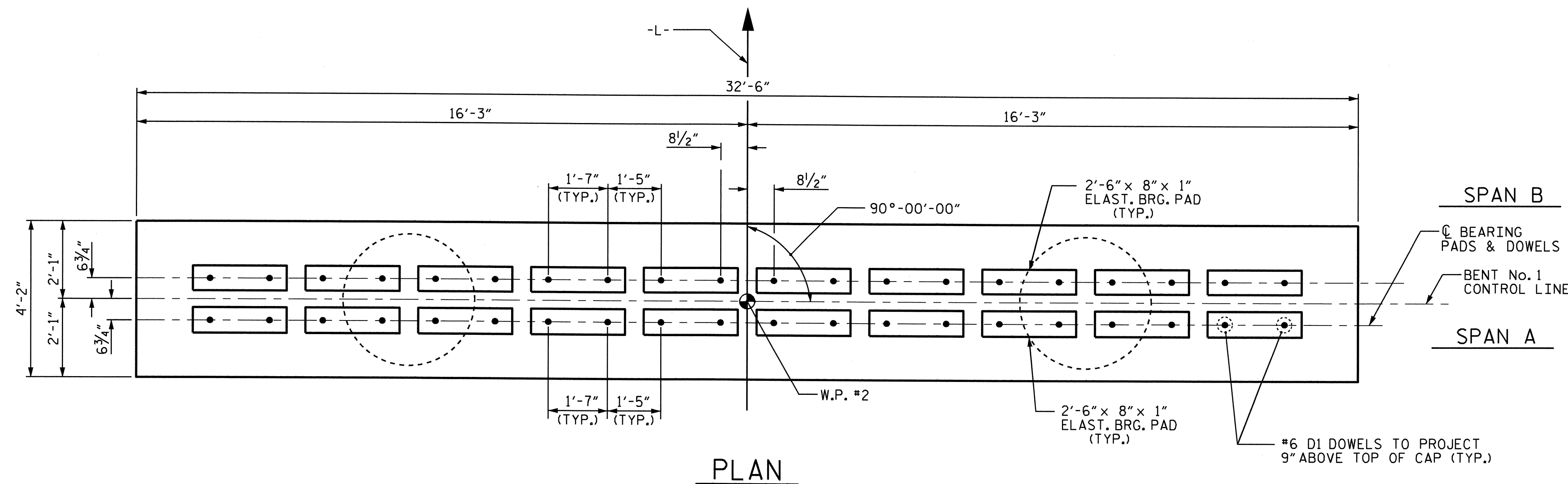
ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".

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.

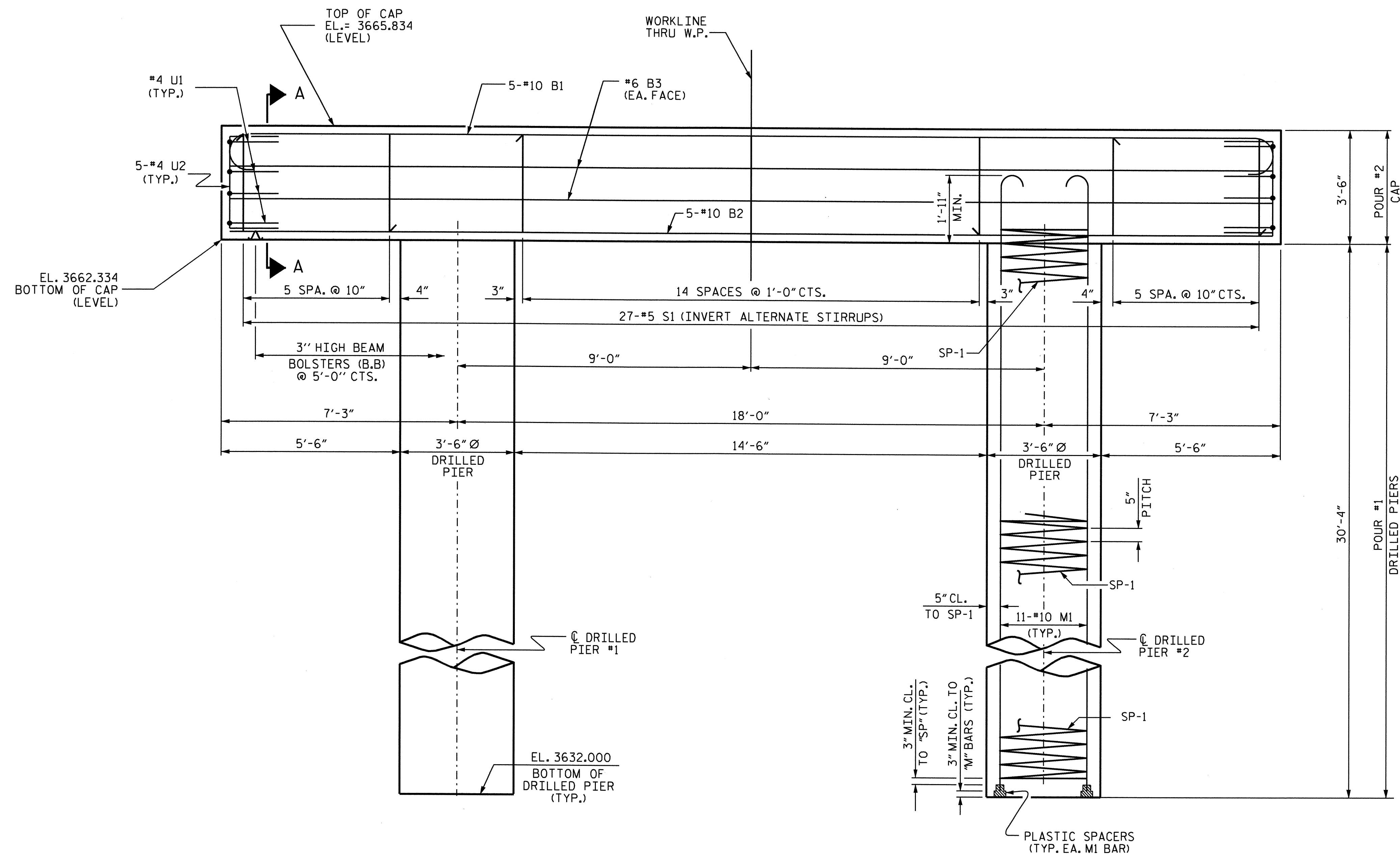
SPLICING OF THE LONGITUDINAL BARS IN THE DRILLED PIERS WILL NOT BE PERMITTED.

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

FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.



PLAN



ELEVATION

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

PROJECT NO. B-4574
MACON COUNTY
 STATION: 13+26.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

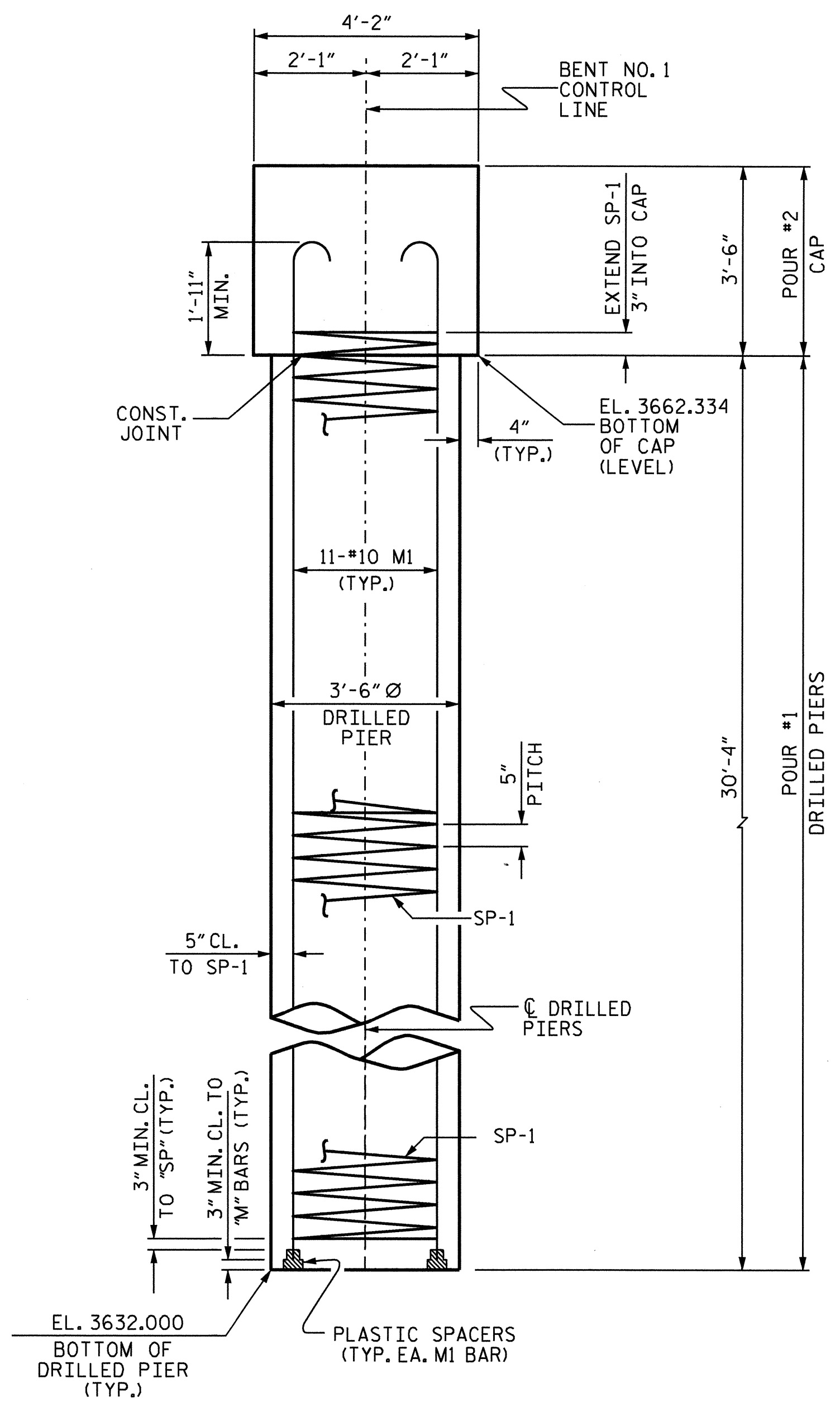
SUBSTRUCTURE
 BENT NO. 1



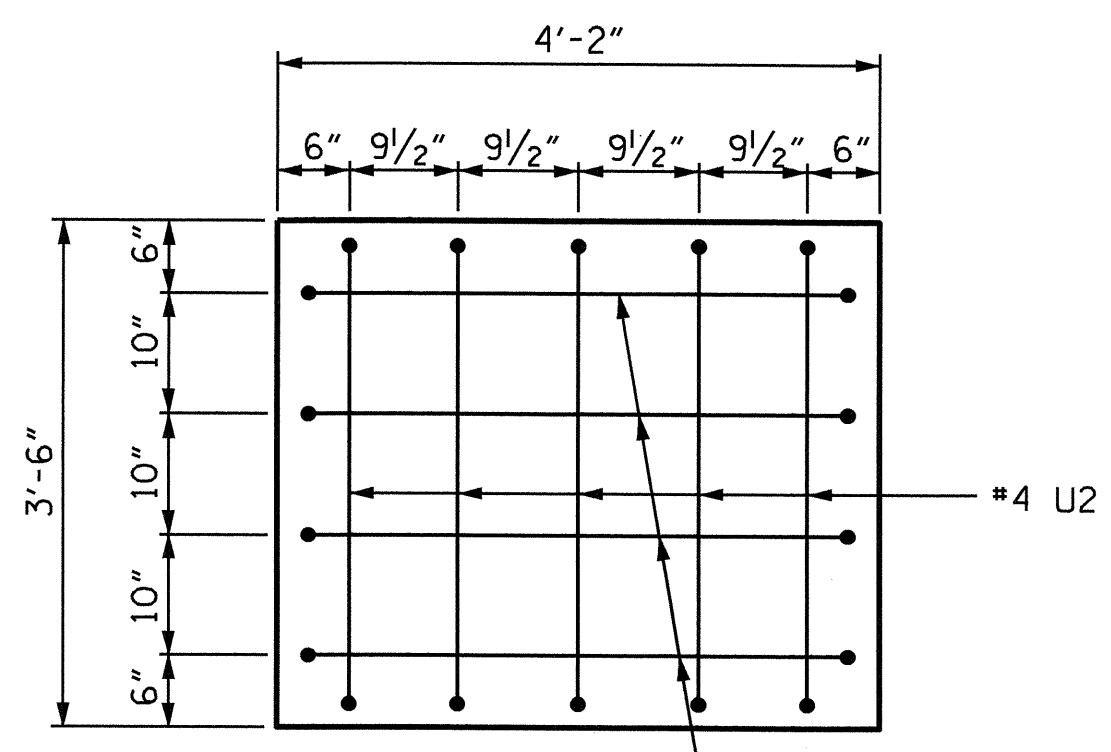
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 CHECKED BY: A. SORSENGINH DATE: 10-15-10

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REVISIONS						SHEET NO.
BY:	DATE:	NO.	BY:	DATE:		S-17
		3				TOTAL SHEETS
		4				23

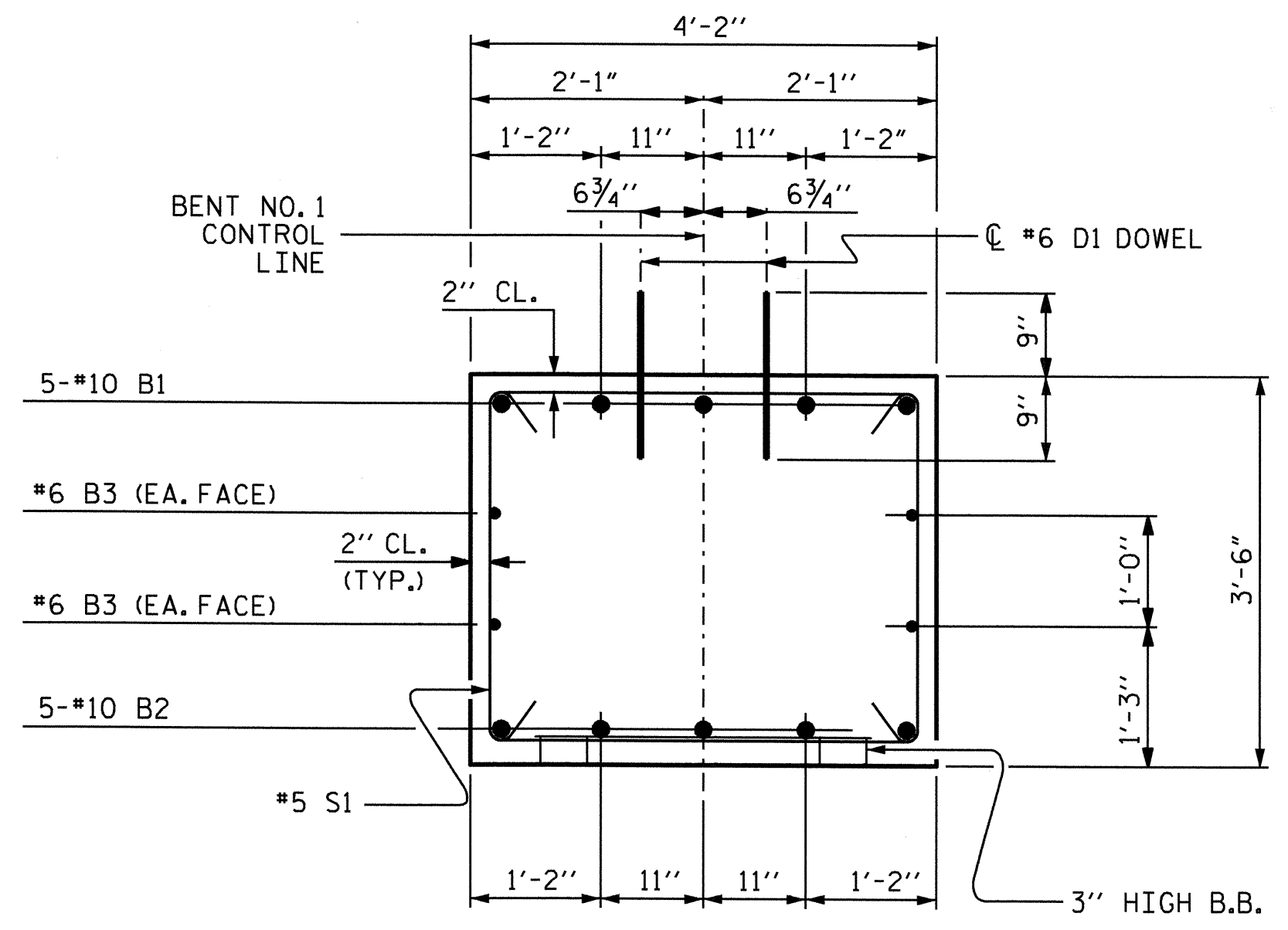


END ELEVATION

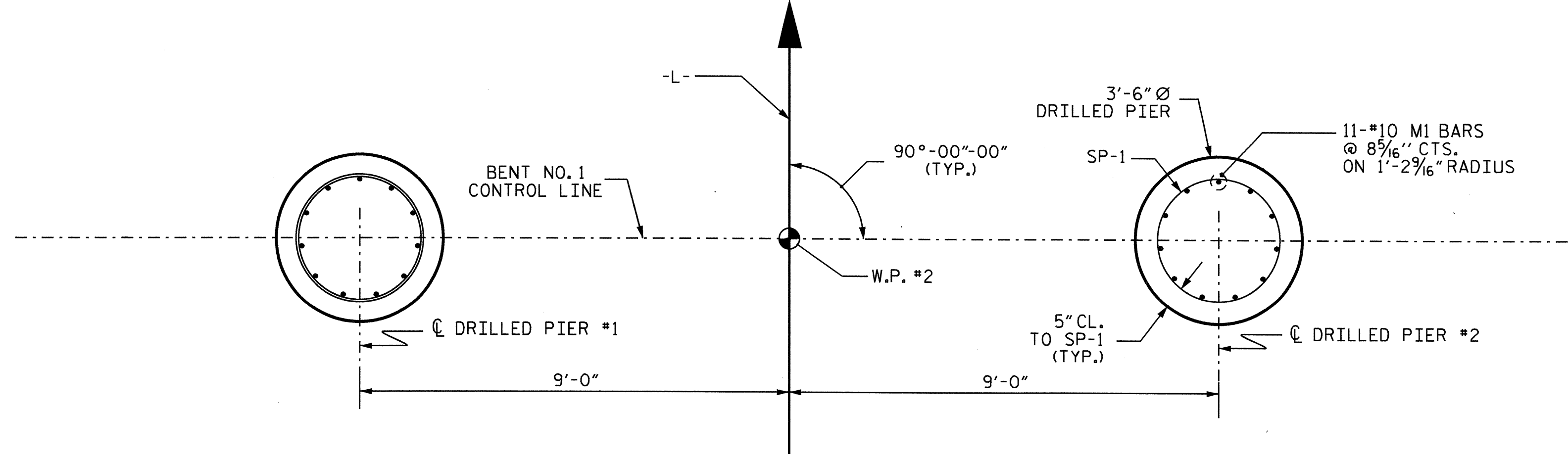


END VIEW

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



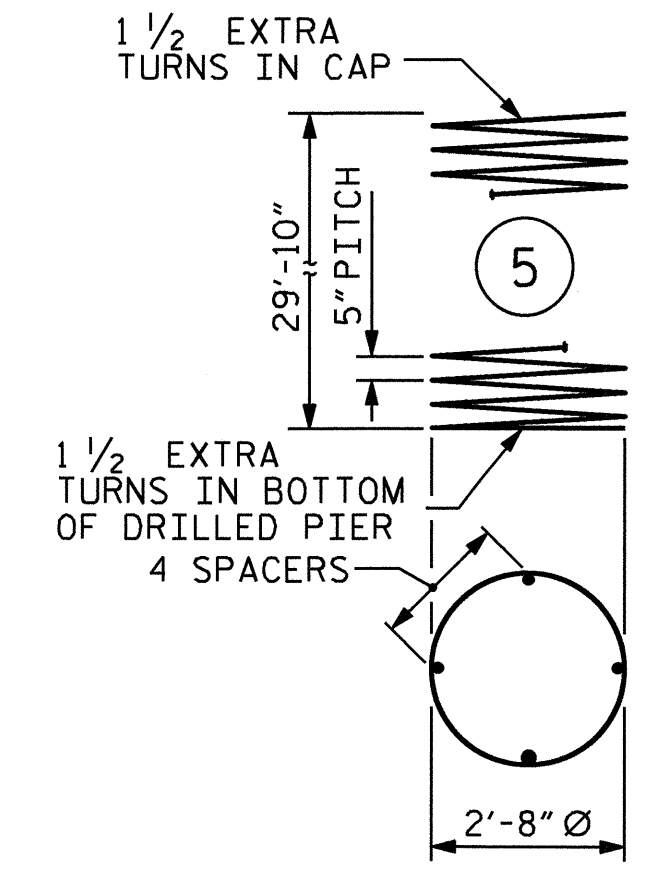
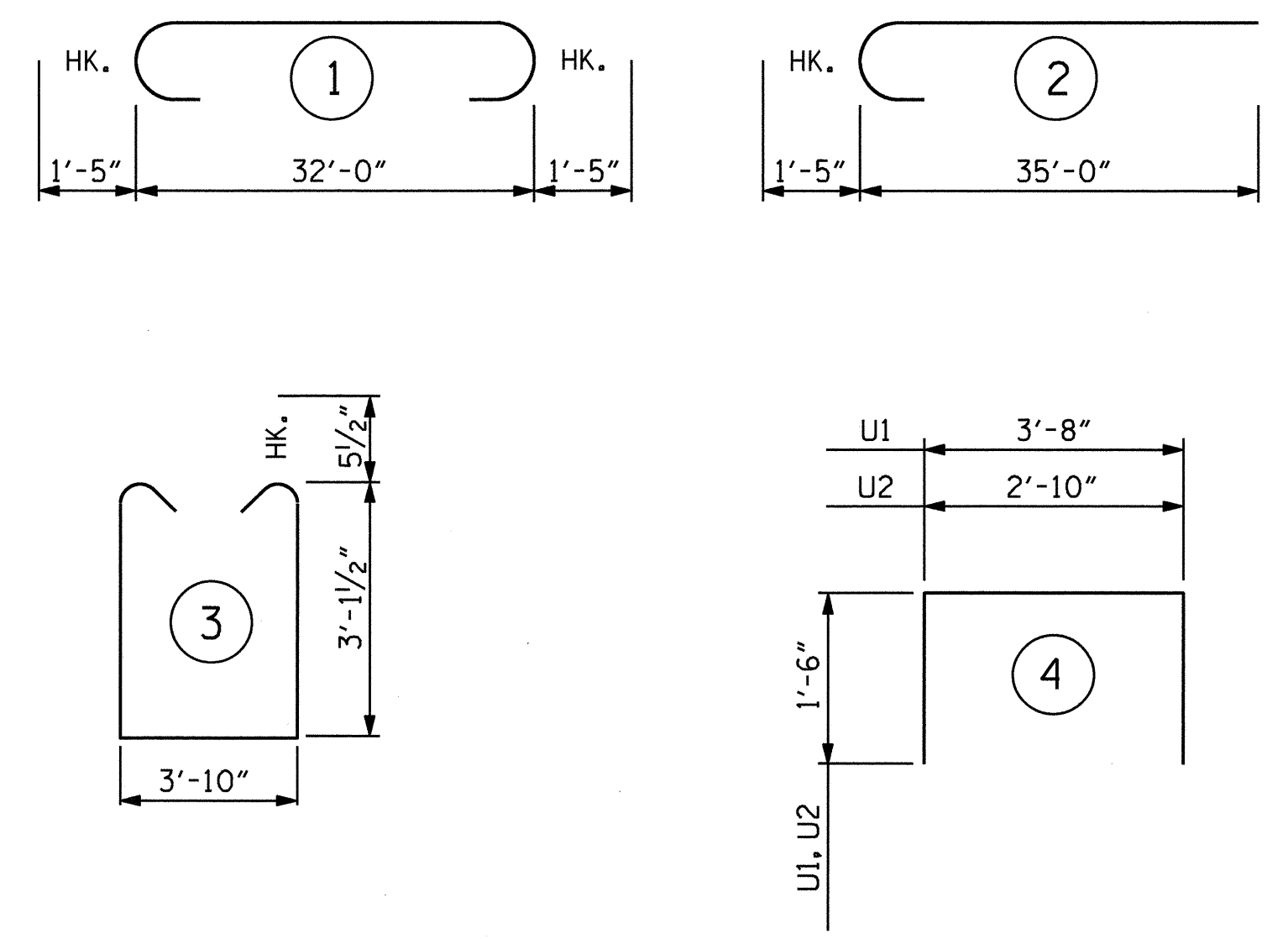
SECTION A-A



PLAN OF DRILLED PIERS

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

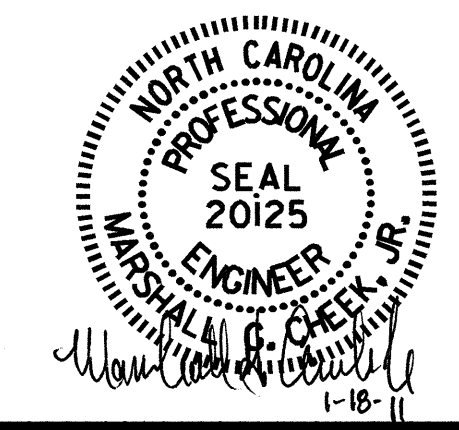
*** THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR
 ▲ NO SEPARATE PAYMENT WILL BE MADE FOR CSL TUBES. CSL TUBES WILL BE INCLUDED IN THE UNIT BID PRICE FOR DRILLED PIERS.

BILL OF MATERIAL

BENT NO. 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	#10	1	34'-10"	749
B2	5	#10	STR	32'-2"	692
B3	4	#6	STR	32'-2"	193
D1	40	#6	STR	1'-6"	90
M1	22	#10	2	36'-5"	3447
S1	27	#5	3	11'-0"	310
U1	8	#4	4	6'-8"	36
U2	10	#4	4	5'-10"	39
SP-1	2	***	5	618'-1"	1289
REINFORCING STEEL					= 5,556 LBS.
SPIRAL COLUMN REINFORCING STEEL					= 1289 LBS.
CLASS "A" CONCRETE BREAKDOWN					
POUR #2 (CAP)					C.Y. = 17.6
TOTAL					C.Y. = 17.6
DRILLED PIERS					
DRILLED PIER CONCRETE					
POUR #1 (DRILLED PIERS)					C.Y. = 21.6
3'-6" Ø DRILLED PIERS					
NOT IN SOIL					LIN. FT. = 22.00
IN SOIL					LIN. FT. = 38.67
PERMANENT STEEL CASING FOR 3'-6" Ø DRILLED PIERS					
DRILLED PIERS					LIN. FT. = 39.26
CROSSHOLE SONIC LOGGING EA. = 1					
SID INSPECTION EA. = 1					
▲ CSL TUBES					LIN. FT. = 262.67

DRAWN BY: A.L. FIGUEROA DATE: 05-26-10
 CHECKED BY: A. SORSENGINH DATE: 10-15-10

13-JAN-2011 12:00
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PROJECT NO. B-4574
MACON COUNTY
 STATION: 13+26.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					SHEET NO.
SUBSTRUCTURE BENT NO. 1					S-18
REVISIONS					TOTAL SHEETS
NO.	BY:	DATE:	NO.	DATE:	23
1			3		
2			4		

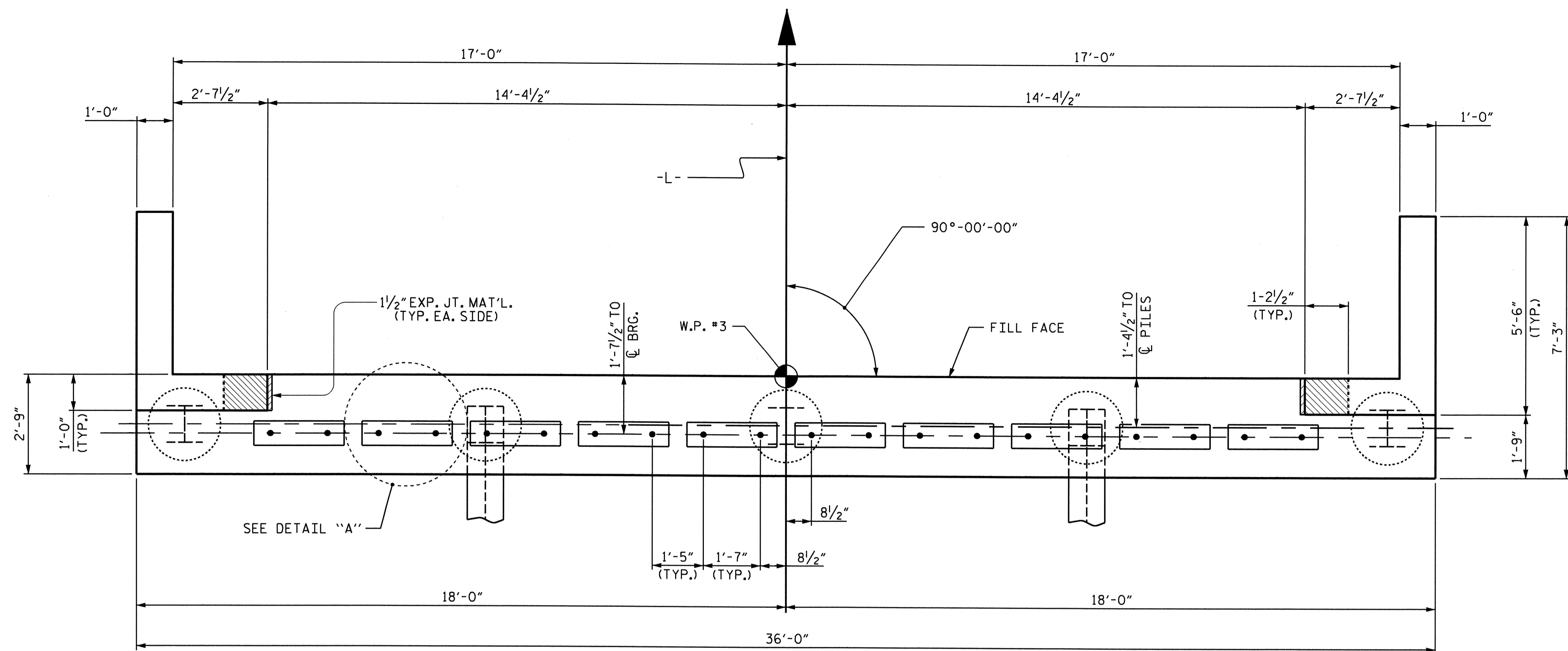
NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #6 DOWELS.

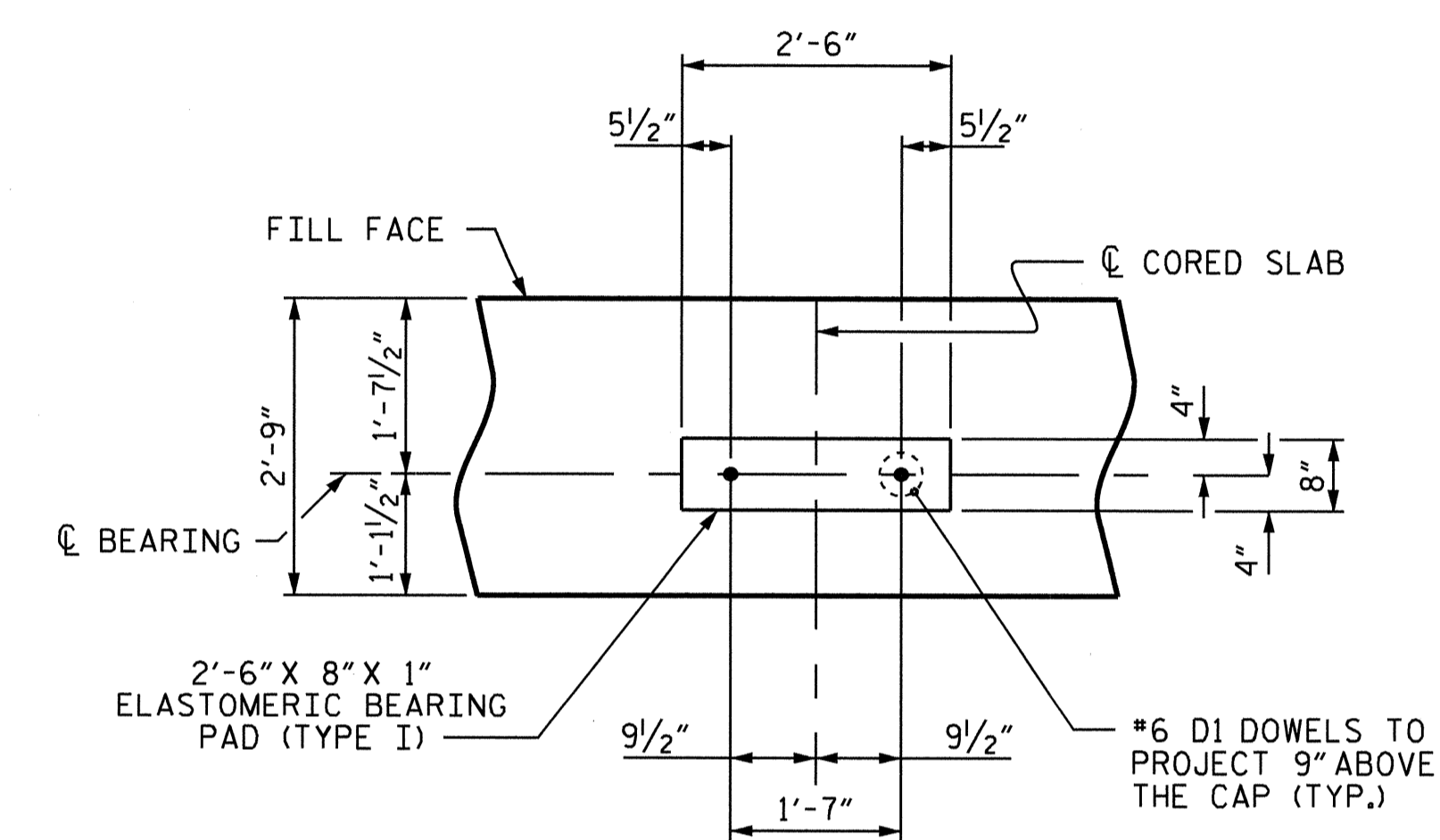
FOR SECTION A-A, SEE SHEET 2 OF 2.

FOR PILE SPLICE DETAILS, SEE SHEET 2 OF 2.

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

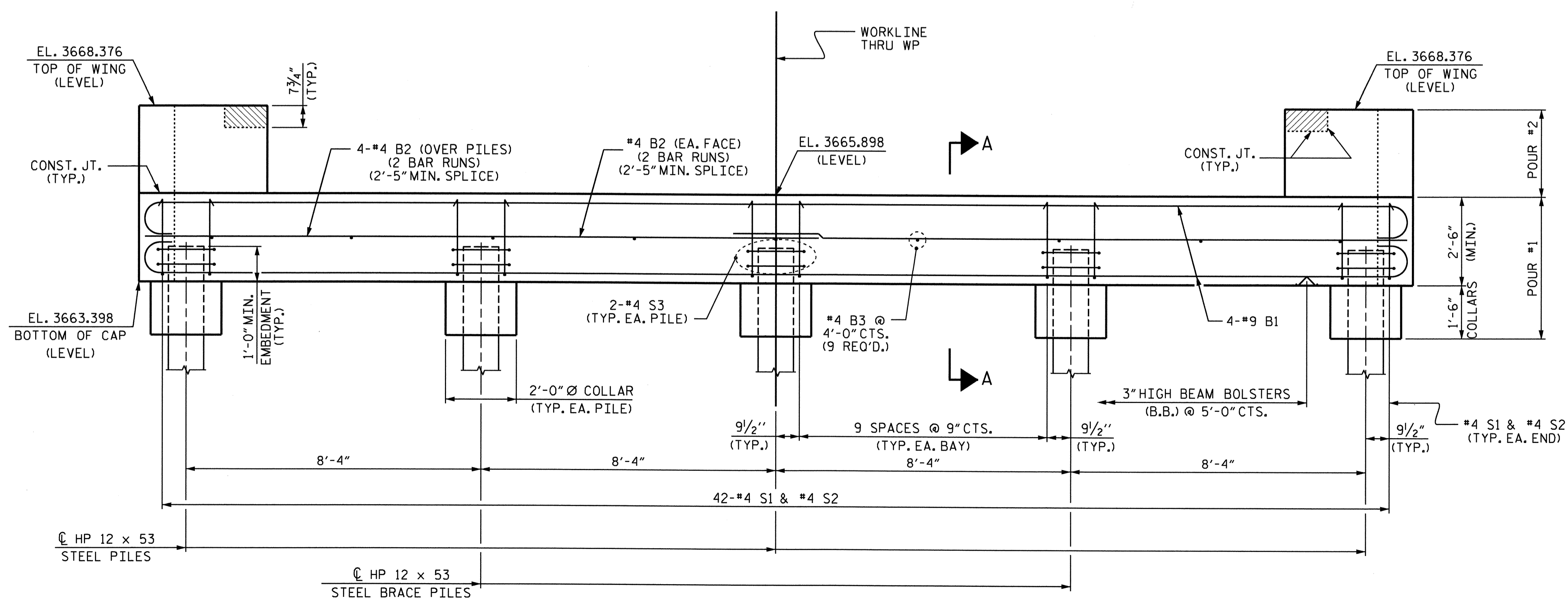


PLAN



DETAIL "A"

(TYP. EA. CORED SLAB UNIT)



ELEVATION

PROJECT NO. B-4574
MACON COUNTY
 STATION: 13+26.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT NO. 2

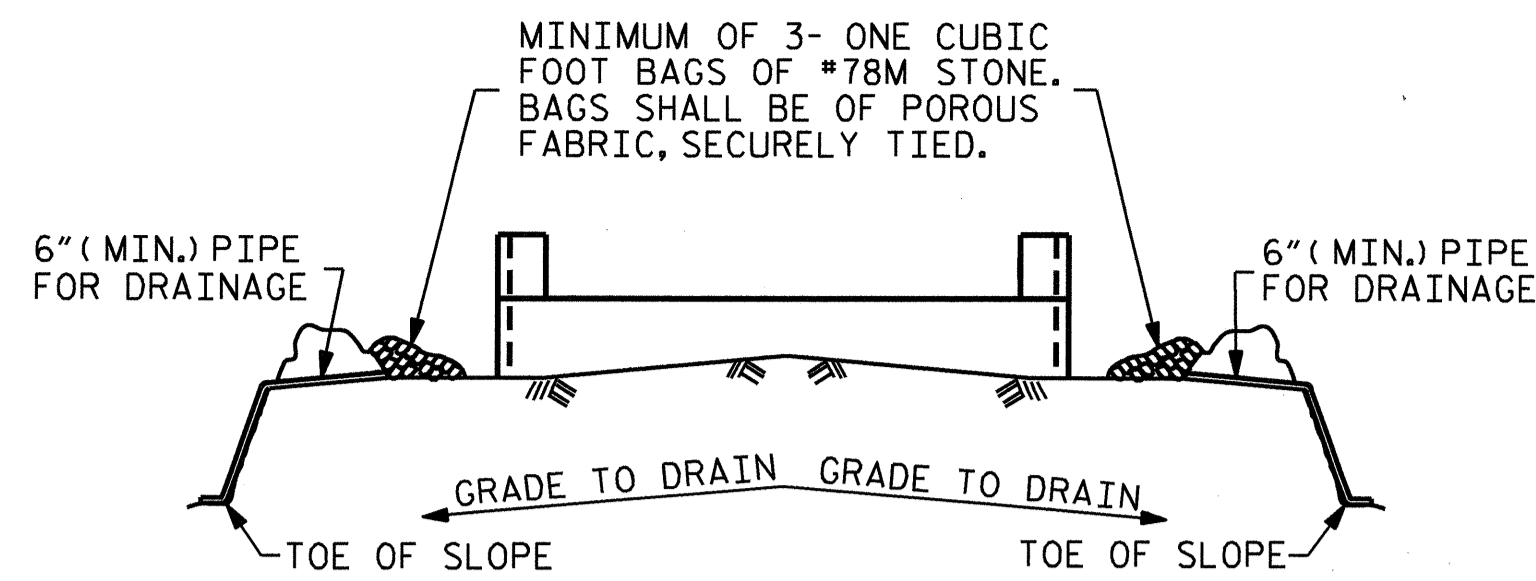


REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			2			S-19
2			4			TOTAL SHEETS 23

DRAWN BY: A.L. FIGUEROA DATE: 05-10-10
 CHECKED BY: A. SORSENGINH DATE: 06-24-10

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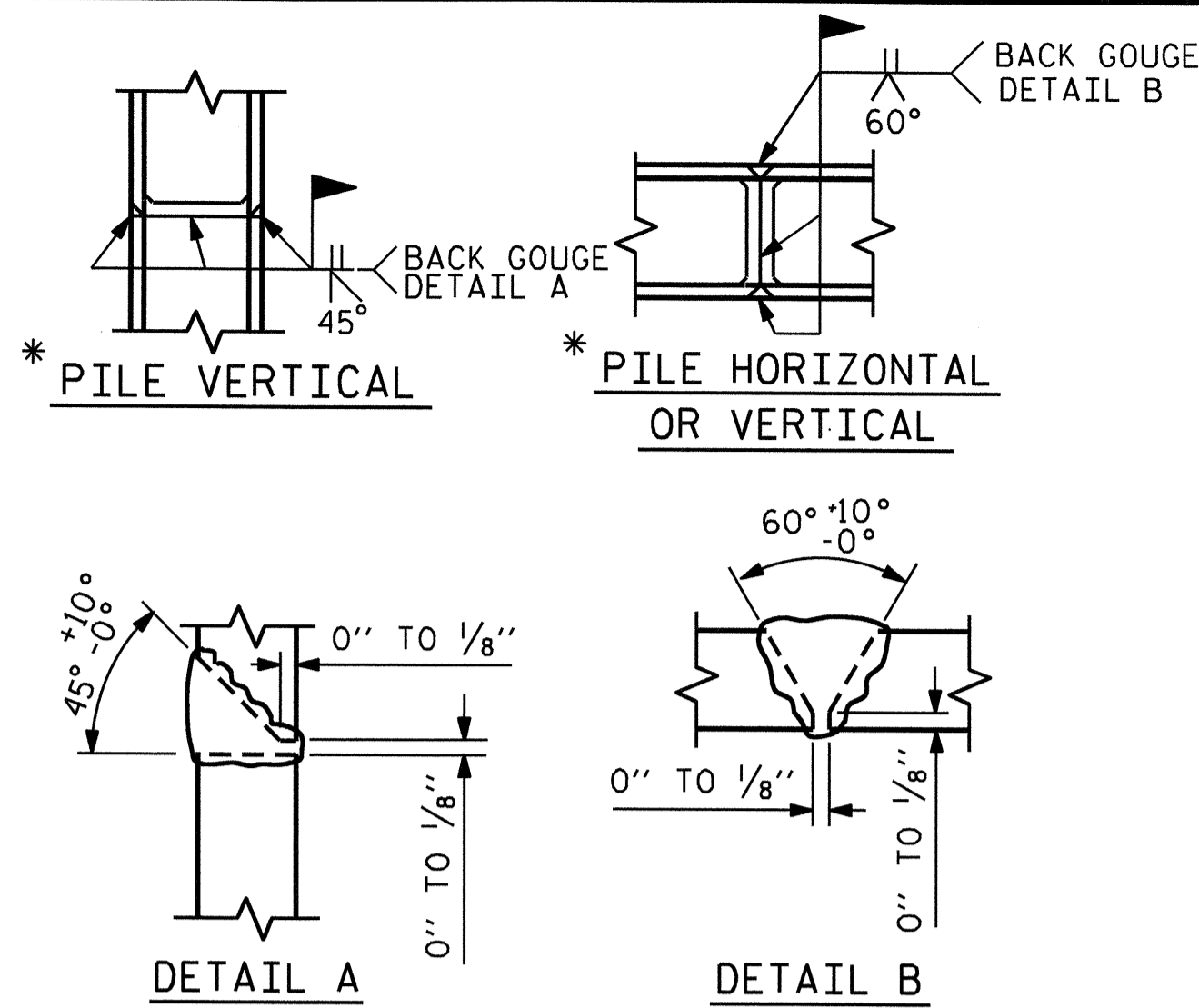


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

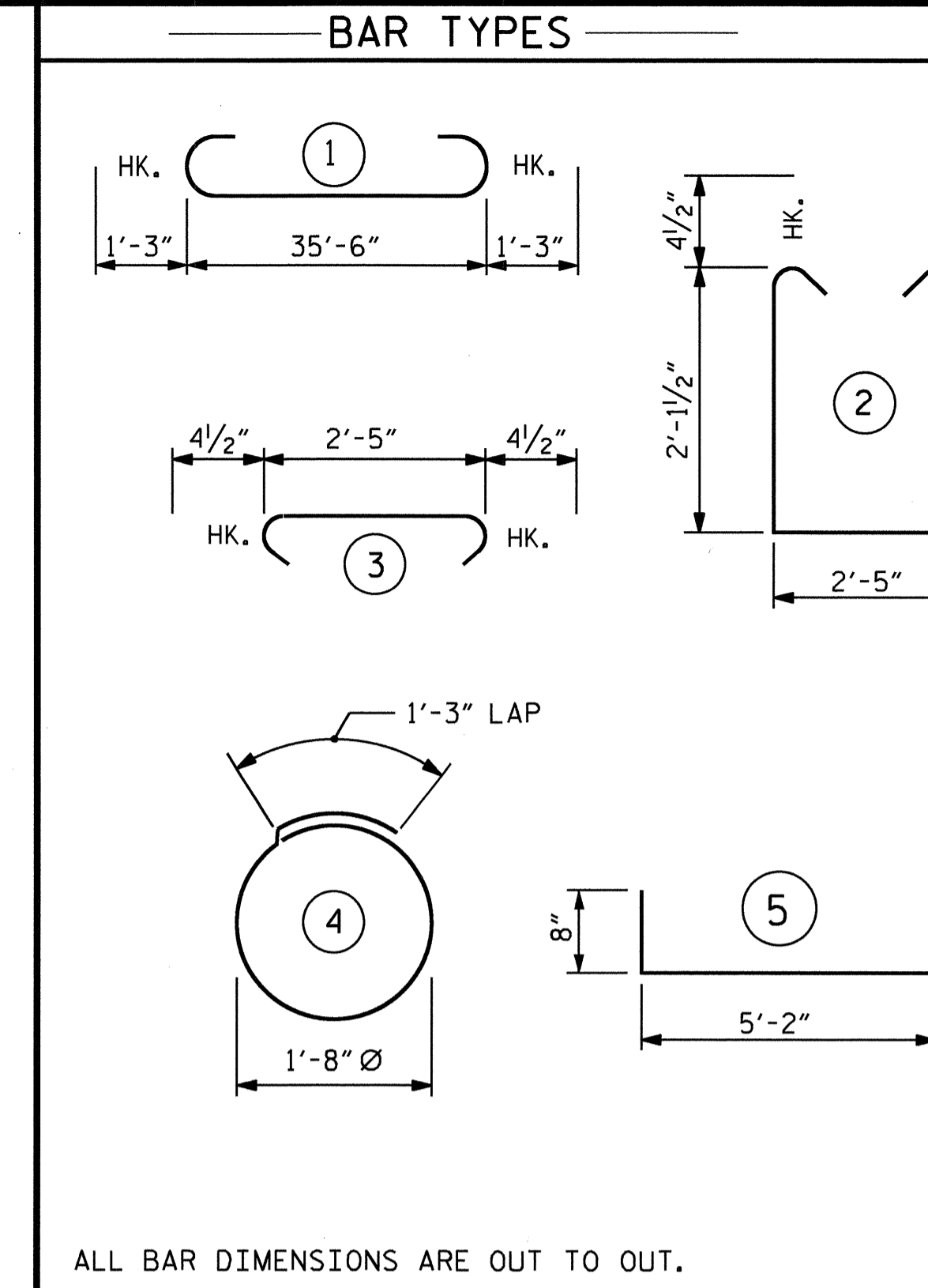
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

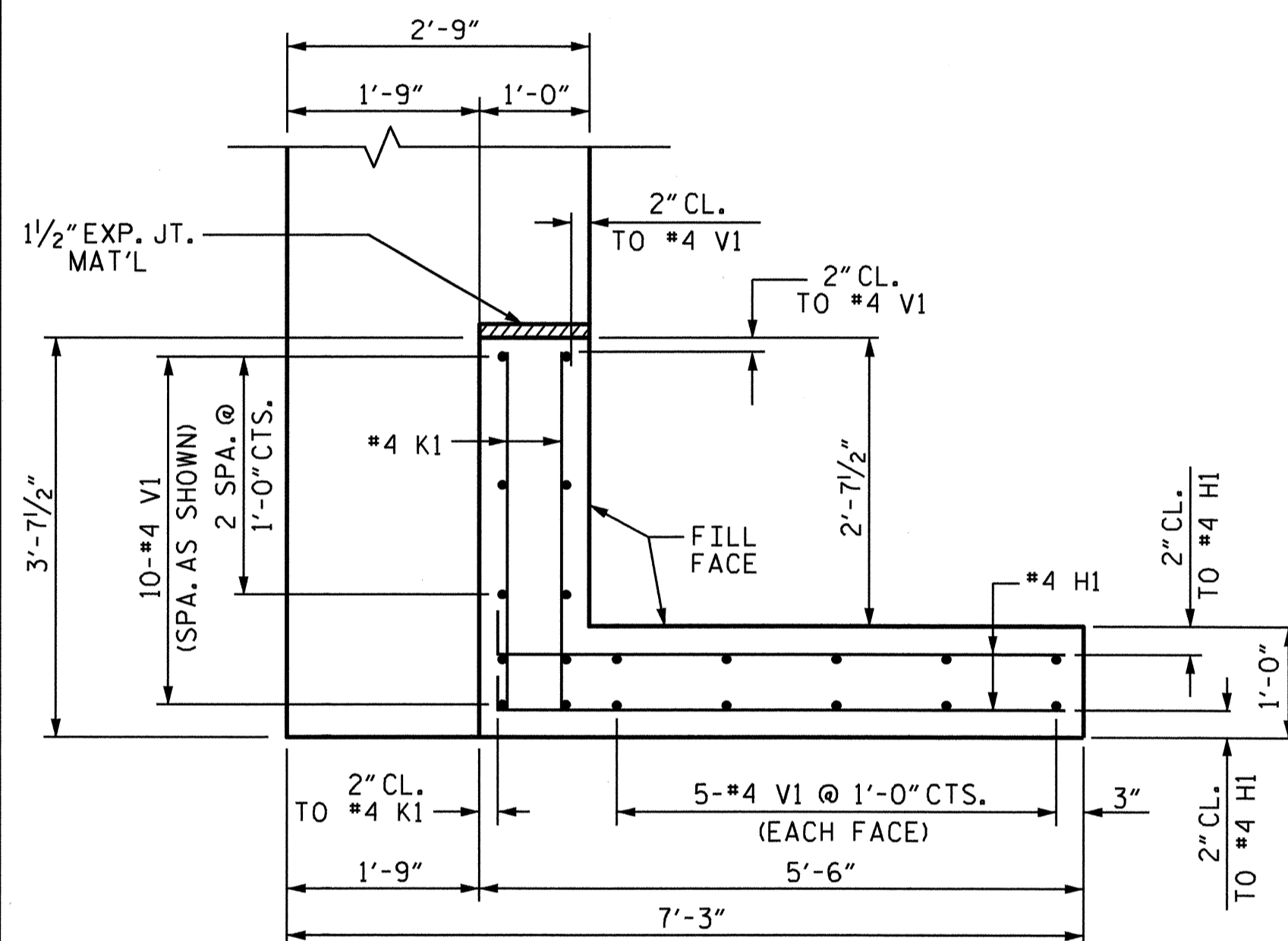


* POSITION OF PILE DURING WELDING.

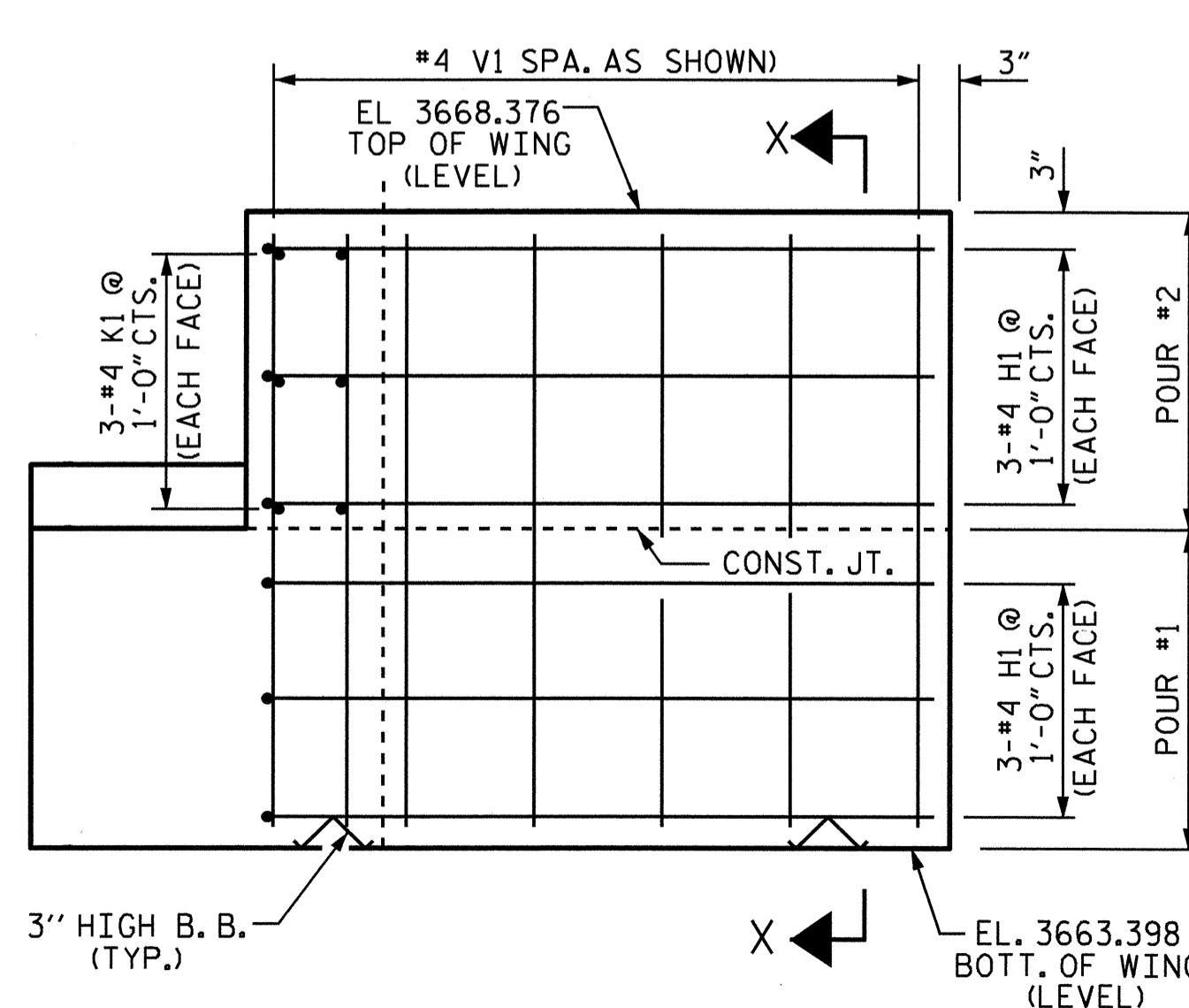
PILE SPLICE DETAILS



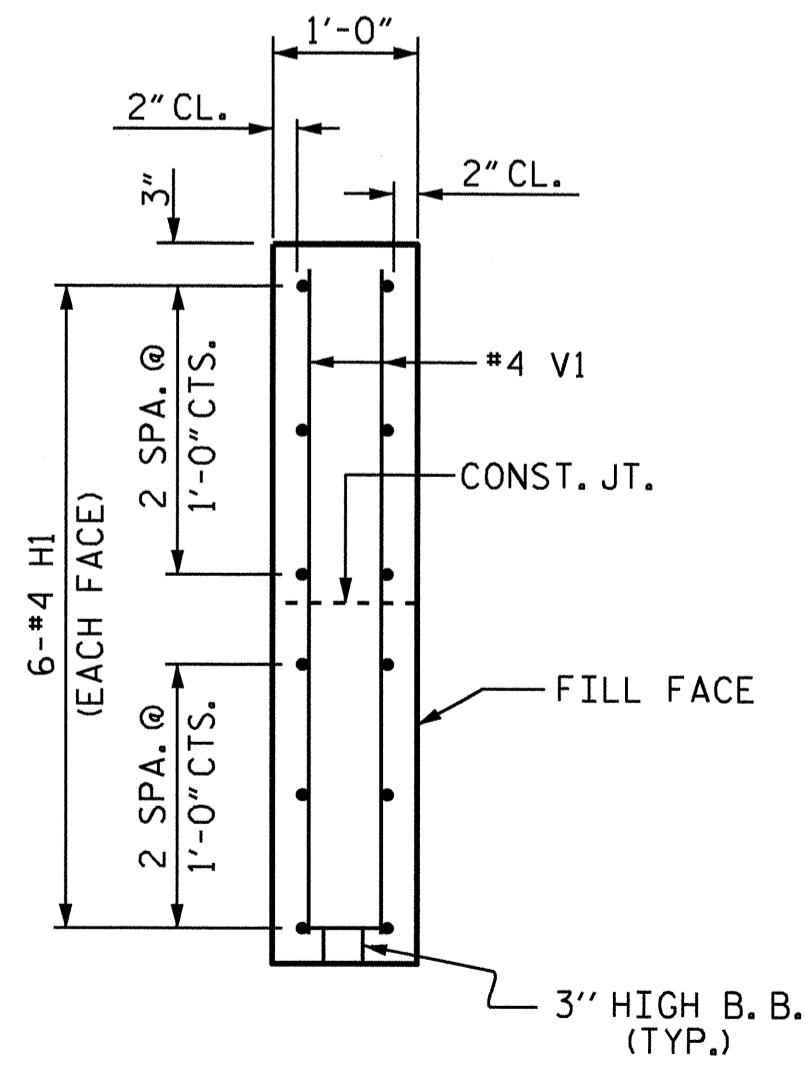
BILL OF MATERIAL					
END BENT NO. 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	38'-0"	1034
B2	12	#4	STR	19'-1"	153
B3	9	#4	STR	2'-5"	15
D1	20	#6	STR	1'-6"	45
H1	24	#4	5	5'-10"	94
K1	12	#4	STR	3'-3"	26
S1	42	#4	2	7'-5"	208
S2	42	#4	3	3'-2"	89
S3	10	#4	4	6'-6"	43
V1	40	#4	STR	4'-7"	122
REINFORCING STEEL					= 1,829 LBS.
CLASS A CONCRETE BREAKDOWN					
POUR #1: COLLARS, CAP & BOTTOM PART OF WINGS					10.9 C.Y.
POUR #2: UPPER PART OF WINGS					1.5 C.Y.
TOTAL CLASS A CONCRETE					12.4 C.Y.
HP 12 X 53 STEEL PILES					
NO. 5					LIN. FT. 140
STEEL PILE POINTS					
					5 EA.



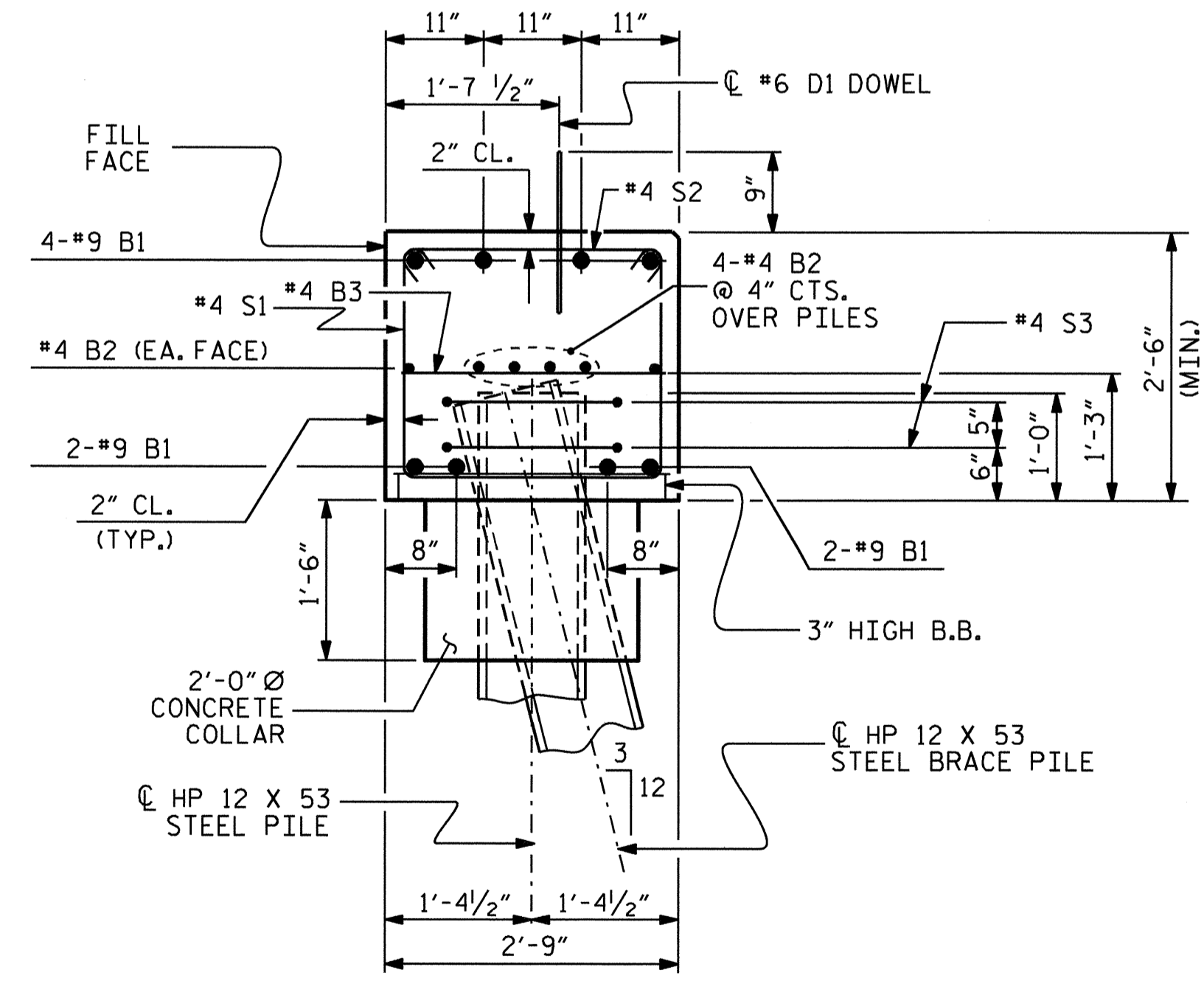
PLAN OF WING



ELEVATION OF WING



SECTION X-X



PROJECT NO. B-4574

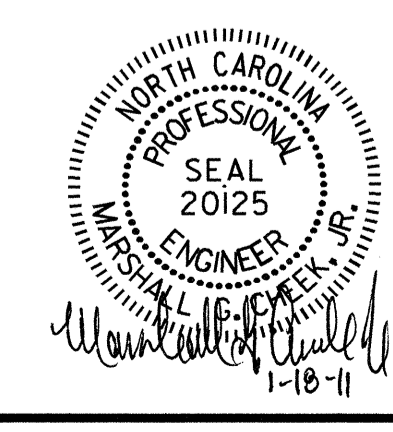
MACON COUNTY

STATION: 13+26.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT NO. 2

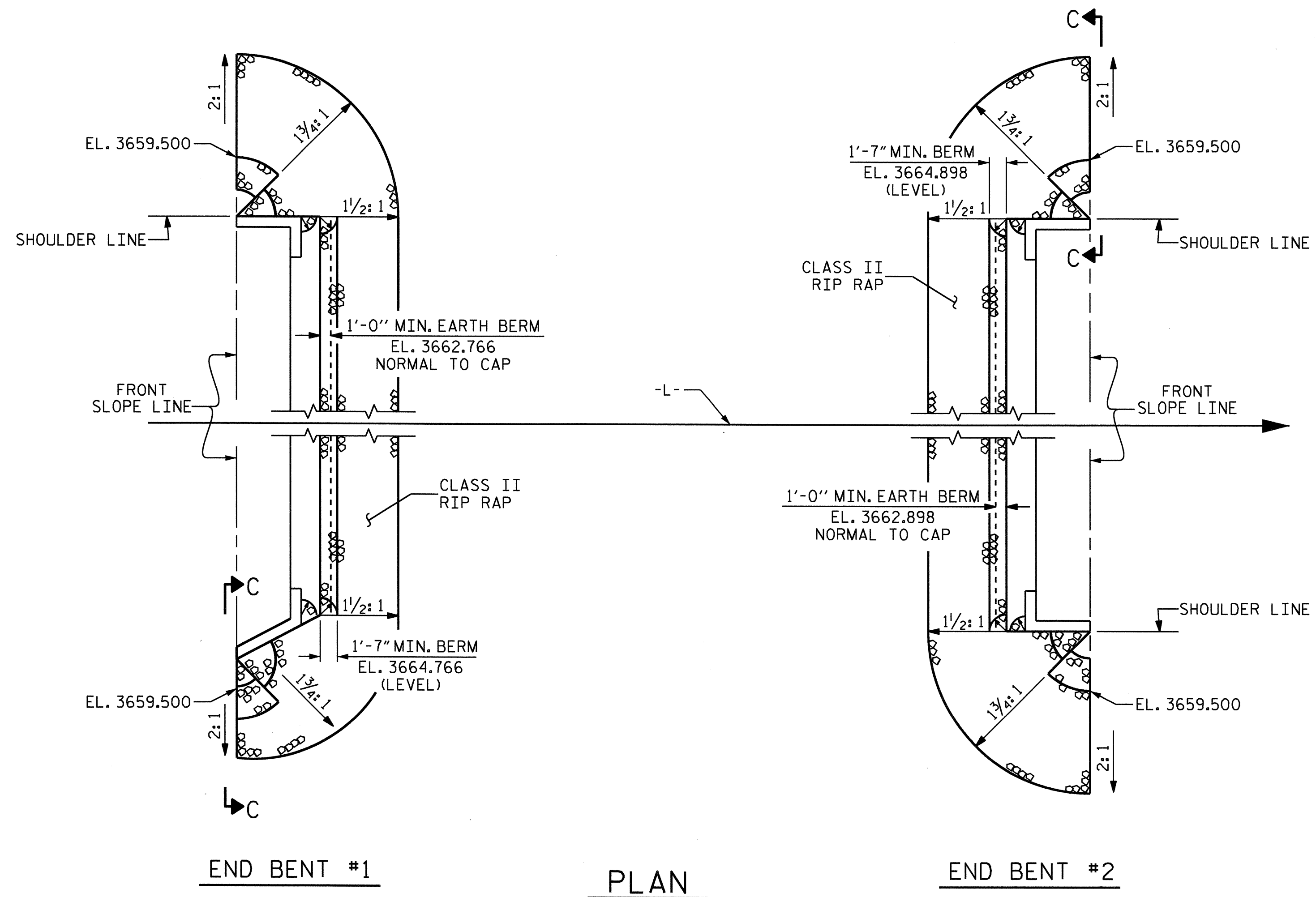


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CHECKED BY: A. SORSENGINH DATE: 06-24-10

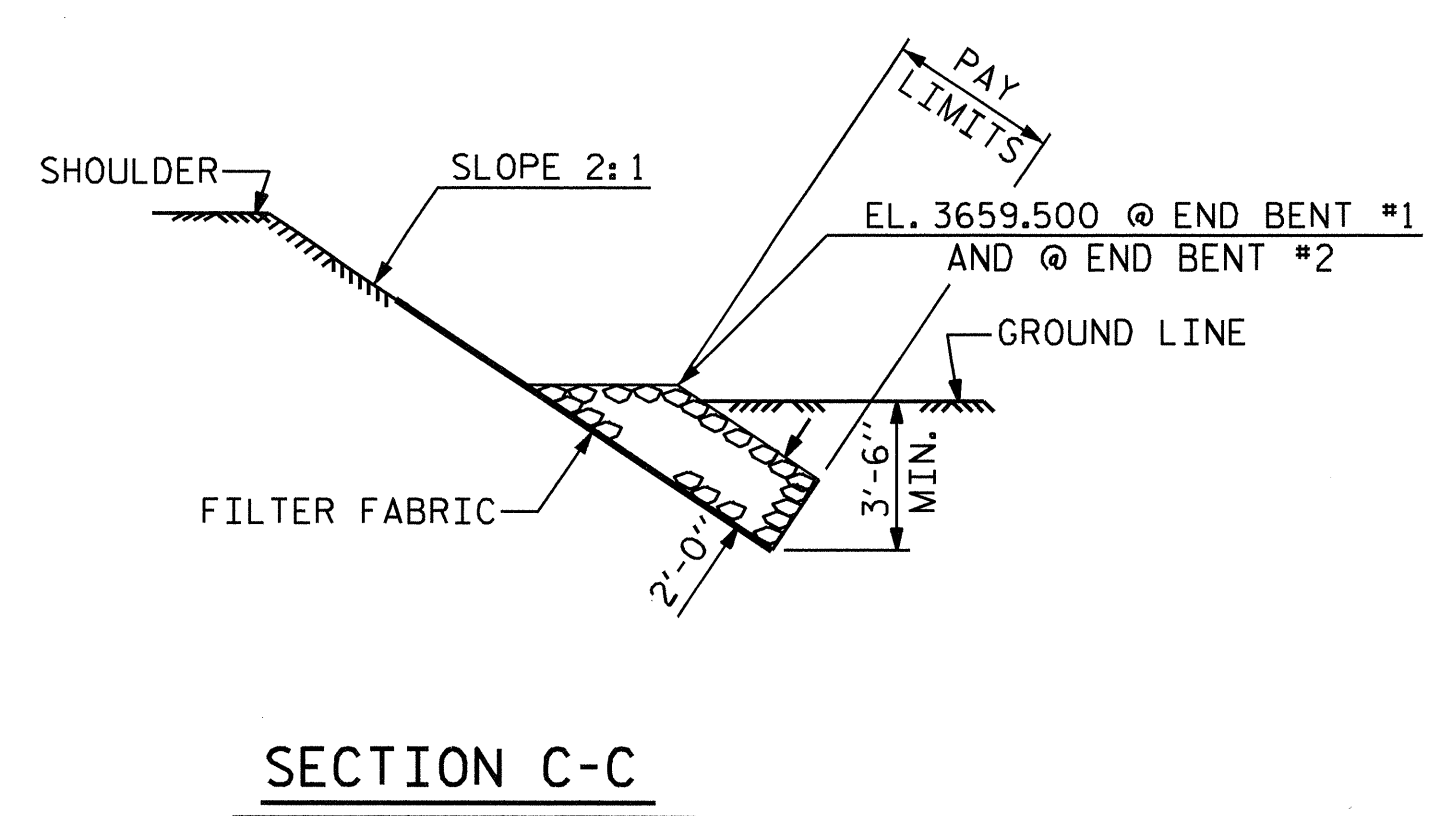
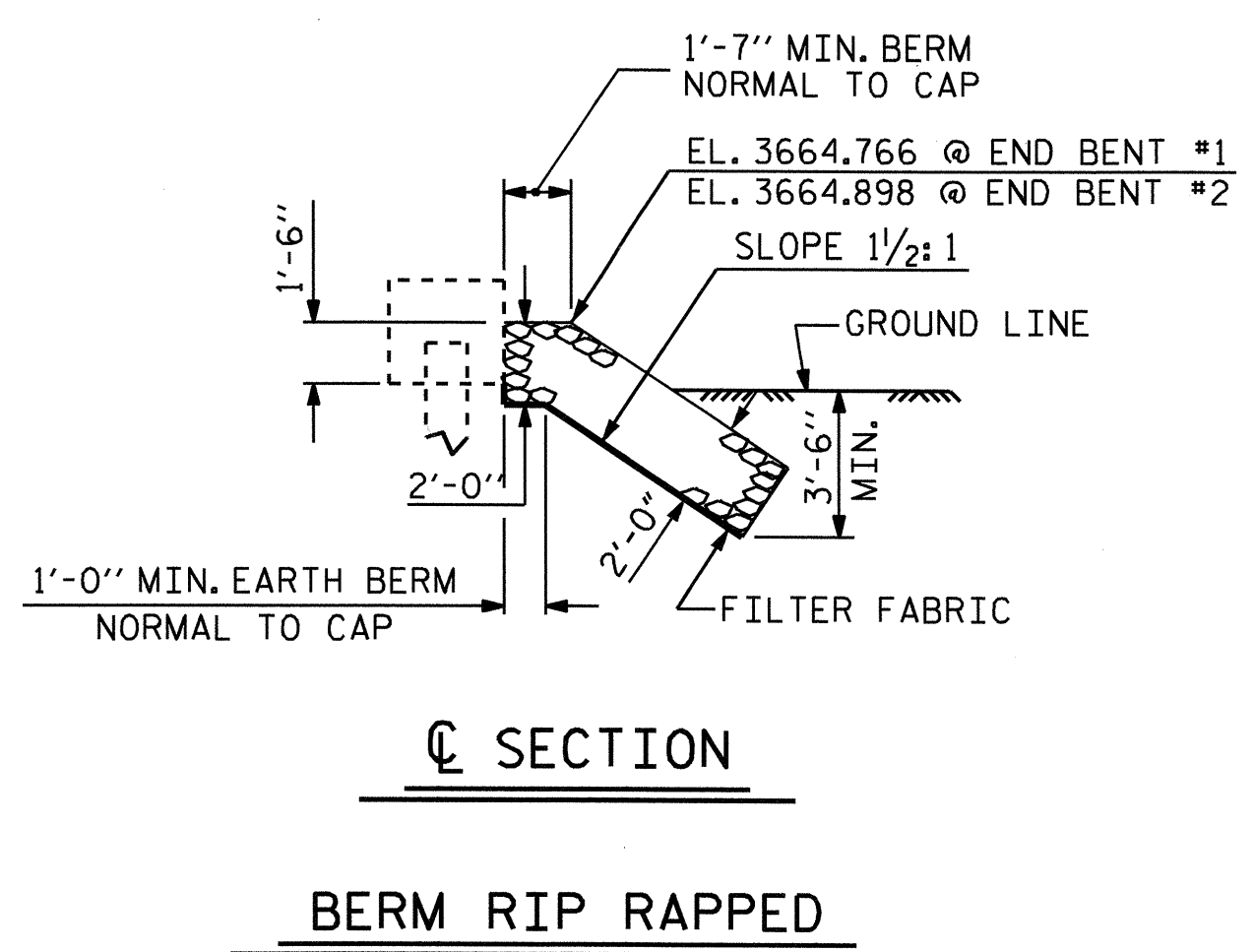
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REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS: 23



ESTIMATED QUANTITIES		
BRIDGE @ STA. 13+26.00 -L-	RIP RAP CLASS II	FILTER FABRIC FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	148	164
END BENT 2	149	166
TOTAL	297	330

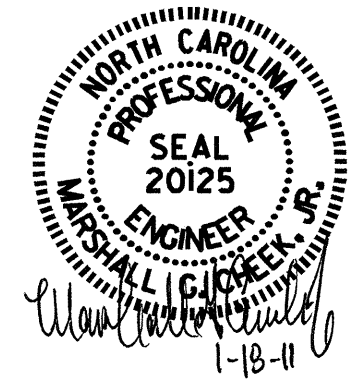


PROJECT NO. B-4574
MACON COUNTY
 STATION: 13+26.00 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

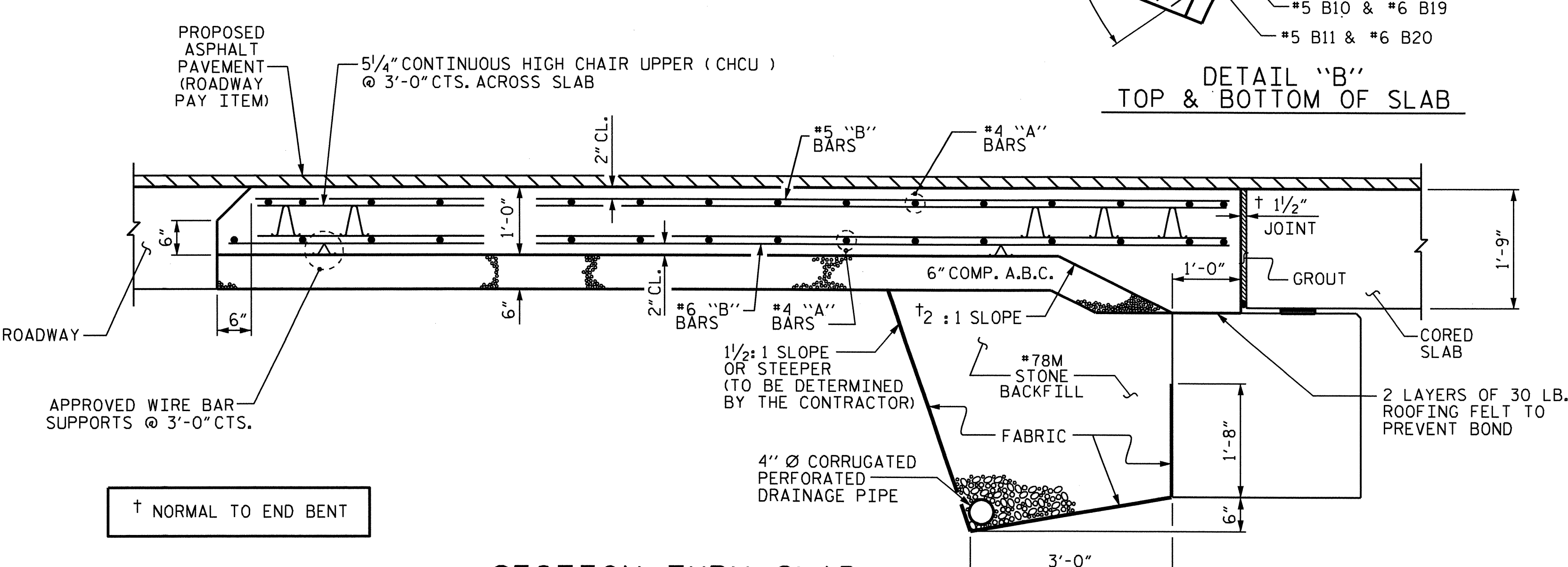
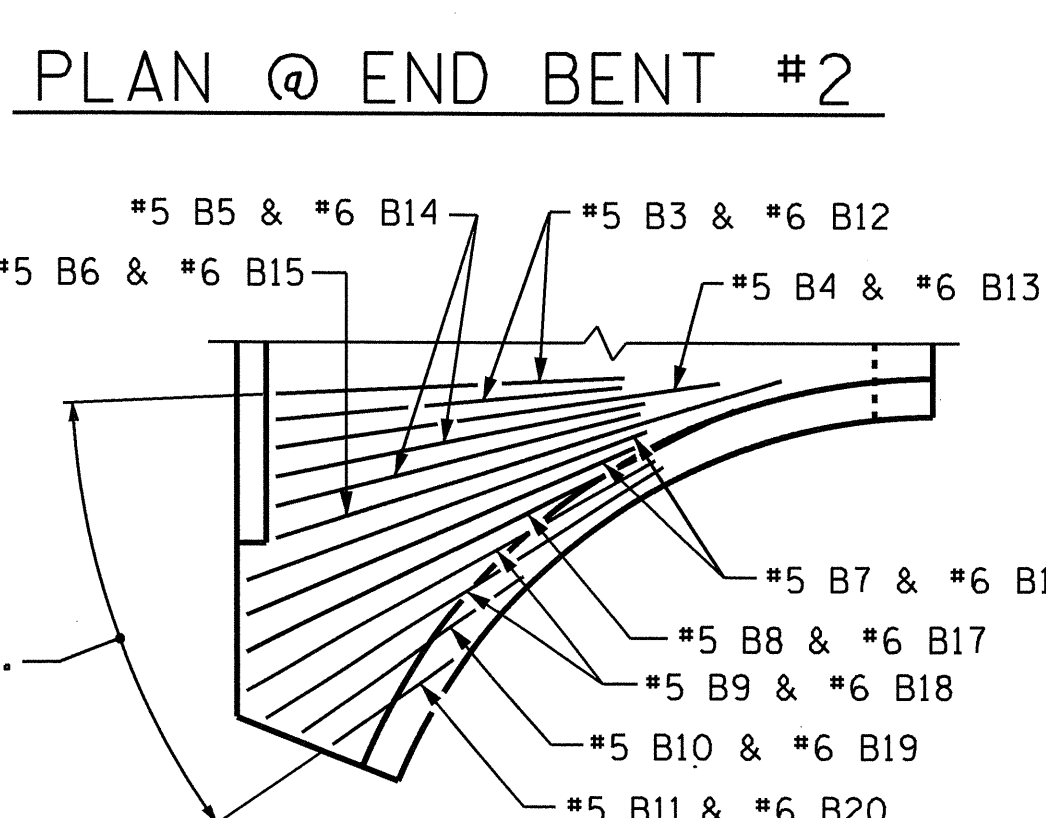
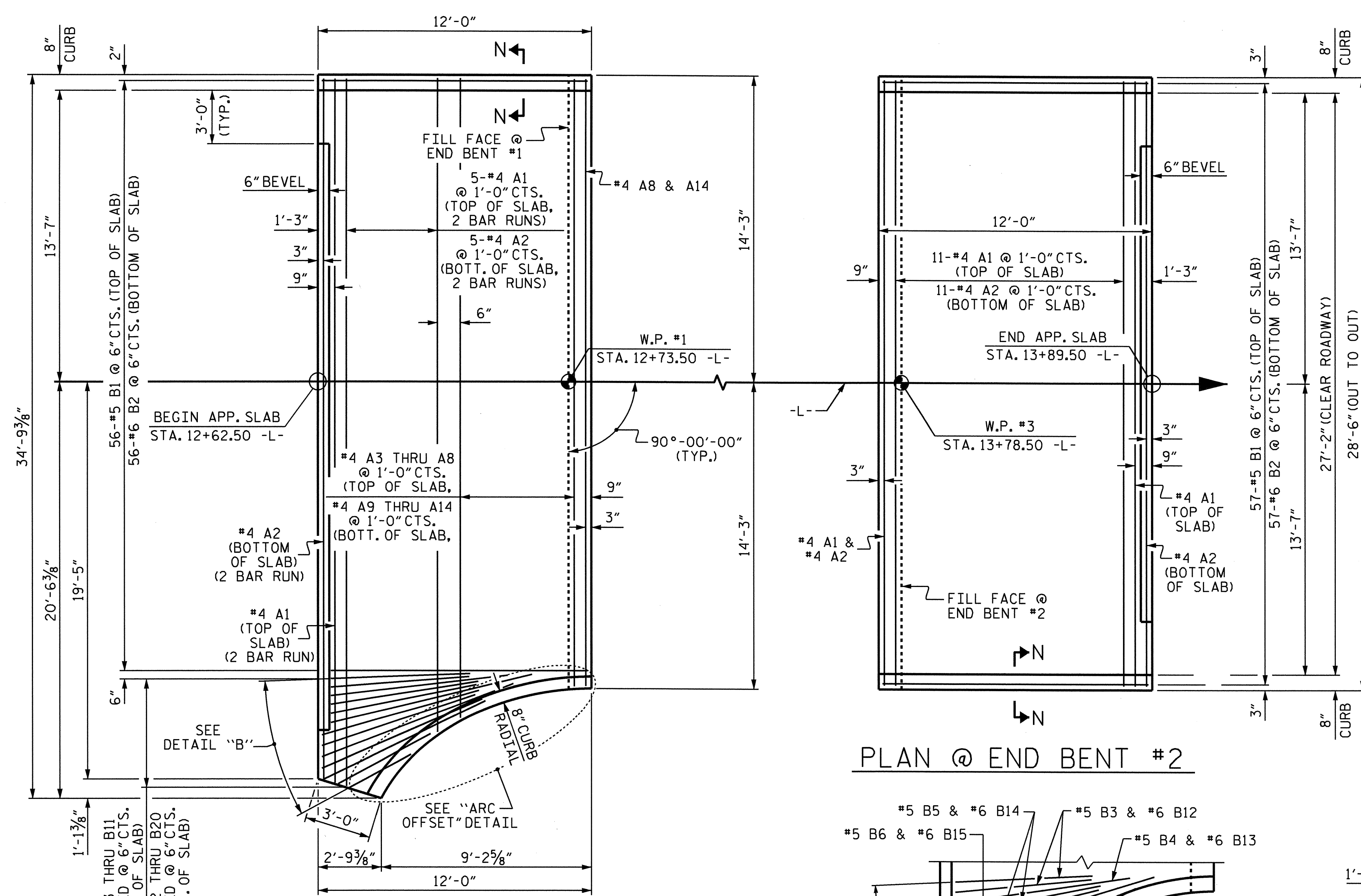
— RIP RAP DETAILS —

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			23



ASSEMBLED BY : A. SORSENGINH DATE : 11/9/10
 CHECKED BY : D. HODGE DATE : 11/10
 DRAWN BY : FCJ 2/88 REV. 8/16/99 RWW/LES
 CHECKED BY : ARB 8/88 REV. 10/17/00 RWW/LES
 REV. 5/1/06 TLA/GM

06-DEC-2010 08:26
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NOTES

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

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

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

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

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

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

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

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

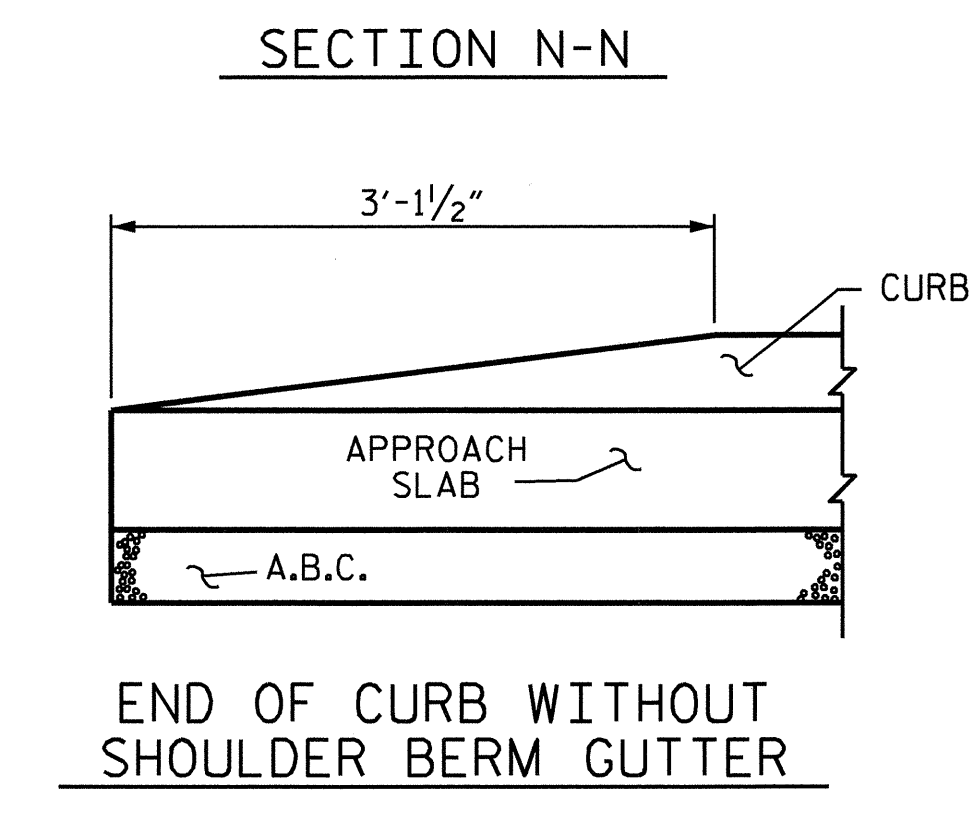
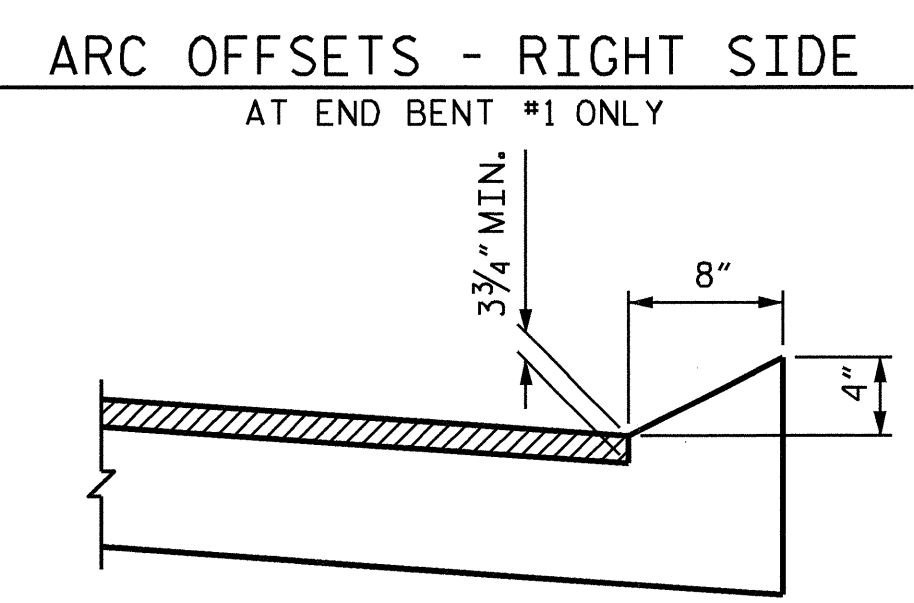
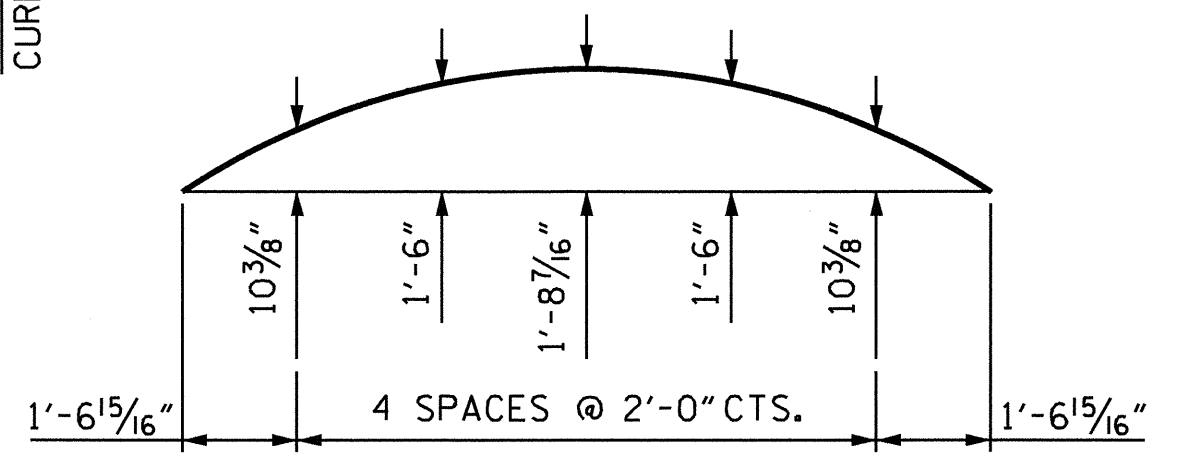
THE CONTRACTOR MAY USE 4" TYPE B-25.0B ASPHALT CONCRETE BASE COURSE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE BASE COURSE SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB, AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB.

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

FOR JOINT DETAILS, SEE "PRESTRESSED CONCRETE CORED SLAB UNIT" SHEETS.

THE JOINT AT THE END BENT SHALL BE GROUTED AS SOON AS PRACTICAL AFTER THE CONSTRUCTION OF THE APPROACH SLABS.

APPROACH SLAB GROOVING IS NOT REQUIRED.



BILL OF MATERIAL

APPROACH SLAB AT EB #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	12	#4	STR	18'-4"	147
*A3	1	#4	STR	29'-11"	20
*A4	1	#4	STR	29'-4"	20
*A5	1	#4	STR	28'-10"	19
*A6	1	#4	STR	28'-6"	19
*A7	1	#4	STR	28'-4"	19
*A8	2	#4	STR	28'-2"	38
A2	12	#4	STR	18'-3"	146
A9	1	#4	STR	29'-11"	20
A10	1	#4	STR	29'-4"	20
A11	1	#4	STR	28'-10"	19
A12	1	#4	STR	28'-6"	19
A13	1	#4	STR	28'-4"	19
A14	2	#4	STR	28'-2"	38
*B1	56	#5	STR	11'-2"	652
*B3	2	#5	STR	6'-0"	13
*B4	1	#5	STR	6'-6"	7
*B5	2	#5	STR	7'-9"	16
*B6	1	#5	STR	9'-1"	9
*B7	2	#5	STR	7'-4"	15
*B8	1	#5	STR	9'-4"	10
*B9	2	#5	STR	8'-1"	17
*B10	1	#5	STR	4'-8"	5
*B11	1	#5	STR	2'-6"	3
B2	56	#6	STR	11'-8"	981
B12	2	#6	STR	6'-0"	18
B13	1	#6	STR	6'-6"	10
B14	2	#6	STR	7'-9"	23
B15	1	#6	STR	9'-1"	14
B16	2	#6	STR	7'-4"	22
B17	1	#6	STR	9'-4"	14
B18	2	#6	STR	8'-1"	24
B19	1	#6	STR	4'-8"	7
B20	1	#6	STR	2'-6"	4

REINFORCING STEEL	LBS.	1398
*EPOXY COATED REINFORCING STEEL	LBS.	1029
CLASS AA CONCRETE	C. Y.	15.9

APPROACH SLAB AT EB #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	13	#4	STR	28'-2"	245
A2	13	#4	STR	28'-2"	245
*B1	57	#5	STR	11'-2"	664
B2	57	#6	STR	11'-8"	999

REINFORCING STEEL	LBS.	1244
*EPOXY COATED REINFORCING STEEL	LBS.	909
CLASS AA CONCRETE	C. Y.	14.2

* THESE BARS ARE EPOXY COATED

PROJECT NO. B-4574
MACON COUNTY
 STATION: 13+26.00 -L-
 SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

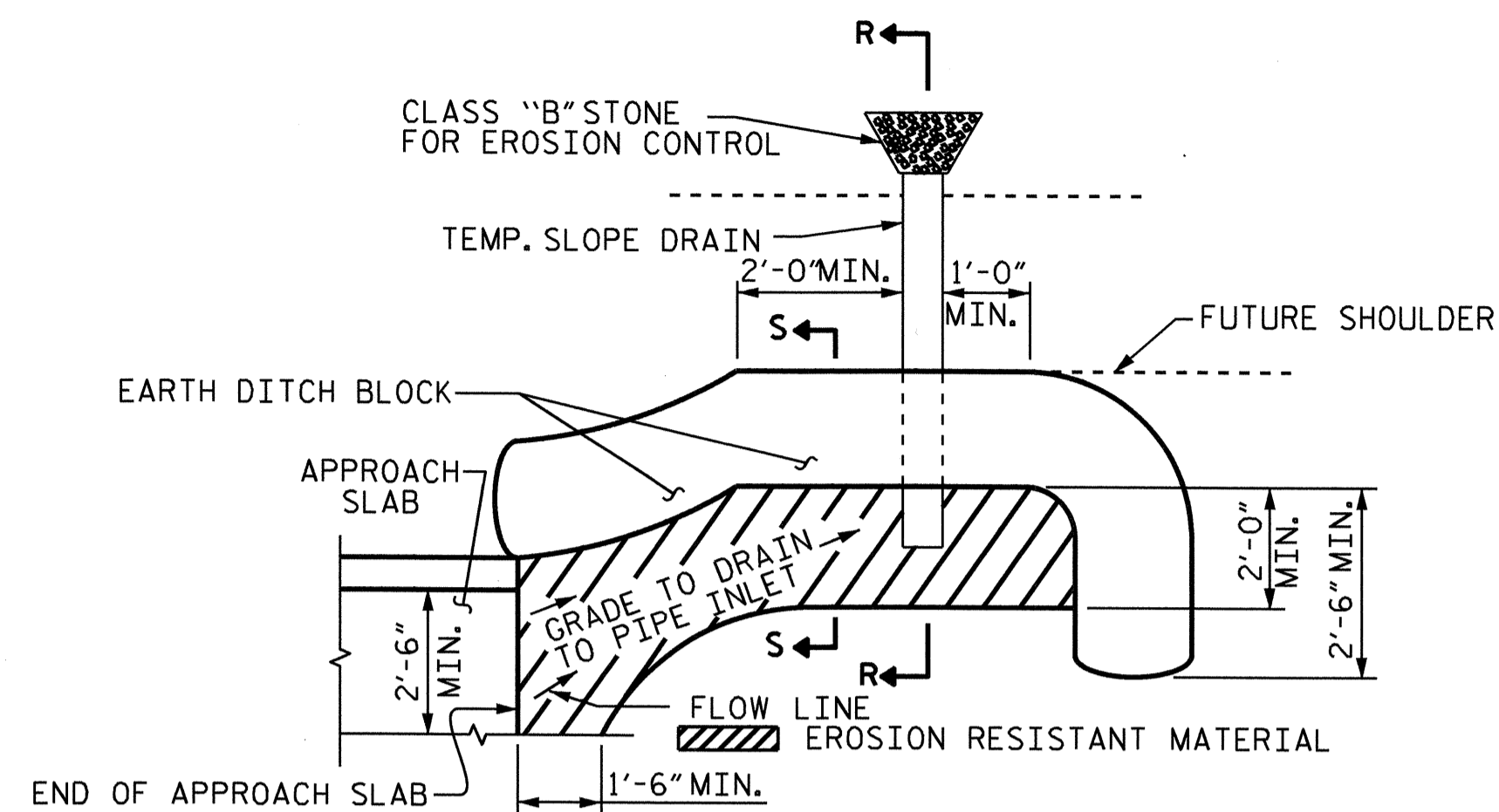
BRIDGE APPROACH SLAB FOR PRESTRESSED CONCRETE CORED SLAB UNIT (SUB-REGIONAL TIER)

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

TOTAL SHEETS: 23

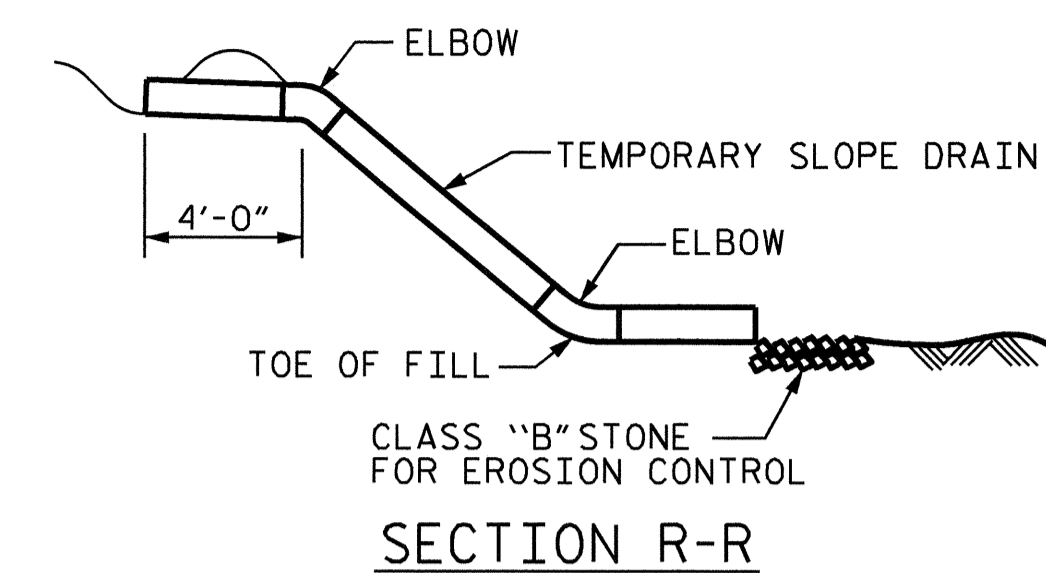
ASSEMBLED BY: A. SORSENGINH DATE: 11/10
 CHECKED BY: M.G. CHEEK DATE: 11/10
 DRAWN BY: KMM 3-08
 CHECKED BY: GM 3-08

13-JAN-2011 12:00
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 DAHODGE

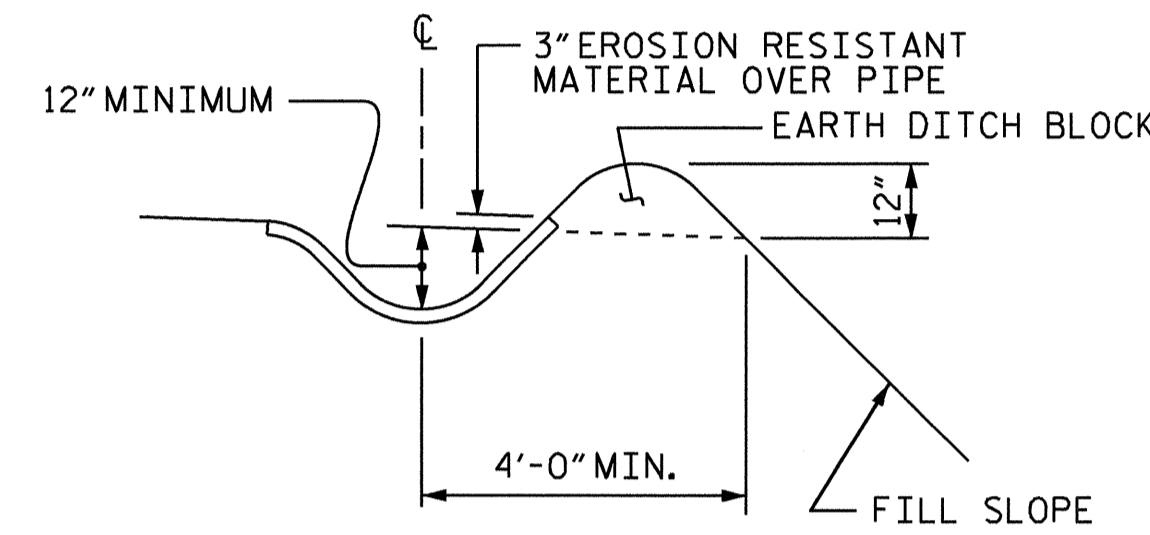


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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



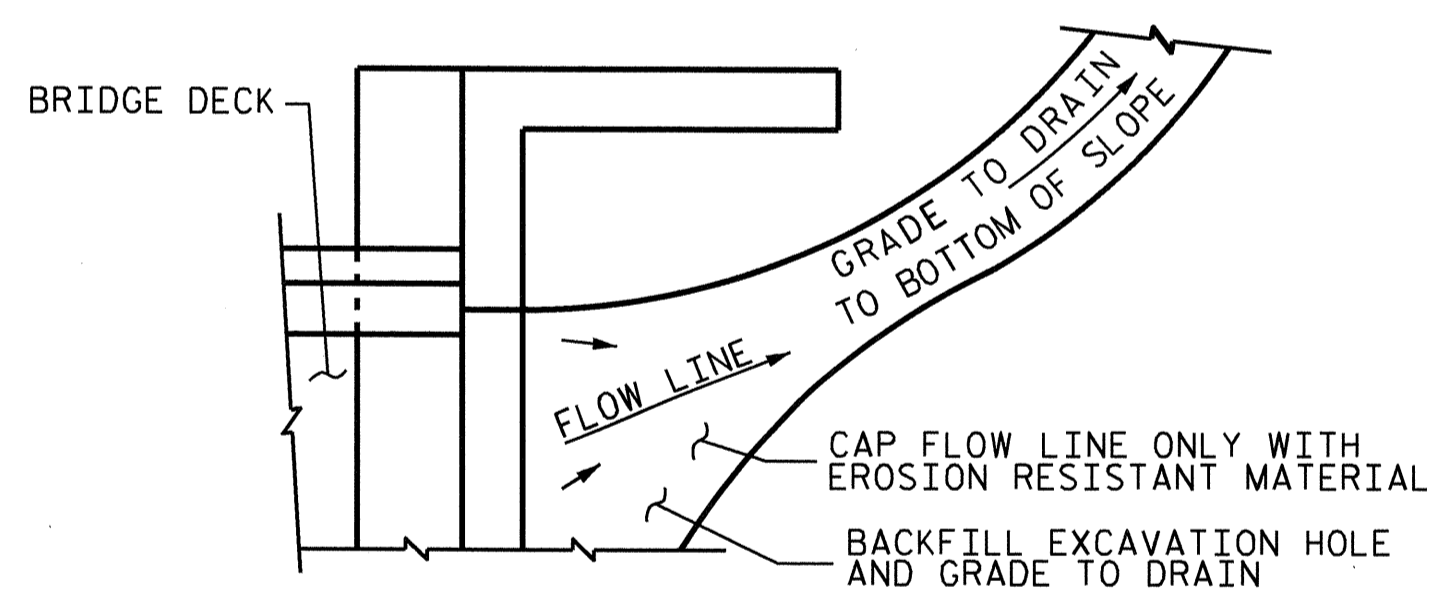
SECTION R-R



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



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

TEMPORARY DRAINAGE DETAIL

PROJECT NO. B-4574
MACON COUNTY
 STATION: 13+26.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD

BRIDGE APPROACH SLAB DETAILS



ASSEMBLED BY :	A. SORSENGINH	DATE :	11/9/10
CHECKED BY :	M.G. CHEEK	DATE :	11/10/10
DRAWN BY :	FCJ 11/88	REV. 10/17/00	RWW/JLE
CHECKED BY :	ARB 11/88	REV. 5/7/03	RWW/JTE
		REV. 5/1/06RR	MAA/KMM

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

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

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

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN