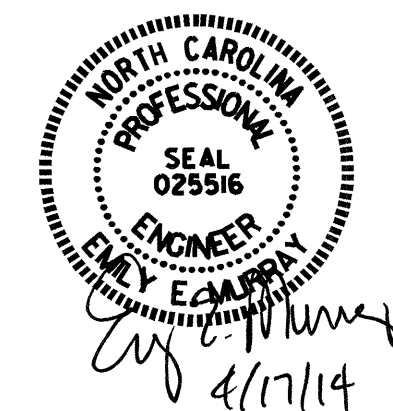


I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS.

PROJECT NO. U-3331
 NASH COUNTY
 STATION: 32+18.50-L-

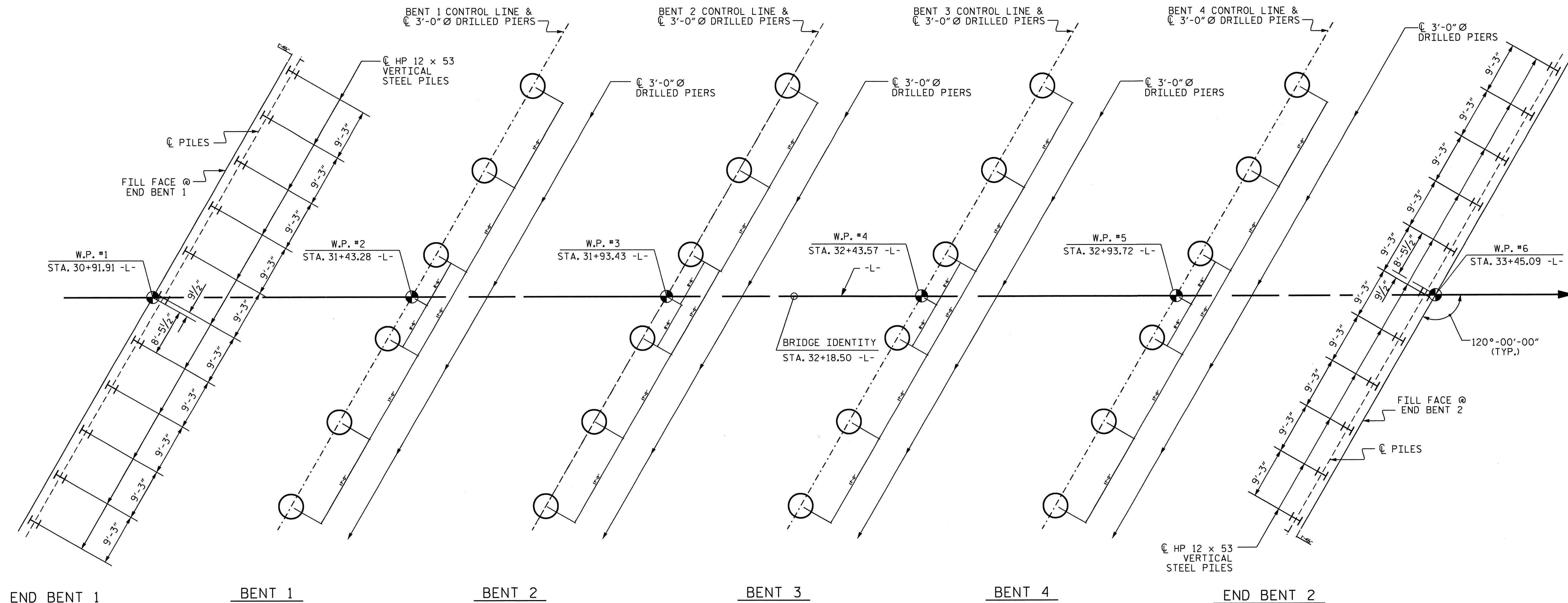
SHEET 1 OF 3 REPLACES BRIDGE #112

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE ON SR 1616 OVER
 STONEY CREEK BETWEEN
 US 64 BUSINESS AND US 64



DRAWN BY: J. MYA/M.L. RORIE DATE: 2/7/14
 CHECKED BY: D. A. GLADDEN DATE: 3/7/14
 DESIGN ENGINEER OF RECORD: M.L. RORIE DATE: 3/7/14

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



FOUNDATION LAYOUT

(DIMENSIONS LOCATING END BENT PILES AND BENT DRILLED PIERS ARE SHOWN TO CENTERLINE PILES AND DRILLED PIERS)

FOUNDATION NOTES:

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NOS. 1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 90 TONS PER PILE, DRIVE PILES TO A REQUIRED DRIVING RESISTANCE OF 150 TONS PER PILE.

THE SCOUR CRITICAL ELEVATION FOR BENT NOS. 1-4 IS ELEVATION 73 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

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

DRILLED PIERS AT BENT NOS. 1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 340 TONS PER PIER AND AT BENT NO. 4 FOR A FACTORED RESISTANCE OF 345 TONS. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 50 TSF.

DRILLED PIERS AT BENT NO. 3 ARE DESIGNED FOR A FACTORED RESISTANCE OF 345 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 30 TSF.

PERMANENT STEEL CASING IS REQUIRED FOR DRILLED PIERS AT BENT NO. 1. DO NOT EXTEND THE CASING BELOW ELEVATION 77 FT WITHOUT APPROVAL FROM THE ENGINEER.

PERMANENT STEEL CASING IS REQUIRED FOR DRILLED PIERS AT BENT NO. 2. DO NOT EXTEND THE CASING BELOW ELEVATION 75 FT WITHOUT APPROVAL FROM THE ENGINEER.

PERMANENT STEEL CASING IS REQUIRED FOR DRILLED PIERS AT BENT NO. 3. DO NOT EXTEND THE CASING BELOW ELEVATION 74 FT WITHOUT APPROVAL FROM THE ENGINEER.

PERMANENT STEEL CASING IS REQUIRED FOR DRILLED PIERS AT BENT NO. 4. DO NOT EXTEND THE CASING BELOW ELEVATION 72 FT WITHOUT APPROVAL FROM THE ENGINEER.

INSTALL DRILLED PIERS AT BENT NO. 1 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 60 FT AND SATISFY THE REQUIRED TIP RESISTANCE.

INSTALL DRILLED PIERS AT BENT NO. 2 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 60 FT AND SATISFY THE REQUIRED TIP RESISTANCE.

INSTALL DRILLED PIERS AT BENT NO. 3 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 51 FT AND SATISFY THE REQUIRED TIP RESISTANCE.

INSTALL DRILLED PIERS AT BENT NO. 4 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 56 FT AND SATISFY THE REQUIRED TIP RESISTANCE.

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.

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.

STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT NOS. 1 AND END BENT NO. 2. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. U-3331

NASH COUNTY

STATION: 32+18.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

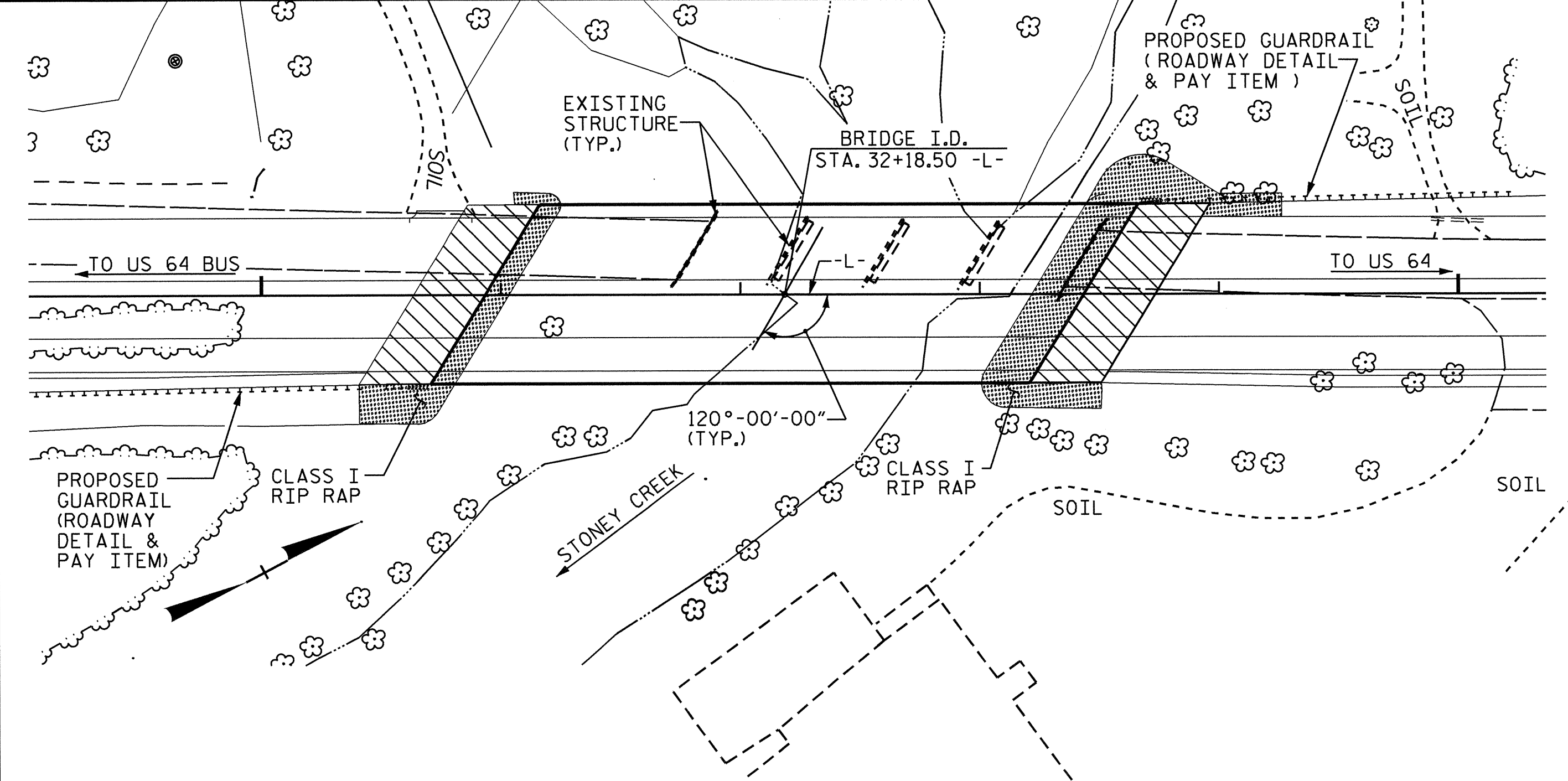
FOR BRIDGE ON SR 1616 OVER
STONEY CREEK BETWEEN
US 64 BUSINESS AND US 64



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

DRAWN BY : J. MYA/M.L. RORIE DATE : 2/7/14
CHECKED BY : D. A. GLADDEN DATE : 3/7/14

B.M. #251 : RR SPIKE IN BASE OF 15" SWEET GUM 14.62' RT. OF STA. 31+21.21 -L- EL. 96.24



NOTE: 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.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

THE EXISTING STRUCTURE CONSISTING OF 4 (1 @ 40'-6", 2 @ 40'-0", 1 @ 40'-4") STEEL PLATE FLOOR ON STEEL I-BEAMS SPANS WITH A CLEAR ROADWAY WIDTH OF 28'-1" SUPPORTED BY REINFORCED CONCRETE POST AND BEAM WITH STEEL CAP & PILE BENTS AND H-CAPS AND PILE END BENTS LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, THIS LOAD LIMIT MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. 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."

AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS I 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 32+18.50 -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 SPICED 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 MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 45 FT. LEFT AND 25 FT. RIGHT 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 USE OF A TEMPORARY CAUSEWAY OR WORK BRIDGE OTHER THAN WHAT IS SHOWN FOR CONSTRUCTION OF DRILLED PIERS WILL NOT BE PERMITTED. CORED SLAB UNITS HAVE BEEN DESIGNED FOR CONSTRUCTION LOADS AND SHALL BE PLACED USING TOP-DOWN CONSTRUCTION METHODS.

THE LOCATION OF THE PERMITTED CONSTRUCTION JOINT IN BENT NO. 4 IS BASED ON THE APPROXIMATE GROUND LINE ELEVATION. IF THE PERMITTED CONSTRUCTION JOINT IS USED AND IS ABOVE THE ACTUAL GROUND ELEVATION, THE CONTRACTOR SHALL PLACE THE PERMITTED CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

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 32+18.50 -L-."

TOTAL BILL OF MATERIAL

	CONSTRUCTION MAINTENANCE & REMOVAL OF TEMP. ACCESS	REMOVAL OF EXISTING STRUCTURE	3'-0" DIA. DRILLED PIERS IN SOIL	3'-0" DIA. DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 3'-0" DIA. DRILLED PIER	SPT TESTING	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	CONCRETE WEARING SURFACE	GROOVING BRIDGE FLOORS	CLASS AA CONCRETE	CLASS A CONCRETE
	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	CU. YDS.
SUPERSTRUCTURE									16094	18263	134.7	
END BENT 1								LUMP SUM				37.9
BENT 1			102.0	72.0	72.0							47.0
BENT 2			112.5	63.0	85.1							47.0
BENT 3			213.0	18.0	92.5	1						47.0
BENT 4			127.0	75.0	105.9							47.0
END BENT 2								LUMP SUM				38.0
TOTAL	LUMP SUM	LUMP SUM	554.5	228.0	355.5	1	1	LUMP SUM	16094	18263	134.7	263.9

HYDRAULIC DATA

DESIGN DISCHARGE	= 11,800 C.F.S.
FREQUENCY OF DESIGN FLOOD	= 50 YR
DESIGN HIGH WATER ELEVATION	= 99.300
DRAINAGE AREA	= 112.0 SQ. MI
BASE DISCHARGE (Q100)	= 14,000 C.F.S.
BASE HIGH WATER ELEVATION	= 100.800

OVERTOPPING DATA

OVERTOPPING DISCHARGE	= 4,815 C.F.S.
FREQUENCY OF OVERTOPPING FLOOD	= < 10 YR
OVERTOPPING FLOOD ELEVATION	= 93.700

PROJECT NO. U-3331
 NASH COUNTY
 STATION: 32+18.50-L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 1616 OVER
 STONEY CREEK BETWEEN
 US 64 BUSINESS AND US 64



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

DRAWN BY : J. MYA/M.L. RORIE DATE : 2/14/14
 CHECKED BY : D. A. GLADDEN DATE : 3/7/14

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ_{DC}	γ_{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			
						LIVELOAD FACTORS	MOMENT					SHEAR					LIVELOAD FACTORS	MOMENT						
							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)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93(I _{nv})	N/A	1	1.3	--	1.75	0.254	1.3	A	EL	24.422	0.648	1.35	A	EL	2.442	0.80	0.254	1.30	A	EL	24.422		
	HL-93(O _{pr})	N/A	--	1.69	--	1.35	0.254	1.69	A	EL	24.422	0.648	1.75	A	EL	2.442	N/A	--	--	--	--	--		
	HS-20(I _{nv})	36.000	2	1.64	59.054	1.75	0.254	1.68	A	EL	24.422	0.648	1.64	A	EL	2.442	0.80	0.254	1.68	A	EL	24.422		
	HS-20(O _{pr})	36.000	--	2.13	76.552	1.35	0.254	2.17	A	EL	24.422	0.648	2.13	A	EL	2.442	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.41	45.994	1.4	0.254	4.26	A	EL	24.422	0.648	4.63	A	EL	2.442	0.80	0.254	3.41	A	EL	24.422	
		SNGARBS2	20.000	--	2.69	53.843	1.4	0.254	3.37	A	EL	24.422	0.648	3.37	A	EL	2.442	0.80	0.254	2.69	A	EL	24.422	
		SNAGRIS2	22.000	--	2.61	57.480	1.4	0.254	3.27	A	EL	19.538	0.648	3.16	A	EL	2.442	0.80	0.254	2.61	A	EL	24.422	
		SNCOTTS3	27.250	--	1.7	46.313	1.4	0.254	2.13	A	EL	24.422	0.648	2.32	A	EL	2.442	0.80	0.254	1.70	A	EL	24.422	
		SNAGGRS4	34.925	--	1.48	51.624	1.4	0.254	1.85	A	EL	24.422	0.648	1.98	A	EL	2.442	0.80	0.254	1.48	A	EL	24.422	
		SNS5A	35.550	--	1.44	51.242	1.4	0.254	1.8	A	EL	24.422	0.648	2.03	A	EL	2.442	0.80	0.254	1.44	A	EL	24.422	
		SNS6A	39.950	--	1.35	53.853	1.4	0.254	1.69	A	EL	24.422	0.648	1.88	A	EL	2.442	0.80	0.254	1.35	A	EL	24.422	
	SNS7B	42.000	--	1.29	53.957	1.4	0.254	1.61	A	EL	24.422	0.648	1.88	A	EL	2.442	0.80	0.254	1.28	A	EL	24.422		
	TTST	TNAGRIT3	33.000	--	1.65	54.501	1.4	0.254	2.07	A	EL	24.422	0.648	2.22	A	EL	2.442	0.80	0.254	1.65	A	EL	24.422	
		TNT4A	33.075	--	1.67	55.104	1.4	0.254	2.08	A	EL	24.422	0.648	2.14	A	EL	2.442	0.80	0.254	1.67	A	EL	24.422	
		TNT6A	41.600	--	1.39	57.740	1.4	0.254	1.74	A	EL	24.422	0.648	2.05	A	EL	2.442	0.80	0.254	1.39	A	EL	24.422	
		TNT7A	42.000	--	1.41	59.182	1.4	0.254	1.76	A	EL	24.422	0.648	1.91	A	EL	2.442	0.80	0.254	1.41	A	EL	24.422	
		TNT7B	42.000	--	1.47	61.698	1.4	0.254	1.84	A	EL	24.422	0.648	1.81	A	EL	2.442	0.80	0.254	1.47	A	EL	24.422	
		TNAGRIT4	43.000	--	1.39	59.949	1.4	0.254	1.74	A	EL	24.422	0.648	1.74	A	EL	2.442	0.80	0.254	1.39	A	EL	24.422	
TNAGT5A		45.000	--	1.3	58.601	1.4	0.254	1.63	A	EL	24.422	0.648	1.77	A	EL	2.442	0.80	0.254	1.30	A	EL	24.422		
TNAGT5B	45.000	3	1.28	57.409	1.4	0.254	1.6	A	EL	24.422	0.648	1.66	A	EL	2.442	0.80	0.254	1.28	A	EL	24.422			

NOTES:

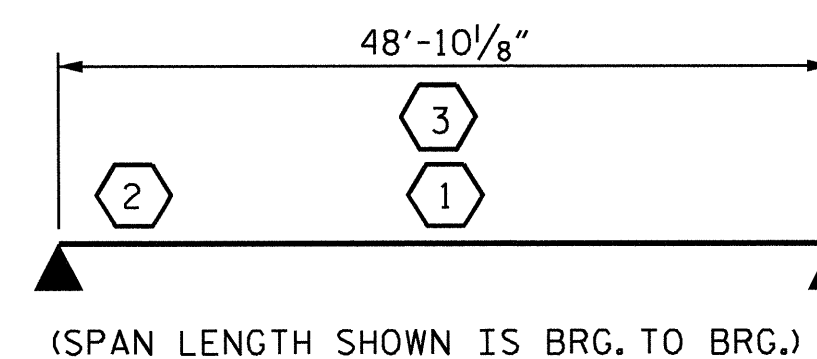
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

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

COMMENTS:

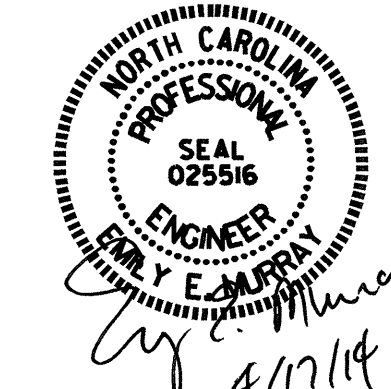
- 1.
- 2.
- 3.
- 4.

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



LRFR SUMMARY
FOR SPANS A-E

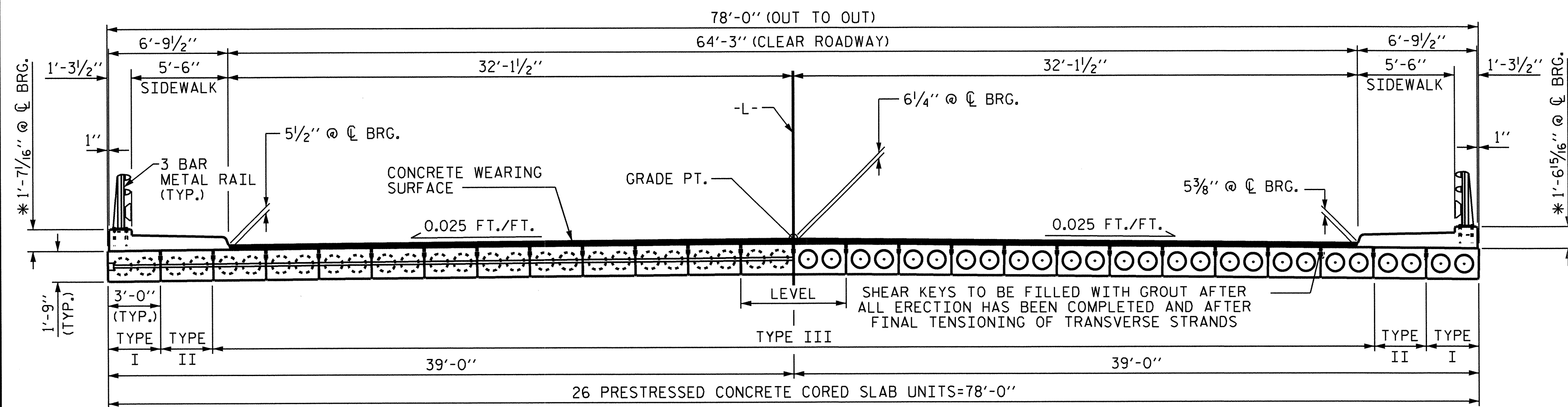
PROJECT NO. U-3331
NASH COUNTY
STATION: 32+18.50 -L-



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

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

ASSEMBLED BY :	M.L. RORIE	DATE :	2-28-14
CHECKED BY :	M.M. AHMED	DATE :	2-28-14
DESIGN ENGINEER OF RECORD :	M.L. RORIE	DATE :	3-7-14
DRAWN BY :	MAA 1/08	REV. 11/12/08RR	MAA/GM
CHECKED BY :	GM/DI 2/08	REV. 10/1/11	MAA/GM

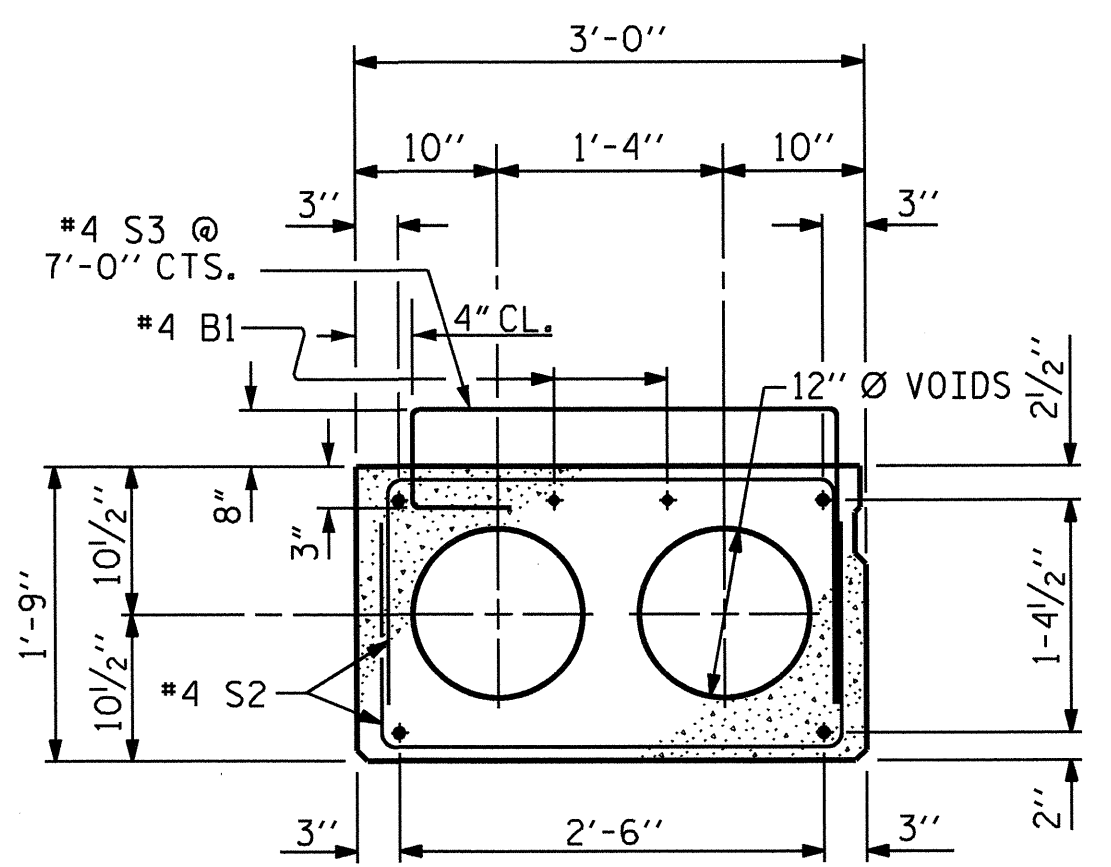


HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

TYPICAL SECTION

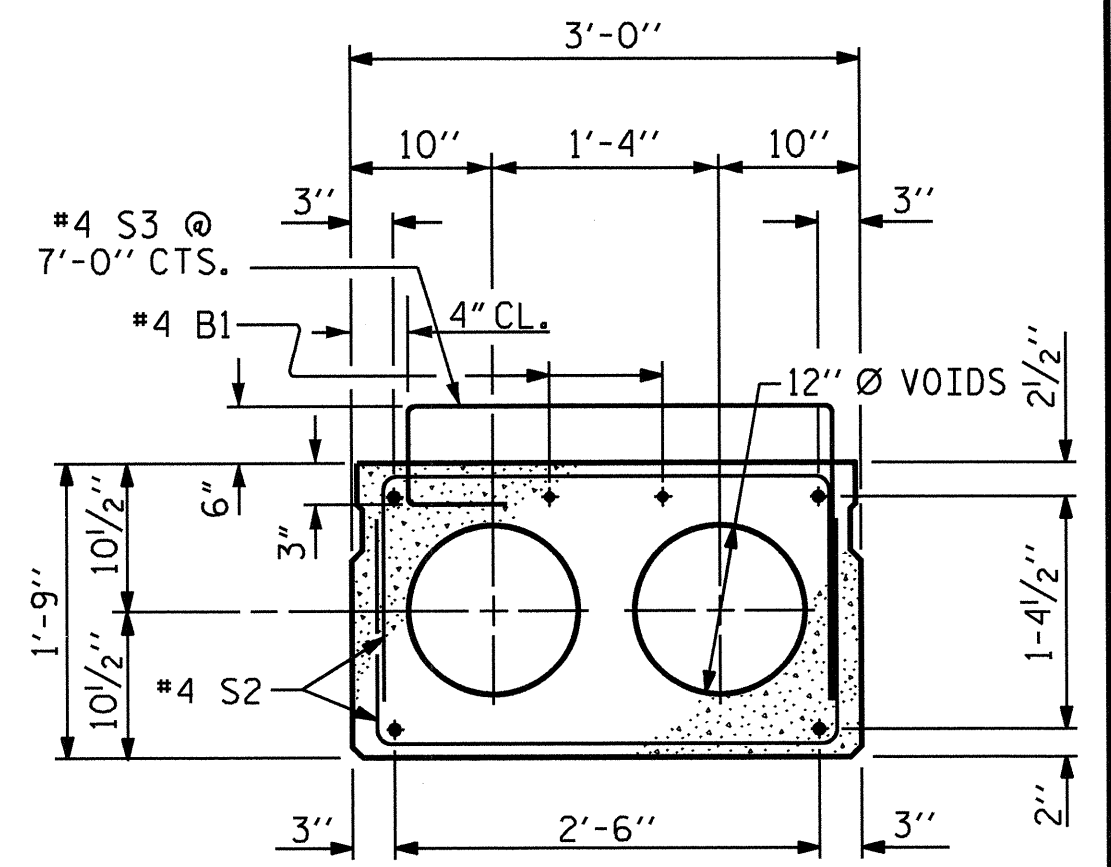
HALF SECTION
THROUGH VOIDS

* - THE MAXIMUM SIDEWALK HEIGHT AND CONCRETE THICKNESS IS SHOWN. THE HEIGHT OF THE SIDEWALK AND CONCRETE THICKNESS VARIES WHILE THE TOP OF THE SIDEWALK FOLLOWS THE PROFILE OF THE GUTTERLINE.



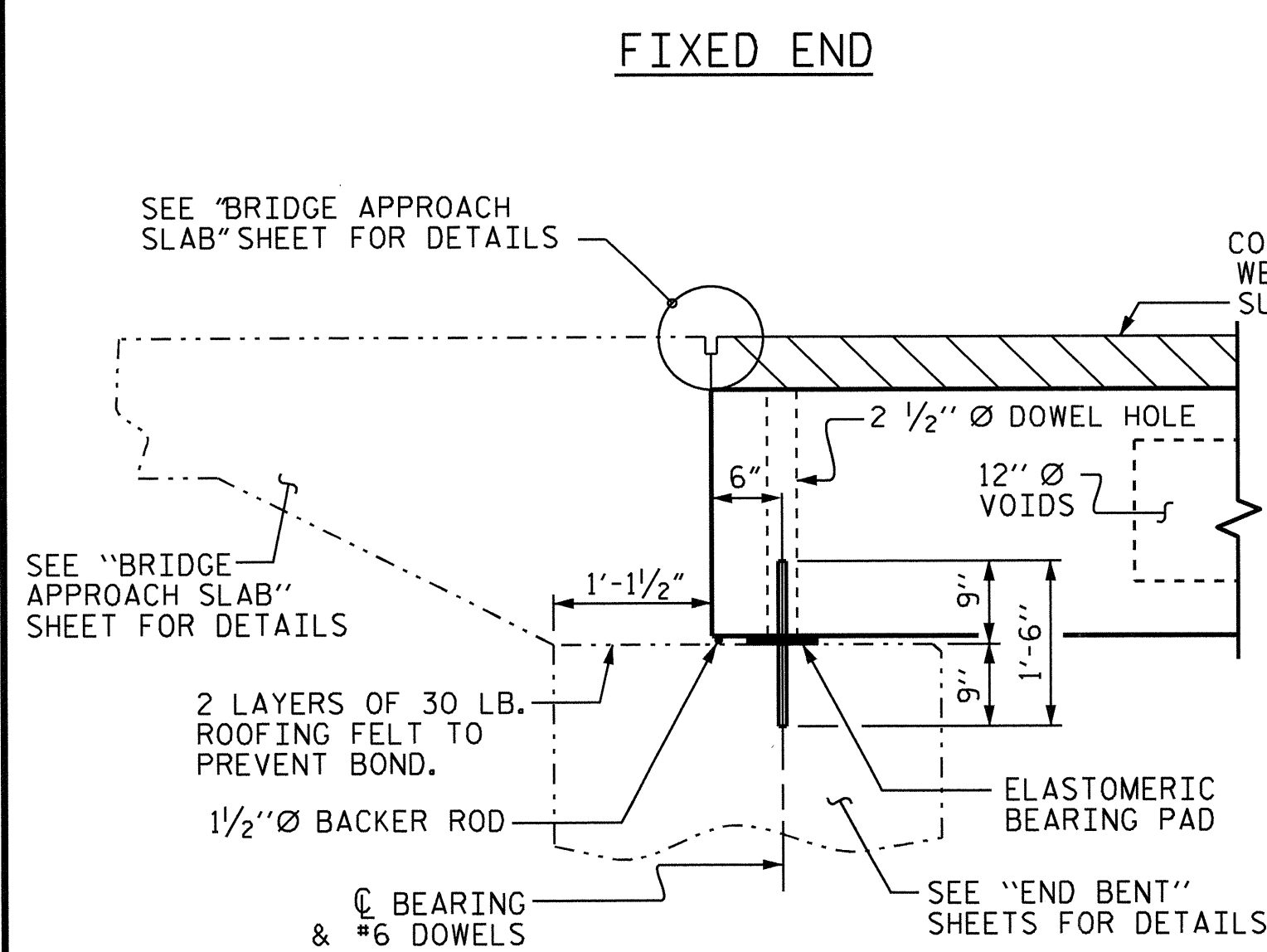
TYPE I
EXTERIOR SLAB SECTION
SIDEWALK SECTION

(FOR PRESTRESSED STRAND LAYOUT, SEE TYPE III INTERIOR SLAB SECTION.)

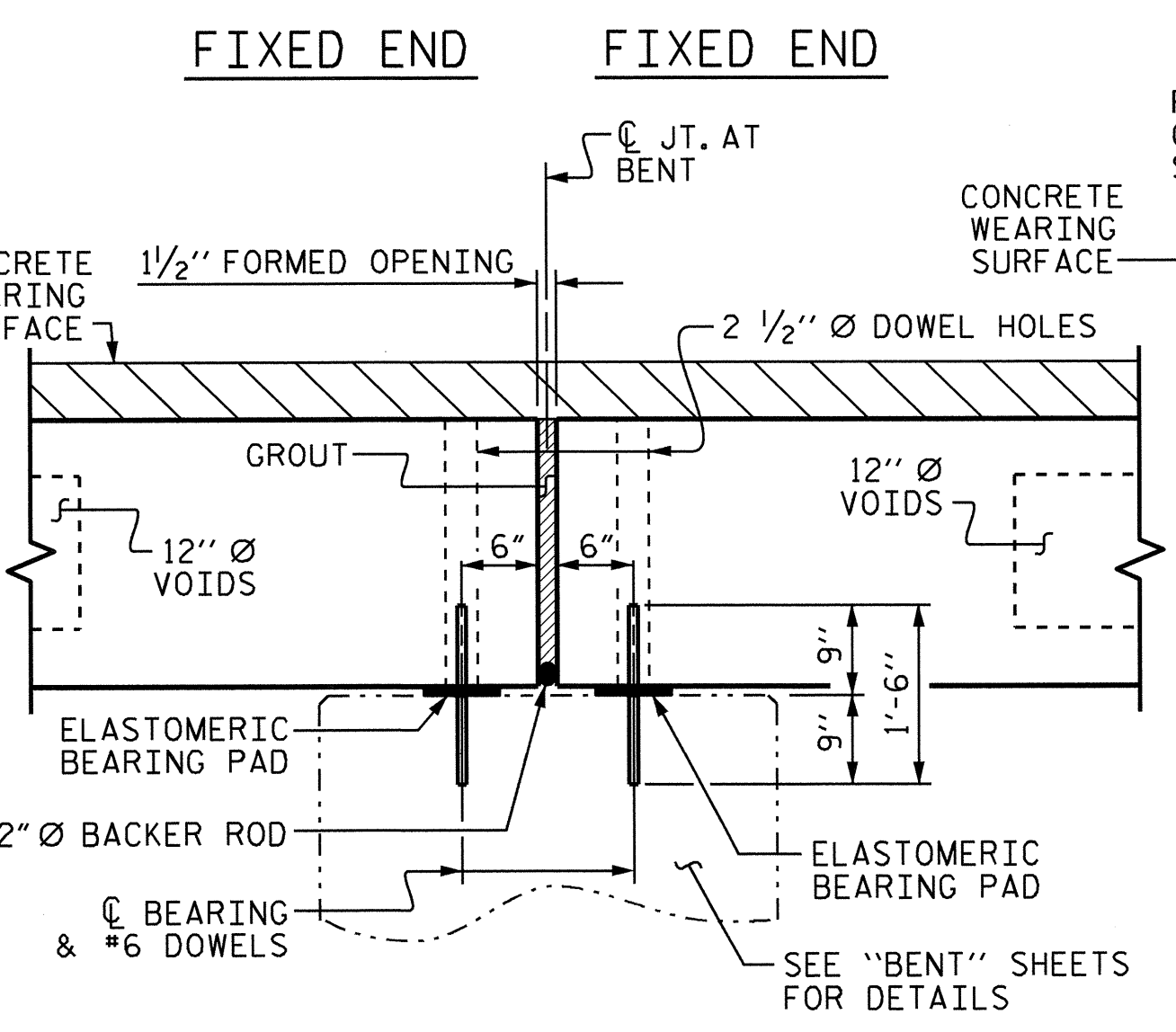


TYPE II
INTERIOR SLAB SECTION
SIDEWALK SECTION

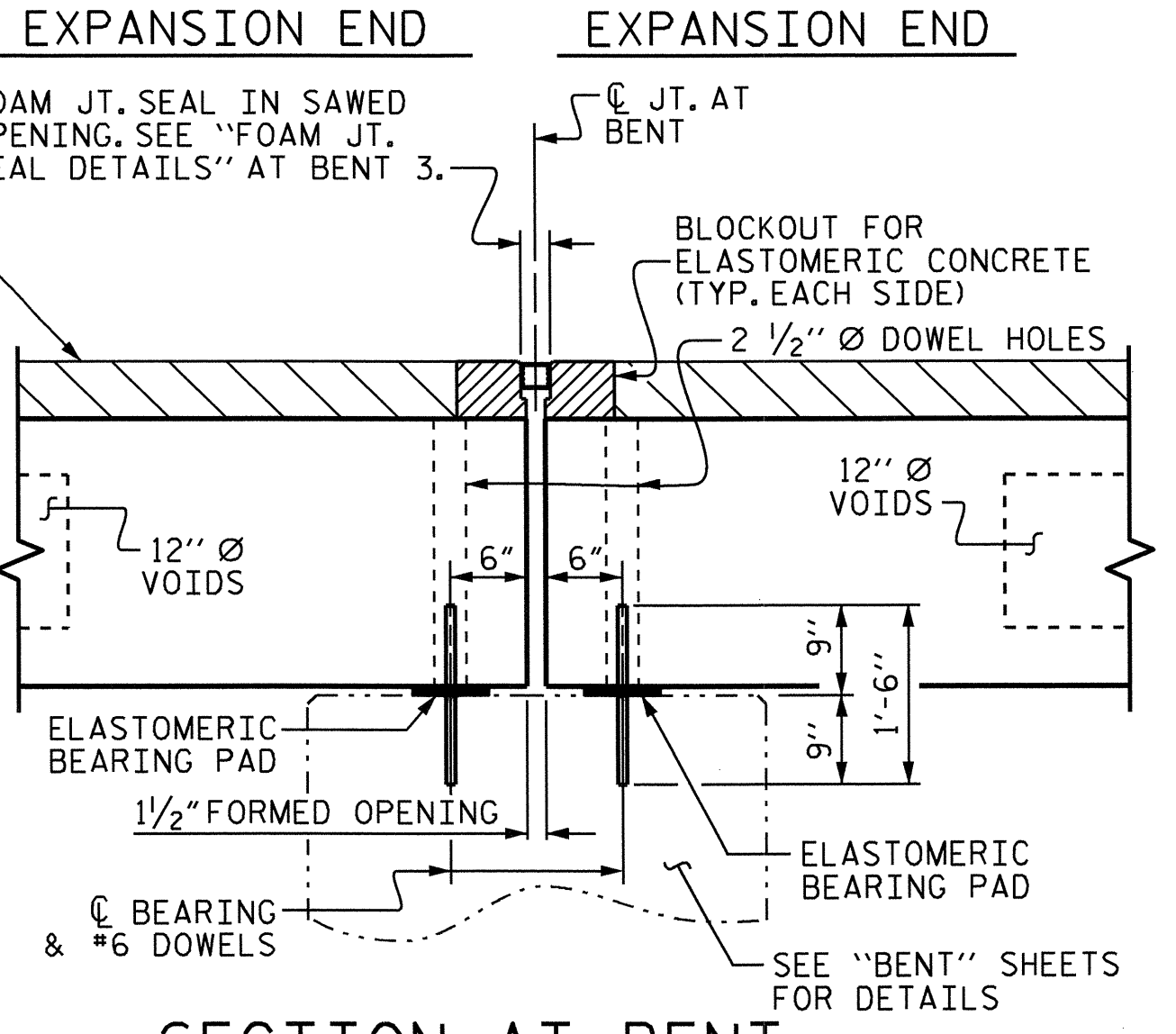
(FOR PRESTRESSED STRAND LAYOUT, SEE TYPE III INTERIOR SLAB SECTION.)



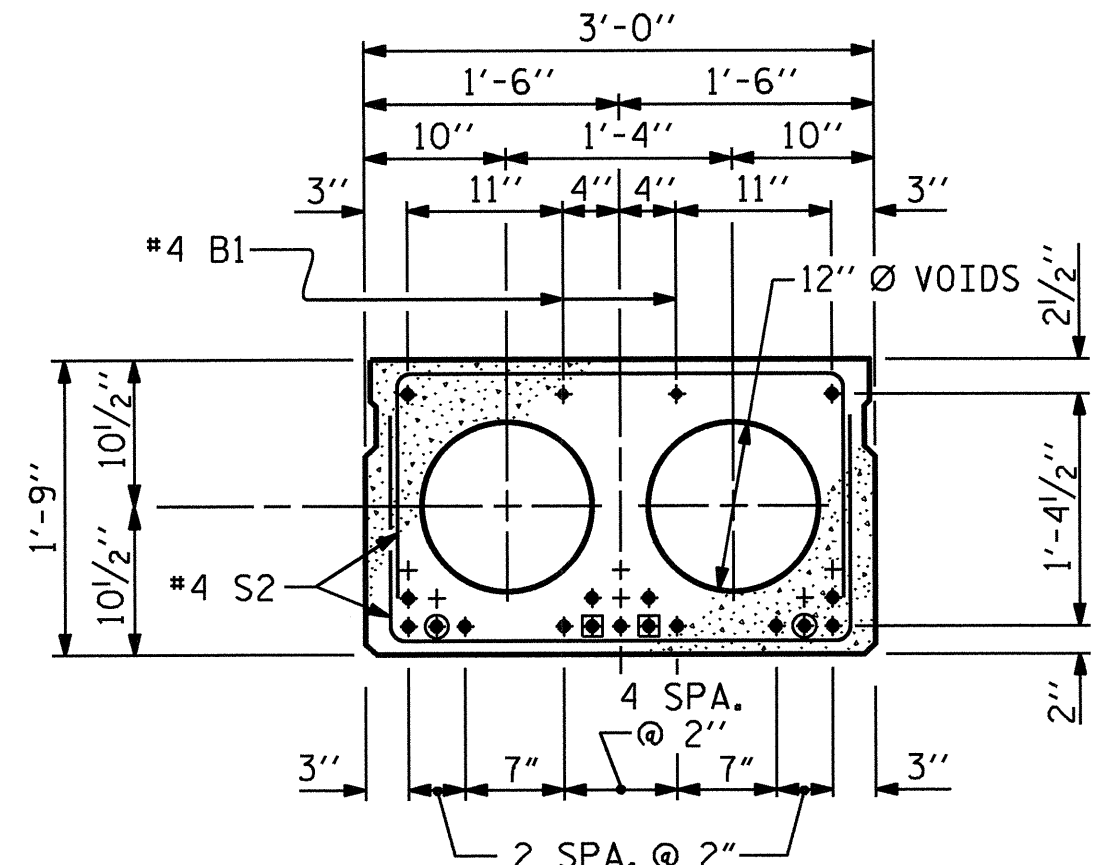
SECTION AT END BENT



SECTION AT BENT
(BENTS 1, 2 AND 4)



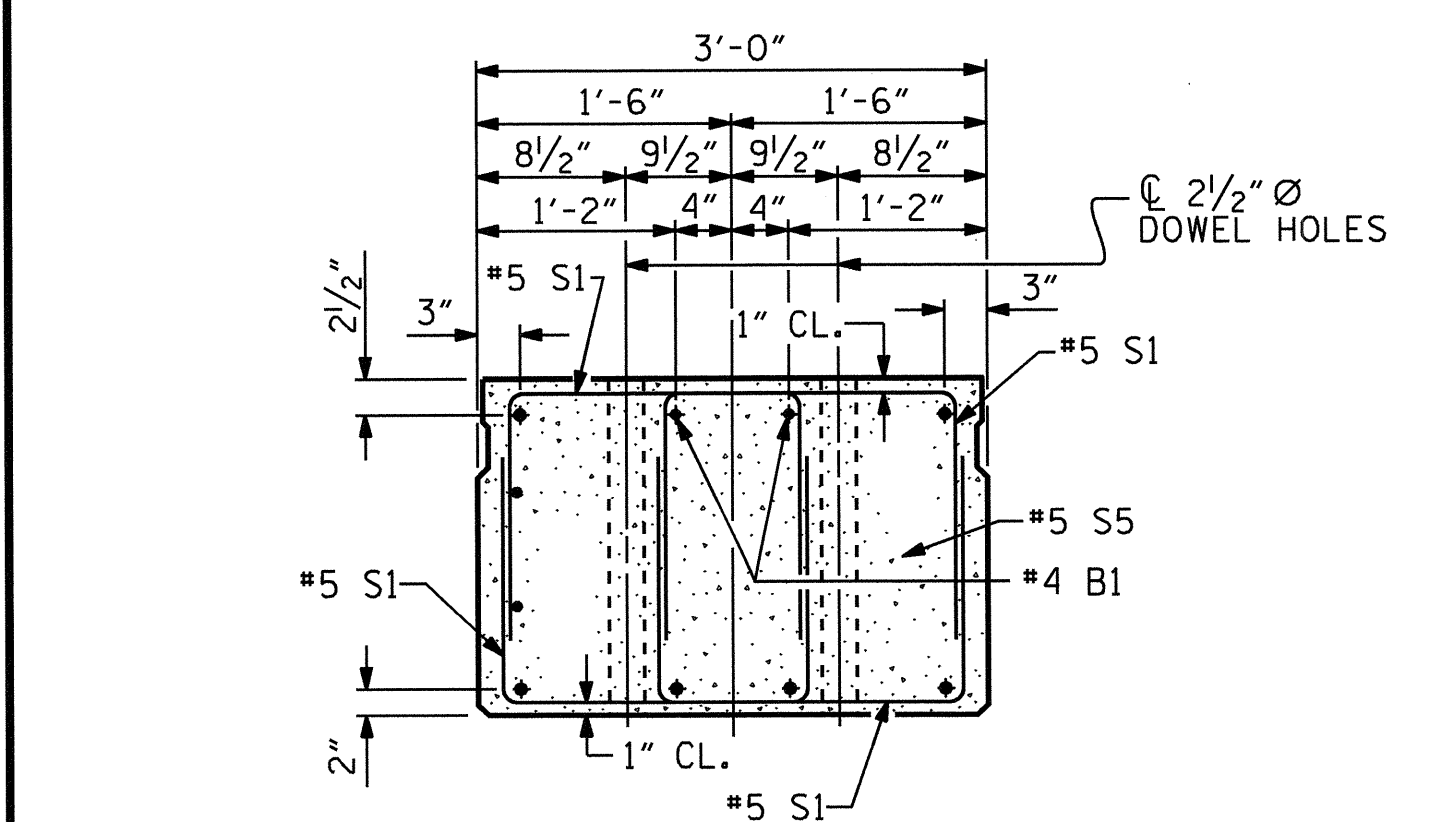
SECTION AT BENT
(BENT 3)



TYPE III
INTERIOR SLAB SECTION
0.6" Ø LOW RELAXATION STRAND LAYOUT
(17 STRANDS, 4 SHEATHED)

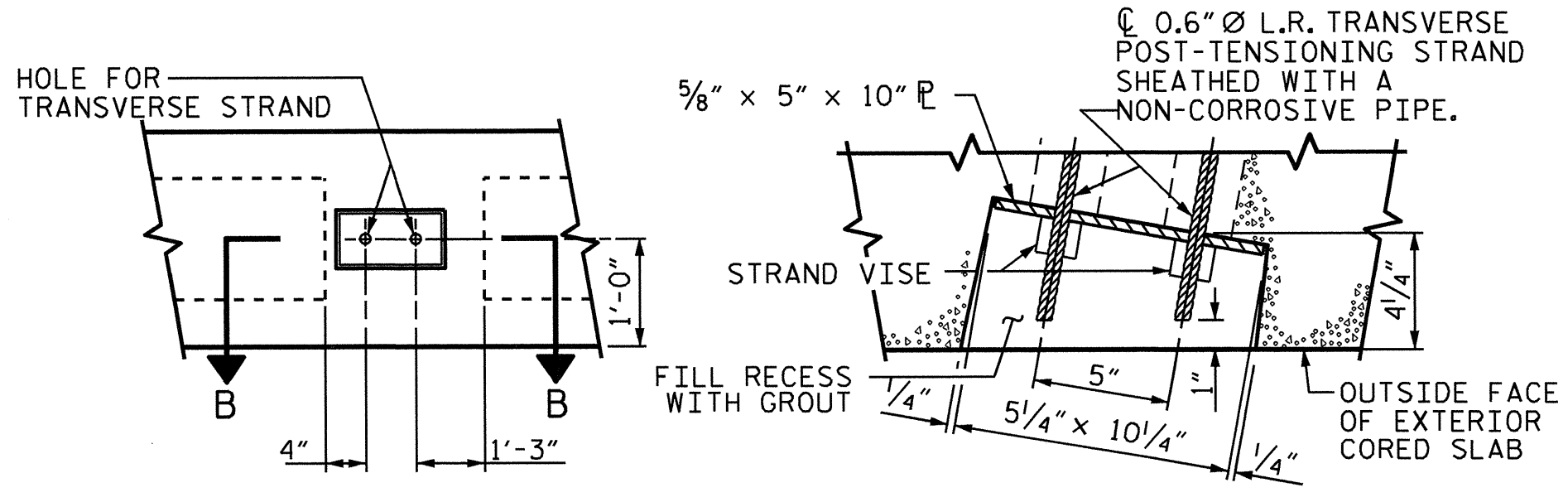
(SPAN A THRU E)

- ☐ THE BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 6'-0" FROM END OF THE CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS ARTICLE 1078-7.
- THE BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 10'-0" FROM END OF THE CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS ARTICLE 1078-7.



END ELEVATION

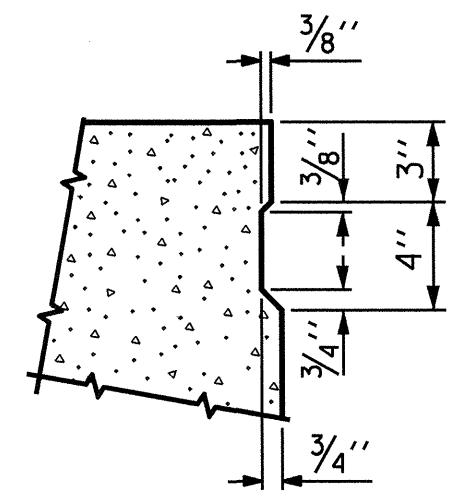
SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES. (STRAND LAYOUT NOT SHOWN.) INTERIOR SLAB SECTION SHOWN-EXTERIOR SLAB SECTION SIMILAR EXCEPT SHEAR KEY LOCATION.



ELEVATION VIEW

SECTION B-B

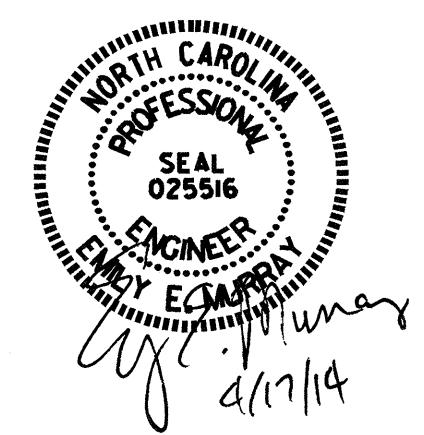
GRouted RECESS AT END OF POST-TENSIONED STRAND-CORED SLABS



SHEAR KEY DETAIL

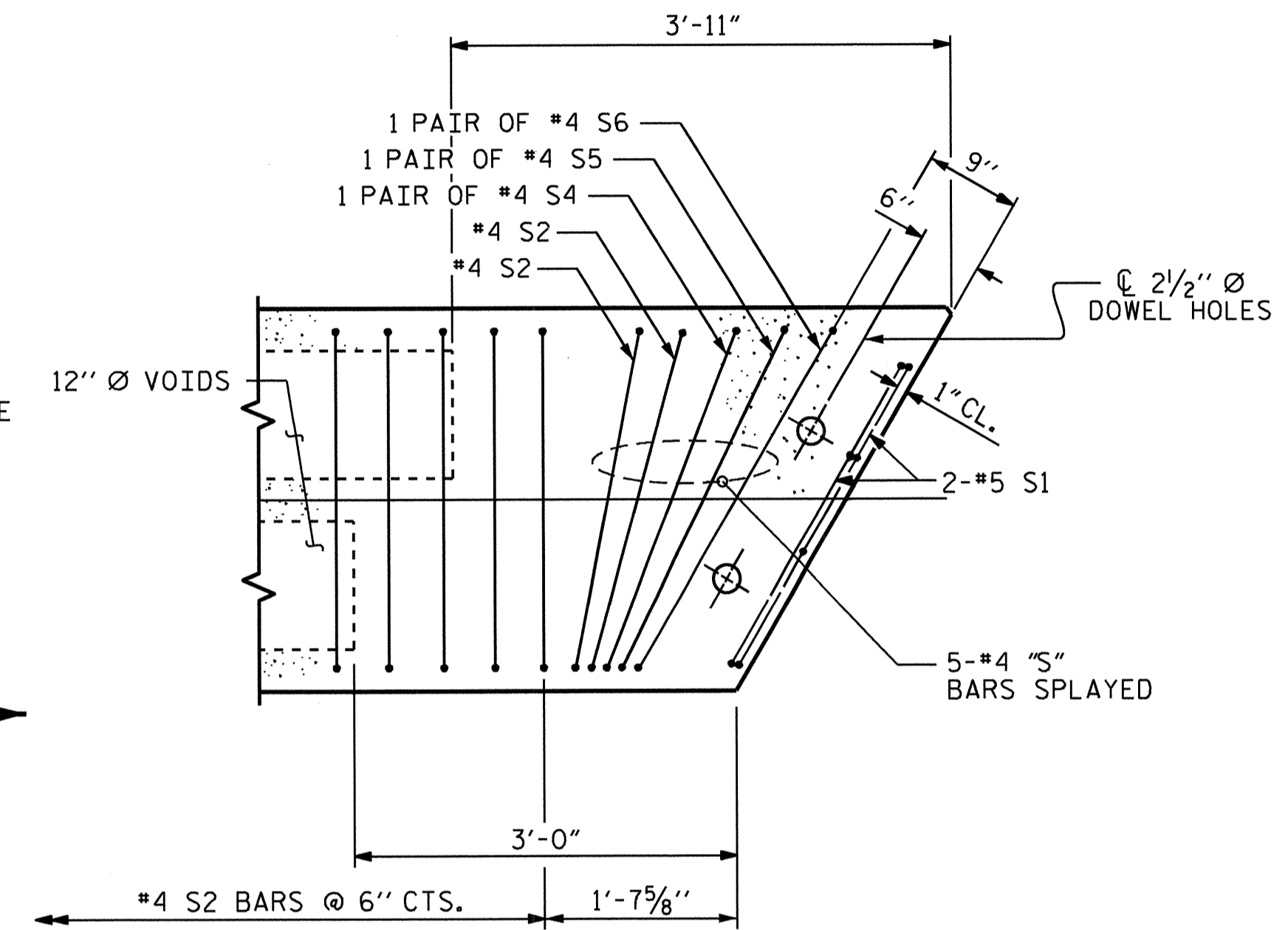
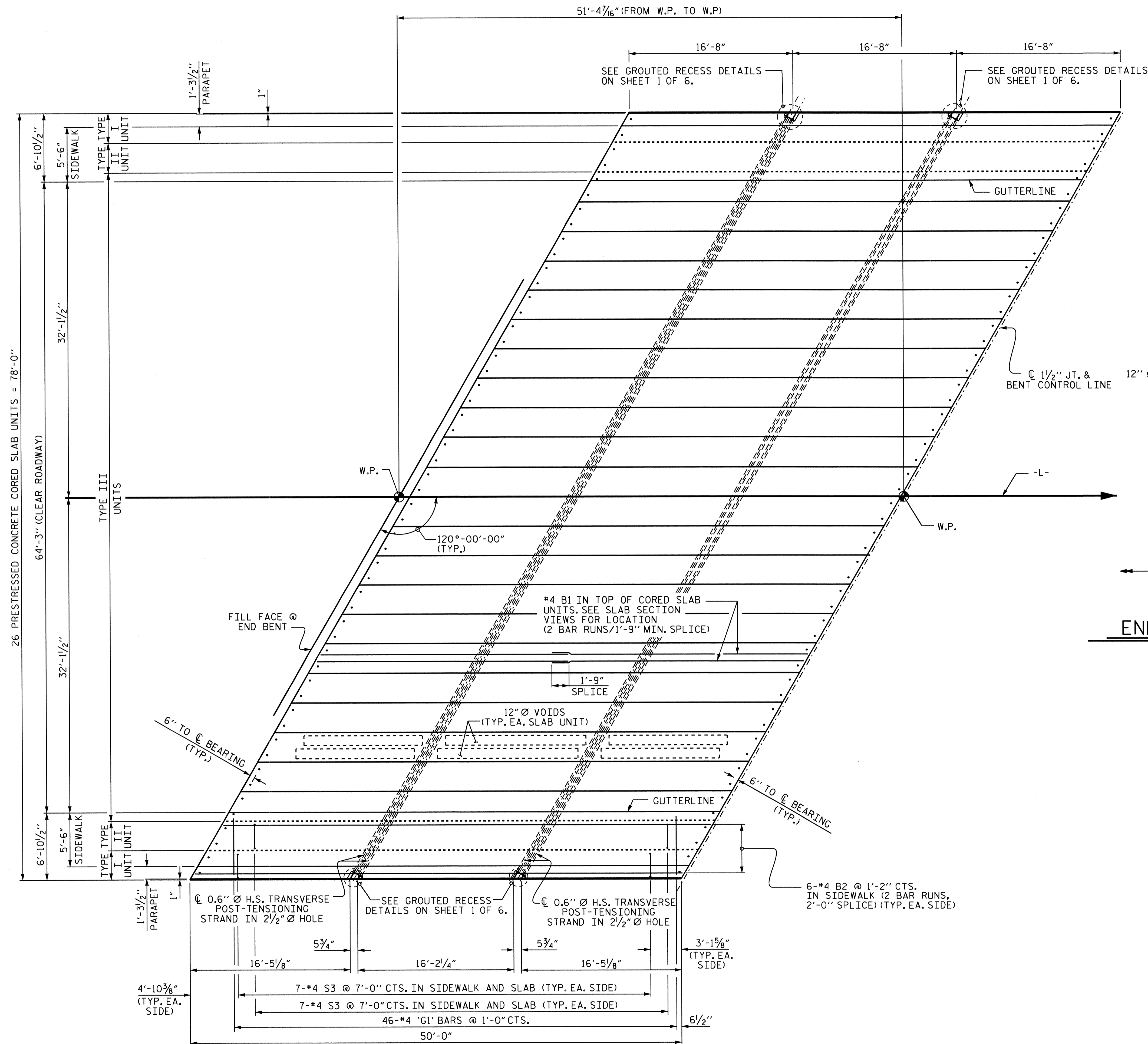
NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR CORED SLABS.

