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TIP PROJECT: U-3330

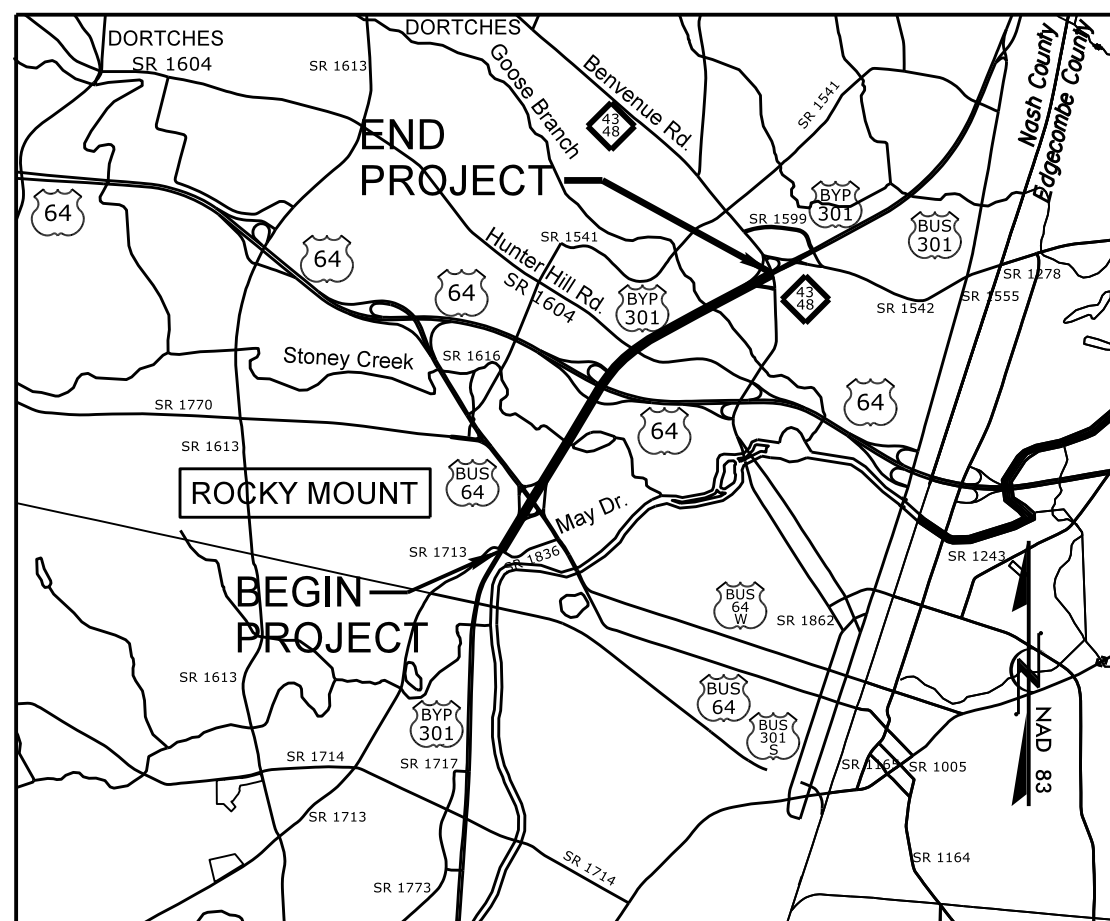
CONTRACT: C203907

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

NASH COUNTY

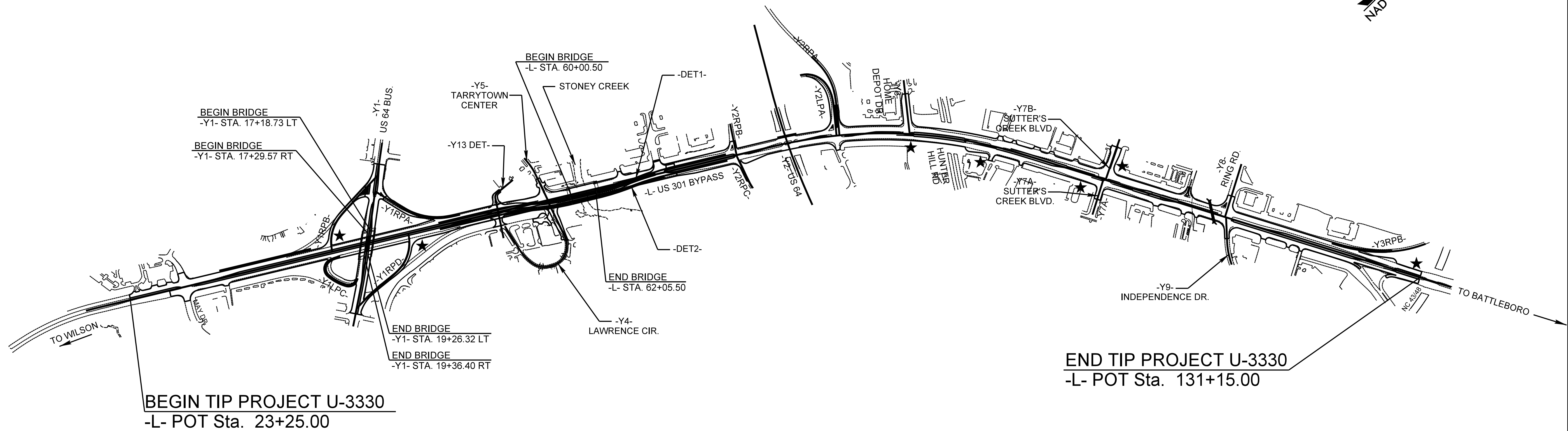
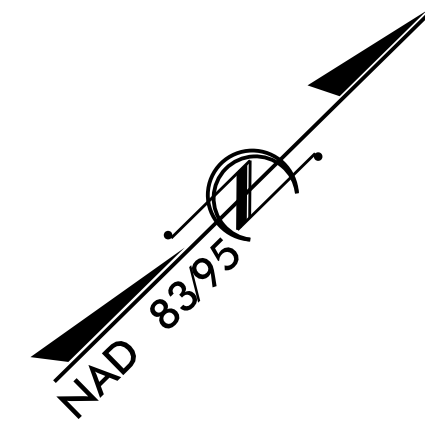
LOCATION: ROCKY MOUNT - US 301 BYPASS FROM SR 1836 (MAY DRIVE) TO NC 43-48 (BENVENUE ROAD) INTERCHANGE

TYPE OF WORK: GRADING, DRAINAGE, PAVING, SIGNALS, NOISE WALL, STRUCTURES, AND CULVERT

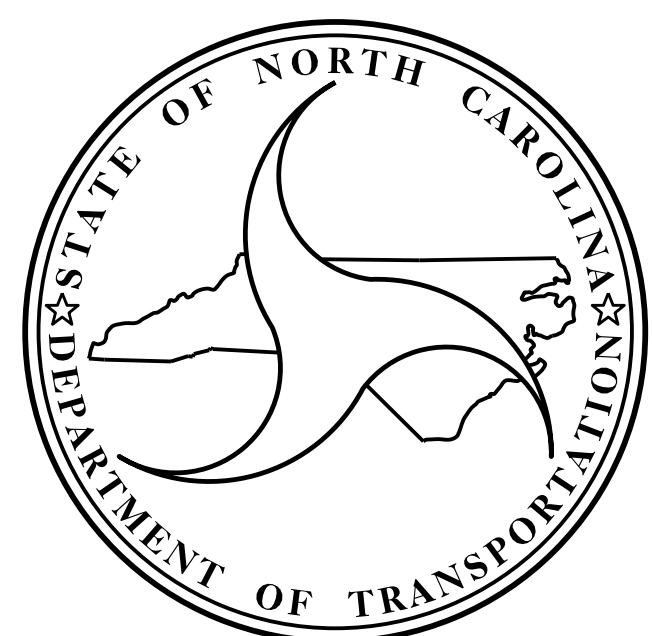


VICINITY MAP

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3330	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
36596.1.2	STP - 0301 (28)	PE	
36596.2.FR1	STP - 0301 (28)	RW	
36596.2.FR1	STP - 0301 (28)	UTIL.	
36596.3.4	STP - 0301 (28)	CONST.	



STRUCTURES



DESIGN DATA

ADT 2016 = 38,580
ADT 2036 = 47,100
K = 10%
D = 55%
T = 4%*
V = 50 mph

*TTST 2% DUAL 2%
FUNCTIONAL CLASS.: URBAN ARTERIAL
STATEWIDE TIER

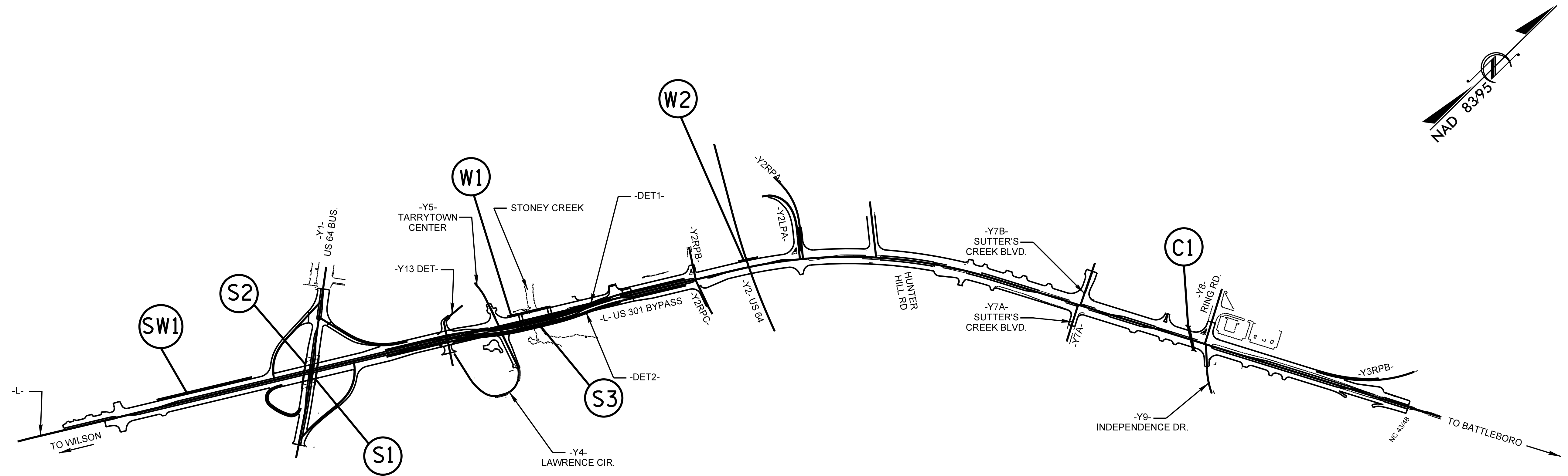
PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-3330 2.005 Miles
LENGTH STRUCTURE TIP PROJECT U-3330 0.039 Mile
TOTAL LENGTH TIP PROJECT U-3330 2.044 Miles

Prepared In the Office of:
DIVISION OF HIGHWAYS
STRUCTURES MANAGEMENT UNIT
1000 BIRCH RIDGE DR.
RALEIGH, N.C. 27610

2012 STANDARD SPECIFICATIONS

LETTING DATE :
May 16, 2017



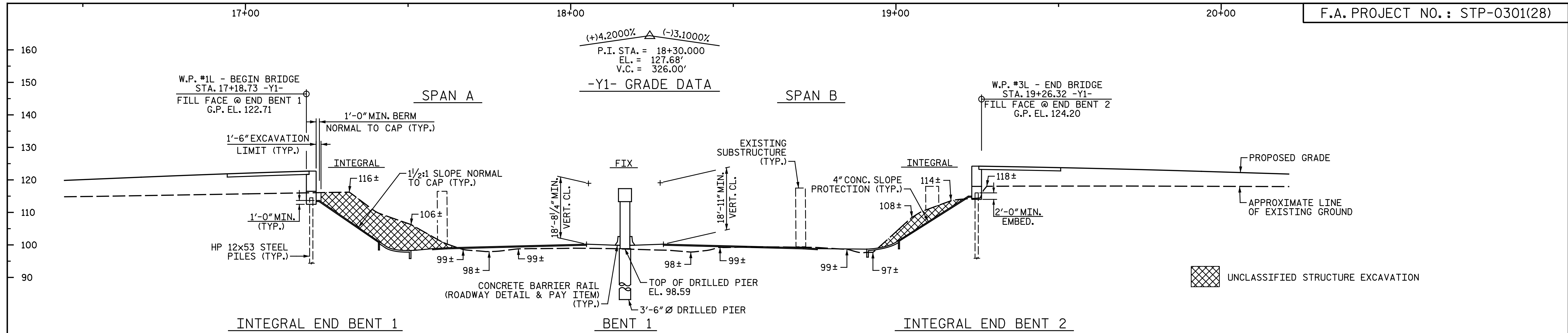
INDEX			
STR	STATION	DESCRIPTION	SHEETS
S1	18+22.61 -Y1- (LEFT LANE)	BRIDGE ON US 64 BUSINESS OVER US 301 BYPASS (LEFT LANE)	S1-1 THRU S1-38
S2	18+22.61 -Y1- (RIGHT LANE)	BRIDGE ON US 64 BUSINESS OVER US 301 BYPASS (RIGHT LANE)	S2-1 THRU S2-39
S3	61+03.00 -L-	BRIDGE OVER STONY CREEK ON US 301 BYPASS	S3-1 THRU S3-42
C1	113+48.00 -L-	DOUBLE 6 X 7 RCBC (LEFT & RIGHT EXTENSIONS) & 66" Ø PIPE	C-1 THRU C-11
SW1	30+80.70 -L-	SOUND BARRIER WALL	SW-1 THRU SW-3
W1	58+80.00 -L-	RETAINING WALL	W-1 THRU W-3
W2	77+40.00 -L-	RETAINING WALL	W-4 THRU W-6

PROJECT NO. U-3330
NASH COUNTY

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

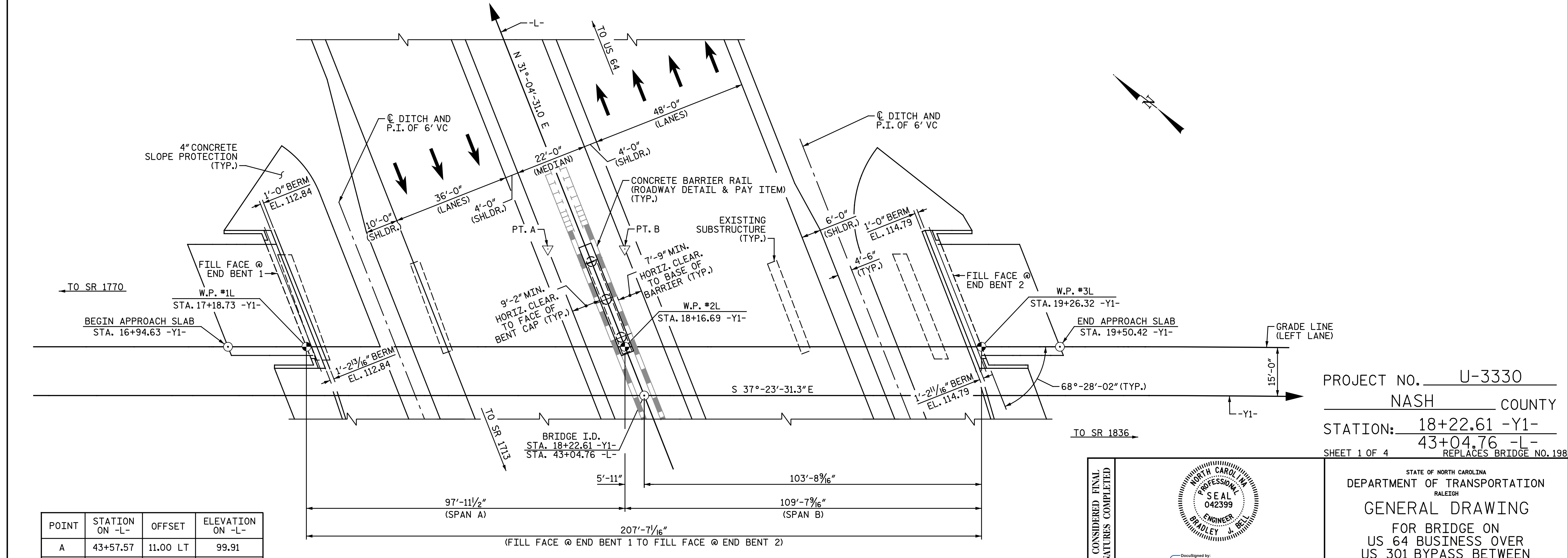
INDEX SHEET

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



SECTION ALONG GRADE LINE (LEFT LANE)

(BENTS ON SECTION AT RIGHT ANGLES TO BENTS)
(SOME EXISTING SUBSTRUCTURE UNITS NOT SHOWN FOR CLARITY)



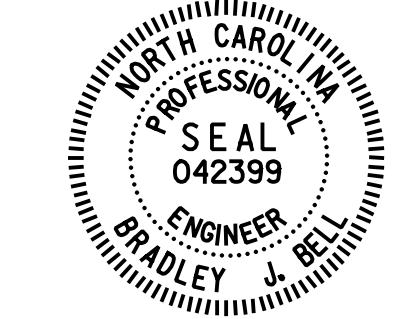
PLAN

(PILES NOT SHOWN IN PLAN VIEW FOR CLARITY)
(SOME EXISTING SUBSTRUCTURE UNITS NOT SHOWN FOR CLARITY)

POINT	STATION ON -L-	OFFSET	ELEVATION ON -L-
A	43+57.57	11.00 LT	99.91
B	43+48.89	11.00 RT	99.94

▽ - DENOTES POINT OF MINIMUM VERTICAL CLEARANCE

PROJECT NO. U-3330
NASH COUNTY
STATION: 18+22.61 -Y1-
43+04.76 -L-
SHEET 1 OF 4 REPLACES BRIDGE NO. 198



DocuSigned by:
Bradley J. Bell
1/27/2017

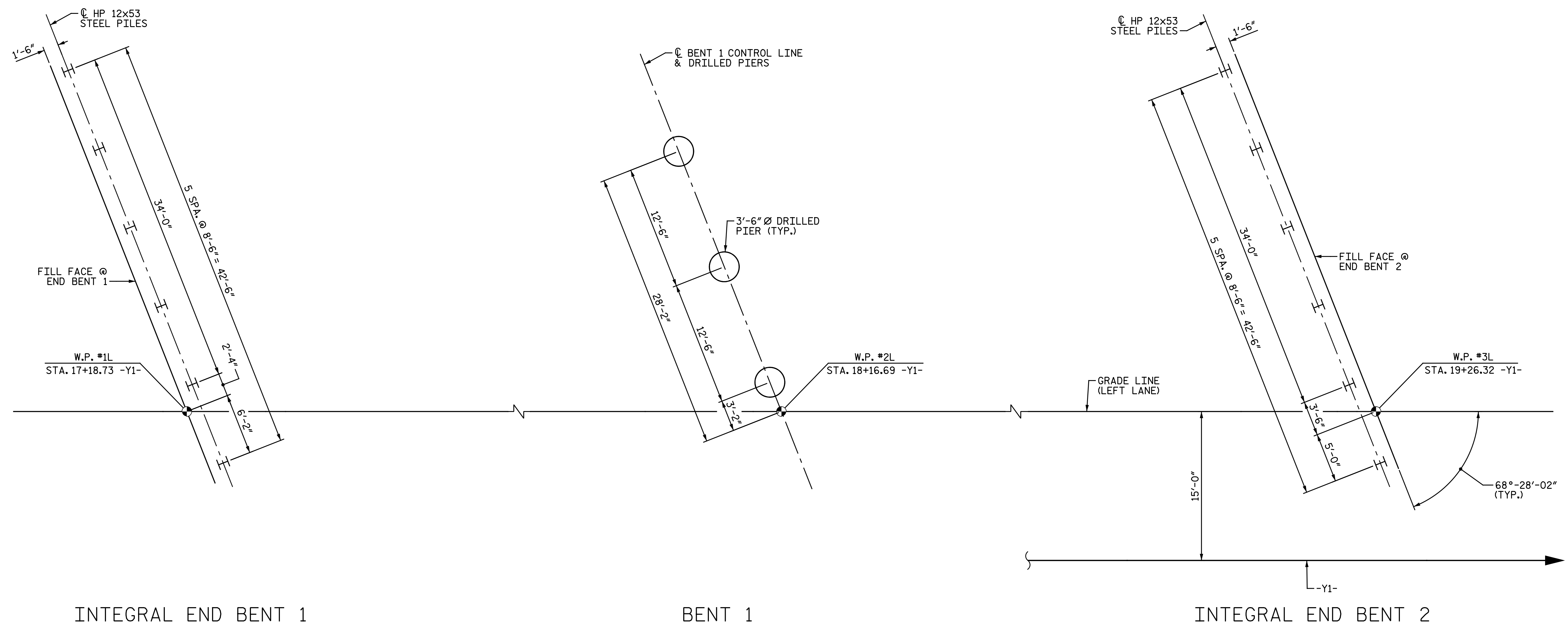
Michael Baker
INTERNATIONAL

Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No.: F-1084

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
GENERAL DRAWING
FOR BRIDGE ON
US 64 BUSINESS OVER
US 301 BYPASS BETWEEN
SR 1770 & SR 1836
LEFT LANES

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

DRAWN BY: CEM / MDM DATE: 8-2-16
CHECKED BY: B. J. BELL DATE: 9-7-16



NOTES:

- FOR DRILLED PIERS, SEE GEOTECHNICAL SPECIAL PROVISIONS AND SECTION 411 OF THE STANDARD SPECIFICATIONS.
- DRILLED PIERS AT BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 705 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 165 TSF.
- INSTALL DRILLED PIERS AT BENT NO.1 TO A TIP ELEVATION NO HIGHER THAN 85 FT AND WITH THE REQUIRED TIP RESISTANCE.
- 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.
- SID INSPECTIONS MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SID INSPECTIONS. FOR SID INSPECTIONS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- FOR PILES, SEE GEOTECHNICAL SPECIAL PROVISIONS AND SECTION 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT END BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 110 TONS PER PILE.
- PILES AT END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 120 TONS PER PILE.
- DRIVE PILES AT END BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 185 TONS PER PILE.
- DRIVE PILES AT END BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 200 TONS PER PILE.

FOUNDATION LAYOUT

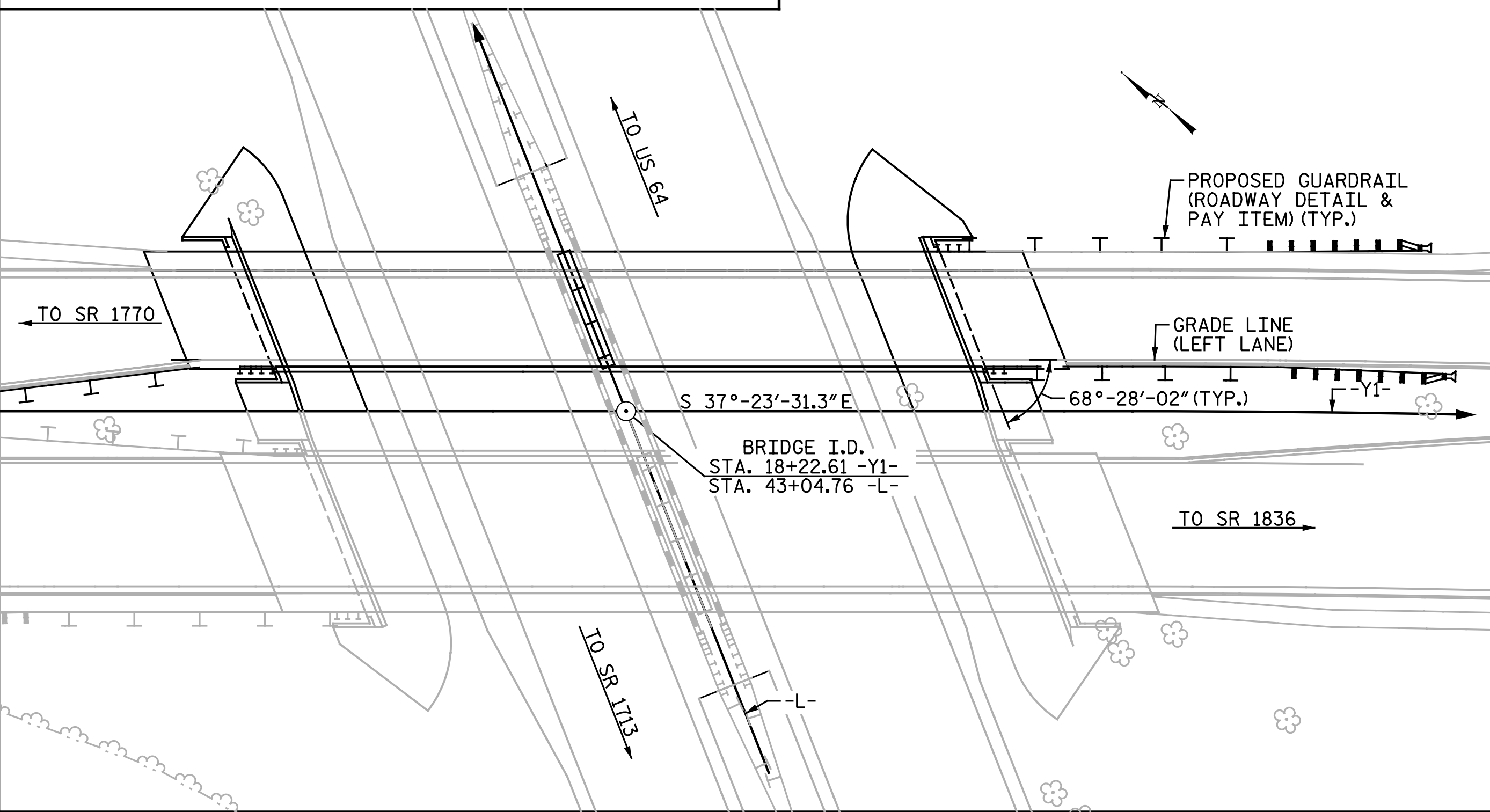
DIMENSIONS LOCATING PILES AND DRILLED PIERS ARE SHOWN TO THE PILE AND DRILLED PIER CENTERLINES. ALL PILES ARE VERTICAL

PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1-
43+04.76 -L-
 SHEET 2 OF 4

DRAWN BY : C. E. MAYHEW DATE : 4-22-16
 CHECKED BY : B. J. BELL DATE : 9-7-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			DEPARTMENT OF TRANSPORTATION RALEIGH GENERAL DRAWING FOR BRIDGE ON US 64 BUSINESS OVER US 301 BYPASS BETWEEN SR 1770 & SR 1836 LEFT LANES	
	Michael Baker Engineering 8000 Regency Parkway, Suite 600 Cary, North Carolina 27518 NC License No.: F-1084		REVISIONS	
	Michael Baker INTERNATIONAL	NO. 1 DATE:	NO. 3 DATE:	NO. 4 DATE:

BM #2 - RR SPIKE IN 24" OAK, STA. 60+94.00 -L-, 420.00' RT., EL. 91.39



LOCATION SKETCH

NOTES:

- ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
- THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
- THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
- FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.
- FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.
- FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
- FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
- METAL STAY-IN-PLACE FORMS SHALL NOT BE WELDED TO BEAM OR GIRDER FLANGES IN THE ZONES REQUIRING CHARPY V-NOTCH TEST. SEE STRUCTURAL STEEL DETAIL SHEETS.
- NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.
- ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

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 SPICE 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 75 FT LEFT OF GRADE LINE AND 15 FT RIGHT OF GRADE LINE 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 EXISTING STRUCTURE CONSISTING OF ONE 43'-6", TWO 55'-0", AND ONE 42'-6" SIMPLE SPANS WITH A CLEAR ROADWAY WIDTH OF 28'-0" AND REINFORCED CONCRETE FLOOR SUPPORTED BY STEEL I-BEAMS ON REINFORCED CONCRETE END BENTS WITH PRESTRESSED CONCRETE PILES AND REINFORCED CONCRETE POST AND BEAM INTERIOR BENTS LOCATED AT THE PROPOSED SITE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 18+22.61 -Y1-"

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

THE ELEVATION(S) AND CLEARANCE(S) SHOWN ON THE PLANS AT THE POINT(S) OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATION(S) ON THE EXISTING PAVEMENT AND CHECK THE CLEARANCE. REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.

TOTAL BILL OF MATERIAL

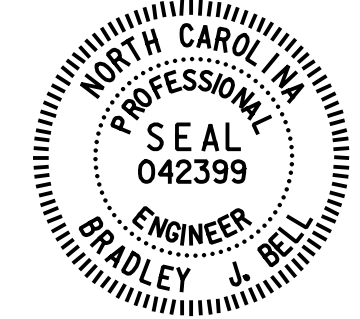
LOCATION	REMOVAL OF EXISTING STRUCTURE	3'-6" DIA. DRILLED PIERS IN SOIL	3'-6" DIA. DRILLED PIERS NOT IN SOIL	SID INSPECTIONS	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	STRUCTURAL STEEL	HP 12x53 STEEL PILES	
	LUMP SUM	LIN. FT.	LIN. FT.	EACH	EACH	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	APPROX. LBS.	NO.	LIN. FT.
SUPERSTRUCTURE							7,560	6,350					221,471		
END BENT 1									39.1		7,538			6	150
BENT 1		16	26	1	1				37.7		8,423	1,890			
END BENT 2									37.8		7,052			6	120
TOTAL	LUMP SUM	16	26	1	1	LUMP SUM	7,560	6,350	114.6	LUMP SUM	23,013	1,890	221,471	12	270

TOTAL BILL OF MATERIAL (CONT'D.)

LOCATION	PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES	THREE BAR METAL RAIL	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	DISC BEARINGS	ELASTOMERIC BEARINGS	ASBESTOS ASSESSMENT
	EA.	LIN. FT.	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM	LUMP SUM
SUPERSTRUCTURE		197.8	205.8		LUMP SUM	LUMP SUM	
END BENT 1	6			241			
BENT 1							
END BENT 2	6			264			
TOTAL	12	197.8	205.8	505	LUMP SUM	LUMP SUM	LUMP SUM

PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1-
43+04.76 -L-
 SHEET 3 OF 4

DRAWN BY : C. E. MAYHEW DATE : 3-20-16
 CHECKED BY : B. J. BELL DATE : 9-8-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	 Documented by: <i>Bradley J. Bell</i> 2/10/2017		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH GENERAL DRAWING FOR BRIDGE ON US 64 BUSINESS OVER US 301 BYPASS BETWEEN SR 1770 & SR 1836 LEFT LANES	
	REVISIONS			
	NO.	BY:	DATE:	SHEET NO.
	1			SI-3
2			TOTAL SHEETS 38	

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 NC License No.: F-1084

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR STEEL GIRDERS

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE						SERVICE II LIMIT STATE						COMMENT NUMBER						
						MOMENT			SHEAR			MOMENT			LIVE-LOAD FACTORS (%LL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR		SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)			
						LIVE-LOAD FACTORS (%LL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	LIVE-LOAD FACTORS (%LL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR								SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	1	1.02	--	1.75	-	1.26	A	4	96.35	-	1.02	B	2	0	1.30	-	1.41	B	1	64.81	1,2,3	
	HL-93 (OPERATING)	N/A		1.33	--	1.35	-	1.64	A	4	96.35	-	1.33	B	2	0	1.00	-	1.84	B	1	64.81	1,2,3	
	HS-20 (INVENTORY)	36.000	2	1.61	57.96	1.75	-	2.03	B	1	64.81	-	1.61	B	3	0	1.30	-	2.56	B	1	64.81	1,2,3	
	HS-20 (OPERATING)	36.000		2.09	75.13	1.35	-	2.63	B	1	64.81	-	2.09	B	3	0	1.00	-	3.33	B	1	64.81	1,2,3	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		4.62	62.37	1.40	-	6.01	B	1	64.81	-	4.62	B	2	0	1.30	-	6.07	B	1	64.81	1,2,3
		SNGARBS2	20.000		3.28	65.60	1.40	-	4.34	B	1	64.81	-	3.28	B	2	0	1.30	-	4.39	B	1	64.81	1,2,3
		SNAGRIS2	22.000		3.04	66.88	1.40	-	4.05	B	1	64.81	-	3.04	B	2	0	1.30	-	4.09	B	1	64.81	1,2,3
		SNCOTTS3	27.250		2.35	64.04	1.40	-	2.99	B	1	64.81	-	2.35	B	2	0	1.30	-	3.02	B	1	64.81	1,2,3
		SNAGGRS4	34.925		1.95	68.10	1.40	-	2.45	B	1	64.81	-	1.95	B	2	0	1.30	-	2.48	B	1	64.81	1,2,3
		SNS5A	35.550		1.91	67.90	1.40	-	2.43	B	1	64.81	-	1.91	B	2	0	1.30	-	2.46	B	1	64.81	1,2,3
		SNS6A	39.950		1.74	69.51	1.40	-	2.21	B	1	64.81	-	1.74	B	2	0	1.30	-	2.23	B	1	64.81	1,2,3
		SNS7B	42.000		1.69	70.98	1.40	-	2.09	B	1	64.81	-	1.69	B	2	0	1.30	-	2.12	B	1	64.81	1,2,3
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.15	70.95	1.40	-	2.67	B	1	64.81	-	2.15	B	3	0	1.30	-	2.70	B	1	64.81	1,2,3
		TNT4A	33.075		2.10	69.46	1.40	-	2.66	B	1	64.81	-	2.10	B	2	0	1.30	-	2.69	B	1	64.81	1,2,3
		TNT6A	41.600		1.80	74.88	1.40	-	2.17	B	1	64.81	-	1.80	B	3	0	1.30	-	2.19	B	1	64.81	1,2,3
		TNT7A	42.000		1.77	74.34	1.40	-	2.19	B	1	64.81	-	1.77	B	2	0	1.30	-	2.22	B	1	64.81	1,2,3
		TNT7B	42.000		1.73	72.66	1.40	-	2.19	B	1	64.81	-	1.73	B	2	0	1.30	-	2.22	B	1	64.81	1,2,3
		TNAGRIT4	43.000		1.69	72.67	1.40	-	2.13	B	1	64.81	-	1.69	B	2	0	1.30	-	2.15	B	1	64.81	1,2,3
	TNAGT5A	45.000		1.63	73.35	1.40	-	2.02	B	1	64.81	-	1.63	B	3	0	1.30	-	2.04	B	1	64.81	1,2,3	
	TNAGT5B	45.000	3	1.57	70.65	1.40	-	2.00	B	1	64.81	-	1.57	B	2	0	1.30	-	2.02	B	1	64.81	1,2,3	
FATIGUE	HL-93 (INVENTORY)	$\gamma_{LL}=0.75$		-																				

LOAD FACTORS:

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

NOTES:

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

ALLOWABLE STRESS FOR SERVICE II LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

1. THE ORIGINAL DESIGN AND RATING OF THIS BRIDGE WERE BASED ON AN INFLUENCE SURFACE ANALYSIS. LIVE LOAD DISTRIBUTION FACTORS WERE NOT USED AND ARE NOT PROVIDED.
2. THE SOFTWARE PACKAGE MDX VERSION 6.5.2943 WAS USED FOR THE INFLUENCE SURFACE ANALYSIS.
3. DISTANCE FROM LEFT END OF SPAN IS GIVEN WITH RESPECT TO CENTERLINE OF BEARING AND IS MEASURED ALONG THE CONTROLLING GIRDER.
4. FATIGUE RATING IS NOT REQUIRED OR REPORTED SINCE GIRDERS DO NOT INCLUDE FATIGUE-PRONE DETAILS.

CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

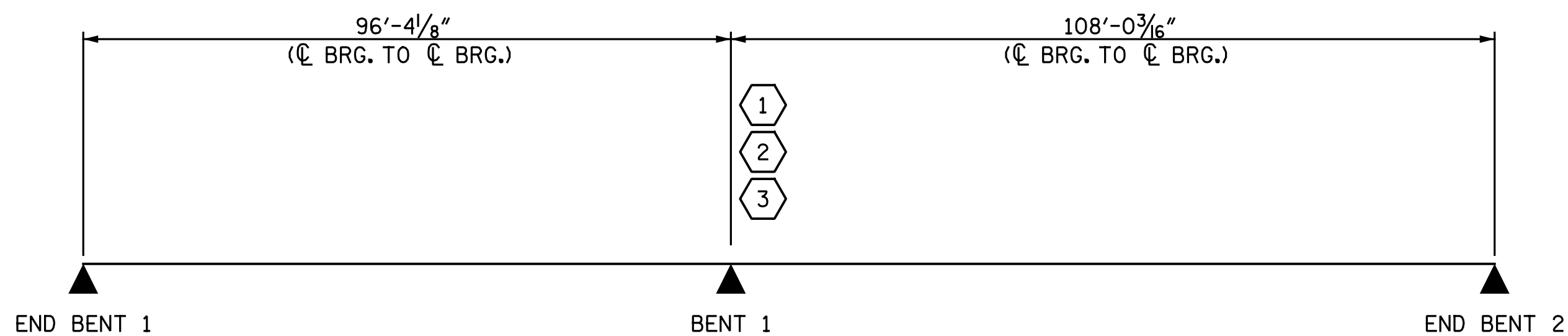
2 DESIGN LOAD RATING (HS-20)

3 LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

GIRDER LOCATION IS PROVIDED USING GIRDER NUMBER, WHERE GIRDER 1 IS THE LEFT EXTERIOR GIRDER LOOKING AHEAD STATION. SEE "FRAMING PLAN" SHEET FOR ALL GIRDER LOCATIONS.



LRFR SUMMARY

PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1-
43+04.76 -L-
 SHEET 4 OF 4

DRAWN BY : C. E. MAYHEW DATE : 8-24-16
 CHECKED BY : B. J. BELL DATE : 8-31-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DocuSigned by:
Bradley J. Bell
C41A3F8EC3A3434...
1/27/2017

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

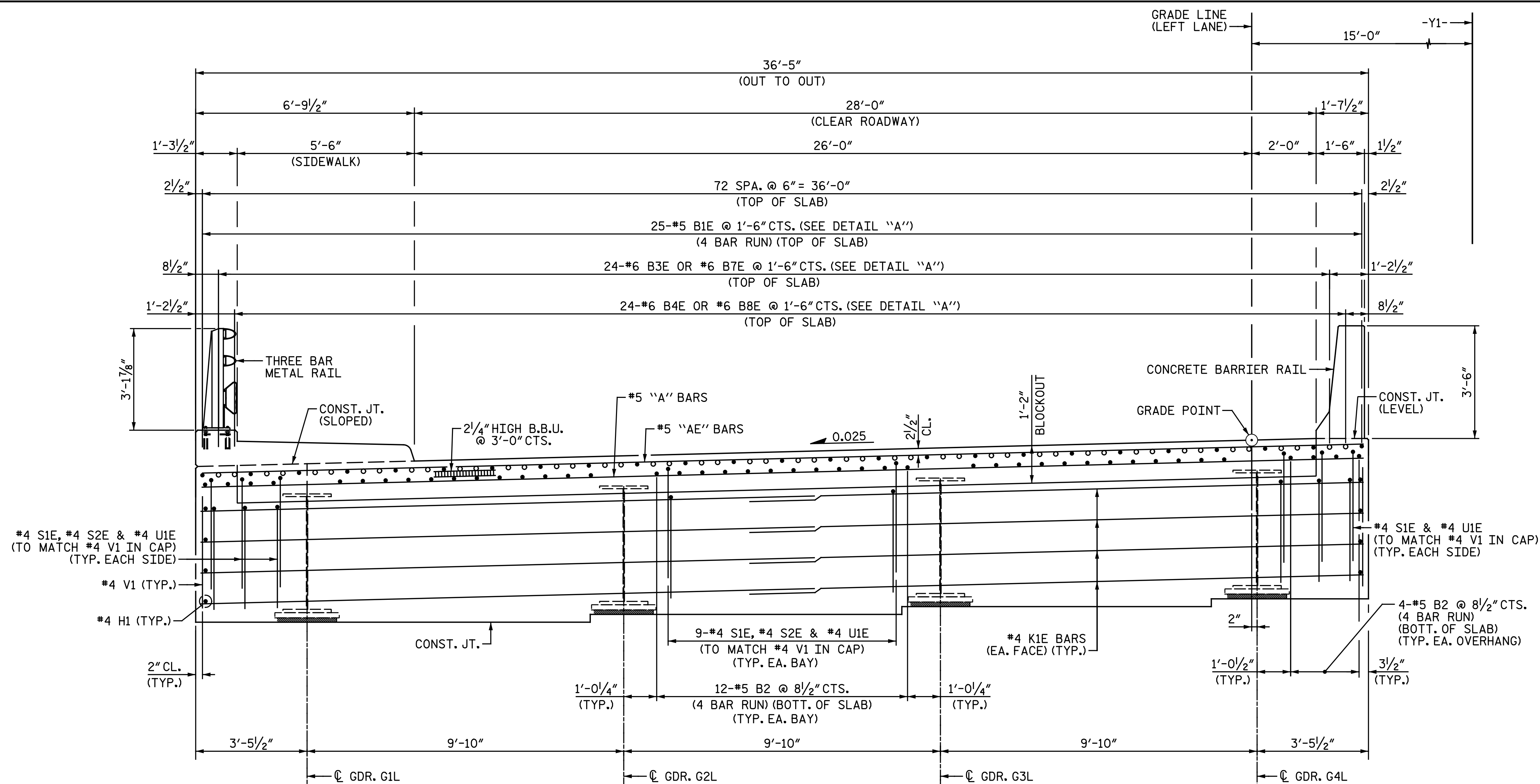
GENERAL DRAWING

LRFR SUMMARY
 FOR STEEL GIRDERS
 (NON-INTERSTATE TRAFFIC)

LEFT LANES

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

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TYPICAL SECTION THRU INTEGRAL END BENT

(END BENT 1 SHOWN, END BENT 2 SIMILAR)
 (#5 A3E BARS NOT SHOWN FOR CLARITY)

NOTES:

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

LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO FACILITATE INSTALLATION OF CONCRETE BARRIER RAIL REINFORCEMENT.

METAL STAY-IN-PLACE FORMS SHALL NOT BE WELDED TO BEAM OR GIRDER FLANGES IN THE ZONES REQUIRING CHARPY V-NOTCH TEST. SEE STRUCTURAL STEEL DETAIL SHEETS.

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

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

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

STRUCTURAL STEEL ERECTION IN A CONTINUOUS UNIT SHALL BE COMPLETE BEFORE FALSEWORK OR FORMS ARE PLACED ON THE UNIT.

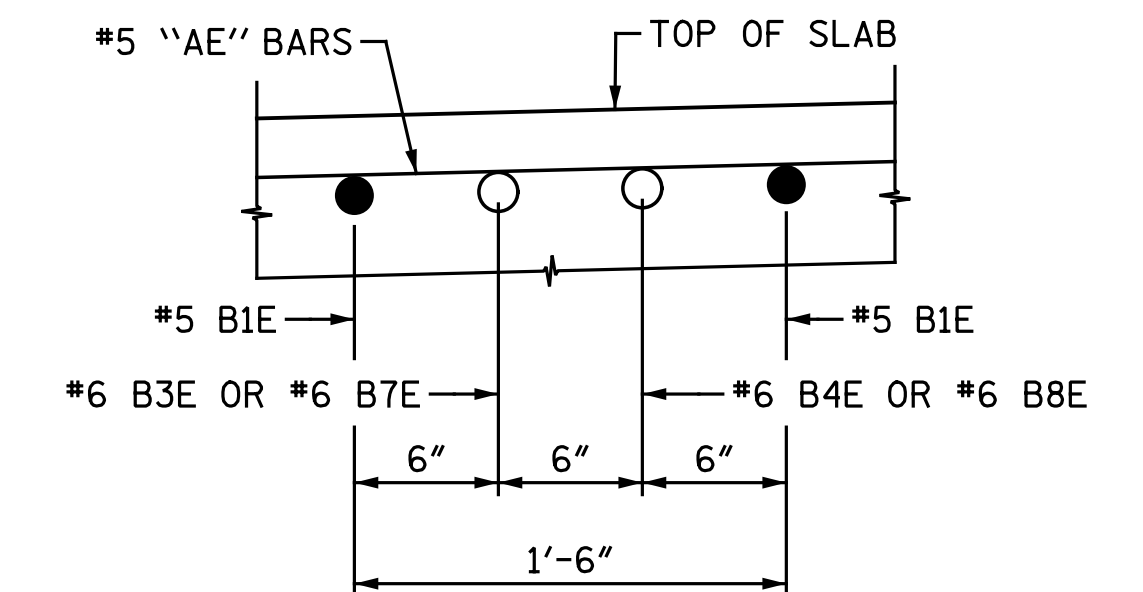
THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN METAL STAY-IN-PLACE FORM SUPPORTS OR FORMS AND BEAM/GIRDER STIFFENERS OR CONNECTOR PLATES. THE PROPOSAL SHALL BE INDICATED, AS APPROPRIATE, ON EITHER THE STEEL WORKING DRAWINGS OR THE METAL STAY-IN-PLACE FORM WORKING DRAWINGS.

FOR CONCRETE BARRIER RAIL DETAILS, SEE "CONCRETE BARRIER RAIL" SHEET.

FOR THREE BAR METAL RAIL DETAILS, SEE "3 BAR METAL RAIL" SHEETS.

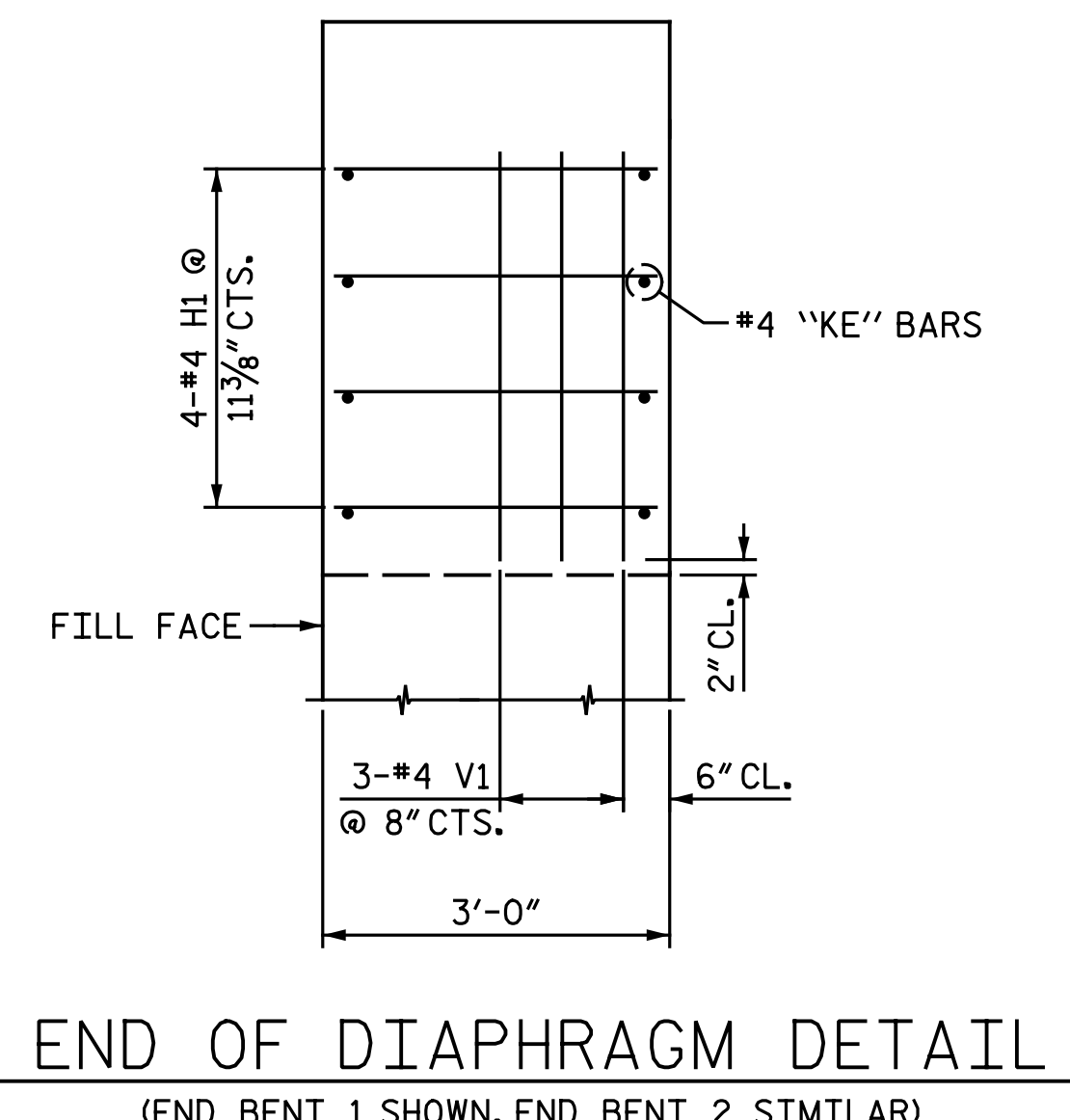
FOR SIDEWALK DETAILS, SEE "SIDEWALK DETAILS" SHEET.

FOR BLOCKOUT DETAILS, SEE "BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT" SHEET.



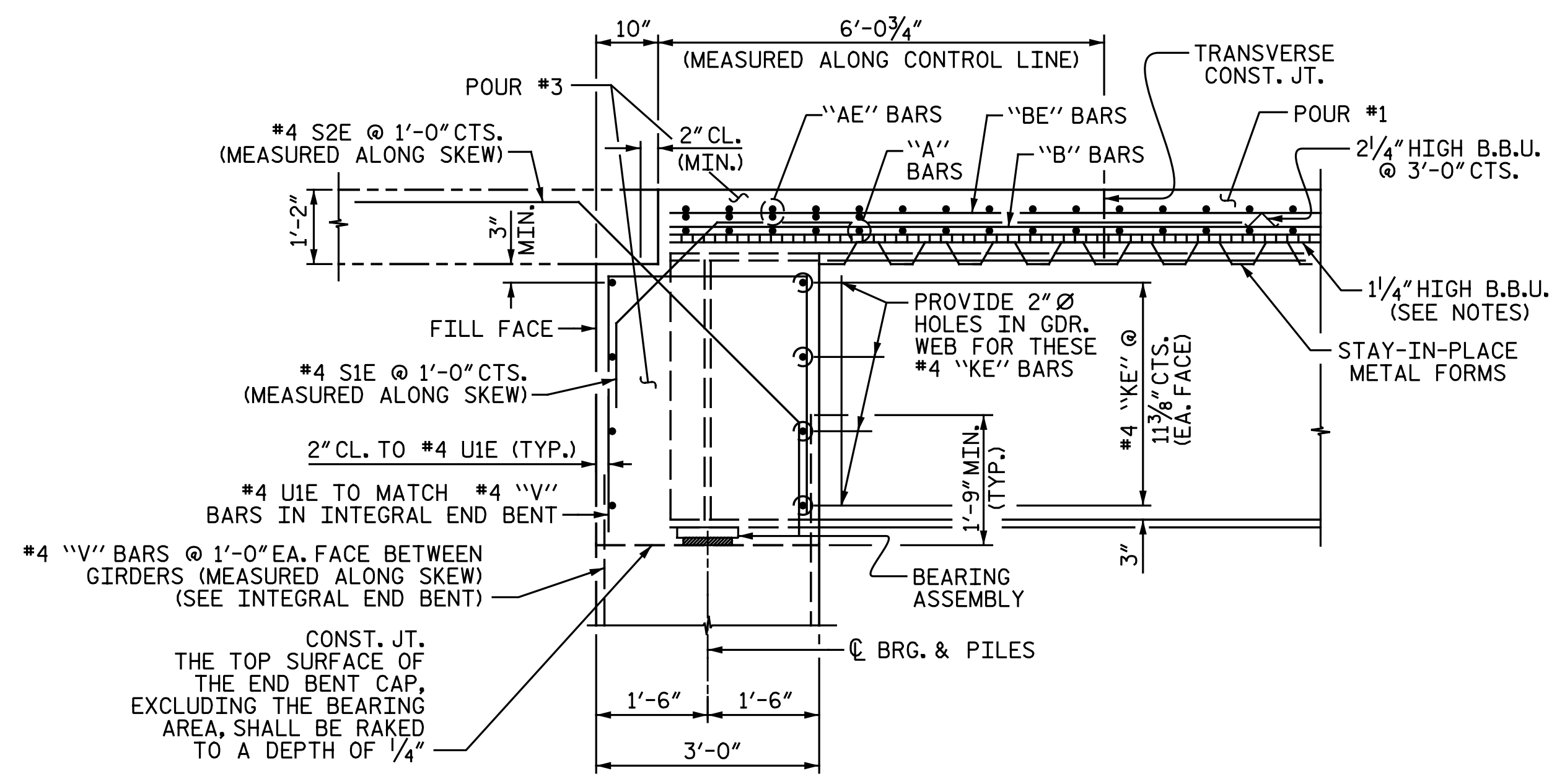
DETAIL "A"

PROJECT NO. U-3330
 NASH COUNTY
 STATION: 18+22.61 -Y1-
 SHEET 1 OF 2



END OF DIAPHRAGM DETAIL

(END BENT 1 SHOWN, END BENT 2 SIMILAR)

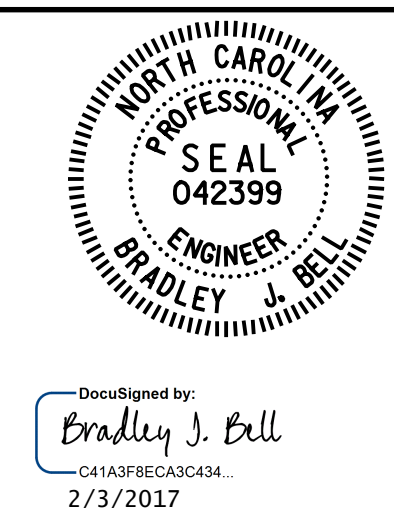


END OF GIRDER DETAIL AT INTEGRAL END BENT

(DIMENSIONS SHOWN ARE NORMAL TO END BENT, U.N.O.)
 (END BENT 1 SHOWN, END BENT 2 SIMILAR)

DRAWN BY: CEM / MDM DATE: 3-15-16
 CHECKED BY: B. J. BELL DATE: 9-8-16

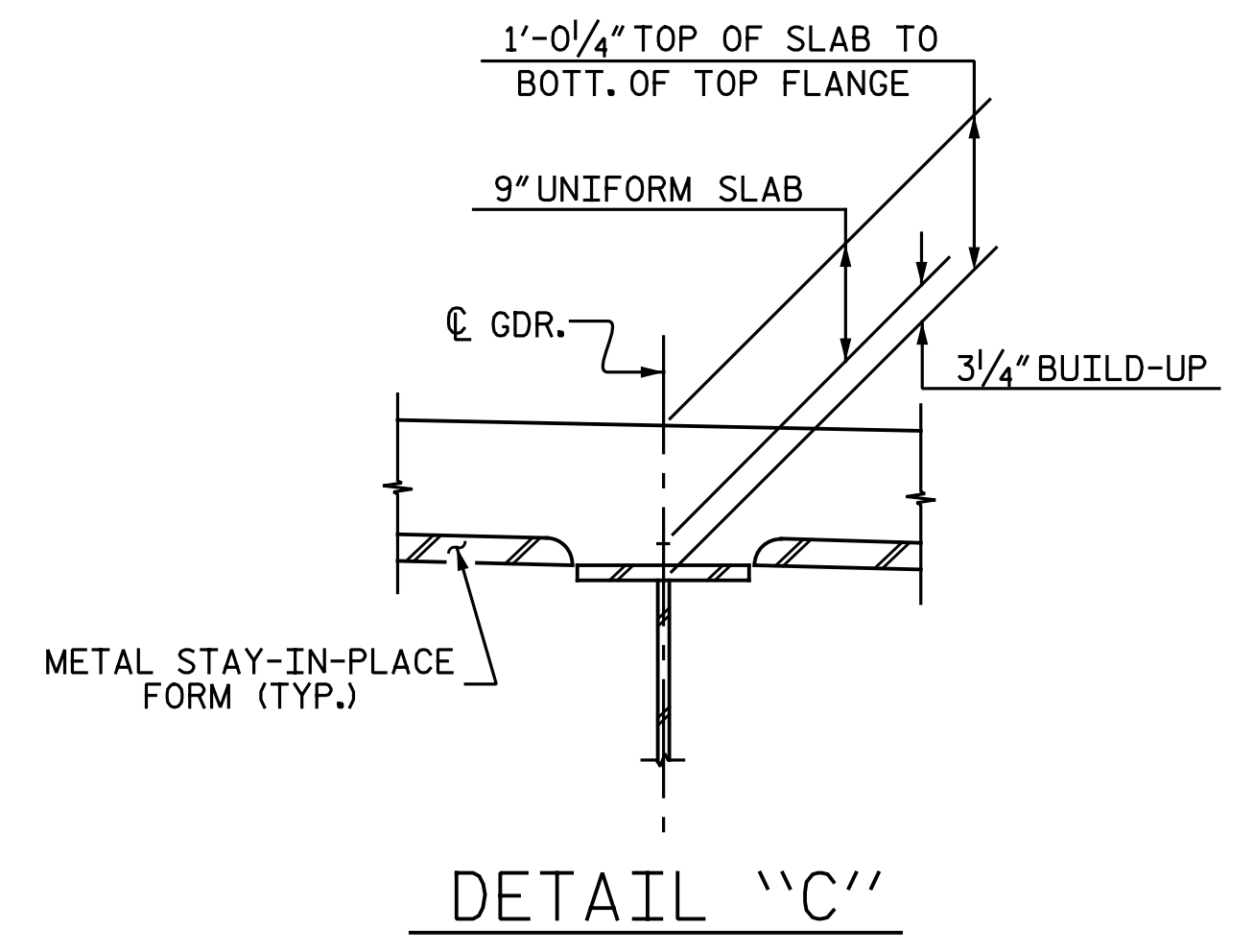
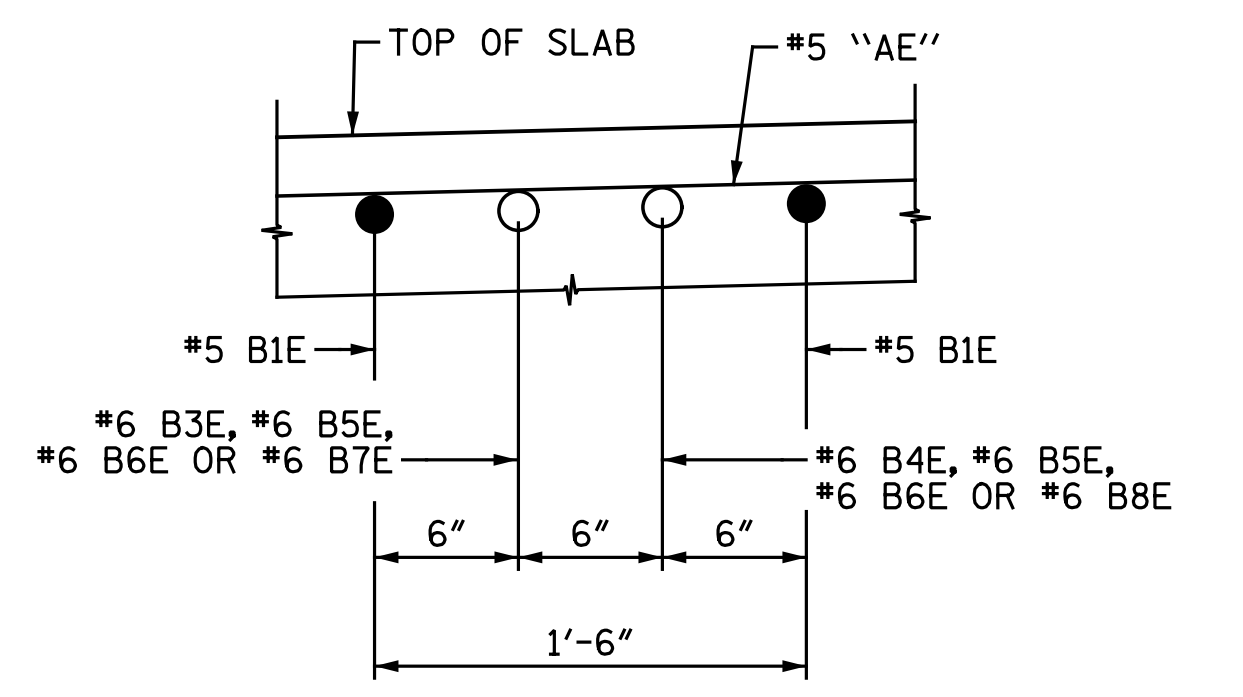
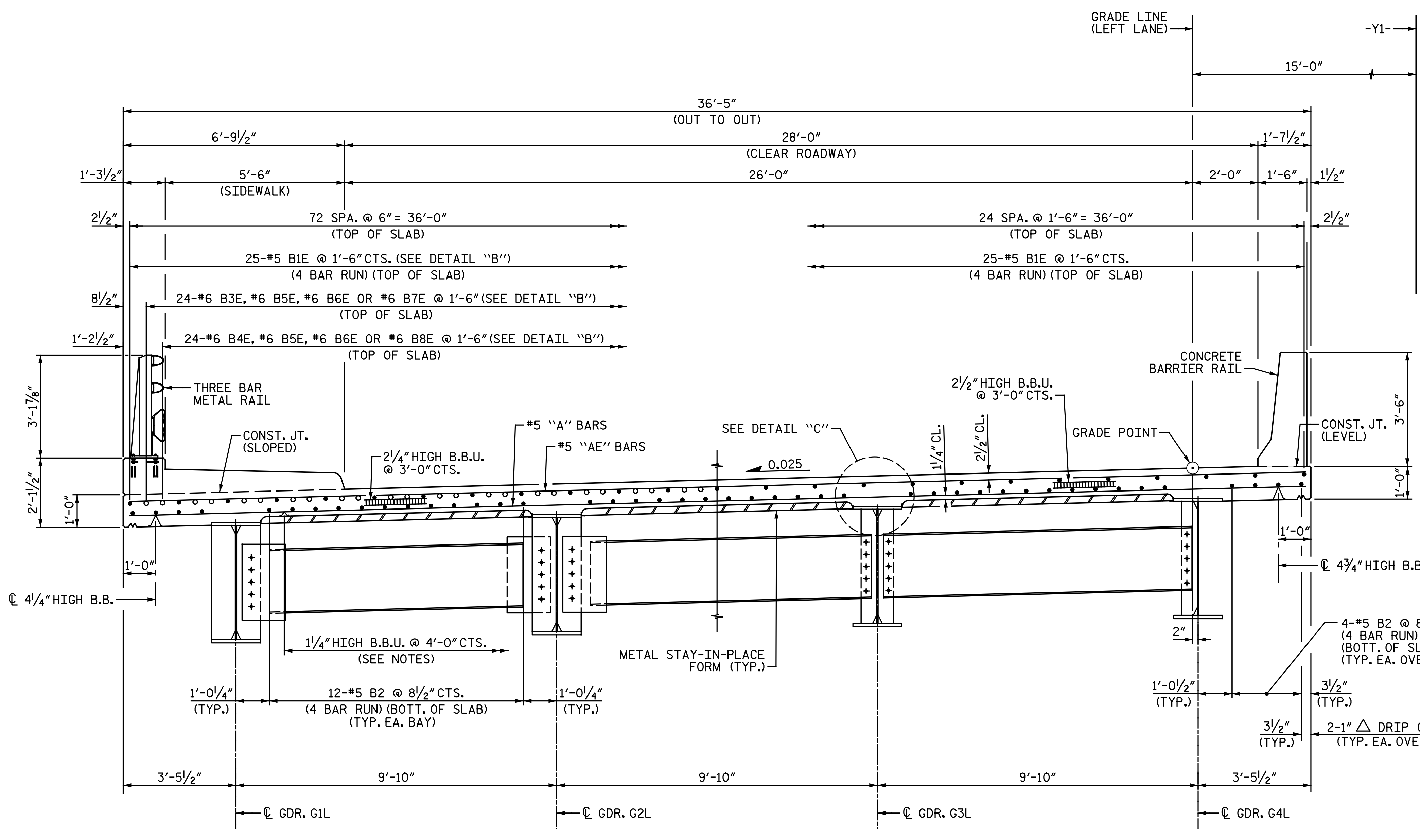
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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STATE OF NORTH CAROLINA		DEPARTMENT OF TRANSPORTATION		RALEIGH		SUPERSTRUCTURE		TYPICAL SECTION		LEFT LANES		SHEET NO. SI-5	
REVISIONS												TOTAL SHEETS	
NO.	BY:	DATE:	NO.	BY:	DATE:							38	
1			3										
2			4										

NOTES:
FOR NOTES, SEE "TYPICAL SECTION", SHEET 1 OF 2.



PARTIAL SECTION AT BENT DIAPHRAGM
(AREAS WITH ADDITIONAL LONGITUDINAL REINFORCEMENT)
(SEE PLAN OF SPAN FOR LOCATIONS)

PARTIAL SECTION AT INTERMEDIATE DIAPHRAGM
(AREAS WITHOUT ADDITIONAL LONGITUDINAL REINFORCEMENT)
(SEE PLAN OF SPAN FOR LOCATIONS)

TYPICAL SECTION

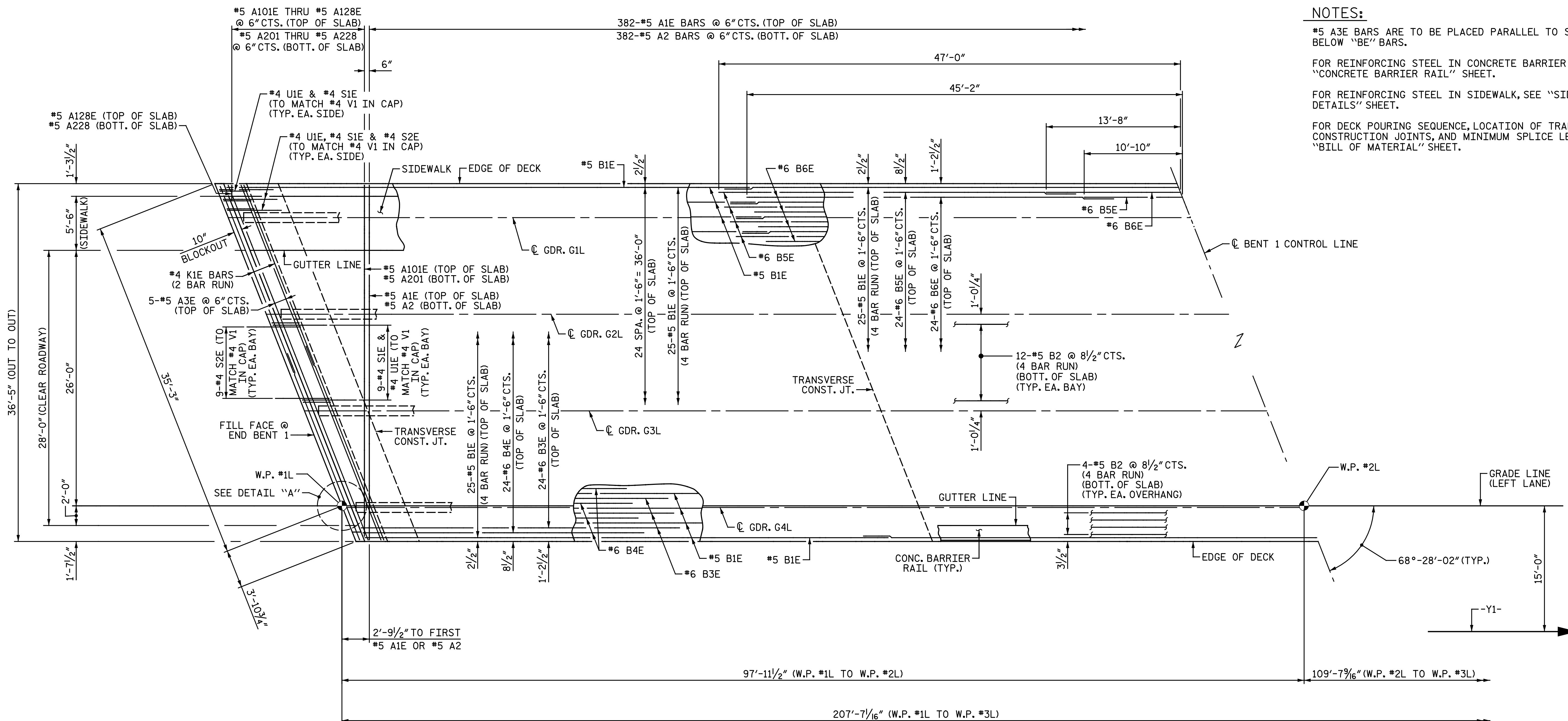
PROJECT NO. U-3330
NASH COUNTY
STATION: 18+22.61 -Y1-
SHEET 2 OF 2

DRAWN BY : CEM / MDM DATE : 3-15-16
CHECKED BY : B. J. BELL DATE : 9-8-16

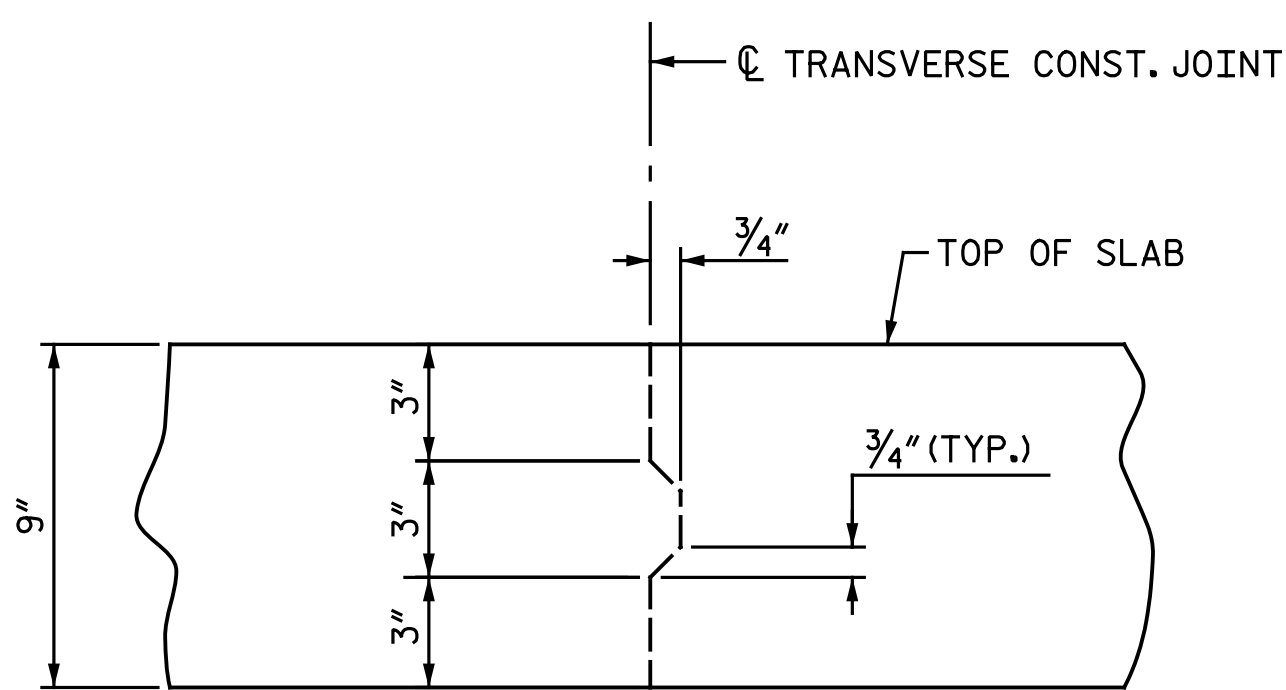
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE TYPICAL SECTION LEFT LANES			
	Michael Baker Engineering 8000 Regency Parkway, Suite 600 Cary, North Carolina 27518 NC License No.: F-1084		REVISIONS			
	NO.	BY:	DATE:	NO.	BY:	DATE:
	1			3		
			2			
			SHEET NO. SI-6			
			TOTAL SHEETS 38			

NOTES:

- #5 A3E BARS ARE TO BE PLACED PARALLEL TO SKEW & BELOW "BE" BARS.
- FOR REINFORCING STEEL IN CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEET.
- FOR REINFORCING STEEL IN SIDEWALK, SEE "SIDEWALK DETAILS" SHEET.
- FOR DECK POURING SEQUENCE, LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, AND MINIMUM SPLICE LENGTHS, SEE "BILL OF MATERIAL" SHEET.

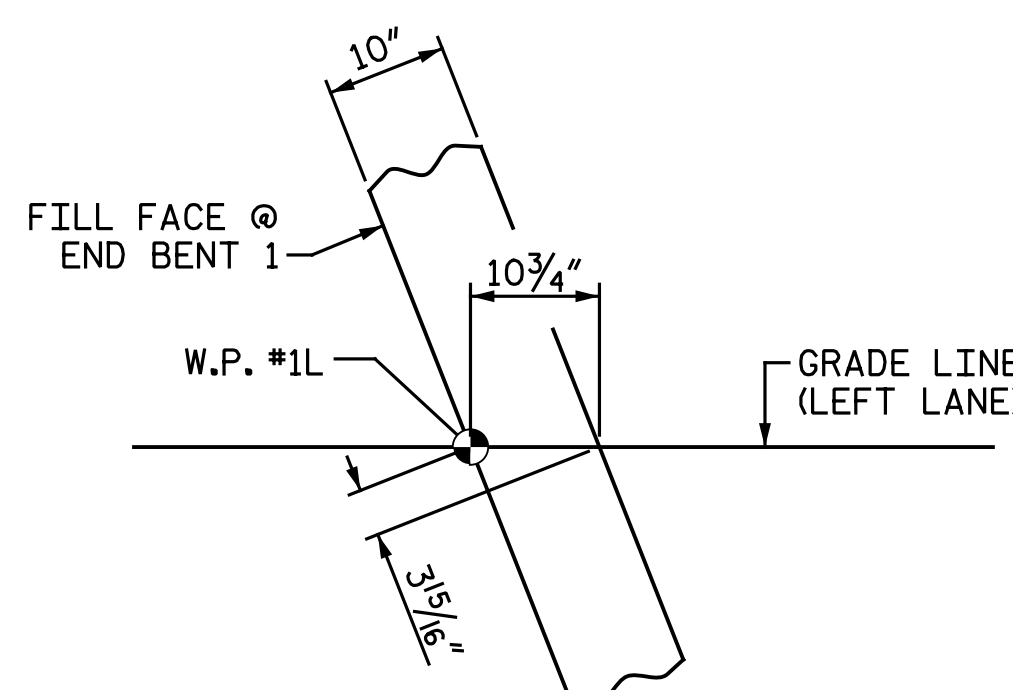


PLAN OF SPAN A



TRANSVERSE CONST. JOINT DETAIL

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



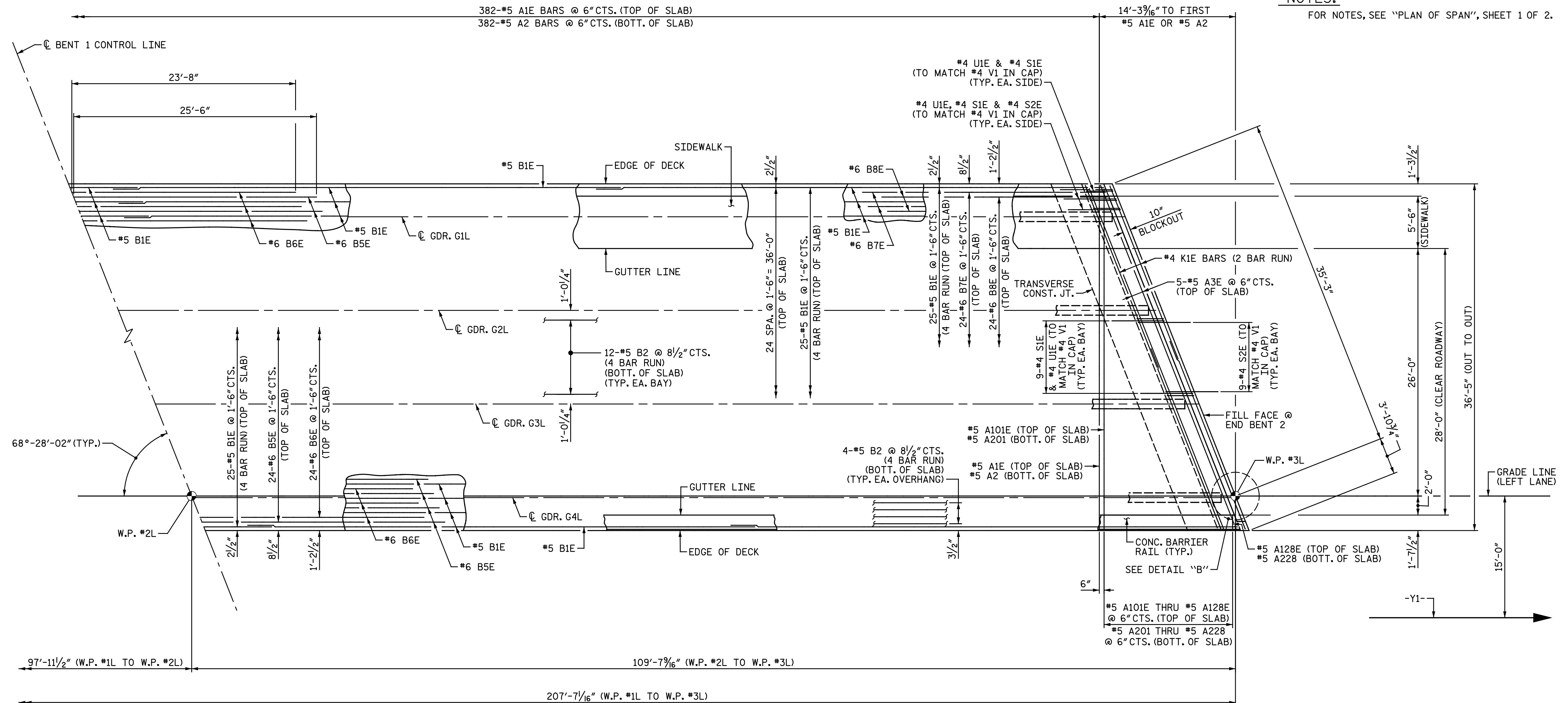
DETAIL "A"

PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1-
 SHEET 1 OF 2

DRAWN BY: C. E. M./N. B. S. DATE: 4-21-16
 CHECKED BY: B. J. BELL DATE: 9-8-16

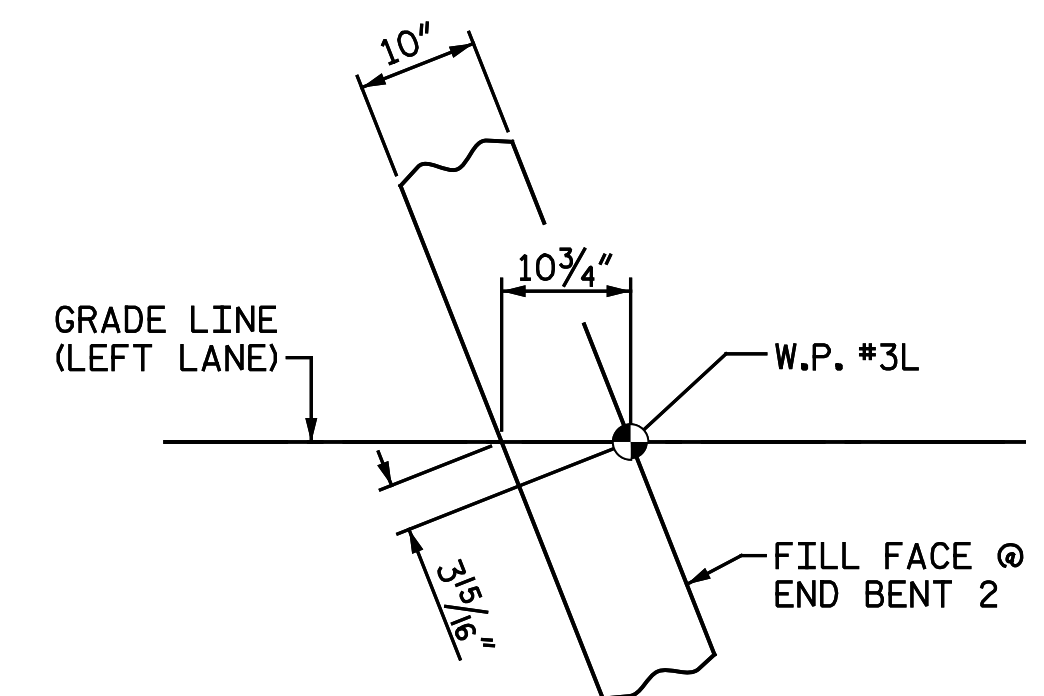
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE PLAN OF SPAN A SPAN A LEFT LANES		SHEET NO. SI-7 TOTAL SHEETS 38		
	REVISIONS						
	NO.	BY:	DATE:	NO.		BY:	DATE:
	1			3			
			4				

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NOTES:
FOR NOTES, SEE "PLAN OF SPAN", SHEET 1 OF 2.

PLAN OF SPAN B

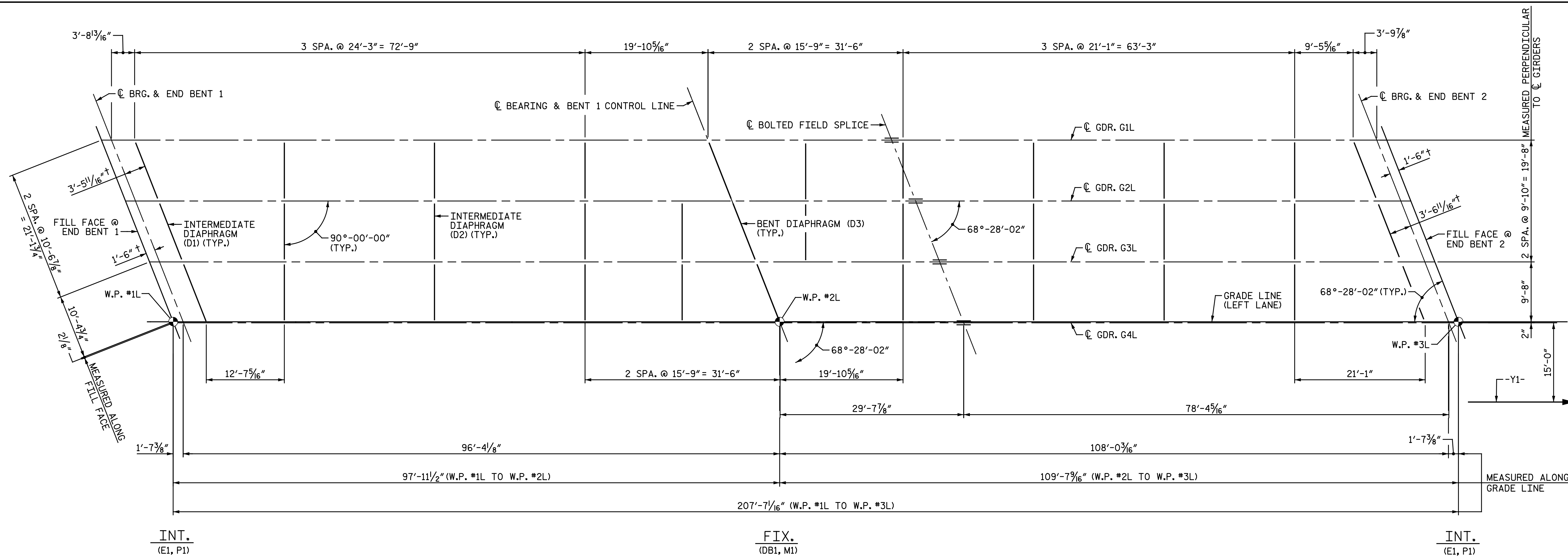


DETAIL "B"

PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1-
 SHEET 2 OF 2

DRAWN BY : C. E. M./N. B. S. DATE : 4-21-16
 CHECKED BY : B. J. BELL DATE : 9-8-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE PLAN OF SPAN SPAN B LEFT LANES		SHEET NO. SI-8 TOTAL SHEETS 38
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	NO.	BY:	DATE:	NO.	
1			3		
2			4		



SPAN A

SPAN B

FRAMING PLAN

ALL LONGITUDINAL MEASUREMENTS ARE ALONG CENTERLINE OF GIRDER, U.N.O.

† MEASURED PERPENDICULAR TO END BENT FILL FACE

NOTES:

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL, UNLESS OTHERWISE NOTED.

ALL FIELD CONNECTIONS TO BE 7/8" DIA. HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED. BOLTS SHALL BE DETAILED WITH THREADS EXCLUDED FROM SHEAR PLANES.

BEARING STIFFENERS ARE TO BE PLACED NORMAL TO THE WEB OF THE GIRDER AND SHALL BE PLUMB IN THE FINAL CONDITION.

PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION (NOR WITHIN 15 FEET OF INTERMEDIATE BEARINGS OF CONTINUOUS UNITS). KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES. KEEP 6" MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.

STUDS ON GIRDERS MAY BE SHIFTED UP TO 1" IF NECESSARY TO CLEAR FLANGE SPLICE WELDS.

TENSION ON THE ASTM A325 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-8 OF THE STANDARD SPECIFICATIONS.

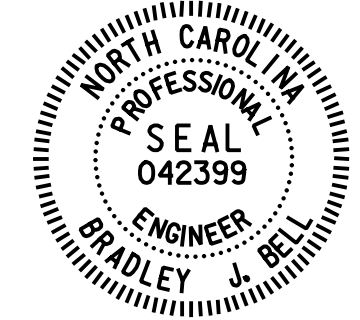
ENDS OF GIRDERS SHALL BE PLUMB IN THE FINAL CONDITION.

FABRICATORS SHALL DETAIL DIAPHRAGM MEMBERS AND CONNECTIONS FOR FULL DEAD LOAD FIT UP. GIRDERS SHALL BE PLUMB AFTER THE FULL AMOUNT OF DEAD LOAD IS APPLIED.

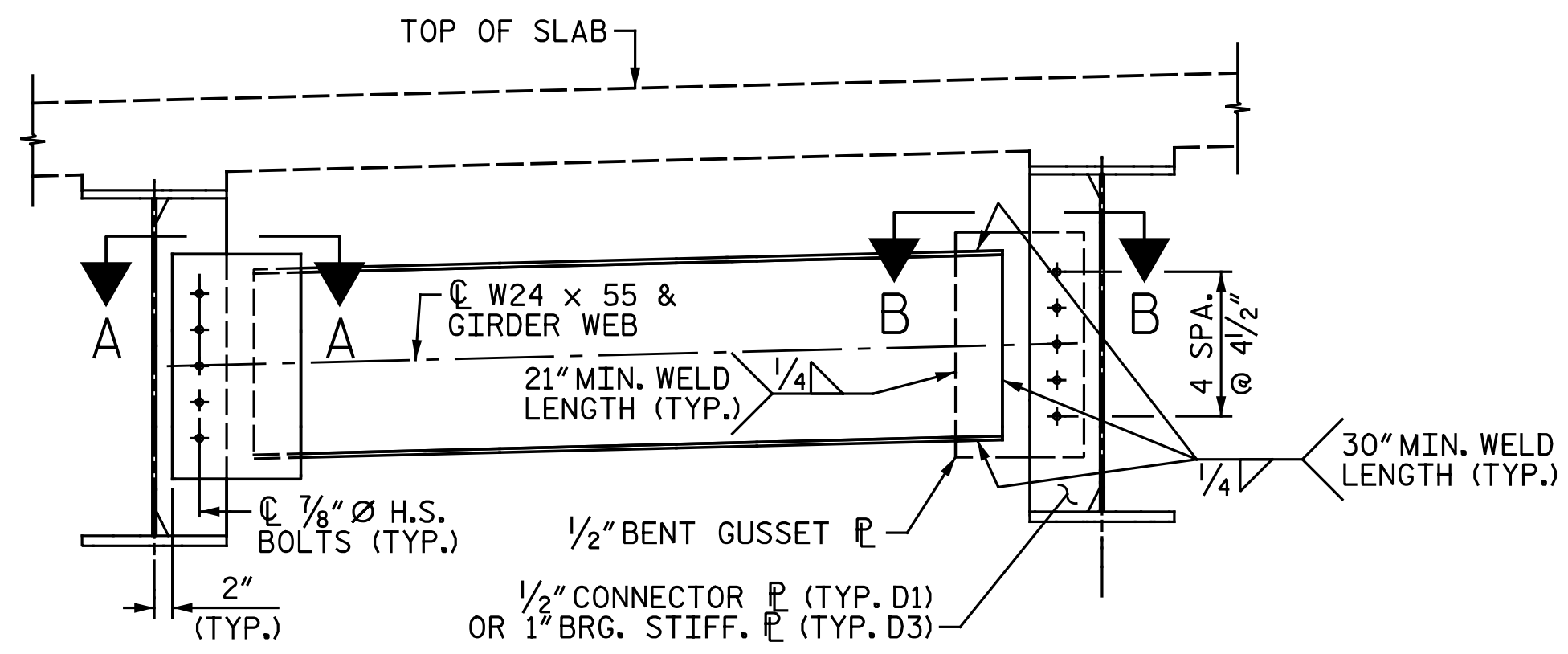
STRUCTURAL STEEL ERECTION IN A CONTINUOUS UNIT SHALL BE COMPLETE BEFORE FALSEWORK OR FORMS ARE PLACED ON THE UNIT.

PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1-

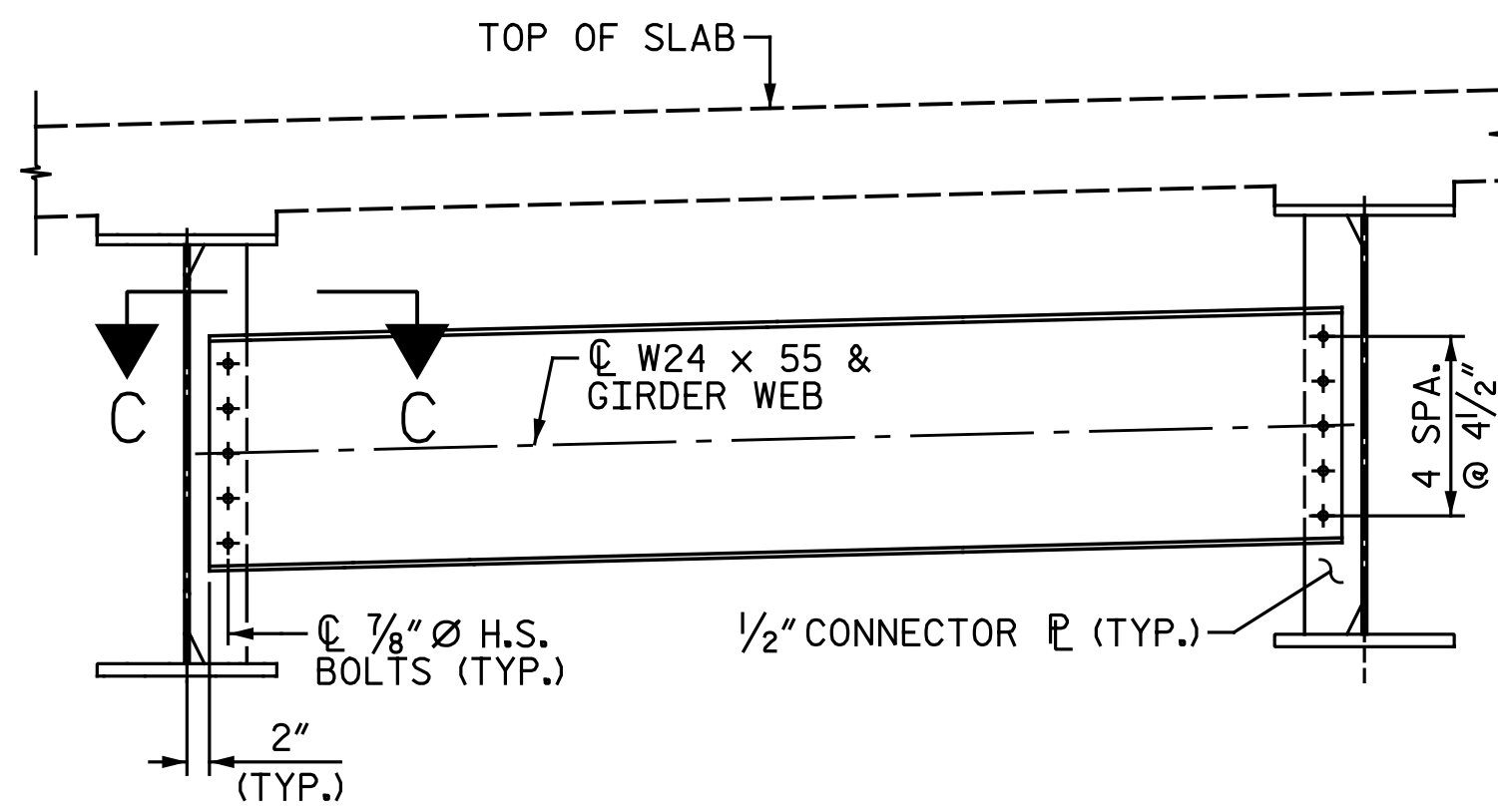
DRAWN BY : M. D. MAYHEW DATE : 7-27-16
 CHECKED BY : B. J. BELL DATE : 8-19-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	 Documented by: Bradley J. Bell 1/27/2017		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE FRAMING PLAN LEFT LANES		SHEET NO. SI-9
	REVISIONS				TOTAL SHEETS 38
	NO.	BY:	DATE:	NO.	
1			3		
2			4		

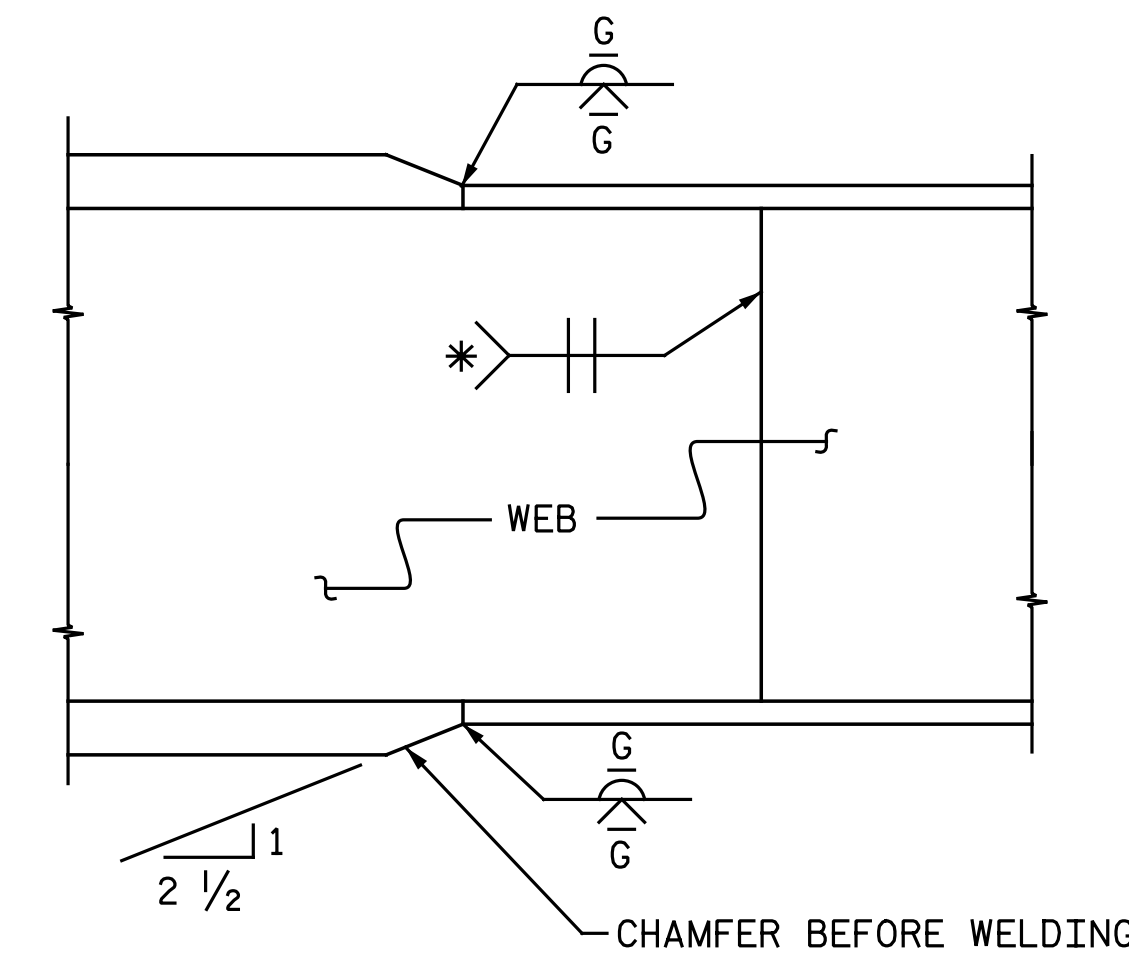
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INTERMEDIATE (D1) & BENT DIAPHRAGM (D3)

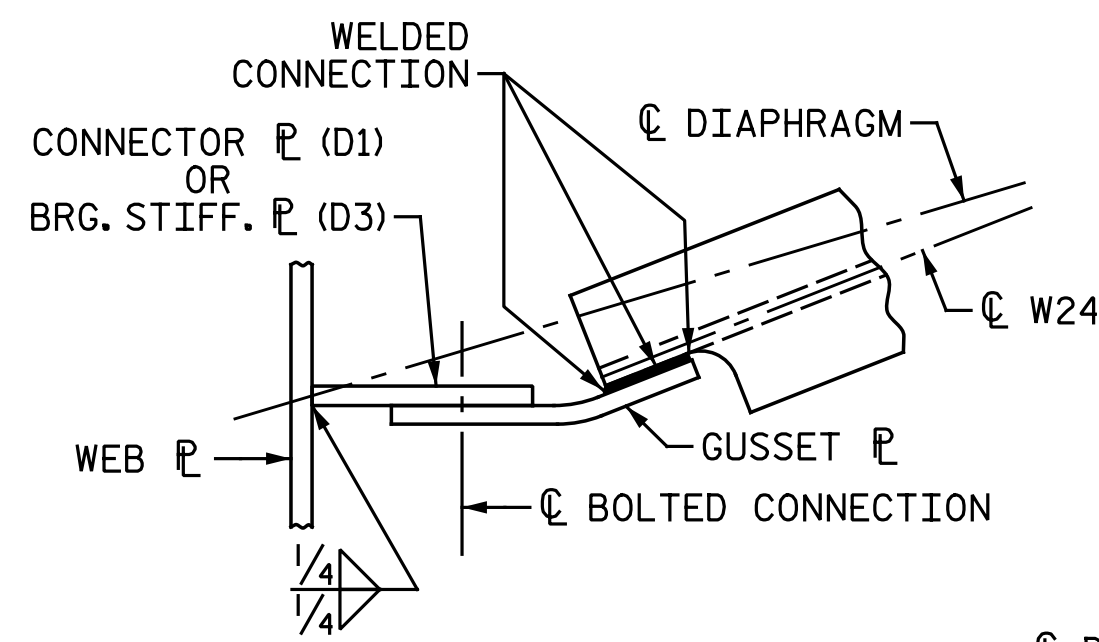


INTERMEDIATE DIAPHRAGM (D2)

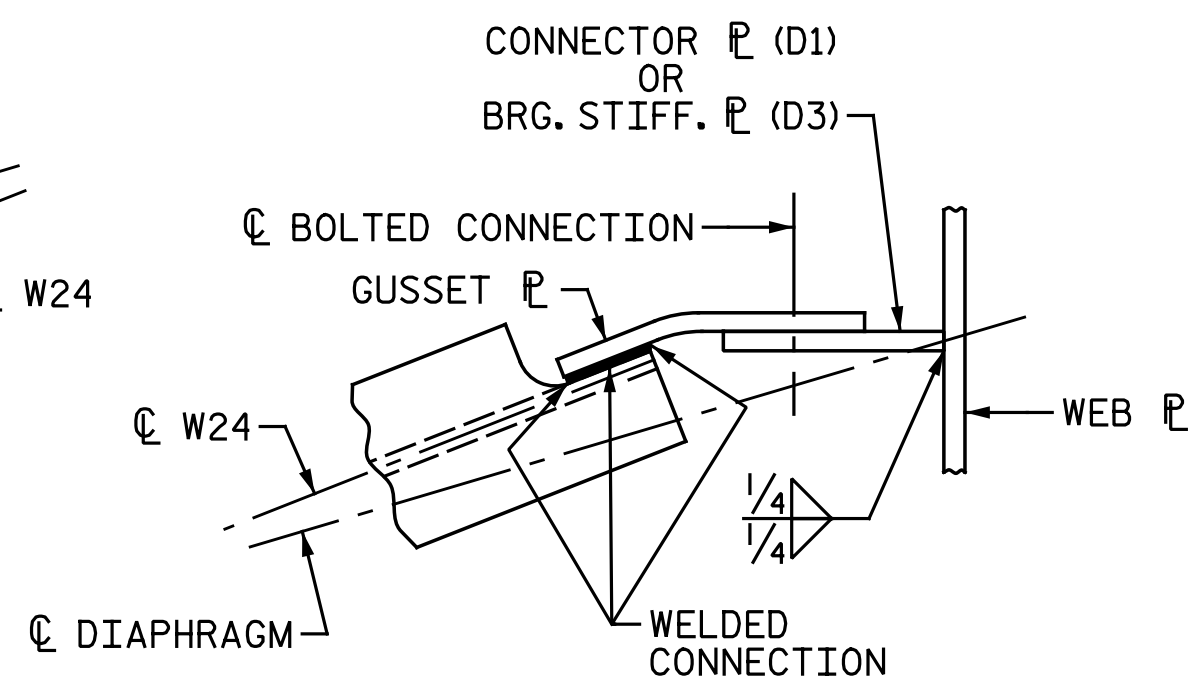


ELEVATION

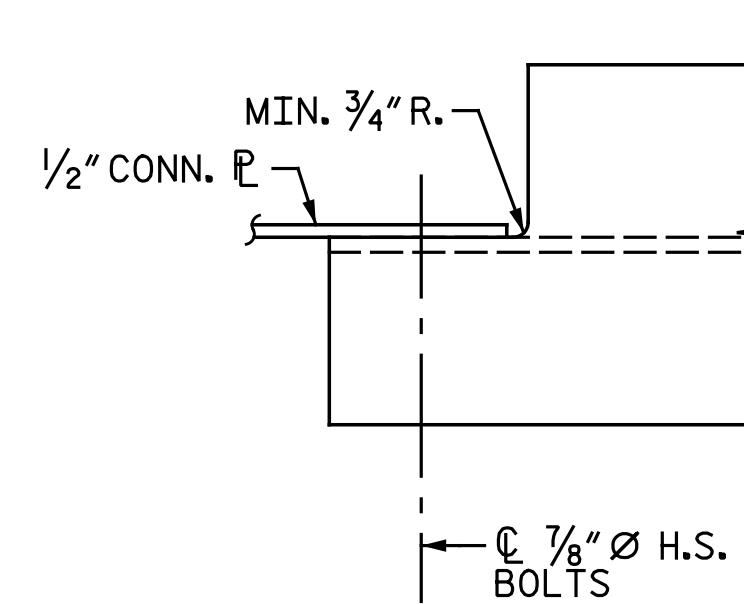
TYPICAL FLANGE AND WEB BUTT JOINT
* GRIND SMOOTH AND FLUSH ON OUTER FACE OF EXTERIOR GIRDERS



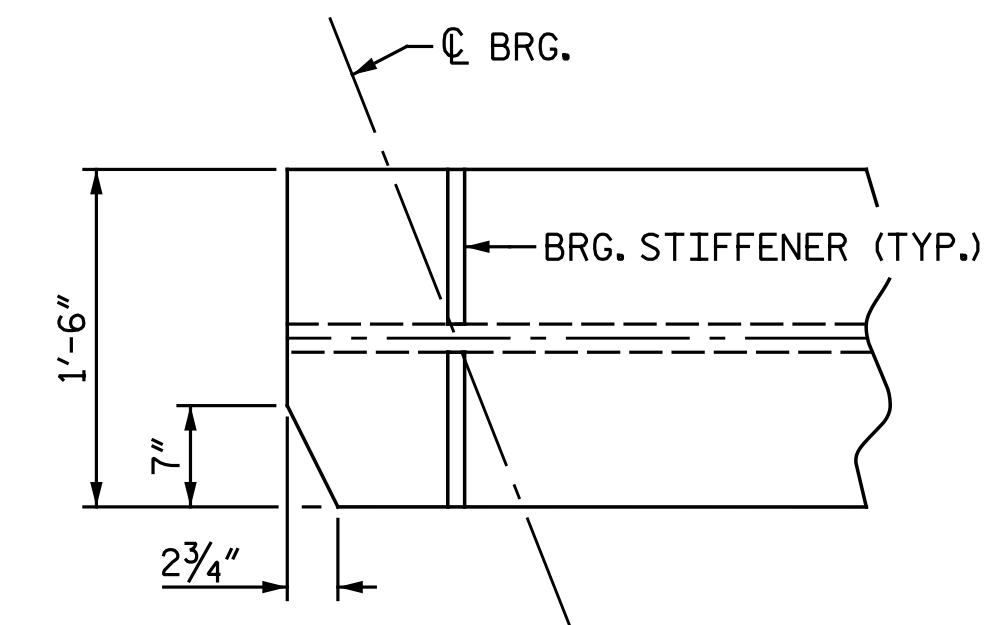
SECTION A-A



SECTION B-B

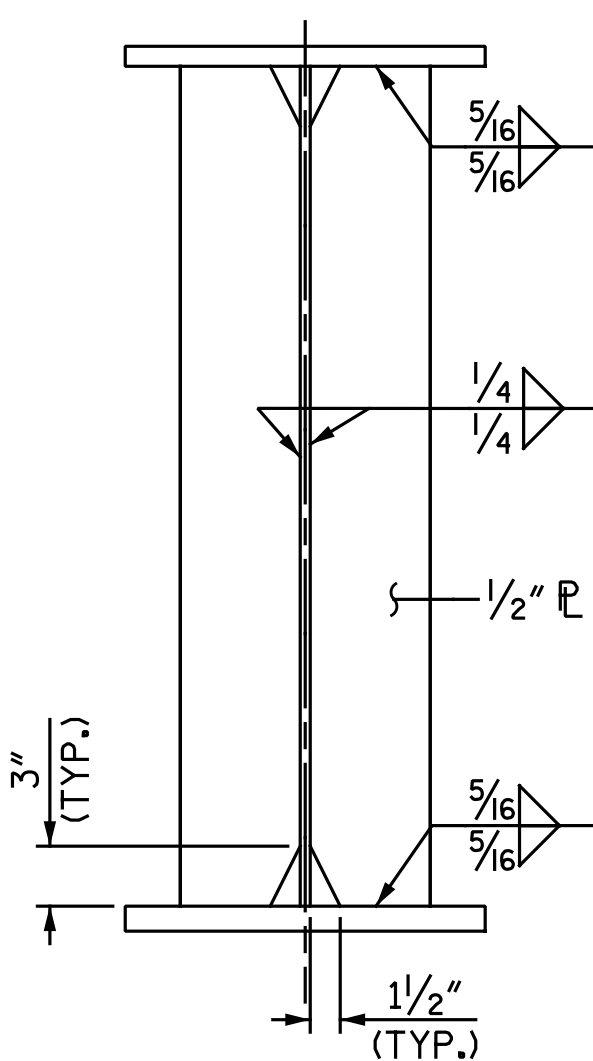


SECTION C-C

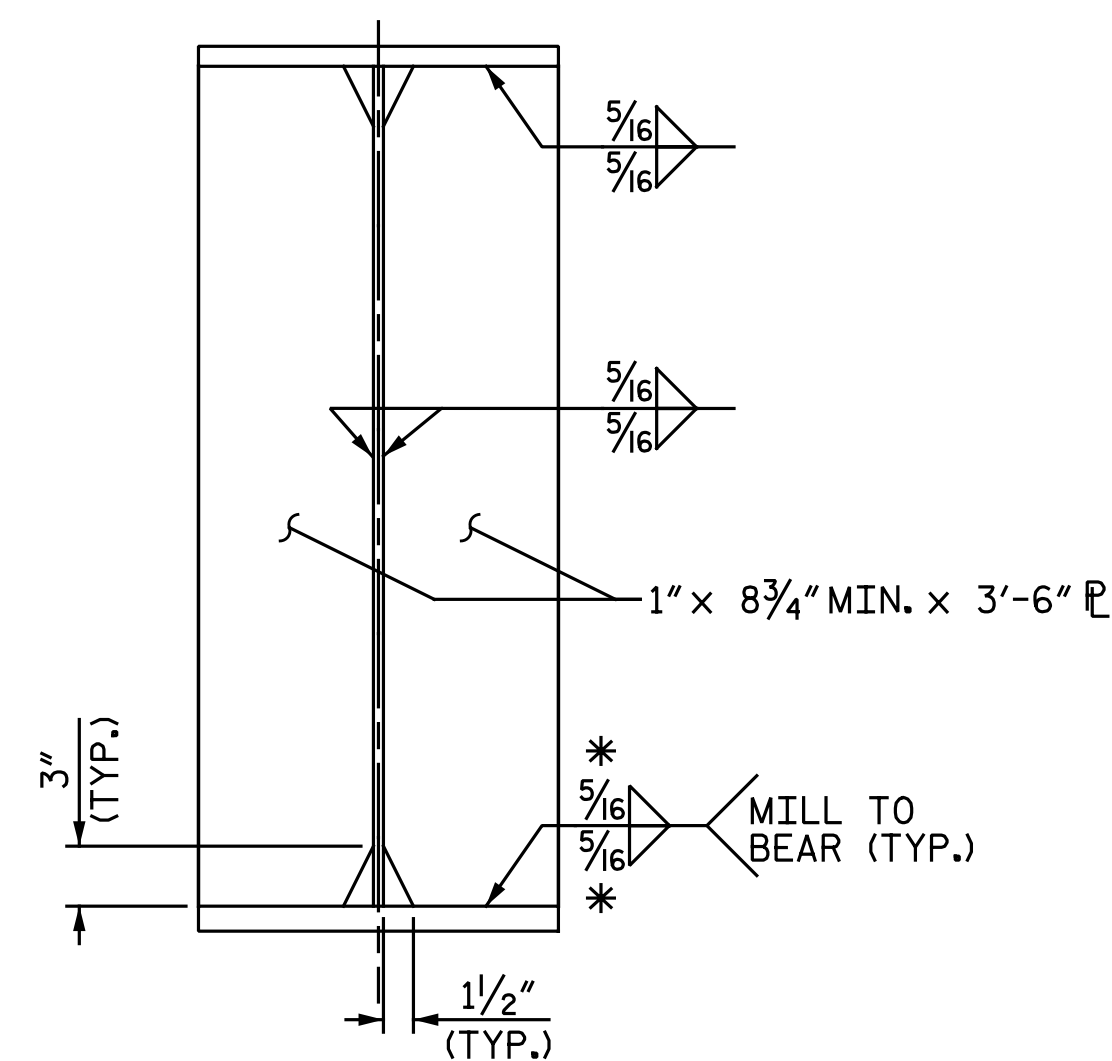


TOP FLANGE CLIP DETAIL

END BENT 1 SHOWN,
END BENT 2 SIMILAR BY ROTATION



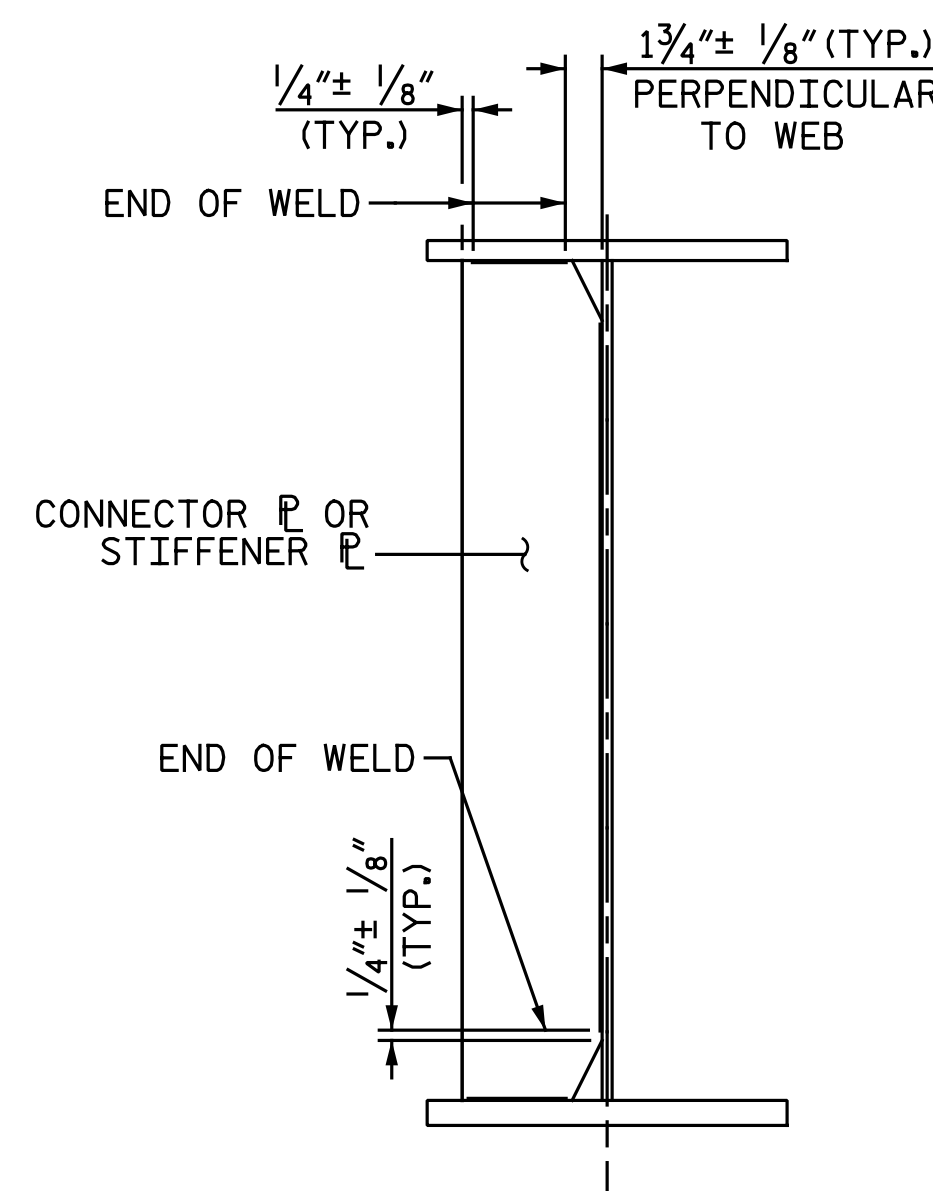
INTERMEDIATE DIAPHRAGM CONNECTOR PL



BEARING STIFFENER

BEARING STIFFENER MAY REQUIRE COPING IF WIDER THAN BOTTOM FLANGE.

* AT BENT 1, WELD BEARING STIFFENER TO BOTTOM FLANGE.



STIFFENER AND CONNECTOR PLATE CONNECTIONS WELD TERMINATION DETAILS

PROJECT NO. U-3330

NASH COUNTY

STATION: 18+22.61 -Y1-

SHEET 2 OF 3

DRAWN BY: M. D. MAYHEW DATE: 8-4-16
CHECKED BY: J. M. GARRISON DATE: 9-7-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



DocuSigned by:
Bradley J. Bell
C41AF8ECAC3A34...
1/27/2017

Michael Baker INTERNATIONAL

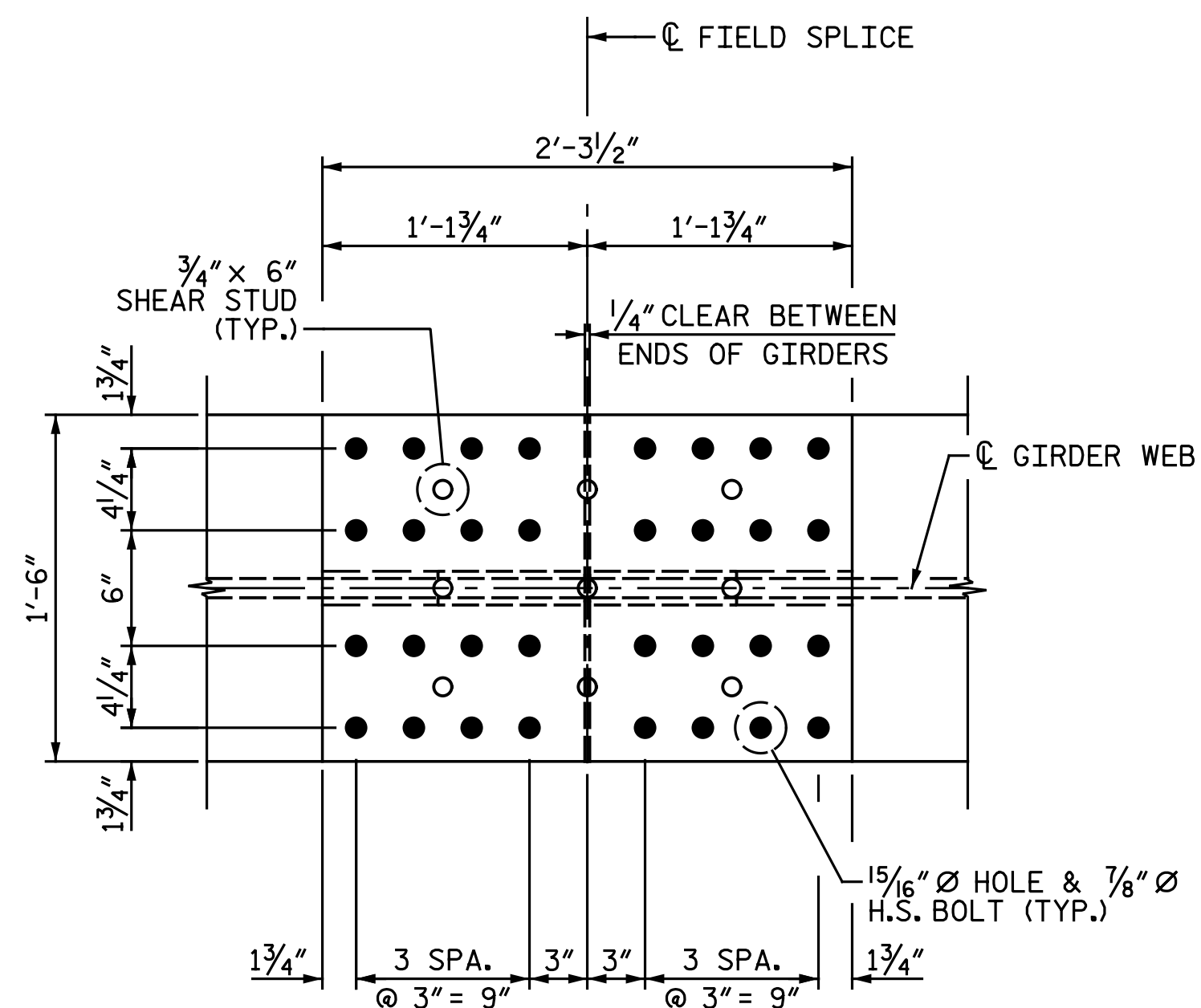
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8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No.: F-1084

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
STRUCTURAL STEEL
DETAILS

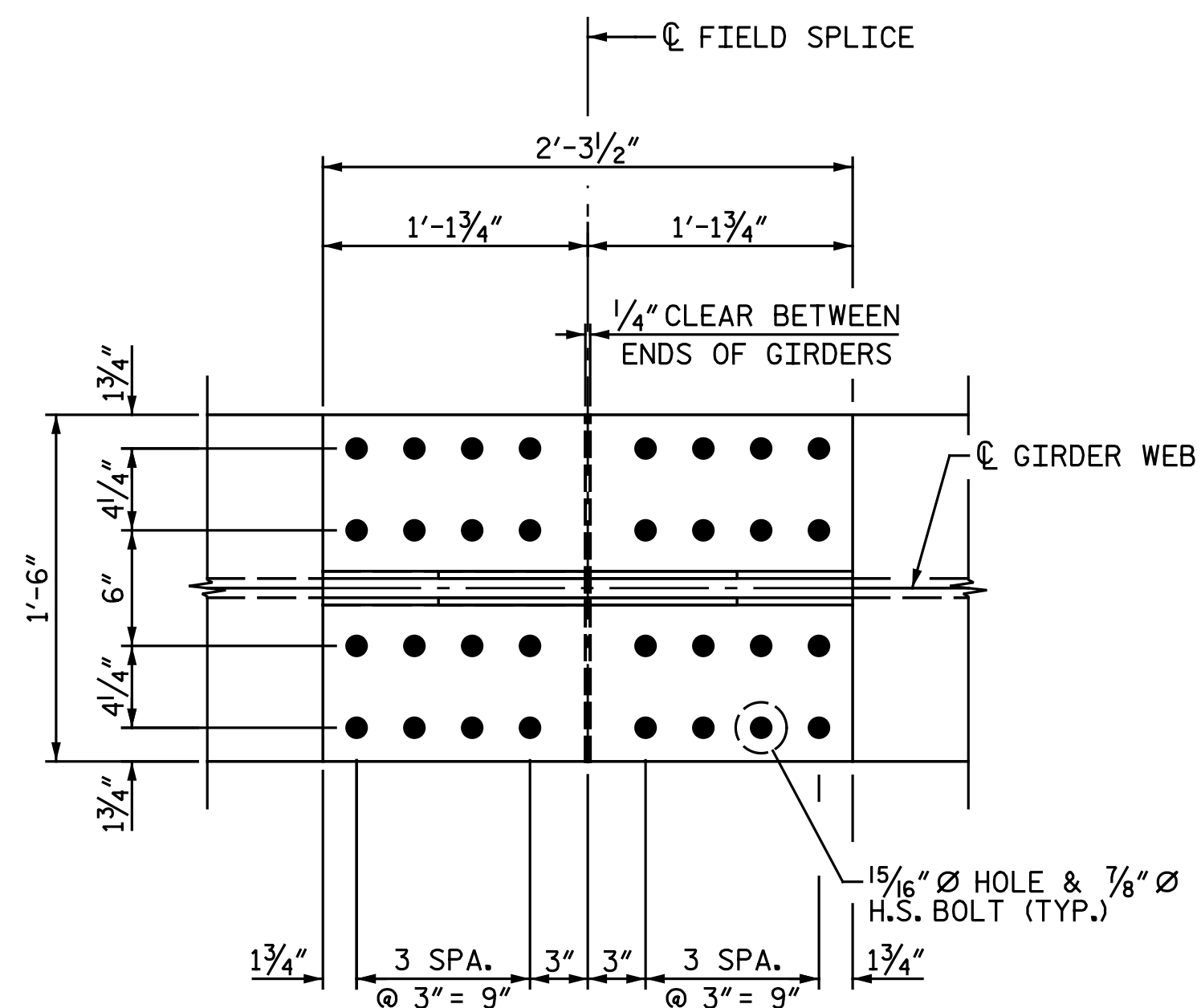
LEFT LANES

REVISIONS

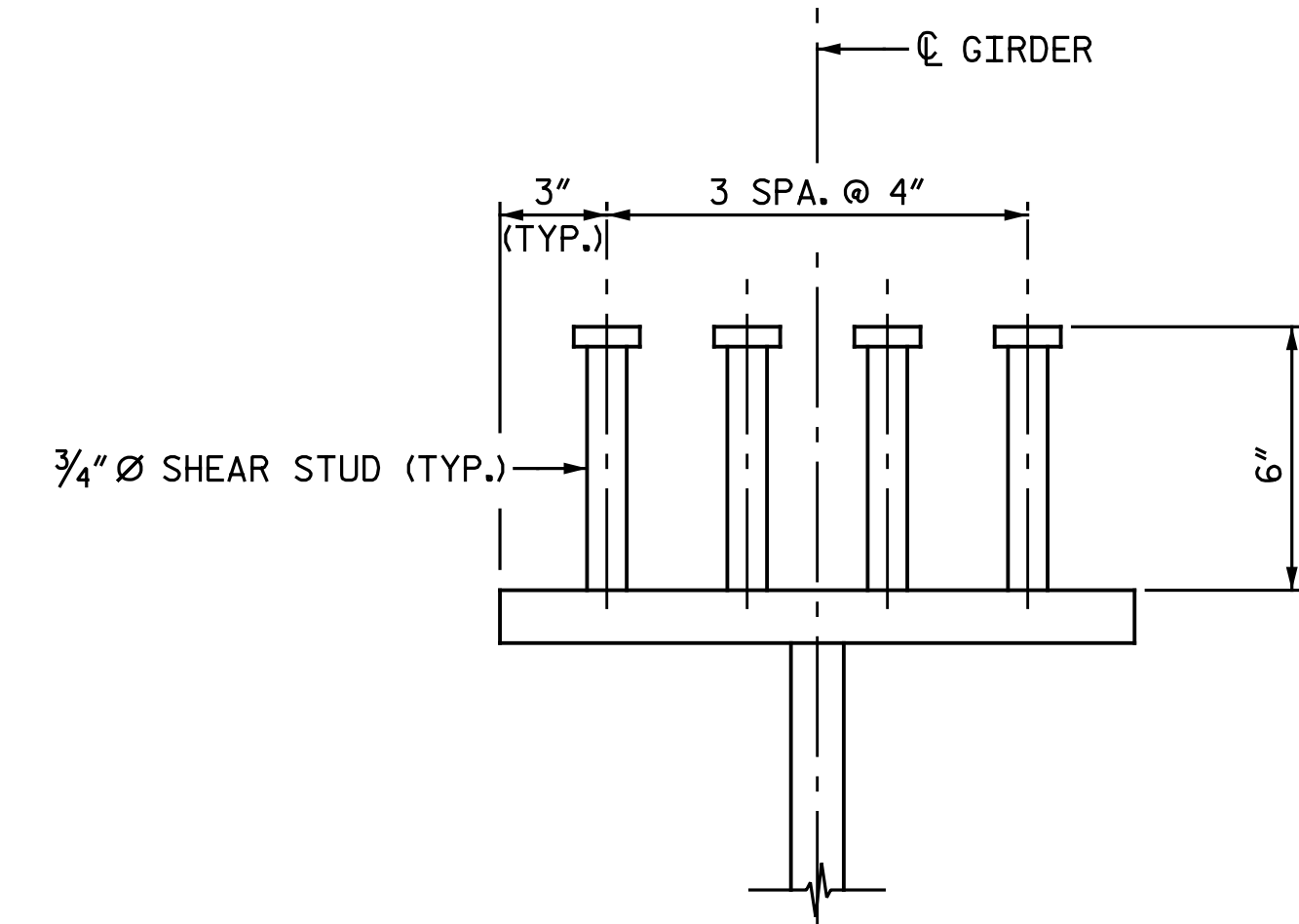
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			SI-II
2			4			TOTAL SHEETS 38



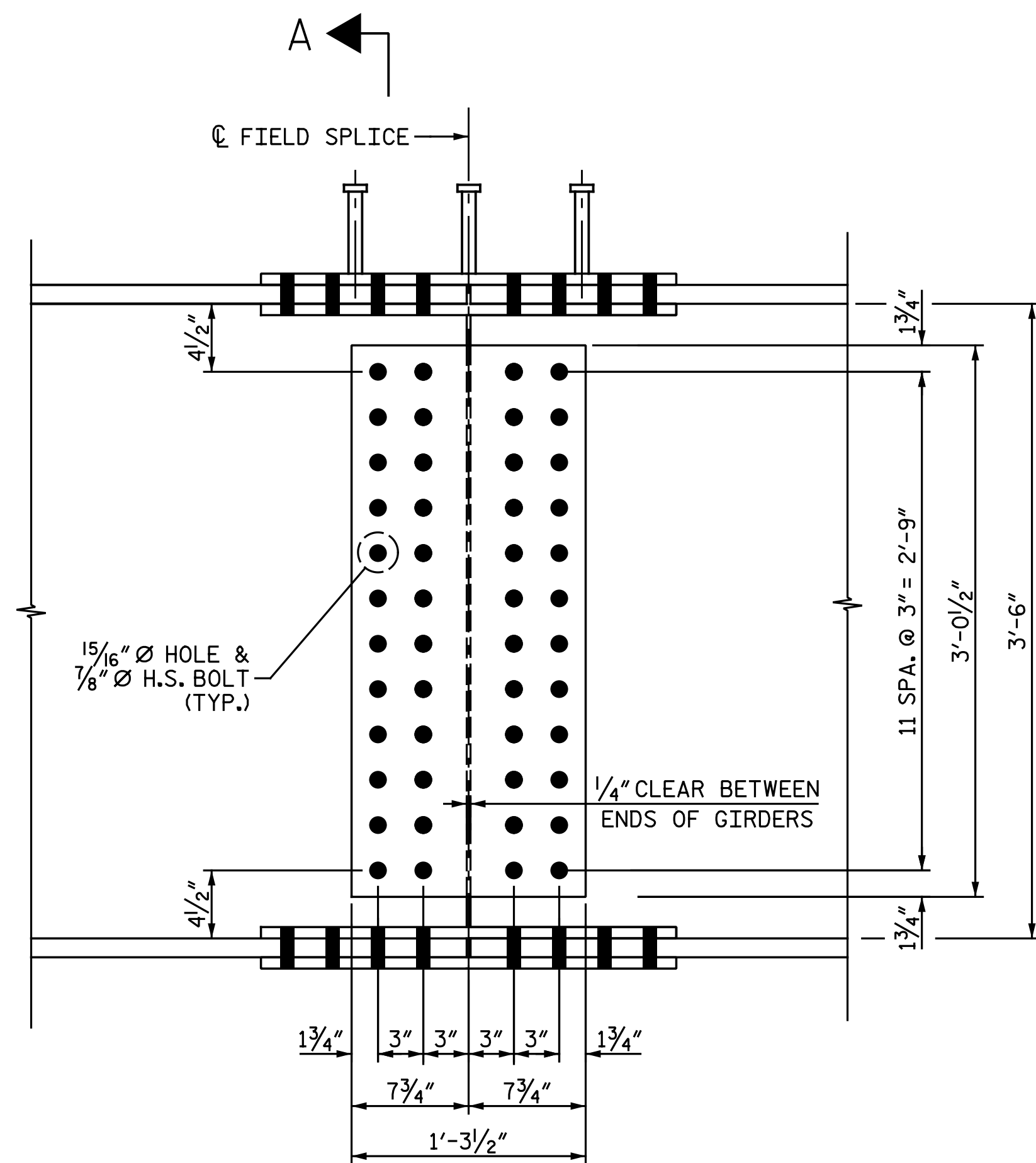
PLAN (TOP OF TOP FLANGE)



PLAN (TOP OF BOTTOM FLANGE)

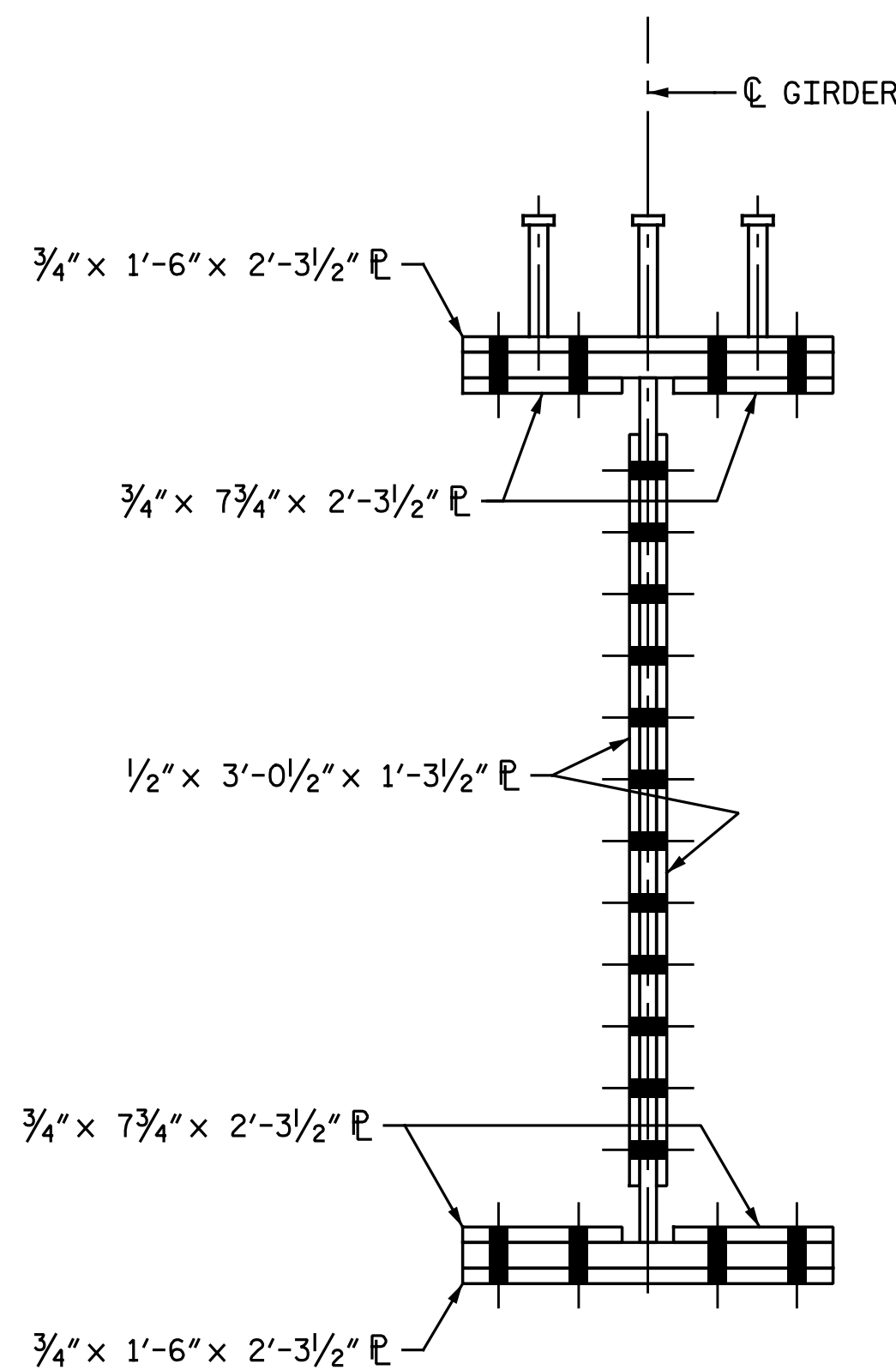


GIRDER SHEAR CONNECTORS
(EXCEPT AT BOLTED FIELD SPLICE)

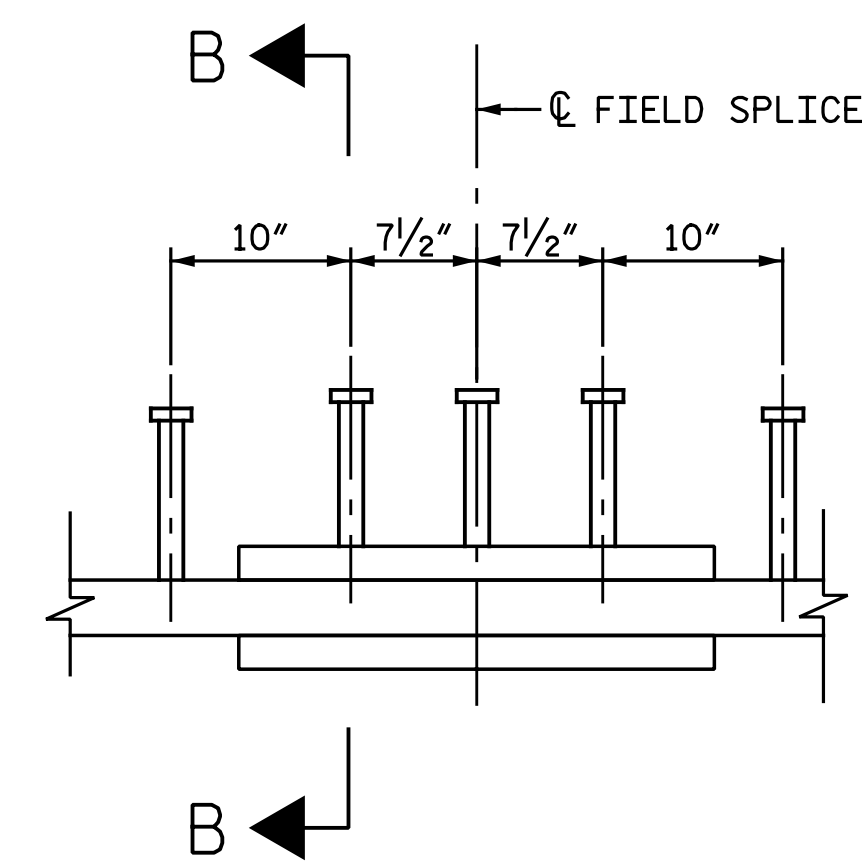


ELEVATION

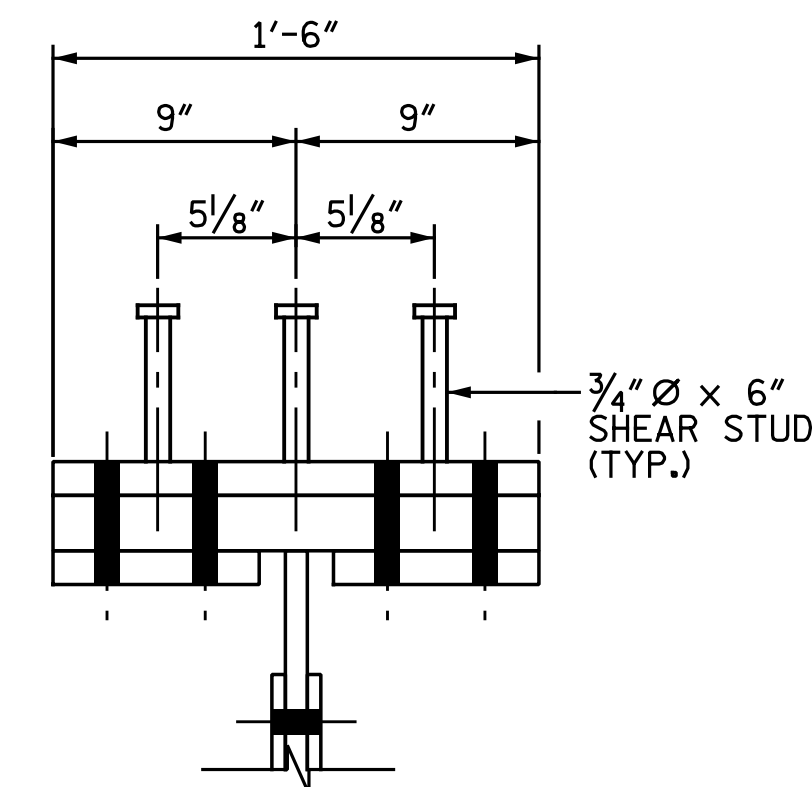
BOLTED FIELD SPLICE DETAILS



SECTION A-A



ELEVATION



SECTION B-B

SHEAR STUD DETAIL
FOR TOP FLANGE SPLICE PLATE

PROJECT NO. U-3330
NASH COUNTY
STATION: 18+22.61 -Y1-

SHEET 3 OF 3

DRAWN BY: M. D. MAYHEW DATE: 8-4-16
CHECKED BY: J. M. GARRISON DATE: 9-7-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE STRUCTURAL STEEL DETAILS LEFT LANES		SHEET NO. SI-12
	REVISIONS				TOTAL SHEETS 38
	NO.	BY:	DATE:	NO.	
	1			3	
2			4		
		Michael Baker Engineering 8000 Regency Parkway, Suite 600 Cary, North Carolina 27518 NC License No.: F-1084			

NOTES

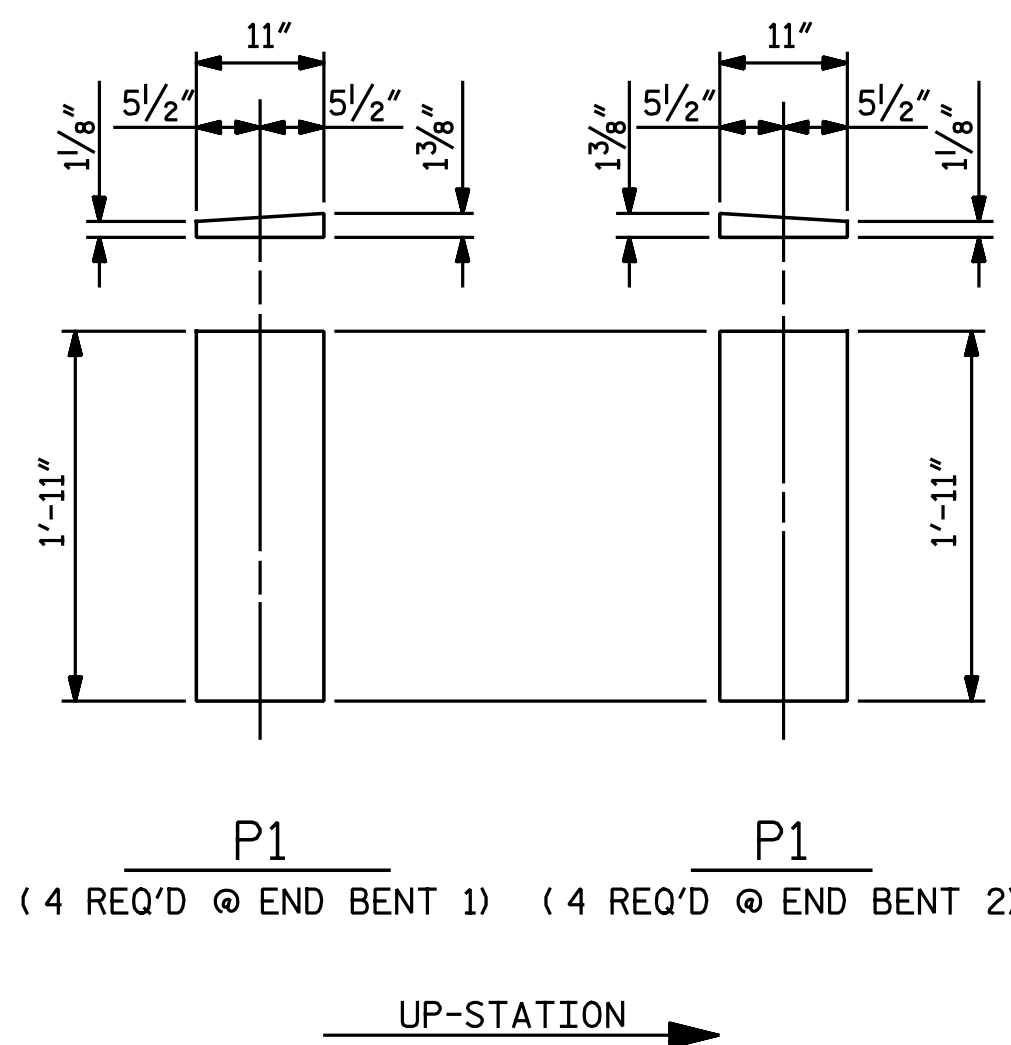
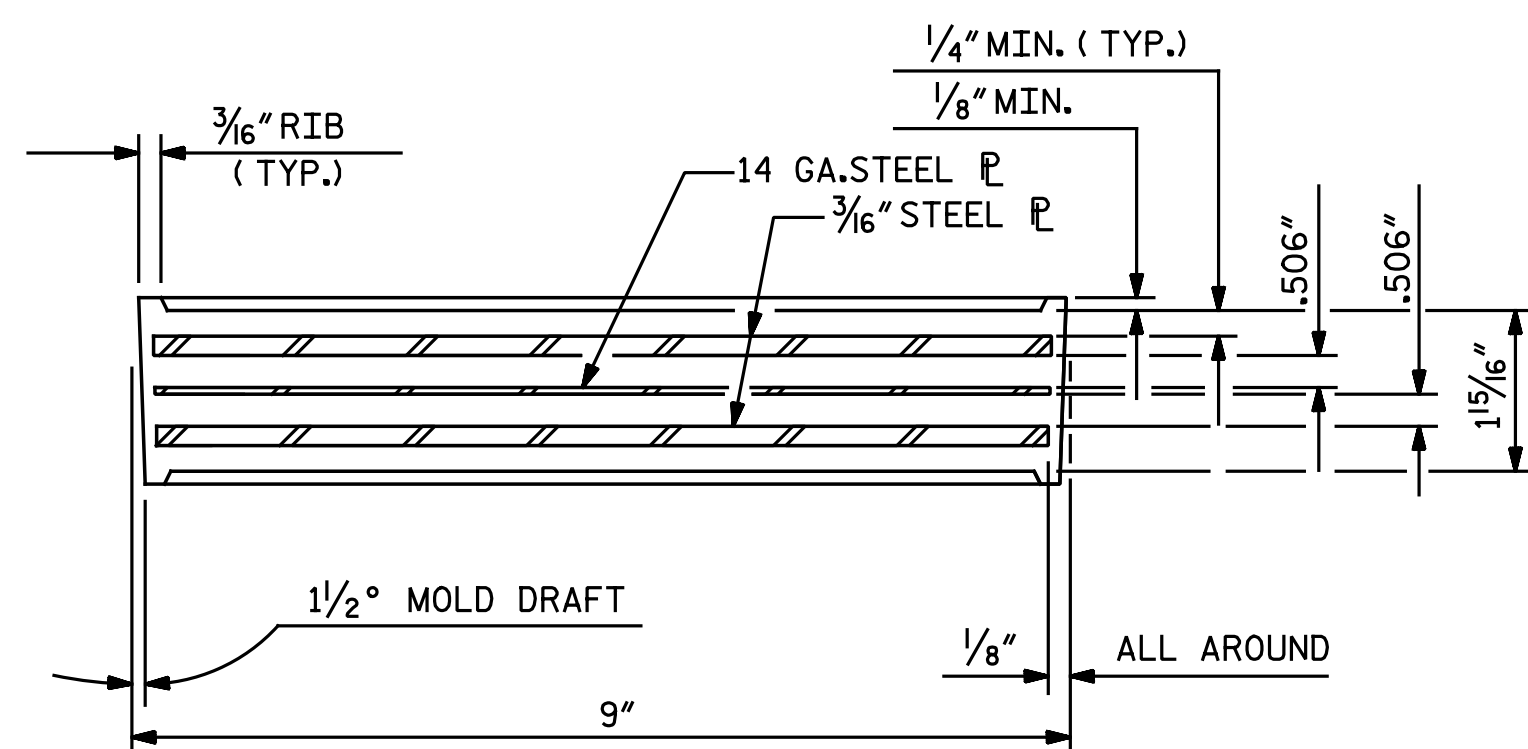
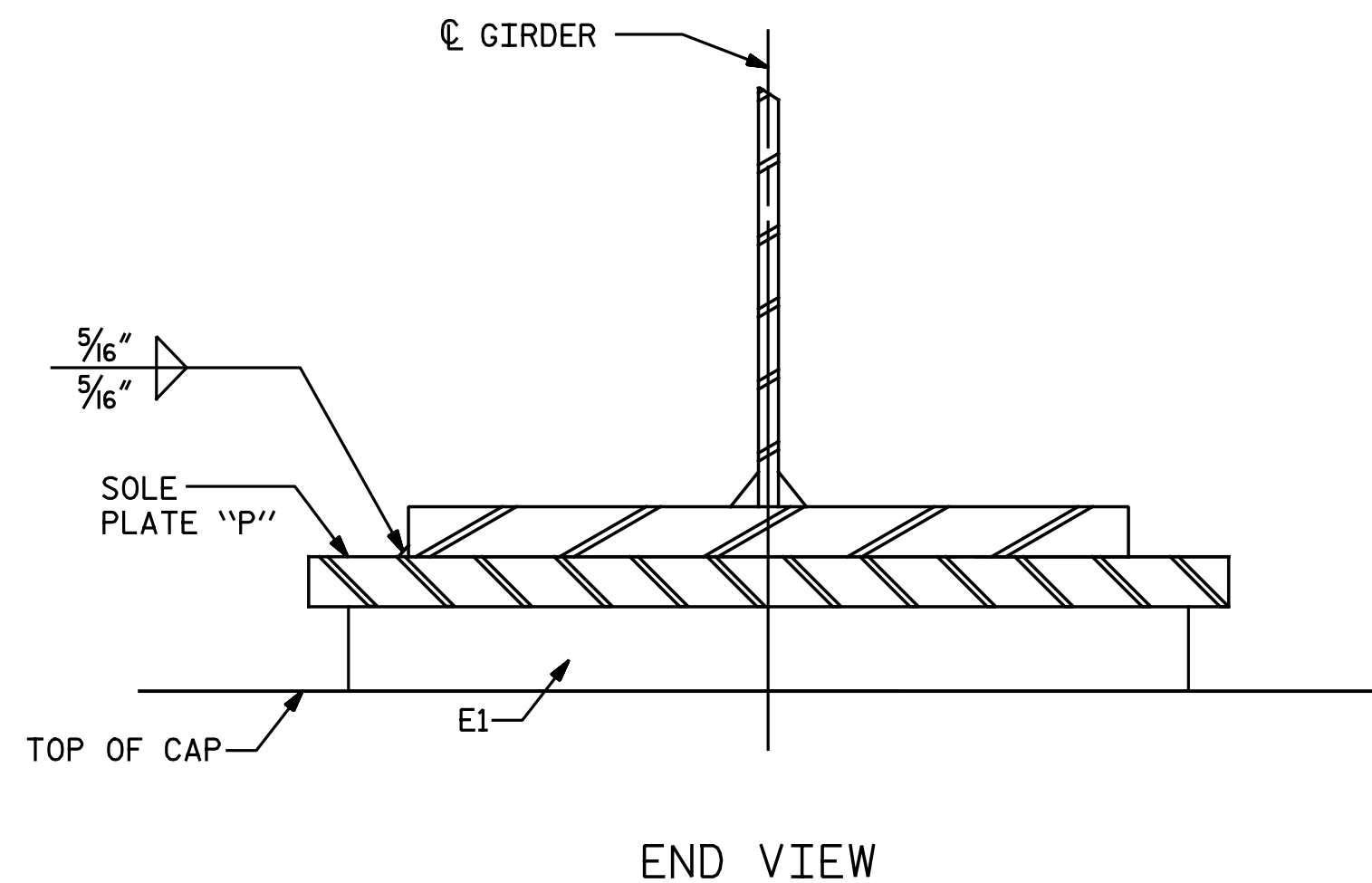
FOR AASHTO M270 GRADE 50W STRUCTURAL STEEL, SOLE PLATE SHALL BE AASHTO M270 GRADE 50W AND SHALL NOT BE GALVANIZED.

SOLE PLATES SHALL BE INCLUDED IN THE PAY ITEM FOR STRUCTURAL STEEL.

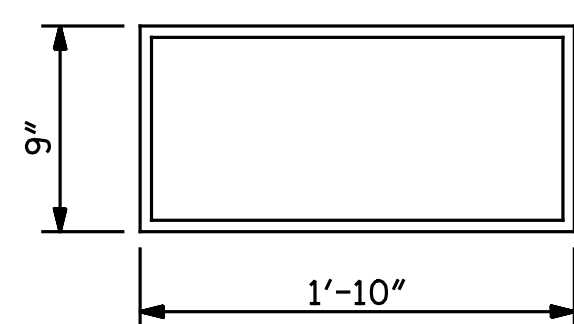
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.



MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE IV	225 k



E1 (8 REQ'D)

TYPE IV

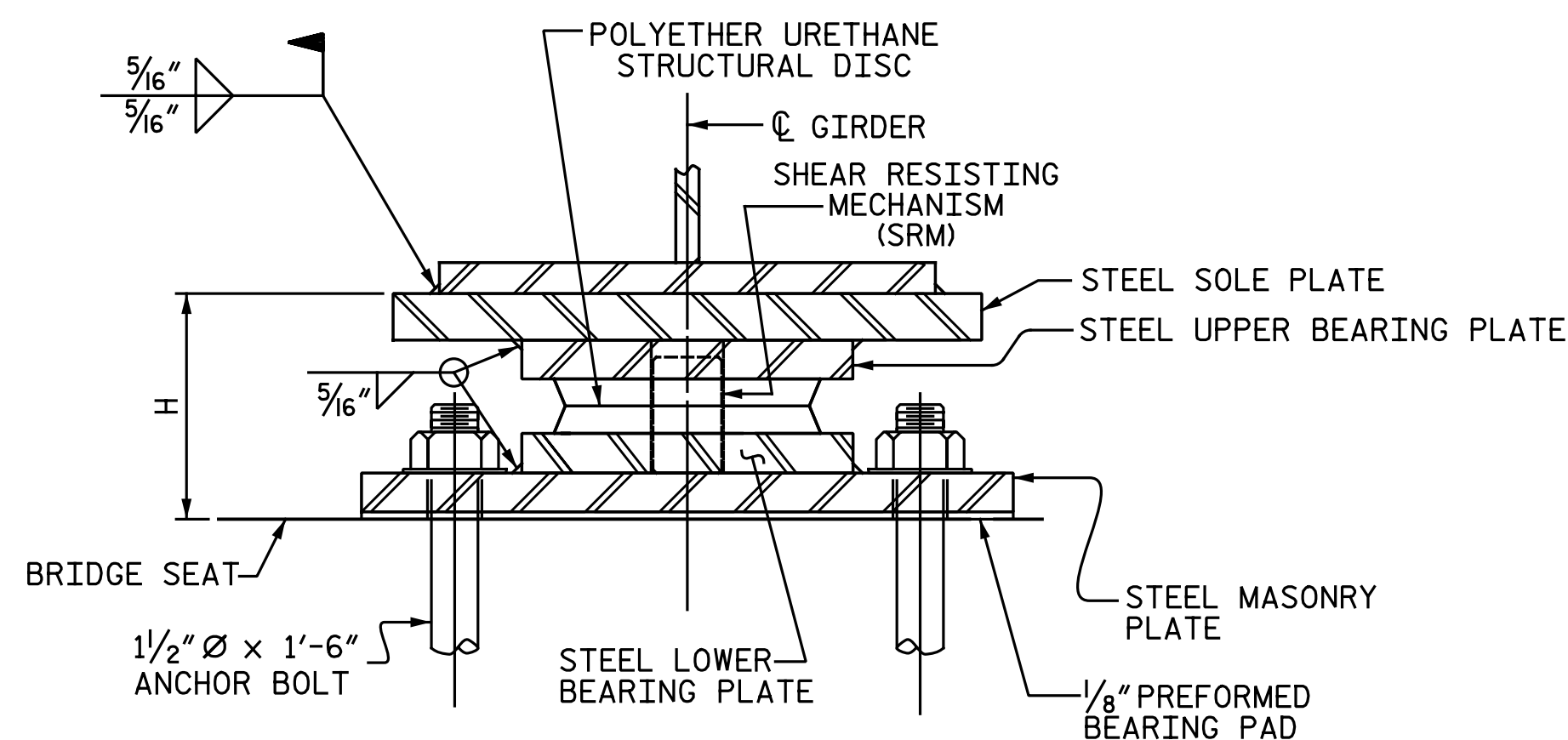
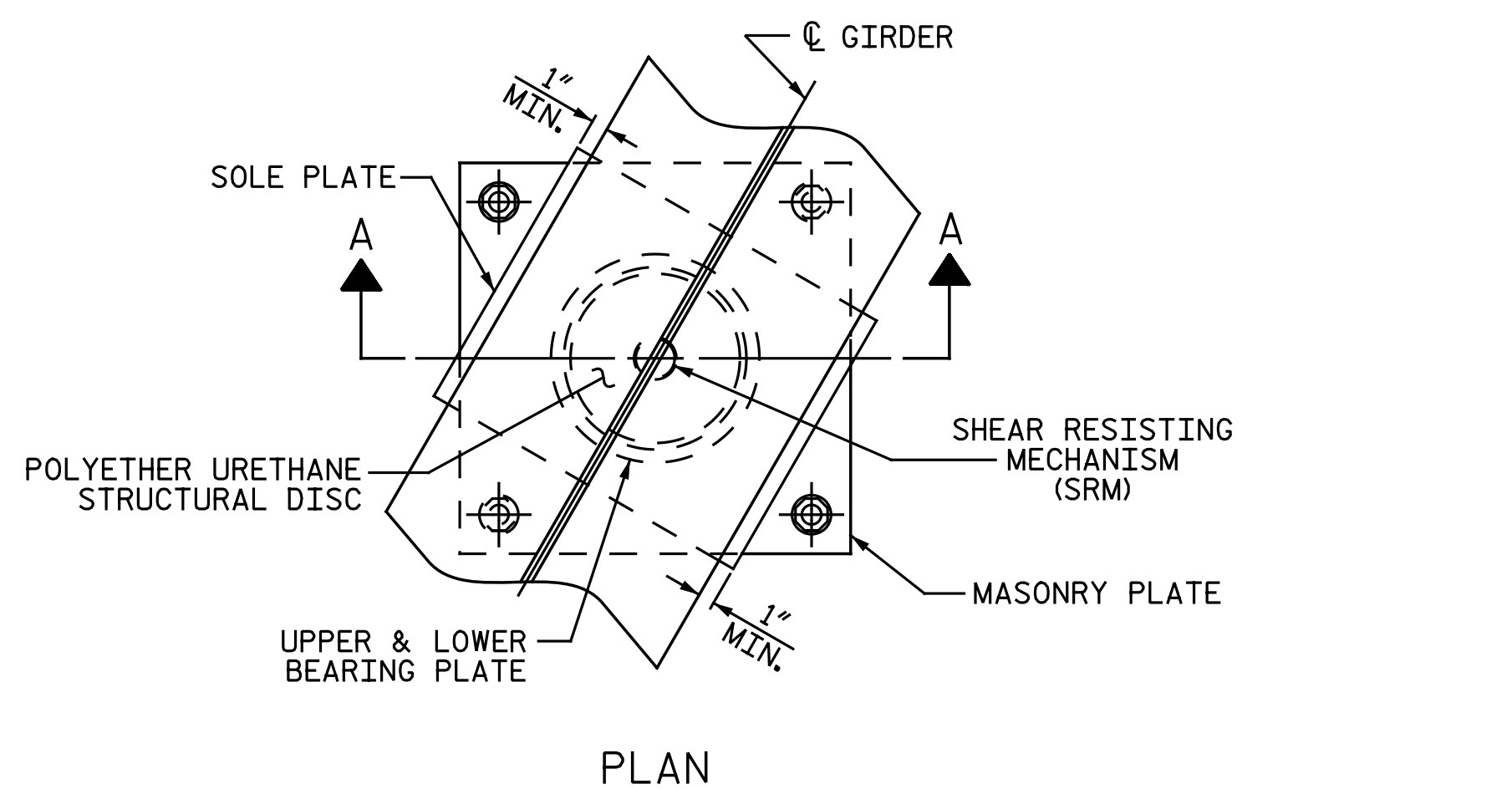
(NCDOT STANDARD BEARING FOR PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURES)

PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1-

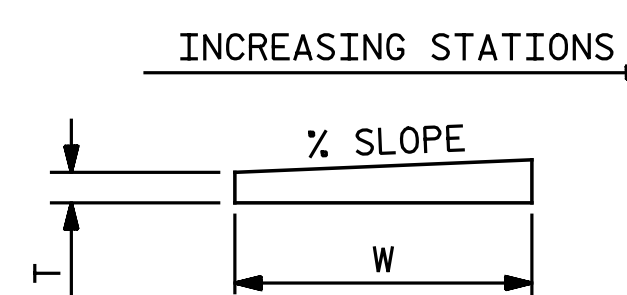
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	 DocuSigned by: Bradley J. Bell CA1A3F8E3A3C434... 1/27/2017	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE ELASTOMERIC BEARING DETAILS LEFT LANES		SHEET NO. SI-13
		REVISIONS		TOTAL SHEETS
		Michael Baker INTERNATIONAL	Michael Baker Engineering 8000 Regency Parkway, Suite 600 Cary, North Carolina 27518 NC License No.: F-1084	NO. BY: DATE: NO. BY: DATE: 1 3 2 4

NOTES

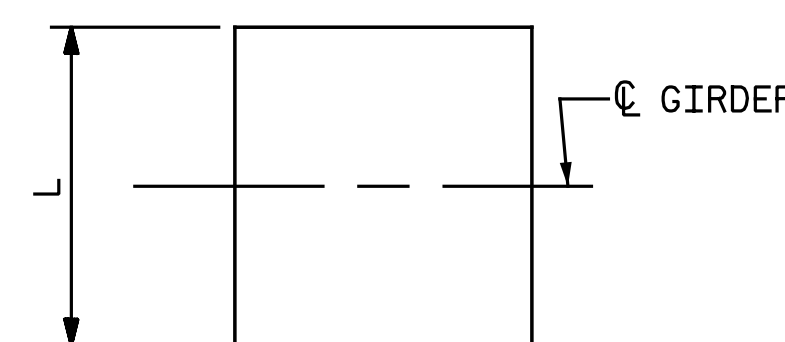
- FOR DISC BEARINGS, SEE SPECIAL PROVISIONS.
- ALL BEARING PLATES SHALL BE AASHTO M270 GRADE 50W OR GRADE 50.
- AT ALL POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS SHALL BE FINGER-TIGHTENED PLUS AN ADDITIONAL 1/4 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.
- WHEN WELDING THE SOLE PLATE TO THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE BEARING DOES NOT EXCEED 250°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE TFE OR URETHANE DISC.
- SOLE PLATES SHOULD BE WELDED TO GIRDER FLANGES BEFORE FALSEWORK IS PLACED.
- ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.
- FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
- THE MINIMUM ROTATIONAL CAPACITY FOR ALL BEARINGS SHALL BE 0.02 RADIAN.



SECTION A-A
DB1, FIXED



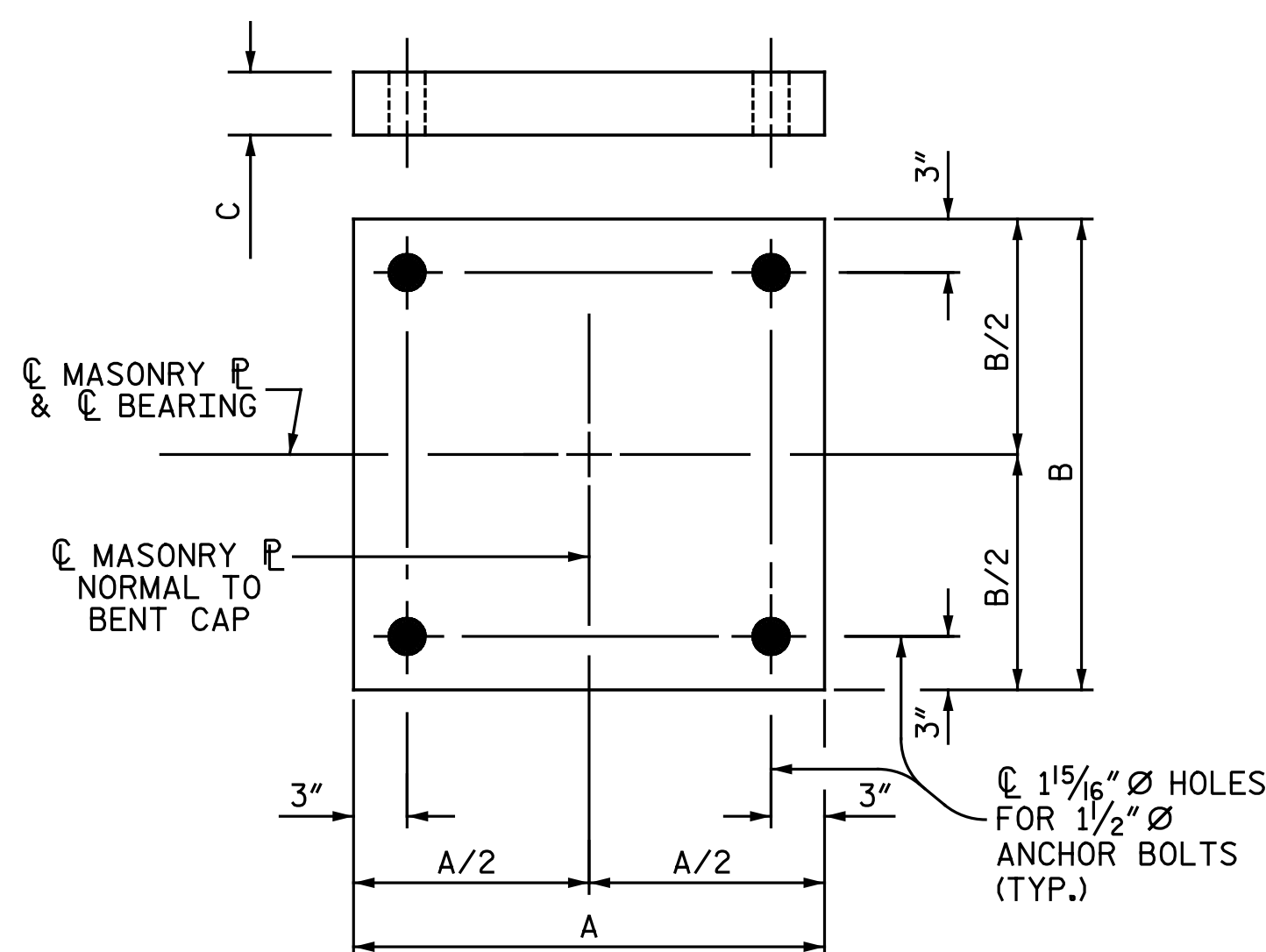
ELEVATION



PLAN

NOTE:
DIMENSIONS "W" AND "T" SHALL BE DETERMINED BY THE BEARING MANUFACTURER.

SOLE PLATE DETAILS



PLAN
MASONRY PLATE
DETAILS

PROJECT NO. U-3330
NASH COUNTY
STATION: 18+22.61 -Y1-

ASSEMBLED BY : N. B. SPEAKS	DATE : 7-05-16
CHECKED BY : T. M. GARRISON	DATE : 8-29-16
DRAWN BY : TMG 08/13	REV. REV.
CHECKED BY : EKP 10/13	REV. REV.

DESIGNATIONS		LOCATION	NUMBER OF BEARINGS	DIMENSIONS				LOADS AND MOVEMENT		UNFACTORED VERTICAL LOAD (KIPS)	FACTORED HORIZONTAL LOAD (KIPS)	ONE-WAY MOVEMENT (IN.)		
BEARINGS	MASONRY PL			BEARING H (IN.)	MASONRY PL A (IN.)	SOLE PLATE B (IN.)	SOLE PLATE C (IN.)	TOP SLOPE (%)	SOLE PLATE L (IN.)				DEAD	LIVE
DB1 (FIXED)	M1	BENT 1	4	5 1/2	22 1/2	22 1/2	3/4	0	20	265	11	170	91	0

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH STANDARD DISC BEARING DETAILS LEFT LANES		SHEET NO. SI-14																	
	Michael Baker Engineering 8000 Regency Parkway, Suite 600 Cary, North Carolina 27518 NC License No.: F-1084				TOTAL SHEETS 38																	
	Michael Baker INTERNATIONAL		REVISIONS <table border="1"> <tr> <th>NO.</th> <th>BY:</th> <th>DATE:</th> <th>NO.</th> <th>BY:</th> <th>DATE:</th> </tr> <tr> <td>1</td> <td></td> <td></td> <td>3</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td>4</td> <td></td> <td></td> </tr> </table>		NO.	BY:	DATE:	NO.	BY:	DATE:	1			3			2			4		
NO.	BY:	DATE:	NO.	BY:	DATE:																	
1			3																			
2			4																			

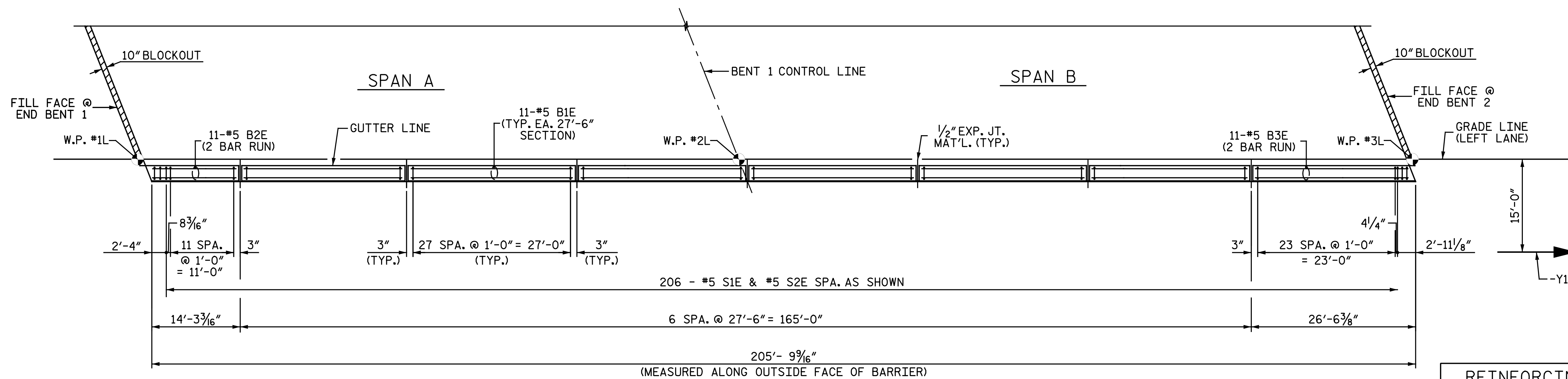
DEAD LOAD DEFLECTION AND CAMBER ORDINATES

	SPAN A																				SPAN B																					
	GIRDER G1L																																									
20TH POINTS	1.0	1.05	1.1	1.15	1.2	1.25	1.3	1.35	1.4	1.45	1.5	1.55	1.6	1.65	1.7	1.75	1.8	1.85	1.9	1.95	2.0	2.05	2.1	2.15	2.2	2.25	2.3	2.35	2.4	2.45	2.5	2.55	2.6	2.65	2.7	2.75	2.8	2.85	2.9	2.95	3.0	
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.003	0.006	0.009	0.011	0.013	0.014	0.015	0.015	0.014	0.013	0.012	0.009	0.007	0.005	0.003	0.001	0.000	-0.001	-0.001	0.000	0.002	0.005	0.009	0.014	0.019	0.024	0.028	0.033	0.036	0.038	0.040	0.040	0.039	0.036	0.032	0.027	0.022	0.015	0.008	0.000	
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.019	0.037	0.054	0.067	0.078	0.086	0.089	0.090	0.087	0.080	0.071	0.059	0.046	0.034	0.021	0.011	0.003	-0.002	-0.003	0.000	0.009	0.022	0.039	0.061	0.084	0.108	0.131	0.152	0.169	0.181	0.188	0.189	0.184	0.172	0.155	0.132	0.103	0.072	0.037	0.000	
DEFLECTION DUE TO WEIGHT OF RAIL AND SIDEWALK	0.000	0.004	0.008	0.012	0.016	0.018	0.020	0.022	0.022	0.022	0.021	0.020	0.017	0.014	0.011	0.008	0.005	0.003	0.001	0.000	0.000	0.002	0.004	0.008	0.012	0.017	0.022	0.026	0.030	0.033	0.036	0.037	0.036	0.035	0.033	0.029	0.024	0.019	0.013	0.007	0.000	
TOTAL DEAD LOAD DEFLECTION	0.000	0.027	0.051	0.075	0.094	0.109	0.120	0.126	0.127	0.123	0.115	0.102	0.086	0.067	0.050	0.032	0.017	0.005	-0.002	-0.004	0.000	0.012	0.031	0.056	0.087	0.119	0.154	0.185	0.215	0.238	0.255	0.264	0.265	0.257	0.241	0.216	0.183	0.143	0.099	0.052	0.000	
VERTICAL CURVE ORDINATE	0.000	0.049	0.094	0.133	0.166	0.195	0.218	0.236	0.249	0.257	0.260	0.257	0.249	0.236	0.218	0.195	0.166	0.133	0.094	0.049	0.000	0.062	0.118	0.167	0.209	0.245	0.274	0.297	0.314	0.323	0.327	0.323	0.314	0.297	0.274	0.245	0.209	0.167	0.118	0.062	0.000	
REQUIRED CAMBER	0"	15/16"	1 3/4"	2 1/2"	3 1/8"	3 5/8"	4 1/16"	4 3/8"	4 1/2"	4 9/16"	4 1/2"	4 5/16"	4"	3 5/8"	3 3/16"	2 11/16"	2 3/16"	1 5/8"	1 1/8"	9/16"	0"	7/8"	1 3/4"	2 1/16"	3 3/16"	4 3/8"	5 1/8"	5 13/16"	6 5/16"	6 3/4"	6 15/16"	7 1/16"	6 5/16"	6 5/8"	6 3/16"	5 9/16"	4 11/16"	3 11/16"	2 5/8"	1 3/8"	0"	
	GIRDER G2L																																									
20TH POINTS	1.0	1.05	1.1	1.15	1.2	1.25	1.3	1.35	1.4	1.45	1.5	1.55	1.6	1.65	1.7	1.75	1.8	1.85	1.9	1.95	2.0	2.05	2.1	2.15	2.2	2.25	2.3	2.35	2.4	2.45	2.5	2.55	2.6	2.65	2.7	2.75	2.8	2.85	2.9	2.95	3.0	
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.003	0.006	0.009	0.012	0.013	0.015	0.015	0.015	0.015	0.013	0.012	0.010	0.007	0.005	0.003	0.001	0.000	-0.001	-0.001	0.000	0.002	0.005	0.009	0.014	0.019	0.024	0.029	0.033	0.036	0.039	0.040	0.040	0.039	0.036	0.032	0.028	0.022	0.015	0.008	0.000	
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.020	0.038	0.056	0.070	0.081	0.089	0.093	0.094	0.091	0.085	0.076	0.064	0.051	0.038	0.025	0.015	0.006	0.000	-0.002	0.000	0.008	0.021	0.039	0.061	0.084	0.108	0.131	0.153	0.169	0.181	0.187	0.188	0.183	0.172	0.155	0.131	0.103	0.071	0.037	0.000	
DEFLECTION DUE TO WEIGHT OF RAIL AND SIDEWALK	0.000	0.002	0.004	0.006	0.007	0.008	0.009	0.010	0.010	0.009	0.009	0.008	0.006	0.005	0.003	0.002	0.001	0.000	0.000	0.000	0.000	0.001	0.003	0.005	0.008	0.010	0.013	0.016	0.018	0.020	0.021	0.021	0.021	0.020	0.019	0.016	0.014	0.010	0.007	0.004	0.000	
TOTAL DEAD LOAD DEFLECTION	0.000	0.025	0.049	0.070	0.088	0.103	0.113	0.118	0.119	0.115	0.107	0.095	0.080	0.063	0.047	0.031	0.017	0.006	-0.001	-0.003	0.000	0.012	0.029	0.053	0.083	0.113	0.145	0.175	0.204	0.225	0.240	0.248	0.248	0.241	0.226	0.203	0.172	0.134	0.093	0.048	0.000	
VERTICAL CURVE ORDINATE	0.000	0.049	0.094	0.133	0.166	0.195	0.218	0.236	0.249	0.257	0.260	0.257	0.249	0.236	0.218	0.195	0.166	0.133	0.094	0.049	0.000	0.062	0.118	0.167	0.209	0.245	0.274	0.297	0.314	0.323	0.327	0.323	0.314	0.297	0.274	0.245	0.209	0.167	0.118	0.062	0.000	
REQUIRED CAMBER	0"	7/8"	1 11/16"	2 1/16"	3 1/16"	3 5/16"	3 15/16"	4 1/4"	4 7/16"	4 1/16"	4 3/8"	4 1/4"	3 15/16"	3 9/16"	3 3/16"	2 11/16"	2 3/16"	1 11/16"	1 1/8"	9/16"	0"	7/8"	1 3/4"	2 5/8"	3 1/2"	4 5/16"	5 1/16"	5 11/16"	6 3/16"	6 3/4"	6 7/16"	6 3/4"	6 7/16"	6"	5 3/8"	4 9/16"	3 5/8"	2 1/2"	1 5/16"	0"		
	GIRDER G3L																																									
20TH POINTS	1.0	1.05	1.1	1.15	1.2	1.25	1.3	1.35	1.4	1.45	1.5	1.55	1.6	1.65	1.7	1.75	1.8	1.85	1.9	1.95	2.0	2.05	2.1	2.15	2.2	2.25	2.3	2.35	2.4	2.45	2.5	2.55	2.6	2.65	2.7	2.75	2.8	2.85	2.9	2.95	3.0	
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.003	0.006	0.009	0.012	0.013	0.015	0.015	0.015	0.015	0.013	0.012	0.010	0.007	0.005	0.003	0.001	-0.001	-0.001	-0.001	0.000	0.002	0.005	0.009	0.014	0.019	0.024	0.029	0.033	0.036	0.039	0.040	0.040	0.039	0.036	0.032	0.027	0.021	0.015	0.008	0.000	
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.021	0.039	0.057	0.072	0.083	0.092	0.097	0.098	0.095	0.089	0.080	0.068	0.054	0.041	0.026	0.015	0.005	0.000	-0.002	0.000	0.008	0.021	0.039	0.060	0.083	0.108	0.129	0.150	0.166	0.179	0.185	0.186	0.181	0.169	0.152	0.130	0.101	0.070	0.037	0.000	
DEFLECTION DUE TO WEIGHT OF RAIL AND SIDEWALK	0.000	0.001	0.003	0.004	0.005	0.006	0.007	0.007	0.007	0.007	0.007	0.006	0.005	0.004	0.003	0.002	0.001	0.001	0.000	0.000	0.000	0.001	0.002	0.004	0.006	0.008	0.010	0.012	0.014	0.016	0.016	0.017	0.018	0.018	0.017	0.016	0.014	0.012	0.009	0.006	0.003	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.025	0.049	0.070	0.088	0.103	0.113	0.119	0.120	0.117	0.109	0.098	0.083	0.066	0.049	0.031	0.017	0.005	-0.002	-0.003	0.000	0.011	0.029	0.051	0.080	0.110	0.142	0.171	0.197	0.218	0.234	0.243	0.243	0.236	0.221	0.199	0.169	0.132	0.092	0.047	0.000	
VERTICAL CURVE ORDINATE	0.000	0.049	0.094	0.133	0.166	0.195	0.218	0.236	0.249	0.257	0.260	0.257	0.249	0.236	0.218	0.195	0.166	0.133	0.094	0.049	0.000	0.062	0.118	0.167	0.209	0.245	0.274	0.297	0.314	0.323	0.327	0.323	0.314	0.297	0.274	0.245	0.209	0.167	0.118	0.062	0.000	
REQUIRED CAMBER	0"	7/8"	1 11/16"	2 1/16"	3 1/16"	3 5/16"	3 15/16"	4 1/4"	4 7/16"	4 1/16"	4 3/8"	4 1/4"	3 15/16"	3 9/16"	3 3/16"	2 11/16"	2 3/16"	1 11/16"	1 1/8"	9/16"	0"	7/8"	1 3/4"	2 5/8"	3 1/2"	4 1/4"	4 5/16"	5 5/8"	6 1/8"	6 1/2"	6 3/4"	6 13/16"	6 11/16"	6 3/8"	5 15/16"	5 1/16"	4 9/16"	3 9/16"	2 1/2"	1 5/16"	0"	
	GIRDER G4L																																									
20TH POINTS	1.0	1.05	1.1	1.15	1.2	1.25	1.3	1.35	1.4	1.45	1.5	1.55	1.6	1.65	1.7	1.75	1.8	1.85	1.9	1.95	2.0	2.05	2.1	2.15	2.2	2.25	2.3	2.35	2.4	2.45	2.5	2.55	2.6	2.65	2.7	2.75	2.8	2.85	2.9	2.95	3.0	
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.003	0.006	0.009	0.011	0.013	0.014	0.015	0.014	0.014	0.013	0.011	0.009	0.006	0.004	0.002	0.001	-0.001	-0.001	-0.001	0.000	0.003	0.006	0.010	0.014	0.019	0.024	0.029	0.033	0.036	0.039	0.040	0.040	0.038	0.036	0.032	0.027	0.021	0.015	0.008	0.000	
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.021	0.040	0.058	0.073	0.085	0.095	0.100	0.101	0.098	0.092	0.083	0.071	0.056	0.043	0.029	0.018	0.007	0.001	-0.002	0.000	0.009	0.021	0.038	0.058	0.080	0.103	0.125	0.145	0.161	0.174	0.181	0.182	0.177	0.166	0.150	0.128	0.100	0.069	0.036	0.000	
DEFLECTION DUE TO WEIGHT OF RAIL AND SIDEWALK	0.000	0.003	0.006	0.008	0.011	0.012	0.014	0.015	0.015	0.015	0.015	0.013	0.012	0.010	0.008	0.006	0.004	0.002	0.001	0.000	0.000	0.001	0.003	0.005	0.008	0.011	0.015	0.018	0.021	0.023	0.024	0.025	0.025	0.024	0.023	0.020	0.017	0.013	0.009	0.005	0.000	
TOTAL DEAD LOAD DEFLECTION	0.000	0.027	0.052	0.075	0.095	0.111	0.123	0.129	0.131	0.127	0.119	0.107	0.091	0.073	0.055	0.037	0.022	0.009	0.001	-0.002	0.000	0.012	0.030	0.053	0.080	0.110	0.142	0.171	0.199	0.220	0.237	0.246	0.247	0.240	0.225	0.202	0.172	0.134	0.093	0.048	0.000	
VERTICAL CURVE ORDINATE	0.000	0.049	0.094	0.133	0.166	0.195	0.218	0.236	0.249	0.257	0.260	0.257	0.249	0.236	0.218	0.195	0.166	0.133	0.094	0.049	0.000	0.062	0.118	0.167	0.209	0.245	0.274	0.297	0.314	0.323	0.327	0.323	0.314	0.297	0.274	0.245	0.209	0.167	0.118	0.062	0.000	
REQUIRED CAMBER	0"	15/16"	1 3/4"	2 1/2"	3 1/8"	3 11/16"	4 1/16"	4 3/8"	4 9/16"	4 5/8"	4 3/16"	4 1/16"	3 11/16"	3 1/4"	2 13/16"	2 1/4"	1 11/16"	1 1/8"	9/16"	0"	7/8"	1 3/4"	2 5/8"	3 1/2"	4 1/4"	5"	5 5/8"	6 1/8"	6 1/2"	6 3/4"	6 13/16"	6 3/4"	6 7/16"	5 15/16"	5 3/8"	4 9/16"	3 5/8"	2 1/2"	1 5/16"	0"		

* INCLUDES SLAB, BUILDUPS, AND STAY-IN-PLACE FORMS. DEFLECTIONS BASED ON SLAB POUR SEQUENCE SHOWN ON "BILL OF MATERIAL" SHEET.

