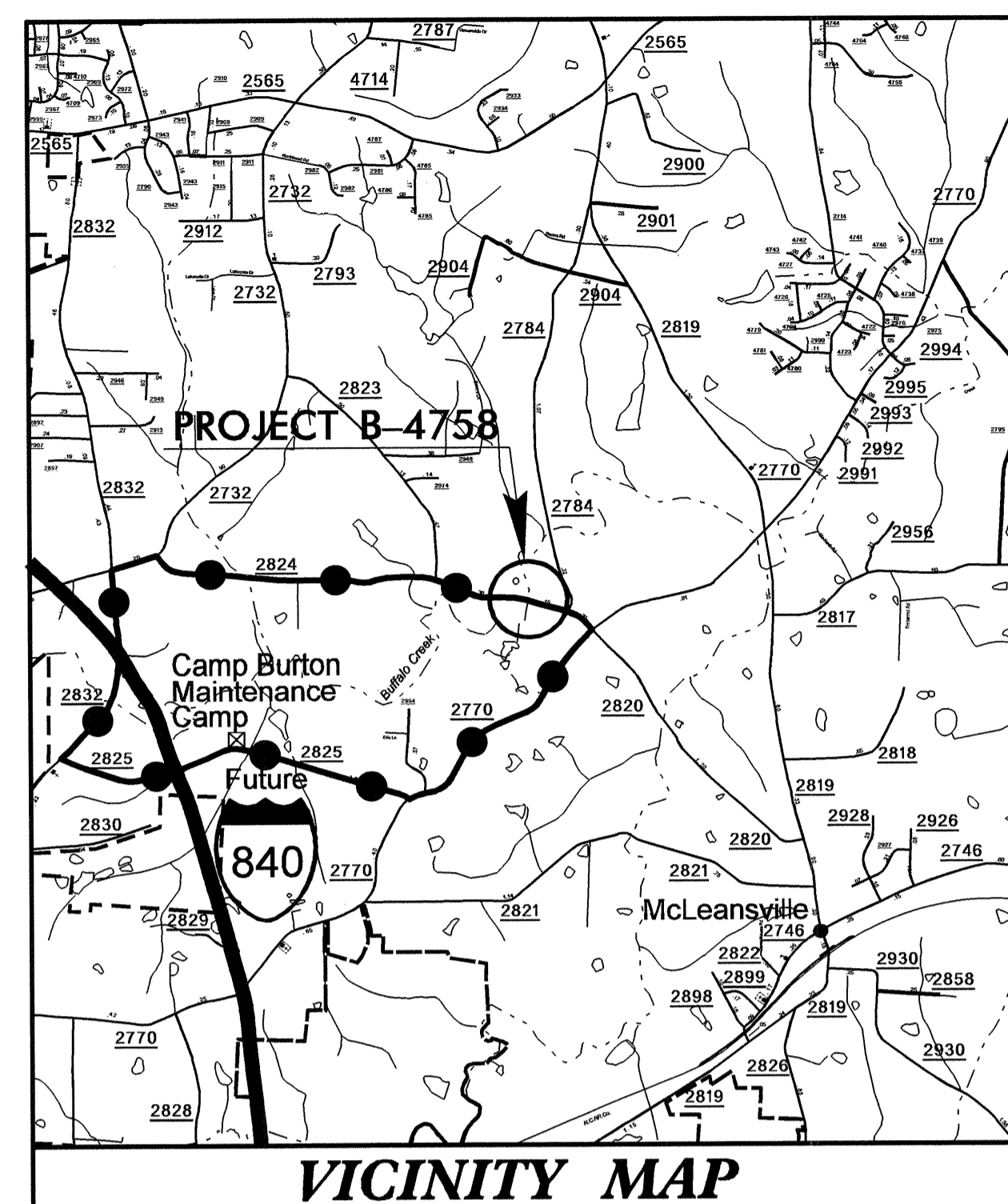


**CONTRACT: C203363 TIP PROJECT: B-4758**



●-●-●- DETOUR ROUTE

STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS  


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**GUILFORD COUNTY**

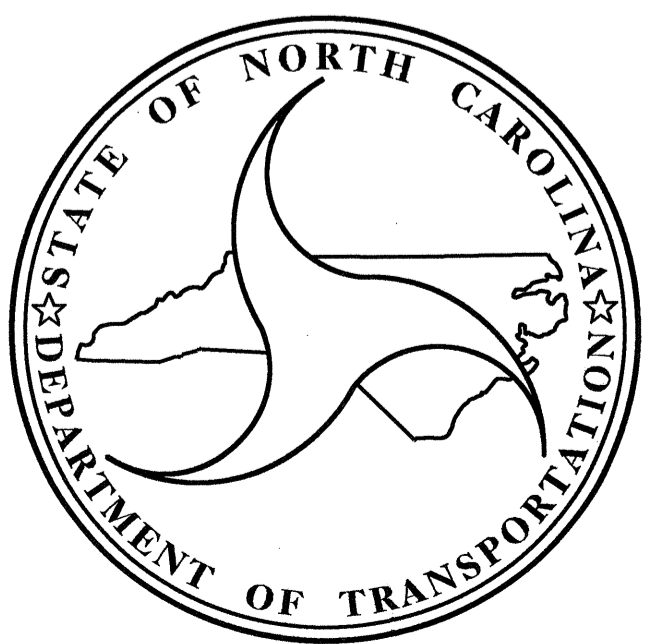
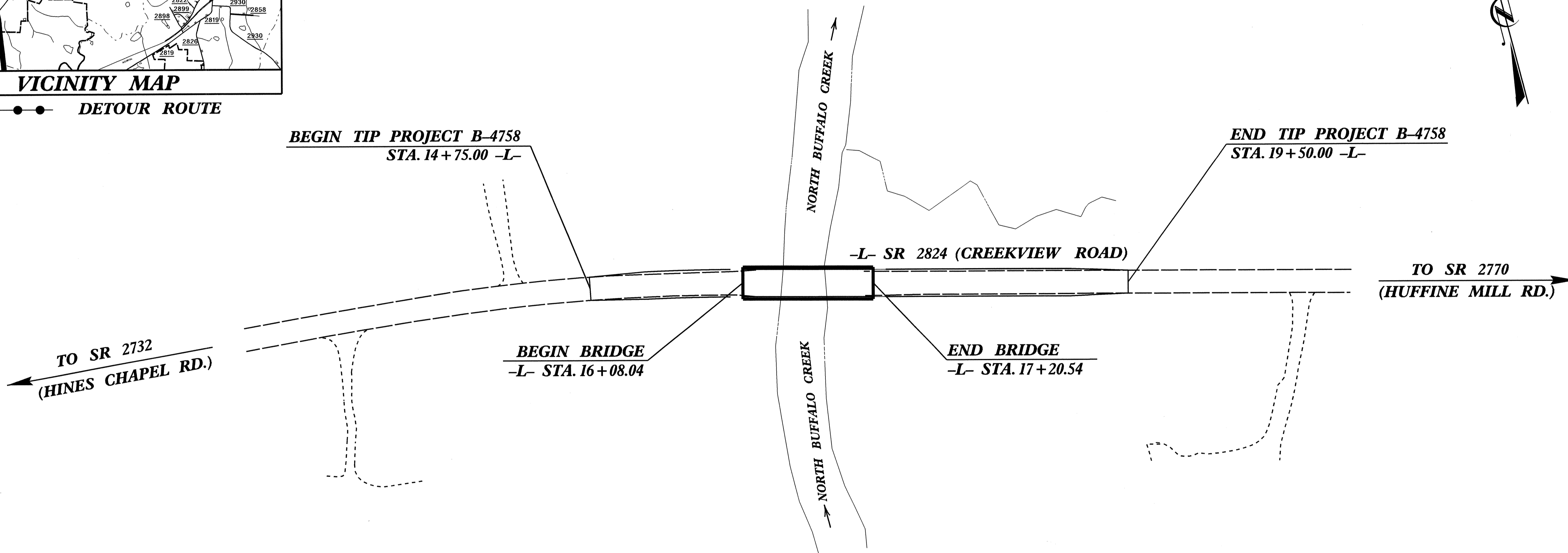

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**LOCATION: BRIDGE NO. 159 OVER NORTH BUFFALO CREEK  
 ON SR 2824 (CREEKVIEW ROAD)**

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4758		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
38530.1.1	BRZ-2824(5)	PE	
38530.2.1	BRZ-2824(5)	RW & UTILITIES	
38530.3.FD1	BRZ-2824(5)	CONST.	

**STRUCTURE**



**DESIGN DATA**

ADT 2014	=	3375
ADT 2030	=	7200
DHV	=	11 %
D	=	55 %
T	=	16 % *
V	=	50 MPH
* TTST 3% DUAL 13%		
FUNC. CLASS = LOCAL RURAL SUB-REGIONAL TIER		

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT B-4758	=	0.069 MI.
LENGTH STRUCTURE TIP PROJECT B-4758	=	0.021 MI.
TOTAL LENGTH TIP PROJECT B-4758	=	0.090 MI.

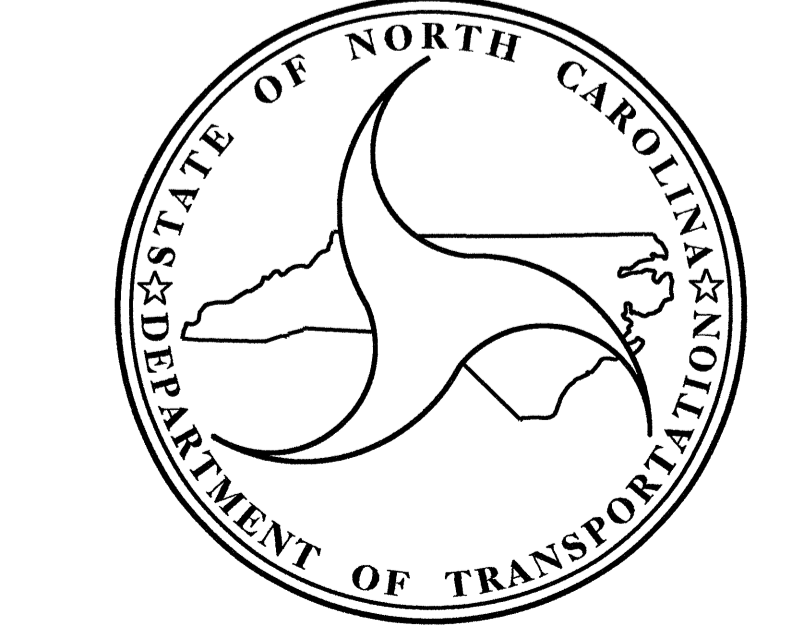
Prepared In the Office of:

**DIVISION OF HIGHWAYS**

2012 STANDARD SPECIFICATIONS

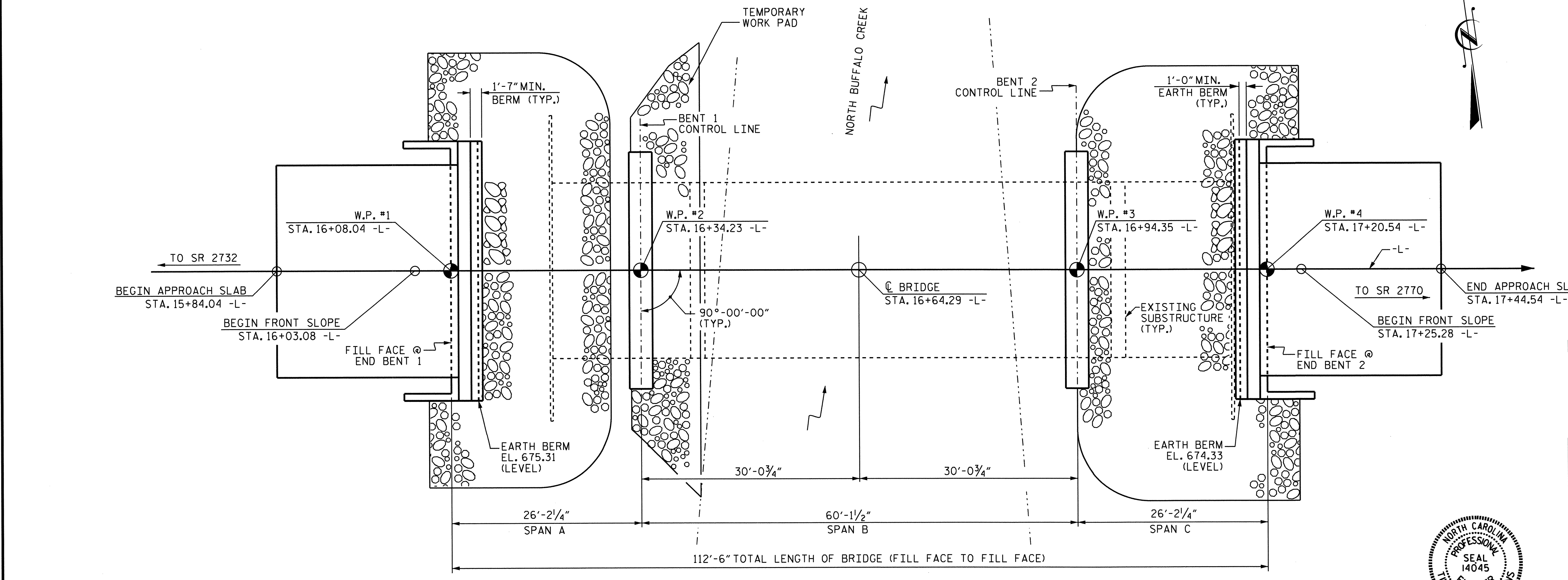
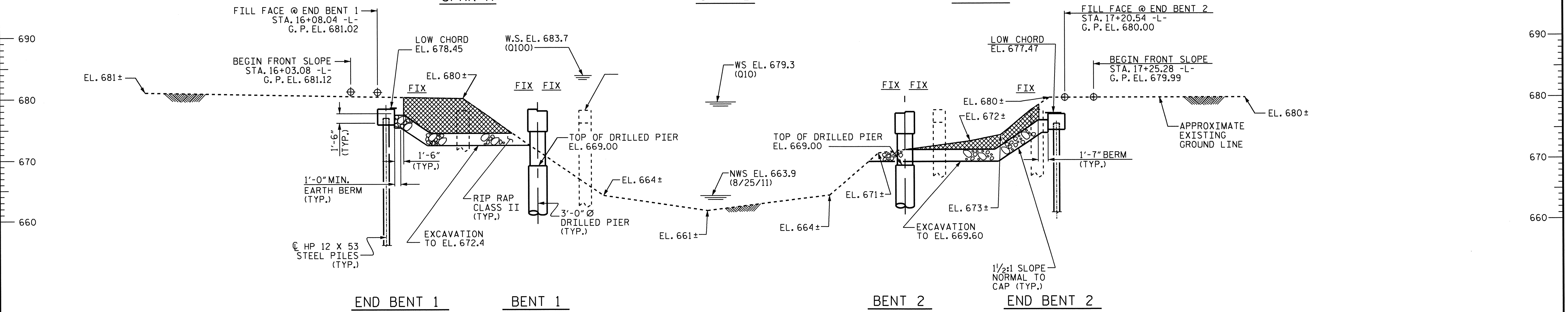
LETTING DATE :	E. E. MURRAY, P.E. <small>PROJECT ENGINEER</small>
MARCH 18, 2014	T. L. COGGINS, P.E. <small>PROJECT DESIGN ENGINEER</small>

**STRUCTURES MANAGEMENT UNIT**  
 1000 BIRCH RIDGE DR.  
 RALEIGH, N.C. 27610



15+50 16+00 16+50 17+00 17+50

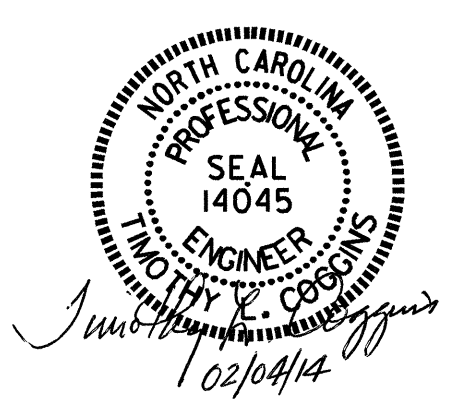
GRADE DATA  
 (-)5.0857% (-)0.3037%  
 PI = 15+80.00  
 EL = 680.43'  
 VC = 210'



I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. B-4758  
 GUILFORD COUNTY  
 STATION: 16+64.29 -L-  
 SHEET 1 OF 3 REPLACES BRIDGE NO. 159

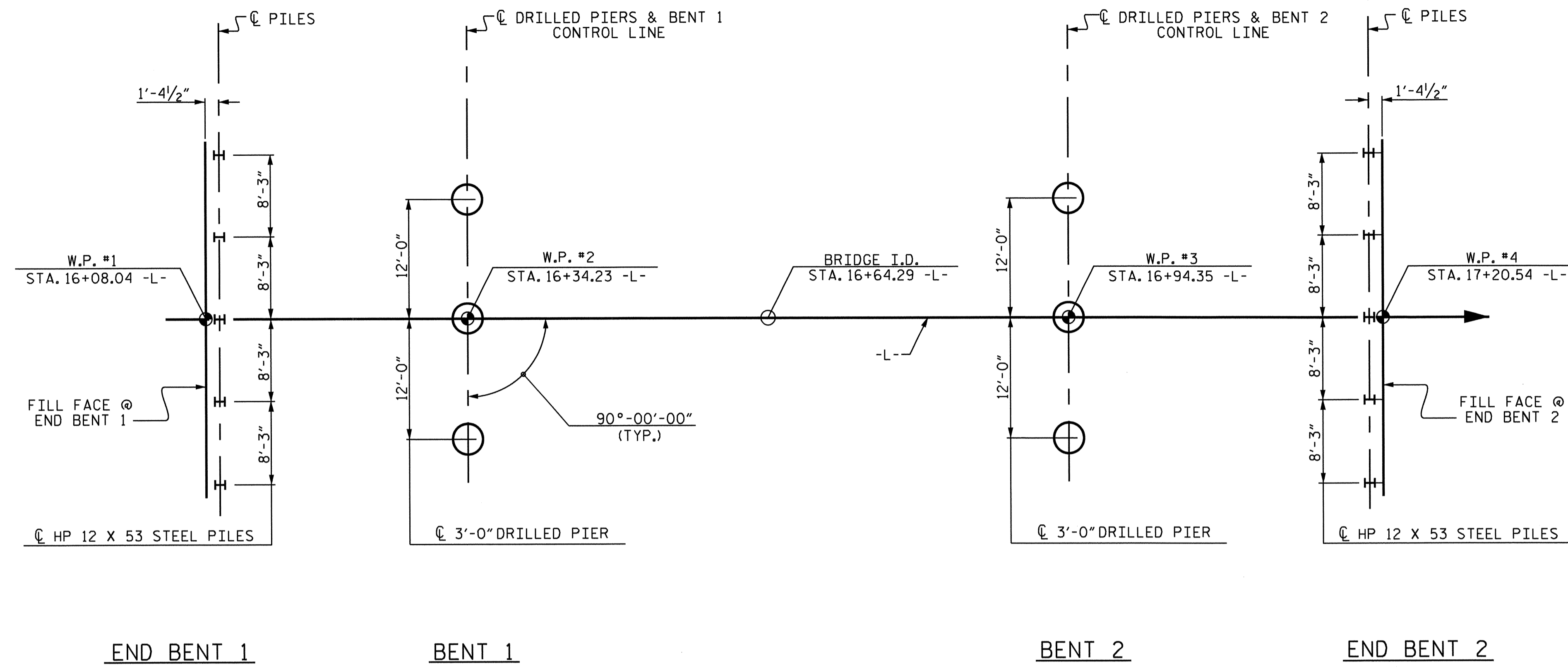
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GENERAL DRAWING  
 BRIDGE OVER  
 NORTH BUFFALO CREEK  
 ON SR 2824 (CREEKVIEW RD.)  
 BETWEEN SR 2732 AND SR 2770



DRAWN BY : M.D. PISO DATE : 09-18-13  
 CHECKED BY : T.L. COGGINS, P.E. DATE : 12-05-13  
 DESIGN ENGINEER OF RECORD: T.L. COGGINS, P.E. DATE : 12-10-13

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

04-FEB-2014 11:56  
 R:\Structures\Plans\Final Plans\b4758.sd.gd.01.dgn  
 tcoggins



**FOUNDATION LAYOUT**  
 DIMENSIONS LOCATING PILES ARE SHOWN TO PILE CENTERLINES.  
 DIMENSIONS LOCATING DRILLED PIERS ARE TO THE DRILLED PIER CENTERLINES.

**FOUNDATION NOTES:**

- FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT END BENT No.1 AND END BENT No.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 55 TONS PER PILE. DRIVE PILES AT END BENT No.1 AND END BENT No.2 TO A REQUIRED DRIVING RESISTANCE OF 95 TONS PER PILE. STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT No.1 AND END BENT No.2. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- DRILLED PIERS AT BENT No.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 340 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 6 TSF.
- DRILLED PIERS AT BENT No.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 340 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 43 TSF.
- INSTALL DRILLED PIERS AT BENT No.1 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 649.50 FT., SATISFY THE REQUIRED TIP RESISTANCE, AND HAVE A PENETRATION OF AT LEAST 6.10 FT. INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.
- INSTALL DRILLED PIERS AT BENT No.2 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 649.50 FT., SATISFY THE REQUIRED TIP RESISTANCE, AND HAVE A PENETRATION OF AT LEAST 6.10 FT. INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.
- THE SCOUR CRITICAL ELEVATION FOR BENT No.1 IS 658.0 FT. AND BENT No.2 IS 657.0 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.
- SPT MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SPT. FOR SPT TESTING, SEE SECTION 411 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 ARE REQUIRED AND CSL TESTING MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR CSL TESTING. FOR CSL TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

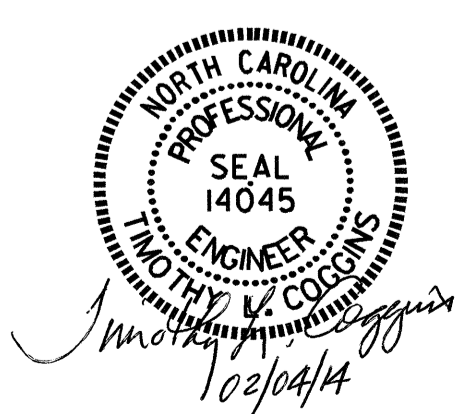
PROJECT NO. B-4758  
GUILFORD COUNTY  
 STATION: 16+64.29 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**

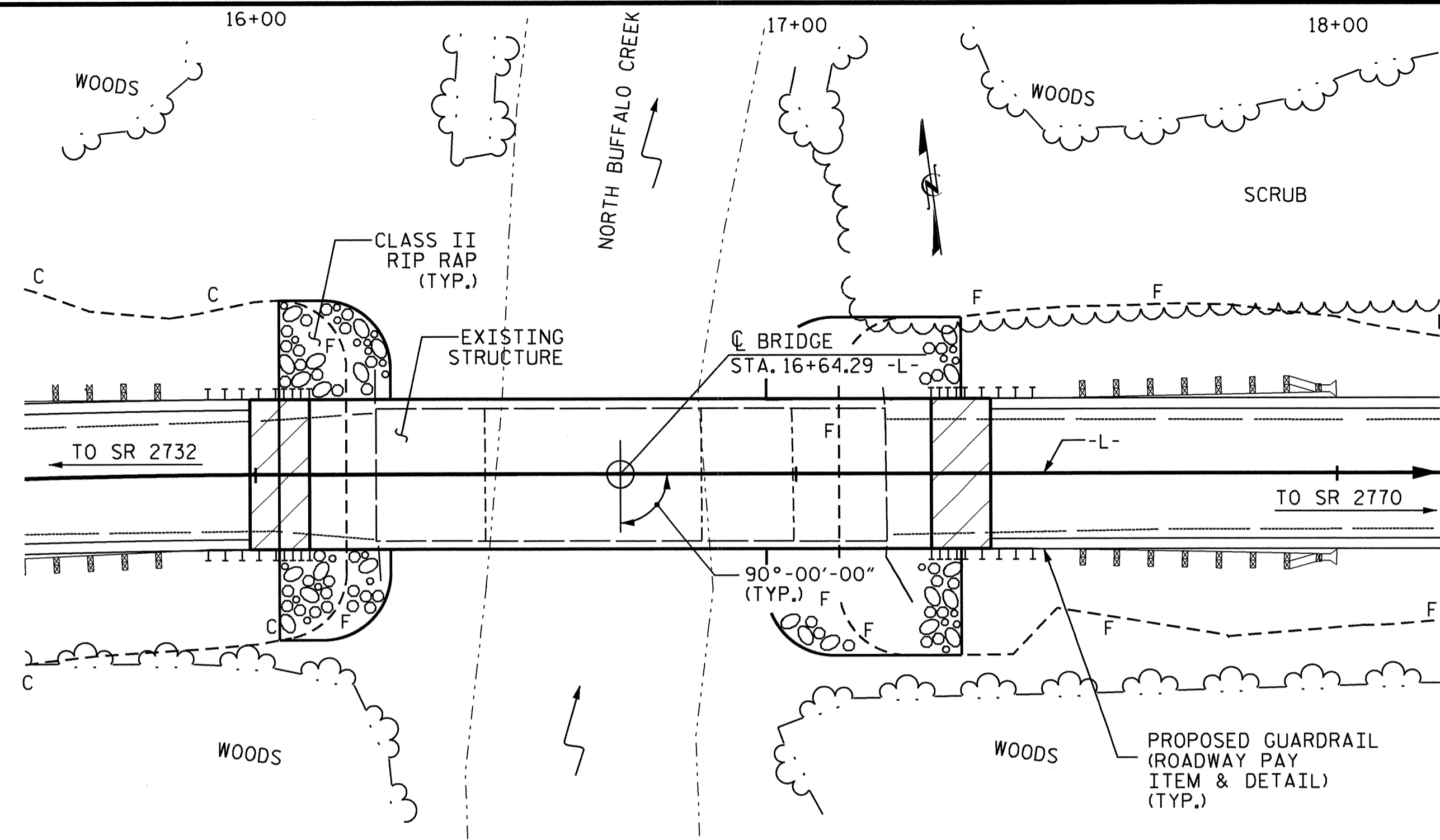
BRIDGE OVER  
 NORTH BUFFALO CREEK  
 ON SR 2824 (CREEKVIEW RD.)  
 BETWEEN SR 2732 AND SR 2770



DRAWN BY : M.D. PISO DATE : 09-18-13  
 CHECKED BY : T.L. COGGINS, P.E. DATE : 12-05-13  
 DESIGN ENGINEER OF RECORD: T.L. COGGINS, P.E. DATE : 12-10-13

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

BM #1 -L- STA. 15+12.00, 109' RIGHT; RR SPIKE ON ROOT OF 18" BEECH, EL. 681.90'



FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

NOTES:

ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

THE EXISTING STRUCTURE CONSISTING OF FOUR SPANS, 1 @ 20'-3", 1 @ 40'-0", 1 @ 17'-0" AND 1 @ 17'-3" WITH A CLEAR ROADWAY WIDTH OF 24'-7" AND A TIMBER DECK ON STEEL I-BEAMS SUPPORTED BY TIMBER CAPS ON PILES AT THE END BENTS AND TIMBER CAPS ON CONCRETE ENCASED PILES AT THE INTERIOR BENTS AND 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 DURING CONSTRUCTION OF THE PROPOSED BRIDGE, THE LOAD LIMIT 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 25 FT. RIGHT AND 30 FT. LEFT AT END BENT No. 1 AND 32 FT. RIGHT AND 30 FT. LEFT AT END BENT No. 2 OF THE 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."

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.

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 THE COMPLIANCE WITH THE 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 16+64.29 -L-".

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 CONCRETE WEARING SURFACE, SEE SPECIAL PROVISIONS.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	3'-0" Ø DRILLED PIERS (IN SOIL)	3'-0" Ø DRILLED PIERS (NOT IN SOIL)	SID INSPECTIONS	SPT TESTING	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	CONCRETE WEARING SURFACE	GROOVING BRIDGE FLOORS	CLASS A CONCRETE
	LUMP SUM	LIN. FT.	LIN. FT.	EACH	EACH	EACH	LUMP SUM	SQ. FT.	SO. FT.	CU. YDS.
SUPERSTRUCTURE								3,069	3,939	
END BENT 1							LUMP SUM			13.8
BENT 1		31.5	27.0							15.6
BENT 2		28.5	30.0							15.3
END BENT 2							LUMP SUM			13.8
TOTAL	LUMP SUM	60.0	57.0	1	1	1	LUMP SUM	3,069	3,939	58.5

HYDRAULIC DATA

DESIGN DISCHARGE	= 5900 CFS
FREQUENCY OF DESIGN FLOOD	= 10 YR.
DESIGN HIGH WATER ELEVATION	= 679.3'
DRAINAGE AREA	= 18.8 SQ. MI.
BASE DISCHARGE (Q100)	= 7000 CFS
BASE HIGH WATER ELEVATION	= 683.7'

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 5408 CFS
FREQUENCY OF OVERTOPPING FLOOD	= 10 YR. +
OVERTOPPING FLOOD ELEVATION	= 679.6'

TOTAL BILL OF MATERIAL

	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	HP 12 X 53 STEEL PILES	STEEL PILE POINTS	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLAB	3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLAB			
	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.	EACH	LIN. FT.	TONS	SO. YDS.	LUMP SUM	NO.	LIN. FT.	NO.	LIN. FT.
SUPERSTRUCTURE	LUMP SUM						220.50			LUMP SUM	20	500.00	10	600.00
END BENT 1		2,045	1,328	5	140.00	5		55	57					
BENT 1		7,842	1,328											
BENT 2		7,776	1,305											
END BENT 2		2,045		5	90.00	5		75	79					
TOTAL	LUMP SUM	19,708	2,633	10	230.00	10	220.50	130	136	LUMP SUM	20	500.0	10	600.00

PROJECT NO. B-4758  
GUILFORD COUNTY  
 STATION: 16+64.29 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION

GENERAL DRAWING  
 BRIDGE OVER  
 NORTH BUFFALO CREEK  
 ON SR 2824 (CREEKVIEW RD.)  
 BETWEEN SR 2732 AND SR 2770



DRAWN BY : M.D. PISO DATE : 09-18-13  
 CHECKED BY : I.L. COGGINS, P.E. DATE : 12-05-13  
 DESIGN ENGINEER OF RECORD: I.L. COGGINS, P.E. DATE : 12-10-13

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

LOAD FACTORS:

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

LOAD AND RESISTANCE FACTOR RATING (LRFD) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS																								
LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE						COMMENT NUMBER		
						MOMENT					SHEAR					MOMENT								
						LIVELOAD FACTORS (%LL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	LIVELOAD FACTORS (%LL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION		DISTANCE FROM LEFT END OF SPAN (FT)	
DESIGN LOAD RATING	HL-93(Inv)	N/A	1	1.15	--	1.75	0.276	1.43	B	EL	29.50	0.519	1.36	B	EL	5.90	0.80	0.276	1.15	B	EL	29.50		
	HL-93(0pr)	N/A	--	1.76	--	1.35	0.276	1.86	B	EL	29.50	0.519	1.76	B	EL	5.90	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	2	1.46	52.520	1.75	0.276	1.82	B	EL	29.50	0.591	1.62	A	EL	1.20	0.80	0.276	1.46	B	EL	29.50	1	
	HS-20(0pr)	36.000	--	2.09	75.386	1.35	0.276	2.35	B	EL	29.50	0.591	2.09	A	EL	1.20	N/A	--	--	--	--	--	1	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500	--	3.14	42.399	1.40	0.276	4.89	B	EL	29.50	0.591	3.74	A	EL	1.20	0.80	0.276	3.14	B	EL	29.50	1
		SNGARBS2	20.000	--	2.40	48.086	1.40	0.276	3.74	B	EL	29.50	0.591	3.00	A	EL	1.20	0.80	0.276	2.40	B	EL	29.50	1
		SNAGRIS2	22.000	--	2.30	50.704	1.40	0.276	3.59	B	EL	29.50	0.591	2.94	A	EL	1.20	0.80	0.276	2.30	B	EL	29.50	1
		SNCOTTS3	27.250	--	1.56	42.638	1.40	0.276	2.43	B	EL	29.50	0.591	1.90	A	EL	1.20	0.80	0.276	1.56	B	EL	29.50	1
		SNAGGRS4	34.925	--	1.33	46.515	1.40	0.276	2.07	B	EL	29.50	0.591	1.83	A	EL	1.20	0.80	0.276	1.33	B	EL	29.50	1
		SNS5A	35.550	--	1.30	46.241	1.40	0.276	2.02	B	EL	29.50	0.591	1.91	A	EL	1.20	0.80	0.276	1.30	B	EL	29.50	1
		SNS6A	39.950	--	1.20	48.093	1.40	0.276	1.87	B	EL	29.50	0.591	1.83	A	EL	1.20	0.80	0.276	1.20	B	EL	29.50	1
		SNS7B	42.000	--	1.15	48.166	1.40	0.276	1.78	B	EL	29.50	0.591	1.84	A	EL	1.20	0.80	0.276	1.15	B	EL	29.50	1
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000	--	1.47	48.547	1.40	0.276	2.29	B	EL	29.50	0.519	2.22	B	EL	5.90	0.80	0.276	1.47	B	EL	29.50	
		TNT4A	33.075	--	1.48	48.967	1.40	0.276	2.30	B	EL	29.50	0.591	2.03	A	EL	1.20	0.80	0.276	1.48	B	EL	29.50	1
		TNT6A	41.600	--	1.22	50.780	1.40	0.276	1.90	B	EL	29.50	0.591	1.92	A	EL	1.20	0.80	0.276	1.22	B	EL	29.50	1
		TNT7A	42.000	--	1.23	51.756	1.40	0.276	1.92	B	EL	29.50	0.591	1.91	A	EL	1.20	0.80	0.276	1.23	B	EL	29.50	1
		TNT7B	42.000	--	1.29	54.061	1.40	0.276	2.00	B	EL	29.50	0.519	1.80	B	EL	5.90	0.80	0.276	1.29	B	EL	29.50	
		TNAGRIT4	43.000	--	1.22	52.271	1.40	0.276	1.89	B	EL	29.50	0.519	1.74	B	EL	5.90	0.80	0.276	1.22	B	EL	29.50	
TNAGT5A	45.000	--	1.14	51.364	1.40	0.276	1.78	B	EL	29.50	0.519	1.75	B	EL	5.90	0.80	0.276	1.14	B	EL	29.50			
TNAGT5B	45.000	3	1.12	50.555	1.40	0.276	1.75	B	EL	29.50	0.519	1.65	B	EL	5.90	0.80	0.276	1.12	B	EL	29.50			

NOTES:

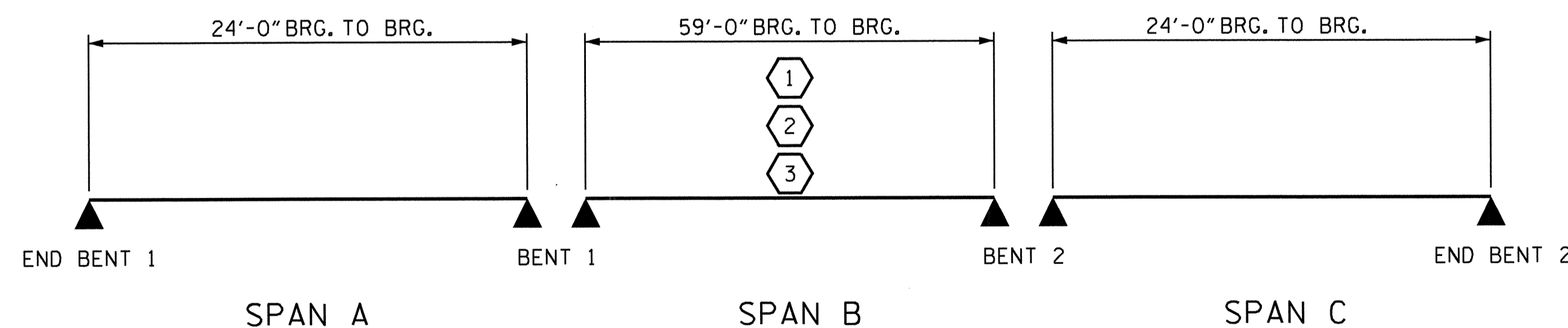
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

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

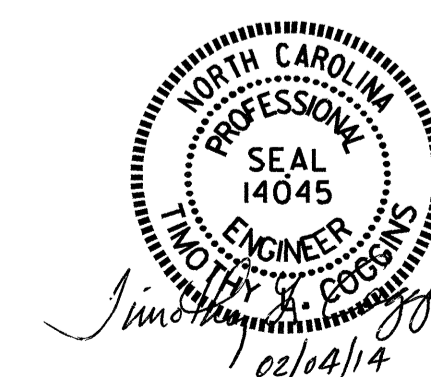
COMMENTS:

- SPAN C IS EQUAL TO SPAN A
- 
- 
- 

#	CONTROLLING LOAD RATING
1	DESIGN LOAD RATING (HL-93)
2	DESIGN LOAD RATING (HS-20)
3	LEGAL LOAD RATING **
** SEE CHART FOR VEHICLE TYPE	
GIRDER LOCATION	
I - INTERIOR GIRDER	
EL - EXTERIOR LEFT GIRDER	
ER - EXTERIOR RIGHT GIRDER	



PROJECT NO. B-4758  
GUILFORD COUNTY  
 STATION: 16+64.29 -L-

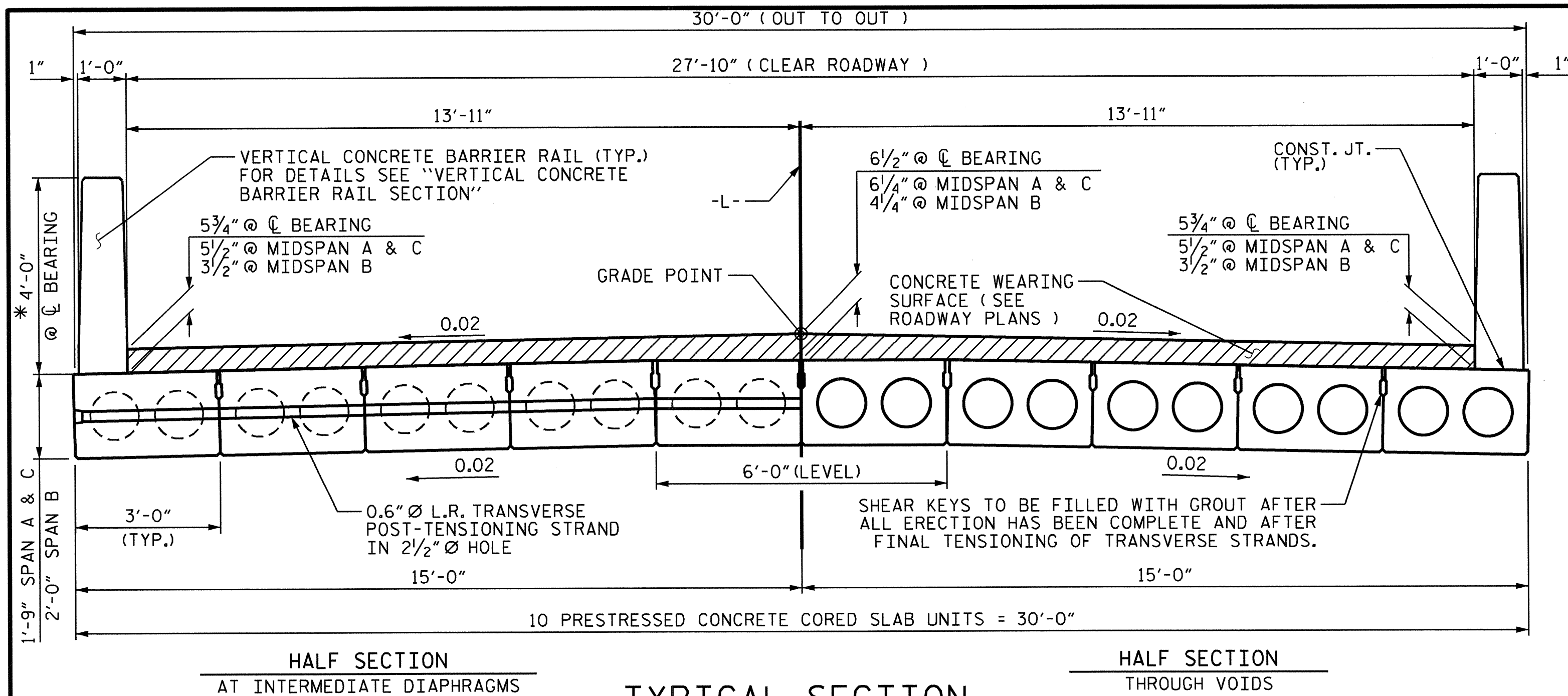


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 LRFR SUMMARY FOR  
 PRESTRESSED  
 CONCRETE GIRDERS  
 (NON-INTERSTATE TRAFFIC)

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

ASSEMBLED BY: M. Ruffin DATE: 9/24/13  
 CHECKED BY: REZA KOUICHEKI DATE: 10/1/13  
 DRAWN BY: MAA 1/08  
 CHECKED BY: GM/DI 2/08

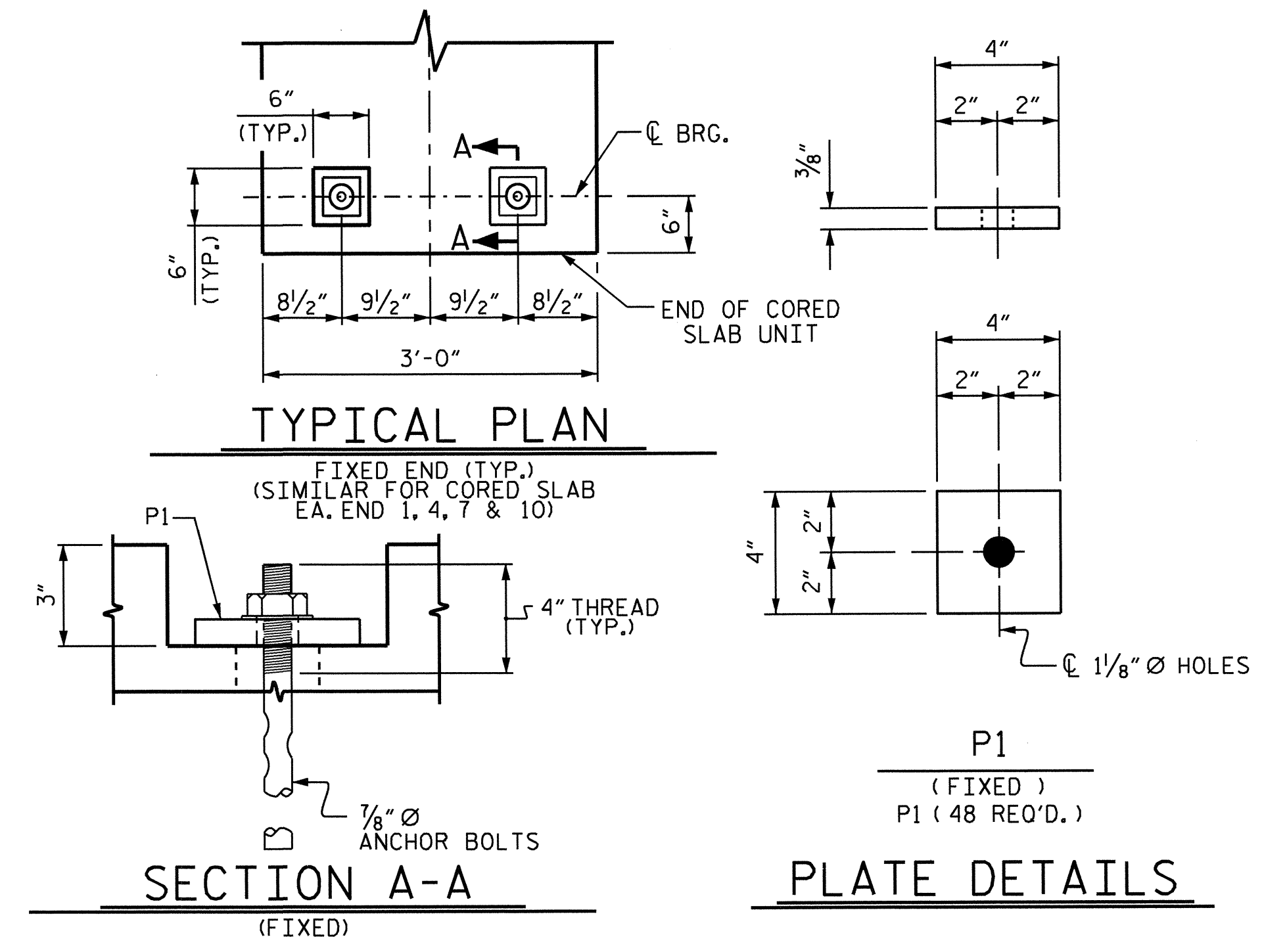
REV. 11/2/08RR MAA/GM  
 REV. 10/1/11 MAA/GM



HALF SECTION AT INTERMEDIATE DIAPHRAGMS  
**TYPICAL SECTION**  
 HALF SECTION THROUGH VOIDS

21" CORED SLAB UNITS FOR SPANS 'A & C'  
 24" CORED SLAB UNITS FOR SPAN 'B'

\* - THE MAXIMUM BARRIER RAIL HEIGHT AND CONCRETE WEARING SURFACE THICKNESS IS SHOWN. THE HEIGHT OF THE BARRIER RAIL AND CONCRETE WEARING SURFACE THICKNESS VARIES WHILE THE TOP OF THE BARRIER RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR RAIL HEIGHT DETAILS AND CONCRETE WEARING SURFACE THICKNESS SEE THE "VERTICAL CONCRETE BARRIER RAIL SECTION" DETAIL.