ASSEMBLED BY :	M.M. AHMED	DATE :	9/30/13
CHECKED BY :	M.L. RORIE, P.E.	DATE :	12/9/13
DESIGN ENGINEER OF RECORD :	M.M. AHMED	DATE :	3/7/14
DRAWN BY :	WJH 4/89	REV. 10/17/00	RWW/LES
CHECKED BY :	FCJ 5/89	REV. 7/10/01RR	RWW/LES
		REV. 5/1/06R	TLA/GM



PROJECT NO. U-3331
NASH COUNTY
STATION: 32+18.50 -L-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD					
3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLAB UNIT					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS
					34



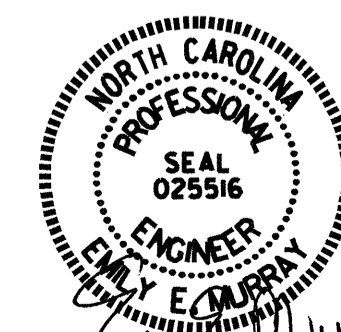
END OF CORED SLAB UNIT DETAIL
(SHOWING SPLAYED STIRRUPS)
(TYPICAL ALL SPANS)

PLAN OF SPAN A OR E
(SPAN E SIMILAR BY ROTATION)

PROJECT NO. U-3331
NASH COUNTY
STATION: 32+18.50 -L-

SHEET 2 OF 6

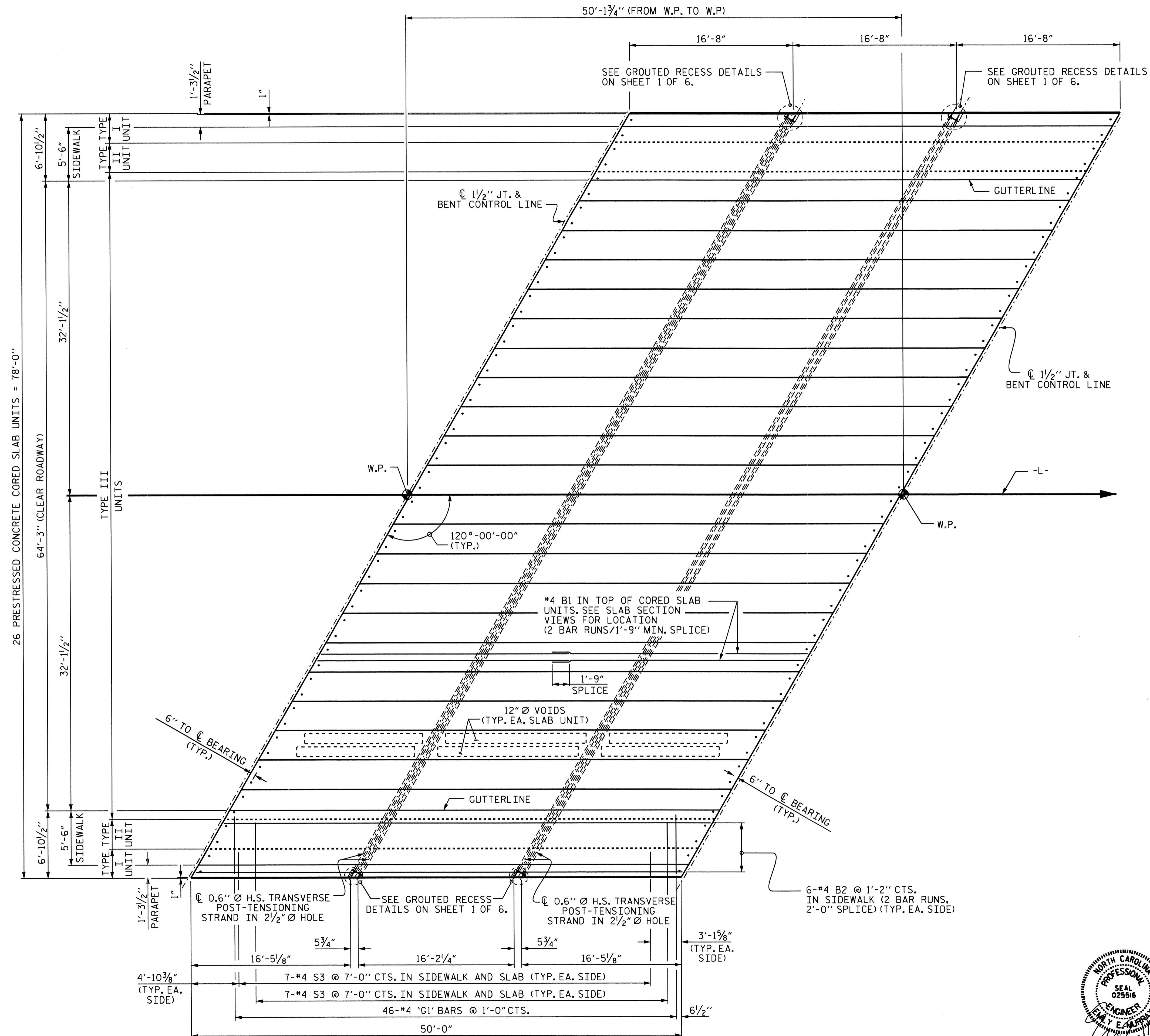
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
PLAN OF SPAN A AND E
120° SKEW



Emily E. Murray
4/17/14

DRAWN BY : M.M. AHMED DATE : 10/1/13
CHECKED BY : M.L. RORIE, P.E. DATE : 12/9/13
DESIGN ENGINEER OF RECORD : M.M. AHMED DATE : 3/7/14

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6	
1			3			TOTAL SHEETS	34
2			4				



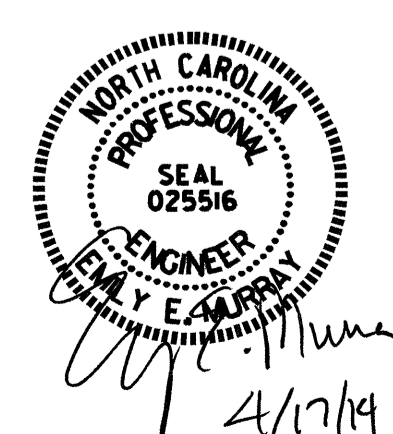
PLAN OF SPAN B, C OR D

PROJECT NO. U-3331
 NASH COUNTY
 STATION: 32+18.50 -L-
 SHEET 3 OF 6

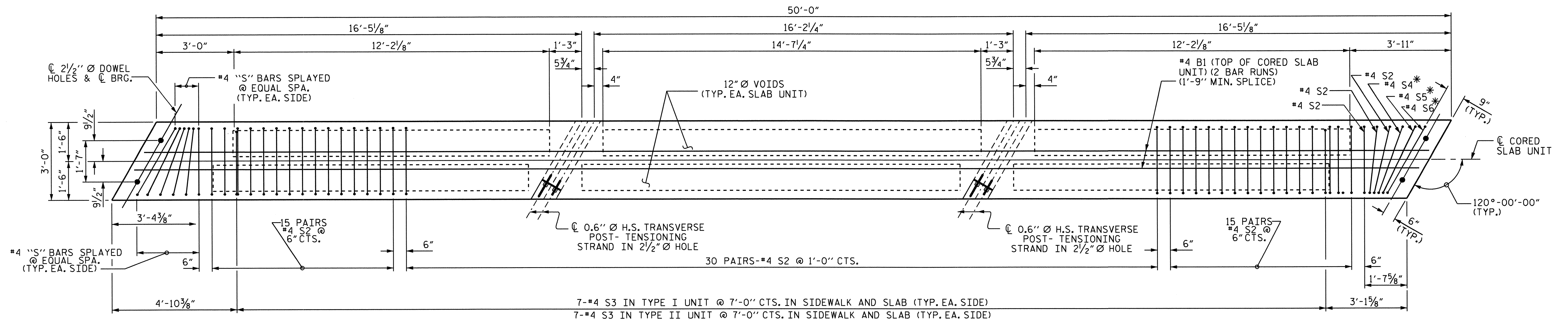
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 PLAN OF SPAN B, C
 AND D
 120° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			34



DRAWN BY : M.M. AHMED DATE : 10/1/13
 CHECKED BY : M.L. RORIE, P.E. DATE : 1/13/14
 DESIGN ENGINEER OF RECORD : M.M. AHMED DATE : 3/7/14



PLAN OF CORED SLAB UNIT

(TYPE I & TYPE II UNIT SHOWN, TYPE III UNIT SIMILAR EXCEPT OMIT S3 & S7 BARS.)
 FOR REINFORCING STEEL AT END OF CORED SLABS, SEE "END OF CORED SLAB UNIT DETAIL"
 (SHEET 2 OF 6).

#4 S2 BARS MAY BE SHIFTED AS NECESSARY
 TO MAINTAIN 1" CLEAR TO GROUDED RECESS AND
 2 1/2" Ø TRANSVERSE POST-TENSIONING STRAND HOLES

* - S4, S5, & S6 BARS IN PAIRS

PROJECT NO. U-3331
NASH COUNTY
 STATION: 32+18.50 -L-

SHEET 4 OF 6

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 CORED SLAB DETAILS

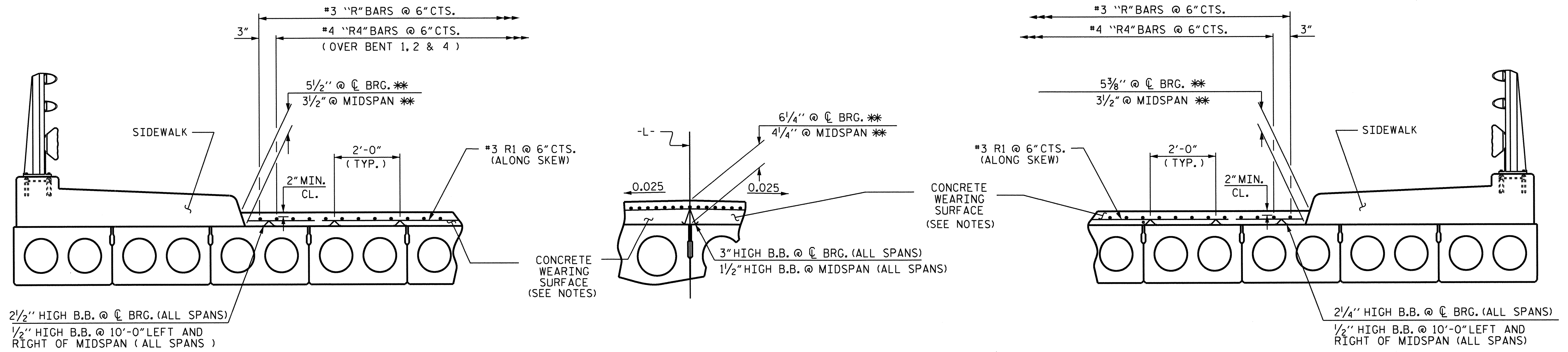


M. M. Ahmed
 4/17/14

DRAWN BY : M.M. AHMED DATE : 10/1/13
 CHECKED BY : M.L. RORIE, P.E. DATE : 1/13/14
 DESIGN ENGINEER OF RECORD : M.M. AHMED DATE : 3/7/14

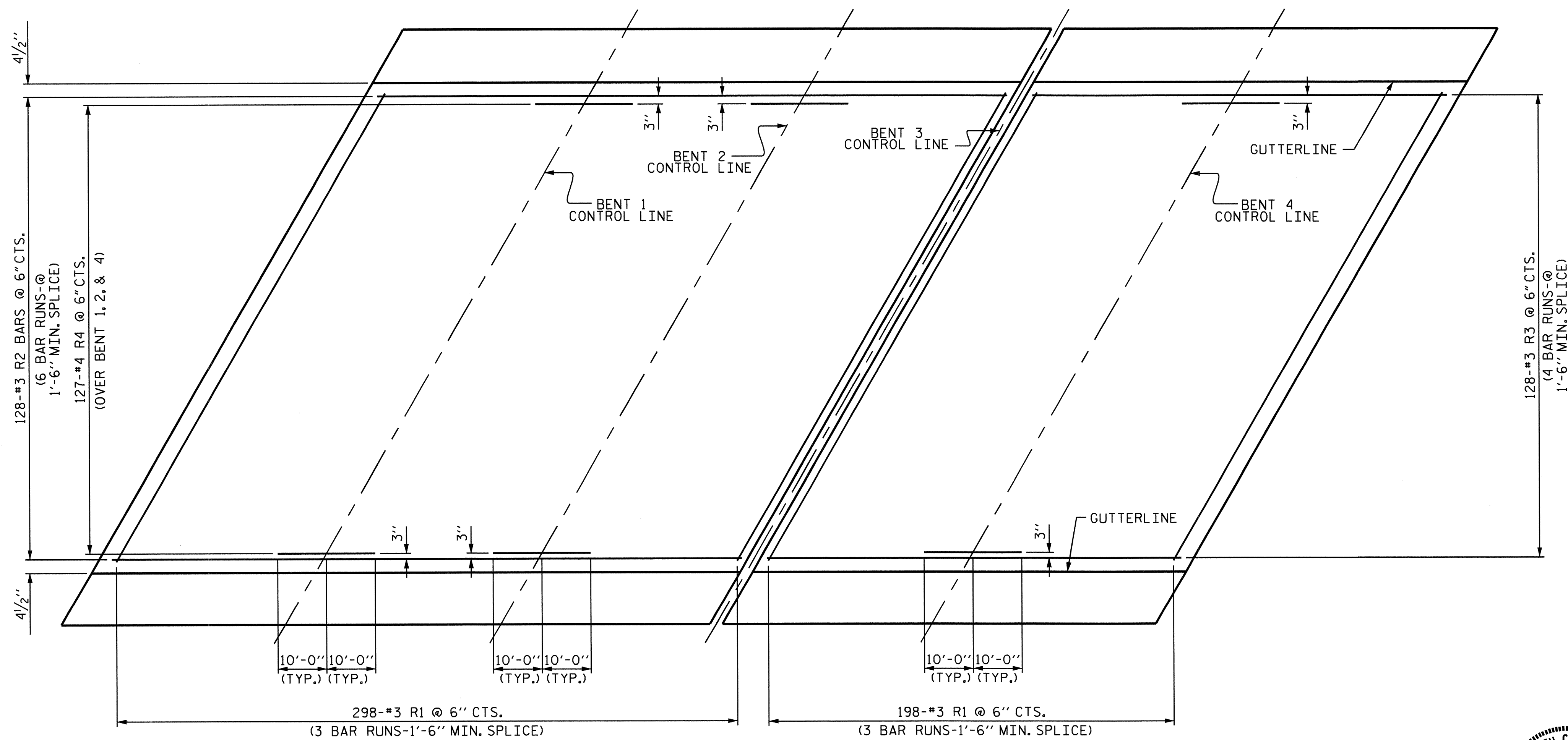
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			34



REINFORCING FOR CONCRETE WEARING SURFACE

** BASED ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATIONS

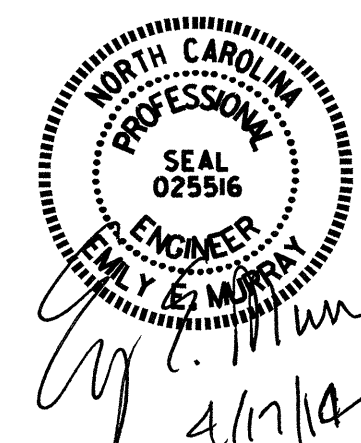


PLAN SHOWING CONCRETE WEARING SURFACE REINFORCING STEEL

BILL OF MATERIAL FOR CONCRETE WEARING SURFACE						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*R1	1488	#3	STR	25'-8"	14360	
*R2	768	#3	STR	26'-3"	7580	
*R3	512	#3	STR	26'-1"	5021	
*R4	381	#4	STR	20'-0"	5090	
* EPOXY COATED REINFORCING STEEL					LB.	32051
CONCRETE WEARING SURFACE					SQ. FT.	16,094

PROJECT NO. U-3331
NASH COUNTY
 STATION: 32+18.50 -L-

SHEET 5 OF 6



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD CONCRETE WEARING SURFACE					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS
					34

ASSEMBLED BY : M.M. AHMED	DATE : 10/2/13
CHECKED BY : M.L. RORIE, P.E.	DATE : 1/14/14
DESIGN ENGINEER OF RECORD : M.M. AHMED	DATE : 3/7/14
DRAWN BY : WJH 4/89	REV. 7/10/01 RWW/LES
CHECKED BY : FCJ 5/89	REV. 5/7/03RRR RWW/JTE
	REV. 5/1/06 TLA/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 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 1/2" Ø DOWEL HOLES AT EXPANSION ENDS OF THE SLAB SECTIONS SHALL BE FILLED WITH JOINT SEALER MATERIAL TO 1/2" ABOVE THE TOP OF DOWELS AND THEN FILLED WITH NON-SHRINK GROUT.

THE BACKER RODS 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.

WHEN A CONCRETE WEARING SURFACE IS DETAILED ON THE CORED SLAB BRIDGE TYPICAL SECTIONS, THE TOP SURFACE OF THE CORED SLAB UNITS SHALL HAVE A 3/8" RAKED FINISH.

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 SIDEWALK AND PARAPET SHALL BE EPOXY COATED.

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

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

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

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

THE #4 S2 STIRRUPS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO THE GROUTED RECESS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

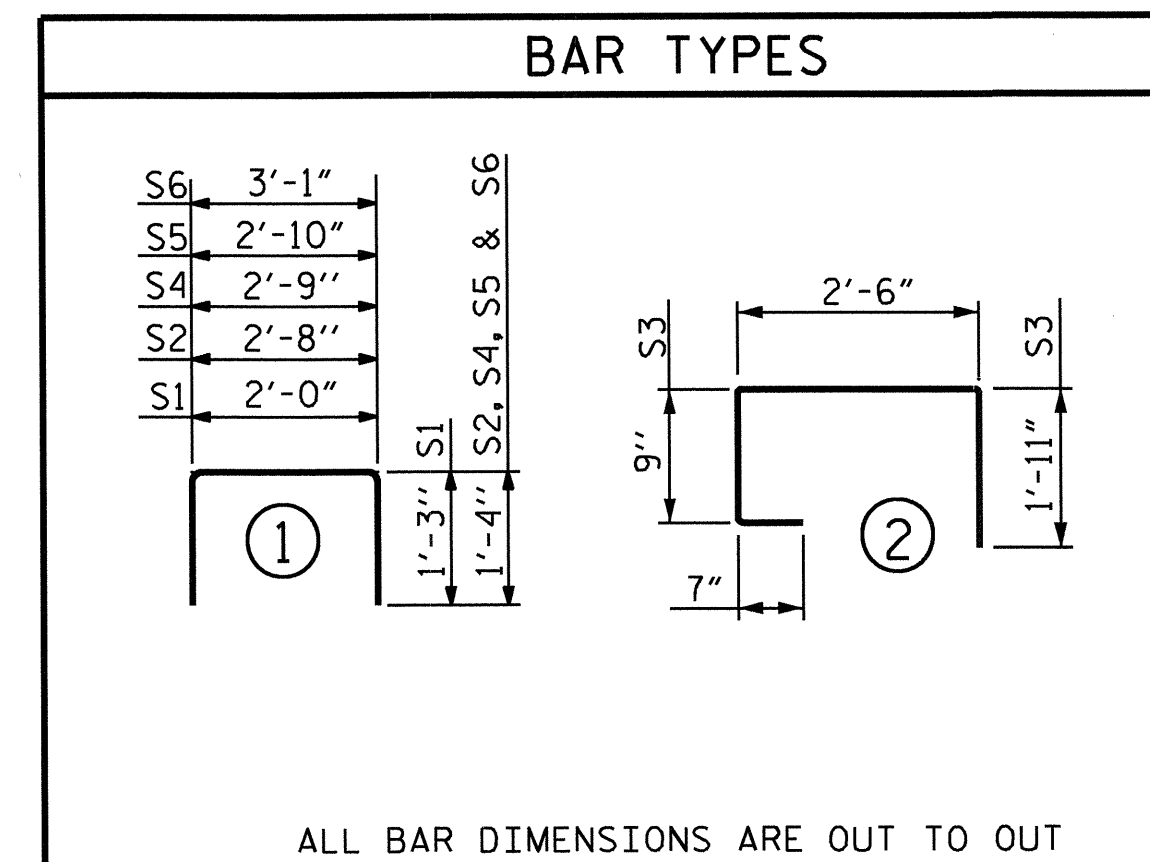
PLACEMENT OF THE CONCRETE WEARING SURFACE SHALL OCCUR AFTER CASTING THE SIDEWALK. THE COST OF THE #3 BARS CAST WITH THE CONCRETE WEARING SURFACE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONCRETE WEARING SURFACE. FOR CONCRETE WEARING SURFACE, SEE SPECIAL PROVISIONS.

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

GROUT THE SHEAR KEYS BETWEEN THE LEVEL AND SLOPED CORED SLAB UNITS PRIOR TO TENSIONING THE TRANSVERSE STRANDS.

DEAD LOAD DEFLECTION AND CAMBER	
3'-0" X 1'-9" (0.6" Ø L.R. STRAND)	
50' CORED SLAB UNIT	SPAN A THRU E
CAMBER (SLAB ALONE IN PLACE) ↑	2 1/8"
DEFLECTION DUE TO CONCRETE WEARING SURFACE ↓	1/8"
FINAL CAMBER ↑	2"

CORED SLAB UNITS REQUIRED				
	TYPE	NUMBER PER SPAN	LENGTH	TOTAL LENGTH
EXTERIOR C.S.-SPAN A	I	2	50'-0"	100'-0"
INTERIOR C.S.-SPAN A	II	2	50'-0"	100'-0"
INTERIOR C.S.-SPAN A	III	22	50'-0"	1100'-0"
EXTERIOR C.S.-SPAN B	I	2	50'-0"	100'-0"
INTERIOR C.S.-SPAN B	II	2	50'-0"	100'-0"
INTERIOR C.S.-SPAN B	III	22	50'-0"	1100'-0"
EXTERIOR C.S.-SPAN C	I	2	50'-0"	100'-0"
INTERIOR C.S.-SPAN C	II	2	50'-0"	100'-0"
INTERIOR C.S.-SPAN C	III	22	50'-0"	1100'-0"
EXTERIOR C.S.-SPAN D	I	2	50'-0"	100'-0"
INTERIOR C.S.-SPAN D	II	2	50'-0"	100'-0"
INTERIOR C.S.-SPAN D	III	22	50'-0"	1100'-0"
EXTERIOR C.S.-SPAN E	I	2	50'-0"	100'-0"
INTERIOR C.S.-SPAN E	II	2	50'-0"	100'-0"
INTERIOR C.S.-SPAN E	III	22	50'-0"	1100'-0"
TOTAL		130		6500'-0"



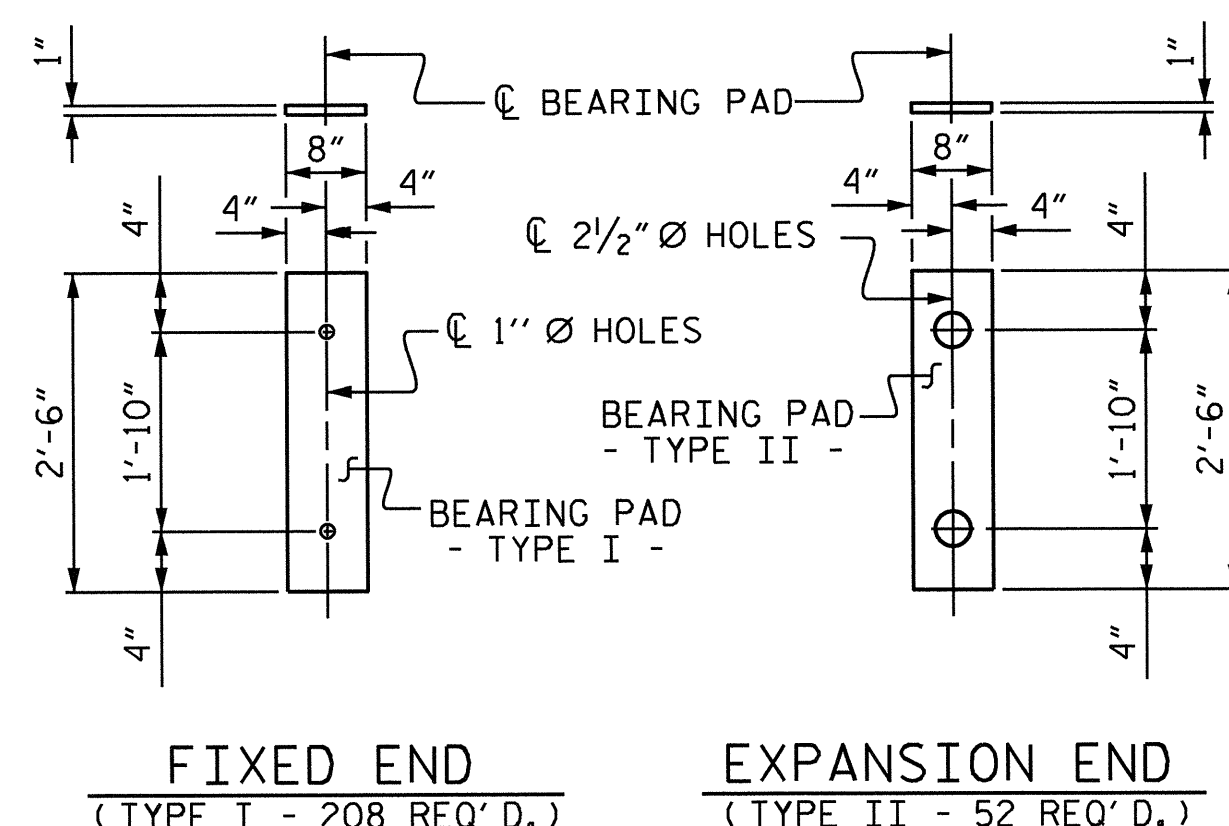
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR ONE CORED SLAB SECTION											
BAR	SIZE	TYPE	TYPE III UNIT			TYPE II UNIT			TYPE I UNIT		
			NUMBER	LENGTH	WEIGHT	NUMBER	LENGTH	WEIGHT	NUMBER	LENGTH	WEIGHT
B1	# 4	STR	4	25'-9"	69	4	25'-9"	69	4	25'-9"	69
S1	# 5	1	8	4'-6"	38	8	4'-6"	38	8	4'-6"	38
S2	# 4	1	132	5'-4"	470	132	5'-4"	470	132	5'-4"	470
*S3	# 4	2				7	5'-9"	27	7	5'-9"	27
S4	# 4	1	4	5'-5"	14	4	5'-5"	14	4	5'-5"	14
S5	# 4	1	4	5'-6"	15	4	5'-6"	15	4	5'-6"	15
S6	# 4	1	4	5'-9"	15	4	5'-9"	15	4	5'-9"	15
REINFORCING STEEL			621 LBS.			621 LBS.			621 LBS.		
* EPOXY COATED REINFORCING STEEL			0			27 LBS.			27 LBS.		
5,500 P.S.I. CONCRETE			7.5 C. Y.			7.3 C. Y.			7.5 C. Y.		
0.6" Ø L.R. STRANDS			17			17			17		

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

CONCRETE RELEASE STRENGTH	
UNIT	PSI
50' UNITS (SPANS A - E)	4000

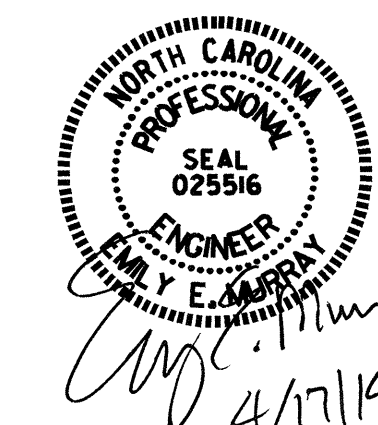
GROOVING BRIDGE FLOORS		
APPROACH SLABS	=	2953 SQ.FT.
BRIDGE DECK	=	15,310 SQ.FT.
TOTAL	=	18,263 SQ.FT.



ELASTOMERIC BEARING DETAILS
(50 DUROMETER HARDNESS)

ASSEMBLED BY : M.M. AHMED	DATE : 1/14/14
CHECKED BY : M.L. RORIE, P.E.	DATE : 1/14/14
DESIGN ENGINEER OF RECORD : M.M. AHMED	DATE : 3/7/14
DRAWN BY : WJH 4/89	REV. 7/10/01 RWW/LES
CHECKED BY : FCJ 5/89	REV. 5/7/03RRR RWW/JTE
	REV. 5/1/06 TLA/CM

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PROJECT NO. U-3331
NASH COUNTY
STATION: 32+18.50 -L-

SHEET 6 OF 6

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			34

STD. NO. PCS3

NOTES :

FOR GUARDRAIL ANCHOR ASSEMBLIES, SEE "GUARDRAIL ANCHORAGE DETAILS" SHEET.

FOR DETAILS OF CONCRETE INSERTS, SEE "3 BAR METAL RAIL" SHEET 3 OF 3.

ALL REINFORCING STEEL IN SIDEWALK AND END POST SHALL BE EPOXY COATED.

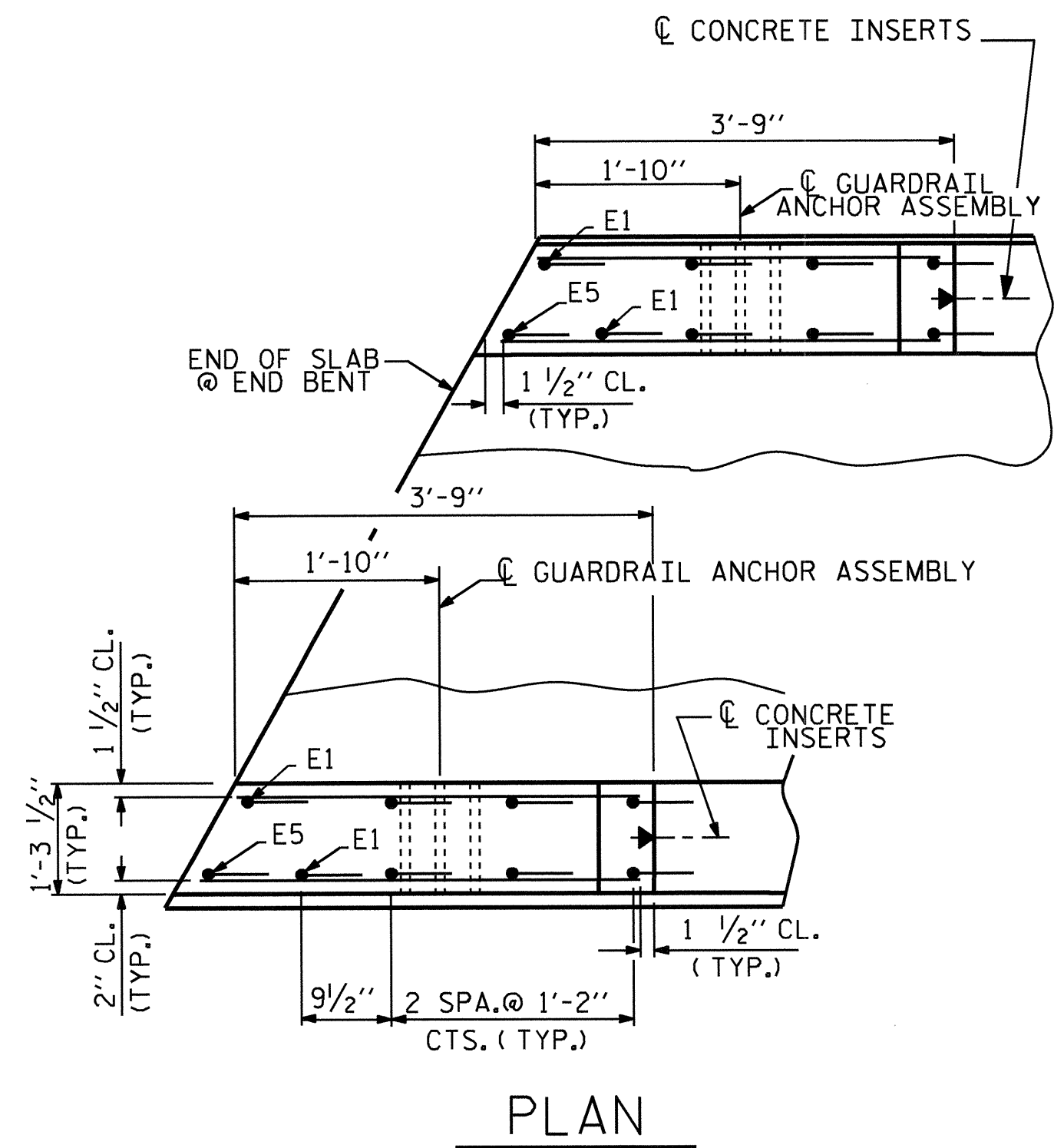
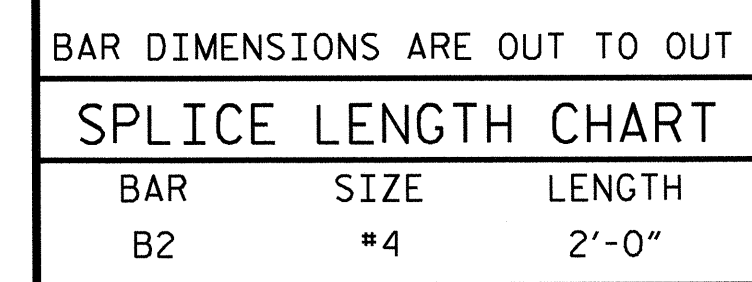
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK IN ACCORDANCE WITH ARTICLE 825-10 (B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FT. TO 10 FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED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

THE COST OF THE SIDEWALKS AND END POSTS ARE INCLUDED IN THE PAY ITEMS FOR CLASS AA CONCRETE AND EPOXY COATED REINFORCING STEEL.

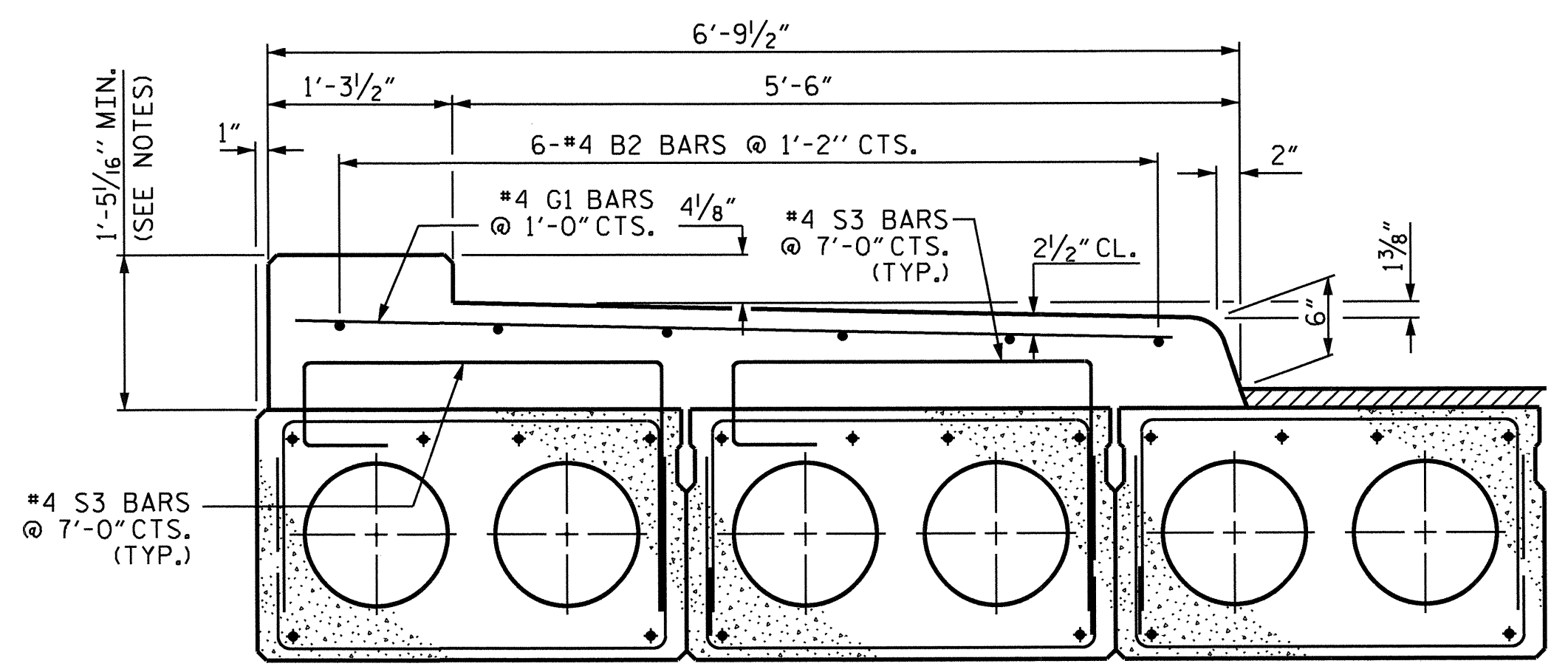
THE MINIMUM HEIGHT OF THE SIDEWALK IS SHOWN. THE HEIGHT OF THE SIDEWALK VARIES WHILE THE TOP OF THE SIDEWALK FOLLOWS THE PROFILE OF THE GUTTERLINE.

BAR TYPE		BILL OF MATERIAL FOR 4 END POSTS AND SIDEWALK				
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*B2	120	#4	STR	25'-10"	2071	
*E1	8	#7	1	3'-7"	59	
*E2	8	#7	1	4'-2"	68	
*E3	8	#7	1	4'-8"	76	
*E4	8	#7	1	5'-0"	82	
*E5	4	#7	1	3'-5"	28	
*F1	8	#6	STR	3'-2"	38	
*F2	8	#6	STR	3'-6"	42	
*F3	4	#6	STR	3'-5"	21	
*F4	8	#6	STR	4'-0"	48	
*F5	4	#6	STR	3'-11"	24	
*G1	460	#4	STR	6'-3"	1921	

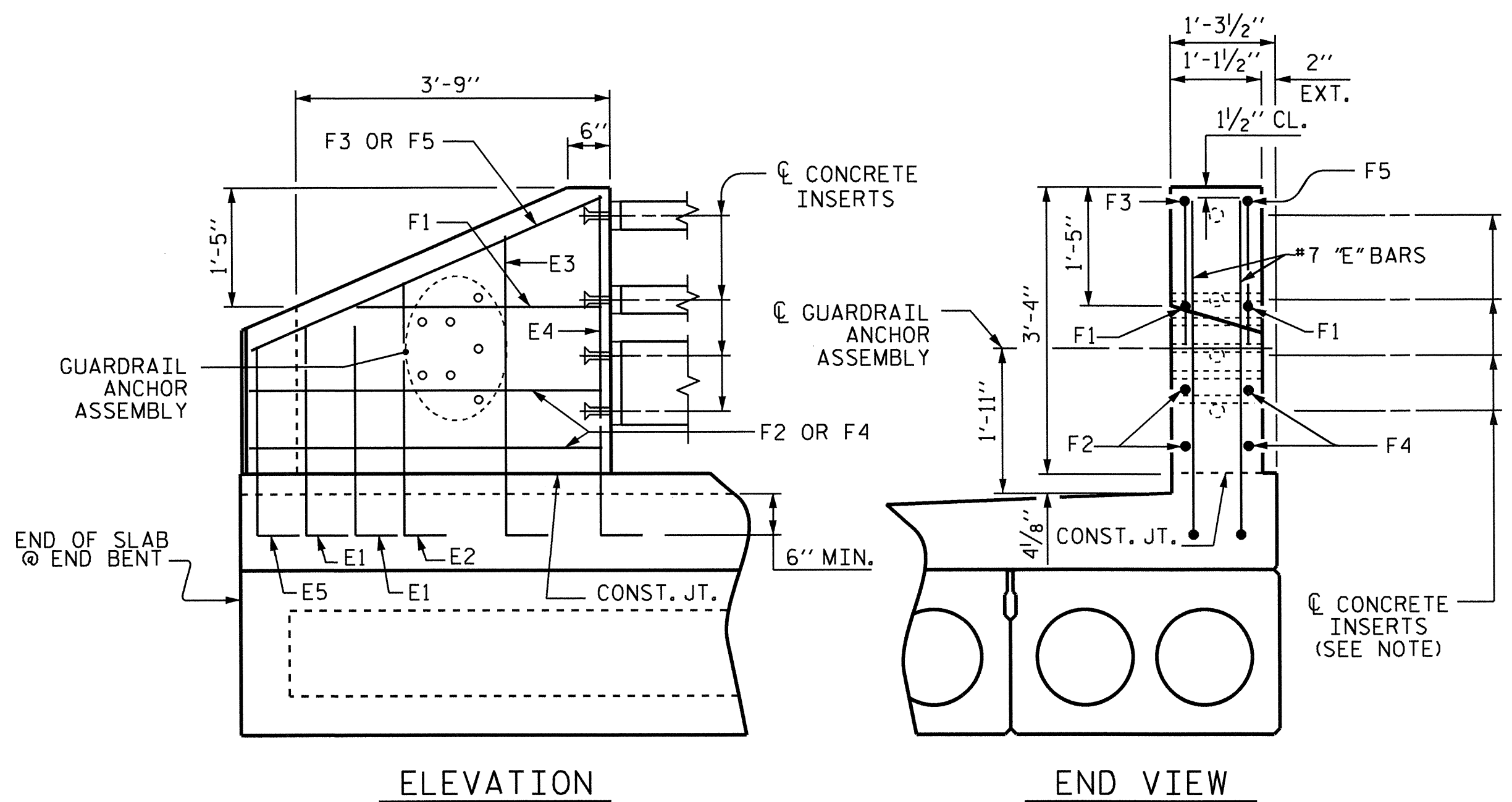
* EPOXY COATED REINFORCING STEEL 4478 LBS.
CLASS AA CONCRETE 134.7 CU.YDS.



PLAN



SECTION THROUGH SIDEWALK



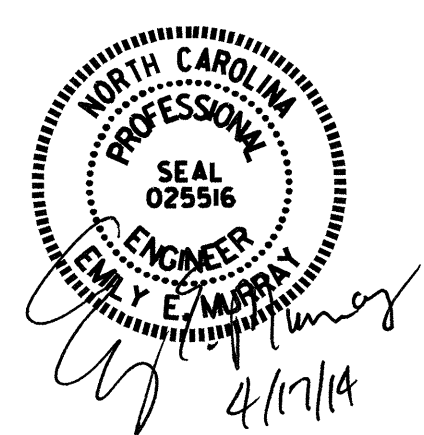
ELEVATION

END VIEW

END POST DETAILS

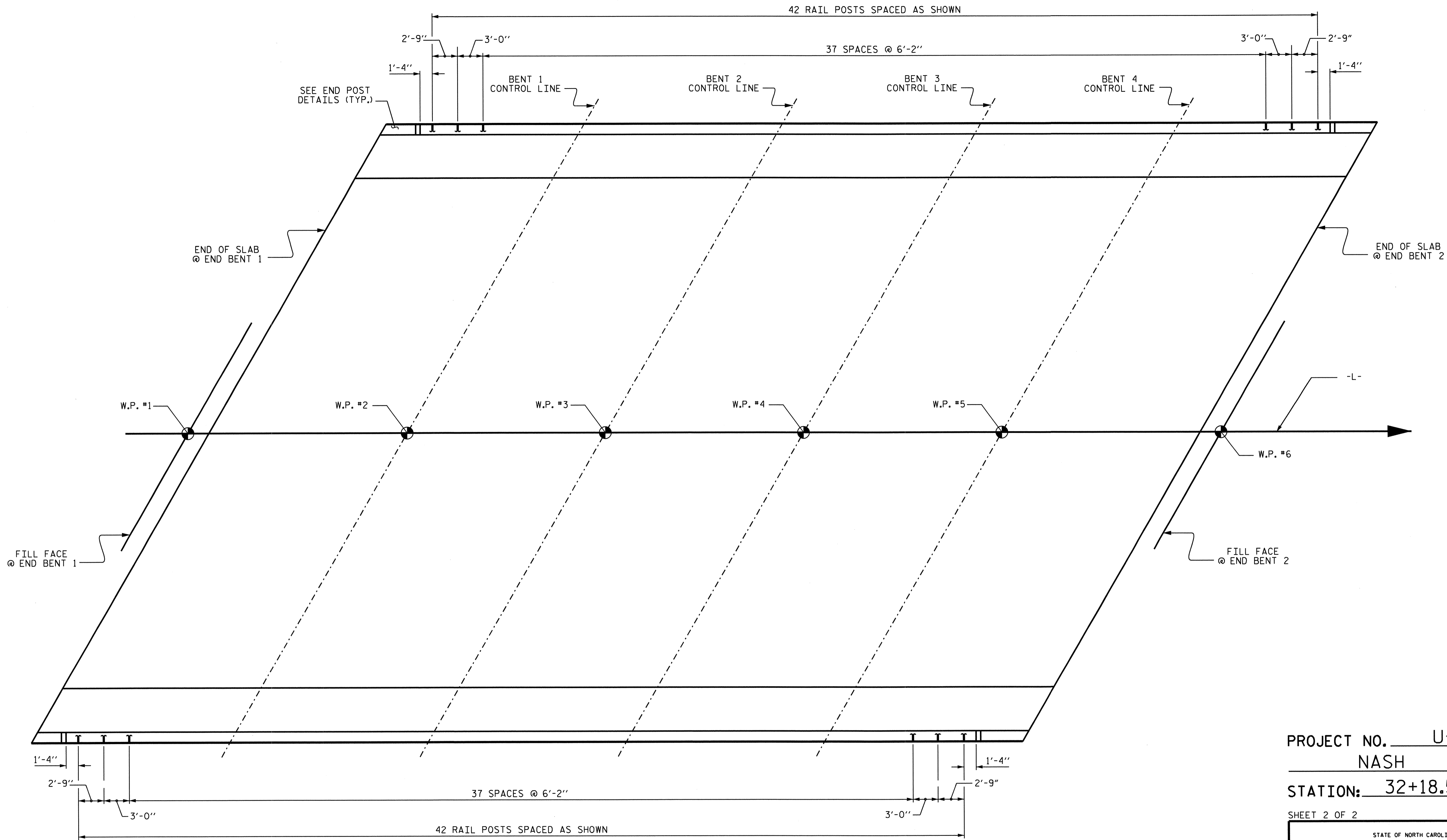
PROJECT NO. U-3331
NASH COUNTY
 STATION: 32+18.50 -L-
 SHEET 1 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
3 BAR METAL RAIL END POST & SIDEWALK DETAILS					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-11
					TOTAL SHEETS 34



DRAWN BY : M.M. AHMED DATE : 1/8/14
 CHECKED BY : M.L. RORIE, P.E. DATE : 1/13/14
 DESIGN ENGINEER OF RECORD : M.M. AHMED DATE : 3/7/14

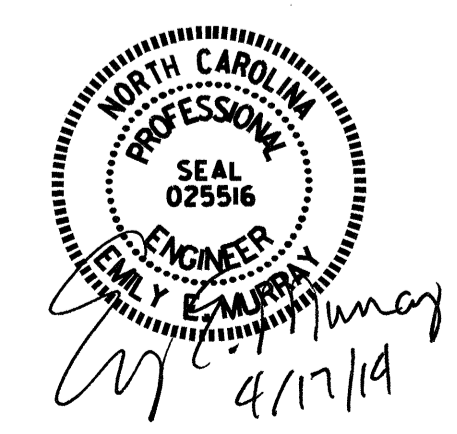
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PLAN OF RAIL POST SPACINGS

PROJECT NO. U-3331
NASH COUNTY
 STATION: 32+18.50 -L-
 SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
RAIL POST SPACINGS FOR THREE BAR METAL RAIL					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-12
					TOTAL SHEETS 34



DRAWN BY : M.M. AHMED DATE : 1/14/14
 CHECKED BY : M.L. RORIE, P.E. DATE : 1/14/14
 DESIGN ENGINEER OF RECORD : M.M. AHMED DATE : 3/7/14

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NOTES

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B221 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. PLACE ONE JOINT SPLICE JUST BEYOND THE 3RD RAIL POST FROM EACH END, TYPICALLY 14' FROM THE END. PLACE OTHER JOINTS AS NEEDED.

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE STANDARD NO. BMR7.

CAP SCREWS SHALL BE ASTM F593 ALLOY 305 STAINLESS STEEL. WASHERS FOR RAIL ATTACHMENT 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 REMAIN VISIBLE AFTER RAIL PLACEMENT.

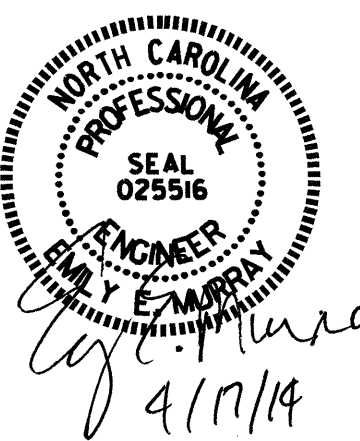
SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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.

PAY LENGTH = 484.67 LIN.FT.

3 BAR METAL RAIL SHALL BE ANODIZED BLACK, SEE NOTES.



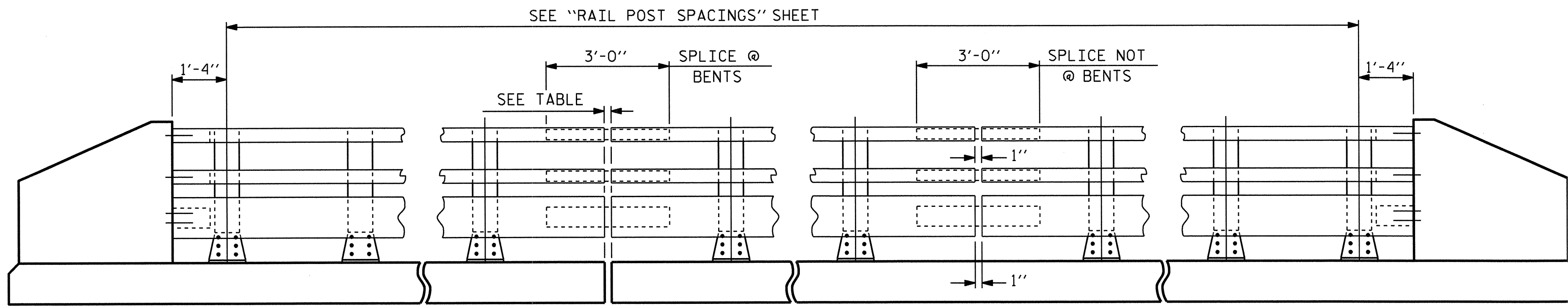
PROJECT NO. U-3331
NASH COUNTY
STATION: 32+18.50 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