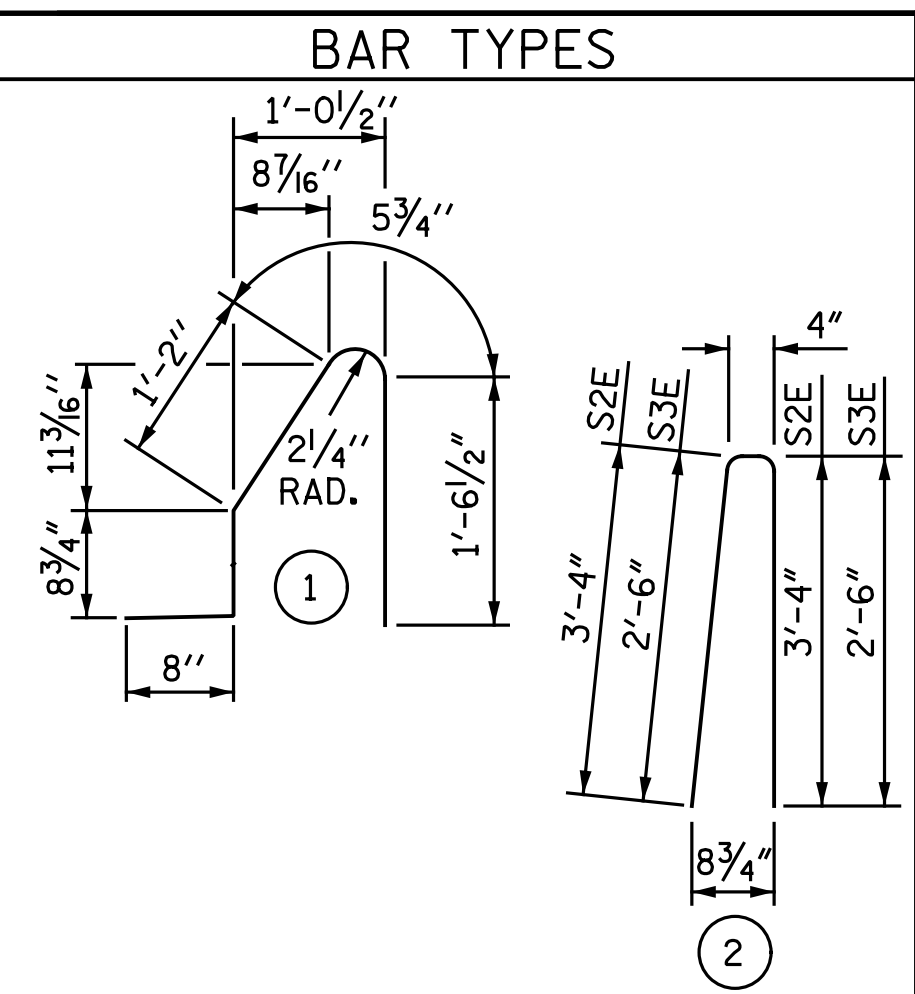
NOTES:

VALUES GIVEN ARE AT TWENTIETH POINTS BETWEEN CENTERLINE OF BEARINGS.
 DEFLECTIONS AND ORDINATES ARE IN FEET (DECIMAL FORM).
 REQUIRED CAMBER VALUES ARE IN INCHES (FRACTION FORM).
 UPWARD DEFLECTIONS AND ORDINATES ARE INDIC



PLAN OF BARRIER RAIL

REINFORCING STEEL SPLICE LENGTHS	
BAR SIZE	BARRIER RAIL (EPOXY COATED)
#5	3'-5"



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR CONCRETE BARRIER RAIL ONLY					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1E	66	#5	STR.	27' - 1"	1,864
B2E	22	#5	STR.	8' - 11"	205
B3E	22	#5	STR.	14' - 9"	338
S1E	210	#5	1	4' - 7"	1,004
S2E	206	#5	2	7' - 0"	1,504
S3E	4	#5	2	5' - 4"	22

EPOXY COATED REINFORCING STEEL	LBS.	4,937
CLASS AA CONCRETE	C.Y.	27.9
CONCRETE BARRIER RAIL	L.F.	205.8

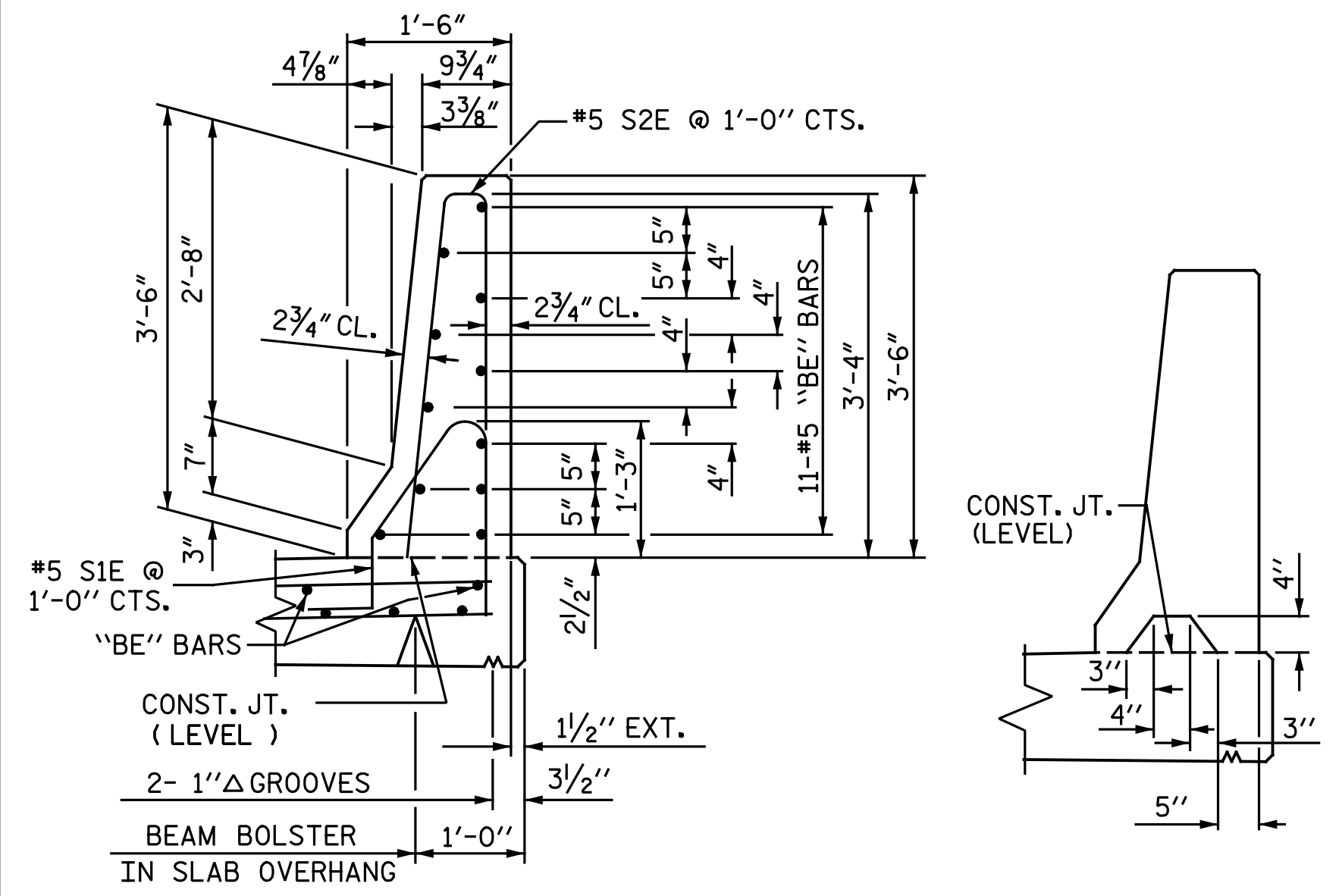
NOTES

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

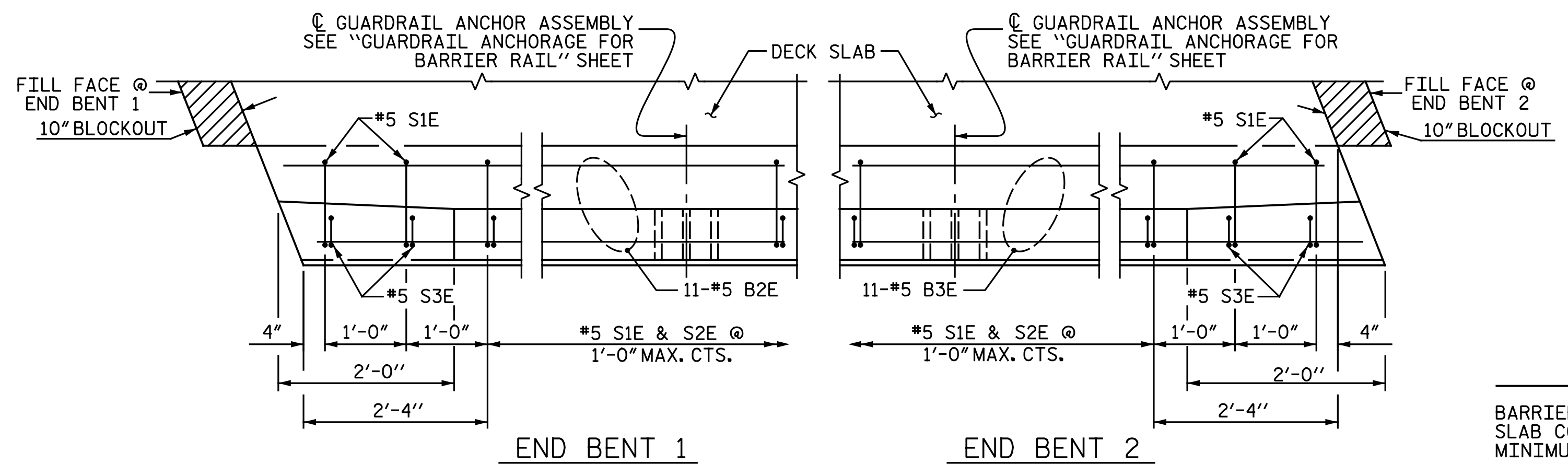
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS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

PROJECT NO. U-3330
 NASH COUNTY
 STATION: 18+22.61 -Y1-

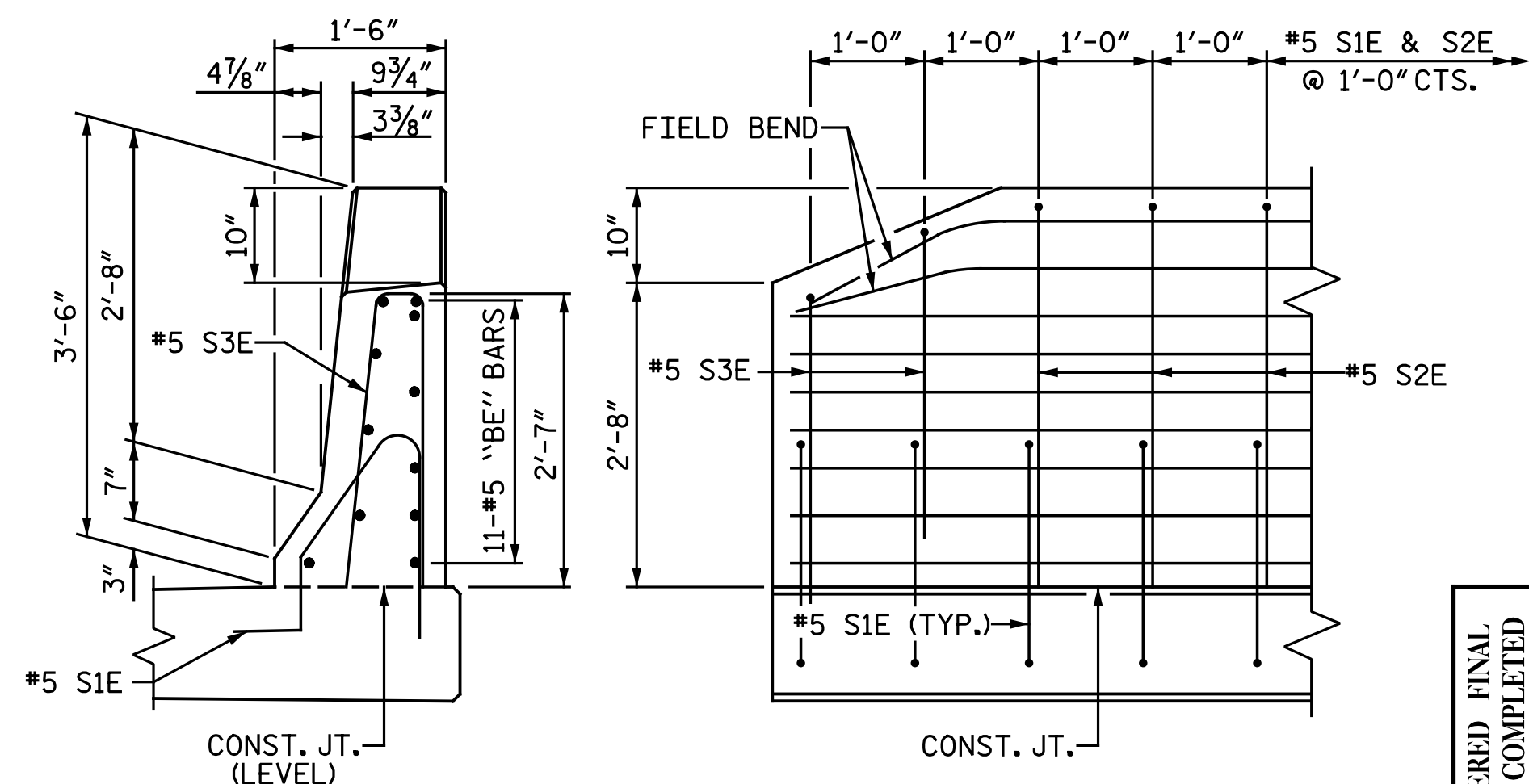


SECTION THRU RAIL

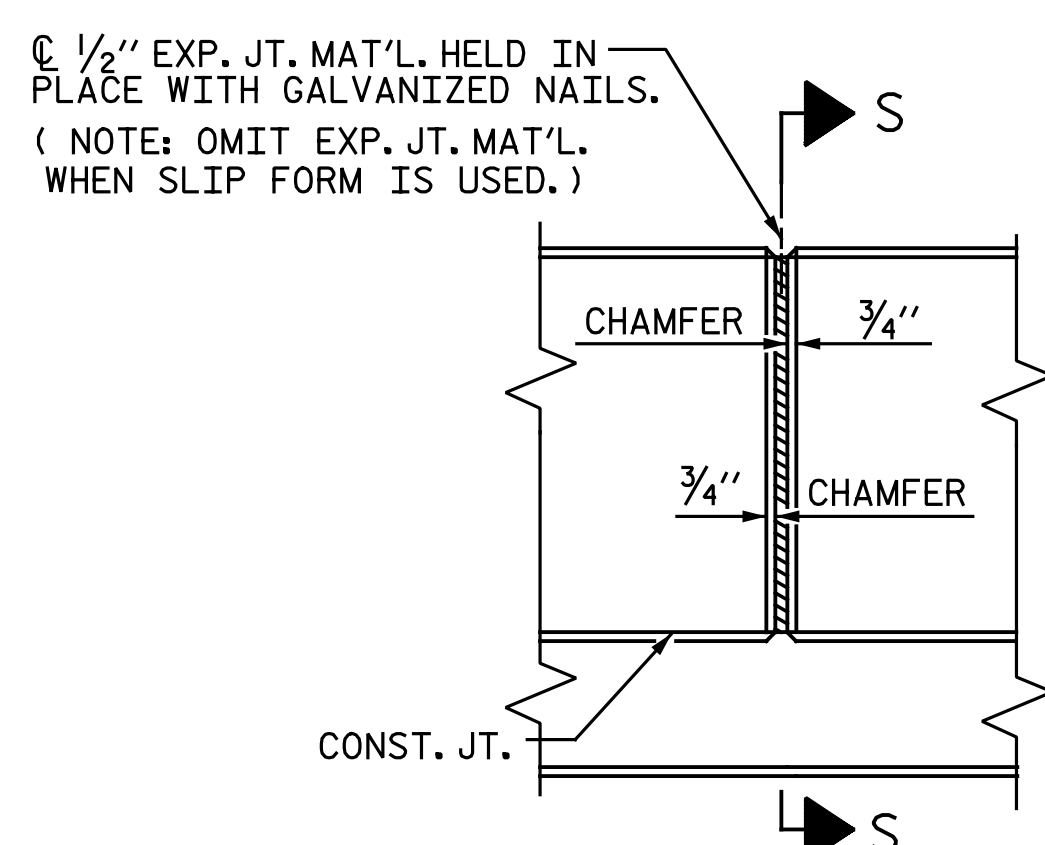
SECTION S-S AT DAM IN OPEN JOINT (THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)



PLAN OF BARRIER RAIL



END OF RAIL DETAILS



ELEVATION AT EXPANSION JOINTS BARRIER RAIL DETAILS

ASSEMBLED BY : N.B. SPEAKS	DATE : 4-28-16
CHECKED BY : A.H. SHARPE	DATE : 5-1-16
DRAWN BY : JMB 1/88	REV. 5/7/03
CHECKED BY : GGH 1/88	REV. 5/1/06
	REV. 10/1/11
RWW/JTE	TLA/GM
MAA/GM	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Professional Engineer Seal for Bradley J. Bell, State of North Carolina, License No. 042399, dated 1/27/2017.

Michael Baker Engineering
 8000 Regency Parkway, Suite 600
 Cary, North Carolina 27518
 NC License No.: F-1084

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD CONCRETE BARRIER RAIL LEFT LANES					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. SI-16	
TOTAL SHEETS 38	

NOTES

AT THE CONTRACTOR'S OPTION, METAL RAIL MAY BE EITHER ALUMINUM OR GALVANIZED STEEL IN ACCORDANCE WITH THE REQUIREMENTS OF THE GENERAL NOTES AND THE FOLLOWING SPECIFICATIONS FOR THE ALTERNATE MATERIALS; HOWEVER, THE CONTRACTOR WILL BE REQUIRED TO USE THE SAME RAIL MATERIAL ON ALL STRUCTURES ON THE PROJECT FOR WHICH METAL RAIL IS DESIGNATED.

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.

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

POST, POST BASES, RAILS, EXPANSION BARS AND CLAMP BARS : AASHTO M270 GRADE 36 STRUCTURAL STEEL - GALVANIZED TO AASHTO M111.

RIVETS: RIVETS SHALL MEET THE REQUIREMENTS OF ASTM A502 FOR GRADE 1 RIVETS.

THE CUT ENDS OF GALVANIZED STEEL RAILING, AFTER GRINDING SMOOTH SHALL BE GIVEN TWO COATS OF ZINC RICH PAINT MEETING THE REQUIREMENTS OF FEDERAL SPECIFICATION MIL-P-26915 USAF TYPE 1, OR OF FEDERAL SPECIFICATIONS TT-P-641.

SHIMS: SHIMS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

RAIL CAPS: RAIL CAPS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

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 "3 BAR METAL RAIL" SHEET 3 OF 3.

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.

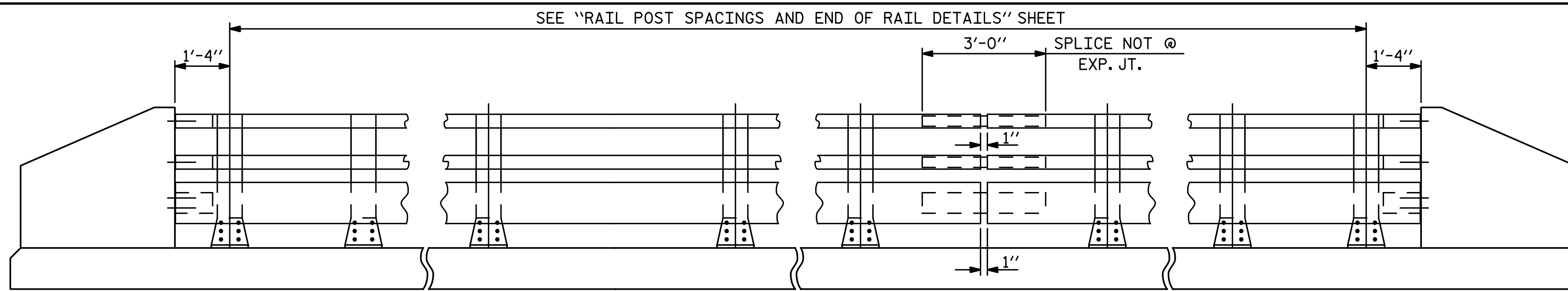
TO INSURE FUTURE IDENTIFICATION OF THE FABRICATOR, A PERMANENT IDENTIFYING MARK SHALL BE PLACED ON EACH POST. THE METHOD OF MARKING AND LOCATION SHALL BE SUCH THAT IT DOES NOT DETRACT FROM THE APPEARANCE OF THE POST, BUT REMAIN VISIBLE AFTER RAIL PLACEMENT.

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

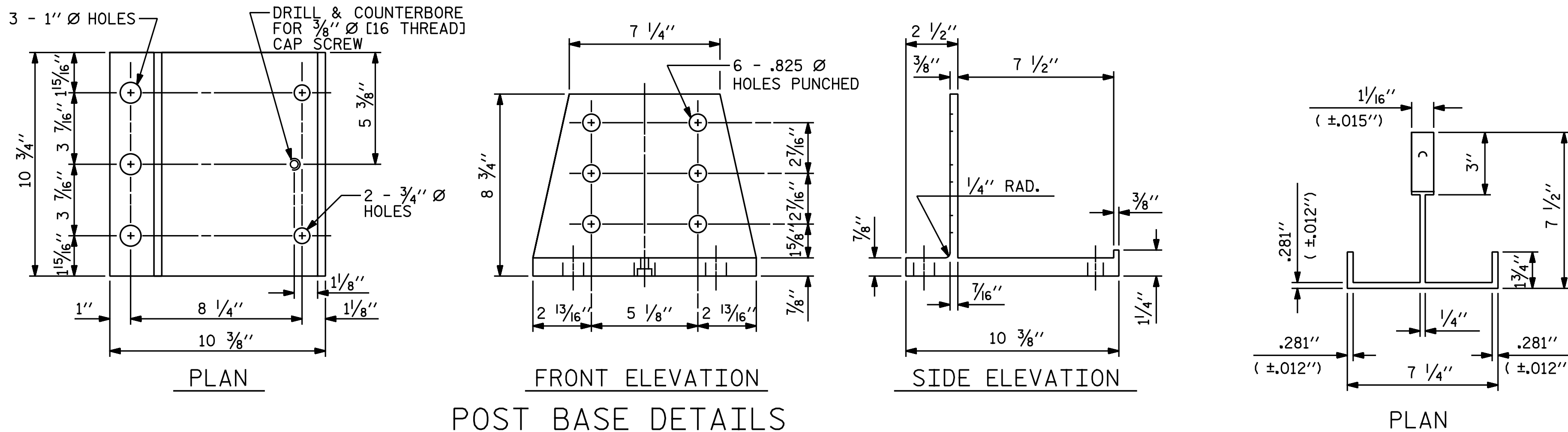
MINOR VARIATIONS IN DETAILS OF METAL RAIL WILL BE CONSIDERED. DETAILS OF SUCH VARIATIONS, IF DESIRED, SHALL BE SUBMITTED FOR APPROVAL.

PAY LENGTH = 197.8 LIN.FT.

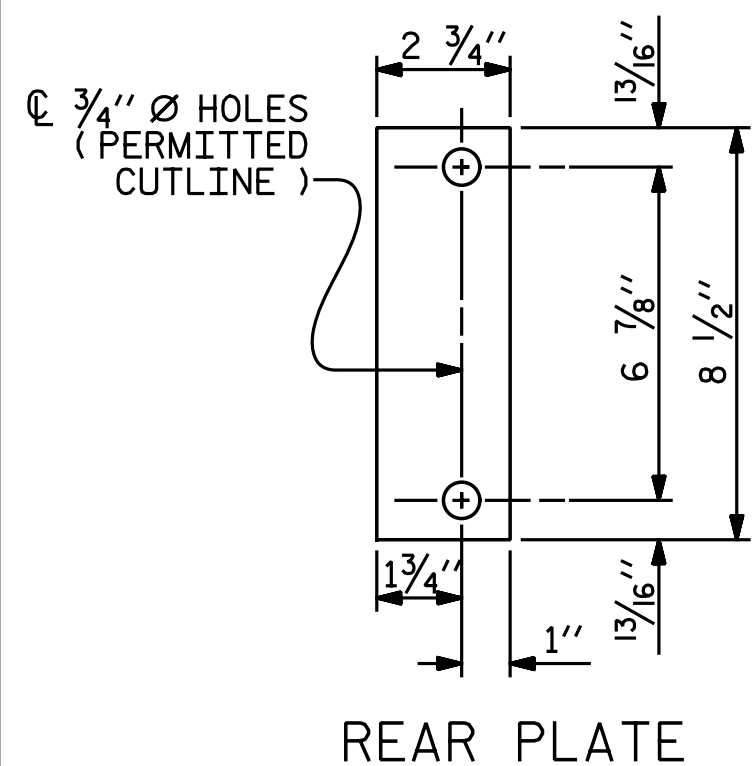


ELEVATION

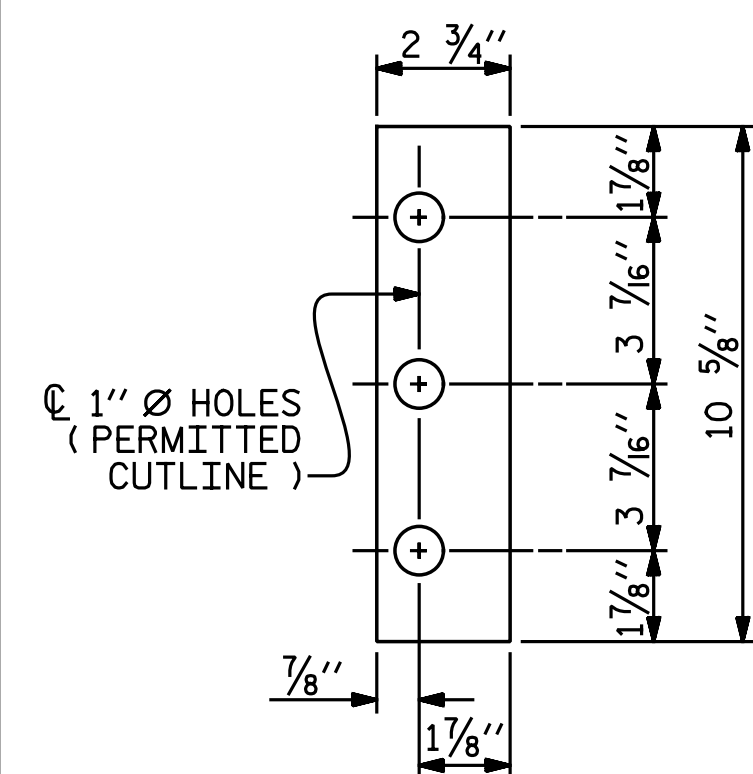
NOTE: FOR ATTACHMENT OF METAL RAIL TO END POST, SEE "3 BAR METAL RAIL" SHEET 3 OF 3



POST BASE DETAILS

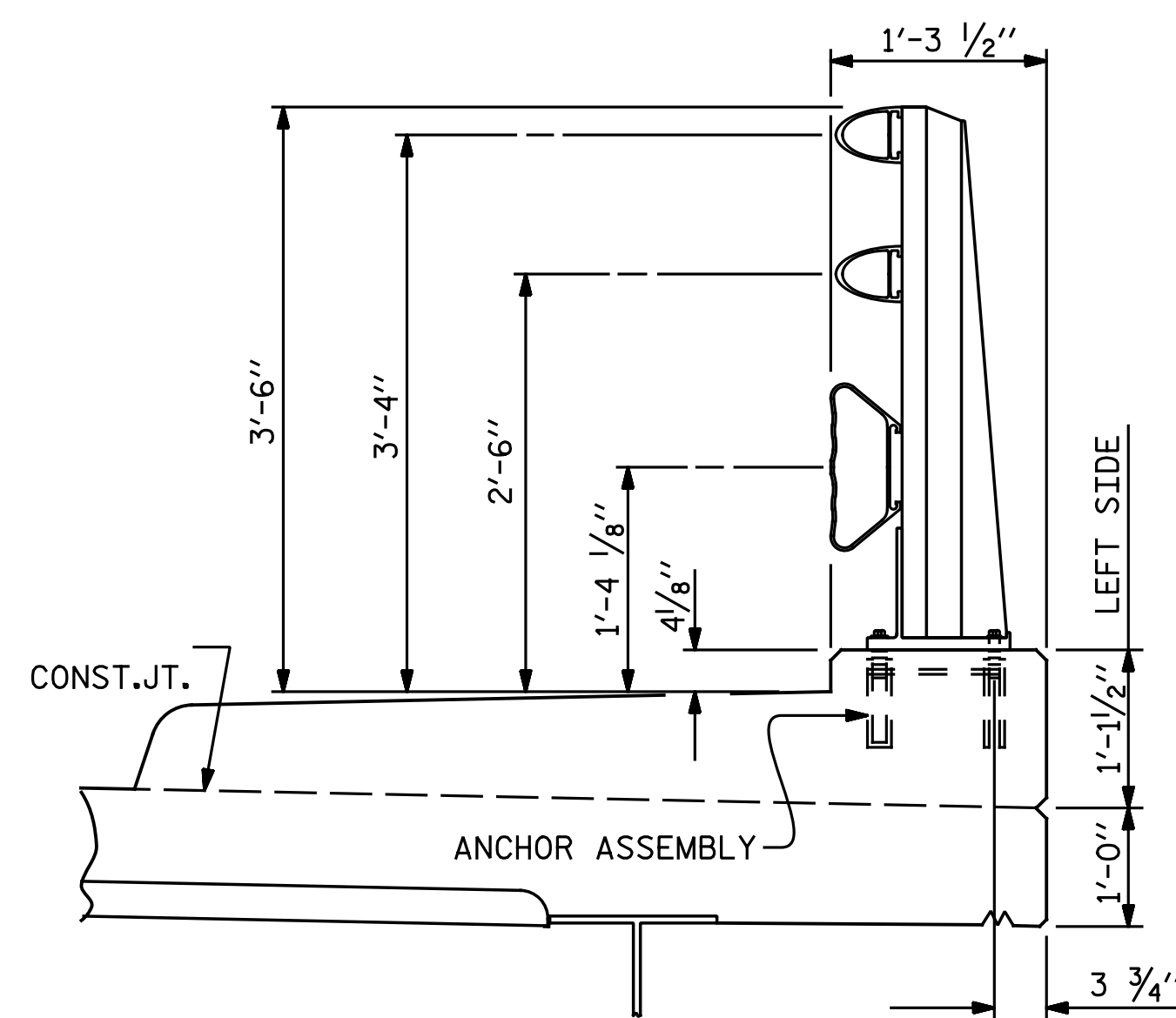


REAR PLATE



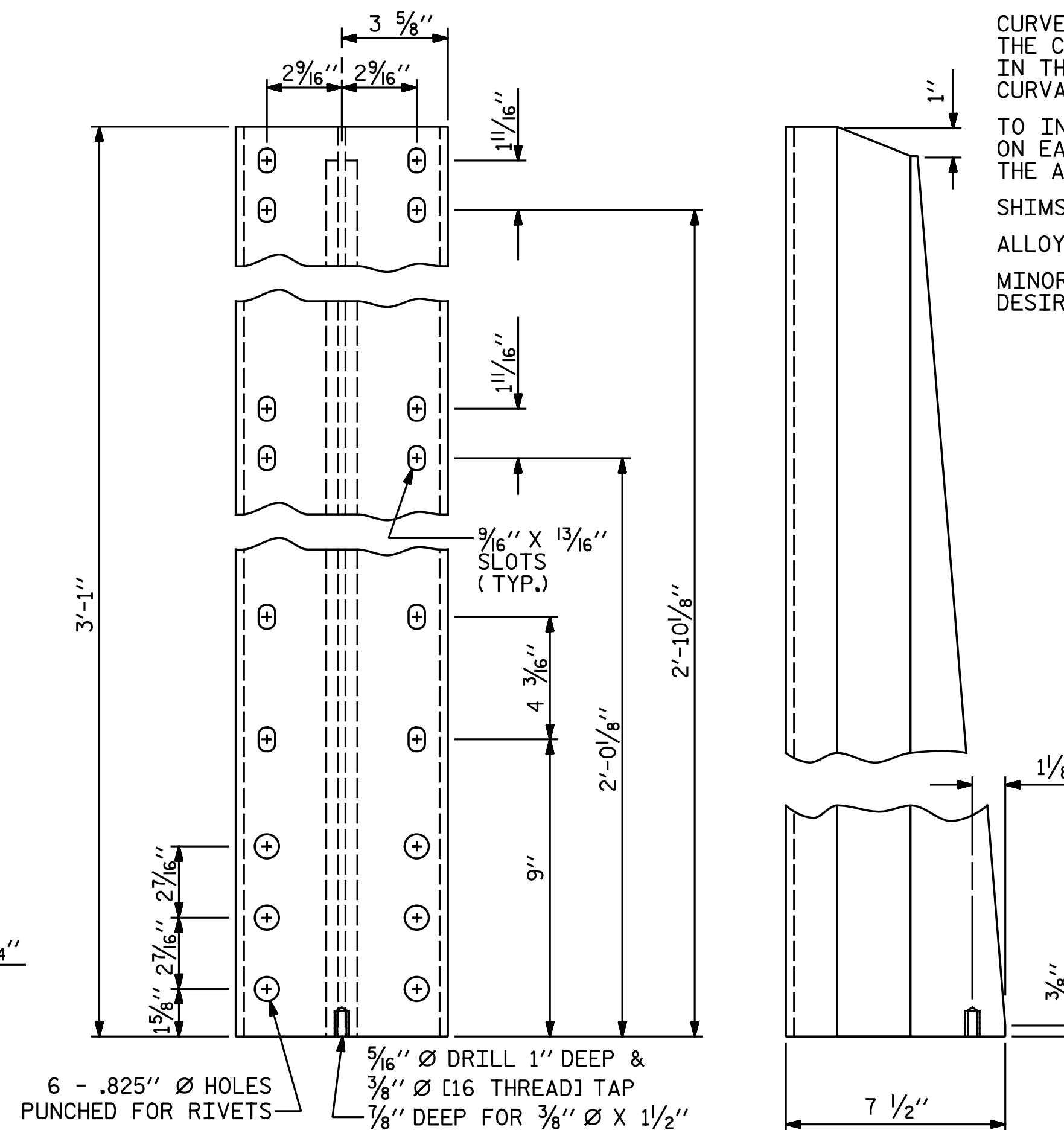
FRONT PLATE
SHIM DETAILS

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



SECTION THRU RAIL

FOR ANCHOR ASSEMBLY, SEE "3 BAR METAL RAIL" SHEET 2 OF 3



FRONT ELEVATION
SIDE ELEVATION
DETAILS OF POST

6 - .825" Ø HOLES PUNCHED FOR RIVETS
5/16" Ø DRILL 1" DEEP & 3/8" Ø [16 THREAD] TAP
3/8" DEEP FOR 3/8" Ø X 1/2" STAINLESS STEEL CAP SCREW

ASSEMBLED BY : N.B. SPEAKS	DATE : 4-28-16
CHECKED BY : A.H. SHARPE	DATE : 5-1-16
DRAWN BY : JMB 1/88	REV. 5/7/03 RWW/JTE
CHECKED BY : GGH 1/88	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

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Documented by:
Bradley J. Bell
 C4143F8E3C3A34...
 1/27/2017

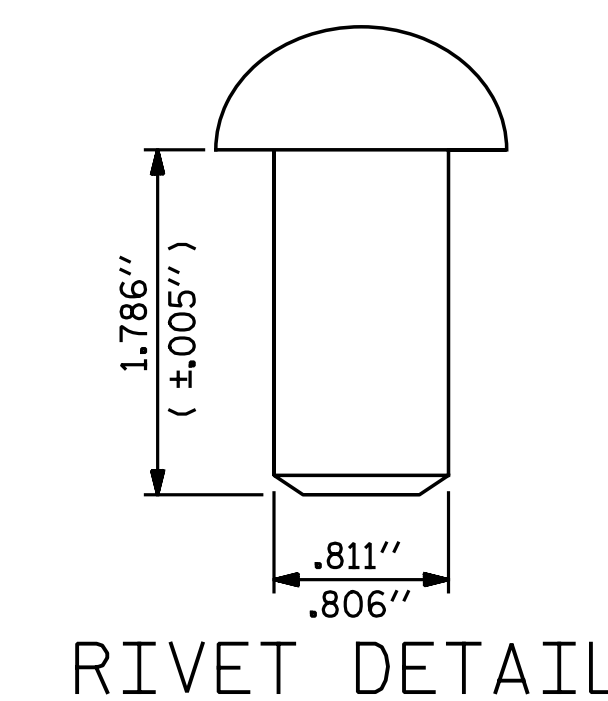
Michael Baker INTERNATIONAL

Michael Baker Engineering
 8000 Regency Parkway, Suite 600
 Cary, North Carolina 27518
 NC License No.: F-1084

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH STANDARD					
3 BAR METAL RAIL					
LEFT LANES					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. SI-17 TOTAL SHEETS 38

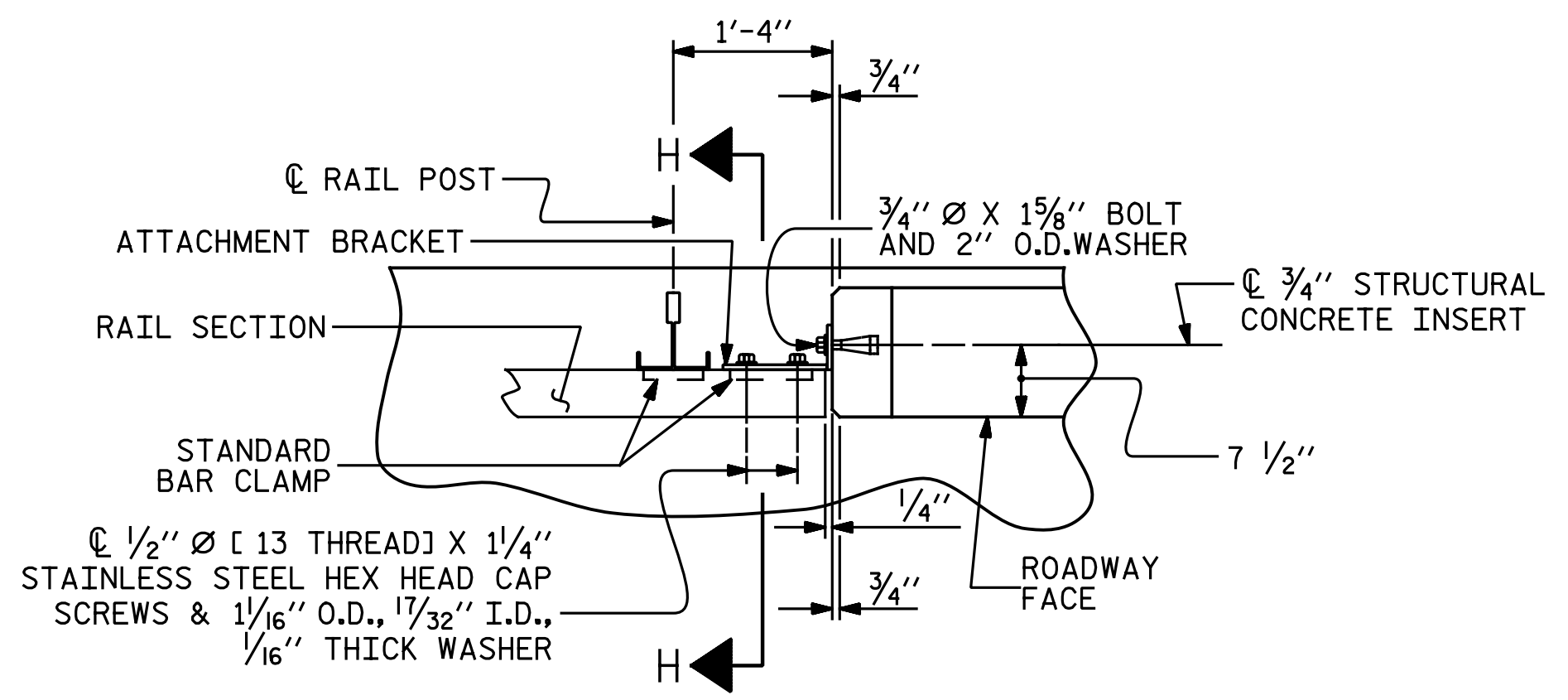
STD. NO. BMR5

PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1-

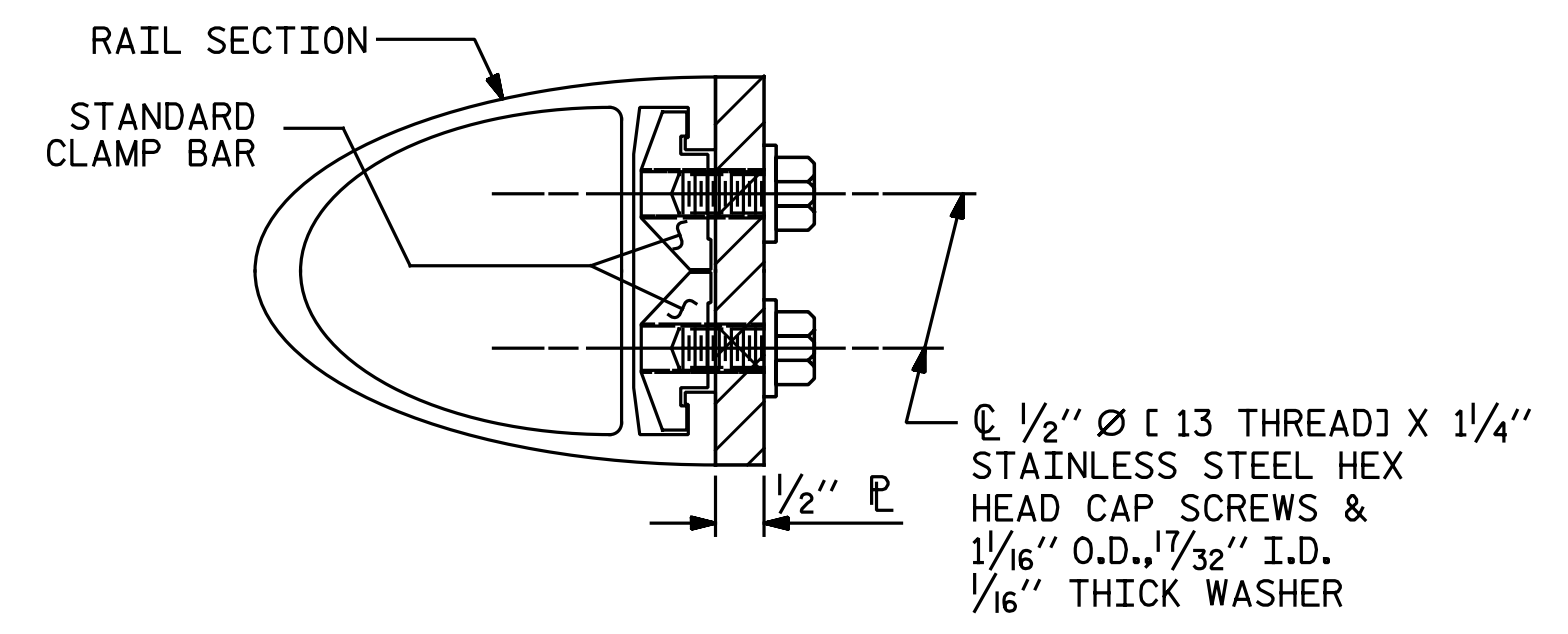


RIVET DETAIL

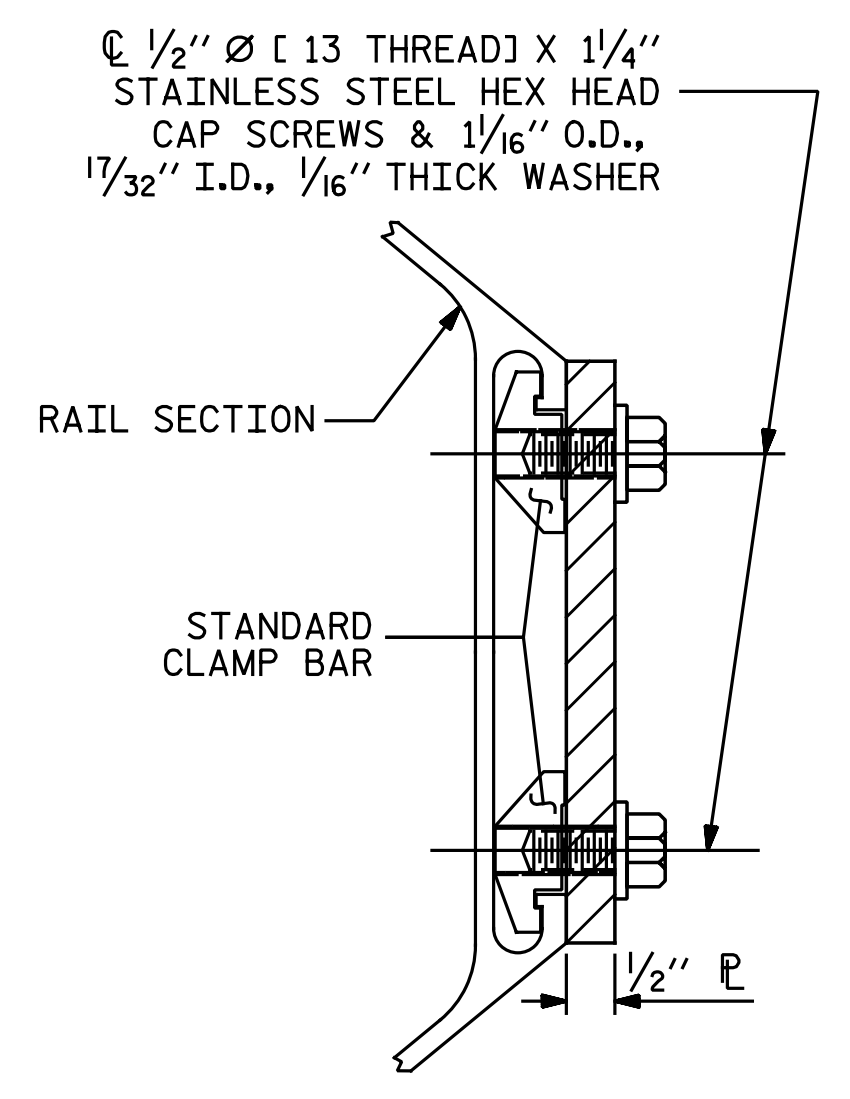
SHEET 1 OF 3



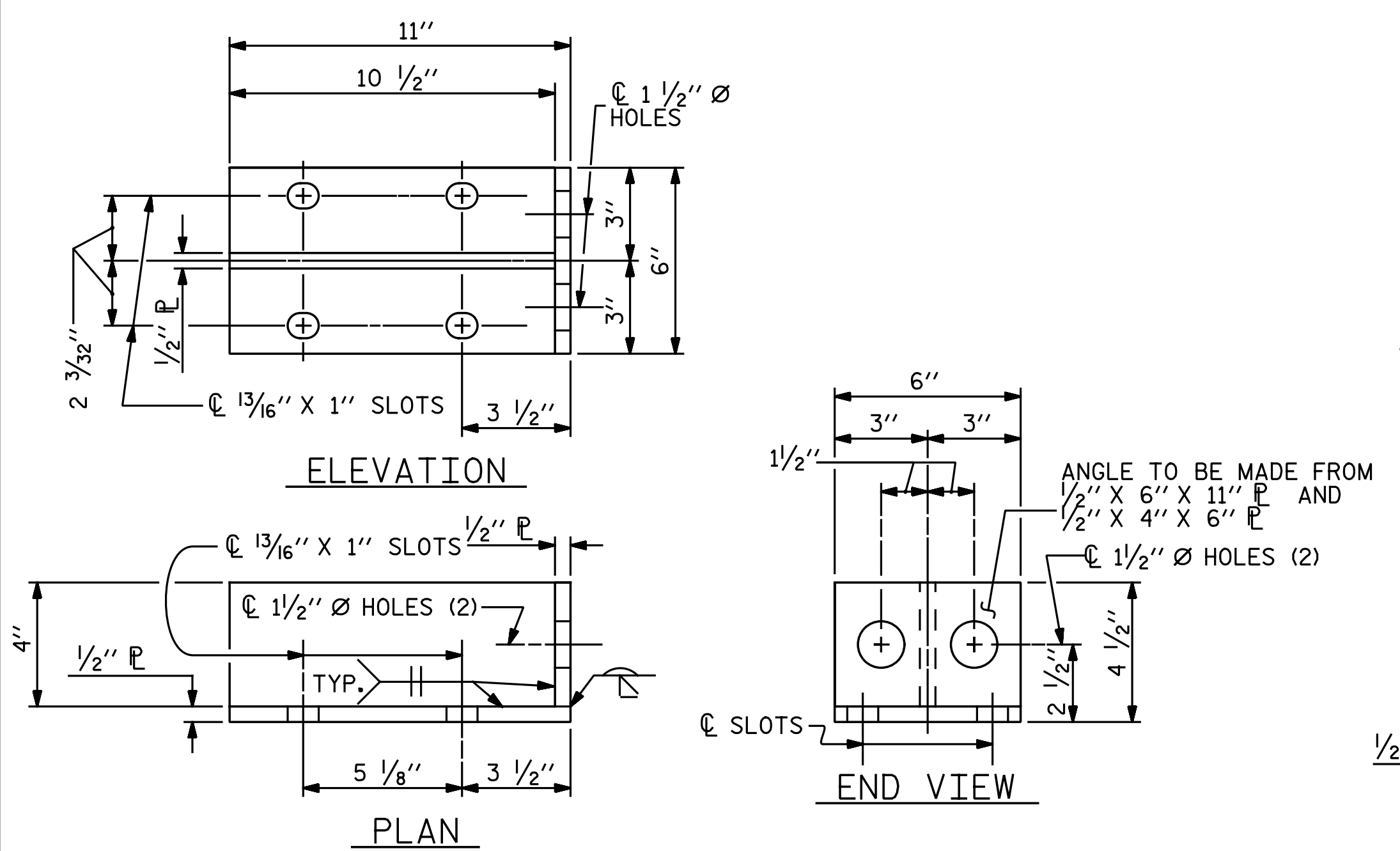
PLAN OF RAIL AND END POST
(STIFFENER ON 1/2" P NOT SHOWN FOR CLARITY)



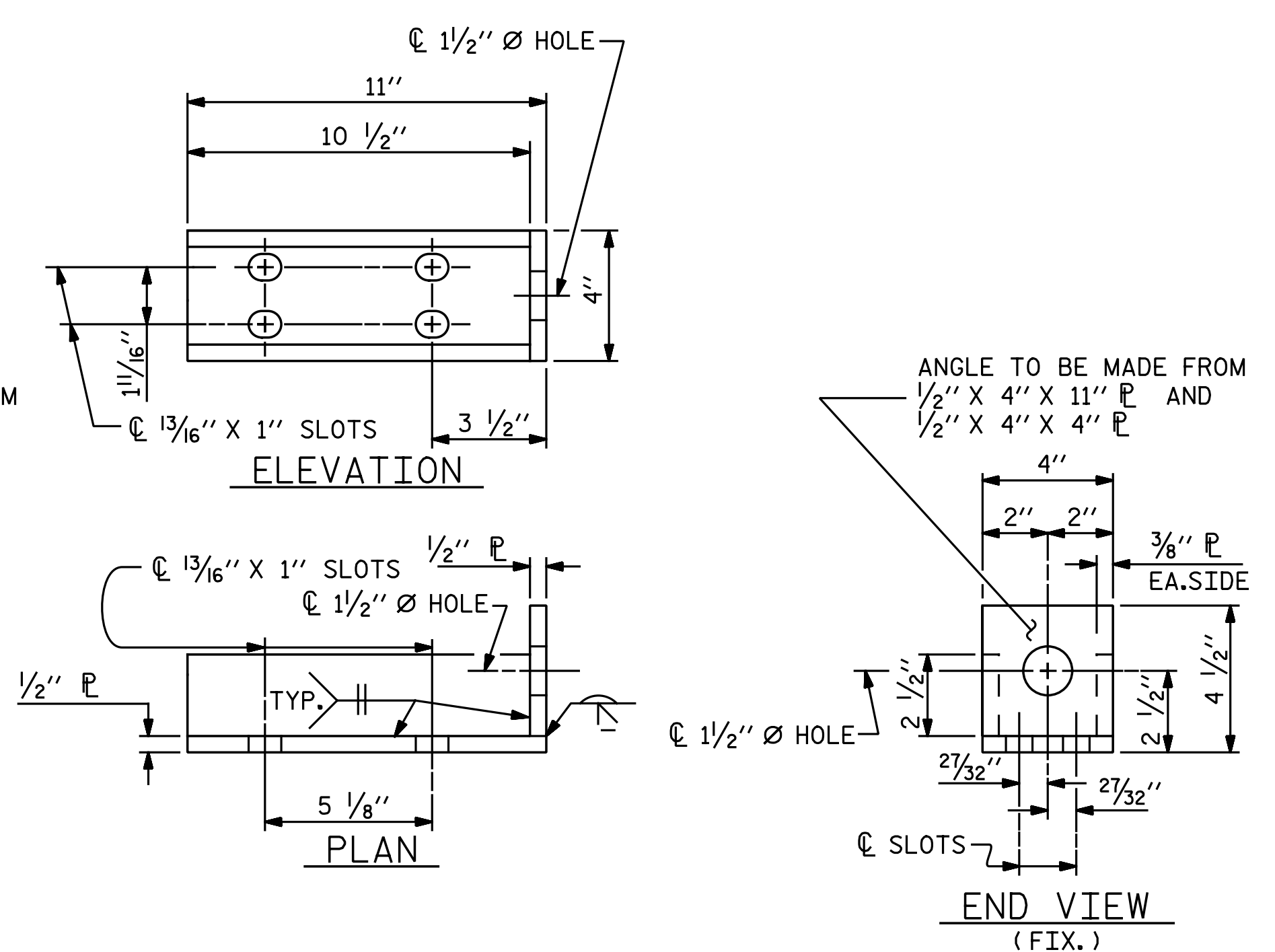
SECTION H-H
(FOR TOP & MIDDLE RAIL)



SECTION H-H
(FOR BOTTOM RAIL)



DETAILS FOR ATTACHMENT BRACKET
(BOTTOM RAIL ONLY)



DETAILS FOR ATTACHMENT BRACKET
(TOP & MIDDLE RAIL ONLY)

NOTES

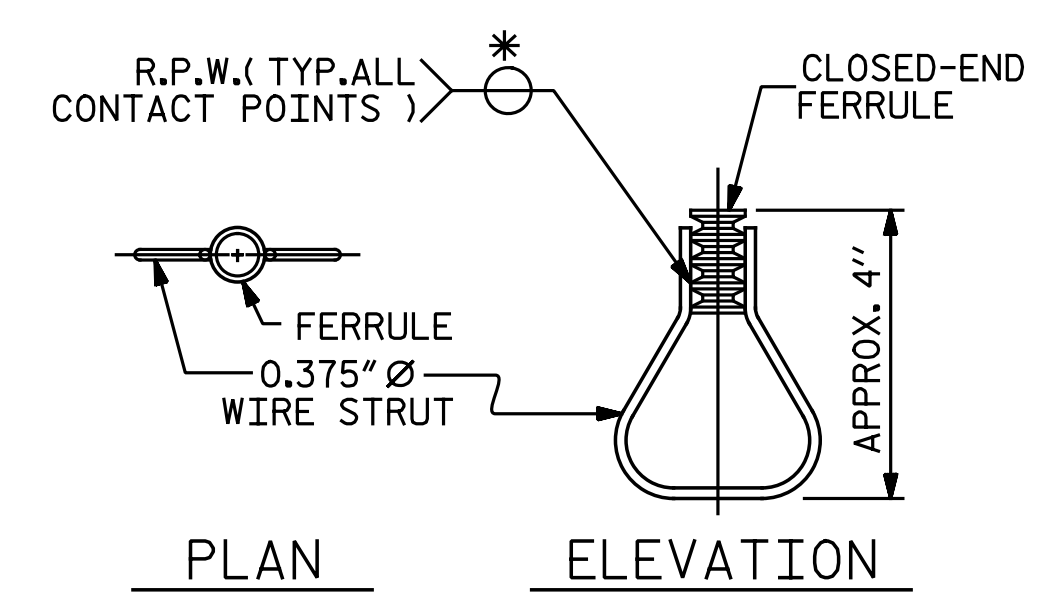
METAL RAIL TO END POST CONNECTION

- 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 (SEE "3 BAR METAL RAIL" SHEET 2 OF 3).
- 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 1/2".
 - 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 CONTRACTORS 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.



STRUCTURAL CONCRETE INSERT

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

PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1-
 SHEET 3 OF 3

ASSEMBLED BY : N.B. SPEAKS	DATE : 4-28-16
CHECKED BY : A.H. SHARPE	DATE : 5-1-16
DRAWN BY : JMB 1/88	REV. 5/7/03 RWW/JTE
CHECKED BY : GGH 1/88	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

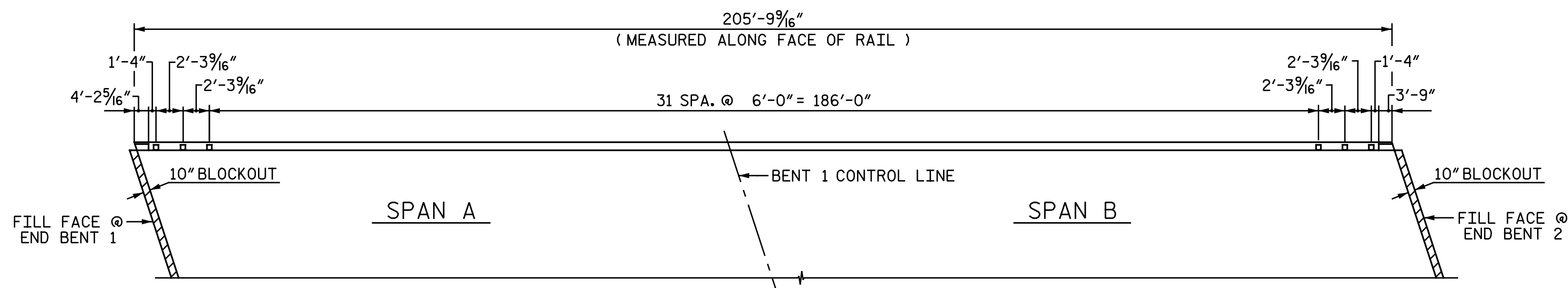
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DocuSigned by:
 Bradley J. Bell
 CA1A3F8E3A3434
 1/27/2017

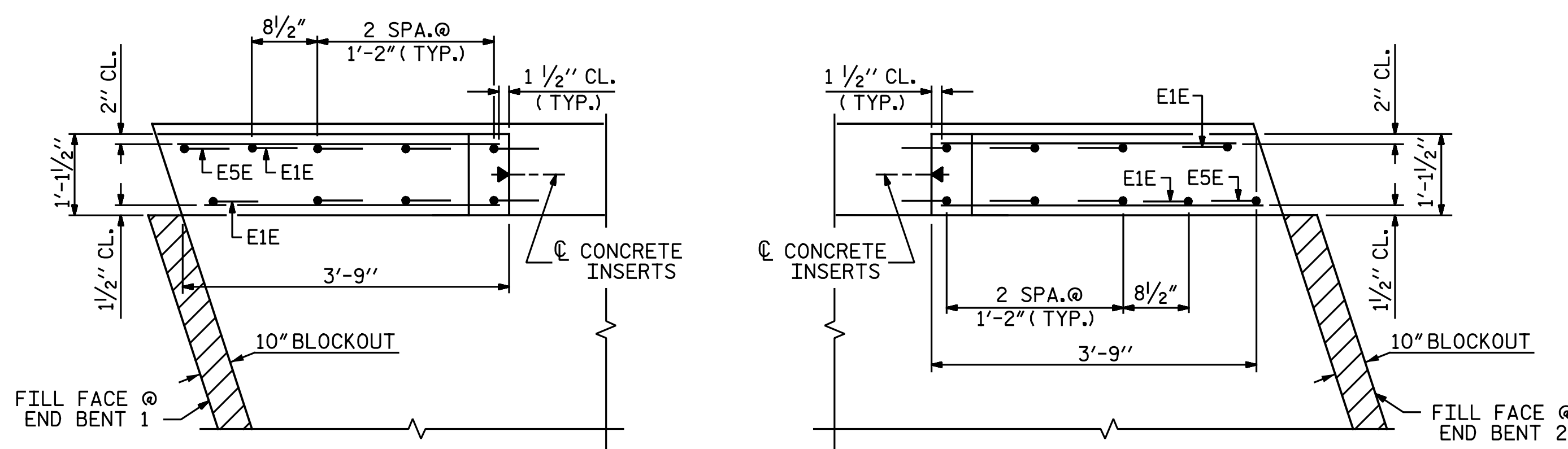
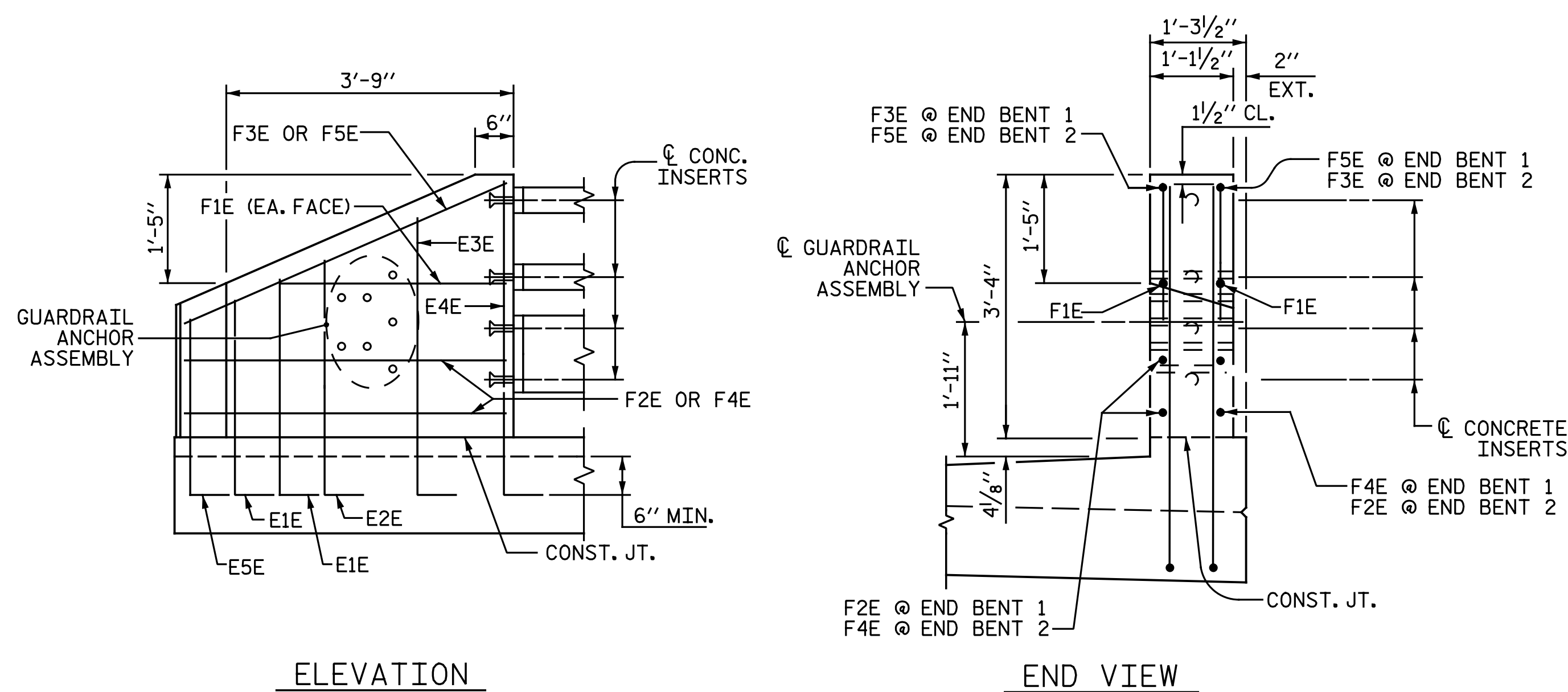
Michael Baker INTERNATIONAL

Michael Baker Engineering
 8000 Regency Parkway, Suite 600
 Cary, North Carolina 27518
 NC License No.: F-1084

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD					
3 BAR METAL RAIL					
LEFT LANES					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. SI-19					TOTAL SHEETS 38



PLAN OF RAIL POST SPACING



END POST DETAILS

BILL OF MATERIAL
ONE END POST (2 REQ'D)

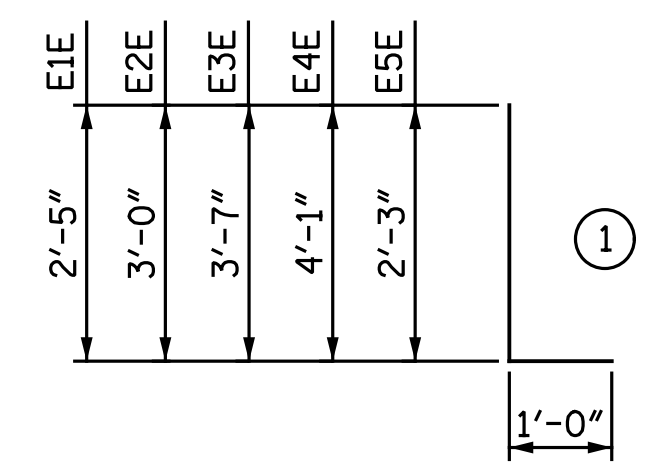
BILL FOR ONE END POST

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
E1E	2	#7	1	3' - 5"	14
E2E	2	#7	1	4' - 0"	16
E3E	2	#7	1	4' - 7"	19
E4E	2	#7	1	5' - 1"	21
E5E	1	#7	1	3' - 3"	7
F1E	2	#6	STR.	3' - 3"	10
F2E	2	#6	STR.	3' - 6"	11
F3E	1	#6	STR.	3' - 10"	6
F4E	2	#6	STR.	3' - 11"	12
F5E	1	#6	STR.	4' - 3"	6

EPOXY COATED REINFORCING STEEL LBS. 122

CLASS AA CONCRETE C.Y. 0.5

BAR TYPE



ALL BAR DIMENSIONS ARE OUT TO OUT.

NOTES:

FOR DETAIL OF GUARDRAIL ANCHOR ASSEMBLY, SEE "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" SHEET.

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

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

NO ADDITIONAL PAYMENT SHALL BE MADE FOR THE CONCRETE END POSTS AS THIS IS CONSIDERED INCIDENTAL TO THE CONSTRUCTION OF THE 3 BAR METAL RAIL.

PROJECT NO. U-3330
NASH COUNTY
STATION: 18+22.61 -Y1-

DRAWN BY : N. B. SPEAKS DATE : 4-28-16
CHECKED BY : A. H. SHARPE DATE : 9-1-16

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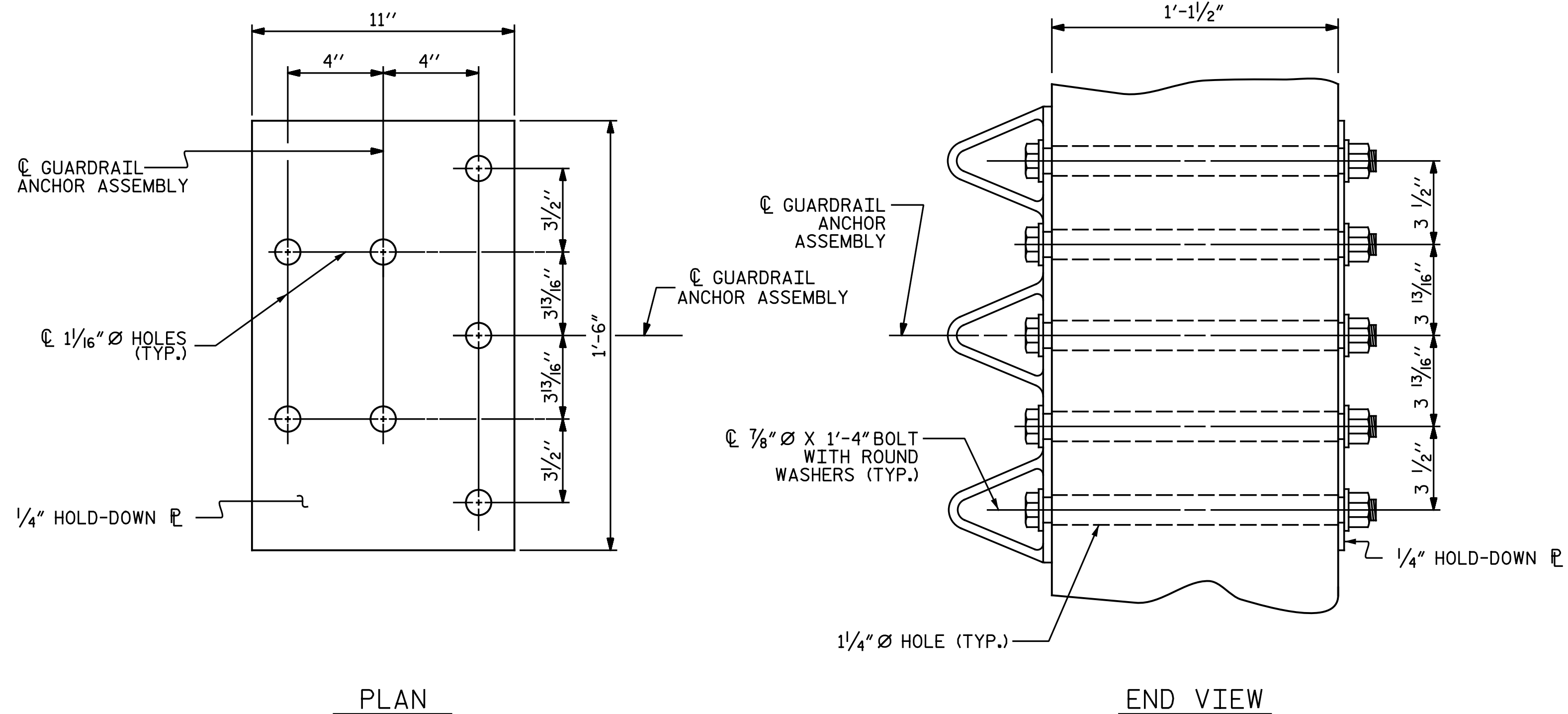


DocuSigned by:
Bradley J. Bell
C41A3BEC3A3434
1/27/2017

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8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No.: F-1084

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
RAIL POST SPACINGS
AND
END OF RAIL DETAILS
LEFT LANES

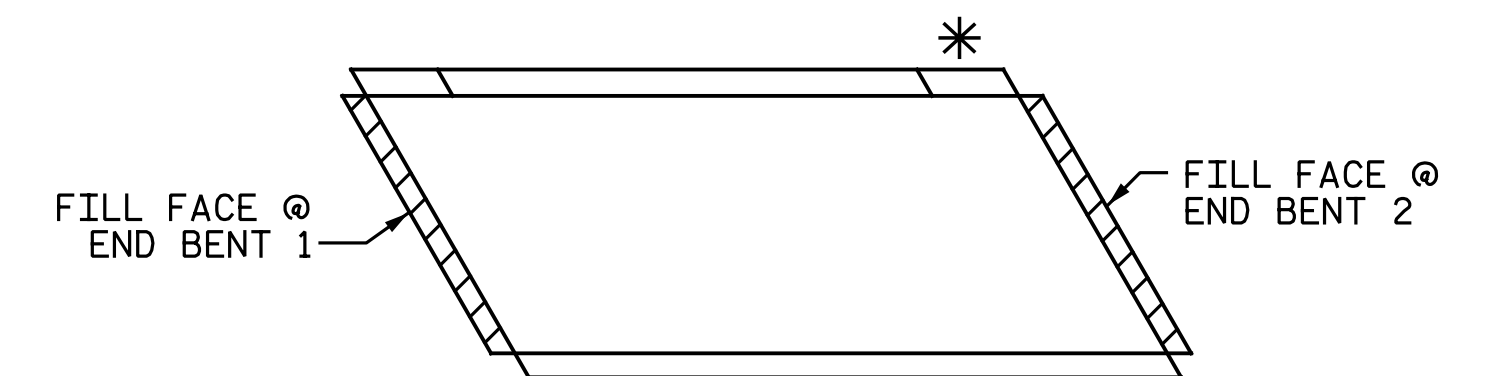
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-20
1			3			TOTAL SHEETS
2			4			38



GUARDRAIL ANCHOR ASSEMBLY DETAILS

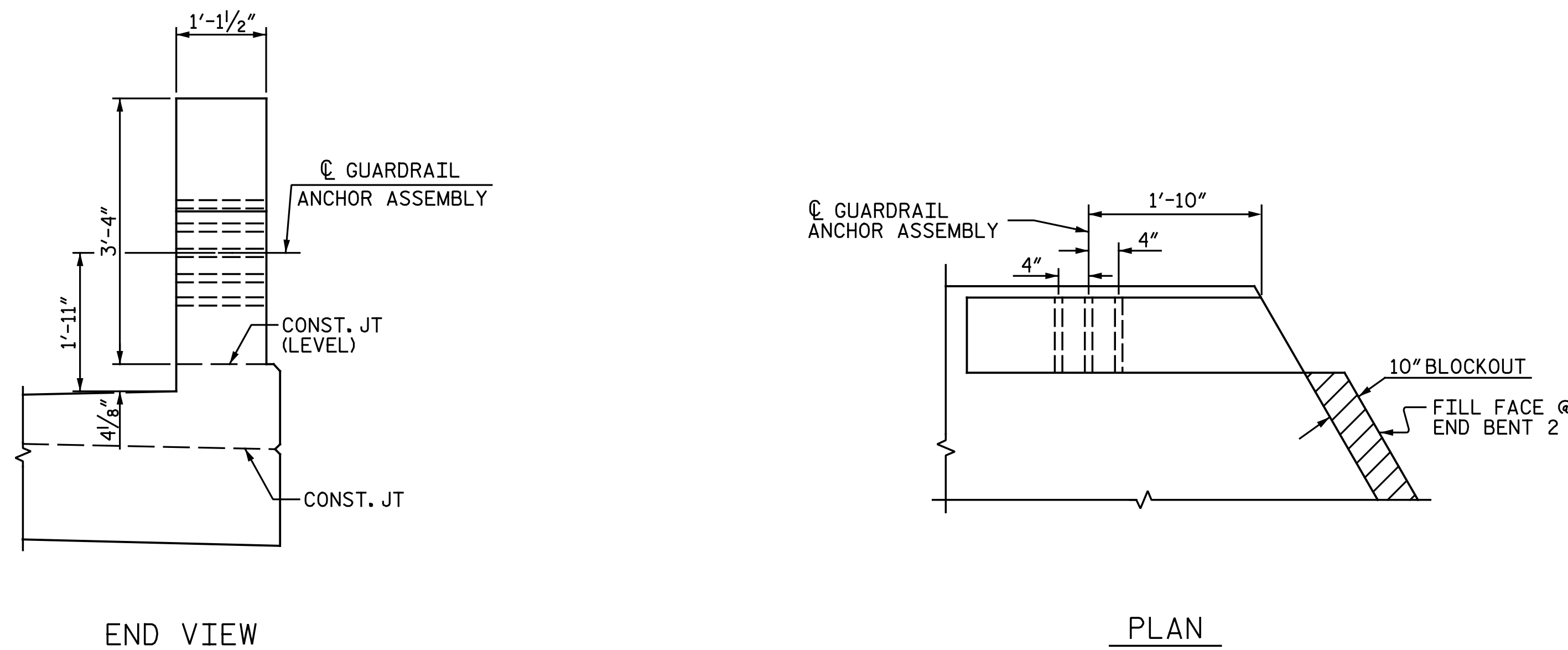
NOTES:

- 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 1/4" 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.



SKETCH SHOWING POINTS OF ATTACHMENTS

* LOCATION OF GUARDRAIL ATTACHMENT

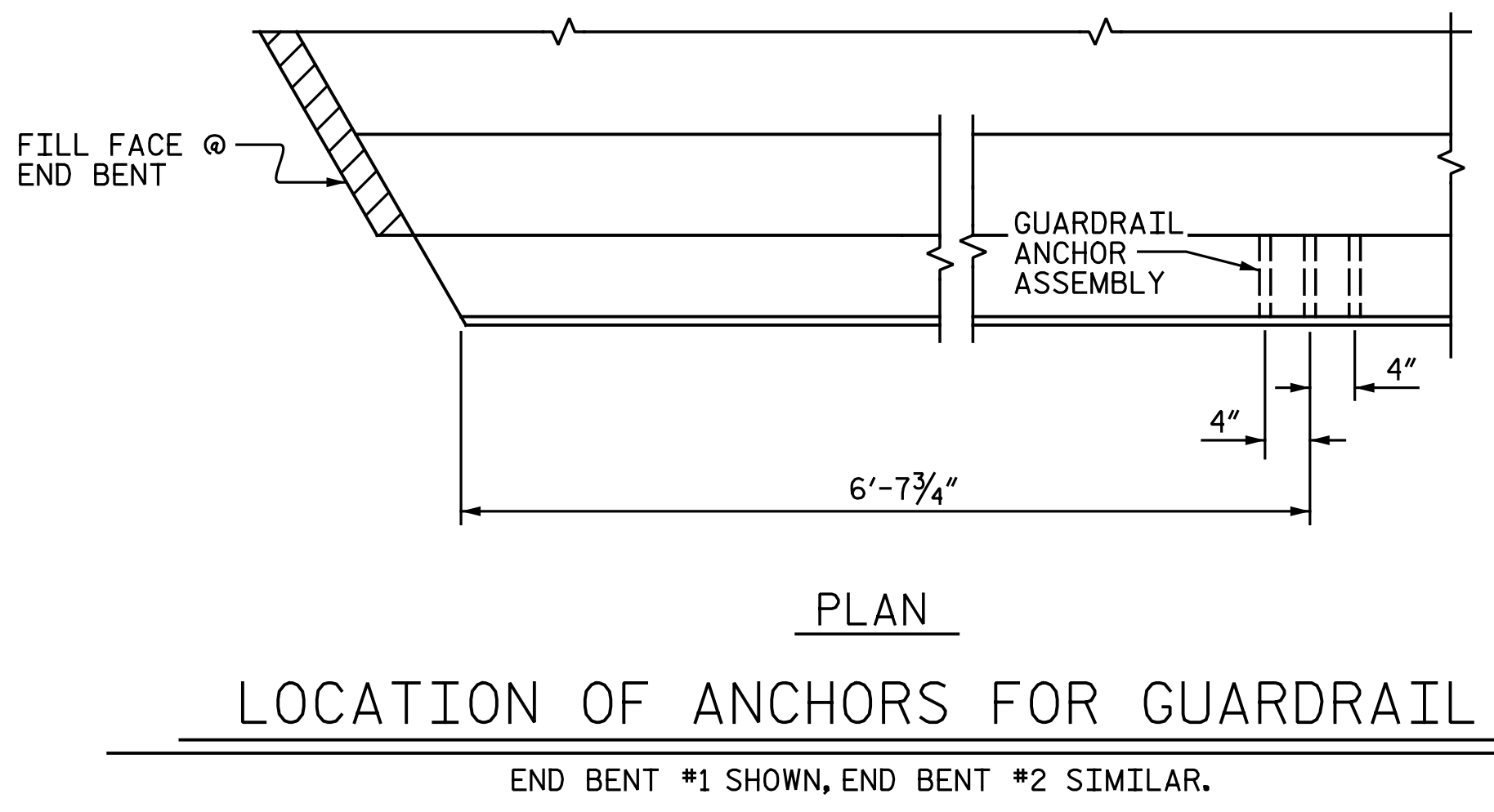
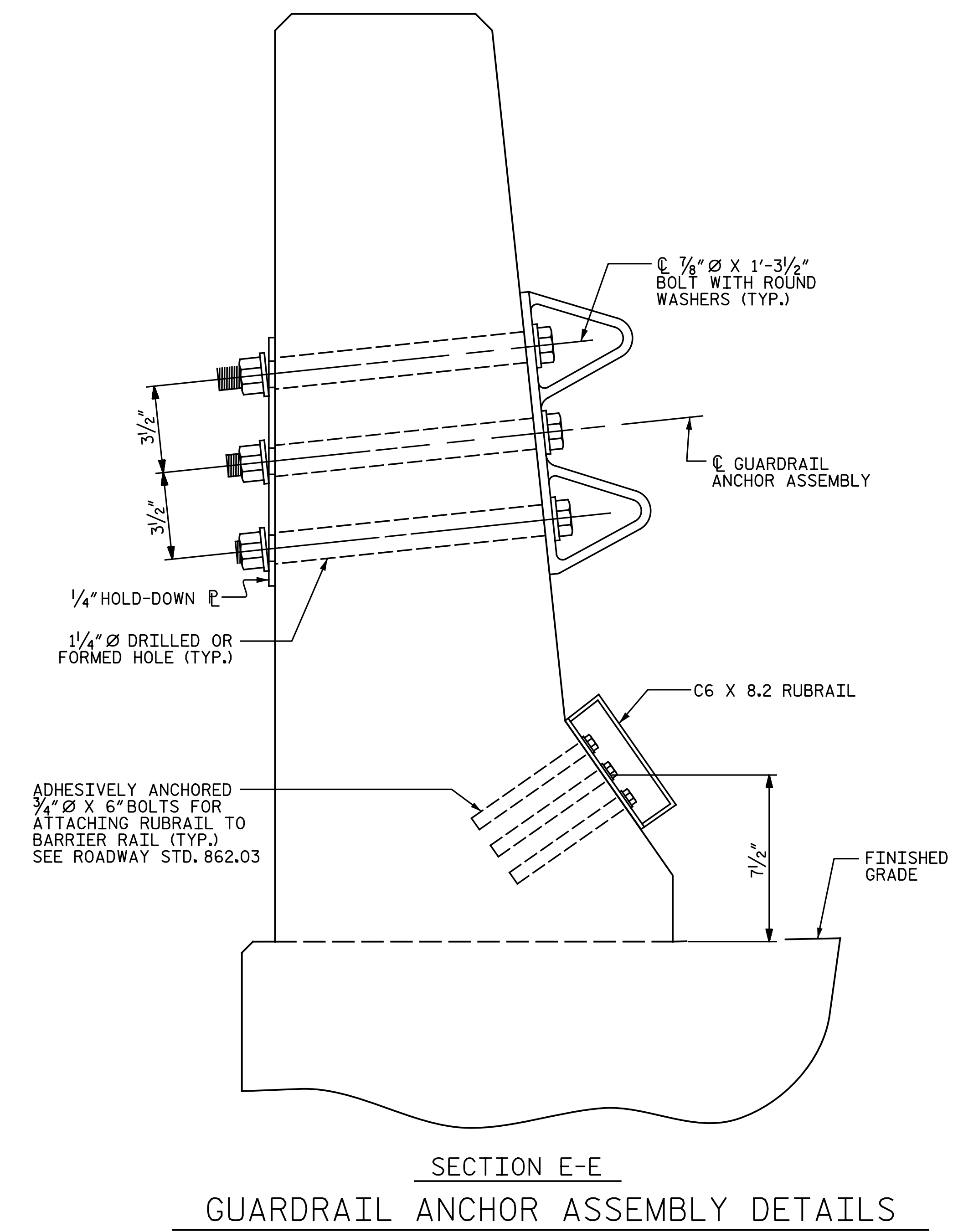
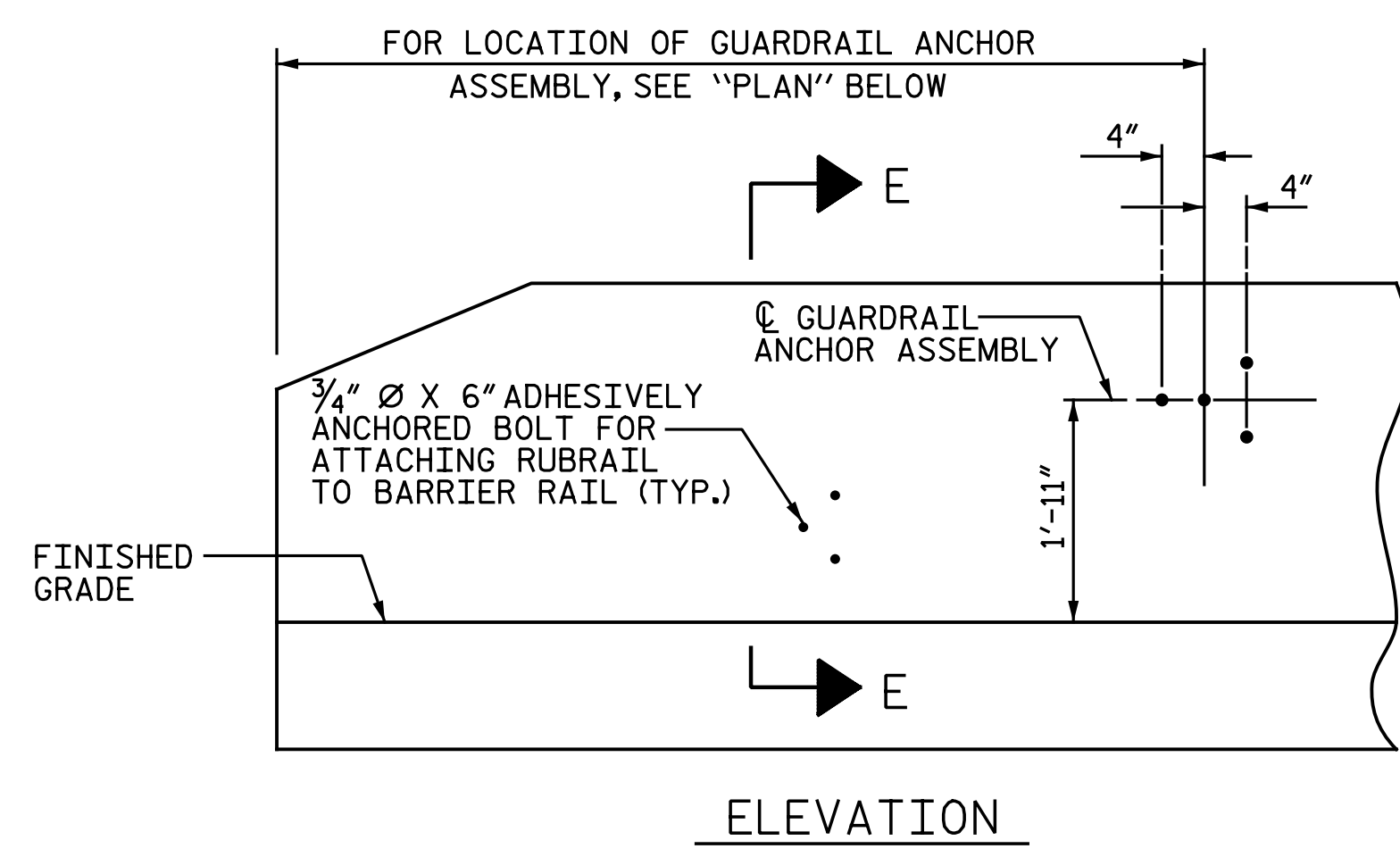
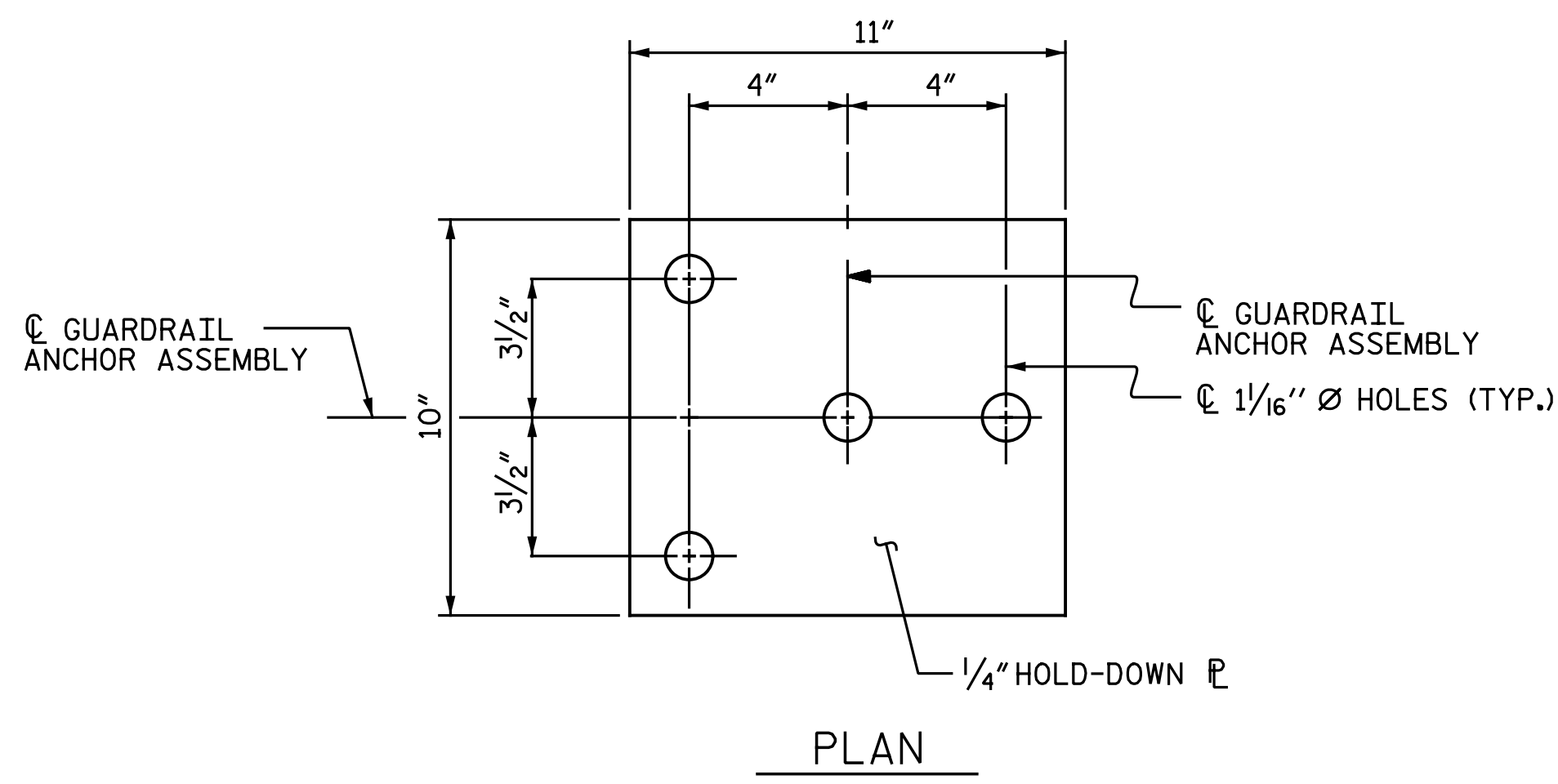


LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1-

ASSEMBLED BY : N.B. SPEAKS	DATE : 8/31/16
CHECKED BY : A.H. SHARPE	DATE : 9/1/16
DRAWN BY : TLA 5/06	REV. 10/1/11 MAA/GM
CHECKED BY : GM 5/06	REV. 7/12 MAA/GM
	REV. 6/13 MAA/GM

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH STANDARD GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS LEFT LANES																			
	Michael Baker Engineering 8000 Regency Parkway, Suite 600 Cary, North Carolina 27518 NC License No.: F-1084																					
	Michael Baker INTERNATIONAL		REVISIONS <table border="1"> <thead> <tr> <th>NO.</th> <th>BY:</th> <th>DATE:</th> <th>NO.</th> <th>BY:</th> <th>DATE:</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> <td></td> <td>3</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td>4</td> <td></td> <td></td> </tr> </tbody> </table>		NO.	BY:	DATE:	NO.	BY:	DATE:	1			3			2			4		
NO.	BY:	DATE:	NO.	BY:	DATE:																	
1			3																			
2			4																			



NOTES

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

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

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

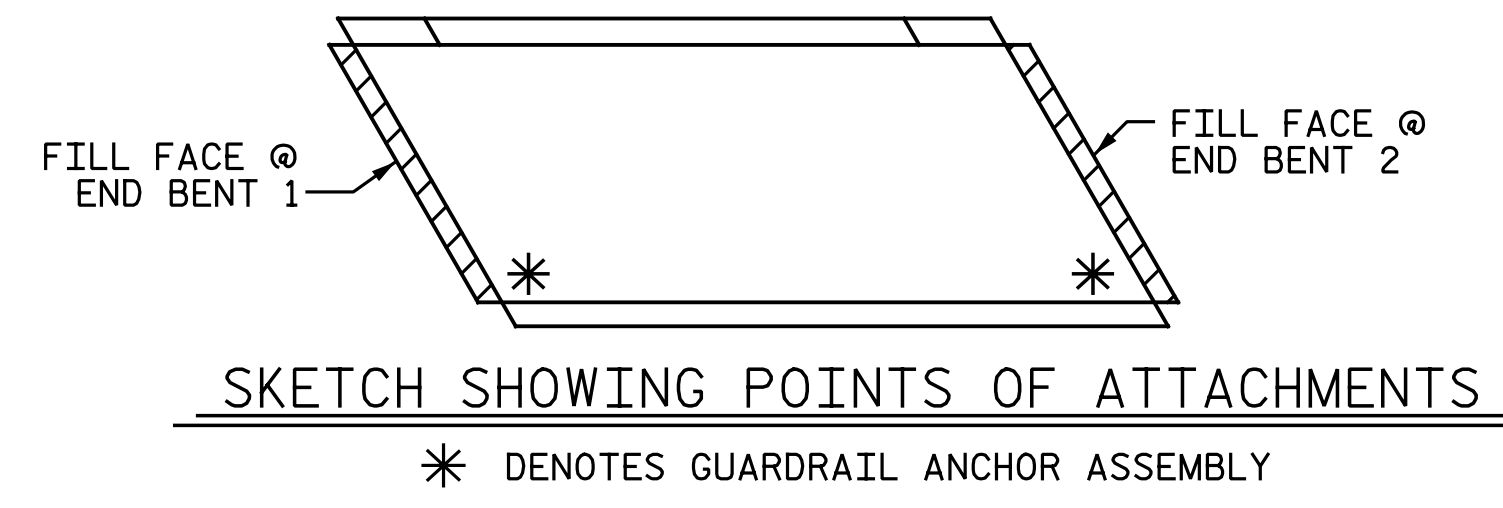
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

THE 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.

THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.



PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1-

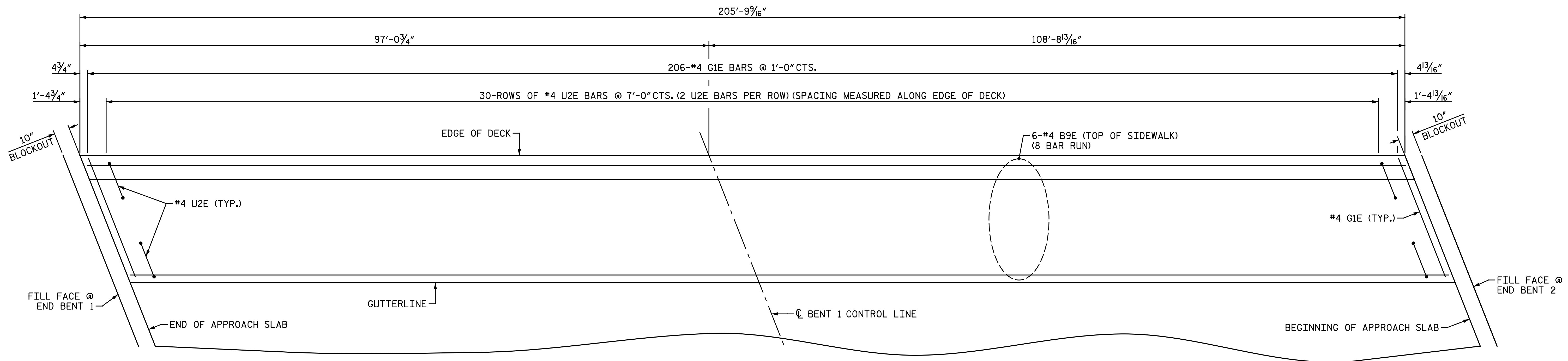
ASSEMBLED BY : N.B. SPEAKS	DATE : 4/28/16
CHECKED BY : A.H. SHARPE	DATE : 9/2/16
DRAWN BY : TLA 5/06	REV. 10/1/11 MAA/GM
CHECKED BY : GM 5/06	REV. 7/12 MAA/GM
	REV. 6/13 MAA/GM

DocuSigned by:
Bradley J. Bell
 C41AF8E3C30434...
 1/27/2017

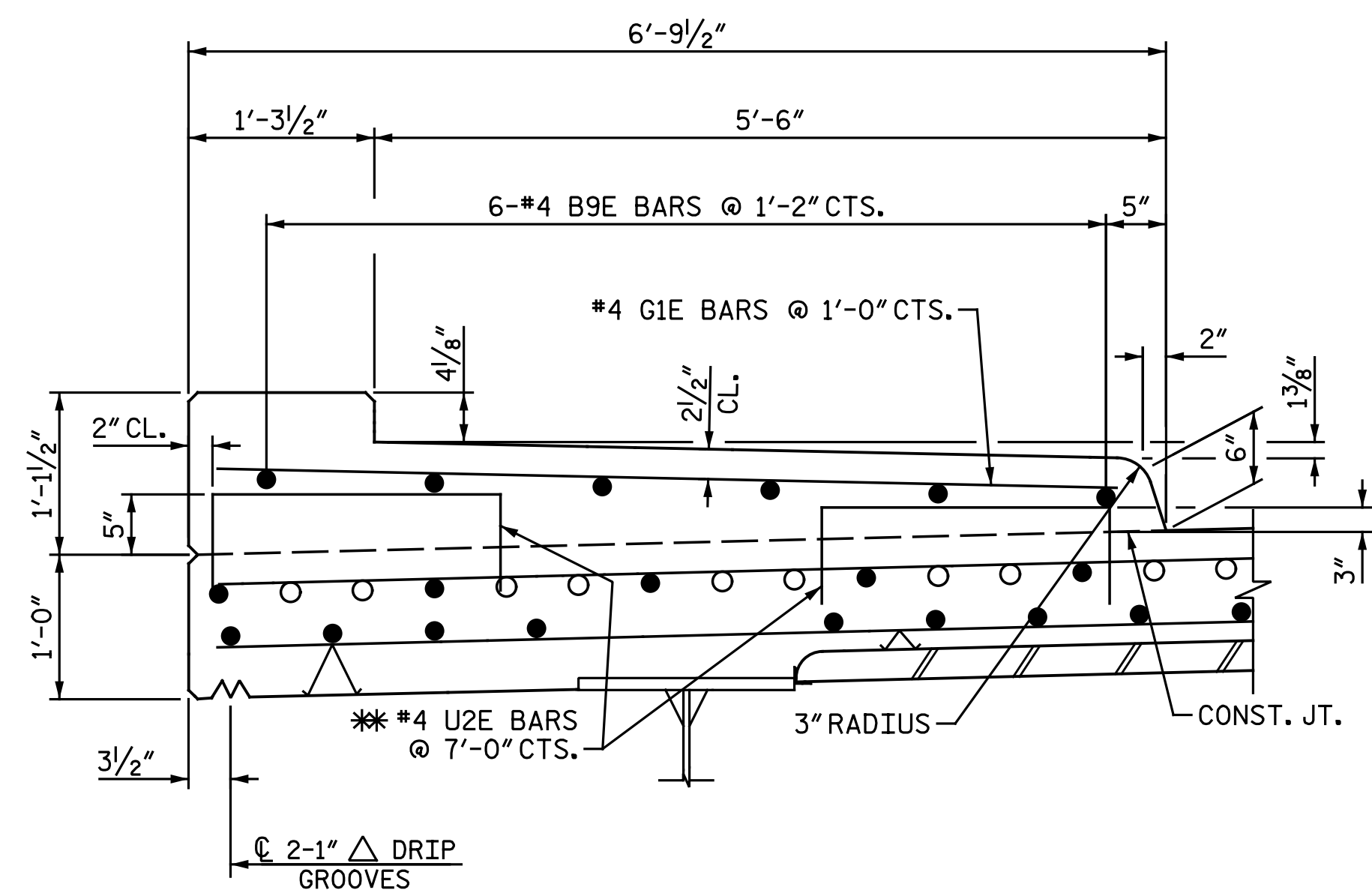
Michael Baker
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 8000 Regency Parkway, Suite 600
 Cary, North Carolina 27518
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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD GUARDRAIL ANCHORAGE FOR BARRIER RAIL LEFT LANES					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. SI-22					TOTAL SHEETS 38



PLAN OF SIDEWALK



SECTION THRU SIDEWALK

**U2E BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF.

NOTES:

FOR END POST DETAILS AND REINFORCING STEEL, SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEET.

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

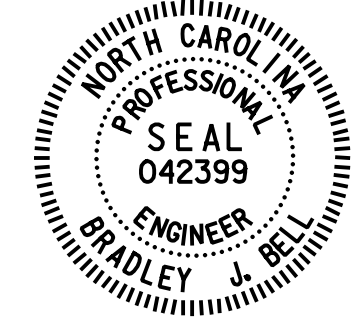
ALL REINFORCING STEEL IN SIDEWALKS SHALL BE EPOXY COATED.

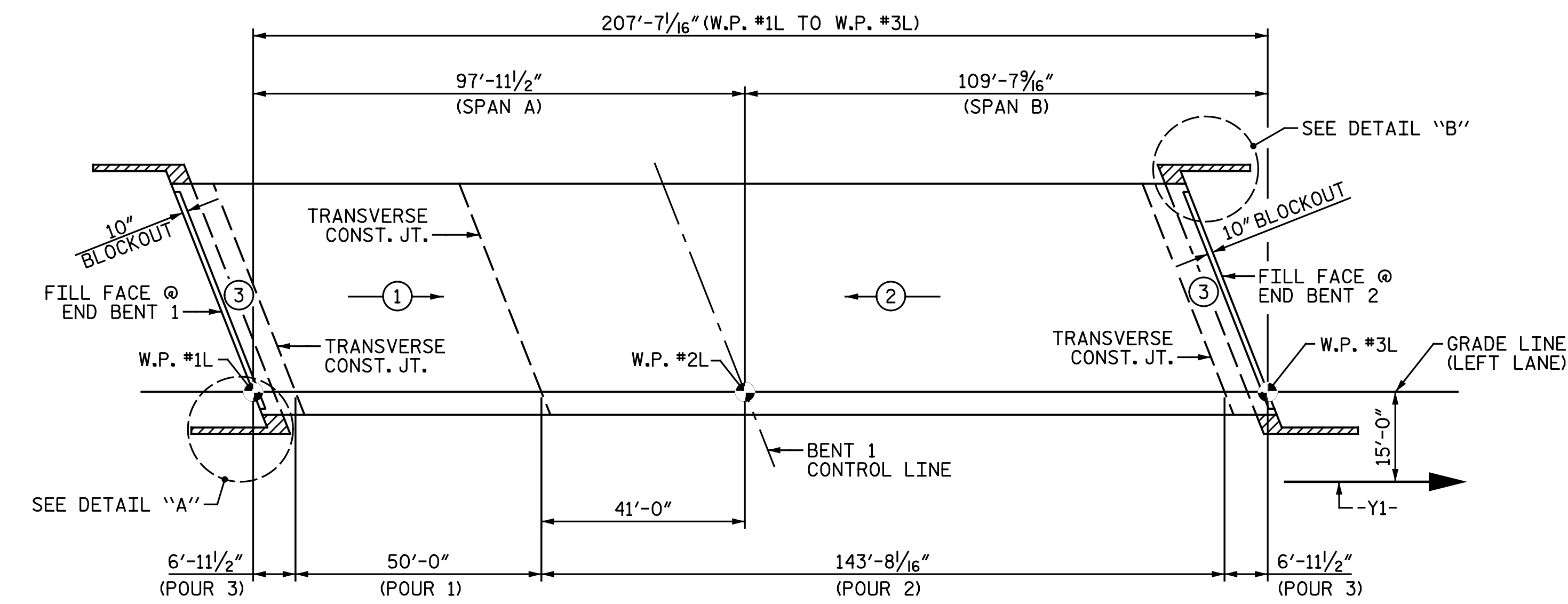
SIDEWALK REINFORCING STEEL AND CONCRETE ON BRIDGE SHALL BE INCLUDED IN THE PAY ITEM FOR THE "REINFORCED CONCRETE DECK SLAB".

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 EACH CENTERLINE RAIL POST LOCATION. NO CONTRACTION JOINTS WILL BE REQUIRED IN THE SHORT PARAPET SECTION OF THE SIDEWALK.

PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1-

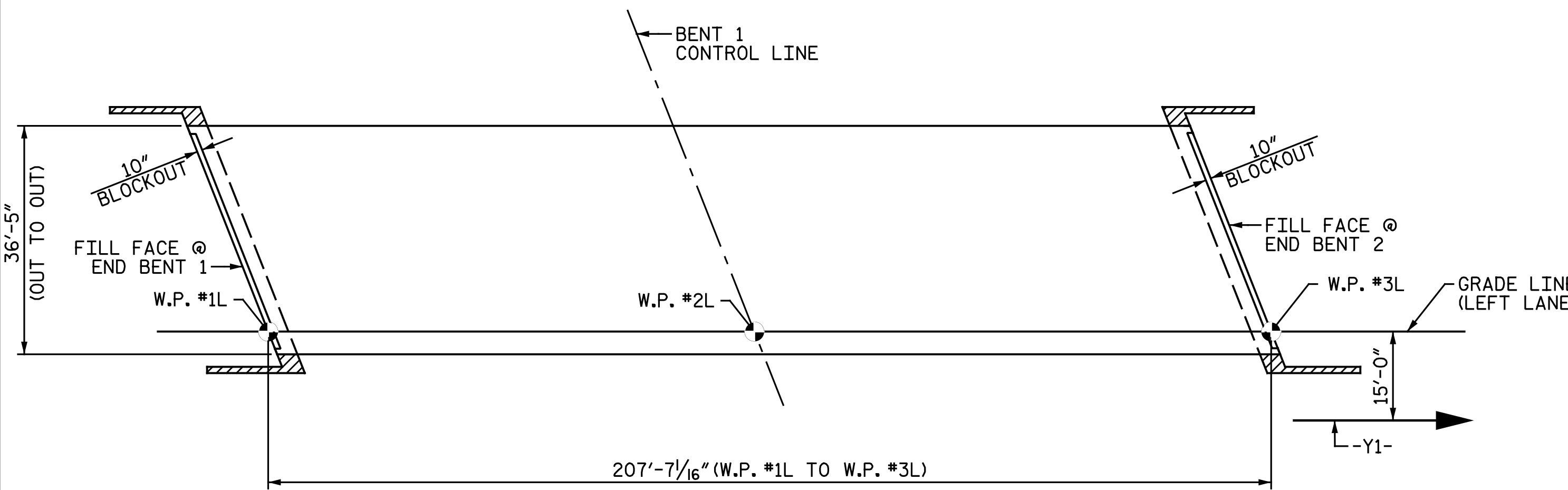
DRAWN BY : M. D. MAYHEW DATE : 9-2-16
 CHECKED BY : J. M. GARRISON DATE : 9-6-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	 DocuSigned by: Bradley J. Bell CA1A3F8EC3A3434 1/27/2017	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE SIDEWALK DETAILS LEFT LANES		SHEET NO. SI-23																		
	Michael Baker INTERNATIONAL	Michael Baker Engineering 8000 Regency Parkway, Suite 600 Cary, North Carolina 27518 NC License No.: F-1084		REVISIONS <table border="1"> <thead> <tr> <th>NO.</th> <th>BY:</th> <th>DATE:</th> <th>NO.</th> <th>BY:</th> <th>DATE:</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> <td></td> <td>3</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td>4</td> <td></td> <td></td> </tr> </tbody> </table>	NO.	BY:	DATE:	NO.	BY:	DATE:	1			3			2			4		
	NO.	BY:	DATE:	NO.	BY:	DATE:																
1			3																			
2			4																			
TOTAL SHEETS 38																						

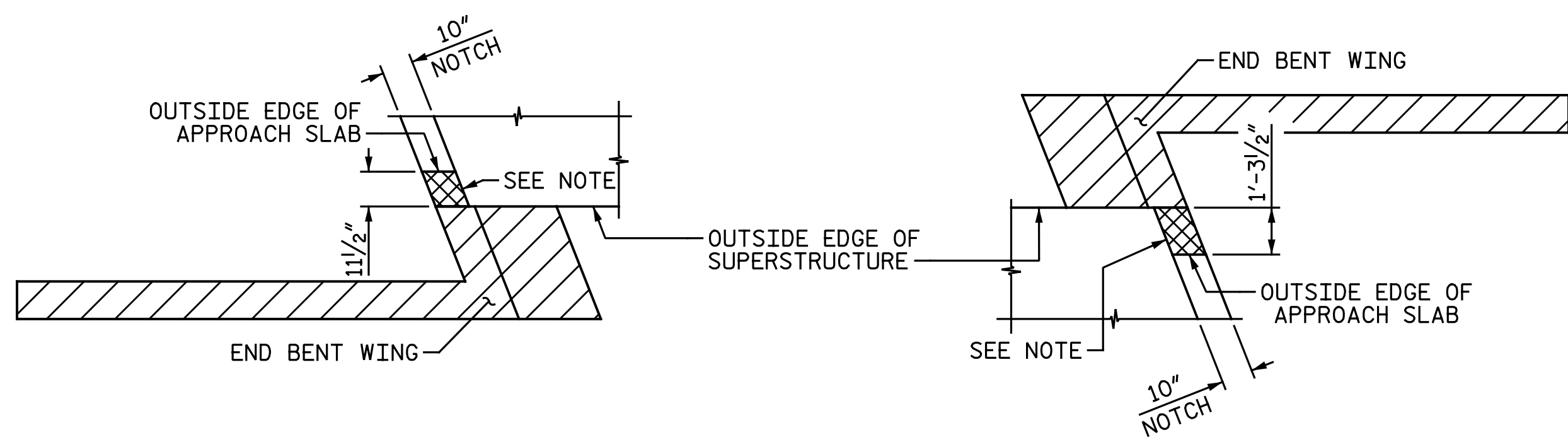


POURING SEQUENCE

① DENOTES POUR NUMBER AND DIRECTION



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ. FT. = 7,560)



DETAIL "A"

RIGHT SIDE OF BRIDGE AT END BENT 1 SHOWN, RIGHT SIDE AT END BENT 2 SIMILAR

DETAIL "B"

LEFT SIDE OF BRIDGE AT END BENT 2 SHOWN, LEFT SIDE AT END BENT 1 SIMILAR

REINFORCING BAR SCHEDULE SPANS A & B

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1E	382	#5	STR.	36' - 1"	14,377
A2	382	#5	STR.	36' - 1"	14,377
A3E	10	#5	STR.	38' - 9"	404
A101E	2	#5	STR.	35' - 8"	74
A102E	2	#5	STR.	34' - 5"	72
A103E	2	#5	STR.	33' - 2"	69
A104E	2	#5	STR.	31' - 10"	66
A105E	2	#5	STR.	30' - 7"	64
A106E	2	#5	STR.	29' - 4"	61
A107E	2	#5	STR.	28' - 1"	59
A108E	2	#5	STR.	26' - 10"	56
A109E	2	#5	STR.	25' - 6"	53
A110E	2	#5	STR.	24' - 3"	51
A111E	2	#5	STR.	23' - 0"	48
A112E	2	#5	STR.	21' - 9"	45
A113E	2	#5	STR.	20' - 5"	43
A114E	2	#5	STR.	19' - 2"	40
A115E	2	#5	STR.	17' - 11"	37
A116E	2	#5	STR.	16' - 8"	35
A117E	2	#5	STR.	15' - 5"	32
A118E	2	#5	STR.	14' - 1"	29
A119E	2	#5	STR.	12' - 10"	27
A120E	2	#5	STR.	11' - 7"	24
A121E	2	#5	STR.	10' - 4"	22
A122E	2	#5	STR.	9' - 1"	19
A123E	2	#5	STR.	7' - 9"	16
A124E	2	#5	STR.	6' - 6"	14
A125E	2	#5	STR.	5' - 3"	11
A126E	2	#5	STR.	4' - 0"	8
A127E	2	#5	STR.	2' - 9"	6
A128E	2	#5	STR.	1' - 5"	3

REINFORCING BAR SCHEDULE SPANS A & B

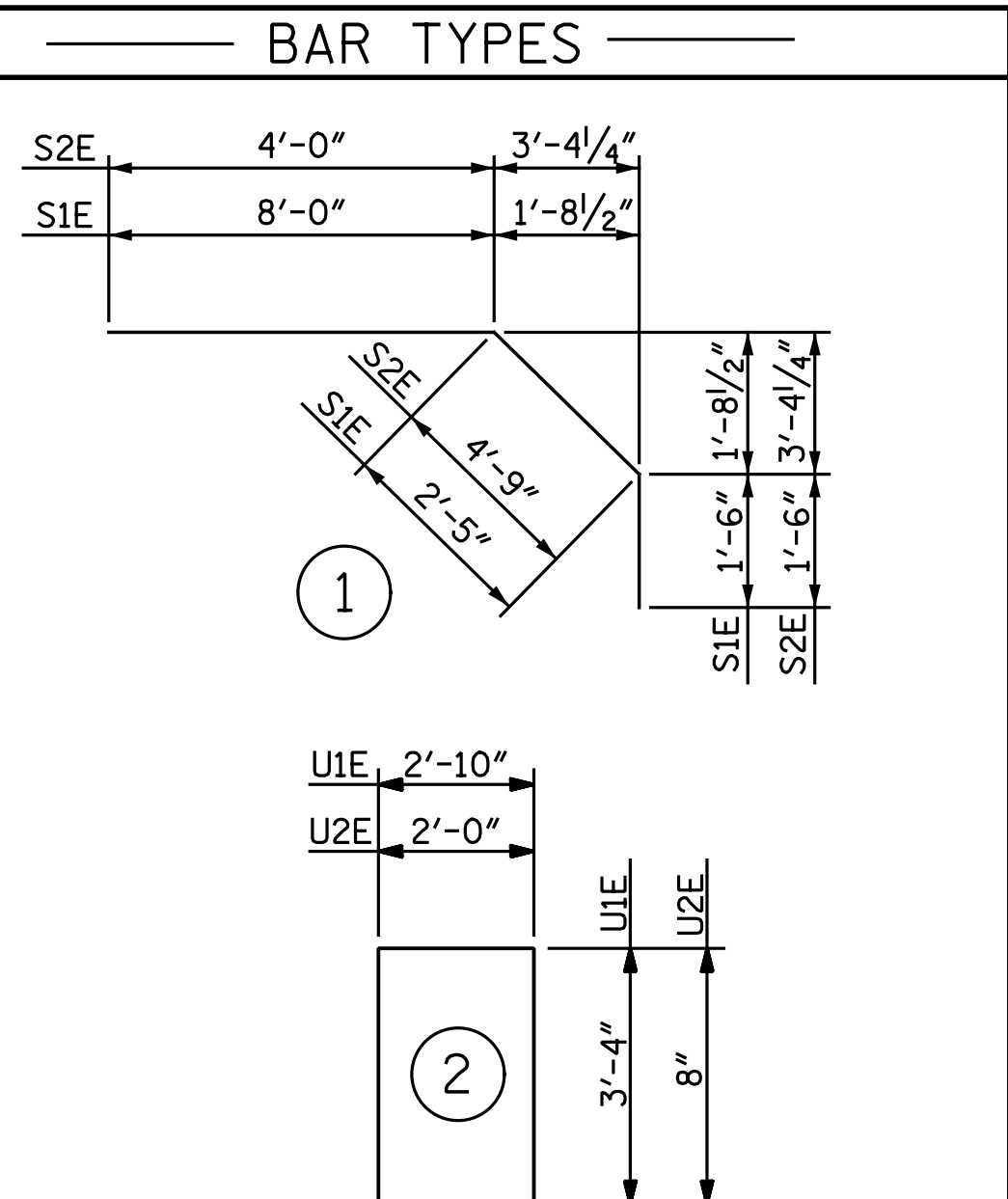
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A201	2	#5	STR.	35' - 8"	74
A202	2	#5	STR.	34' - 5"	72
A203	2	#5	STR.	33' - 2"	69
A204	2	#5	STR.	31' - 10"	66
A205	2	#5	STR.	30' - 7"	64
A206	2	#5	STR.	29' - 4"	61
A207	2	#5	STR.	28' - 1"	59
A208	2	#5	STR.	26' - 10"	56
A209	2	#5	STR.	25' - 6"	53
A210	2	#5	STR.	24' - 3"	51
A211	2	#5	STR.	23' - 0"	48
A212	2	#5	STR.	21' - 9"	45
A213	2	#5	STR.	20' - 5"	43
A214	2	#5	STR.	19' - 2"	40
A215	2	#5	STR.	17' - 11"	37
A216	2	#5	STR.	16' - 8"	35
A217	2	#5	STR.	15' - 5"	32
A218	2	#5	STR.	14' - 1"	29
A219	2	#5	STR.	12' - 10"	27
A220	2	#5	STR.	11' - 7"	24
A221	2	#5	STR.	10' - 4"	22
A222	2	#5	STR.	9' - 1"	19
A223	2	#5	STR.	7' - 9"	16
A224	2	#5	STR.	6' - 6"	14
A225	2	#5	STR.	5' - 3"	11
A226	2	#5	STR.	4' - 0"	8
A227	2	#5	STR.	2' - 9"	6
A228	2	#5	STR.	1' - 5"	3
B1E	100	#5	STR.	53' - 3"	5,554
B2	176	#5	STR.	53' - 0"	9,729
B3E	24	#6	STR.	23' - 3"	838
B4E	24	#6	STR.	21' - 5"	772
B5E	48	#6	STR.	36' - 4"	2,619
B6E	48	#6	STR.	37' - 4"	2,692
B7E	24	#6	STR.	25' - 6"	919
B8E	24	#6	STR.	23' - 8"	853
B9E	48	#4	STR.	27' - 6"	882
G1E	206	#4	STR.	6' - 9"	929
H1	16	#4	STR.	2' - 10"	30
K1E	32	#4	STR.	20' - 10"	445
S1E	66	#4	1	11' - 11"	525
S2E	62	#4	1	10' - 3"	425
U1E	66	#4	2	9' - 6"	419
U2E	60	#4	2	3' - 4"	134
V1	12	#4	STR.	3' - 10"	31

REINFORCING STEEL	LBS.	TOTAL
EPOXY COATED REINF. STEEL	25,251	33,871

"E" SUFFIX DENOTES EPOXY COATED REINFORCING STEEL

GROOVING BRIDGE FLOORS

APPROACH SLABS	1,214 SQ.FT.
BRIDGE DECK	5,136 SQ.FT.
TOTAL	6,350 SQ.FT.



ALL BAR DIMENSIONS ARE OUT TO OUT SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
SPANS A & B		25,251	33,871
POUR 1	55.4		
POUR 2	158.5		
POUR 3*	48.2		
SIDEWALK	37.0		***
TOTALS **	299.1	25,251	33,871

* POUR 3 QUANTITY INCLUDES DIAPHRAGM PORTION OF INTEGRAL END BENT
 ** QUANTITIES FOR CONCRETE BARRIER RAIL ARE NOT INCLUDED
 *** QUANTITIES INCLUDED WITH SPAN TOTALS

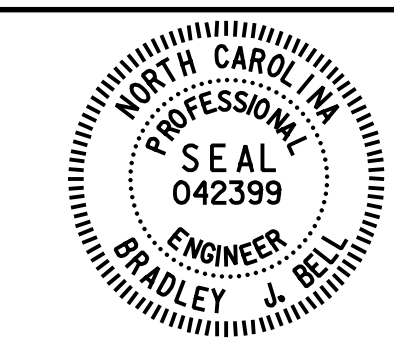
BAR SIZE	SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS			
	EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL	APPROACH SLABS	PARAPET AND BARRIER RAIL	
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"	2'-0"	1'-9"
#5	2'-6"	2'-2"	2'-6"	2'-2"
#6	3'-0"	2'-7"	3'-10"	2'-7"
#7	5'-3"	3'-6"		
#8	6'-10"	4'-7"		

PROJECT NO. U-3330
 NASH COUNTY
 STATION: 18+22.61 -Y1-

DRAWN BY: N. B. SPEAKS DATE: 8-22-16
 CHECKED BY: B. J. BELL DATE: 8-31-16

NOTE:
 CONCRETE SHALL BE POURED IN THE CROSS-HATCHED AREAS SHOWN IN DETAIL "A" AND DETAIL "B" TO MATCH THE TOP OF END BENT WINGS. UNLESS OTHERWISE DIRECTED BY THE ENGINEER, THE CONCRETE IN THESE AREAS SHALL BE POURED AT THE SAME TIME THE BLOCKOUTS IN THE END BENT WINGS ARE FILLED WITH CONCRETE AS NOTED ON SHEET 1 OF "INTEGRAL END BENT 1" AND "INTEGRAL END BENT 2" SHEETS.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

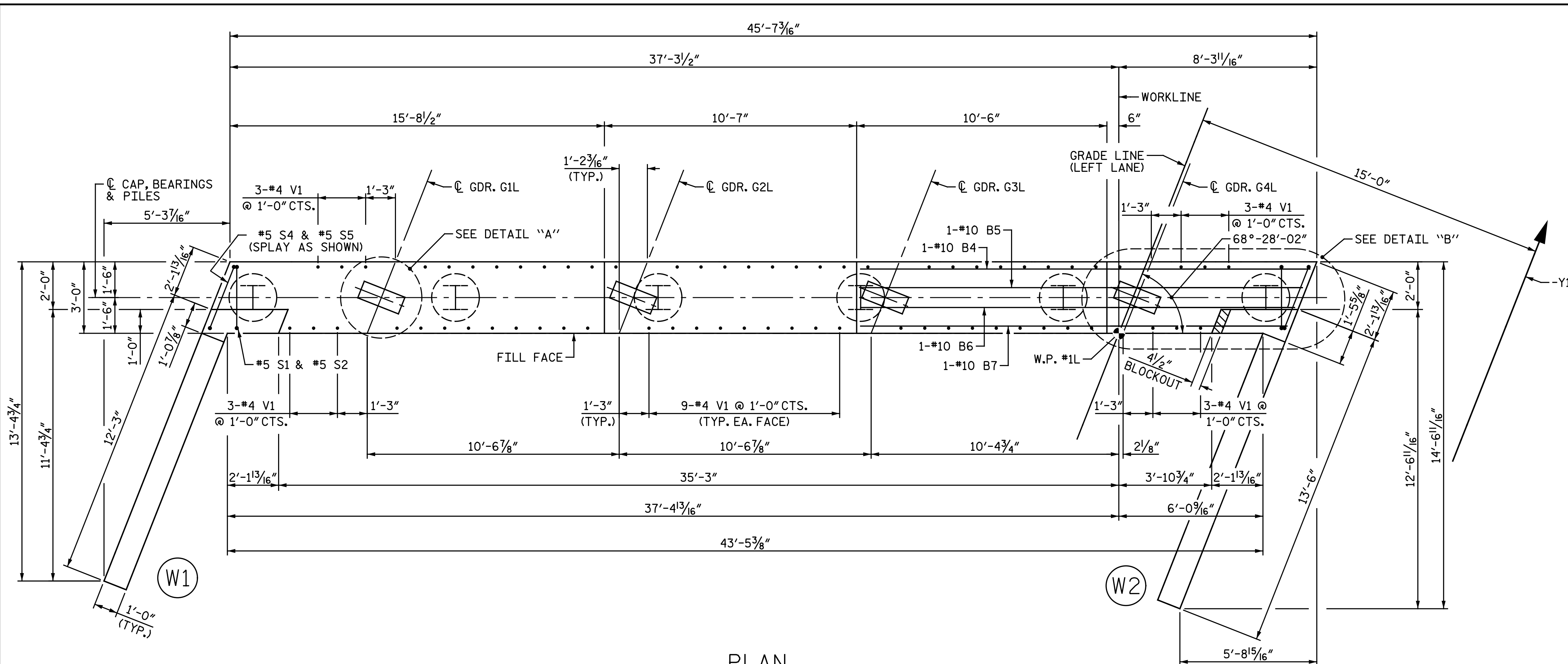


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 NC License No.: F-1084

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

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

TOTAL SHEETS: 38



PLAN

NOTES:

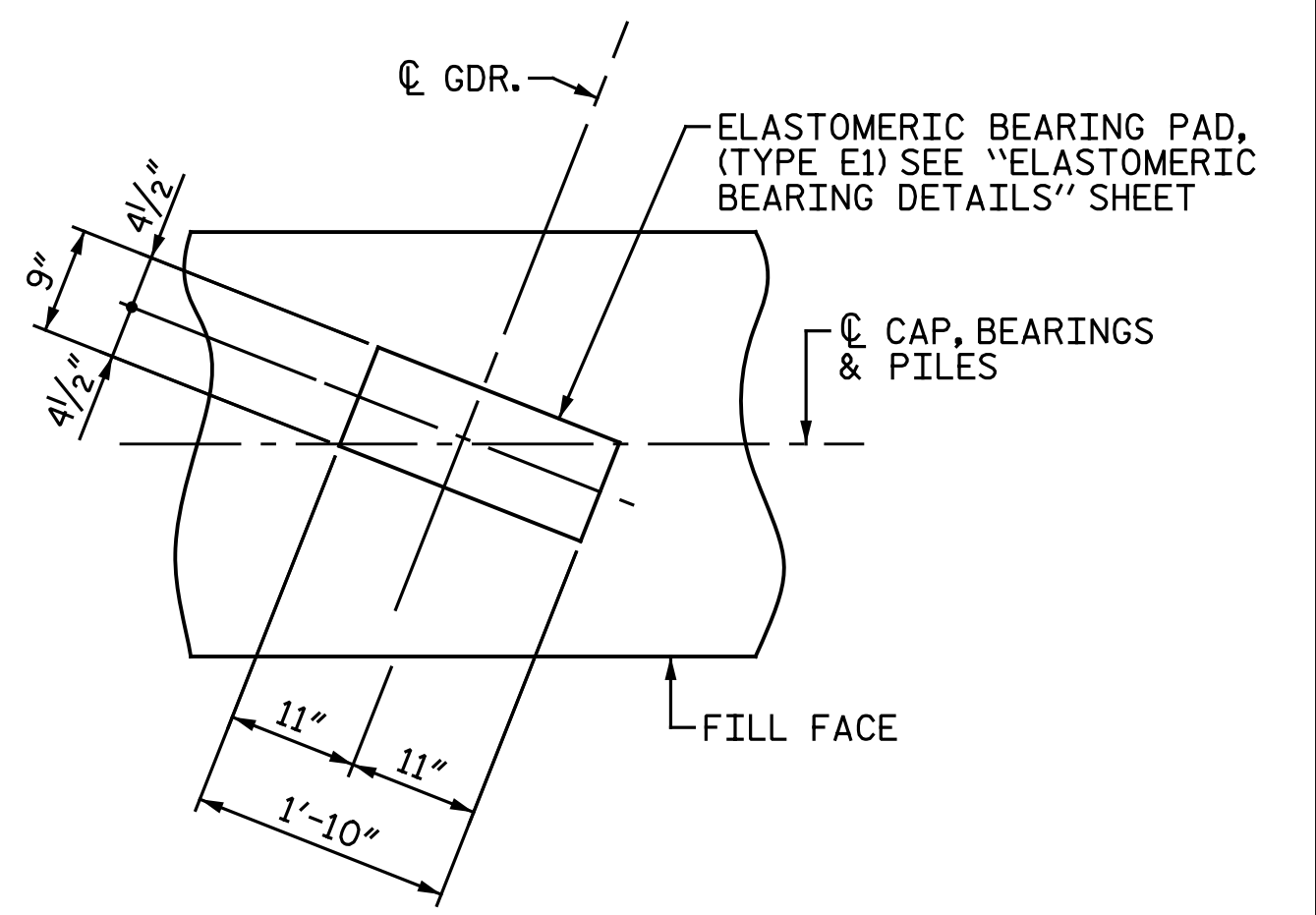
FOR "SECTION A-A" AND "SECTION B-B", SEE "INTEGRAL END BENT 1 DETAILS" SHEET.

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #4 V1 BARS.

THE TOP SURFACE OF THE END BENT CAP, EXCLUDING THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".

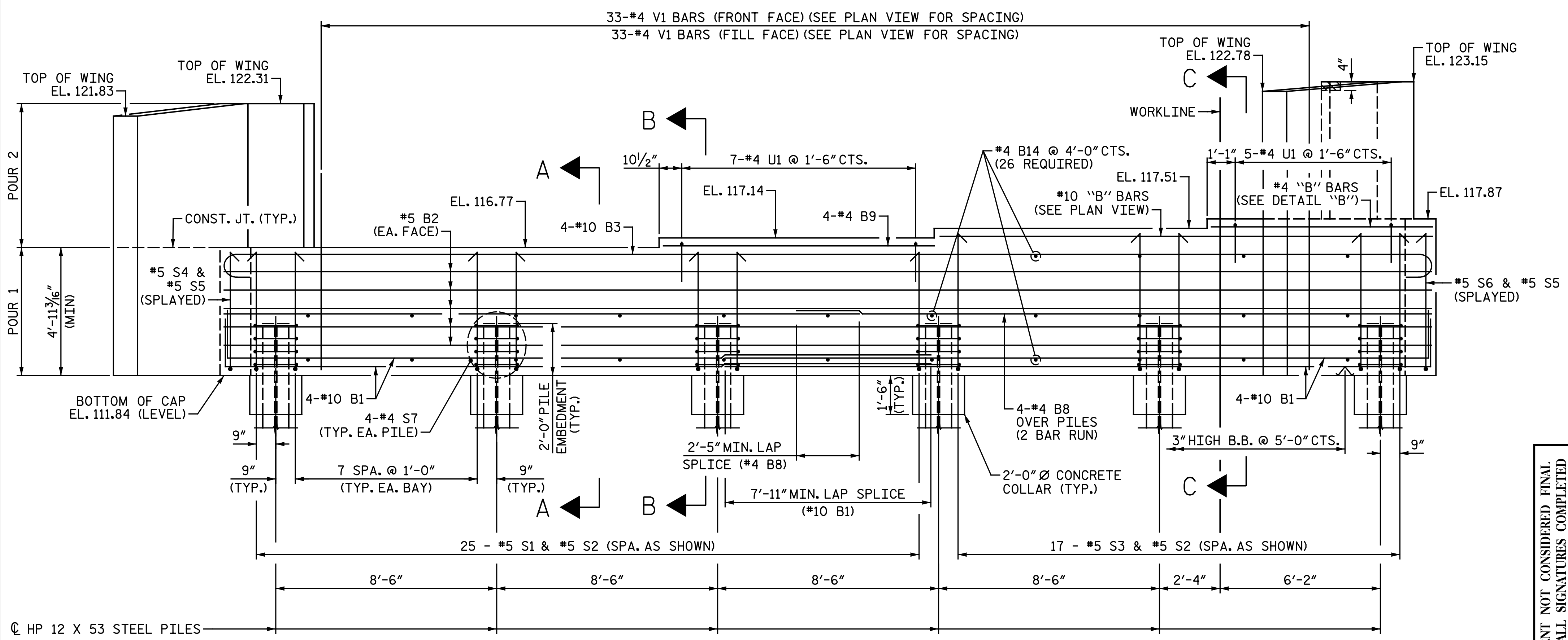
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

#4 B14 BARS MAY BE SHIFTED AS NECESSARY TO CLEAR THE STEEL PILES.

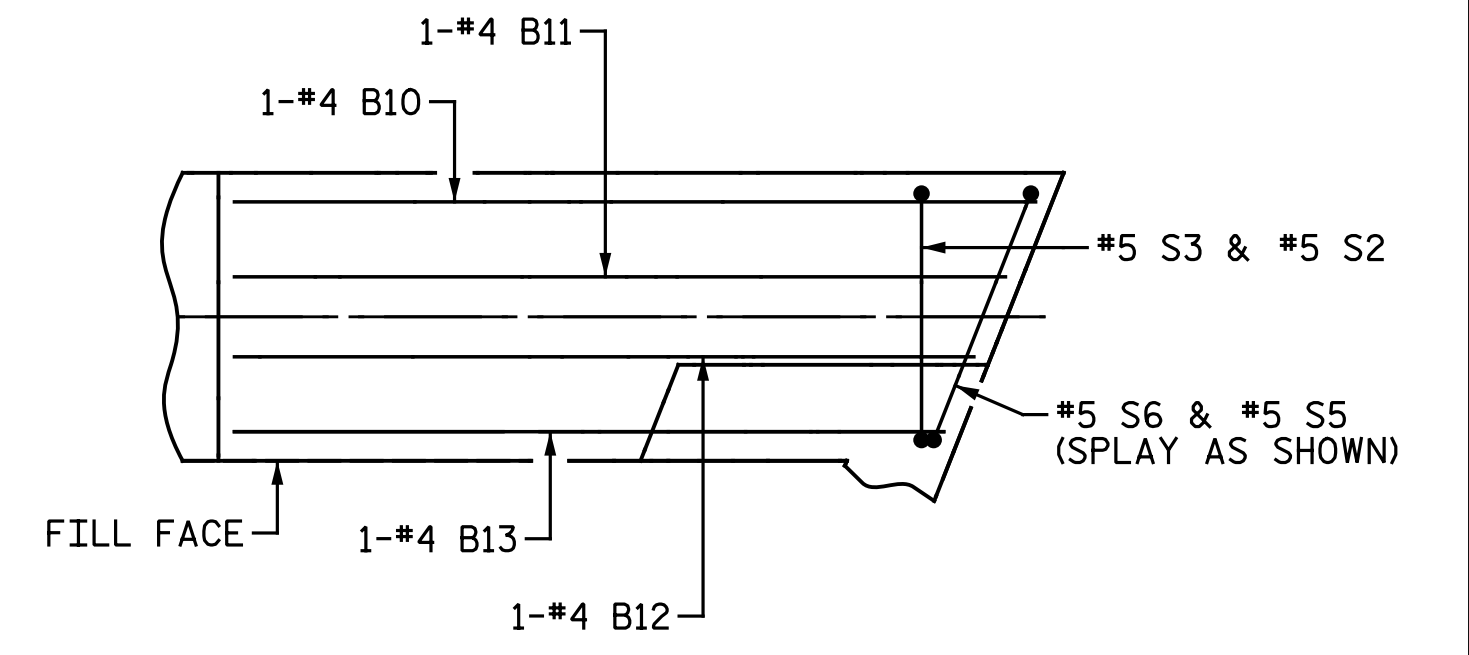


DETAIL "A"

ALL DIMENSIONS AND DETAILS SHOWN ARE TYPICAL FOR ALL BEARINGS AT EACH BRIDGE SEAT LOCATION.



ELEVATION



DETAIL "B"

WING ABOVE CAP NOT SHOWN FOR CLARITY

PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1-
 SHEET 1 OF 2

DRAWN BY: M. D. MAYHEW DATE: 8-8-16
 CHECKED BY: J. M. GARRISON DATE: 8-16-16

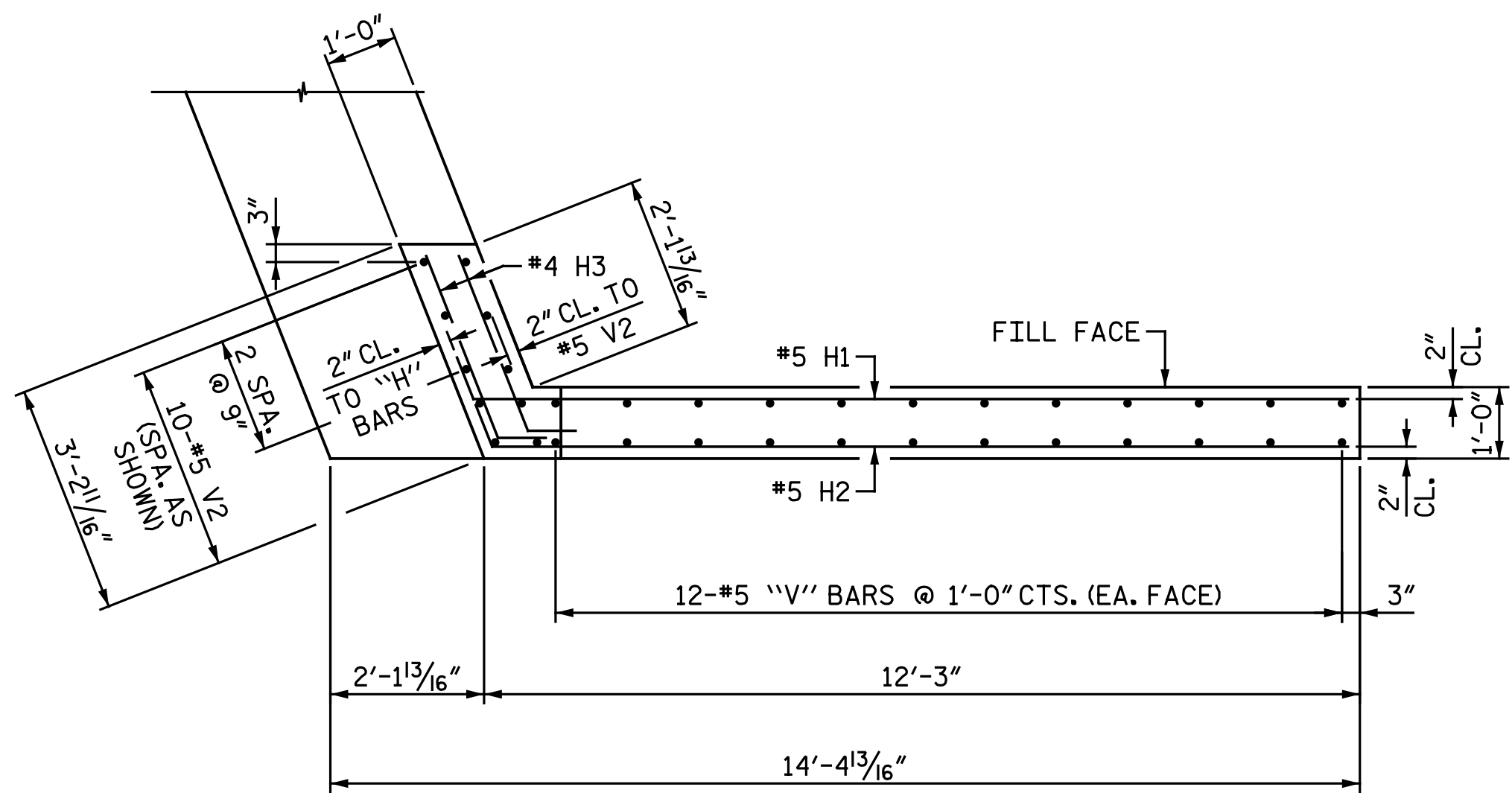
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DocuSigned by:
Bradley J. Bell
 CA1AF8EAC3A3434
 1/27/2017

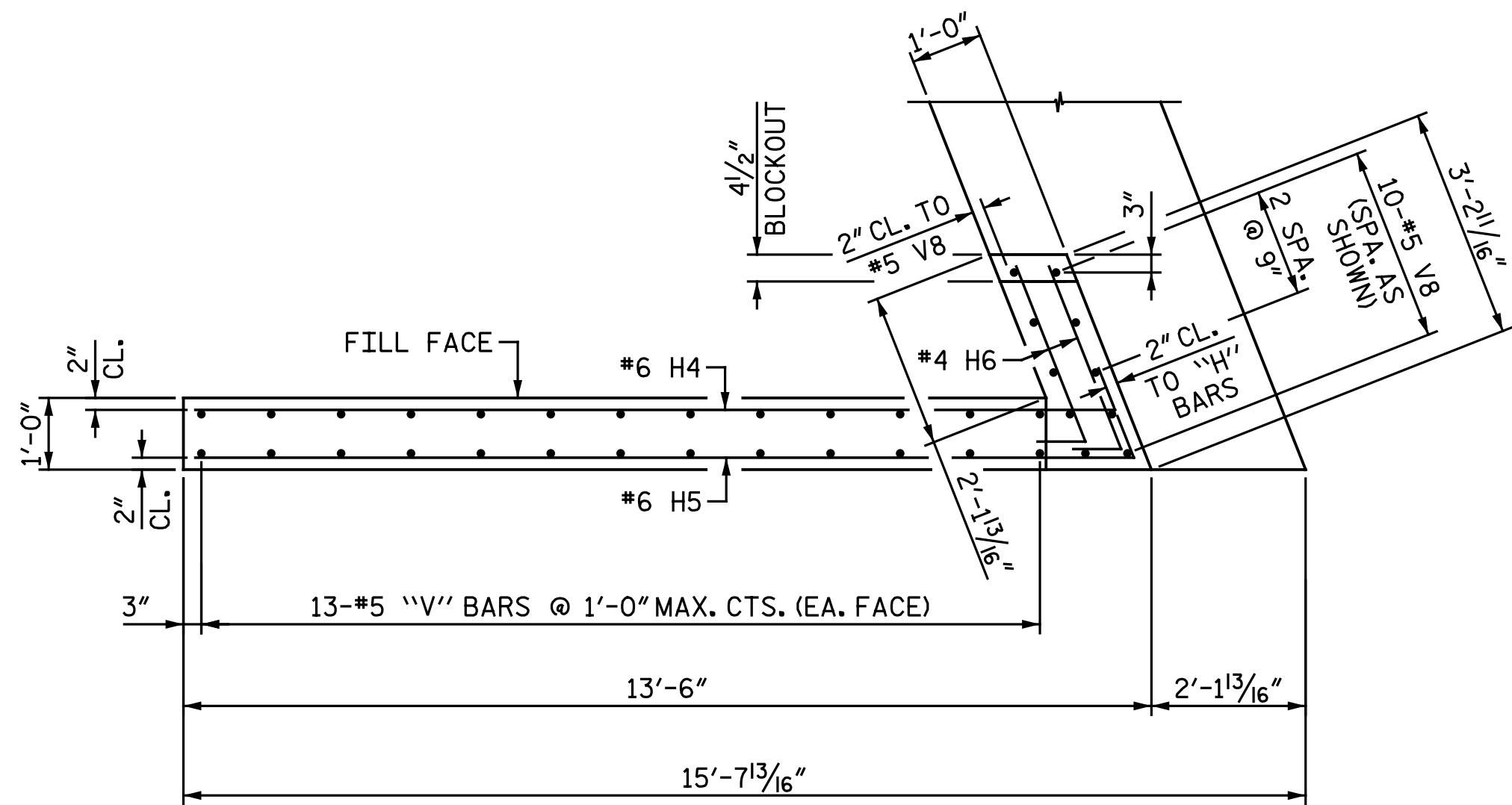
Michael Baker INTERNATIONAL

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 Cary, North Carolina 27518
 NC License No.: F-1084

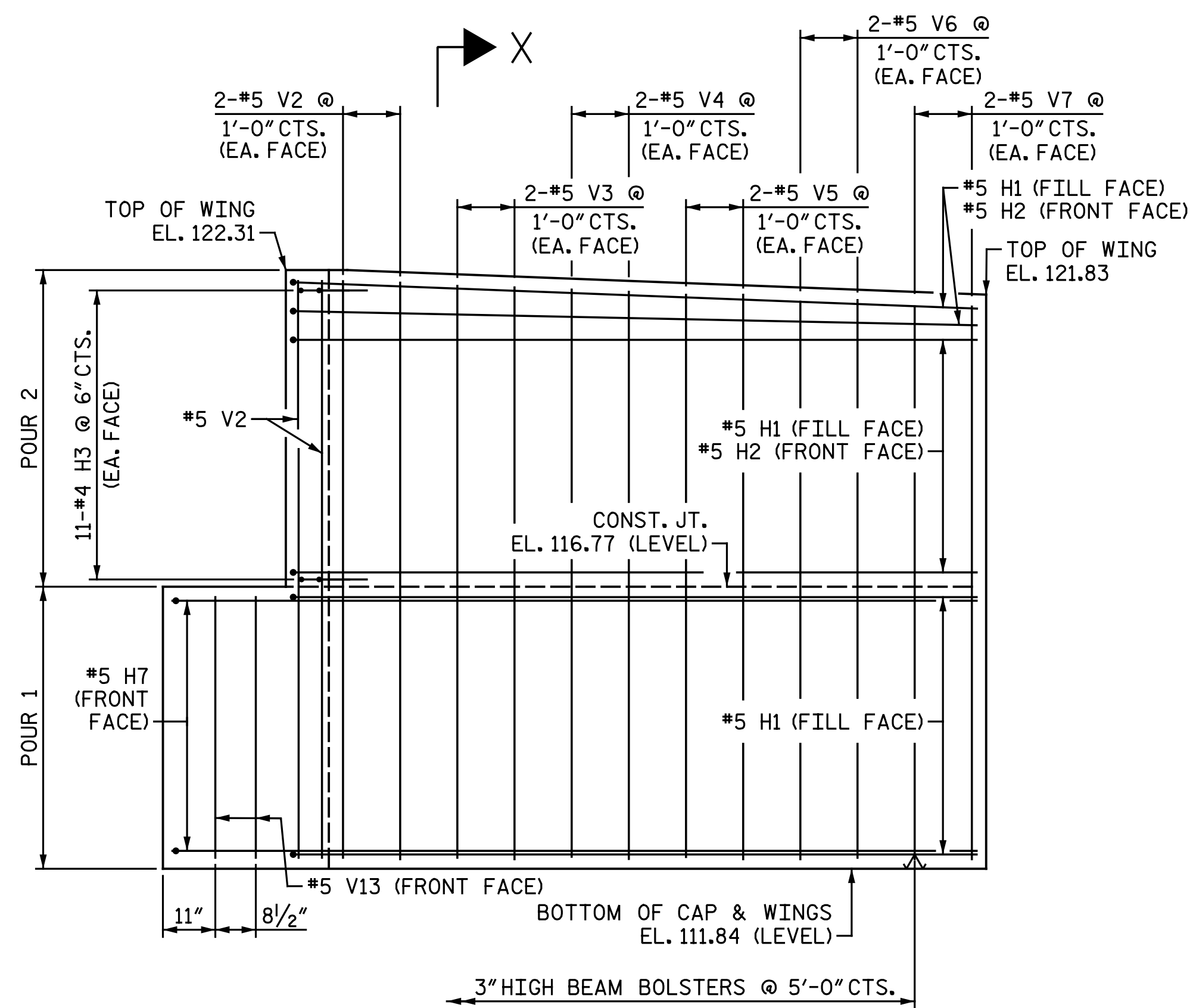
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
INTEGRAL END BENT 1					
LEFT LANES					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. SI-25
					TOTAL SHEETS 38



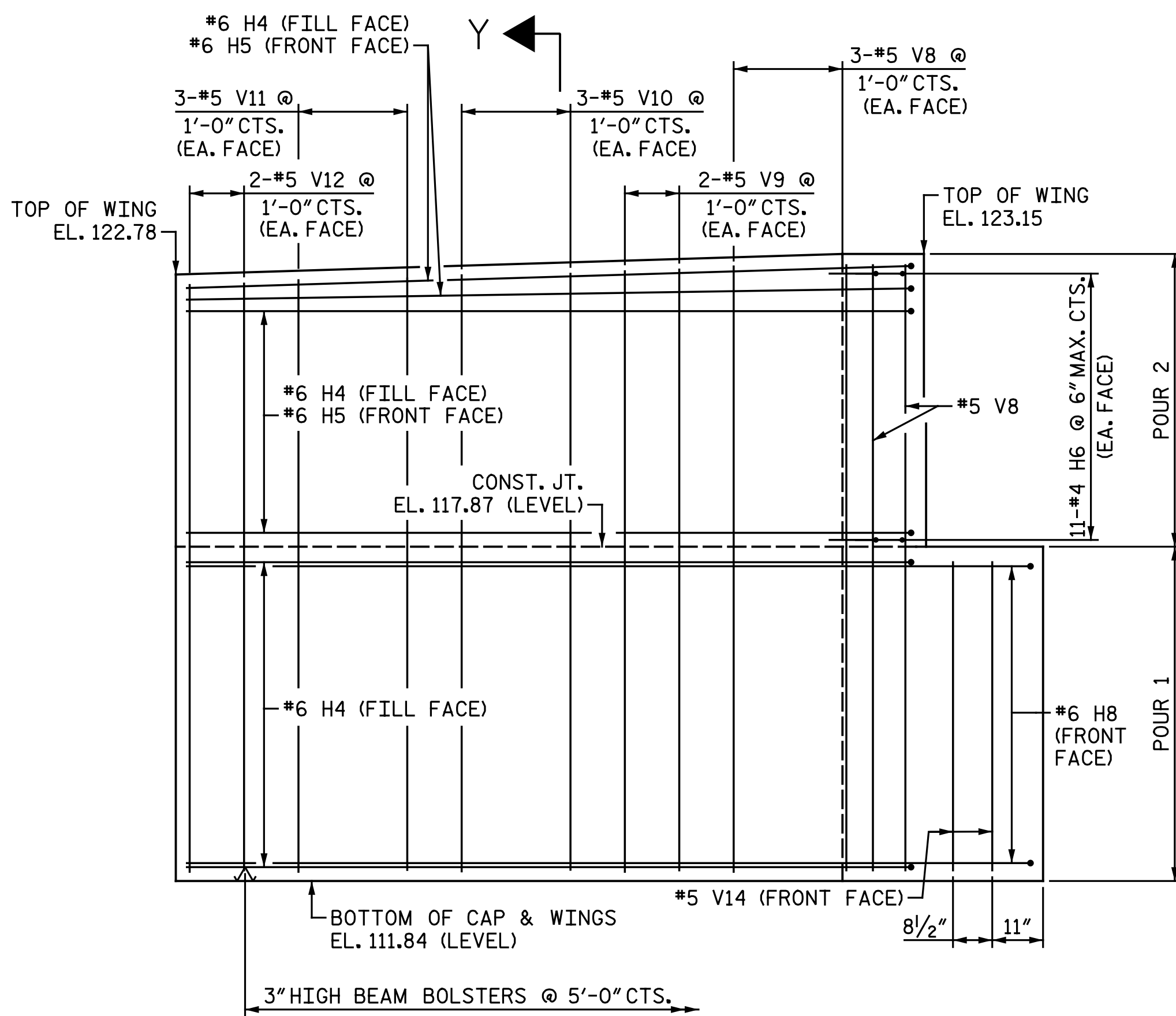
PLAN OF LEFT WING (W1)



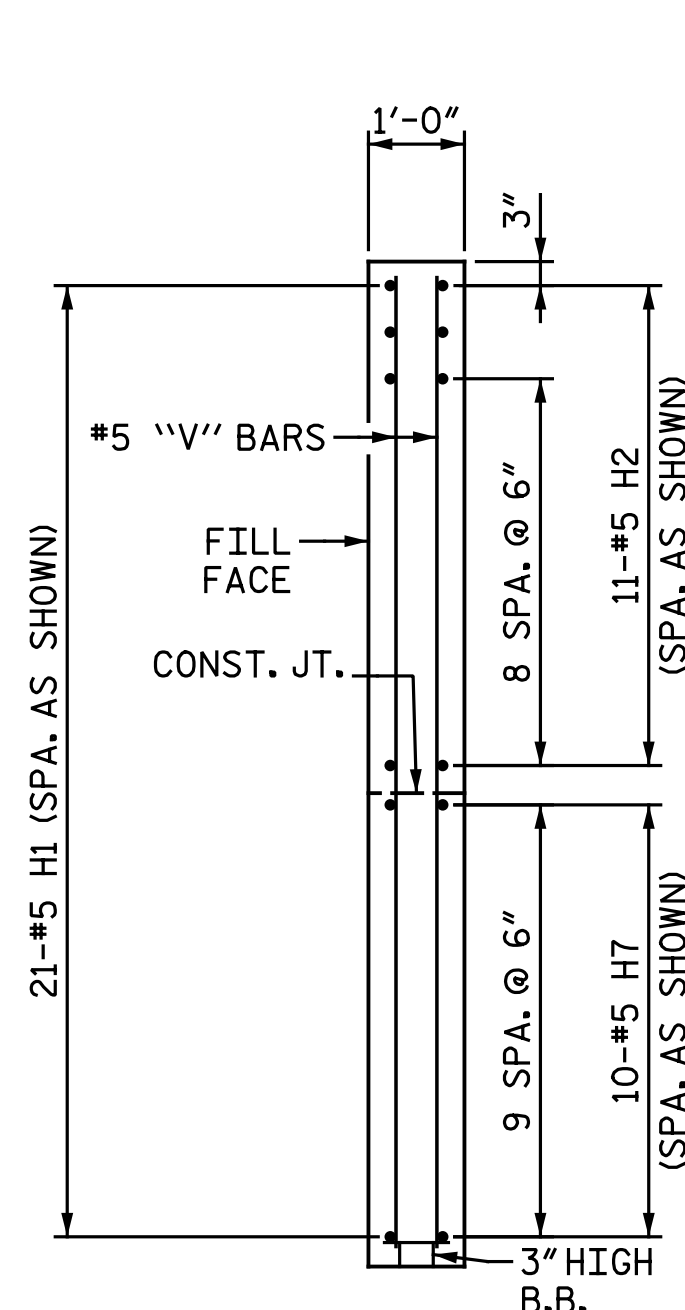
PLAN OF RIGHT WING (W2)



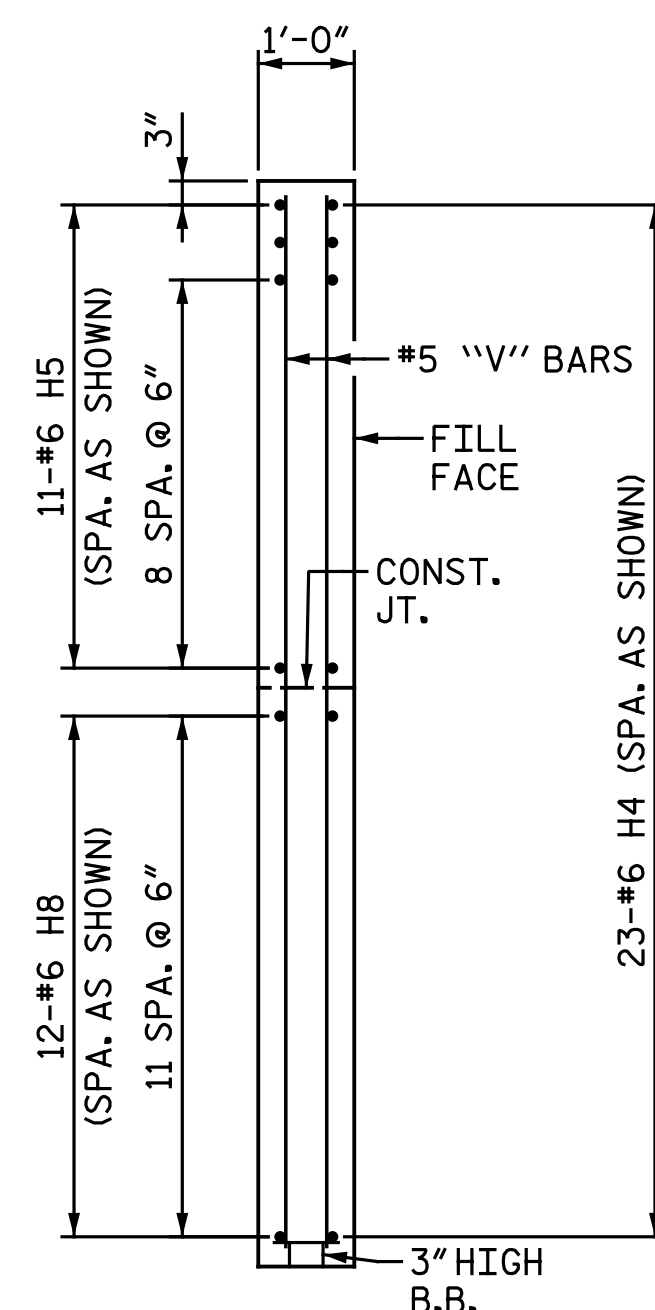
ELEVATION OF LEFT WING (W1)



ELEVATION OF RIGHT WING (W2)



SECTION X-X

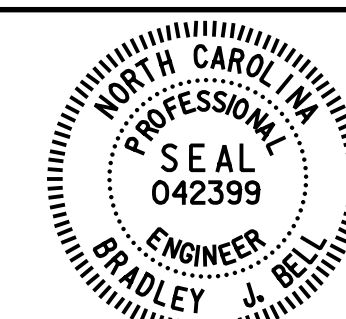


SECTION Y-Y

PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1-
 SHEET 2 OF 2

DRAWN BY : M. D. MAYHEW DATE : 8-8-16
 CHECKED BY : J. M. GARRISON DATE : 8-19-16

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DocuSigned by:
 Bradley J. Bell
 CA1A3F8E3A30434
 1/27/2017

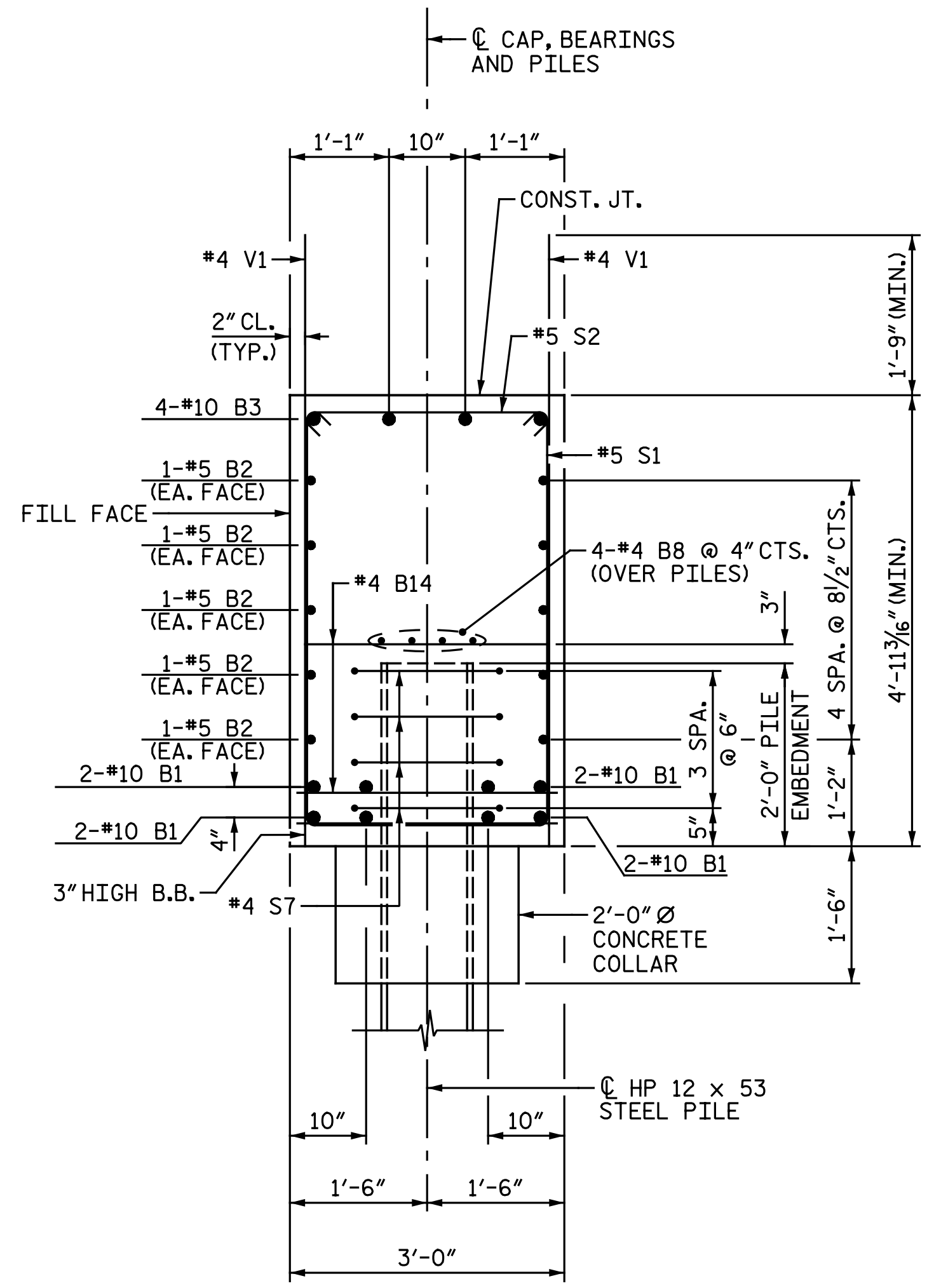
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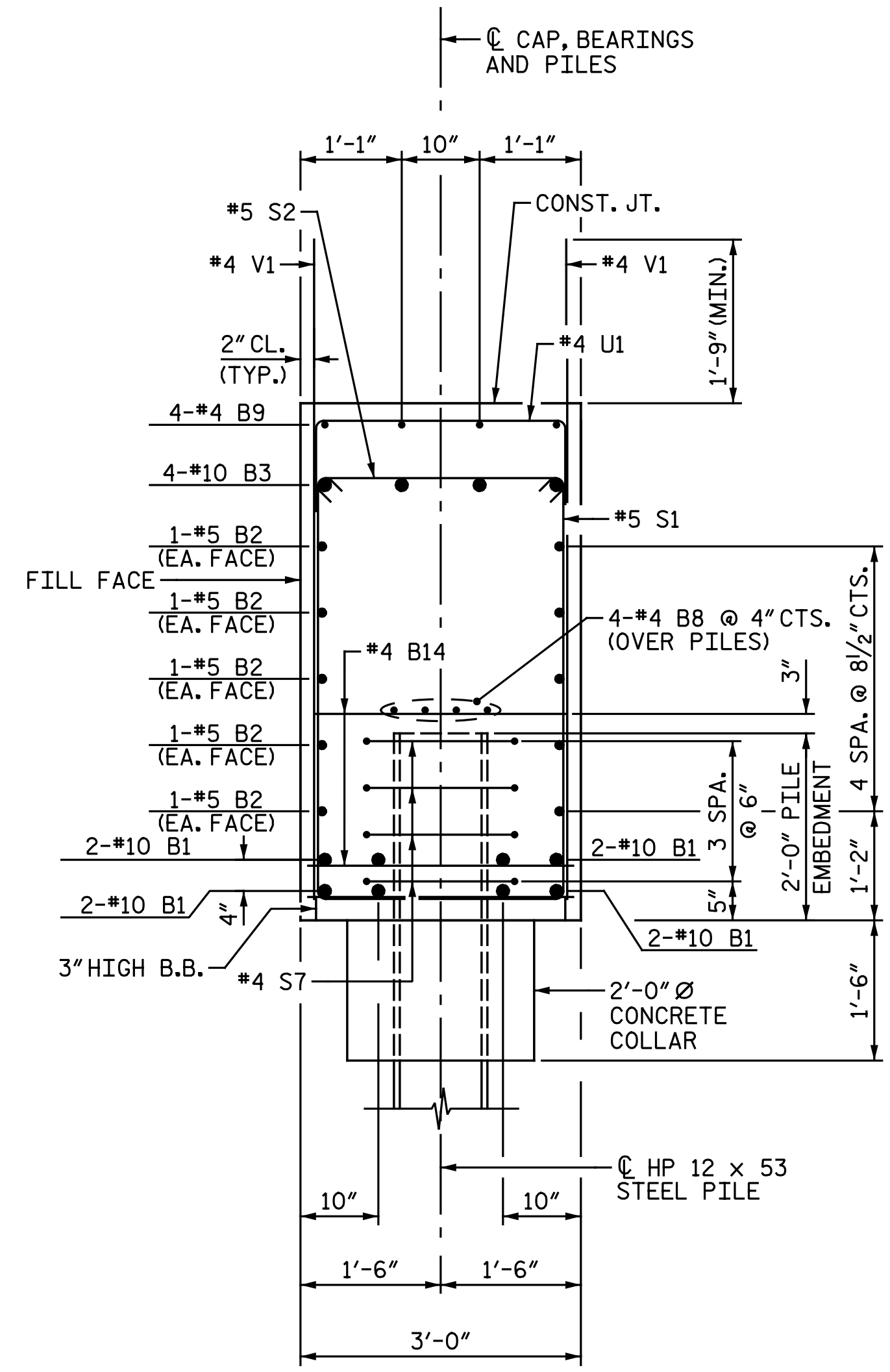
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 INTEGRAL END BENT 1

LEFT LANES

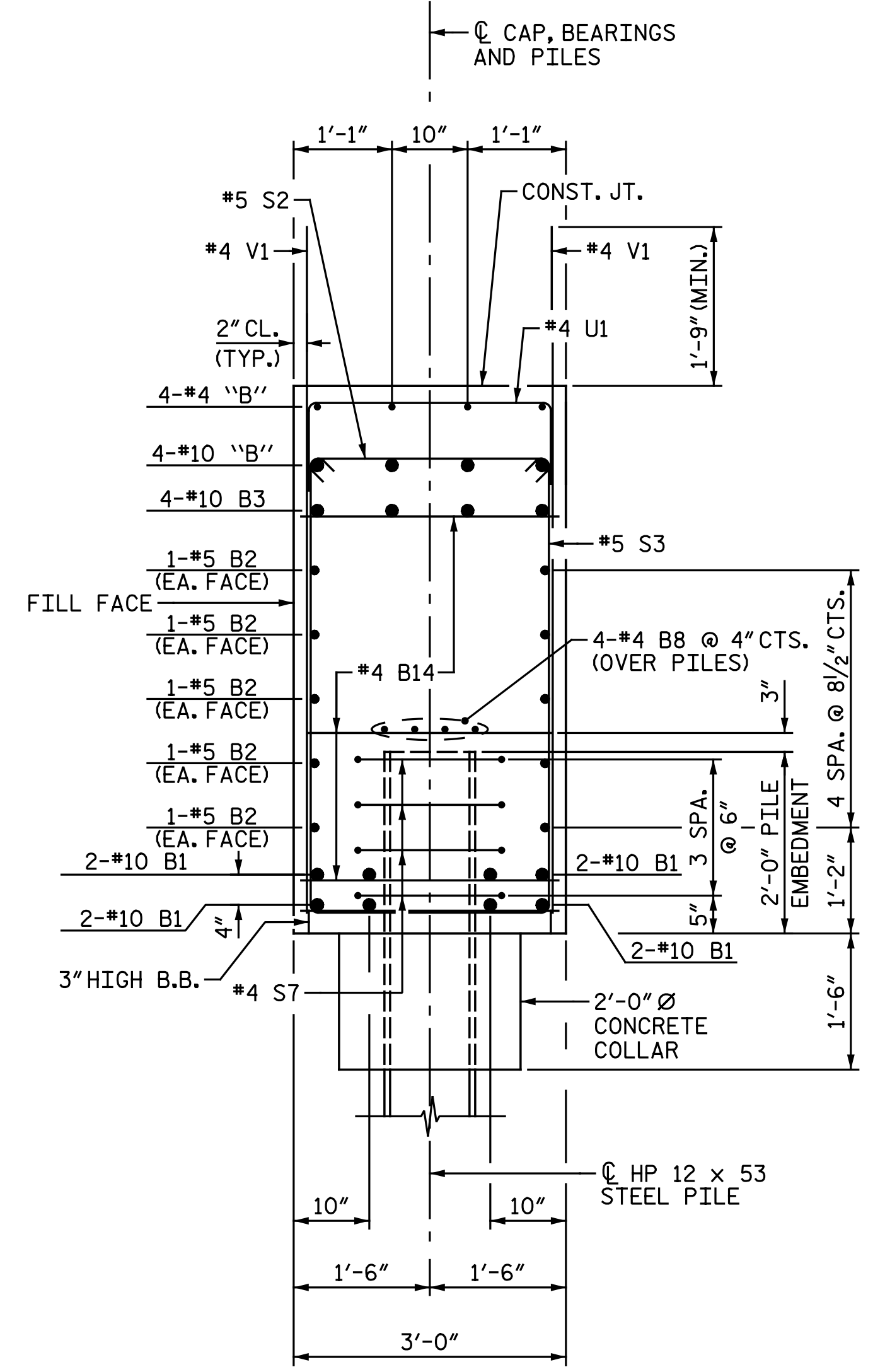
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-26
1			3			TOTAL SHEETS
2			4			38



SECTION A-A



SECTION B-B



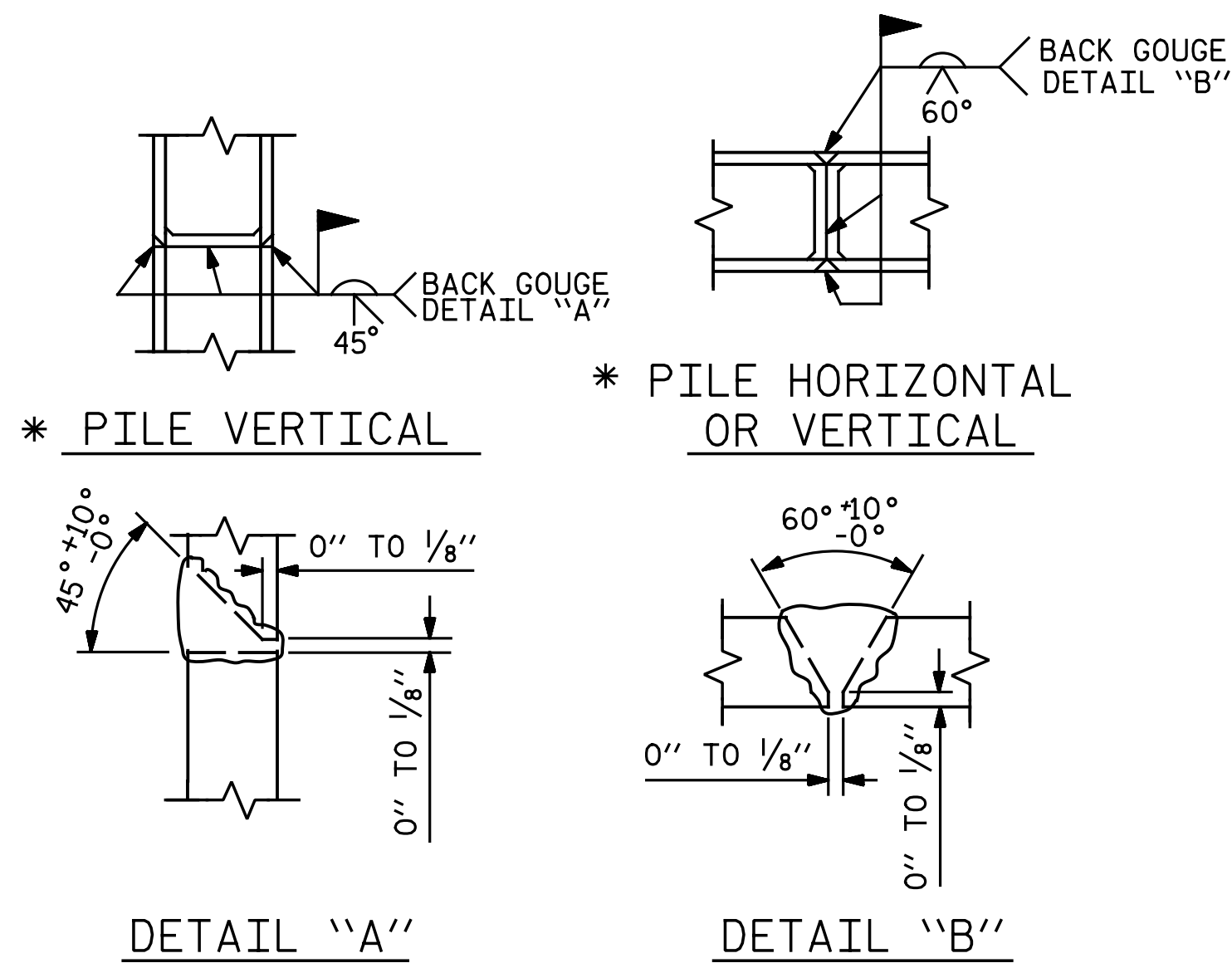
SECTION C-C

PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1-
 SHEET 1 OF 2

DRAWN BY : M. D. MAYHEW DATE : 8-9-16
 CHECKED BY : I. M. GARRISON DATE : 8-19-16

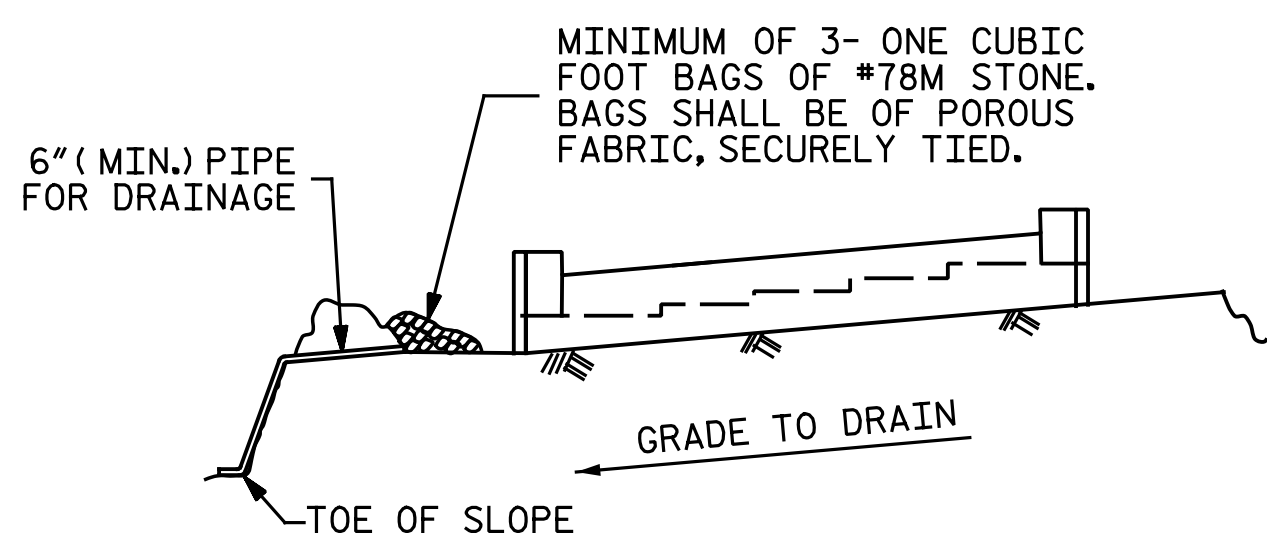
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		REVISIONS			TOTAL SHEETS 38
		NO.	BY:	DATE:	NO.
1			3		
2			4		

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PILE SPLICE DETAILS

* POSITION OF PILE DURING WELDING.



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.

TEMPORARY DRAINAGE AT END BENT

DRAWN BY : M. D. MAYHEW DATE : 8-19-16
 CHECKED BY : J. M. GARRISON DATE : 8-19-16

BILL OF MATERIAL

END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	16	#10	1	28' - 5"	1,956
B2	10	#5	STR.	45' - 2"	471
B3	4	#10	2	48' - 0"	826
B4	1	#10	STR.	18' - 9"	81
B5	1	#10	STR.	18' - 6"	80
B6	1	#10	STR.	18' - 2"	78
B7	1	#10	STR.	17' - 10"	77
B8	8	#4	STR.	23' - 10"	127
B9	4	#4	STR.	10' - 5"	28
B10	1	#4	STR.	8' - 3"	6
B11	1	#4	STR.	8' - 0"	5
B12	1	#4	STR.	7' - 8"	5
B13	1	#4	STR.	7' - 4"	5
B14	26	#4	STR.	2' - 8"	46

H1	21	#5	6	13' - 0"	285
H2	11	#5	6	12' - 9"	146
H3	22	#4	6	3' - 4"	49
H4	23	#6	7	13' - 9"	475
H5	11	#6	7	14' - 1"	233
H6	22	#4	7	3' - 4"	49
H7	10	#5	6	14' - 9"	154
H8	12	#6	7	16' - 2"	291

S1	25	#5	4	12' - 9"	332
S2	42	#5	5	3' - 7"	157
S3	17	#5	4	14' - 3"	253
S4	1	#5	4	12' - 11"	13
S5	2	#5	5	3' - 9"	8
S6	1	#5	4	14' - 5"	15
S7	24	#4	8	6' - 6"	104

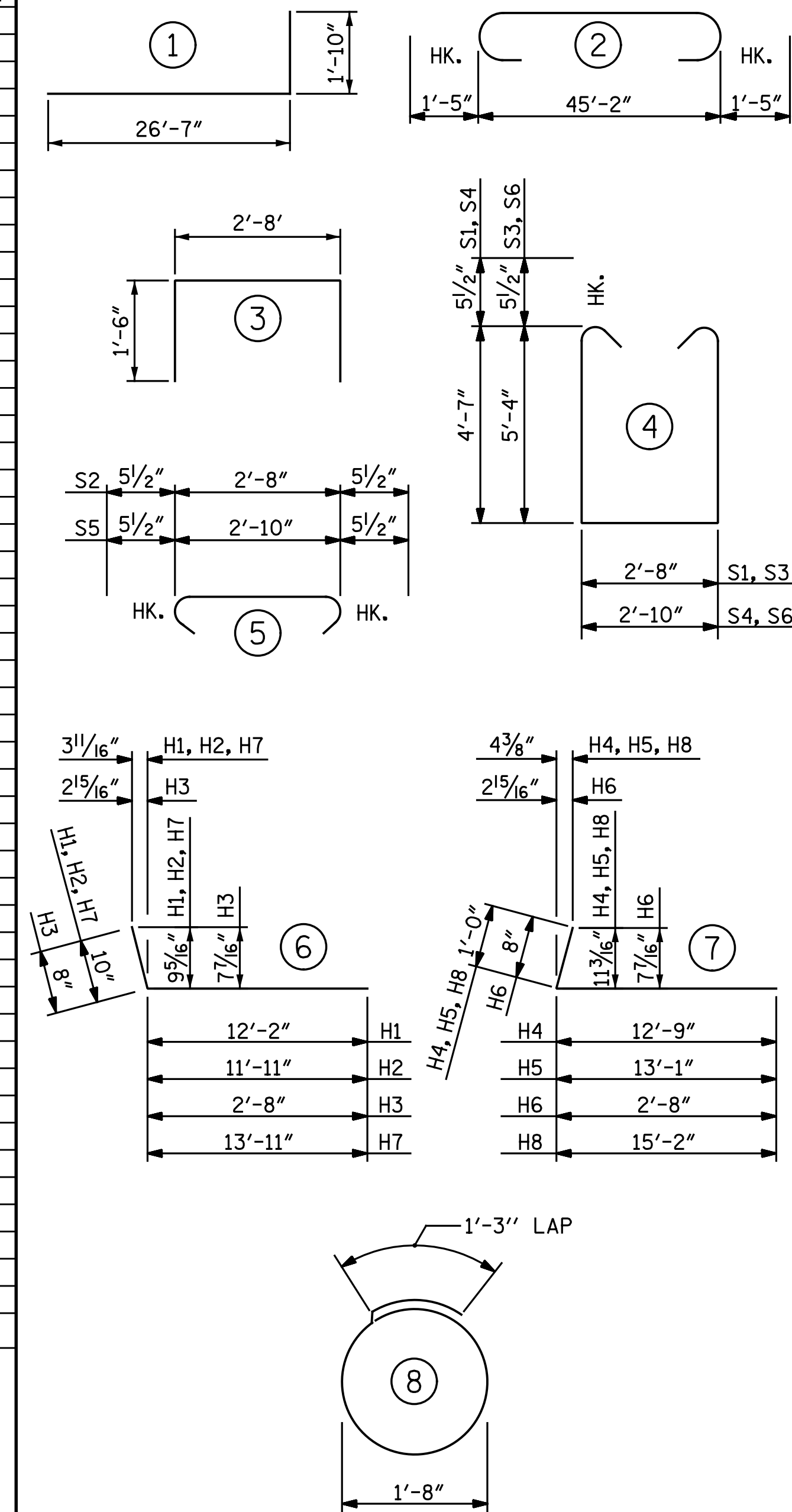
REINFORCING STEEL LBS. 7,538

CLASS A CONCRETE
 POUR 1 - CAP, LOWER PART OF WINGS & COLLARS C.Y. 33.2
 POUR 2 - UPPER PART OF WINGS C.Y. 5.9
 TOTAL C.Y. 39.1

HP 12 x 53 STEEL PILES NO. 6 L.F. 150

PILE DRIVING EQUIPMENT SETUP FOR HP 12 x 53 STEEL PILES EA. 6

BAR TYPES

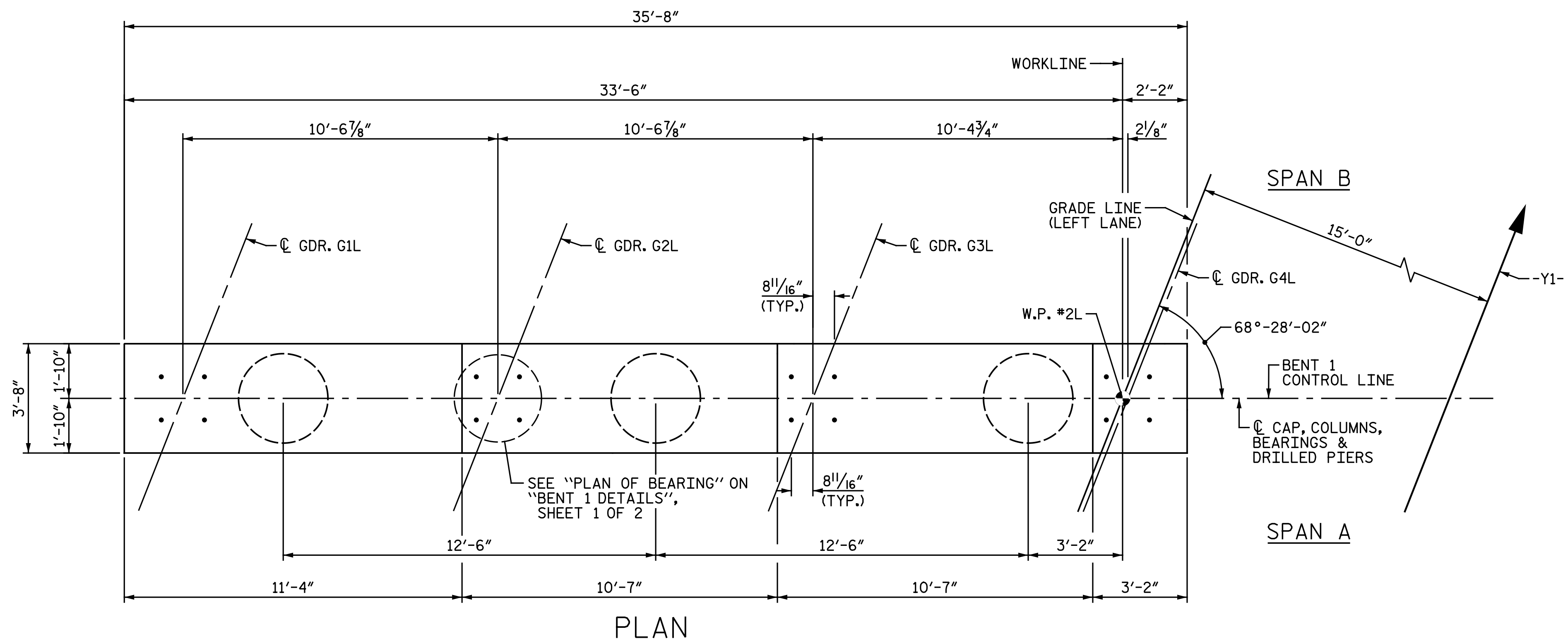


ALL BAR DIMENSIONS ARE OUT TO OUT.

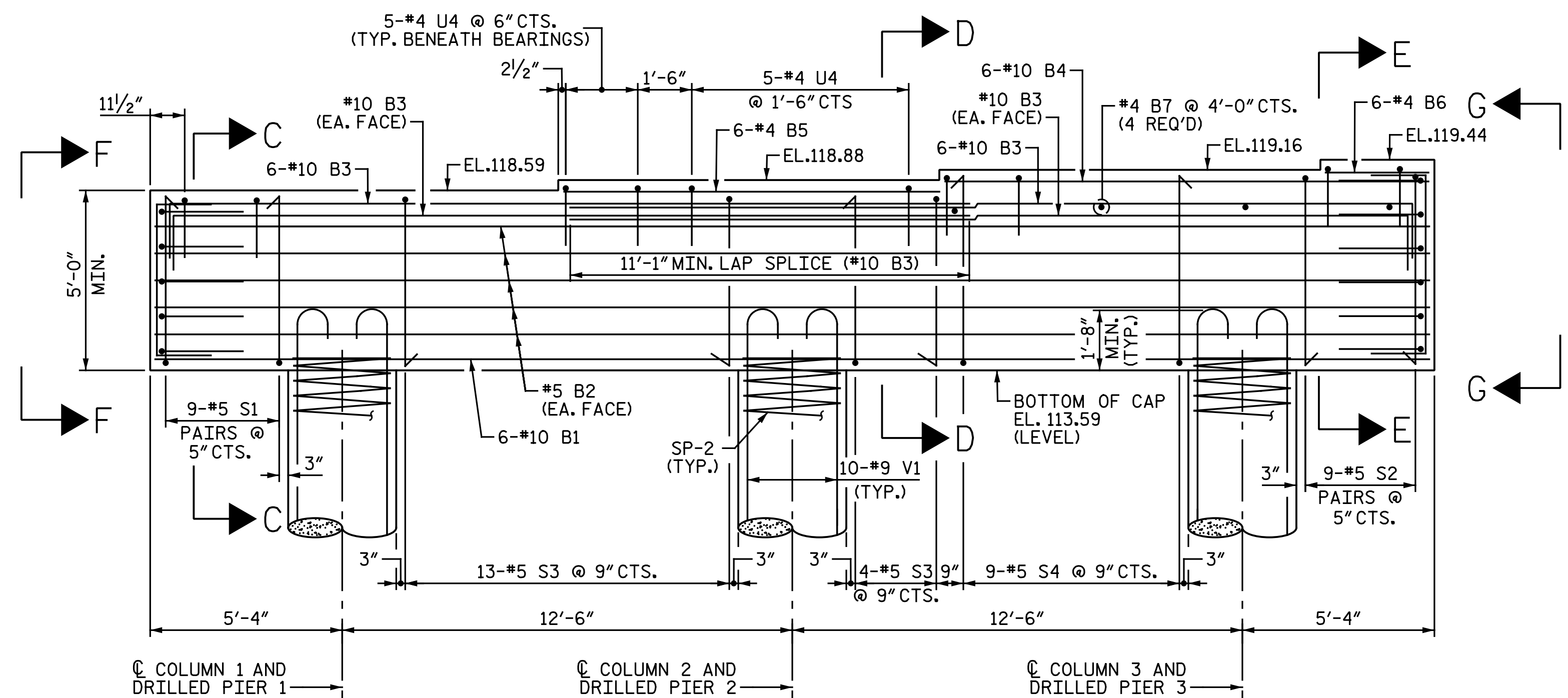
PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1-

SHEET 2 OF 2

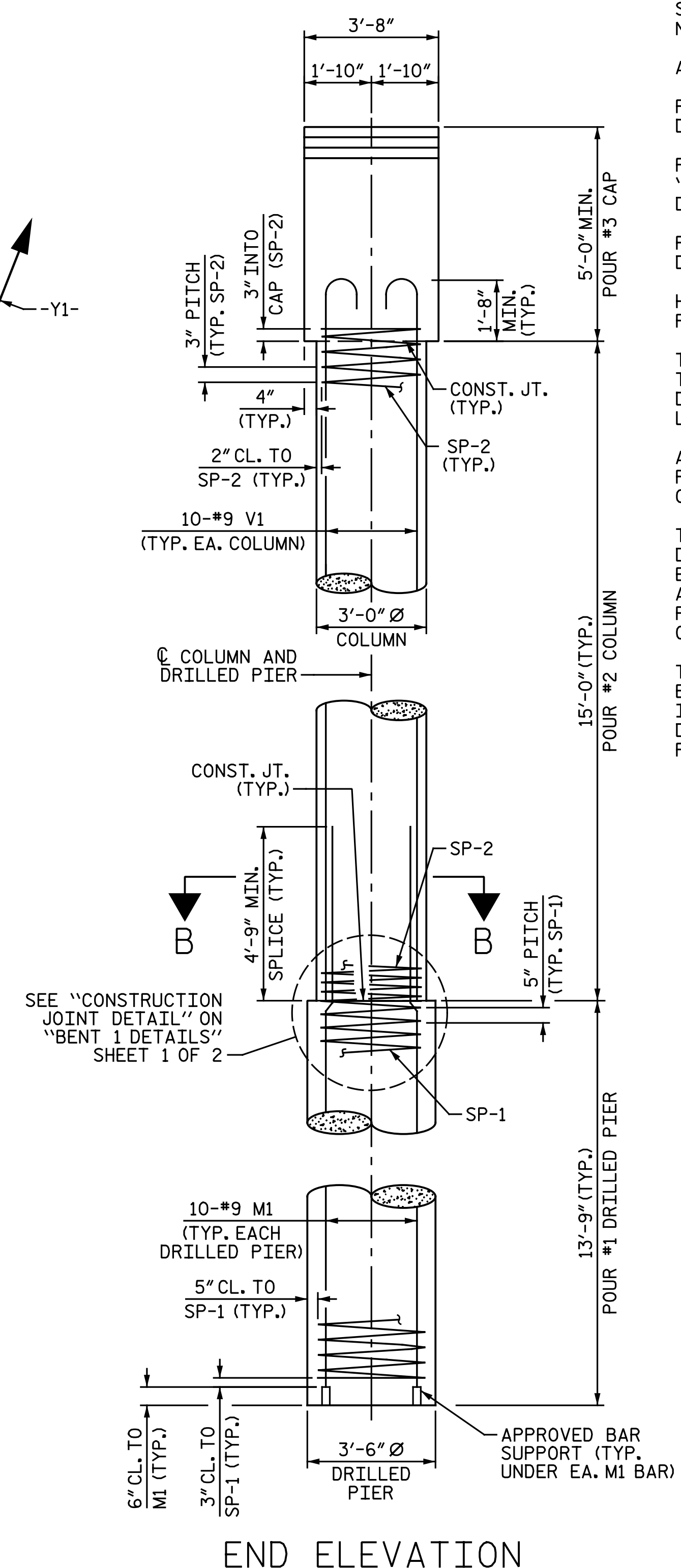
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	<p>DocuSigned by: Bradley J. Bell C41A3F8E3C3A34 2/15/2017</p>	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUBSTRUCTURE INTEGRAL END BENT 1 DETAILS LEFT LANES		REVISIONS <table border="1"> <thead> <tr> <th>NO.</th> <th>BY:</th> <th>DATE:</th> <th>NO.</th> <th>BY:</th> <th>DATE:</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> <td></td> <td>3</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td>4</td> <td></td> <td></td> </tr> </tbody> </table>	NO.	BY:	DATE:	NO.	BY:	DATE:	1			3			2			4			SHEET NO. SI-28 TOTAL SHEETS 38
		NO.	BY:		DATE:	NO.	BY:	DATE:															
1			3																				
2			4																				
Michael Baker INTERNATIONAL Michael Baker Engineering 8000 Regency Parkway, Suite 600 Cary, North Carolina 27518 NC License No.: F-1084																							



PLAN



ELEVATION



END ELEVATION

NOTES:

STIRRUPS & U4 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
 ALTERNATELY INVERT STIRRUPS & STIRRUP PAIRS.
 FOR "SECTION A-A" AND "SECTION B-B", SEE "BENT 1 DETAILS" SHEET 1 OF 2.
 FOR "SECTION C-C", "SECTION D-D", "SECTION E-E", "SECTION F-F" AND "SECTION G-G", SEE "BENT 1 DETAILS" SHEET 2 OF 2.
 FOR ADDITIONAL INFORMATION AND NOTES, SEE "GENERAL DRAWING", SHEET 2 OF 4.
 HOOKS ON V1 BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
 THE CONTRACTORS ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.
 ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".
 THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FOOT BELOW THE GROUND LINE.
 THE CONTRACTOR SHALL ADJUST THE BEARING SEAT AND BOTTOM OF CAP ELEVATIONS AS NECESSARY TO INCORPORATE A MAXIMUM PERMISSIBLE VARIATION IN DISC BEARING DEPTH OF 1/2". SEE SPECIAL PROVISION FOR DISC BEARING.

PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1-

DRAWN BY: C. E. MAYHEW DATE: 8-18-16
 CHECKED BY: J. M. GARRISON DATE: 8-25-16

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

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DocuSigned by:
 Bradley J. Bell
 CA1AF8ECAC3A34
 1/27/2017

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 8000 Regency Parkway, Suite 600
 Cary, North Carolina 27518
 NC License No.: F-1084

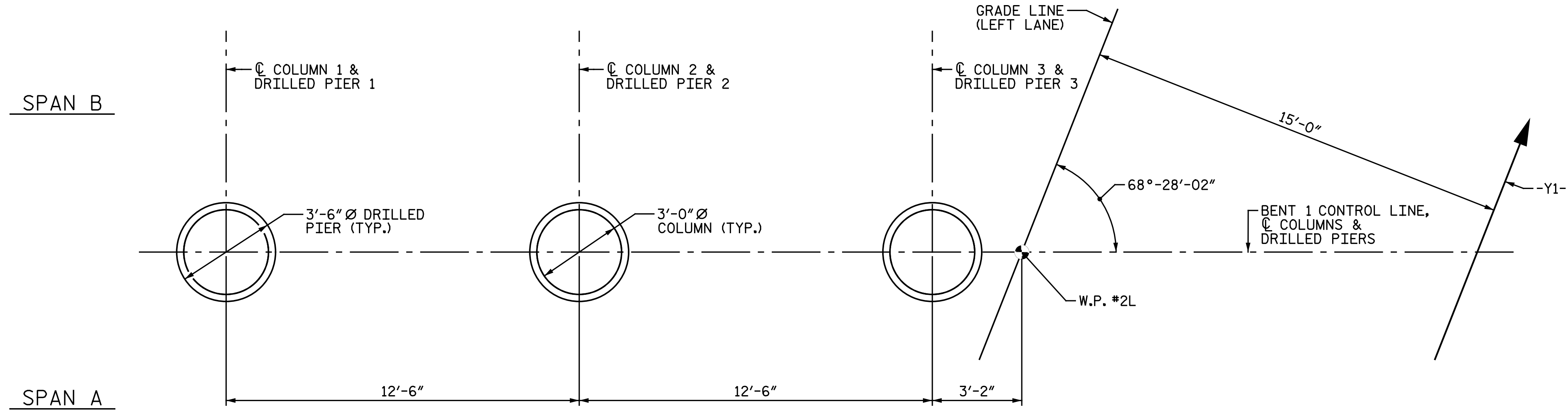
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE

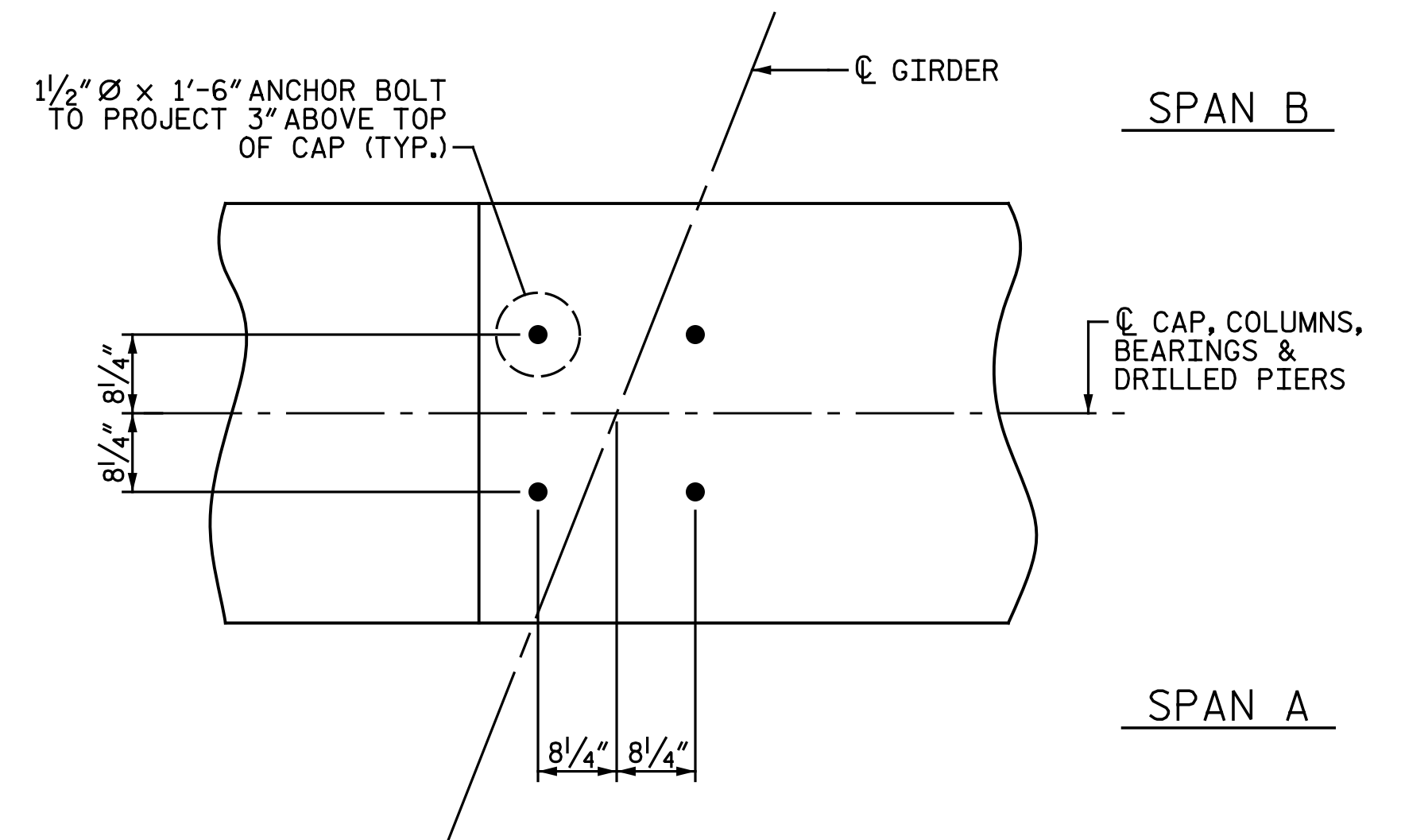
BENT 1

LEFT LANES

REVISIONS						SHEET NO. SI-29
NO.	BY:	DATE:	NO.	BY:	DATE:	
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2			4			

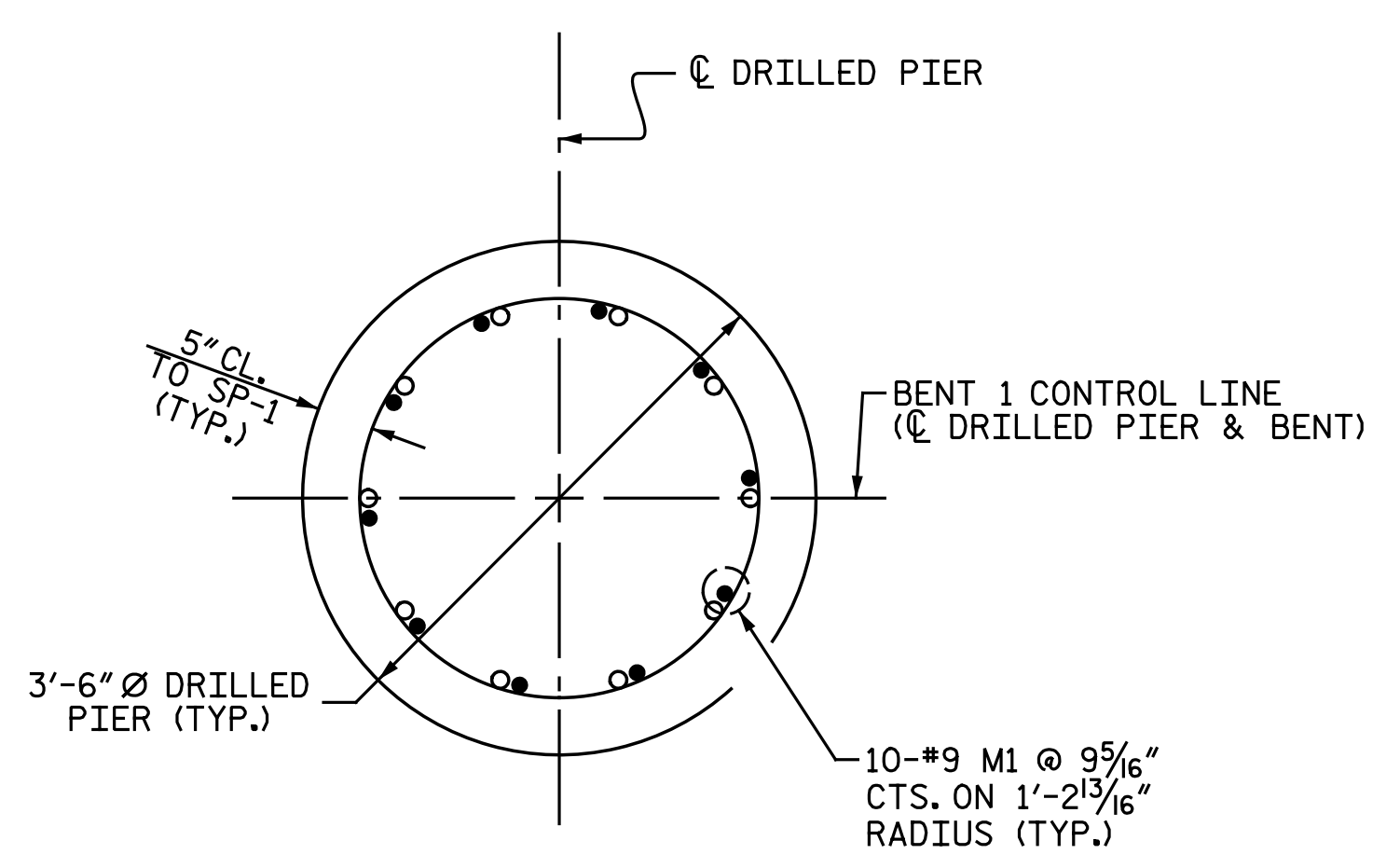


PLAN OF DRILLED PIERS & COLUMNS



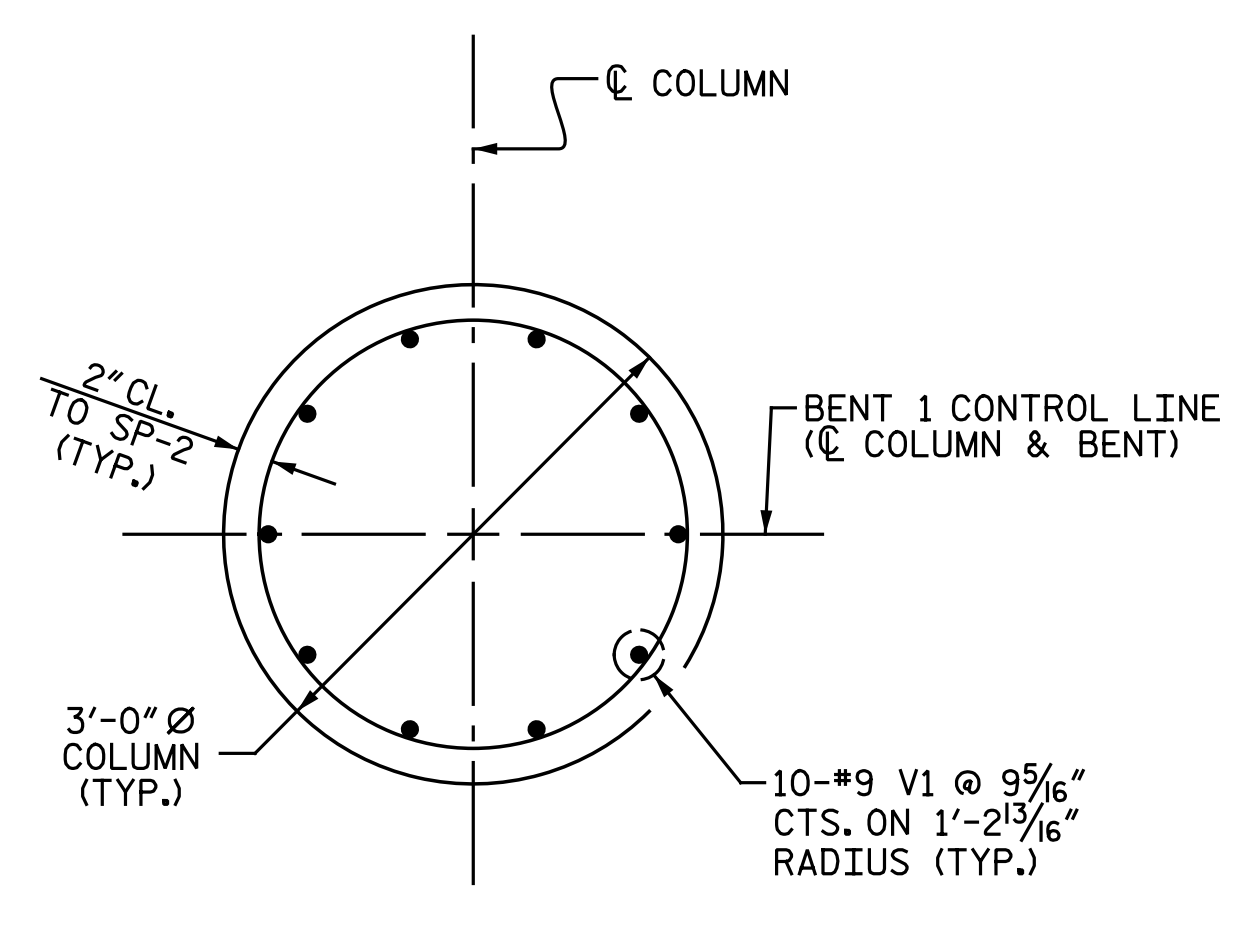
PLAN OF BEARING

ALL DIMENSIONS AND DETAILS SHOWN ARE TYPICAL FOR ALL BEARINGS AT EACH BRIDGE SEAT LOCATION.

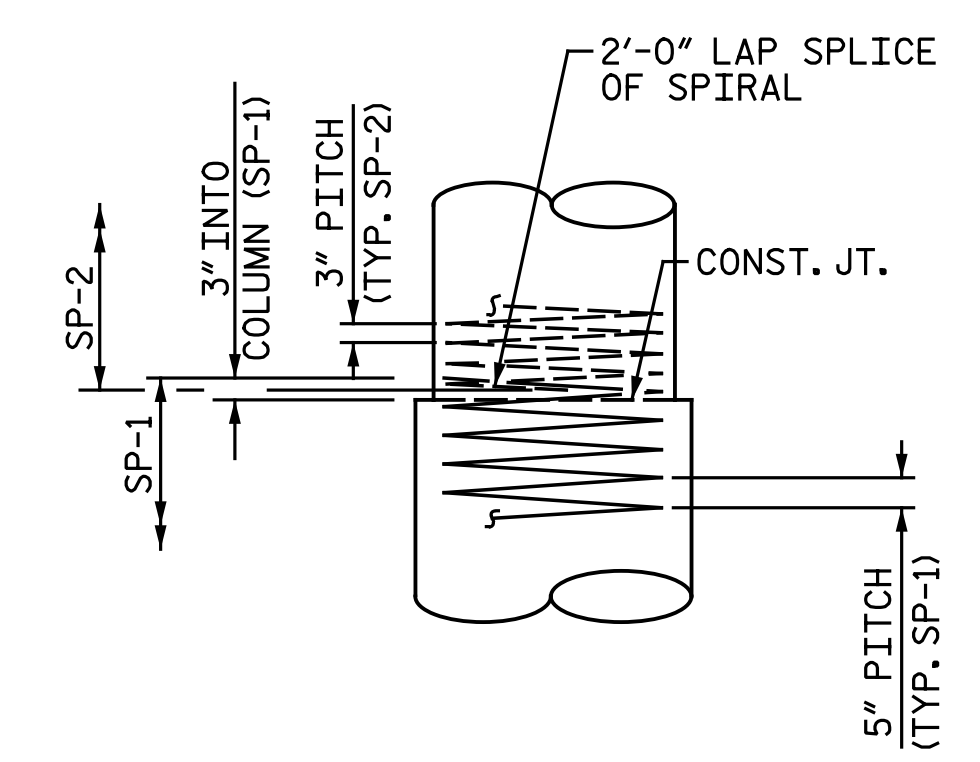


SECTION A-A

● #9 M1
○ #9 V1



SECTION B-B

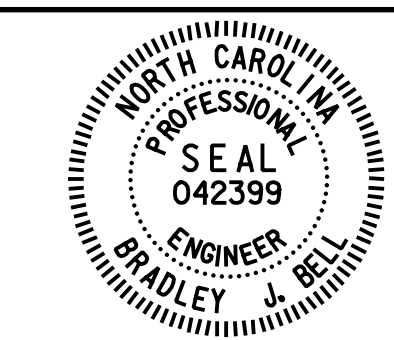


CONSTRUCTION JOINT DETAIL

PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1-
 SHEET 1 OF 2

DRAWN BY : C. E. MAYHEW DATE : 8-8-16
 CHECKED BY : I. M. GARRISON DATE : 8-25-16

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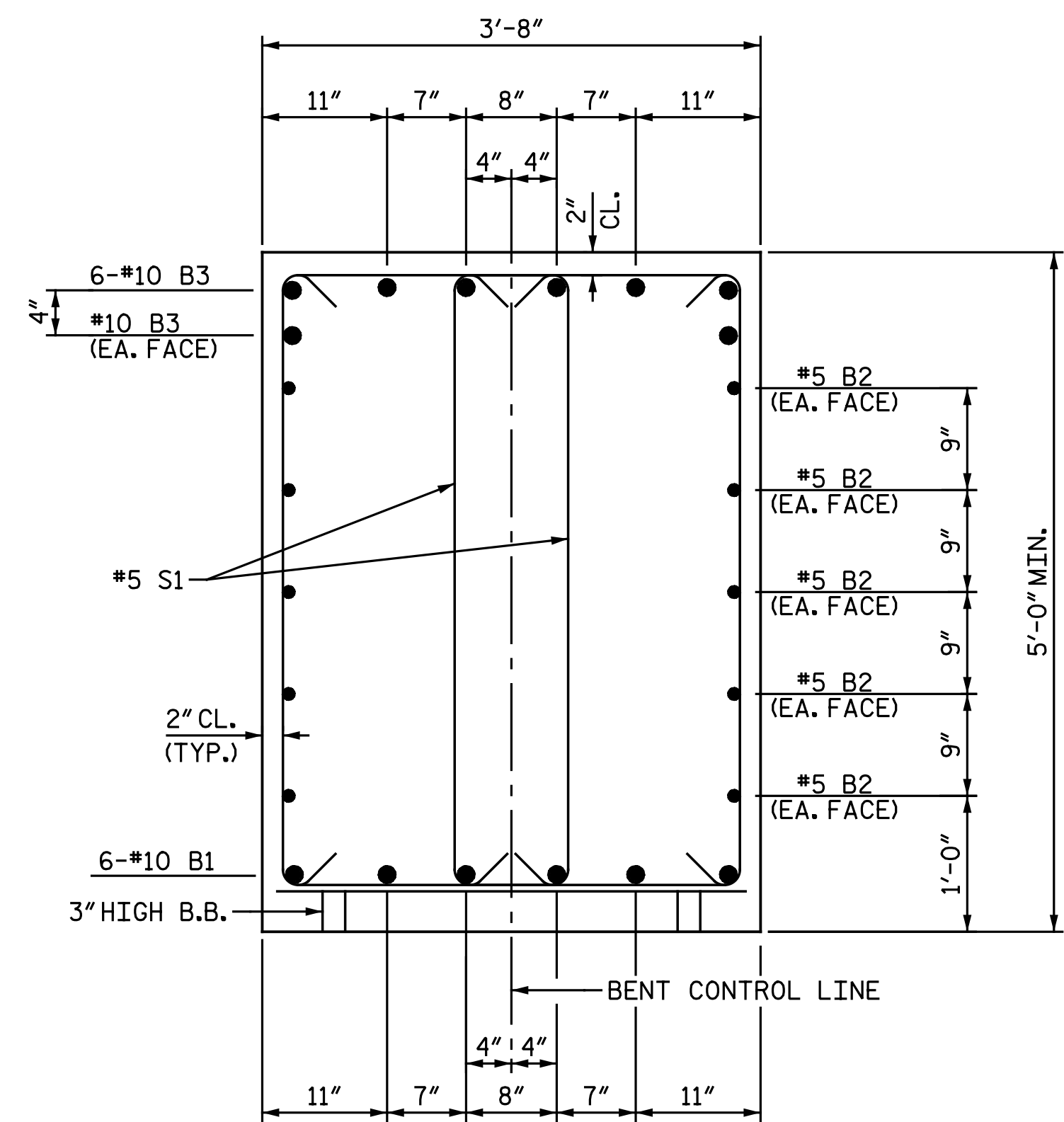


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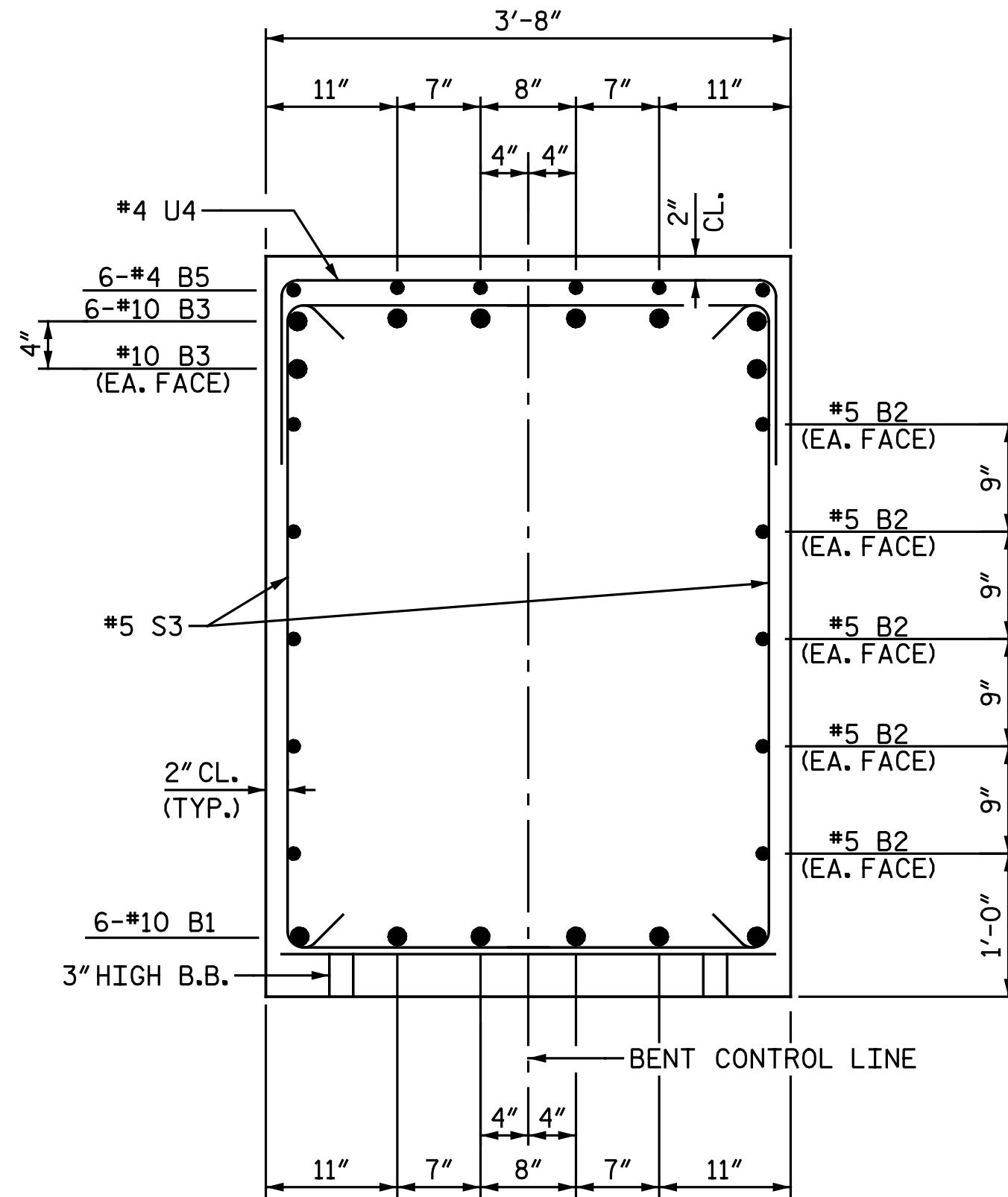
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT 1 DETAILS
 LEFT LANES

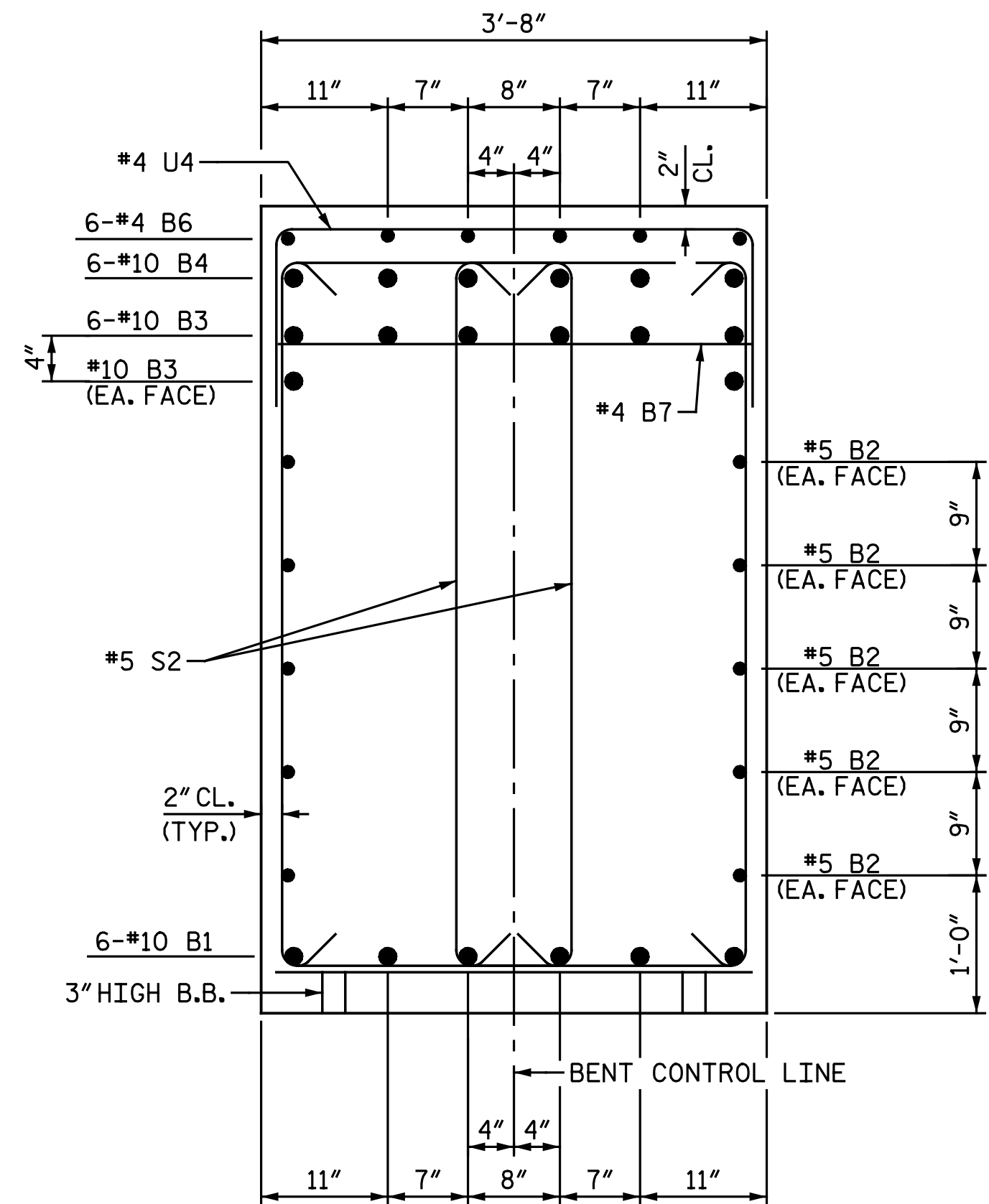
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NO.	BY:	DATE:	NO.	BY:	DATE:	SI-30
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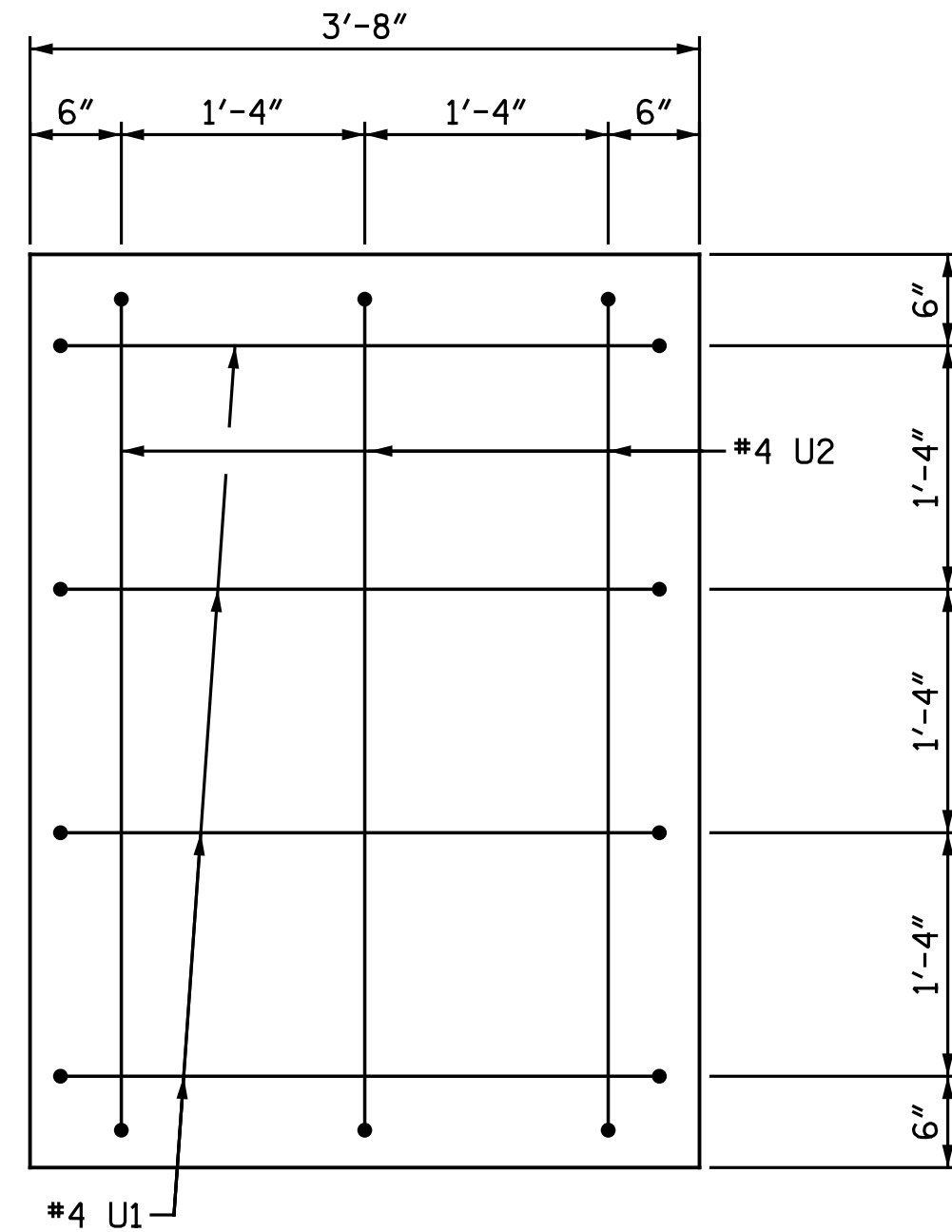
SECTION C-C
(INVERT ALTERNATE STIRRUP PAIRS)



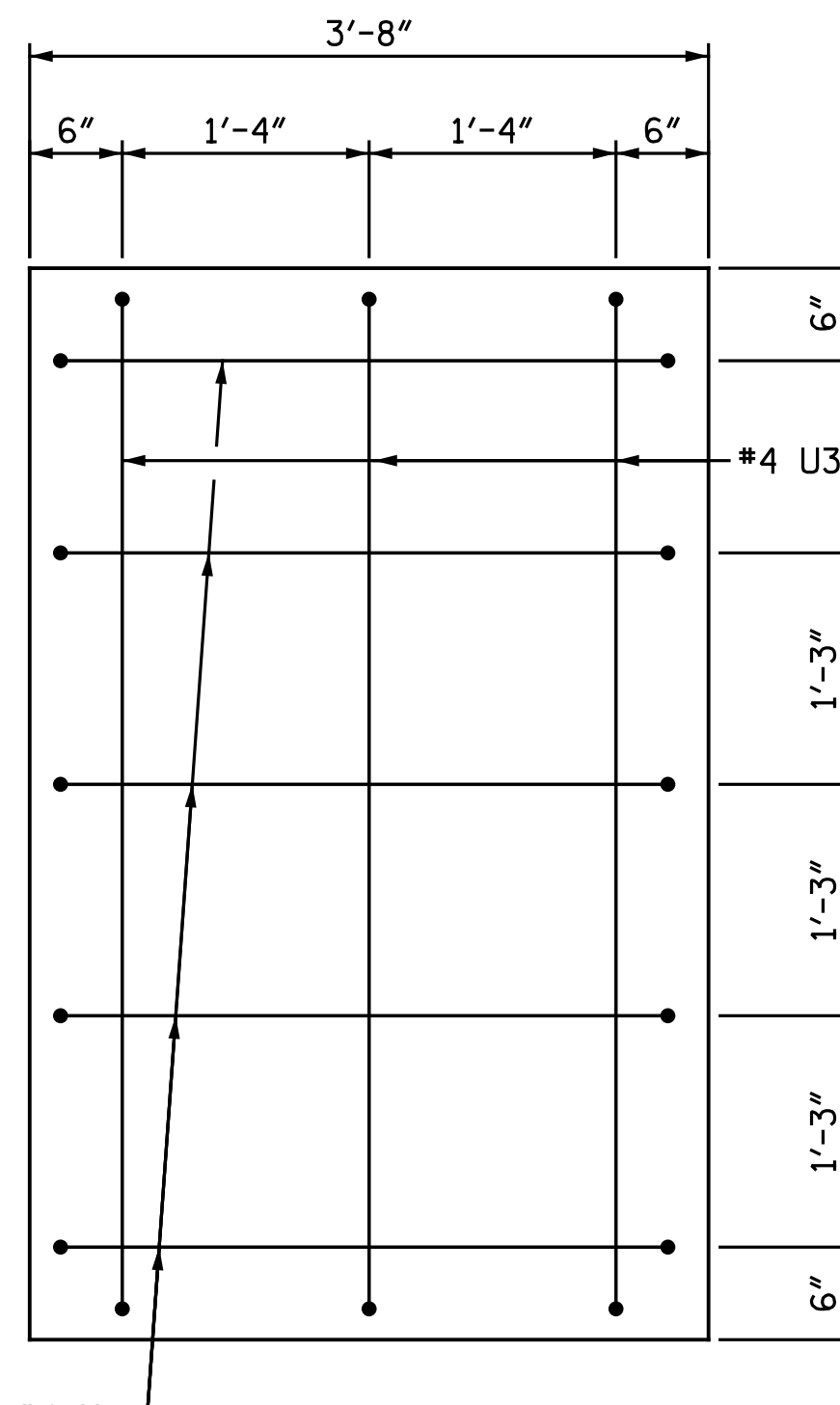
SECTION D-D
(INVERT ALTERNATE STIRRUPS)



SECTION E-E
(INVERT ALTERNATE STIRRUP PAIRS)

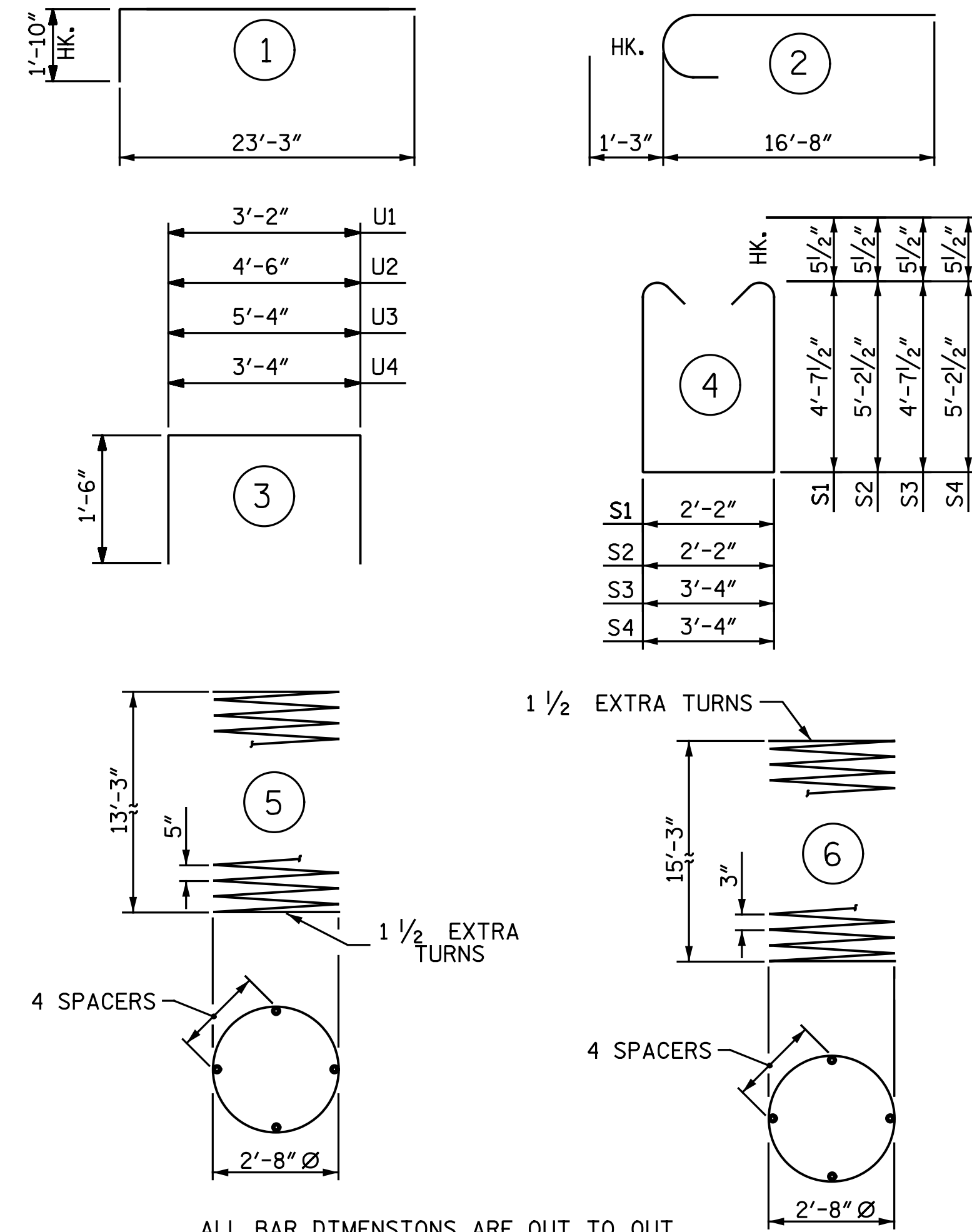


VIEW F-F
ONLY END STIRRUPS SHOWN FOR CLARITY.



VIEW G-G
ONLY END STIRRUPS SHOWN FOR CLARITY.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

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

BILL OF MATERIAL

BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#10	STR.	35' - 4"	912
B2	10	#5	STR.	35' - 4"	369
B3	16	#10	1	25' - 1"	1,727
B4	6	#10	STR.	13' - 5"	346
B5	6	#4	STR.	10' - 5"	42
B6	6	#4	STR.	2' - 10"	11
B7	4	#4	STR.	3' - 4"	9
M1	30	#9	STR.	21' - 0"	2,142
S1	18	#5	4	12' - 4"	232
S2	18	#5	4	13' - 6"	253
S3	17	#5	4	13' - 6"	239
S4	9	#5	4	14' - 8"	138
U1	9	#4	3	6' - 2"	37
U2	3	#4	3	7' - 6"	15
U3	3	#4	3	8' - 4"	17
U4	25	#4	3	6' - 4"	106
V1	30	#9	2	17' - 11"	1,828

REINFORCING STEEL LBS. 8,423

SP-1	3	*	5	273' - 11"	857
SP-2	3	**	6	515' - 8"	1,033

SPIRAL COLUMN REINFORCING STEEL LBS. 1,890

CLASS A CONCRETE				
POUR 2 - COLUMNS	C.Y.	11.8		
POUR 3 - CAP	C.Y.	25.9		
TOTAL CLASS A CONCRETE	C.Y.	37.7		

DRILLED PIER CONCRETE POUR 1 - DRILLED PIERS C.Y. 14.7

3'-6" DIA. DRILLED PIERS IN SOIL LIN. FT. 16

3'-6" DIA. DRILLED PIERS NOT IN SOIL LIN. FT. 26

SID INSPECTIONS EACH 1

CSL TESTING EACH 1

▲ CSL TUBES LIN. FT. 183.0

▲ NO SEPARATE PAYMENT WILL BE MADE FOR CSL TUBES. CSL TUBES WILL BE INCLUDED IN THE UNIT BID PRICE FOR DRILLED PIERS.

PROJECT NO. U-3330

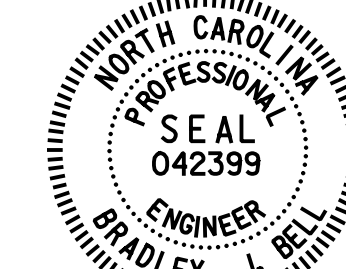
NASH COUNTY

STATION: 18+22.61 -Y1-

SHEET 2 OF 2

DRAWN BY: C. E. MAYHEW DATE: 8-18-16
 CHECKED BY: T. M. GARRISON DATE: 8-25-16

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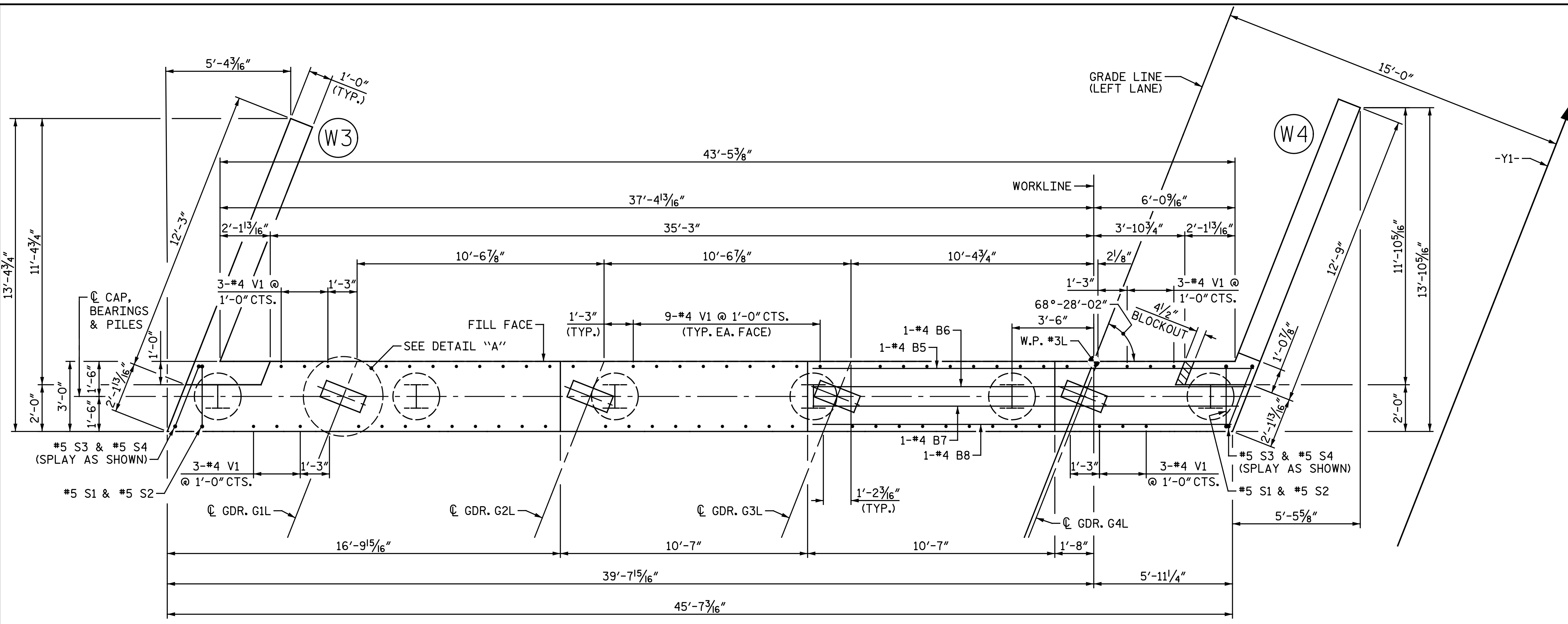
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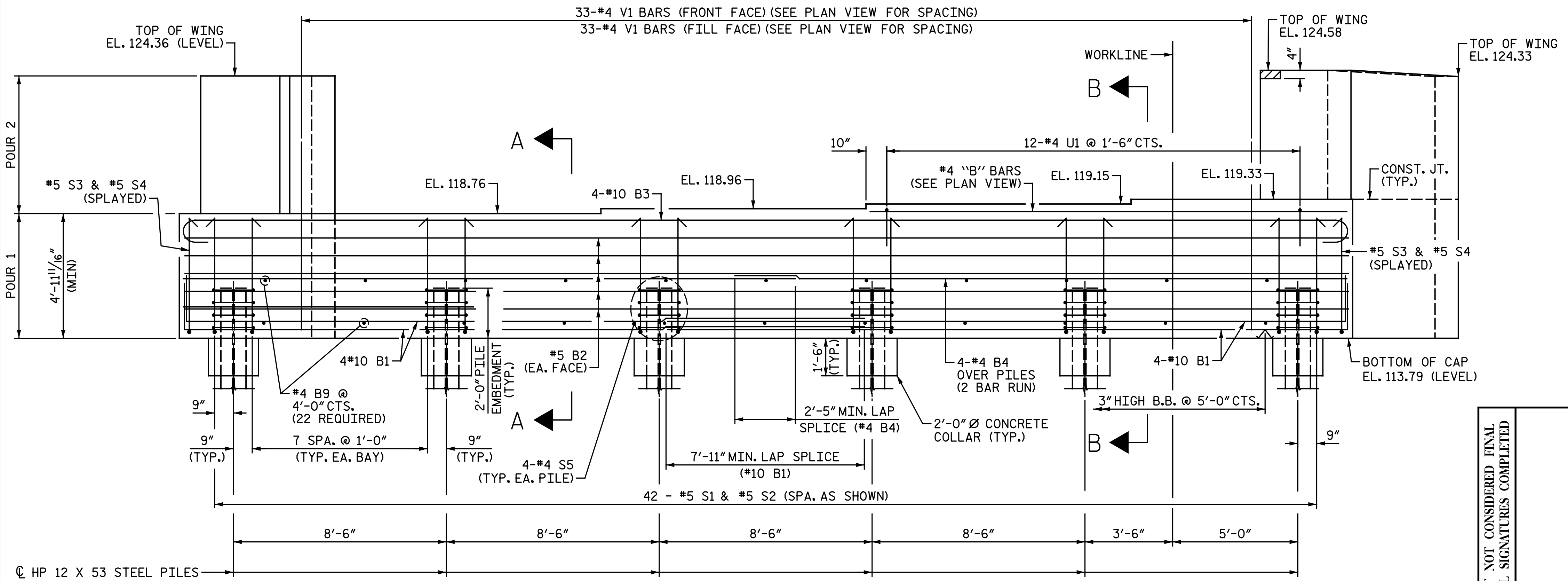
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 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT 1 DETAILS
 LEFT LANES

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PLAN



ELEVATION

NOTES:

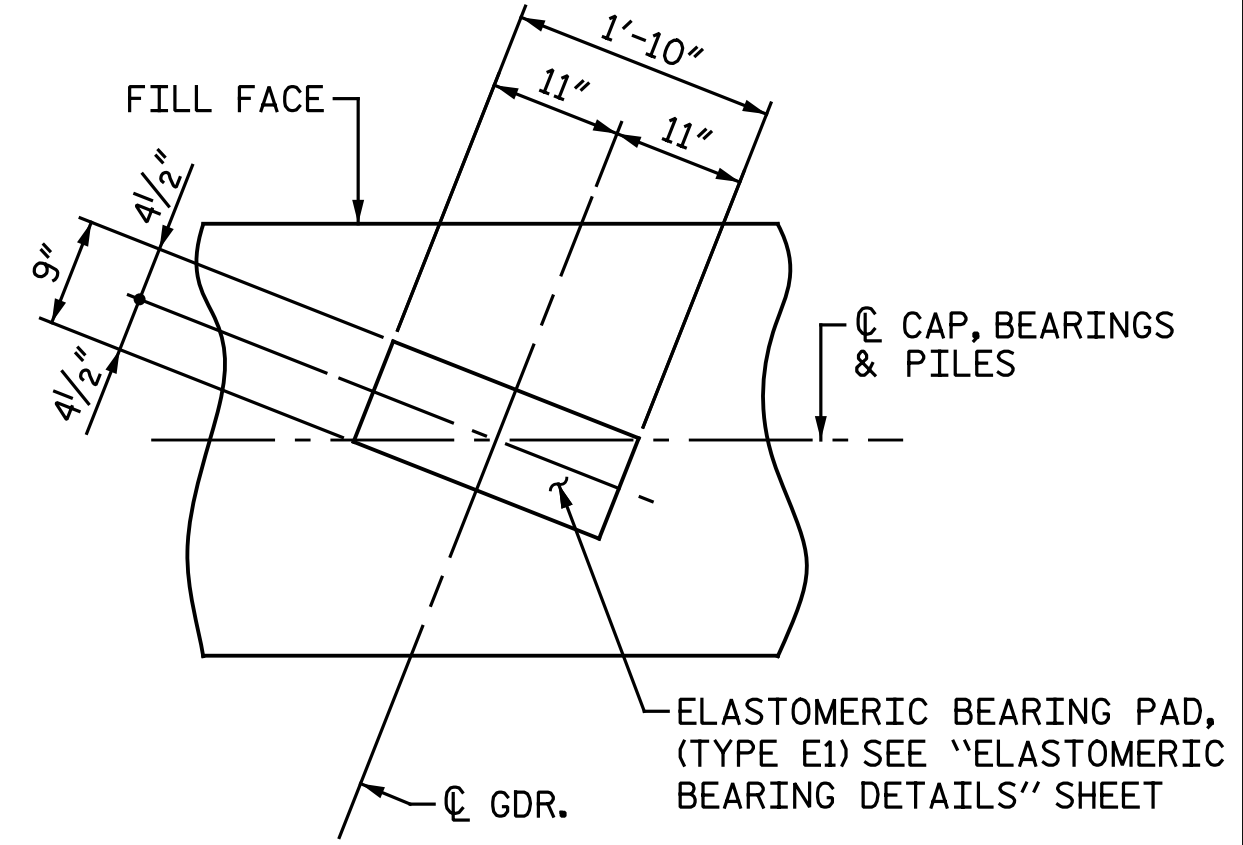
FOR "SECTION A-A" AND "SECTION B-B", SEE "INTEGRAL END BENT 2 DETAILS" SHEET.

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #4 V1 BARS.

THE TOP SURFACE OF THE END BENT CAP, EXCLUDING THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".

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

#4 B9 BARS MAY BE SHIFTED AS NECESSARY TO CLEAR THE STEEL PILES.



DETAIL "A"

ALL DIMENSIONS AND DETAILS SHOWN ARE TYPICAL FOR ALL BEARINGS AT EACH BRIDGE SEAT LOCATION.

PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1-
 SHEET 1 OF 2

DRAWN BY: M. D. MAYHEW DATE: 8-9-16
 CHECKED BY: J. M. GARRISON DATE: 8-12-16

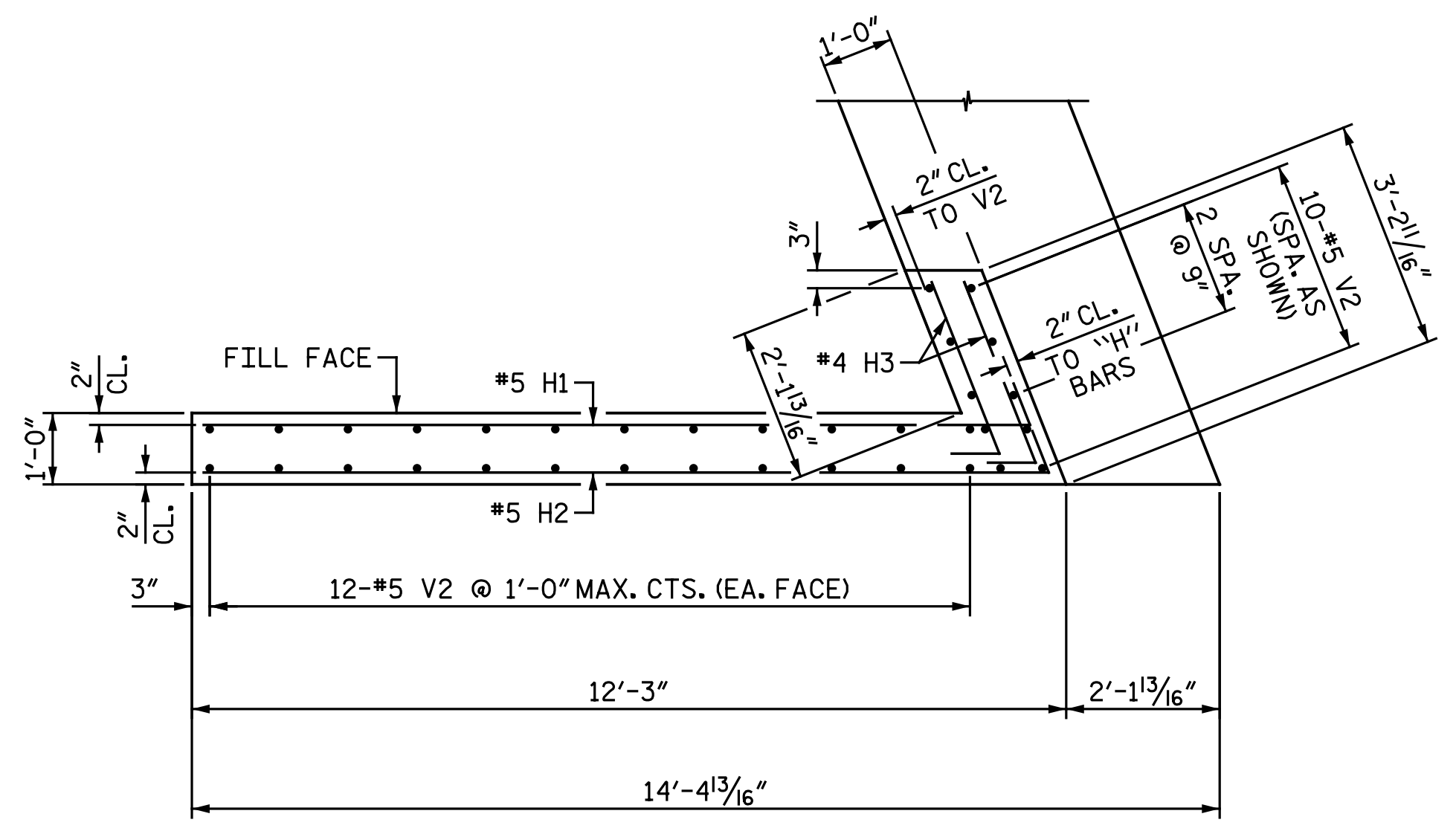
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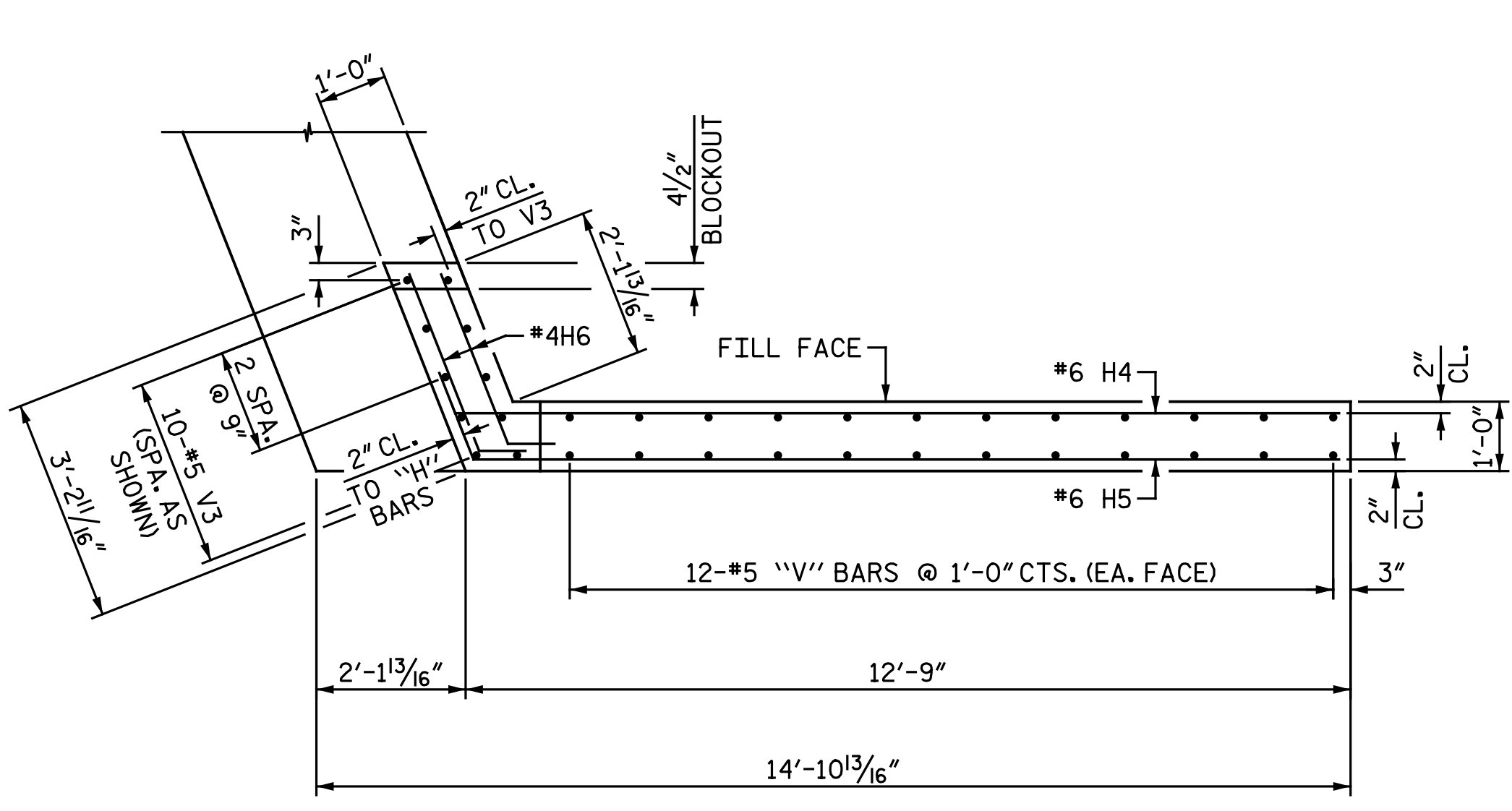
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 INTEGRAL END BENT 2
 LEFT LANES

REVISIONS						SHEET NO. SI-32
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2			4			

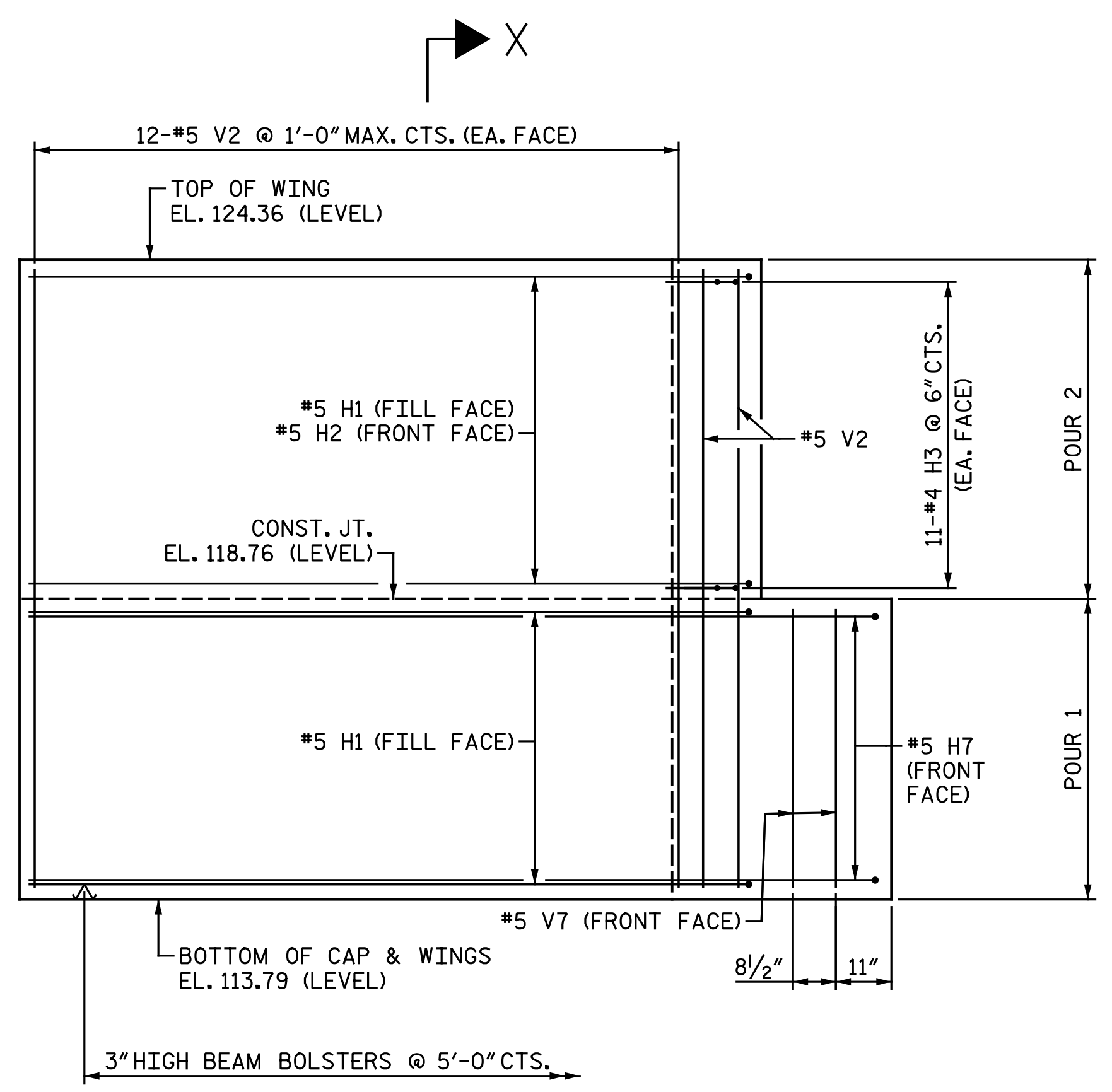
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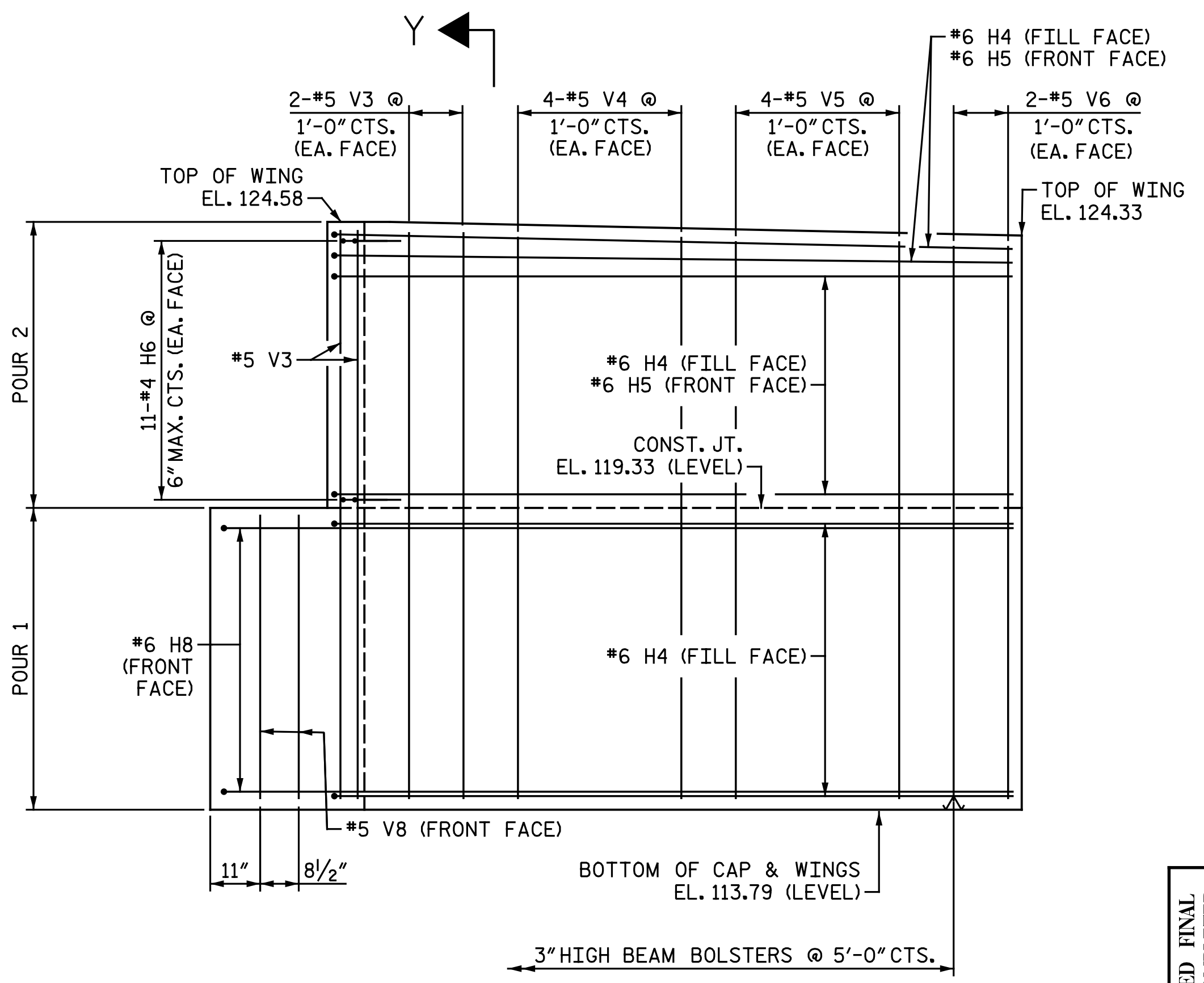
PLAN OF LEFT WING (W3)



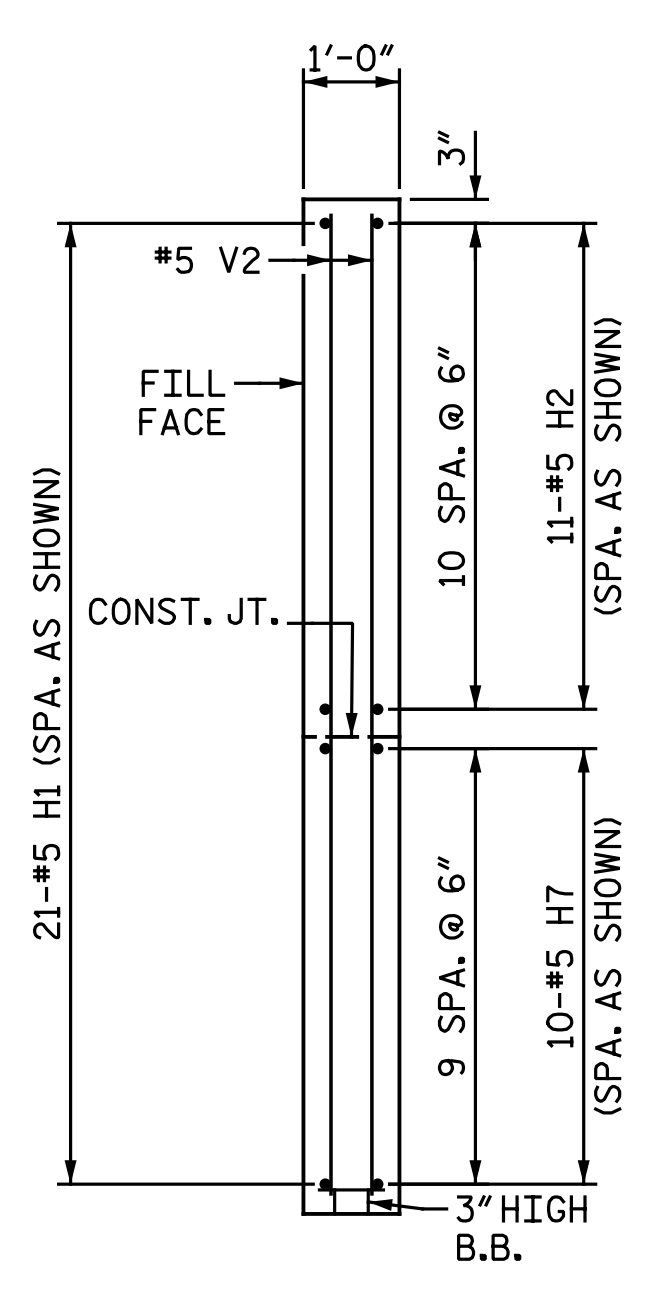
PLAN OF RIGHT WING (W4)



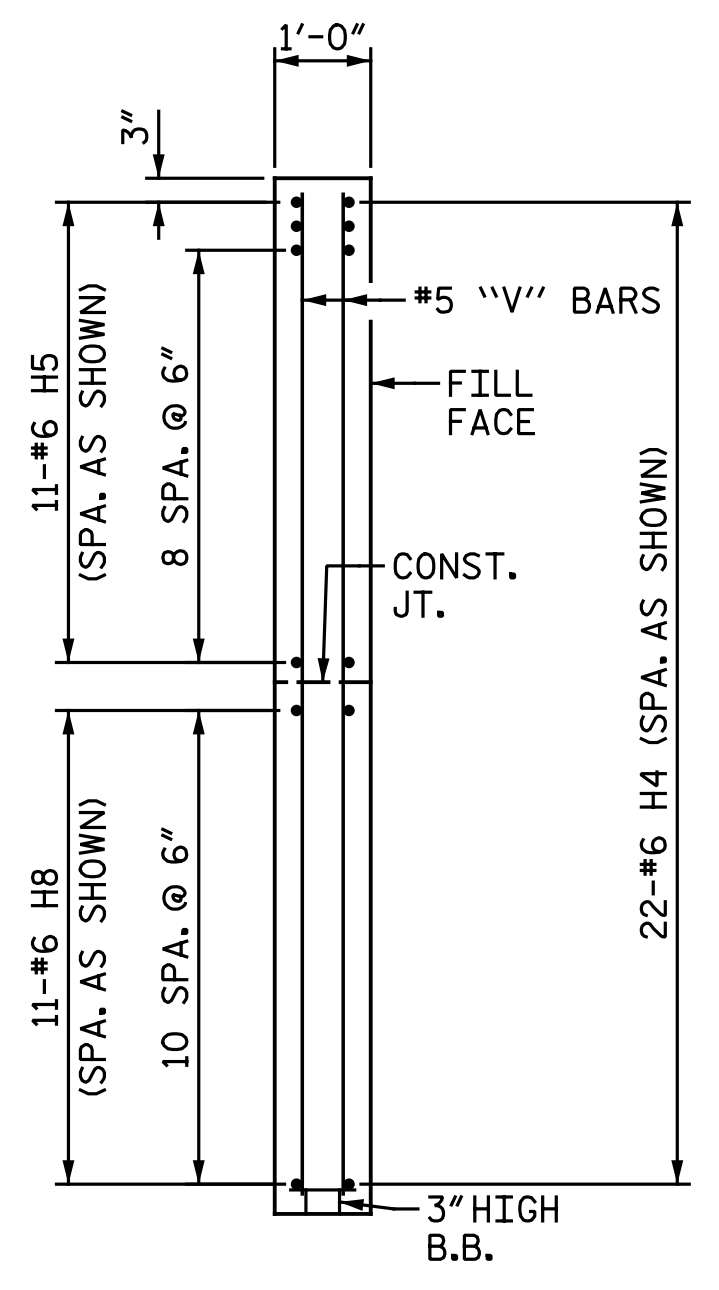
ELEVATION OF LEFT WING (W3)



ELEVATION OF RIGHT WING (W4)



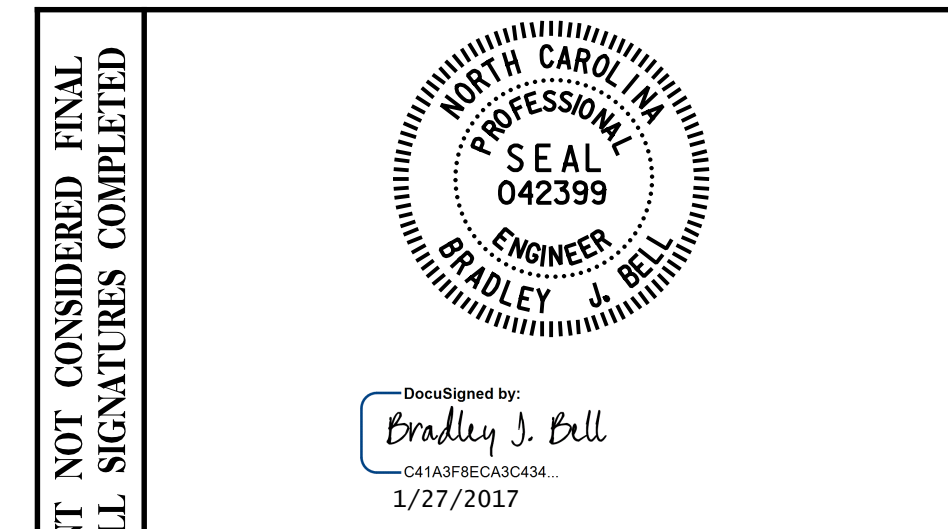
SECTION X-X



SECTION Y-Y

PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1-
 SHEET 2 OF 2

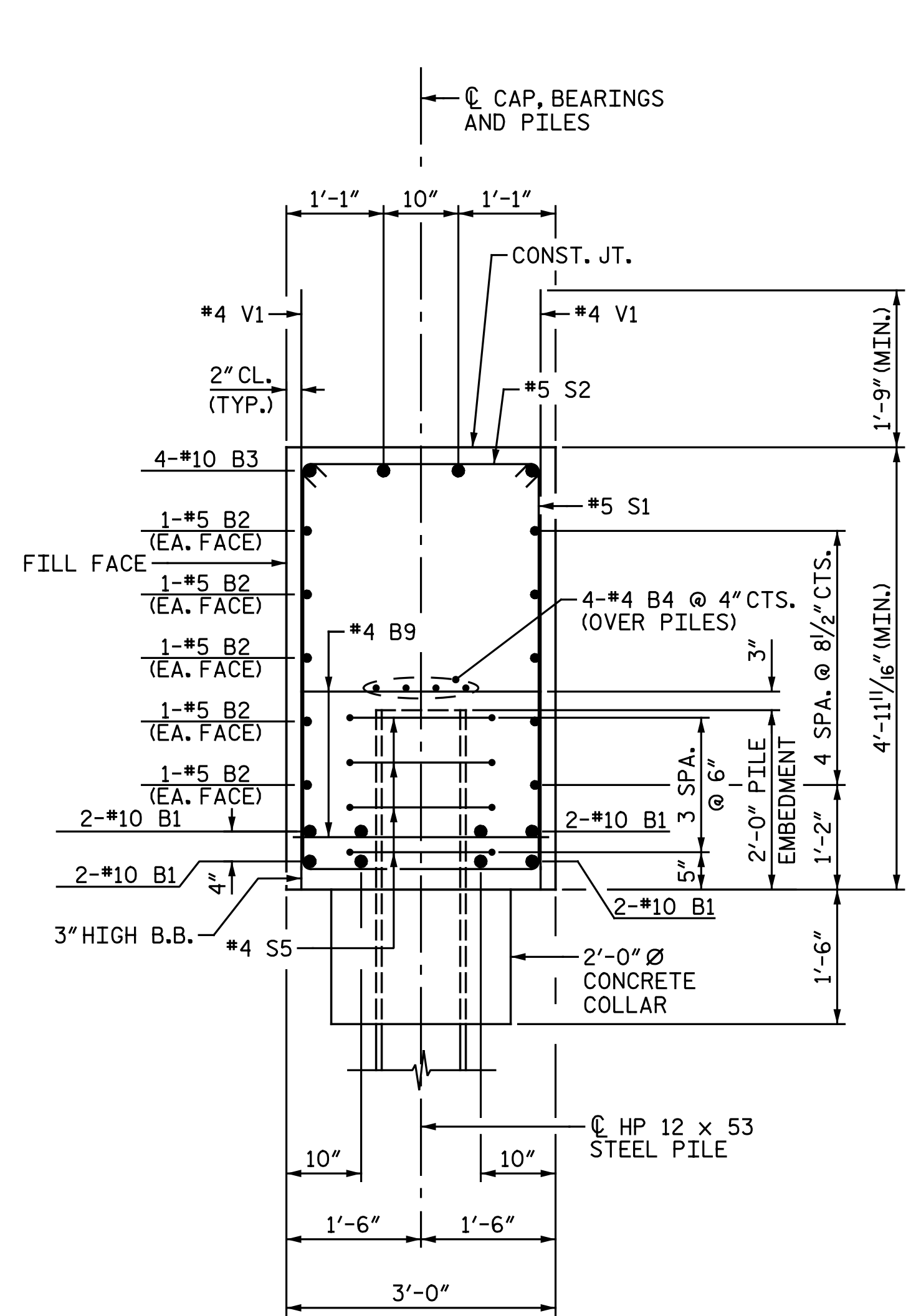
DRAWN BY: M. D. MAYHEW DATE: 8-9-16
 CHECKED BY: I. M. GARRISON DATE: 8-12-16



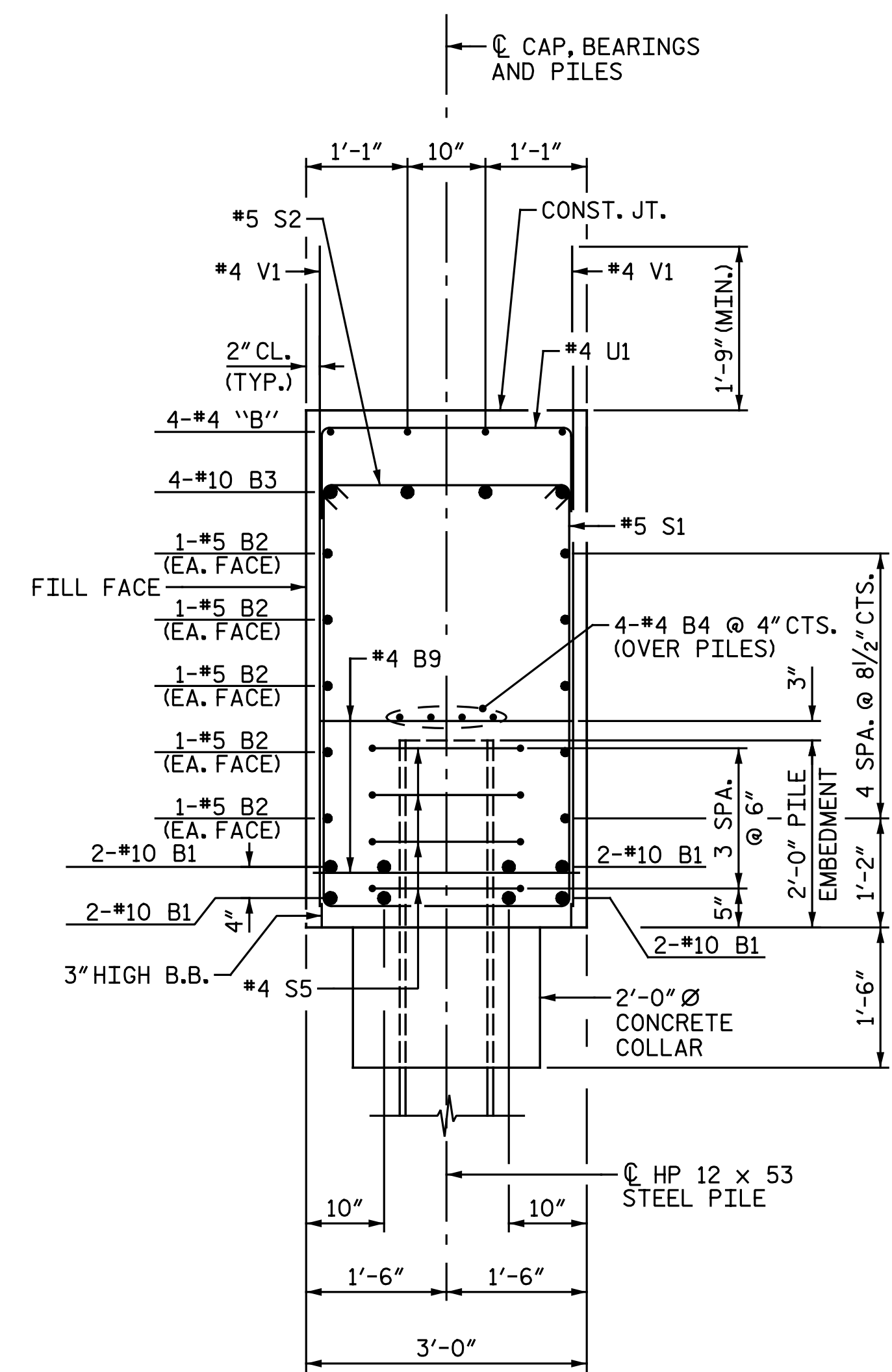
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 INTEGRAL END BENT 2
 LEFT LANES

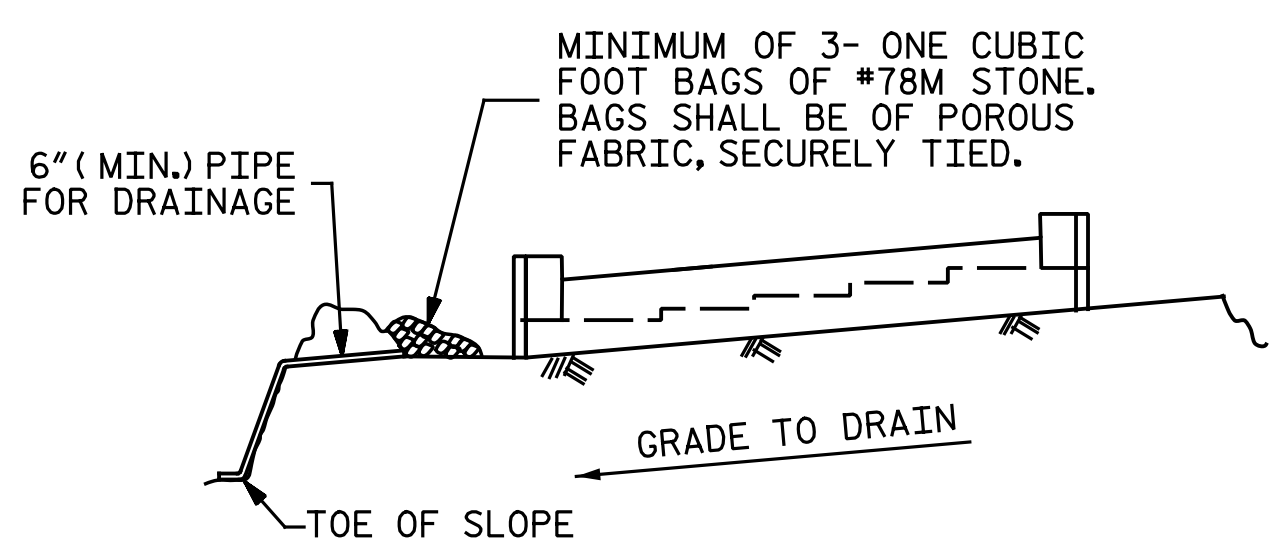
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SECTION A-A



SECTION B-B

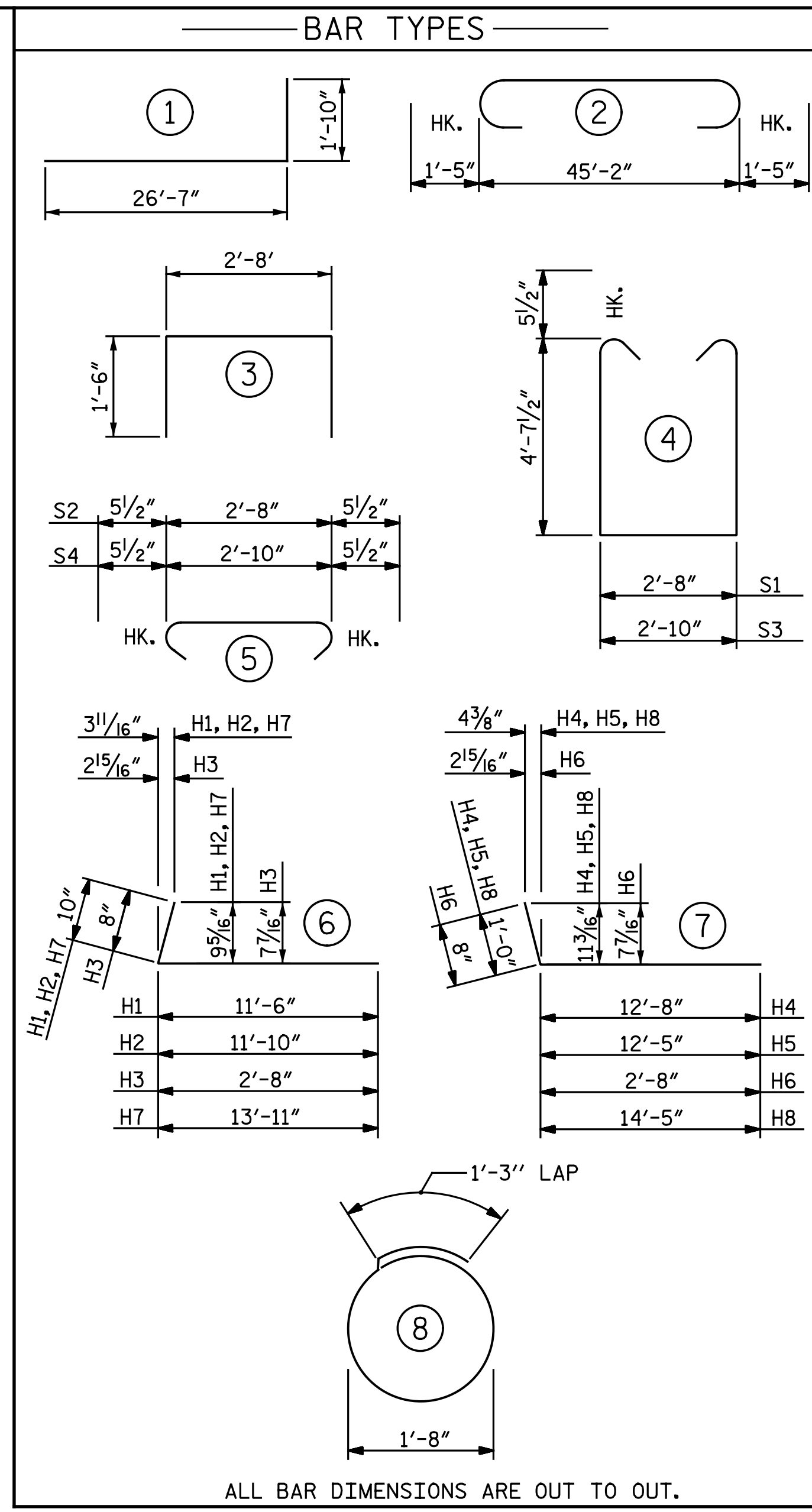


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

TEMPORARY DRAINAGE AT END BENT

DRAWN BY : M. D. MAYHEW DATE : 8-10-16
 CHECKED BY : J. M. GARRISON DATE : 8-12-16



ALL BAR DIMENSIONS ARE OUT TO OUT.

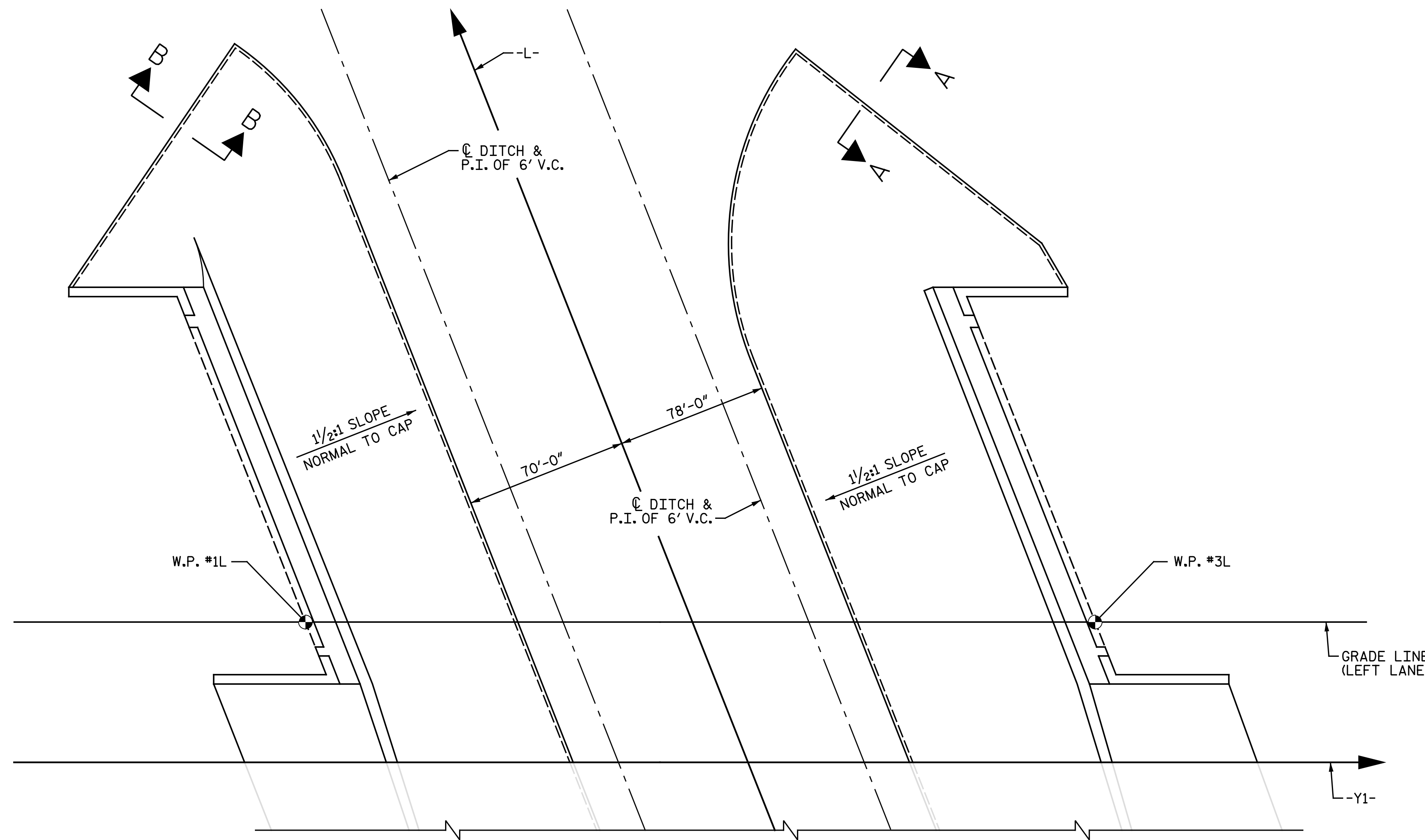
NOTES:
 FOR PILE SPLICE DETAILS, SEE "INTEGRAL END BENT 1 DETAILS", SHEET 2 OF 2.

BILL OF MATERIAL					
END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	16	#10	1	28' - 5"	1,956
B2	10	#5	STR.	45' - 2"	471
B3	4	#10	2	48' - 0"	826
B4	8	#4	STR.	23' - 10"	127
B5	1	#4	STR.	18' - 10"	13
B6	1	#4	STR.	18' - 6"	12
B7	1	#4	STR.	18' - 2"	12
B8	1	#4	STR.	17' - 11"	12
B9	22	#4	STR.	2' - 8"	39
H1	21	#5	6	12' - 4"	270
H2	11	#5	6	12' - 8"	145
H3	22	#4	6	3' - 4"	49
H4	22	#6	7	13' - 4"	452
H5	11	#6	7	13' - 5"	222
H6	22	#4	7	3' - 4"	49
H7	10	#5	6	14' - 9"	154
H8	11	#6	7	15' - 5"	255
S1	42	#5	4	12' - 10"	562
S2	42	#5	5	3' - 7"	157
S3	2	#5	4	13' - 0"	27
S4	2	#5	5	3' - 9"	8
S5	24	#4	8	6' - 6"	104
U1	12	#4	3	5' - 8"	45
V1	66	#4	STR.	7' - 8"	338
V2	34	#5	STR.	10' - 2"	361
V3	14	#5	STR.	10' - 5"	152
V4	8	#5	STR.	10' - 4"	86
V5	8	#5	STR.	10' - 3"	86
V6	4	#5	STR.	10' - 2"	42
V7	2	#5	STR.	4' - 6"	9
V8	2	#5	STR.	5' - 1"	11
REINFORCING STEEL				LBS.	7,052
CLASS A CONCRETE					
POUR 1 -					
CAP, LOWER PART OF					
WINGS & COLLARS				C.Y.	31.9
POUR 2 -					
UPPER PART OF WINGS				C.Y.	5.9
TOTAL				C.Y.	37.8
HP 12 x 53 STEEL PILES					
NO. 6				L.F.	120
PILE DRIVING EQUIPMENT					
SETUP FOR HP 12 x 53					
STEEL PILES				EA.	6

PROJECT NO. U-3330
 NASH COUNTY
 STATION: 18+22.61 -Y1-

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		REVISIONS					
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PLAN

FOR BERM WIDTHS AND ELEVATIONS SEE GENERAL DRAWING AND "SLOPE PROTECTION DETAILS" SHEET 2 OF 2.

GENERAL NOTES

STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT.

MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS.

FOR BERM WIDTH, SEE GENERAL DRAWING.

SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET.

CONCRETE SHALL BE CLASS "B".

THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED.

WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE.

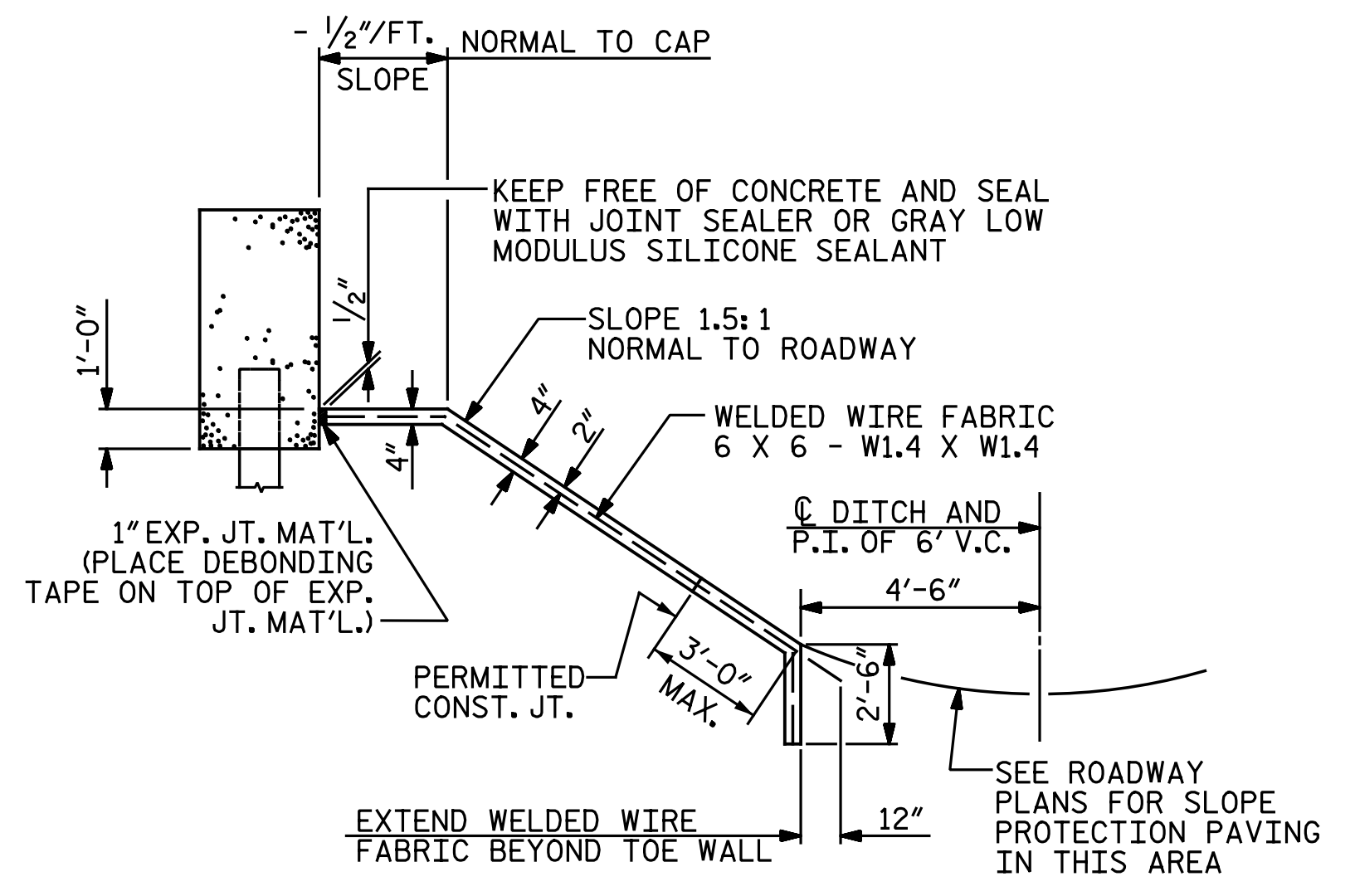
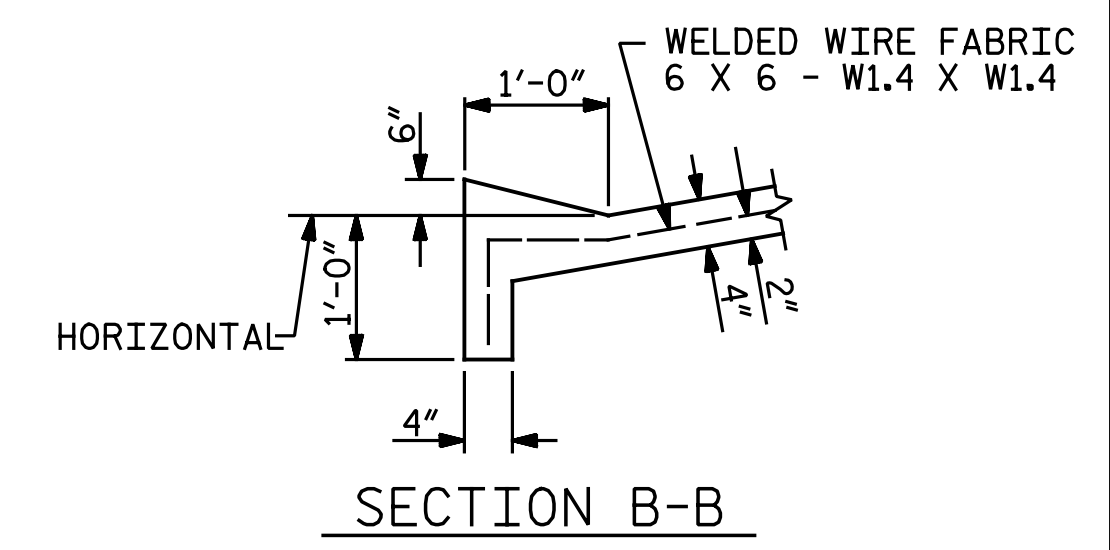
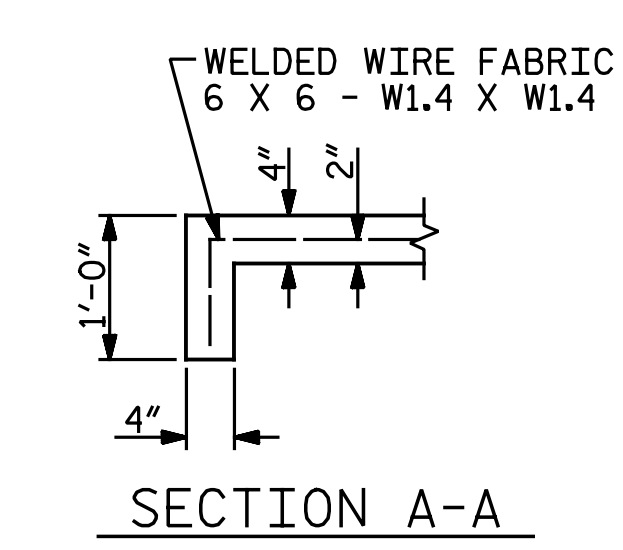
SLOPE PROTECTION SHALL BE POURED IN 5' STRIPS AS SHOWN IN THE "POURING DETAIL" WITH 2'-0" LONG #4 BARS PLACED ALONG THE SLOPE BETWEEN STRIPS AT 1'-6" MAXIMUM SPACING.

SLOPE PROTECTION MAY BE POURED IN ALTERNATE 4' AND 5' STRIPS AS SHOWN IN THE "OPTIONAL POURING DETAIL" WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6".

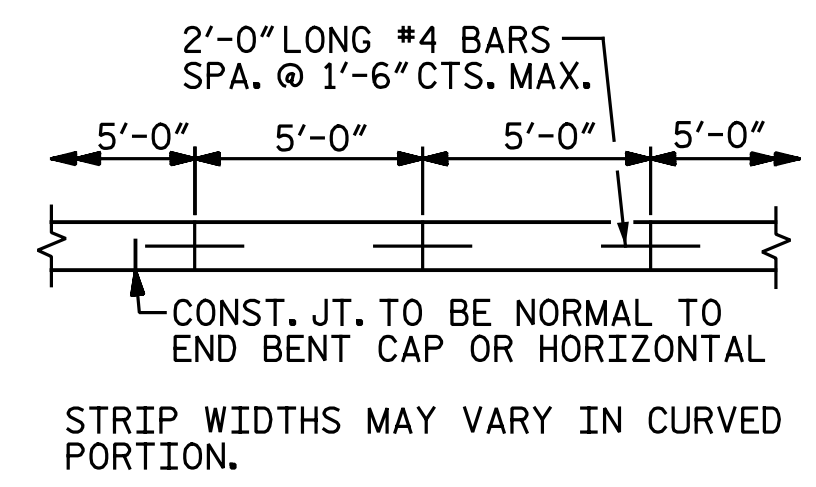
THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

BRIDGE @ STA. 18+22.61 -Y1- (LEFT LANE)	4 INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	241	482
END BENT 2	264	528

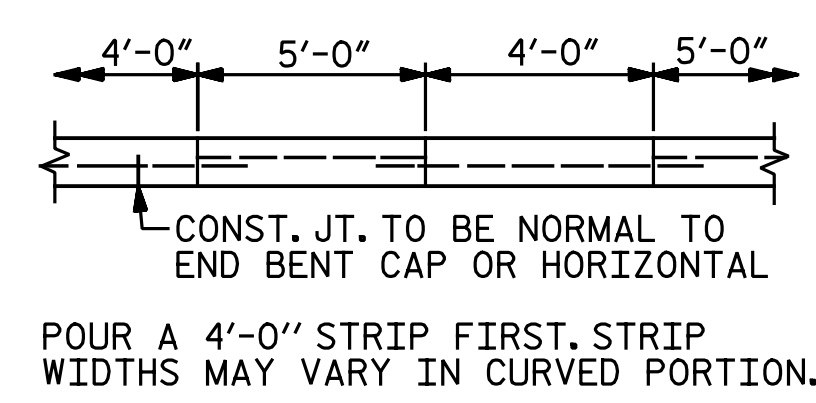
* QUANTITY SHOWN IS BASED ON 5' POURS.



SECTION ALONG C SURVEY WHEN FILL CATCHES IN DITCH



POURING DETAIL



OPTIONAL POURING DETAIL

PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1-
 SHEET 1 OF 2

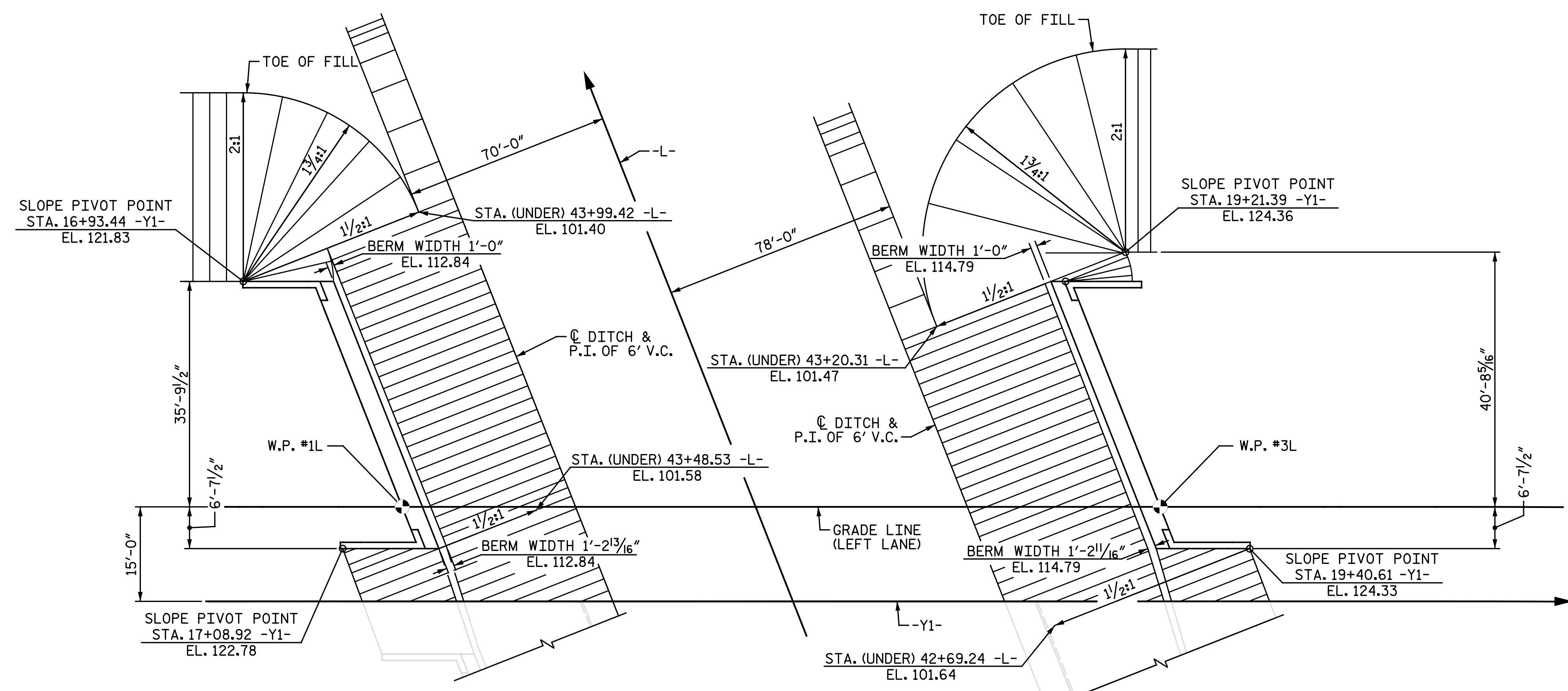
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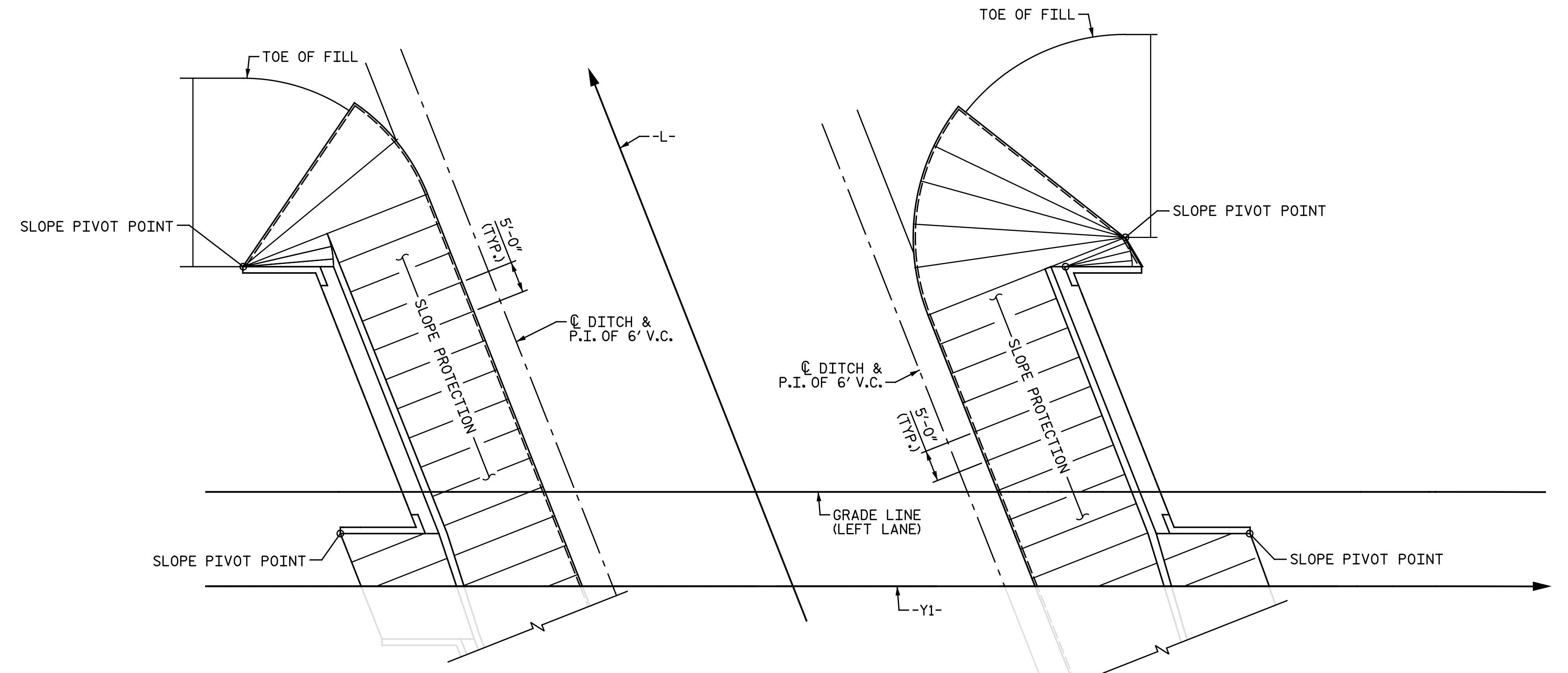
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END BENT 1 PLAN - GRADING END BENT 2

PLAN - GRADING



END BENT 1 PLAN - CONCRETE PLACEMENT END BENT 2

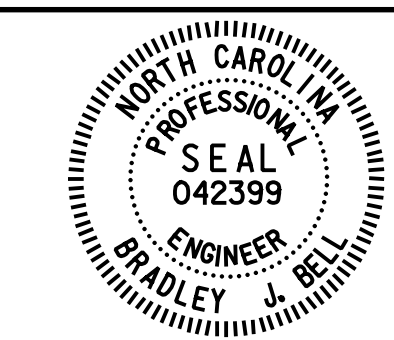
PLAN - CONCRETE PLACEMENT

(1 1/2:1 SLOPE)

PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1-
 SHEET 2 OF 2

DRAWN BY: M. D. MAYHEW DATE: 9-6-16
 CHECKED BY: J. M. GARRISON DATE: 9-7-16

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 CA1A3F8E3A30434
 1/27/2017

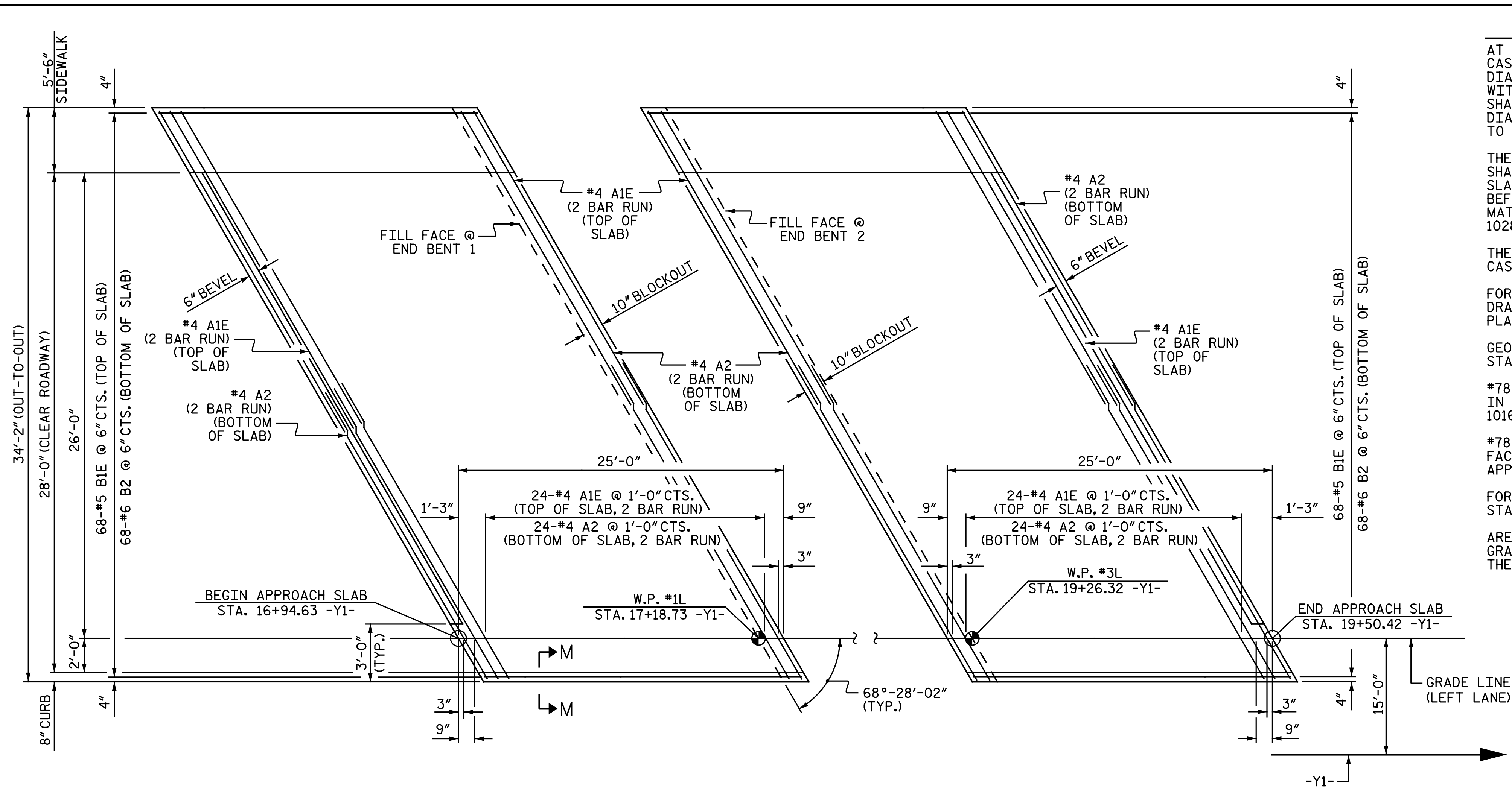
Michael Baker
 INTERNATIONAL

Michael Baker Engineering
 8000 Regency Parkway, Suite 600
 Cary, North Carolina 27518
 NC License No.: F-1084

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

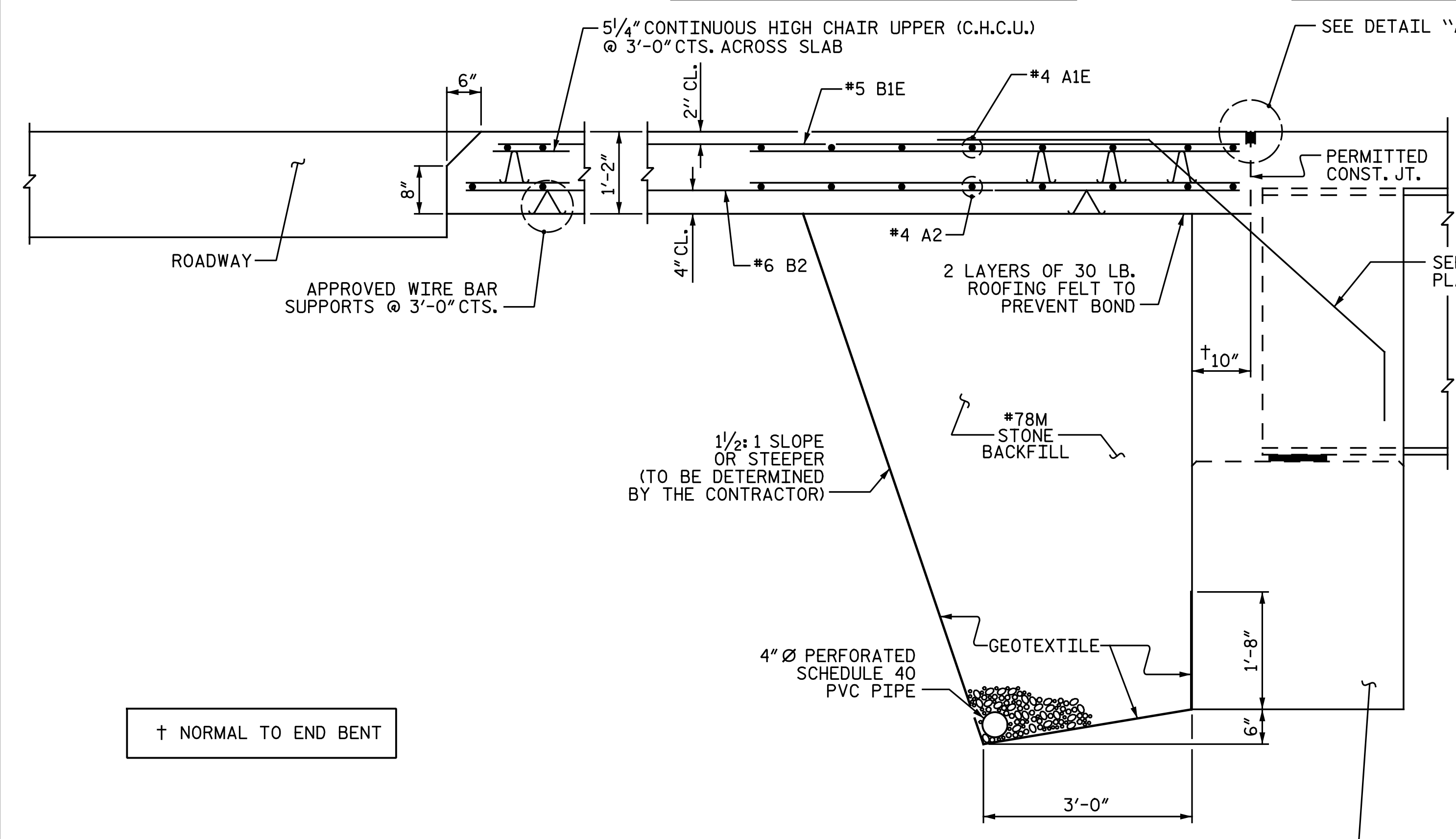
SLOPE PROTECTION
 DETAILS
 LEFT LANES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-36
1			3			TOTAL SHEETS
2			4			38



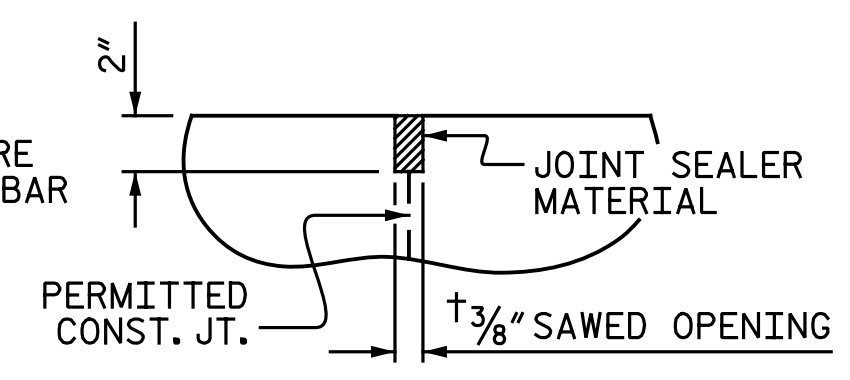
PLAN @ END BENT 1

PLAN @ END BENT 2

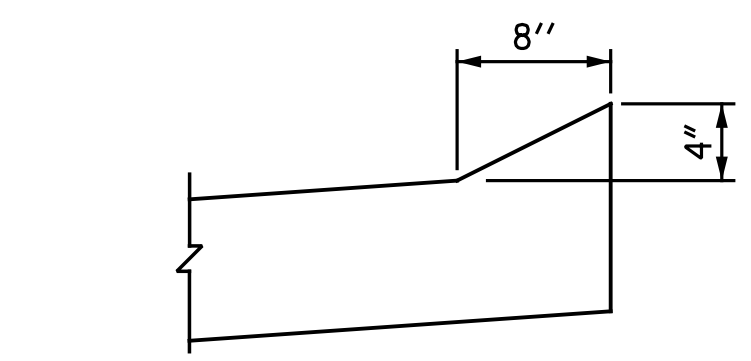


SECTION THRU SLAB

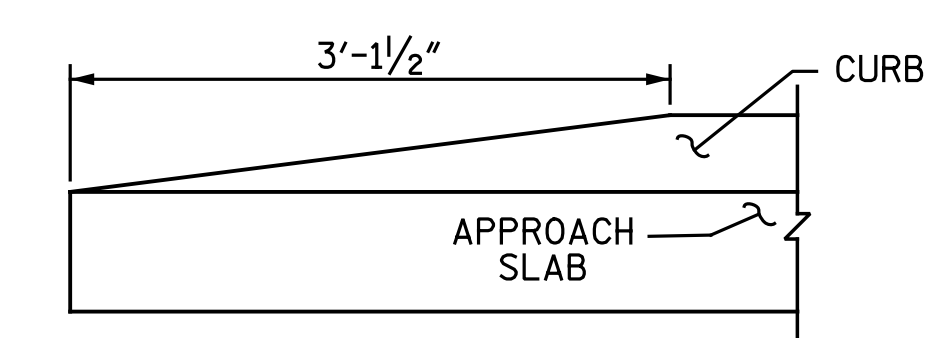
SEE INTEGRAL END BENT SHEETS FOR DETAILS



DETAIL "A"



SECTION M-M



END OF CURB WITHOUT SHOULDER BERM GUTTER

NOTES

AT THE CONTRACTOR'S OPTION, THE APPROACH SLAB MAY BE CAST MONOLITHICALLY WITH THE INTEGRAL END BENT DIAPHRAGM AND THE END SECTION OF BRIDGE DECK. IF CAST WITH THE INTEGRAL DIAPHRAGM, THE LAYERS OF ROOFING FELT SHALL BE OMITTED. IF CAST SEPARATE FROM THE INTEGRAL DIAPHRAGM, APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.

THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWED NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.

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

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.

BILL OF MATERIAL

APPROACH SLAB AT END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1E	52	#4	STR.	19' - 3"	669
A2	52	#4	STR.	19' - 1"	663
B1E	68	#5	STR.	24' - 2"	1,714
B2	68	#6	STR.	24' - 8"	2,519
B3E	4	#4	STR.	24' - 8"	66
G1E	25	#4	STR.	5' - 3"	88
U1E	8	#4	1	3' - 0"	16

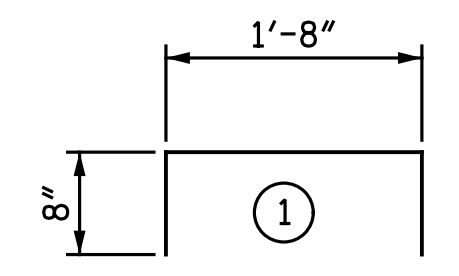
EPOXY COATED REINFORCING STEEL	LBS.	2,553
REINFORCING STEEL	LBS.	3,182
CLASS AA CONCRETE	C.Y.	40.0

BILL OF MATERIAL

APPROACH SLAB AT END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1E	52	#4	STR.	19' - 3"	669
A2	52	#4	STR.	19' - 1"	663
B1E	68	#5	STR.	24' - 2"	1,714
B2	68	#6	STR.	24' - 8"	2,519
B3E	4	#4	STR.	24' - 8"	66
G1E	25	#4	STR.	5' - 3"	88
U1E	8	#4	1	3' - 0"	16

EPOXY COATED REINFORCING STEEL	LBS.	2,553
REINFORCING STEEL	LBS.	3,182
CLASS AA CONCRETE	C.Y.	40.0

BAR TYPE



ALL BAR DIMENSIONS ARE OUT TO OUT.

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

PROJECT NO. U-3330
 NASH COUNTY
 STATION: 18+22.61 -Y1-

DRAWN BY: N. B. SPEAKS DATE: 6-30-16
 CHECKED BY: A. H. SHARPE DATE: 9-2-16

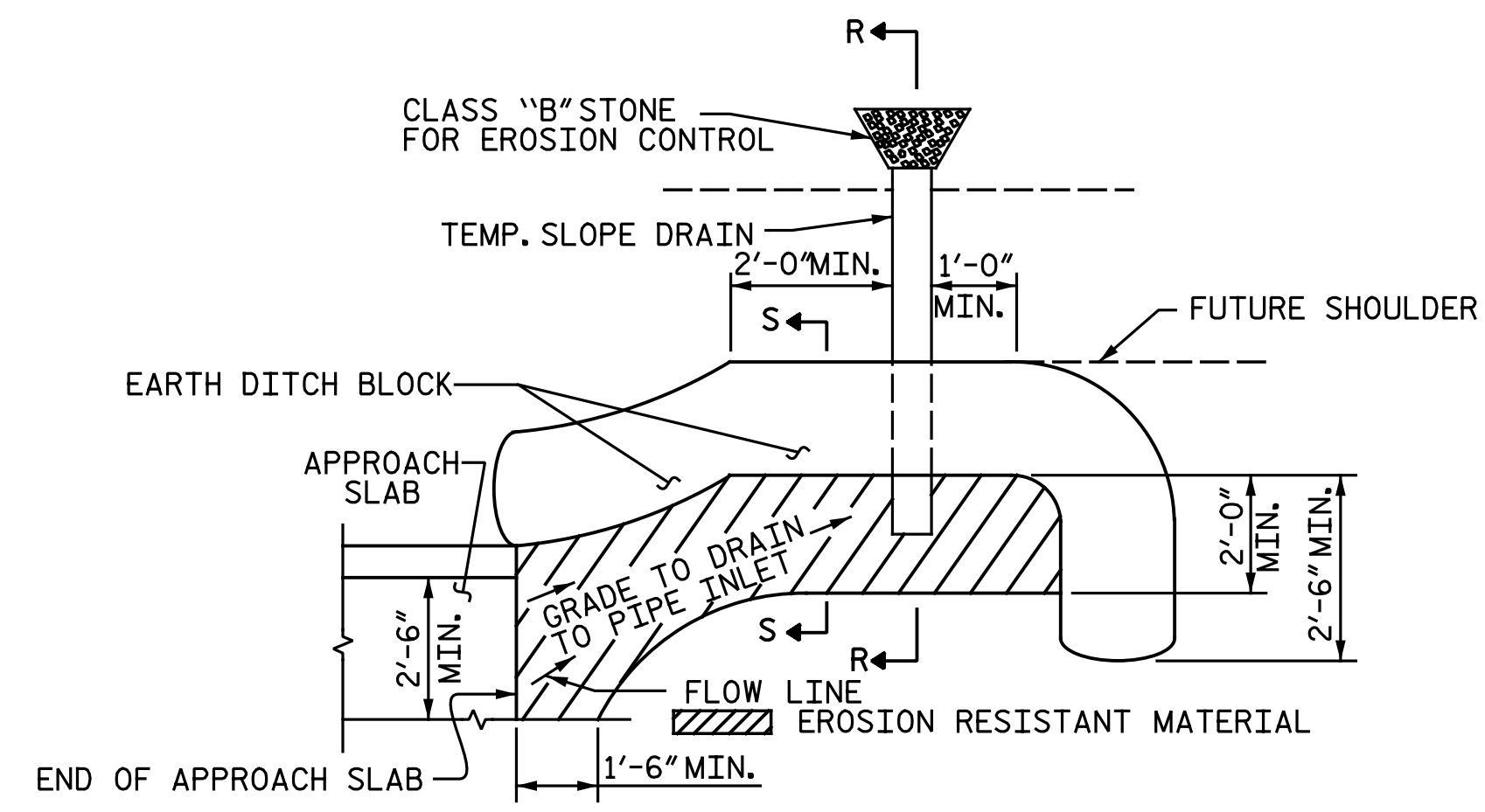
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Professional Engineer Seal for Bradley J. Bell, License No. 042399, dated 1/27/2017.

Michael Baker Engineering
 8000 Regency Parkway, Suite 600
 Cary, North Carolina 27518
 NC License No.: F-1084

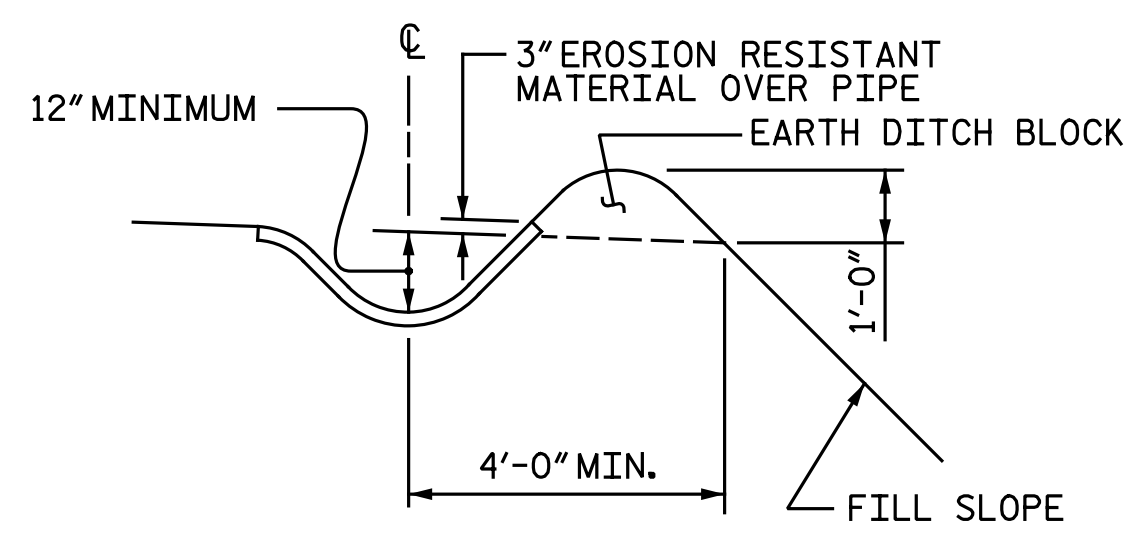
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. SI-37
 TOTAL SHEETS 38

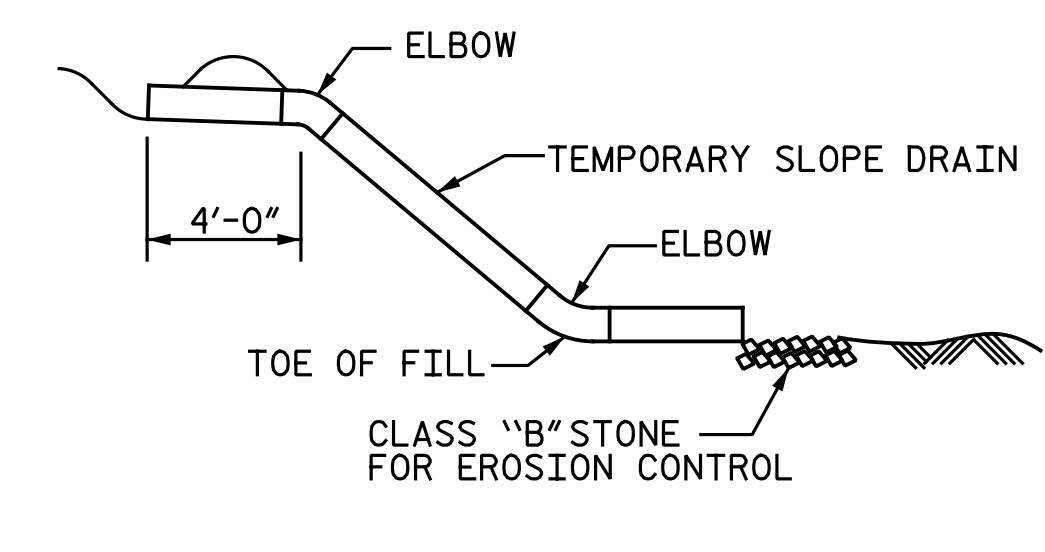


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

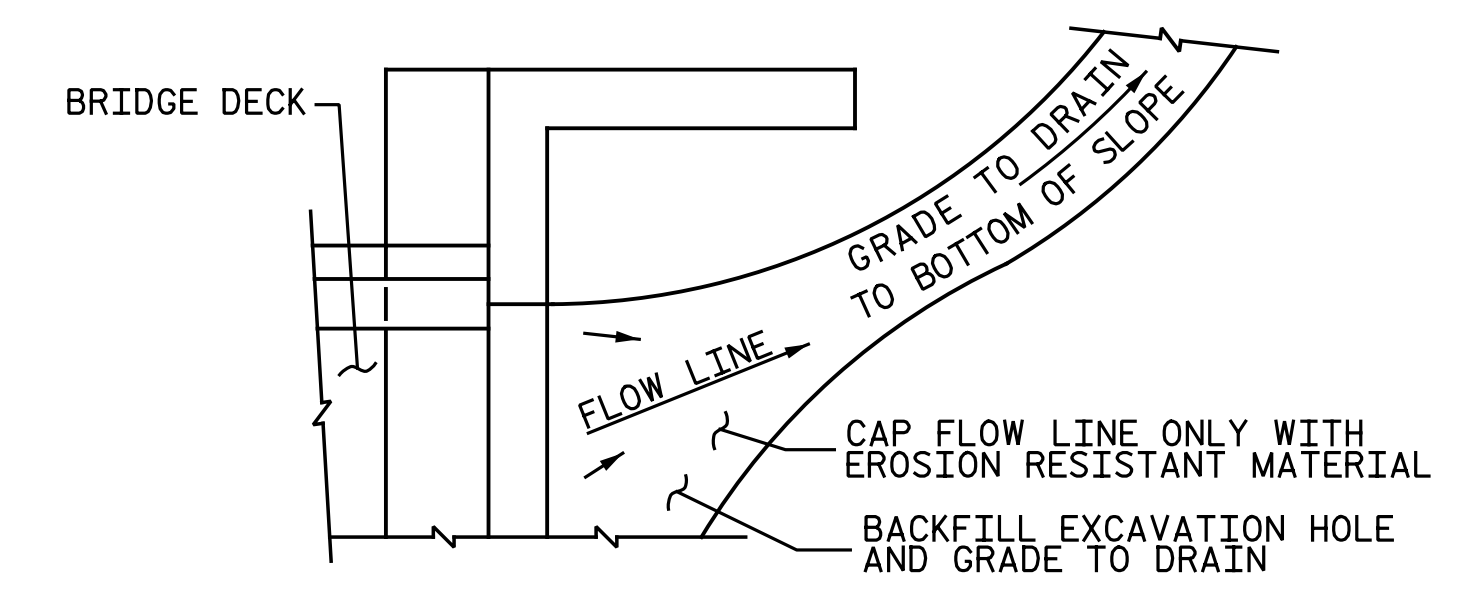
PLAN VIEW



SECTION S-S



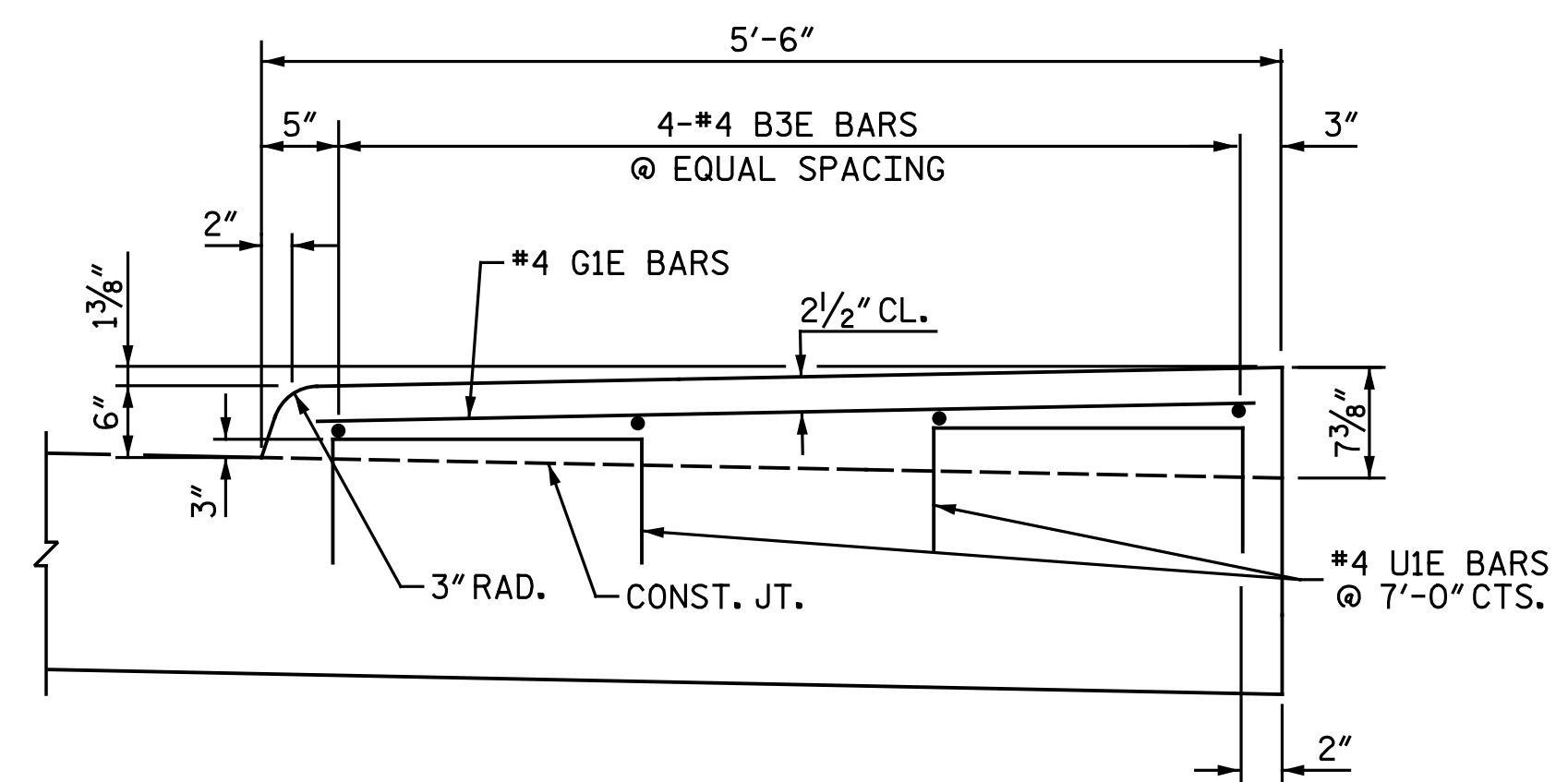
SECTION R-R



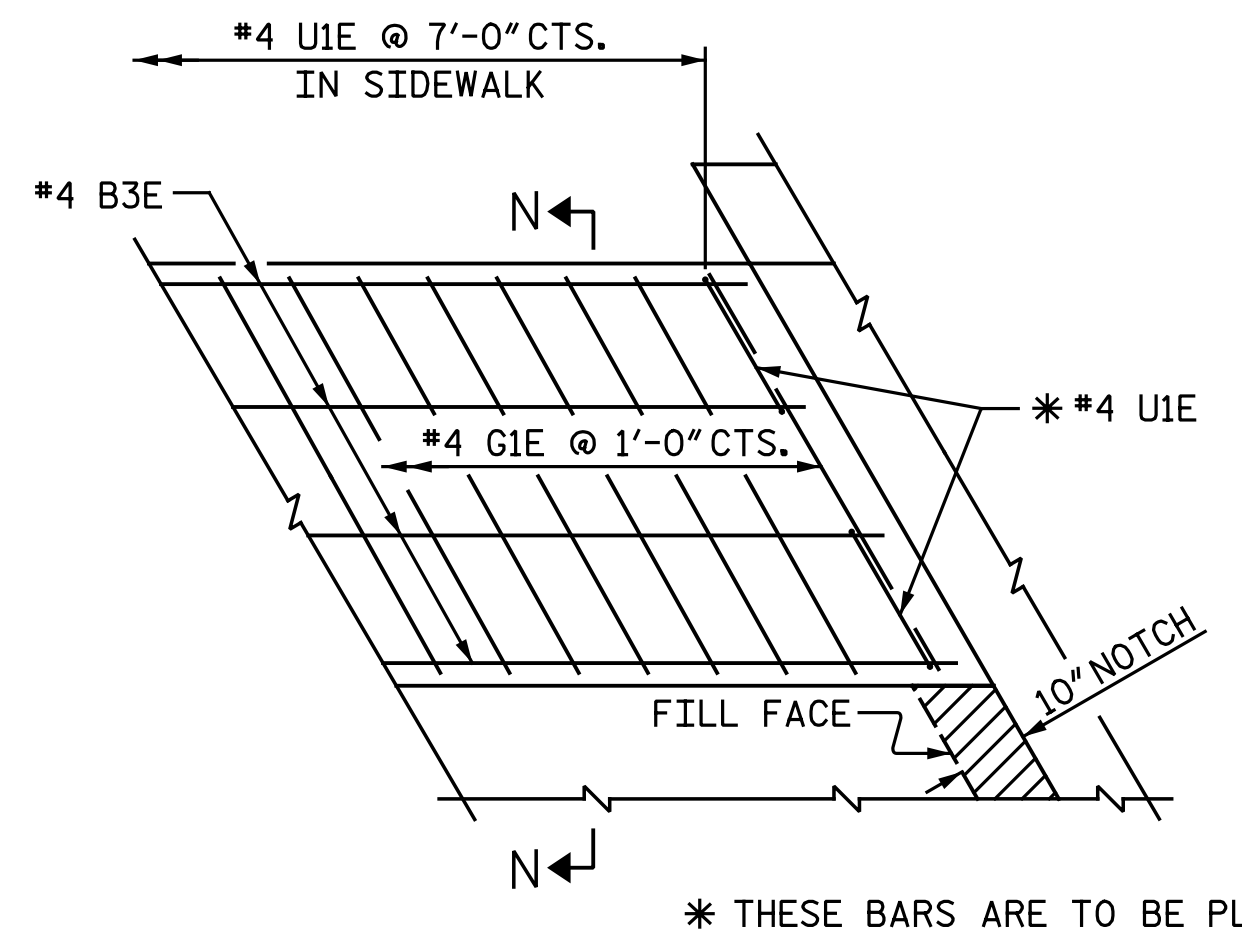
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT 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)



SECTION N-N



PARTIAL PLAN

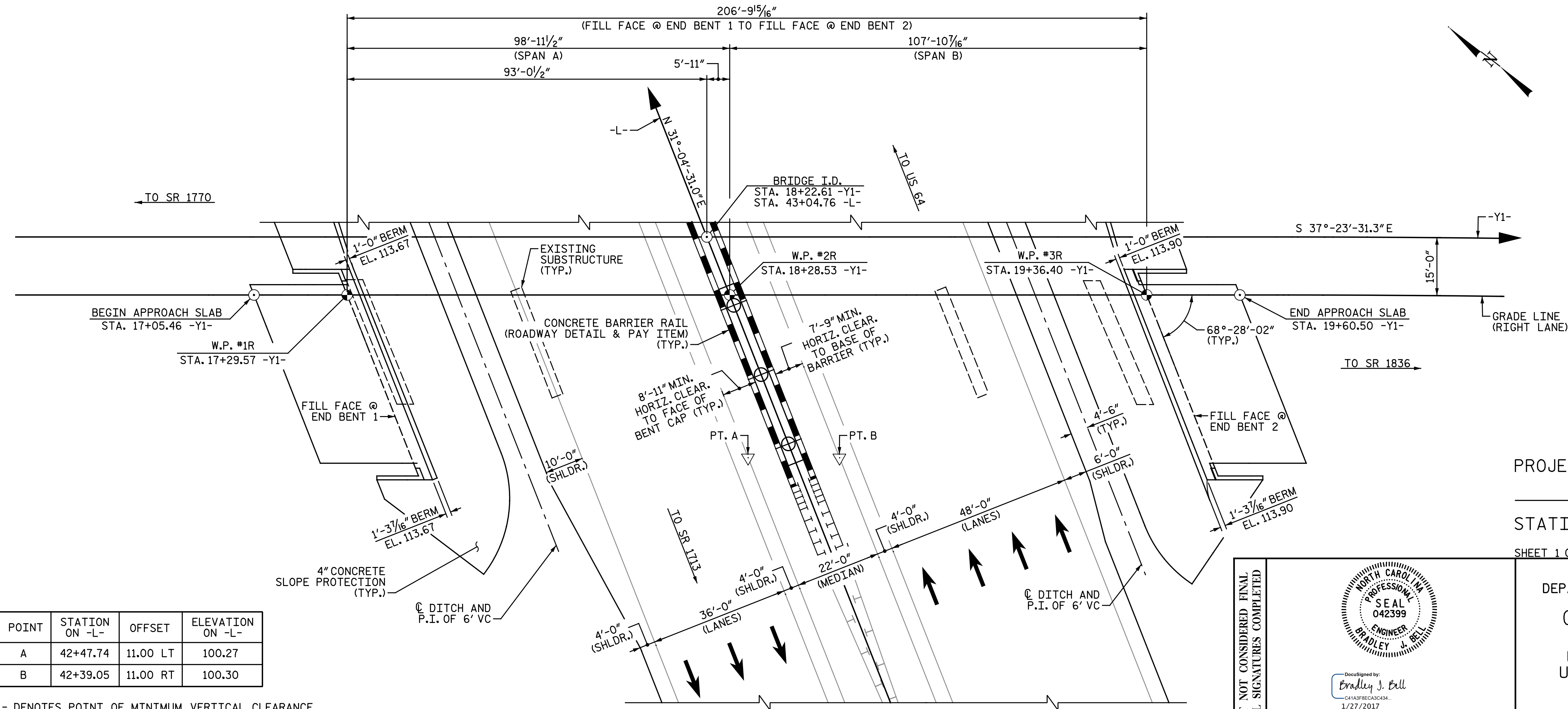
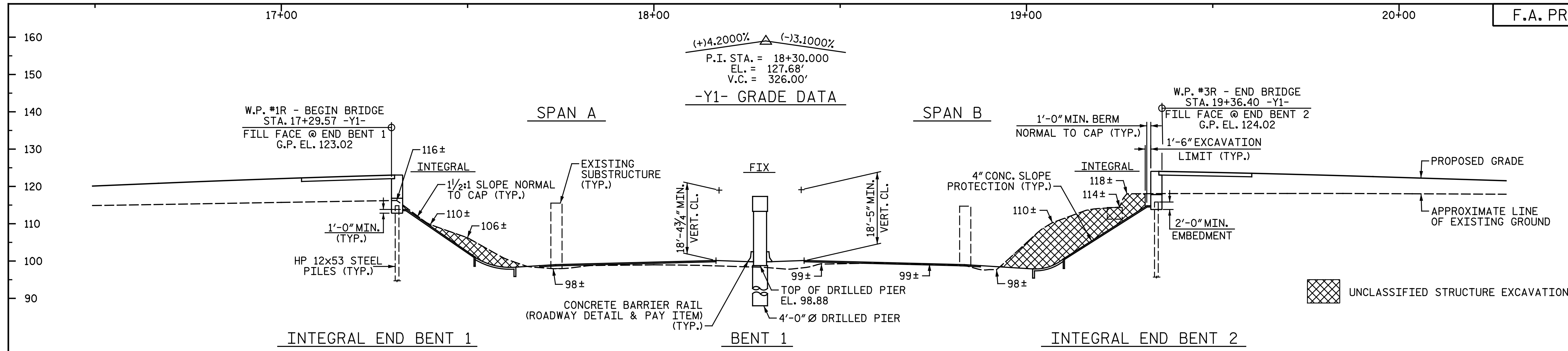
* THESE BARS ARE TO BE PLACED AFTER THE SAWING OF THE JOINT. HOLES SHALL BE DRILLED AND THE DOWELS GROUTED INTO PLACE.

DETAILS OF SIDEWALK ON APPROACH SLAB

PROJECT NO. U-3330
NASH COUNTY
STATION: 18+22.61 -Y1-

ASSEMBLED BY : N.B. SPEAKS	DATE : 7-15-16
CHECKED BY : A.H. SHARPE	DATE : 8-1-16
DRAWN BY : TLA 10/05	REV. 10/1/11 MAA/GM
CHECKED BY : GM 5/06	REV. 12/21/11 MAA/GM
	REV. 6/13 MAA/GM

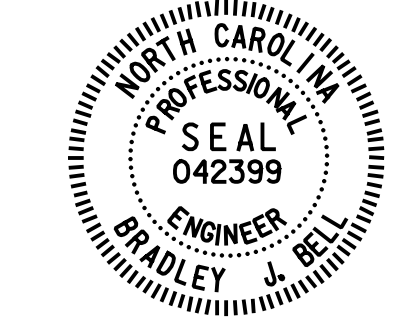
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH STANDARD BRIDGE APPROACH SLAB DETAILS LEFT LANES			
	Michael Baker Engineering 8000 Regency Parkway, Suite 600 Cary, North Carolina 27518 NC License No.: F-1084					
	REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			SI-38
2			4			TOTAL SHEETS 38



POINT	STATION ON -L-	OFFSET	ELEVATION ON -L-
A	42+47.74	11.00 LT	100.27
B	42+39.05	11.00 RT	100.30

▽ - DENOTES POINT OF MINIMUM VERTICAL CLEARANCE

PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1- =
43+04.76 -L-
 SHEET 1 OF 4 REPLACES BRIDGE NO. 196



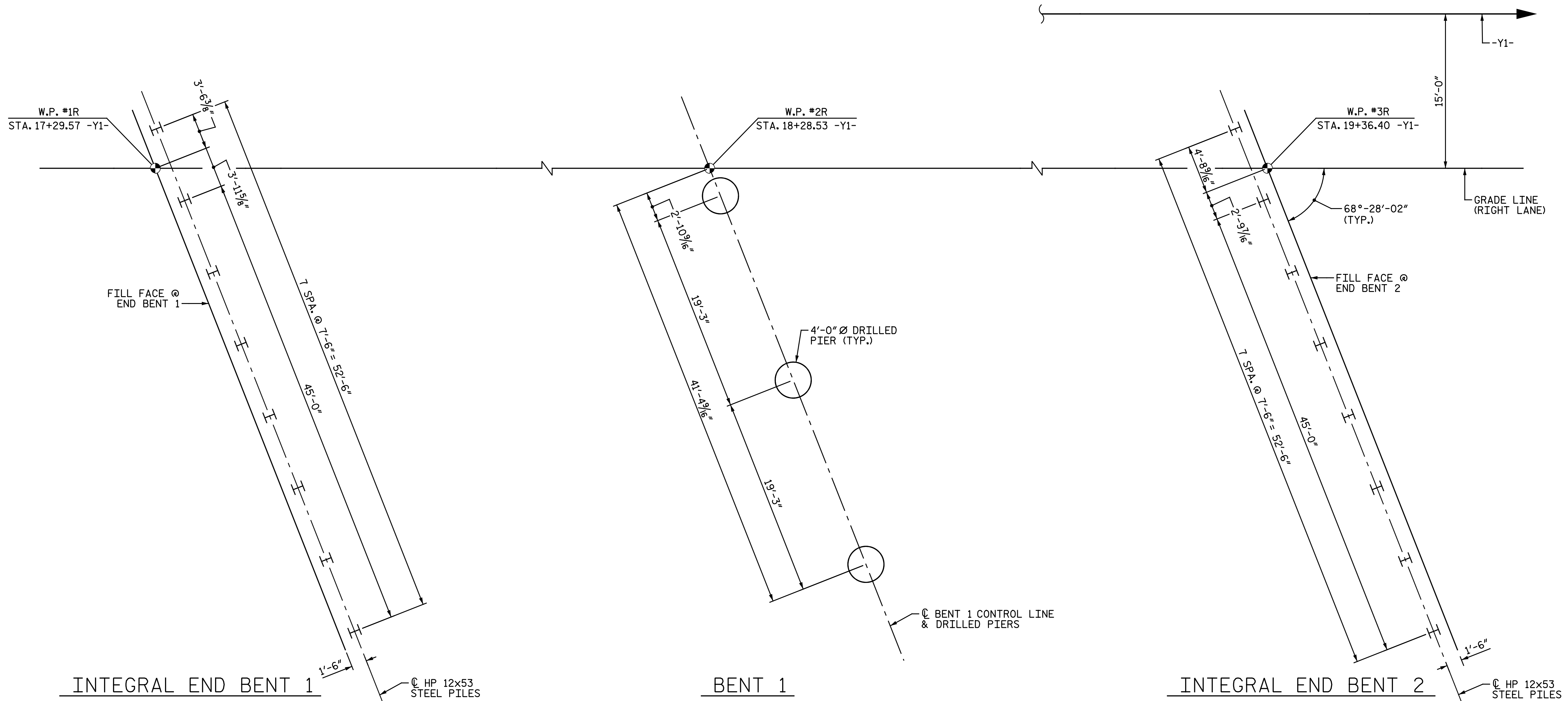
DocuSigned by:
 Bradley J. Bell
 CA1AF8EAC3A34
 1/27/2017

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 8000 Regency Parkway, Suite 600
 Cary, North Carolina 27518
 NC License No.: F-1084

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE ON
 US 64 BUSINESS OVER
 US 301 BYPASS BETWEEN
 SR 1770 & SR 1836
RIGHT LANES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-1
1			3			TOTAL SHEETS
2			4			39

DRAWN BY : CEM / MDM DATE : 8-2-16
 CHECKED BY : A. H. SHARPE DATE : 9-7-16



INTEGRAL END BENT 1

BENT 1

INTEGRAL END BENT 2

FOUNDATION LAYOUT

NOTES:

FOR DRILLED PIERS, SEE GEOTECHNICAL SPECIAL PROVISIONS AND SECTION 411 OF THE STANDARD SPECIFICATIONS.

DRILLED PIERS AT BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 665 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 120 TSF.

INSTALL DRILLED PIERS AT BENT NO. 1 TO A TIP ELEVATION NO HIGHER THAN 83 FT (LEFT), 80 FT (CENTER), AND 76 FT (RIGHT) AND WITH THE REQUIRED TIP RESISTANCE.

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.

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

FOR PILES, SEE GEOTECHNICAL SPECIAL PROVISIONS AND SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 110 TONS PER PILE.

PILES AT END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 120 TONS PER PILE.

DRIVE PILES AT END BENT NO. 1 TO A REQUIRED DRIVING RESISTANCE OF 185 TONS PER PILE.

DRIVE PILES AT END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 200 TONS PER PILE.

DIMENSIONS LOCATING PILES AND DRILLED PIERS ARE SHOWN TO THE PILE AND DRILLED PIER CENTERLINES.

ALL PILES ARE VERTICAL.

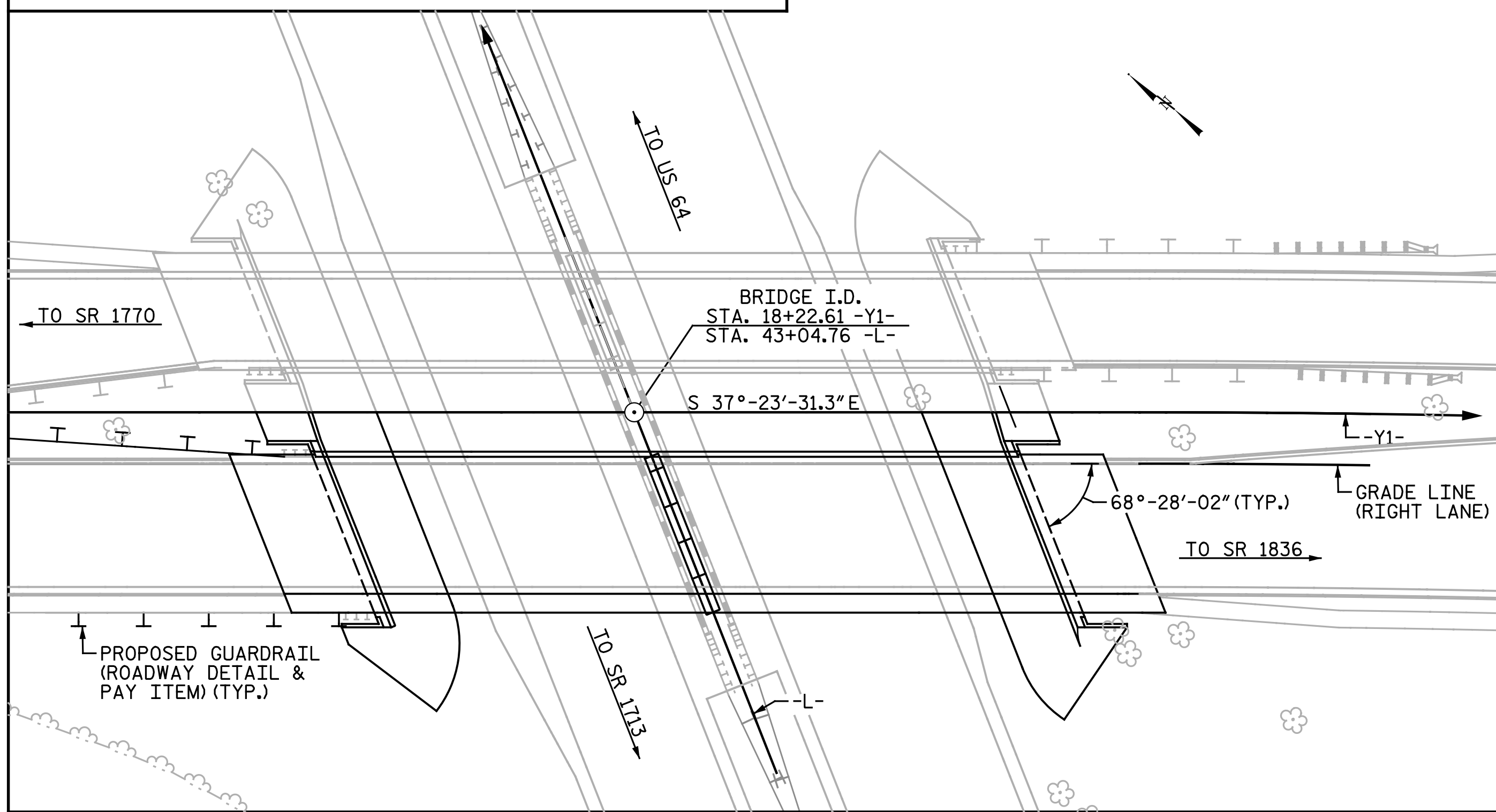
PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1- =
43+04.76 -L-
 SHEET 2 OF 4

DRAWN BY : C. E. MAYHEW DATE : 4-22-16
 CHECKED BY : A. H. SHARPE DATE : 9-07-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH GENERAL DRAWING FOR BRIDGE ON US 64 BUSINESS OVER US 301 BYPASS BETWEEN SR 1770 & SR 1836 RIGHT LANES		SHEET NO. S2-2	
	REVISIONS				TOTAL SHEETS 39	
	NO.	BY:	DATE:	NO.		BY:
1			3			
2			4			

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BM #2 - RR SPIKE IN 24" OAK, STA. 60+94.00 -L-, 420.00' RT., EL. 91.39



LOCATION SKETCH

NOTES:

- ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
- THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
- THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
- FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.
- FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.
- FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
- FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.
- REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
- METAL STAY-IN-PLACE FORMS SHALL NOT BE WELDED TO BEAM OR GIRDER FLANGES IN THE ZONES REQUIRING CHARPY V-NOTCH TEST. SEE STRUCTURAL STEEL DETAIL SHEETS.
- NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.
- ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. 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 15 FT LEFT OF GRADE LINE AND 85 FT RIGHT OF GRADE LINE 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 EXISTING STRUCTURE CONSISTING OF ONE 42'-6", TWO 55'-0", AND ONE 42'-6" SIMPLE SPANS WITH A CLEAR ROADWAY WIDTH OF 28'-0" AND REINFORCED CONCRETE FLOOR SUPPORTED BY STEEL I-BEAMS ON REINFORCED CONCRETE END BENTS WITH TIMBER PILES AND REINFORCED CONCRETE POST AND BEAM INTERIOR BENTS LOCATED AT THE PROPOSED SITE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 18+22.61 -Y1-."

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

THE ELEVATION(S) AND CLEARANCE(S) SHOWN ON THE PLANS AT THE POINT(S) OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATION(S) ON THE EXISTING PAVEMENT AND CHECK THE CLEARANCE. REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.

TOTAL BILL OF MATERIAL

LOCATION	REMOVAL OF EXISTING STRUCTURE	4'-0" DIA. DRILLED PIERS IN SOIL	4'-0" DIA. DRILLED PIERS NOT IN SOIL	SID INSPECTIONS	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	STRUCTURAL STEEL	HP 12x53 STEEL PILES	
	LUMP SUM	LIN. FT.	LIN. FT.	EACH	EACH	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	APPROX. LBS.	NO.	LIN. FT.
SUPERSTRUCTURE							10,011	9,371					276,618		
END BENT 1									45.1		8,520			8	240
BENT 1		47	22	1	1				56.7		9,869	2,894			
END BENT 2									48.1		9,196			8	200
TOTAL	LUMP SUM	47	22	1	1	LUMP SUM	10,011	9,371	149.9	LUMP SUM	27,585	2,894	276,618	16	440

TOTAL BILL OF MATERIAL (CONT'D.)

LOCATION	PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES	THREE BAR METAL RAIL	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	DISC BEARINGS	ELASTOMERIC BEARINGS	ASBESTOS ASSESSMENT
	EA.	LIN. FT.	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM	LUMP SUM
SUPERSTRUCTURE		197.1	205.0		LUMP SUM	LUMP SUM	
END BENT 1	8			276			
BENT 1							
END BENT 2	8			293			
TOTAL	16	197.1	205.0	569	LUMP SUM	LUMP SUM	LUMP SUM

PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1- =
43+04.76 -L-
 SHEET 3 OF 4

DRAWN BY : C. E. MAYHEW DATE : 3-20-16
 CHECKED BY : A. H. SHARPE DATE : 9-6-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH GENERAL DRAWING FOR BRIDGE ON US 64 BUSINESS OVER US 301 BYPASS BETWEEN SR 1770 & SR 1836 RIGHT LANES			
	DocuSigned by: Bradley J. Bell C41A3F8E3C3434 2/10/2017		REVISIONS			
	Michael Baker INTERNATIONAL		Michael Baker Engineering 8000 Regency Parkway, Suite 600 Cary, North Carolina 27518 NC License No.: F-1084			
	NO.	BY:	DATE:	NO.	BY:	DATE:
1			3			TOTAL SHEETS
2			4			39

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR STEEL GIRDERS

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTOR (RF)	TONS = W x RF	STRENGTH I LIMIT STATE						SERVICE II LIMIT STATE						COMMENT NUMBER						
						MOMENT			SHEAR			MOMENT												
						LIVE-LOAD FACTORS (%LL)	DISTRIBUTION FACTOR (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	DISTRIBUTION FACTOR (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	LIVE-LOAD FACTORS (%LL)		DISTRIBUTION FACTOR (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	1	1.10	--	1.75	-	1.17	A	4	97.35	-	1.10	A	2	97.35	1.30	-	1.44	B	5	63.75	1,2,3	
	HL-93 (OPERATING)	N/A		1.42	--	1.35	-	1.52	A	4	97.35	-	1.42	A	2	97.35	1.00	-	1.87	B	5	63.75	1,2,3	
	HS-20 (INVENTORY)	36.000	2	1.55	55.80	1.75	-	2.08	B	5	63.75	-	1.55	A	2	97.35	1.30	-	2.61	B	5	63.75	1,2,3	
	HS-20 (OPERATING)	36.000		2.01	72.33	1.35	-	2.70	B	5	63.75	-	2.01	A	2	97.35	1.00	-	3.39	B	5	63.75	1,2,3	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH		4.55	61.43	1.40	-	6.14	B	5	63.75	-	4.55	A	2	97.35	1.30	-	6.18	B	5	63.75	1,2,3	
		SNGARBS2	20.000		3.24	64.80	1.40	-	4.44	B	5	63.75	-	3.24	A	2	97.35	1.30	-	4.47	B	5	63.75	1,2,3
		SNAGRIS2	22.000		3.01	66.22	1.40	-	4.14	B	5	63.75	-	3.01	A	2	97.35	1.30	-	4.17	B	5	63.75	1,2,3
		SNCOTTS3	27.250		2.31	62.95	1.40	-	3.07	B	5	63.75	-	2.31	A	2	97.35	1.30	-	3.08	B	5	63.75	1,2,3
		SNAGGRS4	34.925		1.92	67.06	1.40	-	2.51	B	5	63.75	-	1.92	A	2	97.35	1.30	-	2.52	B	5	63.75	1,2,3
		SNS5A	35.550		1.89	67.19	1.40	-	2.49	B	5	63.75	-	1.89	A	2	97.35	1.30	-	2.50	B	5	63.75	1,2,3
		SNS6A	39.950		1.71	68.31	1.40	-	2.26	B	5	63.75	-	1.71	A	2	97.35	1.30	-	2.27	B	5	63.75	1,2,3
	SNS7B	42.000		1.69	70.98	1.40	-	2.14	B	5	63.75	-	1.69	A	2	97.35	1.30	-	2.15	B	5	63.75	1,2,3	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.11	69.63	1.40	-	2.74	B	5	63.75	-	2.11	A	2	97.35	1.30	-	2.75	B	5	63.75	1,2,3
		TNT4A	33.075		2.06	68.13	1.40	-	2.72	B	5	63.75	-	2.06	A	2	97.35	1.30	-	2.74	B	5	63.75	1,2,3
		TNT6A	41.600		1.81	75.30	1.40	-	2.23	B	5	63.75	-	1.81	A	2	97.35	1.30	-	2.24	B	5	63.75	1,2,3
		TNT7A	42.000		1.77	74.34	1.40	-	2.25	B	5	63.75	-	1.77	A	2	97.35	1.30	-	2.26	B	5	63.75	1,2,3
		TNT7B	42.000		1.70	71.40	1.40	-	2.25	B	5	63.75	-	1.70	A	2	97.35	1.30	-	2.26	B	5	63.75	1,2,3
TNAGRIT4		43.000		1.67	71.81	1.40	-	2.18	B	5	63.75	-	1.67	A	2	97.35	1.30	-	2.19	B	5	63.75	1,2,3	
FATIGUE	TNACT5A	45.000		1.64	73.80	1.40	-	2.07	B	5	63.75	-	1.64	A	2	97.35	1.30	-	2.08	B	5	63.75	1,2,3	
	TNACT5B	45.000	3	1.58	71.10	1.40	-	2.05	B	5	63.75	-	1.58	A	2	97.35	1.30	-	2.06	B	5	63.75	1,2,3	
FATIGUE	HL-93 (INVENTORY)	%LL=0.75		-																				

LOAD FACTORS:

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

NOTES:

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

ALLOWABLE STRESS FOR SERVICE II LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

- THE ORIGINAL DESIGN AND RATING OF THIS BRIDGE WERE BASED ON AN INFLUENCE SURFACE ANALYSIS. LIVE LOAD DISTRIBUTION FACTORS WERE NOT USED AND ARE NOT PROVIDED.
- THE SOFTWARE PACKAGE MDX VERSION 6.5.2943 WAS USED FOR THE INFLUENCE SURFACE ANALYSIS.
- DISTANCE FROM LEFT END OF SPAN IS GIVEN WITH RESPECT TO CENTERLINE OF BEARING AND IS MEASURED ALONG THE CONTROLLING GIRDER.
- FATIGUE RATING IS NOT REQUIRED OR REPORTED SINCE GIRDERS DO NOT INCLUDE FATIGUE-PRONE DETAILS.

CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

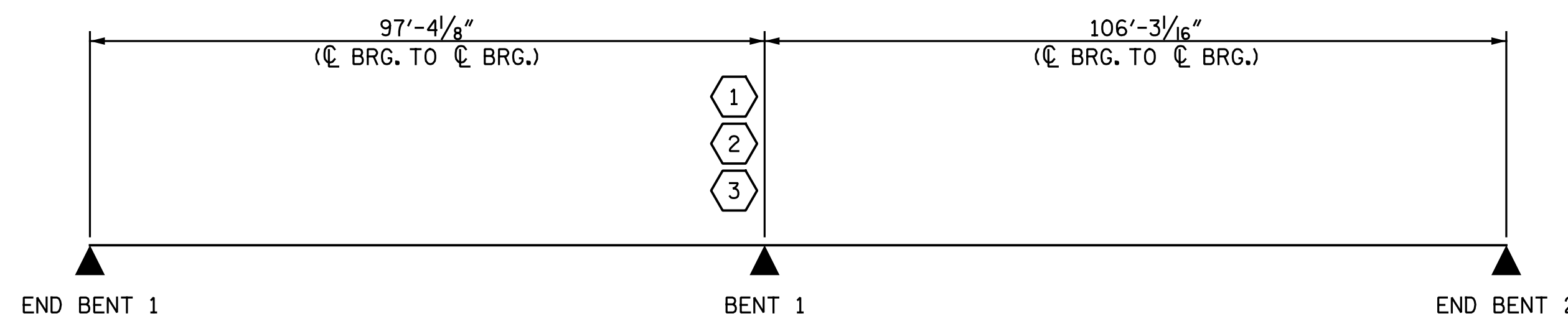
2 DESIGN LOAD RATING (HS-20)

3 LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

GIRDER LOCATION IS PROVIDED USING GIRDER NUMBER, WHERE GIRDER 1 IS THE LEFT EXTERIOR GIRDER LOOKING AHEAD STATION. SEE "FRAMING PLAN" SHEET FOR ALL GIRDER LOCATIONS.

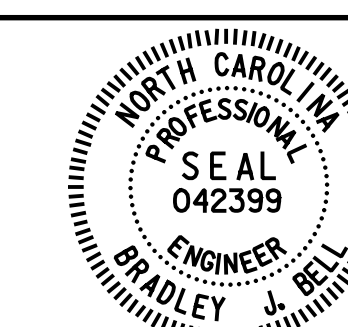


LRFR SUMMARY

PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1- =
43+04.76 -L-
 SHEET 4 OF 4

DRAWN BY : N. B. SPEAKS DATE : 8-10-16
 CHECKED BY : A. H. SHARPE DATE : 9-8-16

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



DocuSigned by:
Bradley J. Bell
CA1A9F8E3C3A34...
1/27/2017

Michael Baker
INTERNATIONAL

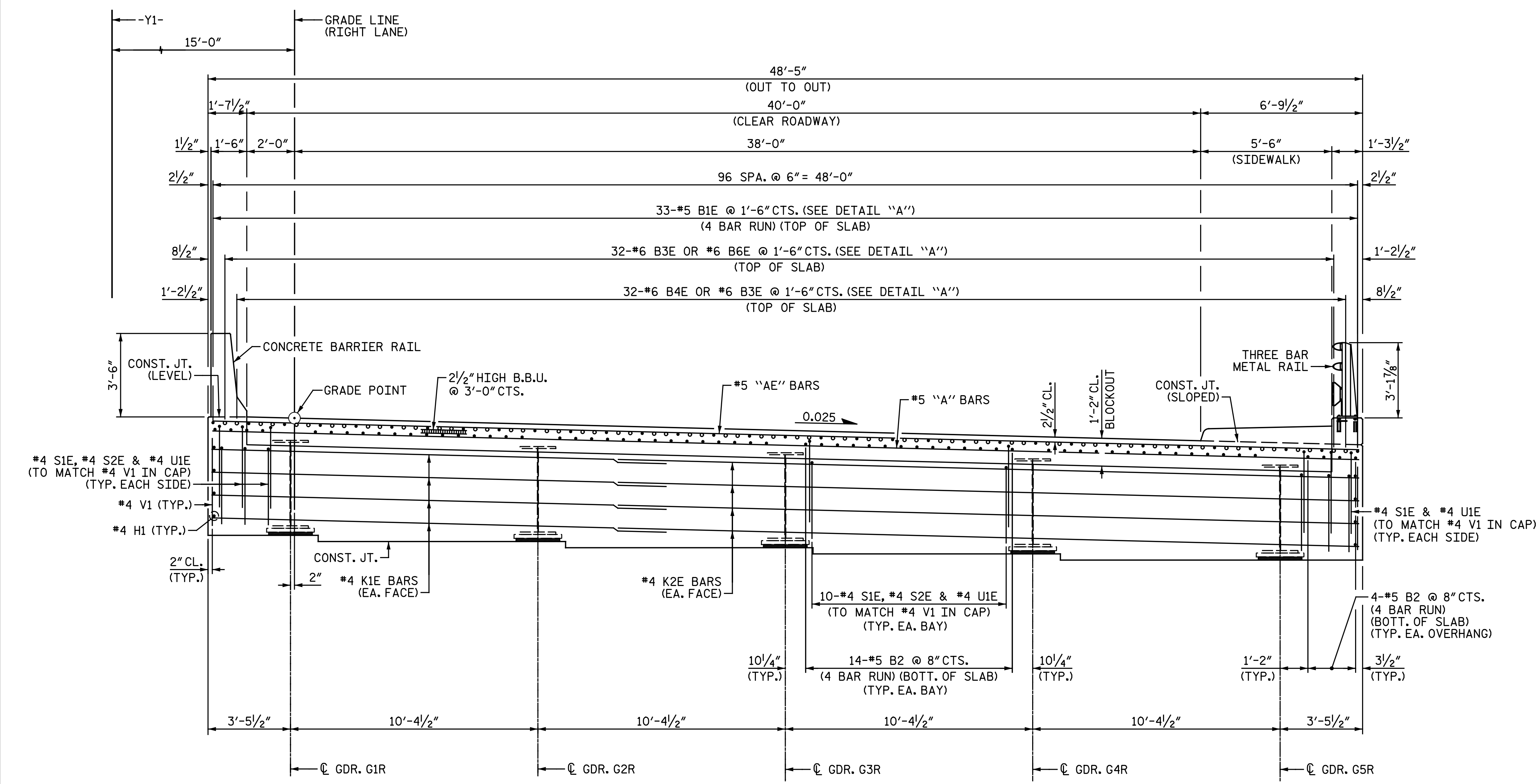
Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No.: F-1084

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 LRFR SUMMARY
 FOR STEEL GIRDERS
 (NON-INTERSTATE TRAFFIC)

RIGHT LANES

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S2-4 TOTAL SHEETS 39
2			4			



TYPICAL SECTION THRU INTEGRAL END BENT
 (END BENT 1 SHOWN, END BENT 2 SIMILAR)
 (*5 A3E BARS ARE NOT SHOWN FOR CLARITY)

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

LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO FACILITATE INSTALLATION OF CONCRETE BARRIER RAIL REINFORCEMENT.

METAL STAY-IN-PLACE FORMS SHALL NOT BE WELDED TO BEAM OR GIRDER FLANGES IN THE ZONES REQUIRING CHARPY V-NOTCH TEST. SEE STRUCTURAL STEEL DETAIL SHEETS.

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

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

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

STRUCTURAL STEEL ERECTION IN A CONTINUOUS UNIT SHALL BE COMPLETE BEFORE FALSEWORK OR FORMS ARE PLACED ON THE UNIT.

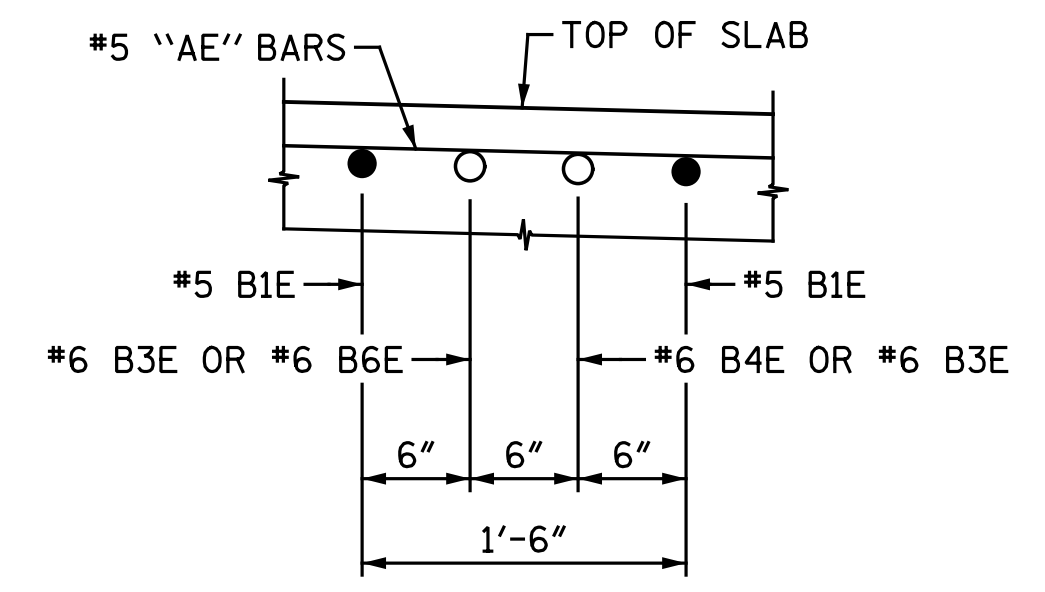
THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN METAL STAY-IN-PLACE FORM SUPPORTS OR FORMS AND BEAM/GIRDER STIFFENERS OR CONNECTOR PLATES. THE PROPOSAL SHALL BE INDICATED, AS APPROPRIATE, ON EITHER THE STEEL WORKING DRAWINGS OR THE METAL STAY-IN-PLACE FORM WORKING DRAWINGS.

FOR CONCRETE BARRIER RAIL DETAILS, SEE "CONCRETE BARRIER RAIL" SHEET.

FOR THREE BAR METAL RAIL DETAILS, SEE "3 BAR METAL RAIL" SHEETS.

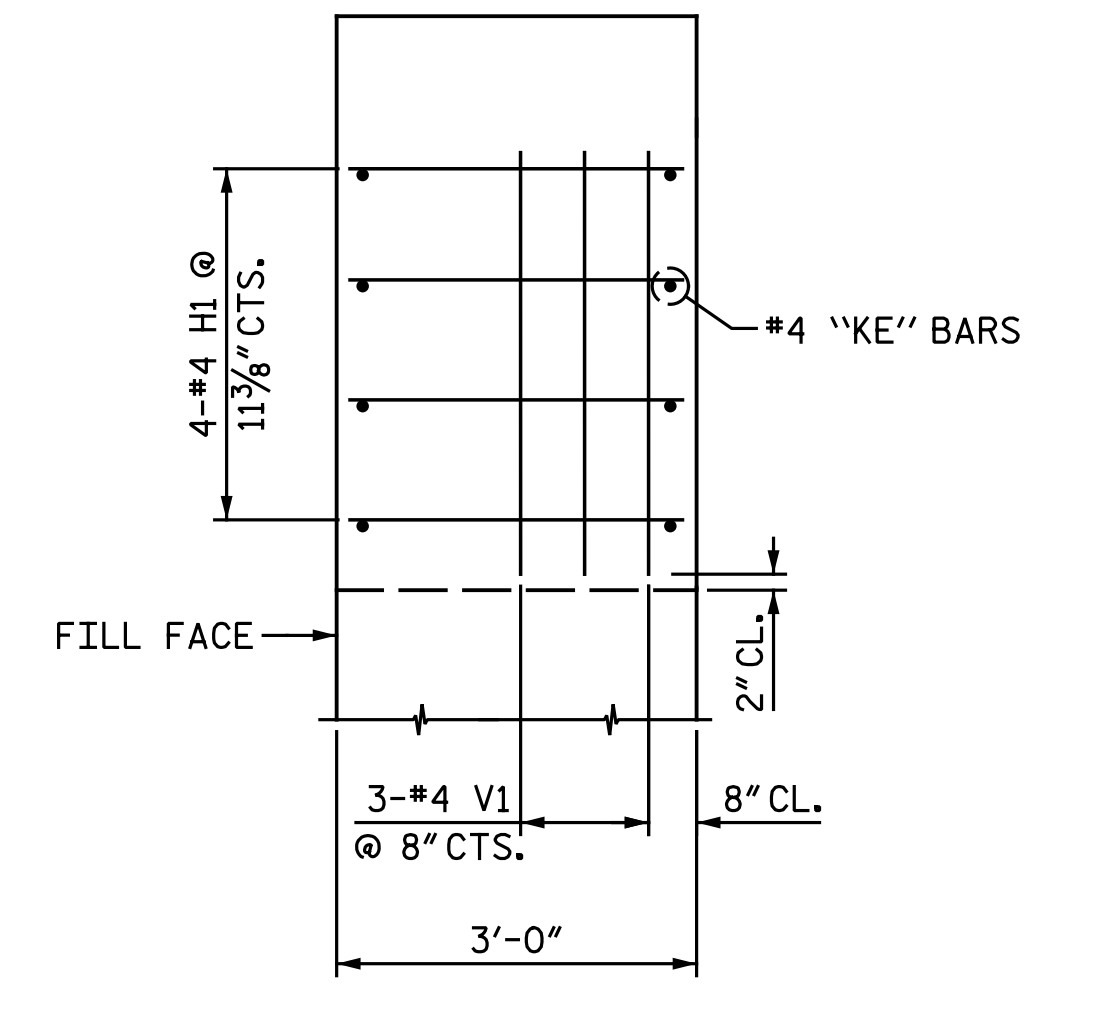
FOR SIDEWALK DETAILS, SEE "SIDEWALK DETAILS" SHEET.

FOR BLOCKOUT DETAILS, SEE "BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT" SHEET.