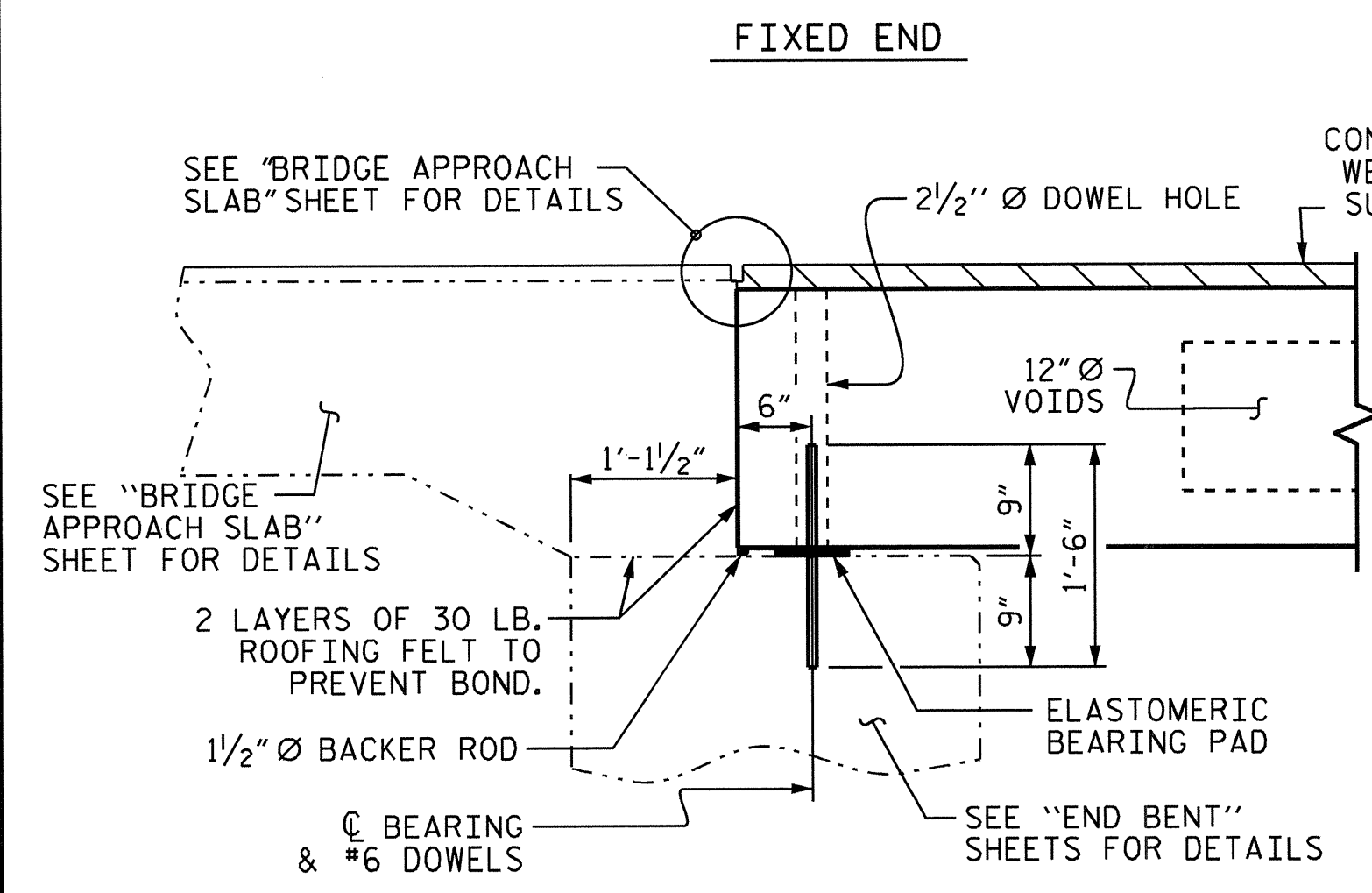


**TYPICAL PLAN**  
 FIXED END (TYP.) (SIMILAR FOR CORED SLAB EA. END 1, 4, 7 & 10)

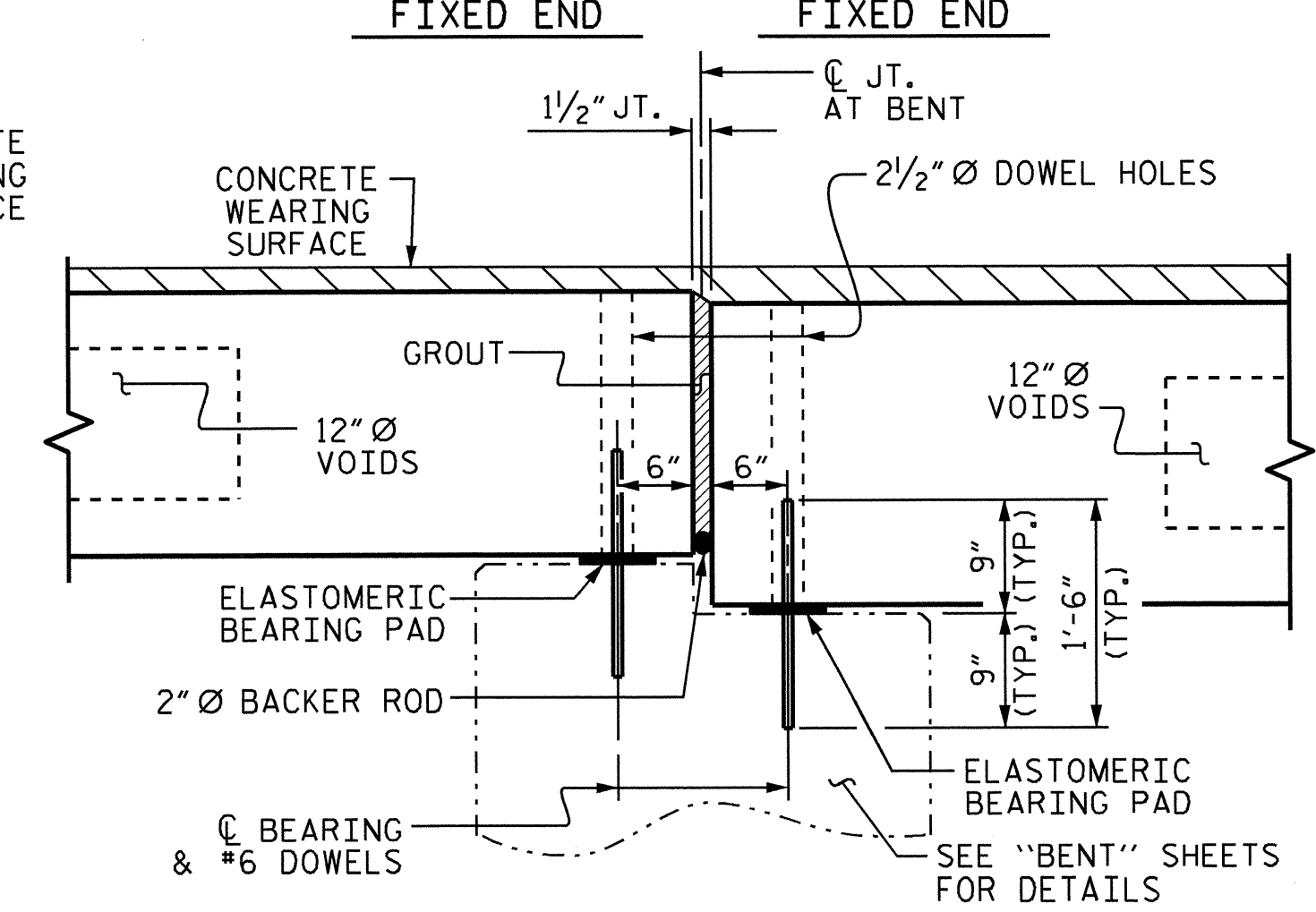
**SECTION A-A**  
 (FIXED)

**PLATE DETAILS**  
 P1 (FIXED)  
 P1 (48 REQ'D.)

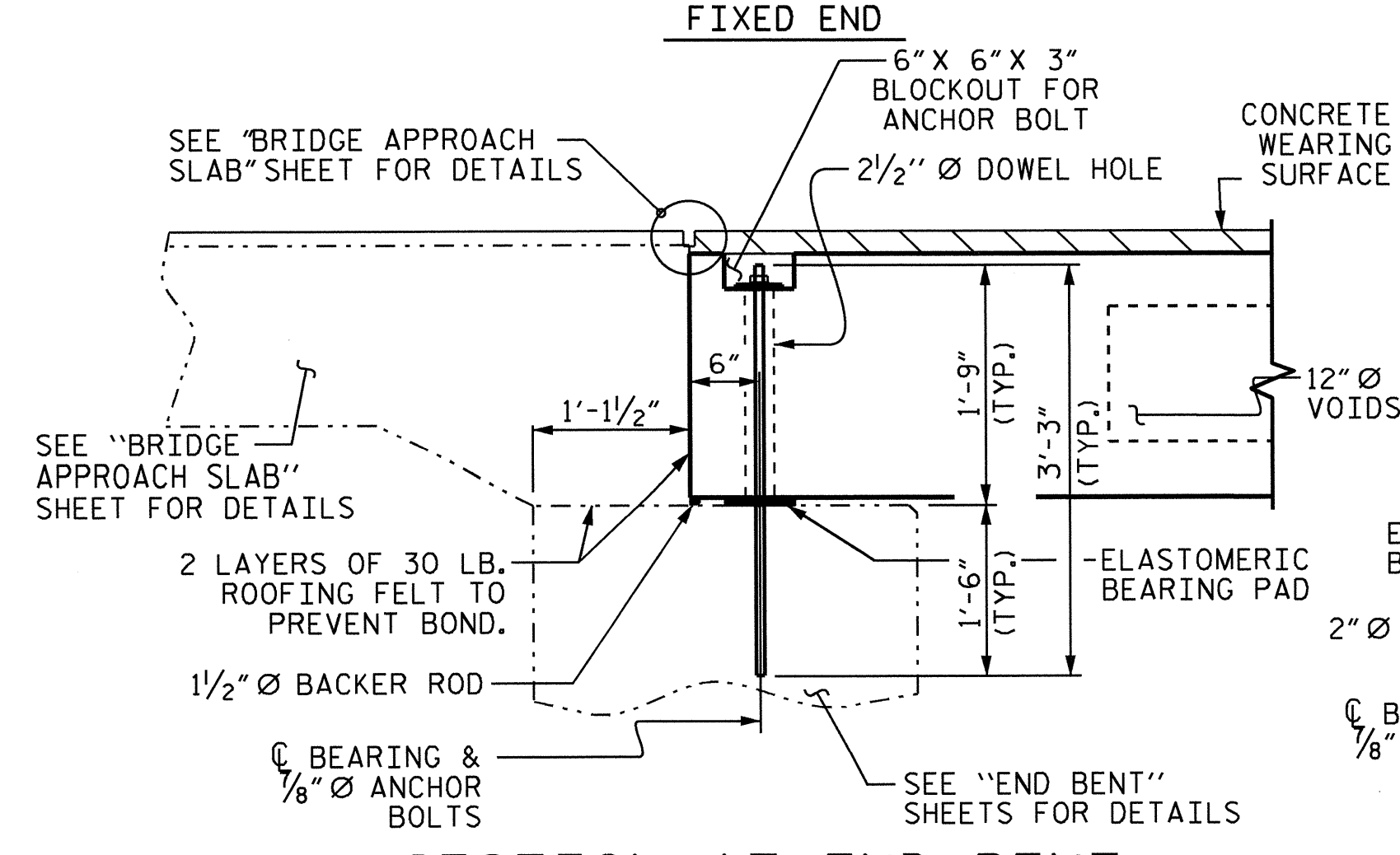
**BLOCKOUT DETAIL FOR ANCHOR BOLTS**



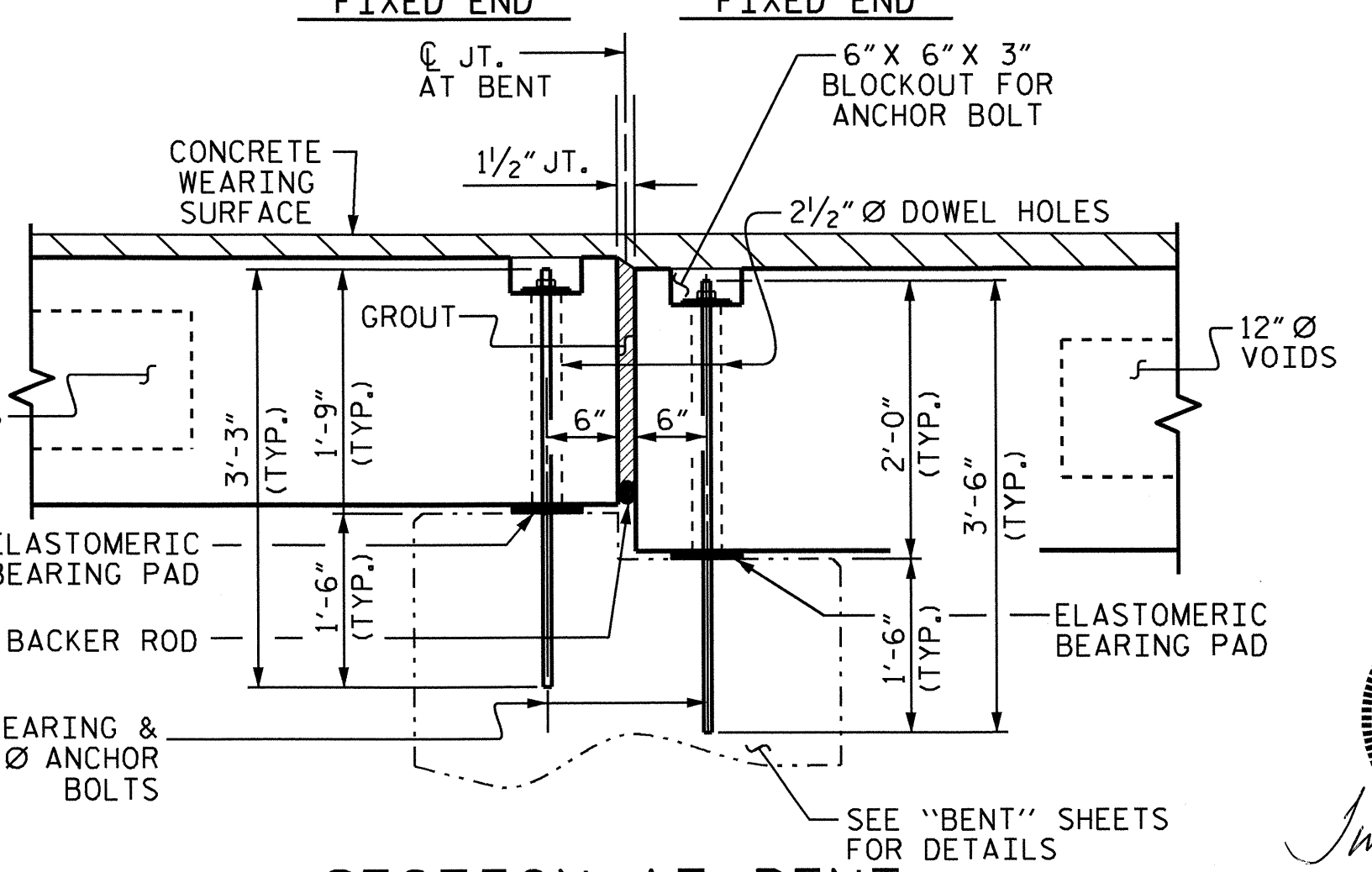
**SECTION AT END BENT**  
 (TYP. FOR CORED SLABS 2, 3, 5, 6, 8, & 9)



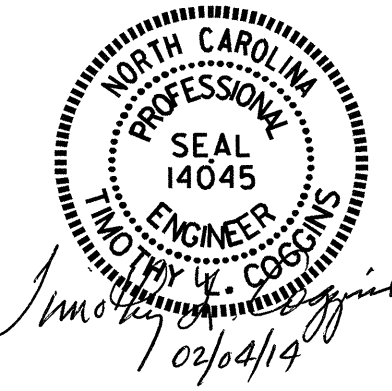
**SECTION AT BENT**  
 (TYP. FOR CORED SLABS 2, 3, 5, 6, 8, & 9)



**SECTION AT END BENT**  
 (TYP. FOR CORED SLABS 1, 4, 7 & 10)



**SECTION AT BENT**  
 (TYP. FOR CORED SLABS 1, 4, 7 & 10)



PROJECT NO. B-4758  
GUILFORD COUNTY  
 STATION: 16+64.29 -L-

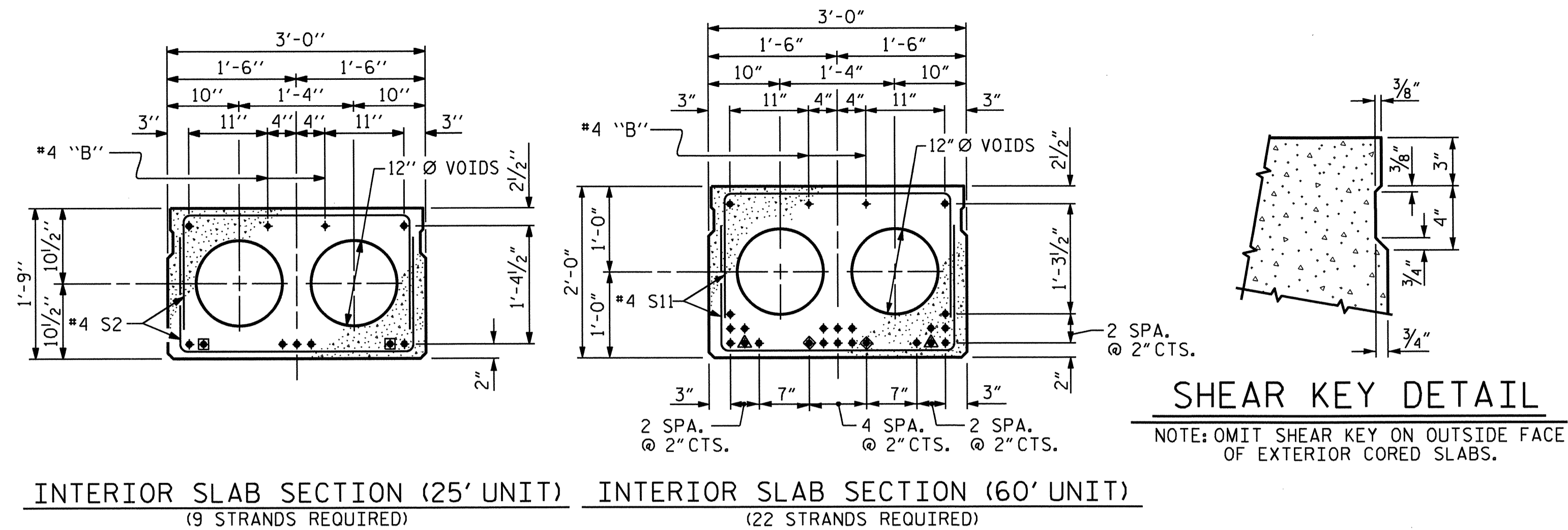
SHEET 1 OF 7

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 3'-0" X 1'-9" AND 2'-0"  
 PRESTRESSED CONCRETE  
 CORED SLAB UNIT  
 90° SKEW

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

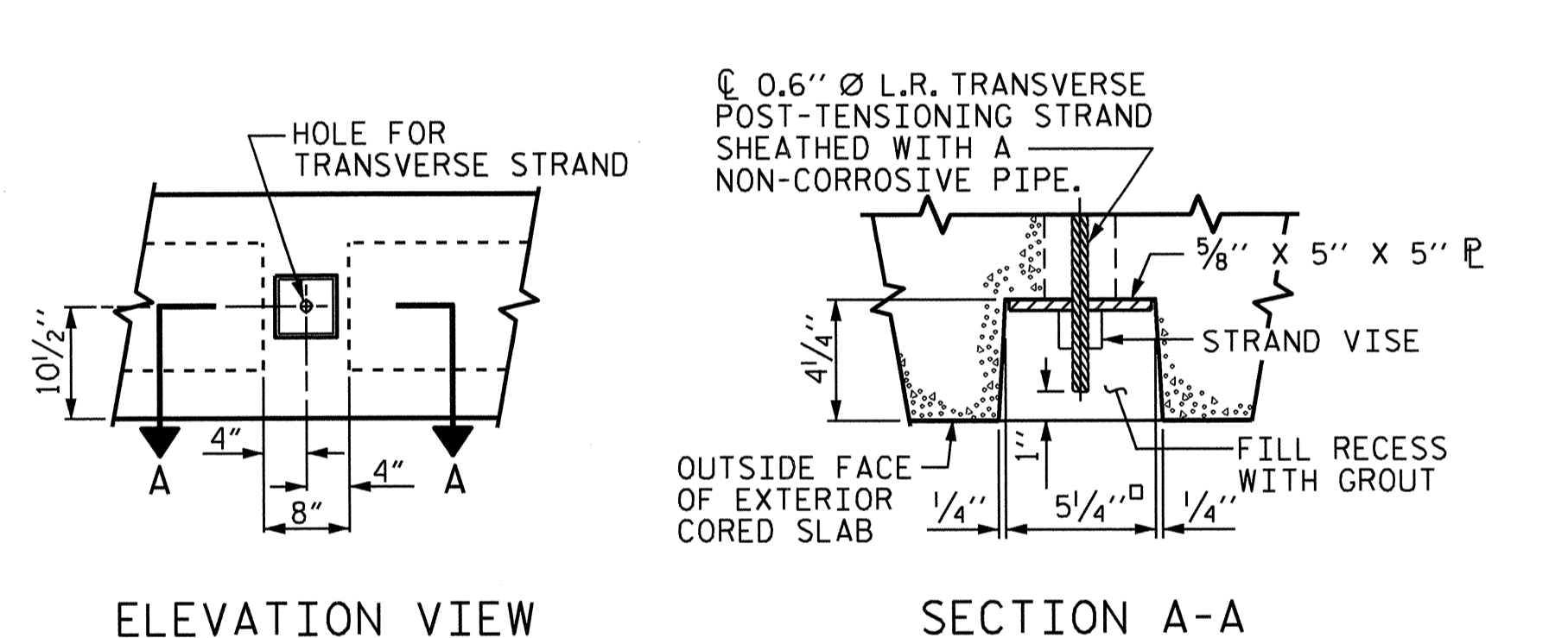
DRAWN BY: N. Ruffin DATE: 9/25/13  
 CHECKED BY: REZA KOUCHEKI DATE: 10/1/13  
 DESIGN ENGINEER OF RECORD: N. RUFFIN DATE: 12/6/13



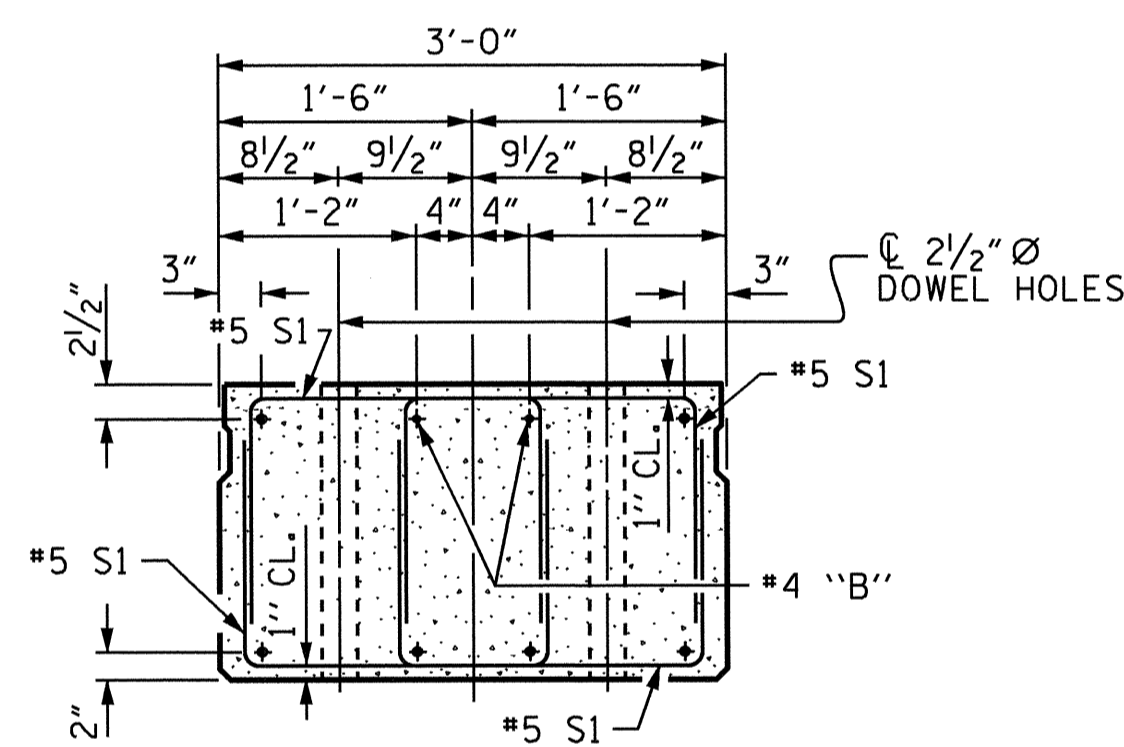
**0.6" Ø LOW RELAXATION STRAND LAYOUT**

- ▲ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 6'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.
- ◆ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 4'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.
- BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 2'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

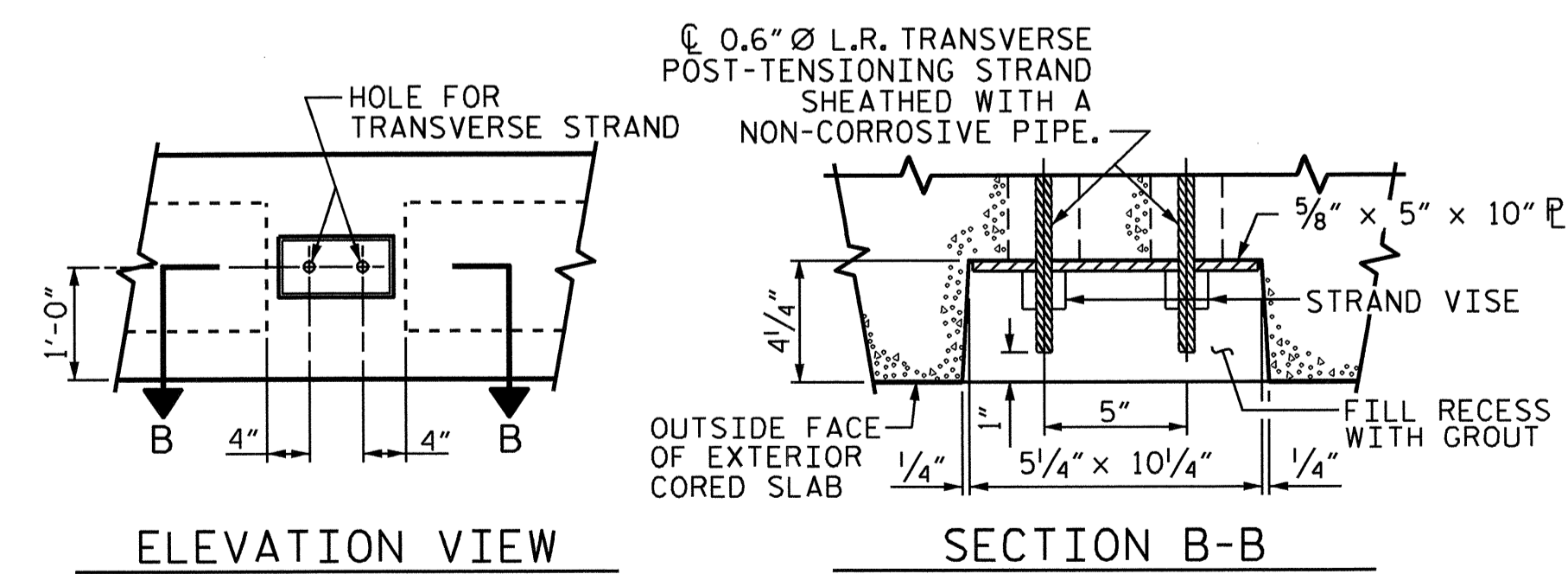
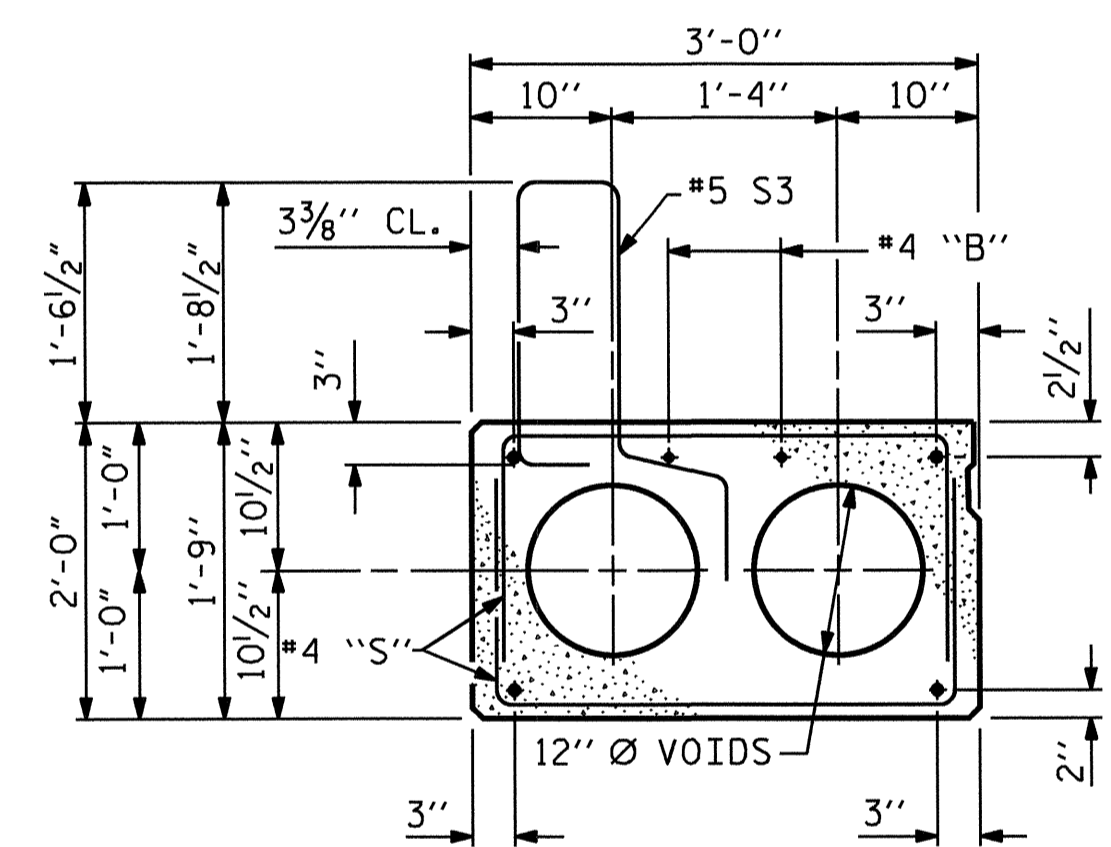
**DEBONDING LEGEND**



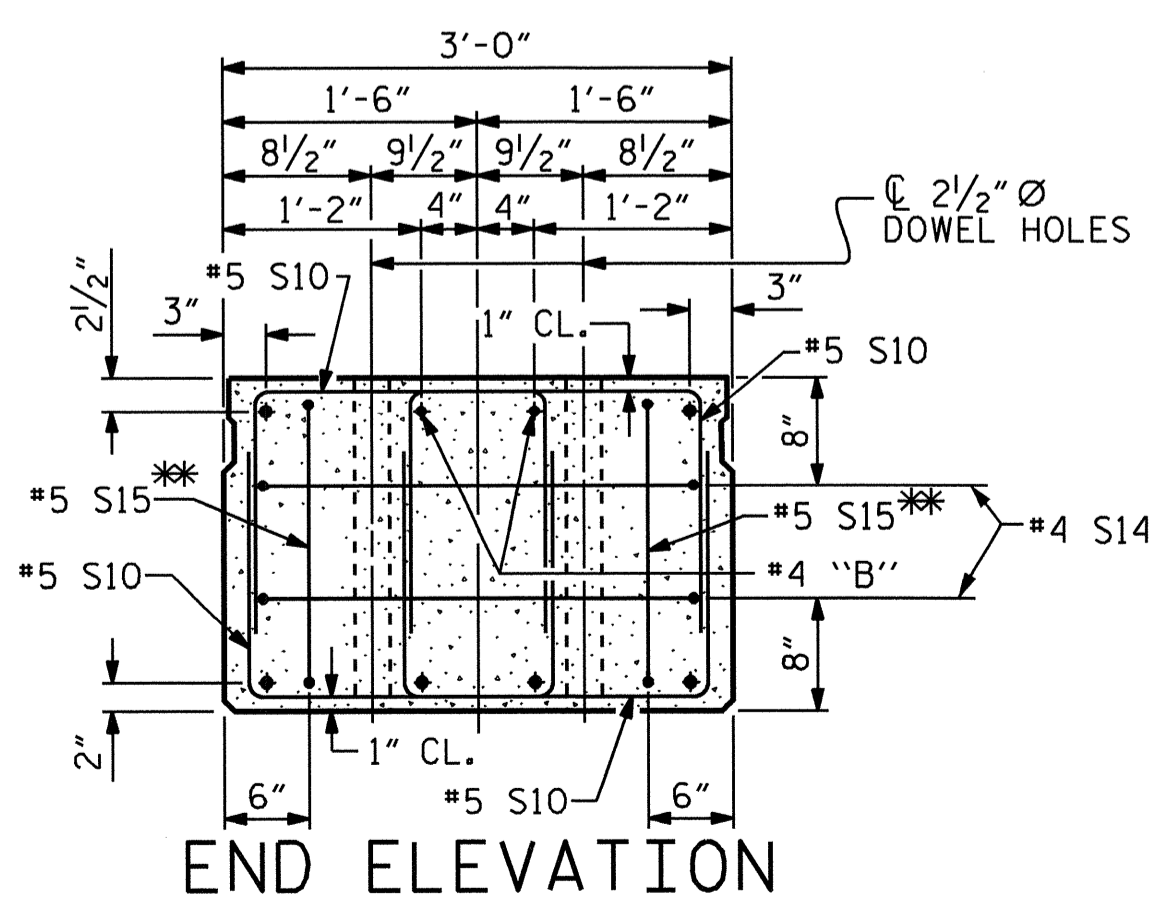
**GROUTED RECESS AT END OF POST-TENSIONED STRAND OF CORED SLABS FOR SPANS 'A & C'**



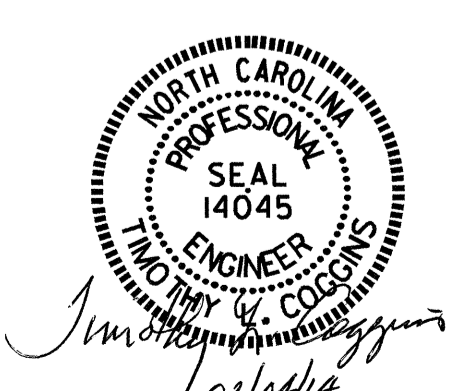
SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES. (STRAND LAYOUT NOT SHOWN.) INTERIOR SLAB UNIT SHOWN-EXTERIOR SLAB UNIT SIMILAR EXCEPT SHEAR KEY LOCATION.



**GROUTED RECESS AT END OF POST-TENSIONED STRAND OF CORED SLABS FOR SPAN 'B'**



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

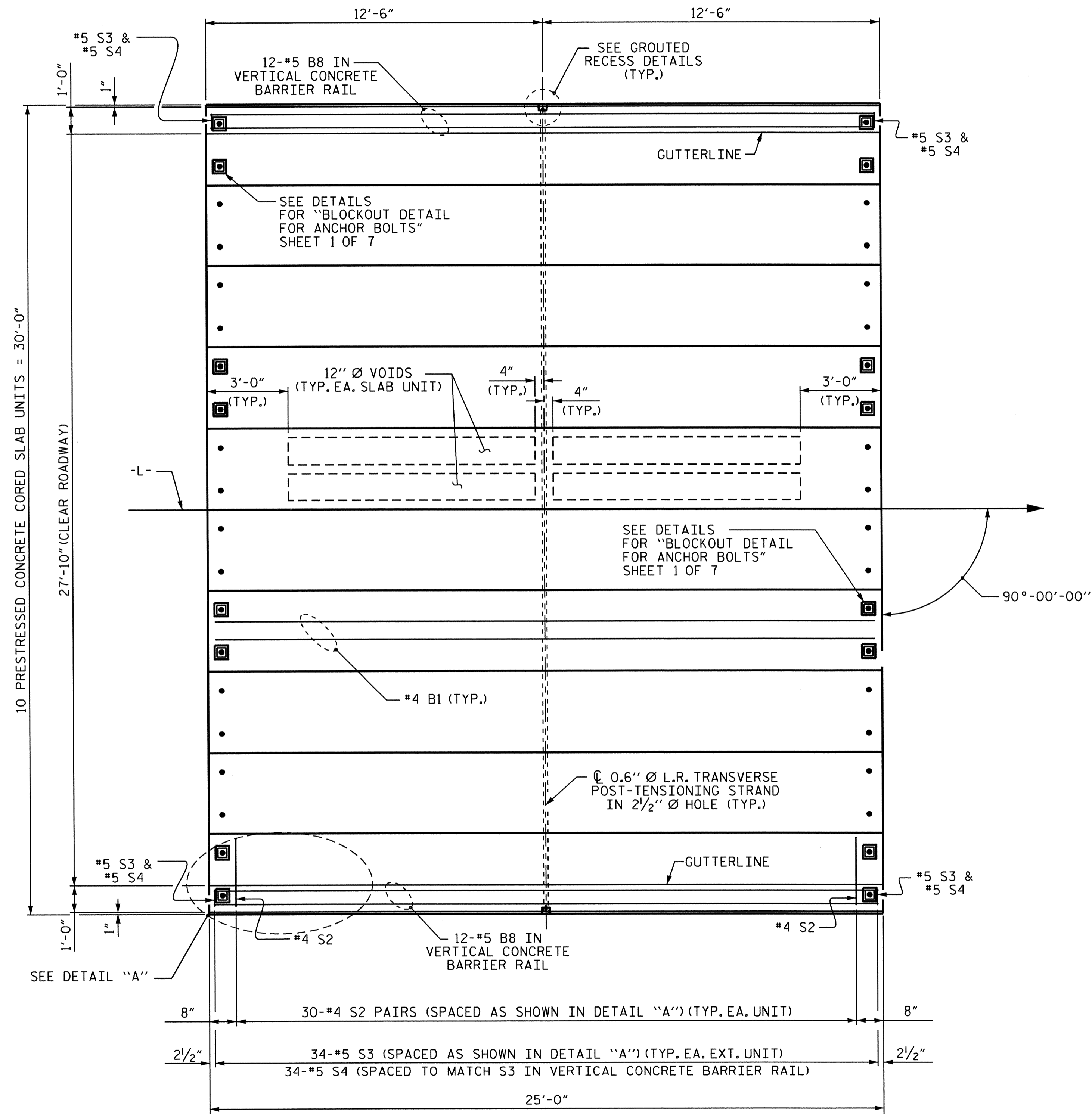


PROJECT NO. B-4758  
GUILFORD COUNTY  
 STATION: 16+64.29 -L-

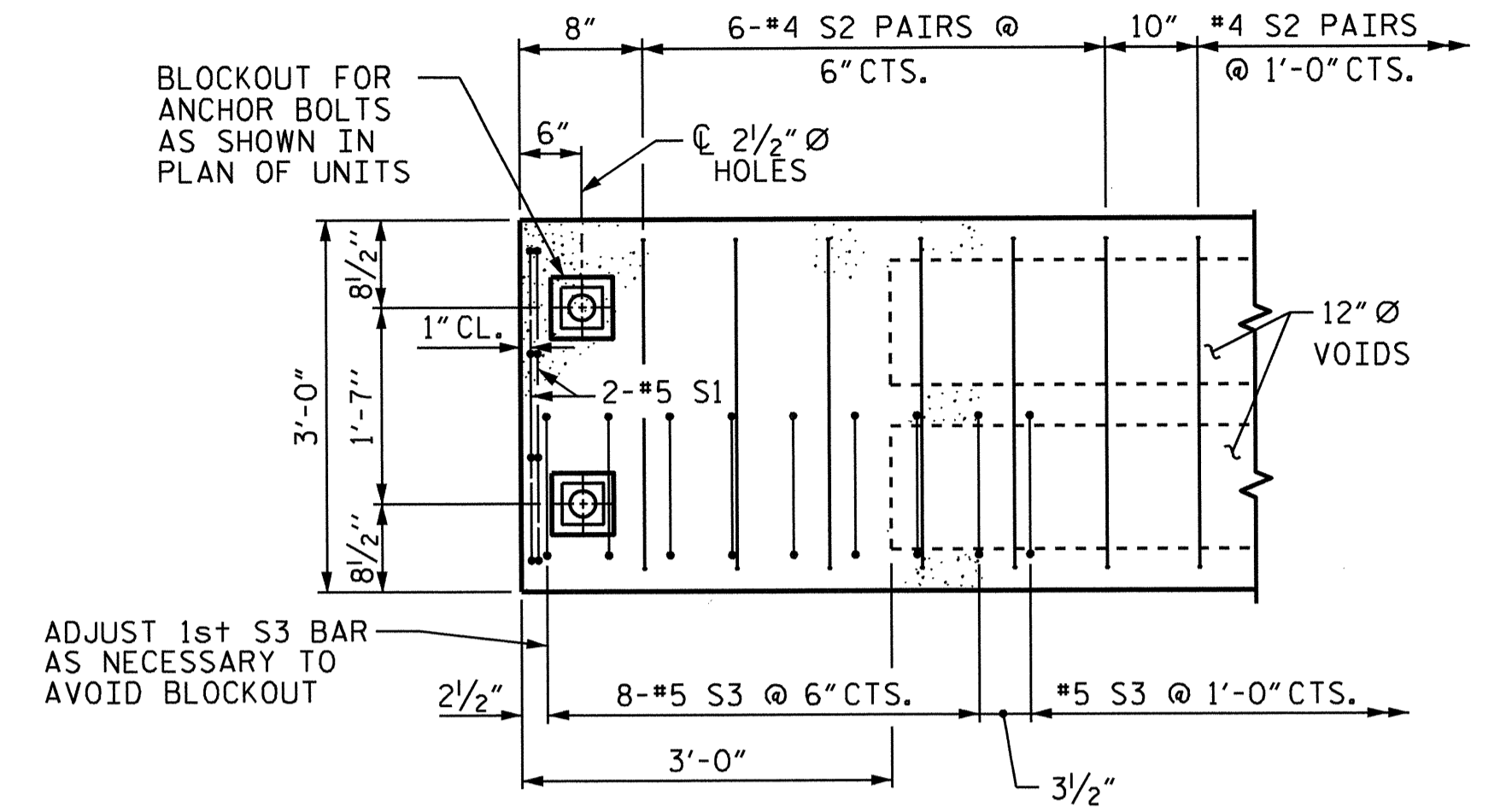
SHEET 2 OF 7

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			22

DRAWN BY: N. Ruffin DATE: 9/25/13  
 CHECKED BY: REZA KOUCHEKI DATE: 10/1/13  
 DESIGN ENGINEER OF RECORD: N. RUFFIN DATE: 12/6/13



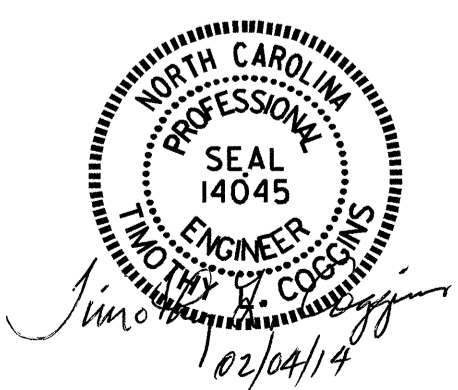
PLAN OF UNIT



DETAIL "A"  
NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.

PROJECT NO. B-4758  
GUILFORD COUNTY  
 STATION: 16+64.29 -L-  
 SHEET 3 OF 7

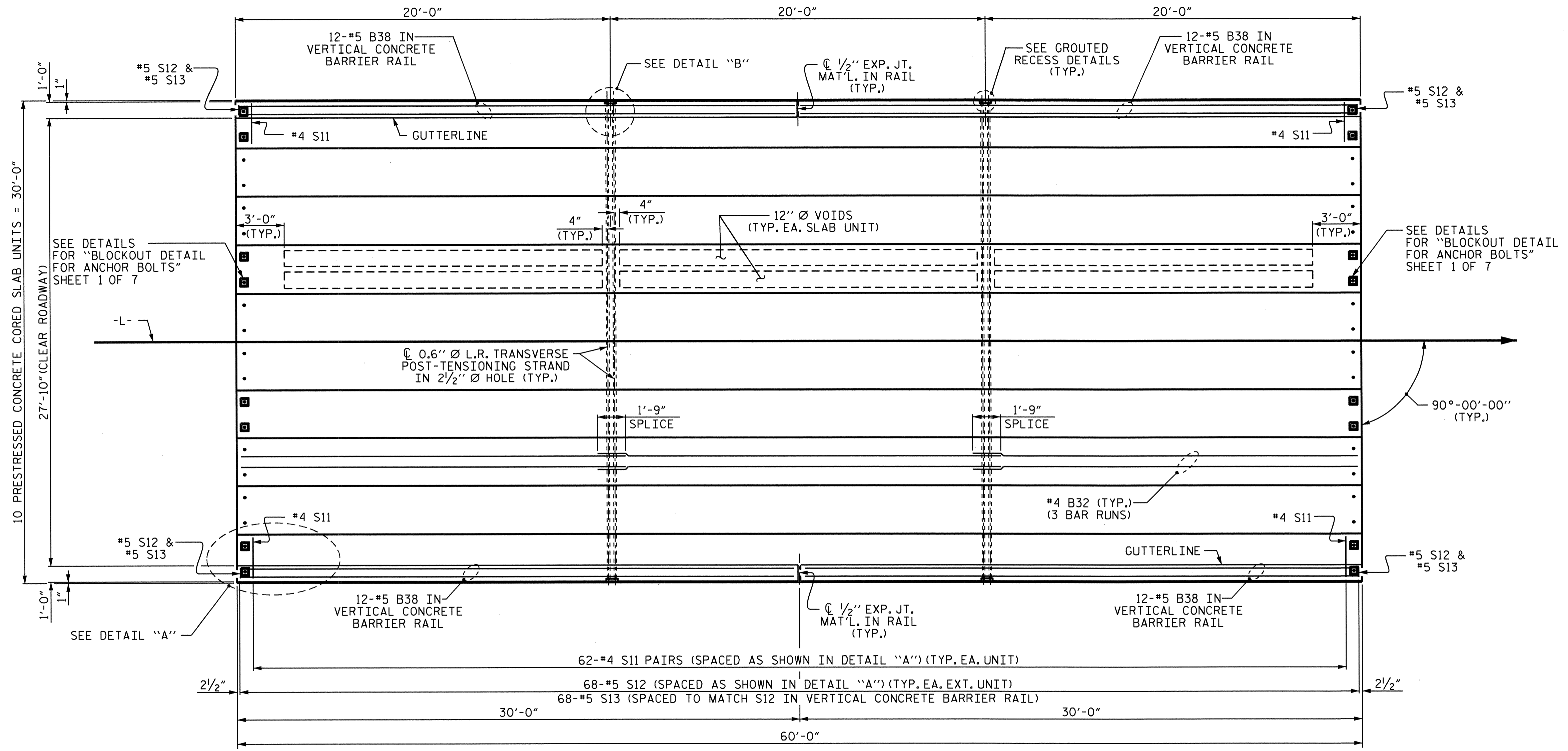
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 PLAN OF 25' UNIT  
 27'-10" CLEAR ROADWAY  
 90° SKEW  
 SPAN A OR SPAN C



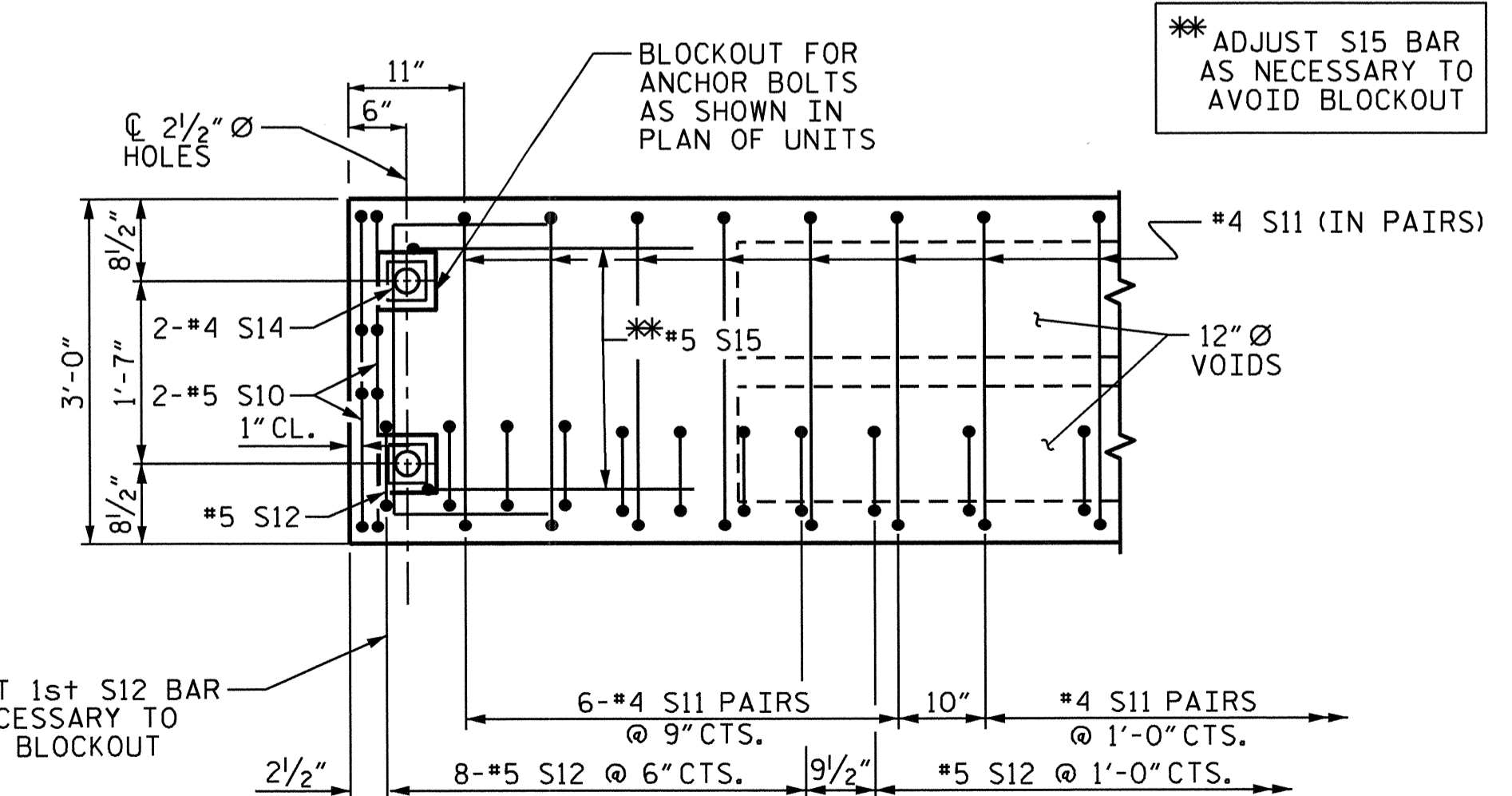
DRAWN BY: N. Ruffin DATE: 9/25/13  
 CHECKED BY: REZA KOUCHEKI DATE: 10/1/13  
 DESIGN ENGINEER OF RECORD: N. RUFFIN DATE: 12/6/13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			22



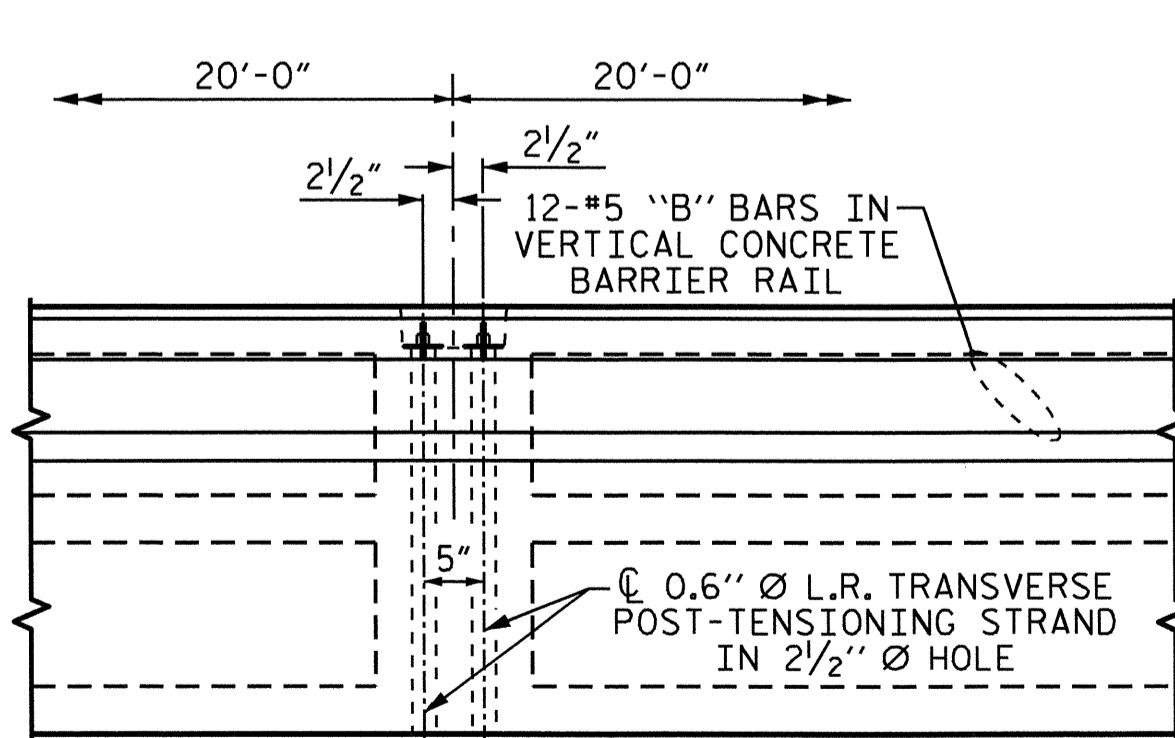


PLAN OF UNIT



DETAIL "A"

NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S12 BARS.



DETAIL "B"

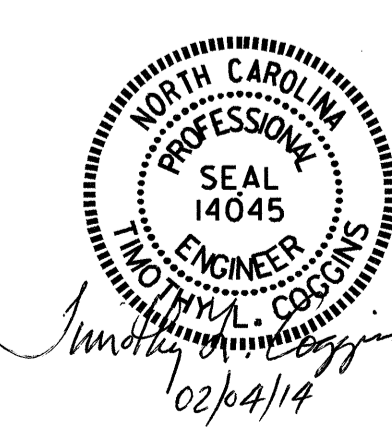
#4 S11 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO GROUDED RECESS AND 2 1/2" Ø TRANSVERSE POST-TENSIONING STRAND HOLES

\*ADJUST S15 BAR AS NECESSARY TO AVOID BLOCKOUT

ADJUST 1st S12 BAR AS NECESSARY TO AVOID BLOCKOUT

DRAWN BY: N. Ruffin DATE: 9/26/13  
 CHECKED BY: REZA KOUICHEKI DATE: 10/1/13  
 DESIGN ENGINEER OF RECORD: N. RUFFIN DATE: 12/6/13

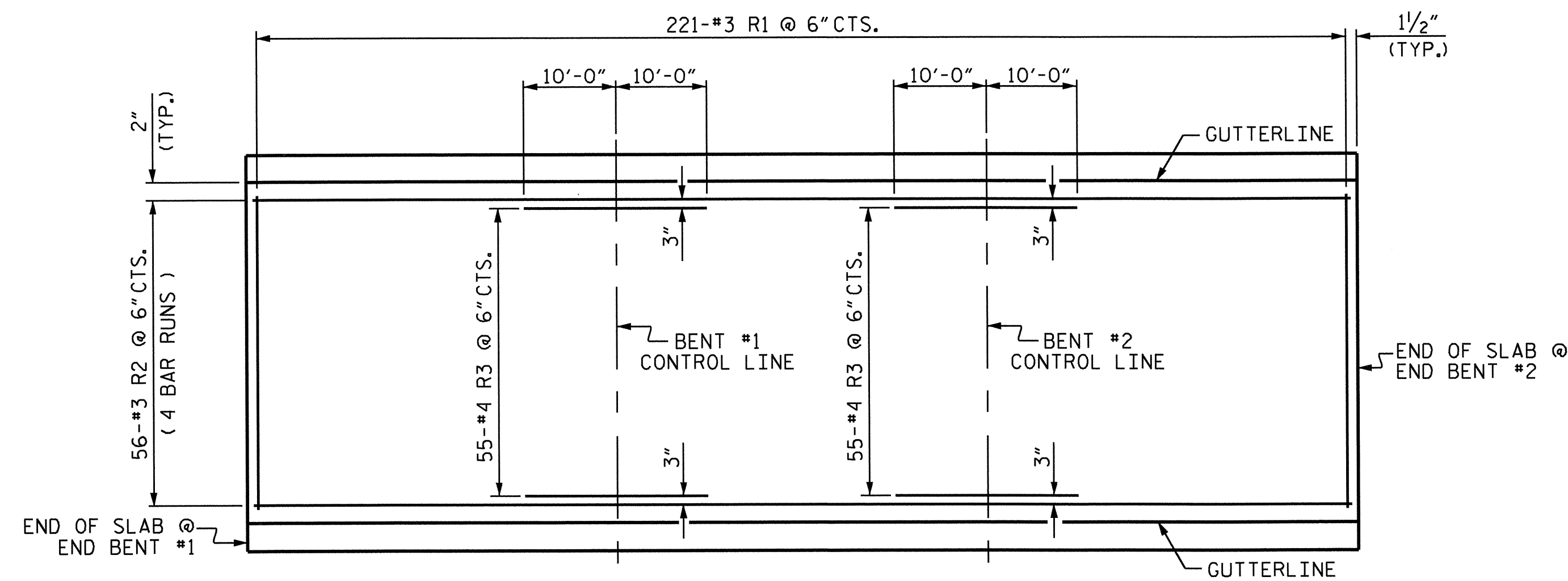
04-FEB-2014 11:07  
 R:\Structures\Plans\Final Plans\B-4758.sm.Final.Plans\_01.dgn  
 nruffin



PROJECT NO. B-4758  
GUILFORD COUNTY  
 STATION: 16+64.29 -L-  
 SHEET 4 OF 7

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 PLAN OF 60' UNIT  
 27'-10" CLEAR ROADWAY  
 90° SKEW  
 SPAN B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			22

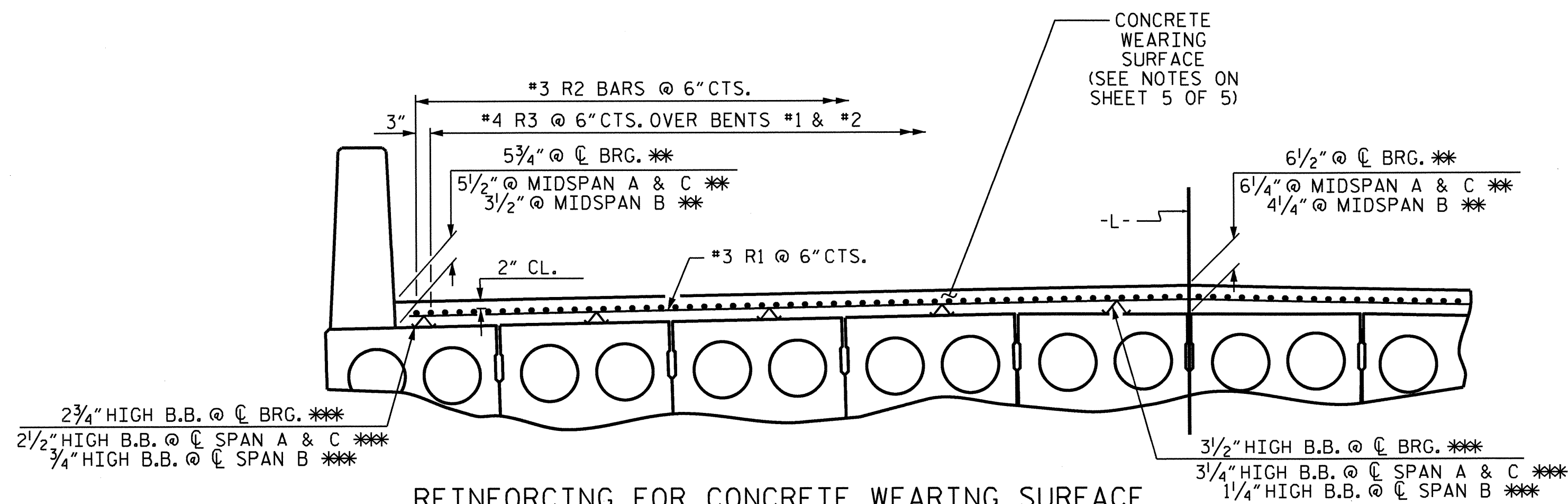


PLAN SHOWING CONCRETE WEARING SURFACE REINFORCING STEEL

BILL OF MATERIAL FOR CONCRETE WEARING SURFACE					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*R1	221	#3	STR	27'-6"	2285
*R2	224	#3	STR	29'-0"	2414
*R3	110	#4	STR	20'-0"	1470
* EPOXY COATED REINFORCING STEEL					LBS. 6169
CONCRETE WEARING SURFACE					SO. FT. 3069

GROOVING BRIDGE FLOORS	
APPROACH SLABS	1209 SQ.FT.
BRIDGE DECK	2730 SQ.FT.
TOTAL	3939 SQ.FT.

SPLICE LENGTH CHART	
BAR SIZE	EPOXY COATED
#3	1'-6"
#4	2'-0"



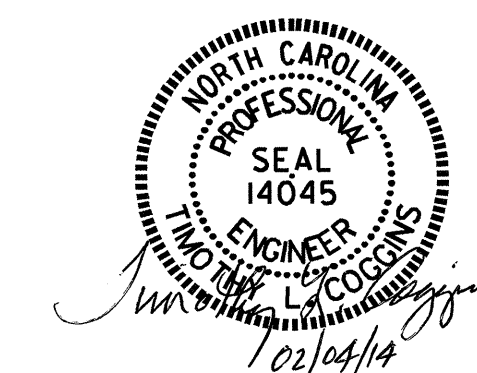
REINFORCING FOR CONCRETE WEARING SURFACE

\*\* BASED ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATIONS  
 \*\*\* BEAM BOLSTERS (B.B.) SHALL BE SPACED AT 2'-0" MAX. CENTERS SET 1'-0" FROM GUTTERLINE.

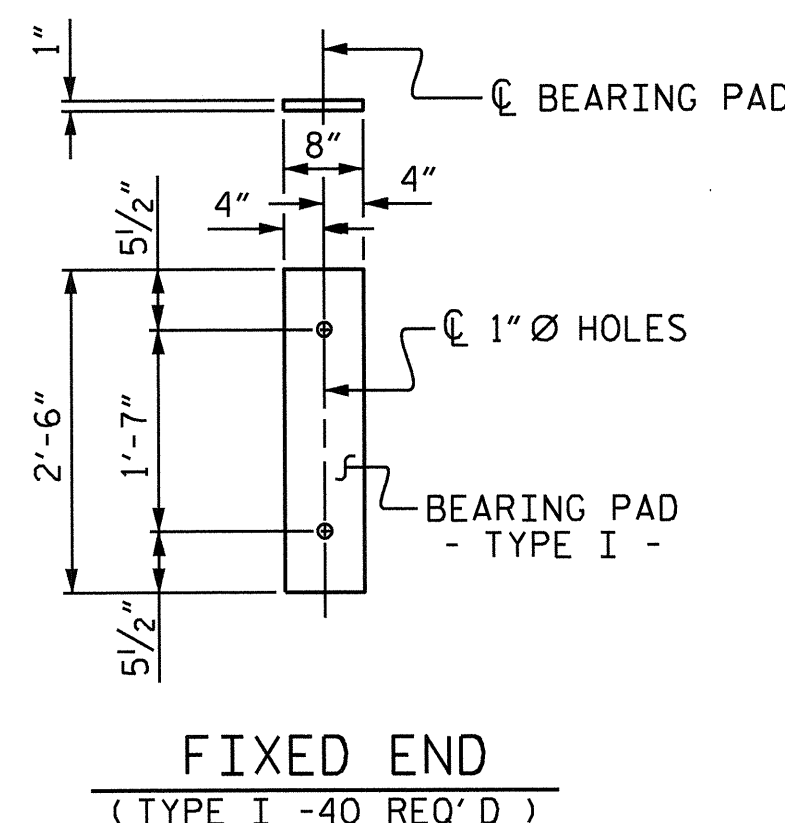
PROJECT NO. B-4758  
GUILFORD COUNTY  
 STATION: 16+64.29 -L-

SHEET 5 OF 7

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE					
CONCRETE WEARING SURFACE DETAILS					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-9
					TOTAL SHEETS 22



DRAWN BY: N. Ruffin DATE: 9/25/13  
 CHECKED BY: REZA KOUICHEKI DATE: 10/1/13  
 DESIGN ENGINEER OF RECORD: N. RUFFIN DATE: 12/6/13



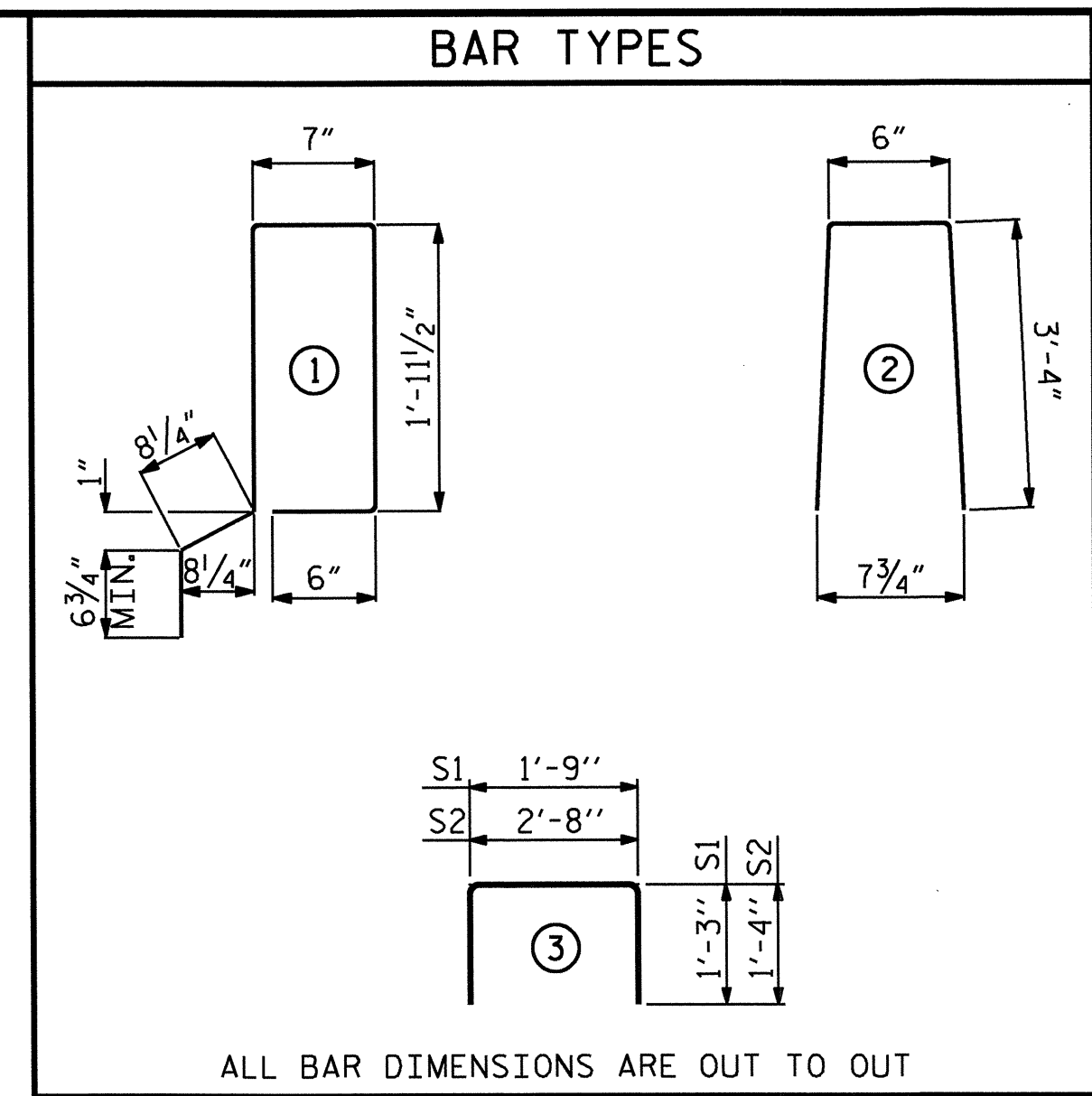
**ELASTOMERIC BEARING DETAILS**  
ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

**BILL OF MATERIAL FOR ONE 25' CORED SLAB UNIT**

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
BI	2	#4	STR	24'-8"	33	24'-8"	33
S1	8	#5	3	4'-3"	35	4'-3"	35
S2	60	#4	3	5'-4"	214	5'-4"	214
*S3	34	#5	1	6'-3"	222		
REINFORCING STEEL				LBS.	282	282	
* EPOXY COATED REINFORCING STEEL				LBS.	222		
5000 P.S.I. CONCRETE				CU. YDS.	3.7	3.7	
0.6" Ø L.R. STRANDS				No.	9	9	

**CORED SLABS REQUIRED**

25' UNIT	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR C.S.	4	25'-0"	100'-0"
INTERIOR C.S.	16	25'-0"	400'-0"
TOTAL	20		500'-0"



**DEAD LOAD DEFLECTION AND CAMBER**

	3'-0" x 1'-9"
25' CORED SLAB UNIT	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	5/16" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	1/16" ↓
FINAL CAMBER	1/4" ↑

\*\* INCLUDES FUTURE WEARING SURFACE

**GUTTERLINE CONCRETE THICKNESS & RAIL HEIGHT**

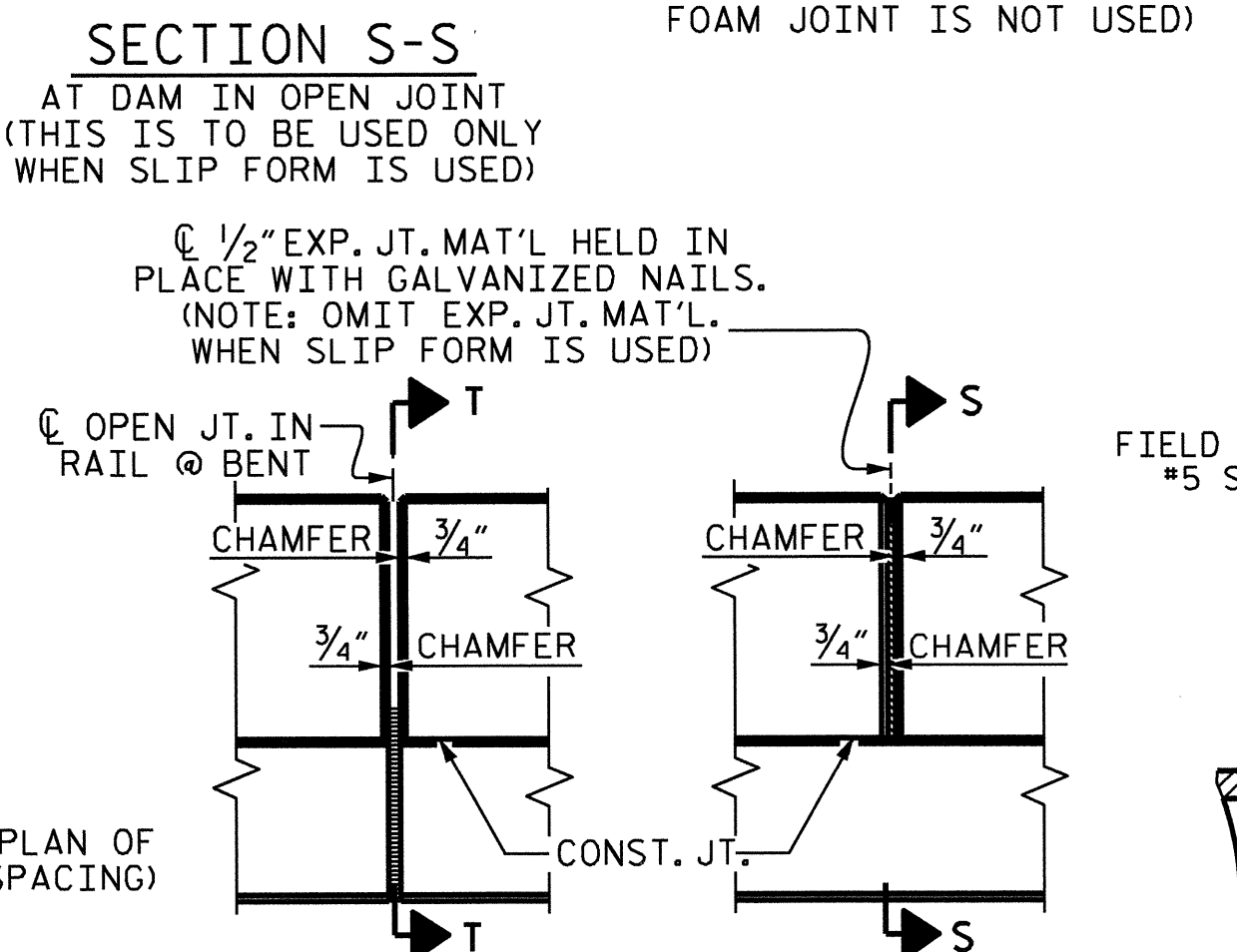
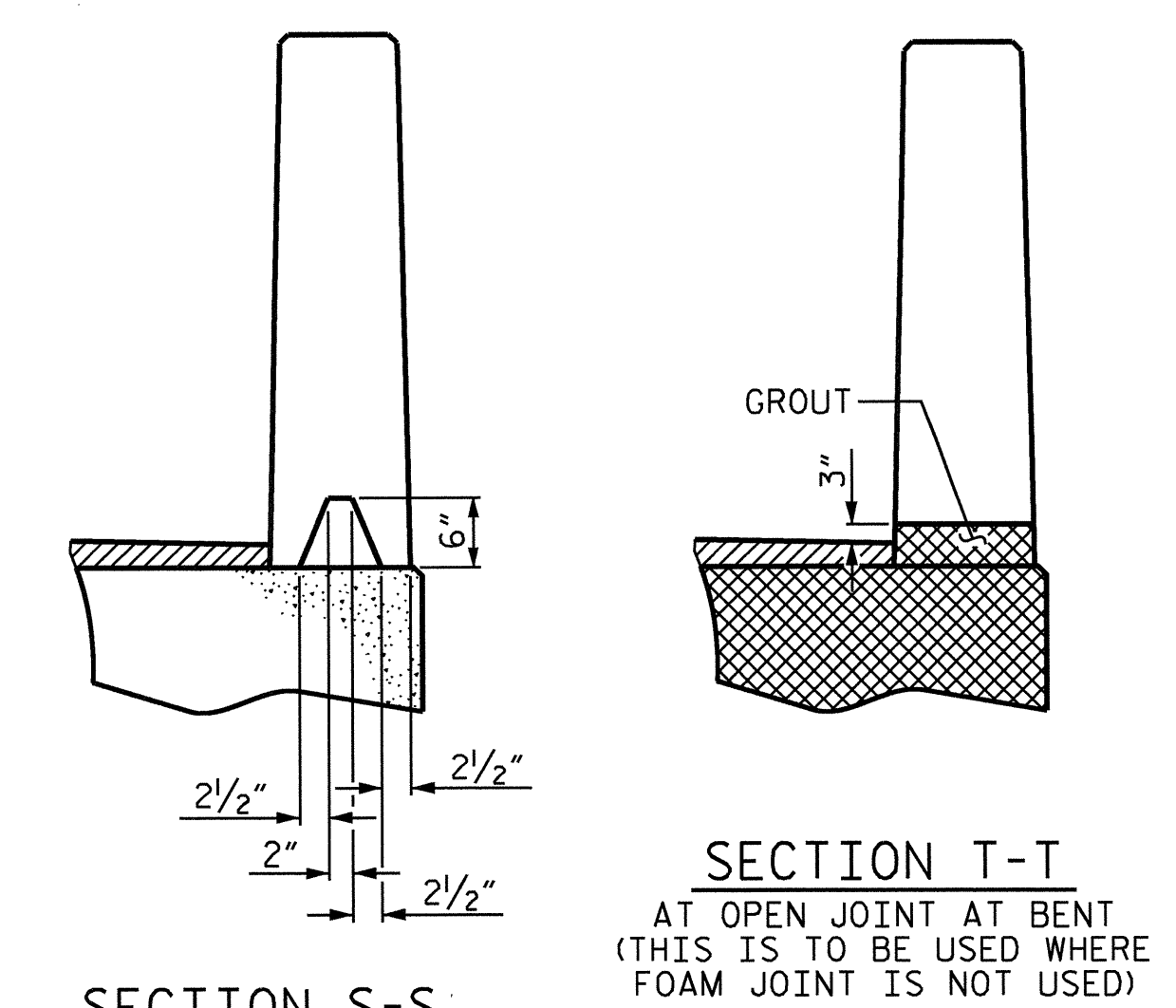
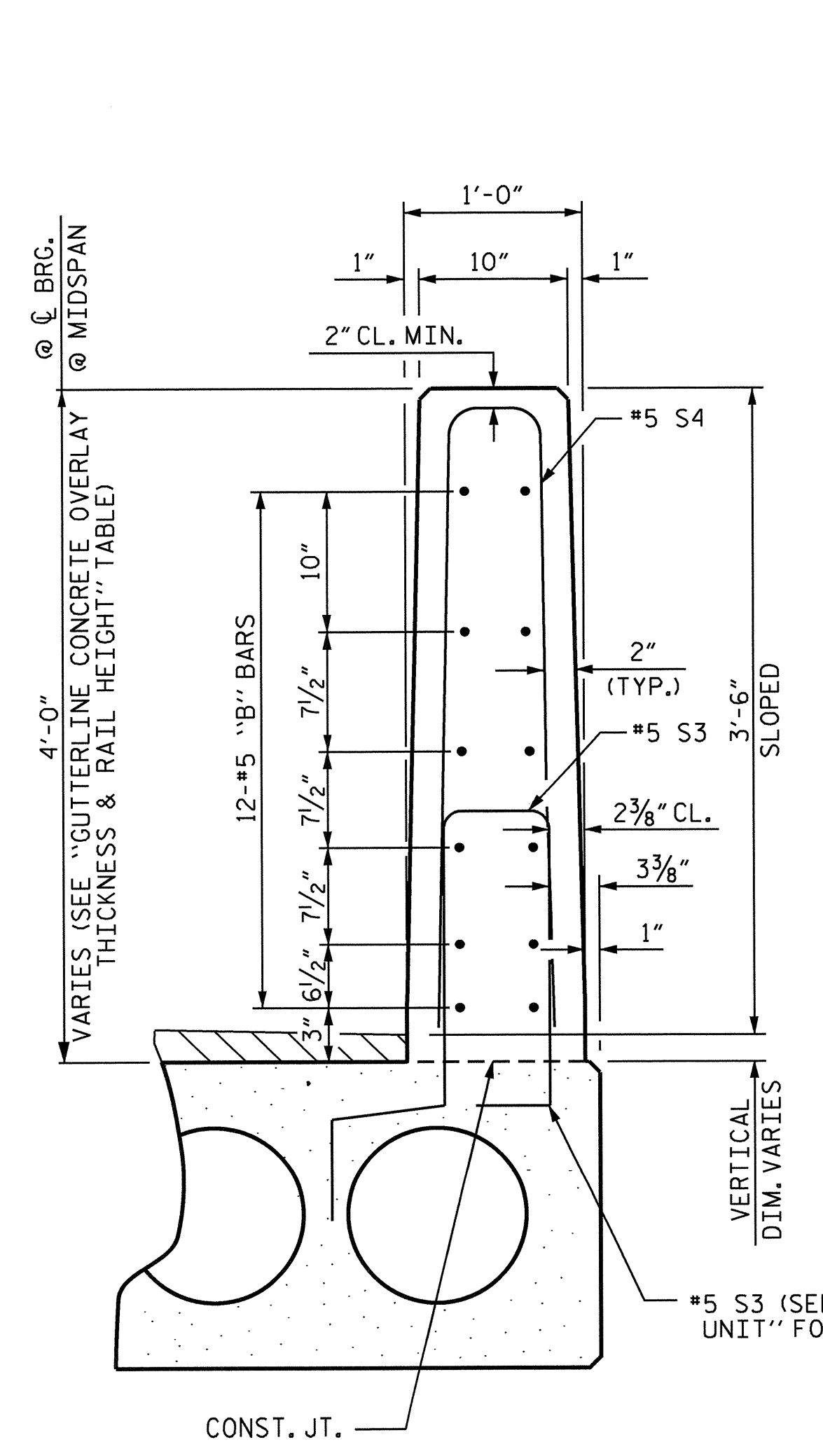
27'-10" CLEAR ROADWAY	CONCRETE OVERLAY THICKNESS	RAIL HEIGHT
	@ MID-SPAN	@ MID-SPAN
	NORMAL CROWN SECTION	
25' UNITS	5/2"	3'-11 3/4"

**GRADE 270 STRANDS**

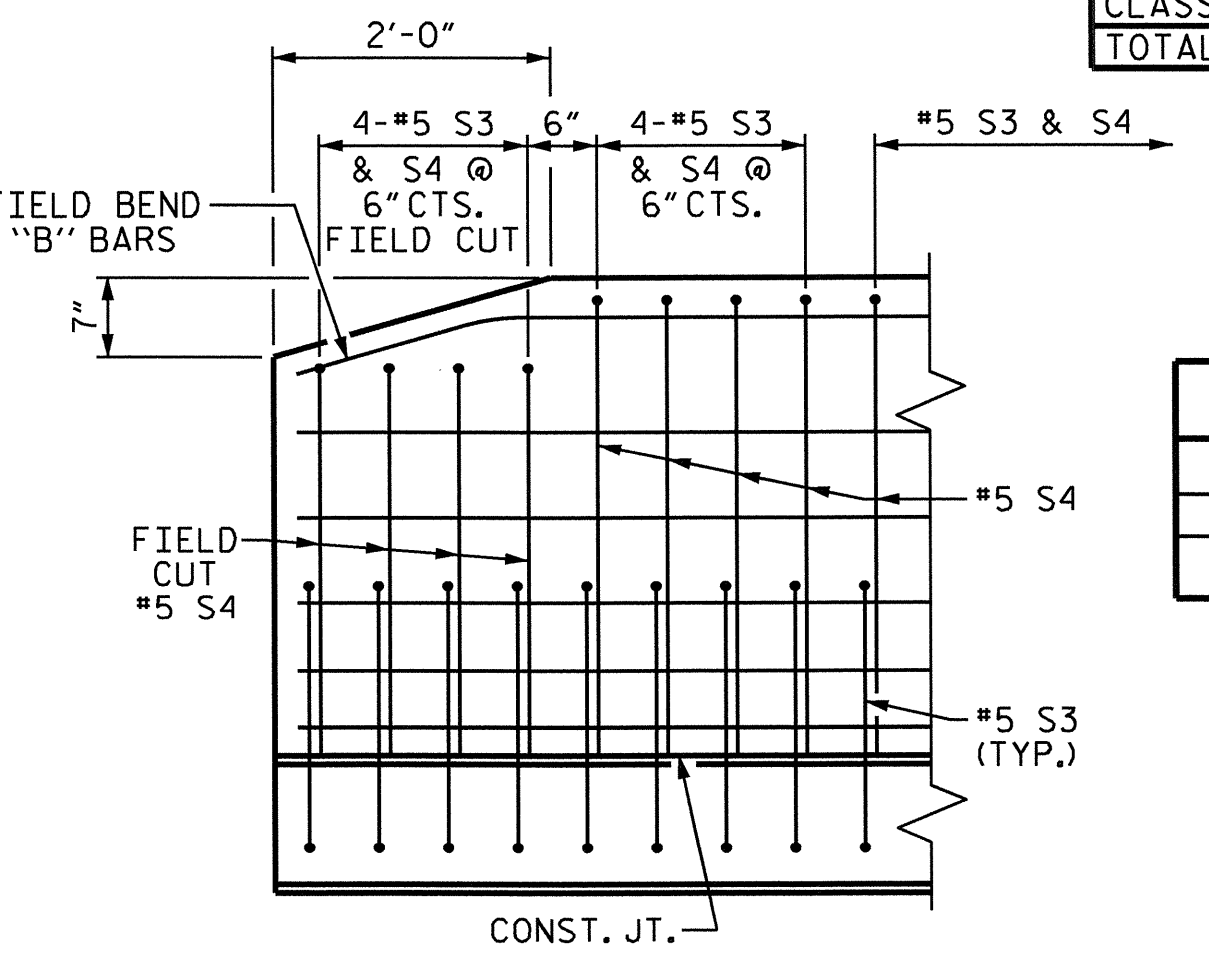
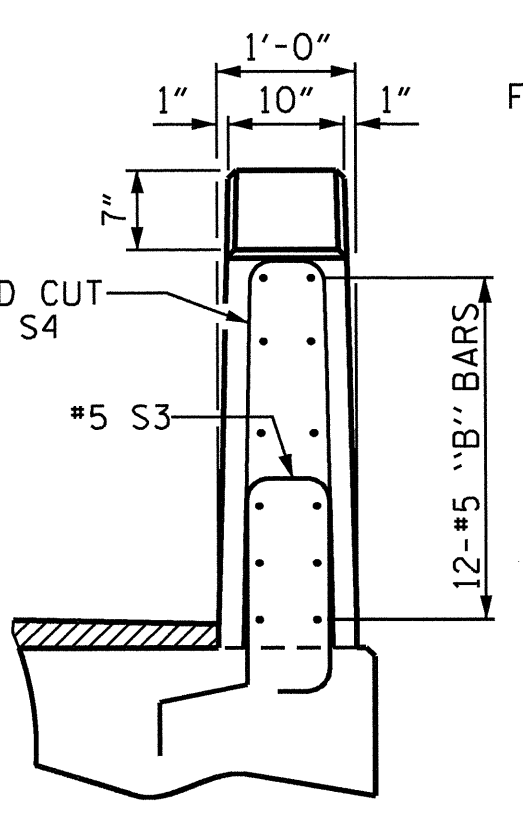
	0.6" Ø L.R.
AREA (SQUARE INCHES)	0.217
ULTIMATE STRENGTH (LBS. PER STRAND)	58,600
APPLIED PRESTRESS (LBS. PER STRAND)	43,950

**BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL**

BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
25' UNIT						
*B8	24	48	#5	STR	24'-7"	1231
*S4	68	136	#5	2	7'-2"	1017
* EPOXY COATED REINFORCING STEEL						LBS. 2048
CLASS AA CONCRETE						CU. YDS. 13.2
TOTAL VERTICAL CONCRETE BARRIER RAIL						LN. FT. 100.25



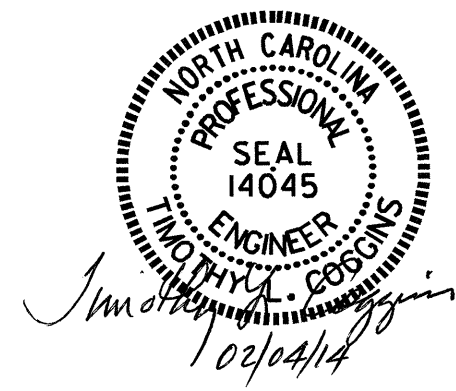
ELEVATION AT EXPANSION JOINTS



END OF RAIL DETAILS

**CONCRETE RELEASE STRENGTH**

UNIT	PSI
25' UNITS	4000



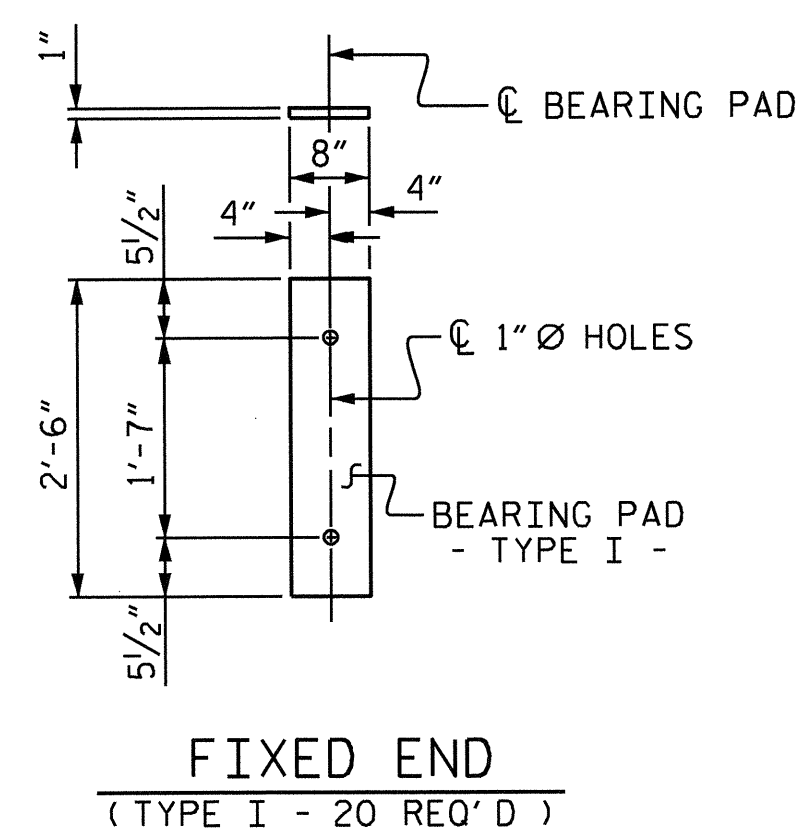
PROJECT NO. B-4758  
GUILFORD COUNTY  
STATION: 16+64.29 -L-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SPAN A OR SPAN C  
3'-0" X 1'-9"  
PRESTRESSED CONCRETE  
CORED SLAB UNIT  
90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS 22
2			4			

DRAWN BY: N. Ruffin DATE: 9/25/13  
CHECKED BY: REZA KOUCHEKI DATE: 10/3/13  
DESIGN ENGINEER OF RECORD: N. RUFFIN DATE: 12/6/13

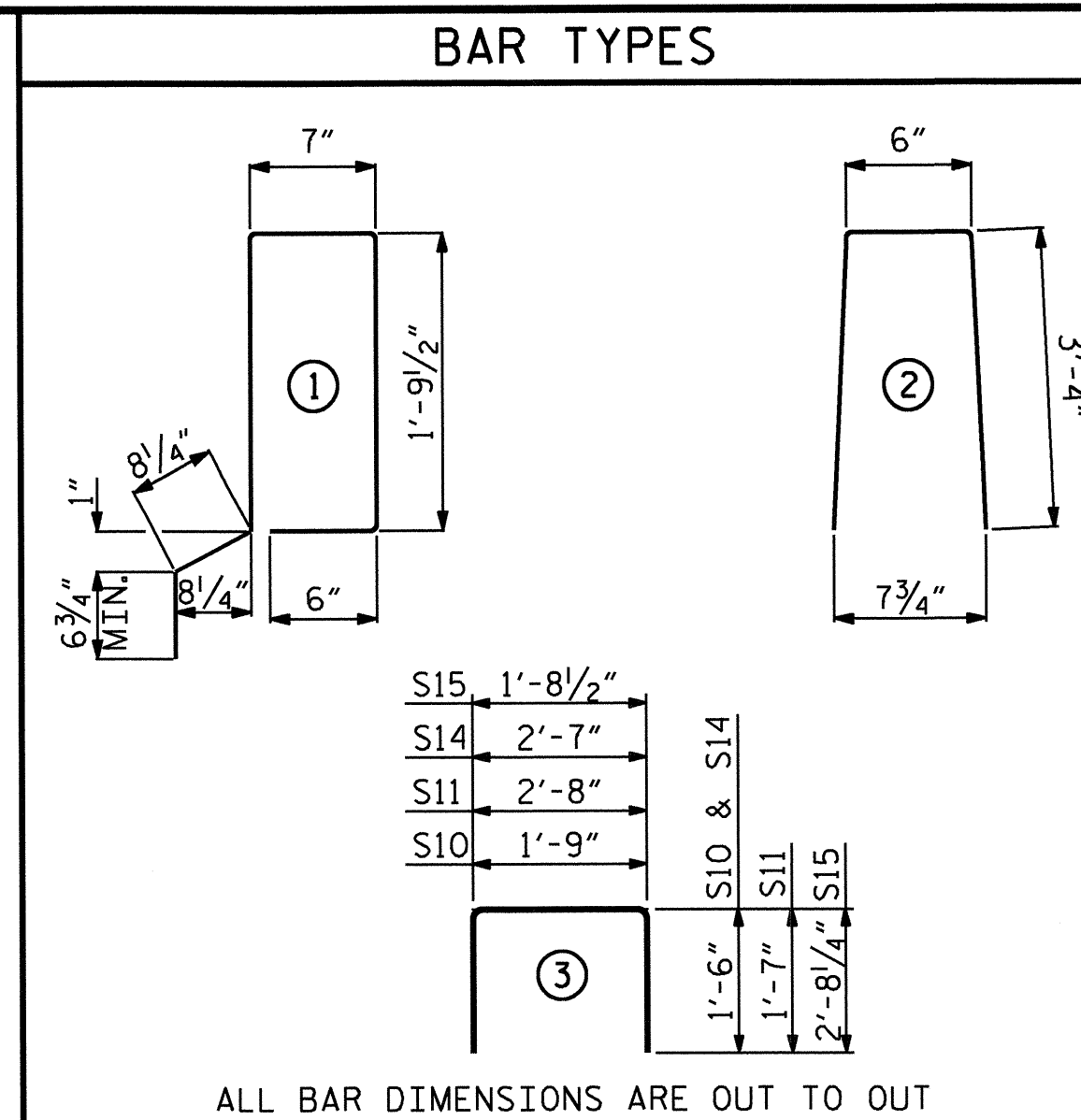


### ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

BILL OF MATERIAL FOR ONE 60' CORED SLAB UNIT							
				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B32	6	#4	STR	21'-2"	85	21'-2"	85
S10	8	#5	3	4'-9"	40	4'-9"	40
S11	124	#4	3	5'-10"	483	5'-10"	483
*S12	68	#5	1	5'-11"	420		
S14	4	#4	3	5'-7"	15	5'-7"	15
S15	4	#5	3	7'-1"	30	7'-1"	30
REINFORCING STEEL				LBS.	653	653	
* EPOXY COATED REINFORCING STEEL				LBS.	420		
6000 P.S.I. CONCRETE				CU. YDS.	10.3	10.3	
0.6" Ø L.R. STRANDS				No.	22	22	

CORED SLABS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
60' UNIT			
EXTERIOR C.S.	2	60'-0"	120'-0"
INTERIOR C.S.	8	60'-0"	480'-0"
TOTAL	10		600'-0"

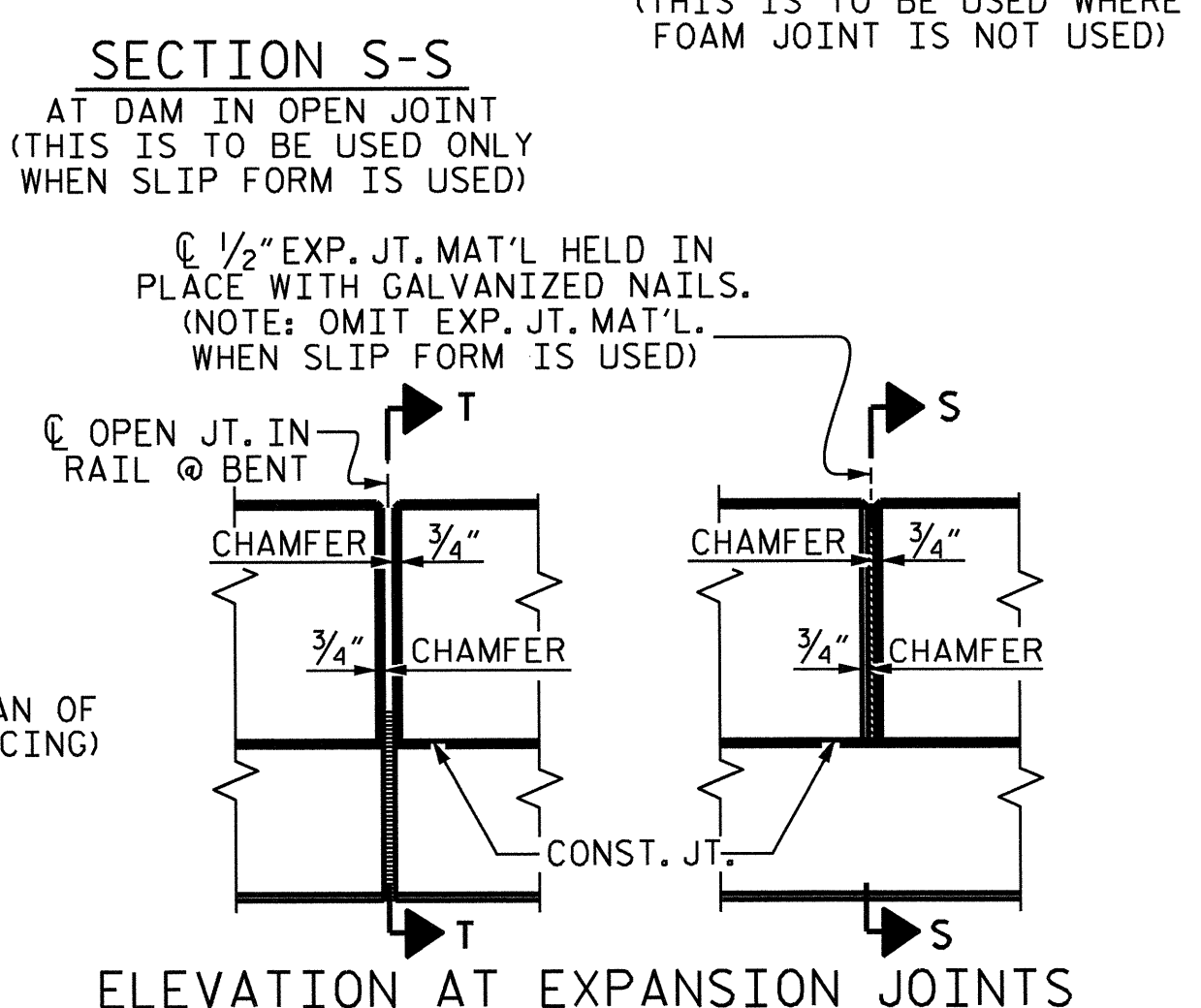
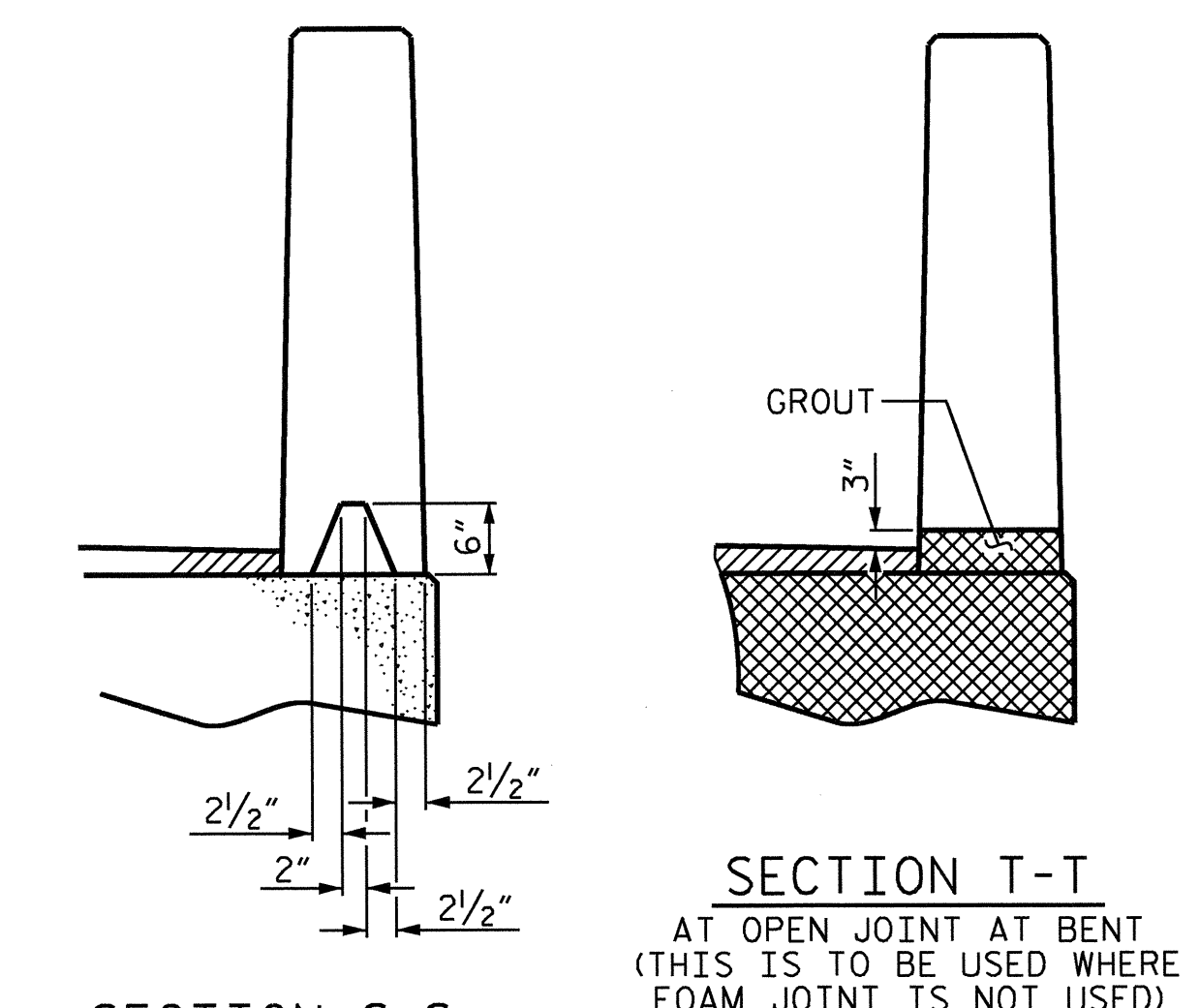
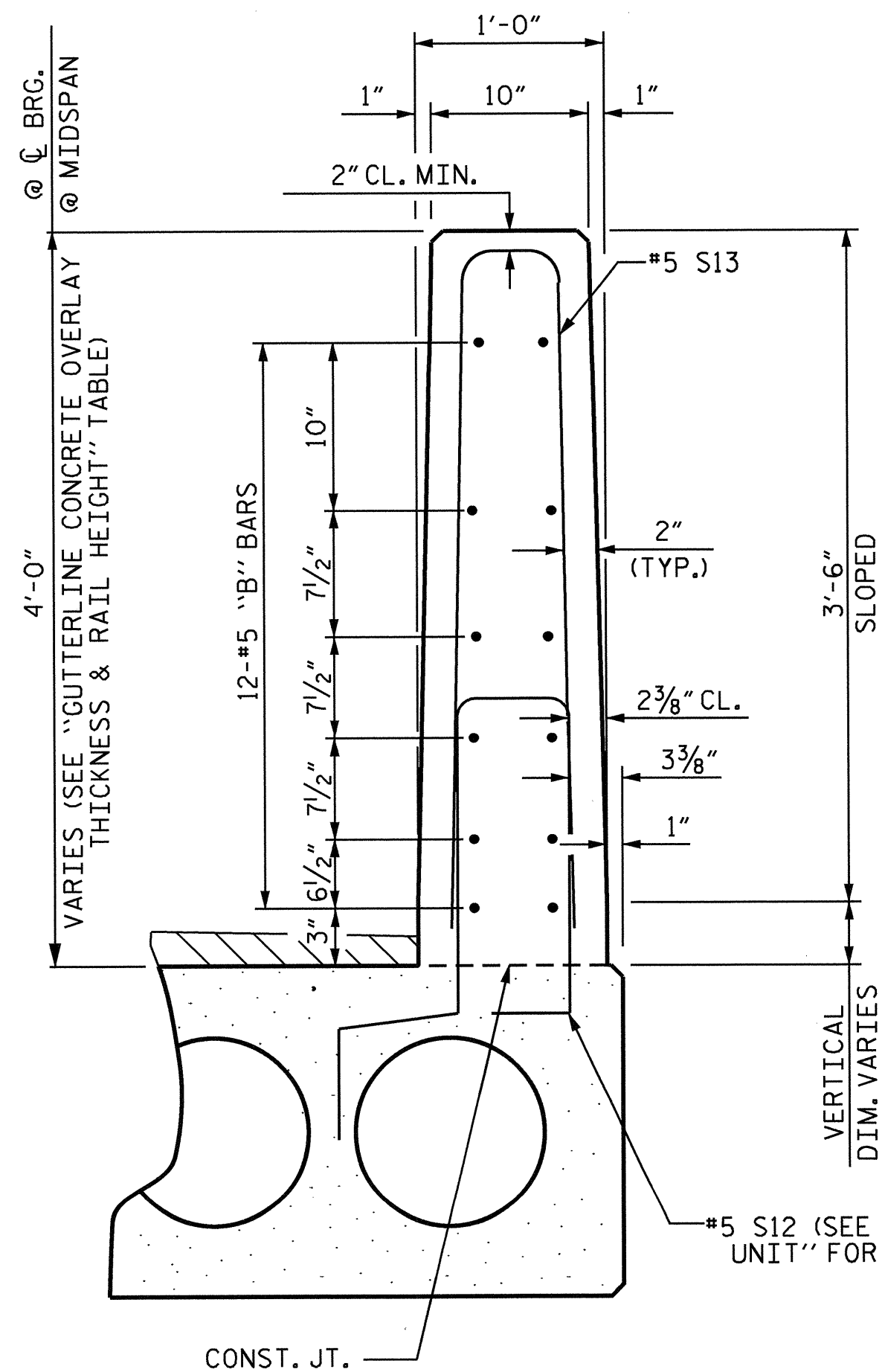


DEAD LOAD DEFLECTION AND CAMBER	
60' CORED SLAB UNIT	3'-0" x 2'-0"
CAMBER (SLAB ALONE IN PLACE)	0.6" Ø L.R. STRAND
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	2 3/16" ↑
FINAL CAMBER	9/16" ↓
	2 1/4" ↑

\*\* INCLUDES FUTURE WEARING SURFACE

GUTTERLINE CONCRETE THICKNESS & RAIL HEIGHT		
27'-10" CLEAR ROADWAY	CONCRETE OVERLAY THICKNESS	RAIL HEIGHT
	@ MID-SPAN	@ MID-SPAN
	NORMAL CROWN SECTION	
60' UNITS	3 1/2"	3'-9 3/4"

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



### VERTICAL CONCRETE BARRIER RAIL SECTION

DRAWN BY: N. Ruffin DATE: 9/25  
 CHECKED BY: REZA KOUCHEKI DATE: 10/2/13  
 DESIGN ENGINEER OF RECORD: N. RUFFIN DATE: 12/6/13

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL						
BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
60' UNIT						
*B38	48	48	#5	STR	29'-7"	1481
*S13	136	136	#5	2	7'-2"	1017
* EPOXY COATED REINFORCING STEEL				LBS.		2498
CLASS AA CONCRETE				CU. YDS.		16.2
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT.		120.25

CONCRETE RELEASE STRENGTH	
UNIT	PSI
60' UNITS	4800

### NOTES

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

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

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

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

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

WHEN CORED SLABS ARE CAST, AN INTERNAL HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDEWAYS. AT LEAST SIX WEEKS PRIOR TO CASTING CORED SLABS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. IN ADDITION TO STRUCTURAL DETAILS, LOCATION AND SPACING OF THE HOLD-DOWNS SHALL BE INDICATED.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE CORED SLAB UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN THE REQUIRED STRENGTH SHOWN IN THE "CONCRETE RELEASE STRENGTH" TABLE.

ALL REINFORCING STEEL IN THE VERTICAL CONCRETE BARRIER RAIL SHALL BE EPOXY COATED.

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

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

PLACEMENT OF THE CONCRETE WEARING SURFACE SHALL OCCUR AFTER CASTING THE VERTICAL CONCRETE BARRIER RAILS. THE COST OF THE REINFORCING STEEL CAST WITH THE CONCRETE WEARING SURFACE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONCRETE WEARING SURFACE. FOR CONCRETE WEARING SURFACE, SPECIAL PROVISIONS.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

TRANSVERSE POST TENSIONING OF THE CORED SLAB UNITS SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

MAINTAIN A SYMMETRIC TENSION FORCE BETWEEN EACH PAIR OF TRANSVERSE POST TENSIONING STRANDS IN THE DIAPHRAGM OF SPAN B.

THE #4 S11 STIRRUPS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO THE GROUTED RECESS FOR THE 3'-0" X 2'-0" CORED SLAB UNITS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR CONCRETE WEARING SURFACE, SEE SPECIAL PROVISIONS.

THE TOP OF THE CORED SLAB UNITS SHALL HAVE A 3/8" RAKED FINISH IN ACCORDANCE WITH THE SECTION 1078-15 OF THE STANDARD SPECIFICATIONS.

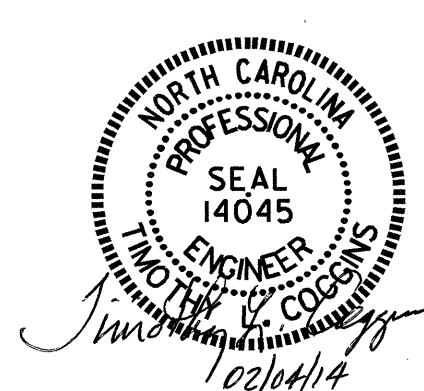
PROJECT NO. B-4758  
GUILFORD COUNTY  
 STATION: 16+64.29 -L-

SHEET 7 OF 7

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SPAN B  
 3'-0" X 2'-0"  
 PRESTRESSED CONCRETE  
 CORED SLAB UNIT  
 90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			22



NOTES

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

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

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

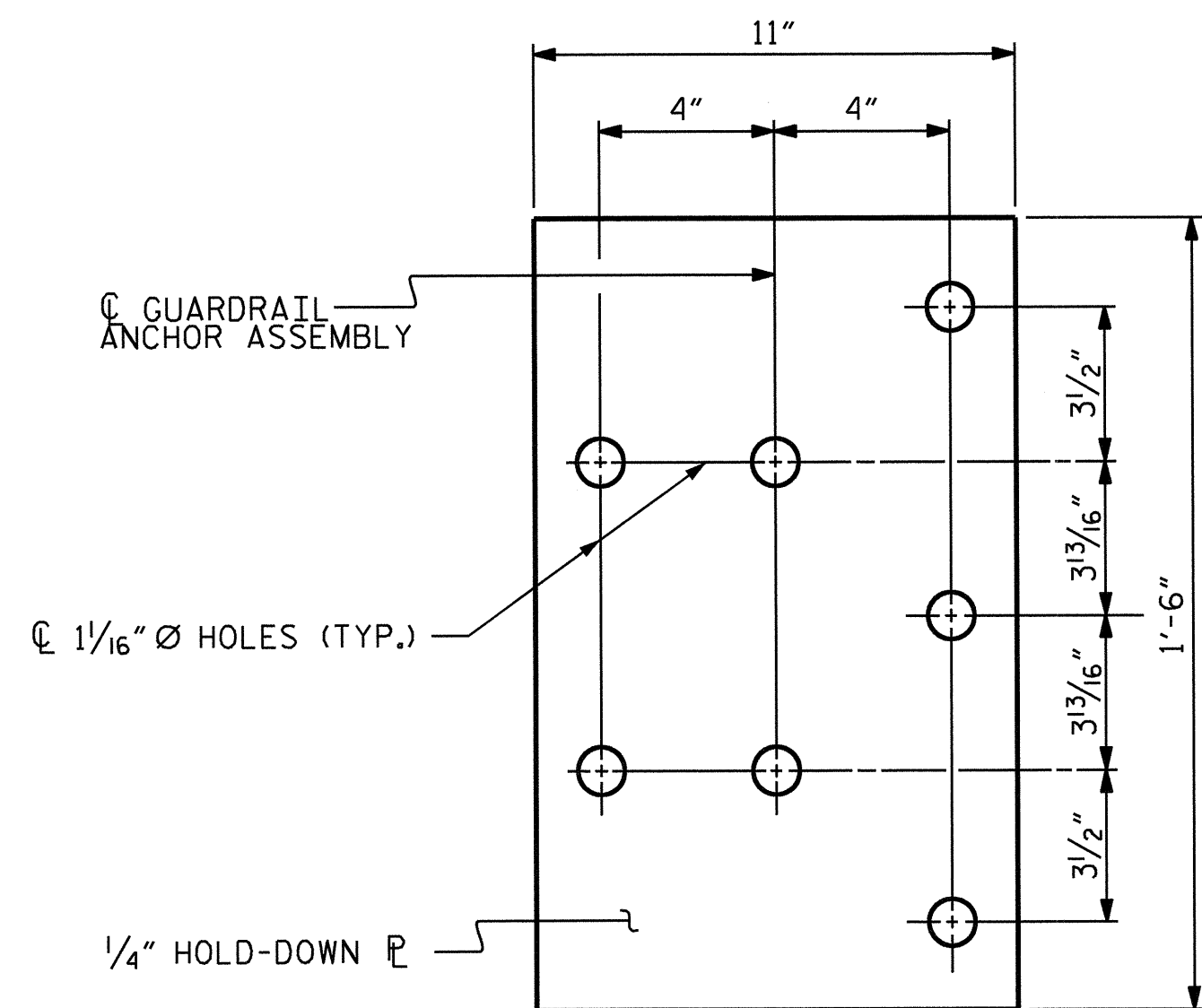
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

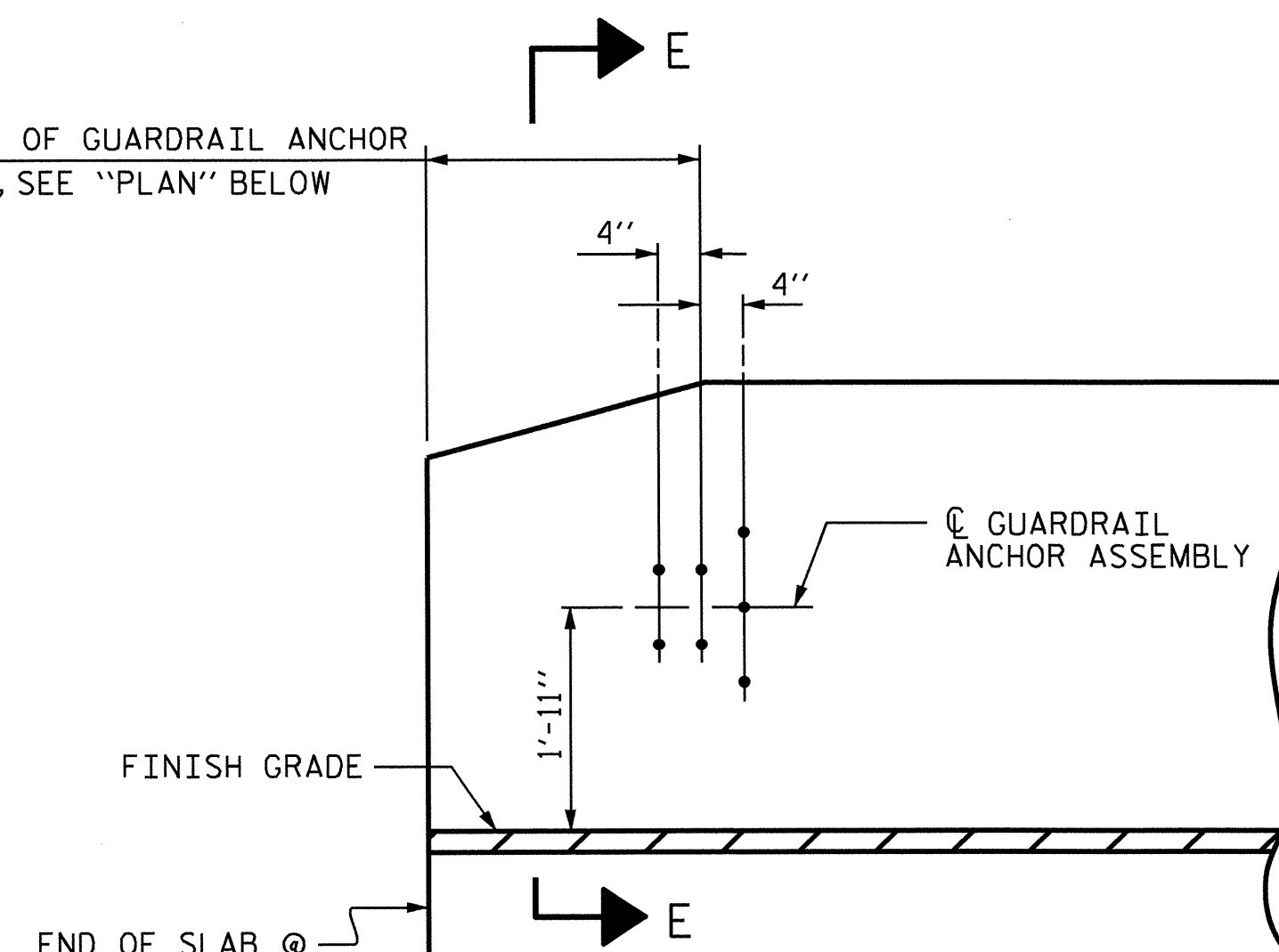
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

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

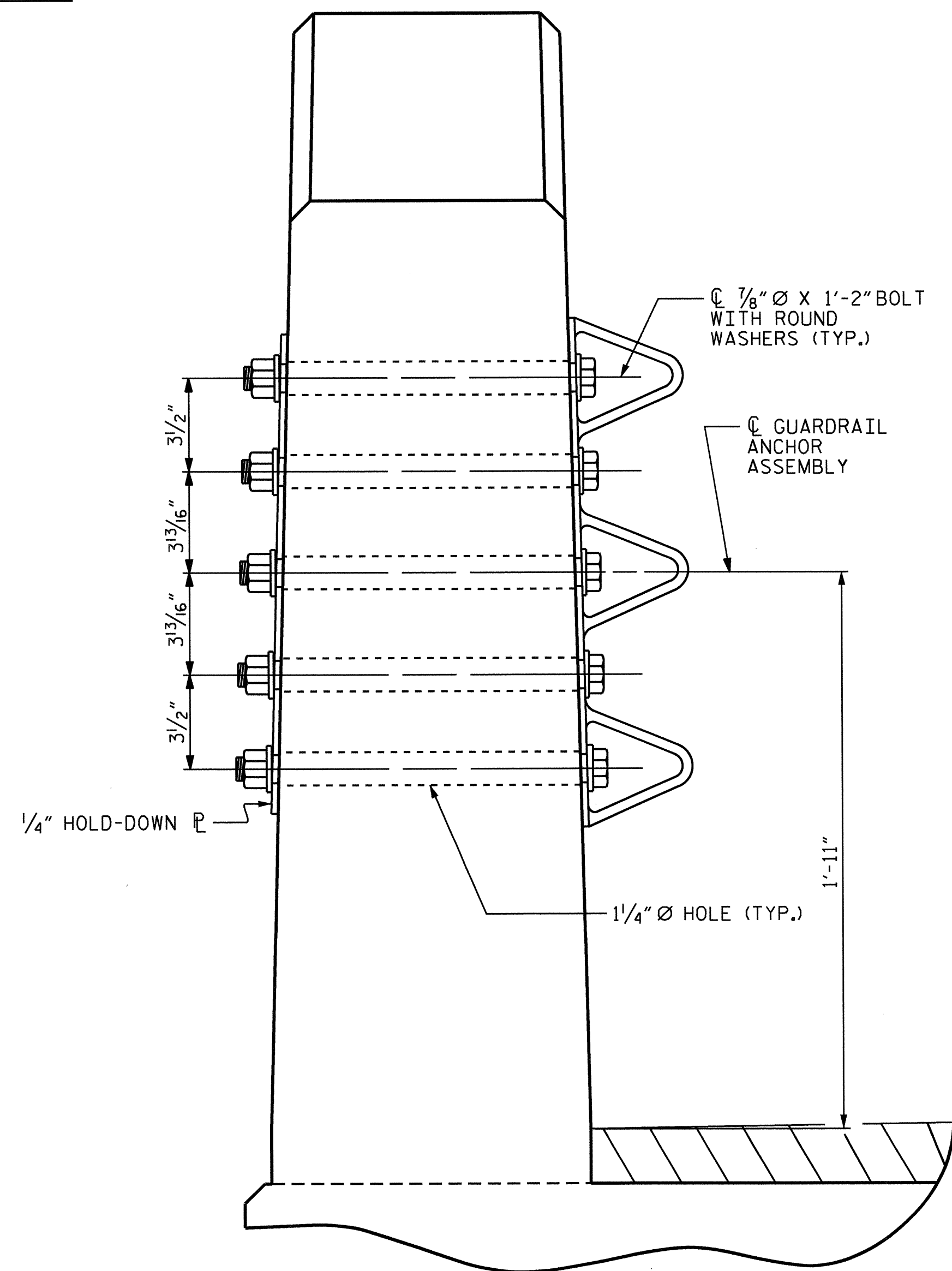


PLAN

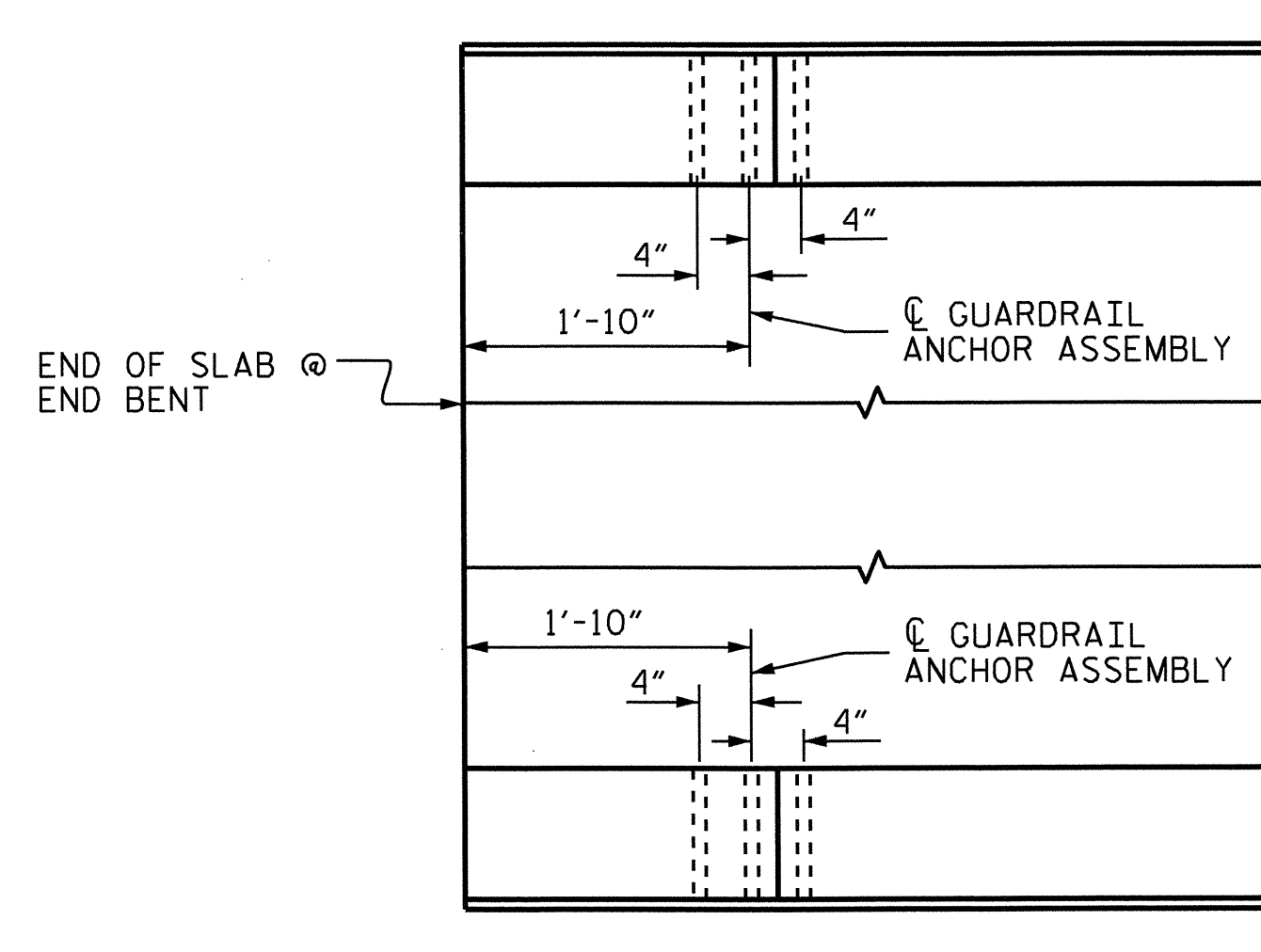
FOR LOCATION OF GUARDRAIL ANCHOR ASSEMBLY, SEE "PLAN" BELOW



ELEVATION



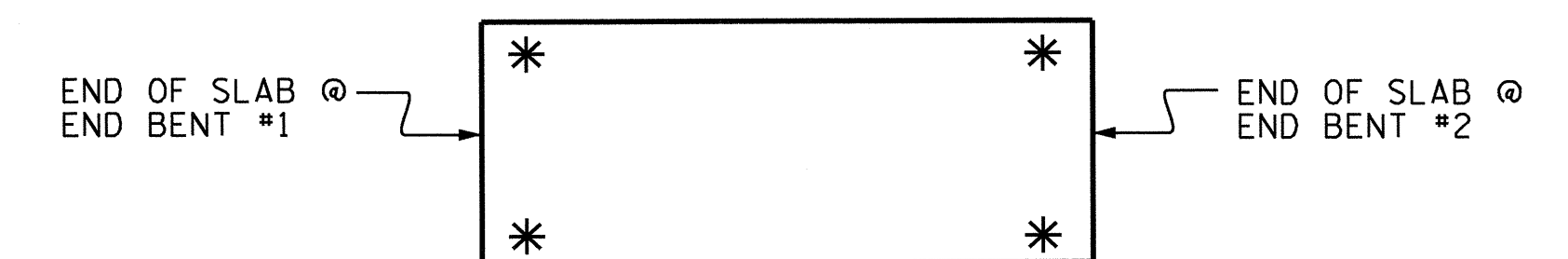
SECTION E-E  
GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

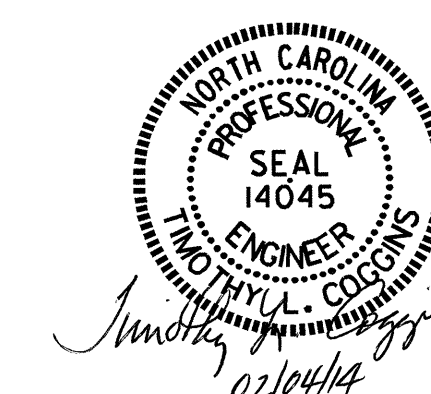
END BENT #1 SHOWN, END BENT #2 SIMILAR.



SKETCH SHOWING POINTS OF ATTACHMENT

\* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. B-4758  
GUILFORD COUNTY  
 STATION: 16+64.29 -L-



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 GUARDRAIL ANCHORAGE  
 FOR VERTICAL CONCRETE  
 BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			22

ASSEMBLED BY: N. Ruffin DATE: 9/27/13  
 CHECKED BY: REZA KOUCHEKI DATE: 10/3/13  
 DRAWN BY: MAA 5/10 REV. 10/1/11 MAA/GM  
 CHECKED BY: GM 5/10 REV. 12/5/11 MAA/GM  
 REV. 6/13 MAA/GM

NOTES

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

THE LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.

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

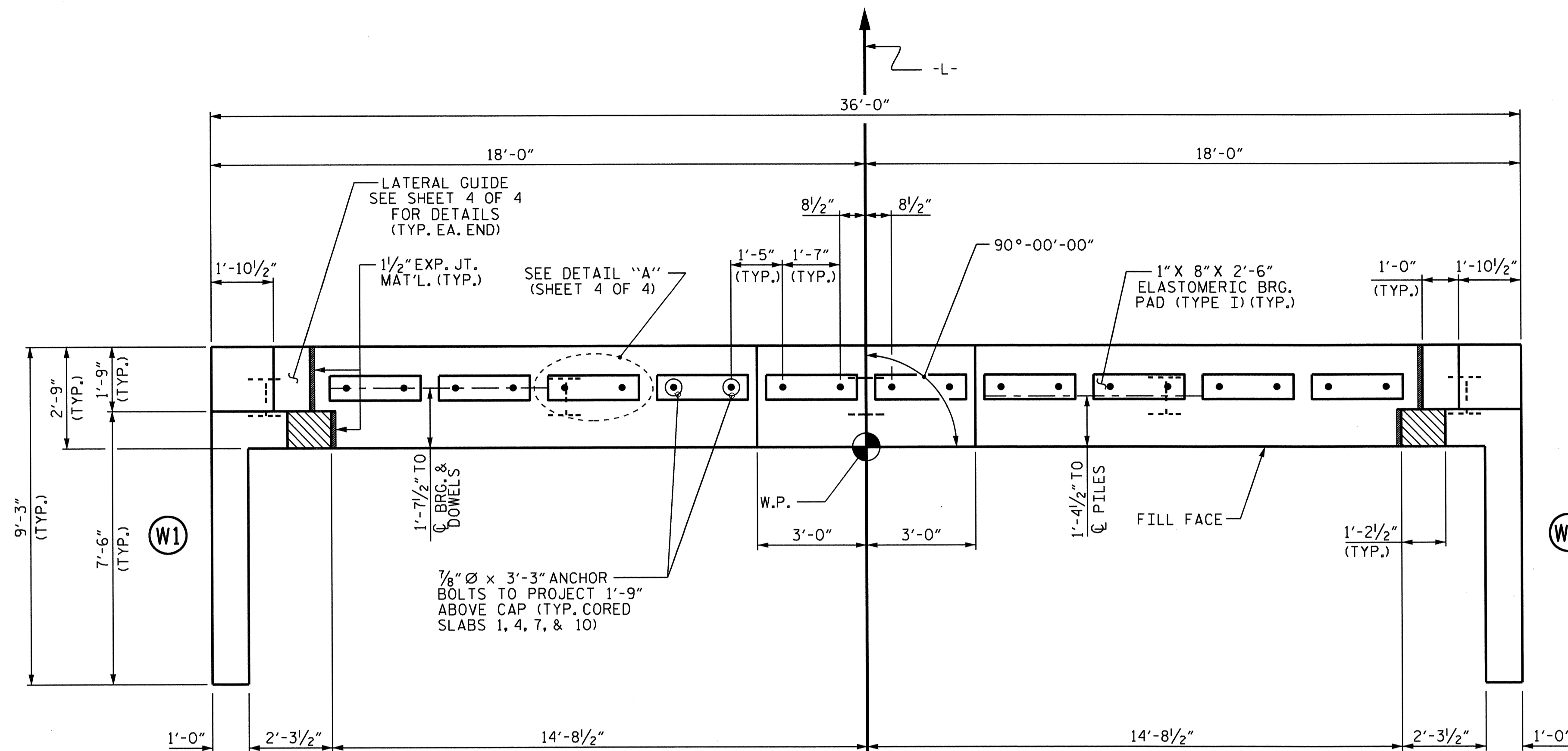
FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

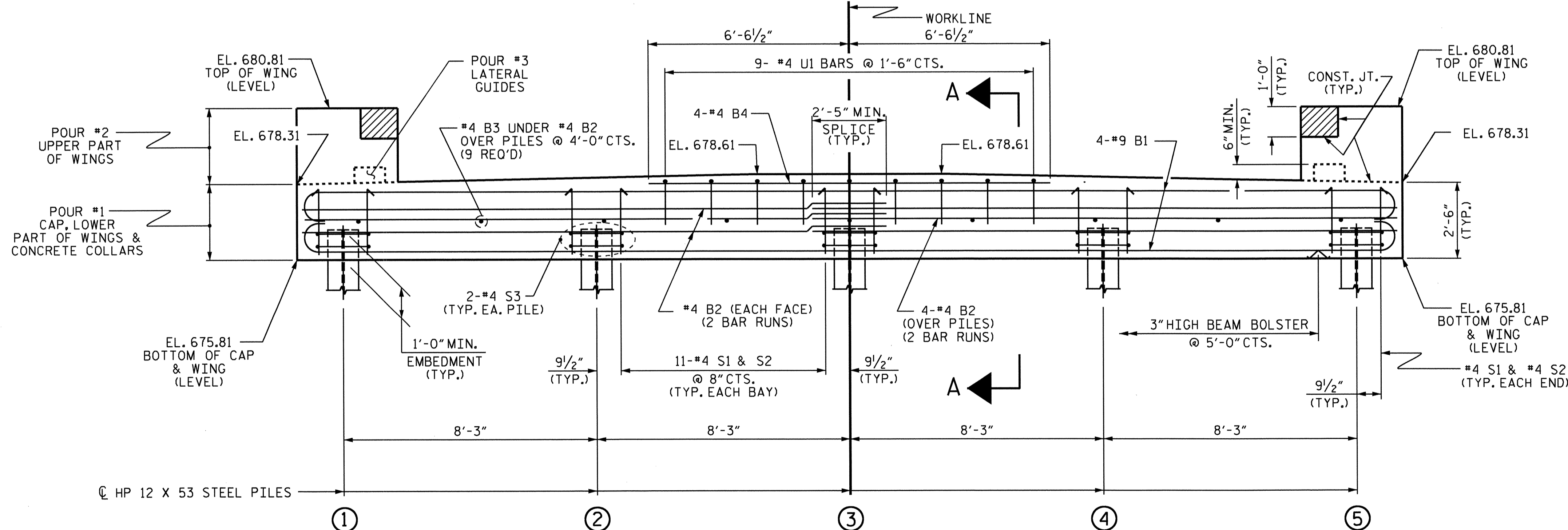
THE CONTRACTOR HAS THE OPTION TO OMIT THE LATERAL GUIDE IF APPROVED BY THE ENGINEER.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449 AND NUTS, WASHERS, AND P1 PLATES SHALL MEET THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS. THE ANCHOR BOLTS, NUTS, WASHERS, AND P1 PLATES SHALL BE GALVANIZED ACCORDING TO THE STANDARD SPECIFICATIONS.

NO SEPARATE PAYMENT WILL BE MADE FOR THE ANCHOR BOLTS, NUTS, WASHERS, AND P1 PLATES AND THE COST OF MATERIALS AND INSTALLATION SHALL BE INCLUDED IN OTHER PAY ITEMS.



PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY.  
FOR SECTION A-A, SEE SHEET 4 OF 4.  
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.  
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

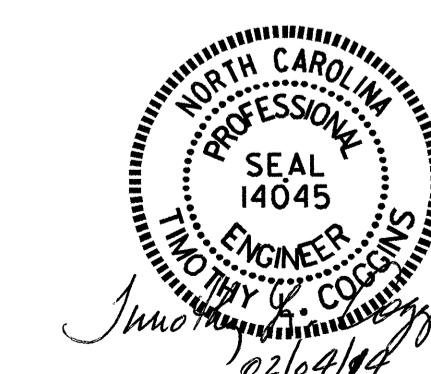
PROJECT NO. B-4758  
GUILFORD COUNTY  
STATION: 16+64.29 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE

END BENT No. 1



DRAWN BY: N. Ruffin DATE: 9/27/13  
CHECKED BY: REZA KOUCHEKI DATE: 10/3/13  
DESIGN ENGINEER OF RECORD: N. RUFFIN DATE: 12/6/13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTALS
2			4			22

NOTES

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

THE LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.

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

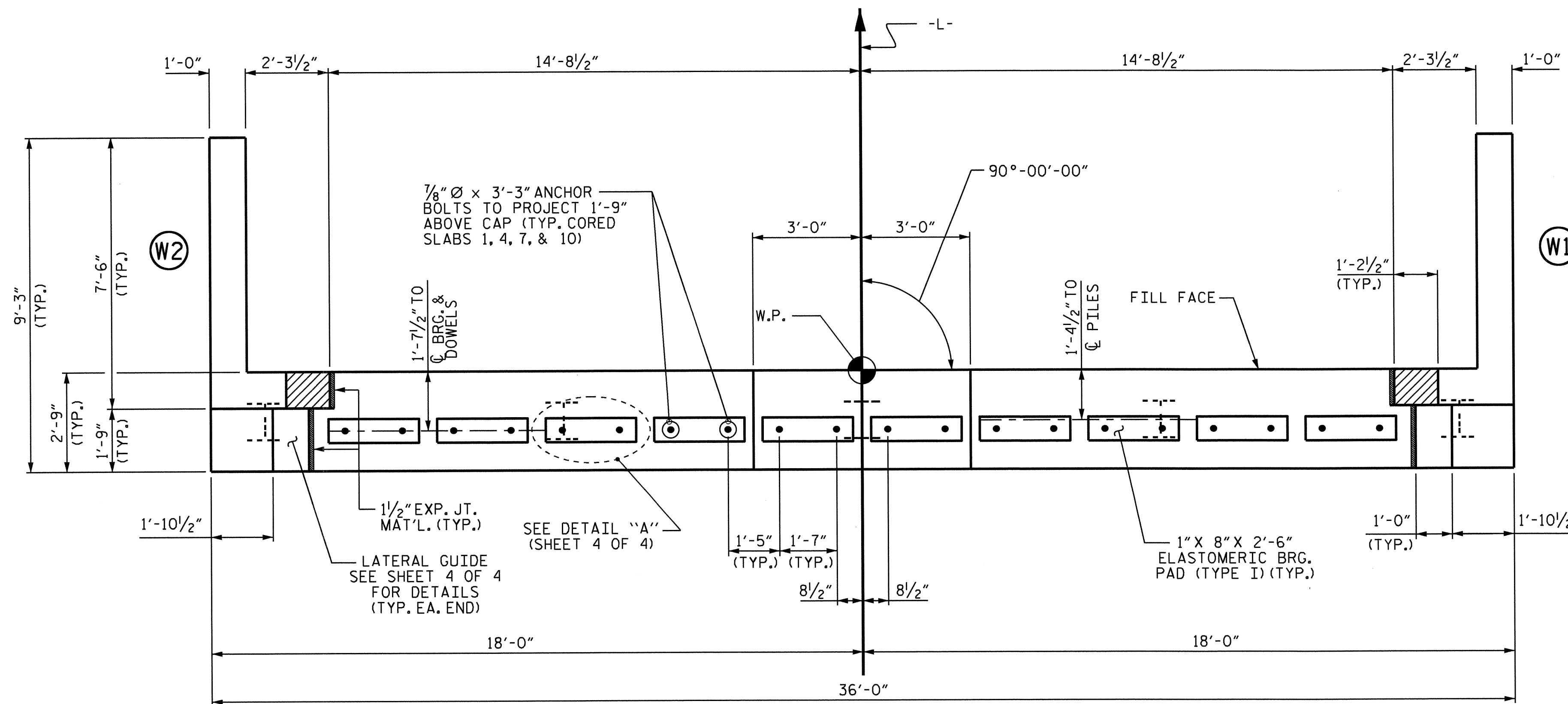
FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

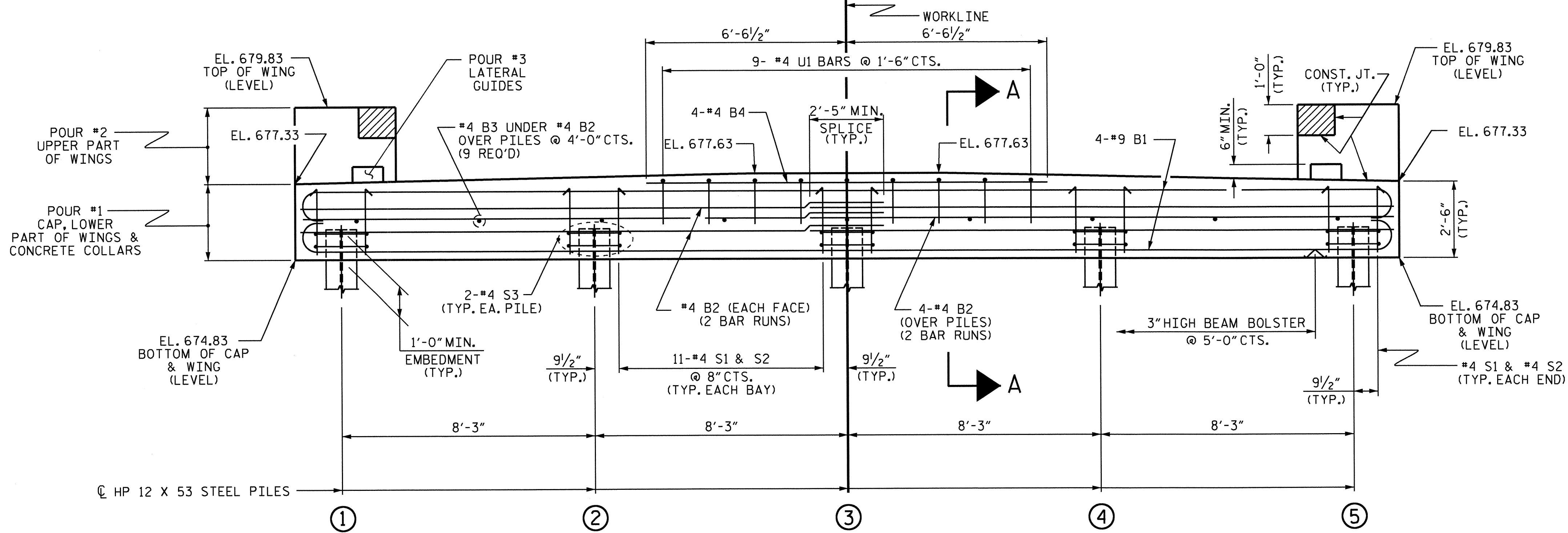
THE CONTRACTOR HAS THE OPTION TO OMIT THE LATERAL GUIDE IF APPROVED BY THE ENGINEER.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449 AND NUTS, WASHERS, AND P1 PLATES SHALL MEET THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS. THE ANCHOR BOLTS, NUTS, WASHERS, AND P1 PLATES SHALL BE GALVANIZED ACCORDING TO THE STANDARD SPECIFICATIONS.

NO SEPARATE PAYMENT WILL BE MADE FOR THE ANCHOR BOLTS, NUTS, WASHERS, AND P1 PLATES AND THE COST OF MATERIALS AND INSTALLATION SHALL BE INCLUDED IN OTHER PAY ITEMS.



PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY.  
FOR SECTION A-A, SEE SHEET 4 OF 4.  
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.  
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

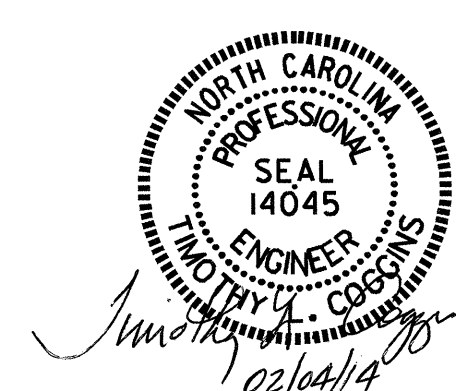
PROJECT NO. B-4758  
GUILFORD COUNTY  
 STATION: 16+64.29 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

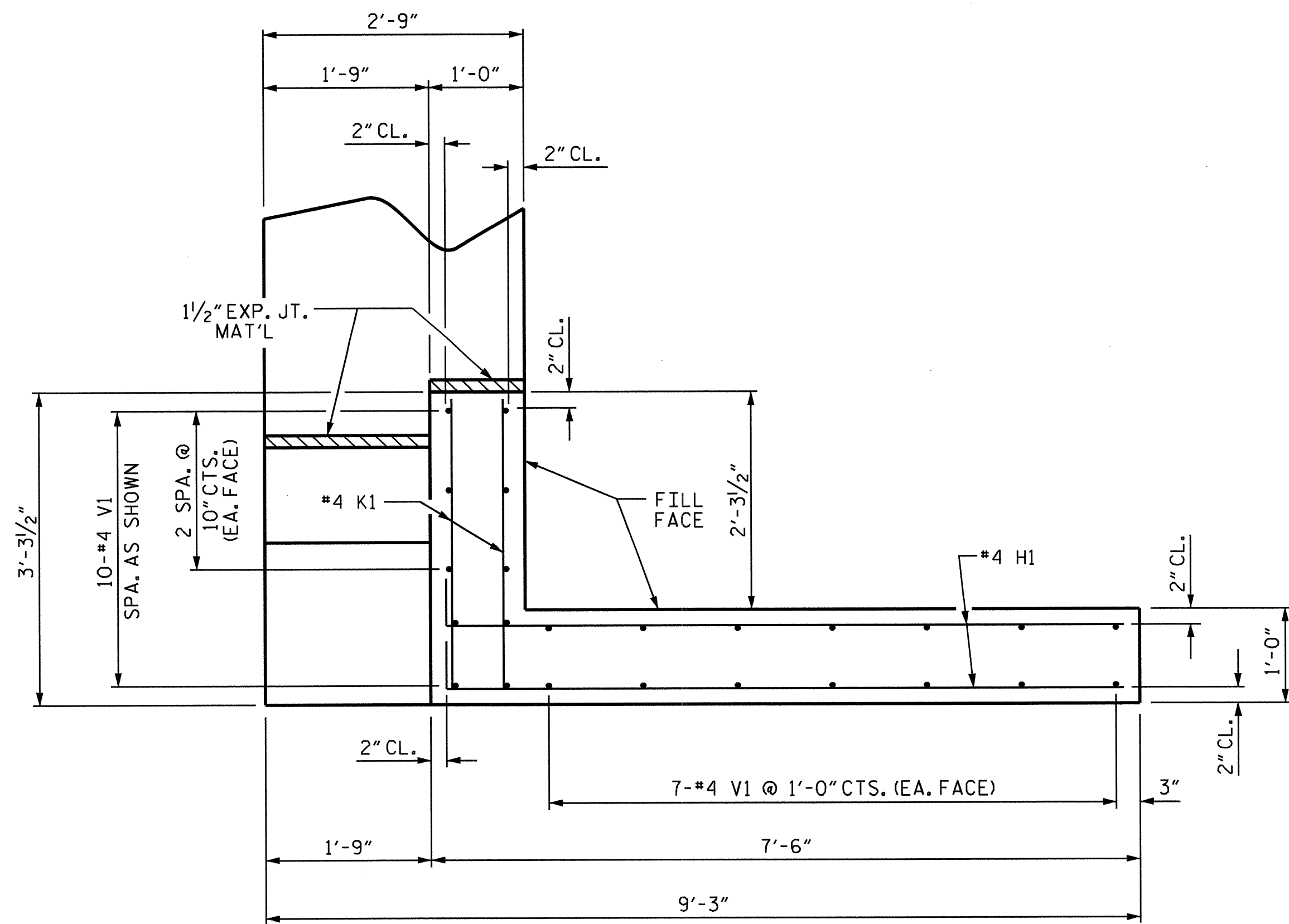
SUBSTRUCTURE

END BENT No. 2

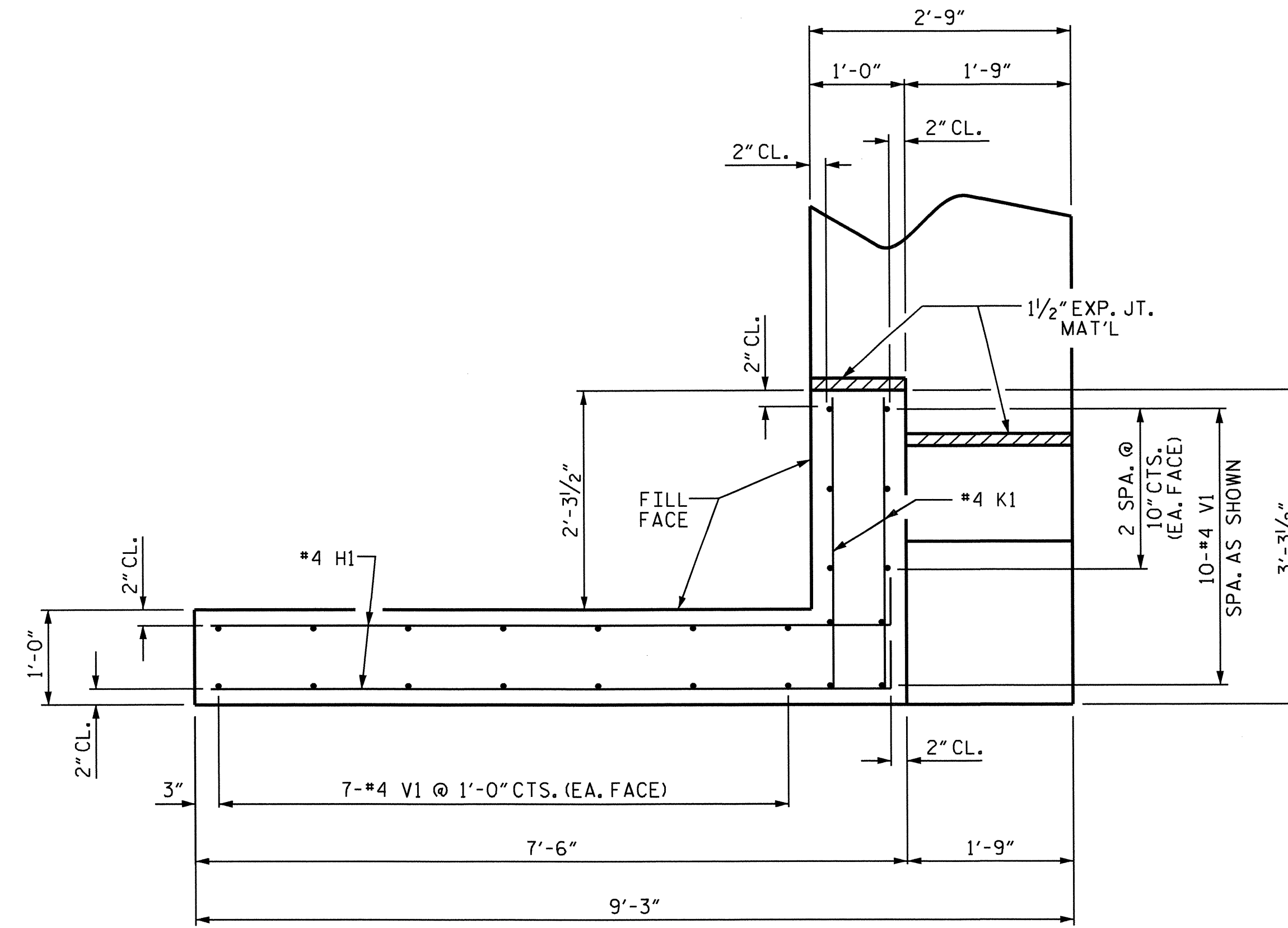


DRAWN BY: N. Ruffin DATE: 9/27/13  
 CHECKED BY: REZA KOUICHEKI DATE: 10/3/13  
 DESIGN ENGINEER OF RECORD: N. RUFFIN DATE: 12/6/13

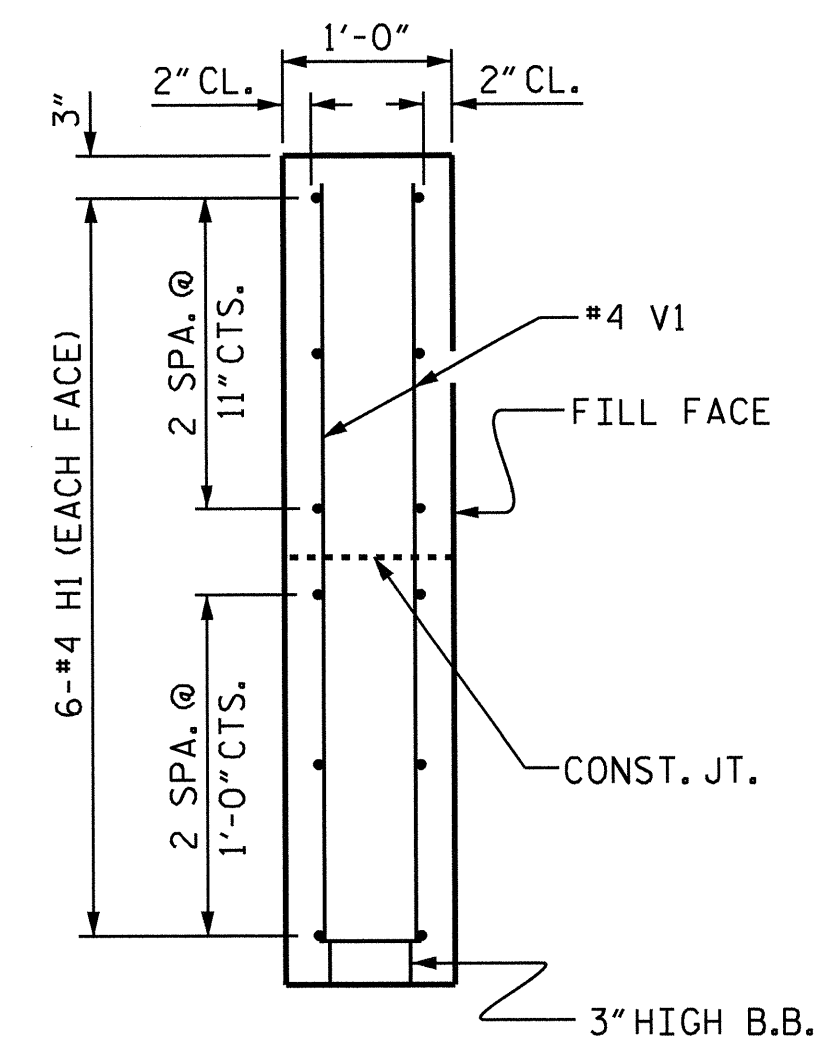
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			22



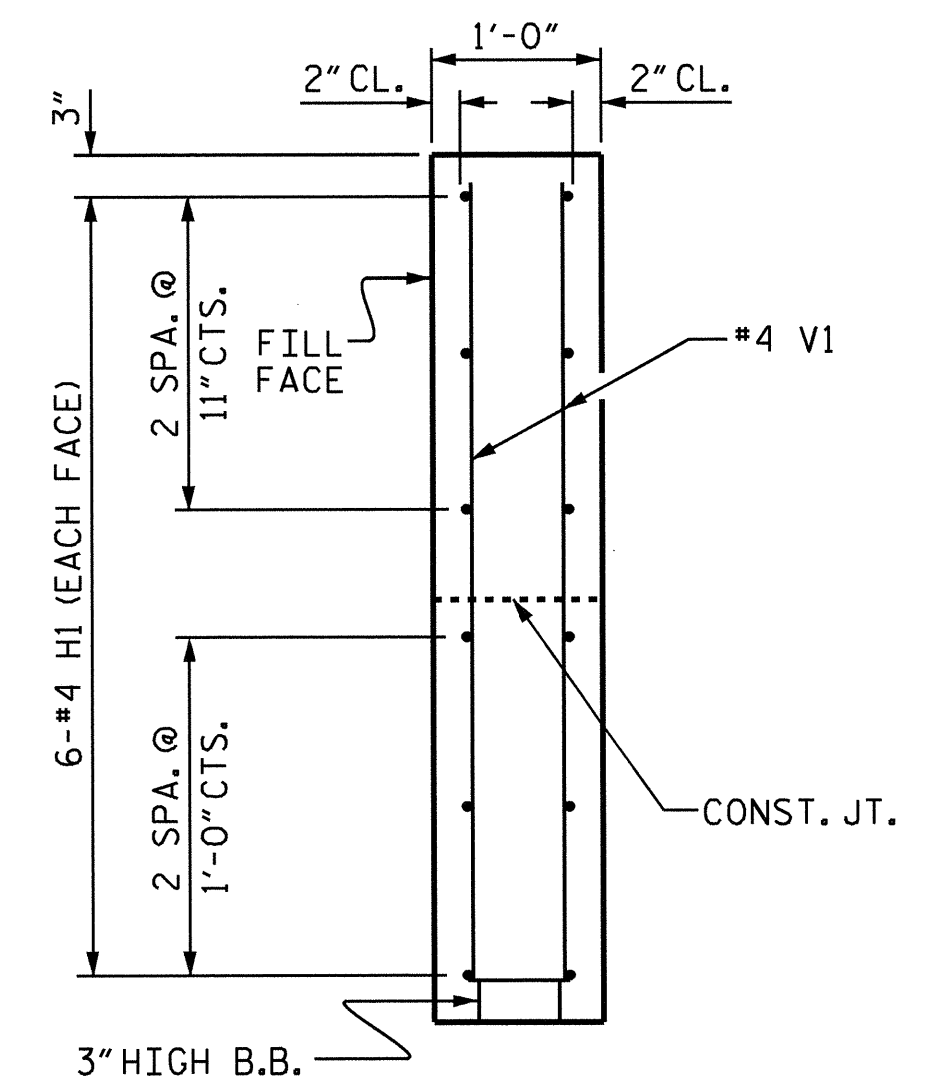
PLAN OF WING (W1)



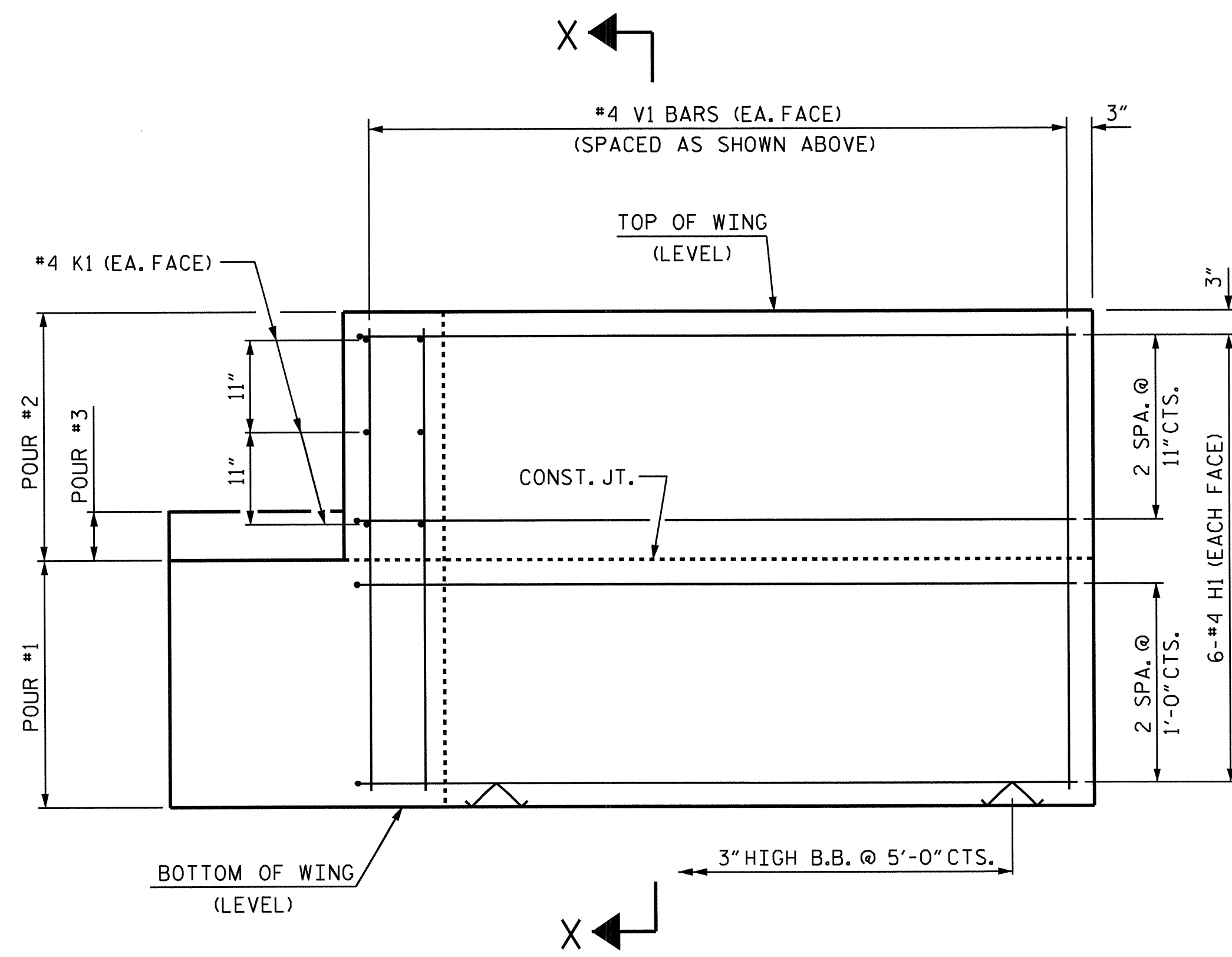
PLAN OF WING (W2)



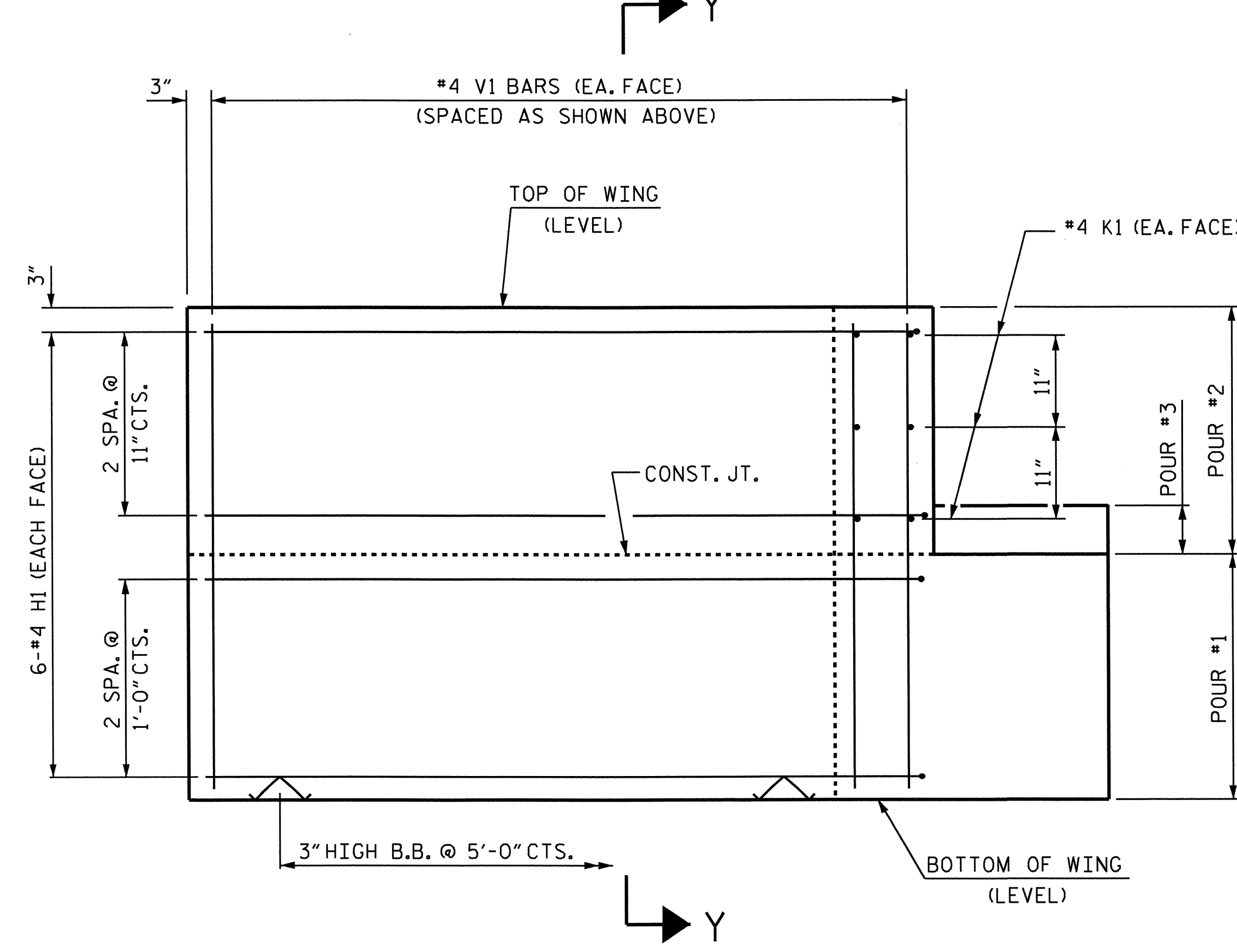
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W1)

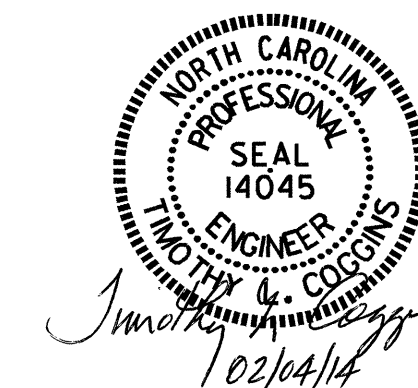


ELEVATION OF WING (W2)

WING DETAILS

DRAWN BY: N. Ruffin DATE: 9/27/13  
 CHECKED BY: REZA KOUCHEKI DATE: 10/3/13  
 DESIGN ENGINEER OF RECORD: N. RUFFIN DATE: 12/6/13

04-FEB-2014 11:07  
 R:\Structures\Plans\Final Plans\B-4758.sm\Final\_Plans\_01.dgn  
 nruffin



PROJECT NO. B-4758  
GUILFORD COUNTY  
 STATION: 16+64.29 -L-

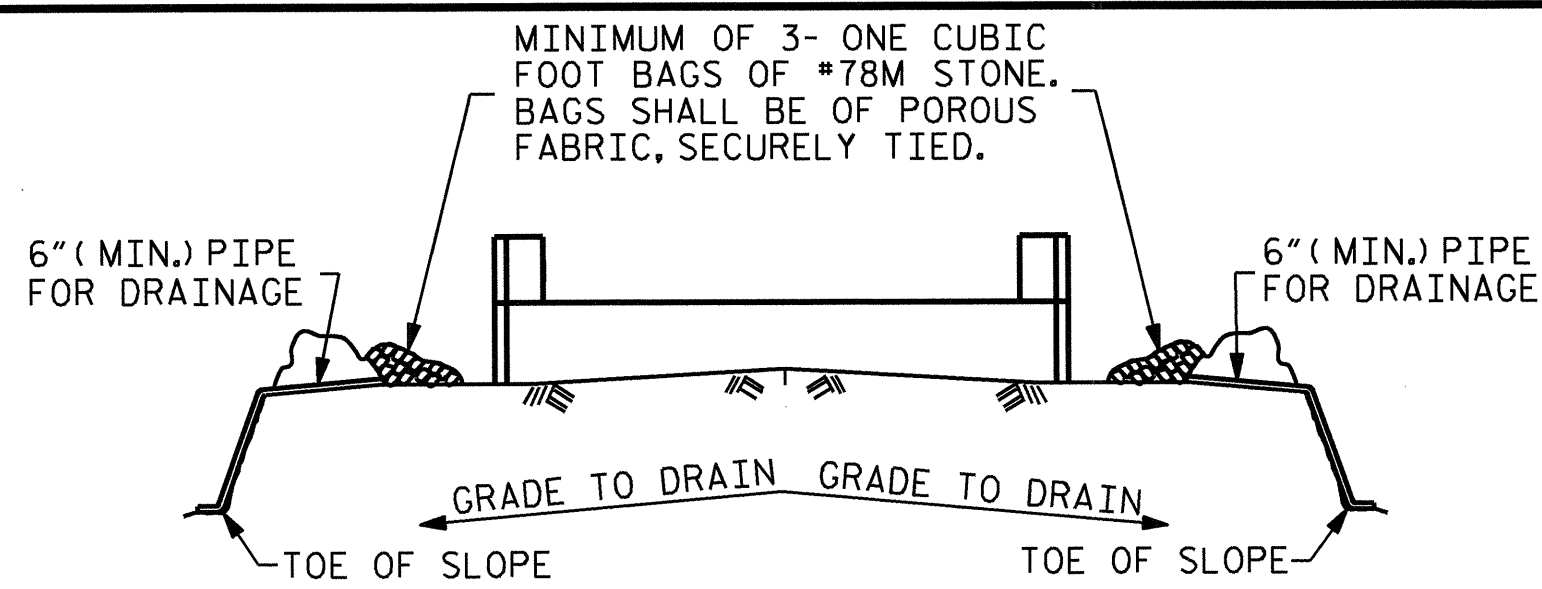
SHEET 3 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

END BENT  
 WING DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			22



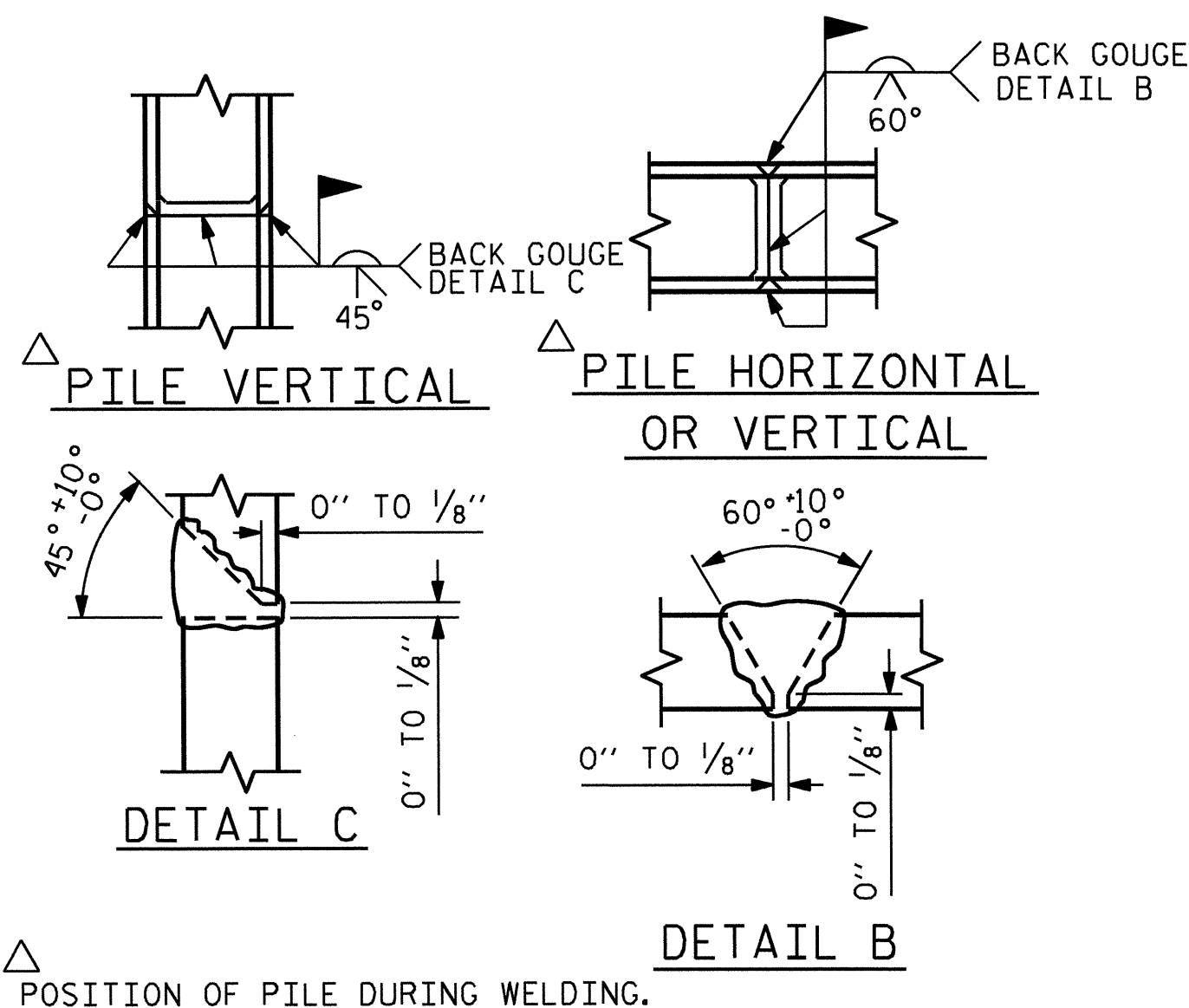


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

### TEMPORARY DRAINAGE AT END BENT

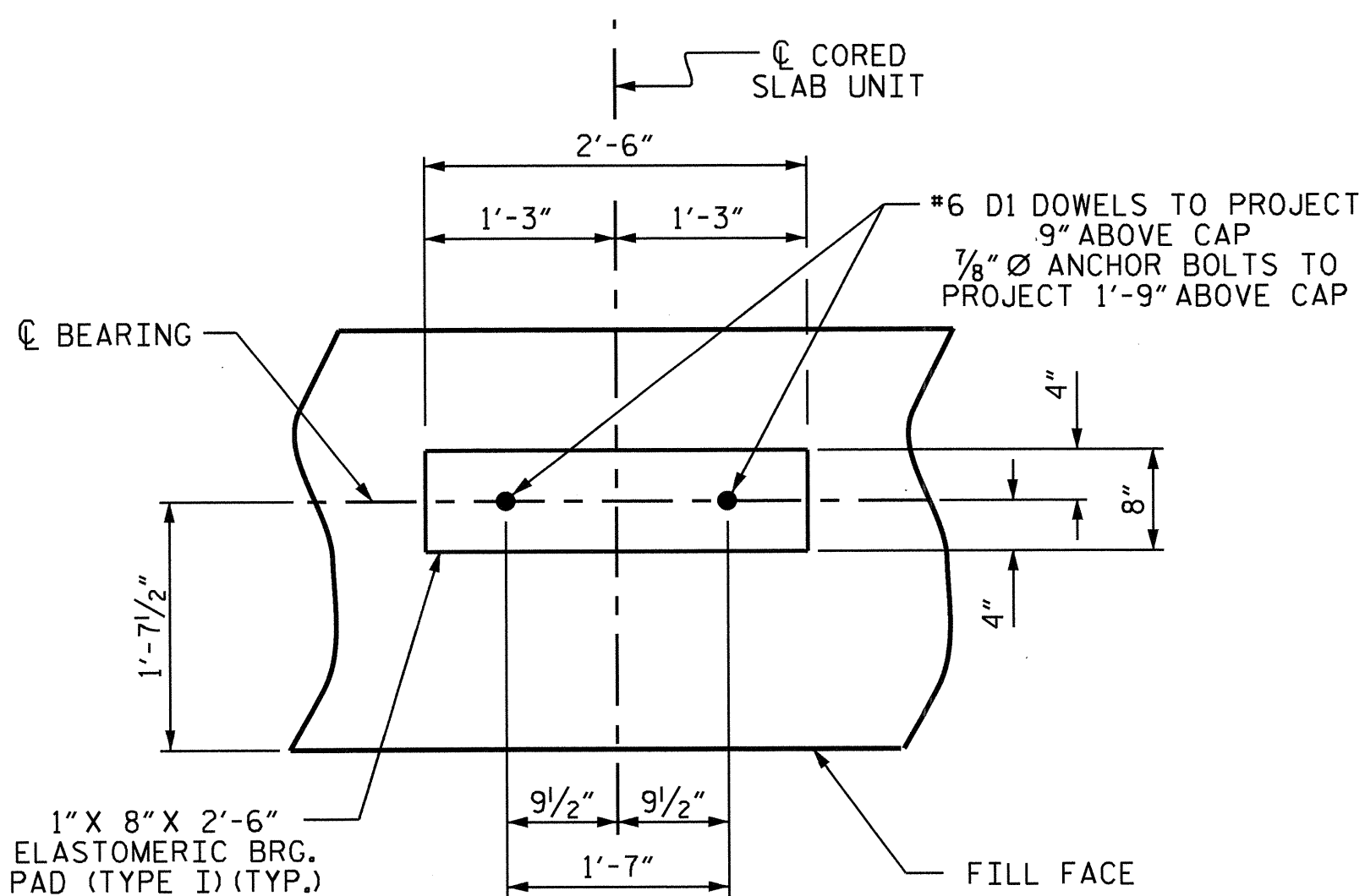


### PILE SPLICE DETAILS

BILL OF MATERIAL FOR ONE END BENT					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9		38'-0"	1034
B2	16	#4	STR	19'-1"	204
B3	9	#4	STR	2'-5"	15
B4	4	#4	STR	13'-1"	35
D1	12	#6	STR	1'-6"	27
H1	24	#4		7'-10"	126
K1	12	#4	STR	2'-11"	23
S1	46	#4		7'-5"	228
S2	46	#4		3'-2"	97
S3	10	#4		6'-6"	43
S4	4	#4		4'-5"	12
U1	9	#4		5'-5"	33
V1	48	#4	STR	4'-8"	150
REINFORCING STEEL (FOR ONE END BENT)					2027 LBS.
CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)					
POUR #1 CAP, LOWER PART OF WINGS & COLLARS					11.9 C.Y.
POUR #2 UPPER PART OF WINGS					1.8 C.Y.
POUR #3 LATERAL GUIDES					0.1 C.Y.
TOTAL CLASS A CONCRETE					13.8 C.Y.

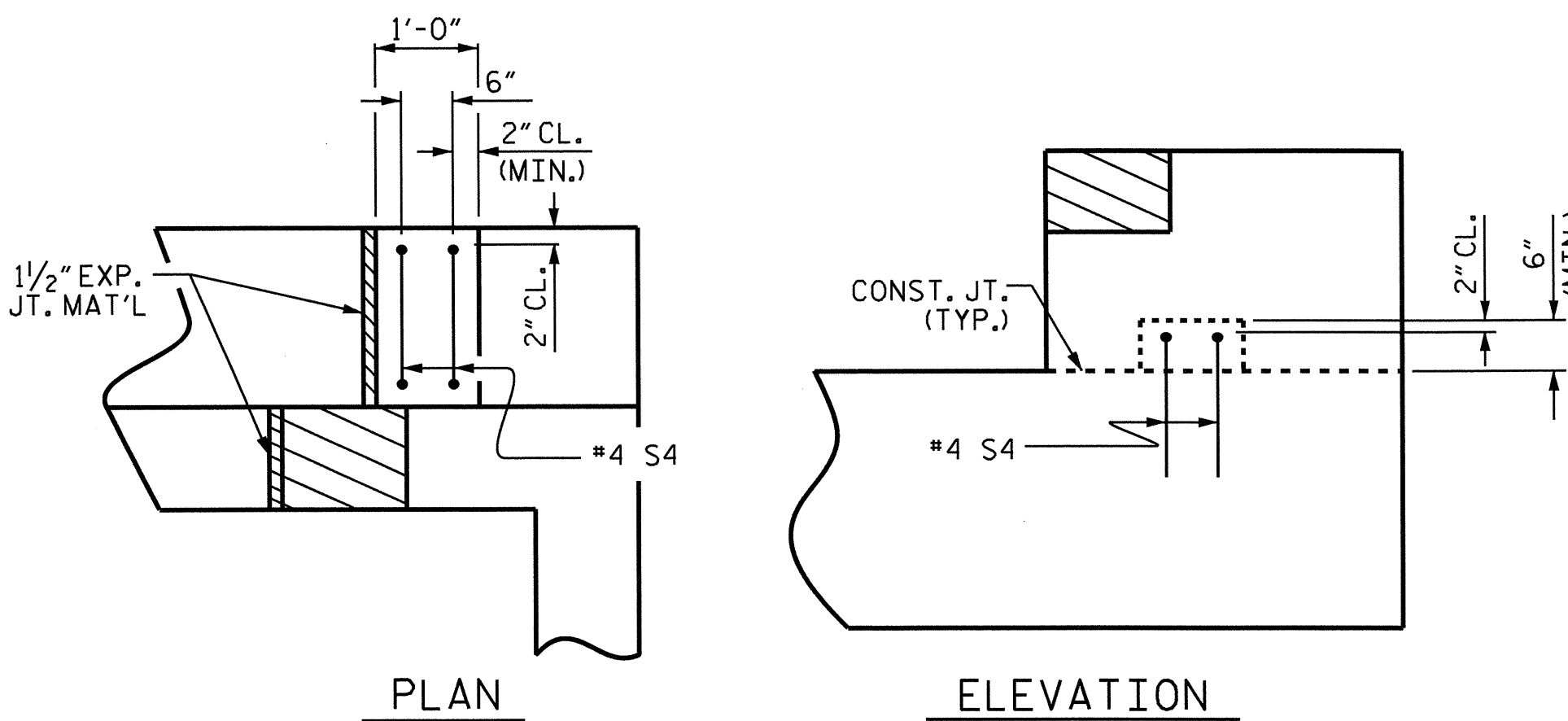
  

BAR TYPES	
<p>①</p>	<p>④</p>
<p>②</p>	<p>⑤</p>
<p>③</p>	<p>⑥</p>
ALL BAR DIMENSIONS ARE OUT TO OUT.	
END BENT No. 1 HP 12 X 53 STEEL PILES NO: 5 LIN. FT. = 140	END BENT No. 2 HP 12 X 53 STEEL PILES NO: 5 LIN. FT. = 90
STEEL PILE POINTS EA. 5	STEEL PILE POINTS EA. 5



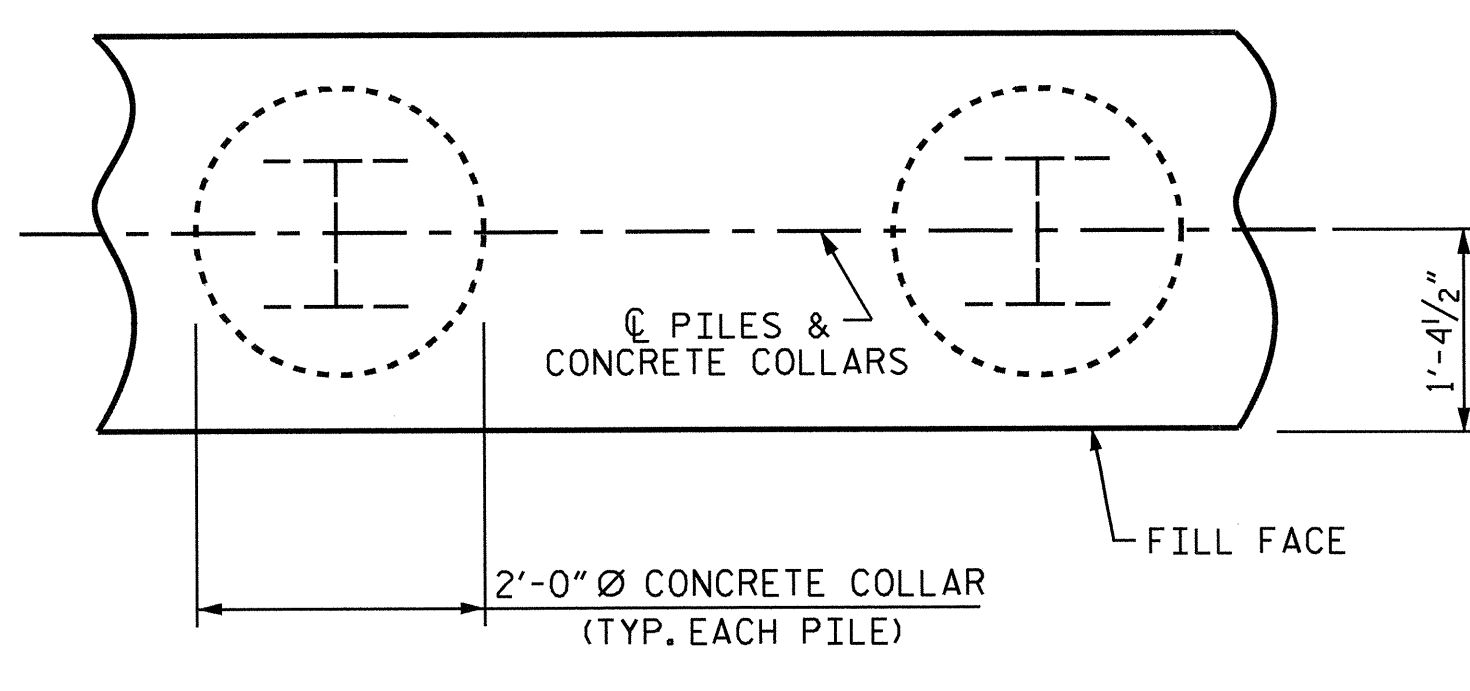
### DETAIL "A"

(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)



### LATERAL GUIDE DETAILS

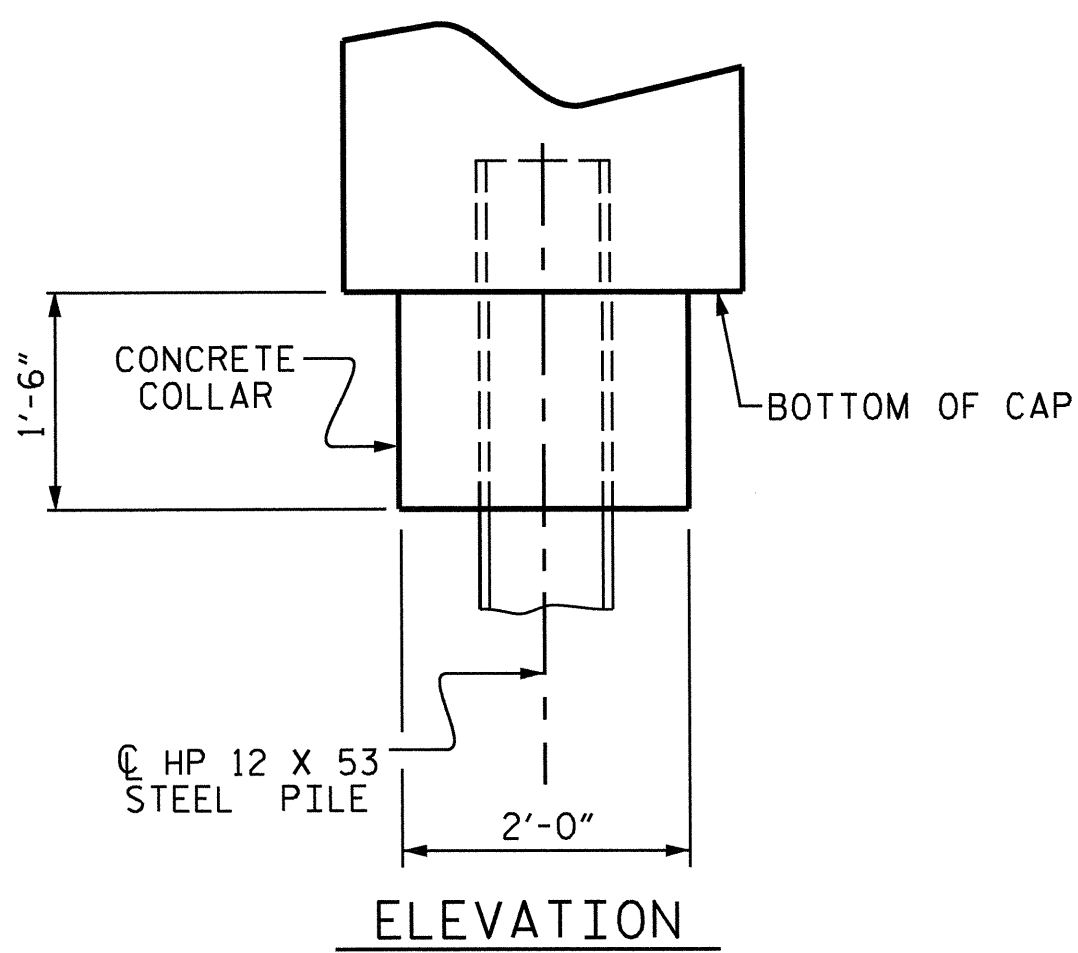
(RIGHT LATERAL GUIDE SHOWN, LEFT END SIMILAR)



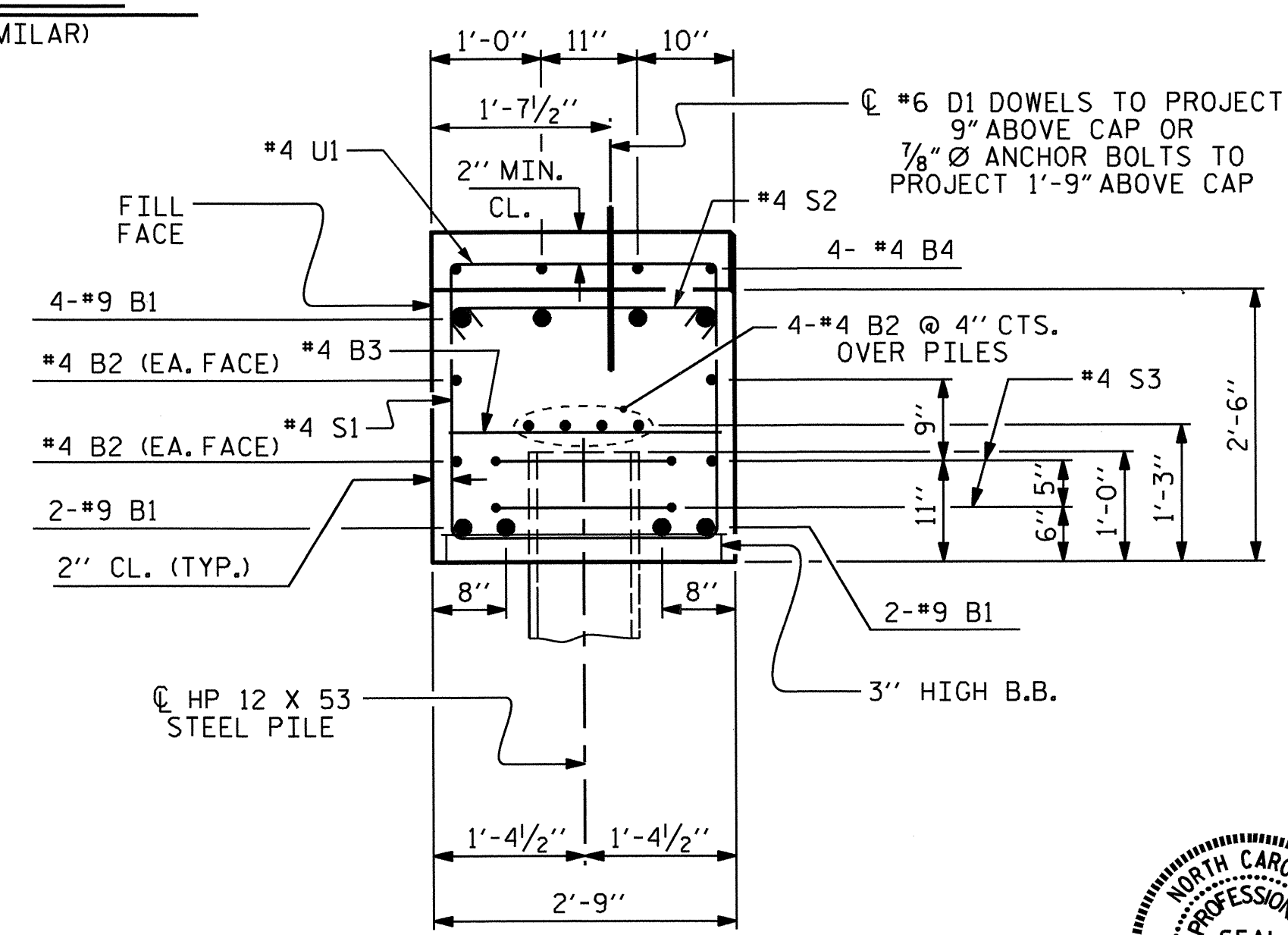
### PLAN

### CORROSION PROTECTION FOR STEEL PILES DETAIL

(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)

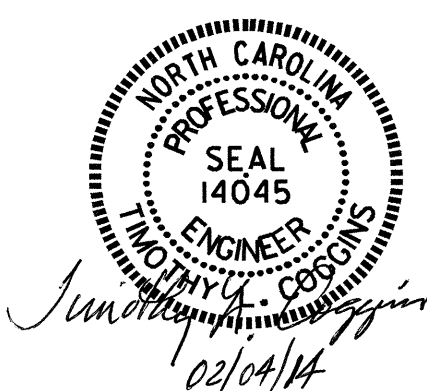


### ELEVATION



### SECTION A-A

(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")



PROJECT NO. B-4758  
 GUILFORD COUNTY  
 STATION: 16+64.29 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE

END BENT No. 1 & 2  
 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS 22
2			4			

DRAWN BY: N. Ruffin DATE: 9/27/13  
 CHECKED BY: REZA KOUCHEKI DATE: 10/6/13  
 DESIGN ENGINEER OF RECORD: N. RUFFIN DATE: 12/6/13

**NOTES**

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

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

FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.

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

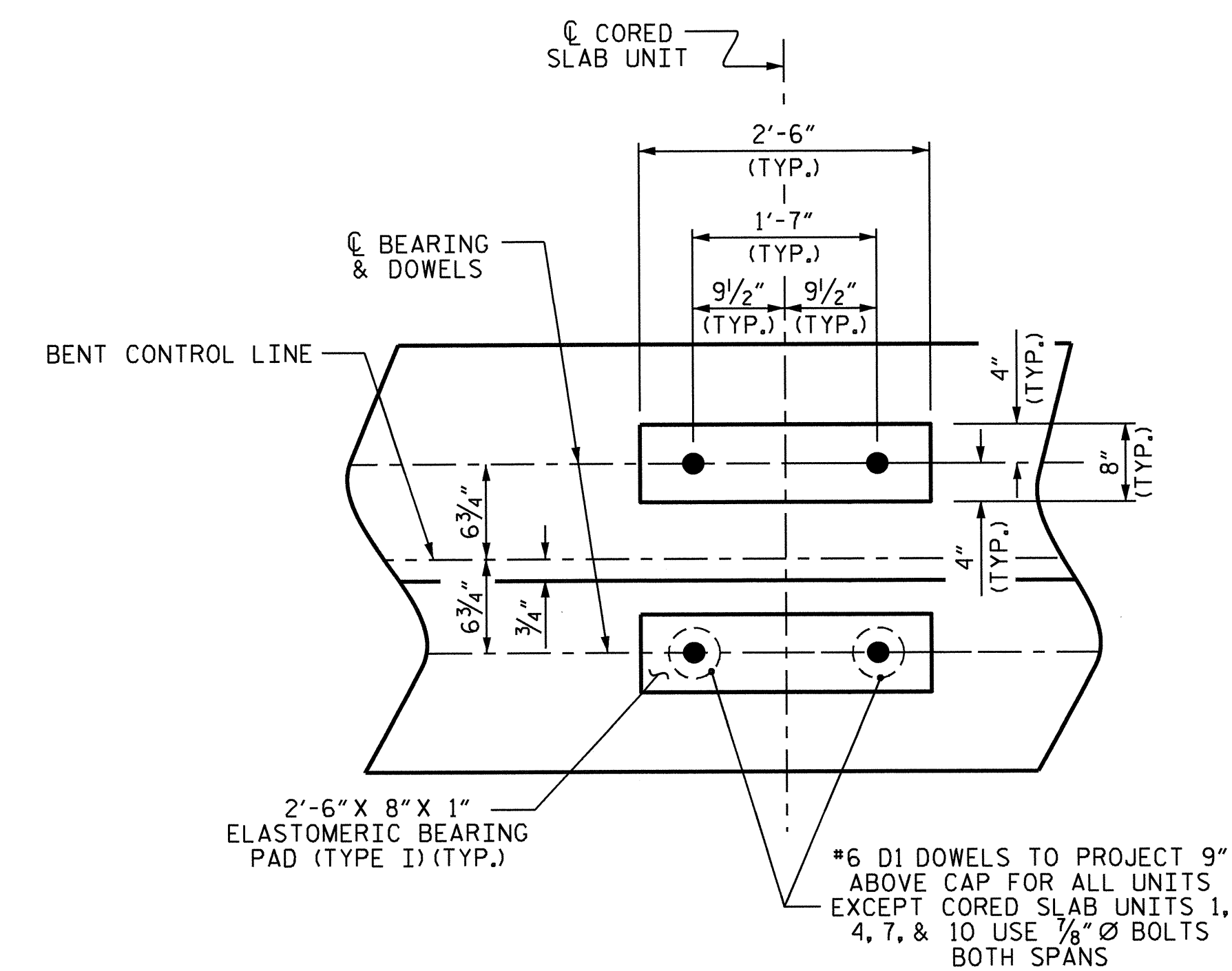
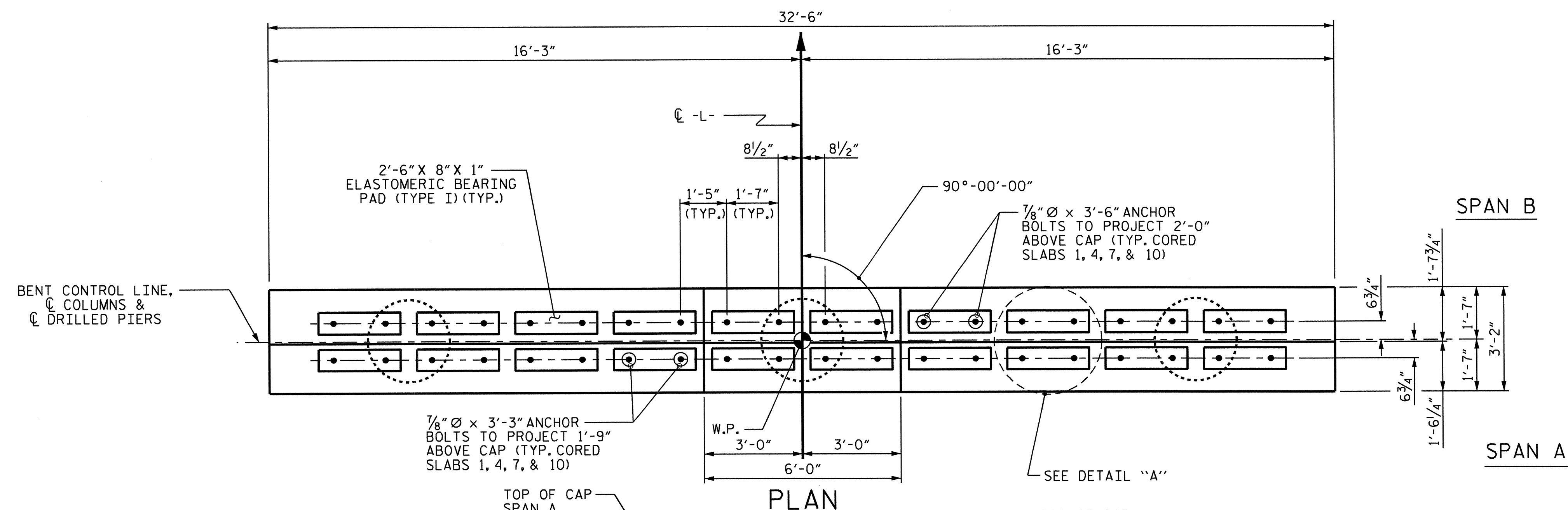
★ INVERT ALTERNATE STIRRUPS.

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

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

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449 AND NUTS, WASHERS, AND P1 PLATES SHALL MEET THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS. THE ANCHOR BOLTS, NUTS, WASHERS, AND P1 PLATES SHALL BE GALVANIZED ACCORDING TO THE STANDARD SPECIFICATIONS.

NO SEPARATE PAYMENT WILL BE MADE FOR THE ANCHOR BOLTS, NUTS, WASHERS, AND P1 PLATES AND THE COST OF MATERIALS AND INSTALLATION SHALL BE INCLUDED IN OTHER PAY ITEMS.



**DETAIL "A"**

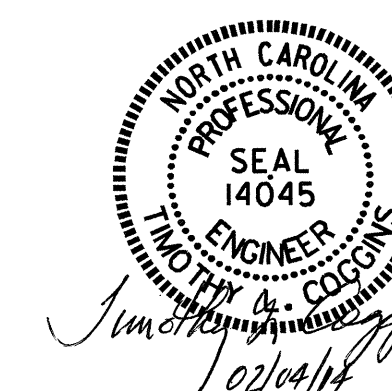
(DIMENSIONS ARE TYPICAL EACH BEARING)

PROJECT NO. B-4758  
GUILFORD COUNTY  
 STATION: 16+64.29 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 BENT No. 1

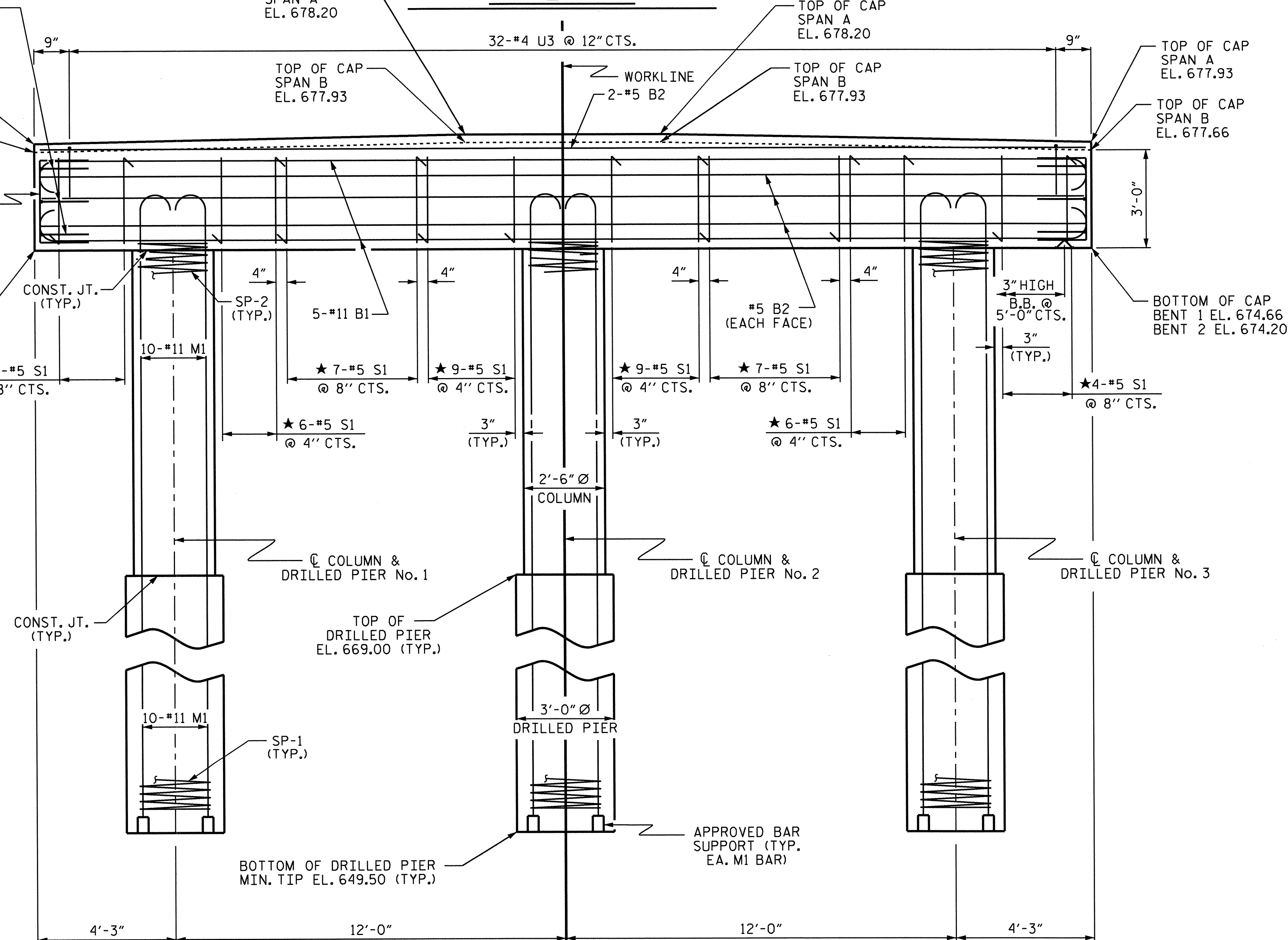


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-17
2			4			TOTAL SHEETS 22

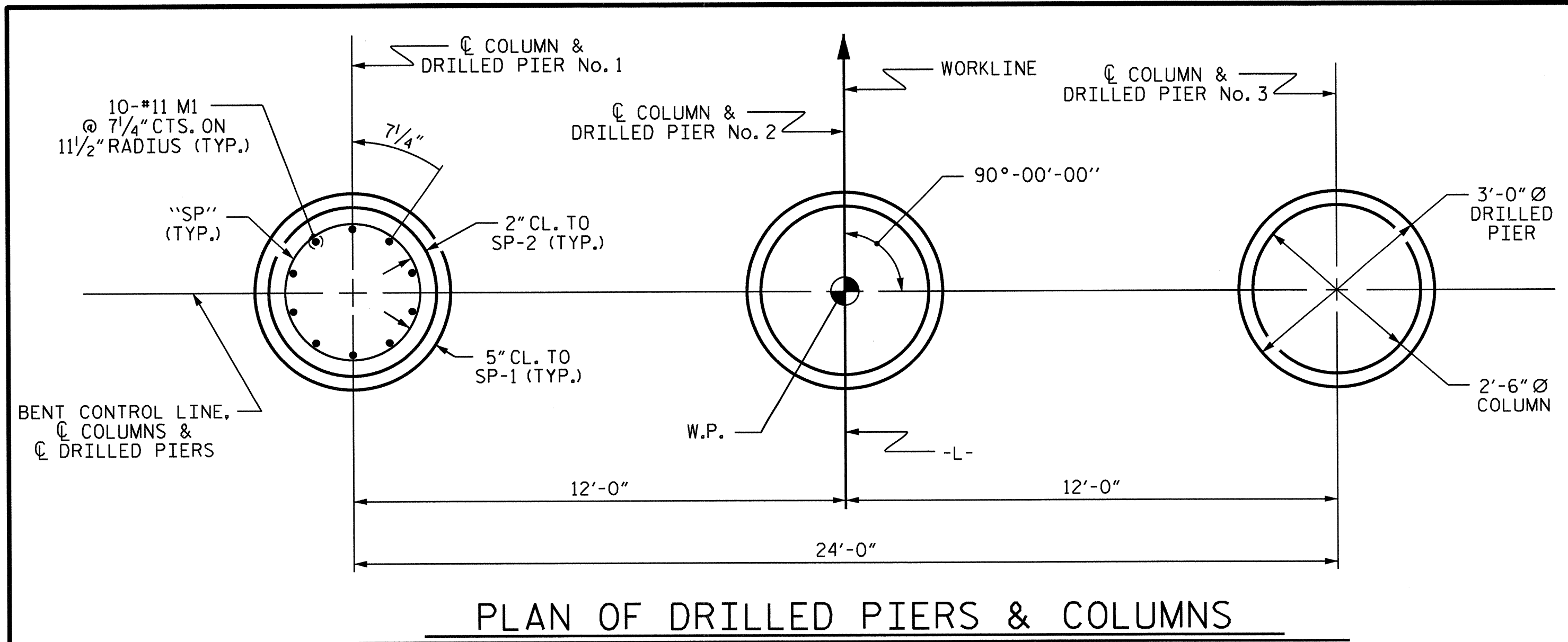
DRAWN BY : N. Ruffin DATE : 9/30/13  
 CHECKED BY : REZA KOUCHEKI DATE : 10/8/13  
 DESIGN ENGINEER OF RECORD : N. RUFFIN DATE : 12/6/13

**ELEVATION**

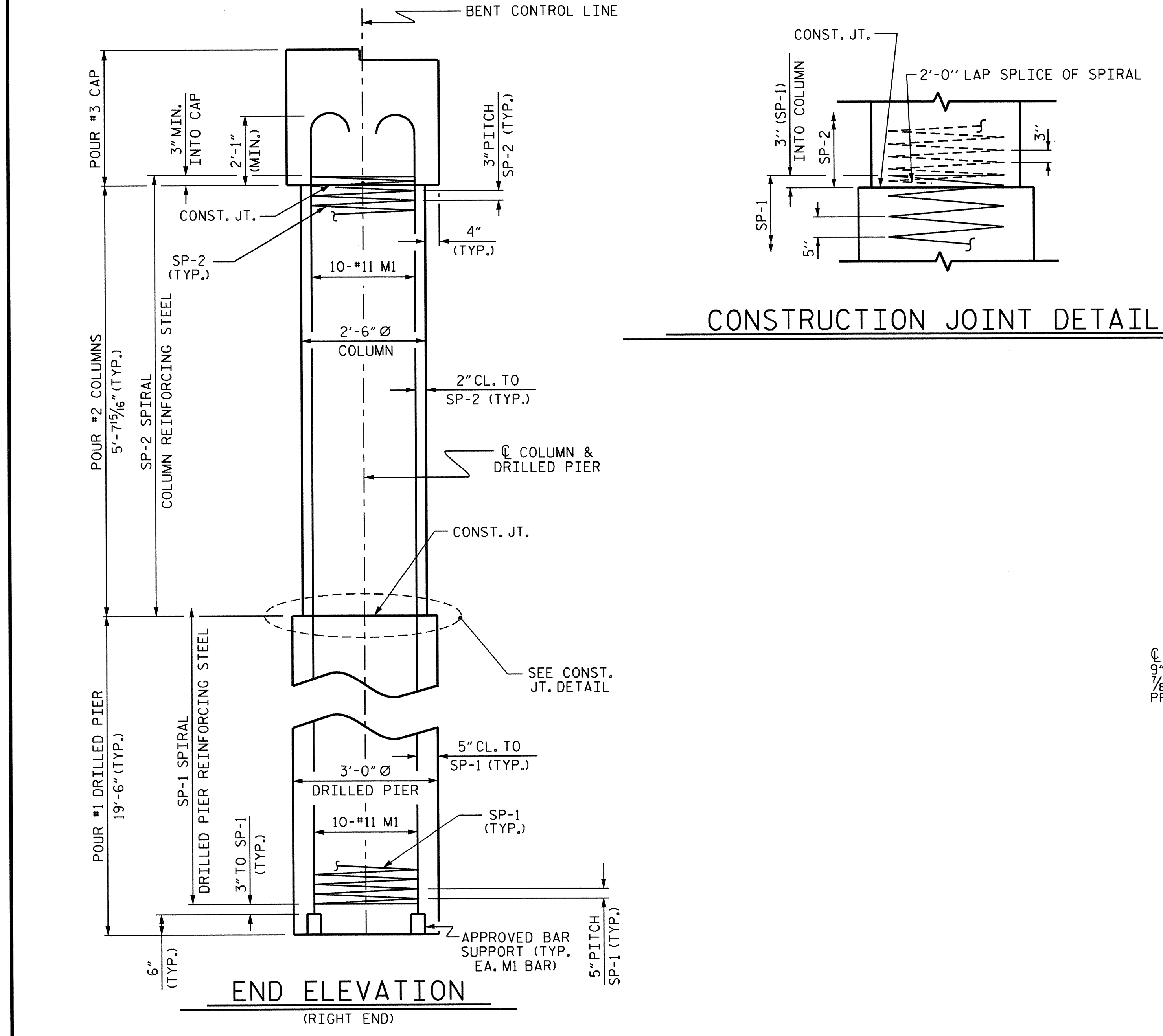
DIMENSIONS & REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER UNLESS OTHERWISE NOTED.



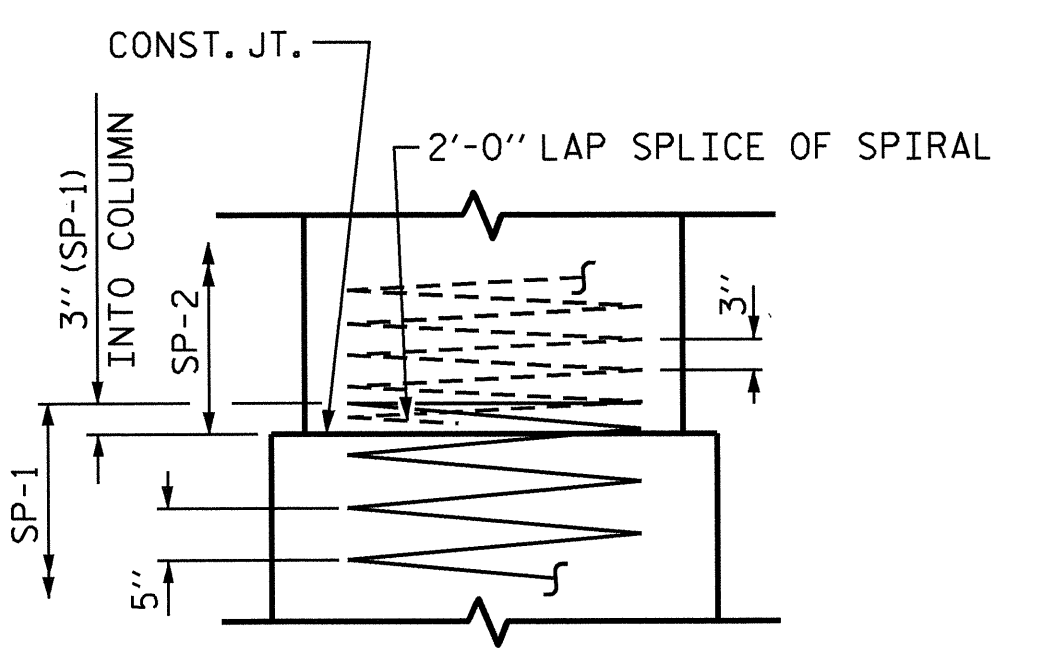
4'-3" 12'-0" 12'-0" 4'-3"



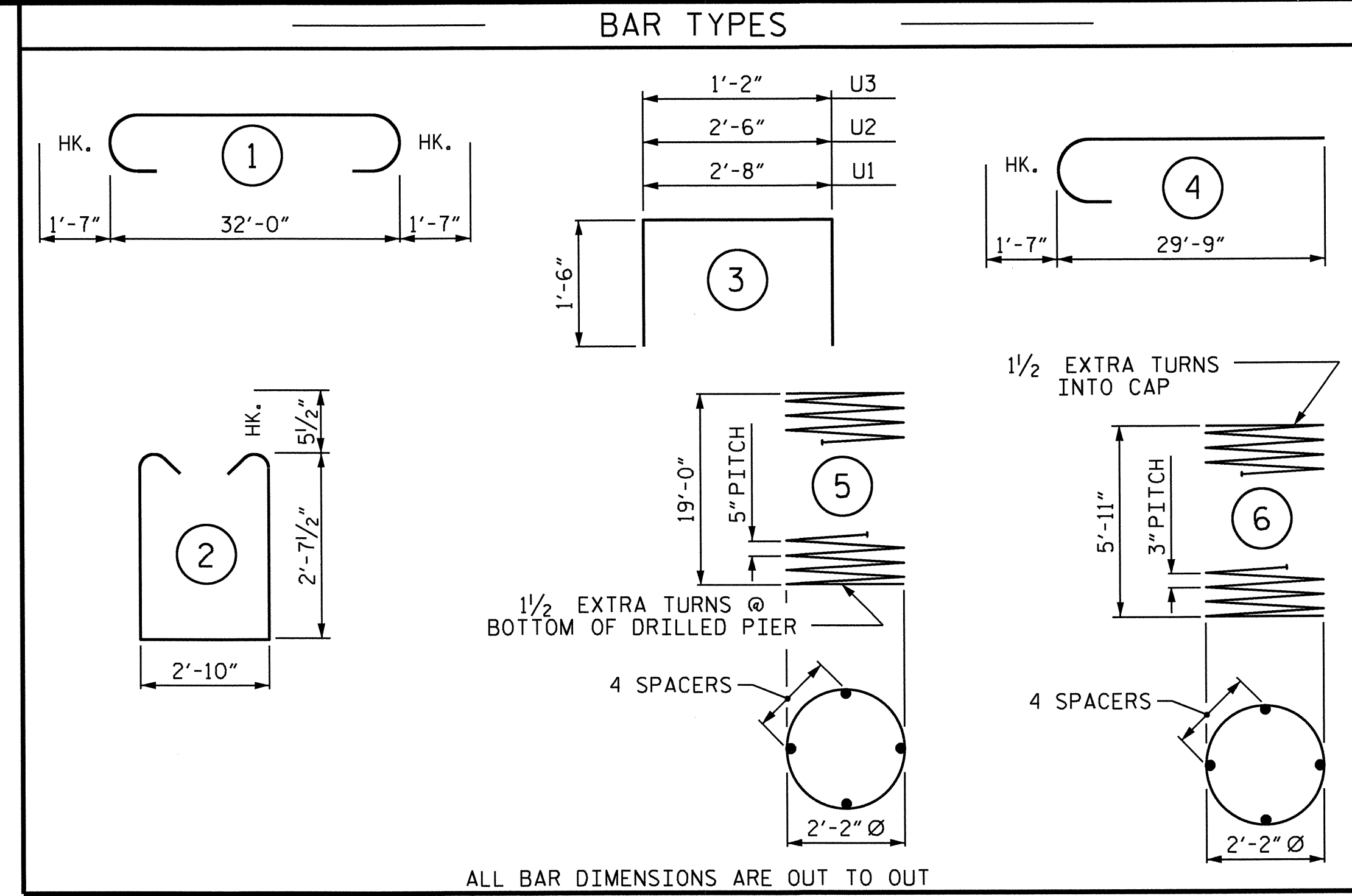
PLAN OF DRILLED PIERS & COLUMNS



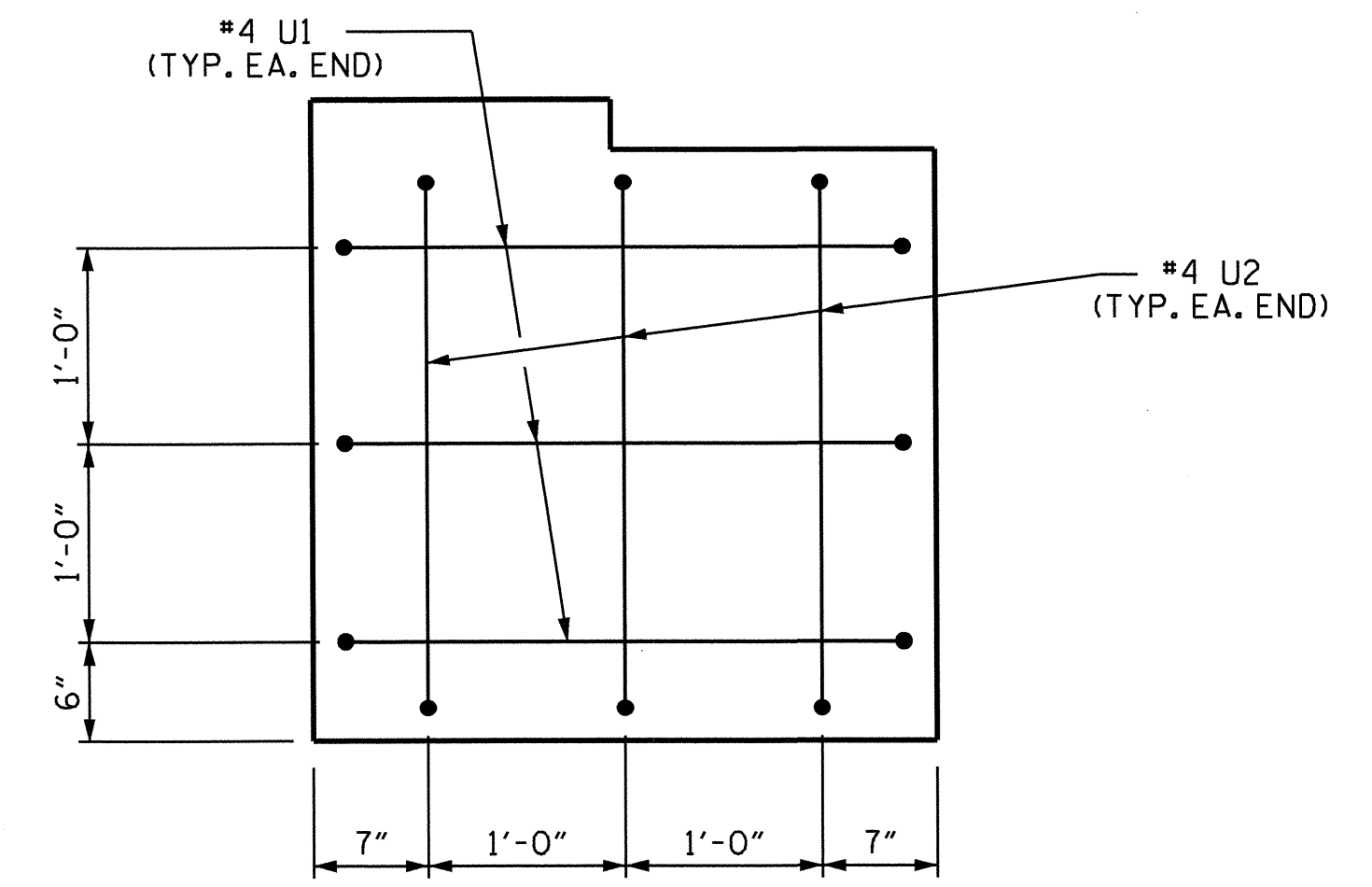
END ELEVATION (RIGHT END)



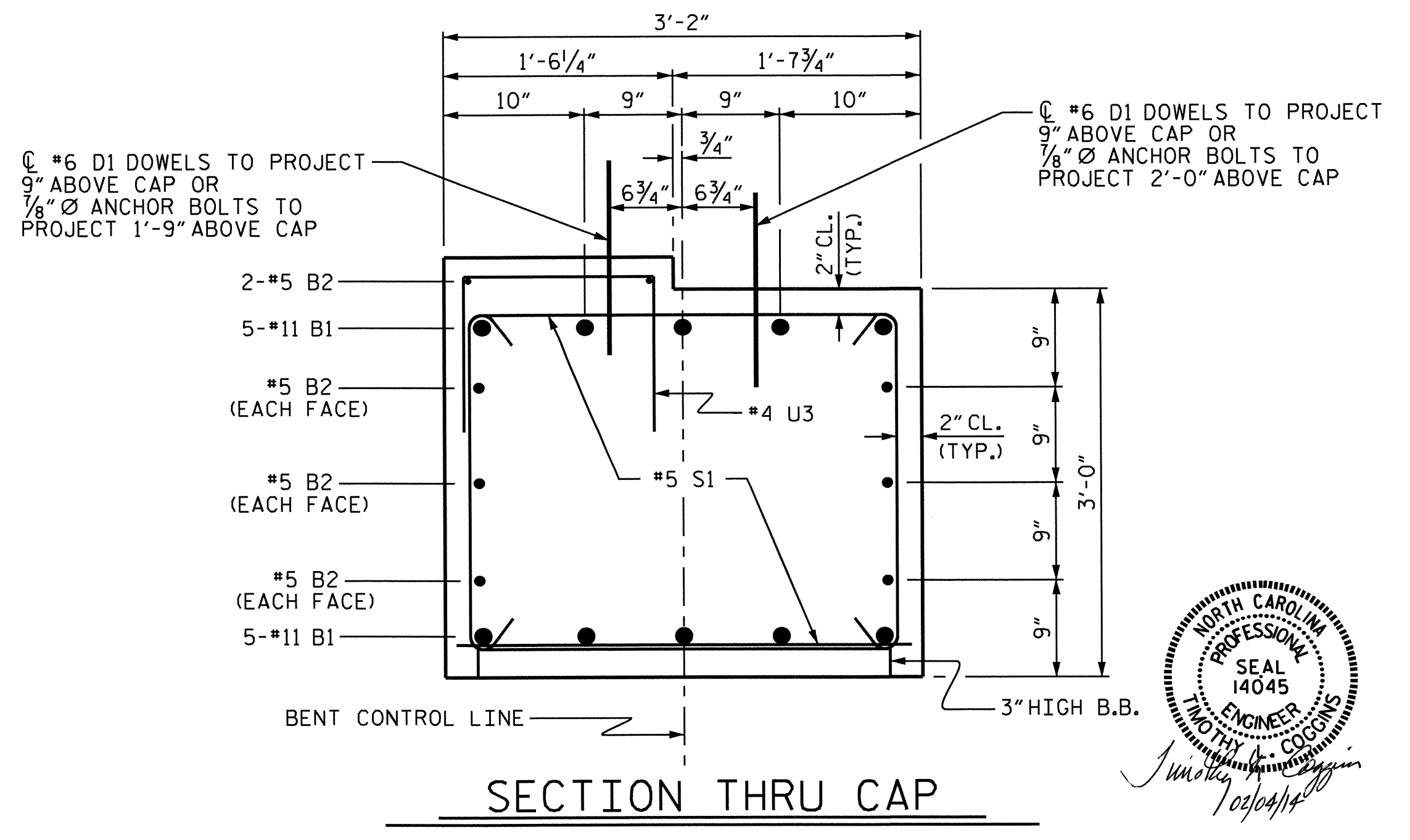
CONSTRUCTION JOINT DETAIL



ALL BAR DIMENSIONS ARE OUT TO OUT



RIGHT END OF CAP VIEW (LEFT END SIMILAR)



SECTION THRU CAP

BILL OF MATERIAL					
BENT No. 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#11		35'-2"	1868
B2	8	#5	STR	32'-2"	268
D1	24	#6	STR	1'-6"	54
M1	30	#11		31'-4"	4994
S1	52	#5		9'-0"	488
U1	6	#4		5'-8"	23
U2	6	#4		5'-6"	22
U3	32	#4		4'-2"	89
REINFORCING STEEL					7806 LBS.
SP-1	3	*	5	316'-3"	990 LBS.
SP-2	3	**	6	168'-9"	338 LBS.
SPIRAL COLUMN REINFORCING STEEL					1328 LBS.
* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR					
** THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR					
CLASS A CONCRETE BREAKDOWN					
POUR #2 (COLUMNS)					3.1 C.Y.
POUR #3 (CAP)					12.5 C.Y.
TOTAL CLASS A CONCRETE					15.6 C.Y.
DRILLED PIERS:					
DRILLED PIER CONCRETE					
POUR #1 (DRILLED PIERS)					15.3 C.Y.
3'-0" Ø DRILLED PIER NOT IN SOIL					27 LIN. FT.
3'-0" Ø DRILLED PIER IN SOIL					31.5 LIN. FT.
CSL TUBES					252 LIN. FT.

PROJECT NO. B-4758  
GUILFORD COUNTY  
 STATION: 16+64.29 -L-

SHEET 2 OF 2

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

SHEET NO. S-18  
TOTAL SHEETS 22

DRAWN BY: N. Ruffin DATE: 9/30/13  
 CHECKED BY: REZA KOUCHEKI DATE: 10/8/13  
 DESIGN ENGINEER OF RECORD: N. RUFFIN DATE: 12/6/13

**NOTES**

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

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

FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.

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

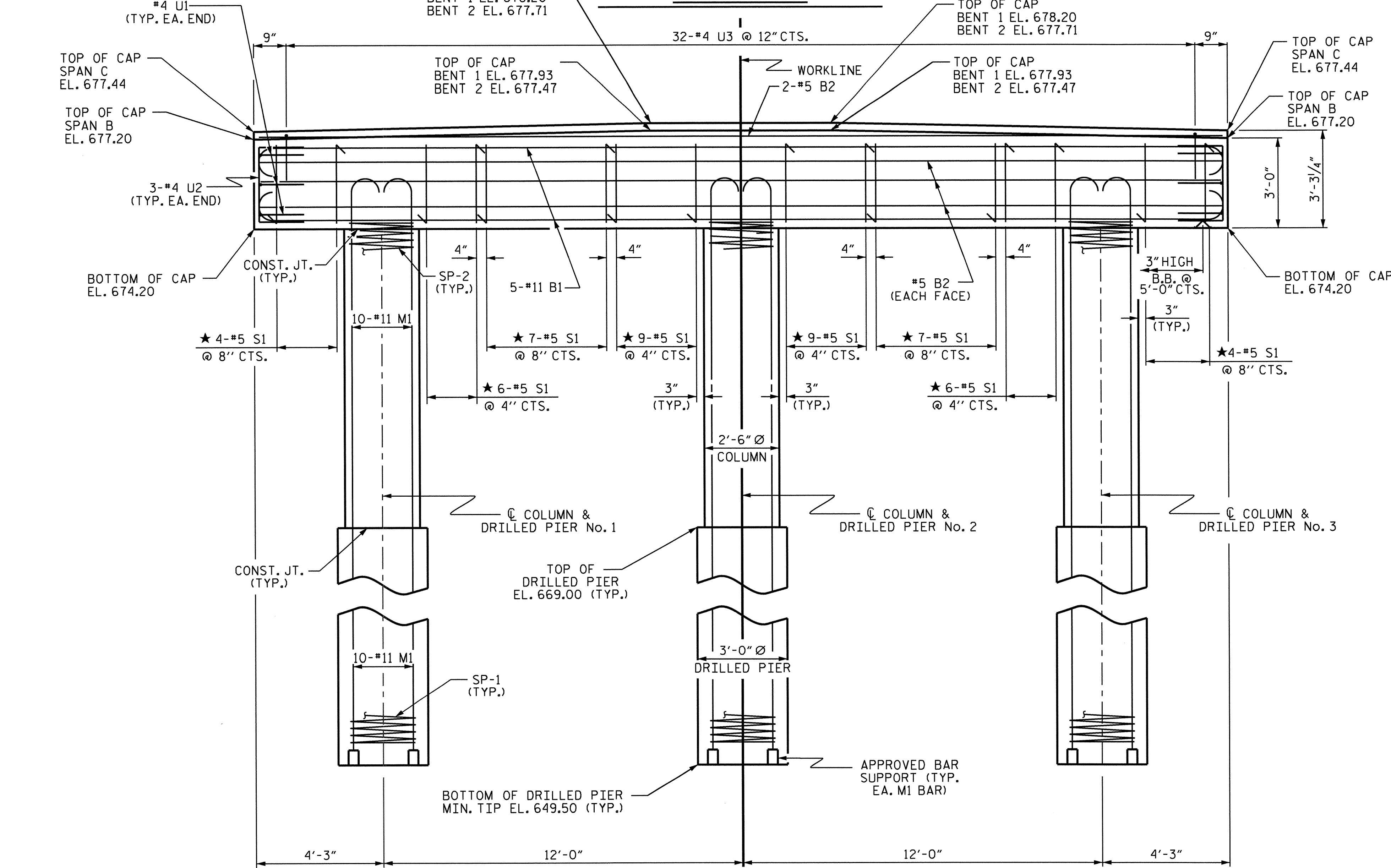
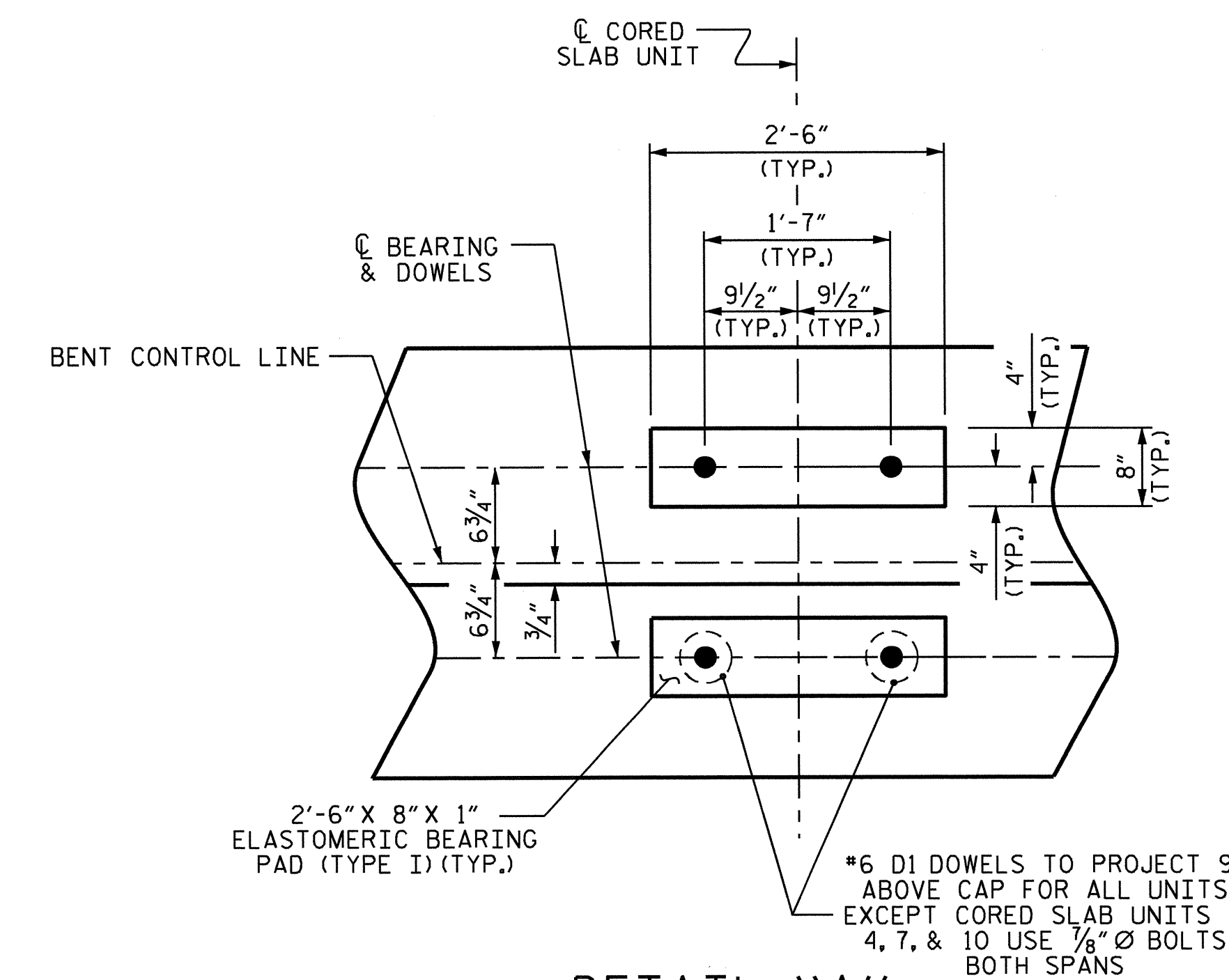
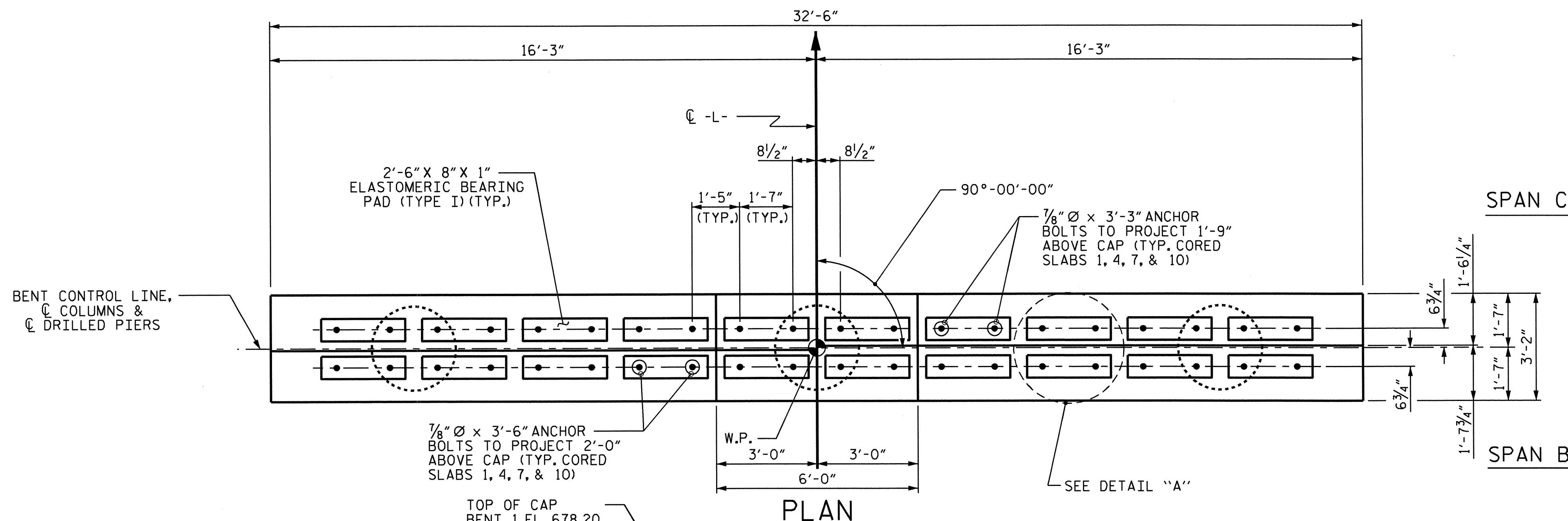
★ INVERT ALTERNATE STIRRUPS.

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

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

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449 AND NUTS, WASHERS, AND P1 PLATES SHALL MEET THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS. THE ANCHOR BOLTS, NUTS, WASHERS, AND P1 PLATES SHALL BE GALVANIZED ACCORDING TO THE STANDARD SPECIFICATIONS.

NO SEPARATE PAYMENT WILL BE MADE FOR THE ANCHOR BOLTS, NUTS, WASHERS, AND P1 PLATES AND THE COST OF MATERIALS AND INSTALLATION SHALL BE INCLUDED IN OTHER PAY ITEMS.



**DETAIL "A"**  
(DIMENSIONS ARE TYPICAL EACH BEARING)

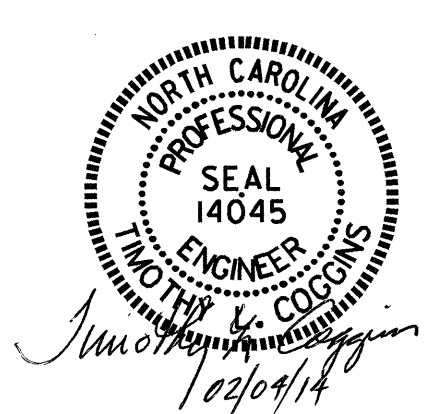
PROJECT NO. B-4758  
GUILFORD COUNTY  
 STATION: 16+64.29 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE**

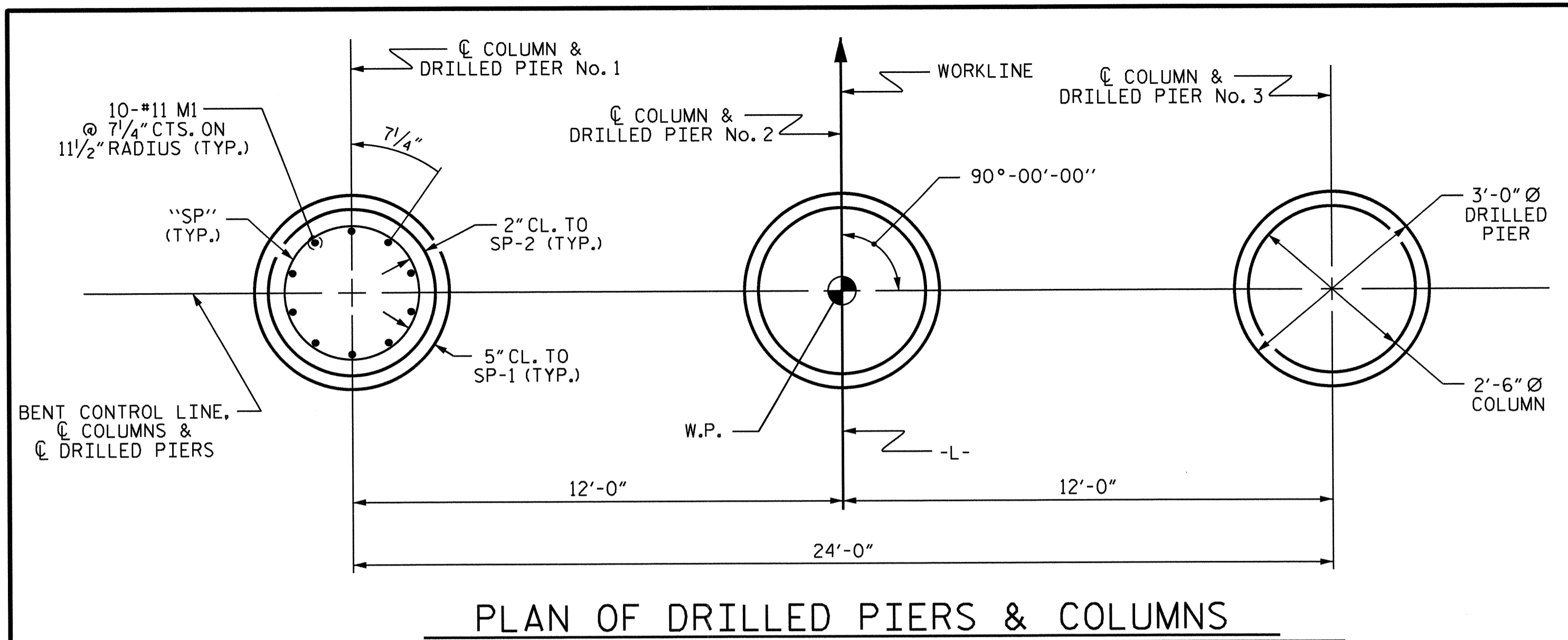
**BENT No. 2**



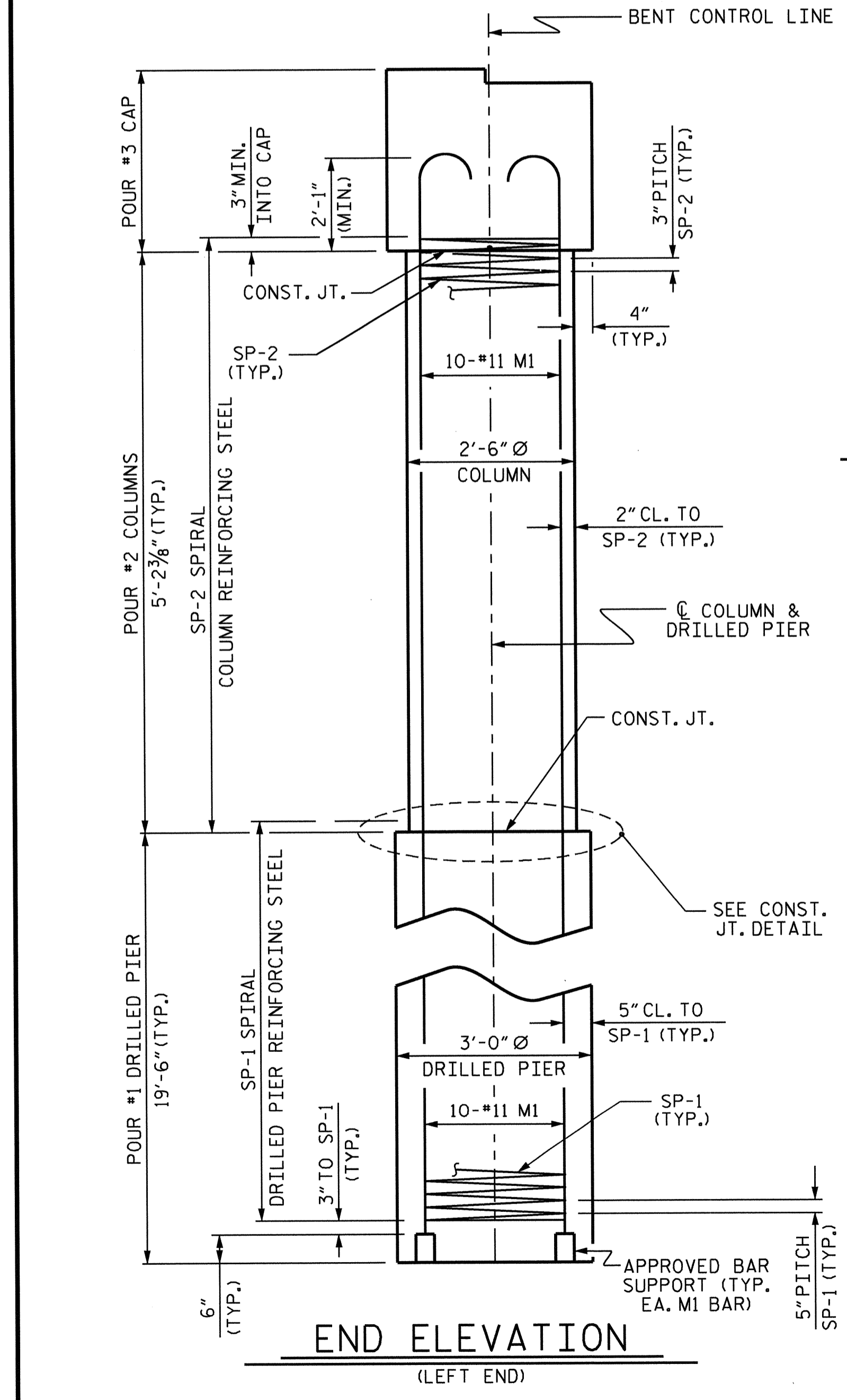
DRAWN BY: N. Ruffin DATE: 9/30/13  
 CHECKED BY: REZA KOUCHEKI DATE: 10/8/13  
 DESIGN ENGINEER OF RECORD: N. RUFFIN DATE: 12/6/13

DIMENSIONS & REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER UNLESS OTHERWISE NOTED.

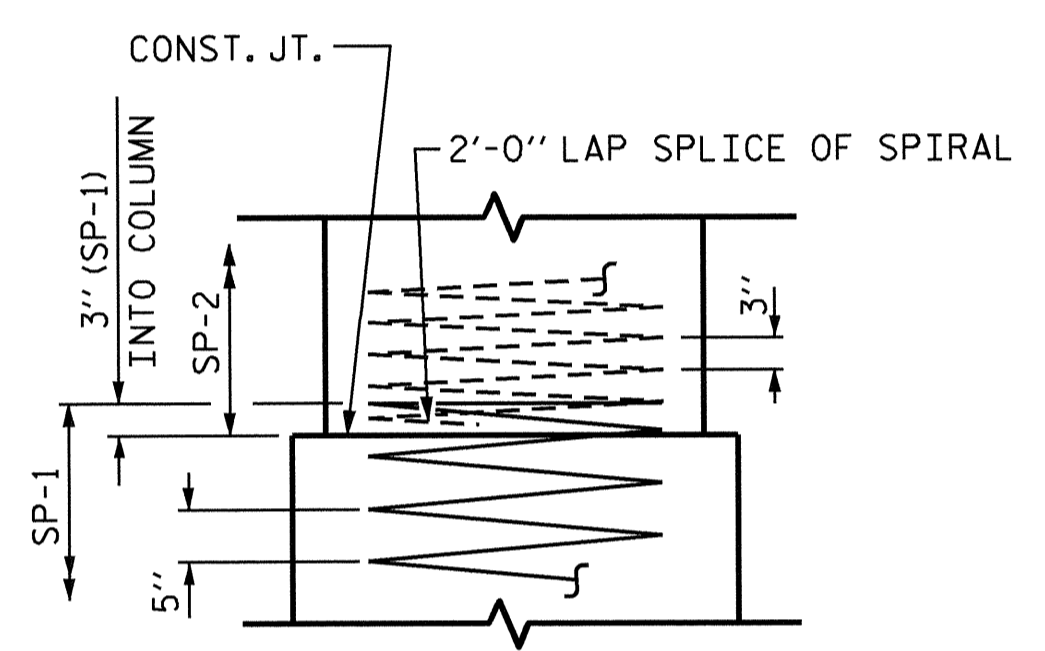
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			22



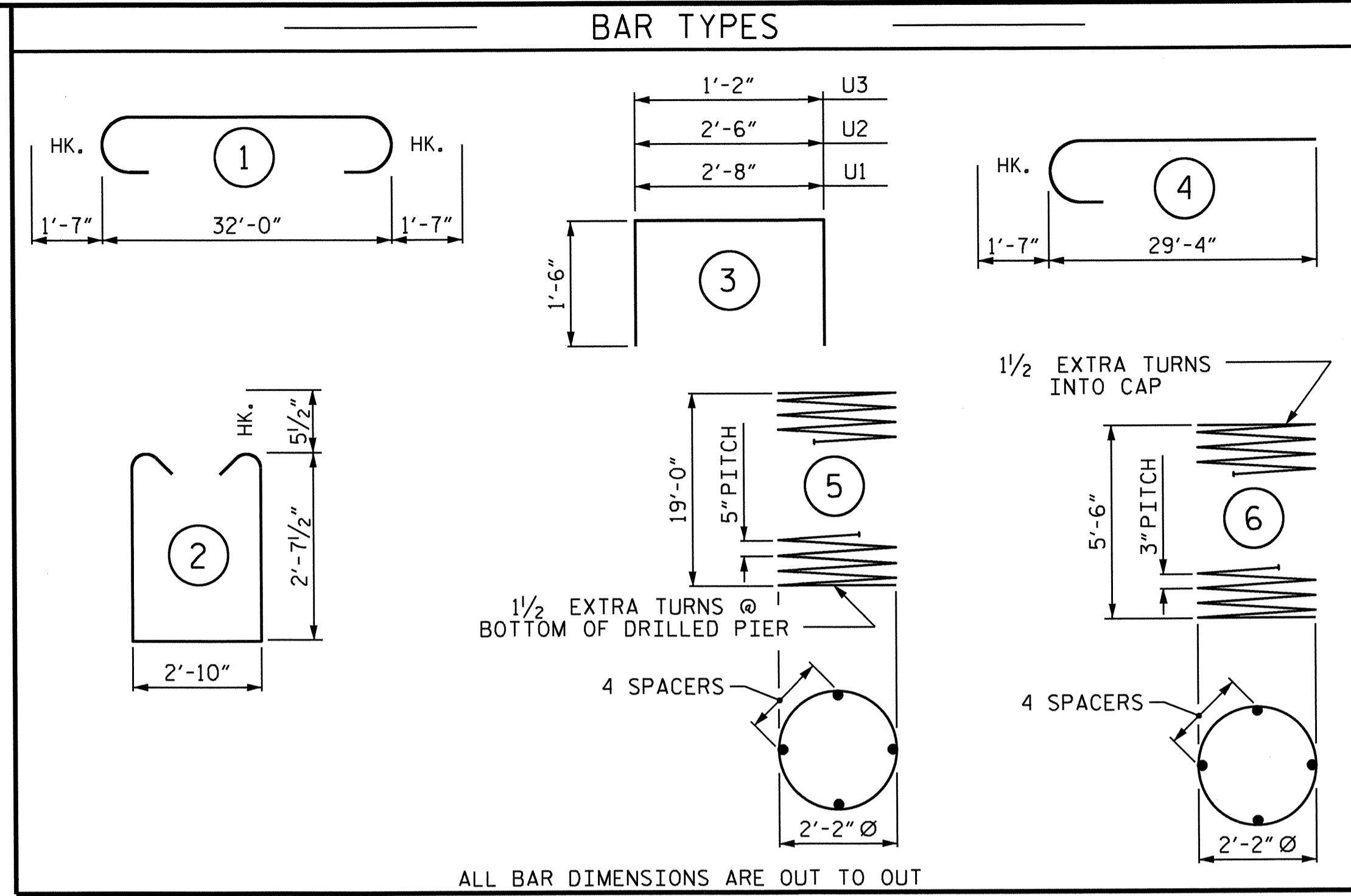
PLAN OF DRILLED PIERS & COLUMNS



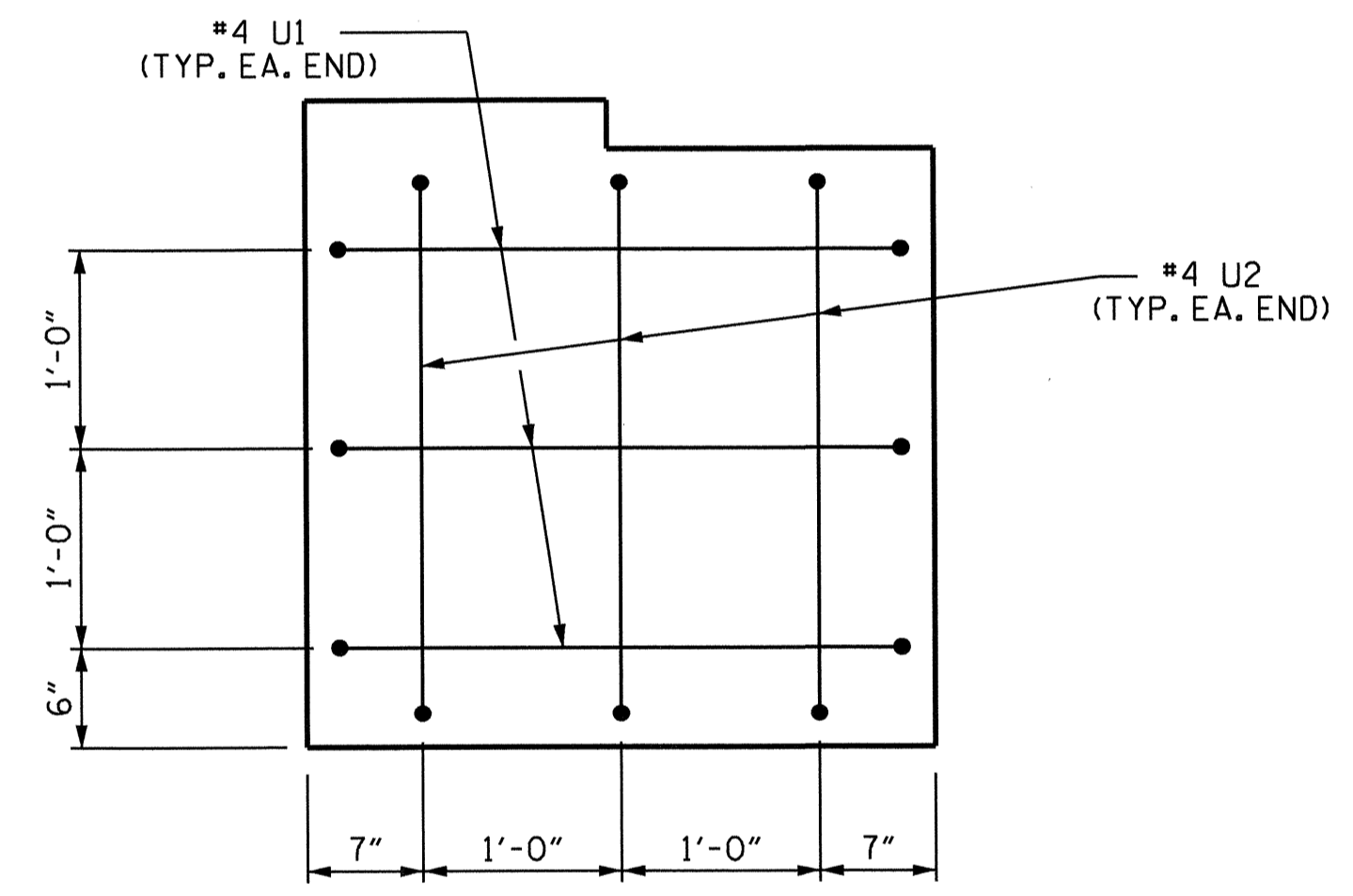
END ELEVATION (LEFT END)



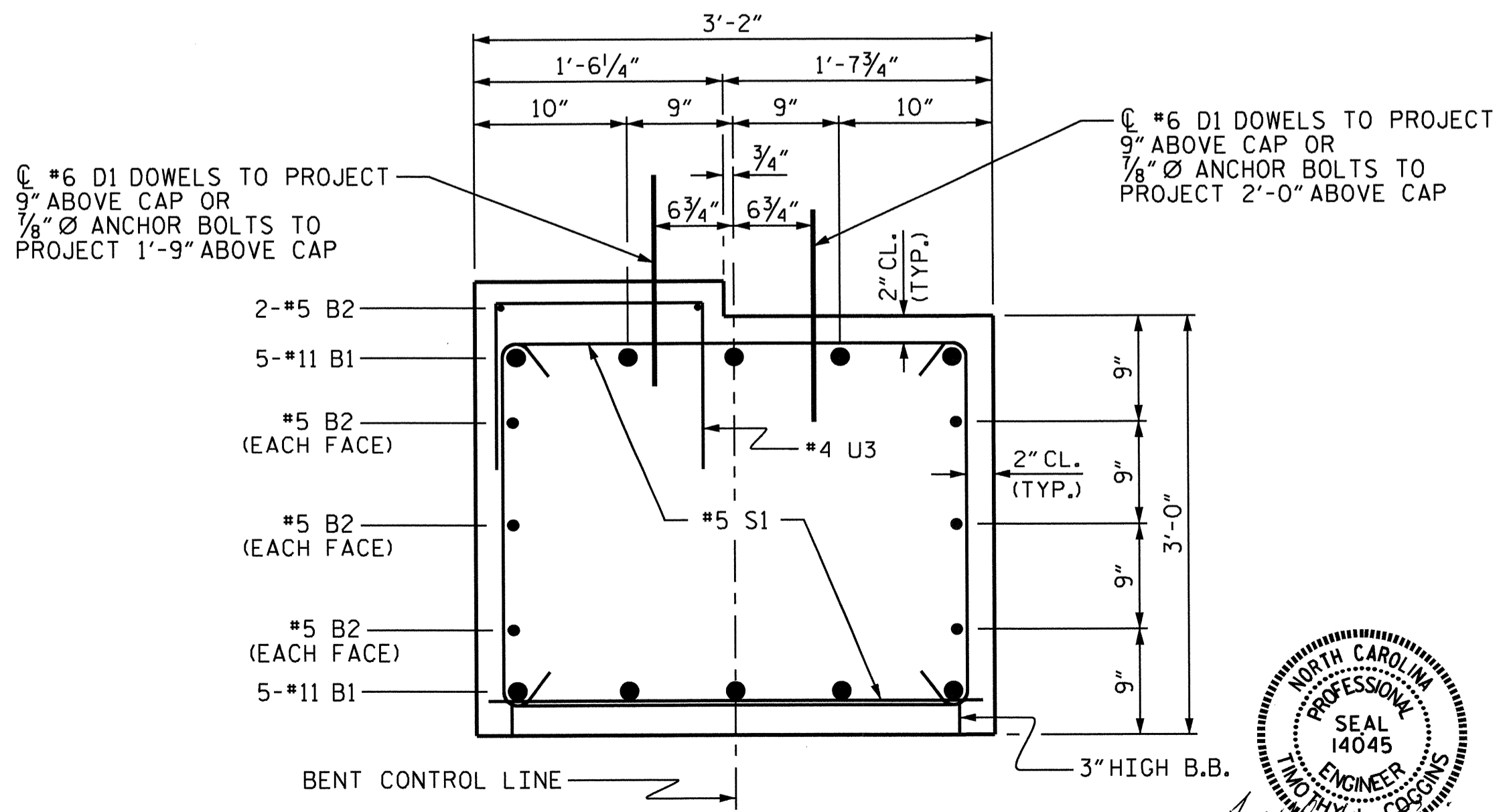
CONSTRUCTION JOINT DETAIL



ALL BAR DIMENSIONS ARE OUT TO OUT



LEFT END OF CAP VIEW (RIGHT END SIMILAR)



SECTION THRU CAP

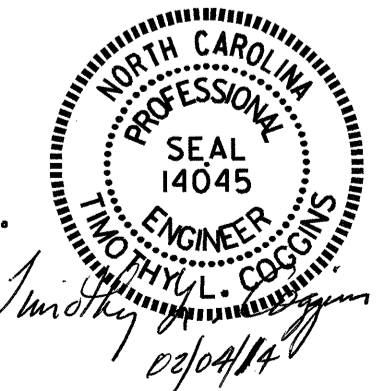
BILL OF MATERIAL					
BENT No. 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#11	1	35'-2"	1868
B2	8	#5	STR	32'-2"	268
D1	24	#6	STR	1'-6"	54
M1	30	#11	4	30'-11"	4928
S1	52	#5	2	9'-0"	488
U1	6	#4	3	5'-8"	23
U2	6	#4	3	5'-6"	22
U3	32	#4	3	4'-2"	89
REINFORCING STEEL					7740 LBS.
SP-1	3	*	5	316'-3"	990 LBS.
SP-2	3	**	6	157'-0"	315 LBS.
SPIRAL COLUMN REINFORCING STEEL					1305 LBS.
* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR					
** THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR					
CLASS A CONCRETE BREAKDOWN					
POUR #2 (COLUMNS)					2.8 C.Y.
POUR #3 (CAP)					12.5 C.Y.
TOTAL CLASS A CONCRETE					15.3 C.Y.
DRILLED PIERS:					
DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)					15.3 C.Y.
3'-0" Ø DRILLED PIER NOT IN SOIL					30 LIN. FT.
3'-0" Ø DRILLED PIER IN SOIL					28.5 LIN. FT.
CSL TUBES					252 LIN. FT.

PROJECT NO. B-4758  
GUILFORD COUNTY  
 STATION: 16+64.29 -L-

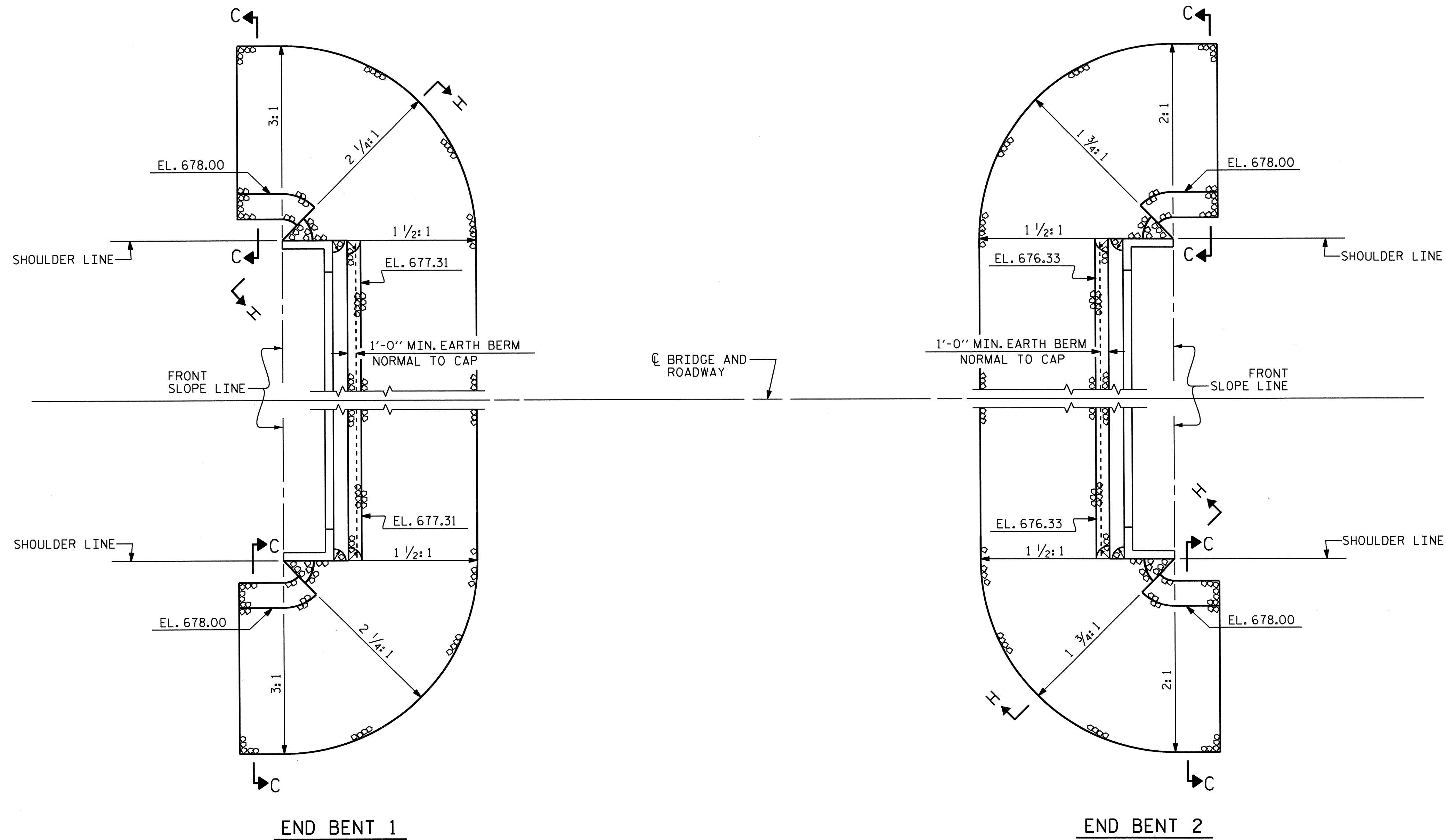
SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH				
SUBSTRUCTURE BENT No. 2				
REVISIONS				SHEET NO.
NO.	BY	DATE	NO.	DATE
1			3	
2			4	
				S-20
				TOTAL SHEETS 22

DRAWN BY: N. Ruffin DATE: 9/30/13  
 CHECKED BY: REZA KOUCHEKI DATE: 10/8/13  
 DESIGN ENGINEER OF RECORD: N. RUFFIN DATE: 12/6/13



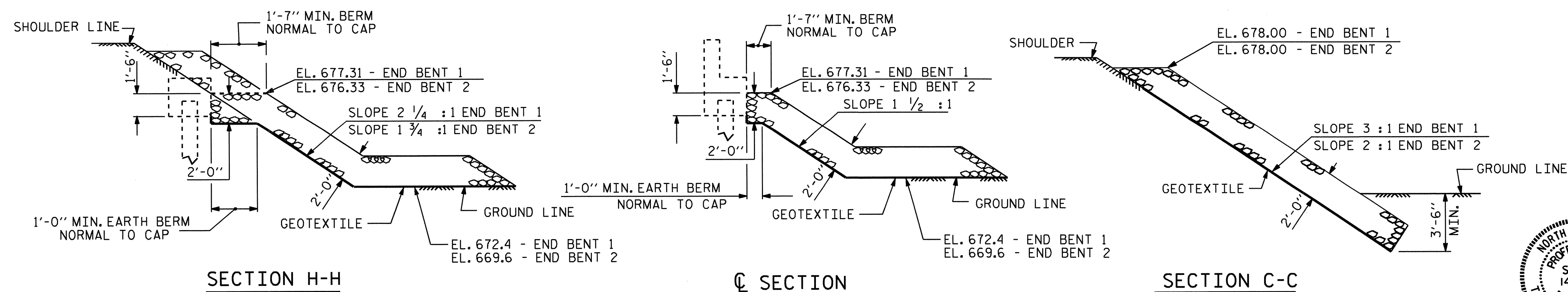
NOTES :  
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.



CL BRIDGE AND ROADWAY

ESTIMATED QUANTITIES		
BRIDGE @ STA. 16+64.29 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	110	122
END BENT 2	135	149

PLAN



SECTION H-H

CL SECTION

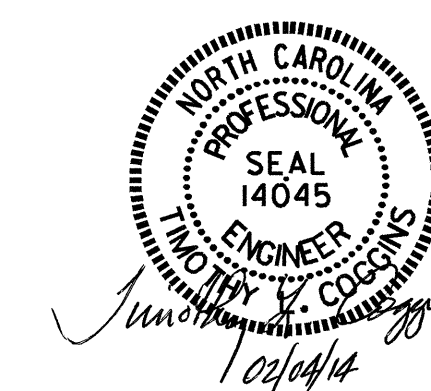
SECTION C-C

BERM RIP RAPPED

PROJECT NO. B-4758  
GUILFORD COUNTY  
STATION: 16+64.29 -L-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

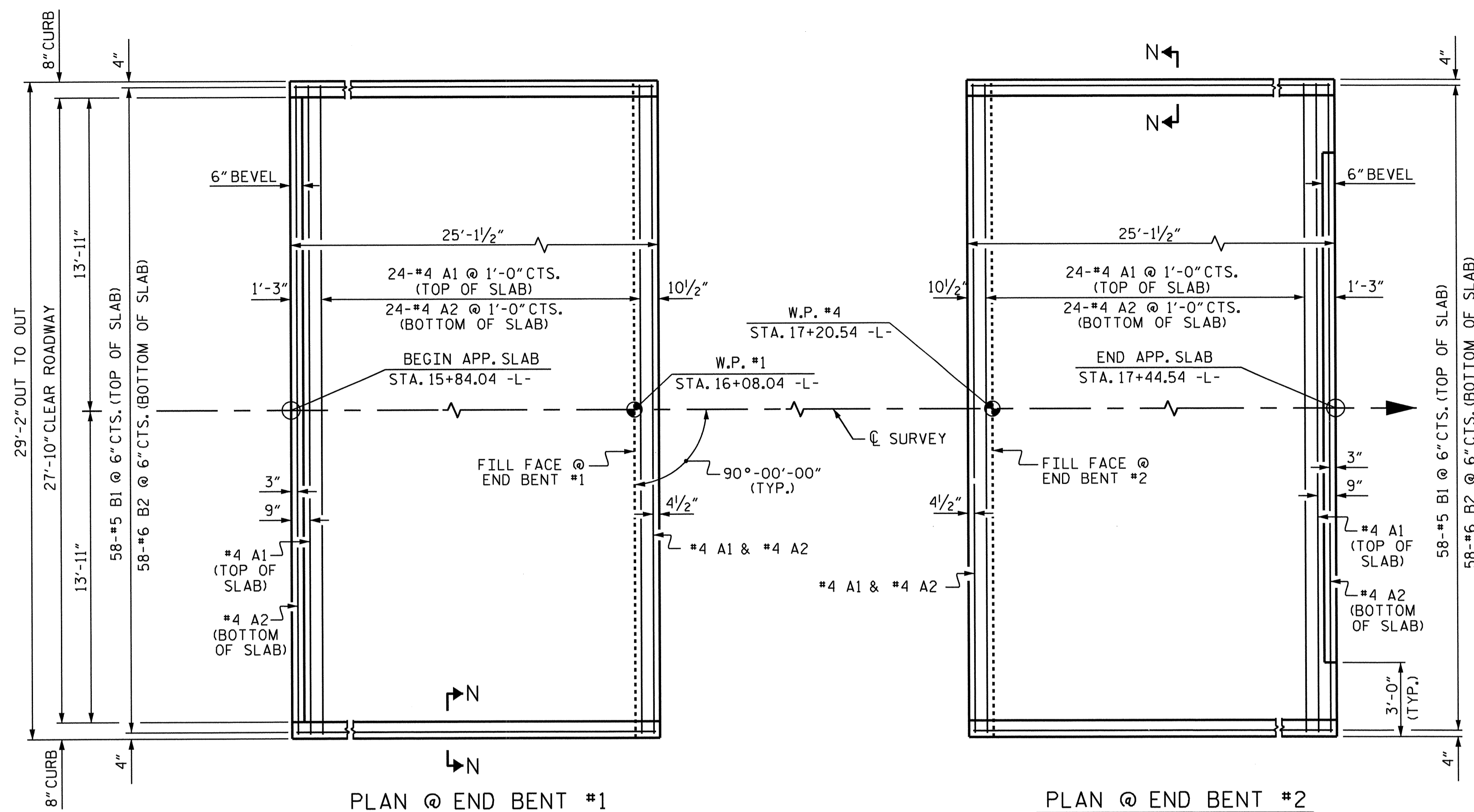
== RIP RAP DETAILS ==



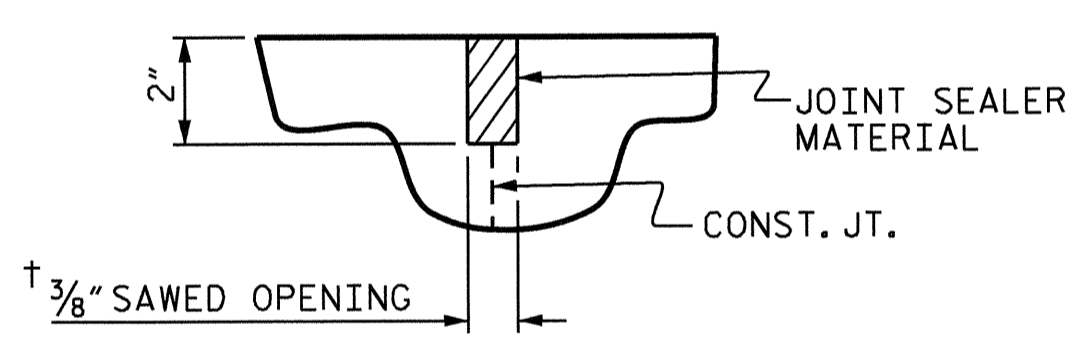
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CHECKED BY : REZA KOUCHEKI DATE : 10/9/13  
DESIGN ENGINEER OF RECORD: N. RUFFIN DATE : 12/10/13

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			22



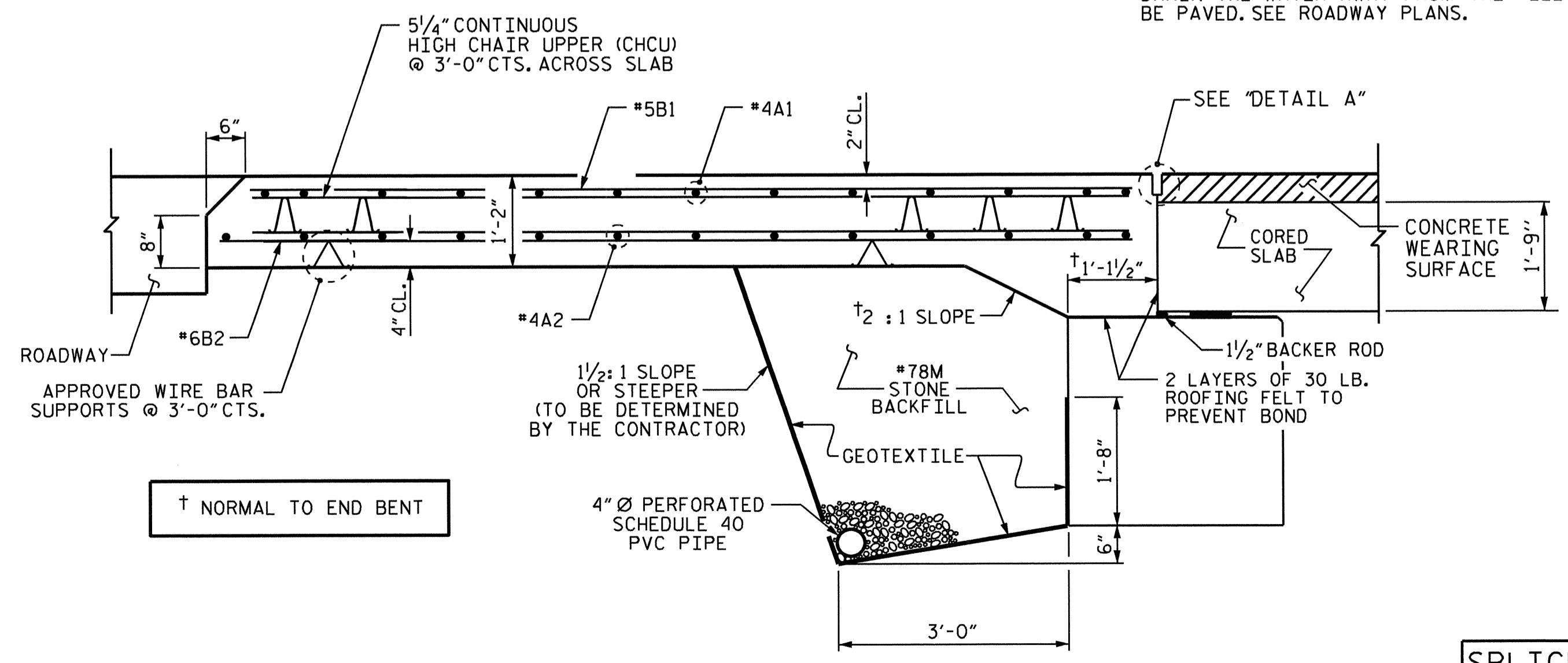
PLAN @ END BENT #1  
 PLAN @ END BENT #2  
 DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



DETAIL A

NOTES

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 4" Ø DRAINAGE PIPE, AND #78M STONE BACKFILL, SEE ROADWAY PLANS.  
 GEOTEXTILE SHALL BE TYPE 1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.  
 #78M STONE BACKFILL (CLASS V SELECT MATERIAL) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.  
 #78M STONE BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.  
 FOR THE 4" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.  
 AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.



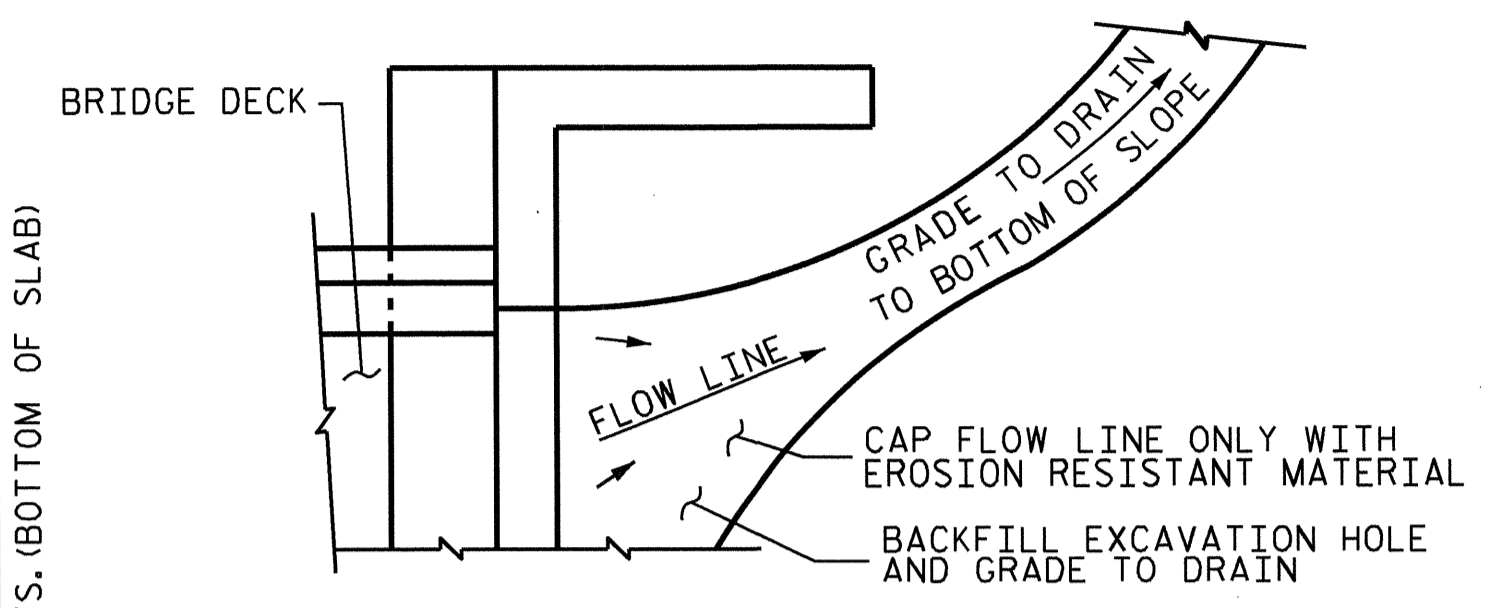
SECTION THRU SLAB

SPlice CHART	
BAR	LENGTH
#4 A1	2'-0"
#4 A2	1'-9"

DRAWN BY: *N. Ruffin* DATE: 9/26/13  
 CHECKED BY: REZA KOUCHEKI DATE: 10/9/13  
 DESIGN ENGINEER OF RECORD: N. RUFFIN DATE: 12/6/13

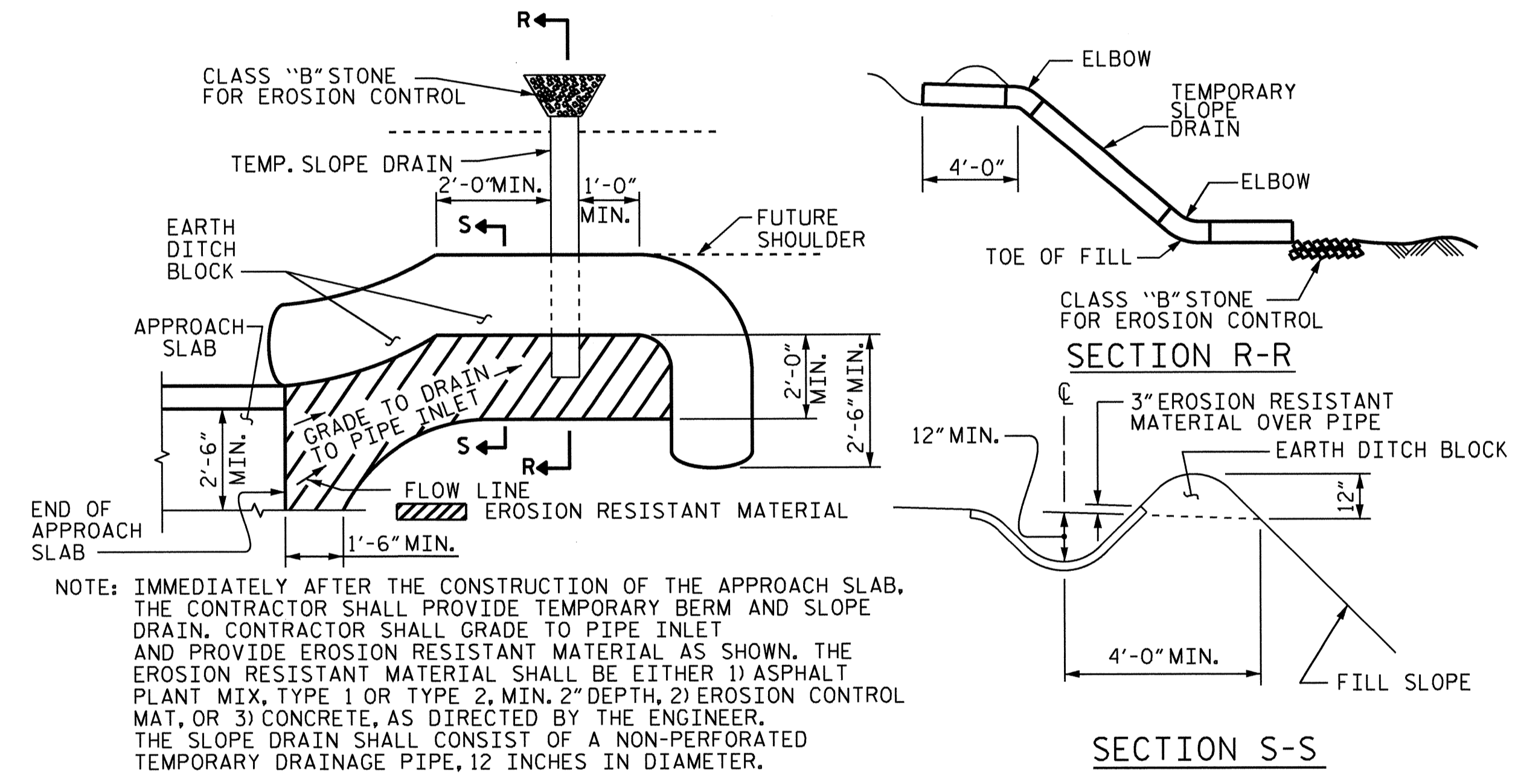
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BILL OF MATERIAL						
APPROACH SLAB AT EB #1						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	26	#4	STR	28'-10"	501	
A2	26	#4	STR	28'-10"	501	
*B1	58	#5	STR	24'-3"	1,467	
B2	58	#6	STR	24'-9"	2,156	
REINFORCING STEEL					LBS.	2,657
*EPOXY COATED REINFORCING STEEL					LBS.	1,968
CLASS AA CONCRETE					C. Y.	34.5
APPROACH SLAB AT EB #2						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	26	#4	STR	28'-10"	501	
A2	26	#4	STR	28'-10"	501	
*B1	58	#5	STR	24'-3"	1,467	
B2	58	#6	STR	24'-9"	2,156	
REINFORCING STEEL					LBS.	2,657
*EPOXY COATED REINFORCING STEEL					LBS.	1,968
CLASS AA CONCRETE					C. Y.	34.5



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

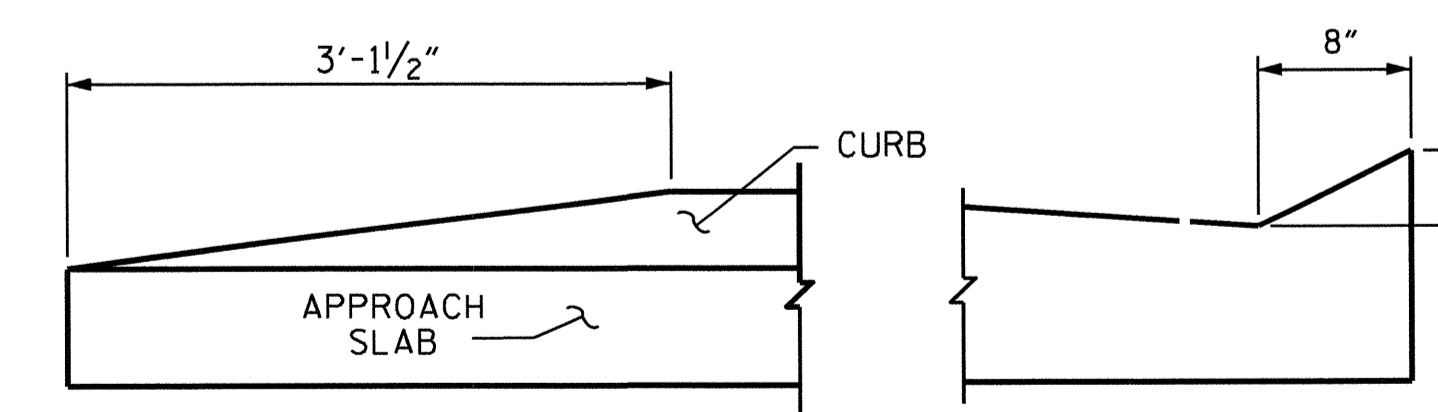
TEMPORARY DRAINAGE DETAIL



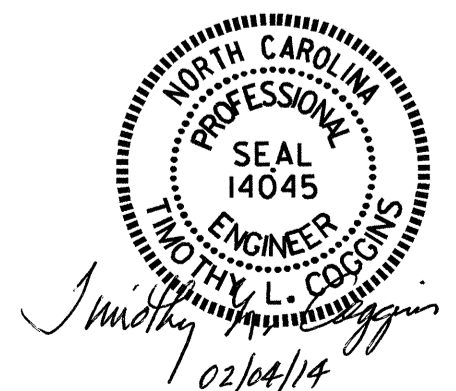
NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

PLAN VIEW  
 TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



END OF CURB WITHOUT SHOULDER BERM GUTTER  
 CURB DETAILS



PROJECT NO. B-4758  
 GUILFORD COUNTY  
 STATION: 16+64.29 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 BRIDGE APPROACH SLAB FOR PRESTRESSED CONCRETE CORED SLAB

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

## 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 2012 "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

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