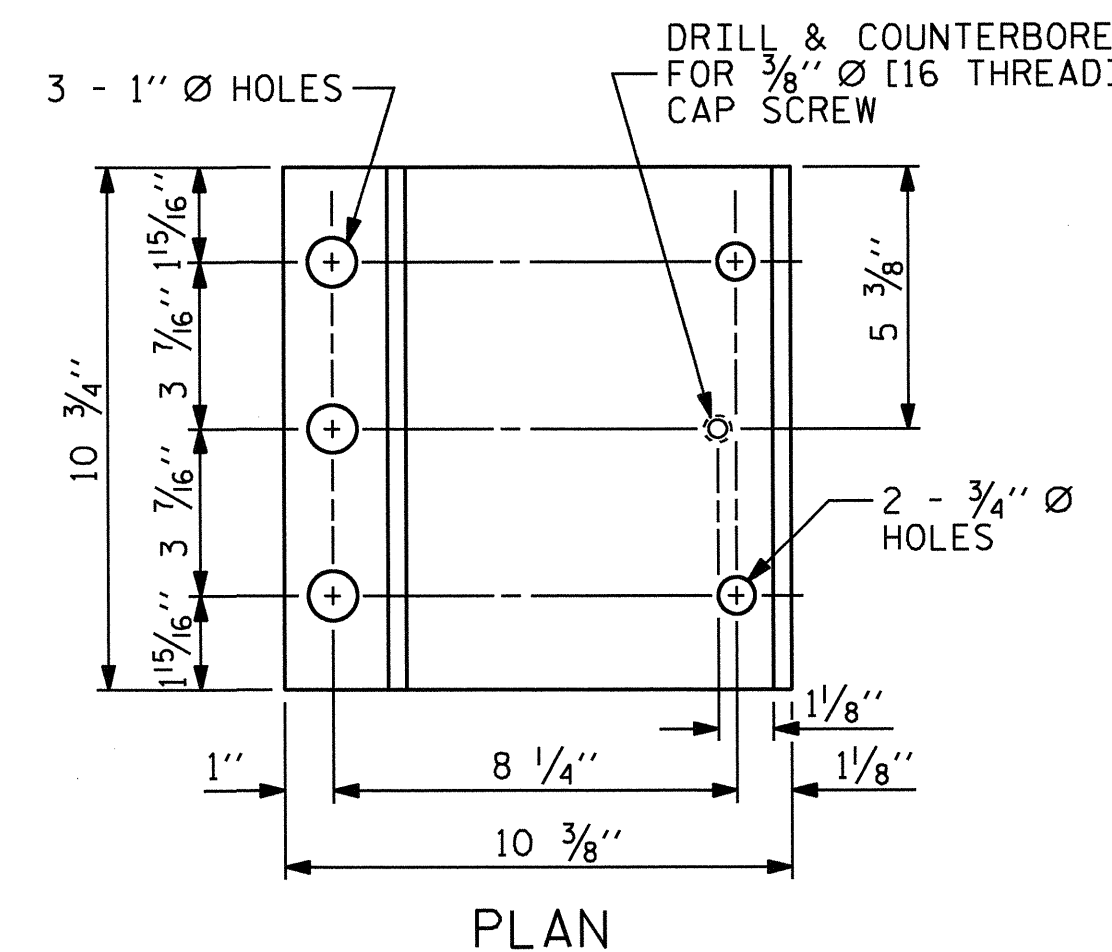
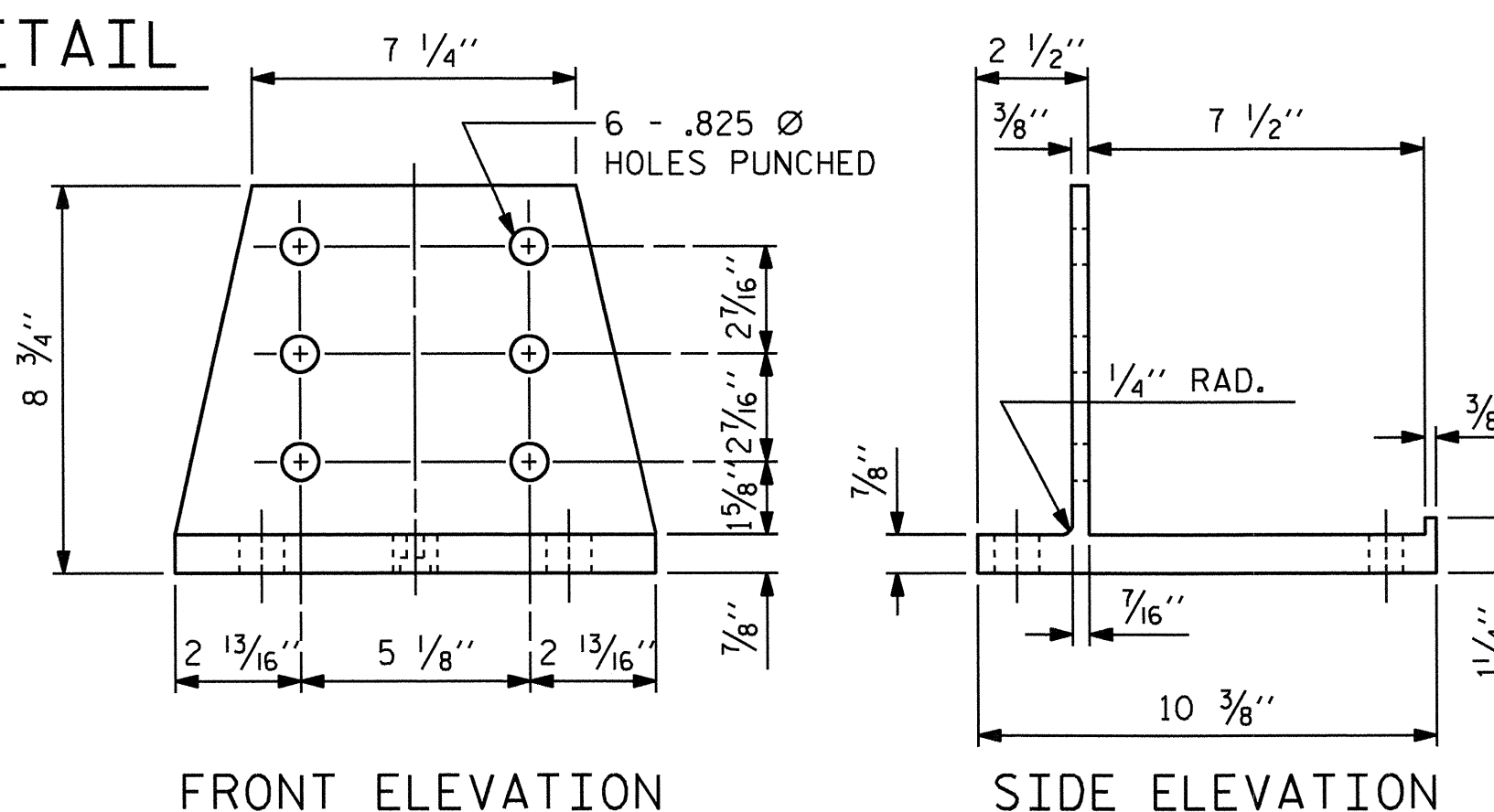
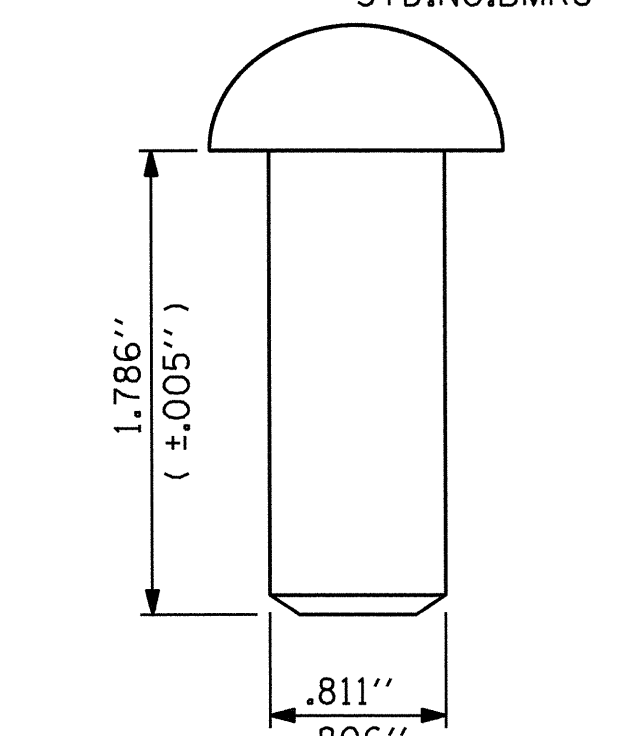
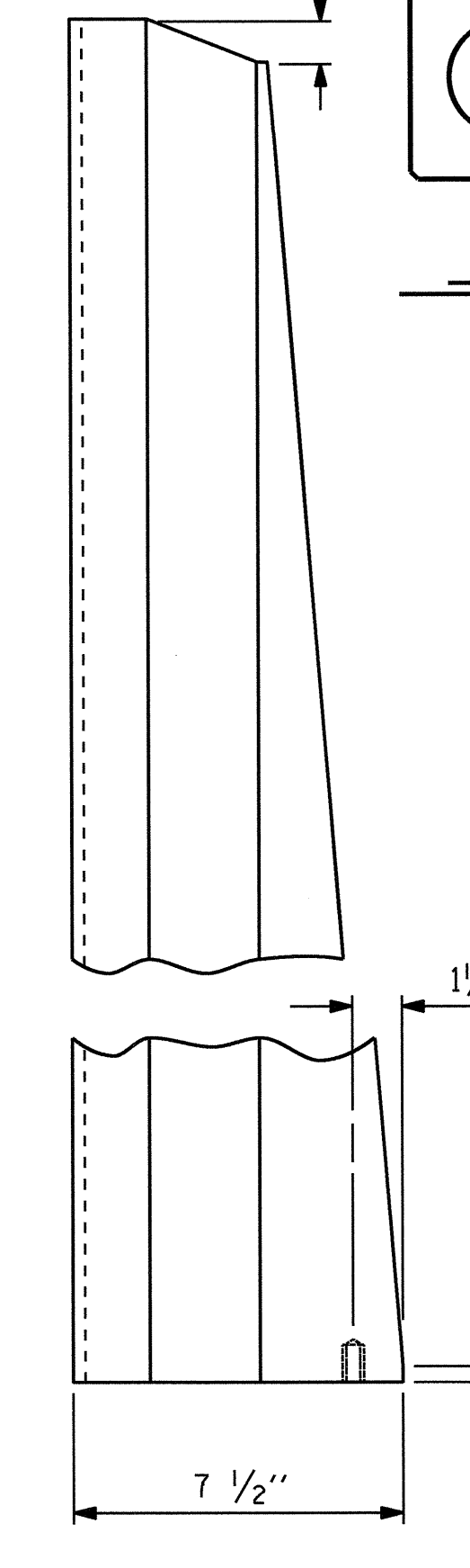
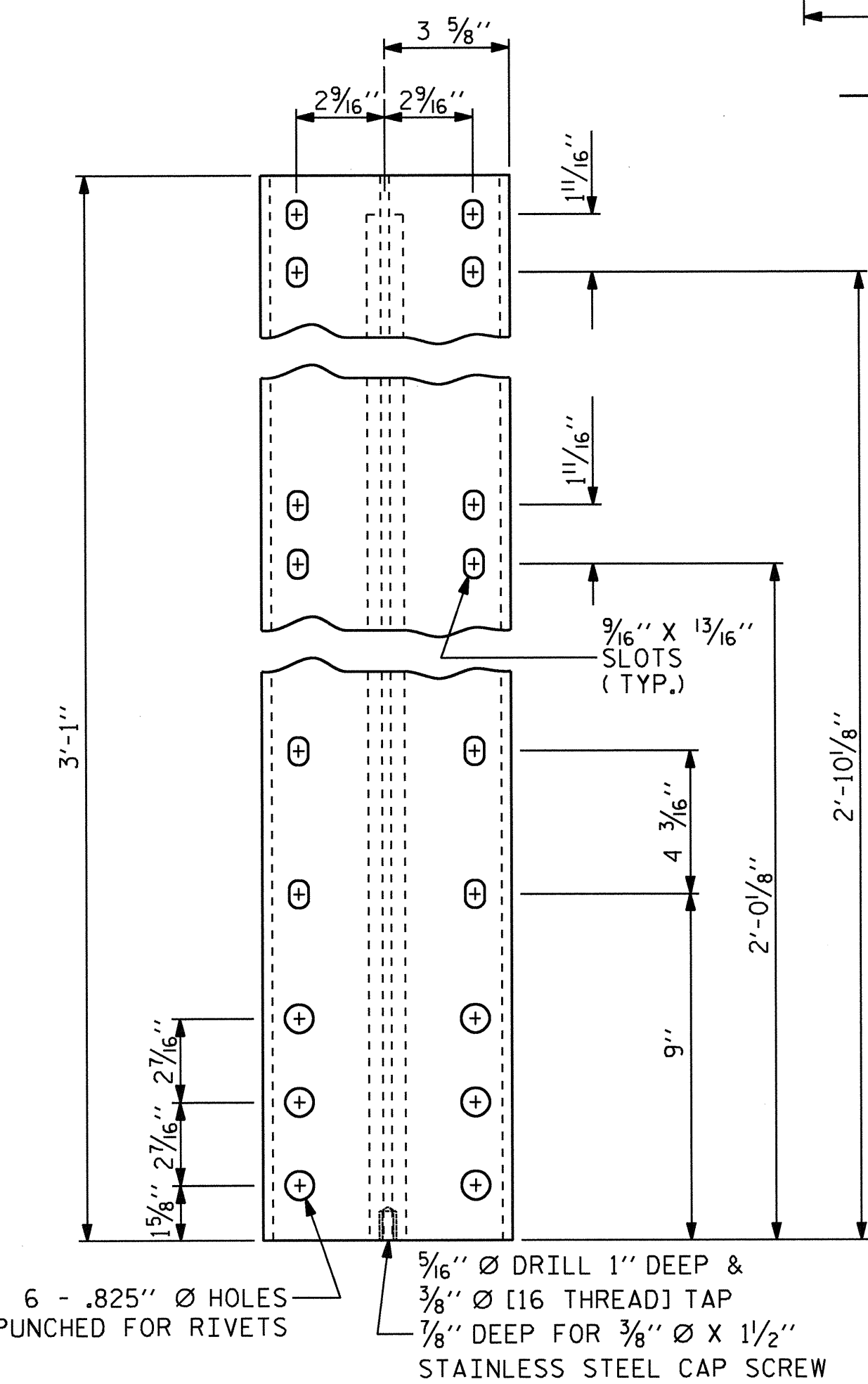
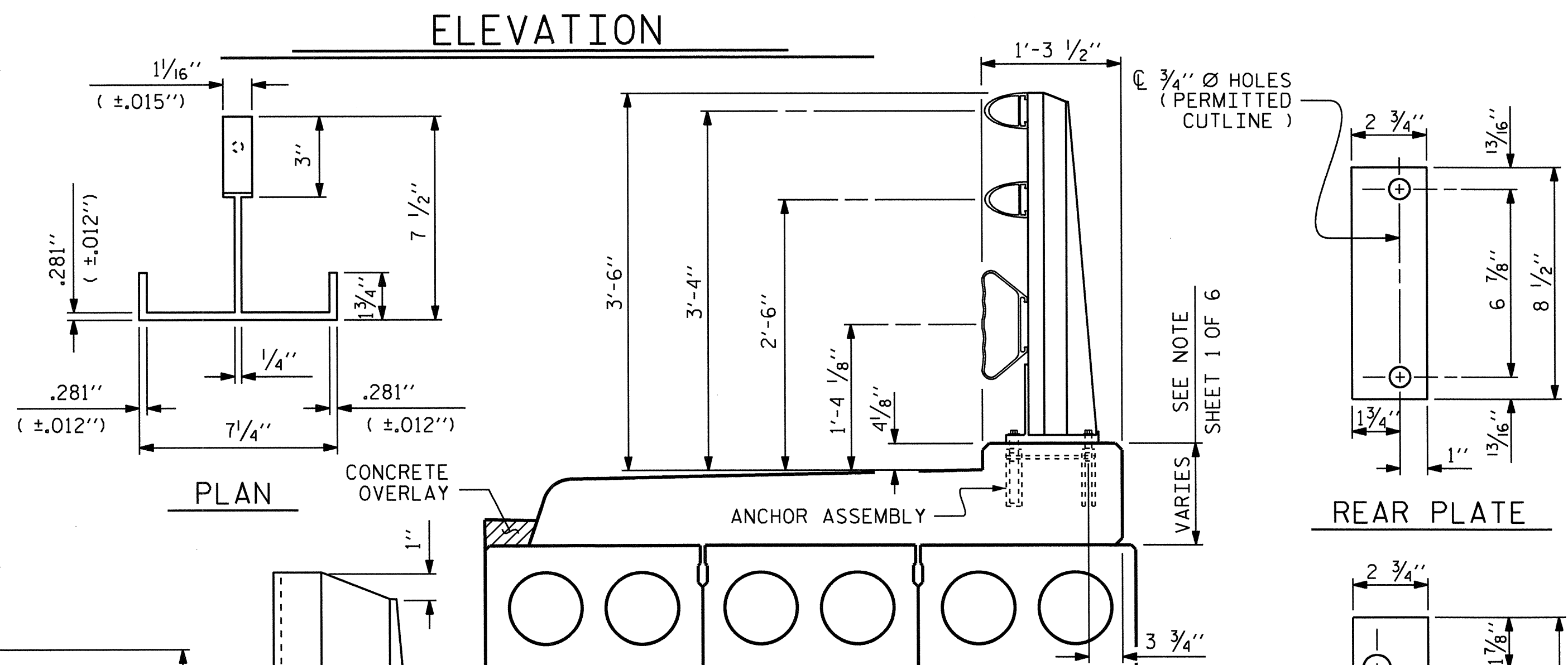
STANDARD
3 BAR METAL RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			34



NOTE:
FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR7.

TABLE	
EXP. JT. @	RAIL OPENING
BENT No. 3	2 5/16"



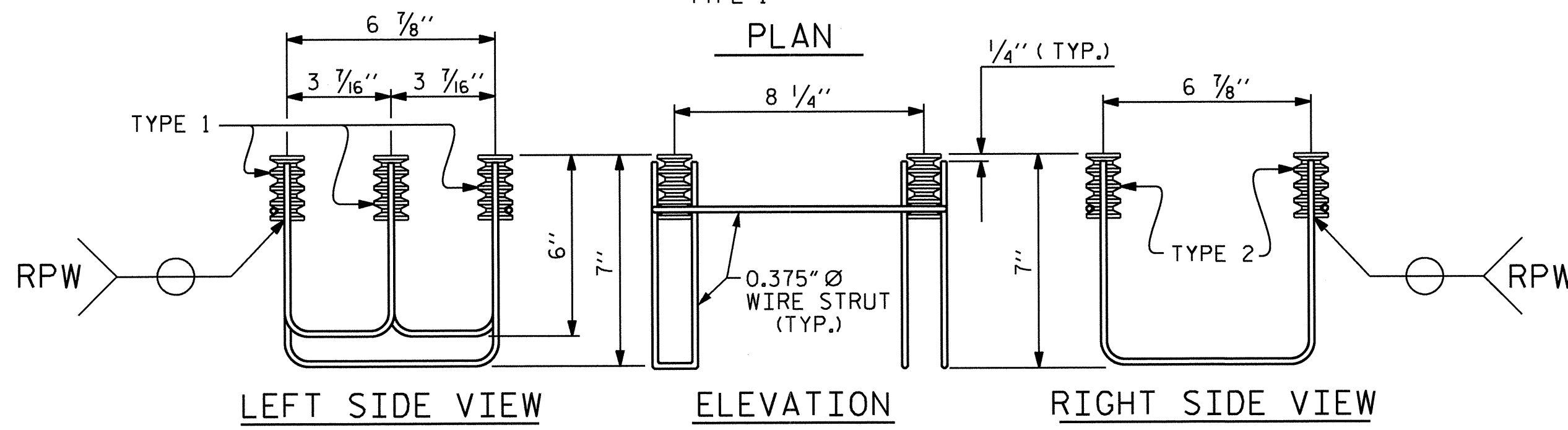
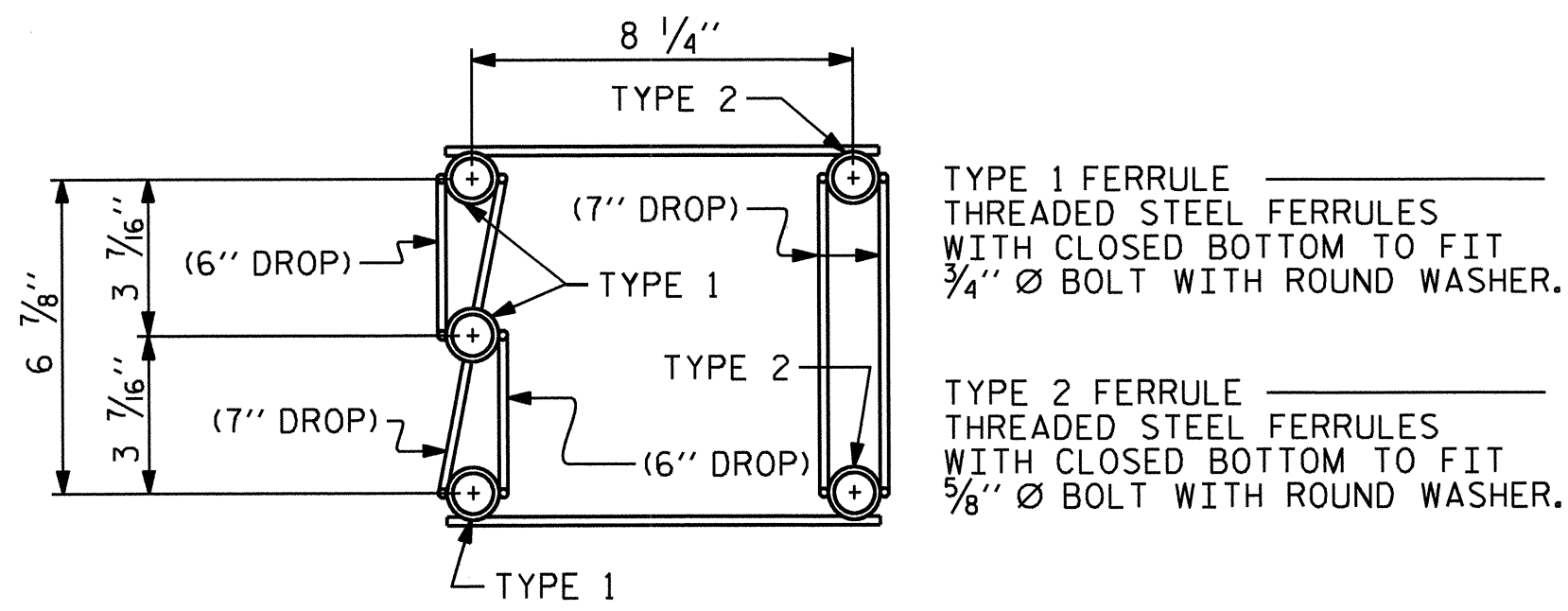
ASSEMBLED BY : M.M. AHMED	DATE : 1/14/14
CHECKED BY : M.L. RORIE, P.E.	DATE : 1/14/14
DESIGN ENGINEER OF RECORD : M.L. RORIE, P.E.	DATE : 3/7/14
DRAWN BY : JMB 1/88	REV. 10/17/00 RWW/LJS
CHECKED BY : GCH 1/88	REV. 5/7/03 RWW/JTE
	REV. 5/1/06 TLA/GM

NOTES

STRUCTURAL CONCRETE ANCHOR ASSEMBLY

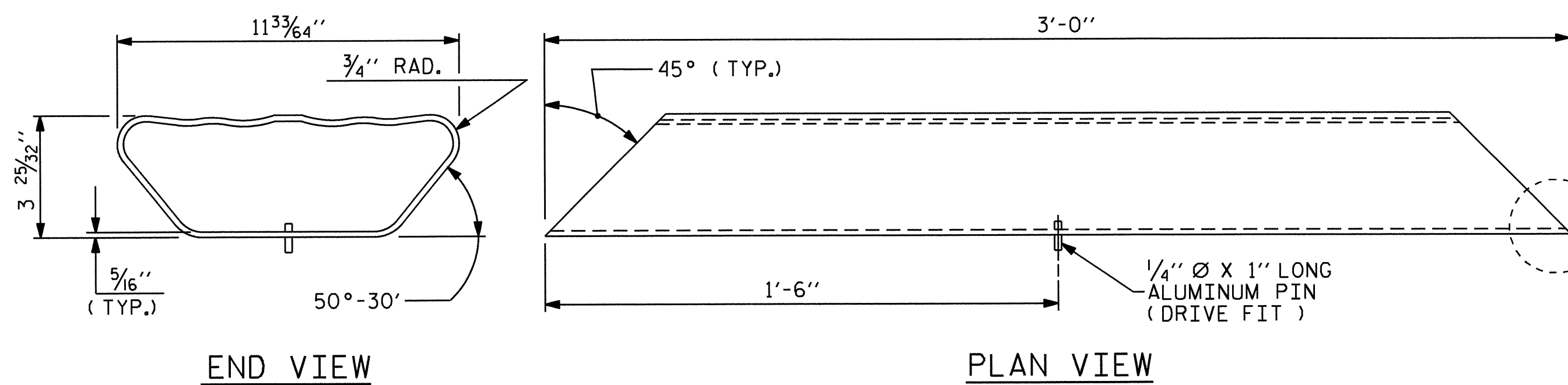
THE STRUCTURAL CONCRETE ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:

- 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 AND 1 1/4" FOR 5/8" FERRULES.
- B. 3 - 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. 2 - 5/8" Ø X 2 1/4" 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 5/8" Ø X 2 1/4" 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.
- D. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.
- E. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.
- F. 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.
- G. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.



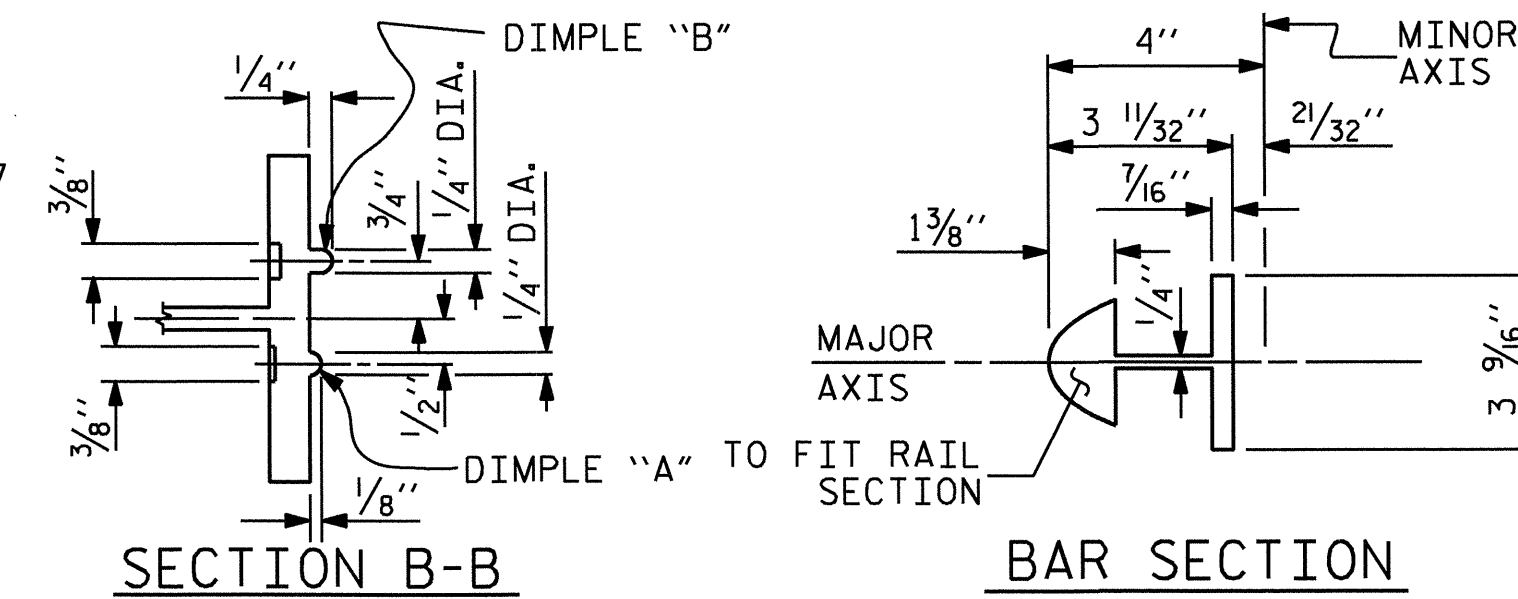
5-BOLT METAL RAIL ANCHOR ASSEMBLY

(84 ASSEMBLIES REQUIRED)



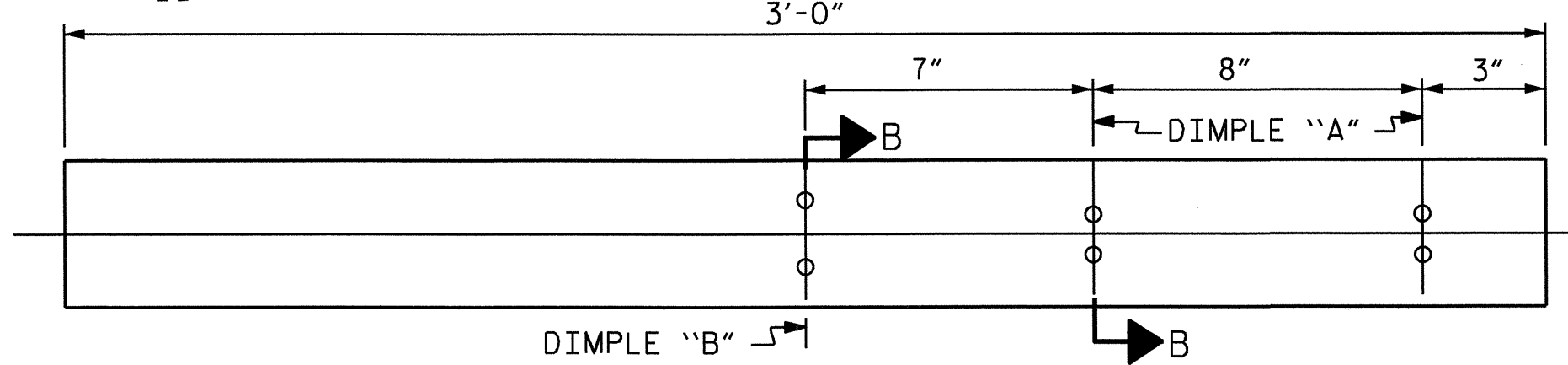
BOTTOM RAIL EXPANSION BAR

BREAK 1/8" RAD. WITH GRINDER - BOTH ENDS



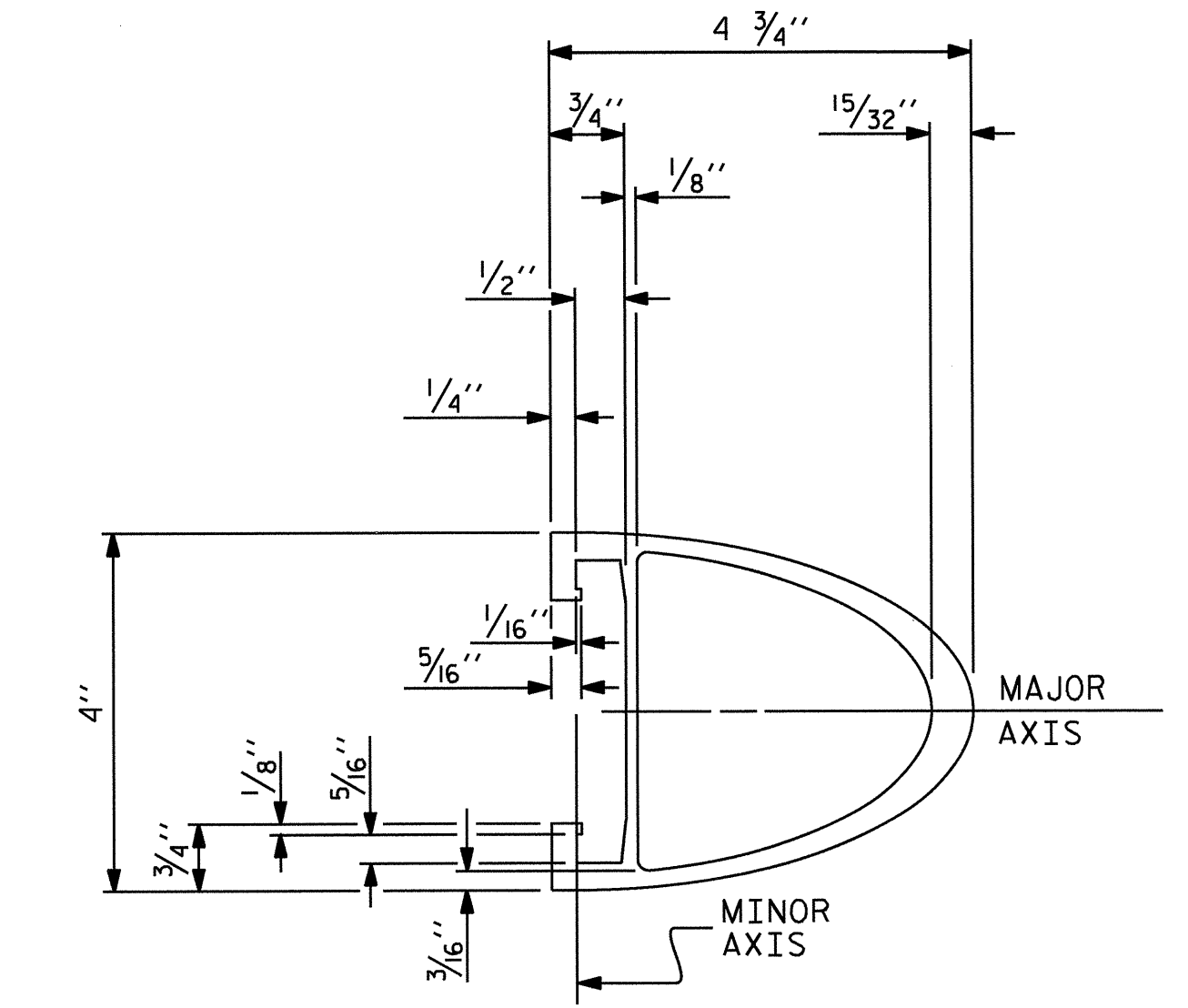
SECTION B-B

BAR SECTION

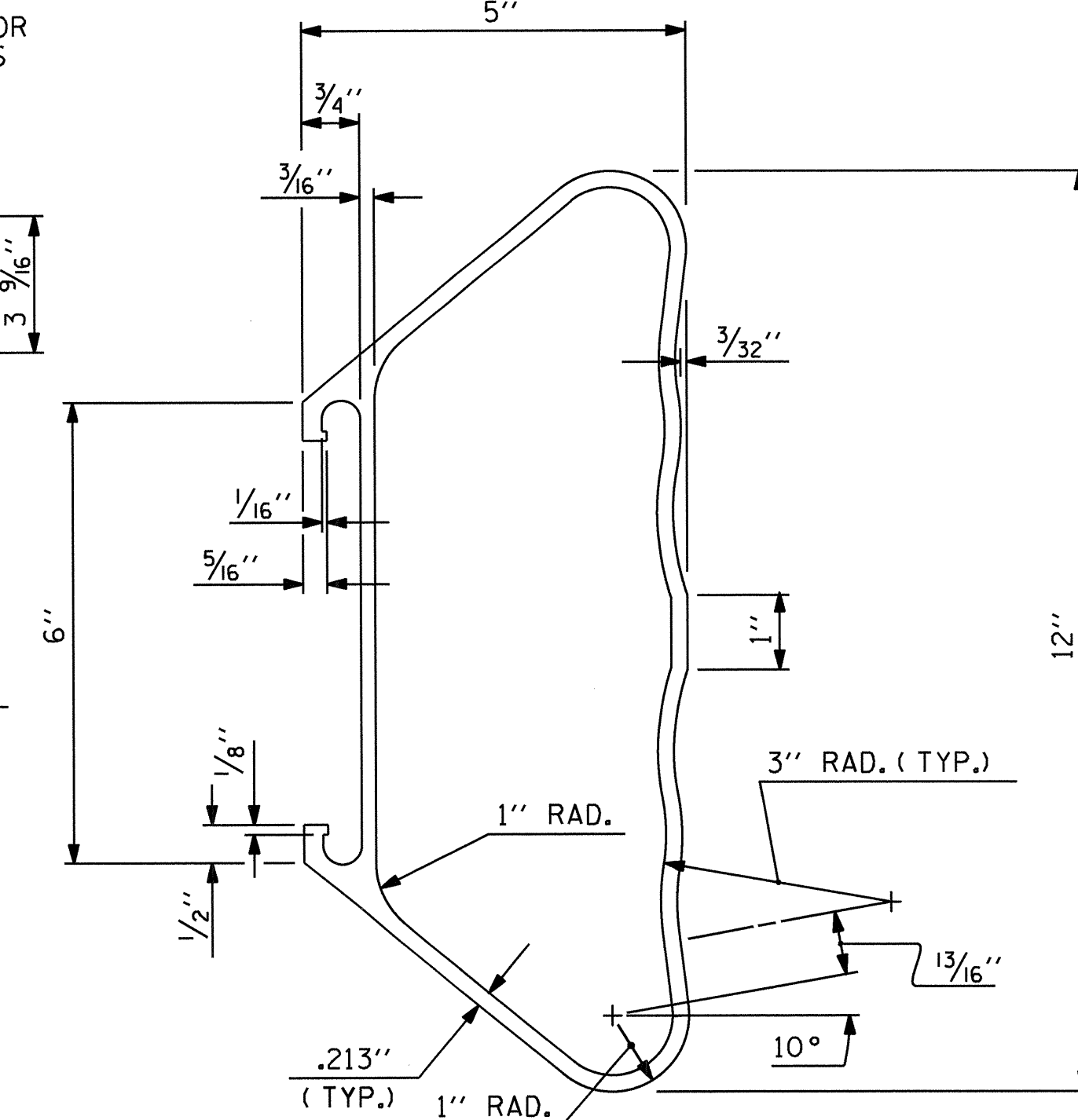


BACK ELEVATION

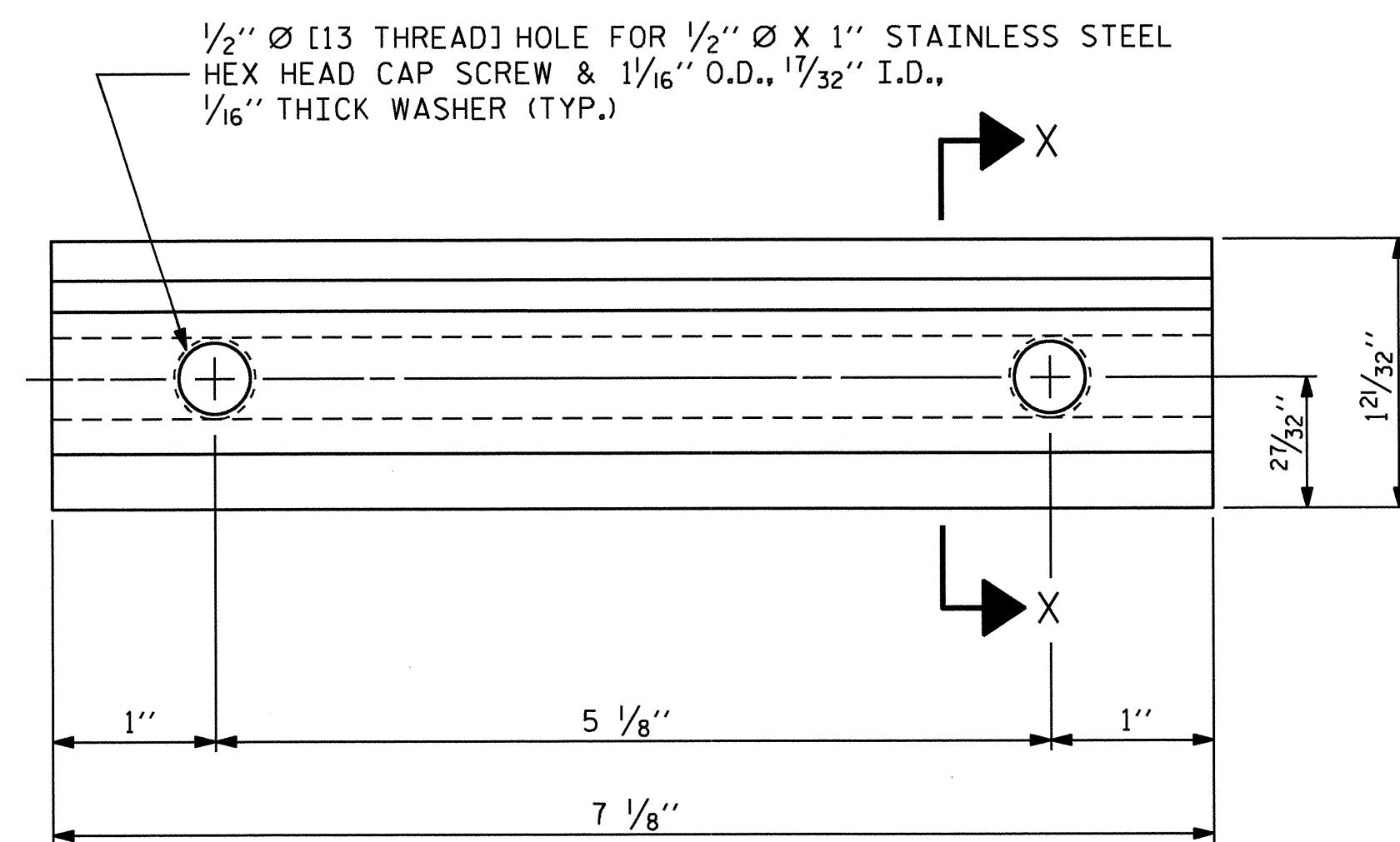
TOP & MIDDLE RAIL EXPANSION BAR



TOP & MIDDLE RAIL SECTION



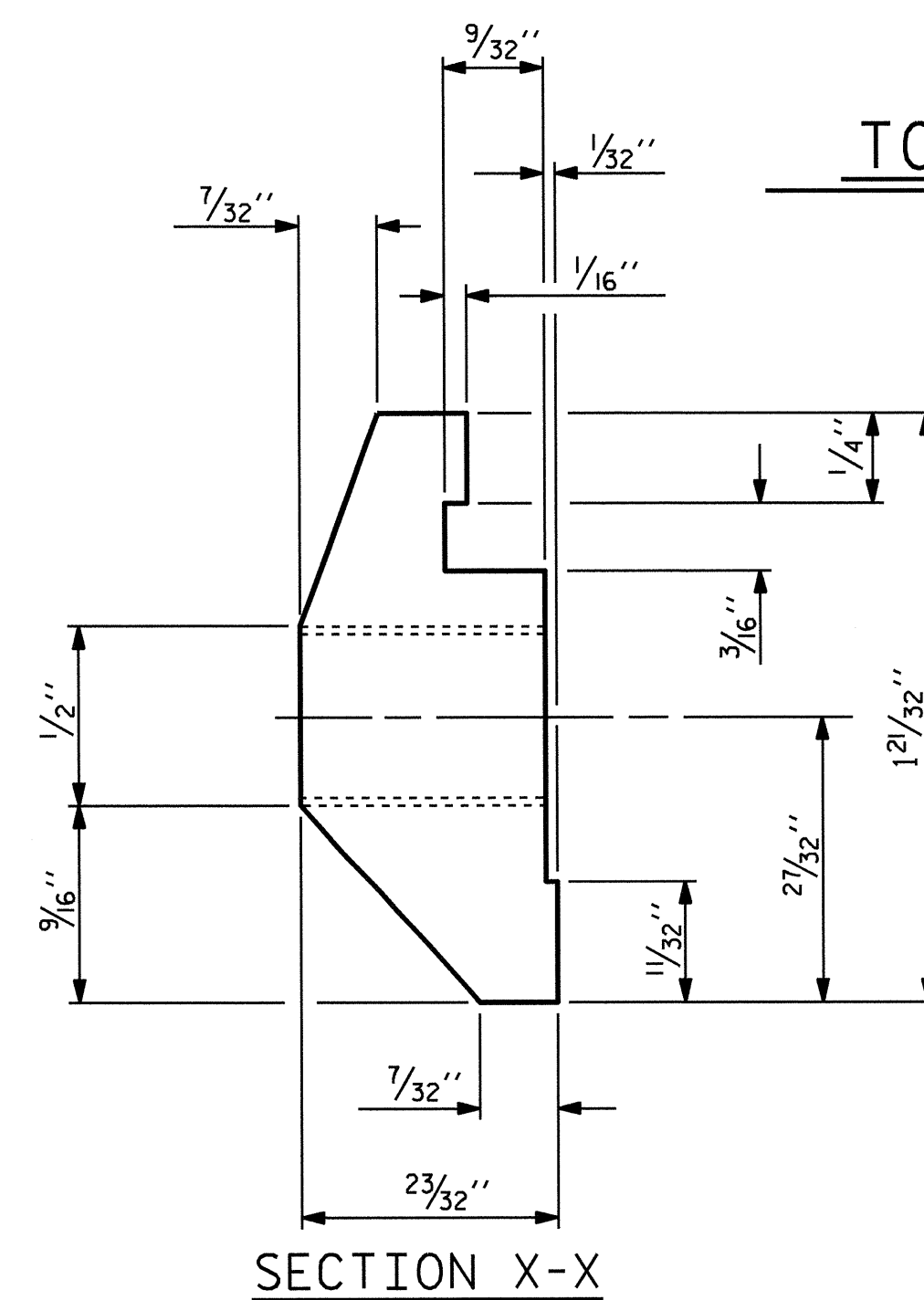
BOTTOM RAIL SECTION



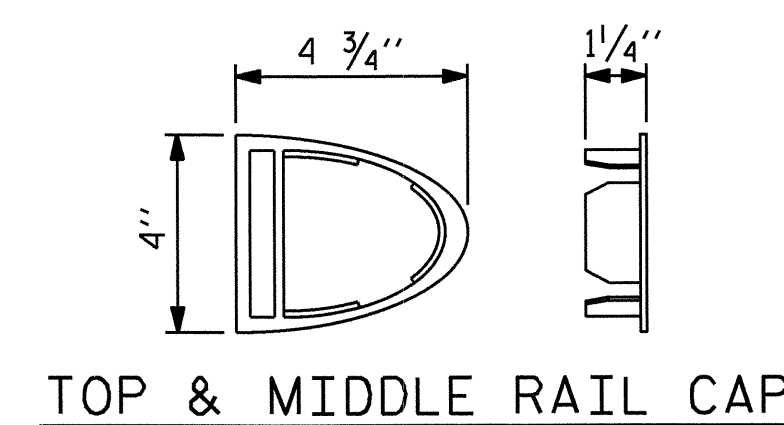
ELEVATION

CLAMP BAR DETAIL

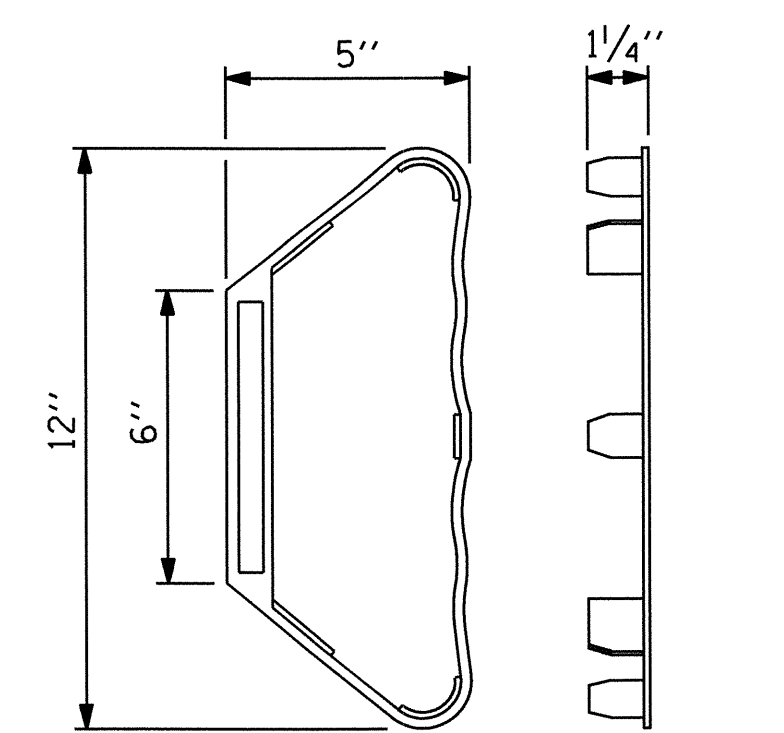
(6 REQUIRED PER POST)



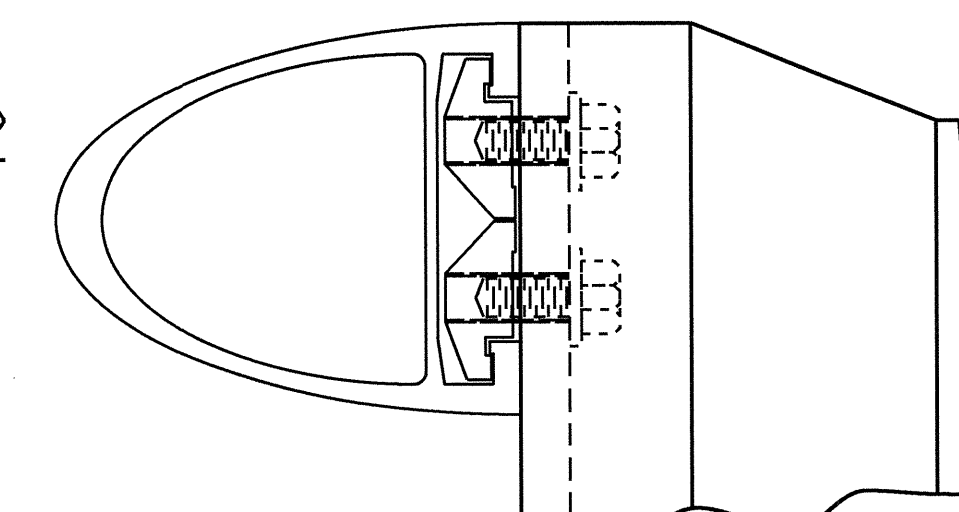
SECTION X-X



TOP & MIDDLE RAIL CAP

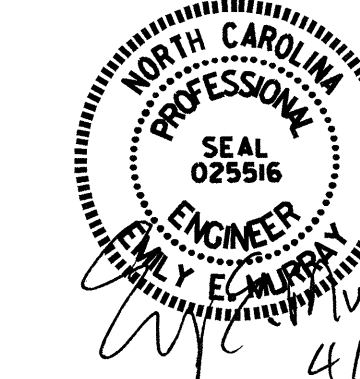


BOTTOM RAIL CAP



CLAMP ASSEMBLY

TOP RAIL SHOWN (MIDDLE & BOTTOM RAIL ARE SIMILAR)



PROJECT NO. U-3331
 NASH COUNTY
 STATION: 32+18.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD

3 BAR METAL RAIL

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

ASSEMBLED BY : M.M. AHMED	DATE 1/14/14
CHECKED BY : M.L. RORIE, P.E.	DATE : 1/14/14
DESIGN ENGINEER OF RECORD : M.L. RORIE, P.E.	DATE : 3/7/14
DRAWN BY : JMB 1/88	REV. 10/17/00 RWW/LES
CHECKED BY : GGH 1/88	REV. 5/17/03 RWW/JTE
	REV. 5/1/06 TLA/GM

NOTES

METAL RAIL TO END POST CONNECTION

THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:

- A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
- B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS, THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 5/8" BOLT SHALL HAVE N.C. THREADS.
- C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F. WASHERS FOR RAIL ATTACHMENT SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

D. STANDARD CLAMP BARS (STD. No. BMR6).

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 3 BAR METAL RAIL.

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.

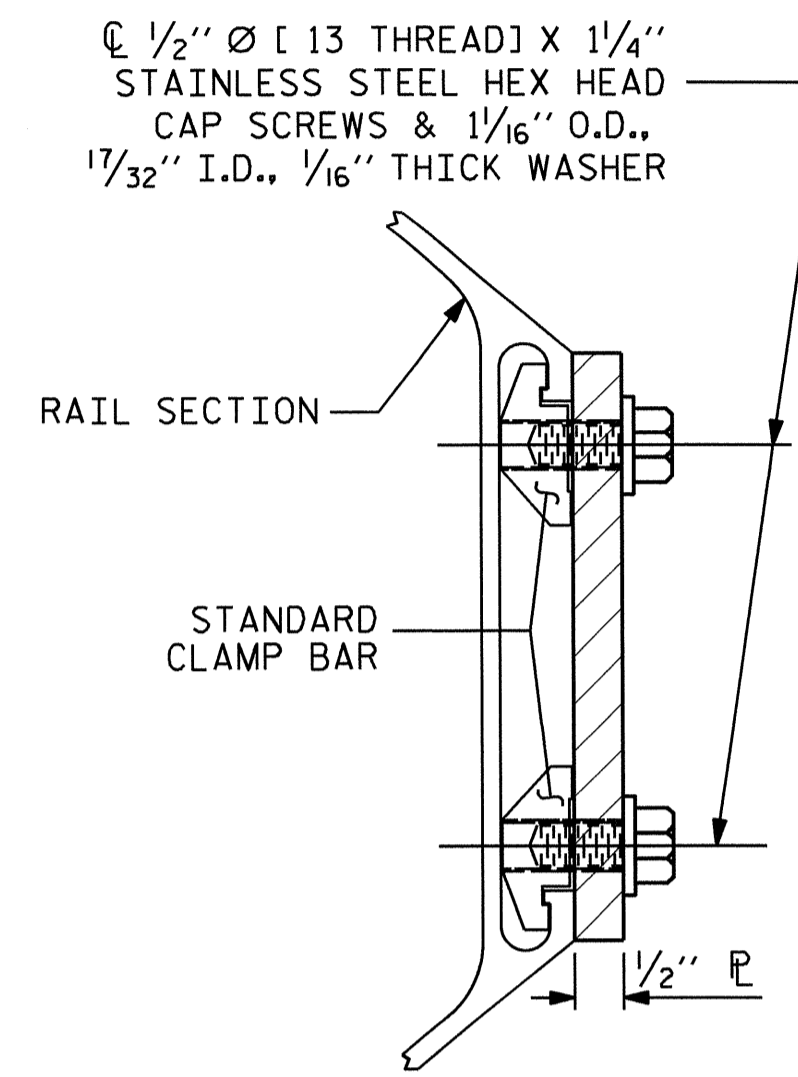
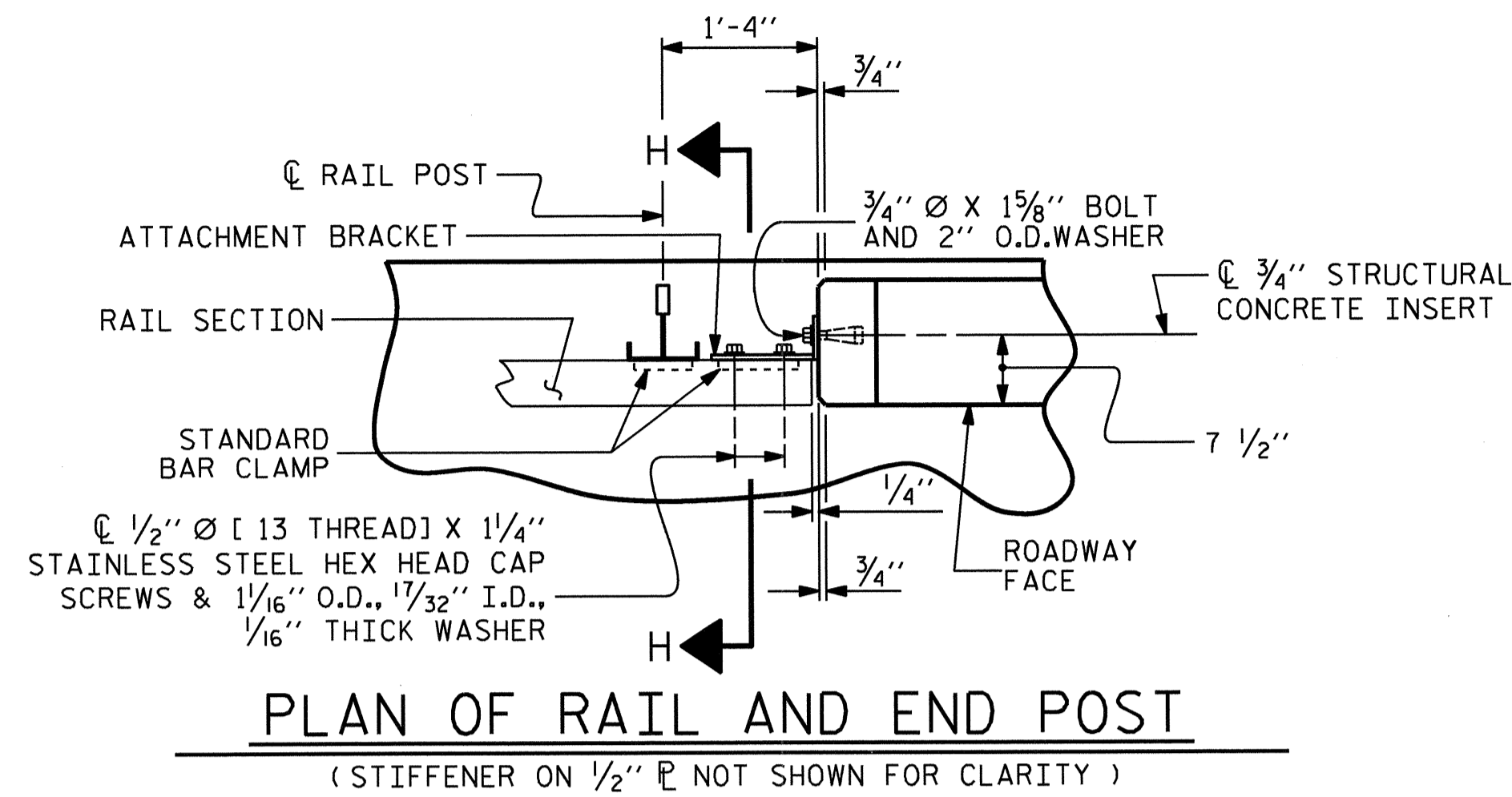
THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø X 1 5/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" Ø X 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT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

NOTES

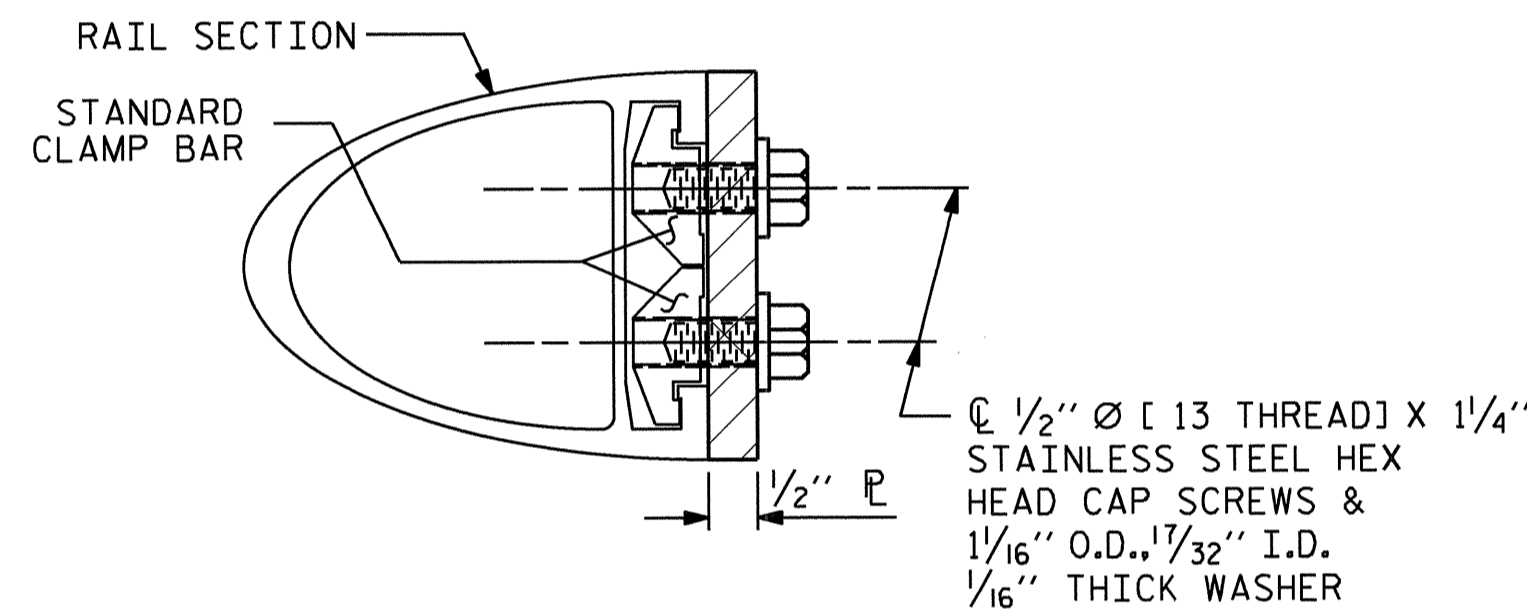
STRUCTURAL CONCRETE INSERT

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

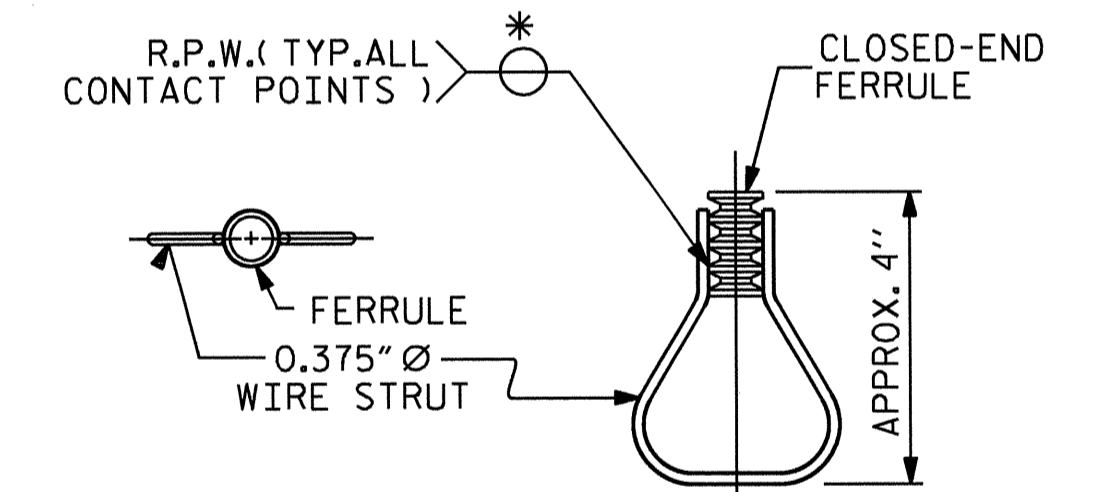
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1 1/2".
- B. 1 - 3/4" Ø X 1 5/8" BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION,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



SECTION H-H
(FOR BOTTOM RAIL)



SECTION H-H
(FOR TOP & MIDDLE RAIL)



STRUCTURAL CONCRETE INSERT

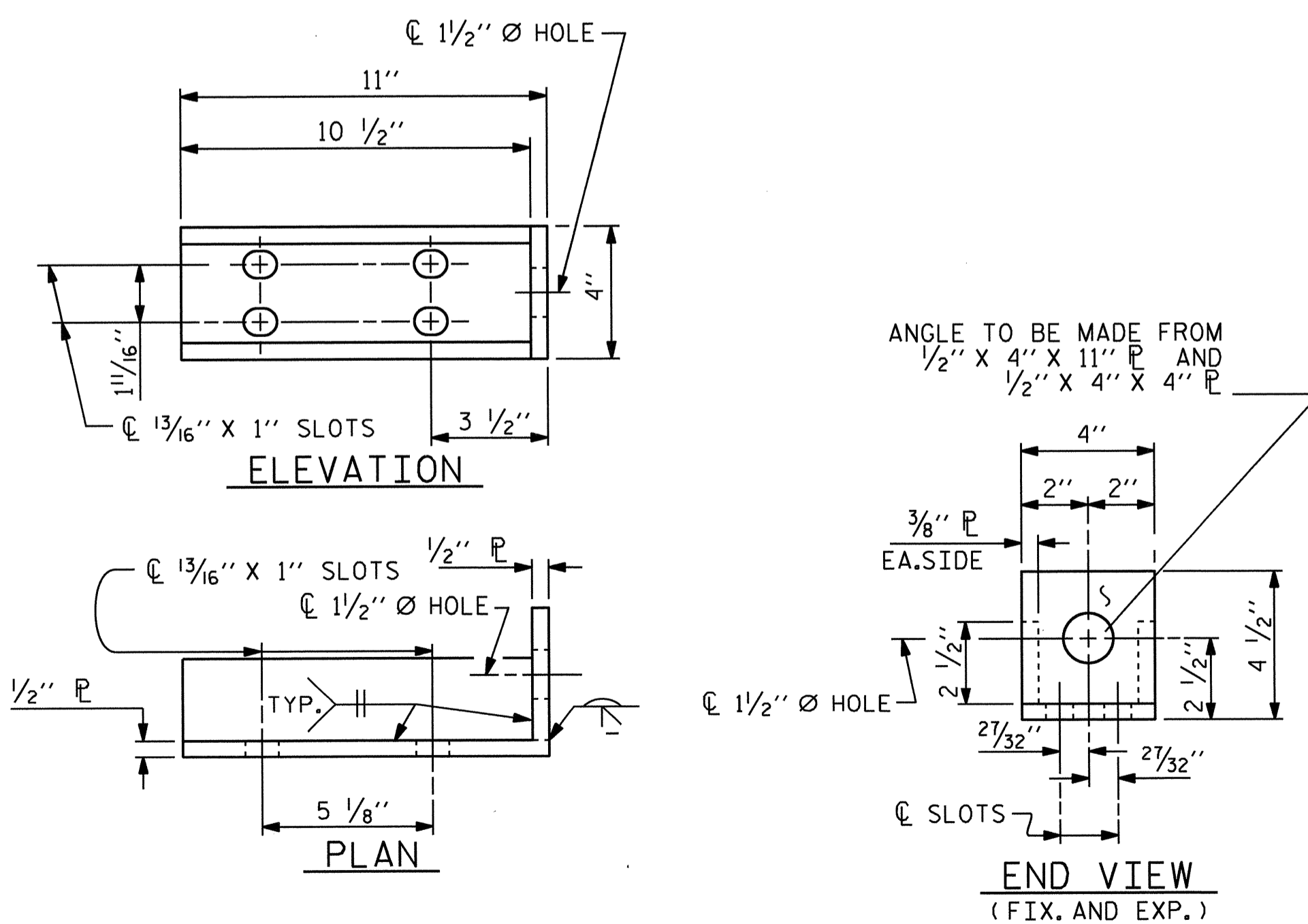
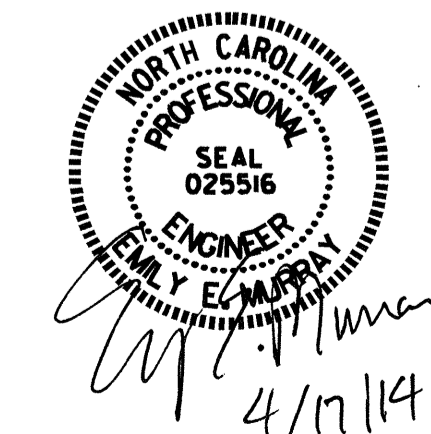
* EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.