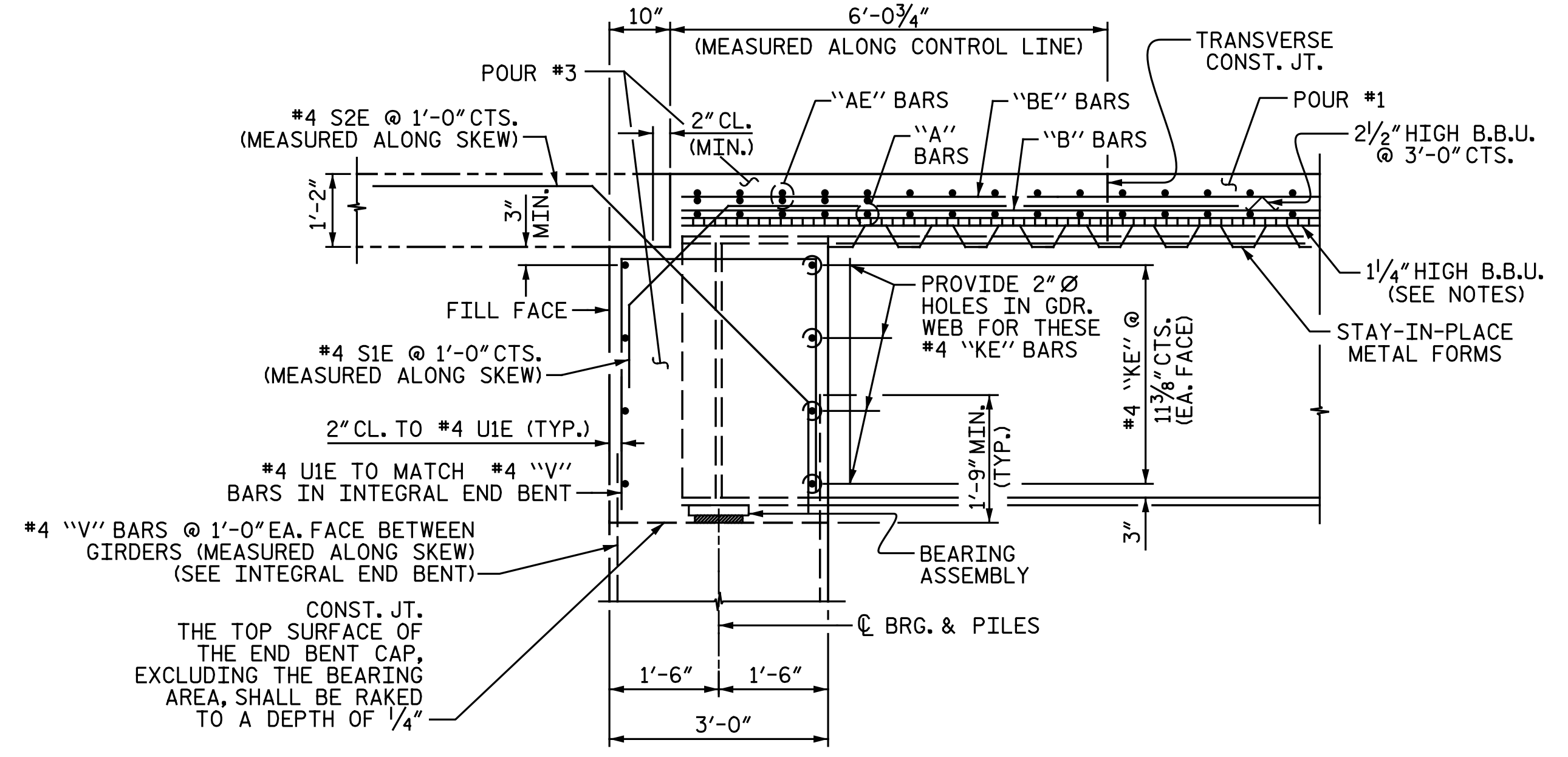


DETAIL "A"

PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1-
 SHEET 1 OF 2



END OF DIAPHRAGM DETAIL
 (END BENT 1 SHOWN, END BENT 2 SIMILAR)



END OF GIRDER DETAIL AT INTEGRAL END BENT
 (DIMENSIONS SHOWN ARE NORMAL TO END BENT, U.N.O.)
 (END BENT 1 SHOWN, END BENT 2 SIMILAR)

DRAWN BY: CEM / MDM DATE: 8-8-16
 CHECKED BY: B. J. BELL DATE: 9-7-16

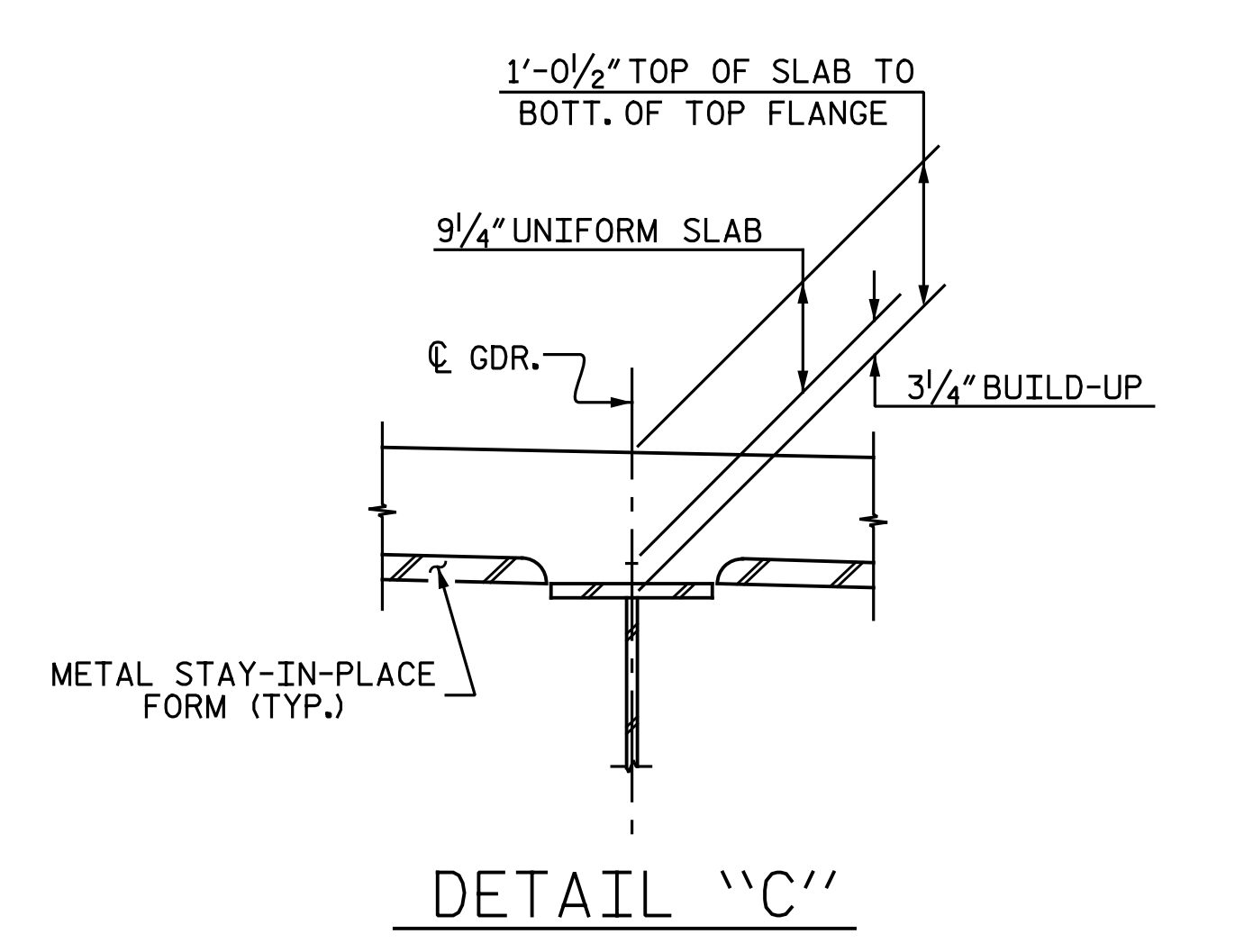
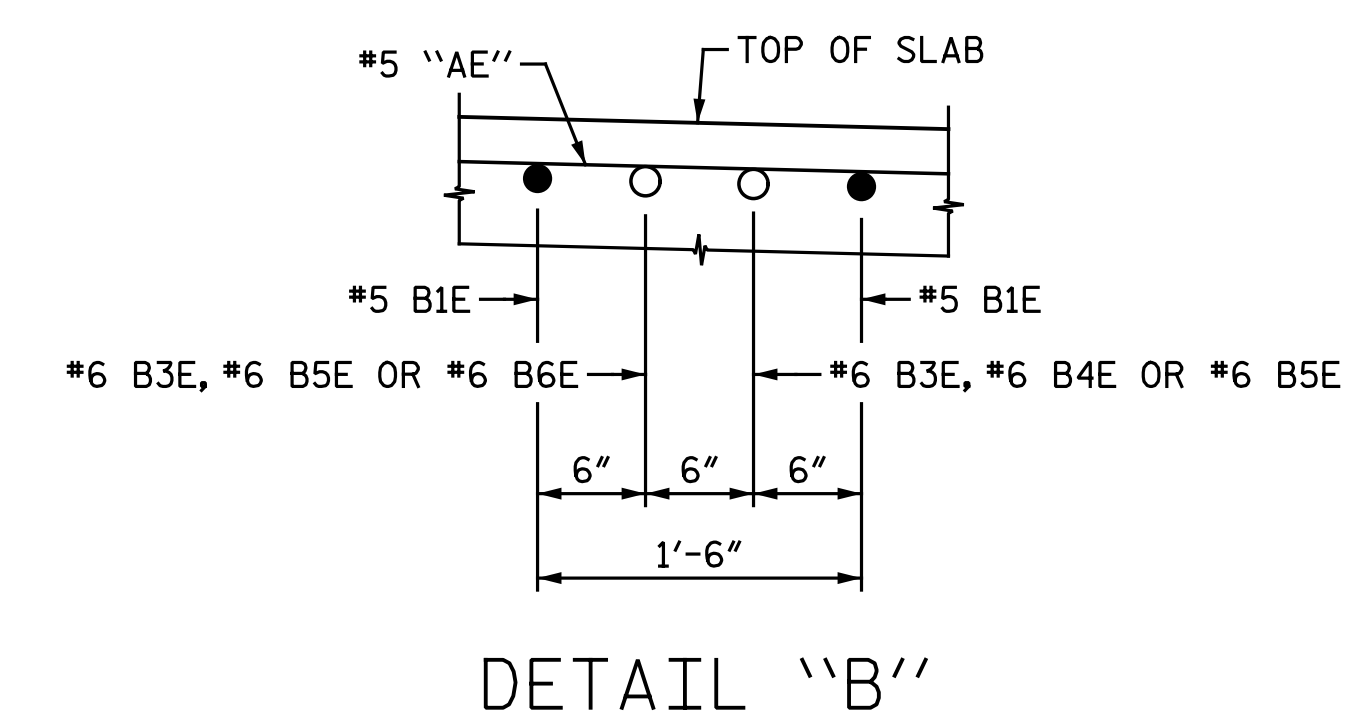
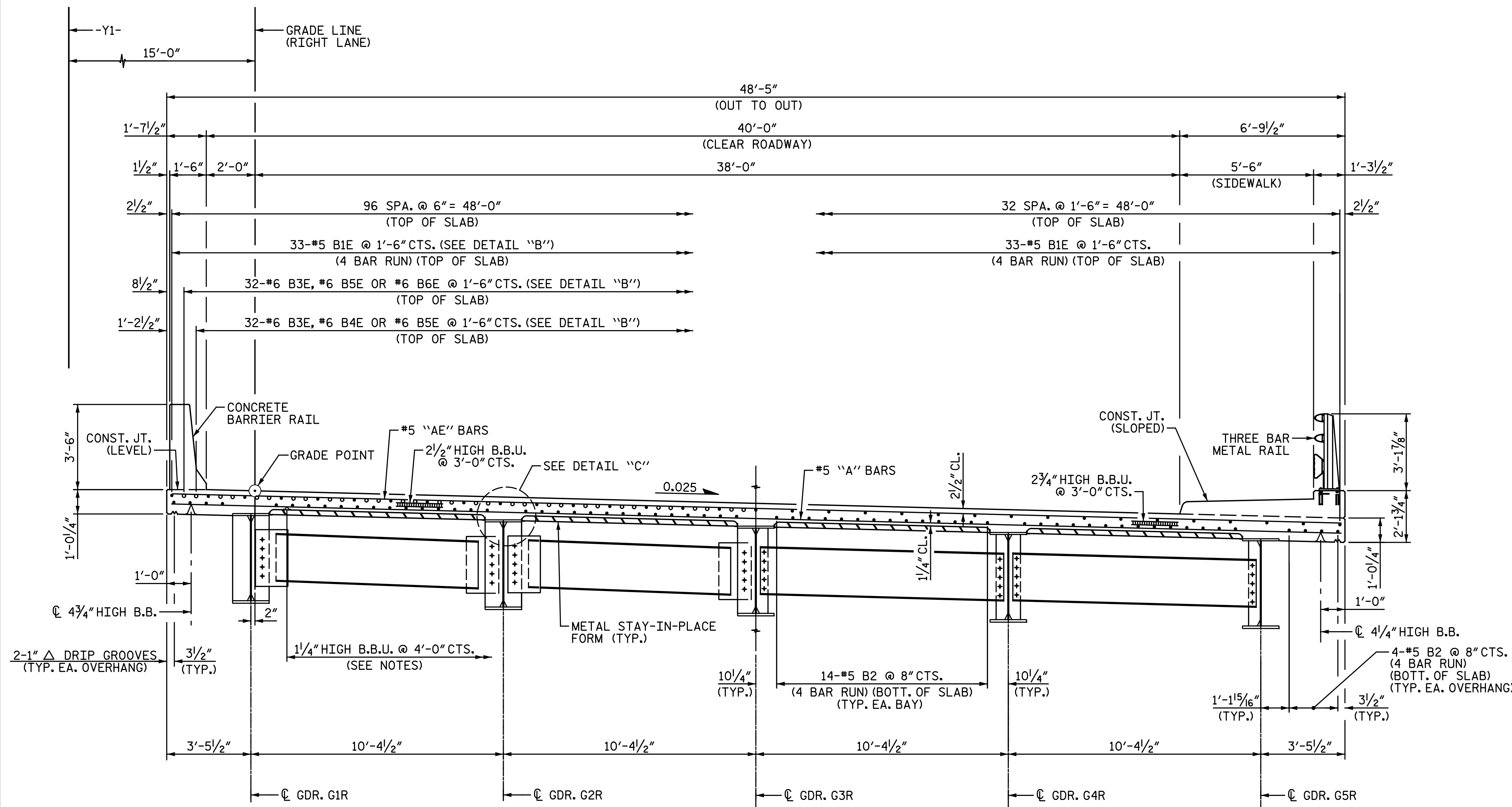
DOCUMENT NOT CONSIDERED FINAL
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Professional Engineer Seal for Bradley J. Bell, State of North Carolina, License No. 042399, dated 2/3/2017.

Michael Baker Engineering
 8000 Regency Parkway, Suite 600
 Cary, North Carolina 27518
 NC License No.: F-1084

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE					
TYPICAL SECTION					
RIGHT LANES					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S2-5					TOTAL SHEETS 39

NOTES:
FOR NOTES, SEE "TYPICAL SECTION", SHEET 1 OF 2.



PARTIAL SECTION AT INTERMEDIATE & BENT DIAPHRAGM
(AREAS WITH ADDITIONAL LONGITUDINAL REINFORCEMENT)
(SEE PLAN OF SPAN FOR LOCATIONS)

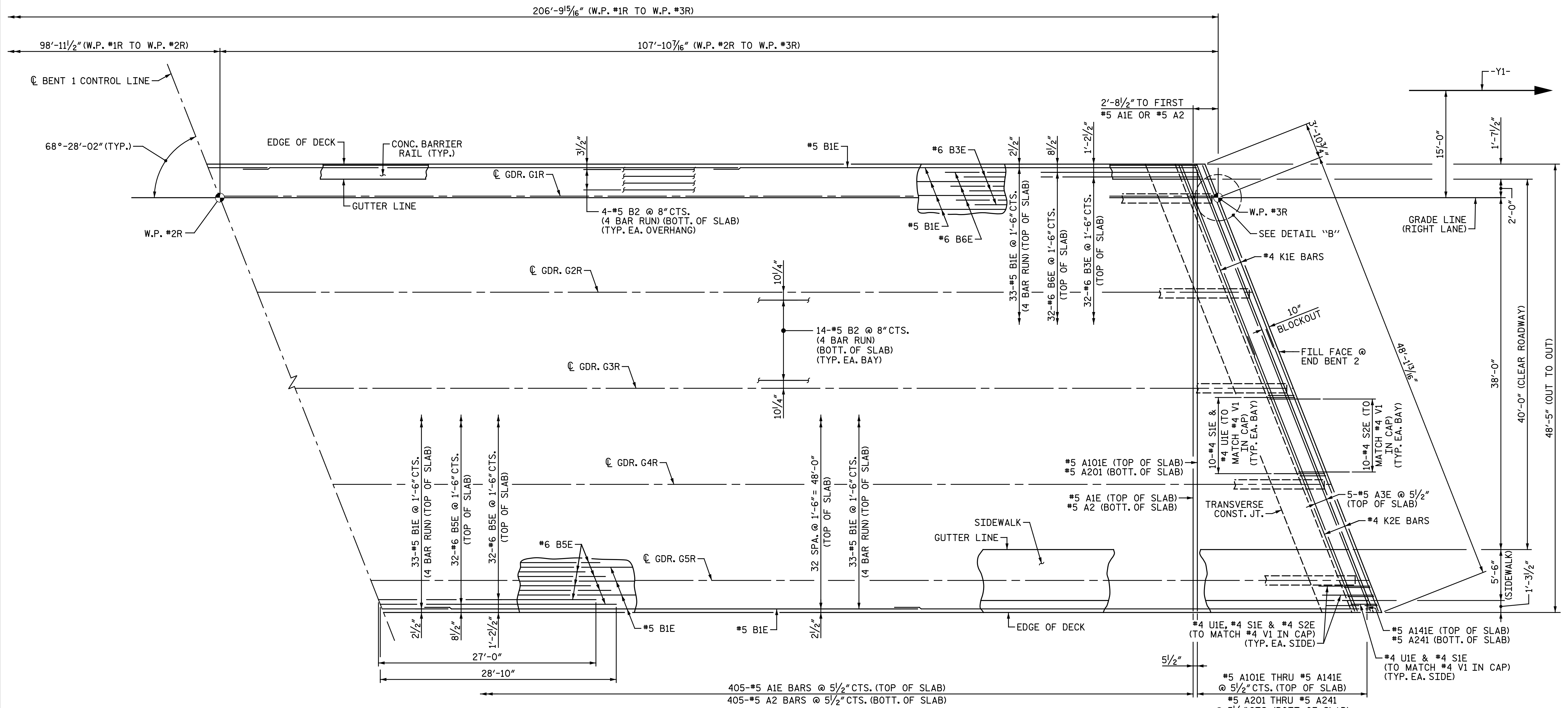
PARTIAL SECTION AT INTERMEDIATE DIAPHRAGM
(AREAS WITHOUT ADDITIONAL LONGITUDINAL REINFORCEMENT)
(SEE PLAN OF SPAN FOR LOCATIONS)

TYPICAL SECTION

PROJECT NO. U-3330
NASH COUNTY
STATION: 18+22.61 -Y1-
SHEET 2 OF 2

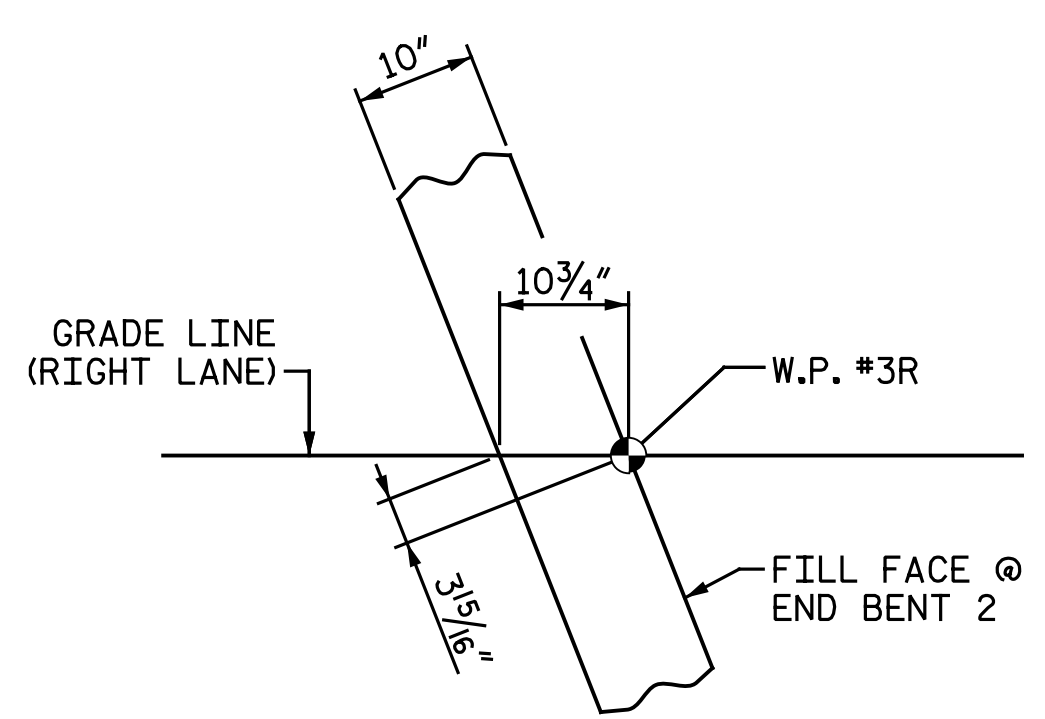
DRAWN BY : M. D. MAYHEW DATE : 8-8-16
CHECKED BY : B. J. BELL DATE : 9-7-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE TYPICAL SECTION RIGHT LANES		
	Michael Baker Engineering 8000 Regency Parkway, Suite 600 Cary, North Carolina 27518 NC License No.: F-1084		REVISIONS		
	Michael Baker INTERNATIONAL		NO. 1 BY: [] DATE: []	NO. 2 BY: [] DATE: []	SHEET NO. S2-6 TOTAL SHEETS 39
	1/27/2017				



PLAN OF SPAN B

NOTES:
FOR NOTES, SEE "PLAN OF SPAN", SHEET 1 OF 2.

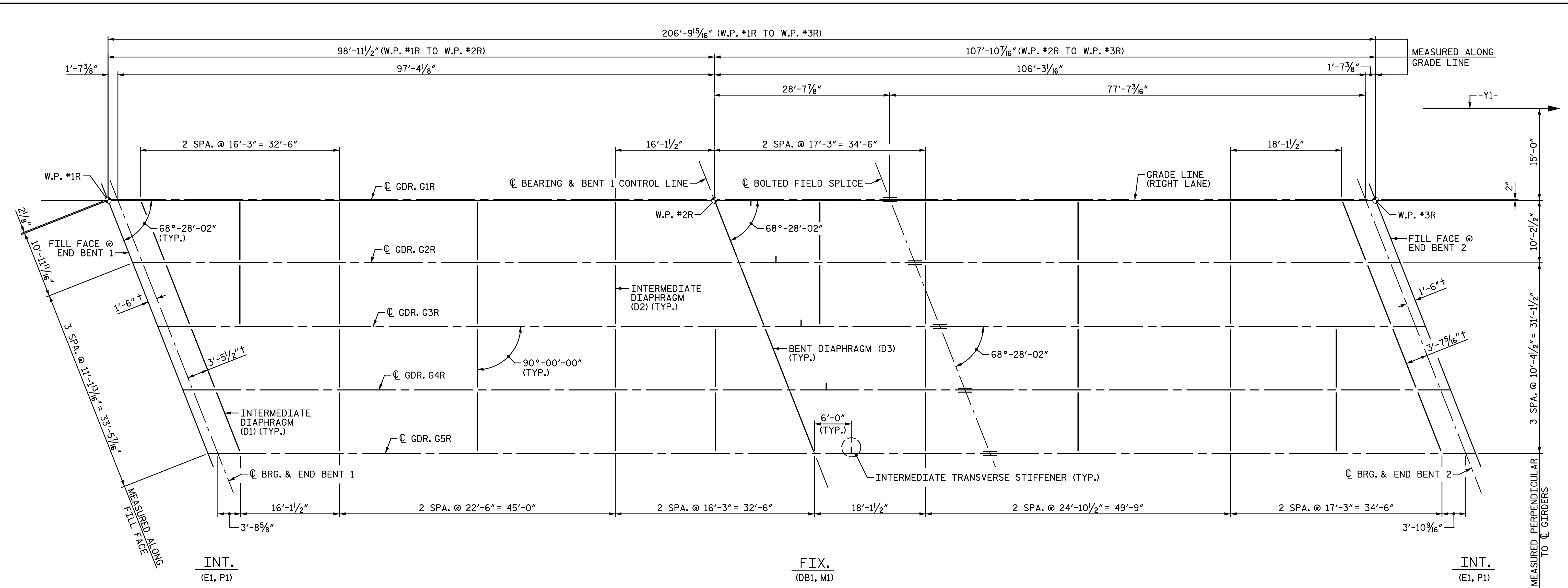


DETAIL "B"

PROJECT NO. U-3330
NASH COUNTY
STATION: 18+22.61 -Y1-
SHEET 2 OF 2

DRAWN BY: C. E. MAYHEW DATE: 4-21-16
CHECKED BY: B. J. BELL DATE: 9-8-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE PLAN OF SPAN SPAN B RIGHT LANES		SHEET NO. S2-8 TOTAL SHEETS 39
		REVISIONS		
		Michael Baker International Michael Baker Engineering 8000 Regency Parkway, Suite 600 Cary, North Carolina 27518 NC License No.: F-1084	DocuSigned by: Bradley J. Bell C41A3F8E3C3A34... 1/27/2017	



INT.
(E1, P1)

FIX.
(DB1, M1)

INT.
(E1, P1)

SPAN A

SPAN B

FRAMING PLAN

ALL LONGITUDINAL MEASUREMENTS ARE ALONG CENTERLINE OF GIRDER, U.N.O.
 † MEASURED PERPENDICULAR TO END BENT FILL FACE

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL, UNLESS OTHERWISE NOTED.

ALL FIELD CONNECTIONS TO BE 7/8" DIA. HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED. BOLTS SHALL BE DETAILED WITH THREADS EXCLUDED FROM SHEAR PLANES.

BEARING STIFFENERS ARE TO BE PLACED NORMAL TO THE WEB OF THE GIRDER AND SHALL BE PLUMB IN THE FINAL CONDITION.

PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION (NOR WITHIN 15 FEET OF INTERMEDIATE BEARINGS OF CONTINUOUS UNITS). KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES. KEEP 6" MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.

STUDS ON GIRDERS MAY BE SHIFTED UP TO 1" IF NECESSARY TO CLEAR FLANGE SPlice WELDS.

TENSION ON THE ASTM A325 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-8 OF THE STANDARD SPECIFICATIONS.

ENDS OF GIRDERS SHALL BE PLUMB IN THE FINAL CONDITION.

FABRICATORS SHALL DETAIL DIAPHRAGM MEMBERS AND CONNECTIONS FOR FULL DEAD LOAD FIT UP. GIRDERS SHALL BE PLUMB AFTER THE FULL AMOUNT OF DEAD LOAD IS APPLIED.

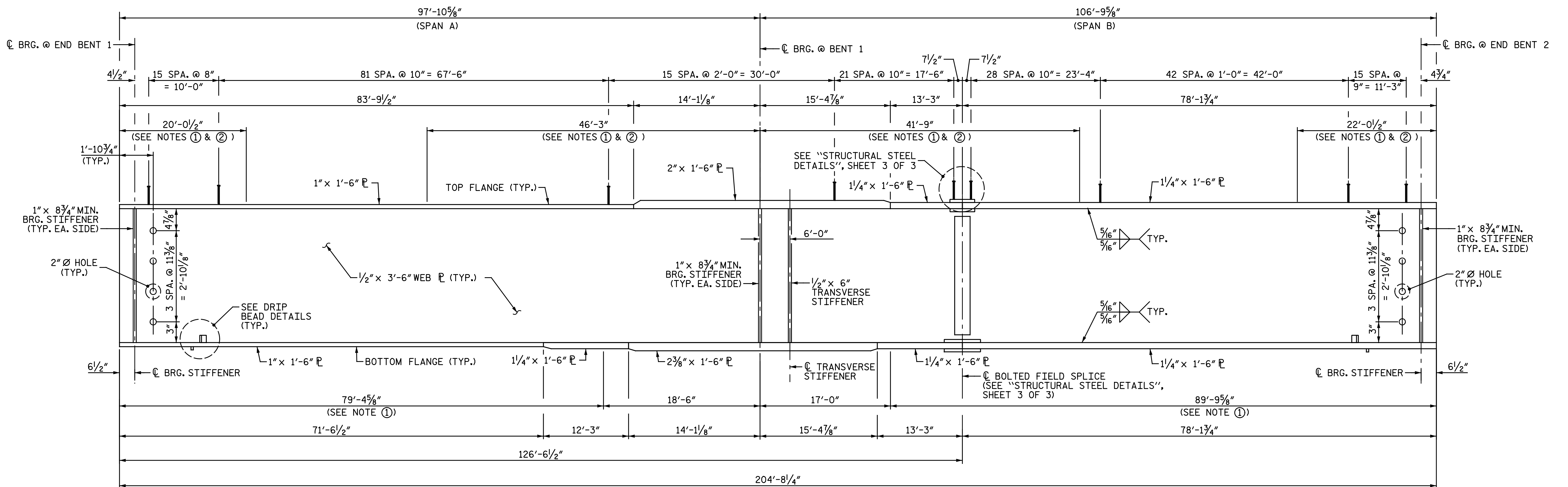
STRUCTURAL STEEL ERECTION IN A CONTINUOUS UNIT SHALL BE COMPLETE BEFORE FALSEWORK OR FORMS ARE PLACED ON THE UNIT.

PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1-

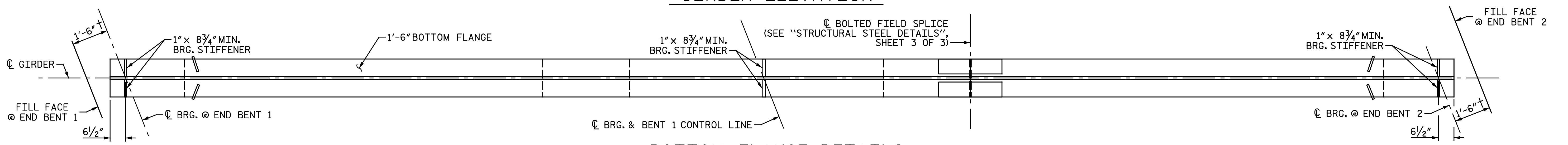
DRAWN BY: M. D. MAYHEW DATE: 9-1-16
 CHECKED BY: B. J. BELL DATE: 9-8-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	 DocuSigned by: Bradley J. Bell CA1AF8ECAC3A34... 1/27/2017	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE FRAMING PLAN RIGHT LANES		SHEET NO. S2-9 TOTAL SHEETS 39				
		REVISIONS						
		NO.	BY:		DATE:	NO.	BY:	DATE:
		1				3		
2			4					

Michael Baker International
 Michael Baker Engineering
 8000 Regency Parkway, Suite 600
 Cary, North Carolina 27518
 NC License No.: F-1084



GIRDER ELEVATION

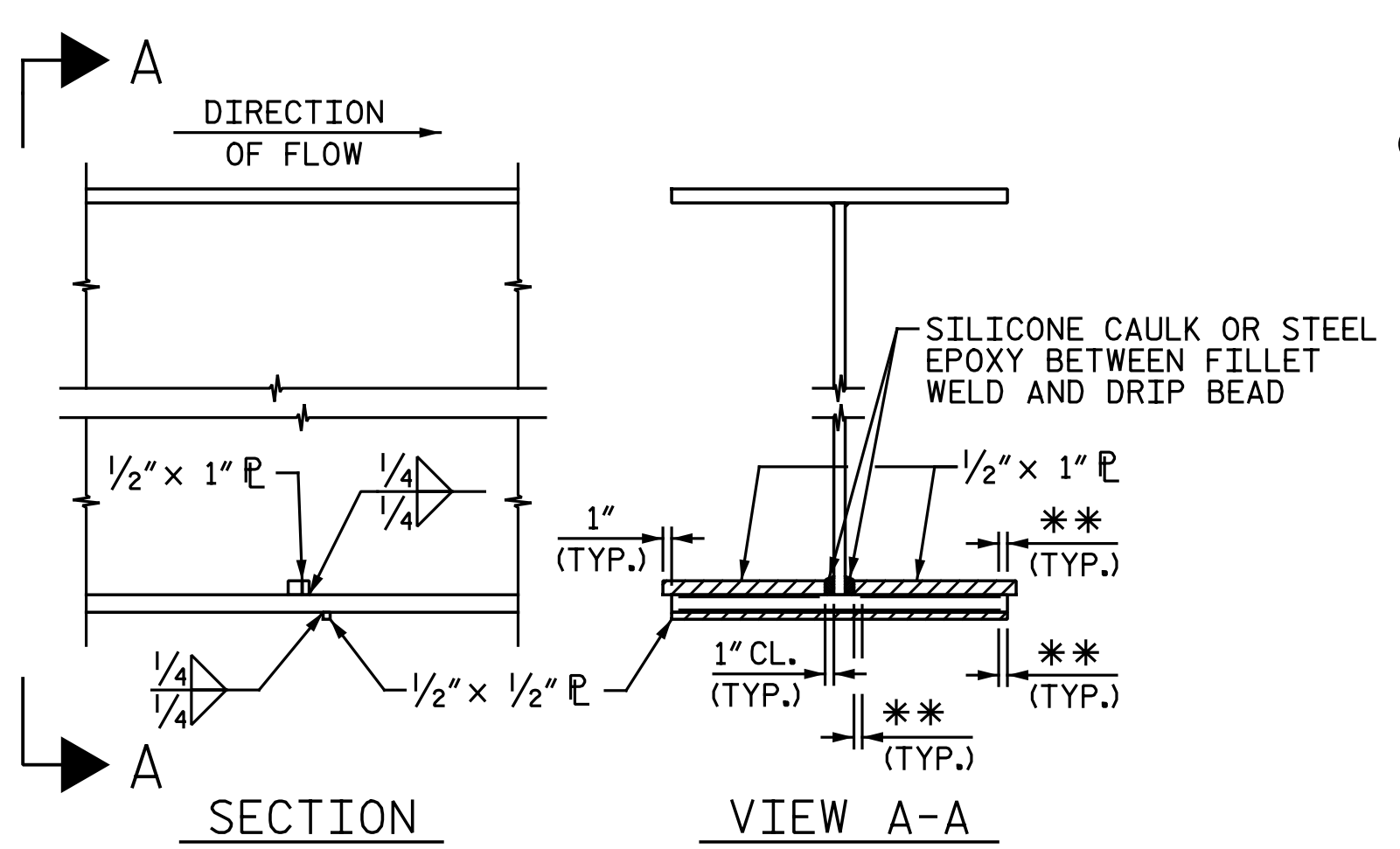
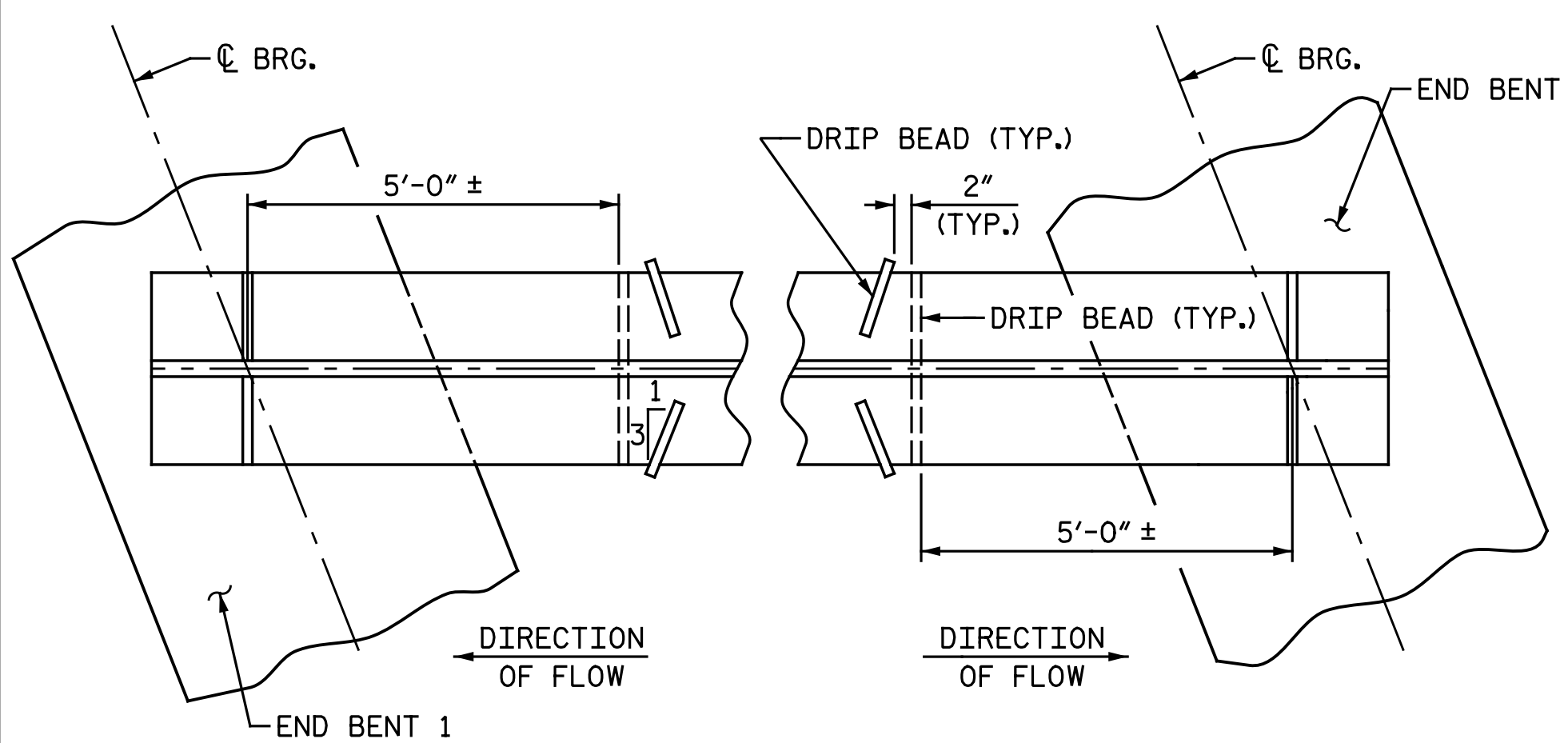


BOTTOM FLANGE DETAILS

NOTES:

- ① CHARPY V-NOTCH TESTS ARE REQUIRED FOR ALL TOP OR BOTTOM FLANGE PLATES WHICH FALL WITHIN THESE LIMITS, ALL WEB PLATES, AND ALL SPLICE PLATES. IF A PERMITTED SHOP FLANGE SPLICE IS NOT USED, CHARPY V-NOTCH TESTS WILL BE REQUIRED FOR THE ENTIRE FLANGE PLATE. FOR CHARPY V-NOTCH TESTS, SEE ARTICLE 1072-7 OF THE STANDARD SPECIFICATIONS.
 - ② NO WELDING OF FORMS OR FALSEWORK TO THE TOP FLANGE WILL BE PERMITTED IN THIS REGION.
- FOR SHEAR CONNECTOR TRANSVERSE SPACING, SEE "STRUCTURAL STEEL DETAILS", SHEET 3 OF 3.
- TRANSVERSE STIFFENERS ARE TO BE PLACED ON ONE SIDE OF THE GIRDER ONLY. TRANSVERSE STIFFENERS ARE NOT TO BE PLACED ON OUTSIDE OF EXTERIOR GIRDER.

PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1-
 SHEET 1 OF 3



DRIP BEAD DETAILS

** SEE "WELD TERMINATION DETAILS" ON "STRUCTURAL STEEL DETAILS", SHEET 2 OF 3.

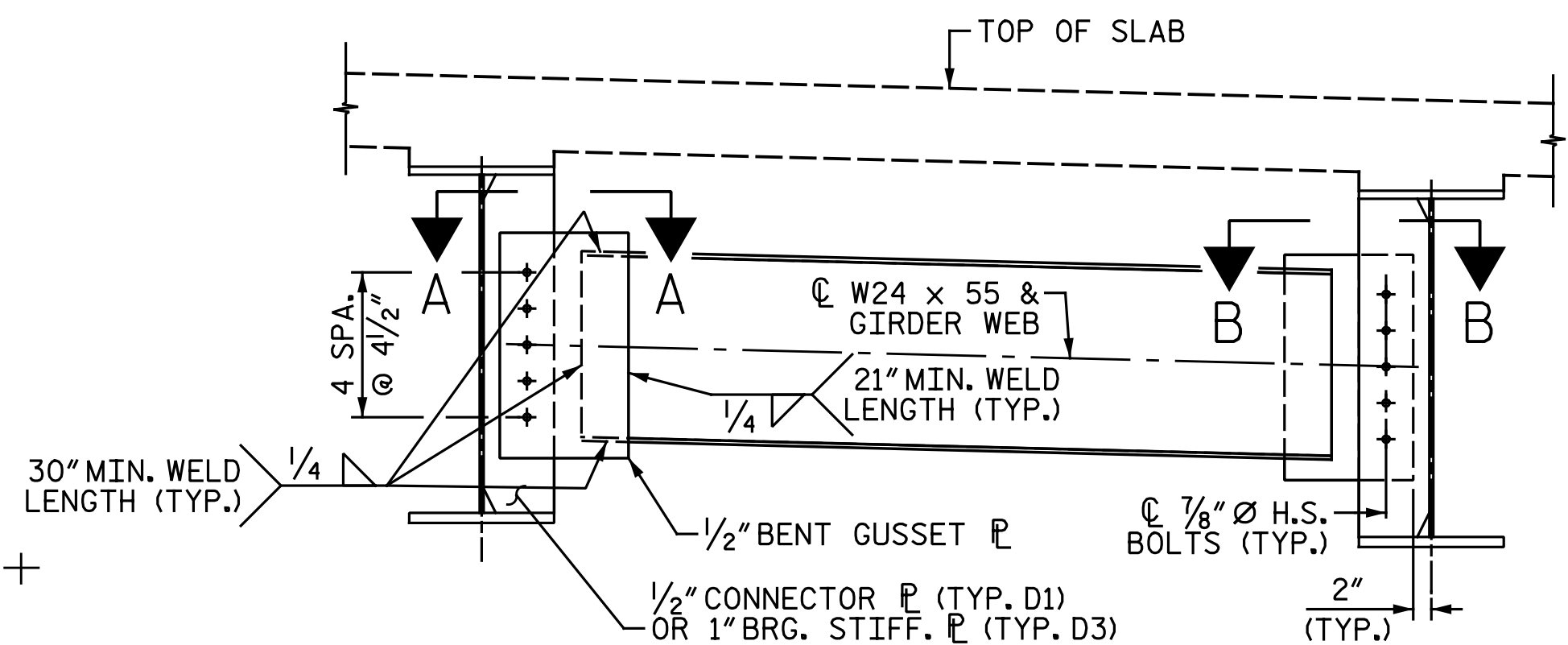
DRAWN BY: N. B. SPEAKS DATE: 8-31-16
 CHECKED BY: J. M. GARRISON DATE: 9-7-16

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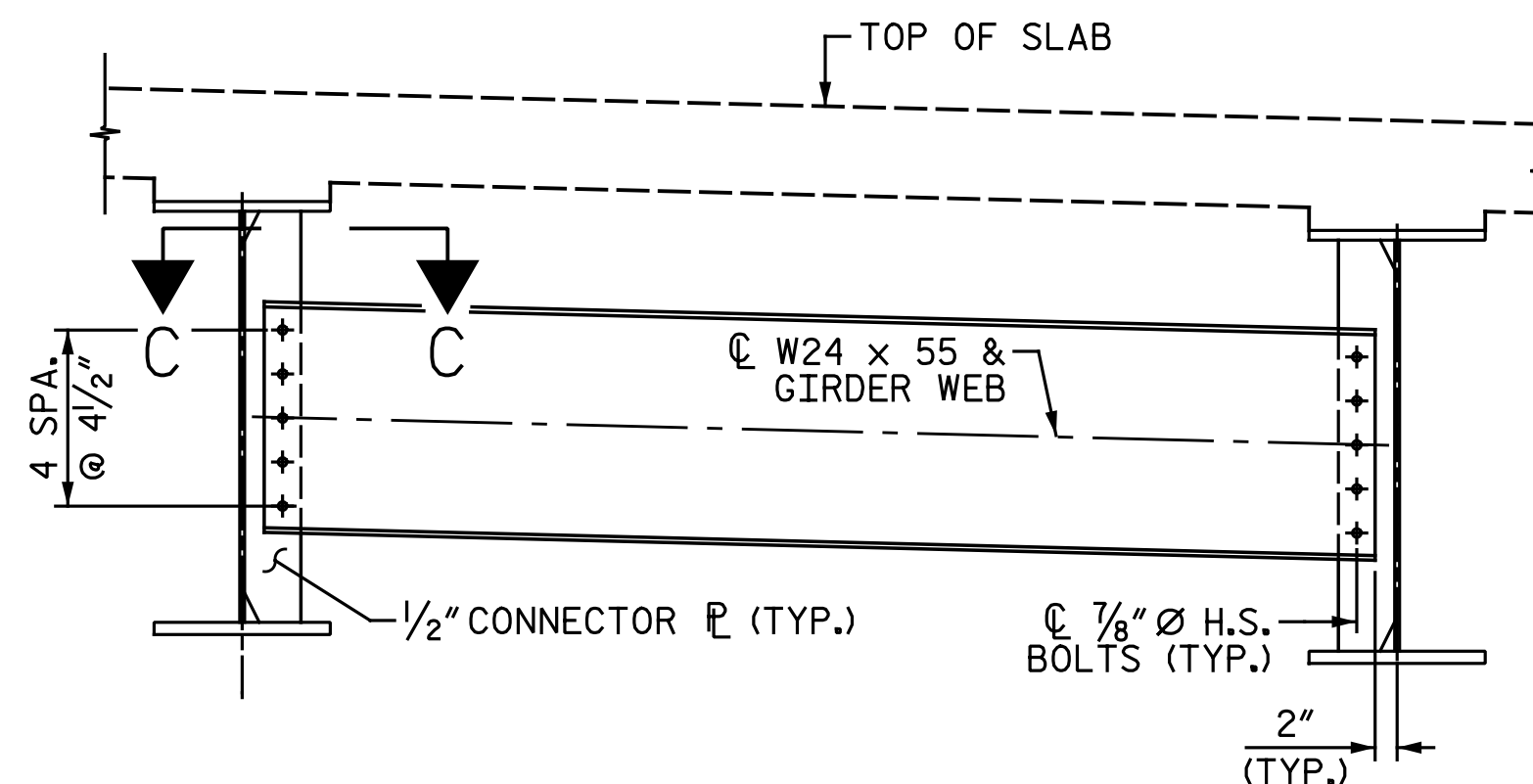
Professional Engineer Seal for Bradley J. Bell, State of North Carolina, License No. 042399, dated 1/27/2017.

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 8000 Regency Parkway, Suite 600
 Cary, North Carolina 27518
 NC License No.: F-1084

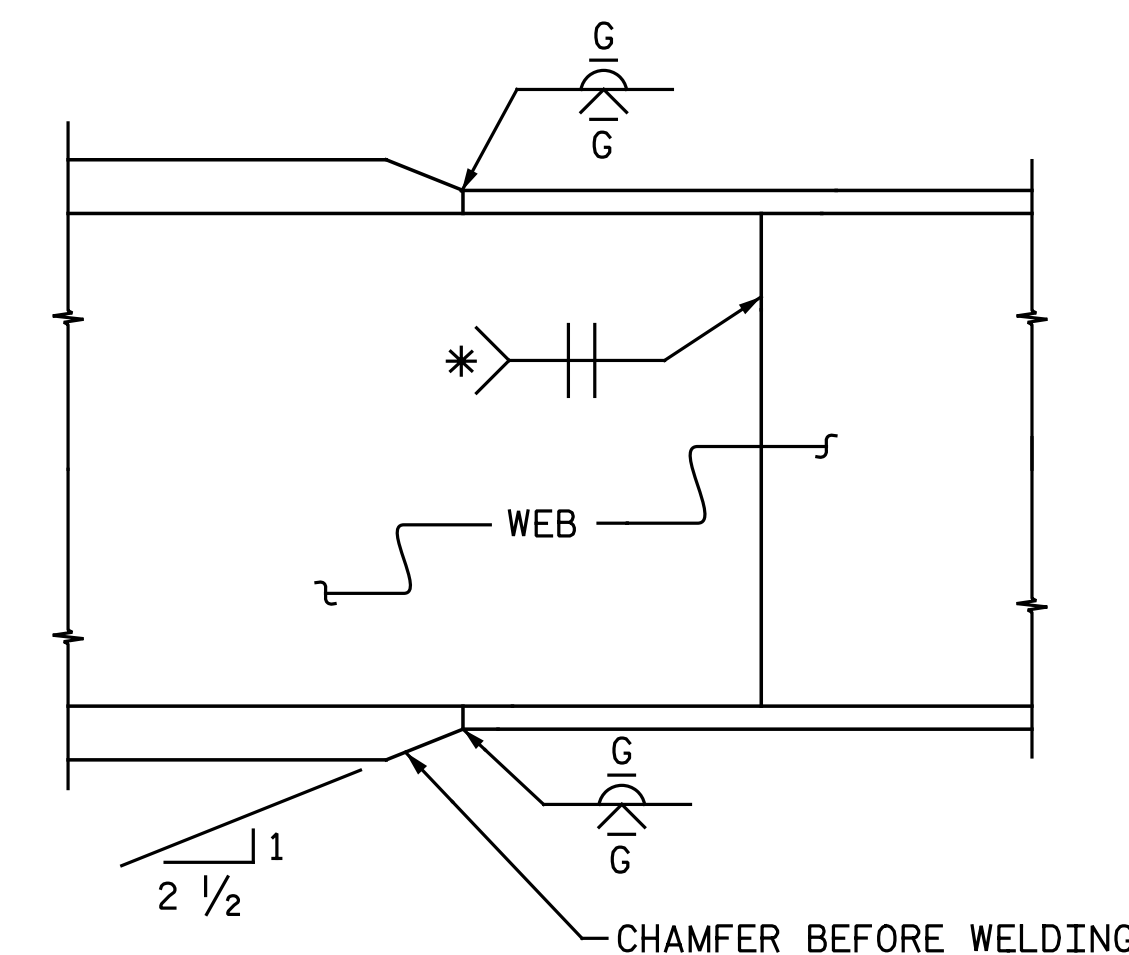
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE					
STRUCTURAL STEEL DETAILS					
RIGHT LANES					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S2-10					TOTAL SHEETS 39



INTERMEDIATE (D1) & BENT DIAPHRAGM (D3)

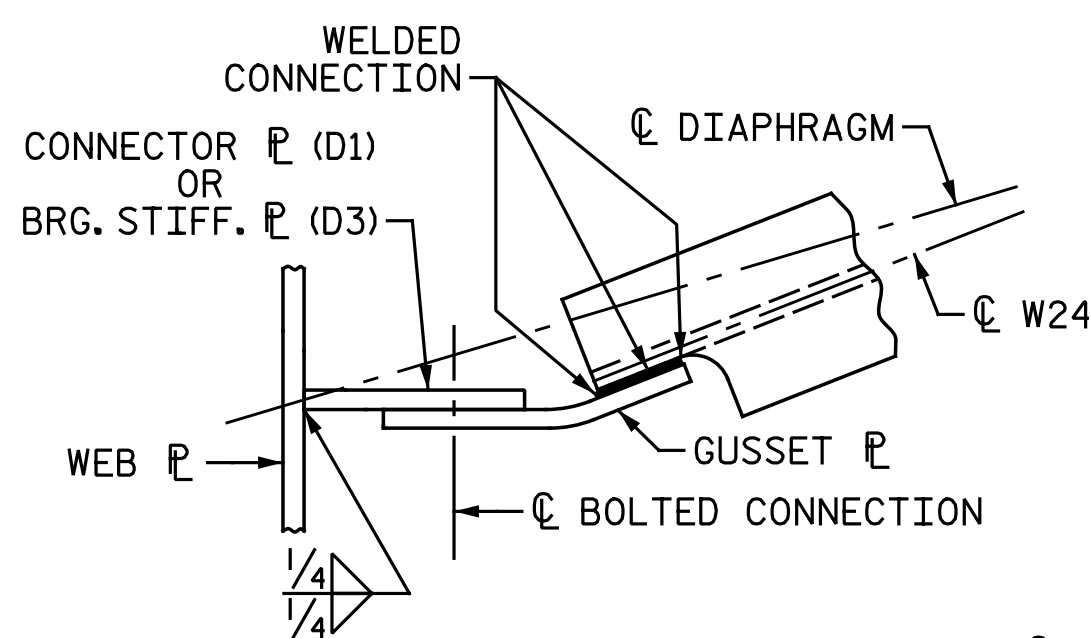


INTERMEDIATE DIAPHRAGM (D2)

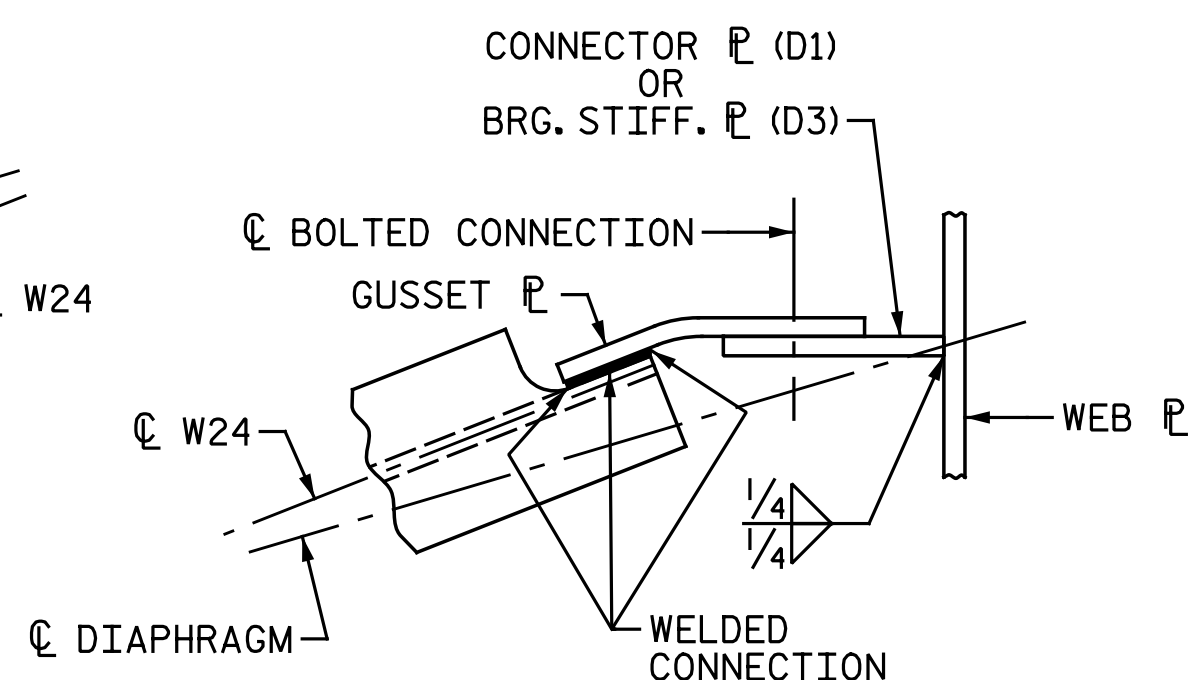


ELEVATION

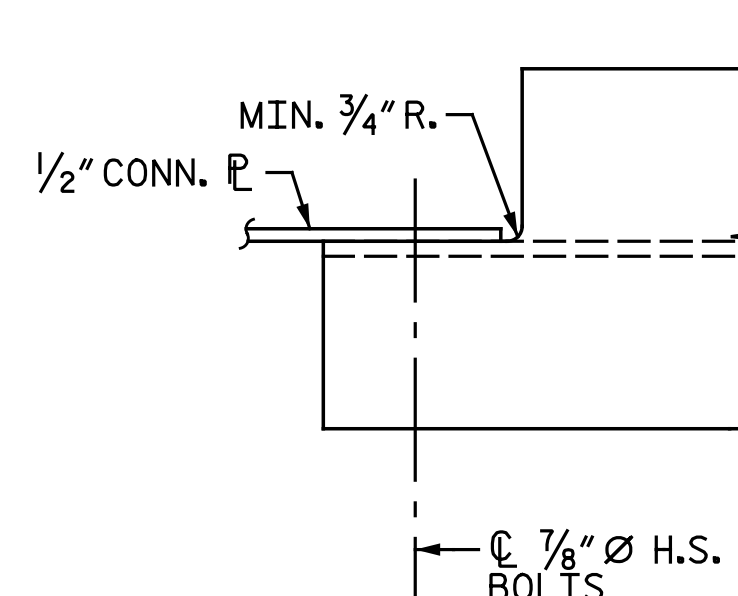
TYPICAL FLANGE AND WEB BUTT JOINT
* GRIND SMOOTH AND FLUSH ON OUTER FACE OF EXTERIOR GIRDERS



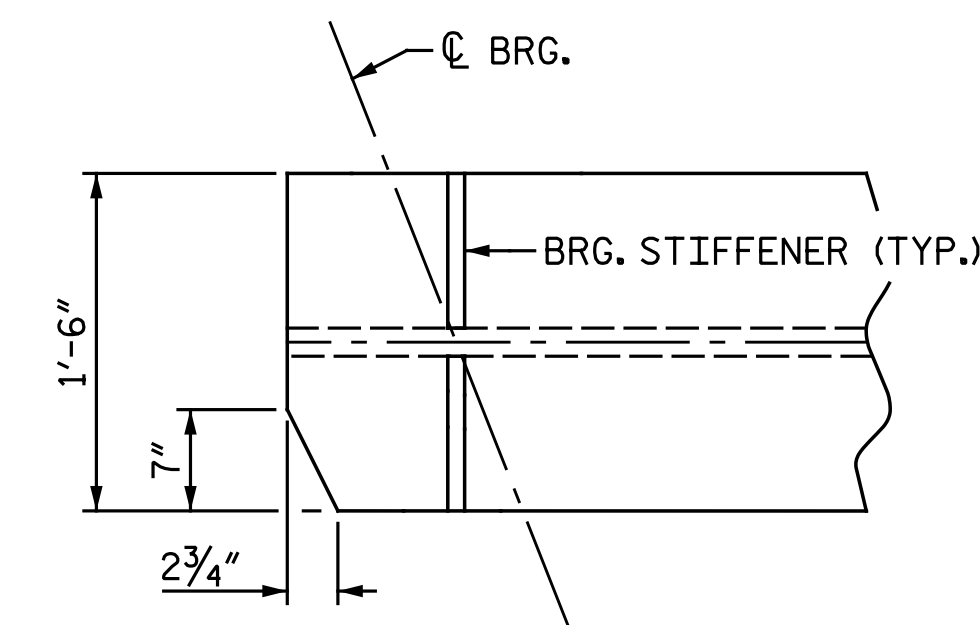
SECTION A-A



SECTION B-B

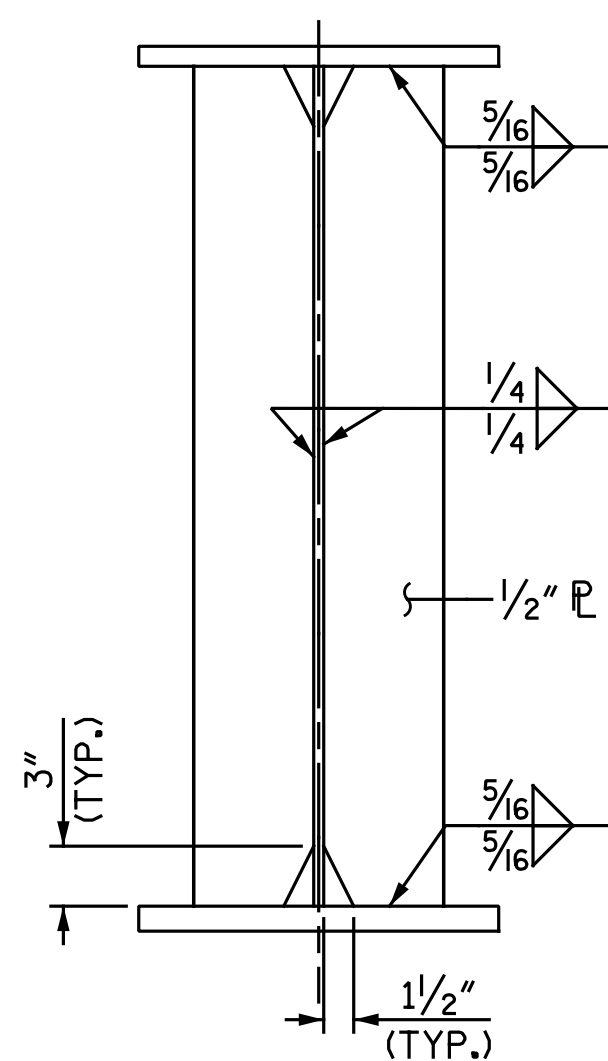


SECTION C-C

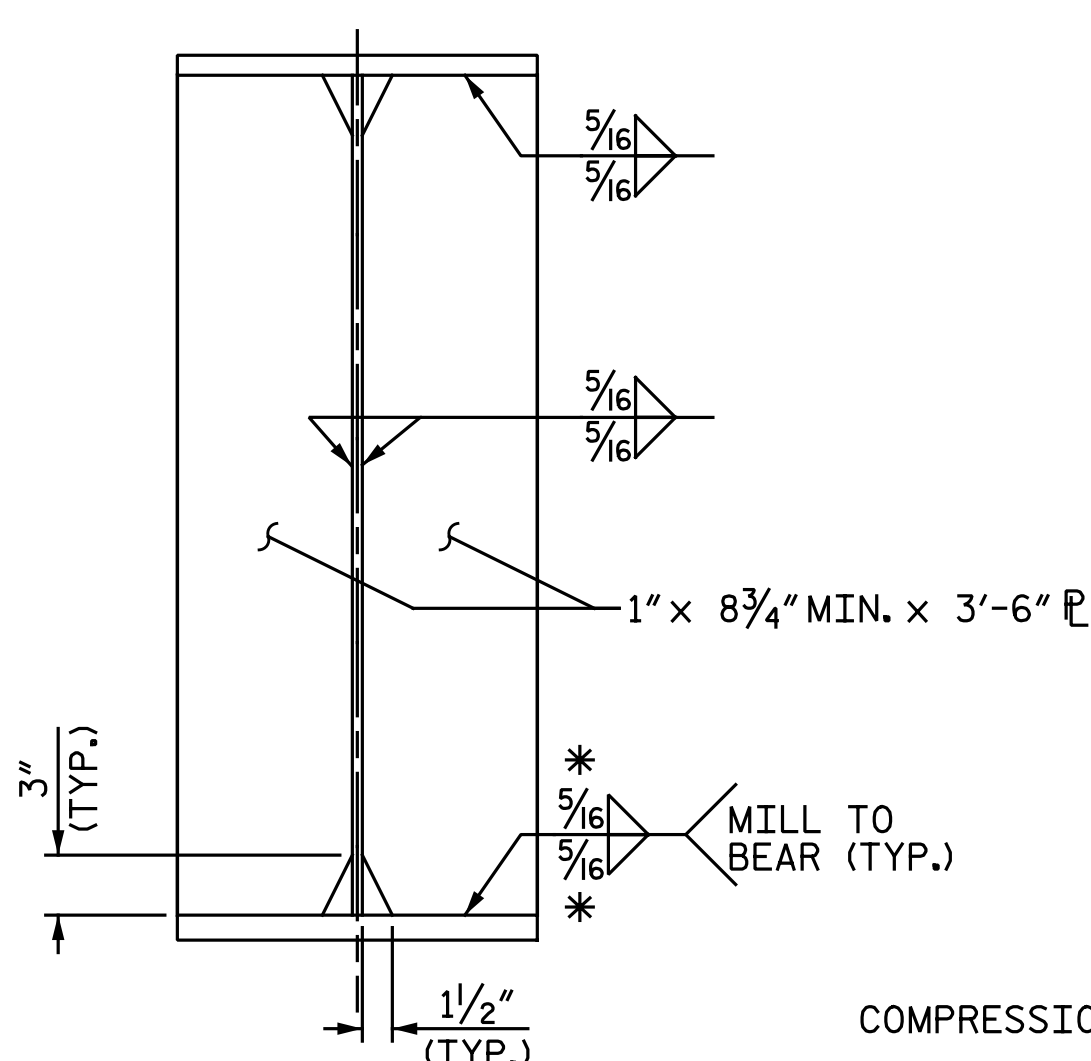


TOP FLANGE CLIP DETAIL

END BENT 1 SHOWN,
END BENT 2 SIMILAR BY ROTATION



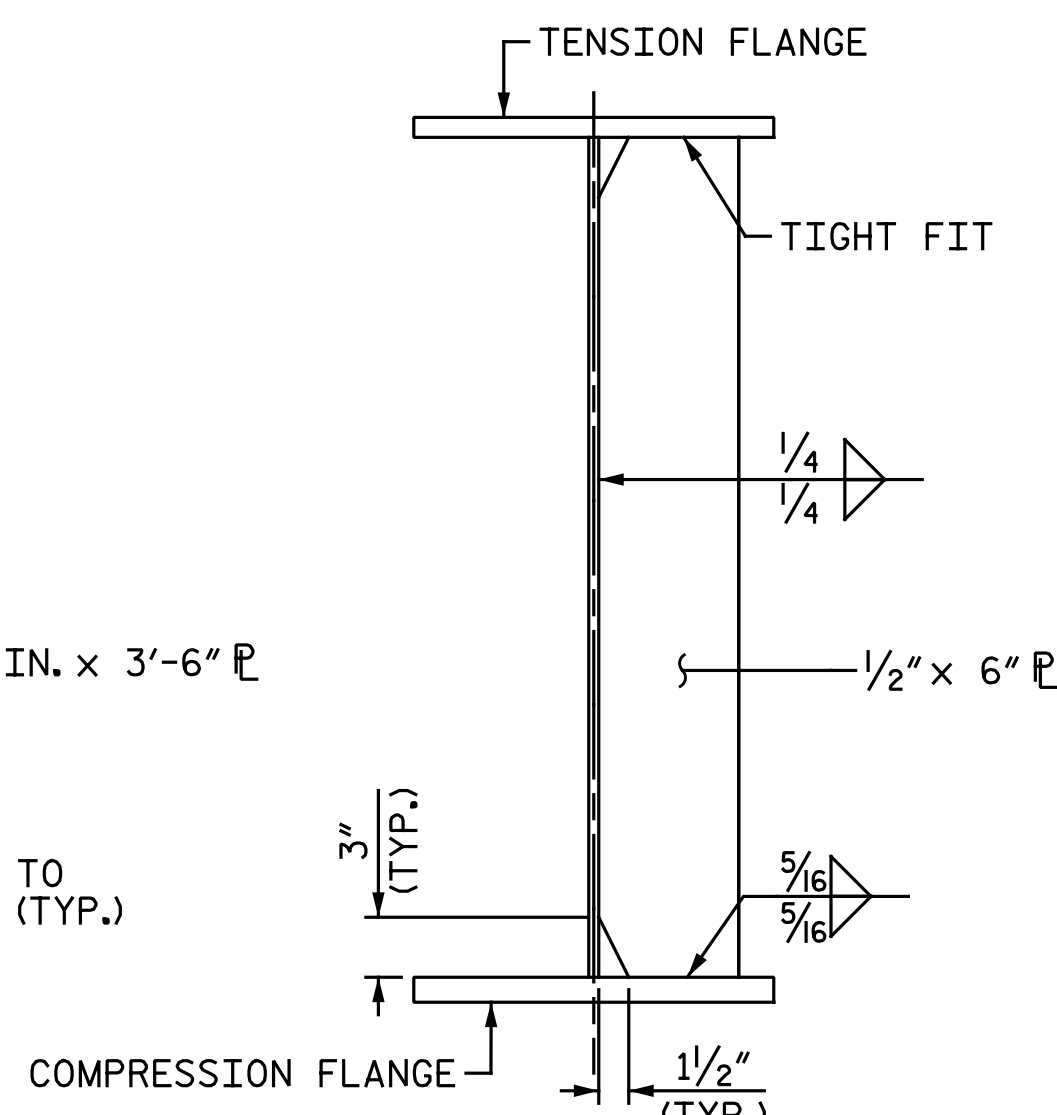
INTERMEDIATE DIAPHRAGM CONNECTOR PLATE



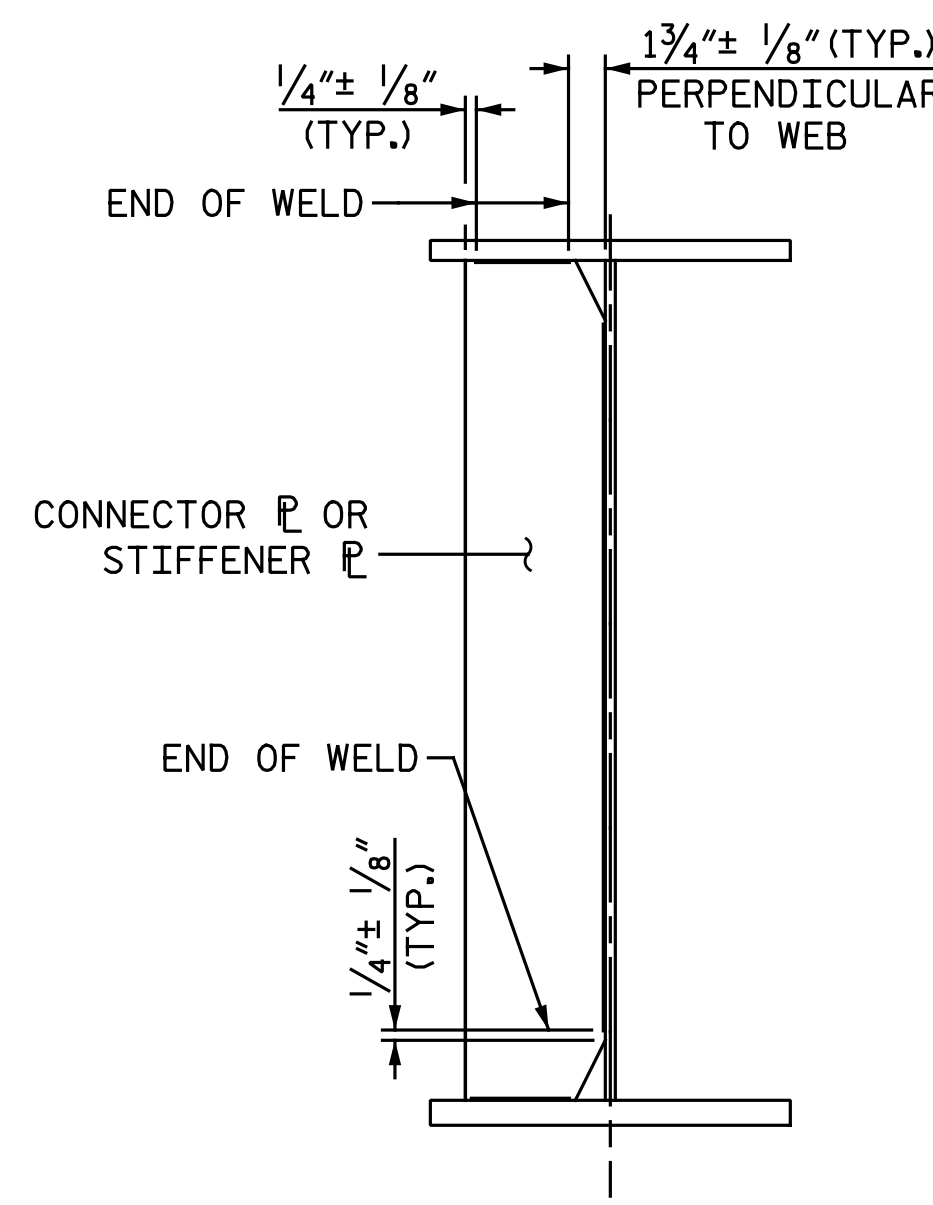
BEARING STIFFENER

BEARING STIFFENER MAY REQUIRE COPING IF WIDER THAN BOTTOM FLANGE.

* AT BENT 1, WELD BEARING STIFFENER TO BOTTOM FLANGE.



TRANSVERSE STIFFENER



STIFFENER AND CONNECTOR PLATE CONNECTIONS
WELD TERMINATION DETAILS

PROJECT NO. U-3330

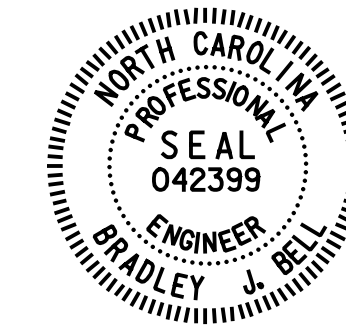
NASH COUNTY

STATION: 18+22.61 -Y1-

SHEET 2 OF 3

DRAWN BY: M. D. M./N. B. S. DATE: 8-8-16
CHECKED BY: J. M. GARRISON DATE: 9-8-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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Bradley J. Bell
C41AF8ECAC3434
1/27/2017

Michael Baker International

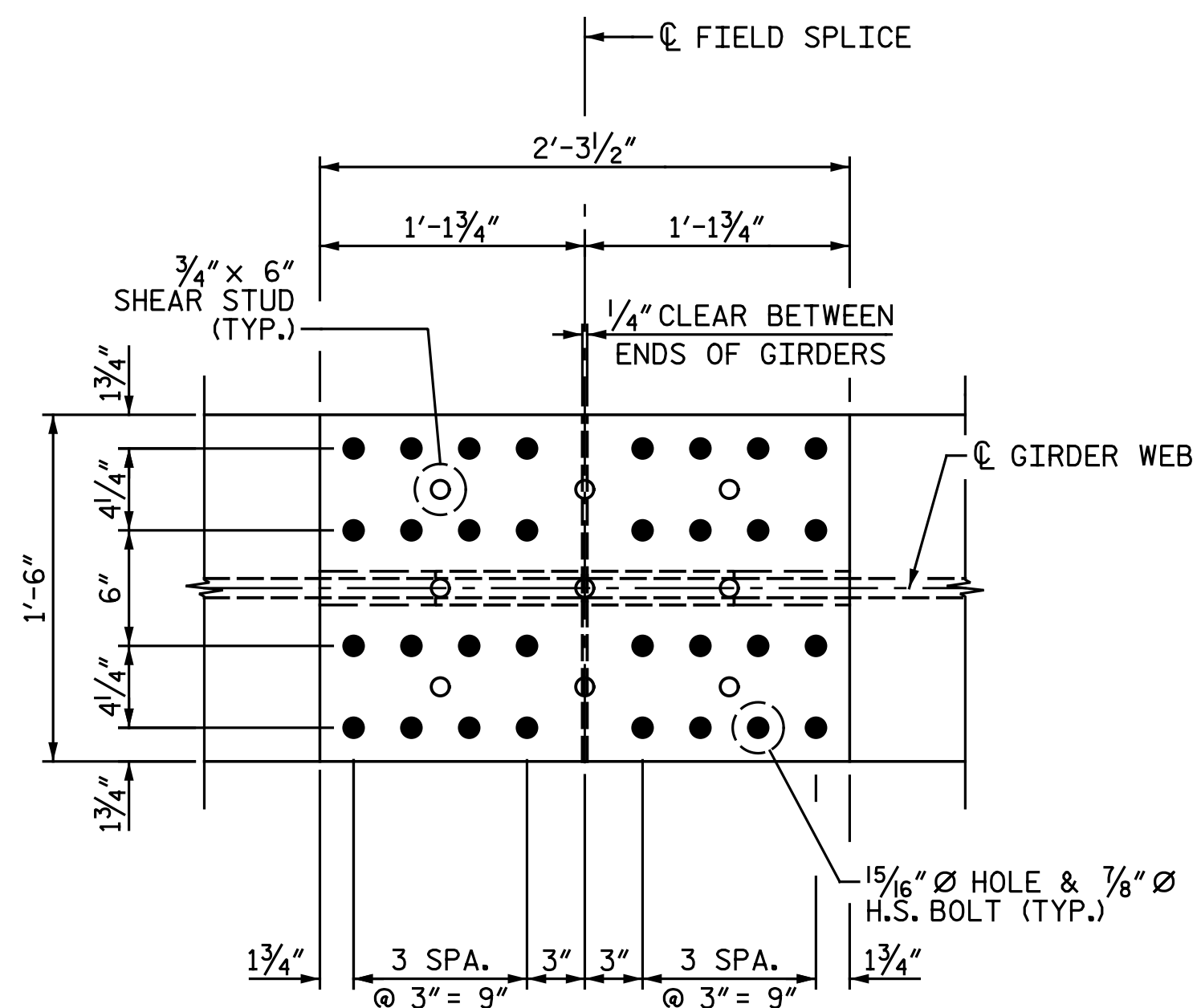
Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No.: F-1084

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
STRUCTURAL STEEL
DETAILS

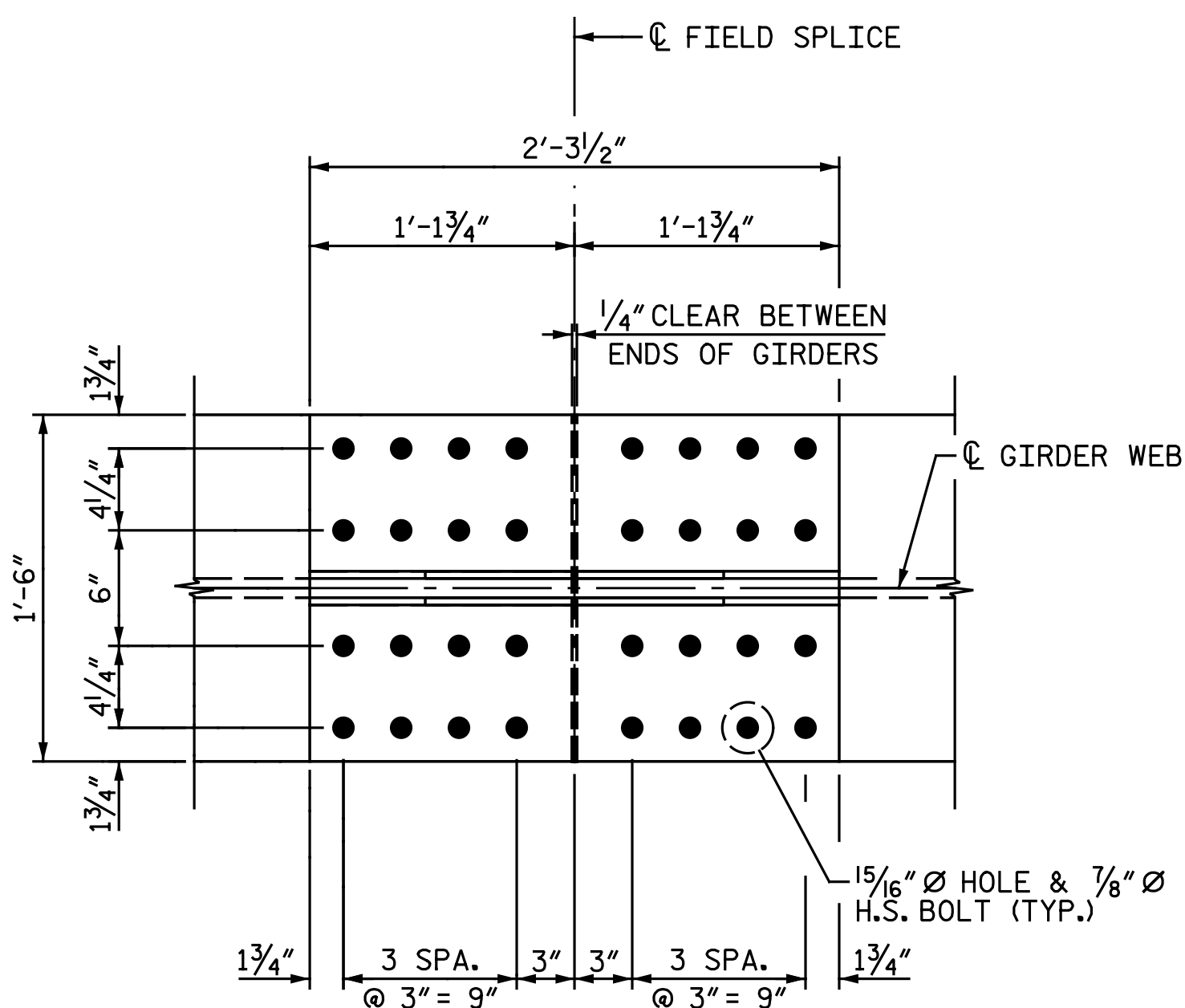
RIGHT LANES

REVISIONS

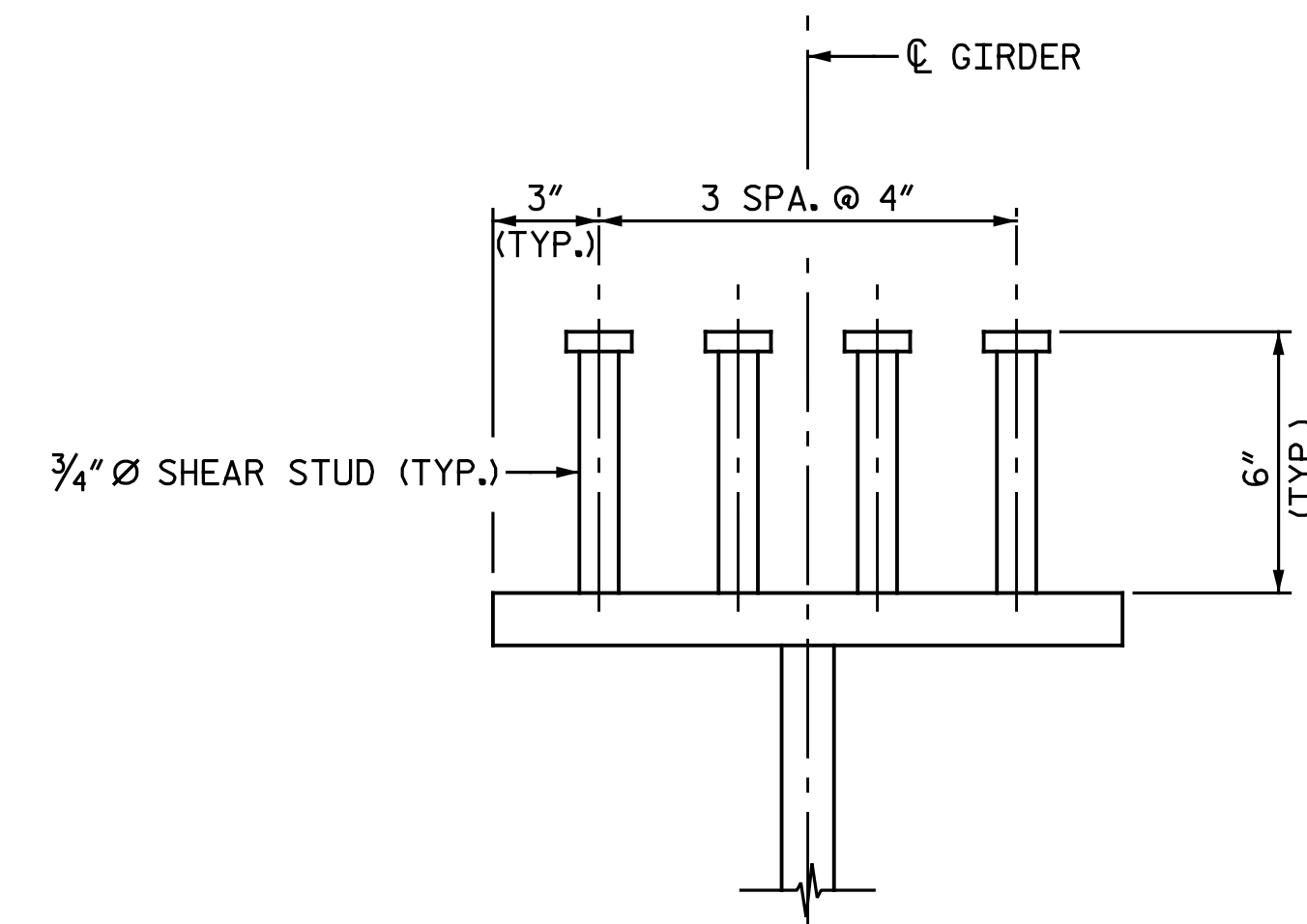
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			TOTAL SHEETS
2			4			39



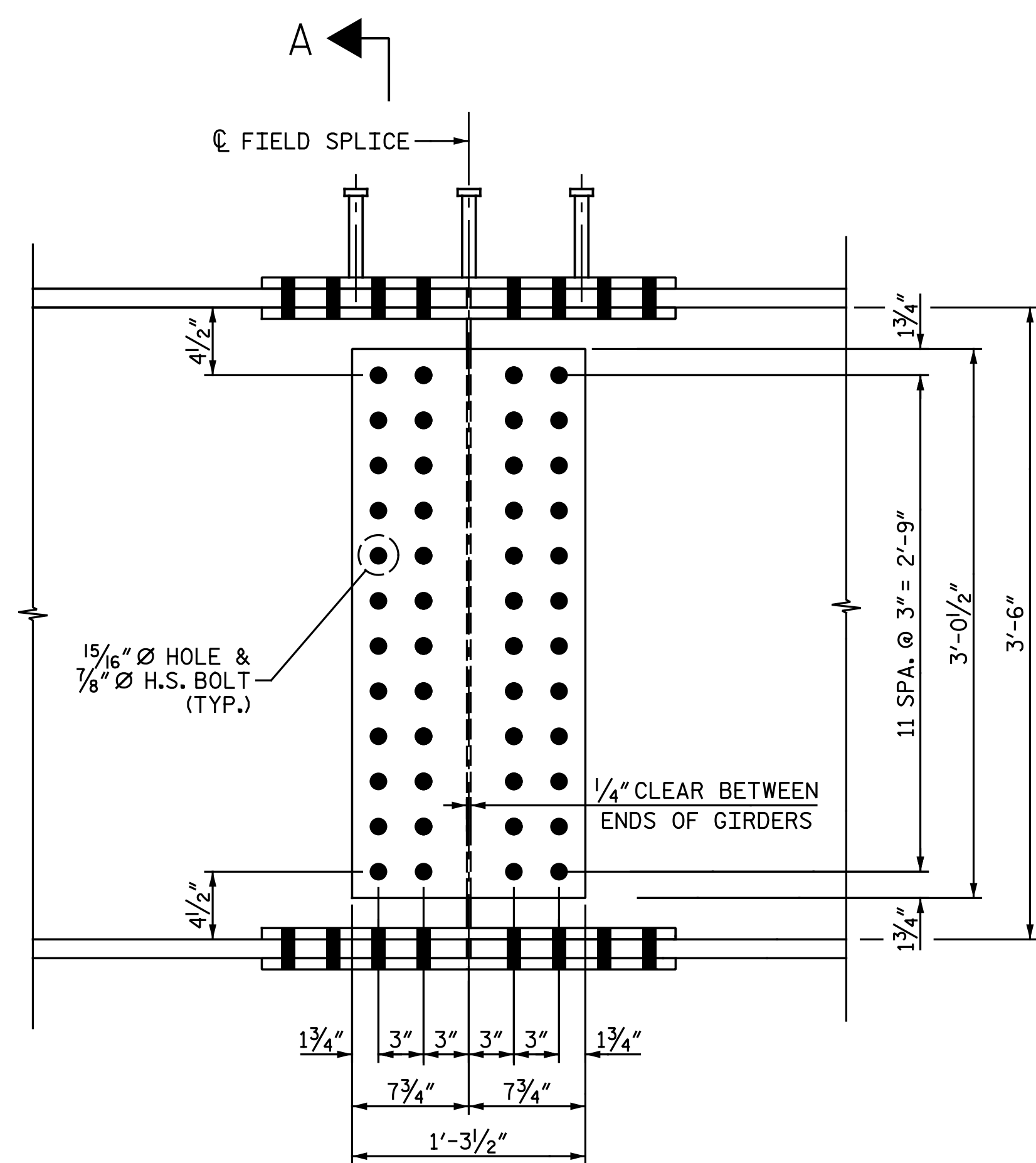
PLAN (TOP OF TOP FLANGE)



PLAN (TOP OF BOTTOM FLANGE)

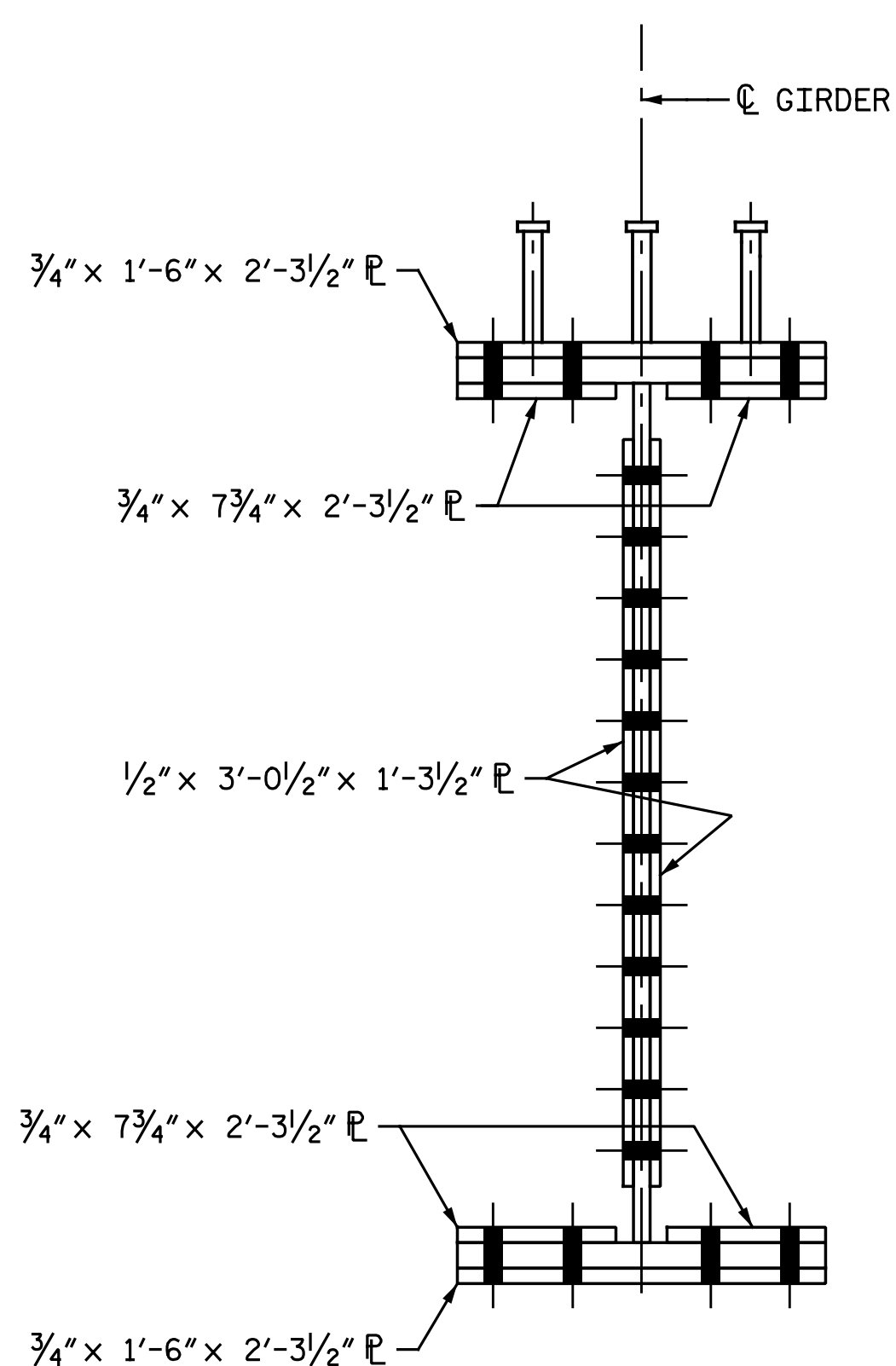


GIRDER SHEAR CONNECTORS
(EXCEPT AT BOLTED FIELD SPLICE)

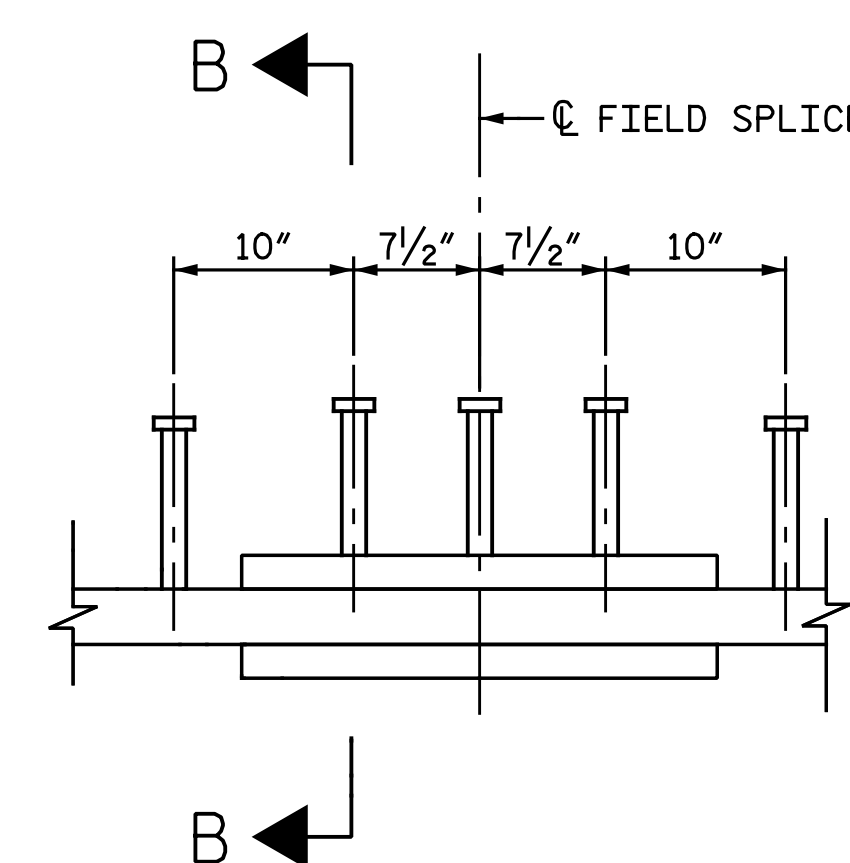


ELEVATION

BOLTED FIELD SPLICE DETAILS

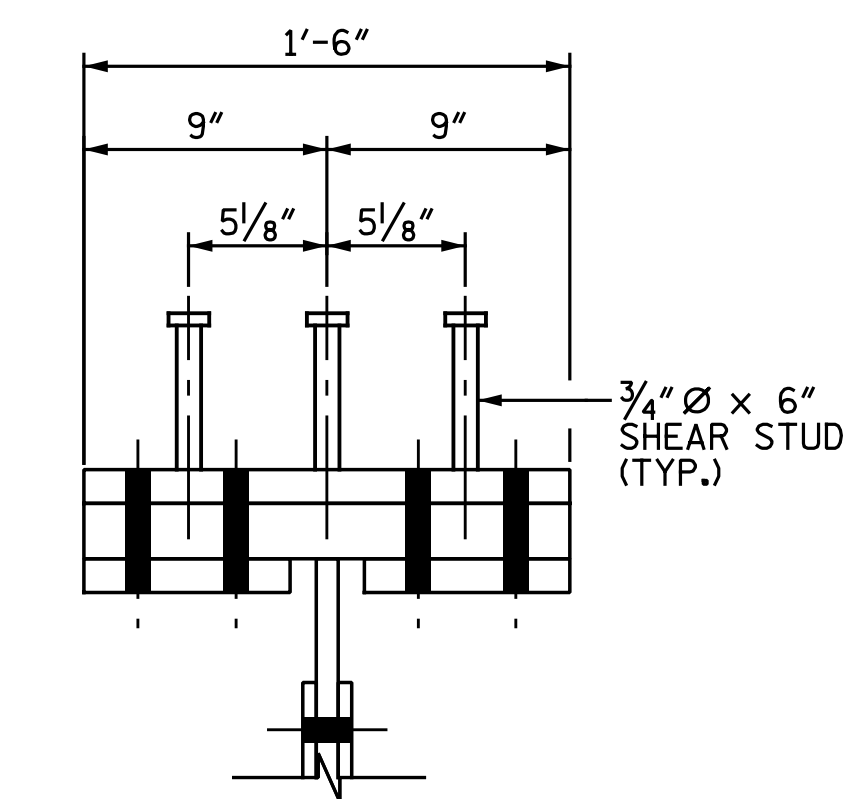


SECTION A-A



ELEVATION

SHEAR STUD DETAIL
FOR TOP FLANGE SPLICE PLATE



SECTION B-B

PROJECT NO. U-3330
NASH COUNTY
STATION: 18+22.61 -Y1-
SHEET 3 OF 3

DRAWN BY: M. D. MAYHEW DATE: 8-4-16
CHECKED BY: J. M. GARRISON DATE: 9-8-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE STRUCTURAL STEEL DETAILS RIGHT LANES			
	REVISIONS				SHEET NO. S2-12	
	NO.	BY:	DATE:	NO.	BY:	DATE:
1			3			39
2			4			

Michael Baker International
 Michael Baker Engineering
 8000 Regency Parkway, Suite 600
 Cary, North Carolina 27518
 NC License No.: F-1084

NOTES

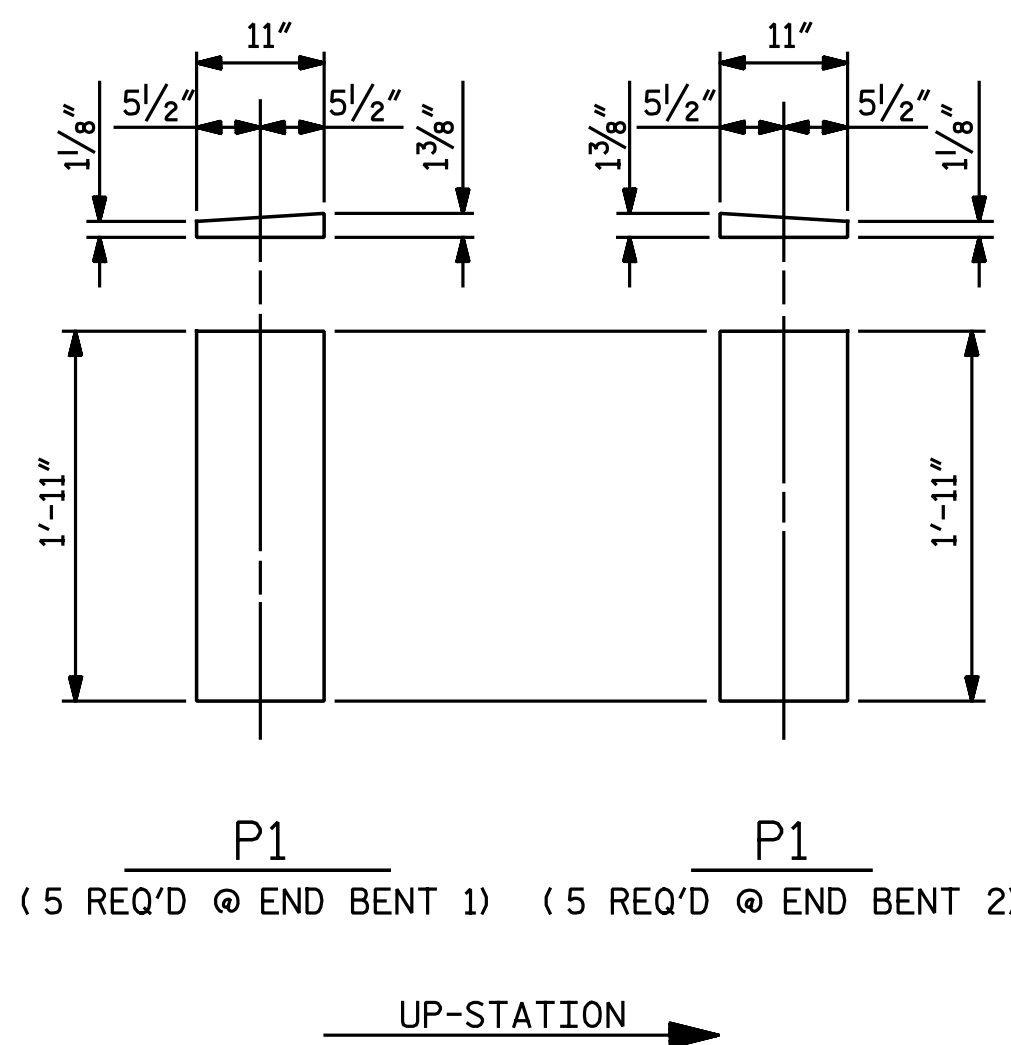
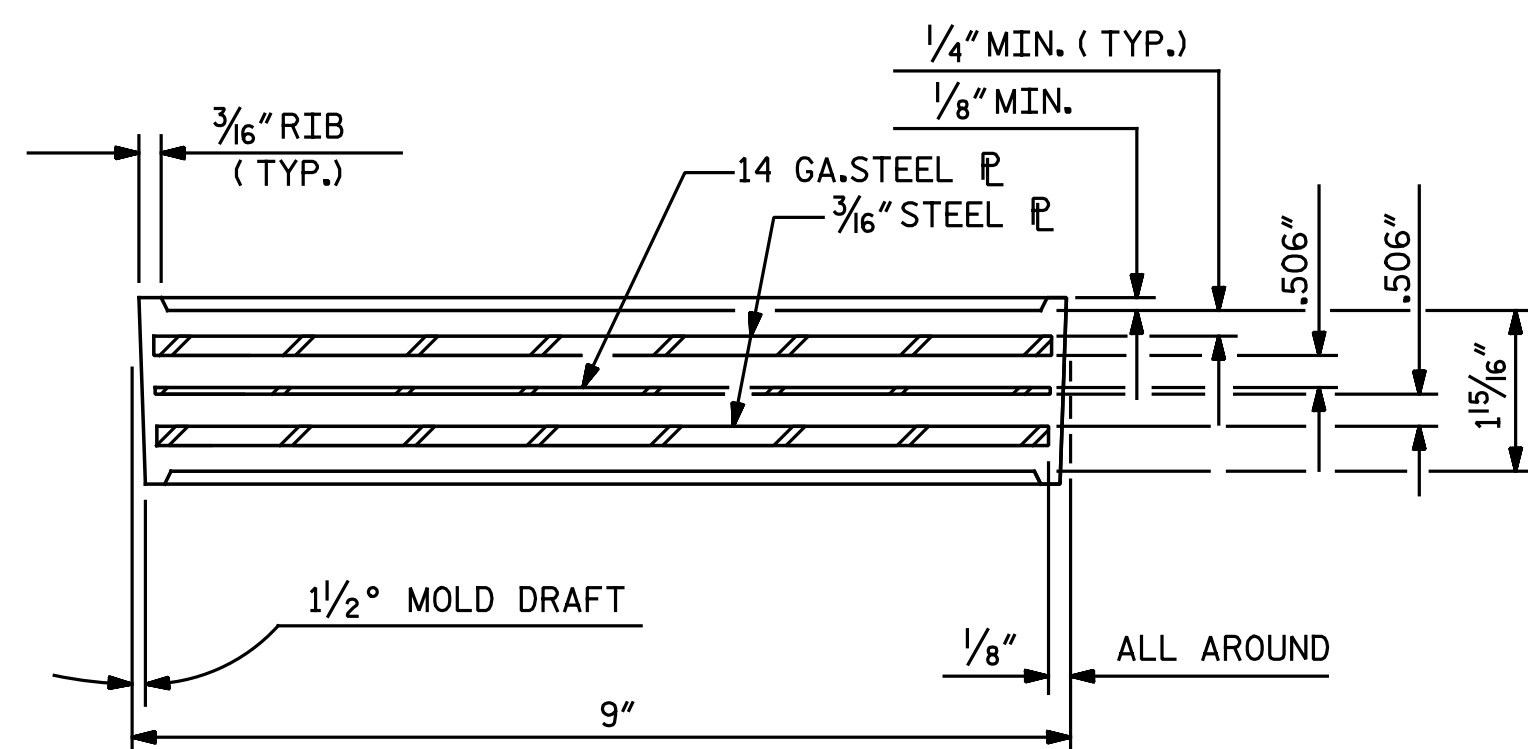
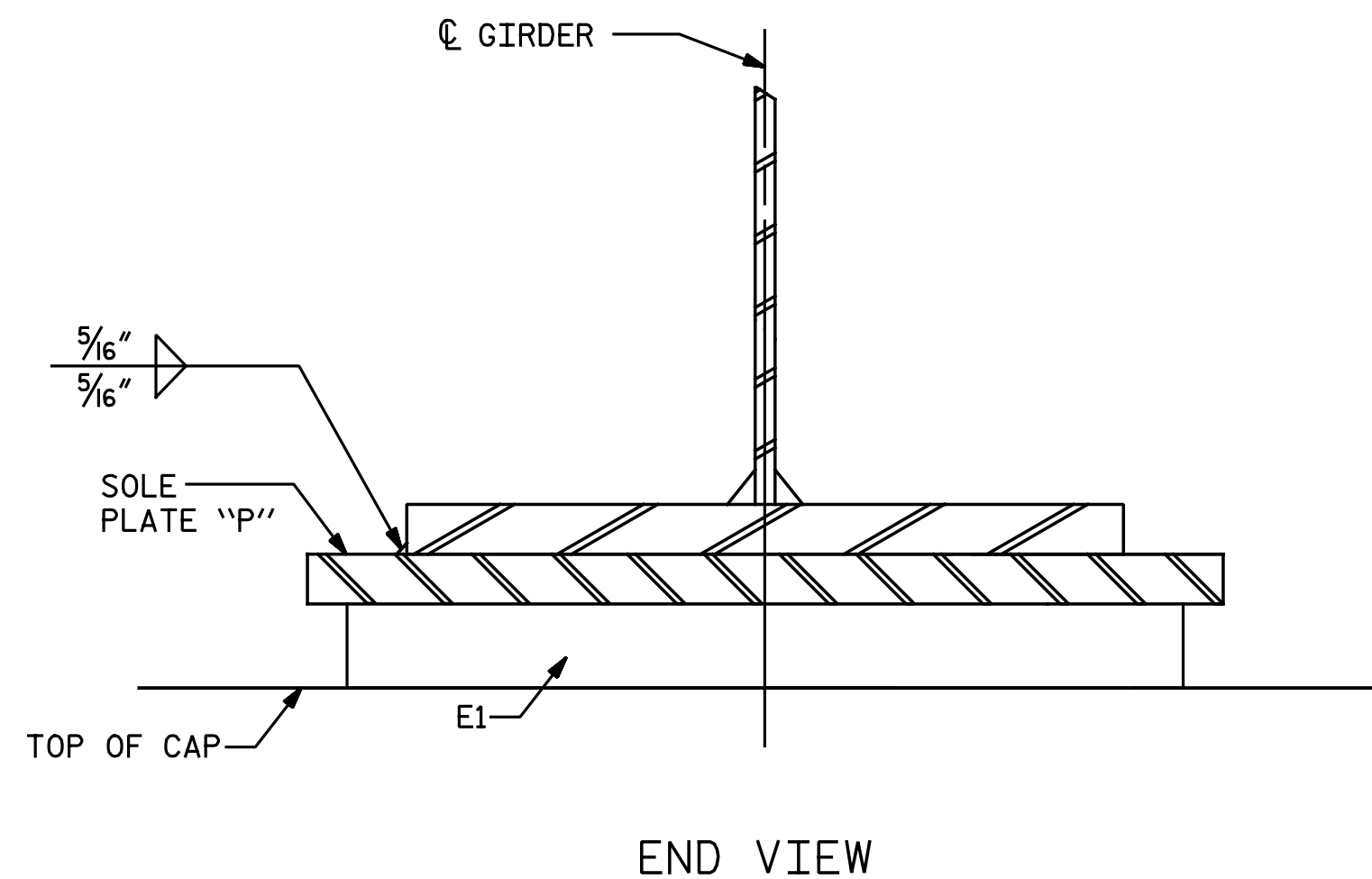
FOR AASHTO M270 GRADE 50W STRUCTURAL STEEL, SOLE PLATE SHALL BE AASHTO M270 GRADE 50W AND SHALL NOT BE GALVANIZED.

SOLE PLATES SHALL BE INCLUDED IN THE PAY ITEM FOR STRUCTURAL STEEL.

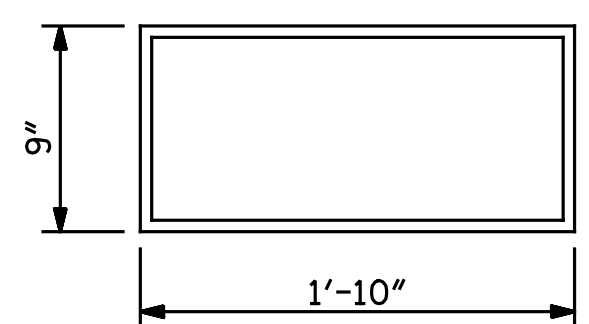
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.



MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE IV	225 k



E1 (10 REQ'D)

TYPE IV

(NCDOT STANDARD BEARING FOR PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURES)

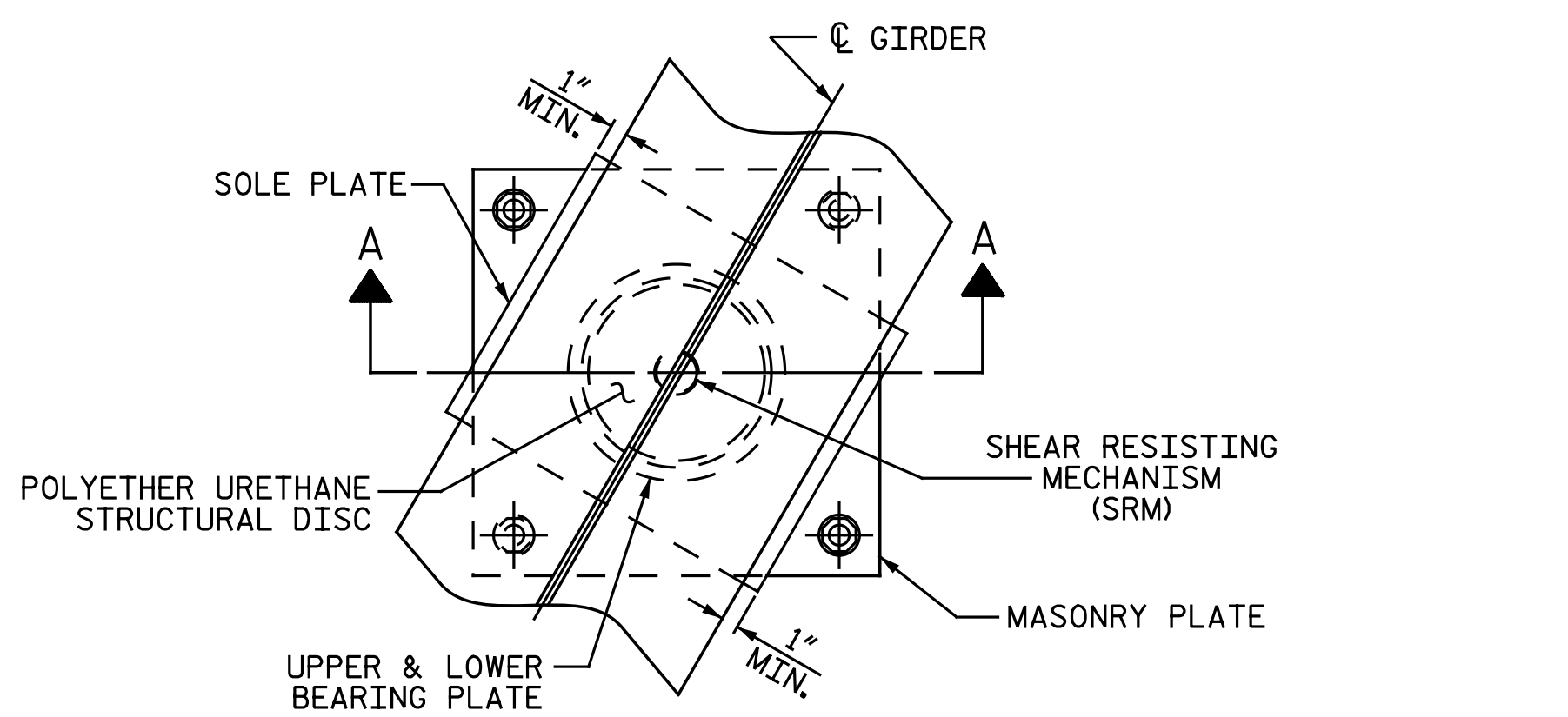
PROJECT NO. U-3330
 NASH COUNTY
 STATION: 18+22.61 -Y1-

DRAWN BY : N. B. SPEAKS DATE : 8-26-16
 CHECKED BY : J. M. GARRISON DATE : 8-29-16

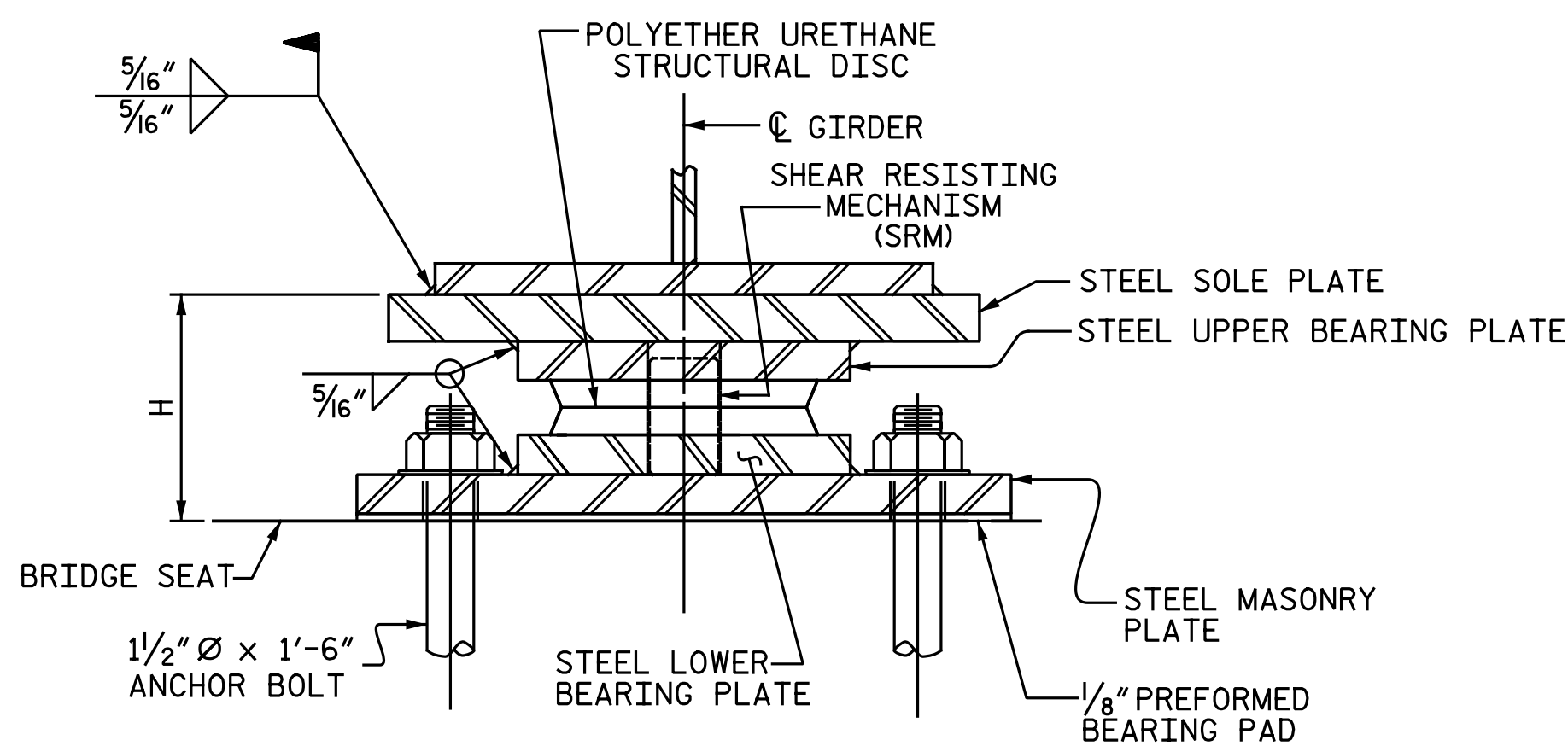
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	 DocuSigned by: Bradley J. Bell CA1A3F8E3A3C434... 1/27/2017	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE ELASTOMERIC BEARING DETAILS RIGHT LANES																			
		REVISIONS		SHEET NO. S2-13																	
		Michael Baker INTERNATIONAL	Michael Baker Engineering 8000 Regency Parkway, Suite 600 Cary, North Carolina 27518 NC License No.: F-1084	<table border="1"> <tr> <th>NO.</th> <th>BY:</th> <th>DATE:</th> <th>NO.</th> <th>BY:</th> <th>DATE:</th> </tr> <tr> <td>1</td> <td></td> <td></td> <td>3</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td>4</td> <td></td> <td></td> </tr> </table>	NO.	BY:	DATE:	NO.	BY:	DATE:	1			3			2			4	
NO.	BY:	DATE:	NO.	BY:	DATE:																
1			3																		
2			4																		

NOTES

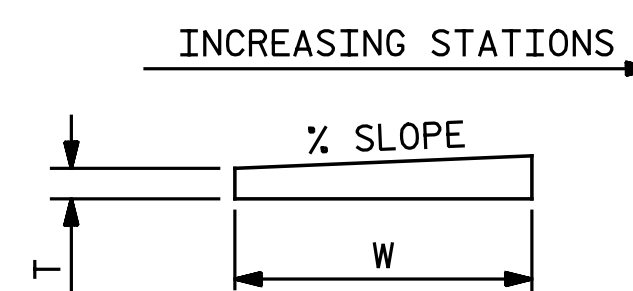
- FOR DISC BEARINGS, SEE SPECIAL PROVISIONS.
- ALL BEARING PLATES SHALL BE AASHTO M270 GRADE 50W OR GRADE 50.
- AT ALL POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS SHALL BE FINGER-TIGHTENED PLUS AN ADDITIONAL 1/4 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.
- WHEN WELDING THE SOLE PLATE TO THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE BEARING DOES NOT EXCEED 250°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE TFE OR URETHANE DISC.
- SOLE PLATES SHOULD BE WELDED TO GIRDER FLANGES BEFORE FALSEWORK IS PLACED.
- ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.
- FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
- THE MINIMUM ROTATIONAL CAPACITY FOR ALL BEARINGS SHALL BE 0.02 RADIAN.



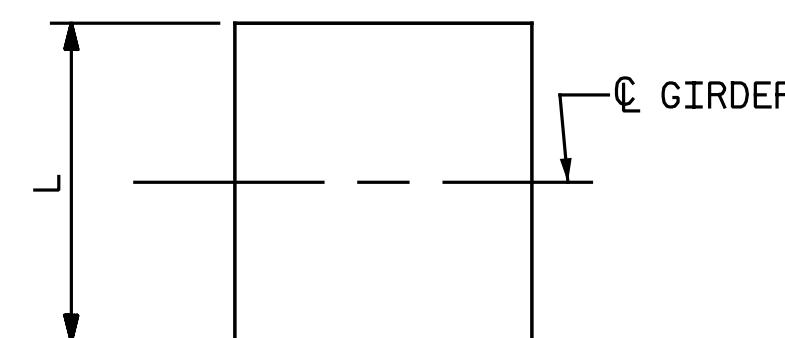
PLAN



SECTION A-A
DB1, FIXED



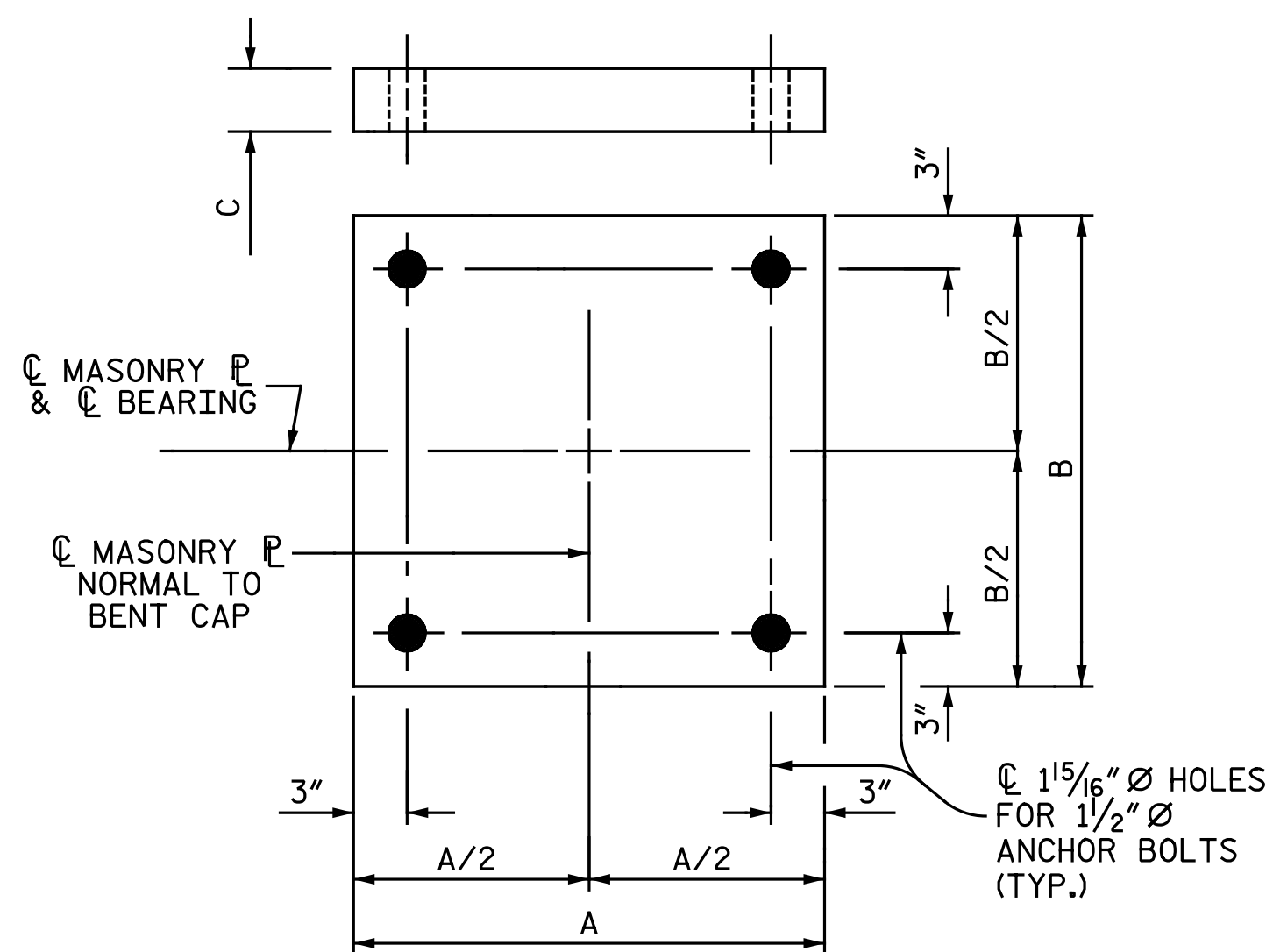
ELEVATION



PLAN

NOTE:
DIMENSIONS "W" AND "T" SHALL BE DETERMINED BY THE BEARING MANUFACTURER.

SOLE PLATE DETAILS



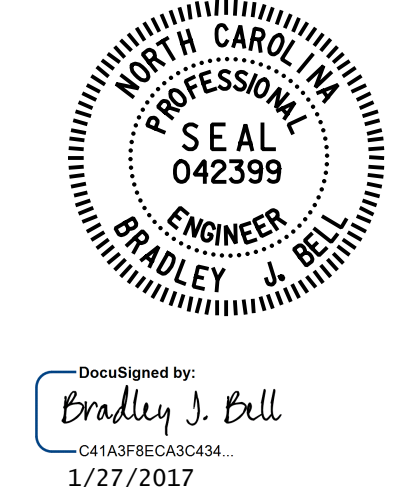
PLAN
MASONRY PLATE
DETAILS

PROJECT NO. U-3330
NASH COUNTY
STATION: 18+22.61 -Y1-

ASSEMBLED BY : N. B. SPEAKS	DATE : 7-05-16
CHECKED BY : T. M. GARRISON	DATE : 8-29-16
DRAWN BY : TMG 08/13	REV. REV.
CHECKED BY : EKP 10/13	REV. REV.

DESIGNATIONS		LOCATION	NUMBER OF BEARINGS	DIMENSIONS				LOADS AND MOVEMENT						
BEARINGS	MASONRY PL			BEARING H (IN.)	MASONRY PL A (IN.)	SOLE PLATE B (IN.)	SOLE PLATE C (IN.)	UNFACTORED VERTICAL LOAD (KIPS)		FACTORED HORIZONTAL LOAD (KIPS)	ONE-WAY MOVEMENT (IN.)			
DB1 (FIXED)	M1			5 1/2	22 1/2	22 1/2	3/4	DC	DW			LIVE LL+IM		
		BENT 1	5					0	20	276	12	176	94	0

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No.: F-1084

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
DISC BEARING
DETAILS
RIGHT LANES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-14
1			3			TOTAL SHEETS
2			4			39

DEAD LOAD DEFLECTION AND CAMBER ORDINATES

	SPAN A																				SPAN B																				
	GIRDER G1R																																								
20TH POINTS	1.0	1.05	1.1	1.15	1.2	1.25	1.3	1.35	1.4	1.45	1.5	1.55	1.6	1.65	1.7	1.75	1.8	1.85	1.9	1.95	2.0	2.05	2.1	2.15	2.2	2.25	2.3	2.35	2.4	2.45	2.5	2.55	2.6	2.65	2.7	2.75	2.8	2.85	2.9	2.95	3.0
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.004	0.007	0.010	0.012	0.014	0.015	0.016	0.016	0.015	0.014	0.012	0.010	0.007	0.005	0.003	0.001	0.000	-0.001	-0.001	0.000	0.002	0.005	0.009	0.013	0.018	0.022	0.027	0.030	0.033	0.035	0.037	0.036	0.035	0.033	0.030	0.025	0.020	0.014	0.007	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.025	0.049	0.070	0.089	0.103	0.114	0.120	0.121	0.118	0.111	0.099	0.086	0.071	0.053	0.038	0.024	0.013	0.004	0.000	0.000	0.007	0.017	0.032	0.049	0.069	0.089	0.110	0.128	0.143	0.154	0.160	0.161	0.157	0.148	0.132	0.113	0.090	0.062	0.032	0.000
DEFLECTION DUE TO WEIGHT OF RAIL AND SIDEWALK	0.000	0.004	0.007	0.010	0.013	0.015	0.017	0.018	0.018	0.018	0.017	0.016	0.014	0.012	0.010	0.007	0.005	0.003	0.001	0.000	0.000	0.001	0.003	0.005	0.008	0.011	0.014	0.018	0.020	0.022	0.024	0.025	0.025	0.024	0.022	0.020	0.016	0.013	0.009	0.004	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.033	0.062	0.090	0.113	0.132	0.146	0.154	0.155	0.151	0.142	0.127	0.110	0.090	0.068	0.048	0.030	0.016	0.005	0.000	0.000	0.010	0.025	0.046	0.070	0.098	0.125	0.154	0.179	0.199	0.213	0.221	0.222	0.216	0.202	0.181	0.155	0.122	0.084	0.043	0.000
VERTICAL CURVE ORDINATE	0.000	0.050	0.095	0.135	0.170	0.199	0.223	0.241	0.255	0.263	0.265	0.263	0.255	0.241	0.223	0.199	0.170	0.135	0.095	0.050	0.000	0.060	0.114	0.161	0.202	0.237	0.265	0.288	0.303	0.313	0.316	0.313	0.303	0.288	0.265	0.237	0.202	0.161	0.114	0.060	0.000
REQUIRED CAMBER	0"	15/16"	1 1/8"	2 1/16"	3 3/8"	3 5/16"	4 7/16"	4 3/4"	4 15/16"	4 5/8"	4 1/2"	4 1/16"	4 3/8"	3 5/16"	3 1/2"	2 5/8"	2 3/8"	1 3/16"	1 3/16"	5/8"	0"	1 3/16"	1 1/16"	2 1/2"	3 1/4"	4"	4 1/16"	5 5/16"	5 13/16"	6 1/8"	6 3/8"	6 7/16"	6 5/16"	6 1/16"	5 5/8"	5"	4 5/16"	3 3/8"	2 3/8"	1 1/4"	0"

	GIRDER G2R																																								
20TH POINTS	1.0	1.05	1.1	1.15	1.2	1.25	1.3	1.35	1.4	1.45	1.5	1.55	1.6	1.65	1.7	1.75	1.8	1.85	1.9	1.95	2.0	2.05	2.1	2.15	2.2	2.25	2.3	2.35	2.4	2.45	2.5	2.55	2.6	2.65	2.7	2.75	2.8	2.85	2.9	2.95	3.0
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.004	0.007	0.010	0.012	0.014	0.016	0.016	0.016	0.016	0.014	0.013	0.010	0.008	0.005	0.003	0.001	0.000	-0.001	-0.001	0.000	0.002	0.005	0.009	0.013	0.018	0.023	0.027	0.031	0.034	0.036	0.037	0.037	0.036	0.033	0.030	0.025	0.020	0.014	0.007	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.026	0.049	0.071	0.089	0.103	0.114	0.121	0.123	0.120	0.113	0.101	0.088	0.073	0.055	0.039	0.025	0.013	0.005	0.000	0.000	0.006	0.017	0.033	0.052	0.074	0.095	0.117	0.135	0.150	0.161	0.168	0.169	0.164	0.155	0.139	0.119	0.094	0.065	0.034	0.000
DEFLECTION DUE TO WEIGHT OF RAIL AND SIDEWALK	0.000	0.002	0.003	0.004	0.005	0.006	0.007	0.007	0.007	0.007	0.006	0.005	0.005	0.003	0.003	0.002	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.003	0.004	0.005	0.007	0.008	0.009	0.010	0.010	0.010	0.010	0.010	0.009	0.008	0.006	0.005	0.003	0.002	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.031	0.059	0.085	0.106	0.124	0.136	0.144	0.146	0.142	0.133	0.119	0.103	0.084	0.063	0.043	0.027	0.014	0.004	-0.001	0.000	0.009	0.023	0.045	0.069	0.097	0.124	0.152	0.175	0.194	0.207	0.215	0.216	0.210	0.197	0.176	0.151	0.119	0.082	0.043	0.000
VERTICAL CURVE ORDINATE	0.000	0.050	0.095	0.135	0.170	0.199	0.223	0.241	0.255	0.263	0.265	0.263	0.255	0.241	0.223	0.199	0.170	0.135	0.095	0.050	0.000	0.060	0.114	0.161	0.202	0.237	0.265	0.288	0.303	0.313	0.316	0.313	0.303	0.288	0.265	0.237	0.202	0.161	0.114	0.060	0.000
REQUIRED CAMBER	0"	15/16"	1 7/8"	2 5/8"	3 5/16"	3 3/8"	4 5/16"	4 5/8"	4 13/16"	4 7/8"	4 3/4"	4 9/16"	4 5/16"	3 7/8"	3 3/16"	2 7/8"	2 3/8"	1 3/16"	1 3/16"	5/8"	0"	1 3/16"	1 5/8"	2 1/2"	3 1/4"	4"	4 1/16"	5 1/4"	5 3/4"	6 1/16"	6 1/4"	6 5/16"	6 1/4"	5 15/16"	5 9/16"	4 5/16"	4 1/4"	3 3/8"	2 3/8"	1 1/4"	0"

	GIRDER G3R																																								
20TH POINTS	1.0	1.05	1.1	1.15	1.2	1.25	1.3	1.35	1.4	1.45	1.5	1.55	1.6	1.65	1.7	1.75	1.8	1.85	1.9	1.95	2.0	2.05	2.1	2.15	2.2	2.25	2.3	2.35	2.4	2.45	2.5	2.55	2.6	2.65	2.7	2.75	2.8	2.85	2.9	2.95	3.0
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.004	0.007	0.010	0.013	0.015	0.016	0.017	0.016	0.016	0.014	0.013	0.010	0.008	0.006	0.003	0.001	0.000	-0.001	-0.001	0.000	0.002	0.005	0.009	0.013	0.018	0.023	0.027	0.031	0.034	0.036	0.037	0.037	0.036	0.034	0.030	0.026	0.020	0.014	0.007	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.025	0.049	0.071	0.089	0.104	0.115	0.121	0.123	0.120	0.112	0.100	0.087	0.072	0.055	0.039	0.025	0.014	0.005	0.000	0.000	0.007	0.018	0.034	0.053	0.076	0.098	0.120	0.138	0.154	0.165	0.171	0.172	0.167	0.157	0.141	0.120	0.095	0.066	0.034	0.000
DEFLECTION DUE TO WEIGHT OF RAIL AND SIDEWALK	0.000	0.001	0.001	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.002	0.003	0.003	0.004	0.005	0.005	0.006	0.006	0.006	0.006	0.005	0.005	0.004	0.003	0.002	0.001	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.030	0.057	0.083	0.104	0.121	0.134	0.140	0.142	0.138	0.129	0.116	0.100	0.082	0.062	0.043	0.027	0.014	0.004	-0.001	0.000	0.010	0.024	0.044	0.068	0.097	0.124	0.151	0.174	0.193	0.207	0.215	0.215	0.209	0.196	0.176	0.150	0.119	0.082	0.043	0.000
VERTICAL CURVE ORDINATE	0.000	0.050	0.095	0.135	0.170	0.199	0.223	0.241	0.255	0.263	0.265	0.263	0.255	0.241	0.223	0.199	0.170	0.135	0.095	0.050	0.000	0.060	0.114	0.161	0.202	0.237	0.265	0.288	0.303	0.313	0.316	0.313	0.303	0.288	0.265	0.237	0.202	0.161	0.114	0.060	0.000
REQUIRED CAMBER	0"	15/16"	1 3/16"	2 5/8"	3 5/16"	3 3/16"	4 1/4"	4 9/16"	4 3/4"	4 13/16"	4 3/4"	4 9/16"	4 1/4"	3 7/8"	3 3/16"	2 7/8"	2 3/8"	1 3/16"	1 3/16"	5/8"	0"	1 3/16"	1 5/8"	2 1/16"	3 1/4"	4"	4 1/16"	5 1/4"	5 3/4"	6 1/16"	6 1/4"	6 5/16"	6 1/4"	5 15/16"	5 9/16"	4 5/16"	4 1/4"	3 3/8"	2 3/8"	1 1/4"	0"

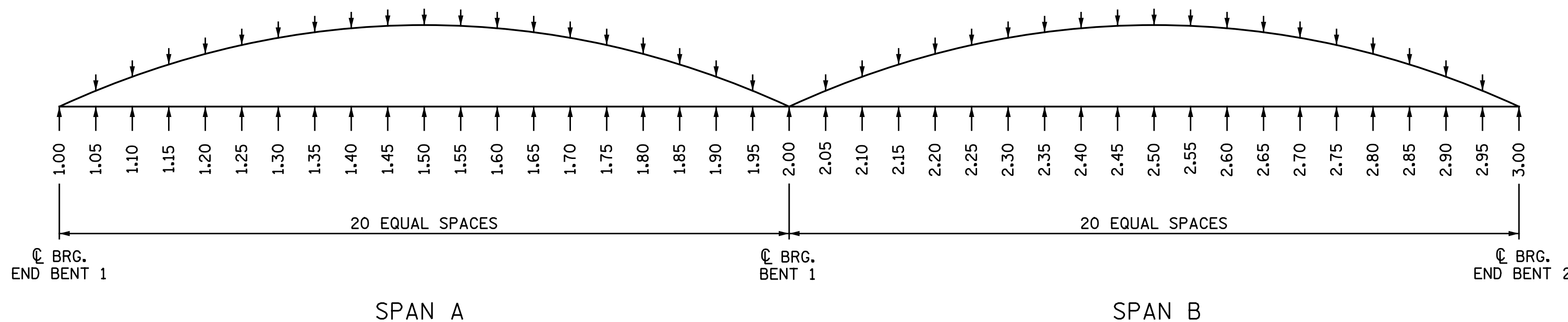
* INCLUDES SLAB, BUILDUPS, AND STAY-IN-PLACE FORMS. DEFLECTIONS BASED ON SLAB POUR SEQUENCE SHOWN ON "BILL OF MATERIAL" SHEET.

NOTES:

- VALUES GIVEN ARE AT TWENTIETH POINTS BETWEEN CENTERLINE OF BEARINGS.
- DEFLECTIONS AND ORDINATES ARE IN FEET (DECIMAL FORM).
- REQUIRED CAMBER VALUES ARE IN INCHES (FRACTION FORM).
- UPWARD DEFLECTIONS AND ORDINATES ARE INDICATED WITH A "-" SIGN.
- UPWARD CAMBERS ARE POSITIVE VALUES.
- SLOPE FOR THE ZERO CAMBER BASE LINE VARIES.

PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1-

SHEET 1 OF 2



SCHEMATIC CAMBER ORDINATES

DRAWN BY : C. E. MAYHEW DATE : 8-17-16
 CHECKED BY : B. J. BELL DATE : 9-1-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE DEAD LOAD DEFLECTION AND CAMBER ORDINATES RIGHT LANES		SHEET NO. S2-15
	Michael Baker Engineering 8000 Regency Parkway, Suite 600 Cary, North Carolina 27518 NC License No.: F-1084		REVISIONS		TOTAL SHEETS 39
	1	2	3	4	

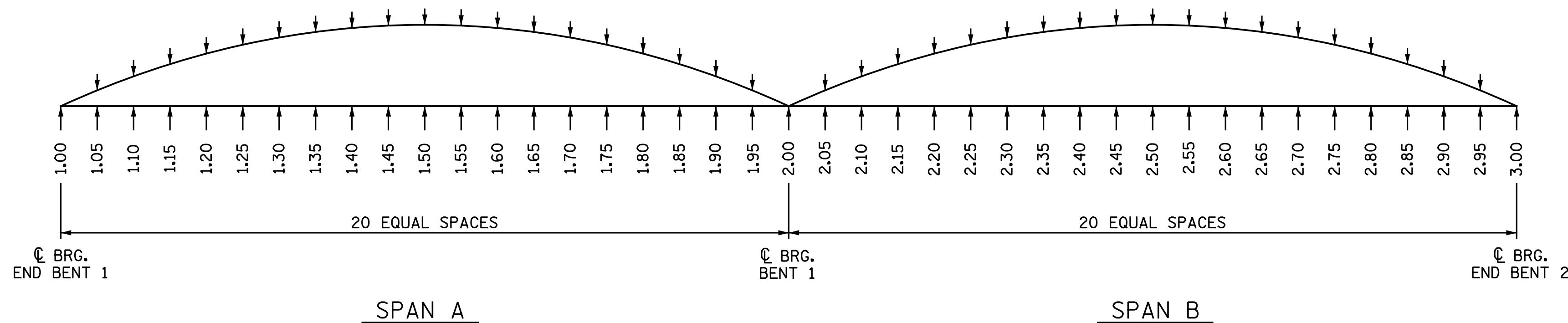
DEAD LOAD DEFLECTION AND CAMBER ORDINATES

	SPAN A																				SPAN B																				
	GIRDER G4R																																								
20TH POINTS	1.0	1.05	1.1	1.15	1.2	1.25	1.3	1.35	1.4	1.45	1.5	1.55	1.6	1.65	1.7	1.75	1.8	1.85	1.9	1.95	2.0	2.05	2.1	2.15	2.2	2.25	2.3	2.35	2.4	2.45	2.5	2.55	2.6	2.65	2.7	2.75	2.8	2.85	2.9	2.95	3.0
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.004	0.007	0.010	0.012	0.014	0.016	0.016	0.016	0.015	0.014	0.012	0.010	0.008	0.005	0.003	0.001	-0.001	-0.001	-0.001	0.000	0.002	0.005	0.009	0.014	0.019	0.023	0.027	0.031	0.034	0.036	0.037	0.037	0.036	0.034	0.030	0.026	0.020	0.014	0.007	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.025	0.048	0.069	0.086	0.101	0.112	0.118	0.120	0.117	0.110	0.098	0.085	0.070	0.053	0.036	0.022	0.011	0.003	-0.001	0.000	0.007	0.019	0.036	0.054	0.077	0.097	0.118	0.135	0.152	0.163	0.169	0.170	0.165	0.155	0.139	0.118	0.093	0.064	0.033	0.000
DEFLECTION DUE TO WEIGHT OF RAIL AND SIDEWALK	0.000	0.002	0.003	0.005	0.006	0.007	0.008	0.009	0.010	0.010	0.009	0.009	0.008	0.007	0.005	0.004	0.003	0.002	0.001	0.000	0.000	0.000	0.001	0.002	0.004	0.006	0.007	0.009	0.011	0.013	0.014	0.015	0.015	0.015	0.014	0.012	0.011	0.008	0.006	0.003	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.030	0.058	0.083	0.105	0.122	0.136	0.143	0.145	0.142	0.133	0.119	0.103	0.084	0.063	0.042	0.025	0.012	0.002	-0.002	0.000	0.010	0.025	0.047	0.072	0.101	0.128	0.154	0.177	0.198	0.213	0.221	0.221	0.215	0.202	0.181	0.155	0.122	0.084	0.043	0.000
VERTICAL CURVE ORDINATE	0.000	0.050	0.095	0.135	0.170	0.199	0.223	0.241	0.255	0.263	0.265	0.263	0.255	0.241	0.223	0.199	0.170	0.135	0.095	0.050	0.000	0.060	0.114	0.161	0.202	0.237	0.265	0.288	0.303	0.313	0.316	0.313	0.303	0.288	0.265	0.237	0.202	0.161	0.114	0.060	0.000
REQUIRED CAMBER	0"	15/16"	1 1/16"	2 5/8"	3 5/8"	3 7/8"	4 5/8"	4 5/8"	4 13/16"	4 7/8"	4 3/4"	4 9/16"	4 5/8"	3 7/8"	3 7/16"	2 7/8"	2 5/16"	1 3/4"	1 3/16"	9/16"	0"	13/16"	1 1/16"	2 1/2"	3 5/16"	4 1/16"	4 3/4"	5 5/16"	5 3/4"	6 1/8"	6 3/8"	6 3/8"	6 5/16"	6 1/16"	5 5/8"	5"	4 5/16"	3 3/8"	2 3/8"	1 1/4"	0"
	GIRDER G5R																																								
20TH POINTS	1.0	1.05	1.1	1.15	1.2	1.25	1.3	1.35	1.4	1.45	1.5	1.55	1.6	1.65	1.7	1.75	1.8	1.85	1.9	1.95	2.0	2.05	2.1	2.15	2.2	2.25	2.3	2.35	2.4	2.45	2.5	2.55	2.6	2.65	2.7	2.75	2.8	2.85	2.9	2.95	3.0
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.004	0.007	0.010	0.012	0.014	0.015	0.015	0.015	0.015	0.013	0.011	0.009	0.007	0.005	0.002	0.001	-0.001	-0.001	-0.001	0.000	0.002	0.005	0.009	0.014	0.018	0.023	0.027	0.031	0.034	0.036	0.037	0.037	0.036	0.033	0.030	0.025	0.020	0.014	0.007	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.024	0.046	0.066	0.084	0.097	0.107	0.113	0.114	0.111	0.104	0.092	0.080	0.065	0.049	0.034	0.022	0.011	0.003	-0.001	0.000	0.007	0.018	0.034	0.052	0.073	0.093	0.114	0.131	0.146	0.157	0.163	0.164	0.159	0.150	0.134	0.115	0.091	0.062	0.032	0.000
DEFLECTION DUE TO WEIGHT OF RAIL AND SIDEWALK	0.000	0.005	0.009	0.014	0.018	0.021	0.023	0.025	0.026	0.025	0.024	0.022	0.020	0.017	0.013	0.010	0.007	0.004	0.002	0.001	0.000	0.002	0.004	0.007	0.011	0.016	0.021	0.025	0.029	0.032	0.034	0.035	0.034	0.033	0.031	0.027	0.023	0.018	0.012	0.006	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.032	0.062	0.090	0.113	0.132	0.145	0.153	0.155	0.151	0.141	0.126	0.108	0.089	0.067	0.047	0.029	0.015	0.004	-0.001	0.000	0.011	0.028	0.051	0.076	0.107	0.137	0.166	0.191	0.212	0.227	0.234	0.235	0.228	0.214	0.192	0.163	0.128	0.088	0.046	0.000
VERTICAL CURVE ORDINATE	0.000	0.050	0.095	0.135	0.170	0.199	0.223	0.241	0.255	0.263	0.265	0.263	0.255	0.241	0.223	0.199	0.170	0.135	0.095	0.050	0.000	0.060	0.114	0.161	0.202	0.237	0.265	0.288	0.303	0.313	0.316	0.313	0.303	0.288	0.265	0.237	0.202	0.161	0.114	0.060	0.000
REQUIRED CAMBER	0"	15/16"	1 7/8"	2 11/16"	3 3/8"	3 5/16"	4 7/16"	4 3/4"	4 15/16"	4 5/16"	4 7/8"	4 11/16"	4 3/8"	3 15/16"	3 1/2"	2 15/16"	2 3/8"	1 13/16"	1 3/16"	9/16"	0"	7/8"	1 1/16"	2 9/16"	3 5/16"	4 1/8"	4 13/16"	5 7/16"	5 5/16"	6 5/16"	6 1/2"	6 9/16"	6 7/16"	6 3/16"	5 3/4"	5 1/8"	4 3/8"	3 1/2"	2 7/16"	1 1/4"	0"

* INCLUDES SLAB, BUILDUPS, AND STAY-IN-PLACE FORMS. DEFLECTIONS BASED ON SLAB POUR SEQUENCE SHOWN ON "BILL OF MATERIAL" SHEET.

NOTES:

- VALUES GIVEN ARE AT TWENTIETH POINTS BETWEEN CENTERLINE OF BEARINGS.
- DEFLECTIONS AND ORDINATES ARE IN FEET (DECIMAL FORM).
- REQUIRED CAMBER VALUES ARE IN INCHES (FRACTION FORM).
- UPWARD DEFLECTIONS AND ORDINATES ARE INDICATED WITH A " - " SIGN.
- UPWARD CAMBERS ARE POSITIVE VALUES.
- SLOPE FOR THE ZERO CAMBER BASE LINE VARIES.



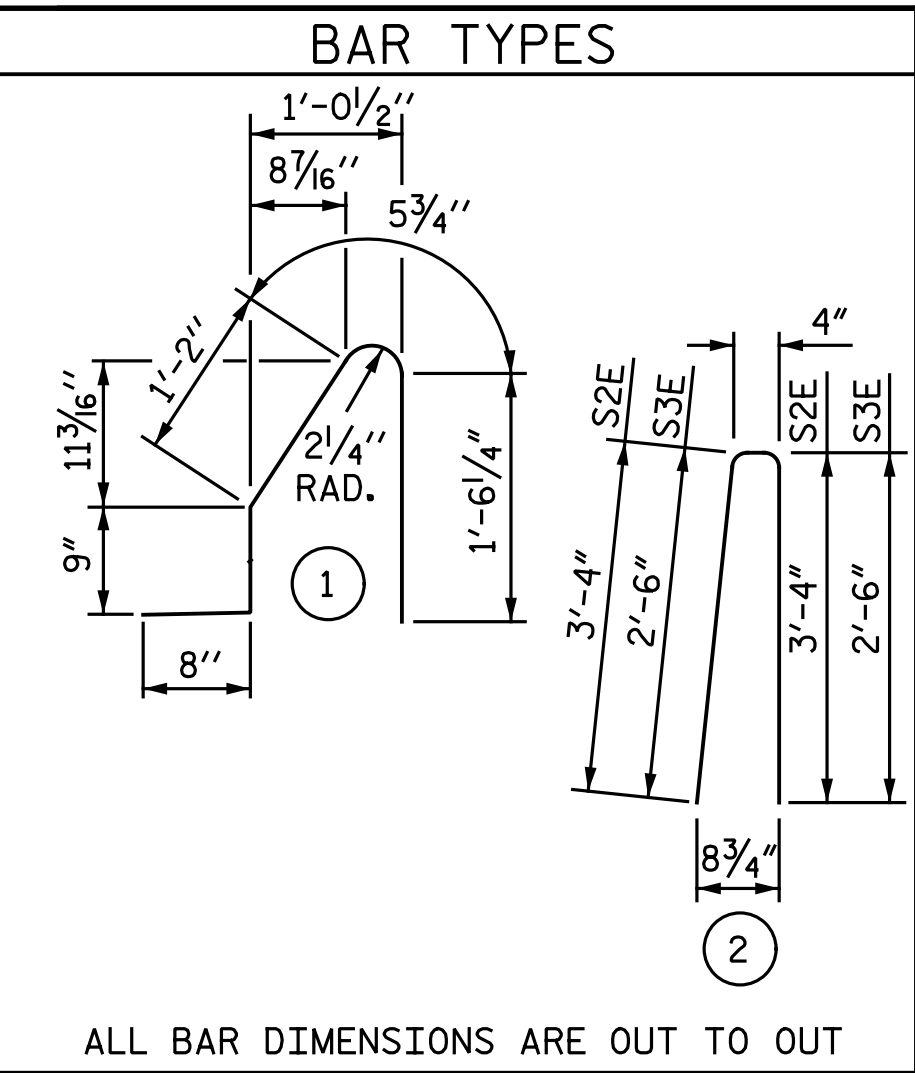
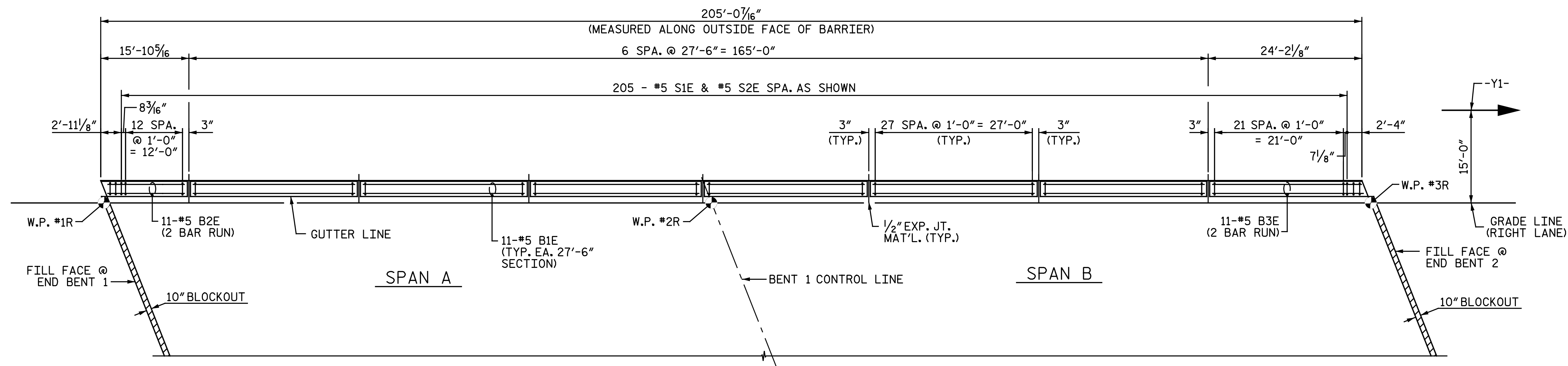
SCHMATIC CAMBER ORDINATES

PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1-

SHEET 2 OF 2

DRAWN BY : C. E. MAYHEW DATE : 8-17-16
 CHECKED BY : B. J. BELL DATE : 9-1-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE DEAD LOAD DEFLECTION AND CAMBER ORDINATES RIGHT LANES	
	DocuSigned by: 1/27/2017		REVISIONS	
	Michael Baker INTERNATIONAL Michael Baker Engineering 8000 Regency Parkway, Suite 600 Cary, North Carolina 27518 NC License No.: F-1084		NO. <u>1</u> BY: <u> </u> DATE: <u> </u>	NO. <u>3</u> BY: <u> </u> DATE: <u> </u>

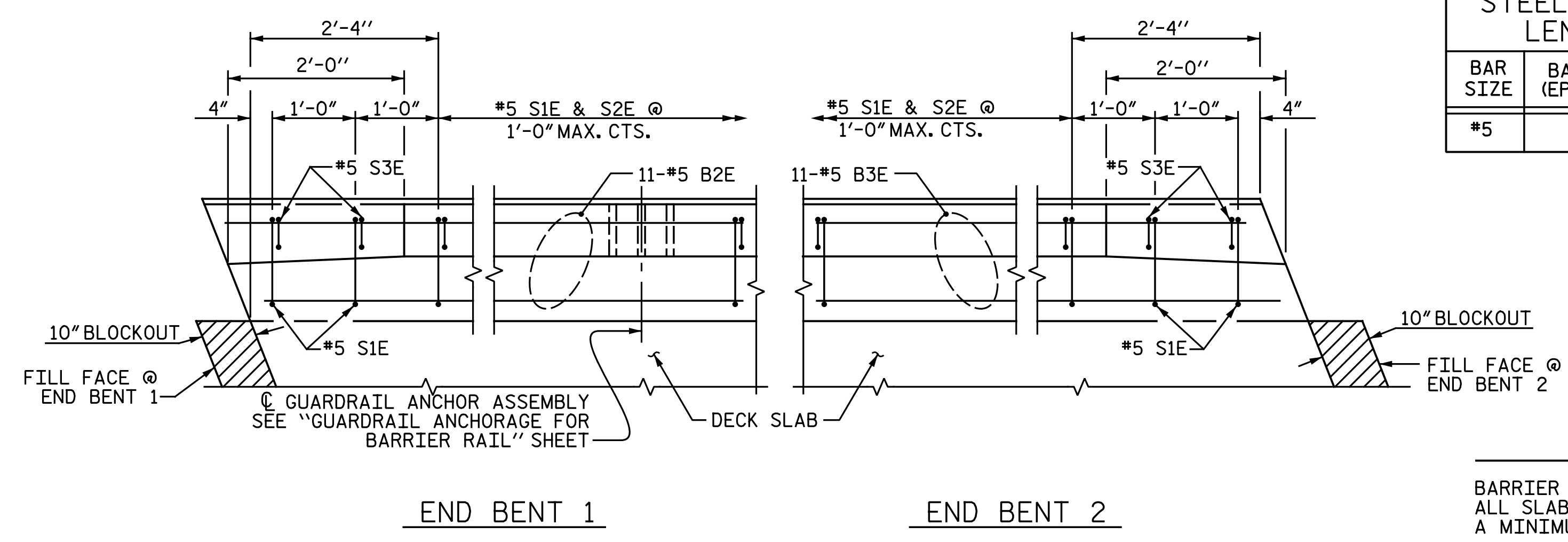
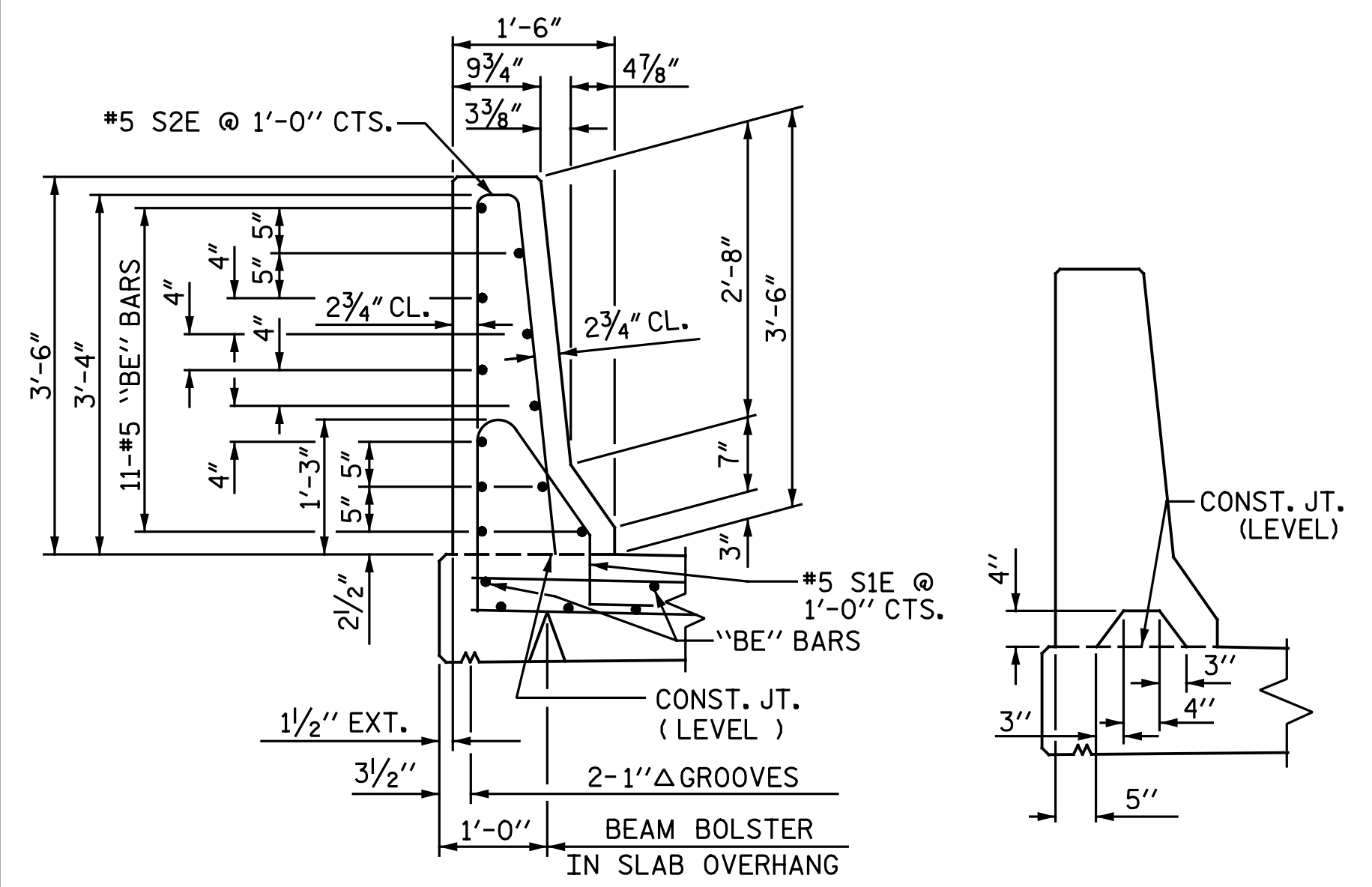


ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL					
FOR CONCRETE BARRIER RAIL ONLY					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1E	66	#5	STR.	27' - 1"	1,864
B2E	22	#5	STR.	9' - 5"	216
B3E	22	#5	STR.	13' - 11"	319
S1E	209	#5	1	4' - 7"	999
S2E	205	#5	2	7' - 0"	1,497
S3E	4	#5	2	5' - 4"	22
EPOXY COATED REINFORCING STEEL				LBS.	4,917
CLASS AA CONCRETE				C.Y.	27.8
CONCRETE BARRIER RAIL				L.F.	205.0

PLAN OF BARRIER RAIL

REINFORCING STEEL SPLICE LENGTHS	
BAR SIZE	BARRIER RAIL (EPOXY COATED)
#5	3'-5"



PLAN OF BARRIER RAIL

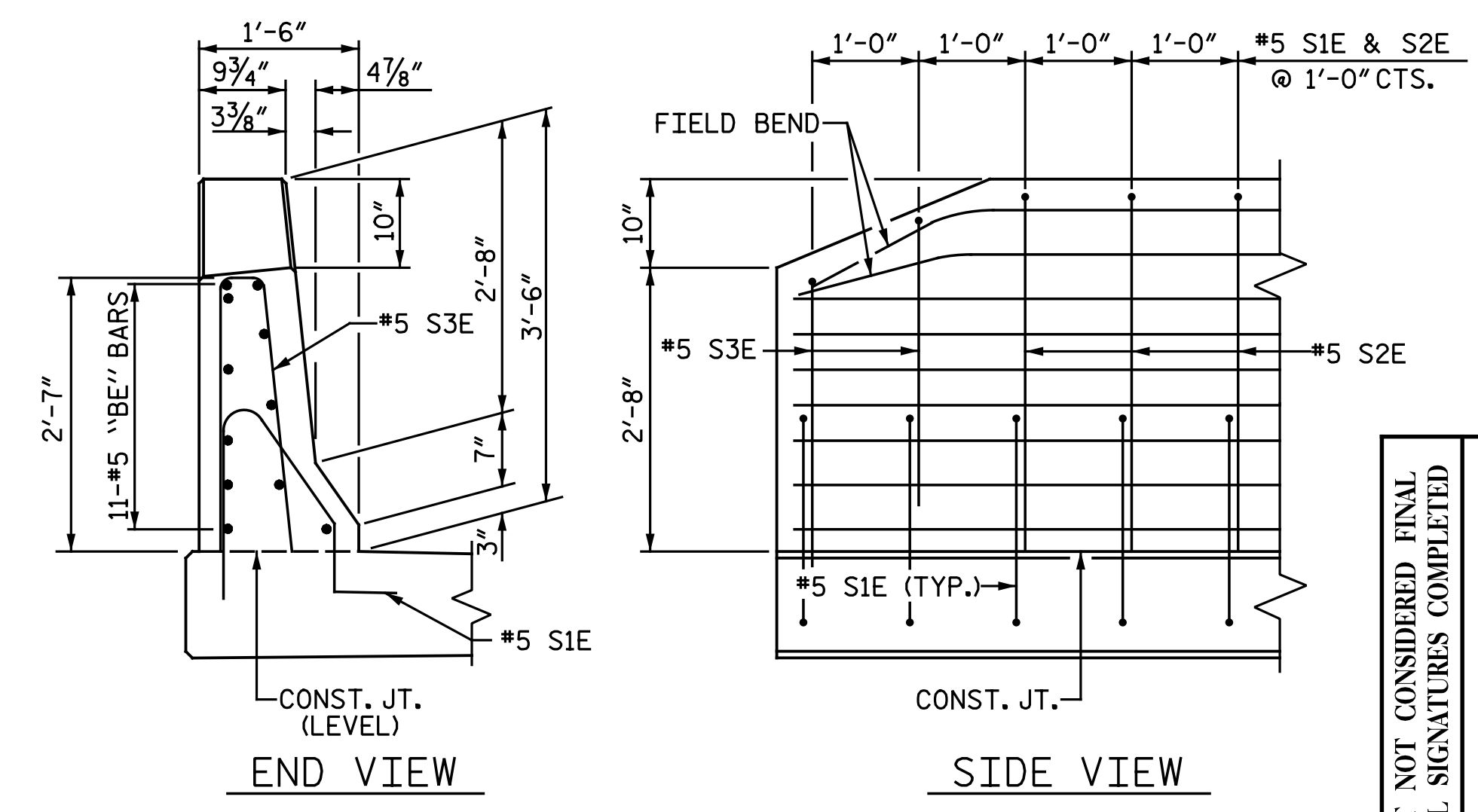
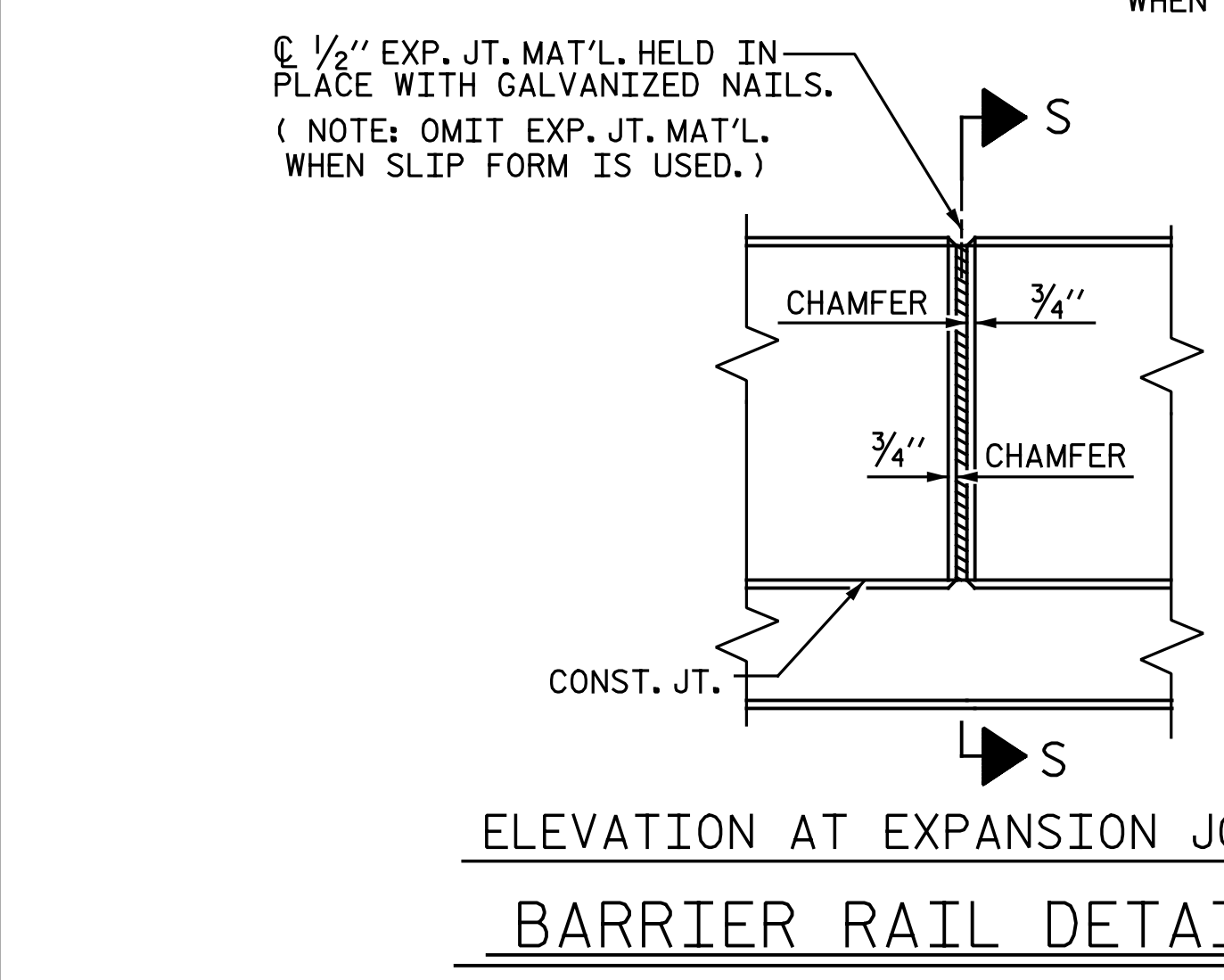
NOTES

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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

PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1-



END OF RAIL DETAILS

ASSEMBLED BY : N.B. SPEAKS	DATE : 4-28-16
CHECKED BY : A.H. SHARPE	DATE : 9-6-16
DRAWN BY : JMB 1/88	REV. 5/7/03 RWW/JTE
CHECKED BY : GGH 1/88	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DocuSigned by:
 Bradley J. Bell
 CA1A3F8E3A30434
 1/27/2017

Michael Baker INTERNATIONAL

Michael Baker Engineering
 8000 Regency Parkway, Suite 600
 Cary, North Carolina 27518
 NC License No. : F-1084

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD CONCRETE BARRIER RAIL RIGHT LANES					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S2-I7	TOTAL SHEETS 39
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NOTES

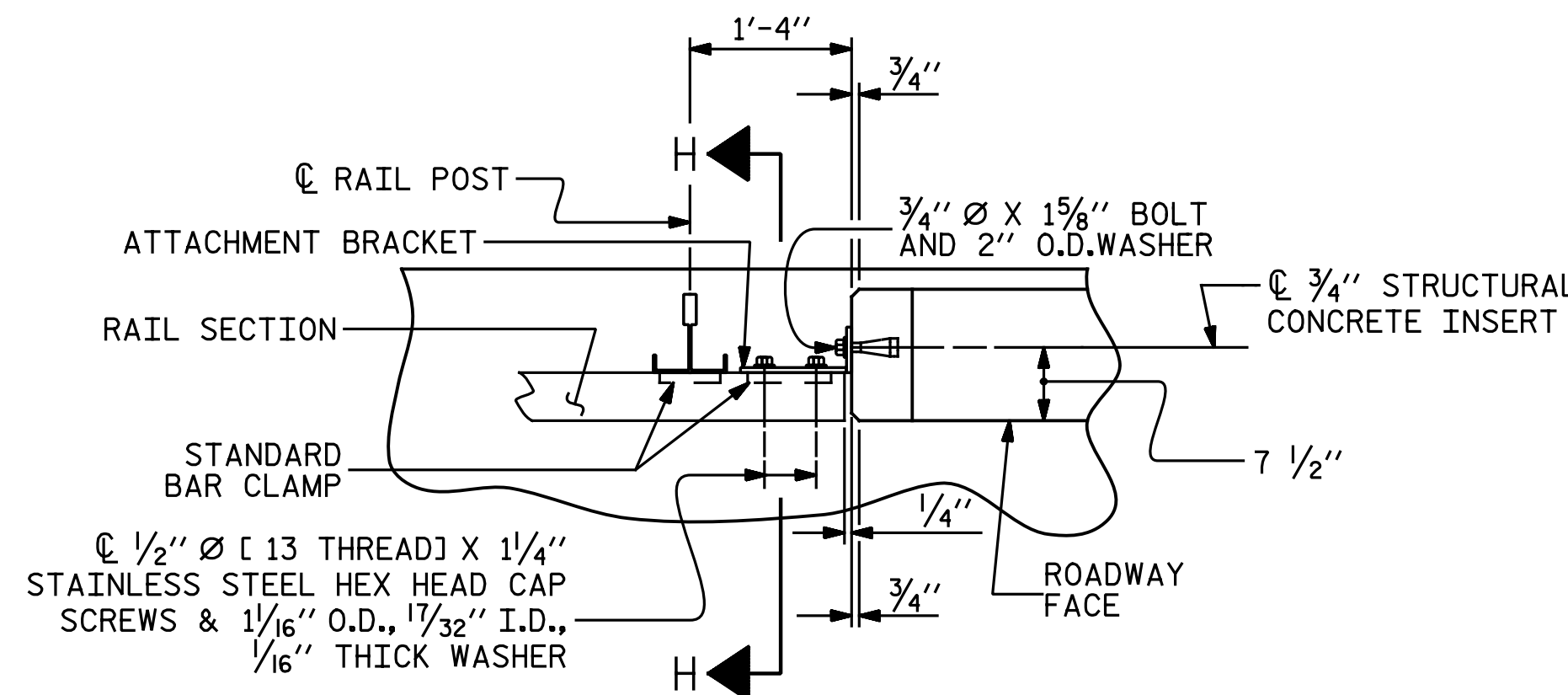
METAL RAIL TO END POST CONNECTION

- 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 (SEE "3 BAR METAL RAIL" SHEET 2 OF 3).
- 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

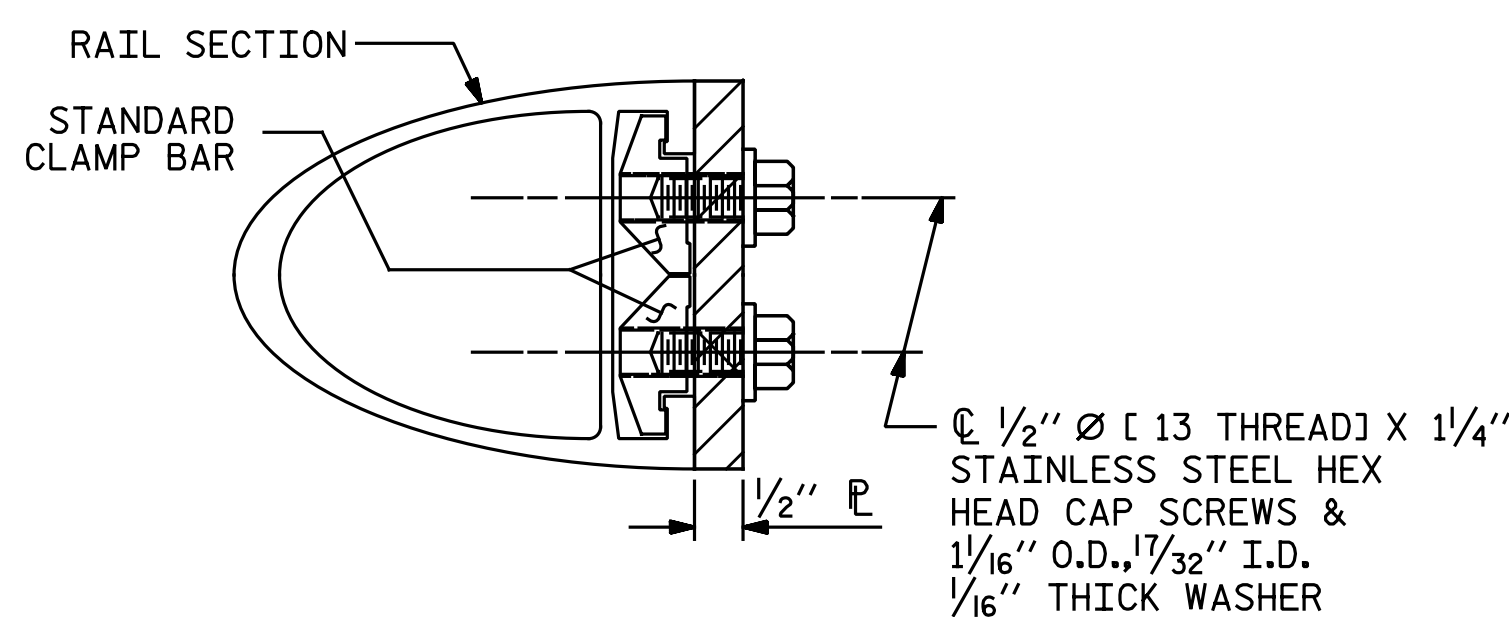
STRUCTURAL CONCRETE INSERT

- 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 1/2".
 - 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.



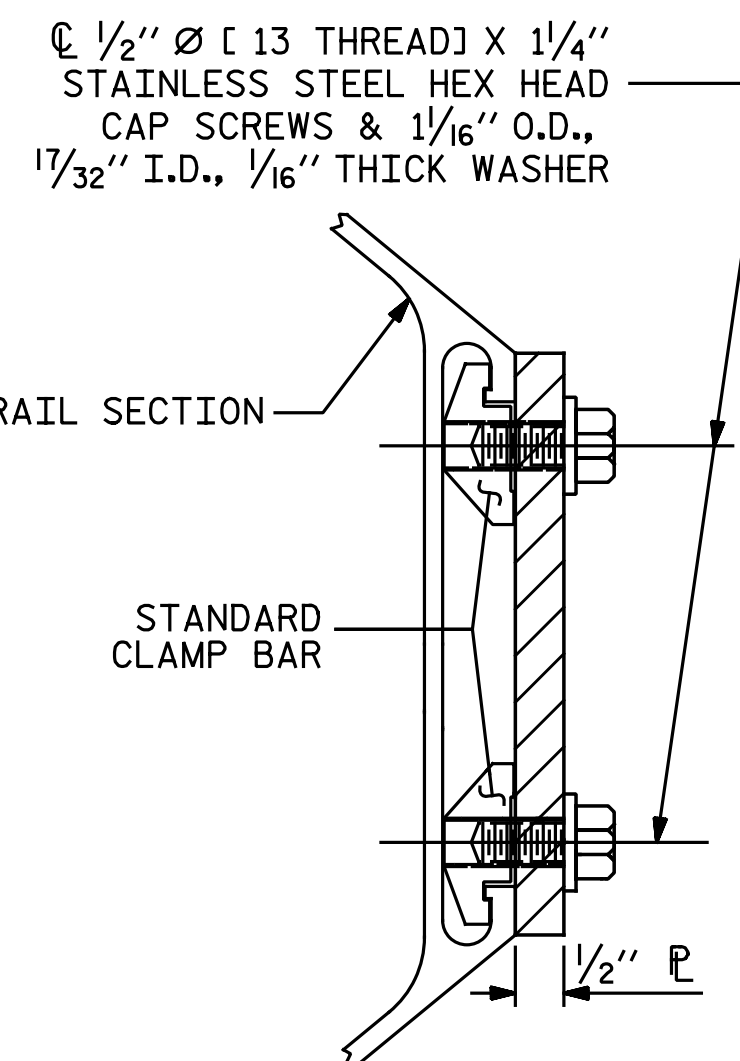
PLAN OF RAIL AND END POST

(STIFFENER ON 1/2" P NOT SHOWN FOR CLARITY)



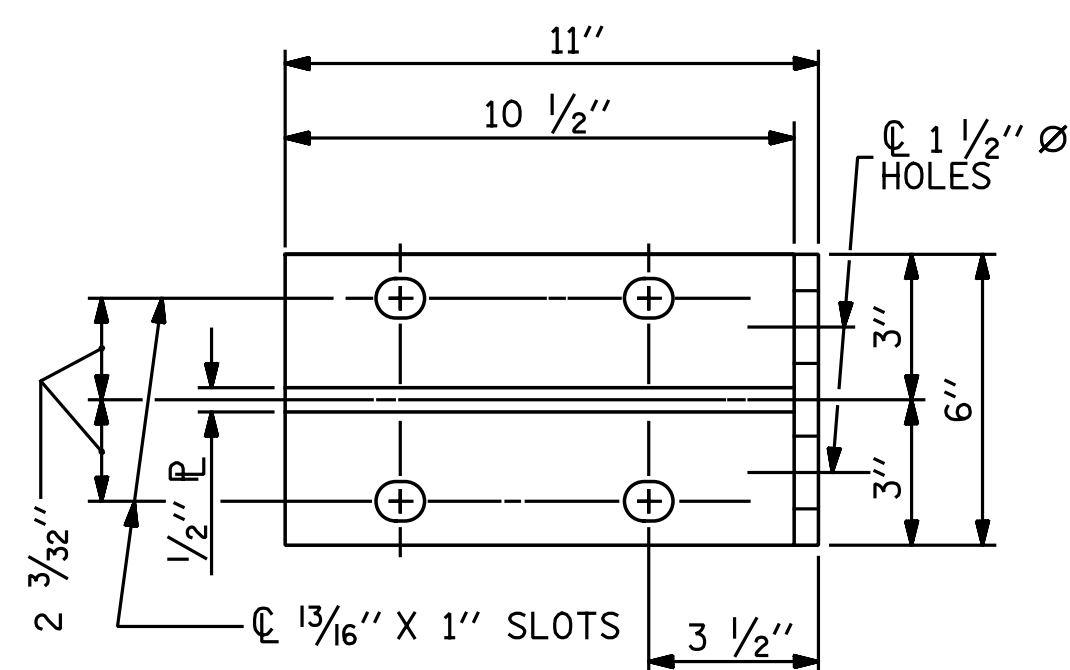
SECTION H-H

(FOR TOP & MIDDLE RAIL)

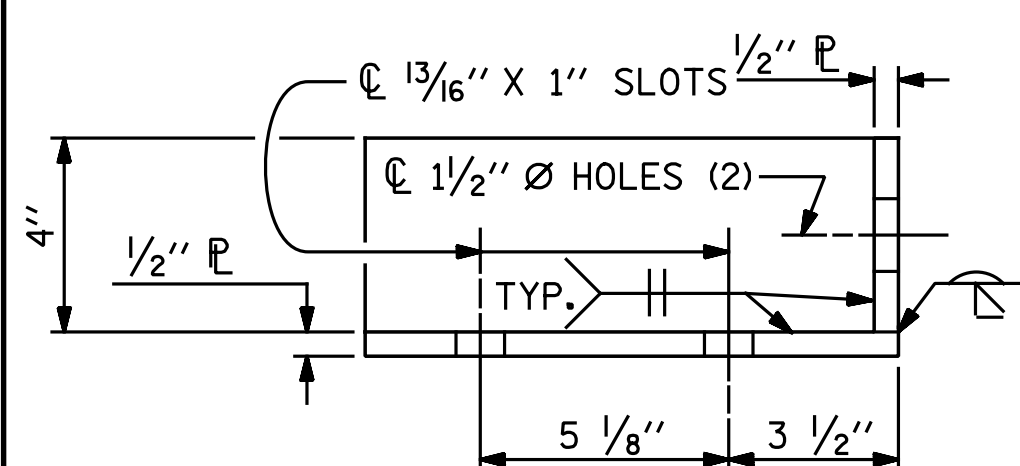


SECTION H-H

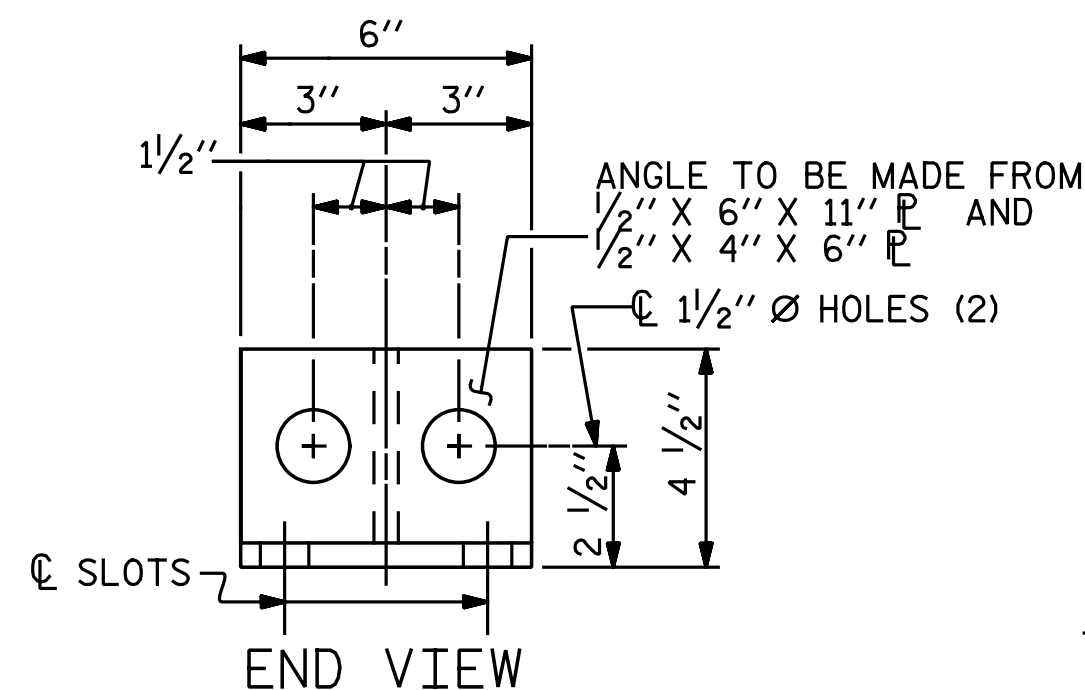
(FOR BOTTOM RAIL)



ELEVATION



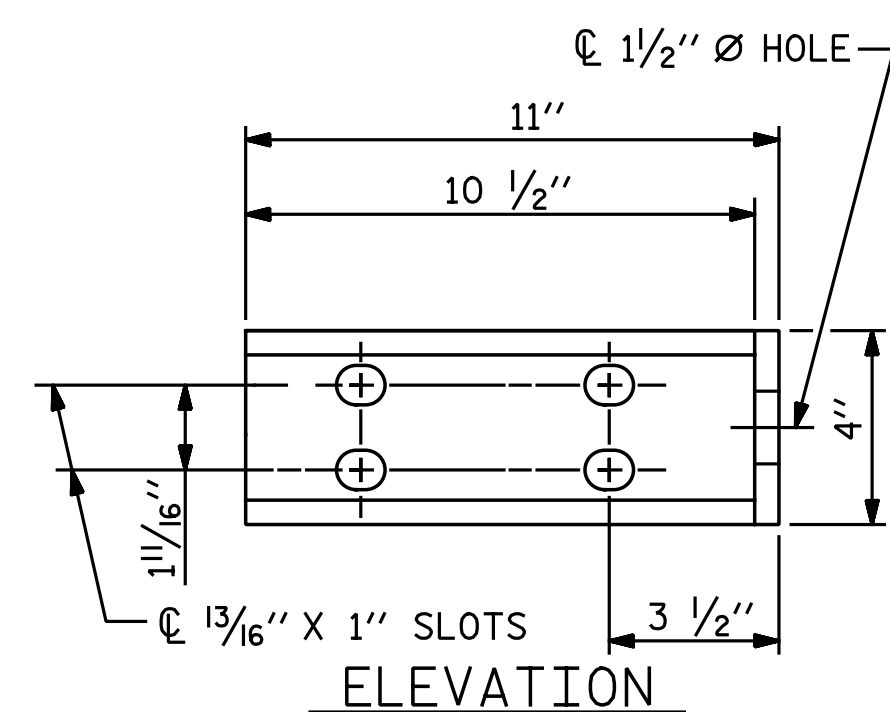
PLAN



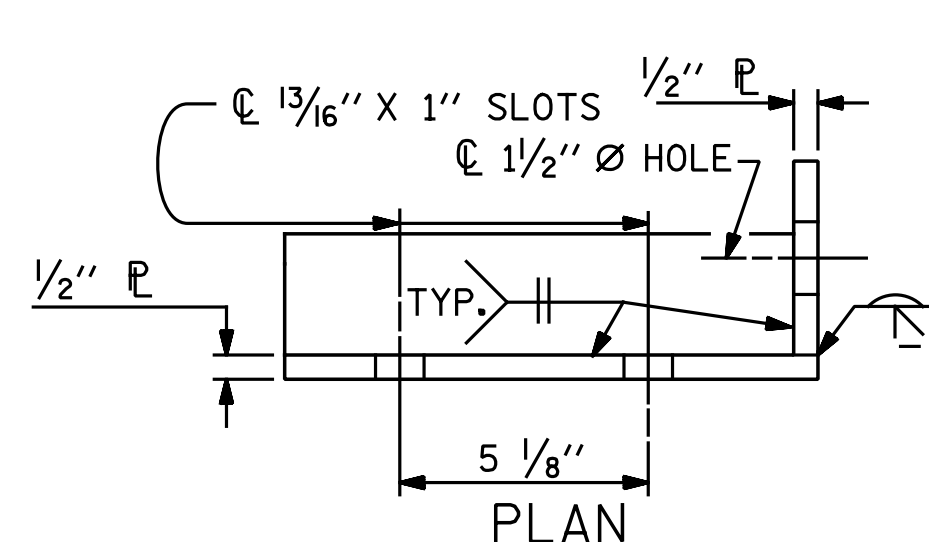
END VIEW

DETAILS FOR ATTACHMENT BRACKET

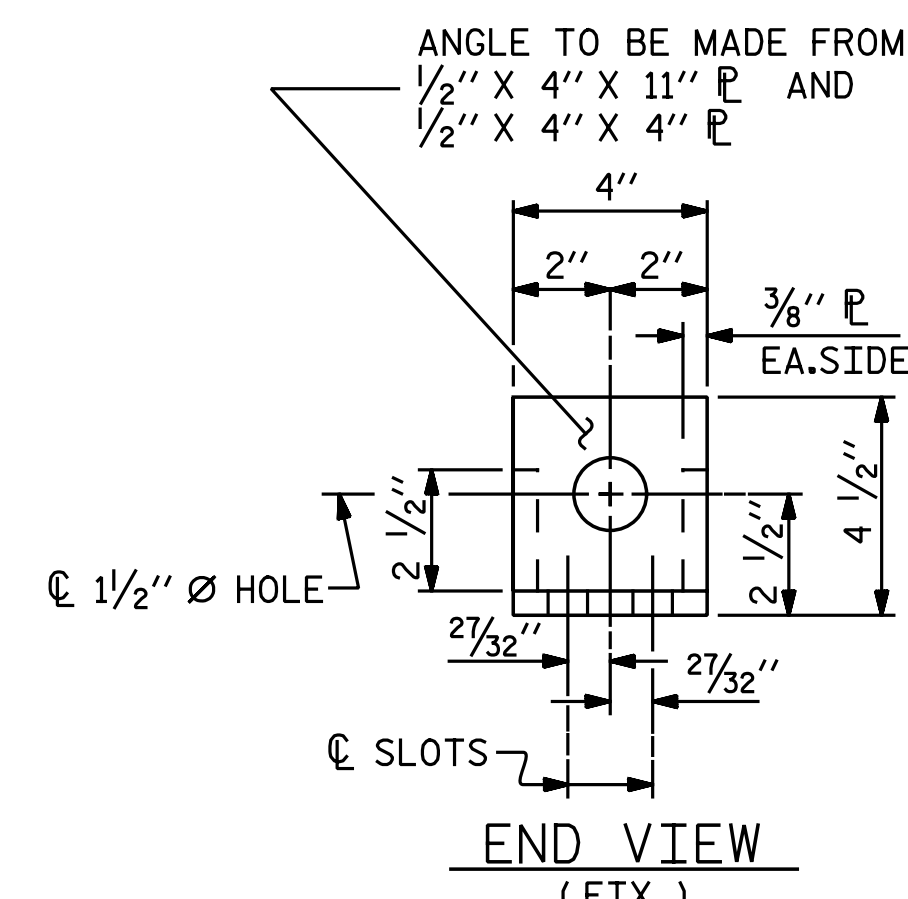
(BOTTOM RAIL ONLY)



ELEVATION



PLAN

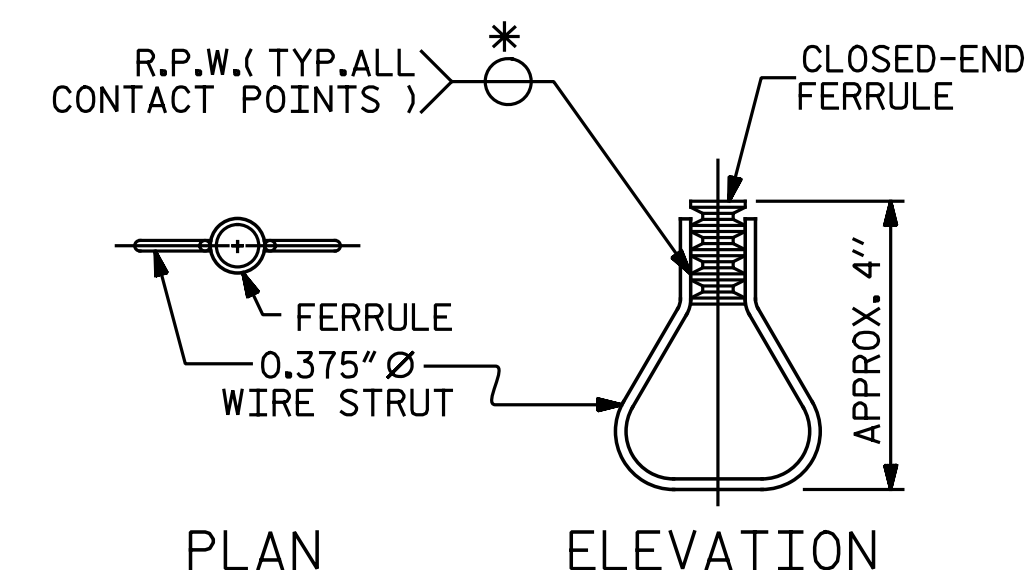


END VIEW

(FIX.)

DETAILS FOR ATTACHMENT BRACKET

(TOP & MIDDLE RAIL ONLY)



STRUCTURAL CONCRETE INSERT

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

PROJECT NO. U-3330

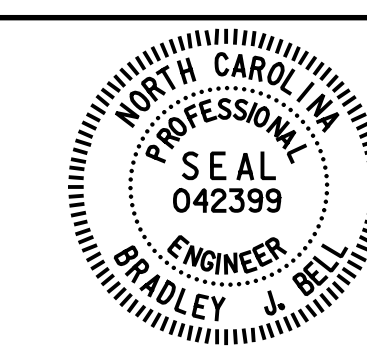
NASH COUNTY

STATION: 18+22.61 -Y1-

SHEET 3 OF 3

ASSEMBLED BY : N.B. SPEAKS	DATE : 4-28-16
CHECKED BY : A.H. SHARPE	DATE : 9-6-16
DRAWN BY : JMB 1/88	REV. 5/7/03 RWW/JTE
CHECKED BY : GGH 1/88	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

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DocuSigned by:
Bradley J. Bell
CA1A3F8E3A3434
1/27/2017

Michael Baker International

Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No.: F-1084

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

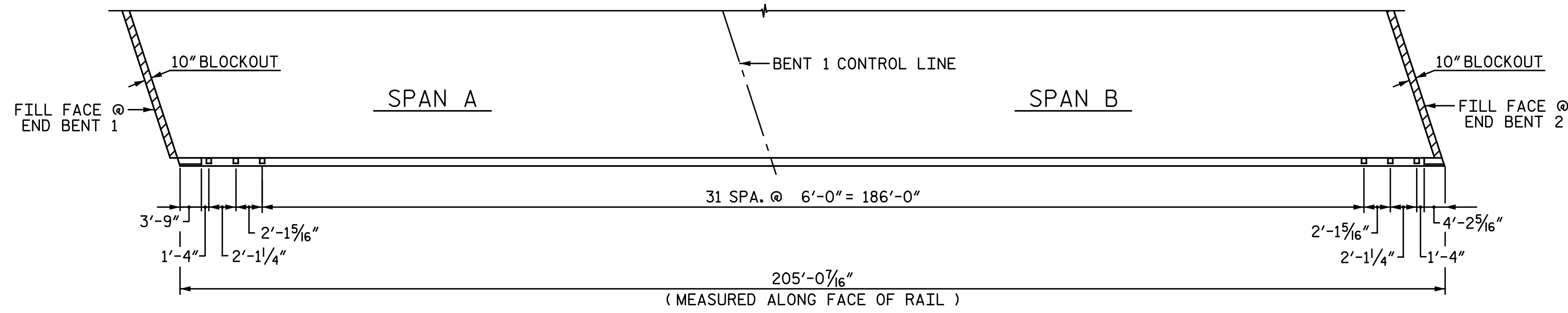
3 BAR METAL RAIL

RIGHT LANES

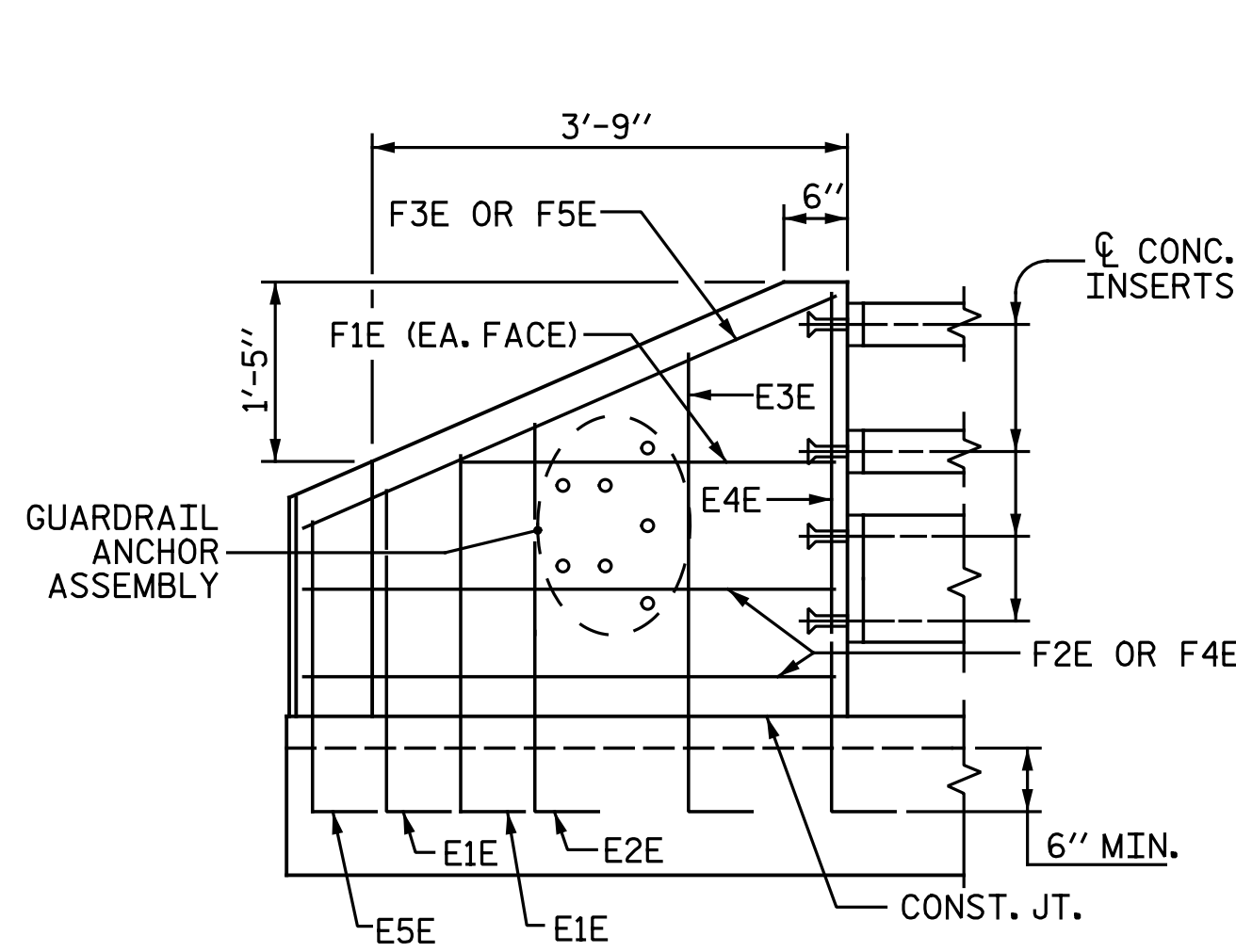
REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S2-20
2			4			TOTAL SHEETS 39

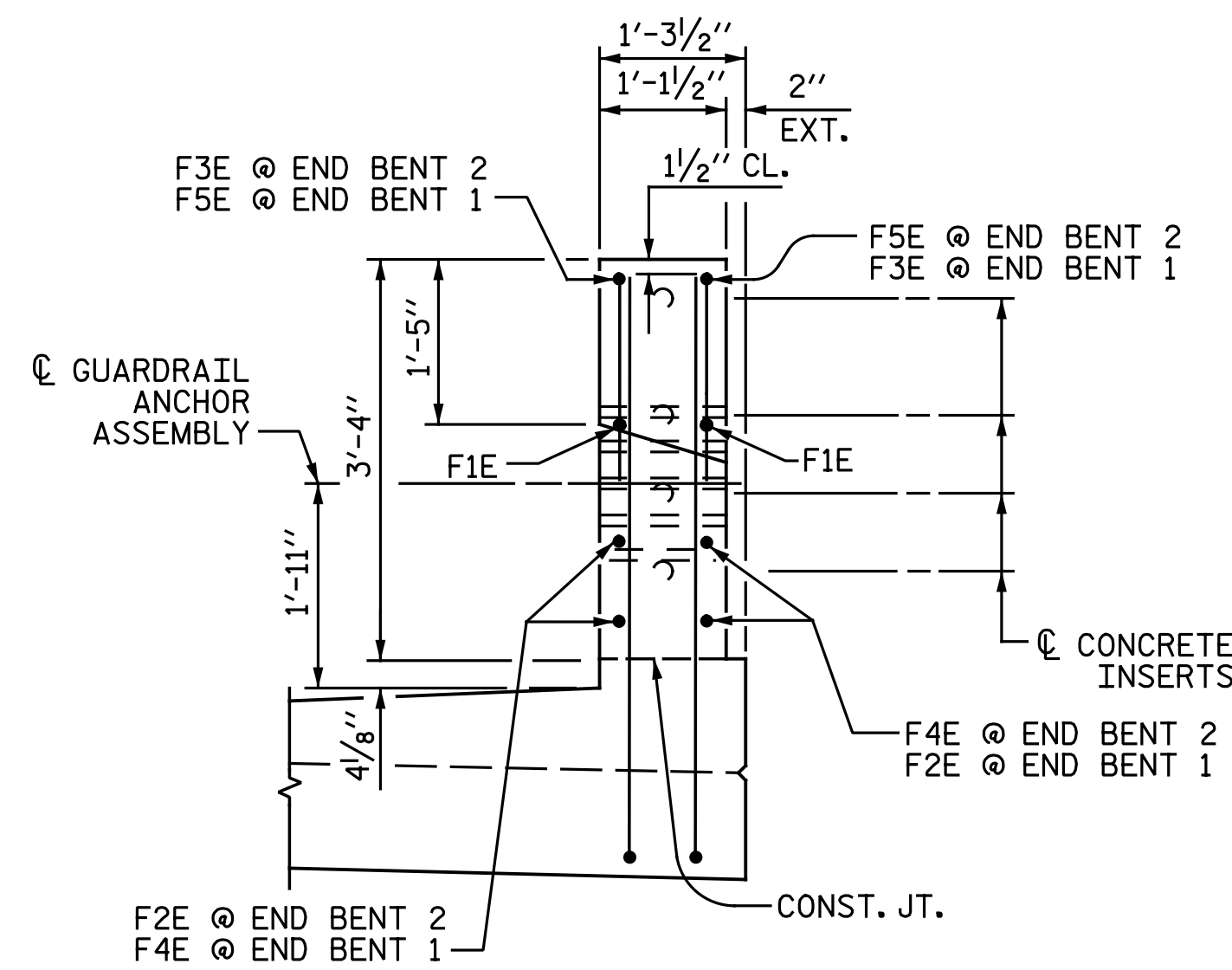
STD. NO. BMR7



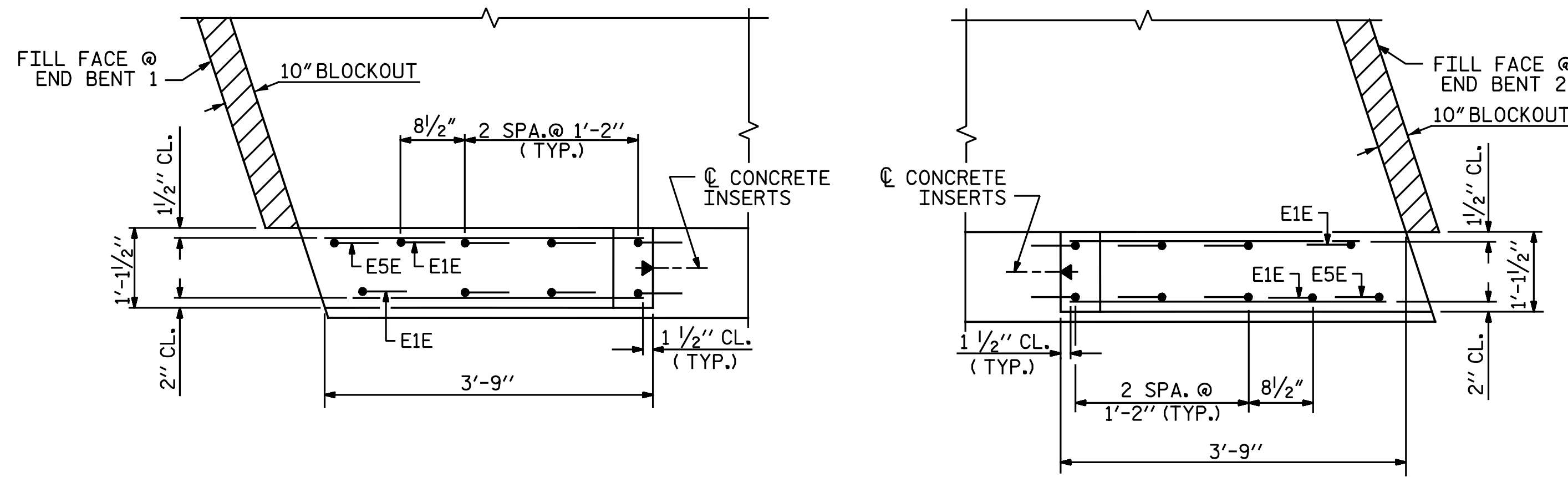
PLAN OF RAIL POST SPACING



ELEVATION



END VIEW



PLAN
END POST DETAILS

BILL OF MATERIAL
ONE END POST (2 REQ'D)

BILL FOR ONE END POST					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
E1E	2	#7	1	3' - 5"	14
E2E	2	#7	1	4' - 0"	16
E3E	2	#7	1	4' - 7"	19
E4E	2	#7	1	5' - 1"	21
E5E	1	#7	1	3' - 3"	7
F1E	2	#6	STR.	3' - 3"	10
F2E	2	#6	STR.	3' - 6"	11
F3E	1	#6	STR.	3' - 10"	6
F4E	2	#6	STR.	3' - 11"	12
F5E	1	#6	STR.	4' - 3"	6
EPOXY COATED REINFORCING STEEL				LBS.	122
CLASS AA CONCRETE				C.Y.	0.5

BAR TYPE

ALL BAR DIMENSIONS ARE OUT TO OUT.

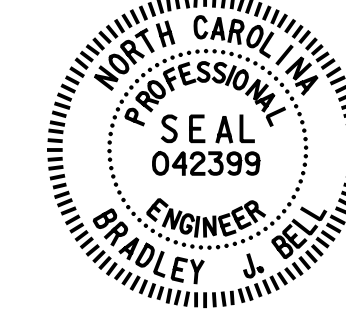
NOTES:

- FOR DETAIL OF GUARDRAIL ANCHOR ASSEMBLY, SEE "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" SHEET.
- FOR DETAILS OF CONCRETE INSERT, SEE "3 BAR METAL RAIL" SHEET 3 OF 3.
- ALL REINFORCING STEEL IN SIDEWALK AND END POSTS SHALL BE EPOXY COATED.
- NO ADDITIONAL PAYMENT SHALL BE MADE FOR THE CONCRETE END POSTS AS THIS IS CONSIDERED INCIDENTAL TO THE CONSTRUCTION OF THE 3 BAR METAL RAIL.

PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1-

DRAWN BY : N. B. SPEAKS DATE : 4-28-16
 CHECKED BY : A. H. SHARPE DATE : 9-6-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



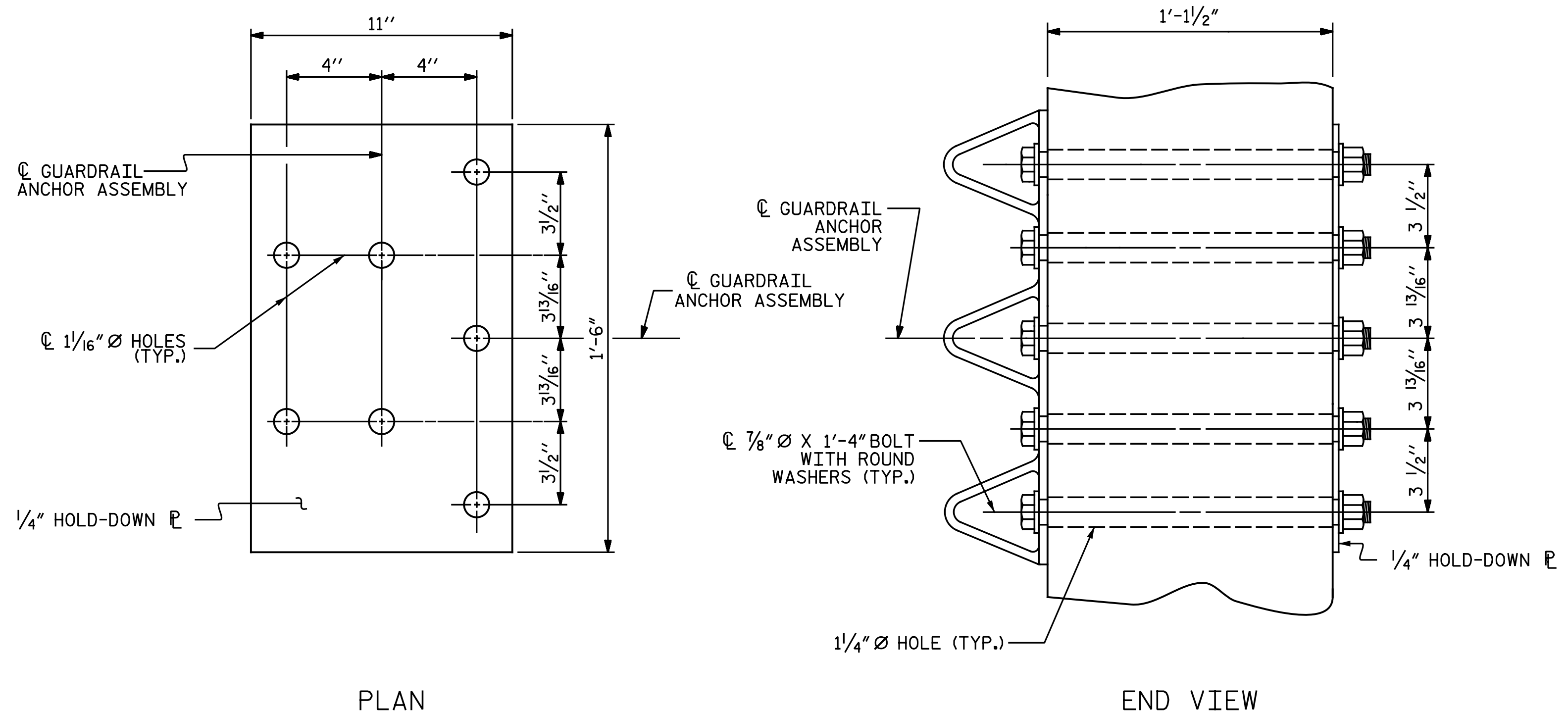
DocuSigned by:
 Bradley J. Bell
 CA1A3F8E3C3A34
 1/27/2017

Michael Baker
 INTERNATIONAL

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 8000 Regency Parkway, Suite 600
 Cary, North Carolina 27518
 NC License No.: F-1084

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 RAIL POST SPACINGS
 AND
 END OF RAIL DETAILS
 RIGHT LANES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-21
1			3			TOTAL SHEETS
2			4			39



GUARDRAIL ANCHOR ASSEMBLY DETAILS

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.

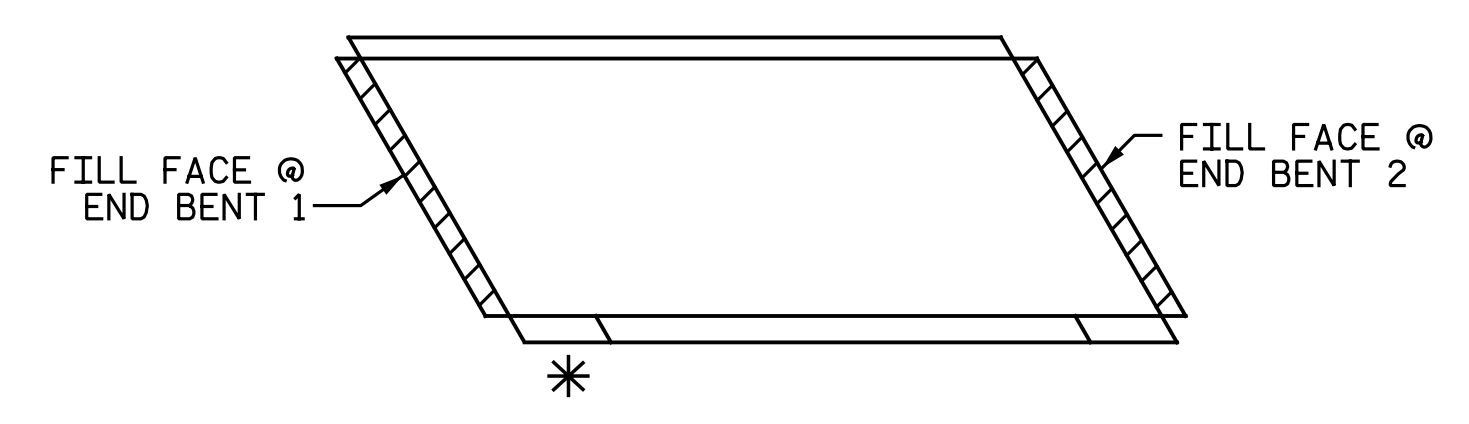
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

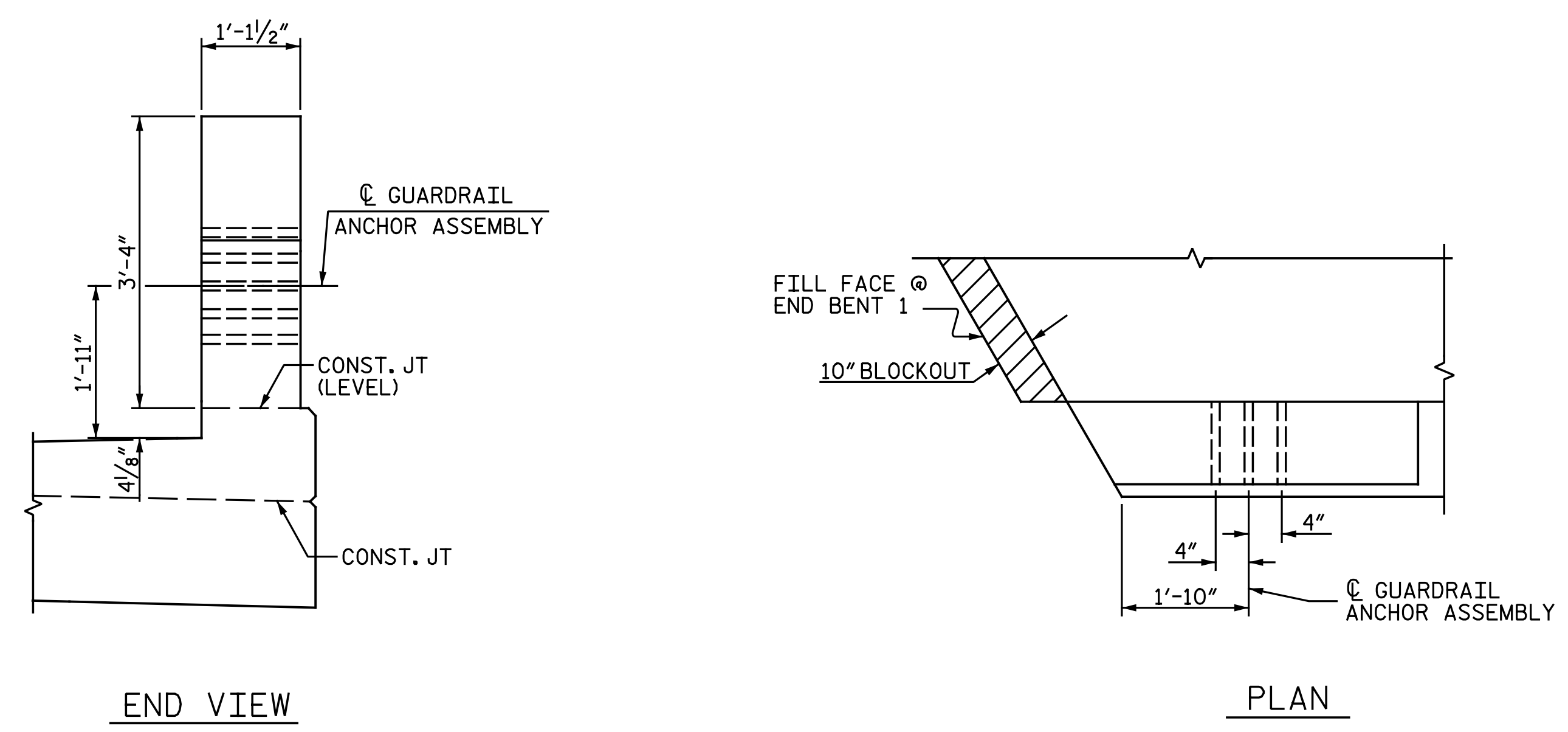
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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

THE 1/4" 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.



SKETCH SHOWING POINTS OF ATTACHMENTS
* LOCATION OF GUARDRAIL ATTACHMENT

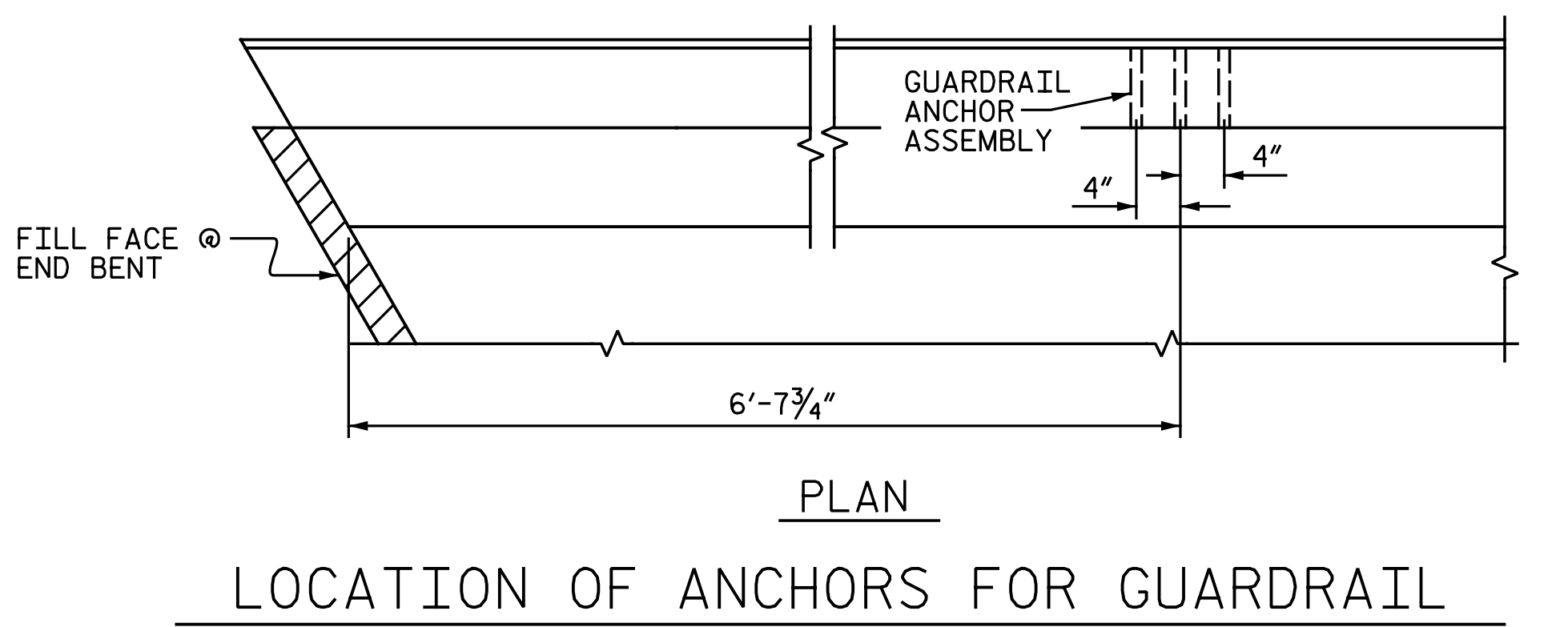
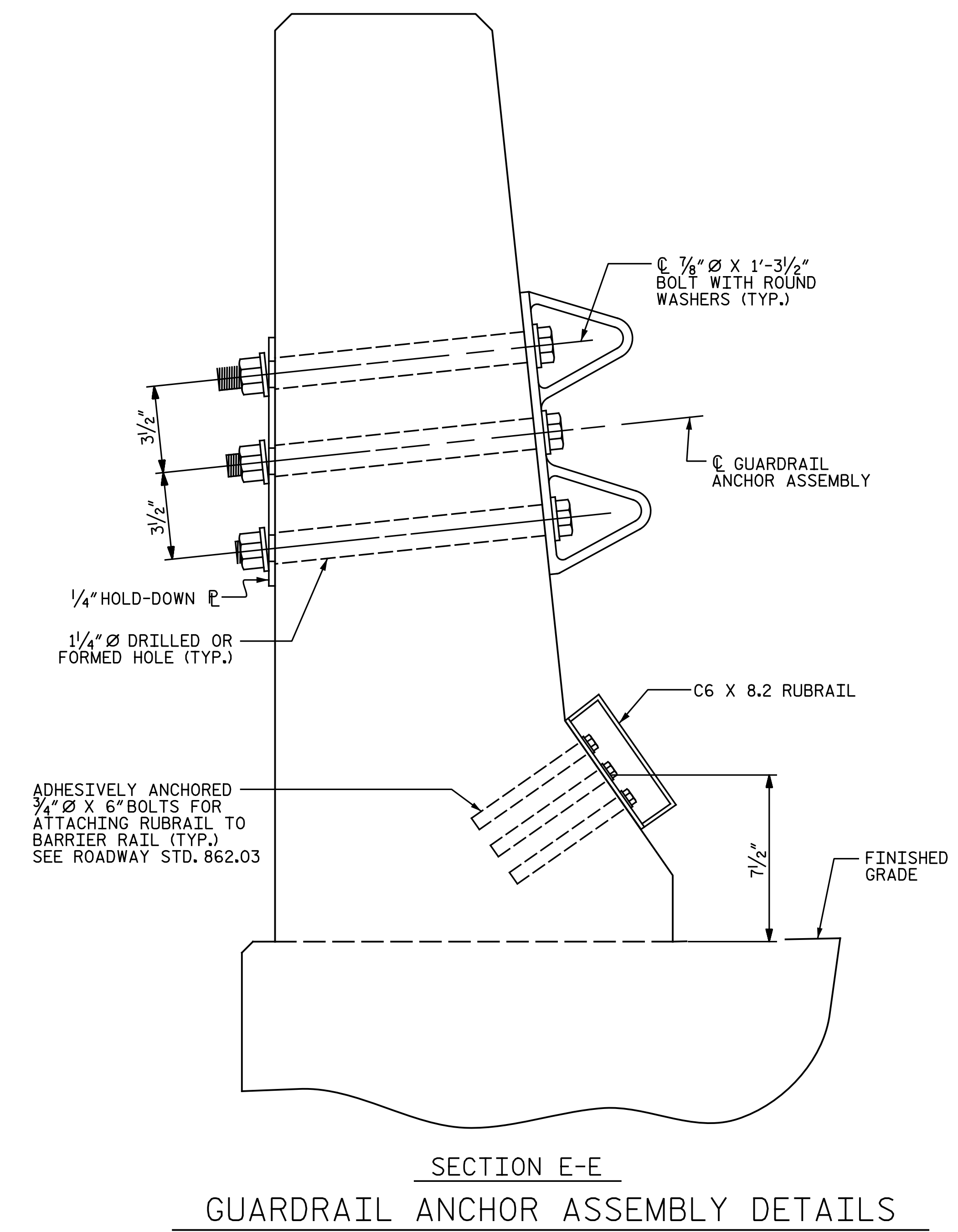
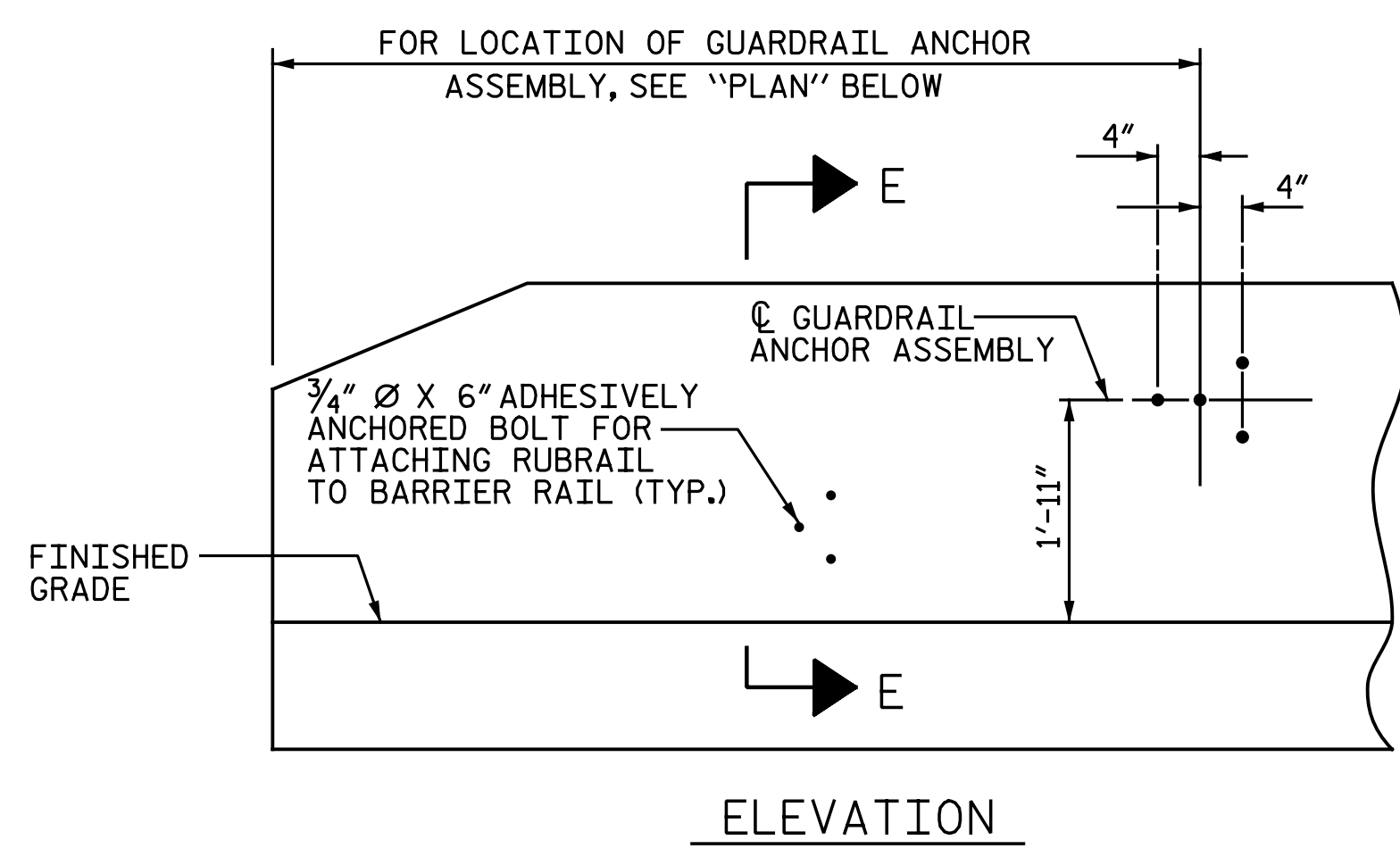
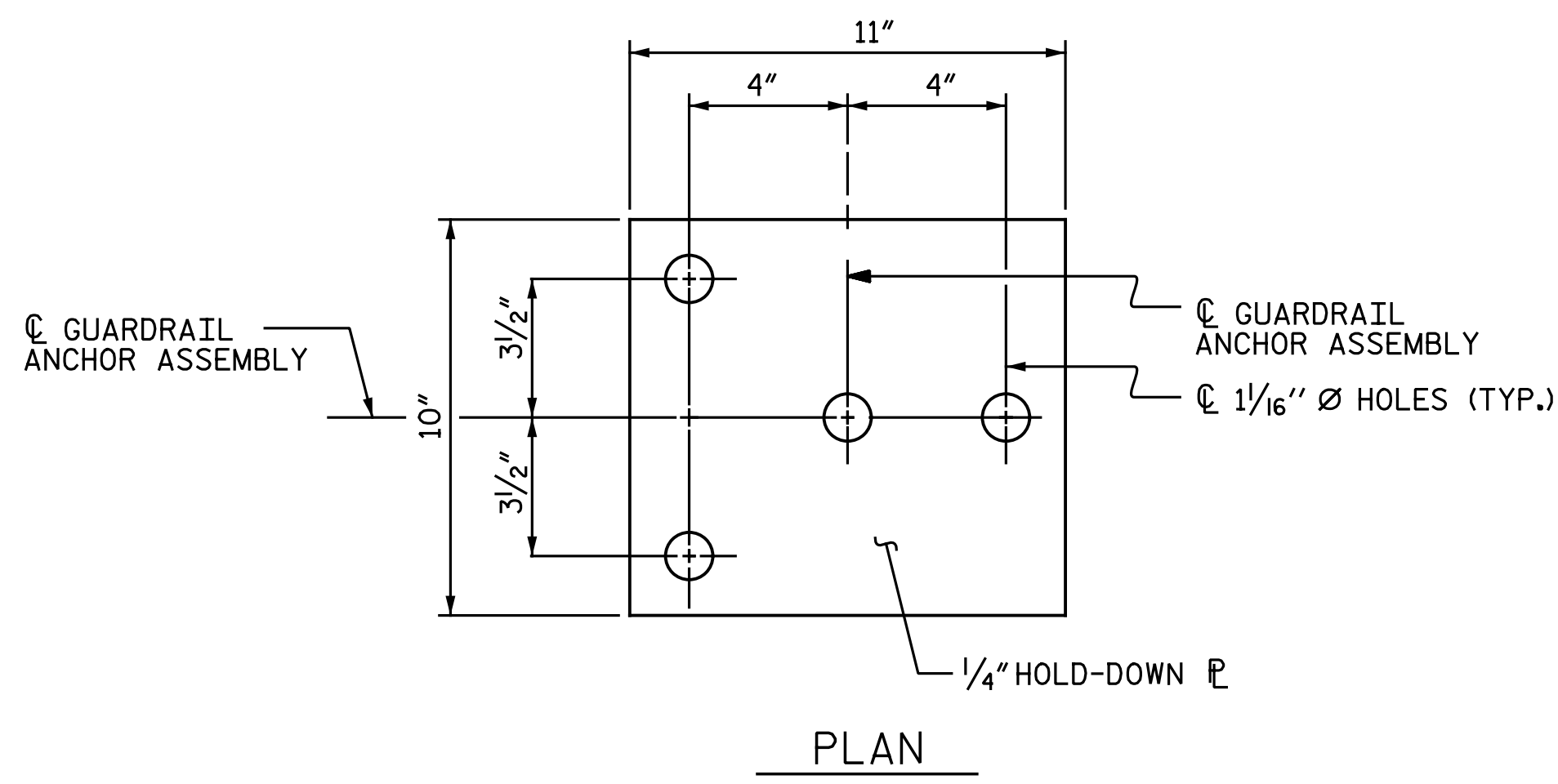


LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. U-3330
NASH COUNTY
STATION: 18+22.61 -Y1-

ASSEMBLED BY : N.B. SPEAKS	DATE : 8/31/16
CHECKED BY : A.H. SHARPE	DATE : 9/6/16
DRAWN BY : TLA 5/06	REV. 10/1/11 MAA/GM
CHECKED BY : GM 5/06	REV. 7/12 MAA/GM
	REV. 6/13 MAA/GM

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH STANDARD GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS RIGHT LANES				
	DocuSigned by: Bradley J. Bell CA1AF8ECAC3A34... 1/27/2017		REVISIONS				
	Michael Baker INTERNATIONAL		Michael Baker Engineering 8000 Regency Parkway, Suite 600 Cary, North Carolina 27518 NC License No.: F-1084				
	NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
	1			3			S2-22
	2			4			TOTAL SHEETS 39



NOTES

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

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

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

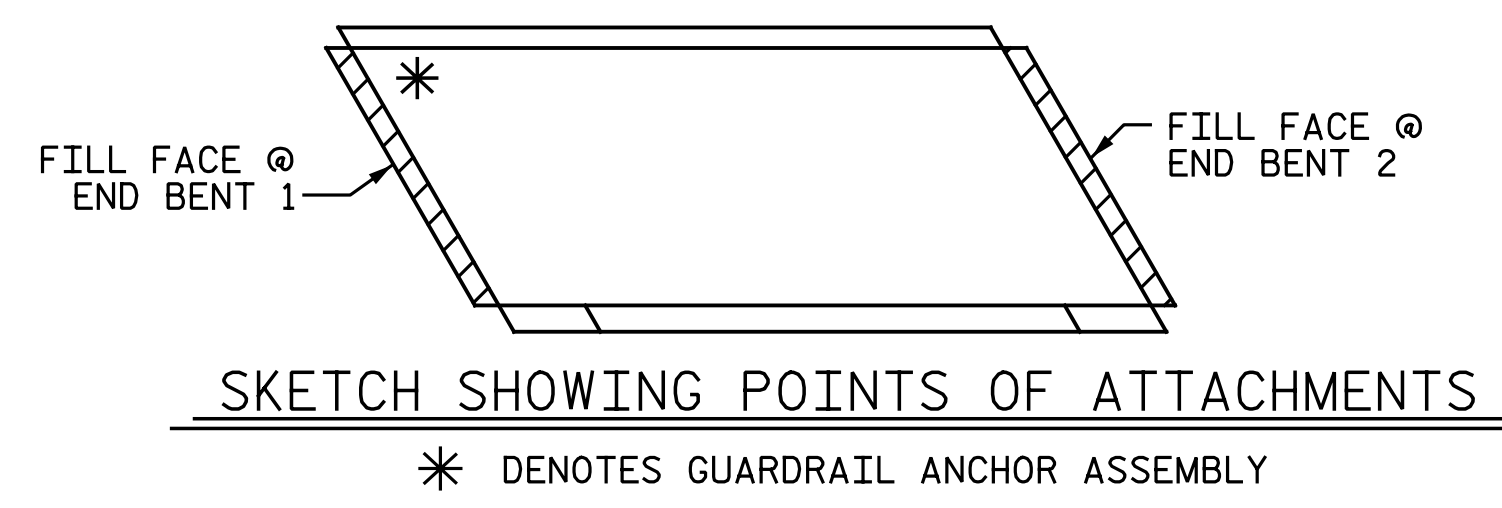
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

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.

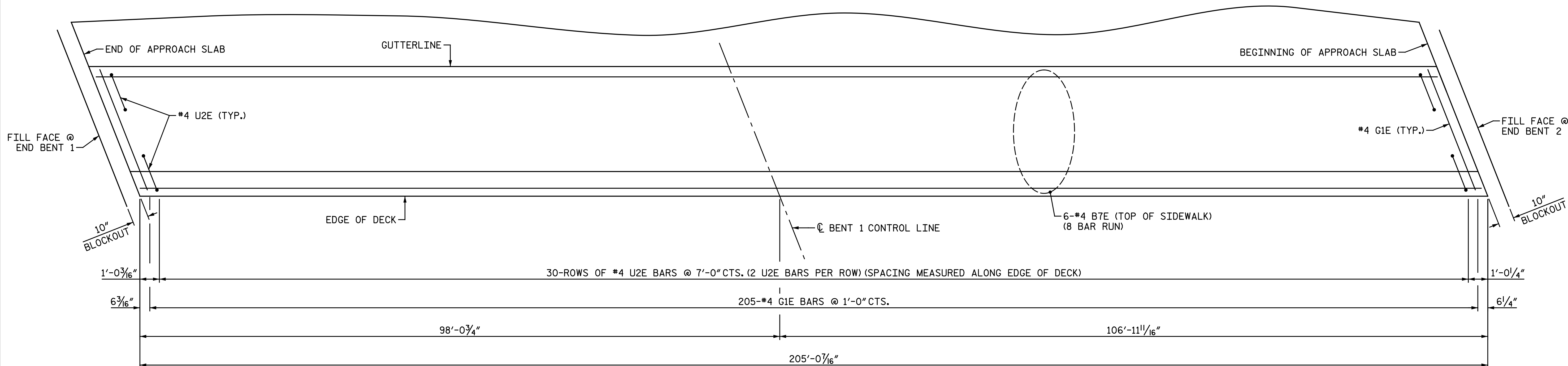
THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.



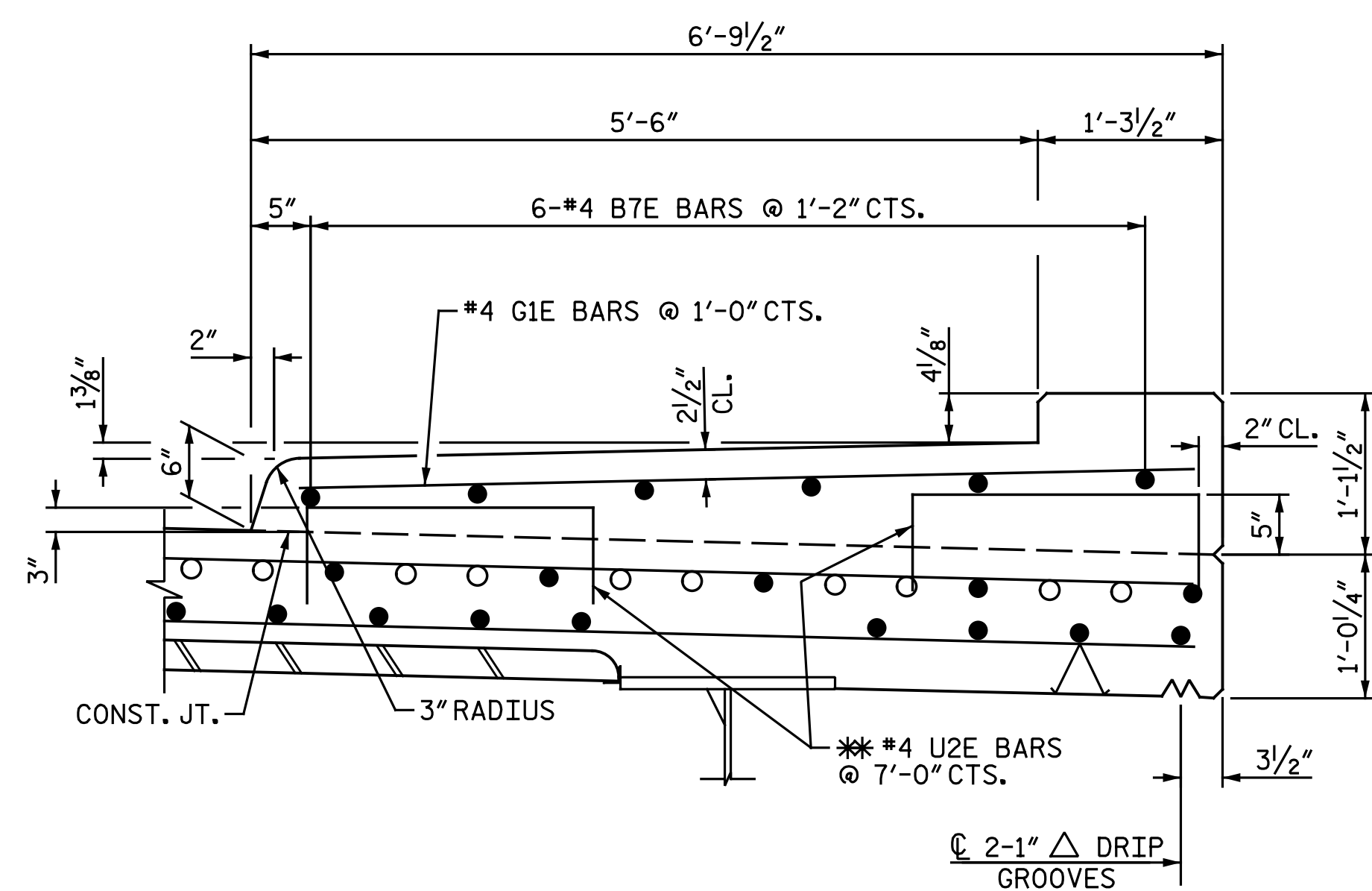
PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1-

ASSEMBLED BY : N.B. SPEAKS	DATE : 4/28/16
CHECKED BY : A.H. SHARPE	DATE : 9/6/16
DRAWN BY : TLA 5/06	REV. 10/1/11 MAA/GM
CHECKED BY : GM 5/06	REV. 7/12 MAA/GM
	REV. 6/13 MAA/GM

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH STANDARD GUARDRAIL ANCHORAGE FOR BARRIER RAIL RIGHT LANES		SHEET NO. S2-23 TOTAL SHEETS 39
	DocuSigned by: Bradley J. Bell C41AF8EC3A3434... 1/27/2017		REVISIONS		
	Michael Baker INTERNATIONAL		Michael Baker Engineering 8000 Regency Parkway, Suite 600 Cary, North Carolina 27518 NC License No.: F-1084		
	NO.	BY:	DATE:	NO.	
1			3		
2			4		



PLAN OF SIDEWALK



SECTION THRU SIDEWALK

**U2E BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF.

NOTES:

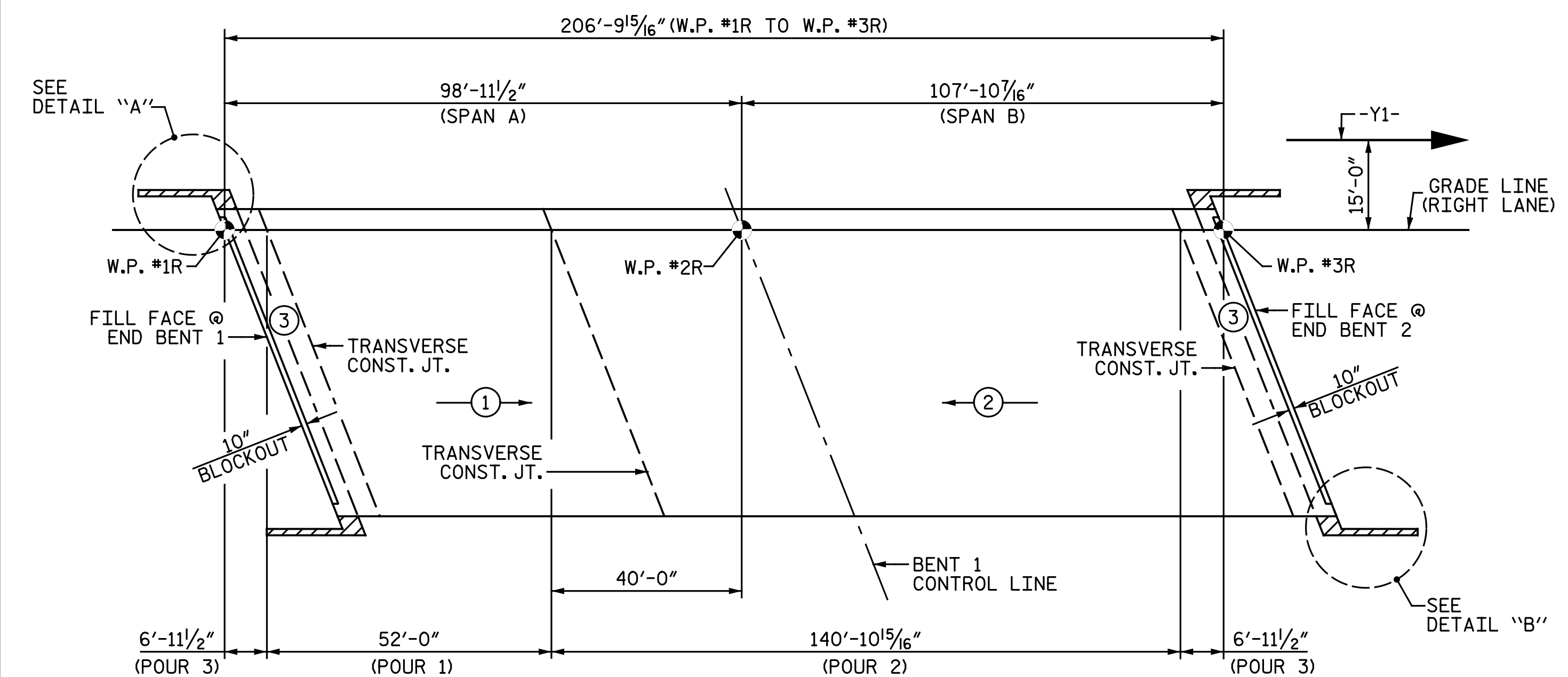
- FOR END POST DETAILS AND REINFORCING STEEL, SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEET.
- SIDEWALK IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.
- ALL REINFORCING STEEL IN SIDEWALKS SHALL BE EPOXY COATED.
- SIDEWALK REINFORCING STEEL AND CONCRETE ON BRIDGE SHALL BE INCLUDED IN THE PAY ITEM FOR THE "REINFORCED CONCRETE DECK SLAB".
- 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 EACH CENTERLINE RAIL POST LOCATION. NO CONTRACTION JOINTS WILL BE REQUIRED IN THE SHORT PARAPET SECTION OF THE SIDEWALK.

PROJECT NO. U-3330
 NASH COUNTY
 STATION: 18+22.61 -Y1-

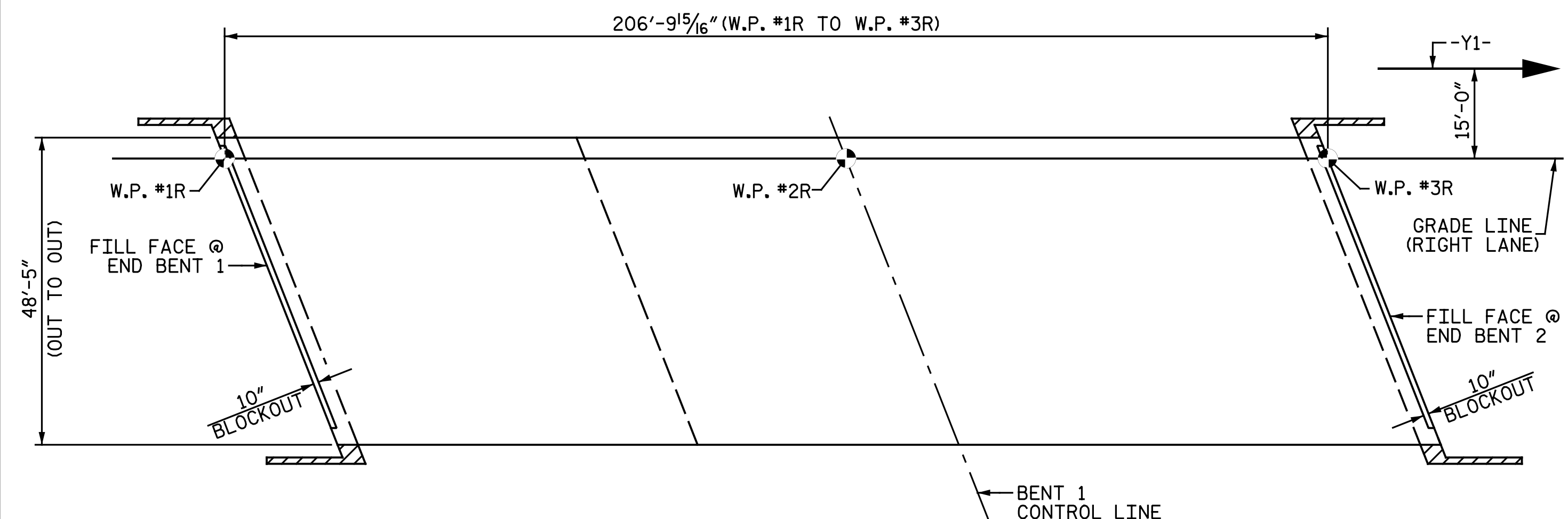
DRAWN BY: M. D. MAYHEW DATE: 9-6-16
 CHECKED BY: J. M. GARRISON DATE: 9-7-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE SIDEWALK DETAILS RIGHT LANES	
	DocuSigned by: Bradley J. Bell CA1A8F8E3A30434 1/27/2017	REVISIONS	
	Michael Baker INTERNATIONAL	Michael Baker Engineering 8000 Regency Parkway, Suite 600 Cary, North Carolina 27518 NC License No.: F-1084	

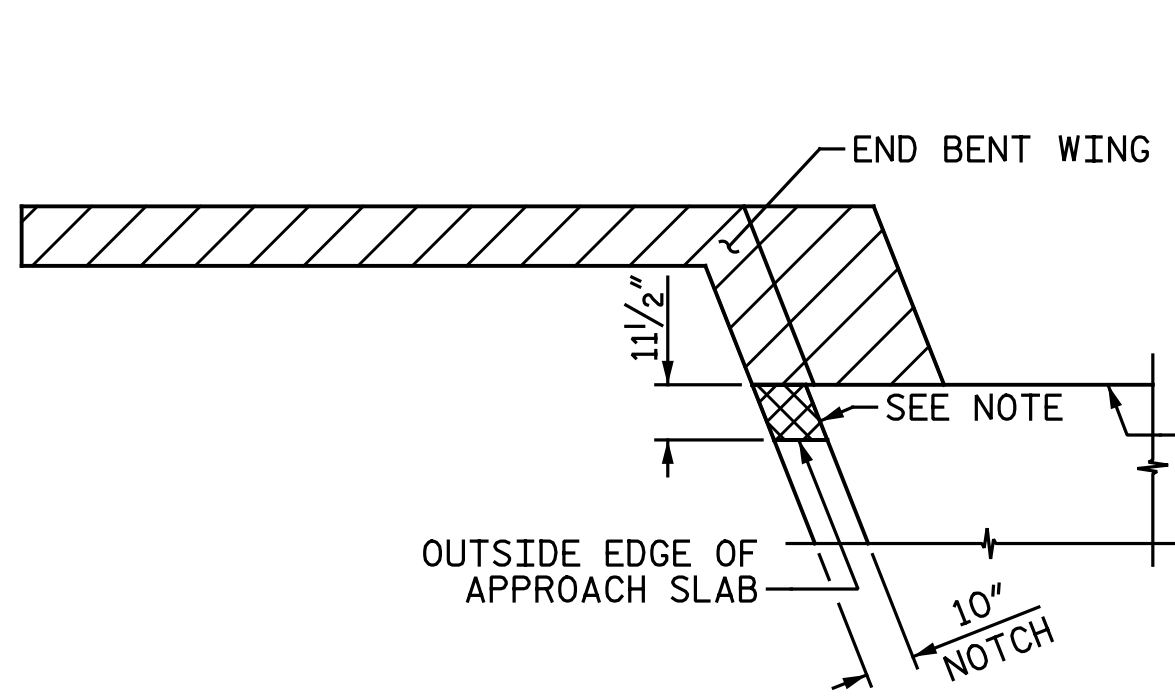
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			TOTAL SHEETS
2			4			39



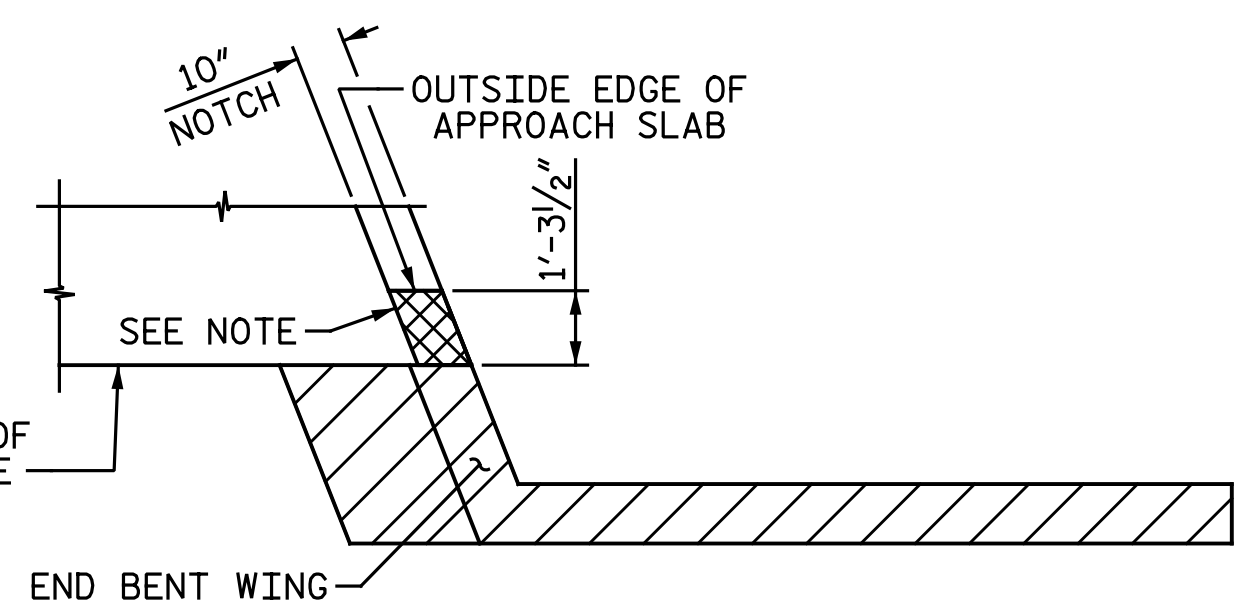
POURING SEQUENCE
 # DENOTES POUR NUMBER AND DIRECTION



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB
 (SQ. FT. = 10,011)



DETAIL "A"
 LEFT SIDE OF BRIDGE AT END BENT 1 SHOWN,
 LEFT SIDE AT END BENT 2 SIMILAR



DETAIL "B"
 RIGHT SIDE OF BRIDGE AT END BENT 2 SHOWN,
 RIGHT SIDE AT END BENT 1 SIMILAR

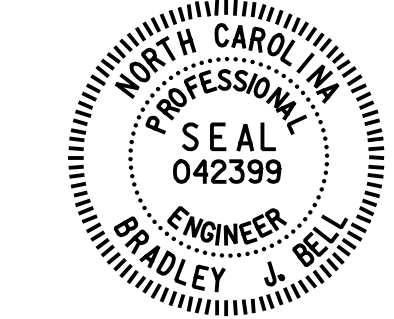
REINFORCING BAR SCHEDULE						REINFORCING BAR SCHEDULE					
SPANS A & B						SPANS A & B					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1E	405	#5	STR.	48' - 1"	20,311	A201	2	#5	STR.	47' - 7"	99
A2	405	#5	STR.	48' - 1"	20,311	A202	2	#5	STR.	46' - 5"	97
A3E	10	#5	STR.	51' - 8"	539	A203	2	#5	STR.	45' - 3"	94
A101E	2	#5	STR.	47' - 7"	99	A204	2	#5	STR.	44' - 1"	92
A102E	2	#5	STR.	46' - 5"	97	A205	2	#5	STR.	42' - 11"	90
A103E	2	#5	STR.	45' - 3"	94	A206	2	#5	STR.	41' - 9"	87
A104E	2	#5	STR.	44' - 1"	92	A207	2	#5	STR.	40' - 7"	85
A105E	2	#5	STR.	42' - 11"	90	A208	2	#5	STR.	39' - 5"	82
A106E	2	#5	STR.	41' - 9"	87	A209	2	#5	STR.	38' - 3"	80
A107E	2	#5	STR.	40' - 7"	85	A210	2	#5	STR.	37' - 1"	77
A108E	2	#5	STR.	39' - 5"	82	A211	2	#5	STR.	35' - 11"	75
A109E	2	#5	STR.	38' - 3"	80	A212	2	#5	STR.	34' - 9"	72
A110E	2	#5	STR.	37' - 1"	77	A213	2	#5	STR.	33' - 7"	70
A111E	2	#5	STR.	35' - 11"	75	A214	2	#5	STR.	32' - 6"	68
A112E	2	#5	STR.	34' - 9"	72	A215	2	#5	STR.	31' - 4"	65
A113E	2	#5	STR.	33' - 7"	70	A216	2	#5	STR.	30' - 2"	63
A114E	2	#5	STR.	32' - 6"	68	A217	2	#5	STR.	29' - 0"	60
A115E	2	#5	STR.	31' - 4"	65	A218	2	#5	STR.	27' - 10"	58
A116E	2	#5	STR.	30' - 2"	63	A219	2	#5	STR.	26' - 8"	56
A117E	2	#5	STR.	29' - 0"	60	A220	2	#5	STR.	25' - 6"	53
A118E	2	#5	STR.	27' - 10"	58	A221	2	#5	STR.	24' - 4"	51
A119E	2	#5	STR.	26' - 8"	56	A222	2	#5	STR.	23' - 2"	48
A120E	2	#5	STR.	25' - 6"	53	A223	2	#5	STR.	22' - 0"	46
A121E	2	#5	STR.	24' - 4"	51	A224	2	#5	STR.	20' - 10"	43
A122E	2	#5	STR.	23' - 2"	48	A225	2	#5	STR.	19' - 8"	41
A123E	2	#5	STR.	22' - 0"	46	A226	2	#5	STR.	18' - 6"	39
A124E	2	#5	STR.	20' - 10"	43	A227	2	#5	STR.	17' - 4"	36
A125E	2	#5	STR.	19' - 8"	41	A228	2	#5	STR.	16' - 2"	34
A126E	2	#5	STR.	18' - 6"	39	A229	2	#5	STR.	15' - 0"	31
A127E	2	#5	STR.	17' - 4"	36	A230	2	#5	STR.	13' - 11"	29
A128E	2	#5	STR.	16' - 2"	34	A231	2	#5	STR.	12' - 9"	27
A129E	2	#5	STR.	15' - 0"	31	A232	2	#5	STR.	11' - 7"	24
A130E	2	#5	STR.	13' - 11"	29	A233	2	#5	STR.	10' - 5"	22
A131E	2	#5	STR.	12' - 9"	27	A234	2	#5	STR.	9' - 3"	19
A132E	2	#5	STR.	11' - 7"	24	A235	2	#5	STR.	8' - 1"	17
A133E	2	#5	STR.	10' - 5"	22	A236	2	#5	STR.	6' - 11"	14
A134E	2	#5	STR.	9' - 3"	19	A237	2	#5	STR.	5' - 9"	12
A135E	2	#5	STR.	8' - 1"	17	A238	2	#5	STR.	4' - 7"	10
A136E	2	#5	STR.	6' - 11"	14	A239	2	#5	STR.	3' - 5"	7
A137E	2	#5	STR.	5' - 9"	12	A240	2	#5	STR.	2' - 3"	5
A138E	2	#5	STR.	4' - 7"	10	A241	2	#5	STR.	1' - 1"	2
A139E	2	#5	STR.	3' - 5"	7	B1E	132	#5	STR.	53' - 1"	7,308
A140E	2	#5	STR.	2' - 3"	5	B2	256	#5	STR.	52' - 10"	14,107
A141E	2	#5	STR.	1' - 1"	2	B3E	64	#6	STR.	23' - 3"	2,235
						B4E	32	#6	STR.	21' - 5"	1,029
						B5E	64	#6	STR.	60' - 0"	5,768
						B6E	32	#6	STR.	25' - 1"	1,206
						B7E	48	#4	STR.	27' - 5"	879
						G1E	205	#4	STR.	6' - 9"	924
						H1	16	#4	STR.	2' - 10"	30
						K1E	16	#4	STR.	21' - 9"	232
						K2E	16	#4	STR.	32' - 11"	352
						S1E	92	#4	1	11' - 11"	732
						S2E	88	#4	1	10' - 3"	603
						U1E	92	#4	2	9' - 6"	584
						U2E	60	#4	2	3' - 4"	134
						V1	12	#4	STR.	3' - 10"	31
						REINFORCING STEEL		LBS.	36,559		
						EPOXY COATED REINF. STEEL		LBS.	44,916		

GROOVING BRIDGE FLOORS	
APPROACH SLABS	1,798 SQ.FT.
BRIDGE DECK	7,573 SQ.FT.
TOTAL	9,371 SQ.FT.

B1E	132	#5	STR.	53' - 1"	7,308
B2	256	#5	STR.	52' - 10"	14,107
B3E	64	#6	STR.	23' - 3"	2,235
B4E	32	#6	STR.	21' - 5"	1,029
B5E	64	#6	STR.	60' - 0"	5,768
B6E	32	#6	STR.	25' - 1"	1,206
B7E	48	#4	STR.	27' - 5"	879
G1E	205	#4	STR.	6' - 9"	924
H1	16	#4	STR.	2' - 10"	30
K1E	16	#4	STR.	21' - 9"	232
K2E	16	#4	STR.	32' - 11"	352
S1E	92	#4	1	11' - 11"	732
S2E	88	#4	1	10' - 3"	603
U1E	92	#4	2	9' - 6"	584
U2E	60	#4	2	3' - 4"	134
V1	12	#4	STR.	3' - 10"	31
REINFORCING STEEL LBS. 36,559					
EPOXY COATED REINF. STEEL LBS. 44,916					

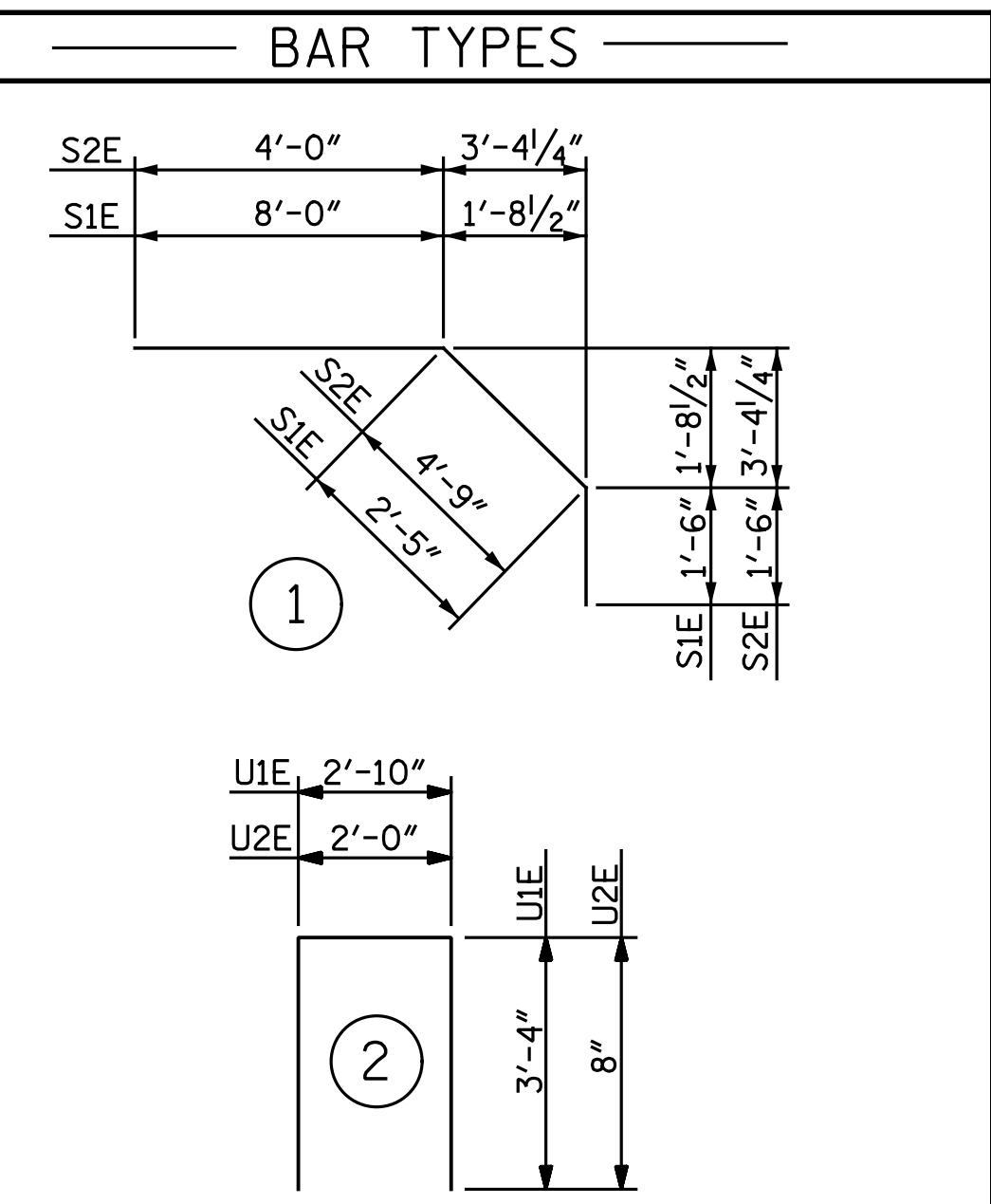
NOTE:
 CONCRETE SHALL BE POURED IN THE CROSS-HATCHED AREAS SHOWN IN DETAIL "A" AND DETAIL "B" TO MATCH THE TOP OF END BENT WINGS. UNLESS OTHERWISE DIRECTED BY THE ENGINEER, THE CONCRETE IN THESE AREAS SHALL BE POURED AT THE SAME TIME THE BLOCKOUTS IN THE END BENT WINGS ARE FILLED WITH CONCRETE AS NOTED ON SHEET 1 OF "INTEGRAL END BENT 1" AND "INTEGRAL END BENT 2" SHEETS.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



DocuSigned by:
 Bradley J. Bell
 CA1A5F8E3C3A34
 1/27/2017

Michael Baker International
 Michael Baker Engineering
 8000 Regency Parkway, Suite 600
 Cary, North Carolina 27518
 NC License No.: F-1084



ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL			
	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
SPANS A & B		36,559	44,916
POUR 1	77.4		
POUR 2	208.6		
POUR 3*	64.3		
SIDEWALK	36.8		***
TOTALS **	387.1	36,559	44,916

* POUR 3 QUANTITY INCLUDES DIAPHRAGM PORTION OF INTEGRAL END BENT
 ** QUANTITIES FOR CONCRETE BARRIER RAIL ARE NOT INCLUDED
 *** QUANTITIES INCLUDED WITH SPAN TOTALS

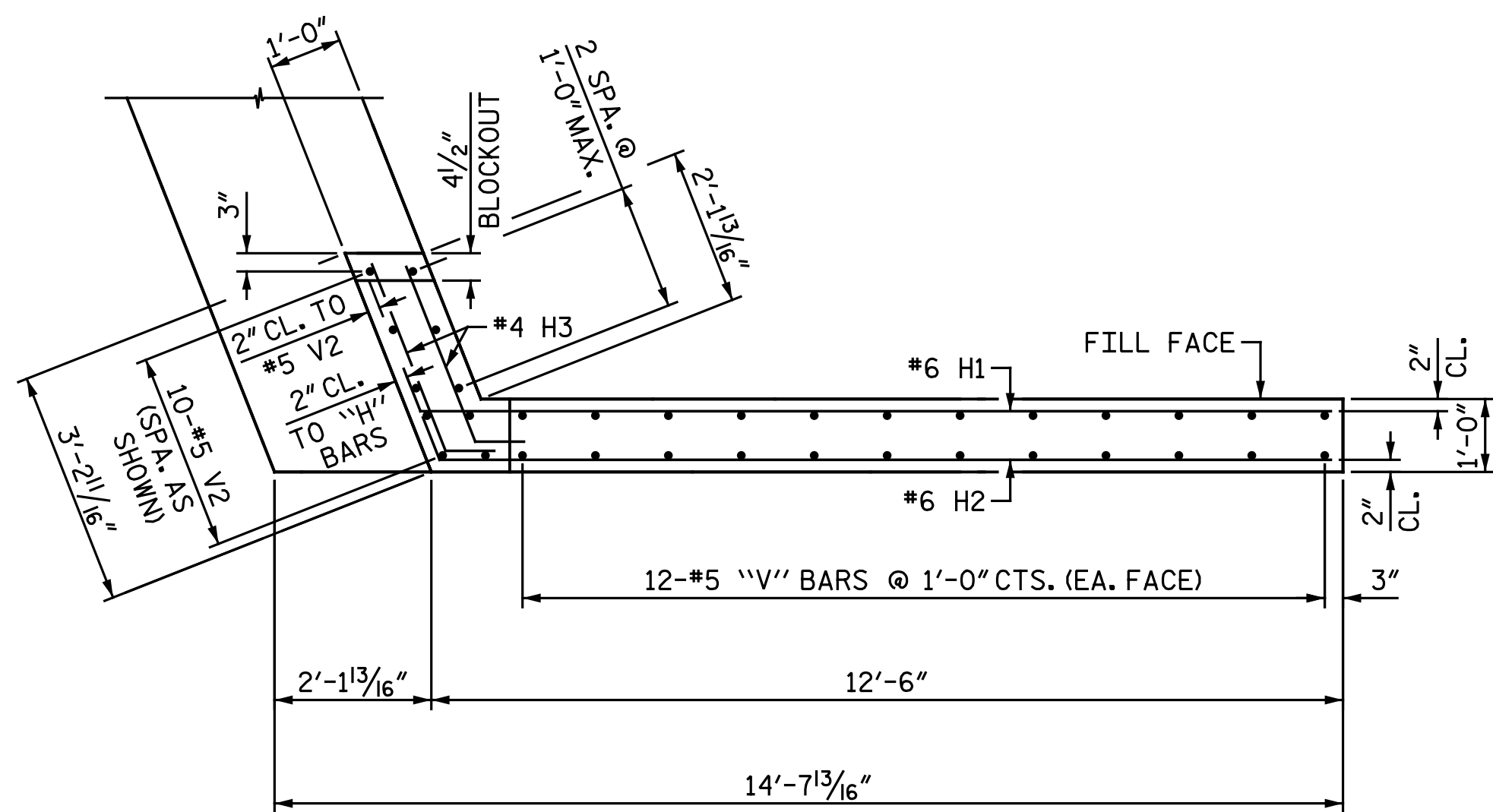
SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS					
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"
#5	2'-6"	2'-2"	2'-6"	2'-2"	3'-5"
#6	3'-0"	2'-7"	3'-10"	2'-7"	4'-4"
#7	5'-3"	3'-6"			
#8	6'-10"	4'-7"			

PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1-

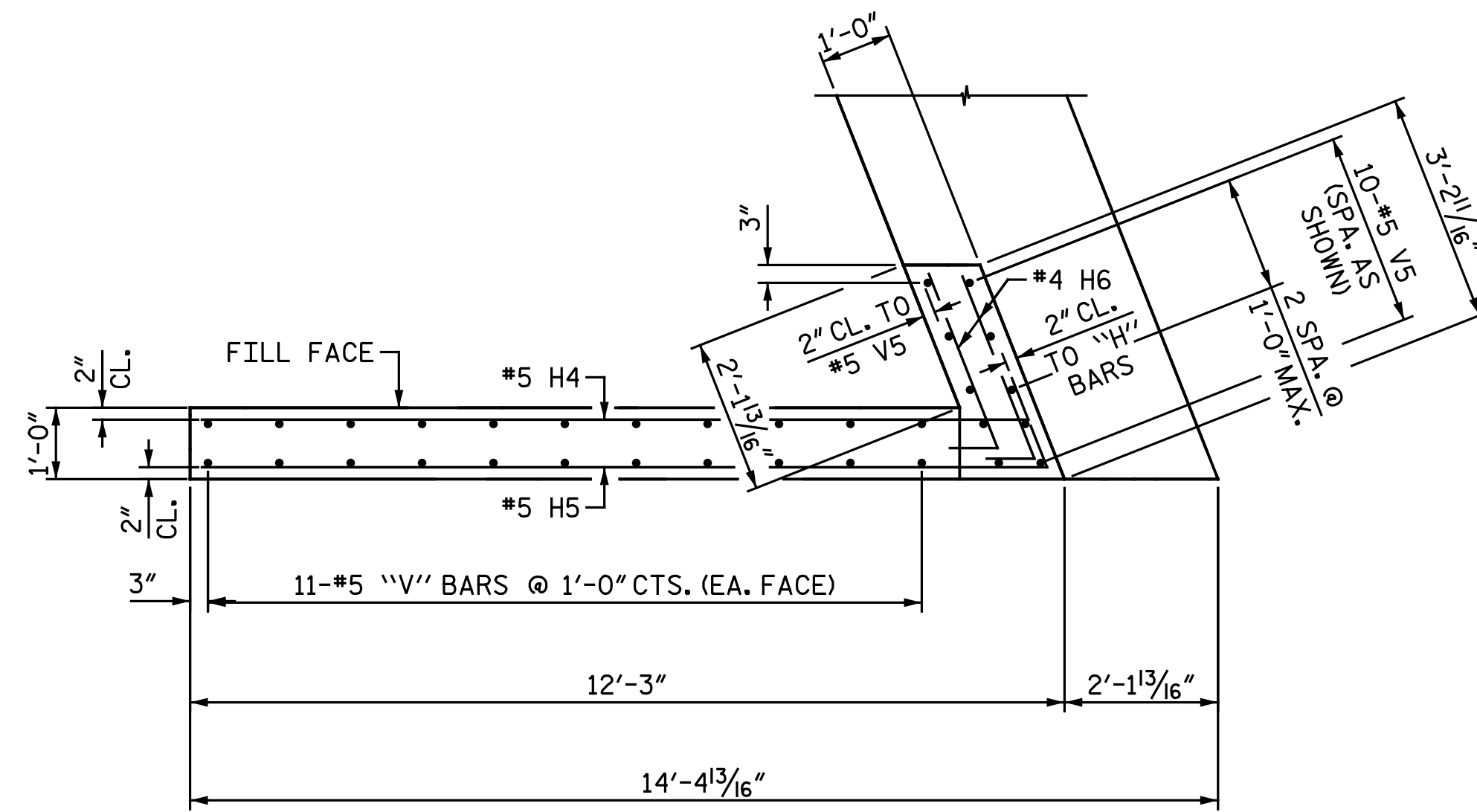
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 BILL OF MATERIAL
 RIGHT LANES

REVISIONS						SHEET NO. S2-25
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 39
2			4			

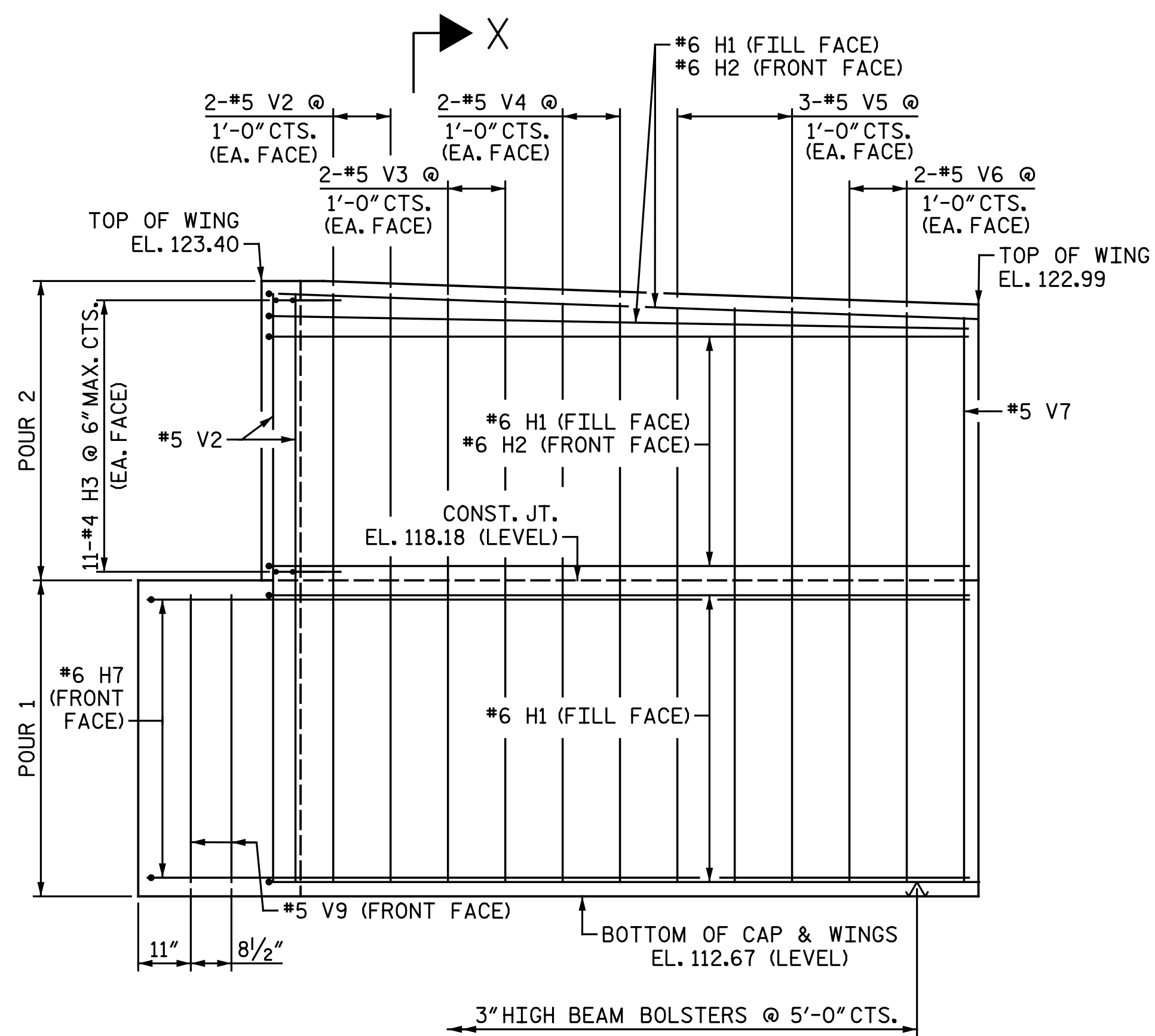
DRAWN BY: N. B. SPEAKS DATE: 9-8-16
 CHECKED BY: B. J. BELL DATE: 9-8-16



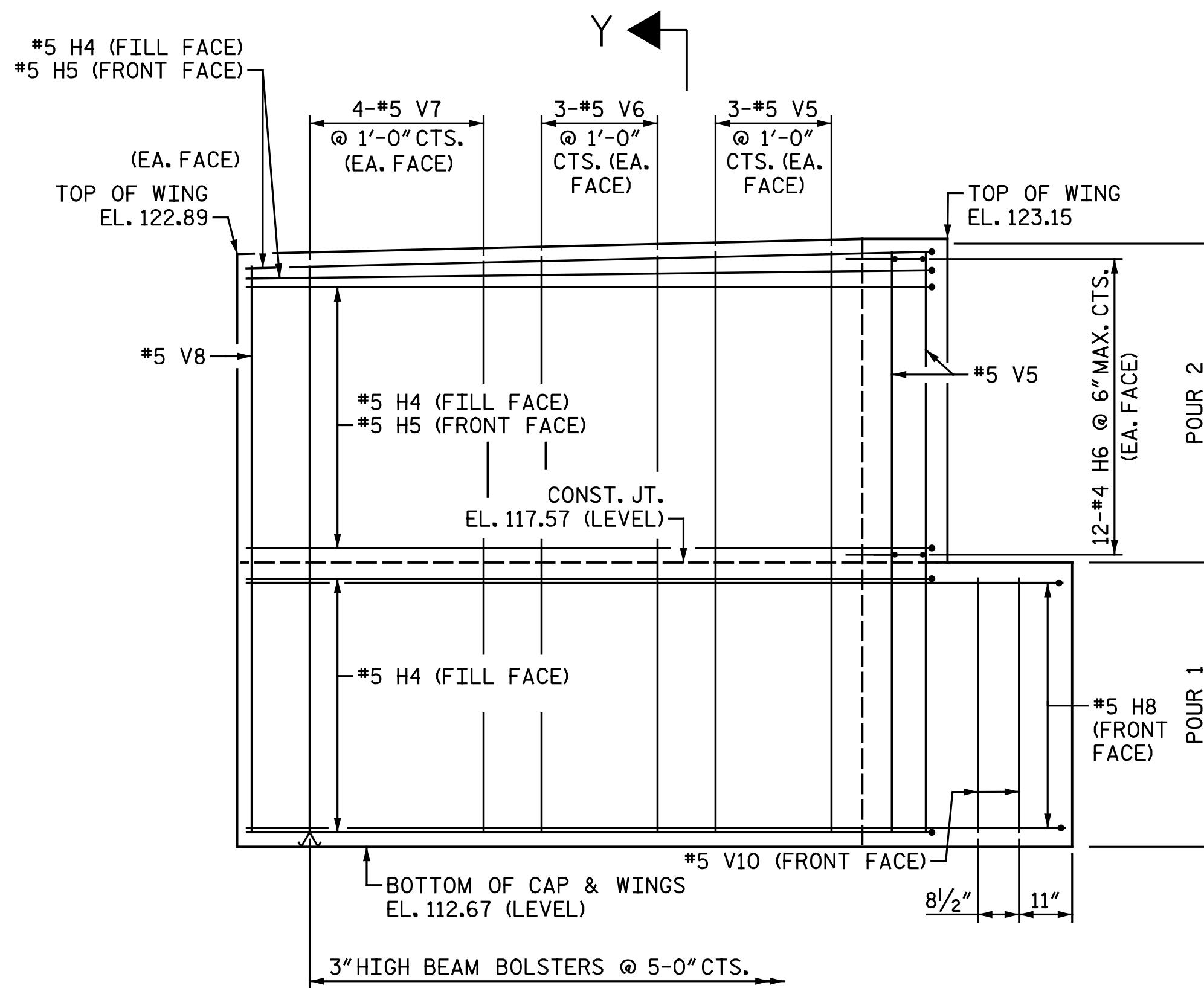
PLAN OF LEFT WING WALL (W1)



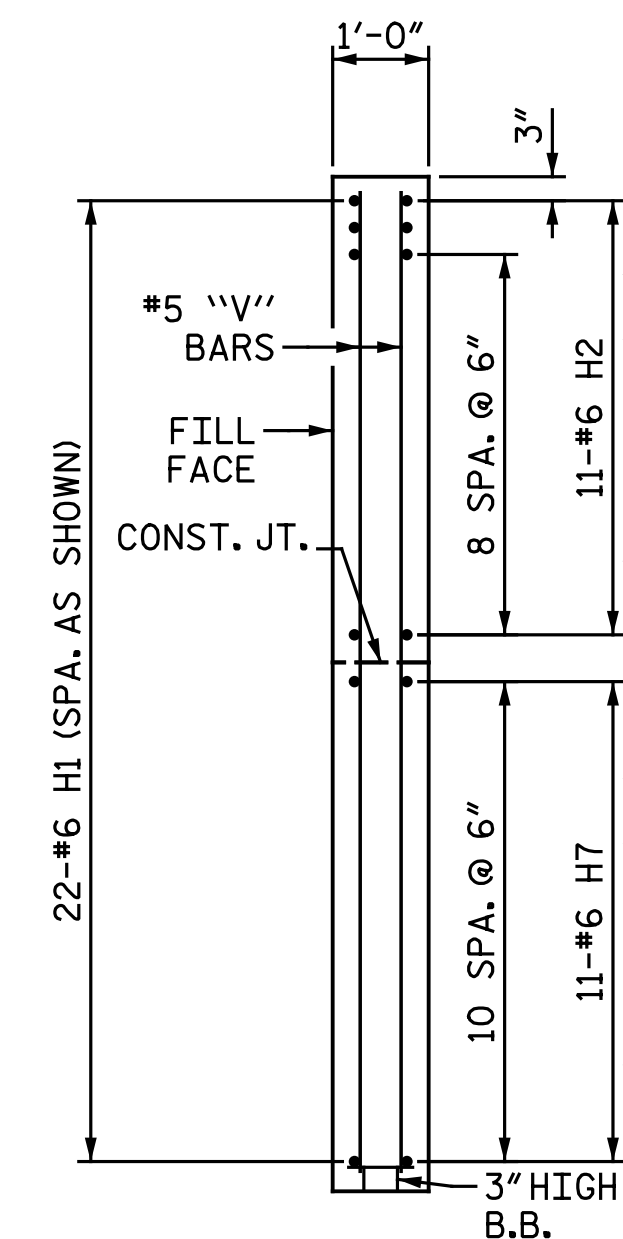
PLAN OF RIGHT WING WALL (W2)



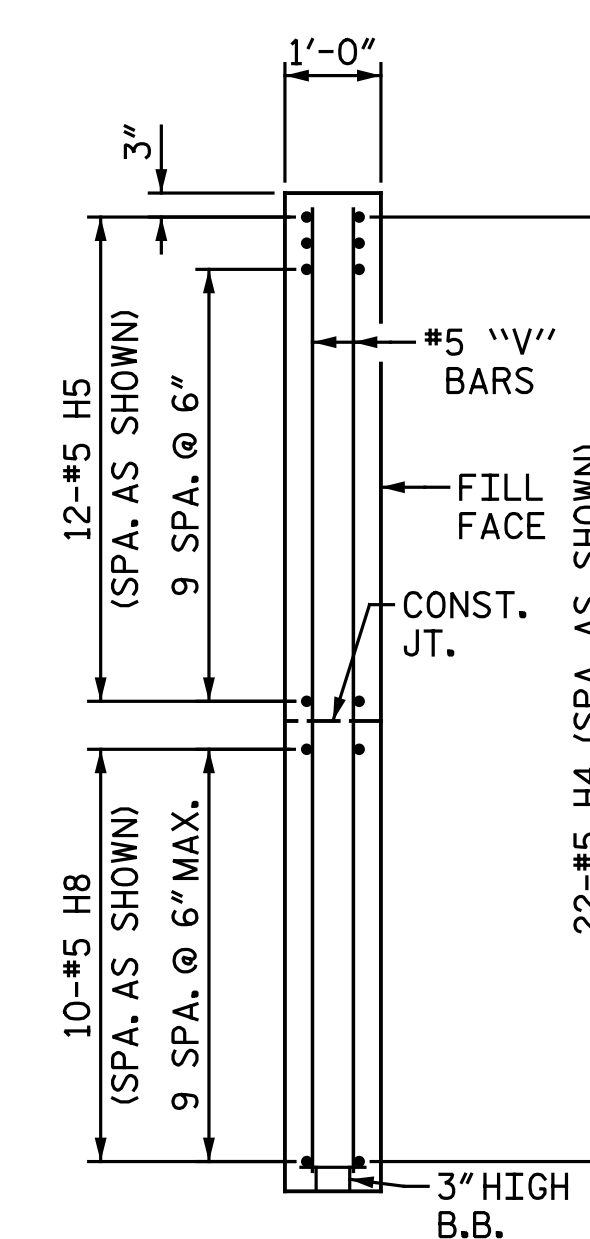
ELEVATION OF LEFT WING WALL (W1)



ELEVATION OF RIGHT WING WALL (W2)



SECTION X-X



SECTION Y-Y

PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1-
 SHEET 2 OF 2

DRAWN BY: M. D. MAYHEW DATE: 8-16-16
 CHECKED BY: A. H. SHARPE DATE: 8-22-16

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

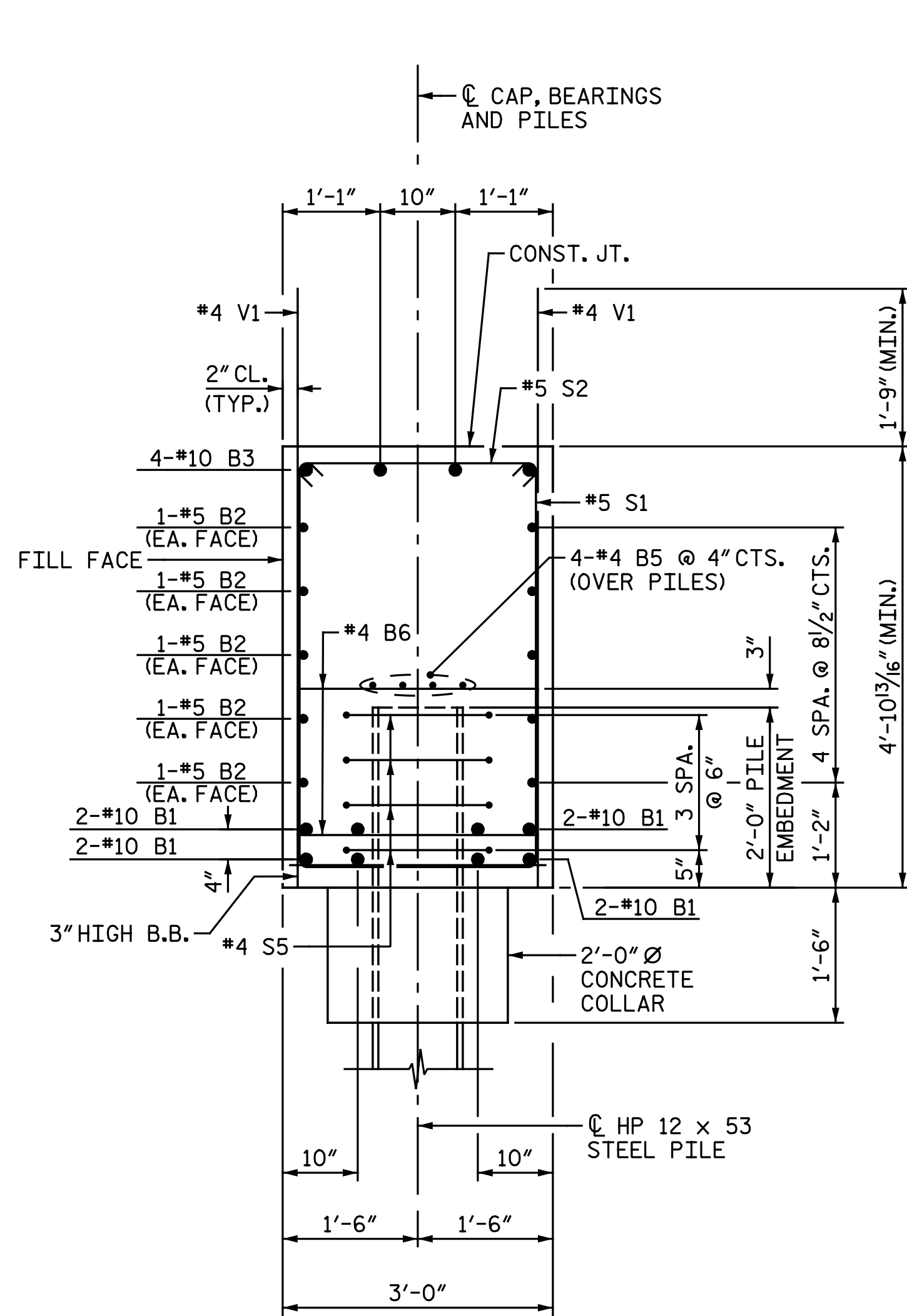


DocuSigned by:
 Bradley J. Bell
 CA1A3F8E3A30434
 1/27/2017

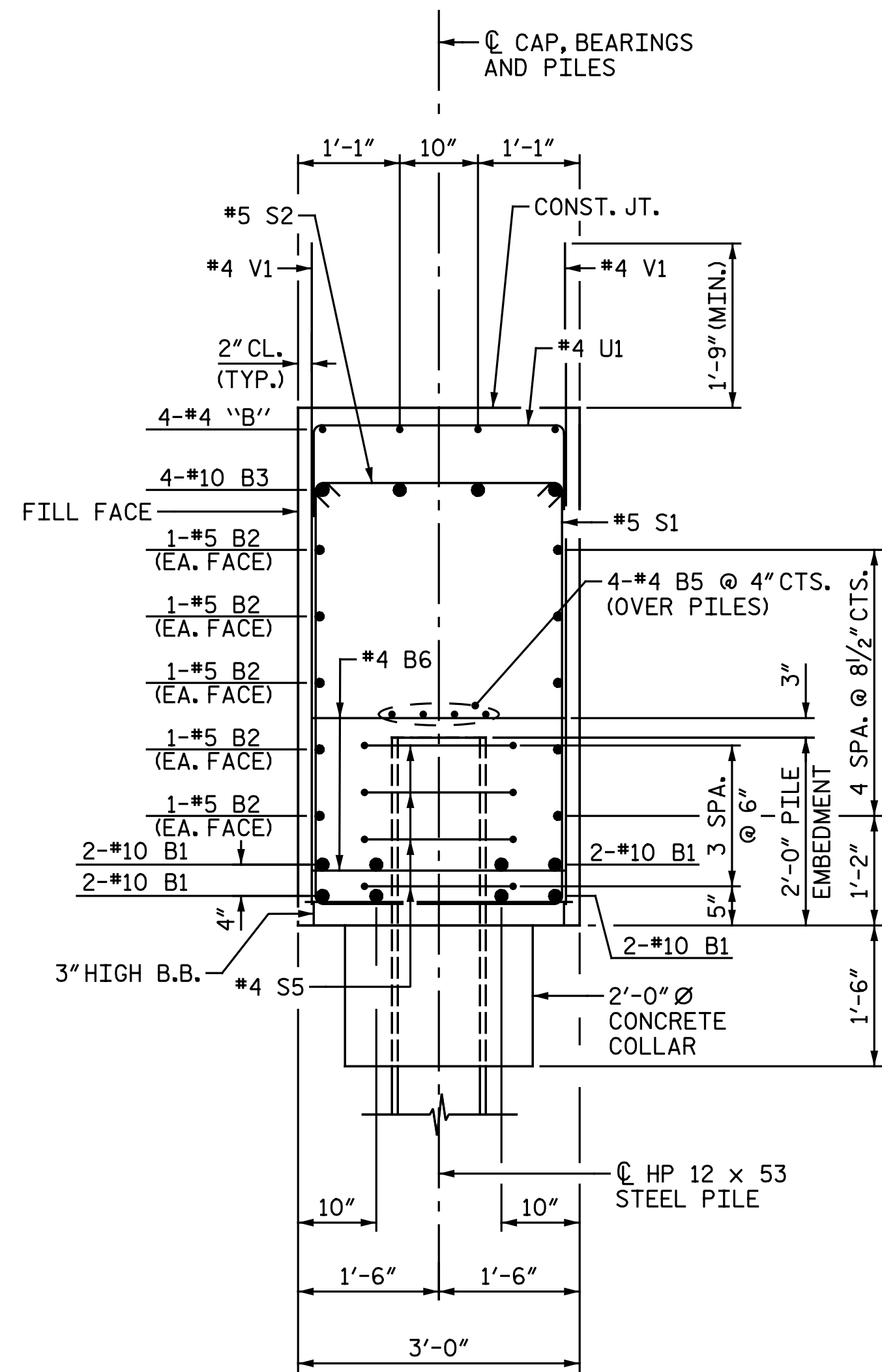
Michael Baker
 INTERNATIONAL

Michael Baker Engineering
 8000 Regency Parkway, Suite 600
 Cary, North Carolina 27518
 NC License No.: F-1084

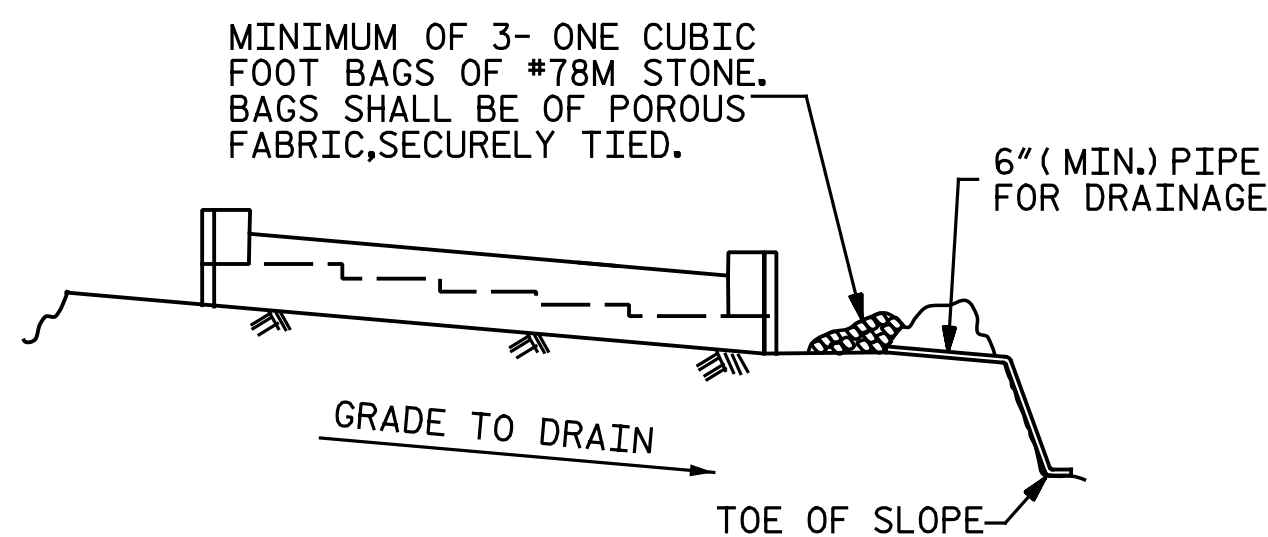
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
INTEGRAL END BENT 1					
RIGHT LANES					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S2-27					TOTAL SHEETS 39



SECTION A-A



SECTION B-B



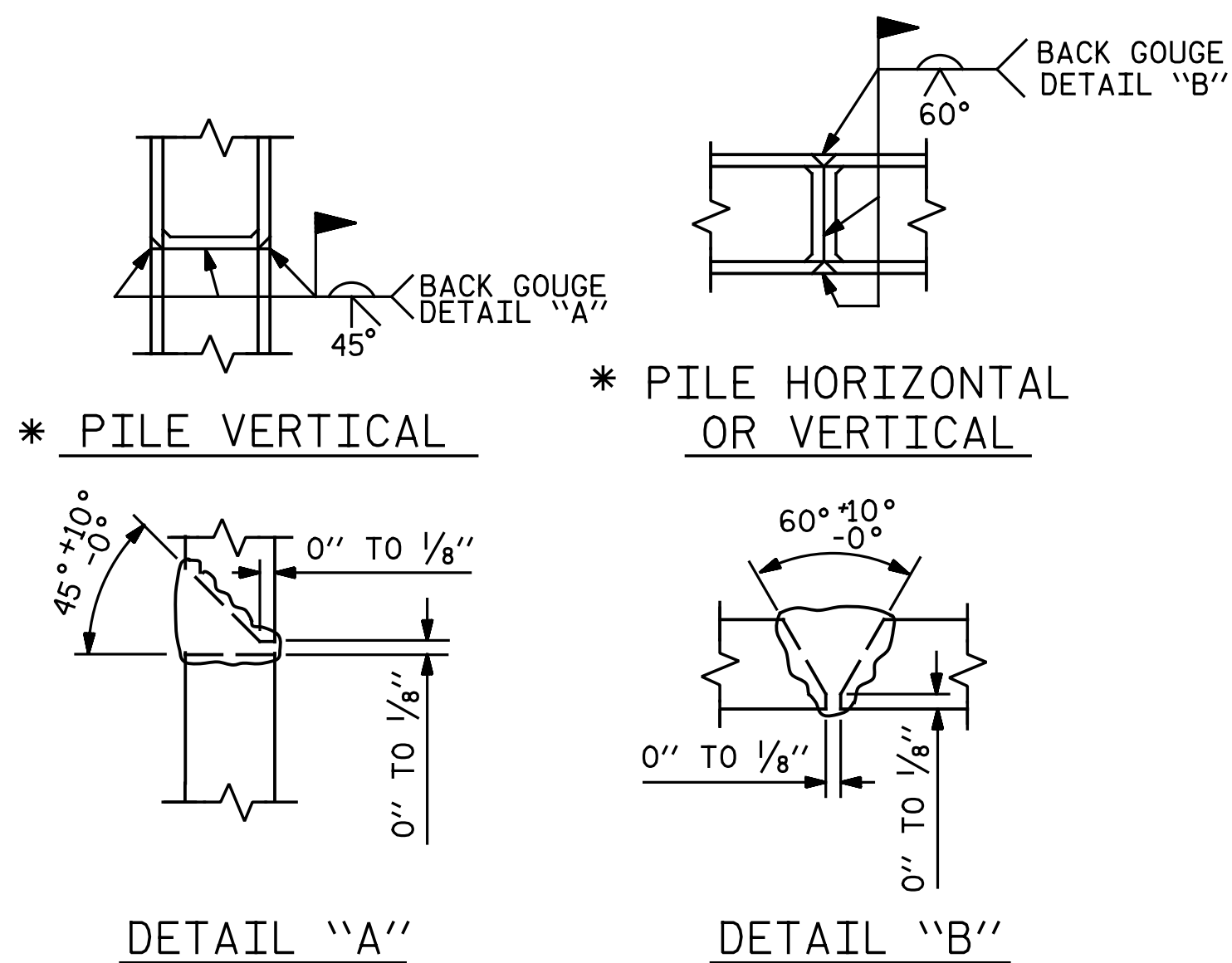
MINIMUM OF 3- ONE CUBIC FOOT BAGS OF #78M STONE. BAGS SHALL BE OF POROUS FABRIC, SECURELY TIED.

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

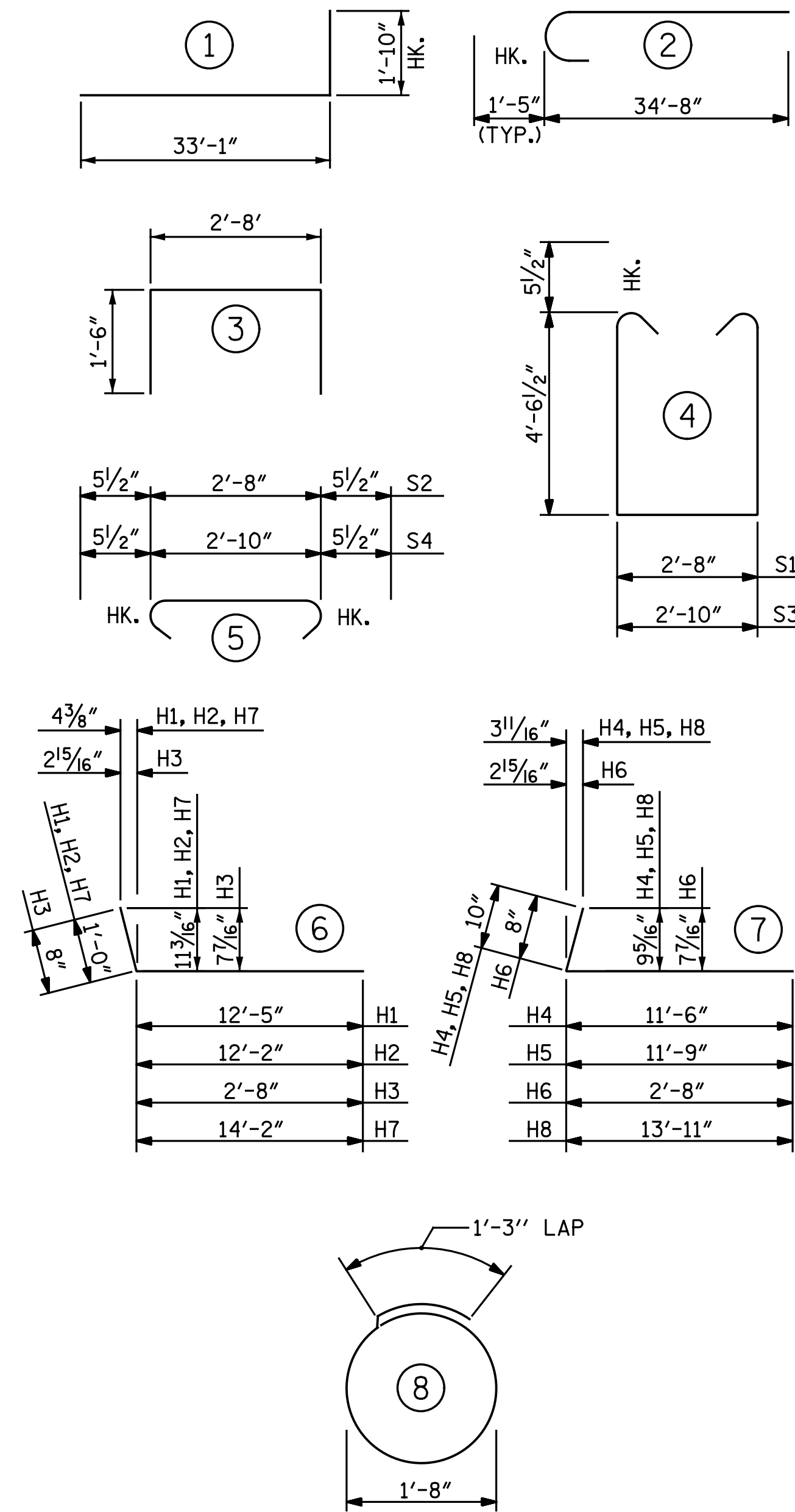
DRAWN BY : M. D. MAYHEW DATE : 8-16-16
 CHECKED BY : A. H. SHARPE DATE : 8-18-16



PILE SPLICE DETAILS

* POSITION OF PILE DURING WELDING.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	16	#10	1	34' - 11"	2404
B2	10	#5	STR.	58' - 1"	606
B3	8	#10	2	36' - 1"	1242
B4	8	#4	STR.	10' - 11"	58
B5	8	#4	STR.	30' - 4"	162
B6	30	#4	STR.	2' - 8"	53
B7	1	#4	STR.	7' - 4"	5
B8	1	#4	STR.	7' - 8"	5
B9	1	#4	STR.	8' - 0"	5
B10	1	#4	STR.	8' - 4"	6

H1	22	#6	6	13' - 5"	443
H2	11	#6	6	13' - 2"	218
H3	22	#4	6	3' - 4"	49
H4	22	#5	7	12' - 4"	283
H5	12	#5	7	12' - 7"	157
H6	24	#4	7	3' - 4"	53
H7	11	#6	6	15' - 2"	251
H8	10	#5	7	14' - 9"	154

S1	55	#5	4	12' - 8"	727
S2	55	#5	5	3' - 7"	206
S3	2	#5	4	12' - 10"	27
S4	2	#5	5	3' - 9"	8
S5	32	#4	8	6' - 6"	139

U1	21	#4	3	5' - 8"	79
----	----	----	---	---------	----

V1	92	#4	STR.	7' - 8"	471
V2	14	#5	STR.	10' - 3"	150
V3	4	#5	STR.	10' - 2"	42
V4	4	#5	STR.	10' - 1"	42
V5	22	#5	STR.	10' - 0"	229
V6	10	#5	STR.	9' - 11"	103
V7	10	#5	STR.	9' - 10"	103
V8	2	#5	STR.	9' - 9"	20
V9	2	#5	STR.	5' - 1"	11
V10	2	#5	STR.	4' - 5"	9

REINFORCING STEEL LBS. 8,520

CLASS A CONCRETE

POUR 1 - CAP, LOWER PART OF WINGS & COLLARS C.Y. 39.4

POUR 2 - UPPER PART OF WINGS C.Y. 5.7

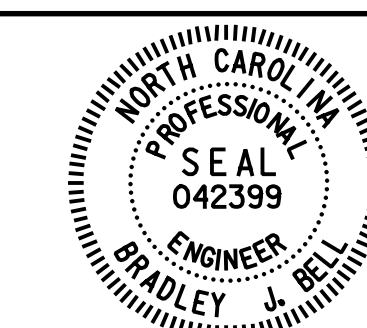
TOTAL C.Y. 45.1

HP 12 x 53 STEEL PILES NO. 8 L.F. 240

PILE DRIVING EQUIPMENT SETUP FOR HP 12 x 53 STEEL PILES EA. 8

PROJECT NO. U-3330
 NASH COUNTY
 STATION: 18+22.61 -Y1-

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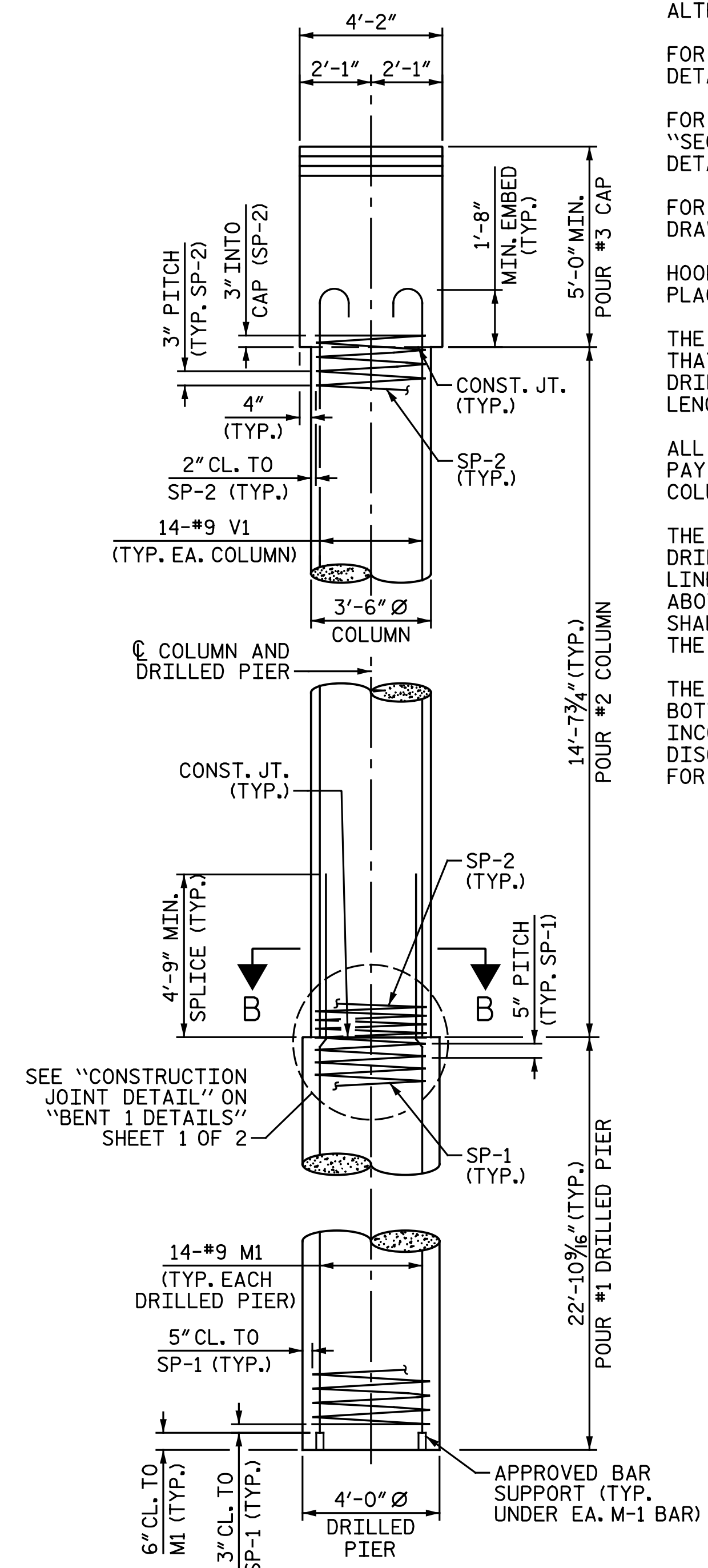
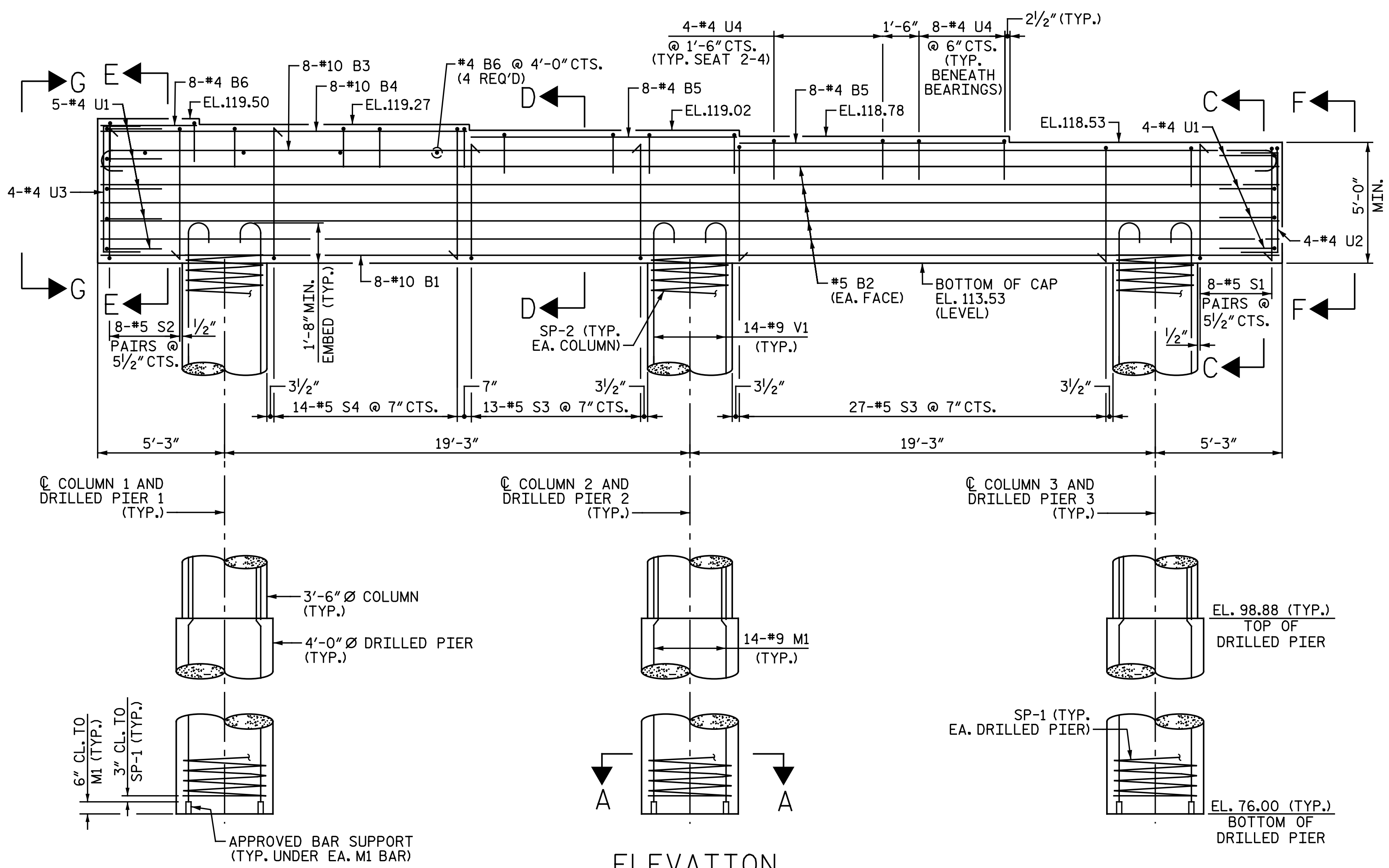
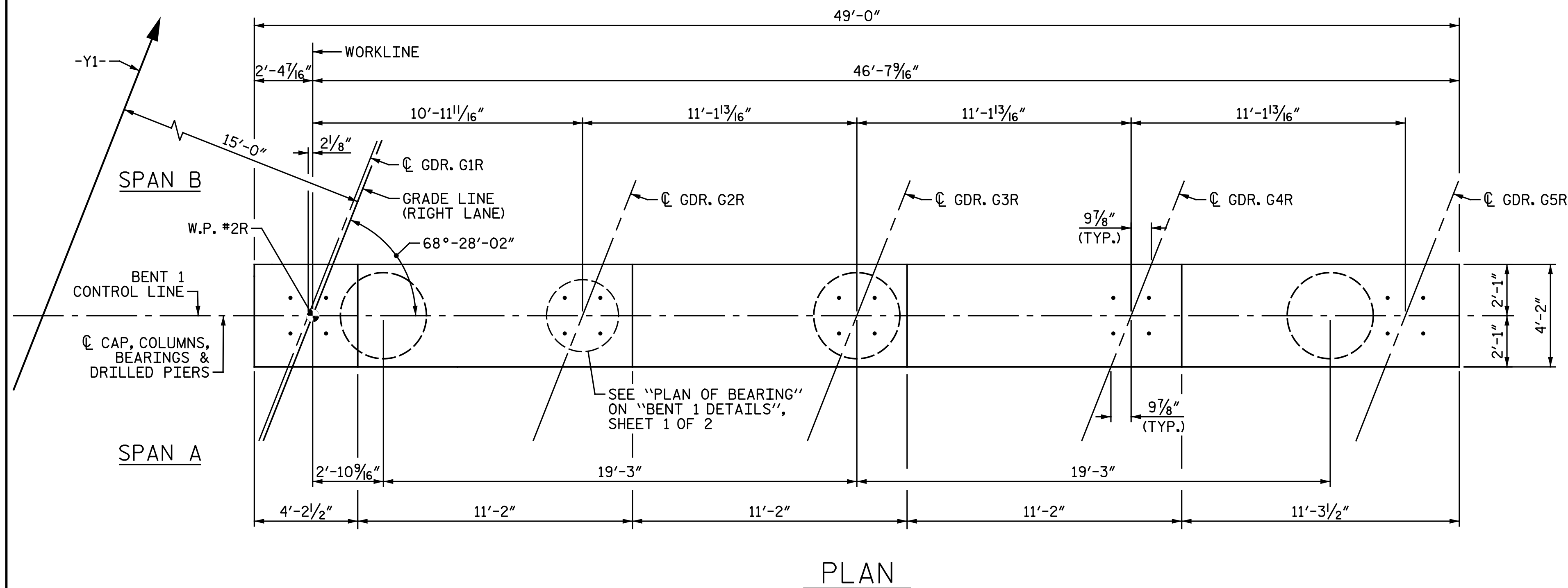
DocuSigned by: Bradley J. Bell
 C41A5F8E3C3A34
 2/15/2017

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

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



NOTES:

STIRRUPS & U4 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

ALTERNATELY INVERT STIRRUPS & STIRRUP PAIRS.

FOR "SECTION A-A" AND "SECTION B-B", SEE "BENT 1 DETAILS" SHEET 1 OF 2.

FOR "SECTION C-C", "SECTION D-D", "SECTION E-E", "SECTION F-F" AND "SECTION G-G", SEE "BENT 1 DETAILS" SHEET 2 OF 2.

FOR ADDITIONAL INFORMATION AND NOTES, SEE "GENERAL DRAWING", SHEET 2 OF 4.

HOOKS ON V1 BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

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

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

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIER IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FOOT BELOW THE GROUND LINE.

THE CONTRACTOR SHALL ADJUST THE BEARING SEAT AND BOTTOM OF CAP ELEVATIONS AS NECESSARY TO INCORPORATE A MAXIMUM PERMISSIBLE VARIATION IN DISC BEARING DEPTH OF 1/2". SEE SPECIAL PROVISION FOR DISC BEARING.

PROJECT NO. U-3330

NASH COUNTY

STATION: 18+22.61 -Y1-

DRAWN BY: C. E. MAYHEW DATE: 8-18-16

CHECKED BY: A. H. SHARPE DATE: 9-2-16

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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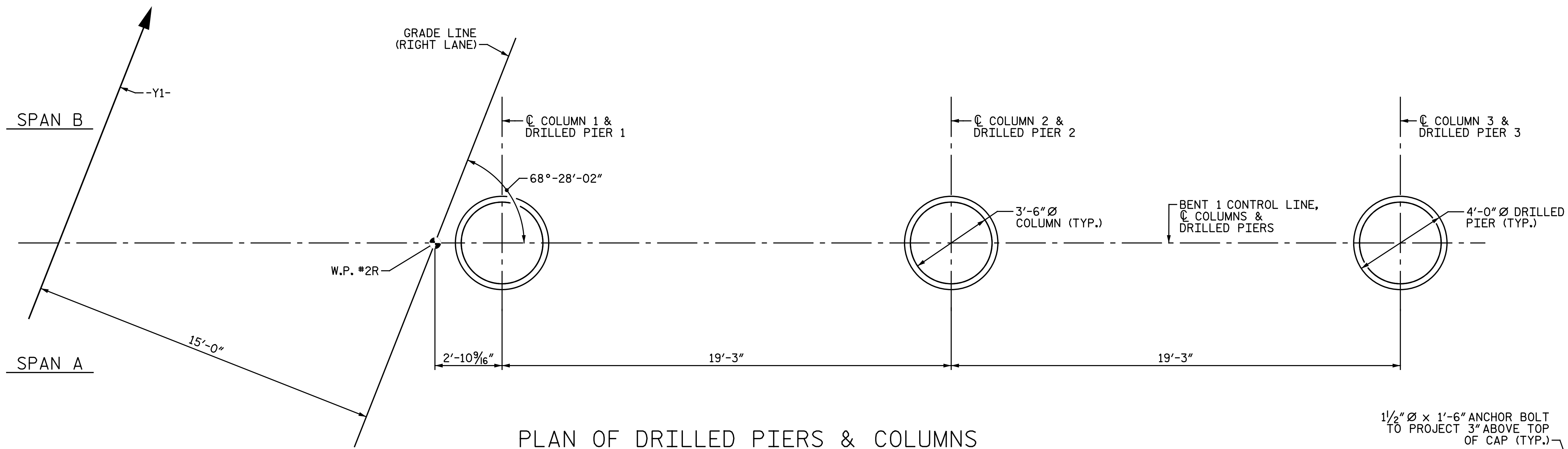
Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No.: F-1084

Professional Engineer Seal: BRADLEY J. BELL, ENGINEER, 042399

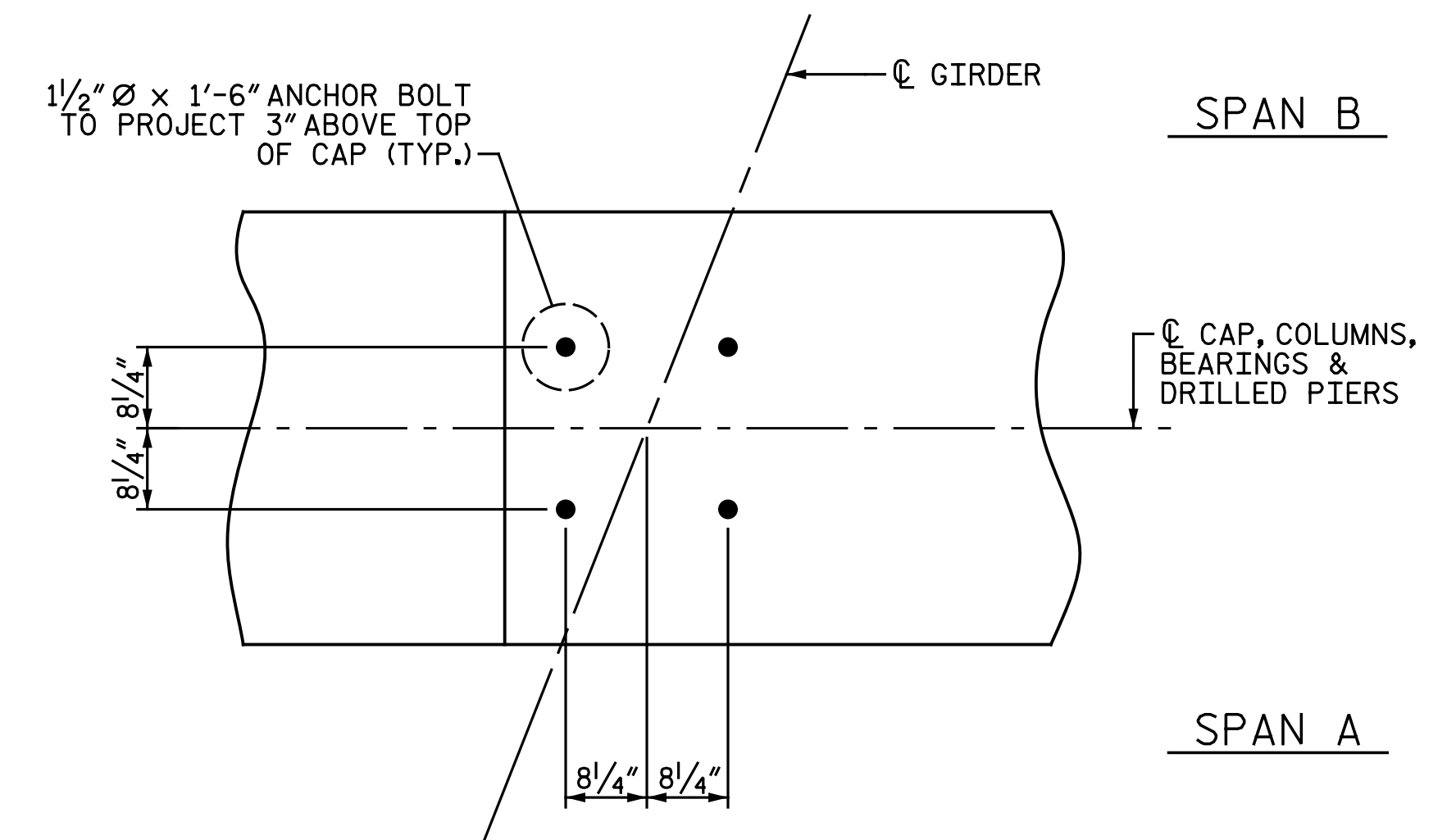
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
BENT 1
RIGHT LANES

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

SHEET NO. **S2-29**
TOTAL SHEETS 39



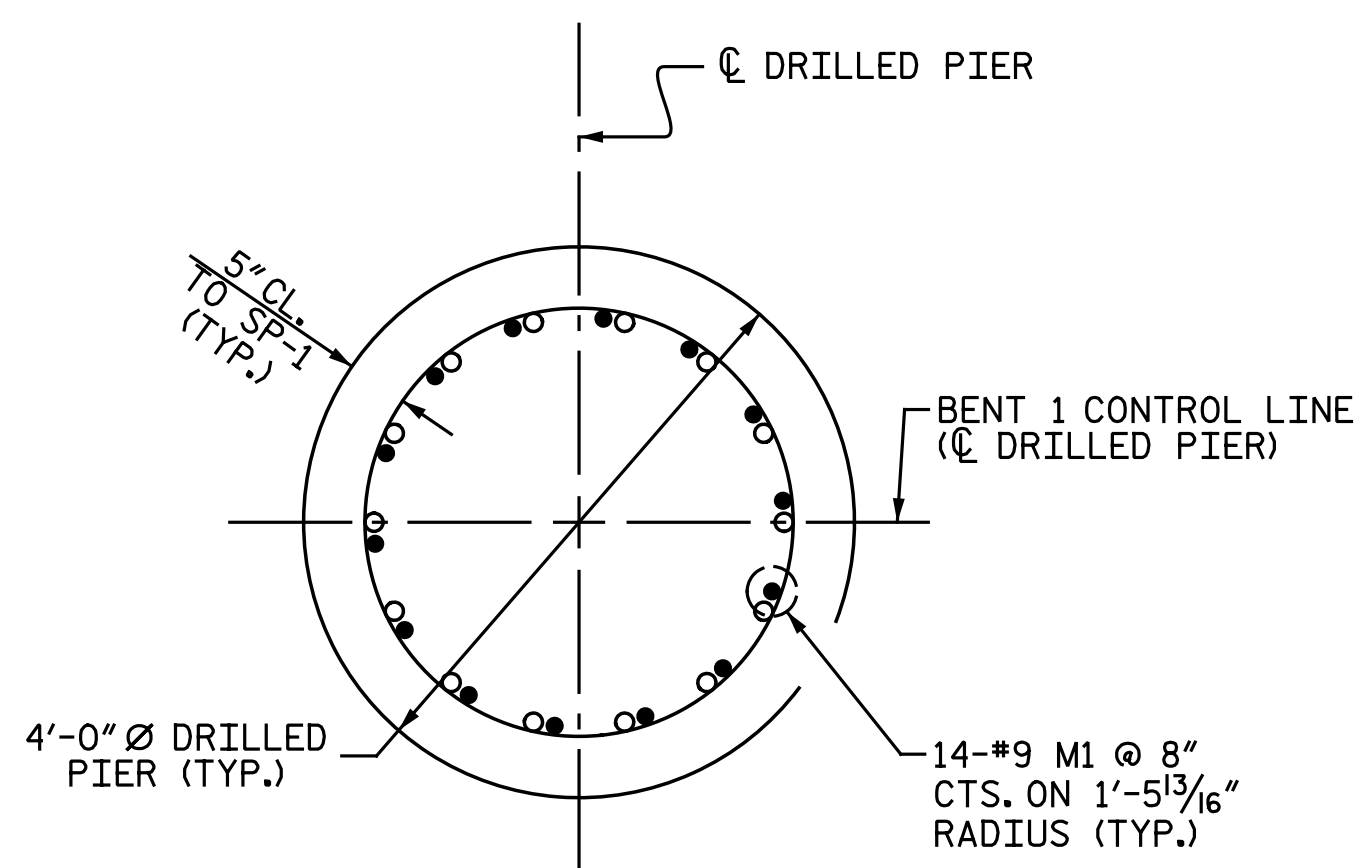
PLAN OF DRILLED PIERS & COLUMNS



PLAN OF BEARING

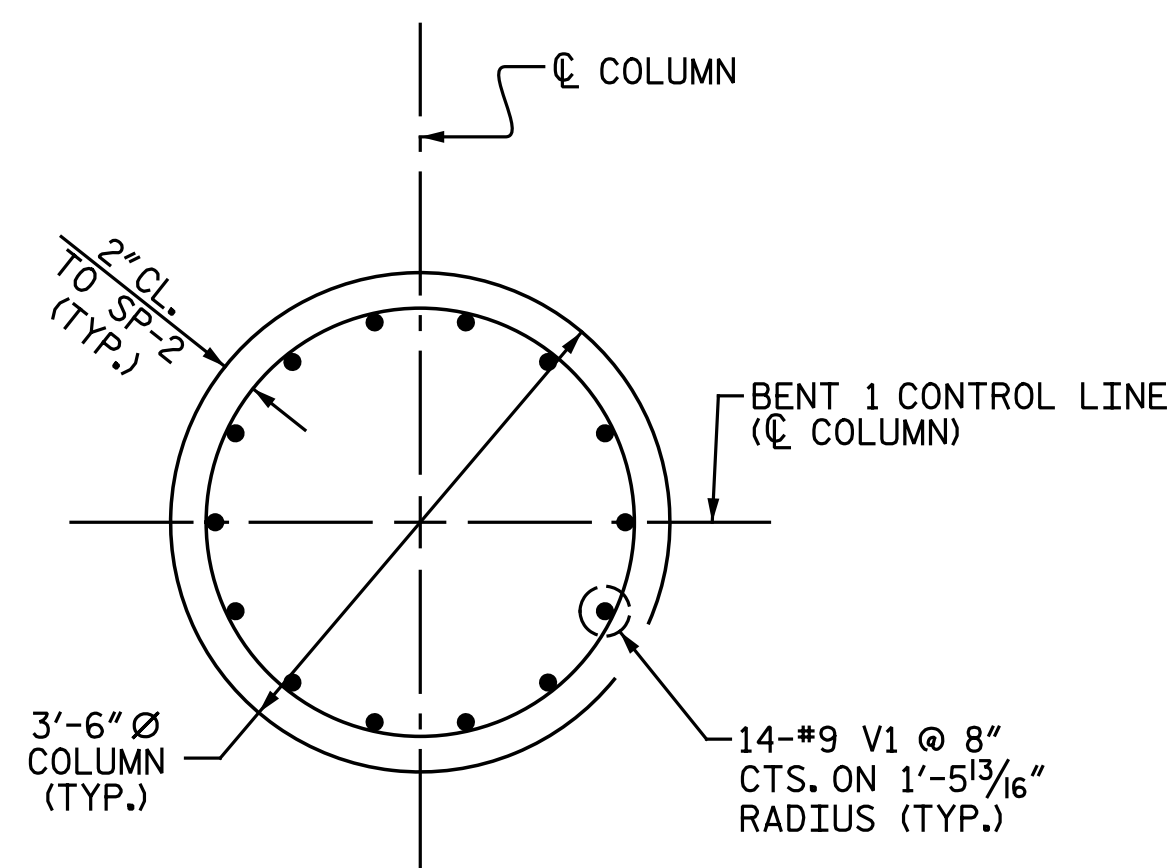
ALL DIMENSIONS AND DETAILS SHOWN ARE TYPICAL FOR ALL BEARINGS AT EACH BRIDGE SEAT LOCATION.

PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1-
 SHEET 1 OF 2

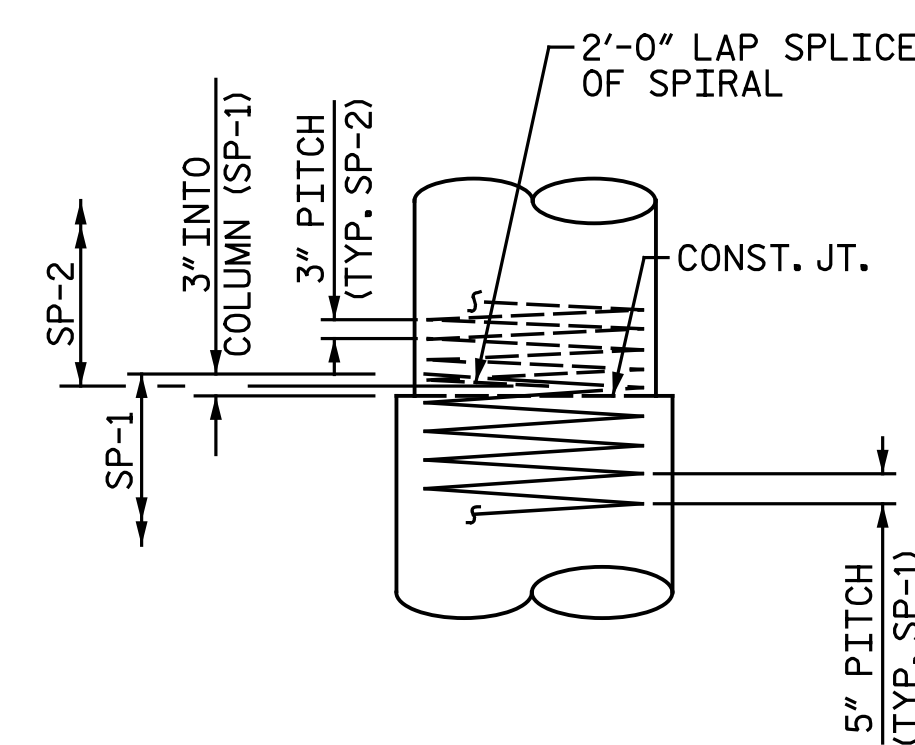


SECTION A-A

● #9 M1
 ○ #9 V1

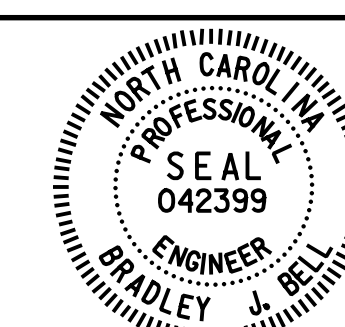


SECTION B-B



CONSTRUCTION JOINT DETAIL

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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE

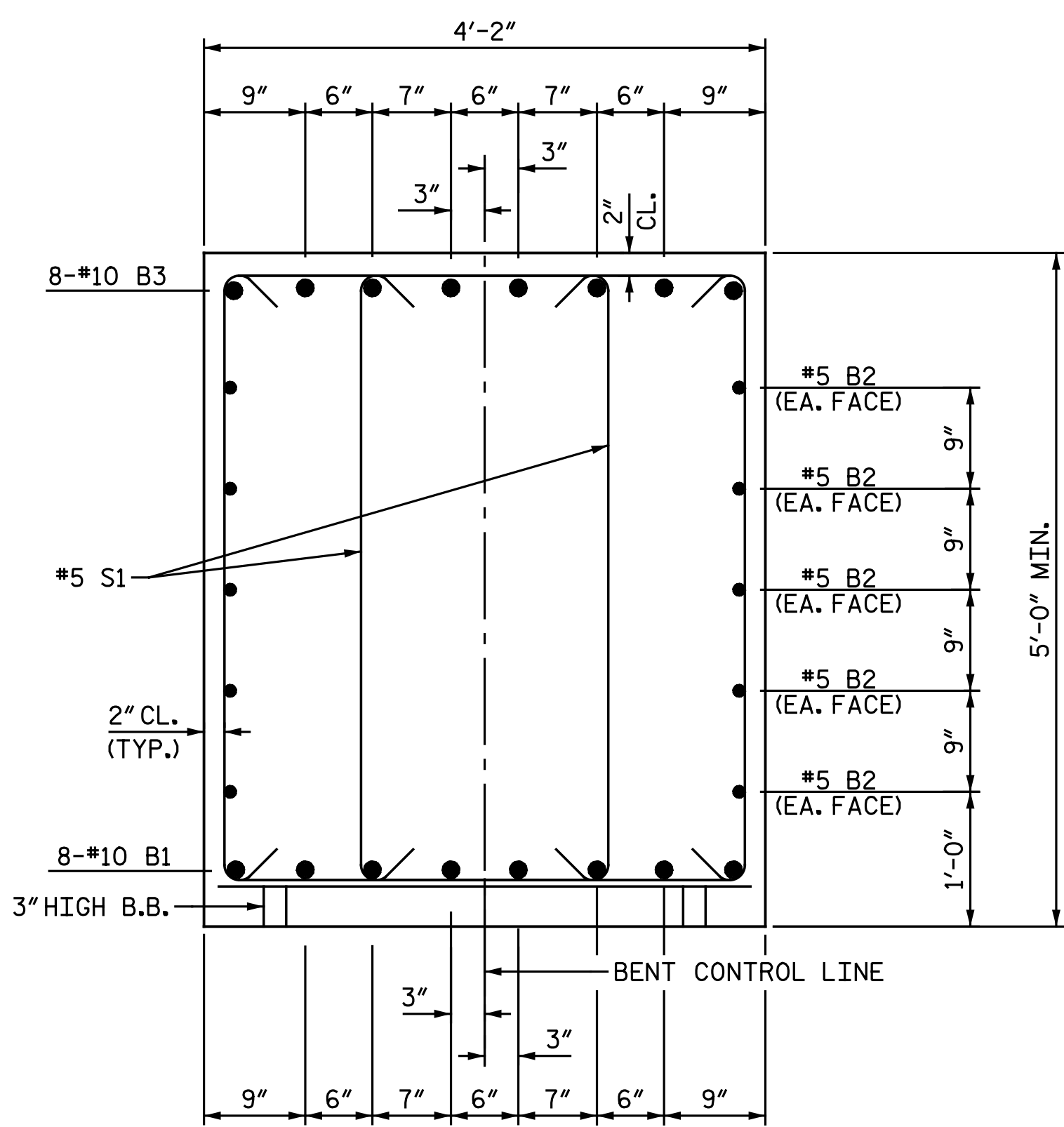
BENT 1 DETAILS

RIGHT LANES

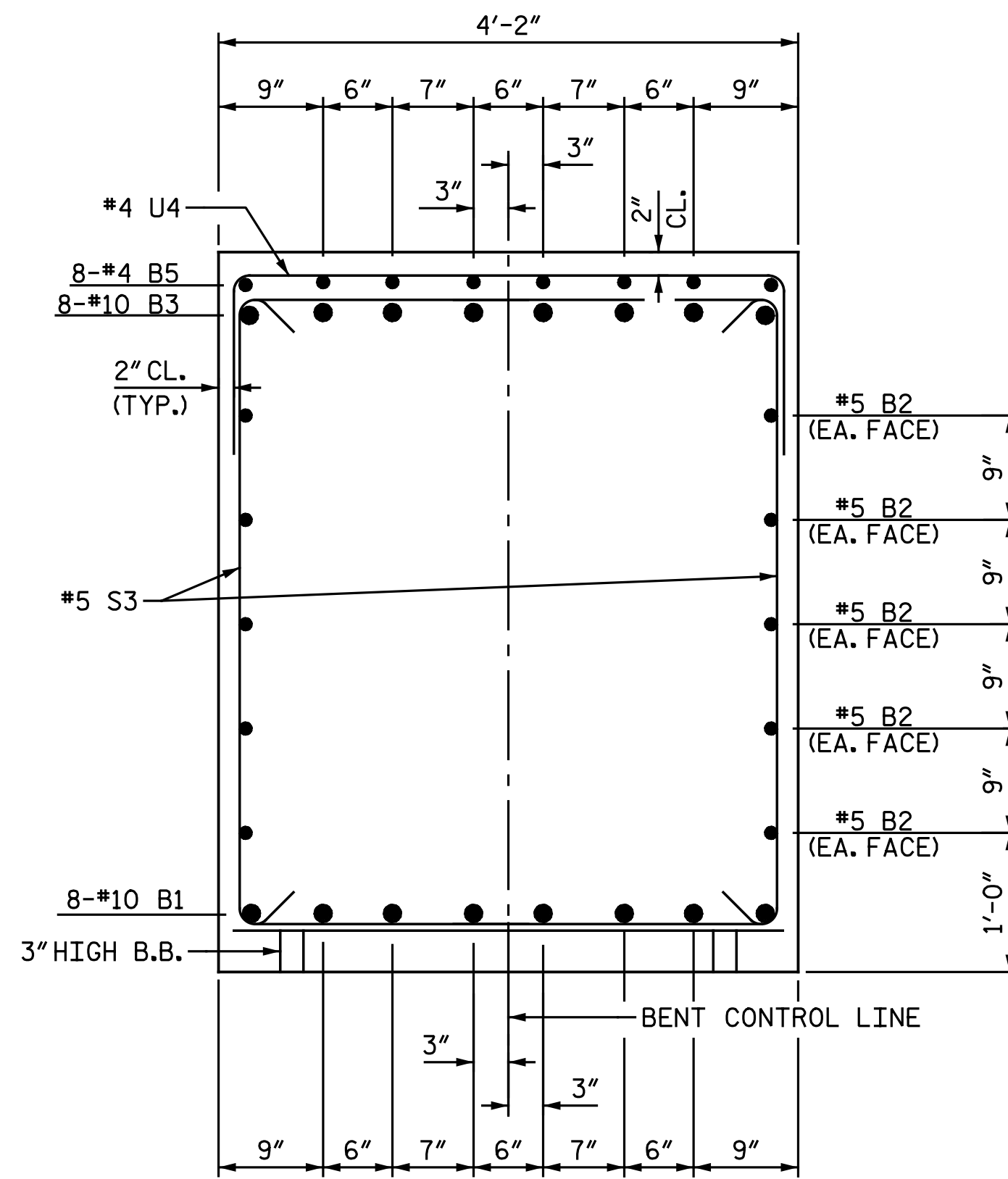
REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			TOTAL SHEETS
2			4			39

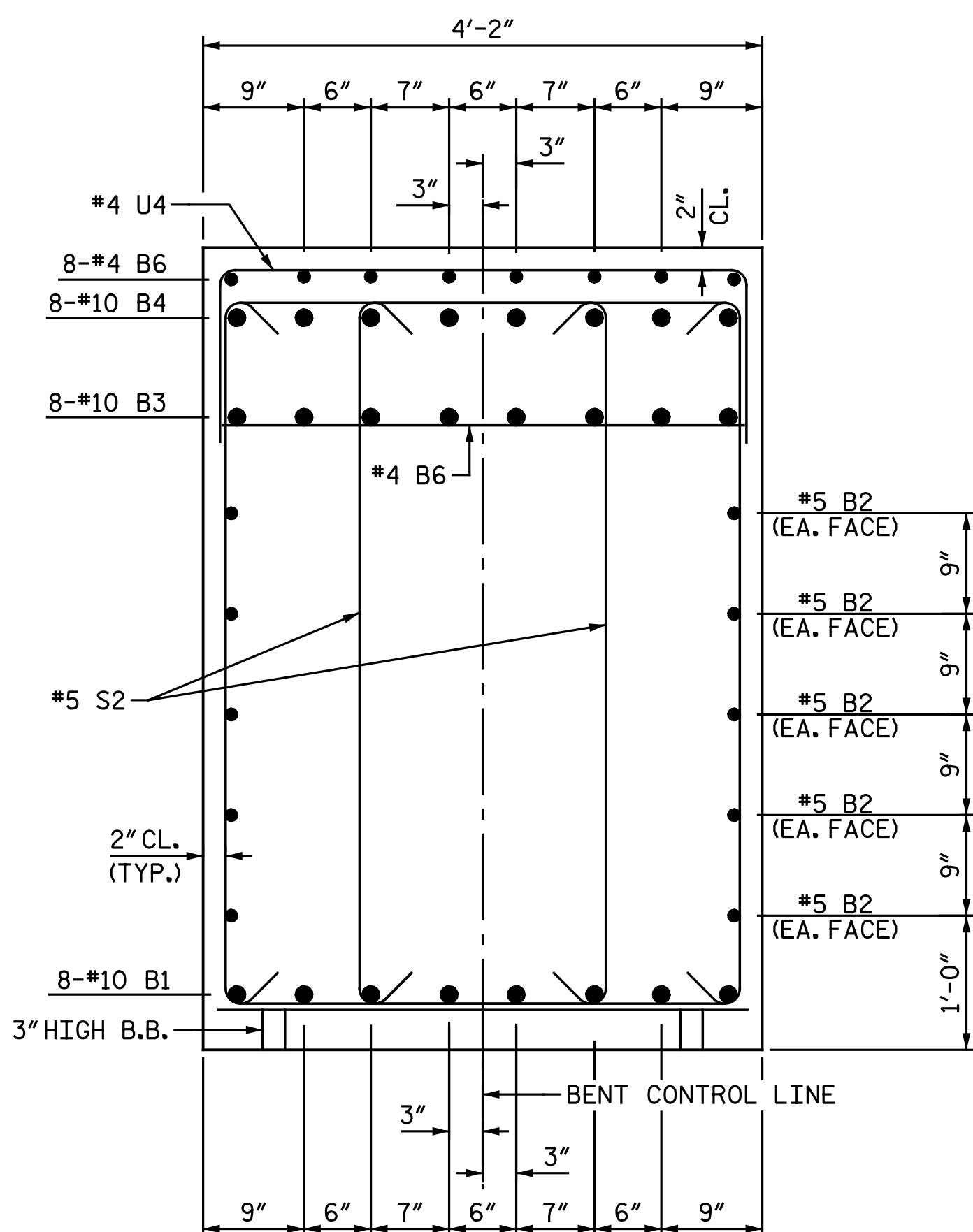
DRAWN BY : C. E. MAYHEW DATE : 8-8-16
 CHECKED BY : M. D. MAYHEW DATE : 9-2-16



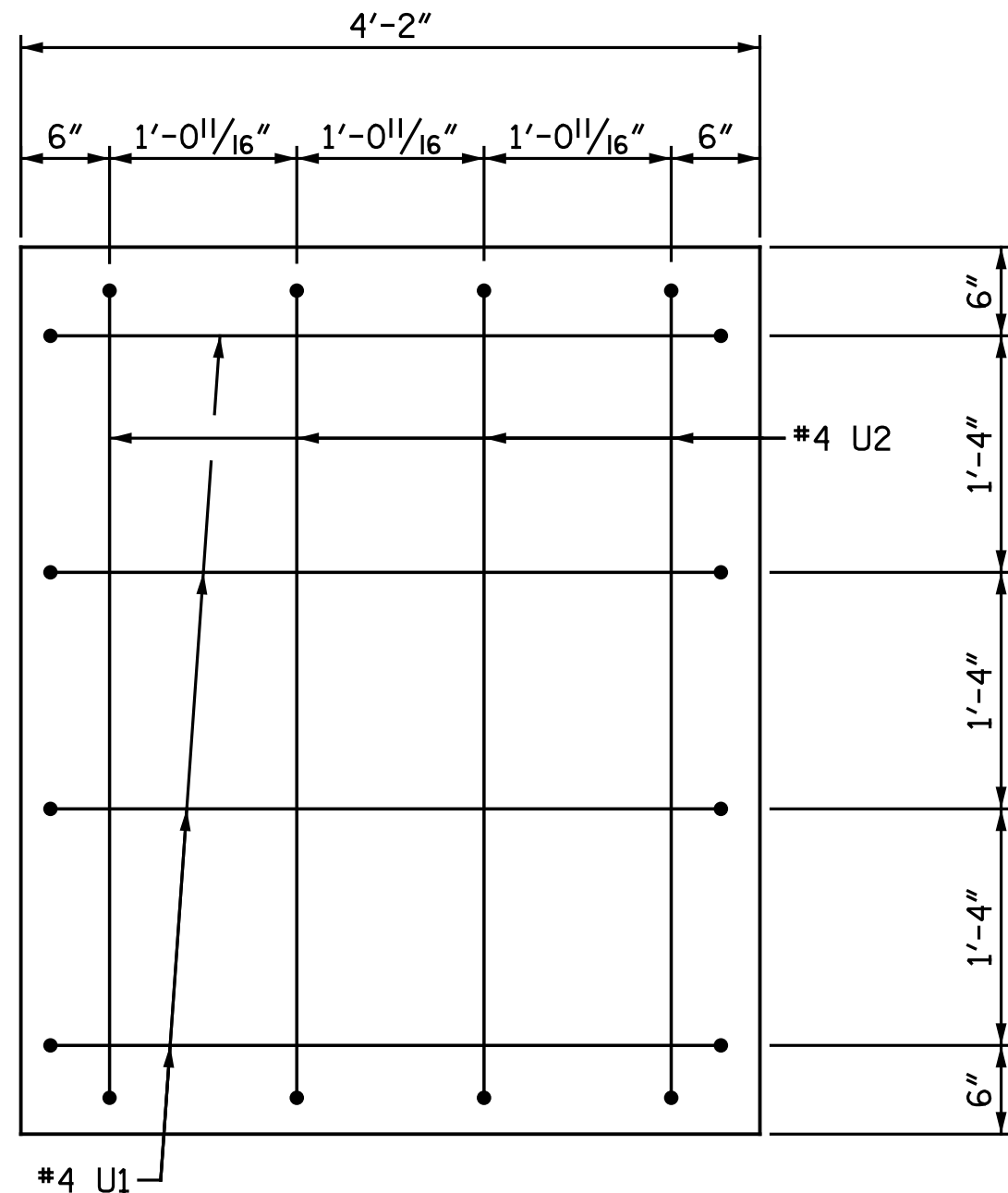
SECTION C-C
(INVERT ALTERNATE STIRRUP PAIRS)



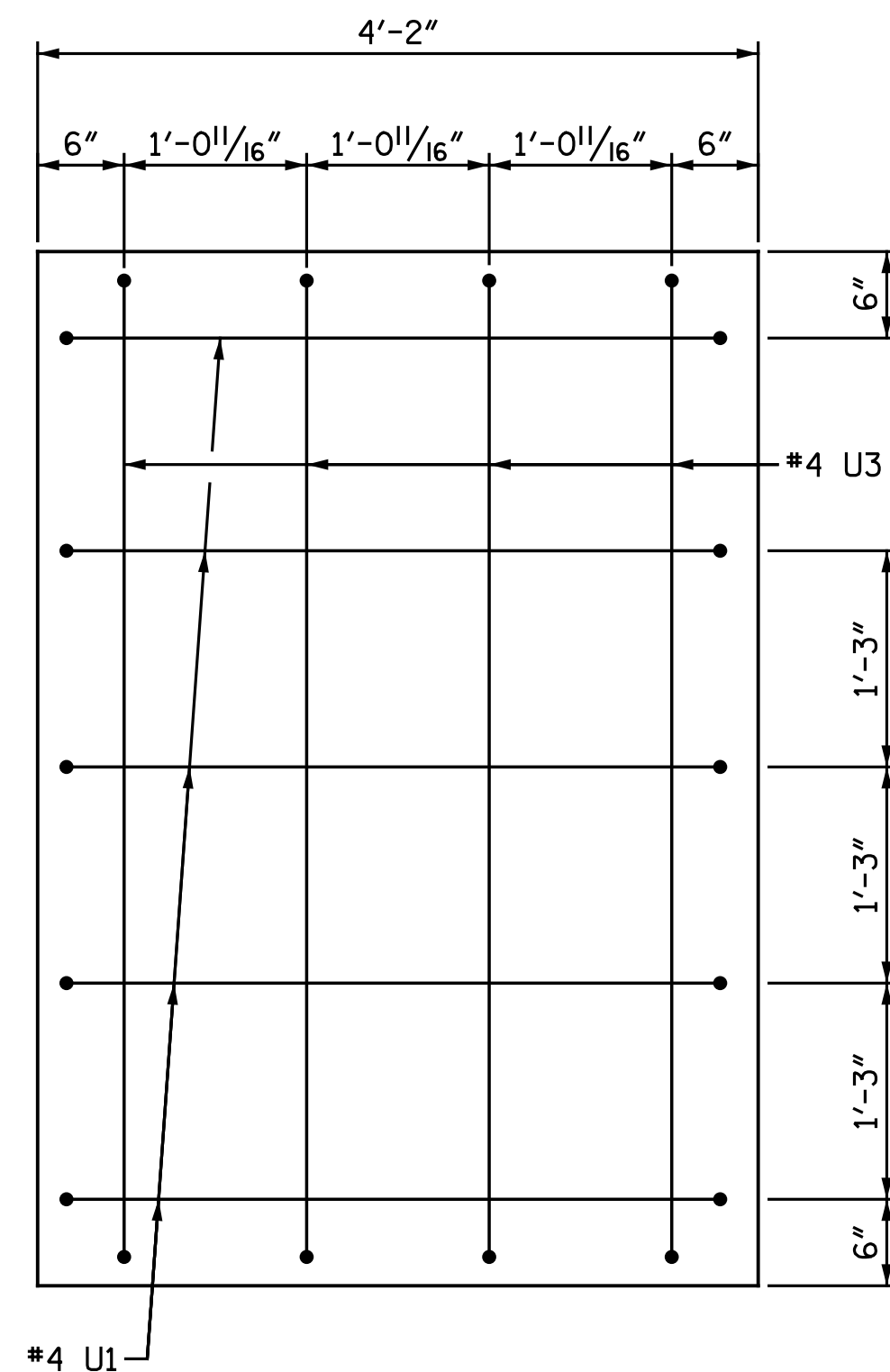
SECTION D-D
(INVERT ALTERNATE STIRRUPS)



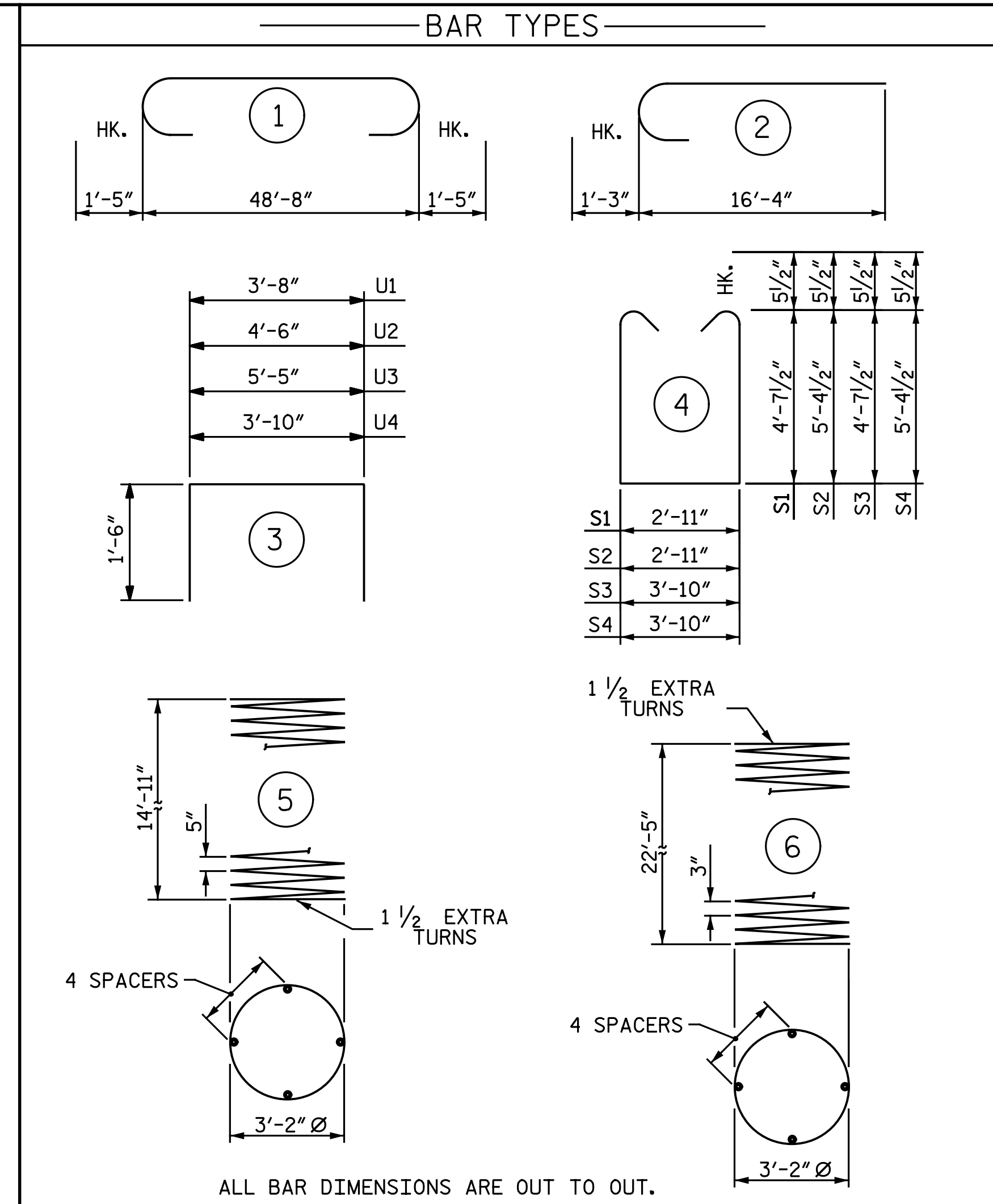
SECTION E-E
(INVERT ALTERNATE STIRRUP PAIRS)



VIEW F-F
ONLY END STIRRUPS SHOWN FOR CLARITY.



VIEW G-G
ONLY END STIRRUPS SHOWN FOR CLARITY.



ALL BAR DIMENSIONS ARE OUT TO OUT.

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

BILL OF MATERIAL

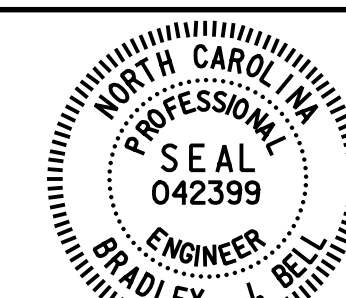
BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#10	STR.	48' - 8"	1,675
B2	10	#5	STR.	48' - 8"	508
B3	8	#10	1	51' - 6"	1,773
B4	8	#10	STR.	15' - 0"	516
B5	16	#4	STR.	11' - 0"	118
B6	12	#4	STR.	3' - 10"	31
M1	11	#9	STR.	30' - 8"	1,147
S1	16	#5	4	13' - 1"	218
S2	16	#5	4	14' - 7"	243
S3	40	#5	4	14' - 0"	584
S4	14	#5	4	15' - 6"	226
U1	9	#4	3	6' - 8"	40
U2	4	#4	3	7' - 6"	20
U3	4	#4	3	8' - 5"	22
U4	52	#4	3	6' - 10"	237
V1	42	#9	2	17' - 7"	2,511
REINFORCING STEEL				LBS.	9,869
SP-1	3	*	5	540' - 9"	1,692
SP-2	3	**	6	600' - 1"	1,202
SPIRAL COLUMN REINFORCING STEEL				LBS.	2,894
CLASS A CONCRETE					
POUR 2 - COLUMNS				C.Y.	15.7
POUR 3 - CAP				C.Y.	41.0
TOTAL CLASS A CONCRETE				C.Y.	56.7
DRILLED PIER CONCRETE					
POUR 1 - DRILLED PIERS				C.Y.	32.0
4'-0" DIA. DRILLED PIERS IN SOIL				LIN. FT.	47
4'-0" DRILLED PIER NOT IN SOIL				LIN. FT.	22
SID INSPECTIONS				EACH	1
CSL TESTING				EACH	1
▲ CSL TUBES				LIN. FT.	292.6

▲ NO SEPARATE PAYMENT WILL BE MADE FOR CSL TUBES. CSL TUBES WILL BE INCLUDED IN THE UNIT BID PRICE FOR DRILLED PIERS.

PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1-
 SHEET 2 OF 2

DRAWN BY: C. E. MAYHEW DATE: 8-23-16
 CHECKED BY: A. H. SHARPE DATE: 9-2-16

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 CA1AF8EC3A3434
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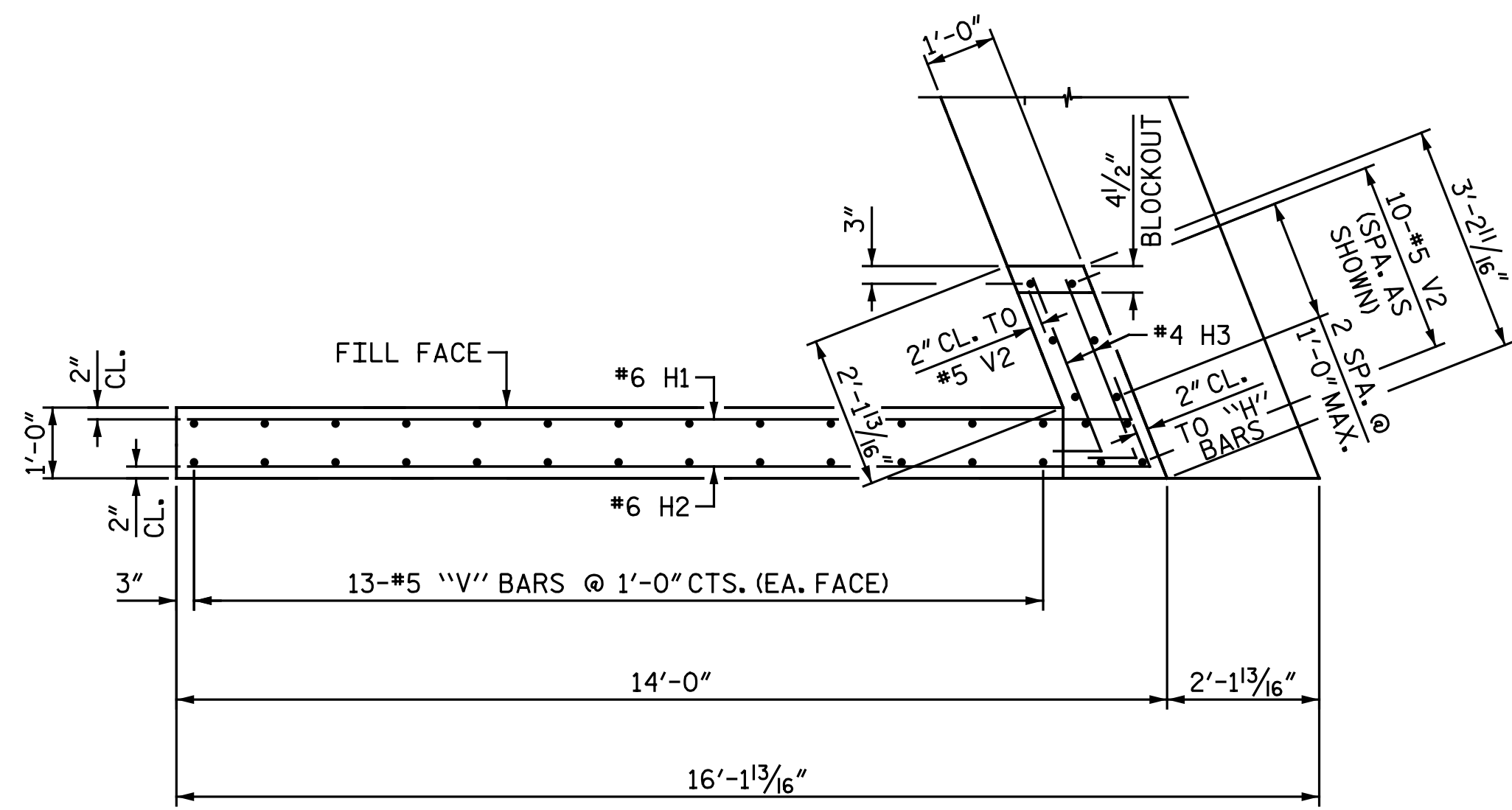
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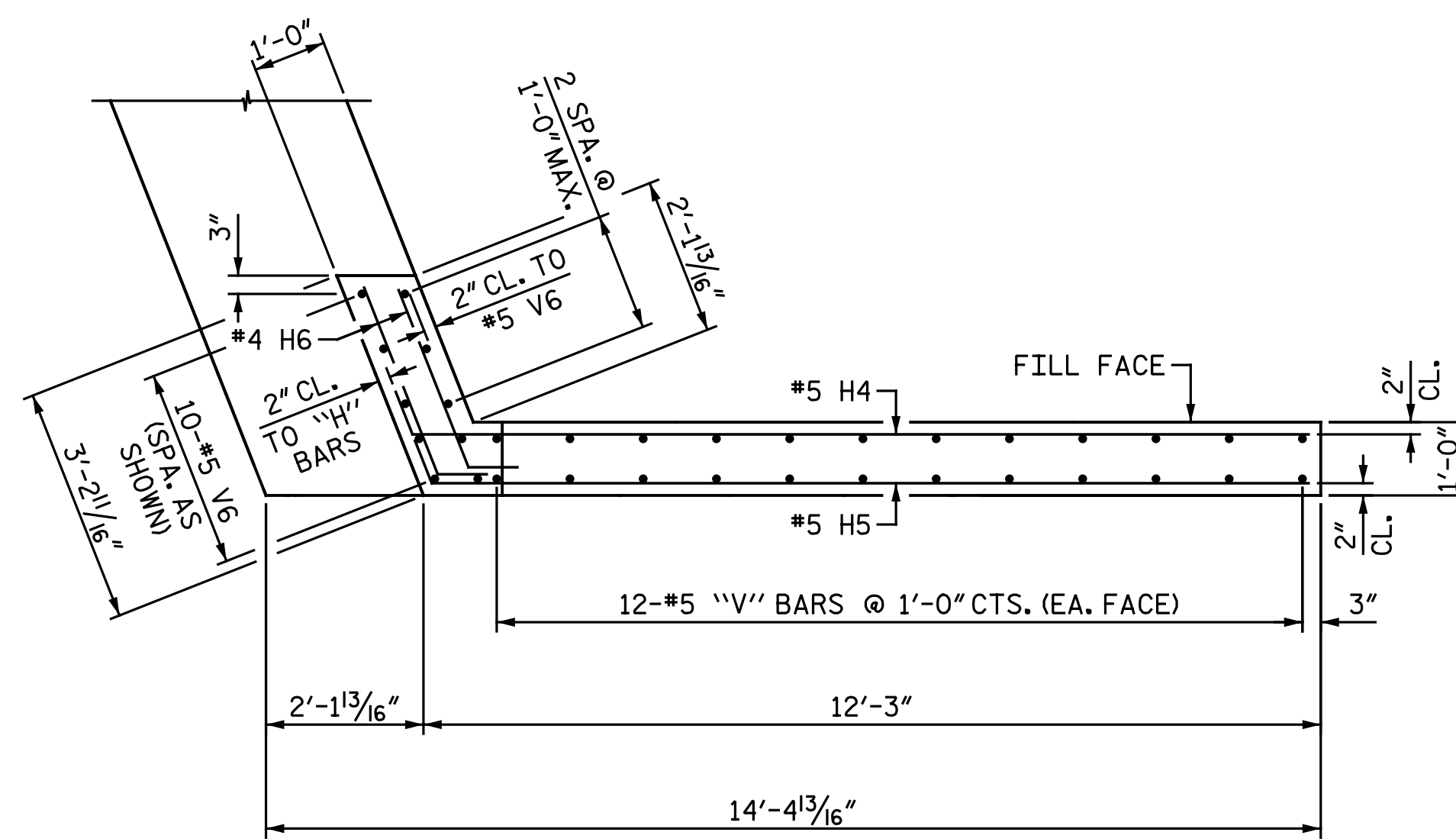
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT 1 DETAILS
 RIGHT LANES

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

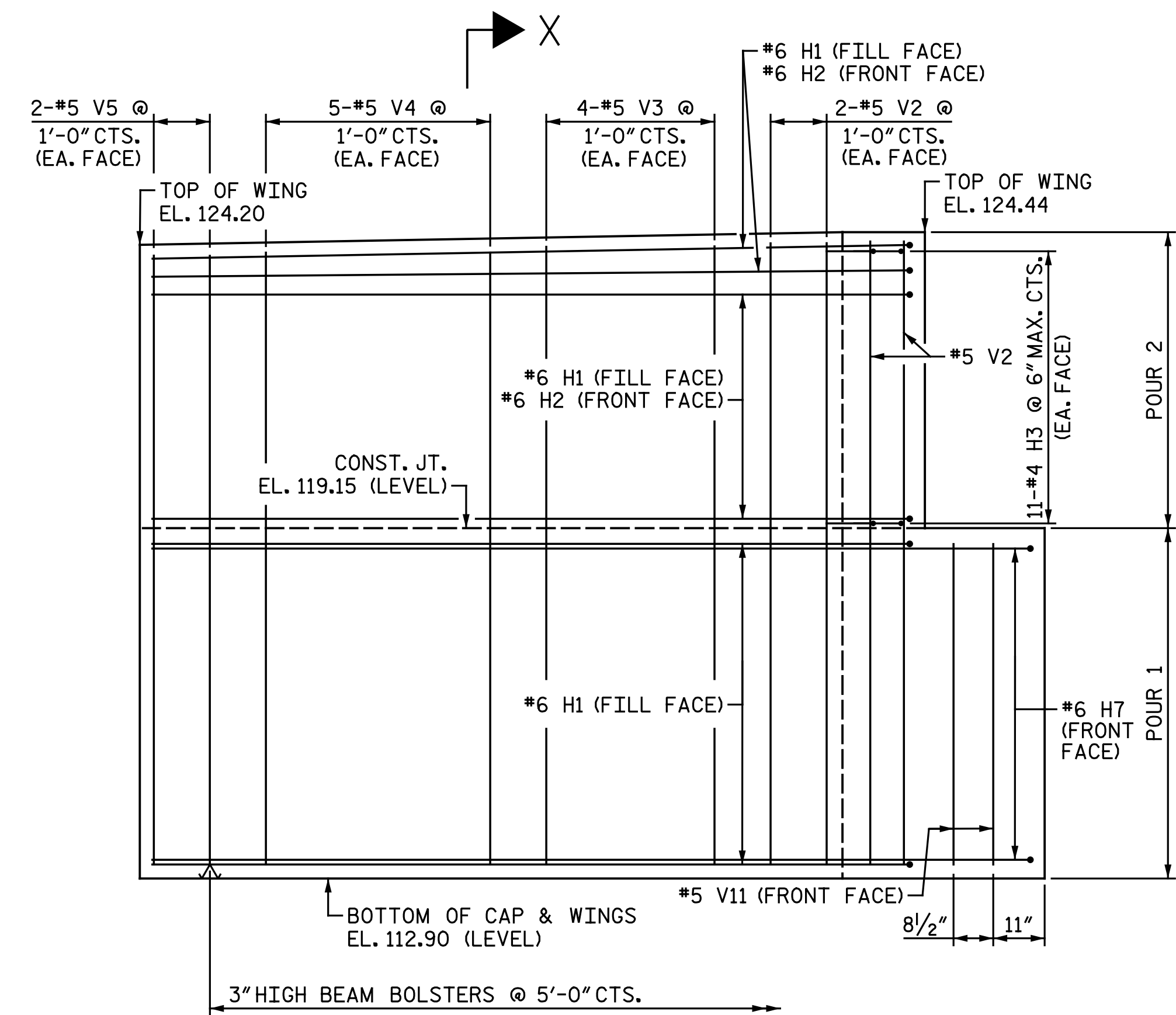
SHEET NO.
S2-31
 TOTAL SHEETS
39



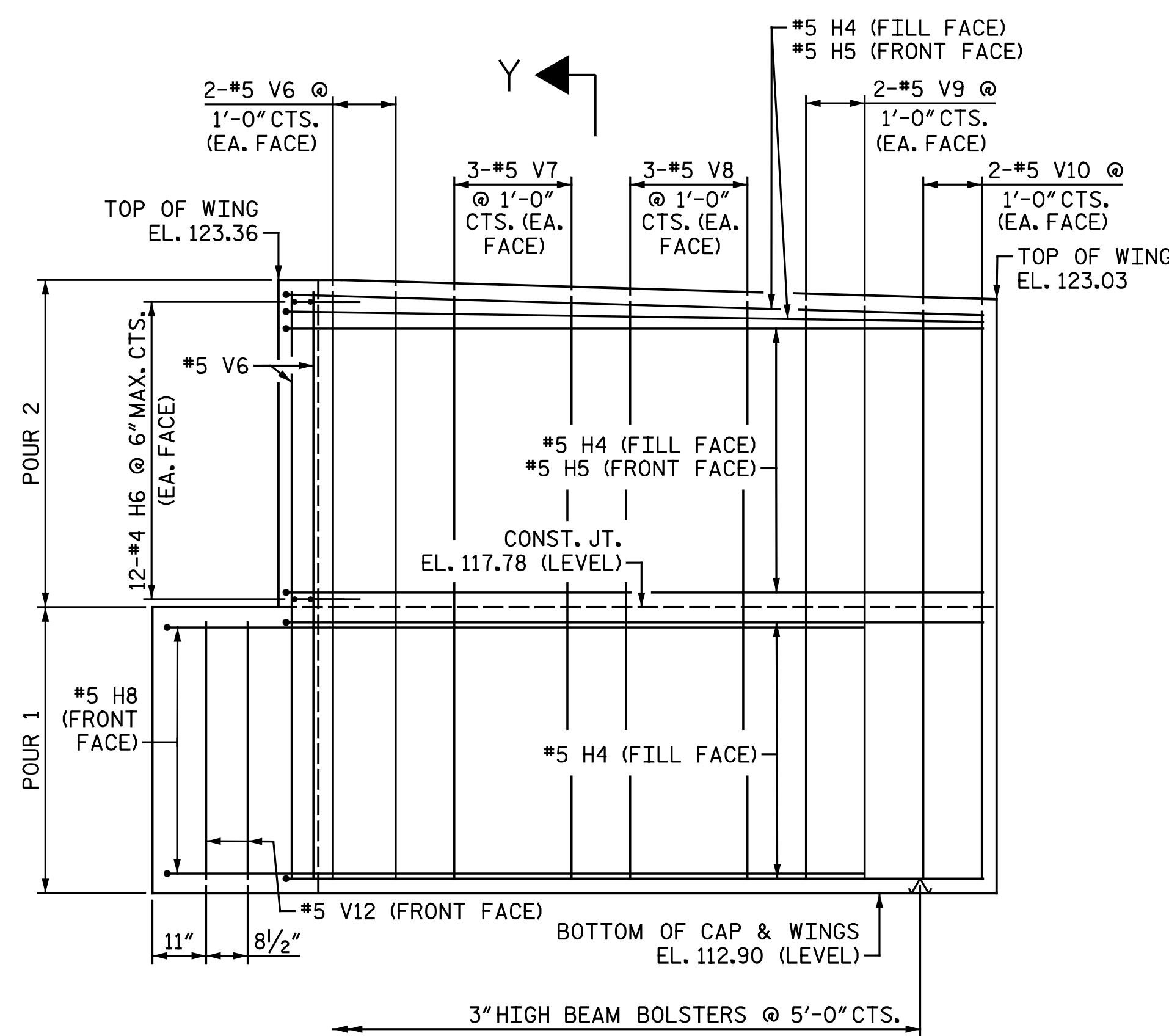
PLAN OF LEFT WING WALL (W3)



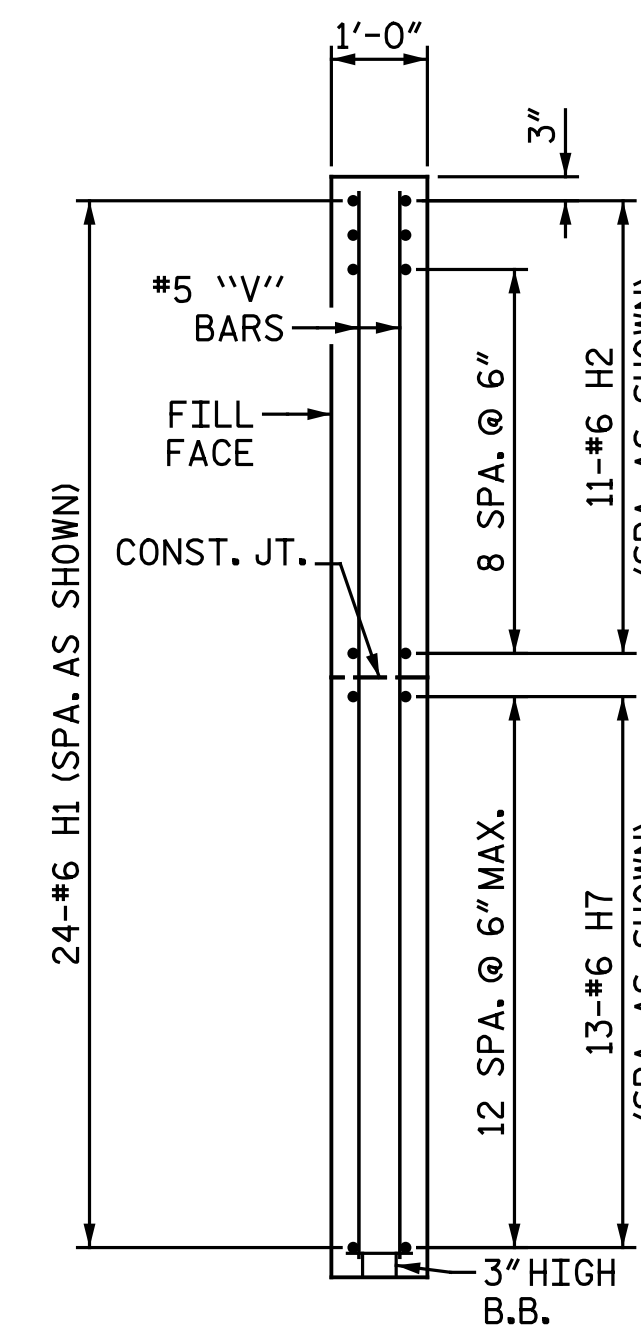
PLAN OF RIGHT WING WALL (W4)



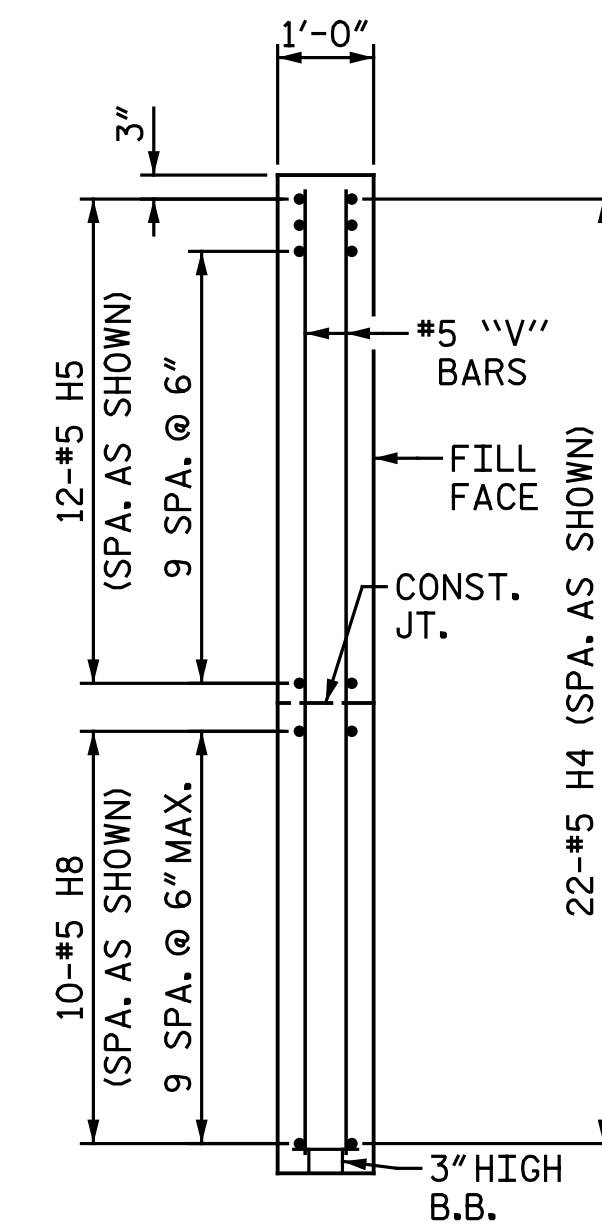
ELEVATION OF LEFT WING WALL (W3)



ELEVATION OF RIGHT WING WALL (W4)



SECTION X-X

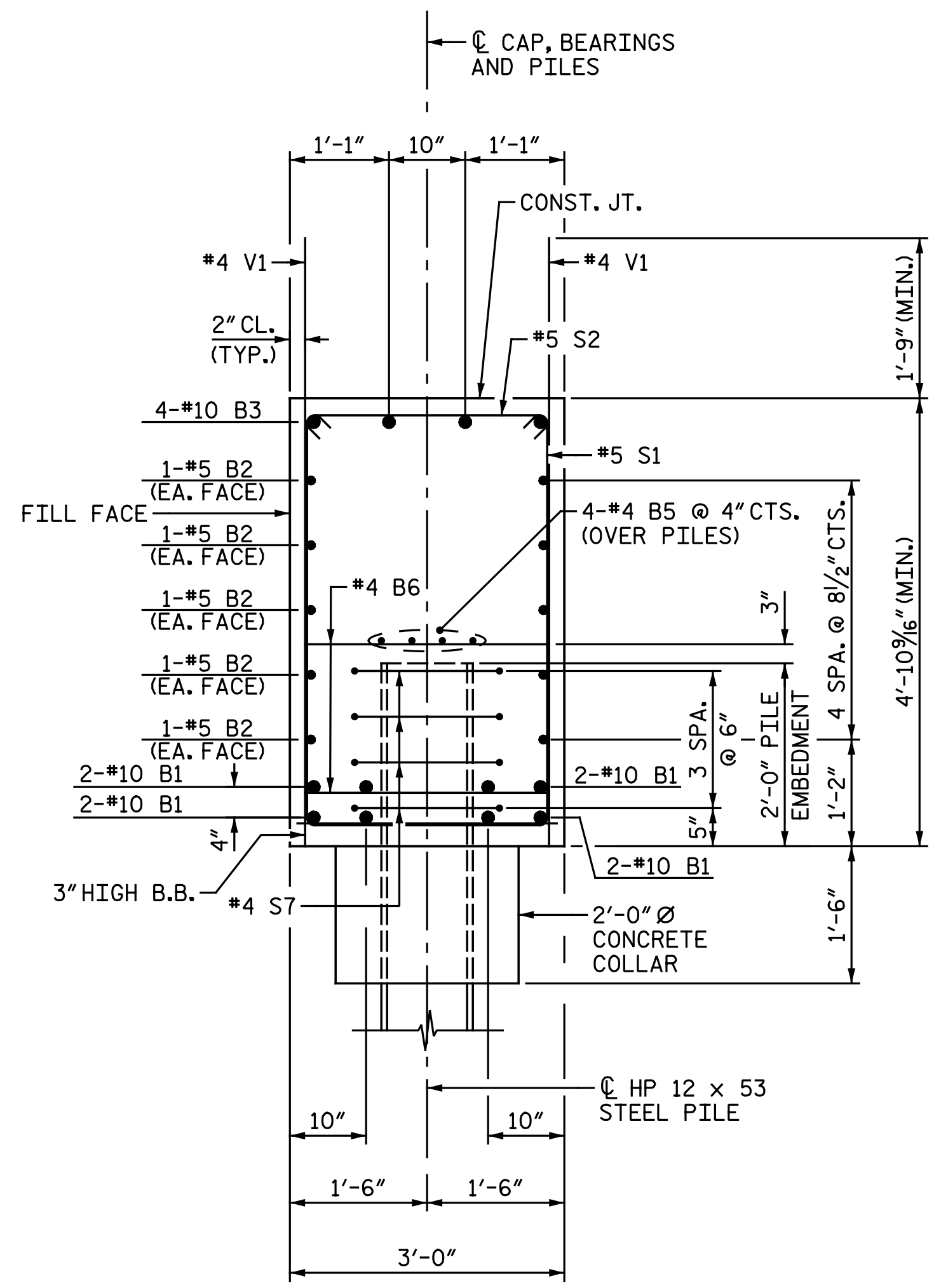


SECTION Y-Y

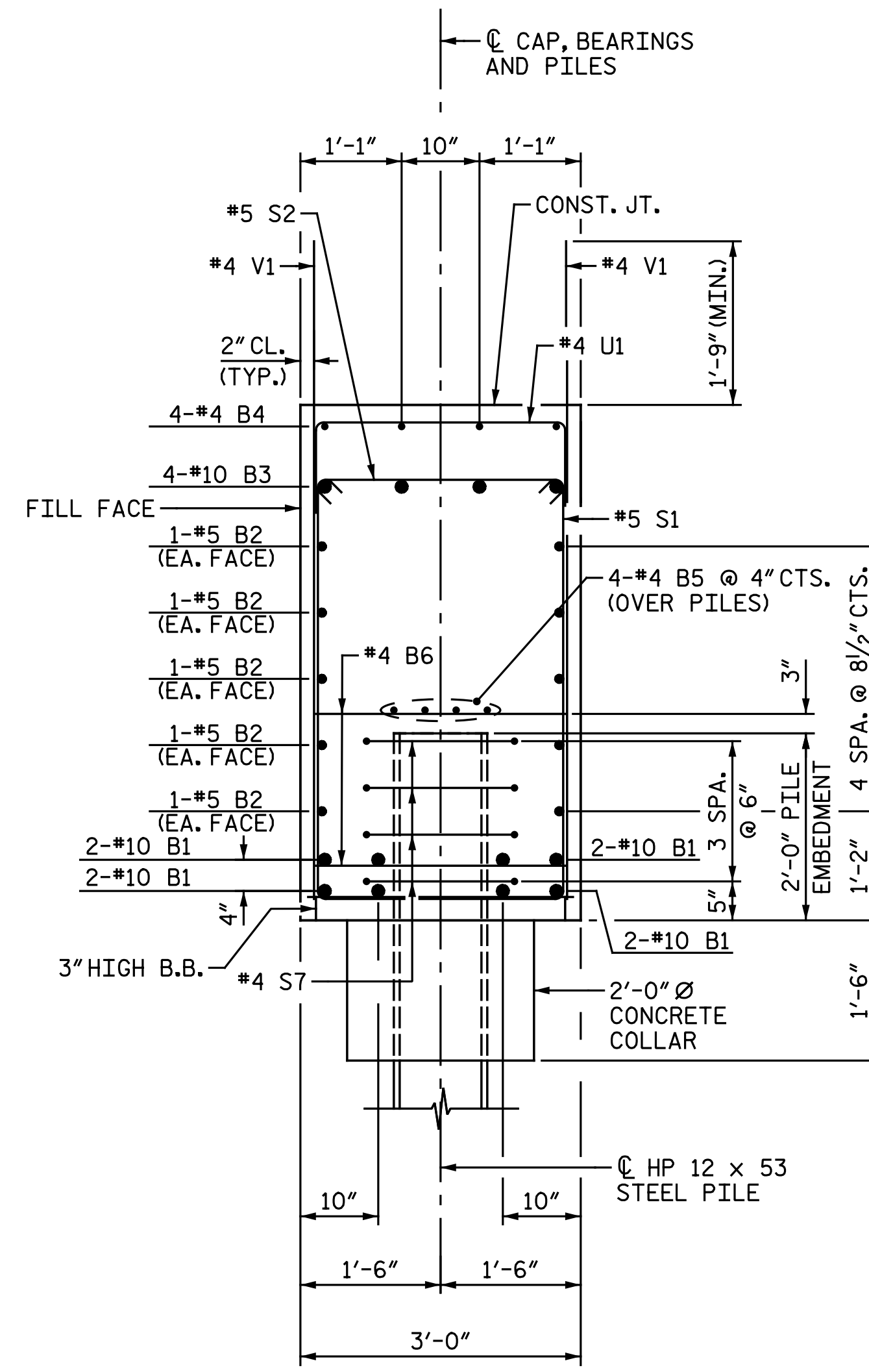
PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1-
 SHEET 2 OF 2

DRAWN BY: M. D. MAYHEW DATE: 8-16-16
 CHECKED BY: A. H. SHARPE DATE: 8-19-16

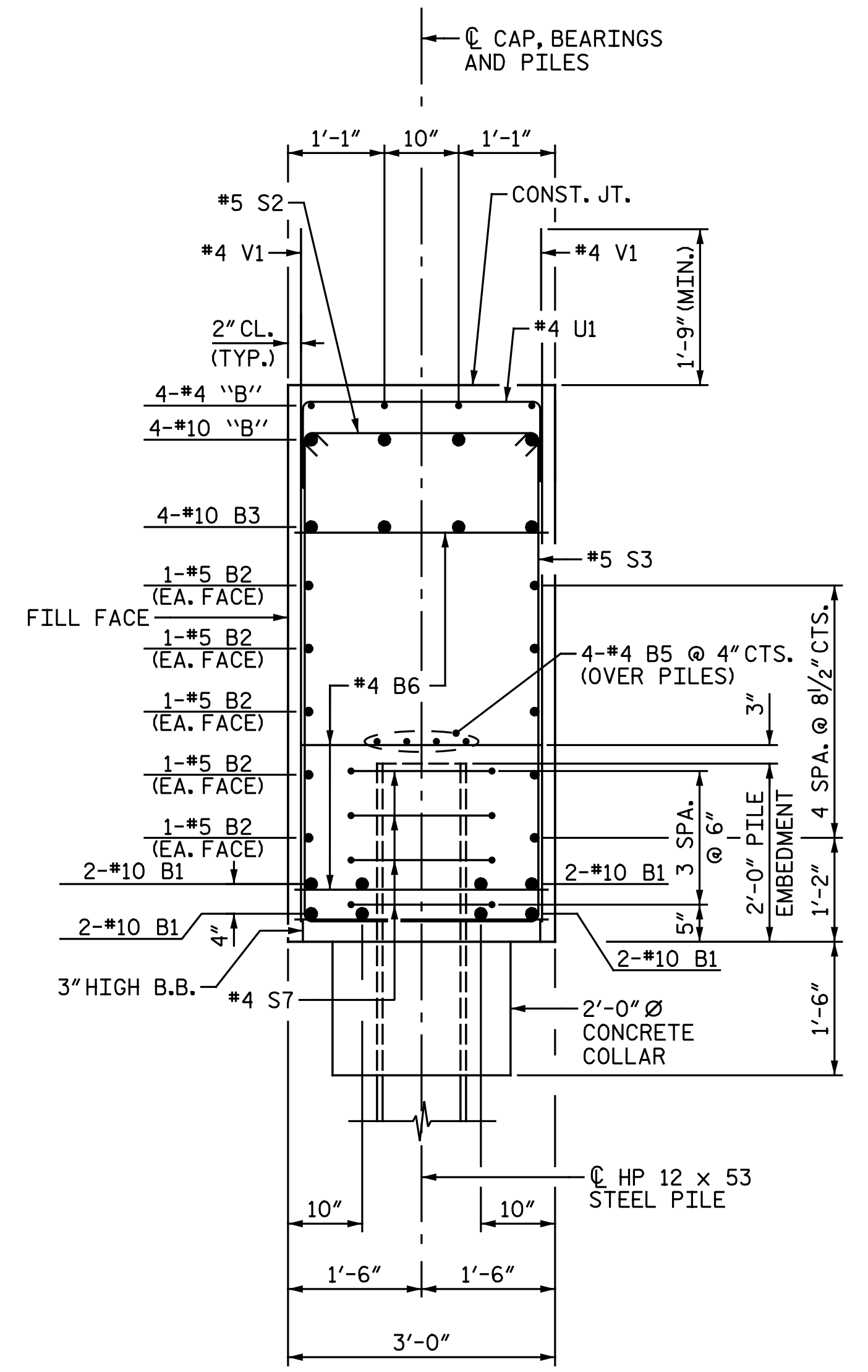
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	REVISIONS				
	NO.	BY:	DATE:	NO.	BY:
1			3		
2			4		
Michael Baker International Michael Baker Engineering 8000 Regency Parkway, Suite 600 Cary, North Carolina 27518 NC License No.: F-1084				SHEET NO. S2-33 TOTAL SHEETS 39	



SECTION A-A



SECTION B-B



SECTION C-C

PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1-
 SHEET 1 OF 2

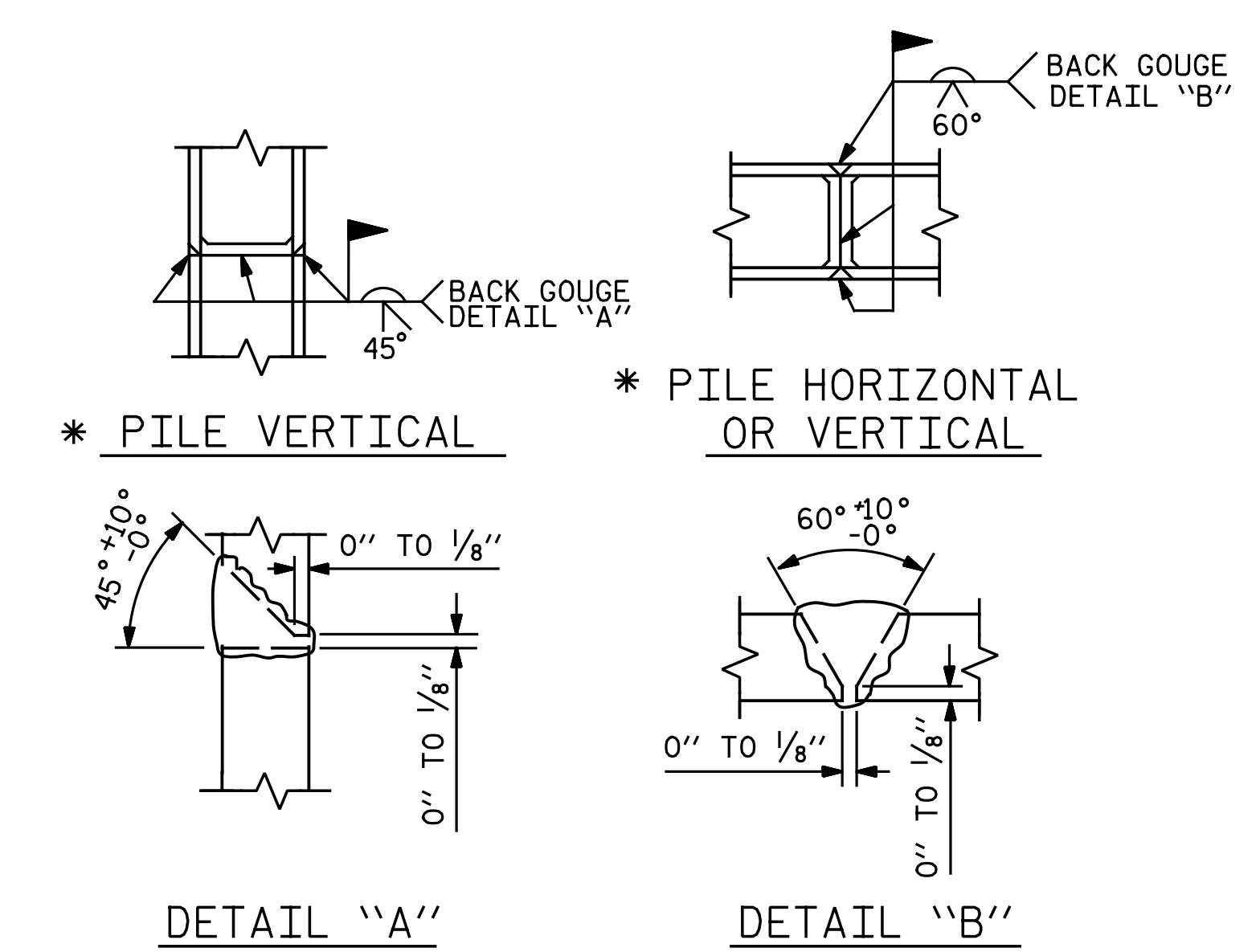
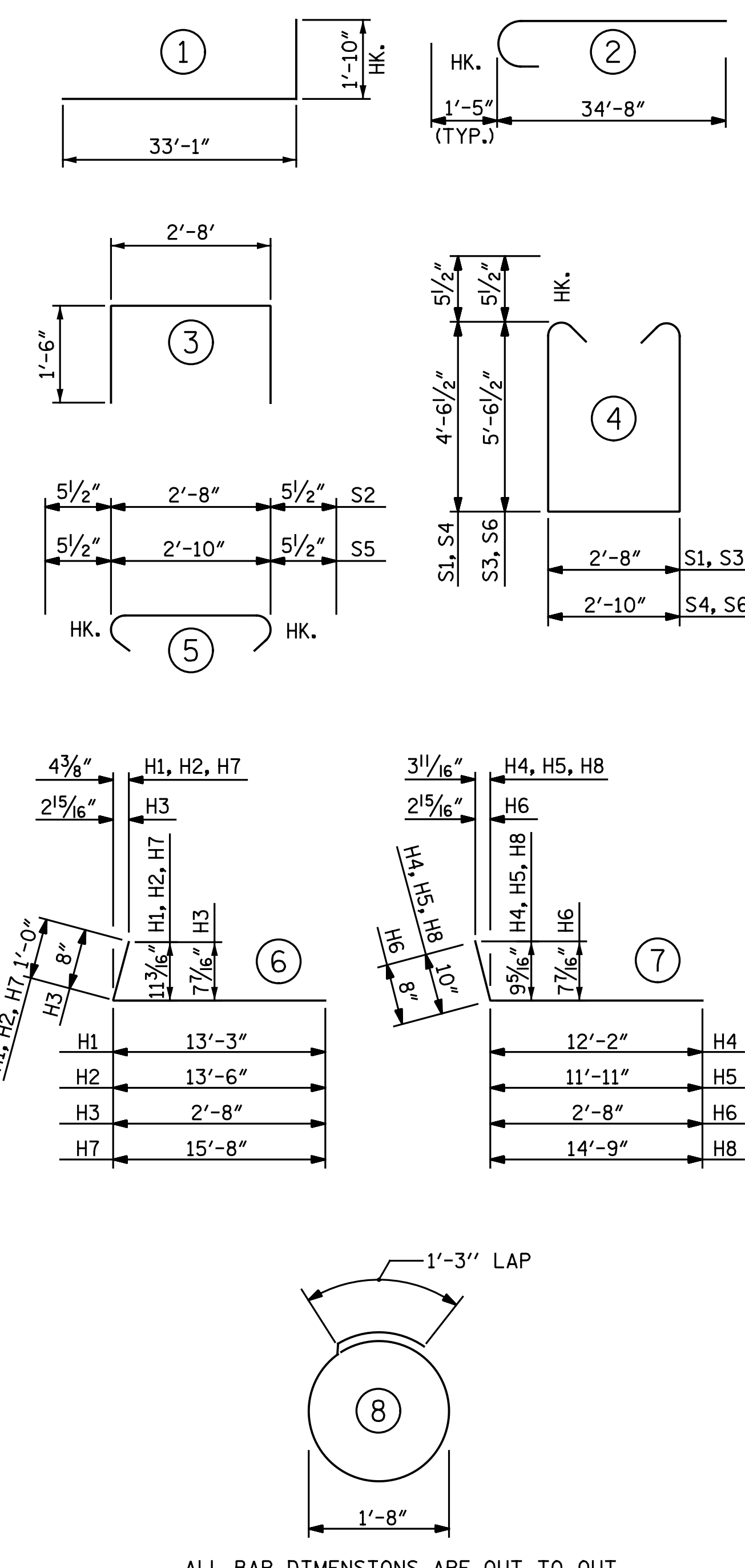
DRAWN BY : M. D. MAYHEW DATE : 8-17-16
 CHECKED BY : A. H. SHARPE DATE : 8-19-16

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		REVISIONS		TOTAL SHEETS 39
		Michael Baker INTERNATIONAL	Michael Baker Engineering 8000 Regency Parkway, Suite 600 Cary, North Carolina 27518 NC License No.: F-1084	NO. BY: DATE: NO. BY: DATE:

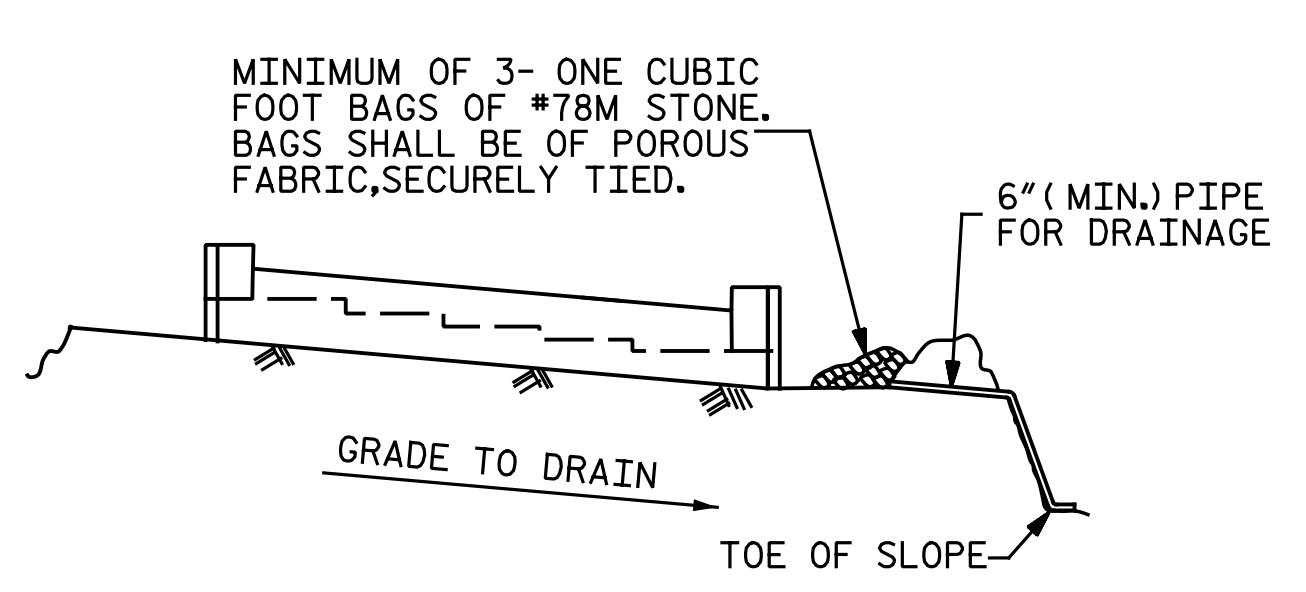
BILL OF MATERIAL

END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	16	#10	1	34' - 11"	2,404
B2	10	#5	STR.	58' - 1"	606
B3	8	#10	2	36' - 1"	1,242
B4	8	#4	STR.	10' - 11"	58
B5	8	#4	STR.	30' - 4"	162
B6	35	#4	STR.	2' - 8"	62
B7	1	#10	STR.	18' - 6"	80
B8	1	#10	STR.	18' - 10"	81
B9	1	#10	STR.	19' - 1"	82
B10	1	#10	STR.	19' - 5"	84
B11	1	#4	STR.	7' - 4"	5
B12	1	#4	STR.	7' - 8"	5
B13	1	#4	STR.	8' - 0"	5
B14	1	#4	STR.	8' - 3"	6
H1	24	#6	6	14' - 3"	514
H2	11	#6	6	14' - 6"	240
H3	22	#4	6	3' - 4"	49
H4	22	#5	7	13' - 0"	298
H5	12	#5	7	12' - 9"	160
H6	24	#4	7	3' - 4"	53
H7	13	#6	6	16' - 8"	325
H8	10	#5	7	14' - 9"	154
S1	37	#5	4	12' - 8"	489
S2	55	#5	5	3' - 7"	206
S3	18	#5	4	14' - 8"	275
S4	1	#5	4	12' - 10"	13
S5	2	#5	5	3' - 9"	8
S6	1	#5	4	14' - 10"	15
S7	32	#4	8	6' - 6"	139
U1	21	#4	3	5' - 8"	79
V1	92	#4	STR.	8' - 4"	512
V2	14	#5	STR.	11' - 1"	162
V3	8	#5	STR.	11' - 0"	92
V4	10	#5	STR.	10' - 11"	114
V5	4	#5	STR.	10' - 10"	45
V6	14	#5	STR.	10' - 0"	146
V7	6	#5	STR.	9' - 11"	62
V8	6	#5	STR.	9' - 10"	62
V9	4	#5	STR.	9' - 9"	41
V10	4	#5	STR.	9' - 8"	40
V11	2	#5	STR.	5' - 10"	12
V12	2	#5	STR.	4' - 5"	9
REINFORCING STEEL				LBS.	9,196
CLASS A CONCRETE					
POUR 1 - CAP, LOWER PART OF WINGS & COLLARS				C.Y.	42.0
POUR 2 - UPPER PART OF WINGS				C.Y.	6.1
TOTAL				C.Y.	48.1
HP 12 x 53 STEEL PILES NO. 8				L.F.	200
PILE DRIVING EQUIPMENT SETUP FOR HP 12 x 53 STEEL PILES				EA.	8

BAR TYPES



PILE SPLICE DETAILS
* POSITION OF PILE DURING WELDING.



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

DRAWN BY : M. D. MAYHEW DATE : 8-17-16
CHECKED BY : A. H. SHARPE DATE : 8-19-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Professional Engineer Seal for Bradley J. Bell, No. 042399, State of North Carolina.

DocuSigned by: Bradley J. Bell, 2/15/2017

Michael Baker International

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
INTEGRAL END BENT 2
DETAILS
RIGHT LANES

REVISIONS

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

SHEET NO. S2-35
TOTAL SHEETS 39

PROJECT NO. U-3330
NASH COUNTY
STATION: 18+22.61 -Y1-
SHEET 2 OF 2

GENERAL NOTES

STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT.

MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS.

FOR BERM WIDTH, SEE GENERAL DRAWING.

SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET.

CONCRETE SHALL BE CLASS "B".

THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED.

WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE.

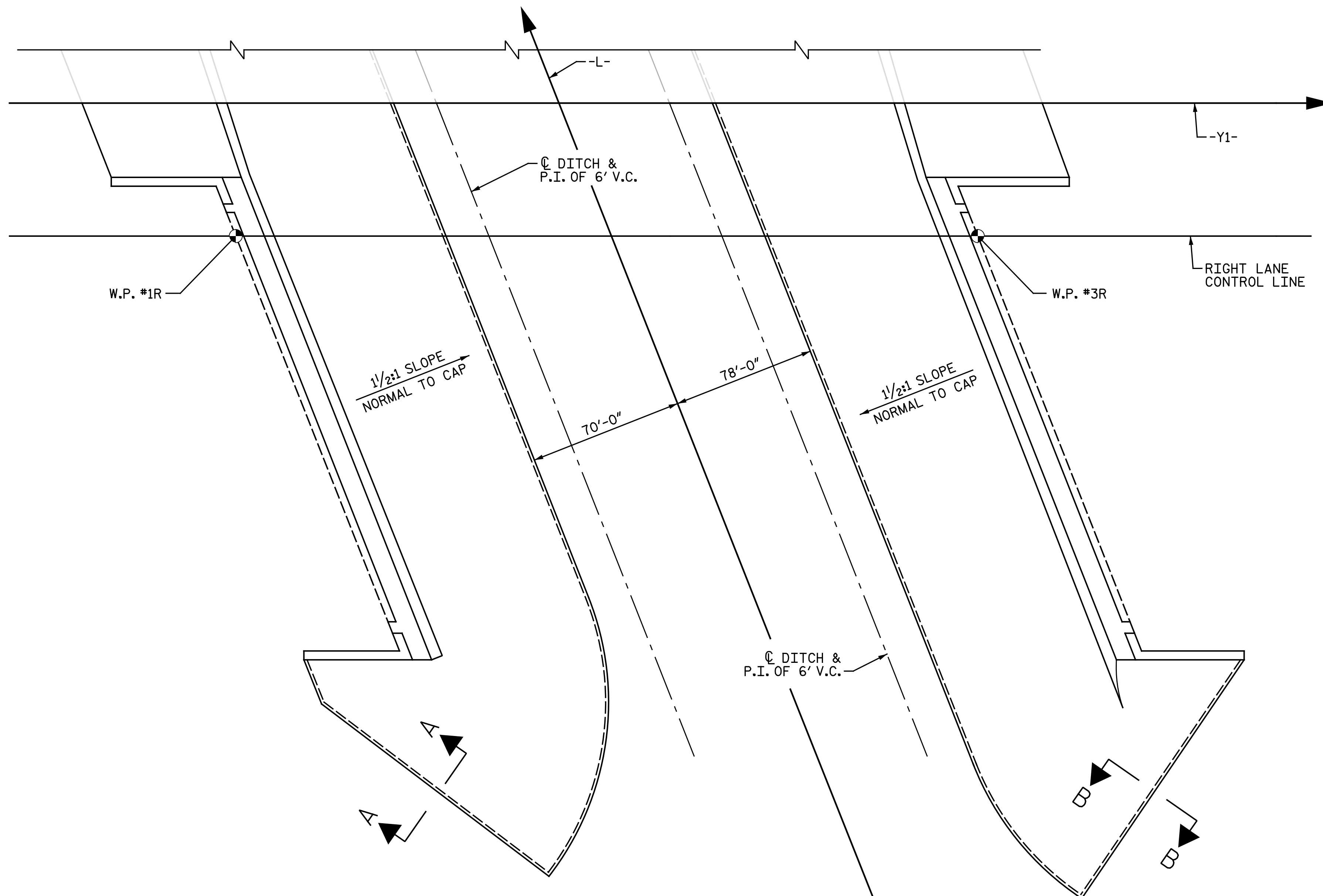
SLOPE PROTECTION SHALL BE POURED IN 5' STRIPS AS SHOWN IN THE "POURING DETAIL" WITH 2'-0" LONG #4 BARS PLACED ALONG THE SLOPE BETWEEN STRIPS AT 1'-6" MAXIMUM SPACING.

SLOPE PROTECTION MAY BE POURED IN ALTERNATE 4' AND 5' STRIPS AS SHOWN IN THE "OPTIONAL POURING DETAIL" WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6".

THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

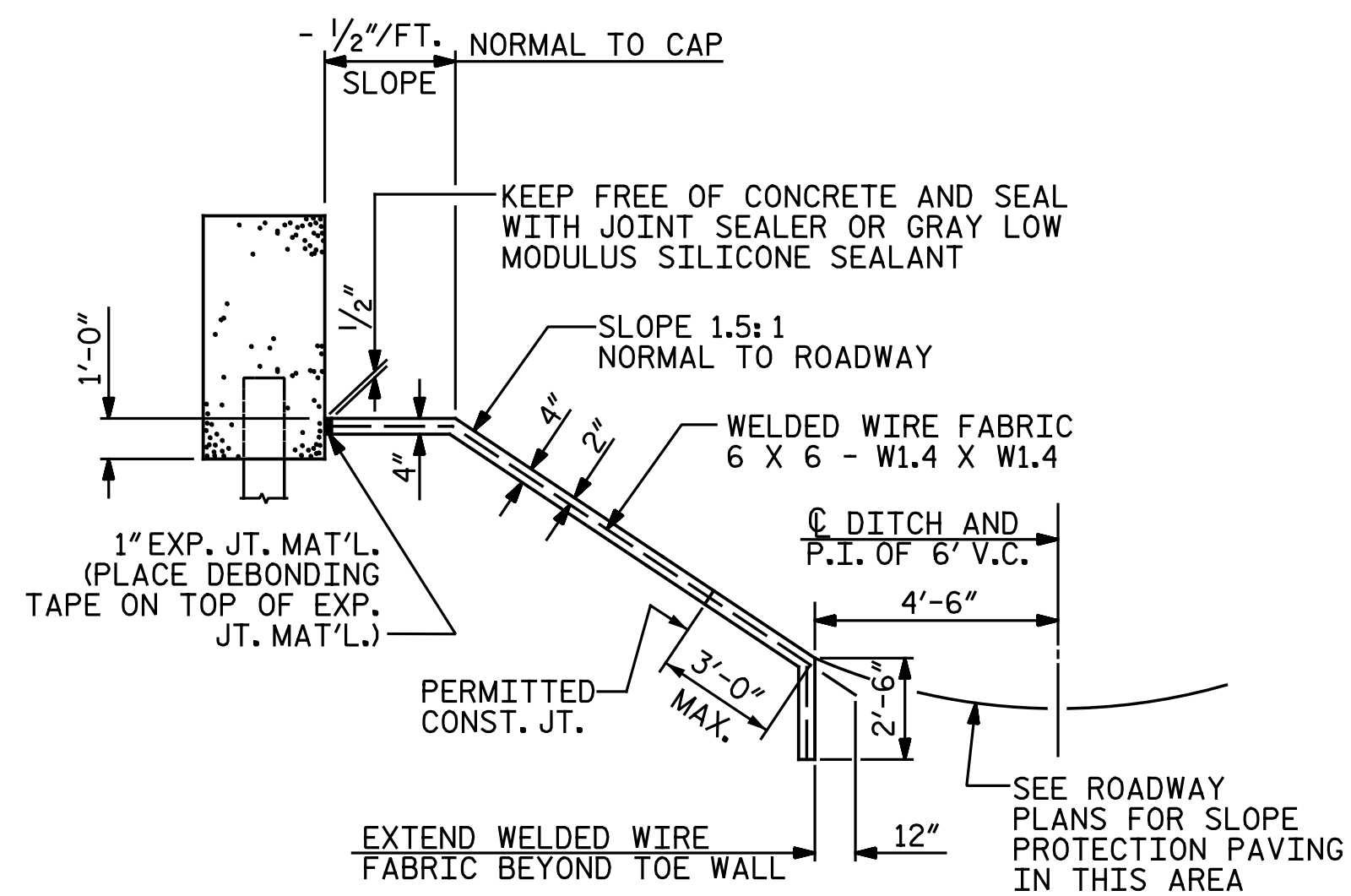
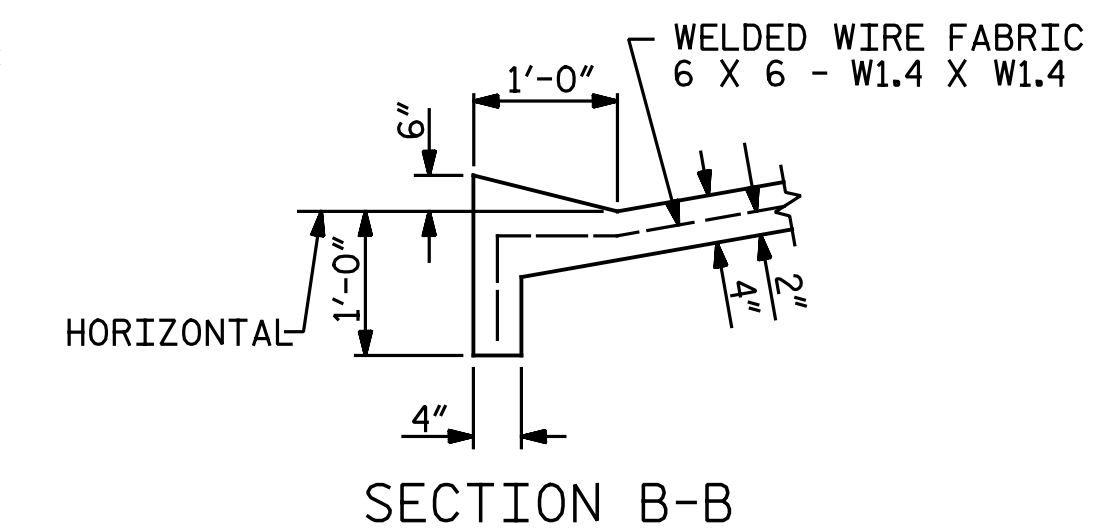
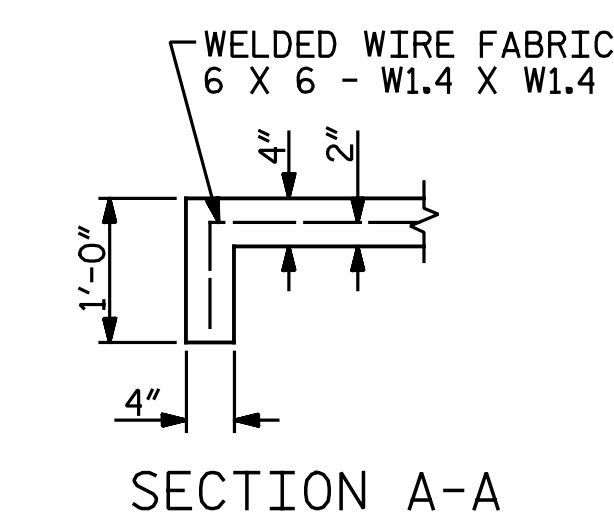
BRIDGE @ STA. 18+22.61 -Y1- (RIGHT LANE)	4 INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	276	552
END BENT 2	293	586

* QUANTITY SHOWN IS BASED ON 5' POURS.

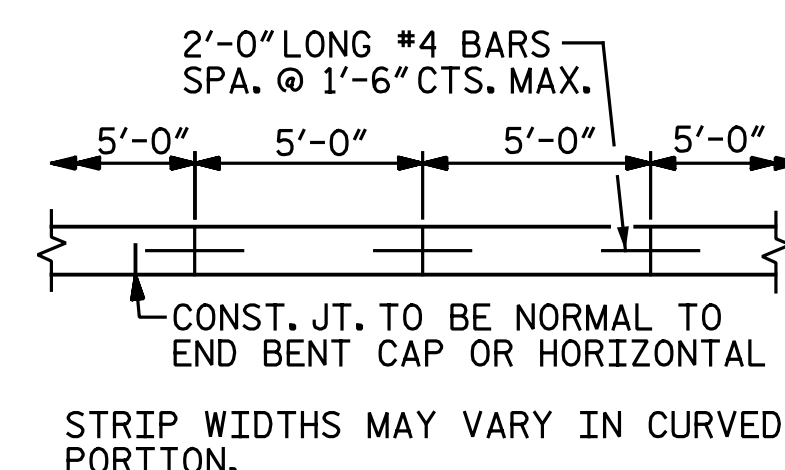


PLAN

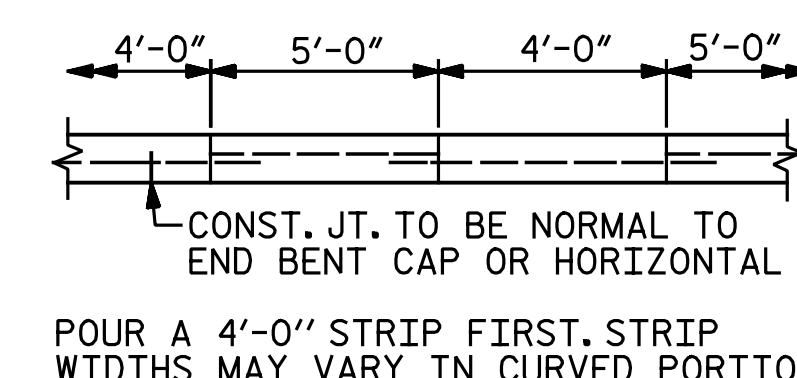
FOR BERM WIDTHS AND ELEVATIONS
SEE GENERAL DRAWING AND "SLOPE
PROTECTION DETAILS" SHEET 2 OF 2.



SECTION ALONG C SURVEY WHEN FILL CATCHES IN DITCH



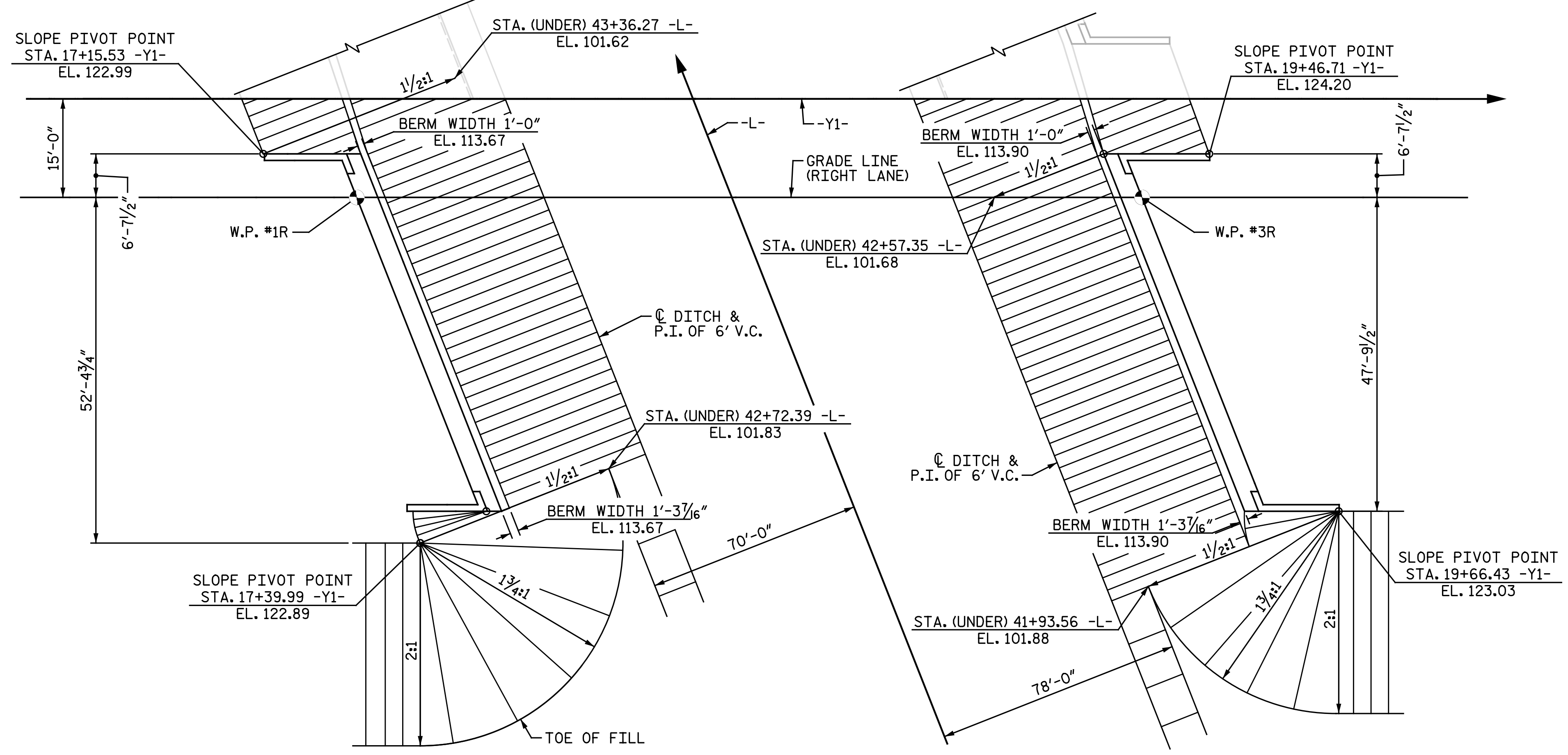
POURING DETAIL



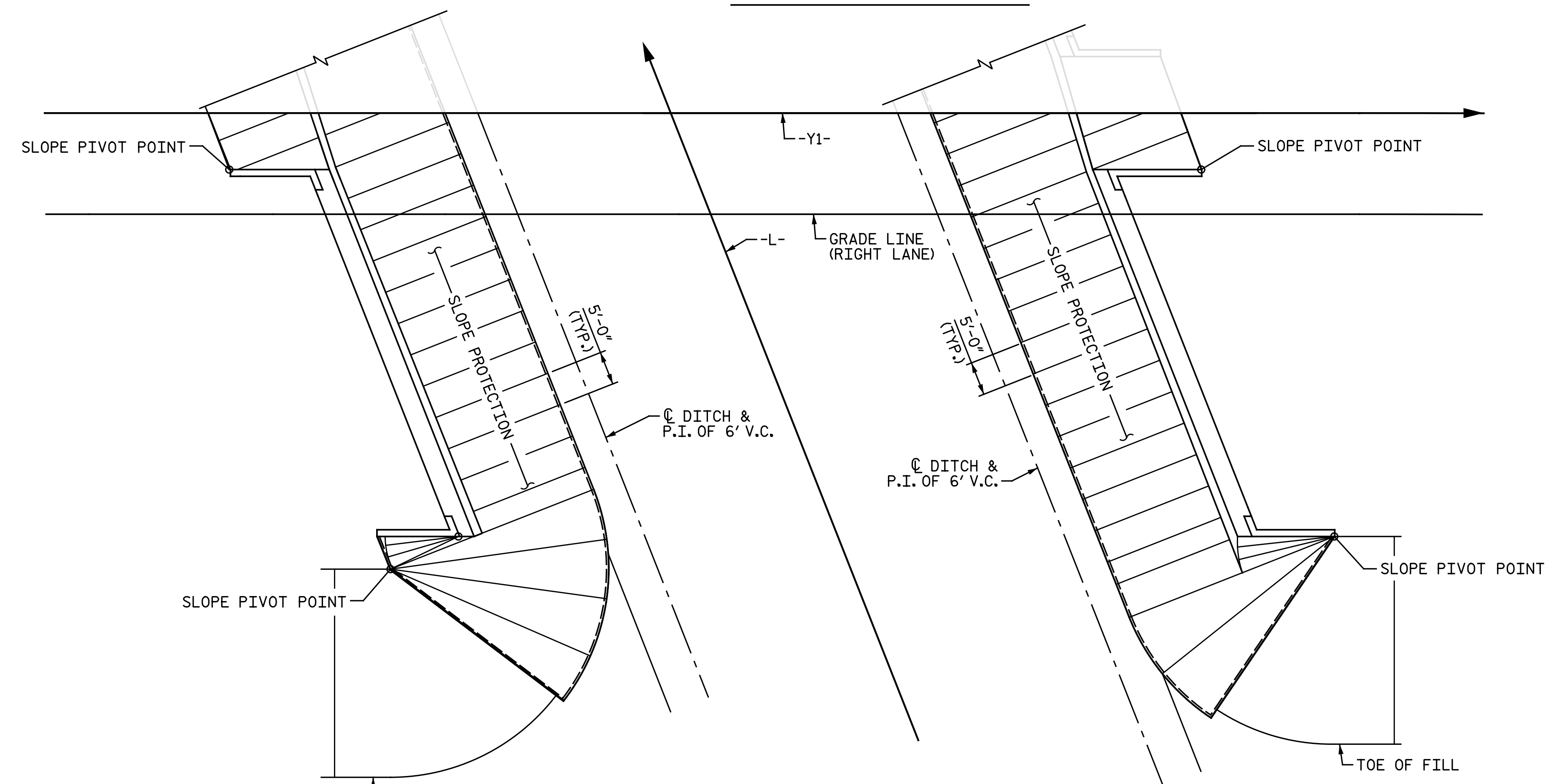
OPTIONAL POURING DETAIL

PROJECT NO. U-3330
NASH COUNTY
STATION: 18+22.61 -Y1-
SHEET 1 OF 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH			
	Michael Baker Engineering 8000 Regency Parkway, Suite 600 Cary, North Carolina 27518 NC License No.: F-1084		SLOPE PROTECTION DETAILS RIGHT LANES			
	REVISIONS		SHEET NO. S2-36			
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			39
2			4			



END BENT 1 PLAN - GRADING END BENT 2

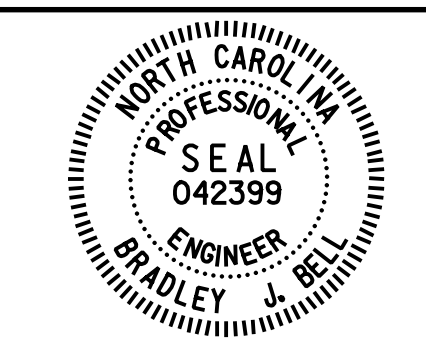


END BENT 1 PLAN - CONCRETE PLACEMENT END BENT 2

PROJECT NO. U-3330
NASH COUNTY
 STATION: 18+22.61 -Y1-
 SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SLOPE PROTECTION
 DETAILS
 RIGHT LANES



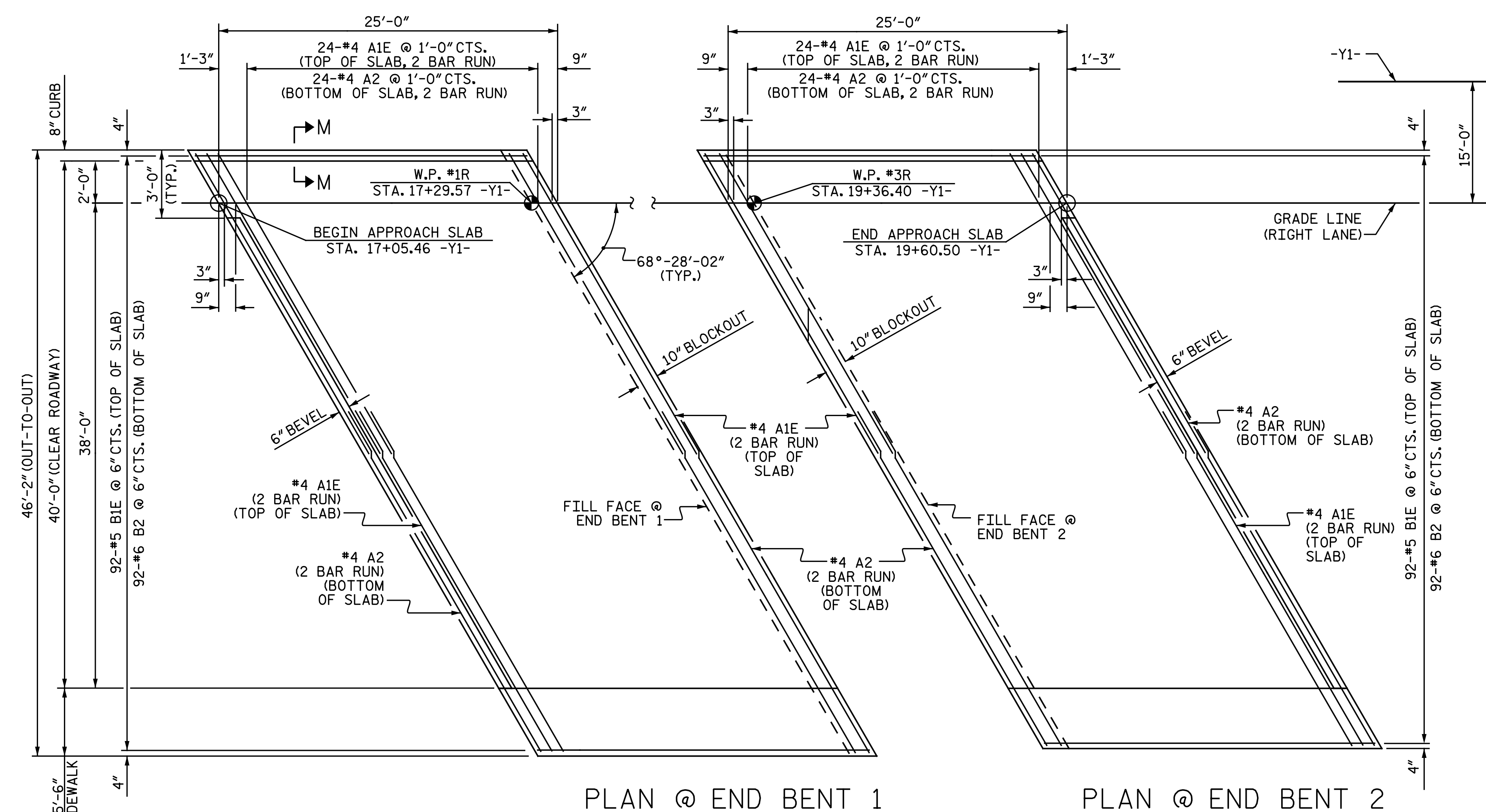
DocuSigned by:
 Bradley J. Bell
 CA1A3F8E3A30434
 1/27/2017

Michael Baker
 INTERNATIONAL
 Michael Baker Engineering
 8000 Regency Parkway, Suite 600
 Cary, North Carolina 27518
 NC License No.: F-1084

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-37
1			3			TOTAL SHEETS
2			4			39

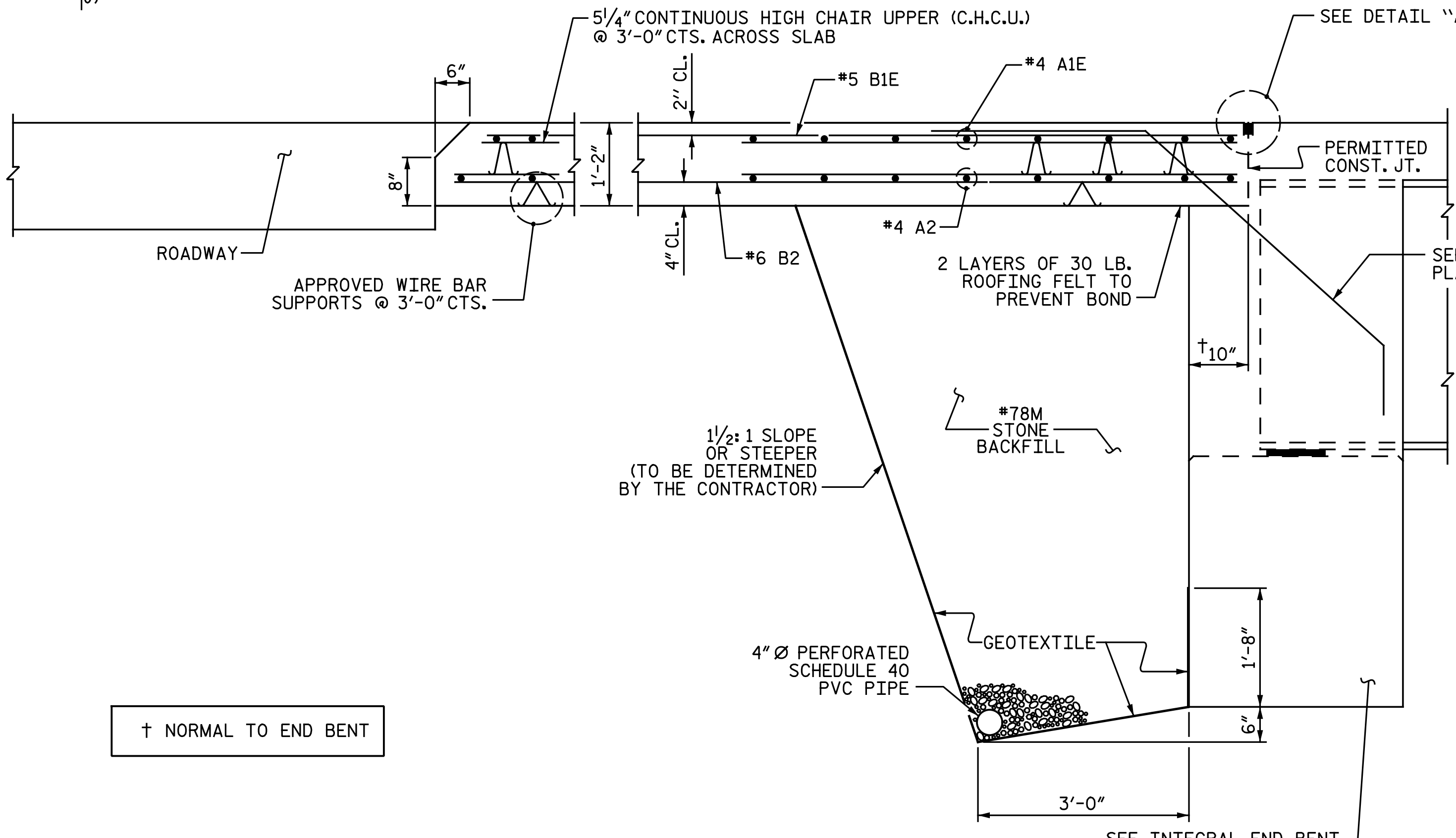
DRAWN BY: M. D. MAYHEW DATE: 9-7-16
 CHECKED BY: J. M. GARRISON DATE: 9-7-16

PLAN - CONCRETE PLACEMENT
 (1 1/2:1 SLOPE)

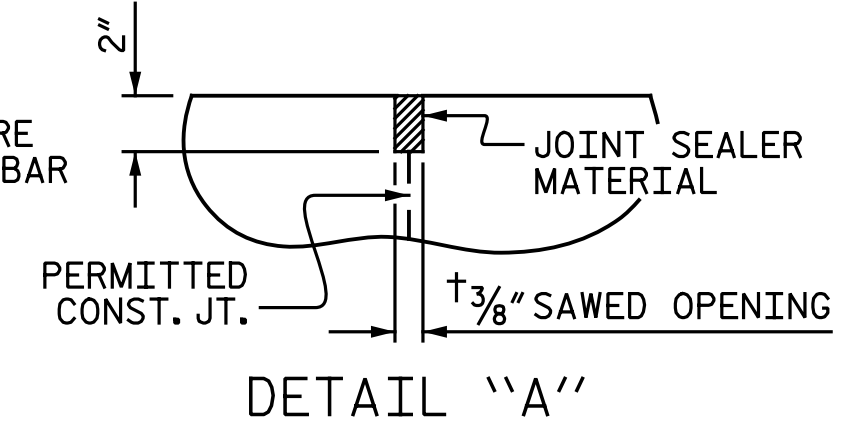


PLAN @ END BENT 1

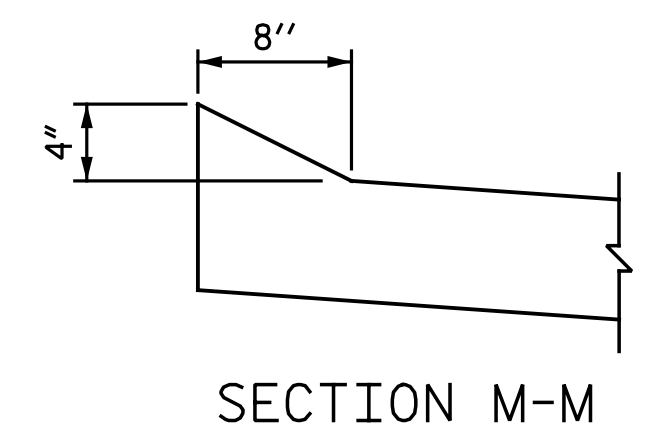
PLAN @ END BENT 2



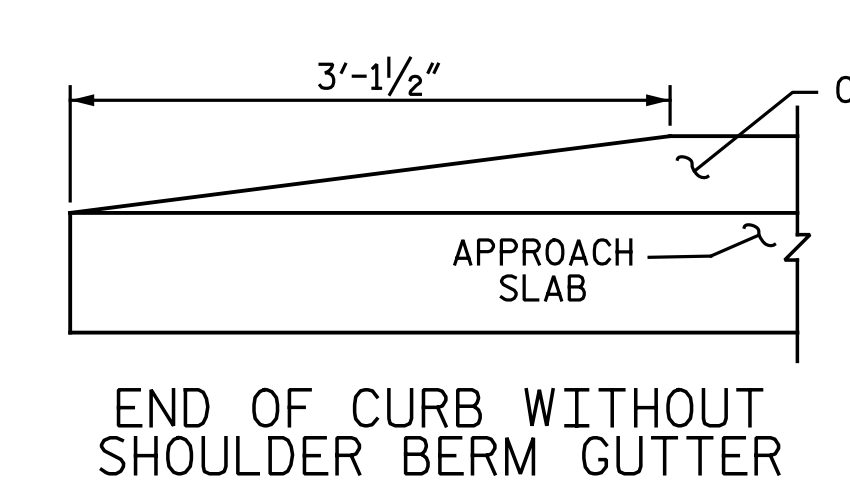
SECTION THRU SLAB



DETAIL "A"



SECTION M-M



END OF CURB WITHOUT SHOULDER BERM GUTTER

NOTES

AT THE CONTRACTOR'S OPTION, THE APPROACH SLAB MAY BE CAST MONOLITHICALLY WITH THE INTEGRAL END BENT DIAPHRAGM AND THE END SECTION OF BRIDGE DECK. IF CAST WITH THE INTEGRAL DIAPHRAGM, THE LAYERS OF ROOFING FELT SHALL BE OMITTED. IF CAST SEPARATE FROM THE INTEGRAL DIAPHRAGM, APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.

THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWED NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.

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

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.

BILL OF MATERIAL

APPROACH SLAB AT END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1E	52	#4	STR.	25' - 8"	892
A2	52	#4	STR.	25' - 7"	889
B1E	92	#5	STR.	24' - 2"	2,319
B2	92	#6	STR.	24' - 8"	3,409
B3E	4	#4	STR.	24' - 8"	66
G1E	25	#4	STR.	5' - 3"	88
U1E	8	#4	1	3' - 0"	16

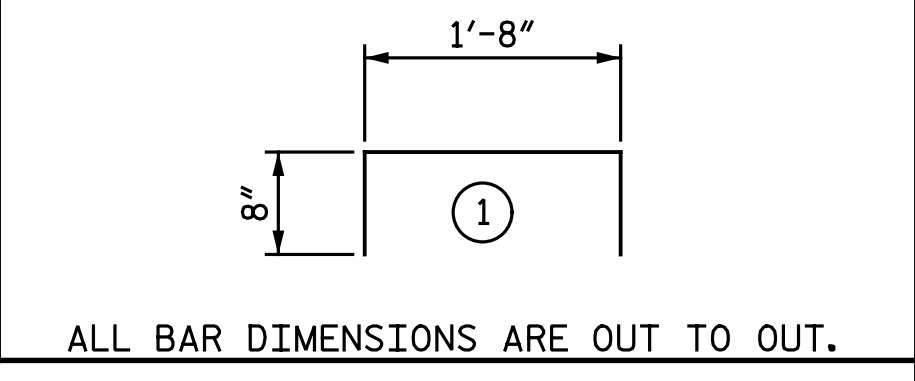
EPOXY COATED REINFORCING STEEL	LBS.	3,381
REINFORCING STEEL	LBS.	4,298
CLASS AA CONCRETE	C.Y.	52.9

BILL OF MATERIAL

APPROACH SLAB AT END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1E	52	#4	STR.	25' - 8"	892
A2	52	#4	STR.	25' - 7"	889
B1E	92	#5	STR.	24' - 2"	2,319
B2	92	#6	STR.	24' - 8"	3,409
B3E	4	#4	STR.	24' - 8"	66
G1E	25	#4	STR.	5' - 3"	88
U1E	8	#4	1	3' - 0"	16

EPOXY COATED REINFORCING STEEL	LBS.	3,381
REINFORCING STEEL	LBS.	4,298
CLASS AA CONCRETE	C.Y.	52.9

BAR TYPE



ALL BAR DIMENSIONS ARE OUT TO OUT.

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

PROJECT NO. U-3330
 NASH COUNTY
 STATION: 18+22.61 -Y1-

DRAWN BY: N. B. SPEAKS DATE: 6-30-16
 CHECKED BY: A. H. SHARPE DATE: 9-7-16

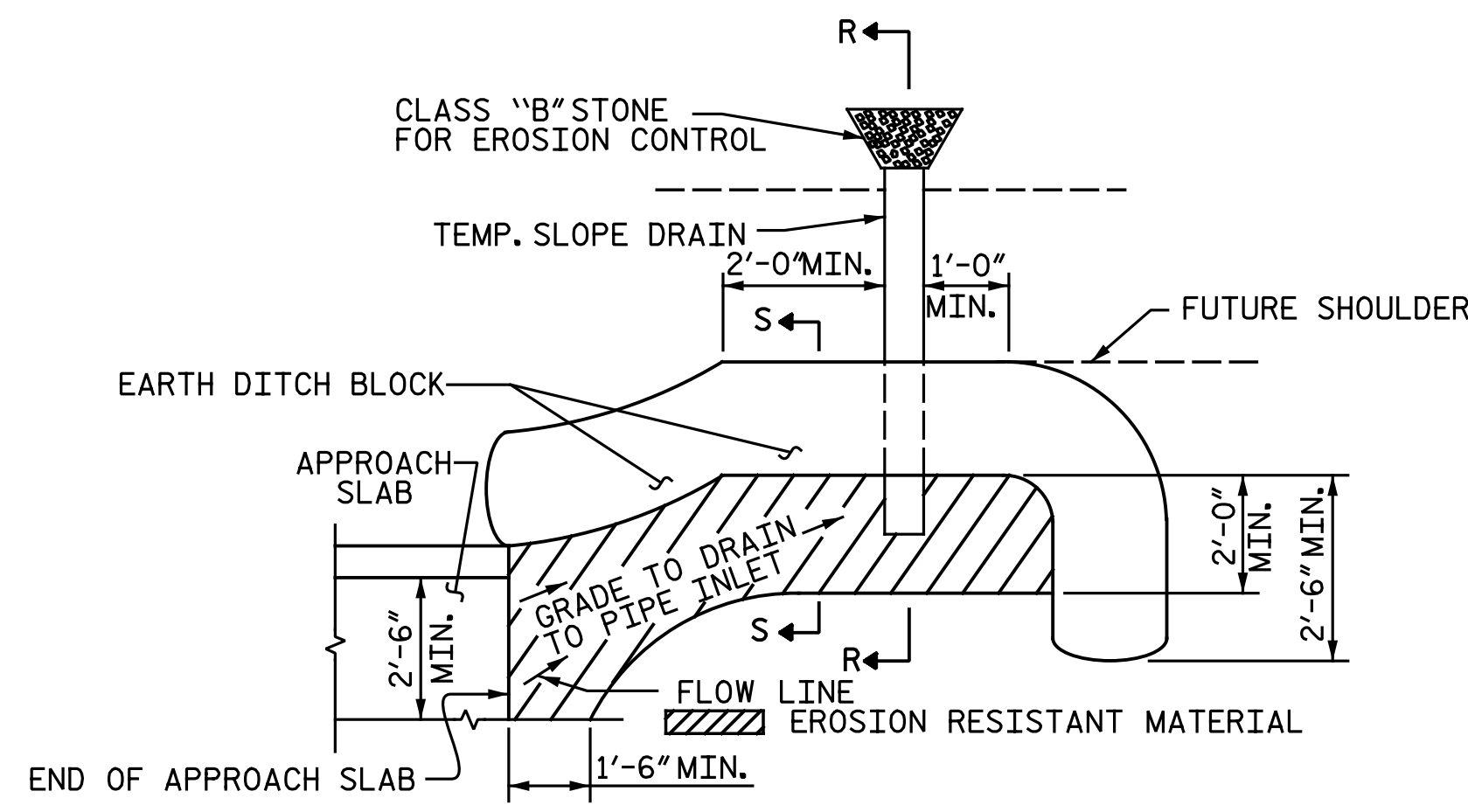
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Professional Engineer Seal for Bradley J. Bell, License No. 042399, dated 1/27/2017.

Michael Baker Engineering
 8000 Regency Parkway, Suite 600
 Cary, North Carolina 27518
 NC License No.: F-1084

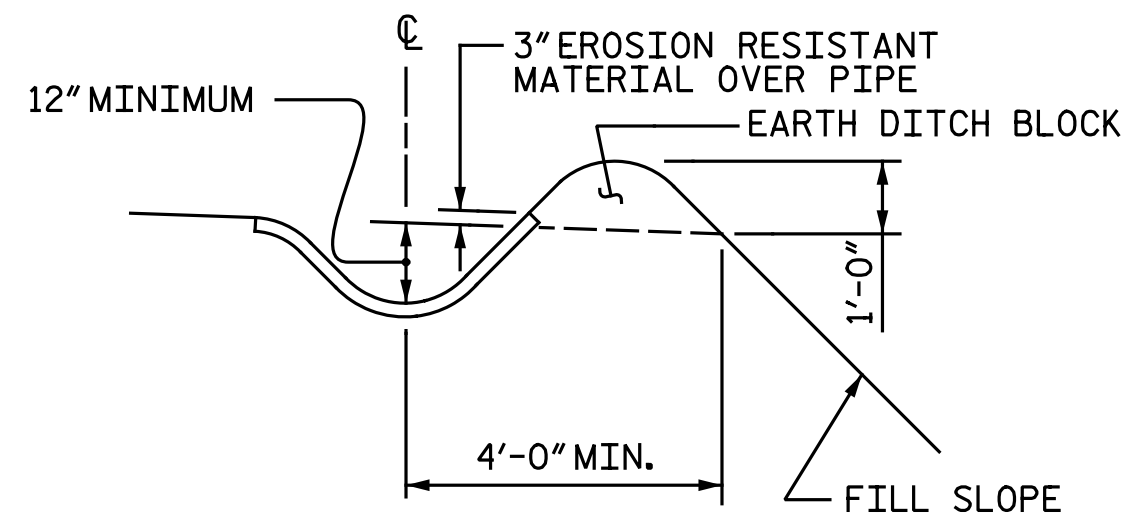
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S2-38
 TOTAL SHEETS 39

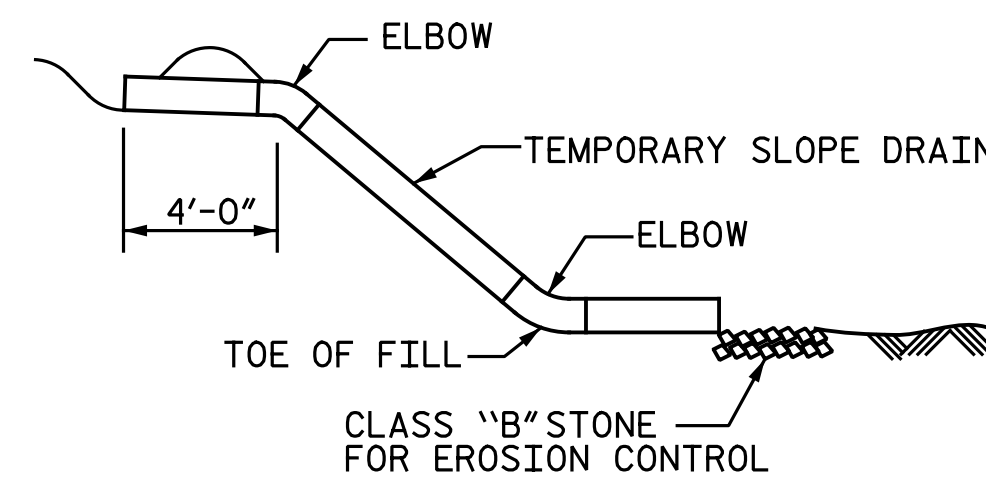


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

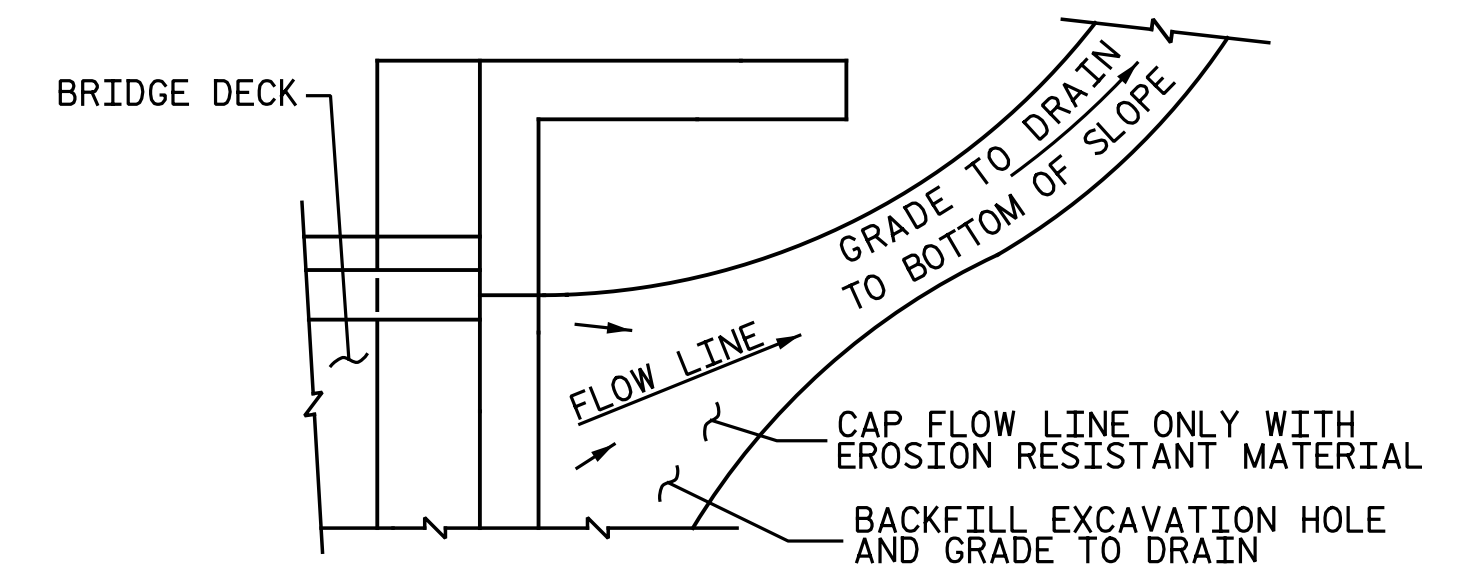
PLAN VIEW



SECTION S-S



SECTION R-R

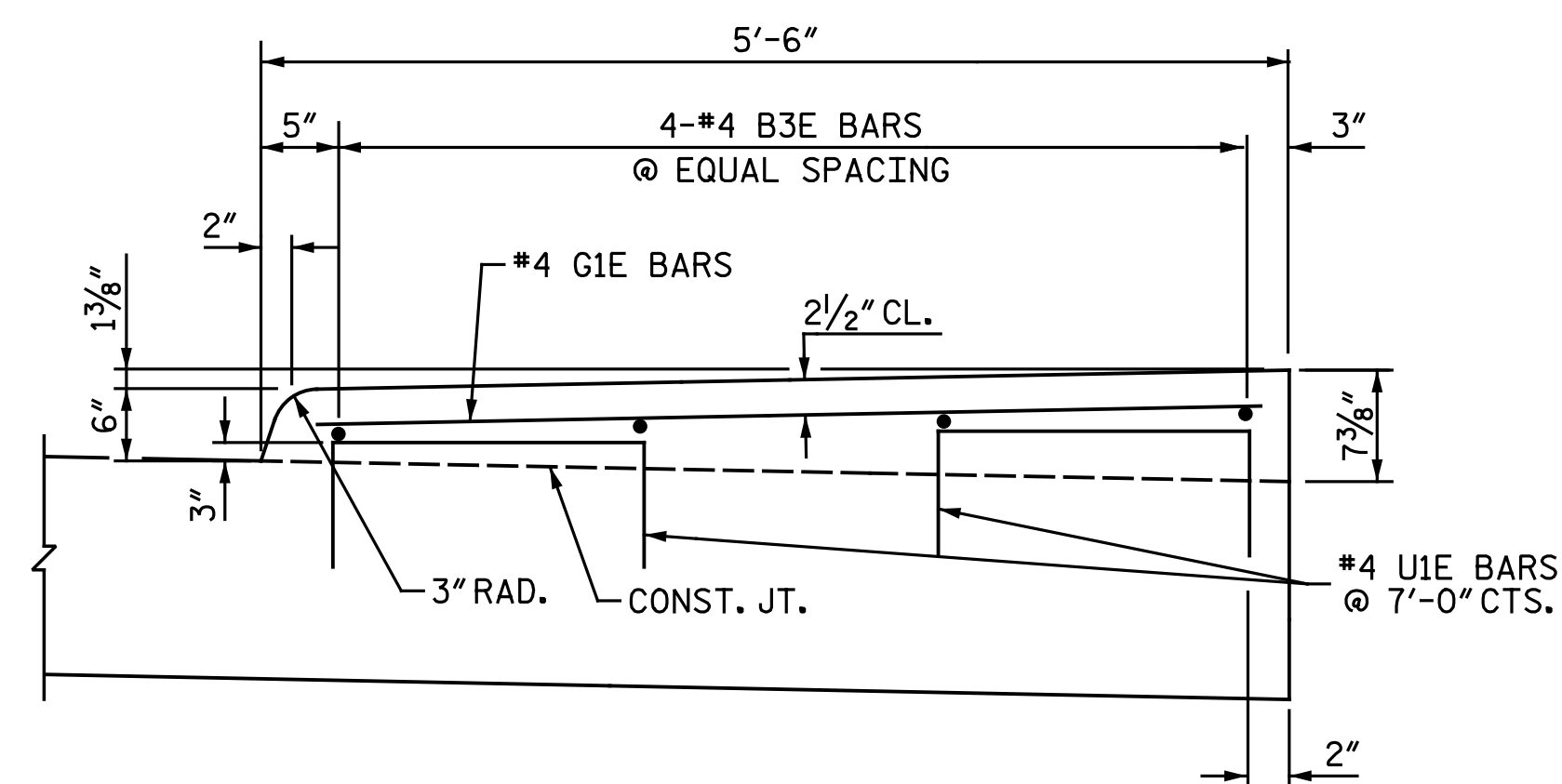


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

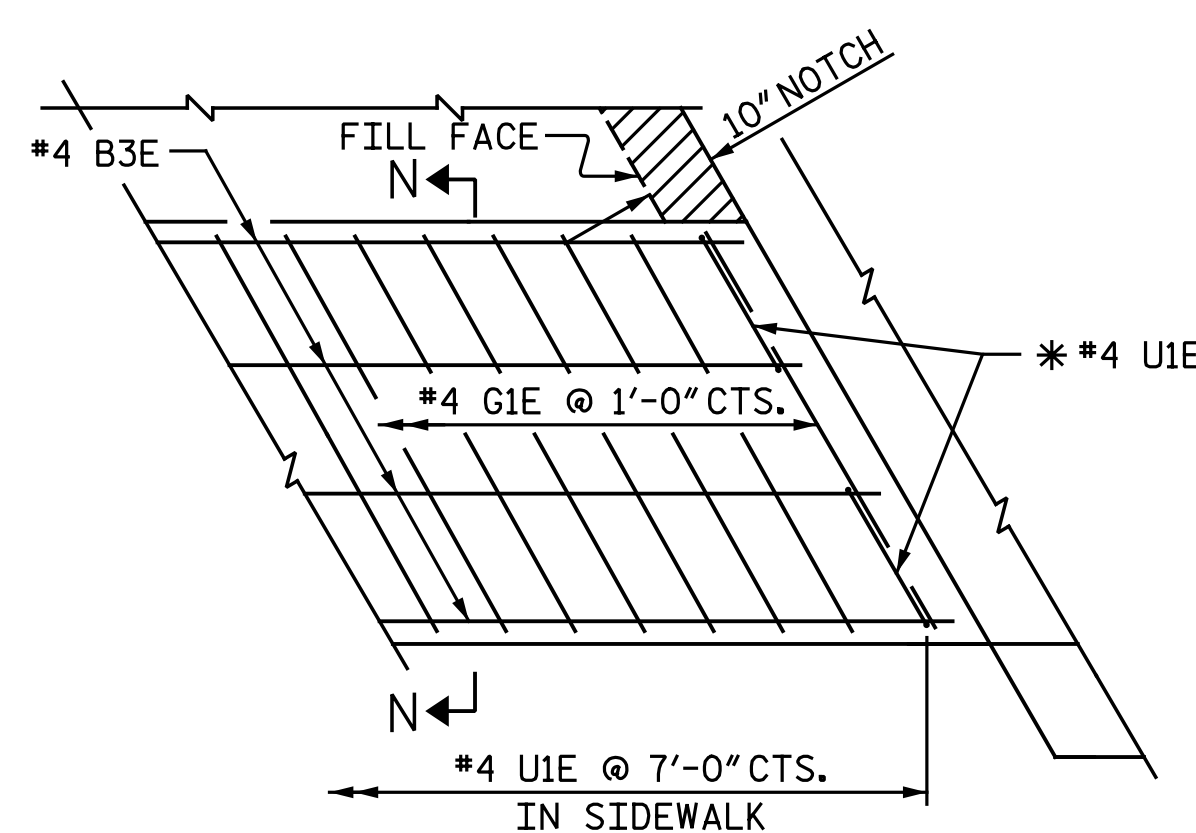
TEMPORARY DRAINAGE DETAIL

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



SECTION N-N



PARTIAL PLAN

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

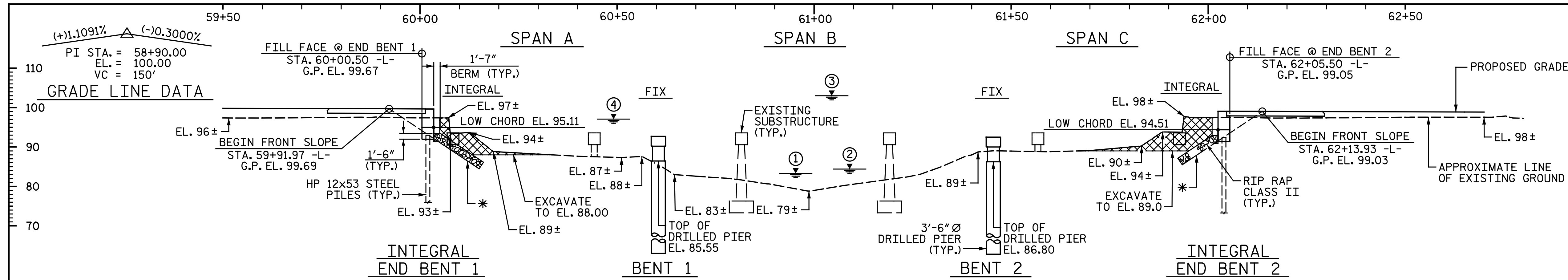
DETAILS OF SIDEWALK ON APPROACH SLAB

PROJECT NO. U-3330
 NASH COUNTY
 STATION: 18+22.61 -Y1-

ASSEMBLED BY : N.B. SPEAKS	DATE : 7-15-16
CHECKED BY : A.H. SHARPE	DATE : 9-7-16
DRAWN BY : TLA 10/05	REV. 10/1/11 MAA/GM
CHECKED BY : GM 5/06	REV. 12/21/11 MAA/GM
	REV. 6/13 MAA/GM

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH STANDARD BRIDGE APPROACH SLAB DETAILS RIGHT LANES			
	REVISIONS				SHEET NO. S2-39	
	NO.	BY:	DATE:	NO.	BY:	DATE:
1			3			39
2			4			

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 NC License No.: F-1084



- NOTES:**
- ⊠ DENOTES UNCLASSIFIED STRUCTURE EXCAVATION
 - ① WATER SURFACE EL. 83.30 ON 11-19-13
 - ② NORMAL WATER SURFACE EL. 84.40
 - ③ HIGH WATER EL. 101.7 ON 09-1999
 - ④ BASE DISCHARGE (Q100) EL. 97.07
 - * SLOPE 1.5:1
- FOR TEMPORARY WORK BRIDGE, SEE SHEET 2 OF 5.

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

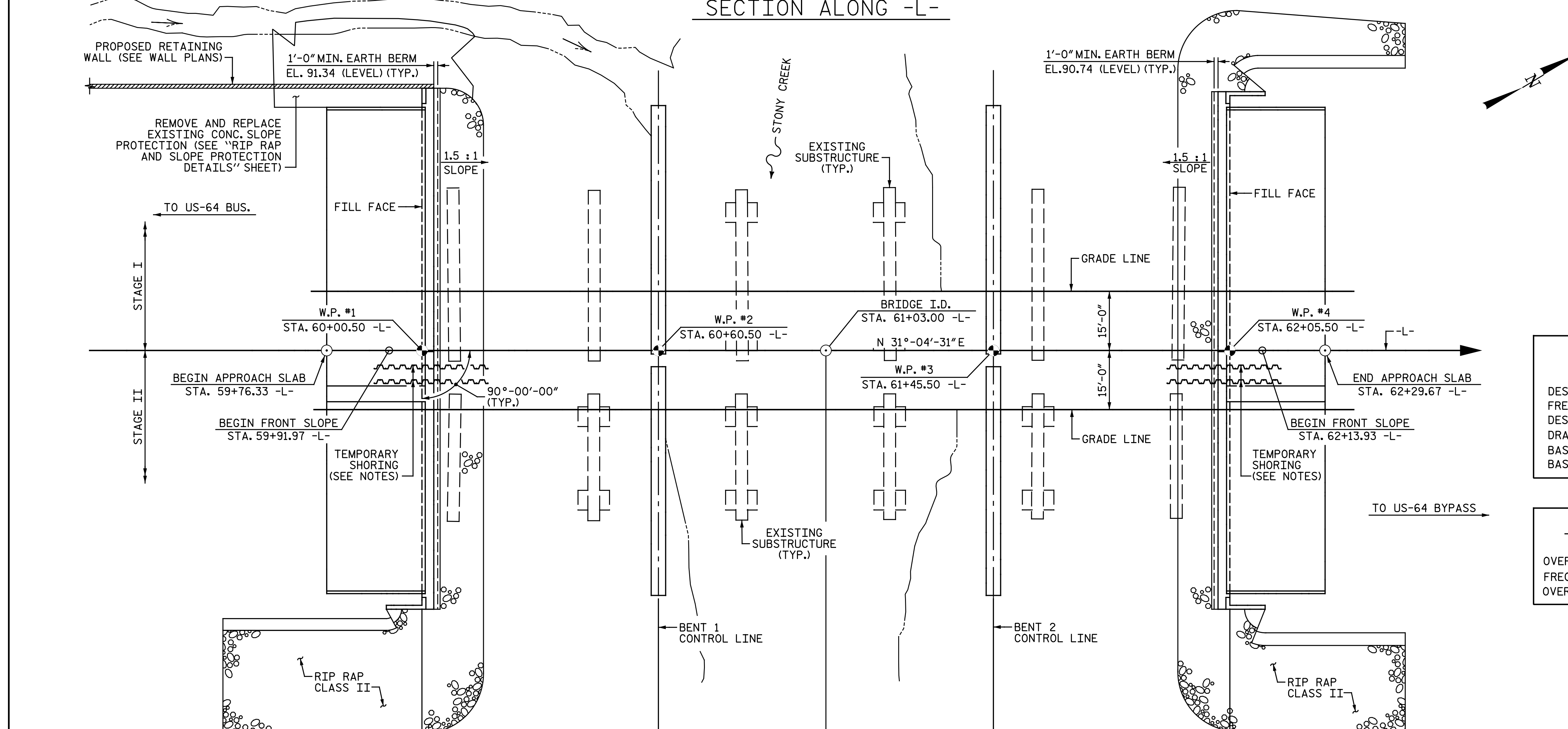
HYDRAULIC DATA

DESIGN DISCHARGE	= 11,800 CFS
FREQUENCY OF DESIGN FLOOD	= 50 YR
DESIGN HIGH WATER ELEVATION	= 95.1
DRAINAGE AREA	= 118 SQ. MI.
BASE DISCHARGE (Q100)	= 14,000 CFS
BASE HIGH WATER ELEVATION	= 97.07

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 16,225 CFS
FREQUENCY OF OVERTOPPING FLOOD	= 100+ YR
OVERTOPPING FLOOD ELEVATION	= 99.30

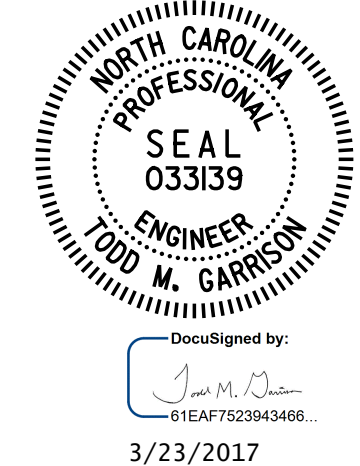
PROJECT NO. U-3330
NASH COUNTY
 STATION: 61+03.00 -L-
 SHEET 1 OF 5 REPLACES BRIDGE NO. 173 & 175 WITH BRIDGE NO. 175



DRAWN BY : M.D.M. / N.B.S. DATE : 9-12-16
 CHECKED BY : J.M. GARRISON DATE : 3-22-17

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 Cary, North Carolina 27518
 NC License No. : F-1084

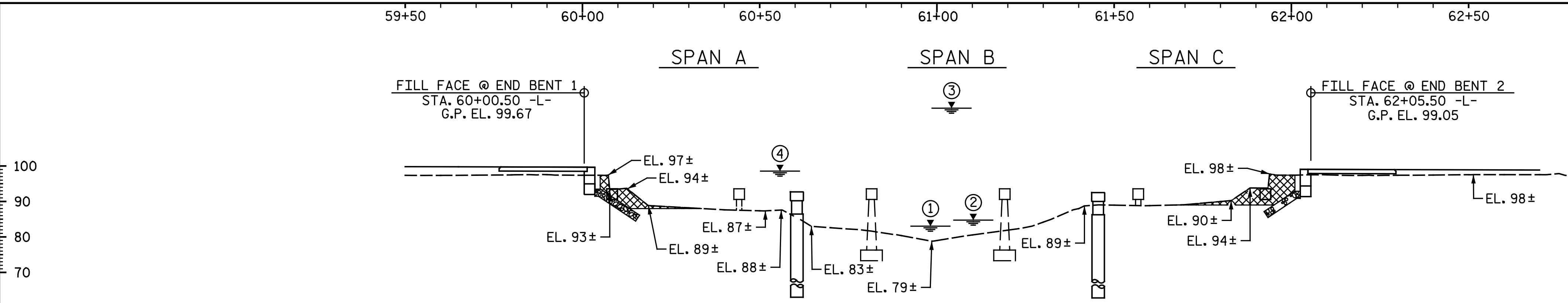
Michael Baker INTERNATIONAL



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE OVER STONY CREEK
 ON US-301 BYPASS
 BETWEEN US-64 BUSINESS
 AND US-64 BYPASS

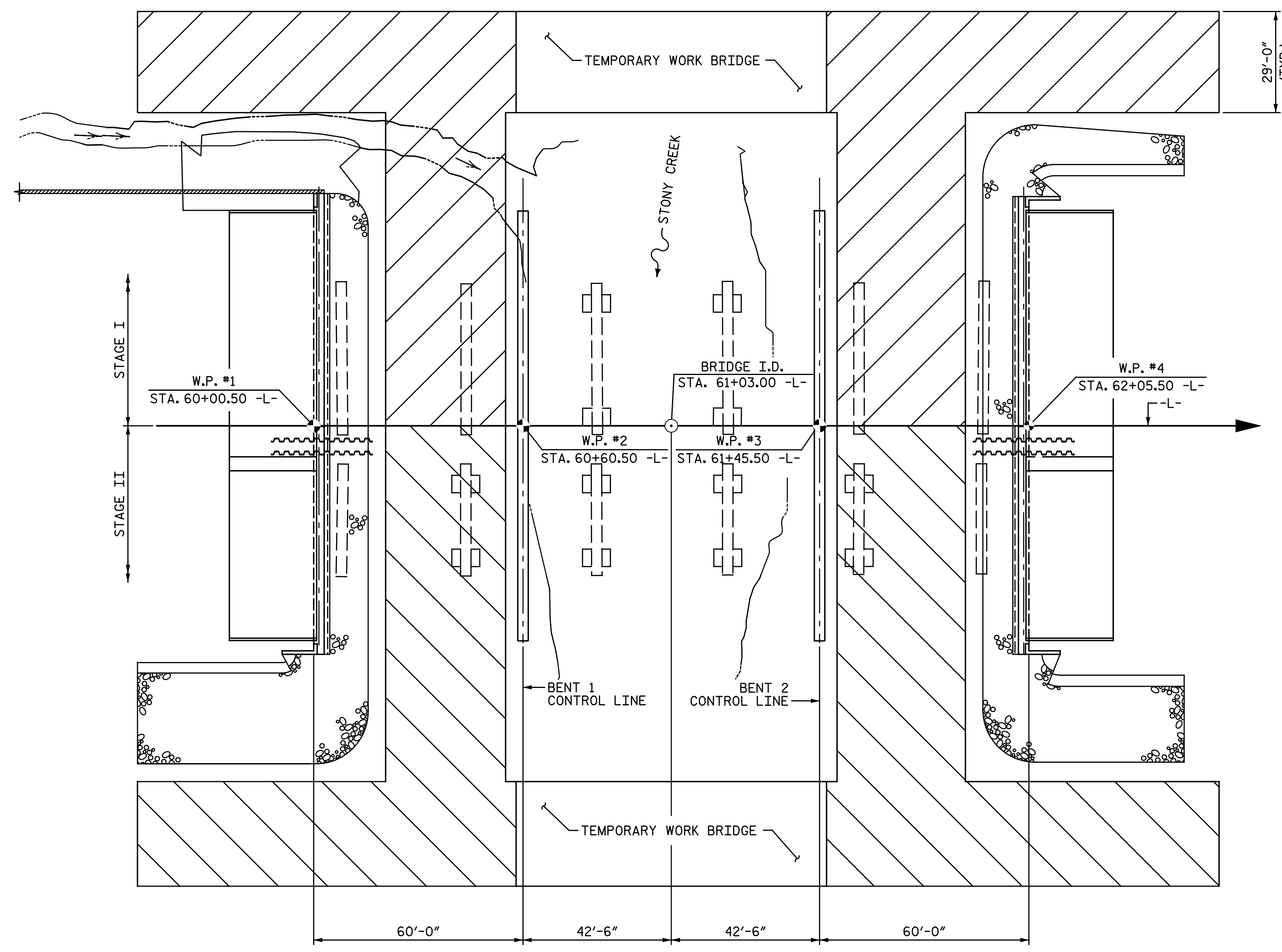
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-1
1			3			TOTAL SHEETS
2			4			42



- ① WATER SURFACE EL. 83.30 ON 11-19-13
- ② NORMAL WATER SURFACE EL. 84.40
- ③ HIGH WATER EL. 101.7 ON 09-1999
- ④ BASE DISCHARGE (Q100) EL. 97.07

DENOTES STAGE I TEMPORARY ACCESS (ROCK CAUSEWAY)

DENOTES STAGE II TEMPORARY ACCESS (ROCK CAUSEWAY)



PROJECT NO. U-3330
NASH COUNTY
 STATION: 61+03.00 -L-
 SHEET 2 OF 5

DRAWN BY : M. D. M. / N. B. S. DATE : 10-28-16
 CHECKED BY : J. M. GARRISON DATE : 12-13-16



DocuSigned by:
 Todd M. Garrison
 61EAF7523943466
 2/3/2017

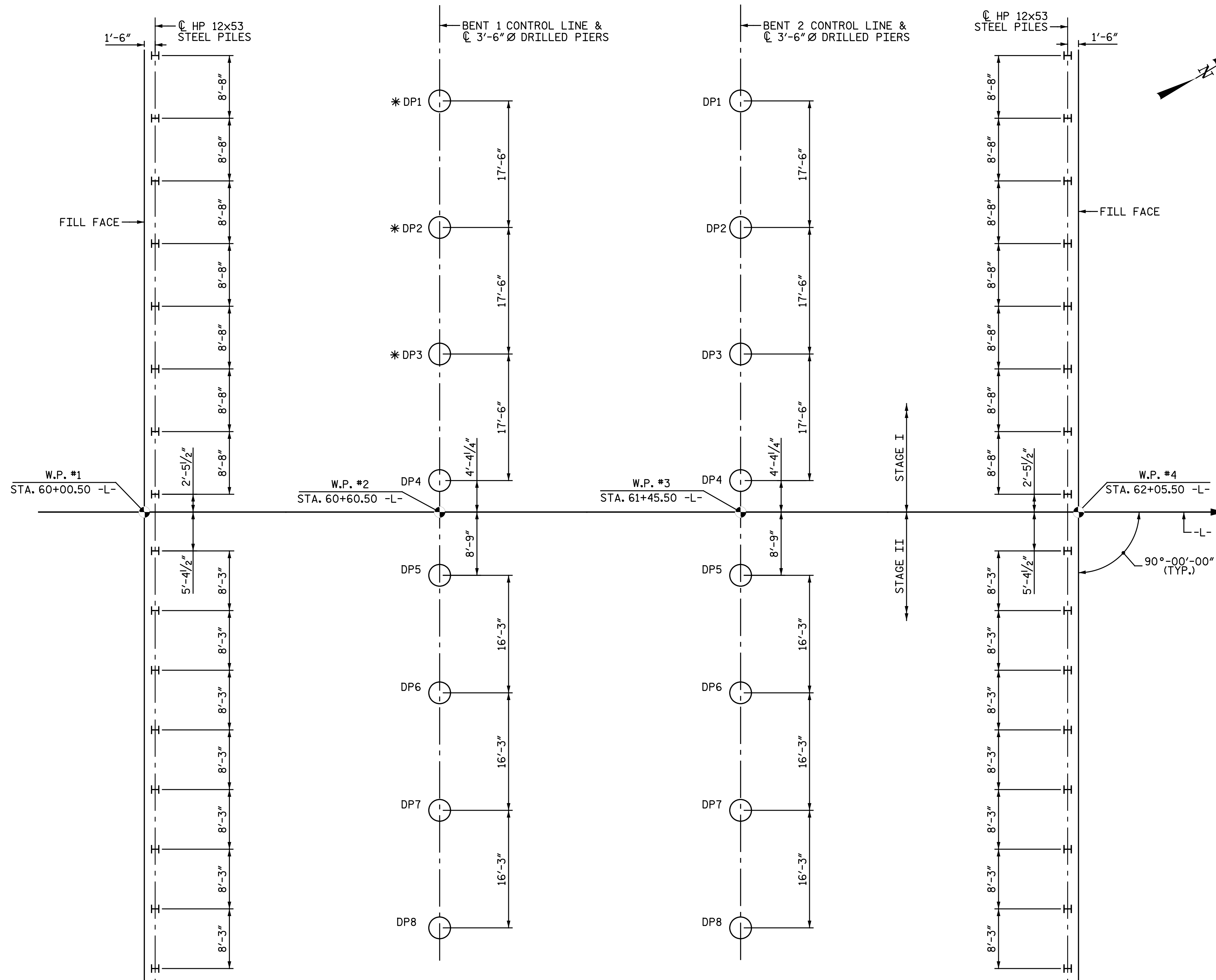
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

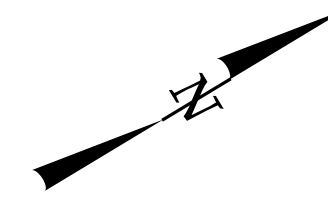
GENERAL DRAWING
 FOR BRIDGE OVER STONY CREEK
 ON US-301 BYPASS
 BETWEEN US-64 BUSINESS
 AND US-64 BYPASS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-2
1			3			TOTAL SHEETS
2			4			42



NOTES:

- FOR PILES, SEE GEOTECHNICAL SPECIAL PROVISIONS AND SECTION 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT END BENT NO.1 AND END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 105 TONS PER PILE.
- DRIVE PILES AT END BENT NO.1 AND END BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 175 TONS PER PILE.
- FOR DRILLED PIERS, SEE GEOTECHNICAL SPECIAL PROVISIONS AND SECTION 411 OF THE STANDARD SPECIFICATIONS.
- DRILLED PIERS AT BENT NO.1 AND BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 475 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 80 TSF AT BENT NO.1 AND 110 TSF AT BENT NO.2.
- * PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO.1 LEFT. IF REQUIRED, DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 71.5 WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT CASINGS.
- INSTALL DRILLED PIERS AT BENT NO.1 TO A TIP ELEVATION NO HIGHER THAN 63.0 (DP1 - DP3), 65.0 (DP4, DP5) AND 57.0 (DP6 - DP8) WITH THE REQUIRED TIP RESISTANCE.
- INSTALL DRILLED PIERS AT BENT NO.2 TO A TIP ELEVATION NO HIGHER THAN 57.0 (DP1, DP2), 51.0 (DP3 - DP6) AND 66.0 (DP7, DP8) WITH THE REQUIRED TIP RESISTANCE.
- THE SCOUR CRITICAL ELEVATIONS ARE ELEVATION 69.0 (DP1 - DP3), 73.0 (DP4, DP5) AND 68.0 (DP6 - DP8) FOR BENT NO.1 AND ELEVATION 69.0 (DP1, DP2), 67.0 (DP3 - DP6) AND 72.0 (DP7, DP8) FOR BENT NO.2. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.
- DO NOT USE SLURRY CONSTRUCTION FOR DRILLED PIERS AT BENT NO.1 AND BENT NO.2.
- SID INSPECTIONS MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SID INSPECTIONS. FOR SID INSPECTIONS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- CSL TUBES ARE REQUIRED AND CSL TESTING MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR CSL TESTING. FOR CSL TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.



BENT 1

BENT 2

INTEGRAL
END BENT 1

INTEGRAL
END BENT 2

FOUNDATION LAYOUT

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

PROJECT NO. U-3330
NASH COUNTY
 STATION: 61+03.00 -L-
 SHEET 3 OF 5

DRAWN BY : M. D. M./N. B. S. DATE : 9-19-16
 CHECKED BY : J. M. GARRISON DATE : 10-20-16



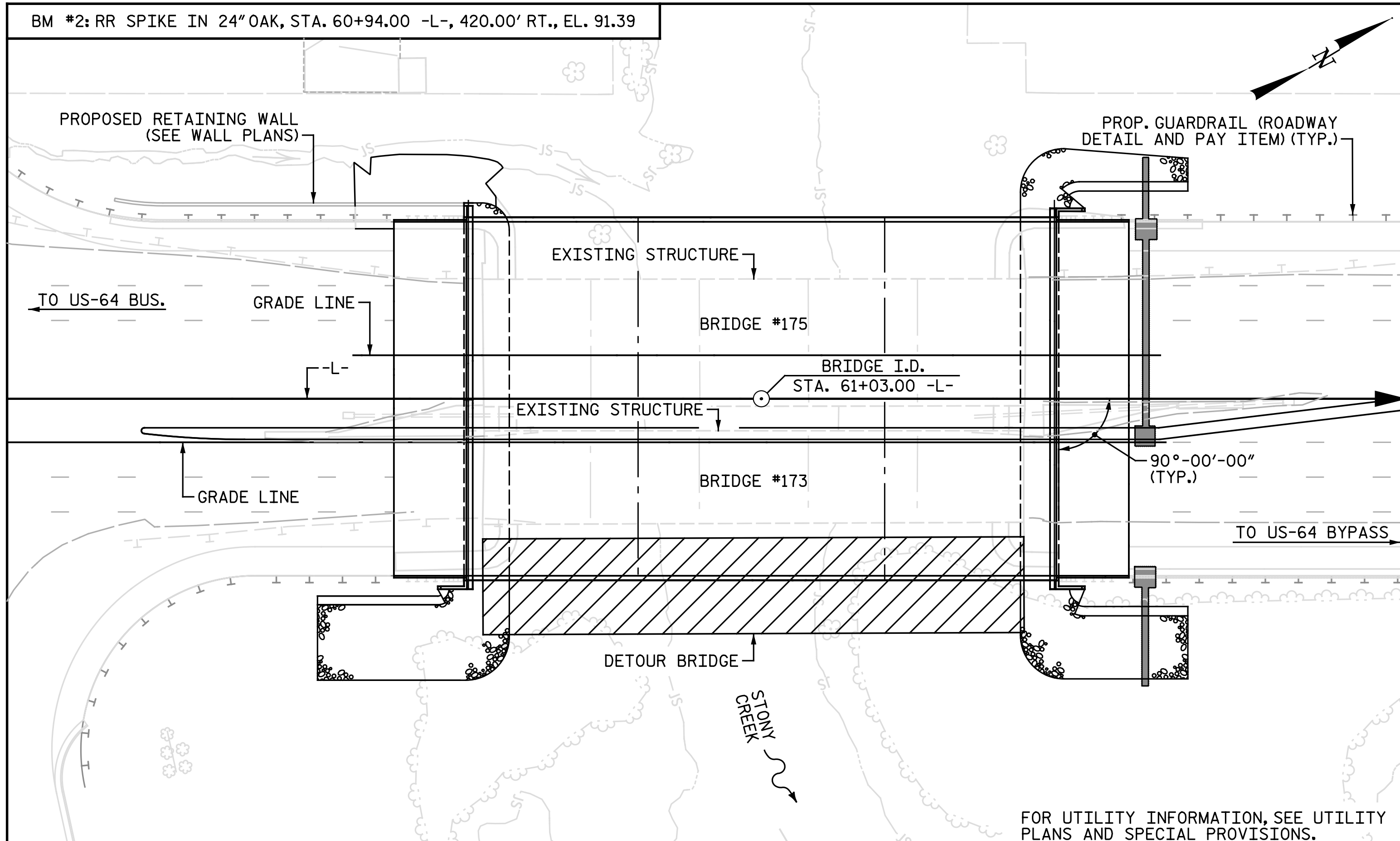
DocuSigned by:

 61EAF7523943466...
 2/3/2017

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 INTERNATIONAL
 Michael Baker Engineering
 8000 Regency Parkway, Suite 600
 Cary, North Carolina 27518
 NC License No.: F-1084

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE OVER STONY CREEK
 ON US-301 BYPASS
 BETWEEN US-64 BUSINESS
 AND US-64 BYPASS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-3
1			3			TOTAL SHEETS
2			4			42



LOCATION SKETCH

NOTES:

- ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
- THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
- THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- FOR PLACING LOAD ON STRUCTURAL MEMBERS, SEE SPECIAL PROVISIONS.
- THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. 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 75 FT EACH SIDE OF CENTER LINE 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.
- AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 61+03.00 -L-.
- REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
- NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.
- ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50 AND PAINTED IN ACCORDANCE WITH SYSTEM 1 OF ARTICLE 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

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 STRUCTURES AT STATION 61+03.00 -L-.'

FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.

THE BRIDGE RAILS ON TEMPORARY STRUCTURE SHALL BE DESIGNED FOR THE AASHTO LRFD TEST LEVEL 3 (TL-3) CRASH TEST CRITERIA. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURE, SEE SPECIAL PROVISIONS.

THE CONTRACTOR WILL BE REQUIRED TO CONSTRUCT, MAINTAIN AND AFTERWARDS REMOVE A TEMPORARY STRUCTURE AT STATION 61+03.00 -L- FOR USE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURE, SEE SPECIAL PROVISIONS.

THE EXISTING LEFT LANE STRUCTURE CONSISTING OF 5 SPANS @ 37'-6" WITH A CLEAR ROADWAY WIDTH OF 42'-3" ON A REINFORCED CONCRETE FLOOR ON I-BEAMS ON END BENTS, BENT 1 & BENT 4 OF REINFORCED CONC. CAPS ON CONCRETE PILES AND BENTS 2 & 3 OF REINFORCED CONC. POST AND BEAM WITH FOOTINGS AND LOCATED AT PROPOSED SITE SHALL BE REMOVED.

AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING RIGHT LANE STRUCTURE CONSISTING OF 5 SPANS @ 37'-6" WITH A CLEAR ROADWAY WIDTH OF 28'-0" ON A REINFORCED CONCRETE DECK GIRDERS ON END BENTS OF REINFORCED CONC. CAPS ON TIMBER PILES AND INTERIOR BENTS OF REINFORCED CONC. POST AND BEAM WITH FOOTINGS AND LOCATED AT PROPOSED SITE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

THE SUBSTRUCTURE OF THE EXISTING BRIDGES INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGES SUBSTRUCTURES SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

REMOVAL OF THE EXISTING BRIDGES 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 BRIDGES IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18-EVALUATING SCOUR AT BRIDGES."

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS. DRILLED PIERS AT BENT 1 SHALL BE TERMINATED 1 FOOT ABOVE NORMAL WATER SURFACE ELEVATION FOR SHAFTS LOCATED IN WATER.

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS AT BENT 2 IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.

FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

LOCATION	CONSTRUCTION, MAINTENANCE & REMOVAL OF TEMPORARY STRUCTURE	CONSTRUCTION, MAINTENANCE & REMOVAL OF TEMPORARY ACCESS	REMOVAL OF EXISTING STRUCTURES	3'-6" DIA. DRILLED PIERS IN SOIL	3'-6" DIA. DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 3'-6" DIA. DRILLED PIER	SID INSPECTIONS	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS
	LUMP SUM	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM
SUPERSTRUCTURE										25,676	29,950		
END BENT 1												59.0	
BENT 1				116	80	42.2	2	1				87.1	
BENT 2				186	60		2	1				83.9	
END BENT 2												60.5	
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	302	140	42.2	4	2	LUMP SUM	25,676	29,950	290.5	LUMP SUM

TOTAL BILL OF MATERIAL (CONT'D.)

LOCATION	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	STRUCTURAL STEEL	HP 12x53 STEEL PILES	PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	ASBESTOS ASSESSMENT	
	LBS.	LBS.	LBS.	NO.	LIN. FT.	EA.	LIN. FT.	SQ. YDS.	TONS	SQ. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE			733,280				406.67				LUMP SUM	
END BENT 1	12,451			16	400	16		205	385	430		
BENT 1	22,857	5,217										
BENT 2	24,079	5,982										
END BENT 2	12,645			16	640	16		460	510			
TOTAL	72,032	11,199	733,280	32	1,040	32	406.67	205	845	940	LUMP SUM	LUMP SUM

PROJECT NO. U-3330
NASH COUNTY
 STATION: 61+03.00 -L-
 SHEET 4 OF 5

DRAWN BY : M. D. M./N. B. S. DATE : 9-12-16
 CHECKED BY : J. M. GARRISON DATE : 3-22-17

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER STONY CREEK
ON US-301 BYPASS
BETWEEN US-64 BUSINESS
AND US-64 BYPASS

Michael Baker International

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8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No.: F-1084

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

SHEET NO.	
S3-4	TOTAL SHEETS
42	42

LOAD FACTORS:

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

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR STEEL BEAMS

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE						SERVICE II LIMIT STATE						COMMENT NUMBER						
						MOMENT			SHEAR			MOMENT												
						LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	BEAM LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	BEAM LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γ_{LL})		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	BEAM LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.11	--	1.75	0.680	1.11	B	I	85.00	0.887	2.96	B	I	0.00	1.30	0.680	1.63	B	I	85.00	1	
	HL-93 (OPERATING)	N/A		1.44	--	1.35	0.680	1.44	B	I	85.00	0.887	3.84	B	I	0.00	1.00	0.680	2.12	B	I	85.00	1	
	HS-20 (INVENTORY)	36.000	②	2.03	73.08	1.75	0.680	2.03	B	I	85.00	0.887	3.94	B	I	0.00	1.30	0.646	3.39	B	I	42.50	1	
	HS-20 (OPERATING)	36.000		2.63	94.68	1.35	0.680	2.63	B	I	85.00	0.887	5.11	B	I	0.00	1.00	0.646	4.41	B	I	42.50	1	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		6.45	87.08	1.40	0.680	6.45	B	I	85.00	0.887	12.27	B	I	0.00	1.30	0.646	7.42	B	I	42.50	1
		SNGARBS2	20.000		4.42	88.40	1.40	0.680	4.42	B	I	85.00	0.887	8.53	B	I	0.00	1.30	0.646	5.63	B	I	42.50	1
		SNAGRIS2	22.000		4.04	88.88	1.40	0.680	4.04	B	I	85.00	0.887	7.85	B	I	0.00	1.30	0.646	5.37	B	I	42.50	1
		SNCOTTS3	27.250		3.17	86.38	1.40	0.680	3.17	B	I	85.00	0.887	6.09	B	I	0.00	1.30	0.646	3.72	B	I	42.50	1
		SNAGGRS4	34.925		2.51	87.66	1.40	0.680	2.51	B	I	85.00	0.887	4.92	B	I	0.00	1.30	0.646	3.15	B	I	42.50	1
		SNS5A	35.550		2.48	88.16	1.40	0.680	2.48	B	I	85.00	0.887	4.92	B	I	0.00	1.30	0.646	3.08	B	I	42.50	1
		SNS6A	39.950		2.24	89.49	1.40	0.680	2.24	B	I	85.00	0.887	4.45	B	I	0.00	1.30	0.646	2.84	B	I	42.50	1
	SNS7B	42.000		2.12	89.04	1.40	0.680	2.12	B	I	85.00	0.887	4.32	B	I	0.00	1.30	0.646	2.71	B	I	42.50	1	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.69	88.77	1.40	0.680	2.69	B	I	85.00	0.887	5.34	B	I	0.00	1.30	0.646	3.48	B	I	42.50	1
		TNT4A	33.075		2.72	89.96	1.40	0.680	2.72	B	I	85.00	0.887	5.26	B	I	0.00	1.30	0.646	3.47	B	I	42.50	1
		TNT6A	41.600		2.18	90.69	1.40	0.680	2.18	B	I	85.00	0.887	4.52	B	I	0.00	1.30	0.646	2.86	B	I	42.50	1
		TNT7A	42.000		2.16	90.72	1.40	0.680	2.16	B	I	85.00	0.887	4.45	B	I	0.00	1.30	0.646	2.88	B	I	42.50	1
		TNT7B	42.000		2.19	91.98	1.40	0.680	2.19	B	I	85.00	0.887	4.28	B	I	0.00	1.30	0.646	2.95	B	I	42.50	1
		TNAGRIT4	43.000		2.10	90.30	1.40	0.680	2.10	B	I	85.00	0.887	4.15	B	I	0.00	1.30	0.646	2.85	B	I	42.50	1
TNAGT5A		45.000		2.01	90.45	1.40	0.680	2.01	B	I	85.00	0.887	4.06	B	I	0.00	1.30	0.646	2.68	B	I	42.50	1	
TNAGT5B	45.000	③	1.99	89.55	1.40	0.680	1.99	B	I	85.00	0.887	3.95	B	I	0.00	1.30	0.646	2.64	B	I	42.50	1		
FATIGUE	HL-93 (INVENTORY)	$\gamma_{LL}=0.75$		-																				

NOTES:

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

ALLOWABLE STRESS FOR SERVICE II LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

- DISTANCE FROM LEFT END OF SPAN IS GIVEN WITH RESPECT TO CENTERLINE OF BEARING AND IS MEASURED ALONG THE CONTROLLING BEAM.
- FATIGUE RATING IS NOT REQUIRED SINCE BEAM DOES NOT INCLUDE FATIGUE-PRONE DETAILS.

CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

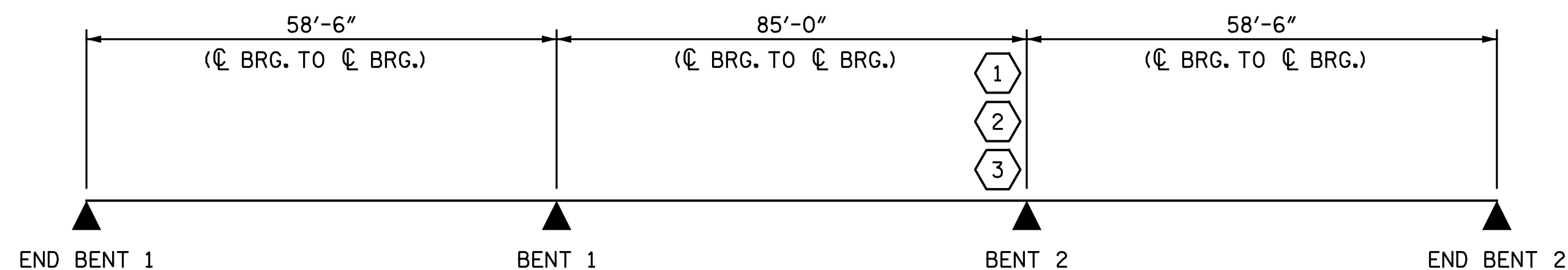
② DESIGN LOAD RATING (HS-20)

③ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

BEAM LOCATION

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



LRFR SUMMARY

PROJECT NO. U-3330
NASH COUNTY
 STATION: 61+03.00 -L-
 SHEET 5 OF 5

DRAWN BY : C. E. MAYHEW DATE : 12-14-16
 CHECKED BY : B. J. BELL DATE : 12-15-16

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 LRFR SUMMARY FOR
 STEEL BEAMS
 (NON-INTERSTATE TRAFFIC)

REVISIONS

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

SHEET NO. **S3-5**
 TOTAL SHEETS 42

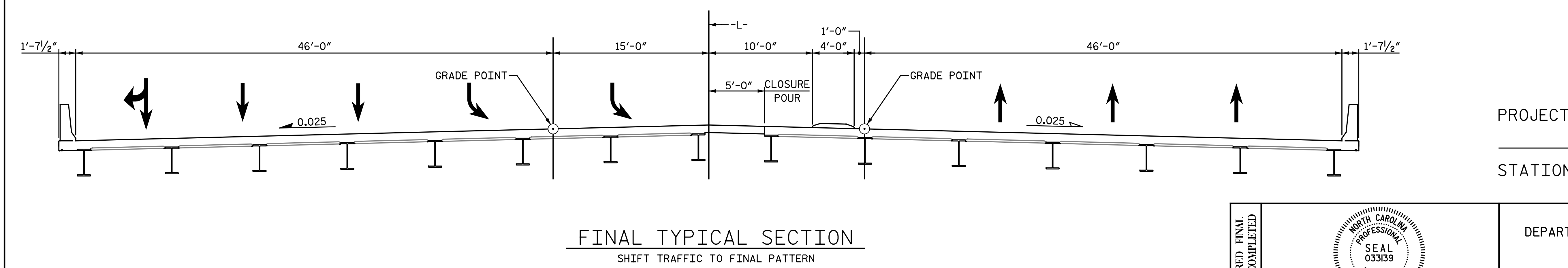
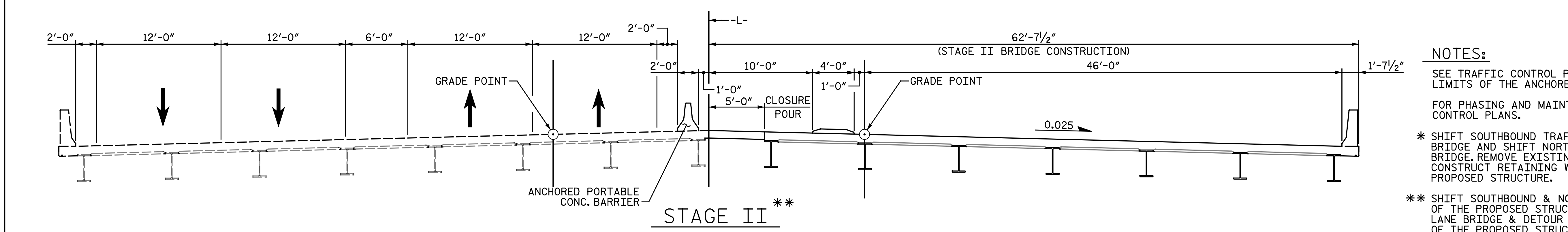
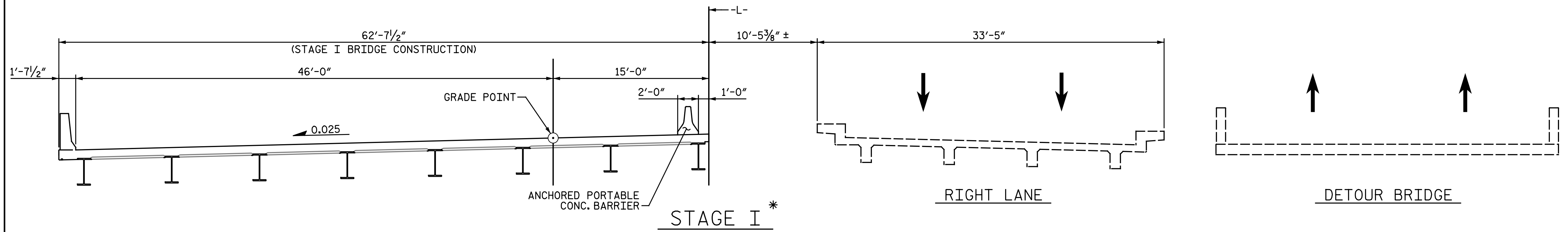
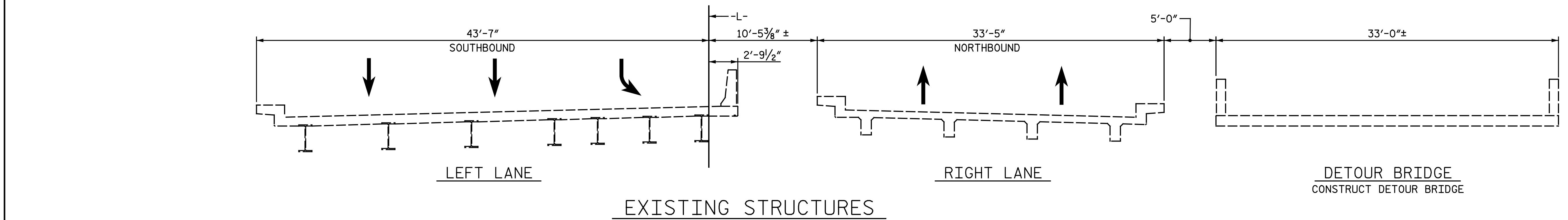
Michael Baker Engineering
 8000 Regency Parkway, Suite 600
 Cary, North Carolina 27518
 NC License No.: F-1084

Michael Baker INTERNATIONAL

DocuSigned by:
 Todd M. Garrison
 61EAF7523943466
 2/3/2017

Seal: NORTH CAROLINA PROFESSIONAL SEAL 033139 ENGINEER TODD M. GARRISON

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



NOTES:

SEE TRAFFIC CONTROL PLANS FOR LOCATION AND PAY LIMITS OF THE ANCHORED PORTABLE CONCRETE BARRIER.

FOR PHASING AND MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS.

* SHIFT SOUTHBOUND TRAFFIC ONTO EXISTING RIGHT LANE BRIDGE AND SHIFT NORTHBOUND TRAFFIC ONTO DETOUR BRIDGE. REMOVE EXISTING LEFT LANE BRIDGE AND CONSTRUCT RETAINING WALL AND STAGE I OF THE PROPOSED STRUCTURE.

** SHIFT SOUTHBOUND & NORTHBOUND TRAFFIC ONTO STAGE I OF THE PROPOSED STRUCTURE. REMOVE EXISTING RIGHT LANE BRIDGE & DETOUR BRIDGE AND CONSTRUCT STAGE II OF THE PROPOSED STRUCTURE.

PROJECT NO. U-3330

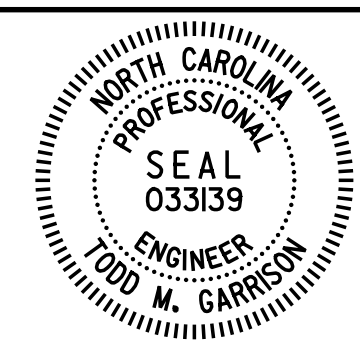
NASH COUNTY

STATION: 61+03.00 -L-

DRAWN BY : M. D. M. / N. B. S. DATE : 9-22-16

CHECKED BY : I. M. GARRISON DATE : 12-13-16

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DocuSigned by:
Todd M. Garrison
61EAF7523943466
2/3/2017

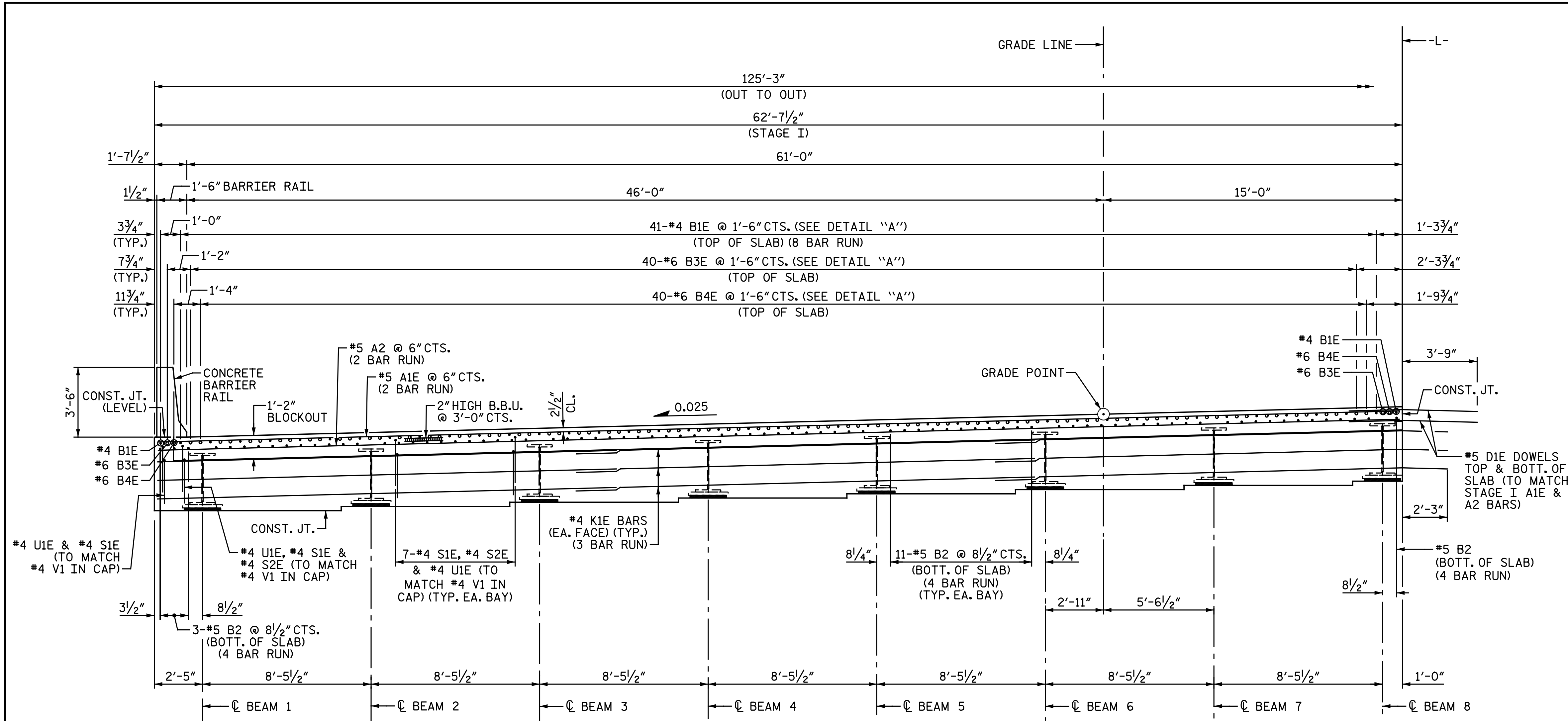
Michael Baker International

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONSTRUCTION SEQUENCE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-6
1			3			TOTAL SHEETS
2			4			42



TYPICAL SECTION AT INTEGRAL END BENT - STAGE I
(END BENT 1 SHOWN, END BENT 2 SIMILAR)

NOTES:

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

METAL STAY-IN-PLACE FORMS SHALL NOT BE WELDED TO BEAM OR GIRDER FLANGES IN THE ZONES REQUIRING CHARPY V-NOTCH TEST. SEE STRUCTURAL STEEL DETAIL SHEETS.

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

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

STRUCTURAL STEEL ERECTION IN A CONTINUOUS UNIT SHALL BE COMPLETE BEFORE FALSEWORK OR FORMS ARE PLACED ON THE UNIT.

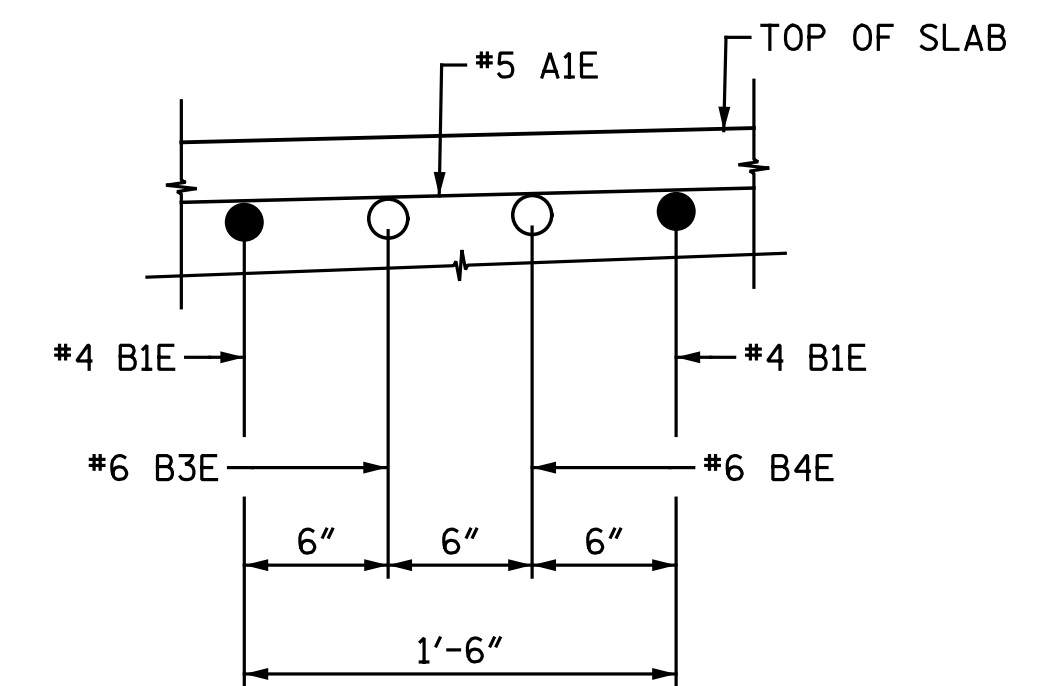
THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN METAL STAY-IN-PLACE FORM SUPPORTS OR FORMS AND BEAM/GIRDER STIFFENERS OR CONNECTOR PLATES. THE PROPOSAL SHALL BE INDICATED, AS APPROPRIATE, ON EITHER THE STEEL WORKING DRAWINGS OR THE METAL STAY-IN-PLACE FORM WORKING DRAWINGS.

DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE TOP AND BOTTOM SLAB REINFORCING STEEL.

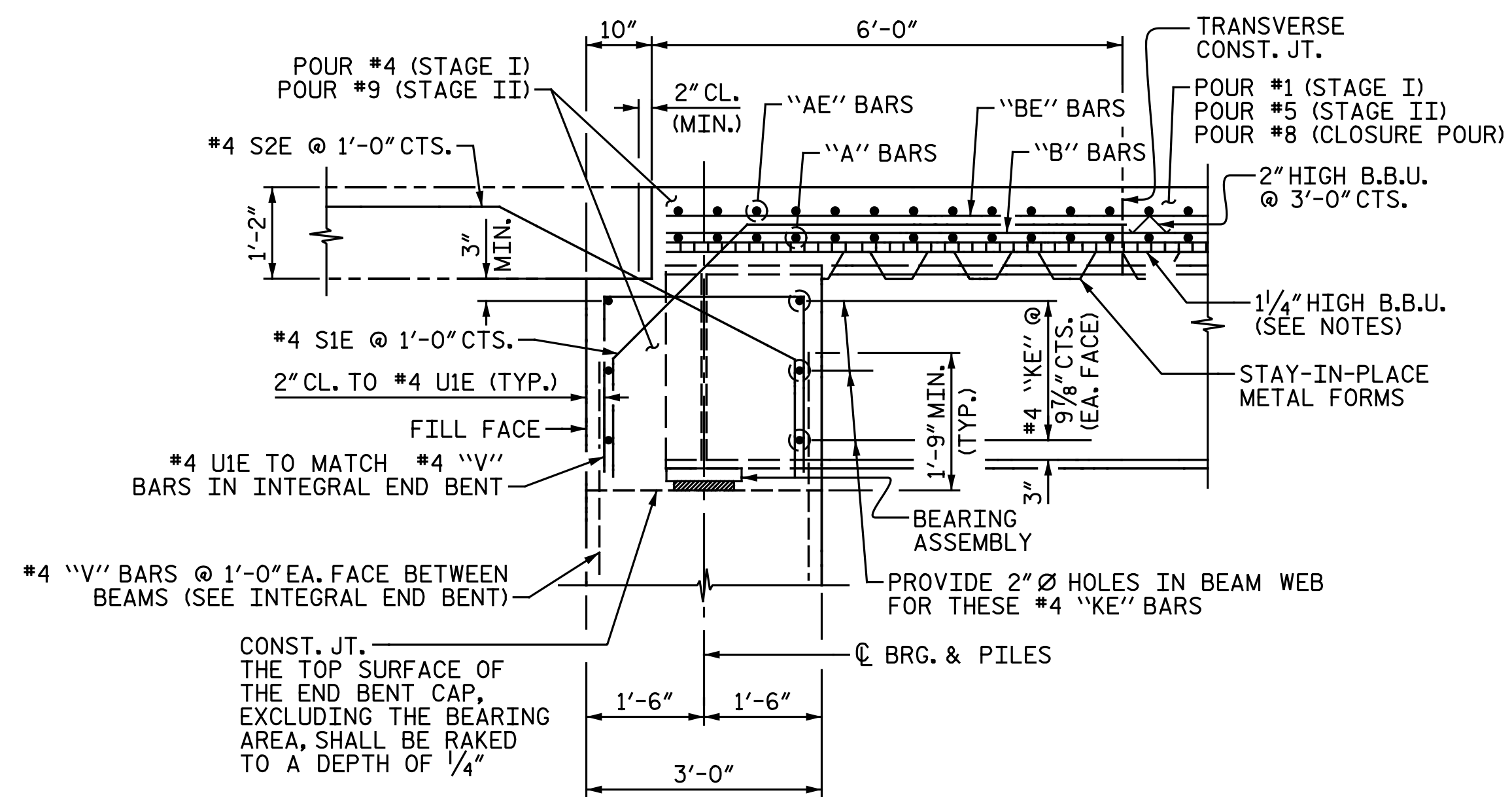
FOR CONCRETE BARRIER RAIL DETAILS, SEE "CONCRETE BARRIER RAIL" SHEET.

LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO FACILITATE INSTALLATION OF CONCRETE BARRIER RAIL REINFORCEMENT.

FOR WIDTH OF BLOCKOUT AND DISTANCE FROM SURVEY LINE TO EDGES OF BLOCKOUT, SEE "BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT" SHEET.



DETAIL "A"



END OF BEAM DETAIL AT
INTEGRAL END BENT
(END BENT 1 SHOWN, END BENT 2 SIMILAR)

PROJECT NO. U-3330

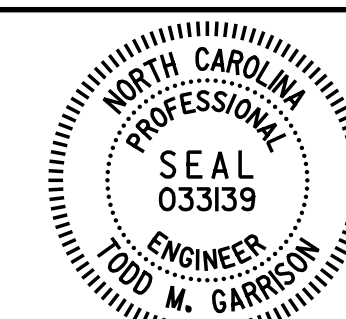
NASH COUNTY

STATION: 61+03.00 -L-

SHEET 1 OF 4

DRAWN BY: M.D.M. / C.E.M. DATE: 12-13-16
CHECKED BY: J.M. GARRISON DATE: 12-14-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



DocuSigned by:
Todd M. Garrison
61EAF7523943466
2/3/2017

Michael Baker
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
TYPICAL SECTIONS

STAGE I

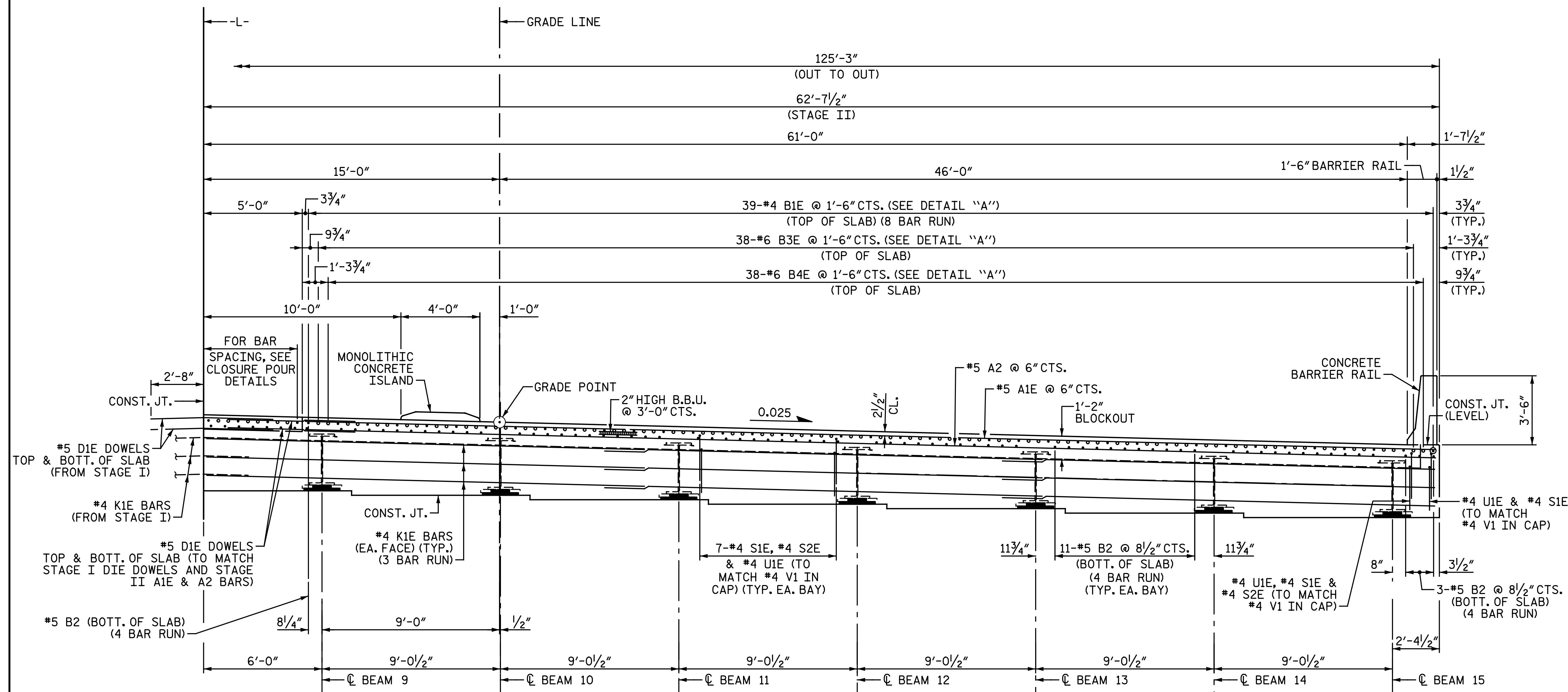
REVISIONS						SHEET NO. S3-7
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 42
2			4			

NOTES:

FOR DETAIL "A", SEE "TYPICAL SECTIONS STAGE I" SHEET 1 OF 4.

FOR CLOSURE POUR DETAILS, SEE "TYPICAL SECTIONS STAGE II" SHEET 4 OF 4.

FOR WIDTH OF BLOCKOUT AND DISTANCE FROM SURVEY LINE TO EDGES OF BLOCKOUT, SEE "BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT" SHEET.



TYPICAL SECTION AT INTEGRAL END BENT - STAGE II
(END BENT 1 SHOWN, END BENT 2 SIMILAR)


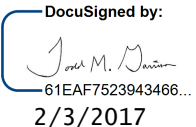
PROJECT NO. U-3330

NASH COUNTY

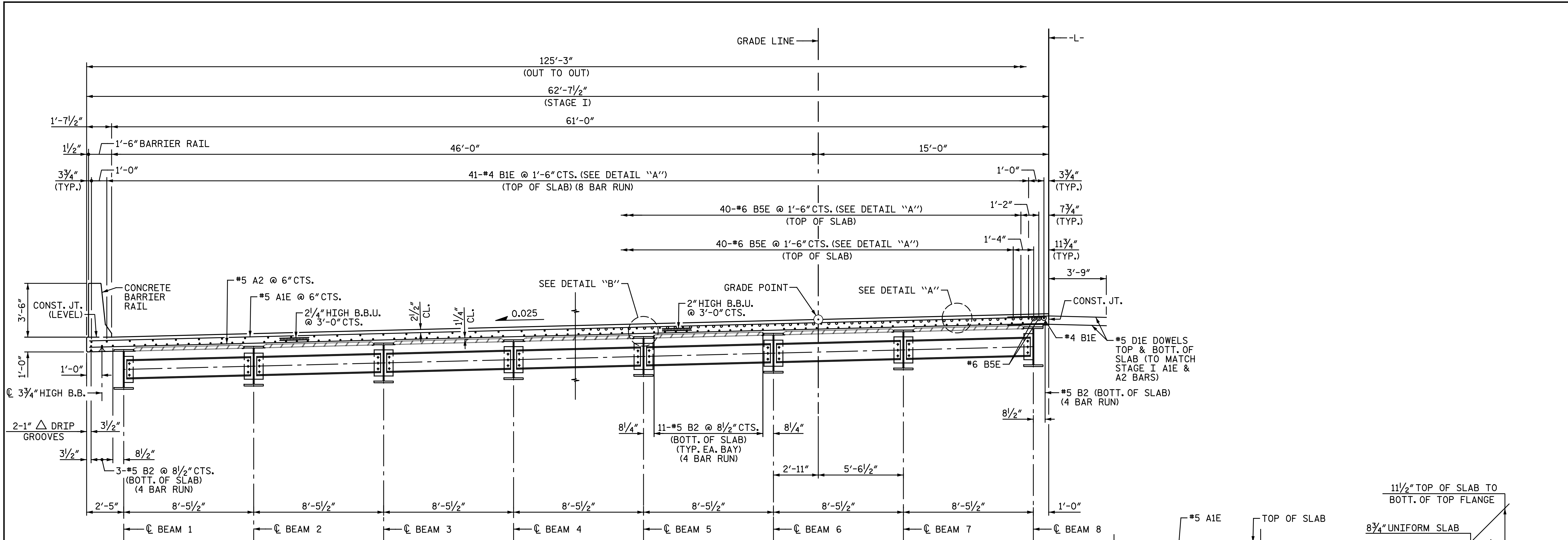
STATION: 61+03.00 -L-

SHEET 2 OF 4

DRAWN BY : M.D.M. / C.E.M. DATE : 12-13-16
CHECKED BY : J. M. GARRISON DATE : 12-14-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	 DocuSigned by:  2/3/2017		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE TYPICAL SECTIONS STAGE II		SHEET NO. S3-8 TOTAL SHEETS 42		
	REVISIONS						
	NO.	BY:	DATE:	NO.		BY:	DATE:
	1			3			
2			4				

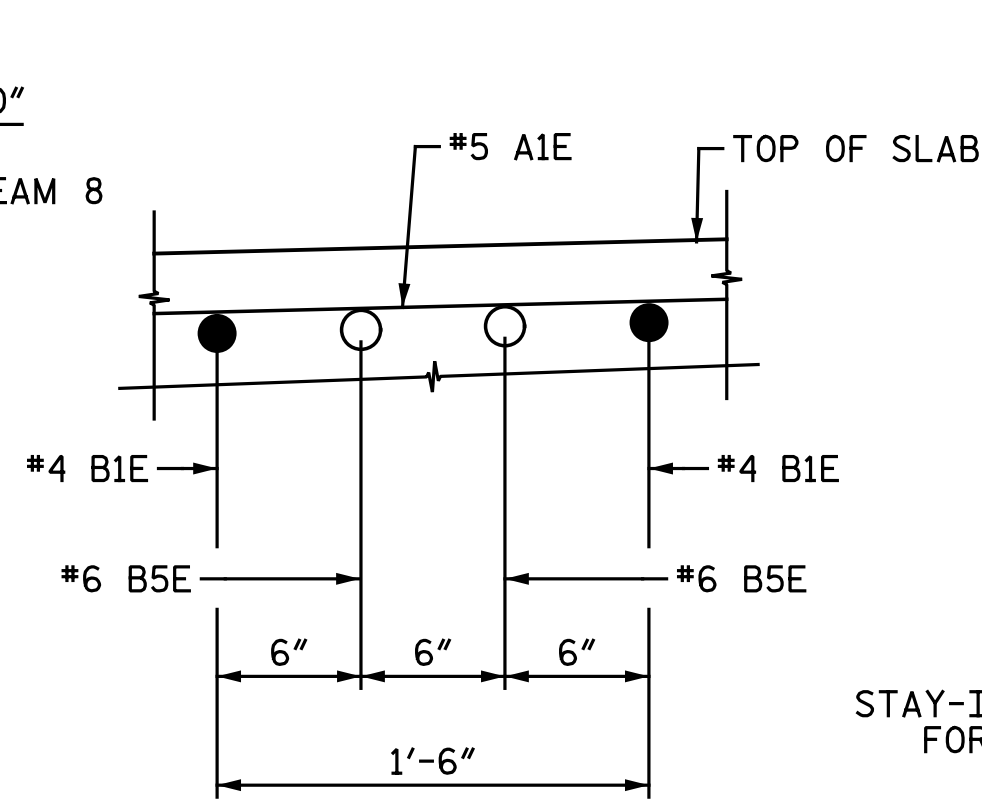
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 NC License No.: F-1084



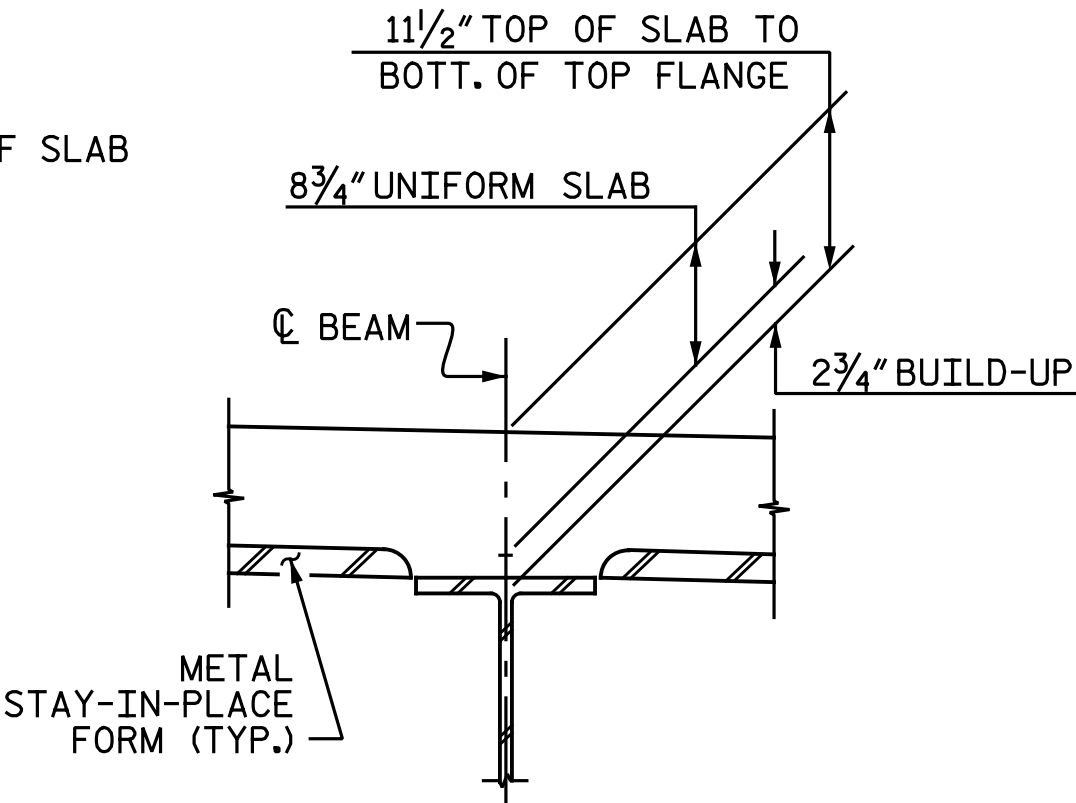
PARTIAL SECTION AT INTERMEDIATE DIAPHRAGM

PARTIAL SECTION AT BENT DIAPHRAGM

TYPICAL SECTION - STAGE I




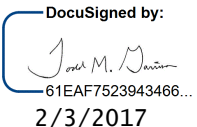
DETAIL "A"



DETAIL "B"

PROJECT NO. U-3330
 NASH COUNTY
 STATION: 61+03.00 -L-
 SHEET 3 OF 4

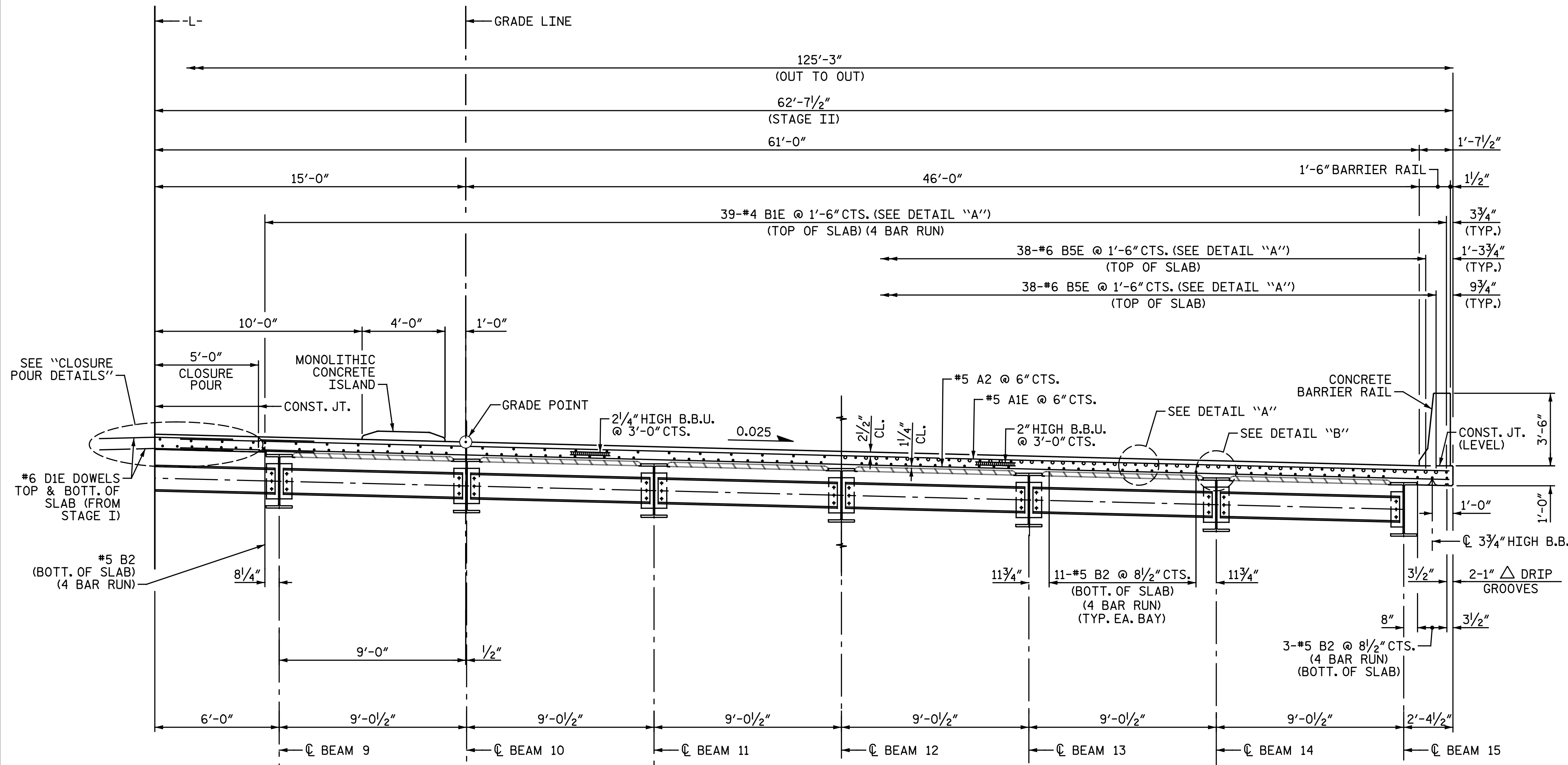
DRAWN BY : C. E. MAYHEW DATE : 12-13-16
 CHECKED BY : J. M. GARRISON DATE : 12-15-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	 DocuSigned by:  2/3/2017		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE TYPICAL SECTIONS STAGE I			
	REVISIONS					
	NO.	BY:	DATE:	NO.	BY:	DATE:
	1			3		
2			4			
			SHEET NO. S3-9		TOTAL SHEETS 42	

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NOTES:

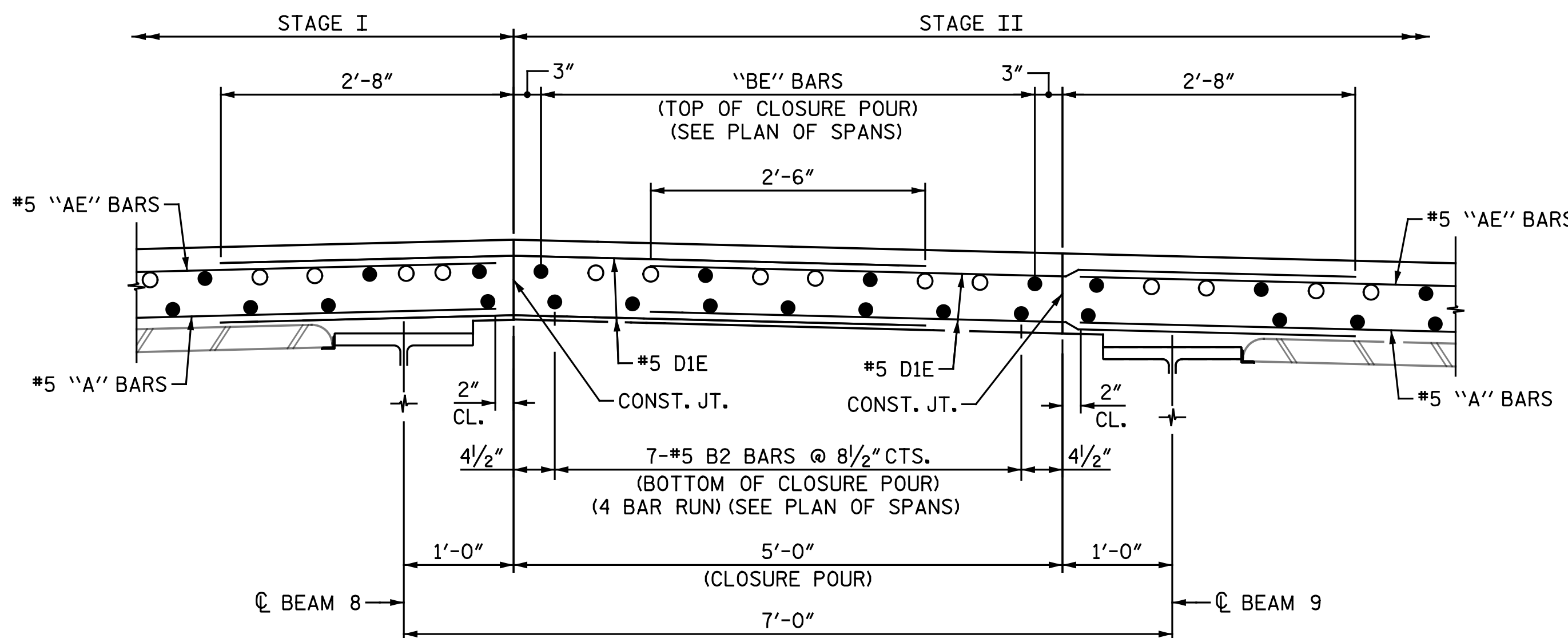
FOR DETAIL "A", SEE "TYPICAL SECTIONS STAGE I", SHEET 3 OF 4.
 FOR DETAIL "B", SEE "TYPICAL SECTIONS STAGE I", SHEET 3 OF 4.



PARTIAL SECTION AT INTERMEDIATE DIAPHRAGM

PARTIAL SECTION AT BENT DIAPHRAGM


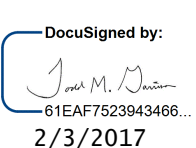

TYPICAL SECTION - STAGE II

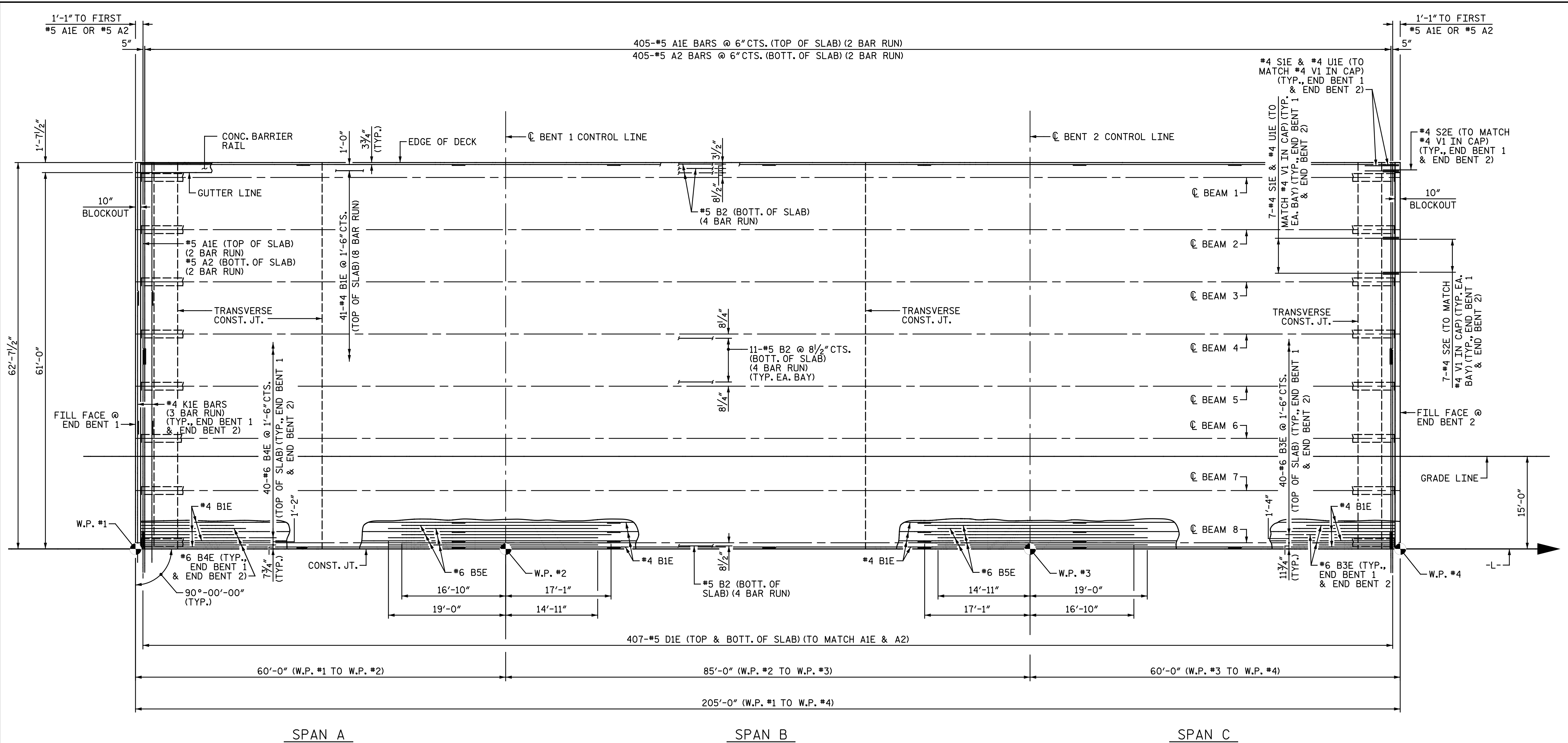


CLOSURE POUR DETAILS

PROJECT NO. U-3330
NASH COUNTY
 STATION: 61+03.00 -L-
 SHEET 4 OF 4

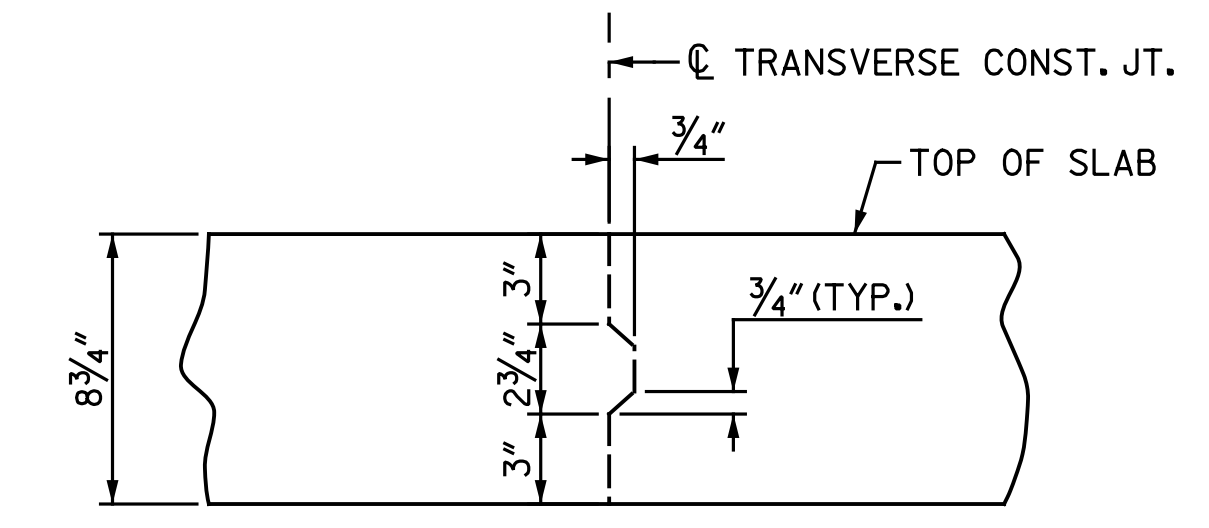
DRAWN BY : C. E. MAYHEW DATE : 12-14-16
 CHECKED BY : J. M. GARRISON DATE : 12-15-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	 DocuSigned by:  61EAF7523943466... 2/3/2017		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE TYPICAL SECTIONS STAGE II		SHEET NO. S3-10		
	REVISIONS				TOTAL SHEETS 42		
	NO.	BY:	DATE:	NO.		BY:	DATE:
	1			3			
2			4				
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PLAN OF SPANS

PROJECT NO. U-3330
 NASH COUNTY
 STATION: 61+03.00 -L-
 SHEET 1 OF 2

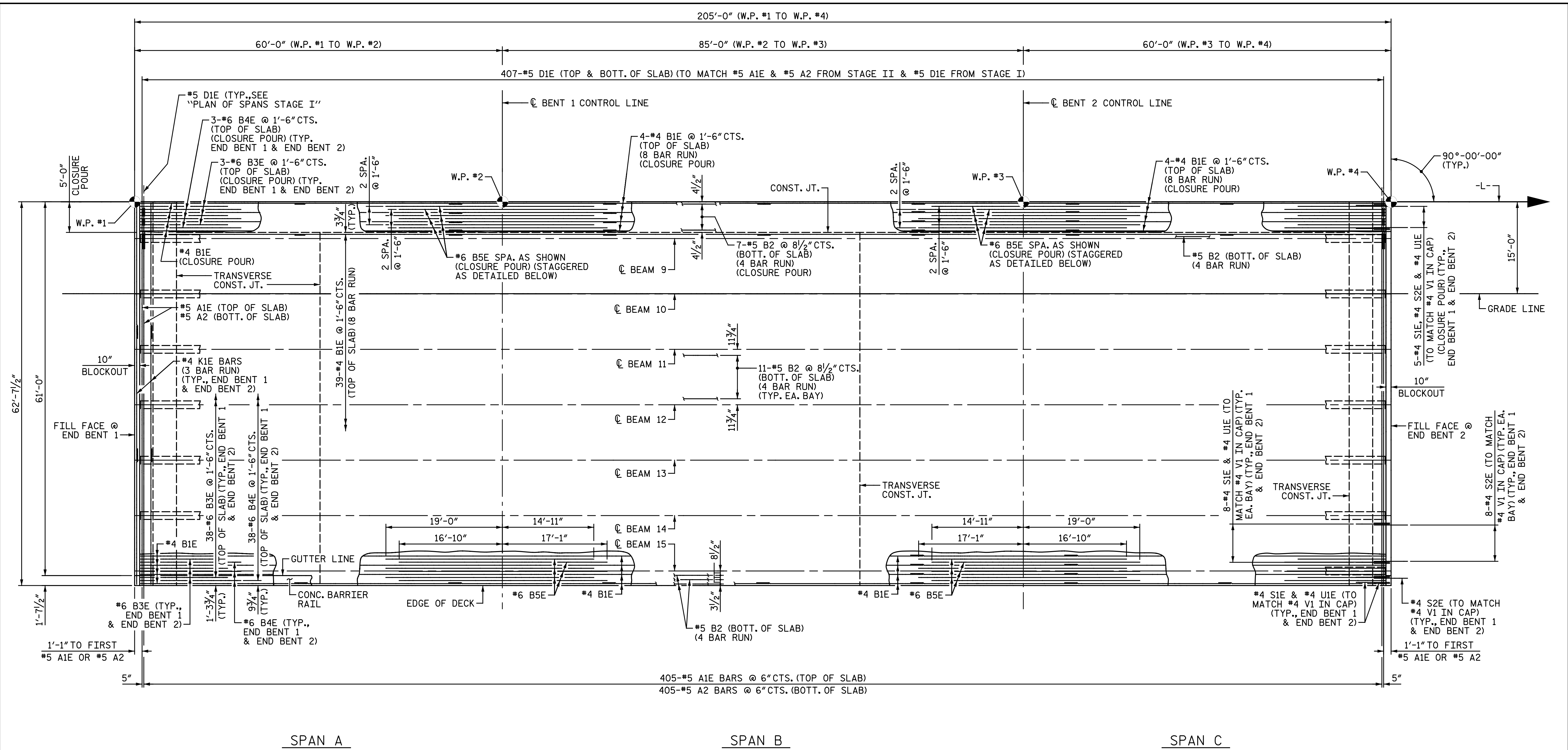


TRANSVERSE CONST. JT. DETAIL
 REINFORCING STEEL IN SLAB NOT SHOWN, LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THRU JOINT.

NOTES:
 FOR REINFORCING STEEL IN CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEET.
 FOR DECK POURING SEQUENCE, LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, AND MINIMUM SPLICE LENGTHS, SEE "BILL OF MATERIAL" SHEET.

DRAWN BY : M. D. MAYHEW DATE : 11-22-16
 CHECKED BY : J. M. GARRISON DATE : 12-13-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE PLAN OF SPANS STAGE I		SHEET NO. S3-II TOTAL SHEETS 42		
			REVISIONS				
	NO.	BY:	DATE:	NO.		BY:	DATE:
	1			3			
2			4				



405-#5 A1E BARS @ 6" CTS. (TOP OF SLAB)
 405-#5 A2 BARS @ 6" CTS. (BOTT. OF SLAB)

SPAN A

SPAN B

SPAN C

PLAN OF SPANS

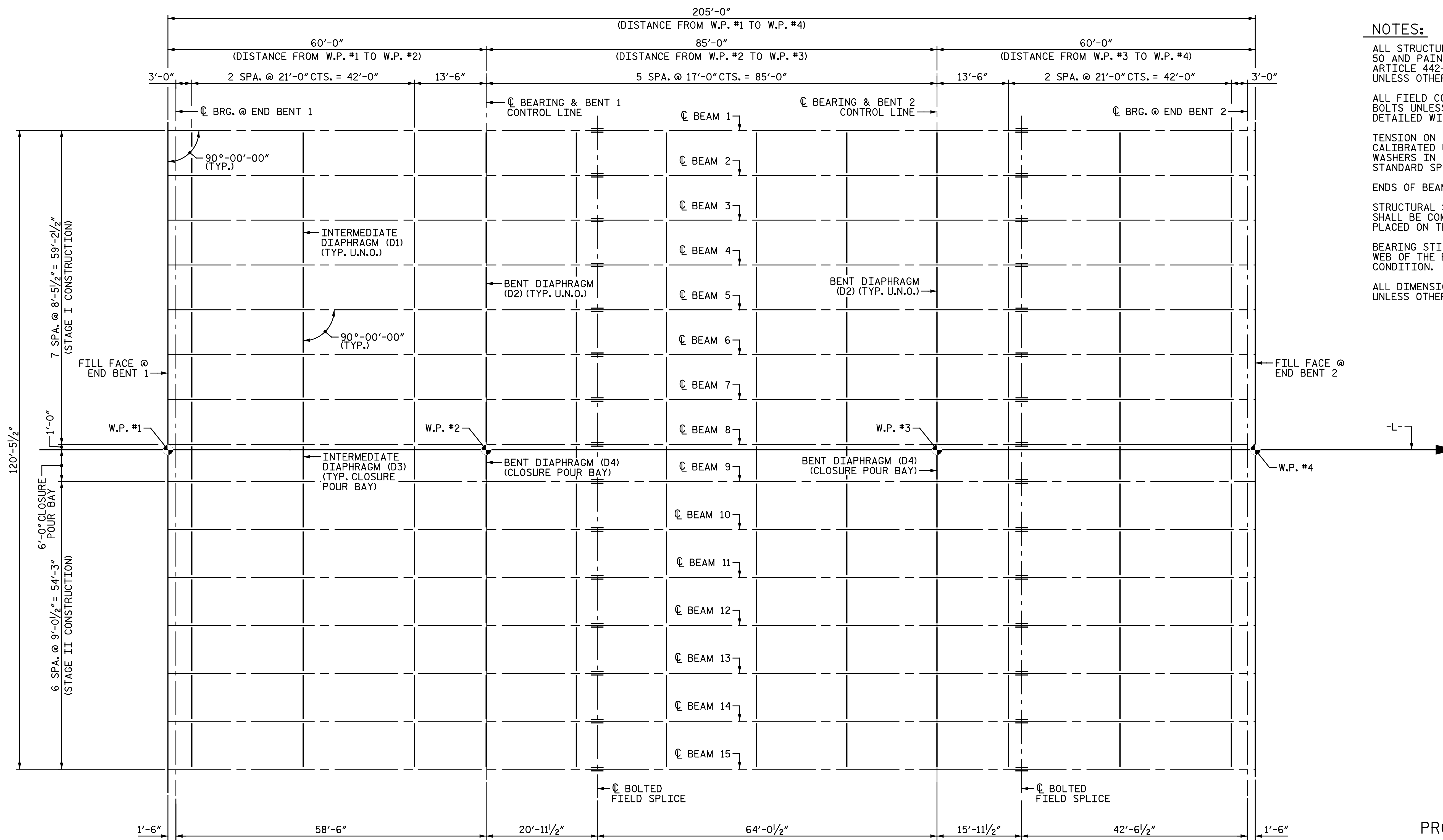
NOTES:
 FOR TRANSVERSE CONSTRUCTION JOINT DETAIL, SEE "PLAN OF SPANS STAGE I" SHEET 1 OF 2.
 FOR NOTES, SEE "PLAN OF SPANS STAGE I" SHEET 1 OF 2.

PROJECT NO. U-3330
NASH COUNTY
 STATION: 61+03.00 -L-
 SHEET 2 OF 2

DRAWN BY: M. D. MAYHEW DATE: 12-09-16
 CHECKED BY: J. M. GARRISON DATE: 12-13-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE PLAN OF SPANS STAGE II		SHEET NO. S3-12 TOTAL SHEETS 42
	REVISIONS				
	NO.	BY:	DATE:	NO.	
1			3		
2			4		

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NOTES:

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50 AND PAINTED IN ACCORDANCE WITH SYSTEM 1 OF ARTICLE 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

ALL FIELD CONNECTIONS TO BE 7/8" DIA. HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED. BOLTS SHALL BE DETAILED WITH THREADS EXCLUDED FROM SHEAR PLANE.

TENSION ON THE ASTM A325 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-8 OF THE STANDARD SPECIFICATIONS.

ENDS OF BEAMS SHALL BE PLUMB.

STRUCTURAL STEEL ERECTION IN A CONTINUOUS UNIT SHALL BE COMPLETE BEFORE FALSEWORK OR FORMS ARE PLACED ON THE UNIT.

BEARING STIFFENERS ARE TO BE PLACED NORMAL TO THE WEB OF THE BEAM AND SHALL BE PLUMB IN THE FINAL CONDITION.

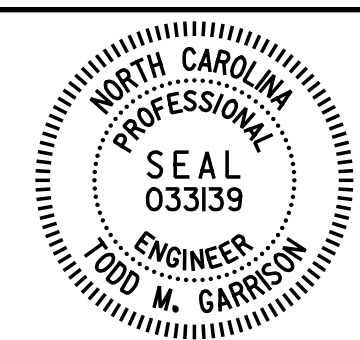
ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL, UNLESS OTHERWISE NOTED.

FRAMING PLAN
(U.N.O. - DENOTES "UNLESS NOTED OTHERWISE")

PROJECT NO. U-3330
NASH COUNTY
STATION: 61+03.00 -L-

DRAWN BY: M. D. MAYHEW DATE: 12-1-16
CHECKED BY: A. H. SHARPE DATE: 12-12-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

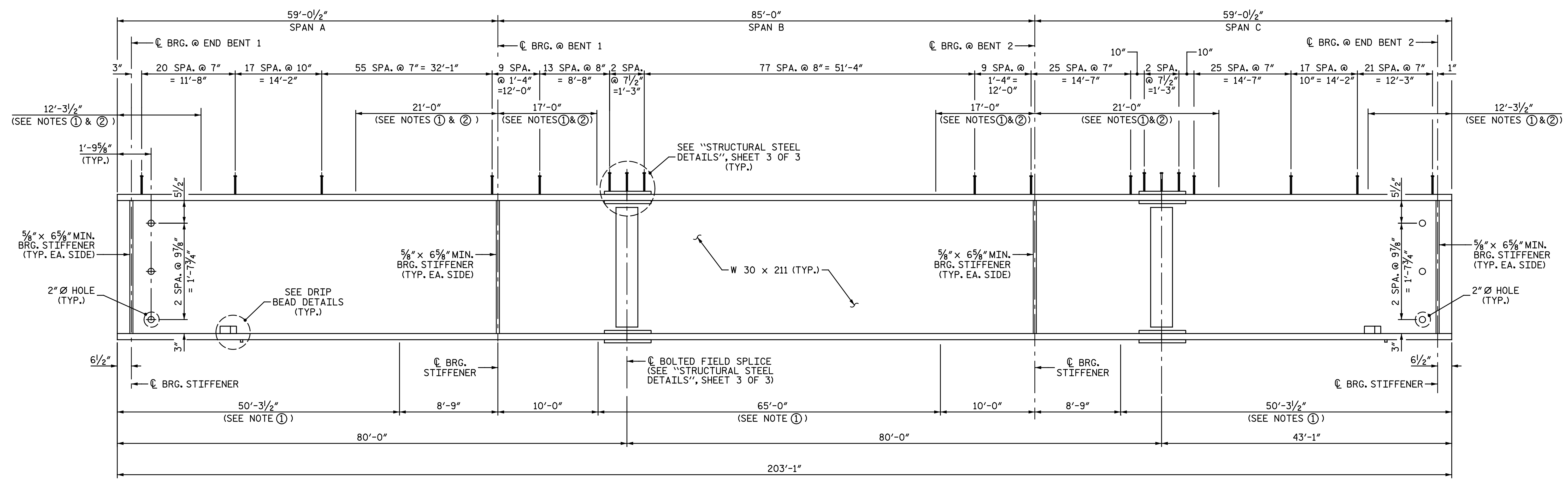


DocuSigned by:
Todd M. Garrison
61EAF7523943466
2/3/2017

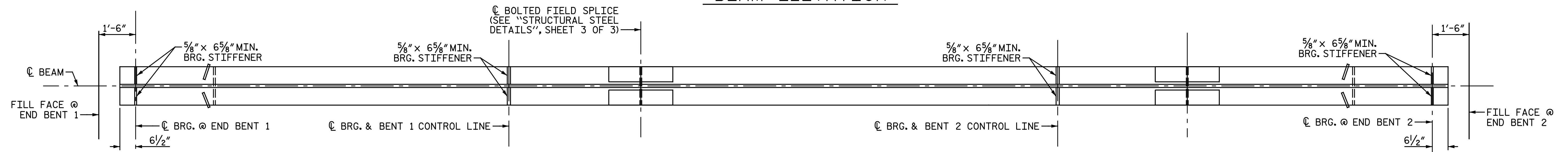
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
FRAMING PLAN

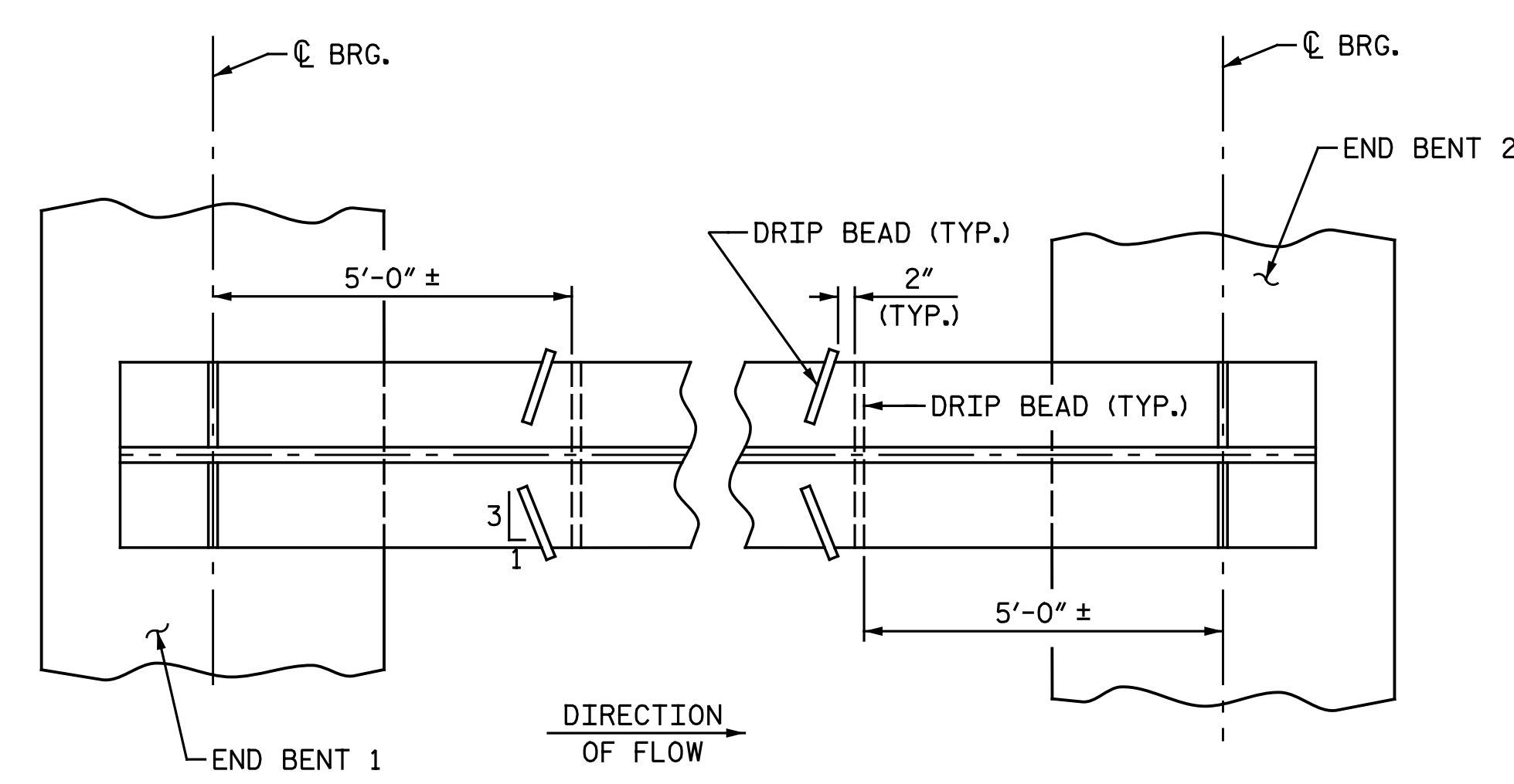
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-13
1			3			TOTAL SHEETS
2			4			42



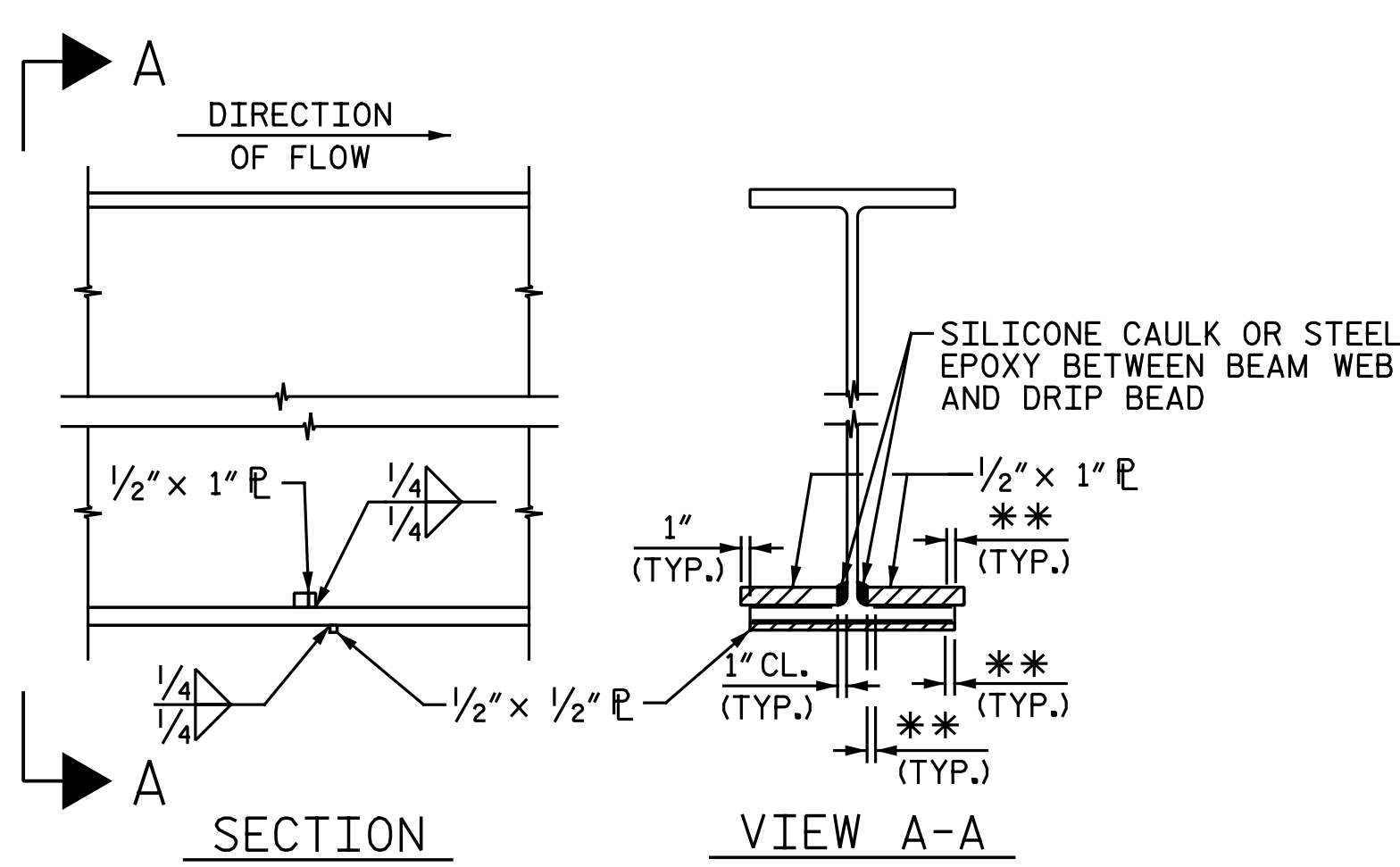
BEAM ELEVATION



BOTTOM FLANGE DETAILS



PART PLAN - BOTTOM FLANGE



SECTION

VIEW A-A

DRIP BEAD DETAILS

NOTES:

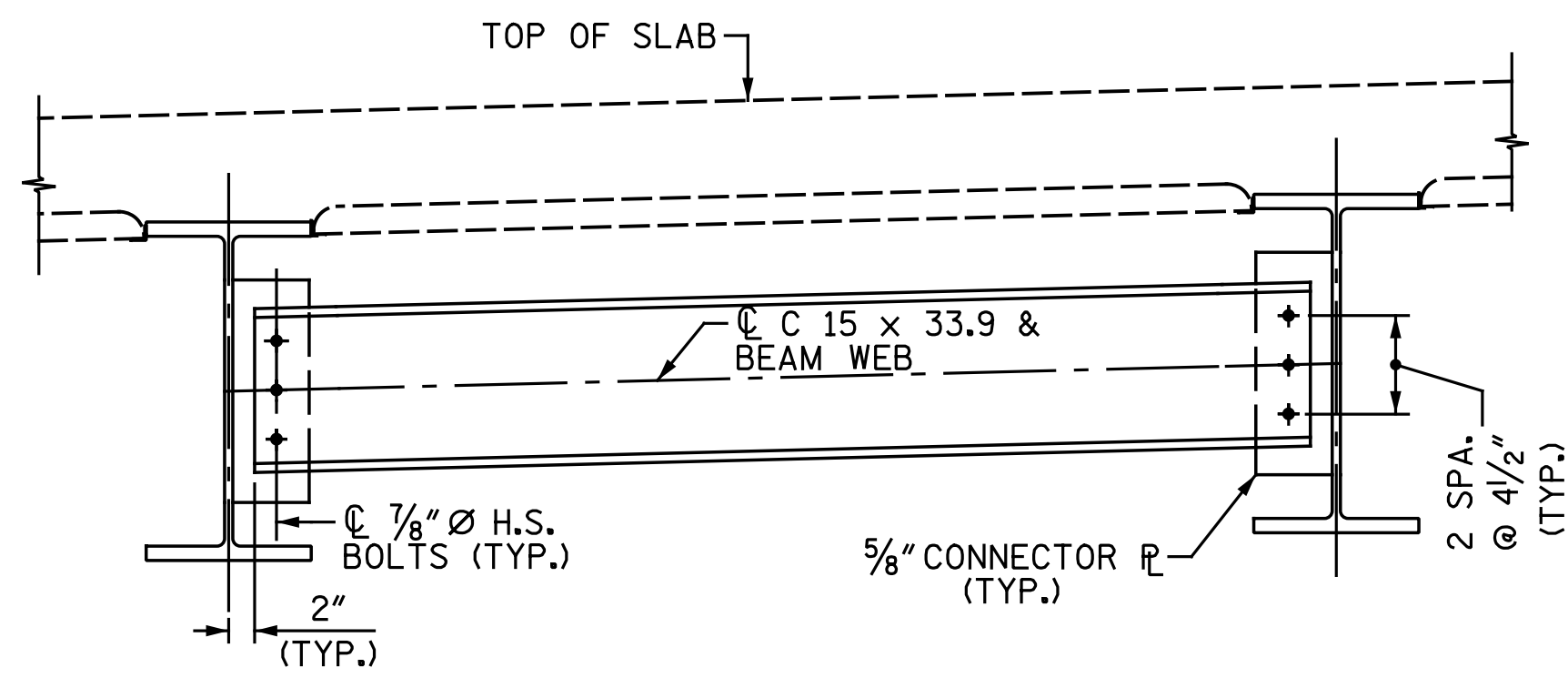
- ① CHARPY V-NOTCH TESTS ARE REQUIRED FOR ALL TOP OR BOTTOM FLANGES WHICH FALL WITHIN THESE LIMITS, ALL WEBS AND ALL SPLICE PLATES. FOR CHARPY V-NOTCH TESTS, SEE ARTICLE 1072-7 OF THE STANDARD SPECIFICATIONS.
 - ② NO WELDING OF FORMS OR FALSEWORK TO THE TOP FLANGE WILL BE PERMITTED IN THIS REGION.
- FOR SHEAR CONNECTOR TRANSVERSE SPACING, SEE "STRUCTURAL STEEL DETAILS", SHEET 3 OF 3.

PROJECT NO. U-3330
NASH COUNTY
 STATION: 61+03.00 -L-
 SHEET 1 OF 3

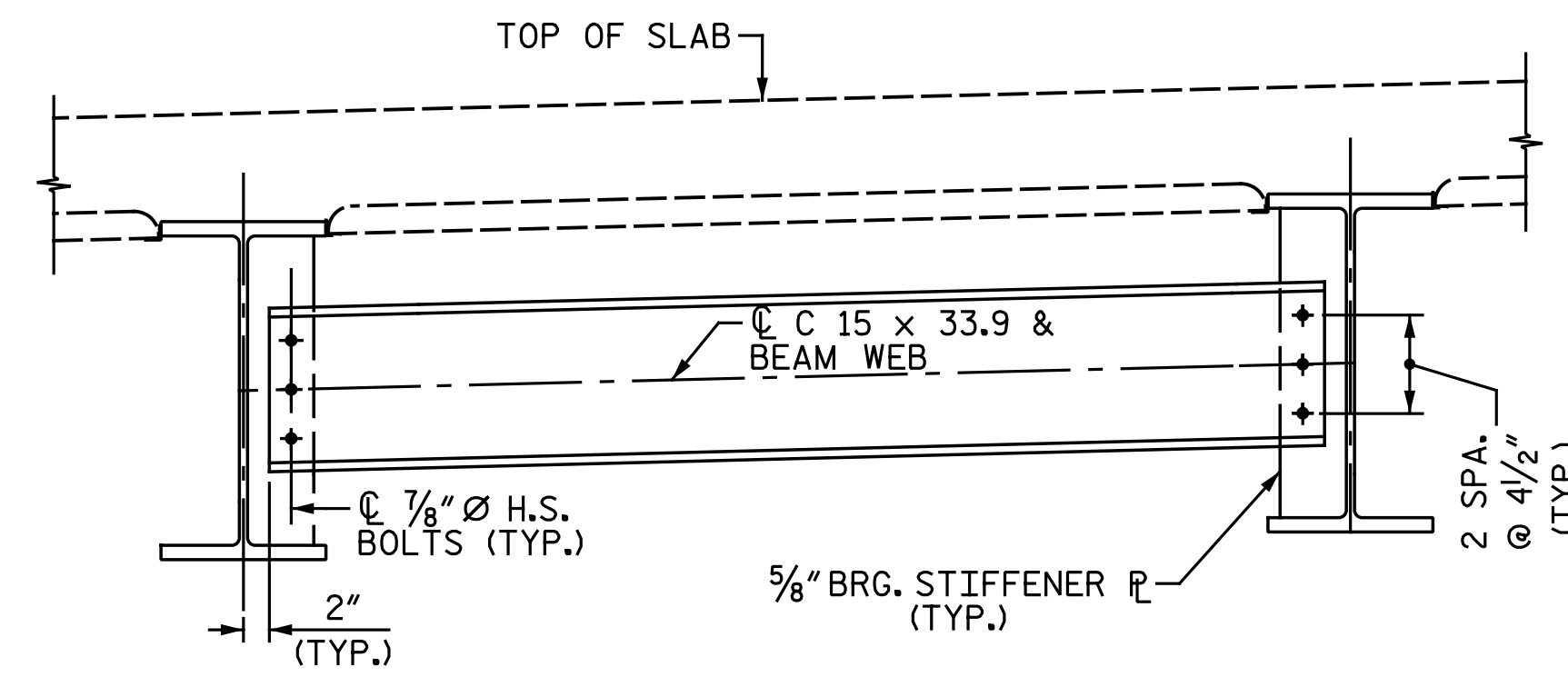
DRAWN BY : M. D. M. / N. B. S. DATE : 9-27-16
 CHECKED BY : J. M. GARRISON DATE : 10-12-16

** SEE "WELD TERMINATION DETAILS" ON "STRUCTURAL STEEL DETAILS", SHEET 2 OF 3.

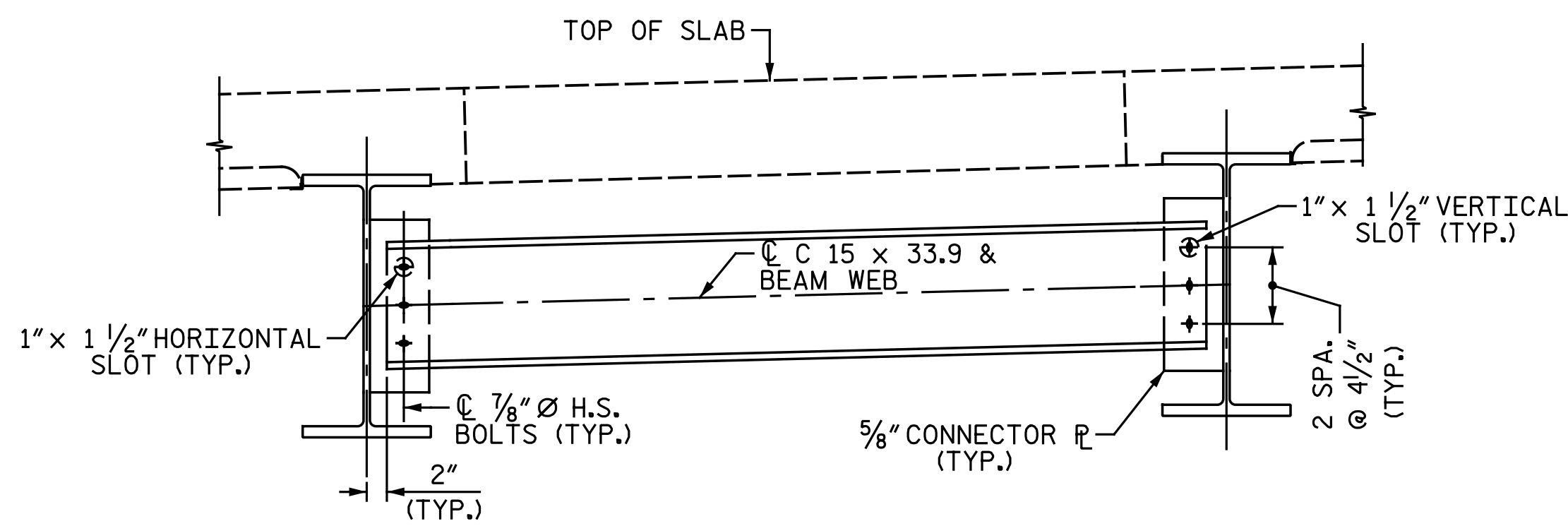
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH		SHEET NO. S3-14 TOTAL SHEETS 42															
		SUPERSTRUCTURE																	
		STRUCTURAL STEEL DETAILS																	
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NO.	BY:	DATE:	NO.	BY:	DATE:														
1			3																
2			4																
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INTERMEDIATE DIAPHRAGM (D1)

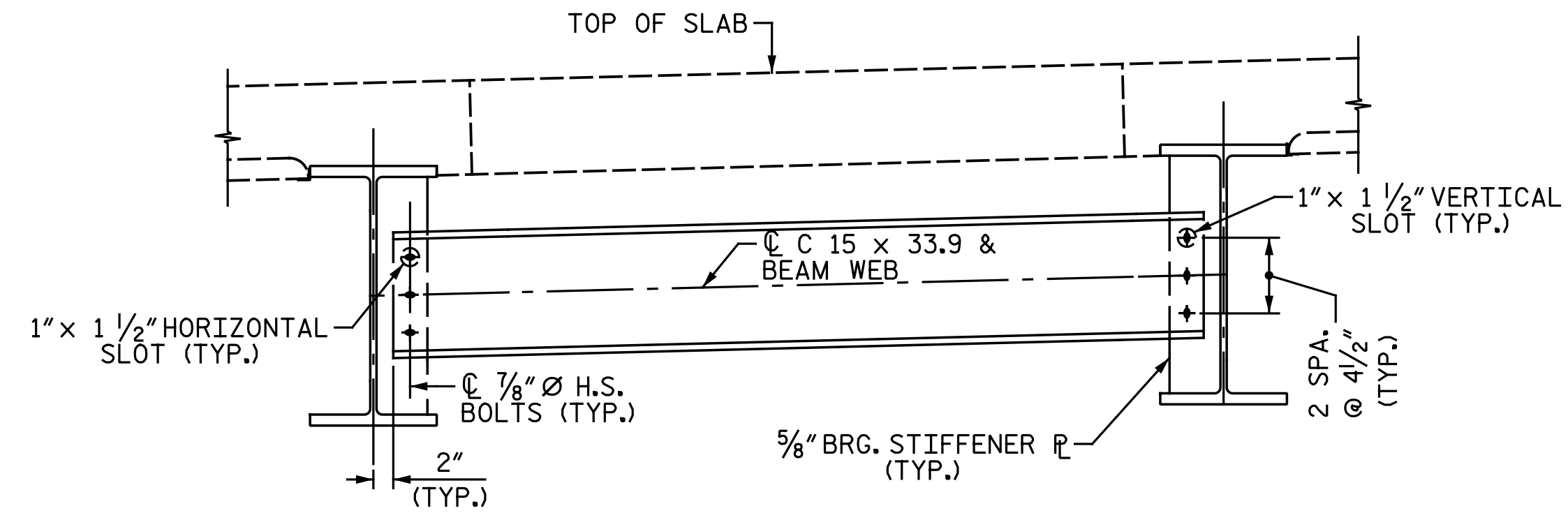


BENT DIAPHRAGM (D2)



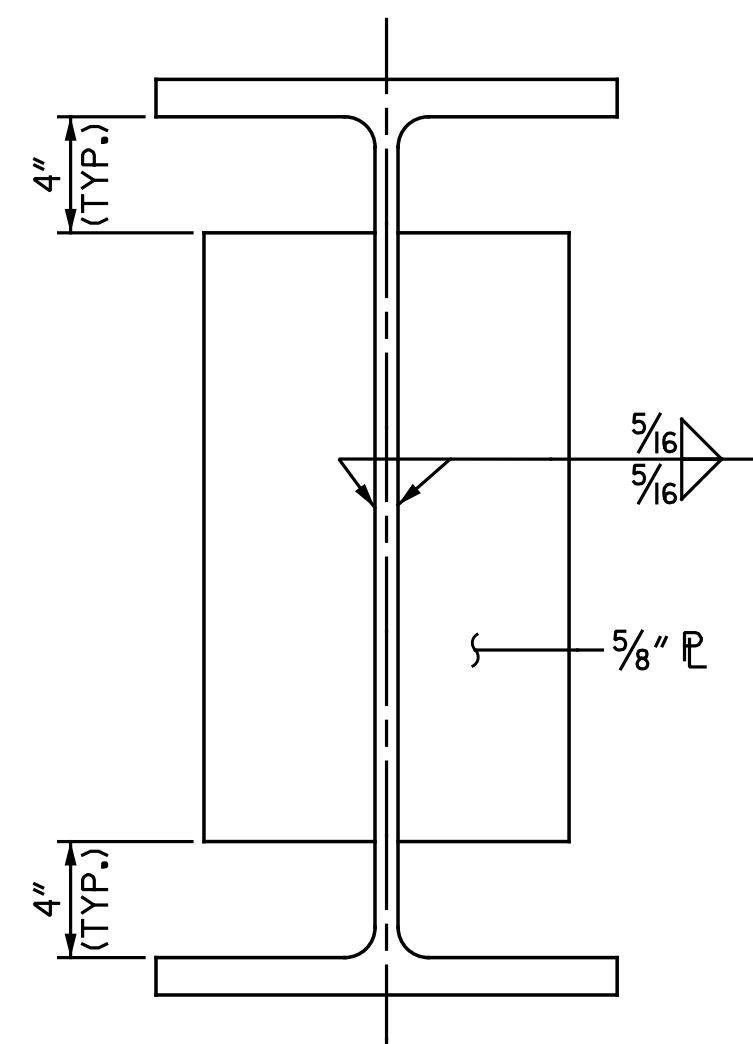
INTERMEDIATE DIAPHRAGM IN CLOSURE POUR BAY (D3)

NUTS ON BOLTS FOR CONNECTING DIAPHRAGM TO CONNECTOR PLATE SHALL BE LEFT LOOSE FOR PURPOSE OF ADJUSTMENT UNTIL BOTH SIDES OF SLAB HAVE BEEN POURED.

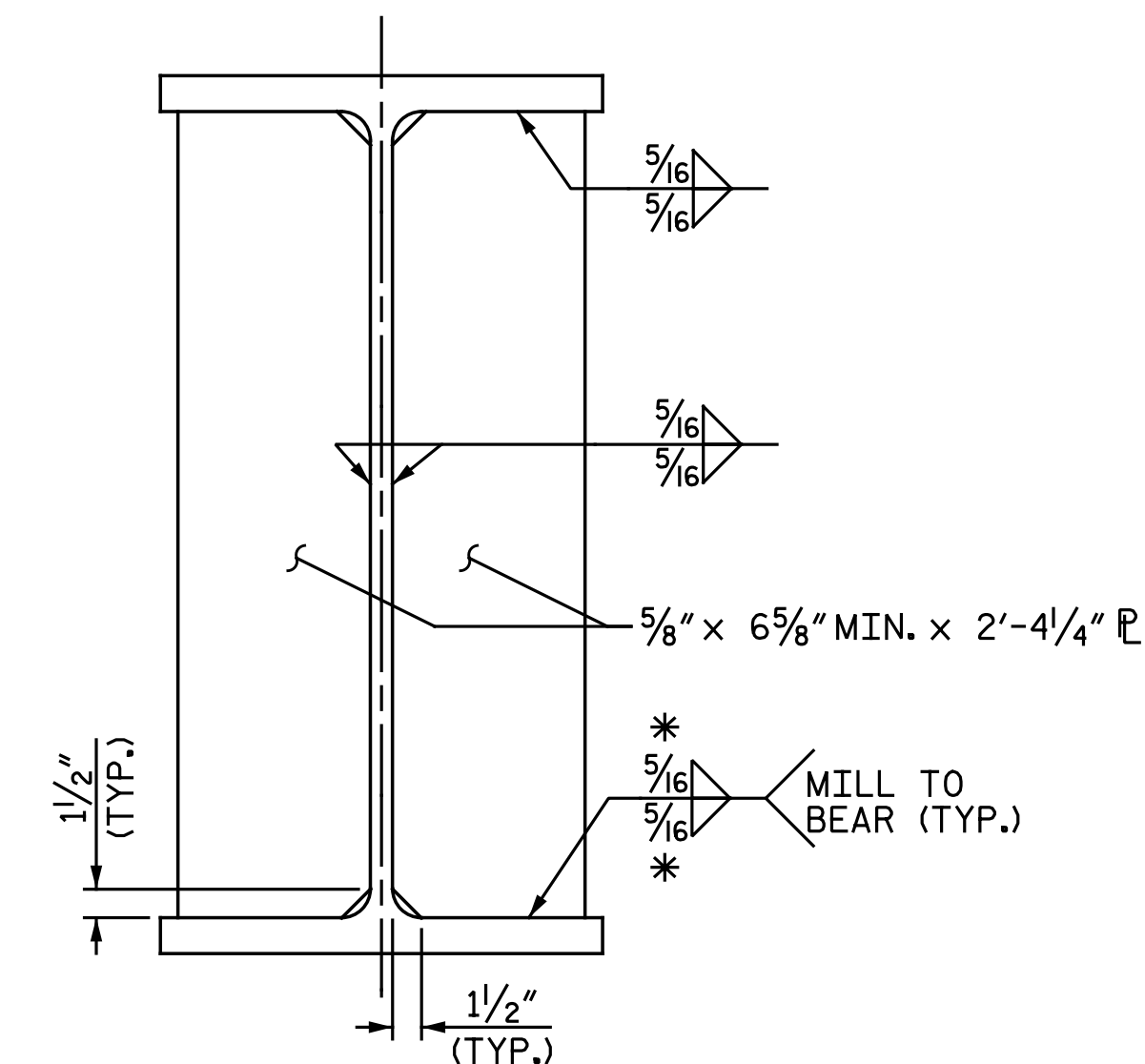


BENT DIAPHRAGM IN CLOSURE POUR BAY (D4)

NUTS ON BOLTS FOR CONNECTING DIAPHRAGM TO CONNECTOR PLATE SHALL BE LEFT LOOSE FOR PURPOSE OF ADJUSTMENT UNTIL BOTH SIDES OF SLAB HAVE BEEN POURED.



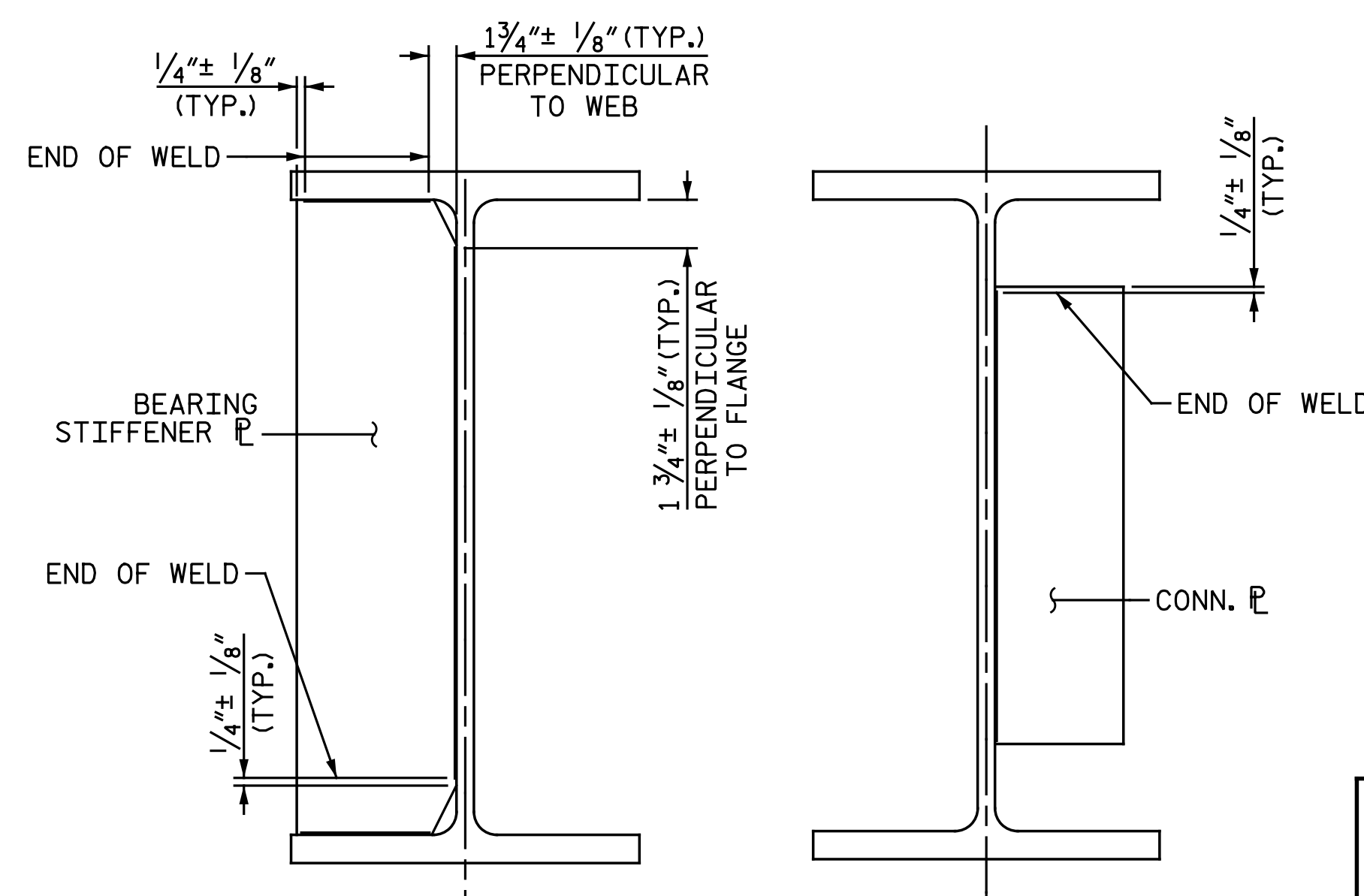
INTERMEDIATE DIAPHRAGM CONNECTOR PLATE



BEARING STIFFENER

BEARING STIFFENER MAY REQUIRE COPING IF WIDER THAN BOTTOM FLANGE.

* AT BENT 1 AND BENT 2, WELD BEARING STIFFENER TO BOTTOM FLANGE IF USED AS A CONNECTOR PLATE.

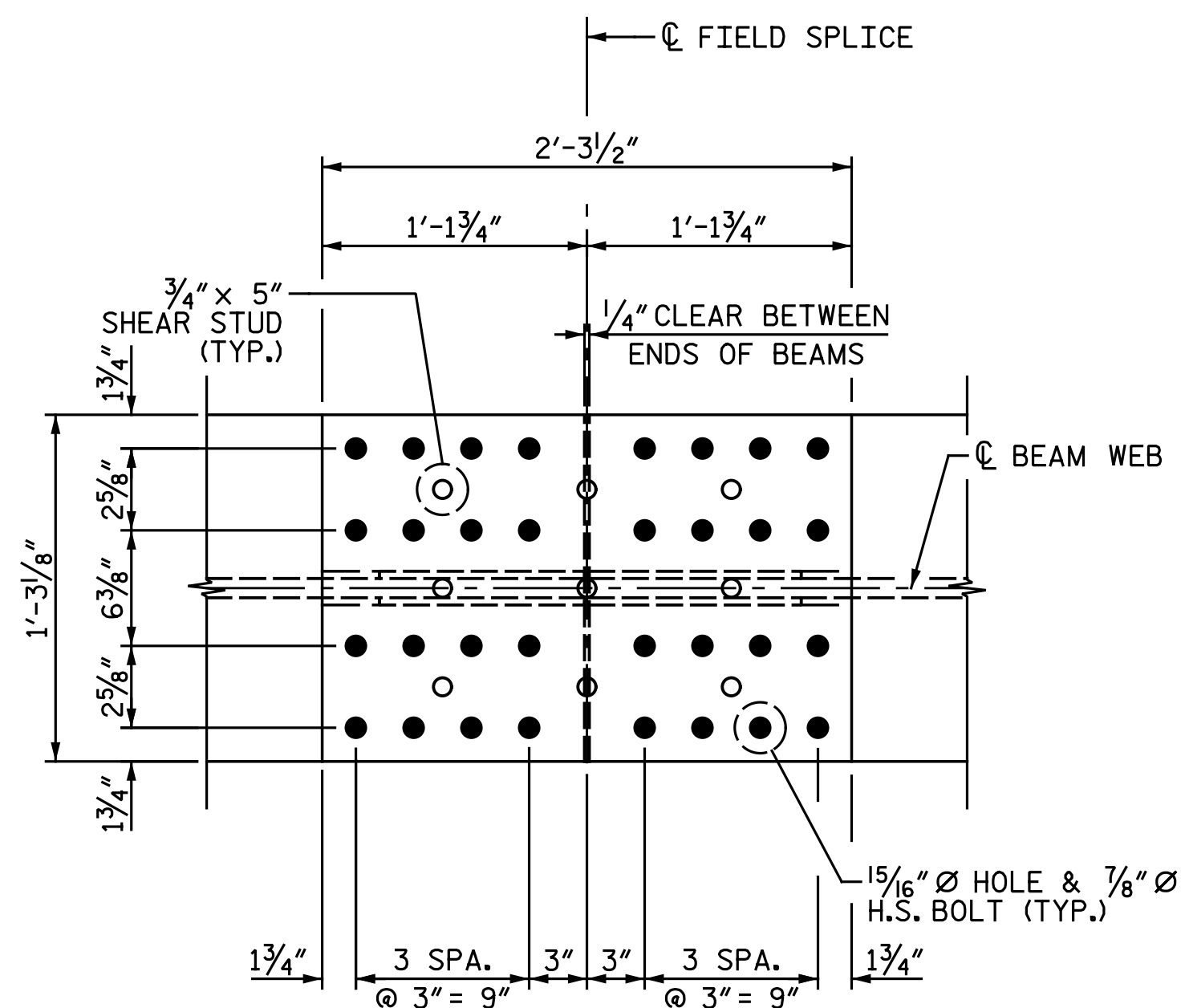


STIFFENER AND CONNECTOR PLATE CONNECTIONS WELD TERMINATION DETAILS

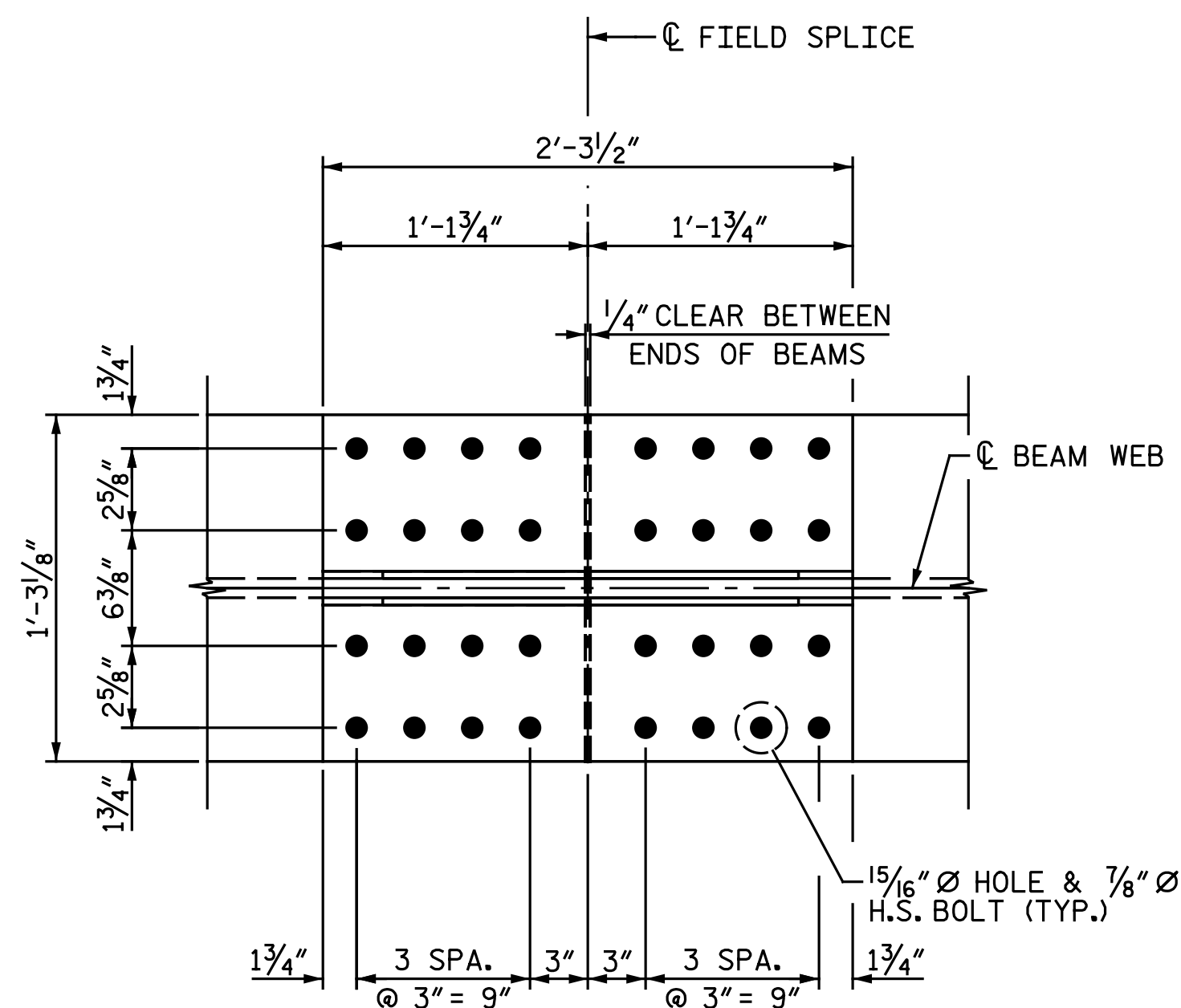
PROJECT NO. U-3330
 NASH COUNTY
 STATION: 61+03.00 -L-
 SHEET 2 OF 3

DRAWN BY : N. B. SPEAKS DATE : 10-10-16
 CHECKED BY : J. M. GARRISON DATE : 10-12-16

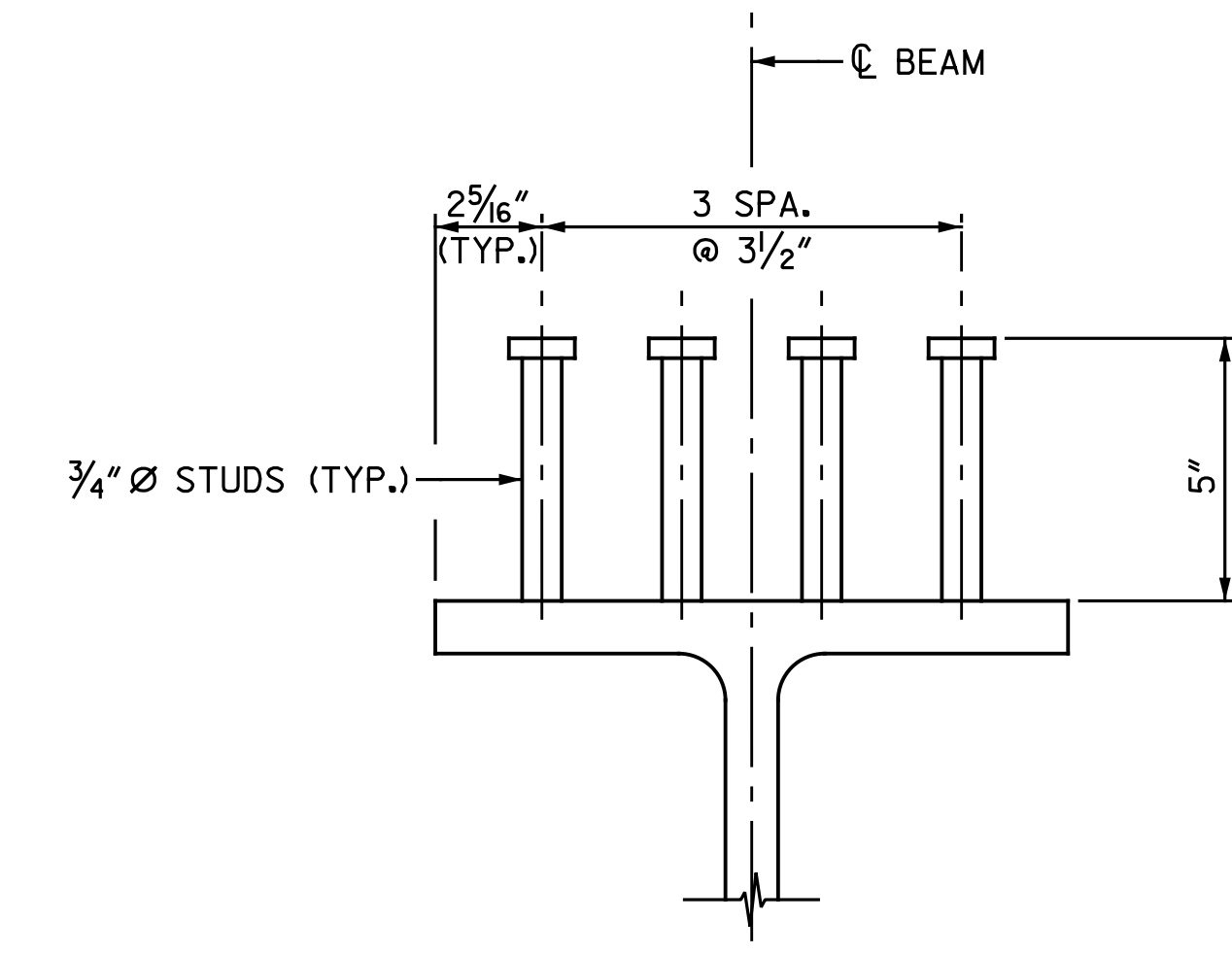
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE STRUCTURAL STEEL DETAILS	
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	REVISIONS NO. BY: DATE: NO. BY: DATE:		SHEET NO. S3-15 TOTAL SHEETS 42	



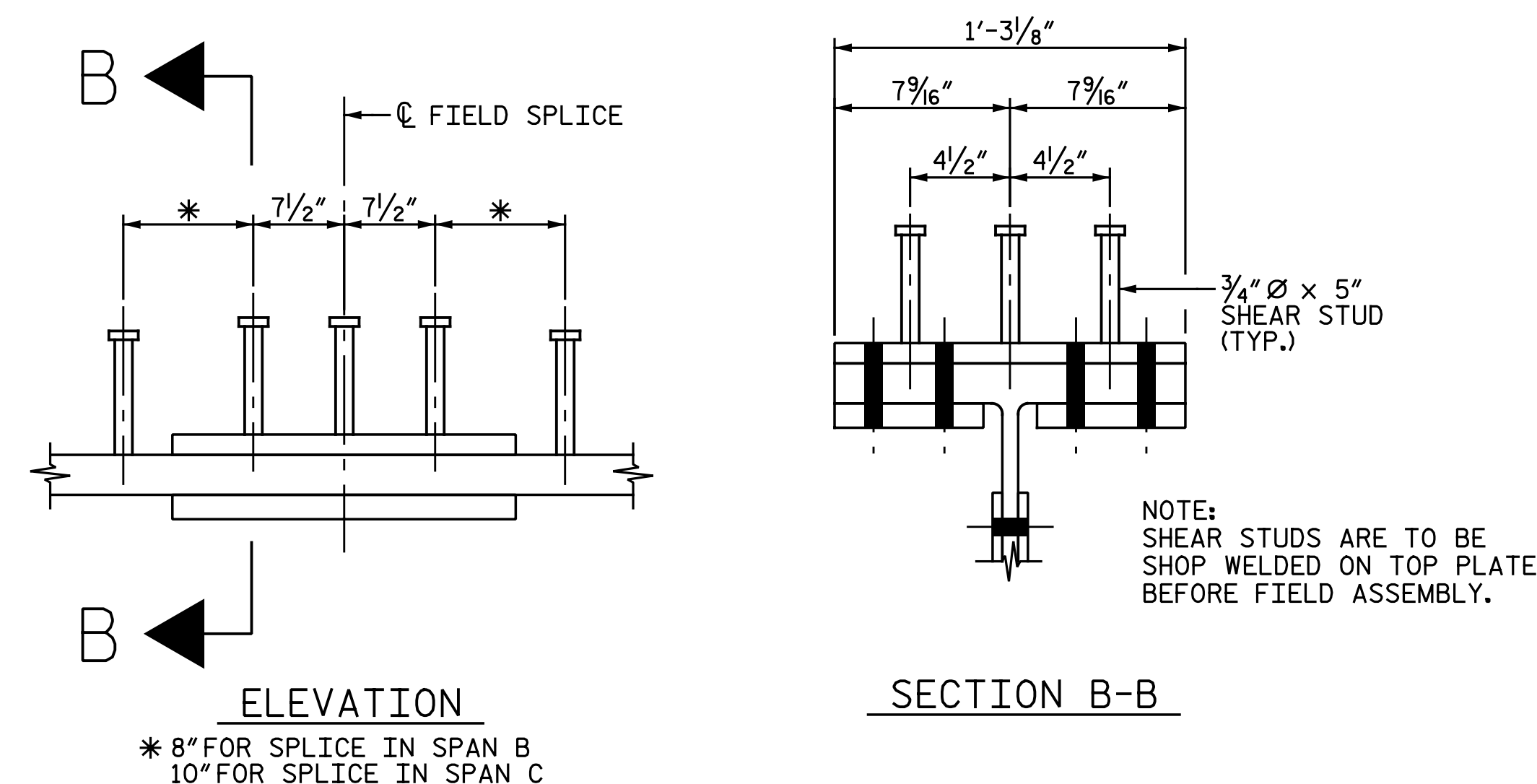
PLAN (TOP OF TOP FLANGE)



PLAN (TOP OF BOTTOM FLANGE)

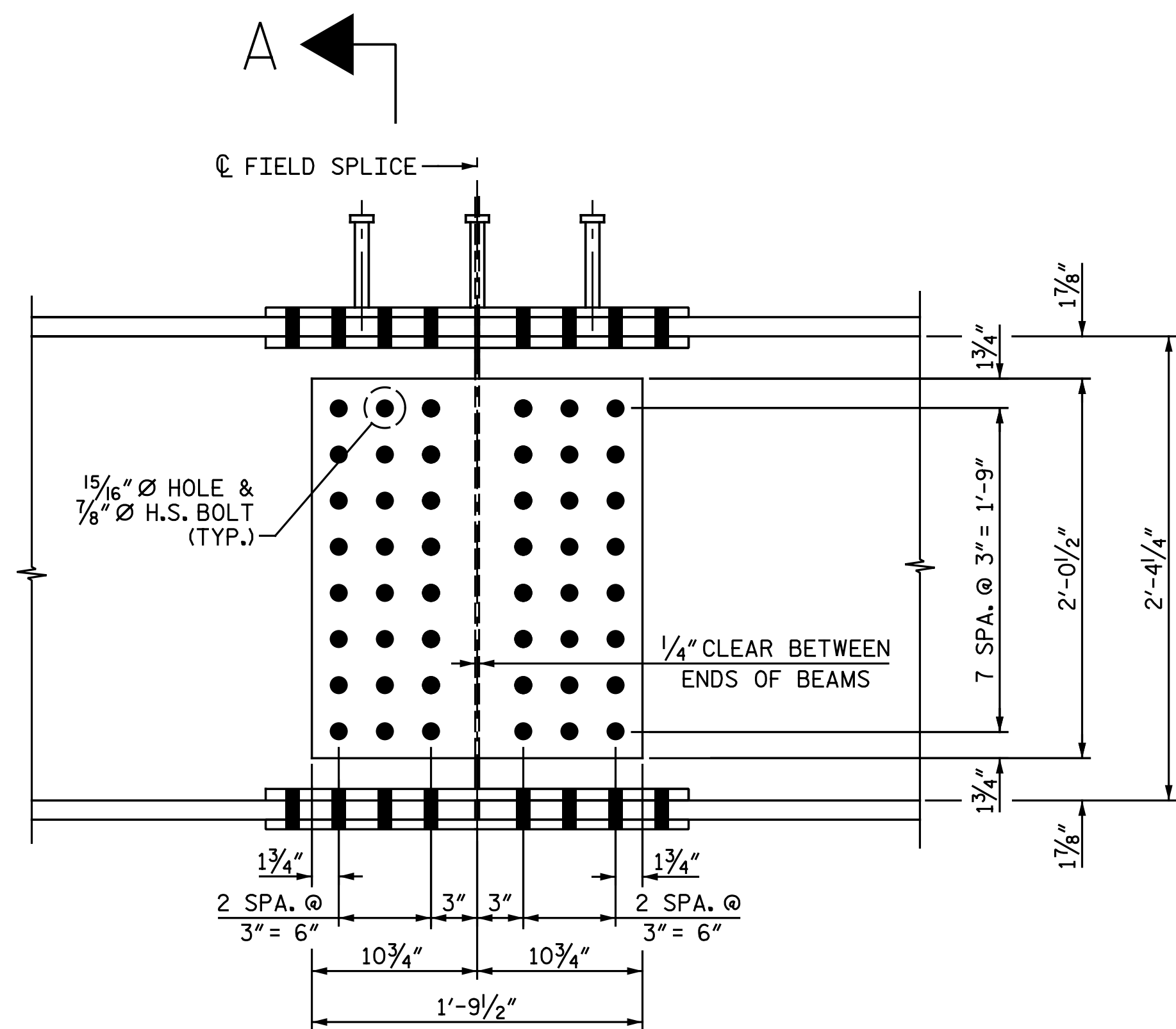


BEAM SHEAR CONNECTORS
(EXCEPT AT BOLTED FIELD SPLICES)

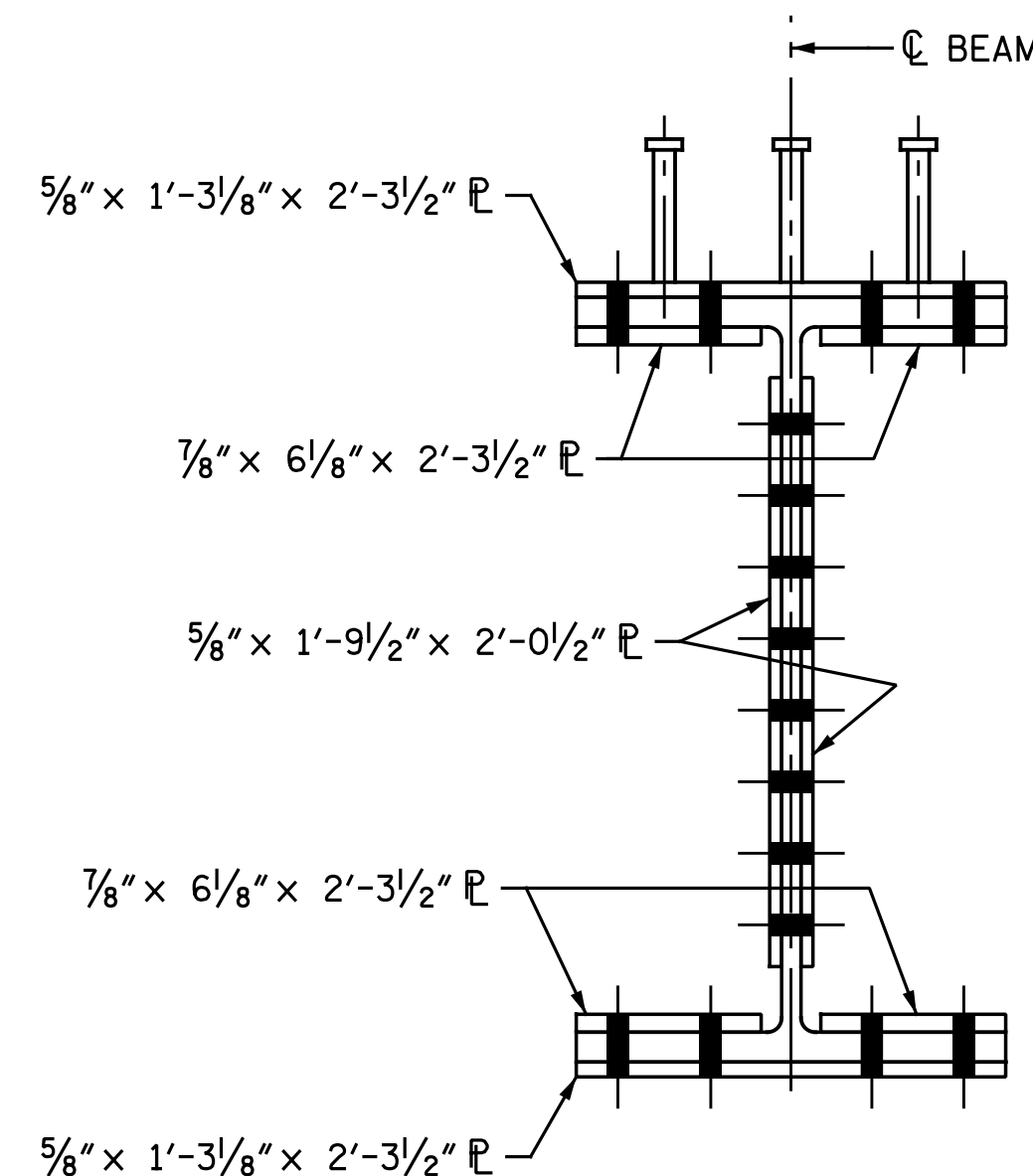


SHEAR STUD DETAIL
FOR TOP FLANGE SPLICE PLATE

PROJECT NO. U-3330
NASH COUNTY
 STATION: 61+03.00 -L-
 SHEET 3 OF 3




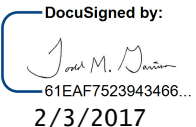
ELEVATION



SECTION A-A

BOLTED FIELD SPLICE DETAILS
 (DETAILS ARE TYPICAL FOR SPLICE IN SPAN B AND SPLICE IN SPAN C UNLESS OTHERWISE NOTED)

DRAWN BY : N. B. SPEAKS DATE : 10-11-16
 CHECKED BY : J. M. GARRISON DATE : 10-12-16

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		REVISIONS			
		NO.	BY:		DATE:
1			3		
2			4		

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NOTES

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

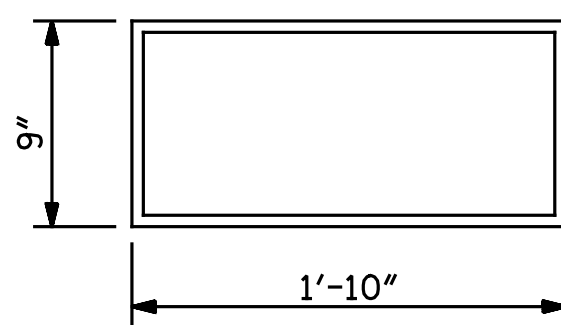
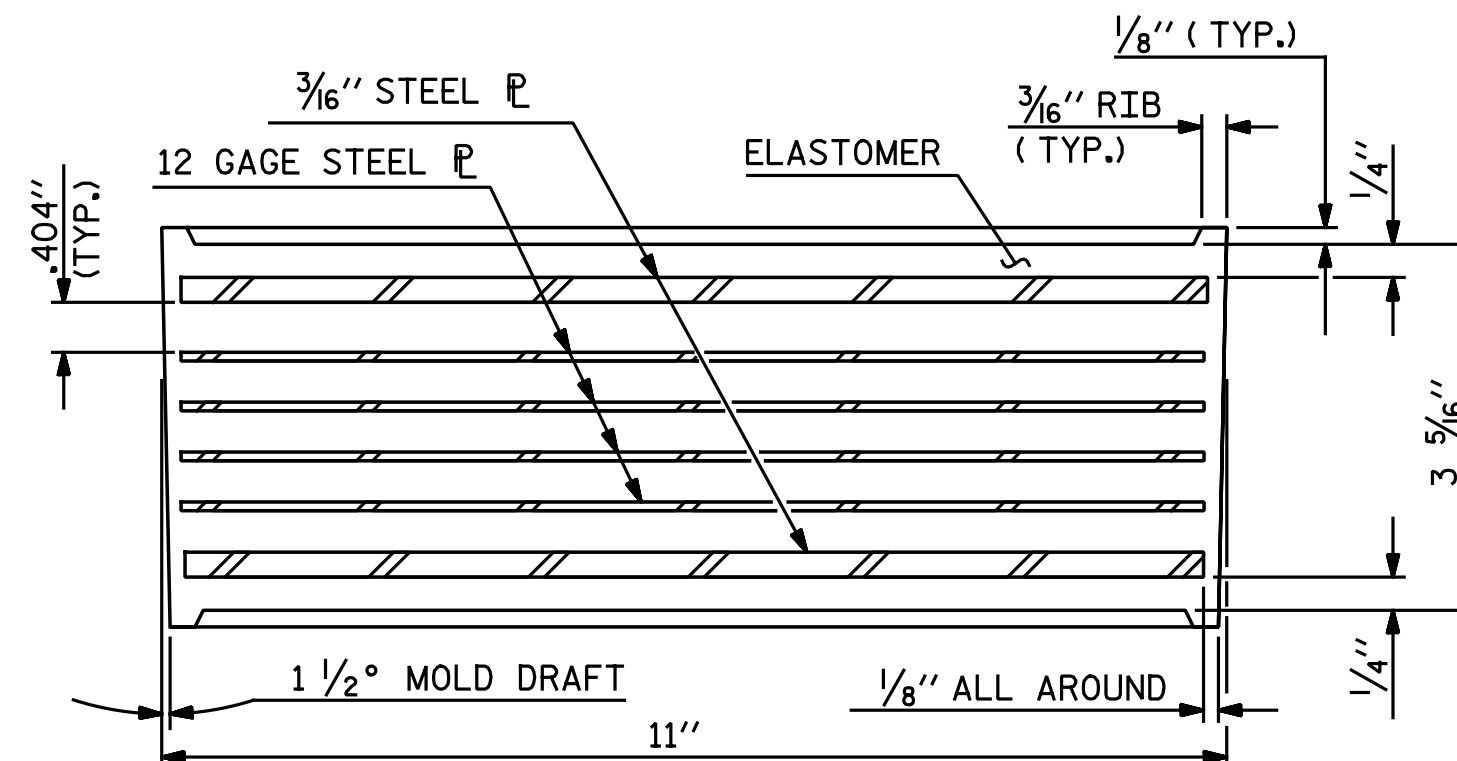
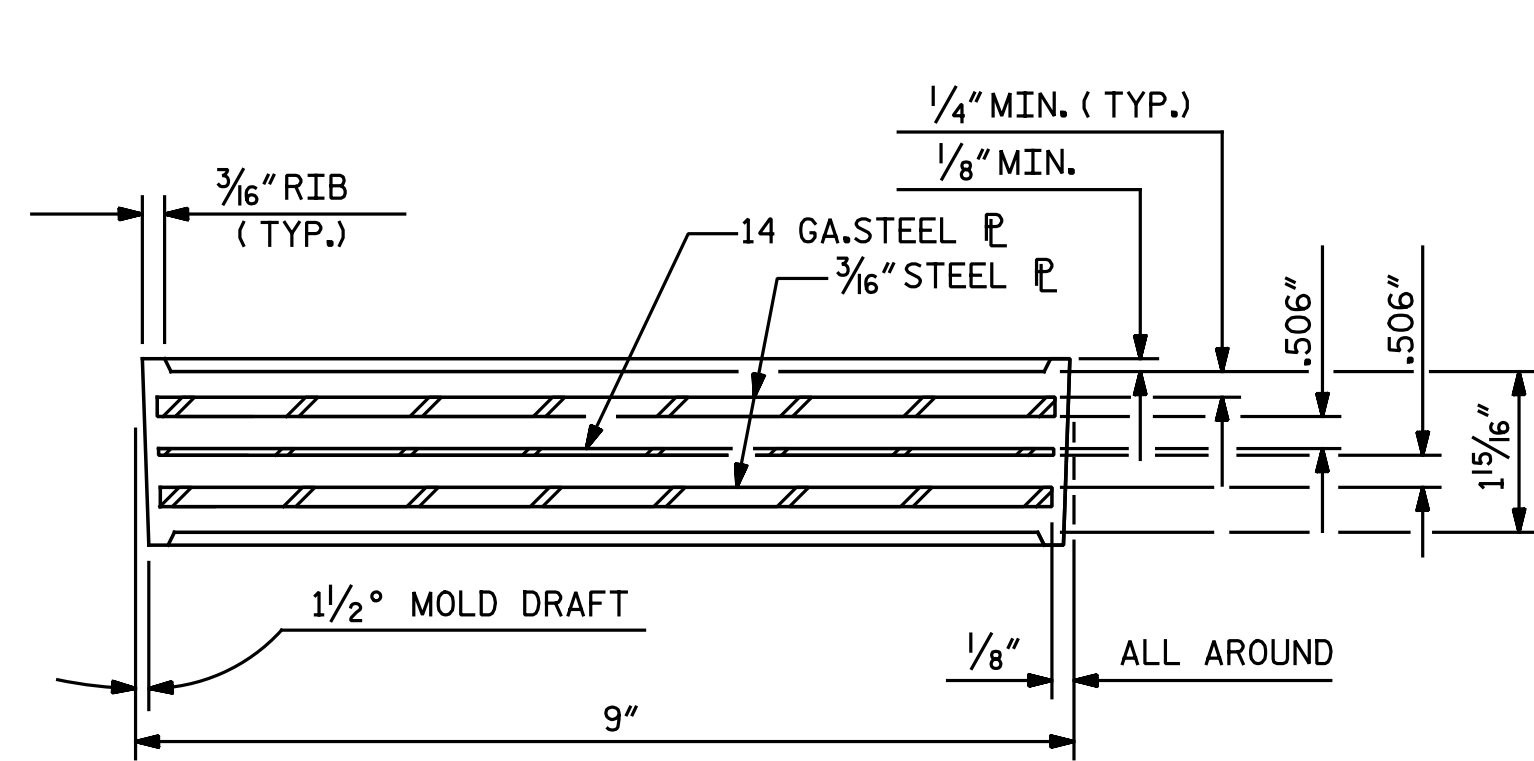
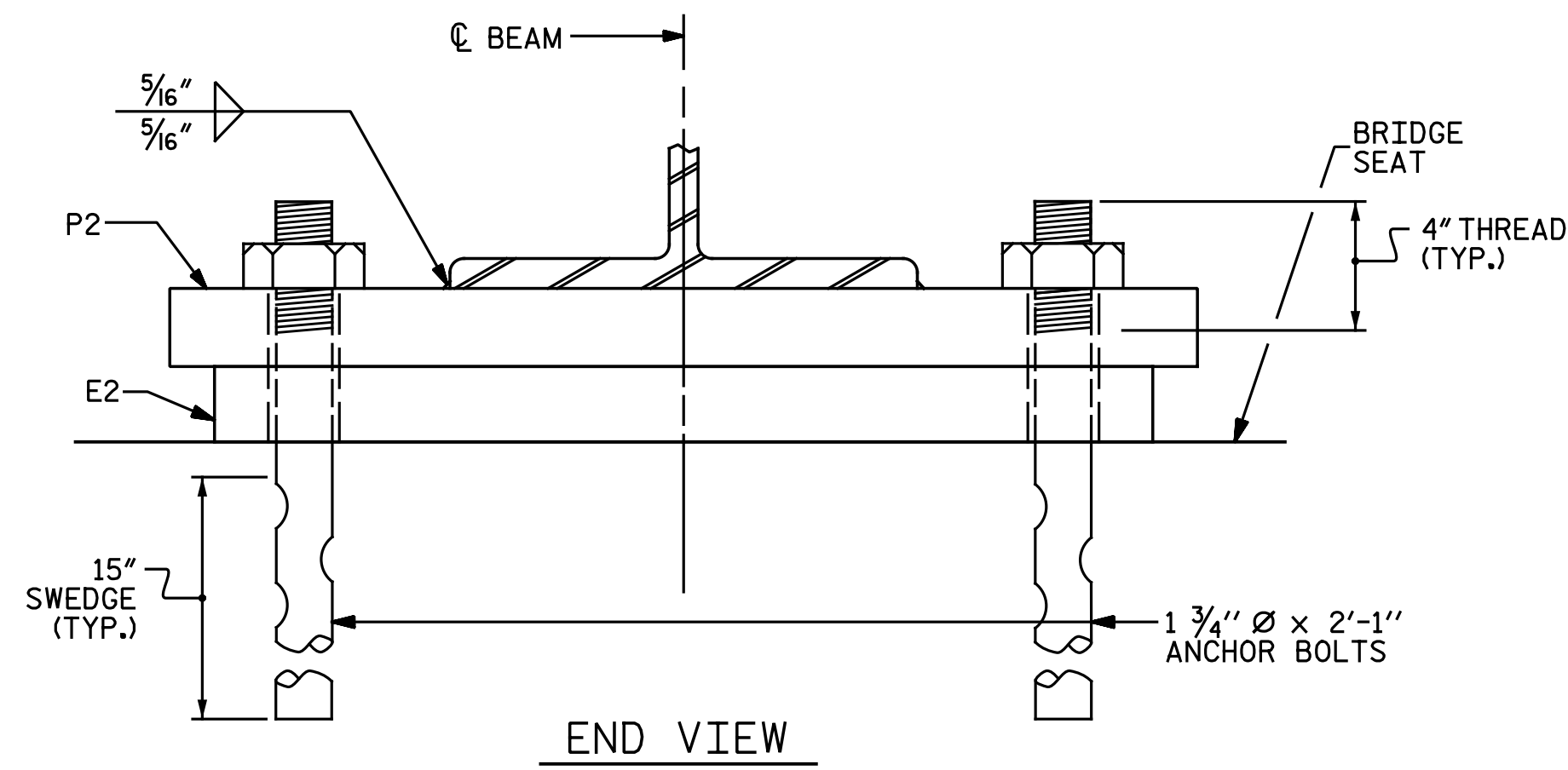
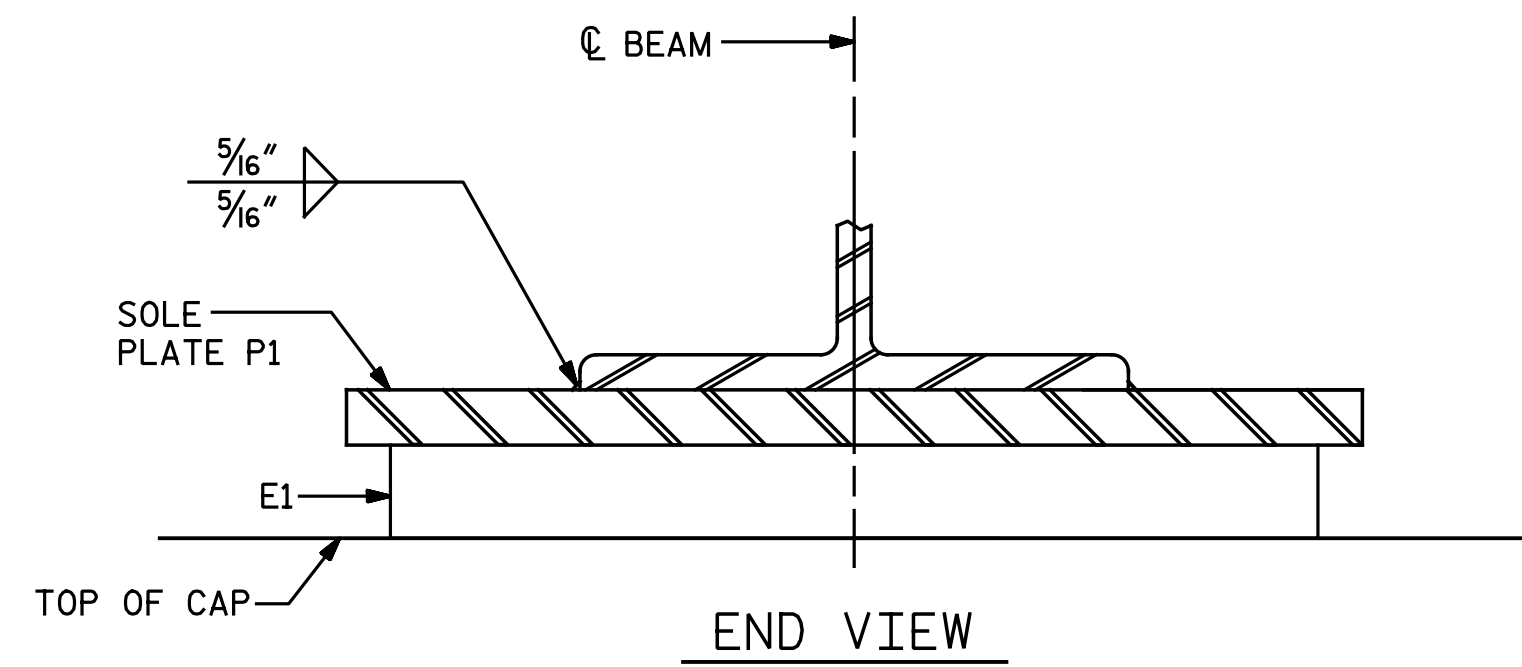
FOR PAINTED STRUCTURAL STEEL (EXCLUDING AASHTO M270 GRADE 50W), SOLE PLATES, ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.



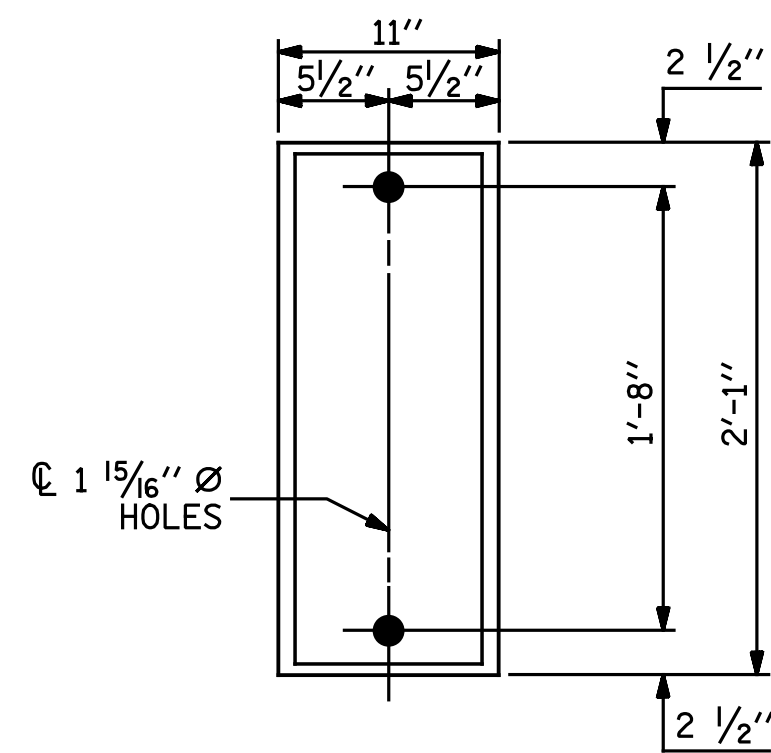
E1 (16 REQ'D) STAGE I
E1 (14 REQ'D) STAGE II

PLAN VIEW OF ELASTOMERIC BEARING

TYPE IV

(NCDOT STANDARD BEARING FOR PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURES)

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE IV	225 k



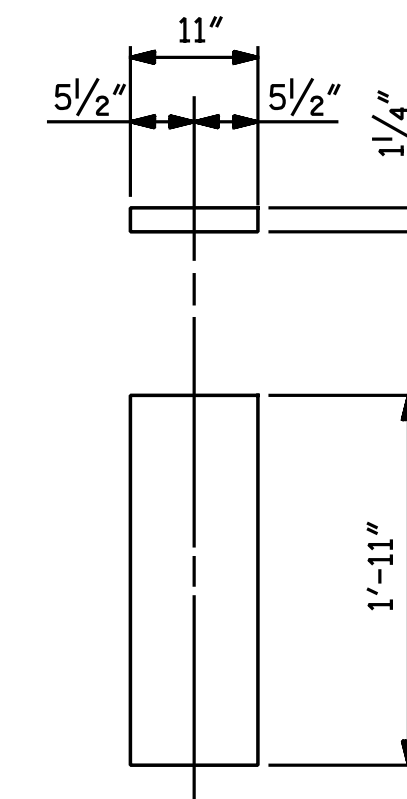
E2 (16 REQ'D) STAGE I
E2 (14 REQ'D) STAGE II

PLAN VIEW OF ELASTOMERIC BEARING

TYPE IV

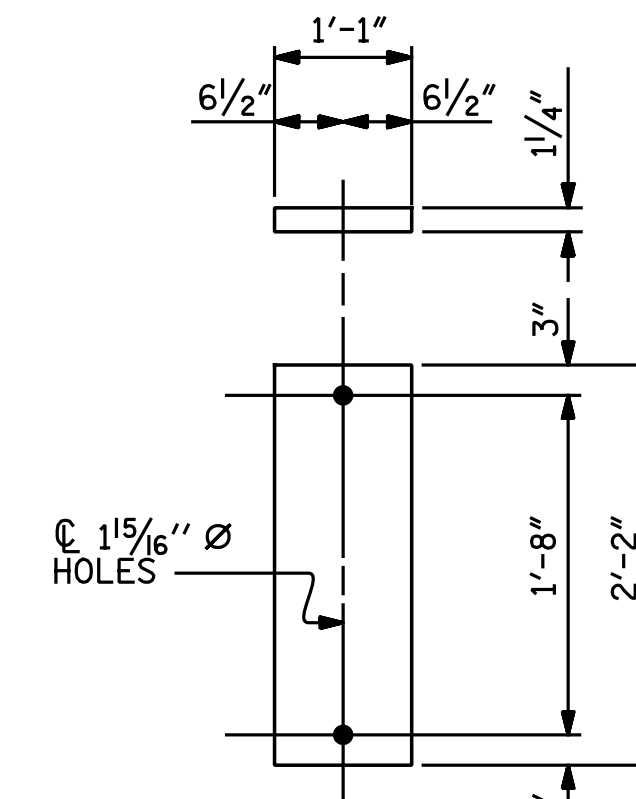
(NCDOT STANDARD BEARING FOR STEEL SUPERSTRUCTURES)

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE IV	310 k



(16 REQ'D STAGE I)
(14 REQ'D STAGE II)

SOLE PLATE DETAILS ("P")



(16 REQ'D STAGE I)
(14 REQ'D STAGE II)

PROJECT NO. U-3330
NASH COUNTY
STATION: 61+03.00 -L-

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DocuSigned by:
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01EAF7523943466
2/3/2017

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-17
1			3			TOTAL SHEETS
2			4			42

DRAWN BY: M. D. MAYHEW DATE: 12-7-16
CHECKED BY: J. M. GARRISON DATE: 12-8-16

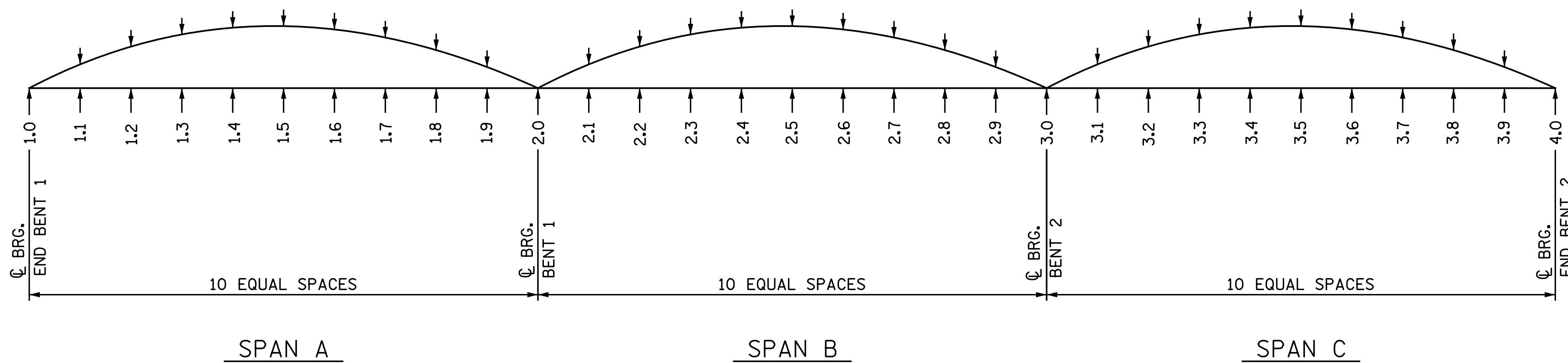
DEAD LOAD DEFLECTION AND CAMBER ORDINATES

	SPAN A										SPAN B										SPAN C										
	GIRDER G1, G2, G3, G9, G10, G13, G14, AND G15																														
10TH POINTS	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.002	0.004	0.004	0.005	0.004	0.003	0.001	0.000	-0.001	0.000	0.004	0.010	0.016	0.020	0.021	0.020	0.016	0.010	0.004	0.000	-0.001	0.000	0.001	0.003	0.004	0.005	0.004	0.004	0.002	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.007	0.013	0.016	0.017	0.015	0.010	0.005	0.000	-0.002	0.000	0.015	0.038	0.060	0.074	0.080	0.074	0.059	0.037	0.015	0.000	-0.002	0.001	0.006	0.011	0.015	0.018	0.017	0.013	0.007	0.000
DEFLECTION DUE TO WEIGHT OF RAIL **	0.000	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.000	0.000	0.000	0.002	0.004	0.006	0.008	0.008	0.008	0.006	0.004	0.002	0.000	0.000	0.000	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.010	0.018	0.022	0.024	0.021	0.014	0.007	0.000	-0.003	0.000	0.021	0.052	0.082	0.102	0.109	0.102	0.081	0.051	0.020	0.000	-0.003	0.001	0.008	0.015	0.021	0.025	0.023	0.018	0.010	0.000
REQUIRED CAMBER	0"	1/8"	3/16"	1/4"	5/16"	1/4"	3/16"	1/16"	0"	-1/16"	0"	1/4"	5/8"	1"	1 1/4"	1 5/16"	1 1/4"	1"	5/8"	1/4"	0"	-1/16"	0"	1/8"	3/16"	1/4"	5/16"	1/4"	3/16"	1/8"	0"

	GIRDER G4, G5, G6, G7, G8, G11, AND G12																														
	10TH POINTS	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.002	0.004	0.004	0.005	0.004	0.003	0.001	0.000	-0.001	0.000	0.004	0.010	0.016	0.020	0.021	0.020	0.016	0.010	0.004	0.000	-0.001	0.000	0.001	0.003	0.004	0.005	0.004	0.004	0.002	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.007	0.013	0.016	0.017	0.015	0.010	0.005	0.000	-0.002	0.000	0.015	0.038	0.059	0.074	0.079	0.074	0.059	0.037	0.015	0.000	-0.002	0.001	0.006	0.011	0.015	0.018	0.017	0.013	0.007	0.000
DEFLECTION DUE TO WEIGHT OF RAIL **	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.009	0.017	0.020	0.022	0.019	0.013	0.006	0.000	-0.003	0.000	0.019	0.048	0.075	0.094	0.100	0.094	0.075	0.047	0.019	0.000	-0.003	0.001	0.007	0.014	0.019	0.023	0.021	0.017	0.009	0.000
REQUIRED CAMBER	0"	1/8"	3/16"	1/4"	1/4"	1/4"	1/8"	1/16"	0"	-1/16"	0"	1/4"	9/16"	7/8"	1 1/8"	1 3/16"	1 1/8"	7/8"	9/16"	1/4"	0"	-1/16"	0"	1/16"	3/16"	1/4"	1/4"	1/4"	3/16"	1/8"	0"

NOTES:


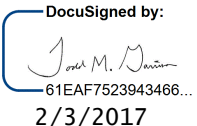
- VALUES GIVEN ARE AT TENTH POINTS BETWEEN CENTERLINE OF BEARINGS.
- DEFLECTIONS AND ORDINATES ARE IN FEET (DECIMAL FORM).
- REQUIRED CAMBER VALUES ARE IN INCHES (FRACTION FORM).
- UPWARD DEFLECTIONS AND ORDINATES ARE INDICATED WITH A "-" SIGN.
- * INCLUDES SLAB, BUILDUPS, AND STAY-IN-PLACE FORMS. DEFLECTIONS BASED ON SLAB POUR SEQUENCE SHOWN ON "BILL OF MATERIAL" SHEET.
- ** INCLUDES WEIGHT OF MONOLITHIC ISLAND.



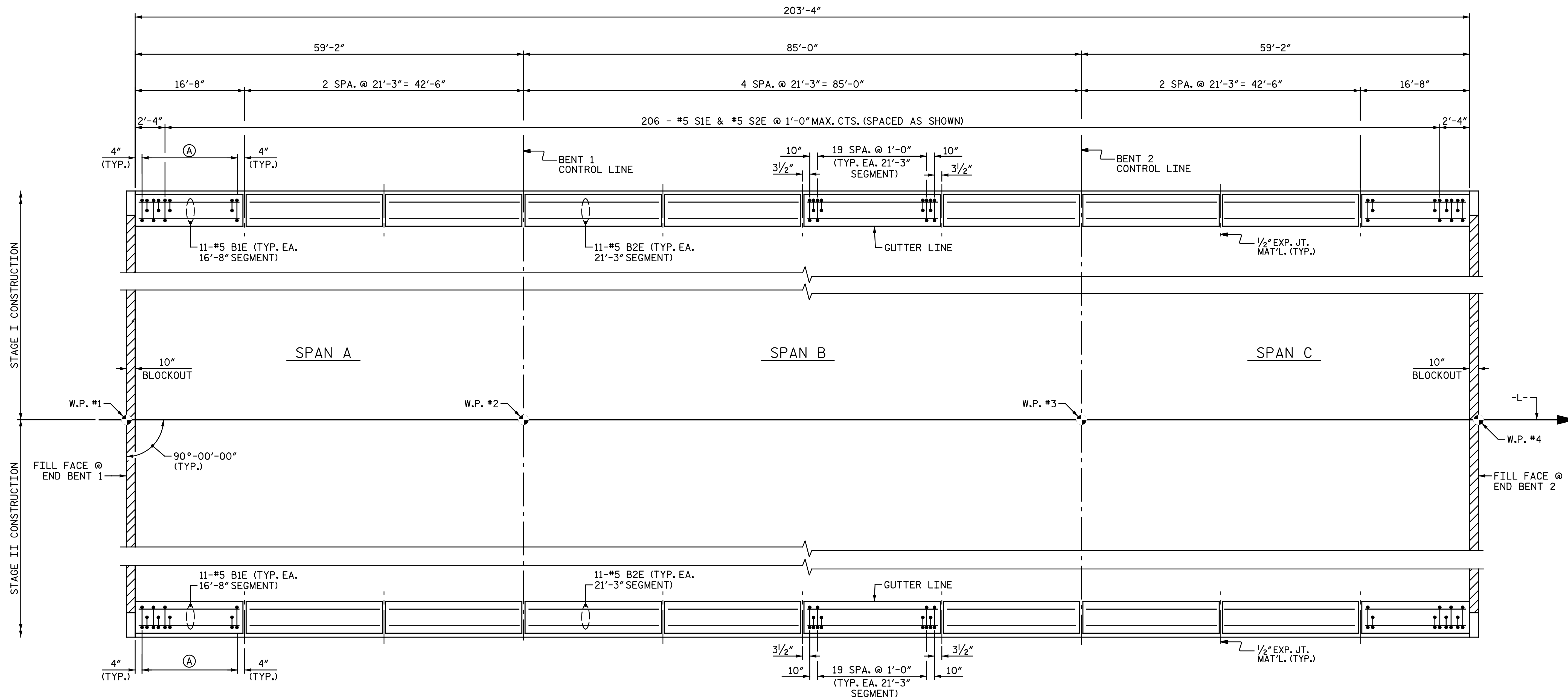
SCHMATIC CAMBER ORDINATES

PROJECT NO. U-3330
NASH COUNTY
 STATION: 61+03.00 -L-

DRAWN BY : M. D. MAYHEW DATE : 4-19-16
 CHECKED BY : B. J. BELL DATE : 12-14-16

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	REVISIONS				SHEET NO. S3-18	
	NO.	BY:	DATE:	NO.	BY:	DATE:
1			3			
2			4			


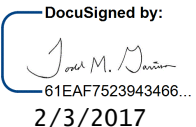
Michael Baker INTERNATIONAL
 Michael Baker Engineering
 8000 Regency Parkway, Suite 600
 Cary, North Carolina 27518
 NC License No.: F-1084



PLAN OF BARRIER RAIL
 (A) 16 SPA. @ 1'-0" (TYP. EA. 16'-8" SEGMENT)

PROJECT NO. U-3330
NASH COUNTY
 STATION: 61+03.00 -L-

DRAWN BY : M. D. M. / N. B. S. DATE : 9-21-16
 CHECKED BY : A. H. SHARPE DATE : 9-22-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	 DocuSigned by:  61EAF7523943466... 2/3/2017	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH		CONCRETE BARRIER RAIL		
		REVISIONS				SHEET NO. S3-19
		NO.	BY:	DATE:	NO.	BY:
1			3			
2			4			

Michael Baker
 INTERNATIONAL
 Michael Baker Engineering
 8000 Regency Parkway, Suite 600
 Cary, North Carolina 27518
 NC License No.: F-1084

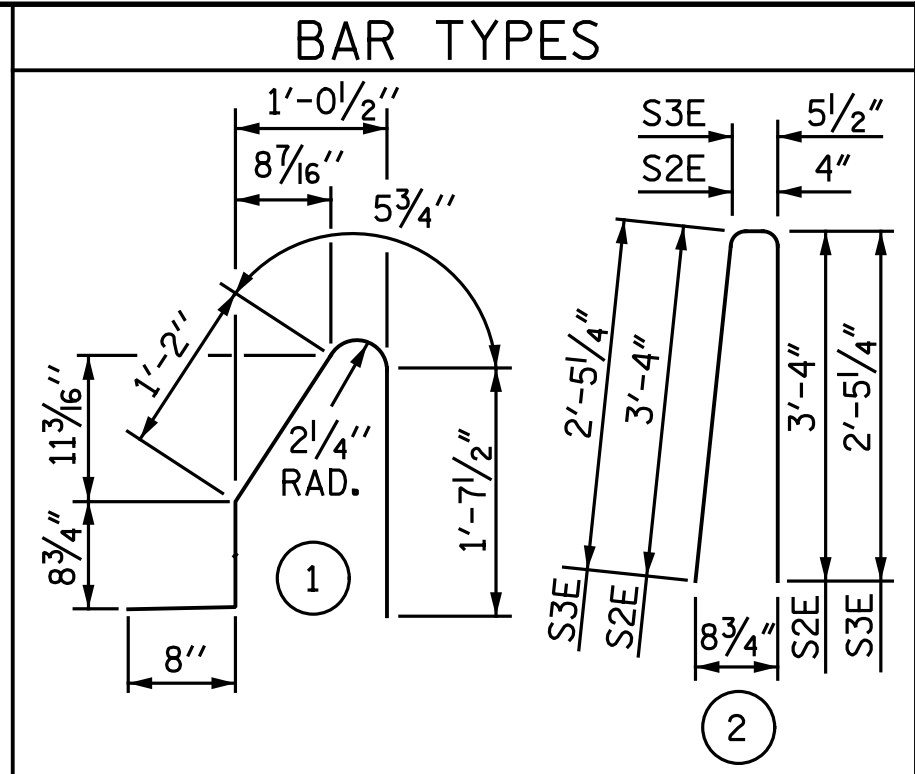
TOTAL SHEETS
42

NOTES

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

STAGE I					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1E	22	#5	STR	16'-4"	375
B2E	88	#5	STR	20'-10"	1912
S1E	210	#5	1	4'-8"	1022
S2E	206	#5	2	7'-0"	1504
S3E	4	#5	2	5'-4"	22

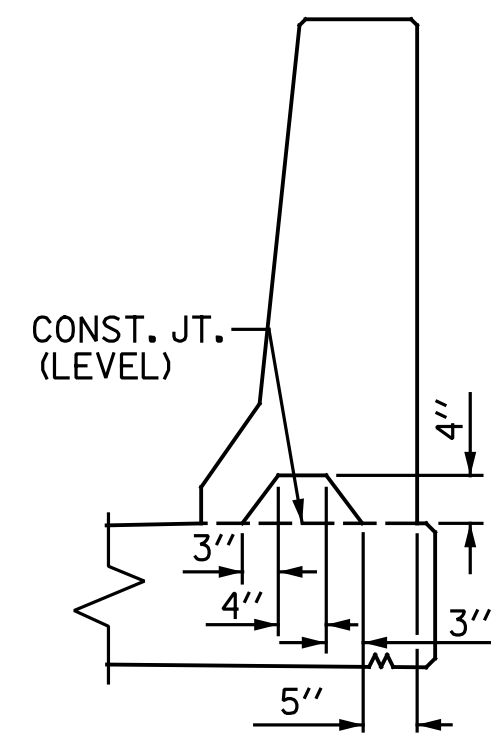
EPOXY COATED REINFORCING STEEL	LBS.	4,835
CLASS AA CONCRETE	C.Y.	27.6
CONCRETE BARRIER RAIL	L.F.	203.33

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

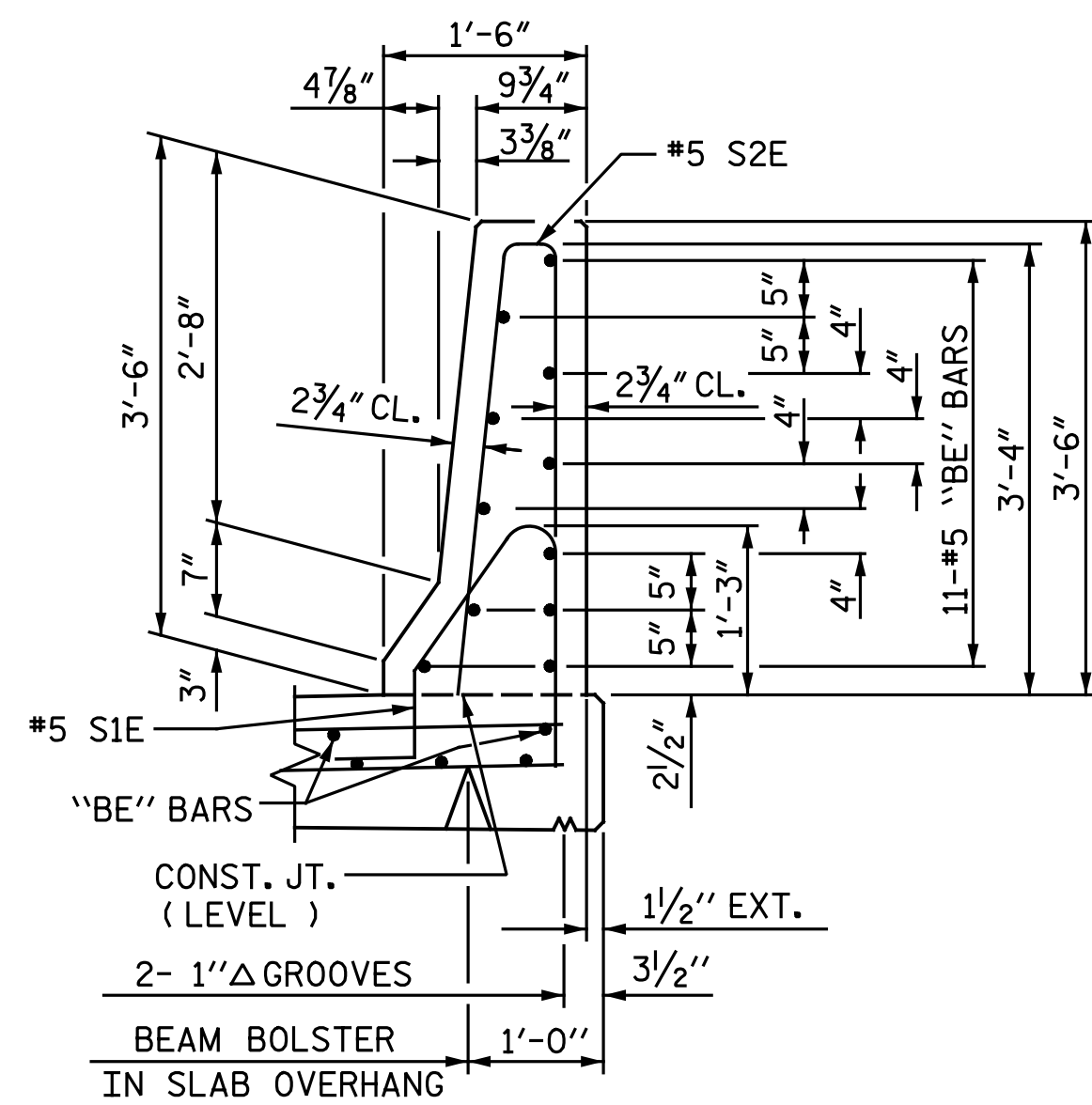
STAGE II					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1E	22	#5	STR	16'-4"	375
B2E	88	#5	STR	20'-10"	1912
S1E	210	#5	1	4'-8"	1022
S2E	206	#5	2	7'-0"	1504
S3E	4	#5	2	5'-4"	22

EPOXY COATED REINFORCING STEEL	LBS.	4,835
CLASS AA CONCRETE	C.Y.	27.6
CONCRETE BARRIER RAIL	L.F.	203.33

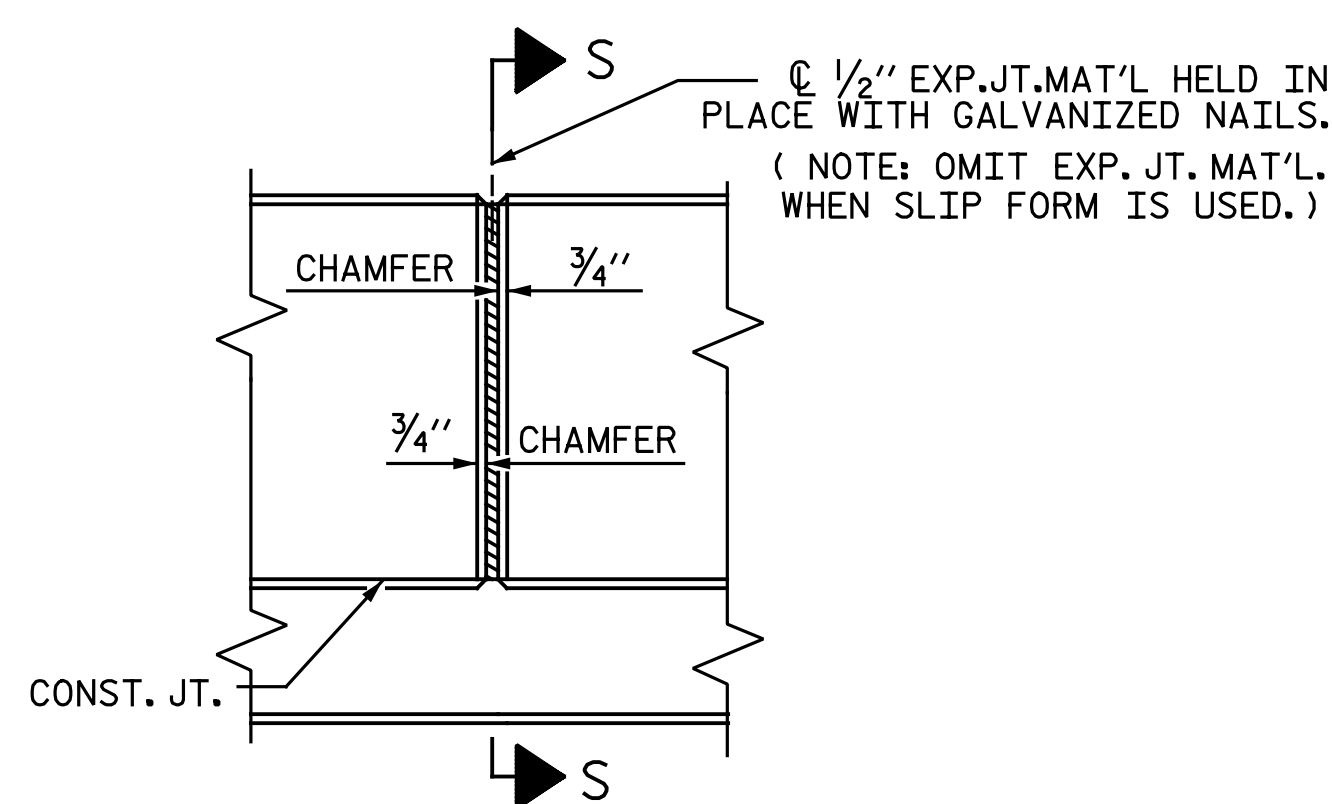


SECTION S-S

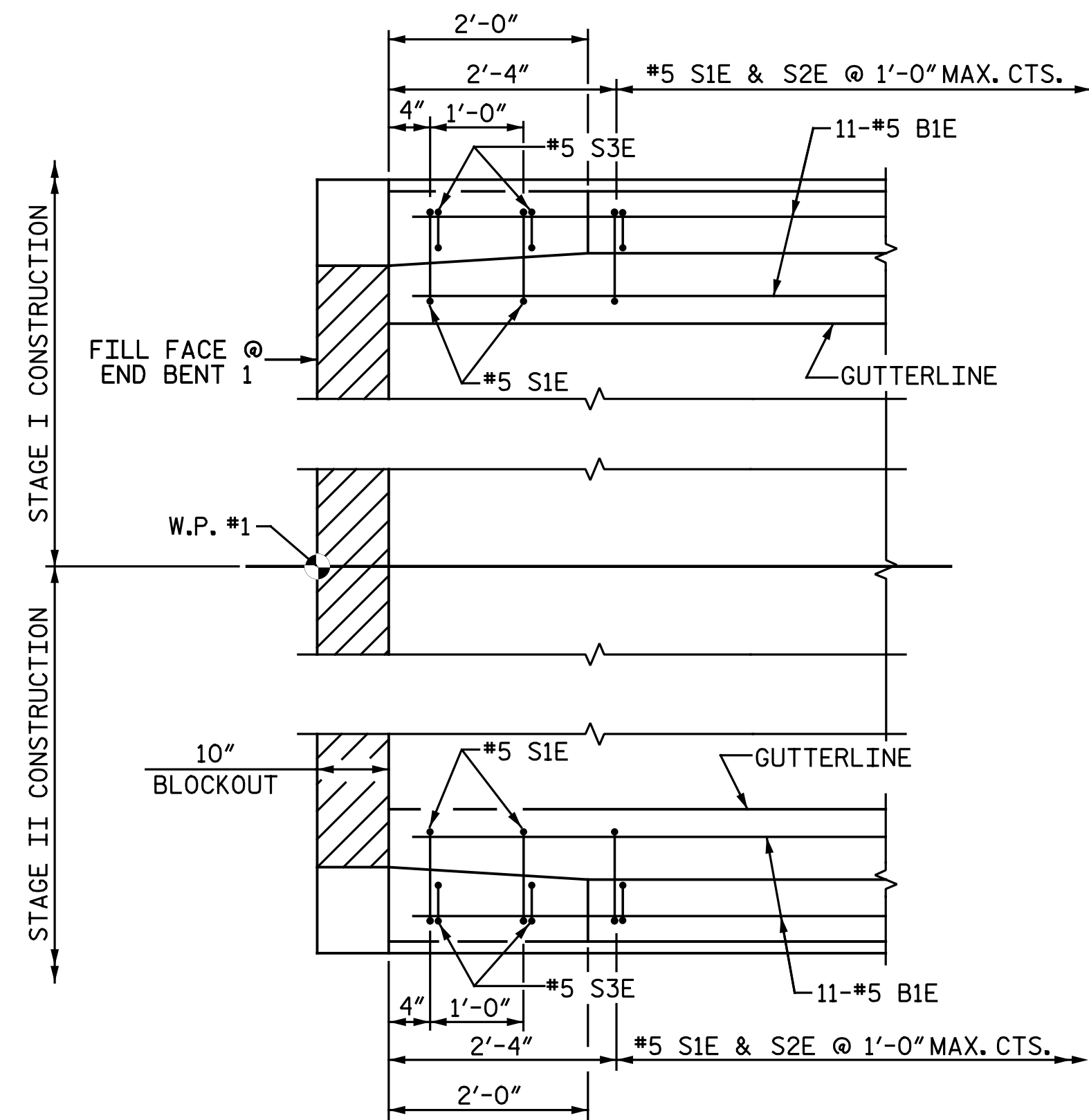
AT DAM IN OPEN JOINT (THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)



SECTION THRU RAIL

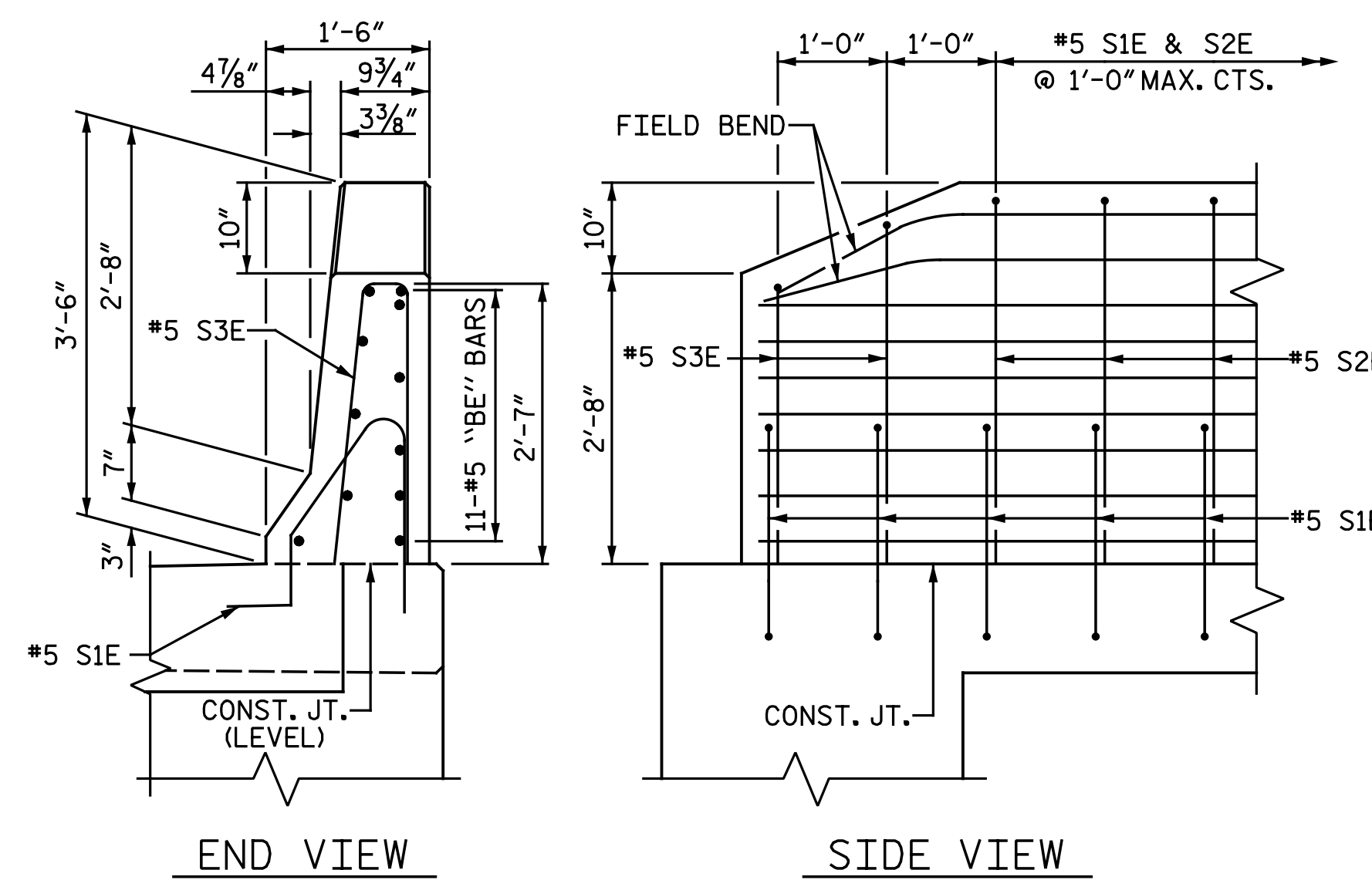


ELEVATION AT EXPANSION JOINTS BARRIER RAIL DETAILS



PLAN

(END OF RAIL @ END BENT 1 SHOWN, END BENT 2 SIMILAR)



END VIEW

SIDE VIEW

END OF RAIL DETAILS

DRAWN BY : N. B. SPEAKS DATE : 9-21-16
 CHECKED BY : A. H. SHARPE DATE : 9-22-16

PROJECT NO. U-3330
 NASH COUNTY
 STATION: 61+03.00 -L-

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	DocuSigned by: 61EAF7523943466... 2/3/2017	Michael Baker Engineering 8000 Regency Parkway, Suite 600 Cary, North Carolina 27518 NC License No.: F-1084																	
	Michael Baker INTERNATIONAL	REVISIONS <table border="1"> <thead> <tr> <th>NO.</th> <th>BY:</th> <th>DATE:</th> <th>NO.</th> <th>BY:</th> <th>DATE:</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> <td></td> <td>3</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td>4</td> <td></td> <td></td> </tr> </tbody> </table>	NO.	BY:	DATE:	NO.	BY:	DATE:	1			3			2			4	
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1			3																
2			4																

SHEET NO. S3-20
 TOTAL SHEETS 42

NOTES

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

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

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

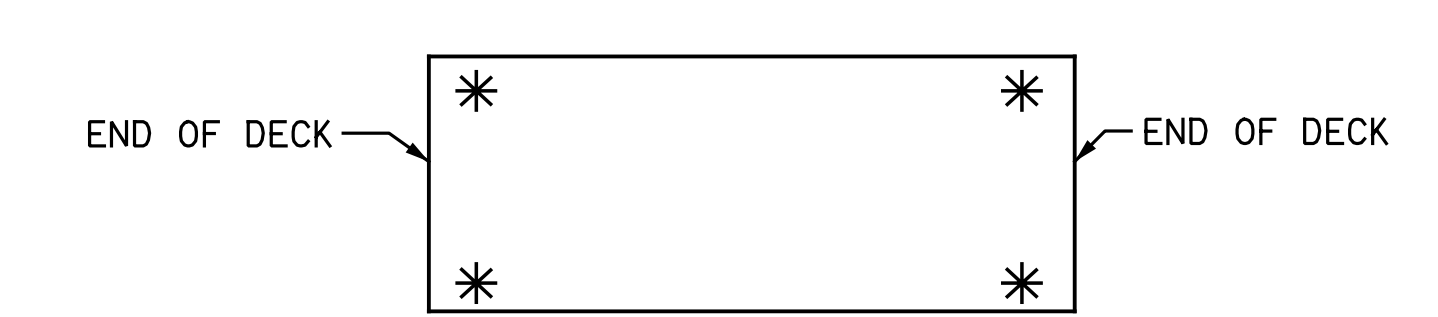
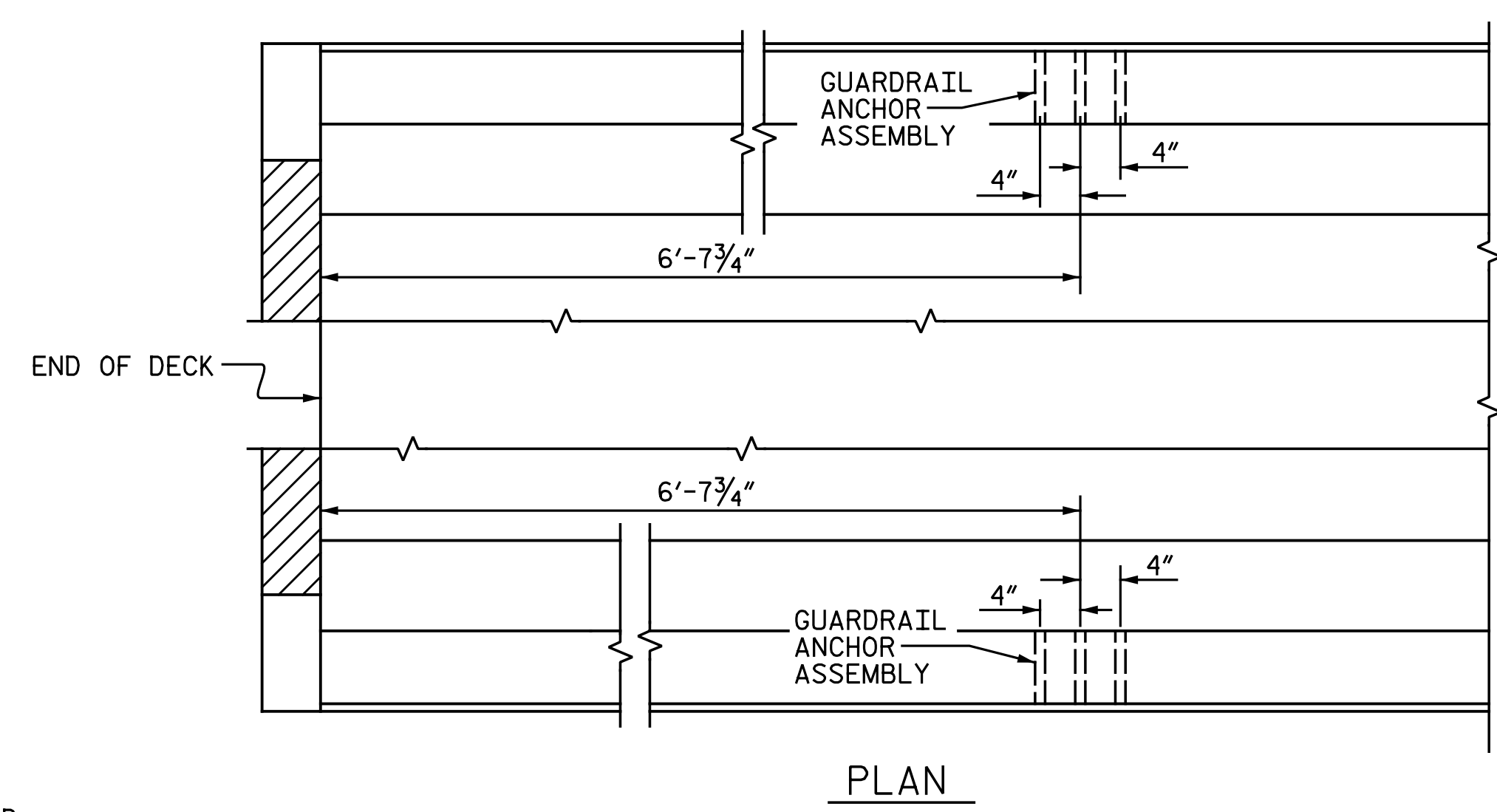
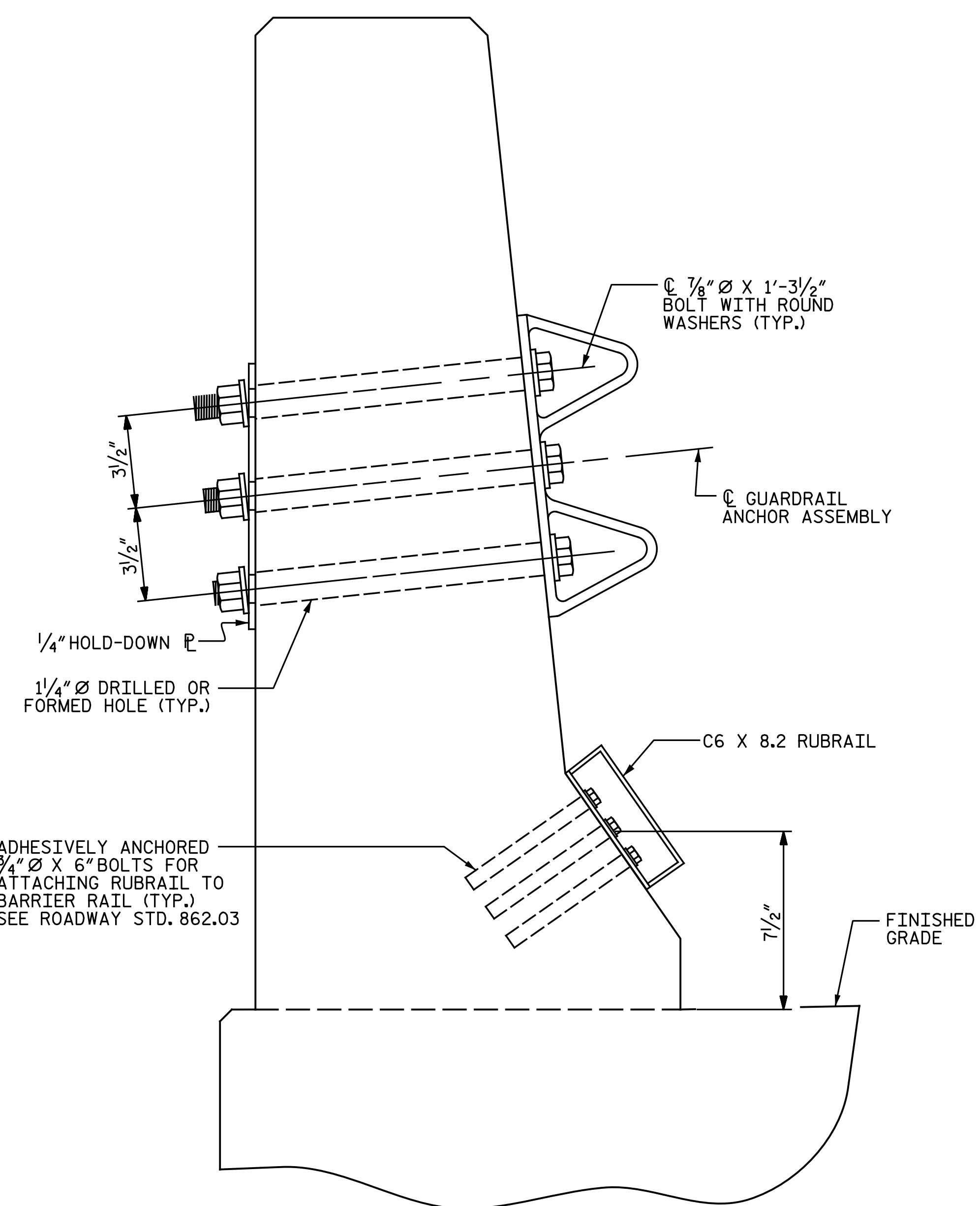
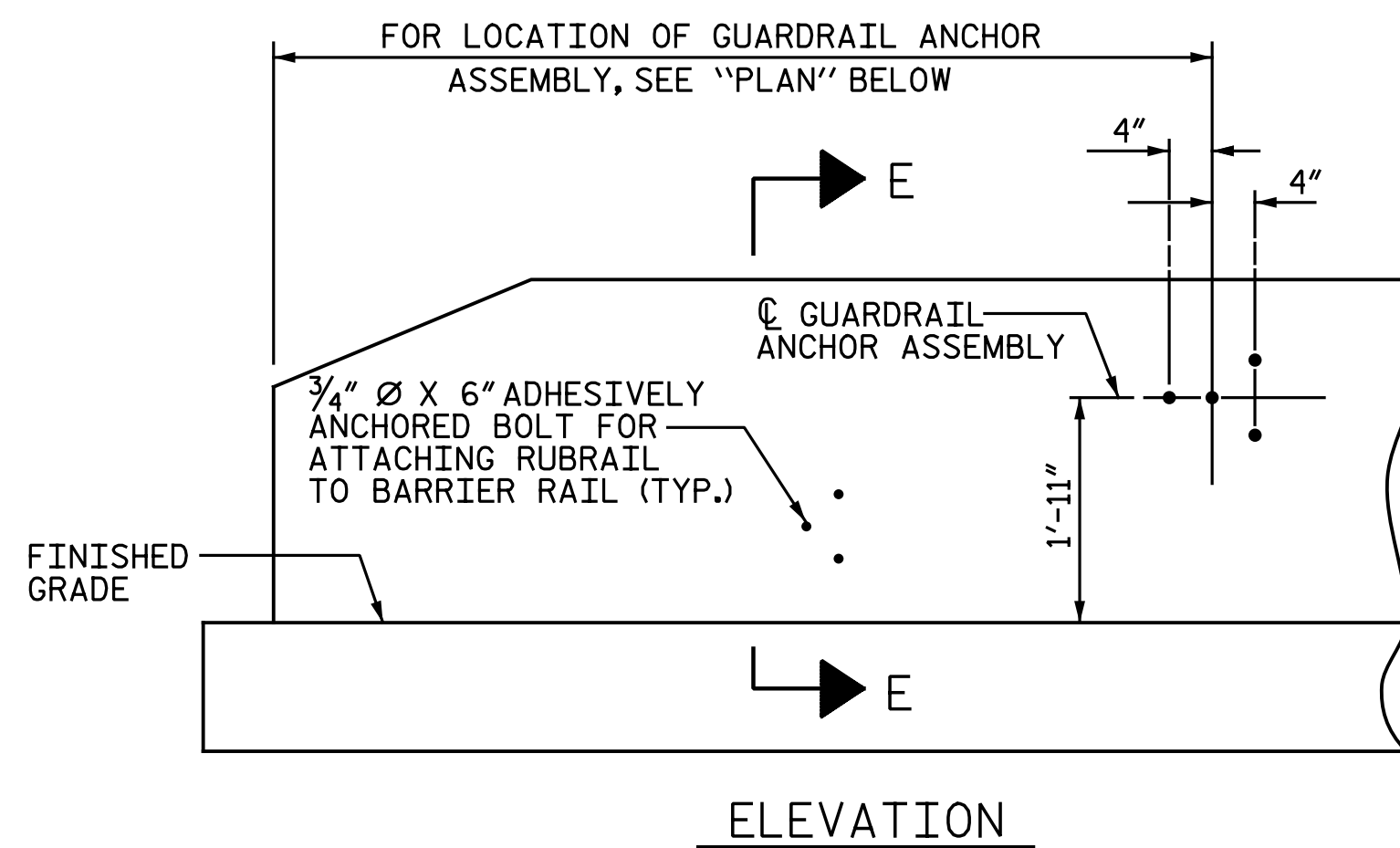
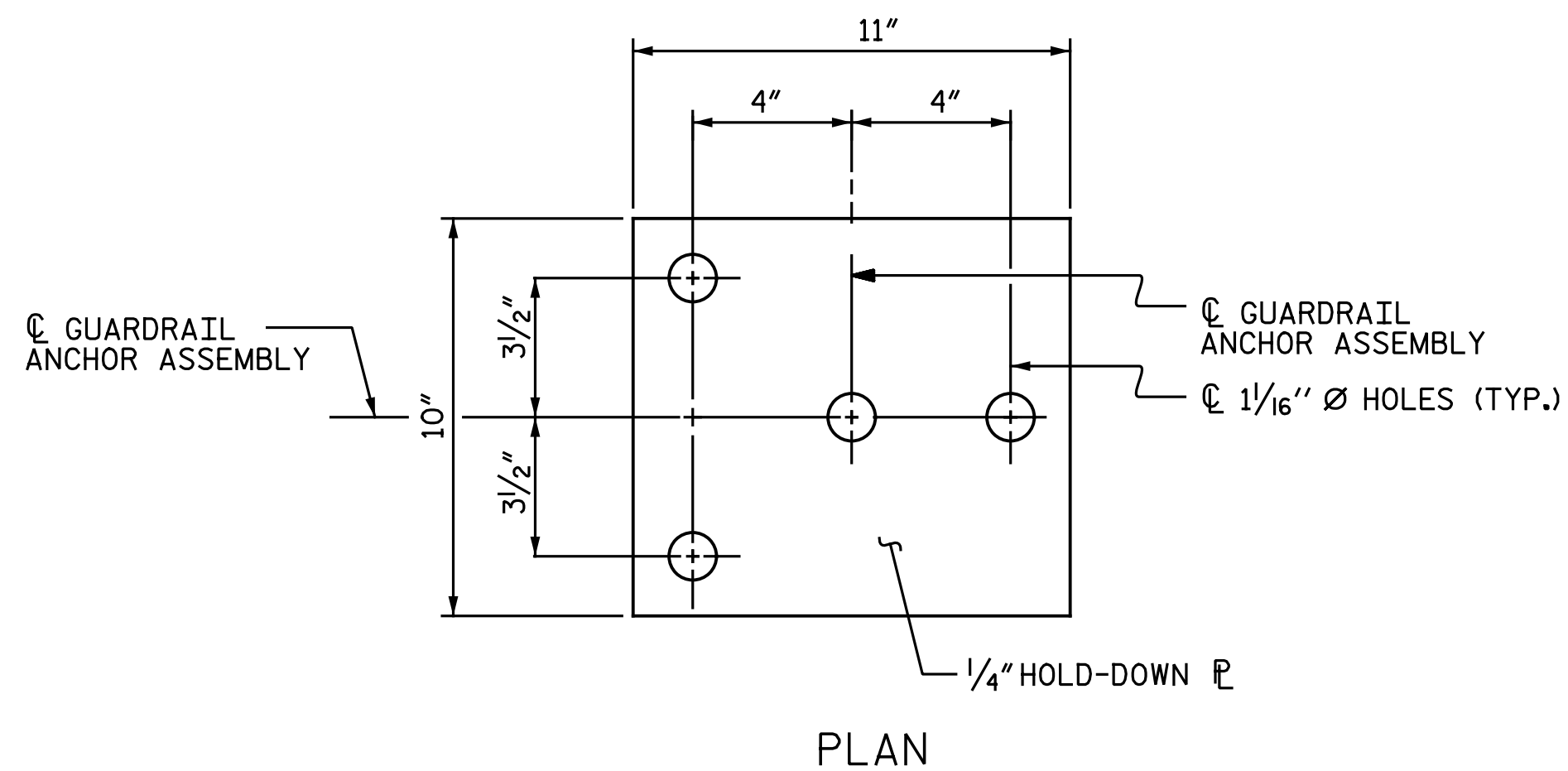
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

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.

THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.



LOCATION OF ANCHORS FOR GUARDRAIL
END BENT #1 SHOWN, END BENT #2 SIMILAR.

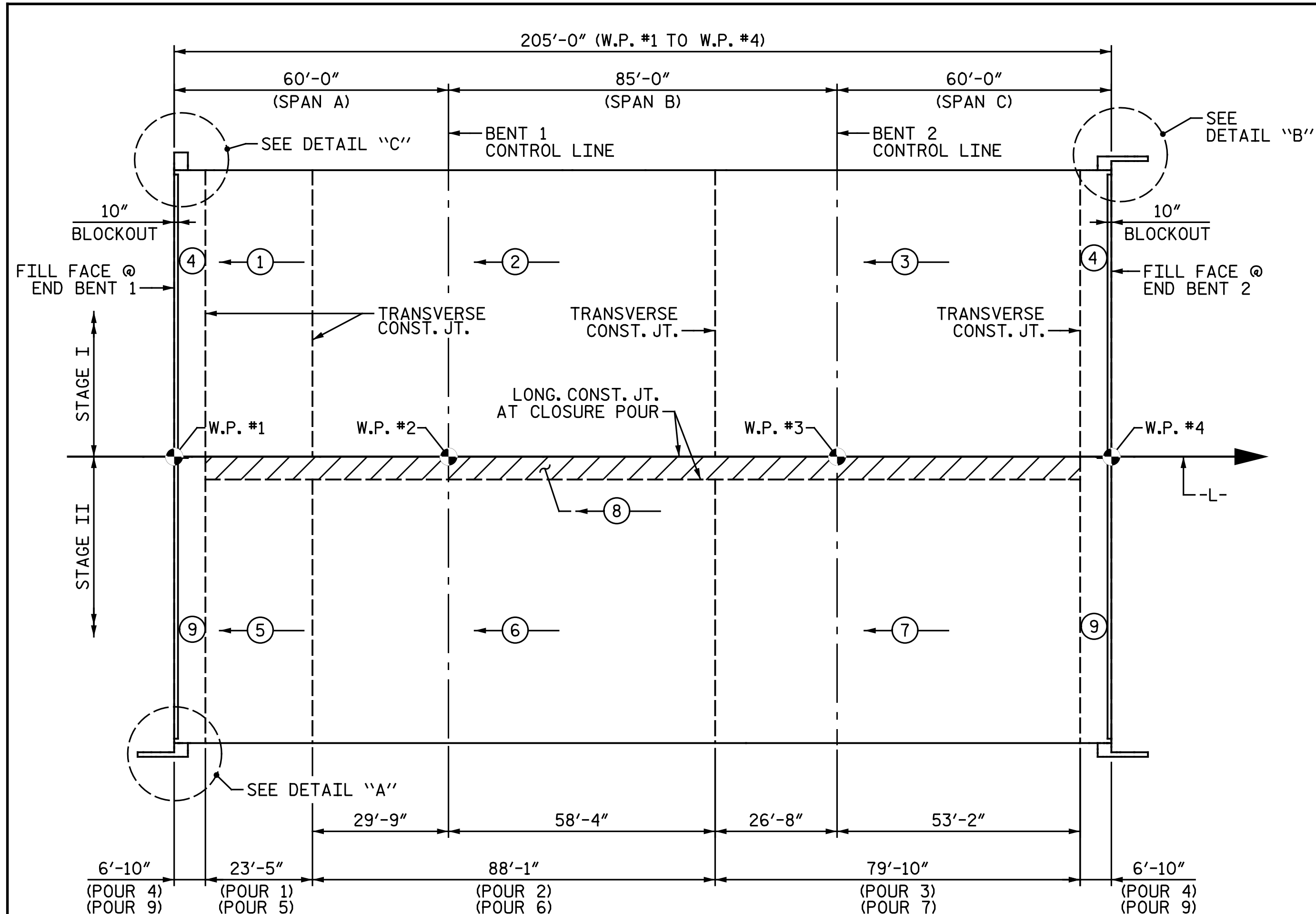
SECTION E-E
GUARDRAIL ANCHOR ASSEMBLY DETAILS

PROJECT NO. U-3330
NASH COUNTY
STATION: 61+03.00 -L-

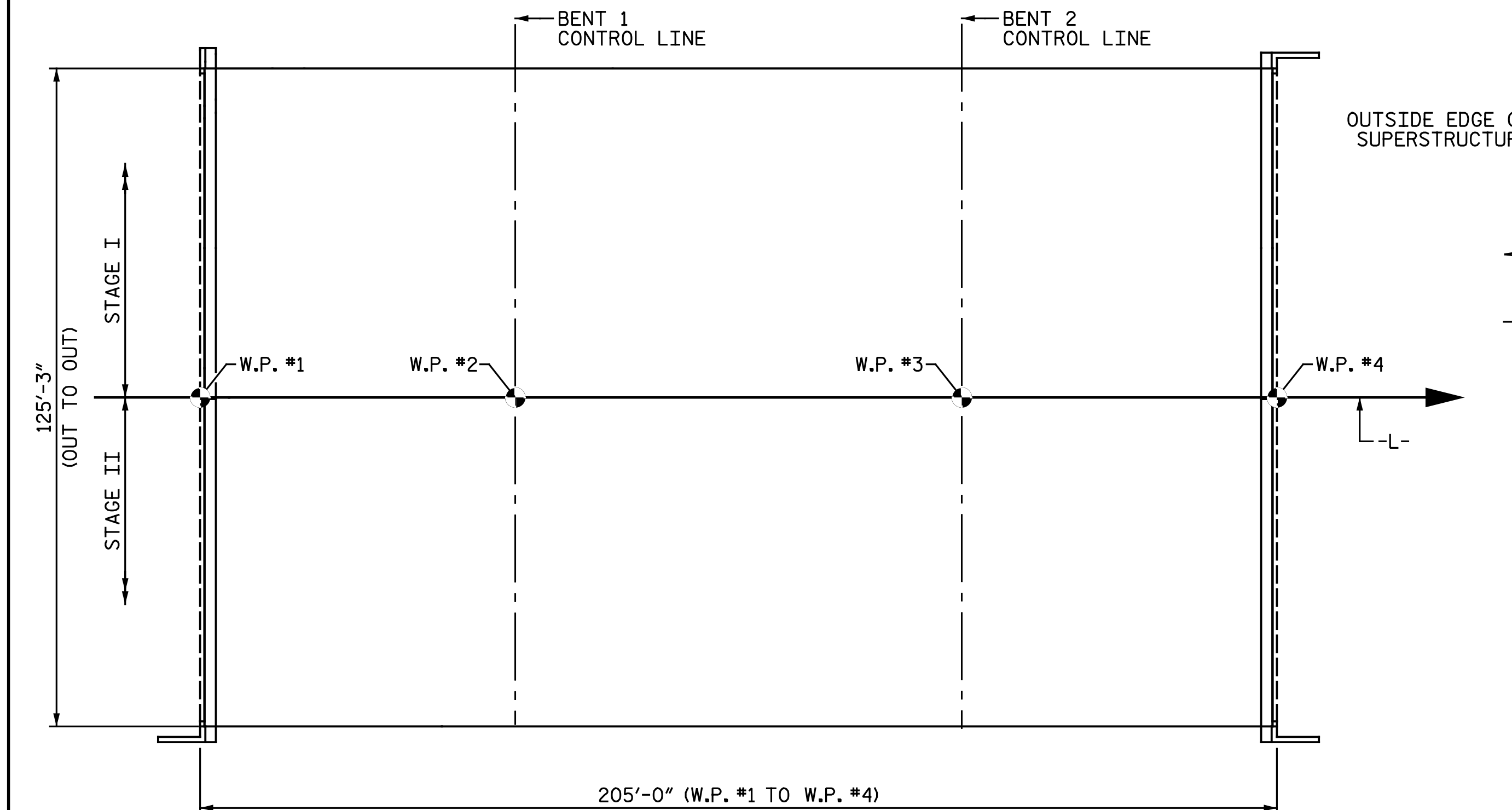
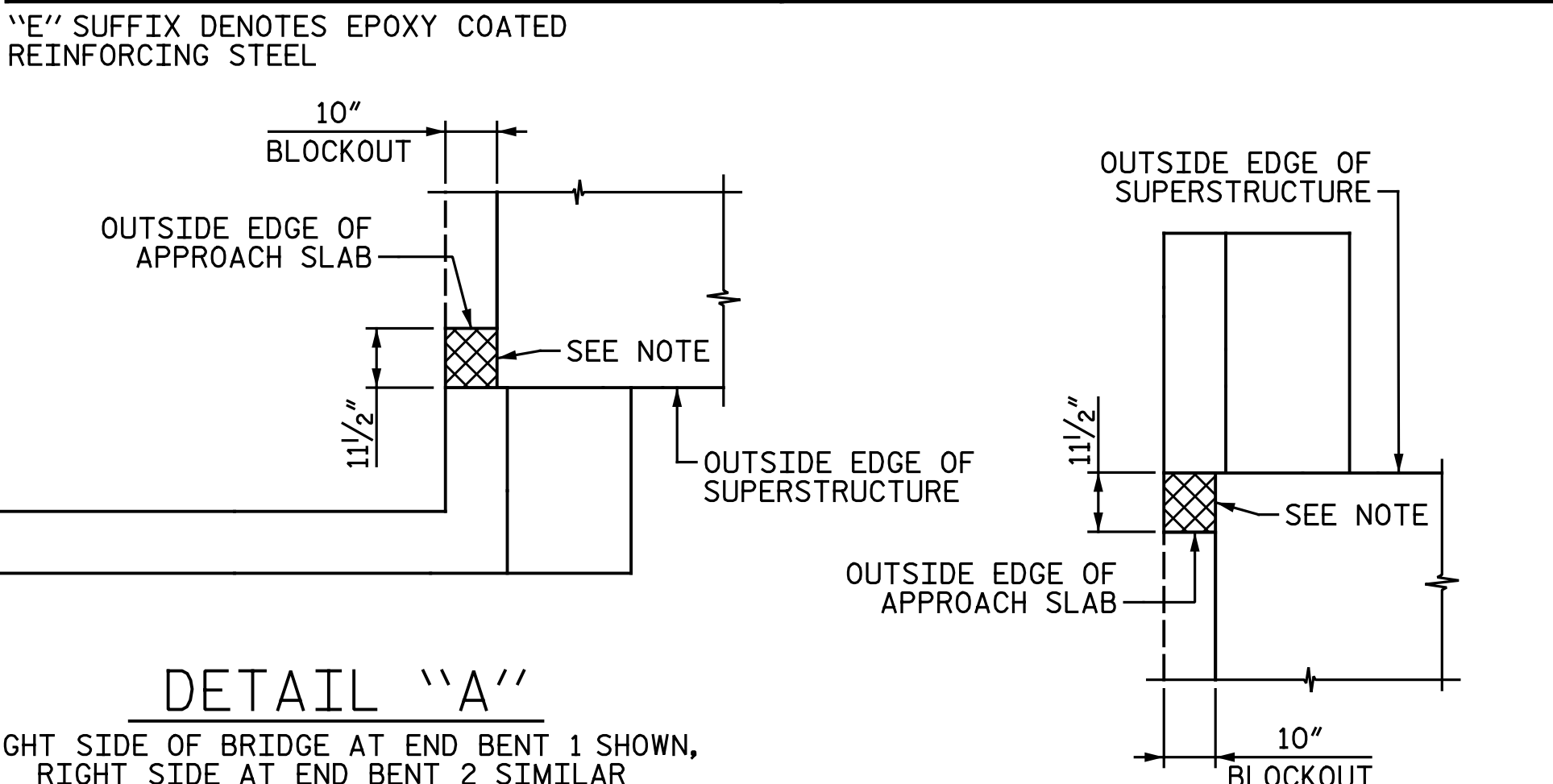
ASSEMBLED BY : M. D. MAYHEW	DATE : 4-12-16
CHECKED BY : A. H. SHARPE	DATE : 12-13-16
DRAWN BY : TLA 5/06	REV. 10/1/11 MAA/GM
CHECKED BY : GM 5/06	REV. 7/12 MAA/GM
	REV. 6/13 MAA/GM

9:40:07 AM
Y:\Projects\NCDOT\U-3330\Site 2\DWG\Final\403_041_U3330_SMU.GR.dgn
cmayhew

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH STANDARD GUARDRAIL ANCHORAGE FOR BARRIER RAIL																											
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	Michael Baker INTERNATIONAL	<table border="1"> <thead> <tr> <th colspan="6">REVISIONS</th> <th>SHEET NO.</th> </tr> <tr> <th>NO.</th> <th>BY:</th> <th>DATE:</th> <th>NO.</th> <th>BY:</th> <th>DATE:</th> <th>S3-21</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> <td></td> <td>3</td> <td></td> <td></td> <td>TOTAL SHEETS</td> </tr> <tr> <td>2</td> <td></td> <td></td> <td>4</td> <td></td> <td></td> <td>42</td> </tr> </tbody> </table>	REVISIONS						SHEET NO.	NO.	BY:	DATE:	NO.	BY:	DATE:	S3-21	1			3			TOTAL SHEETS	2			4		
REVISIONS						SHEET NO.																							
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-21																							
1			3			TOTAL SHEETS																							
2			4			42																							



REINFORCING BAR SCHEDULE						REINFORCING BAR SCHEDULE					
STAGE I						STAGE II					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1E	814	#5	STR.	32' - 5"	27,522	A1E	407	#5	STR.	57' - 3"	24,303
A2	814	#5	STR.	32' - 3"	27,380	A2	407	#5	STR.	57' - 3"	24,303
B1E	344	#4	STR.	27' - 2"	6,243	B1E	344	#4	STR.	27' - 2"	6,243
B2	324	#5	STR.	52' - 5"	17,713	B2	308	#5	STR.	52' - 5"	16,839
B3E	84	#6	STR.	14' - 2"	1,787	B3E	82	#6	STR.	14' - 2"	1,745
B4E	84	#6	STR.	16' - 4"	2,061	B4E	82	#6	STR.	16' - 4"	2,012
B5E	168	#6	STR.	33' - 11"	8,558	B5E	164	#6	STR.	33' - 11"	8,355
D1E	814	#5	STR.	6' - 5"	5,448	D1E	814	#5	STR.	6' - 5"	5,448
K1E	36	#4	STR.	22' - 11"	551	K1E	36	#4	STR.	22' - 1"	531
S1E	102	#4	1	11' - 8"	795	S1E	110	#4	1	11' - 8"	857
S2E	100	#4	1	9' - 6"	635	S2E	108	#4	1	9' - 6"	685
U1E	102	#4	2	7' - 2"	488	U1E	110	#4	2	7' - 2"	527
REINFORCING STEEL					LBS. 45,093	REINFORCING STEEL					LBS. 41,142
EPOXY COATED REINF. STEEL					LBS. 54,088	EPOXY COATED REINF. STEEL					LBS. 50,706



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB

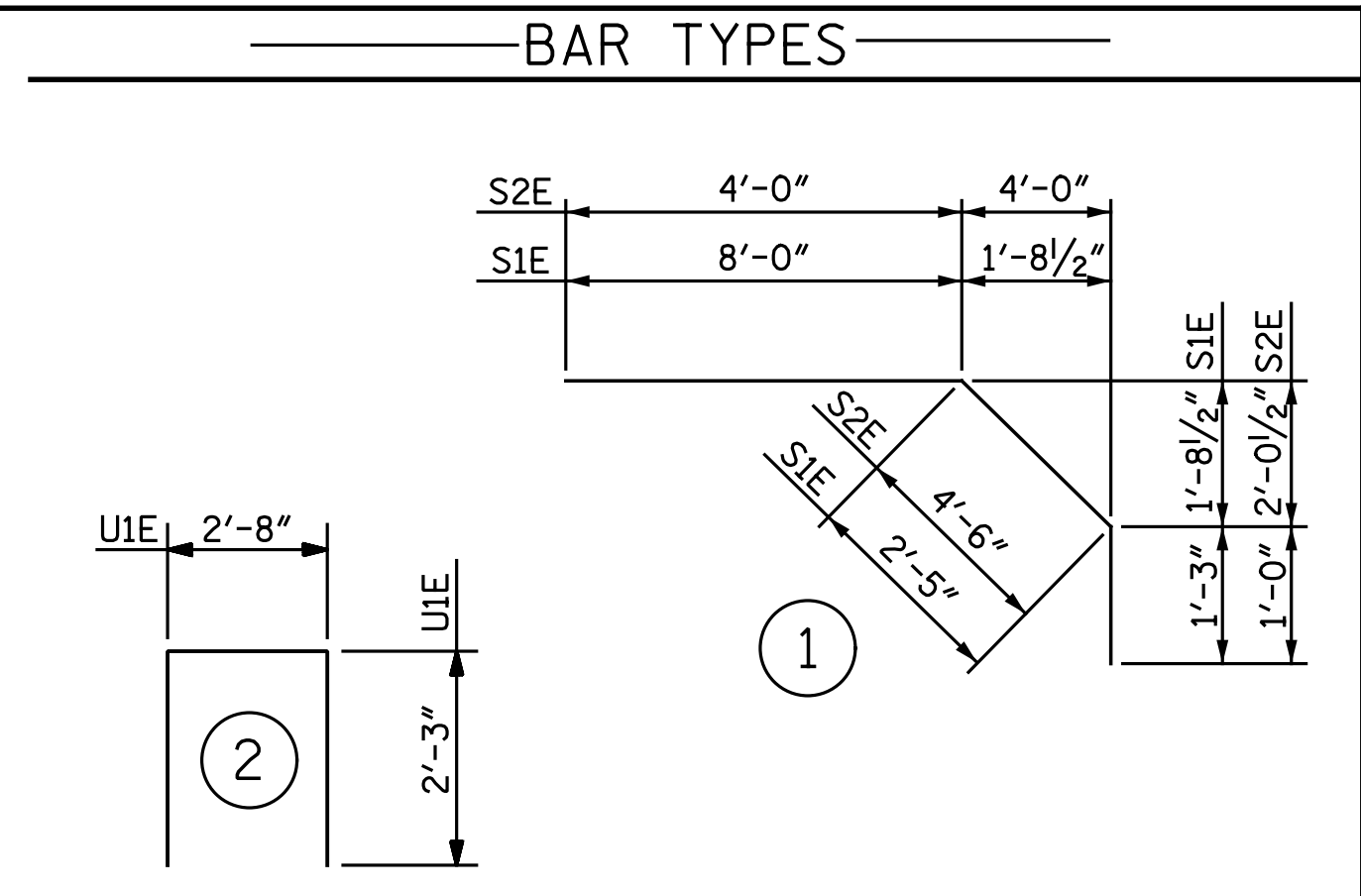
(STAGE I - SQ. FT. = 12,838)

(STAGE II - SQ. FT. = 12,838)

(TOTAL SQ. FT. = 25,676)

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

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



ALL BAR DIMENSIONS ARE OUT TO OUT

—SUPERSTRUCTURE BILL OF MATERIAL—

	CLASS AA CONCRETE (CU. YDS.)		REINFORCING STEEL (LBS.)		EPOXY COATED REINFORCING STEEL (LBS.)	
	STAGE I	STAGE II	STAGE I	STAGE II	STAGE I	STAGE II
SPANS A, B & C			45,093	41,142	54,088	50,706
POUR 1	44.7					
POUR 2	168.0					
POUR 3	152.3					
POUR 4 *	61.5					
POUR 5		41.1				
POUR 6		154.6				
POUR 7		140.1				
POUR 8		34.0				
POUR 9 *		61.7				
MONO-LITHIC ISLAND						693
TOTALS **	426.5	442.6	45,093	41,142	54,088	51,399

* POUR 4 AND POUR 9 INCLUDES DIAPHRAGM PORTION OF INTEGRAL END BENT.

** QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED.

GROOVING BRIDGE FLOORS

APPROACH SLABS - STAGE I	2,896 SQ.FT.
APPROACH SLABS - STAGE II	2,896 SQ.FT.
BRIDGE DECK - STAGE I	12,079 SQ.FT.
BRIDGE DECK - STAGE II	12,079 SQ.FT.
TOTAL	29,950 SQ.FT.

PROJECT NO. U-3330

NASH COUNTY

STATION: 61+03.00 -L-

DRAWN BY: C. E. MAYHEW DATE: 12-12-16

CHECKED BY: A. H. SHARPE DATE: 12-14-16

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Professional Engineer Seal for Todd M. Garrison, North Carolina License No. 033139.

Michael Baker Engineering, 8000 Regency Parkway, Suite 600, Cary, North Carolina 27518, NC License No.: F-1084

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

REVISIONS						SHEET NO. S3-23
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 42
2			4			

NOTES:

FOR "SECTION A-A" AND "SECTION B-B", SEE "INTEGRAL END BENT 1 DETAILS" SHEET 1 OF 2.

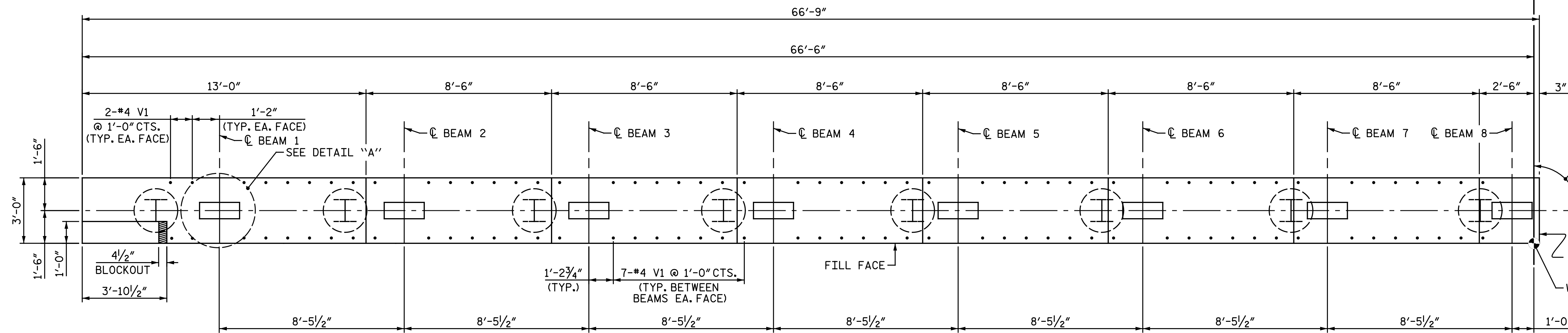
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #4 V1 BARS.

THE TOP SURFACE OF THE END BENT CAP, EXCLUDING THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".

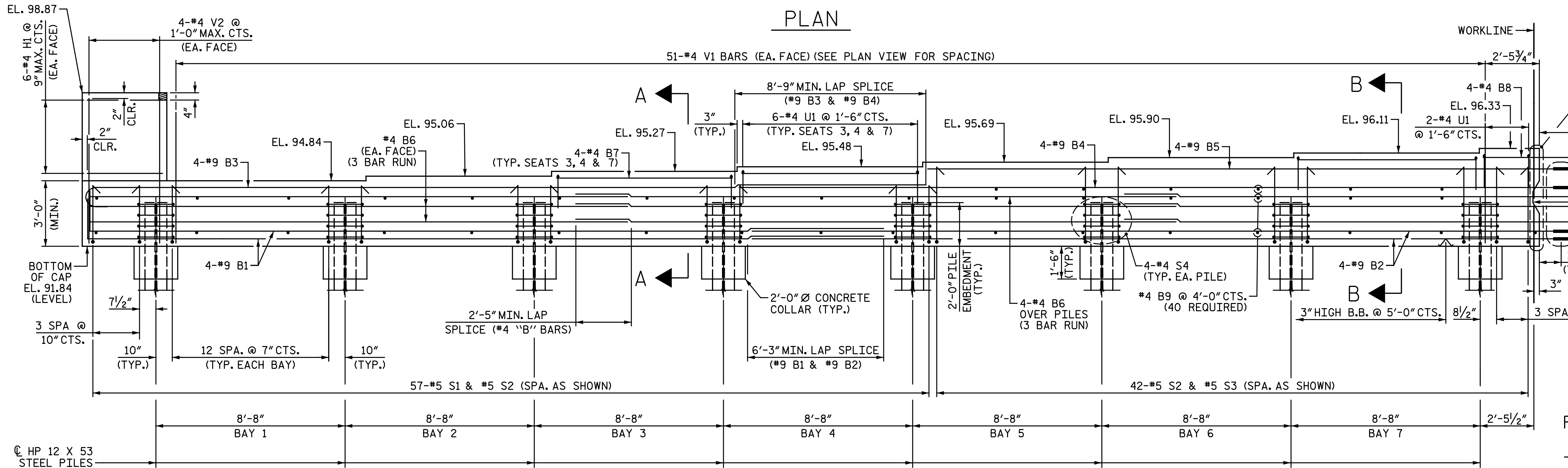
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

#4 B9 BARS MAY BE SHIFTED AS NECESSARY TO CLEAR THE STEEL PILES.

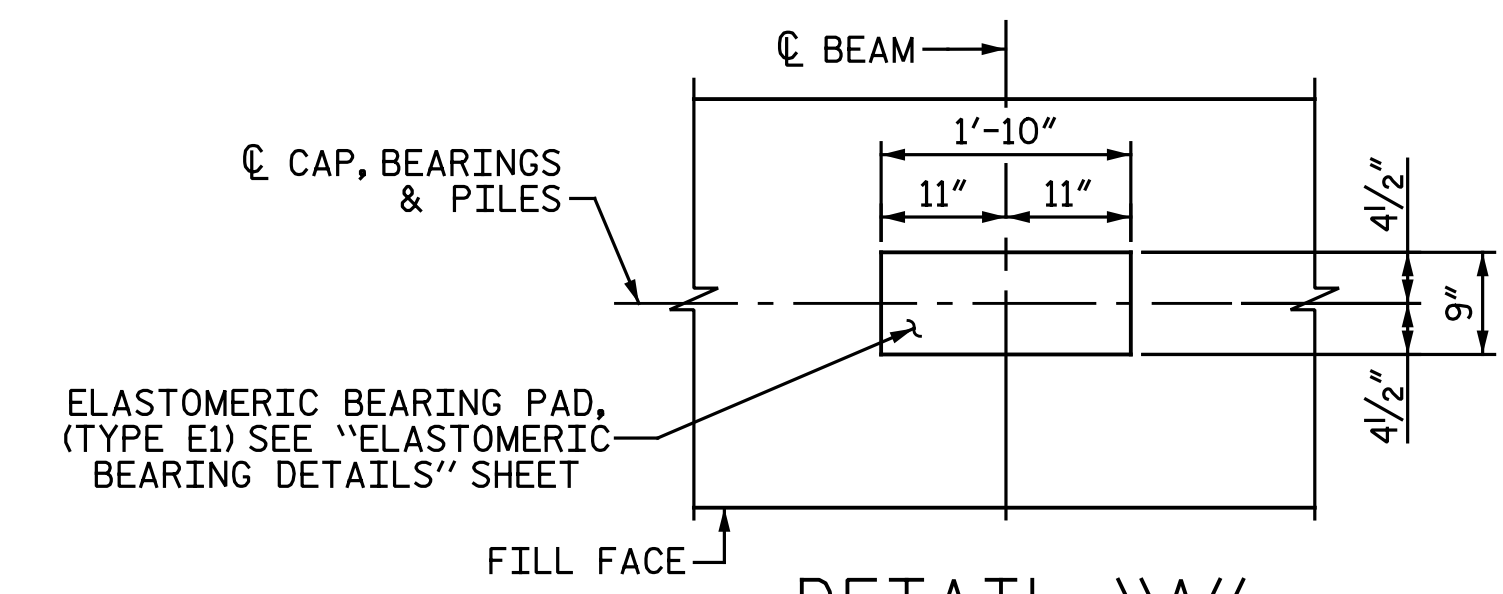
FOR MECHANICAL BUTT SPlicing OF REINFORCING STEEL, SEE SECTION 425-5 OF THE STANDARD SPECIFICATIONS.



PLAN

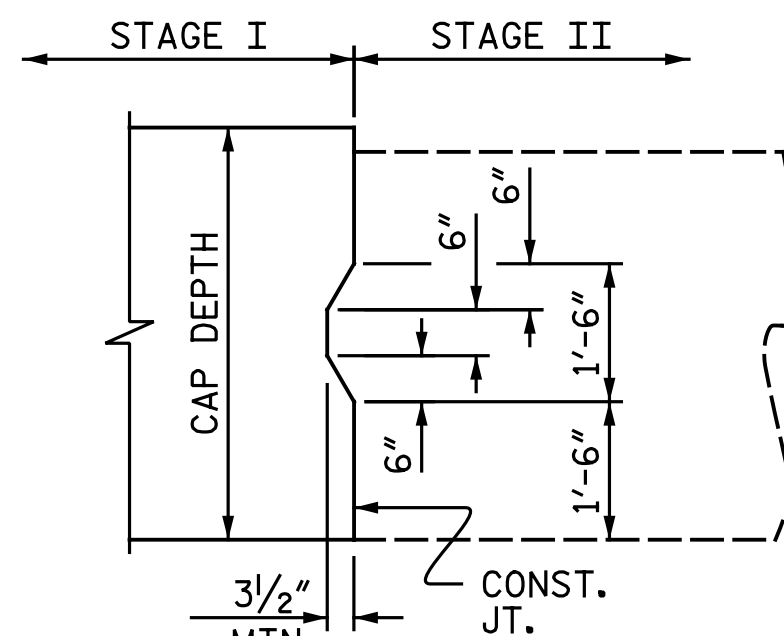


ELEVATION



DETAIL "A"

ALL DIMENSIONS AND DETAILS SHOWN ARE TYPICAL FOR ALL BEARINGS @ EACH BRIDGE SEAT LOCATION.



DETAIL "B"

PROJECT NO. U-3330
NASH COUNTY
 STATION: 61+03.00 -L-

SHEET 1 OF 2

DRAWN BY : N. B. SPEAKS DATE : 11-3-16
 CHECKED BY : A. H. SHARPE DATE : 11-14-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



DocuSigned by:
 Todd M. Garrison
 61EAF7523943466
 2/3/2017

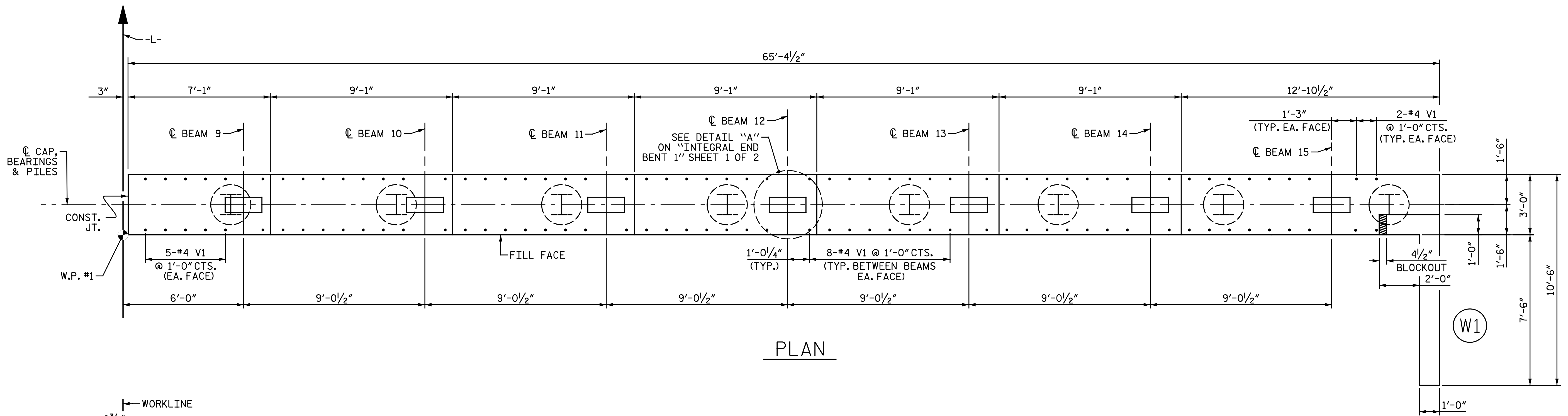
Michael Baker INTERNATIONAL

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 8000 Regency Parkway, Suite 600
 Cary, North Carolina 27518
 NC License No.: F-1084

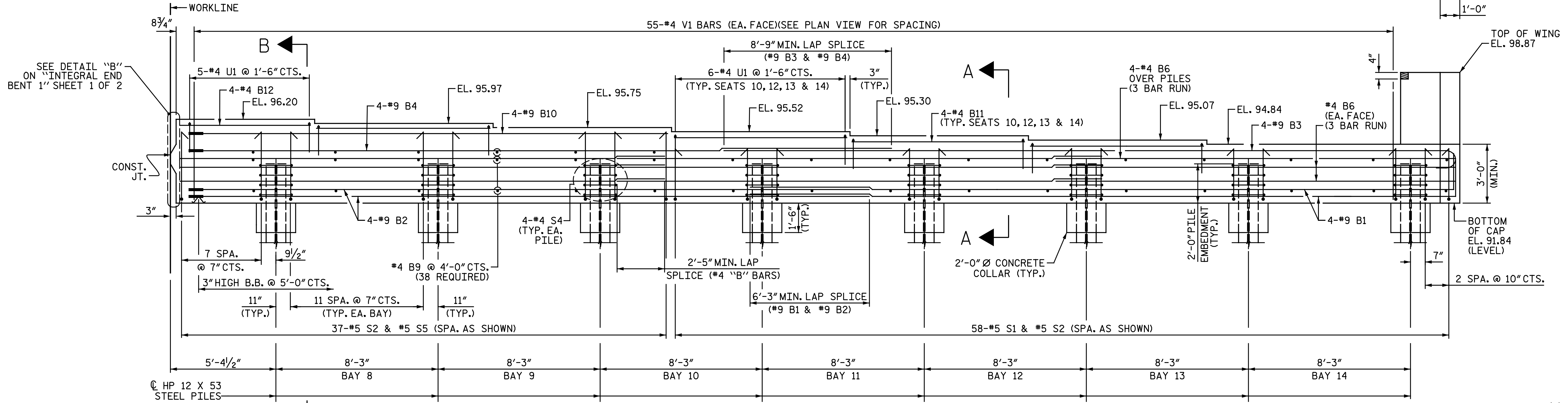
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 INTEGRAL END BENT 1

STAGE I

NO.		BY:	DATE:	NO.		BY:	DATE:	SHEET NO.	
1				3				S3-24	
2				4				TOTAL SHEETS 42	




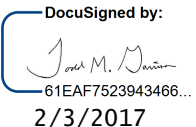
PLAN



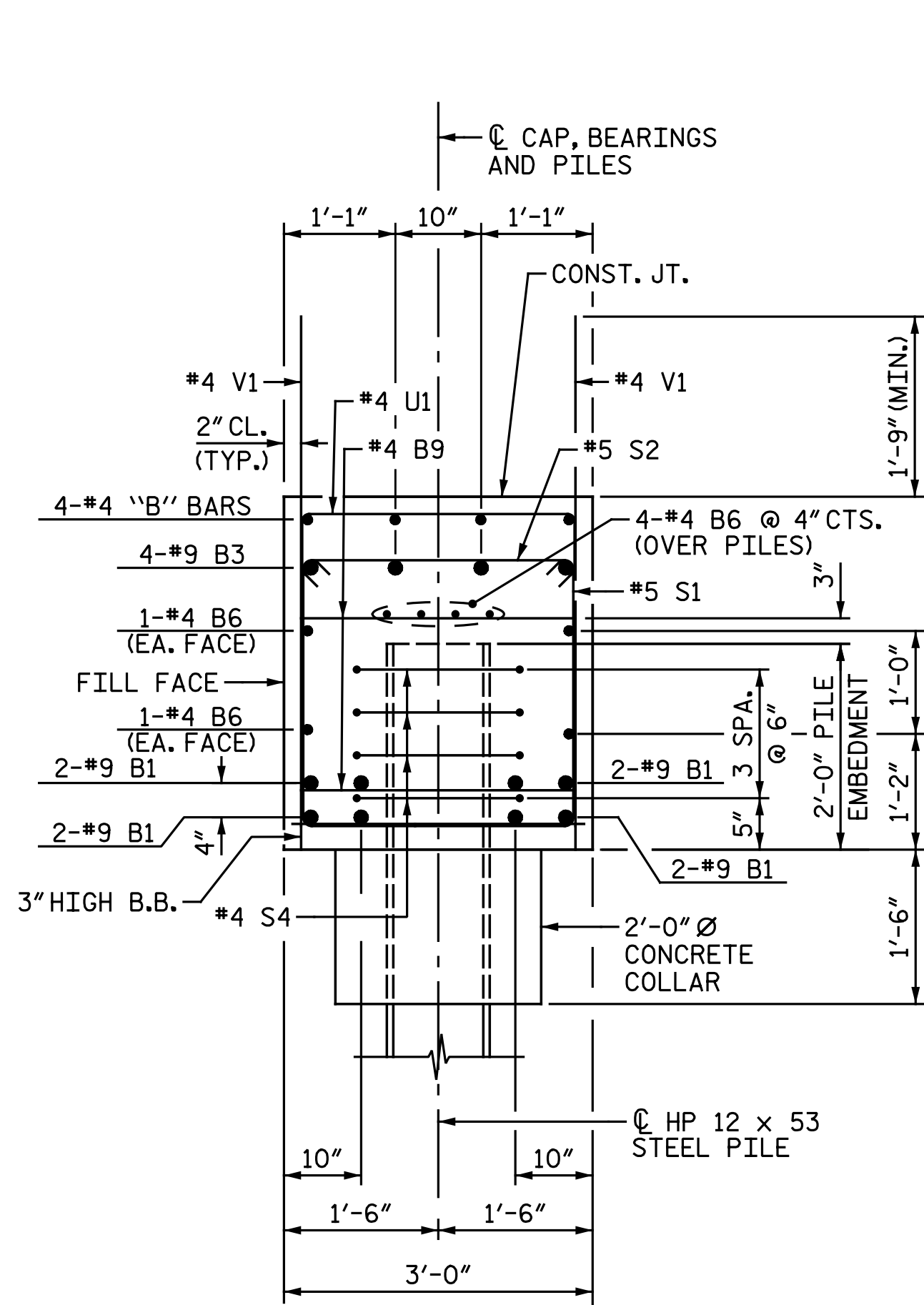
ELEVATION

PROJECT NO. U-3330
NASH COUNTY
 STATION: 61+03.00 -L-
 SHEET 2 OF 2

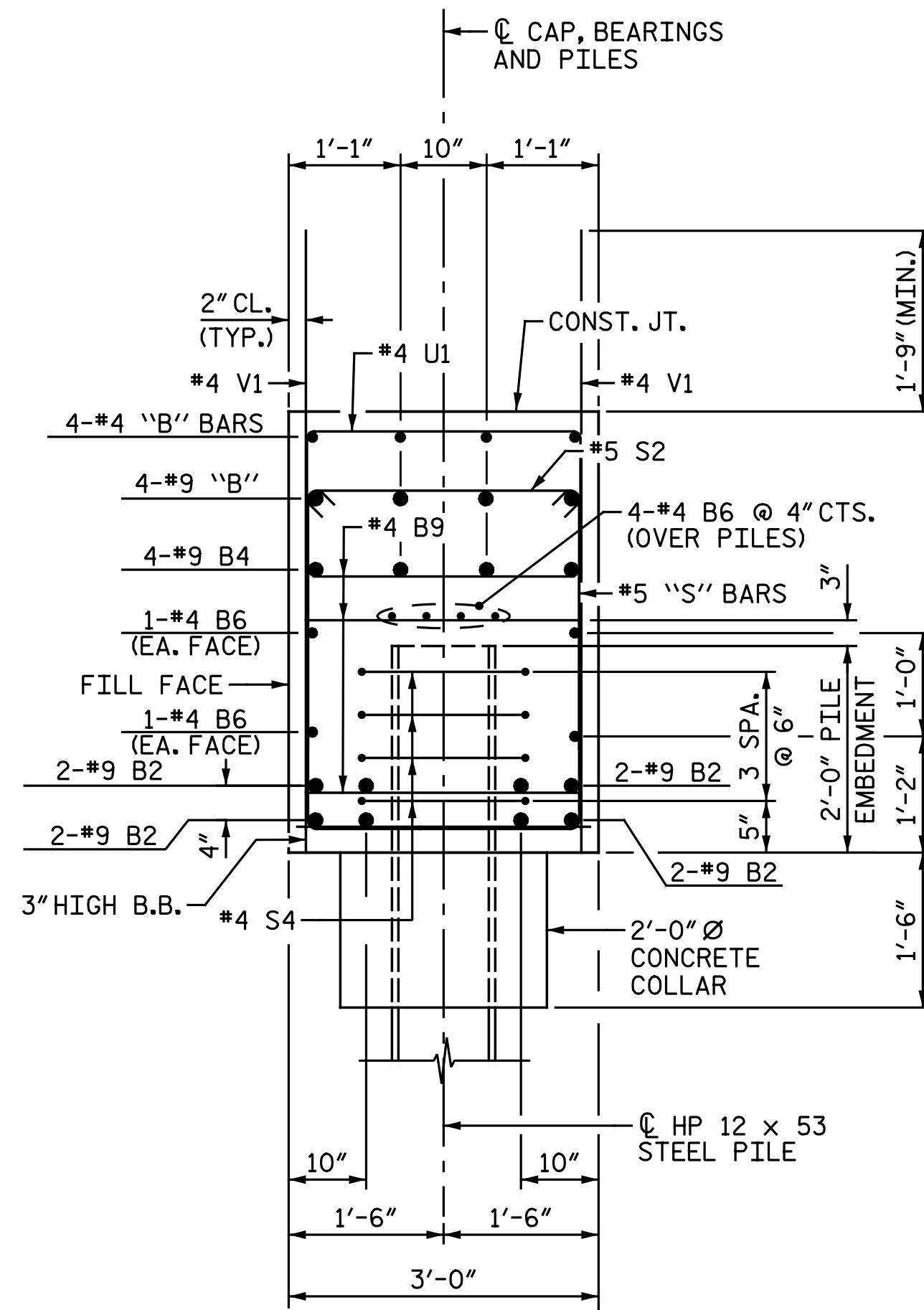
DRAWN BY : N. B. SPEAKS DATE : 11-3-16
 CHECKED BY : A. H. SHARPE DATE : 11-15-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	 DocuSigned by:  2/3/2017		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUBSTRUCTURE INTEGRAL END BENT 1 STAGE II		SHEET NO. S3-25 TOTAL SHEETS 42		
	REVISIONS						
	NO.	BY:	DATE:	NO.		BY:	DATE:
	1			3			
2			4				

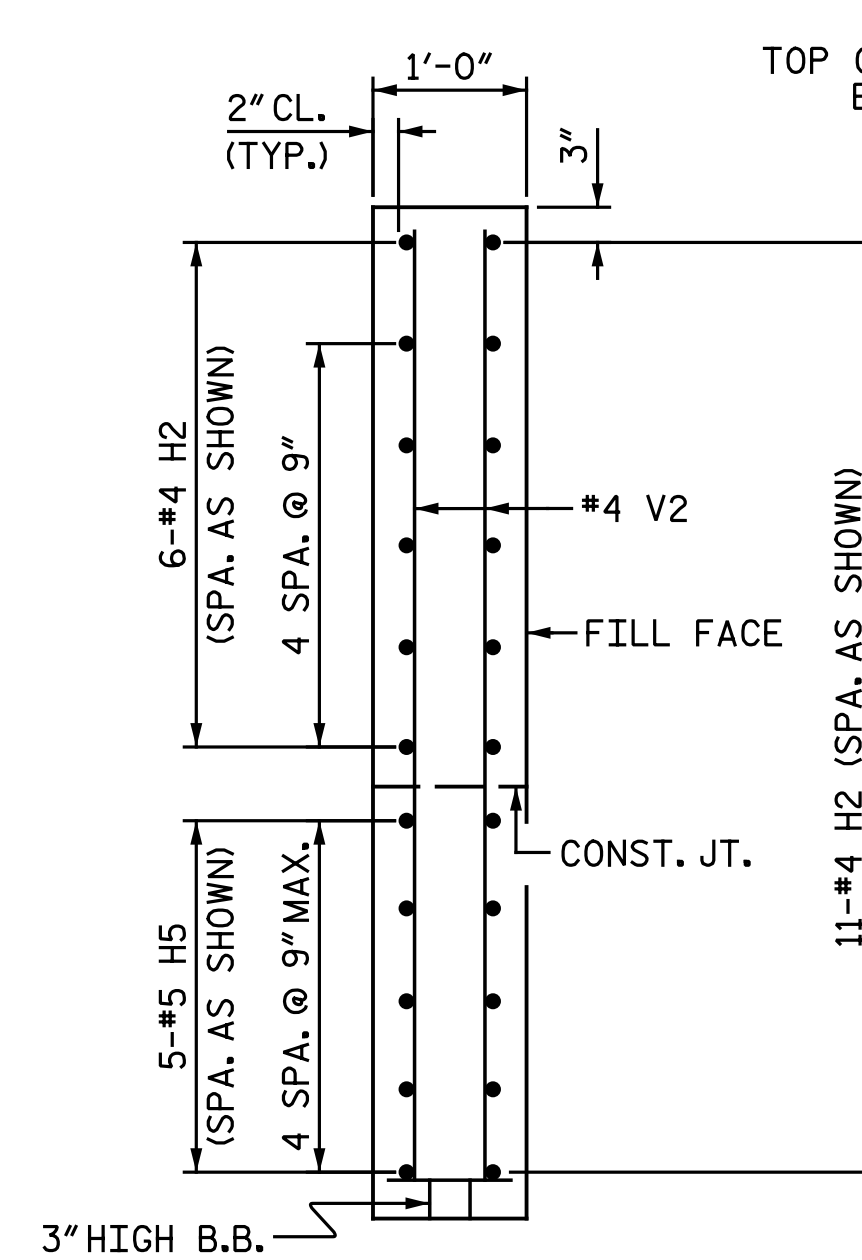
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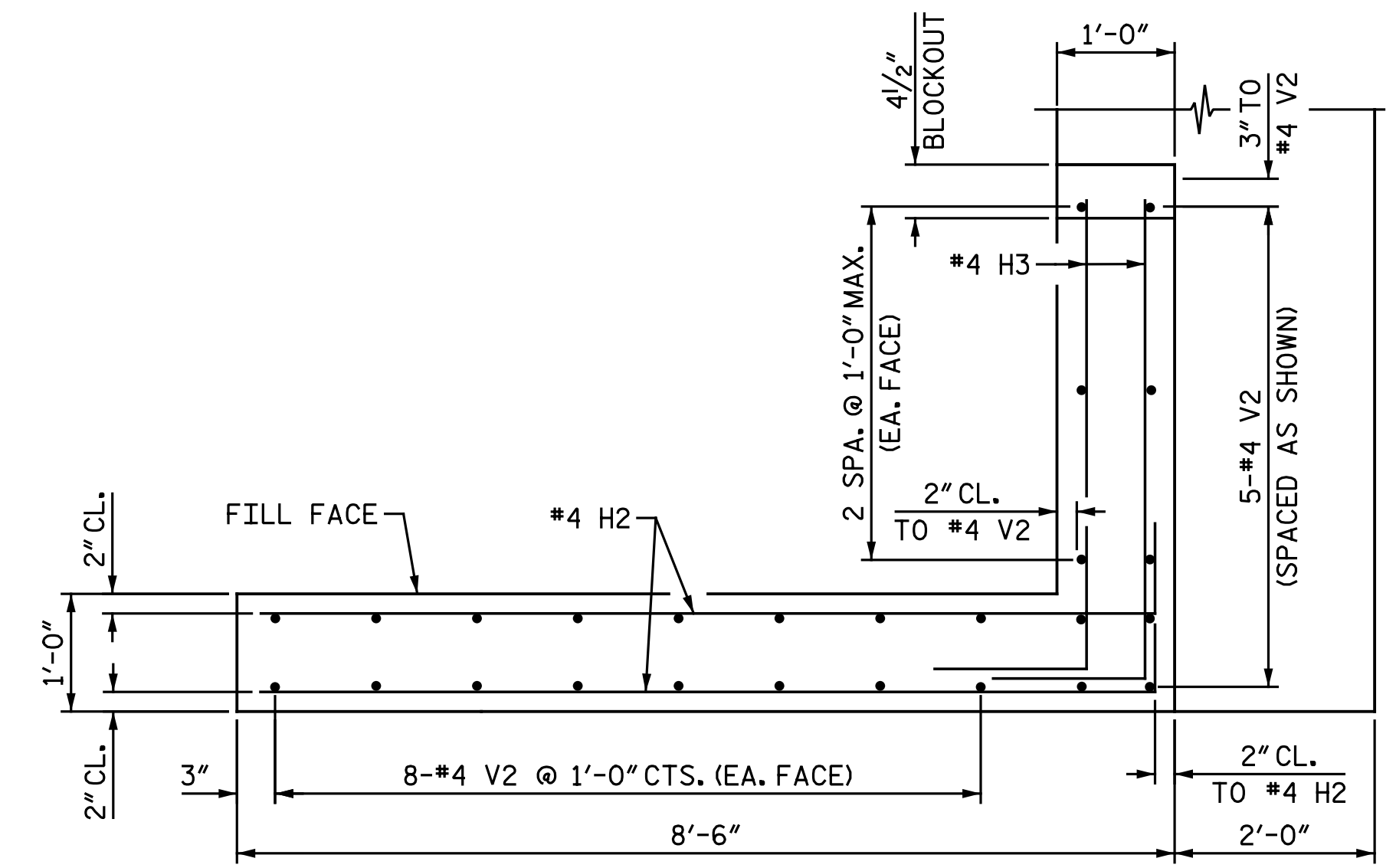
SECTION A-A



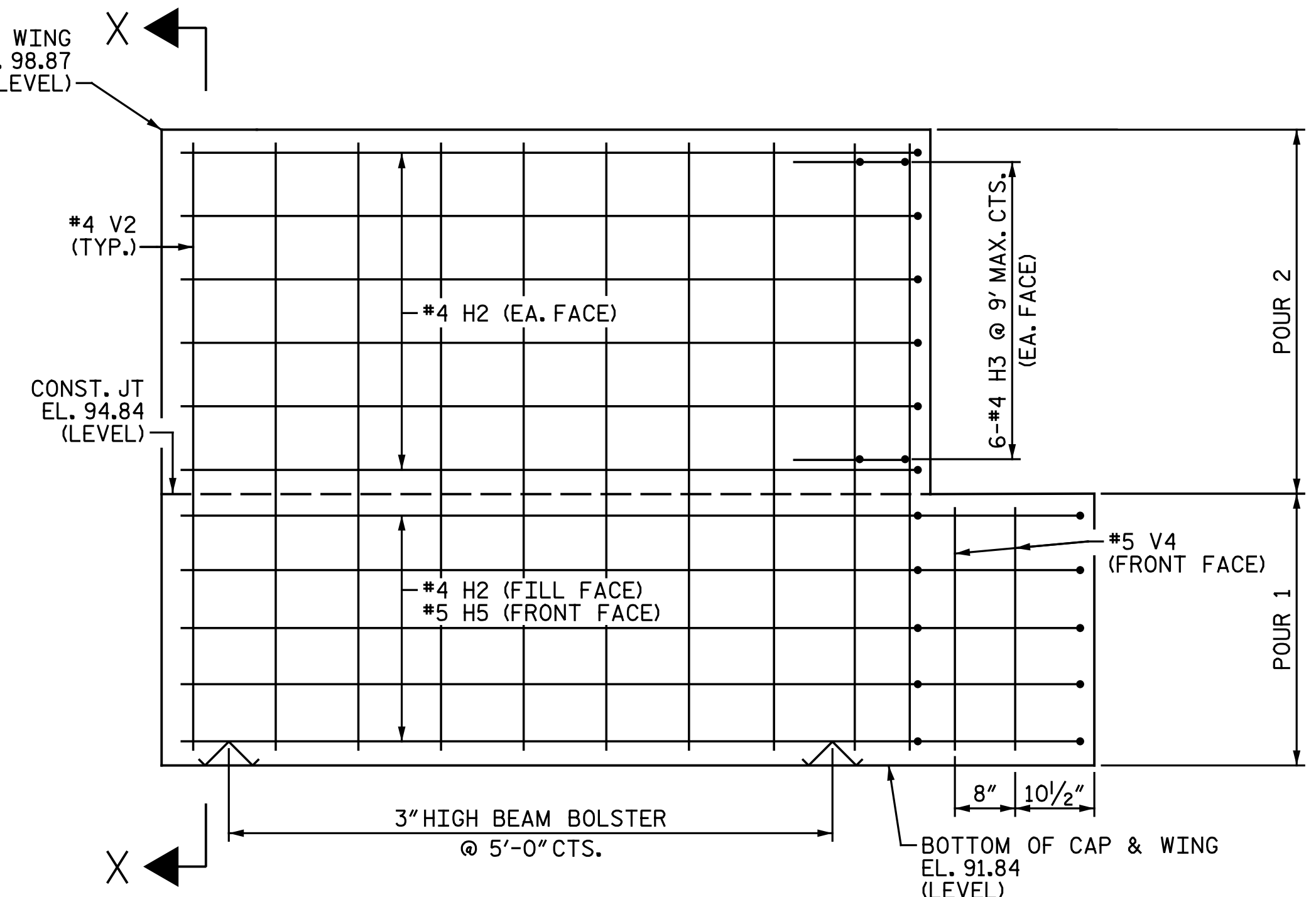
SECTION B-B



SECTION X-X



PLAN OF RIGHT WING WALL (W1)



ELEVATION OF RIGHT WING WALL (W1)


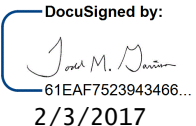
PROJECT NO. U-3330

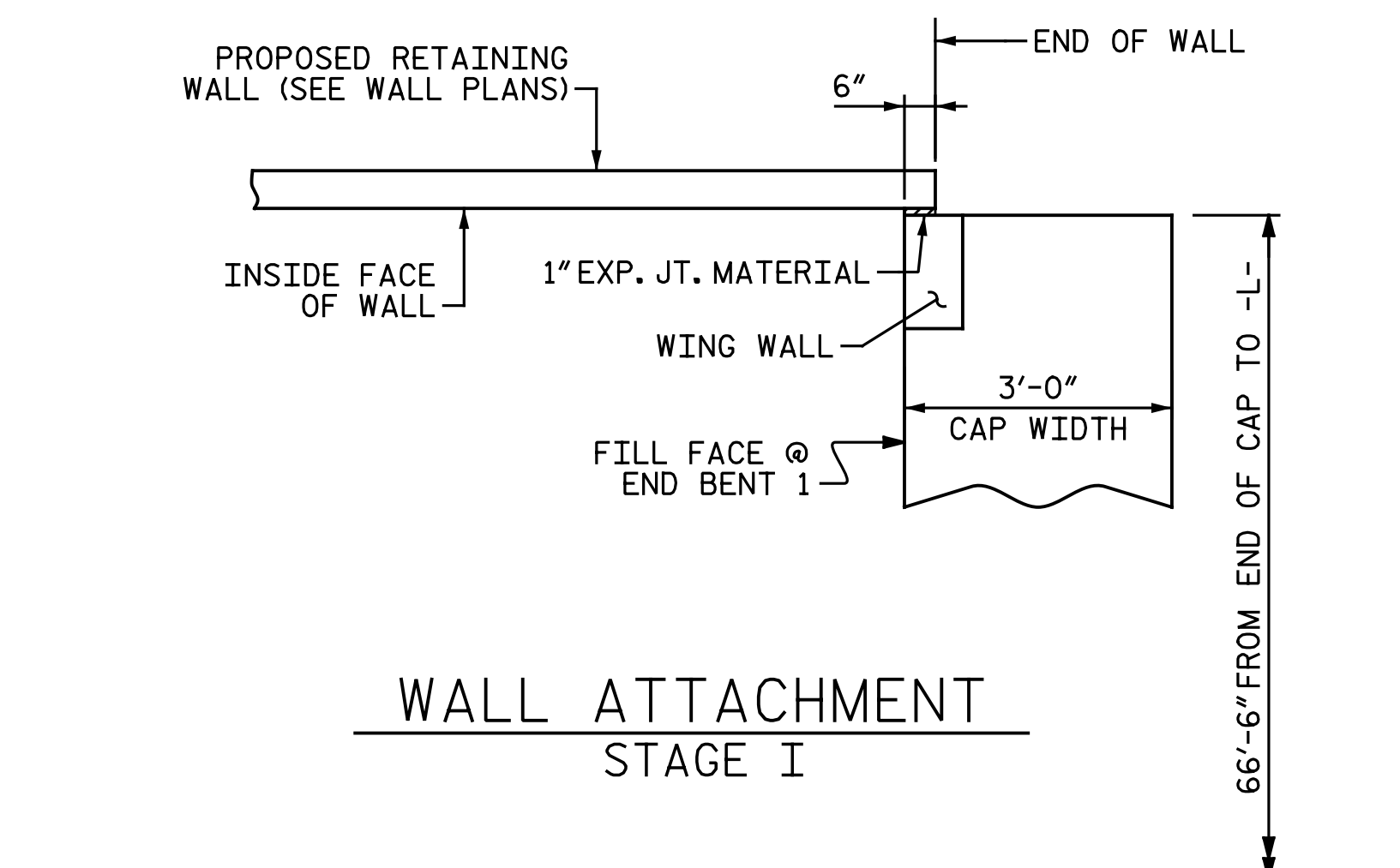
NASH COUNTY

STATION: 61+03.00 -L-

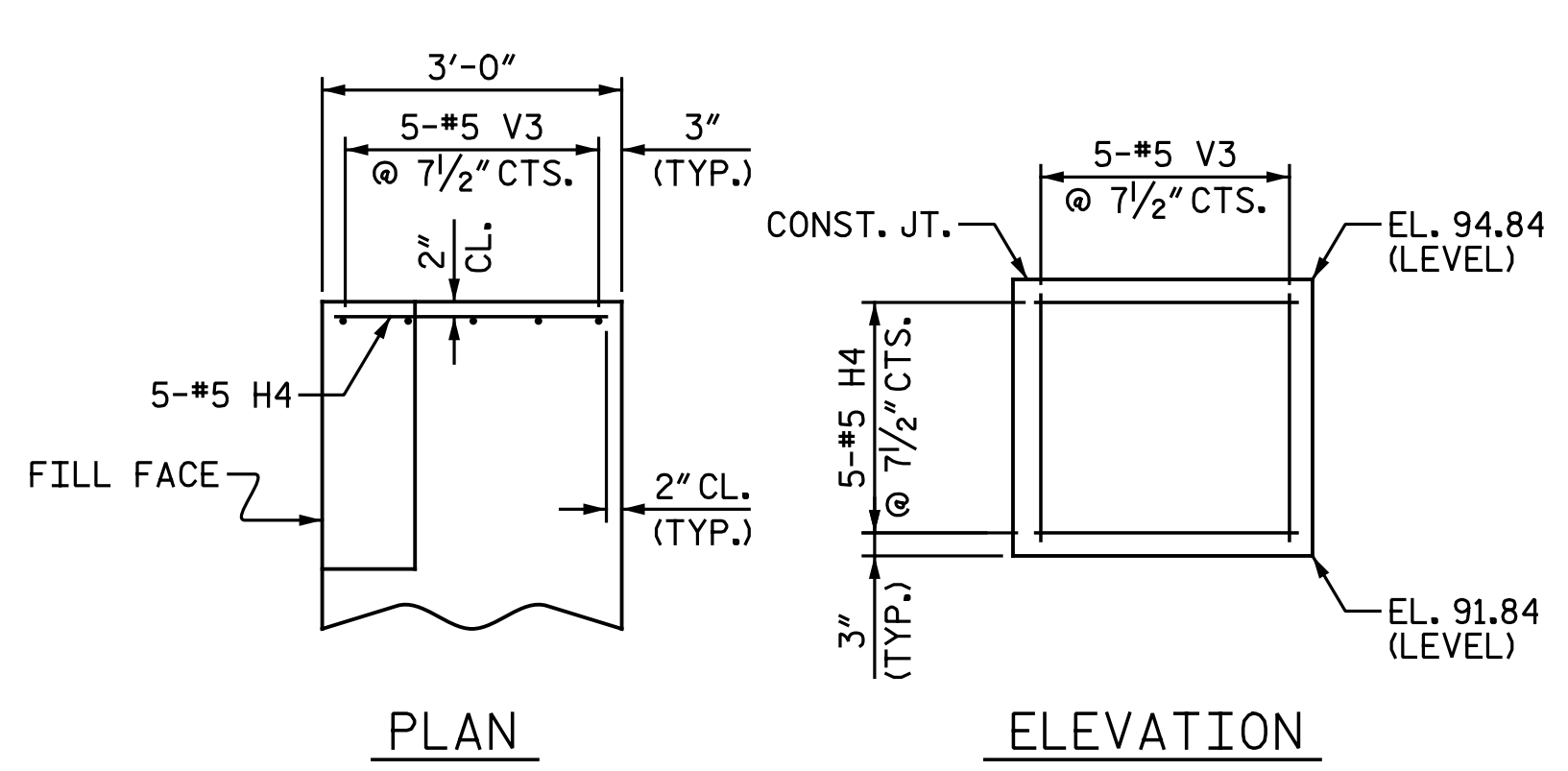
SHEET 1 OF 2

DRAWN BY : N. B. SPEAKS DATE : 11-30-16
 CHECKED BY : A. H. SHARPE DATE : 12-1-16

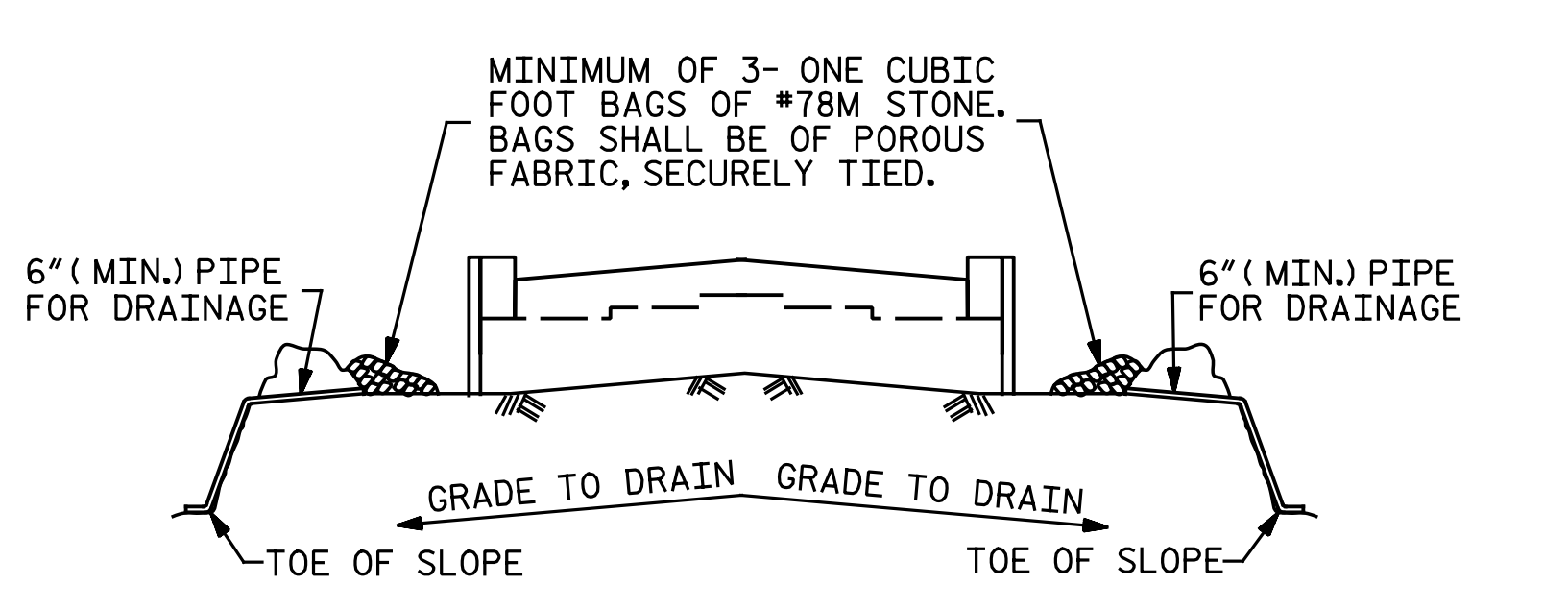
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	 DocuSigned by:  61EAF7523943466... 2/3/2017	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUBSTRUCTURE INTEGRAL END BENT 1 DETAILS		REVISIONS		SHEET NO. S3-26 TOTAL SHEETS 42
		Michael Baker Engineering 8000 Regency Parkway, Suite 600 Cary, North Carolina 27518 NC License No.: F-1084	NO. 1 BY: [] DATE: []	NO. 2 BY: [] DATE: []	NO. 3 BY: [] DATE: []	



WALL ATTACHMENT
STAGE I



LEFT END BENT CAP
STAGE I



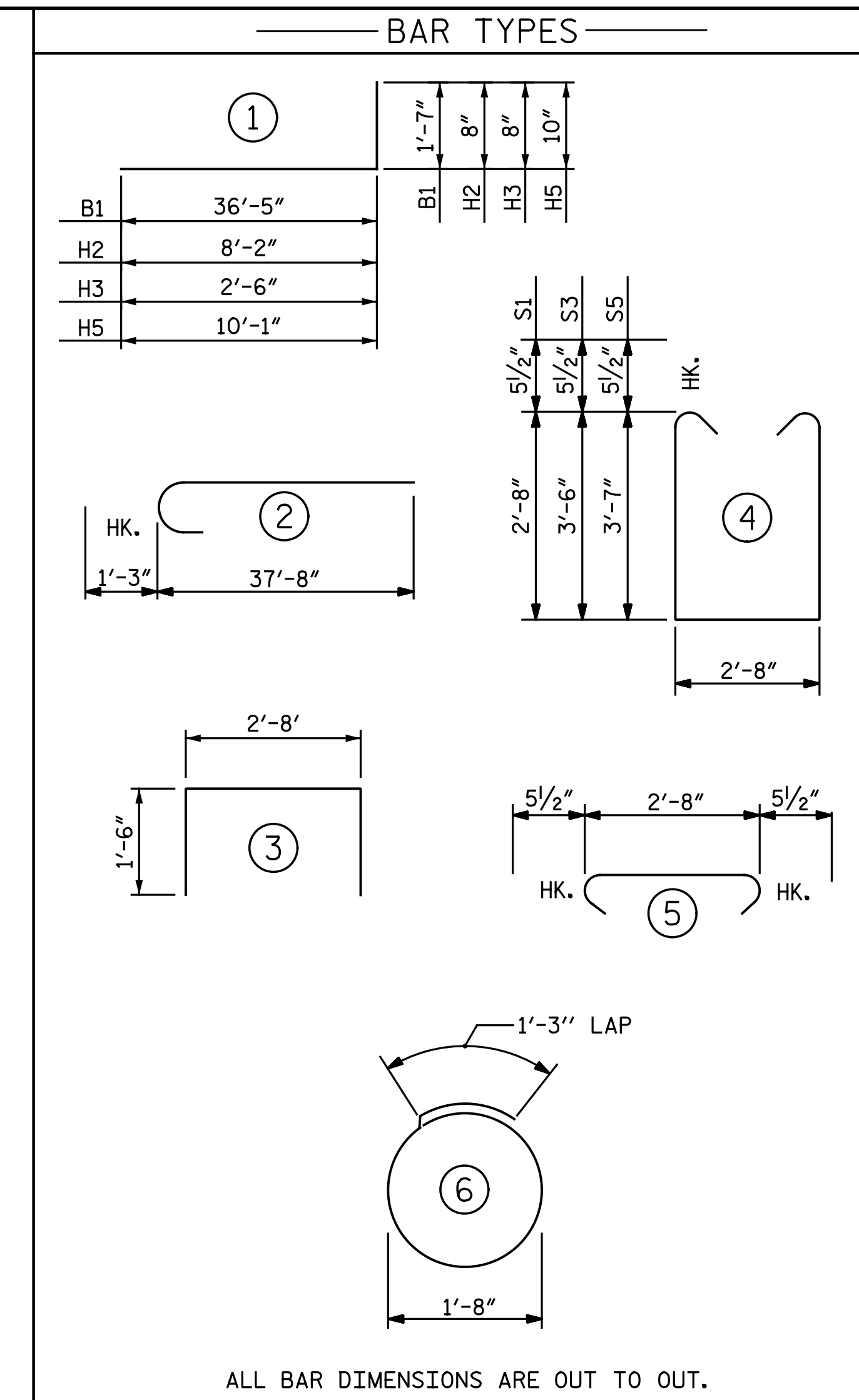
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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. BAGGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

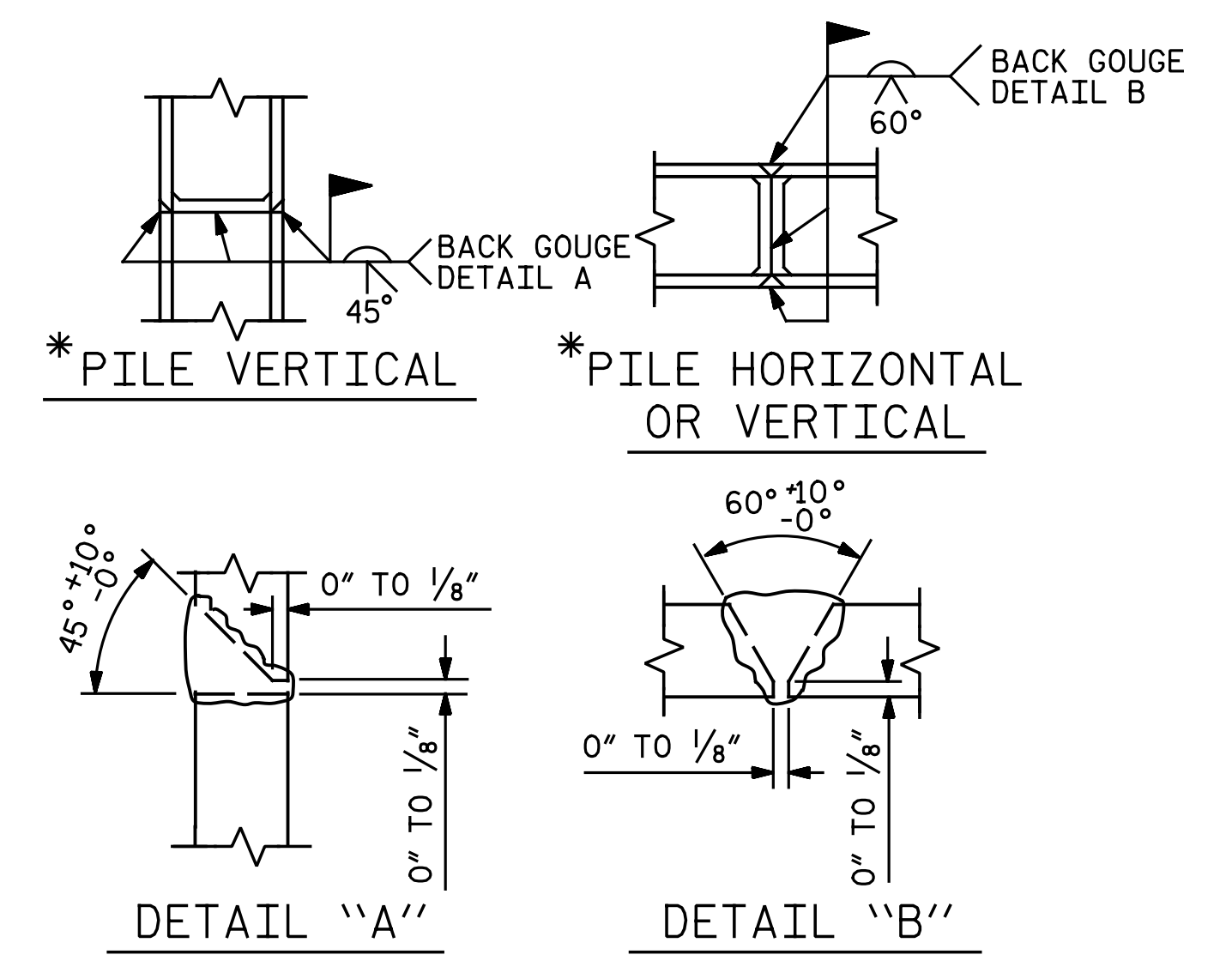
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

DRAWN BY : N. B. SPEAKS DATE : 12-2-16
 CHECKED BY : A. H. SHARPE DATE : 12-2-16



ALL BAR DIMENSIONS ARE OUT TO OUT.



PILE SPLICE DETAILS
* POSITION OF PILE DURING WELDING.

BILL OF MATERIAL

END BENT 1												
STAGE I					STAGE II							
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	8	#9		38'-0"	1,034	B1	8	#9		38'-0"	1,034	
B2	8	#9	STR	37'-5"	1,018	B2	8	#9	STR	37'-5"	1,018	
B3	4	#9		38'-11"	529	B3	4	#9		38'-11"	529	
B4	4	#9	STR	38'-8"	526	B4	4	#9	STR	38'-8"	526	
B5	4	#9	STR	29'-1"	396	B6	24	#4	STR	24'-8"	395	
B6	24	#4	STR	24'-8"	395	B9	38	#4	STR	2'-8"	68	
B7	12	#4	STR	8'-4"	67	B10	4	#9	STR	24'-1"	328	
B8	4	#4	STR	5'-2"	14	B11	16	#4	STR	8'-11"	95	
B9	40	#4	STR	2'-8"	71	B12	4	#4	STR	6'-9"	18	
H1	12	#4	STR	3'-6"	28	H2	17	#4		1	8'-10"	100
H4	5	#5	STR	2'-8"	14	H3	12	#4		1	3'-2"	25
S1	57	#5		8'-11"	530	H5	5	#5		1	10'-11"	57
S2	99	#5		3'-7"	370	S1	58	#5		4	8'-11"	539
S3	42	#5		10'-7"	464	S2	95	#5		5	3'-7"	355
S4	32	#4		6'-6"	139	S4	32	#4		6	6'-6"	139
U1	20	#4		5'-8"	76	S5	37	#5		4	10'-9"	415
V1	102	#4	STR	6'-1"	414	U1	29	#4		3	5'-8"	110
V2	8	#4	STR	6'-7"	35	V1	110	#4	STR	6'-1"	447	
V3	5	#5	STR	2'-8"	14	V2	26	#4	STR	6'-7"	114	
						V4	2	#5	STR	2'-7"	5	
REINFORCING STEEL					LBS. 6,134	REINFORCING STEEL					LBS. 6,317	
CLASS A CONCRETE						CLASS A CONCRETE						
POUR 1 - CAP & COLLAR					C.Y. 28.3	POUR 1 - CAP, LOWER PART OF WING OF COLLAR					C.Y. 28.5	
POUR 2 - BACKWALL					C.Y. 0.6	POUR 2 - UPPER PART OF WING					C.Y. 1.6	
TOTAL CLASS A CONCRETE					C.Y. 28.9	TOTAL CLASS A CONCRETE					C.Y. 30.1	
HP 12 x 53 STEEL PILES						HP 12 x 53 STEEL PILES						
NO. 8					L.F. 200	NO. 8					L.F. 200	
PILE DRIVING EQUIPMENT SETUP FOR HP 12 x 53 STEEL PILES					EA. 8	PILE DRIVING EQUIPMENT SETUP FOR HP 12 x 53 STEEL PILES					EA. 8	

PROJECT NO. U-3330
NASH COUNTY
 STATION: 61+03.00 -L-
 SHEET 2 OF 2

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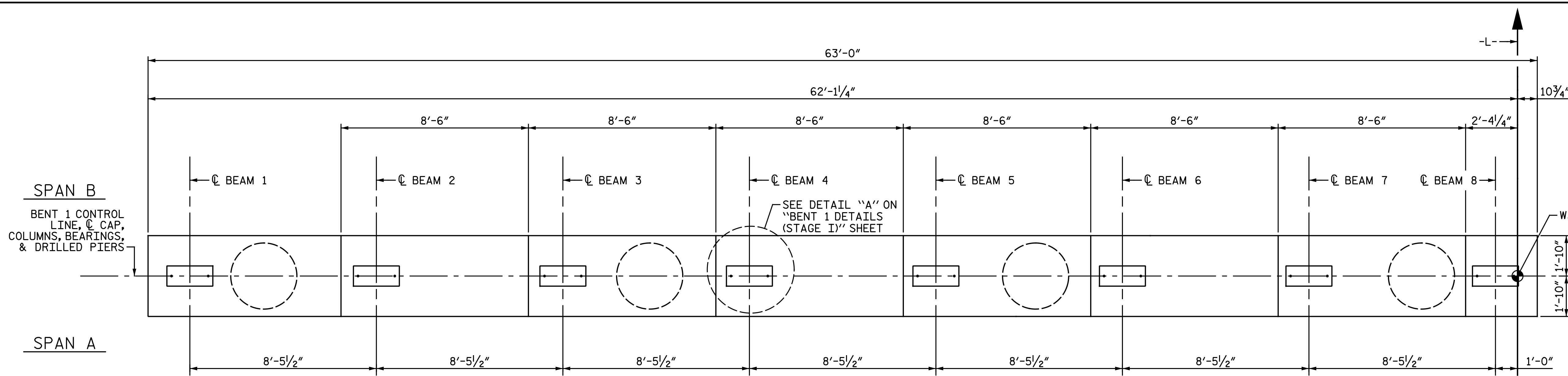
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 INTEGRAL END BENT 1
 DETAILS

REVISIONS

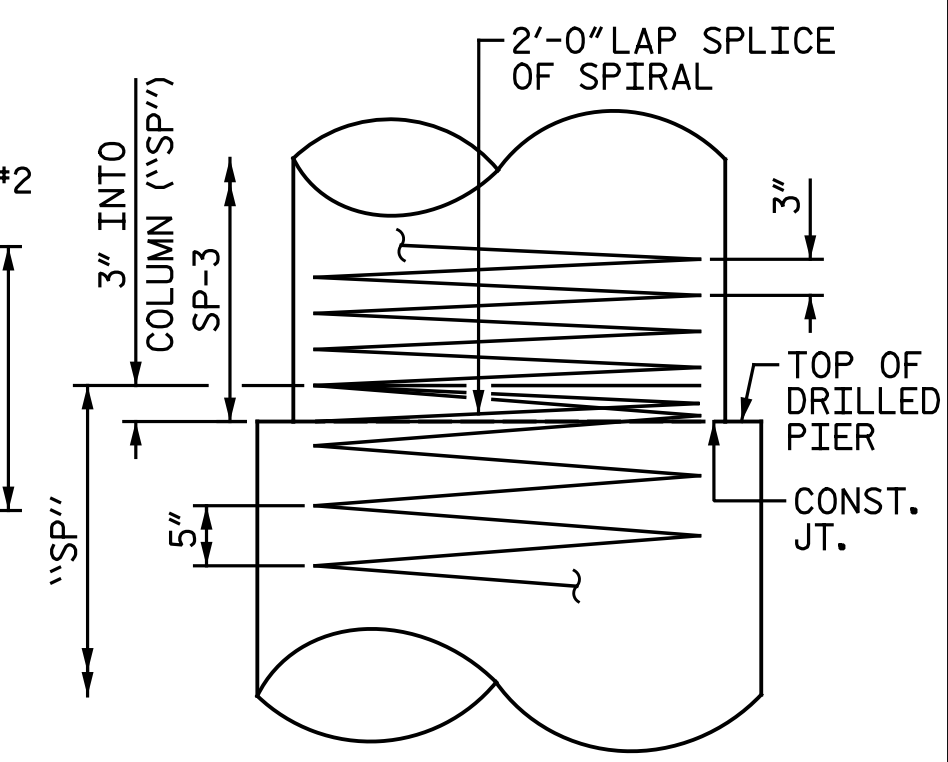
NO.	BY:	DATE:	NO.	BY:	DATE:
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2			4		

SHEET NO. **S3-27**
 TOTAL SHEETS 42

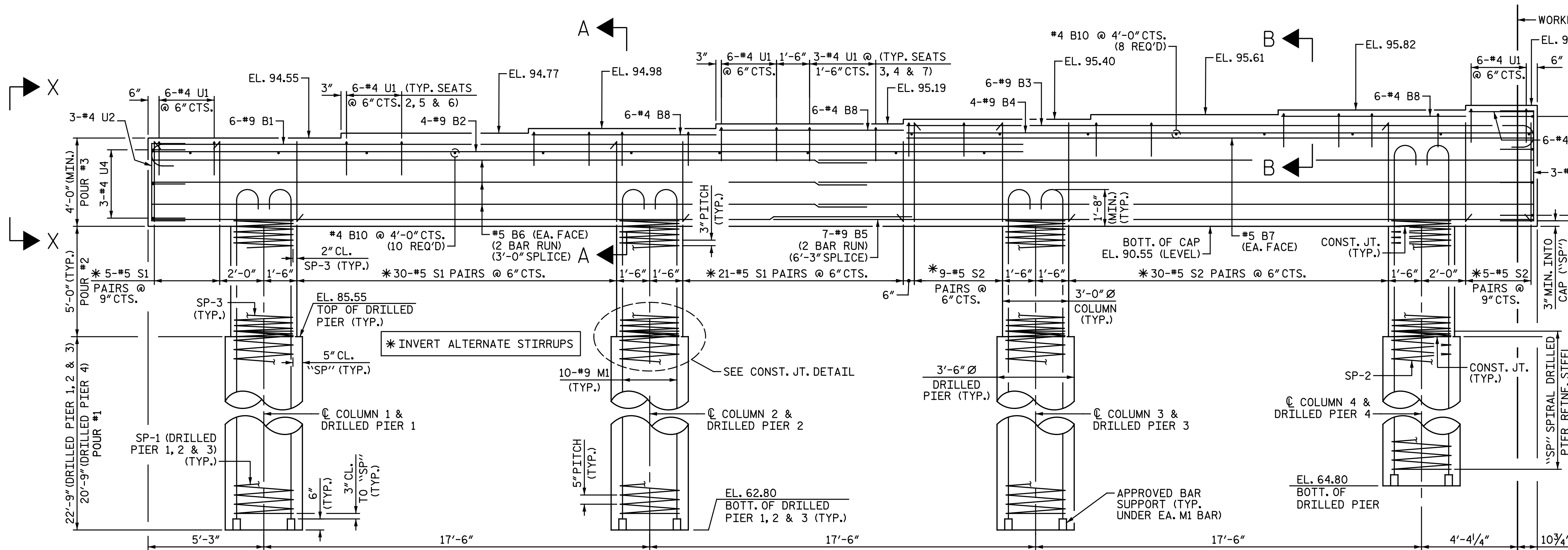
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PLAN



CONSTRUCTION JT. DETAIL



ELEVATION

PROJECT NO. U-3330
NASH COUNTY
 STATION: 61+03.00 -L-

DRAWN BY : M. D. MAYHEW DATE : 11-21-16
 CHECKED BY : A. H. SHARPE DATE : 12-6-16

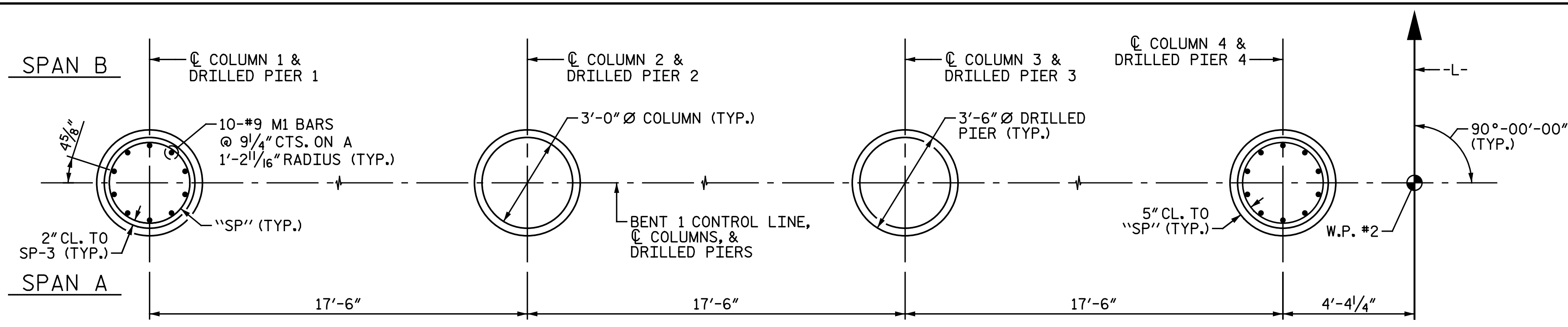
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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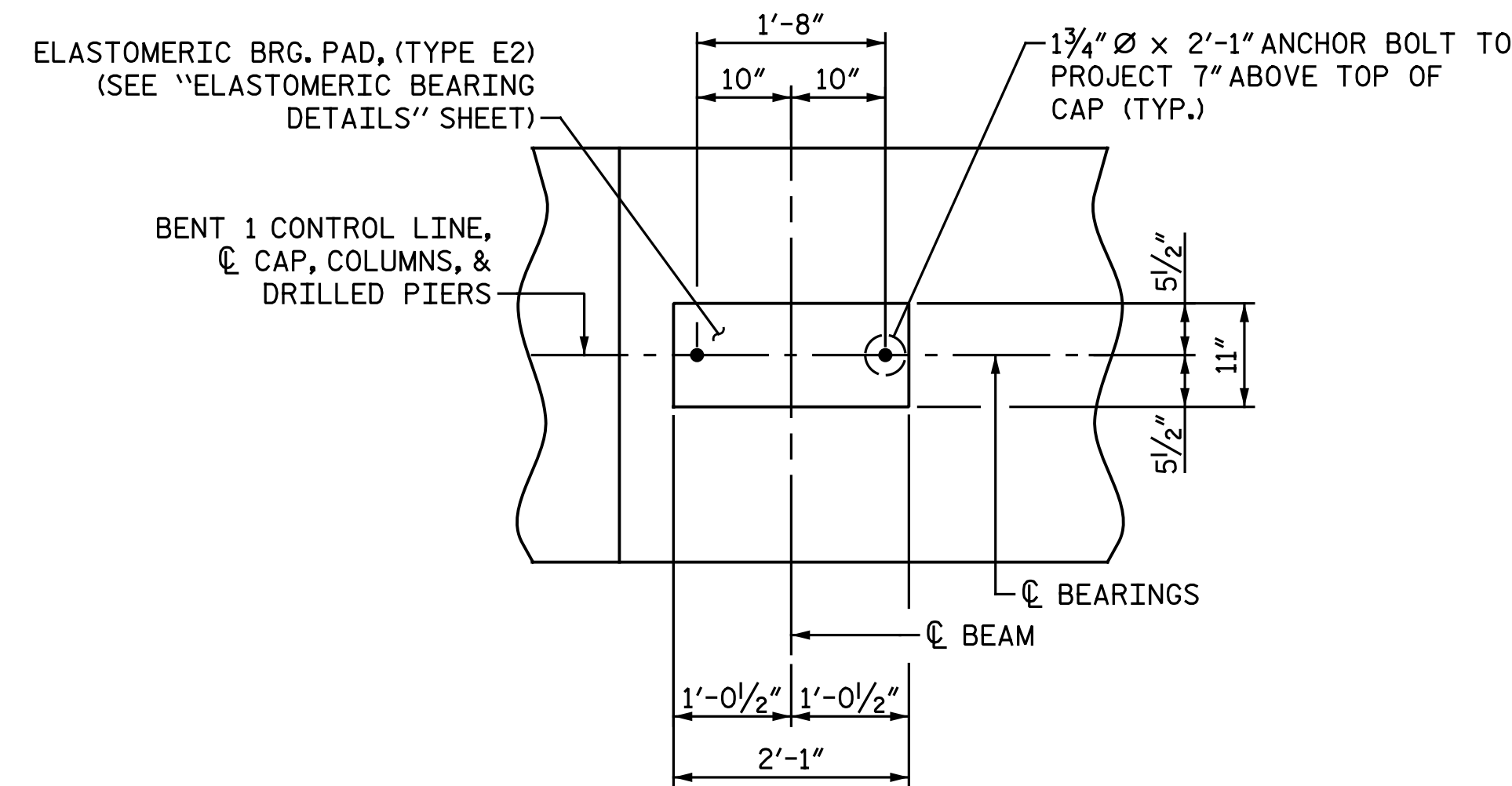
 61EAF7523943466...
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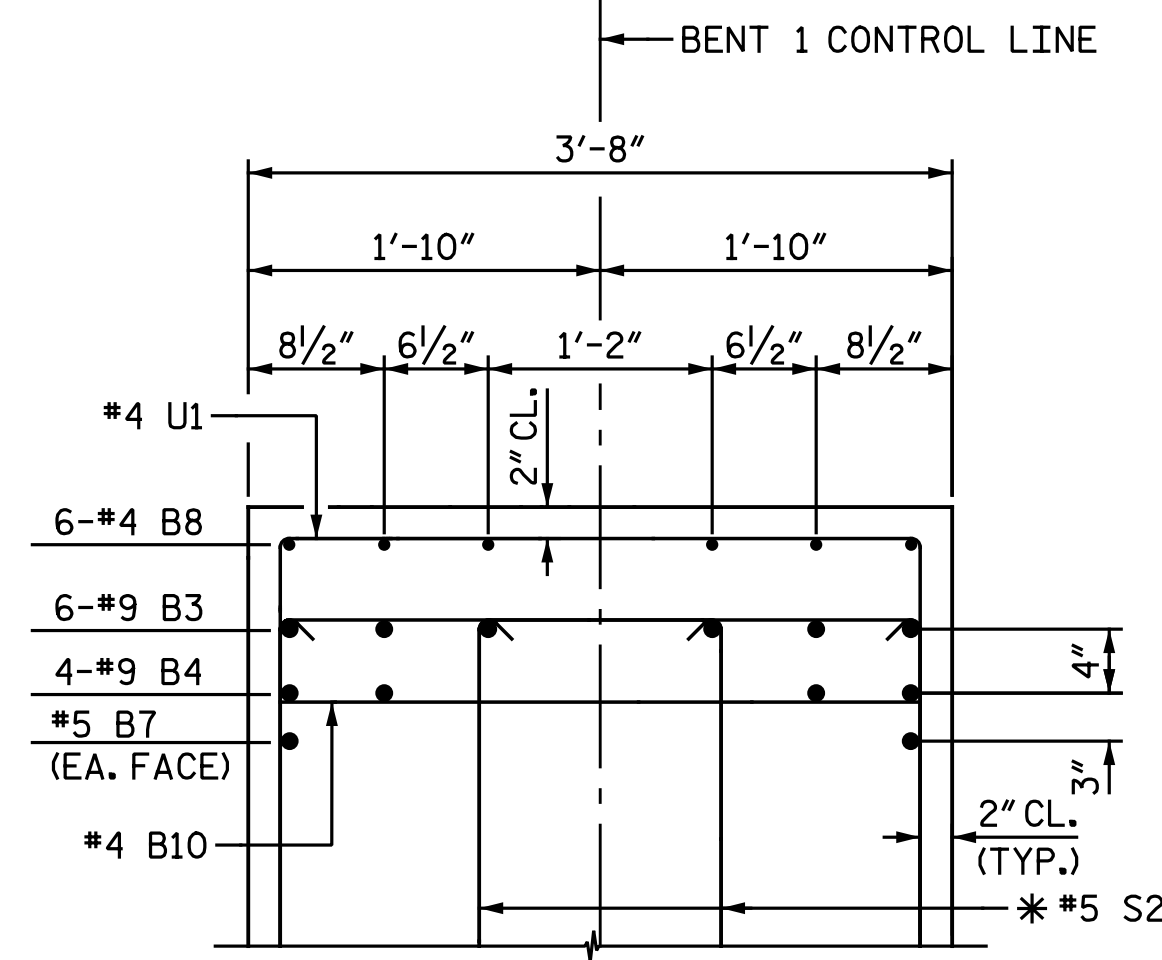
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
BENT 1					
STAGE I					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S3-28 TOTAL SHEETS 42



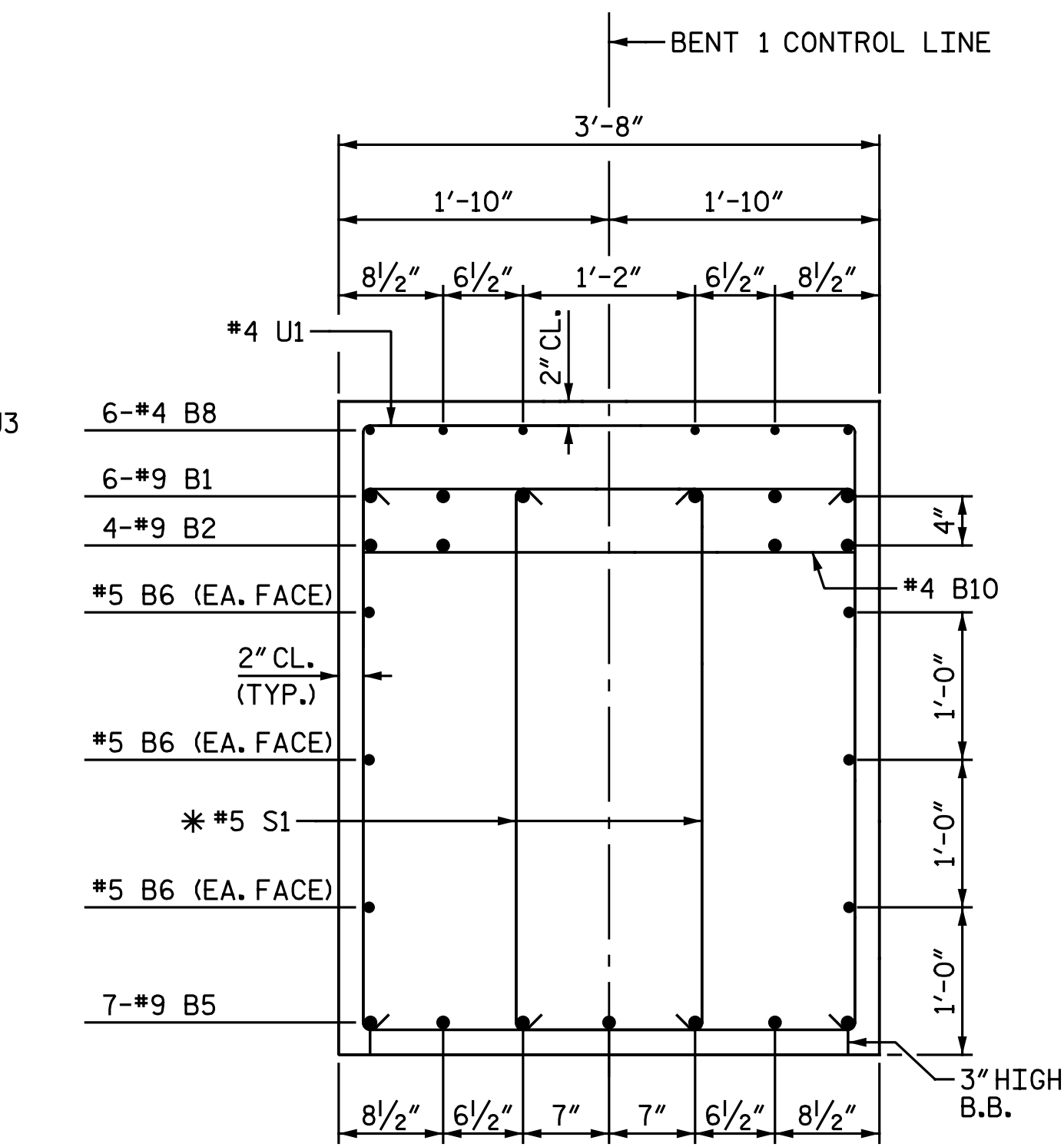
PLAN OF DRILLED PIERS & COLUMNS



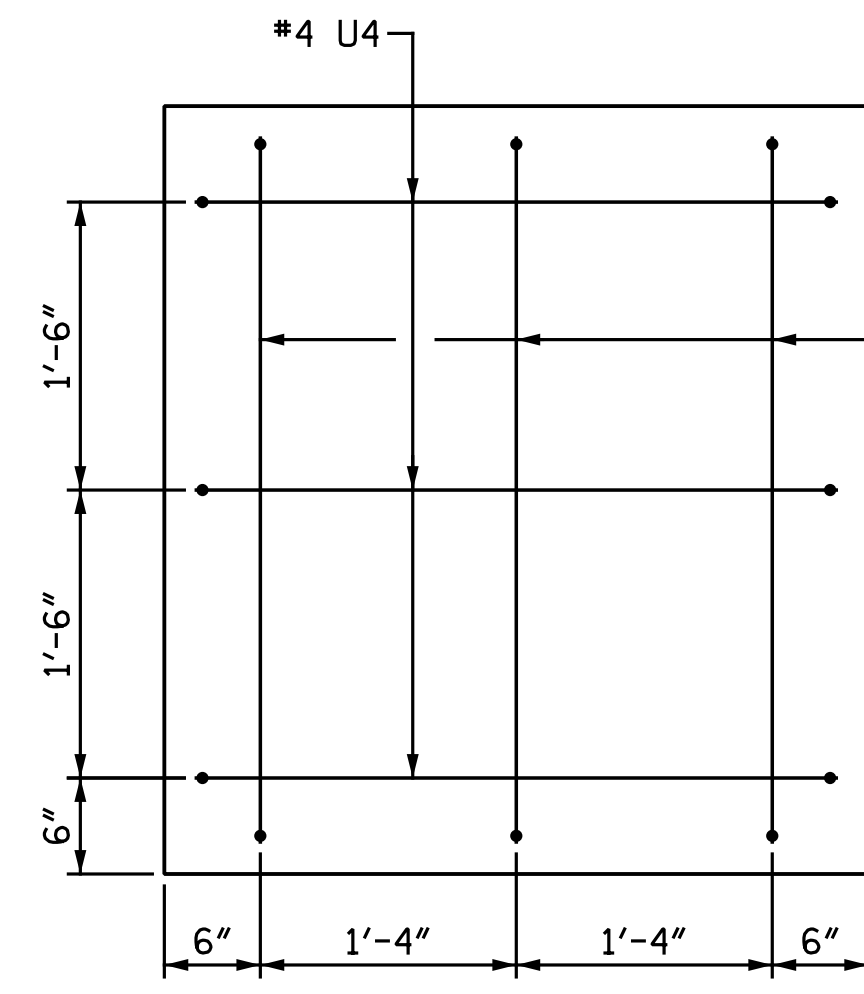
DETAIL "A"
DIMENSIONS ARE TYPICAL FOR EACH BEARING



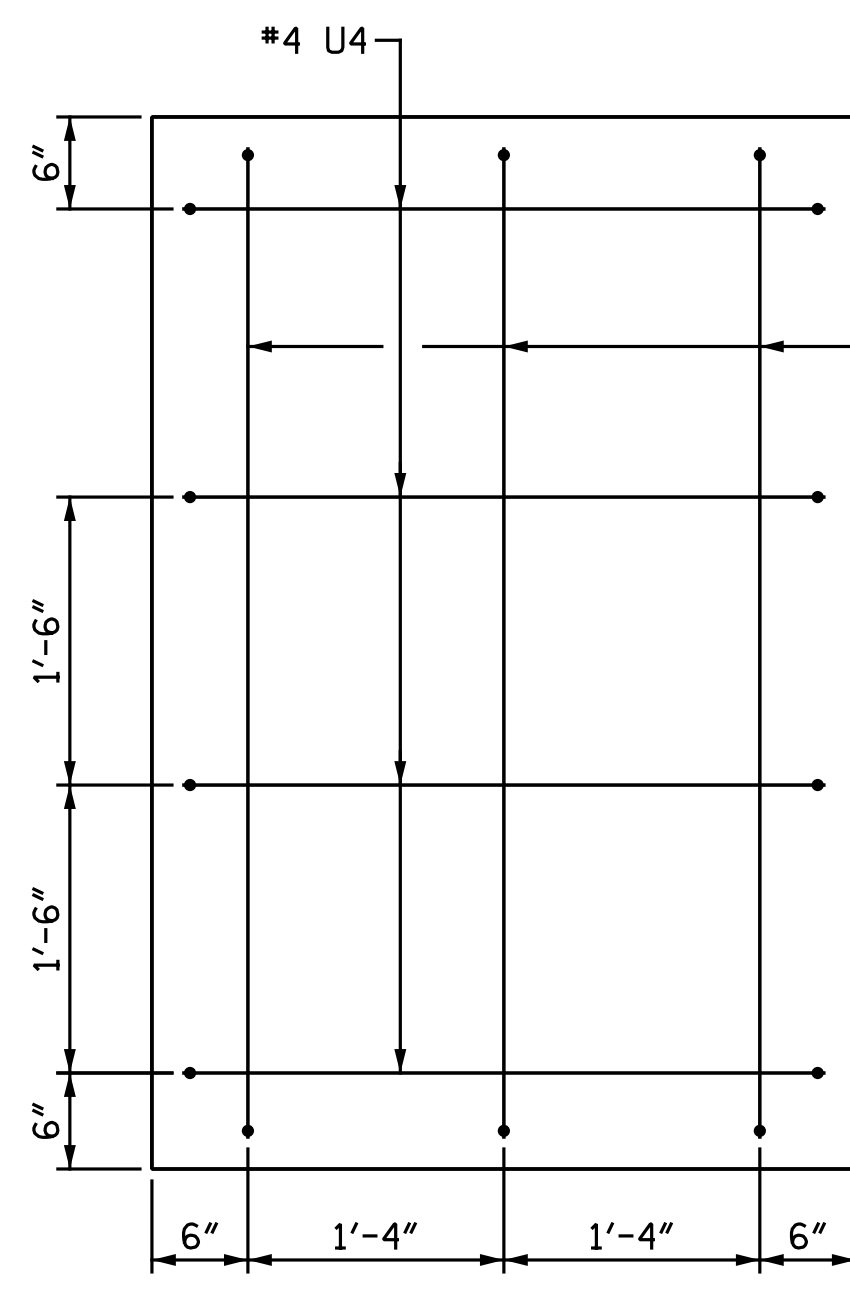
PARTIAL SECTION B-B
* INVERT ALTERNATE STIRRUPS



SECTION A-A
* INVERT ALTERNATE STIRRUPS

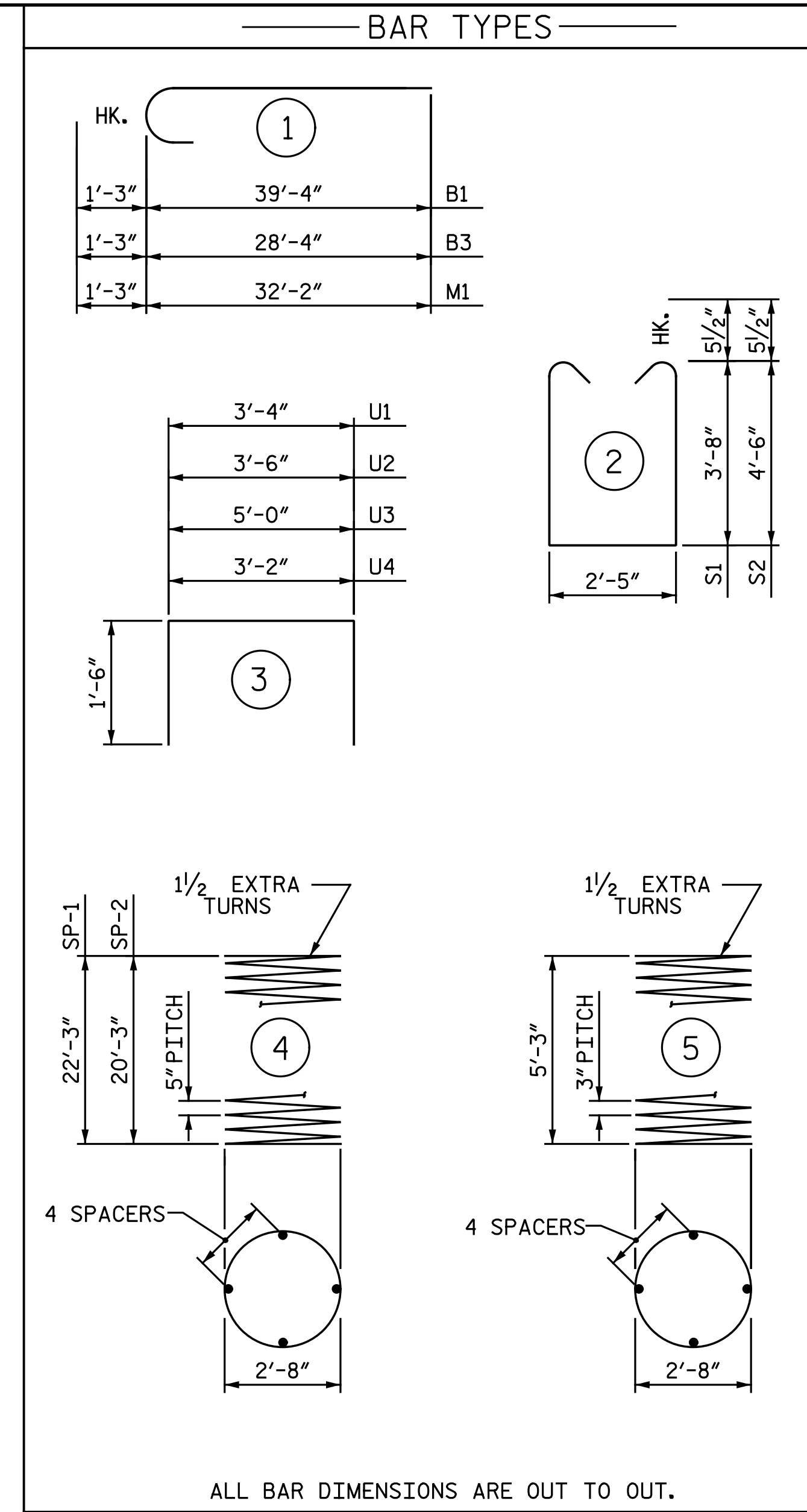


VIEW X-X



VIEW Y-Y


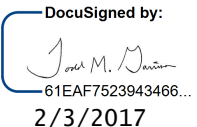
DRAWN BY : M. D. MAYHEW DATE : 11-21-16
CHECKED BY : A. H. SHARPE DATE : 12-7-16



NOTES:
FOR NOTES, SEE "BENT 1 DETAILS (STAGE II)" SHEET.

BILL OF MATERIAL					
BENT 1 - STAGE I					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#9	1	40' - 7"	828
B2	4	#9	STR	39' - 4"	535
B3	6	#9	1	29' - 7"	603
B4	4	#9	STR	28' - 5"	386
B5	14	#9	STR	34' - 6"	1,642
B6	12	#5	STR	32' - 10"	411
B7	2	#5	STR	28' - 5"	59
B8	18	#4	STR	8' - 4"	100
B9	6	#4	STR	2' - 11"	12
B10	18	#4	STR	3' - 4"	40
M1	40	#9	1	33' - 5"	4,545
S1	112	#5	2	10' - 8"	1,246
S2	88	#5	2	12' - 4"	1,132
U1	57	#4	3	6' - 4"	241
U2	3	#4	3	6' - 6"	13
U3	3	#4	3	8' - 0"	16
U4	7	#4	3	6' - 2"	29
REINFORCING STEEL					LBS. 11,838
SP-1	3	*	4	463' - 10"	1,451
SP-2	1	*	4	424' - 5"	443
SP-3	4	**	5	198' - 0"	529
SPIRAL COLUMN REINFORCING STEEL					LBS. 2,423
* THE SP-1 & SP-2 SPIRAL REINF. STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.					
** THE SP-3 SPIRAL REINF. STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.					
CLASS A CONCRETE					
POUR 2 - COLUMNS				C.Y.	5.3
POUR 3 - CAP				C.Y.	40.1
TOTAL CLASS A CONCRETE				C.Y.	45.4
DRILLED PIER CONCRETE					
POUR 1 - DRILLED PIERS				C.Y.	31.8
3'-6" DIA. DRILLED PIERS IN SOIL				LIN. FT.	50.0
3'-6" DIA. DRILLED PIERS NOT IN SOIL				LIN. FT.	39.0
PERMANENT STEEL CASING FOR 3'-6" DIA. DRILLED PIER				LIN. FT.	42.2
SID INSPECTIONS				EA.	1
▲ CSL TUBES				LIN. FT.	380

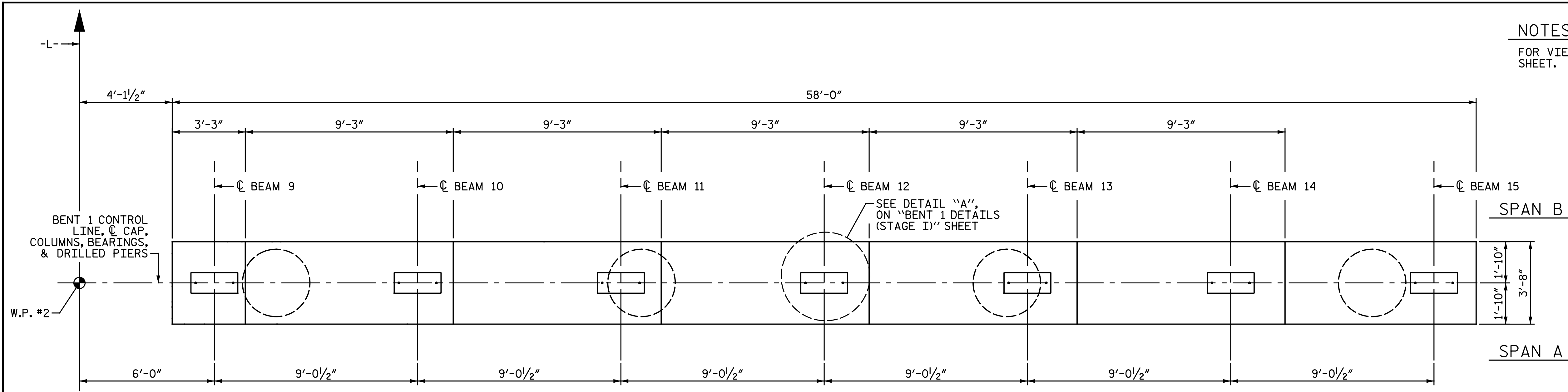
PROJECT NO. U-3330
NASH COUNTY
STATION: 61+03.00 -L-

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

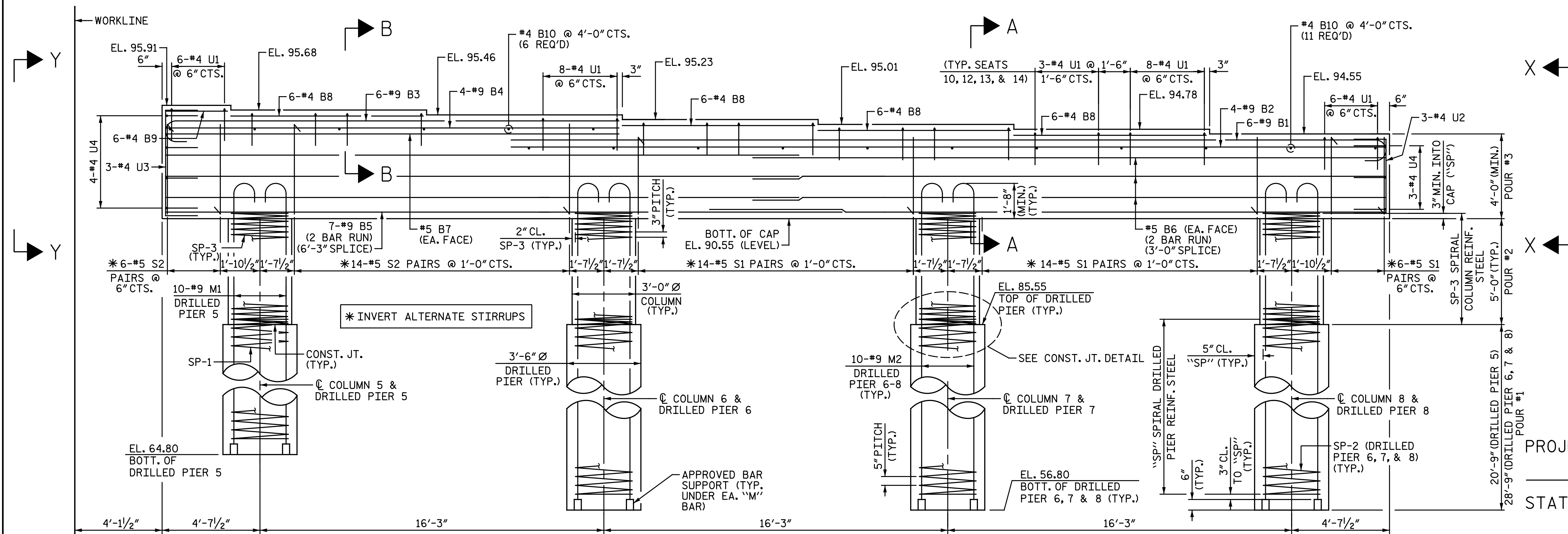
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Cary, North Carolina 27518
NC License No.: F-1084

SHEET NO. S3-29
TOTAL SHEETS 42

NOTES:
FOR VIEW X-X & VIEW Y-Y, SEE "BENT 1 DETAILS (STAGE I)" SHEET.




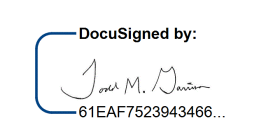
PLAN



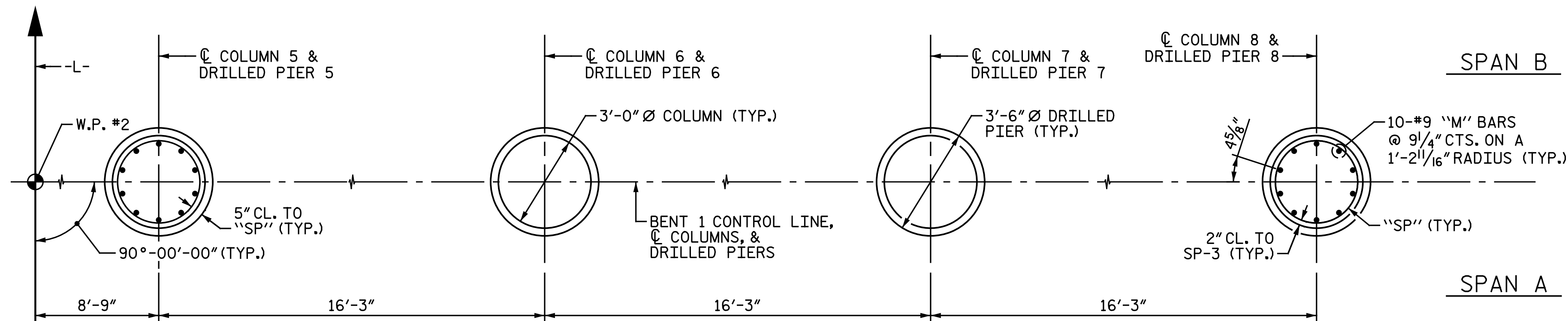
ELEVATION

PROJECT NO. U-3330
NASH COUNTY
STATION: 61+03.00 -L-

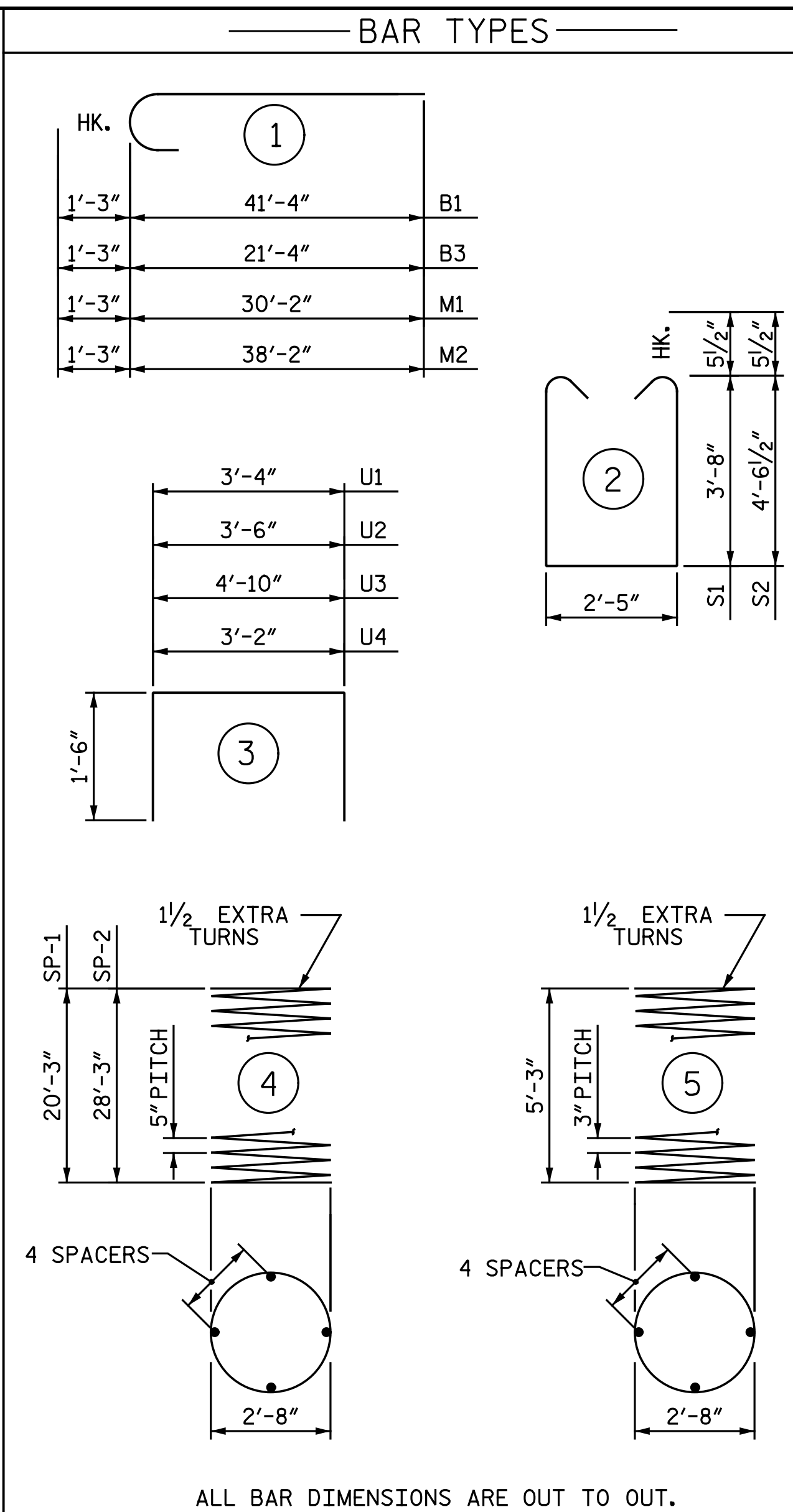
DRAWN BY: M. D. MAYHEW DATE: 12-6-16
CHECKED BY: A. H. SHARPE DATE: 12-8-16

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

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NC License No.: F-1084



PLAN OF DRILLED PIERS & COLUMNS



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
BENT 1 - STAGE II					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#9	1	42' - 7"	869
B2	4	#9	STR	41' - 4"	562
B3	6	#9	1	22' - 7"	461
B4	4	#9	STR	21' - 4"	290
B5	14	#9	STR	32' - 0"	1,523
B6	12	#5	STR	30' - 4"	380
B7	2	#5	STR	21' - 5"	45
B8	24	#4	STR	9' - 1"	146
B9	6	#4	STR	2' - 11"	12
B10	17	#4	STR	3' - 4"	38
M1	10	#9	1	31' - 5"	1,068
M2	30	#9	1	39' - 5"	4,021
S1	68	#5	2	10' - 8"	757
S2	40	#5	2	12' - 5"	518
U1	64	#4	3	6' - 4"	271
U2	3	#4	3	6' - 6"	13
U3	3	#4	3	7' - 10"	16
U4	7	#4	3	6' - 2"	29

REINFORCING STEEL					LBS.
SP-1	1	*	4	424' - 5"	443
SP-2	3	*	4	582' - 4"	1,822
SP-3	4	**	5	198' - 0"	529

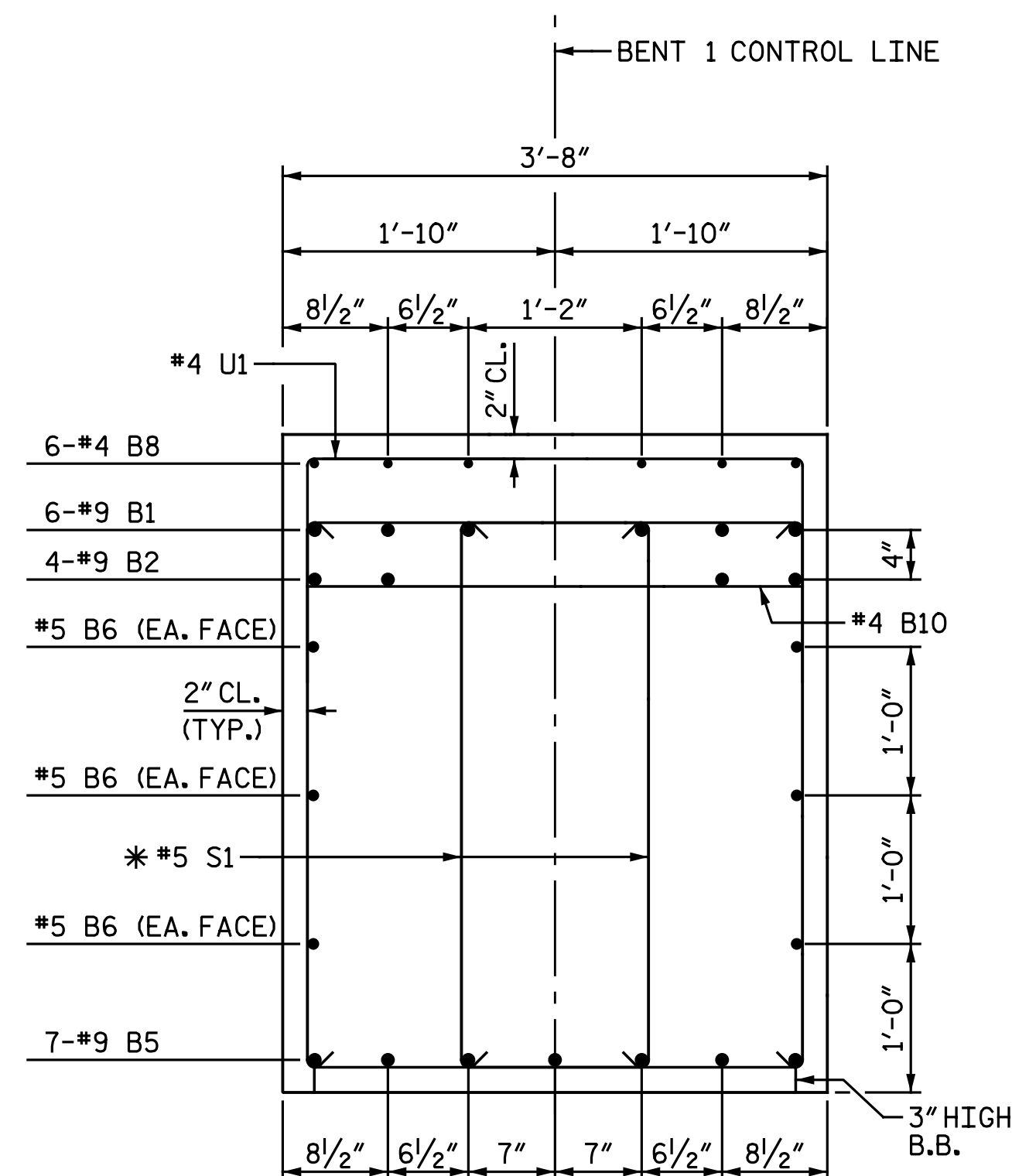
SPIRAL COLUMN REINFORCING STEEL					LBS.
SP-1	1	*	4	424' - 5"	443
SP-2	3	*	4	582' - 4"	1,822
SP-3	4	**	5	198' - 0"	529

CLASS A CONCRETE
 POUR 2 - COLUMNS C.Y. 5.3
 POUR 3 - CAP C.Y. 36.4
 TOTAL CLASS A CONCRETE C.Y. 41.7

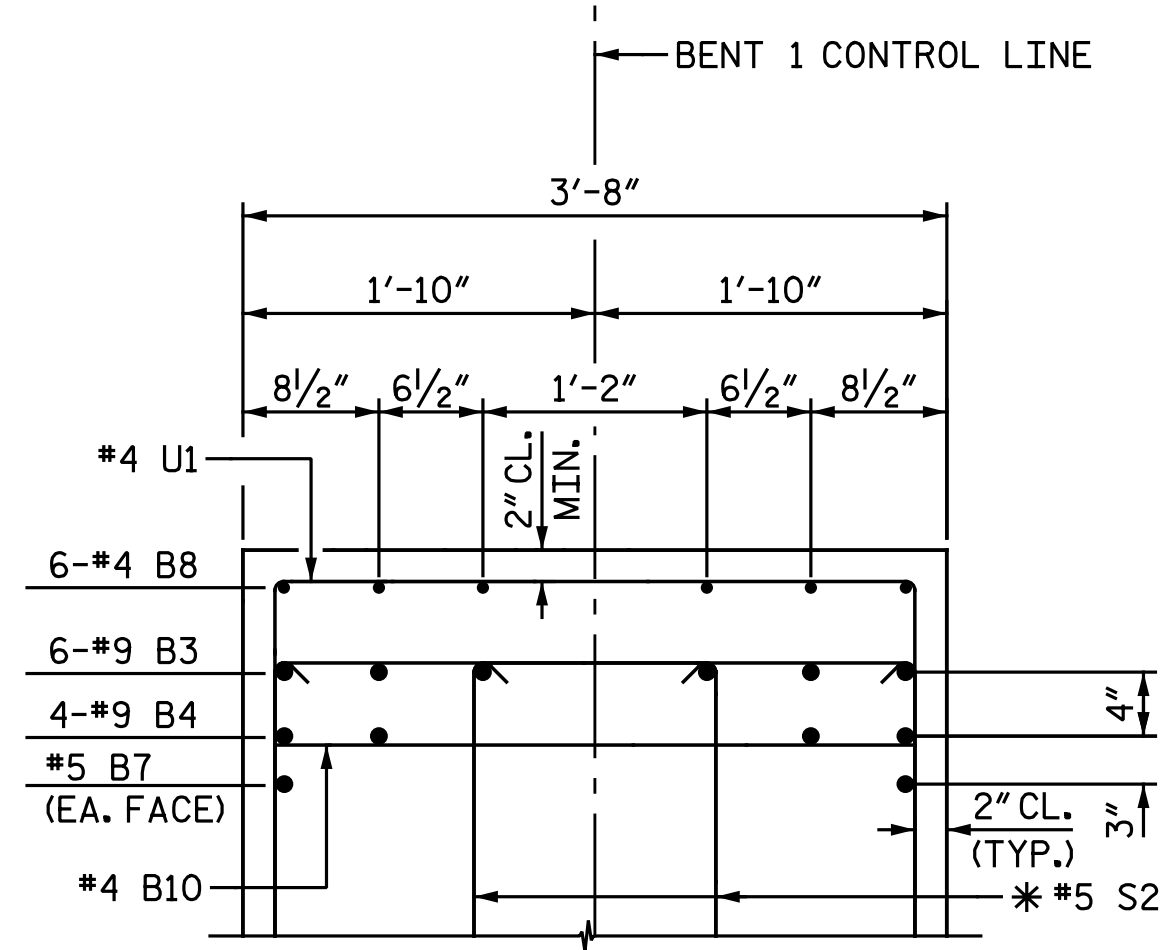
DRILLED PIER CONCRETE			
POUR 1 - DRILLED PIERS	C.Y.	38.2	
3'-6" DIA. DRILLED PIERS IN SOIL	LIN. FT.	66.0	
3'-6" DIA. DRILLED PIERS NOT IN SOIL	LIN. FT.	41.0	

SID INSPECTIONS	EA.	1	
CSL TUBES	LIN. FT.	452	

▲ NO SEPARATE PAYMENT WILL BE MADE FOR CSL TUBES. CSL TUBES WILL BE INCLUDED IN THE UNIT BID PRICE FOR DRILLED PIERS.



SECTION A-A
 * INVERT ALTERNATE STIRRUPS



PARTIAL SECTION B-B
 * INVERT ALTERNATE STIRRUPS

- NOTES:**
- STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
 - HOOKS ON "M" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
 - FOR DRILLED PIERS, SEE GEOTECHNICAL SPECIAL PROVISIONS AND SECTION 411 OF THE STANDARD SPECIFICATIONS.
 - ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".
 - DRILLED PIERS SHOULD BE TERMINATED A MINIMUM OF ONE FOOT ABOVE NORMAL WATER SURFACE ELEVATION FOR SHAFTS LOCATED IN WATER.
 - THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.
 - FOR ADDITIONAL INFORMATION AND NOTES, SEE "GENERAL DRAWING", SHEET 3 OF 5.

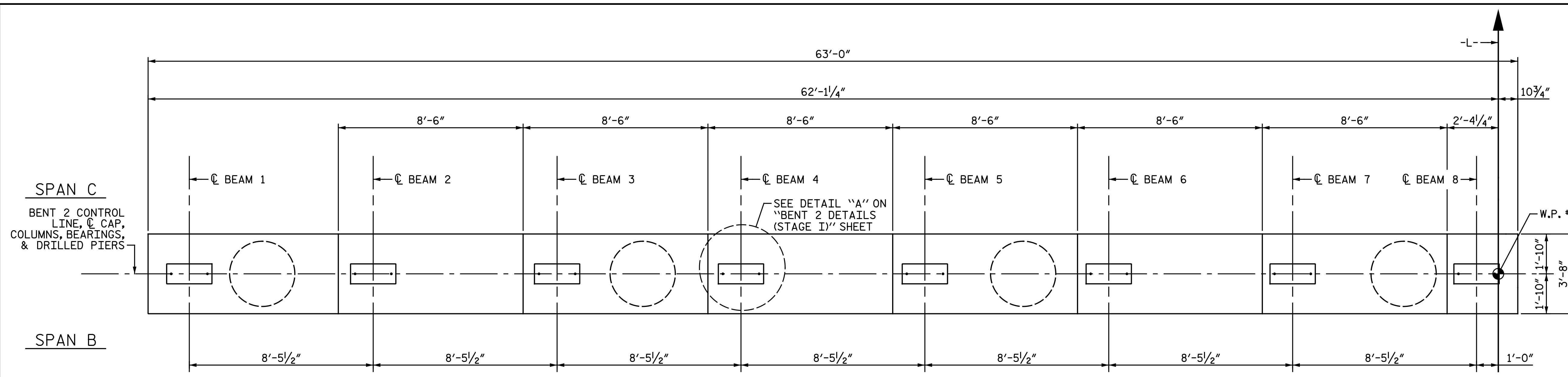
DRAWN BY : M. D. MAYHEW DATE : 12-6-16
 CHECKED BY : A. H. SHARPE DATE : 12-8-16

PROJECT NO. U-3330
 NASH COUNTY
 STATION: 61+03.00 -L-

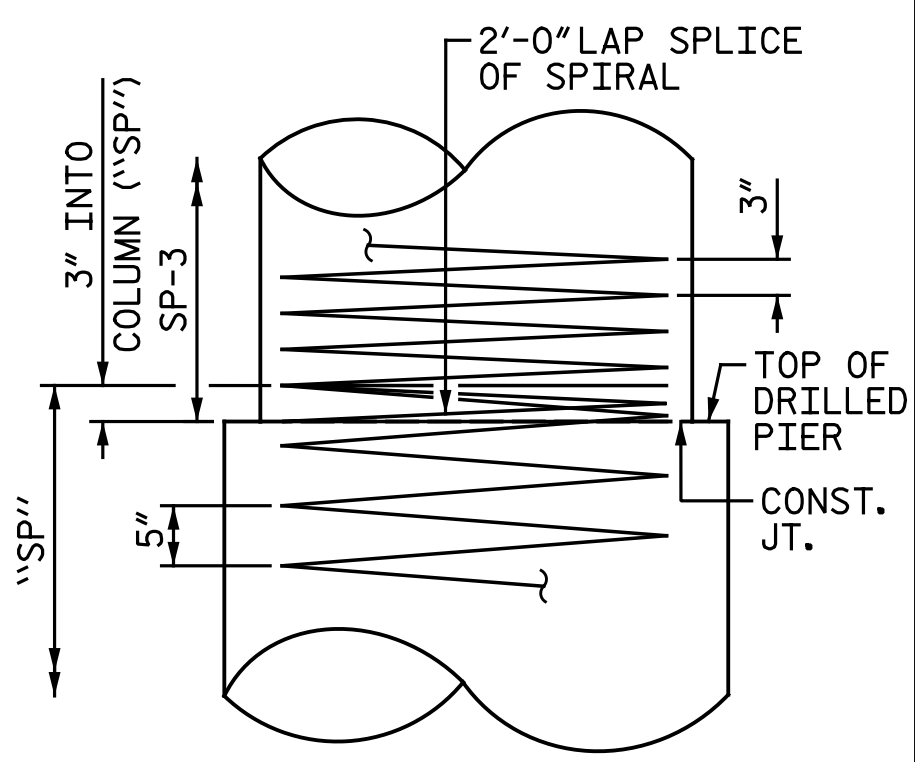
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUBSTRUCTURE BENT 1 DETAILS STAGE II		
	REVISIONS				
	NO.	BY:	DATE:	NO.	BY:
1			3		
2			4		

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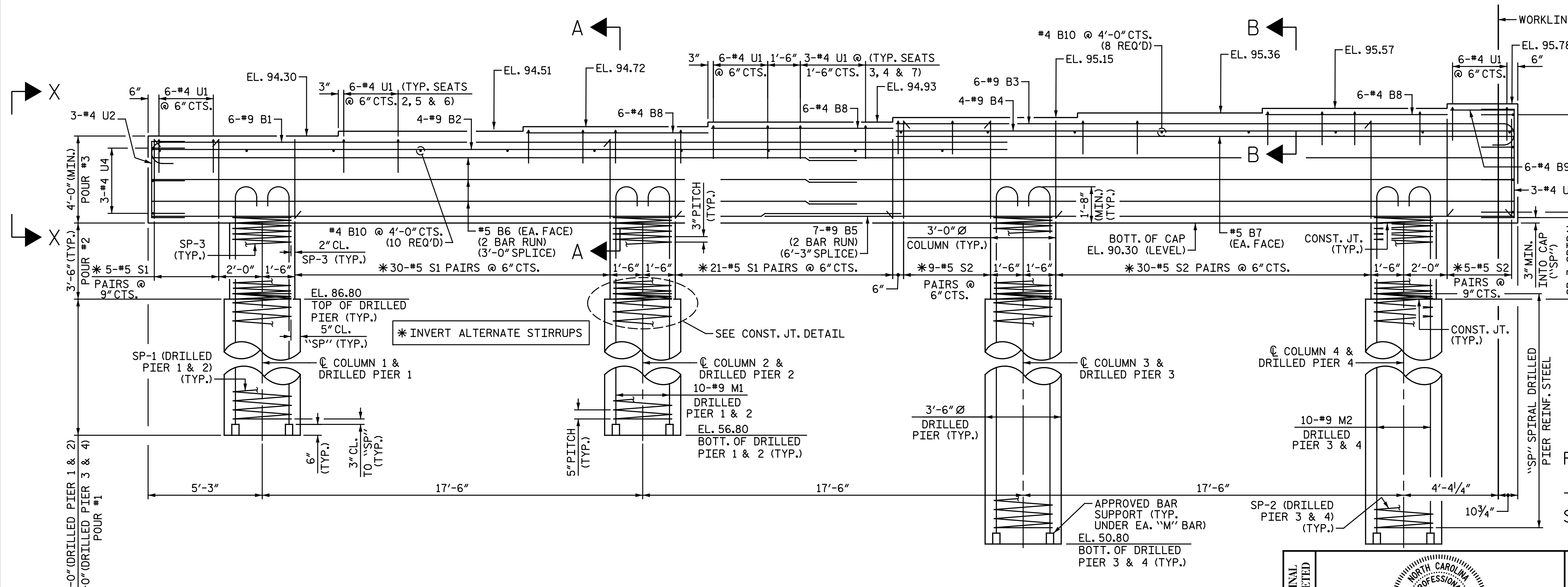
SHEET NO.
S3-31
 TOTAL SHEETS
42



PLAN



CONSTRUCTION JT. DETAIL



ELEVATION

PROJECT NO. U-3330
 NASH COUNTY
 STATION: 61+03.00 -L-

DRAWN BY: M. D. MAYHEW DATE: 11-29-16
 CHECKED BY: A. H. SHARPE DATE: 12-9-16

DOCUMENT NOT CONSIDERED FINAL
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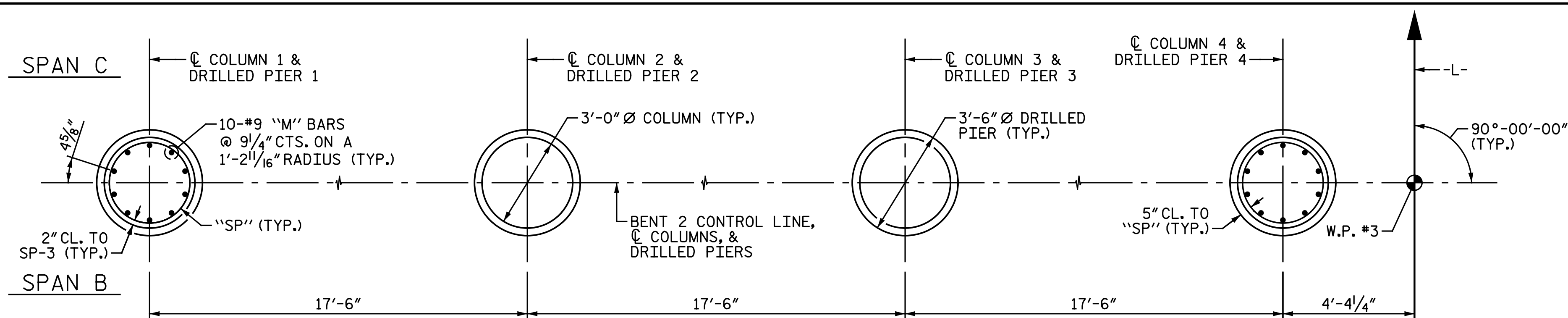
Professional Engineer Seal for Todd M. Garrison, North Carolina License No. 033139. Includes a signature and date stamp: 2/3/2017.

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT 2
 STAGE I

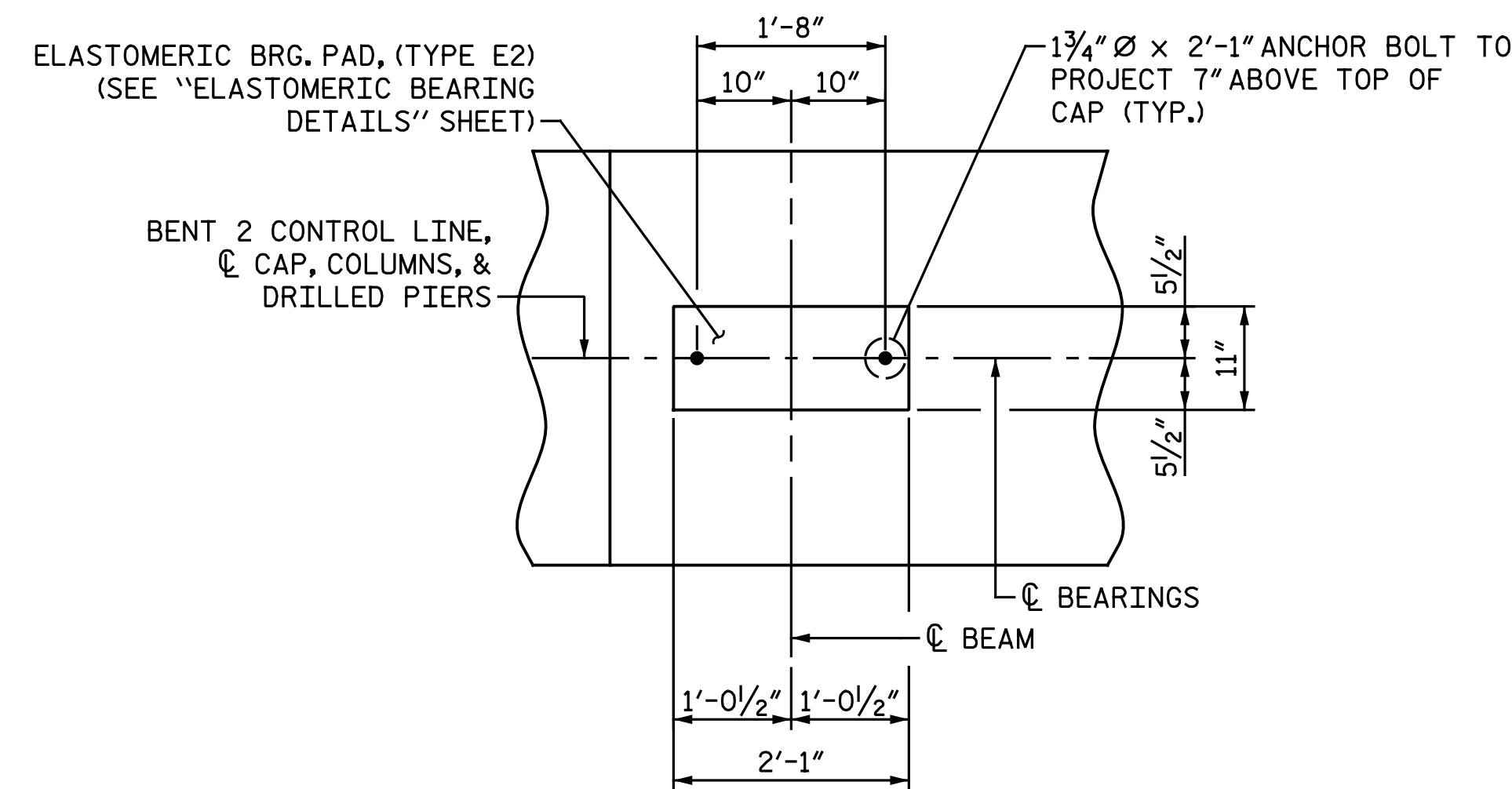
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NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S3-32
 TOTAL SHEETS 42

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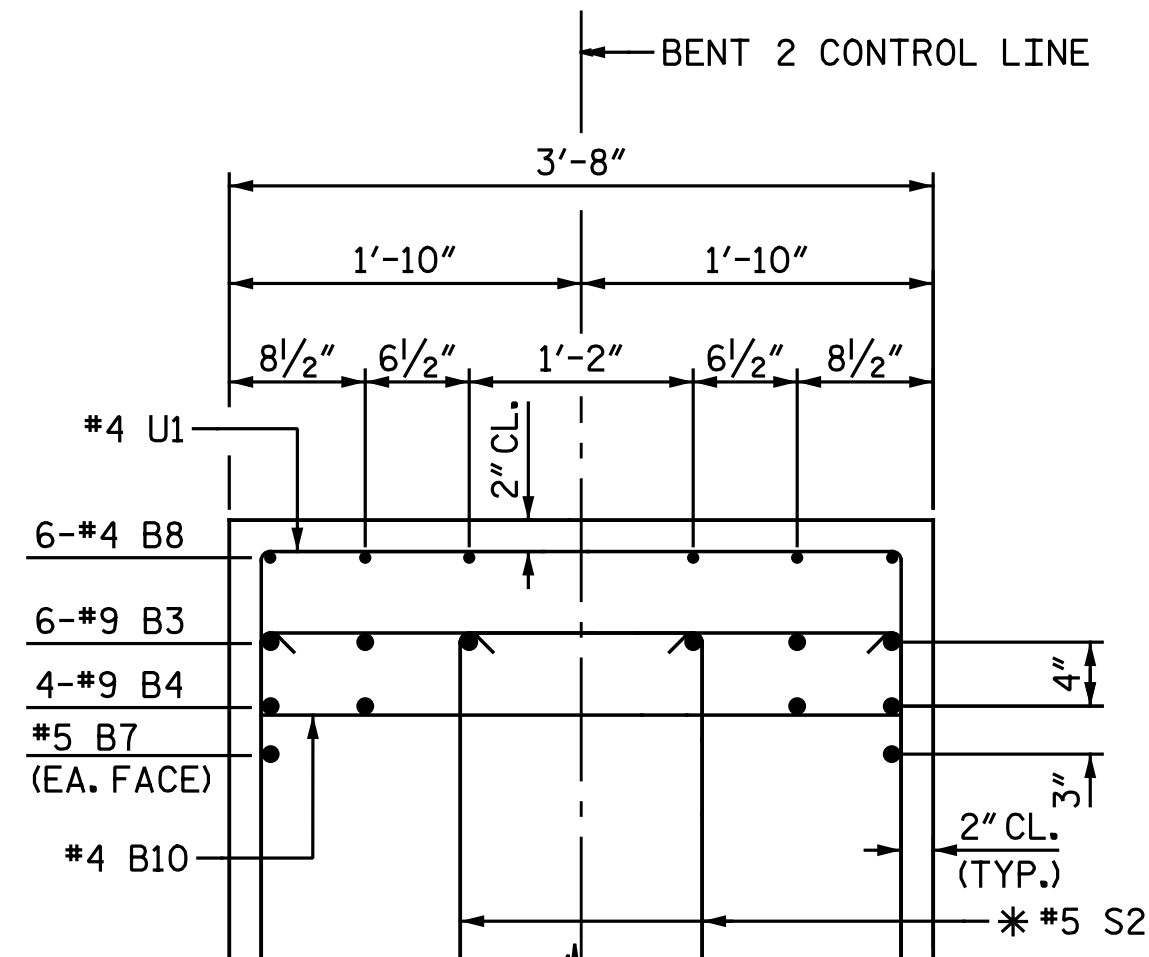


PLAN OF DRILLED PIERS & COLUMNS



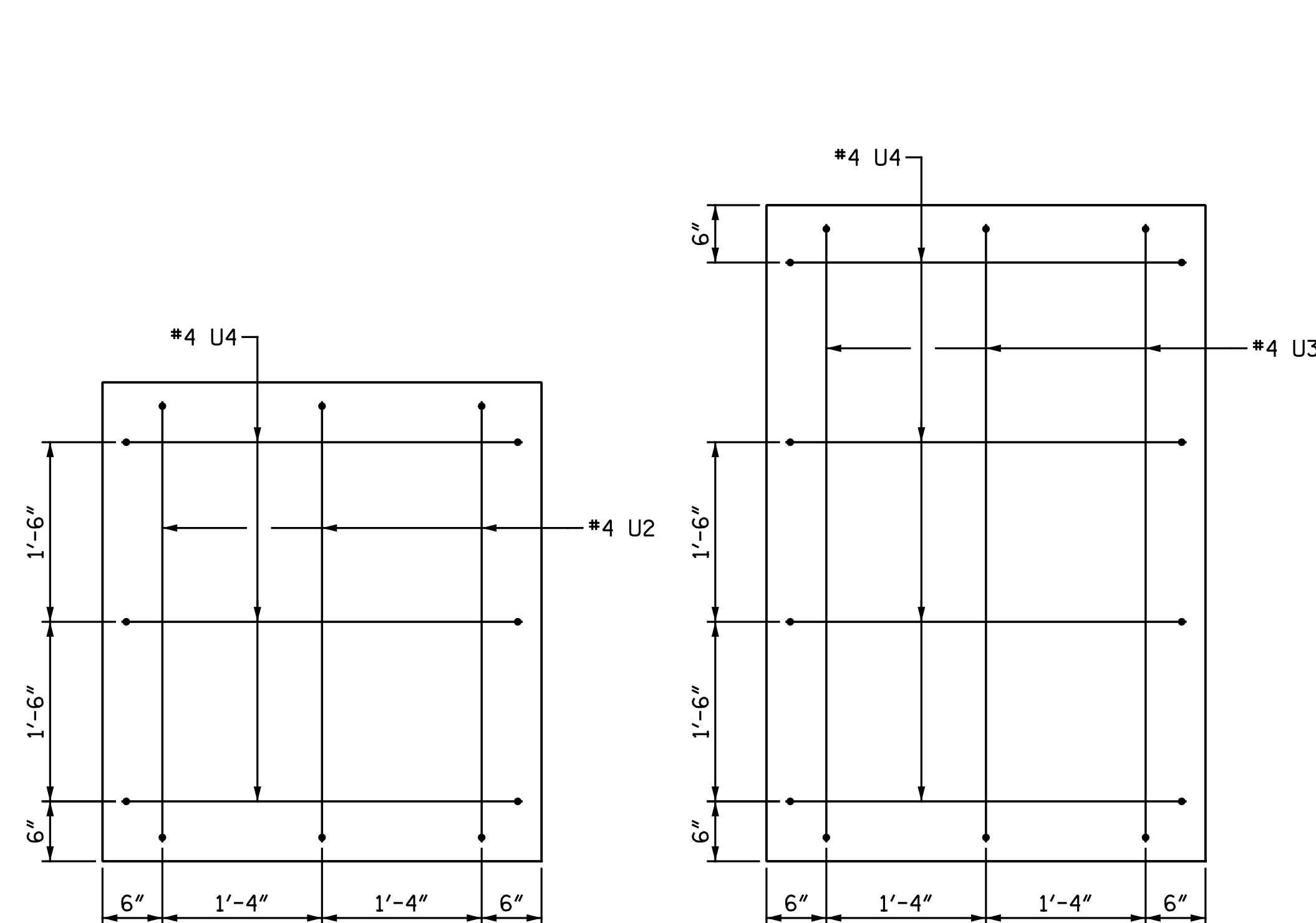
DETAIL "A"

DIMENSIONS ARE TYPICAL FOR EACH BEARING



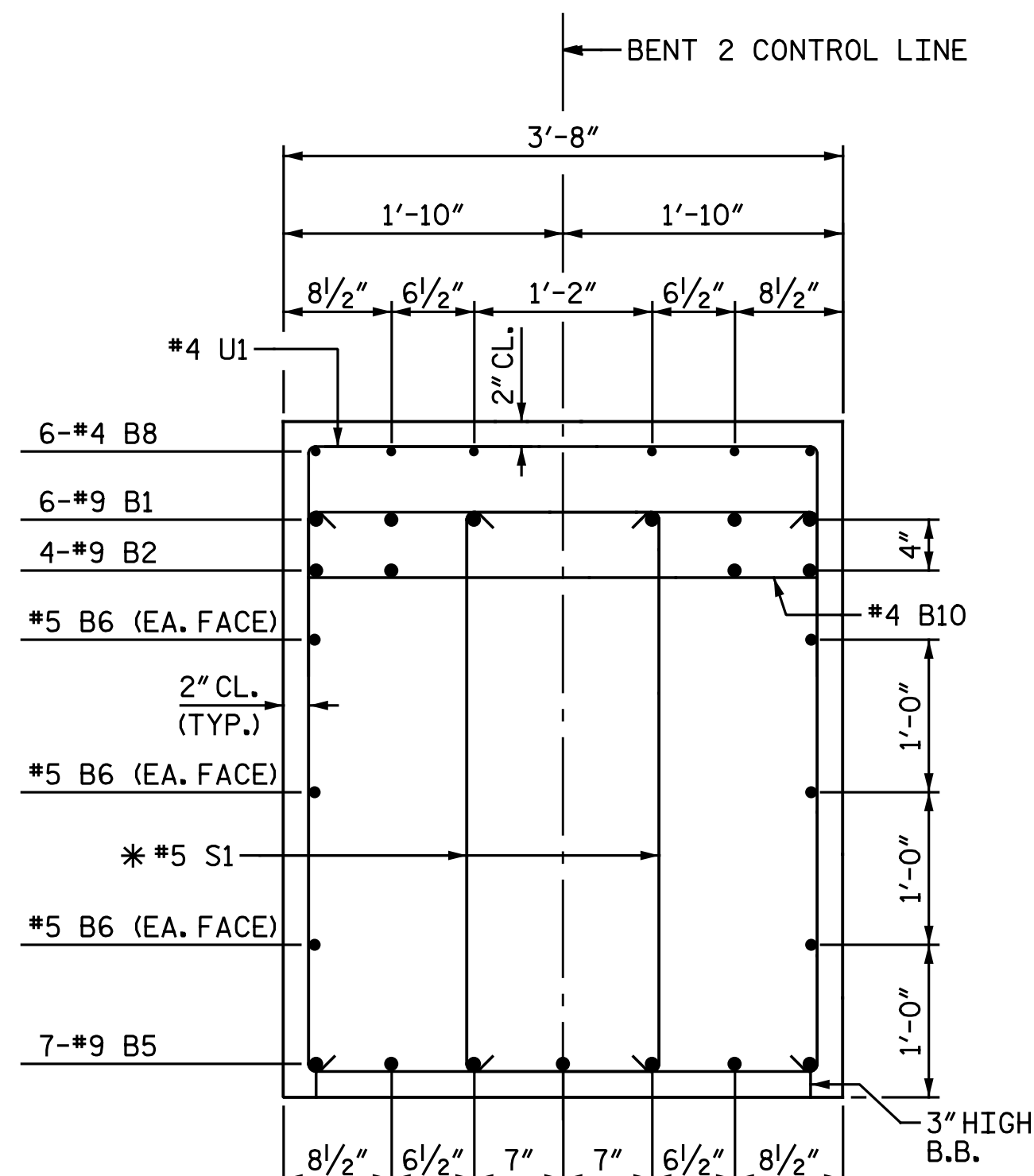
PARTIAL SECTION B-B

* INVERT ALTERNATE STIRRUPS



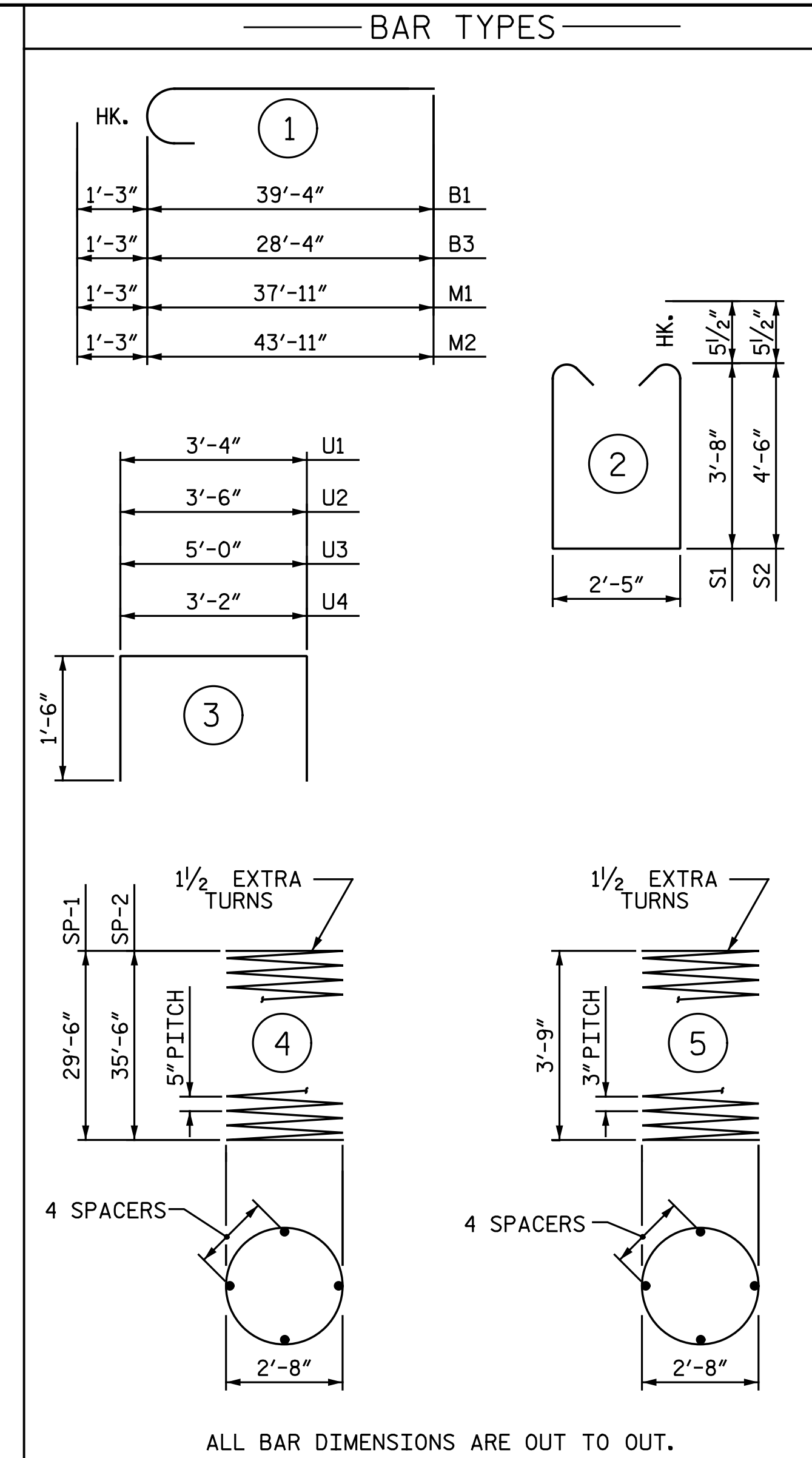
VIEW X-X

VIEW Y-Y



SECTION A-A

* INVERT ALTERNATE STIRRUPS



NOTES:
FOR NOTES, SEE "BENT 2 DETAILS (STAGE II)" SHEET.

BILL OF MATERIAL					
BENT 2 - STAGE I					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#9	1	40' - 7"	828
B2	4	#9	STR	39' - 4"	535
B3	6	#9	1	29' - 7"	603
B4	4	#9	STR	28' - 5"	386
B5	14	#9	STR	34' - 6"	1,642
B6	12	#5	STR	32' - 10"	411
B7	2	#5	STR	28' - 5"	59
B8	18	#4	STR	8' - 4"	100
B9	6	#4	STR	2' - 11"	12
B10	18	#4	STR	3' - 4"	40
M1	20	#9	1	39' - 2"	2,663
M2	20	#9	1	45' - 2"	3,071
S1	112	#5	2	10' - 8"	1,246
S2	88	#5	2	12' - 4"	1,132
U1	57	#4	3	6' - 4"	241
U2	3	#4	3	6' - 6"	13
U3	3	#4	3	8' - 0"	16
U4	7	#4	3	6' - 2"	29
REINFORCING STEEL				LBS.	13,027
SP-1	2	*	4	607' - 0"	1,266
SP-2	2	*	4	725' - 5"	1,513
SP-3	4	**	5	148' - 6"	397
SPIRAL COLUMN REINFORCING STEEL				LBS.	3,176
* THE SP-1 & SP-2 SPIRAL REINF. STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.					
** THE SP-3 SPIRAL REINF. STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.					
CLASS A CONCRETE					
POUR 2 - COLUMNS			C.Y.	3.7	
POUR 3 - CAP			C.Y.	40.1	
TOTAL CLASS A CONCRETE			C.Y.	43.8	
DRILLED PIER CONCRETE					
POUR 1 - DRILLED PIERS			C.Y.	47.1	
3'-6" DIA. DRILLED PIERS IN SOIL			LIN. FT.	108.0	
3'-6" DIA. DRILLED PIERS NOT IN SOIL			LIN. FT.	24.0	
SID INSPECTIONS			EA.	1	
▲ CSL TUBES			LIN. FT.	552	

▲ NO SEPARATE PAYMENT WILL BE MADE FOR CSL TUBES. CSL TUBES WILL BE INCLUDED IN THE UNIT BID PRICE FOR DRILLED PIERS.

PROJECT NO. U-3330
NASH COUNTY
STATION: 61+03.00 -L-

DRAWN BY: M. D. MAYHEW DATE: 12-6-16
CHECKED BY: A. H. SHARPE DATE: 12-9-16

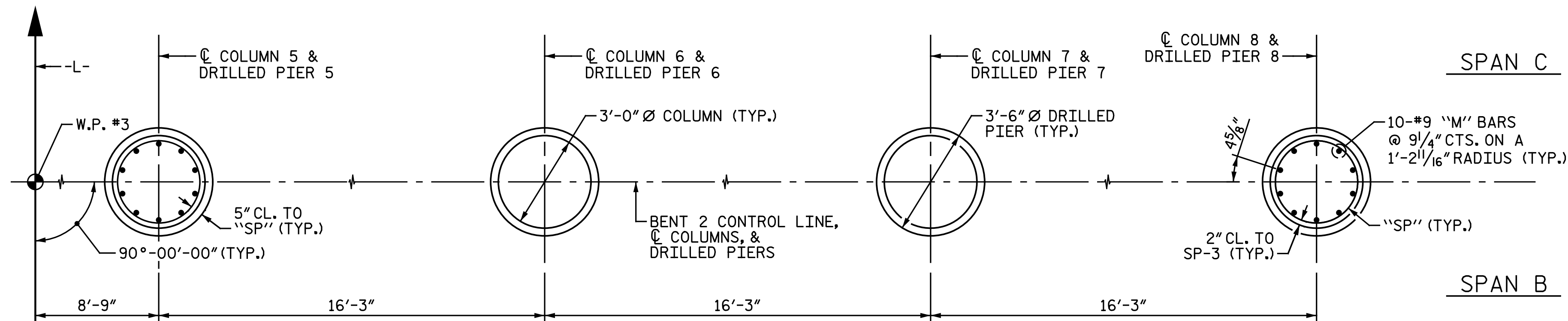
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DocuSigned by:
Todd M. Garrison
61EAF7523943466
2/3/2017

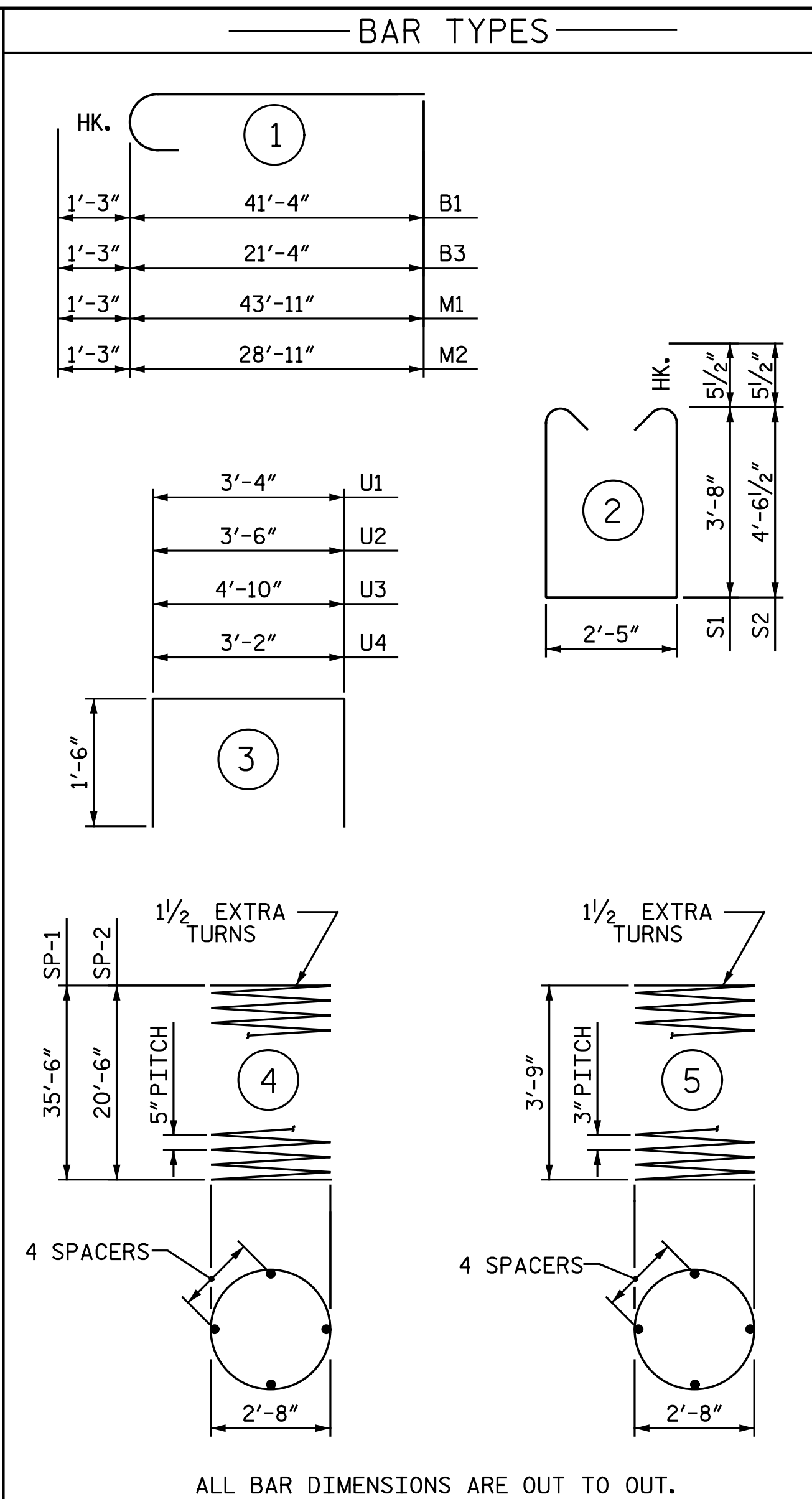
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Michael Baker Engineering
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Cary, North Carolina 27518
NC License No.: F-1084

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

SHEET NO. S3-33	
TOTAL SHEETS	42



PLAN OF DRILLED PIERS & COLUMNS



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
BENT 2 - STAGE II					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#9	1	42' - 7"	869
B2	4	#9	STR	41' - 4"	562
B3	6	#9	1	22' - 7"	461
B4	4	#9	STR	21' - 4"	290
B5	14	#9	STR	32' - 0"	1,523
B6	12	#5	STR	30' - 4"	380
B7	2	#5	STR	21' - 5"	45
B8	24	#4	STR	9' - 1"	146
B9	6	#4	STR	2' - 11"	12
B10	17	#4	STR	3' - 4"	38
M1	20	#9	1	45' - 2"	3,071
M2	20	#9	1	30' - 2"	2,051
S1	68	#5	2	10' - 8"	757
S2	40	#5	2	12' - 5"	518
U1	64	#4	3	6' - 4"	271
U2	3	#4	3	6' - 6"	13
U3	3	#4	3	7' - 10"	16
U4	7	#4	3	6' - 2"	29

REINFORCING STEEL					LBS.
SP-1	2	*	4	725' - 5"	1,513
SP-2	2	*	4	429' - 4"	896
SP-3	4	**	5	148' - 6"	397

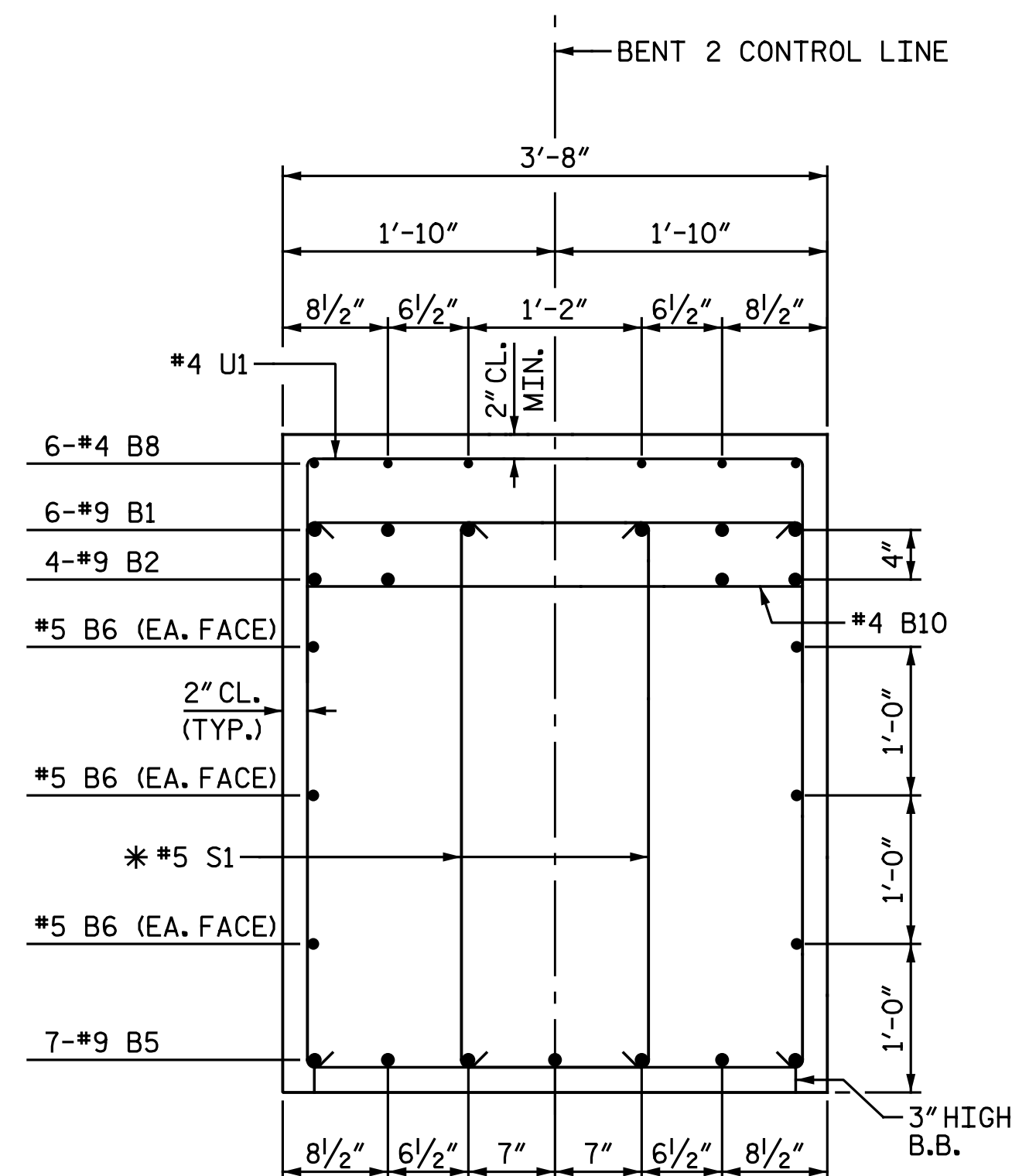
SPIRAL COLUMN REINFORCING STEEL					LBS.
SP-1	2	*	4	725' - 5"	1,513
SP-2	2	*	4	429' - 4"	896
SP-3	4	**	5	148' - 6"	397

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

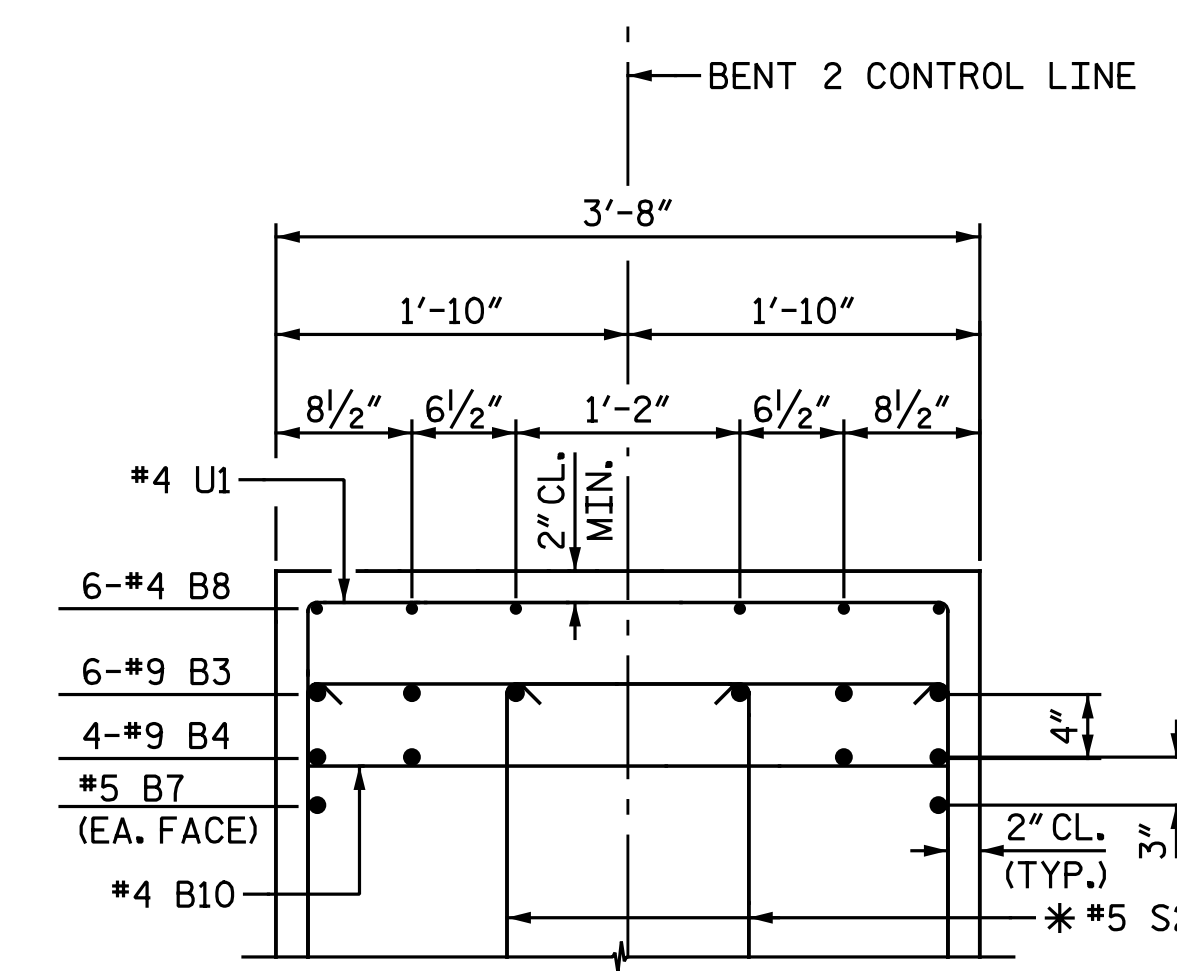
CLASS A CONCRETE		
POUR 2 - COLUMNS	C.Y.	3.7
POUR 3 - CAP	C.Y.	36.4
TOTAL CLASS A CONCRETE	C.Y.	40.1

DRILLED PIER CONCRETE		
POUR 1 - DRILLED PIERS	C.Y.	40.6
3'-6" DIA. DRILLED PIERS IN SOIL	LIN. FT.	78.0
3'-6" DIA. DRILLED PIERS NOT IN SOIL	LIN. FT.	36.0
SID INSPECTIONS	EA.	1
CSL TUBES	LIN. FT.	480

▲ NO SEPARATE PAYMENT WILL BE MADE FOR CSL TUBES. CSL TUBES WILL BE INCLUDED IN THE UNIT BID PRICE FOR DRILLED PIERS.



SECTION A-A
* INVERT ALTERNATE STIRRUPS



PARTIAL SECTION B-B
* INVERT ALTERNATE STIRRUPS

NOTES:

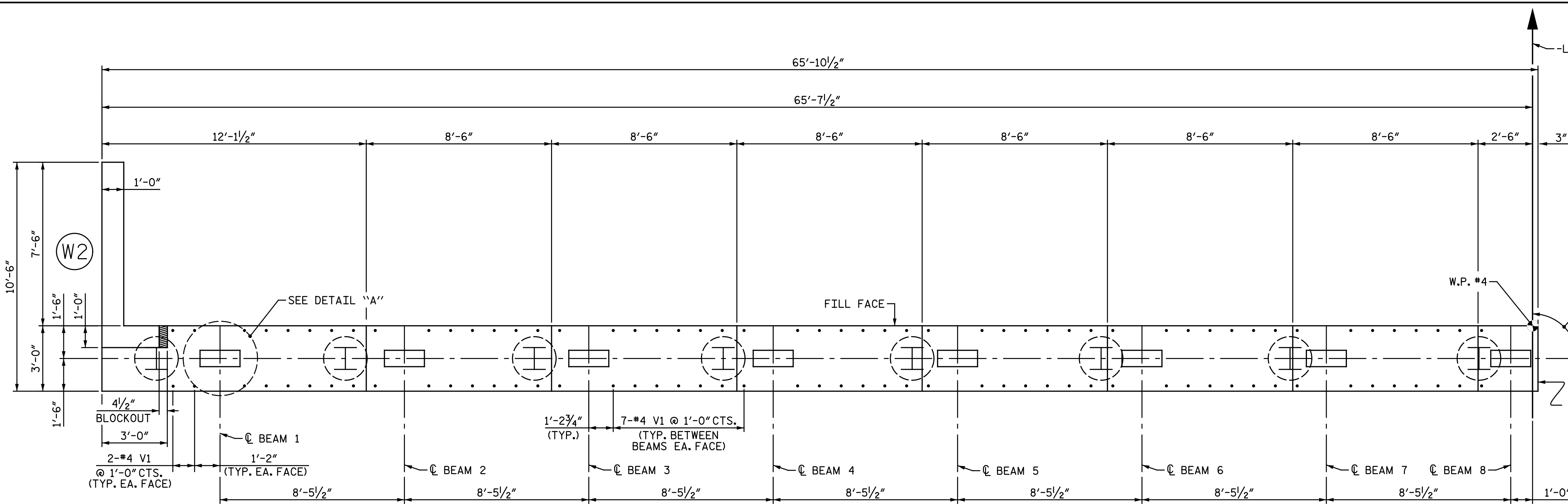
- STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- HOOKS ON "M" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
- FOR DRILLED PIERS, SEE GEOTECHNICAL SPECIAL PROVISIONS AND SECTION 411 OF THE STANDARD SPECIFICATIONS.
- ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".
- THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FOOT BELOW THE GROUND LINE.
- THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.
- FOR ADDITIONAL INFORMATION AND NOTES, SEE "GENERAL DRAWING", SHEET 3 OF 5.

DRAWN BY : M. D. MAYHEW DATE : 12-6-16
 CHECKED BY : A. H. SHARPE DATE : 12-9-16

PROJECT NO. U-3330
 NASH COUNTY
 STATION: 61+03.00 -L-

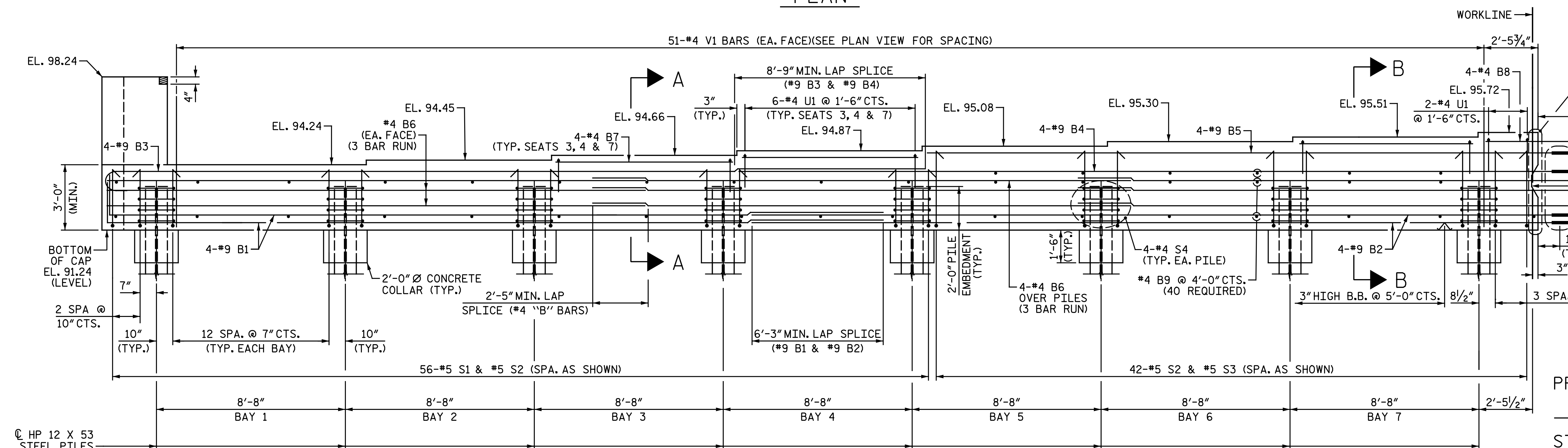
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUBSTRUCTURE BENT 2 DETAILS STAGE II																			
		Michael Baker Engineering 8000 Regency Parkway, Suite 600 Cary, North Carolina 27518 NC License No.: F-1084																			
	Michael Baker INTERNATIONAL		REVISIONS <table border="1"> <thead> <tr> <th>NO.</th> <th>BY:</th> <th>DATE:</th> <th>NO.</th> <th>BY:</th> <th>DATE:</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> <td></td> <td>3</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td>4</td> <td></td> <td></td> </tr> </tbody> </table>		NO.	BY:	DATE:	NO.	BY:	DATE:	1			3			2			4	
NO.	BY:	DATE:	NO.	BY:	DATE:																
1			3																		
2			4																		

SHEET NO. S3-35
 TOTAL SHEETS 42



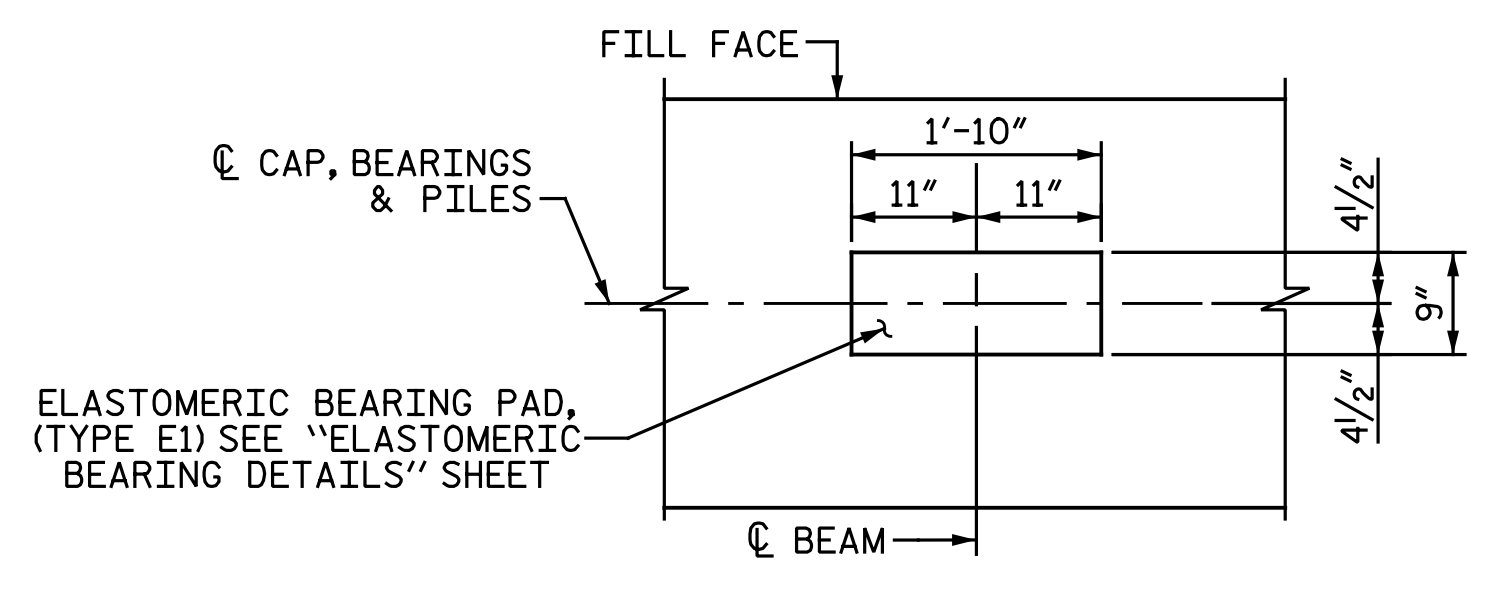
PLAN

NOTES:
 FOR "SECTION A-A" AND "SECTION B-B", SEE "INTEGRAL END BENT 2 DETAILS" SHEET 1 OF 2.
 STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #4 V1 BARS.
 THE TOP SURFACE OF THE END BENT CAP, EXCLUDING THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".
 THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.
 #4 B9 BARS MAY BE SHIFTED AS NECESSARY TO CLEAR THE STEEL PILES.
 FOR MECHANICAL BUTT SPlicing OF REINFORCING STEEL, SEE SECTION 425-5 OF THE STANDARD SPECIFICATIONS.
 90°-00'-00" @ CAP, BEARINGS & PILES
 CONST. JT.



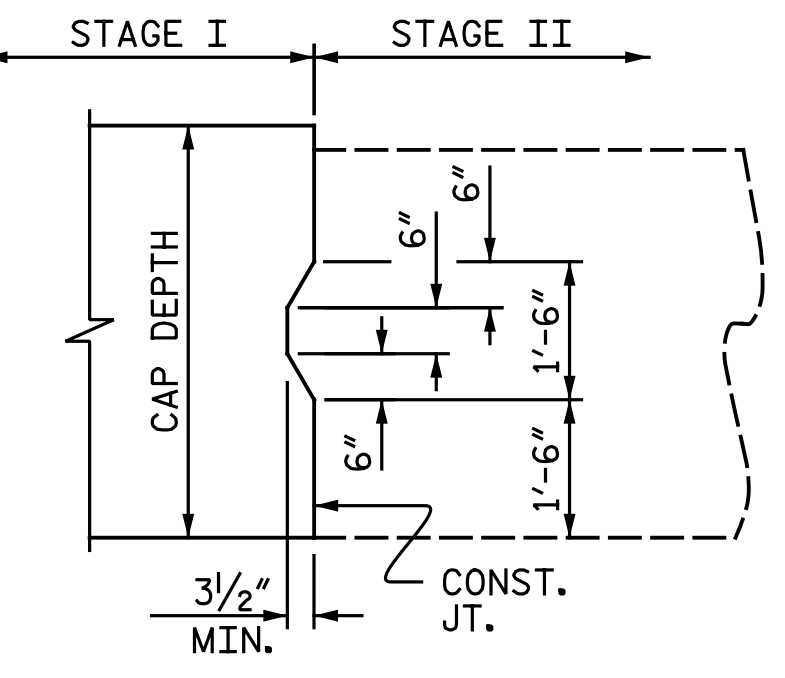
ELEVATION

PROJECT NO. U-3330
NASH COUNTY
 STATION: 61+03.00 -L-
 SHEET 1 OF 2



DETAIL "A"

ALL DIMENSIONS AND DETAILS SHOWN ARE TYPICAL FOR ALL BEARINGS @ EACH BRIDGE SEAT LOCATION.



DETAIL "B"

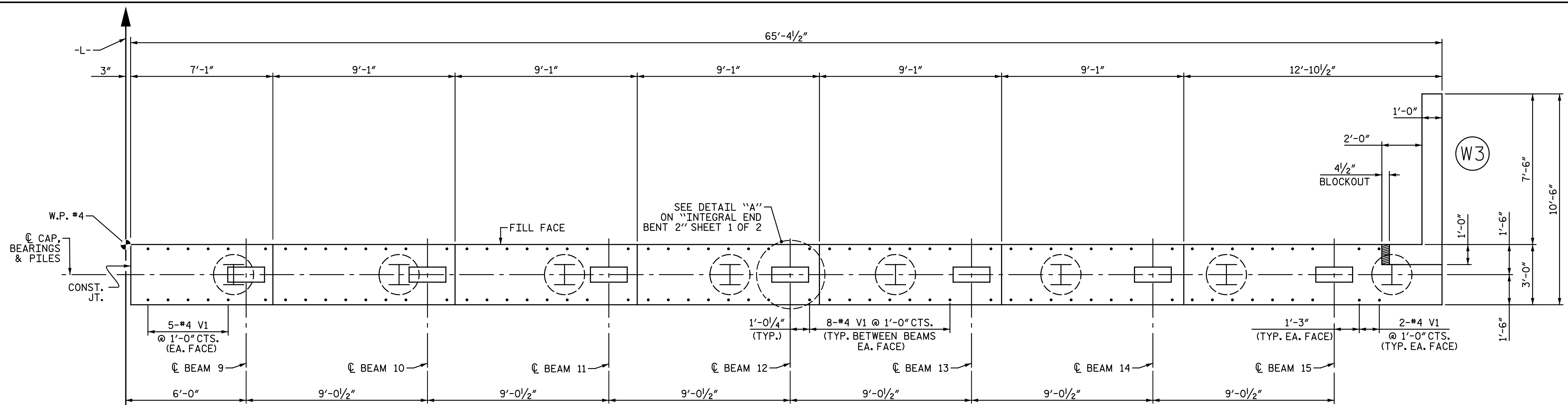
DRAWN BY : N. B. SPEAKS DATE : 12-7-16
 CHECKED BY : A. H. SHARPE DATE : 12-8-16

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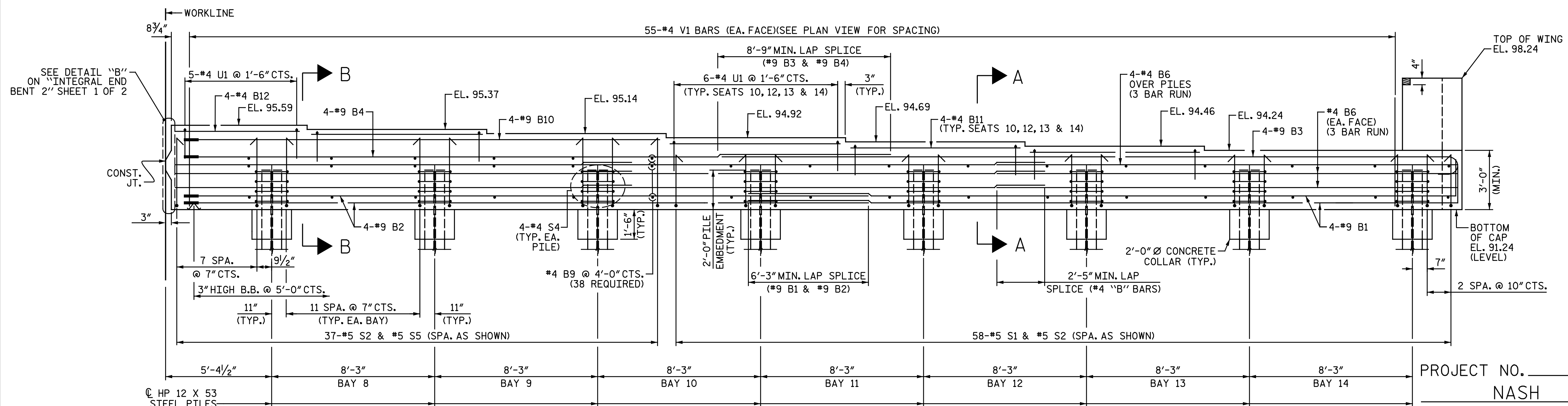
DocuSigned by:
 Todd M. Garrison
 61EAF7523943466
 2/3/2017

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 Cary, North Carolina 27518
 NC License No.: F-1084

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
INTEGRAL END BENT 2					
STAGE I					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S3-36					TOTAL SHEETS 42




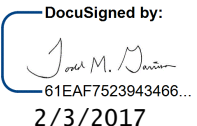
PLAN

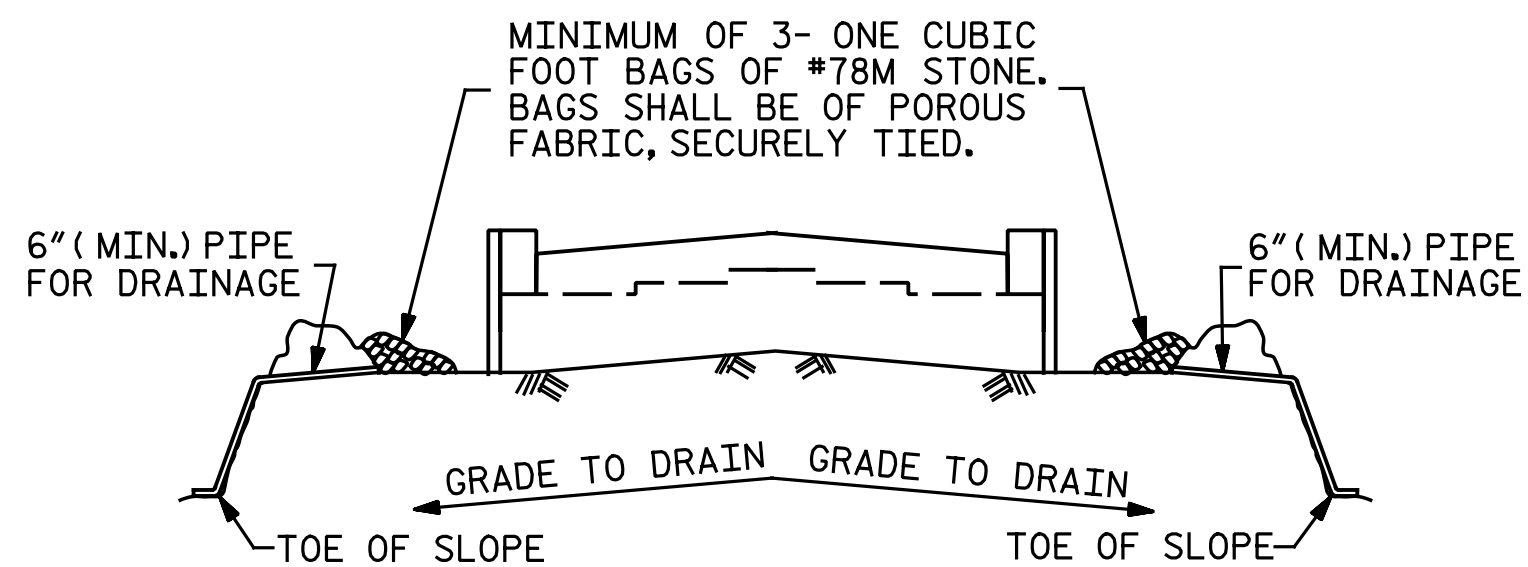


ELEVATION

PROJECT NO. U-3330
NASH COUNTY
 STATION: 61+03.00 -L-
 SHEET 2 OF 2

DRAWN BY : N. B. SPEAKS DATE : 12-8-16
 CHECKED BY : A. H. SHARPE DATE : 12-8-16

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	REVISIONS				TOTAL SHEETS 42		
	NO.	BY:	DATE:	NO.		BY:	DATE:
	1			3			
2			4				
Michael Baker INTERNATIONAL		Michael Baker Engineering 8000 Regency Parkway, Suite 600 Cary, North Carolina 27518 NC License No.: F-1084					

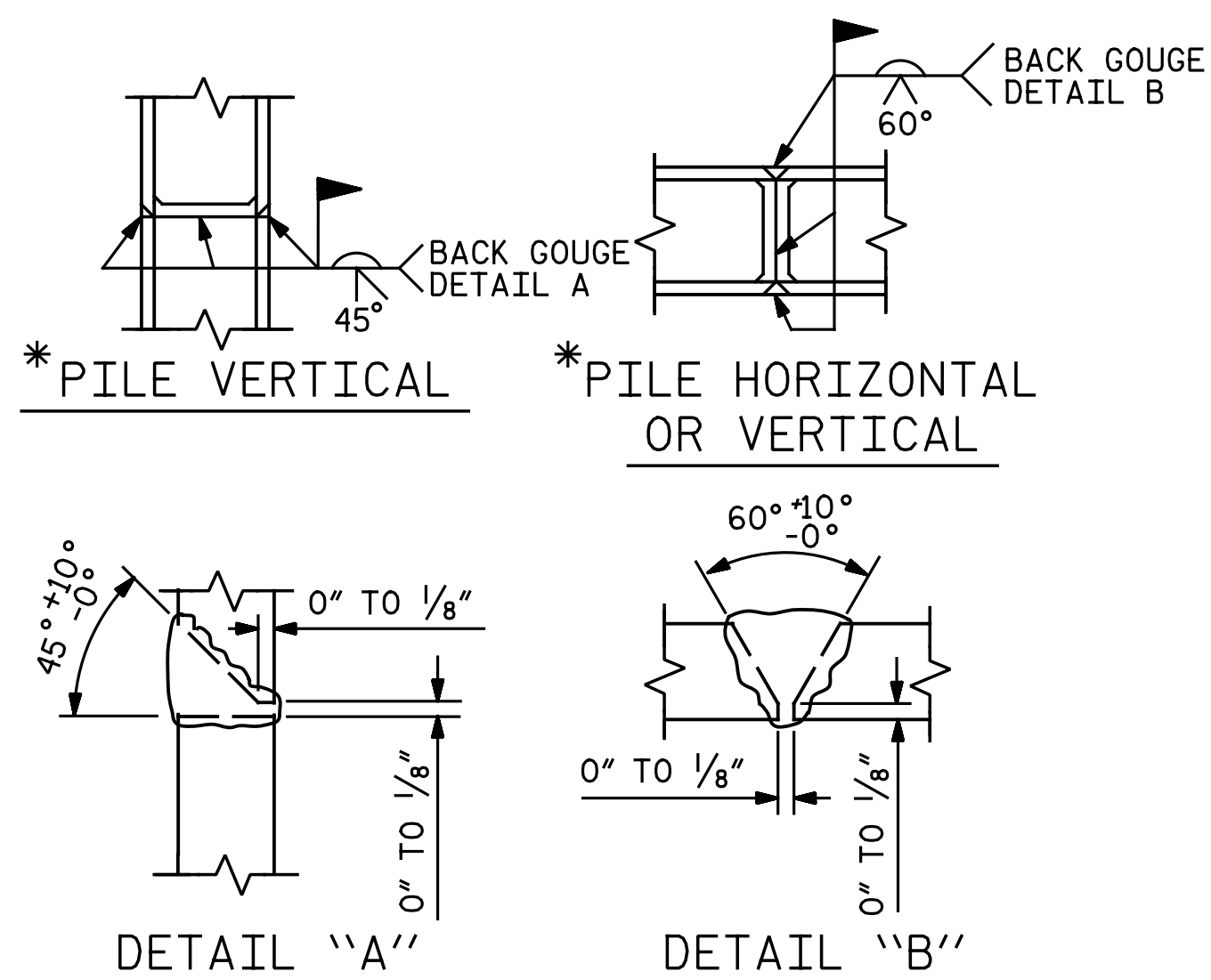


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

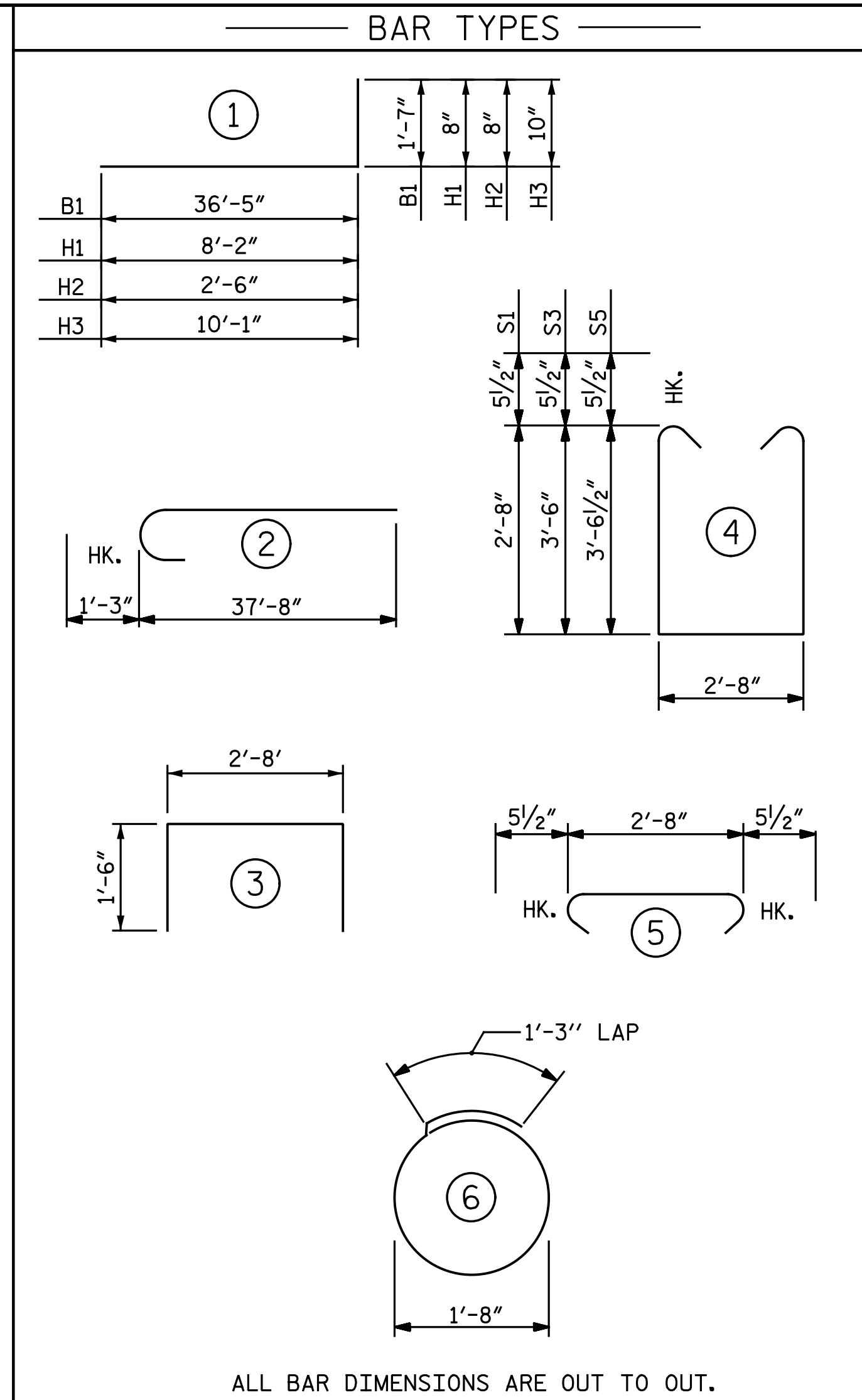
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



PILE SPLICE DETAILS

* POSITION OF PILE DURING WELDING.



BILL OF MATERIAL

END BENT 2

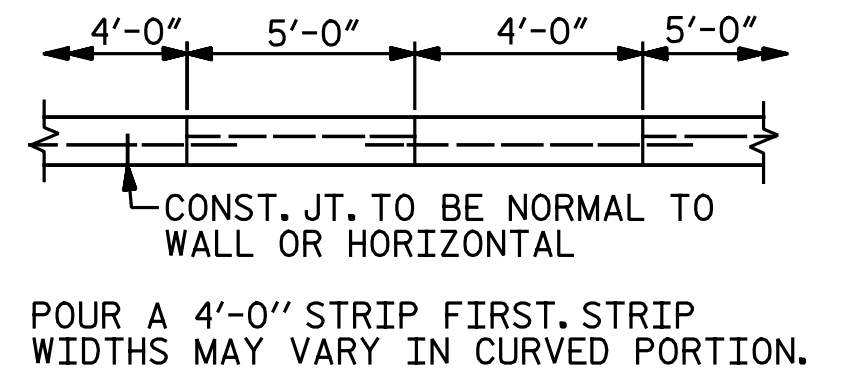
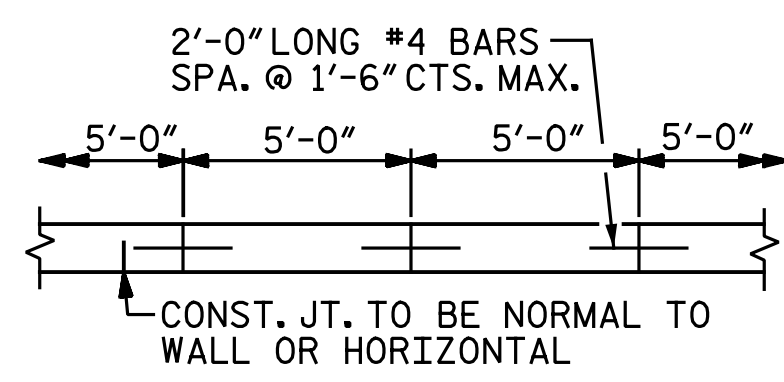
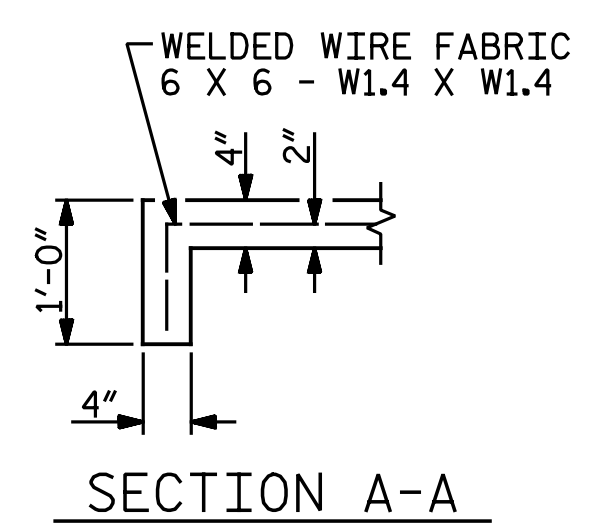
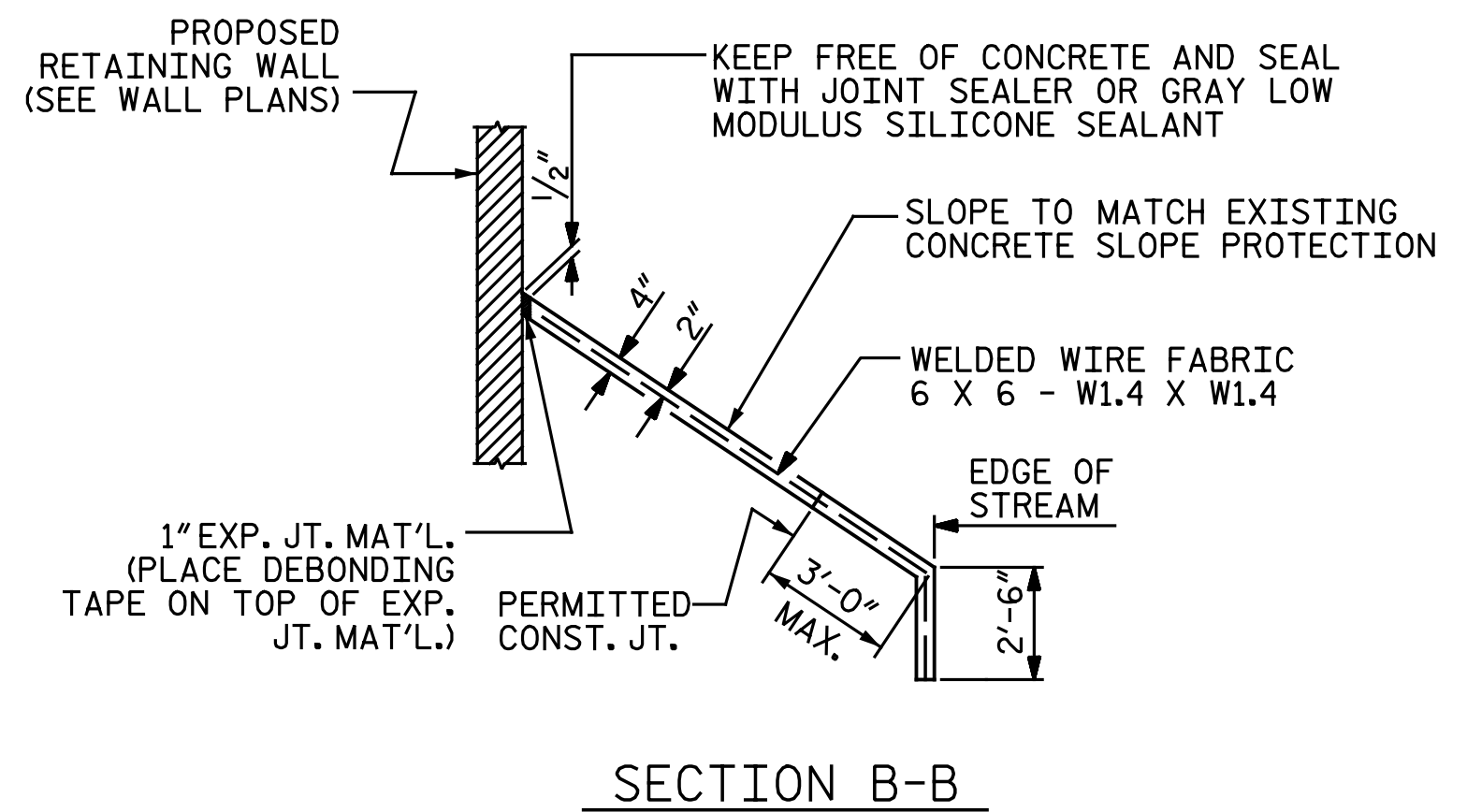
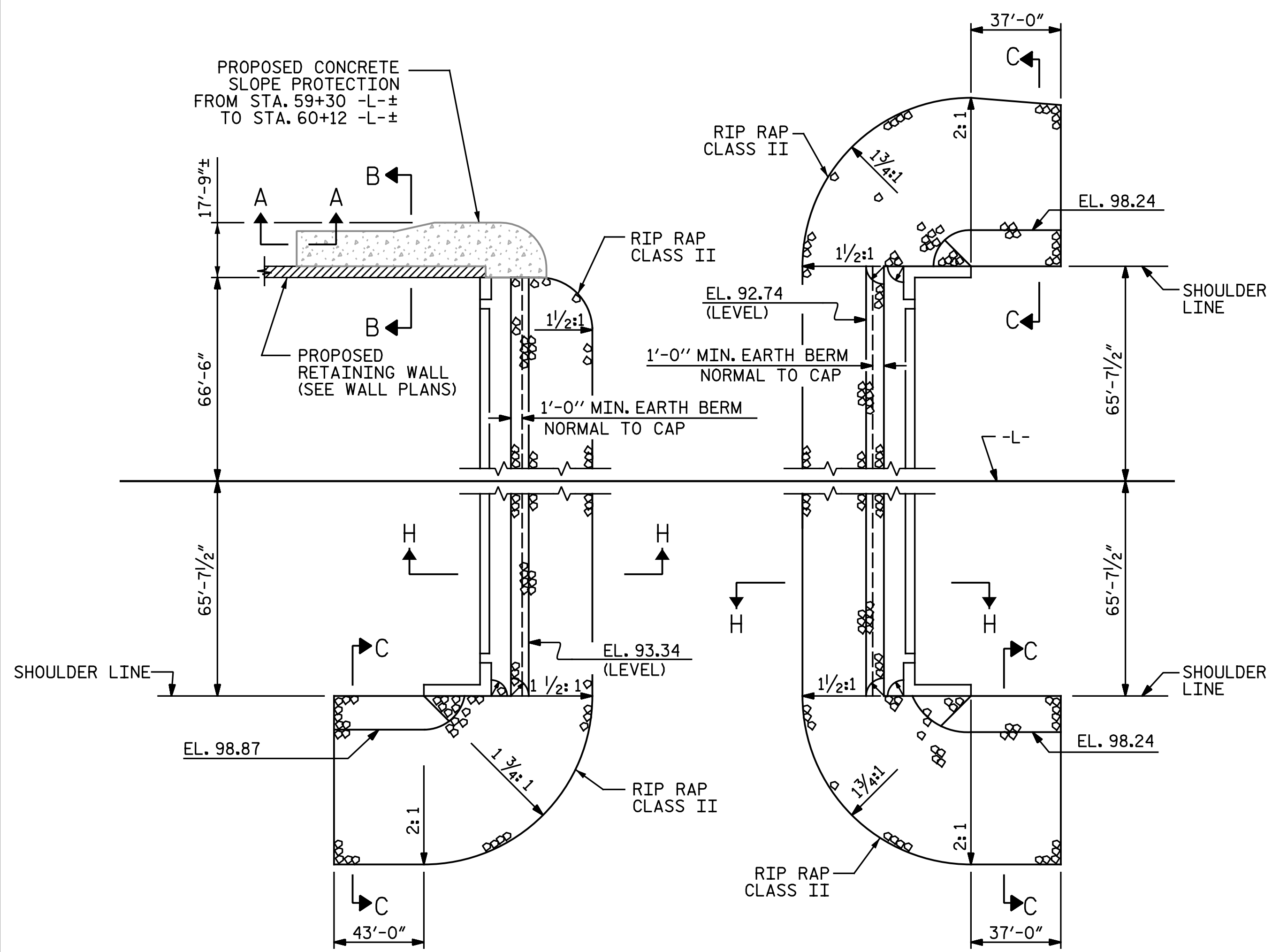
STAGE I						STAGE II						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	8	#9		38' - 0"	1,034	B1	8	#9		38' - 0"	1,034	
B2	8	#9	STR	37' - 5"	1,018	B2	8	#9	STR	37' - 5"	1,018	
B3	4	#9	2	38' - 11"	529	B3	4	#9	2	38' - 11"	529	
B4	4	#9	STR	38' - 8"	526	B4	4	#9	STR	38' - 8"	526	
B5	4	#9	STR	29' - 1"	396	B6	24	#4	STR	24' - 8"	395	
B6	24	#4	STR	24' - 8"	395	B9	38	#4	STR	2' - 8"	68	
B7	12	#4	STR	8' - 4"	67	B10	4	#9	STR	24' - 1"	328	
B8	4	#4	STR	5' - 2"	14	B11	16	#4	STR	8' - 11"	95	
B9	40	#4	STR	2' - 8"	71	B12	4	#4	STR	6' - 9"	18	
H1	17	#4	1	8' - 10"	100	H1	17	#4	1	8' - 10"	100	
H2	12	#4	1	3' - 2"	25	H2	12	#4	1	3' - 2"	25	
H3	5	#5	1	10' - 11"	57	H3	5	#5	1	10' - 11"	57	
S1	56	#5	4	8' - 11"	521	S1	58	#5	4	8' - 11"	539	
S2	98	#5	5	3' - 7"	366	S2	95	#5	5	3' - 7"	355	
S3	42	#5	4	10' - 7"	464	S4	32	#4	6	6' - 6"	139	
S4	32	#4	6	6' - 6"	139	S5	37	#5	4	10' - 8"	412	
U1	20	#4	3	5' - 8"	76	U1	29	#4	3	5' - 8"	110	
V1	102	#4	STR	6' - 1"	414	V1	110	#4	STR	6' - 1"	447	
V2	26	#4	STR	6' - 7"	114	V2	26	#4	STR	6' - 7"	114	
V3	2	#5	STR	2' - 7"	5	V3	2	#5	STR	2' - 7"	5	
REINFORCING STEEL						LBS.	6,331					
CLASS A CONCRETE						CLASS A CONCRETE						
POUR 1 - CAP, LOWER PART OF WING & COLLAR						C.Y.	28.8					
POUR 2 - UPPER PART OF WING						C.Y.	1.6					
TOTAL CLASS A CONCRETE						C.Y.	30.4					
HP 12 x 53 STEEL PILES						HP 12 x 53 STEEL PILES						
NO. 8						L.F.	320					
PILE DRIVING EQUIPMENT SETUP FOR HP 12 x 53 STEEL PILES						EA.	8					

DRAWN BY : N. B. SPEAKS DATE : 12-2-16
 CHECKED BY : A. H. SHARPE DATE : 12-2-16

PROJECT NO. U-3330
NASH COUNTY
 STATION: 61+03.00 -L-

SHEET 2 OF 2

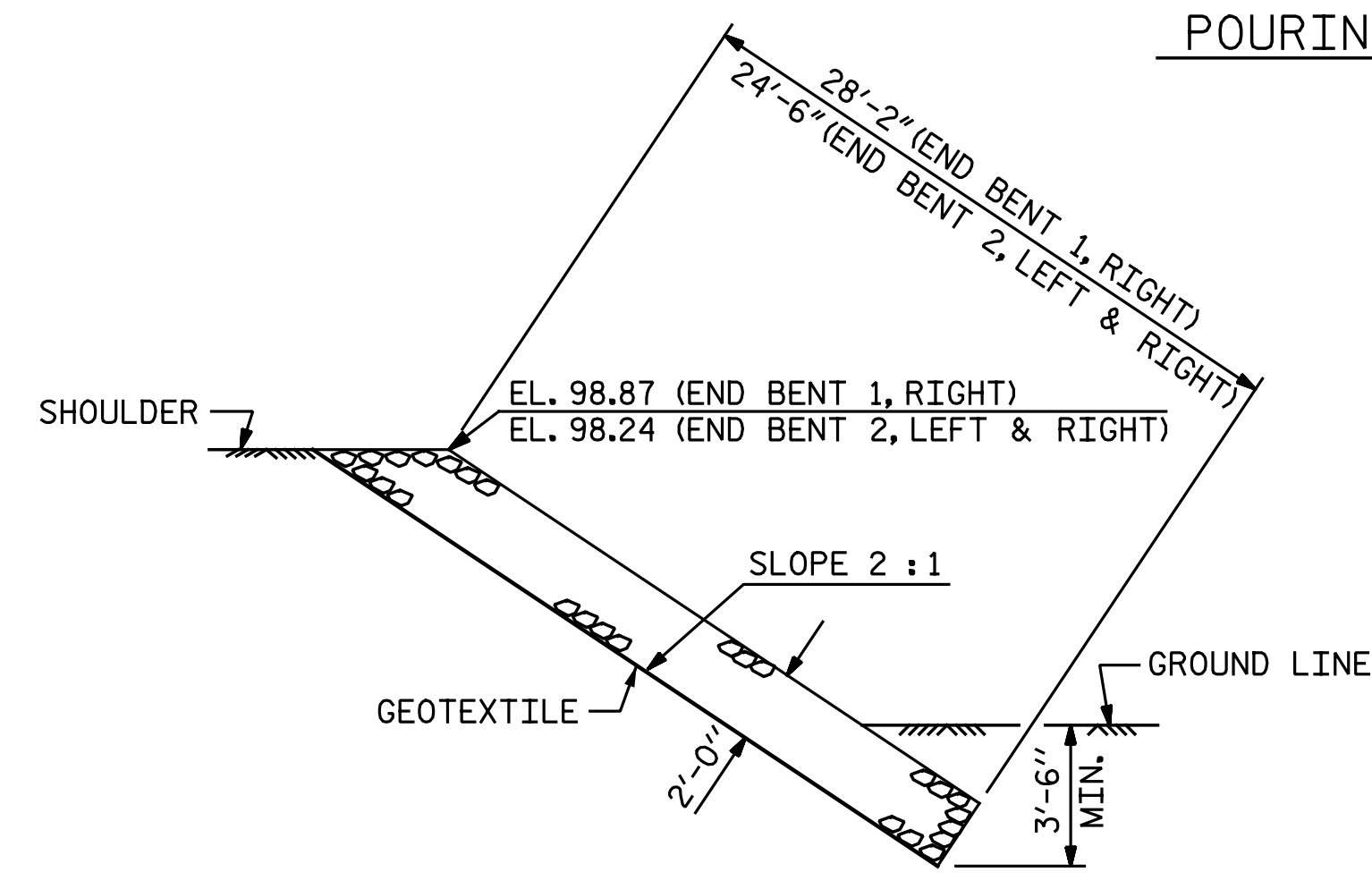
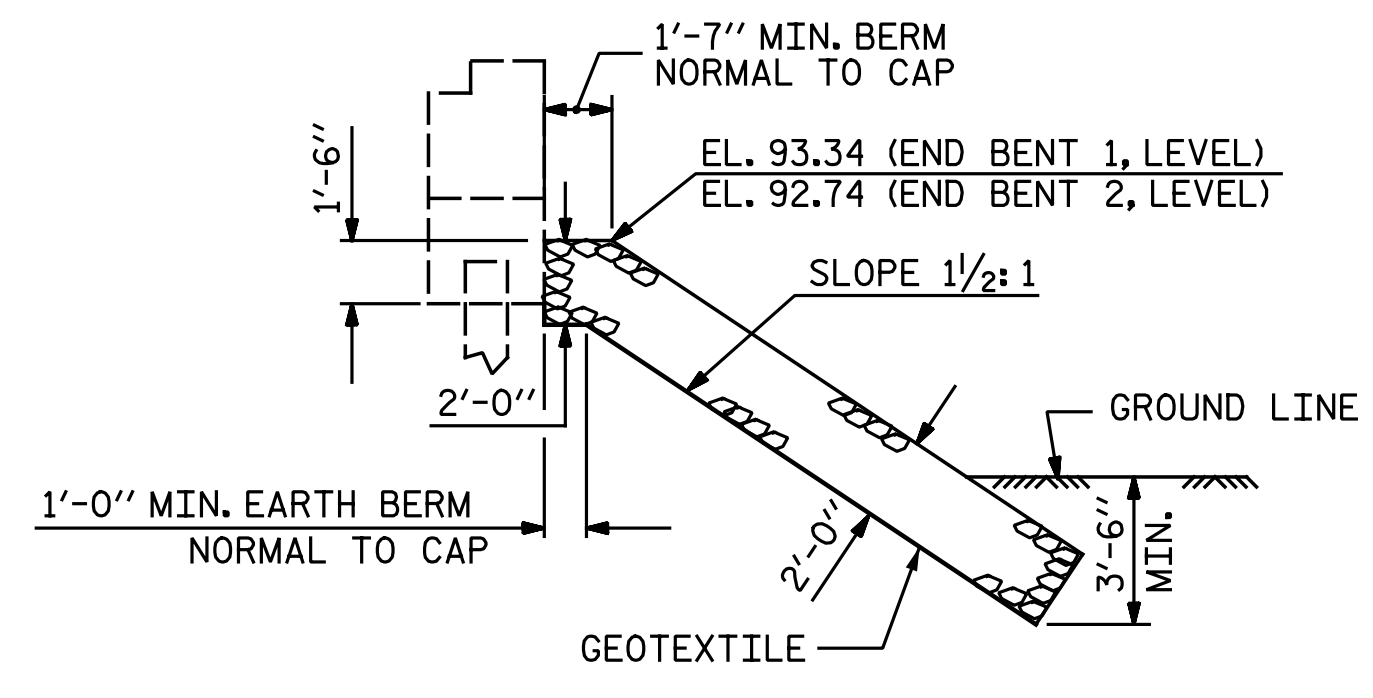
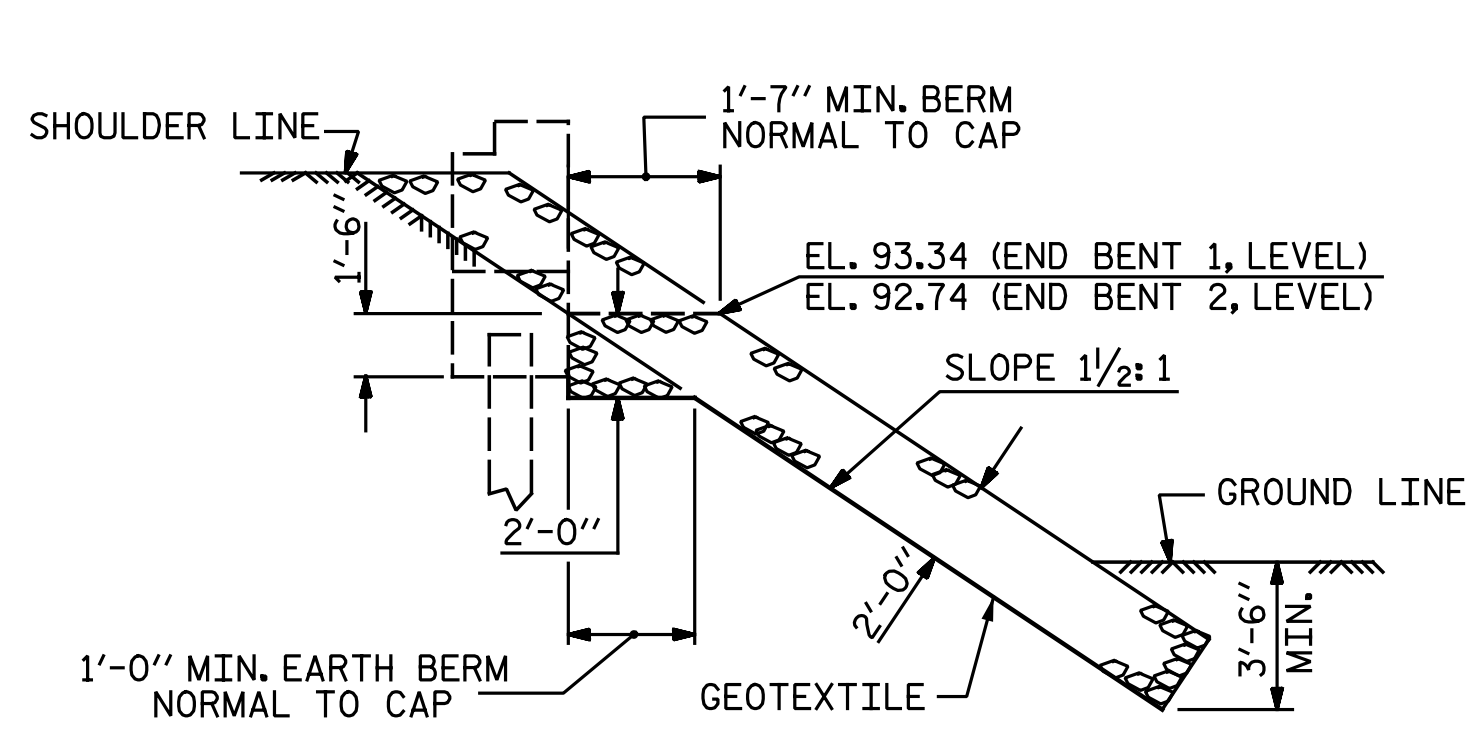
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUBSTRUCTURE INTEGRAL END BENT 2 DETAILS			
	DocuSigned by: 61EAF7523943466... 2/15/2017		REVISIONS			
	Michael Baker INTERNATIONAL		Michael Baker Engineering 8000 Regency Parkway, Suite 600 Cary, North Carolina 27518 NC License No.: F-1084			
	NO.	BY:	DATE:	NO.	BY:	DATE:
1			3			S3-39
2			4			TOTAL SHEETS 42



NOTES :

- PROPOSED CONCRETE SLOPE PROTECTION BETWEEN PROPOSED RETAINING WALL AND STREAM SHALL BE PLACED FOLLOWING REMOVAL OF EXISTING CONCRETE SLOPE PROTECTION AND CONSTRUCTION OF PROPOSED RETAINING WALL AND END BENT CAP.
- THE CONTRACTOR MAY SUBMIT AN ALTERNATE PLAN FOR REMOVAL OF EXISTING CONCRETE SLOPE PROTECTION AND PLACEMENT OF PROPOSED CONCRETE SLOPE PROTECTION TO THE ENGINEER FOR APPROVAL.
- STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT.
- MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS.
- SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET.
- CONCRETE SHALL BE CLASS "B".
- THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED.
- WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE.
- SLOPE PROTECTION SHALL BE POURED IN 5' STRIPS AS SHOWN IN THE "POURING DETAIL" WITH 2'-0" LONG #4 BARS PLACED ALONG THE SLOPE BETWEEN STRIPS AT 1'-6" MAXIMUM SPACING.
- SLOPE PROTECTION MAY BE POURED IN ALTERNATE 4' AND 5' STRIPS AS SHOWN IN THE "OPTIONAL POURING DETAIL" WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6".
- THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.
- THE COST OF THE REMOVAL OF EXISTING CONCRETE SLOPE PROTECTION SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

SHOULDER RIP RAP IS HIGHER THAN BERM RIP RAP



PROJECT NO. U-3330
NASH COUNTY
STATION: 61+03.00 -L-

ESTIMATED QUANTITIES				
BRIDGE @ STA. 61+03.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	4" SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	TONS	SQUARE YARDS	SQUARE YARDS	APPROX. L.F.
END BENT 1	385	430	205	410
END BENT 2	460	510	---	---

* QUANTITY SHOWN IS BASED ON 5' POURS.

DRAWN BY : T. M. GARRISON DATE : 3-22-17
CHECKED BY : V. A. PATEL DATE : 3-22-17

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RIP RAP AND SLOPE PROTECTION DETAILS

REVISIONS

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

SHEET NO.
S3-40
TOTAL SHEETS
42

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8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
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NOTES

AT THE CONTRACTOR'S OPTION, THE APPROACH SLAB MAY BE CAST MONOLITHICALLY WITH THE INTEGRAL END BENT DIAPHRAGM AND THE END SECTION OF BRIDGE DECK. IF CAST WITH THE INTEGRAL DIAPHRAGM, THE LAYERS OF ROOFING FELT SHALL BE OMITTED. IF CAST SEPARATE FROM THE INTEGRAL DIAPHRAGM, APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.

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

THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWED NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS. FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 4" Ø DRAINAGE PIPE, AND #78M STONE BACKFILL, SEE ROADWAY PLANS.

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

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.

FOR REINFORCING IN THE MONOLITHIC ISLAND, SEE "BRIDGE APPROACH SLAB DETAILS" SHEET.

BILL OF MATERIAL

STAGE I
FOR ONE APPROACH SLAB
(2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1E	78	#4	STR	22'-7"	1,177
A2	78	#4	STR	22'-4"	1,164
B1E	123	#5	STR	24'-2"	3,100
B2	123	#6	STR	24'-8"	4,557

REINFORCING STEEL	LBS.	4,277
EPOXY COATED REINFORCING STEEL	LBS.	5,721
CLASS AA CONCRETE	C. Y.	66.4

STAGE II
FOR ONE APPROACH SLAB
(2 REQ'D)

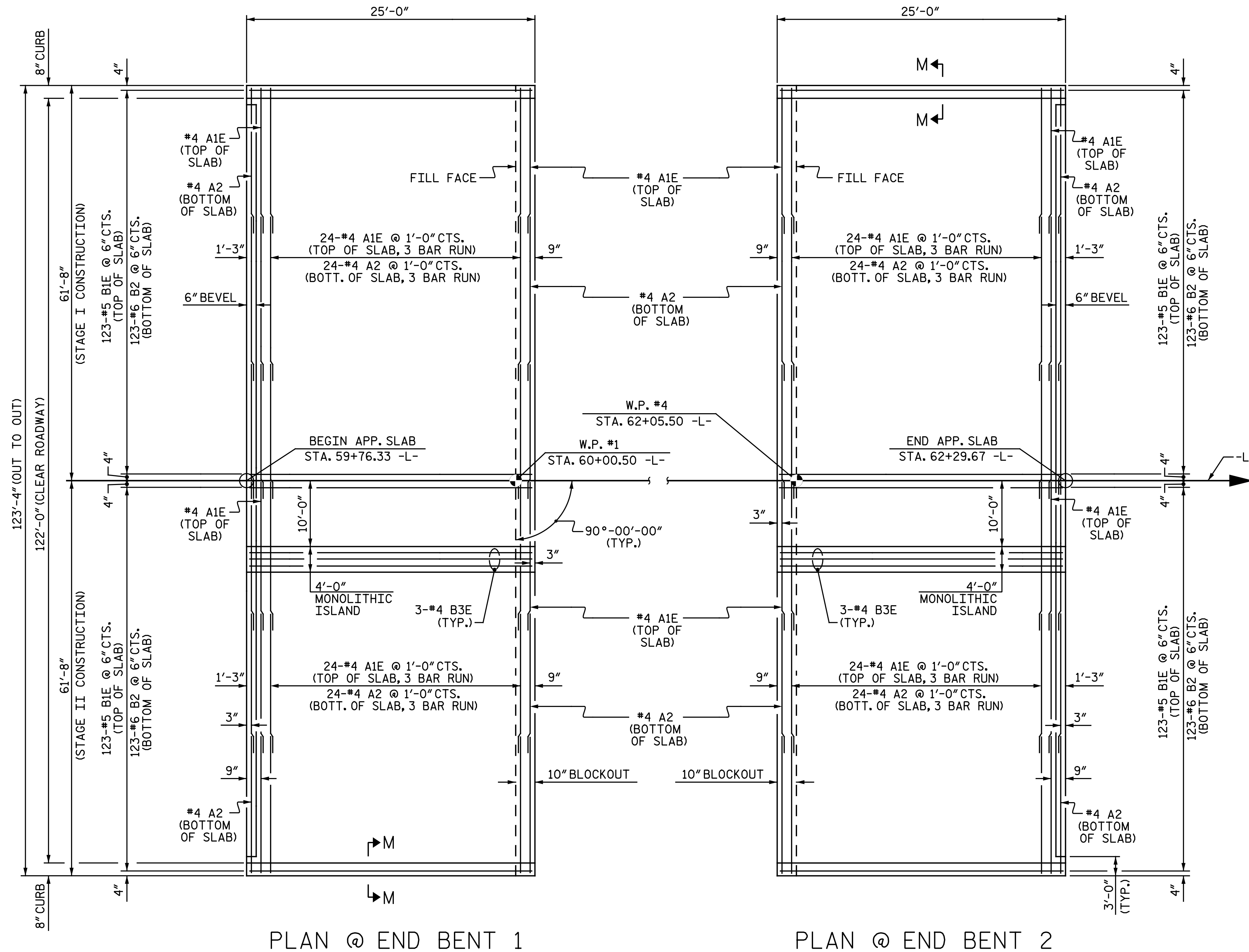
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1E	78	#4	STR	22'-7"	1,177
A2	78	#4	STR	22'-4"	1,164
B1E	123	#5	STR	24'-2"	3,100
B2	123	#6	STR	24'-8"	4,557

REINFORCING STEEL	LBS.	4,277
EPOXY COATED REINFORCING STEEL	LBS.	5,721
CLASS AA CONCRETE	C. Y.	66.4

FOR ONE MONOLITHIC ISLAND
(2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B3E	3	#4	STR	24'-8"	49
G1E	17	#4	STR	2'-10"	32

EPOXY COATED REINFORCING STEEL	LBS.	81
CLASS AA CONCRETE	C. Y.	1.3



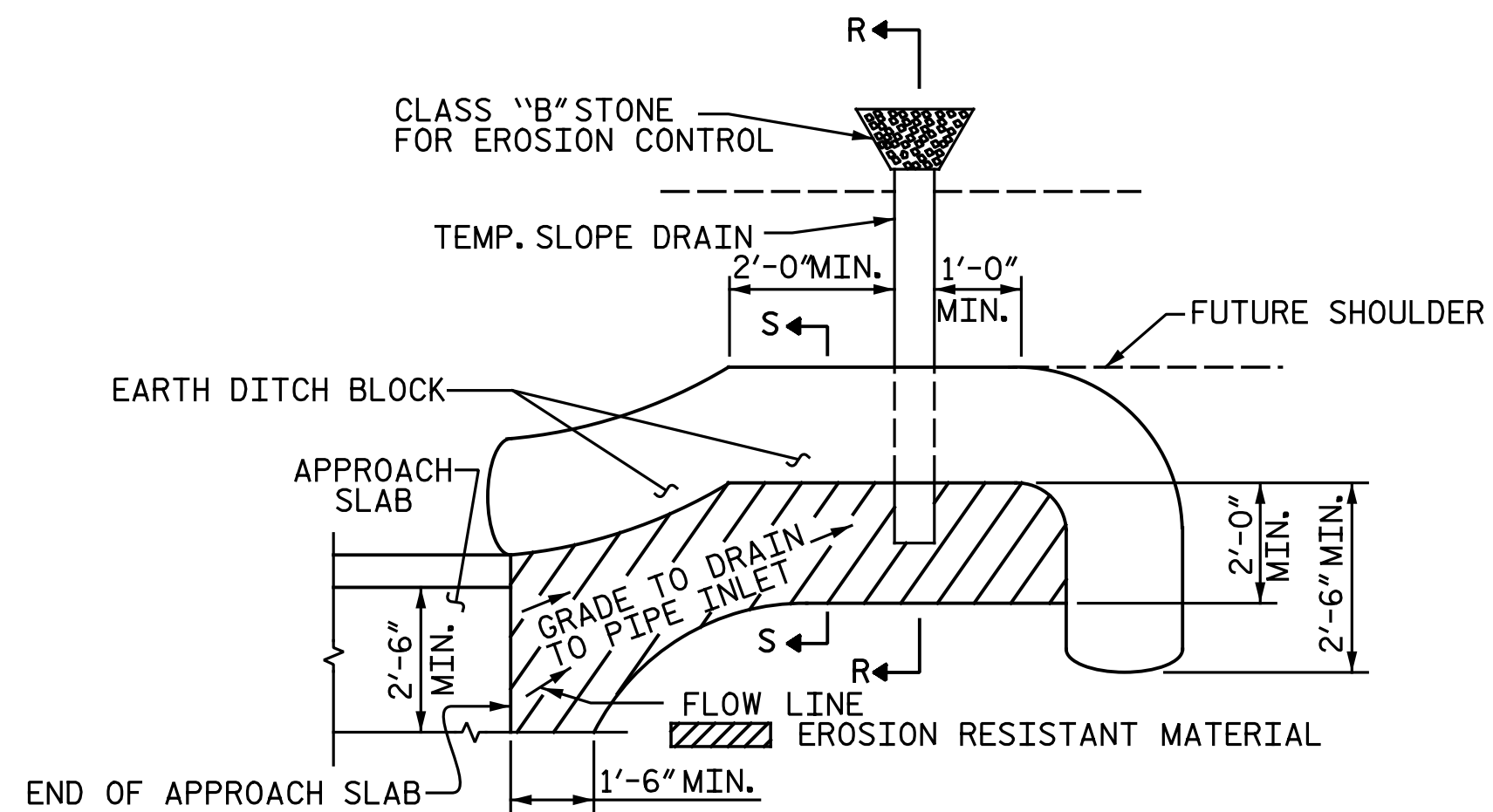
SPlice LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"

PROJECT NO. U-3330
NASH COUNTY
 STATION: 61+03.00 -L-

DRAWN BY : M. D. M. / N. B. S. DATE : 9-14-16
 CHECKED BY : A. H. SHARPE DATE : 9-27-16

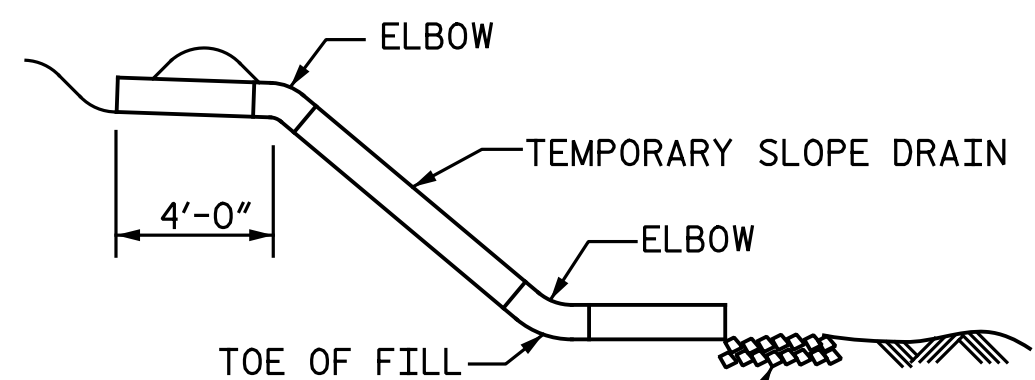
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		BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT						
		REVISIONS	SHEET NO. S3-41					
		NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
		1			3			42
		2			4			

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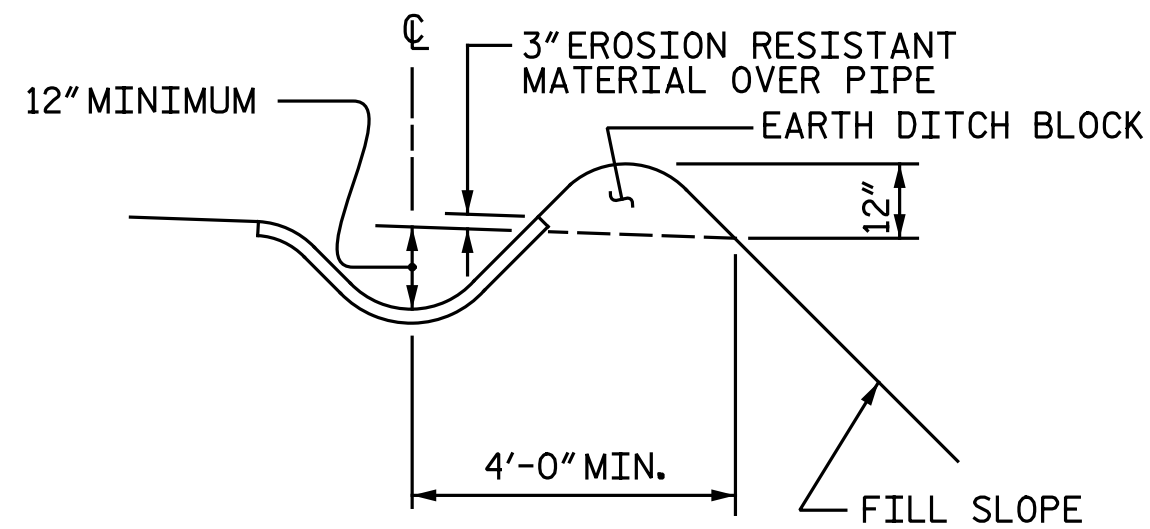


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

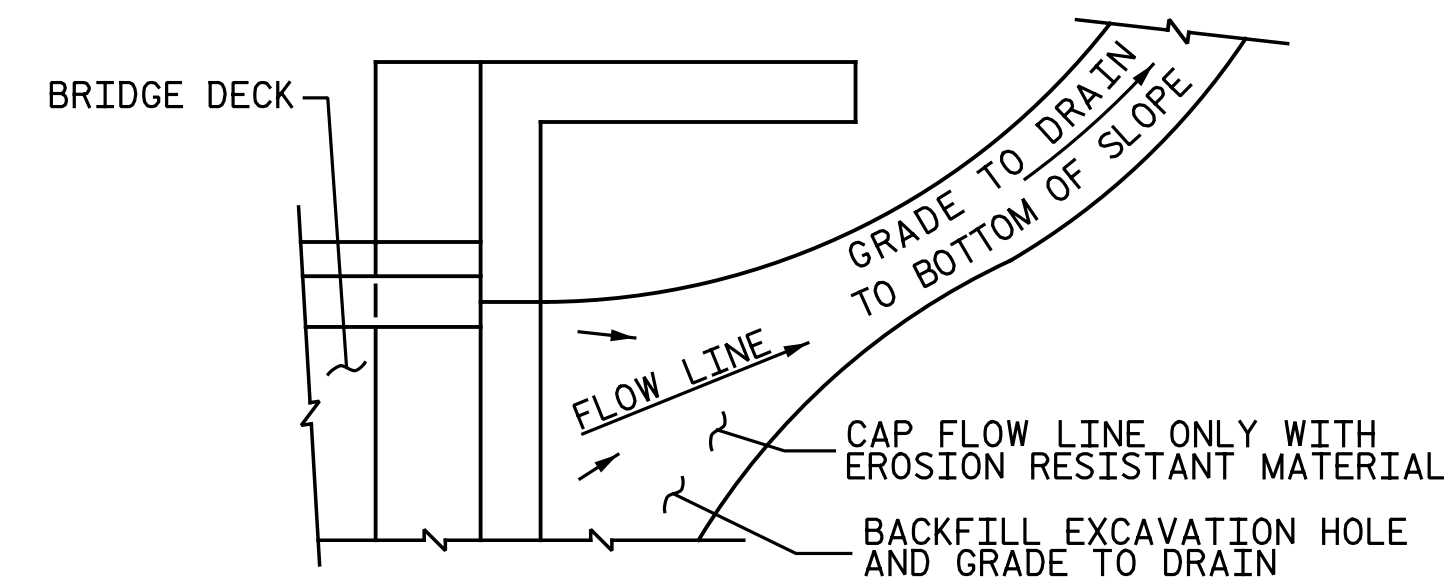
PLAN VIEW



SECTION R-R



SECTION S-S

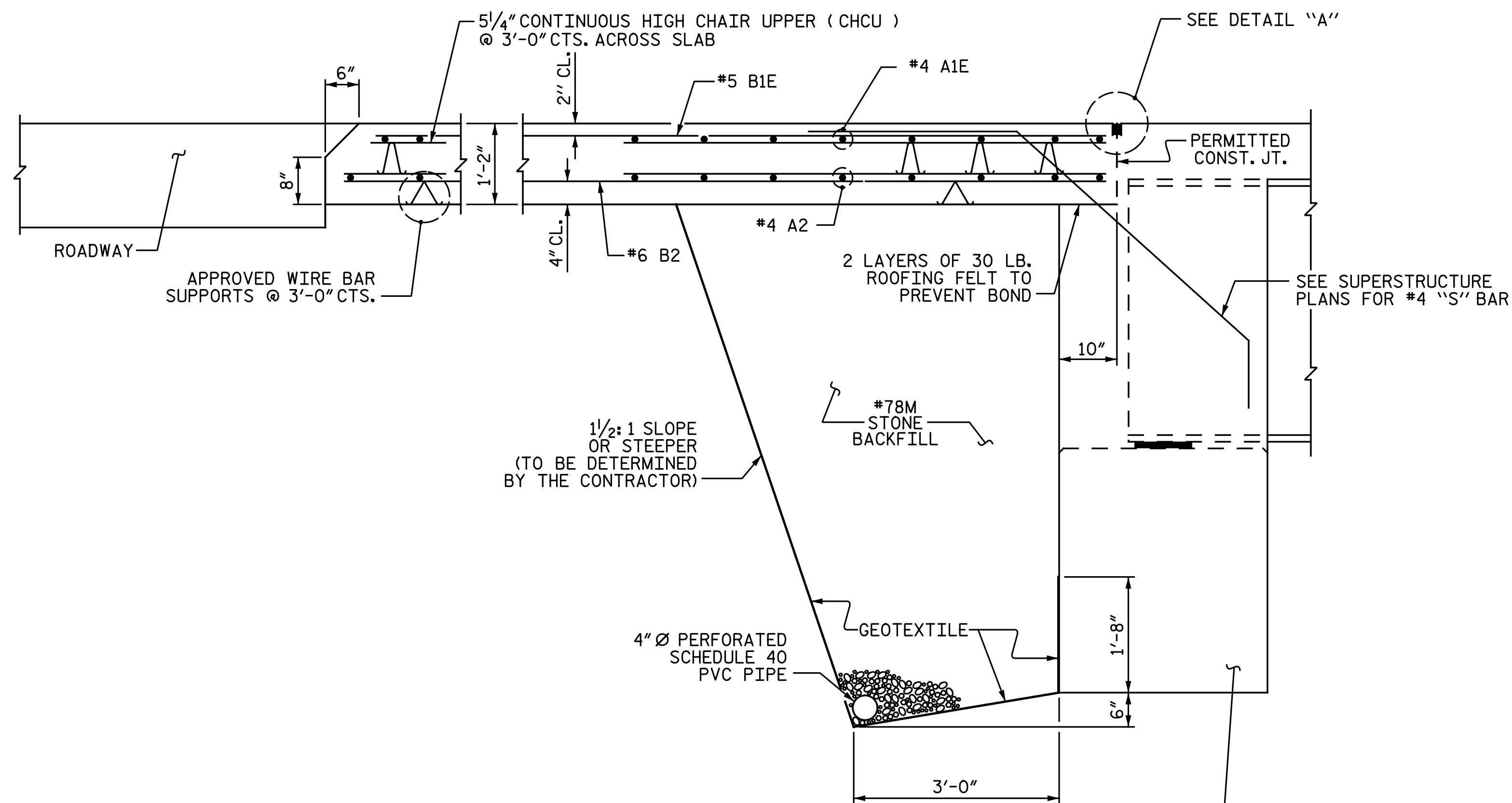


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL

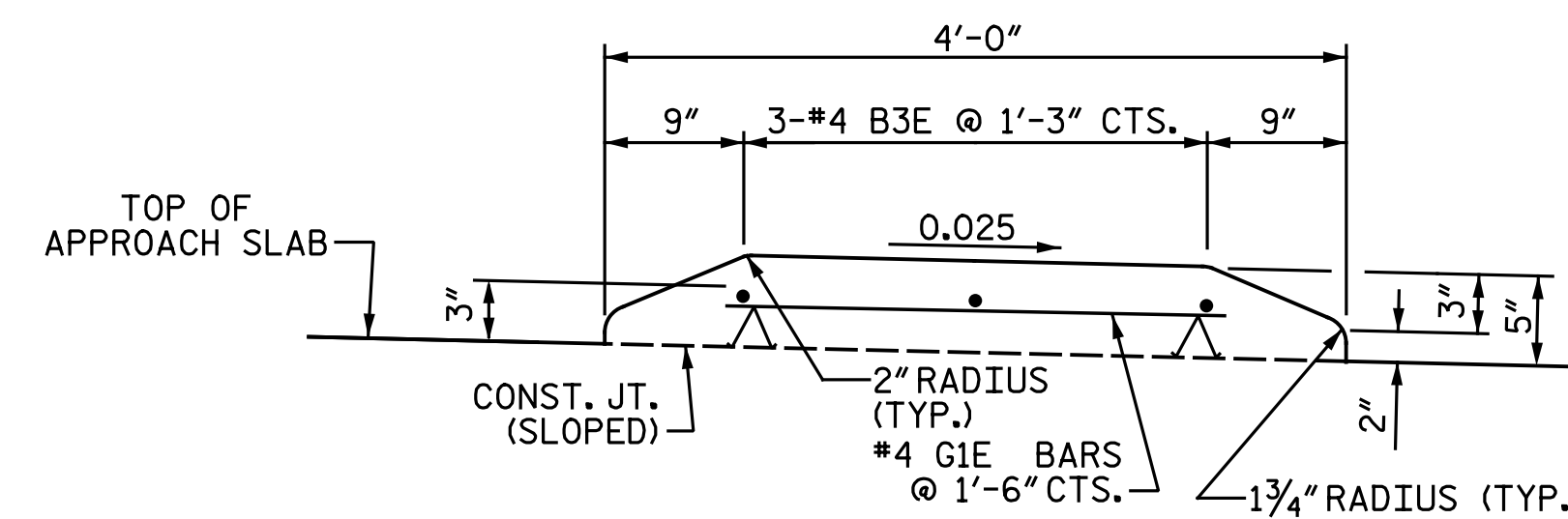
TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USE WHEN SHOULDER BERM GUTTER IS REQUIRED)

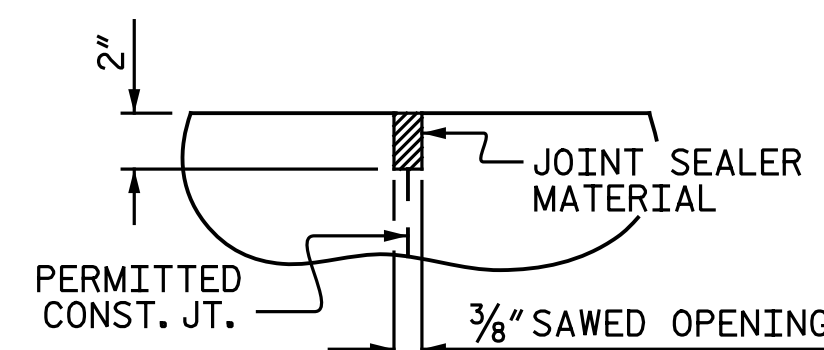


SECTION THRU SLAB

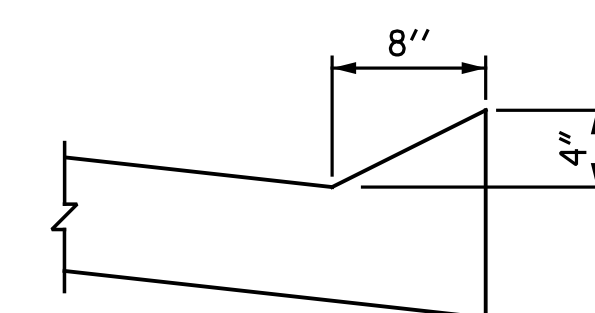
SEE INTEGRAL END BENT SHEETS FOR DETAILS



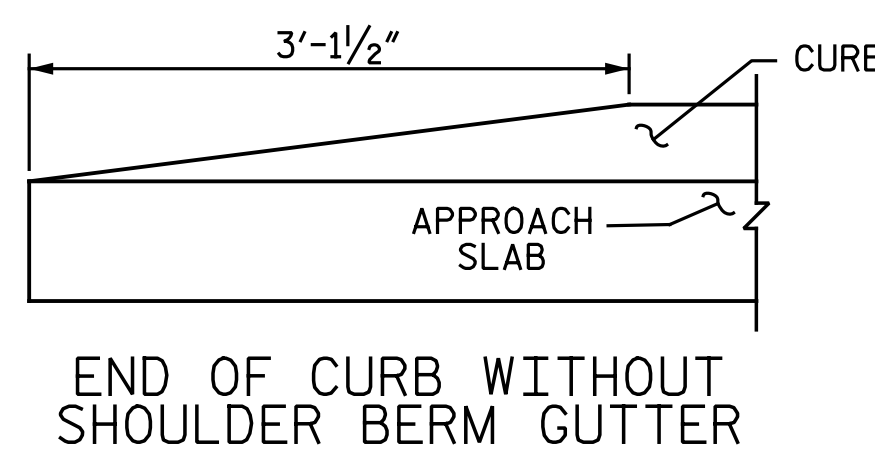
SECTION THRU MONOLITHIC ISLAND



DETAIL "A"





SECTION M-M



END OF CURB WITHOUT SHOULDER BERM GUTTER

PROJECT NO. U-3330
 NASH COUNTY
 STATION: 61+03.00 -L-

DRAWN BY : M. D. M. / N. B. S. DATE : 4-11-16
 CHECKED BY : A. H. SHARPE DATE : 9-27-16

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	REVISIONS					SHEET NO. S3-42 TOTAL SHEETS 42
	NO.	BY:	DATE:	NO.		
1			3			
2			4			

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

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN