

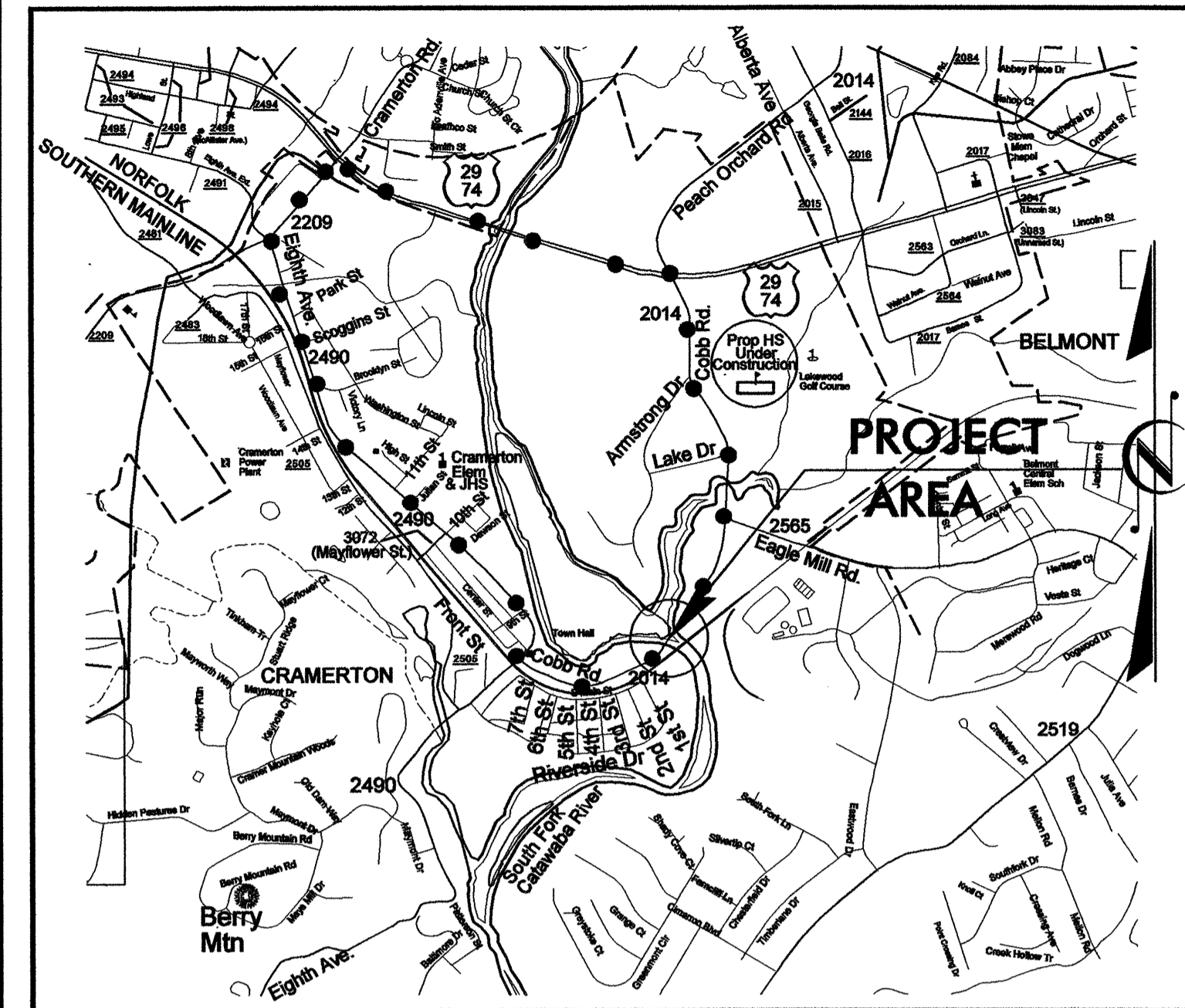
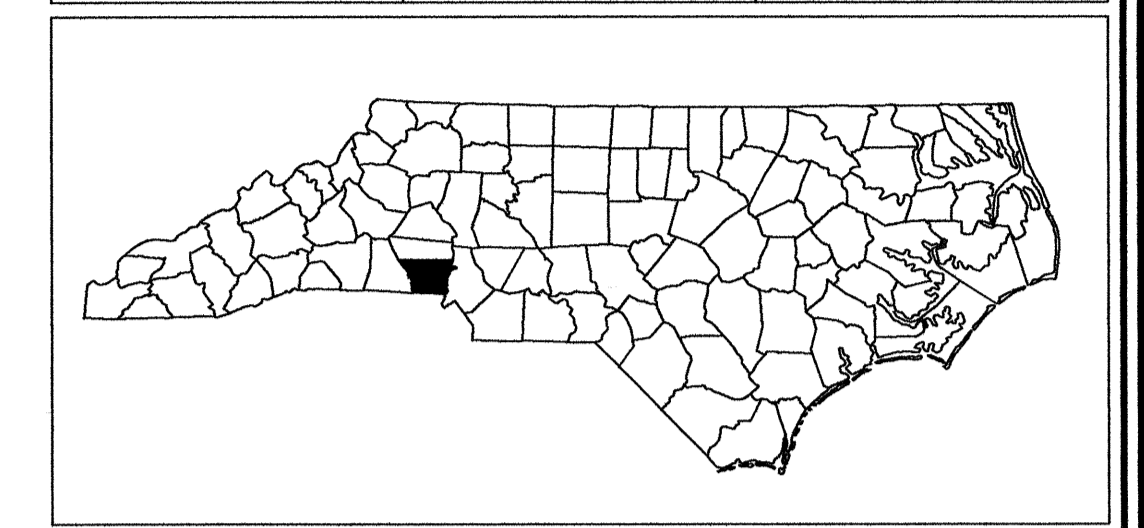
09/28/09
 5/10/2012 8:57:01 AM User: birmingham
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 CONTRACT: C203014
 TIP PROJECT: B-4752

STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

GASTON COUNTY

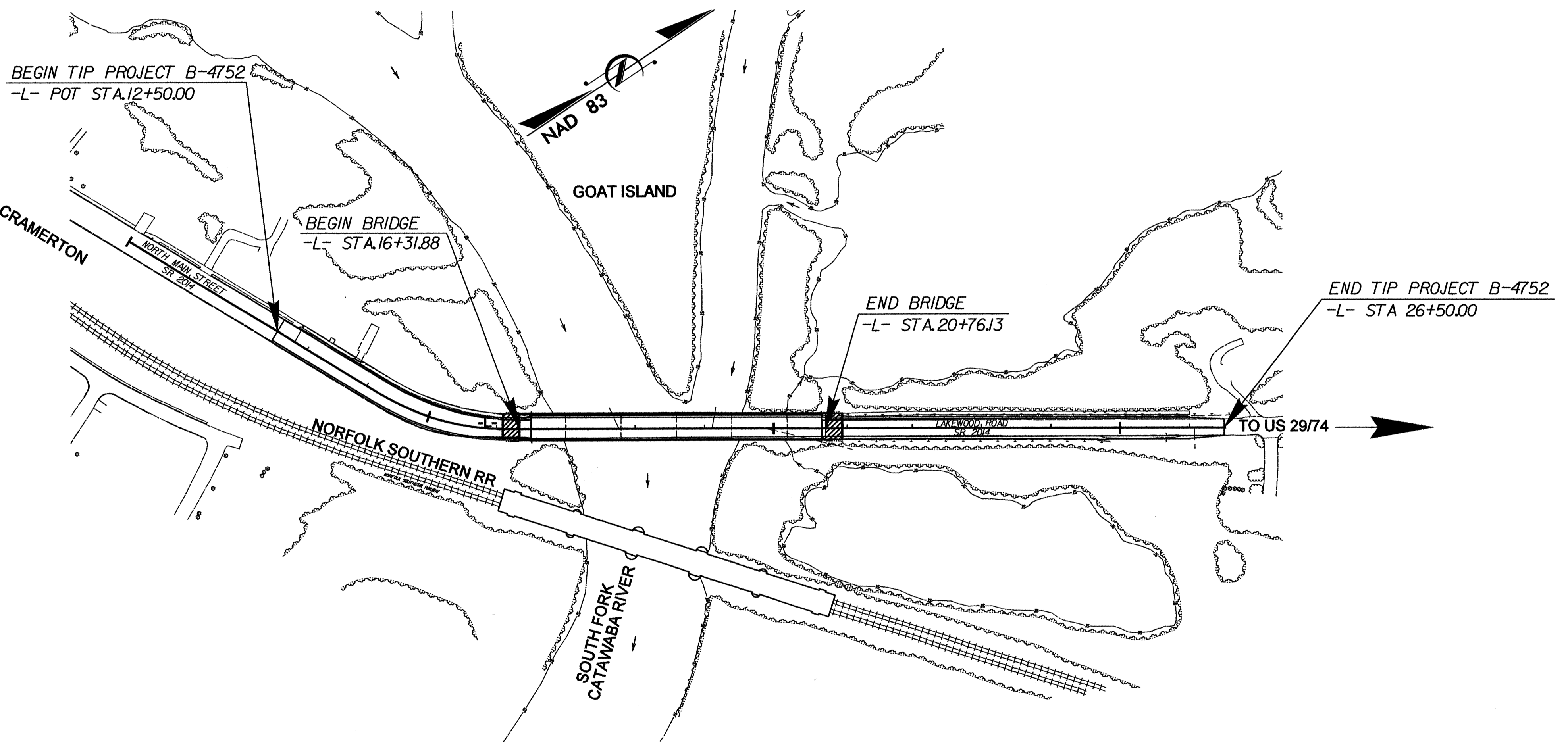
LOCATION: BRIDGE NO. 6 ON SR 2014 (MAIN STREET)
 OVER SOUTH FORK CATAWBA RIVER
 TYPE OF WORK: GRADING, PAVING, DRAINAGE AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4752		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
38524.1.1	BRSTP-2014(3)	PE	
38524.2.1	BRSTP-2014(3)	R/W, UTIL	

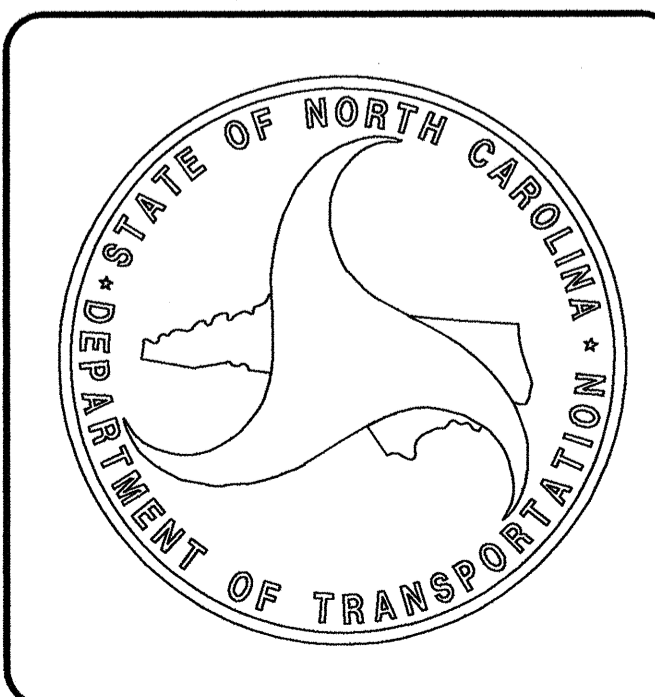


VICINITY MAP

OFFSITE DETOUR



STRUCTURES



DESIGN DATA

ADT 2010 = 4500
 ADT 2035 = 7500
 DHV = 10%
 D = 70%
 T = 3% *
 V = 40 MPH
 * TTST 1% DUAL 2%

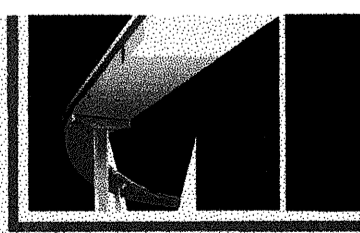
FUNCTIONAL CLASSIFICATION:
 MINOR ARTERIAL

SUBREGIONAL TIER DESIGN

PROJECT LENGTH

LENGTH OF ROADWAY F.A. PROJECT BRSTP-2014(3) = 0.181 MI.
 LENGTH OF STRUCTURE F.A. PROJECT BRSTP-2014(3) = 0.084 MI.
 TOTAL LENGTH OF F.A. PROJECT BRSTP-2014(3) = 0.265 MI.

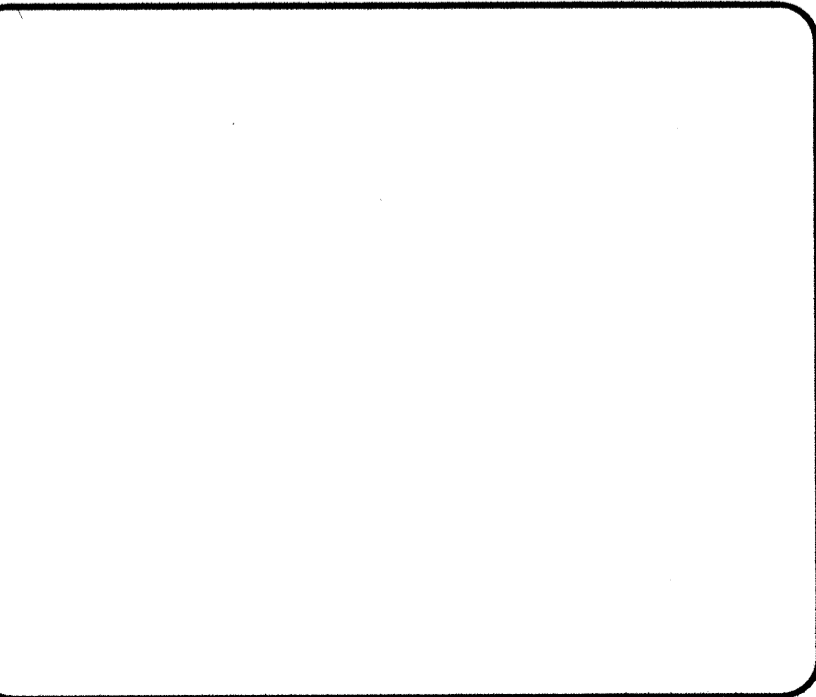
Prepared in the Office of:



MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER : P-0671

2012 STANDARD SPECIFICATIONS

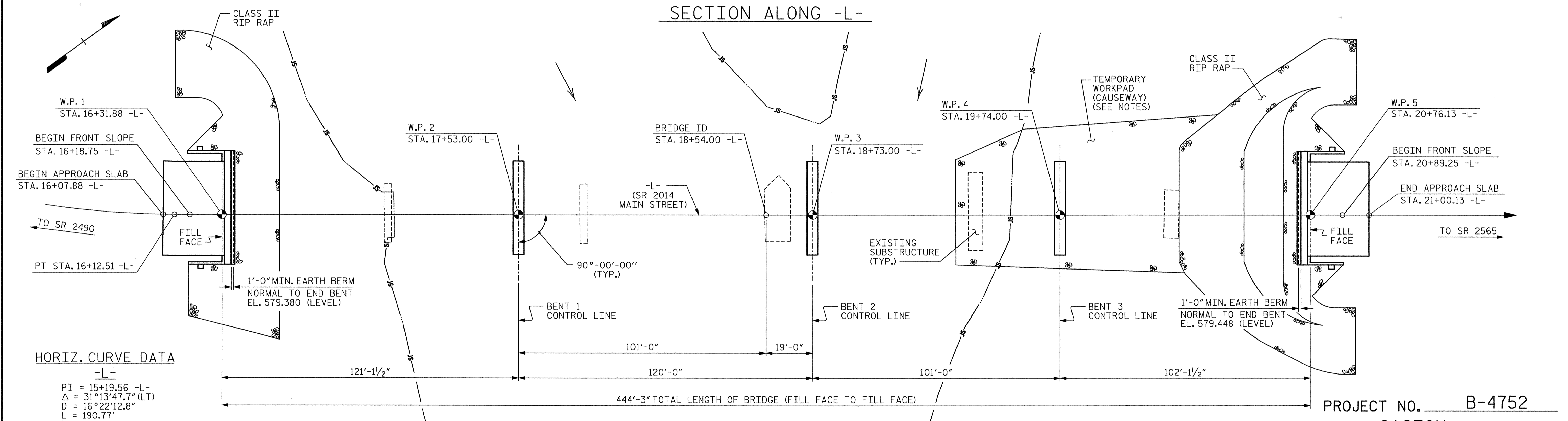
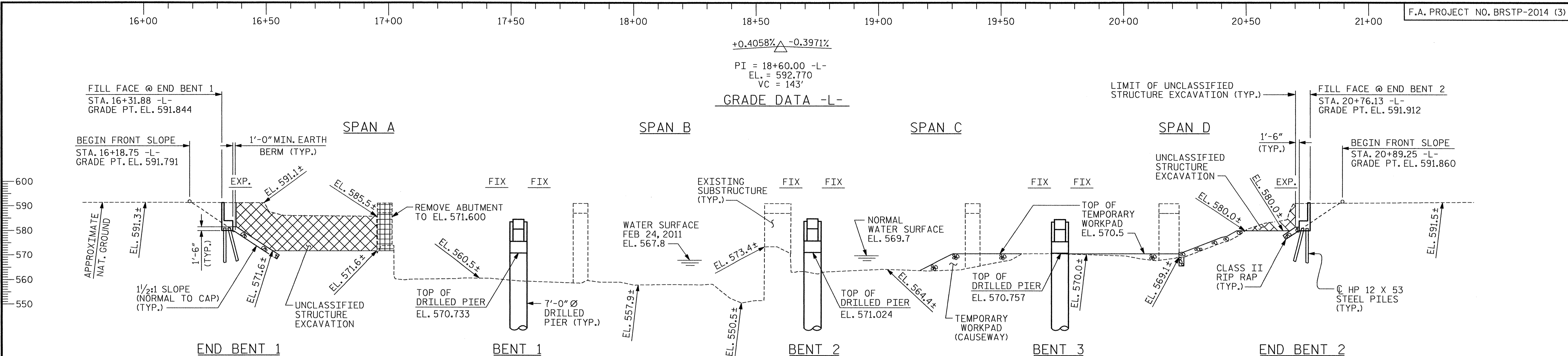
LETTING DATE:
 AUGUST 21, 2012



DIVISION OF HIGHWAYS
 STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER

P.E.



HYDRAULIC DATA

DESIGN DISCHARGE	23,000 C.F.S.
FREQUENCY OF DESIGN FLOOD	25 YRS.
DESIGN HIGH WATER ELEVATION	578.1 FT.
DRAINAGE AREA	637 SQ. MI.
BASE DISCHARGE (Q100)	35,530 C.F.S.
BASE HIGH WATER ELEVATION	580.800

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	50,050+ C.F.S.
FREQUENCY OF OVERTOPPING FLOOD	500+ YRS.
OVERTOPPING FLOOD ELEVATION	591.900

PROJECT NO. **B-4752**
GASTON COUNTY
 STATION: **18+54.00 -L-**
 SHEET 1 OF 3 REPLACE BRIDGE NO. 6

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE OVER
 SOUTH FORK CATAWBA RIVER
 ON SR 2014 (MAIN STREET)
 BETWEEN SR 2490 & SR 2565



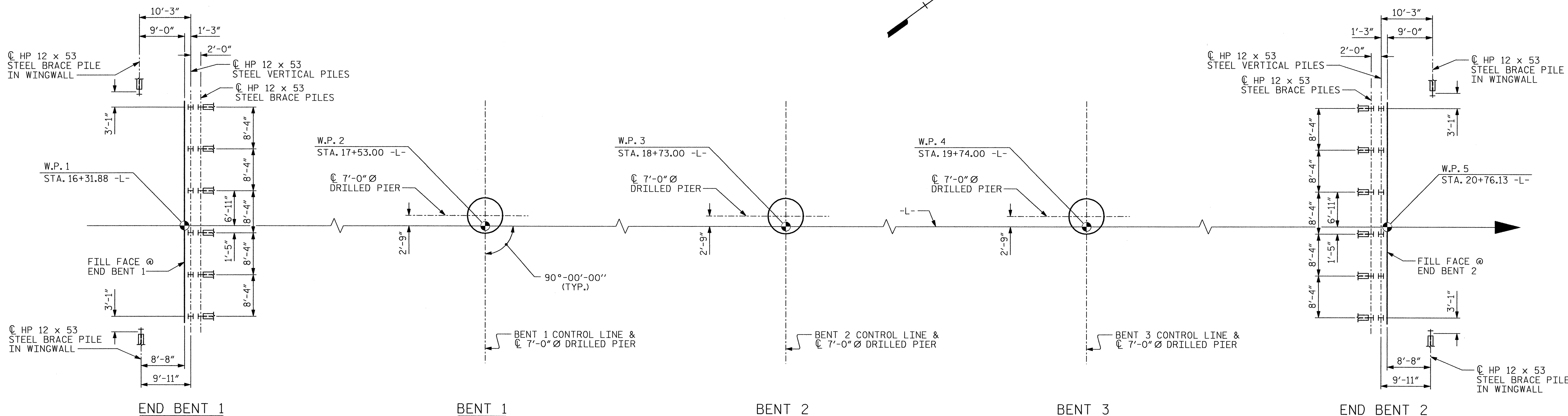
MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER : P-0671

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

TOTAL SHEETS: **46**

DRAWN BY : **B.E. LANNING** DATE : **03/12**
 CHECKED BY : **B.E. ATKINSON** DATE : **03/12**

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FOUNDATION LAYOUT

DIMENSIONS LOCATING END BENT PILES AND BENT DRILLED PIERS ARE SHOWN TO CENTERLINE PILES AND DRILLED PIERS.
BRACE PILES ARE TO BE BATTERED AT 3:12.

FOUNDATION NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT 1 AND END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 110 TONS PER PILE.

DRIVE PILES AT END BENT 1 AND END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 185 TONS PER PILE.

STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT 1 AND END BENT 2. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY OF 30,000 TO 45,000 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT END BENT 1 AND END BENT 2. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.

FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

DRILLED PIER AT BENT 1 IS DESIGNED FOR A FACTORED RESISTANCE OF 1459 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 30 TSF.

DRILLED PIER AT BENT 2 IS DESIGNED FOR A FACTORED RESISTANCE OF 1356 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 30 TSF.

DRILLED PIER AT BENT 3 IS DESIGNED FOR A FACTORED RESISTANCE OF 1327 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 30 TSF.

PERMANENT STEEL CASING IS REQUIRED FOR DRILLED PIER AT BENT 1. DO NOT EXTEND PERMANENT CASING BELOW ELEVATION 545 FT WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

PERMANENT STEEL CASING IS REQUIRED FOR DRILLED PIER AT BENT 2. DO NOT EXTEND PERMANENT CASING BELOW ELEVATION 540 FT WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

PERMANENT STEEL CASING MAY BE REQUIRED FOR DRILLED PIER AT BENT 3. IF REQUIRED, DO NOT EXTEND PERMANENT CASING BELOW ELEVATION 550 FT WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT STEEL CASING.

INSTALL DRILLED PIER AT BENT 1 THAT EXTENDS TO AN ELEVATION NO HIGHER THAN 527 FT, SATISFY THE REQUIRED TIP RESISTANCE AND HAS A PENETRATION OF AT LEAST 15 FT INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

INSTALL DRILLED PIER AT BENT 2 THAT EXTENDS TO AN ELEVATION NO HIGHER THAN 511 FT, SATISFY THE REQUIRED TIP RESISTANCE AND HAS A PENETRATION OF AT LEAST 12 FT INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

INSTALL DRILLED PIER AT BENT 3 THAT EXTENDS TO AN ELEVATION NO HIGHER THAN 510 FT, SATISFY THE REQUIRED TIP RESISTANCE AND HAS A PENETRATION OF AT LEAST 16 FT INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

SID INSPECTIONS MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SID INSPECTIONS. FOR SID INSPECTIONS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

CSL TUBES AND TESTING ARE REQUIRED FOR DRILLED PIERS AT BENT 1, BENT 2 AND BENT 3. FOR CSL TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. B-4752
GASTON COUNTY
 STATION: 18+54.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE OVER
 SOUTH FORK CATAWBA RIVER
 ON SR 2014 (MAIN STREET)
 BETWEEN SR 2490 & SR 2565



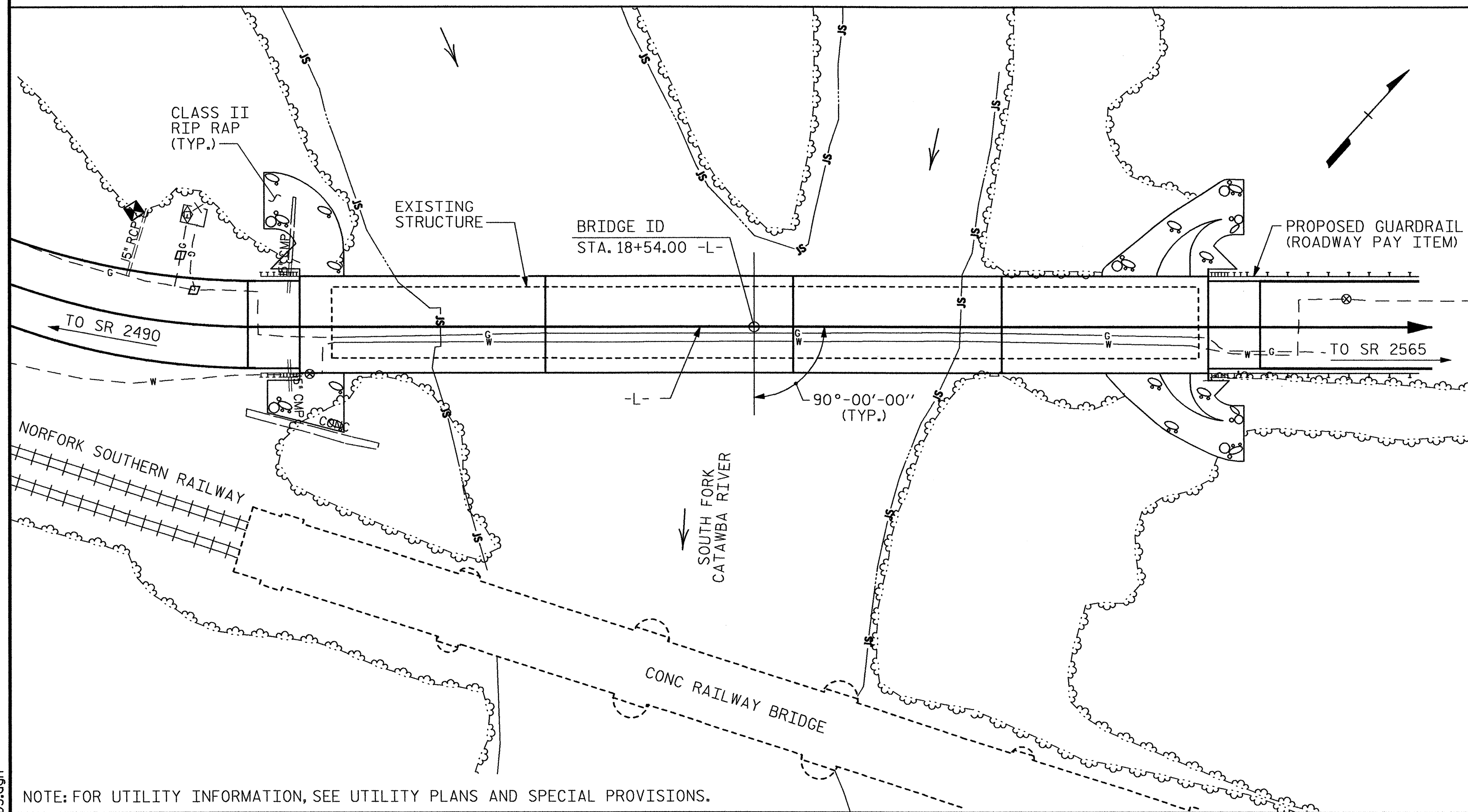
MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER : P-0671

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S-2
2			4			46

DRAWN BY : B.E. LANNING DATE : 03/12
 CHECKED BY : B.E. ATKINSON DATE : 03/12

5/10/2012 9:34:27 AM User: blanning Filename: P:\NC Projects\M11007 - 2011-2013 Design LSC\M11007.02 - B-4752 Gaston\B-4752\Structures\B-4752-SD-602.dgn

BENCHMARK #2 IS A R.R. SPIKE SET IN 12" HICKORY 77' LEFT OF -BL- STA. 14+08.00 ELEV. 590.53 NAVD 88



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 FOR SEISMIC PERFORMANCE ZONE 1.
 REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
 THE EXISTING STRUCTURE CONSISTING OF 1 SPAN @ 50'-0", 4 SPANS @ 80'-0", AND 1 SPAN @ 50'-0" WITH A REINFORCED CONCRETE DECK ON I-BEAMS WITH A CLEAR ROADWAY WIDTH OF 24 FT., WITH END BENTS AND INTERIOR BENT 4 OF REINFORCED CONCRETE AND STEEL PILES, WITH INTERIOR BENTS 1,3, AND 5 OF REINFORCED CONCRETE SOLID WEB PIER ON FOOTINGS, WITH BENT 2 OF REINFORCED CONCRETE POST AND BEAM, LOCATED AT THE SITE OF THE PROPOSED STRUCTURE 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.
 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 SHALL BE EXCAVATED FOR A DISTANCE OF 60 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 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.
 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 STATION 18+54.00 -L-.

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. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

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.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR INSTALLATION AND ATTACHMENT OF 12" D.I.R.J. WATER MAIN, SEE SPECIAL PROVISIONS.

FOR FOUNDATION NOTES, SEE "FOUNDATION LAYOUT" SHEET.

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 18+54.00 -L-.

TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STA. 18+54.00 -L-	REMOVAL OF EXISTING STRUCTURE	7'-0" Ø DRILLED PIER IN SOIL	7'-0" Ø DRILLED PIER NOT IN SOIL	PERMANENT STEEL CASING FOR 7'-0" Ø DRILLED PIER	SID INSPECTIONS	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS
	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM
SUPERSTRUCTURE									17,722	14,206		LUMP SUM
END BENT 1								LUMP SUM			58.9	
BENT 1			26.75	17.00	25.8		1				54.5	
BENT 2			43.25	17.00	31.0		1				54.5	
BENT 3			45.00	16.00	20.8		1				54.5	
END BENT 2								LUMP SUM			58.9	
TOTAL	LUMP SUM	LUMP SUM	115.00	50.00	77.6	3	3	LUMP SUM	17,722	14,206	281.3	LUMP SUM

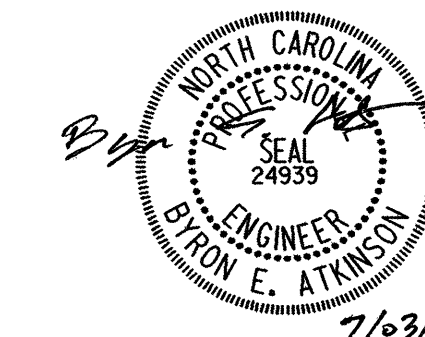
TOTAL BILL OF MATERIAL

	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	72" PRESTRESSED CONCRETE MODIFIED BULB TEE GIRDERS	HP 12 X 53 STEEL PILES	STEEL PILE POINTS	TWO BAR METAL RAIL	1'-2" x 2'-6" CONCRETE PARAPET	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	FOAM JOINT SEALS	ELECTRICAL CONDUIT SYSTEM	INSTALL 12" D.I.R.J. WATER MAIN
	LBS.	LBS	NO. LIN. FT.	NO. LIN. FT.	EACH	LIN. FT.	LIN. FT.	TON	SQ. YDS.	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM
SUPERSTRUCTURE			16 1,754.67			856.94	884.22			LUMP SUM	LUMP SUM		
END BENT 1	7,486			14 426	14			630	700				
BENT 1	18,057	2,463											
BENT 2	22,131	3,286											
BENT 3	22,257	3,328											
END BENT 2	7,486			14 812	14			1,280	1,420				
TOTAL	77,417	9,077	16 1,754.67	28 1,238	28	856.94	884.22	1,910	2,120	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM

PROJECT NO. B-4752
 GASTON COUNTY
 STATION: 18+54.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING
 FOR BRIDGE OVER
 SOUTH FORK CATAWBA RIVER
 ON SR 2014 (MAIN STREET)
 BETWEEN SR 2490 & SR 2565



MI ENGINEERING
 1011 SCHAUH DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER: P-0671

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

TOTAL SHEETS: 46

DRAWN BY: B.E. LANNING DATE: 03/12
 CHECKED BY: B.E. ATKINSON DATE: 03/12

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LOAD AND RESISTANCE FACTOR RATING (LRFR) 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								
						LIVE-LOAD FACTORS (γ _L)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (F+)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (F+)	LIVE-LOAD FACTORS (γ _L)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (F+)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.01	--	1.75	0.849	1.63	D	I	59.300	1.044	1.01	A	I	94.200	0.80	0.849	1.45	A	I	47.100		
	HL-93 (OPERATING)	N/A		1.33	--	1.35	0.849	2.11	D	I	59.300	1.044	1.33	A	I	94.200	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	②	1.51	54.36	1.75	0.849	2.29	D	I	59.300	1.044	1.51	A	I	94.200	0.80	0.849	2.10	A	I	47.100		
	HS-20 (OPERATING)	36.000		1.98	71.28	1.35	0.849	2.97	D	I	59.300	1.044	1.98	A	I	94.200	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SN5H	13.500		4.96	66.96	1.40	0.849	6.69	D	I	59.300	1.044	4.96	A	I	94.200	0.80	0.849	5.02	A	I	47.100	
		SNGARBS2	20.000		3.43	68.60	1.40	0.849	4.86	D	I	59.300	1.044	3.43	A	I	94.200	0.80	0.849	3.60	A	I	47.100	
		SNAGRIS2	22.000		3.15	69.30	1.40	0.849	4.55	D	I	59.300	1.044	3.15	A	I	94.200	0.80	0.849	3.36	A	I	47.100	
		SNCOTTS3	27.250		2.38	64.86	1.40	0.849	3.34	D	I	59.300	1.044	2.38	A	I	94.200	0.80	0.849	2.50	A	I	47.100	
		SNAGRS4	34.925		1.83	63.91	1.40	0.849	2.75	D	I	59.300	1.044	1.83	A	I	94.200	0.80	0.849	2.04	A	I	47.100	
		SNS5A	35.550		1.81	64.35	1.40	0.849	2.71	D	I	59.300	1.044	1.81	A	I	94.200	0.80	0.849	2.01	A	I	47.100	
		SNS6A	39.950		1.64	65.52	1.40	0.849	2.46	D	I	59.300	1.044	1.64	A	I	94.200	0.80	0.849	1.82	A	I	47.100	
	SN57B	42.000		1.59	66.78	1.40	0.849	2.35	D	I	59.300	1.044	1.59	A	I	94.200	0.80	0.849	1.74	A	I	47.100		
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.97	65.01	1.40	0.849	3.02	D	I	59.300	1.044	1.97	A	I	94.200	0.80	0.849	2.22	A	I	47.100	
		TNT4A	33.075		1.92	63.50	1.40	0.849	2.99	D	I	59.300	1.044	1.92	A	I	94.200	0.80	0.849	2.21	A	I	47.100	
		TNT6A	41.600		1.64	68.22	1.40	0.849	2.44	D	I	59.300	1.044	1.64	A	I	94.200	0.80	0.849	1.79	A	I	47.100	
		TNT7A	42.000		1.60	67.20	1.40	0.849	2.44	D	I	59.300	1.044	1.60	A	I	94.200	0.80	0.849	1.79	A	I	47.100	
		TNT7B	42.000		1.54	64.68	1.40	0.849	2.48	D	I	59.300	1.044	1.54	A	I	94.200	0.80	0.849	1.81	A	I	47.100	
		TNAGRIT4	43.000		1.49	64.07	1.40	0.849	2.39	D	I	59.300	1.044	1.49	A	I	94.200	0.80	0.849	1.76	A	I	47.100	
TNAGT5A		45.000	③	1.45	65.25	1.40	0.849	2.28	D	I	59.300	1.044	1.45	A	I	94.200	0.80	0.849	1.67	A	I	47.100		
TNAGT5B	45.000		1.50	67.50	1.40	0.849	2.25	D	I	59.300	1.044	1.50	A	I	94.200	0.80	0.849	1.65	A	I	47.100			

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.

ALL GIRDERS ON THIS STRUCTURE HAVE BEEN DESIGNED FOR TRAFFIC LOADS, INCLUDING GIRDERS ADJACENT TO THE SIDEWALK SECTION.

COMMENTS:

1. DISTANCES IN THE TABLE ARE MEASURED FROM THE @ BEARING IN EACH SPAN.

- 2.
- 3.
- 4.

CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

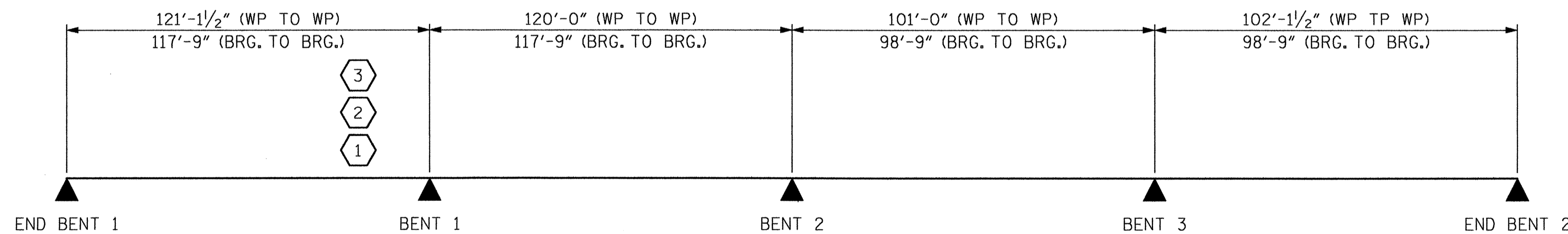
② DESIGN LOAD RATING (HS-20)

③ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

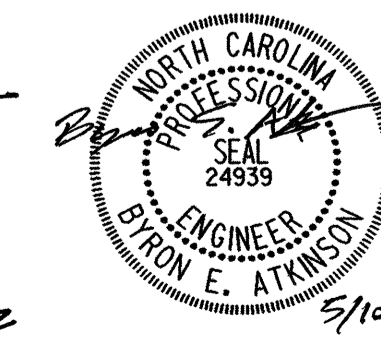
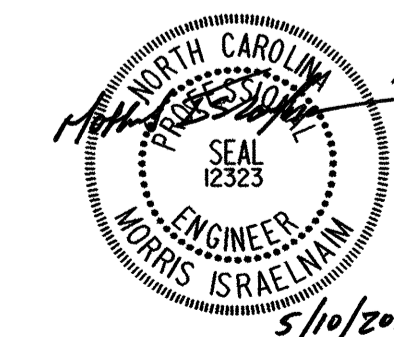
I - INTERIOR GIRDER
E - EXTERIOR GIRDER



LRFR SUMMARY

PROJECT NO. B-4752
GASTON COUNTY
 STATION: 18+54.00 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 LRFR SUMMARY FOR
 PRESTRESSED
 CONCRETE GIRDERS
 (NON-INTERSTATE TRAFFIC)



ASSEMBLED BY : B.E. ATKINSON DATE : 03/12
 CHECKED BY : A.K. ORR DATE : 03/12
 DRAWN BY : MAA 1/08 REV. 11/12/08RR MAA/GM
 CHECKED BY : GM/DI 2/08 REV. 10/11/11 MAA/GM

MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER : P-0671

REVISIONS						SHEET NO. S-4
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 46
2			4			

NOTES

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.

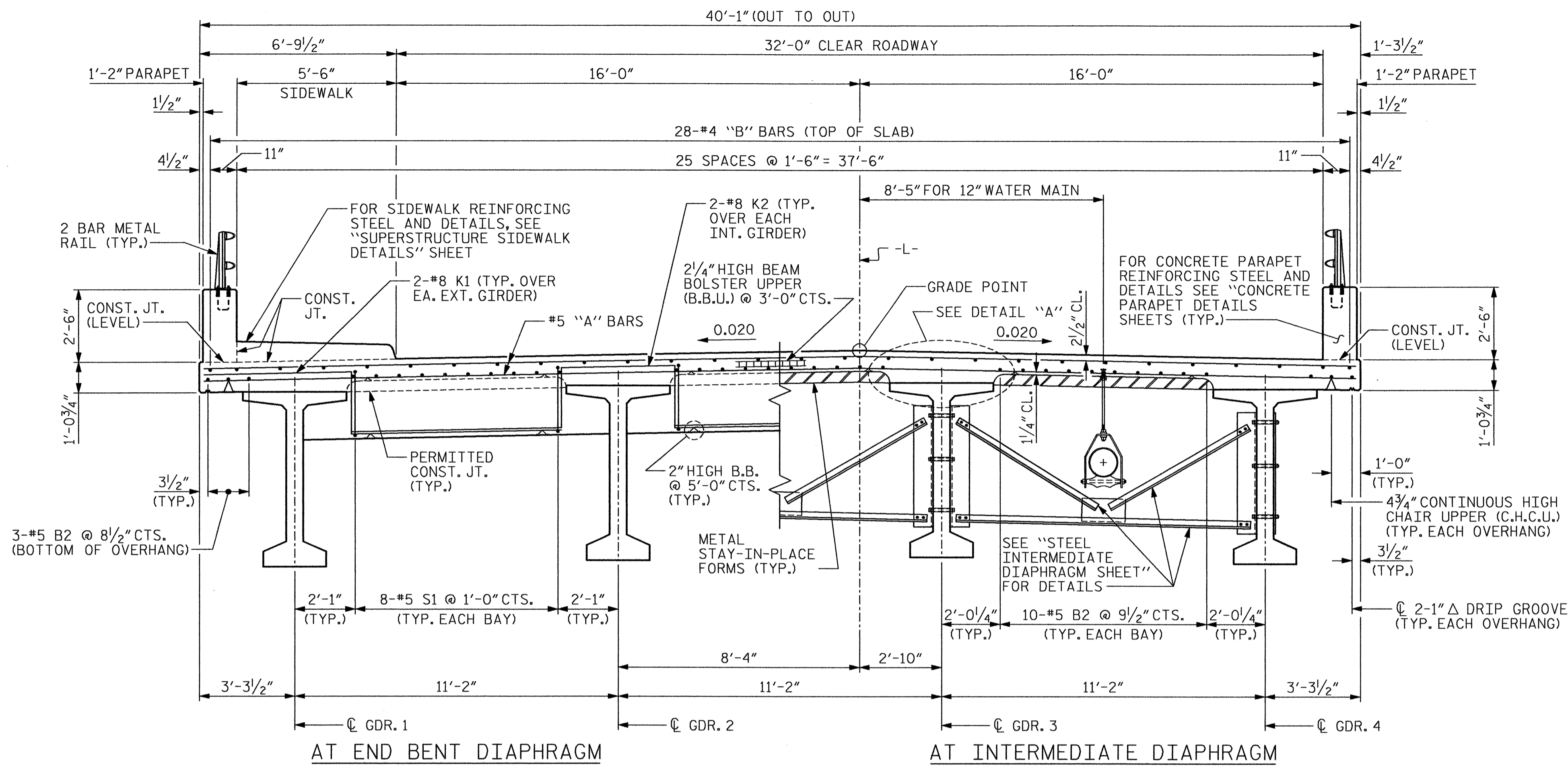
PROVIDE 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS, WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.U.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2 1/2"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

PARAPETS AND SIDEWALK SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.

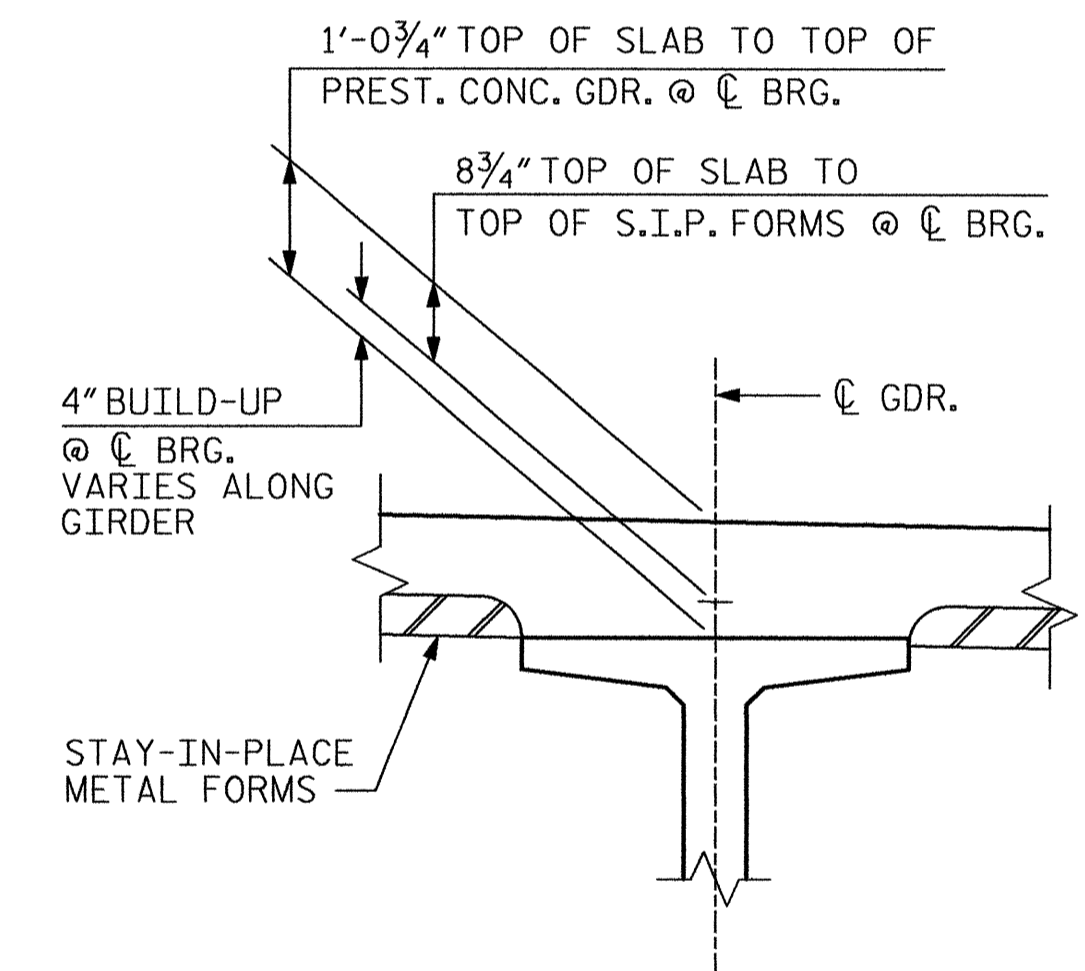
THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF THE PARAPETS, END POSTS AND SIDEWALK.

SEE SHEETS S-25 THRU S-26 FOR CONCRETE INSERTS IN BRIDGE DECK AND LATERAL BRACING FOR 12" Ø D.I. WATER MAIN ATTACHMENT.

ALL DIMENSIONS ARE HORIZONTAL OR VERTICAL UNLESS OTHERWISE NOTED.

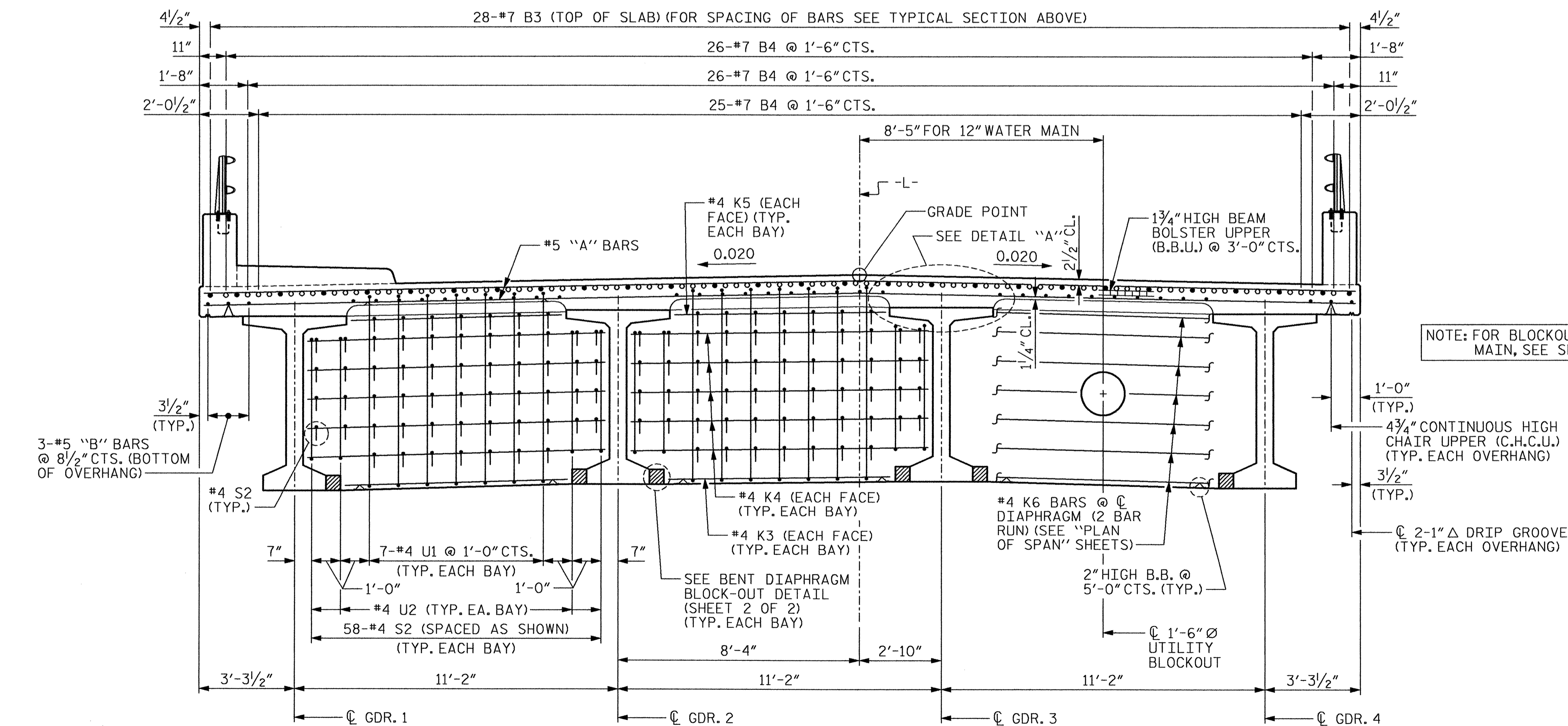


TYPICAL SECTION



DETAIL "A"

NOTE: FOR BLOCKOUT DETAILS OF 12" WATER MAIN, SEE SHEET 2 OF 2.



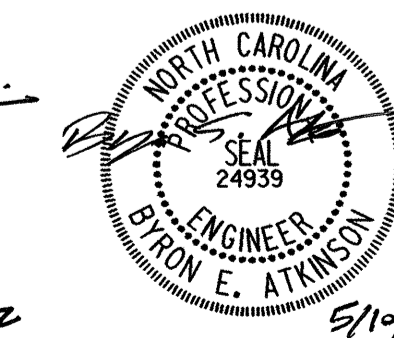
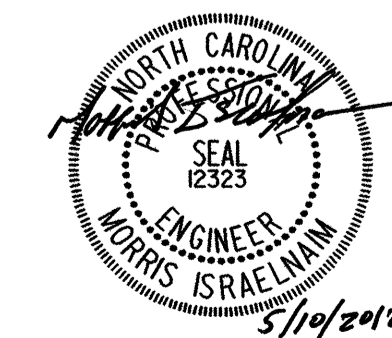
TYPICAL SECTION @ BENT DIAPHRAGM

(FOR ADDITIONAL DIMENSIONS, SEE TYPICAL SECTION ABOVE)

PROJECT NO. B-4752
GASTON COUNTY
 STATION: 18+54.00 -L-

SHEET 1 OF 2

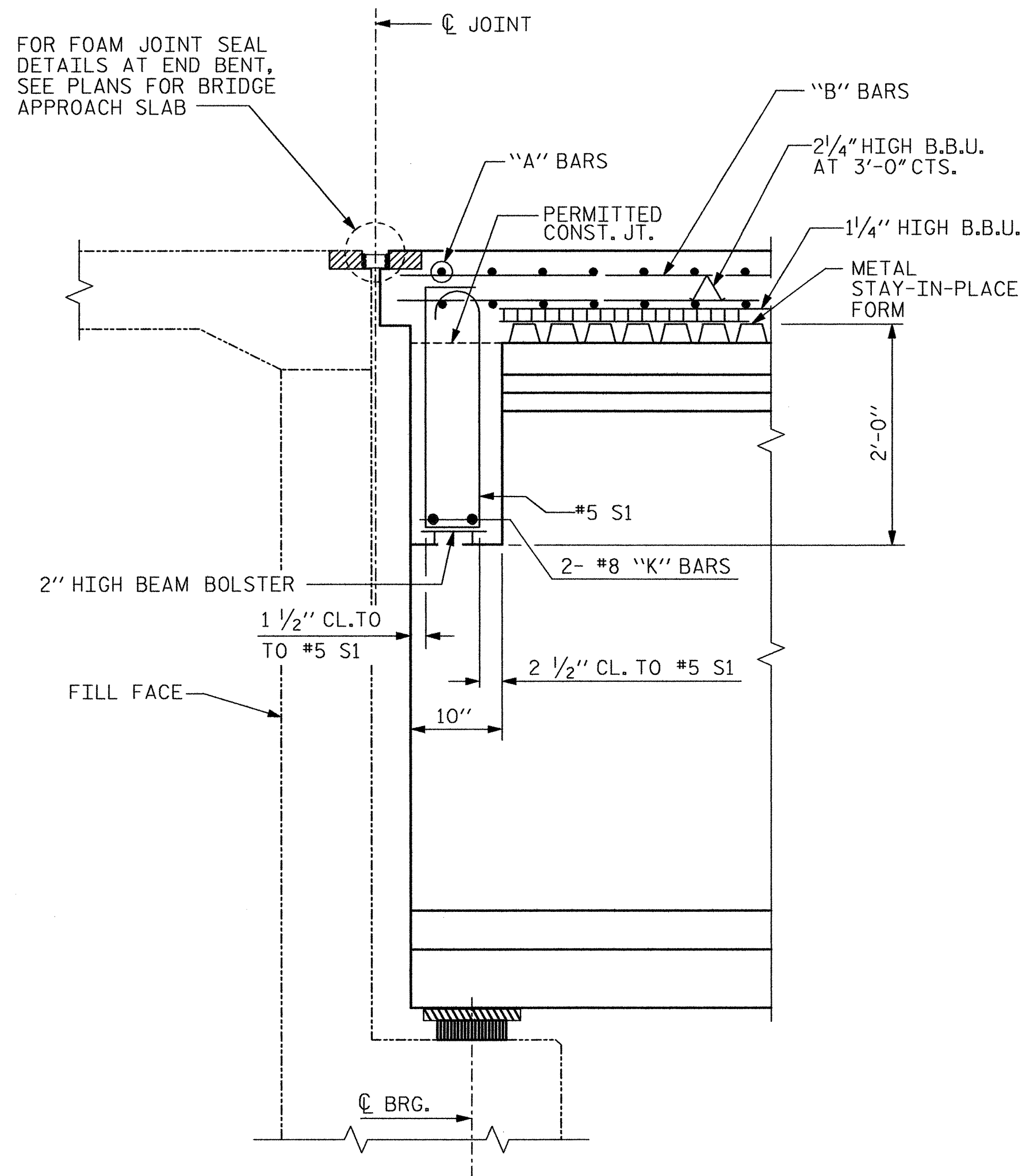
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUPERSTRUCTURE
TYPICAL SECTION



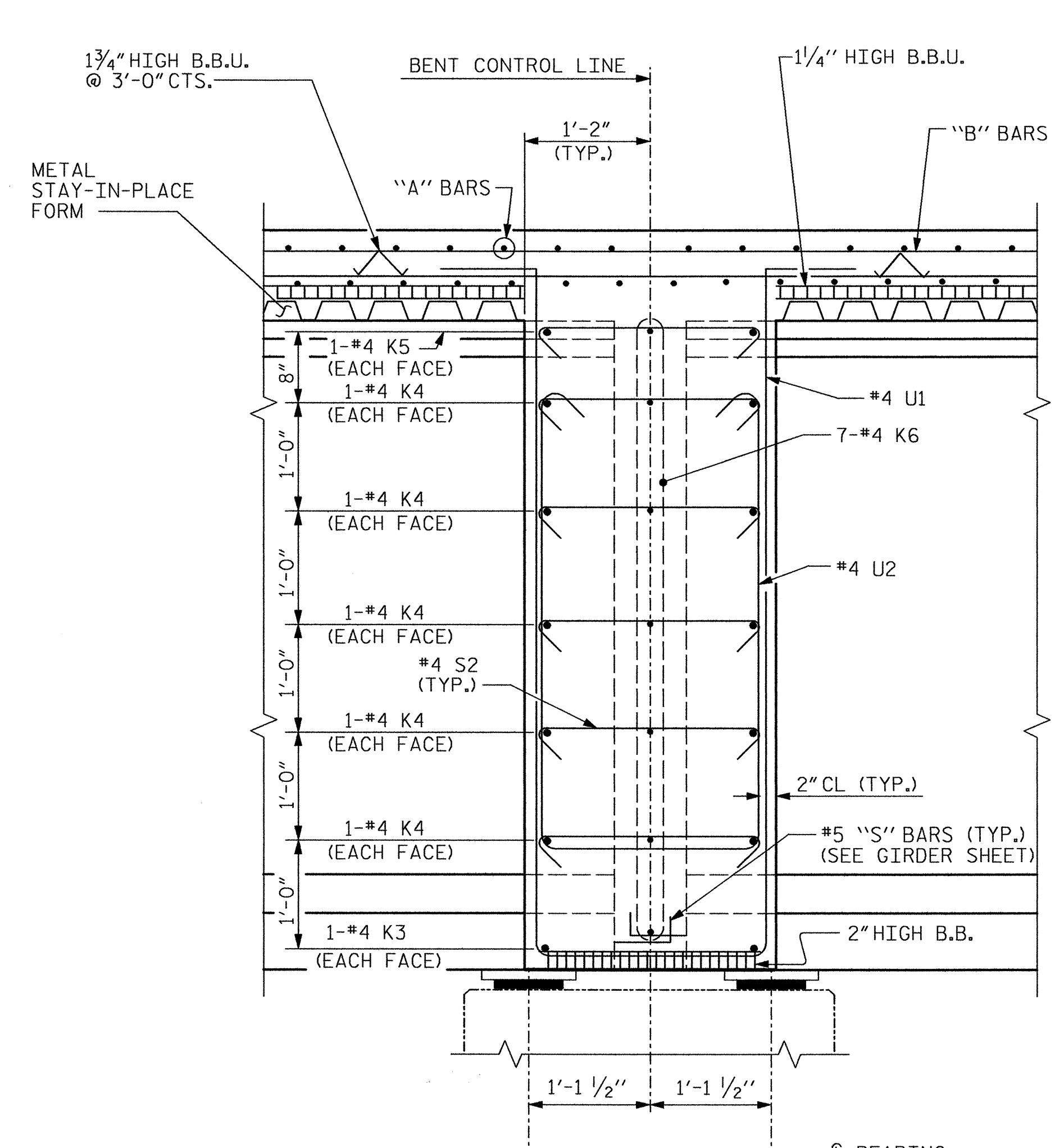
	MI ENGINEERING			NO.			REVISIONS			SHEET NO. S-5	
	1011 SCHAUB DRIVE, SUITE 100			NO.	BY:	DATE:	NO.	BY:	DATE:		TOTAL SHEETS
	RALEIGH, NC 27606			1			3				46
	(919) 851-6606			2			4				

DRAWN BY: B.E. LANNING DATE: 01/12
 CHECKED BY: B.E. ATKINSON DATE: 01/12

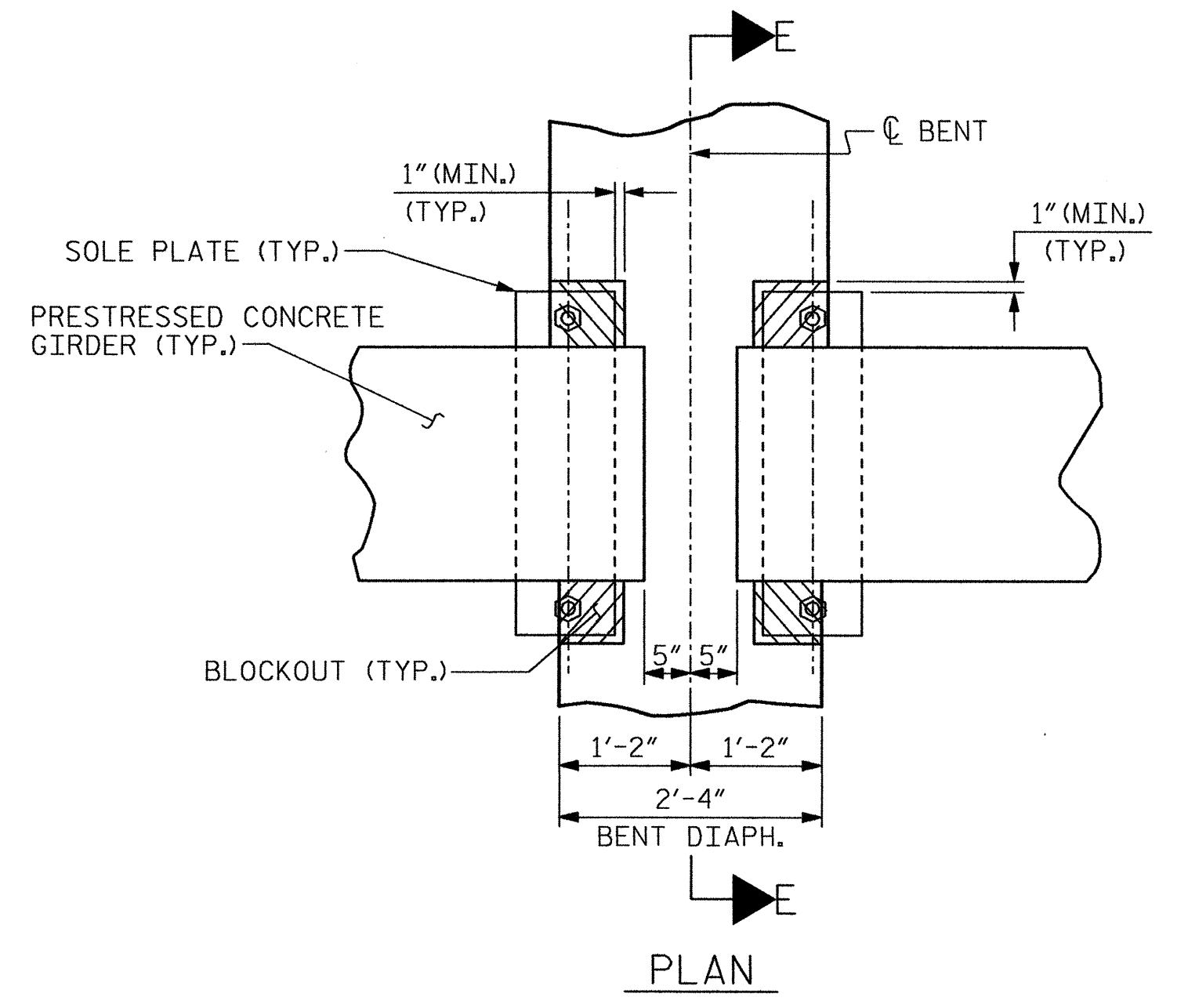
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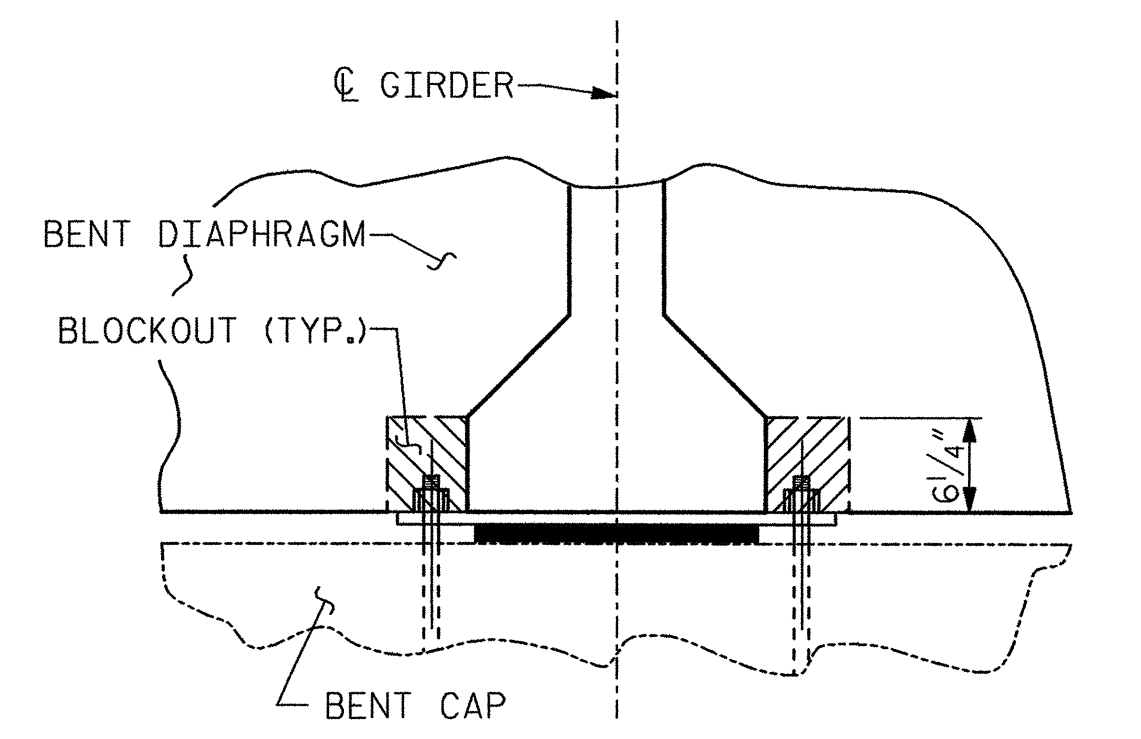
SECTION A-A



SECTION B-B

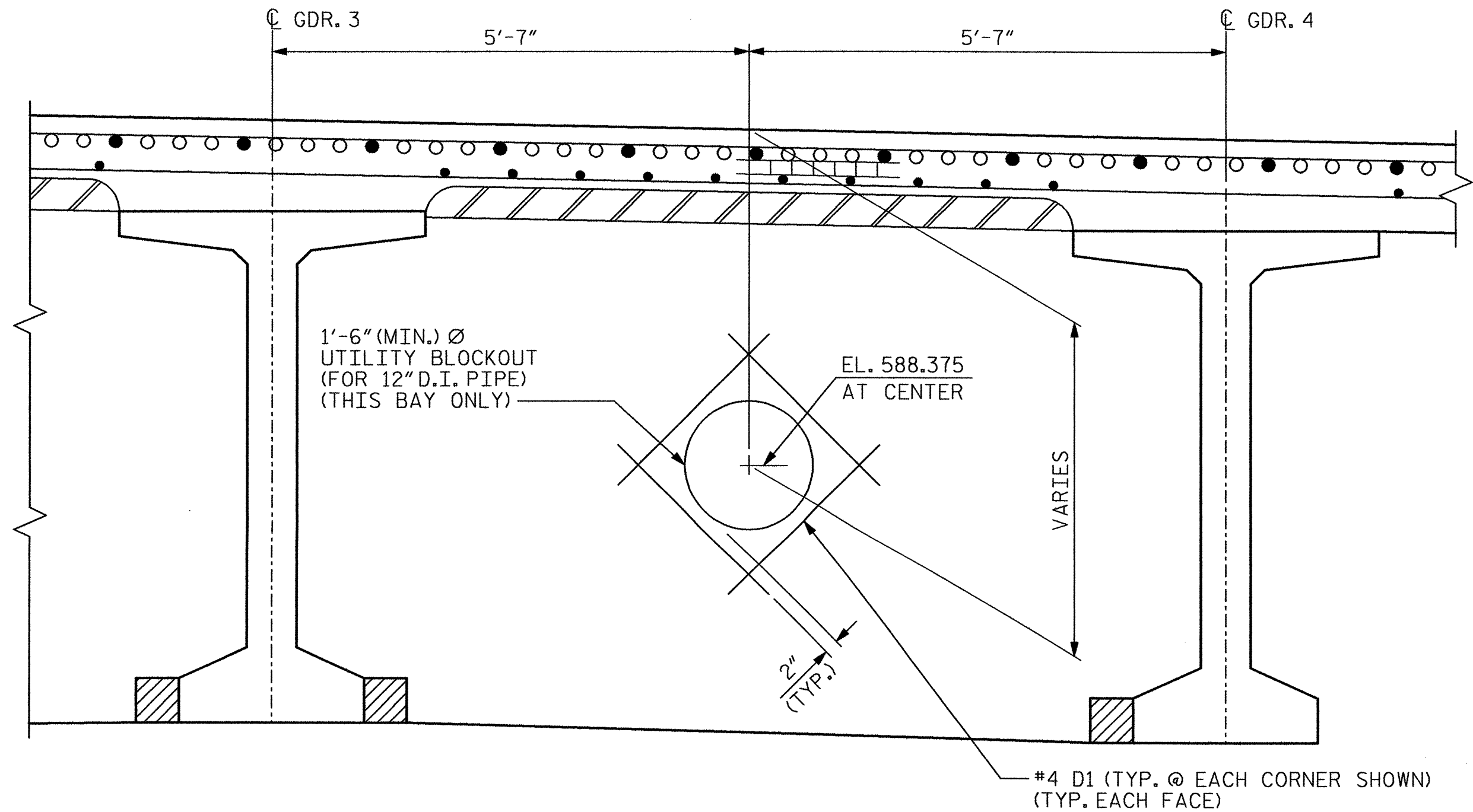


PLAN

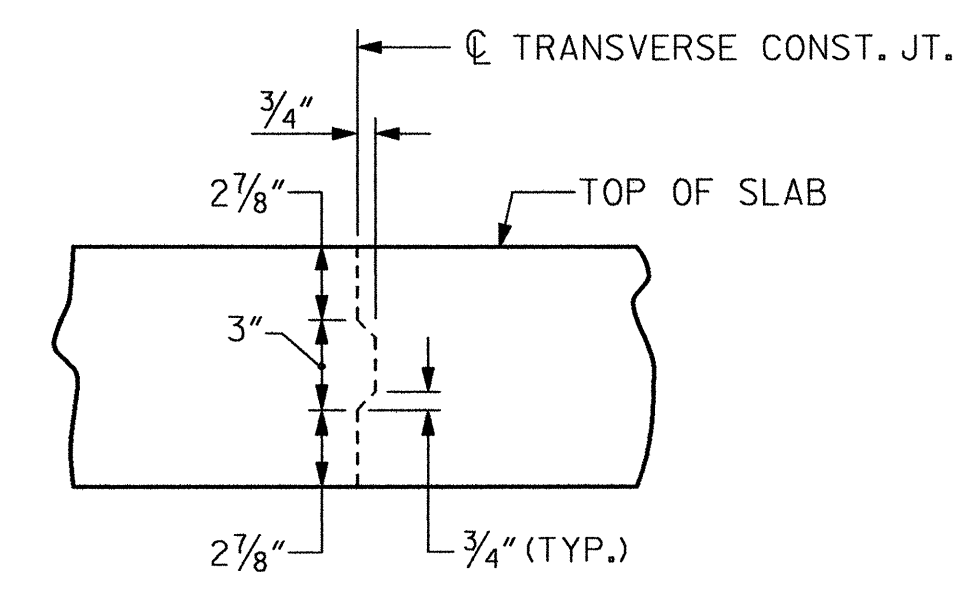


SECTION E-E

BENT DIAPHRAGM BLOCKOUT DETAIL



UTILITY BLOCKOUT AT CONTINUOUS BENT DIAPHRAGM



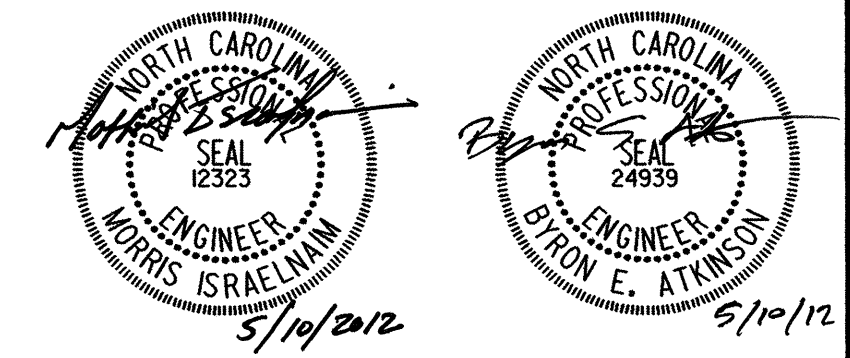
TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB

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

PROJECT NO. B-4752
 GASTON COUNTY
 STATION: 18+54.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 TYPICAL SECTION
 DETAILS

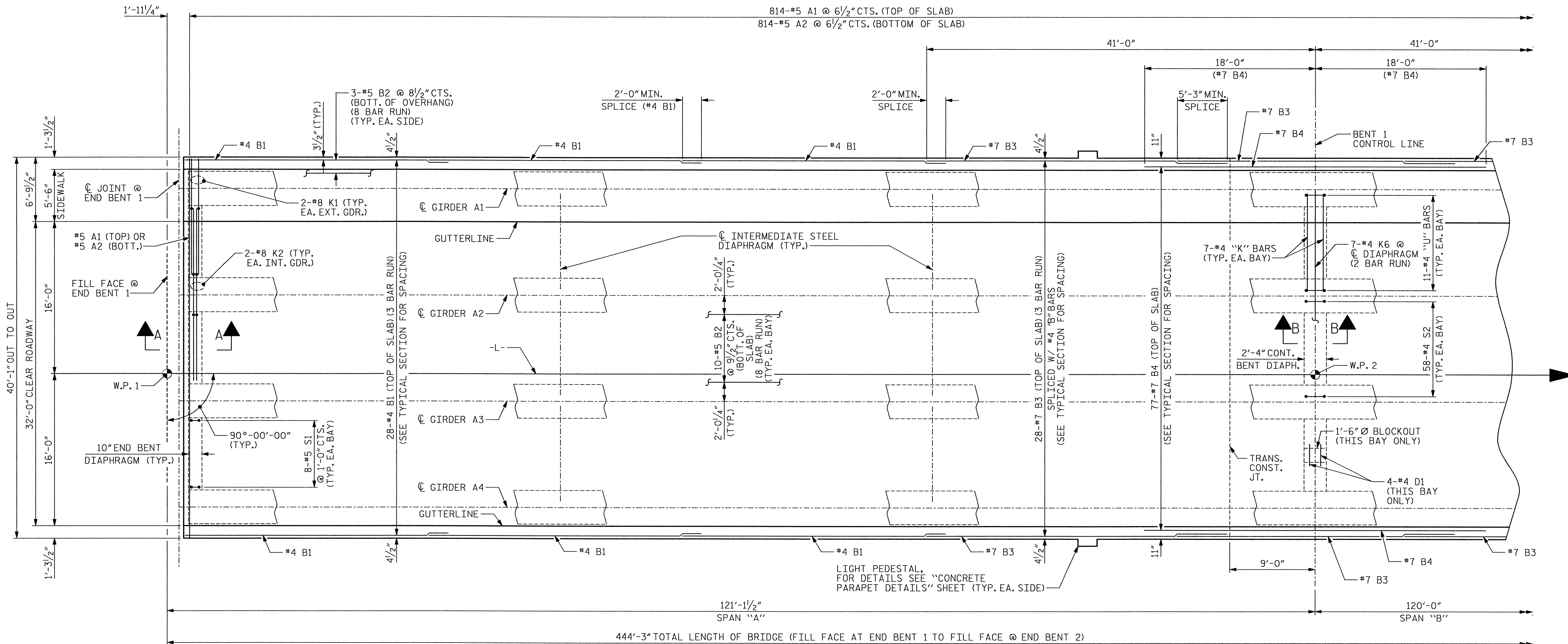


MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER: P-0671

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			46

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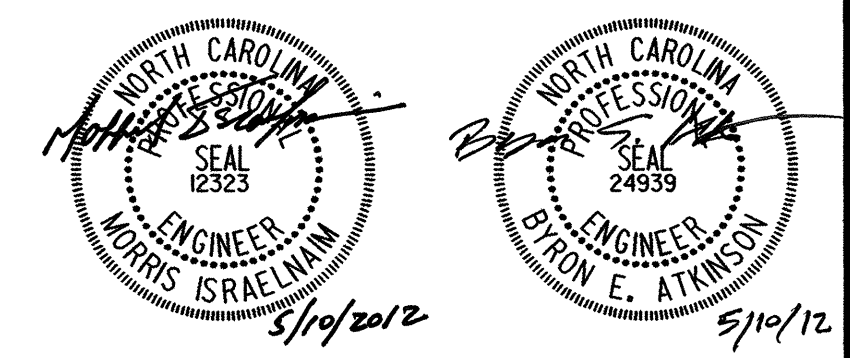
PLAN OF SPAN "A"

- NOTES**
- FOR REINFORCING STEEL IN PARAPET, SEE "CONCRETE PARAPET DETAILS" SHEETS.
 - FOR REINFORCING STEEL IN SIDEWALK, SEE "SIDEWALK DETAILS" SHEET.
 - FOR SECTION VIEWS, SEE "TYPICAL SECTION DETAILS" SHEET.
 - FOR CONCRETE INSERTS IN BRIDGE DECK, SEE "UTILITY ATTACHMENT DETAILS" SHEETS.
 - FOR LOCATION OF INTERMEDIATE STEEL DIAPHRAGMS, SEE "FRAMING PLAN" SHEET.

PROJECT NO. B-4752
GASTON COUNTY
 STATION: 18+54.00 -L-

SHEET 1 OF 4

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

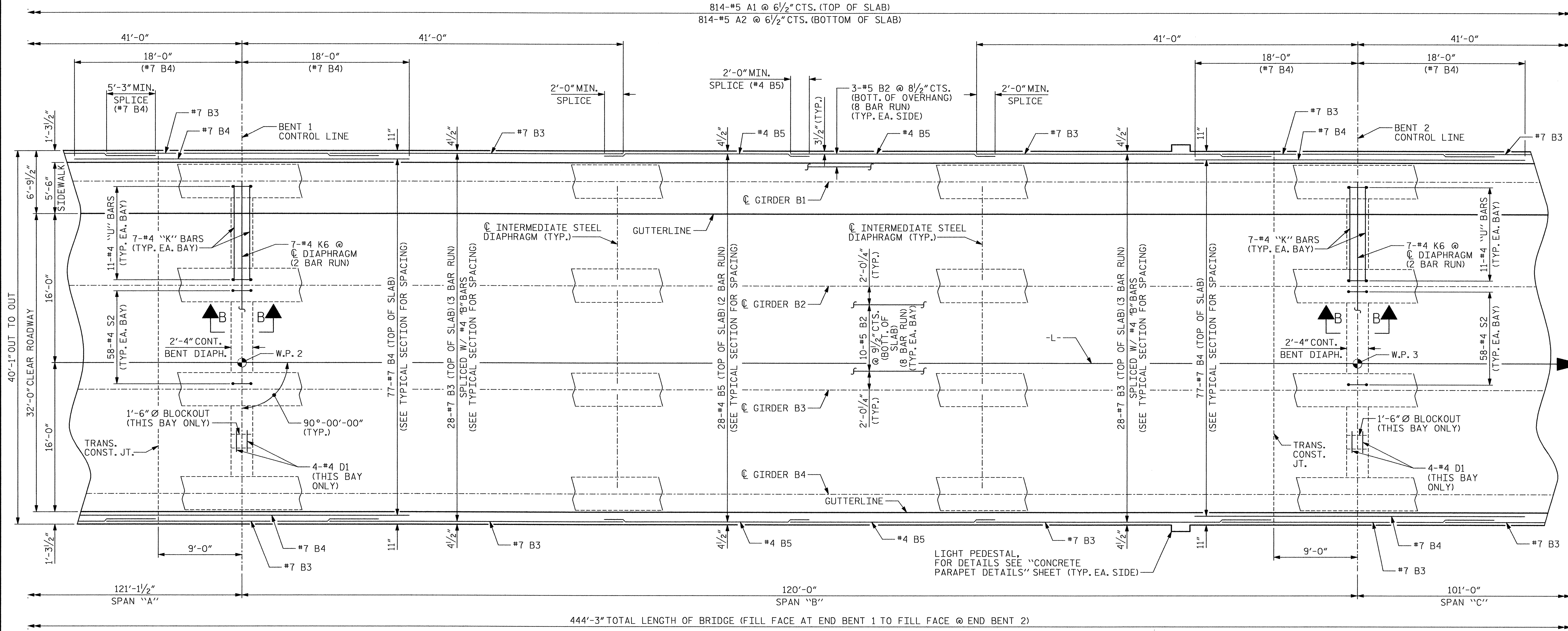


MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER : P-0671

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

DRAWN BY : B.E. LANNING DATE : 01/12
 CHECKED BY : B.E. ATKINSON DATE : 01/12

SHEET NO.
S-7
 TOTAL SHEETS
46



PLAN OF SPAN "B"

- NOTES**
- FOR REINFORCING STEEL IN PARAPET, SEE "CONCRETE PARAPET DETAILS" SHEETS.
 - FOR REINFORCING STEEL IN SIDEWALK, SEE "SIDEWALK DETAILS" SHEET.
 - FOR SECTION VIEWS, SEE "TYPICAL SECTION DETAILS" SHEET.
 - FOR CONCRETE INSERTS IN BRIDGE DECK, SEE "UTILITY ATTACHMENT DETAILS" SHEETS.
 - FOR LOCATION OF INTERMEDIATE STEEL DIAPHRAGMS, SEE "FRAMING PLAN" SHEET.

PROJECT NO. B-4752
GASTON COUNTY
 STATION: 18+54.00 -L-

SHEET 2 OF 4

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



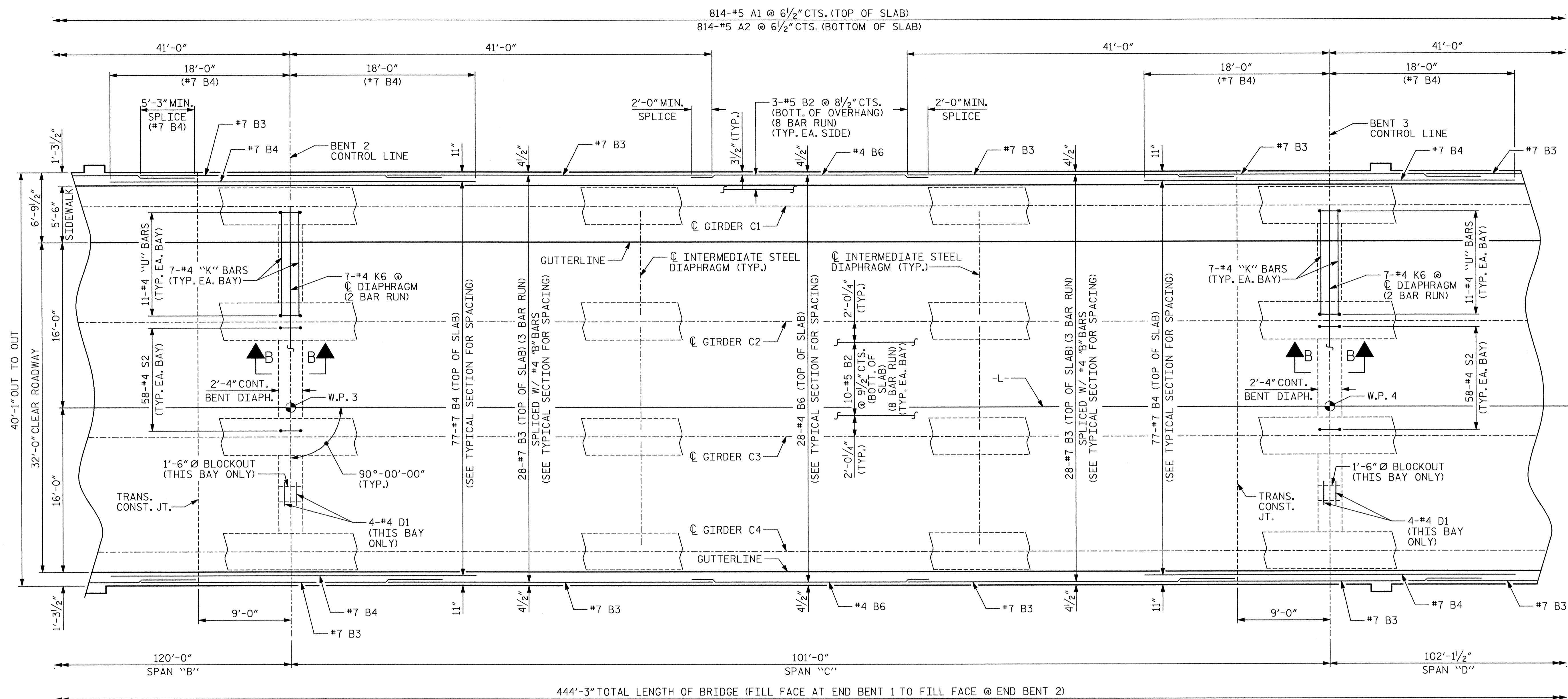
MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27806
 (919) 851-6606
 FIRM PE NUMBER : P-0671

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

TOTAL SHEETS: 46

DRAWN BY : B.E. LANNING DATE : 01/12
 CHECKED BY : B.E. ATKINSON DATE : 01/12

5/10/2012 9:54:56 AM User: bplanning
 File: P:\NC Projects\M1007 - 2011-2013 Design LSC\M1007.02 - B-4752 Gaston\B-4752\Structure\B-4752_SD_PSB.dgn



PLAN OF SPAN "C"

NOTES

- FOR REINFORCING STEEL IN PARAPET, SEE "CONCRETE PARAPET DETAILS" SHEETS.
- FOR REINFORCING STEEL IN SIDEWALK, SEE "SIDEWALK DETAILS" SHEET.
- FOR SECTION VIEWS, SEE "TYPICAL SECTION DETAILS" SHEET.
- FOR CONCRETE INSERTS IN BRIDGE DECK, SEE "UTILITY ATTACHMENT DETAILS" SHEETS.
- FOR LOCATION OF INTERMEDIATE STEEL DIAPHRAGMS, SEE "FRAMING PLAN" SHEET.

PROJECT NO. B-4752

GASTON COUNTY

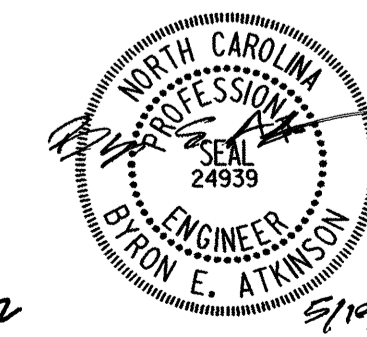
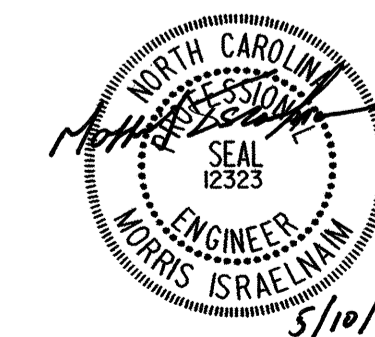
STATION: 18+54.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS
SPAN "C"



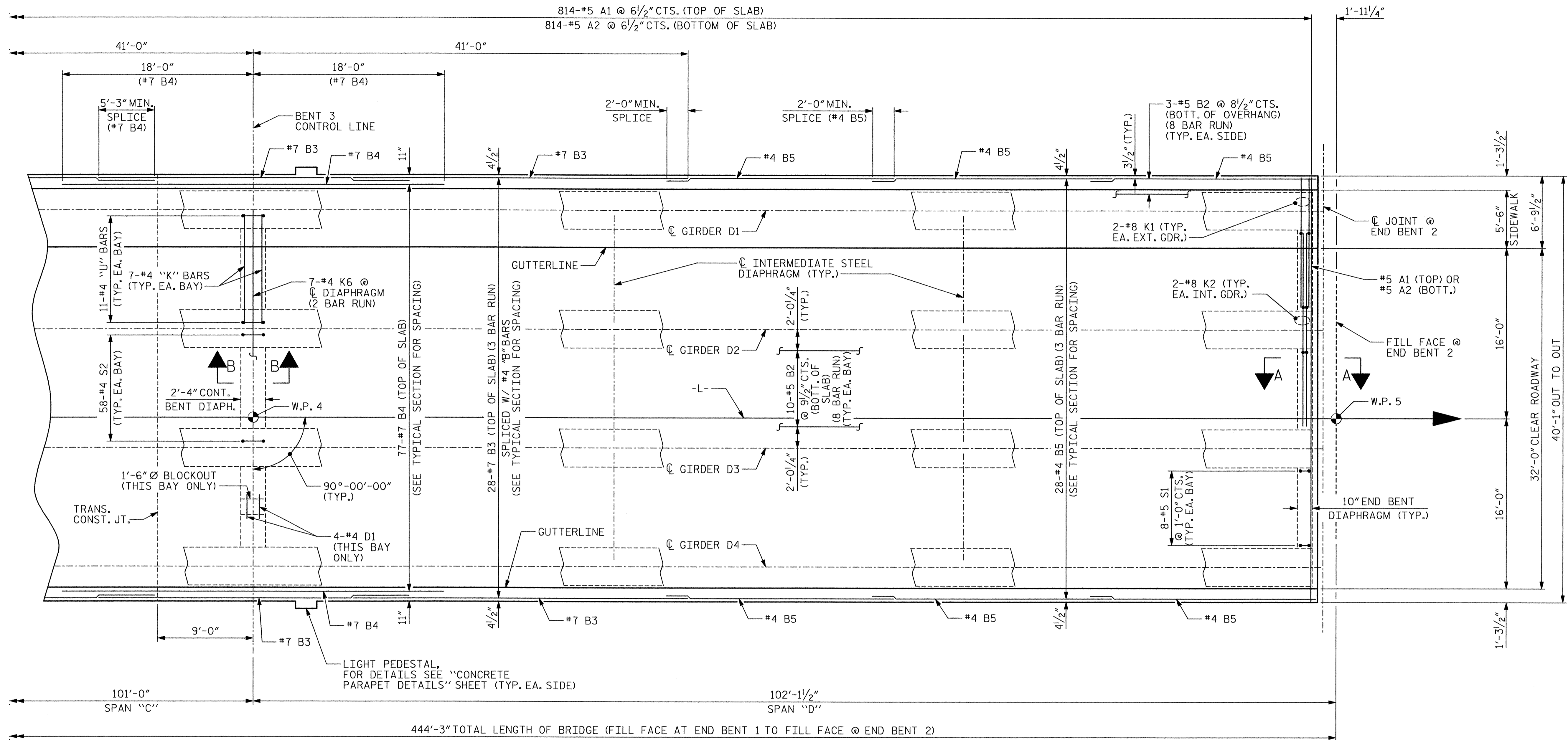
MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

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

TOTAL SHEETS: 46

DRAWN BY : B.E. LANNING DATE : 01/12
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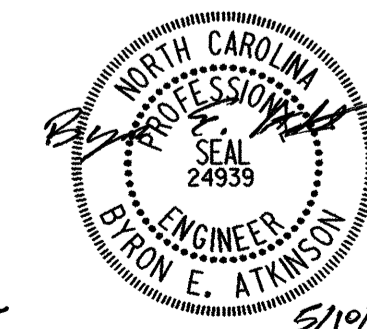
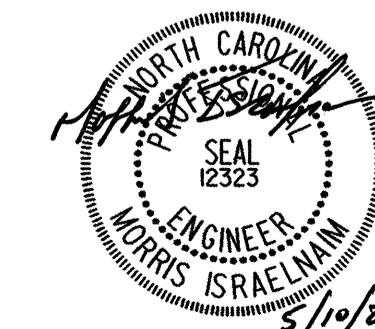
PLAN OF SPAN "D"

- NOTES
- FOR REINFORCING STEEL IN PARAPET, SEE "CONCRETE PARAPET DETAILS" SHEETS.
 - FOR REINFORCING STEEL IN SIDEWALK, SEE "SIDEWALK DETAILS" SHEET.
 - FOR SECTION VIEWS, SEE "TYPICAL SECTION DETAILS" SHEET.
 - FOR CONCRETE INSERTS IN BRIDGE DECK, SEE "UTILITY ATTACHMENT DETAILS" SHEETS.
 - FOR LOCATION OF INTERMEDIATE STEEL DIAPHRAGMS, SEE "FRAMING PLAN" SHEET.

PROJECT NO. B-4752
GASTON COUNTY
STATION: 18+54.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
PLAN OF SPANS
SPAN "D"



MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27806
(919) 851-6606
FIRM PE NUMBER : P-0671

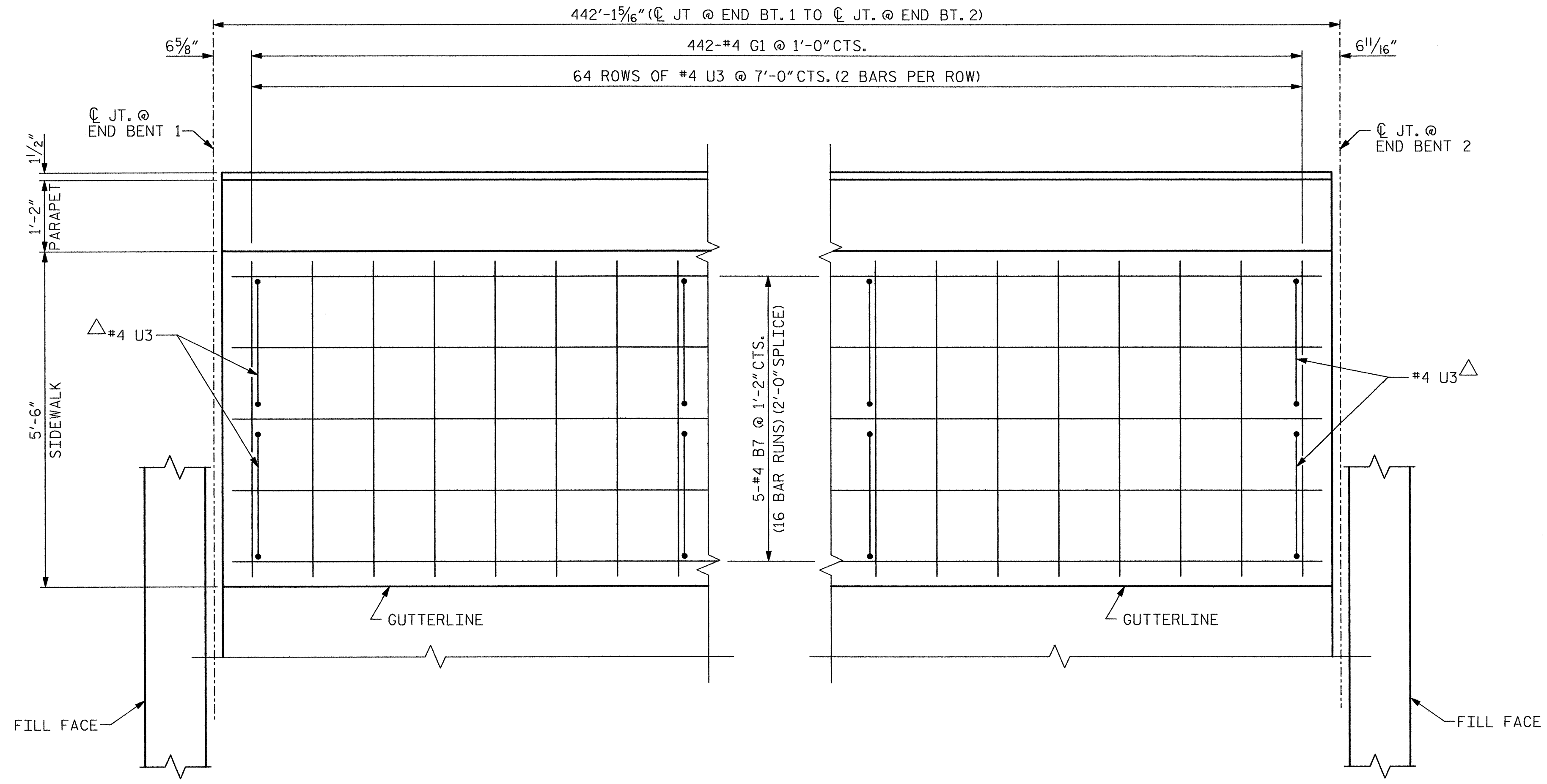
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NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	

SHEET NO. S-10
TOTAL SHEETS 46

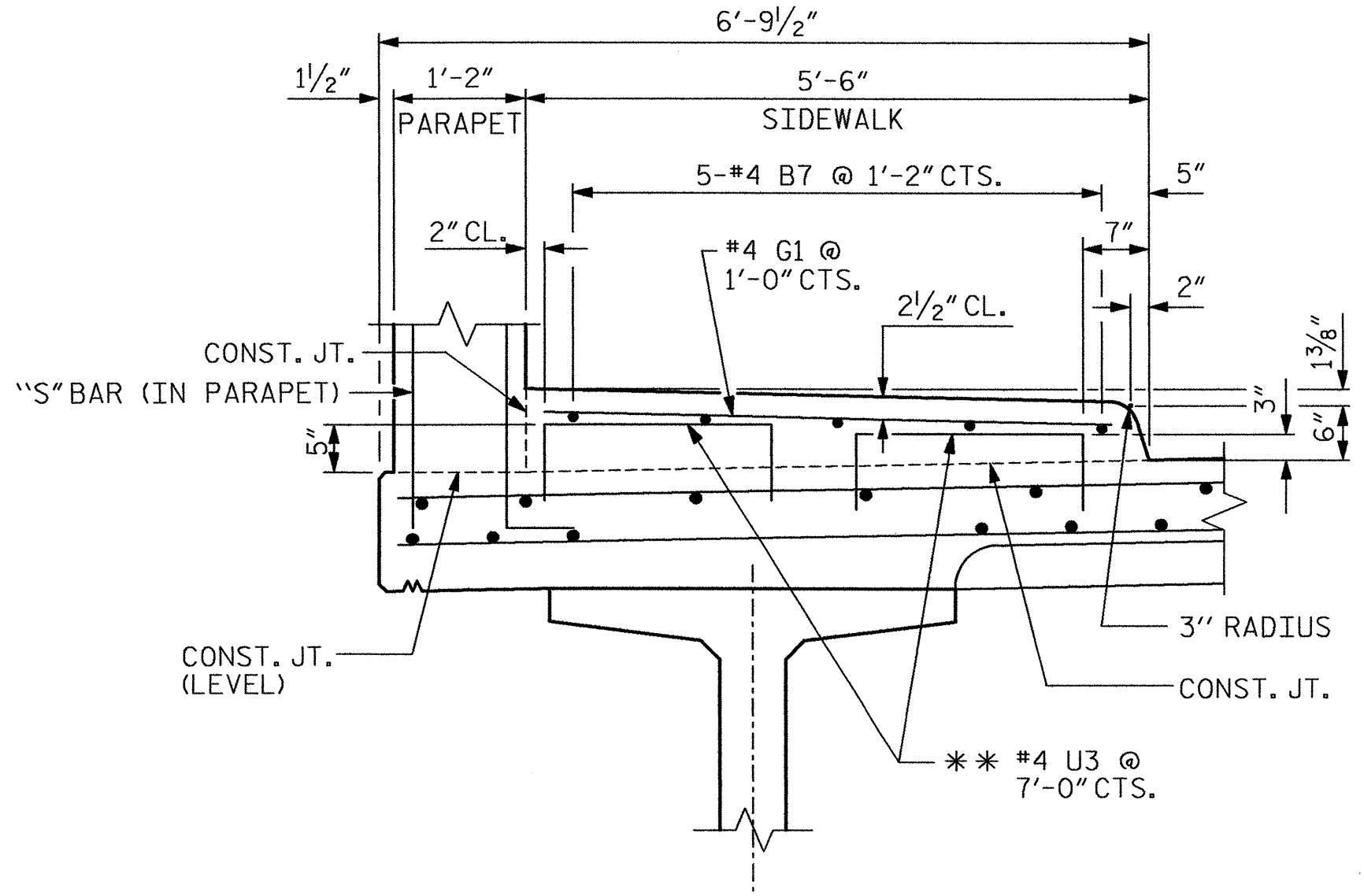
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CHECKED BY : B.E. ATKINSON DATE : 01/12

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PLAN OF SIDEWALK



SECTION THRU SIDEWALK

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

FOR REINFORCEMENT DETAILS OF PARAPET, SEE "CONCRETE PARAPET DETAILS" SHEET.

NOTES

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

ALL REINFORCING STEEL IN SIDEWALK SHALL BE EPOXY COATED.

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

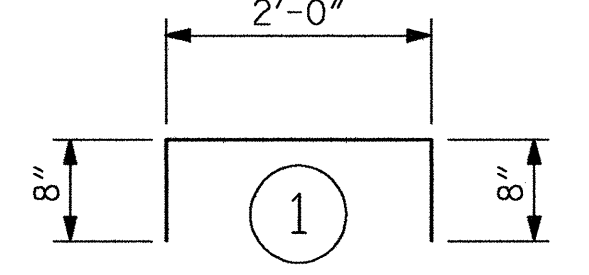
NO SEPARATE PAYMENT WILL BE MADE FOR THE SIDEWALK AS IT IS INCLUDED WITH THE REINFORCED CONCRETE DECK SLAB PAY ITEM.

THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF THE SIDEWALK.

△ THE #4 U3 BARS WITHIN A DISTANCE OF 4'-0" OF THE JOINT ARE TO BE PLACED AFTER THE SAWING OF THE JOINT. THE HOLES SHALL BE DRILLED AND THE BARS GROUTED INTO PLACE.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

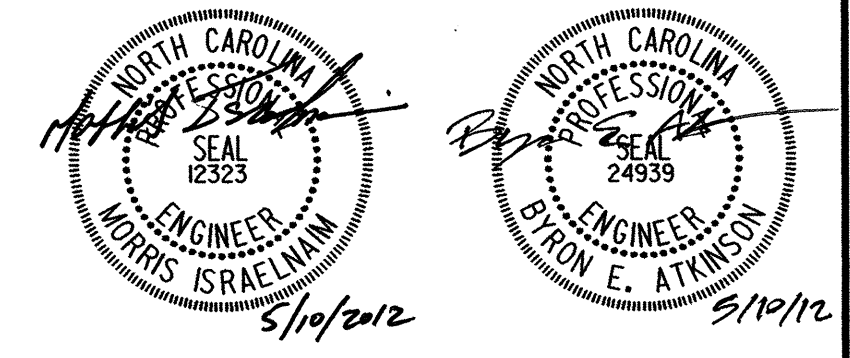
BILL OF MATERIAL					
FOR SIDEWALK ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B7	80	#4	STR	29'-6"	1,576
*G1	442	#4	STR	5'-0"	1,476
*U3	128	#4	1	3'-4"	285
* EPOXY COATED REINFORCING STEEL				LBS.	3,337
CLASS AA CONCRETE				C. Y.	54.3



ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT NO. B-4752
GASTON COUNTY
 STATION: 18+54.00 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 SIDEWALK DETAILS

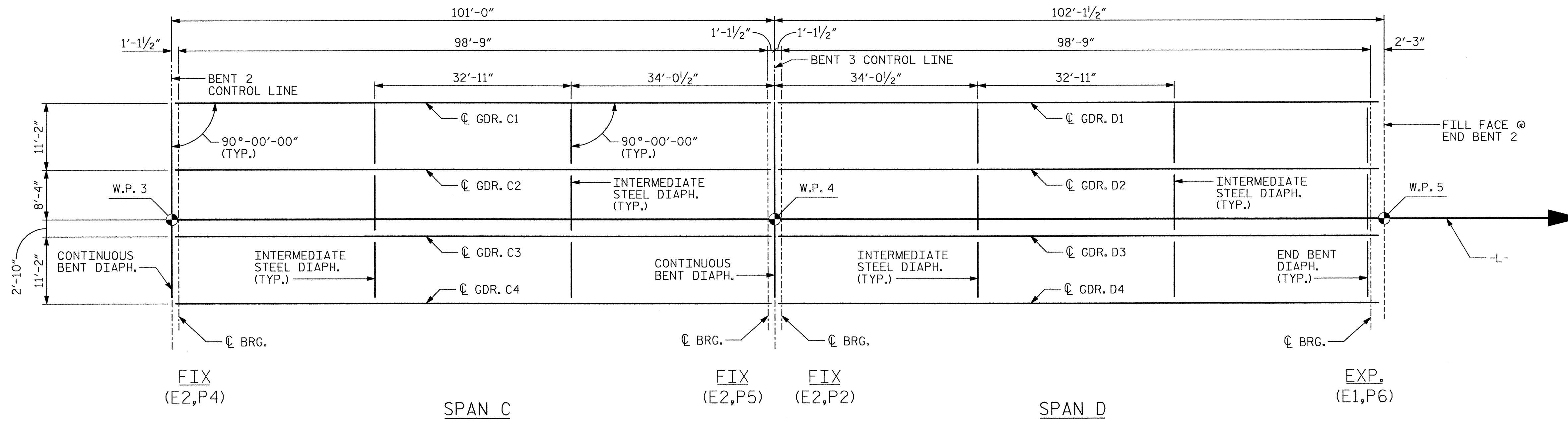
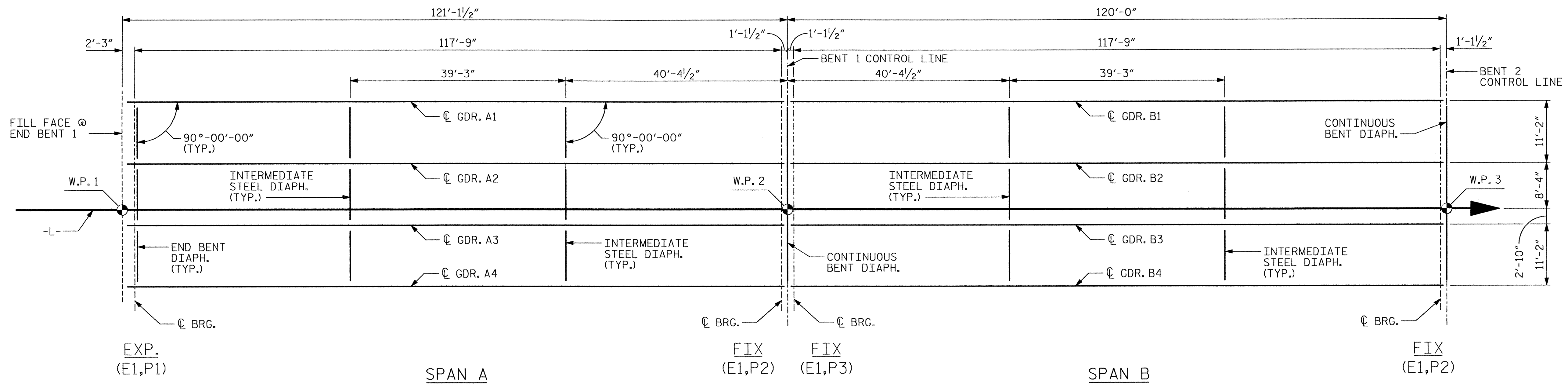


MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER : P-0671

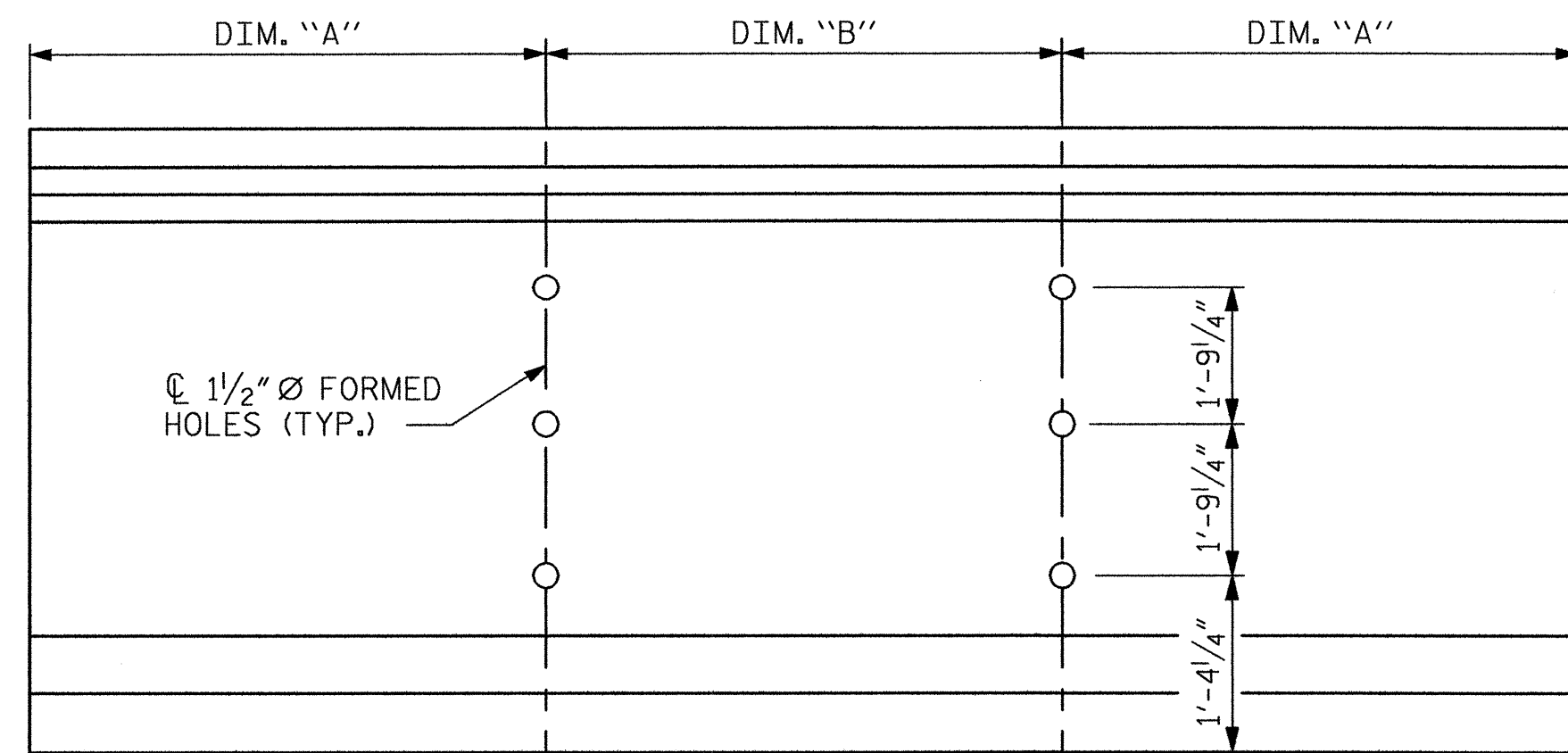
REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	

TOTAL SHEETS: 46

DRAWN BY : J.S. ISRAELNAIM DATE : 12/11
 CHECKED BY : B.E. ATKINSON DATE : 01/12



FRAMING PLAN



GIRDER ELEVATION

FORMED HOLE LOCATION		
GIRDER	DIM. "A"	DIM. "B"
A1, A2, A3, A4 B1, B2, B3, B4	39'-11 1/2"	39'-3"
C1, C2, C3, C4 D1, D2, D3, D4	33'-7 1/2"	32'-11"

PROJECT NO. B-4752
GASTON COUNTY
 STATION: 18+54.00 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 FRAMING PLAN

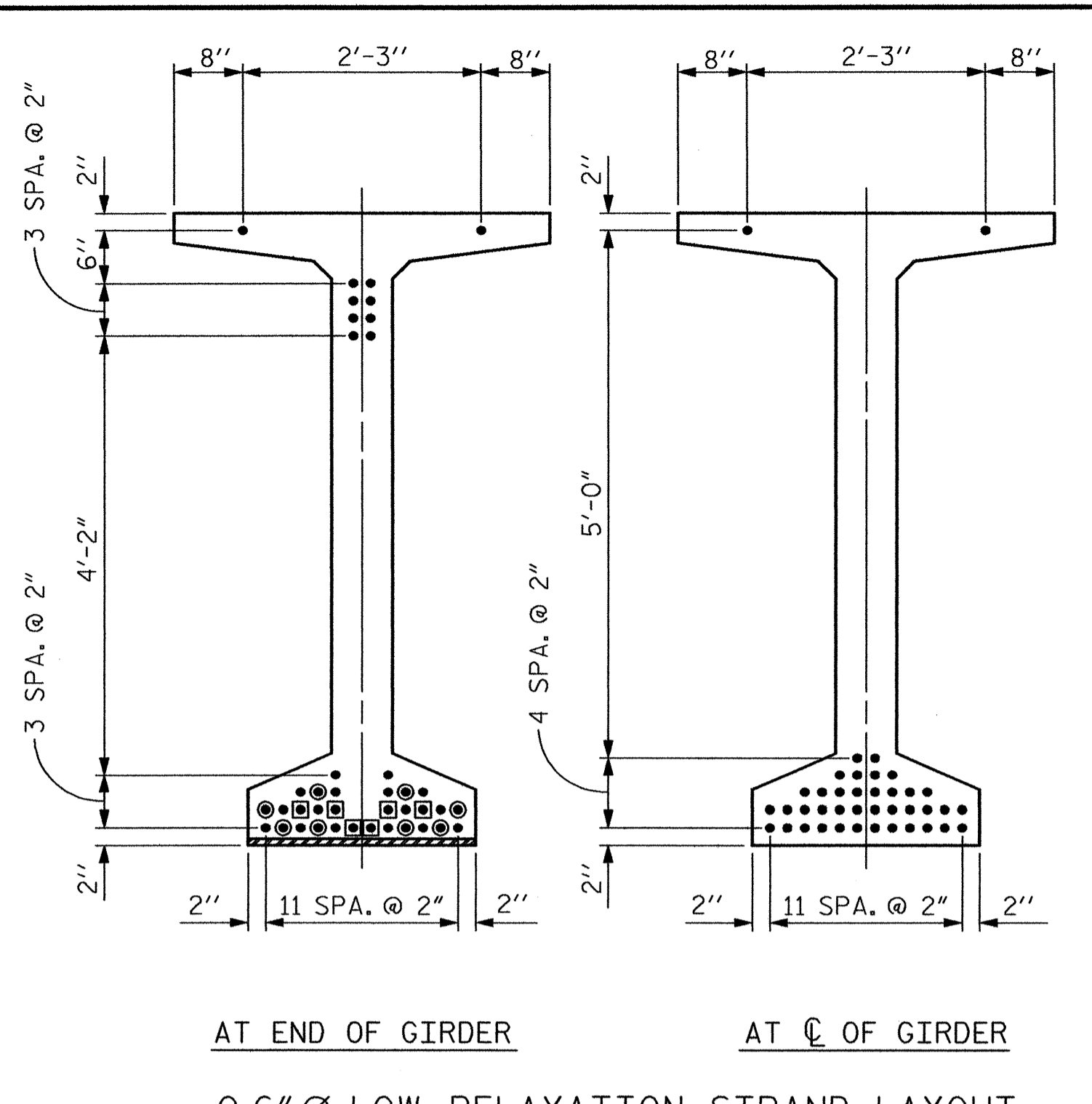
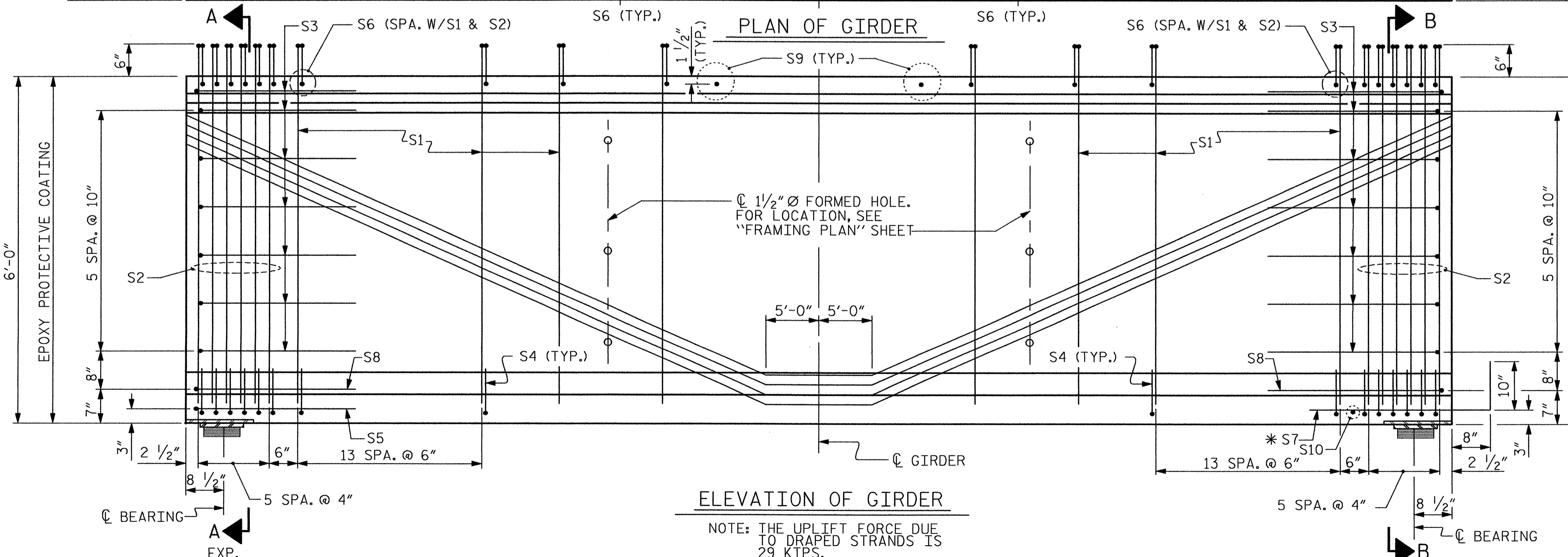
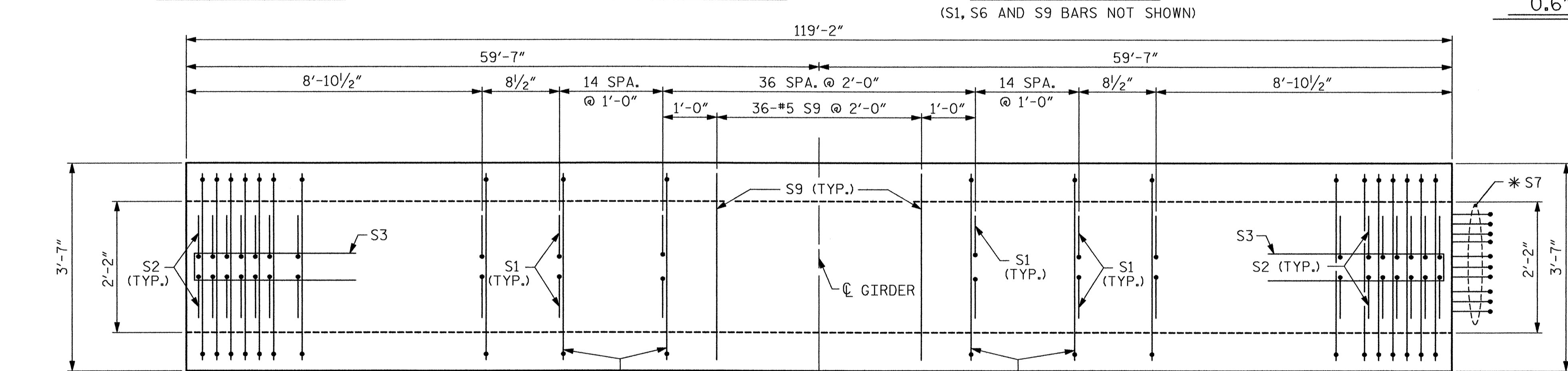
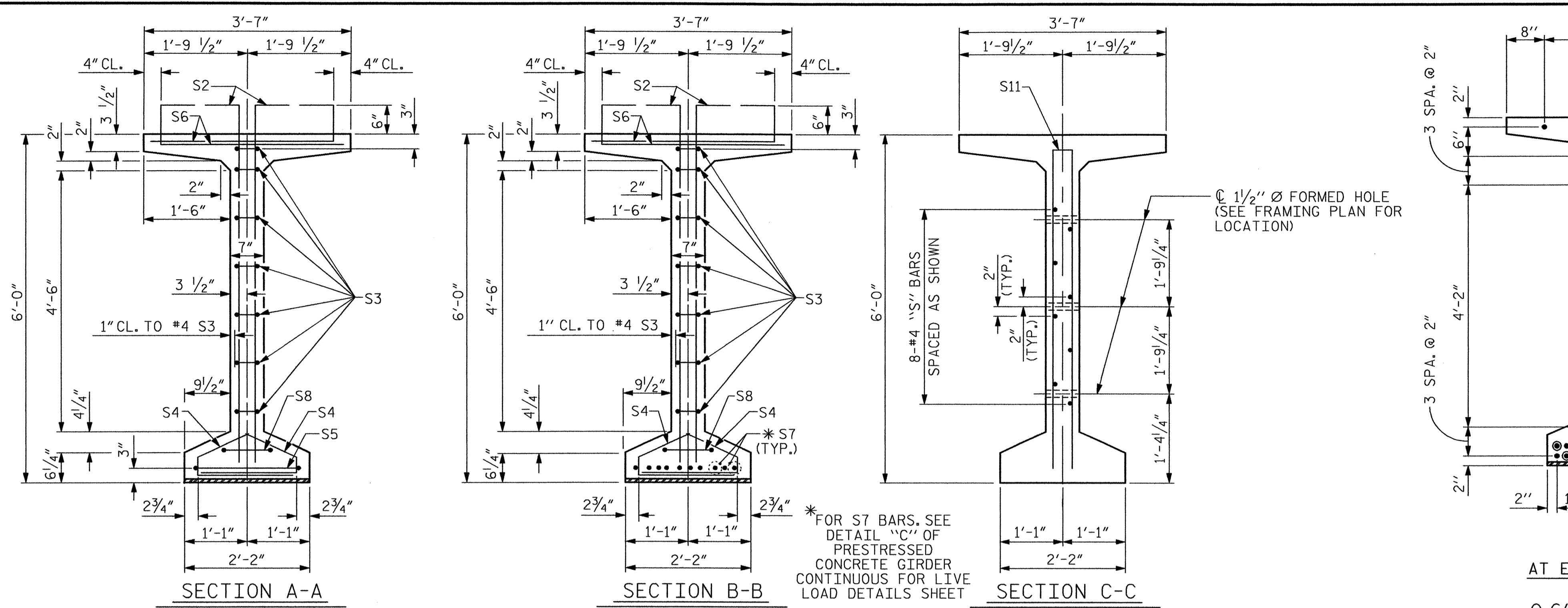


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 (919) 851-6606
 FIRM PE NUMBER : P-0671

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			46

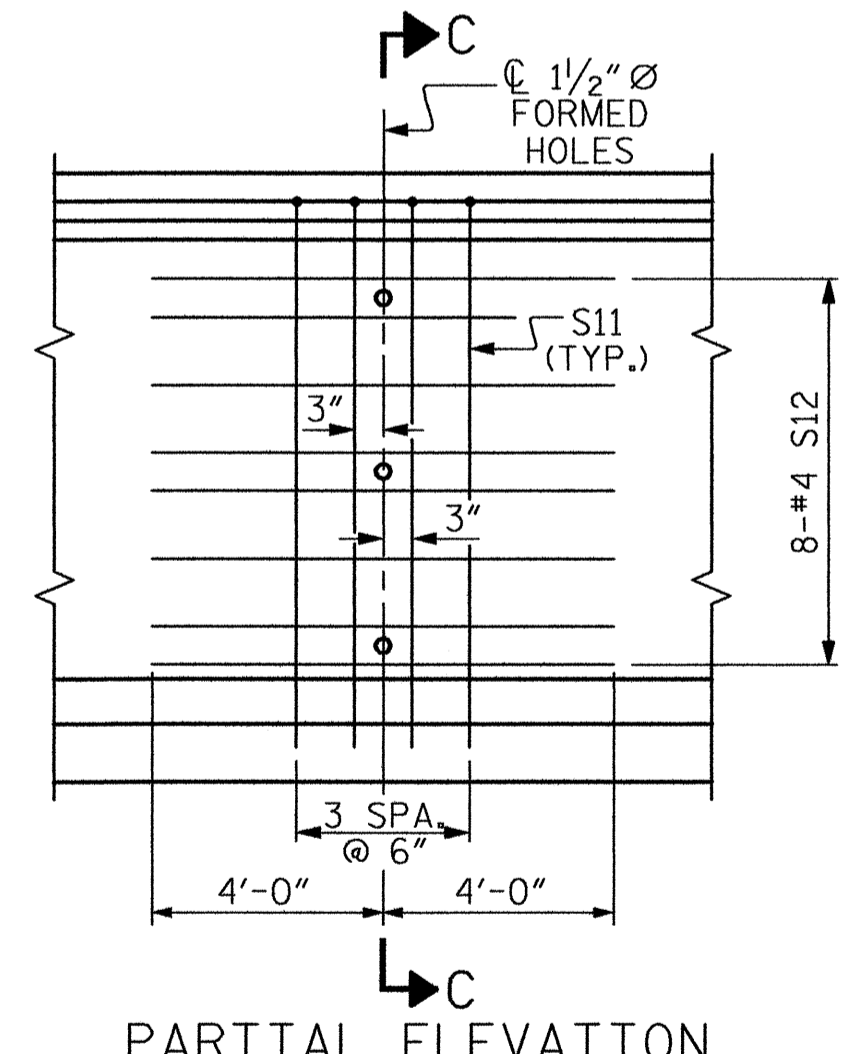
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DEBONDING LEGEND
 SEE STANDARD SPECIFICATIONS ARTICLE 1078-13.

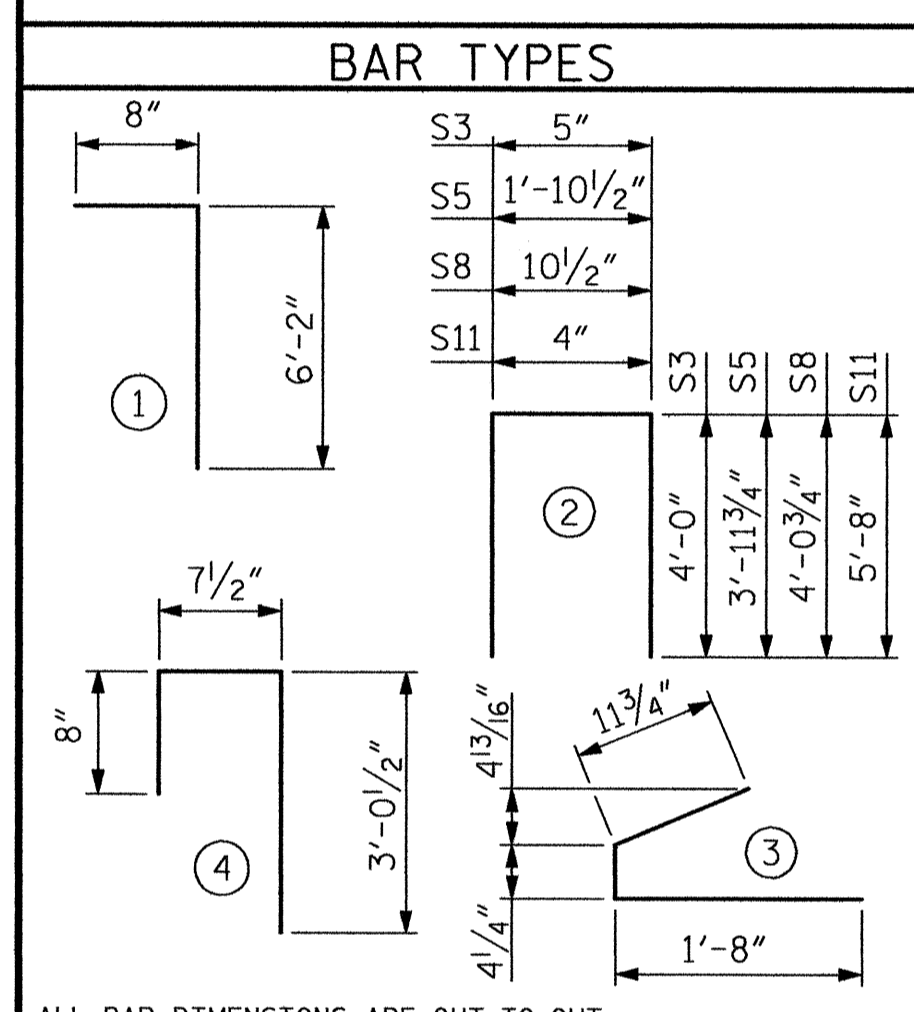
- FULLY BONDED STRAND
- STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 2'-0" FROM END OF GIRDER



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

REINFORCING STEEL FOR ONE GIRDER						
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	
S1	186	#4	1	6'-10"	849	
S2	24	#5	1	6'-10"	171	
S3	14	#4	2	8'-5"	79	
S4	80	#4	3	3'-0"	160	
S5	1	#5	2	9'-10"	10	
S6	210	#5	4	4'-4"	949	
*S7	10	#5	STR	3'-8"	38	
S8	2	#5	2	9'-0"	19	
S9	36	#5	STR	3'-3"	122	
S10	1	#3	STR	1'-10"	1	
S11	8	#5	2	11'-8"	97	
S12	16	#4	STR	8'-0"	86	

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



QUANTITIES FOR ONE GIRDER			
REINFORCING STEEL	8500 PSI CONCRETE	0.6" Ø L.R. STRANDS	
LB.	C.Y.	No.	
2,581	25.6	40	

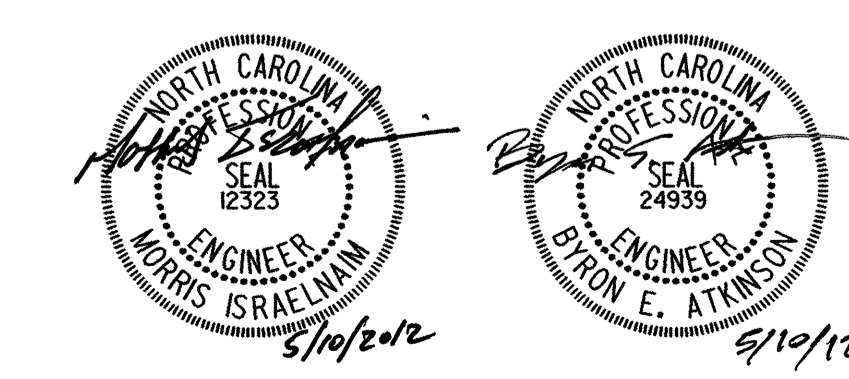
GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
4	119'-2"	476'-8"

PROJECT NO. B-4752
GASTON COUNTY
 STATION: 18+54.00 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 72" PRESTRESSED CONCRETE
 MODIFIED BULB TEE
 CONTINUOUS FOR LIVE LOAD
 SPAN A



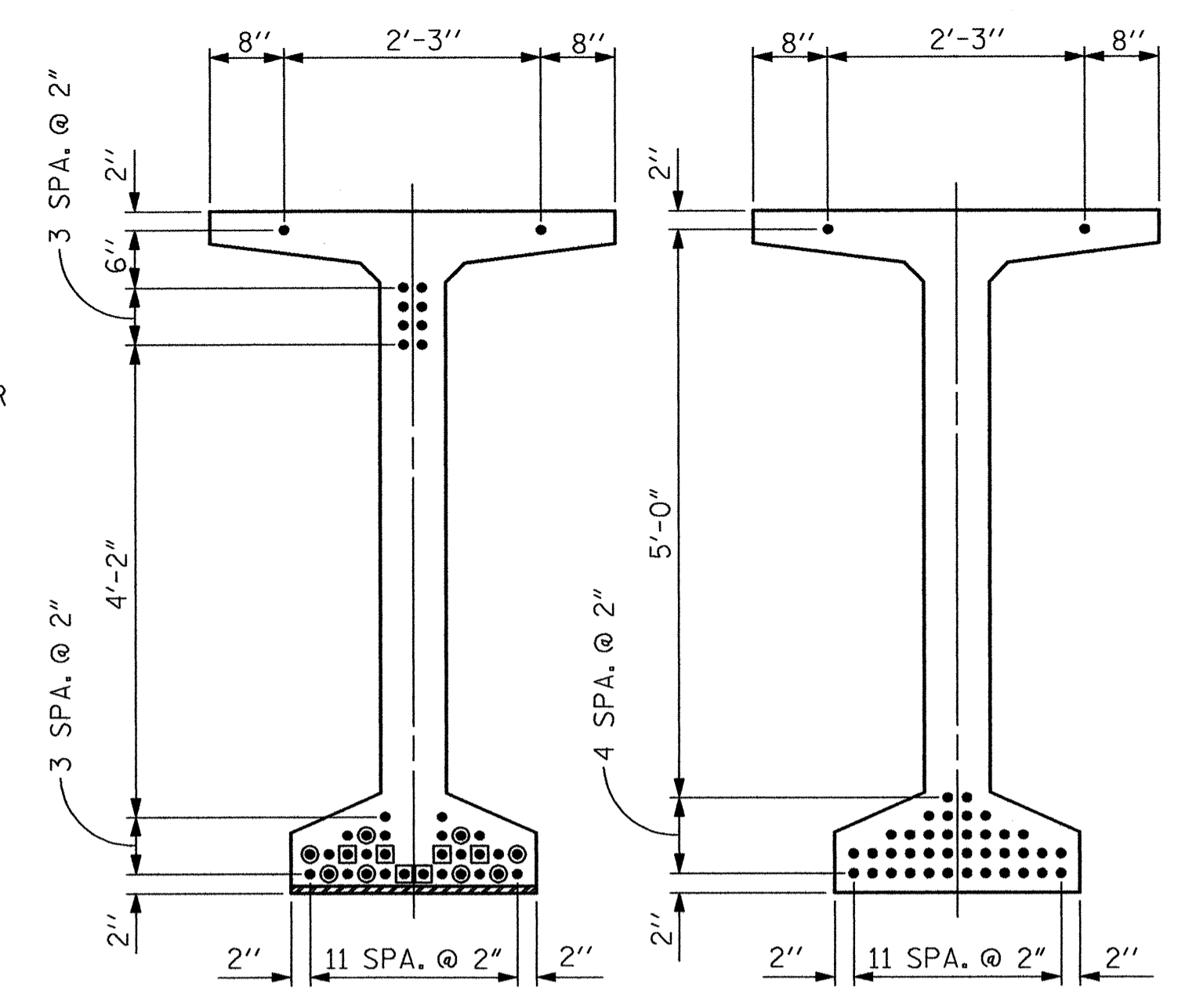
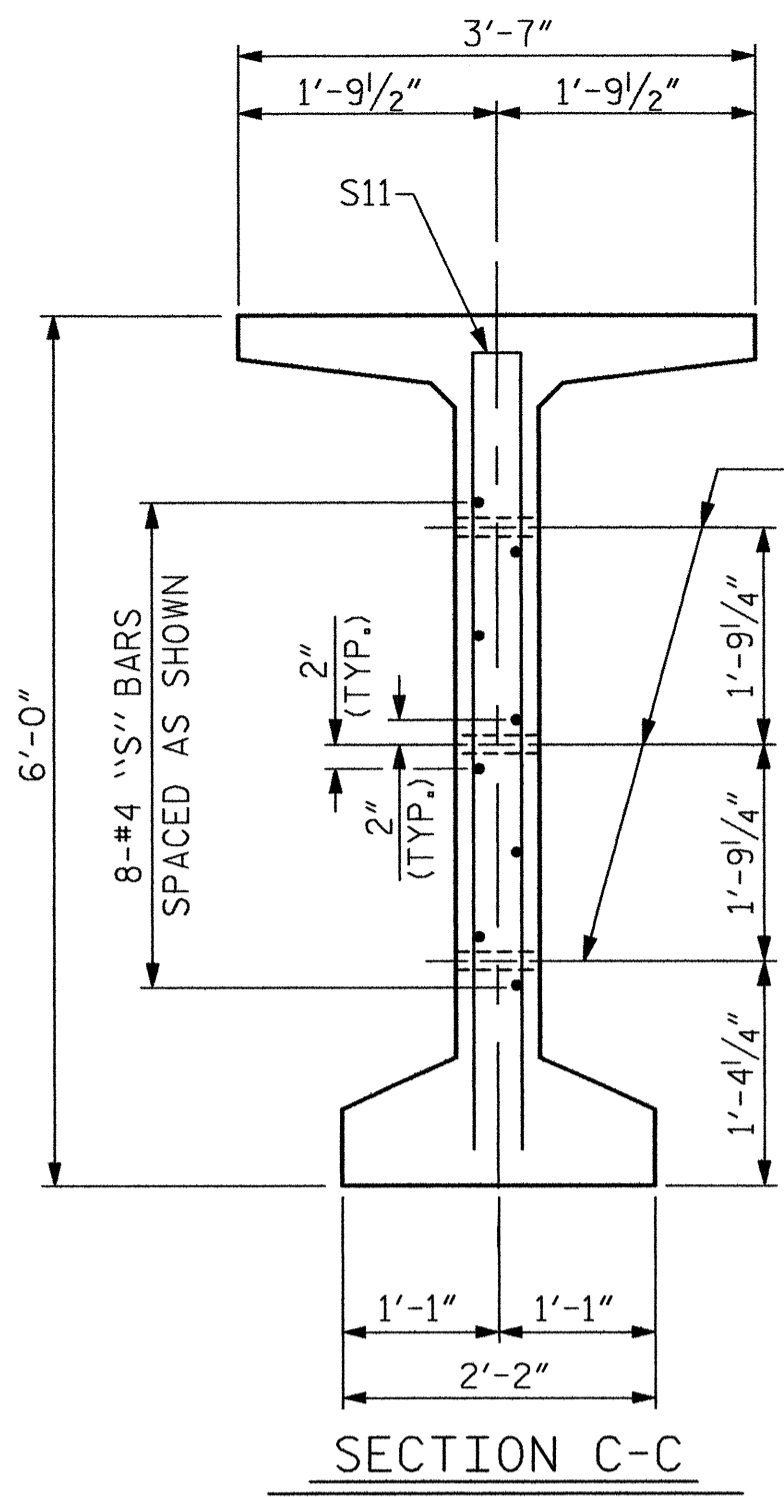
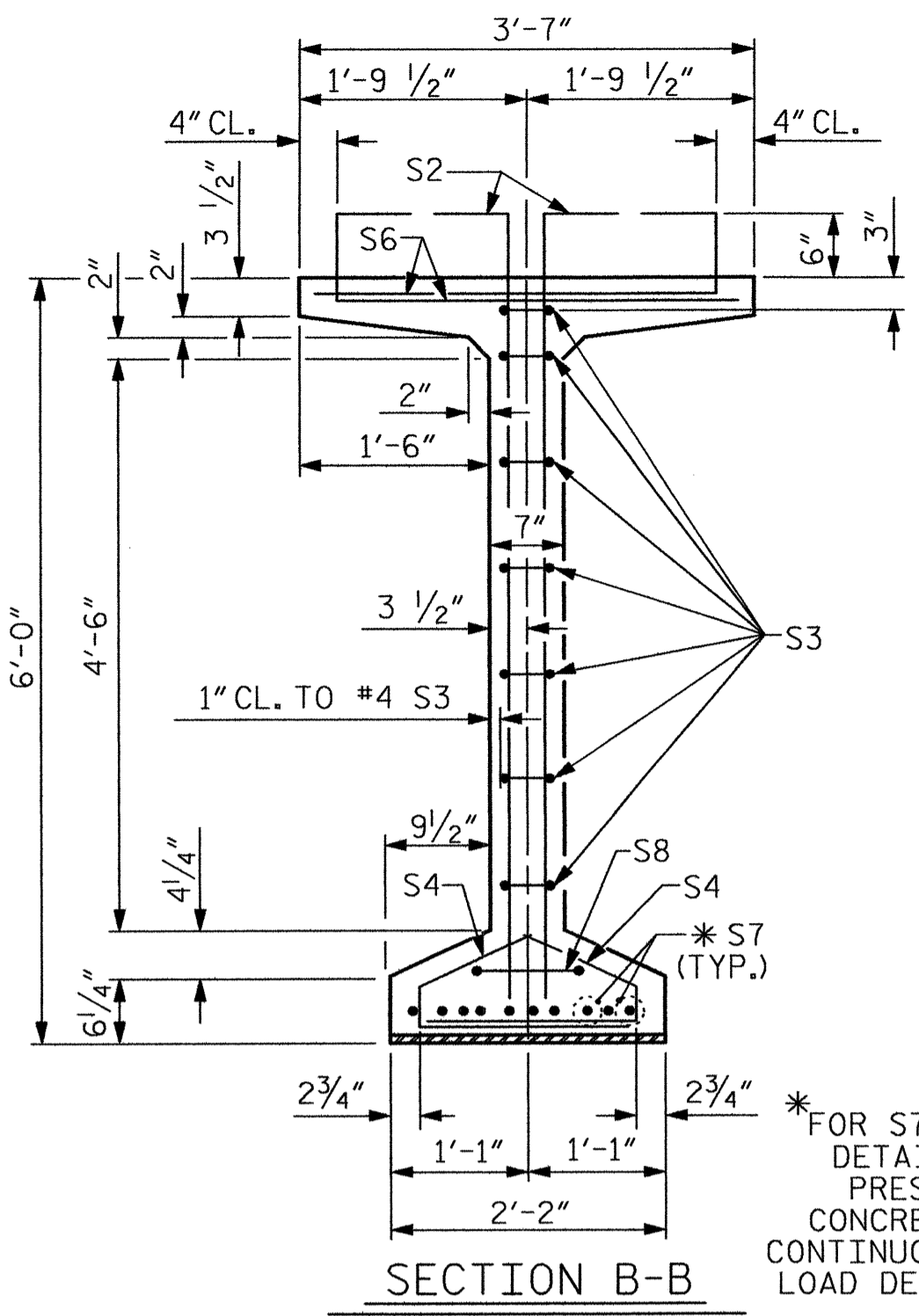
MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER : P-0671

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

SHEET NO. **S-13**
 TOTAL SHEETS **46**

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 ASSEMBLED BY : J.S. ISRAELNAIM DATE : 12/11
 CHECKED BY : B.E. ATKINSON DATE : 02/12
 DRAWN BY : EEM 2/6/97 REV. 10/17/00 RWW/LES
 CHECKED BY : VAP 2/6/97 REV. 5/1/06R TLA/DM
 REV. 10/1/11 MAA/GM

5/10/2012 10:15:04 AM User: blanning
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*FOR S7 BARS, SEE
 DETAIL "C" OF
 PRESTRESSED
 CONCRETE GIRDER
 CONTINUOUS FOR LIVE
 LOAD DETAILS SHEET

(S1, S6 AND S9 BARS NOT SHOWN)

AT END OF GIRDER AT C OF GIRDER
 0.6" Ø LOW RELAXATION STRAND LAYOUT

DEBONDING LEGEND
 SEE STANDARD SPECIFICATIONS ARTICLE 1078-13.

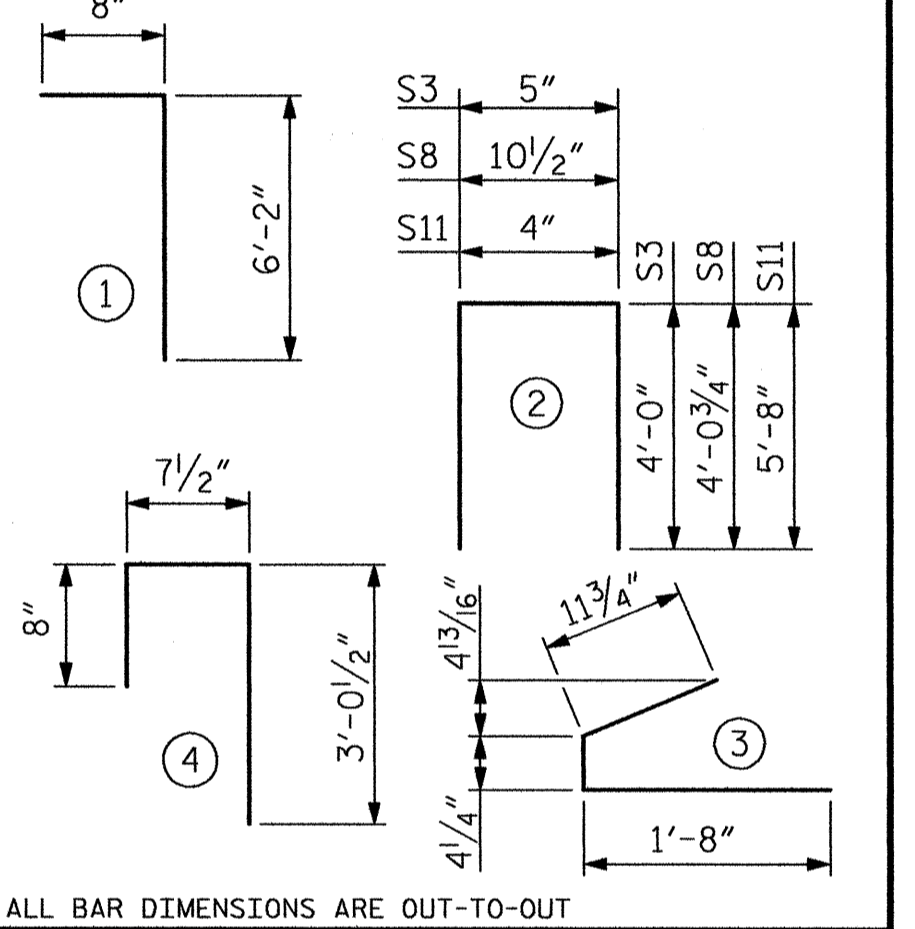
- FULLY BONDED STRAND
- STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 2'-0" FROM END OF GIRDER

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

REINFORCING STEEL FOR ONE GDR						
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	
S1	186	#4	1	6'-10"	849	
S2	24	#5	1	6'-10"	171	
S3	14	#4	2	8'-5"	79	
S4	80	#4	3	3'-0"	160	
S6	210	#5	4	4'-4"	949	
*S7	20	#5	STR	3'-8"	76	
S8	2	#5	2	9'-0"	19	
S9	36	#5	STR	3'-3"	122	
S10	2	#3	STR	1'-10"	1	
S11	8	#5	2	11'-8"	97	
S12	16	#4	STR	8'-0"	86	

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

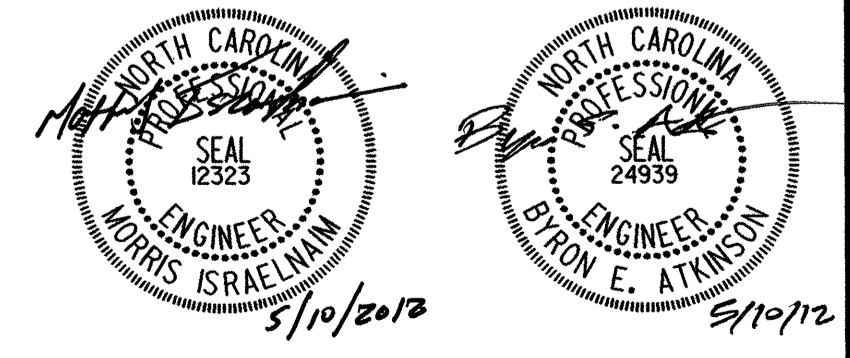
QUANTITIES FOR ONE GIRDER			
REINFORCING STEEL	8500 PSI CONCRETE	0.6" Ø L.R. STRANDS	
LB.	C.Y.	No.	
2,609	25.6	40	

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
4	119'-2"	476'-8"

PROJECT NO. B-4752
GASTON COUNTY
 STATION: 18+54.00 -L-

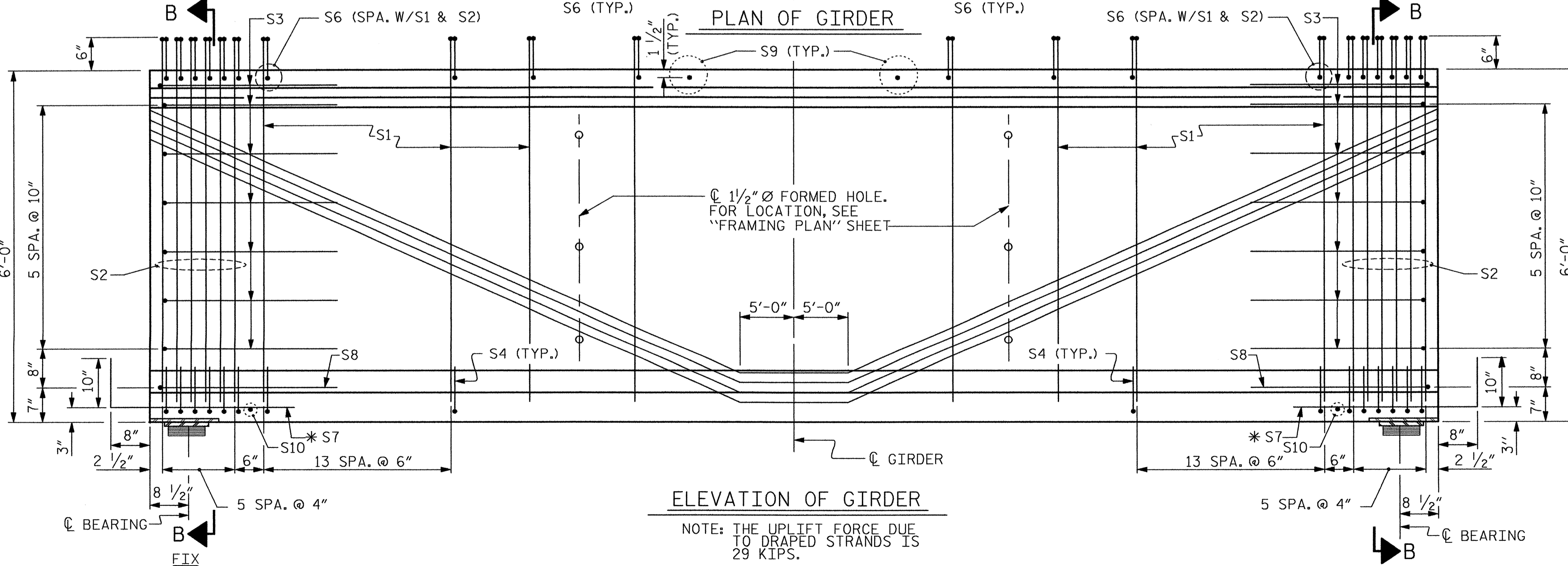
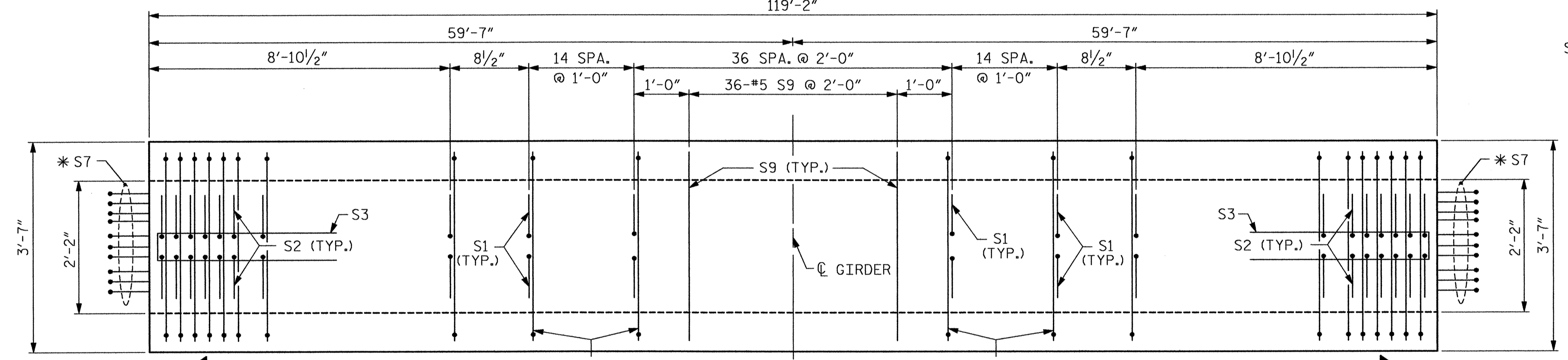
SHEET 2 OF 5

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



MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER: P-0671

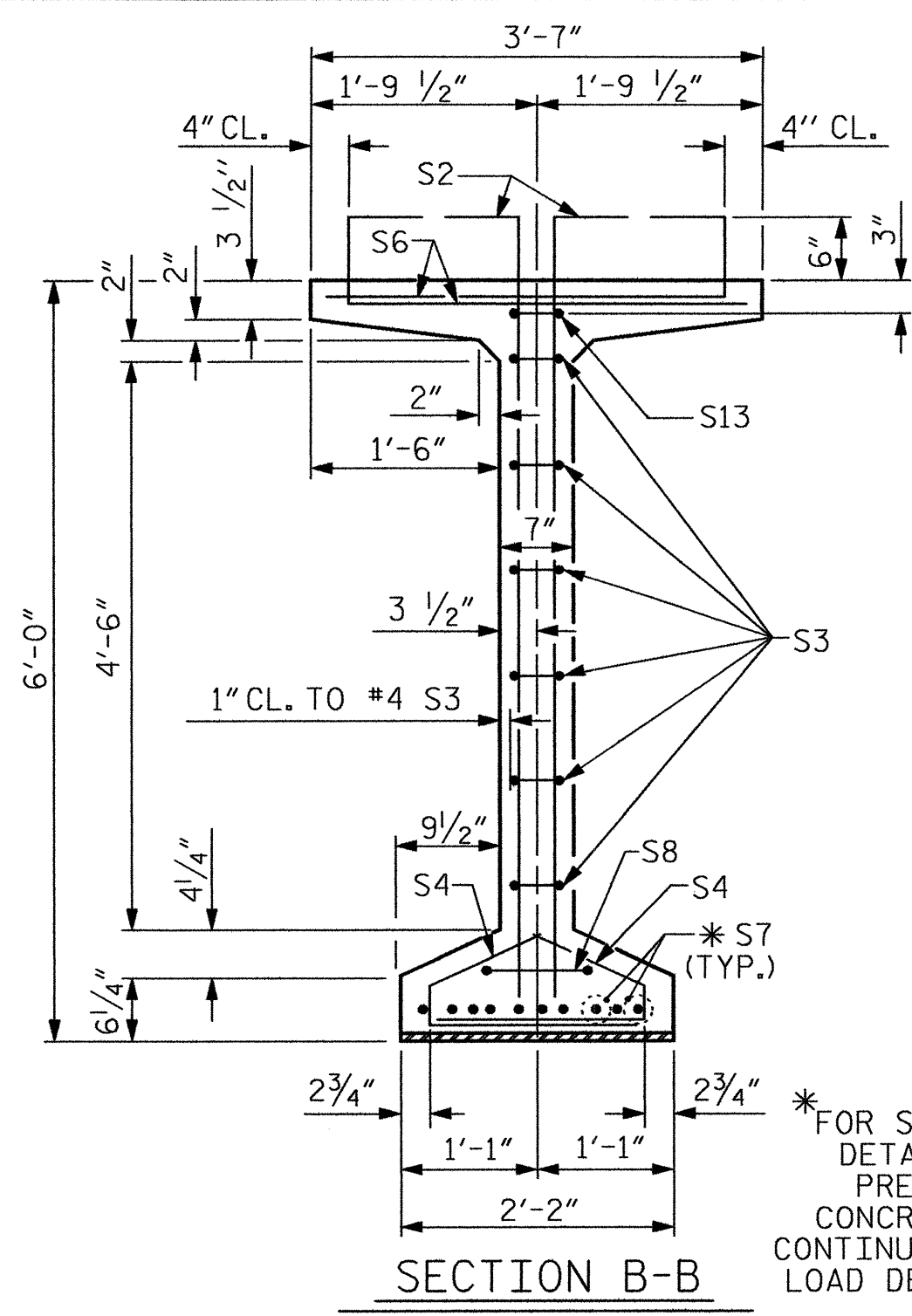
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	DATE:	TOTAL SHEETS
1			3		46
2			4		



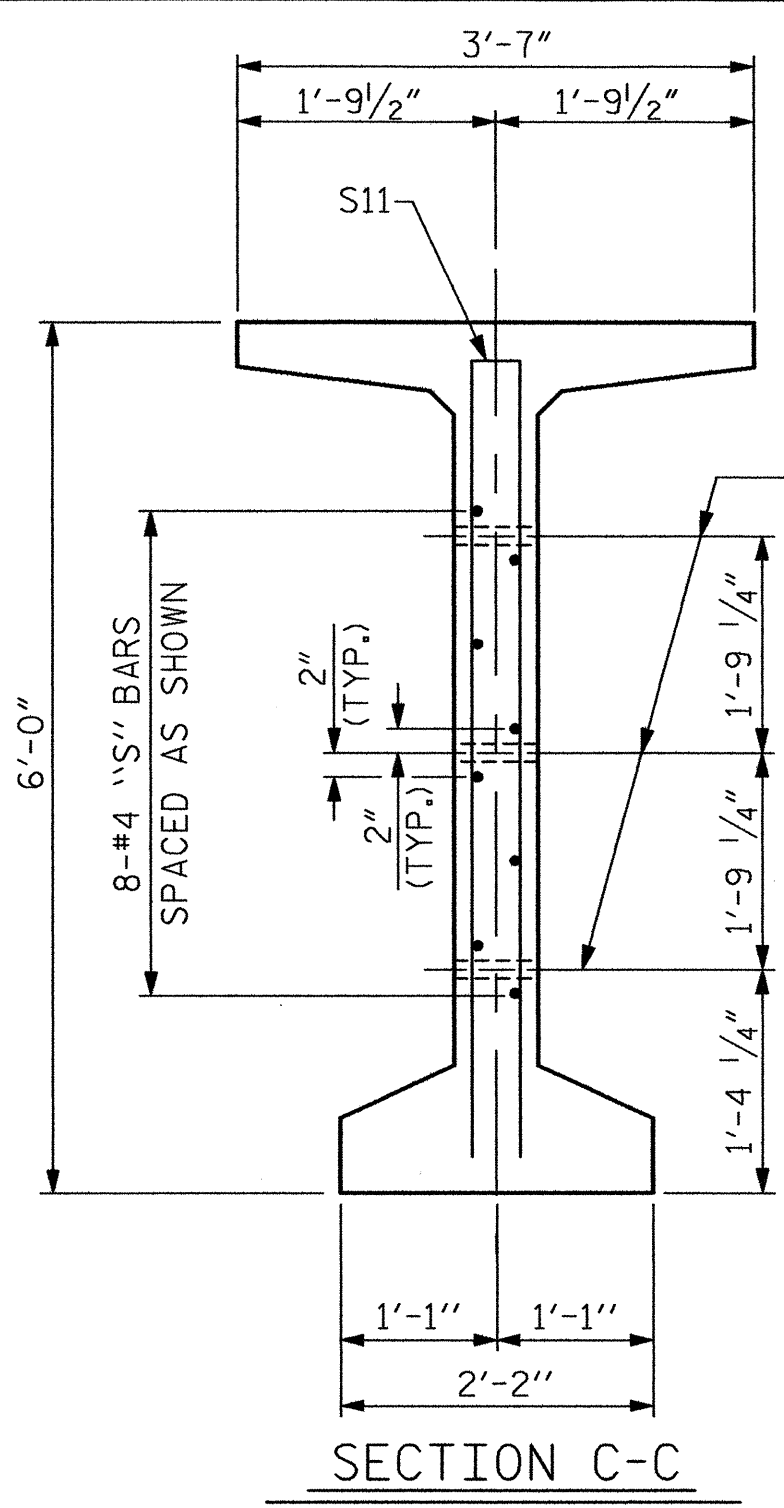
NOTE: THE UPLIFT FORCE DUE TO DRAPED STRANDS IS 29 KIPS.

ASSEMBLED BY : J.S. ISRAELNAIM	DATE : 12/11
CHECKED BY : B.E. ATKINSON	DATE : 02/12
DRAWN BY : EEM 2/6/97	REV. 10/17/00 RWW/LES
CHECKED BY : VAP 2/6/97	REV. 5/1/06R TLA/GM
	REV. 10/1/11 MAA/GM

5/10/2012 10:18:21 AM User: blanning
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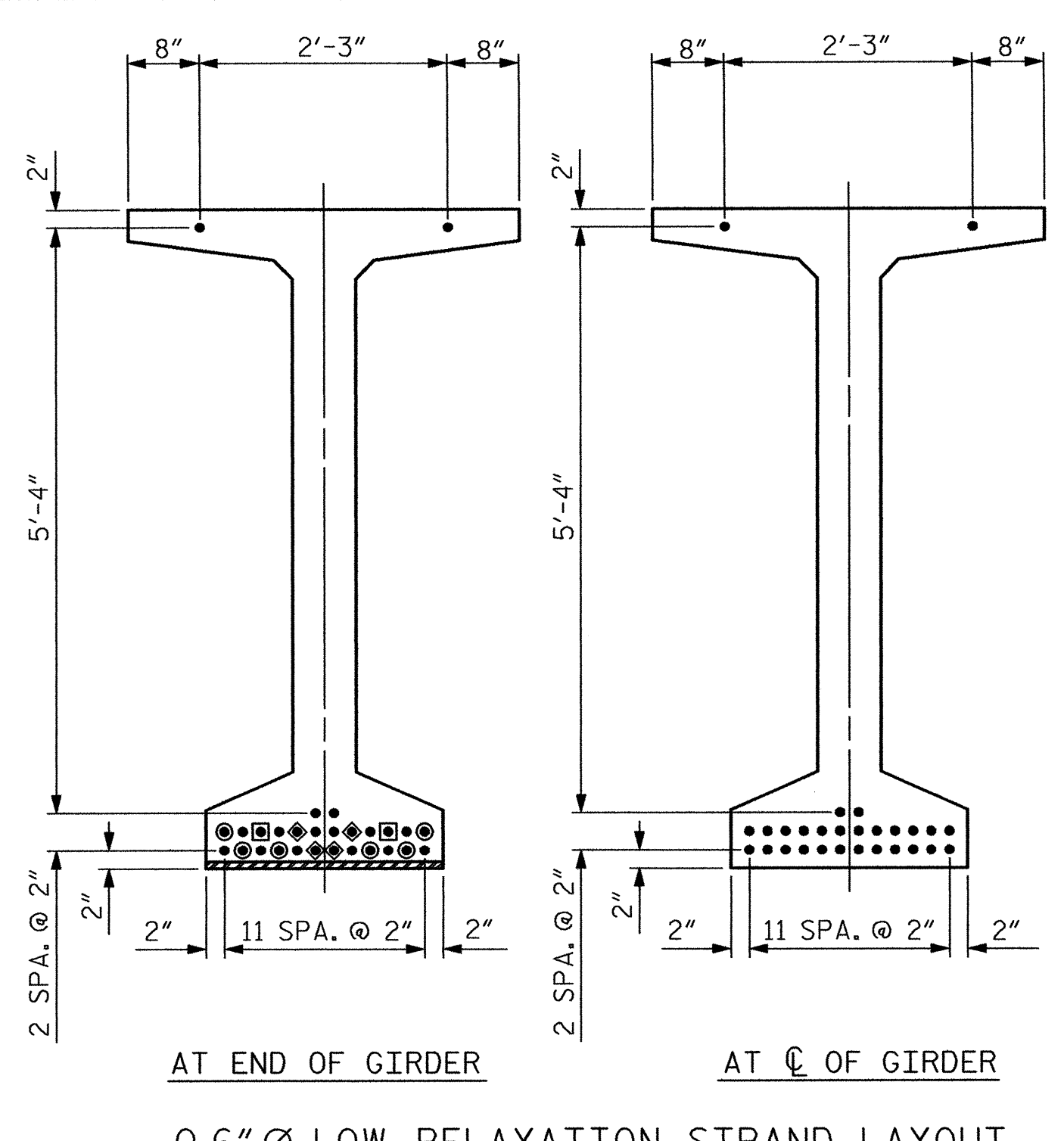


* FOR S7 BARS, SEE
 DETAIL "C" OF
 PRESTRESSED
 CONCRETE GIRDER
 CONTINUOUS FOR LIVE
 LOAD DETAILS SHEET



1 1/2" Ø FORMED HOLE
 (SEE FRAMING PLAN FOR
 LOCATION)

SECTION C-C
(S1, S6 AND S9 BARS NOT SHOWN)



AT END OF GIRDER AT C OF GIRDER
0.6" Ø LOW RELAXATION STRAND LAYOUT

DEBONDING LEGEND

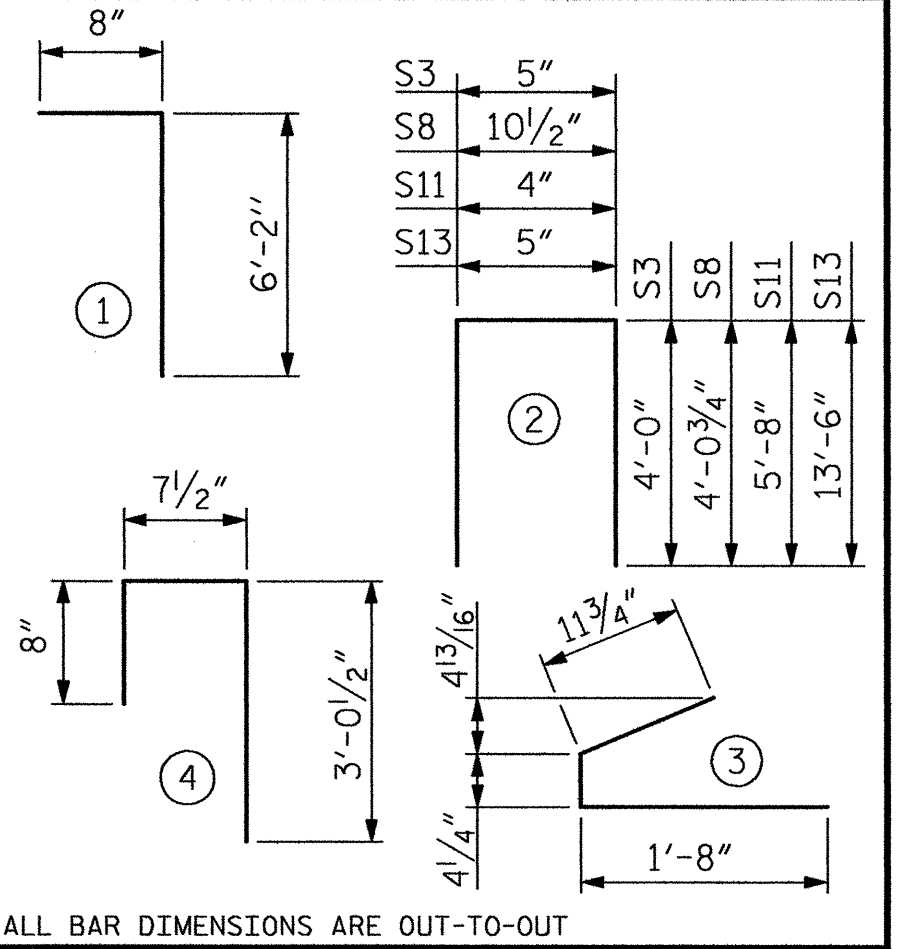
- SEE STANDARD SPECIFICATIONS ARTICLE 1078-13.
- FULLY BONDED STRAND
 - STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
 - STRANDS DEBONDED FOR 2'-0" FROM END OF GIRDER
 - ◇ STRANDS DEBONDED FOR 17'-6" FROM END OF GIRDER

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

REINFORCING STEEL FOR ONE GDR					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	94	#4	1	6'-10"	429
S2	84	#5	1	6'-10"	599
S3	12	#4	2	8'-5"	67
S4	84	#4	3	3'-0"	168
S6	178	#5	4	4'-4"	805
*S7	20	#5	STR	3'-8"	76
S8	2	#5	2	9'-0"	19
S9	34	#5	STR	3'-3"	115
S10	2	#3	STR	1'-10"	1
S11	8	#5	2	11'-8"	97
S12	16	#4	STR	8'-0"	86
S13	2	#4	2	27'-5"	37

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

BAR TYPES



QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL	8500 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
	2,499	21.5	28

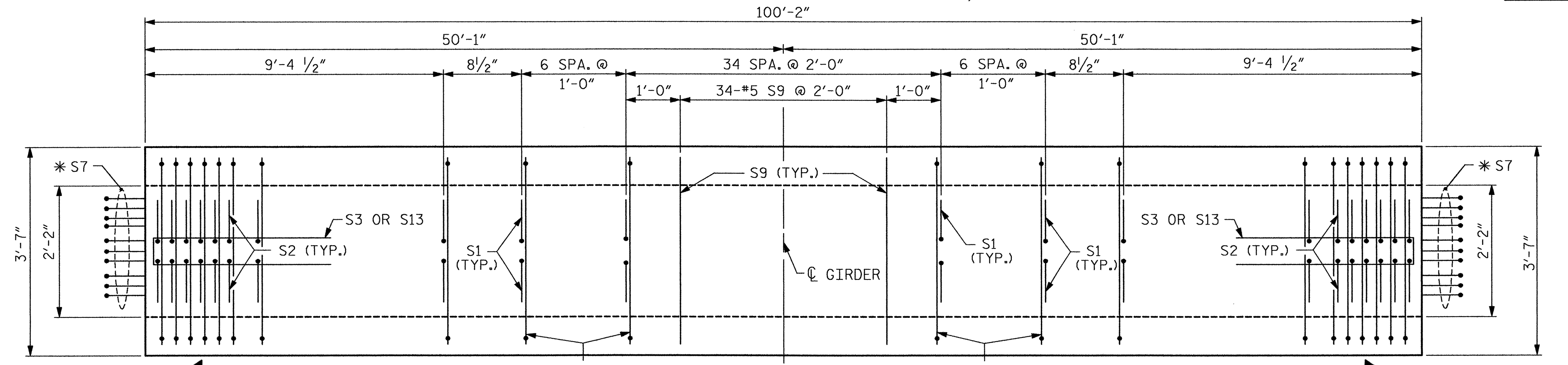
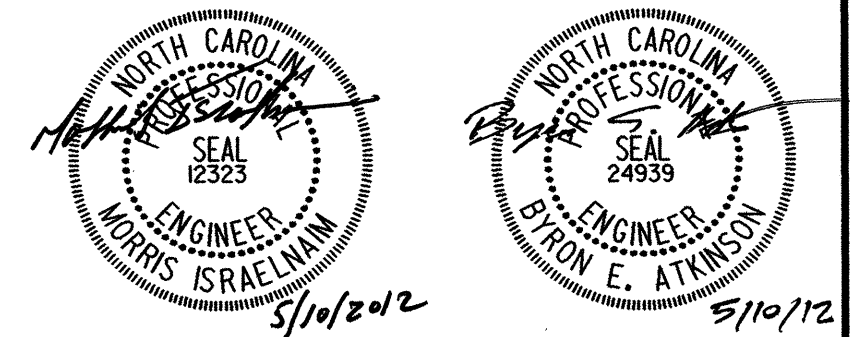
GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	100'-2"	400'-8"

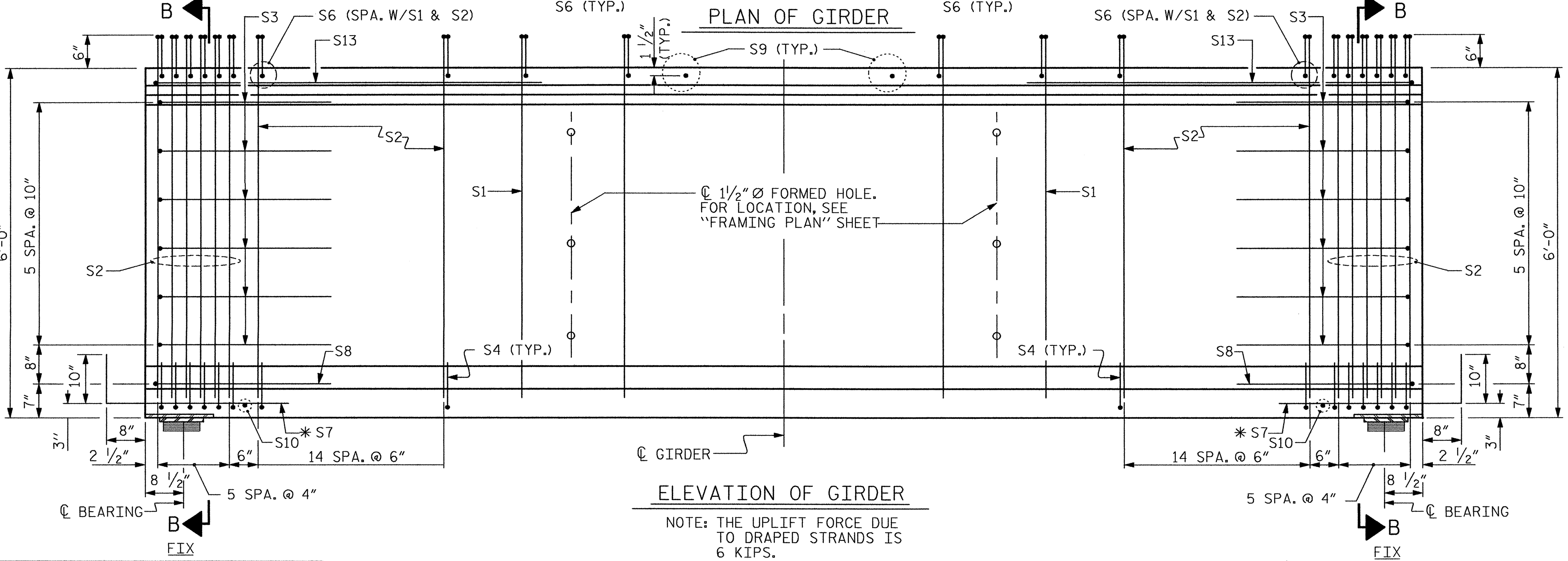
PROJECT NO. B-4752
GASTON COUNTY
 STATION: 18+54.00 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 72" PRESTRESSED CONCRETE
 MODIFIED BULB TEE
 CONTINUOUS FOR LIVE LOAD
 SPAN C

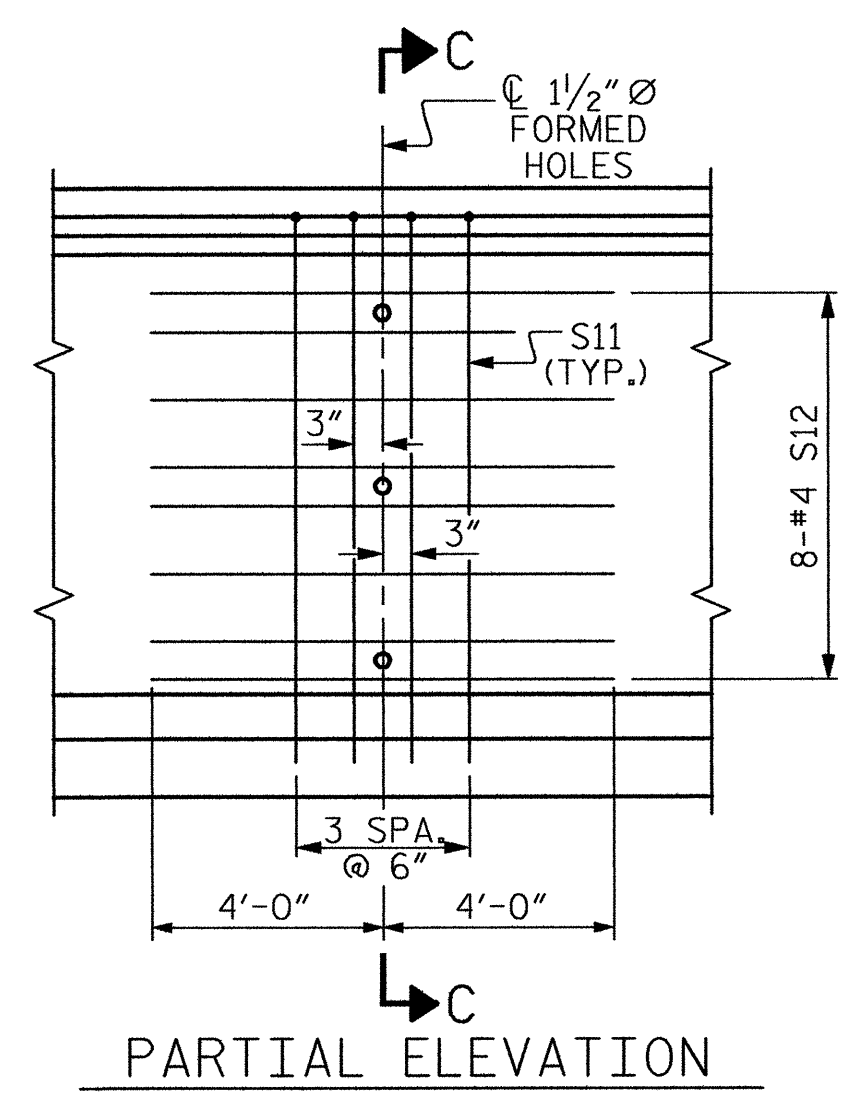


PLAN OF GIRDER



ELEVATION OF GIRDER

NOTE: THE UPLIFT FORCE DUE TO DRAPED STRANDS IS 6 KIPS.



PARTIAL ELEVATION

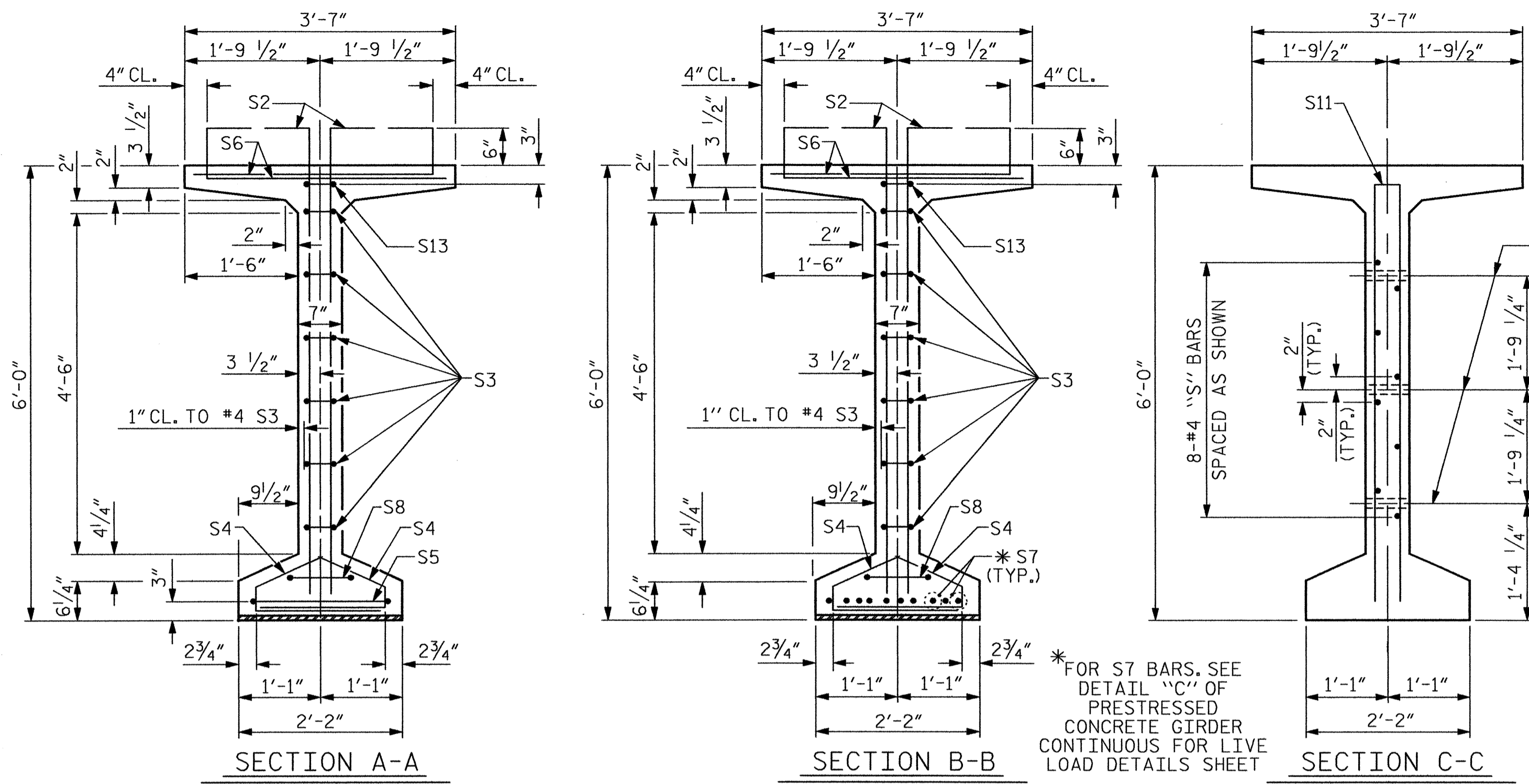
ASSEMBLED BY : J.S. ISRAELNIM	DATE : 12/11
CHECKED BY : B.E. ATKINSON	DATE : 02/12
DRAWN BY : EEM 2/6/97	REV. 10/17/00 RWW/LES
CHECKED BY : VAP 2/6/97	REV. 5/1/06R TLA/GM
	REV. 10/1/11 MAA/GM

MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER : P-0671

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

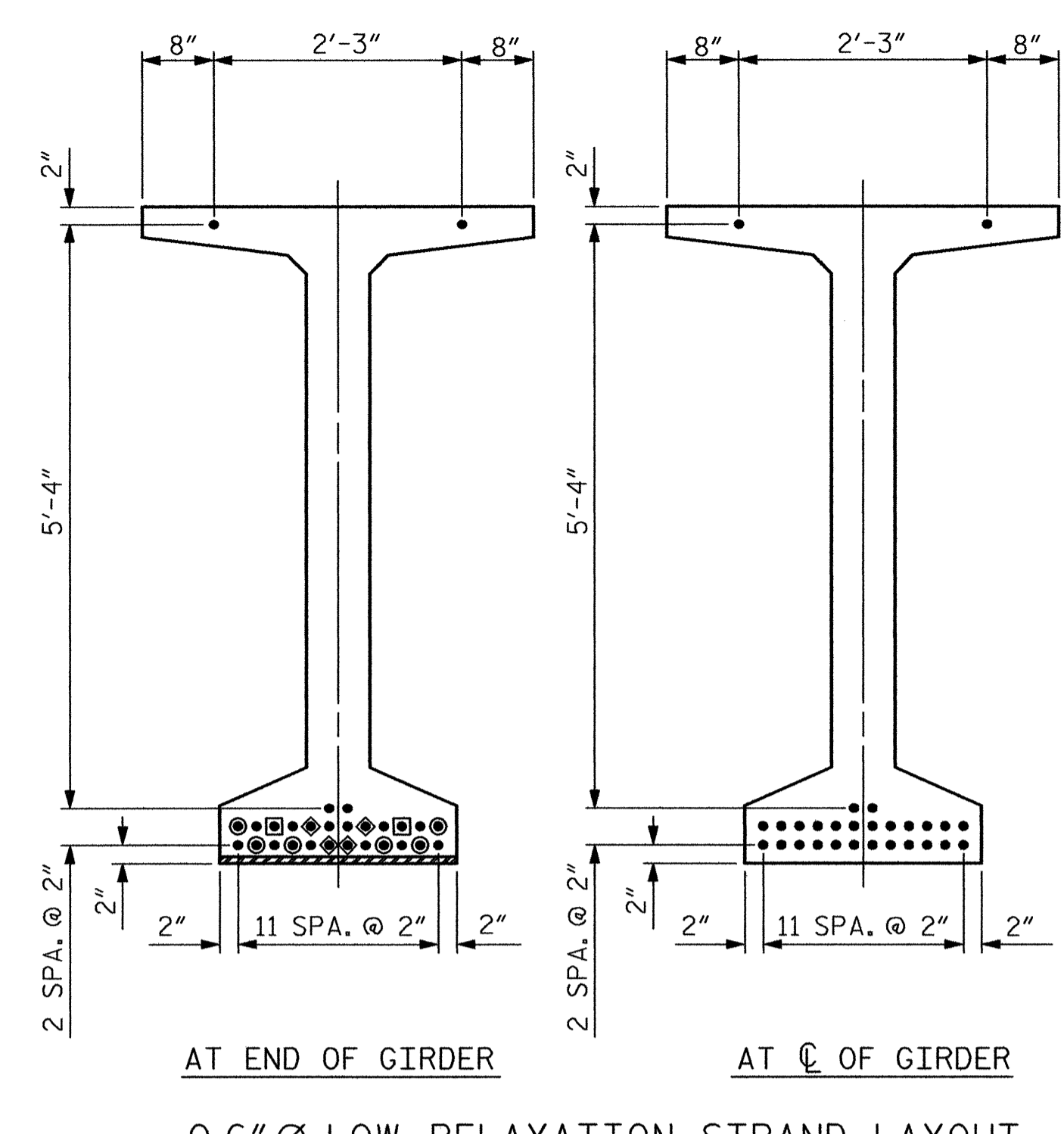
SHEET NO. S-15
TOTAL SHEETS 46

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1/2" Ø FORMED HOLE
 (SEE FRAMING PLAN FOR LOCATION)

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

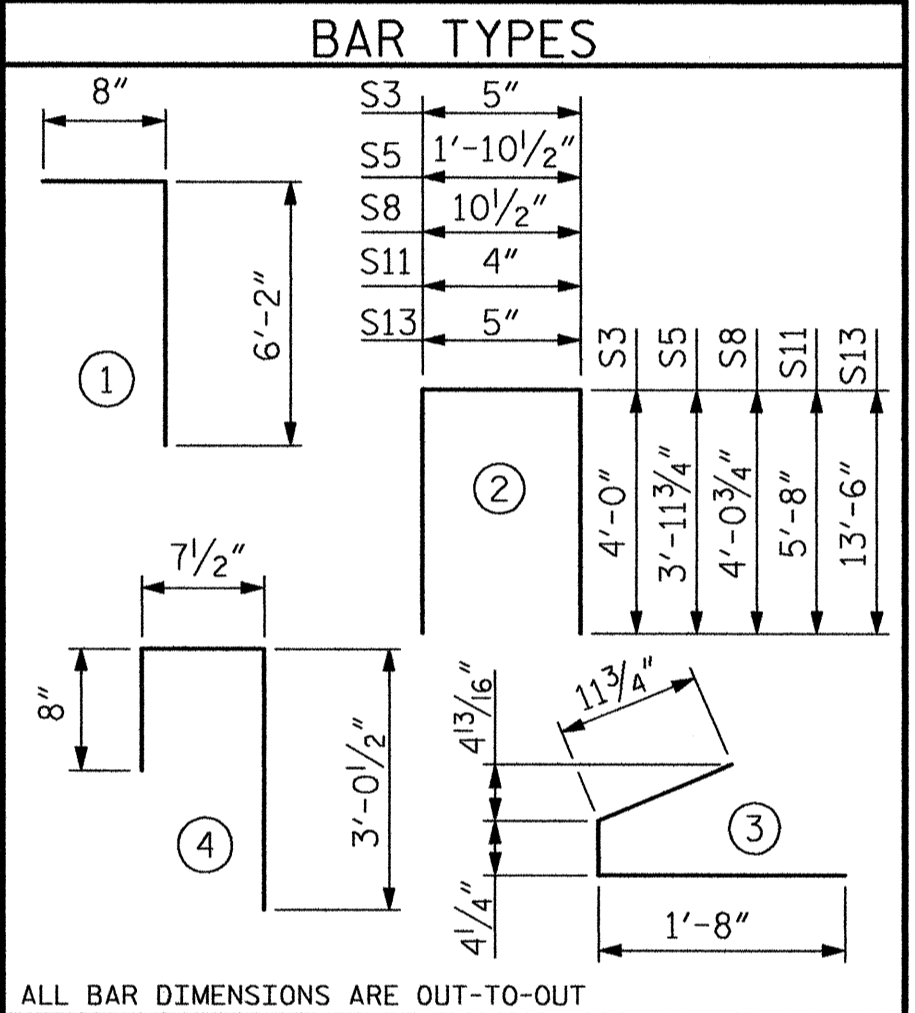


AT END OF GIRDER AT C OF GIRDER
 0.6" Ø LOW RELAXATION STRAND LAYOUT

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

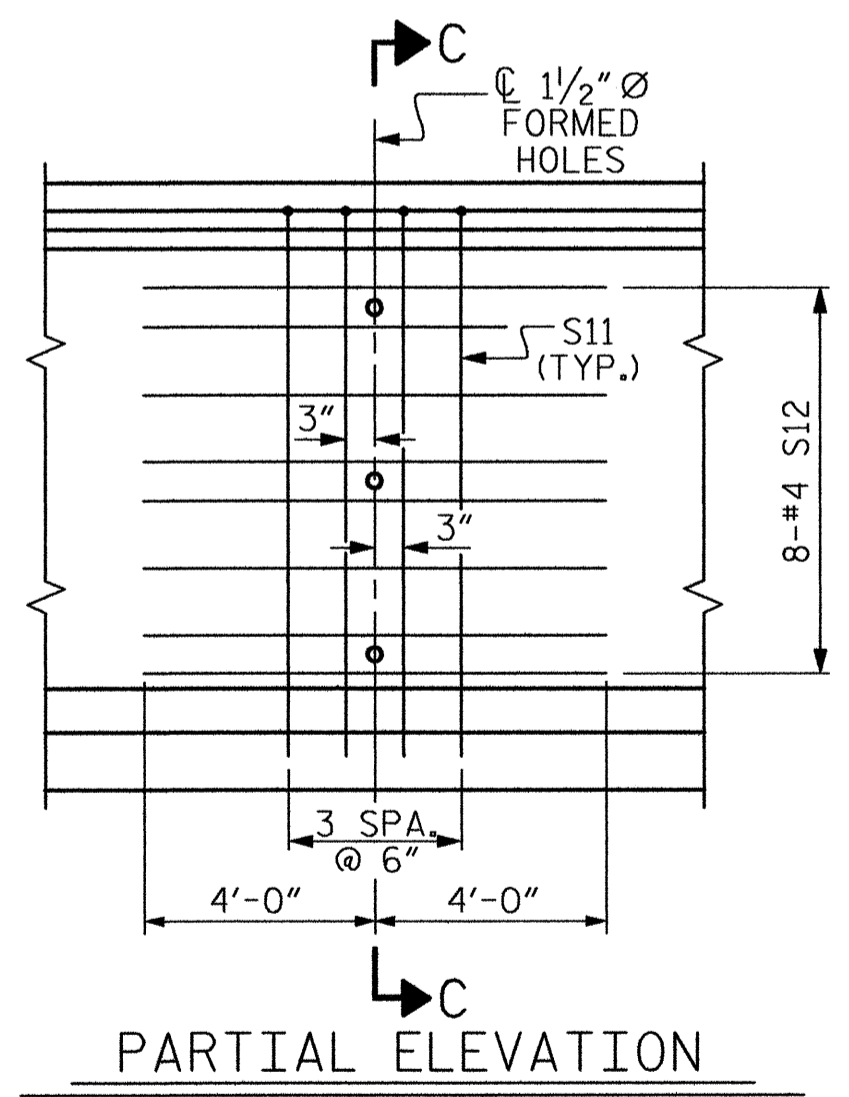
REINFORCING STEEL FOR ONE GDR					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	94	#4	1	6'-10"	429
S2	84	#5	1	6'-10"	599
S3	12	#4	2	8'-5"	67
S4	84	#4	3	3'-0"	168
S5	1	#5	2	9'-10"	10
S6	178	#5	4	4'-4"	805
*S7	10	#5	STR	3'-8"	38
S8	2	#5	2	9'-0"	19
S9	34	#5	STR	3'-3"	115
S10	1	#3	STR	1'-10"	1
S11	8	#5	2	11'-8"	97
S12	16	#4	STR	8'-0"	86
S13	2	#4	2	27'-5"	37

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



DEBONDING LEGEND
 SEE STANDARD SPECIFICATIONS ARTICLE 1078-13.

- FULLY BONDED STRAND
- STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 2'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 17'-6" FROM END OF GIRDER



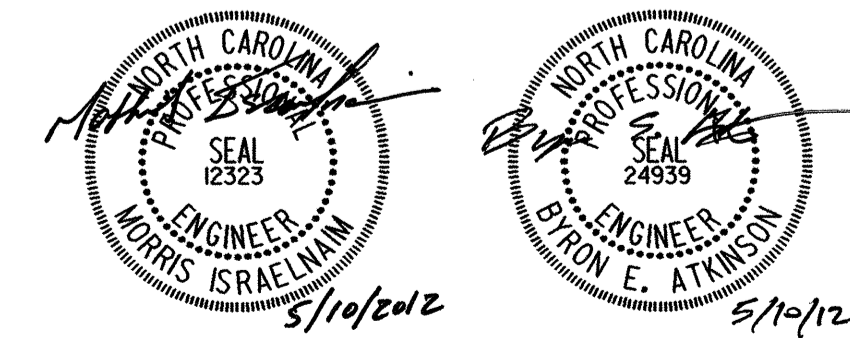
QUANTITIES FOR ONE GIRDER			
REINFORCING STEEL	8500 PSI CONCRETE	0.6" Ø L.R. STRANDS	
LB.	C.Y.	No.	
2,471	21.5	28	

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
4	100'-2"	400'-8"

PROJECT NO. B-4752
GASTON COUNTY
 STATION: 18+54.00 -L-

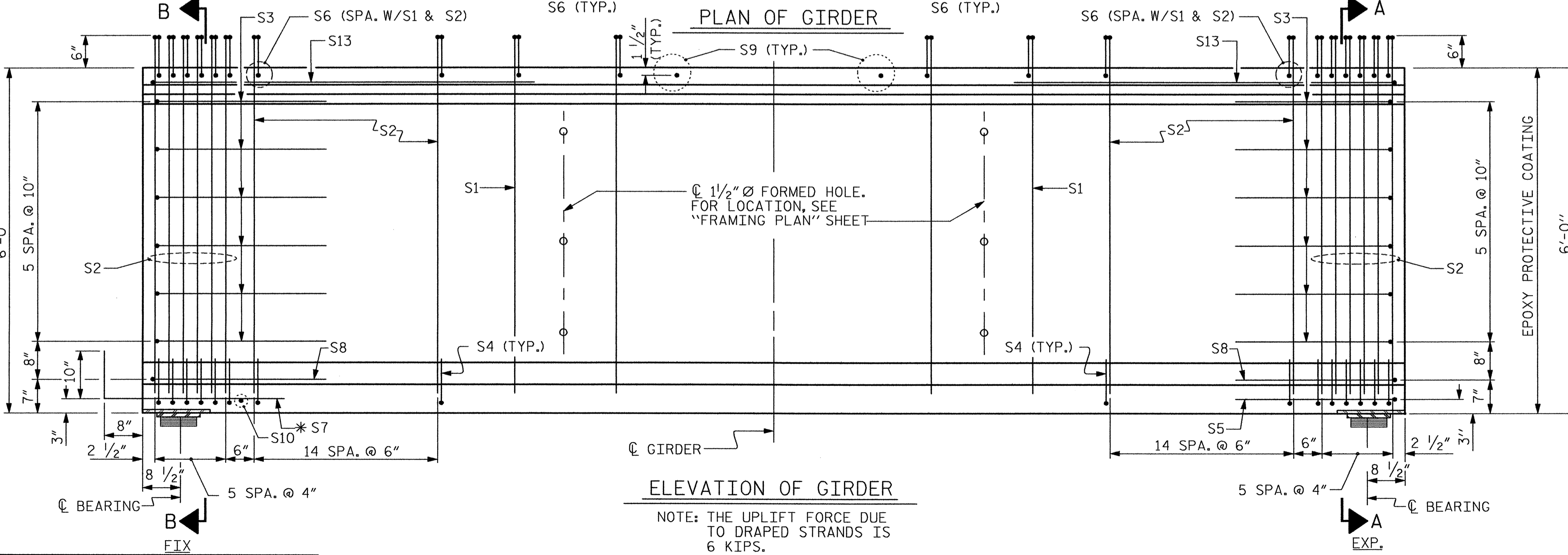
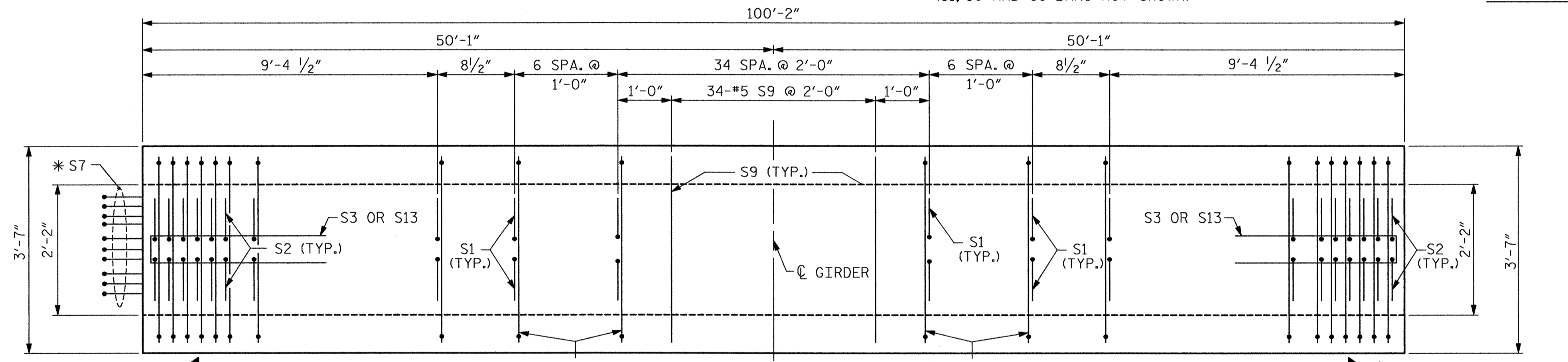
SHEET 4 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 72" PRESTRESSED CONCRETE
 MODIFIED BULB TEE
 CONTINUOUS FOR LIVE LOAD
 SPAN D



MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6806
 FIRM PE NUMBER: P-0671

REVISIONS					SHEET NO. S-16
NO.	BY:	DATE:	NO.	DATE:	
1			3		TOTAL SHEETS 46
2			4		



ASSEMBLED BY : J.S. ISRAELNIM	DATE : 12/11
CHECKED BY : B.E. ATKINSON	DATE : 02/12
DRAWN BY : EEM 2/6/97	REV. 10/17/00 RWW/LES
CHECKED BY : VAP 2/6/97	REV. 5/1/06R TLA/GM
	REV. 10/1/11 MAA/GM

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 SHALL BE GRADE 60.

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

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

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

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

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6500 PSI.

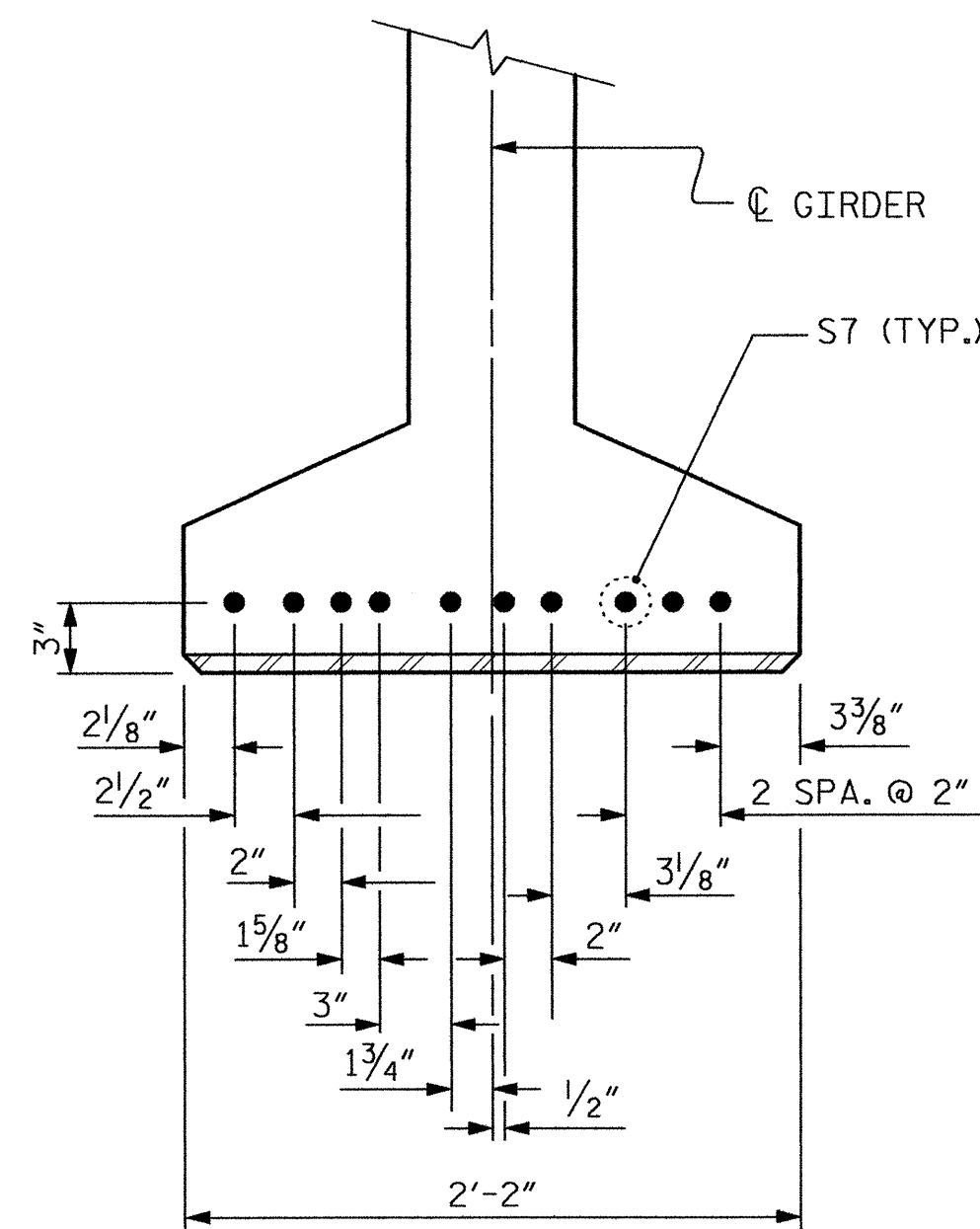
DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

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

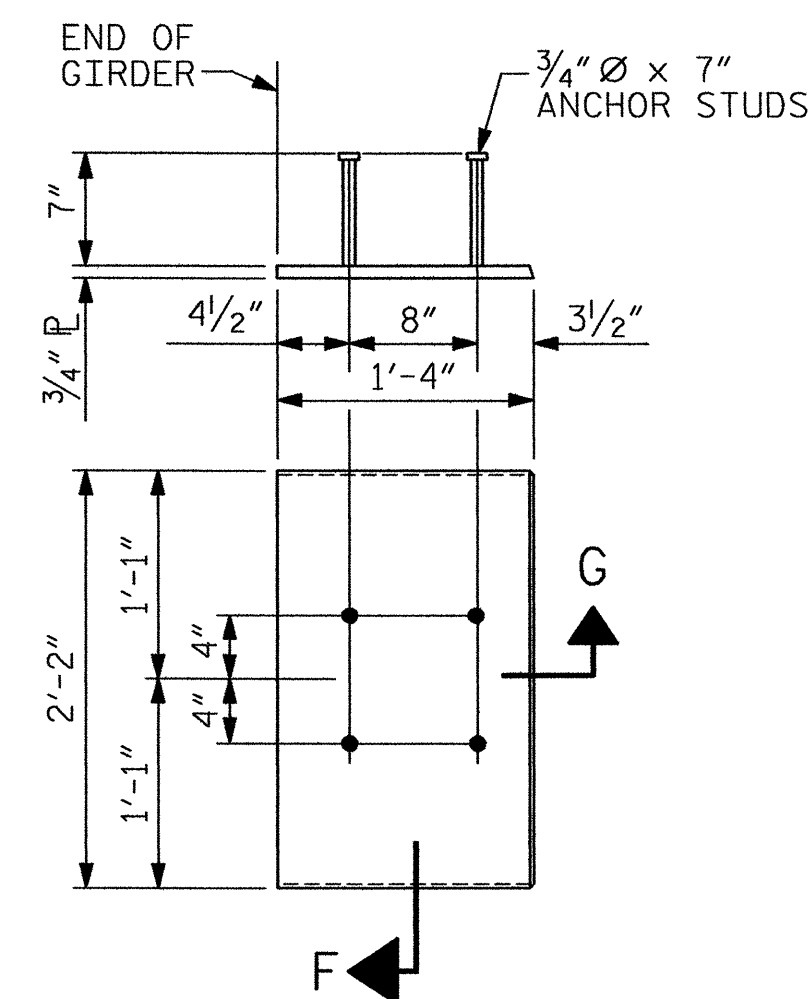
WHEN DRAPED STRANDS ARE DETAILED, THE LONGITUDINAL LOCATION OF THE HOLD DOWN DEVICES SHALL BE WITHIN 6" OF THE LOCATION SHOWN AND THE CENTER OF GRAVITY OF THE GROUP OF DRAPED STRANDS SHALL BE LOCATED WITHIN 1/2" OF THE THEORETICAL LOCATION SHOWN.

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

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



DETAIL "C"



SECTION "G"

SECTION "F"

(SEE NOTES)

EMBEDDED PLATE "B-1" DETAILS

(2 REQ'D. PER GIRDER)

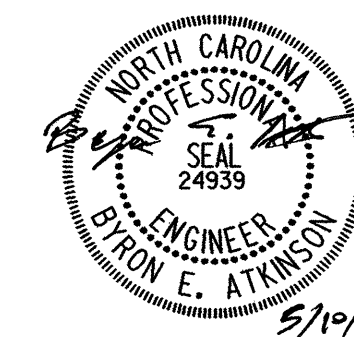
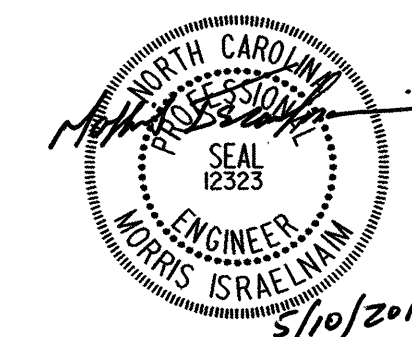
DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
0.60" Ø LOW RELAXATION STRANDS	SPAN A																					
	GIRDERS 1 & 4										GIRDERS 2 & 3											
	TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.123	0.220	0.290	0.334	0.349	0.334	0.290	0.220	0.123	0	0	0.123	0.220	0.290	0.334	0.349	0.334	0.290	0.220	0.123	0
** DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.051	0.099	0.136	0.159	0.166	0.157	0.132	0.094	0.047	0	0	0.061	0.117	0.162	0.190	0.198	0.187	0.158	0.113	0.057	0
FINAL CAMBER ↑	0	7/8"	1 1/16"	1 7/8"	2 1/8"	2 3/16"	2 1/8"	1 7/8"	1 1/2"	1 5/16"	0	0	3/4"	1 1/4"	1 9/16"	1 3/4"	1 13/16"	1 3/4"	1 9/16"	1 5/16"	1 3/16"	0
0.60" Ø LOW RELAXATION STRANDS	SPAN B																					
	GIRDERS 1 & 4										GIRDERS 2 & 3											
	TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.123	0.220	0.290	0.334	0.349	0.334	0.290	0.220	0.123	0	0	0.123	0.220	0.290	0.334	0.349	0.334	0.290	0.220	0.123	0
** DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.045	0.089	0.124	0.147	0.156	0.148	0.126	0.091	0.046	0	0	0.054	0.108	0.151	0.178	0.188	0.180	0.153	0.110	0.056	0
FINAL CAMBER ↑	0	1 5/16"	1 9/16"	2"	2 1/4"	2 5/16"	2 1/4"	2"	1 9/16"	1 5/16"	0	0	1 3/16"	1 3/8"	1 11/16"	1 7/8"	1 15/16"	1 7/8"	1 5/8"	1 5/16"	1 3/16"	0
0.60" Ø LOW RELAXATION STRANDS	SPAN C																					
	GIRDERS 1 & 4										GIRDERS 2 & 3											
	TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.074	0.132	0.172	0.195	0.203	0.195	0.172	0.132	0.074	0	0	0.074	0.132	0.172	0.195	0.203	0.195	0.172	0.132	0.074	0
** DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.022	0.044	0.061	0.072	0.076	0.072	0.061	0.043	0.022	0	0	0.027	0.054	0.075	0.088	0.093	0.088	0.075	0.053	0.027	0
FINAL CAMBER ↑	0	5/8"	1 1/16"	1 5/16"	1 1/2"	1 1/2"	1 1/2"	1 5/16"	1 1/16"	5/8"	0	0	9/16"	1 5/16"	1 3/16"	1 1/4"	1 5/16"	1 1/4"	1 3/16"	1 5/16"	9/16"	0
0.60" Ø LOW RELAXATION STRANDS	SPAN D																					
	GIRDERS 1 & 4										GIRDERS 2 & 3											
	TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.074	0.132	0.172	0.195	0.203	0.195	0.172	0.132	0.074	0	0	0.074	0.132	0.172	0.195	0.203	0.195	0.172	0.132	0.074	0
** DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.024	0.047	0.066	0.079	0.083	0.080	0.068	0.049	0.025	0	0	0.029	0.057	0.080	0.095	0.100	0.096	0.081	0.059	0.030	0
FINAL CAMBER ↑	0	5/8"	1"	1 1/4"	1 3/8"	1 1/16"	1 3/8"	1 1/4"	1"	9/16"	0	0	9/16"	7/8"	1 1/8"	1 3/16"	1 1/4"	1 3/16"	1 1/16"	7/8"	1/2"	0

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

PROJECT NO. B-4752
GASTON COUNTY
STATION: 18+54.00 -L-

SHEET 5 OF 5

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



MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER: P-0671

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			46

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ASSEMBLED BY : J.S. ISRAELNAIM	DATE : 12/11
CHECKED BY : B.E. ATKINSON	DATE : 01/12
DRAWN BY : ELR 11/91	REV. 7/10/01RR LES/RDR
CHECKED BY : GRP 11/91	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

STRUCTURAL STEEL NOTES

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

TENSION ON THE ASTM A325 BOLTS THROUGH THE ANGLE MEMBER SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

TENSION ON THE ASTM A449 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL 1/4 TURN.

THE PLATES, BENT PLATES, AND ANGLES 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 PROVISION AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

GALVANIZE THE HIGH STRENGTH BOLTS, NUTS, WASHERS AND DIRECT TENSION INDICATORS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

USE AN ASTM F436 HARDENED WASHER WITH STANDARD AND SLOTTED HOLES UNDER EACH BOLT HEAD AND NUT.

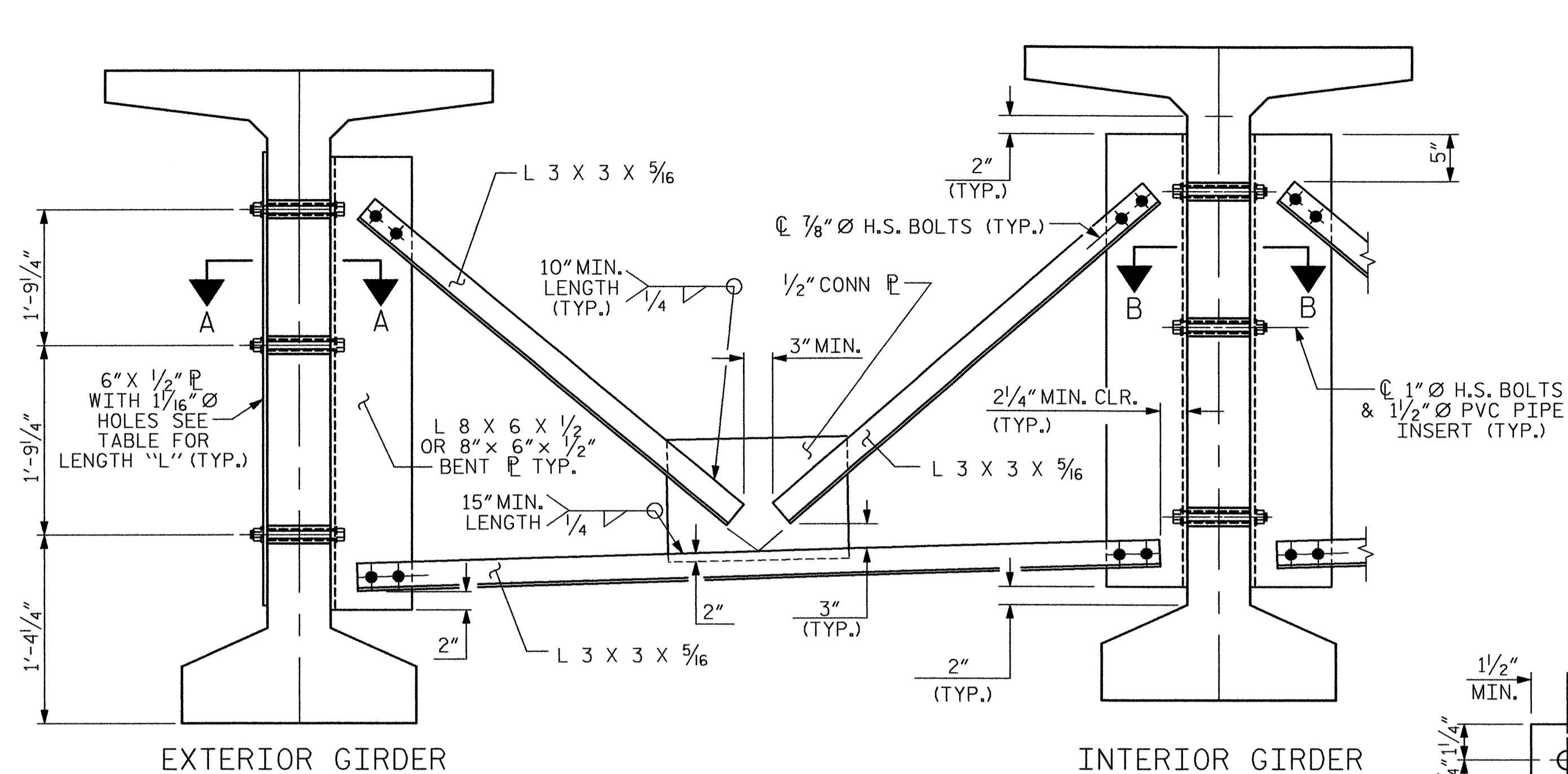
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

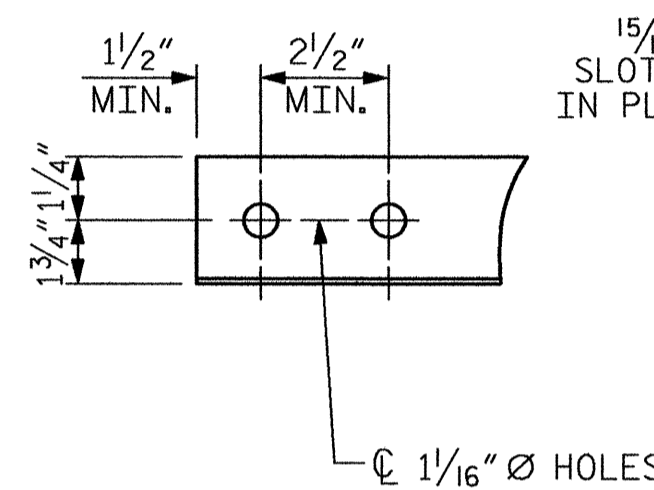
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

IN THE EXTERIOR BAYS, PLACE TEMPORARY STRUTS BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED.

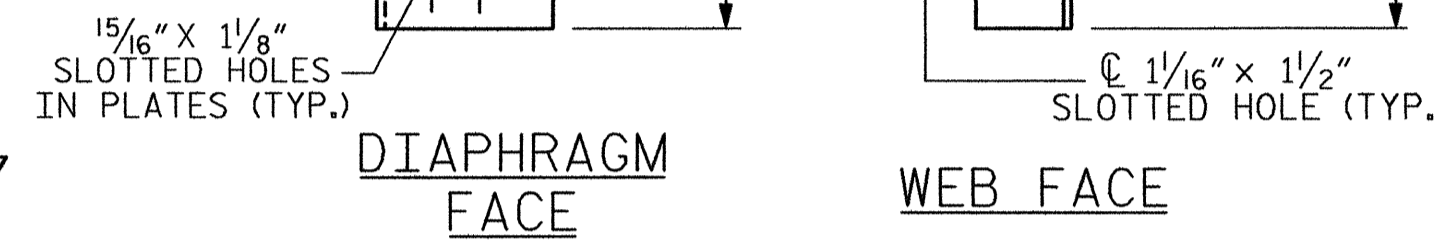
THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.



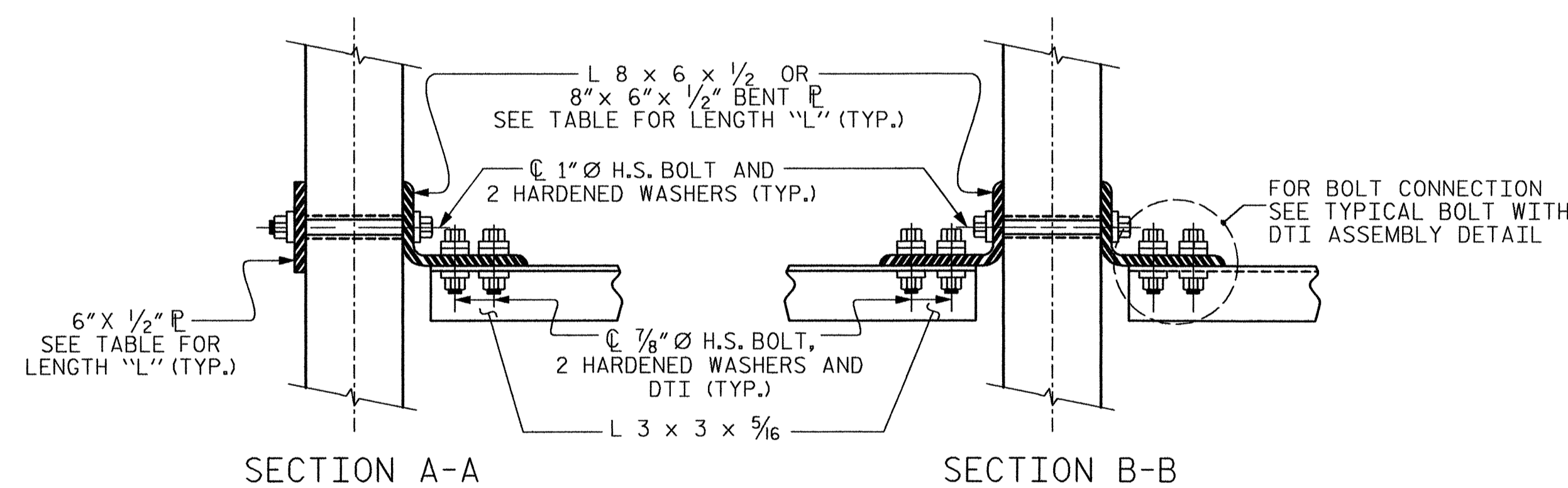
PART SECTION AT INTERMEDIATE DIAPHRAGM



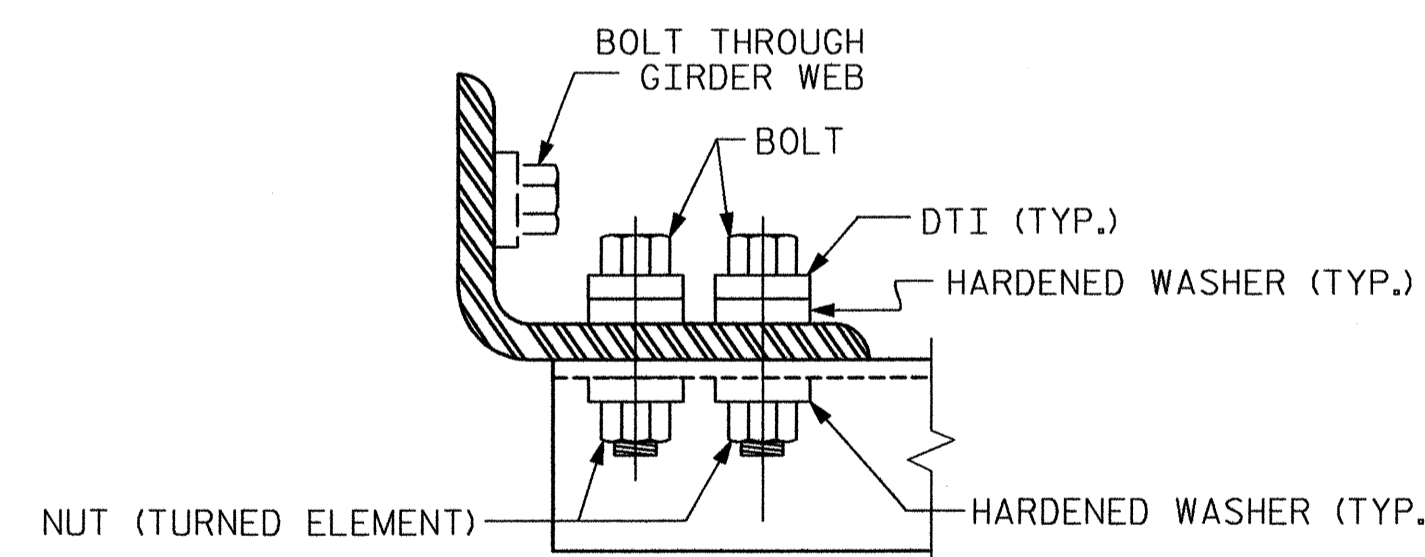
ANGLE END
(L 3 x 3 x 5/16)



CONNECTOR PLATE DETAIL

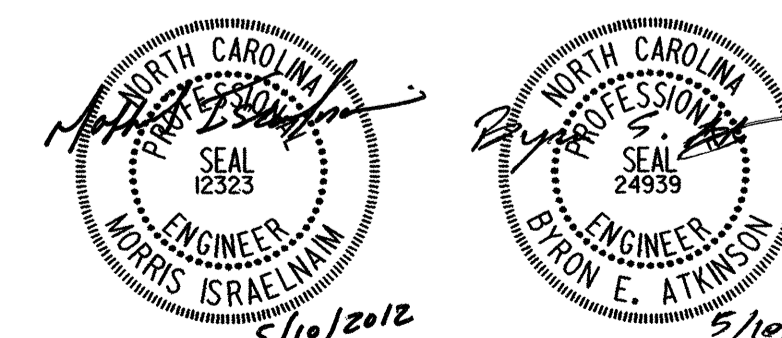


CONNECTION DETAILS
(FOR SKEW = 90°)



BOLT WITH DTI ASSEMBLY DETAIL

PROJECT NO. B-4752
GASTON COUNTY
 STATION: 18+54.00 -L-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 INTERMEDIATE
 STEEL DIAPHRAGMS
 72" MODIFIED BULB TEE
 PRESTRESSED CONCRETE
 GIRDERS

MI ENGINEERING 1011 SCHAUB DRIVE, SUITE 100 RALEIGH, NC 27606 (919) 851-6606 FIRM PE NUMBER: P-0671	REVISIONS						SHEET NO. S-18 TOTAL SHEETS 46
	NO.	BY:	DATE:	NO.	BY:	DATE:	
	1			3			
	2			4			

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ASSEMBLED BY : J.S. ISRAELNAIM	DATE : 12/11
CHECKED BY : B.E. ATKINSON	DATE : 01/12
DRAWN BY : RWW 11/09	ADDED 11/23/09R
CHECKED BY : GM 11/09	REV. 10/11 MAA/GM

NOTES

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

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

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

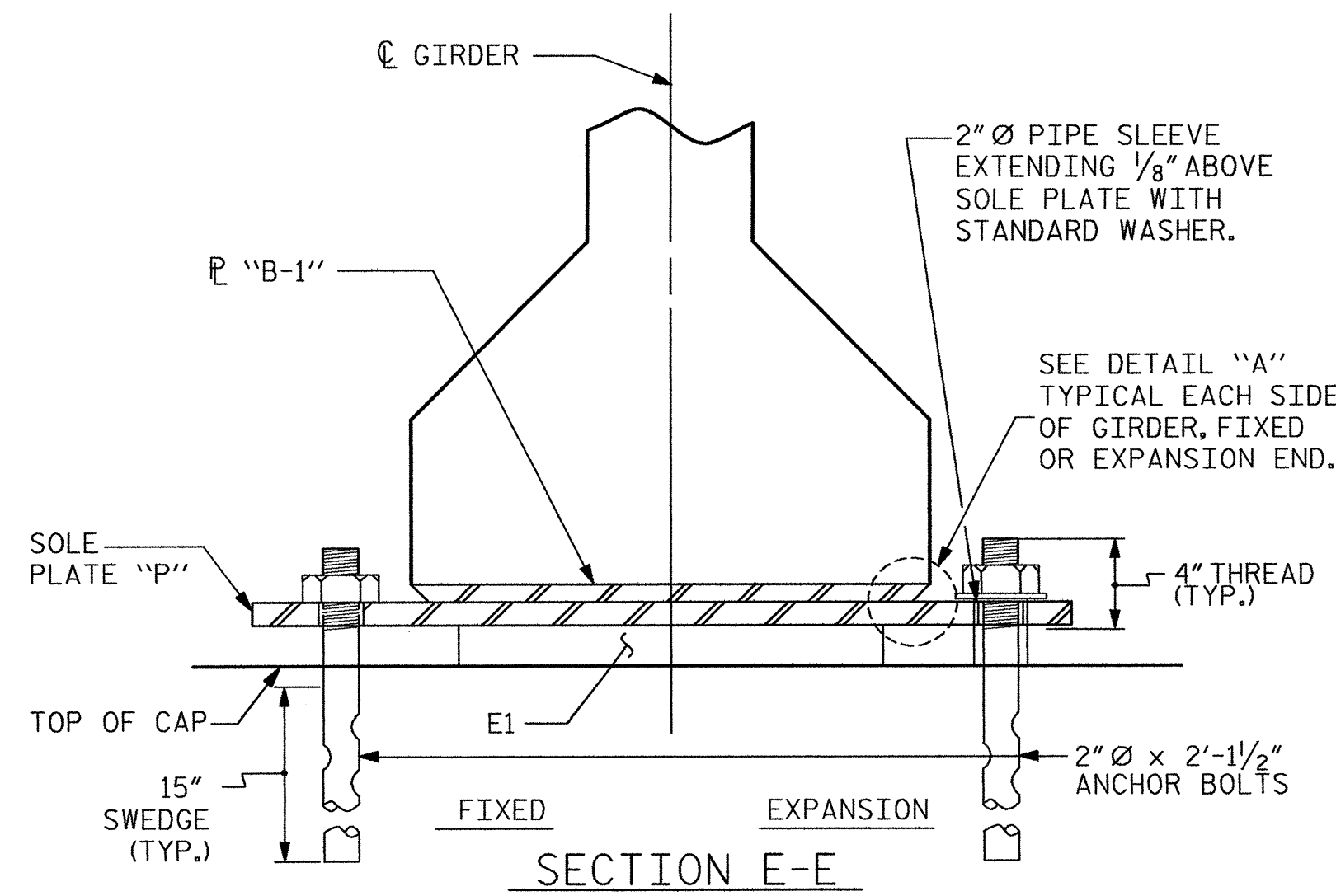
PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE PORTION OF THE EMBEDDED PLATE AND SOLE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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

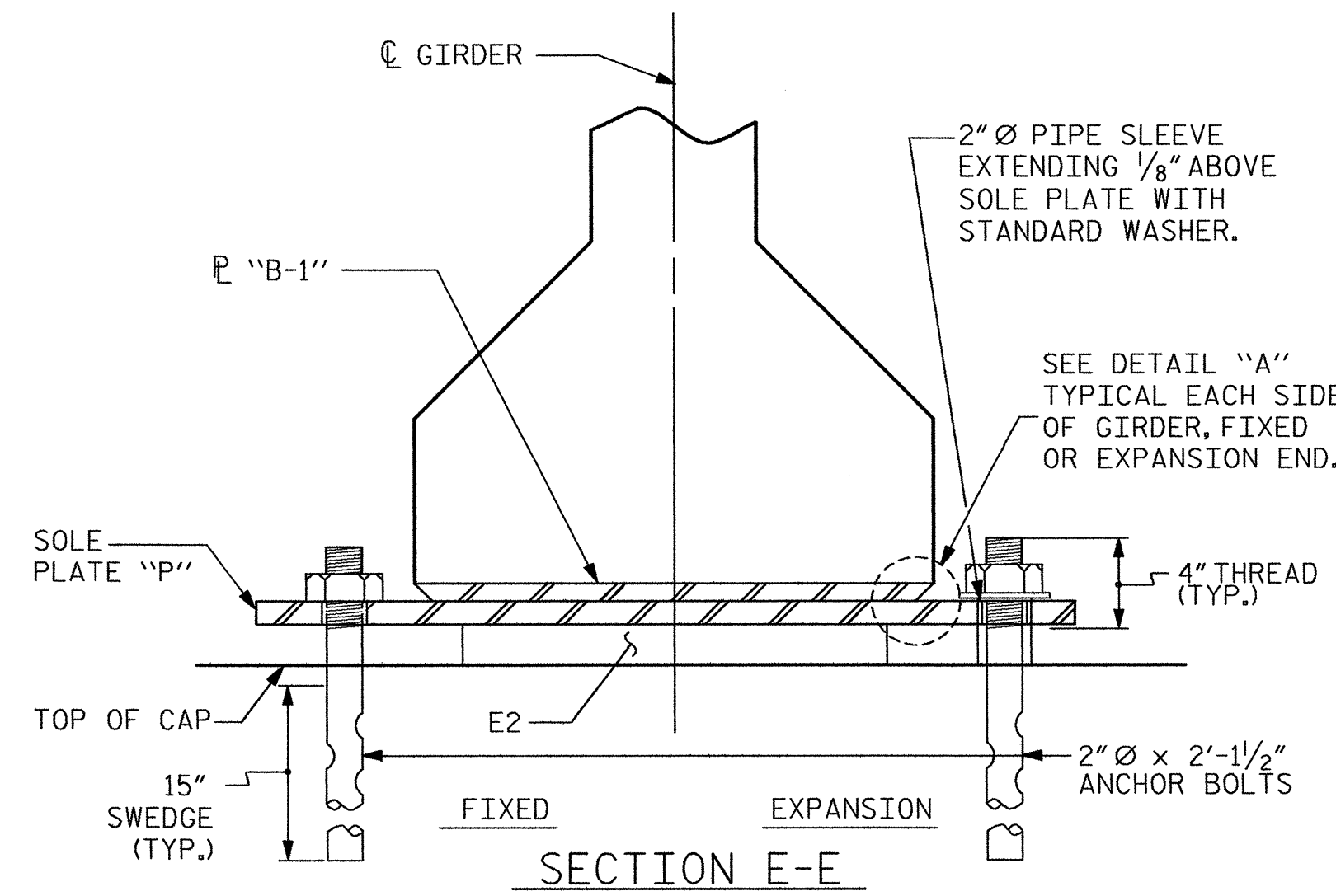
SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

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

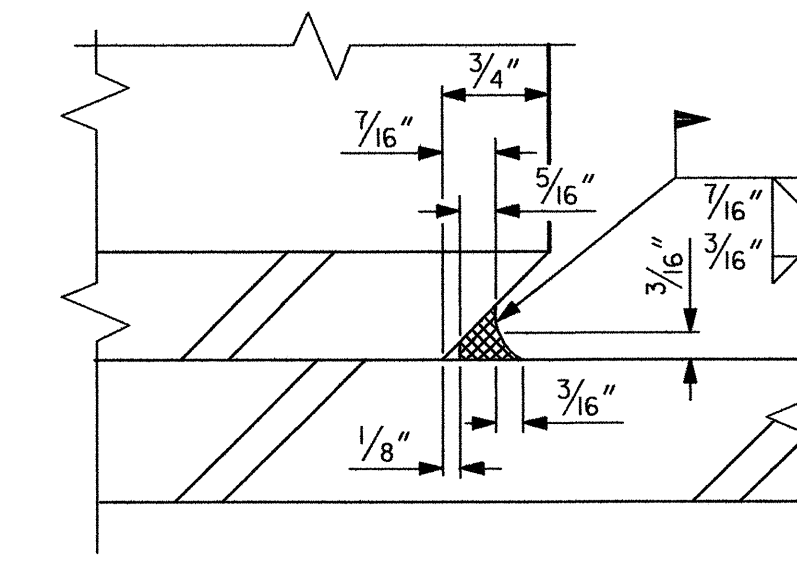
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.



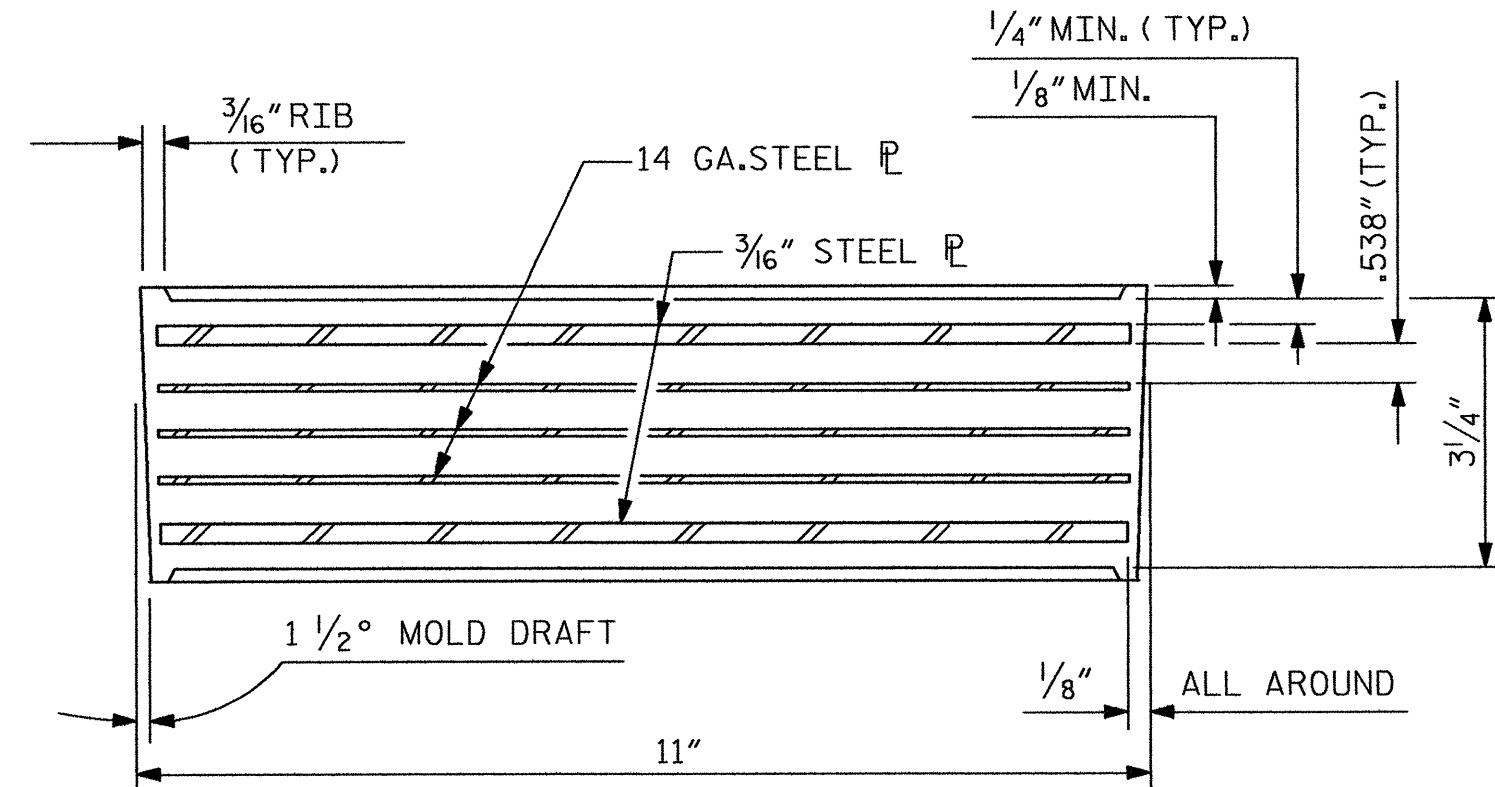
SECTION E-E



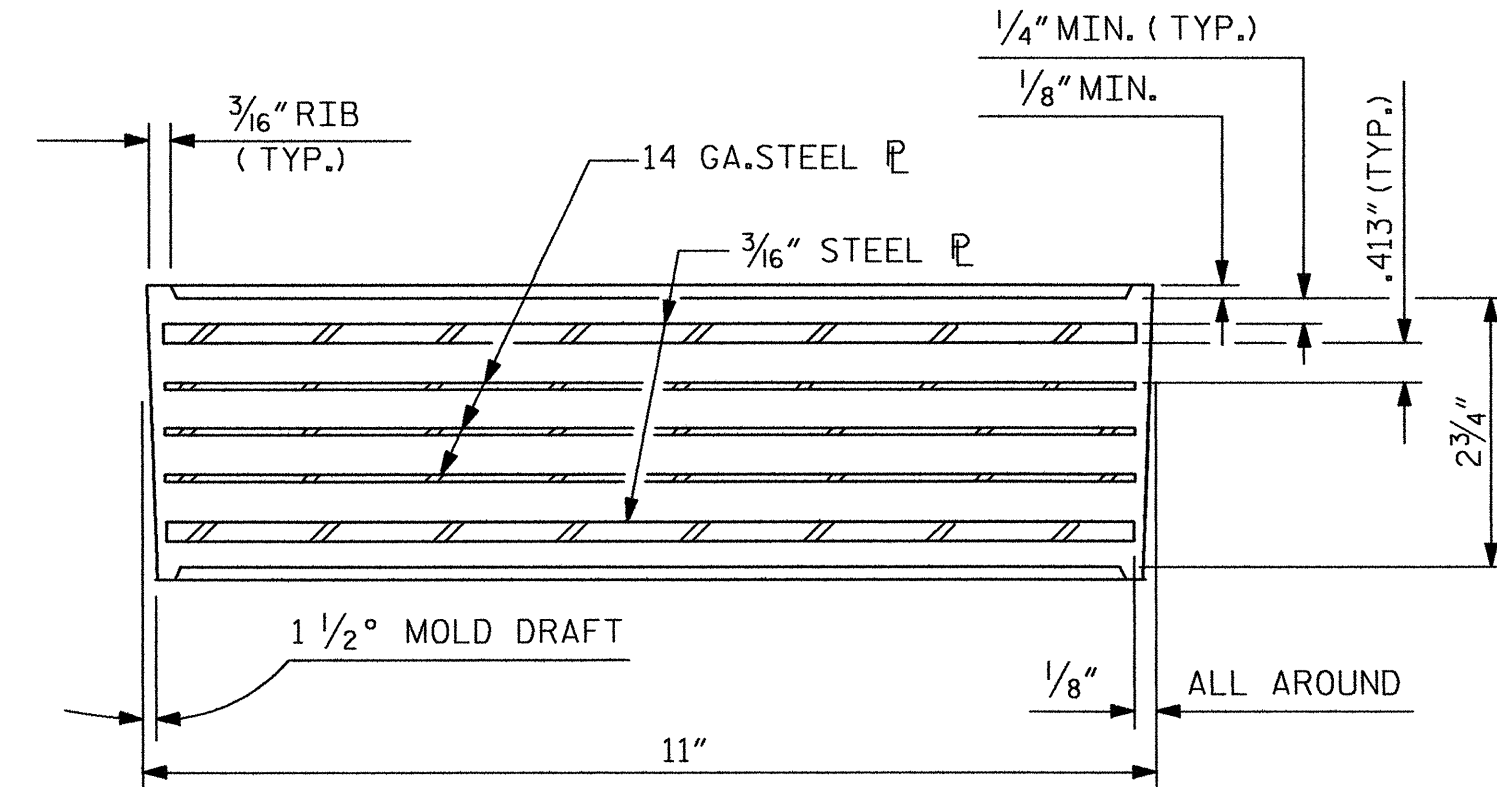
SECTION E-E



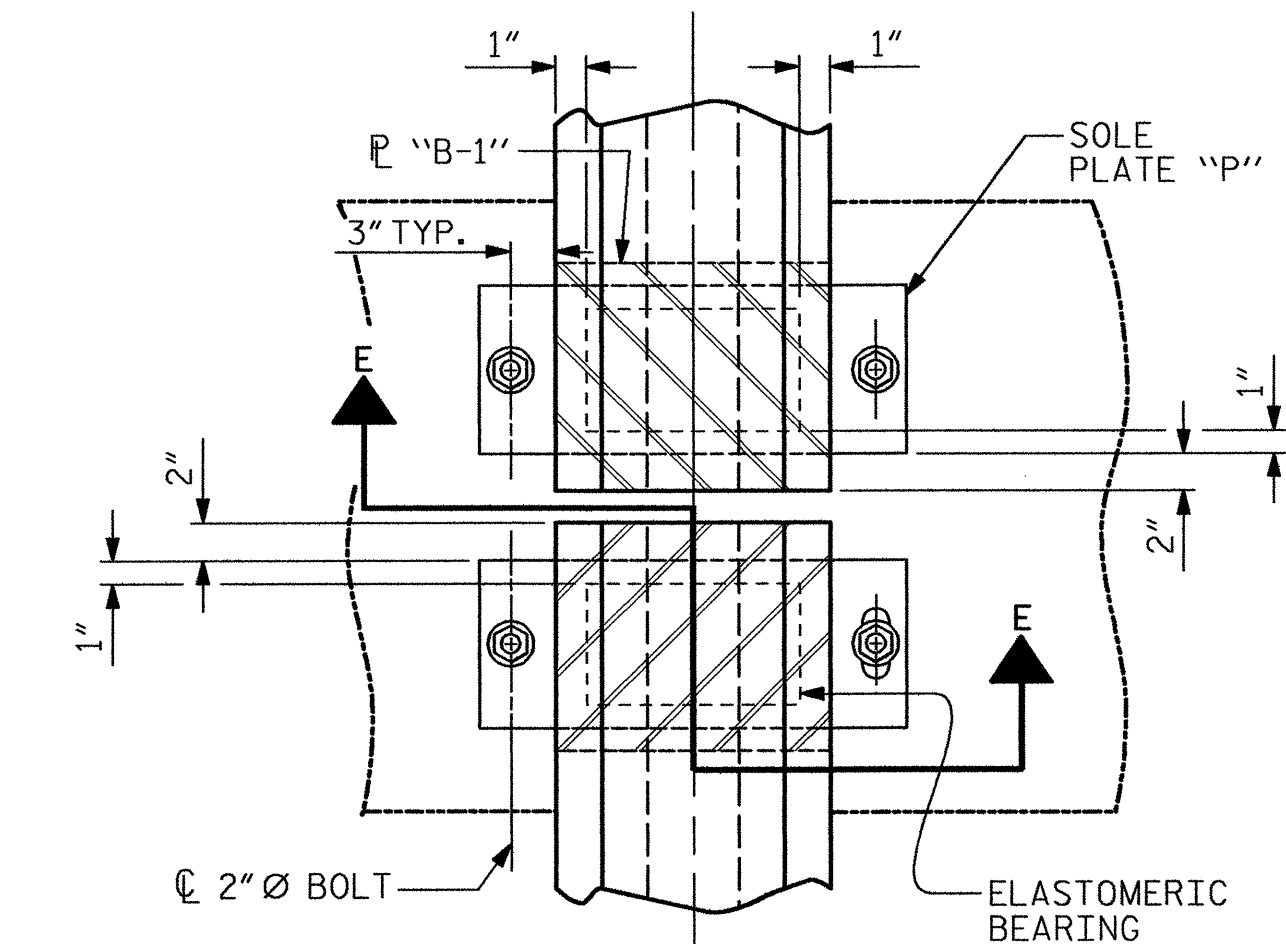
DETAIL "A"



TYPICAL SECTION OF ELASTOMERIC BEARINGS

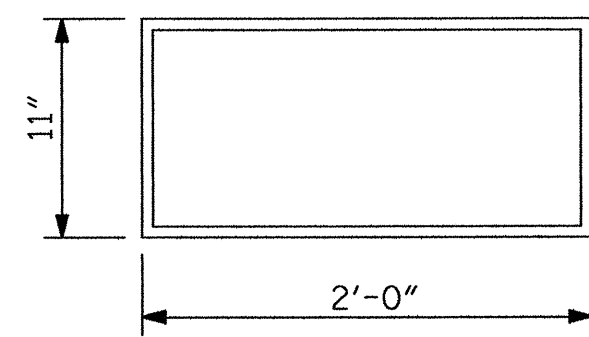


TYPICAL SECTION OF ELASTOMERIC BEARINGS



TYPICAL HALF-PLAN (SHOWING CONTINUOUS BENT)

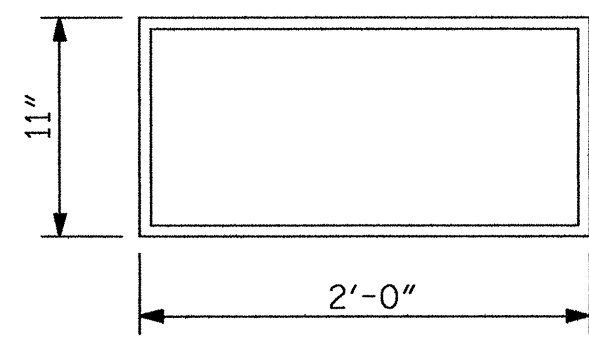
TYPICAL HALF-PLAN (SHOWING SIMPLE SPAN BENT)



E1 (20 REQ'D.)

PLAN VIEW OF ELASTOMERIC BEARING

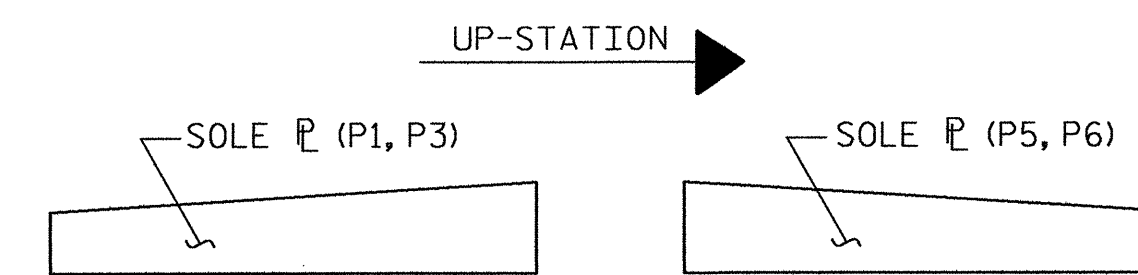
TYPE E1



E2 (12 REQ'D.)

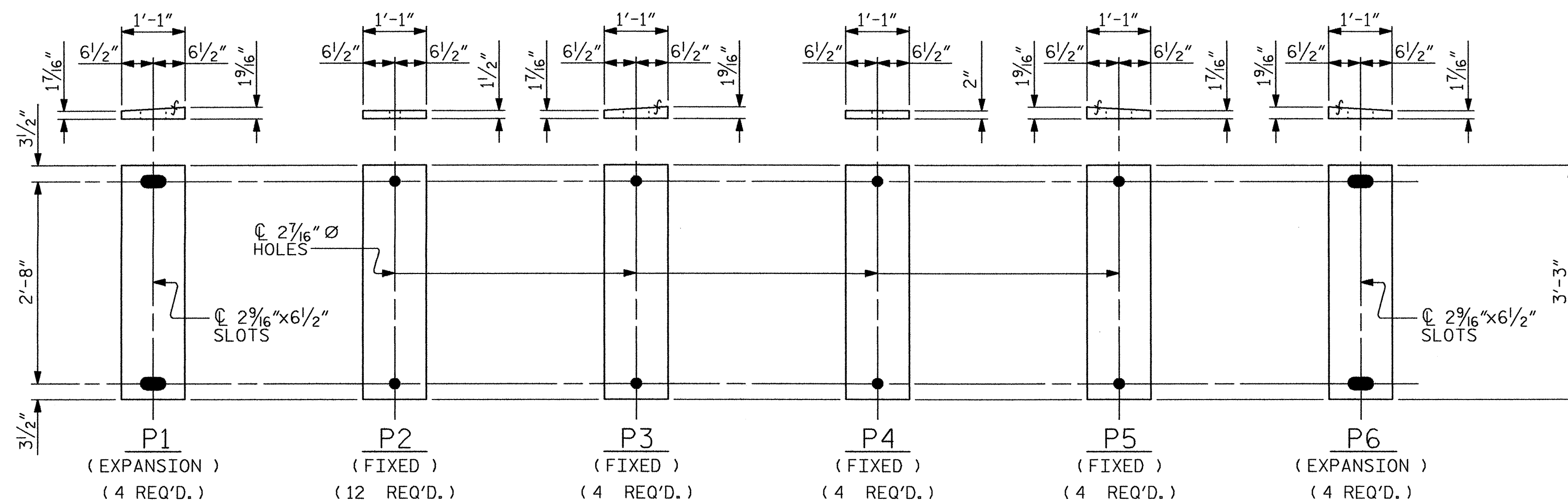
PLAN VIEW OF ELASTOMERIC BEARING

TYPE E2



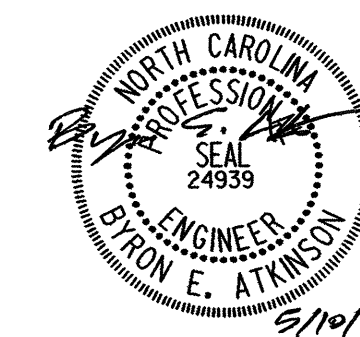
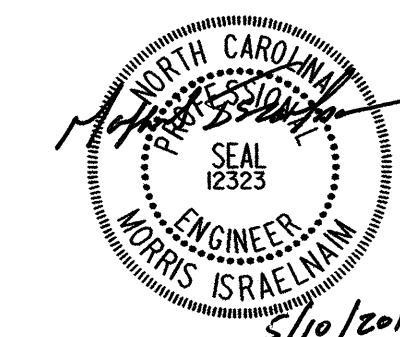
SOLE PLATE PLACEMENT DETAIL

LOAD RATINGS	
	MAX.D.L.+ L.L.
TYPE E1	310 K
TYPE E2	270 K



SOLE PLATE DETAILS ("P")

PROJECT NO. B-4752
GASTON COUNTY
 STATION: 18+54.00 -L-



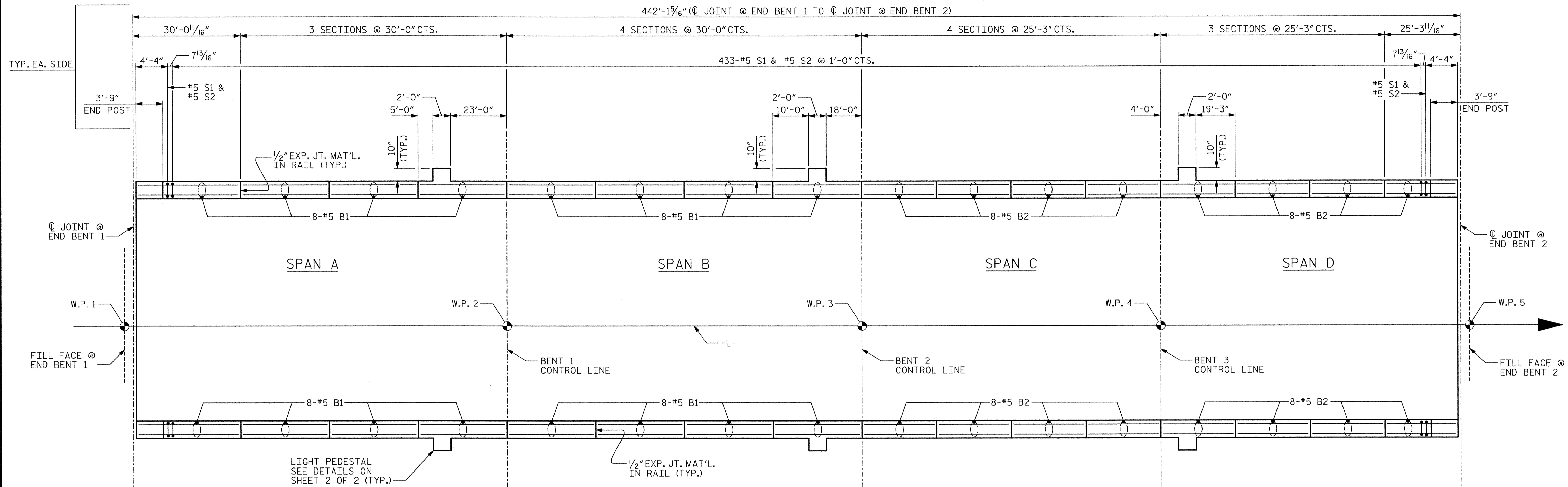
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 ELASTOMERIC BEARING
 DETAILS

NO.	BY:	DATE:	REVISIONS			SHEET NO.
			NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			46

DRAWN BY: B.E. LANNING DATE: 03/12
 CHECKED BY: B.E. ATKINSON DATE: 03/12

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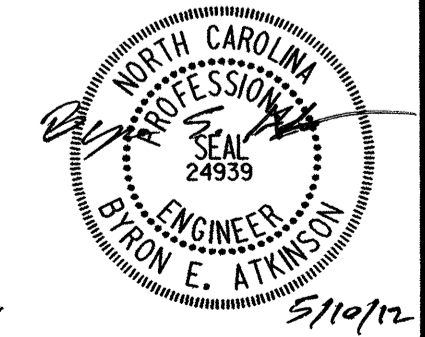


PLAN OF PARAPET

PROJECT NO. B-4752
GASTON COUNTY
 STATION: 18+54.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 CONCRETE PARAPET
 FOR
 2 BAR METAL RAIL



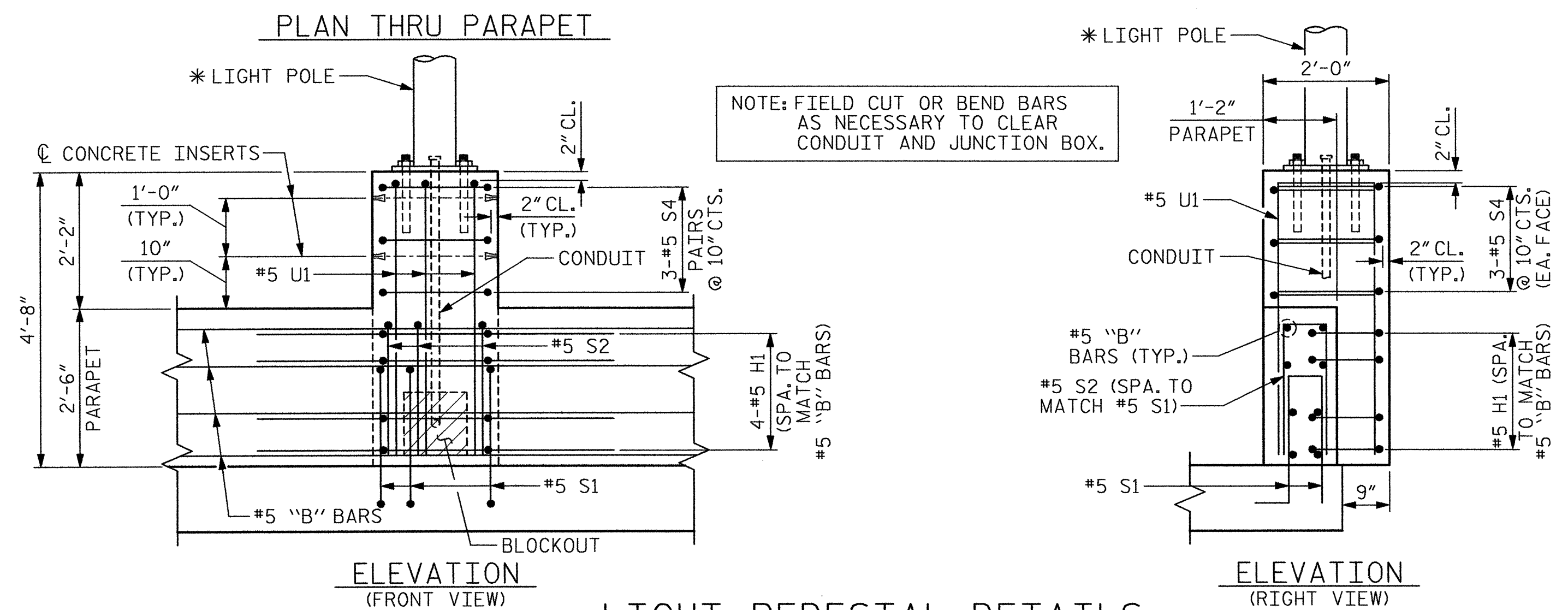
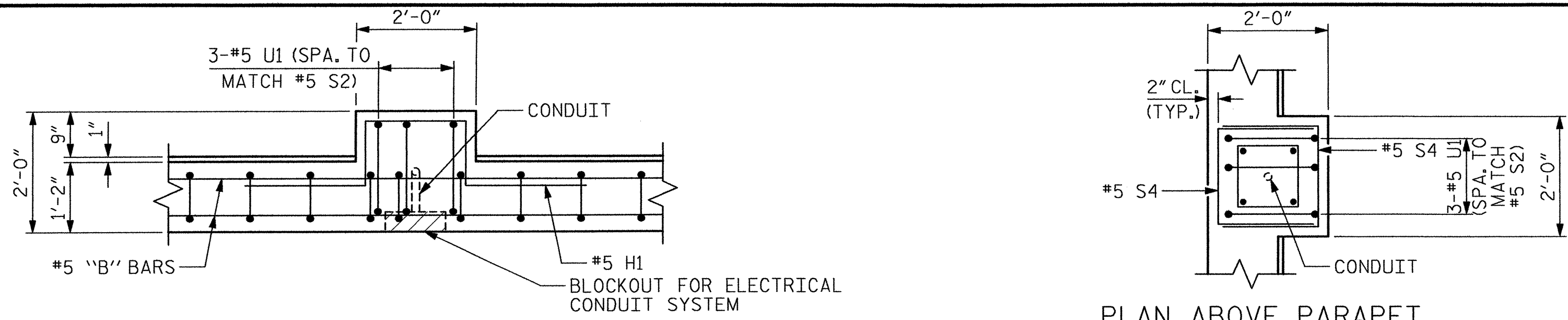
MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER: P-0671

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

SHEET NO.
S-20
 TOTAL SHEETS
46

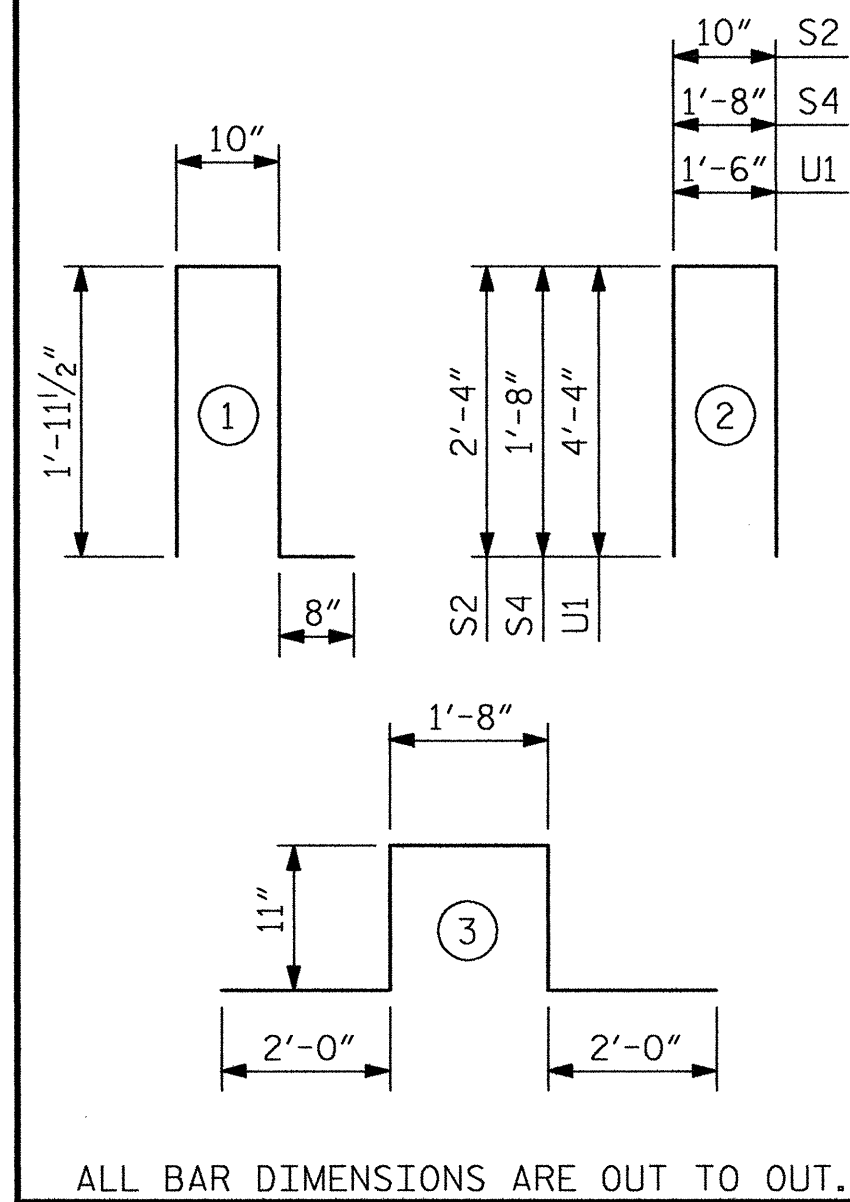
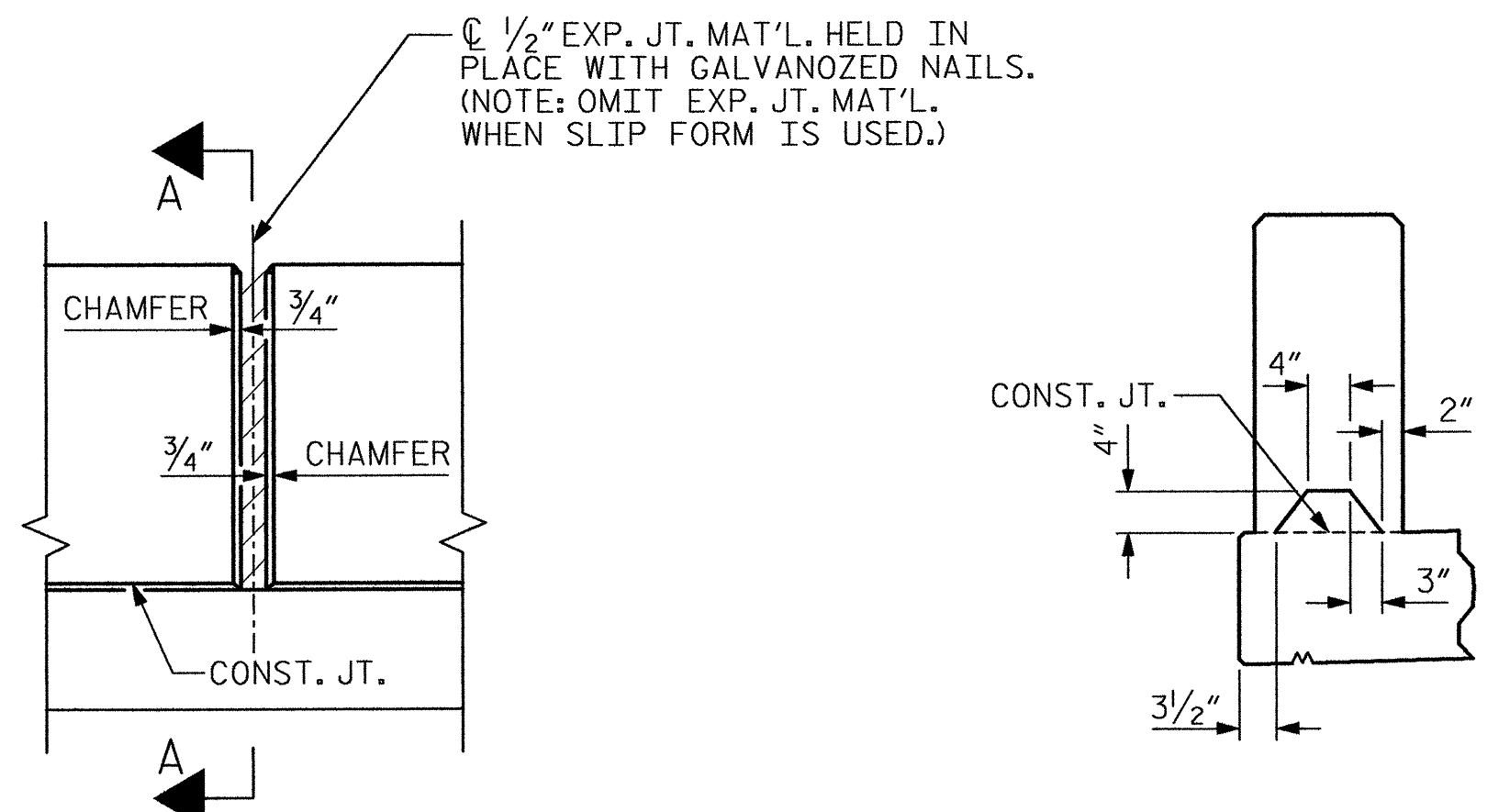
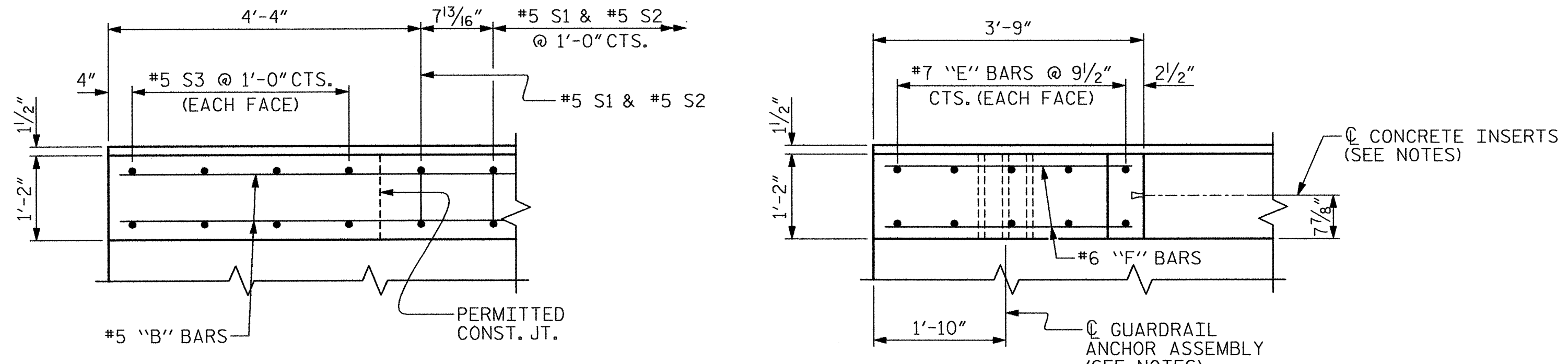
DRAWN BY : B.E. LANNING DATE : 02/12
 CHECKED BY : B.E. ATKINSON DATE : 02/12

5/10/2012 10:36:27 AM User: b.lanning
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NOTE: FIELD CUT OR BEND BARS AS NECESSARY TO CLEAR CONDUIT AND JUNCTION BOX.

LIGHT PEDESTAL DETAILS
 (* LIGHT POLE & ANCHORAGE TO BE PROVIDED BY OTHERS.)



NOTES

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

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

THE #5 S1 AND #5 S2 BARS MAY BE SHIFTED SLIGHTLY IN ORDER TO MAINTAIN A 2" MINIMUM CLEARANCE TO THE 1/2" EXPANSION JOINT MATERIAL IN PARAPET.

FOR DETAILS OF CONCRETE INSERTS IN END POSTS, SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEET.

THE JOINTS IN THE DECK AT THE END BENTS SHALL BE SAWED PRIOR TO CASTING OF THE PARAPET.

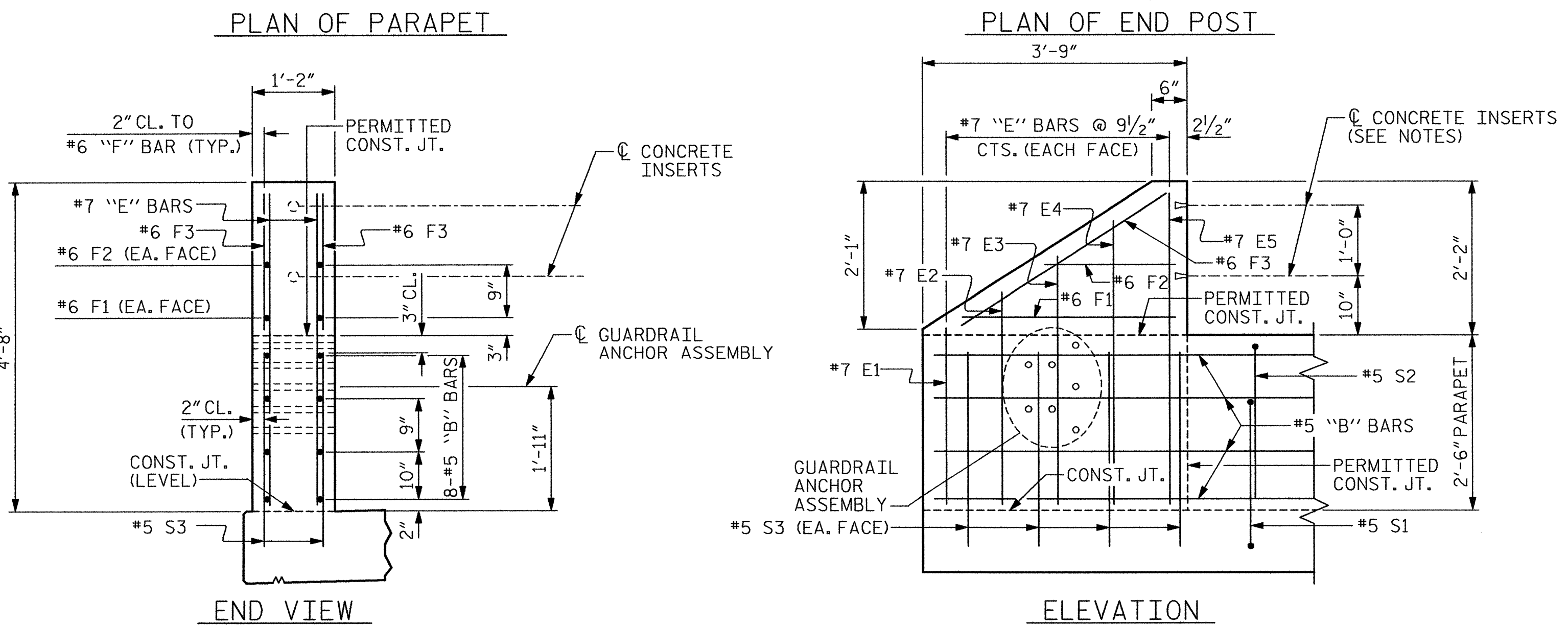
THE #5 S3 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. LEVEL TWO FIELD TESTING IS REQUIRED AND THE YIELD LOAD FOR THE #5 S3 BAR IS 18.6 KIPS.

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

FOR DETAILS AND LOCATION OF GUARDRAIL ANCHOR ASSEMBLIES, SEE "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" SHEETS.

FOR DETAILS OF ELECTRICAL CONDUIT SYSTEM, SEE "ELECTRICAL CONDUIT SYSTEM" SHEET.

BILL OF MATERIAL					
PARAPET AND END POSTS					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	128	#5	STR	29'-7"	3949
*B2	128	#5	STR	24'-10"	3315
*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	3'-0"	36
*F2	8	#6	STR	1'-9"	21
*F3	8	#6	STR	3'-4"	40
*H1	24	#5	3	7'-6"	188
*S1	870	#5	1	5'-5"	4915
*S2	870	#5	2	5'-6"	4991
*S3	32	#5	STR	3'-0"	100
*S4	36	#5	2	5'-0"	188
*U1	18	#5	2	10'-2"	191
* EPOXY COATED REINFORCING STEEL				18,217	LBS.
CLASS AA CONCRETE				99.1	C. Y.
1'-2" x 2'-6" CONCRETE PARAPET				884.22	LIN. FT.

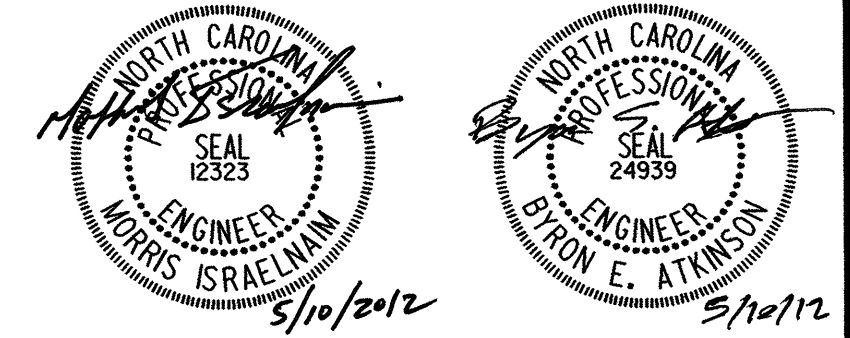


PARAPET AND END POST FOR TWO BAR RAIL

END BENT 1 SHOWN, END BENT 2 SIMILAR

DRAWN BY: B.E. LANNING DATE: 02/12
 CHECKED BY: B.E. ATKINSON DATE: 02/12

PARAPET DETAILS



MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER: P-0671

PROJECT NO. B-4752
GASTON COUNTY
 STATION: 18+54.00 -L-
 SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 CONCRETE PARAPET
 DETAILS

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

TOTAL SHEETS: 46

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 BLACK. 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.

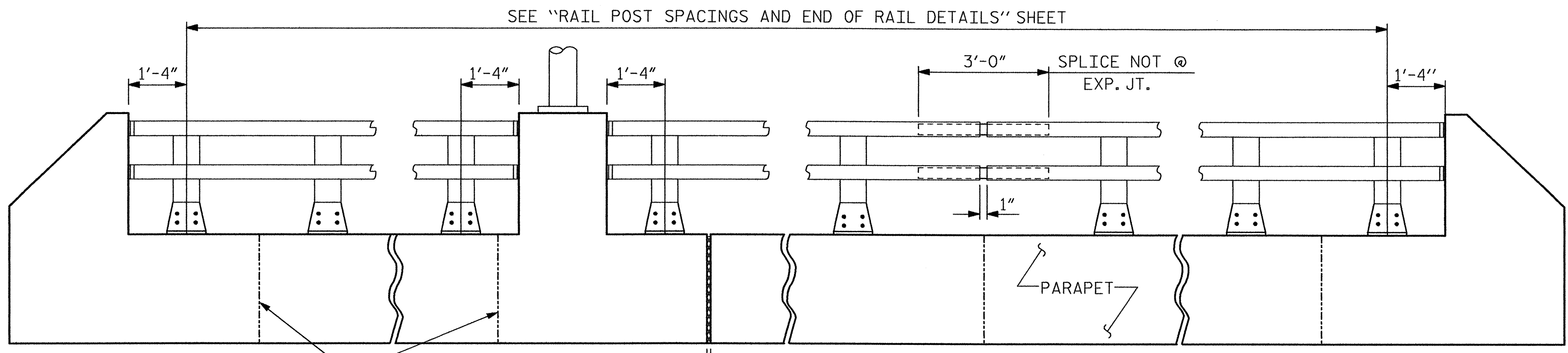
THE CONTRACTOR SHALL SUBMIT A SAMPLE OF COMPATIBLE BLACK EXTERIOR ACRYLIC PAINT TO THE ENGINEER. THIS PAINT SHALL MATCH THE ANODIZED RAIL COLOR AS CLOSELY AS POSSIBLE. AFTER ERECTION OF THE ANODIZED ALUMINUM RAILING, ALL EXPOSED ANCHOR BOLTS, NUTS, WASHERS, MACHINE SCREWS, CAP SCREWS, BOLTS, ATTACHMENT 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. METHOD OF MEASUREMENT FOR METAL RAILS: FOR LENGTH OF METAL RAILS TO BE PAID FOR, SEE THE STANDARD SPECIFICATIONS. CURVED RAIL USAGE: WHERE RAILS ARE TO BE USED ON BRIDGES ON HORIZONTAL AND/OR VERTICAL CURVATURE THE CONTRACTOR MAY, AT HIS OPTION, HAVE THE REQUIRED CURVATURE IN THE RAIL FORMED IN THE SHOP OR IN THE FIELD. IN EITHER EVENT, THE RAIL SHALL CONFORM WITHOUT BUCKLING OR KINKING TO THE REQUIRED CURVATURE IN A UNIFORM MANNER ACCEPTABLE TO THE ENGINEER. TO INSURE FUTURE IDENTIFICATION OF THE FABRICATOR, A PERMANENT IDENTIFYING MARK SHALL BE PLACED ON EACH POST. THE METHOD OF MARKING AND LOCATION SHALL BE SUCH THAT IT DOES NOT DETRACT FROM THE APPEARANCE OF THE POST, BUT REMAINS VISIBLE AFTER RAIL PLACEMENT. SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT. ALLOY 6351-T5 MAY BE SUBSTITUTED FOR ALLOY 6061-T6 WHERE APPLICABLE. MINOR VARIATIONS IN DETAILS OF METAL RAIL WILL BE CONSIDERED. DETAILS OF SUCH VARIATIONS, IF DESIRED, SHALL BE SUBMITTED FOR APPROVAL. GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF PARAPET SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

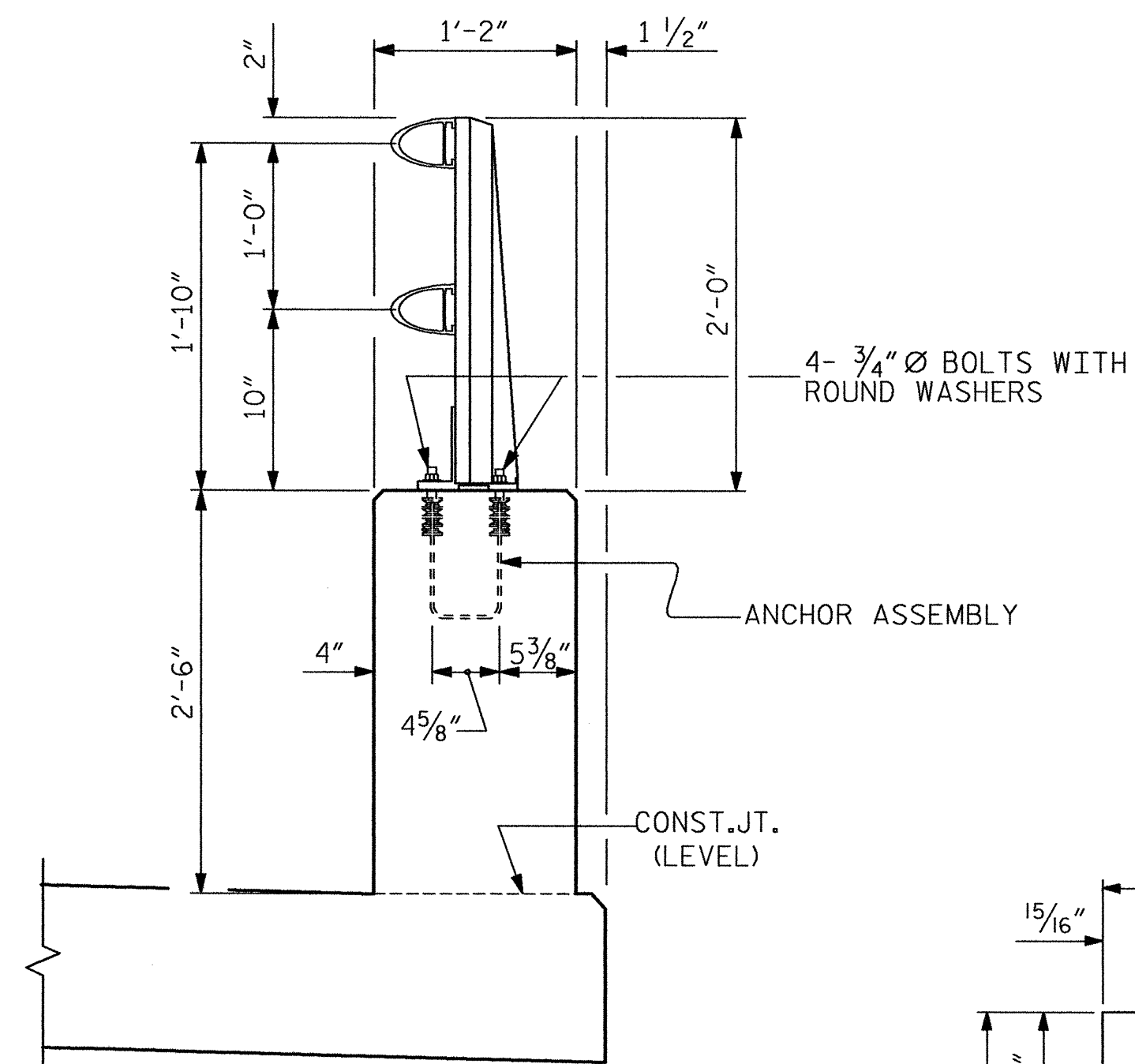
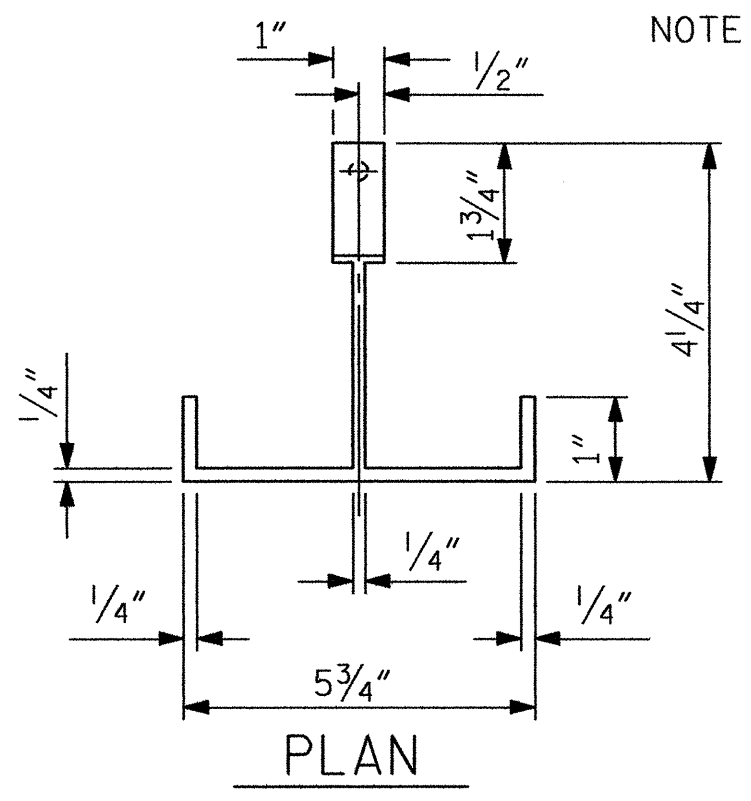
PAY LENGTH = 856.94 LIN. FT.

2 BAR METAL RAIL SHALL BE ANODIZED BLACK, SEE NOTES

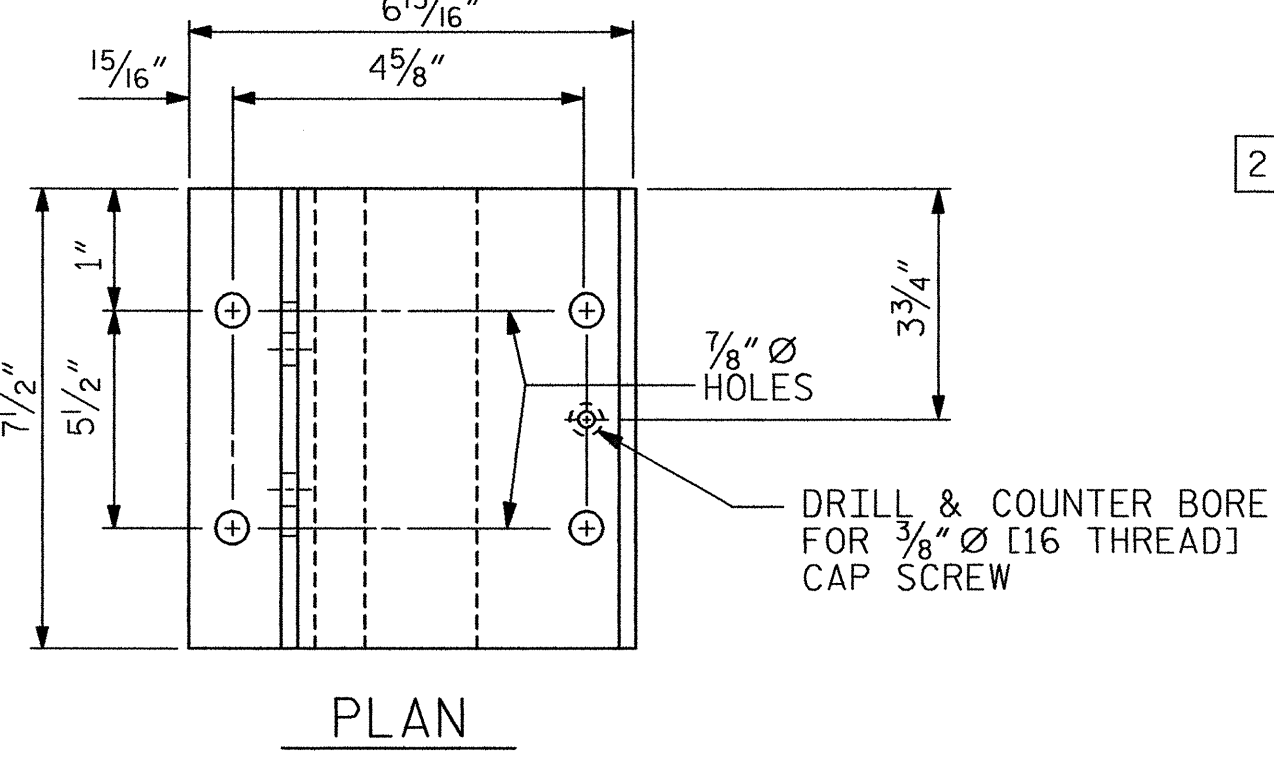


ELEVATION

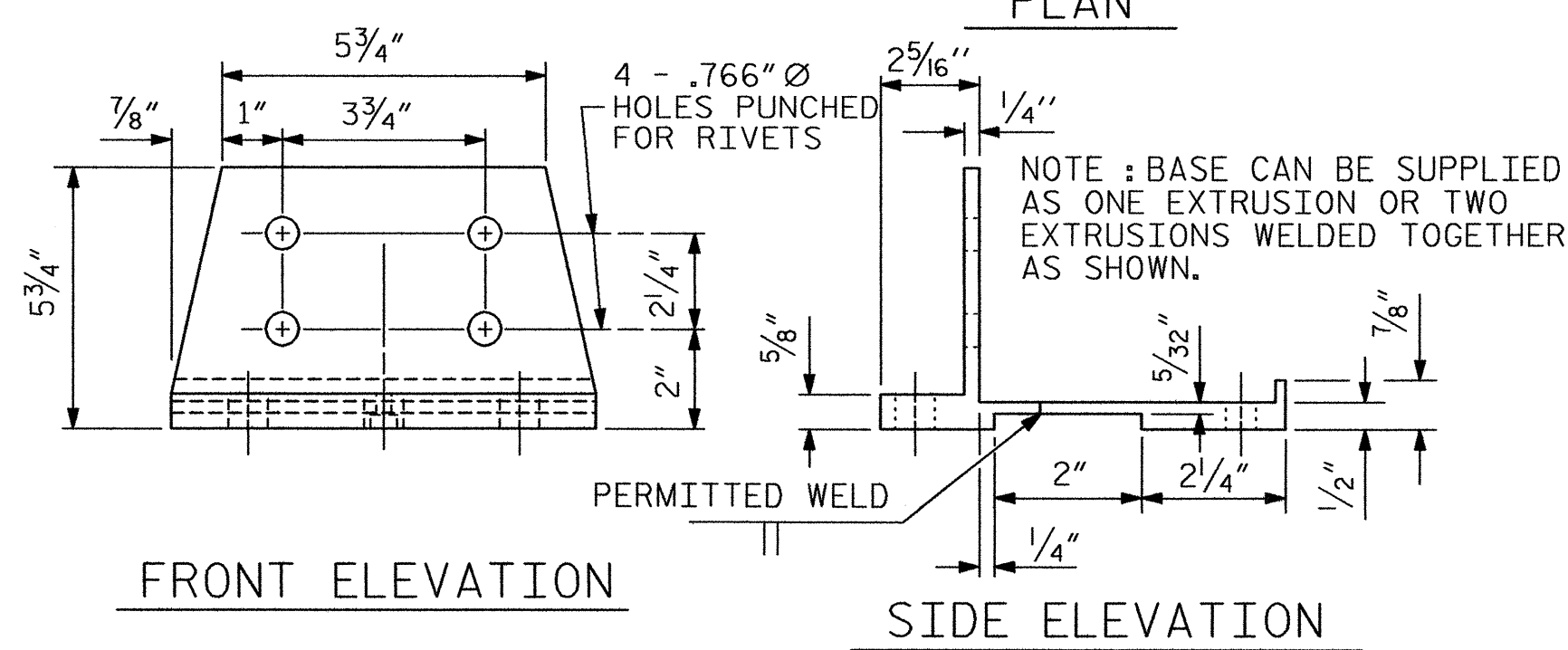
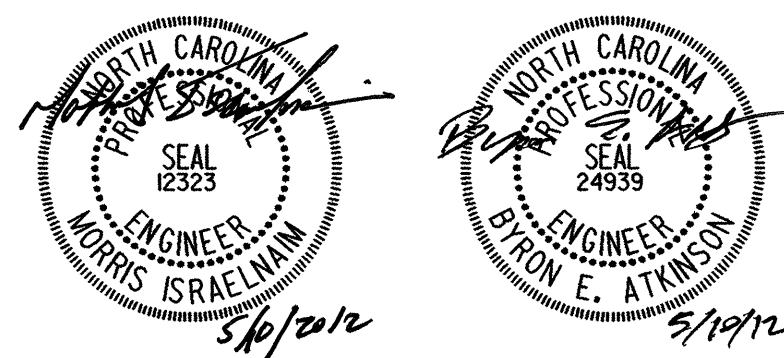
NOTE : FOR ATTACHMENT OF METAL RAIL TO END POST AND LIGHT PEDESTAL, SEE STANDARD NO. BMR2.



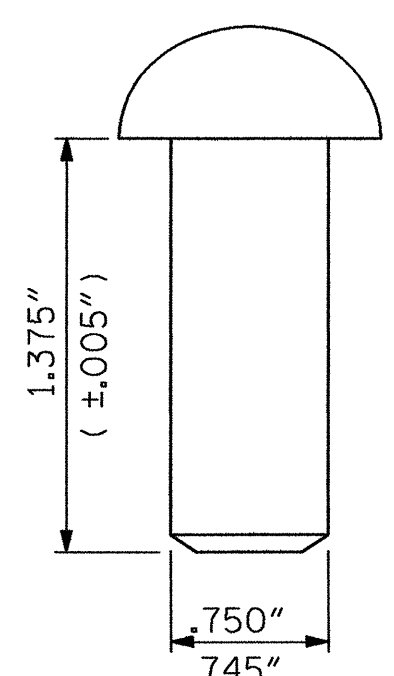
SECTION THRU PARAPET AND RAIL



RIVET DETAIL



POST BASE DETAILS



PROJECT NO. B-4752
GASTON COUNTY
 STATION: 18+54.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD

2 BAR METAL RAIL

REVISIONS				SHEET NO.		
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			46

MI ENGINEERING
 1011 SCHAU DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER : P-0671

5/10/2012 10:41:54 AM User: Planning Filename: P:\NC Projects\MI1007 - 2011-2013 Design_LSC\MI1007.02 - B-4752 Gaston\B-4752\Structures\B-4752.SD.BMR1.dgn

ASSEMBLED BY : J.S. ISRAELNAIM	DATE : 12/11
CHECKED BY : B.E. ATKINSON	DATE : 01/12
DRAWN BY : EEM 6/94	REV. 5/7/03R RWW/JTE
CHECKED BY : RGW 6/94	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

NOTES

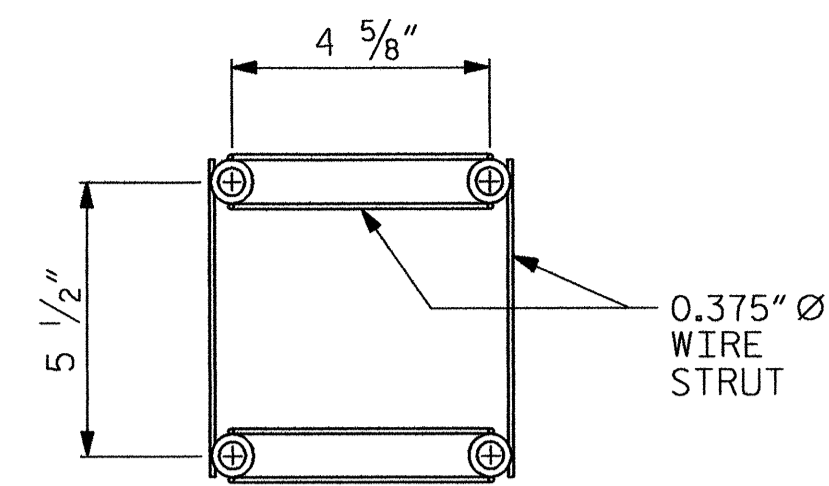
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

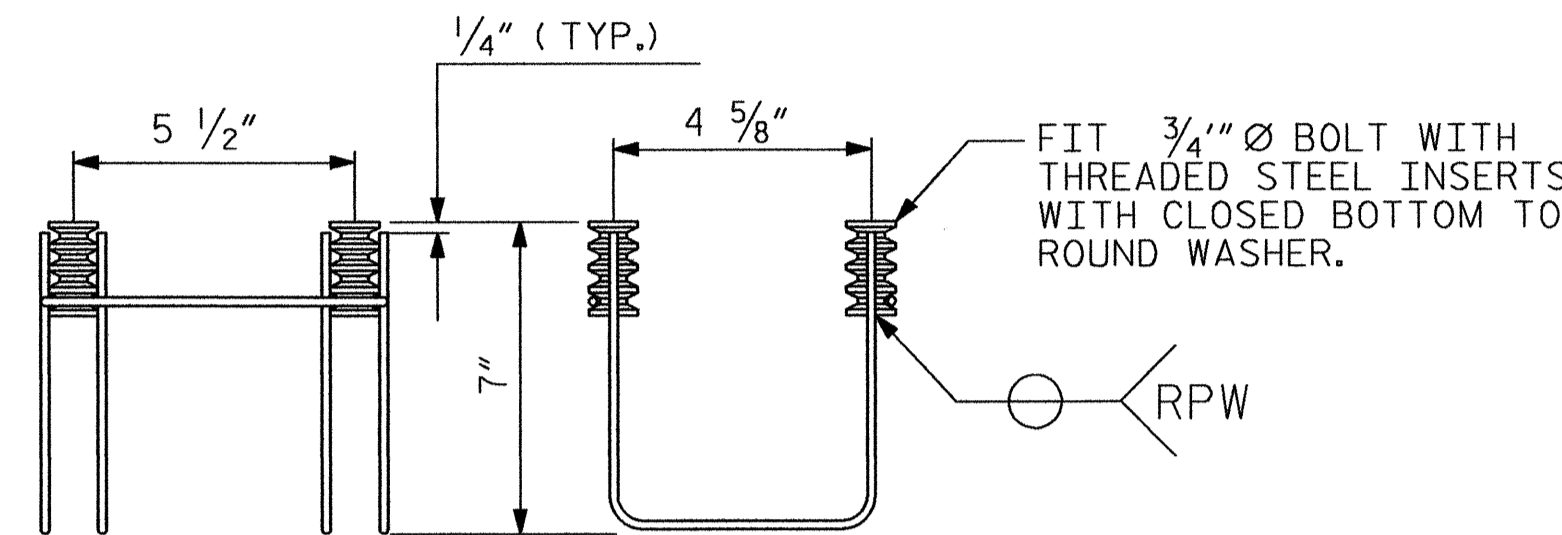
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.
- B. 4 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT 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 1/16" 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 THE STANDARD SPECIFICATIONS.

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

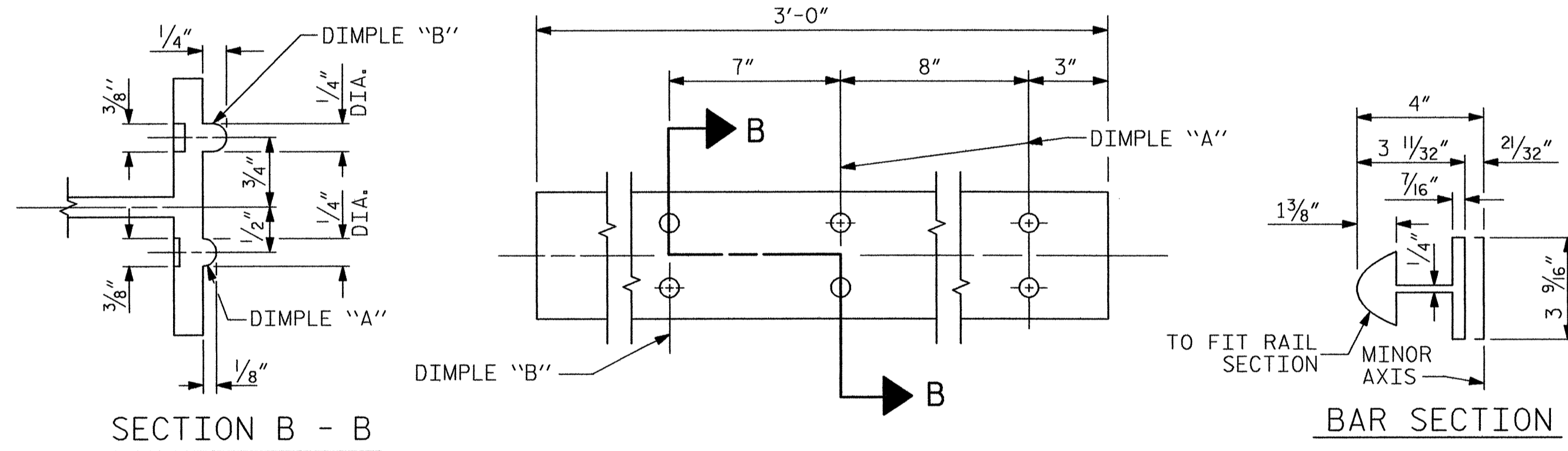


SIDE VIEW

ELEVATION

4-BOLT METAL RAIL ANCHOR ASSEMBLY

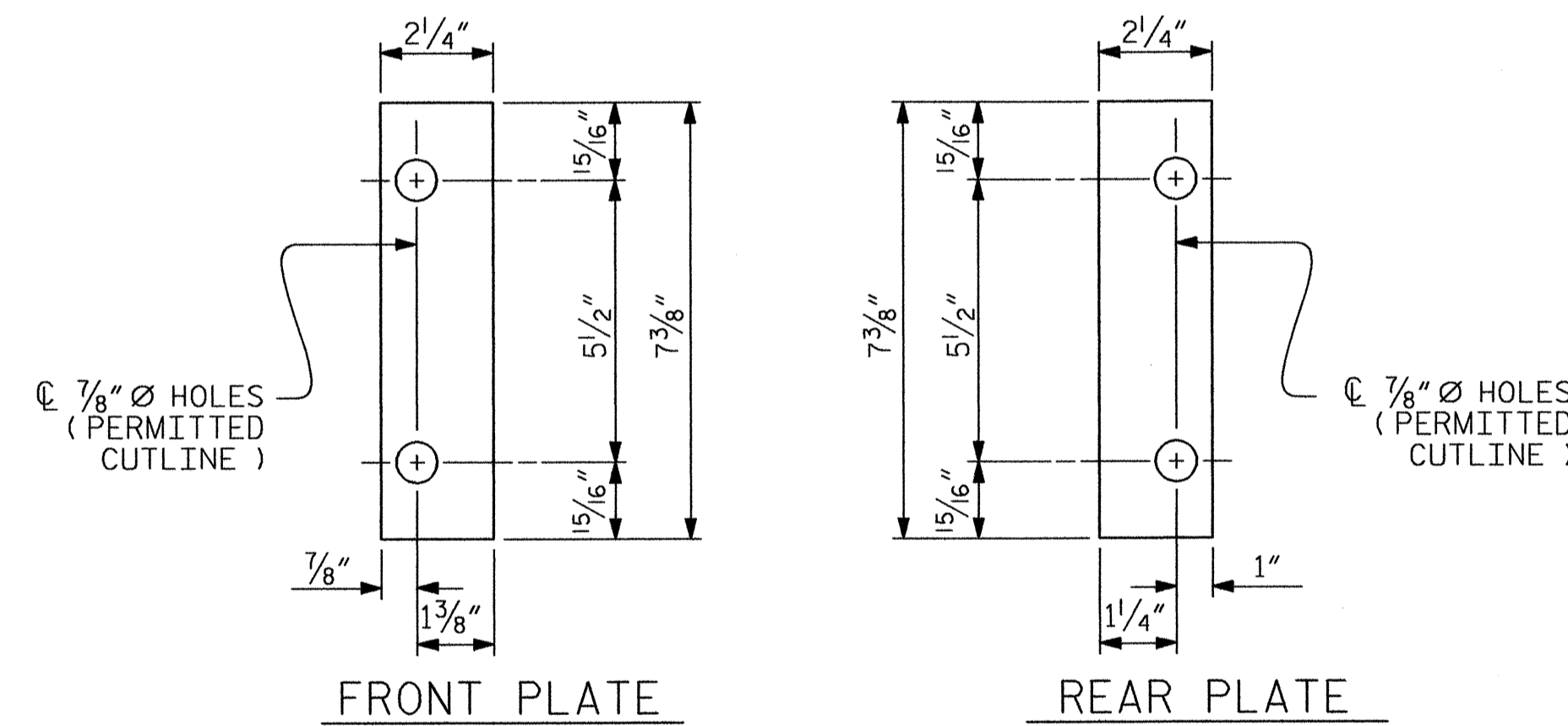
(148 ASSEMBLIES REQUIRED)



SECTION B - B

EXPANSION BAR DETAILS

BAR SECTION

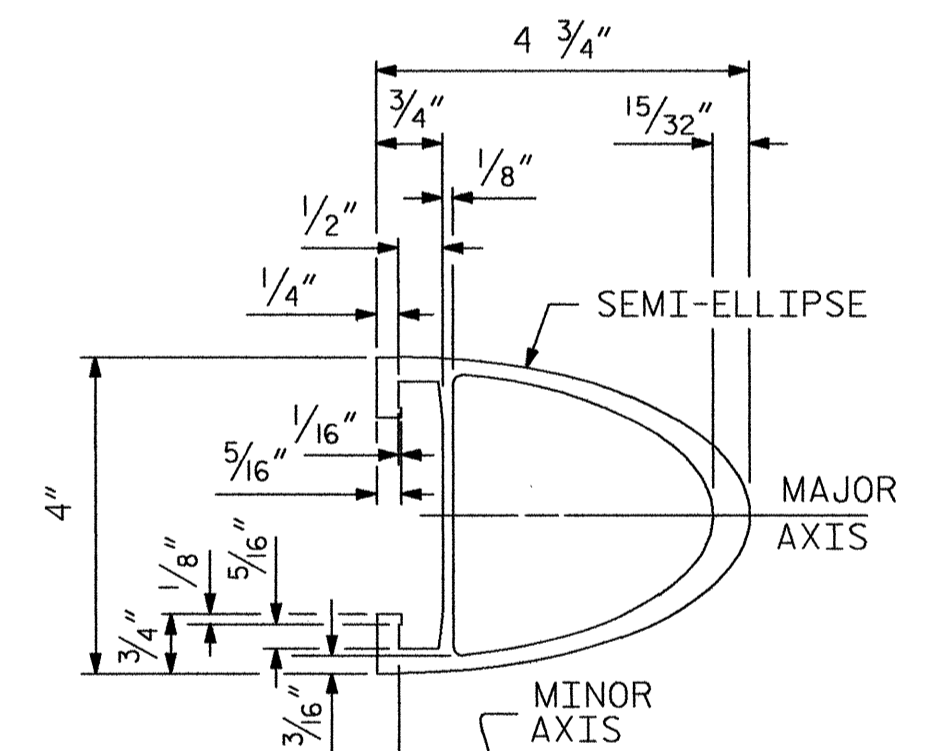


FRONT PLATE

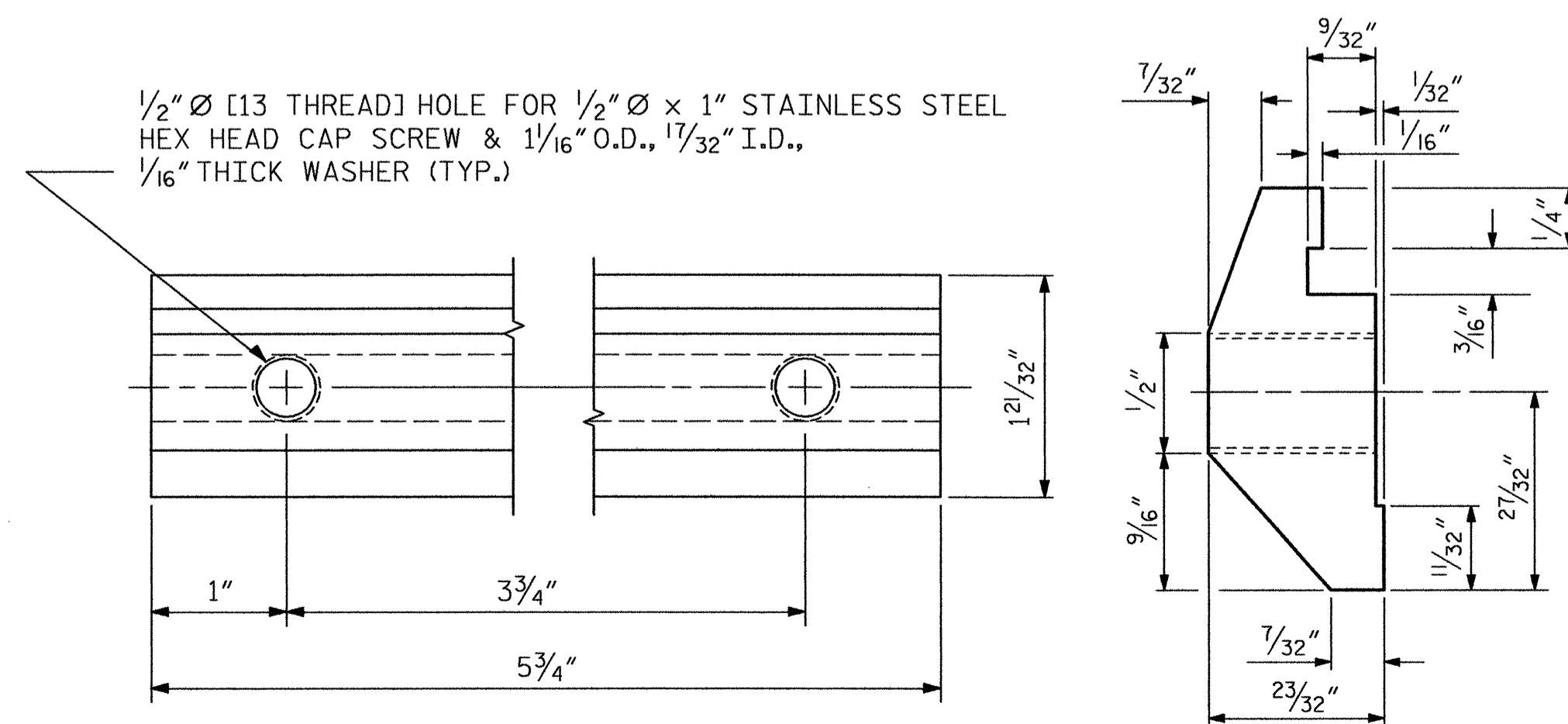
REAR PLATE

SHIM DETAILS

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

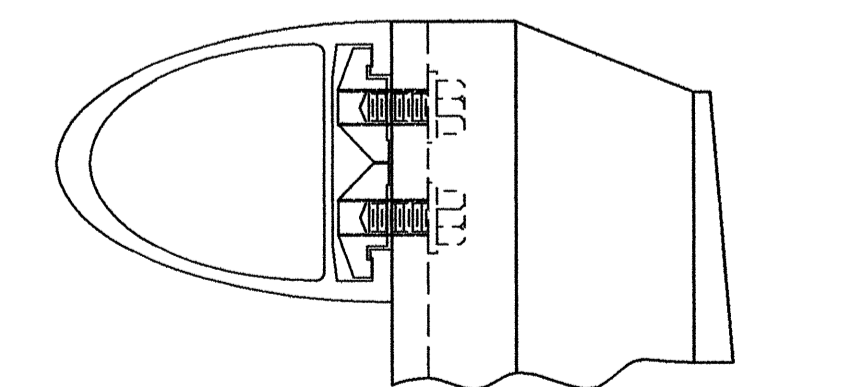


RAIL SECTION

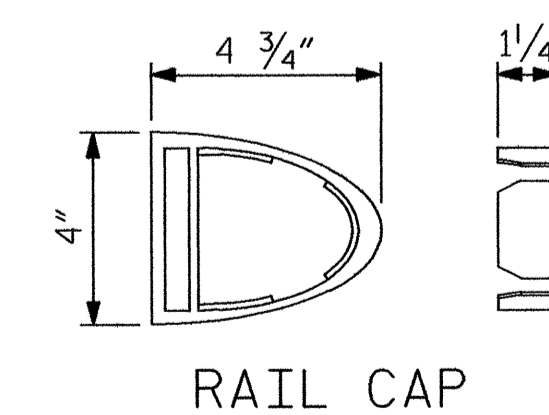


CLAMP BAR DETAIL

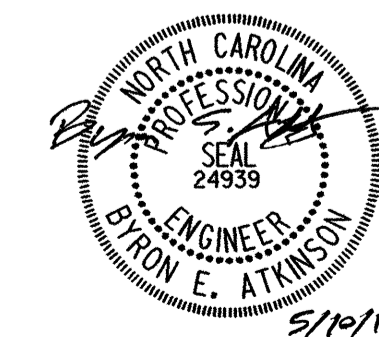
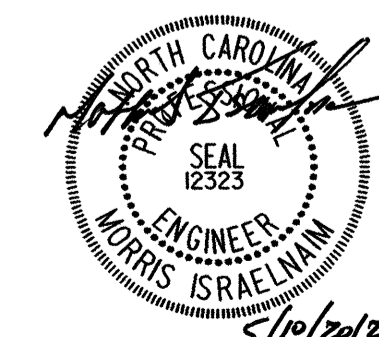
(4 REQUIRED PER POST)



CLAMP ASSEMBLY



RAIL CAP



PROJECT NO. B-4752

GASTON COUNTY

STATION: 18+54.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

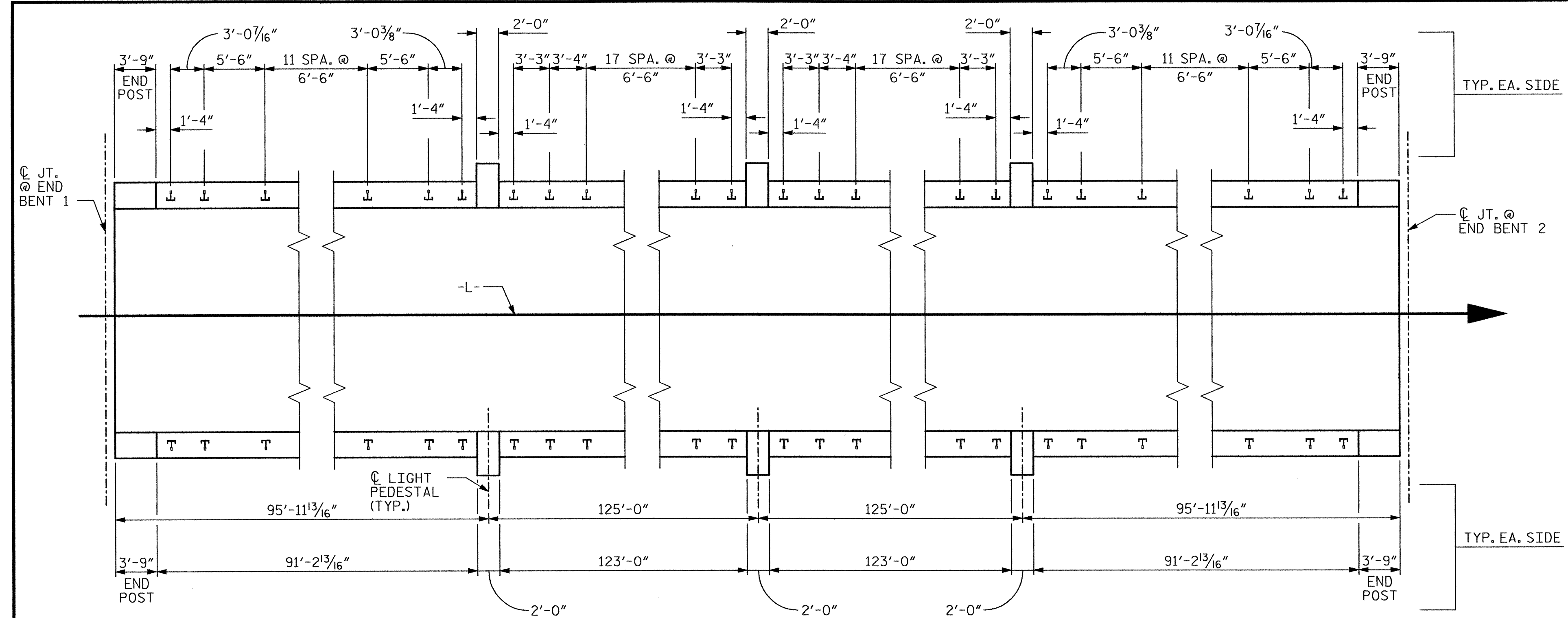
STANDARD
2 BAR METAL RAIL

ASSEMBLED BY : J.S. ISRAELNIM	DATE : 12/11
CHECKED BY : B.E. ATKINSON	DATE : 01/12
DRAWN BY : EEM 6/94	REV. 8/16/99 MAB/LES
CHECKED BY : RGW 6/94	REV. 5/1/06R KMM/GM
	REV. 10/1/11 MAA/GM

MI ENGINEERING		REVISIONS		SHEET NO.
1011 SCHAU DRIVE, SUITE 100		NO.	DATE	S-23
RALEIGH, NC 27606		1		TOTAL SHEETS
(919) 851-6606		2		46
FIRM PE NUMBER : P-0671				

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5/10/2012 10:48:23 AM User: blanning File: MI1007.dgn - 2011-2013 Design LSC MI1007.02 - B-4752 Gaston\B-4752\Structures\B-4752_SD_BMR3.dgn



PLAN OF RAIL POST SPACINGS

NOTES

- STRUCTURAL CONCRETE INSERT
- THE STRUCTURAL CONCRETE INSERT 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 1 1/2".
 - 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.)
 - 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 3/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

NOTES

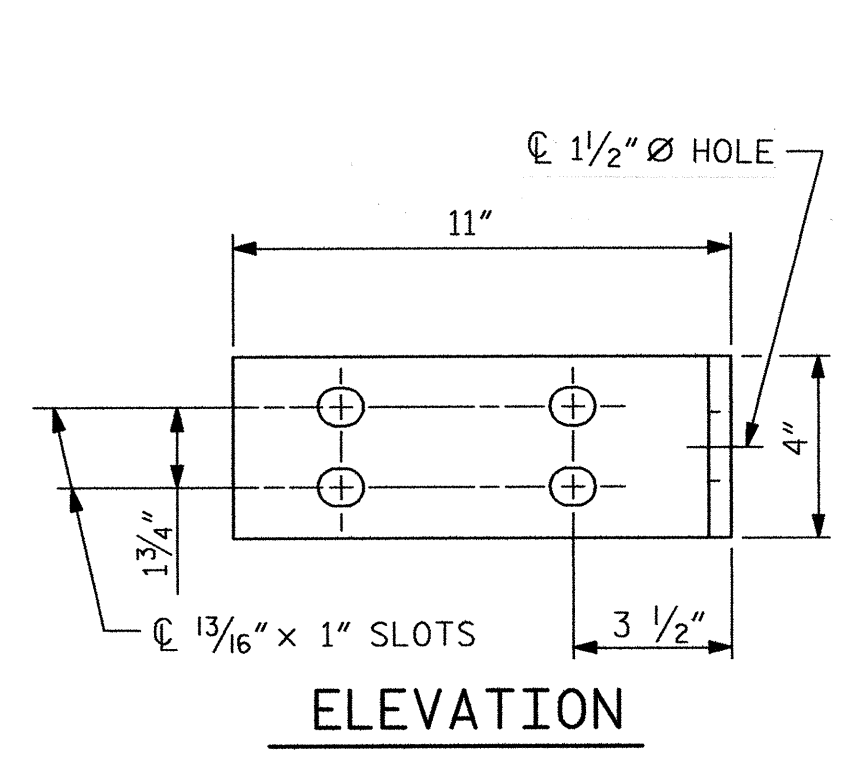
- METAL RAIL TO END POST CONNECTION
- THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
 - 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. 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.
 - 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.
 - STANDARD CLAMP BARS (SEE METAL RAIL SHEET).
 - 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.

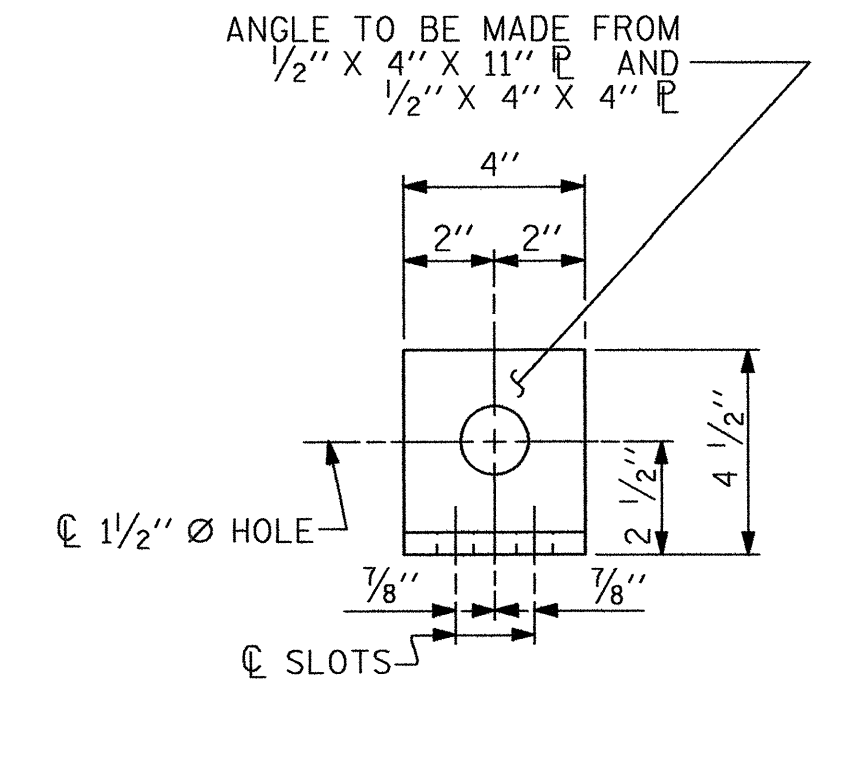
THE 3/4" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

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.

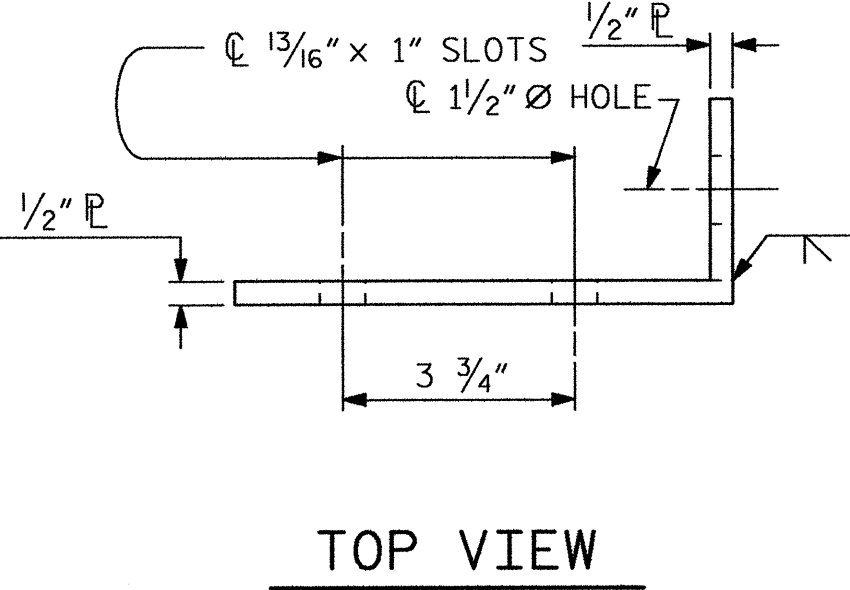
THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø x 1 5/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" Ø x 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT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



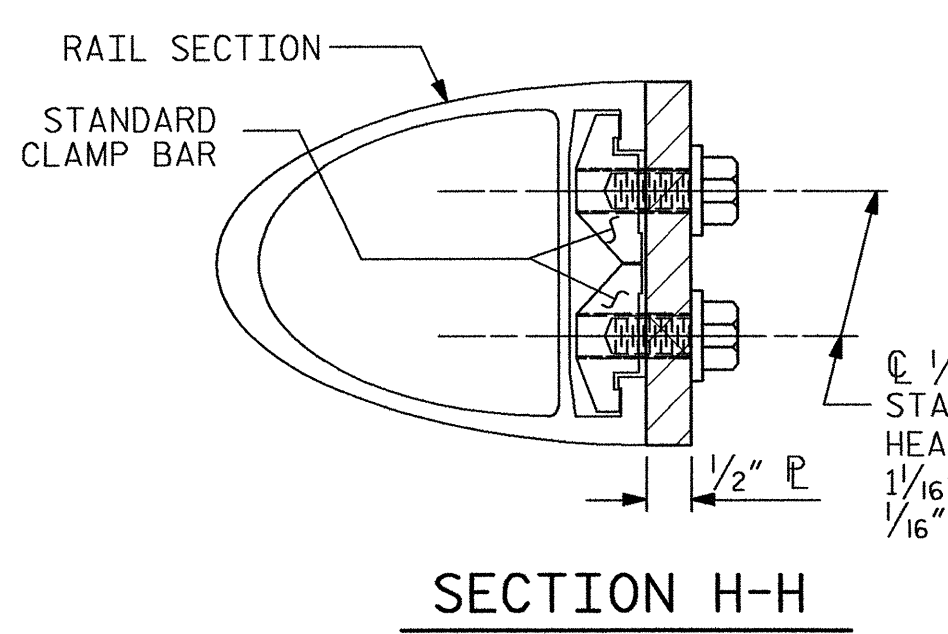
ELEVATION



END VIEW

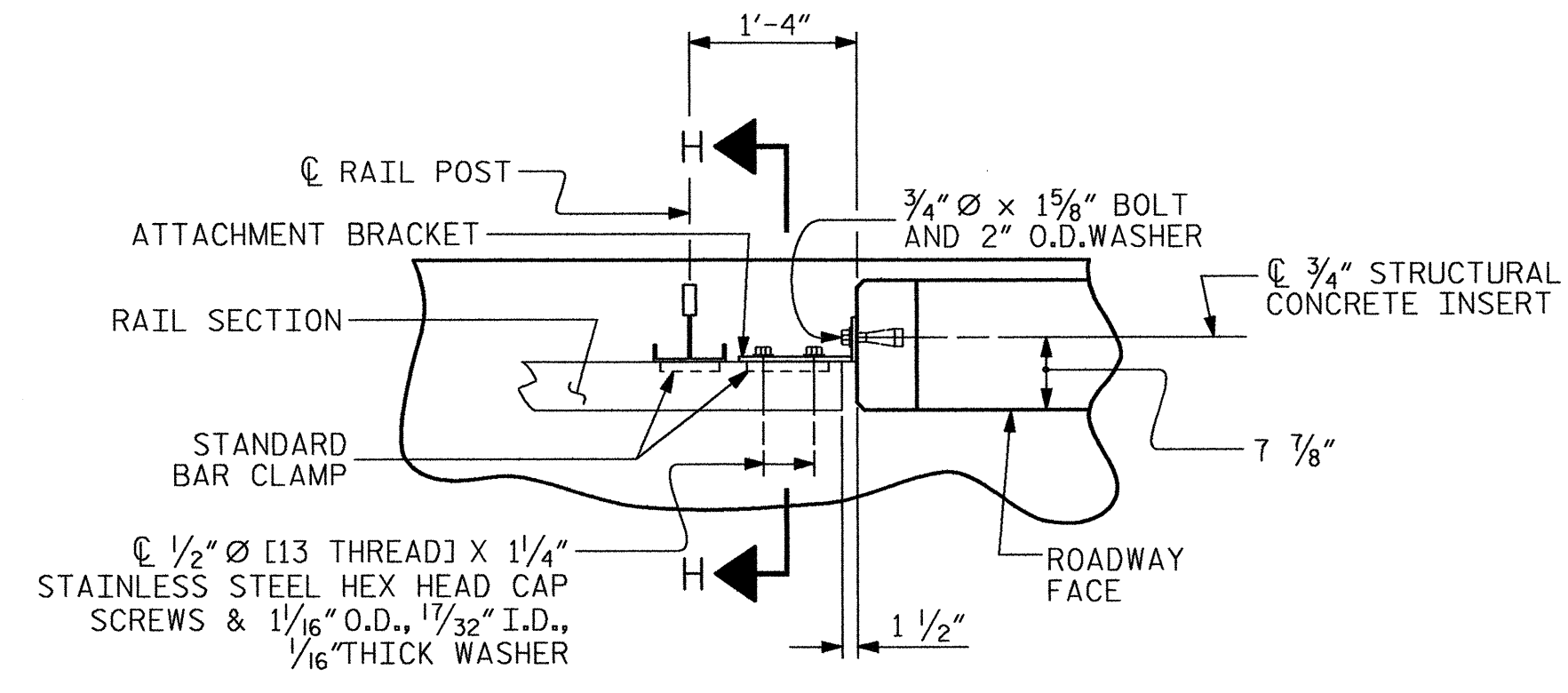


TOP VIEW

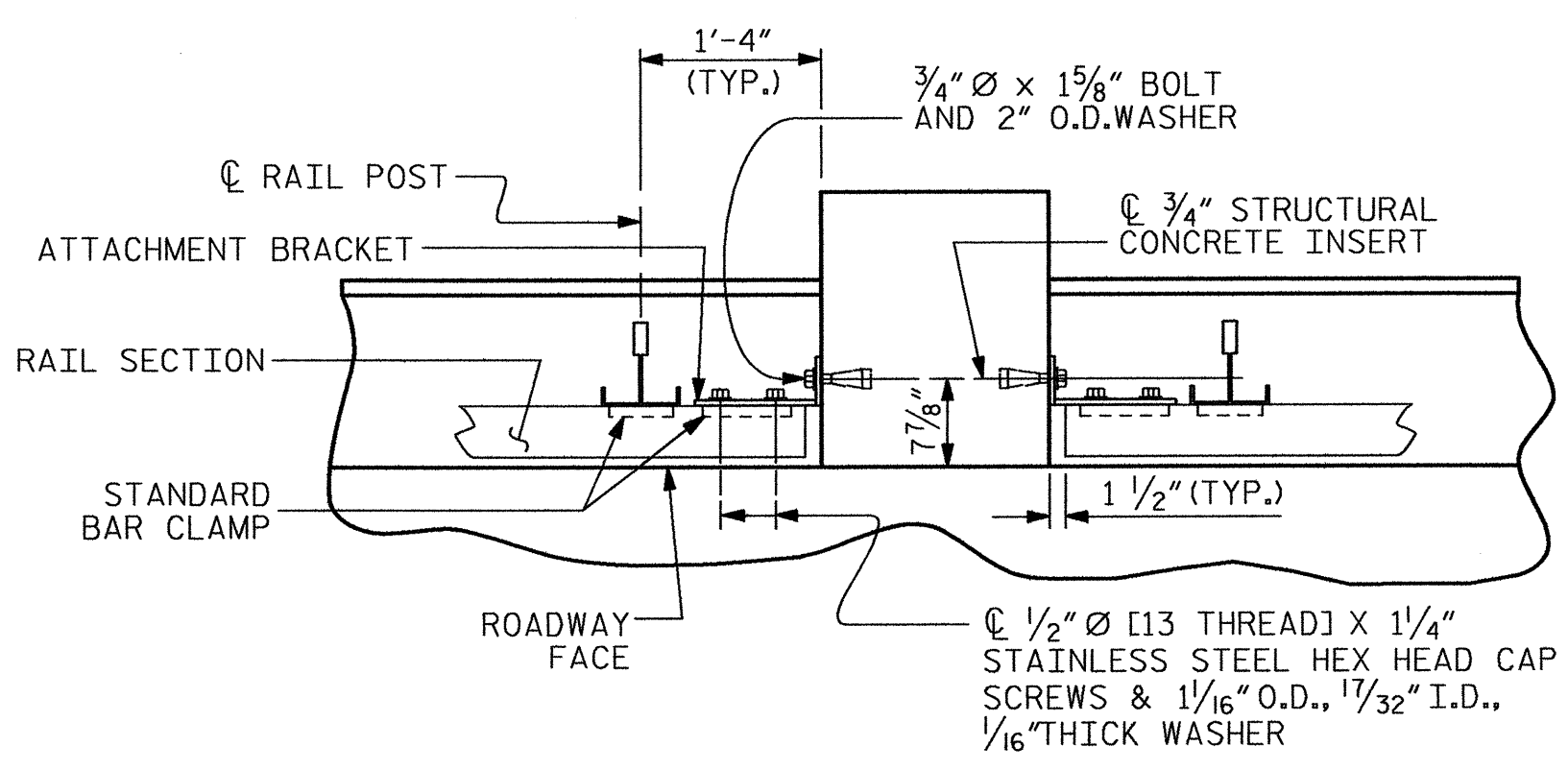


SECTION H-H

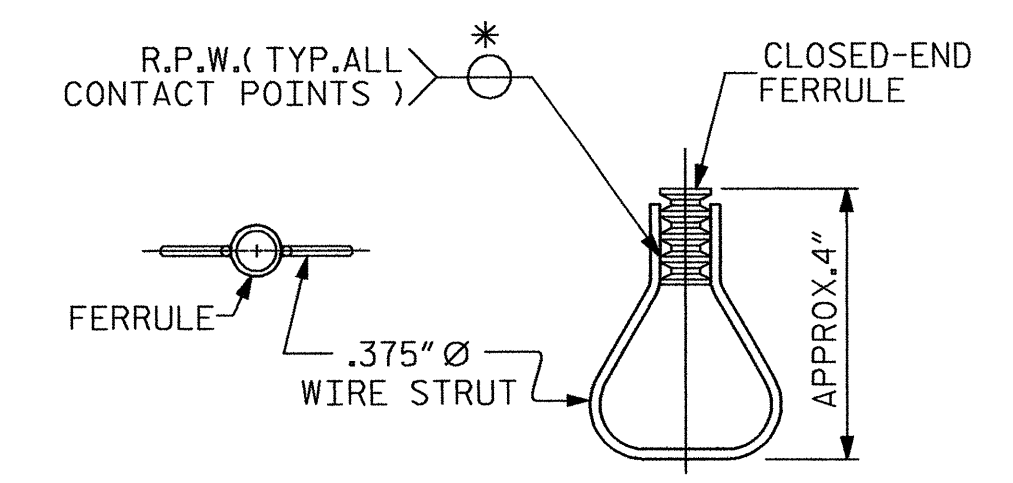
FIXED



PLAN - RAIL AND END POST



PLAN - RAIL AND LIGHT PEDESTAL
(RAIL ATTACHMENT TYPICAL EACH SIDE OF LIGHT PEDESTAL)



PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

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

PROJECT NO. B-4752
GASTON COUNTY
 STATION: 18+54.00 -L-

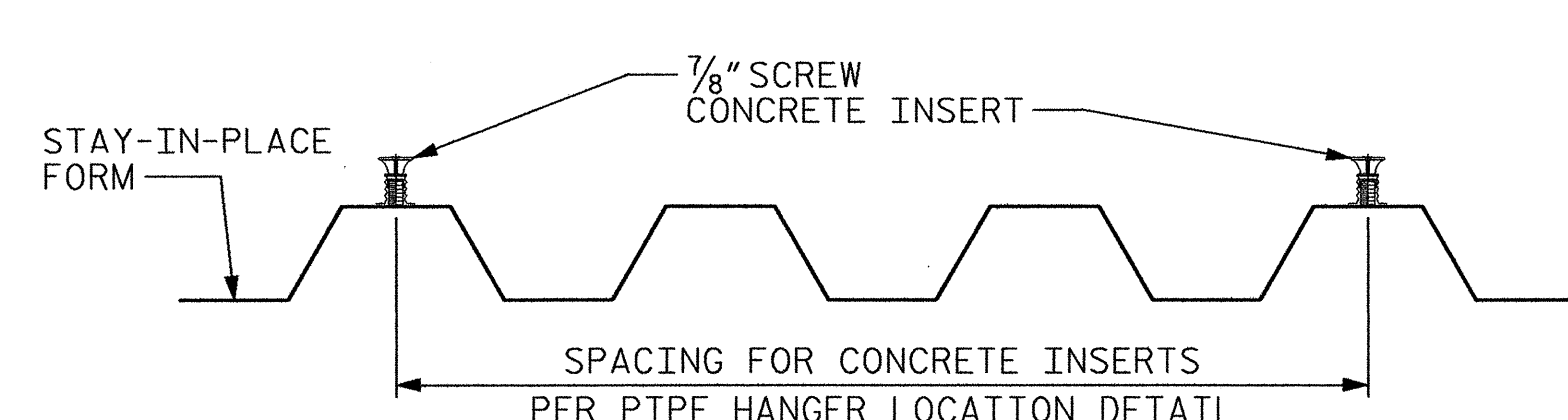
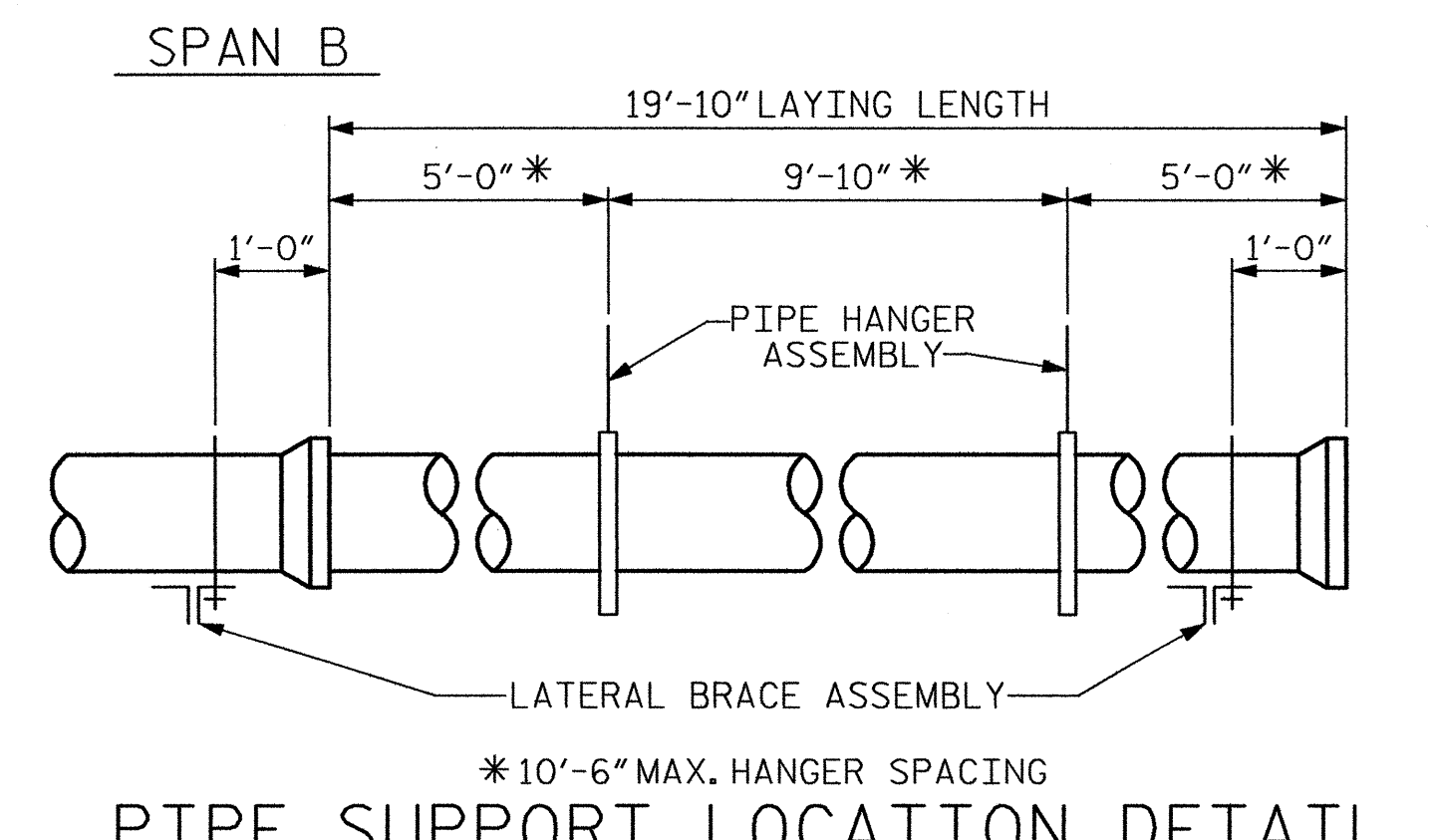
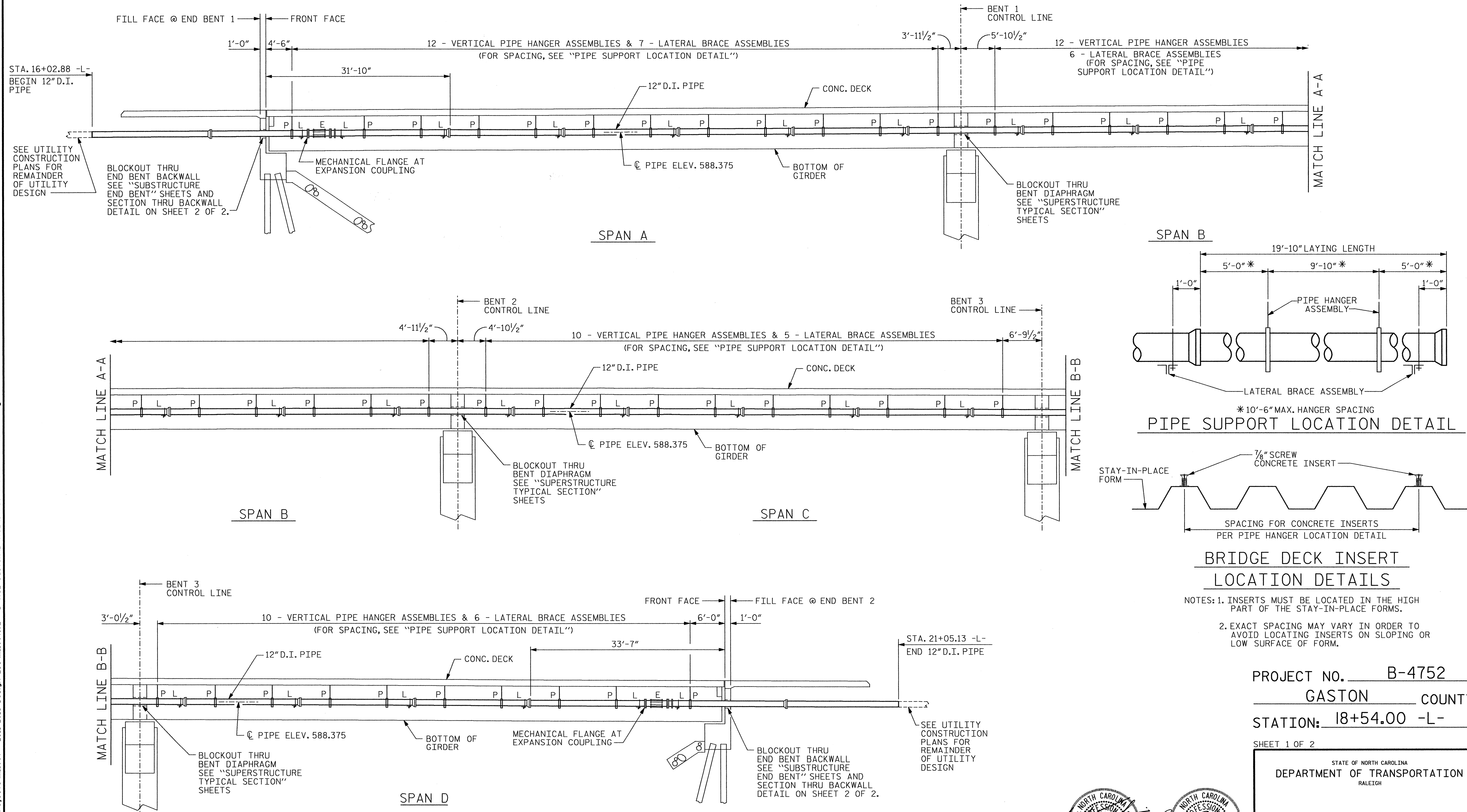
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 RAIL POST SPACINGS
 AND
 END OF RAIL DETAILS
 FOR ONE OR TWO BAR METAL RAILS

Professional Engineer Seal for Morris Israel Naim, License No. 24939, dated 5/10/2012.

MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER : P-0671

REVISIONS						SHEET NO. S-24
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 46
2			4			

5/10/2012 10:51:47 AM User: biamming
 Filename: P:\NC Projects\M1007 - 2011-2013 Design LSC\M1007.02 - B-4752 Gaston\B-4752\Structures\B-4752-SD-UAD1.dgn



BRIDGE DECK INSERT LOCATION DETAILS

NOTES: 1. INSERTS MUST BE LOCATED IN THE HIGH PART OF THE STAY-IN-PLACE FORMS.
 2. EXACT SPACING MAY VARY IN ORDER TO AVOID LOCATING INSERTS ON SLOPING OR LOW SURFACE OF FORM.

PROJECT NO. B-4752
GASTON COUNTY
 STATION: 18+54.00 -L-
 SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

UTILITY ATTACHMENT DETAILS

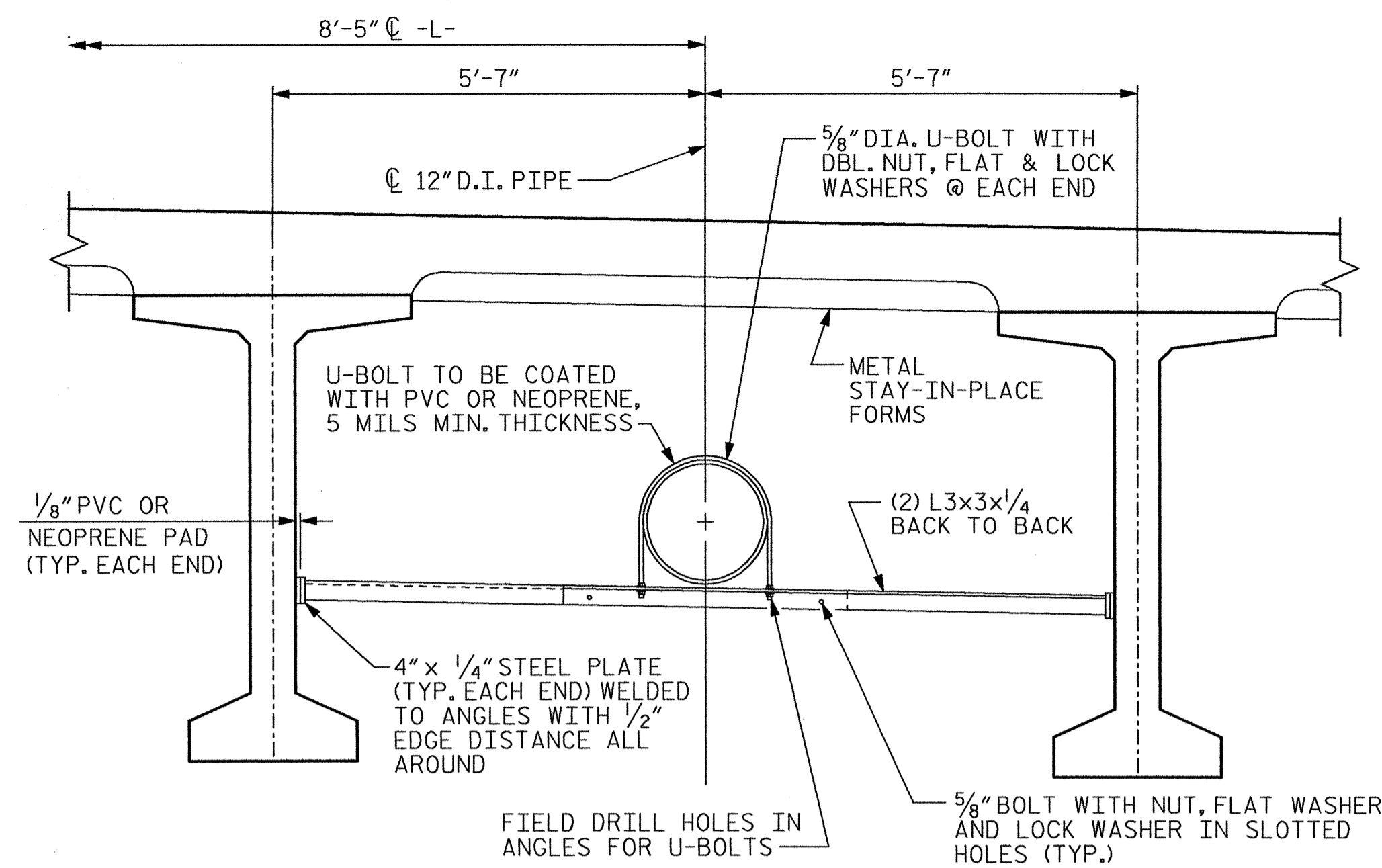
Professional Engineer Seal for **BRON E. ATKINSON**, License No. 24939, dated 5/10/2012.

P = PIPE HANGER ASSEMBLY
 L = LATERAL BRACE ASSEMBLY
 E = EXPANSION COUPLING ASSEMBLY

DRAWN BY: B. E. ATKINSON DATE: 02/12
 CHECKED BY: P. A. de PAOLI DATE: 03/12

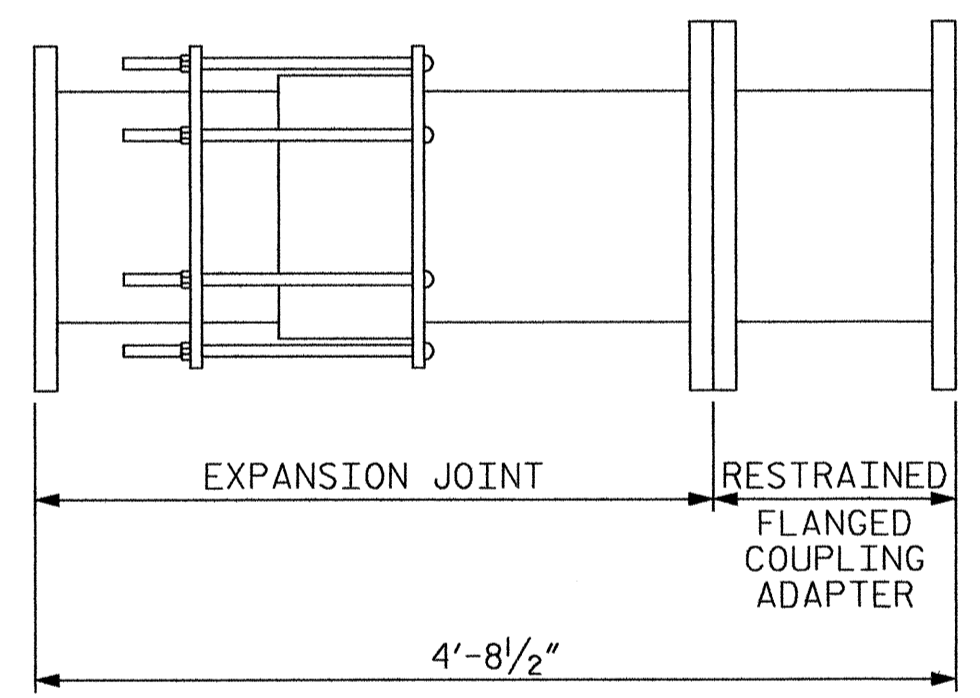
NO.		BY:		DATE:		NO.		BY:		DATE:		SHEET NO.	
1						3						S-25	TOTAL SHEETS
2						4						46	

MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER: P-0671



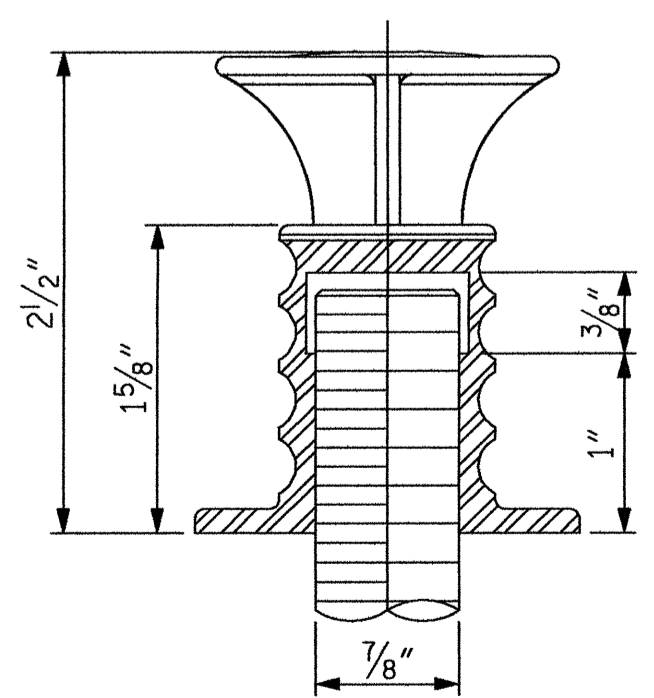
LATERAL BRACE ASSEMBLY

- NOTES: 1. LATERAL BRACING IS REQUIRED AT ALL PIPE JOINTS.
 2. BRACE SHALL BE PLACED SNUG AGAINST BEAM WEB. DO NOT FORCE OR JACK.
 3. ALL LATERAL BRACING, BOLTS, NUTS, WASHERS AND U-BOLTS SHALL BE GALVANIZED.

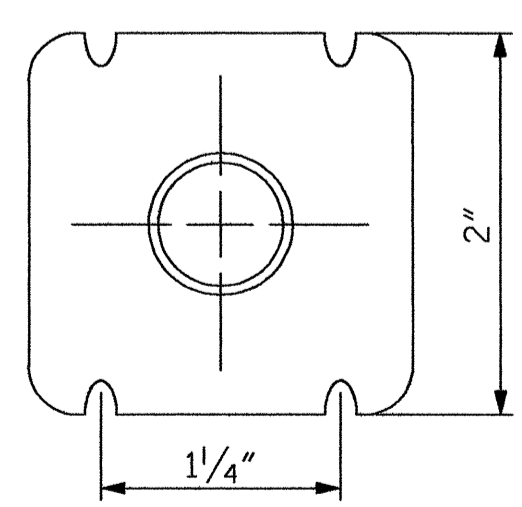


EXPANSION COUPLING ASSEMBLY

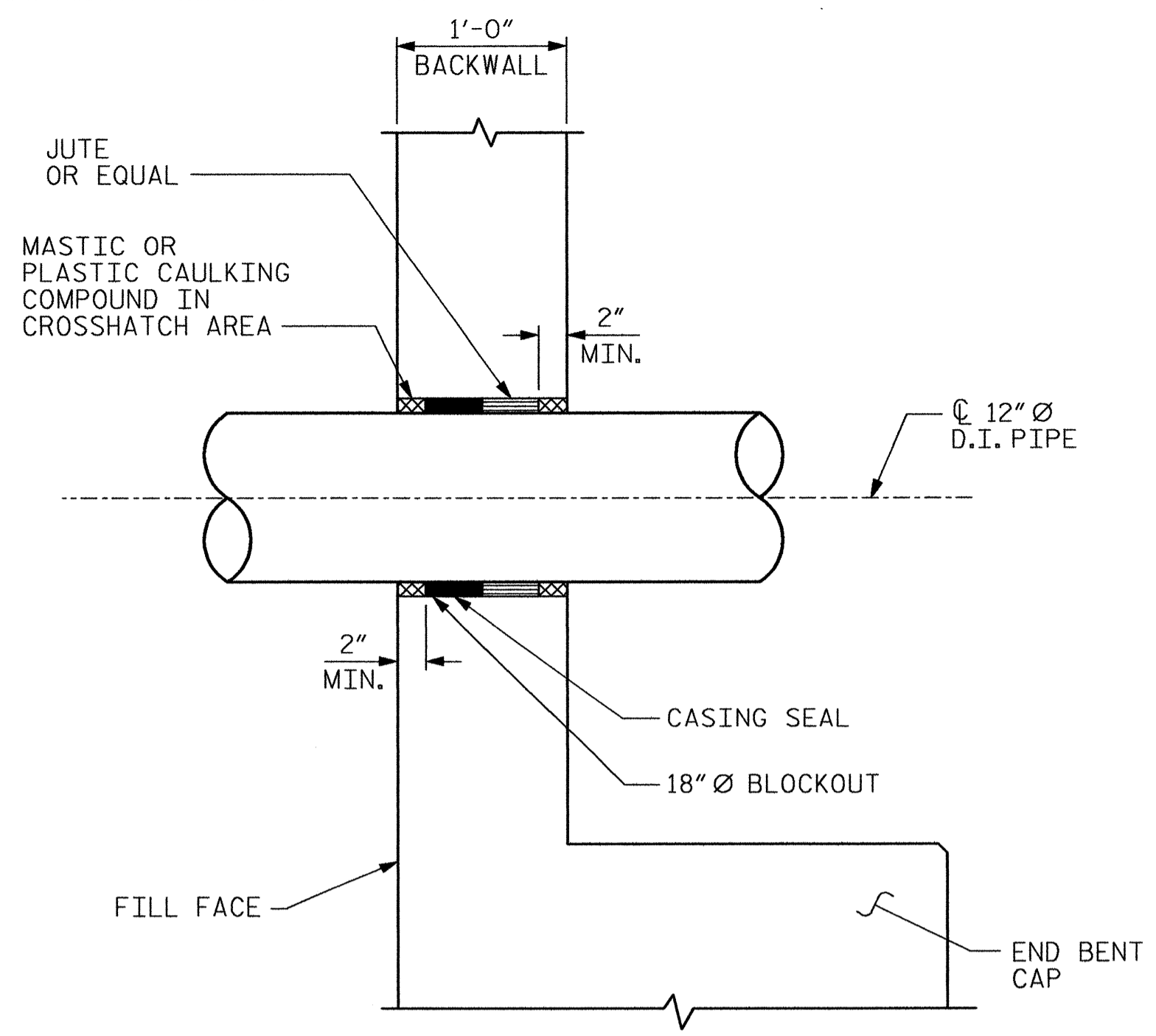
NOTE: TOTAL PIPE MOVEMENT IS 3.305 INCHES.



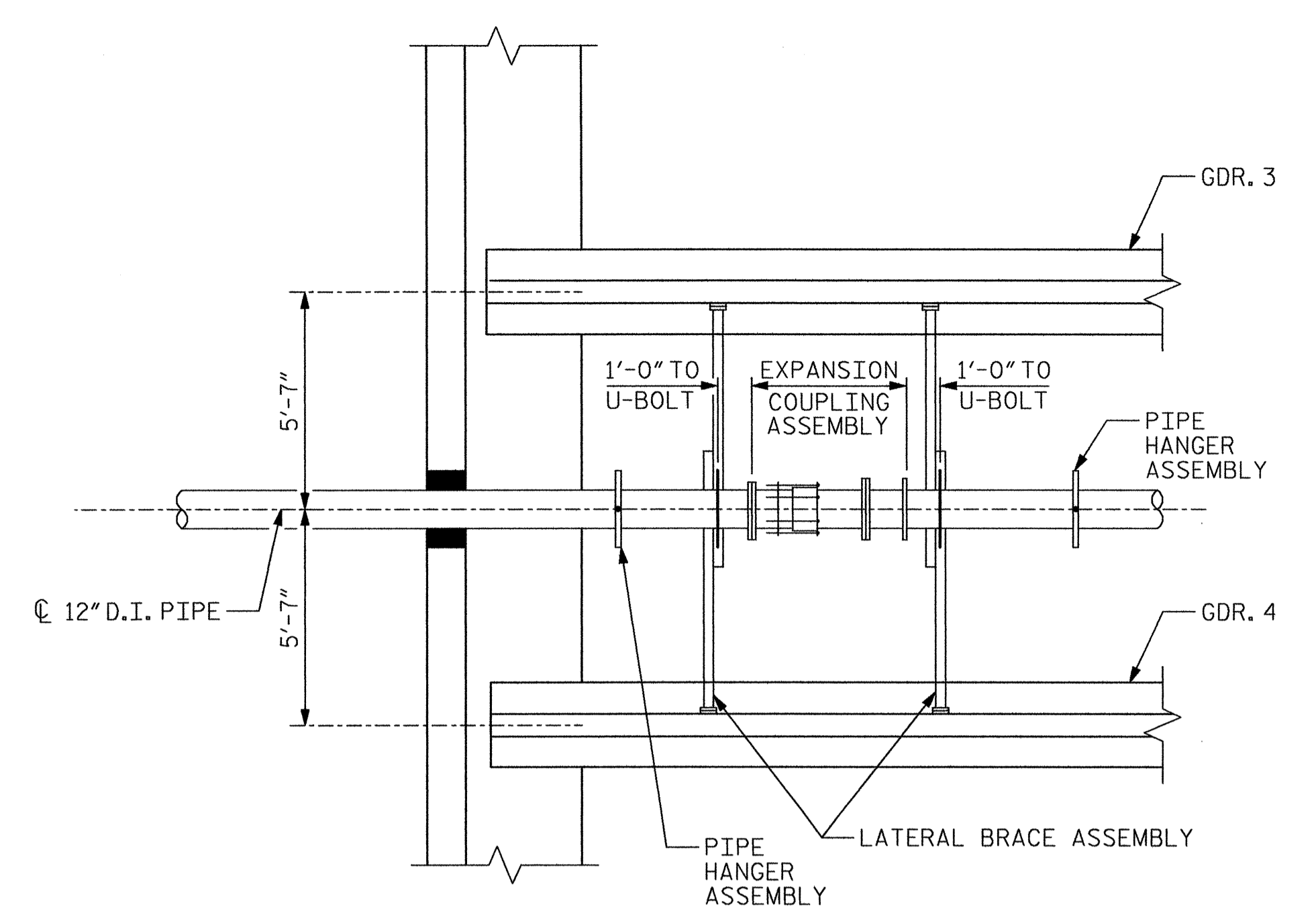
SCREW CONCRETE INSERT DETAIL



MINIMUM LOAD, LBS.
2500



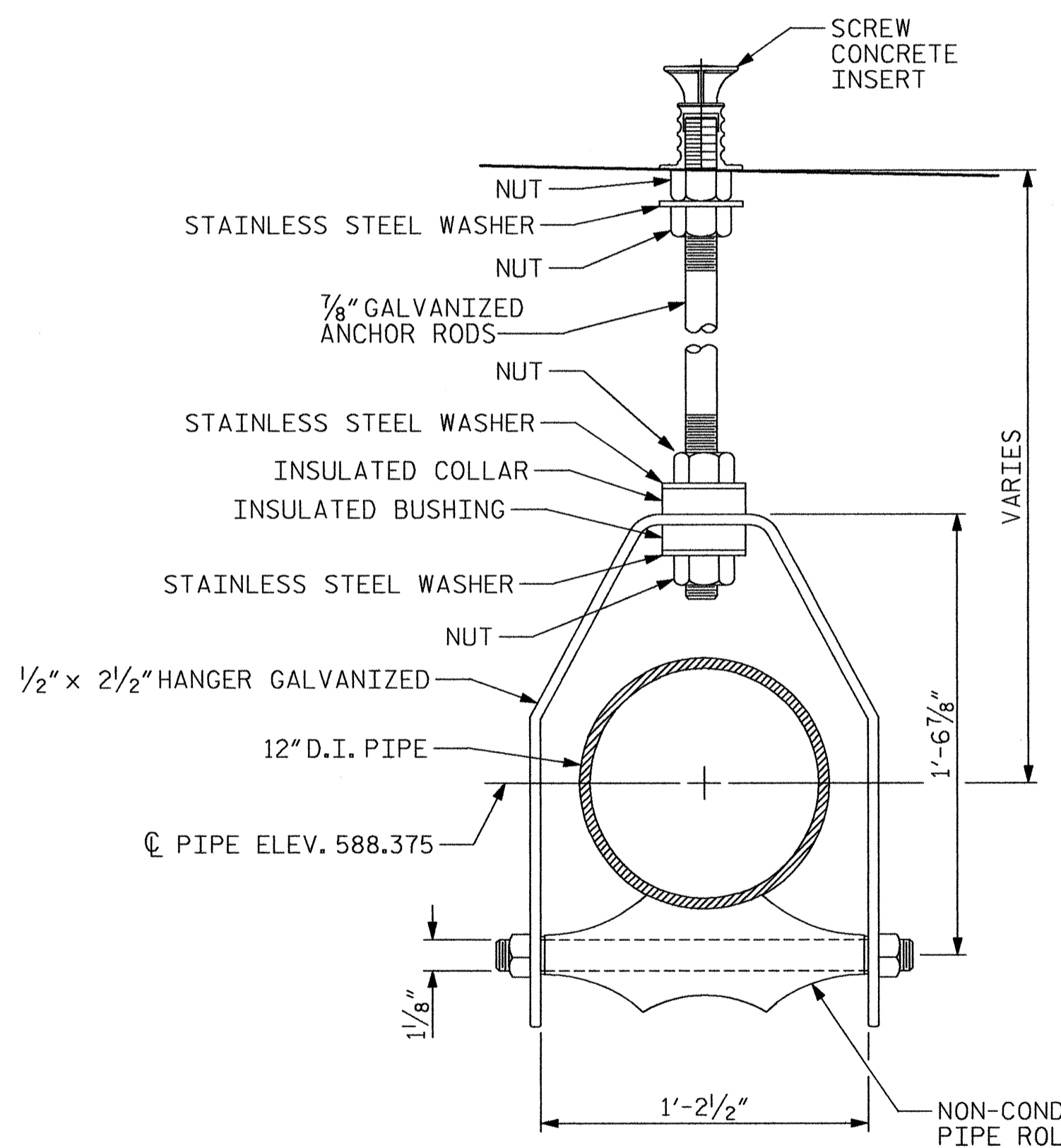
SECTION THRU BACKWALL



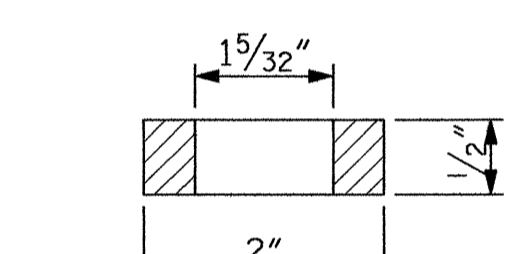
PLAN AT END BENT

NOTE: END BENT 1 SHOWN, END BENT 2 SIMILAR.

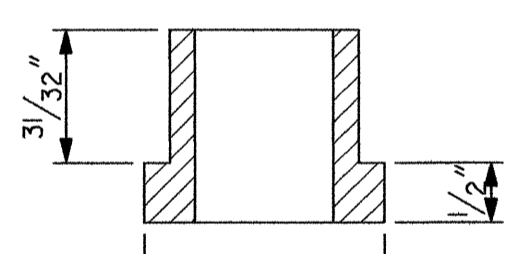
BILL OF MATERIAL FOR 12" WATER MAIN		
NO.	UNITS	ITEM
1	44 EA.	PIPE HANGER ASSEMBLY
2	502 LF	12" Ø DUCTILE IRON RESTRAINED JOINT (D.I.R.J.) WATER PIPE, PRESSURE CLASS 350
3	2 EA.	MODULAR TYPE CASING SEAL
4	2 EA.	JUTE
5	2 EA.	MASTIC OR PLASTIC CAULKING COMPOUND
6	2 EA.	END PLUGS (OR CAPS) FOR 12" Ø D.I. PIPE
7	24 EA.	LATERAL BRACE ASSEMBLY
8	2 EA.	EXPANSION COUPLING ASSEMBLY
9	1 LOT	PAINT (AS REQUIRED)



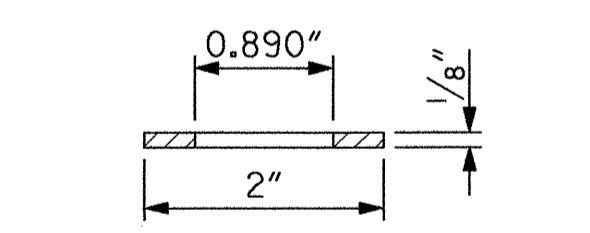
PIPE HANGER ASSEMBLY



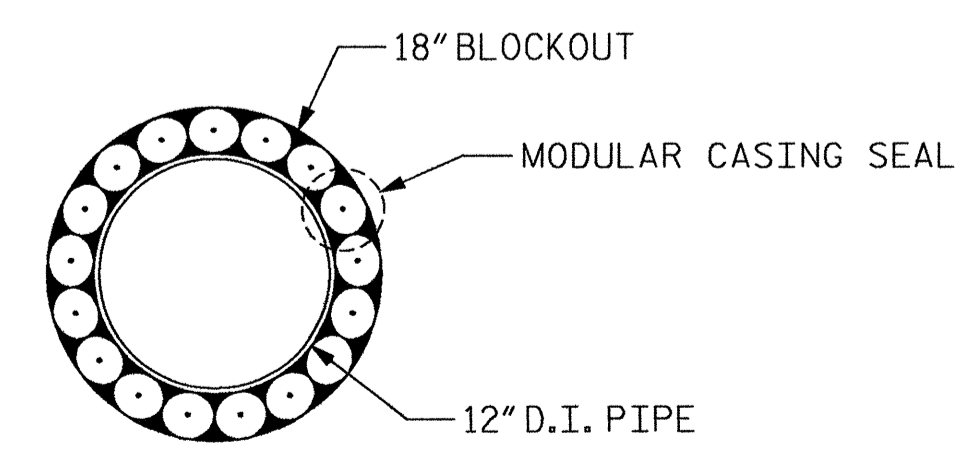
INSULATED COLLAR



INSULATED BUSHING



STAINLESS STEEL WASHER TOP AND BOTTOM



PIPE AND CASING SEAL SECTION

PROJECT NO. B-4752
GASTON COUNTY
 STATION: 18+54.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

UTILITY ATTACHMENT DETAILS

Professional Engineer seals for Morris Israel (No. 24323, dated 5/10/2012) and Bron E. Atkinson (No. 24939, dated 5/10/2012).

MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER : P-0671

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

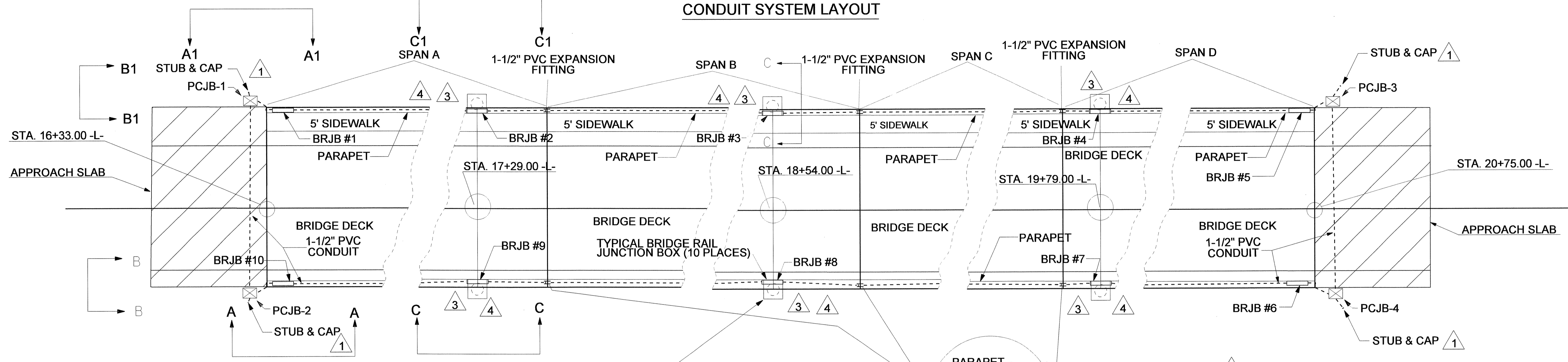
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DRAWN BY: B.E. LANNING DATE: 03/12
 CHECKED BY: P.A. de PAOLI DATE: 03/12

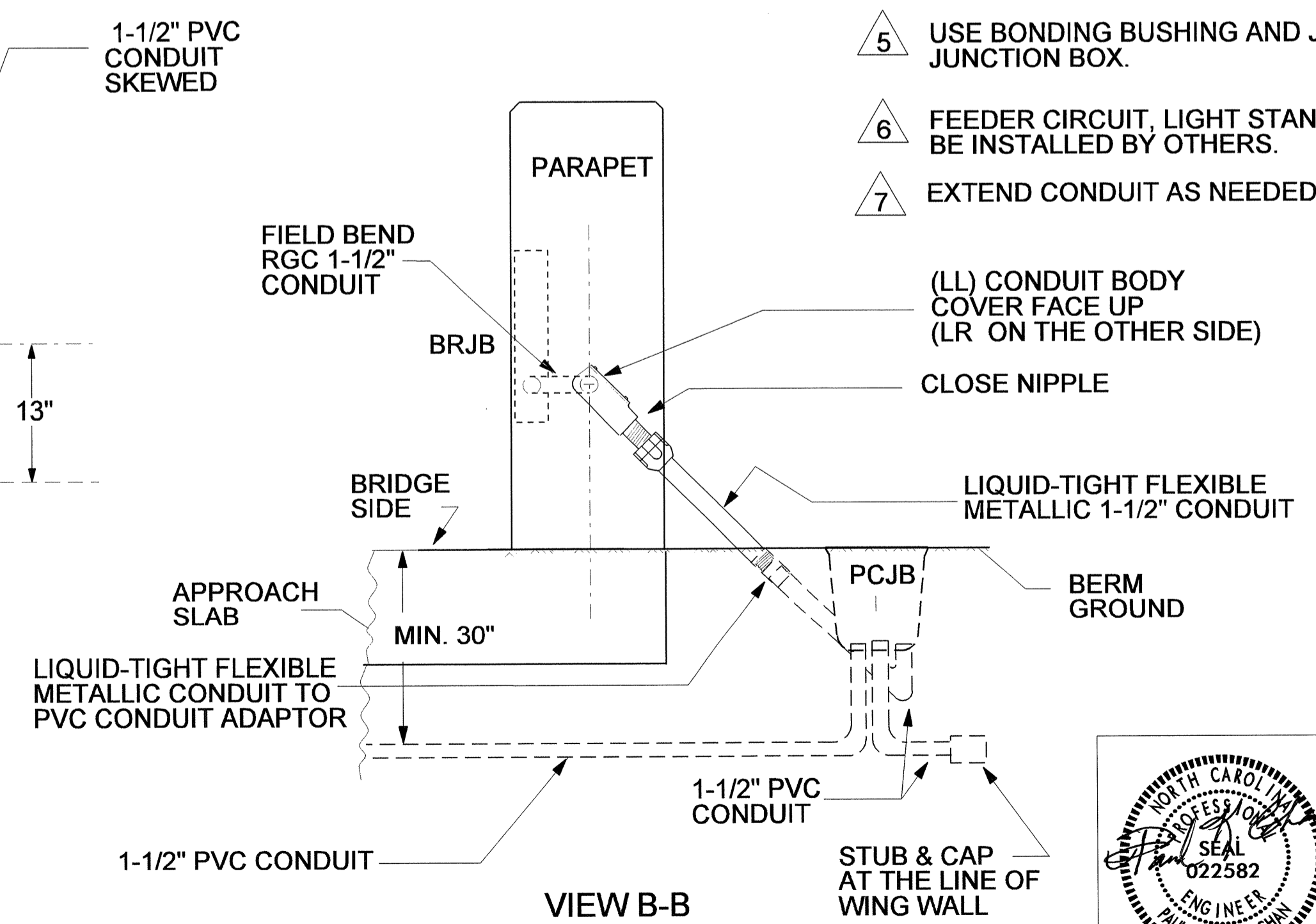
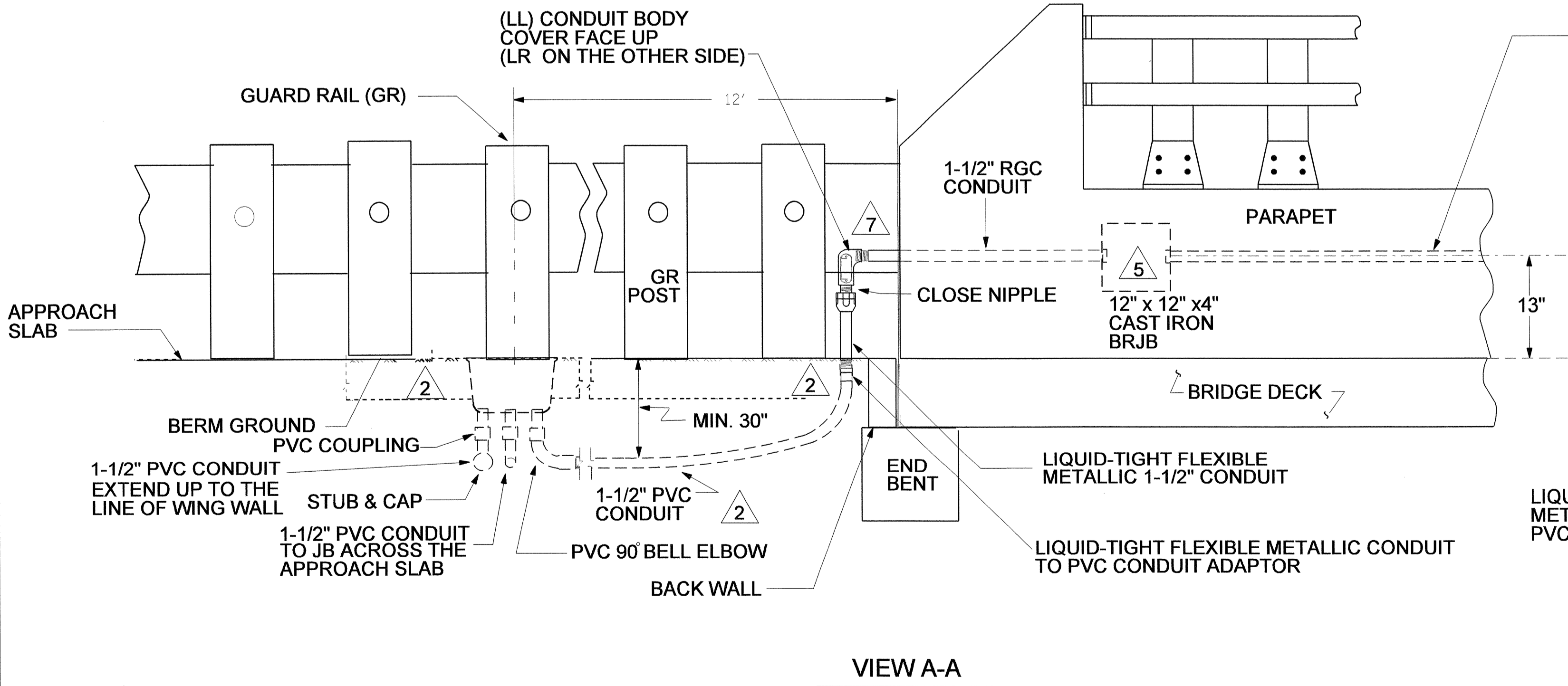
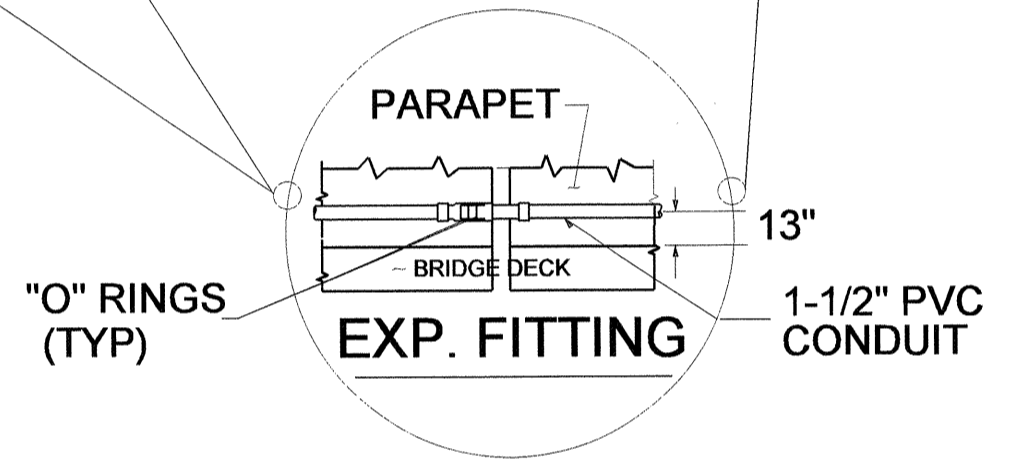
USE FOR LIGHTING CONSTRUCTION ONLY

CONDUIT SYSTEM LAYOUT



NOTES

- 1 CAP AND PERMANENTLY MARK CONDUIT STUB. CONDUIT TO BE CONNECTED BY OTHERS
- 2 ENSURE THAT CONDUIT IS NOT IN CONFLICT WITH GUARDRAIL POSTS.
- 3 SEE STRUCTURE PLANS FOR LOCATION AND DETAILS FOR LIGHT PEDESTALS.
- 4 ANCHOR BOLTS AND INSTALLATION WILL BE PROVIDED BY THE LIGHT STANDARD MANUFACTURER.
- 5 USE BONDING BUSHING AND JUMPER TO BOND RGC TO BR JUNCTION BOX.
- 6 FEEDER CIRCUIT, LIGHT STANDARDS AND LUMINAIRES TO BE INSTALLED BY OTHERS.
- 7 EXTEND CONDUIT AS NEEDED TO CLEAR THE BACK WALL

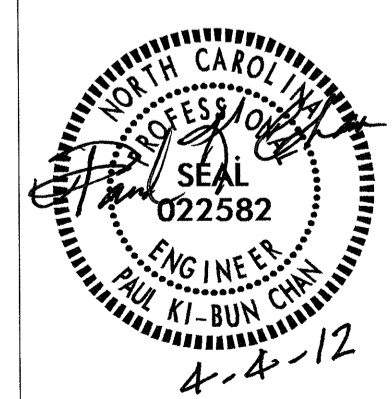


PROJECT NO. **B-4752**
GASTON COUNTY
 STATION: **18+54.00 -L-**

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 ROADWAY DESIGN LIGHTING & ELECTRICAL

ELECTRICAL CONDUIT SYSTEM
 BRIDGE NO.6 ON SR 2014 (LAKEWOOD RD)
 OVER SOUTH FORK CATAWBA RIVER
 BETWEEN SR 2490 & SR 2465



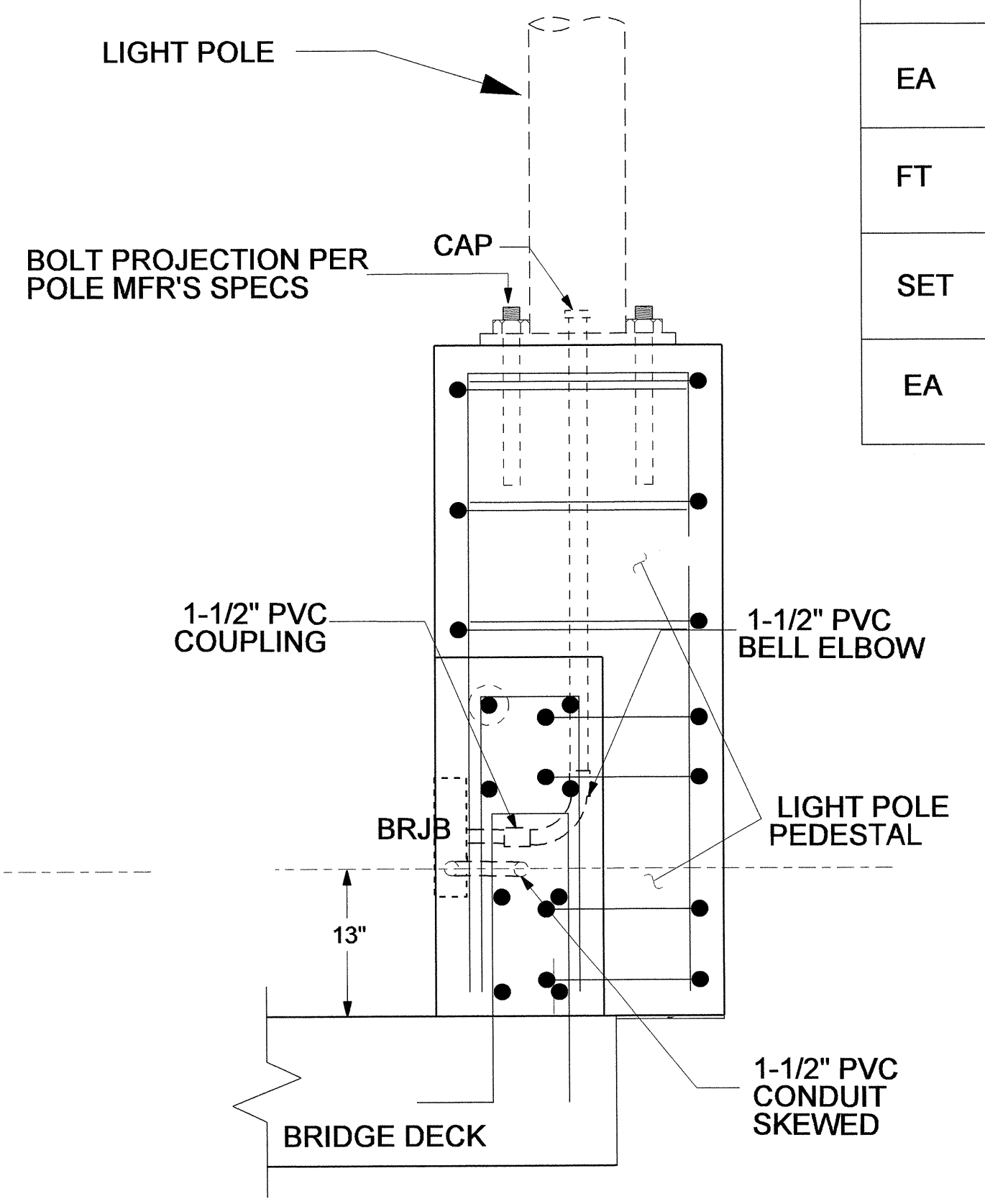
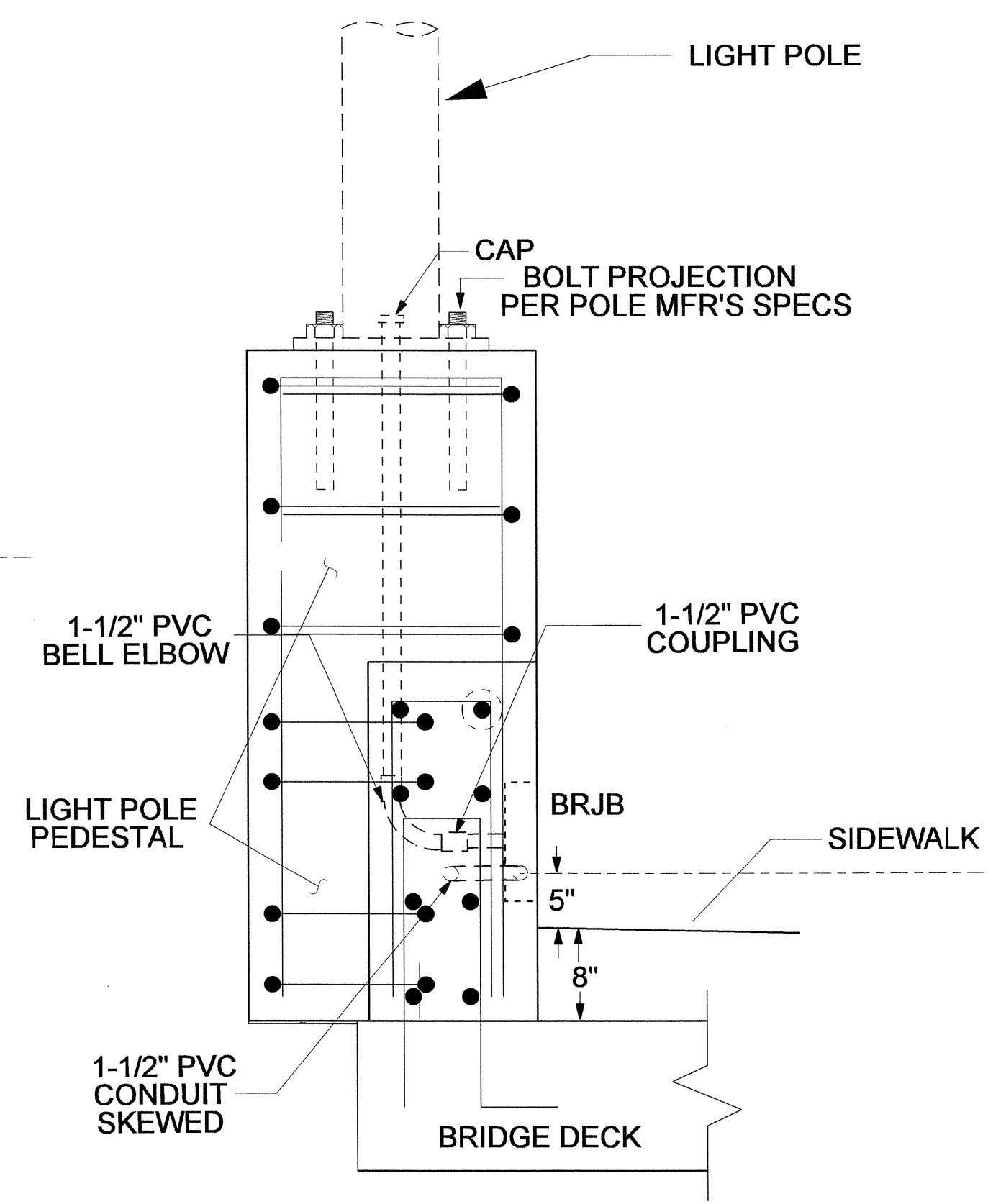
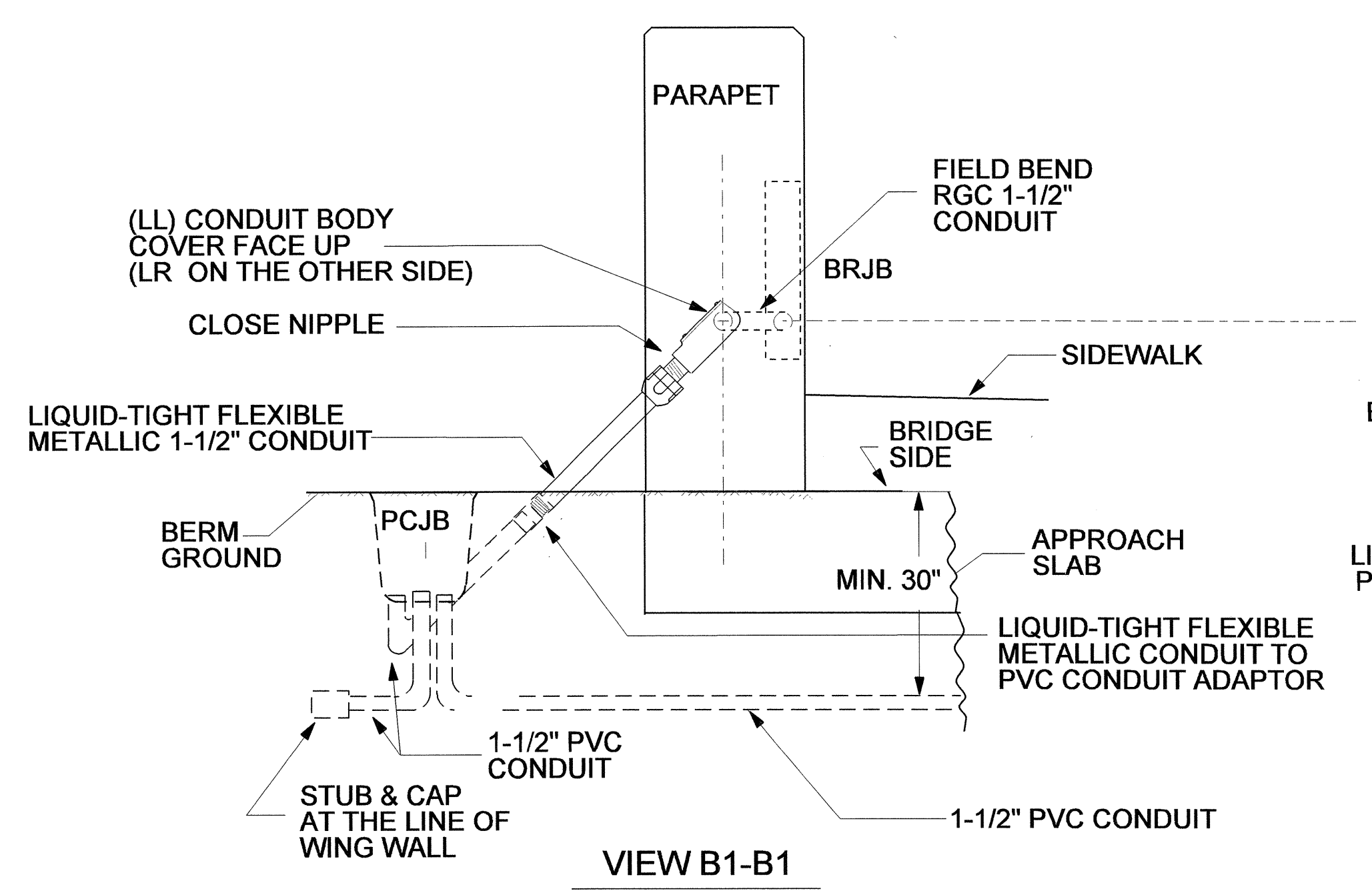
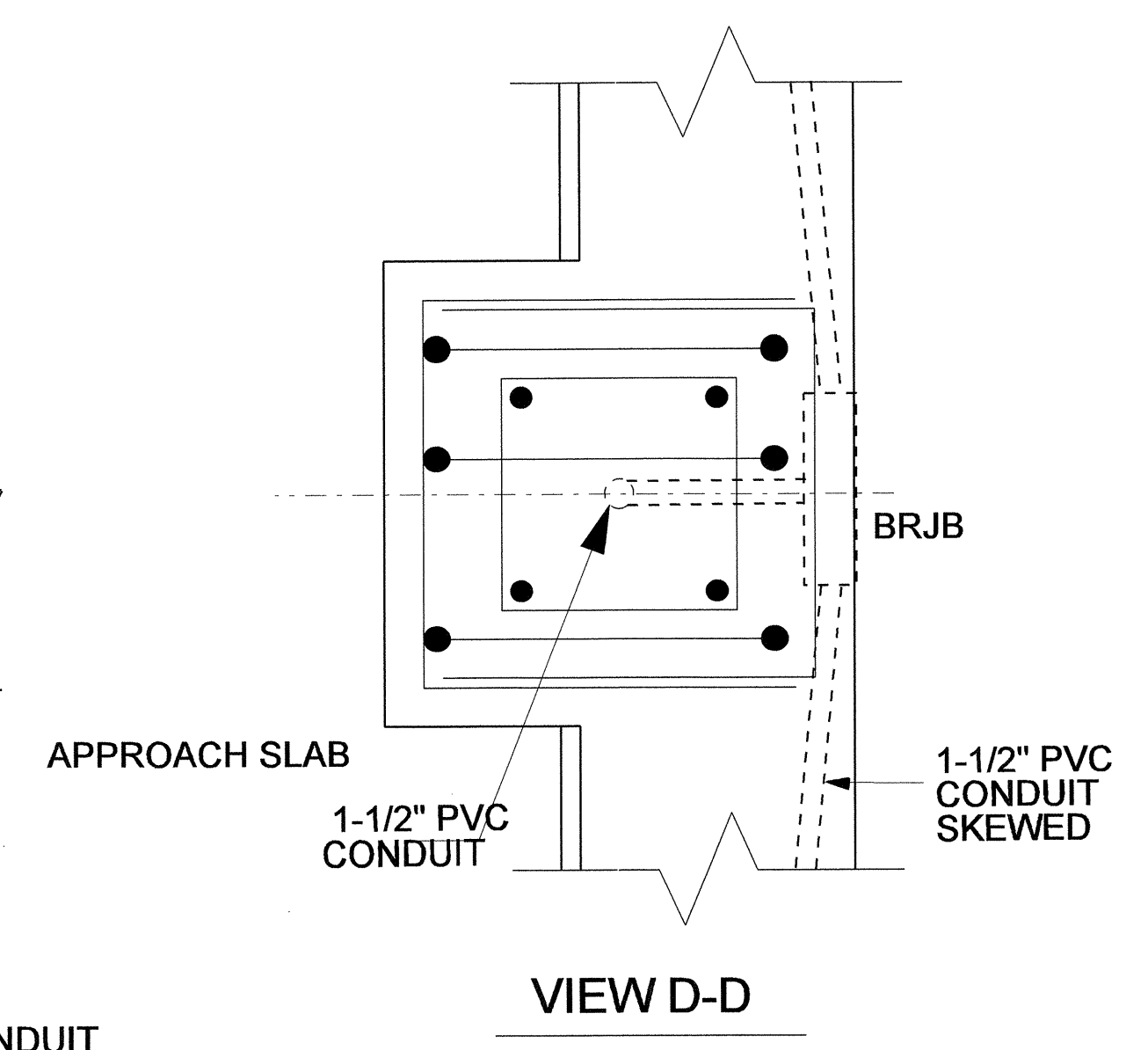
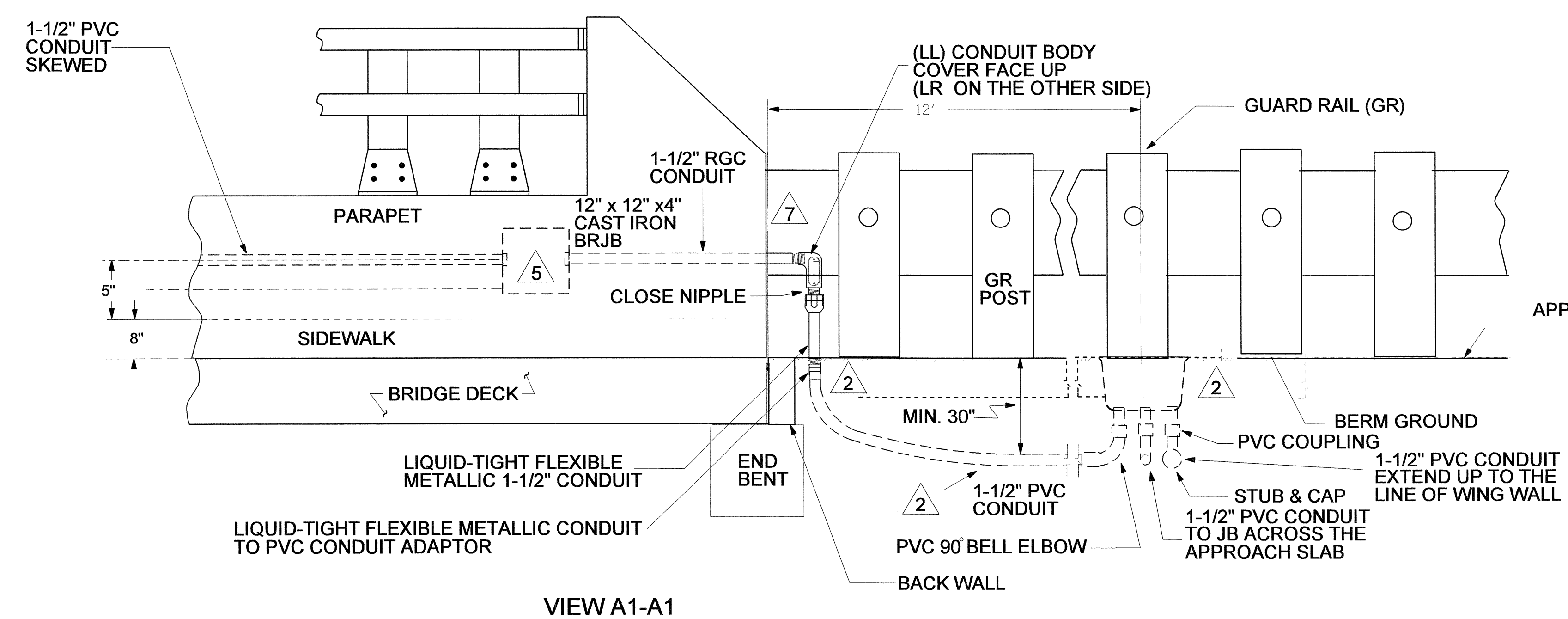
DRAWN BY: **A. BROWN** DATE: **4-4-12**
 CHECKED BY: **P.K. CHAN** DATE: **4-4-12**

SEE PROJECT SPECIAL PROVISIONS TITLED
 "ELECTRICAL CONDUIT SYSTEM" FOR MATERIALS
 CONSTRUCTION METHODS AND PAYMENT.

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-27
1			3			TOTAL SHEETS
2			4			46

USE FOR LIGHTING CONSTRUCTION ONLY

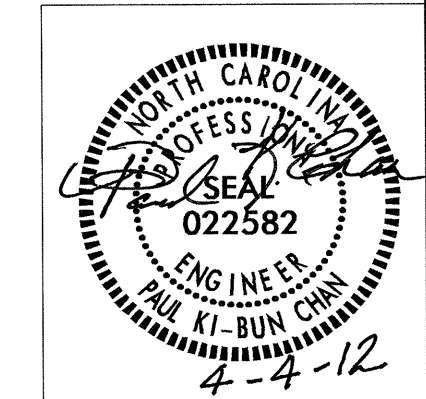
ESTIMATED BILL OF MATERIALS		
UNIT	ITEM	QNTY
EA	PCJB: 12"X11"X18" POLYMER CONCRETE JUNCTION BOX	4
EA	BRJB : 12"X12"X4" CAST IRON FLUSH MOUNT JUNCTION BOX	10
EA	PVC TO LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT 1-1/2" ADAPTER	4
EA	1-1/2" RGC CLOSE NIPPLE	4
EA	GALVANIZED IRON 1-1/2" LL CONDUIT BODY WITH COVER & GASKET	4
EA	GALVANIZED IRON 1-1/2" LR CONDUIT BODY WITH COVER & GASKET	4
FT	1-1/2" RGC CONDUIT	40
FT	1-1/2" LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT	32
FT	1-1/2" PVC CONDUIT	1100
EA	1-1/2" PVC 90 BELL ELBOW	18
EA	1-1/2" PVC COUPLING	18
EA	1-1/2" PVC EXPANSION FITTINGS	6
FT	PULL LINE	1200
SET	POLE MANUFACTURER'S ANCHOR BOLT SET WITH 2 WASHERS & 2 NUTS PER BOLT	6
EA	MASTIC	REQ'D



DRAWN BY: A. BROWN DATE: 4-4-12
 CHECKED BY: PK CHAN DATE: 4-4-12

SEE PROJECT SPECIAL PROVISIONS TITLED "ELECTRICAL CONDUIT SYSTEM" FOR MATERIALS CONSTRUCTION METHODS AND PAYMENT.

PROJECT NO. B-4752
GASTON COUNTY
 STATION: 18+54.00 -L-
 SHEET 2 OF 2



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 ROADWAY DESIGN LIGHTING & ELECTRICAL
ELECTRICAL CONDUIT SYSTEM
 BRIDGE NO 6 ON SR 2014 (LAKEWOOD RD)
 OVER SOUTH FORK CATAWBA RIVER
 BETWEEN SR 2490 & SR 2465

REVISIONS				SHEET NO.	
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TOTAL SHEETS: **46**

NOTES (FOR METAL RAILS)

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.

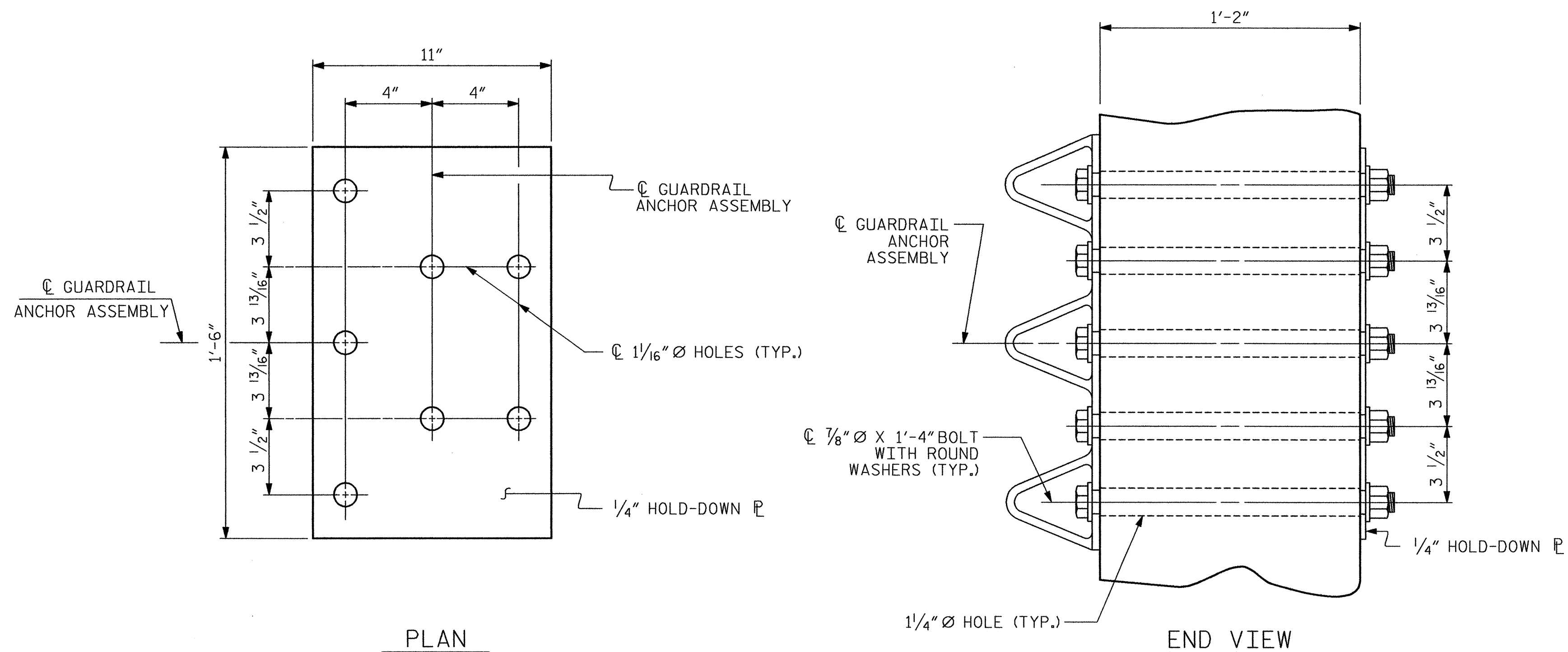
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

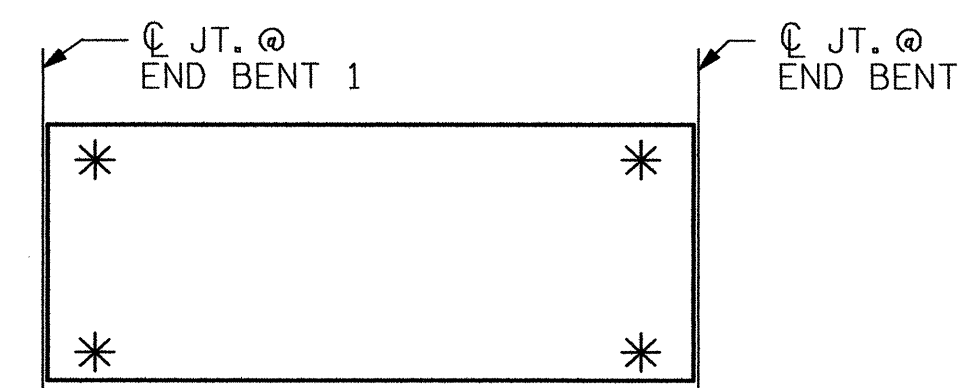
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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.

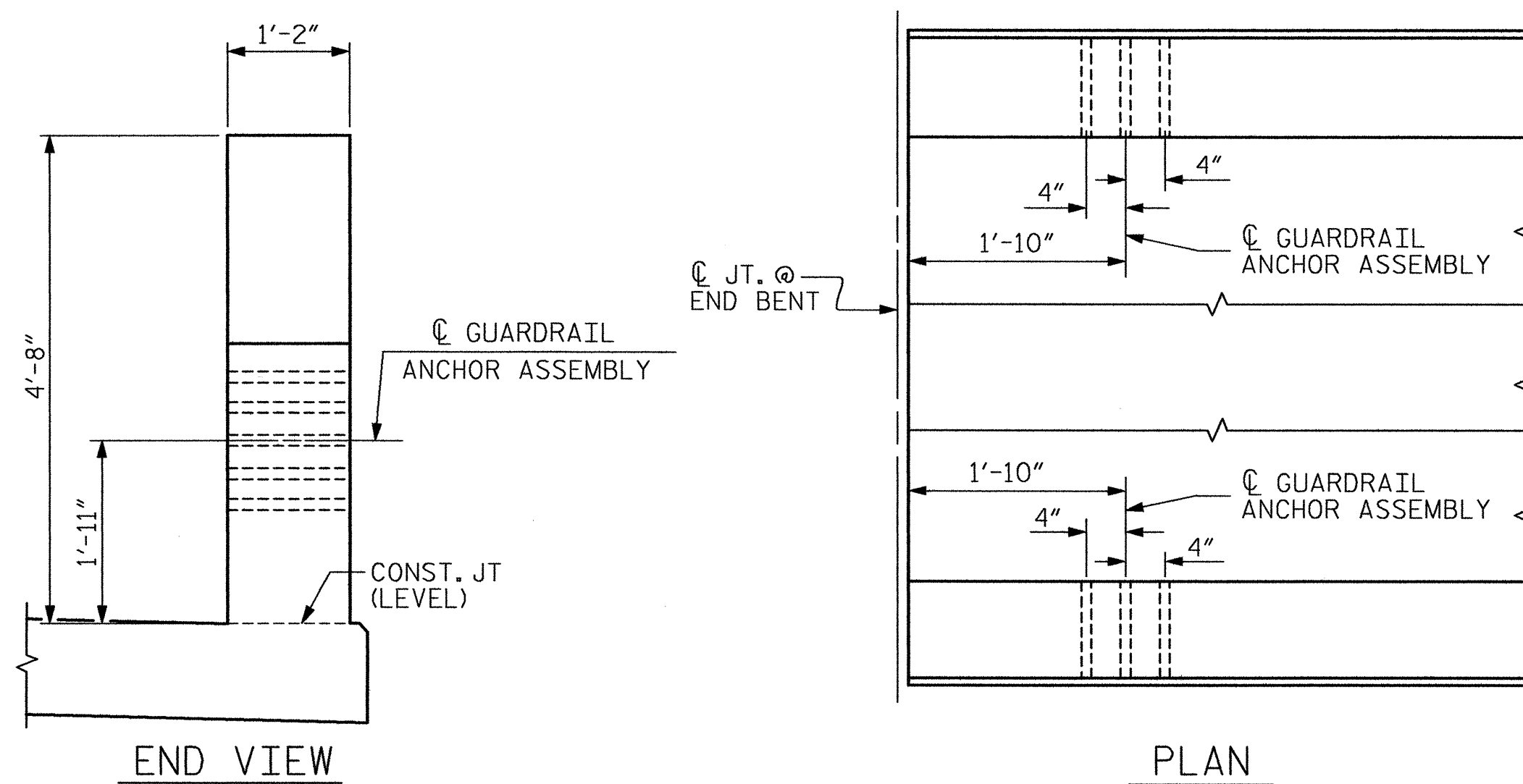


GUARDRAIL ANCHOR ASSEMBLY DETAILS



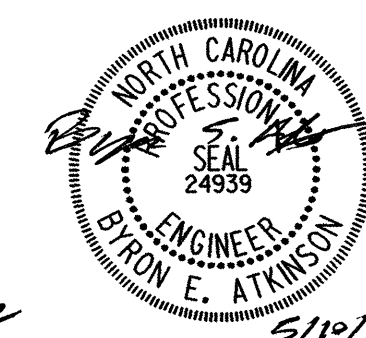
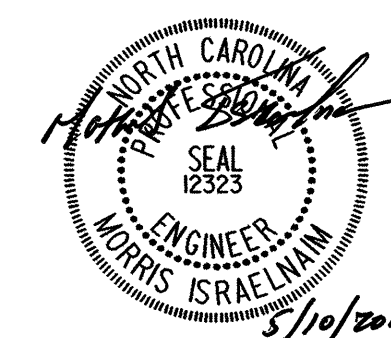
SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT



LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. B-4752
GASTON COUNTY
 STATION: 18+54.00 -L-



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

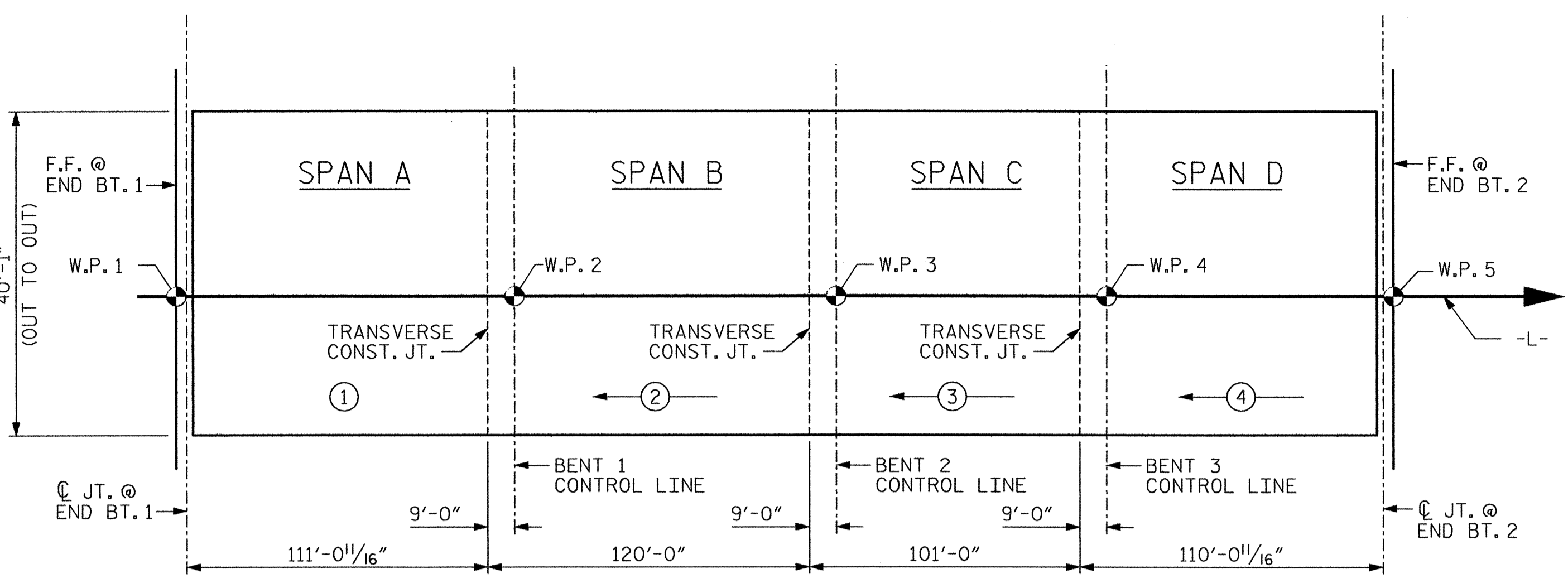
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CHECKED BY : B.E. ATKINSON	DATE : 01/12
DRAWN BY : MAA 5/10	ADDED 5/6/10
CHECKED BY : CM 5/10	REV. 10/1/11 MAA/GM
	REV. 12/5/11 MAA/GM

MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER : P-0671

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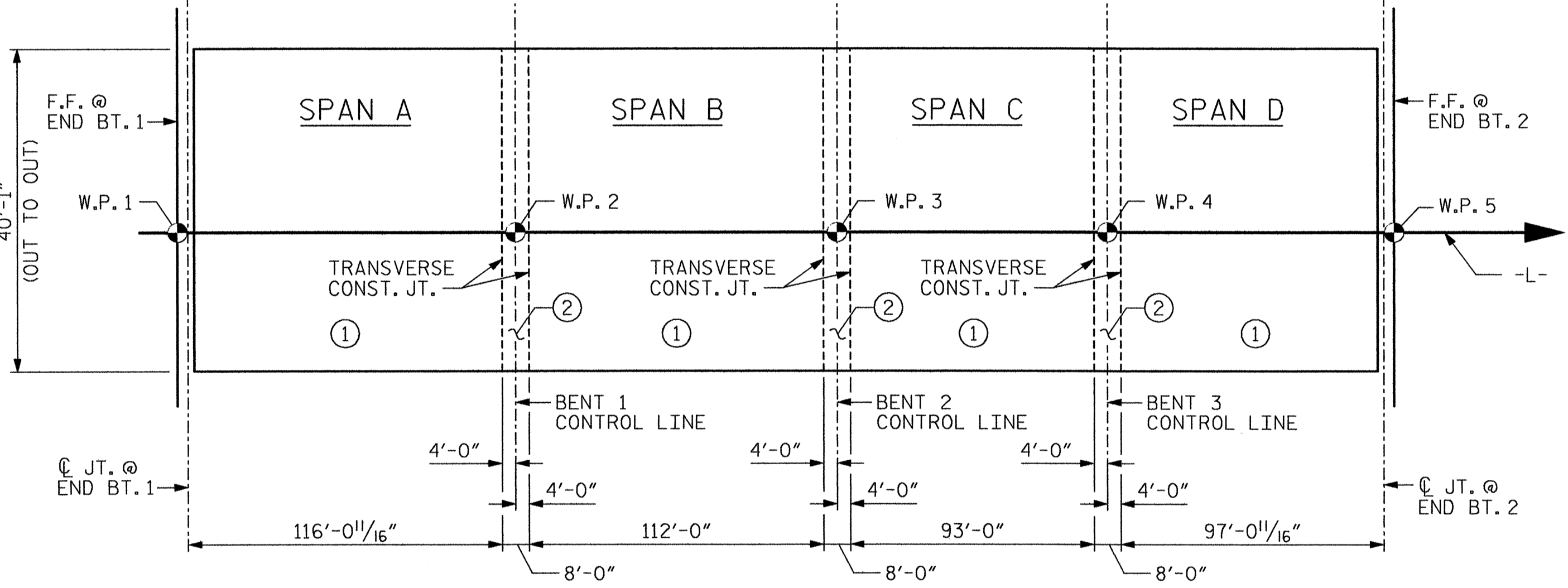
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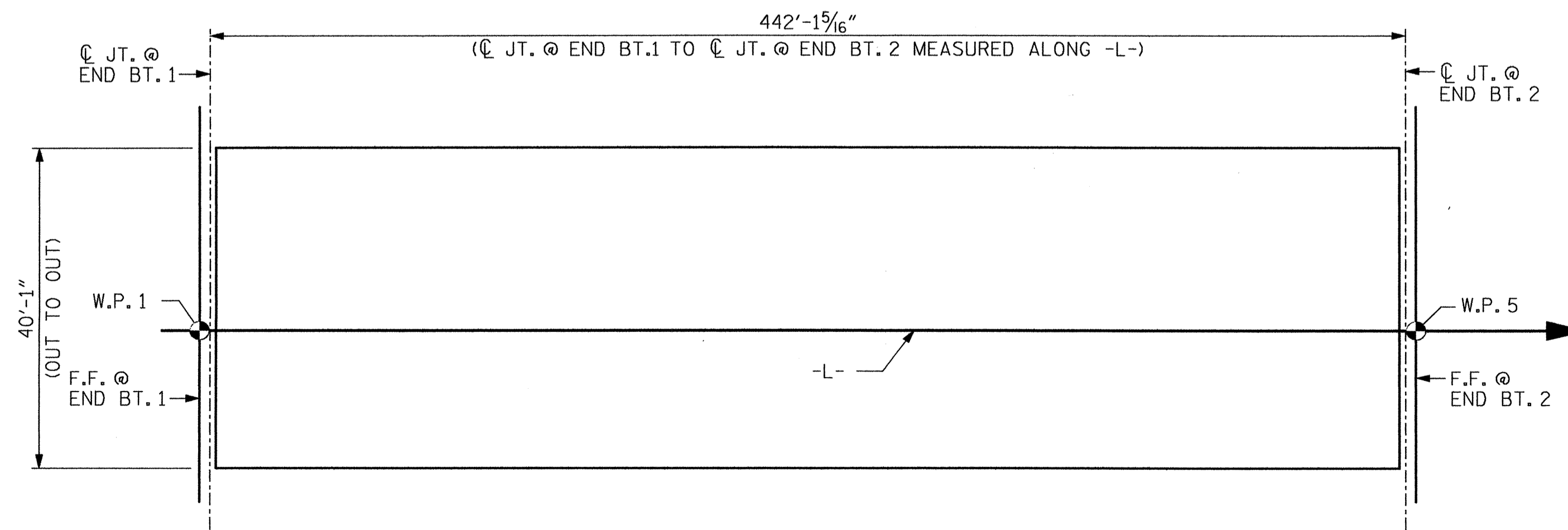
POURING SEQUENCE

⊕ INDICATES POUR NUMBER AND POUR DIRECTION



OPTIONAL POURING SEQUENCE

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



LAYOUT FOR COMPUTING AREA
REINFORCED CONCRETE DECK SLAB
(SQ. FT. = 17,722)

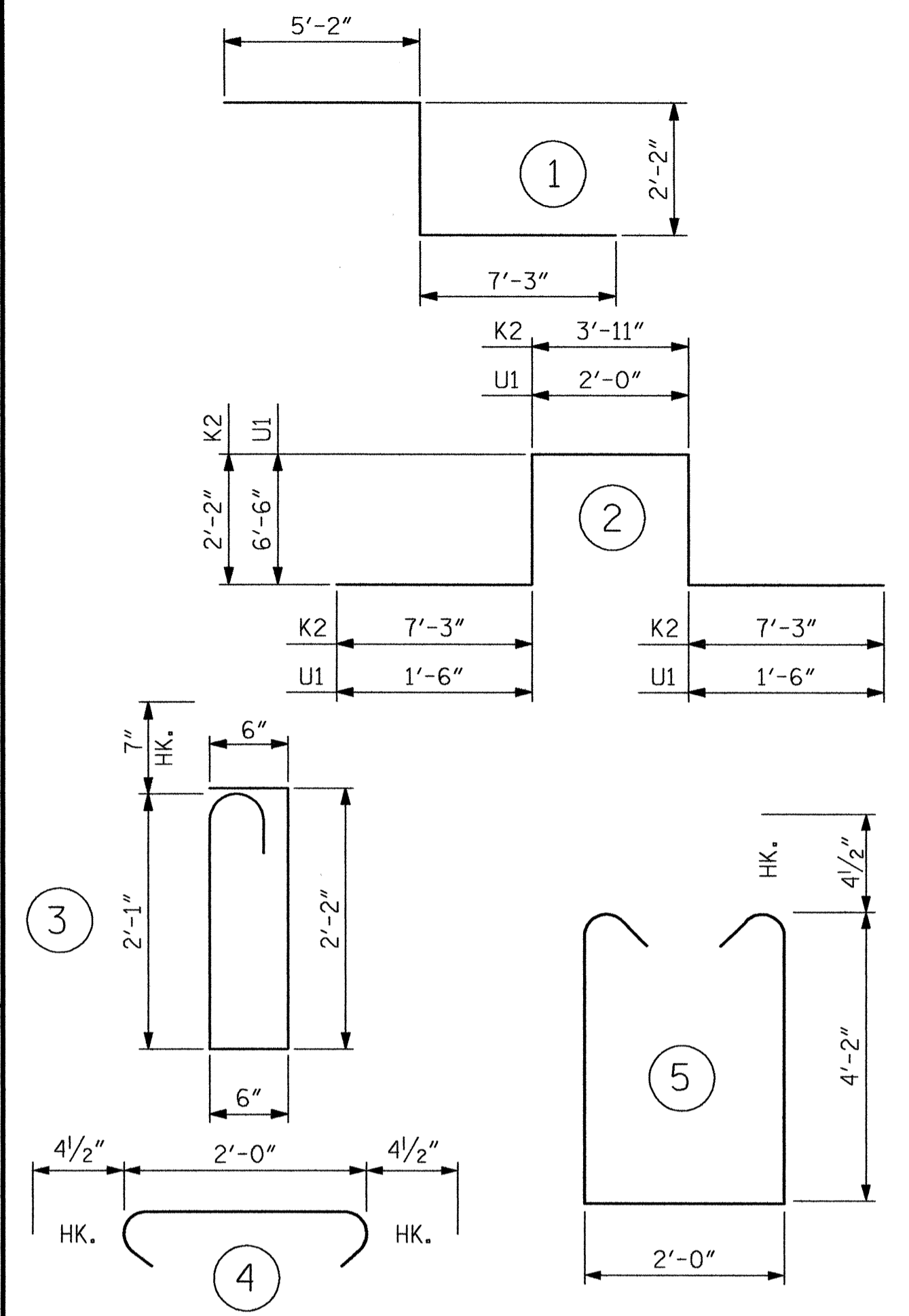
REINFORCING BAR SCHEDULE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	814	# 5	STR	39' - 9"	33748
A2	814	# 5	STR	39' - 9"	33748
* B1	84	# 4	STR	28' - 4"	1590
B2	288	# 5	STR	57' - 2"	17172
* B3	252	# 7	STR	31' - 0"	15968
* B4	231	# 7	STR	36' - 0"	16998
* B5	140	# 4	STR	22' - 0"	2057
* B6	28	# 4	STR	23' - 0"	430
D1	24	# 4	STR	3' - 6"	56
* K1	8	# 8	1	14' - 6"	310
* K2	8	# 8	2	22' - 9"	486
* K3	18	# 4	STR	5' - 6"	66
* K4	90	# 4	STR	10' - 3"	616
* K5	18	# 4	STR	7' - 3"	87
* K6	42	# 4	STR	20' - 9"	582
* S1	48	# 5	3	5' - 10"	292
S2	522	# 4	4	2' - 9"	959
* U1	63	# 4	2	18' - 0"	758
U2	36	# 4	5	11' - 1"	267
* EPOXY COATED REINFORCING STEEL				LBS.	73,988
REINFORCING STEEL				LBS.	52,202

GROOVING BRIDGE FLOORS

APPROACH SLABS	1,400 SQ.FT.
BRIDGE DECK	12,806 SQ.FT.
TOTAL	14,206 SQ.FT.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

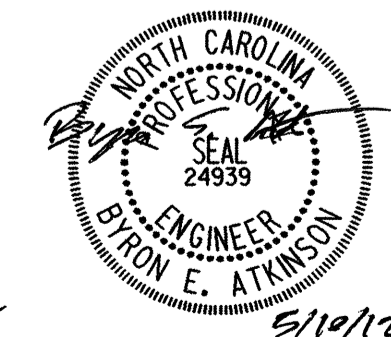
SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
POUR #1	171.4	-	-
POUR #2	201.0	-	-
POUR #3	171.9	-	-
POUR #4	187.4	-	-
TOTALS**	731.7	52,202	73,988

**QUANTITIES FOR PARAPET AND SIDEWALK ARE NOT INCLUDED.

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

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



PROJECT NO. B-4752
GASTON COUNTY
STATION: 18+54.00 -L-

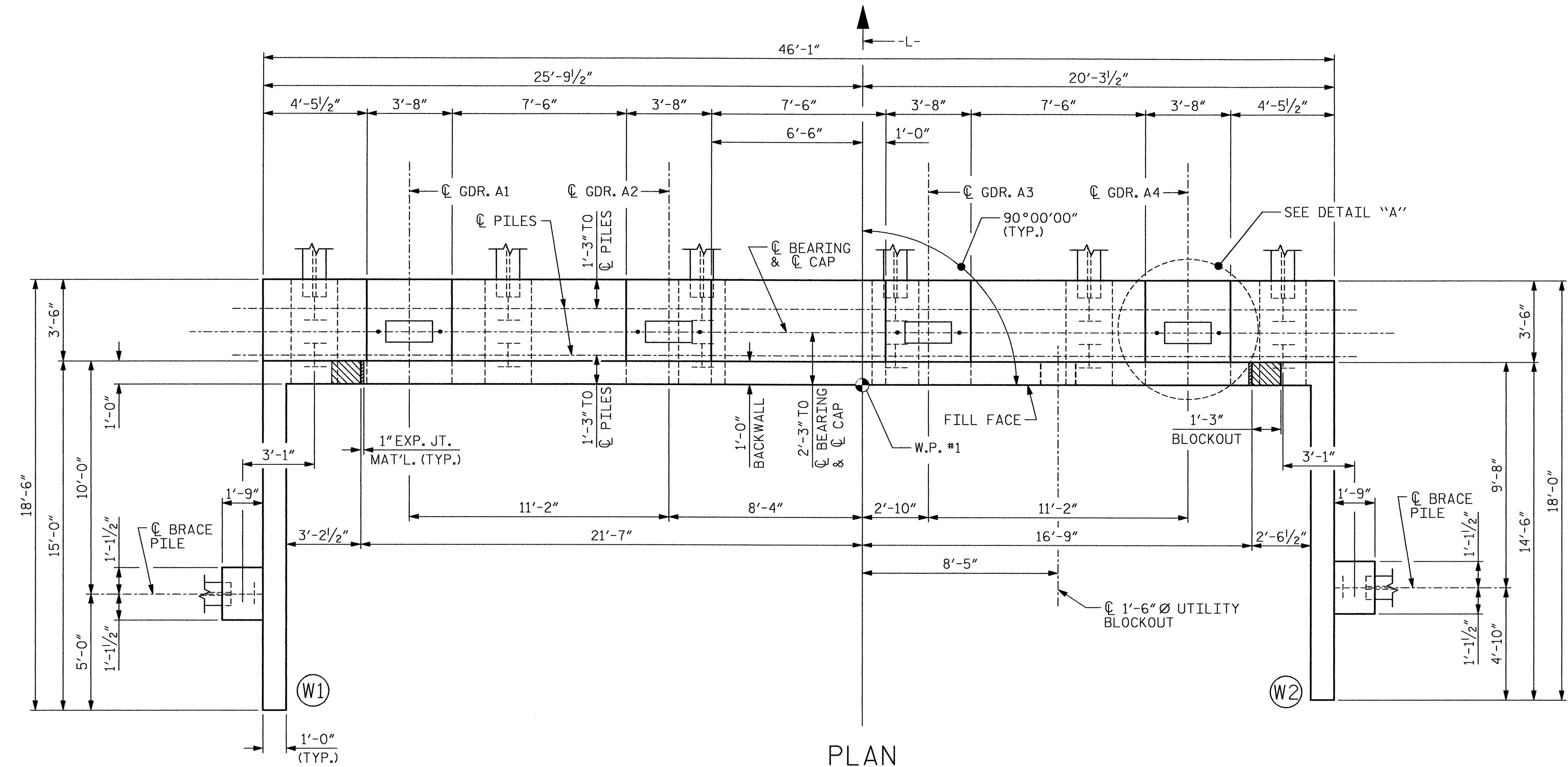
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
BILL OF MATERIAL

DRAWN BY : B.E. LANNING DATE : 01/12
CHECKED BY : B.E. ATKINSON DATE : 03/12

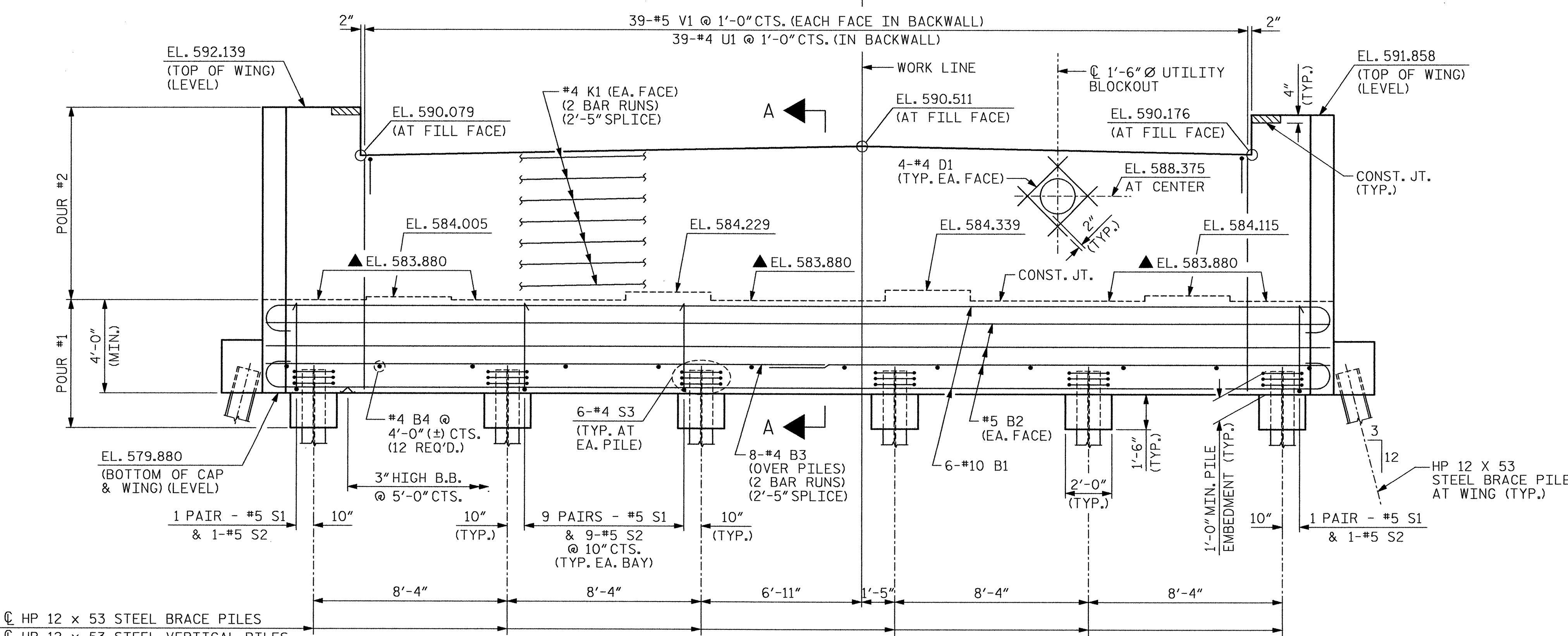
MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

REVISIONS						SHEET NO.
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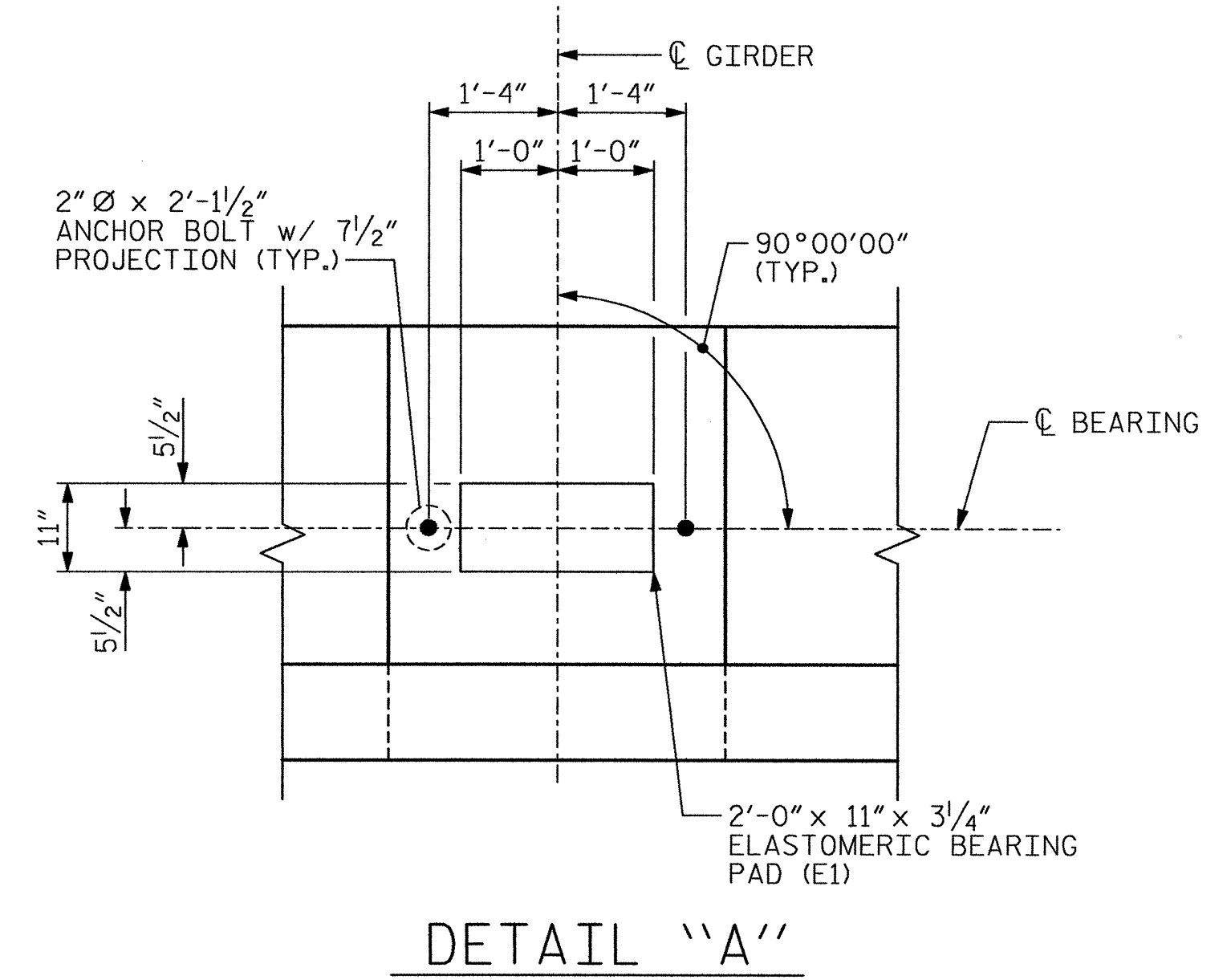
PLAN



ELEVATION

NOTES

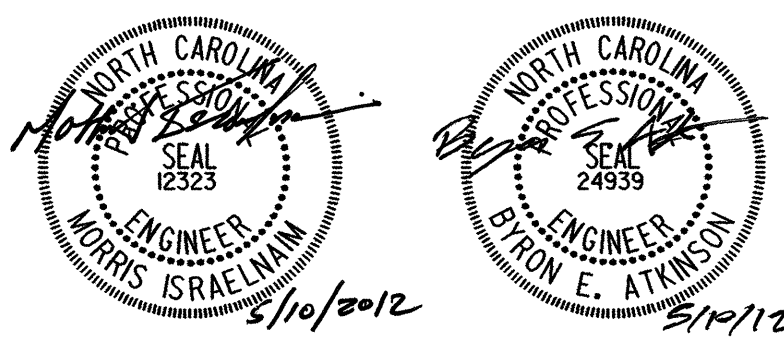
- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- #5 V1 BARS IN BACKWALL SHALL BE PLACED 2" CLEAR FROM THE TOP OF BACKWALL. BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
- THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
- THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.
- ▲ FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS, SEE SECTION A-A ON SHEET 3 OF 3.
- THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" Ø DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.
- FOR SECTION A-A, PILE SPLICE DETAILS AND TEMPORARY DRAINAGE DETAILS, SEE SHEET 3 OF 3.
- THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE PARAPET AND END POST ARE CAST IF SLIP FORMING IS USED.
- REINFORCING STEEL IN BACKWALL SHALL BE SHIFTED OR CUT AS NECESSARY FOR THE UTILITY BLOCKOUT.
- SEE SPECIAL PROVISION FOR INSTALLATION OF 12 INCH WATER MAIN.



DETAIL "A"

PROJECT NO. B-4752
 GASTON COUNTY
 STATION: 18+54.00 -L-
 SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT I



MI ENGINEERING 1011 SCHAUB DRIVE, SUITE 100 RALEIGH, NC 27606 (919) 851-6606 FIRM PE NUMBER : P-0671	REVISIONS				SHEET NO. S-31 TOTAL SHEETS 46
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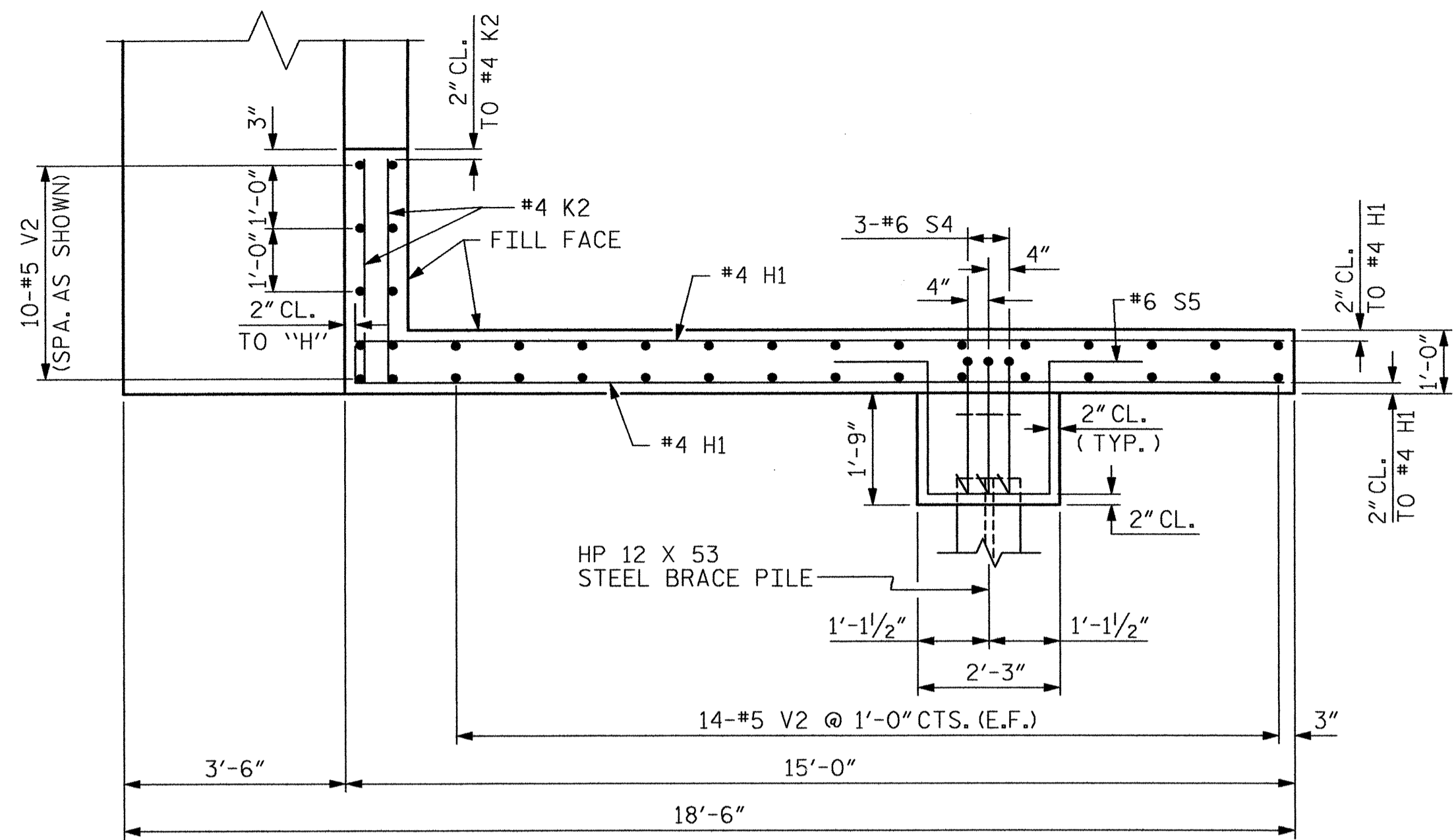
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5/10/2012

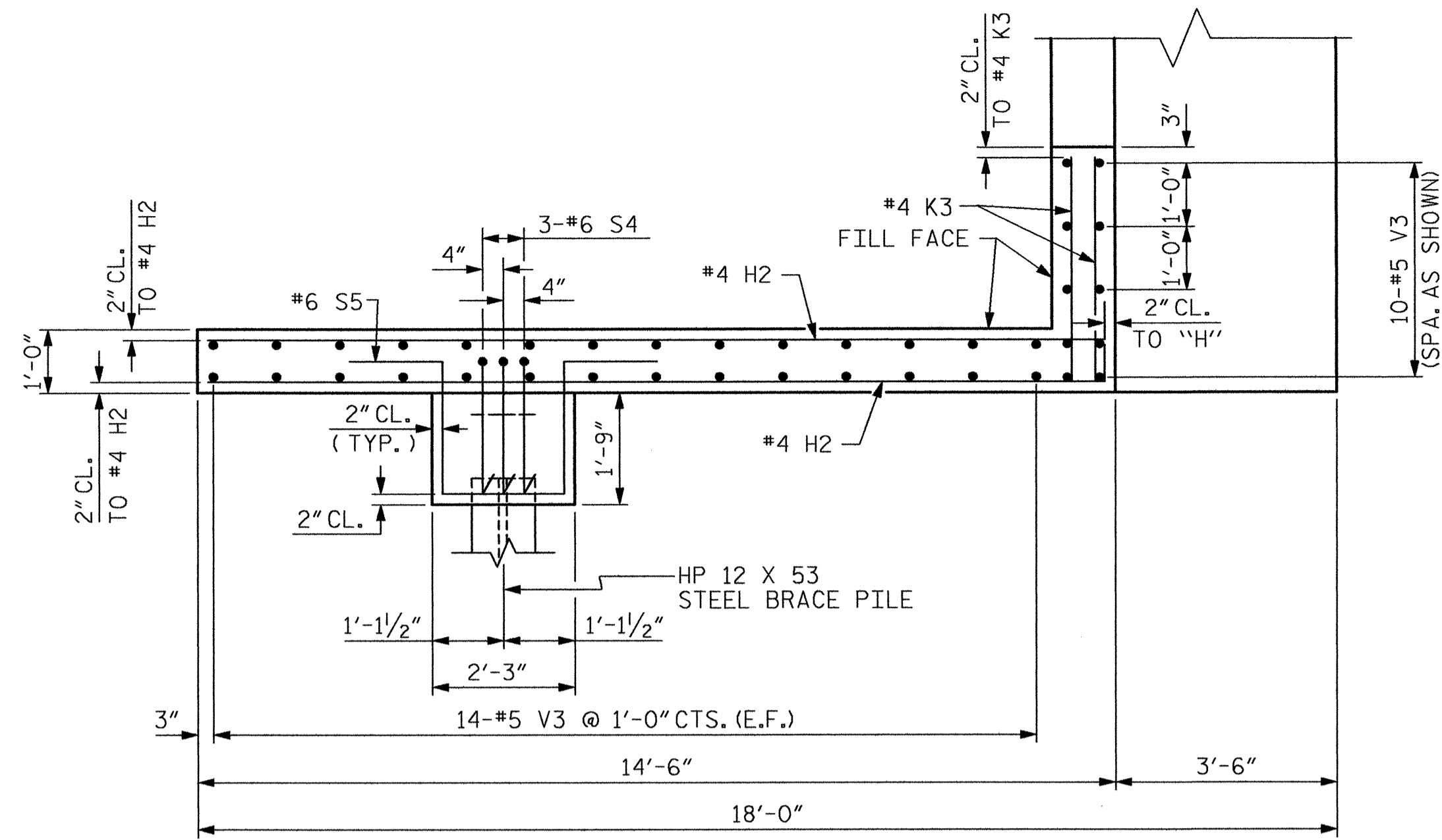
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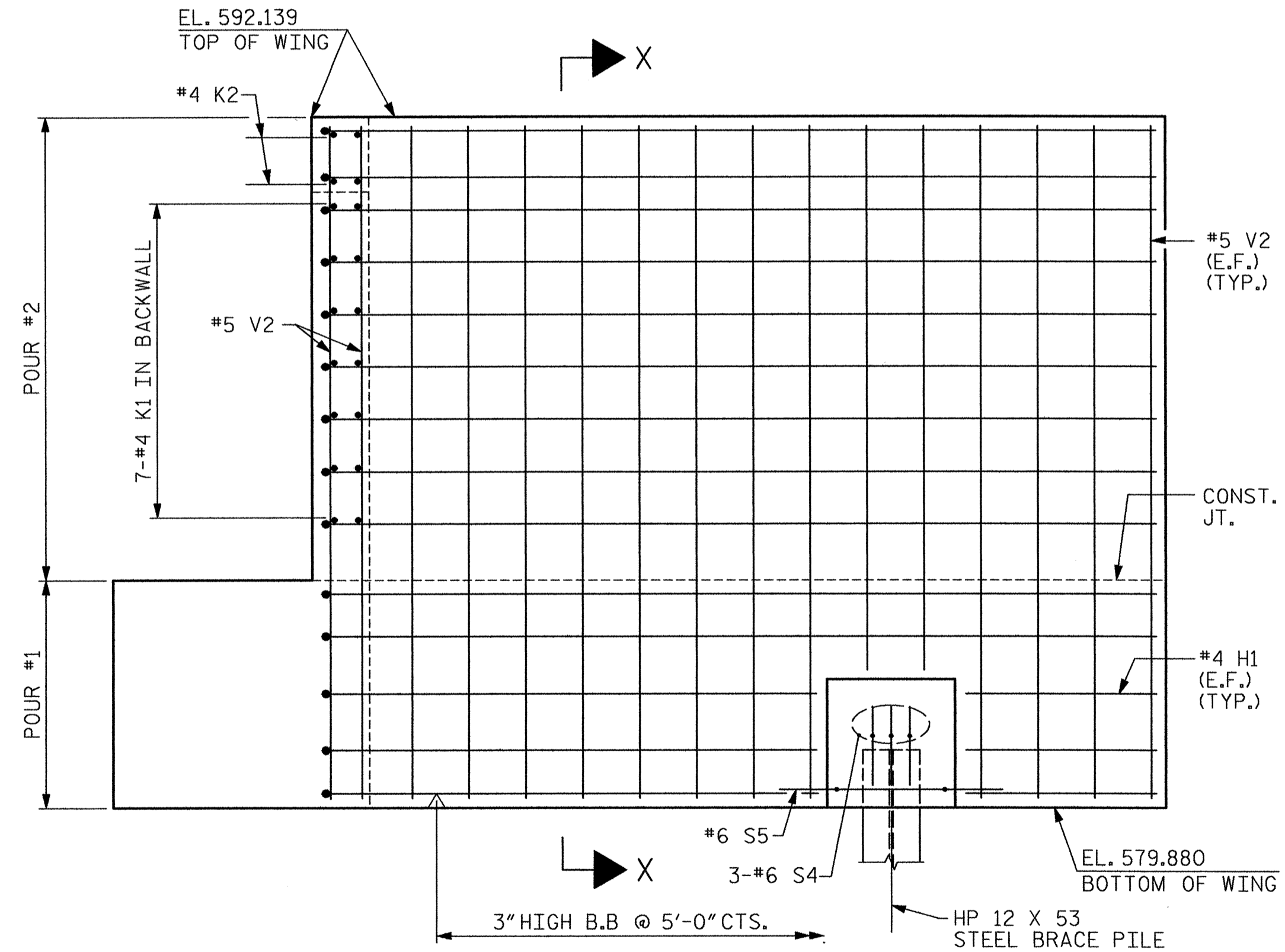
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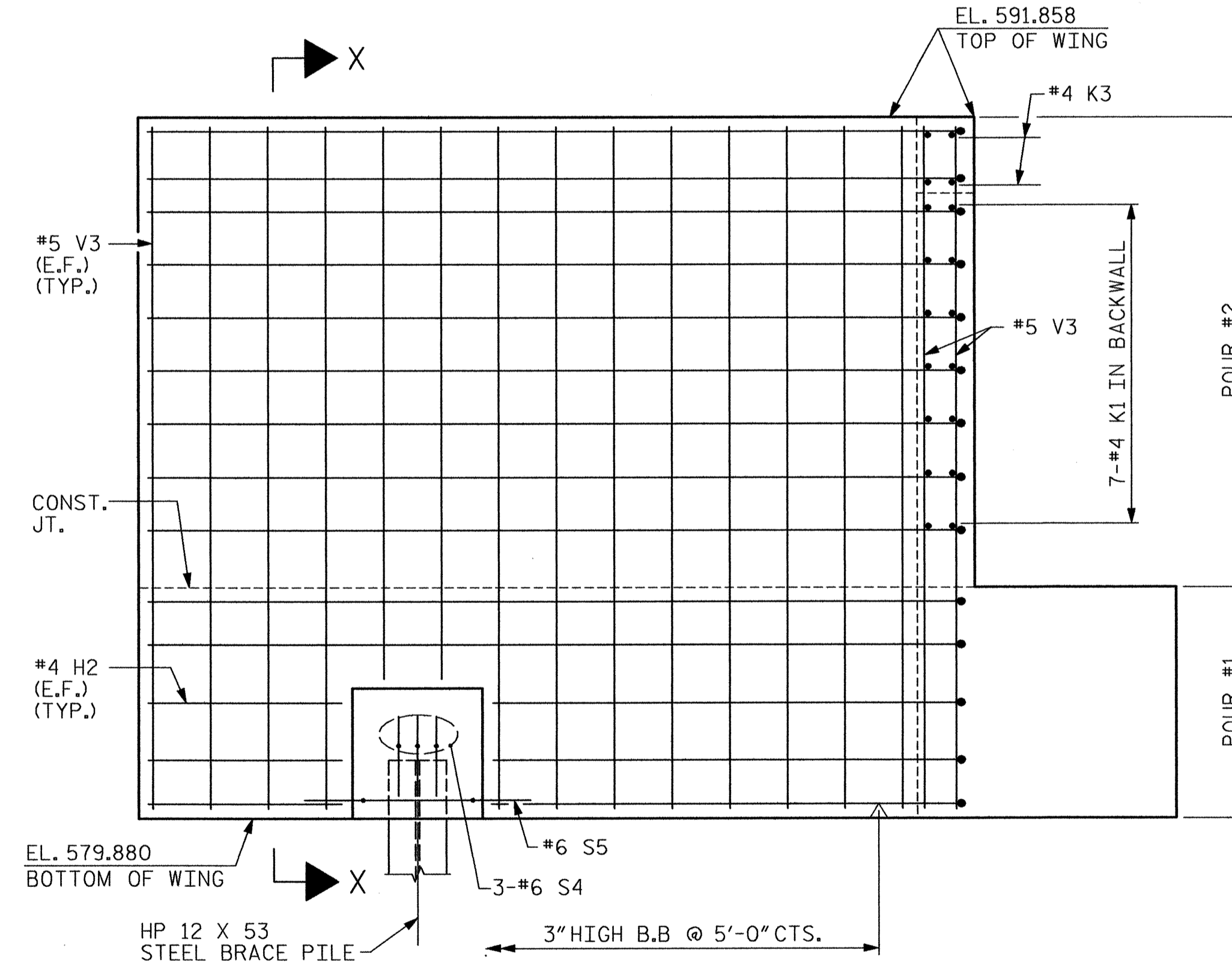
PLAN OF WING (W1)



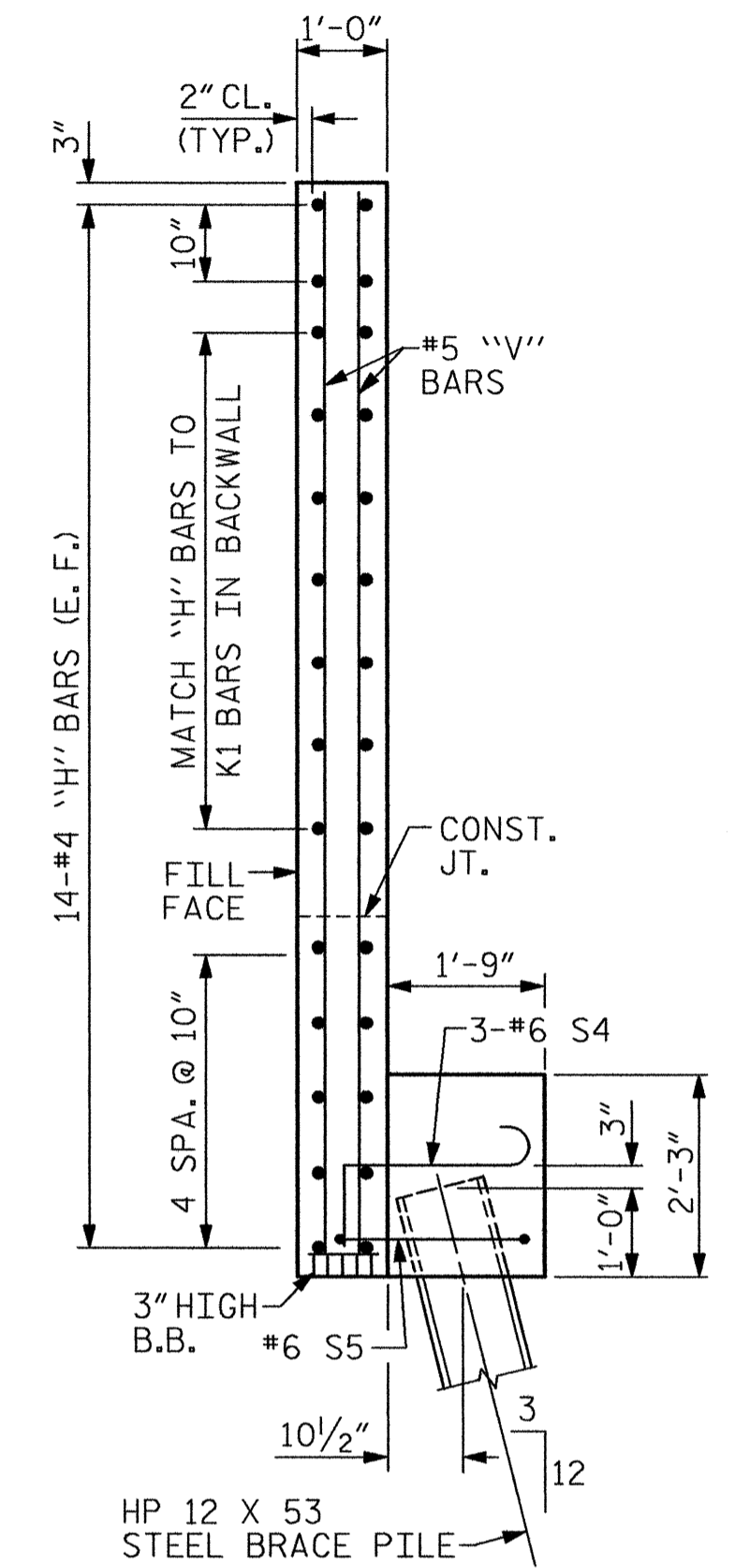
PLAN OF WING (W2)



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

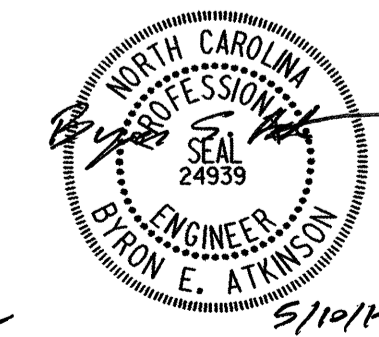
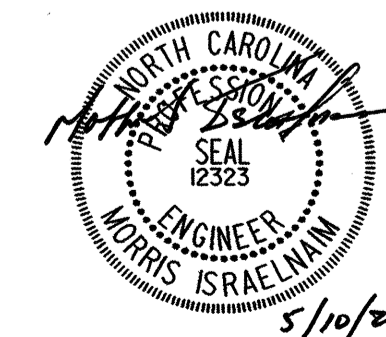


SECTION X-X

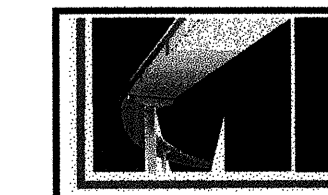
PROJECT NO. B-4752
GASTON COUNTY
 STATION: 18+54.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT I



DRAWN BY : B.E. ATKINSON DATE : 03/12
 CHECKED BY : M. ISRAELNAIM DATE : 03/12

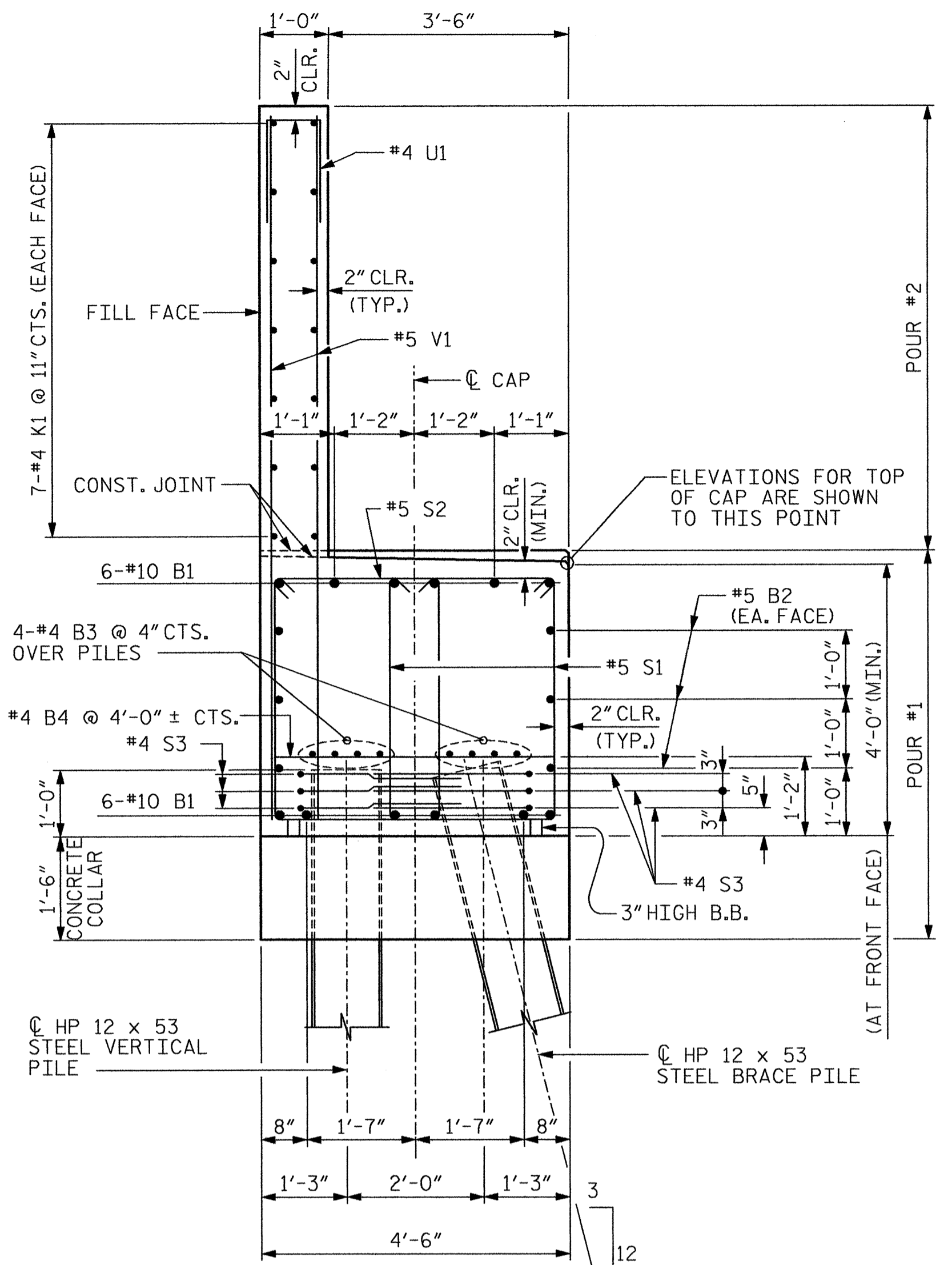


MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER : P-0671

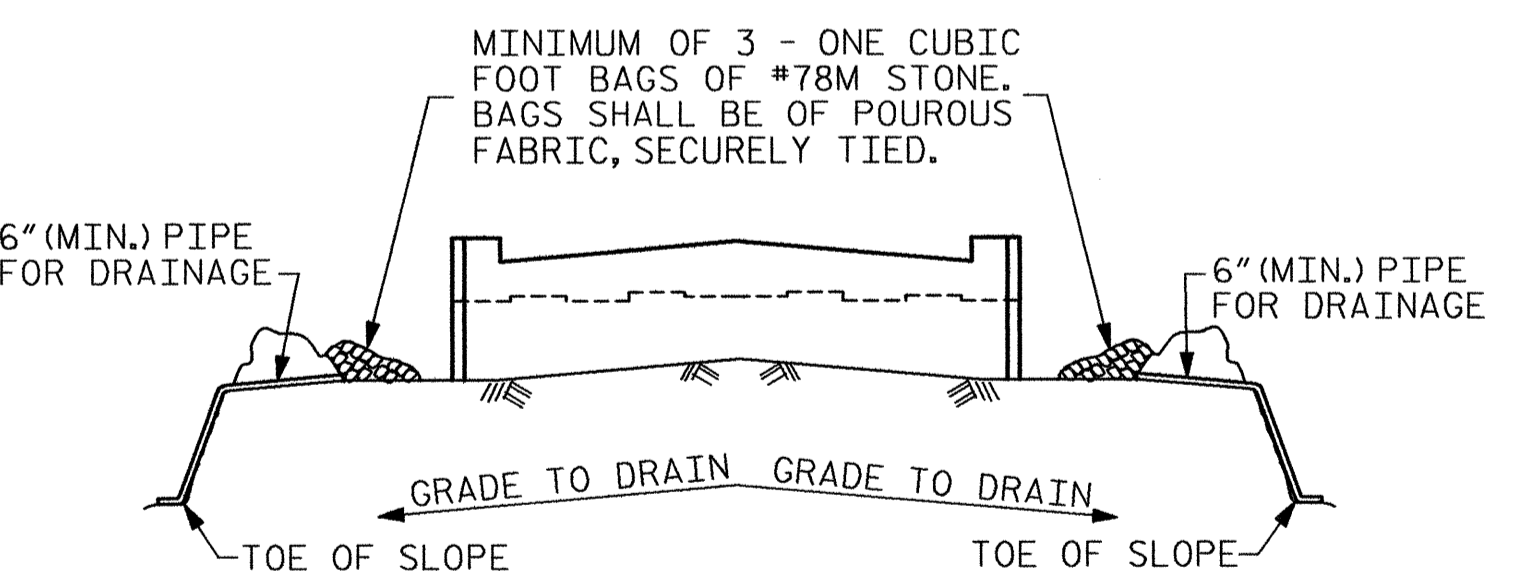
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SHEET NO.
S-32
 TOTAL SHEETS
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SECTION A-A

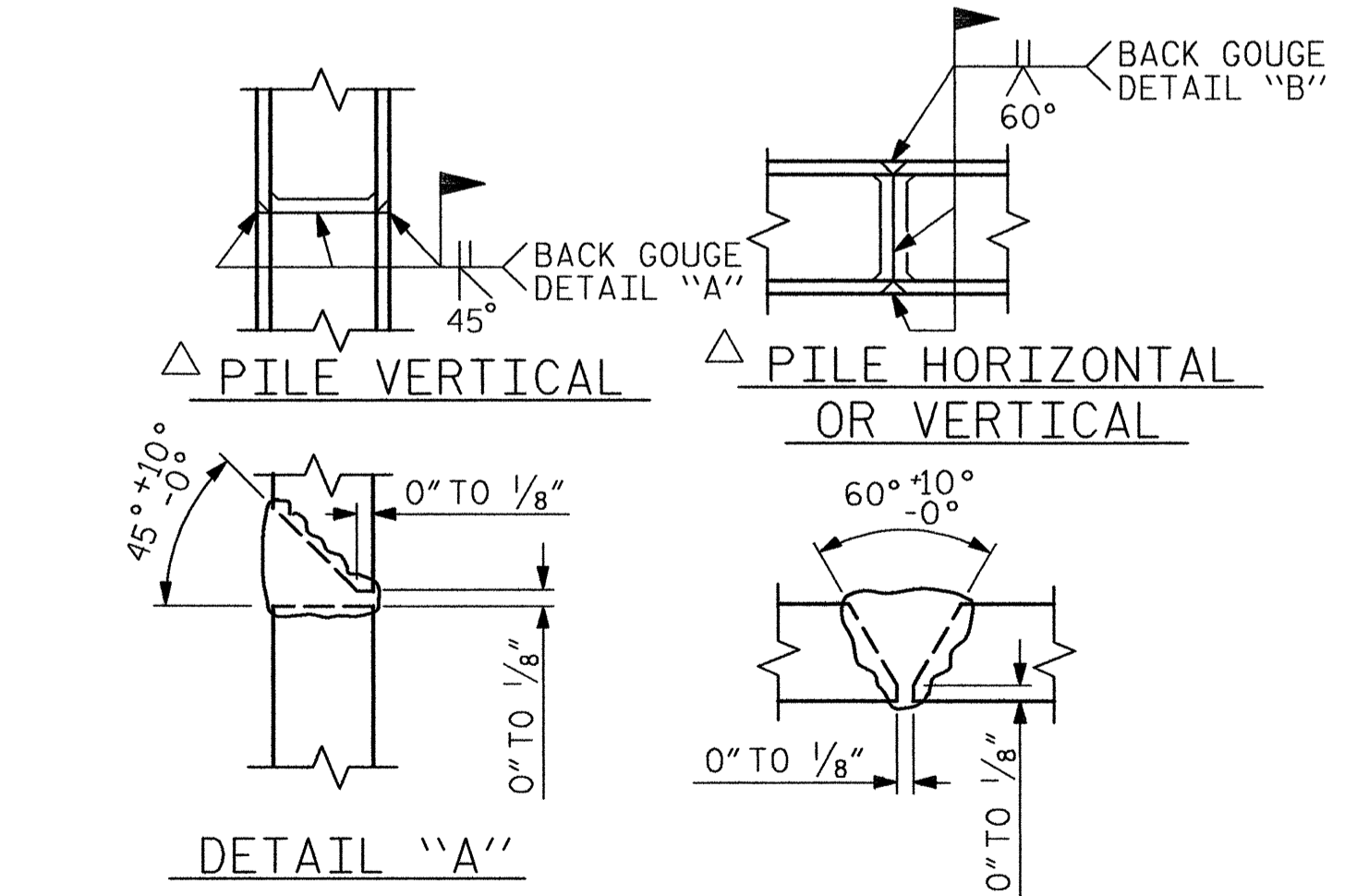


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

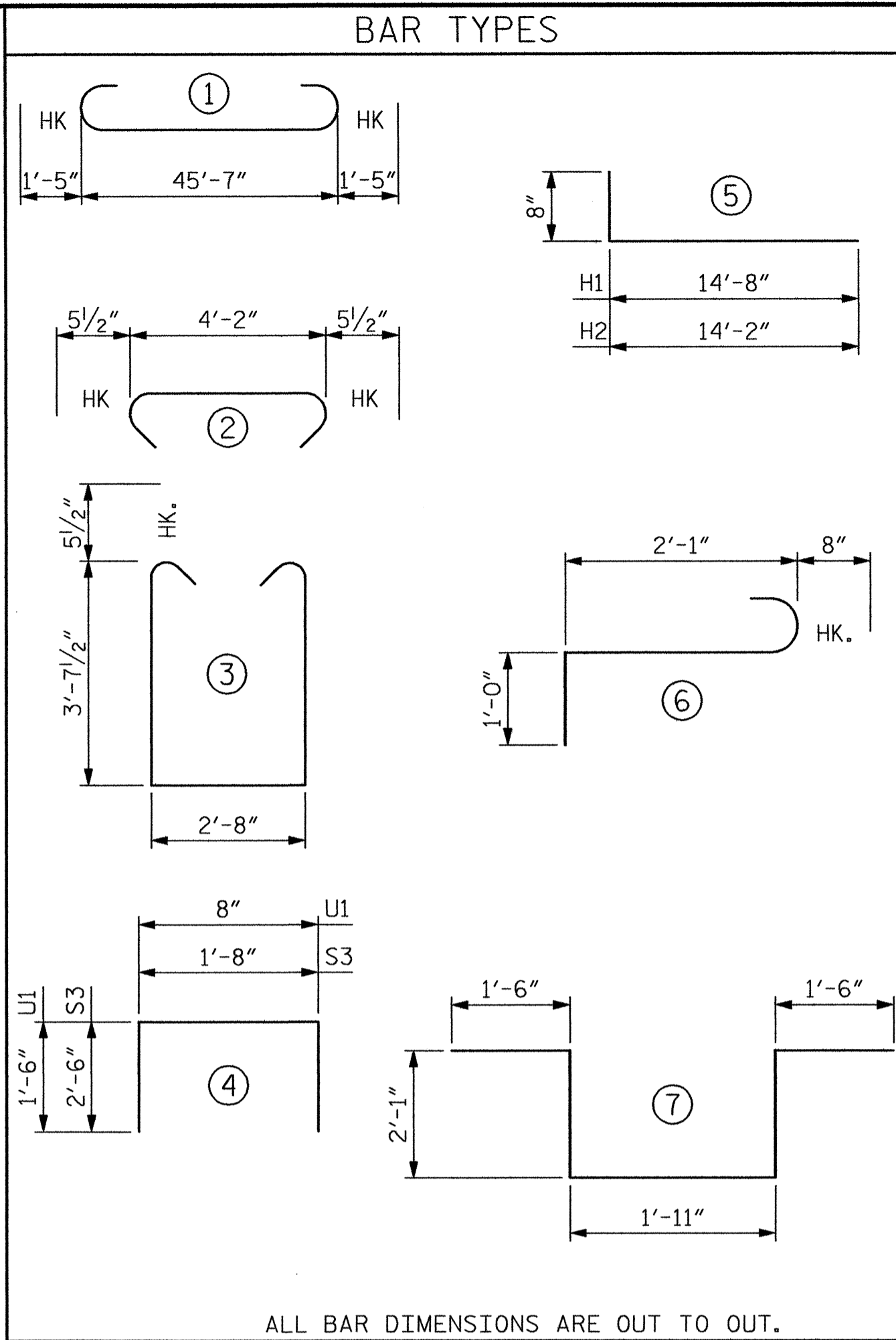
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

TEMPORARY DRAINAGE AT END BENT



POSITION OF PILE DURING WELDING.
 PILE SPLICE DETAILS



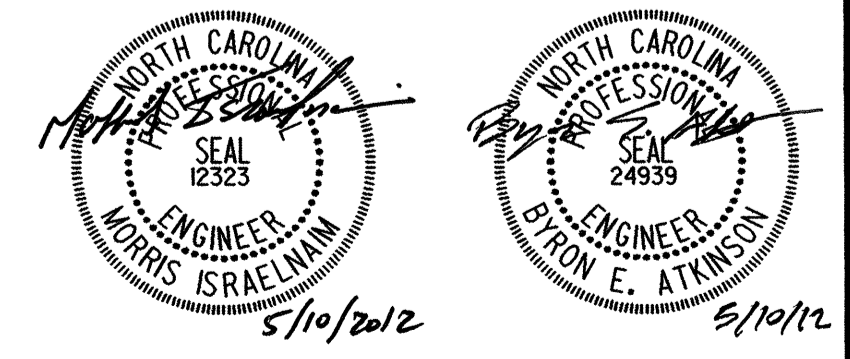
BILL OF MATERIAL					
END BENT 1					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	12	#10	1	48'-5"	2500
B2	6	#5	STR	45'-9"	286
B3	16	#4	STR	24'-1"	257
B4	12	#4	STR	4'-2"	33
D1	8	#4	STR	3'-6"	19
H1	28	#4	5	15'-4"	287
H2	28	#4	5	14'-10"	277
K1	28	#4	STR	24'-1"	450
K2	4	#4	STR	3'-10"	10
K3	4	#4	STR	3'-2"	8
S1	94	#5	3	10'-10"	1062
S2	47	#5	2	5'-1"	249
S3	36	#4	4	6'-8"	160
S4	6	#6	6	3'-9"	34
S5	2	#6	7	9'-1"	27
U1	39	#4	4	3'-8"	96
V1	78	#5	STR	9'-10"	800
V2	38	#5	STR	11'-11"	472
V3	38	#5	STR	11'-7"	459
REINFORCING STEEL					7,486 LBS.
CLASS A CONCRETE BREAKDOWN					
POUR #1 (CAP, COLLARS & LOWER WING)					39.5 C.Y.
POUR #2 (BACKWALL & UPPER WING)					19.4 C.Y.
TOTAL CLASS A CONCRETE					58.9 C.Y.
HP 12 x 53 STEEL PILES NO. 14					426 LIN. FT.
STEEL PILE POINTS					14 EACH

PROJECT NO. B-4752
GASTON COUNTY
 STATION: 18+54.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT I



MI ENGINEERING		REVISIONS				SHEET NO.
1011 SCHAU DRIVE, SUITE 100 RALEIGH, NC 27606 (919) 851-6606 FIRM PE NUMBER: P-0671		NO.	BY:	DATE:	NO.	DATE:
1		3				
2		4				

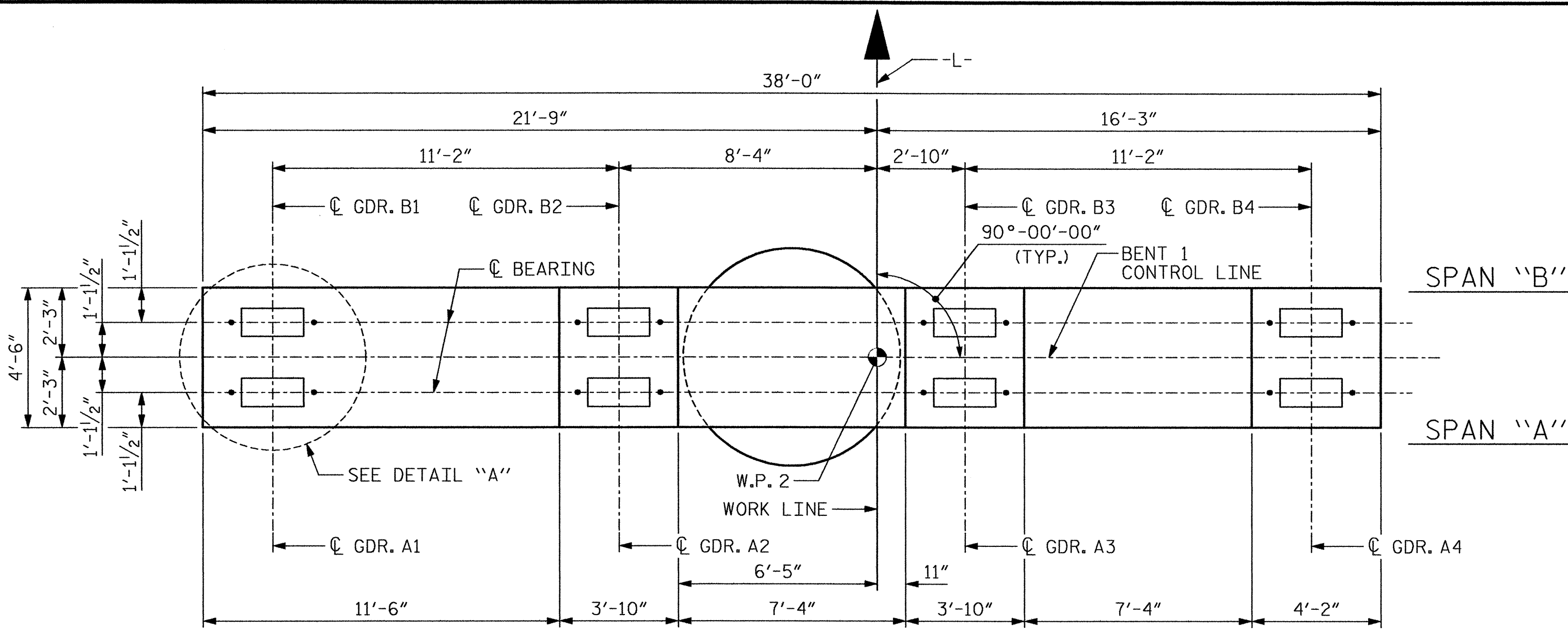
TOTAL SHEETS: 46

DRAWN BY: B.E. ATKINSON DATE: 03/12
 CHECKED BY: M. ISRAELNAIM DATE: 03/12

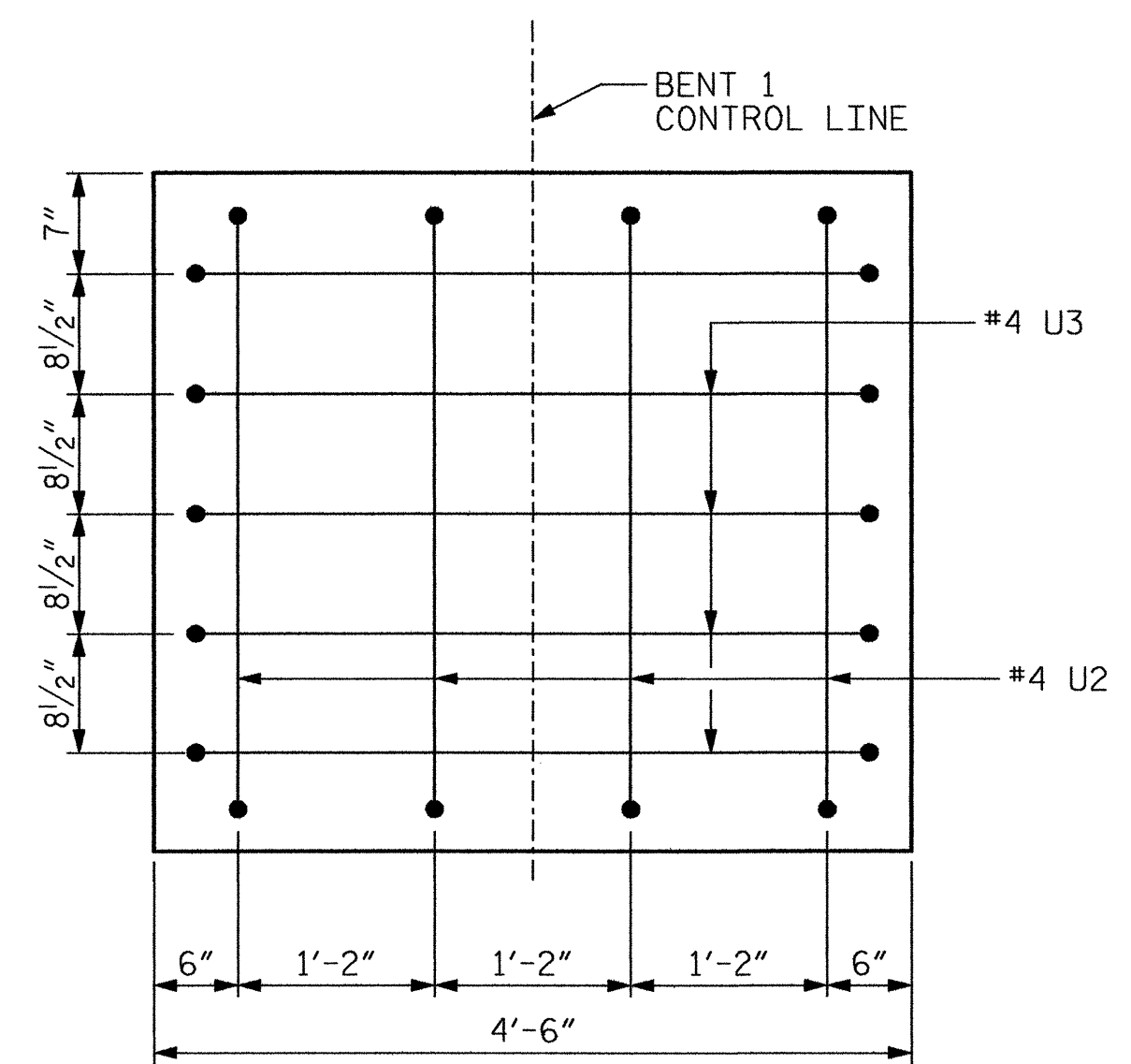
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11:51:17 AM
User: blanning
Filename: P:\NC Projects\M1007 - 2011-2013 Design LSC\M1007.02 - B-4752 Gaston\B-4752\Structures\B-4752-SD-B1A.dgn



PLAN



VIEW C-C

NOTES

STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

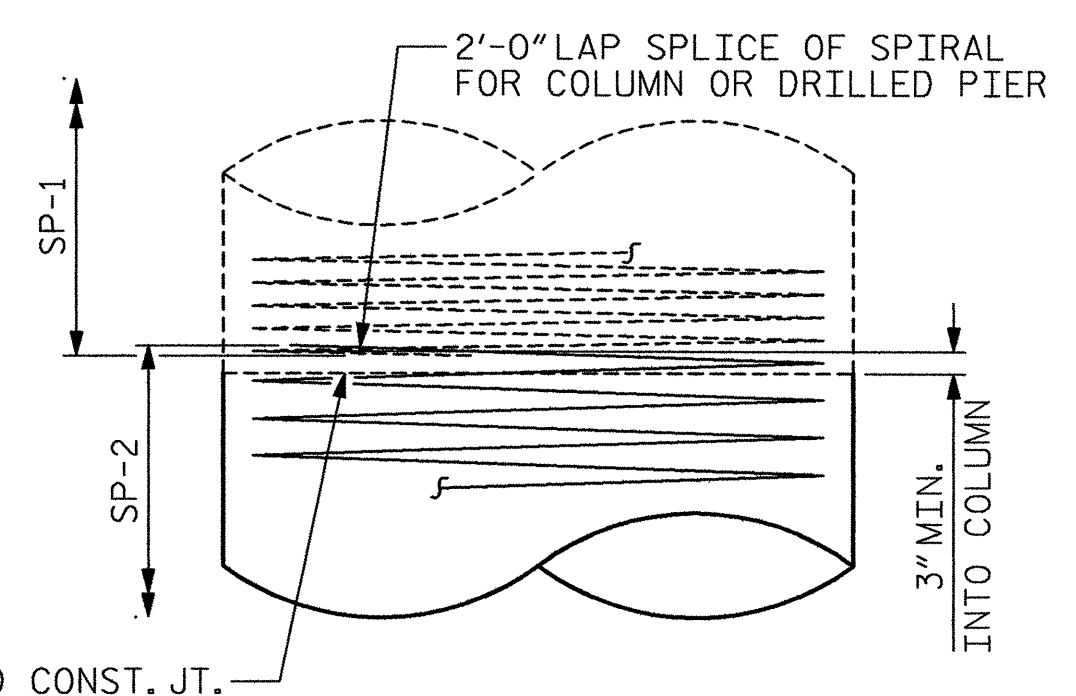
DETAILED DRAWINGS FOR FALSEWORK AND FORMS FOR THIS HAMMERHEAD BENT CAP SHALL BE SUBMITTED. SEE SHEET SN.

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

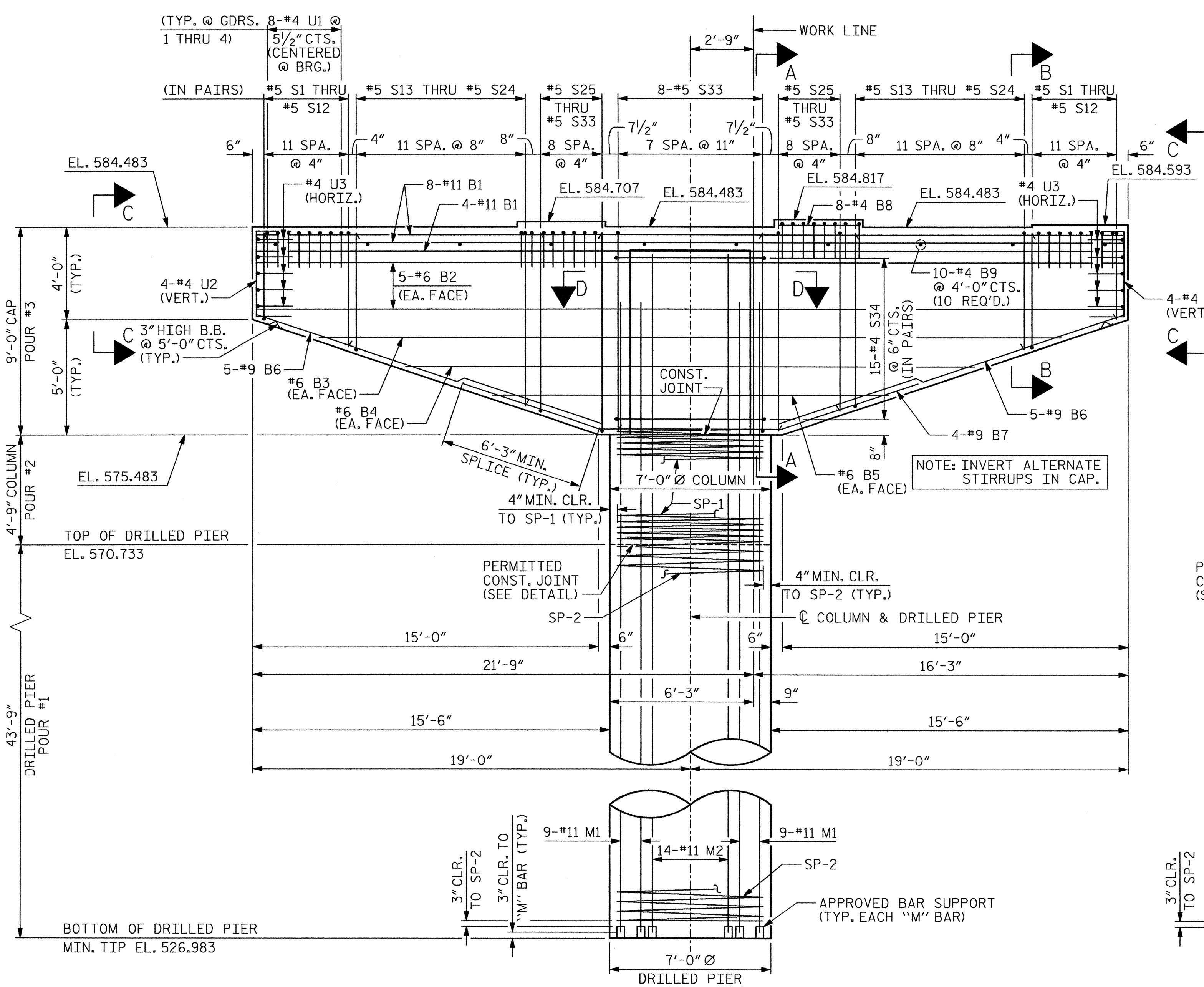
SPlicing OF THE LONGITUDINAL BARS IN THE DRILLED PIER WILL NOT BE PERMITTED.

FOR SECTIONS A-A, B-B, AND D-D, SEE SHEET 2 OF 2.

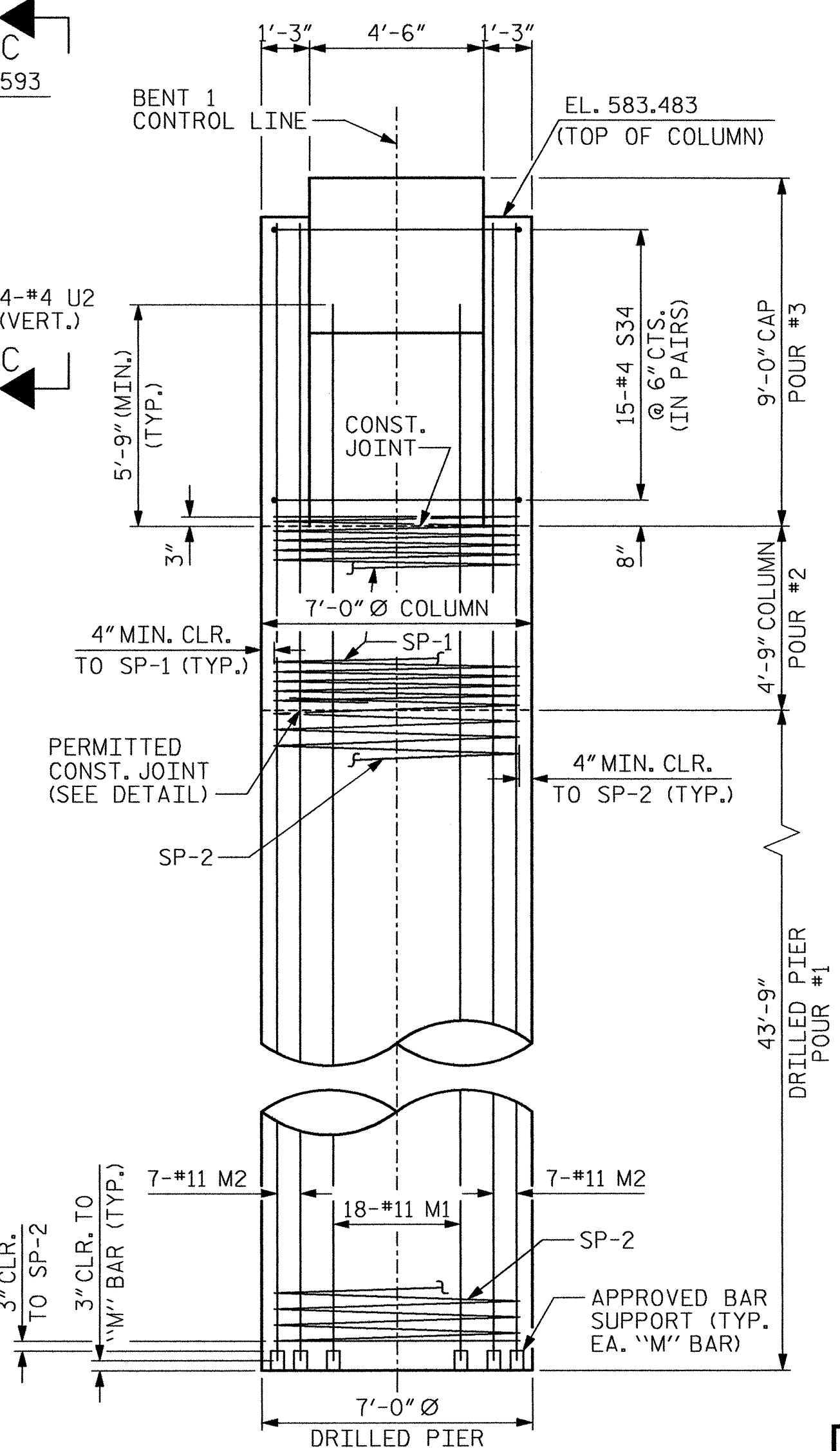
FOR DRILLED PIERS & PERMANENT STEEL CASING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.



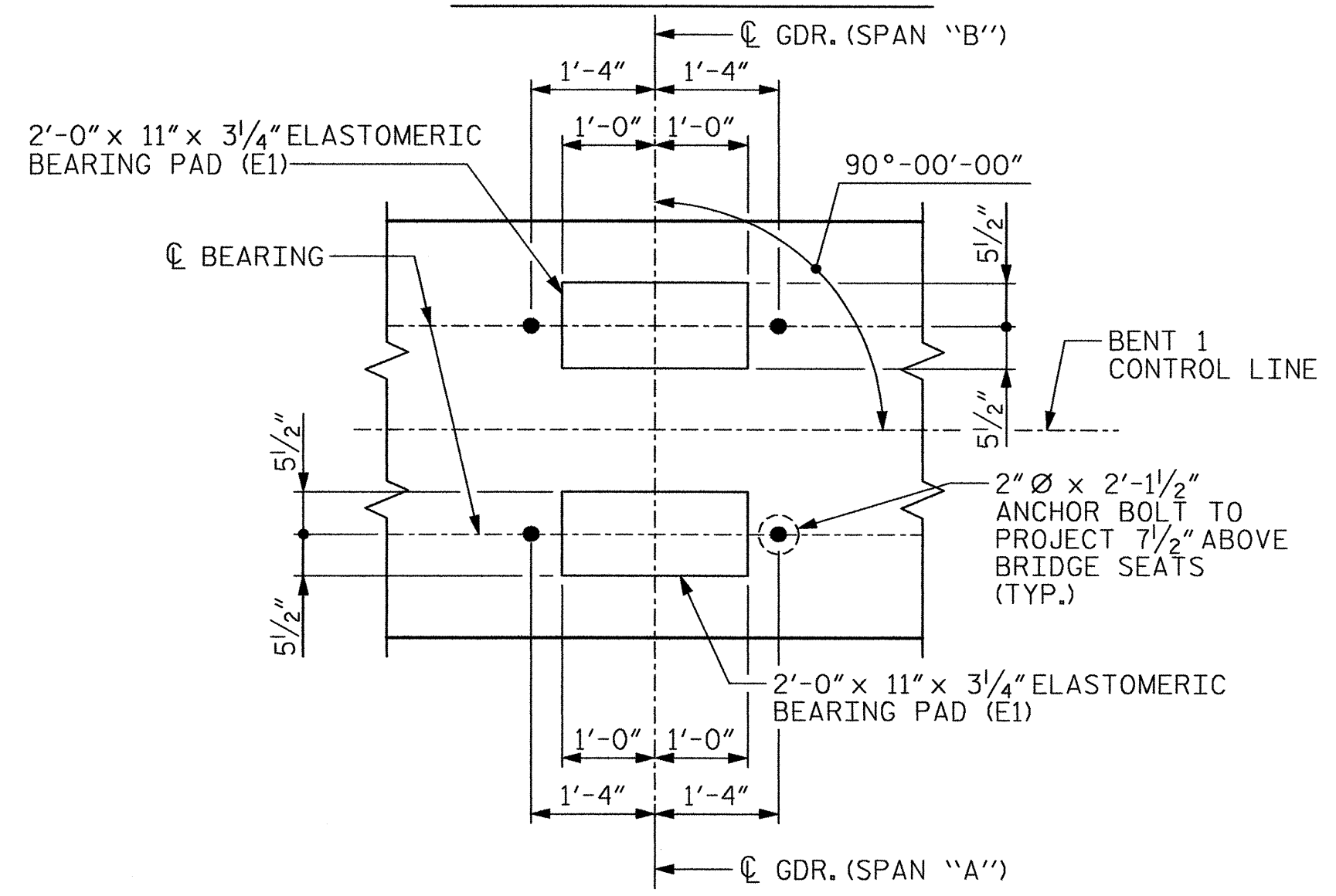
PERMITTED CONSTRUCTION JOINT DETAIL



ELEVATION



END ELEVATION



DETAIL "A"

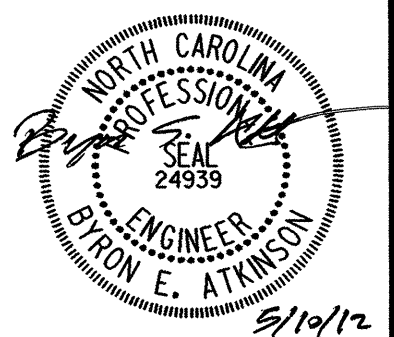
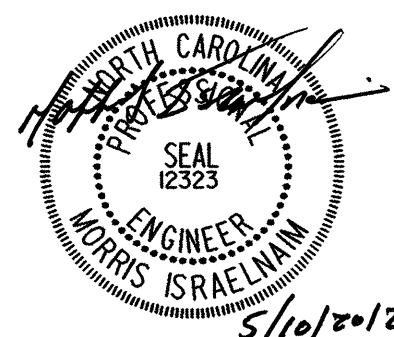
TYP. AT EACH BEARING

PROJECT NO. B-4752

GASTON COUNTY

STATION: 18+54.00 -L-

SHEET 1 OF 2

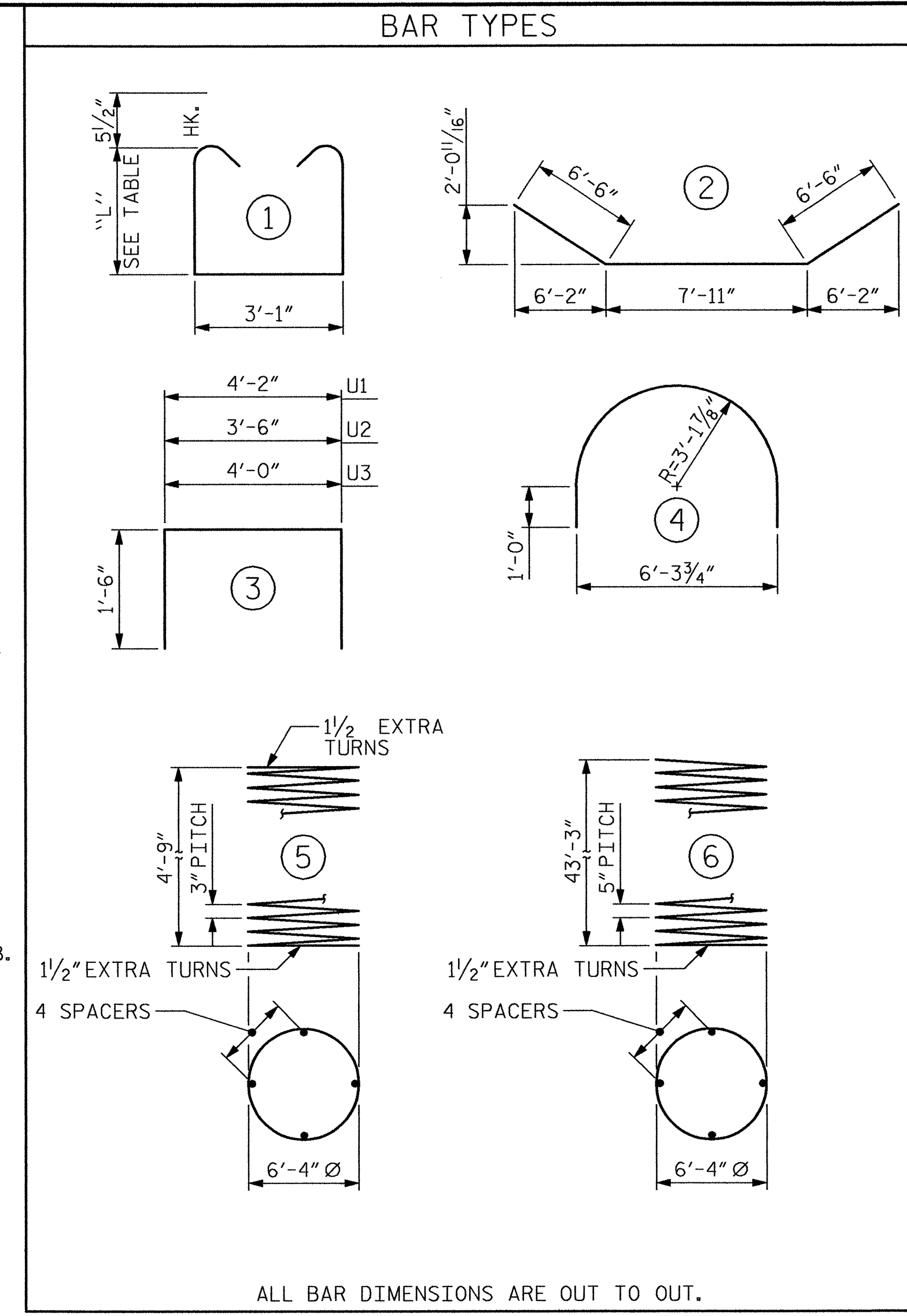
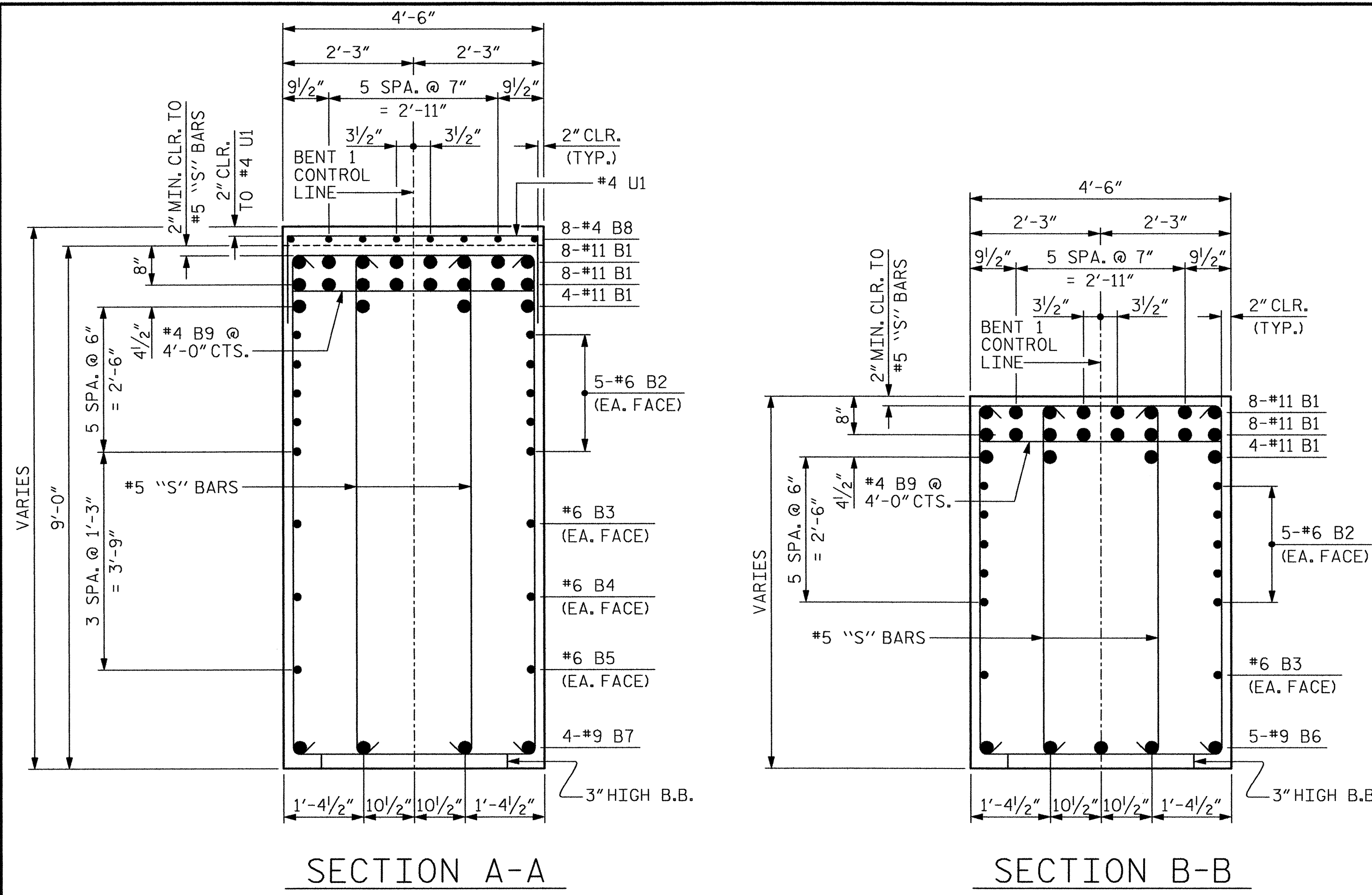


MI ENGINEERING 1011 SCHAU DRIVE, SUITE 100 RALEIGH, NC 27606 (919) 851-6606 FIRM PE NUMBER: P-0671		REVISIONS			SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 46

5/10/2012
11:15:28 AM

User: blanning

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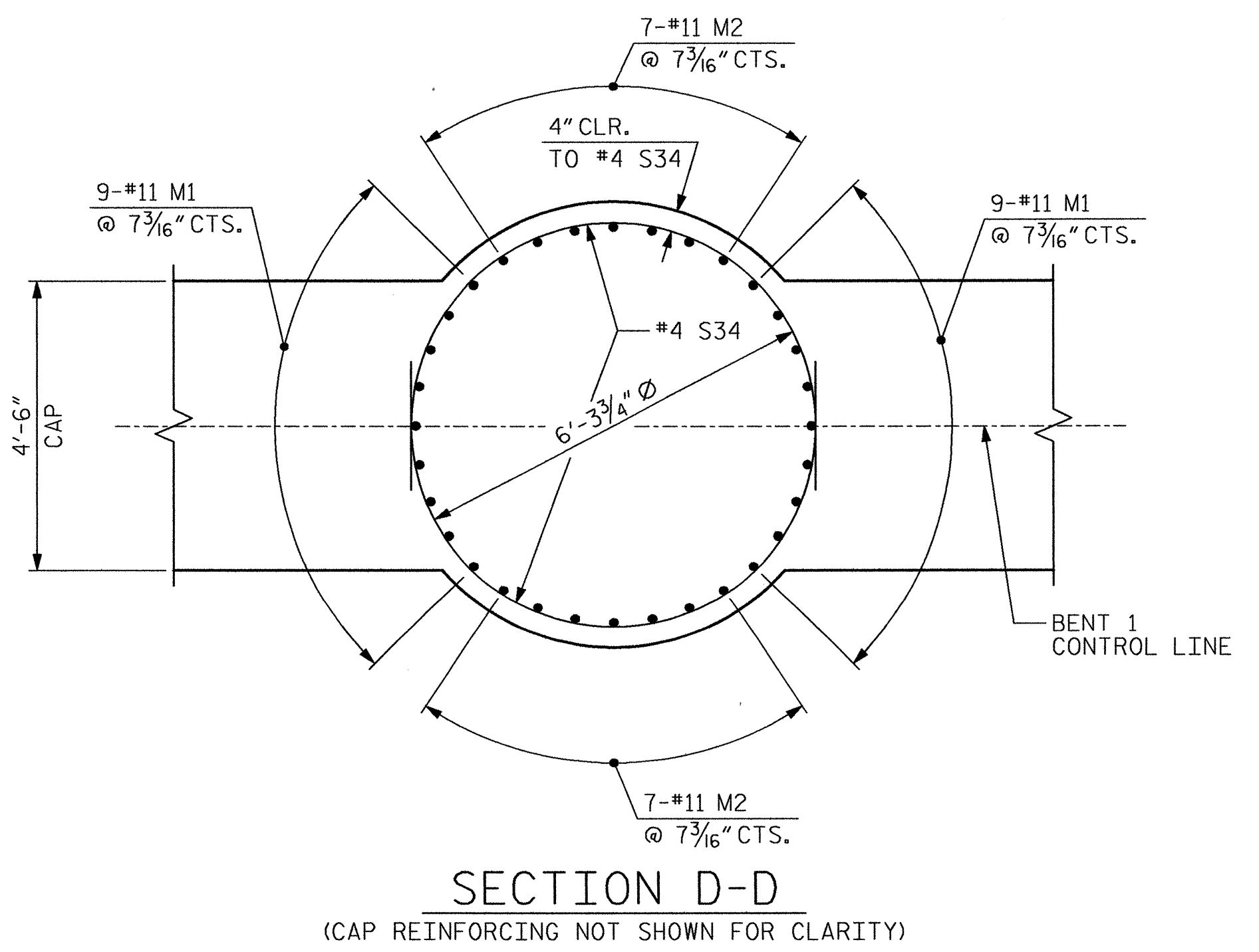
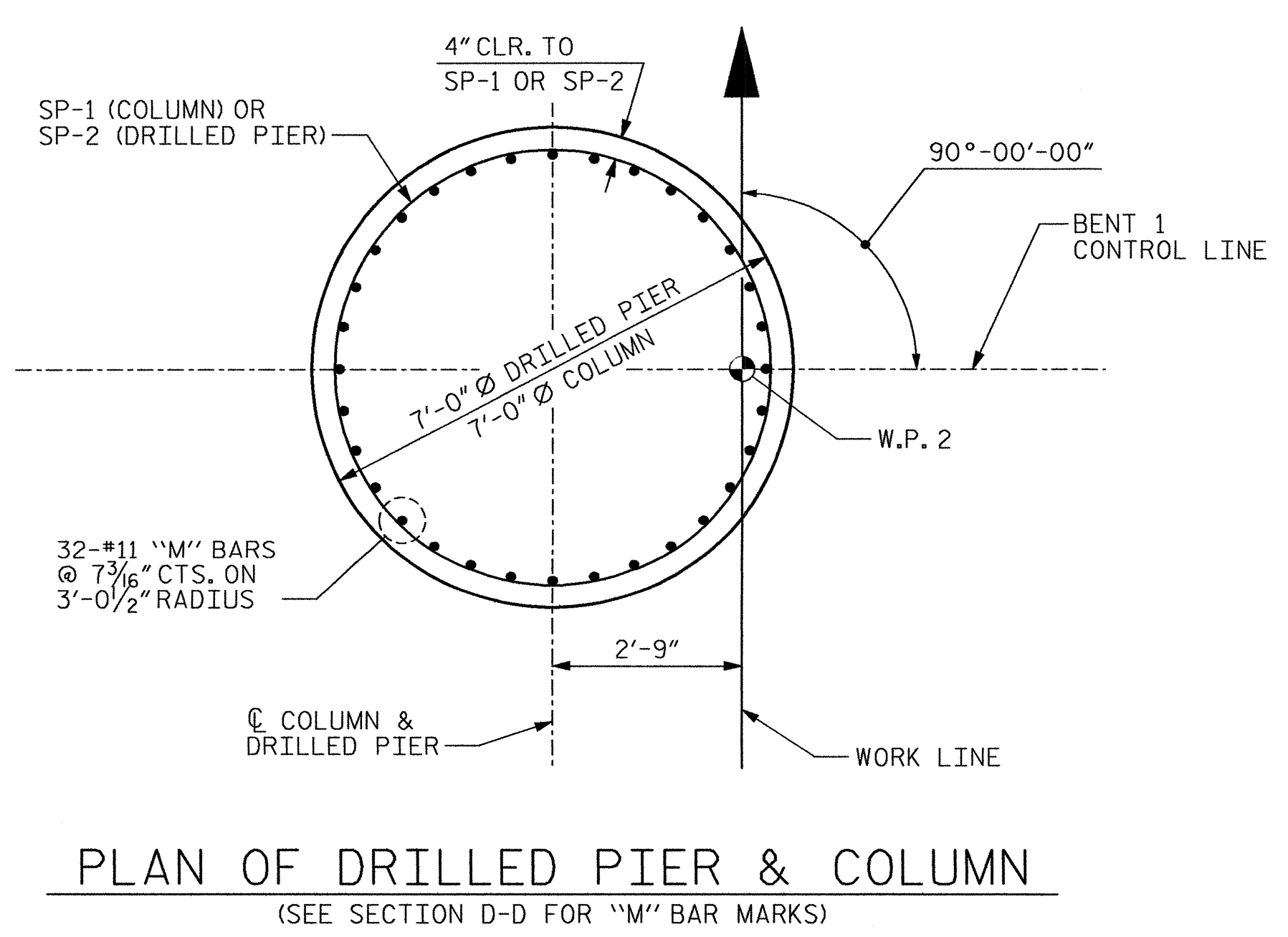


BILL OF MATERIAL											
BENT 1											
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	SIZE	TYPE	LENGTH	WEIGHT		
B1	20	#11	STR	37'-8"	4002	S19	4	#5	1	16'-11"	71
B2	10	#6	STR	37'-8"	566	S20	4	#5	1	17'-4"	72
B3	2	#6	STR	32'-2"	97	S21	4	#5	1	17'-10"	74
B4	2	#6	STR	24'-8"	74	S22	4	#5	1	18'-3"	76
B5	2	#6	STR	17'-2"	52	S23	4	#5	1	18'-8"	78
B6	10	#9	STR	15'-6"	527	S24	4	#5	1	19'-2"	80
B7	4	#9	2	20'-11"	284	S25	4	#5	1	19'-7"	82
B8	8	#4	STR	3'-6"	19	S26	4	#5	1	19'-10"	83
B9	10	#4	STR	4'-2"	28	S27	4	#5	1	20'-0"	83
						S28	4	#5	1	20'-3"	84
M1	18	#11	STR	54'-0"	5164	S29	4	#5	1	20'-6"	86
M2	14	#11	STR	56'-1"	4172	S30	4	#5	1	20'-8"	86
						S31	4	#5	1	20'-11"	87
S1	4	#5	1	11'-7"	48	S32	4	#5	1	21'-2"	88
S2	4	#5	1	11'-10"	49	S33	20	#5	1	21'-3"	443
S3	4	#5	1	12'-0"	50	S34	30	#4	4	11'-11"	239
S4	4	#5	1	12'-3"	51						
S5	4	#5	1	12'-6"	52	U1	32	#4	3	7'-2"	153
S6	4	#5	1	12'-8"	53	U2	8	#4	3	6'-6"	35
S7	4	#5	1	12'-11"	54	U3	10	#4	3	7'-0"	47
S8	4	#5	1	13'-2"	55						
S9	4	#5	1	13'-4"	56	SP-1	1	**	5	434'-11"	291
S10	4	#5	1	13'-7"	57	SP-2	1	***	6	2082'-4"	2172
S11	4	#5	1	13'-10"	58						
S12	4	#5	1	14'-0"	58						
S13	4	#5	1	14'-3"	59						
S14	4	#5	1	14'-8"	61						
S15	4	#5	1	15'-2"	63						
S16	4	#5	1	15'-7"	65						
S17	4	#5	1	16'-0"	67						
S18	4	#5	1	16'-6"	69						
									REINFORCING STEEL	18,057	LBS.
									SPIRAL COLUMN		
									REINFORCING STEEL	2,463	LBS.
CLASS A CONCRETE BREAKDOWN											
									POUR #2 (COLUMN)	6.8	C.Y.
									POUR #3 (CAP & PART COLUMN)	47.7	C.Y.
									TOTAL	54.5	C.Y.
7'-0" Ø DRILLED PIER											
									DRILLED PIER CONCRETE		
									POUR 1 (DRILLED PIER)	62.4	C.Y.
									7'-0" Ø DRILLED PIER		
									IN SOIL	26.75	LIN. FT.
									7'-0" Ø DRILLED PIER		
									NOT IN SOIL	17.00	LIN. FT.
									PERMANENT STEEL CASING FOR		
									7'-0" Ø DRILLED PIER	25.8	LIN. FT.
									CSL TUBES	316.8	LIN. FT.

STIRRUP HEIGHT TABLE			
BAR	"L"	BAR "L"	
S1	3'-9 1/2"	S12	5'-0"
S2	3'-11"	S13	5'-1 1/2"
S3	4'-0"	S14	5'-4"
S4	4'-1 1/2"	S15	5'-7"
S5	4'-3"	S16	5'-9 1/2"
S6	4'-4"	S17	6'-0"
S7	4'-5 1/2"	S18	6'-3"
S8	4'-7"	S19	6'-5 1/2"
S9	4'-8"	S20	6'-8"
S10	4'-9 1/2"	S21	6'-11"
S11	4'-11"	S22	7'-1 1/2"
S23	7'-4"	S24	7'-7"
S25	7'-9 1/2"	S26	7'-11"
S27	8'-0"	S28	8'-1 1/2"
S29	8'-3"	S30	8'-4"
S31	8'-5 1/2"	S32	8'-7"
S33	8'-7 1/2"		

ALL BAR DIMENSIONS ARE OUT TO OUT.

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



PROJECT NO. B-4752
GASTON COUNTY
STATION: 18+54.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 1
SECTION AND DETAILS

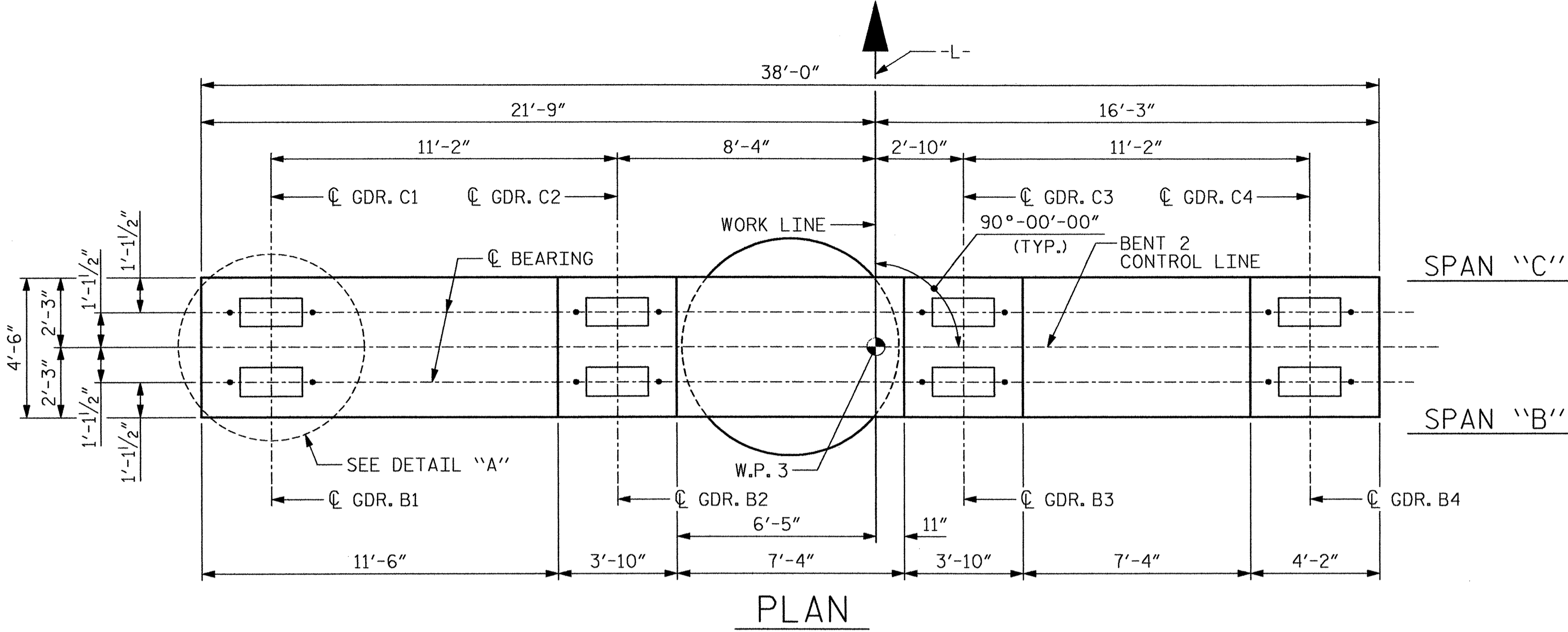


MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER: P-0671

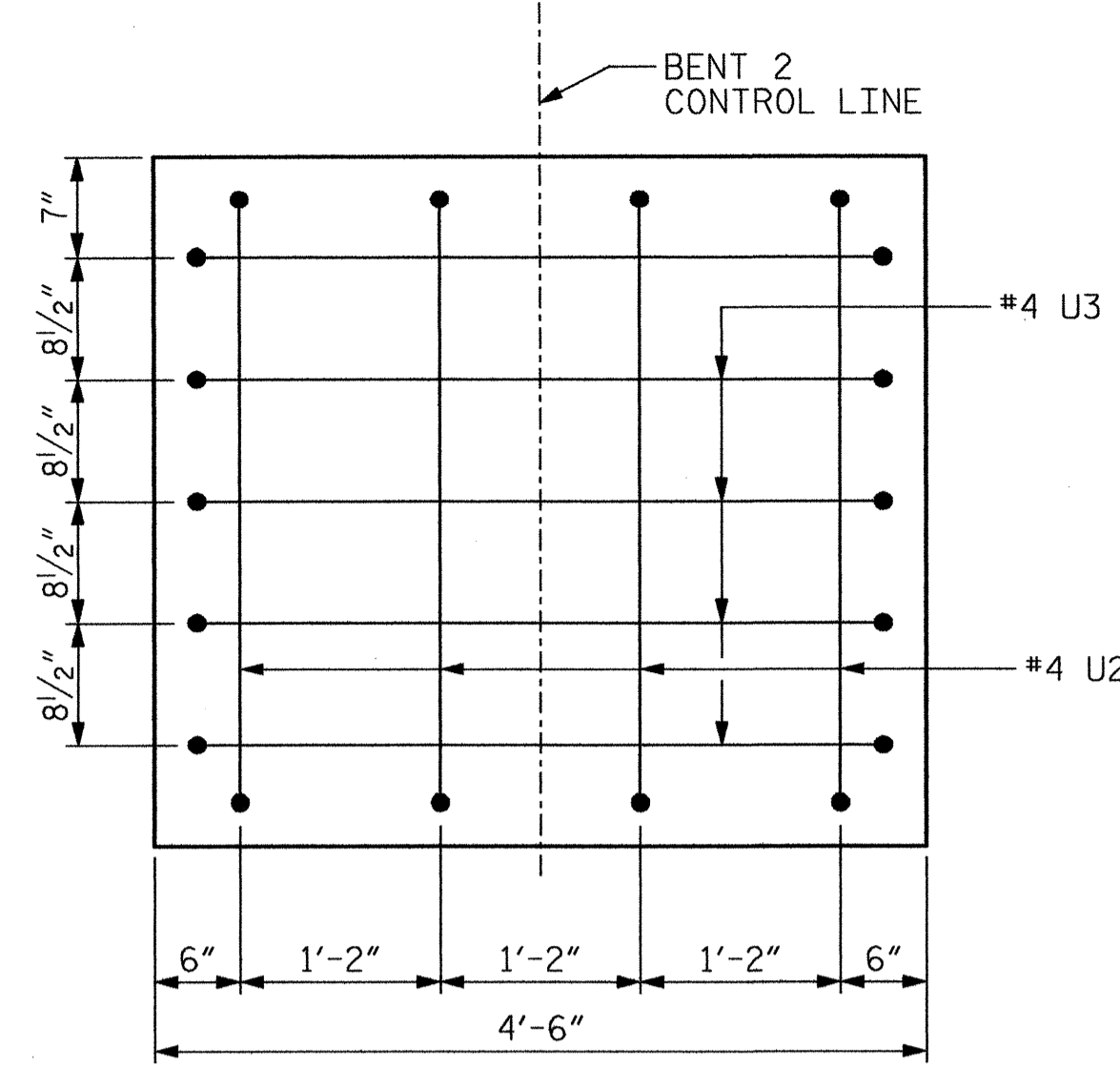
REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	

TOTAL SHEETS: 46

DRAWN BY: B.E. LANNING DATE: 03/12
CHECKED BY: B.E. ATKINSON DATE: 03/12

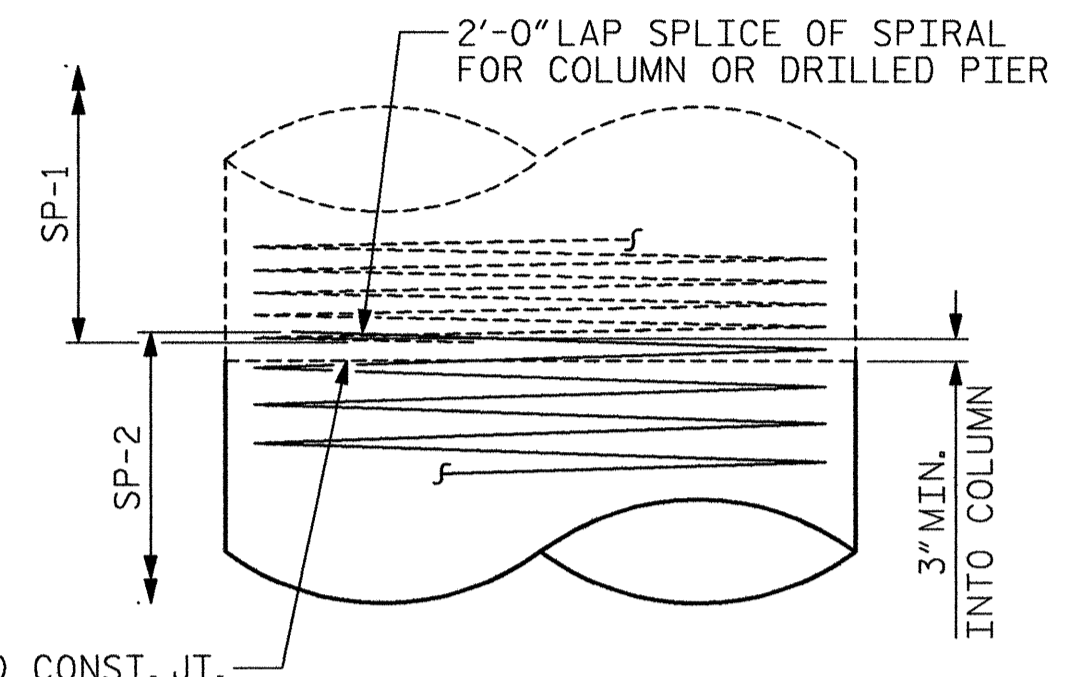


PLAN

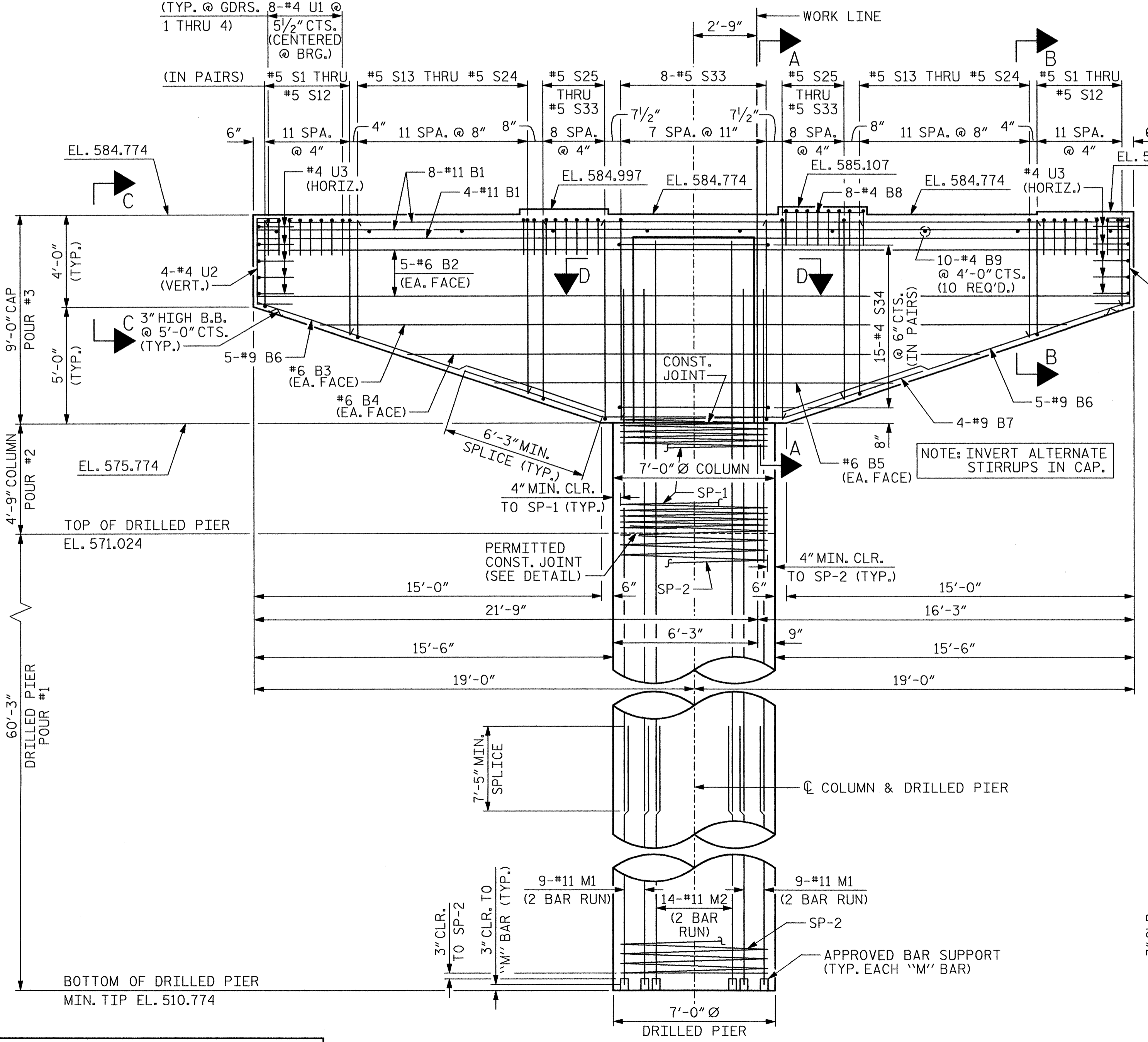


VIEW C-C

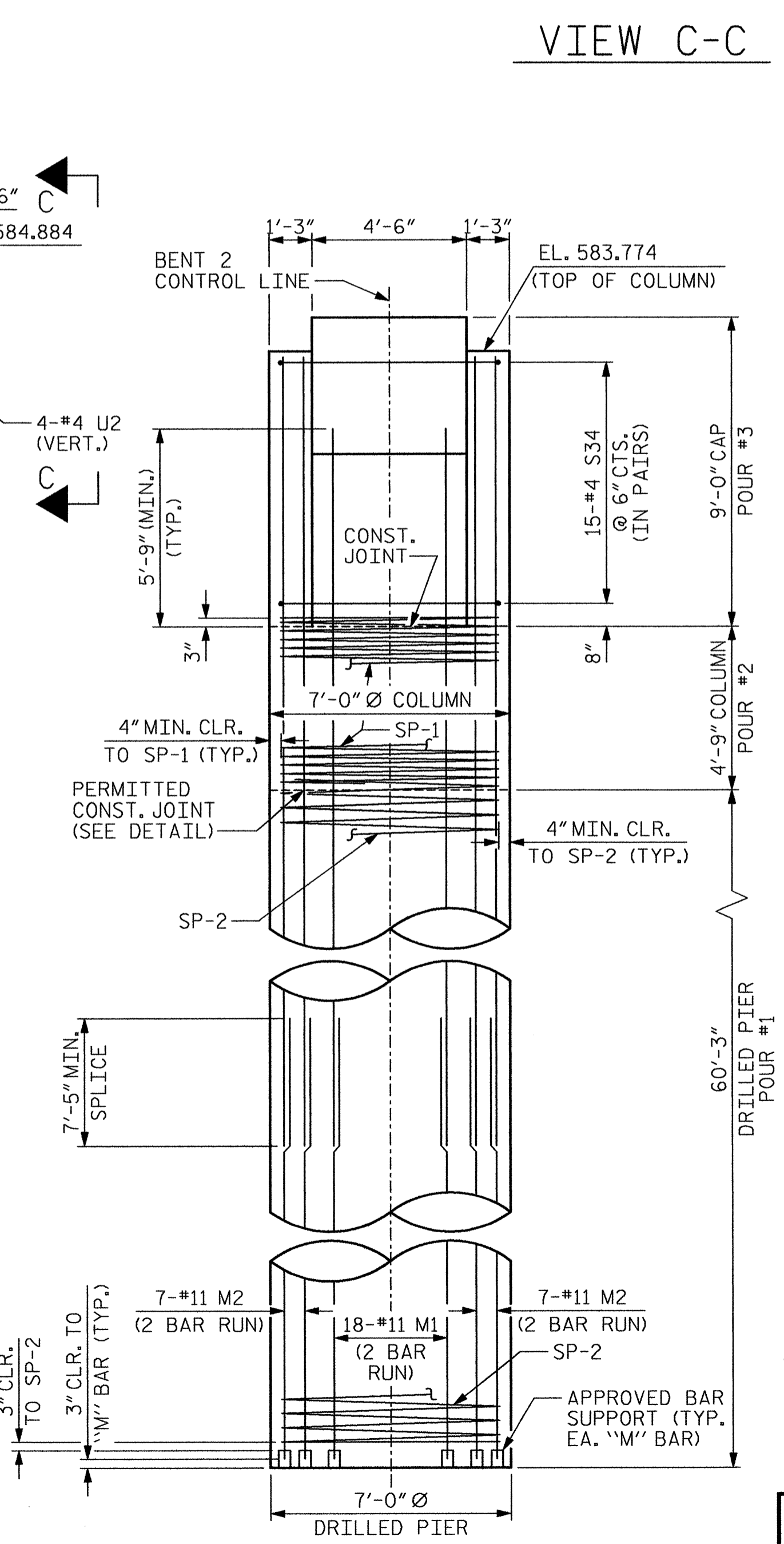
NOTES
 STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
 DETAILED DRAWINGS FOR FALSEWORK AND FORMS FOR THIS HAMMERHEAD BENT CAP SHALL BE SUBMITTED. SEE SHEET SN.
 ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".
 FOR SECTIONS A-A, B-B, AND D-D, SEE SHEET 2 OF 2.
 FOR DRILLED PIERS & PERMANENT STEEL CASING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.



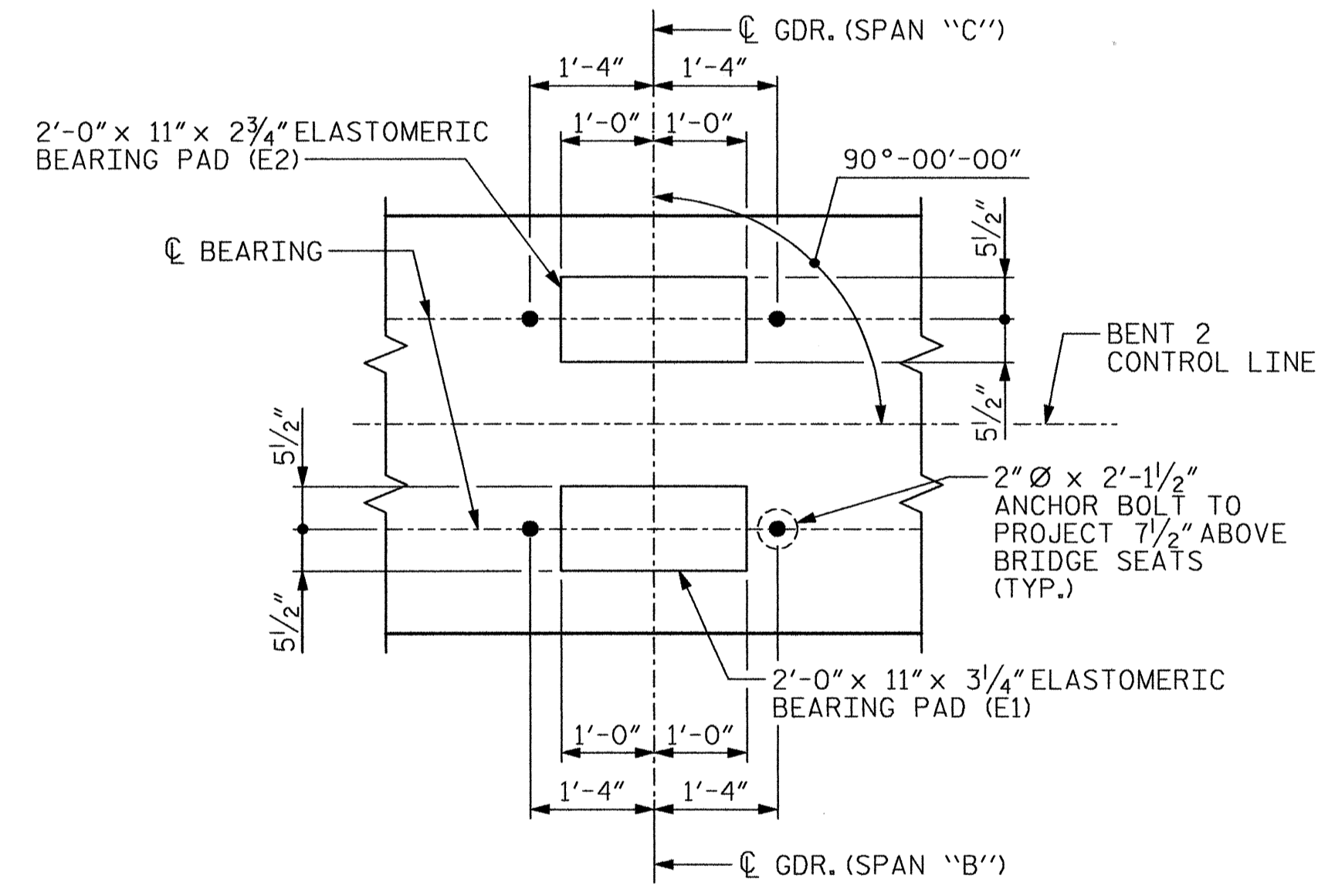
PERMITTED CONSTRUCTION JOINT DETAIL



ELEVATION

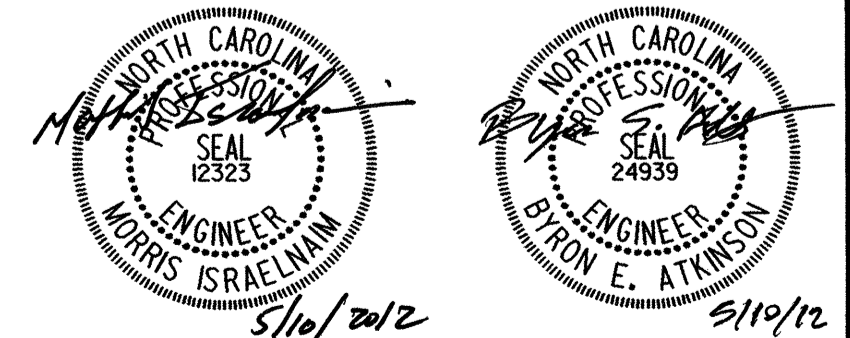


END ELEVATION



DETAIL "A"

TYP. AT EACH BEARING
 PROJECT NO. B-4752
GASTON COUNTY
 STATION: 18+54.00 -L-
 SHEET 1 OF 2

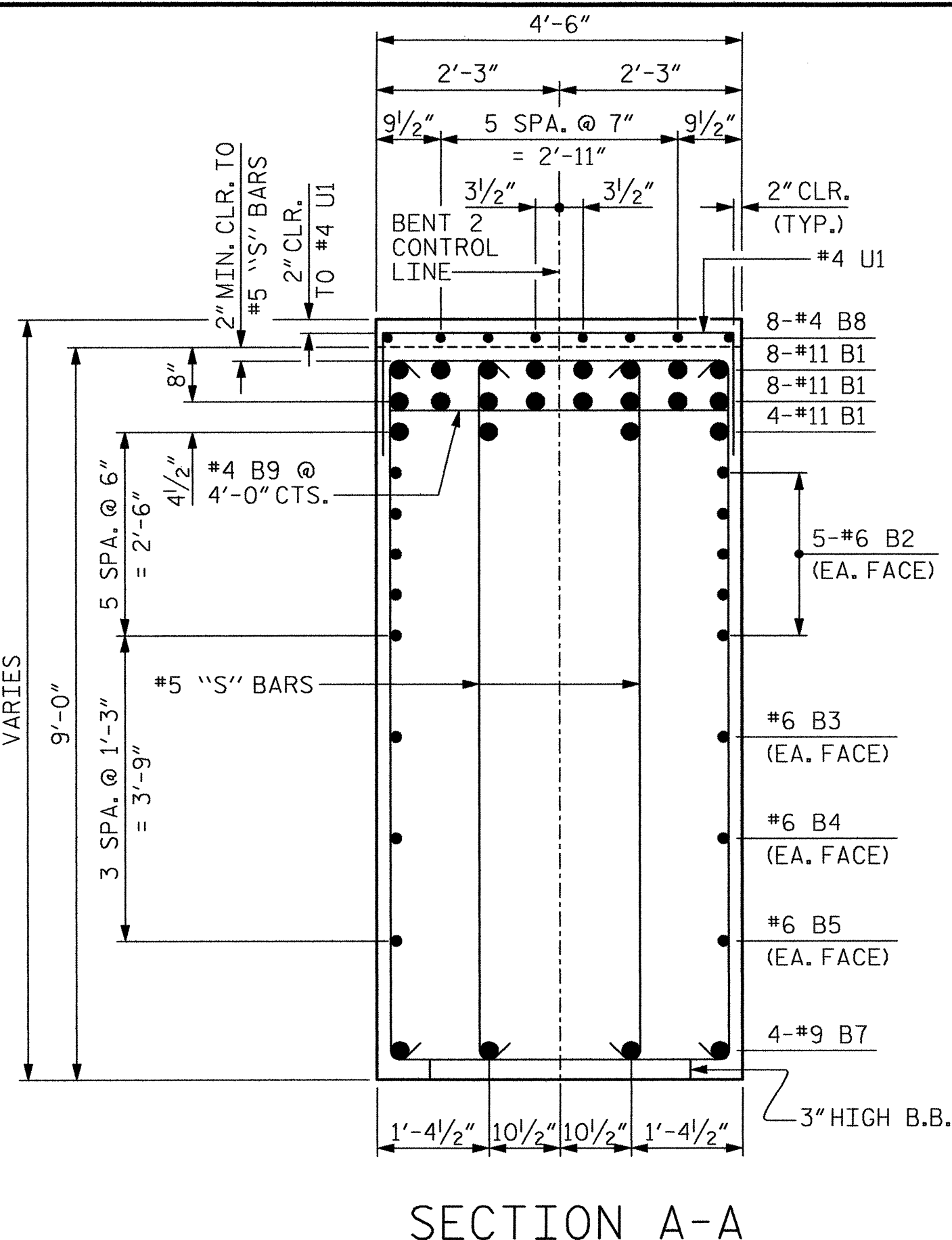


MI ENGINEERING 1011 SCHAUB DRIVE, SUITE 100 RALEIGH, NC 27606 (919) 851-6606 FIRM PE NUMBER : P-0671		REVISIONS		SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	
				TOTAL SHEETS 46

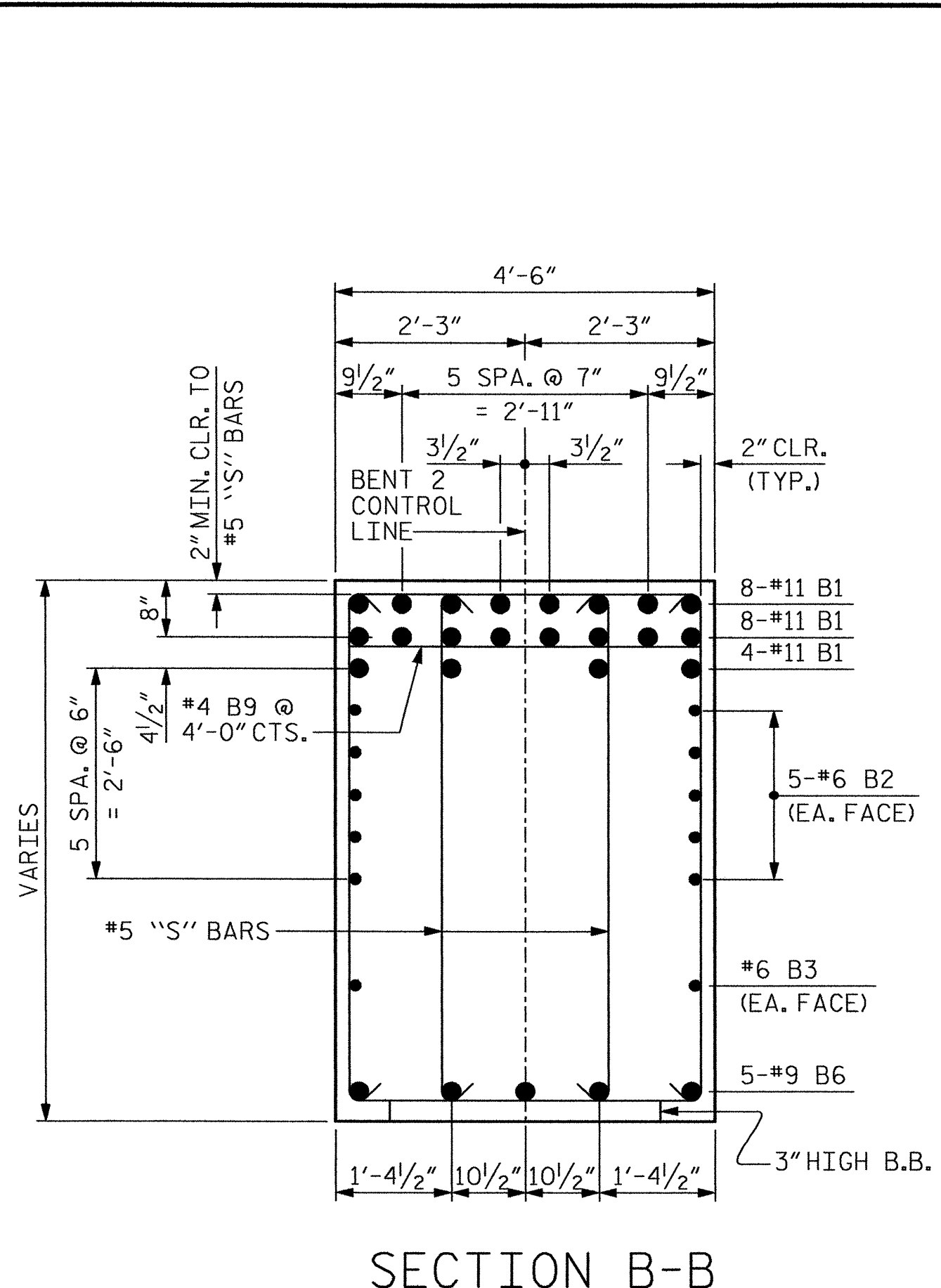
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DRAWN BY: B.E. LANNING DATE: 03/12
 CHECKED BY: B.E. ATKINSON DATE: 03/12

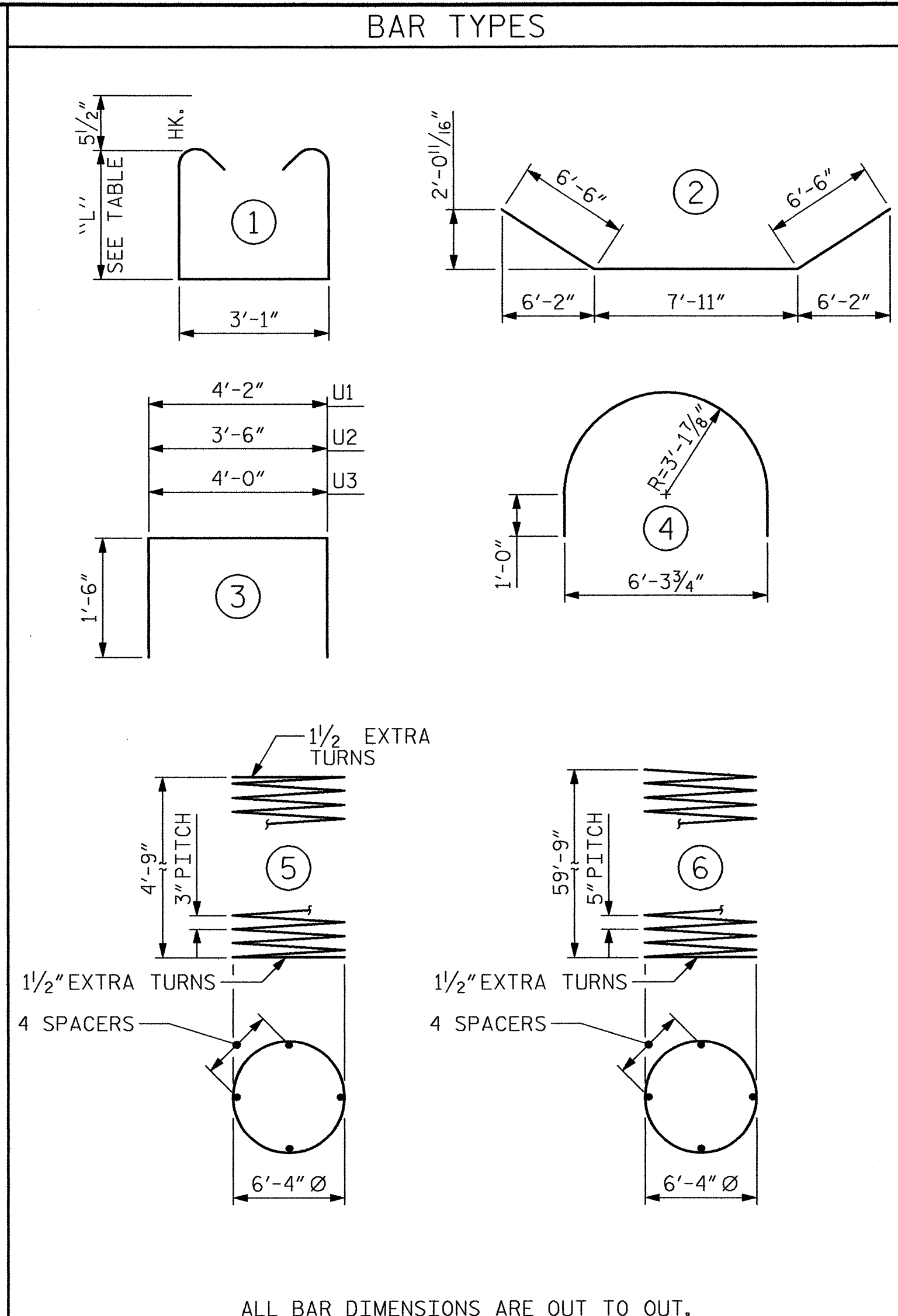
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SECTION A-A



SECTION B-B



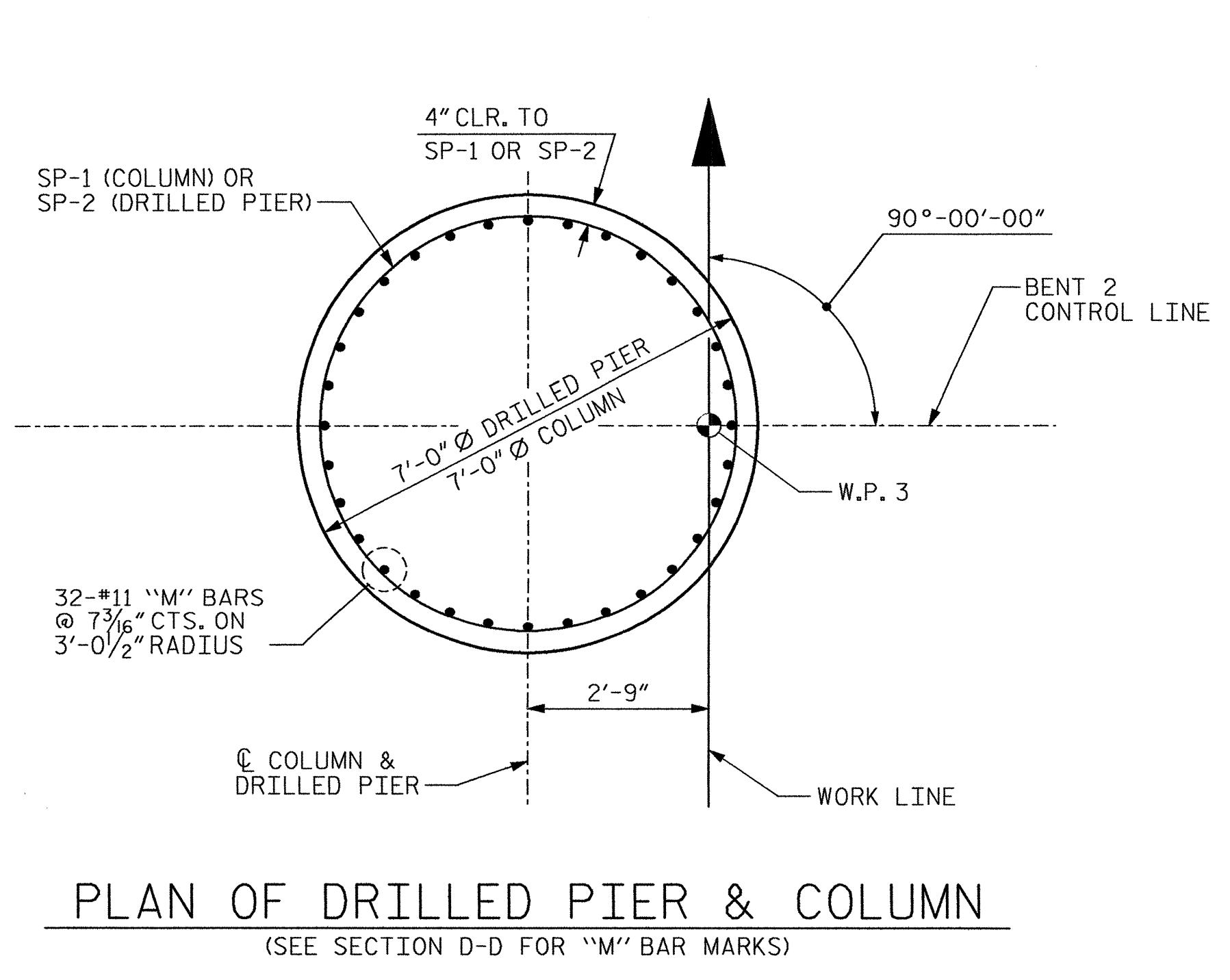
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL											
BENT 2											
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	SIZE	TYPE	LENGTH	WEIGHT		
B1	20	#11	STR	37'-8"	4002	S19	4	#5	1	16'-11"	71
B2	10	#6	STR	37'-8"	566	S20	4	#5	1	17'-4"	72
B3	2	#6	STR	32'-2"	97	S21	4	#5	1	17'-10"	74
B4	2	#6	STR	24'-8"	74	S22	4	#5	1	18'-3"	76
B5	2	#6	STR	17'-2"	52	S23	4	#5	1	18'-8"	78
B6	10	#9	STR	15'-6"	527	S24	4	#5	1	19'-2"	80
B7	4	#9	2	20'-11"	284	S25	4	#5	1	19'-7"	82
B8	8	#4	STR	3'-6"	19	S26	4	#5	1	19'-10"	83
B9	10	#4	STR	4'-2"	28	S27	4	#5	1	20'-0"	83
						S28	4	#5	1	20'-3"	84
M1	36	#11	STR	39'-0"	7459	S29	4	#5	1	20'-6"	86
M2	28	#11	STR	40'-0"	5951	S30	4	#5	1	20'-8"	86
						S31	4	#5	1	20'-11"	87
S1	4	#5	1	11'-7"	48	S32	4	#5	1	21'-2"	88
S2	4	#5	1	11'-10"	49	S33	20	#5	1	21'-3"	443
S3	4	#5	1	12'-0"	50	S34	30	#4	4	11'-11"	239
S4	4	#5	1	12'-3"	51	U1	32	#4	3	7'-2"	153
S5	4	#5	1	12'-6"	52	U2	8	#4	3	6'-6"	35
S6	4	#5	1	12'-8"	53	U3	10	#4	3	7'-0"	47
S7	4	#5	1	12'-11"	54						
S8	4	#5	1	13'-2"	55						
S9	4	#5	1	13'-4"	56						
S10	4	#5	1	13'-7"	57						
S11	4	#5	1	13'-10"	58						
S12	4	#5	1	14'-0"	58						
S13	4	#5	1	14'-3"	59						
S14	4	#5	1	14'-8"	61						
S15	4	#5	1	15'-2"	63						
S16	4	#5	1	15'-7"	65						
S17	4	#5	1	16'-0"	67						
S18	4	#5	1	16'-6"	69						
				REINFORCING STEEL				22,131 LBS.			
				SPIRAL COLUMN REINFORCING STEEL				3,286 LBS.			
				CLASS A CONCRETE BREAKDOWN							
				POUR #2 (COLUMN)				6.8 C.Y.			
				POUR #3 (CAP & PART COLUMN)				47.7 C.Y.			
				TOTAL				54.5 C.Y.			
				7'-0" Ø DRILLED PIER							
				DRILLED PIER CONCRETE POUR 1 (DRILLED PIER)				85.9 C.Y.			
				7'-0" Ø DRILLED PIER IN SOIL				43.25 LIN. FT.			
				7'-0" Ø DRILLED PIER NOT IN SOIL				17.00 LIN. FT.			
				PERMANENT STEEL CASING FOR 7'-0" Ø DRILLED PIER				31.0 LIN. FT.			
				CSL TUBES				432.3 LIN. FT.			

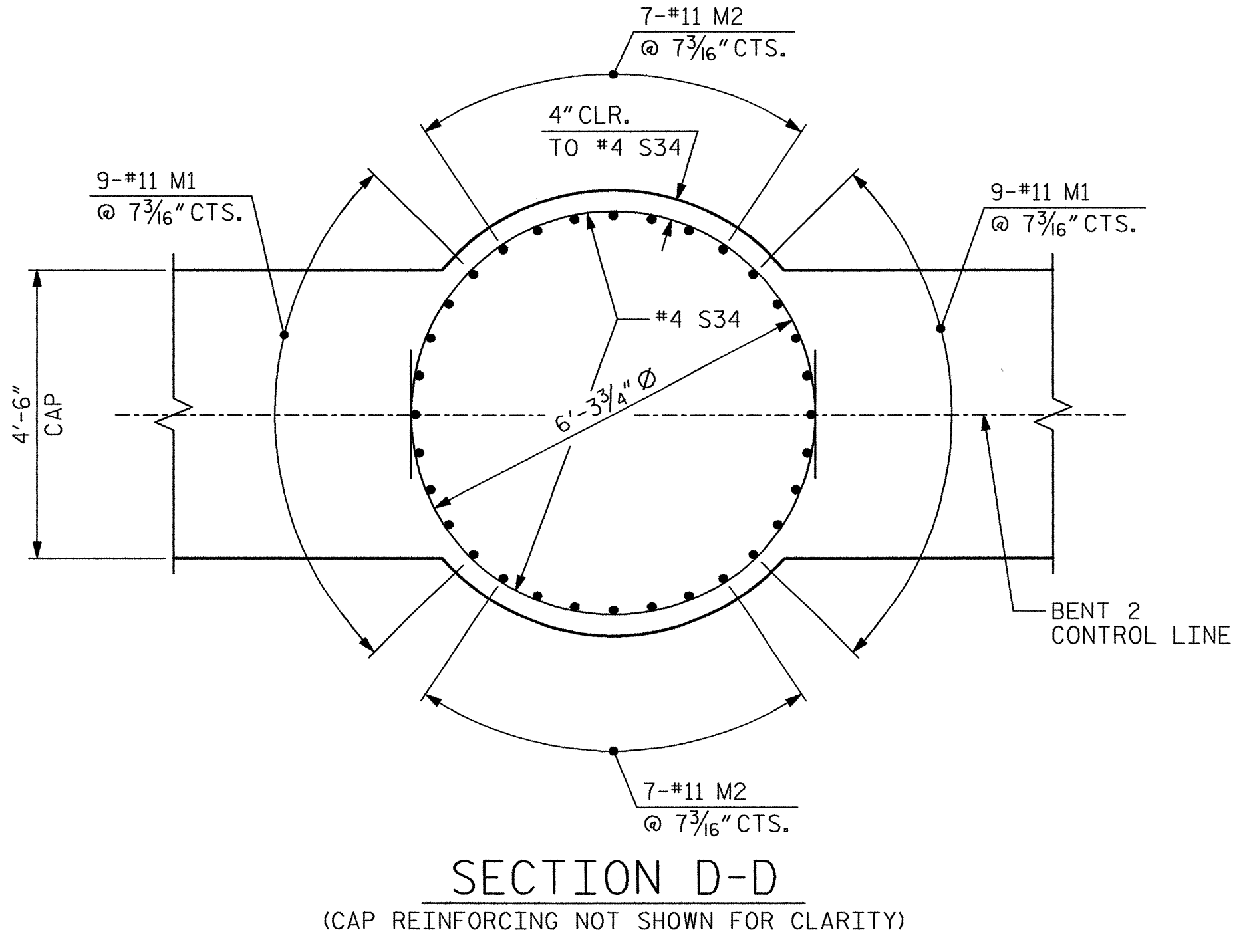
STIRRUP HEIGHT TABLE

BAR	"L"	BAR	"L"	BAR	"L"
S1	3'-9 1/2"	S12	5'-0"	S23	7'-4"
S2	3'-11"	S13	5'-1 1/2"	S24	7'-7"
S3	4'-0"	S14	5'-4"	S25	7'-9 1/2"
S4	4'-1 1/2"	S15	5'-7"	S26	7'-11"
S5	4'-3"	S16	5'-9 1/2"	S27	8'-0"
S6	4'-4"	S17	6'-0"	S28	8'-1 1/2"
S7	4'-5 1/2"	S18	6'-3"	S29	8'-3"
S8	4'-7"	S19	6'-5 1/2"	S30	8'-4"
S9	4'-8"	S20	6'-8"	S31	8'-5 1/2"
S10	4'-9 1/2"	S21	6'-11"	S32	8'-7"
S11	4'-11"	S22	7'-1 1/2"	S33	8'-7 1/2"

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



PLAN OF DRILLED PIER & COLUMN
(SEE SECTION D-D FOR "M" BAR MARKS)



SECTION D-D
(CAP REINFORCING NOT SHOWN FOR CLARITY)

PROJECT NO. B-4752
GASTON COUNTY
 STATION: 18+54.00 -L-
 SHEET 2 OF 2

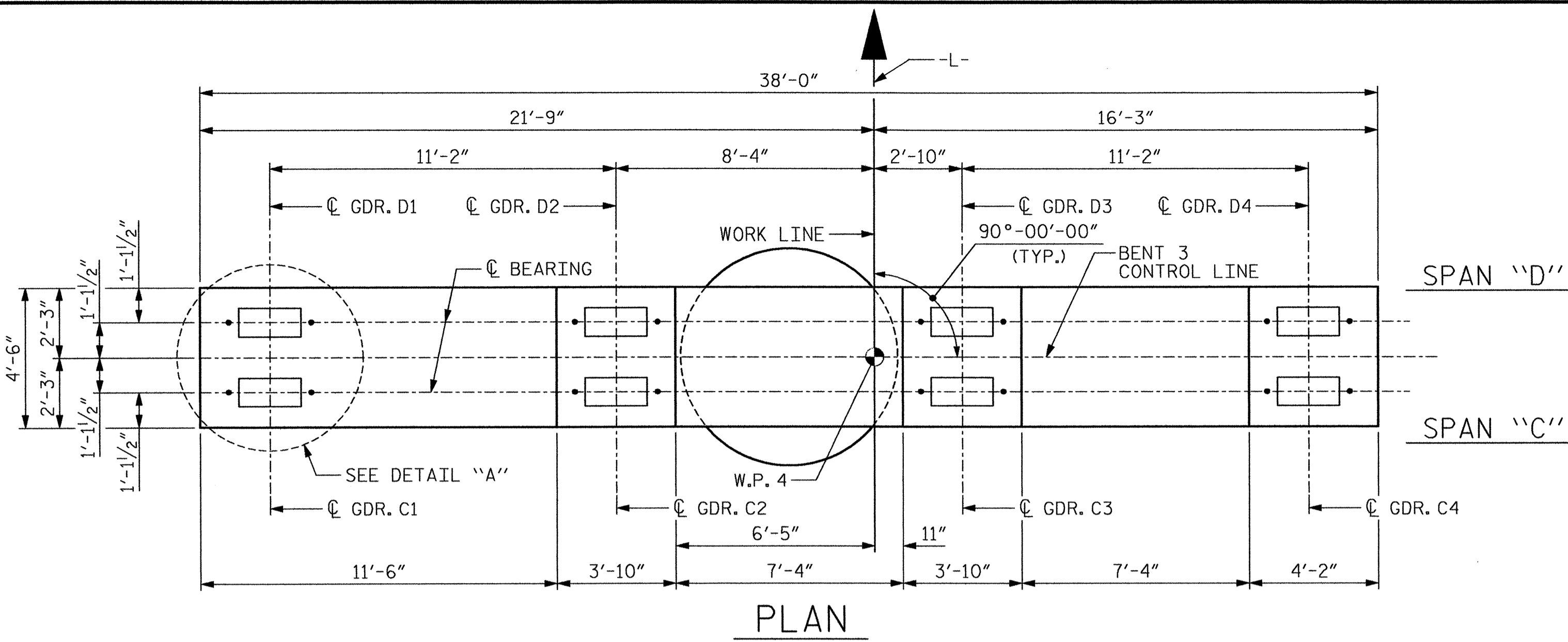


STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT 2 SECTION AND DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

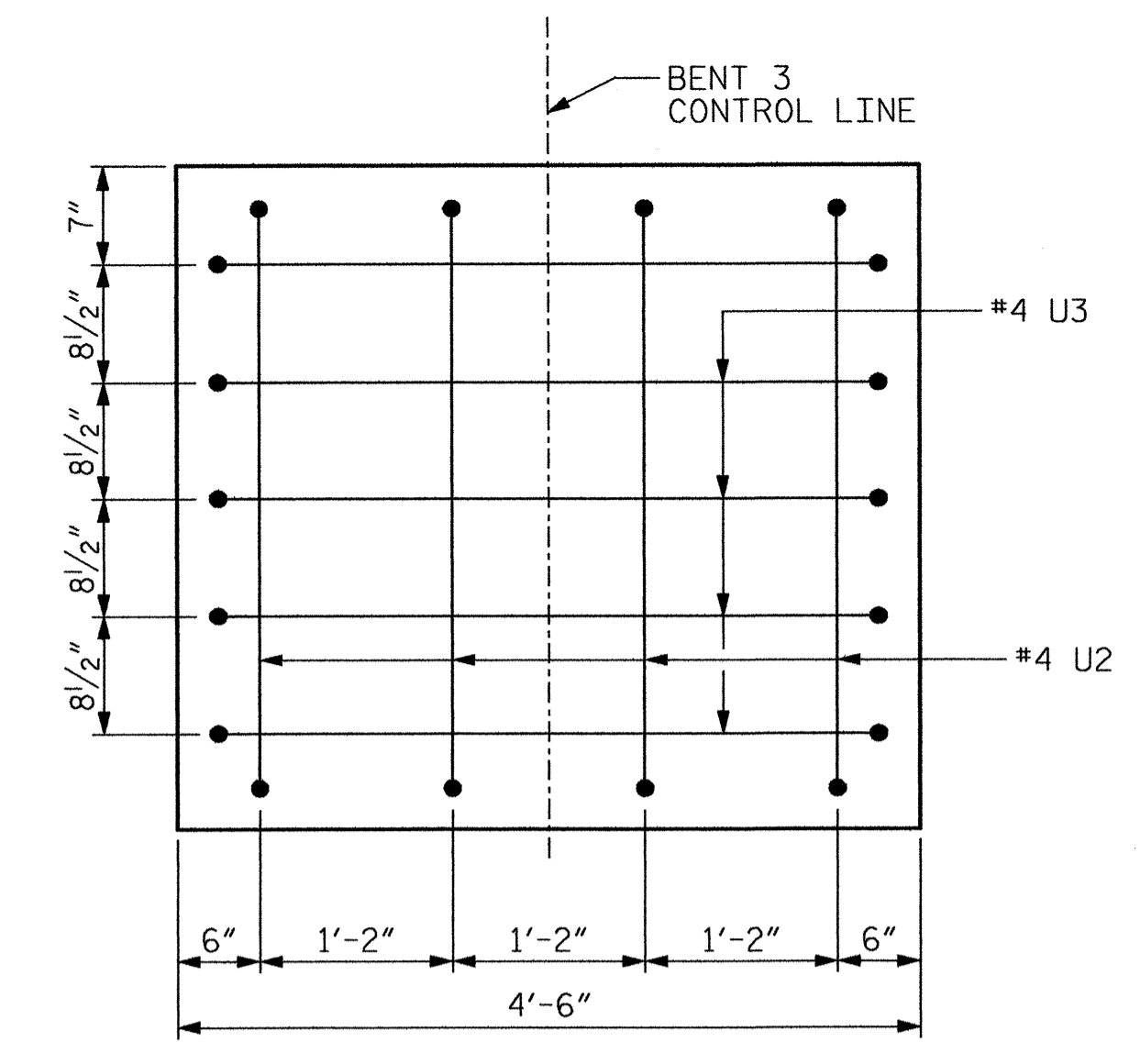
MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER: P-0671

SHEET NO.
S-37
 TOTAL SHEETS
46

DRAWN BY: B.E. LANNING DATE: 03/12
 CHECKED BY: B.E. ATKINSON DATE: 03/12

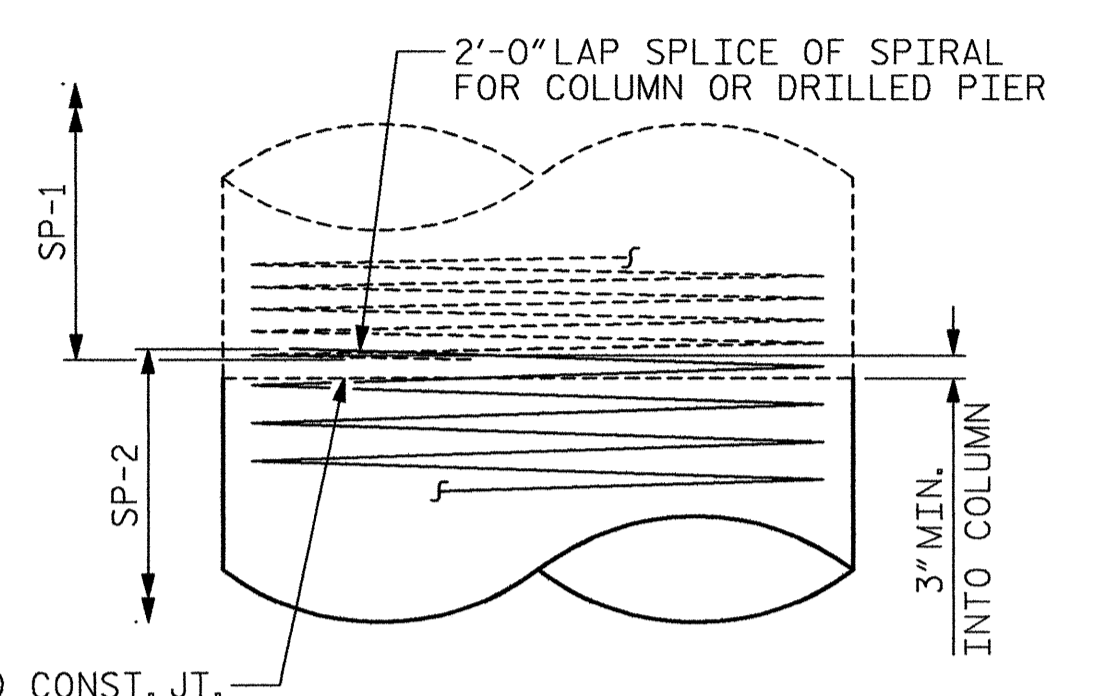


PLAN

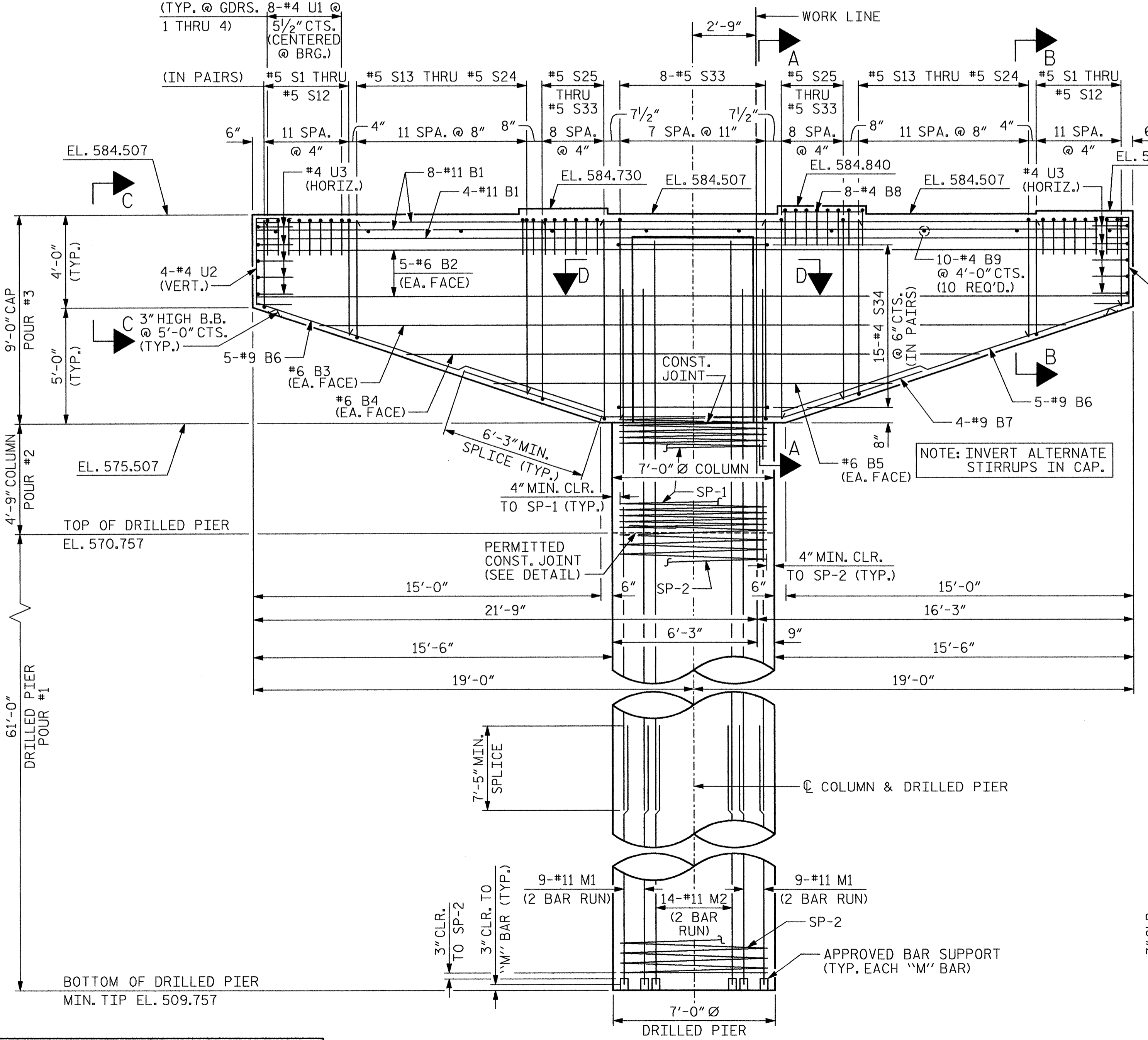


VIEW C-C

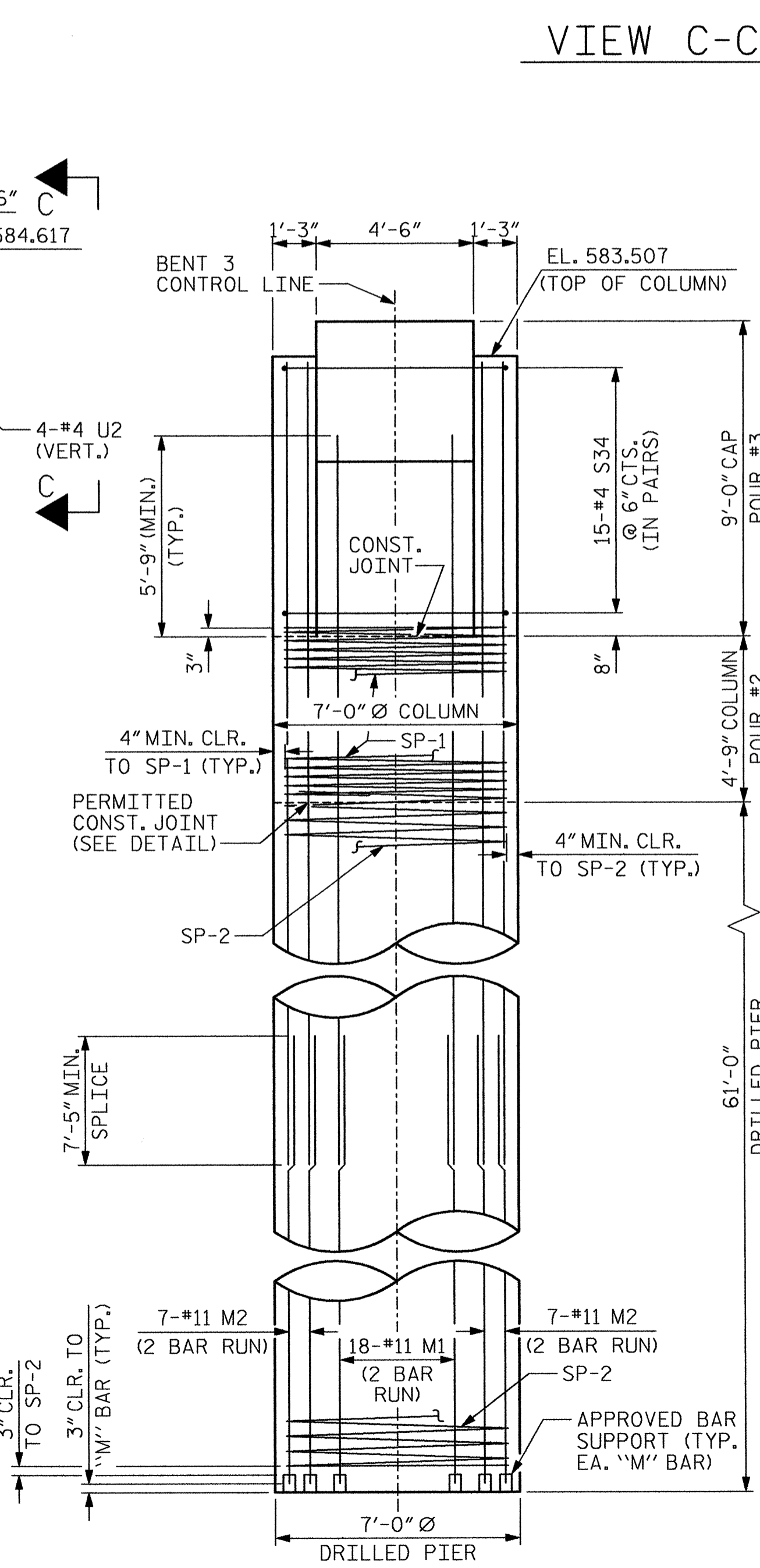
NOTES
 STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
 DETAILED DRAWINGS FOR FALSEWORK AND FORMS FOR THIS HAMMERHEAD BENT CAP SHALL BE SUBMITTED. SEE SHEET SN.
 ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".
 FOR SECTIONS A-A, B-B, AND D-D, SEE SHEET 2 OF 2.
 FOR DRILLED PIERS & PERMANENT STEEL CASING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.



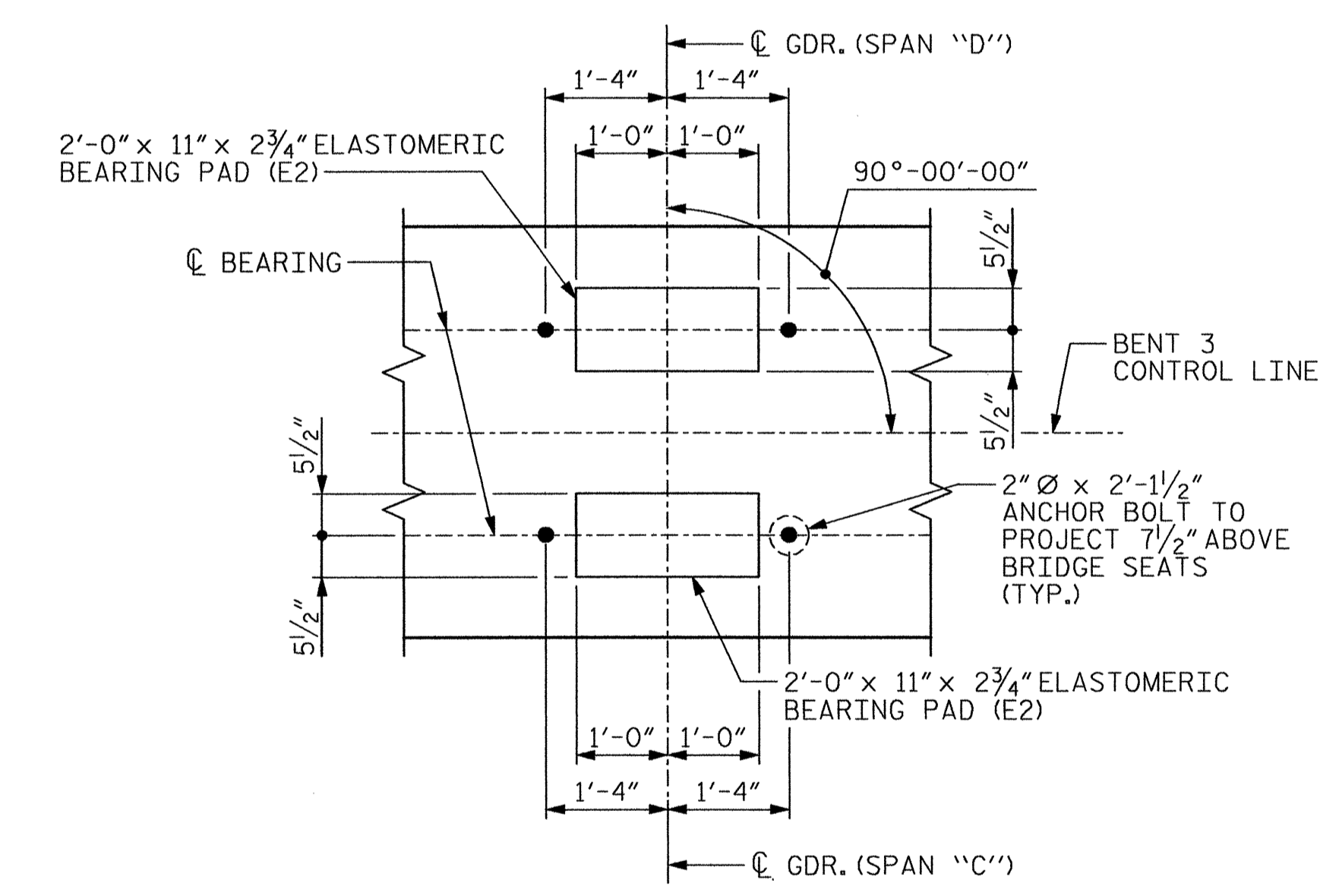
PERMITTED CONSTRUCTION JOINT DETAIL



ELEVATION



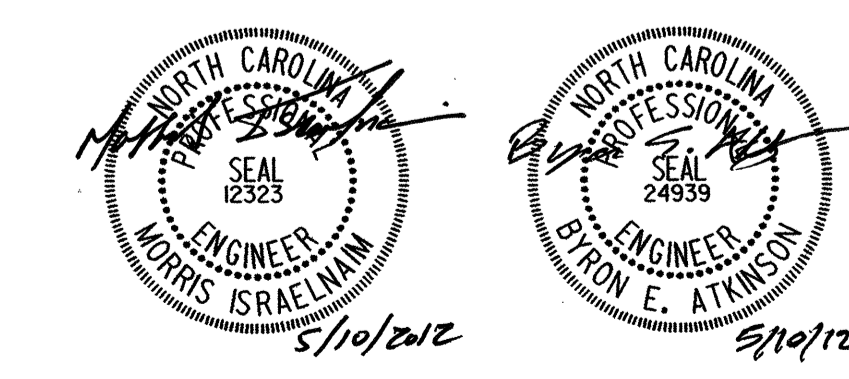
END ELEVATION



DETAIL "A"

TYP. AT EACH BEARING
 PROJECT NO. B-4752
GASTON COUNTY
 STATION: 18+54.00 -L-

SHEET 1 OF 2



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
BENT 3
 PLAN AND ELEVATION

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

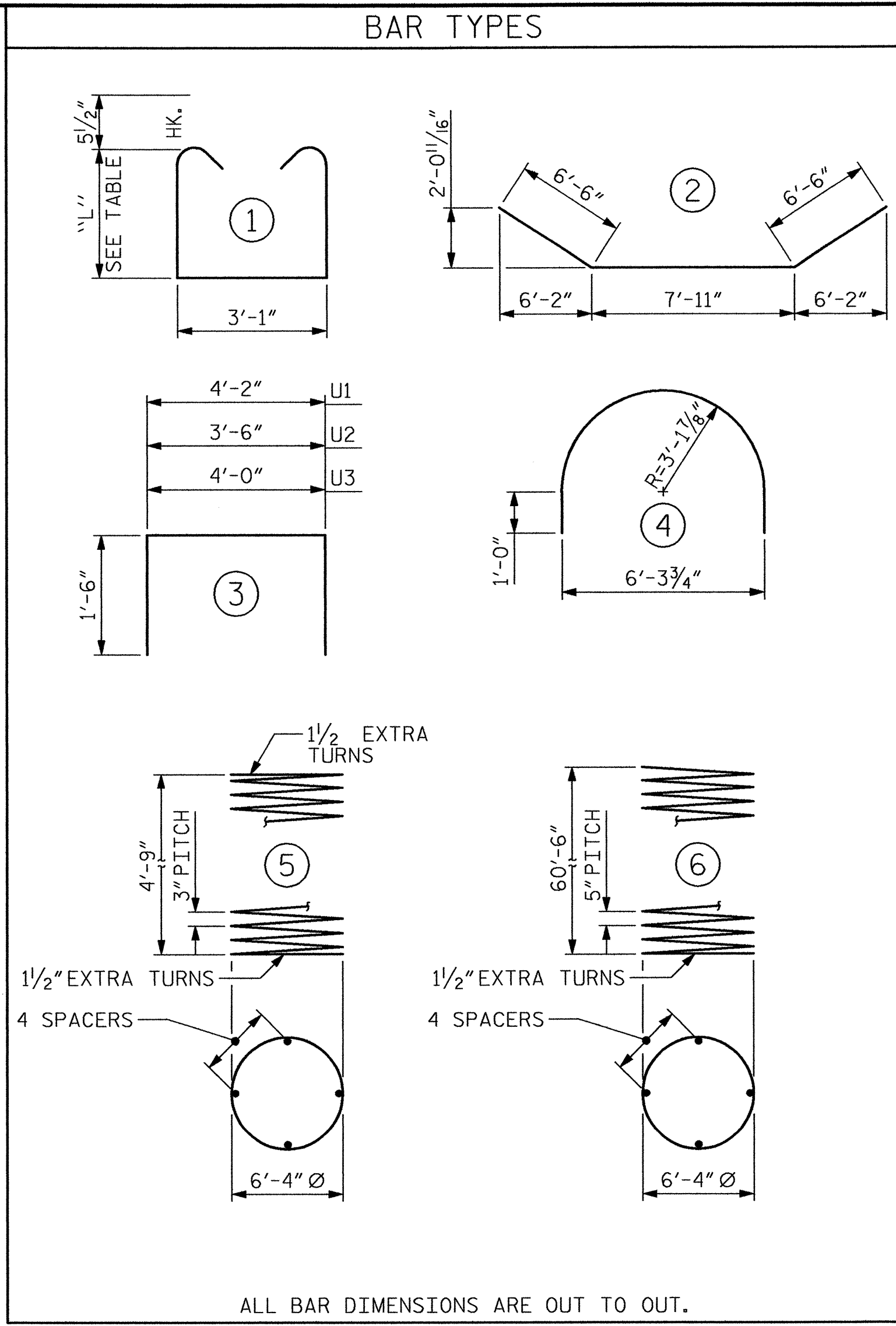
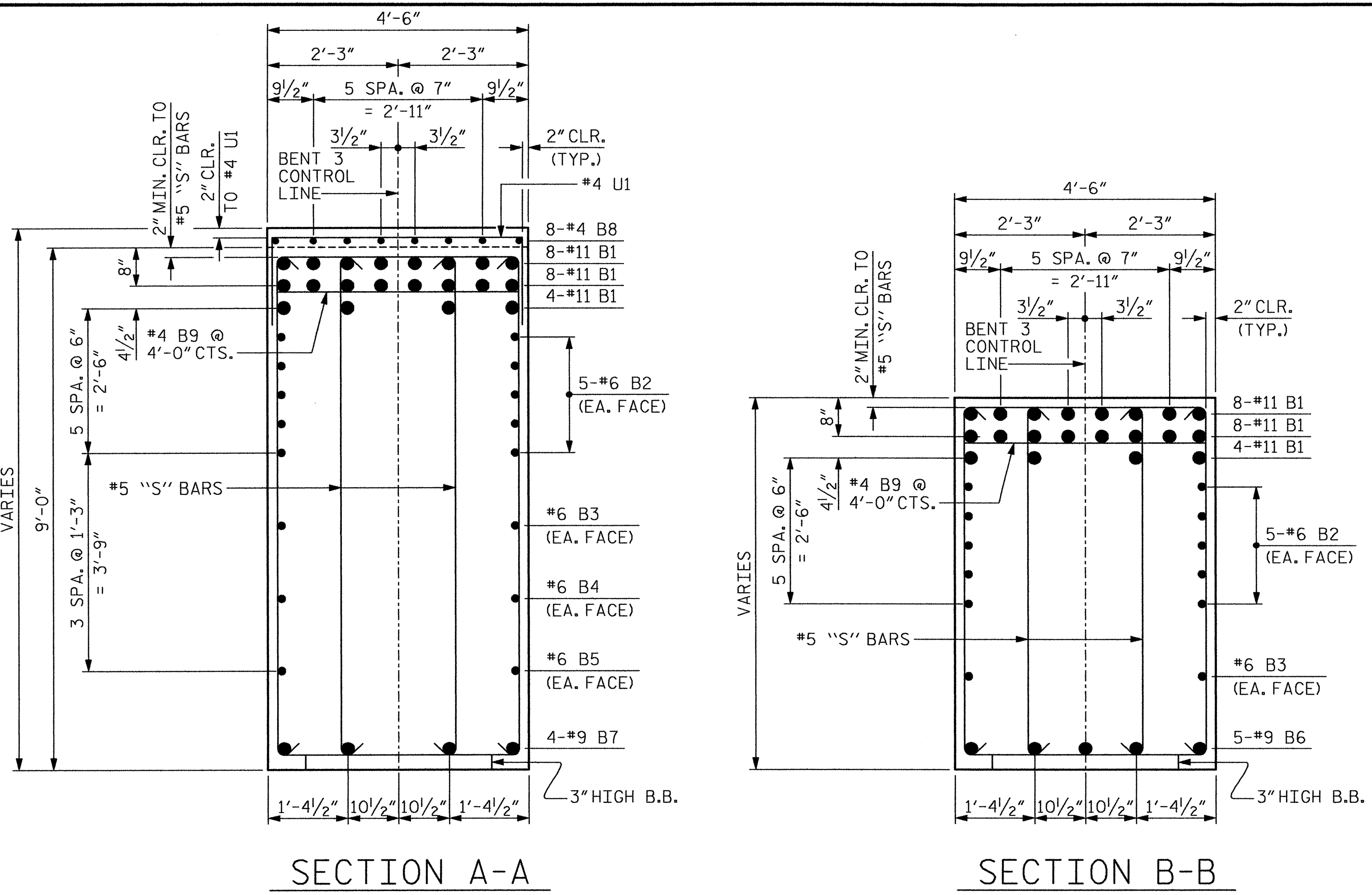
MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER: P-0671

SHEET NO. **S-38**
 TOTAL SHEETS 46

5/10/2012 11:28:32 AM User: blanning
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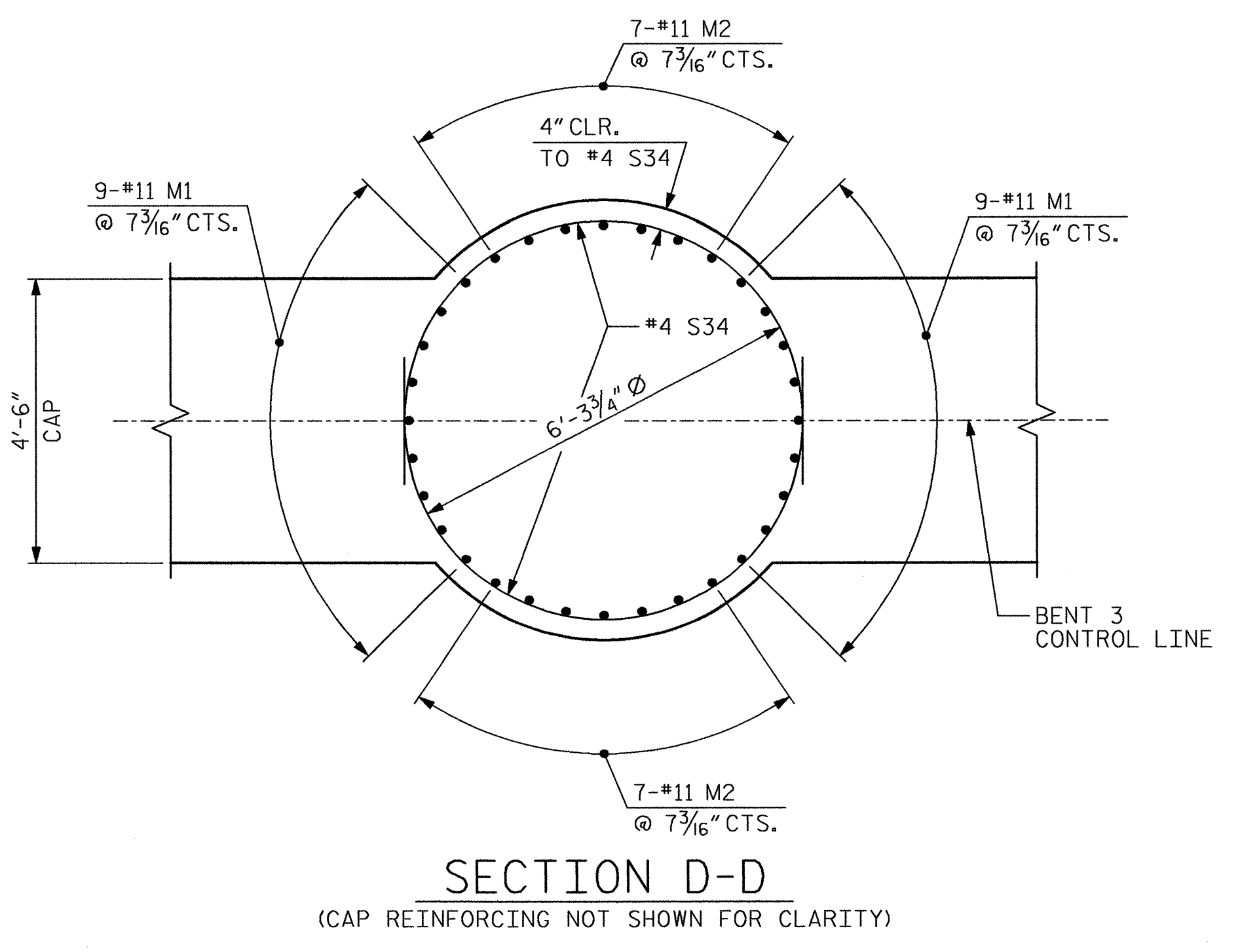
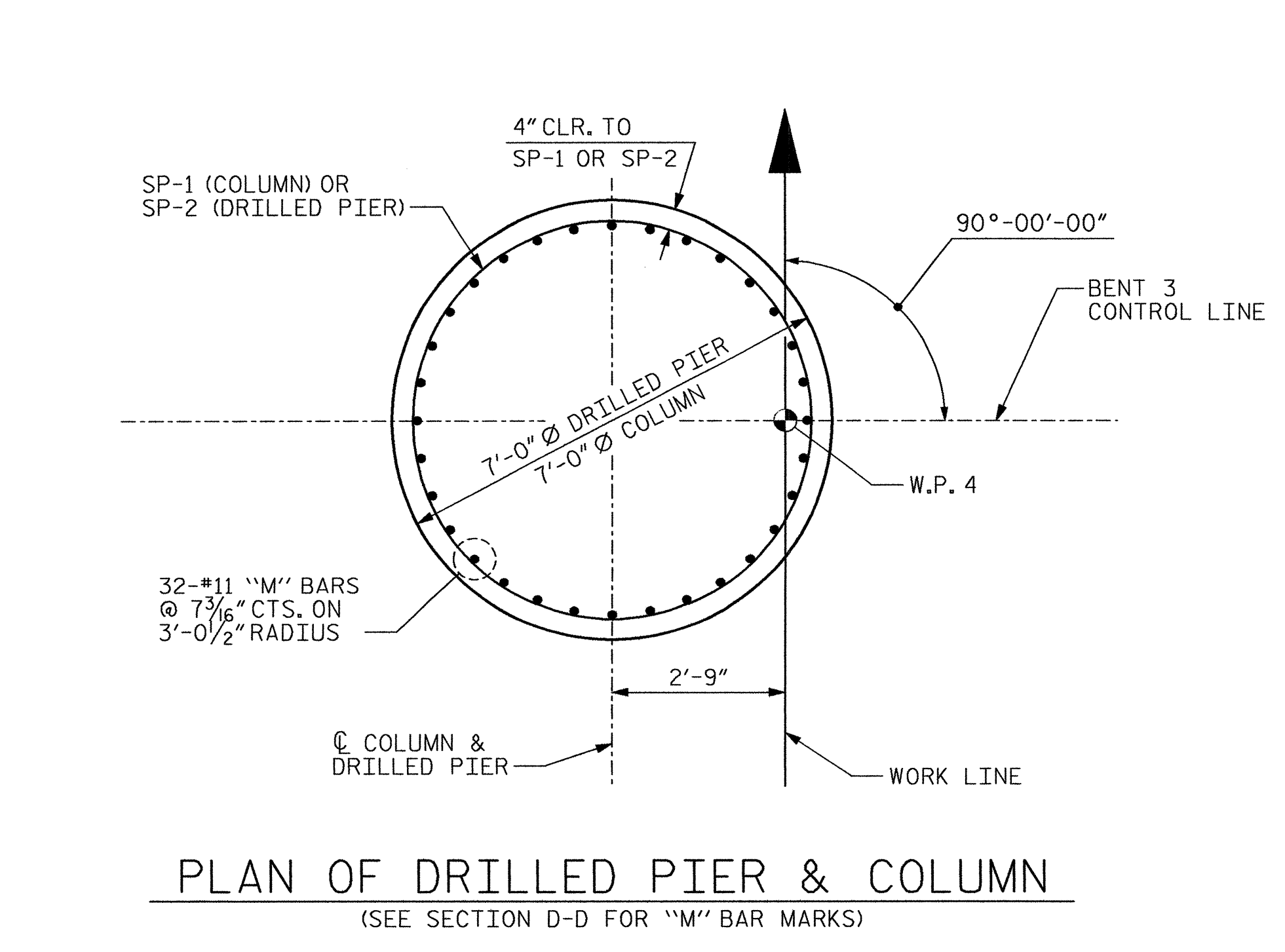
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 CHECKED BY: B.E. ATKINSON DATE: 03/12

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BILL OF MATERIAL											
BENT 3											
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	SIZE	TYPE	LENGTH	WEIGHT		
B1	20	#11	STR	37'-8"	4002	S19	4	#5	1	16'-11"	71
B2	10	#6	STR	37'-8"	566	S20	4	#5	1	17'-4"	72
B3	2	#6	STR	32'-2"	97	S21	4	#5	1	17'-10"	74
B4	2	#6	STR	24'-8"	74	S22	4	#5	1	18'-3"	76
B5	2	#6	STR	17'-2"	52	S23	4	#5	1	18'-8"	78
B6	10	#9	STR	15'-6"	527	S24	4	#5	1	19'-2"	80
B7	4	#9	2	20'-11"	284	S25	4	#5	1	19'-7"	82
B8	8	#4	STR	3'-6"	19	S26	4	#5	1	19'-10"	83
B9	10	#4	STR	4'-2"	28	S27	4	#5	1	20'-0"	83
						S28	4	#5	1	20'-3"	84
						S29	4	#5	1	20'-6"	86
						S30	4	#5	1	20'-8"	86
						S31	4	#5	1	20'-11"	87
						S32	4	#5	1	21'-2"	88
						S33	20	#5	1	21'-3"	443
						S34	30	#4	4	11'-11"	239
M1	36	#11	STR	39'-4"	7523	U1	32	#4	3	7'-2"	153
M2	28	#11	STR	40'-5"	6013	U2	8	#4	3	6'-6"	35
						U3	10	#4	3	7'-0"	47
S1	4	#5	1	11'-7"	48	SP-1	1	**	5	434'-11"	291
S2	4	#5	1	11'-10"	49	SP-2	1	***	6	2911'-4"	3037
S3	4	#5	1	12'-0"	50						
S4	4	#5	1	12'-3"	51						
S5	4	#5	1	12'-6"	52						
S6	4	#5	1	12'-8"	53						
S7	4	#5	1	12'-11"	54						
S8	4	#5	1	13'-2"	55						
S9	4	#5	1	13'-4"	56						
S10	4	#5	1	13'-7"	57						
S11	4	#5	1	13'-10"	58						
S12	4	#5	1	14'-0"	58						
S13	4	#5	1	14'-3"	59						
S14	4	#5	1	14'-8"	61						
S15	4	#5	1	15'-2"	63						
S16	4	#5	1	15'-7"	65						
S17	4	#5	1	16'-0"	67						
S18	4	#5	1	16'-6"	69						
REINFORCING STEEL 22,257 LBS.											
SPIRAL COLUMN REINFORCING STEEL 3,328 LBS.											
CLASS A CONCRETE BREAKDOWN											
POUR #2 (COLUMN) 6.8 C.Y.											
POUR #3 (CAP & PART COLUMN) 47.7 C.Y.											
TOTAL 54.5 C.Y.											
7'-0" Ø DRILLED PIER											
DRILLED PIER CONCRETE POUR 1 (DRILLED PIER) 86.9 C.Y.											
7'-0" Ø DRILLED PIER IN SOIL 45.00 LIN. FT.											
7'-0" Ø DRILLED PIER NOT IN SOIL 16.00 LIN. FT.											
PERMANENT STEEL CASING FOR 7'-0" Ø DRILLED PIER 20.8 LIN. FT.											
CSL TUBES 437.5 LIN. FT.											

STIRRUP HEIGHT TABLE					
BAR	"L"	BAR	"L"	BAR	"L"
S1	3'-9 1/2"	S12	5'-0"	S23	7'-4"
S2	3'-11"	S13	5'-1 1/2"	S24	7'-7"
S3	4'-0"	S14	5'-4"	S25	7'-9 1/2"
S4	4'-1 1/2"	S15	5'-7"	S26	7'-11"
S5	4'-3"	S16	5'-9 1/2"	S27	8'-0"
S6	4'-4"	S17	6'-0"	S28	8'-1 1/2"
S7	4'-5 1/2"	S18	6'-3"	S29	8'-3"
S8	4'-7"	S19	6'-5 1/2"	S30	8'-4"
S9	4'-8"	S20	6'-8"	S31	8'-5 1/2"
S10	4'-9 1/2"	S21	6'-11"	S32	8'-7"
S11	4'-11"	S22	7'-1 1/2"	S33	8'-7 1/2"



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

PROJECT NO. B-4752
 GASTON COUNTY
 STATION: 18+54.00 -L-
 SHEET 2 OF 2



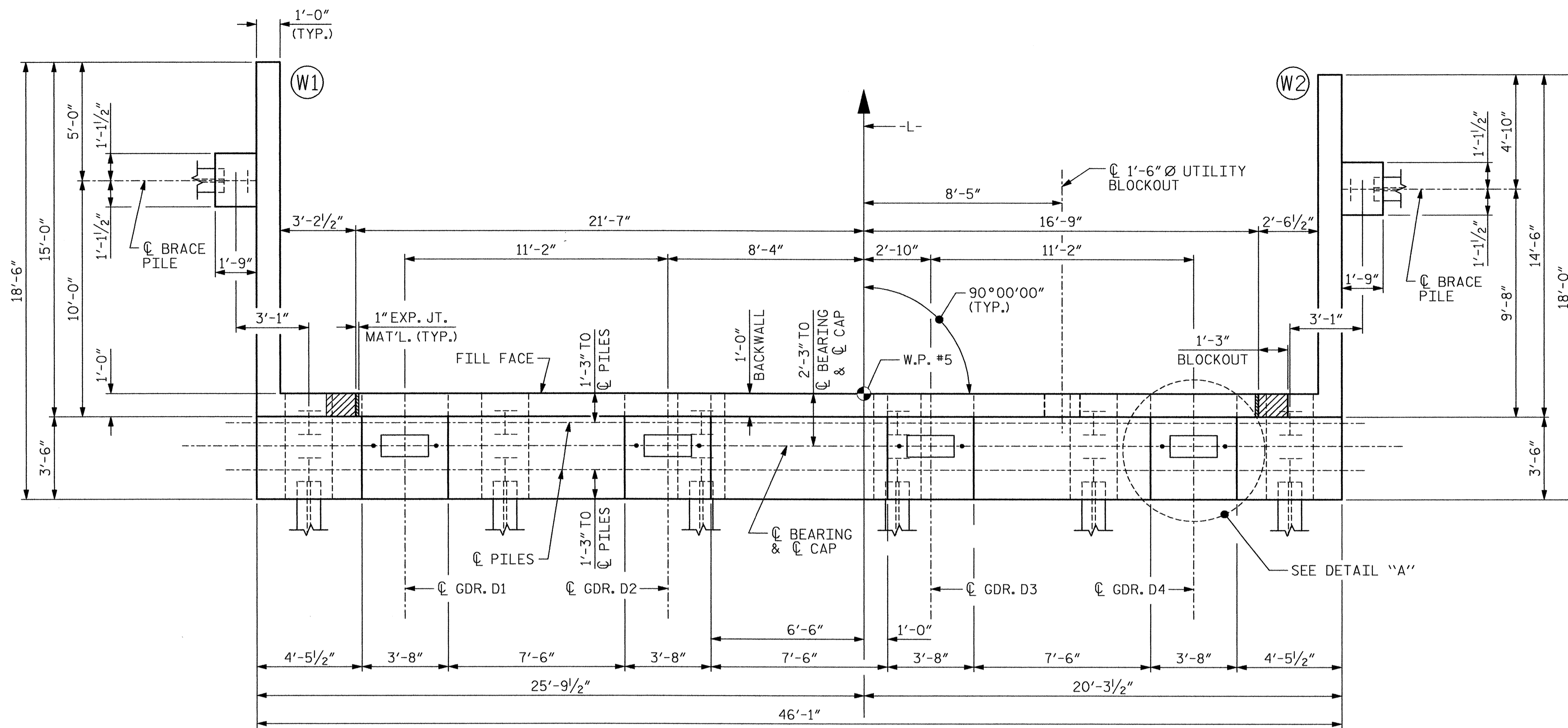
STATE OF NORTH CAROLINA			
DEPARTMENT OF TRANSPORTATION			
RALEIGH			
SUBSTRUCTURE			
BENT 3			
SECTION AND DETAILS			

DRAWN BY: B.E. LANNING DATE: 03/12
 CHECKED BY: B.E. ATKINSON DATE: 03/12

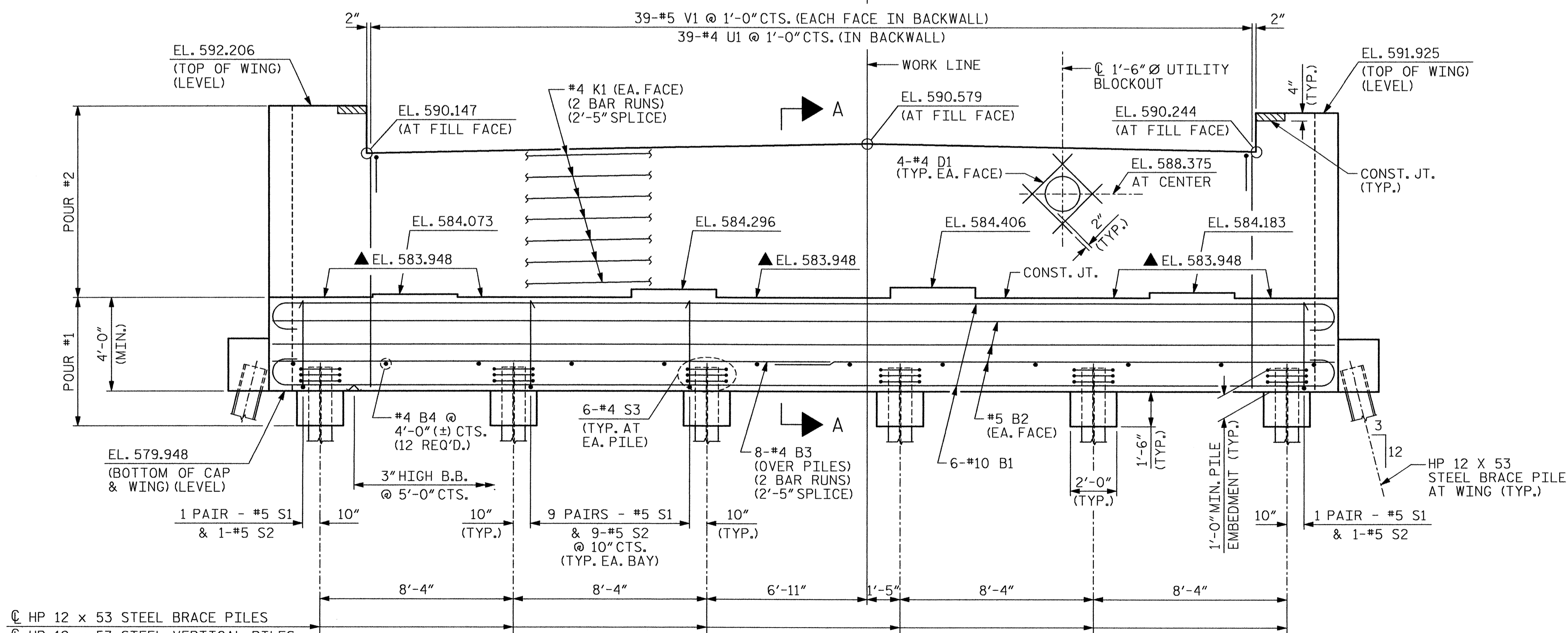
MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER: P-0671

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

TOTAL SHEETS 46



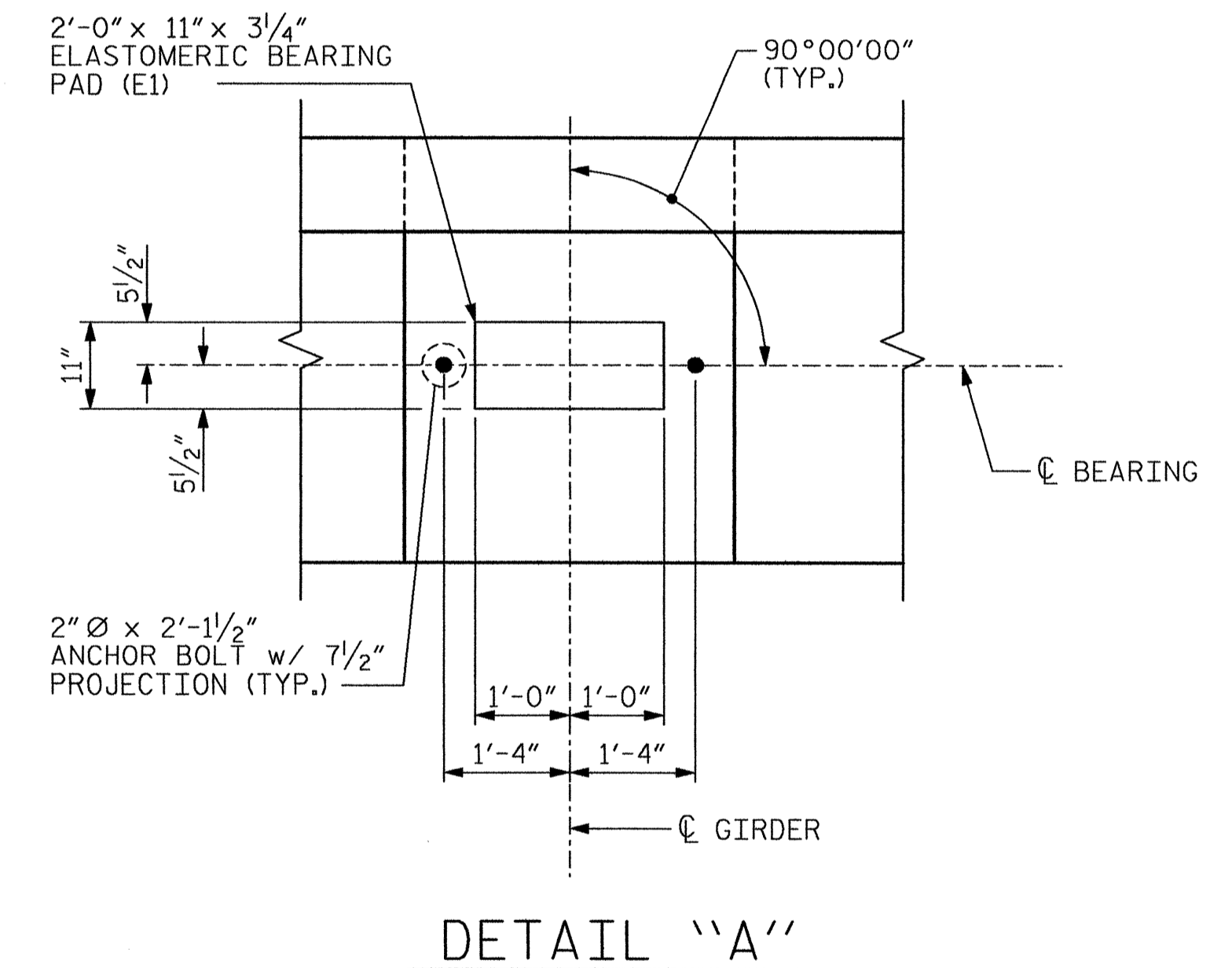
PLAN



ELEVATION

NOTES

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- #5 V1 BARS IN BACKWALL SHALL BE PLACED 2" CLEAR FROM THE TOP OF BACKWALL. BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
- THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
- THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.
- ▲ FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS, SEE SECTION A-A ON SHEET 3 OF 3.
- THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" Ø DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.
- FOR SECTION A-A, PILE SPLICE DETAILS AND TEMPORARY DRAINAGE DETAILS, SEE SHEET 3 OF 3.
- THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE PARAPET AND END POST ARE CAST IF SLIP FORMING IS USED.
- REINFORCING STEEL IN BACKWALL SHALL BE SHIFTED OR CUT AS NECESSARY FOR THE UTILITY BLOCKOUT.
- SEE SPECIAL PROVISION FOR INSTALLATION OF 12 INCH WATER MAIN.

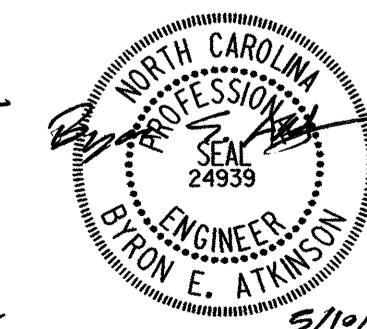


DETAIL "A"

PROJECT NO. B-4752
GASTON COUNTY
 STATION: 18+54.00 -L-

SHEET 1 OF 3

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



MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27806
 (919) 851-6606
 FIRM PE NUMBER: P-0671

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-40
1			3			TOTAL SHEETS
2			4			46

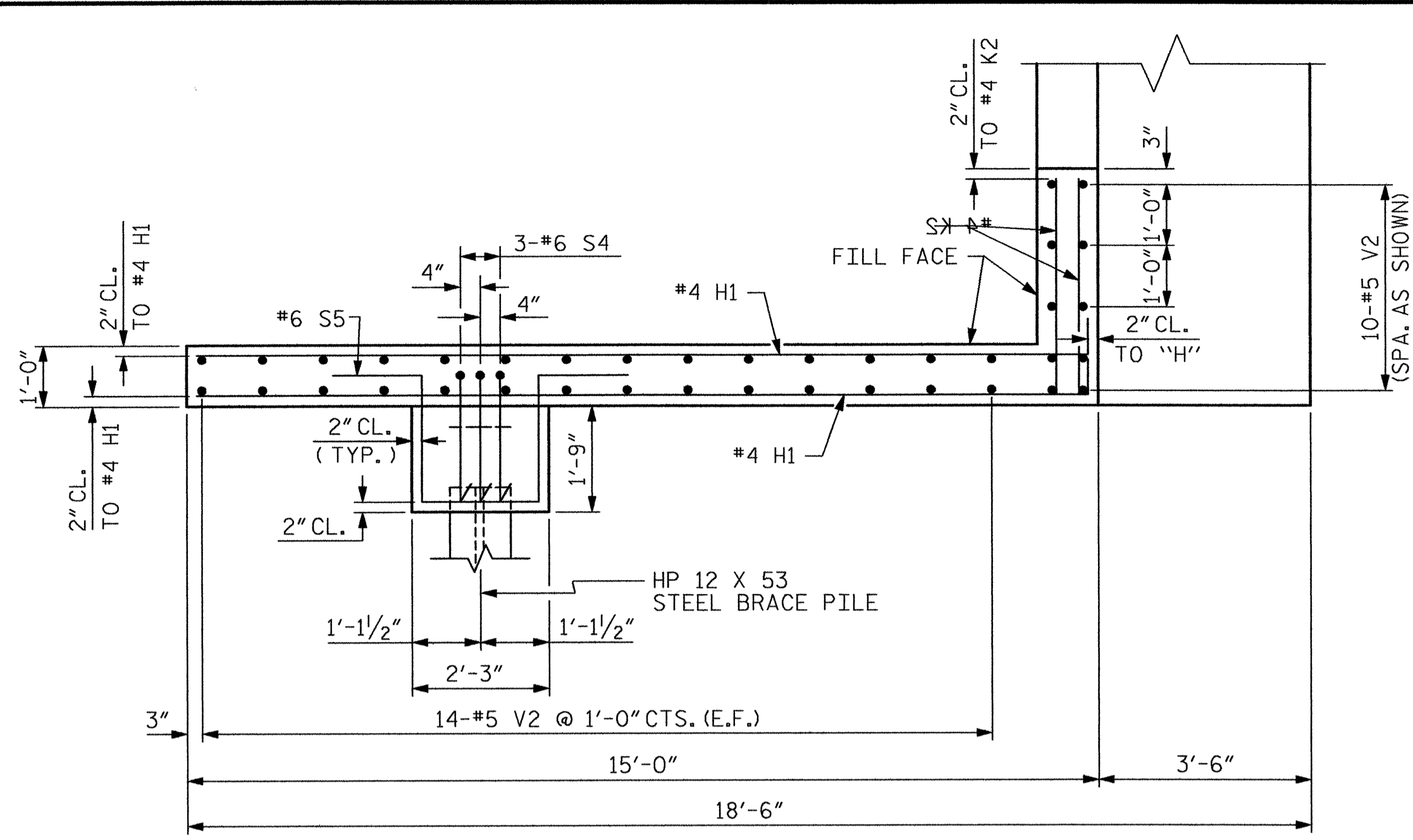
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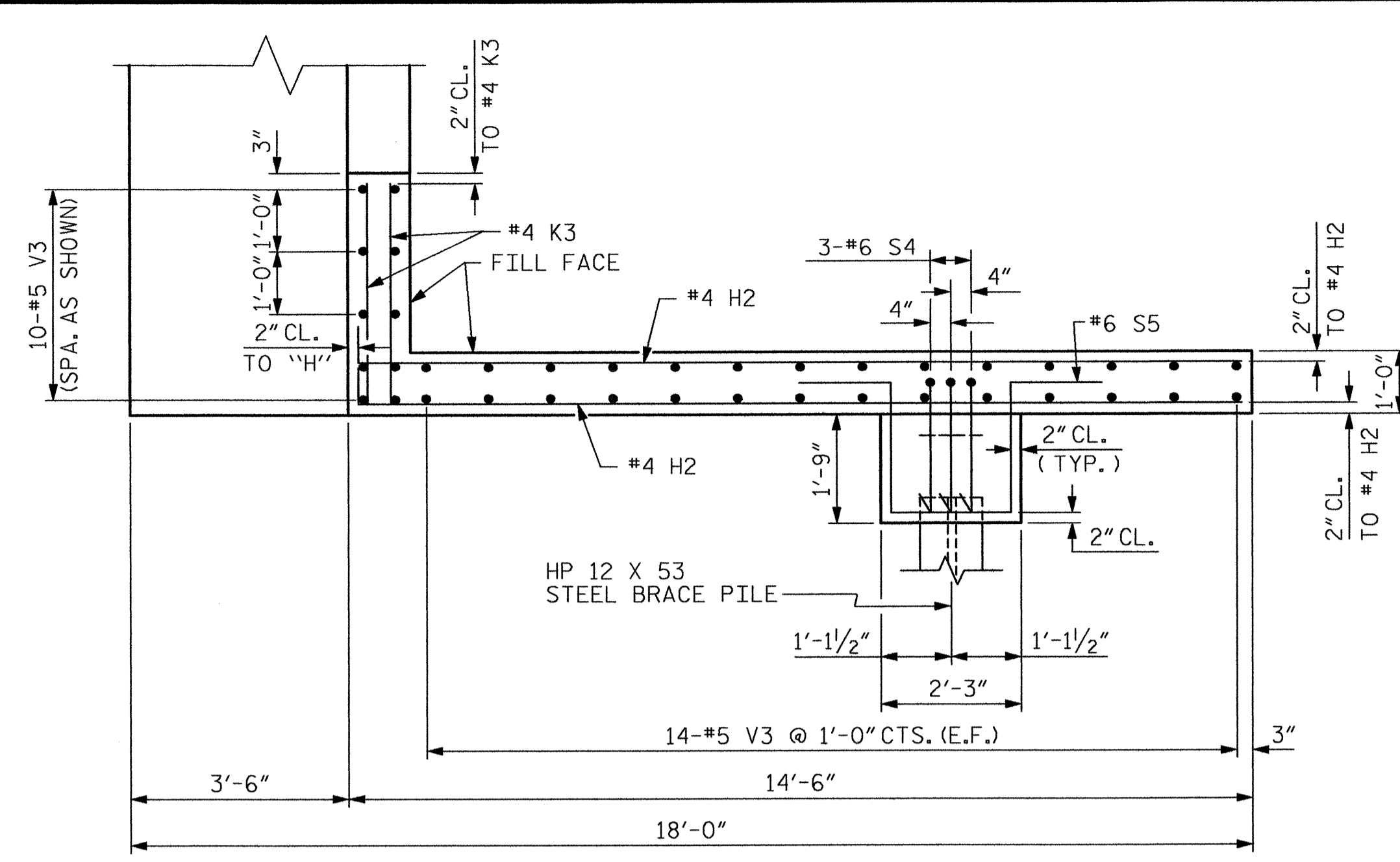
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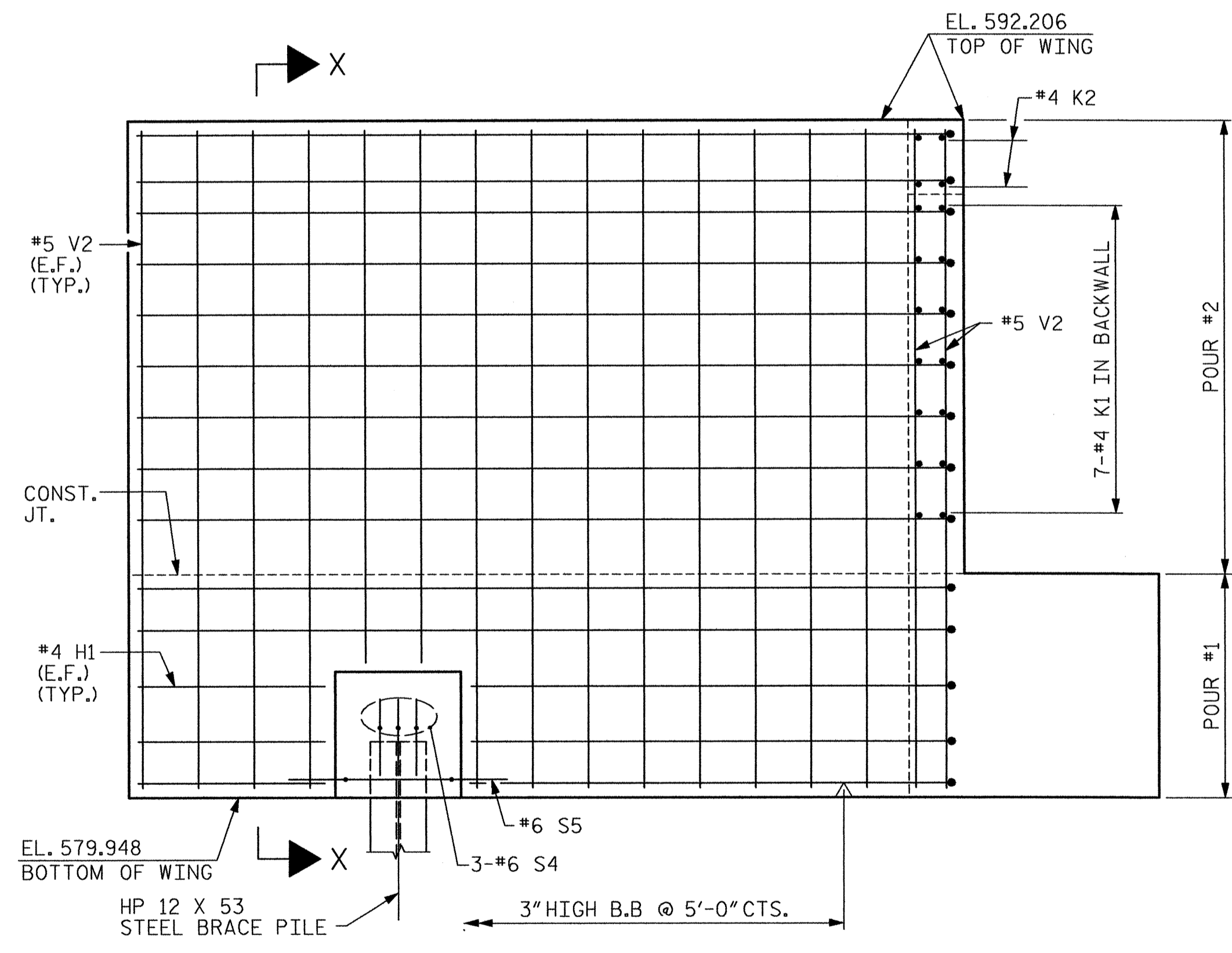
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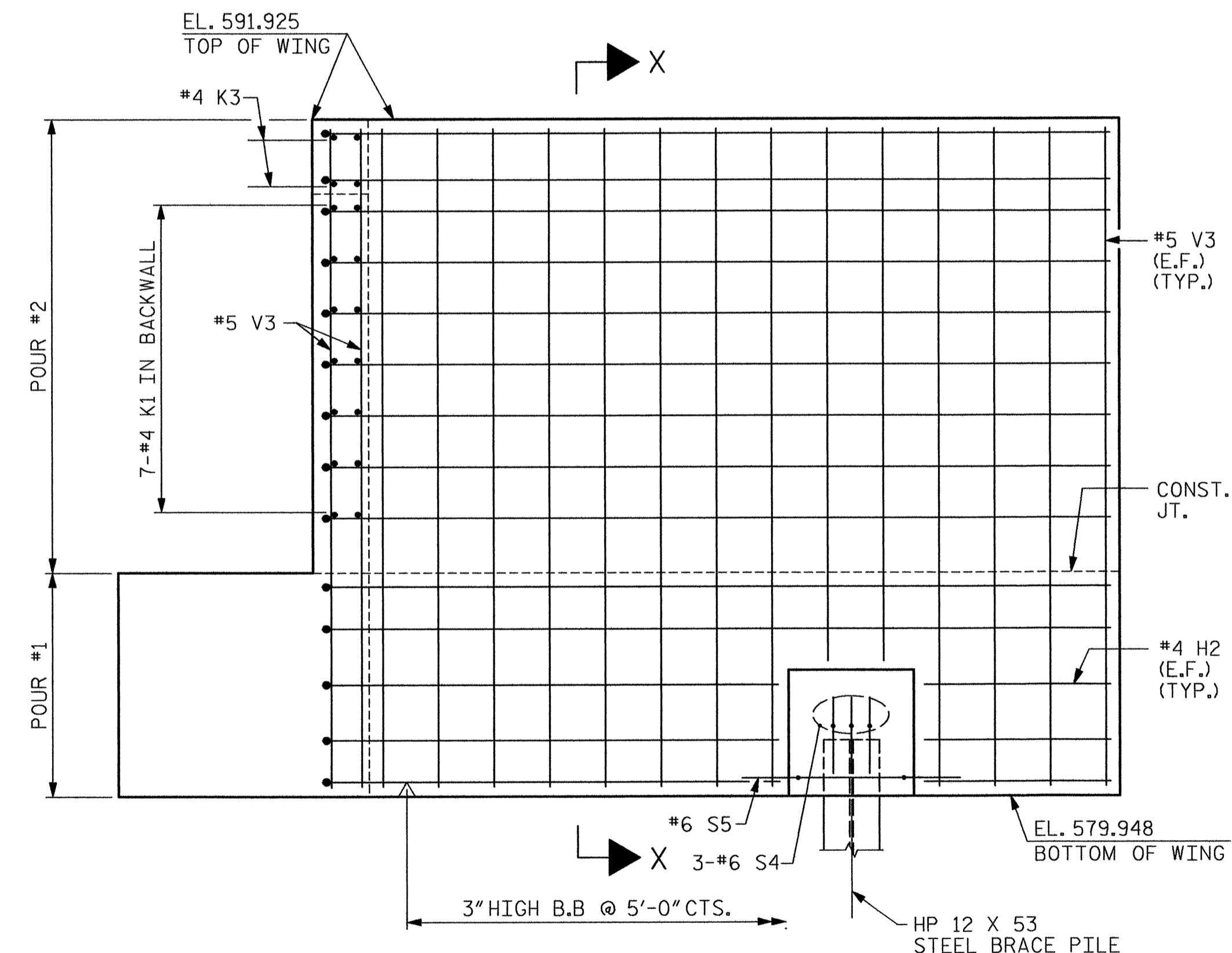
PLAN OF WING (W1)



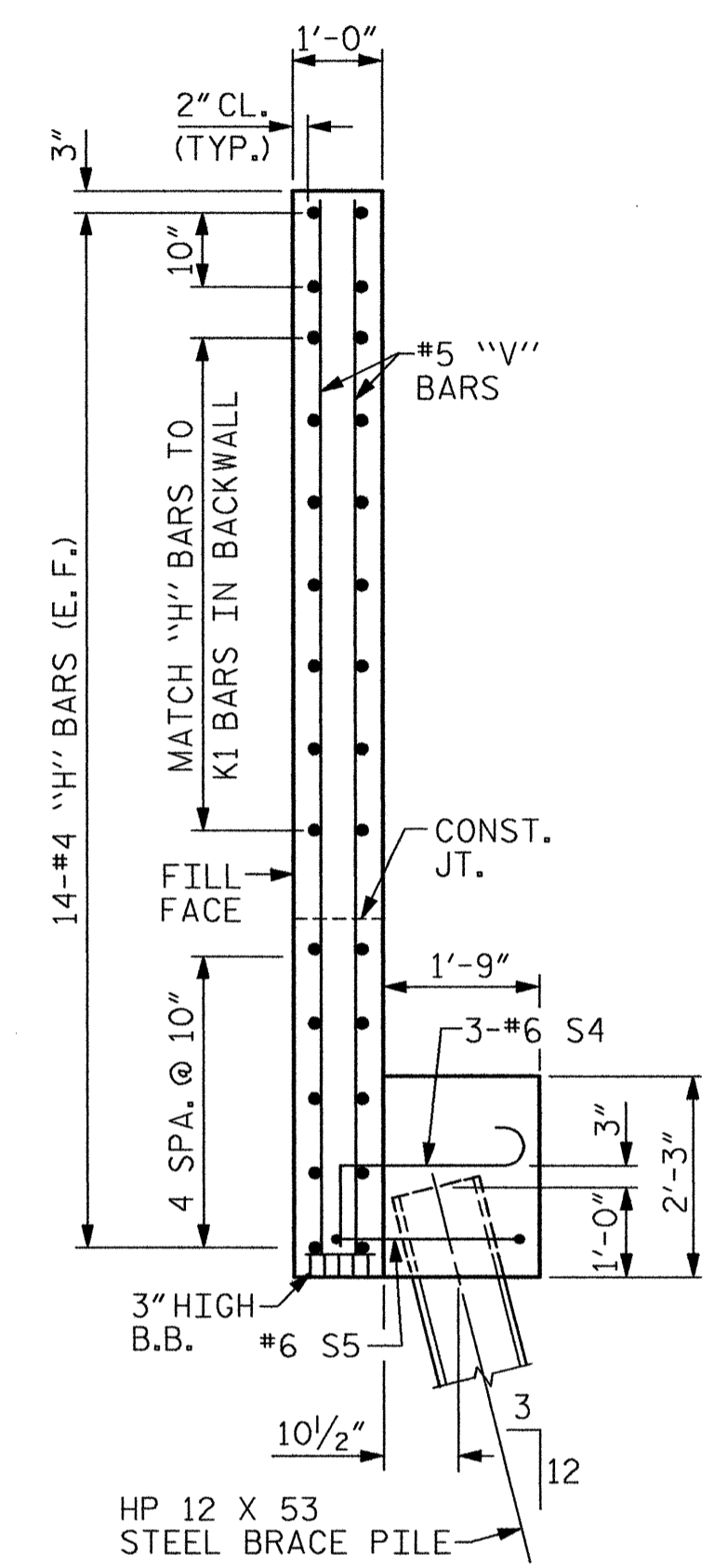
PLAN OF WING (W2)



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)



SECTION X-X

PROJECT NO. B-4752
GASTON COUNTY
 STATION: 18+54.00 -L-

SHEET 2 OF 3

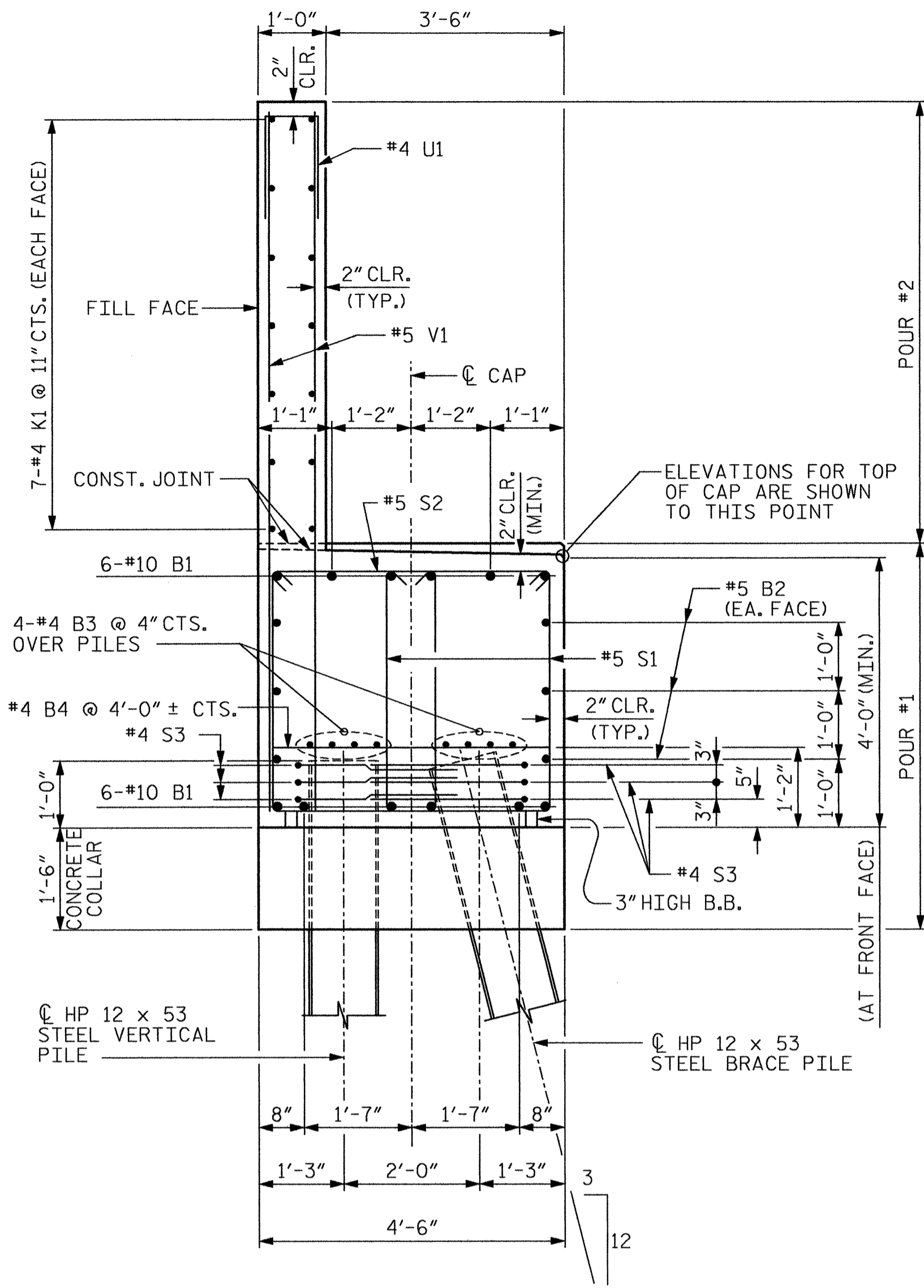
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT 2

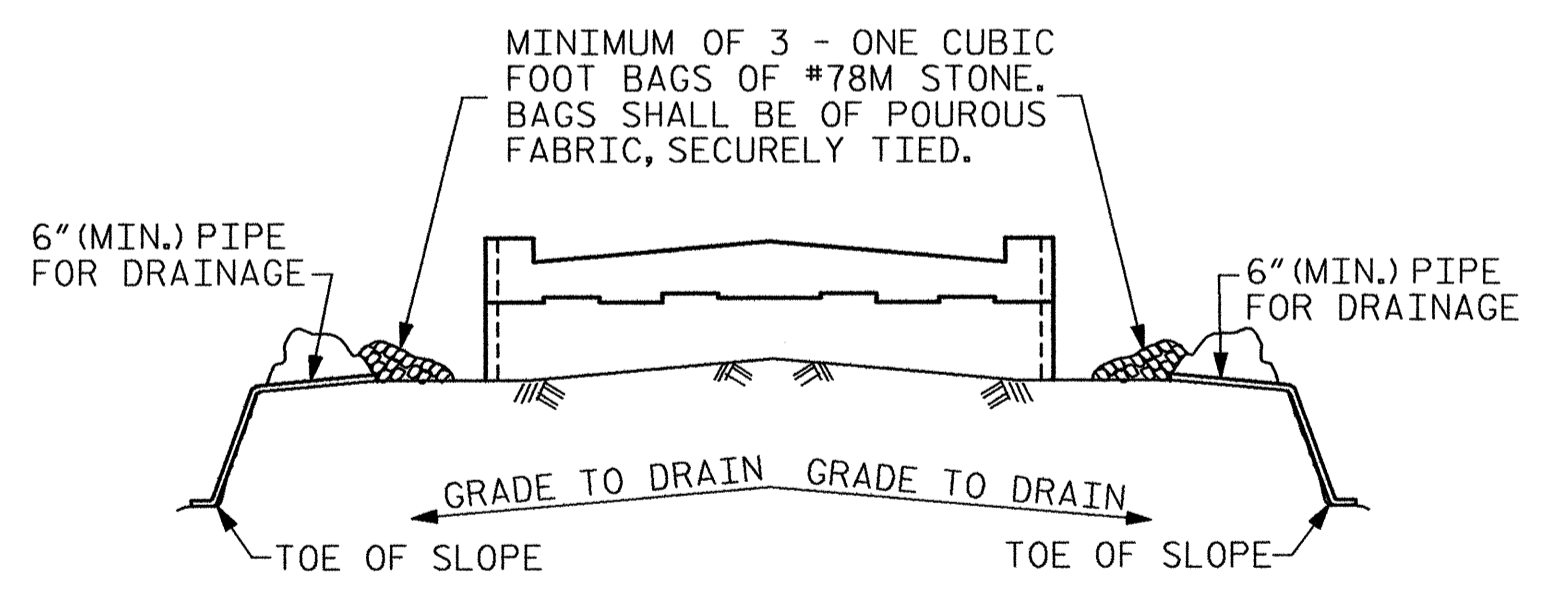


MI ENGINEERING 1011 SCHAUB DRIVE, SUITE 100 RALEIGH, NC 27606 (919) 851-6606 FIRM PE NUMBER: P-0671		REVISIONS			SHEET NO. S-41
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
TOTAL SHEETS					46

DRAWN BY : B.E. ATKINSON DATE : 03/12
 CHECKED BY : M. ISRAELNAIM DATE : 03/12



SECTION A-A

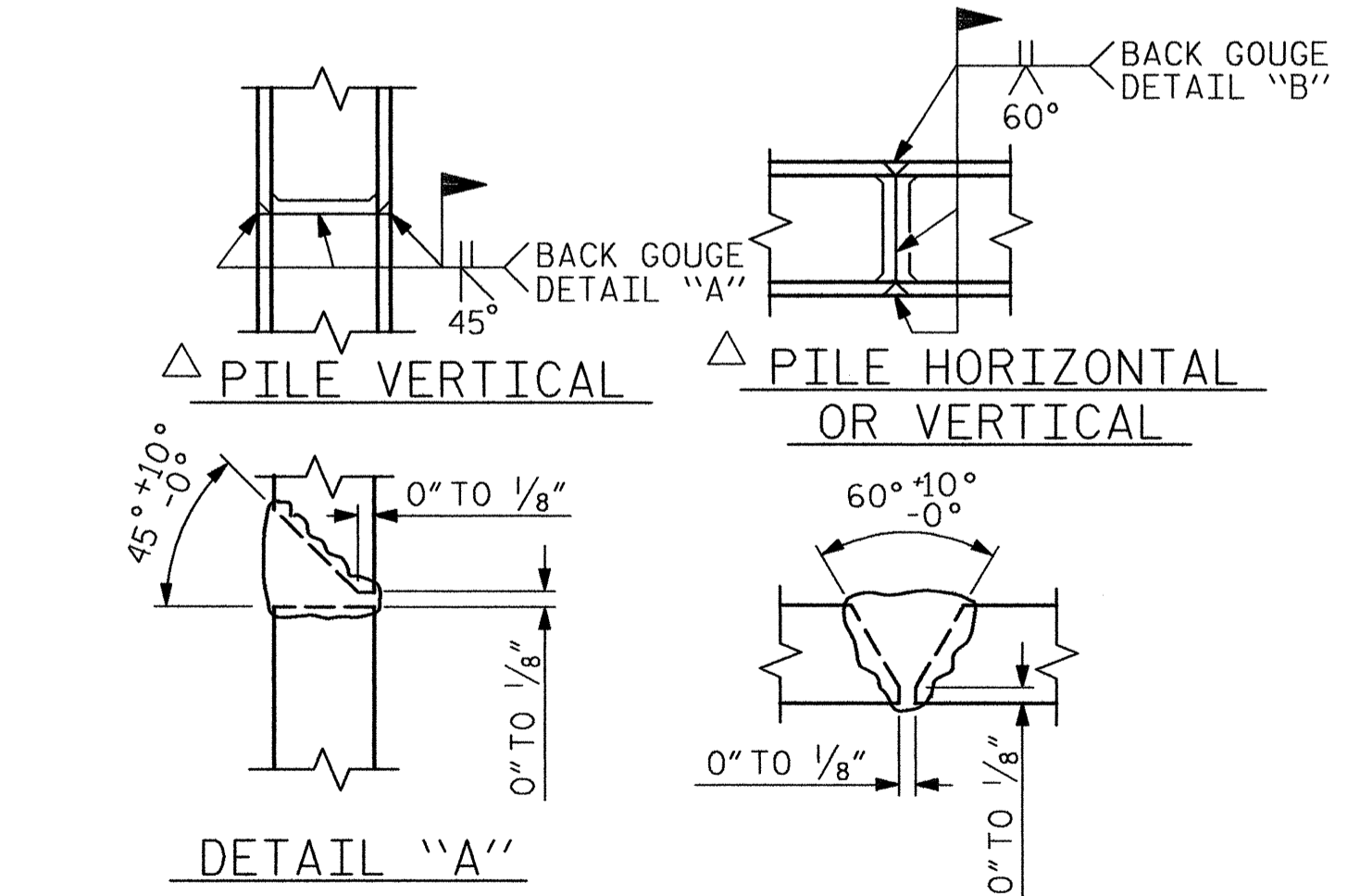


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

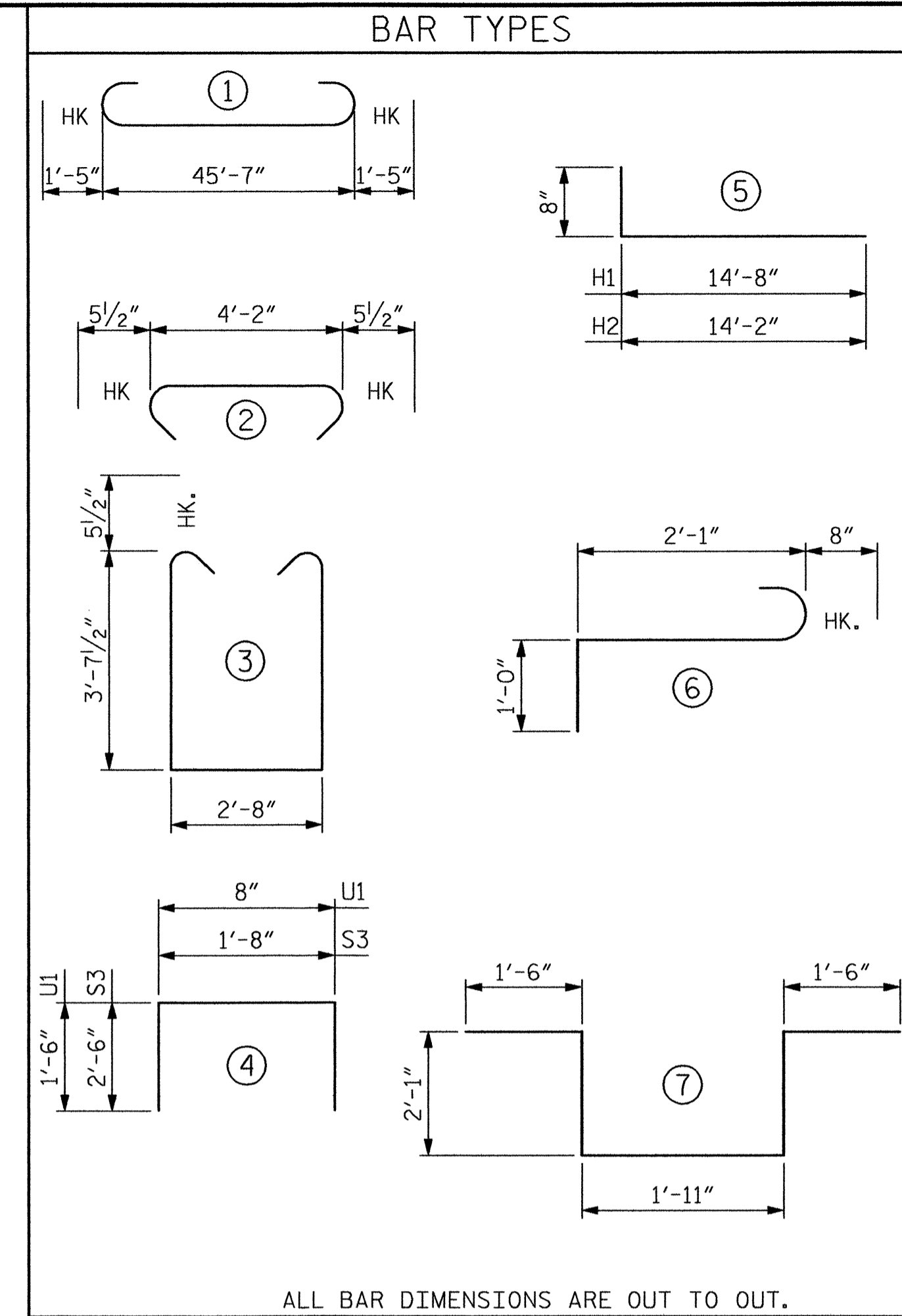
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

TEMPORARY DRAINAGE AT END BENT



POSITION OF PILE DURING WELDING. PILE SPLICE DETAILS



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#10		48'-5"	2500
B2	6	#5	STR	45'-9"	286
B3	16	#4	STR	24'-1"	257
B4	12	#4	STR	4'-2"	33
D1	8	#4	STR	3'-6"	19
H1	28	#4	5	15'-4"	287
H2	28	#4	5	14'-10"	277
K1	28	#4	STR	24'-1"	450
K2	4	#4	STR	3'-10"	10
K3	4	#4	STR	3'-2"	8
S1	94	#5	3	10'-10"	1062
S2	47	#5	2	5'-1"	249
S3	36	#4	4	6'-8"	160
S4	6	#6	6	3'-9"	34
S5	2	#6	7	9'-1"	27
U1	39	#4	4	3'-8"	96
V1	78	#5	STR	9'-10"	800
V2	38	#5	STR	11'-11"	472
V3	38	#5	STR	11'-7"	459
REINFORCING STEEL					7,486 LBS.
CLASS A CONCRETE BREAKDOWN					
POUR #1 (CAP, COLLARS & LOWER WING)					39.5 C.Y.
POUR #2 (BACKWALL & UPPER WING)					19.4 C.Y.
TOTAL CLASS A CONCRETE					58.9 C.Y.
HP 12 x 53 STEEL PILES NO. 14					812 LIN. FT.
STEEL PILE POINTS					14 EACH

PROJECT NO. B-4752
 GASTON COUNTY
 STATION: 18+54.00 -L-
 SHEET 3 OF 3

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



NO.	REVISIONS			SHEET NO.
	BY:	DATE:	DATE:	
1				S-42
2				TOTAL SHEETS: 46

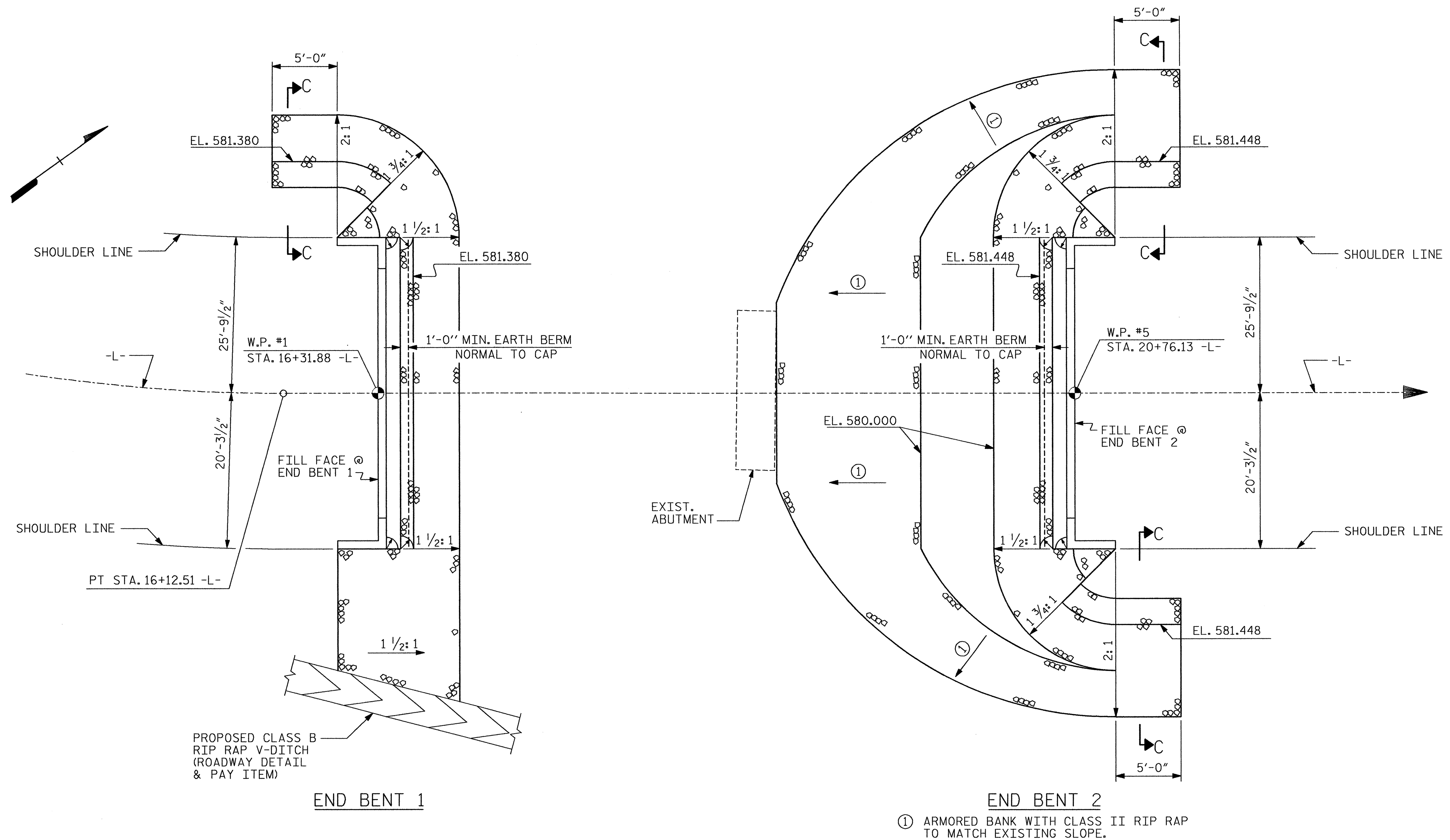
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 CHECKED BY: M. ISRAELNAIM DATE: 03/12

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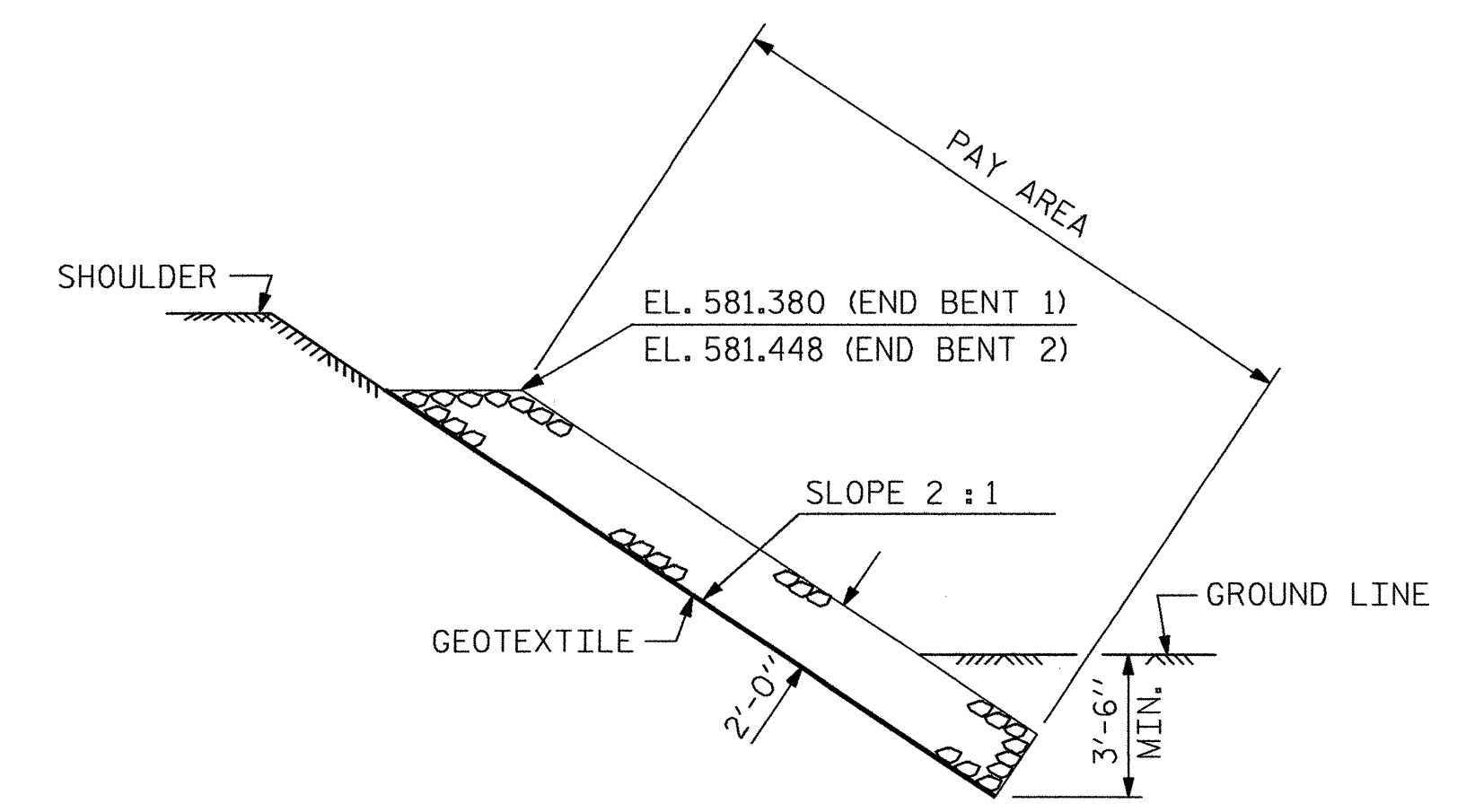
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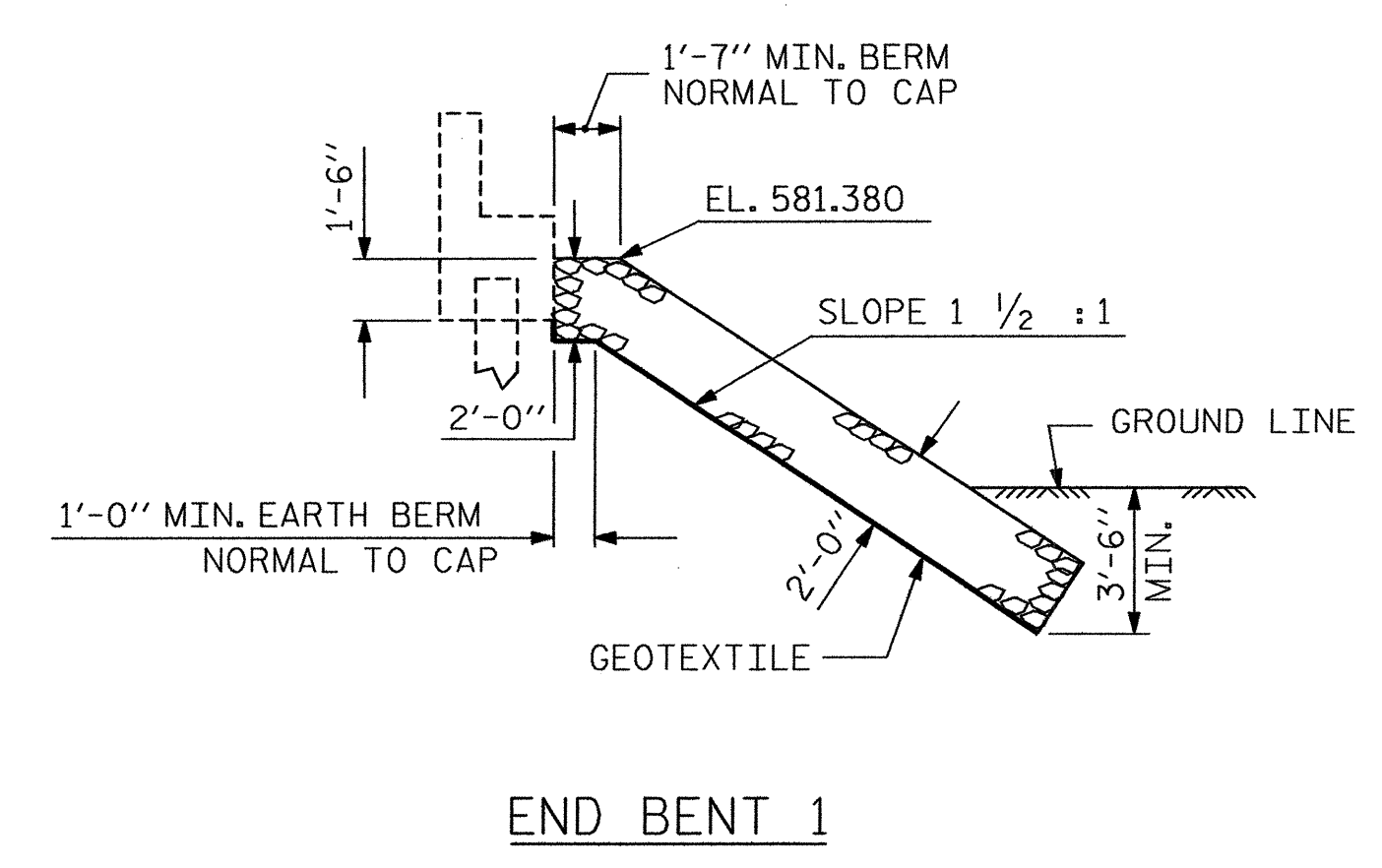


PLAN

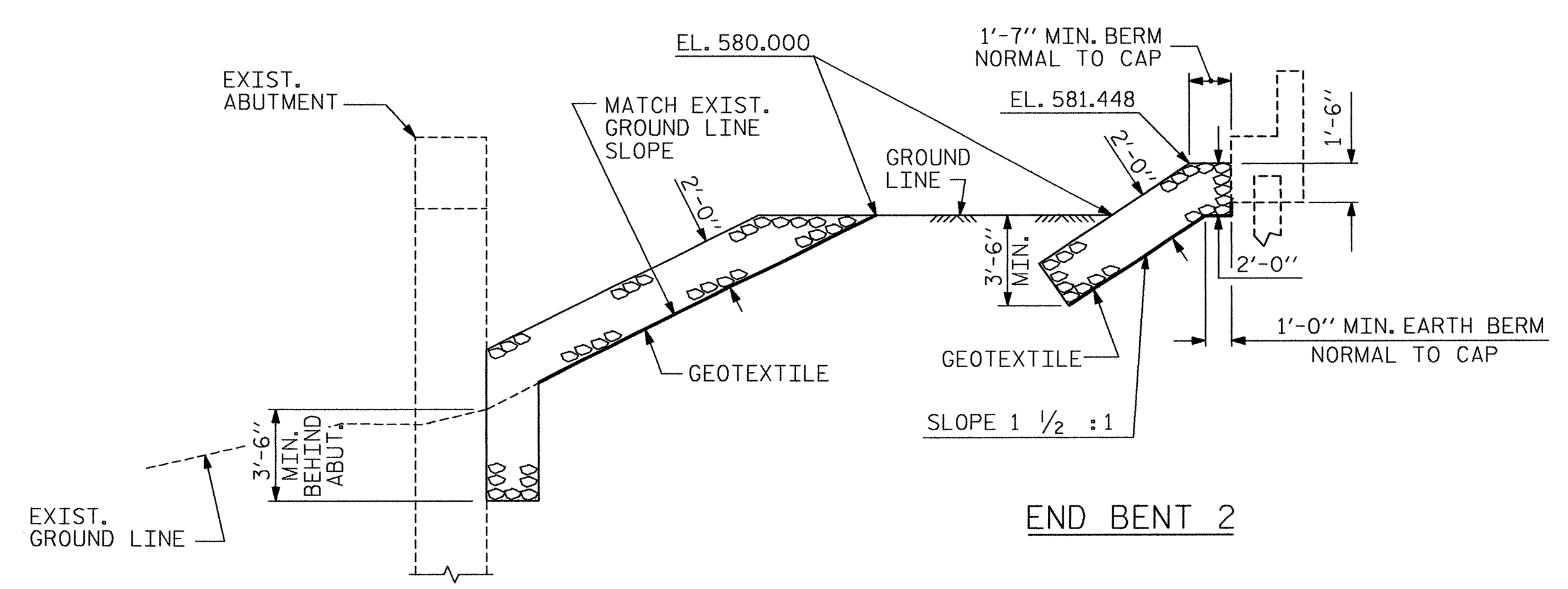
ESTIMATED QUANTITIES		
BRIDGE @ STA. 18+54.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	630	700
END BENT 2	1280	1420



SECTION C-C



END BENT 1

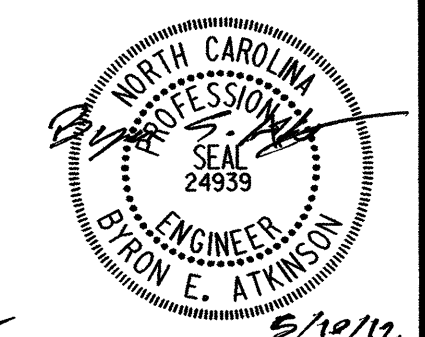
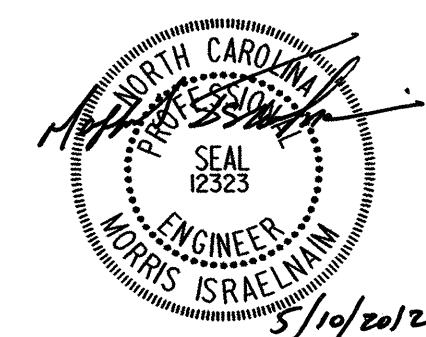


END BENT 2

SECTION
BERM RIP RAPPED

PROJECT NO. B-4752
GASTON COUNTY
 STATION: 18+54.00 -L-

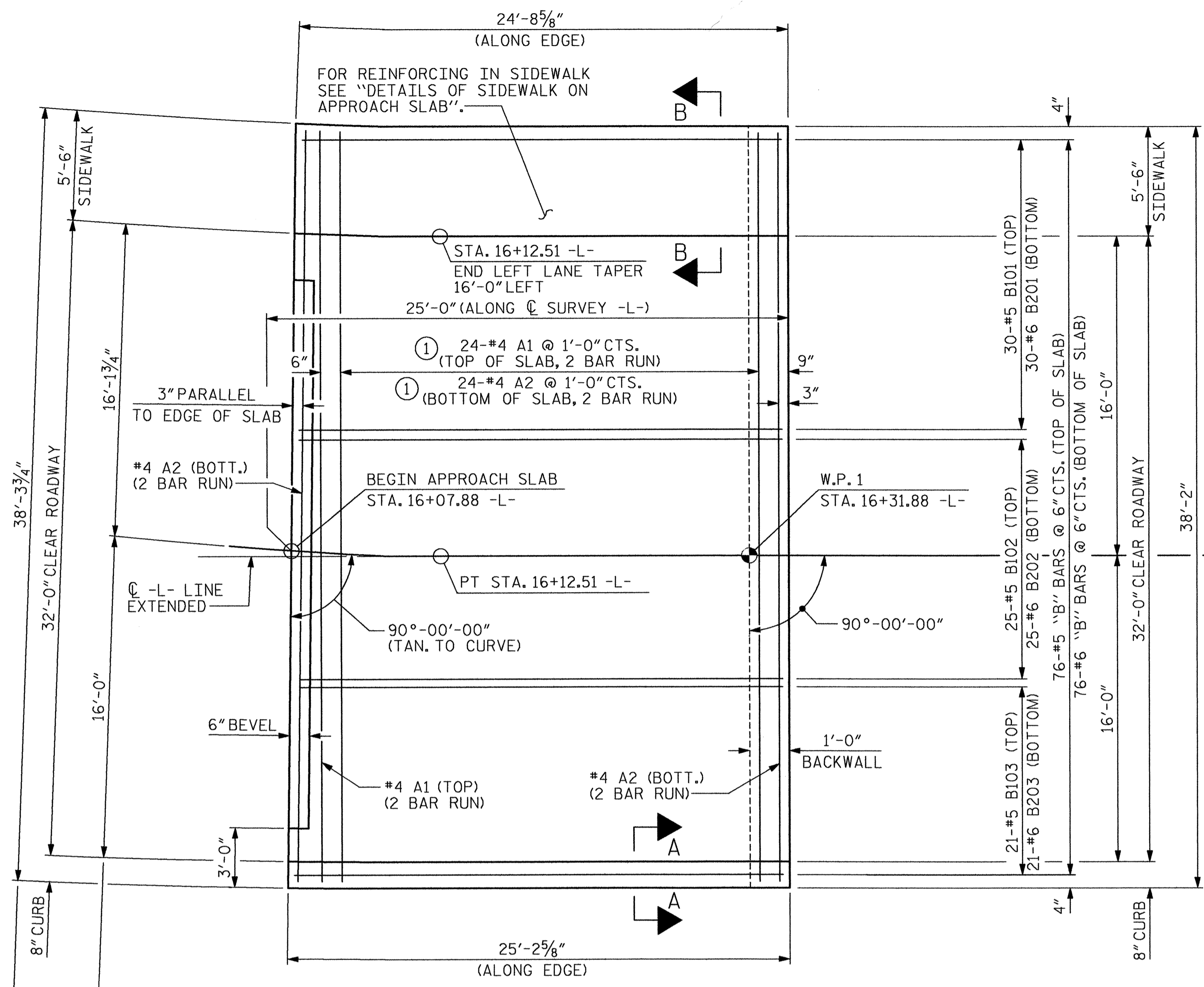
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 RIP RAP DETAILS



ASSEMBLED BY : B.E. ATKINSON	DATE : 03/12
CHECKED BY : M. ISRAELNAIM	DATE : 03/12
DRAWN BY : REK 1/84	REV. 5/1/06R TLA/GM
CHECKED BY : RDU 1/84	REV. 10/1/11 MAA/GM
	REV. 12/21/11 MAA/GM

MI ENGINEERING 1011 SCHUB DRIVE, SUITE 100 RALEIGH, NC 27606 (919) 851-6606 FIRM PE NUMBER : P-0671	REVISIONS			SHEET NO. S-43 TOTAL SHEETS 46
	NO.	BY:	DATE:	
	1			
	2			

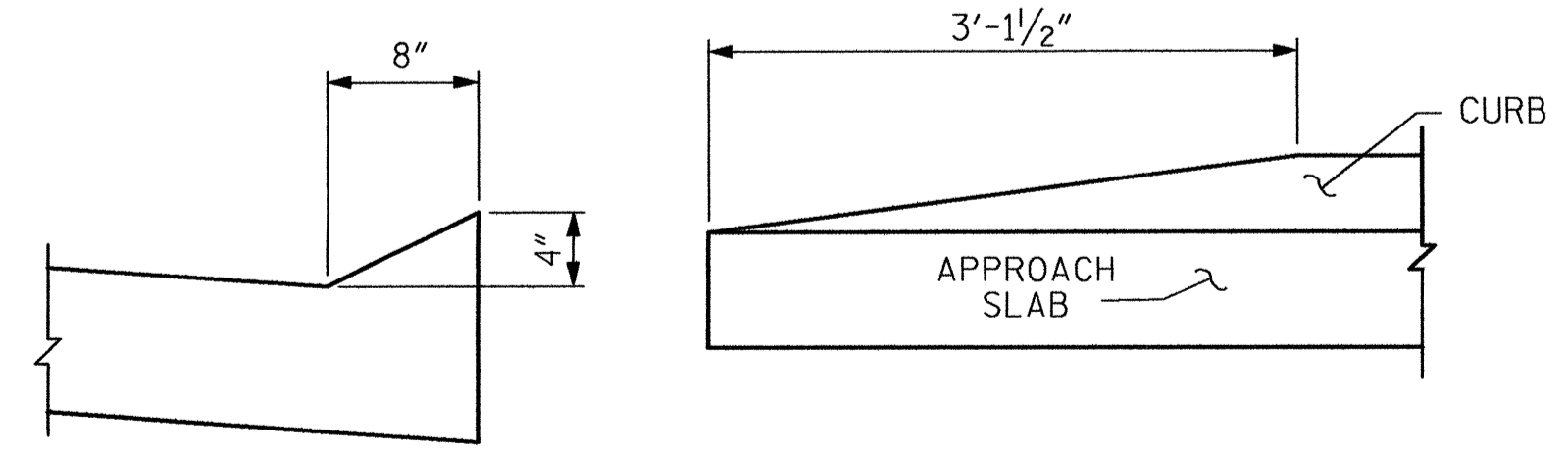
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PLAN AT END BENT 1

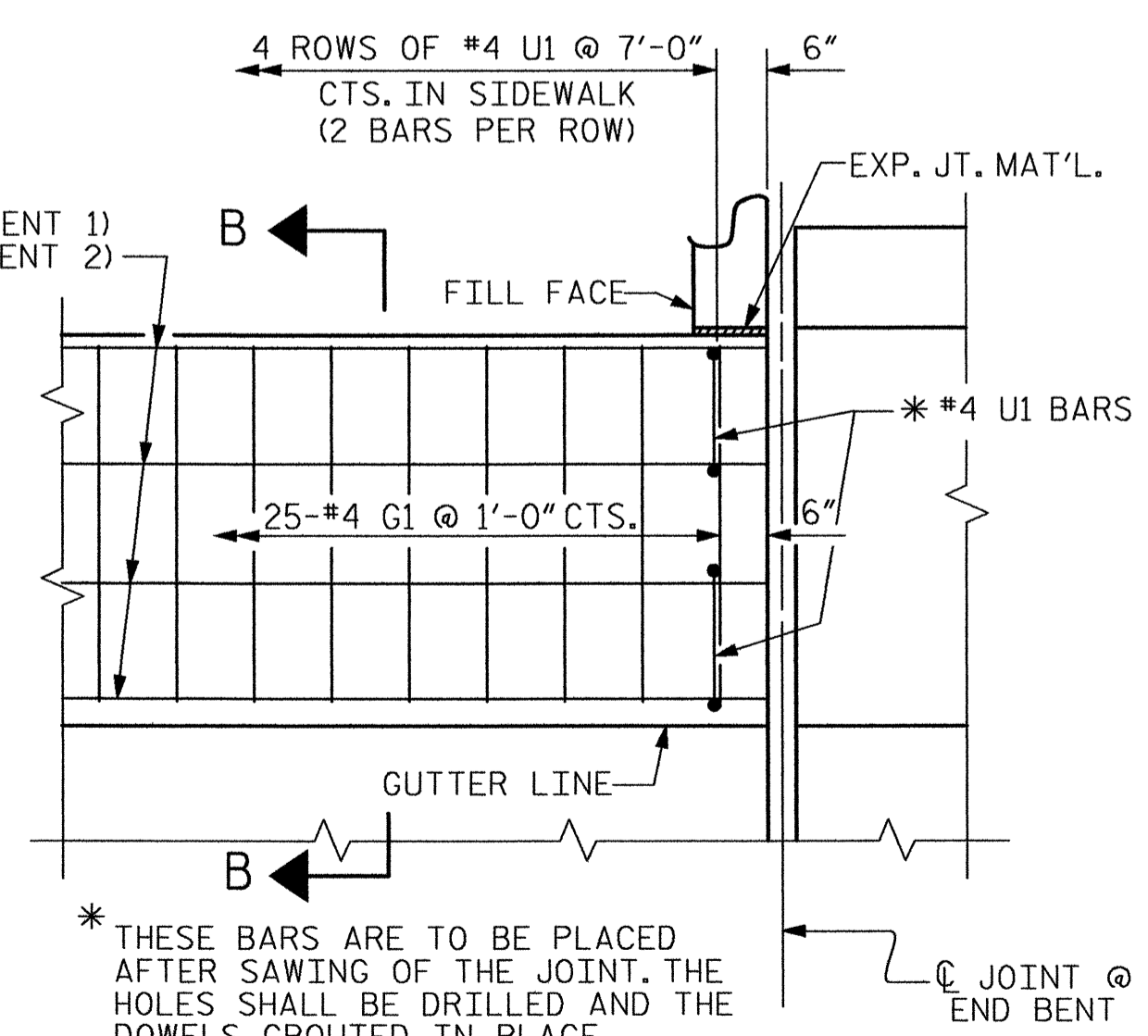
BLOCKOUT FOR ELASTOMERIC CONCRETE NOT SHOWN FOR CLARITY

(1) (PLACED ALONG C SURVEY -L- AND -L- LINE EXTENDED)



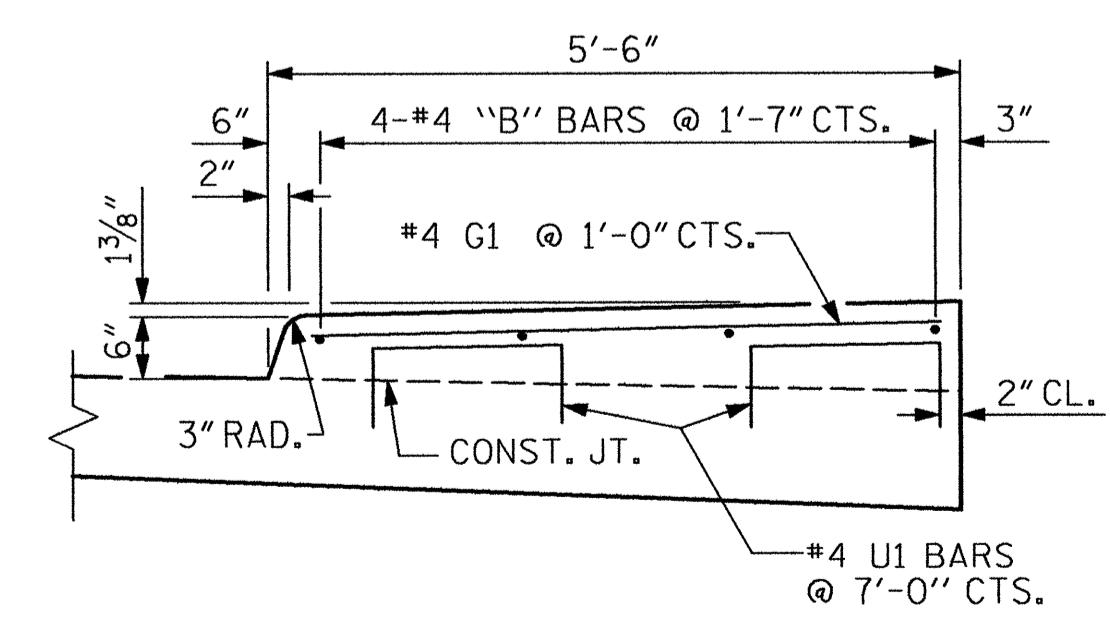
END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS



PLAN

DETAILS OF SIDEWALK ON APPROACH SLAB



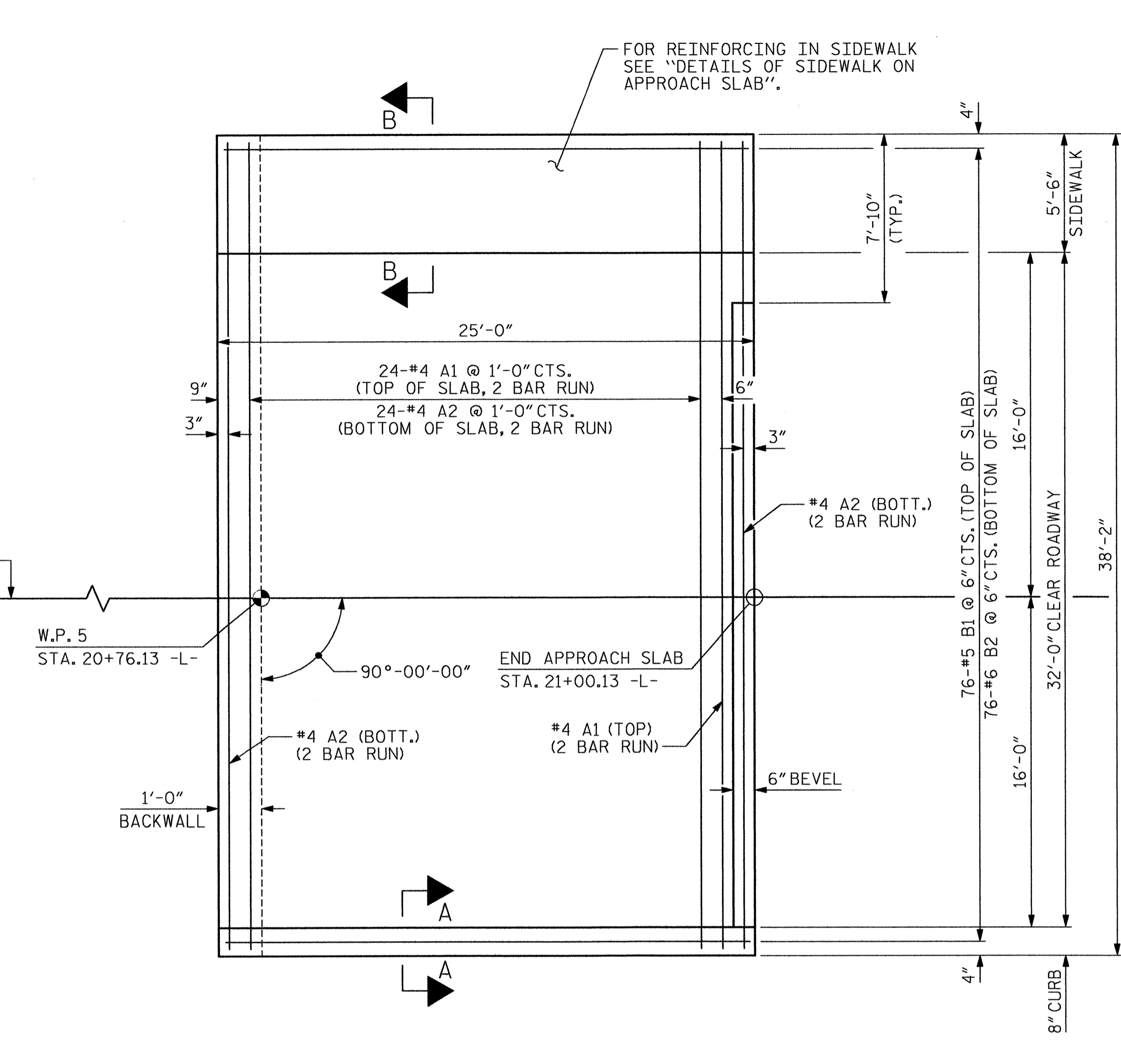
SECTION B-B

DETAILS OF SIDEWALK ON APPROACH SLAB

PLAN AT END BENT 2

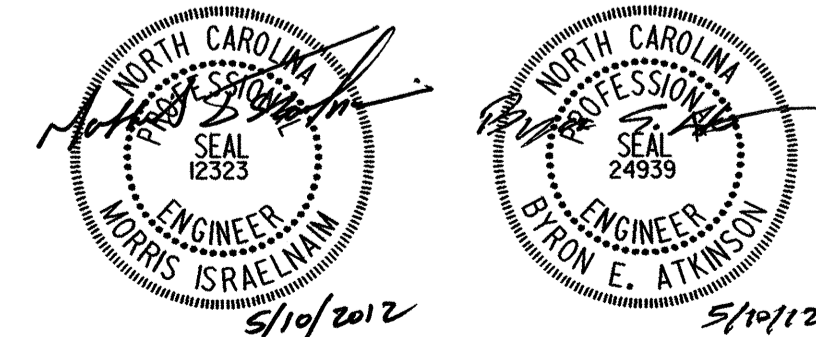
BLOCKOUT FOR ELASTOMERIC CONCRETE NOT SHOWN FOR CLARITY

(1) (PLACED ALONG C SURVEY -L- AND -L- LINE EXTENDED)



PROJECT NO. B-4752
GASTON COUNTY
 STATION: 18+54.00 -L-
 SHEET 1 OF 3

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



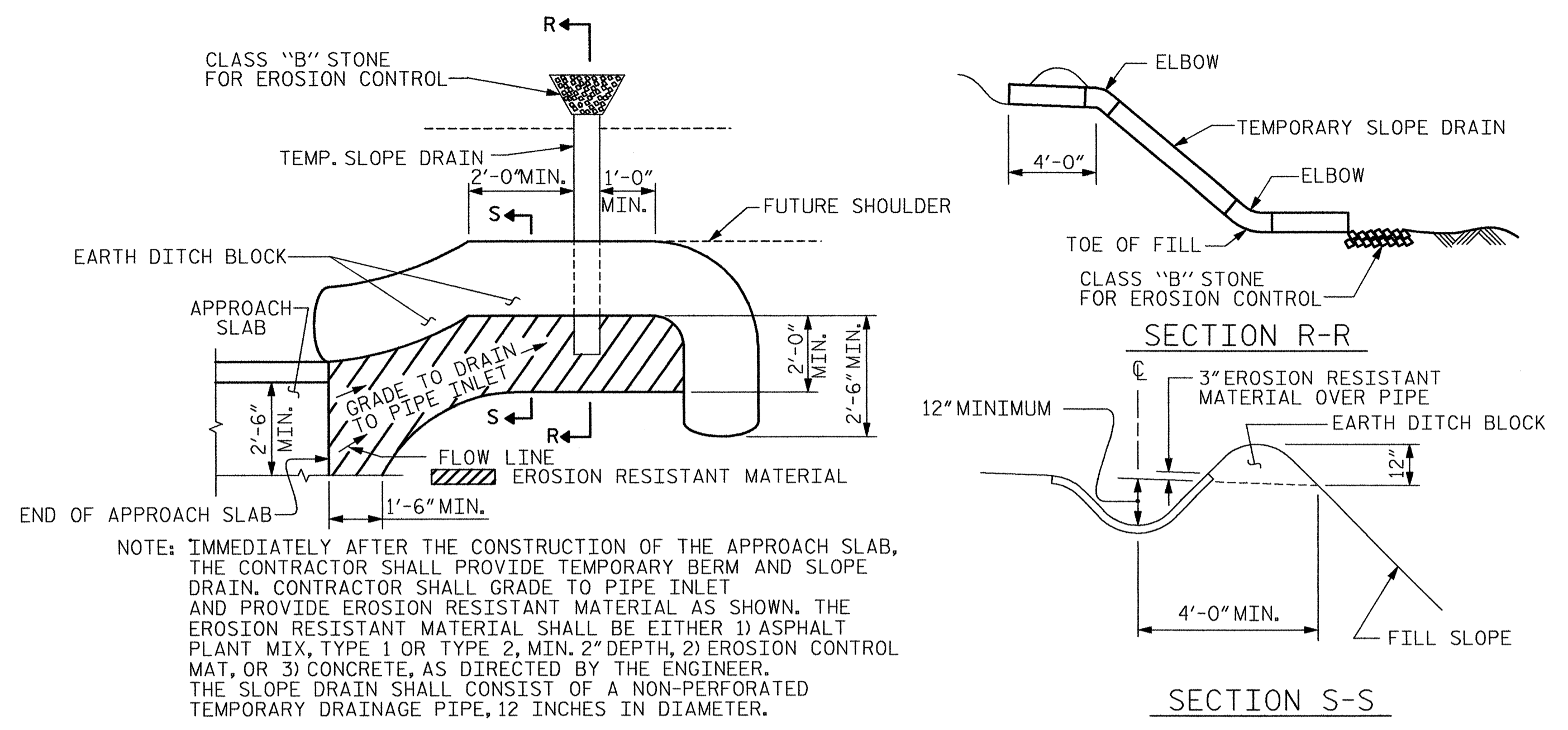
MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER : P-0671

REVISIONS				SHEET NO.
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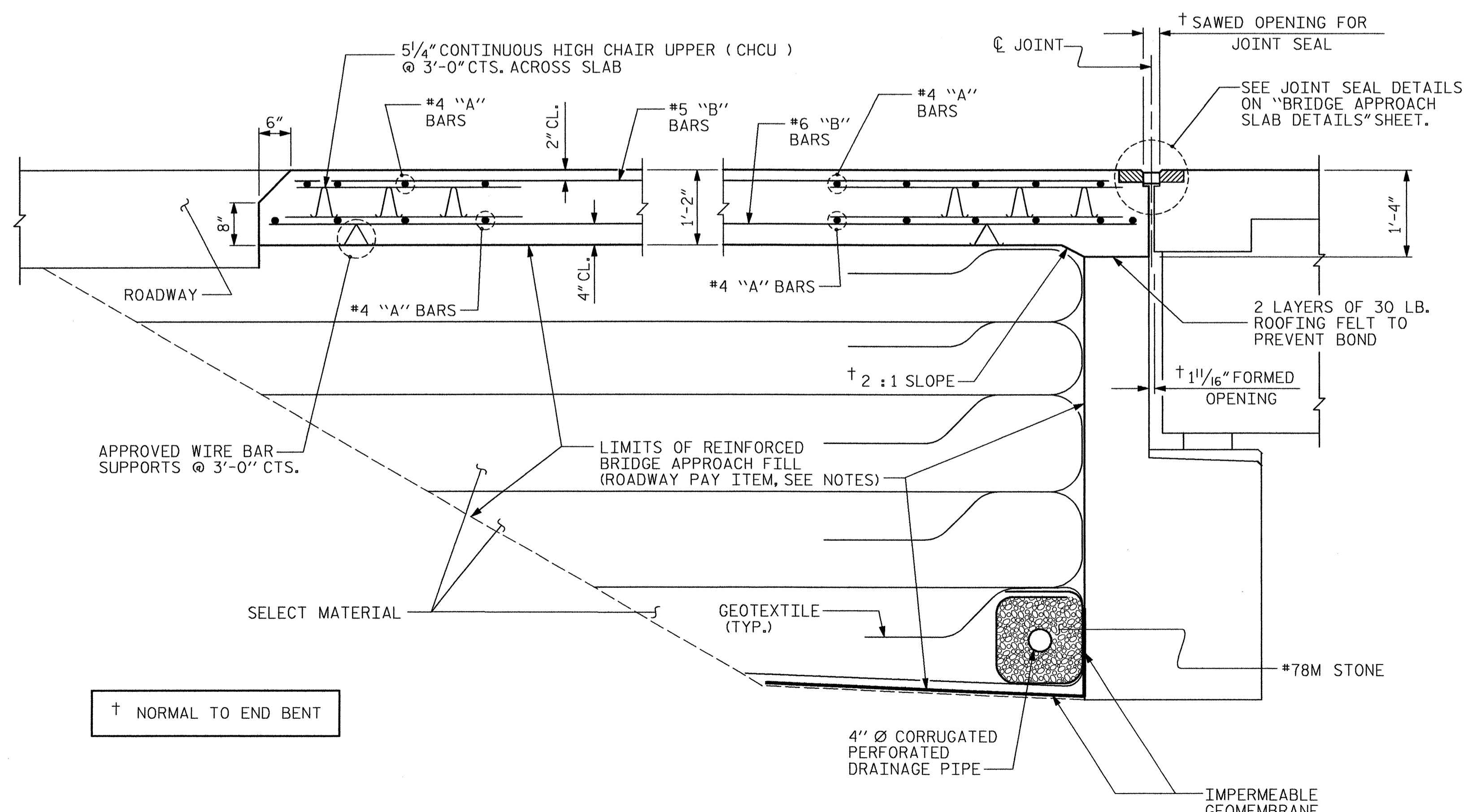
TOTAL SHEETS: 46

DRAWN BY : B.E. LANNING DATE : 01/12
 CHECKED BY : B.E. ATKINSON DATE : 02/12

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



SECTION THRU SLAB

NOTES

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

FOR REINFORCED BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 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 JOINT SHALL BE SAWS PRIOR TO THE CASTING OF THE SIDEWALK OR PARAPET AND END POST.

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

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

WITH SIDEWALK COVER PLATES

THE STEEL PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 OR APPROVED EQUAL. AFTER FABRICATION, THE PLATES SHALL BE COMMERCIALY BLAST CLEANED AND EITHER COATED WITH A MINIMUM THICKNESS OF 4 MILS (DRY) OF ZINC-RICH PAINT, GALVANIZED OR METALLIZED TO A MINIMUM THICKNESS OF 6 MILS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

THE 3/4" DIAMETER HEX HEAD BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL.

NO SEPARATE PAYMENT WILL BE MADE FOR FURNISHING AND INSTALLING THE COVER PLATE. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE LUMP SUM PRICE FOR "FOAM JOINT SEALS".

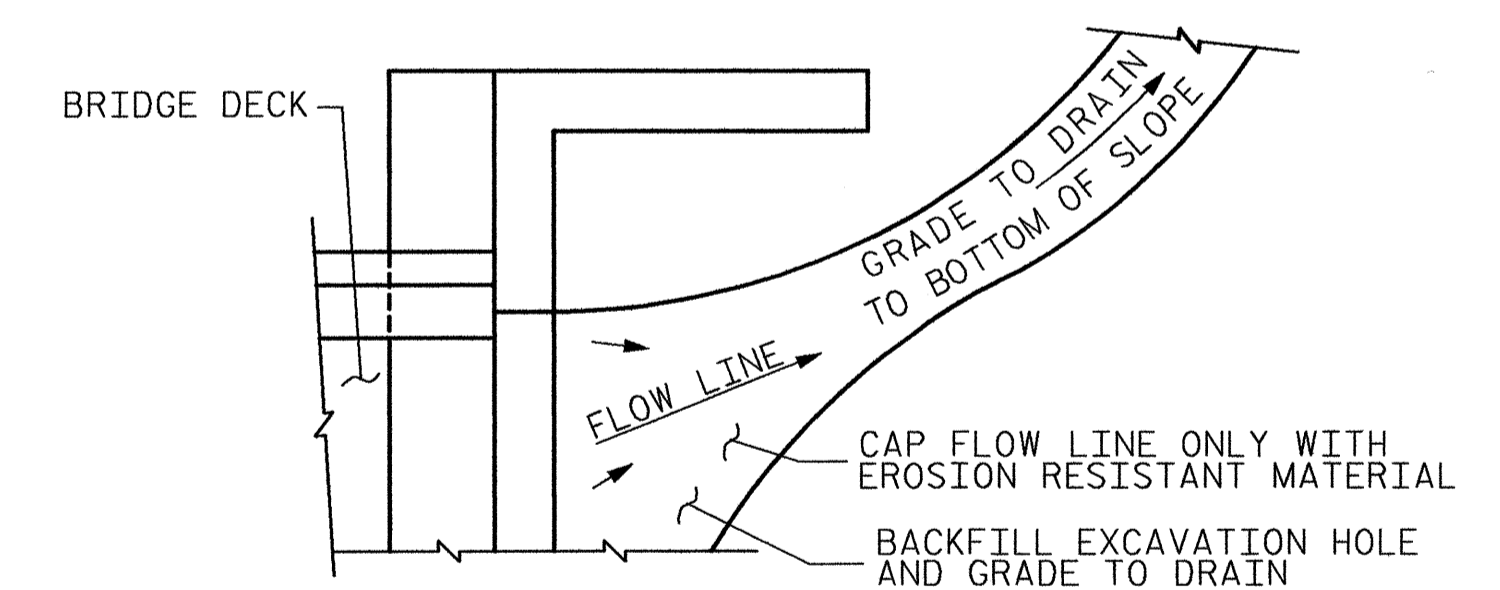
WITH FOAM JOINT SEAL

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 3 1/16".

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-10"	2'-7"



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

BILL OF MATERIAL					
APPROACH SLAB AT EB #1					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	50	#4	STR 20'-0"	668	
A2	52	#4	STR 19'-11"	692	
*B3	4	#4	STR 24'-4"	65	
*B101	30	#5	STR 23'-4"	730	
*B102	25	#5	STR 23'-7"	615	
*B103	21	#5	STR 23'-9"	520	
B201	30	#6	STR 24'-4"	1096	
B202	25	#6	STR 24'-7"	923	
B203	21	#6	STR 24'-9"	781	
*G1	25	#4	STR 5'-0"	84	
*U1	8	#4	1 3'-0"	16	
REINFORCING STEEL				3,492 LBS.	
*EPOXY COATED REINFORCING STEEL				2,698 LBS.	
CLASS AA CONCRETE					
POUR 1 APPROACH SLAB				41.3 C.Y.	
POUR 2 SIDEWALK				3.1 C.Y.	
TOTAL				44.4 C.Y.	
APPROACH SLAB AT EB #2					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	50	#4	STR 20'-0"	668	
A2	52	#4	STR 19'-11"	692	
*B1	76	#5	STR 23'-8"	1876	
B2	76	#6	STR 24'-8"	2816	
*B4	4	#4	STR 24'-8"	66	
*G1	25	#4	STR 5'-0"	84	
*U1	8	#4	1 3'-0"	16	
REINFORCING STEEL				3,508 LBS.	
*EPOXY COATED REINFORCING STEEL				2,710 LBS.	
CLASS AA CONCRETE					
POUR 1 APPROACH SLAB				41.3 C.Y.	
POUR 2 SIDEWALK				3.1 C.Y.	
TOTAL				44.4 C.Y.	
BAR TYPE					
ALL BAR DIMENSIONS ARE OUT TO OUT.					

PROJECT NO. B-4752
GASTON COUNTY
 STATION: 18+54.00 -L-

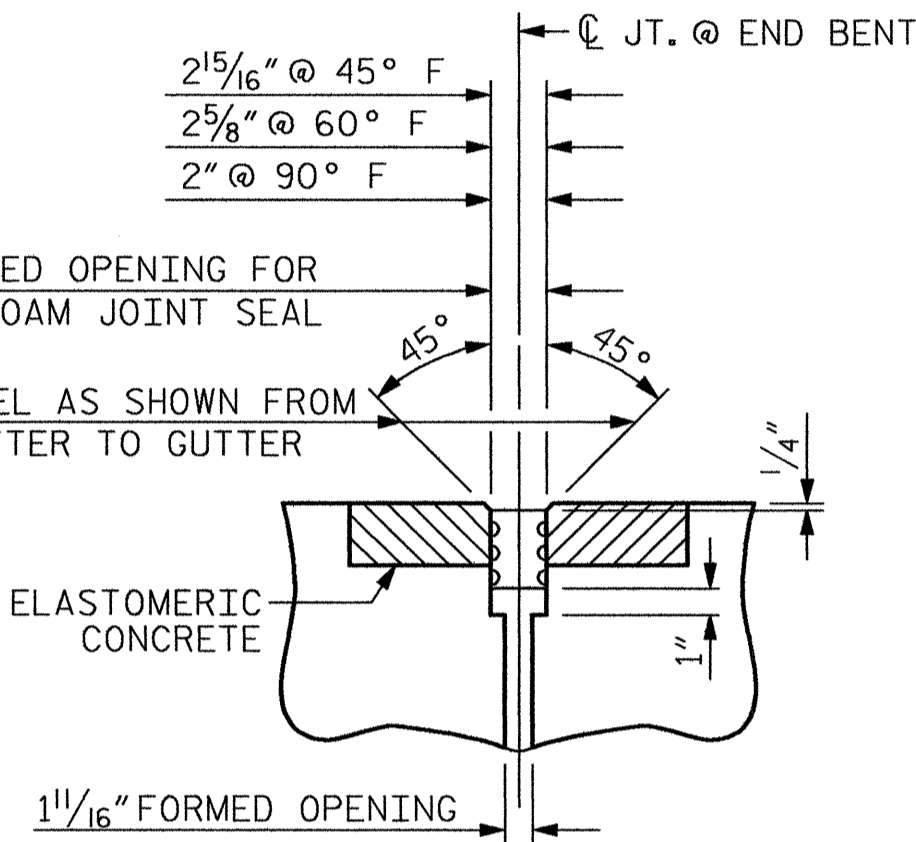
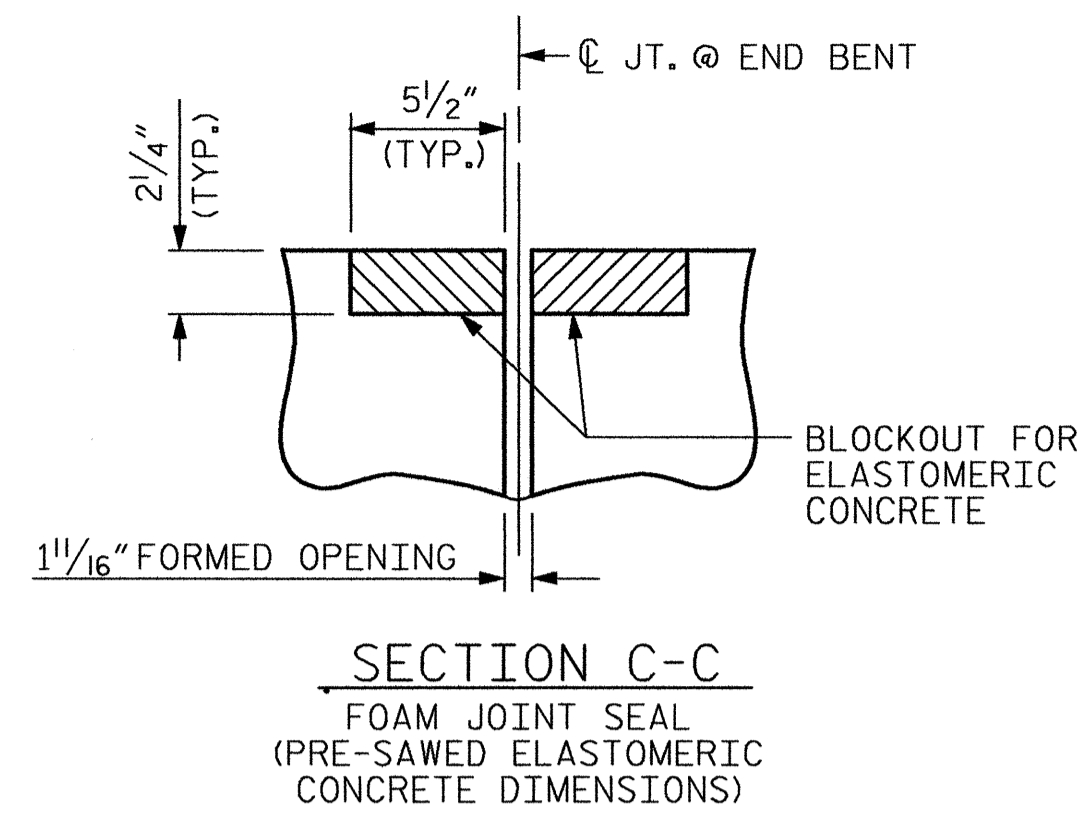
SHEET 2 OF 3
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT



MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
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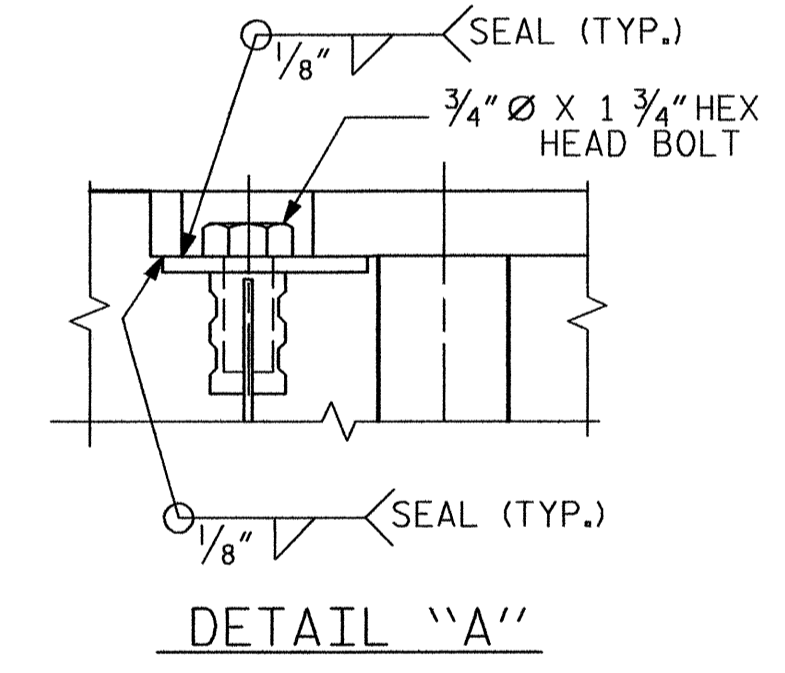
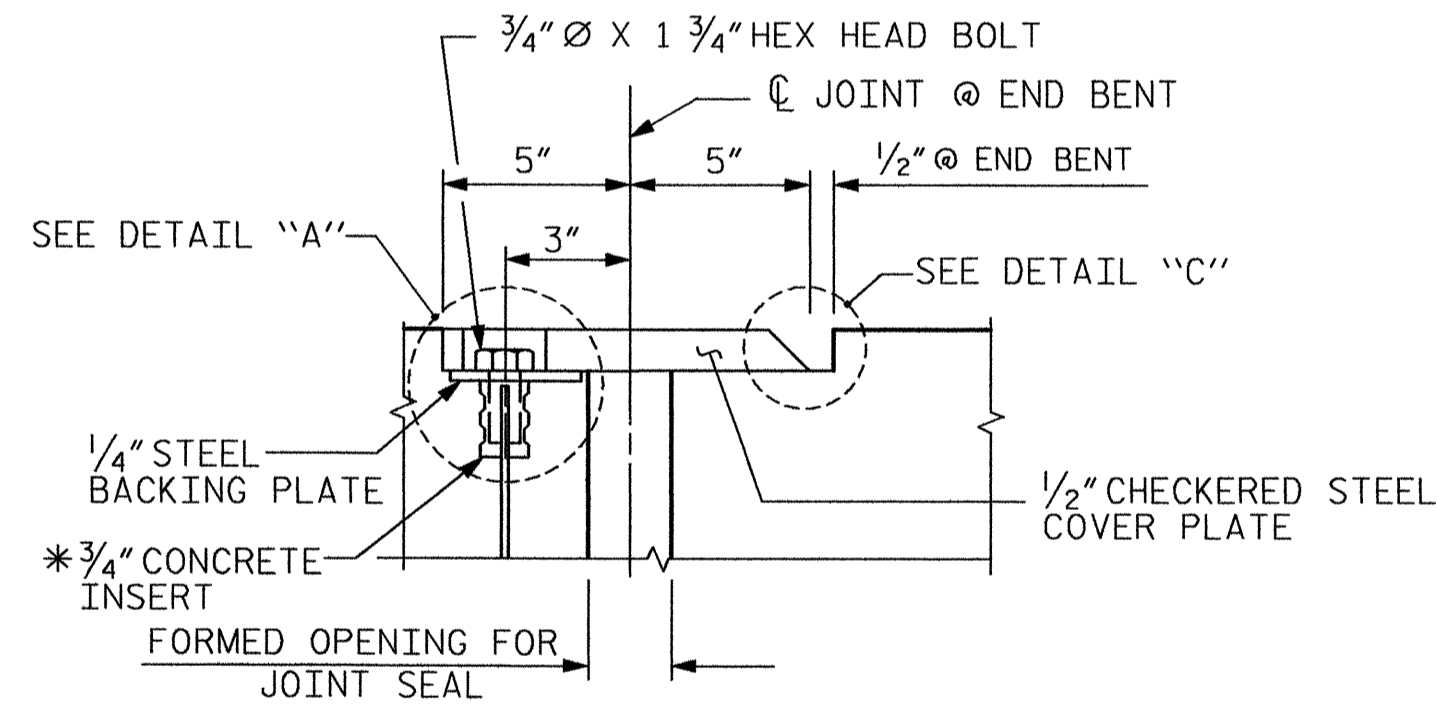
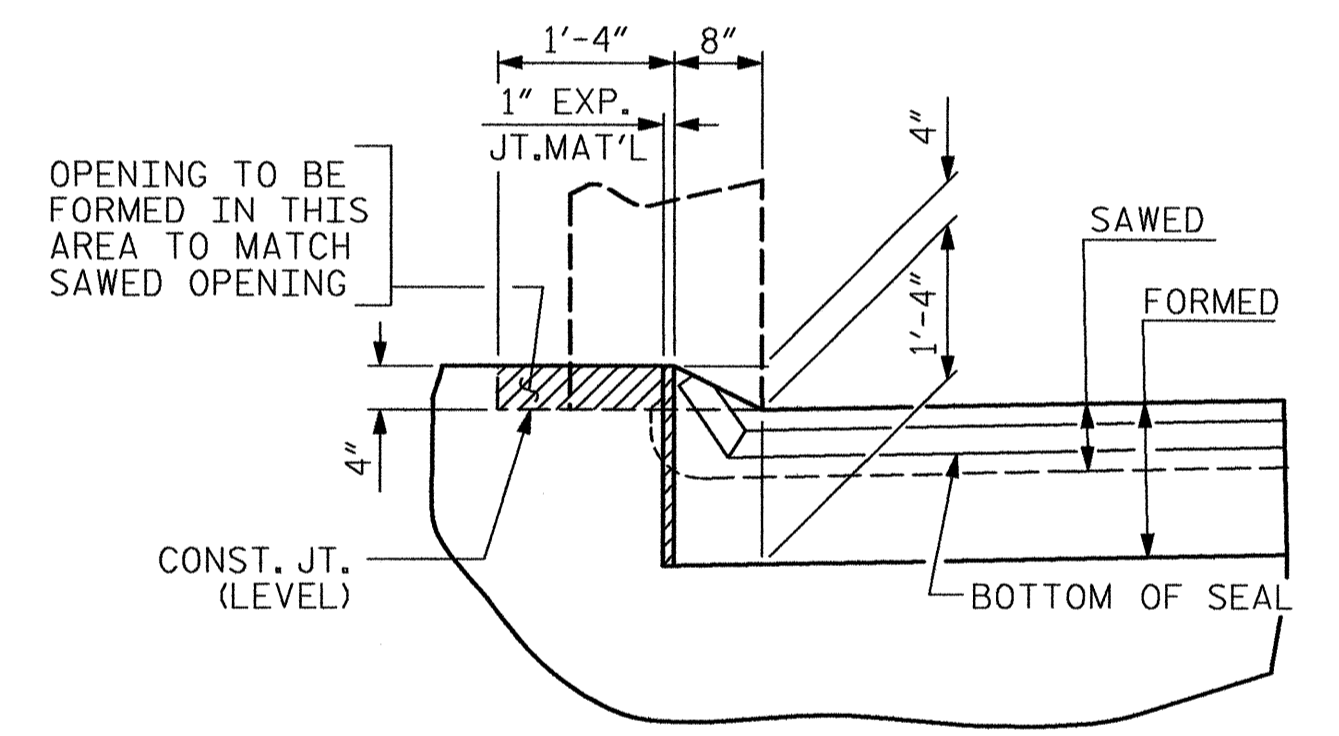
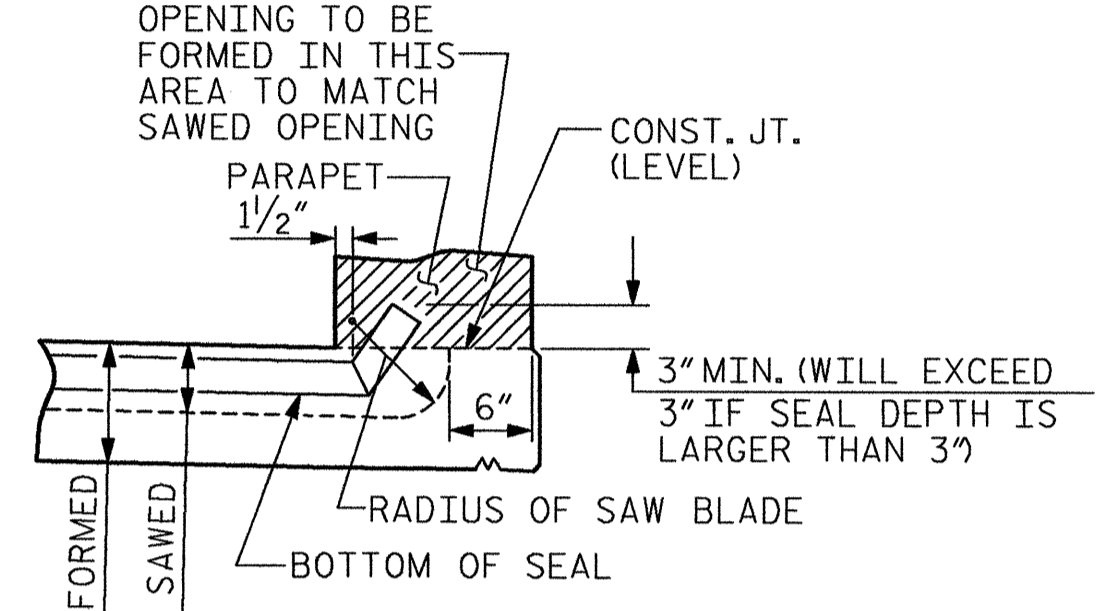
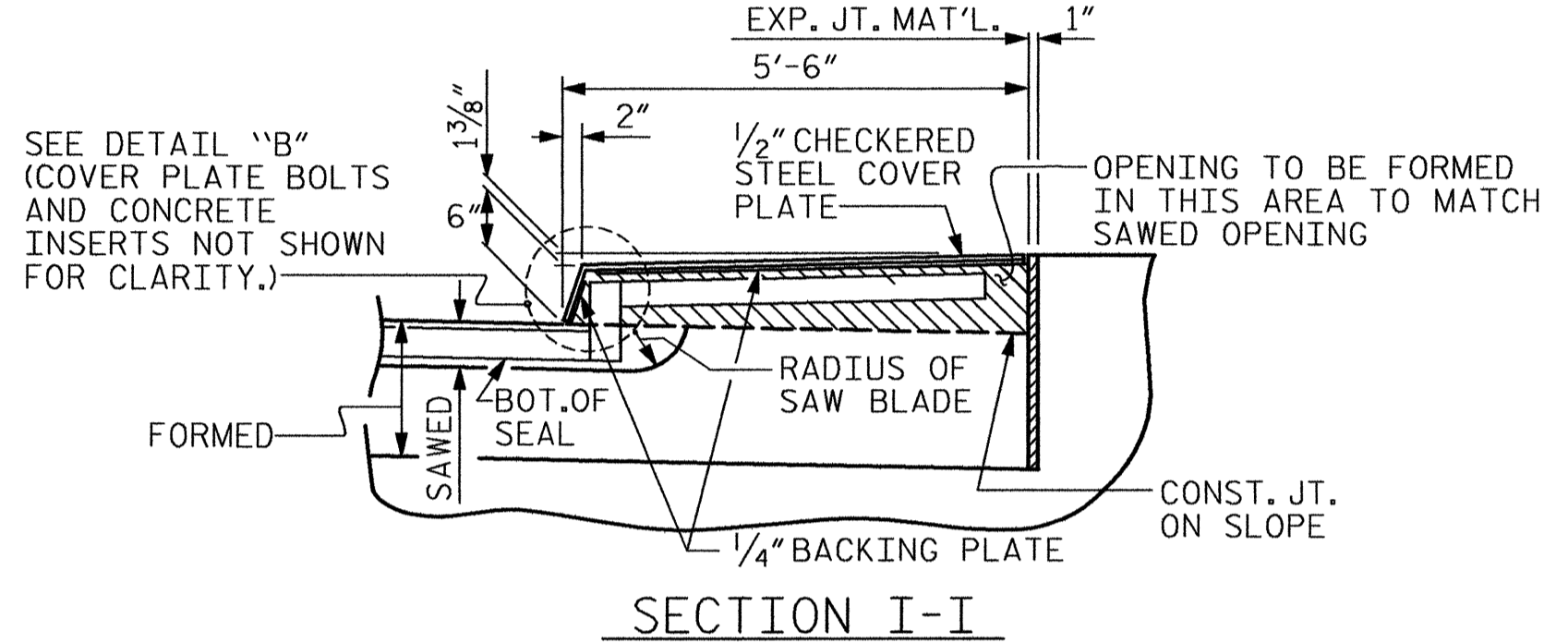
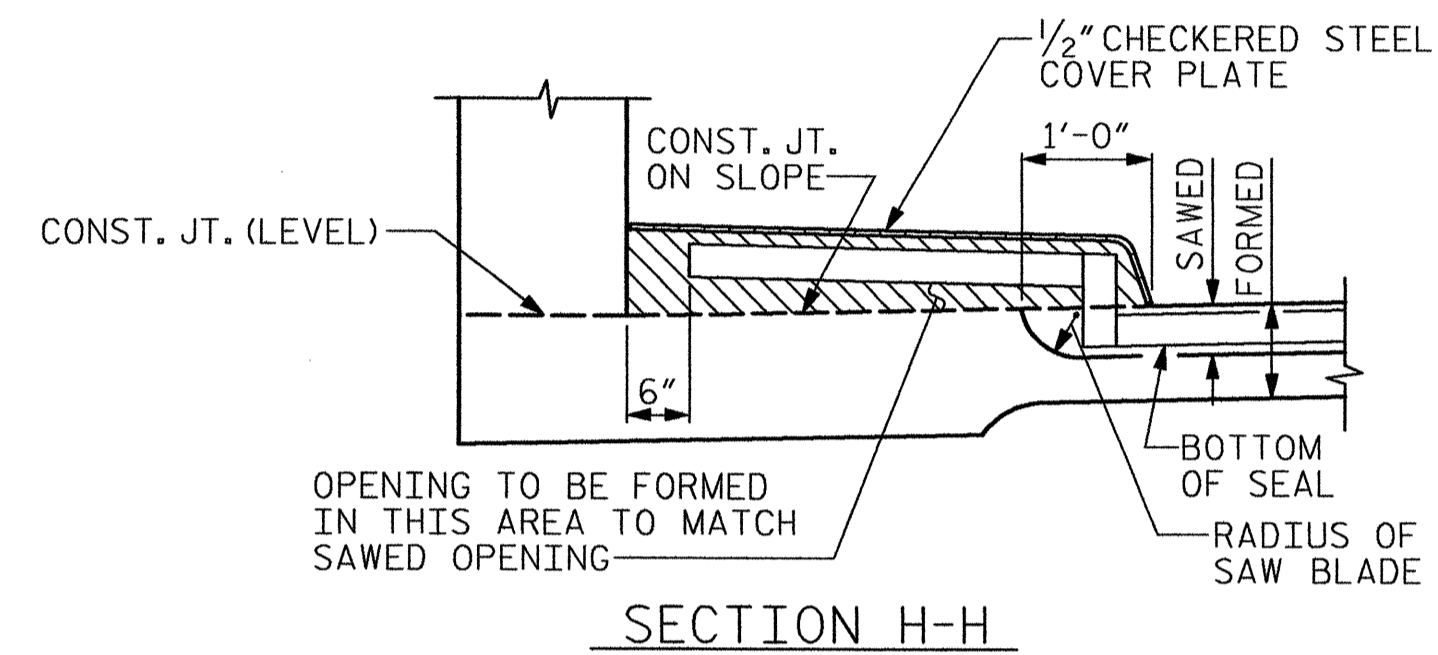
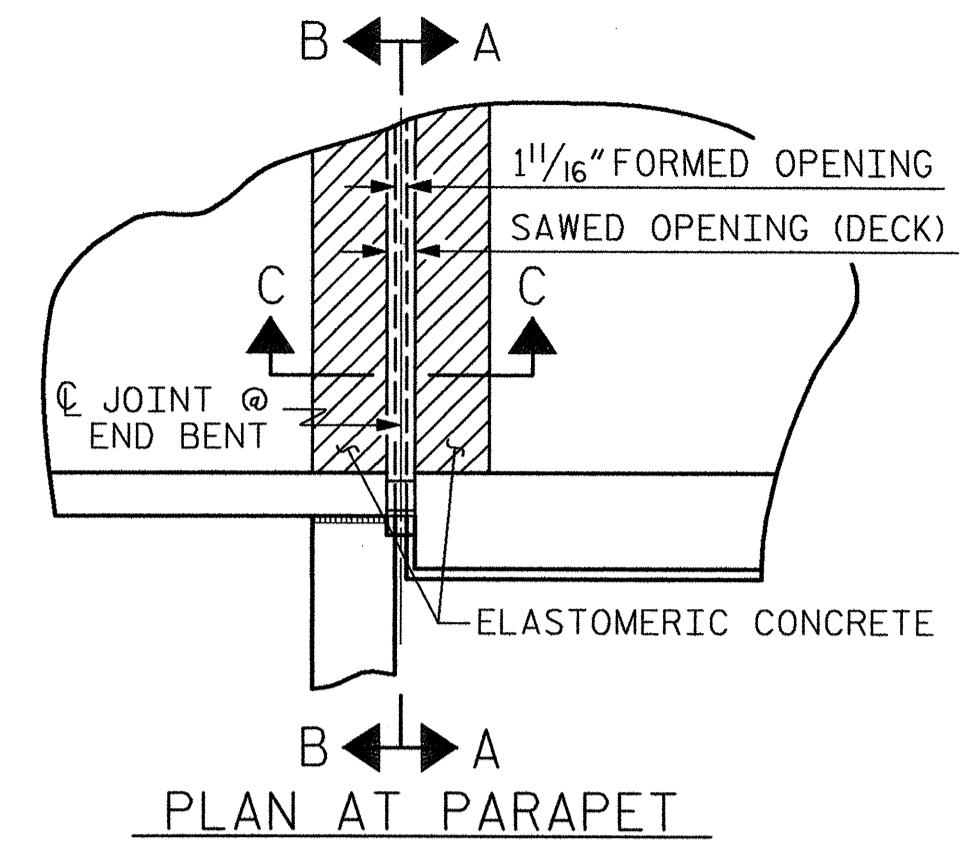
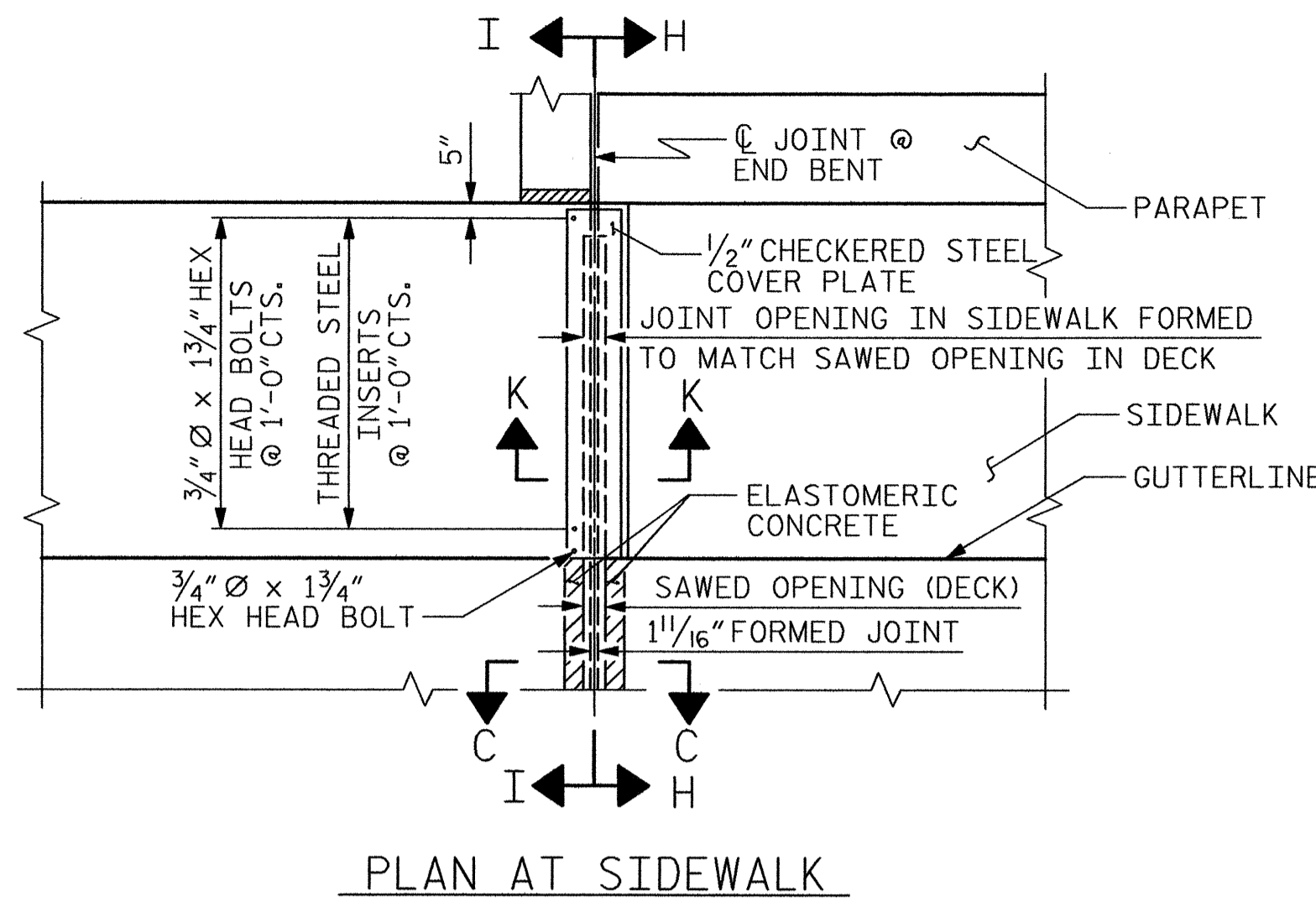
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 CHECKED BY: B.E. ATKINSON DATE: 02/12

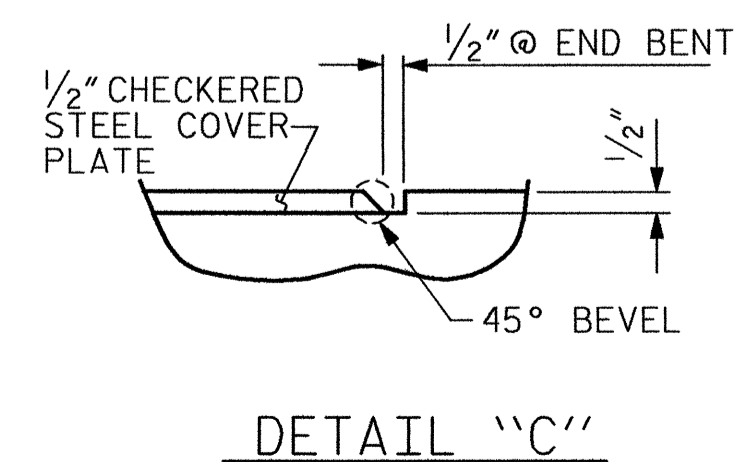
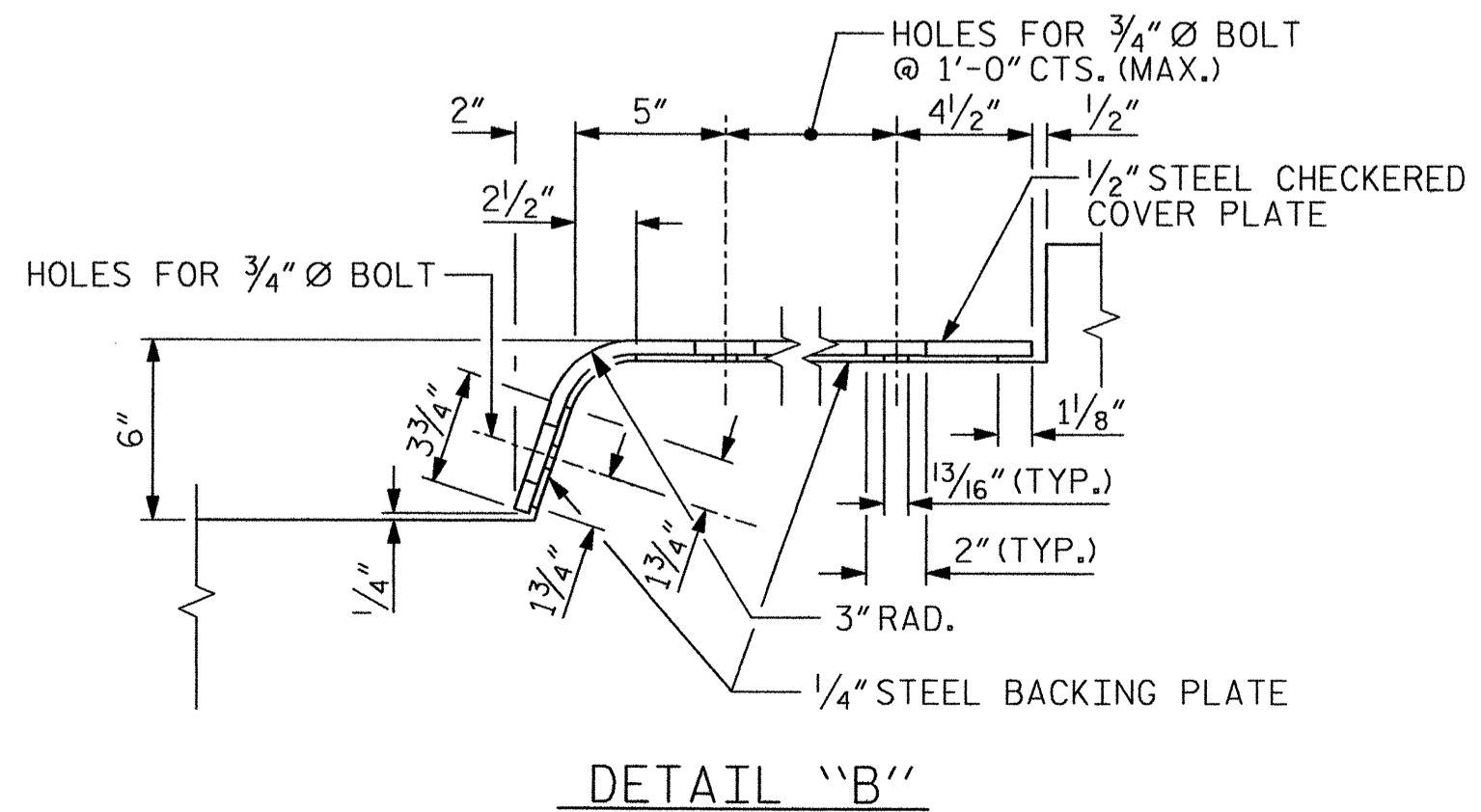


ELASTOMERIC CONCRETE	
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
1	5.5
2	5.5
TOTAL	11.0

* BASED ON THE MINIMUM BLOCKOUT SHOWN.



* THE 3/4" CONCRETE INSERTS SHALL BE CLOSED-END FERRULES WITH LOOPED WIRE STRUTS ATTACHED TO THEM. THE INSERTS SHALL CONFORM TO AASHTO M169, GRADE 12L14 AND SHALL HAVE A TENSILE WORKING LOAD CAPACITY OF 3000 LBS.



JOINT SEAL DETAILS AT PARAPET

FOAM JOINT SEAL TO BE CUT, HEAT WELDED AND TURNED UP PARALLEL TO SLOPED FACE OF THE PARAPET.

JOINT SEAL DETAILS AT SIDEWALK

PROJECT NO. B-4752
GASTON COUNTY
STATION: 18+54.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH
SLAB DETAILS

Professional Engineer Seal for North Carolina, License No. 24939, dated 5/10/2012.

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER: P-0671

REVISIONS				SHEET NO.			
NO.	BY:	DATE:	NO.	BY:	DATE:	S-46	
1			3			TOTAL SHEETS	
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DRAWN BY: B.E. LANNING DATE: 01/12
CHECKED BY: B.E. ATKINSON DATE: 02/12

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