PROJECT NO. U-3331
NASH COUNTY
 STATION: 32+18.50 -L-

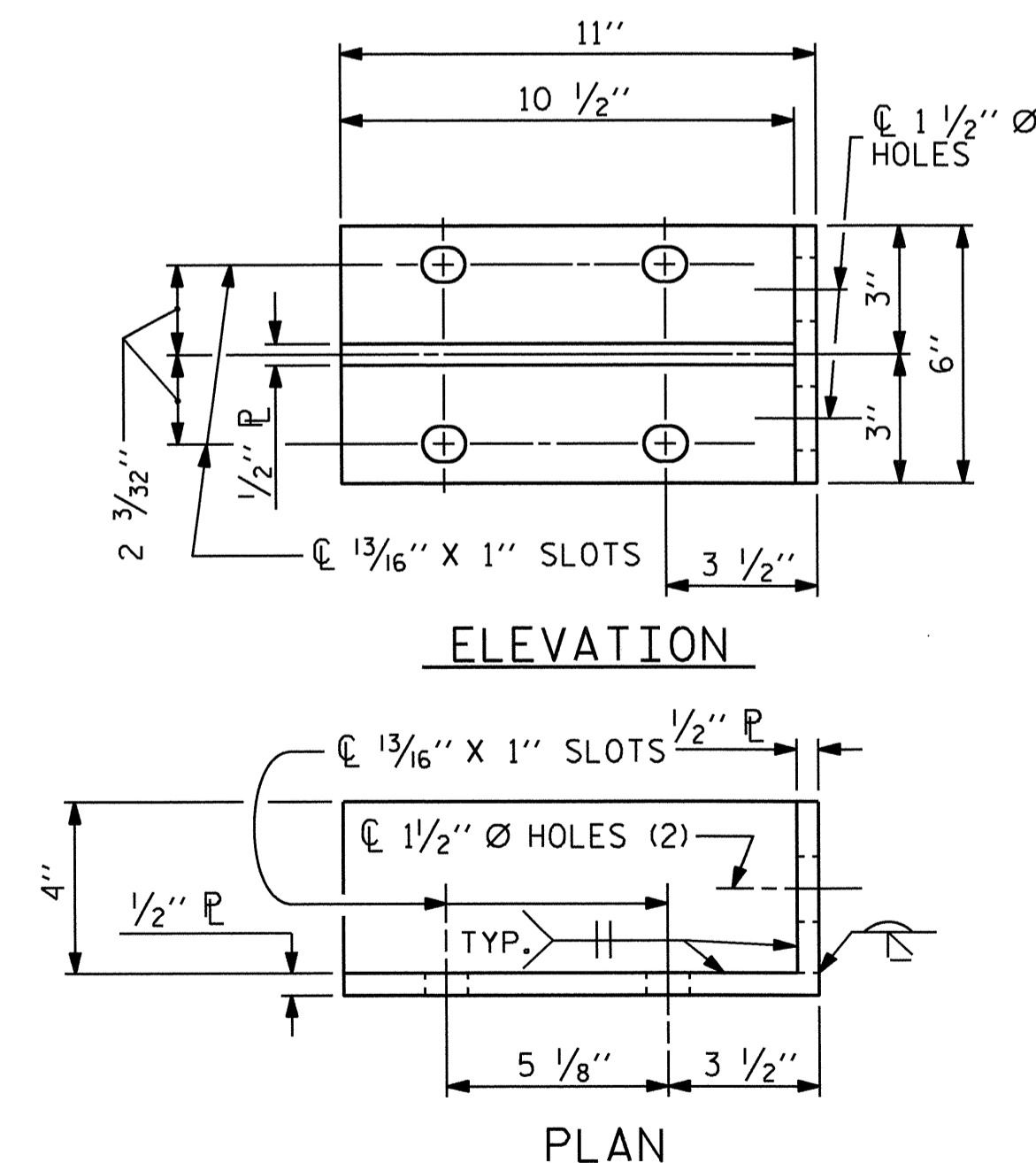
SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 3 BAR METAL RAIL

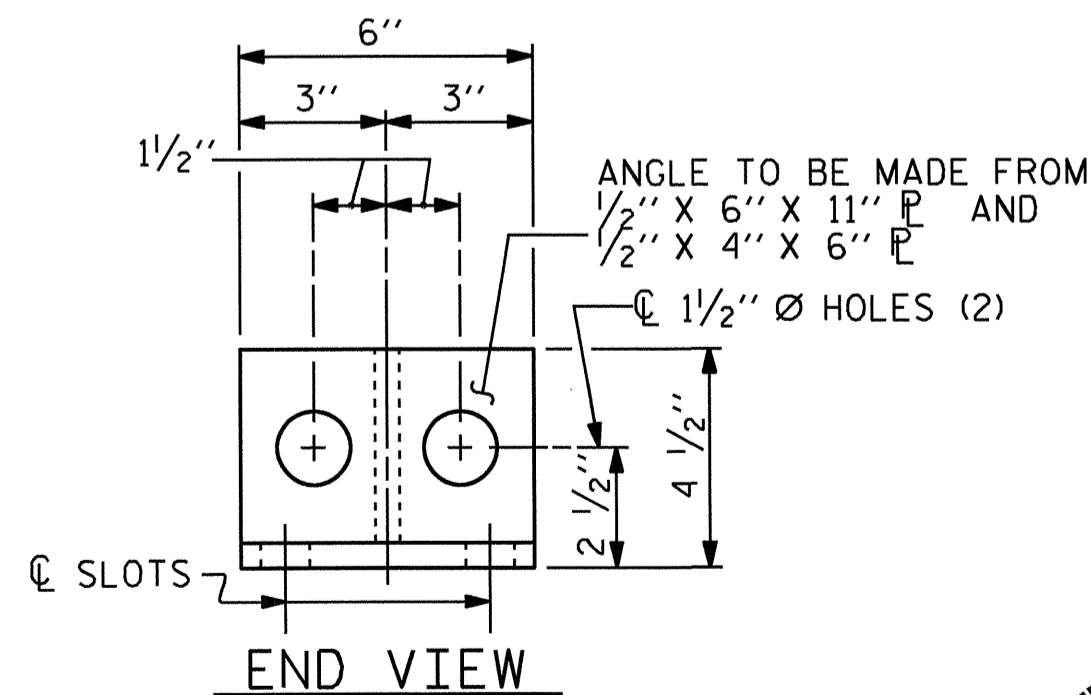
REVISIONS						SHEET NO. S-15
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 34
2			4			



DETAILS FOR ATTACHMENT BRACKET
(TOP & MIDDLE RAIL ONLY)



DETAILS FOR ATTACHMENT BRACKET
(BOTTOM RAIL ONLY)



END VIEW

ASSEMBLED BY : M.M. AHMED	DATE 1/13/14
CHECKED BY : M.L. RORIE, P.E.	DATE : 1/13/14
DESIGN ENGINEER OF RECORD : M.L. RORIE, P.E.	DATE : 3/7/14
DRAWN BY : JMB 1/88	REV. 10/17/00 RWW/LES
CHECKED BY : GGH 1/88	REV. 5/7/03 RWW/JTE
	REV. 5/1/06 TLA/GM

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.

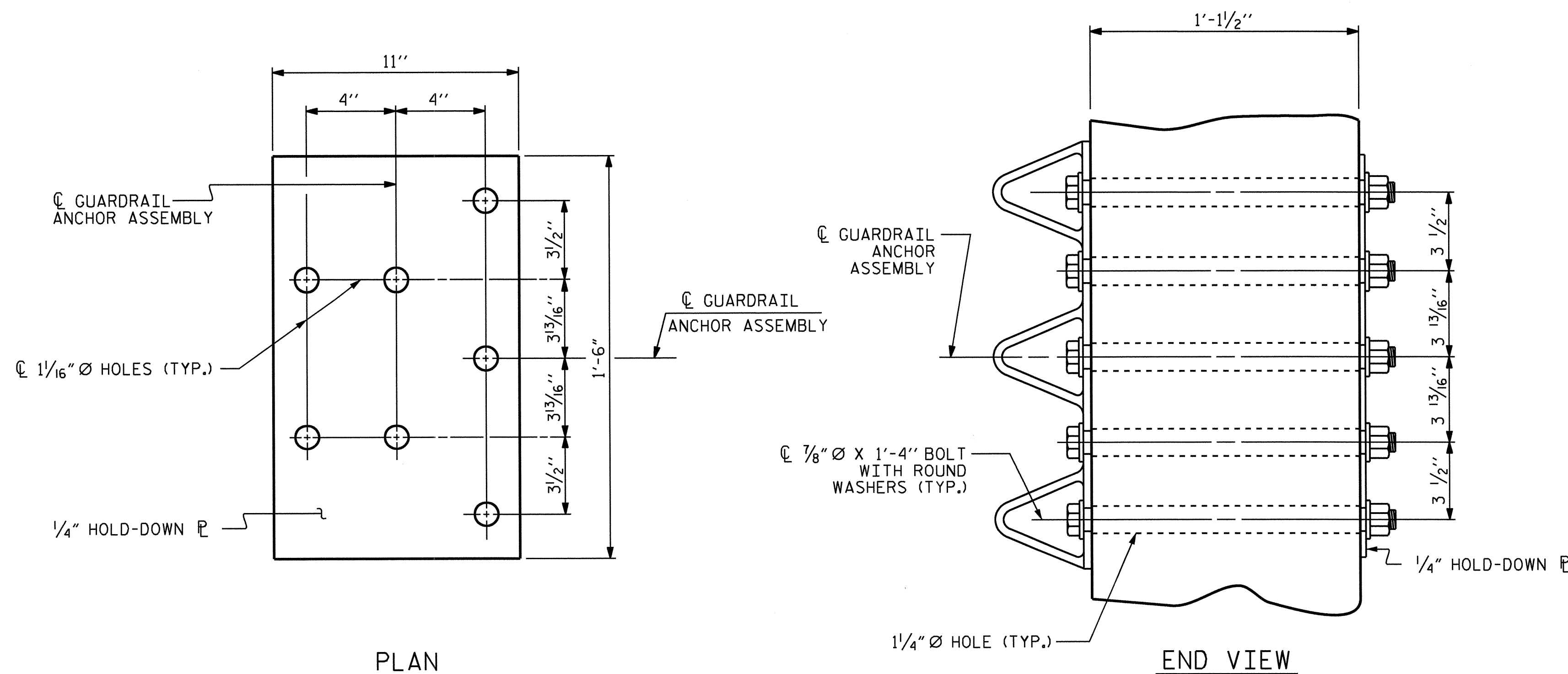
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

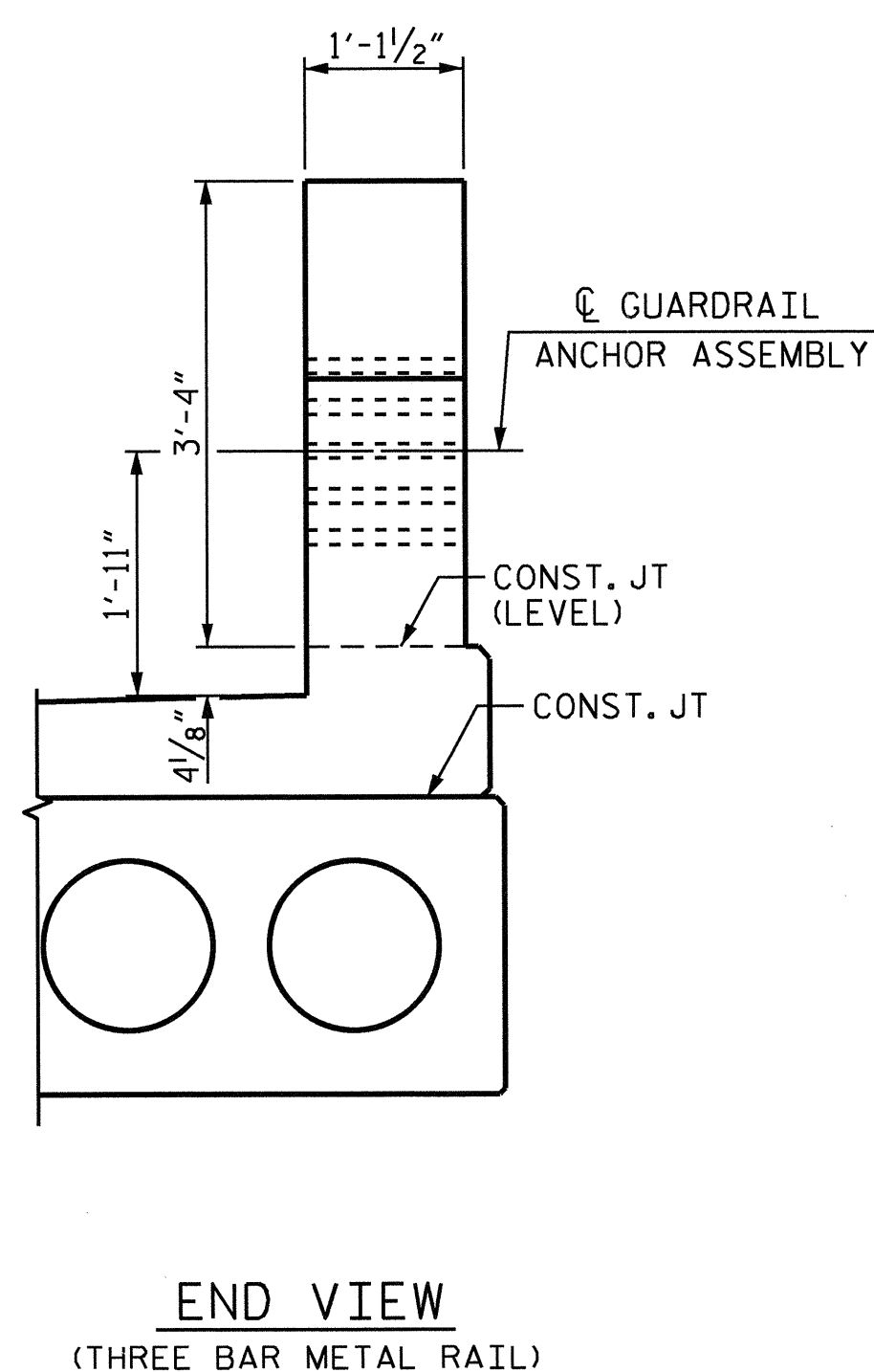
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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

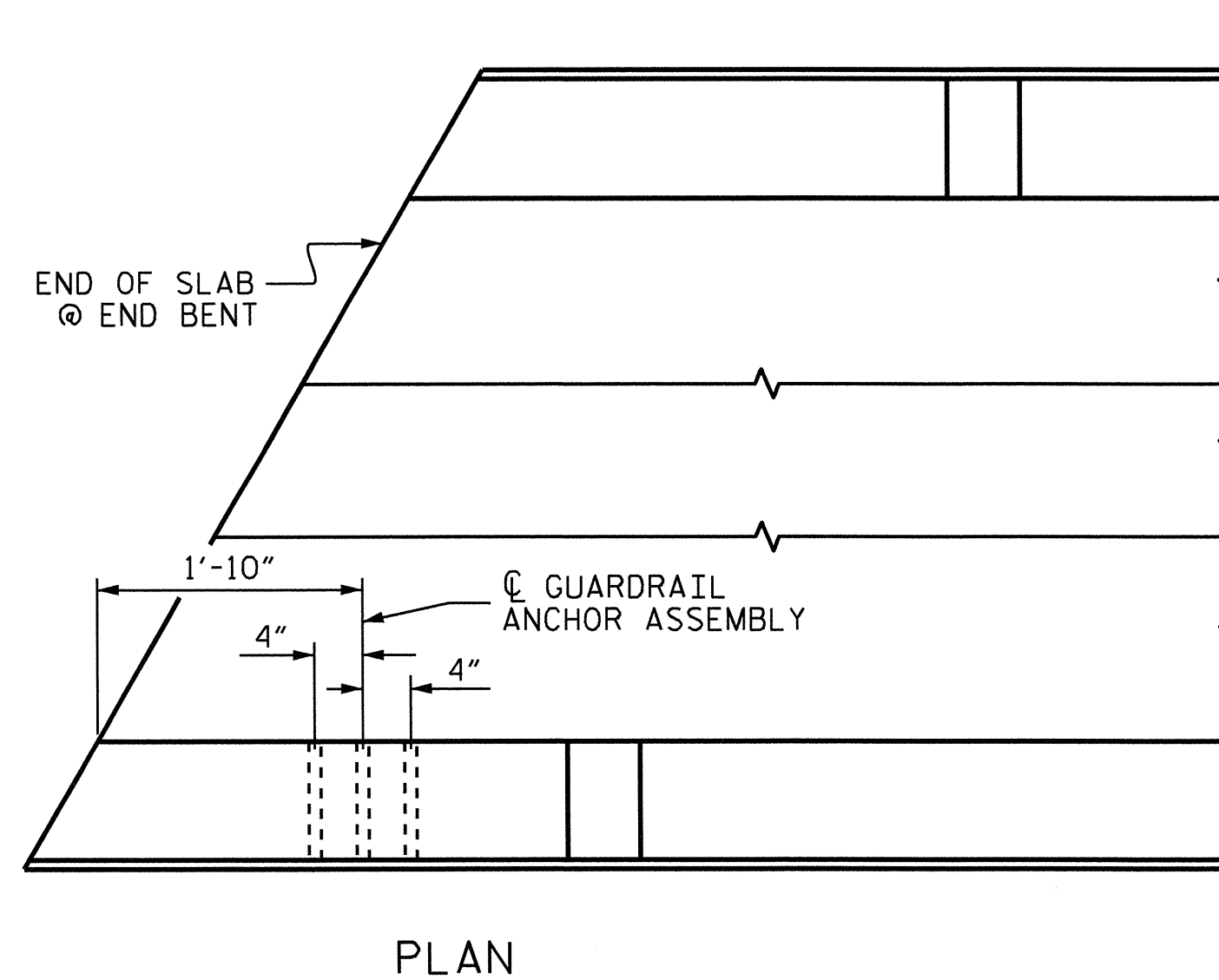
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



GUARDRAIL ANCHOR ASSEMBLY DETAILS

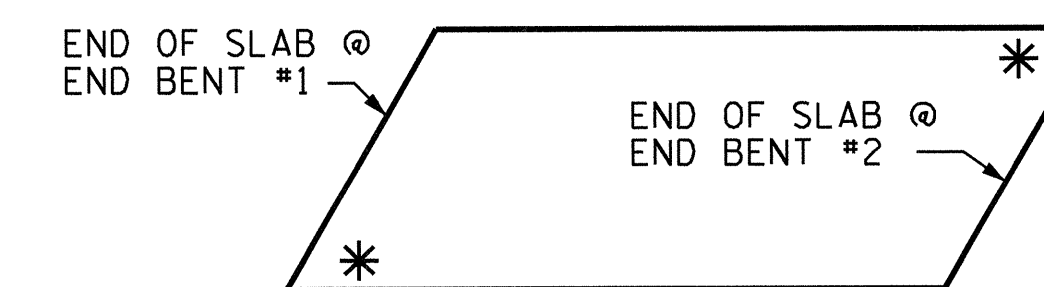


END VIEW
(THREE BAR METAL RAIL)



PLAN

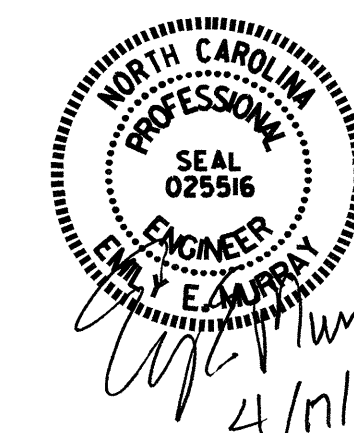
LOCATION OF GUARDRAIL ANCHOR AT END POST



SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT

PROJECT NO. U-3331
NASH COUNTY
STATION: 32+18.50 -L-



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

ASSEMBLED BY : M.M. AHMED	DATE : 1/9/14
CHECKED BY : M.L. RORIE, P.E.	DATE : 1/14/14
DESIGN ENGINEER OF RECORD : M.L. RORIE, P.E.	DATE : 1/14/14
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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			34

(SHT 5) STD. NO. GRA3

NOTES

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.

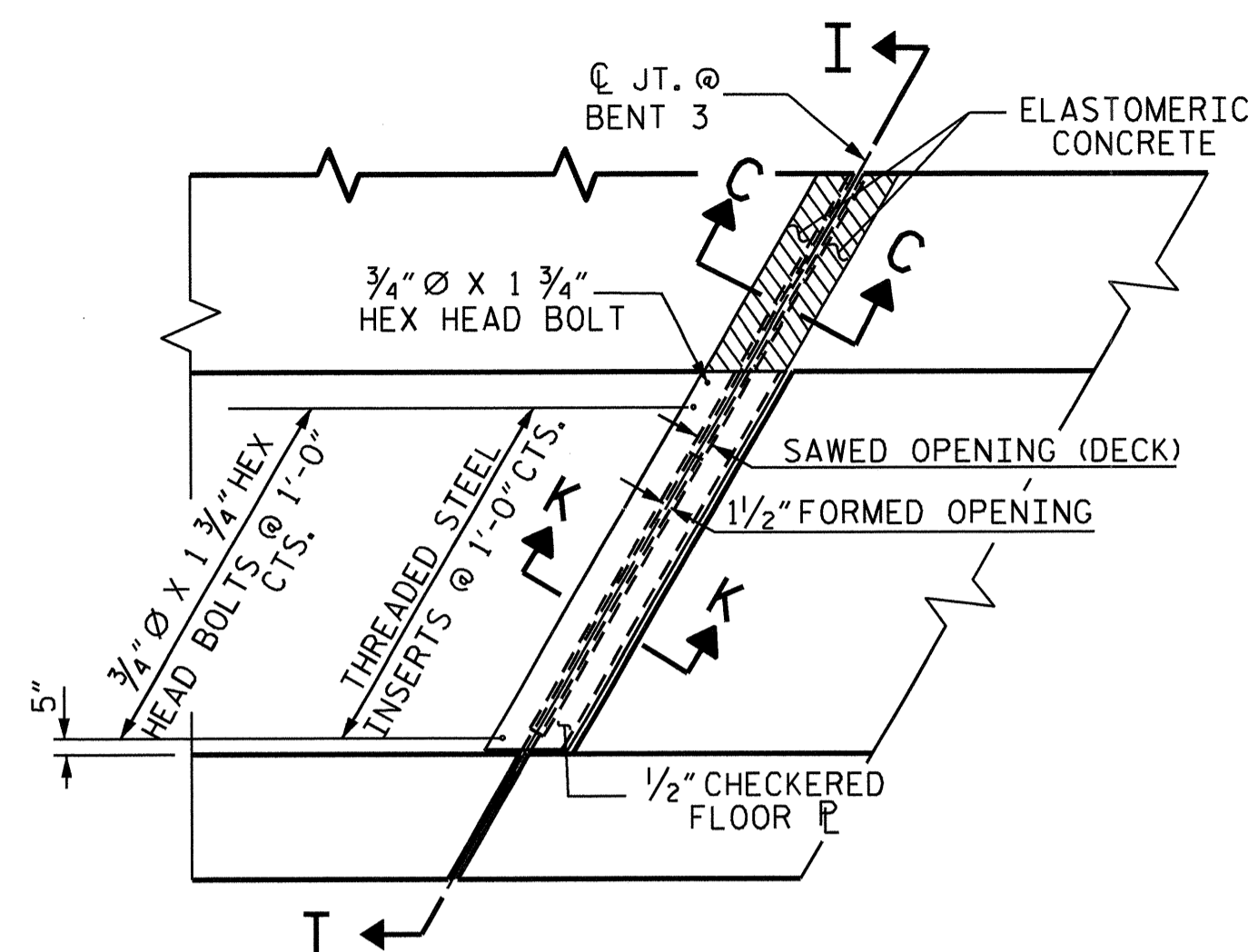
THE 3/4" DIAMETER HEX HEAD BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL.

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".

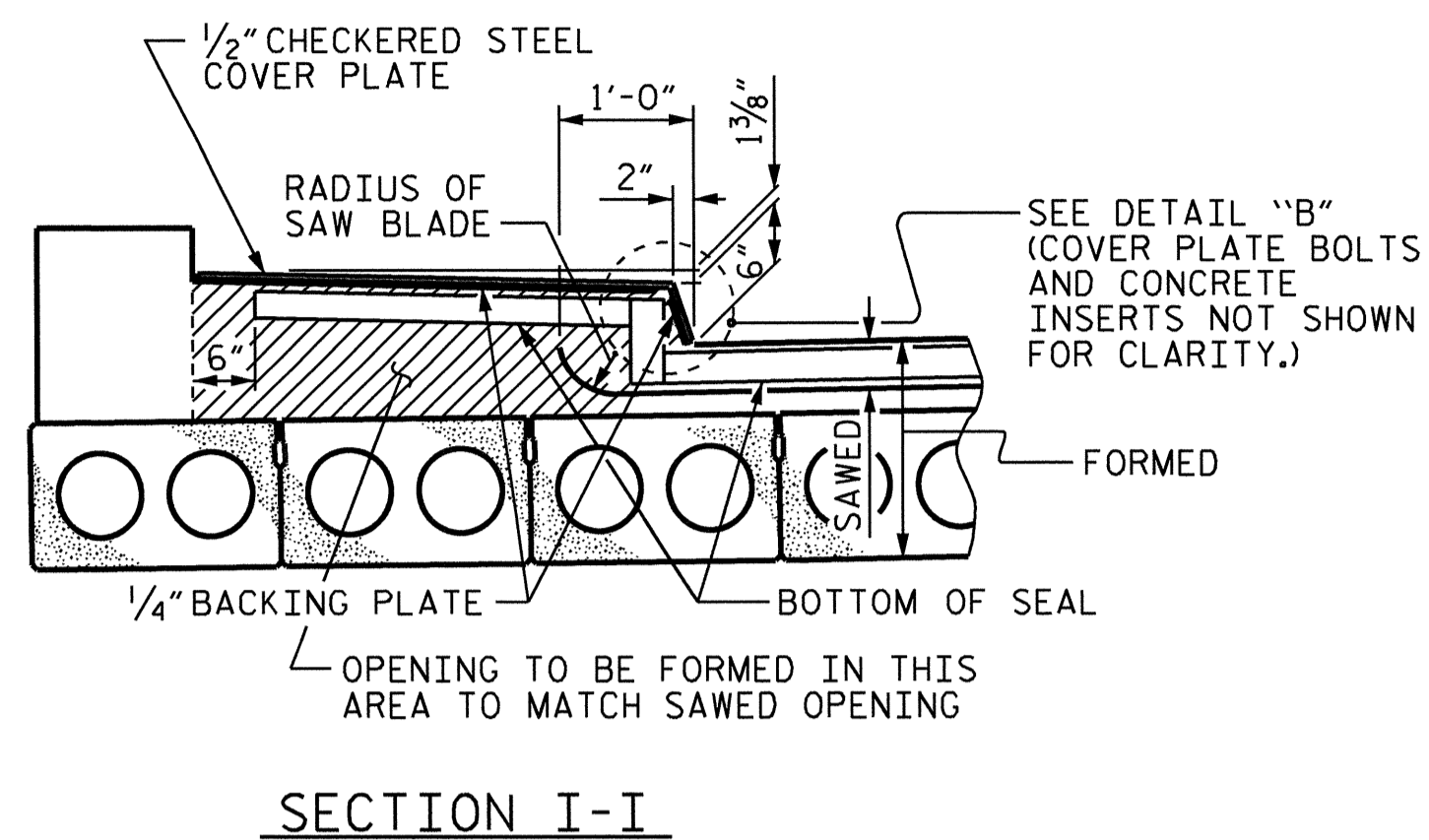
THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 3" AT BENT NO. 3.

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

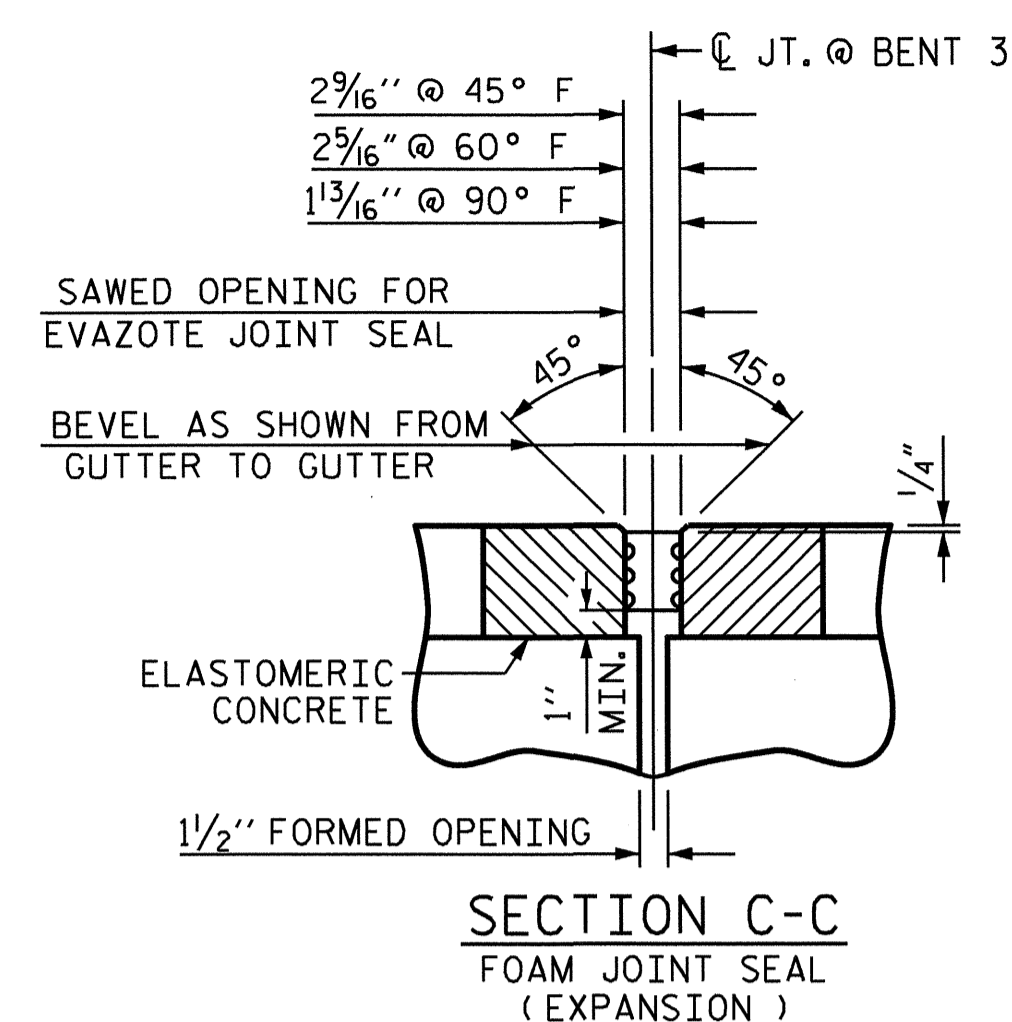
FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.



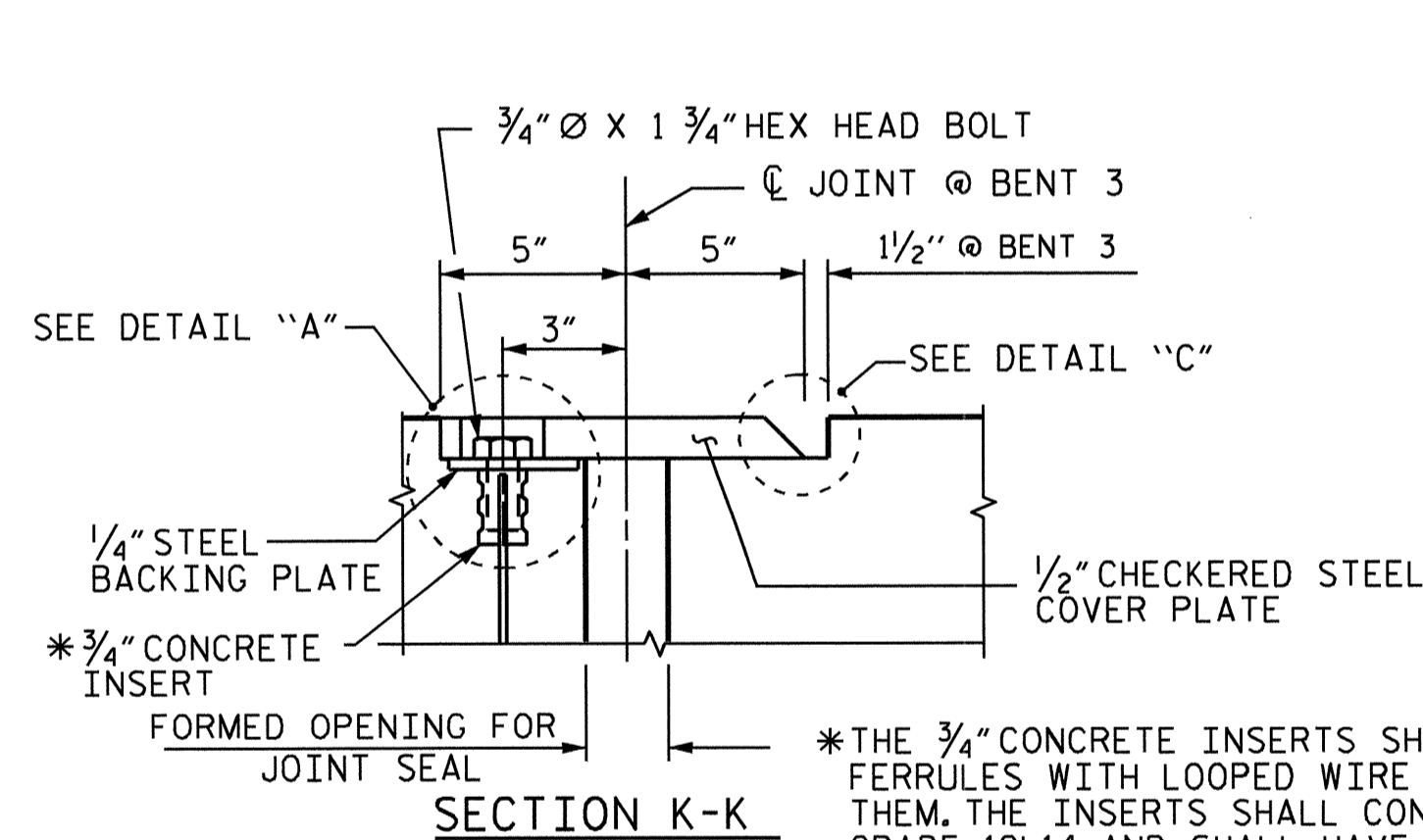
PLAN VIEW AT SIDEWALK
JOINT SEAL DETAILS @ BENT 3



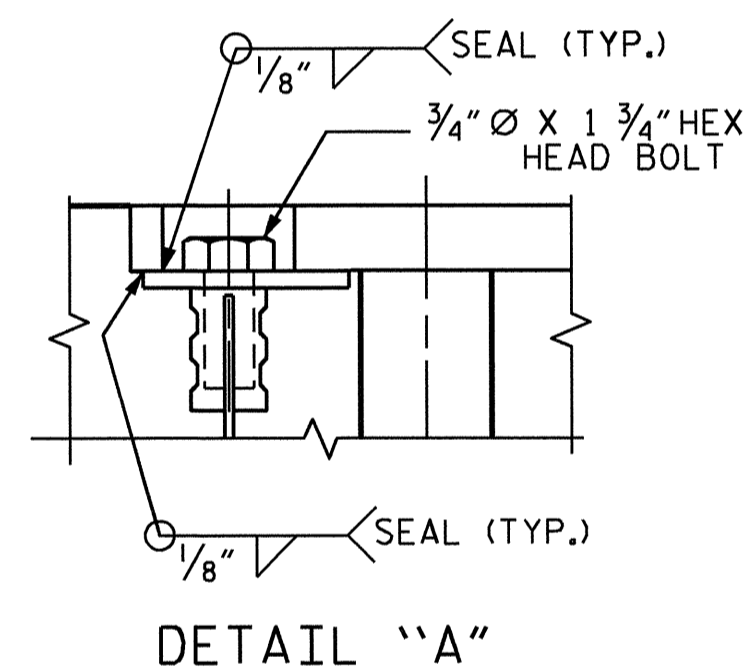
SECTION I-I



SECTION C-C
FOAM JOINT SEAL
(EXPANSION)

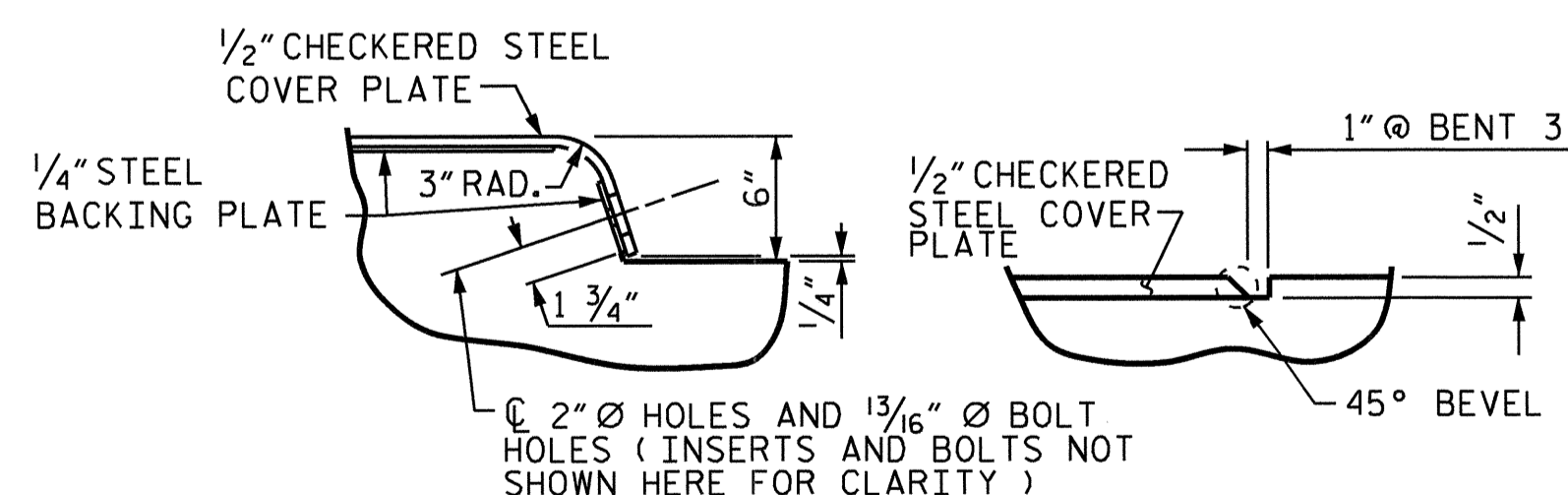


SECTION K-K



DETAIL "A"

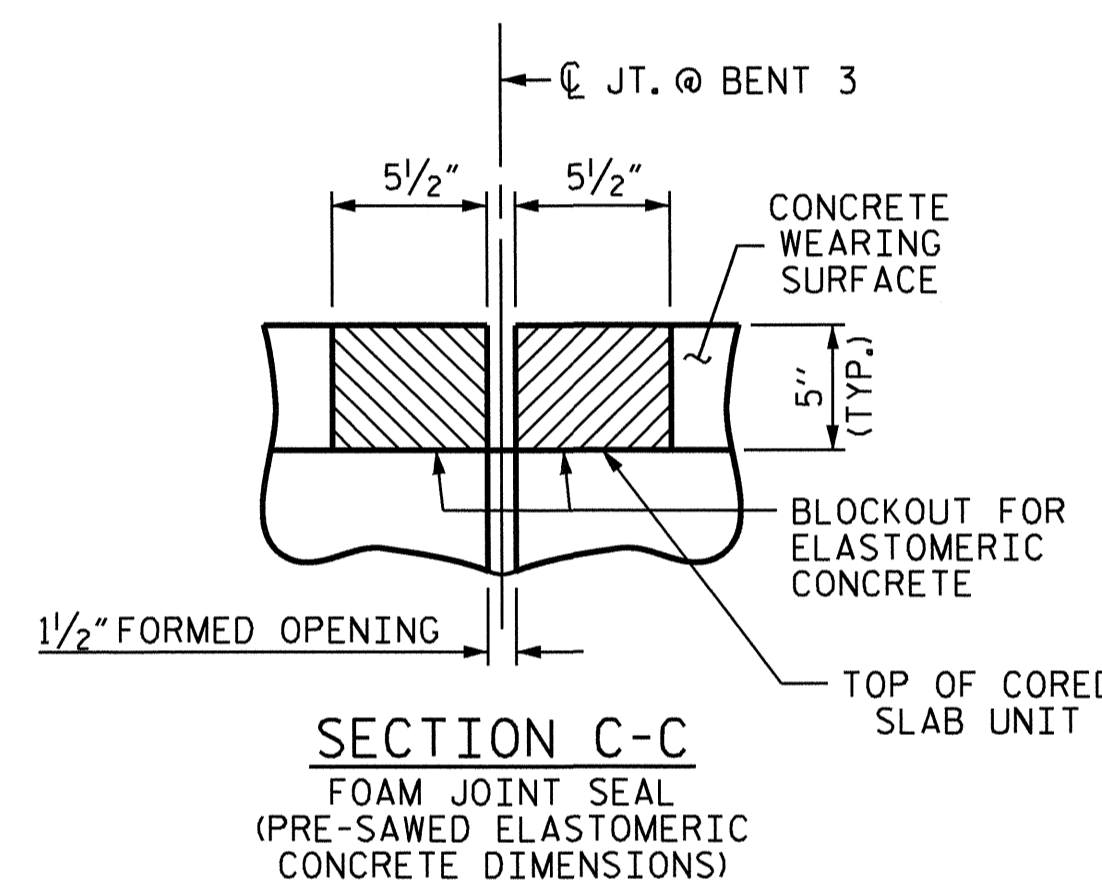
* THE 3/4" CONCRETE INSERTS SHALL BE CLOSED-END FERRULES WITH LOOPED WIRE STRUTS ATTACHED TO THEM. THE INSERTS SHALL CONFORM TO AASHTO M169, GRADE 12L14 AND SHALL HAVE A TENSILE WORKING LOAD CAPACITY OF 3000 LBS.



DETAIL "B"

DETAIL "C"

JOINT SEAL DETAILS @ BENT 3



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

ELASTOMERIC CONCRETE	
BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
BENT 3	28.3
TOTAL	28.3

* BASED ON THE MINIMUM BLOCKOUT SHOWN.

PROJECT NO. U-3331
NASH COUNTY
STATION: 32+18.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

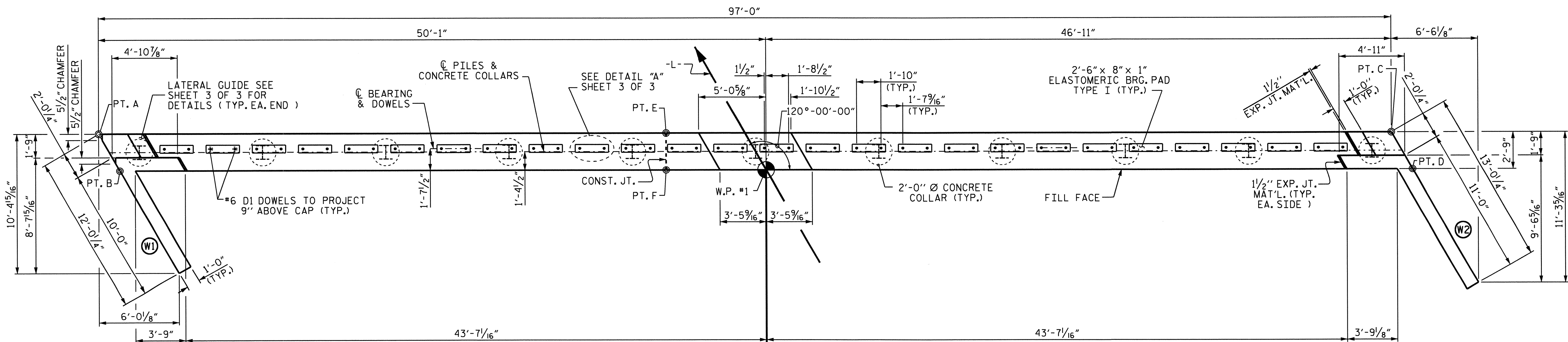
STANDARD
FOAM JOINT SEAL
@ BENT 3



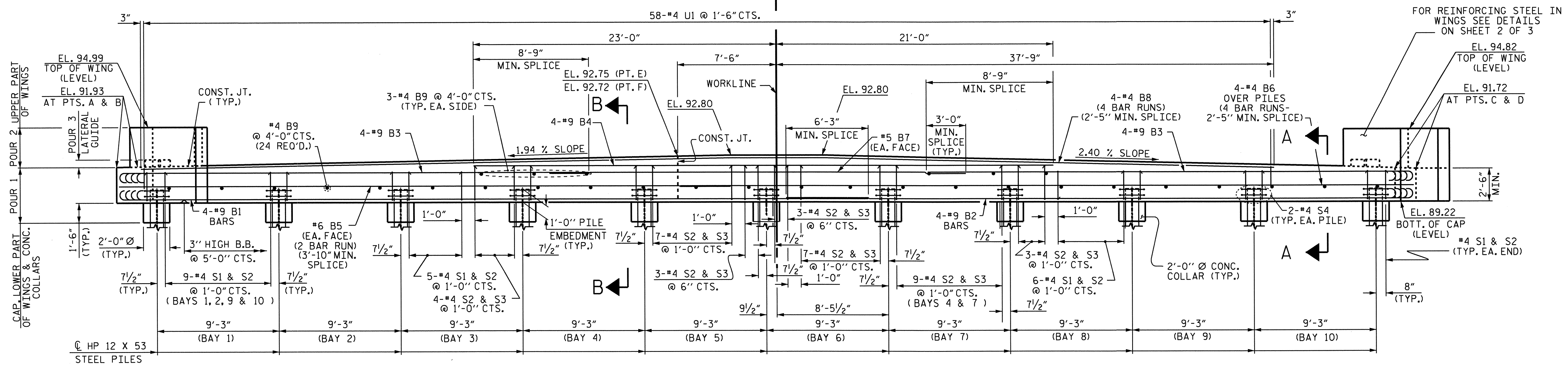
Handwritten signature and date: 4/17/14

ASSEMBLED BY : M.M. AHMED	DATE : 1-24-13
CHECKED BY : M.L. RORIE, P.E.	DATE : 1-24-14
DESIGN ENGINEER OF RECORD : M.M. AHMED	DATE : 3-7-14
DRAWN BY : FCJ 11/88	REV. 10/17/00 RWW/LES
CHECKED BY : ARB 11/88	REV. 5/7/03 RWW/JTE
	REV. 5/1/06R MAA/KMM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS 34
2			4			



PLAN



ELEVATION

NOTES

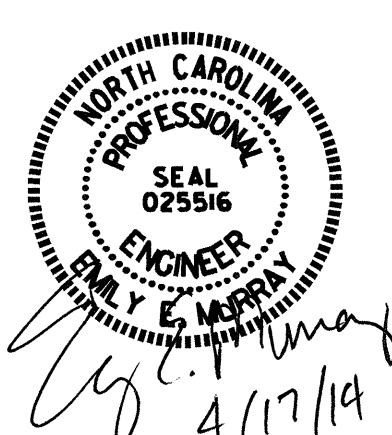
- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.
- THE LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.
- FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.
- FOR WING DETAILS, SEE SHEET 2 OF 3.
- THE CONTRACTOR HAS THE OPTION TO OMIT THE LATERAL GUIDE IF APPROVED BY THE ENGINEER.

PROJECT NO. U-3331
 NASH COUNTY
 STATION: 32+18.50 -L-

SHEET 1 OF 3

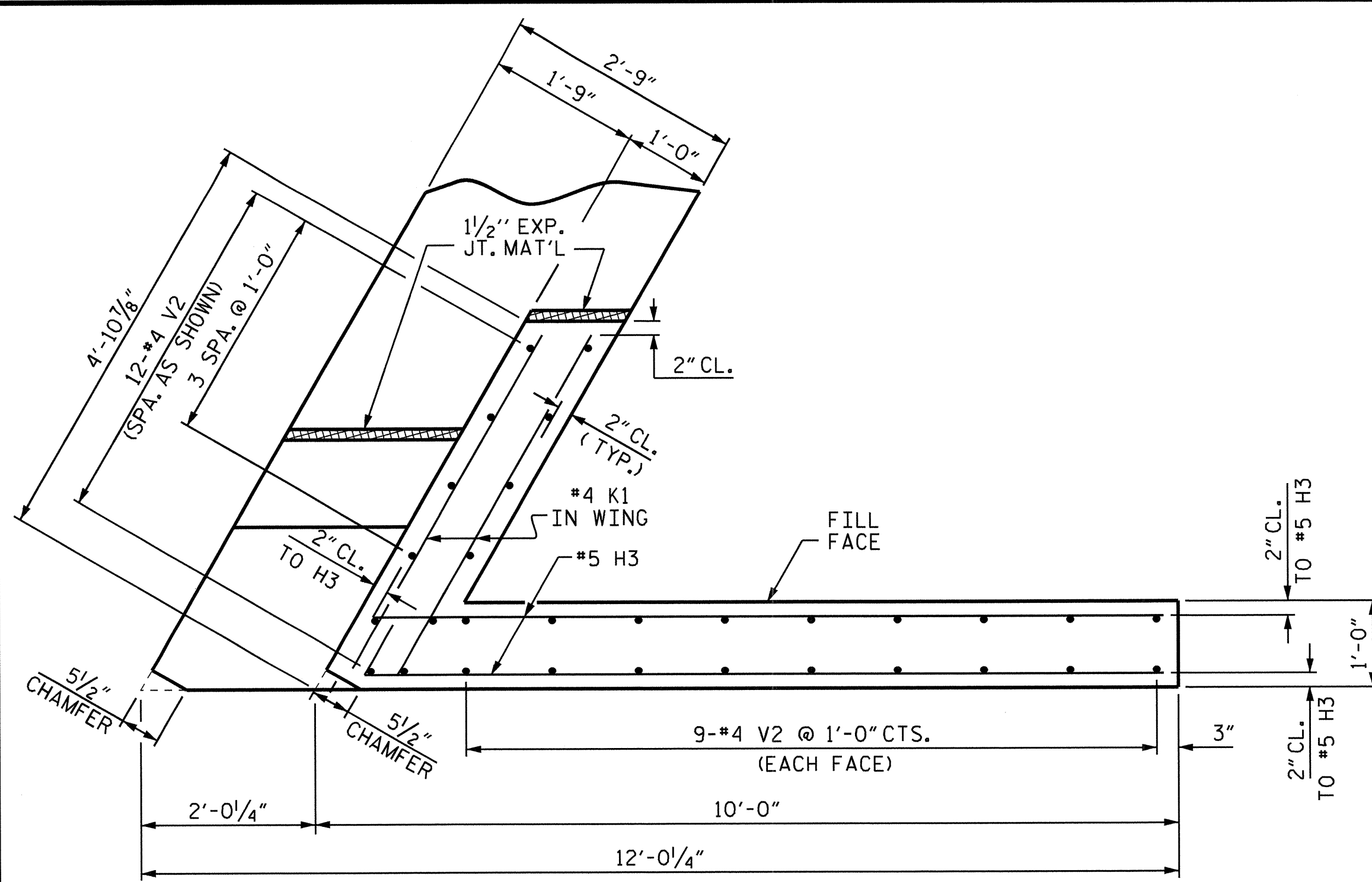
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 END BENT 1**

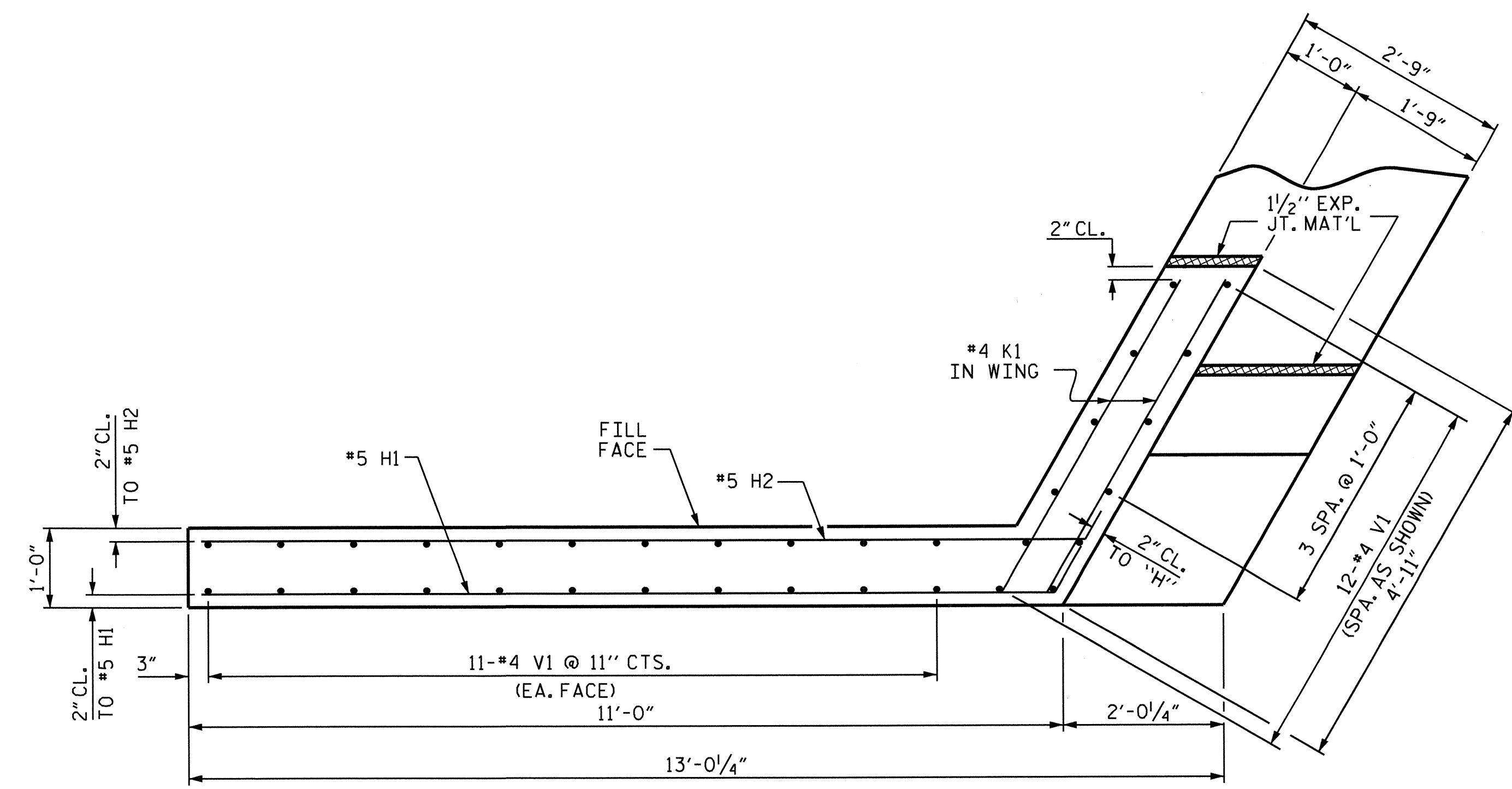


DRAWN BY : M.M. AHMED DATE : 2/5/14
 CHECKED BY : M.L. RORIE, P.E. DATE : 2/5/14
 DESIGN ENGINEER OF RECORD: K.P. SEDAI, P.E. DATE : -

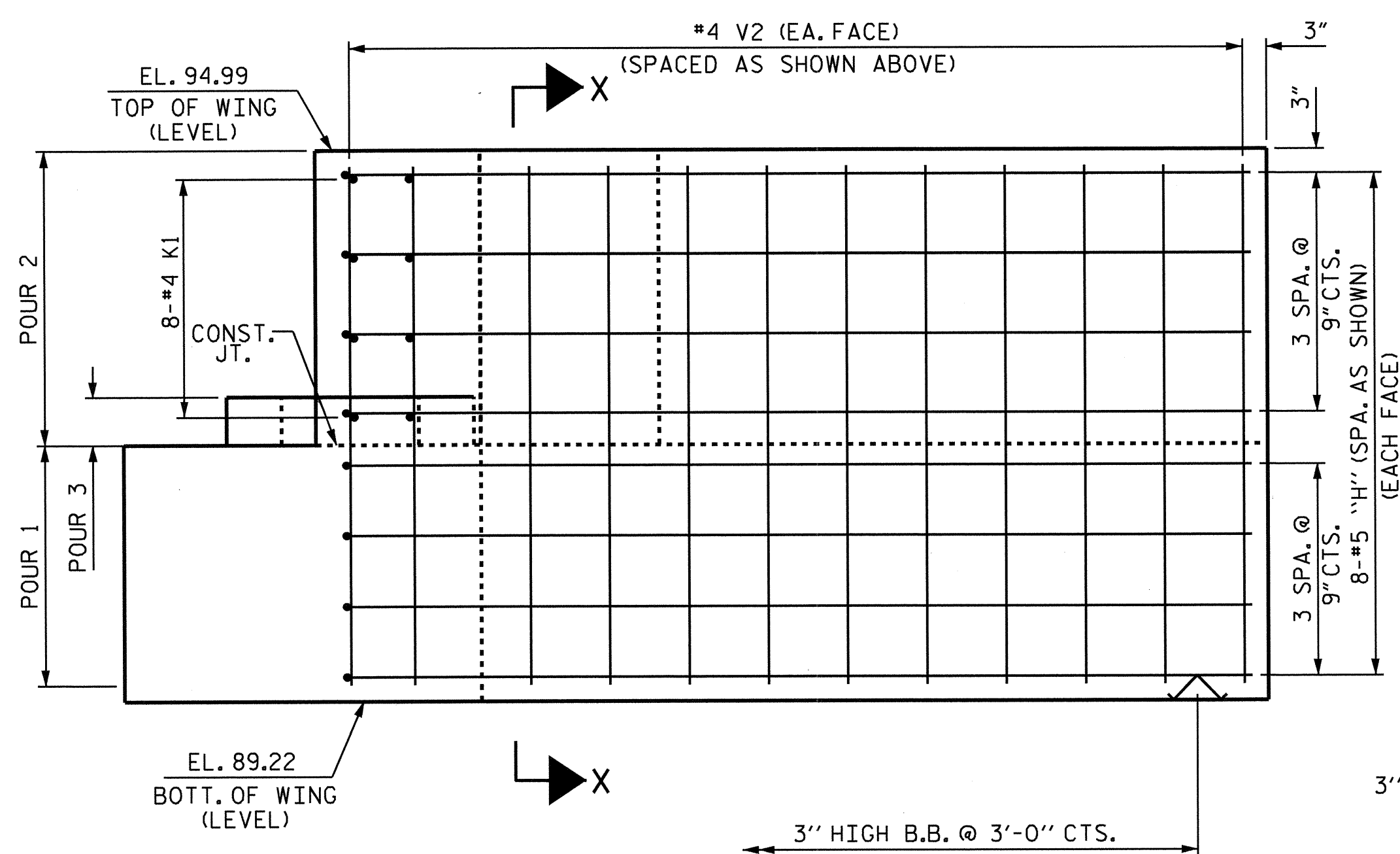
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18	
1			3			TOTAL SHEETS	
2			4			34	



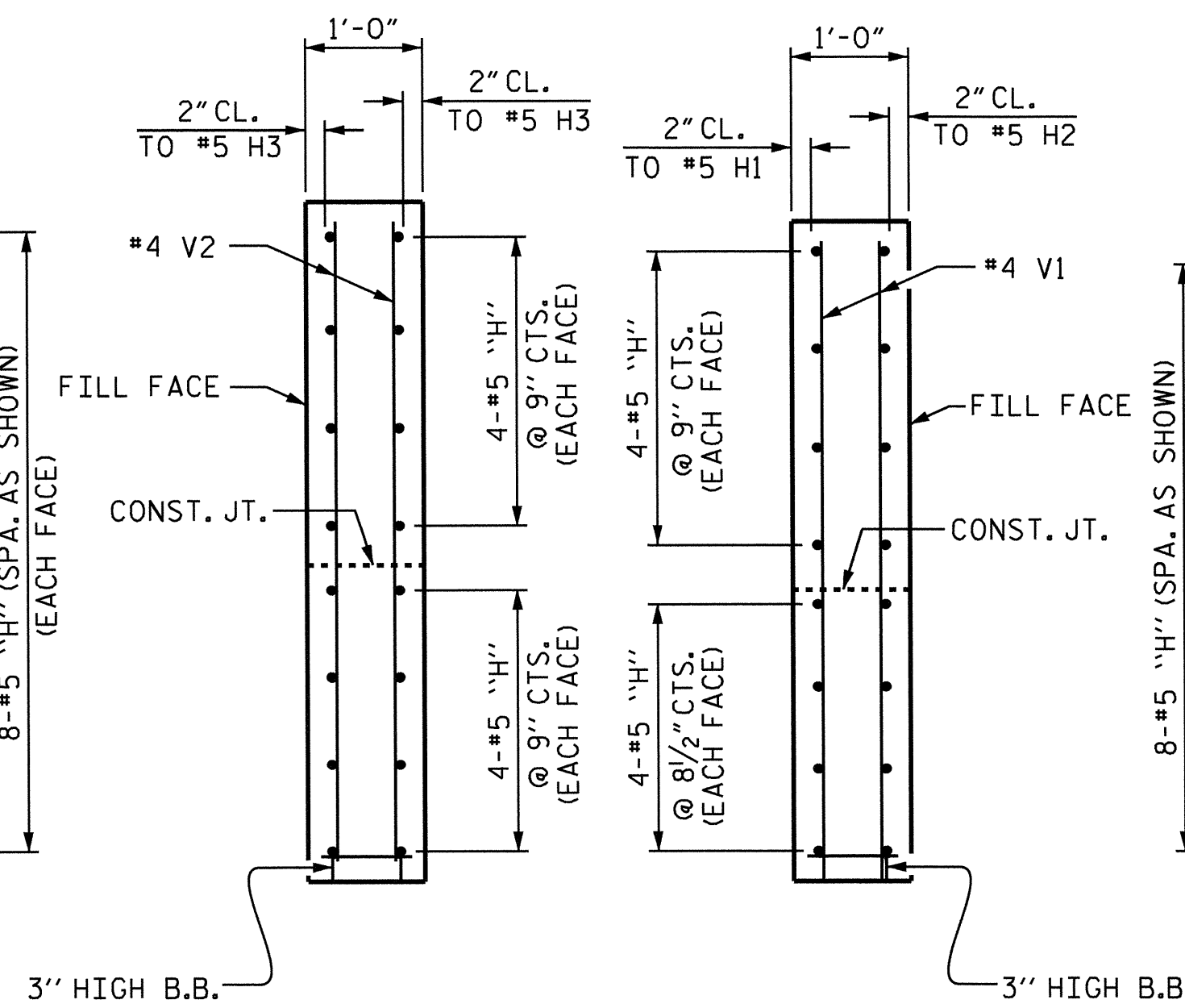
PLAN OF WING - W1



PLAN OF WING - W2

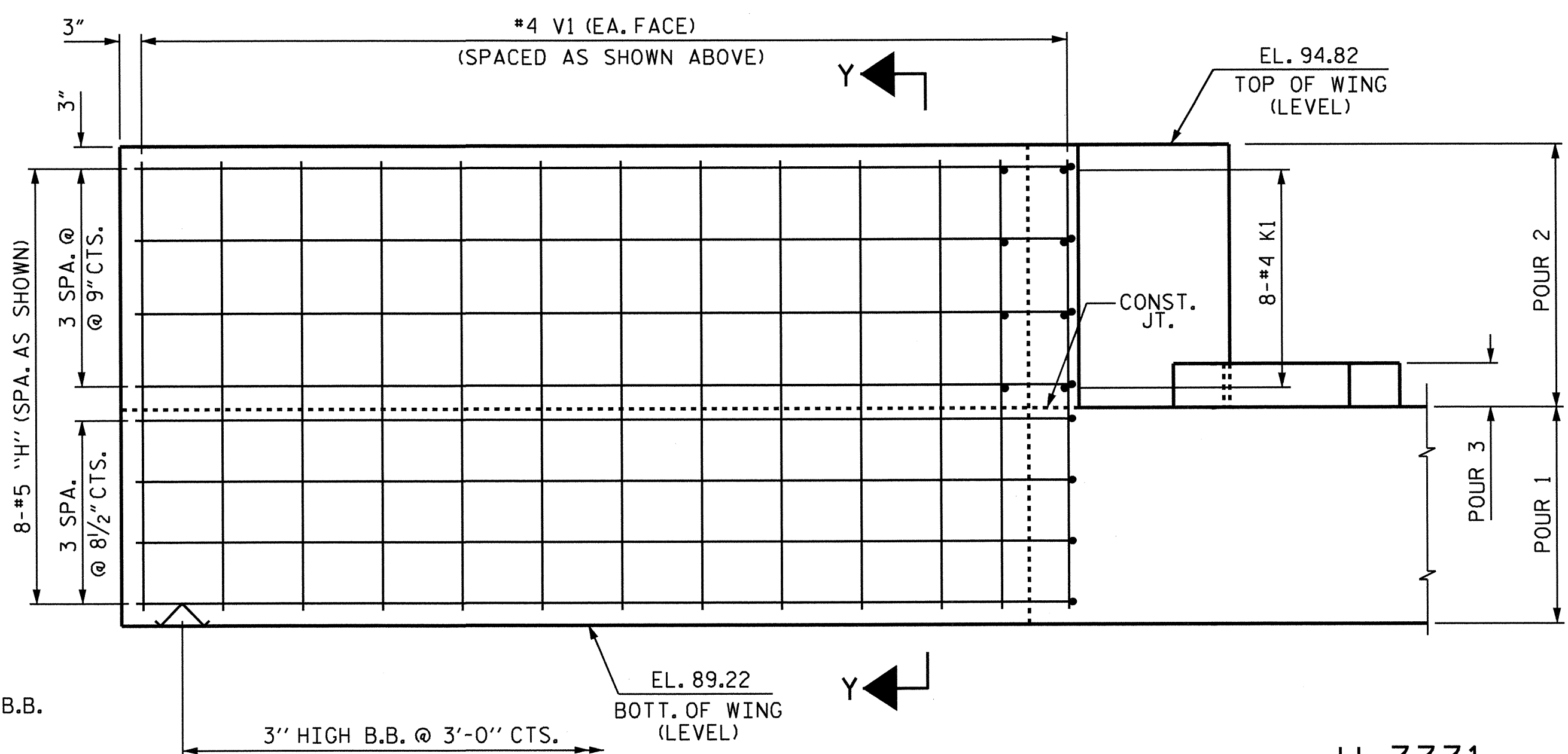


ELEVATION OF WING - W1



SECTION X-X

SECTION Y-Y



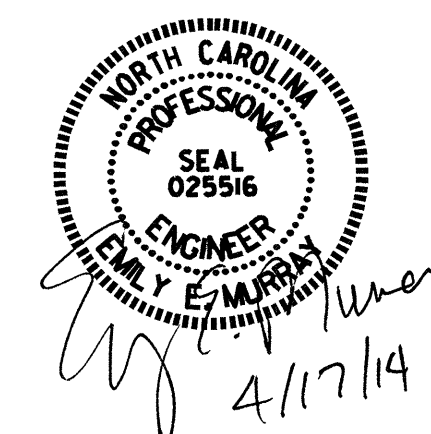
ELEVATION OF WING - W2

PROJECT NO. U-3331
NASH COUNTY
 STATION: 32+18.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

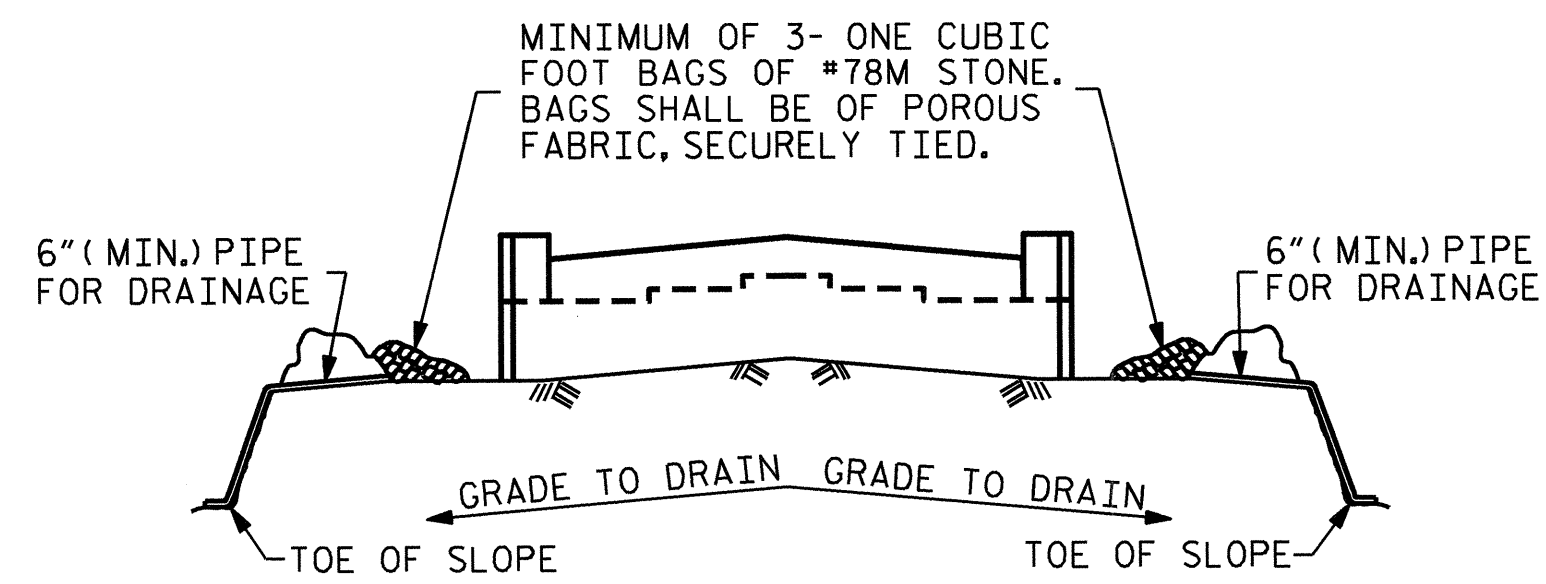
SUBSTRUCTURE
 END BENT 1



DRAWN BY: M.M. AHMED DATE: 11/7/13
 CHECKED BY: M.L. RORIE, P.E. DATE: 1/11/14
 DESIGN ENGINEER OF RECORD: K.P. SEDAI, P.E. DATE: -

17-APR-2014 14:09
 R:\Structures\Plans\Final Plans\U3331.SD.EB.dgn
 dgladden

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19	
1			3			TOTAL SHEETS	
2			4			34	

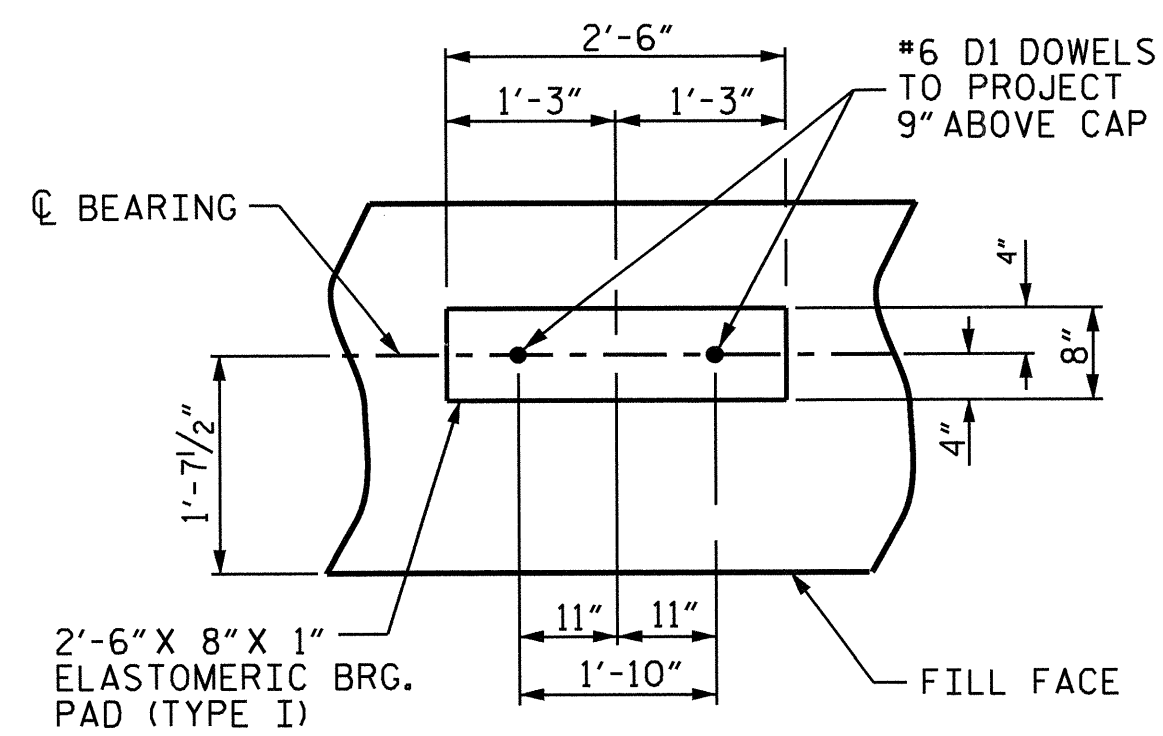


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

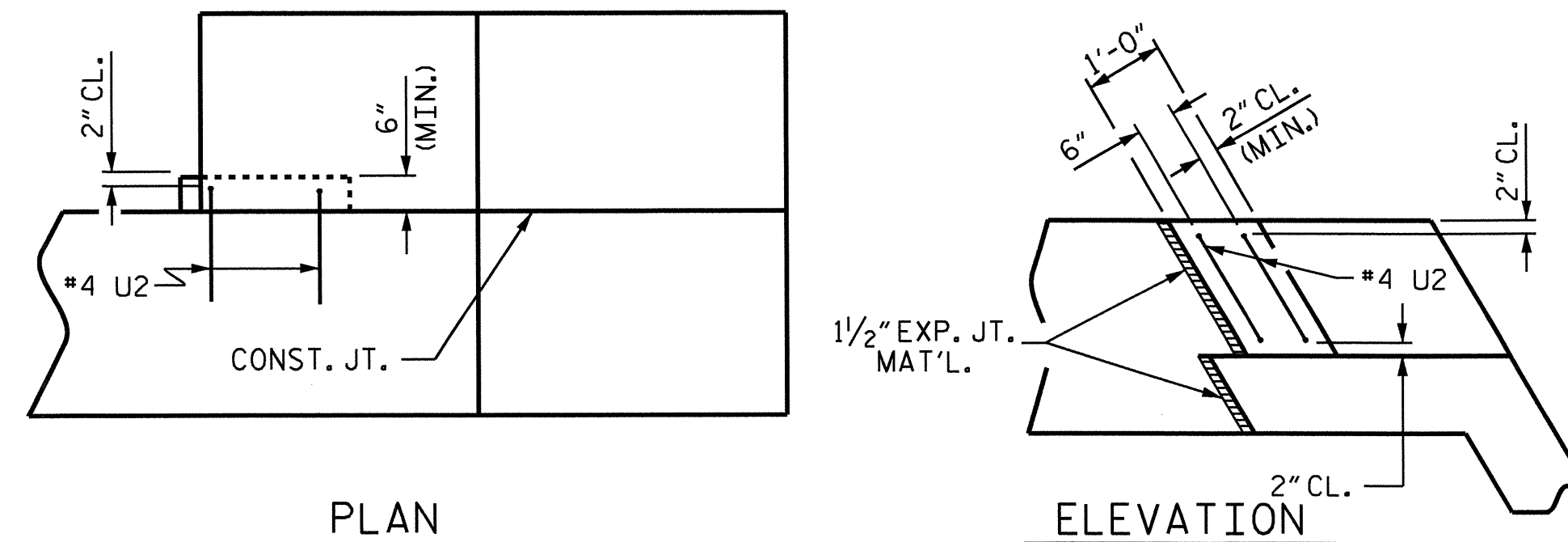
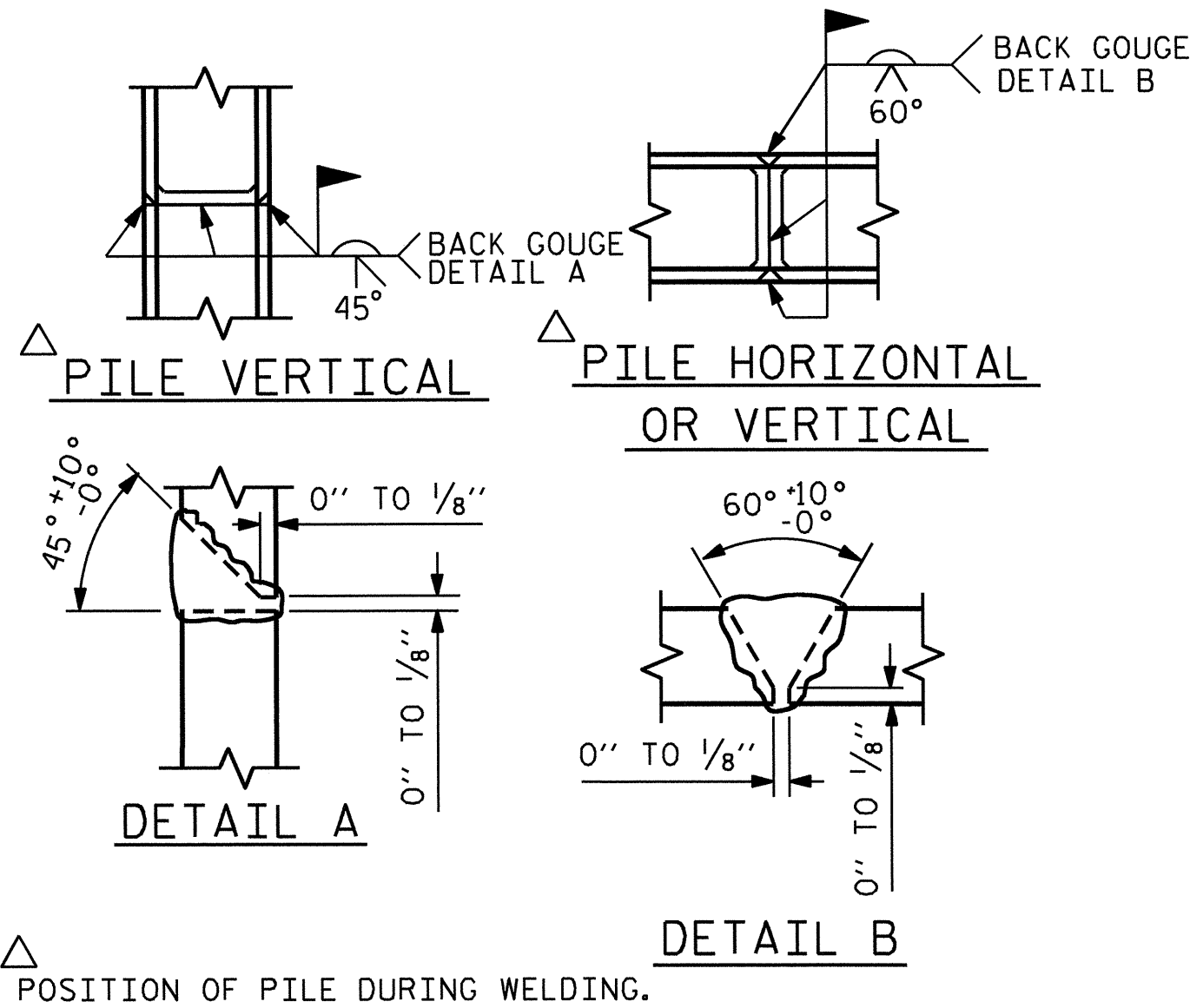
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

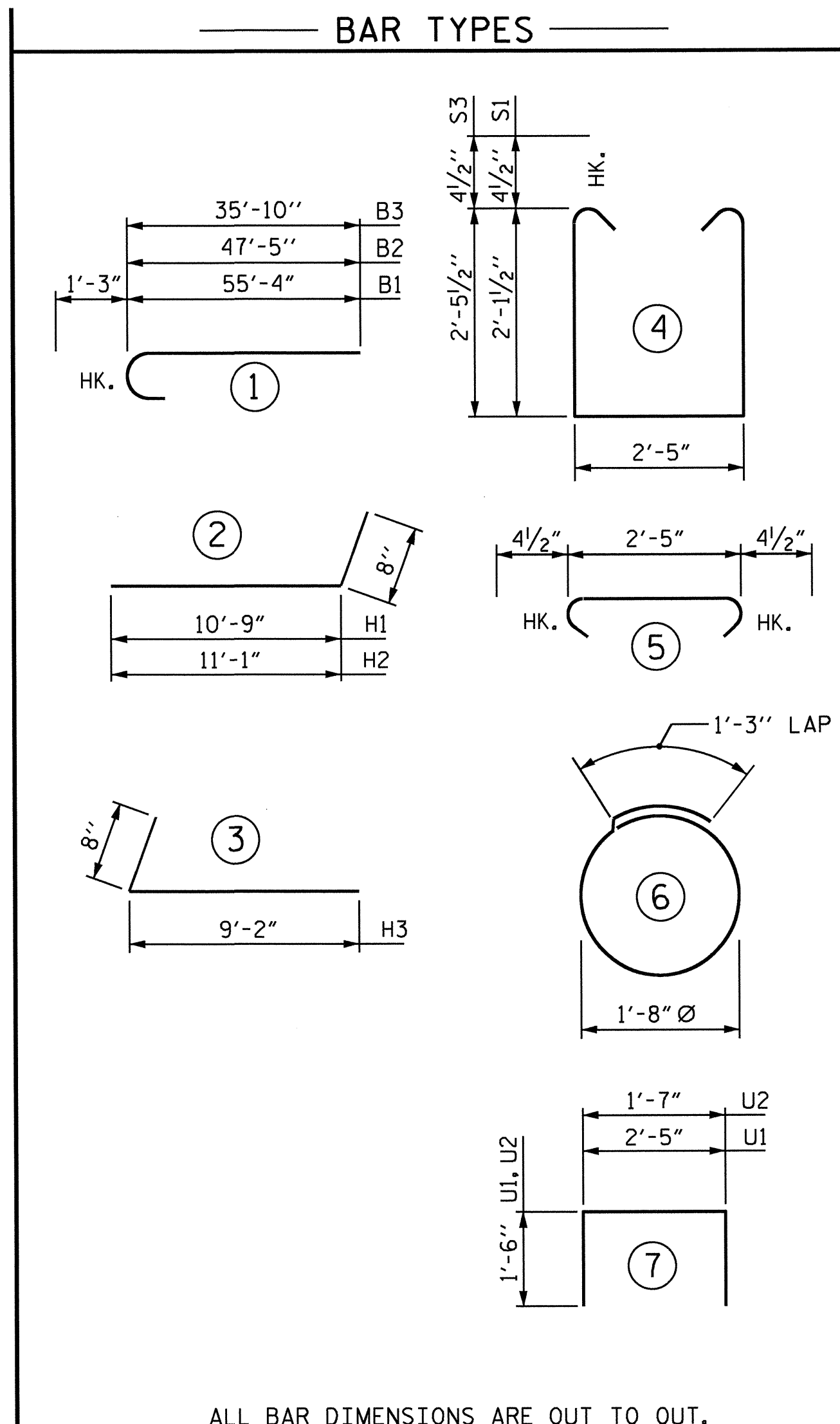
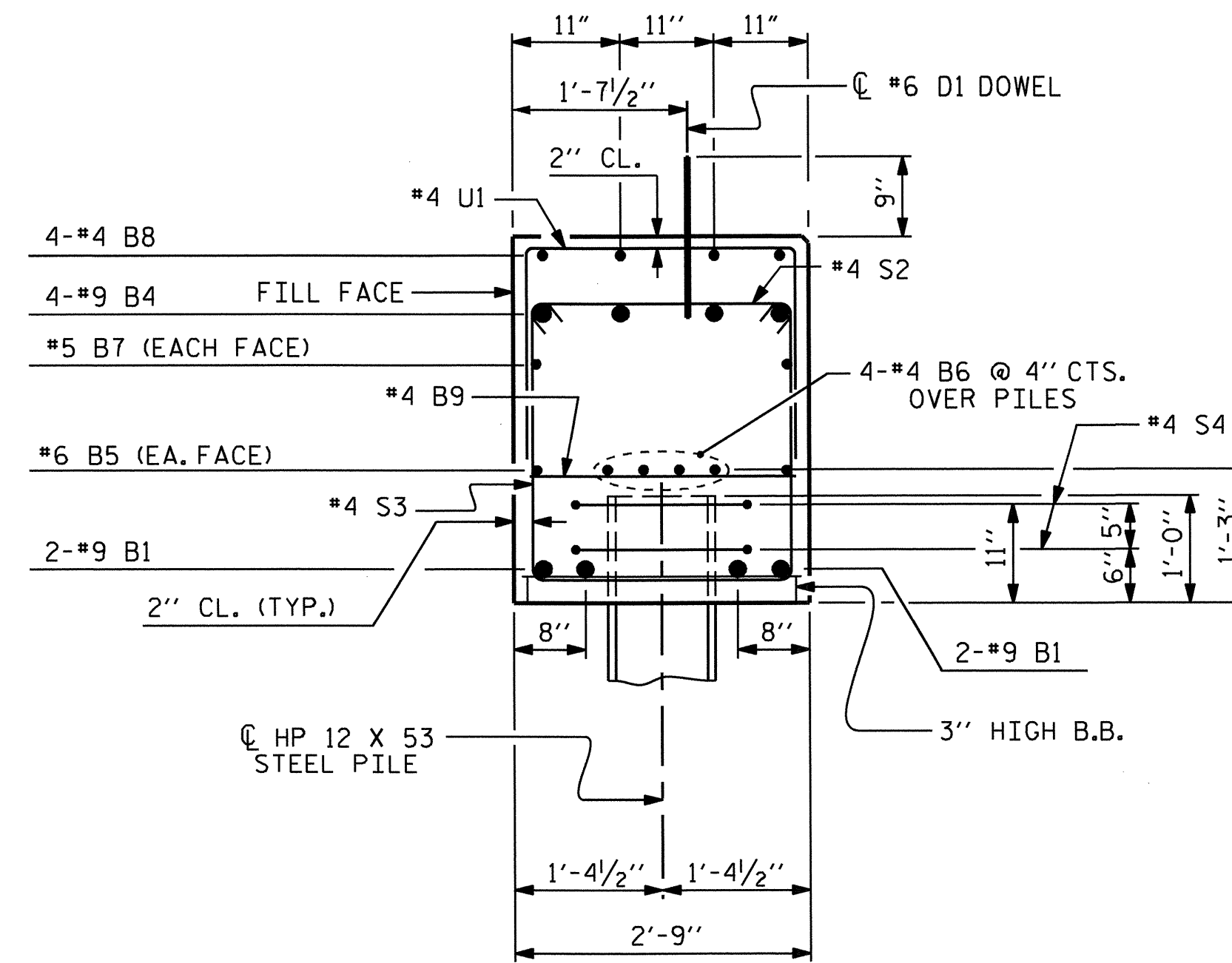
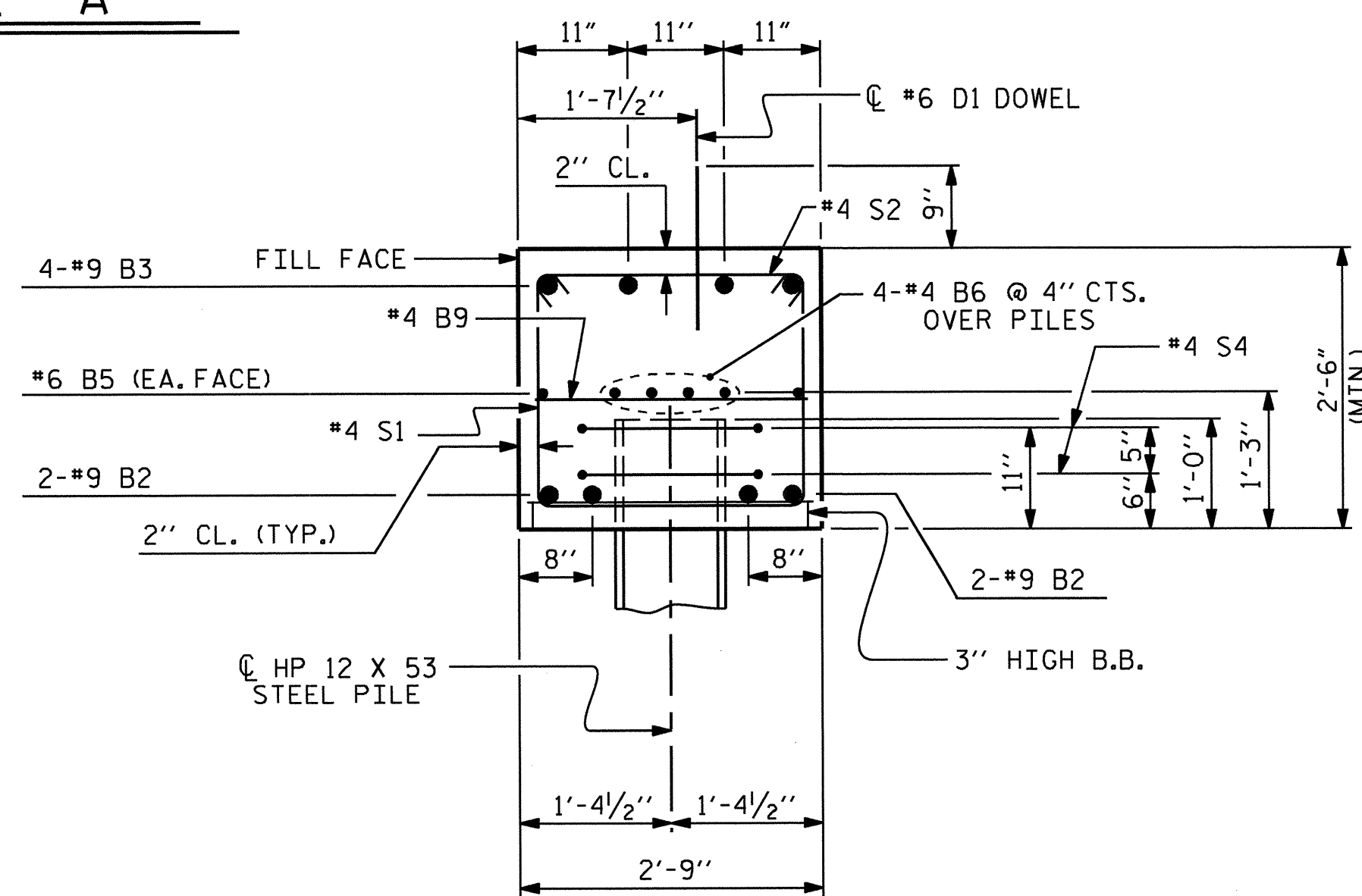


DETAIL "A"



LATERAL GUIDE DETAILS

(END BENT No. 1, RIGHT LATERAL GUIDE SHOWN, LEFT END SIMILAR)



BILL OF MATERIAL					
END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#9	1	56'-7"	770
B2	4	#9	1	48'-8"	662
B3	8	#9	1	37'-1"	1009
B4	4	#9	STR	44'-0"	598
B5	4	#6	STR	50'-3"	302
B6	16	#4	STR	26'-0"	278
B7	2	#5	STR	32'-6"	68
B8	16	#4	STR	23'-4"	249
B9	30	#4	STR	2'-5"	48
D1	52	#6	STR	1'-6"	117
H1	8	#5	2	11'-5"	95
H2	8	#5	2	11'-9"	98
H3	16	#5	3	9'-10"	164
K1	16	#4	STR	4'-6"	48
S1	49	#4	4	7'-5"	243
S2	94	#4	5	3'-2"	199
S3	45	#4	4	8'-1"	243
S4	22	#4	6	6'-6"	96
U1	58	#4	7	5'-5"	210
U2	4	#4	7	4'-7"	12
V1	34	#4	STR	5'-3"	119
V2	30	#4	STR	5'-5"	109
REINFORCING STEEL					5737 LBS.
CLASS A CONCRETE BREAKDOWN					
POUR 1 (CAP, CONCRETE COLLARS & LOWER PART OF WING)					34.6 C.Y.
POUR 2 (UPPER PART OF WING)					3.2 C.Y.
POUR 3 (LATERAL GUIDES)					0.1 C.Y.
TOTAL CLASS A CONCRETE					37.9 C.Y.
END BENT No. 1					
HP 12 X 53 STEEL PILES					
NO: 11				165 LIN. FT.	
STEEL PILE POINTS 11 EA.					

PROJECT NO. U-3331

NASH COUNTY

STATION: 32+18.50 -L-

SHEET 3 OF 3

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

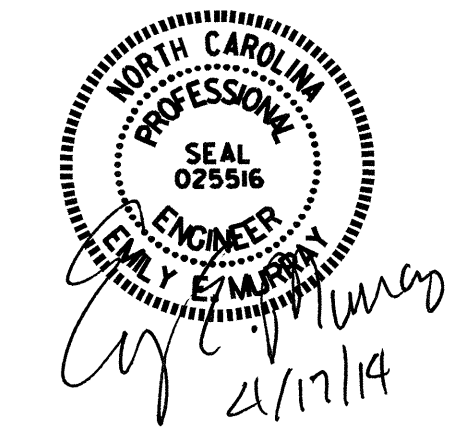
SHEET NO. S-20

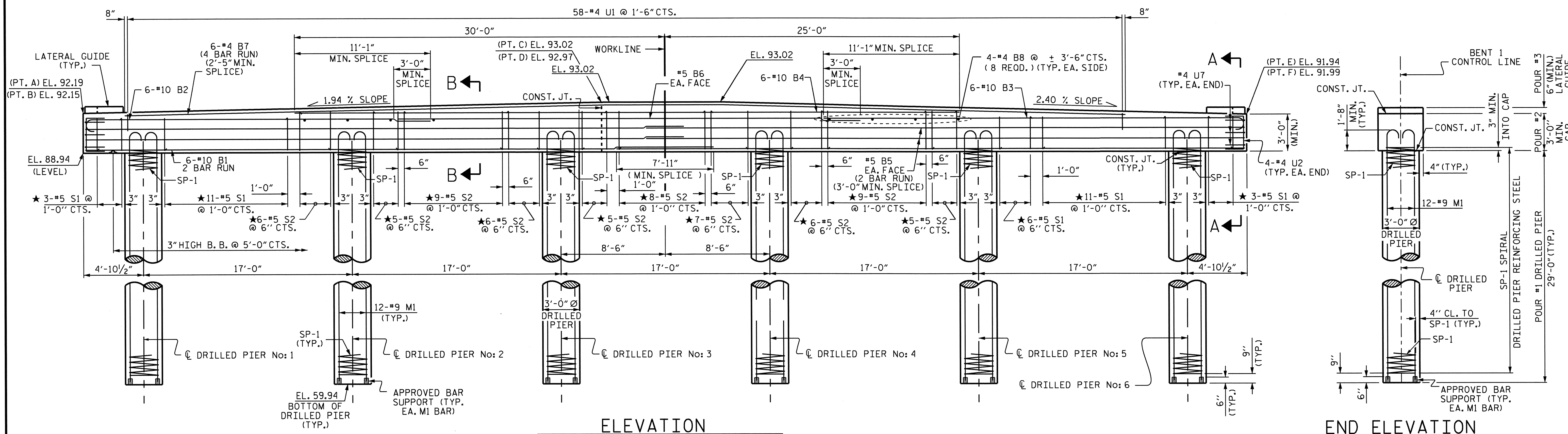
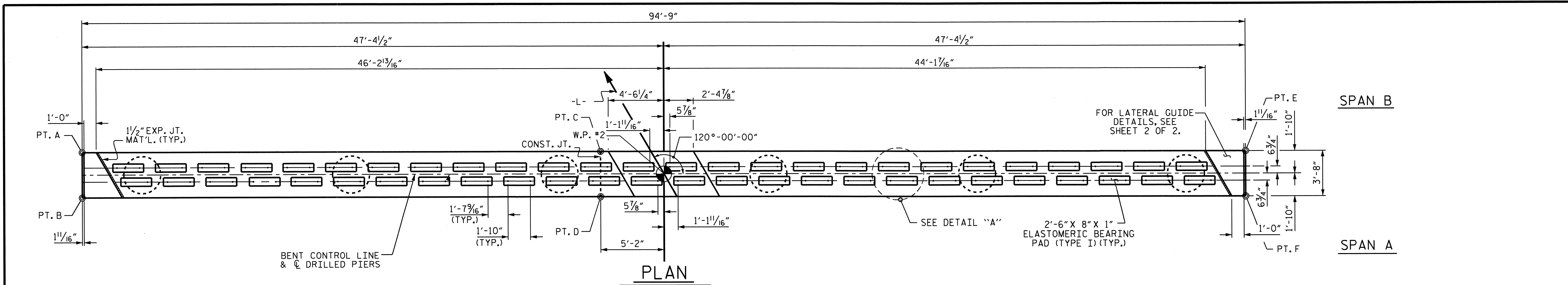
TOTAL SHEETS 34

DRAWN BY: M.M. AHMED DATE: 11/7/13

CHECKED BY: M.L. RORIE, P.E. DATE: 2/11/14

DESIGN ENGINEER OF RECORD: K.P. SEDAI, P.E. DATE: -





NOTES

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

HOOKS ON M1 BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

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

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

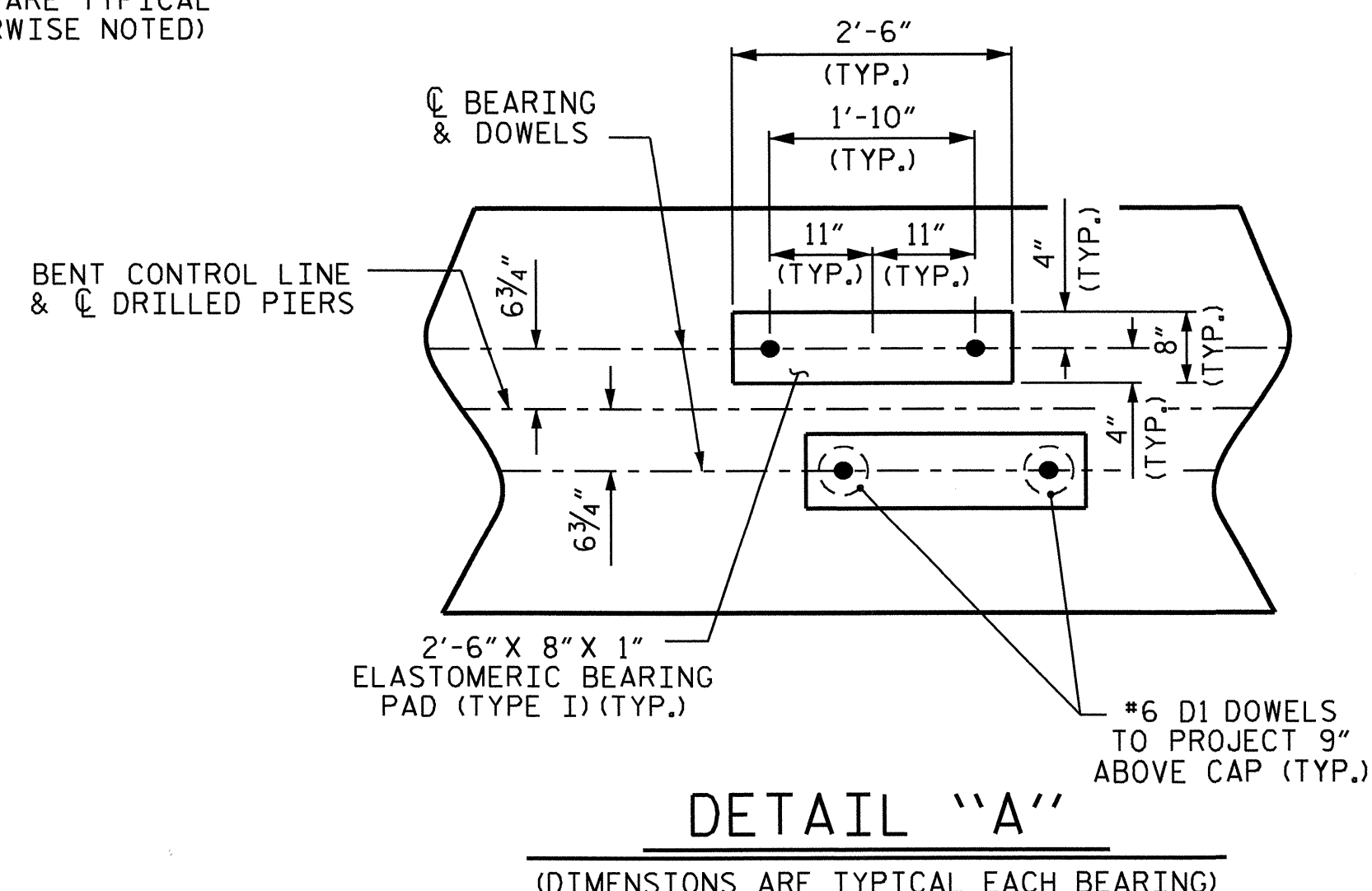
THE LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.

★ INVERT ALTERNATE STIRRUPS.

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

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

DRAWN BY: M.M. AHMED DATE: 11/21/13
 CHECKED BY: M.L. RORIE, P.E. DATE: 1/31/14
 DESIGN ENGINEER OF RECORD: K.P. SEDA, P.E. DATE: -



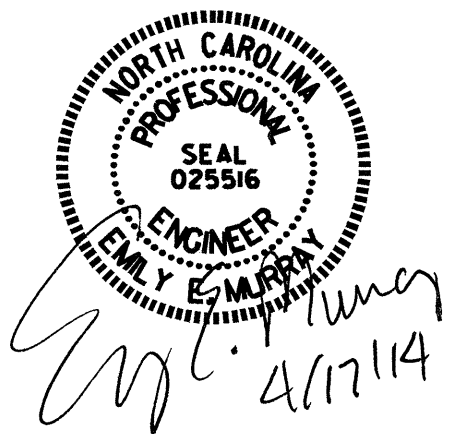
PROJECT NO. U-3331
 NASH COUNTY
 STATION: 32+18.50 -L-
 SHEET 1 OF 2

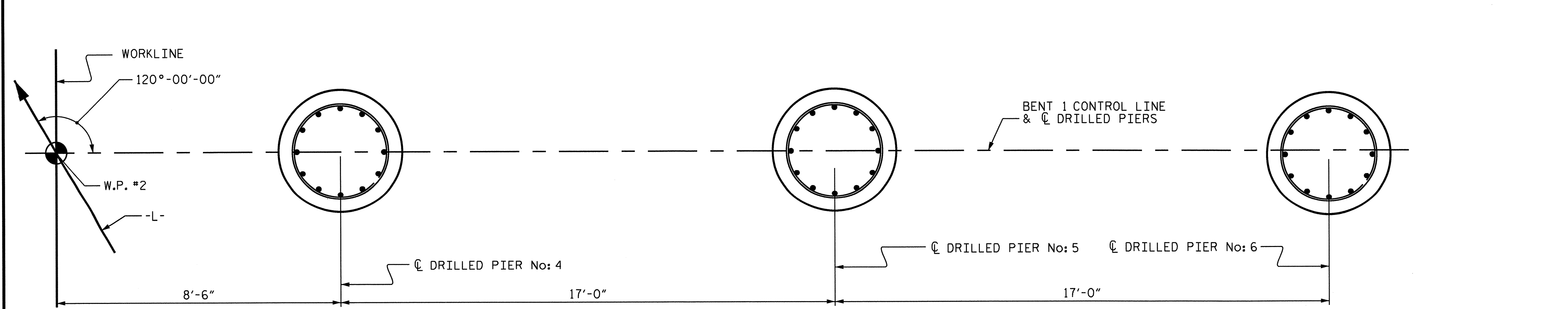
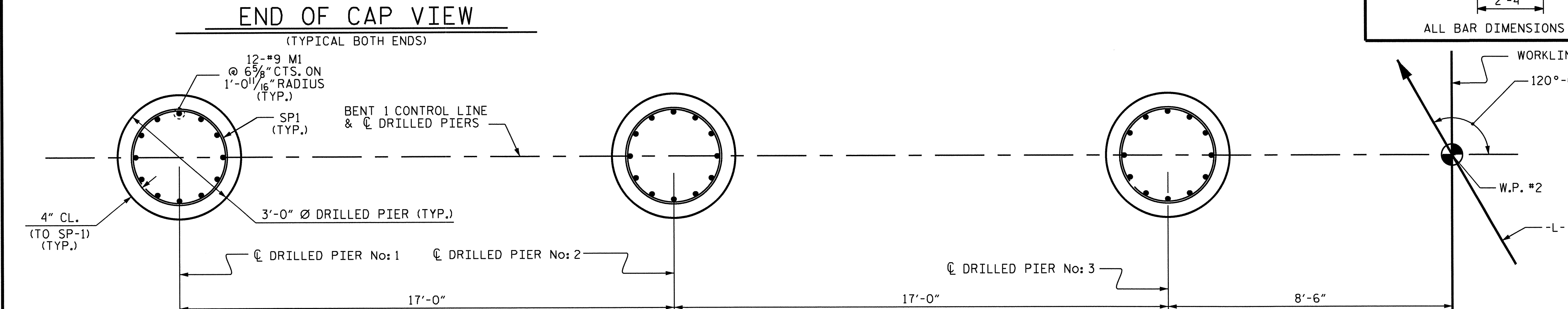
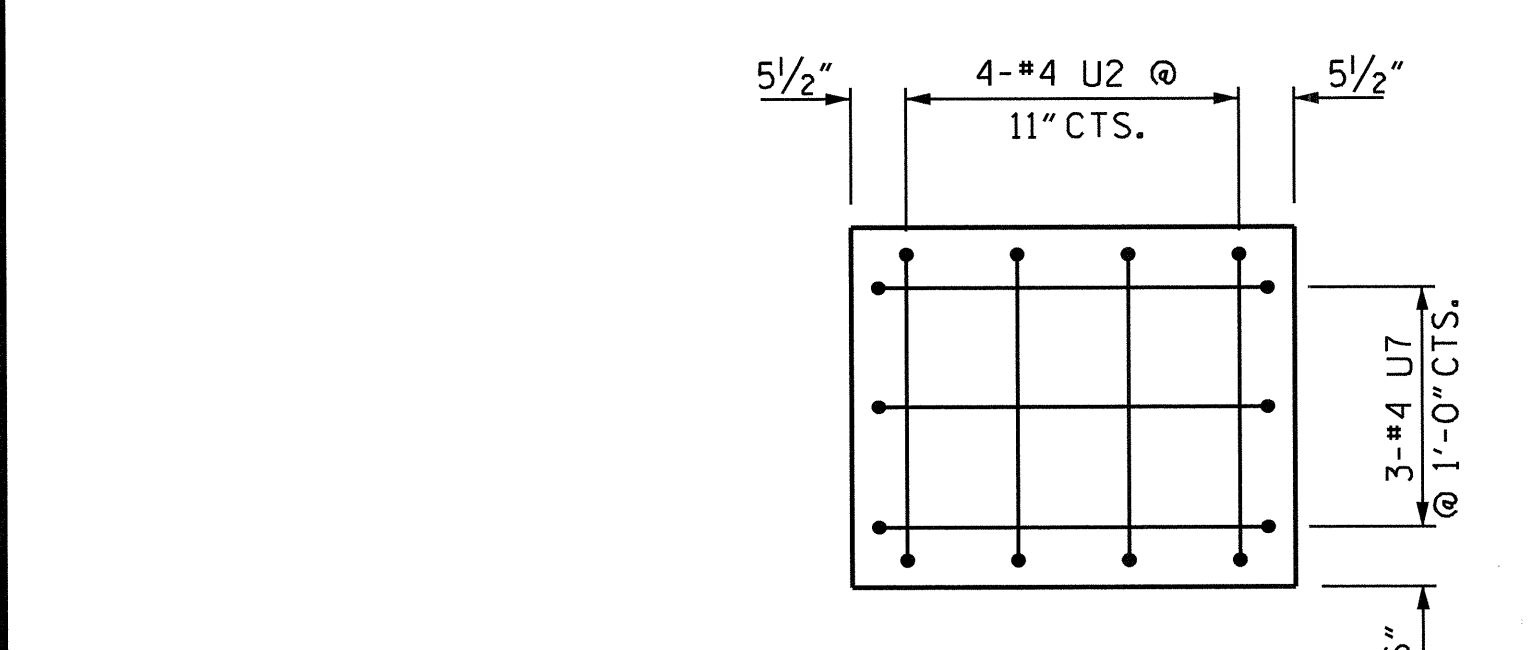
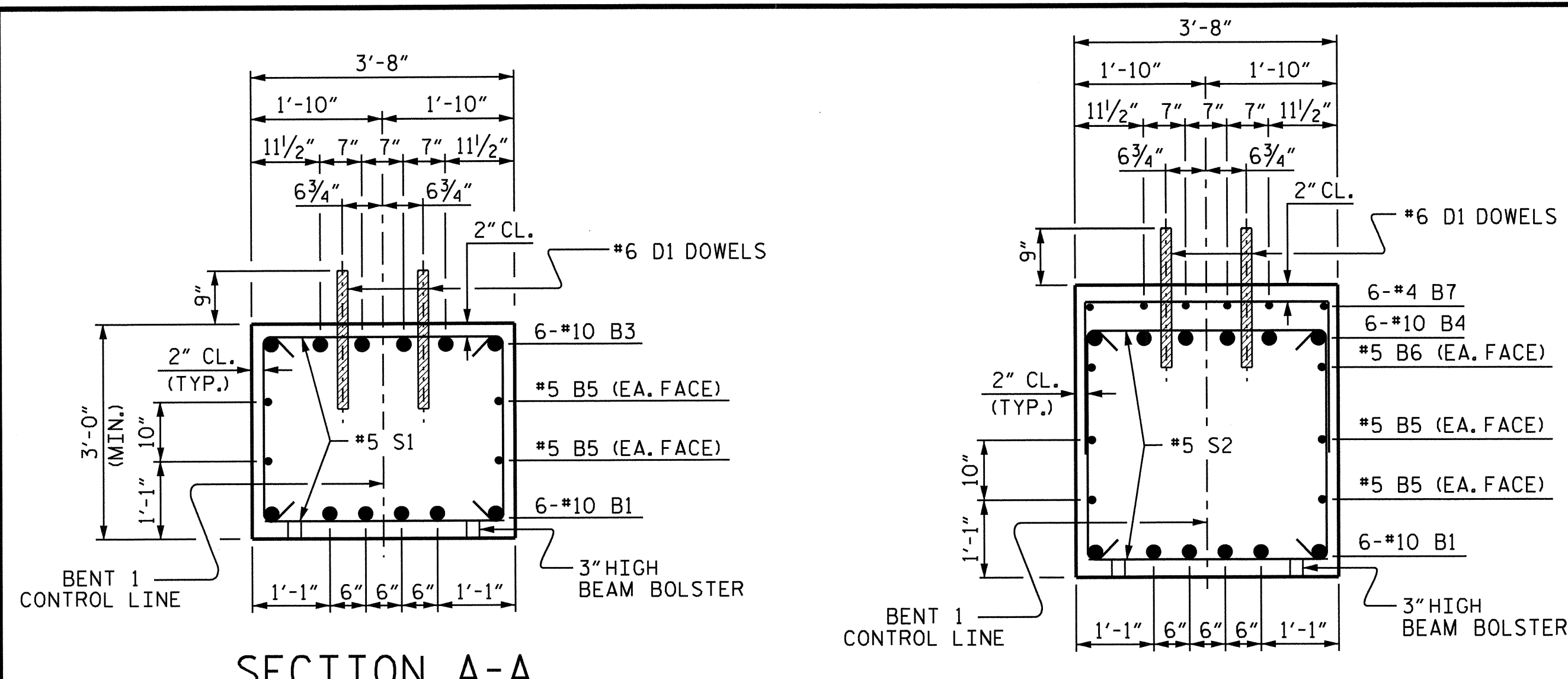
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE BENT 1

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

SHEET NO. S-21
 TOTAL SHEETS 34





BILL OF MATERIAL					
BENT 1					
BAR	NO	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#10	STR	51'-2"	2642
B2	6	#10	1	29'-8"	766
B3	6	#10	1	34'-8"	895
B4	6	#10	STR	55'-0"	1420
B5	8	#5	STR	48'-9"	407
B6	2	#5	STR	39'-0"	81
B7	24	#4	STR	23'-7"	378
B8	10	#4	STR	3'-4"	22
B9	2	#4	STR	3'-10"	5
D1	104	#6	STR	1'-6"	234
M1	72	#9	1	34'-5"	8425
S1	34	#5	2	9'-6"	337
S2	66	#5	2	10'-7"	729
U1	58	#4	3	6'-4"	245
U2	8	#4	3	5'-6"	29
U3	2	#4	3	3'-7"	5
U4	2	#4	3	4'-2"	6
U5	2	#4	3	4'-9"	6
U6	2	#4	3	5'-4"	7
U7	6	#4	3	6'-2"	25

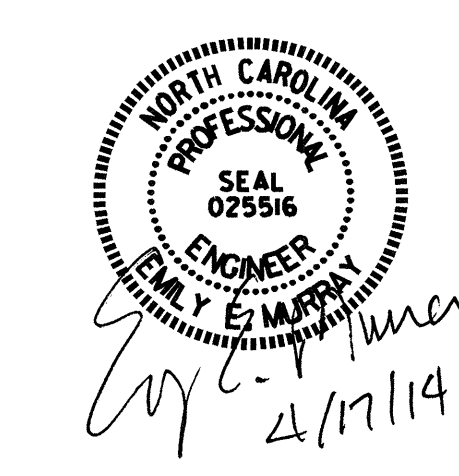
REINFORCING STEEL	LBS.	16,664
SP-1	6 * 4	512'-7" 3208
SPIRAL COLUMN REINFORCING STEEL		LBS. 3208
CLASS A CONCRETE BREAKDOWN		
POUR #2 (CAP)	C.Y.	46.7
POUR #3 (LATERAL GUIDES)	C.Y.	0.3
TOTAL CLASS A CONCRETE		C.Y. 47.0
DRILLED PIERS		
DRILLED PIER CONCRETE		
POUR #1 (DRILLED PIERS)	C.Y.	45.6
3'-0" Ø DRILLED PIERS IN SOIL: 102.0 LIN. FT.		
3'-0" Ø DRILLED PIERS NOT IN SOIL: 72.0 LIN. FT.		
PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIER 72.0 LIN. FT.		
CSL TUBES		732.0 LIN. FT.

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

PROJECT NO. U-3331
NASH COUNTY
 STATION: 32+18.50 -L-
 SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 BENT 1**

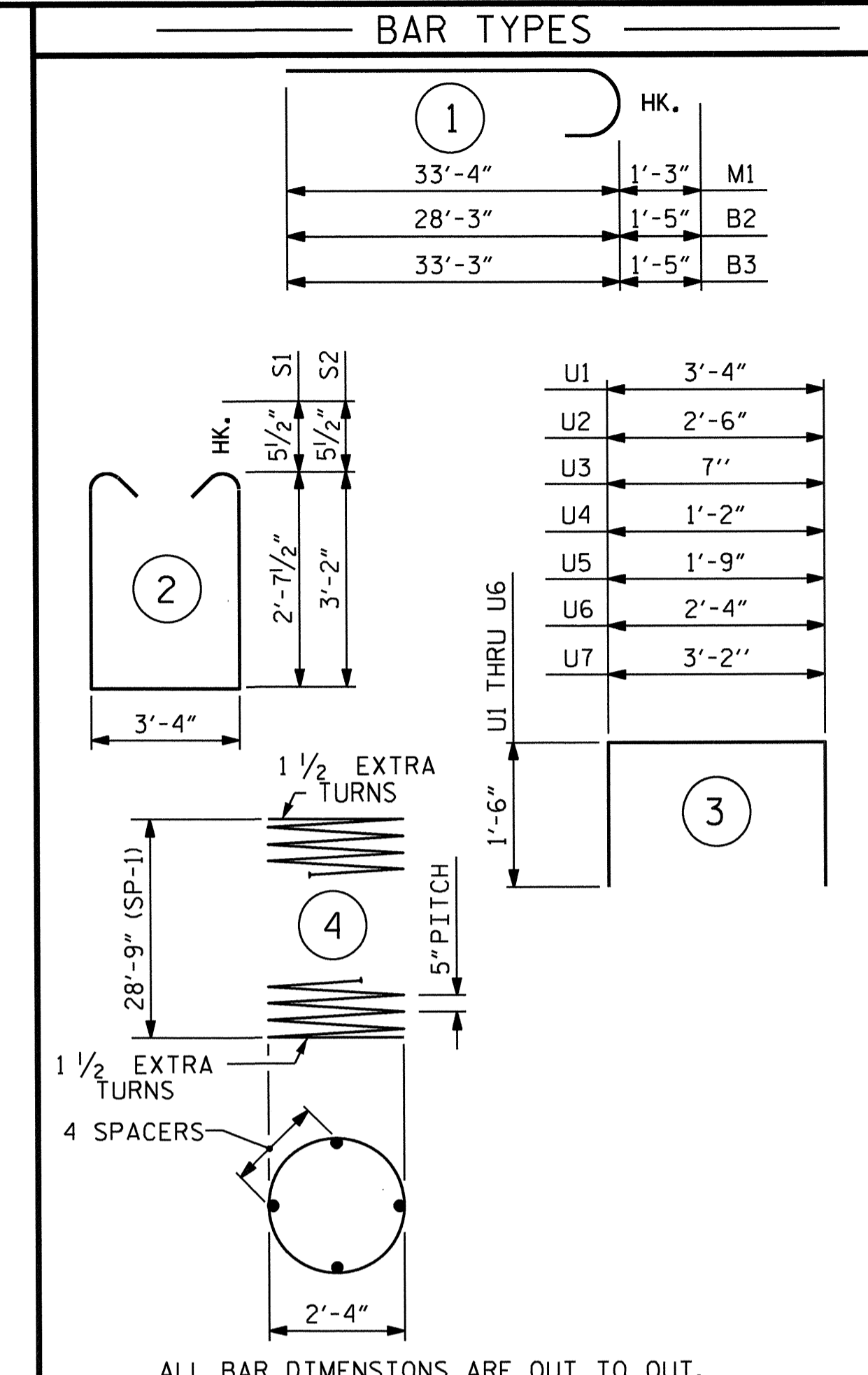
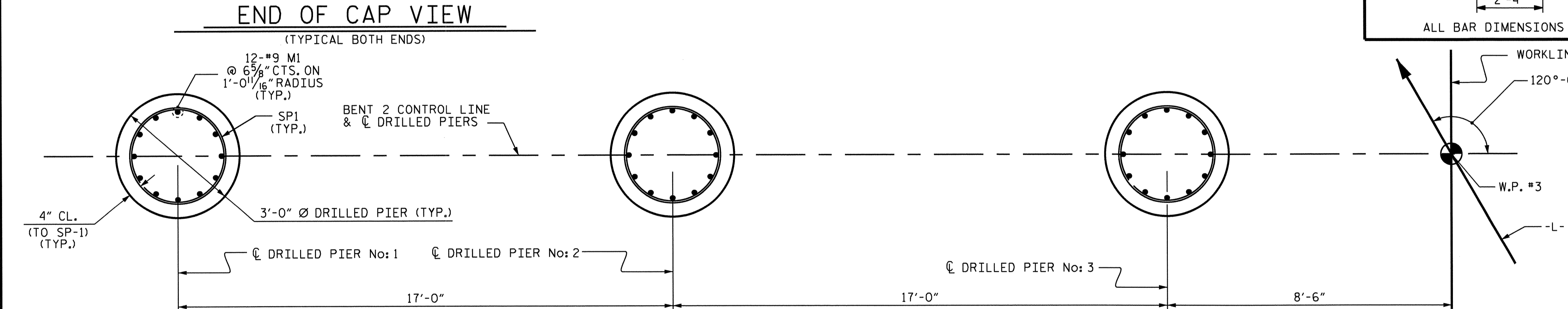
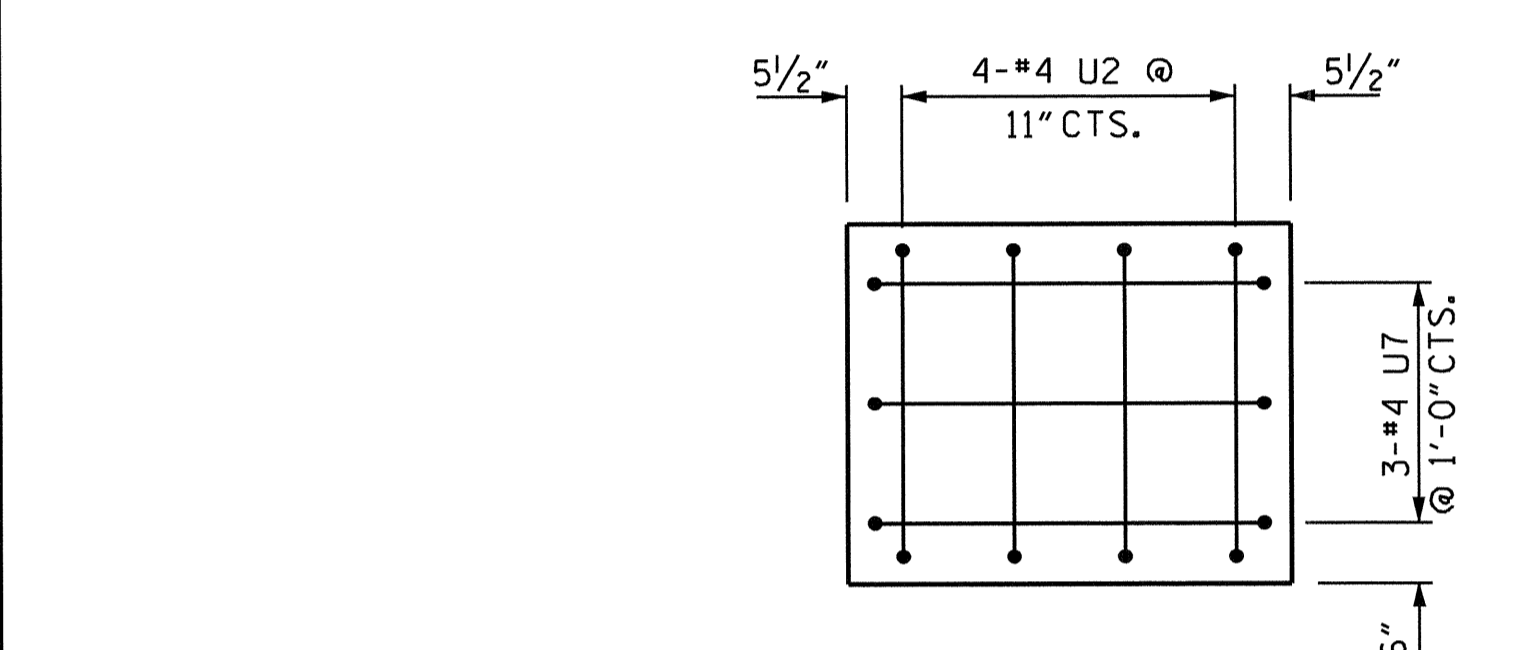
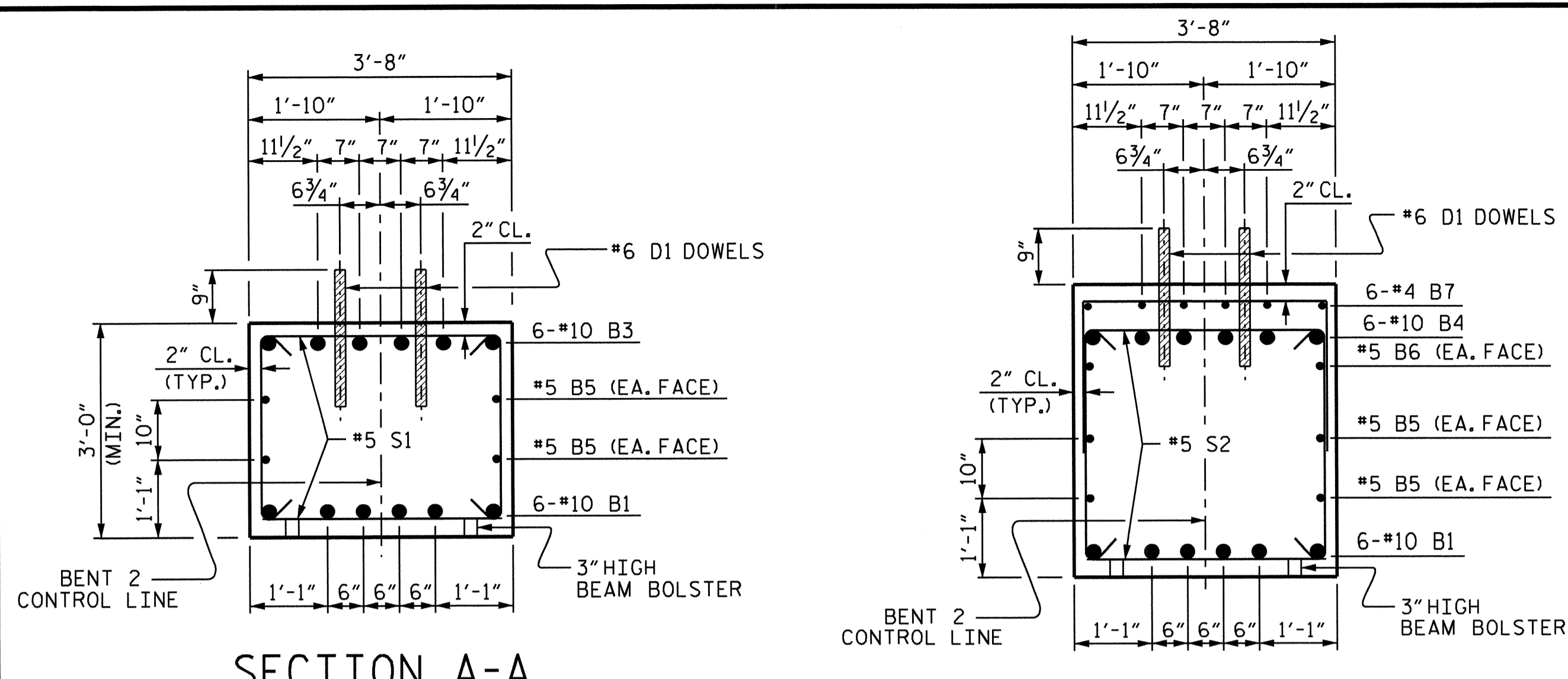


DRAWN BY: M.M. AHMED DATE: 11/26/13
 CHECKED BY: M.L. RORIE, P.E. DATE: 1/31/14
 DESIGN ENGINEER OF RECORD: K.P. SEDA, P.E. DATE: -

PLAN OF DRILLED PIERS
 REINFORCING STEEL AND DIMENSIONS ARE TYPICAL FOR ALL DRILLED PIERS.

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

SHEET NO. S-22
 TOTAL SHEETS 34



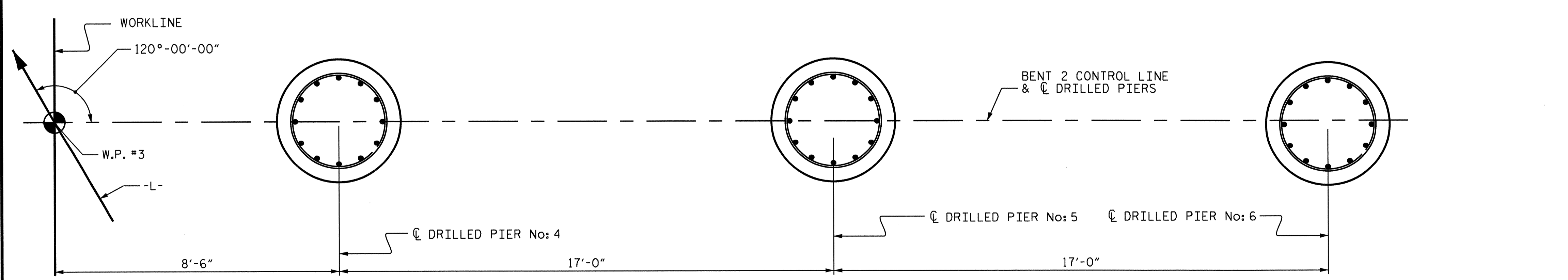
BILL OF MATERIAL					
BENT 2					
BAR	NO	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#10	STR	51'-2"	2642
B2	6	#10	1	29'-8"	766
B3	6	#10	1	34'-8"	895
B4	6	#10	STR	55'-0"	1420
B5	8	#5	STR	48'-9"	407
B6	2	#5	STR	39'-0"	81
B7	24	#4	STR	23'-7"	378
B8	10	#4	STR	3'-4"	22
B9	2	#4	STR	3'-10"	5
D1	104	#6	STR	1'-6"	234
M1	72	#9	1	34'-7"	8466
S1	34	#5	2	9'-6"	337
S2	66	#5	2	10'-7"	729
U1	58	#4	3	6'-4"	245
U2	8	#4	3	5'-6"	29
U3	2	#4	3	3'-7"	5
U4	2	#4	3	4'-2"	6
U5	2	#4	3	4'-9"	6
U6	2	#4	3	5'-4"	7
U7	6	#4	3	6'-2"	25

REINFORCING STEEL	LBS.	16,705
SP-1	6	* 4 516'-11"
SPIRAL COLUMN REINFORCING STEEL	LBS.	3235

CLASS A CONCRETE BREAKDOWN		
POUR #2 (CAP)	C.Y.	46.7
POUR #3 (LATERAL GUIDES)	C.Y.	0.3
TOTAL CLASS A CONCRETE	C.Y.	47.0

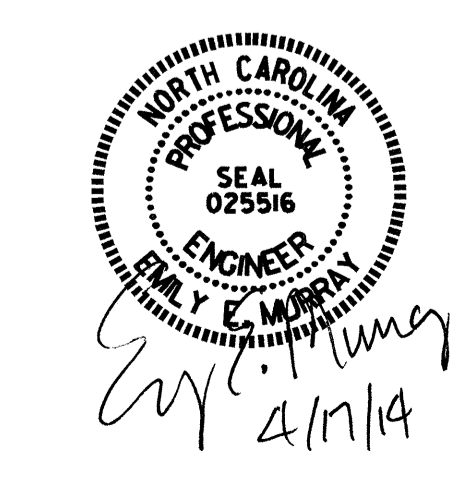
DRILLED PIERS	
DRILLED PIER CONCRETE	
POUR #1 (DRILLED PIERS)	C.Y. 45.9
3'-0" Ø DRILLED PIERS IN SOIL:	112.5 LIN. FT.
3'-0" Ø DRILLED PIERS NOT IN SOIL:	63.0 LIN. FT.
PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIER	85.1 LIN. FT.
CSL TUBES	738.0 LIN. FT.

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



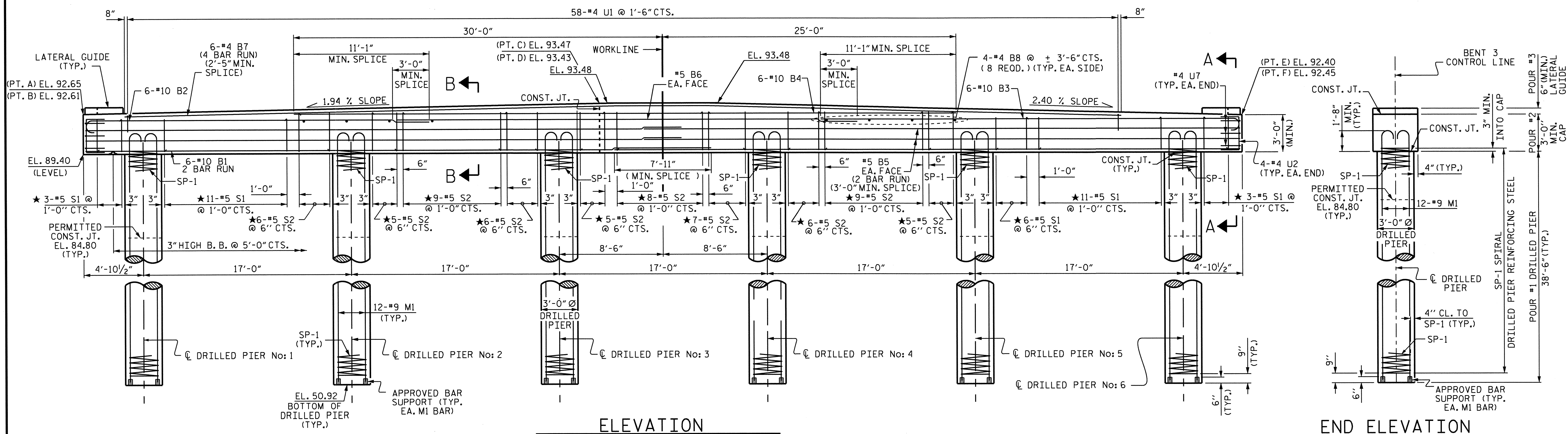
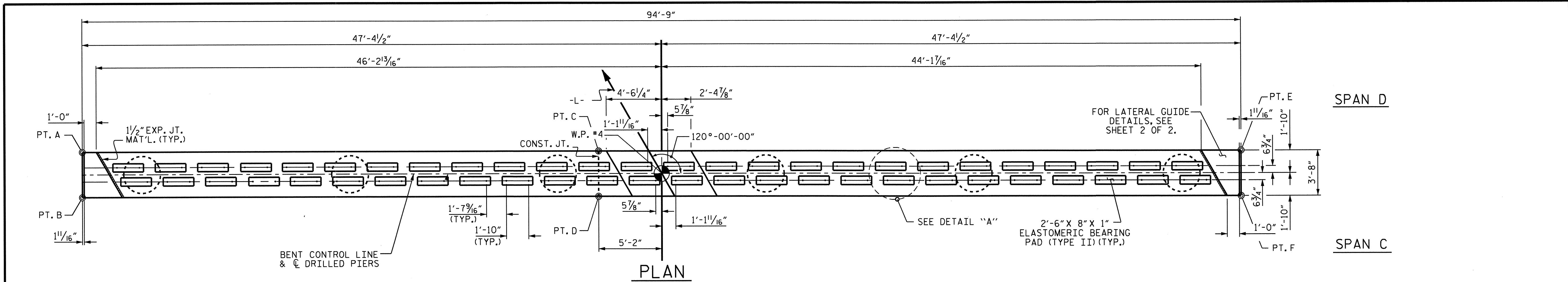
DRAWN BY: M.M. AHMED DATE: 2/3/14
 CHECKED BY: M.L. RORIE, P.E. DATE: 2/3/14
 DESIGN ENGINEER OF RECORD: K.P. SEDAI, P.E. DATE: -

PLAN OF DRILLED PIERS
 REINFORCING STEEL AND DIMENSIONS ARE TYPICAL FOR ALL DRILLED PIERS.



PROJECT NO. U-3331
 NASH COUNTY
 STATION: 32+18.50 -L-
 SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT 2					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-24
					TOTAL SHEETS 34

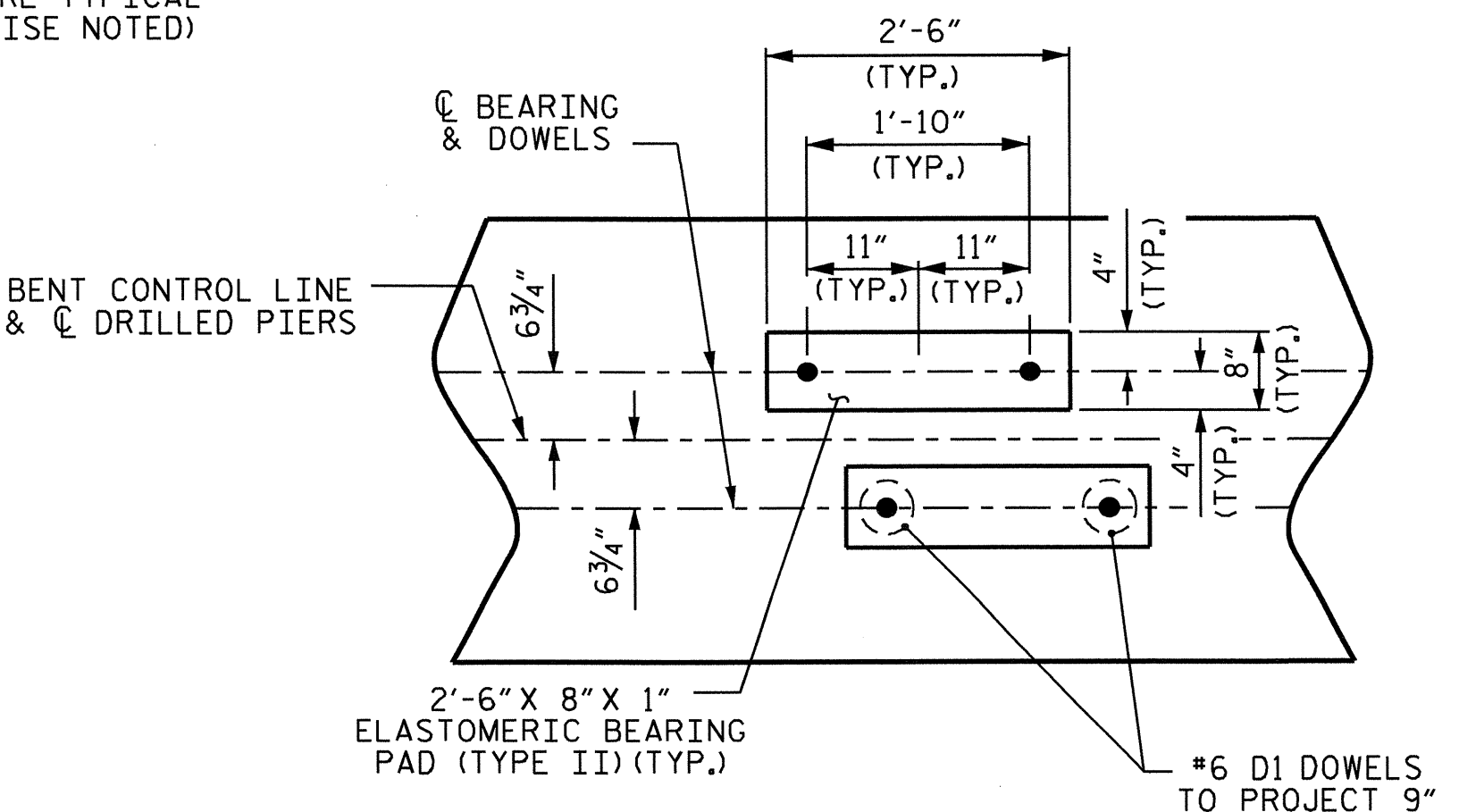


END ELEVATION

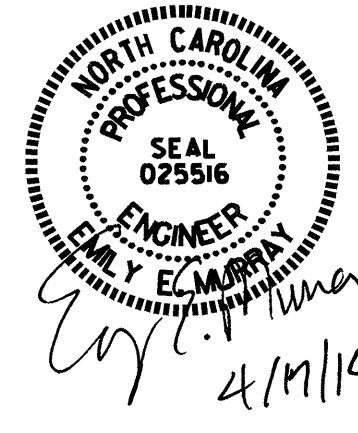
(REINFORCING STEEL AND DIMENSIONS ARE TYPICAL FOR ALL DRILLED PIERS UNLESS OTHERWISE NOTED)

NOTES

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.
- HOOKS ON M1 BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
- FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL DRILLED PIER REINFORCING STEEL."
- THE LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.
- ★ INVERT ALTERNATE STIRRUPS.
- THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.
- THE CONTRACTOR HAS THE OPTION TO OMIT THE LATERAL GUIDE IF APPROVED BY THE ENGINEER.



(DIMENSIONS ARE TYPICAL EACH BEARING)

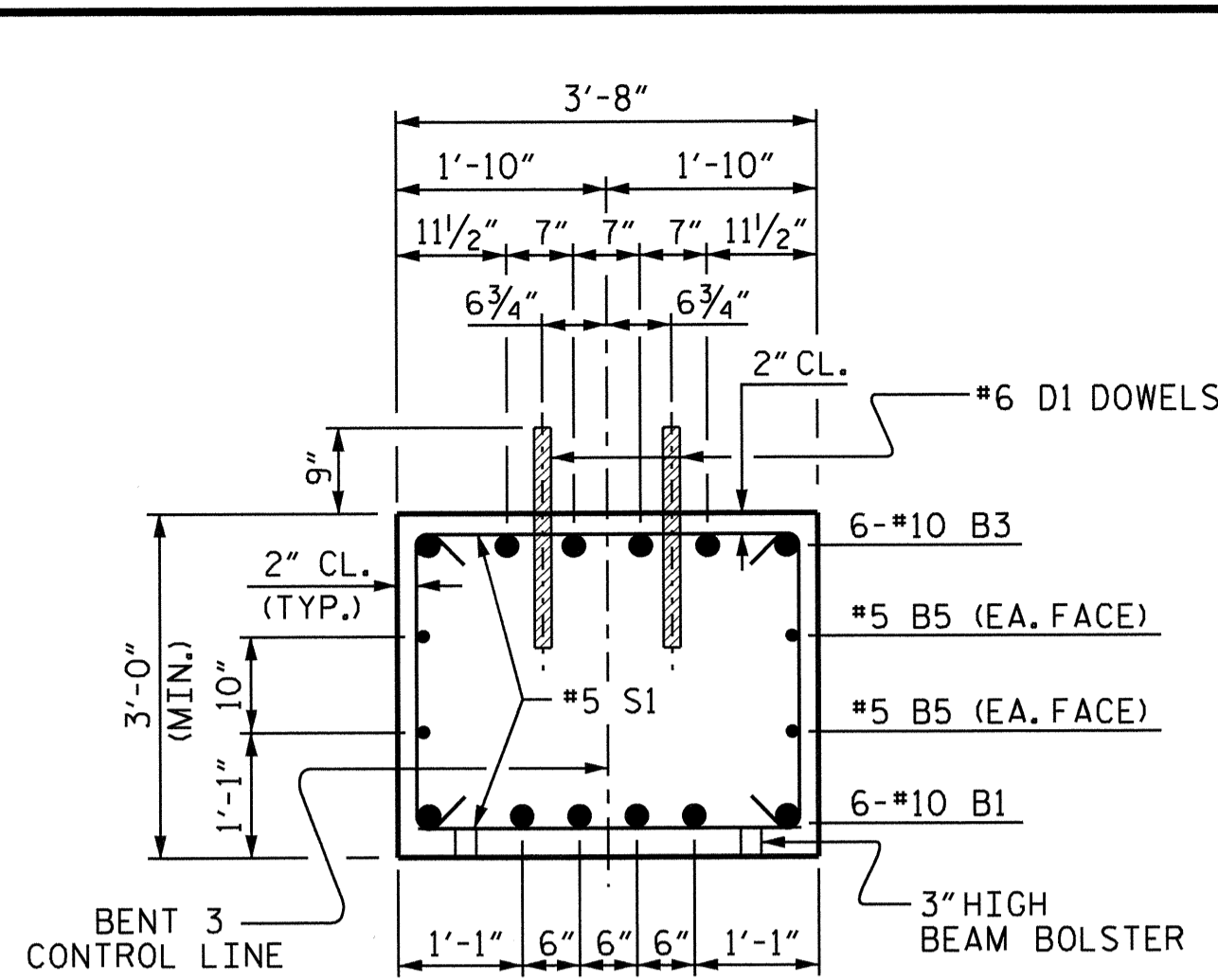


PROJECT NO. U-3331
 NASH COUNTY
 STATION: 32+18.50 -L-

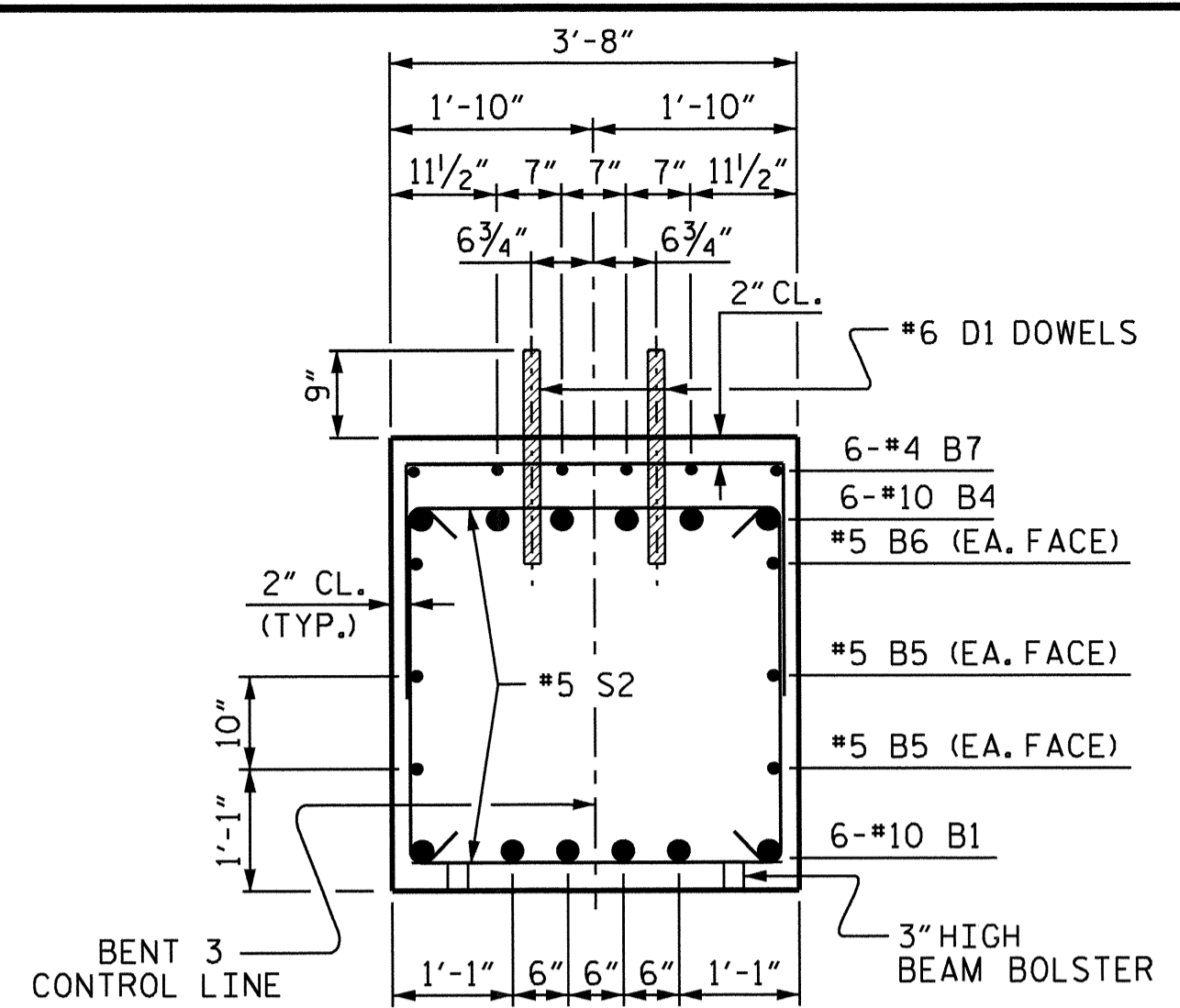
SHEET 1 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT 3					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 34

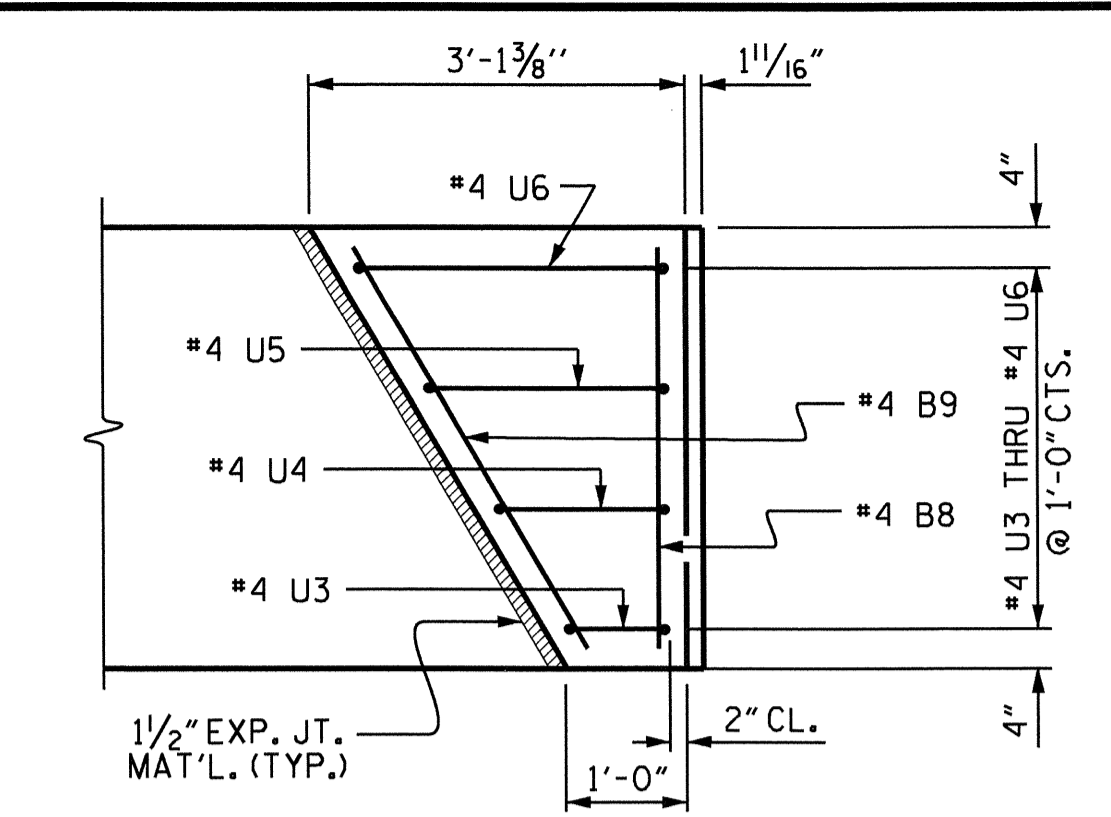
DRAWN BY: M.M. AHMED DATE: 2/3/14
 CHECKED BY: M.L. RORIE, P.E. DATE: 2/3/14
 DESIGN ENGINEER OF RECORD: K.P. SEDAI, P.E. DATE:



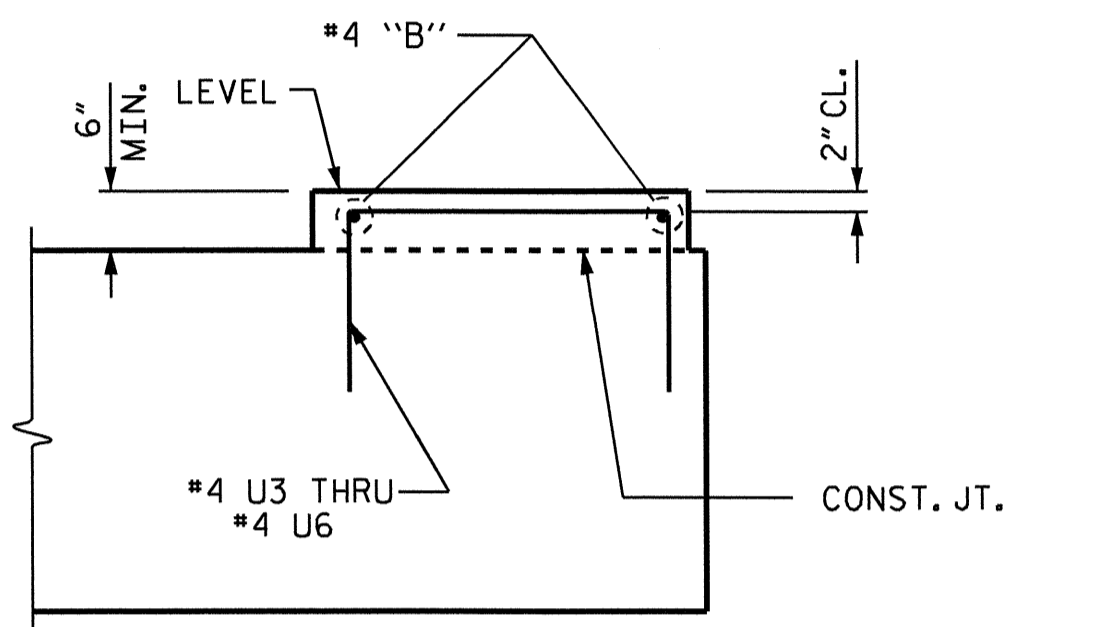
SECTION A-A



SECTION B-B

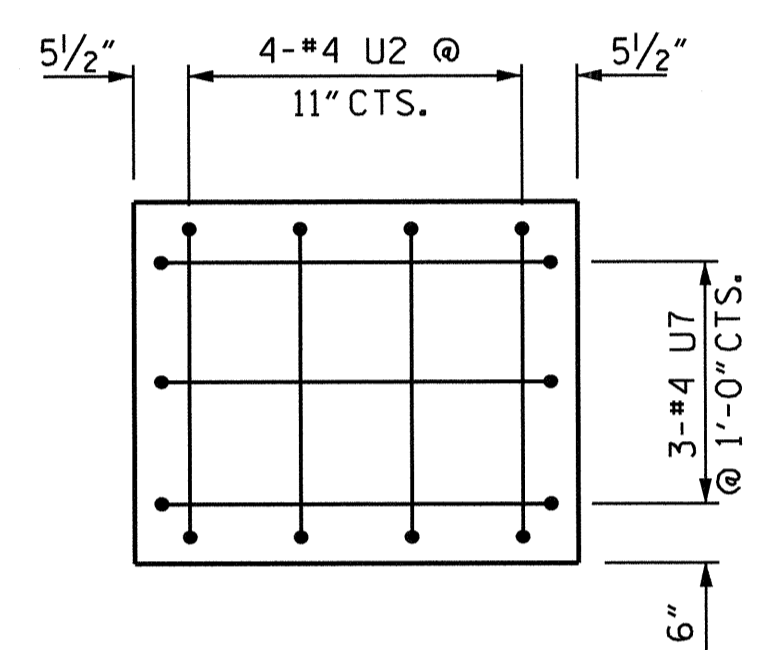


PLAN

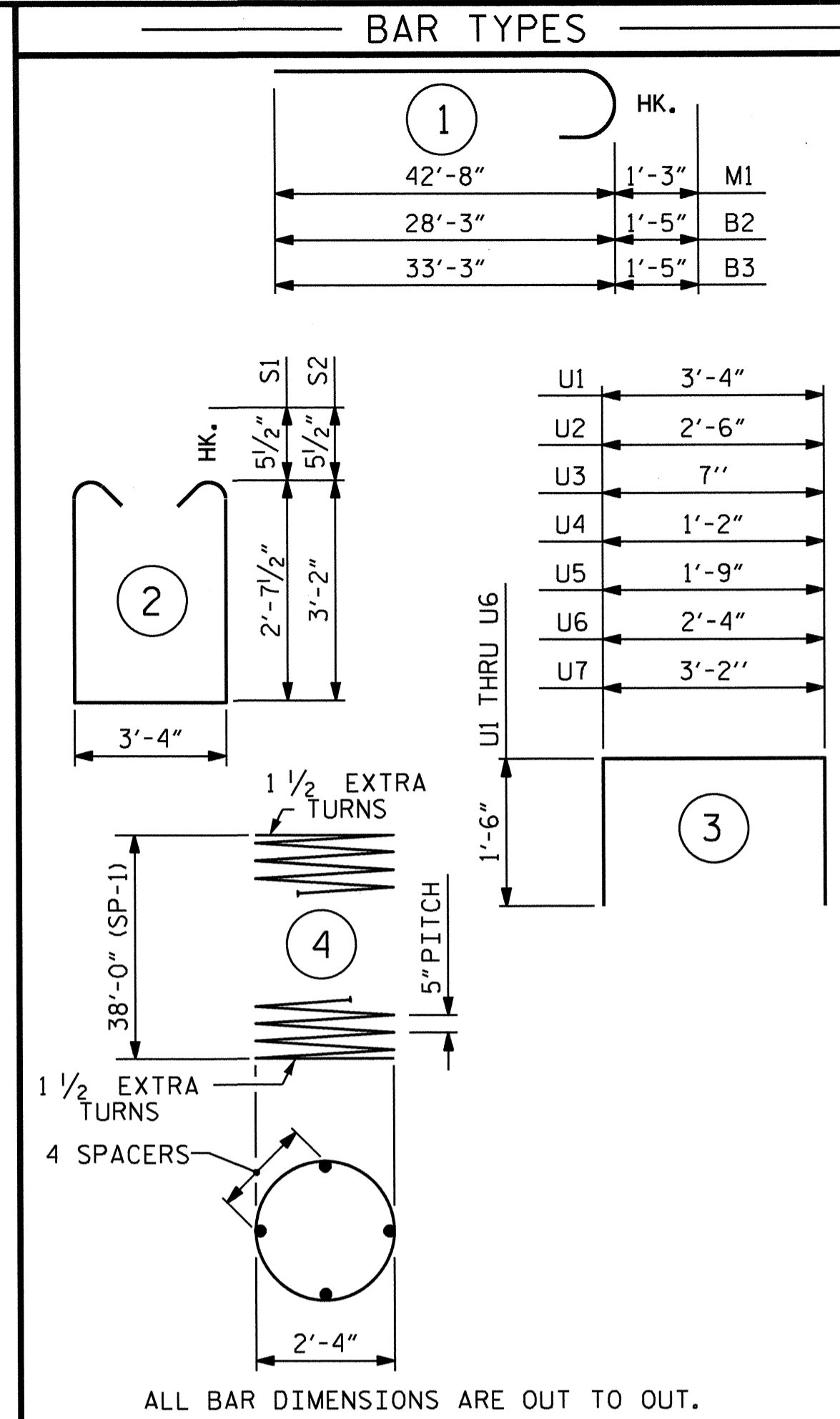


ELEVATION

LATERAL GUIDE DETAILS
(RIGHT LATERAL GUIDE SHOWN, LEFT SIDE SIMILAR)



END OF CAP VIEW
(TYPICAL BOTH ENDS)



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
BENT 3					
BAR	NO	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#10	STR	51'-2"	2642
B2	6	#10	1	29'-8"	766
B3	6	#10	1	34'-8"	895
B4	6	#10	STR	55'-0"	1420
B5	8	#5	STR	48'-9"	407
B6	2	#5	STR	39'-0"	81
B7	24	#4	STR	23'-7"	378
B8	10	#4	STR	3'-4"	22
B9	2	#4	STR	3'-10"	5
D1	104	#6	STR	1'-6"	234
M1	72	#9	1	43'-11"	10,751
S1	34	#5	2	9'-6"	337
S2	66	#5	2	10'-7"	729
U1	58	#4	3	6'-4"	245
U2	8	#4	3	5'-6"	29
U3	2	#4	3	3'-7"	5
U4	2	#4	3	4'-2"	6
U5	2	#4	3	4'-9"	6
U6	2	#4	3	5'-4"	7
U7	6	#4	3	6'-2"	25

REINFORCING STEEL LBS. 18,990

SP-1 6 * 4 676'-3" 4232

SPIRAL COLUMN REINFORCING STEEL LBS. 4232

CLASS A CONCRETE BREAKDOWN

POUR #2 (CAP) C.Y. 46.7

POUR #3 (LATERAL GUIDES) C.Y. 0.3

TOTAL CLASS A CONCRETE C.Y. 47.0

DRILLED PIERS

DRILLED PIER CONCRETE

POUR #1 (DRILLED PIERS) C.Y. 60.5

3'-0" Ø DRILLED PIERS IN SOIL: 213.0 LIN. FT.

3'-0" Ø DRILLED PIERS NOT IN SOIL: 18.0 LIN. FT.

PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIER 92.5 LIN. FT.

CSL TUBES 960.0 LIN. FT.

SPT TESTING 1 EA.

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

PROJECT NO. U-3331

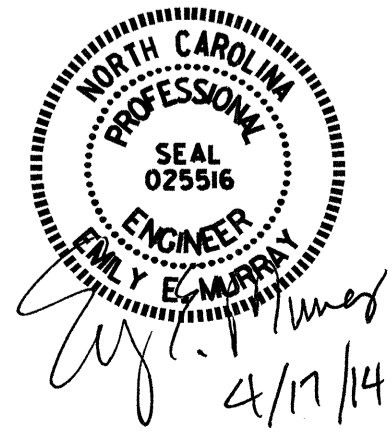
NASH COUNTY

STATION: 32+18.50 -L-

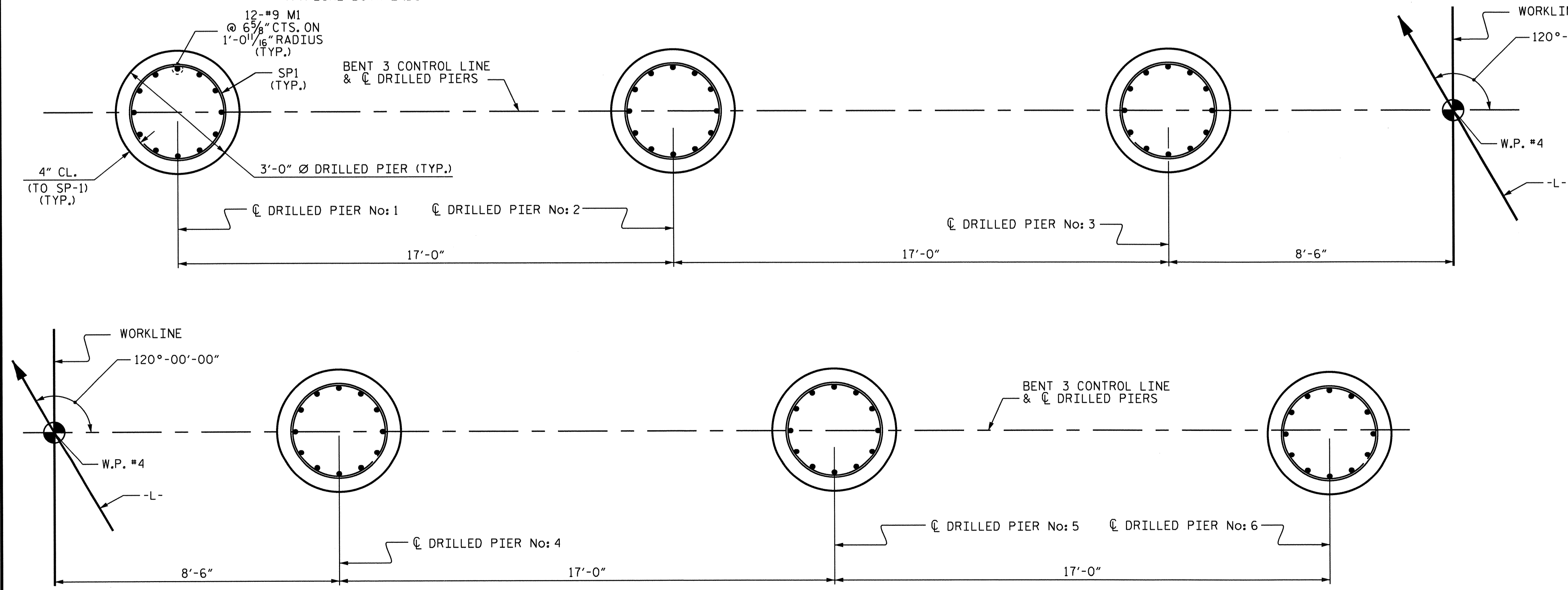
SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 3



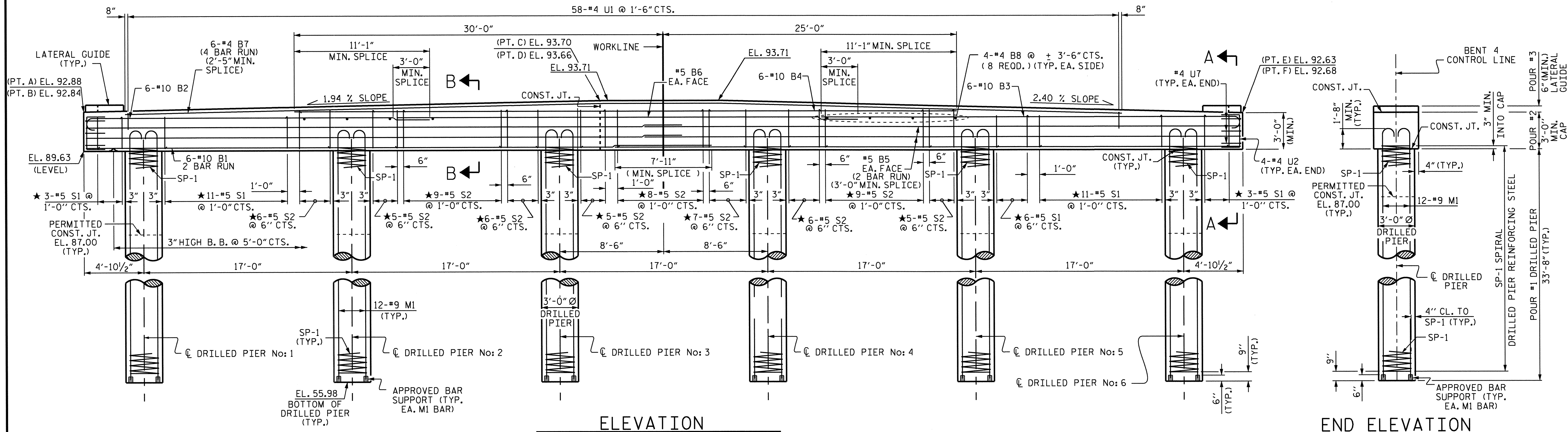
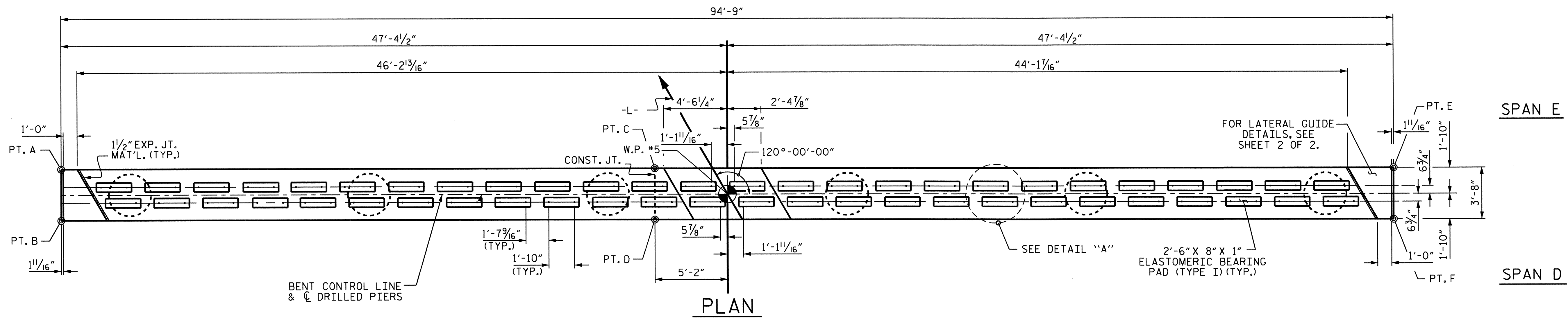
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26	
1			3			TOTAL SHEETS	34
2			4				



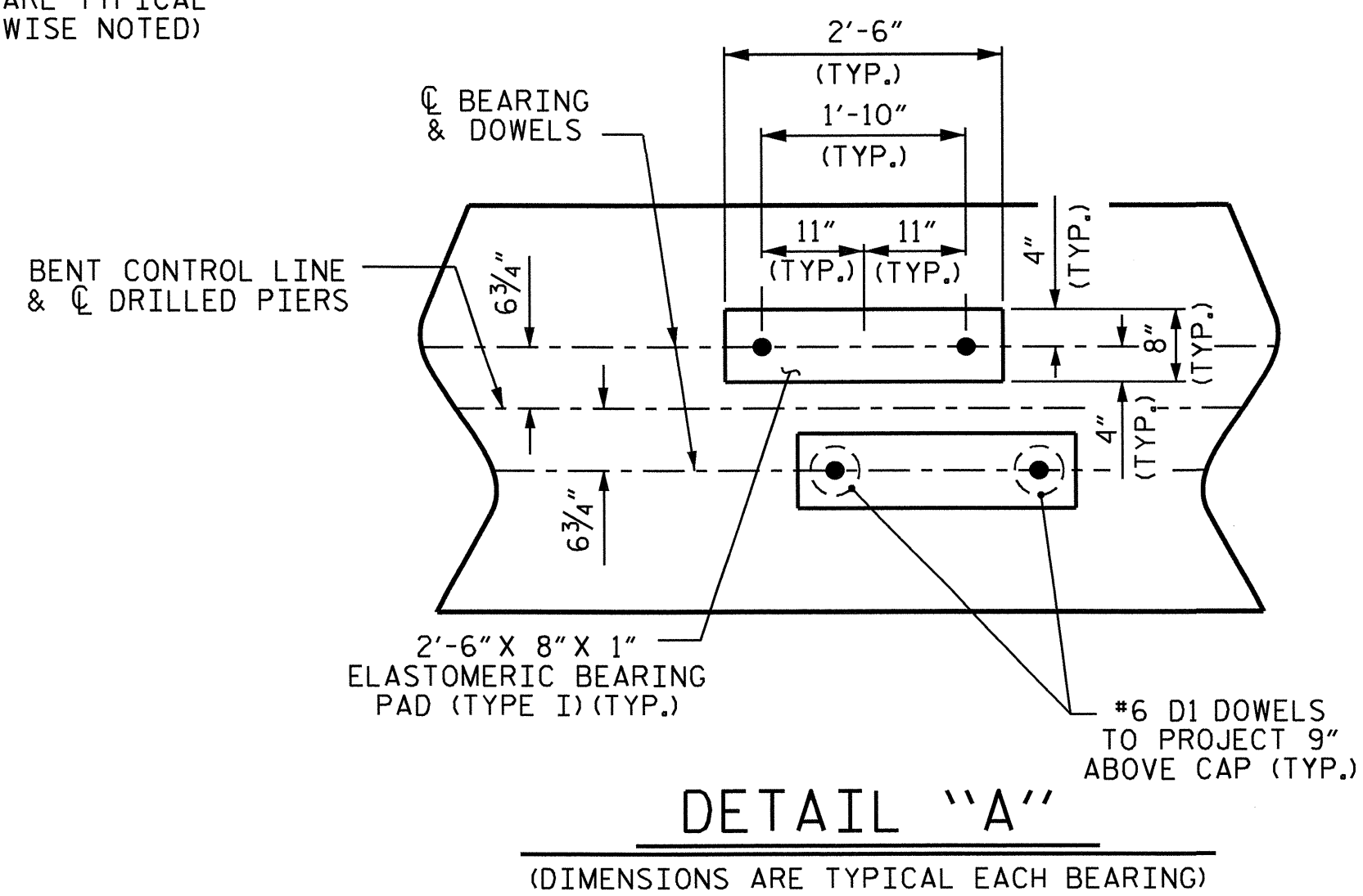
PLAN OF DRILLED PIERS

REINFORCING STEEL AND DIMENSIONS ARE TYPICAL FOR ALL DRILLED PIERS.

DRAWN BY: M.M. AHMED DATE: 2/3/14
CHECKED BY: M.L. RORIE, P.E. DATE: 2/3/14
DESIGN ENGINEER OF RECORD: K.P. SEDAI, P.E. DATE: -



ELEVATION
(REINFORCING STEEL AND DIMENSIONS ARE TYPICAL FOR ALL DRILLED PIERS UNLESS OTHERWISE NOTED)



NOTES

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.
- HOOKS ON M1 BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
- FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL DRILLED PIER REINFORCING STEEL."
- THE LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.
- ★ INVERT ALTERNATE STIRRUPS.
- THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.
- THE CONTRACTOR HAS THE OPTION TO OMIT THE LATERAL GUIDE IF APPROVED BY THE ENGINEER.

DRAWN BY: M.M. AHMED DATE: 2/3/14
 CHECKED BY: M.L. RORIE, P.E. DATE: 2/3/14
 DESIGN ENGINEER OF RECORD: K.P. SEDAI, P.E. DATE: -

11-MAR-2014 15:40
 R:\Structures\Plans\Final Plans\U3331.SD.B.dgn
 dgladden

PROJECT NO. U-3331

NASH COUNTY

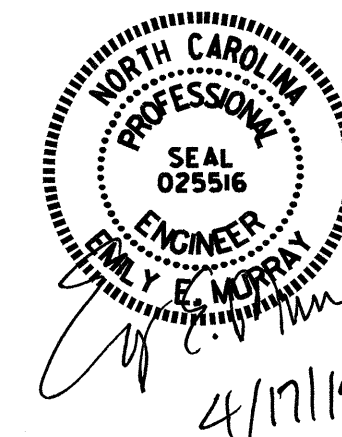
STATION: 32+18.50 -L-

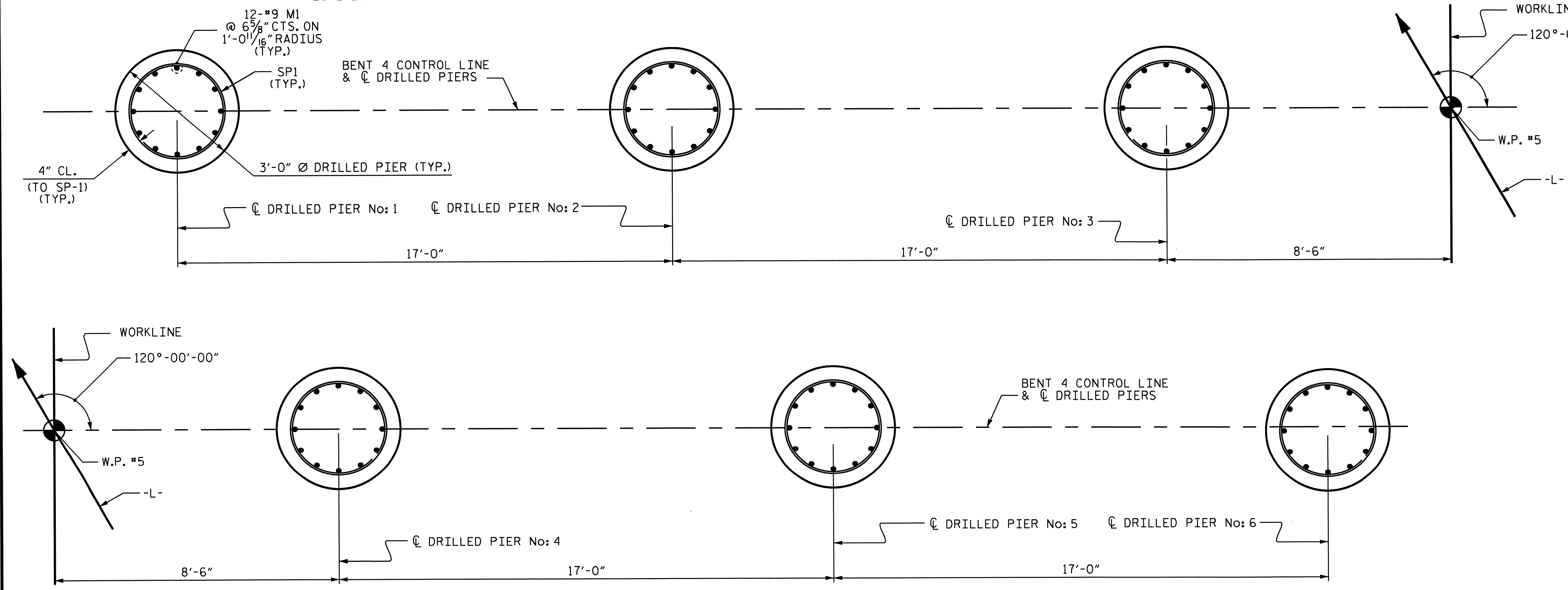
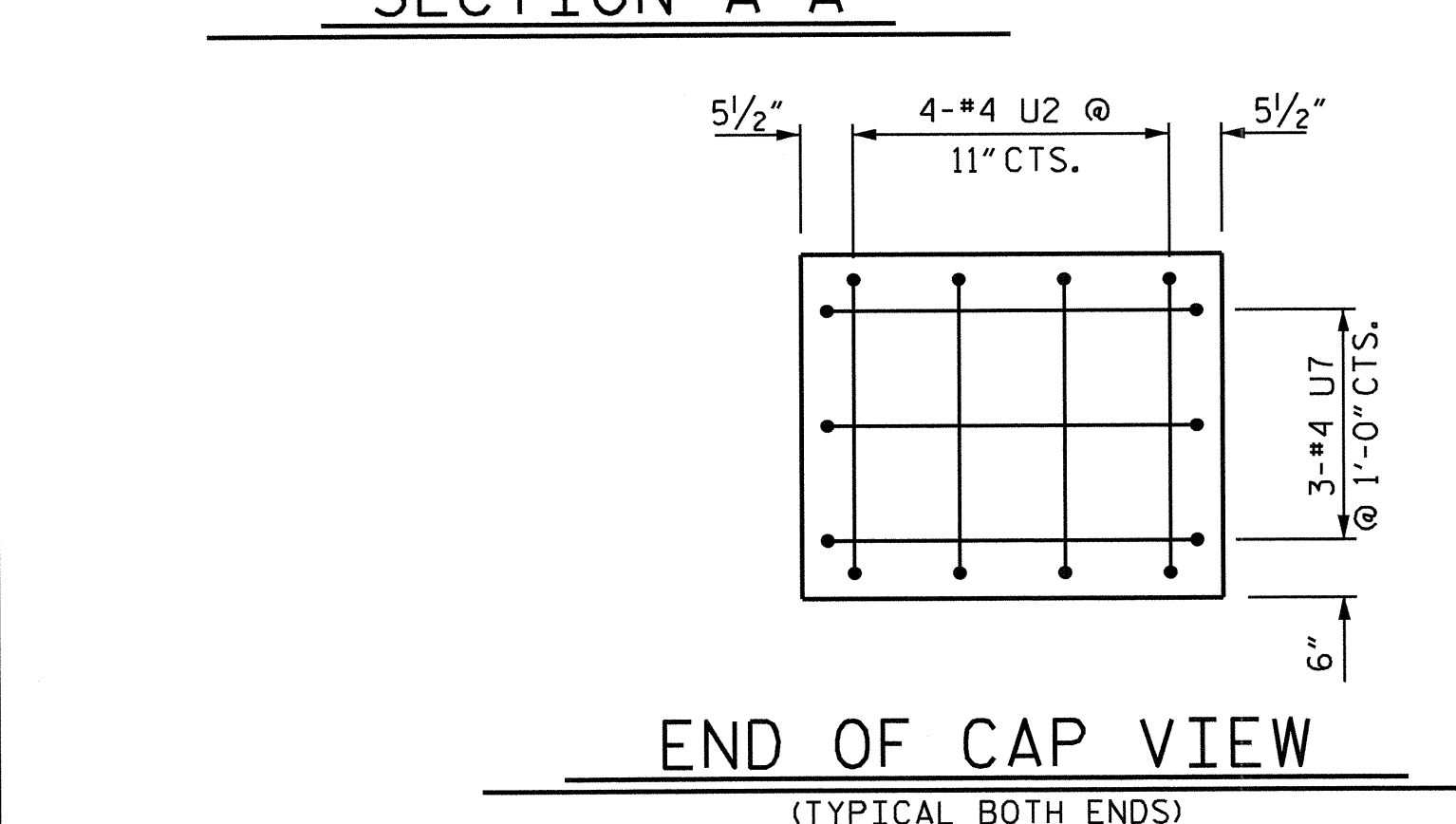
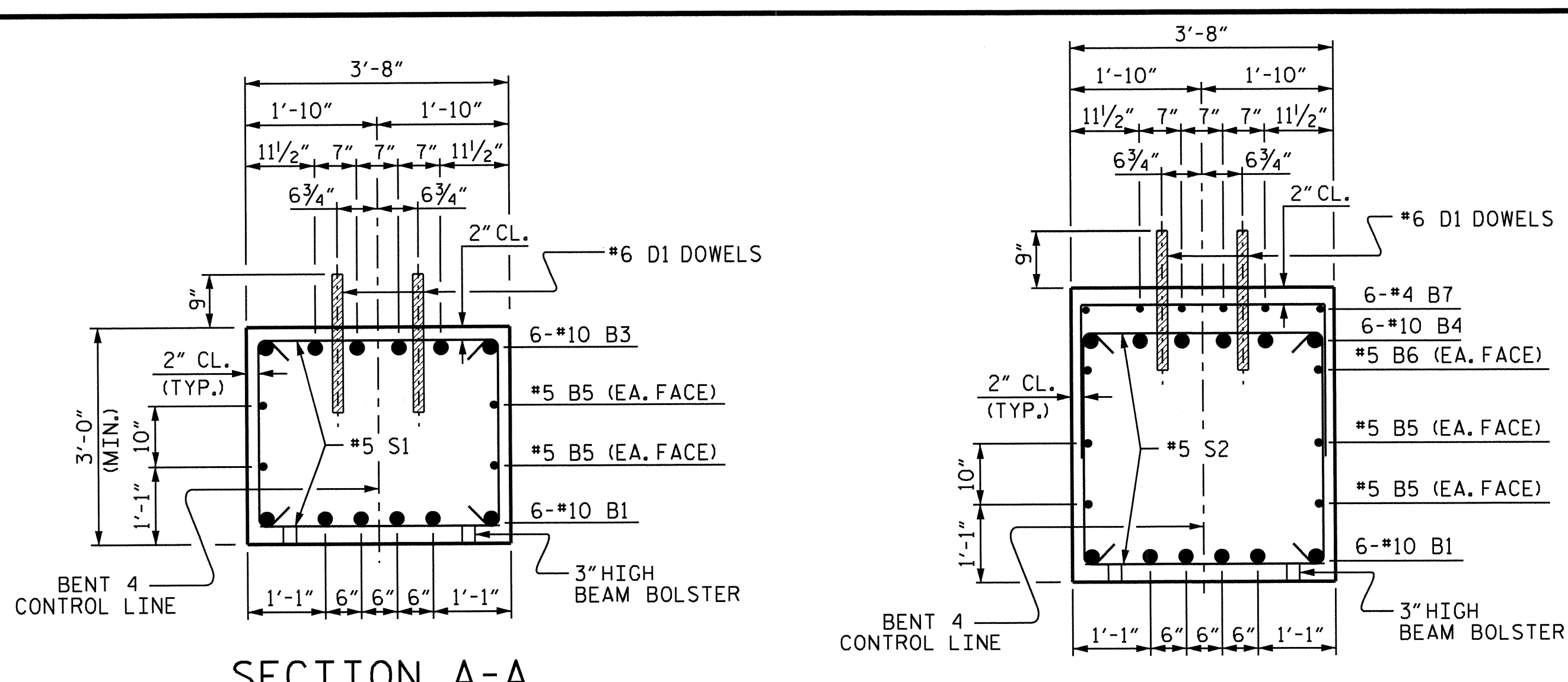
SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

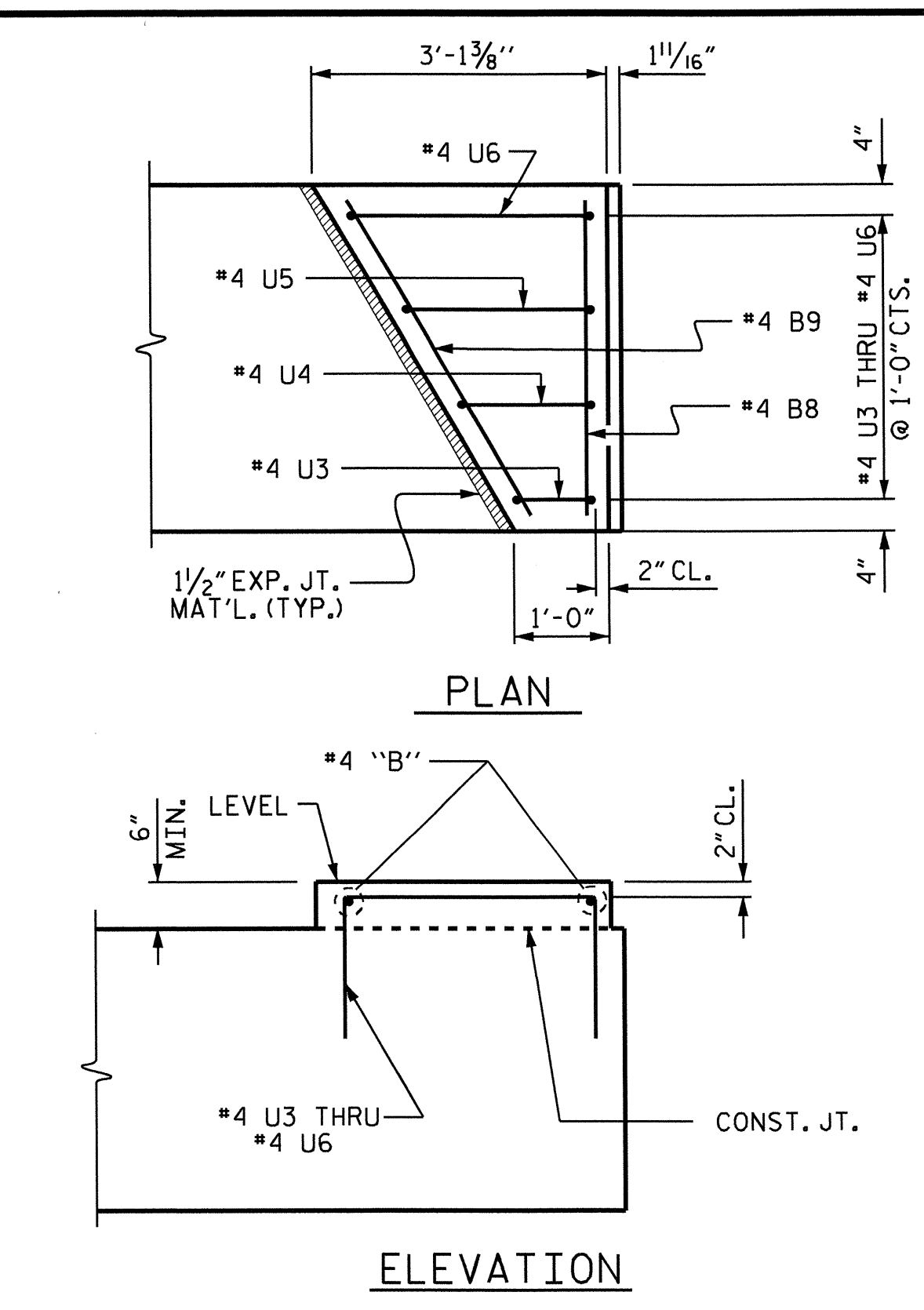
SUBSTRUCTURE
 BENT 4

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27	
1			3			TOTAL SHEETS 34	
2			4				

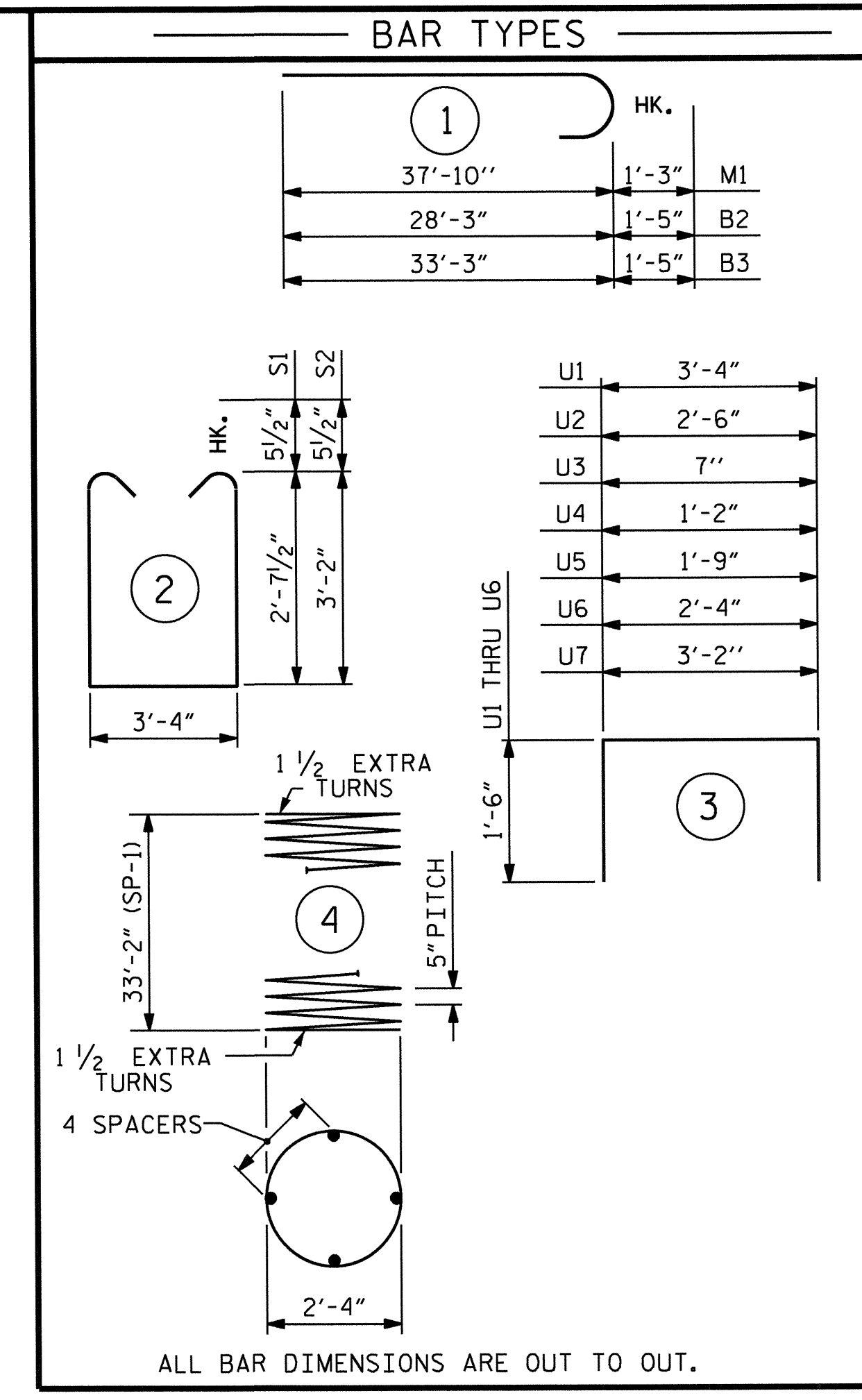




DRAWN BY: M.M. AHMED DATE: 2/3/14
 CHECKED BY: M.L. RORIE, P.E. DATE: 2/3/14
 DESIGN ENGINEER OF RECORD: K.P. SEDAI, P.E. DATE: 2/3/14



LATERAL GUIDE DETAILS
 (RIGHT LATERAL GUIDE SHOWN, LEFT SIDE SIMILAR)



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
BENT 4					
BAR	NO	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#10	STR	51'-2"	2642
B2	6	#10	1	29'-8"	766
B3	6	#10	1	34'-8"	895
B4	6	#10	STR	55'-0"	1420
B5	8	#5	STR	48'-9"	407
B6	2	#5	STR	39'-0"	81
B7	24	#4	STR	23'-7"	378
B8	10	#4	STR	3'-4"	22
B9	2	#4	STR	3'-10"	5
D1	104	#6	STR	1'-6"	234
M1	72	#9	1	39'-1"	9568
S1	34	#5	2	9'-6"	337
S2	66	#5	2	10'-7"	729
U1	58	#4	3	6'-4"	245
U2	8	#4	3	5'-6"	29
U3	2	#4	3	3'-7"	5
U4	2	#4	3	4'-2"	6
U5	2	#4	3	4'-9"	6
U6	2	#4	3	5'-4"	7
U7	6	#4	3	6'-2"	25

REINFORCING STEEL	LBS.	17,807
SP-1	* 4	593'-0" 3711
SPIRAL COLUMN REINFORCING STEEL	LBS.	3711
CLASS A CONCRETE BREAKDOWN		
POUR #2 (CAP)	C.Y.	46.7
POUR #3 (LATERAL GUIDES)	C.Y.	0.3
TOTAL CLASS A CONCRETE	C.Y.	47.0

DRILLED PIERS	
DRILLED PIER CONCRETE	
POUR #1 (DRILLED PIERS)	C.Y. 52.9
3'-0" Ø DRILLED PIERS IN SOIL:	127.0 LIN. FT.
3'-0" Ø DRILLED PIERS NOT IN SOIL:	75.0 LIN. FT.
PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIER	105.9 LIN. FT.
CSL TUBES	844.0 LIN. FT.

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

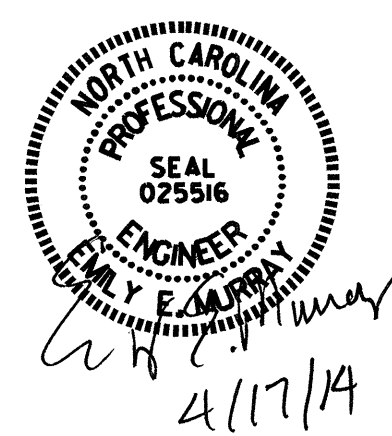
PROJECT NO. U-3331
 NASH COUNTY
 STATION: 32+18.50 -L-

SHEET 2 OF 2

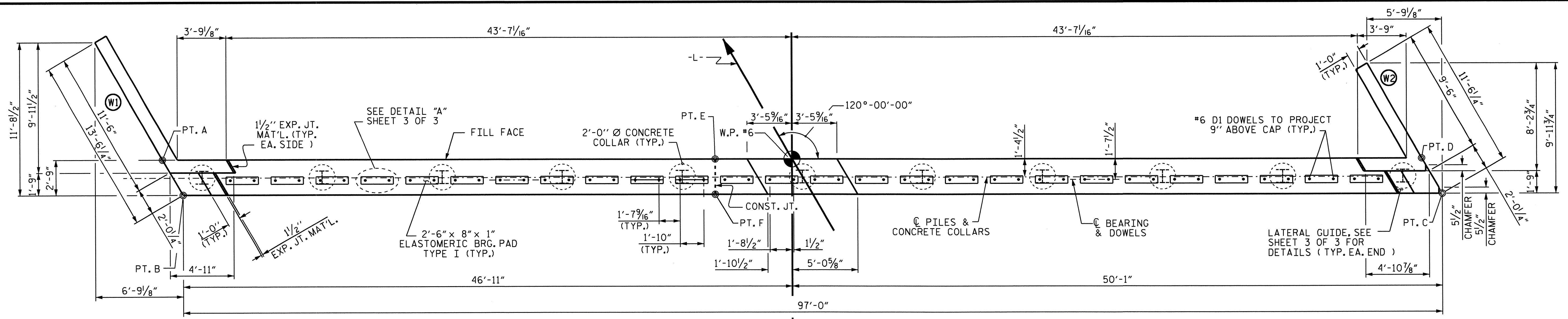
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 BENT 4

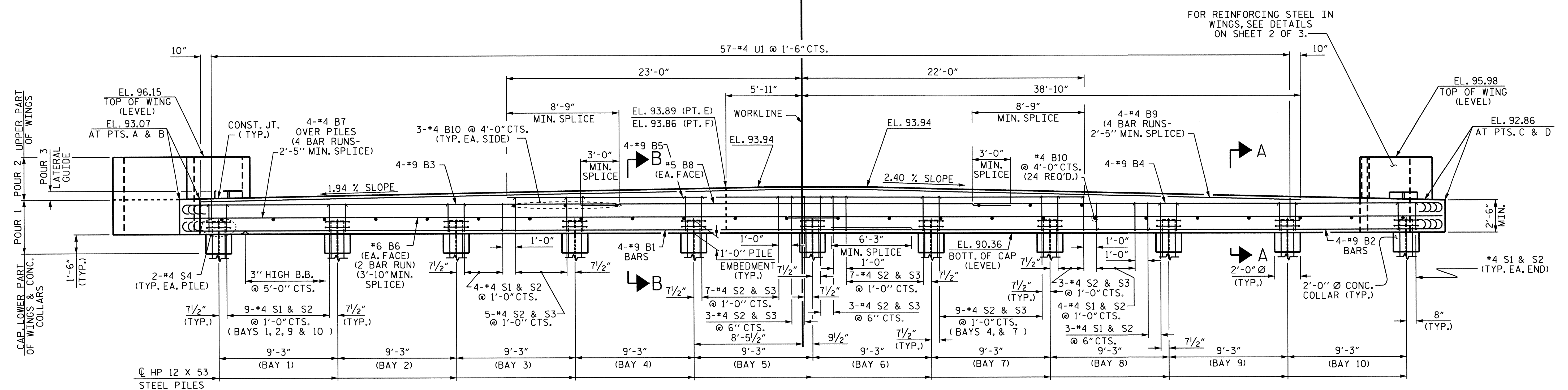
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS
2			4			34



PLAN OF DRILLED PIERS
 REINFORCING STEEL AND DIMENSIONS ARE TYPICAL FOR ALL DRILLED PIERS.



PLAN



ELEVATION

NOTES

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.
- THE LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.
- FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.
- FOR WING DETAILS, SEE SHEET 2 OF 3.
- THE CONTRACTOR HAS THE OPTION TO OMIT THE LATERAL GUIDE IF APPROVED BY THE ENGINEER.

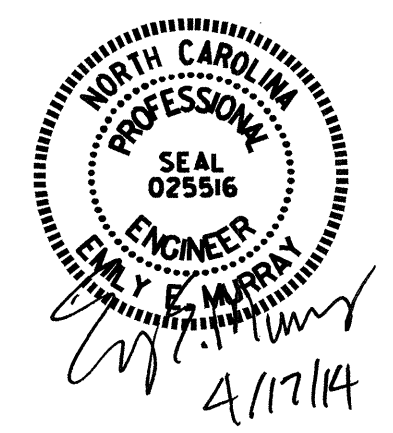
PROJECT NO. U-3331
 NASH COUNTY
 STATION: 32+18.50 -L-

SHEET 1 OF 3

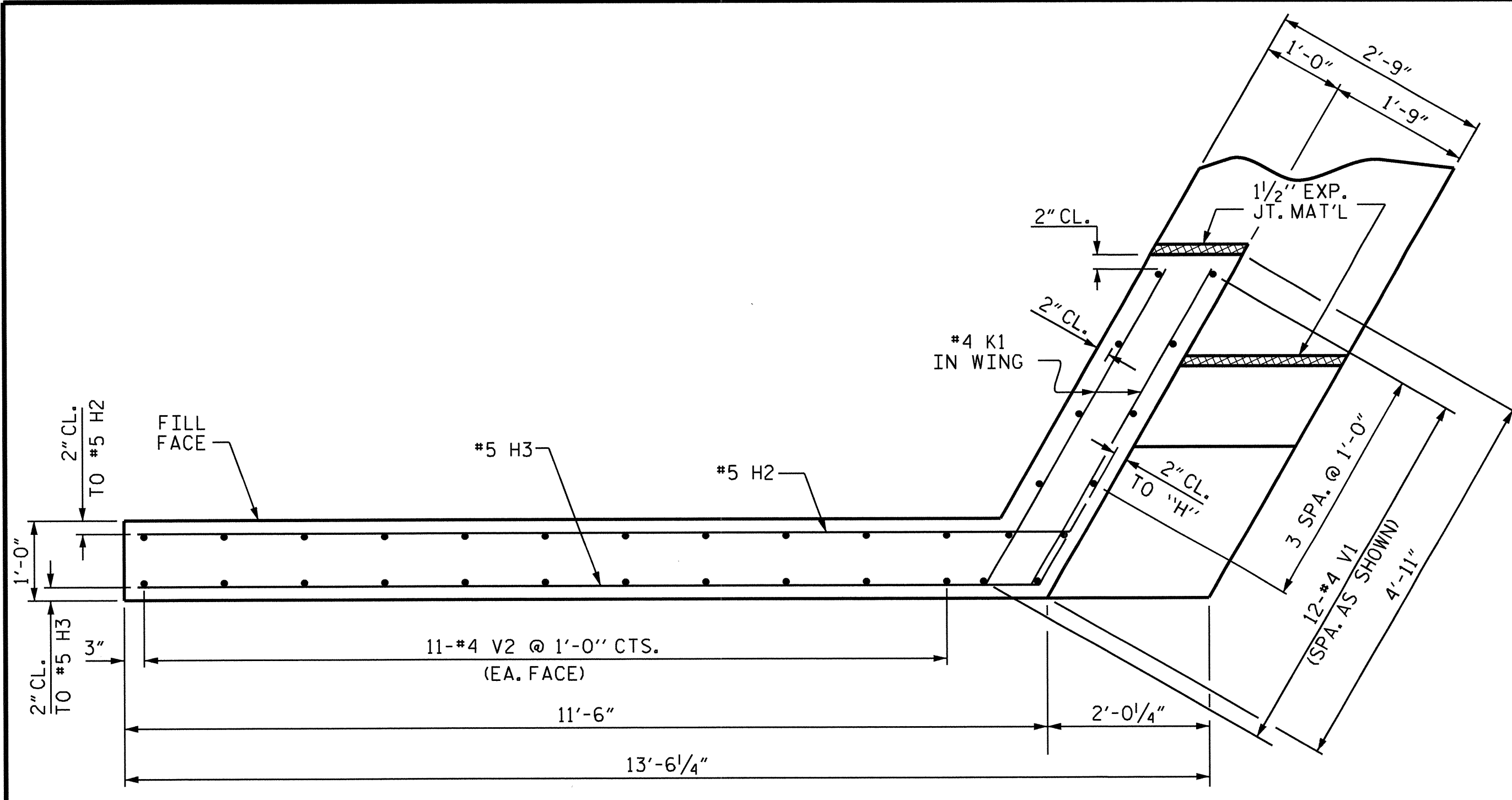
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 END BENT 2**

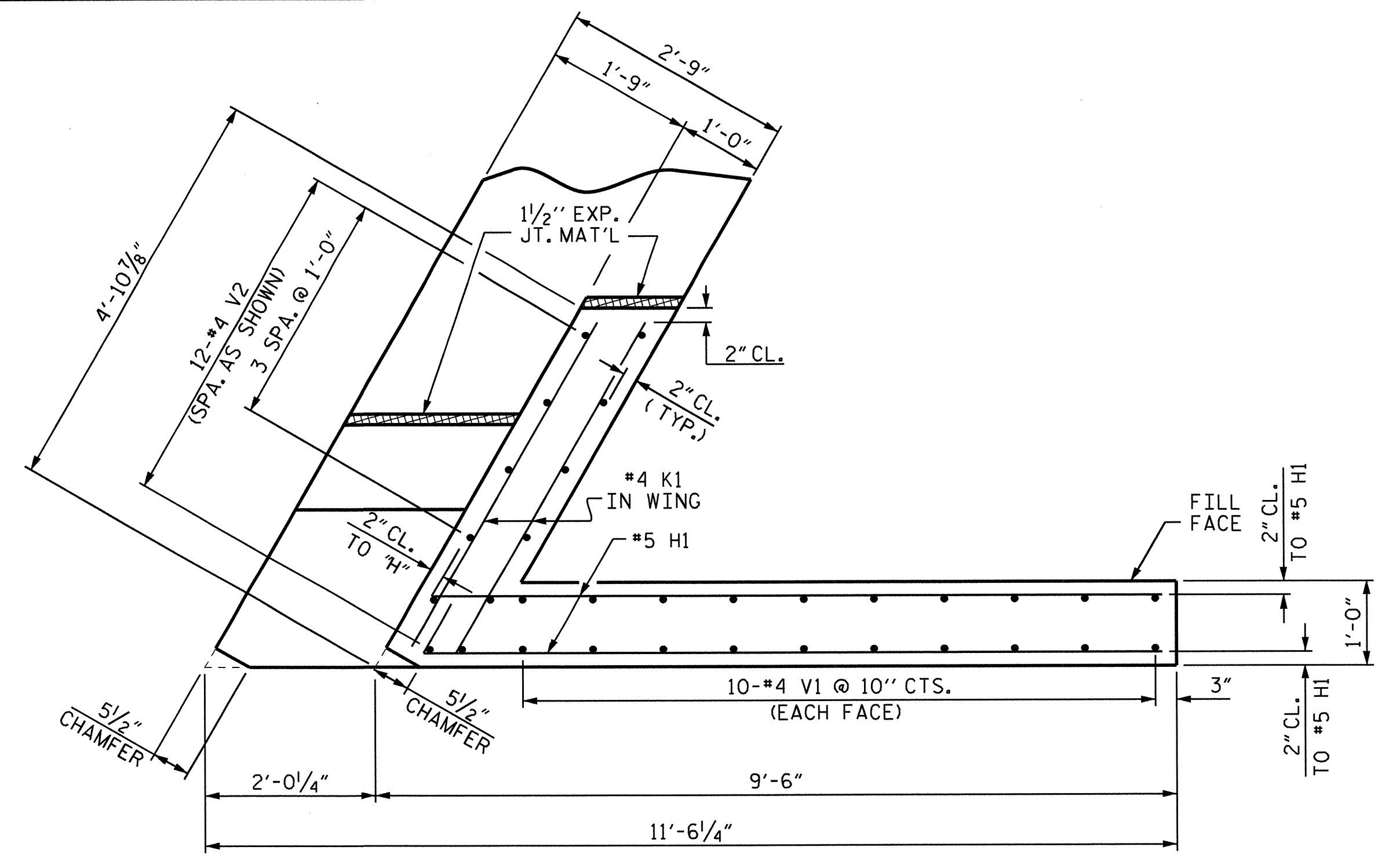
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS 34
2			4			



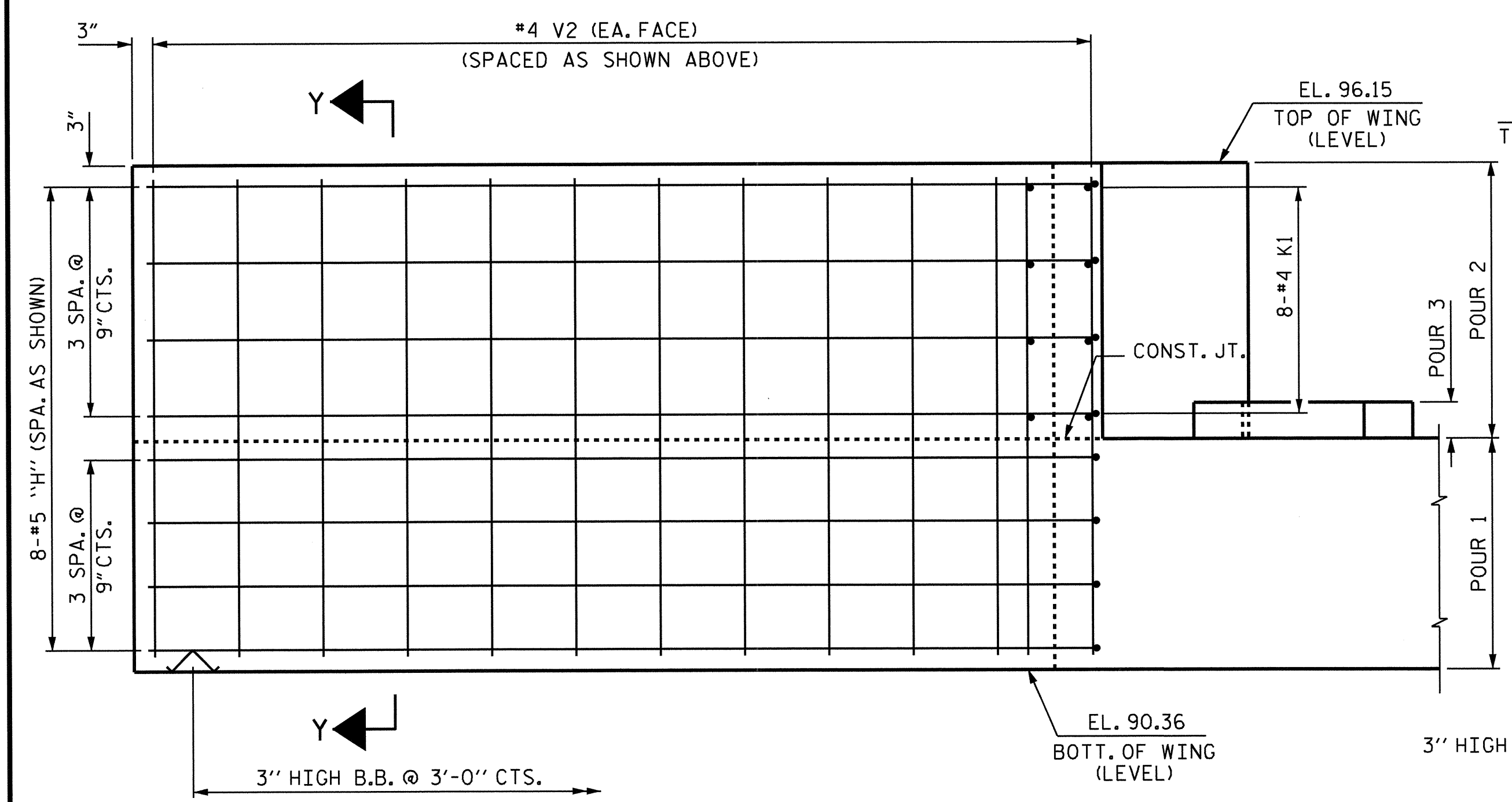
DRAWN BY: M.M. AHMED DATE: 11/15/13
 CHECKED BY: M.L. RORIE, P.E. DATE: 2/3/14
 DESIGN ENGINEER OF RECORD: K.P. SEDAI, P.E. DATE: -



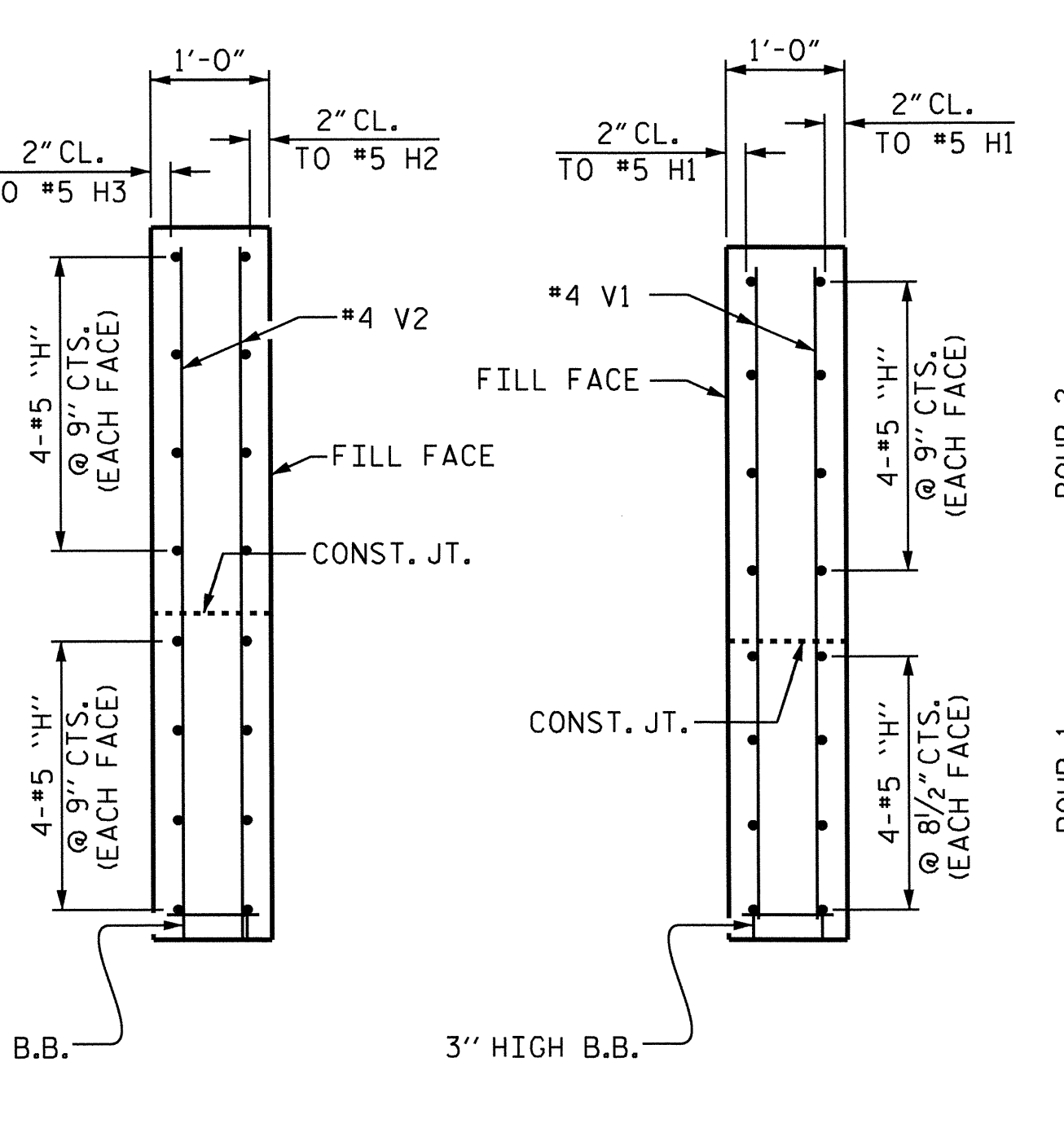
PLAN OF WING - W1



PLAN OF WING - W2

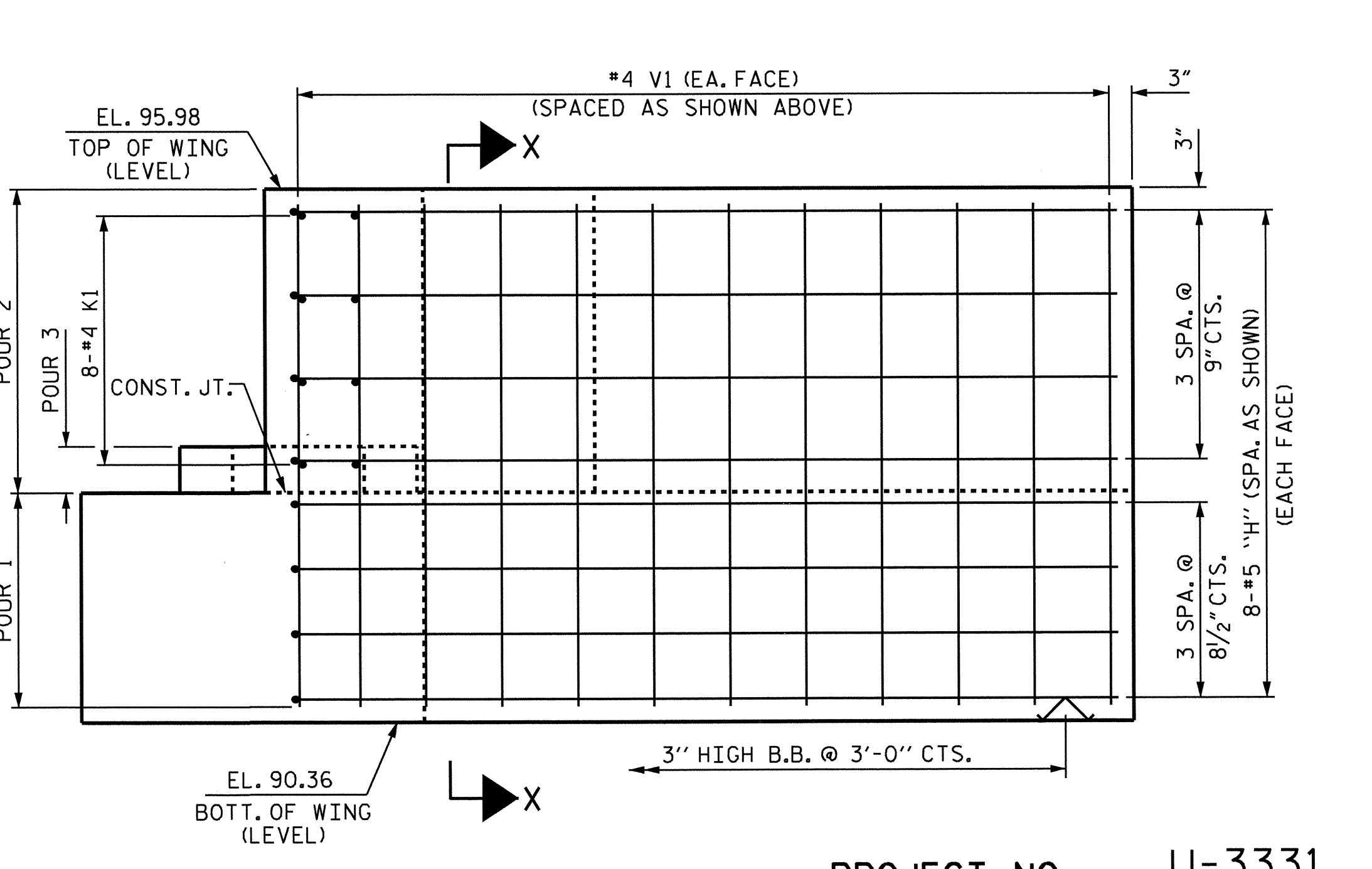


ELEVATION OF WING - W1



SECTION Y-Y

SECTION X-X



ELEVATION OF WING - W2

PROJECT NO. U-3331
NASH COUNTY
 STATION: 32+18.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

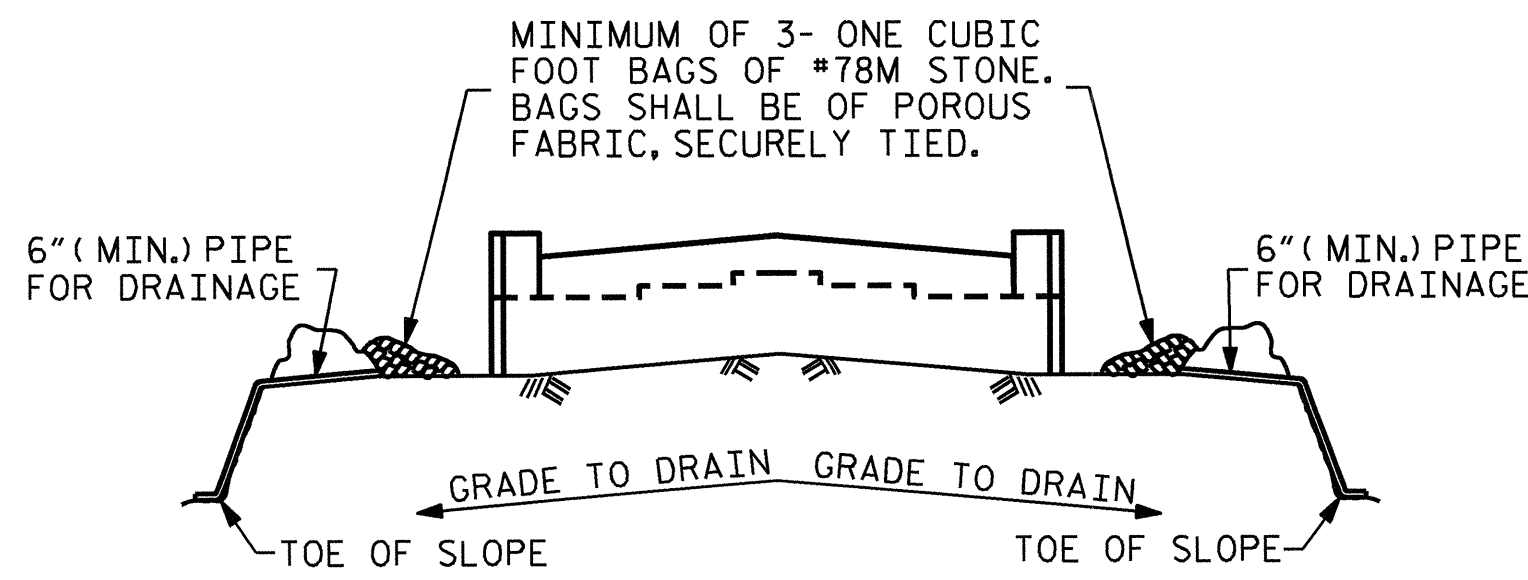
SUBSTRUCTURE
 END BENT 2



DRAWN BY : M.M. AHMED DATE : 11/15/13
 CHECKED BY : M.L. RORIE, P.E. DATE : 2/10/14
 DESIGN ENGINEER OF RECORD: K.P. SEDA, P.E. DATE : -

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30	
1			3			TOTAL SHEETS	
2			4			34	

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 dgladden

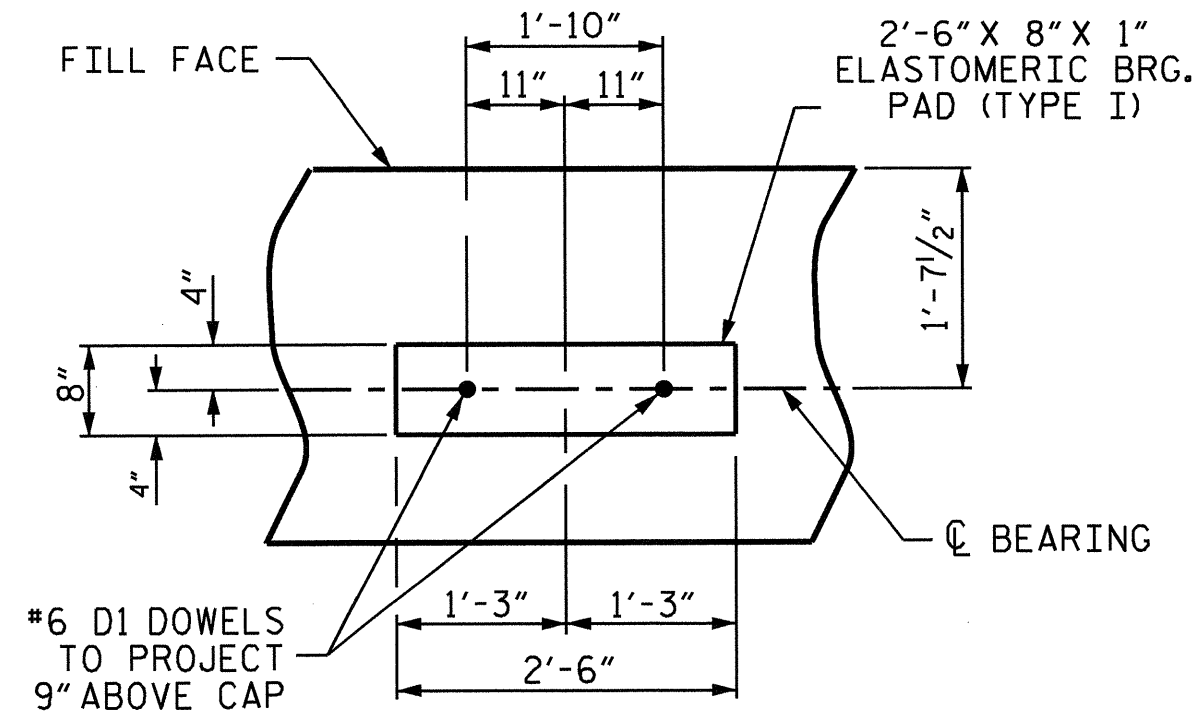


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

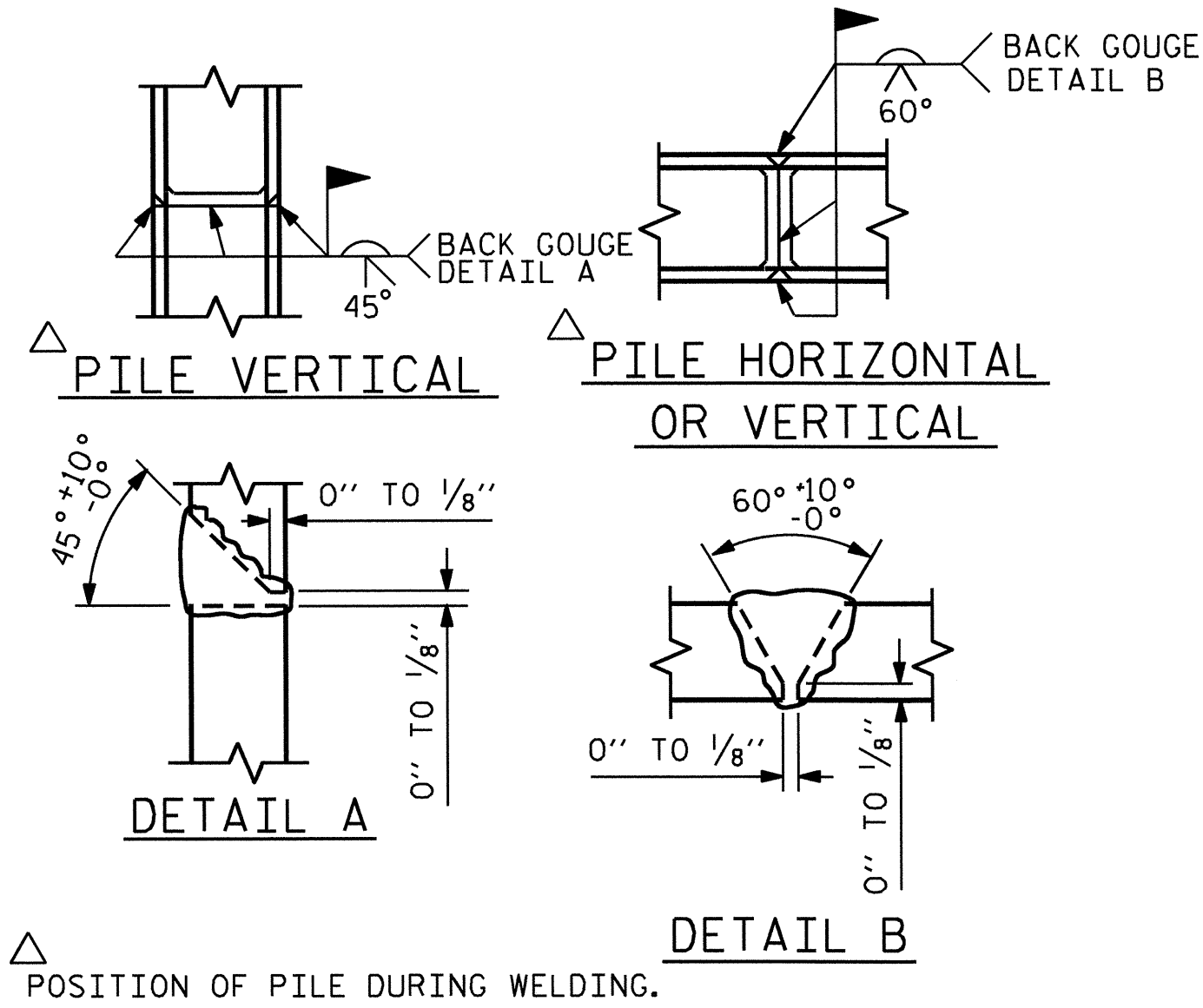
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

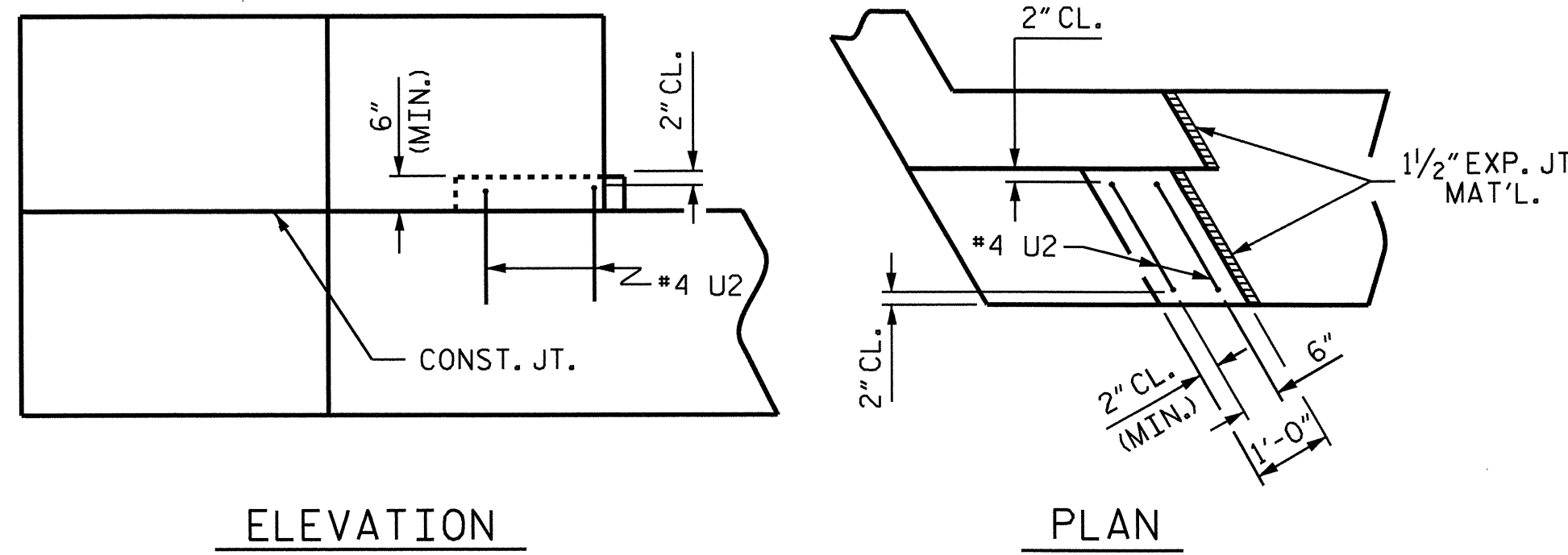
TEMPORARY DRAINAGE AT END BENT



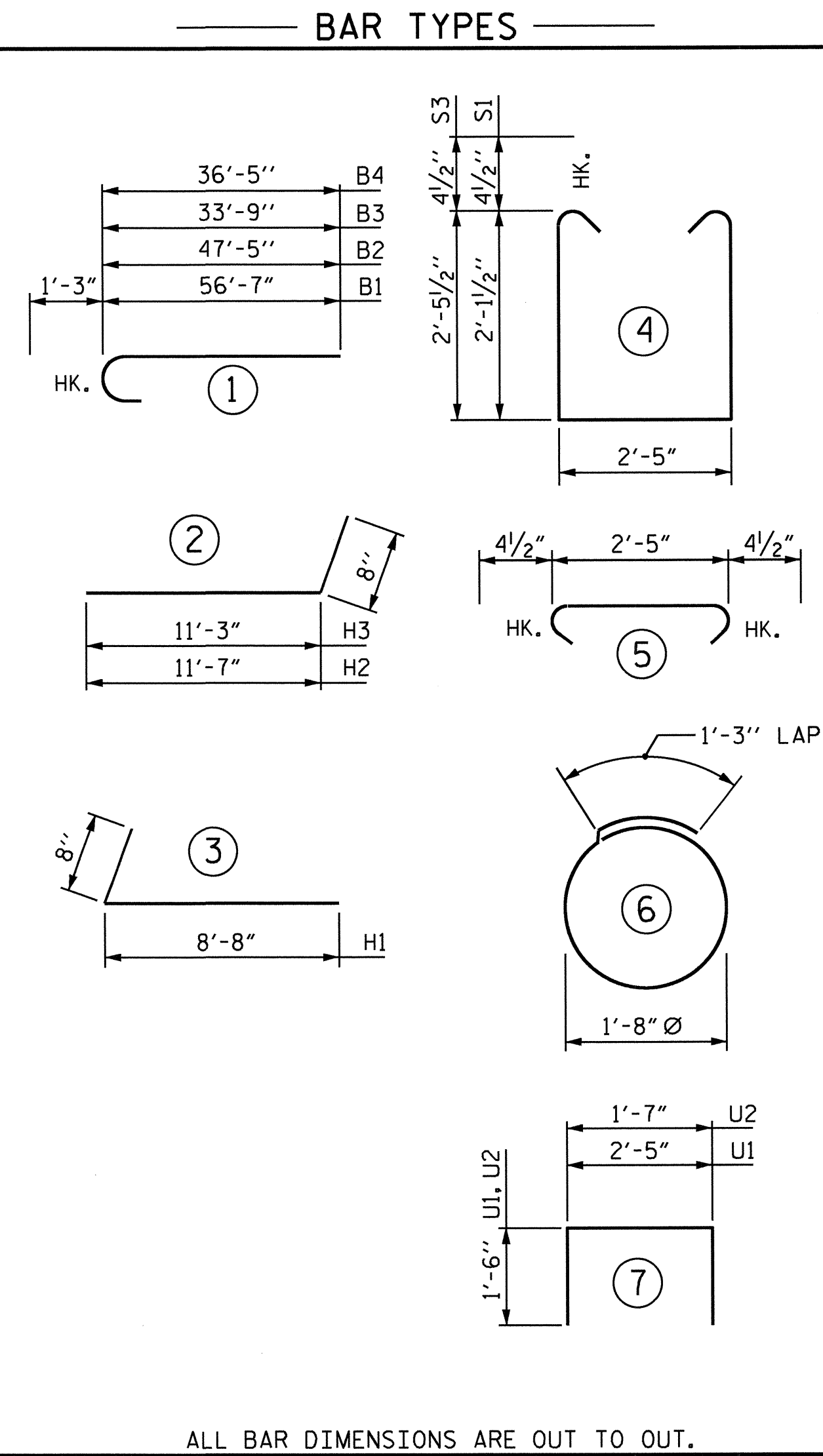
DETAIL "A"



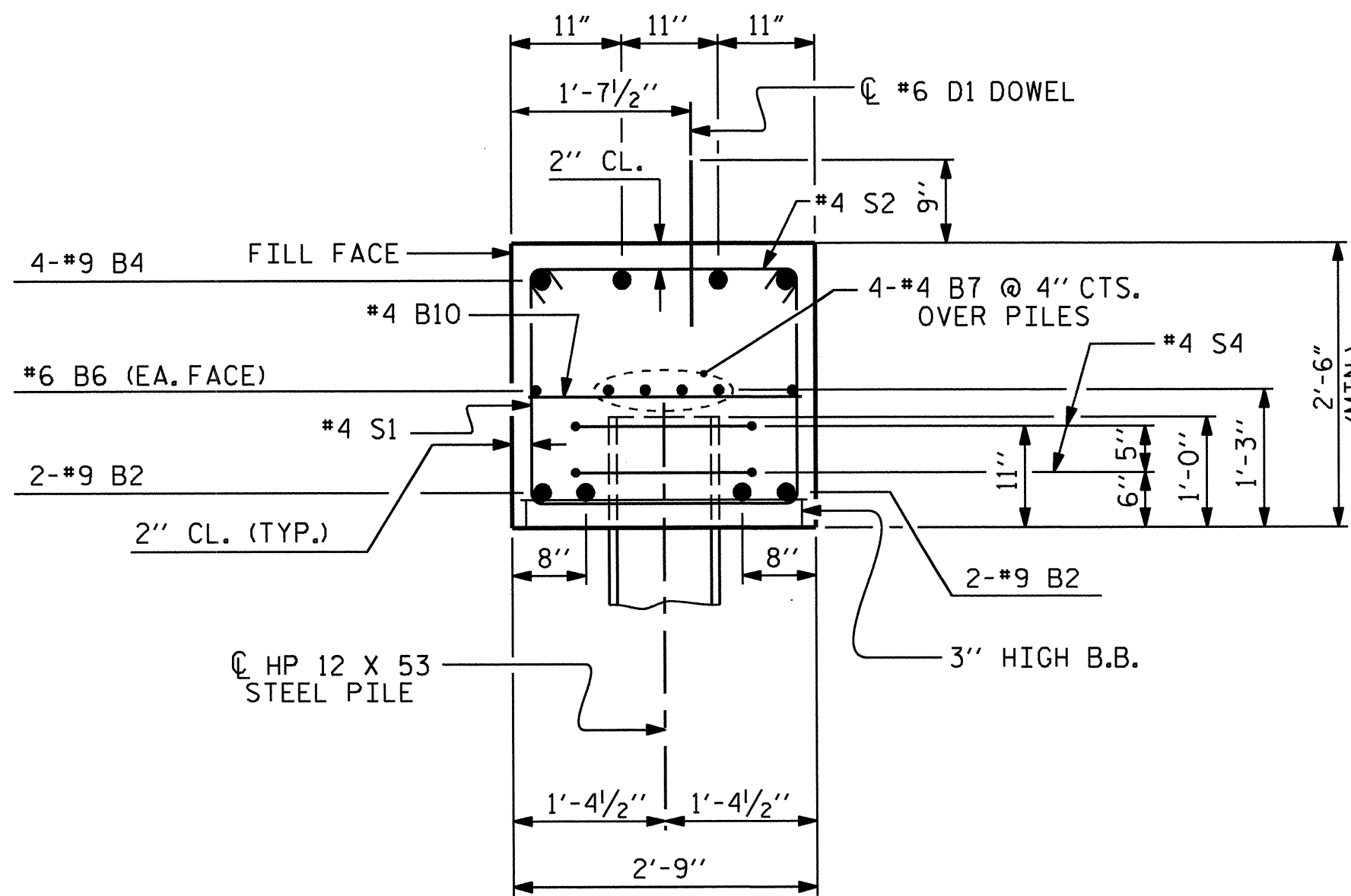
PILE SPLICE DETAILS



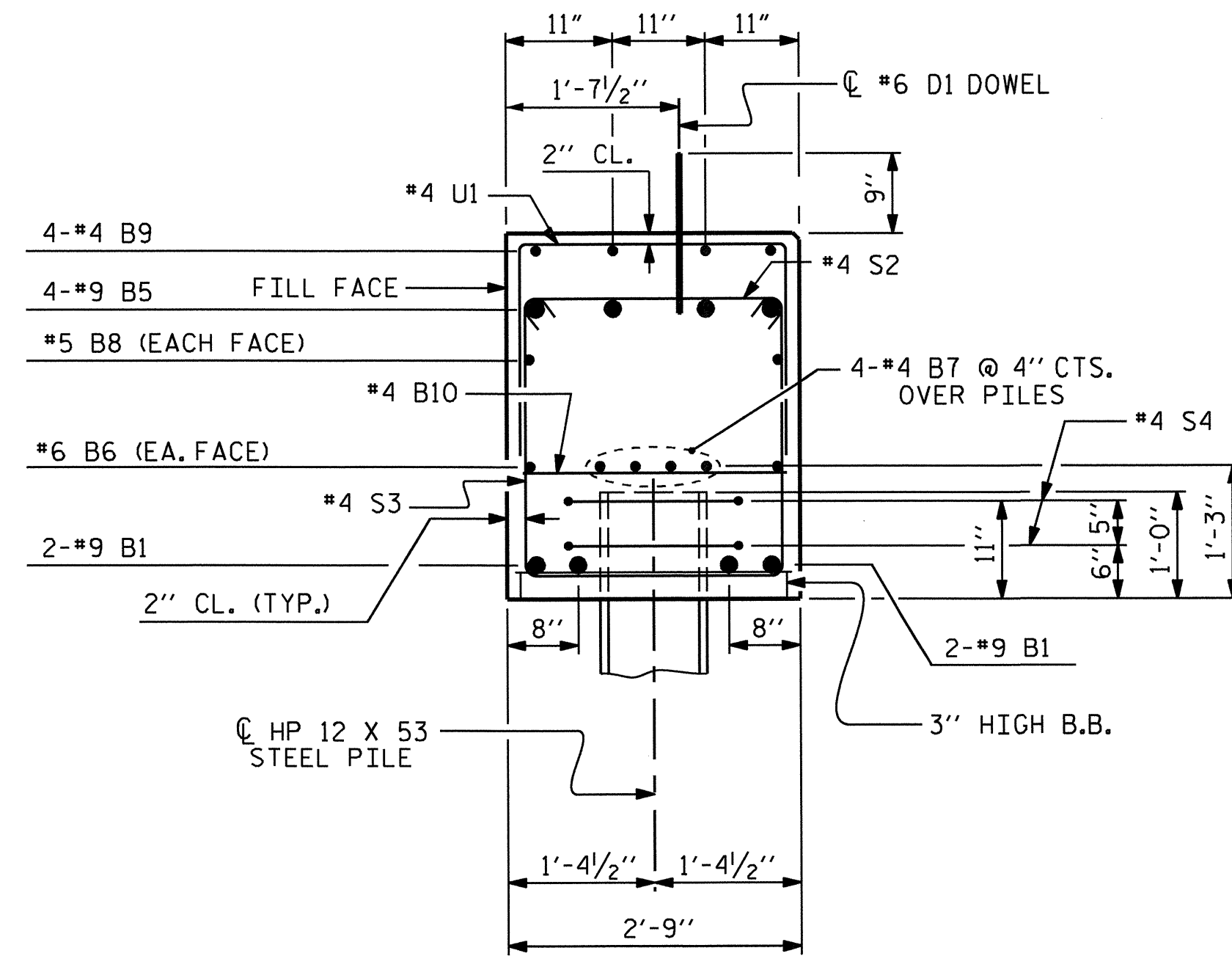
LATERAL GUIDE DETAILS
(END BENT No. 2, LEFT LATERAL GUIDE SHOWN, RIGHT END SIMILAR)



BILL OF MATERIAL					
END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#9	1	57'-10"	787
B2	4	#9	1	48'-8"	662
B3	4	#9	1	35'-0"	476
B4	4	#9	1	37'-8"	512
B5	4	#9	STR	45'-0"	612
B6	4	#6	STR	50'-3"	302
B7	16	#4	STR	26'-0"	278
B8	2	#5	STR	33'-6"	70
B9	16	#4	STR	23'-4"	249
B10	30	#4	STR	2'-5"	48
D1	52	#6	STR	1'-6"	117
H1	16	#5	3	9'-4"	155
H2	8	#5	2	12'-3"	102
H3	8	#5	2	11'-11"	99
K1	16	#4	STR	4'-6"	48
S1	49	#4	4	7'-5"	243
S2	95	#4	5	3'-2"	201
S3	46	#4	4	8'-1"	248
S4	22	#4	6	6'-6"	96
U1	57	#4	7	5'-5"	206
U2	4	#4	7	4'-7"	12
V1	32	#4	STR	5'-3"	112
V2	34	#4	STR	5'-5"	123
REINFORCING STEEL					5758 LBS.
CLASS A CONCRETE BREAKDOWN					
POUR 1 (CAP, CONCRETE COLLARS & LOWER PART OF WING)					34.6 C.Y.
POUR 2 (UPPER PART OF WING)					3.3 C.Y.
POUR 3 (LATERAL GUIDES)					0.1 C.Y.
TOTAL CLASS A CONCRETE					38.0 C.Y.
END BENT No. 2					
HP 12 X 53 STEEL PILES					
NO: 11 110 LIN. FT.					
STEEL PILE POINTS 11 EA.					



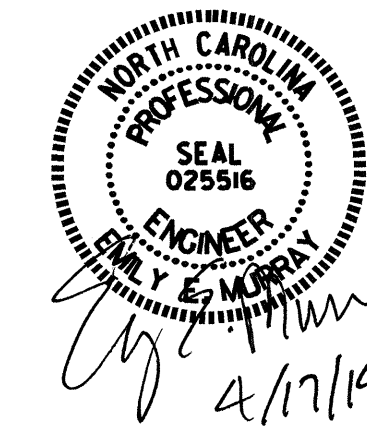
SECTION A-A
(CONCRETE COLLAR NOT SHOWN FOR CLARITY)



SECTION B-B
(CONCRETE COLLAR NOT SHOWN FOR CLARITY)

DRAWN BY: M.M. AHMED DATE: 11/7/13
 CHECKED BY: M.L. RORIE, P.E. DATE: 2/17/14
 DESIGN ENGINEER OF RECORD: K.P. SEDAI, P.E. DATE: -

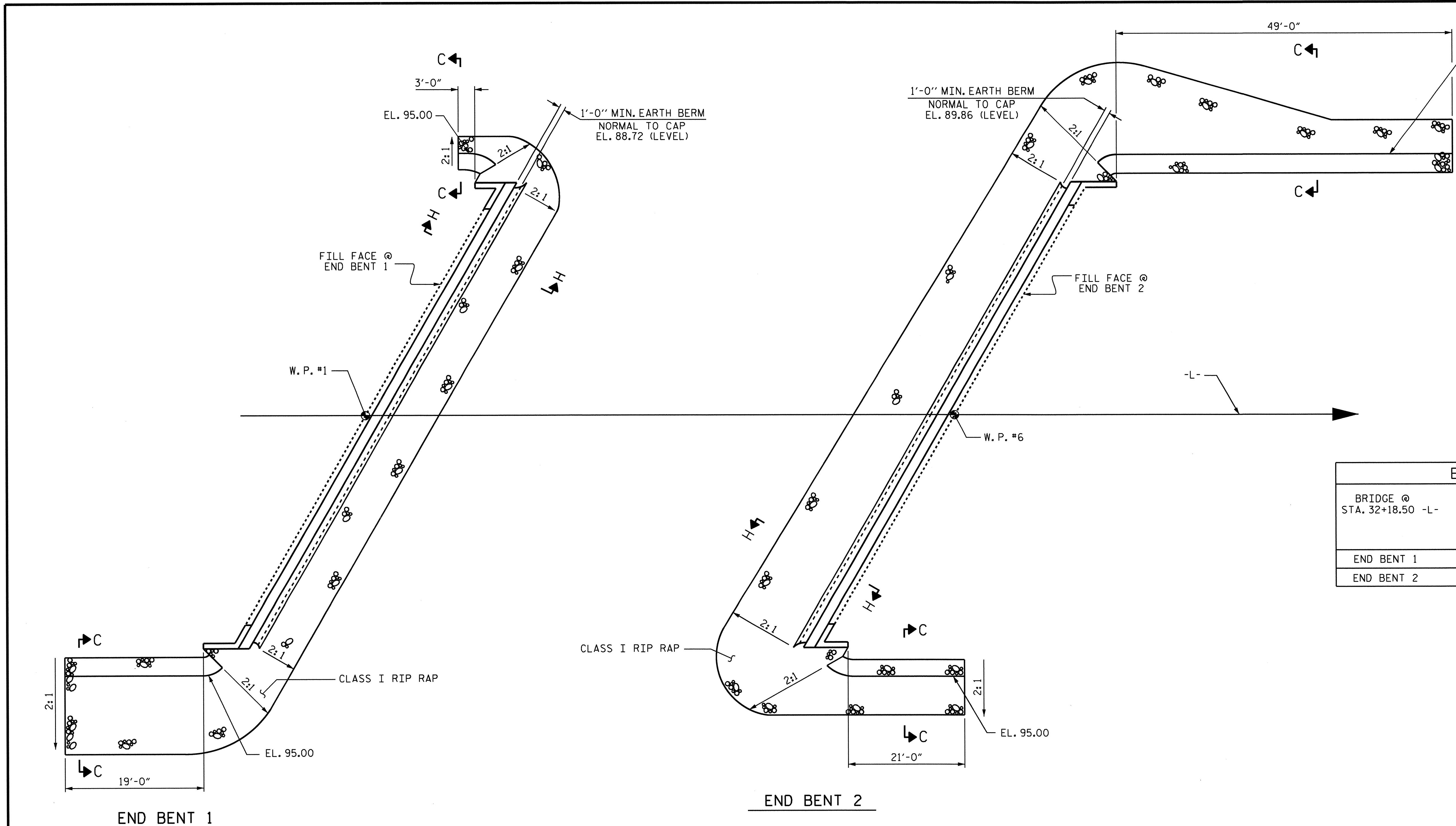
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 dgladden



PROJECT NO. U-3331
 NASH COUNTY
 STATION: 32+18.50 -L-

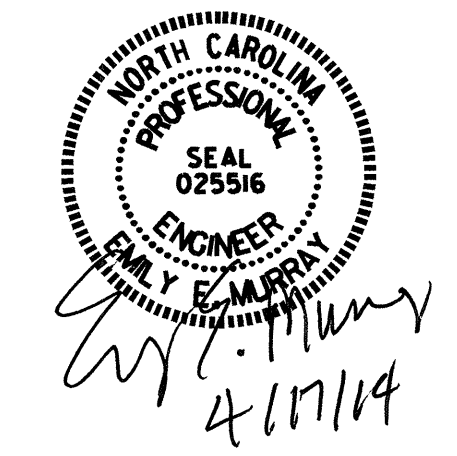
SHEET 3 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT 2					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-31
					TOTAL SHEETS 34

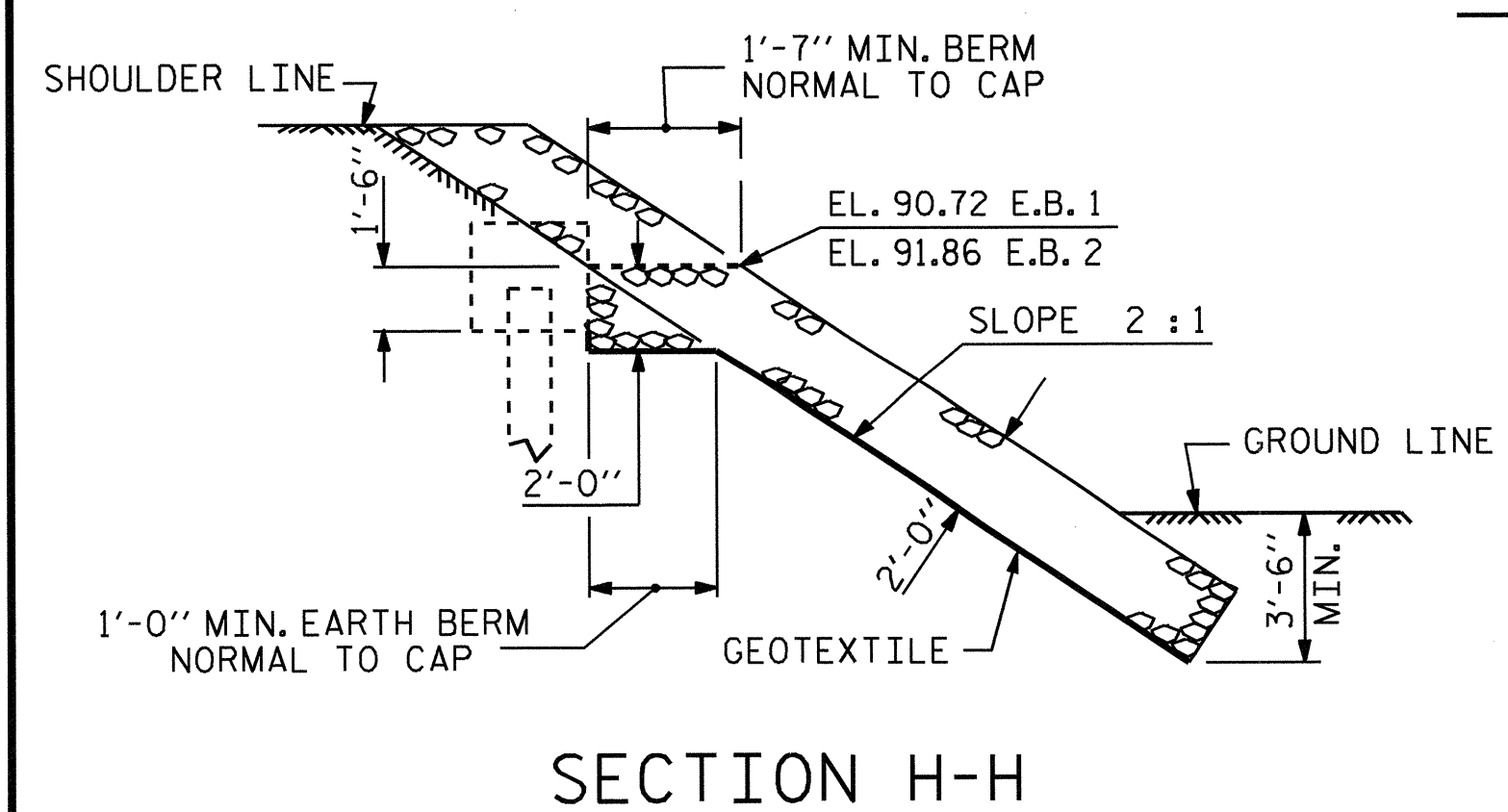


NOTES :
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.

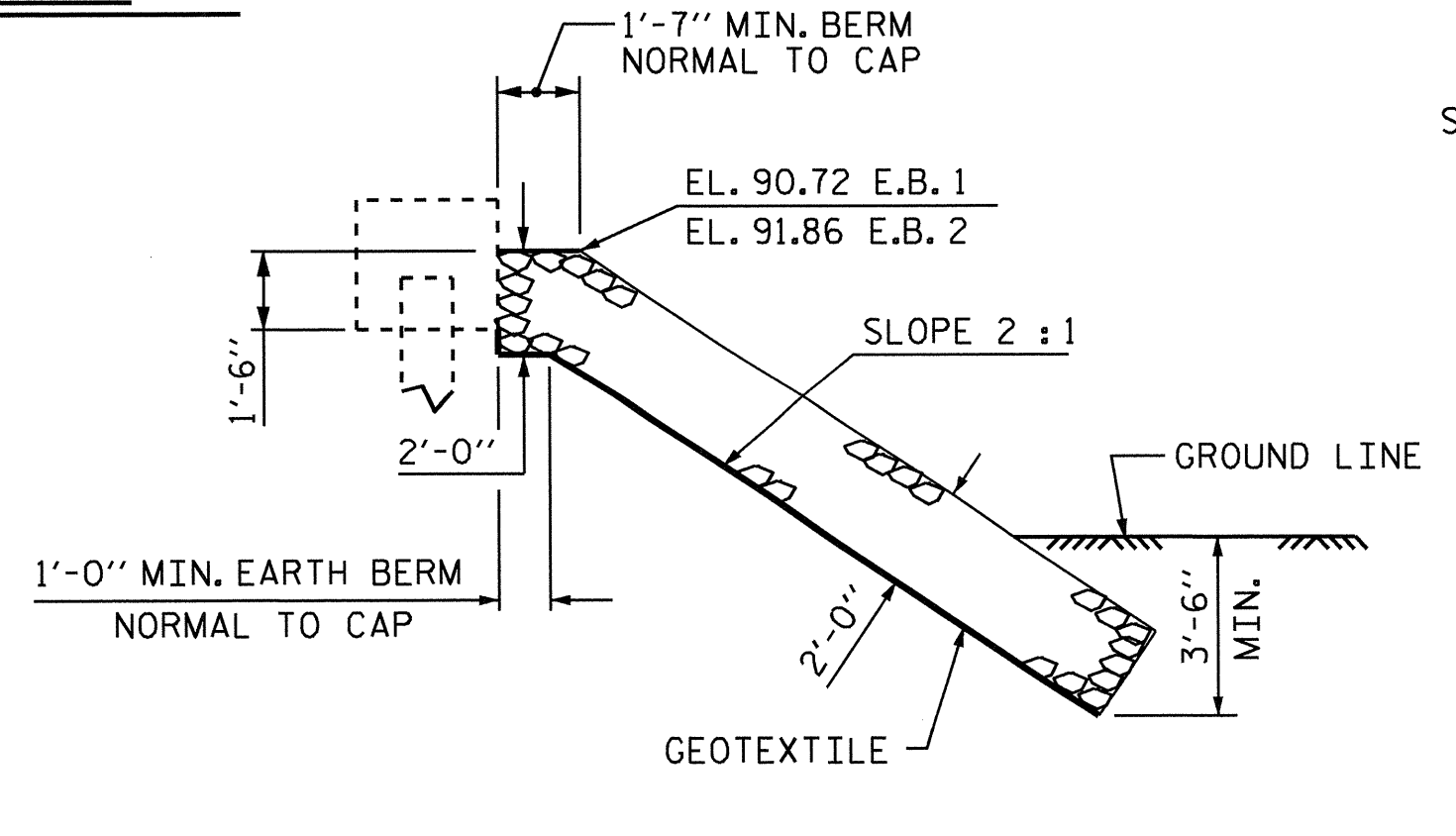
ESTIMATED QUANTITIES		
BRIDGE @ STA. 32+18.50 -L-	RIP RAP CLASS I (2'-0" THICK)	GEOTEXTILES FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	119	132
END BENT 2	181	201



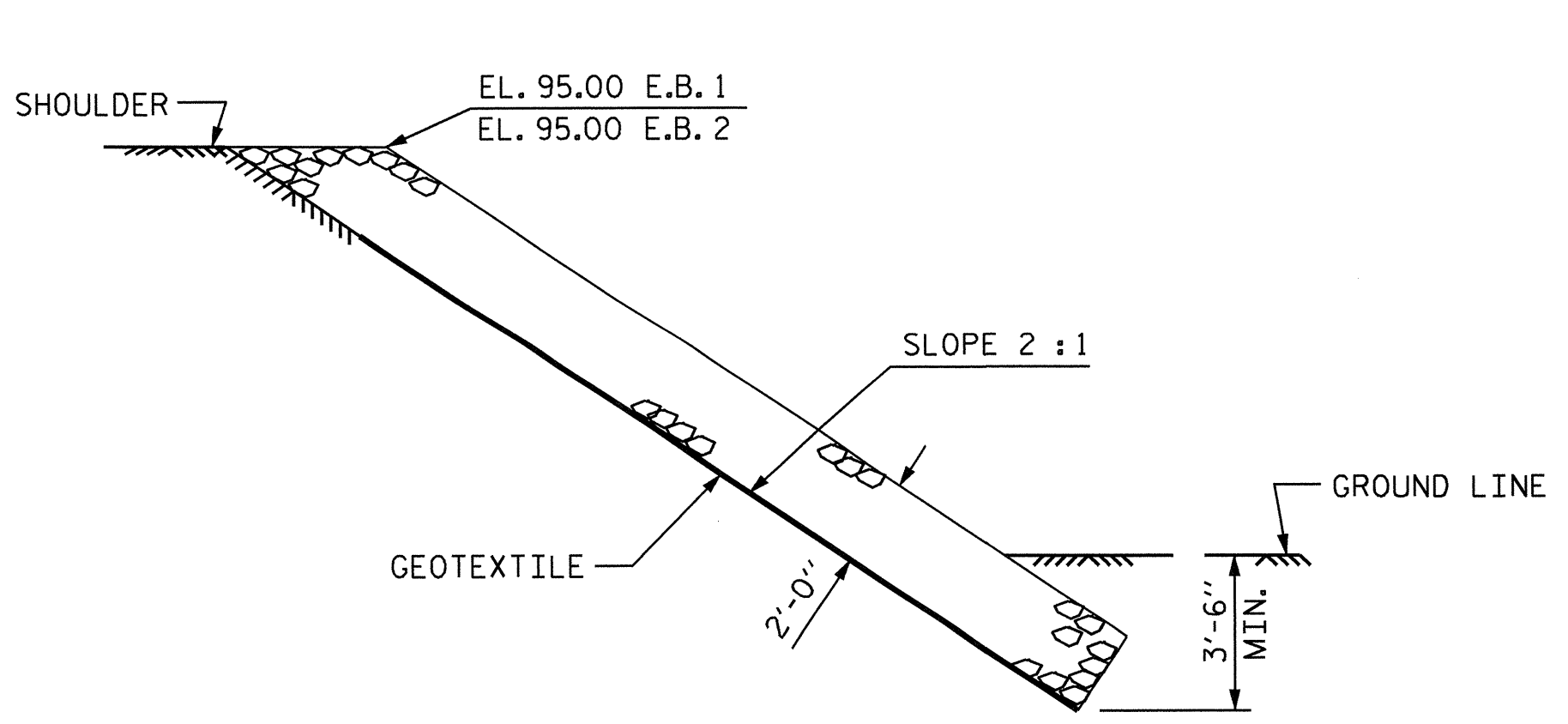
PLAN



SECTION H-H



SECTION BERM RIP RAP



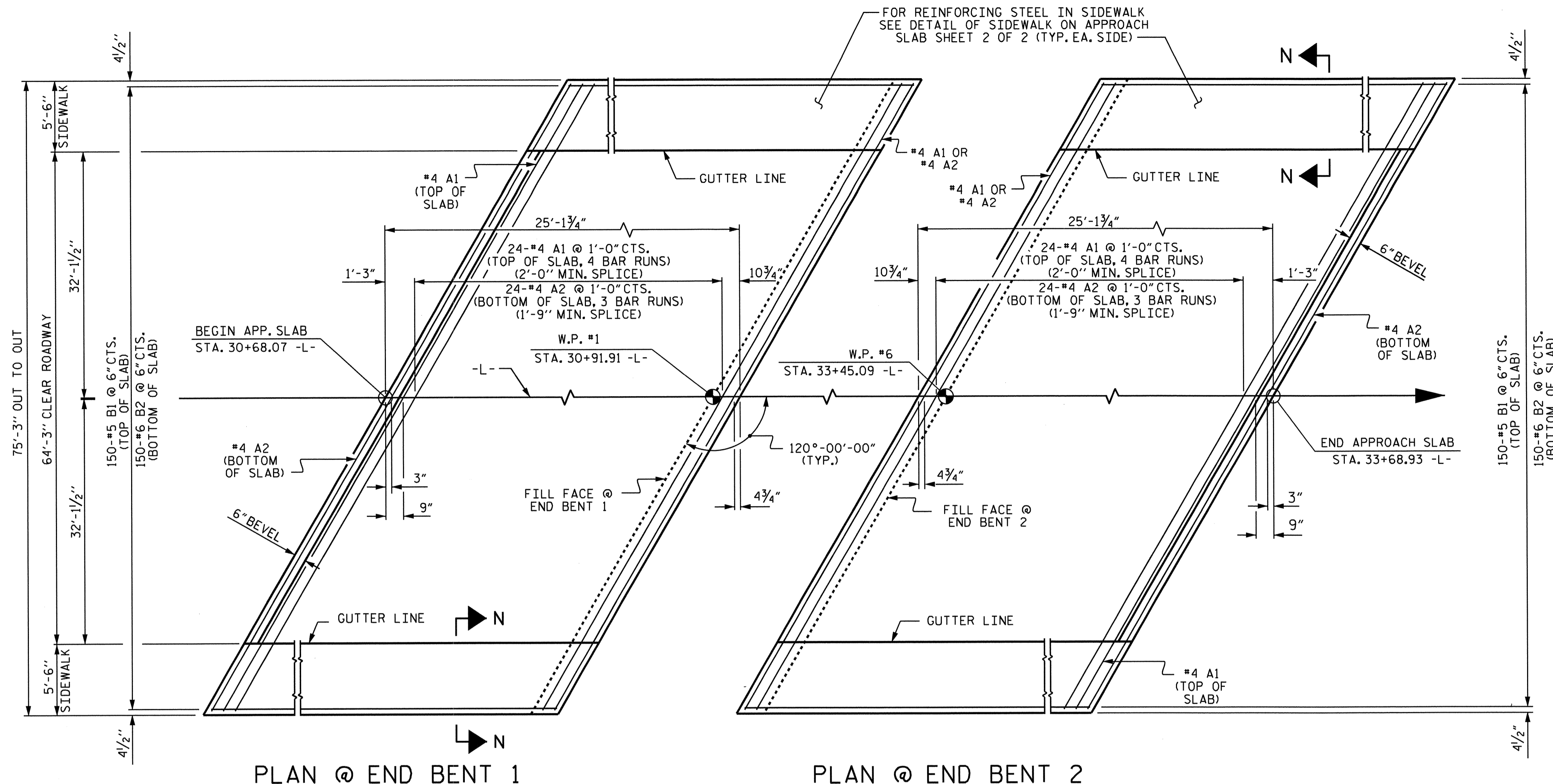
SECTION C-C

PROJECT NO. U-3331
NASH COUNTY
STATION: 32+18.50 -L-

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

ASSEMBLED BY : M.M. AHMED
CHECKED BY : M.L. RORIE, P.E.
DATE : 2/3/14
DATE : 2/3/14
DRAWN BY : FCJ 2/88
CHECKED BY : ARB 8/88
REV. 8/16/99 RWW/LES
REV. 10/17/00 RWW/LES
REV. 5/1/06 TLA/GM

REVISIONS						SHEET NO. S-32
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 34
2			4			



PLAN @ END BENT 1

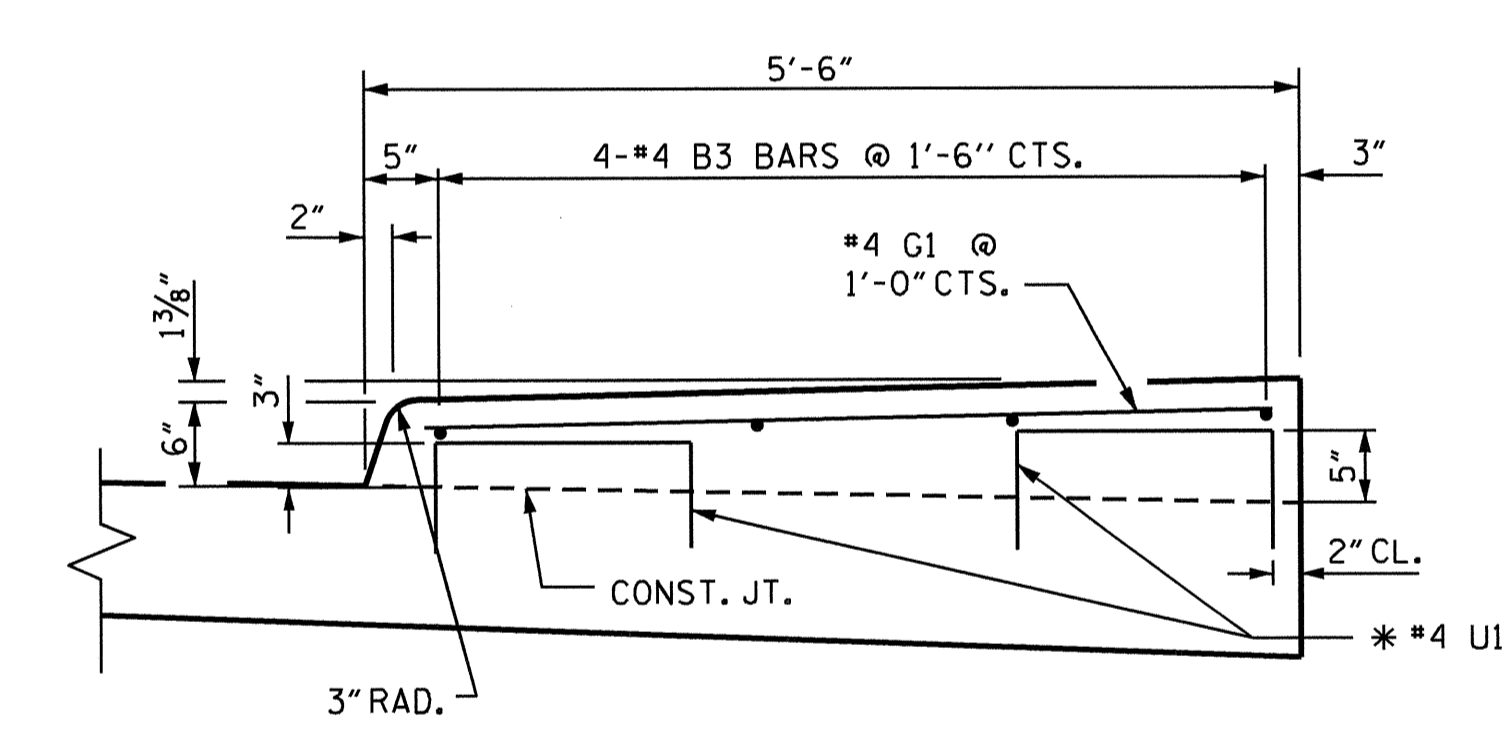
PLAN @ END BENT 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

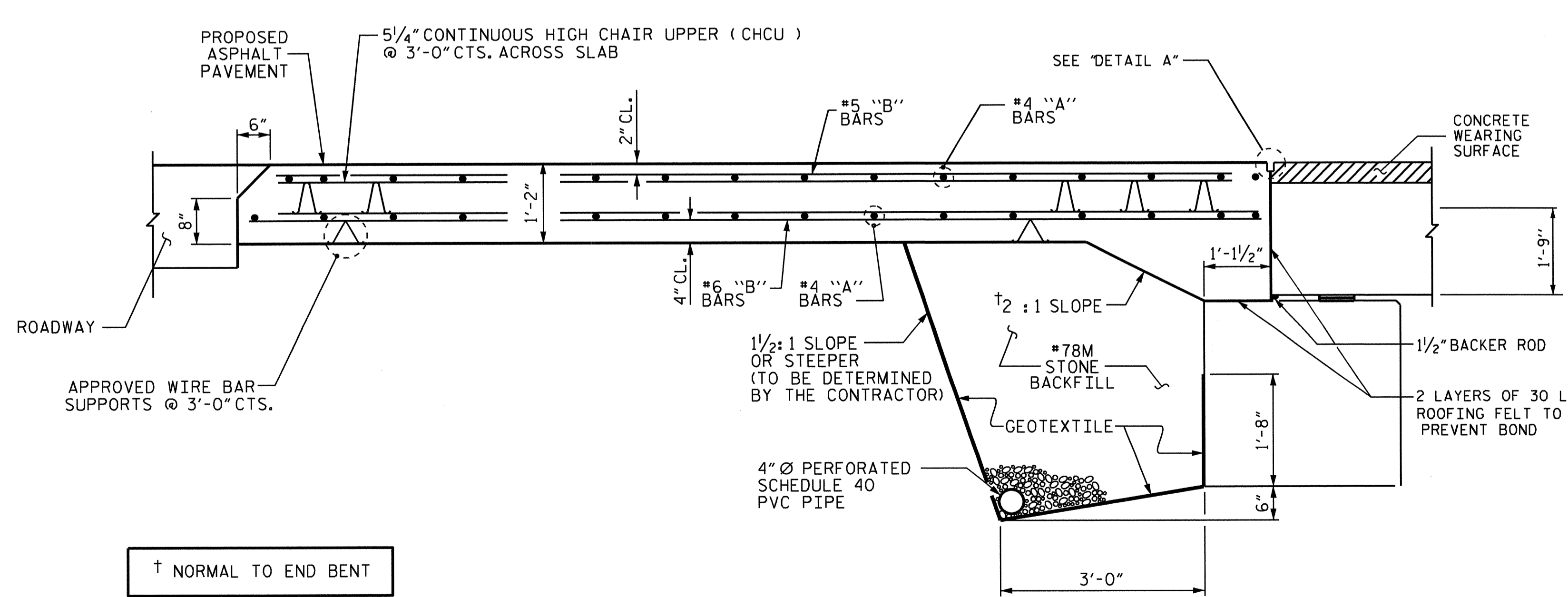
BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.

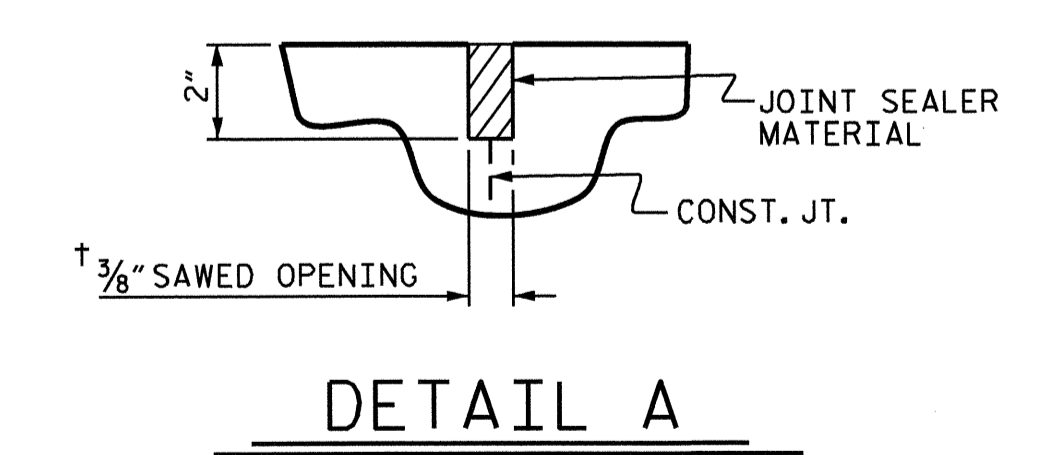
BILL OF MATERIAL FOR ONE APPROACH SLAB (2 REQ'D)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	104	#4	STR	23'-2"	1609
A2	78	#4	STR	30'-0"	1563
* B1	150	#5	STR	24'-1"	3768
B2	150	#6	STR	24'-8"	5557
* B3	8	#4	STR	24'-8"	132
* G1	50	#4	STR	5'-9"	192
* U1	16	#4	1	3'-3"	35
REINFORCING STEEL					LBS. 7120
* EPOXY COATED REINFORCING STEEL					LBS. 5736
CLASS AA CONCRETE					
SLAB					C.Y. 88.1
SIDEWALK					C.Y. 6.3
TOTAL CLASS AA CONCRETE					C.Y. 94.4



SECTION N-N
SIDEWALK DETAILS



SECTION THRU SLAB

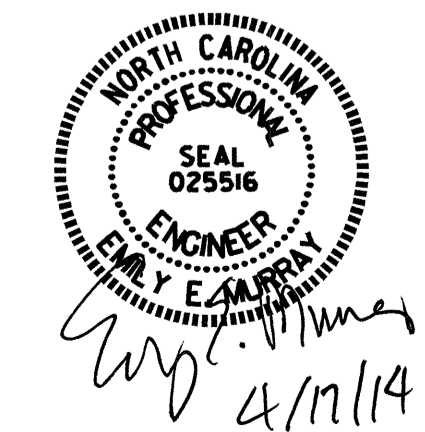


DETAIL A

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

PROJECT NO. U-3331
NASH COUNTY
 STATION: 32+18.50 -L-
 SHEET 1 OF 2

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



REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33	
1			3			TOTAL SHEETS 34	
2			4				

DRAWN BY: M.M. AHMED DATE: 12/9/13
 CHECKED BY: M.L. RORIE, P.E. DATE: 1/24/14
 DESIGN ENGINEER OF RECORD: M.M. AHMED DATE: 3/7/14

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.

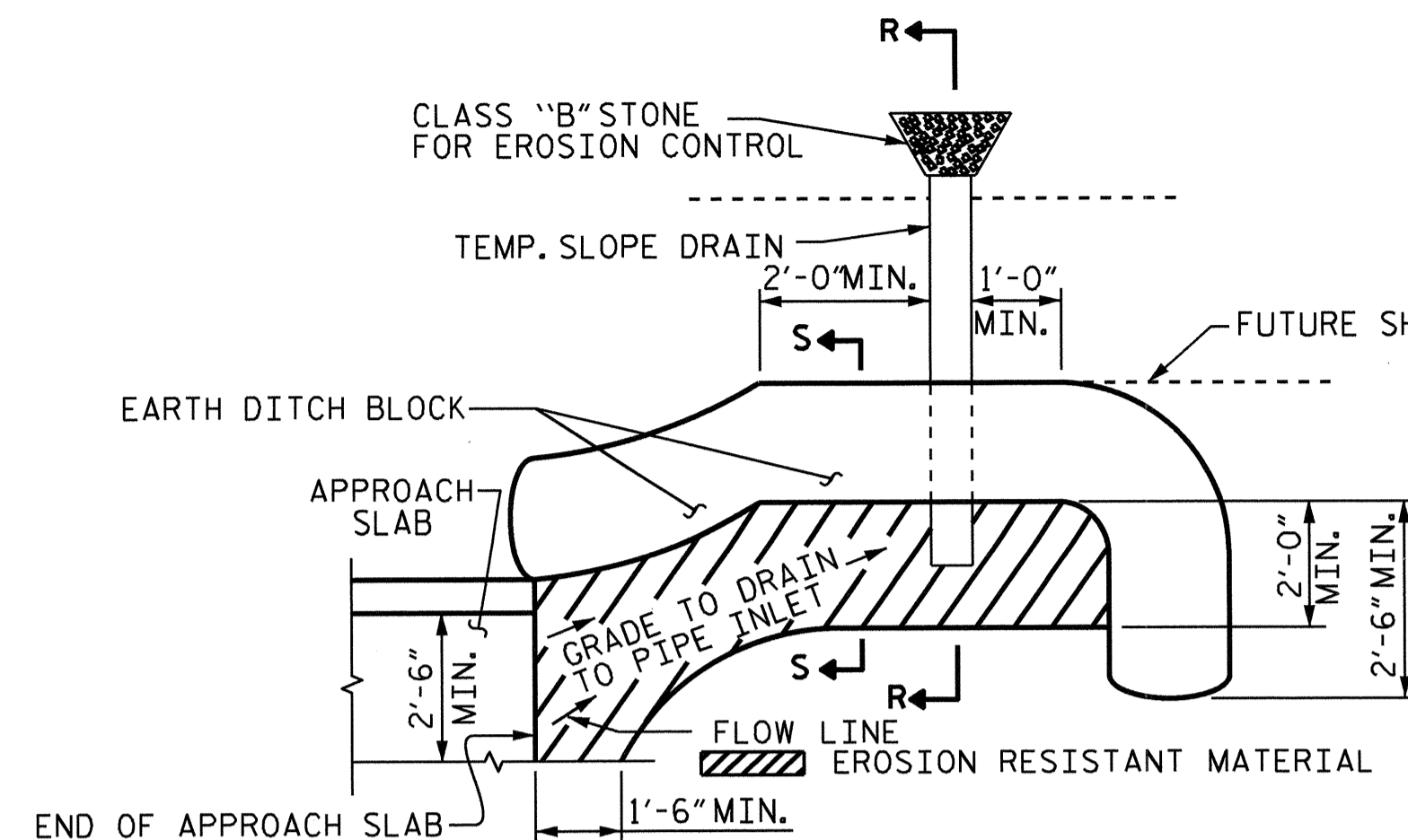
FOR THE 4" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

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.

APPROACH SLAB GROOVING IS REQUIRED.

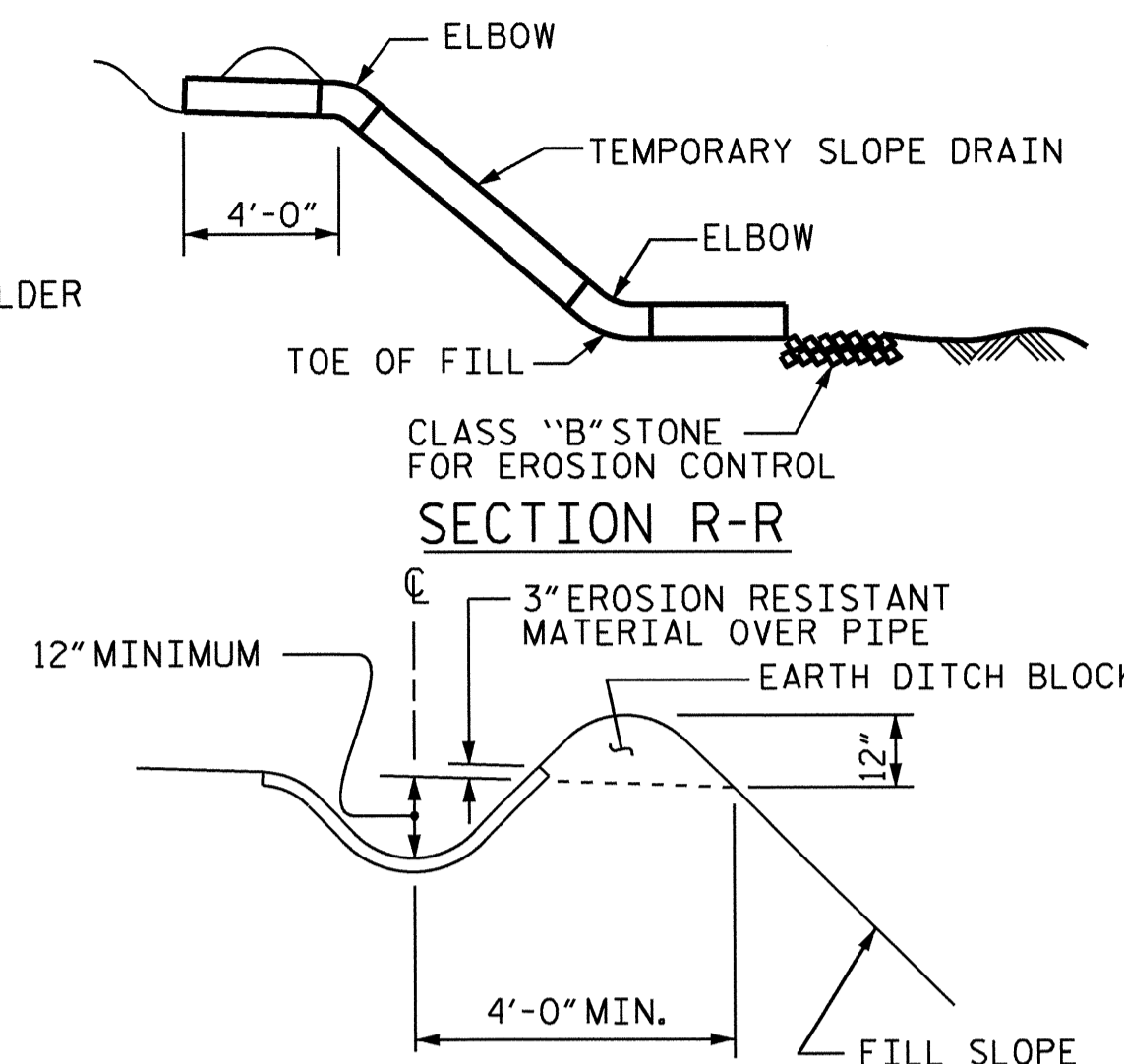
APPROACH SLABS SHALL BE POURED AFTER CONCRETE OVERLAY IS POURED.

UI BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER THE SLAB HAS BEEN SCREEDED AND FLOAT FINISHED.

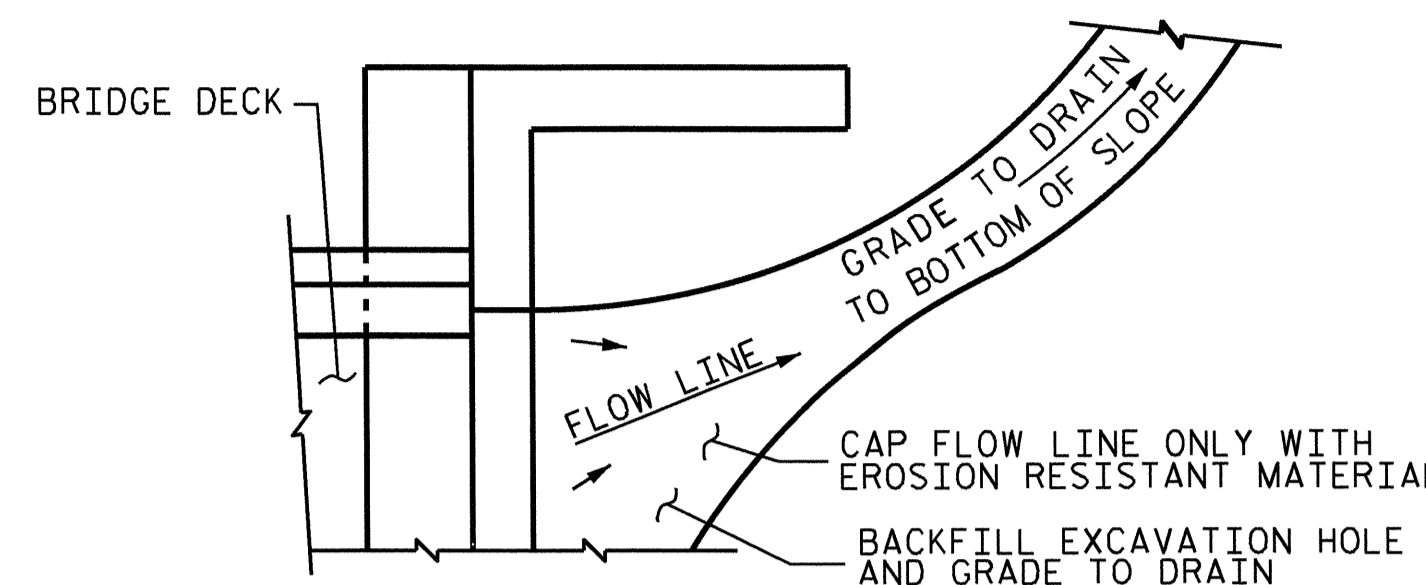


NOTE:
IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

PLAN VIEW



SECTION R-R

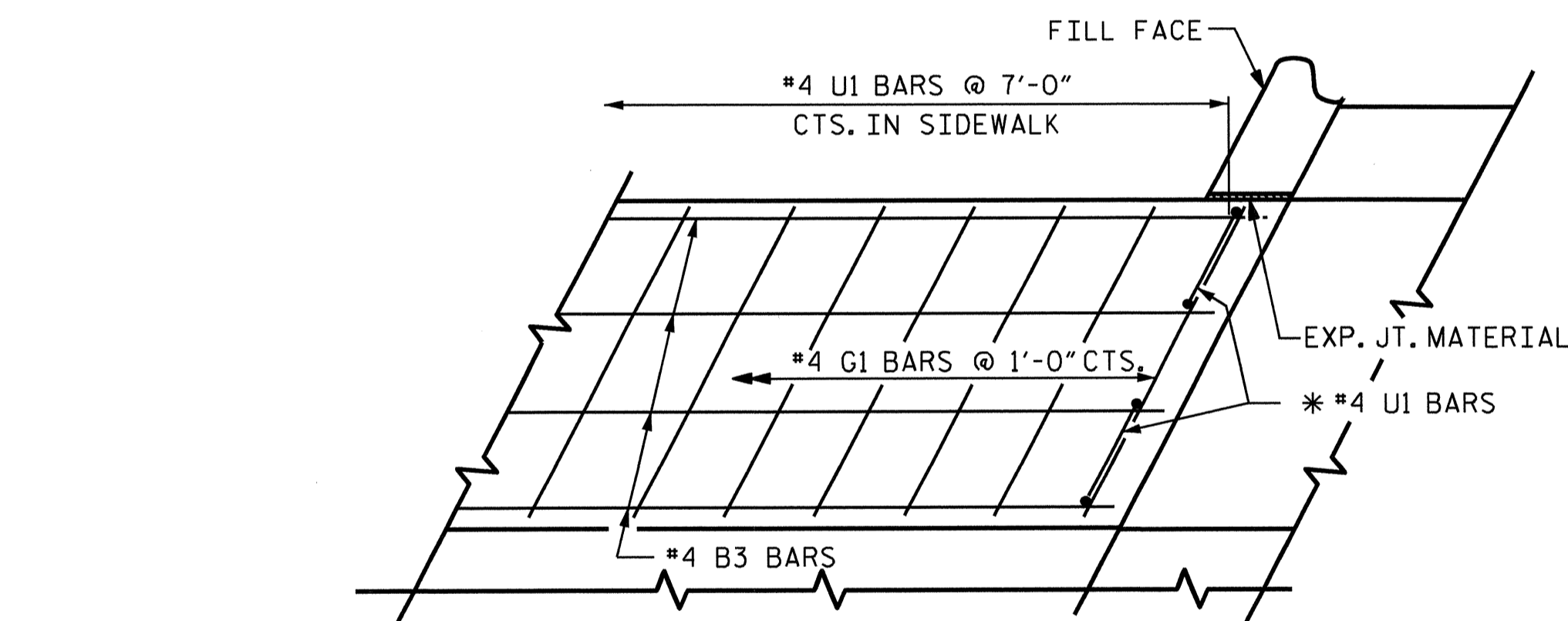


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

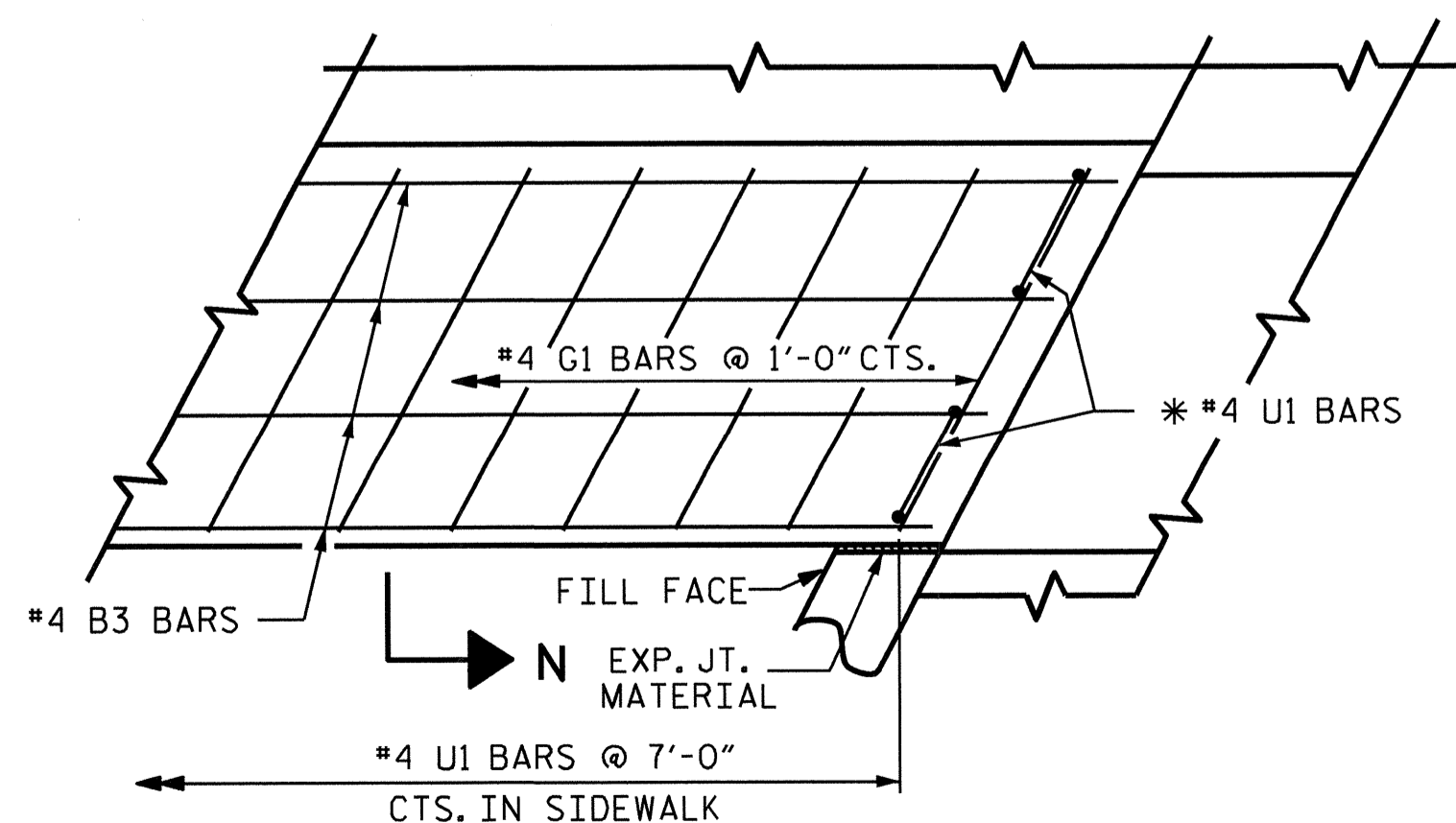
TEMPORARY DRAINAGE DETAIL

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



* THESE BARS ARE TO BE PLACED AFTER THE SAWING OF THE JOINT. THE HOLES SHALL BE DRILLED AND THE UI BARS GROUTED INTO PLACE.



PLAN

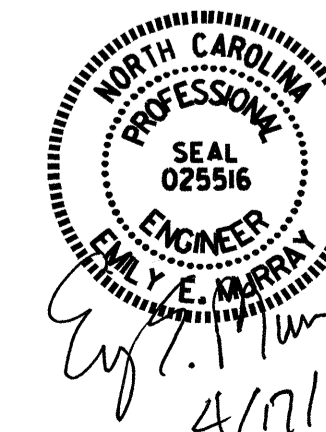
DETAILS OF SIDEWALK ON APPROACH SLAB

ASSEMBLED BY : M.M. AHMED	DATE : 1-24-13
CHECKED BY : M.L. RORIE, P.E.	DATE : 1-24-14
DESIGN ENGINEER OF RECORD : M.M. AHMED	DATE : 3-7-14
DRAWN BY : FCJ 11/88	REV. 10/17/00 RWW/LES
CHECKED BY : ARB 11/88	REV. 5/7/03 RWW/JTE
	REV. 5/1/06R MAA/KMM

PROJECT NO. U-3331
NASH COUNTY
STATION: 32+18.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
BRIDGE APPROACH
SLAB DETAILS



REVISIONS						SHEET NO.
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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. FINISHES AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN